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Supplementary Information for Marine bioregions in the Southwest Pacific to support integrated ocean governance

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Supplementary Material S1. Environmental and biological information download and pre-processing**.**

Name	Parameter	Link	Resolution	Treatment
General Bathymetric Chart (GEBCO)	• Bathymetry	http://www.gebco.net/	.00833333 degrees (~.9km)	
OceanColor Aqua MODIS Products	• Surface Monthly Chlorophyll-a Concentration • maximum • mean • minimum • range • Surface Monthly Sea Surface Temperature • maximum • mean • minimum • range	http://oceancolor.gsfc.nasa.gov/	.04166666 degrees (~4km)	Summary statistics from July 2002 to April 2016 were calculated (maximum, mean, minimum, and range).
Bio-ORACLE 2009 (Tyberghein et al. 2012)	• Surface Calcite Concentration • Surface Dissolved Oxygen Concentration • Surface Nitrate Concentration • Photosynthetically Available Radiation ▪ maximum ▪ mean • Surface pH • Surface Phosphorus Concentration • Surface Salinity • Surface Silicate Concentration	http://www.bio-oracle.org/	.08333333 deg (~9km)	All remotely-sensed datasets were resampled to 5 arc minute resolution (approximately 9km), all in-situ datasets were interpolated with DIVA (data interpolating variational analysis) using the variational inverse method. Finally a uniform land mask was applied.
CSIRO Atlas of Regional Seas (CARS)	• Depth of 20 degree isotherm	www.marine.csiro.au/~dunn/cars2009	0.5 degrees	Each dataset is an extraction from the World Ocean Database (2008).

	• Dynamic Height with regard to 2000m • Mixed layer depth • Nitrate concentration at 1000m depth • Oxygen concentration at 1000m depth • Phospate Concentration at 1000m depth • Salinity at 1000m depth • Silicate Concentration at 1000m depth • Temperature ○ 30m depth ○ 200m depth ○ 1000m depth		(~55km)	Datasets were first quality controlled, then interpolated using an adaptive-lengthscale loess mapper to maximise resolution in data-rich regions, and the mapper's "BAR" algorithm takes account of topographic barriers. The NetCDF files contain data at 79 depths, we used 30m, 200m, and 1000m. The depth of 20°C isotherm was calculated using the seawater temperature depth series along with the NumPy linear interpolation algorithm (numpy.interp). The 1000m seawater temperature, depth of 20°C isotherm, and Dynamic Height with regard to 2000m did not have complete coverage so they were filled using the GDAL fillnodata interpolation algorithm with default settings. The version of CARS that was used was 2009.
GADM database of Global Administrative Areas	• Distance from land	http://www.gadm.org/	.00833333 degrees (~.9km)	
Shoreline data	• Mean high water shoreline	https://www.soest.hawaii.edu/pwessel/gshhg/	NA	GSHHG version 2.3.6
Exclusive Economic Zones (EEZs)	• Maritime boundaries	http://www.marineregions.org/eez.php	NA	
Institute for Marine Remote Sensing (IMaRS) Millennium Coral Reef Mapping	• Morphological classes of coral reef ecosystems	http://imars.marine.usf.edu/MC/output_south_pacific.html	30 m	

Supplementary Material S2. Species list of modelled species.

Genus	*Species*	Model Category
Abudefduf	*sexfasciatus*	Fish
Abudefduf	*vaigiensis*	Fish
Acanthochromis	*polyacanthus*	Fish
Acanthurus	*achilles*	Fish
Acanthurus	*albipectoralis*	Fish
Acanthurus	*auranticavus*	Fish
Acanthurus	*blochii*	Fish
Acanthurus	*dussumieri*	Fish
Acanthurus	*grammoptilus*	Fish
Acanthurus	*guttatus*	Fish
Acanthurus	*leucocheilus*	Fish
Acanthurus	*lineatus*	Fish
Acanthurus	*maculiceps*	Fish
Acanthurus	*mata*	Fish
Acanthurus	*nigricans*	Fish
Acanthurus	*nigricauda*	Fish
Acanthurus	*nigrofuscus*	Fish
Acanthurus	*nigroris*	Fish
Acanthurus	*olivaceus*	Fish
Acanthurus	*pyroferus*	Fish
Acanthurus	*sp*	Fish
Acanthurus	*thompsoni*	Fish
Acanthurus	*triostegus*	Fish
Acanthurus	*xanthopterus*	Fish
Aethaloperca	*rogaa*	Fish
Amblyglyphidodon	*aureus*	Fish
Amblyglyphidodon	*curacao*	Fish
Amblyglyphidodon	*leucogaster*	Fish
Amblyglyphidodon	*melanopterus*	Fish
Amblyglyphidodon	*orbicularis*	Fish
Amphiprion	*barberi*	Fish
Amphiprion	*chrysopterus*	Fish
Amphiprion	*clarkii*	Fish
Amphiprion	*melanopus*	Fish
Amphiprion	*perideraion*	Fish
Anampses	*caeruleopunctatus*	Fish
Anampses	*melanurus*	Fish
Anampses	*meleagrides*	Fish
Anampses	*neoguinaicus*	Fish
Anampses	*twistii*	Fish
Anyperodon	*leucogrammicus*	Fish
Aphareus	*furca*	Fish

Apolemichthys	*griffisi*	Fish
Apolemichthys	*trimaculatus*	Fish
Apolemichthys	*xanthopunctatus*	Fish
Aprion	*virescens*	Fish
Aulostomus	*chinensis*	Fish
Balistapus	*undulatus*	Fish
Balistoides	*conspicillum*	Fish
Balistoides	*viridescens*	Fish
Bodianus	*anthioides*	Fish
Bodianus	*axillaris*	Fish
Bodianus	*dictynna*	Fish
Bodianus	*loxozonus*	Fish
Bodianus	*mesothorax*	Fish
Bodianus	*prognathus*	Fish
Bolbometopon	*muricatum*	Fish
Caesio	*caerulaurea*	Fish
Caesio	*cuning*	Fish
Caesio	*lunaris*	Fish
Caesio	*teres*	Fish
Calotomus	*carolinus*	Fish
Carangoides	*ferdau*	Fish
Carangoides	*orthogrammus*	Fish
Carangoides	*plagiotaenia*	Fish
Caranx	*ignobilis*	Fish
Caranx	*lugubris*	Fish
Caranx	*melampygus*	Fish
Caranx	*papuensis*	Fish
Caranx	*sexfasciatus*	Fish
Centropyge	*bicolor*	Fish
Centropyge	*bispinosa*	Fish
Centropyge	*flavissima*	Fish
Centropyge	*heraldi*	Fish
Centropyge	*loriculus*	Fish
Centropyge	*nox*	Fish
Centropyge	*tibicen*	Fish
Centropyge	*vrolikii*	Fish
Cephalopholis	*argus*	Fish
Cephalopholis	*cyanostigma*	Fish
Cephalopholis	*leopardus*	Fish
Cephalopholis	*miniata*	Fish
Cephalopholis	*sexmaculata*	Fish
Cephalopholis	*spiloparaea*	Fish
Cephalopholis	*urodeta*	Fish
Cetoscarus	*ocellatus*	Fish
Chaetodon	*auriga*	Fish

Chaetodon	*baronessa*	Fish
Chaetodon	*bennetti*	Fish
Chaetodon	*citrinellus*	Fish
Chaetodon	*ephippium*	Fish
Chaetodon	*flavirostris*	Fish
Chaetodon	*kleinii*	Fish
Chaetodon	*lineolatus*	Fish
Chaetodon	*lunula*	Fish
Chaetodon	*lunulatus*	Fish
Chaetodon	*melannotus*	Fish
Chaetodon	*mertensii*	Fish
Chaetodon	*meyerii*	Fish
Chaetodon	*multicinctus*	Fish
Chaetodon	*ornatissimus*	Fish
Chaetodon	*oxycephalus*	Fish
Chaetodon	*pelewensis*	Fish
Chaetodon	*plebeius*	Fish
Chaetodon	*punctatofasciatus*	Fish
Chaetodon	*quadromaculatus*	Fish
Chaetodon	*rafflesii*	Fish
Chaetodon	*reticulatus*	Fish
Chaetodon	*semeion*	Fish
Chaetodon	*speculum*	Fish
Chaetodon	*trifascialis*	Fish
Chaetodon	*ulietensis*	Fish
Chaetodon	*unimaculatus*	Fish
Chaetodon	*vadabundus*	Fish
Chaetodontoplus	*mesoleucus*	Fish
Cheilinus	*chlorourus*	Fish
Cheilinus	*fasciatus*	Fish
Cheilinus	*oxycephalus*	Fish
Cheilinus	*perspicillatus*	Fish
Cheilinus	*trilobatus*	Fish
Cheilinus	*undulatus*	Fish
Choerodon	*anchorago*	Fish
Chlorurus	*bleekeri*	Fish
Chlorurus	*frontalis*	Fish
Chlorurus	*japanensis*	Fish
Chlorurus	*microrhinos*	Fish
Chlorurus	*sordidus*	Fish
Chromis	*acares*	Fish
Chromis	*agilis*	Fish
Chromis	*alpha*	Fish
Chromis	*amboinensis*	Fish
Chromis	*analis*	Fish

Chromis	*atripectoralis*	Fish
Chromis	*atripes*	Fish
Chromis	*chrysura*	Fish
Chromis	*delta*	Fish
Chromis	*flavomaculata*	Fish
Chromis	*iomelas*	Fish
Chromis	*lepidolepis*	Fish
Chromis	*margaritifer*	Fish
Chromis	*retrofasciata*	Fish
Chromis	*ternatensis*	Fish
Chromis	*vanderbilti*	Fish
Chromis	*viridis*	Fish
Chromis	*weberi*	Fish
Chromis	*xanthochira*	Fish
Chromis	*xanthura*	Fish
Chrysiptera	*biocellata*	Fish
Chrysiptera	*brownriggii*	Fish
Chrysiptera	*cyanea*	Fish
Chrysiptera	*rollandi*	Fish
Chrysiptera	*talboti*	Fish
Chrysiptera	*taupou*	Fish
Chrysiptera	*traceyi*	Fish
Cirrhilabrus	*exquisitus*	Fish
Cirrhilabrus	*katherinae*	Fish
Cirrhilabrus	*punctatus*	Fish
Cirrhilabrus	*scottorum*	Fish
Cirrhilabrus	*sp*	Fish
Cirrhitichthys	*falco*	Fish
Cirrhitichthys	*oxycephalus*	Fish
Cirrhitops	*hubbardi*	Fish
Cirrhitus	*pinnulatus*	Fish
Coris	*aygula*	Fish
Coris	*batuensis*	Fish
Coris	*centralis*	Fish
Coris	*dorsomacula*	Fish
Coris	*gaimard*	Fish
Ctenochaetus	*binotatus*	Fish
Ctenochaetus	*cyanocheilus*	Fish
Ctenochaetus	*flavicauda*	Fish
Ctenochaetus	*hawaiiensis*	Fish
Ctenochaetus	*marginatus*	Fish
Ctenochaetus	*sp.*	Fish
Ctenochaetus	*striatus*	Fish
Ctenochaetus	*strigosus*	Fish
Ctenochaetus	*tominiensis*	Fish

Dascyllus	*albisella*	Fish
Dascyllus	*aruanus*	Fish
Dascyllus	*auripinnis*	Fish
Dascyllus	*flavicaudus*	Fish
Dascyllus	*reticulatus*	Fish
Dascyllus	*trimaculatus*	Fish
Decapterus	*macarellus*	Fish
Diodon	*hystrix*	Fish
Diproctacanthus	*xanthurus*	Fish
Dischistodus	*melanotus*	Fish
Elagatis	*bipinnulata*	Fish
Epibulus	*insidiator*	Fish
Epinephelus	*caeruleopunctatus*	Fish
Epinephelus	*fasciatus*	Fish
Epinephelus	*fuscoguttatus*	Fish
Epinephelus	*hexagonatus*	Fish
Epinephelus	*howlandi*	Fish
Epinephelus	*macrospilos*	Fish
Epinephelus	*maculatus*	Fish
Epinephelus	*melanostigma*	Fish
Epinephelus	*merra*	Fish
Epinephelus	*ongus*	Fish
Epinephelus	*polyphekadion*	Fish
Epinephelus	*retouti*	Fish
Epinephelus	*sp*	Fish
Epinephelus	*spilotoceps*	Fish
Epinephelus	*tauvina*	Fish
Fistularia	*commersonii*	Fish
Forcipiger	*flavissimus*	Fish
Forcipiger	*longirostris*	Fish
Genicanthus	*melanospilos*	Fish
Gnathodentex	*aureolineatus*	Fish
Gomphosus	*varius*	Fish
Gracila	*albomarginata*	Fish
Halichoeres	*biocellatus*	Fish
Halichoeres	*chloropterus*	Fish
Halichoeres	*chrysus*	Fish
Halichoeres	*claudia*	Fish
Halichoeres	*hortulanus*	Fish
Halichoeres	*margaritaceus*	Fish
Halichoeres	*marginatus*	Fish
Halichoeres	*melanurus*	Fish
Halichoeres	*melasmapomus*	Fish
Halichoeres	*ornatissimus*	Fish
Halichoeres	*prosopeion*	Fish

Halichoeres	*richmondi*	Fish
Halichoeres	*scapularis*	Fish
Halichoeres	*sp*	Fish
Halichoeres	*trimaculatus*	Fish
Hemitaurichthys	*polylepis*	Fish
Hemitaurichthys	*thompsoni*	Fish
Hemigymnus	*fasciatus*	Fish
Hemigymnus	*melapterus*	Fish
Heniochus	*acuminatus*	Fish
Heniochus	*chrysostomus*	Fish
Heniochus	*monoceros*	Fish
Heniochus	*singularius*	Fish
Heniochus	*varius*	Fish
Hipposcarus	*longiceps*	Fish
Hologymnosus	*annulatus*	Fish
Hologymnosus	*doliatus*	Fish
Kyphosus	*bigibbus*	Fish
Kyphosus	*cinerascens*	Fish
Kyphosus	*sp*	Fish
Kyphosus	*vaigiensis*	Fish
Labrichthys	*unilineatus*	Fish
Labrid	*sp*	Fish
Labroides	*bicolor*	Fish
Labroides	*dimidiatus*	Fish
Labroides	*pectoralis*	Fish
Labroides	*rubrolabiatus*	Fish
Labropsis	*australis*	Fish
Labropsis	*micronesica*	Fish
Labropsis	*xanthonota*	Fish
Lepidozygus	*tapeinosoma*	Fish
Lethrinus	*atkinsoni*	Fish
Lethrinus	*erythracanthus*	Fish
Lethrinus	*erythropterus*	Fish
Lethrinus	*harak*	Fish
Lethrinus	*obsoletus*	Fish
Lethrinus	*olivaceus*	Fish
Lethrinus	*sp*	Fish
Lethrinus	*xanthochilus*	Fish
Lutjanus	*biguttatus*	Fish
Lutjanus	*bohar*	Fish
Lutjanus	*ehrenbergii*	Fish
Lutjanus	*fulviflamma*	Fish
Lutjanus	*fulvus*	Fish
Lutjanus	*gibbus*	Fish
Lutjanus	*kasmira*	Fish

Lutjanus	*monostigma*	Fish
Lutjanus	*rivulatus*	Fish
Lutjanus	*semicinctus*	Fish
Luzonichthys	*sp*	Fish
Macolor	*macularis*	Fish
Macolor	*niger*	Fish
Macropharyngodon	*meleagris*	Fish
Macropharyngodon	*negrosensis*	Fish
Melichthys	*niger*	Fish
Melichthys	*vidua*	Fish
Monotaxis	*grandoculis*	Fish
Mulloidichthys	*flavolineatus*	Fish
Mulloidichthys	*vanicolensis*	Fish
Naso	*annulatus*	*Fish*
Naso	*brachycentron*	*Fish*
Naso	*brevirostris*	*Fish*
Naso	*caesius*	*Fish*
Naso	*hexacanthus*	*Fish*
Naso	*lituratus*	*Fish*
Naso	*tonganus*	*Fish*
Naso	*tuberosus*	*Fish*
Naso	*unicornis*	*Fish*
Naso	*vlamingii*	*Fish*
Nemateleotris	*magnifica*	*Fish*
Neocirrhites	*armatus*	*Fish*
Neoglyphidodon	*carlsoni*	*Fish*
Neoglyphidodon	*melas*	*Fish*
Neoglyphidodon	*nigroris*	*Fish*
Neoglyphidodon	*thoracotaeniatus*	*Fish*
Novaculichthys	*taeniourus*	*Fish*
Odonus	*niger*	*Fish*
Ostracion	*cubicus*	*Fish*
Ostracion	*meleagris*	*Fish*
Ostracion	*solorensis*	*Fish*
Oxycheilinus	*bimaculatus*	*Fish*
Oxycheilinus	*celebicus*	*Fish*
Oxycheilinus	*digramma*	*Fish*
Oxycheilinus	*orientalis*	*Fish*
Oxycheilinus	*unifasciatus*	*Fish*
Paracanthurus	*hepatus*	*Fish*
Paracheilinus	*filamentosus*	*Fish*
Paracirrhites	*arcatus*	*Fish*
Paracirrhites	*bicolor*	*Fish*
Paracirrhites	*forsteri*	*Fish*
Paracirrhites	*hemistictus*	*Fish*

Paracirrhites	*nisus*	*Fish*
Paracirrhites	*xanthus*	*Fish*
Parupeneus	*barberinoides*	*Fish*
Parupeneus	*barberinus*	*Fish*
Parupeneus	*ciliatus*	*Fish*
Parupeneus	*crassilabris*	*Fish*
Parupeneus	*cyclostomus*	*Fish*
Parupeneus	*indicus*	*Fish*
Parupeneus	*insularis*	*Fish*
Parupeneus	*multifasciatus*	*Fish*
Parupeneus	*pleurostigma*	*Fish*
Parupeneus	*spilurus*	*Fish*
Parupeneus	*trifasciatus*	*Fish*
Pentapodus	*trivittatus*	*Fish*
Plectorhinchus	*chaetodonoides*	*Fish*
Plectorhinchus	*vittatus*	*Fish*
Plectroglyphidodon	*dickii*	*Fish*
Plectroglyphidodon	*flaviventris*	*Fish*
Plectroglyphidodon	*imparipennis*	*Fish*
Plectroglyphidodon	*johnstonianus*	*Fish*
Plectroglyphidodon	*lacrymatus*	*Fish*
Plectroglyphidodon	*phoenixensis*	*Fish*
Plectropomus	*areolatus*	*Fish*
Plectropomus	*laevis*	*Fish*
Plectropomus	*leopardus*	*Fish*
Plectropomus	*maculatus*	*Fish*
Pomacanthus	*imperator*	*Fish*
Pomacanthus	*navarchus*	*Fish*
Pomacanthus	*semicirculatus*	*Fish*
Pomacanthus	*sexstriatus*	*Fish*
Pomacentrid	*sp*	*Fish*
Pomacentrus	*adelus*	*Fish*
Pomacentrus	*amboinensis*	*Fish*
Pomacentrus	*bankanensis*	*Fish*
Pomacentrus	*brachialis*	*Fish*
Pomacentrus	*callainus*	*Fish*
Pomacentrus	*coelestis*	*Fish*
Pomacentrus	*fuscidorsalis*	*Fish*
Pomacentrus	*imitator*	*Fish*
Pomacentrus	*lepidogenys*	*Fish*
Pomacentrus	*maafu*	*Fish*
Pomacentrus	*moluccensis*	*Fish*
Pomacentrus	*nigromanus*	*Fish*
Pomacentrus	*nigromarginatus*	*Fish*
Pomacentrus	*pavo*	*Fish*

Pomacentrus	*philippinus*	*Fish*
Pomacentrus	*reidi*	*Fish*
Pomacentrus	*spilotoceps*	*Fish*
Pomacentrus	*vaiuli*	*Fish*
Pomachromis	*exilis*	*Fish*
Pomachromis	*richardsoni*	*Fish*
Pseudanthias	*bartlettorum*	*Fish*
Pseudanthias	*cooperi*	*Fish*
Pseudanthias	*dispar*	*Fish*
Pseudanthias	*huchtii*	*Fish*
Pseudanthias	*olivaceus*	*Fish*
Pseudanthias	*pascalus*	*Fish*
Pseudanthias	*pleurotaenia*	*Fish*
Pseudanthias	*squamipinnis*	*Fish*
Pseudanthias	*tuka*	*Fish*
Pseudobalistes	*flavimarginatus*	*Fish*
Pseudocheilinus	*evanidus*	*Fish*
Pseudocheilinus	*hexataenia*	*Fish*
Pseudocheilinus	*octotaenia*	*Fish*
Pseudocheilinus	*tetrataenia*	*Fish*
Pseudocoris	*yamashiroi*	*Fish*
Pseudodax	*moluccanus*	*Fish*
Pseudojuloides	*cerasinus*	*Fish*
Ptereleotris	*evides*	*Fish*
Ptereleotris	*heteroptera*	*Fish*
Ptereleotris	*microlepis*	*Fish*
Pterocaesio	*marri*	*Fish*
Pterocaesio	*pisang*	*Fish*
Pterocaesio	*tile*	*Fish*
Pterocaesio	*trilineata*	*Fish*
Pygoplites	*diacanthus*	*Fish*
Rhinecanthus	*aculeatus*	*Fish*
Rhinecanthus	*rectangulus*	*Fish*
Scarid	*sp*	*Fish*
Scarus	*altipinnis*	*Fish*
Scarus	*chameleon*	*Fish*
Scarus	*dimidiatus*	*Fish*
Scarus	*festivus*	*Fish*
Scarus	*flavipectoralis*	*Fish*
Scarus	*forsteni*	*Fish*
Scarus	*frenatus*	*Fish*
Scarus	*ghobban*	*Fish*
Scarus	*globiceps*	*Fish*
Scarus	*longipinnis*	*Fish*
Scarus	*niger*	*Fish*

Scarus	*oviceps*	*Fish*
Scarus	*prasiognathos*	*Fish*
Scarus	*psittacus*	*Fish*
Scarus	*quoyi*	*Fish*
Scarus	*rivulatus*	*Fish*
Scarus	*rubroviolaceus*	*Fish*
Scarus	*schlegeli*	*Fish*
Scarus	*sp*	*Fish*
Scarus	*spinus*	*Fish*
Scarus	*tricolor*	*Fish*
Scolopsis	*bilineata*	*Fish*
Scolopsis	*ciliata*	*Fish*
Scolopsis	*lineata*	*Fish*
Scolopsis	*margaritifera*	*Fish*
Scolopsis	*temporalis*	*Fish*
Scolopsis	*trilineata*	*Fish*
Scomberoides	*lysan*	*Fish*
Serranocirrhitus	*latus*	*Fish*
Siganus	*argenteus*	*Fish*
Siganus	*corallinus*	*Fish*
Siganus	*doliatus*	*Fish*
Siganus	*guttatus*	*Fish*
Siganus	*puellus*	*Fish*
Siganus	*punctatissimus*	*Fish*
Siganus	*punctatus*	*Fish*
Siganus	*spinus*	*Fish*
Siganus	*stellatus*	*Fish*
Siganus	*uspi*	*Fish*
Siganus	*vermiculatus*	*Fish*
Siganus	*vulpinus*	*Fish*
Sphyraena	*barracuda*	*Fish*
Sphyraena	*helleri*	*Fish*
Sphyraena	*qenie*	*Fish*
Stegastes	*albifasciatus*	*Fish*
Stegastes	*aureus*	*Fish*
Stegastes	*fasciolatus*	*Fish*
Stegastes	*gascoynei*	*Fish*
Stegastes	*nigricans*	*Fish*
Stethojulis	*balteata*	*Fish*
Stethojulis	*bandanensis*	*Fish*
Stethojulis	*strigiventer*	*Fish*
Stethojulis	*trilineata*	*Fish*
Sufflamen	*bursa*	*Fish*
Sufflamen	*chrysopterum*	*Fish*
Sufflamen	*fraenatum*	*Fish*

Thalassoma	*amblycephalum*	*Fish*
Thalassoma	*duperrey*	*Fish*
Thalassoma	*hardwicke*	*Fish*
Thalassoma	*jansenii*	*Fish*
Thalassoma	*lunare*	*Fish*
Thalassoma	*lutescens*	*Fish*
Thalassoma	*nigrofasciatum*	*Fish*
Thalassoma	*purpureum*	*Fish*
Thalassoma	*quinquevittatum*	*Fish*
Thalassoma	*trilobatum*	*Fish*
Variola	*albimarginata*	*Fish*
Variola	*louti*	*Fish*
Xanthichthys	*auromarginatus*	*Fish*
Zanclus	*cornutus*	*Fish*
Zebrasoma	*flavescens*	*Fish*
Zebrasoma	*rostratum*	*Fish*
Zebrasoma	*scopas*	*Fish*
Zebrasoma	*velifer*	*Fish*

Scleractinian corals

Genus	**Species**	**Model Category**
Acanthastrea	*echinata*	Coral
Acropora	*abrotanoides*	Coral
Acropora	*aculeus*	Coral
Acropora	*austera*	Coral
Acropora	*caroliniana*	Coral
Acropora	*cerealis*	Coral
Acropora	*humilis*	Coral
Acropora	*clathrata*	Coral
Acropora	*cytherea*	Coral
Acropora	*digitifera*	Coral
Acropora	*florida*	Coral
Acropora	*gemmifera*	Coral
Acropora	*granulosa*	Coral
Acropora	*hyacinthus*	Coral
Acropora	*latistella*	Coral
Acropora	*listeri*	Coral
Acropora	*microclados*	Coral
Acropora	*millepora*	Coral
Acropora	*monticulosa*	Coral
Acropora	*nana*	Coral
Acropora	*nasuta*	Coral
Acropora	*paniculata*	Coral
Acropora	*robusta*	Coral
Astreopora	*gracilis*	Coral

Astreopora	*listeri*	Coral
Astreopora	*myriophthalma*	Coral
Astreopora	*randalli*	Coral
Astreopora	*suggesta*	Coral
Coscinaraea	*columna*	Coral
Ctenactis	*echinata*	Coral
Diploastrea	*heliopora*	Coral
Echinophyllia	*aspera*	Coral
Echinopora	*gemmacea*	Coral
Echinopora	*lamellosa*	Coral
Euphyllia	*glabrescens*	Coral
Favia	*matthaii*	Coral
Favia	*pallida*	Coral
Favia	*stelligera*	Coral
Favites	*abdita*	Coral
Fungia	*concinna*	Coral
Fungia	*fungites*	Coral
Fungia	*granulosa*	Coral
Fungia	*paumotensis*	Coral
Fungia	*scruposa*	Coral
Fungia	*scutaria*	Coral
Galaxea	*astreata*	Coral
Galaxea	*fascicularis*	Coral
Gardineroseris	*planulata*	Coral
Goniastrea	*pectinata*	Coral
Goniastrea	*retiformis*	Coral
Halomitra	*pileus*	Coral
Herpolitha	*limax*	Coral
Hydnophora	*exesa*	Coral
Hydnophora	*microconos*	Coral
Hydnophora	*rigida*	Coral
Isopora	*palifera*	Coral
Leptastrea	*purpurea*	Coral
Leptastrea	*transversa*	Coral
Leptoria	*phrygia*	Coral
Leptoseris	*explanata*	Coral
Leptoseris	*mycetoseroides*	Coral
Leptoseris	*scabra*	Coral
Lobophyllia	*hemprichii*	Coral
Merulina	*ampliata*	Coral
Merulina	*scabricula*	Coral
Montastrea	*annuligera*	Coral
Montastrea	*curta*	Coral
Montipora	*foveolata*	Coral
Montipora	*informis*	Coral

Mycedium	*elephantotus*	Coral
Oxypora	*crassispinosa*	Coral
Oxypora	*lacera*	Coral
Pachyseris	*rugosa*	Coral
Pachyseris	*speciosa*	Coral
Pavona	*chiriquensis*	Coral
Pavona	*decussata*	Coral
Pavona	*duerdeni*	Coral
Pavona	*maldivensis*	Coral
Platygyra	*daedalea*	Coral
Platygyra	*pini*	Coral
Plesiastrea	*versipora*	Coral
Pocillopora	*damicornis*	Coral
Pocillopora	*eydouxi*	Coral
Pocillopora	*meandrina*	Coral
Pocillopora	*verrucosa*	Coral
Porites	*annae*	Coral
Porites	*cylindrica*	Coral
Porites	*lobata*	Coral
Porites	*massive*	Coral
Porites	*rus*	Coral
Psammocora	*nierstraszi*	Coral
Psammocora	*profundacella*	Coral
Sandalolitha	*dentata*	Coral
Sandalolitha	*robusta*	Coral
Stylocoeniella	*armata*	Coral
Stylocoeniella	*guentheri*	Coral
Stylophora	*pistillata*	Coral
Turbinaria	*peltata*	Coral
Turbinaria	*reniformis*	Coral
Turbinaria	*stellulata*	Coral
Acanthastrea	*brevis*	Coral
Acropora	*sp*	Coral
Acropora	*polystoma*	Coral
Acropora	*tenuis*	Coral
Acropora	*horrida*	Coral
Acropora	*globiceps*	Coral
Acropora	*grandis*	Coral
Acropora	*kimbeensis*	Coral
Acropora	*longicyathus*	Coral
Acropora	*loripes*	Coral
Acropora	*lutkeni*	Coral
Acropora	*microphthalma*	Coral
Acropora	*muricata*	Coral
Acropora	*secale*	Coral

Acropora	*selago*	Coral
Acropora	*solitaryensis*	Coral
Acropora	*subglabra*	Coral
Acropora	*subulata*	Coral
Acropora	*surculosa*	Coral
Acropora	*valida*	Coral
Acropora	*verweyi*	Coral
Coeloseris	*mayeri*	Coral
Ctenactis	*crassa*	Coral
Echinophyllia	*orpheensis*	Coral
Favia	*favus*	Coral
Favia	*matthai*	Coral
Favia	*rotumana*	Coral
Favia	*rotundata*	Coral
Favia	*speciosa*	Coral
Favites	*sp*	Coral
Favites	*halicora*	Coral
Favites	*pentagona*	Coral
Favites	*russelli*	Coral
Fungia	*horrida*	Coral
Fungia	*repanda*	Coral
Goniopora	*lobata*	Coral
Heliopora	*coerulea*	Coral
Hydnophora	*pilosa*	Coral
Isopora	*cuneata*	Coral
Lobophyllia	*corymbosa*	Coral
Lobophyllia	*hataii*	Coral
Millepora	*platyphylla*	Coral
Montipora	*aequituberculata*	Coral
Montipora	*caliculata*	Coral
Montipora	*capitata*	Coral
Montipora	*danae*	Coral
Montipora	*grisea*	Coral
Montipora	*tuberculosa*	Coral
Montipora	*turgescens*	Coral
Montipora	*verrucosa*	Coral
Oulophyllia	*crispa*	Coral
Pavona	*cactus*	Coral
Pavona	*clavus*	Coral
Pavona	*varians*	Coral
Pavona	*venosa*	Coral
Plerogyra	*sinuosa*	Coral
Porites	*lichen*	Coral
Porites	*lutea*	Coral
Psammocora	*contigua*	Coral

Psammocora	*haimeana*	Coral
Scapophyllia	*cylindrica*	Coral
Seriatopora	*aculeata*	Coral
Seriatopora	*hystrix*	Coral
Symphyllia	*radians*	Coral
Symphyllia	*recta*	Coral
Tubipora	*musica*	Coral
Acropora	*aspera*	Coral
Acropora	*carduus*	Coral
Acropora	*cuneata*	Coral
Acropora	*divaricata*	Coral
Acropora	*elseyi*	Coral
Acropora	*formosa*	Coral
Acropora	*nobilis*	Coral
Acropora	*palifera*	Coral
Acropora	*samoensis*	Coral
Acropora	*sarmentosa*	Coral
Ctenactis	*albitentaculata*	Coral
Cyphastrea	*chalcidicum*	Coral
Cyphastrea	*microphthalma*	Coral
Cyphastrea	*serailia*	Coral
Favites	*complanata*	Coral
Favites	*flexuosa*	Coral
Fungia	*danai*	Coral
Goniopora	*minor*	Coral
Goniopora	*somaliensis*	Coral
Millepora	*dichotoma*	Coral
Millepora	*tenella*	Coral
Montastrea	*magnistellata*	Coral
Montastrea	*valenciennesi*	Coral
Montipora	*hoffmeisteri*	Coral
Pavona	*explanulata*	Coral
Pectinia	*paeonia*	Coral
Physogyra	*lichtensteini*	Coral
Platygyra	*contorta*	Coral
Platygyra	*lamellina*	Coral
Platygyra	*sinensis*	Coral
Platygyra	*verweyi*	Coral
Pocillopora	*danae*	Coral
Porites	*nigrescens*	Coral
Porites	*solida*	Coral
Porites	*vaughani*	Coral
Psammocora	*digitata*	Coral
Seriatopora	*caliendrum*	Coral
Symphyllia	*agaricia*	Coral

Acropora	*cerealis*	Coral
Acropora	*echinata*	Coral
Acropora	*valenciennesi*	Coral
Astreopora	*myriophthalma*	Coral
Echinopora	*mammiformis*	Coral
Euphyllia	*cristata*	Coral
Favia	*lizardensis*	Coral
Favia	*truncatus*	Coral
Goniastrea	*edwardsi*	Coral
Heliofungia	*actiniformis*	Coral
Leptastrea	*pruinosa*	Coral
Leptastrea	*transversa*	Coral
Montipora	*digitata*	Coral
Montipora	*monasteriata*	Coral
Pectinia	*lactuca*	Coral
Platygyra	*ryukyuensis*	Coral
Pocillopora	*damicornis*	Coral
Pocillopora	*verrucosa*	Coral
Porites	*nigrescens*	Coral
Scolymia	*vitiensis*	Coral
Seriatopora	*hystrix*	Coral
Stylophora	*pistillata*	Coral
Symphyllia	*agaricia*	Coral
Acropora	*plumosa*	Coral
Cantharellus	*jebbi*	Coral
Echinophyllia	*echinata*	Coral
Anacropora	*forbesi*	Coral
Turbinaria	*frondens*	Coral
Fungia	*cycloseris*	Coral
Leptoseris	*hawaiiensis*	Coral
Lobophyllia	*hemprichi*	Coral
Echinopora	*horrida*	Coral
Leptoseris	*scabra*	Coral
Merulina	*ampliata*	Coral
Fungia	*moluccensis*	Coral
Pavona	*varians*	Coral
Pectinia	*alcicornis*	Coral
Polyphyllia	*talpina*	Coral
Porites	*digitate*	Coral
Seriatopora	*hystrix*	Coral
Clavularia	*sp*	Coral
Dendronephthya	*sp*	Coral
Galaxea	*fasicularis*	Coral
Goniasatrea	*aspera*	Coral
Goniasatrea	*edwardsi*	Coral

Goniasatrea	*pectinata*	Coral
Goniasatrea	*retiformis*	Coral
Lobophytum	*sp*	Coral
Millepora	*exesa*	Coral
Nephthea	*sp*	Coral
Palythoa	*sp*	Coral
Paralemnalia	*sp*	Coral
Platygyra	*daedelea*	Coral
Sarcophyton	*sp*	Coral
Sinularia	*sp*	Coral

Mobile invertebrates

Genus	**Species**	**Model Category**
Acanthaster	*planci*	Invertebrate
Actinopyga	*lecanora*	Invertebrate
Actinopyga	*mauritiana*	Invertebrate
Actinopyga	*miliaris*	Invertebrate
Astralium	*sp*	Invertebrate
Atrina	*sp*	Invertebrate
Atrina	*vexillum*	Invertebrate
Beguina	*semiorbiculata*	Invertebrate
Bohadschia	*argus*	Invertebrate
Bohadschia	*graeffei*	Invertebrate
Bohadschia	*similis*	Invertebrate
Bohadschia	*vitiensis*	Invertebrate
Cerithium	*nodulosum*	Invertebrate
Chama	*sp*	Invertebrate
Choriaster	*granulatus*	Invertebrate
Cloth	*Cloth*	Invertebrate
Conus	*distans*	Invertebrate
Conus	*flavidus*	Invertebrate
Conus	*litteratus*	Invertebrate
Conus	*marmoreus*	Invertebrate
Conus	*miles*	Invertebrate
Conus	*sp*	Invertebrate
Culcita	*novaeguineae*	Invertebrate
Cypraea	*annulus*	Invertebrate
Cypraea	*caputserpensis*	Invertebrate
Cypraea	*moneta*	Invertebrate
Cypraea	*tigris*	Invertebrate
Diadema	*sp*	Invertebrate
Dolabella	*auricularia*	Invertebrate
Echinometra	*mathaei*	Invertebrate
Echinothrix	*calamaris*	Invertebrate
Echinothrix	*diadema*	Invertebrate

Heterocentrotus	*mammillatus*	Invertebrate
Hippopus	*hippopus*	Invertebrate
Holothuria	*atra*	Invertebrate
Holothuria	*coluber*	Invertebrate
Holothuria	*edulis*	Invertebrate
Holothuria	*fuscogilva*	Invertebrate
Holothuria	*fuscopunctata*	Invertebrate
Holothuria	*leucospilota*	Invertebrate
Holothuria	*nobilis*	Invertebrate
Holothuria	*scabra*	Invertebrate
Hyotissa	*sp*	Invertebrate
Lambis	*lambis*	Invertebrate
Lambis	*truncata*	Invertebrate
Latirolagena	*smaragdula*	Invertebrate
Linckia	*laevigata*	Invertebrate
Metal	*Metal*	Invertebrate
NetLine	*NetLine*	Invertebrate
Octopus	*cyanea*	Invertebrate
Ovula	*ovum*	Invertebrate
Panulirus	*sp*	Invertebrate
Panulirus	*versicolor*	Invertebrate
Pinctada	*margaritifera*	Invertebrate
Plastic	*Plastic*	Invertebrate
Protoreaster	*nodosus*	Invertebrate
Spondylus	*sp*	Invertebrate
Stichodactyla	*gigantea*	Invertebrate
Stichodactyla	*sp*	Invertebrate
Stichopus	*chloronotus*	Invertebrate
Stichopus	*hermanni*	Invertebrate
Stichopus	*horrens*	Invertebrate
Strombus	*luhuanus*	Invertebrate
Synapta	*sp*	Invertebrate
Tectus	*pyramis*	Invertebrate
Thais	*armigera*	Invertebrate
Thais	*sp*	Invertebrate
Thelenota	*ananas*	Invertebrate
Thelenota	*anax*	Invertebrate
Tridacna	*crocea*	Invertebrate
Tridacna	*derasa*	Invertebrate
Tridacna	*maxima*	Invertebrate
Tridacna	*sp*	Invertebrate
Tridacna	*squamosa*	Invertebrate
Tripneustes	*gratilla*	Invertebrate
Trochus	*maculata*	Invertebrate
Trochus	*niloticus*	Invertebrate

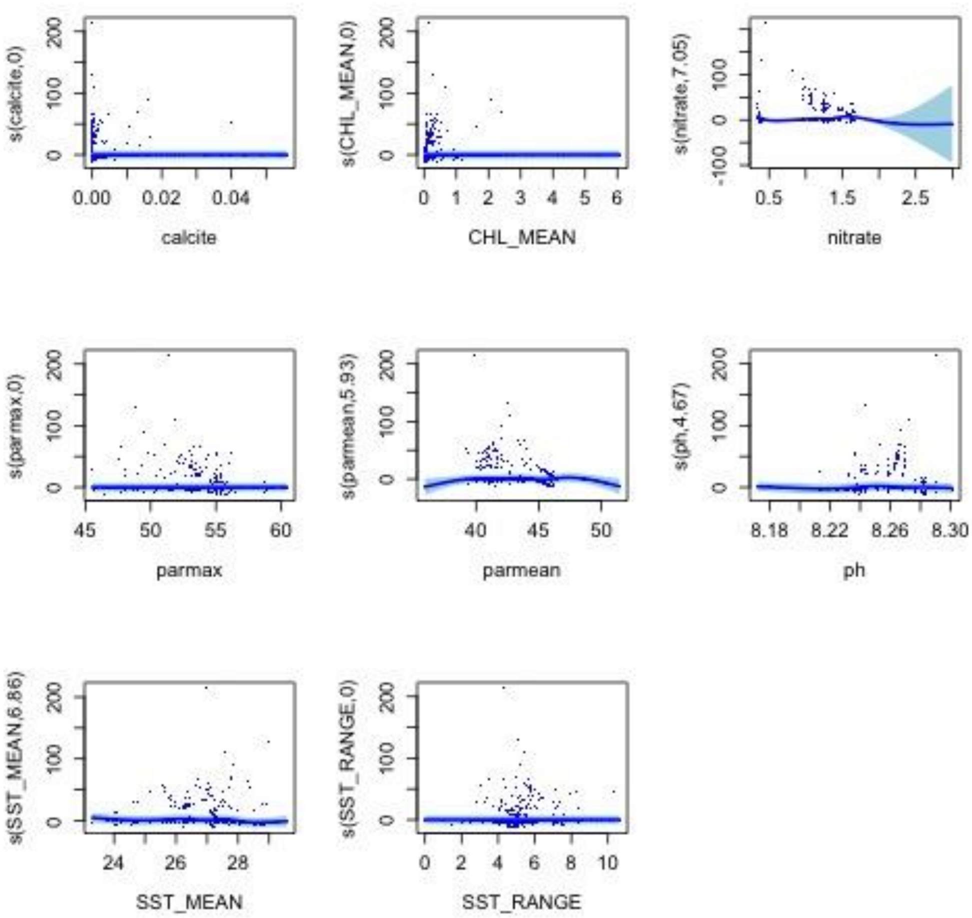
Turbo	*argyrostomus*	Invertebrate
Turbo	*chrysostomus*	Invertebrate
Turbo	*crassus*	Invertebrate
Turbo	*setosus*	Invertebrate
Turbo	*sp*	Invertebrate
Vasum	*ceramicum*	Invertebrate

Supplementary Material S3. Model outputs: Statistics and model plots for all models

Fishes

F1 Abudefduf sexfasciatus, n = 168 observations

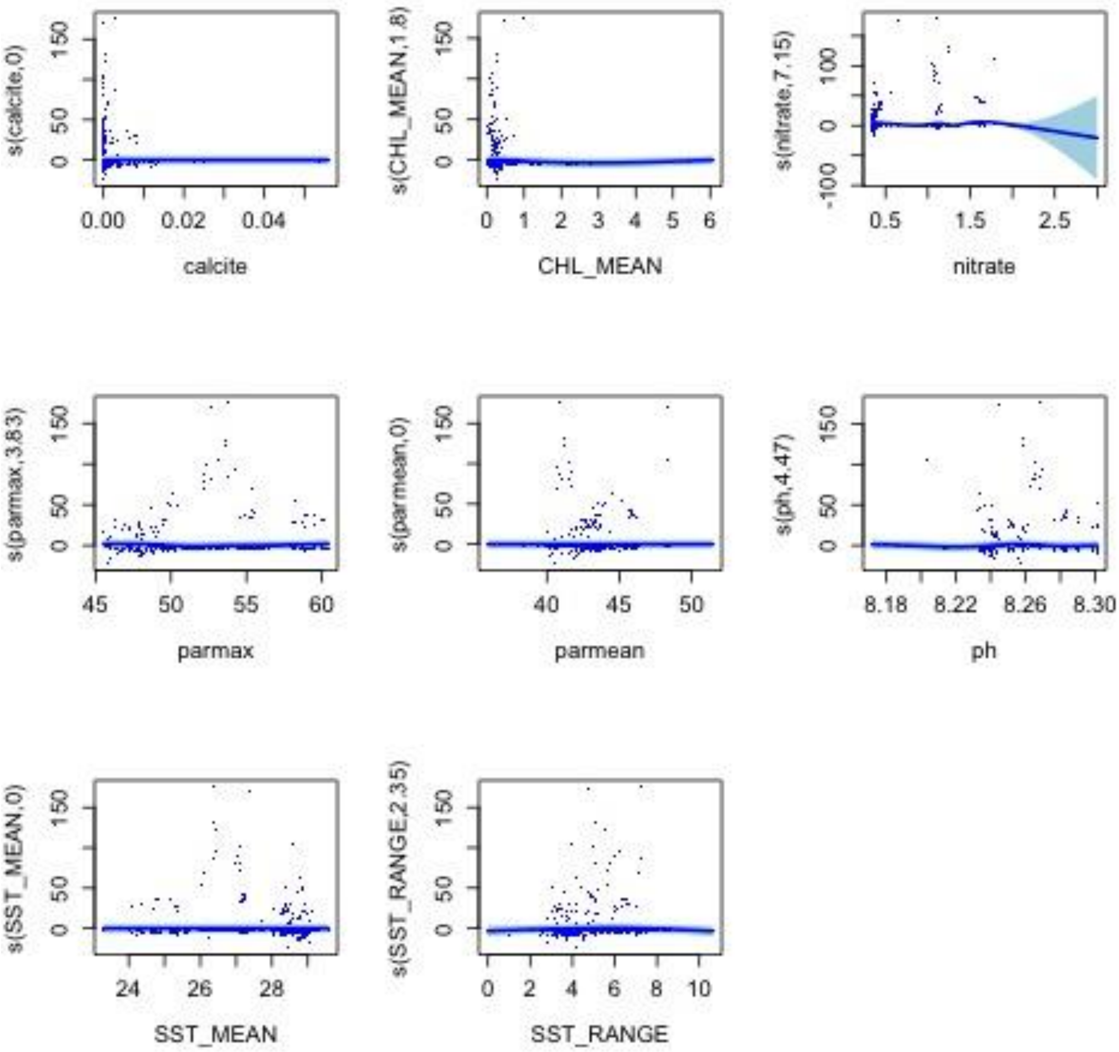
	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.783735e-05	9	1.236569e-05	5.443412e-01
s(CHL_MEAN)	1.757437e-05	9	2.039144e-06	7.788614e-01
s(nitrate)	7.046944e+00	9	7.762972e+01	8.019835e-17
s(parmax)	4.255286e-05	9	1.854320e-05	6.793797e-01
s(parmean)	5.925695e+00	9	1.785152e+01	2.361699e-03
s(ph)	4.670385e+00	9	2.180485e+01	3.622871e-05
s(SST_MEAN)	6.859938e+00	9	8.175833e+01	1.292263e-17
s(SST_RANGE)	1.467777e-05	9	2.284566e-06	1.000000e+00



F2 Abudefduf vaigiensis, n = 136 observations

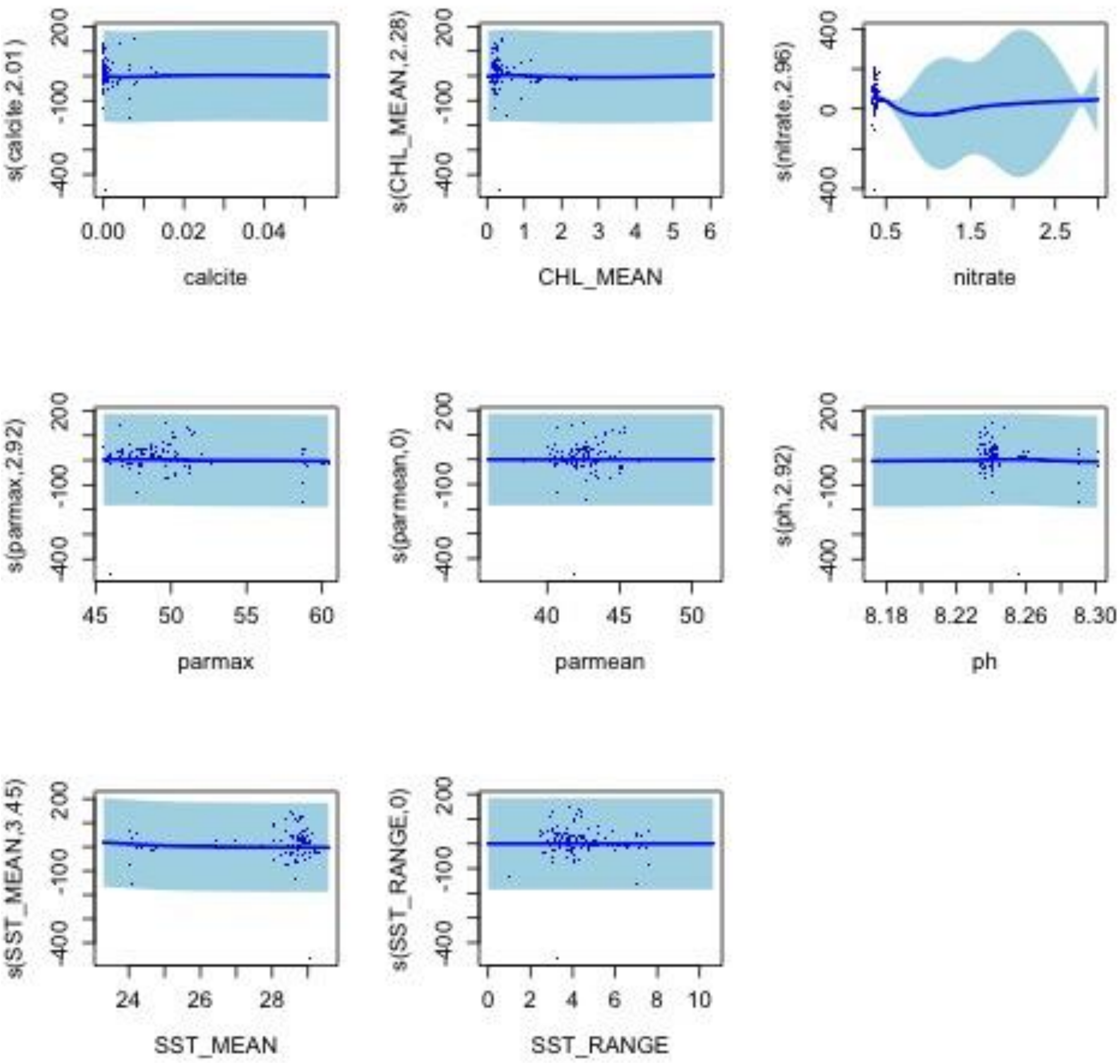
	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.577315e-05	9	1.410877e-05	3.384066e-01
s(CHL_MEAN)	1.797630e+00	9	8.432506e+00	6.574015e-03
s(nitrate)	7.153253e+00	9	7.595492e+01	2.166142e-16
s(parmax)	3.830598e+00	9	3.706606e+01	2.461892e-09
s(parmean)	7.277880e-05	9	3.518102e-05	5.789579e-01

	edf	Ref.df	Chi.sq	p-value
s(ph)	4.468325e+00	9	2.047974e+01	8.216545e-05
s(SST_MEAN)	2.775617e-04	9	1.312566e-04	5.600707e-01
s(SST_RANGE)	2.352365e+00	9	8.981270e+00	5.416869e-03



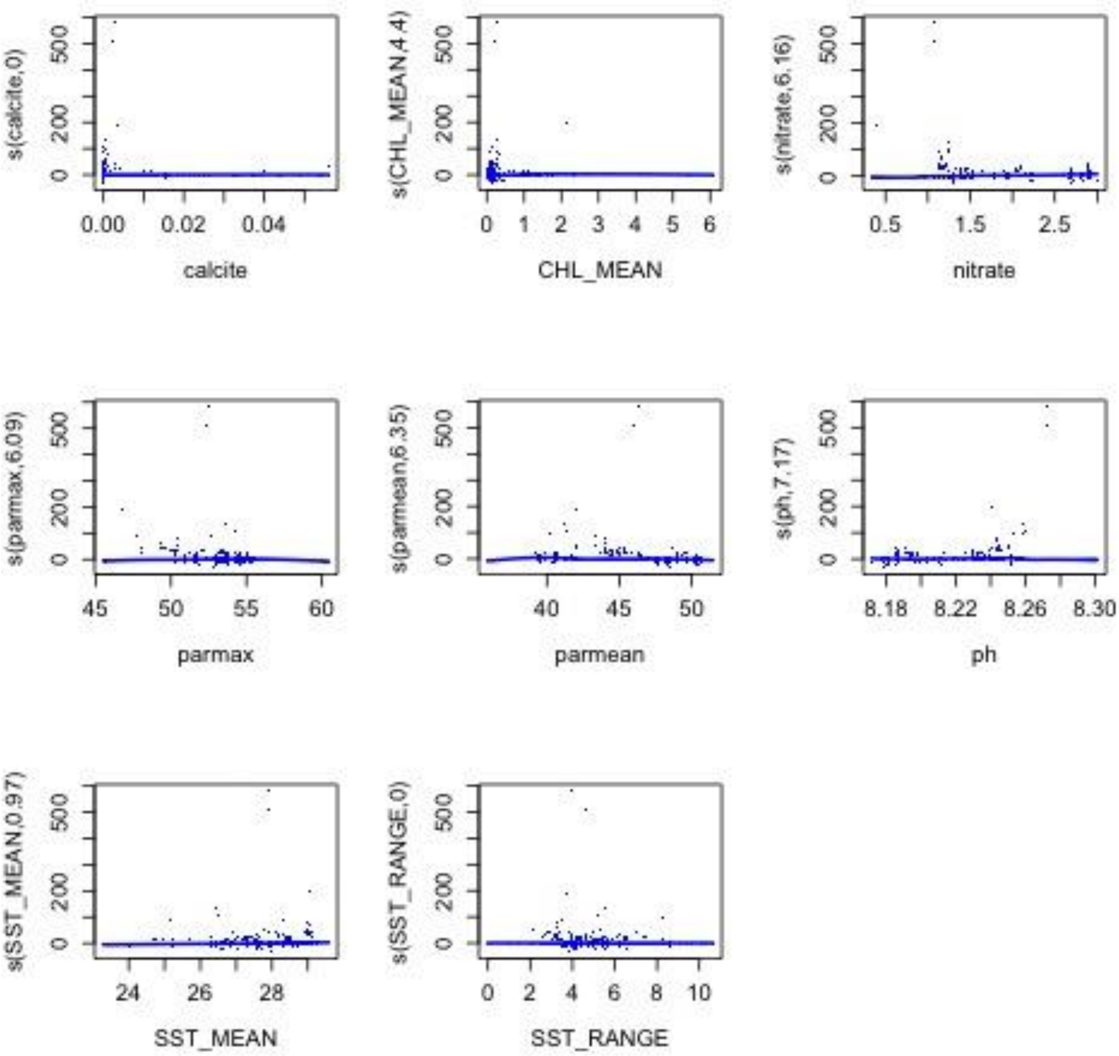
F3 Acanthochromis polyacanthus, n = 78 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.0148193280	9	1.975191e+01	1.135712e-05
s(CHL_MEAN)	2.2807116584	9	1.580647e+01	1.848629e-04
s(nitrate)	2.9550360342	8	1.119013e+01	3.114788e-03
s(parmax)	2.9230907625	9	1.631634e+01	1.641905e-04
s(parmean)	0.0001590814	9	1.715578e-04	2.715192e-01
s(ph)	2.9235666834	9	8.673565e+00	1.335046e-02
s(SST_MEAN)	3.4516437999	9	1.861719e+01	4.748409e-05
s(SST_RANGE)	0.0000491347	9	2.223366e-05	5.552805e-01



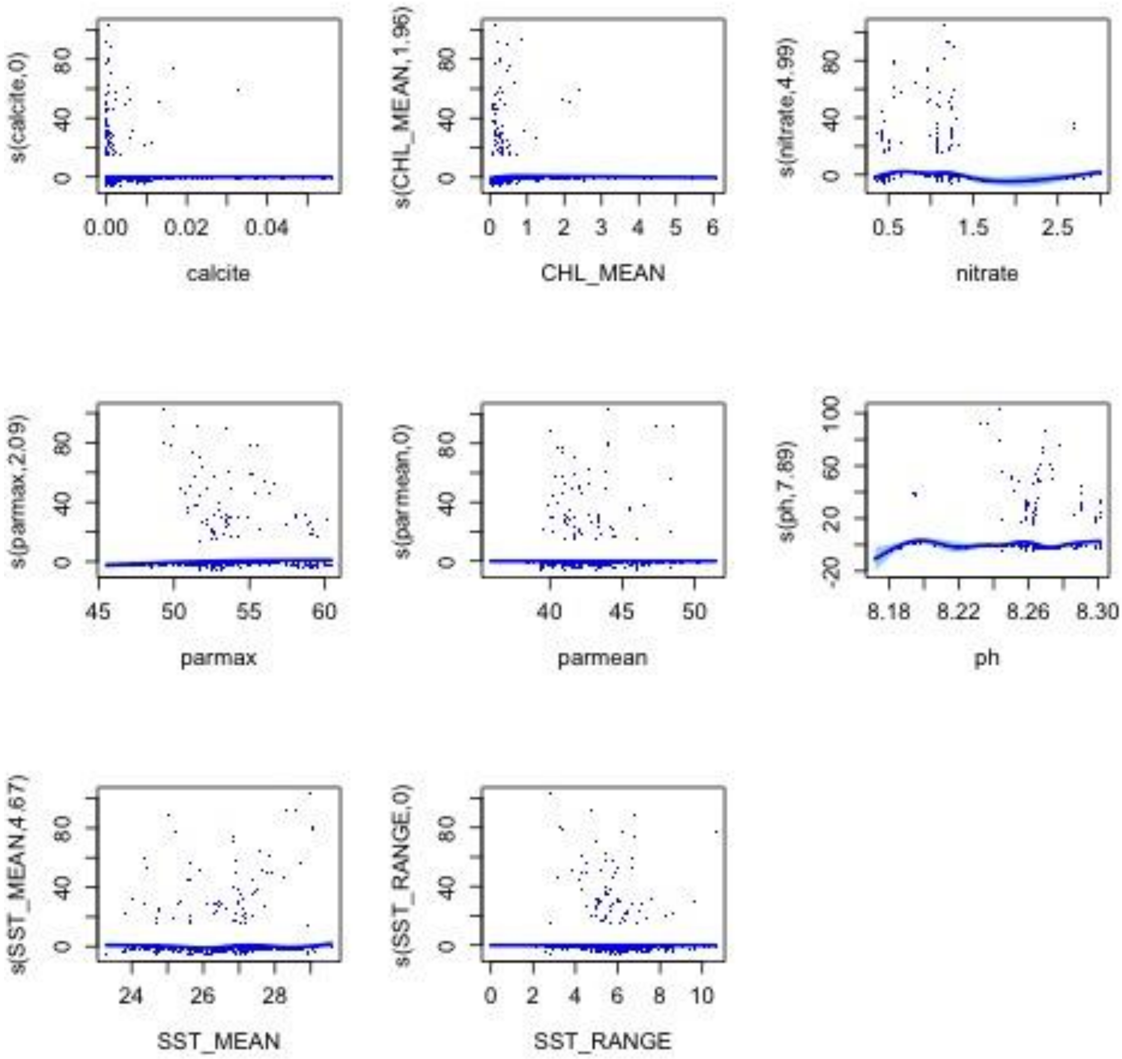
F4 Acanthurus achilles, n = 615 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.006225e-06	9	3.082656e-07	1.000000e+00
s(CHL_MEAN)	4.396812e+00	9	2.798127e+01	4.075701e-06
s(nitrate)	6.160959e+00	9	5.278507e+01	9.526982e-11
s(parmax)	6.091694e+00	9	6.395174e+01	7.934286e-14
s(parmean)	6.350336e+00	9	1.383598e+02	4.709586e-31
s(ph)	7.167898e+00	9	6.800786e+01	1.165777e-13
s(SST_MEAN)	9.726001e-01	9	3.244988e+01	1.255561e-09
s(SST_RANGE)	5.106109e-04	9	2.458301e-04	5.721741e-01



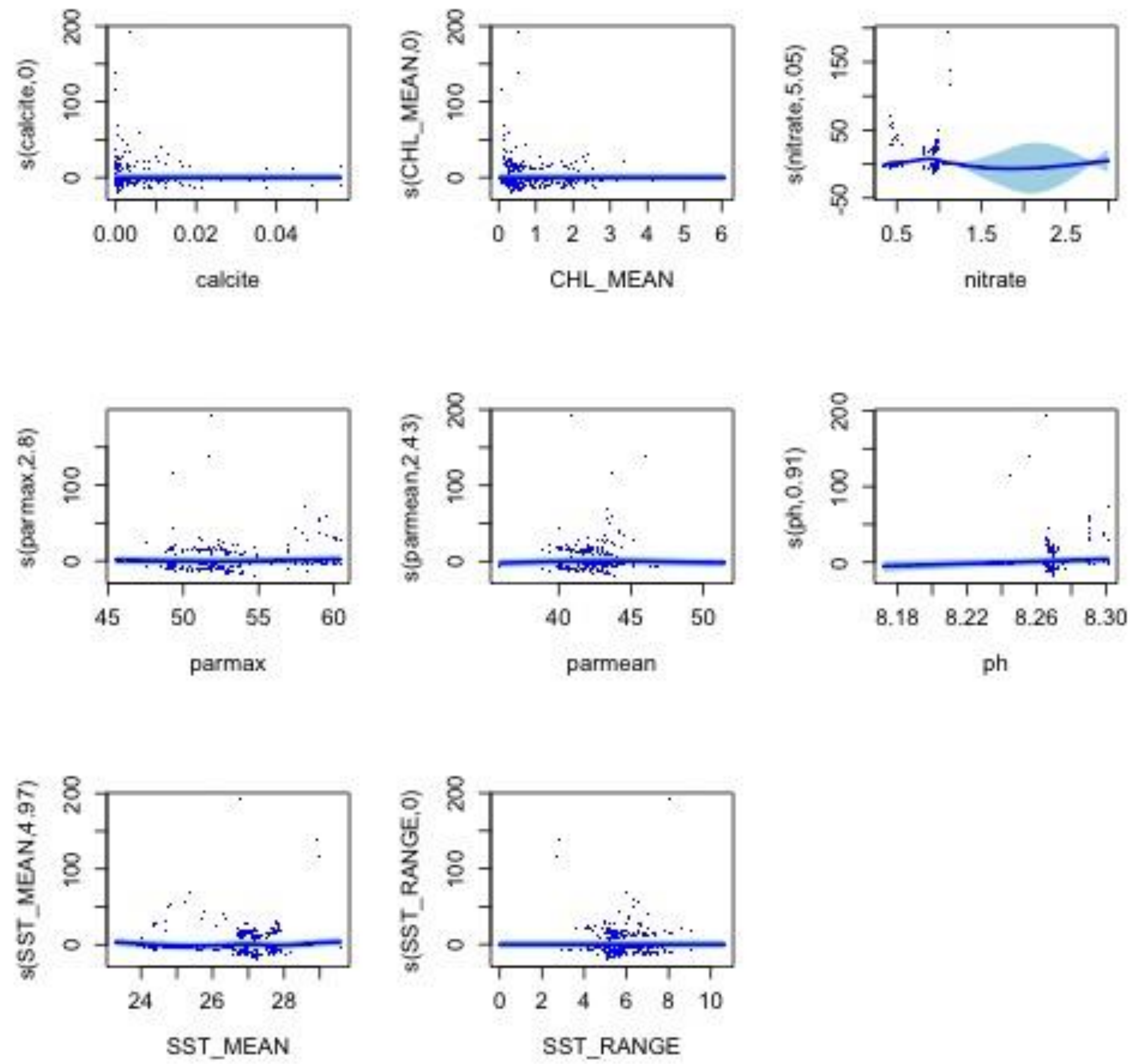
F5 Acanthurus albipectoralis, n = 160 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.241711e-06	8	2.483779e-06	6.328155e-01
s(CHL_MEAN)	1.962871e+00	9	1.364791e+01	4.169356e-04
s(nitrate)	4.990055e+00	9	2.531201e+01	1.074268e-05
s(parmax)	2.092265e+00	9	1.083358e+01	1.318818e-03
s(parmean)	7.405185e-04	9	5.160618e-04	4.160235e-01
s(ph)	7.891588e+00	9	7.363247e+01	1.954058e-15
s(SST_MEAN)	4.666958e+00	9	2.555059e+01	7.995645e-06
s(SST_RANGE)	1.075343e-05	9	5.899199e-06	5.386969e-01



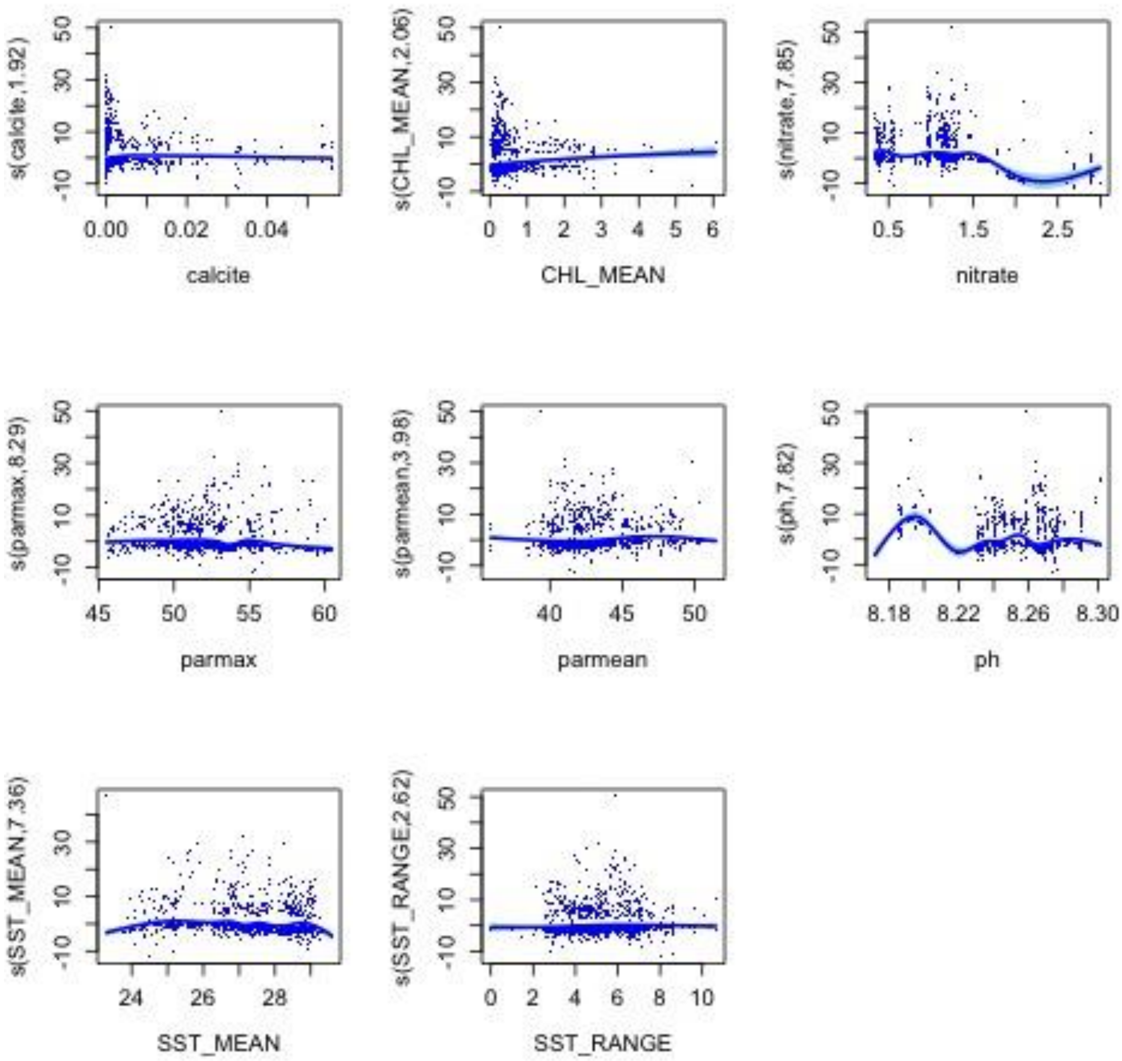
F6 Acanthurus auranticavus, n = 193 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.758243e-05	9	1.989240e-05	5.020541e-01
s(CHL_MEAN)	1.511006e-05	9	1.210556e-07	1.000000e+00
s(nitrate)	5.051238e+00	9	1.325543e+02	6.343144e-32
s(parmax)	2.800438e+00	9	1.630453e+01	6.927090e-05
s(parmean)	2.425512e+00	9	1.184627e+01	6.818091e-04
s(ph)	9.104167e-01	9	7.261850e+00	2.082503e-03
s(SST_MEAN)	4.974405e+00	9	3.205028e+01	3.592969e-07
s(SST_RANGE)	2.775845e-05	9	1.049693e-05	5.788221e-01



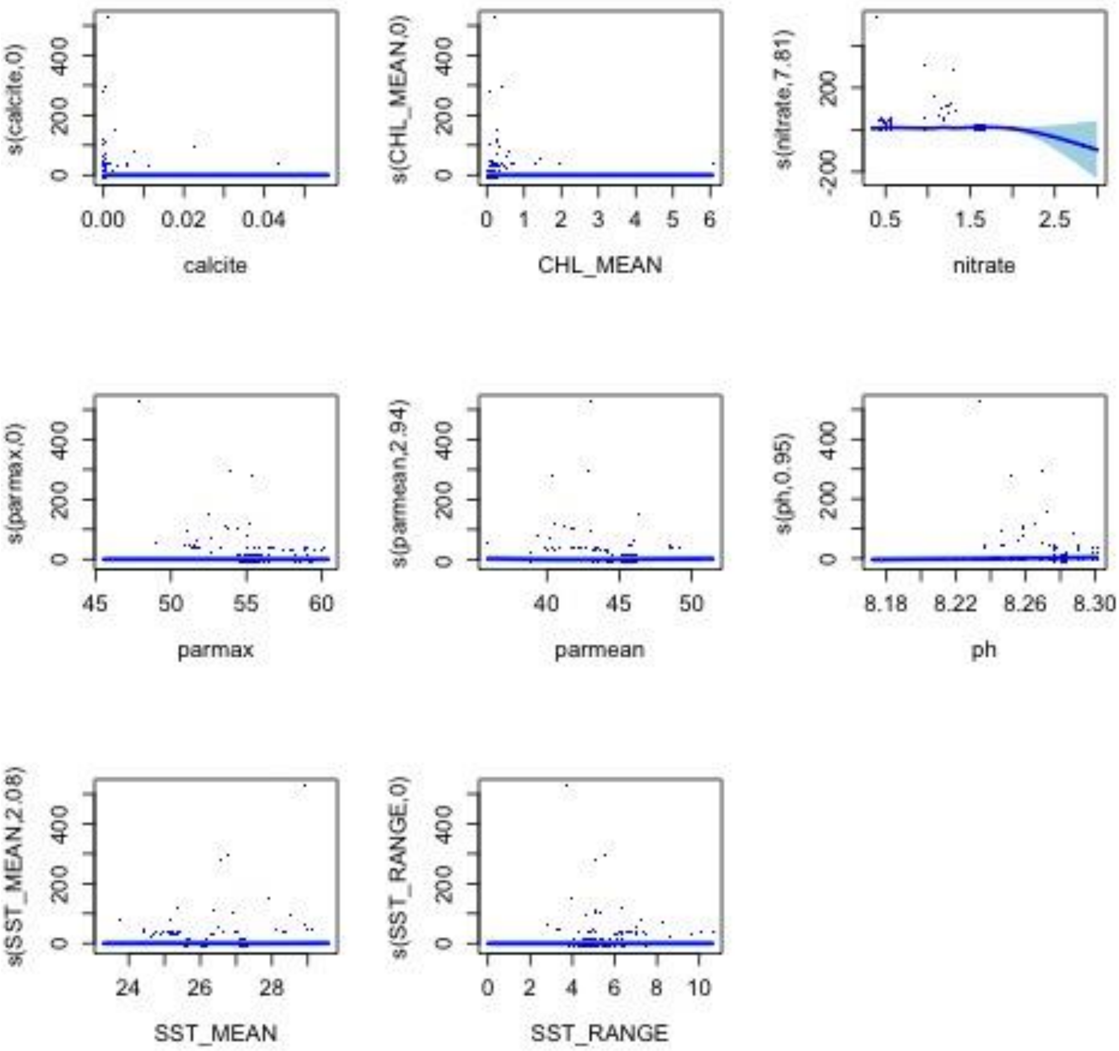
F7 Acanthurus blochii, n = 698 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.919794	9	24.01371	1.358811e-06
s(CHL_MEAN)	2.058836	9	63.44541	1.253453e-16
s(nitrate)	7.845028	9	98.25521	3.738100e-20
s(parmax)	8.289437	9	78.46045	6.633317e-15
s(parmean)	3.977168	9	46.77599	1.327480e-11
s(ph)	7.819817	9	227.89065	3.533984e-49
s(SST_MEAN)	7.362396	9	63.86942	2.014249e-12
s(SST_RANGE)	2.624579	9	10.14233	4.270102e-03



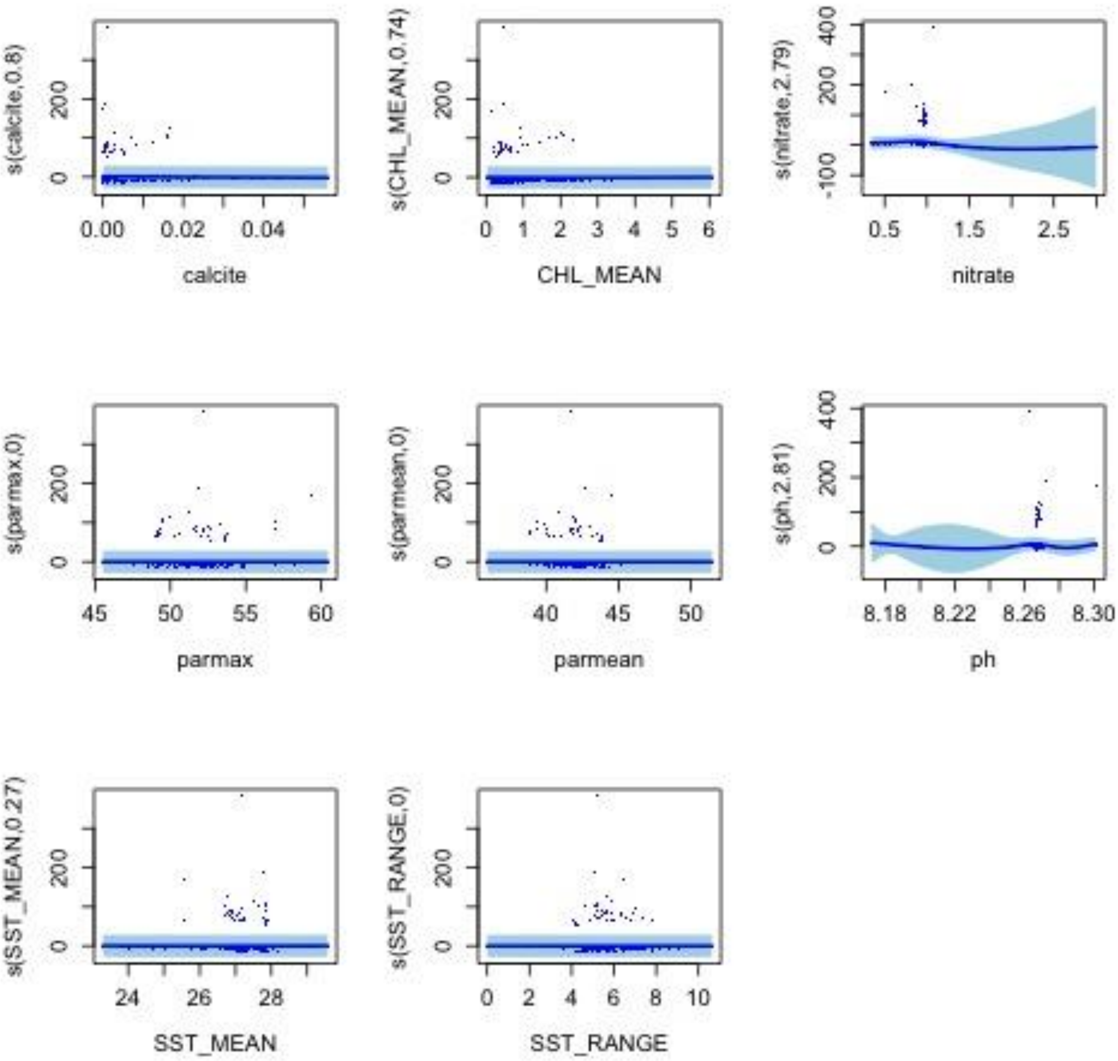
F8 Acanthurus dussumieri, n = 106 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.572446e-06	9	2.735499e-07	8.155754e-01
s(CHL_MEAN)	2.311783e-05	9	2.258675e-05	3.138883e-01
s(nitrate)	7.805634e+00	9	6.266969e+01	1.717645e-12
s(parmax)	1.681525e-06	9	5.262762e-07	6.823289e-01
s(parmean)	2.941810e+00	9	1.932191e+01	1.954541e-05
s(ph)	9.546868e-01	9	1.884590e+01	1.204813e-06
s(SST_MEAN)	2.079233e+00	9	6.072576e+00	2.643678e-02
s(SST_RANGE)	8.358001e-06	9	7.547223e-06	3.636326e-01



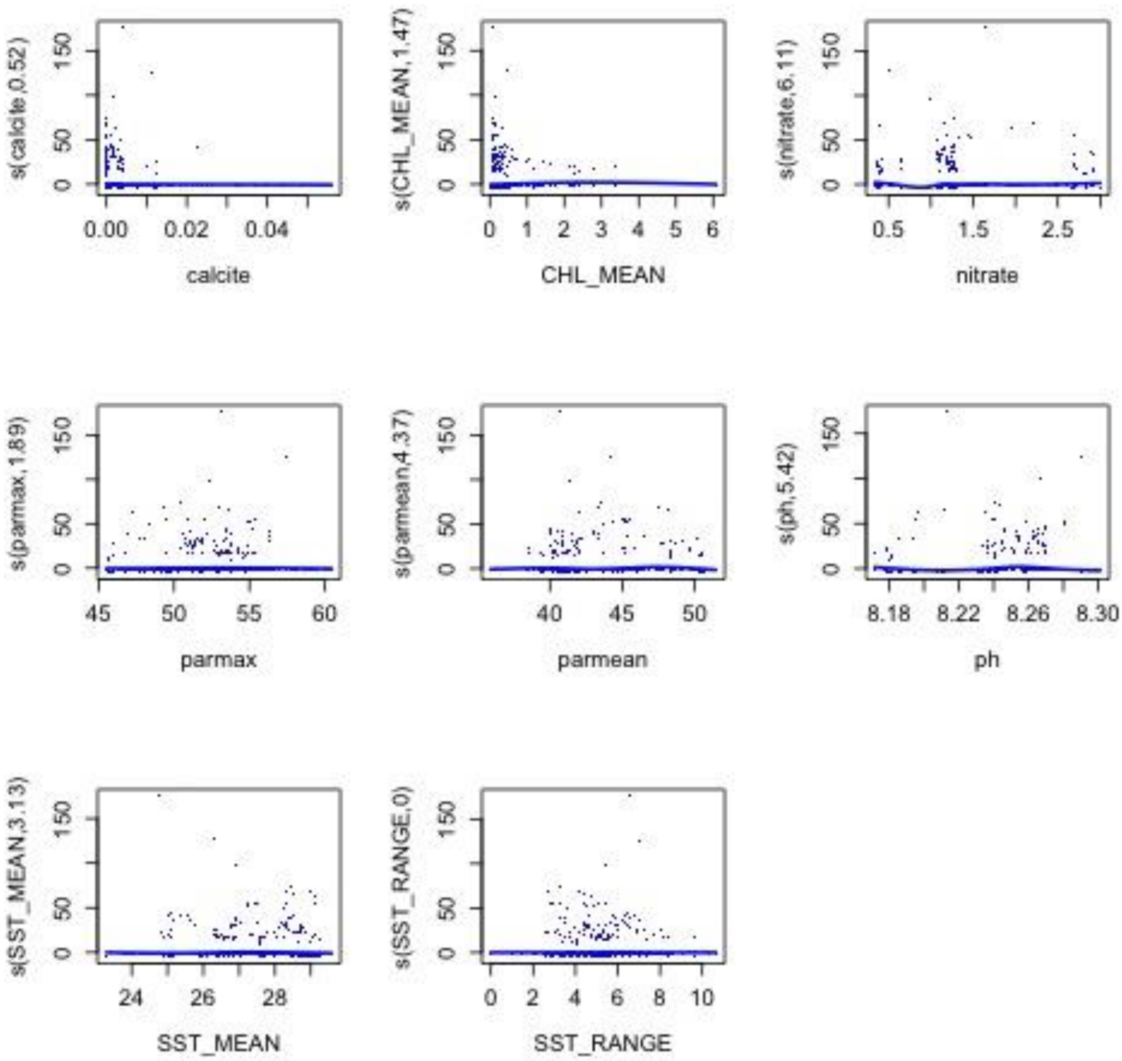
F9 Acanthurus grammoptilus, n = 46 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.008262e-01	6	3.303490e+00	0.0405778157
s(CHL_MEAN)	7.416677e-01	9	2.731759e+00	0.0480854317
s(nitrate)	2.788465e+00	9	1.709682e+01	0.0001571561
s(parmax)	7.194863e-05	9	4.214802e-05	0.5179279173
s(parmean)	4.519002e-05	9	2.249989e-06	1.0000000000
s(ph)	2.810462e+00	9	1.358153e+01	0.0006250668
s(SST_MEAN)	2.670481e-01	9	3.184654e-01	0.2596322246
s(SST_RANGE)	1.024520e-04	9	4.911360e-05	0.5259025538



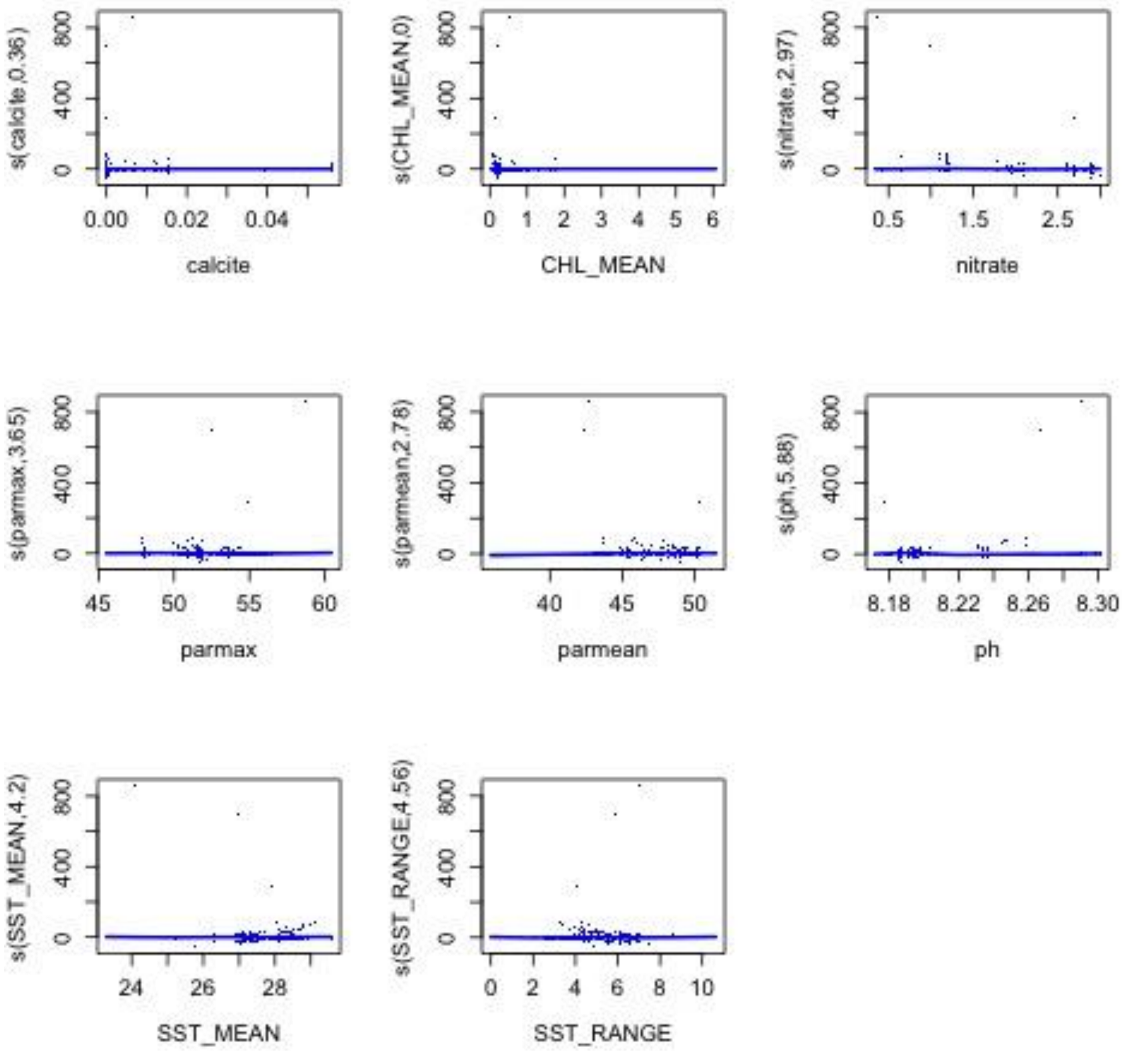
F10 Acanthurus guttatus, n = 207 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.228530e-01	6	8.532267e-01	1.958022e-01
s(CHL_MEAN)	1.466799e+00	9	2.121702e+01	5.776807e-07
s(nitrate)	6.107603e+00	9	4.803788e+01	4.979900e-11
s(parmax)	1.885812e+00	9	5.037062e+00	3.421208e-02
s(parmean)	4.372025e+00	9	3.607751e+01	5.149591e-09
s(ph)	5.419574e+00	9	5.776639e+01	9.377068e-15
s(SST_MEAN)	3.131389e+00	9	1.359735e+01	6.203584e-04
s(SST_RANGE)	4.455125e-05	9	1.653817e-05	7.075943e-01



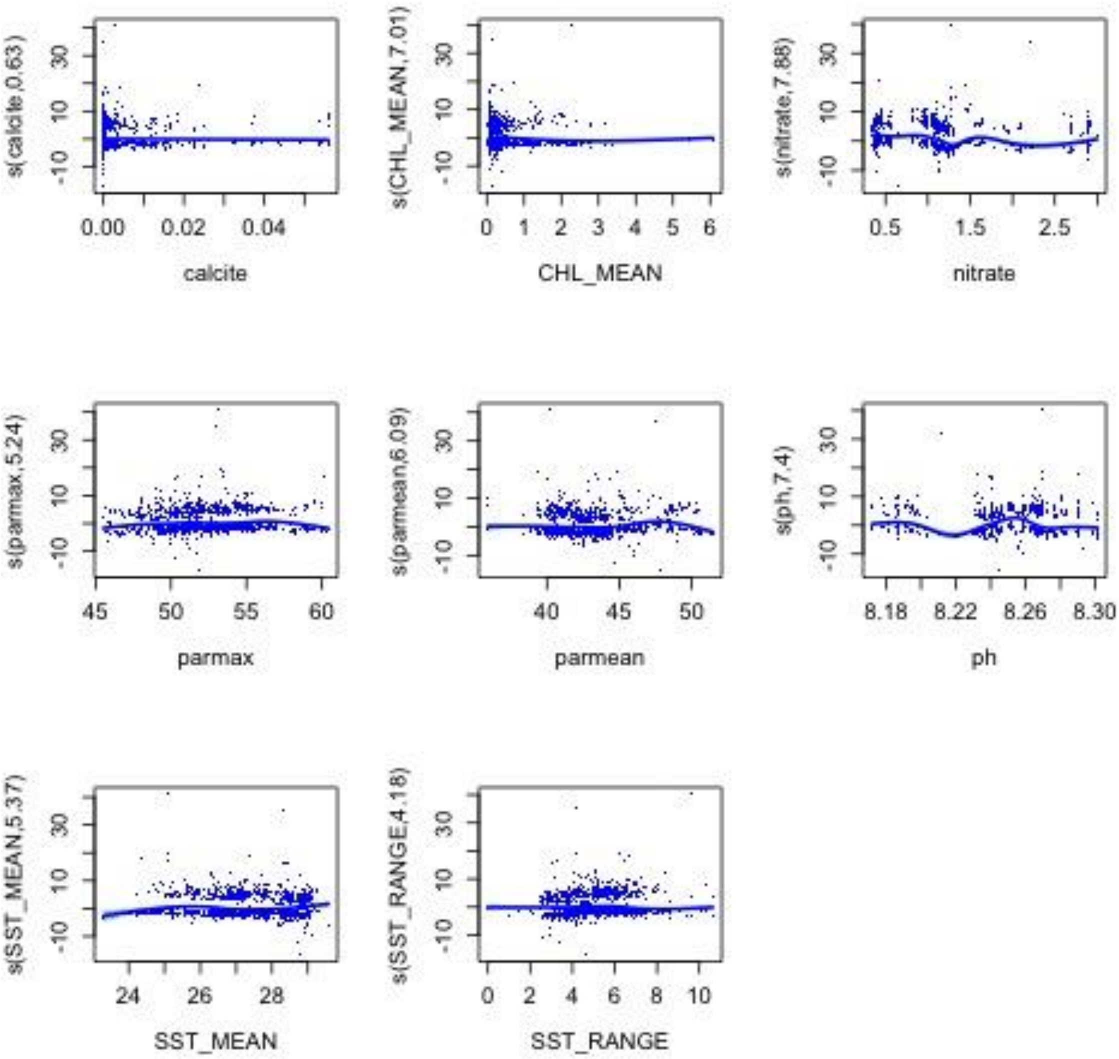
F11 Acanthurus leucocheilus, n = 215 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.567418e-01	6	5.818106e-01	1.798160e-01
s(CHL_MEAN)	9.649348e-05	9	8.674989e-05	3.207293e-01
s(nitrate)	2.965247e+00	9	1.039092e+01	2.606361e-03
s(parmax)	3.652321e+00	9	1.827517e+01	4.447645e-05
s(parmean)	2.775939e+00	9	2.601106e+01	7.065506e-08
s(ph)	5.884621e+00	9	4.306588e+01	1.581797e-10
s(SST_MEAN)	4.195002e+00	9	1.067404e+01	8.984843e-03
s(SST_RANGE)	4.559917e+00	9	1.643538e+01	5.508172e-04



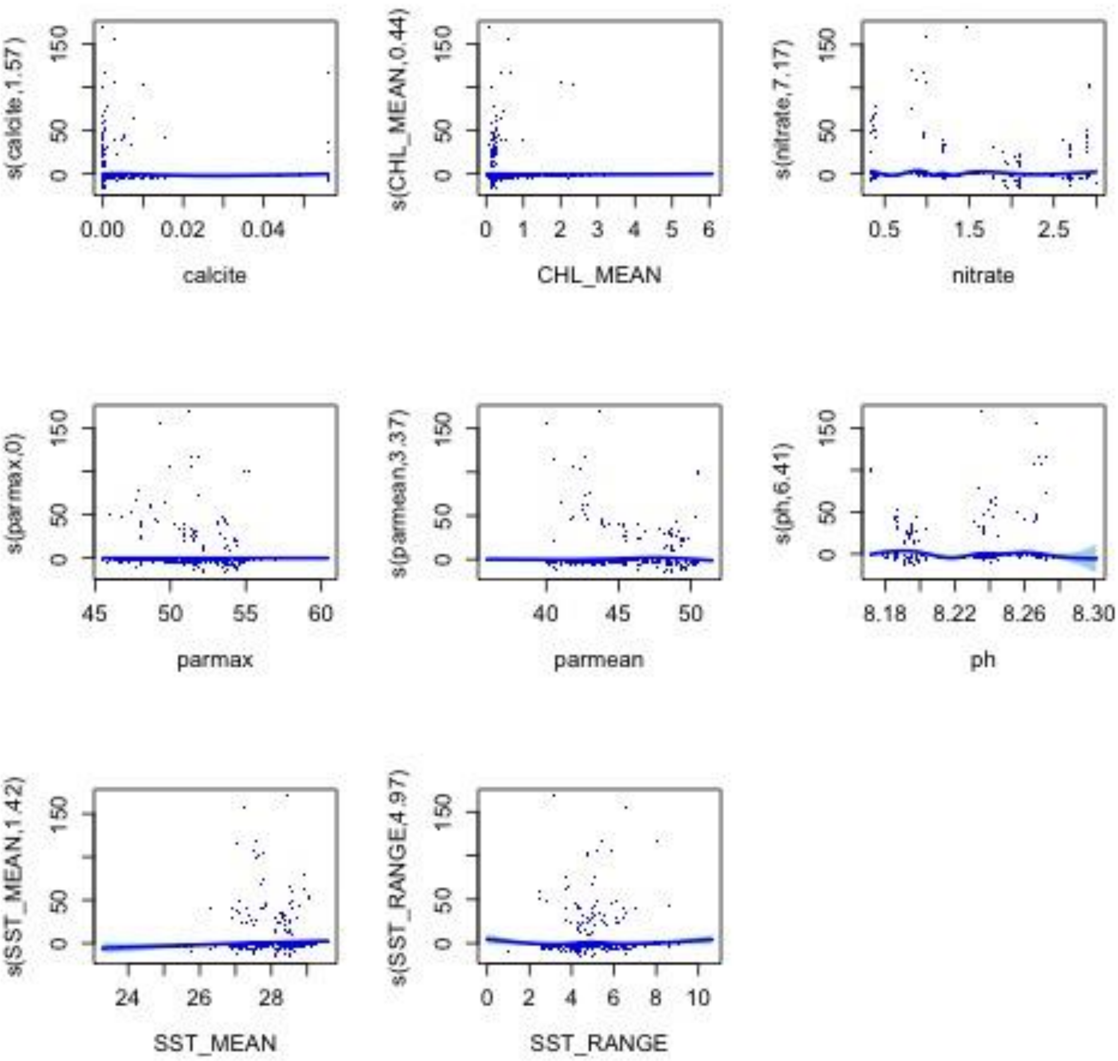
F12 Acanthurus lineatus, n = 1254 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6274602	6	1.561289	1.100733e-01
s(CHL_MEAN)	7.0099142	9	48.586856	5.306264e-09
s(nitrate)	7.8801586	9	208.807719	2.974775e-47
s(parmax)	5.2378957	9	42.090150	2.696437e-09
s(parmean)	6.0852815	9	86.367788	9.331842e-20
s(ph)	7.3965777	9	246.824468	8.253344e-57
s(SST_MEAN)	5.3664066	9	43.957243	5.665826e-10
s(SST_RANGE)	4.1775297	9	28.275154	1.594733e-06



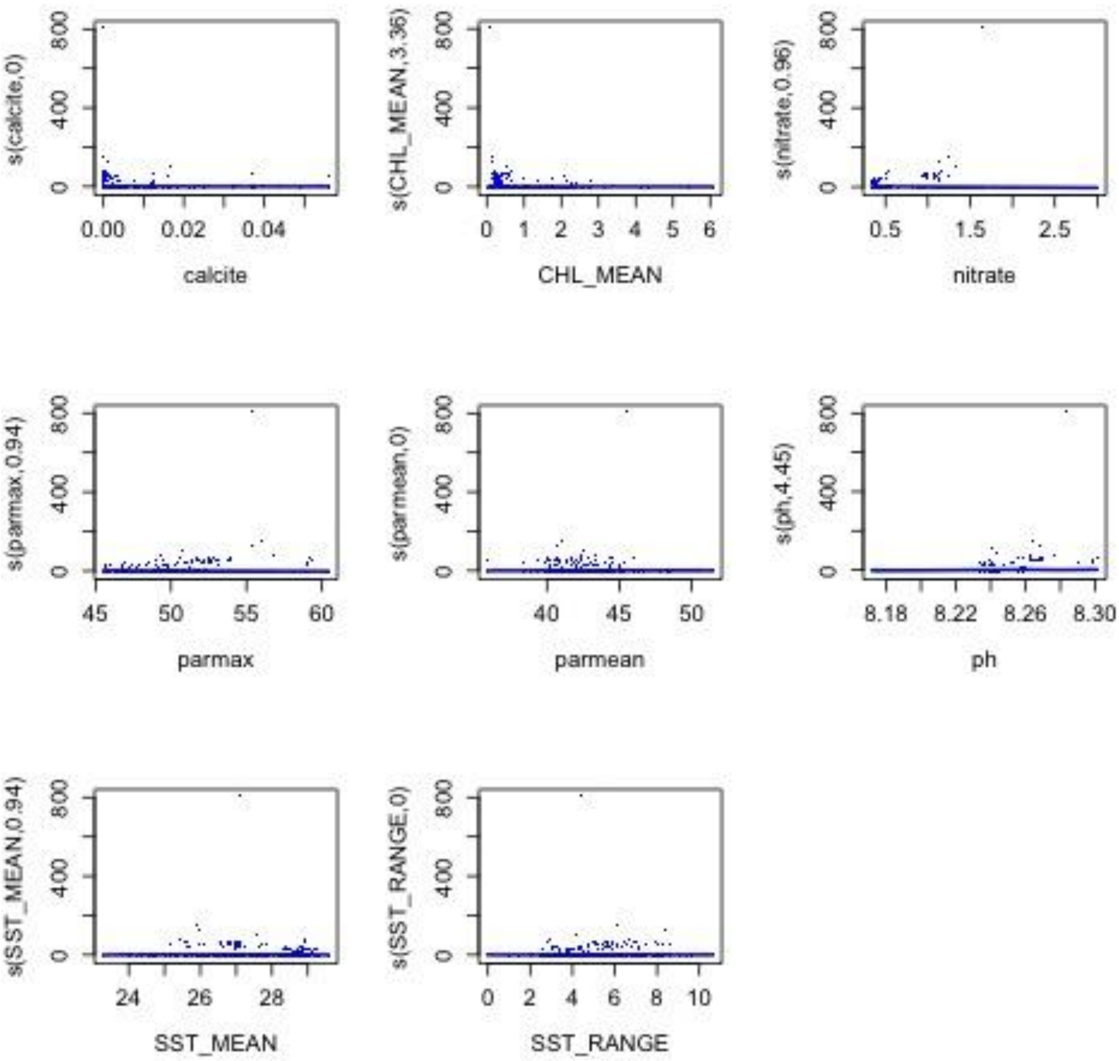
F13 Acanthurus maculiceps, n = 206 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.5737532779	9	4.081314e+00	6.226268e-02
s(CHL_MEAN)	0.4409259028	9	7.194159e-01	1.872334e-01
s(nitrate)	7.1673704416	9	4.841196e+01	1.633729e-09
s(parmax)	0.0001833027	9	1.510951e-04	3.513310e-01
s(parmean)	3.3721610914	9	2.104386e+01	1.924962e-05
s(ph)	6.4062967783	9	3.826404e+01	1.075171e-07
s(SST_MEAN)	1.4222300350	9	8.627016e+00	1.820434e-03
s(SST_RANGE)	4.9679022803	9	2.477880e+01	2.059347e-05



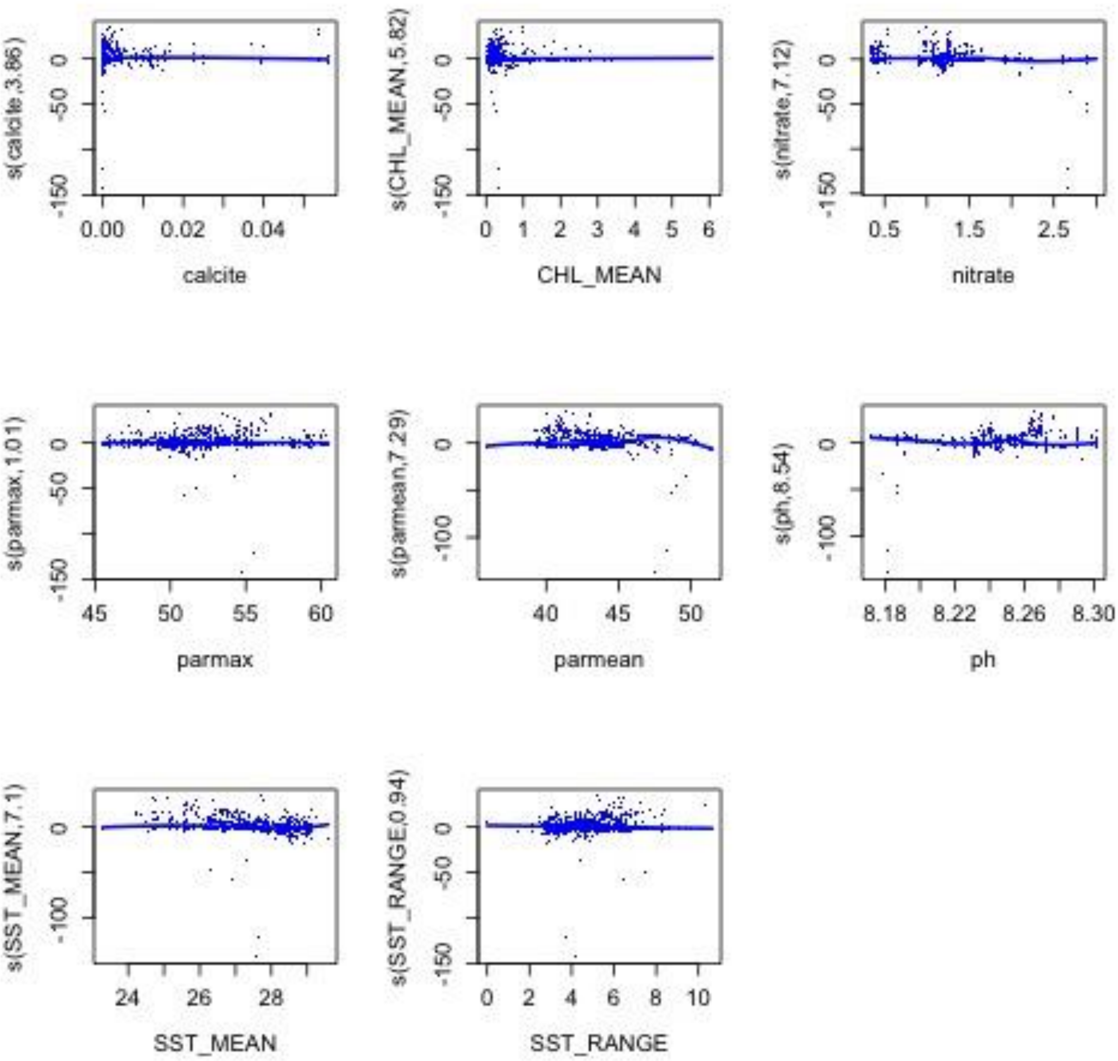
F14 Acanthurus mata, n = 137 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.145589e-05	9	2.701035e-05	4.637381e-01
s(CHL_MEAN)	3.361009e+00	9	1.881166e+01	1.723757e-04
s(nitrate)	9.583029e-01	9	2.100876e+01	6.861233e-07
s(parmax)	9.350984e-01	9	1.405924e+01	4.014954e-05
s(parmean)	4.821218e-05	9	2.793025e-05	5.026336e-01
s(ph)	4.452412e+00	9	1.751806e+01	4.914417e-04
s(SST_MEAN)	9.435169e-01	9	1.266981e+00	2.365365e-01
s(SST_RANGE)	4.583849e-05	9	2.716643e-05	5.428514e-01



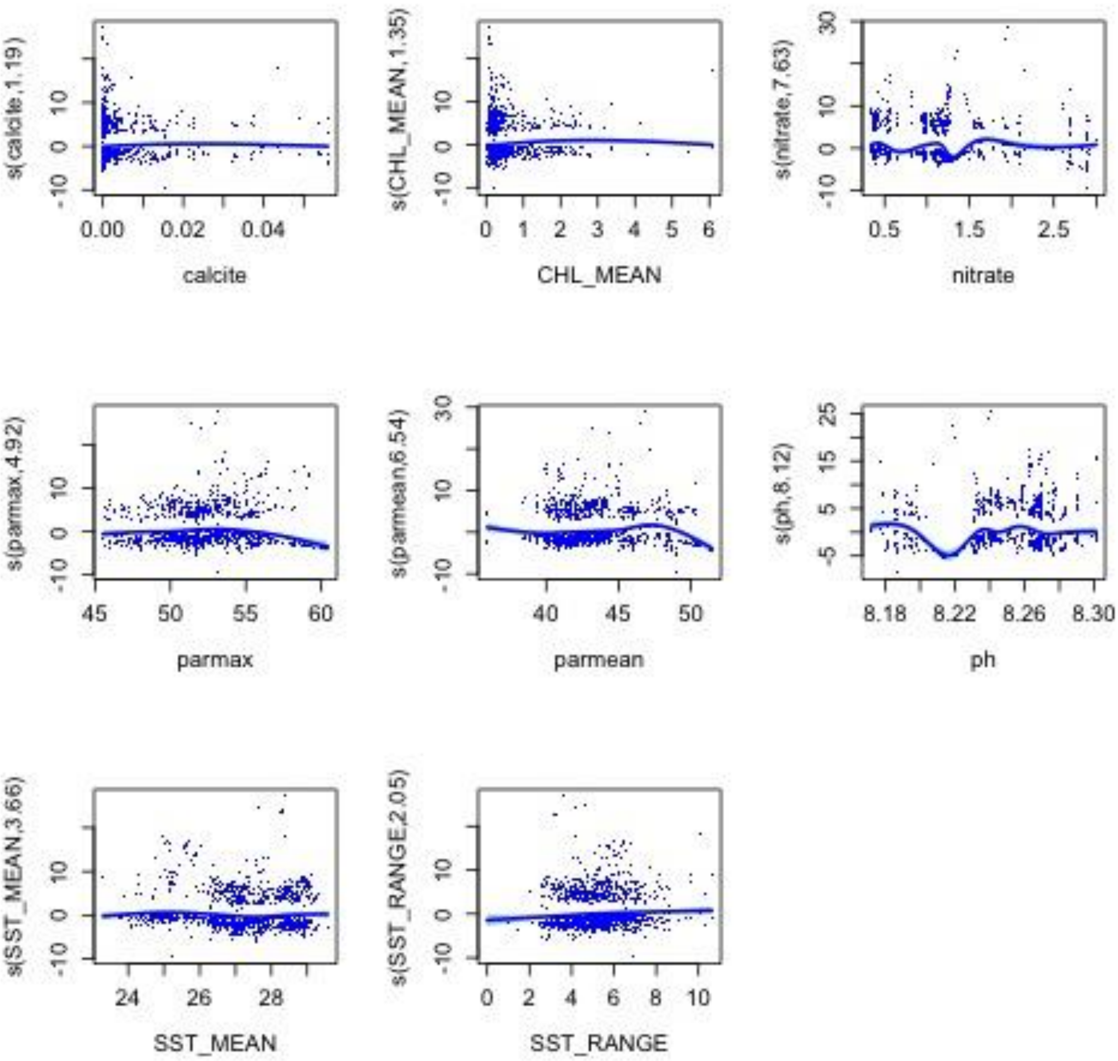
F15 Acanthurus nigricans, n = 2086 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.8572943	9	32.285347	3.765167e-07
s(CHL_MEAN)	5.8211143	9	45.712545	3.653635e-09
s(nitrate)	7.1204859	9	93.432133	3.872817e-20
s(parmax)	1.0074769	9	1.973384	1.169216e-01
s(parmean)	7.2864189	9	375.448410	4.823316e-86
s(ph)	8.5390585	9	361.600895	1.449866e-82
s(SST_MEAN)	7.1007122	9	82.385652	6.091515e-17
s(SST_RANGE)	0.9446395	9	15.913219	3.483280e-05



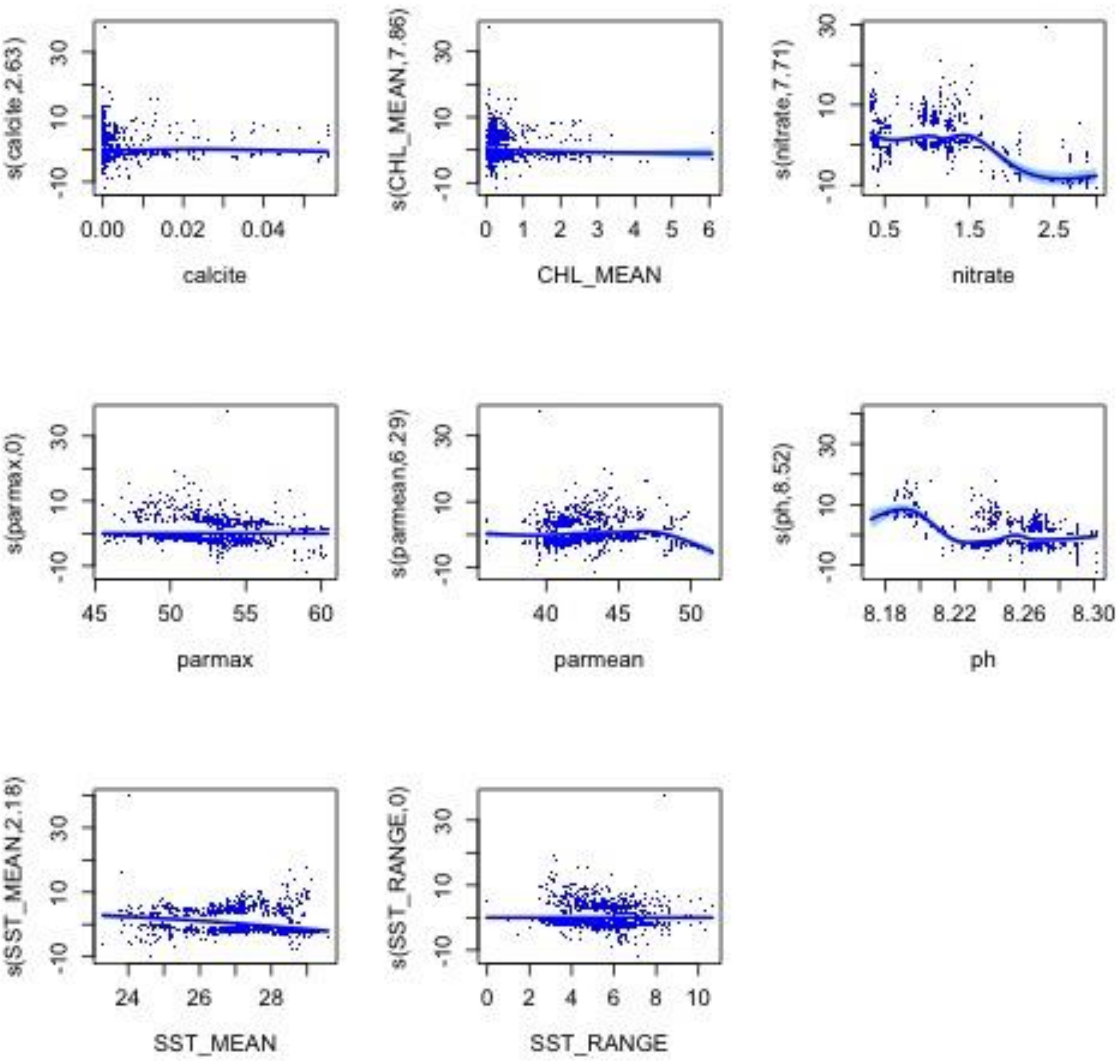
F16 Acanthurus nigricauda, n = 839 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.187901	9	7.290493	3.752529e-03
s(CHL_MEAN)	1.354585	9	17.085036	1.127145e-05
s(nitrate)	7.631455	9	204.898605	1.064298e-44
s(parmax)	4.920815	9	58.800737	5.496167e-14
s(parmean)	6.537482	9	121.781887	9.214909e-28
s(ph)	8.115314	9	129.127231	6.658348e-27
s(SST_MEAN)	3.656469	9	17.221532	1.834398e-04
s(SST_RANGE)	2.047073	9	13.666670	2.356748e-04



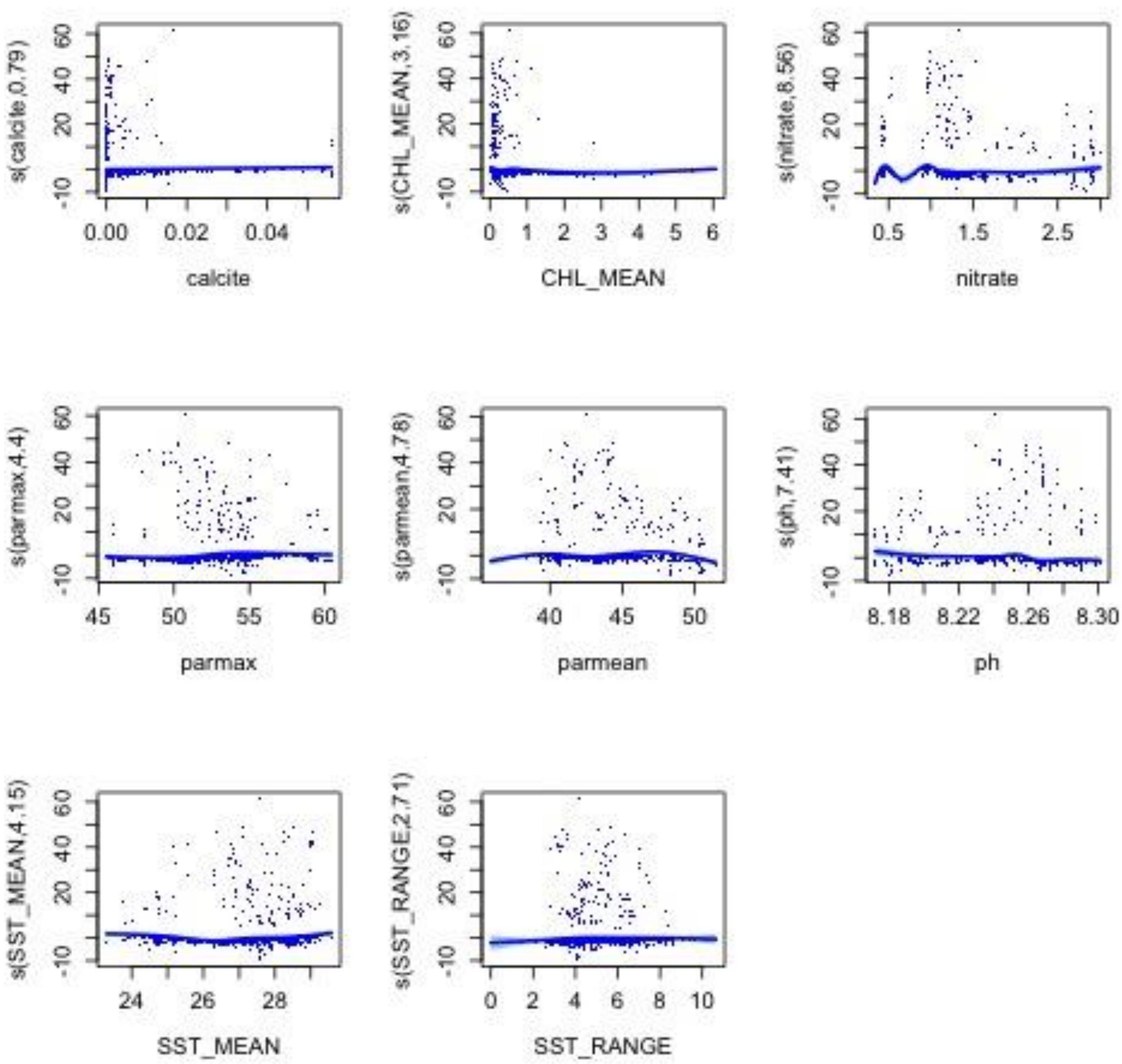
F17 Acanthurus nigrofuscus, n = 1715 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.6276954471	9	8.700430e+00	1.655751e-02
s(CHL_MEAN)	7.8568409335	9	5.657538e+01	2.936877e-10
s(nitrate)	7.7114254766	9	1.607281e+02	6.399360e-35
s(parmax)	0.0001270063	9	4.806409e-05	7.319607e-01
s(parmean)	6.2911062048	9	7.150886e+01	2.666157e-15
s(ph)	8.5233514532	9	2.002398e+02	4.648257e-43
s(SST_MEAN)	2.1814672810	9	1.170519e+02	1.351270e-31
s(SST_RANGE)	0.0006368930	9	6.010844e-04	3.521948e-01


s(calcite,2.63)
calcite
s(CHL_MEAN,7.86)
CHL_MEAN
s(nitrate,7.71)
nitrate
s(parmax,0)
parmax
s(parmean,6.29)
parmean
s(ph,8.52)
ph
s(SST_MEAN,2.18)
SST_MEAN
s(SST_RANGE,0)
SST_RANGE

F18 Acanthurus nigroris, n = 584 observations

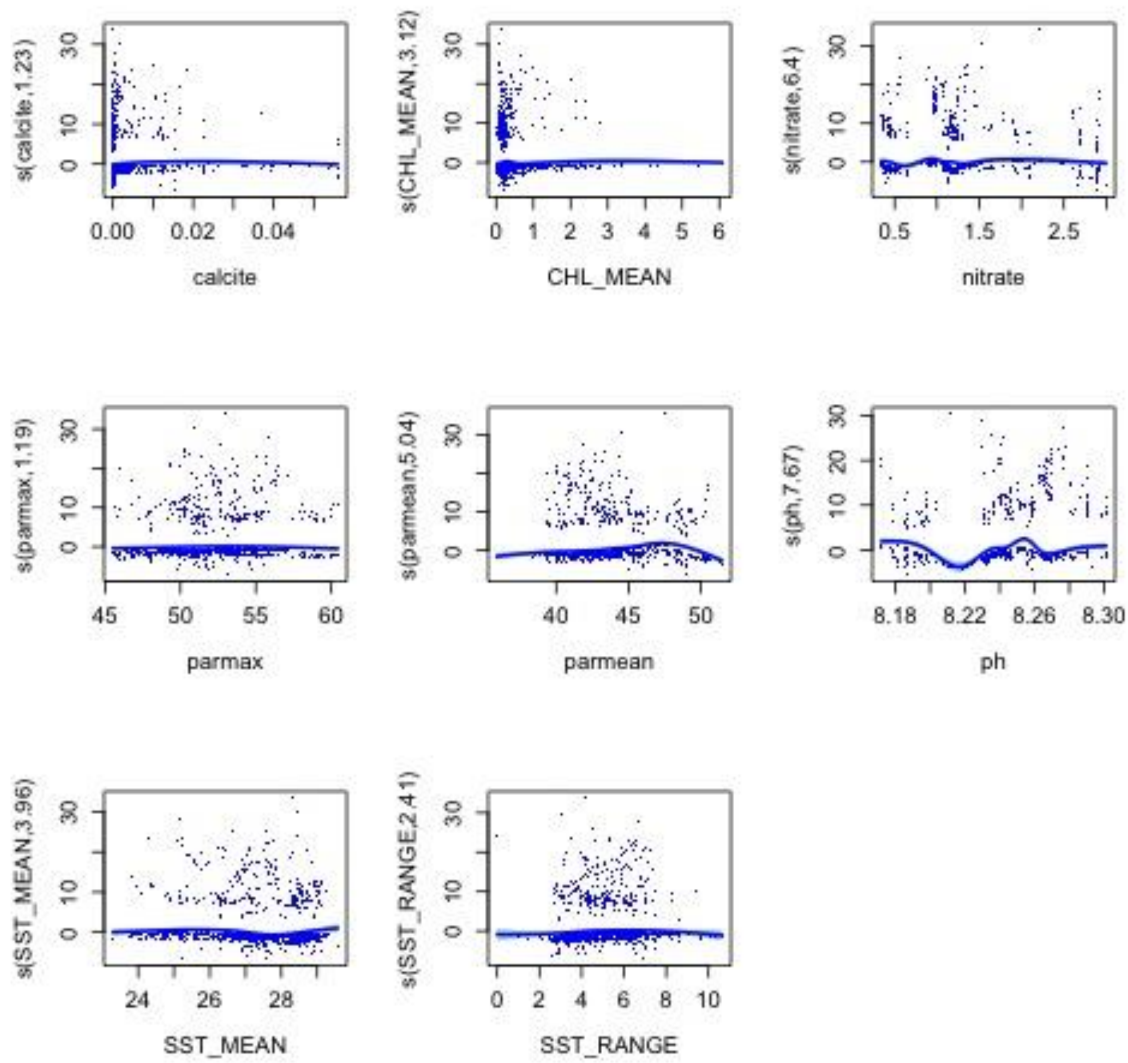
	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7908732	5	3.744267	2.579620e-02
s(CHL_MEAN)	3.1616879	9	18.397944	1.473662e-04
s(nitrate)	8.5597264	9	61.365179	1.200391e-11
s(parmax)	4.4003692	9	35.176801	1.481207e-08
s(parmean)	4.7848282	9	64.244462	6.996537e-16
s(ph)	7.4117579	9	41.989709	3.451771e-08
s(SST_MEAN)	4.1498965	9	41.931933	1.192508e-10
s(SST_RANGE)	2.7089374	9	6.797976	3.387357e-02



F19 Acanthurus olivaceus, n = 755 observations

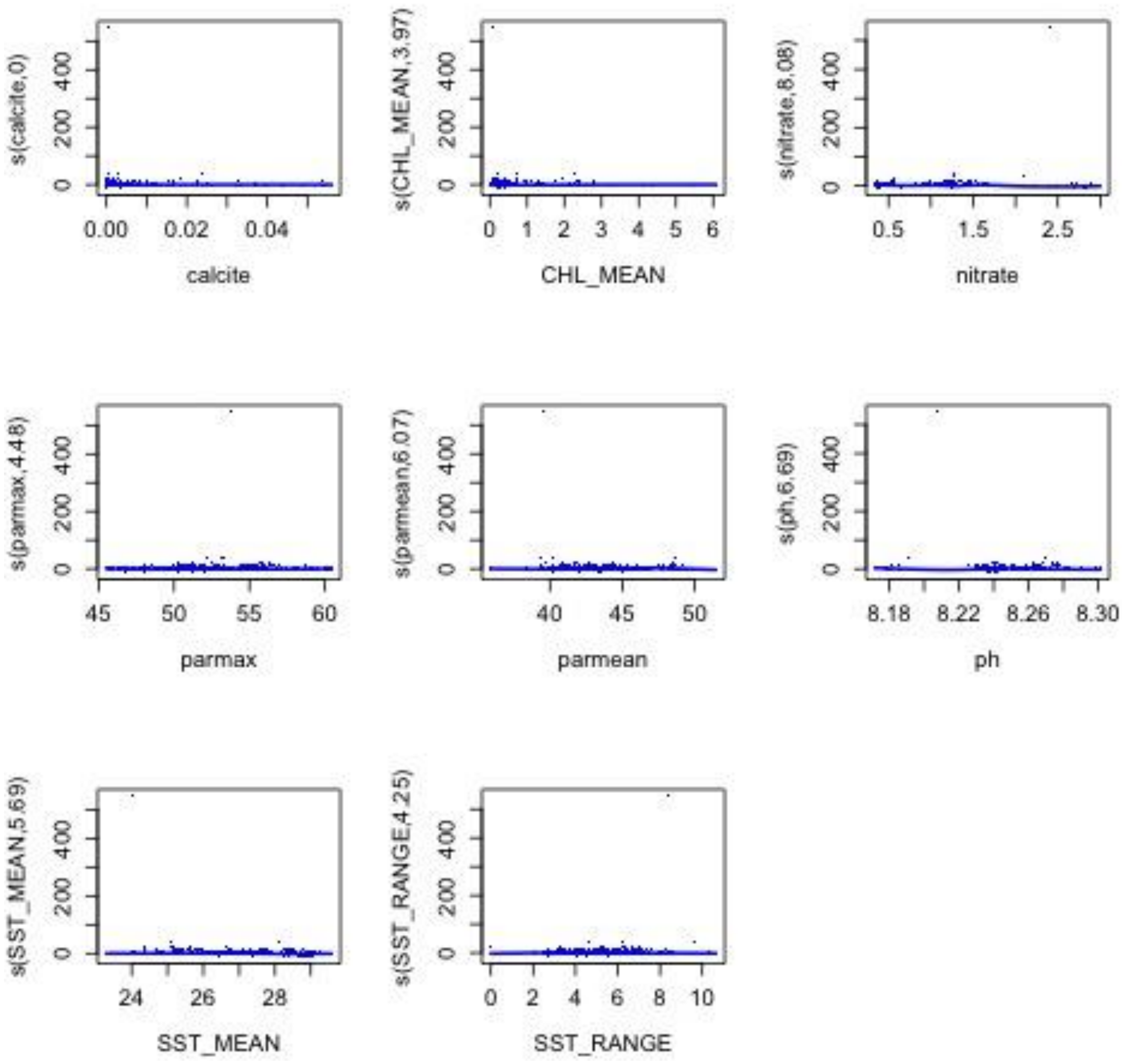
	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.227053	9	7.454104	4.960768e-03
s(CHL_MEAN)	3.119649	9	9.288579	1.729963e-02
s(nitrate)	6.403161	9	28.669274	1.395216e-05
s(parmax)	1.186908	9	3.408519	4.043837e-02

	edf	Ref.df	Chi.sq	p-value
s(parmean)	5.043193	9	98.846670	2.077668e-24
s(ph)	7.669865	9	189.712586	4.288247e-42
s(SST_MEAN)	3.955842	9	29.209792	1.796885e-07
s(SST_RANGE)	2.406493	9	9.070340	5.942784e-03



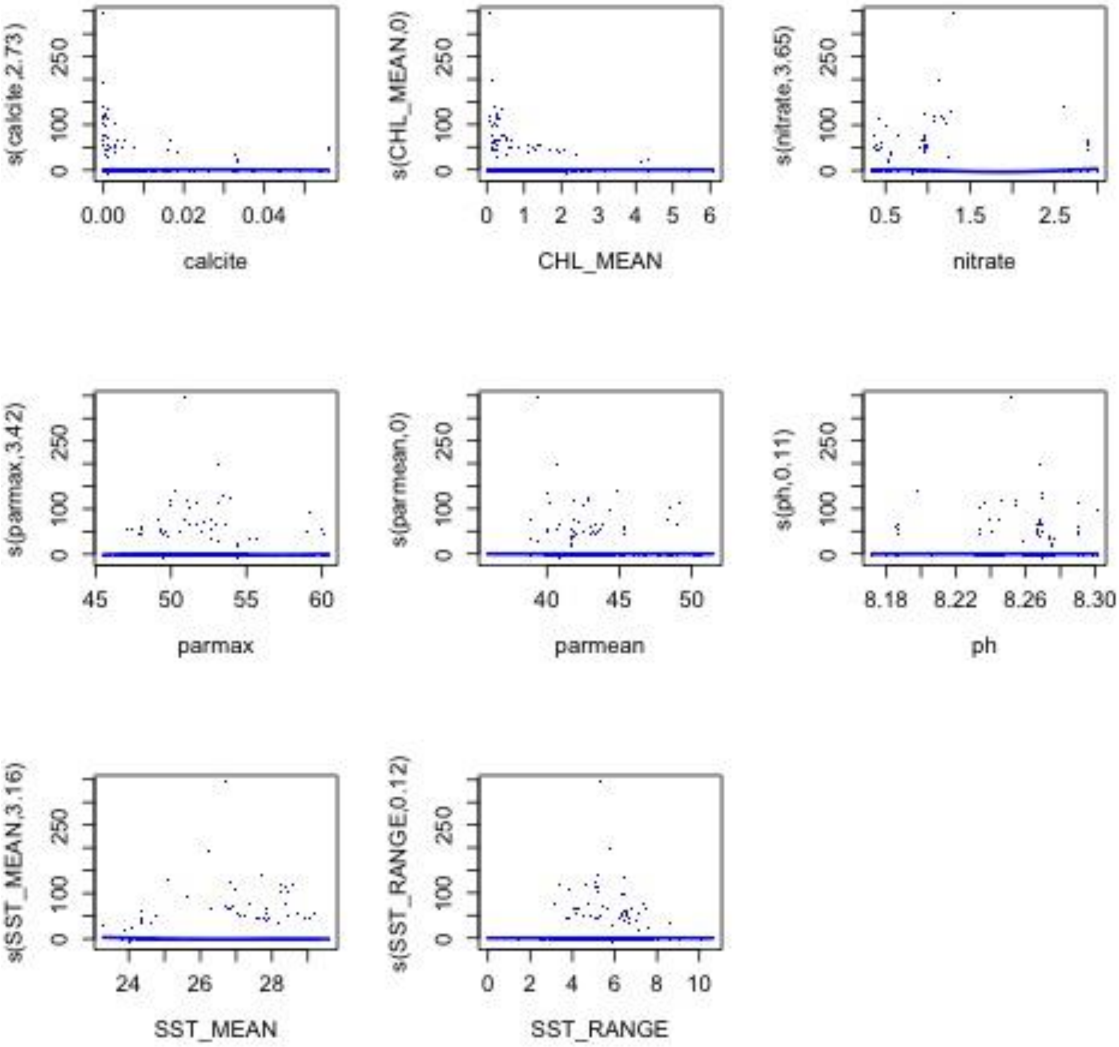
F20 Acanthurus pyroferus, n = 907 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0004940853	9	3.428407e-04	4.376642e-01
s(CHL_MEAN)	3.9689632376	9	4.117866e+01	2.078127e-09
s(nitrate)	8.0792107439	9	2.287651e+02	4.163971e-55
s(parmax)	4.4817613792	9	1.648829e+01	7.592708e-04
s(parmean)	6.0747951834	9	6.704730e+01	1.011268e-15
s(ph)	6.6915272512	9	7.826689e+01	1.656752e-18
s(SST_MEAN)	5.6895404972	9	8.460443e+01	8.400666e-21
s(SST_RANGE)	4.2496657156	9	2.640638e+01	4.618395e-06



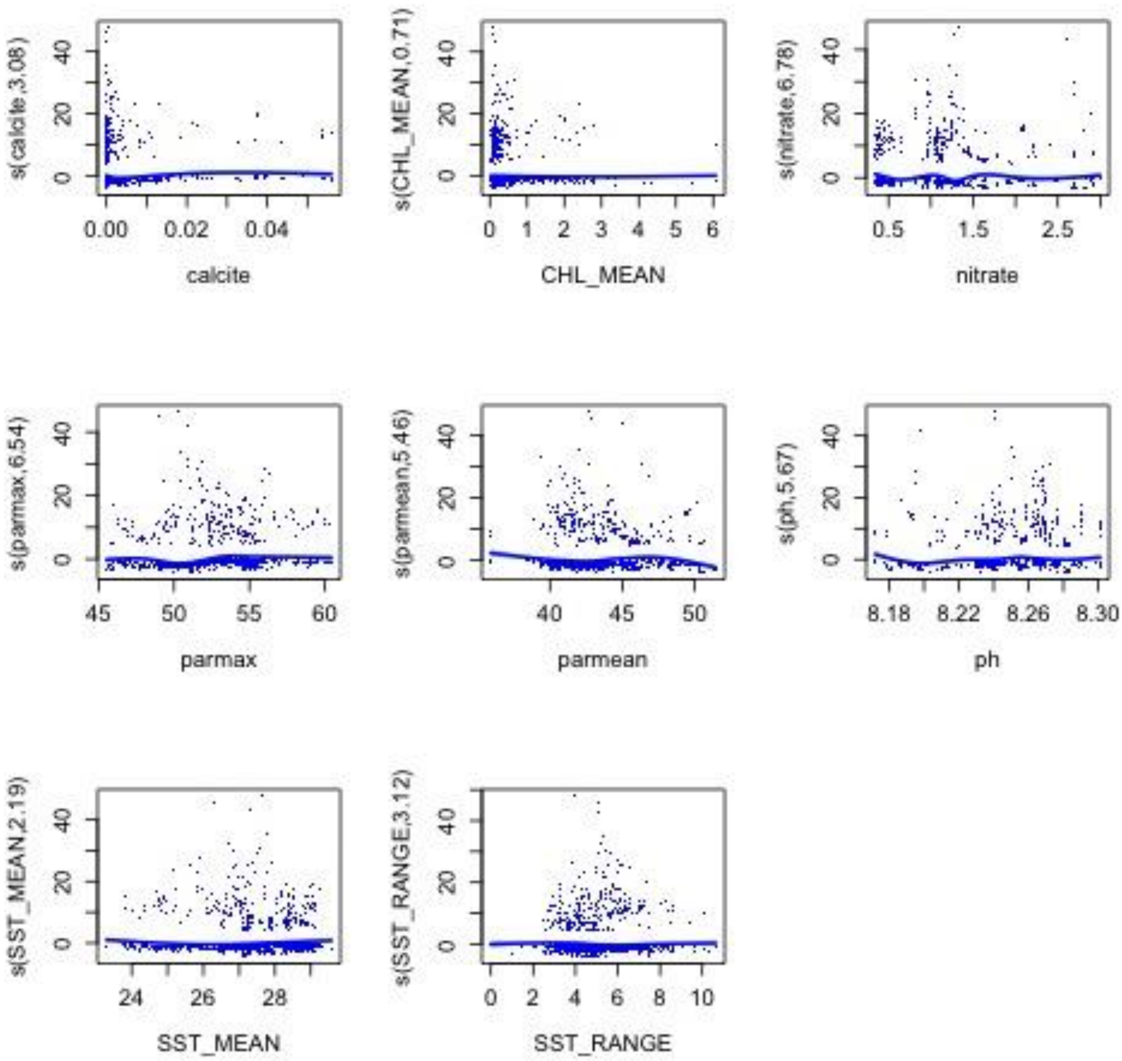
F21 Acanthurus sp, n = 182 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.726787e+00	9	1.298852e+01	1.696666e-03
s(CHL_MEAN)	1.531493e-05	9	5.322645e-06	5.959742e-01
s(nitrate)	3.650690e+00	9	3.809483e+01	3.179481e-10
s(parmax)	3.422575e+00	9	1.072157e+01	7.994942e-03
s(parmean)	1.718261e-05	9	6.108519e-06	7.138429e-01
s(ph)	1.118903e-01	9	1.242706e-01	2.503611e-01
s(SST_MEAN)	3.156427e+00	9	1.686736e+01	6.485123e-05
s(SST_RANGE)	1.240701e-01	9	1.260413e-01	3.262933e-01



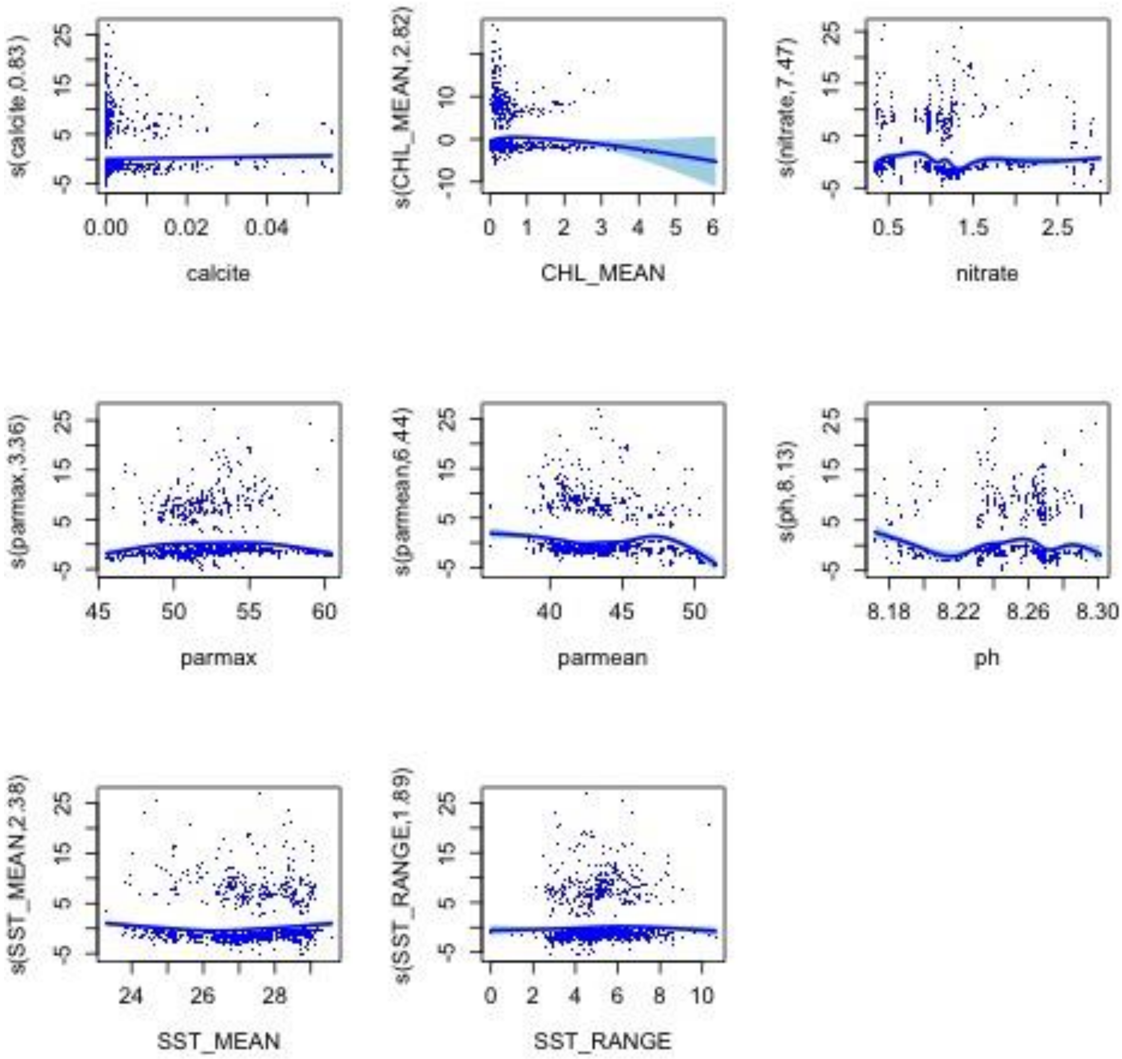
F22 Acanthurus thompsoni, n = 745 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.0840779	9	26.782052	5.759608e-07
s(CHL_MEAN)	0.7099614	9	1.804277	9.357114e-02
s(nitrate)	6.7756188	9	76.273705	2.431693e-17
s(parmax)	6.5353414	9	74.259036	1.489608e-16
s(parmean)	5.4610676	9	67.474012	2.834834e-16
s(ph)	5.6666919	9	32.248364	3.759872e-07
s(SST_MEAN)	2.1896620	9	13.213006	1.166284e-04
s(SST_RANGE)	3.1246266	9	10.632440	5.080719e-03



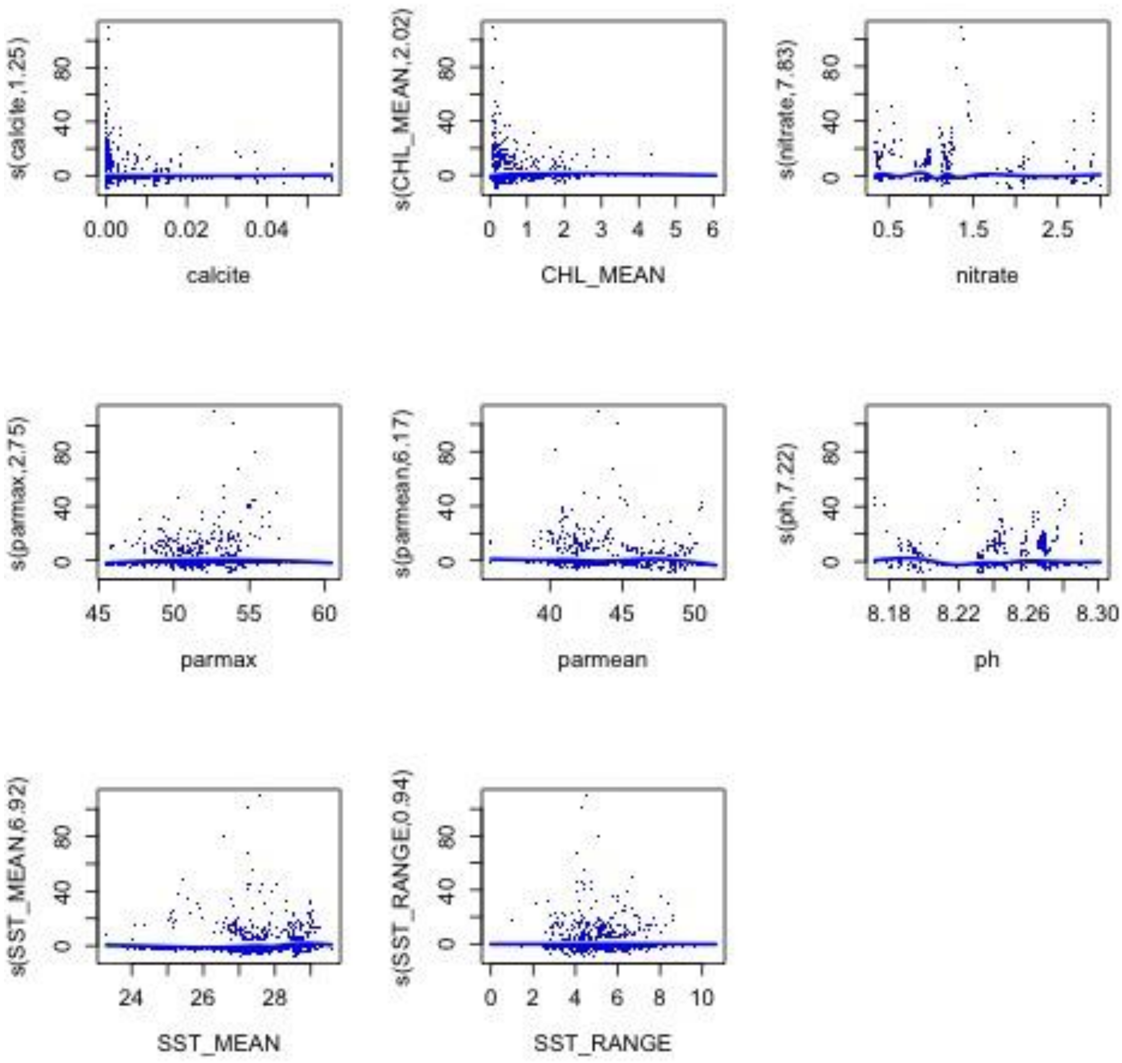
F23 Acanthurus triostegus, n = 722 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.833917	6	4.916918	1.362493e-02
s(CHL_MEAN)	2.816770	9	21.685846	1.416239e-05
s(nitrate)	7.469148	9	78.587037	4.281009e-16
s(parmax)	3.364121	9	27.596072	3.062554e-07
s(parmean)	6.439848	9	100.728986	1.286981e-22
s(ph)	8.129353	9	91.999720	4.183204e-19
s(SST_MEAN)	2.380096	9	18.296502	8.258951e-06
s(SST_RANGE)	1.886490	9	6.132428	1.746205e-02



F24 Acanthurus xanthopterus, n = 404 observations

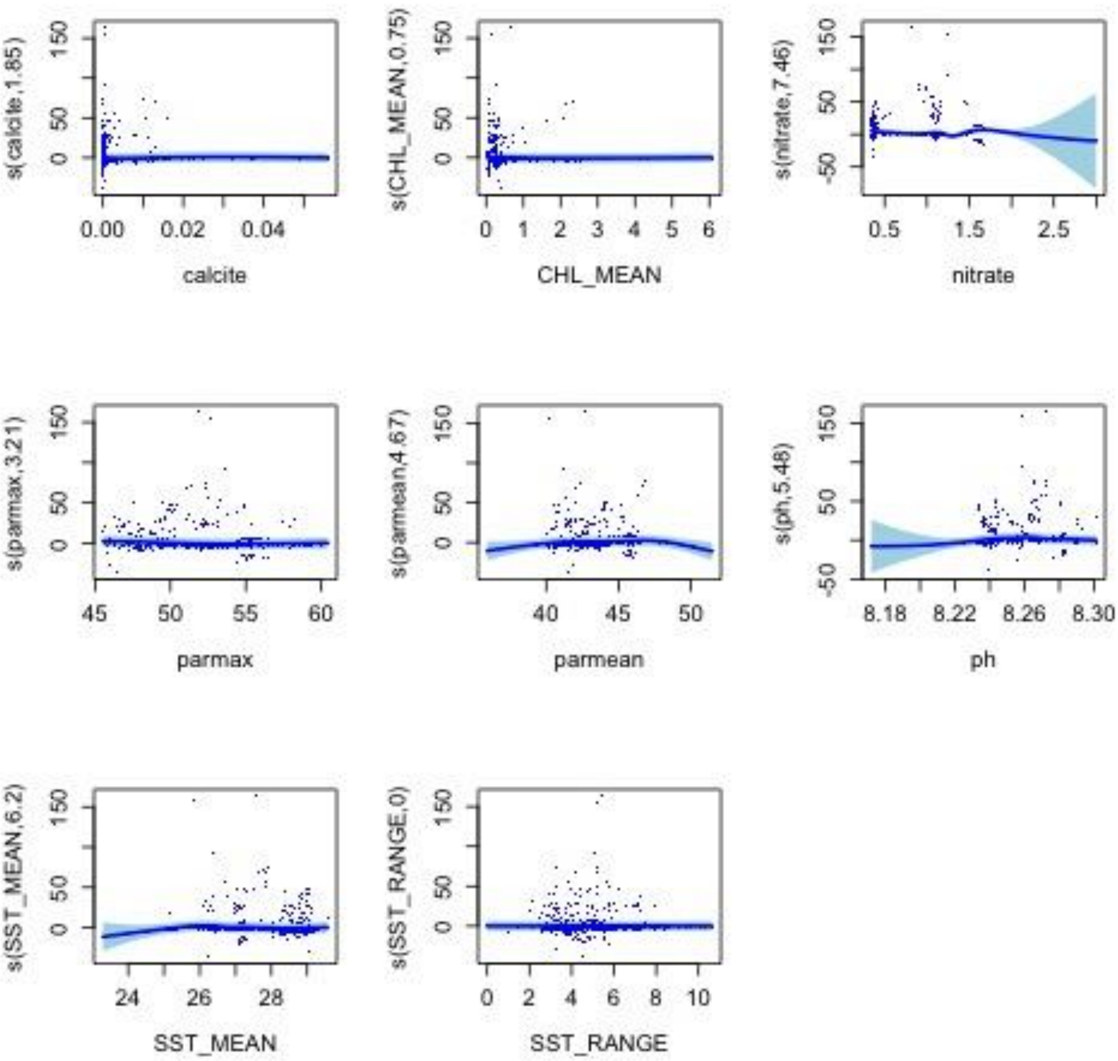
	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.2518918	9	2.572598	1.155606e-01
s(CHL_MEAN)	2.0204138	9	24.355472	6.426613e-07
s(nitrate)	7.8320572	9	93.785183	4.015175e-19
s(parmax)	2.7507729	9	27.754492	3.633586e-08
s(parmean)	6.1685193	9	65.555536	2.176068e-14
s(ph)	7.2174582	9	82.939019	4.659984e-18
s(SST_MEAN)	6.9227303	9	49.174268	4.059605e-10
s(SST_RANGE)	0.9393755	9	1.429245	1.879585e-01



F25 Aethaloperca rogaa

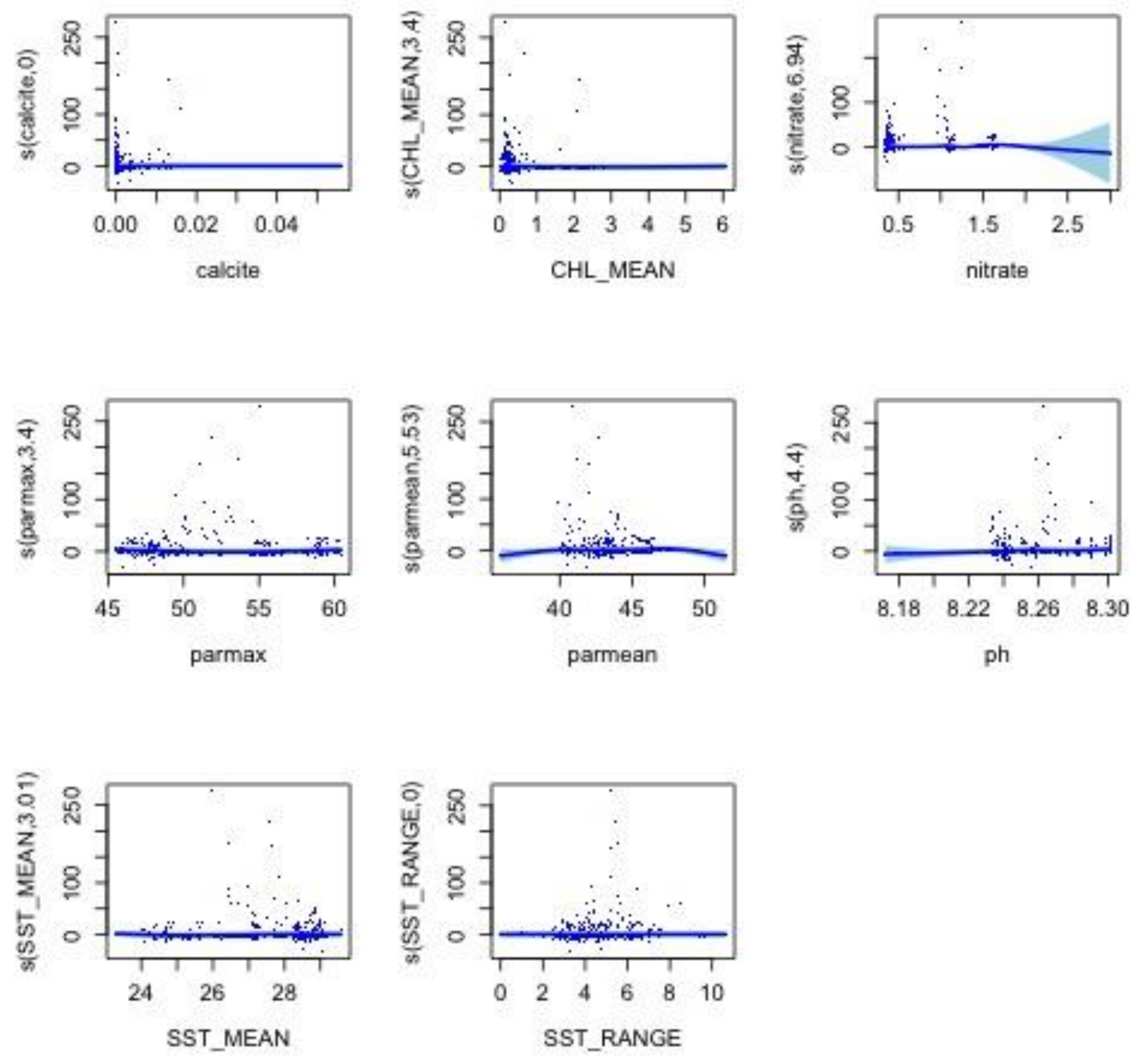
F26 Amblyglyphidodon aureus, n = 175 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.845492296	9	7.285595e+00	1.294203e-02
s(CHL_MEAN)	0.750439288	9	2.050001e+00	8.192054e-02
s(nitrate)	7.455487367	9	1.012102e+02	1.462890e-22
s(parmax)	3.214176043	9	2.398383e+01	1.186833e-06
s(parmean)	4.674148826	9	2.021424e+01	1.248265e-04
s(ph)	5.476891148	9	3.722541e+01	2.067172e-08
s(SST_MEAN)	6.199501198	9	2.953123e+01	4.051053e-06
s(SST_RANGE)	0.000892846	9	7.129392e-04	4.323613e-01



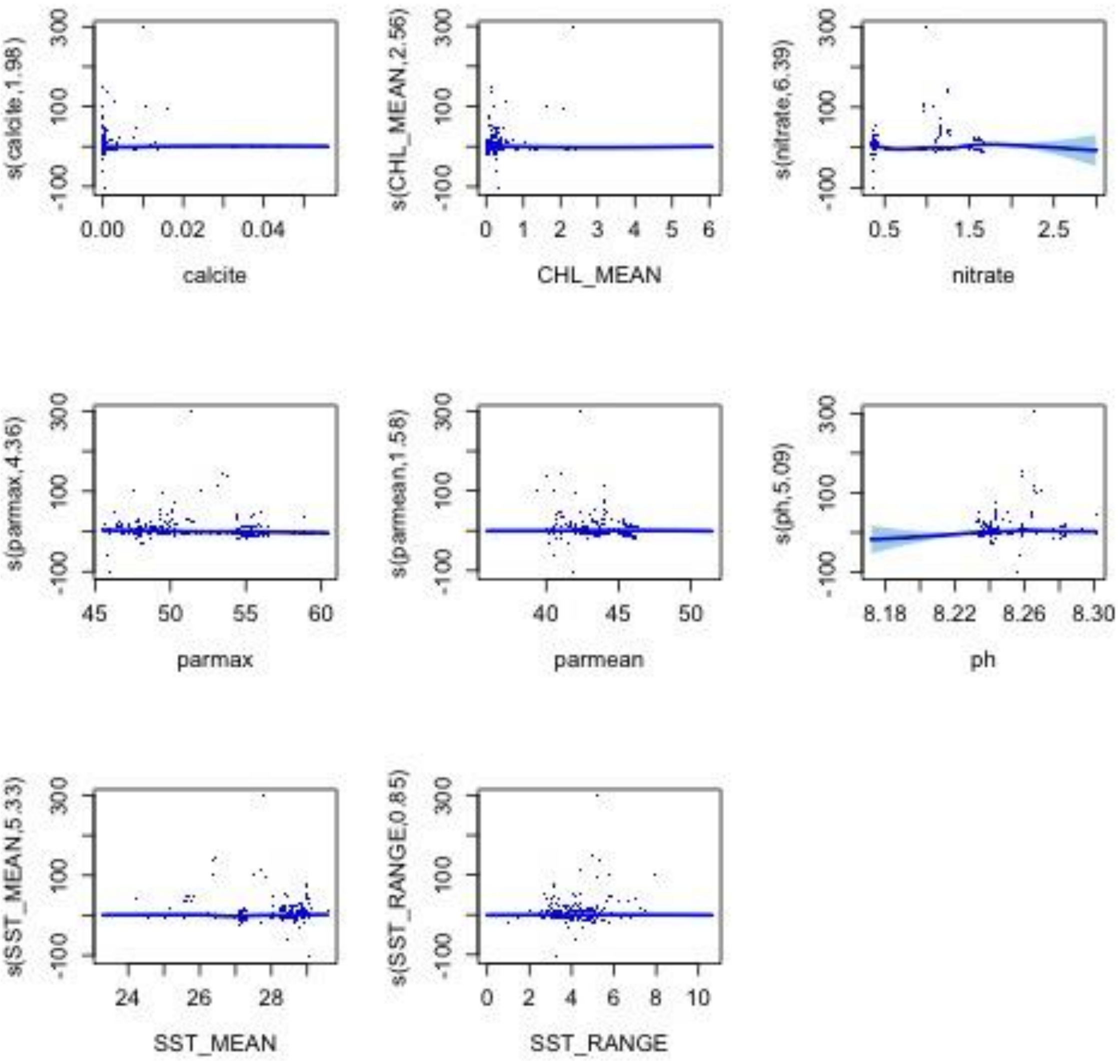
F27 Amblyglyphidodon curacao, n = 149 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0002909076	8	1.626113e-04	4.894151e-01
s(CHL_MEAN)	3.4047617494	9	2.185874e+01	2.784862e-05
s(nitrate)	6.9421930396	9	8.135583e+01	1.397024e-18
s(parmax)	3.4011781037	9	5.174546e+01	4.529142e-14
s(parmean)	5.5269107822	9	1.785443e+01	1.217219e-03
s(ph)	4.3972855075	9	3.626243e+01	2.410648e-09
s(SST_MEAN)	3.0102845638	9	1.202068e+01	1.859694e-03
s(SST_RANGE)	0.0009120130	9	9.536379e-04	2.934505e-01



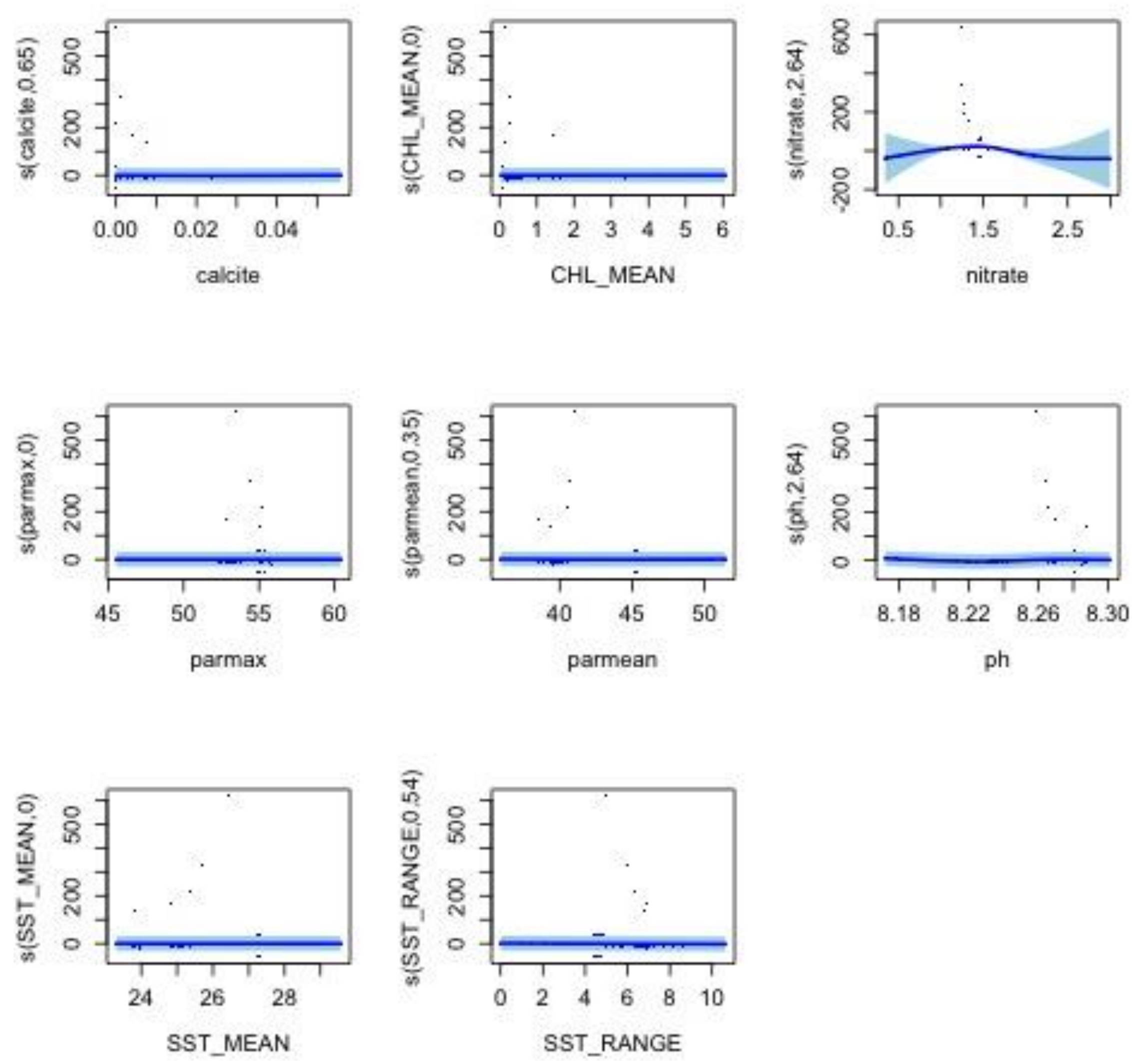
F28 Amblyglyphidodon leucogaster, n = 139 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.9777271	9	12.903992	7.707707e-04
s(CHL_MEAN)	2.5625581	9	16.153386	2.639440e-04
s(nitrate)	6.3873009	9	122.885339	1.626522e-30
s(parmax)	4.3619262	9	39.537680	5.264309e-10
s(parmean)	1.5761395	9	3.127517	8.800348e-02
s(ph)	5.0934902	9	44.195277	6.084808e-11
s(SST_MEAN)	5.3302818	9	25.915816	1.168003e-05
s(SST_RANGE)	0.8500262	9	1.349987	1.719035e-01



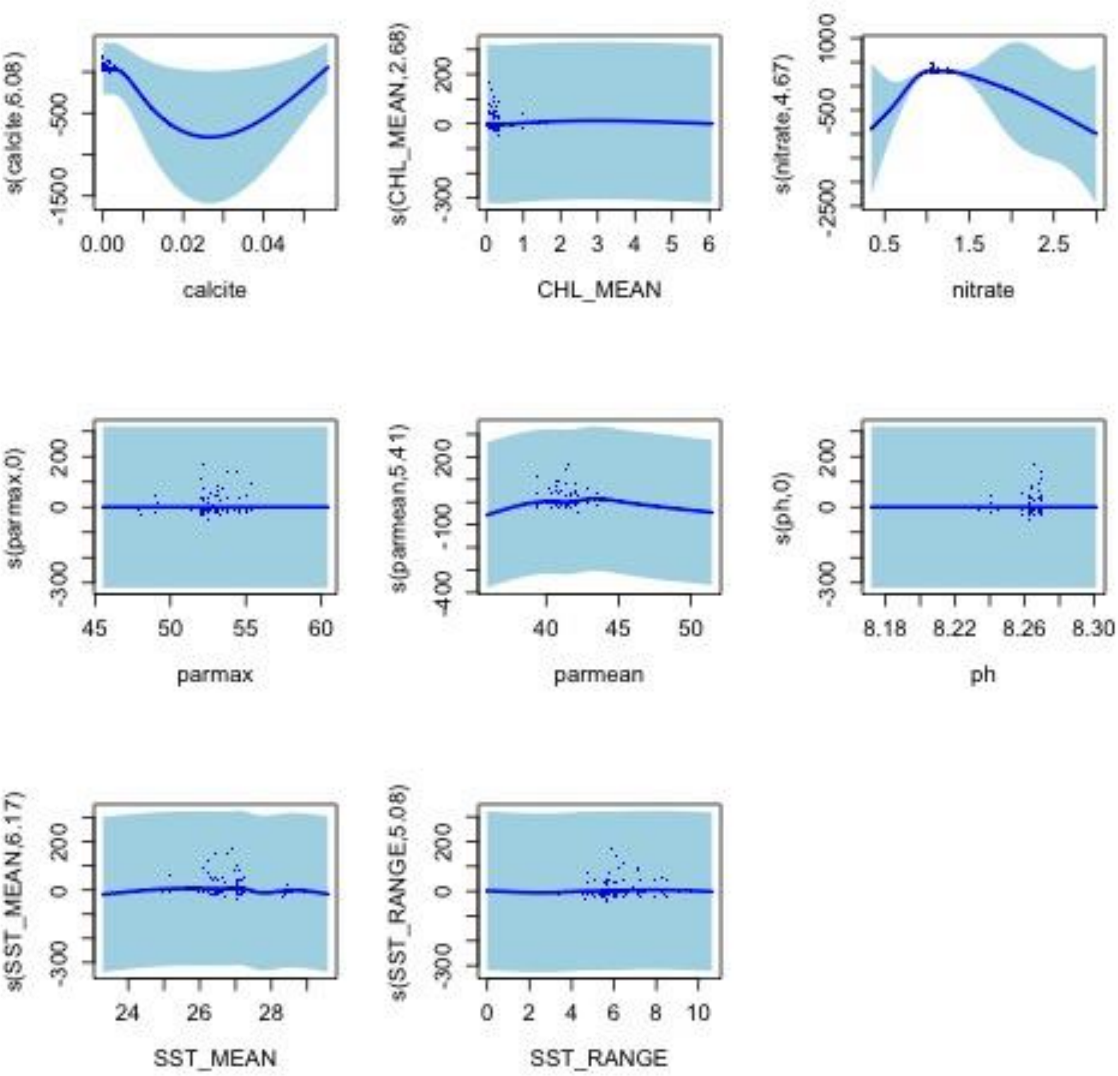
F29 Amblyglyphidodon melanopterus, n = 31 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.454150e-01	9	1.092946e+00	0.1757595701
s(CHL_MEAN)	1.663956e-05	9	5.379654e-06	0.5436146884
s(nitrate)	2.637100e+00	8	1.323880e+01	0.0004030207
s(parmax)	1.331123e-05	9	4.134668e-06	0.6198624200
s(parmean)	3.460295e-01	9	6.354188e-01	0.0974453546
s(ph)	2.635422e+00	8	1.343157e+01	0.0004569172
s(SST_MEAN)	8.103569e-06	9	2.046813e-06	0.6564118067
s(SST_RANGE)	5.447918e-01	9	9.708430e-01	0.1518307802



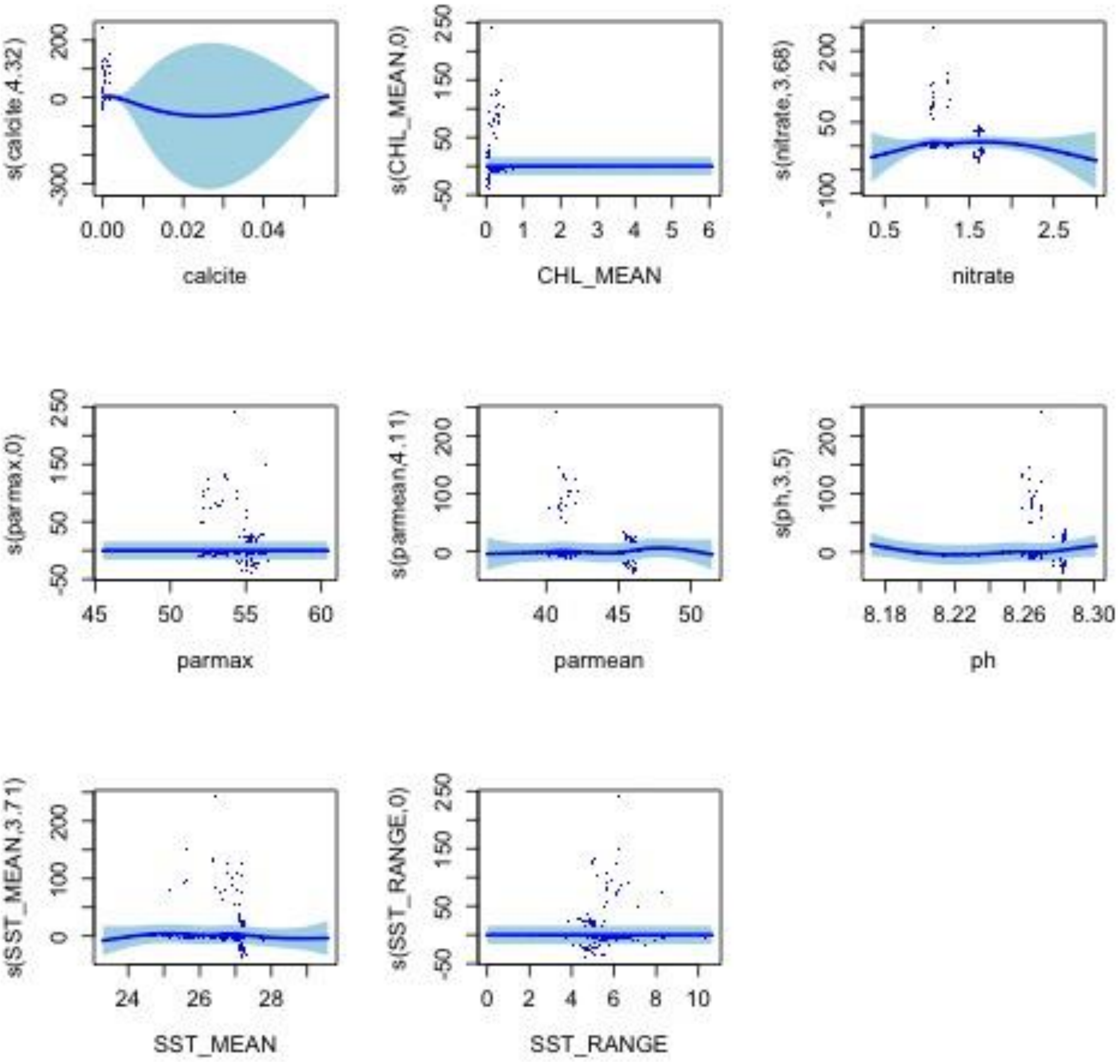
F30 Amblyglyphidodon orbicularis, n = 86 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.076142e+00	9	4.401989e+01	7.347598e-09
s(CHL_MEAN)	2.684348e+00	9	1.289418e+01	1.240173e-03
s(nitrate)	4.667104e+00	9	3.288466e+01	2.178469e-07
s(parmax)	4.802204e-04	9	4.769711e-04	2.936279e-01
s(parmean)	5.413444e+00	9	4.787017e+01	1.881443e-10
s(ph)	7.791718e-06	7	1.238630e-06	7.003186e-01
s(SST_MEAN)	6.167733e+00	9	3.360214e+01	1.020864e-06
s(SST_RANGE)	5.076975e+00	9	3.603333e+01	7.062966e-08



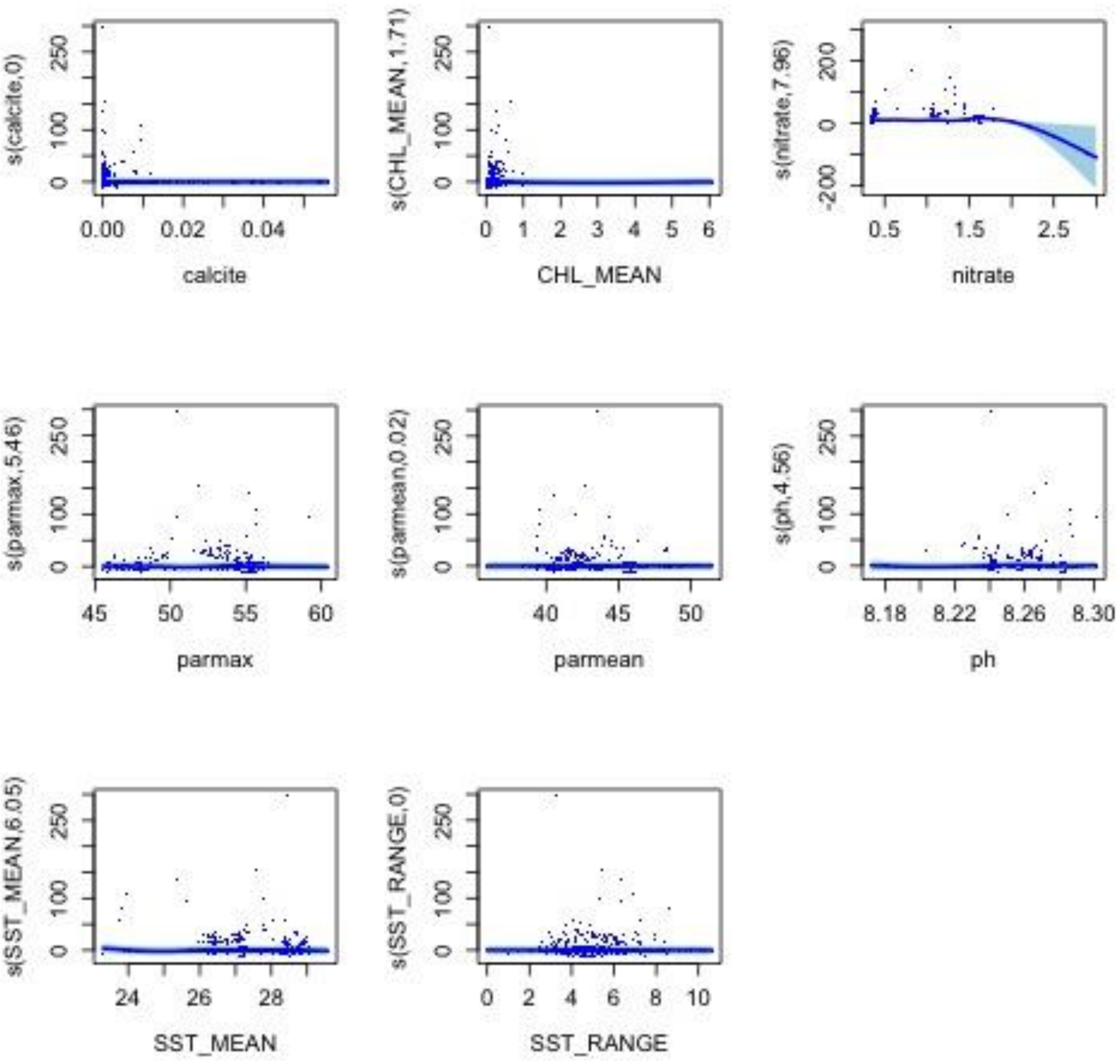
F31 Amphiprion barberi, n = 68 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.319643e+00	9	1.398103e+01	0.0059876730
s(CHL_MEAN)	1.156481e-04	9	7.214683e-06	0.8441077772
s(nitrate)	3.675154e+00	9	1.348961e+01	0.0008999396
s(parmax)	9.863651e-06	9	3.950418e-06	0.5575923866
s(parmean)	4.107060e+00	9	1.784611e+01	0.0001569116
s(ph)	3.502487e+00	9	9.317757e+00	0.0087830329
s(SST_MEAN)	3.714029e+00	9	1.183193e+01	0.0027974233
s(SST_RANGE)	1.701046e-04	9	1.015523e-04	0.5002804611



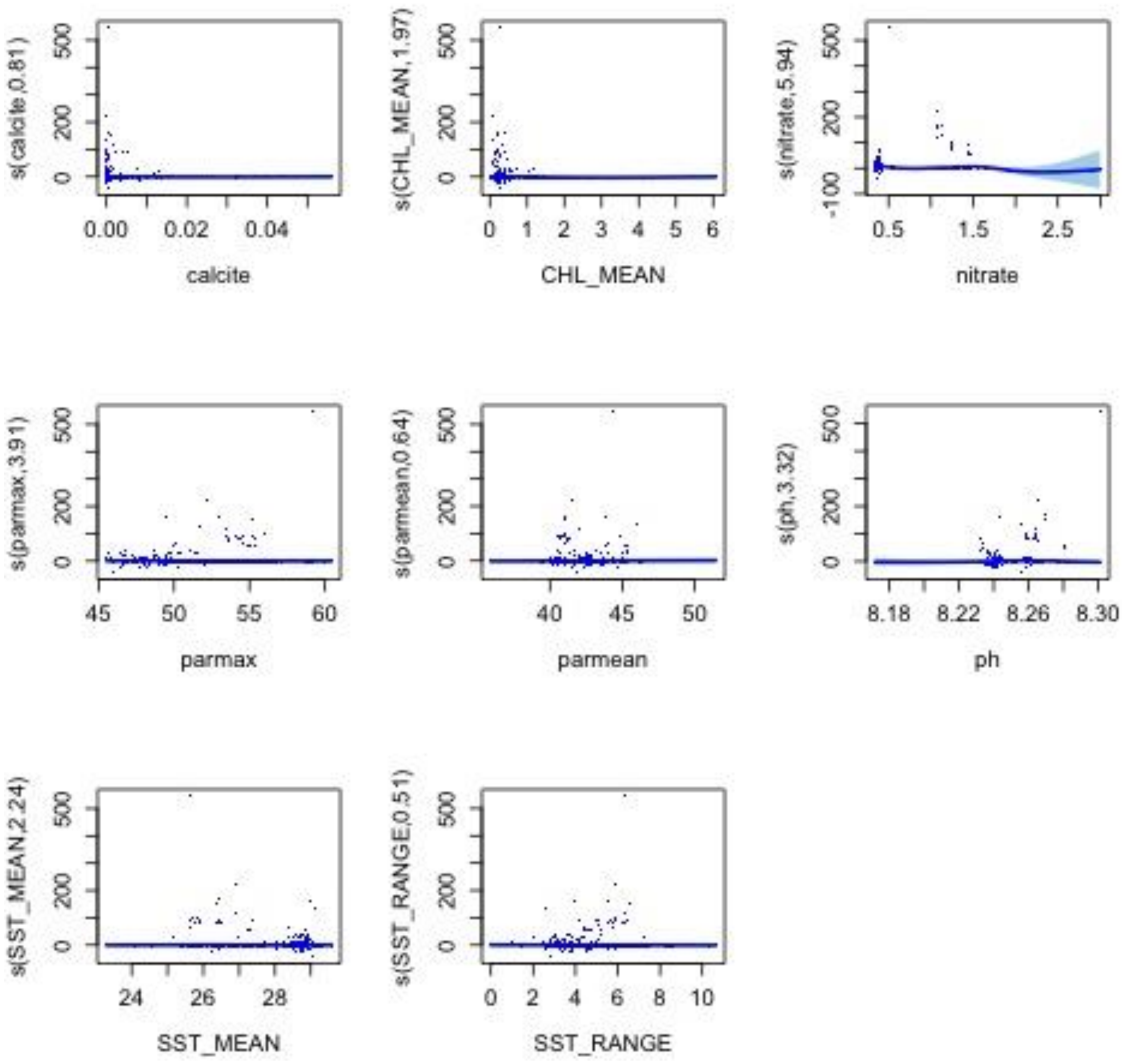
F32 Amphiprion chrysopterus, n = 268 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.511582e-05	9	2.465896e-05	6.247459e-01
s(CHL_MEAN)	1.705545e+00	9	5.866476e+00	2.639146e-02
s(nitrate)	7.964484e+00	9	1.462559e+02	3.372203e-33
s(parmax)	5.456738e+00	9	5.042581e+01	4.385519e-11
s(parmean)	1.683844e-02	9	1.642828e-02	3.202711e-01
s(ph)	4.562272e+00	9	2.525653e+01	4.674545e-06
s(SST_MEAN)	6.050377e+00	9	2.560237e+01	4.760636e-05
s(SST_RANGE)	1.021678e-04	9	4.262123e-05	6.473235e-01



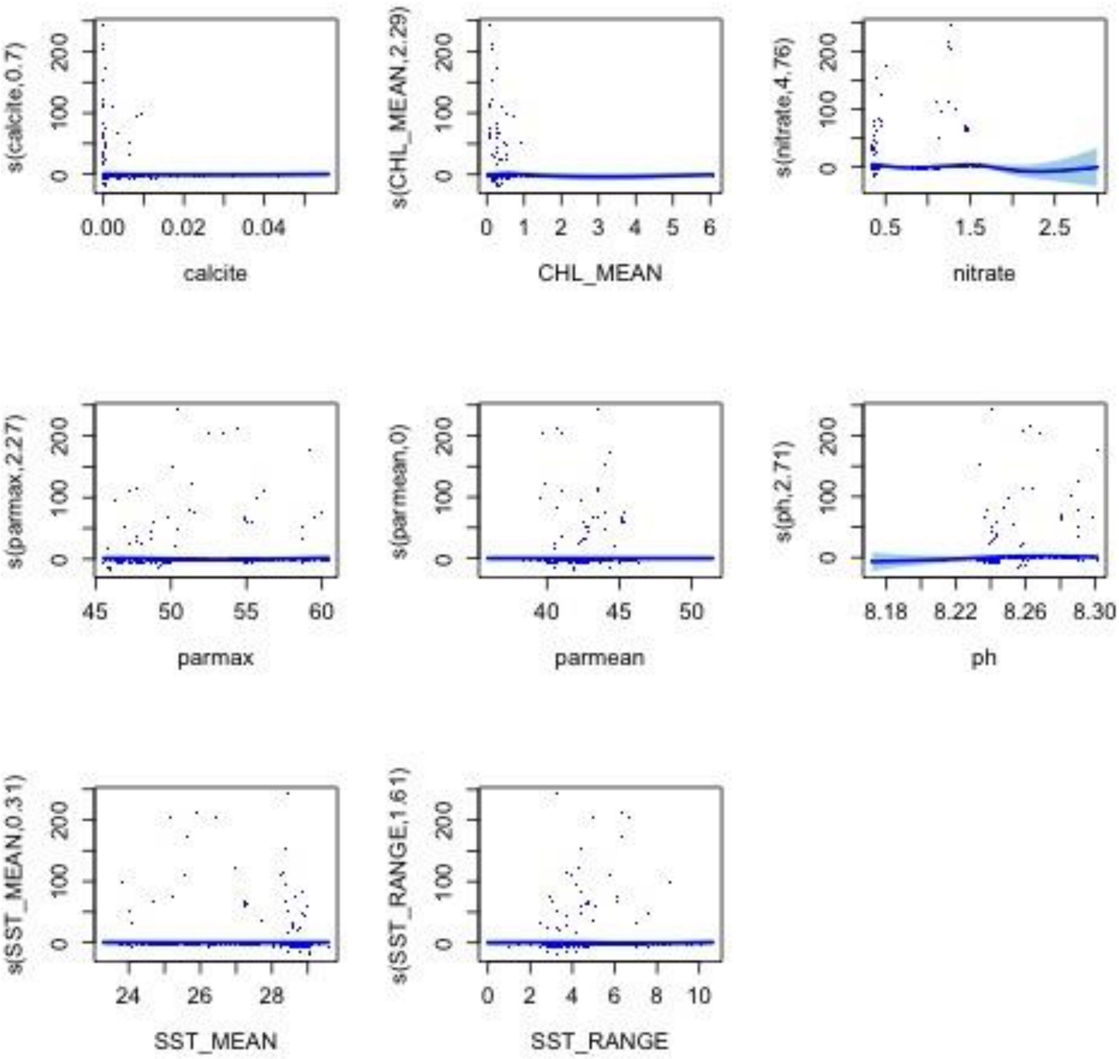
F33 Amphiprion clarkii, n = 71 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8053657	9	2.3811074	7.434679e-02
s(CHL_MEAN)	1.9727282	9	8.9701496	5.849522e-03
s(nitrate)	5.9409615	9	86.4232232	9.605576e-21
s(parmax)	3.9110288	9	13.9659097	1.653098e-03
s(parmean)	0.6381086	9	1.7982656	6.991142e-02
s(ph)	3.3202859	9	27.0211099	2.824202e-07
s(SST_MEAN)	2.2360035	9	4.2867823	8.773039e-02
s(SST_RANGE)	0.5055960	9	0.9651786	1.565667e-01



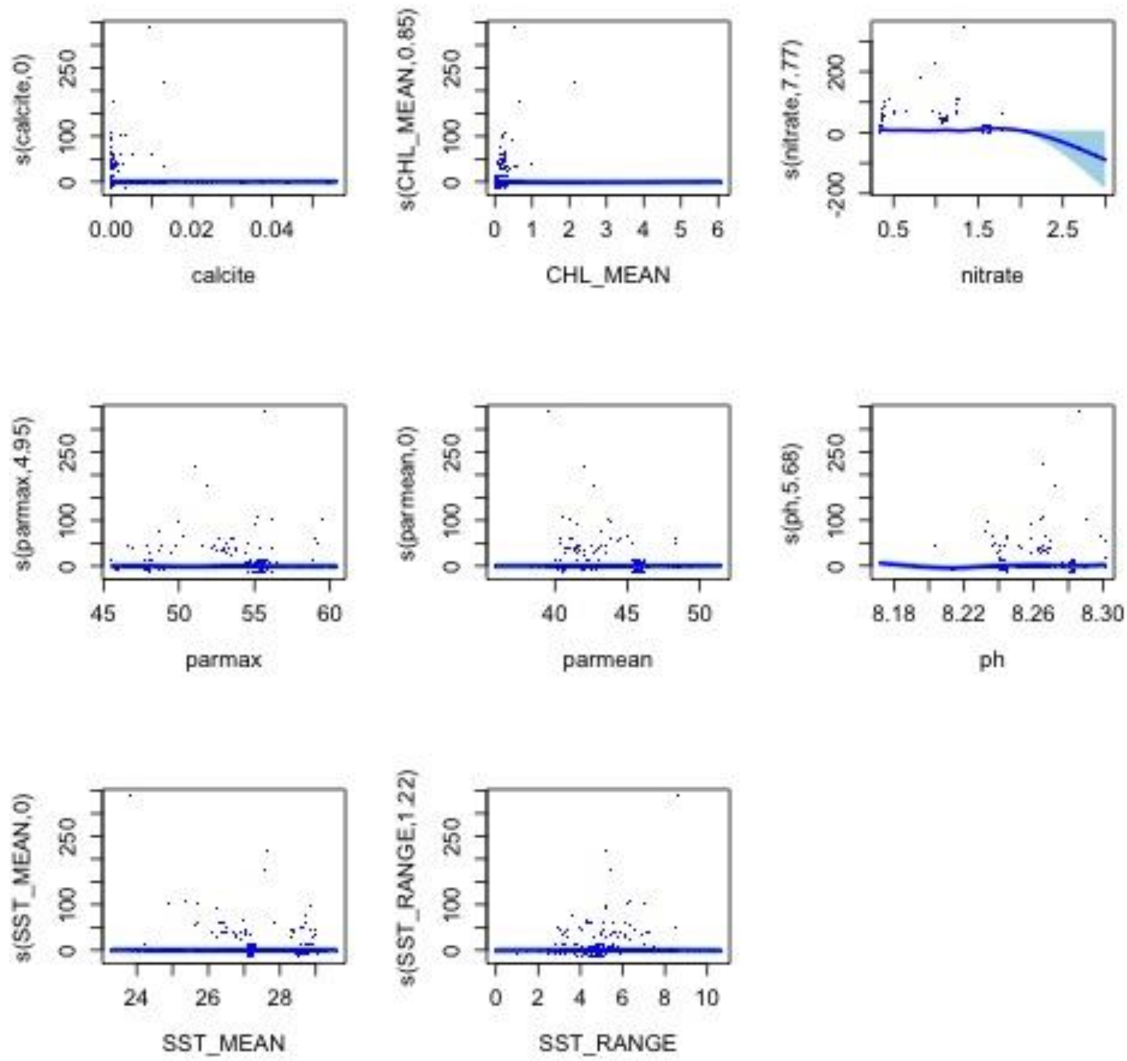
F34 Amphiprion melanopus, n = 49 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7042607171	9	1.700374e+00	1.059252e-01
s(CHL_MEAN)	2.2943401634	9	9.758664e+00	4.480350e-03
s(nitrate)	4.7609374997	9	4.055727e+01	5.951714e-10
s(parmax)	2.2663438555	9	1.102670e+01	1.025292e-03
s(parmean)	0.0006704398	9	4.169275e-04	4.090320e-01
s(ph)	2.7083823612	9	1.564920e+01	5.579669e-05
s(SST_MEAN)	0.3081153932	9	3.468607e-01	2.524325e-01
s(SST_RANGE)	1.6053454835	9	3.663219e+00	6.581335e-02



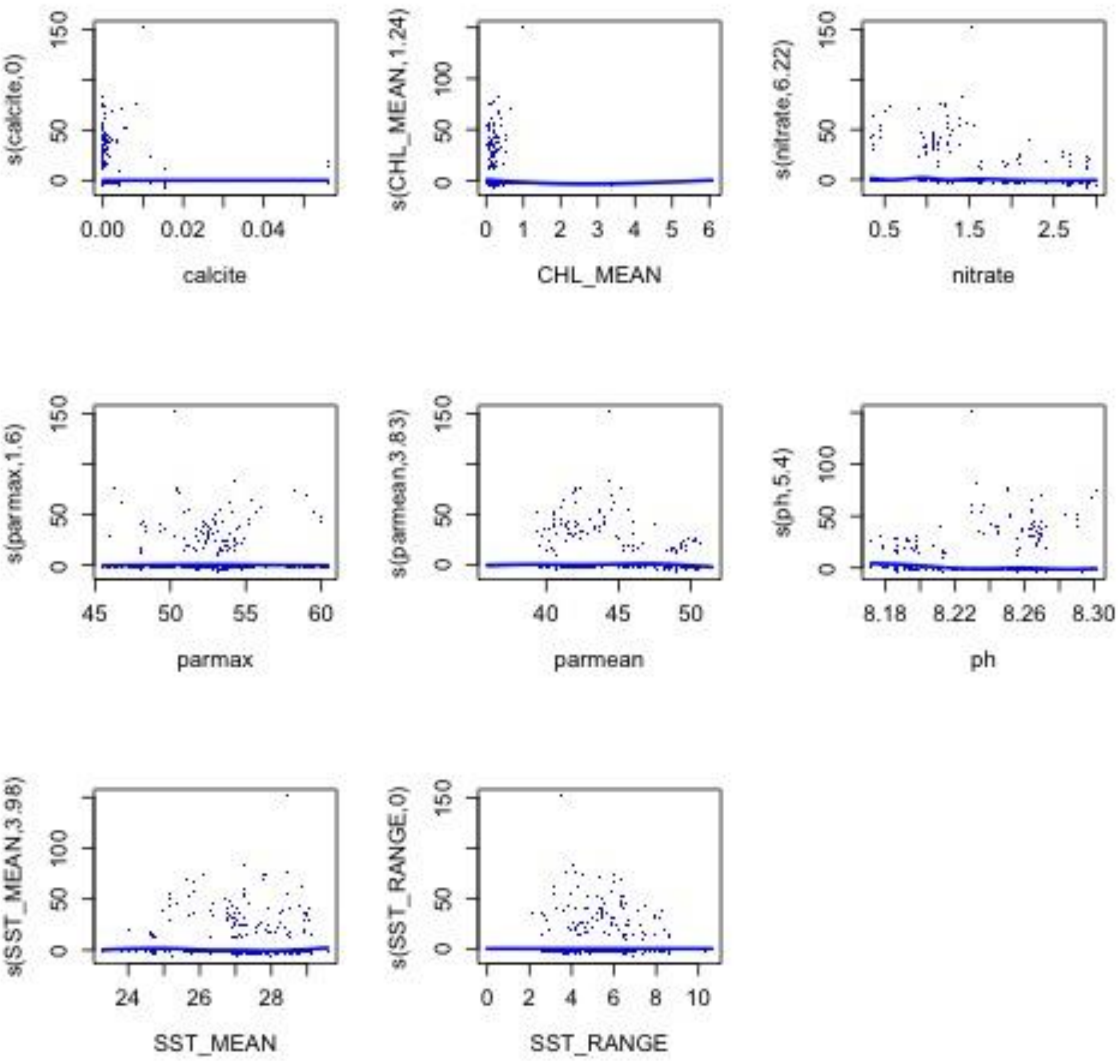
F35 Amphiprion perideraion, n = 127 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.820618e-05	9	4.426636e-05	4.770982e-01
s(CHL_MEAN)	8.538928e-01	9	2.760613e+00	5.739419e-02
s(nitrate)	7.769488e+00	9	1.388134e+02	1.197140e-30
s(parmax)	4.945140e+00	9	2.174924e+01	1.159895e-04
s(parmean)	1.796753e-04	9	5.380094e-05	7.468144e-01
s(ph)	5.676019e+00	9	3.416720e+01	1.242654e-07
s(SST_MEAN)	1.014301e-04	9	6.422592e-05	4.871397e-01
s(SST_RANGE)	1.215557e+00	9	2.057318e+00	1.521680e-01



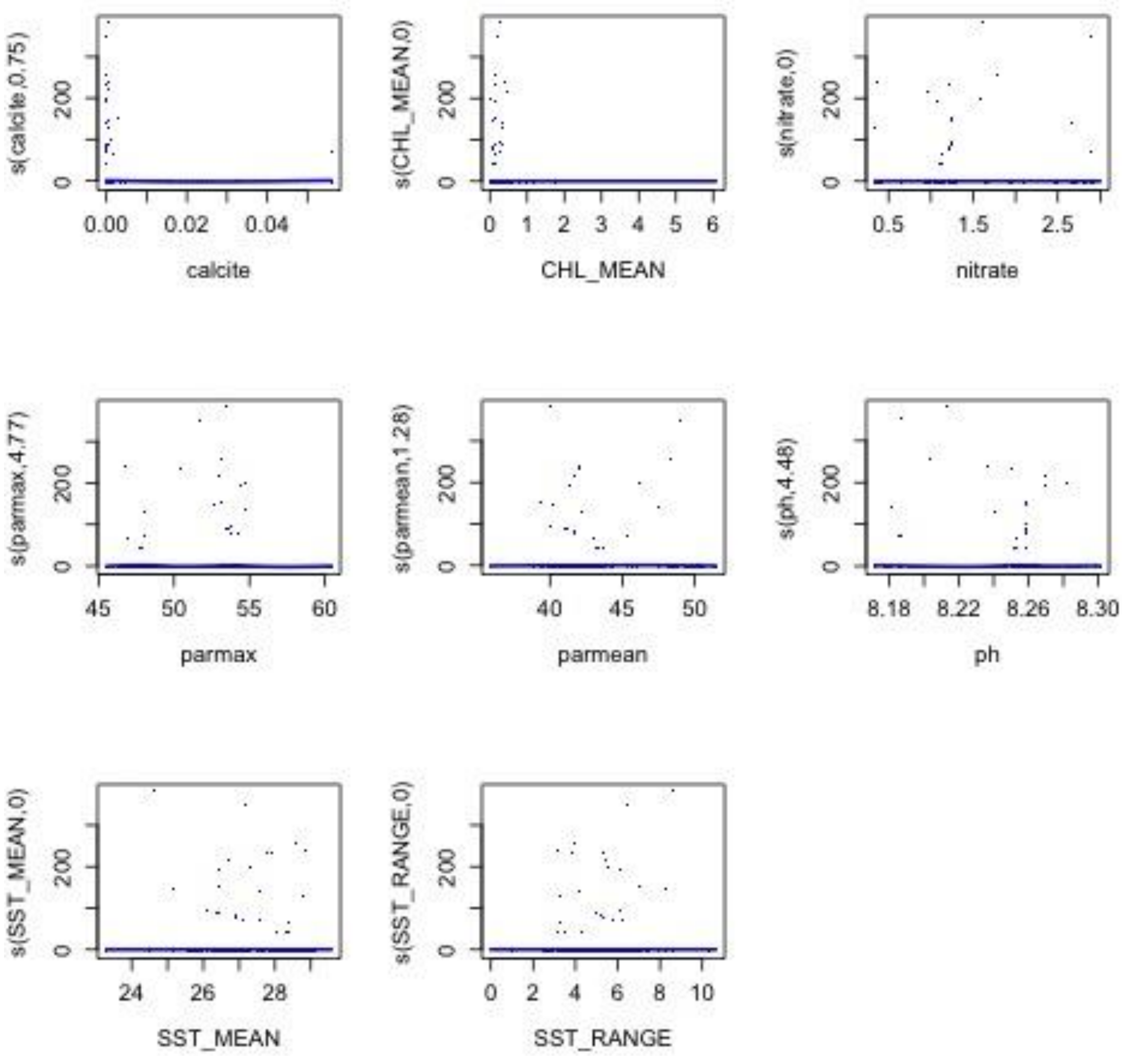
F36 Anampses caeruleopunctatus, n = 296 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0009761768	9	1.169645e-03	2.634509e-01
s(CHL_MEAN)	1.2374346091	9	1.357254e+01	8.693459e-05
s(nitrate)	6.2199282119	9	3.096744e+01	1.227468e-06
s(parmax)	1.6049050451	9	3.939474e+00	4.824444e-02
s(parmean)	3.8271709345	9	3.269464e+01	1.331643e-08
s(ph)	5.4037755143	9	3.052039e+01	2.458391e-07
s(SST_MEAN)	3.9801205294	9	2.569032e+01	1.170928e-06
s(SST_RANGE)	0.0001475853	9	8.784397e-05	5.383499e-01



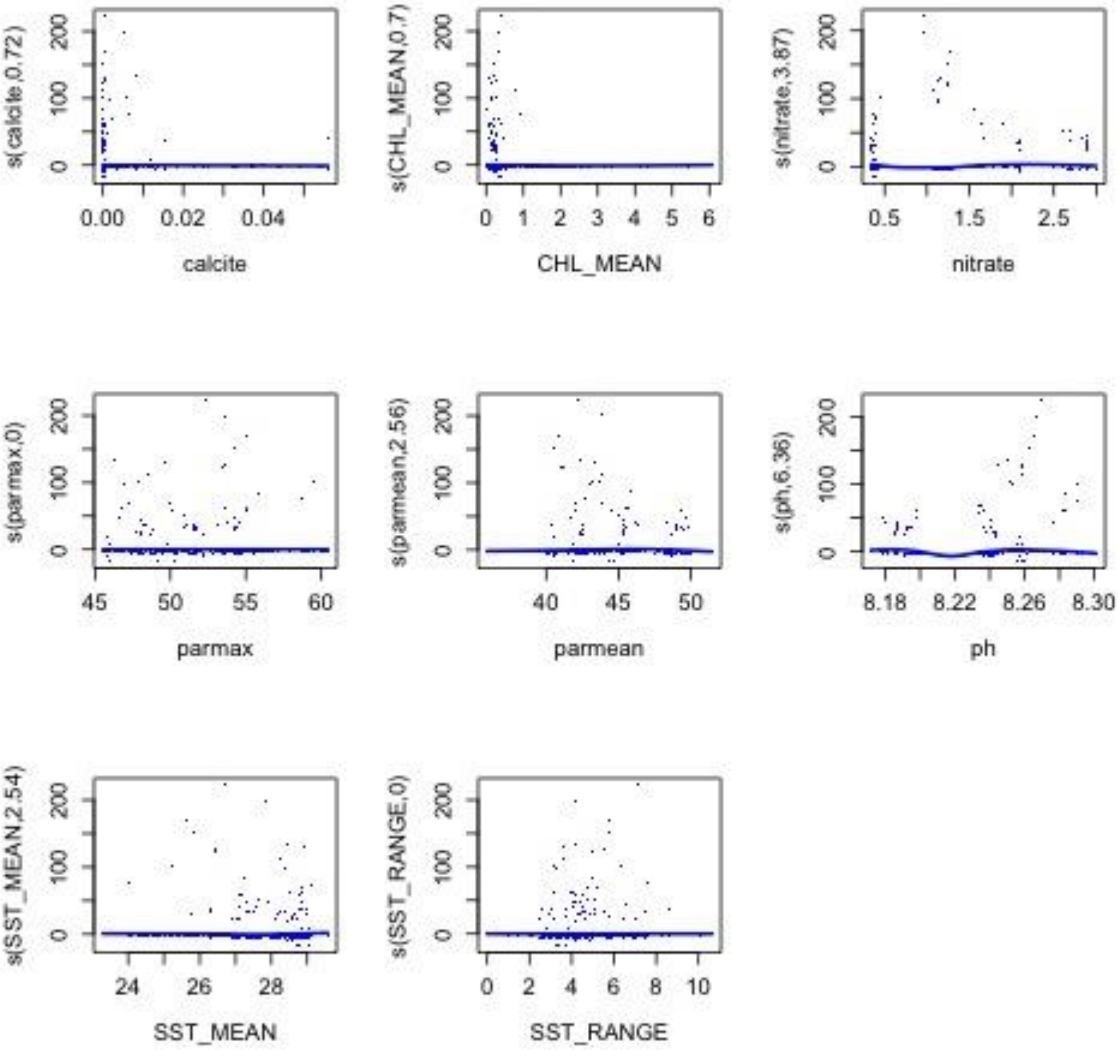
37 Anampses melanurus, n = 62 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.486474e-01	9	1.356921e+00	0.1629488829
s(CHL_MEAN)	2.314545e-04	9	1.667336e-04	0.3769212284
s(nitrate)	5.239992e-06	9	1.319597e-06	0.7763954301
s(parmax)	4.769129e+00	9	1.842598e+01	0.0004448347
s(parmean)	1.280434e+00	9	2.640307e+00	0.0968492369
s(ph)	4.476459e+00	9	1.853447e+01	0.0002943957
s(SST_MEAN)	1.530865e-05	9	1.559080e-06	1.0000000000
s(SST_RANGE)	2.560832e-05	9	1.294373e-05	0.6061089742



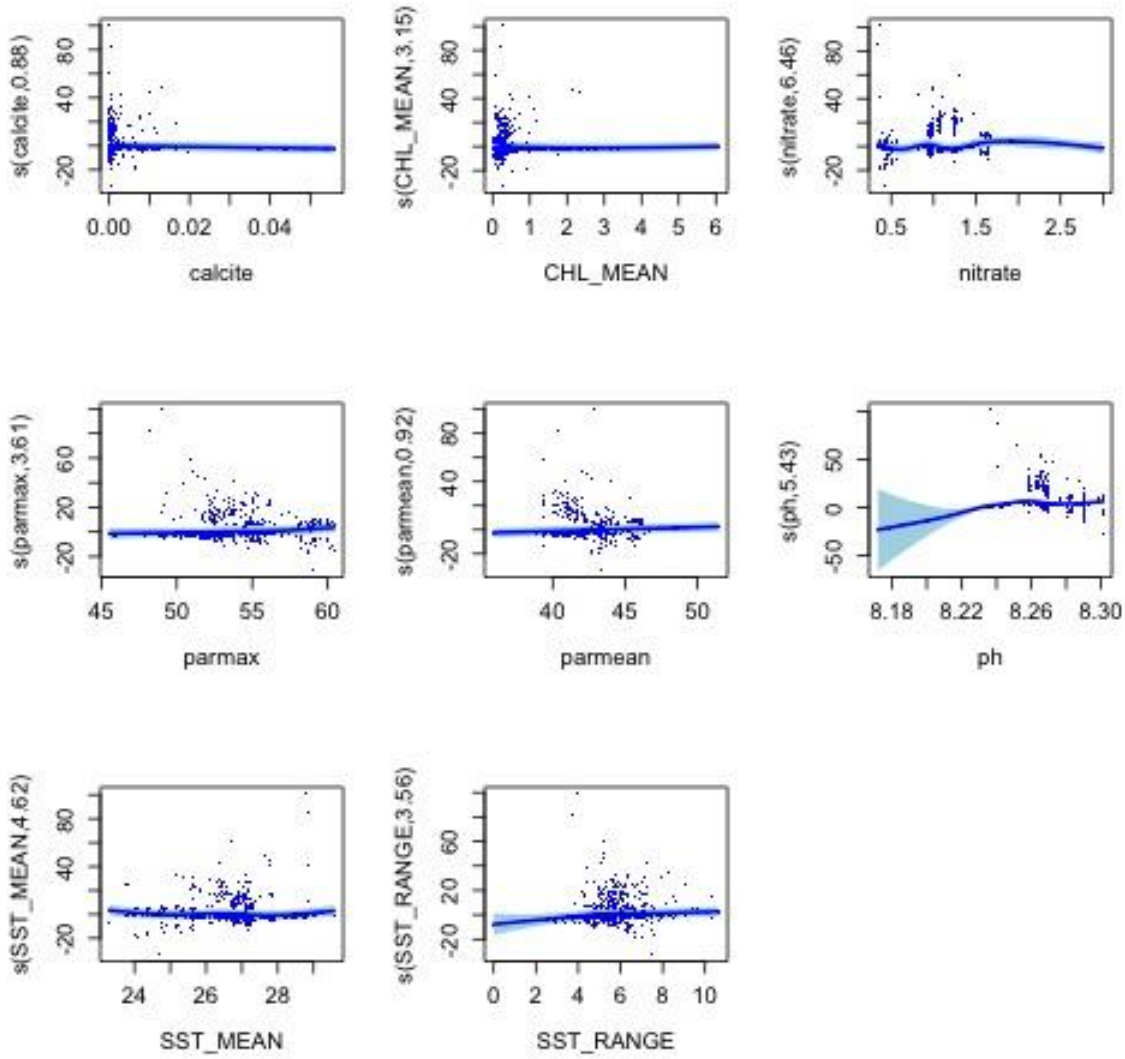
38 Anampses meleagrides, n = 106 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7160834065	7	2.050527e+00	8.410453e-02
s(CHL_MEAN)	0.6951761671	9	1.518395e+00	1.238477e-01
s(nitrate)	3.8651219905	9	5.832057e+01	1.533808e-15
s(parmax)	0.0002222635	9	1.480523e-04	4.079186e-01
s(parmean)	2.5563407214	9	2.260862e+01	4.733003e-07
s(ph)	6.3625854861	9	4.967054e+01	4.156149e-11
s(SST_MEAN)	2.5394801532	9	9.862315e+00	2.973431e-03
s(SST_RANGE)	0.0002841270	9	1.561251e-04	5.694216e-01



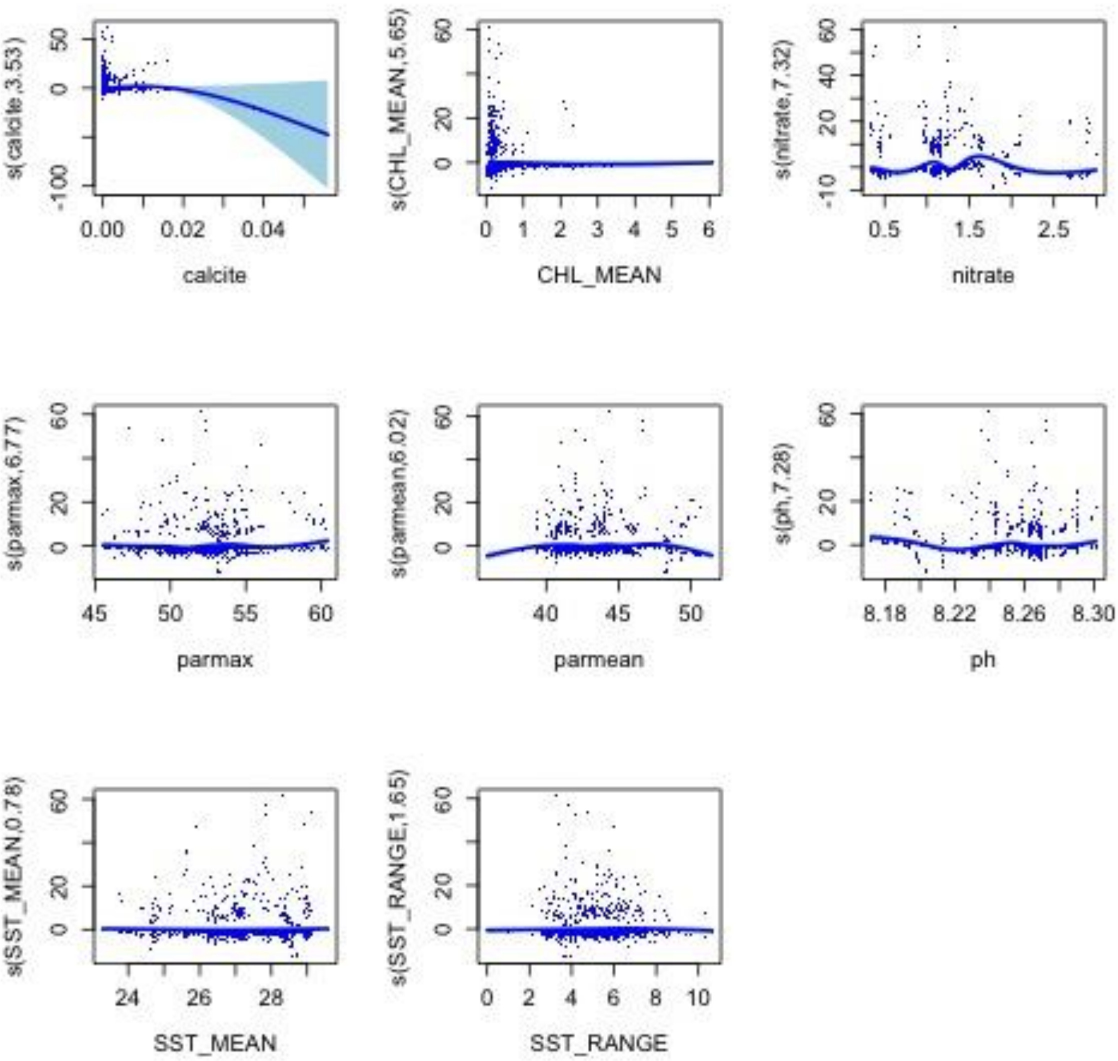
39 Anampses neoguinaicus, n = 343 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8834671	6	6.31657	6.852268e-03
s(CHL_MEAN)	3.1542009	9	23.68133	8.115249e-06
s(nitrate)	6.4567576	9	105.66536	4.739582e-25
s(parmax)	3.6065320	9	23.72464	3.392491e-06
s(parmean)	0.9170839	9	10.26784	3.103690e-04
s(ph)	5.4269245	9	68.37474	2.647303e-16
s(SST_MEAN)	4.6176806	9	25.06863	3.693617e-06
s(SST_RANGE)	3.5640156	9	23.59456	8.027340e-06



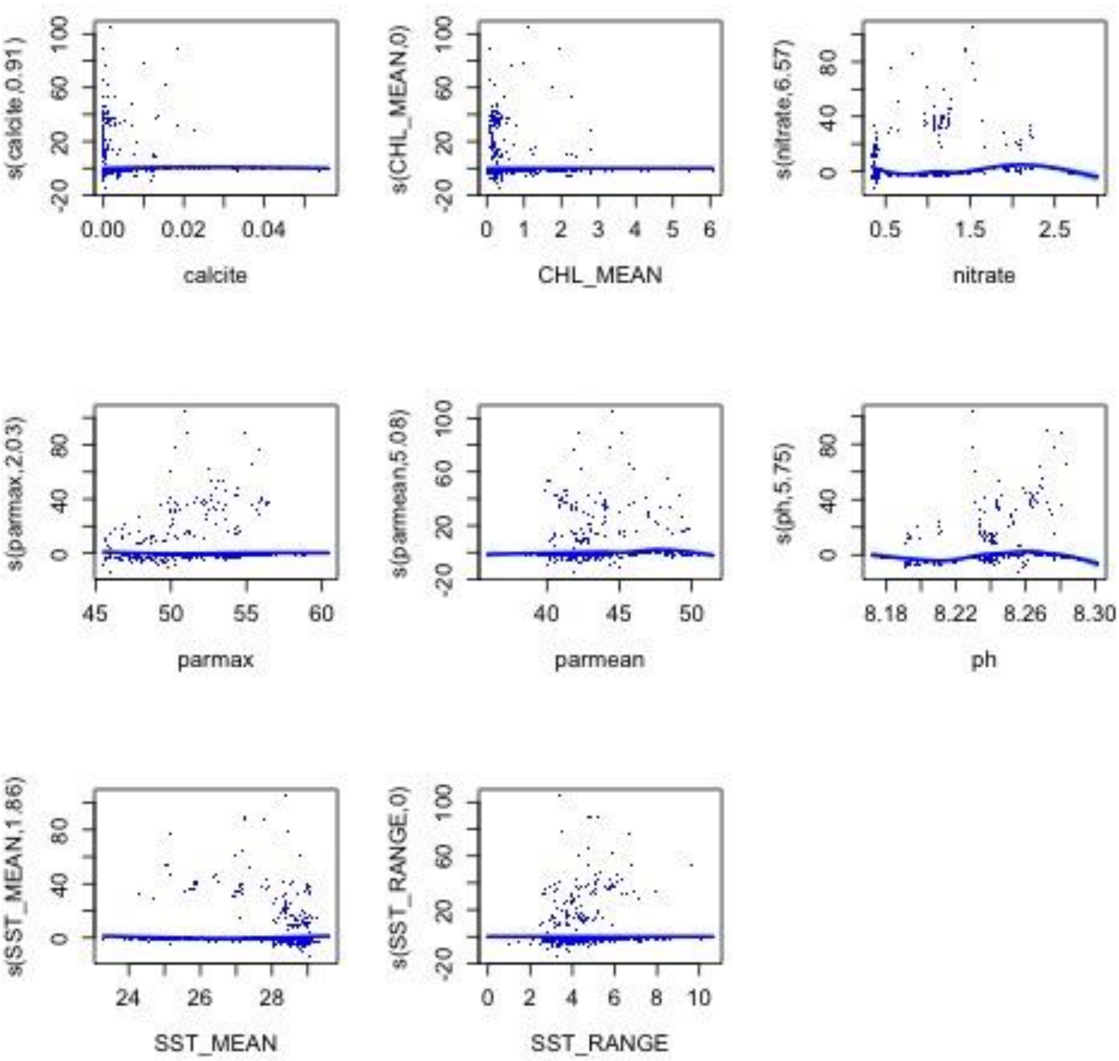
40 Anampses twistii, n = 643 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.5325431	9	20.617285	7.651380e-05
s(CHL_MEAN)	5.6489148	9	74.234520	8.421079e-16
s(nitrate)	7.3157902	9	290.281903	6.677958e-68
s(parmax)	6.7689866	9	44.694066	4.808739e-09
s(parmean)	6.0198431	9	46.840954	2.954201e-10
s(ph)	7.2761419	9	66.972682	2.145946e-14
s(SST_MEAN)	0.7812709	9	1.575506	9.381074e-02
s(SST_RANGE)	1.6465275	9	3.801374	6.203131e-02



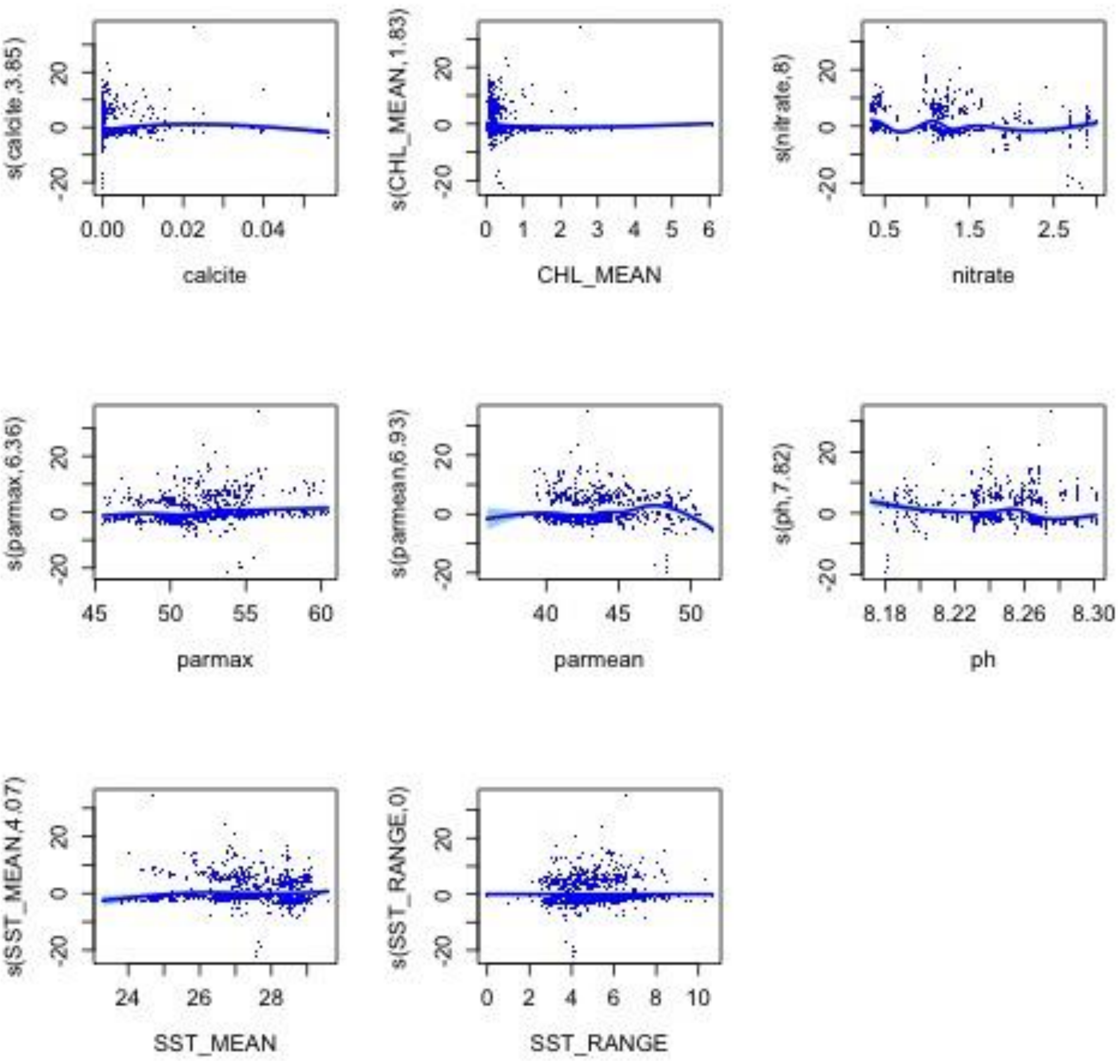
41 Anyperodon leucogrammicus, n = 160 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9066807869	9	4.957201e+00	1.161950e-02
s(CHL_MEAN)	0.0003688564	9	3.134794e-04	3.311591e-01
s(nitrate)	6.5685980607	9	1.425187e+02	5.481292e-35
s(parmax)	2.0287888618	9	6.902898e+00	1.038915e-02
s(parmean)	5.0767066301	9	2.597678e+01	6.629703e-06
s(ph)	5.7518519796	9	5.511335e+01	6.780295e-13
s(SST_MEAN)	1.8604614538	9	8.834180e+00	1.609163e-03
s(SST_RANGE)	0.0004087877	9	4.375654e-04	2.870492e-01



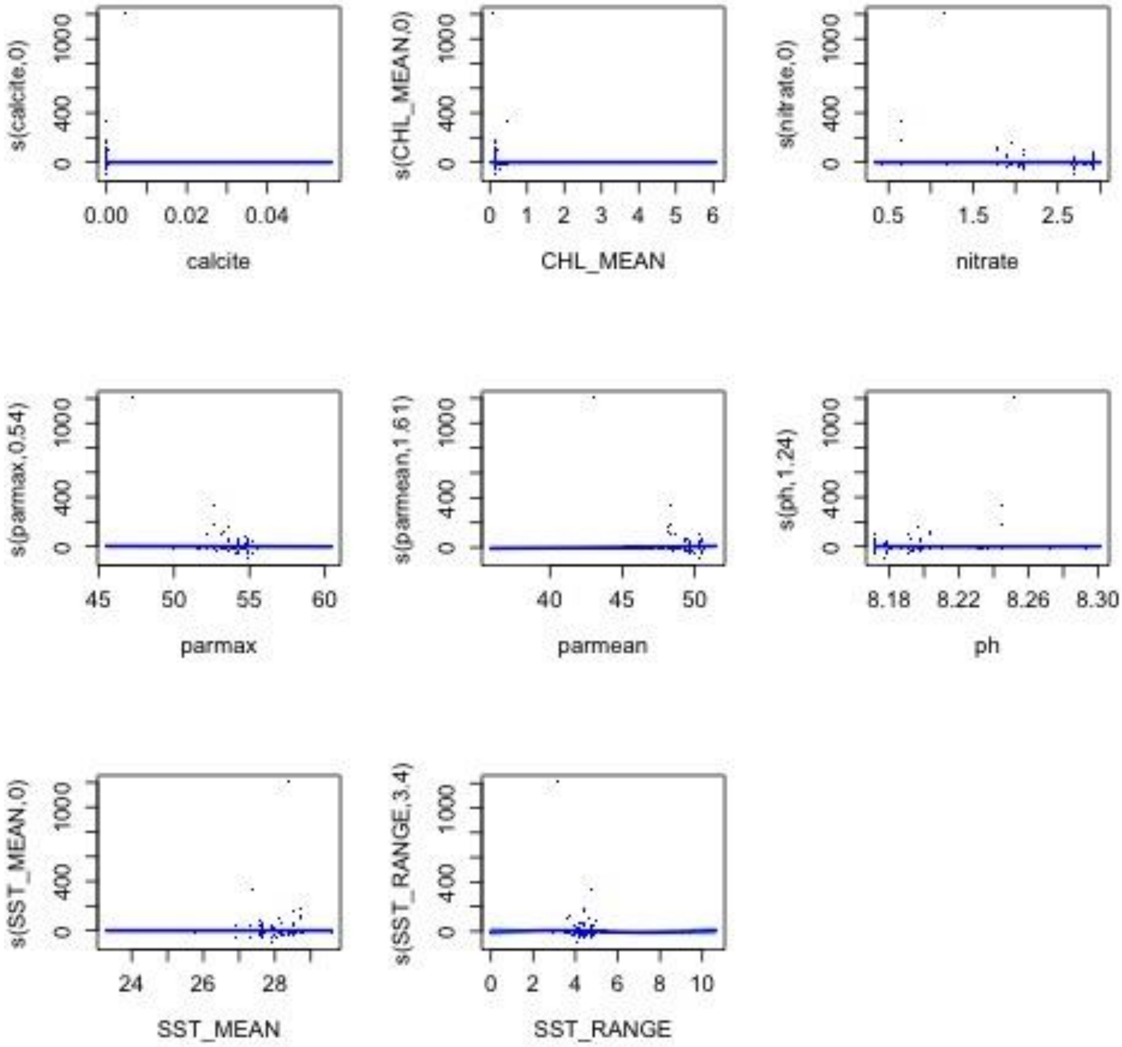
42 Aphareus furca, n = 1500 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.845635734	9	4.092872e+01	3.605633e-09
s(CHL_MEAN)	1.832441895	9	2.174098e+01	2.484413e-06
s(nitrate)	7.997126555	9	2.572861e+02	1.046065e-59
s(parmax)	6.361405499	9	5.123089e+01	9.495154e-11
s(parmean)	6.934273528	9	2.503715e+02	7.694385e-60
s(ph)	7.817554652	9	1.439523e+02	1.309665e-32
s(SST_MEAN)	4.073658286	9	1.372877e+01	2.452724e-03
s(SST_RANGE)	0.003596455	9	3.322666e-03	3.301031e-01



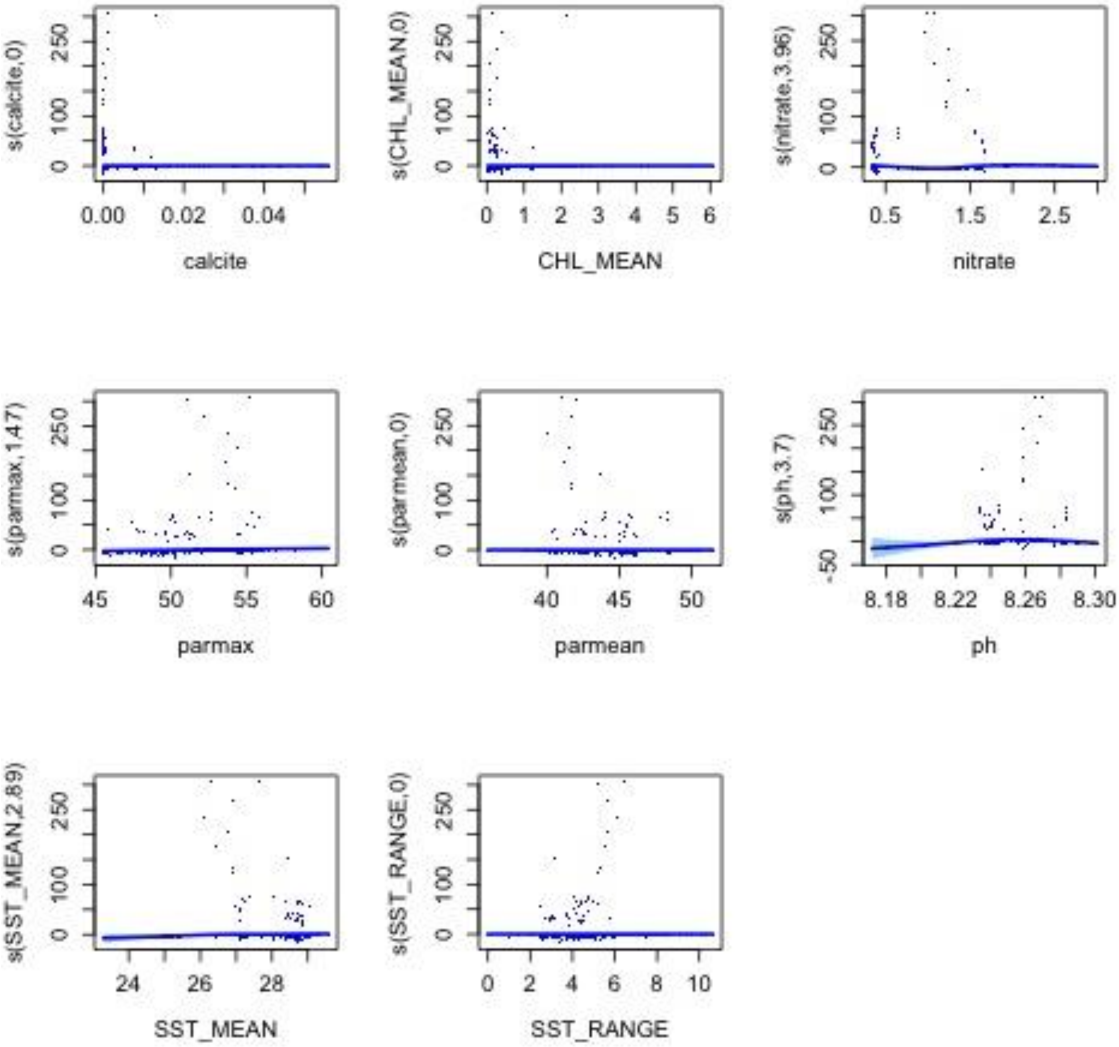
43 Apolemichthys griffisi, n = 72 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.721988e-06	9	3.217942e-07	1.000000e+00
s(CHL_MEAN)	7.747570e-05	9	6.561759e-05	3.516388e-01
s(nitrate)	1.019945e-05	9	2.468419e-06	6.944120e-01
s(parmax)	5.438941e-01	9	1.233691e+00	1.194708e-01
s(parmean)	1.608469e+00	9	2.443954e+01	1.236617e-08
s(ph)	1.238938e+00	9	4.982374e+00	1.136759e-02
s(SST_MEAN)	1.087706e-05	9	1.980695e-06	7.267838e-01
s(SST_RANGE)	3.402880e+00	9	3.216873e+01	2.218167e-08



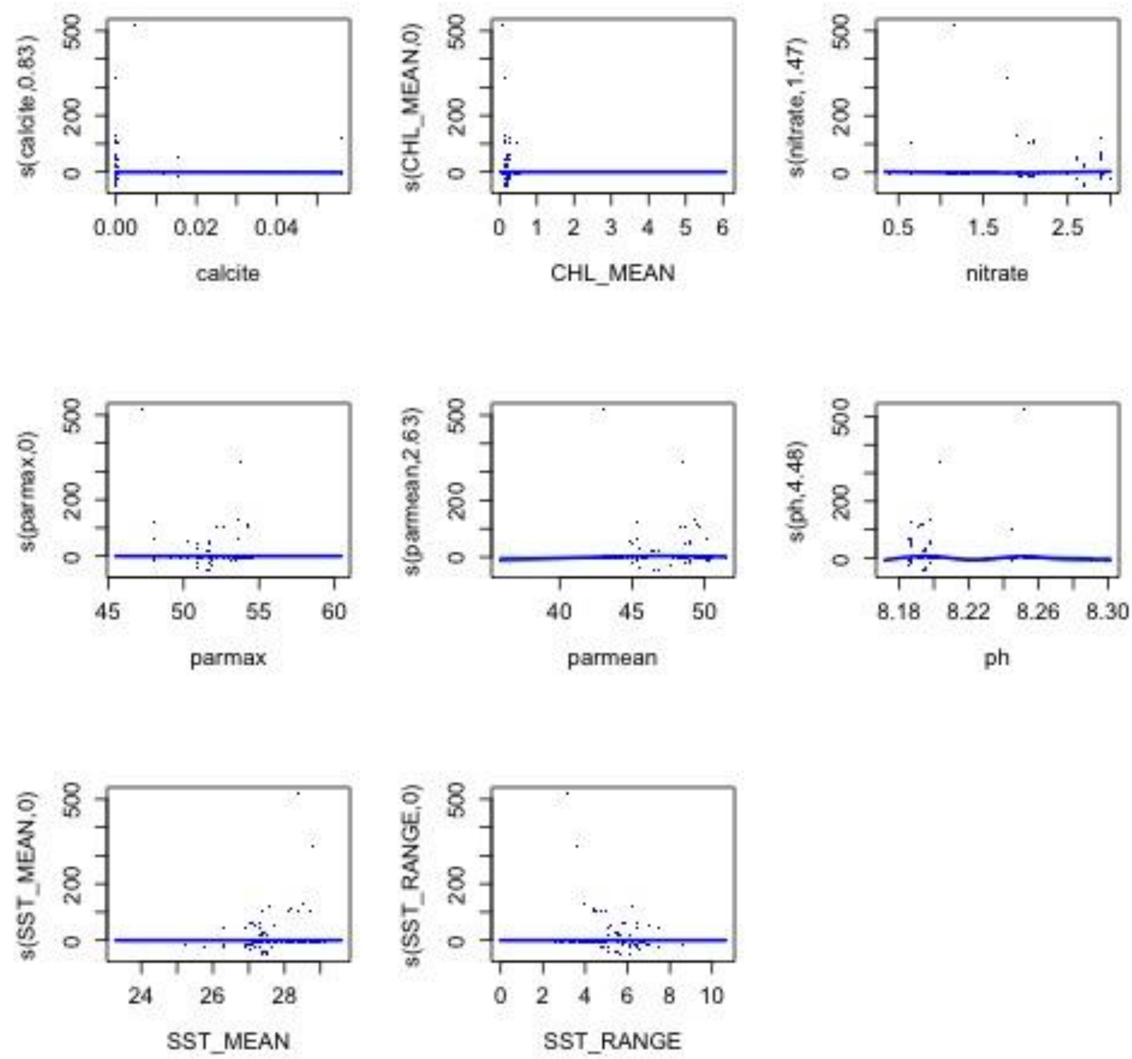
44 Apolemichthys trimaculatus, n = 121 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.398570e-06	8	2.913608e-07	7.330958e-01
s(CHL_MEAN)	8.424800e-06	9	4.302982e-06	4.668232e-01
s(nitrate)	3.962998e+00	9	7.725284e+01	9.817989e-21
s(parmax)	1.468455e+00	9	1.244751e+01	1.757642e-04
s(parmean)	1.527184e-06	9	4.053554e-07	7.009311e-01
s(ph)	3.698315e+00	9	2.879355e+01	8.131585e-08
s(SST_MEAN)	2.886570e+00	9	9.662985e+00	7.225855e-03
s(SST_RANGE)	2.881275e-04	9	1.669944e-04	5.372172e-01



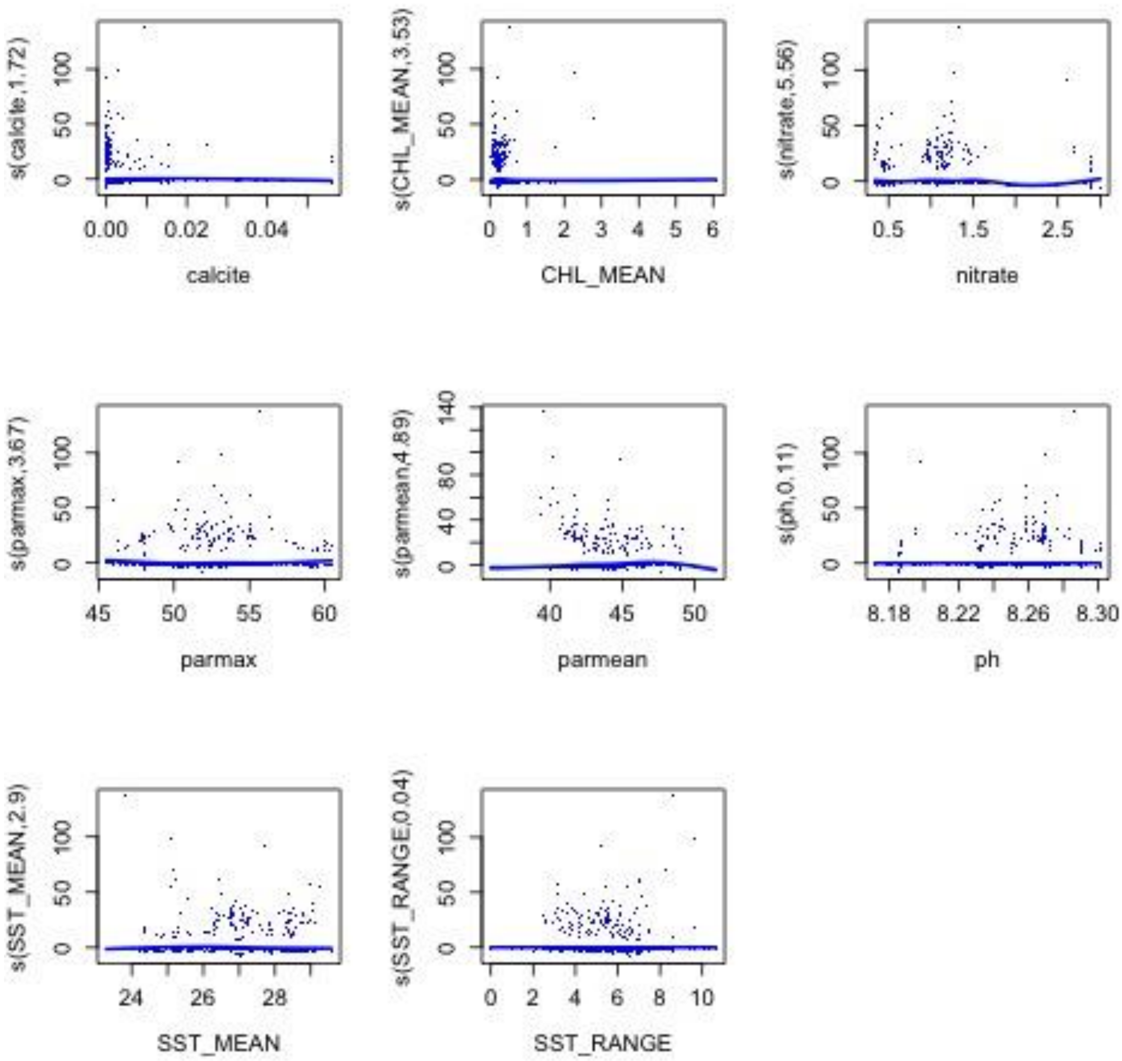
45 Apolemichthys xanthopunctatus, n = 214 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.252695e-01	6	4.104827e+00	2.494571e-02
s(CHL_MEAN)	2.427345e-05	9	3.038033e-06	7.282912e-01
s(nitrate)	1.467182e+00	9	2.011103e+01	2.645733e-06
s(parmax)	4.854267e-05	9	8.884758e-06	8.485126e-01
s(parmean)	2.634109e+00	9	1.762335e+01	7.524725e-05
s(ph)	4.483877e+00	9	2.352459e+01	8.734466e-06
s(SST_MEAN)	4.210123e-05	9	7.016130e-06	8.716436e-01
s(SST_RANGE)	2.924746e-05	9	4.232494e-06	1.000000e+00



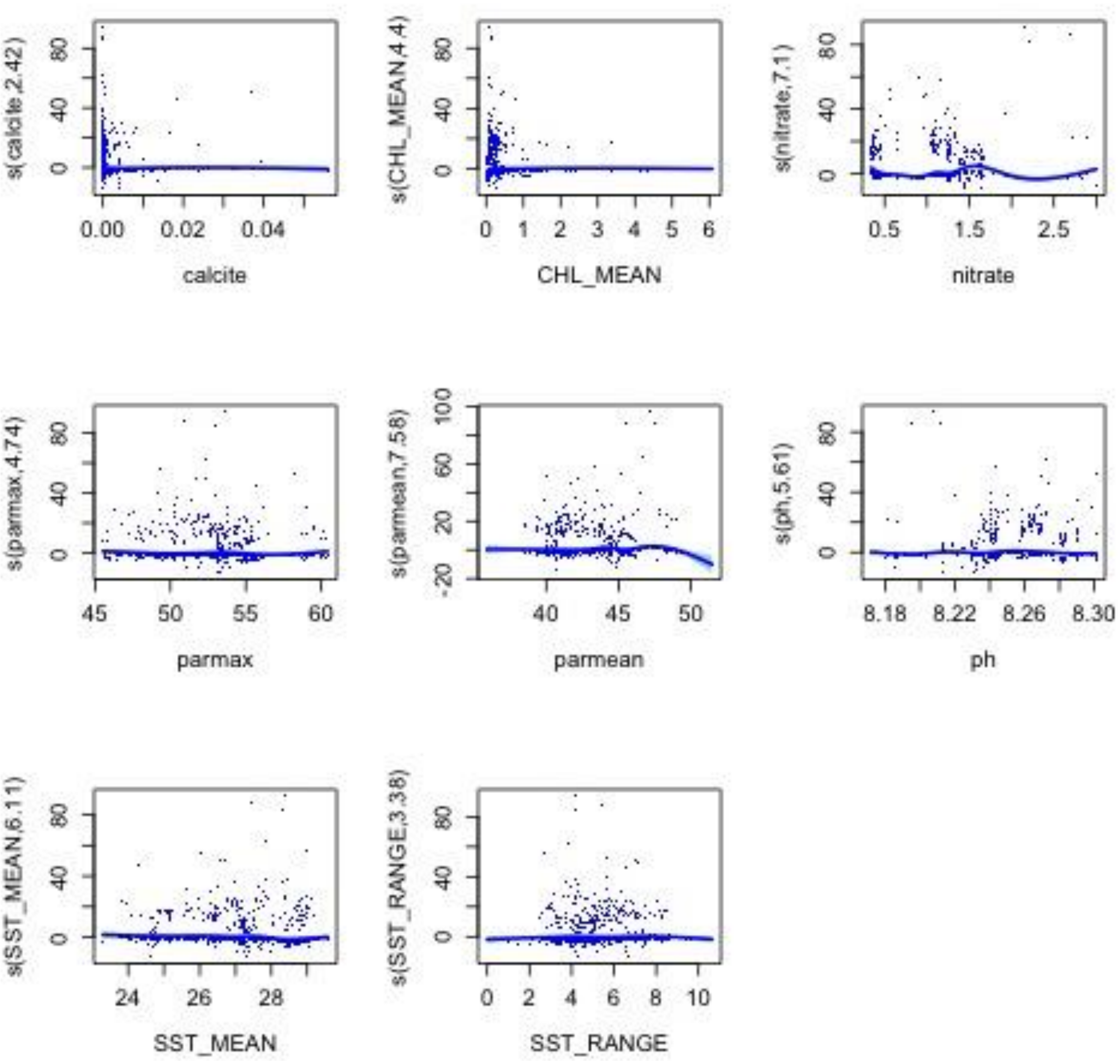
46 Aprion virescens, n = 216 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.7213899	9	6.49953409	1.718676e-02
s(CHL_MEAN)	3.5318401	9	24.82281197	6.911021e-06
s(nitrate)	5.5594435	9	49.98566412	4.301671e-11
s(parmax)	3.6685695	9	27.36936463	4.367328e-07
s(parmean)	4.8890247	9	68.06511867	1.453009e-16
s(ph)	0.1068100	9	0.12100888	2.247255e-01
s(SST_MEAN)	2.8951501	9	18.13367610	2.411380e-05
s(SST_RANGE)	0.0398273	9	0.04082442	3.191304e-01



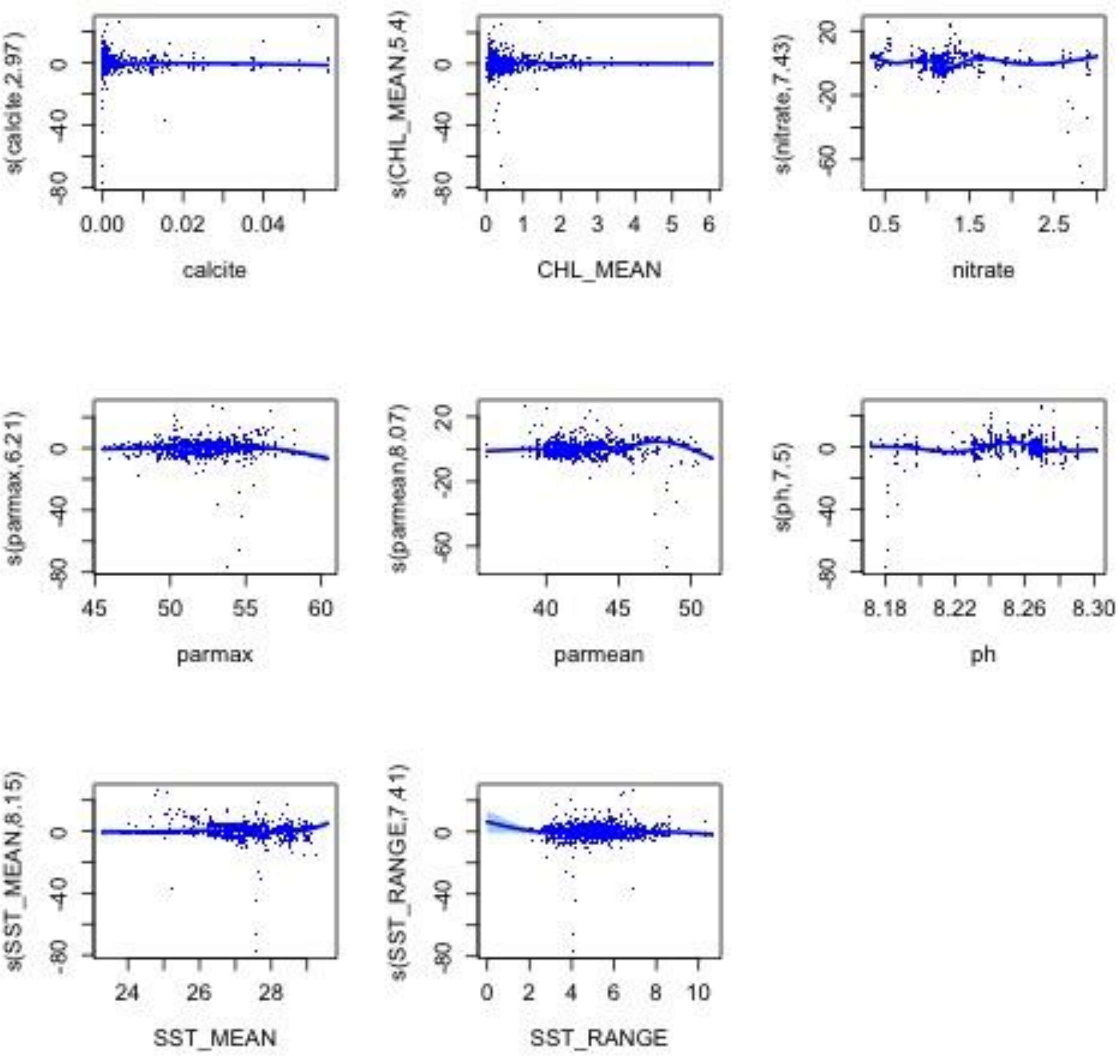
47 Aulostomus chinensis, n = 333 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.419623	9	7.046744	2.896331e-02
s(CHL_MEAN)	4.395305	9	26.867926	7.479917e-06
s(nitrate)	7.101515	9	197.811933	8.719155e-47
s(parmax)	4.738374	9	28.628495	1.766908e-06
s(parmean)	7.581532	9	38.369966	5.232165e-07
s(ph)	5.613545	9	20.538373	2.902242e-04
s(SST_MEAN)	6.110855	9	31.449202	1.791580e-06
s(SST_RANGE)	3.384098	9	7.413039	5.011691e-02



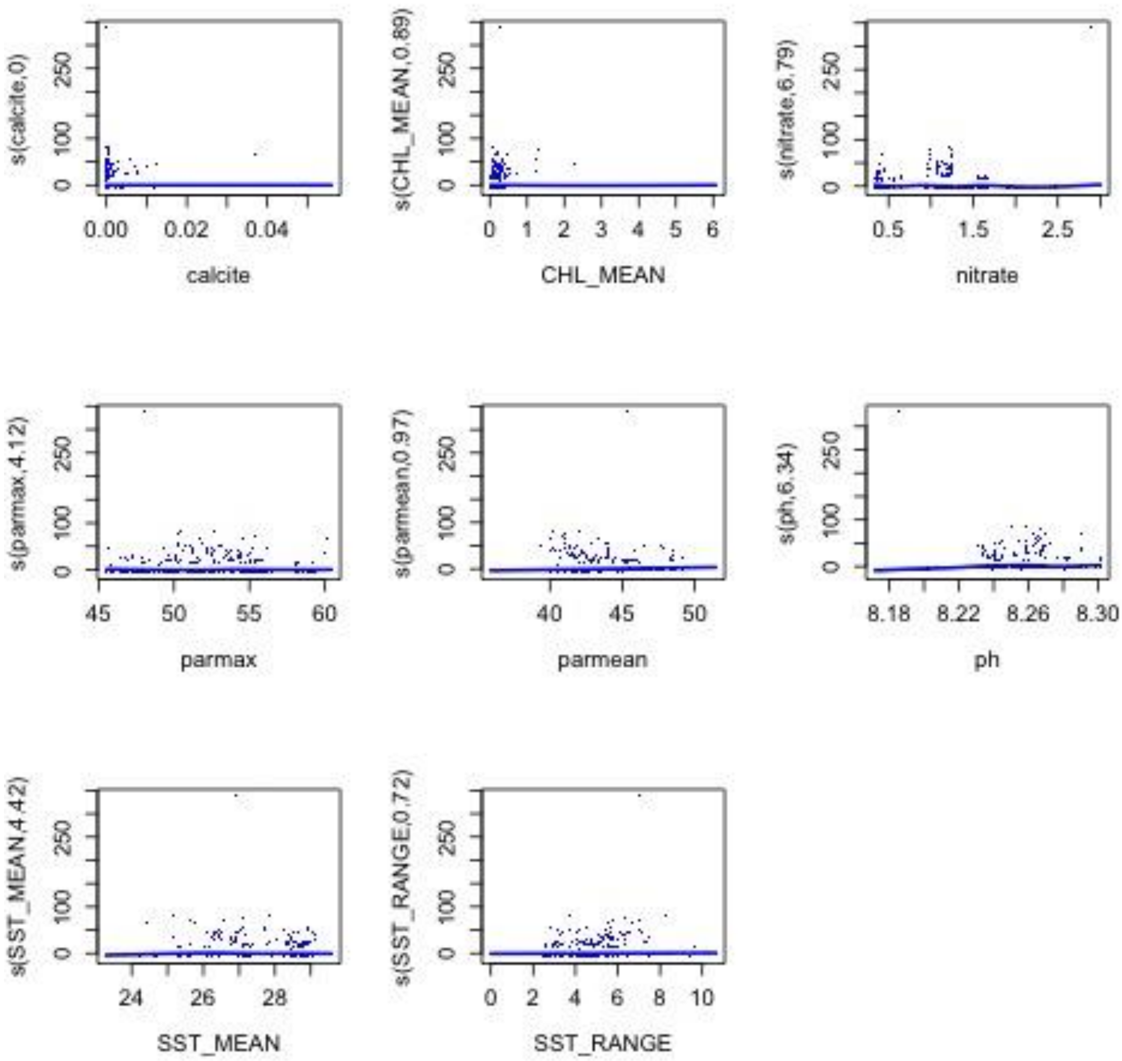
48 Balistapus undulatus, n = 2721 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.965472	9	28.13590	9.868463e-07
s(CHL_MEAN)	5.401403	9	32.66905	1.786393e-06
s(nitrate)	7.425977	9	376.80918	7.886480e-87
s(parmax)	6.210368	9	32.30532	2.089781e-06
s(parmean)	8.067870	9	301.60266	3.846471e-68
s(ph)	7.495873	9	262.92726	3.060450e-61
s(SST_MEAN)	8.150428	9	83.31337	2.639082e-16
s(SST_RANGE)	7.406479	9	46.37858	1.772585e-08



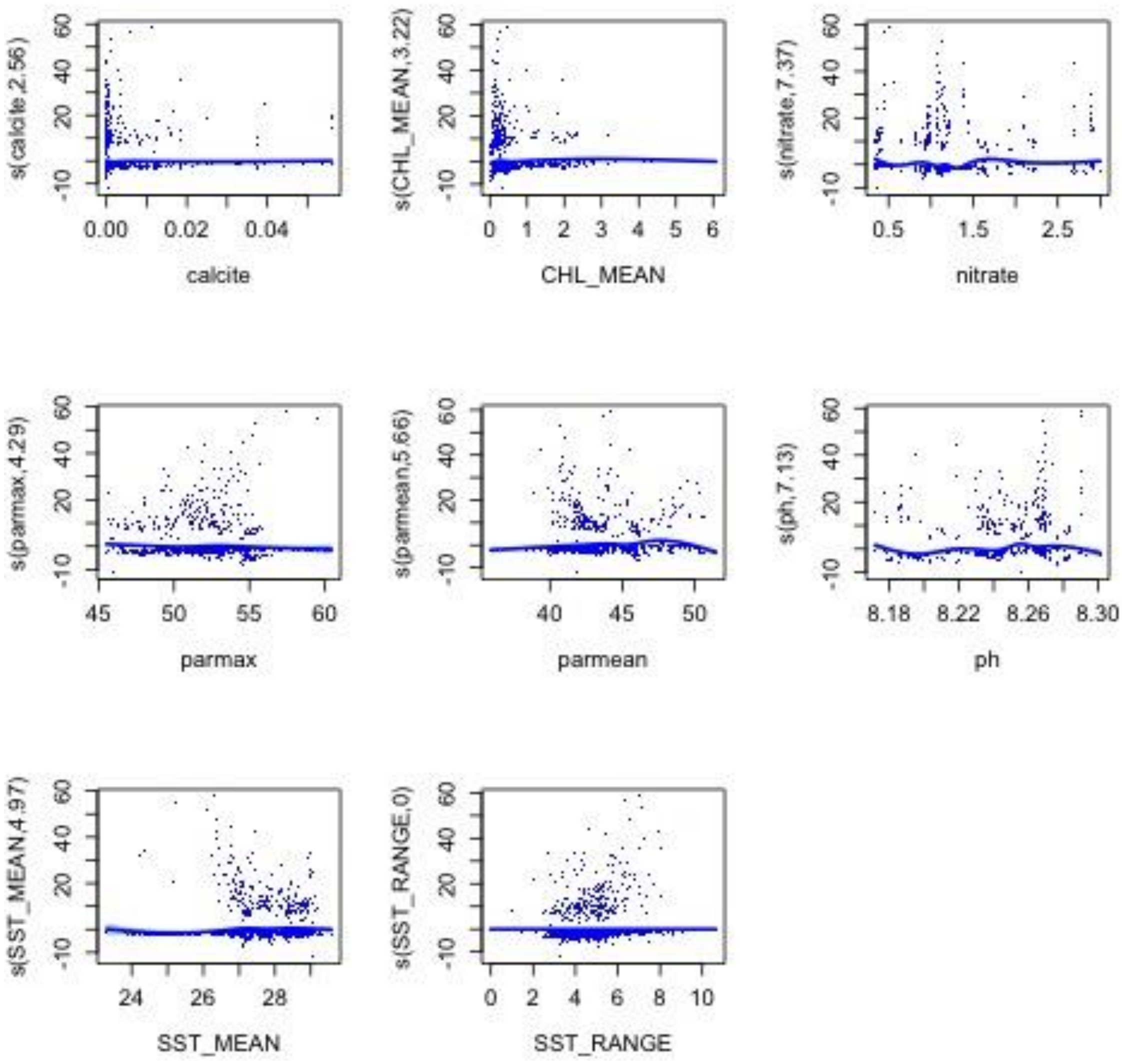
49 Balistoides conspicillum, n = 141 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.444421e-05	8	2.286897e-06	1.000000e+00
s(CHL_MEAN)	8.934378e-01	9	3.620848e+00	3.097304e-02
s(nitrate)	6.791116e+00	9	7.258860e+01	2.520672e-16
s(parmax)	4.119666e+00	9	2.045108e+01	7.260889e-05
s(parmean)	9.670304e-01	9	2.682734e+01	6.402163e-09
s(ph)	6.343226e+00	9	6.865498e+01	9.279899e-16
s(SST_MEAN)	4.424789e+00	9	1.621632e+01	1.025865e-03
s(SST_RANGE)	7.208386e-01	8	2.518294e+00	5.675692e-02



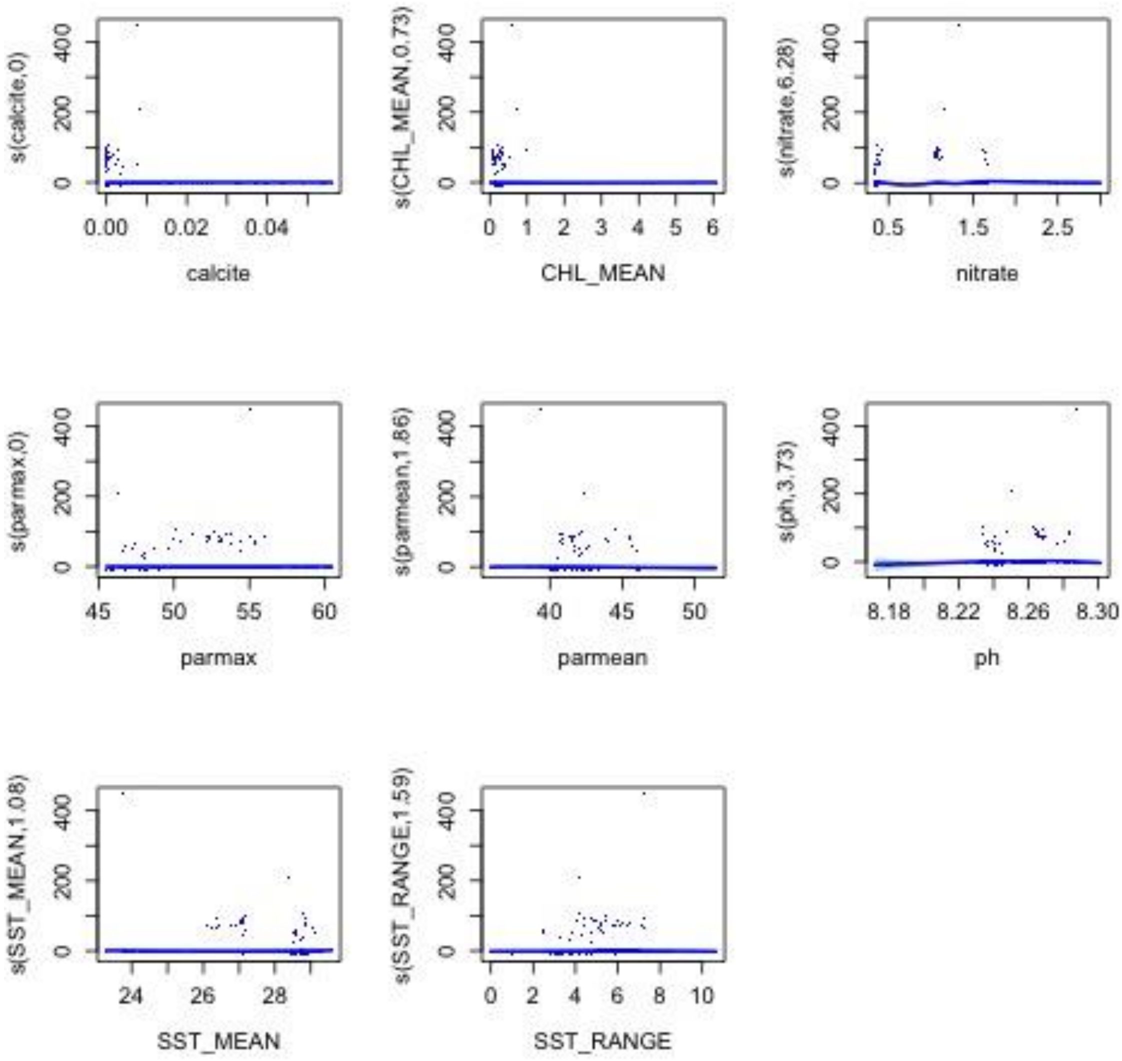
50 Balistoides viridescens, n = 348 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.557282e+00	9	6.643404e+00	4.674283e-02
s(CHL_MEAN)	3.218566e+00	9	1.542039e+01	7.893489e-04
s(nitrate)	7.367743e+00	9	1.052285e+02	1.084848e-22
s(parmax)	4.291083e+00	9	1.465512e+01	2.119265e-03
s(parmean)	5.662687e+00	9	6.211539e+01	9.363731e-14
s(ph)	7.128498e+00	9	7.693410e+01	3.691934e-16
s(SST_MEAN)	4.970562e+00	9	2.295496e+01	3.664792e-05
s(SST_RANGE)	4.937475e-05	9	1.928503e-05	6.769332e-01



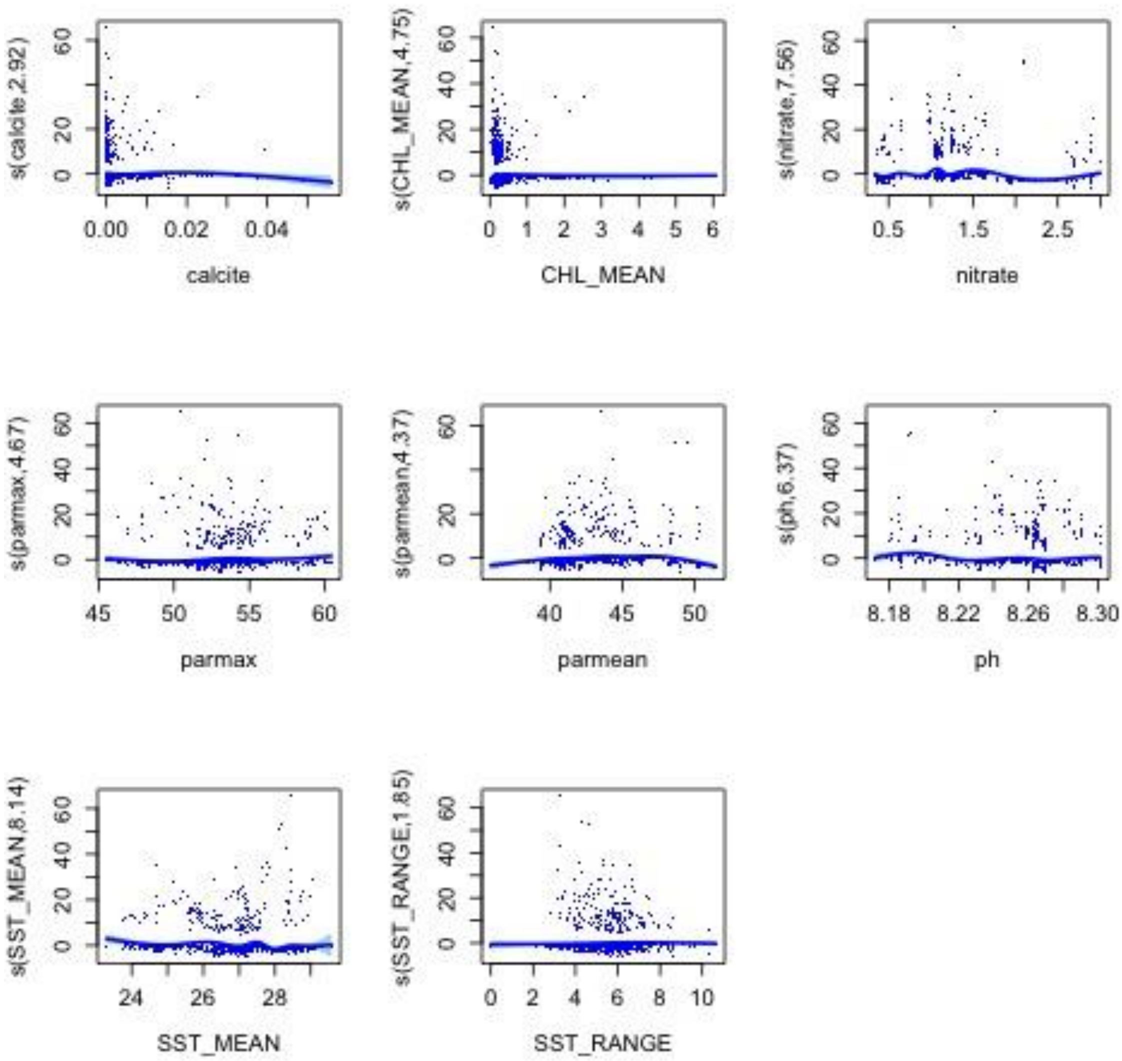
51 Bodianus anthioides, n = 42 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.264443e-05	9	2.164527e-06	7.817156e-01
s(CHL_MEAN)	7.274774e-01	9	1.968258e+00	8.463705e-02
s(nitrate)	6.282890e+00	9	4.925733e+01	6.777423e-11
s(parmax)	2.124899e-05	9	8.913149e-06	6.580391e-01
s(parmean)	1.859452e+00	9	6.161352e+00	1.435126e-02
s(ph)	3.726909e+00	9	1.008155e+01	1.093265e-02
s(SST_MEAN)	1.083578e+00	9	2.361241e+00	7.155413e-02
s(SST_RANGE)	1.592352e+00	9	3.529419e+00	7.333897e-02



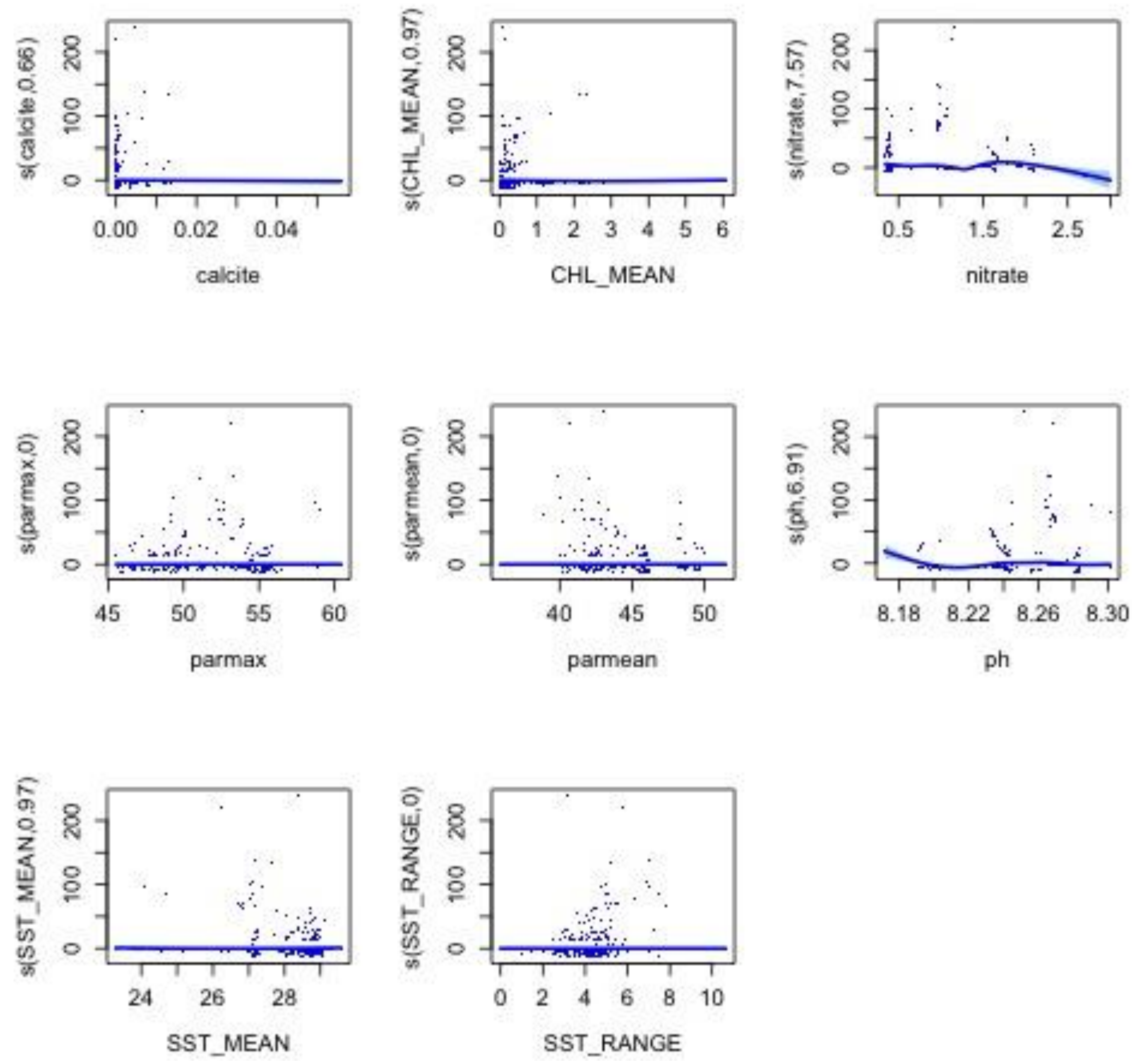
52 Bodianus axillaris, n = 509 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.918368	9	12.450068	3.178592e-03
s(CHL_MEAN)	4.752486	9	27.195479	1.049626e-05
s(nitrate)	7.555883	9	131.883684	5.684386e-30
s(parmax)	4.669093	9	19.466690	1.792617e-04
s(parmean)	4.373176	9	32.177967	4.470327e-08
s(ph)	6.374291	9	42.260361	3.156377e-09
s(SST_MEAN)	8.140766	9	61.978843	2.521917e-12
s(SST_RANGE)	1.851245	9	3.647459	9.753808e-02



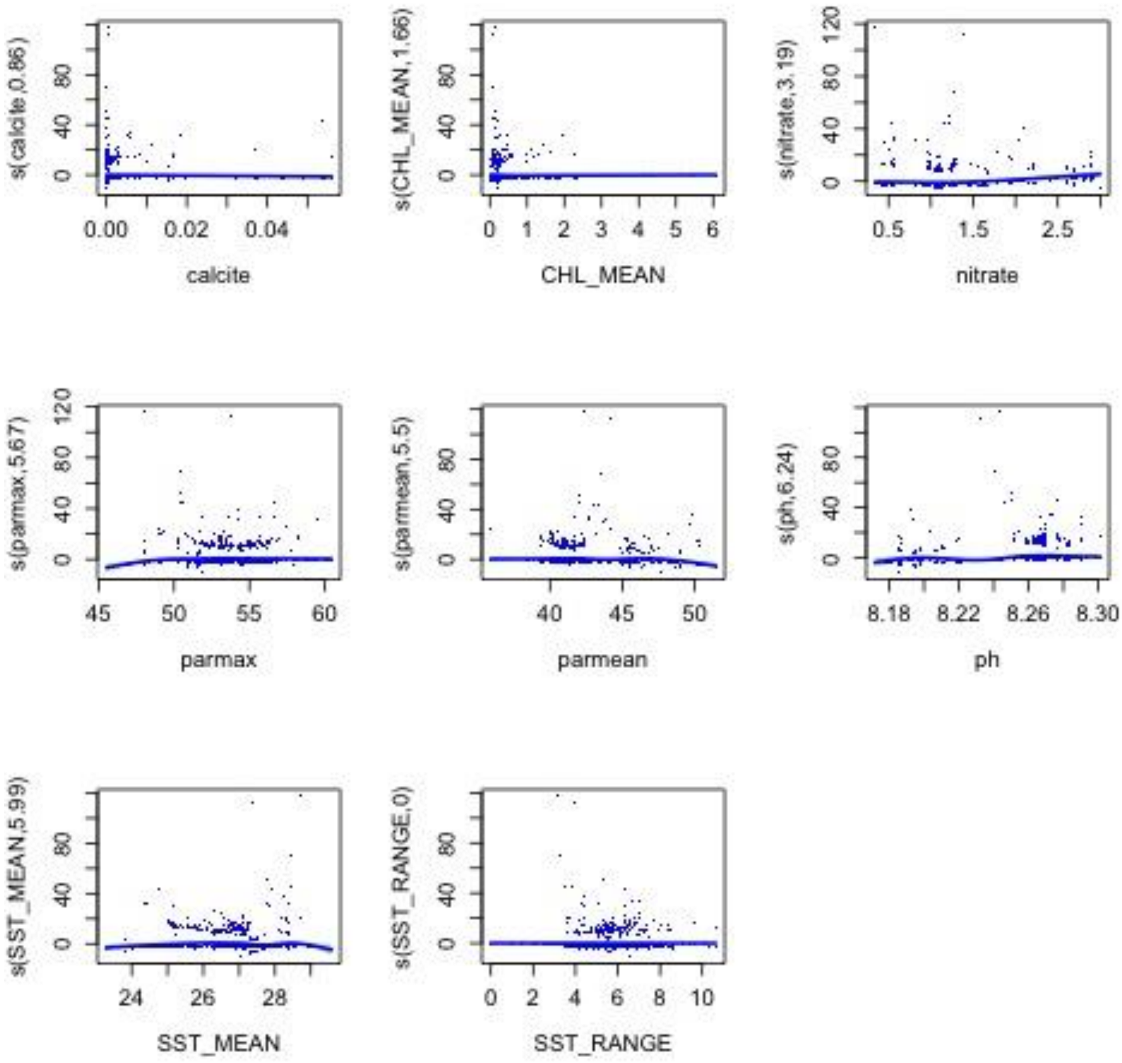
53 Bodianus dictynna, n = 140 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.602335e-01	6	1.320088e+00	1.534934e-01
s(CHL_MEAN)	9.728894e-01	9	6.339799e+00	5.655006e-03
s(nitrate)	7.565611e+00	9	1.256496e+02	1.865921e-28
s(parmax)	8.106838e-05	9	1.062910e-05	1.000000e+00
s(parmean)	1.815309e-04	9	1.687107e-04	3.205864e-01
s(ph)	6.911972e+00	9	7.168360e+01	1.458041e-15
s(SST_MEAN)	9.679040e-01	9	1.892942e+00	1.112910e-01
s(SST_RANGE)	2.038663e-04	9	1.144291e-04	5.824761e-01



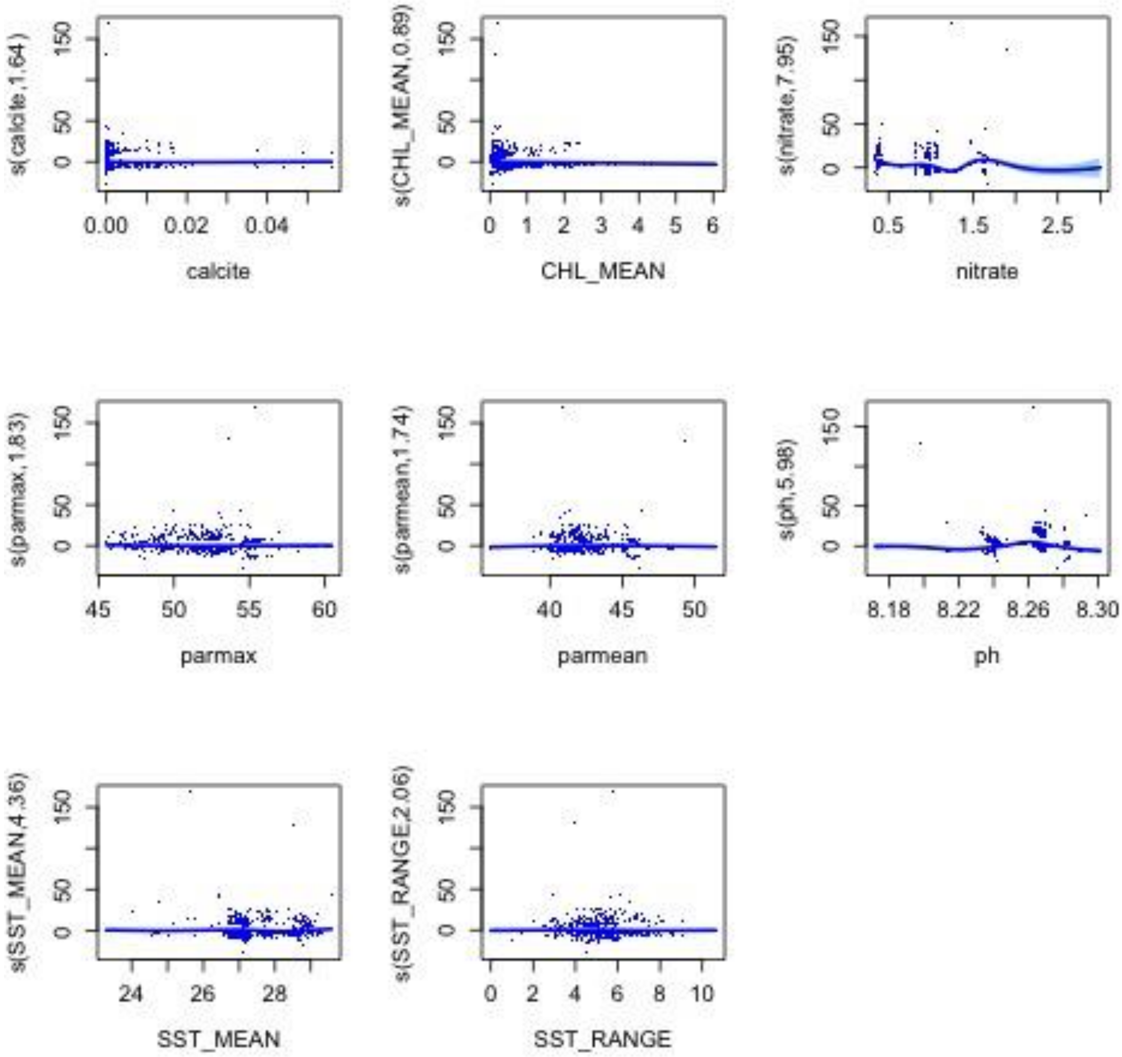
54 Bodianus loxozonus, n = 506 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8579632878	6	5.384937e+00	1.160817e-02
s(CHL_MEAN)	1.6649909586	9	7.023956e+00	1.181685e-02
s(nitrate)	3.1889599107	9	2.370103e+01	6.819990e-07
s(parmax)	5.6748887149	9	3.705197e+01	3.905307e-08
s(parmean)	5.5011448772	9	3.699353e+01	3.266370e-08
s(ph)	6.2363090237	9	5.090316e+01	2.131208e-12
s(SST_MEAN)	5.9938890677	9	3.952828e+01	2.056119e-08
s(SST_RANGE)	0.0004964387	9	1.616765e-04	6.527795e-01



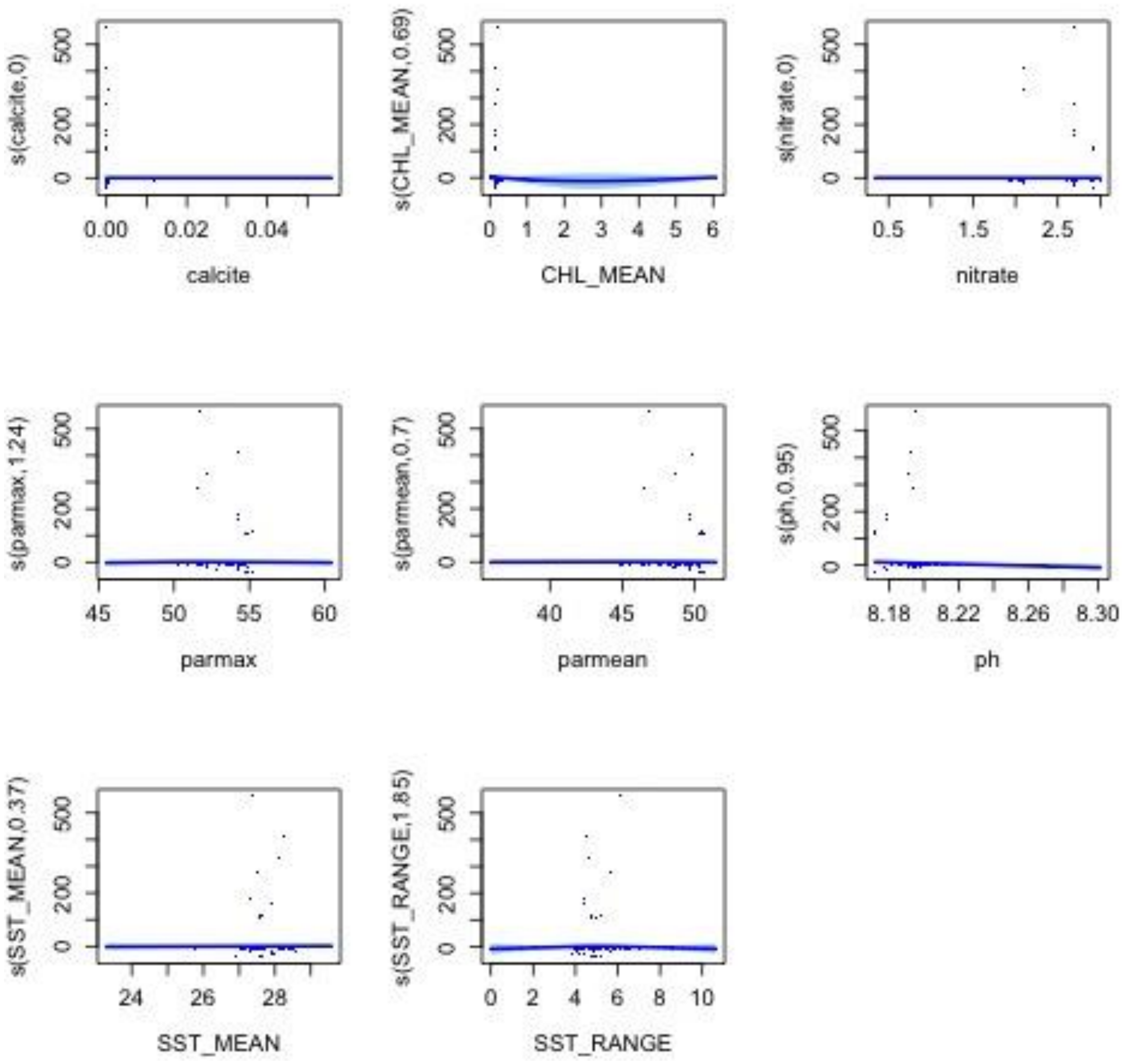
55 Bodianus mesothorax, n = 352 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.6418827	9	10.511810	1.319358e-03
s(CHL_MEAN)	0.8901806	8	7.526948	2.643026e-03
s(nitrate)	7.9521920	9	169.916008	7.675587e-40
s(parmax)	1.8250527	9	4.528579	3.584574e-02
s(parmean)	1.7384269	9	5.376339	1.584047e-02
s(ph)	5.9814844	9	61.238341	3.141567e-14
s(SST_MEAN)	4.3612051	9	24.393935	4.476687e-06
s(SST_RANGE)	2.0605468	9	7.122162	1.166319e-02



56 Bodianus prognathus, n = 71 observations

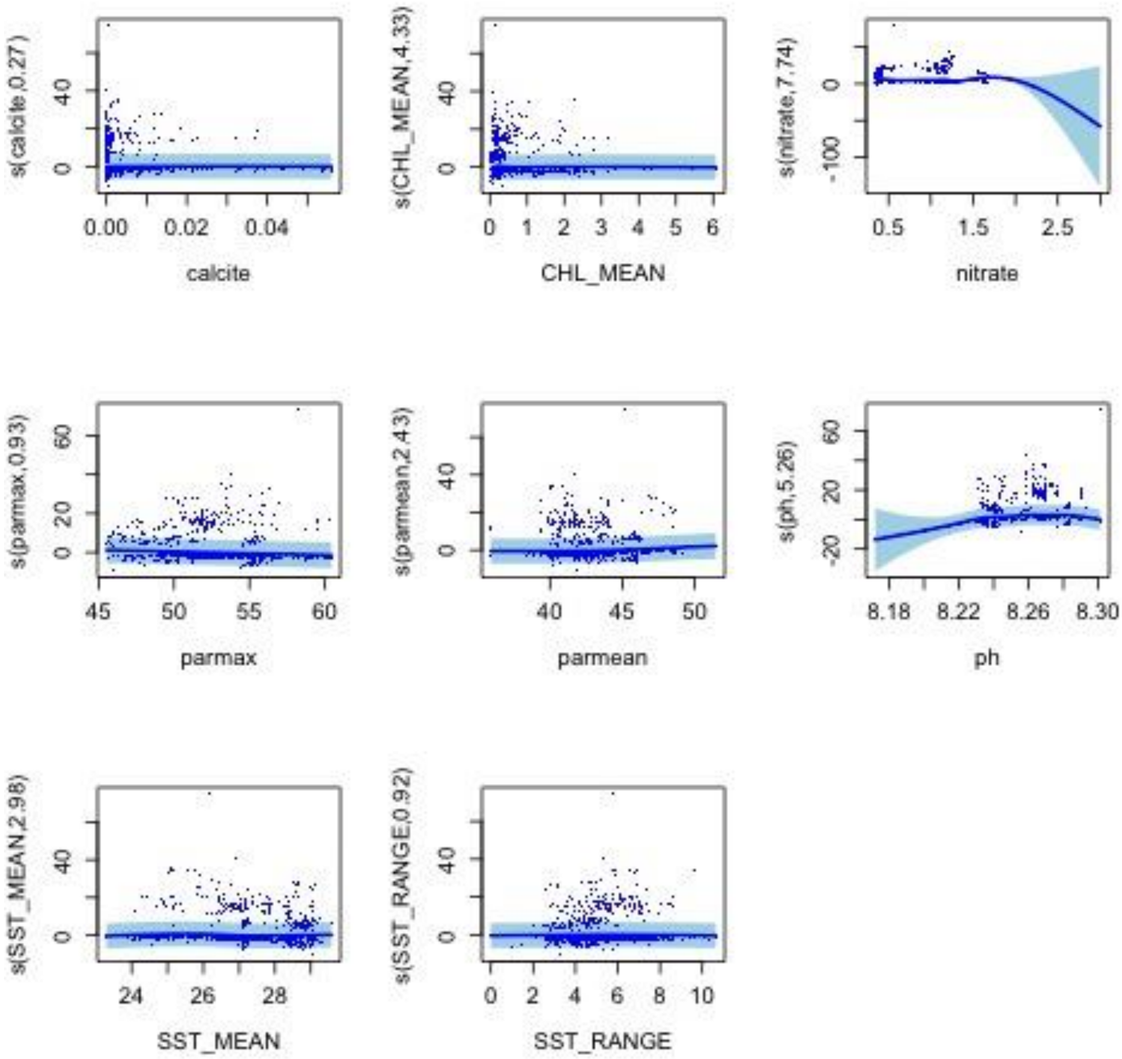
	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.977047e-07	9	1.306302e-08	9.847716e-01
s(CHL_MEAN)	6.878945e-01	8	1.621406e+00	1.099843e-01
s(nitrate)	2.887719e-07	9	2.107519e-08	9.034405e-01
s(parmax)	1.238708e+00	9	1.925071e+00	1.342357e-01
s(parmean)	7.013285e-01	8	1.381589e+00	6.998633e-02
s(ph)	9.538975e-01	4	1.620905e+01	3.942843e-06
s(SST_MEAN)	3.716043e-01	9	3.964923e-01	2.801217e-01
s(SST_RANGE)	1.846765e+00	9	3.834398e+00	6.920005e-02



57 Bolbometopon muricatum

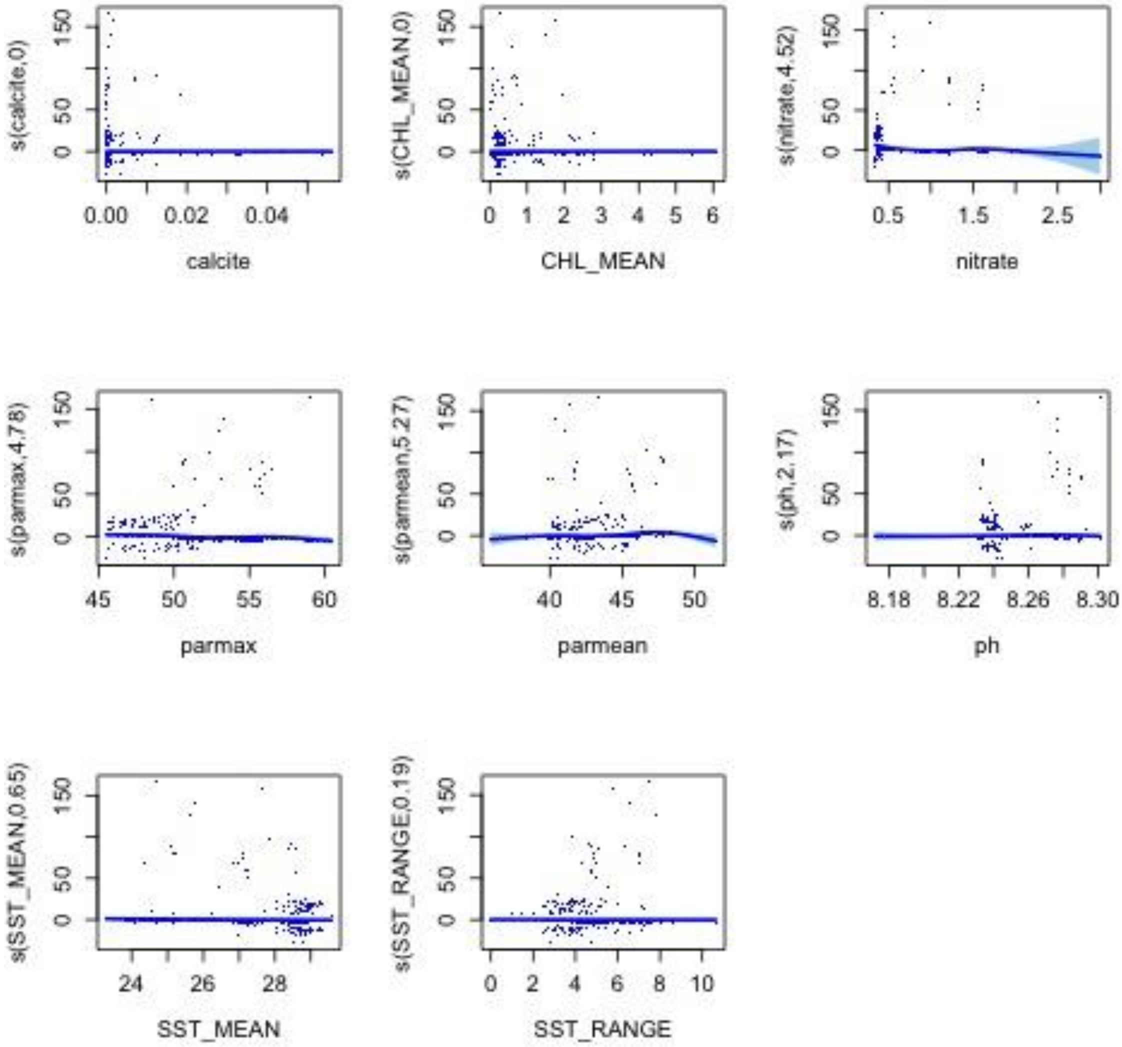
58 Caesio caerulaurea, n = 346 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.2655574	8	0.3379929	2.494270e-01
s(CHL_MEAN)	4.3276527	9	29.2824981	1.941441e-06
s(nitrate)	7.7396028	9	149.6141844	7.229006e-34
s(parmax)	0.9334623	9	13.2763421	4.634731e-05
s(parmean)	2.4292678	9	14.3053562	1.409734e-04
s(ph)	5.2637999	9	42.3612924	8.505820e-10
s(SST_MEAN)	2.9780898	9	10.9141856	3.266302e-03
s(SST_RANGE)	0.9181055	9	1.5797079	1.499584e-01



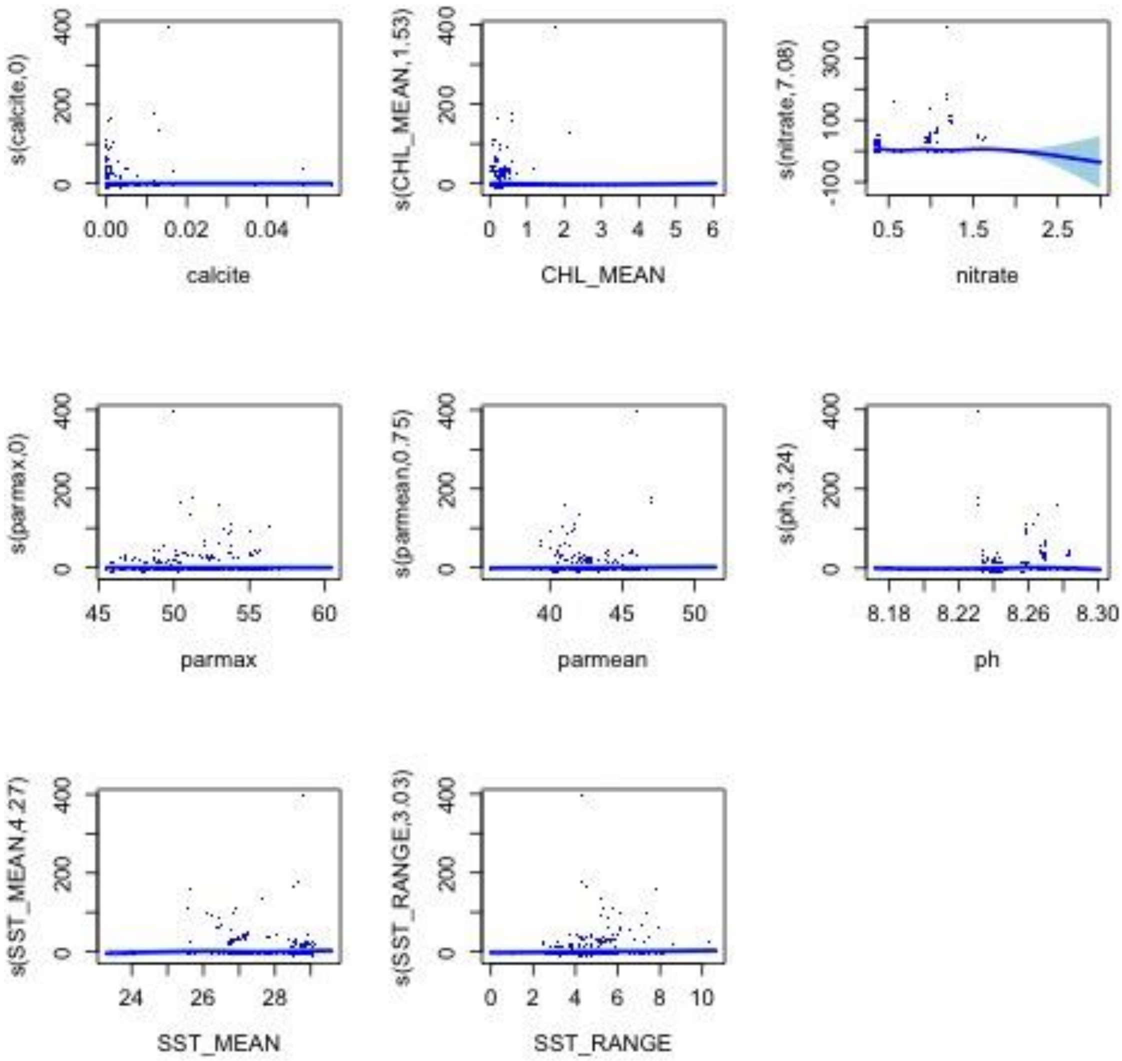
59 Caesio cuning, n = 100 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.599644e-05	8	1.661500e-05	5.175434e-01
s(CHL_MEAN)	2.749680e-05	9	1.582478e-06	9.206325e-01
s(nitrate)	4.516019e+00	9	1.241088e+02	5.664516e-33
s(parmax)	4.784007e+00	9	2.729846e+01	1.800330e-06
s(parmean)	5.270573e+00	9	3.323737e+01	1.228095e-07
s(ph)	2.172607e+00	9	5.101869e+00	4.401686e-02
s(SST_MEAN)	6.532300e-01	9	1.816881e+00	8.371558e-02
s(SST_RANGE)	1.916148e-01	9	2.174148e-01	2.737087e-01



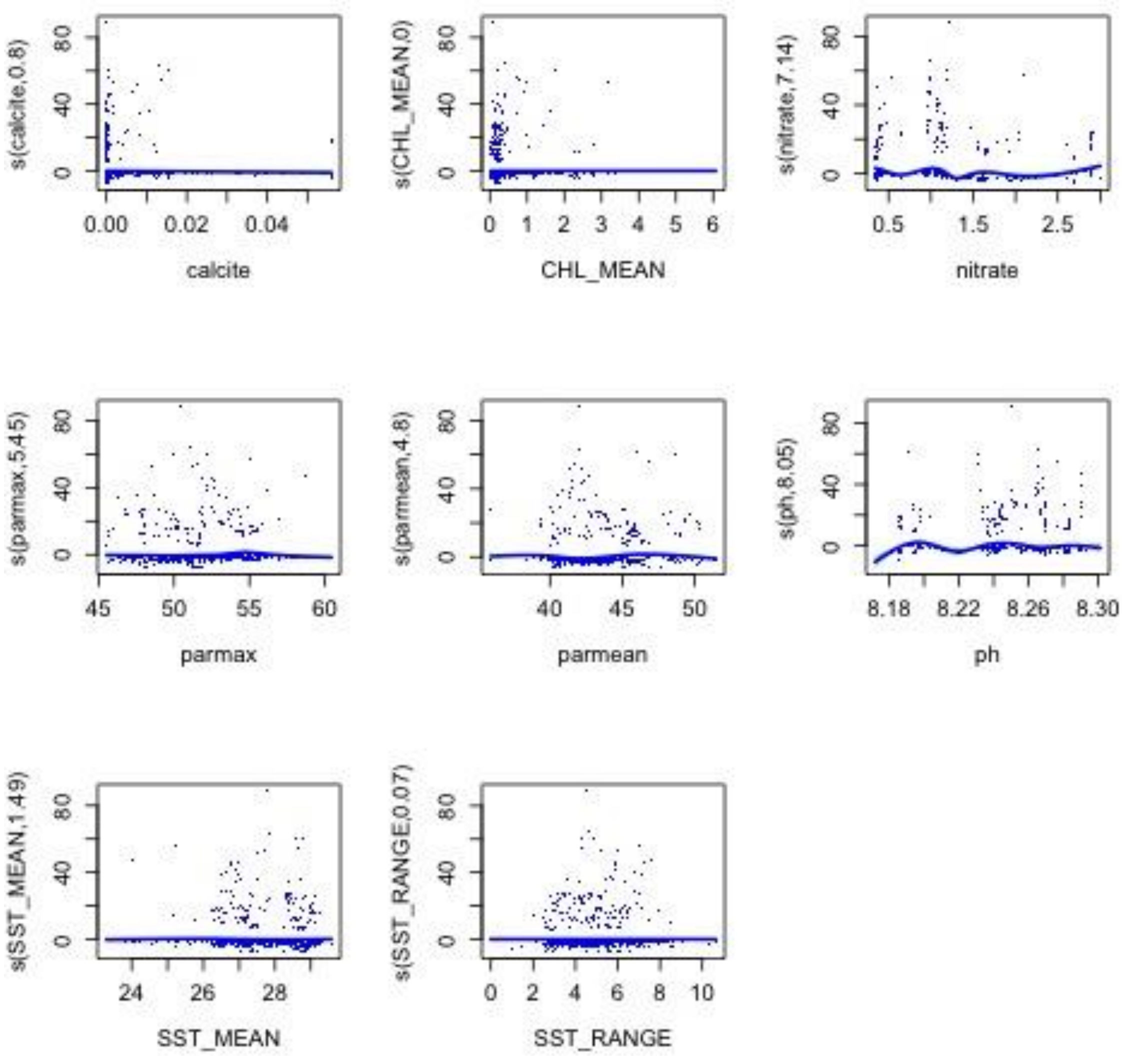
60 Caesio lunaris, n = 96 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.354959e-07	9	1.320888e-07	8.706569e-01
s(CHL_MEAN)	1.531421e+00	9	1.198196e+01	4.747344e-04
s(nitrate)	7.078848e+00	9	1.002937e+02	3.152841e-23
s(parmax)	2.606474e-04	9	4.596107e-04	1.566777e-01
s(parmean)	7.461030e-01	9	2.874156e+00	4.164516e-02
s(ph)	3.244910e+00	9	1.719662e+01	9.732470e-05
s(SST_MEAN)	4.265418e+00	9	1.828894e+01	2.091796e-04
s(SST_RANGE)	3.033058e+00	9	1.204369e+01	2.758437e-03



61 Caesio teres, n = 391 observations

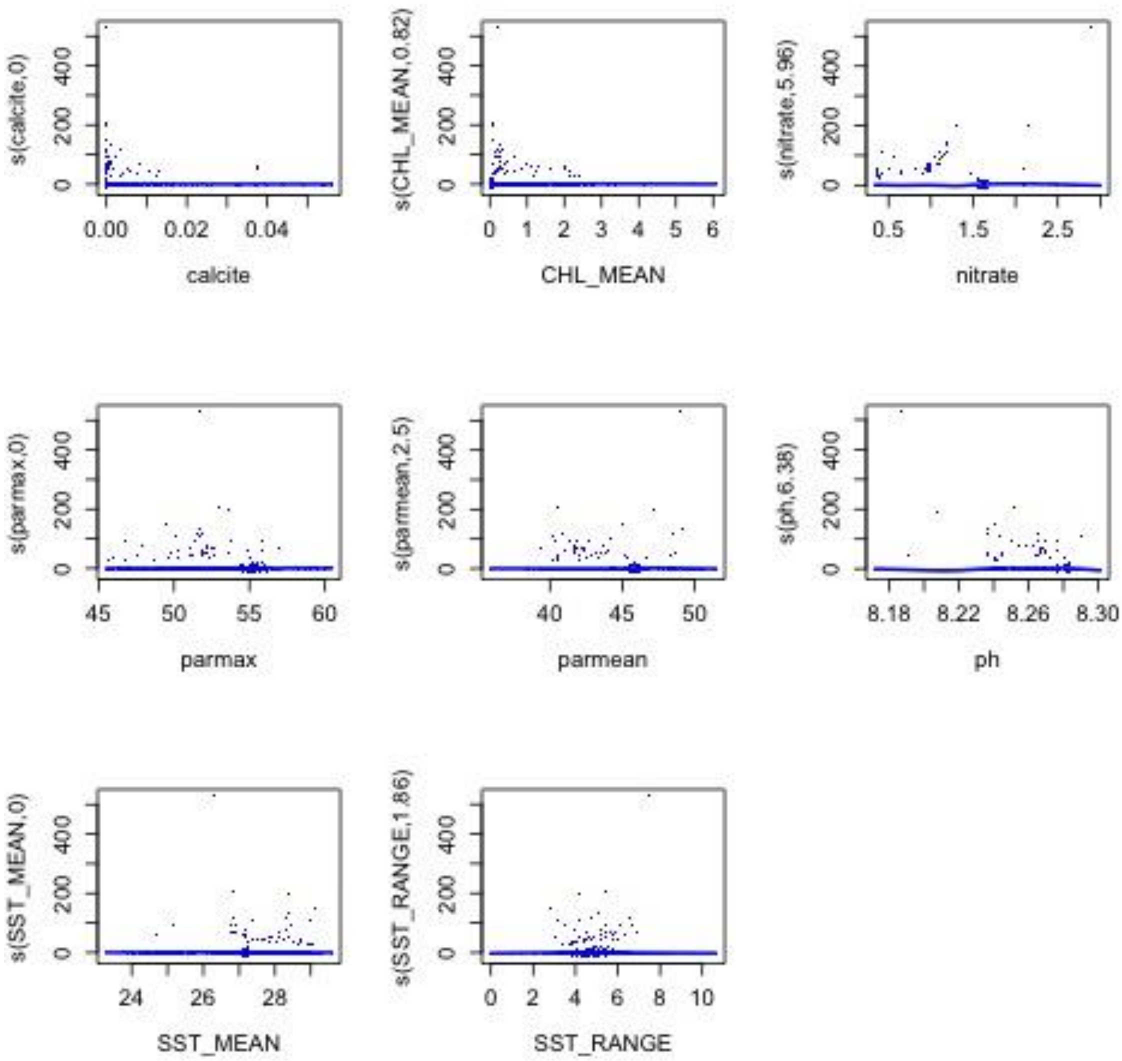
	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.990409e-01	6	3.573453e+00	3.256975e-02
s(CHL_MEAN)	4.670169e-05	9	1.745204e-05	5.451234e-01
s(nitrate)	7.135830e+00	9	1.251995e+02	2.590581e-27
s(parmax)	5.452159e+00	9	3.119681e+01	1.900062e-06
s(parmean)	4.799002e+00	9	5.821405e+01	9.611075e-14
s(ph)	8.051394e+00	9	5.788394e+01	2.860920e-11
s(SST_MEAN)	1.490747e+00	9	2.434312e+00	1.533918e-01
s(SST_RANGE)	7.407096e-02	9	7.735671e-02	3.031064e-01



62 Calatomus carolinus

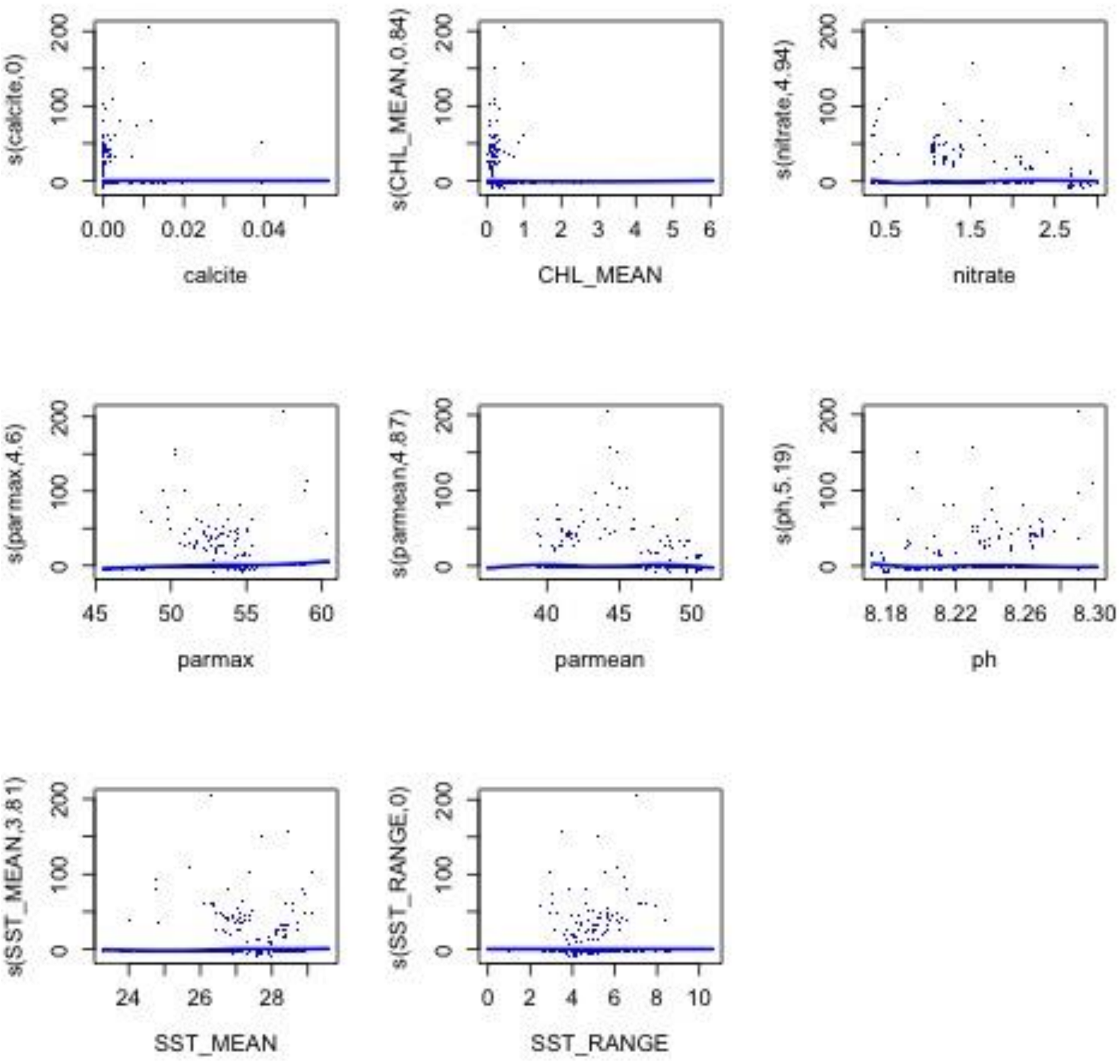
63 Carangoides ferdau, n = 98 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.148279e-05	9	6.240763e-06	6.414282e-01
s(CHL_MEAN)	8.195573e-01	9	3.621883e+00	2.556399e-02
s(nitrate)	5.955197e+00	9	6.332677e+01	5.294949e-15
s(parmax)	2.160286e-05	9	6.927468e-06	7.520233e-01
s(parmean)	2.504541e+00	9	5.433214e+00	5.953777e-02
s(ph)	6.383293e+00	9	3.150109e+01	1.886341e-06
s(SST_MEAN)	4.210864e-05	9	1.467970e-05	6.965699e-01
s(SST_RANGE)	1.861984e+00	9	5.189295e+00	3.324356e-02



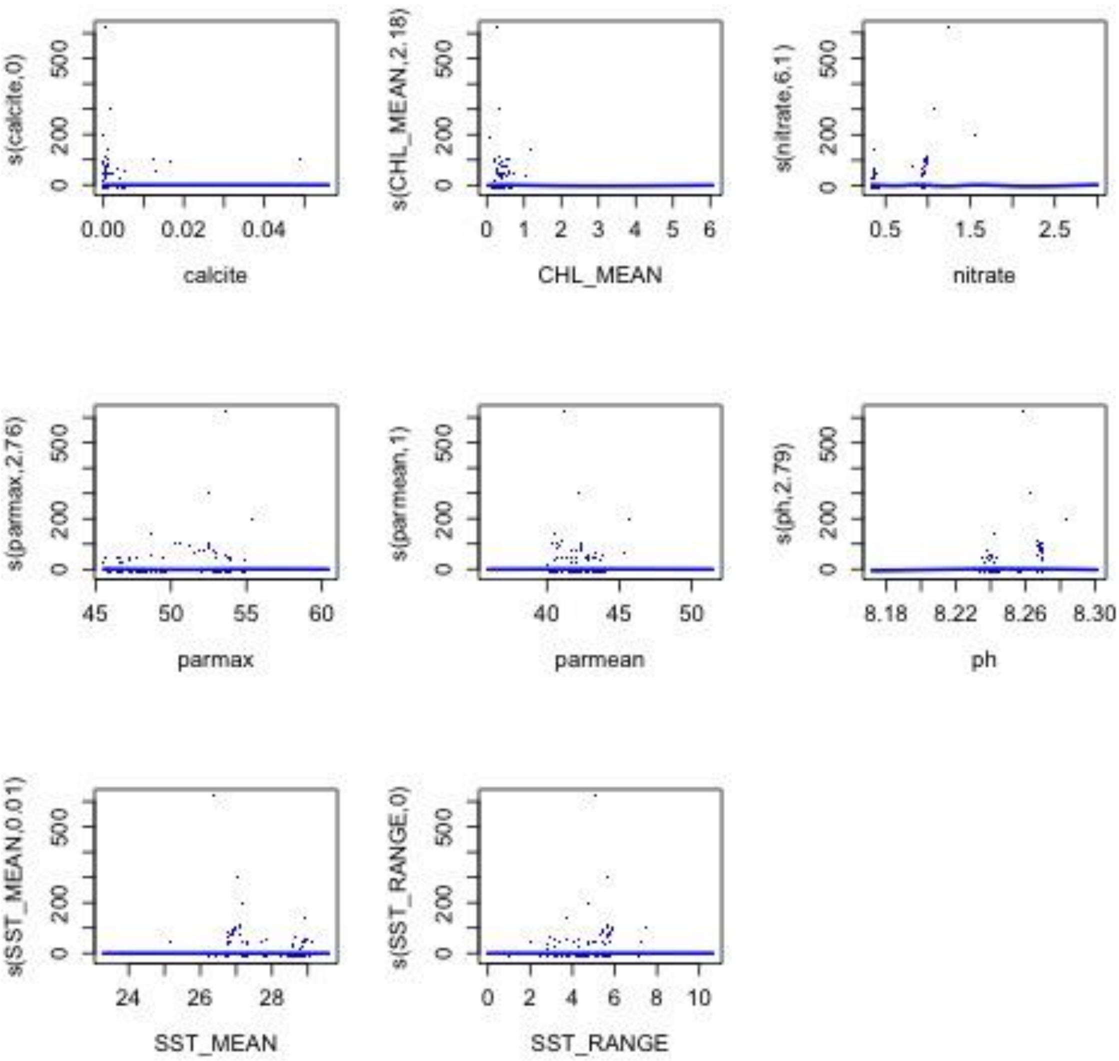
64 Carangoides orthogrammus, n = 234 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.056857e-05	9	6.328696e-06	4.592433e-01
s(CHL_MEAN)	8.358810e-01	9	2.503771e+00	6.569443e-02
s(nitrate)	4.941366e+00	9	1.915264e+01	2.245436e-04
s(parmax)	4.597219e+00	9	3.133632e+01	1.588837e-07
s(parmean)	4.870820e+00	9	5.937429e+01	2.029047e-14
s(ph)	5.194450e+00	9	3.685712e+01	7.966171e-09
s(SST_MEAN)	3.809969e+00	9	1.514397e+01	6.439361e-04
s(SST_RANGE)	1.224662e-04	9	5.799794e-05	6.160521e-01



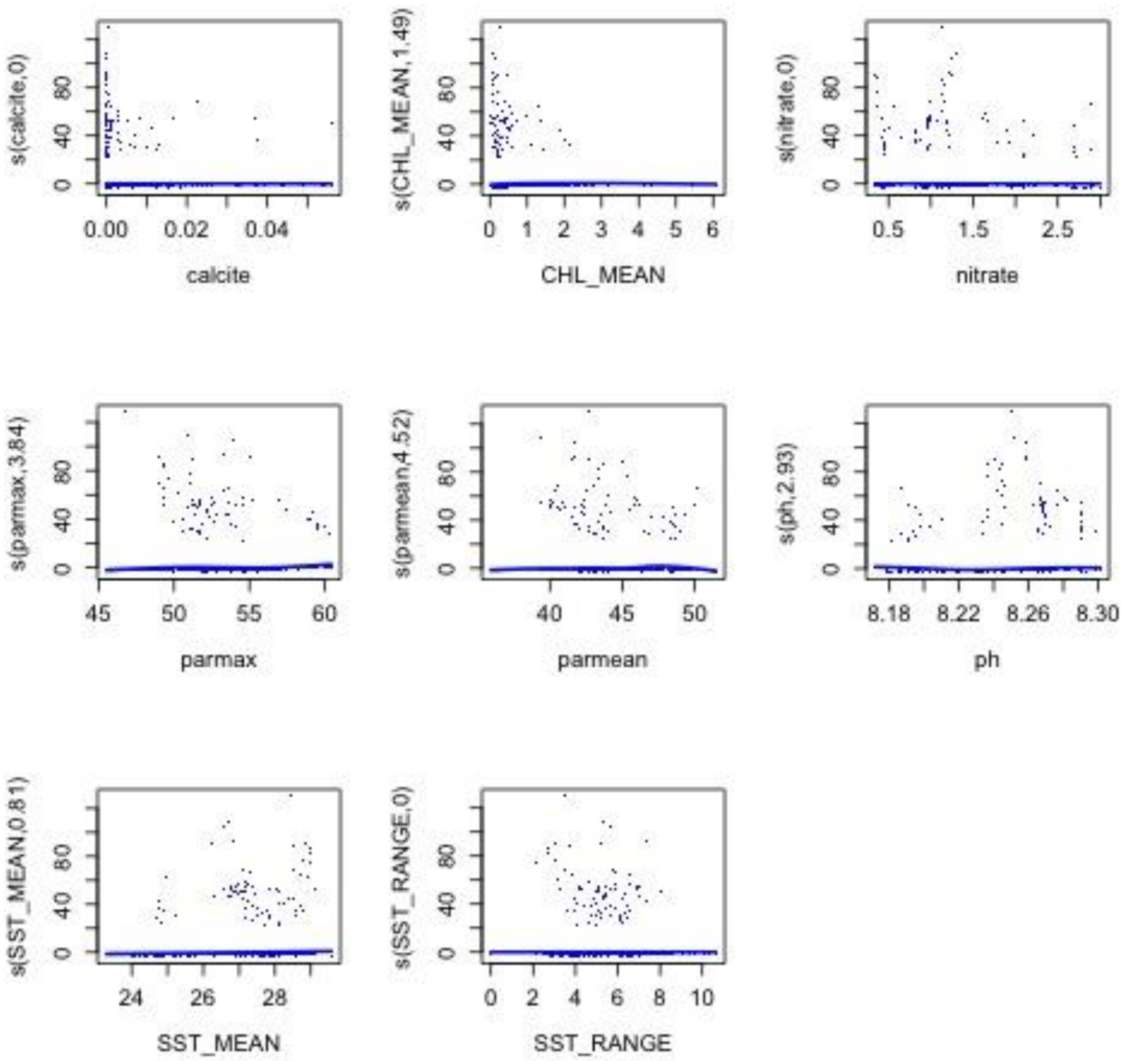
65 Carangoides plagiotaenia, n = 41 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.020352e-05	9	1.720662e-05	4.800162e-01
s(CHL_MEAN)	2.175476e+00	9	1.105670e+01	2.575019e-03
s(nitrate)	6.103102e+00	9	4.103876e+01	6.382997e-09
s(parmax)	2.763353e+00	9	1.552542e+01	1.118215e-04
s(parmean)	1.003501e+00	9	1.181704e+00	2.731263e-01
s(ph)	2.794086e+00	9	8.145853e+00	1.593715e-02
s(SST_MEAN)	8.216831e-03	9	7.999183e-03	3.147530e-01
s(SST_RANGE)	3.802052e-05	9	2.389946e-05	4.642300e-01



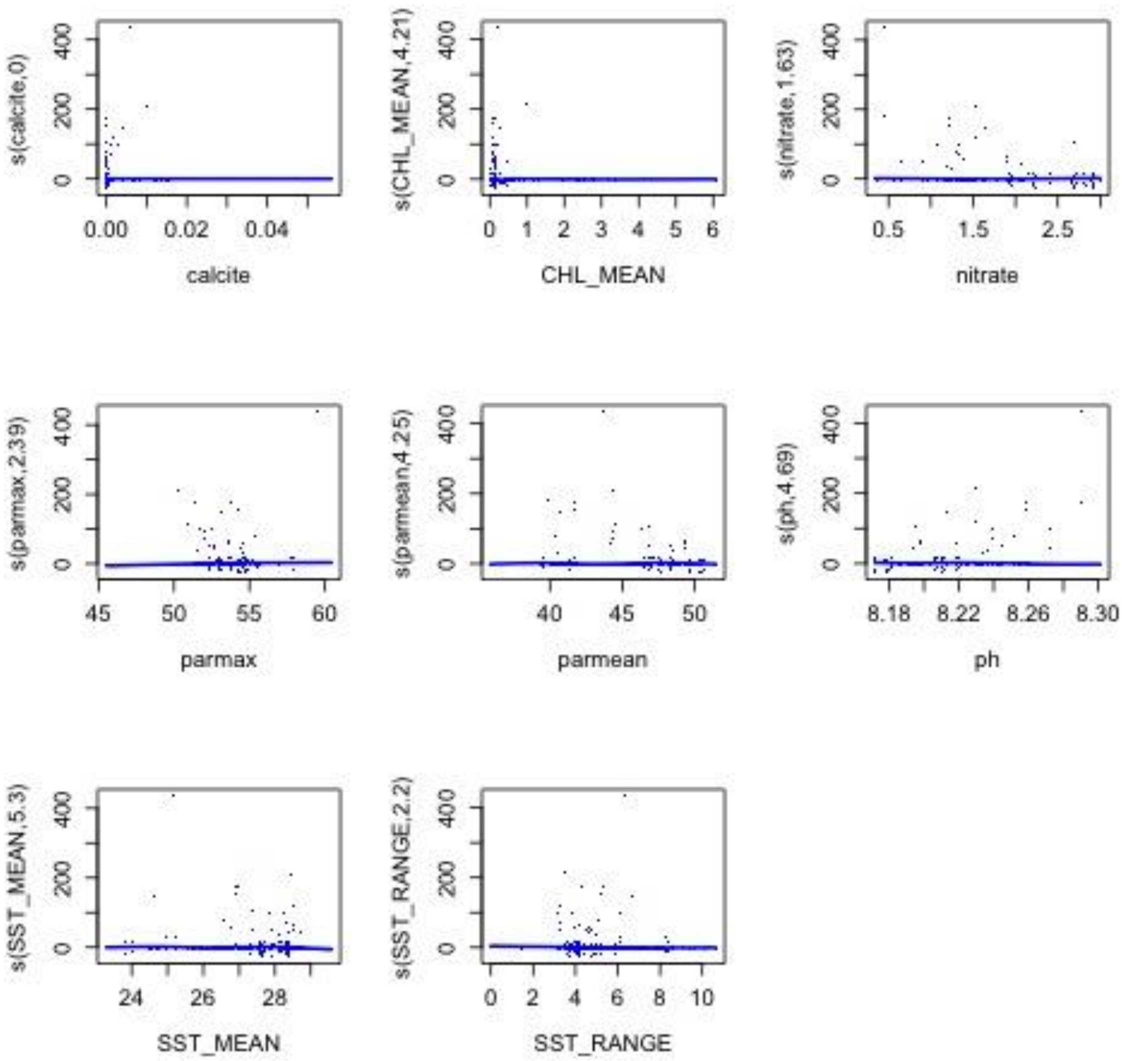
66 Caranx ignobilis, n = 96 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.042541e-05	9	5.204512e-07	1.000000e+00
s(CHL_MEAN)	1.493747e+00	9	8.506328e+00	3.507869e-03
s(nitrate)	1.262017e-03	9	1.076931e-03	3.164305e-01
s(parmax)	3.843625e+00	9	1.850763e+01	1.143641e-04
s(parmean)	4.522490e+00	9	2.562658e+01	8.186763e-06
s(ph)	2.926282e+00	9	1.749778e+01	6.499500e-05
s(SST_MEAN)	8.097354e-01	9	4.099676e+00	1.860212e-02
s(SST_RANGE)	2.915206e-05	9	1.420700e-05	6.213092e-01



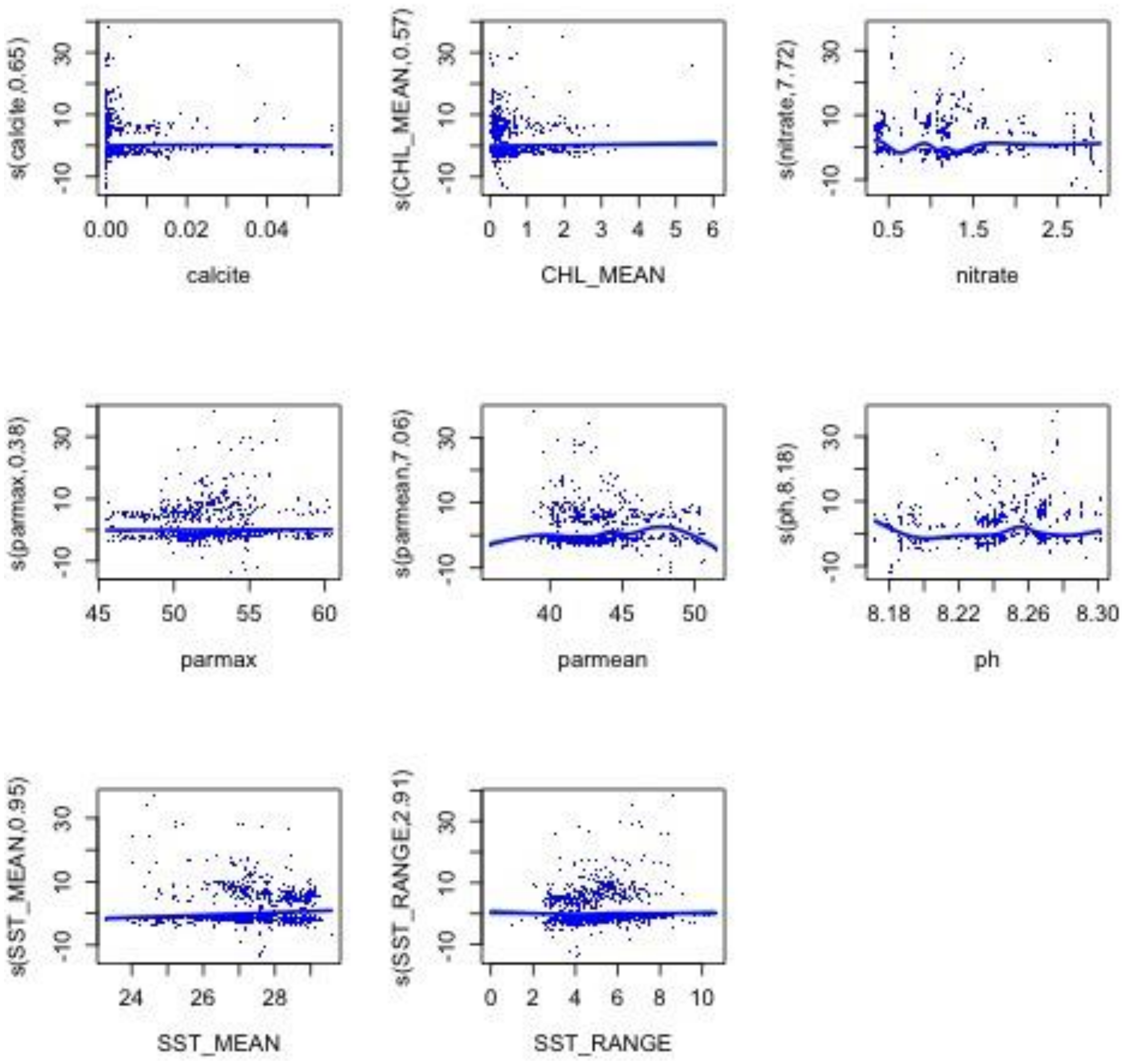
67 Caranx lugubris, n = 292 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.104971e-05	9	3.784624e-06	9.169720e-01
s(CHL_MEAN)	4.209830e+00	9	2.253422e+01	3.694775e-05
s(nitrate)	1.632185e+00	9	1.060478e+01	2.821023e-04
s(parmax)	2.389085e+00	9	2.166873e+01	9.195759e-07
s(parmean)	4.247257e+00	9	3.373532e+01	8.056998e-09
s(ph)	4.685830e+00	9	4.428278e+01	9.903290e-12
s(SST_MEAN)	5.298552e+00	9	2.212483e+01	5.708496e-05
s(SST_RANGE)	2.196198e+00	9	9.611811e+00	2.150716e-03



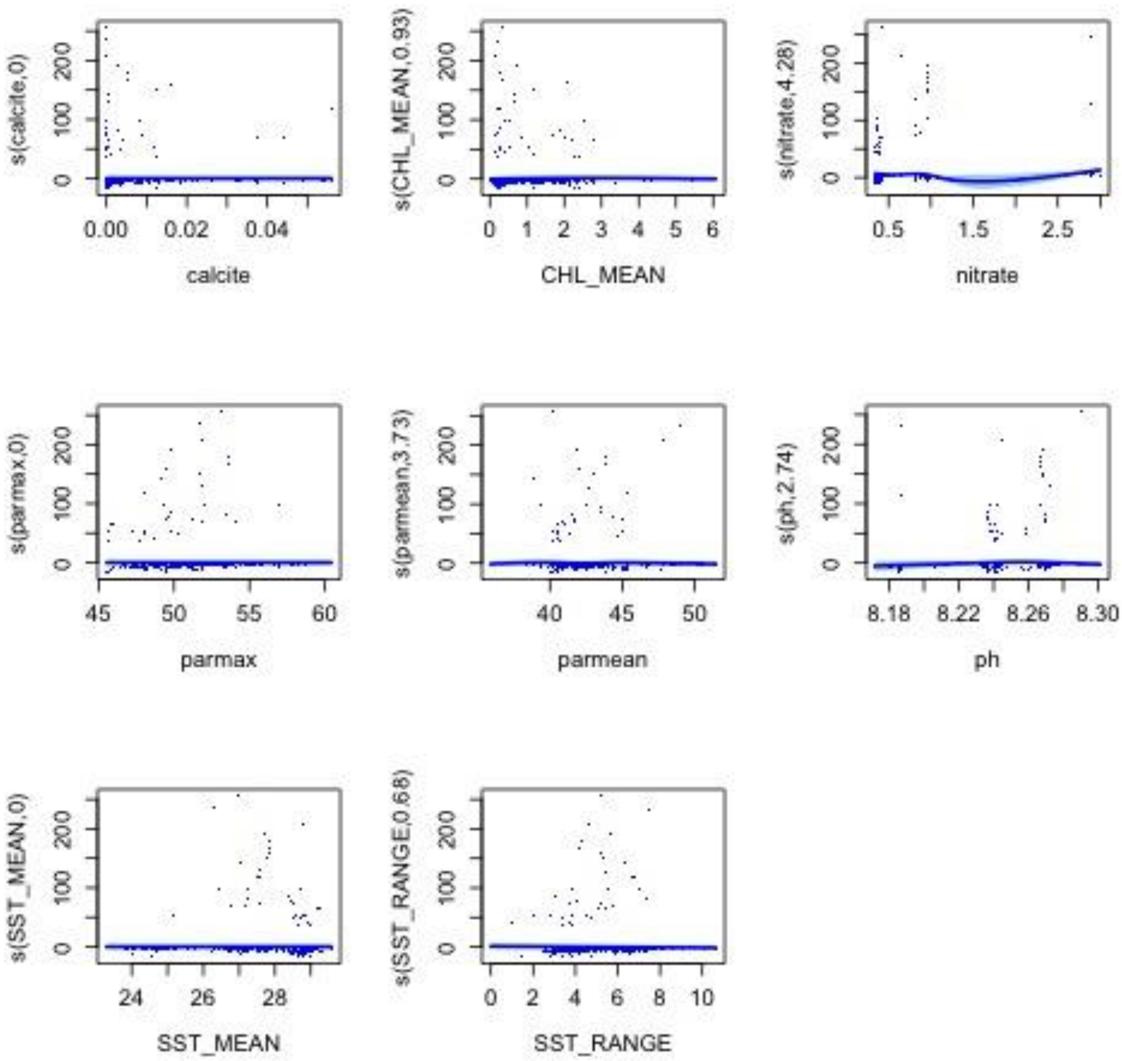
68 Caranx melampygus, n = 1096 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6534065	9	1.7047962	8.611921e-02
s(CHL_MEAN)	0.5689377	9	1.3896268	1.025736e-01
s(nitrate)	7.7173127	9	234.2981748	2.343288e-50
s(parmax)	0.3752618	9	0.5864687	1.978882e-01
s(parmean)	7.0593364	9	212.7961945	1.897509e-47
s(ph)	8.1815972	9	160.3871130	4.962199e-34
s(SST_MEAN)	0.9450888	9	16.6219395	6.109218e-06
s(SST_RANGE)	2.9142195	9	6.1639096	6.962620e-02



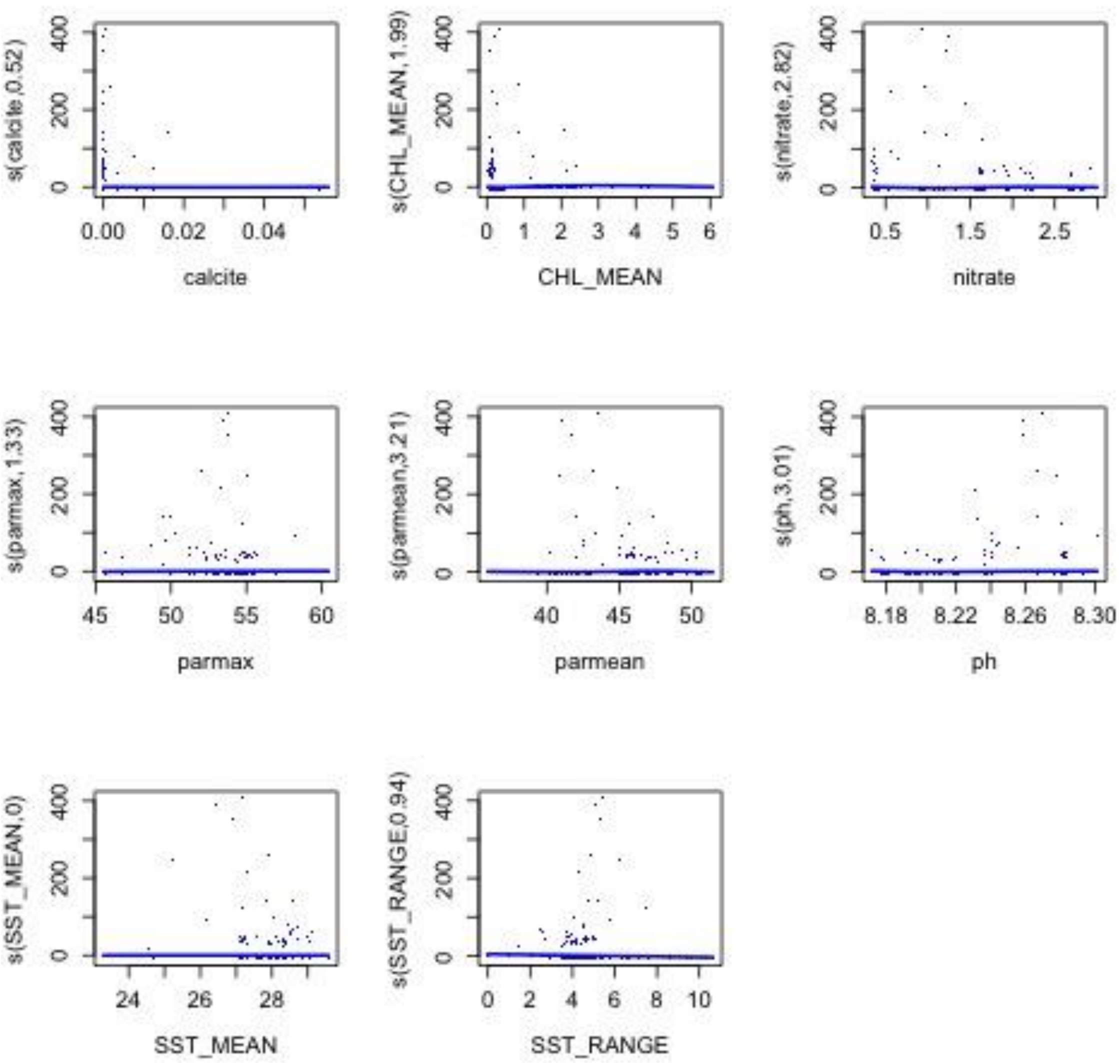
69 Caranx papuensis, n = 34 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.255897e-06	9	6.467900e-07	7.213512e-01
s(CHL_MEAN)	9.347813e-01	9	6.547755e+00	4.499307e-03
s(nitrate)	4.277901e+00	9	2.238125e+01	8.731074e-06
s(parmax)	1.379124e-06	9	2.080916e-07	9.636982e-01
s(parmean)	3.734281e+00	9	1.093696e+01	9.347785e-03
s(ph)	2.737981e+00	9	8.990704e+00	4.446688e-03
s(SST_MEAN)	1.623358e-03	9	1.750197e-03	2.771617e-01
s(SST_RANGE)	6.824428e-01	8	2.075140e+00	7.458777e-02



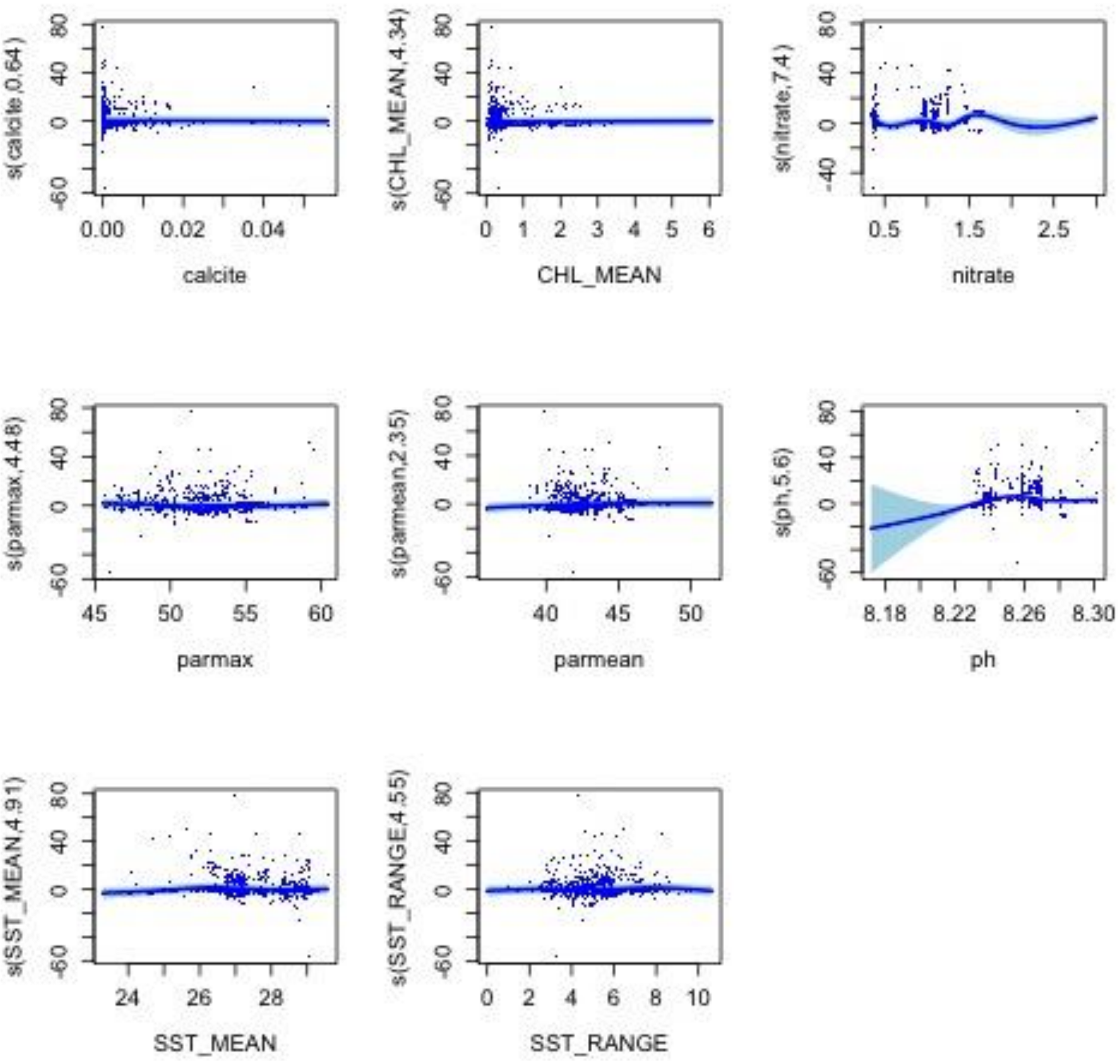
70 Caranx sexfasciatus, n = 59 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.195013e-01	9	8.710529e-01	1.840605e-01
s(CHL_MEAN)	1.990394e+00	9	1.874080e+01	6.481124e-06
s(nitrate)	2.821148e+00	9	2.037113e+01	1.170428e-06
s(parmax)	1.333052e+00	9	3.123944e+00	6.011046e-02
s(parmean)	3.212785e+00	9	2.287232e+01	1.111864e-06
s(ph)	3.006363e+00	9	9.686478e+00	3.490587e-03
s(SST_MEAN)	5.789788e-05	9	9.797872e-06	8.986984e-01
s(SST_RANGE)	9.437619e-01	9	1.528631e+01	1.509573e-05



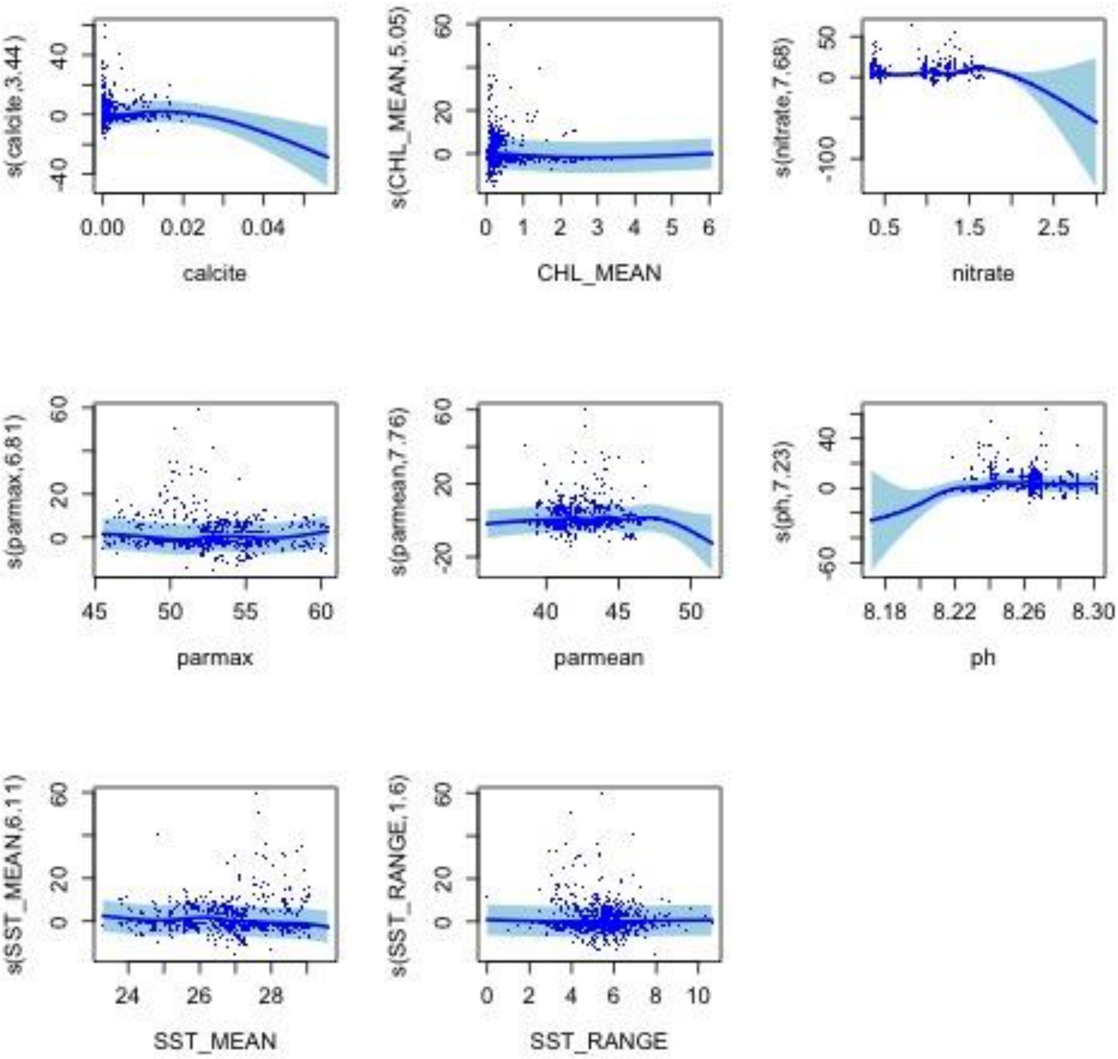
71 Centropyge bicolor, n = 504 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6414769	7	1.659789	1.012558e-01
s(CHL_MEAN)	4.3435347	9	60.645916	9.616281e-14
s(nitrate)	7.4027359	9	246.082000	2.802685e-59
s(parmax)	4.4839025	9	27.512501	1.493166e-06
s(parmean)	2.3541201	9	19.280751	5.175317e-06
s(ph)	5.5953954	9	103.180881	6.752119e-25
s(SST_MEAN)	4.9071753	9	34.458047	2.839915e-08
s(SST_RANGE)	4.5529415	9	16.224707	1.586811e-03



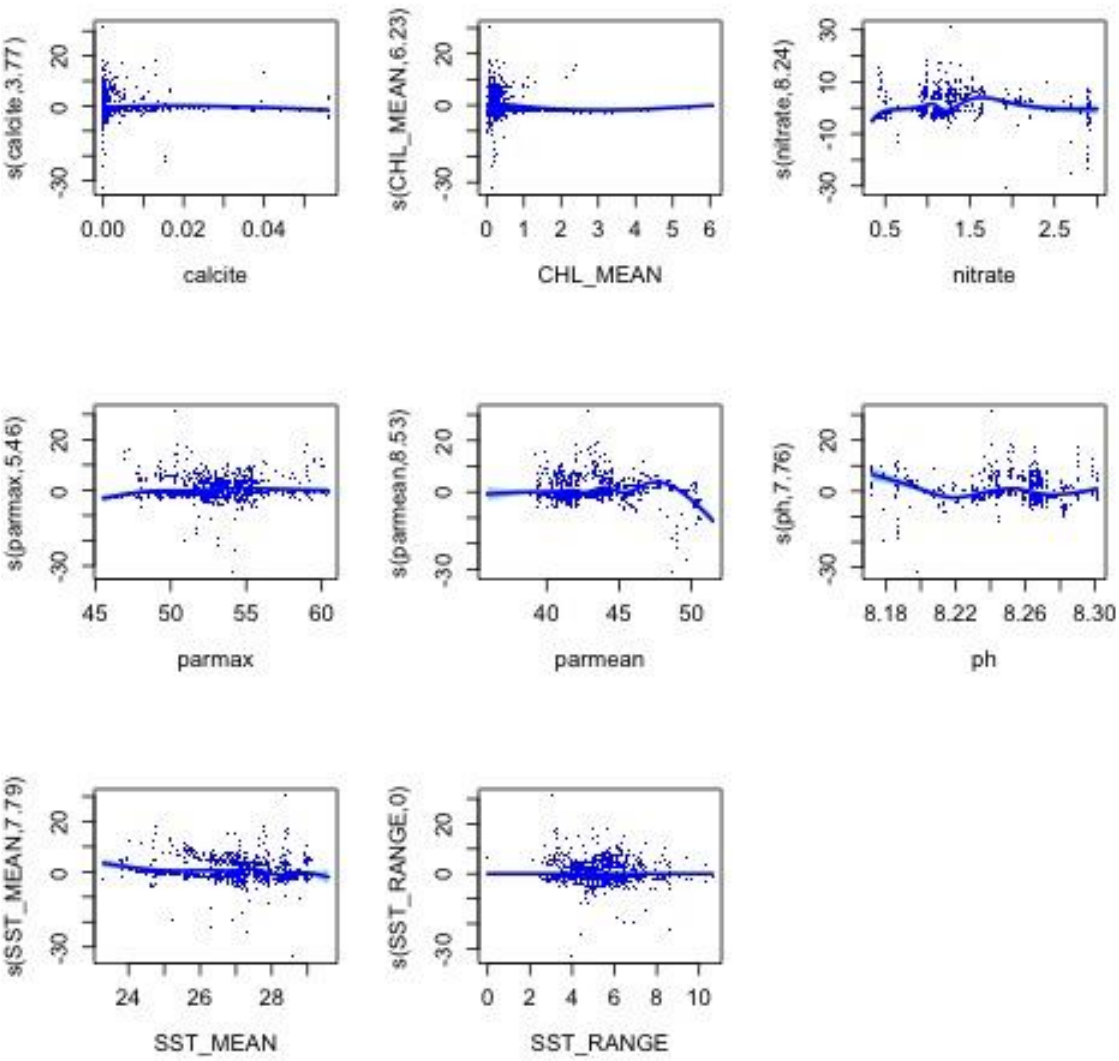
72 Centropyge bispinosa, n = 1065 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.435775	9	44.41158	2.076895e-10
s(CHL_MEAN)	5.045312	9	51.98729	4.732826e-11
s(nitrate)	7.683139	9	221.37804	6.911427e-50
s(parmax)	6.813131	9	77.57784	1.450771e-16
s(parmean)	7.763154	9	48.13455	6.633722e-09
s(ph)	7.225628	9	82.76454	2.933314e-17
s(SST_MEAN)	6.110716	9	53.94500	1.117681e-11
s(SST_RANGE)	1.601739	9	5.04792	2.578542e-02



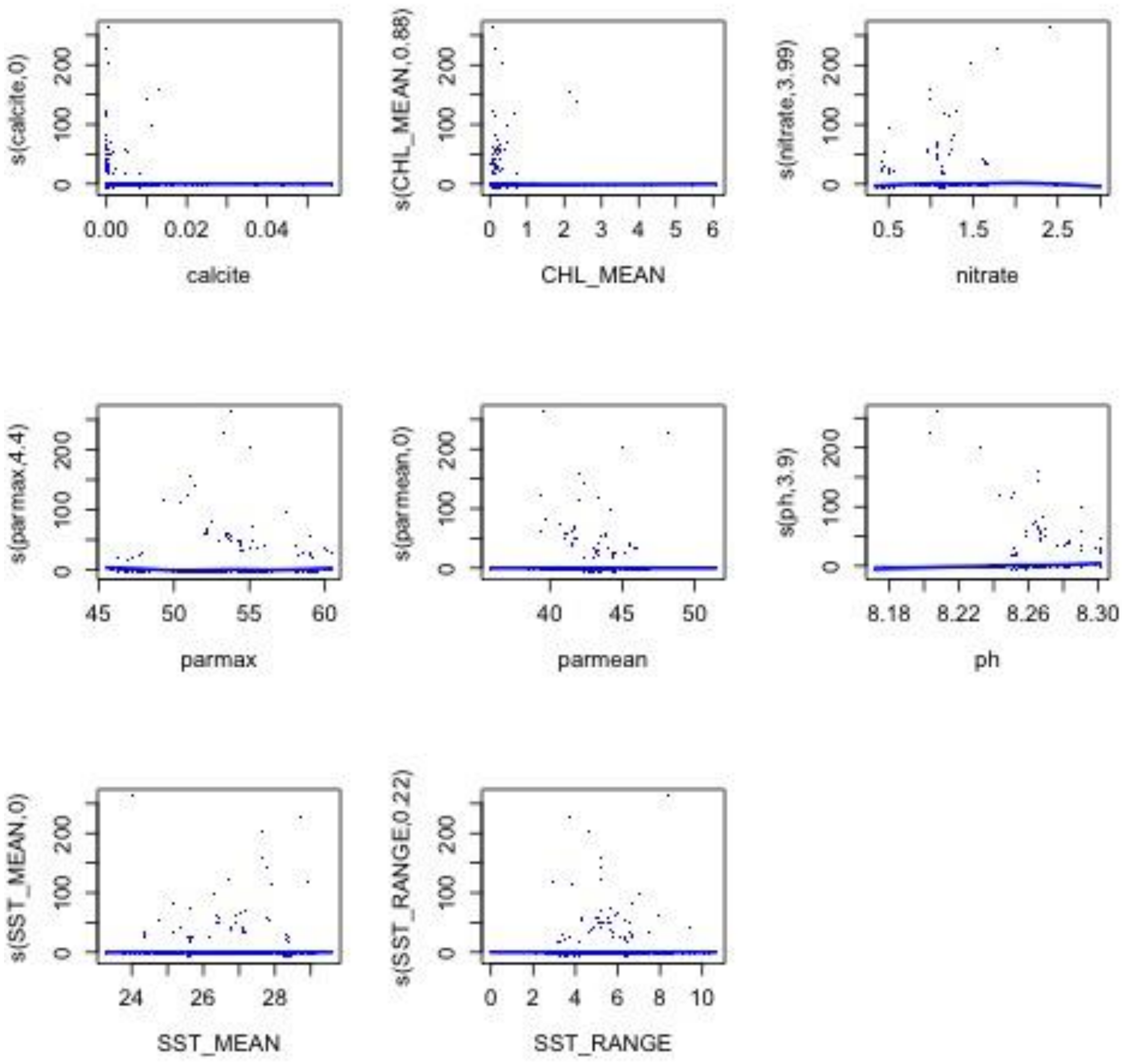
73 Centropyge flavissima, n = 2324 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.7661166009	9	2.966028e+01	1.261702e-06
s(CHL_MEAN)	6.2313009590	9	1.078205e+02	8.093748e-23
s(nitrate)	8.2422761036	9	2.813226e+02	1.193987e-63
s(parmax)	5.4553003802	9	3.408077e+01	3.187344e-07
s(parmean)	8.5271873801	9	2.431627e+02	1.335321e-52
s(ph)	7.7640071961	9	1.398330e+02	4.671564e-31
s(SST_MEAN)	7.7897569564	9	7.665373e+01	2.609910e-15
s(SST_RANGE)	0.0009666897	9	8.553562e-04	3.816235e-01



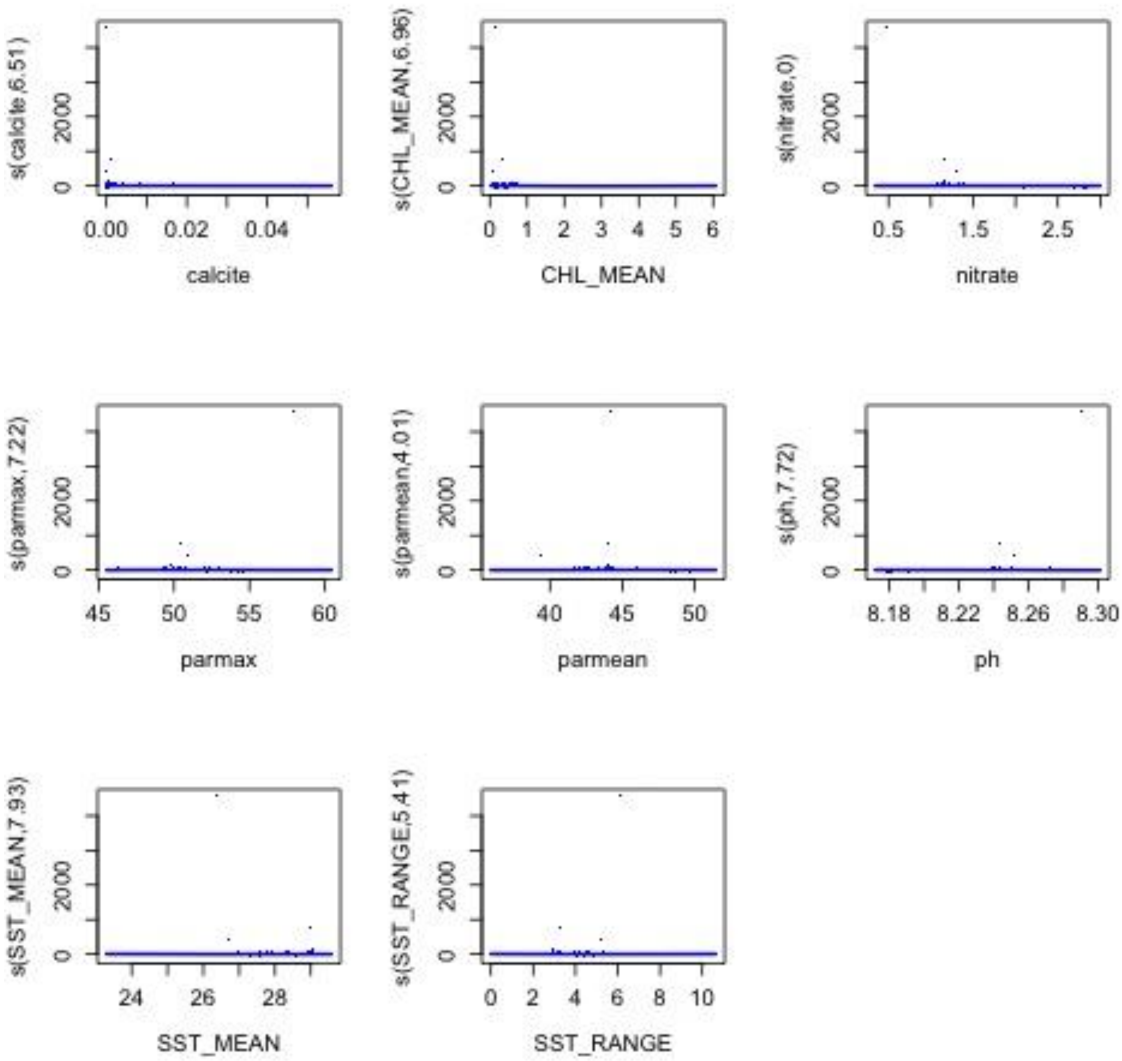
74 Centropyge heraldi, n = 137 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.511986e-05	8	1.041671e-05	5.575836e-01
s(CHL_MEAN)	8.794841e-01	9	2.968955e+00	5.008183e-02
s(nitrate)	3.994571e+00	9	2.192574e+01	8.150205e-06
s(parmax)	4.398428e+00	9	4.043517e+01	9.045574e-10
s(parmean)	1.346866e-04	9	7.435805e-05	4.363680e-01
s(ph)	3.897106e+00	9	3.364340e+01	1.827753e-09
s(SST_MEAN)	4.463665e-04	9	3.271282e-04	3.336904e-01
s(SST_RANGE)	2.202412e-01	9	2.703721e-01	2.603427e-01



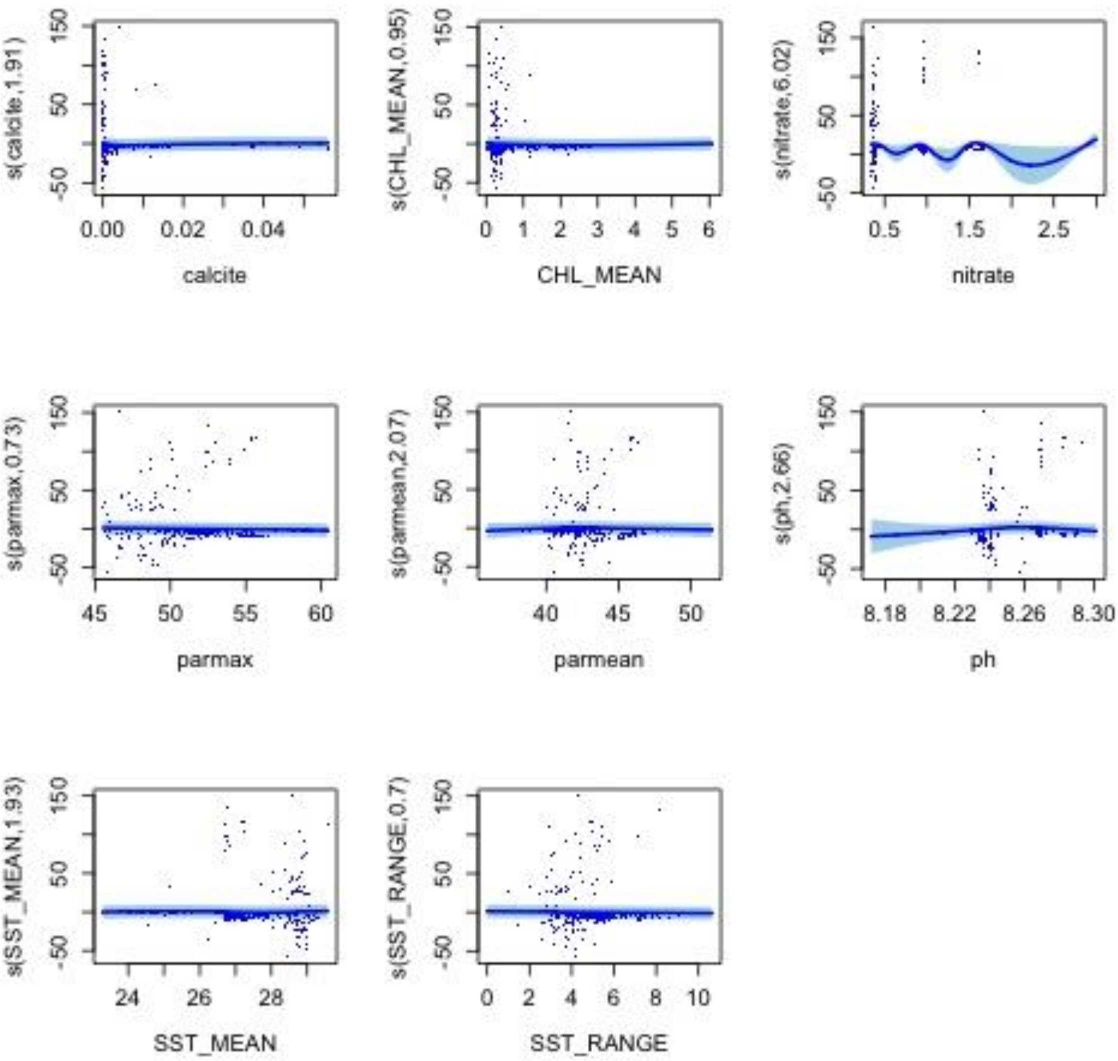
75 Centropyge loriculus, n = 969 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.509185e+00	9	6.962416e+01	3.588900e-14
s(CHL_MEAN)	6.956688e+00	9	5.673802e+01	4.434172e-11
s(nitrate)	6.764844e-05	9	4.453435e-05	4.347870e-01
s(parmax)	7.222137e+00	9	5.525567e+01	2.784999e-11
s(parmean)	4.006423e+00	9	7.014503e+01	5.597276e-18
s(ph)	7.717767e+00	9	1.326728e+02	2.424418e-29
s(SST_MEAN)	7.928163e+00	9	8.556745e+01	3.307803e-18
s(SST_RANGE)	5.412365e+00	9	2.316600e+01	8.727782e-05



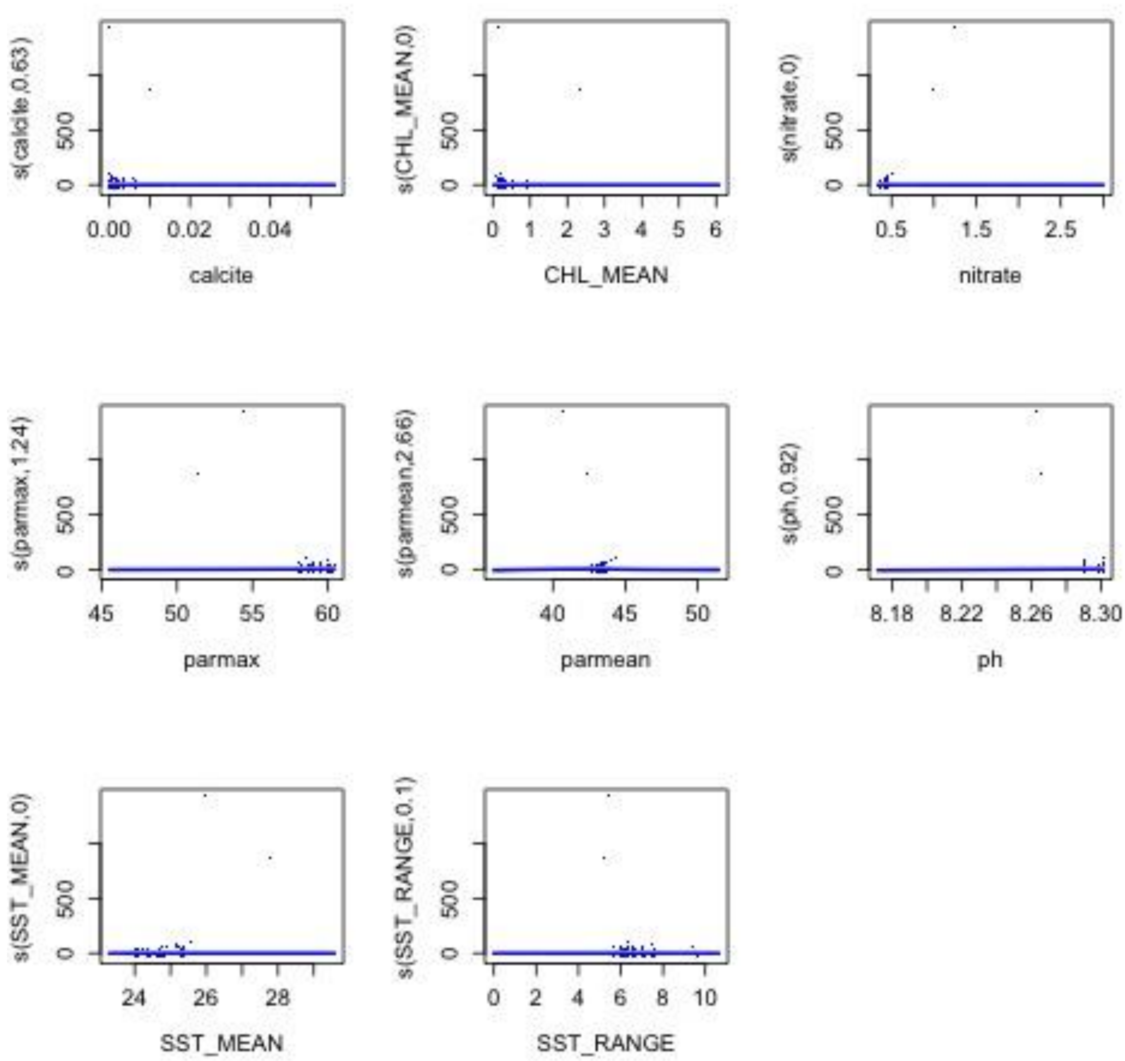
76 Centropyge nox, n = 52 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.9087724	9	11.477204	0.0015727855
s(CHL_MEAN)	0.9544874	9	4.259973	0.0229468600
s(nitrate)	6.0180127	9	17.539772	0.0018495575
s(parmax)	0.7252186	9	2.339208	0.0496237857
s(parmean)	2.0700709	9	6.286955	0.0150439782
s(ph)	2.6607782	9	12.774485	0.0008115103
s(SST_MEAN)	1.9282919	9	4.264715	0.0702206126
s(SST_RANGE)	0.7002185	9	1.882628	0.0948298558



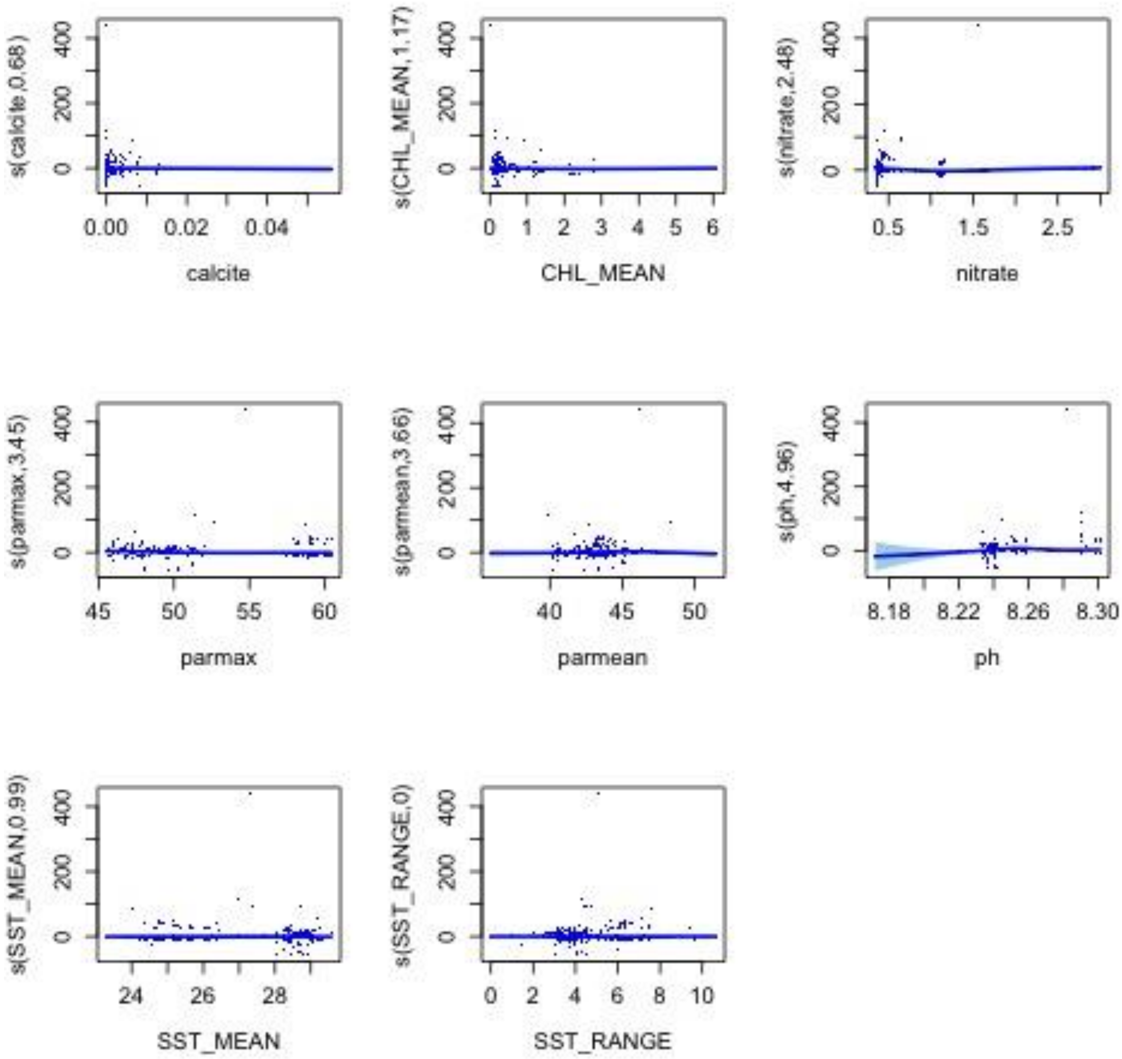
77 Centropyge tibicen, n = 48 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.267118e-01	9	1.354911e+00	1.222071e-01
s(CHL_MEAN)	5.826001e-06	9	1.061386e-06	8.090550e-01
s(nitrate)	6.994966e-06	9	3.159491e-06	4.878910e-01
s(parmax)	1.238174e+00	9	1.529125e+01	2.747139e-05
s(parmean)	2.656920e+00	9	1.916554e+01	2.550973e-05
s(ph)	9.157803e-01	9	1.021978e+01	4.801915e-04
s(SST_MEAN)	8.840565e-06	9	5.940788e-06	3.849792e-01
s(SST_RANGE)	9.973541e-02	9	1.064988e-01	2.906553e-01



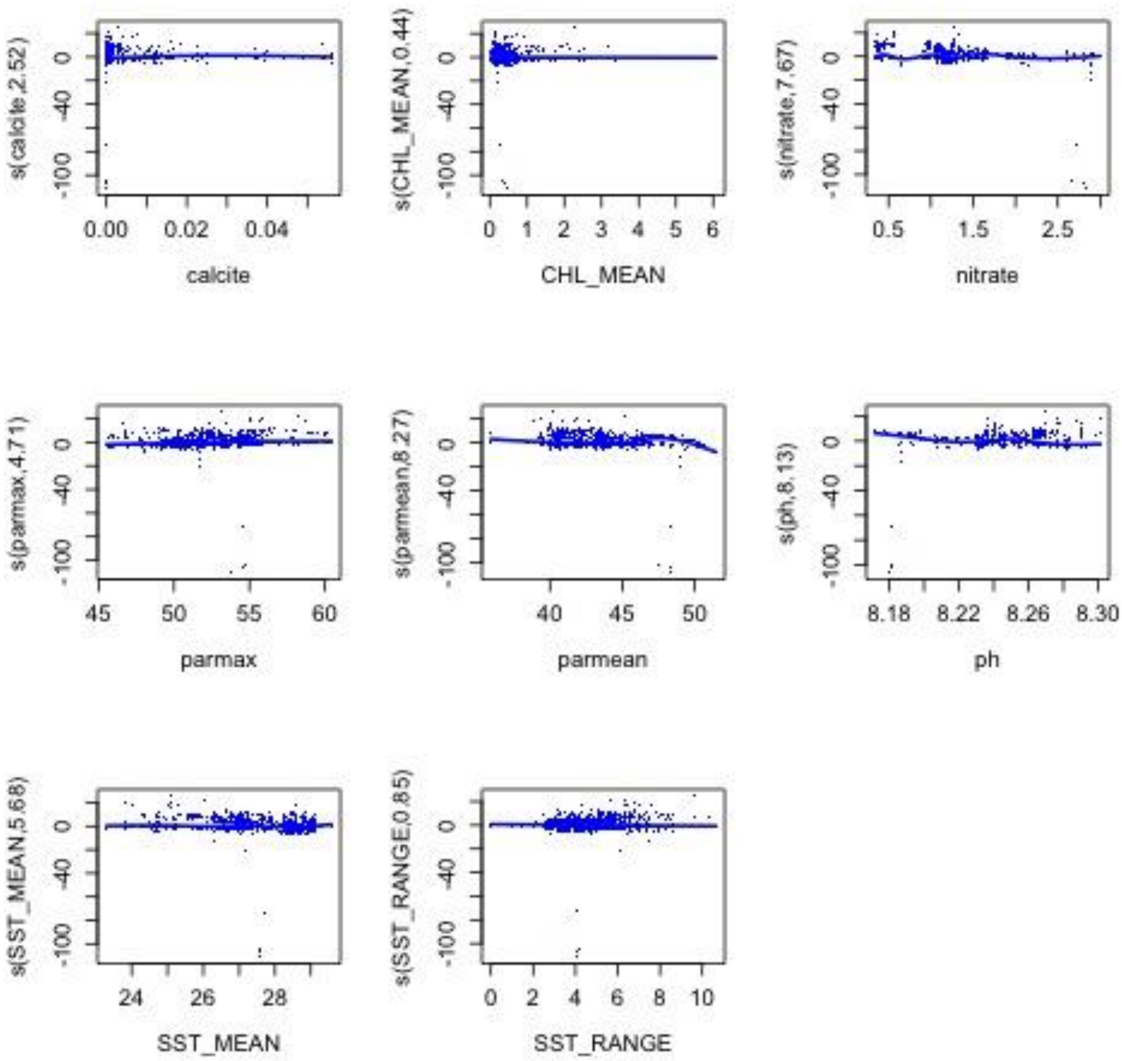
78 Centropyge vrolikii, n = 170 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.781581e-01	7	1.752714e+00	9.393704e-02
s(CHL_MEAN)	1.171527e+00	9	1.353811e+01	6.947376e-05
s(nitrate)	2.481957e+00	9	1.240645e+02	2.636951e-35
s(parmax)	3.449384e+00	9	4.629667e+01	4.691123e-13
s(parmean)	3.662031e+00	9	3.975742e+01	1.677204e-11
s(ph)	4.959022e+00	9	5.358509e+01	3.162885e-13
s(SST_MEAN)	9.858622e-01	9	2.546393e+00	5.352571e-02
s(SST_RANGE)	5.263955e-05	9	1.245872e-05	8.472650e-01



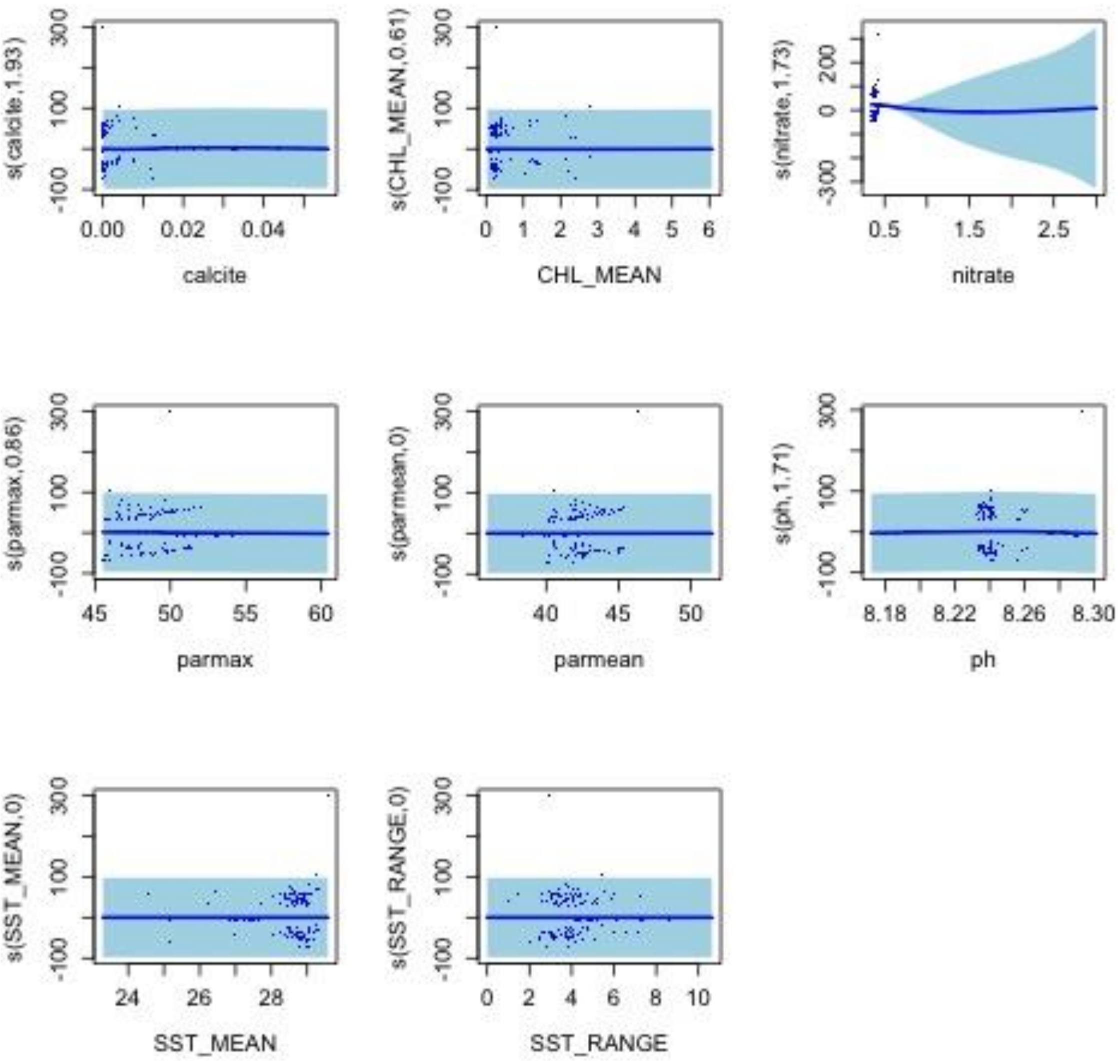
79 Cephalopholis argus, n = 2163 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.5228388	9	31.777464	3.257286e-08
s(CHL_MEAN)	0.4443596	9	0.730650	1.939498e-01
s(nitrate)	7.6718134	9	200.634194	2.633021e-43
s(parmax)	4.7133404	9	68.851381	2.928827e-16
s(parmean)	8.2730908	9	350.113872	1.195720e-77
s(ph)	8.1291118	9	345.112254	2.868265e-78
s(SST_MEAN)	5.6782906	9	38.631850	4.667796e-08
s(SST_RANGE)	0.8535743	9	5.513559	1.018858e-02



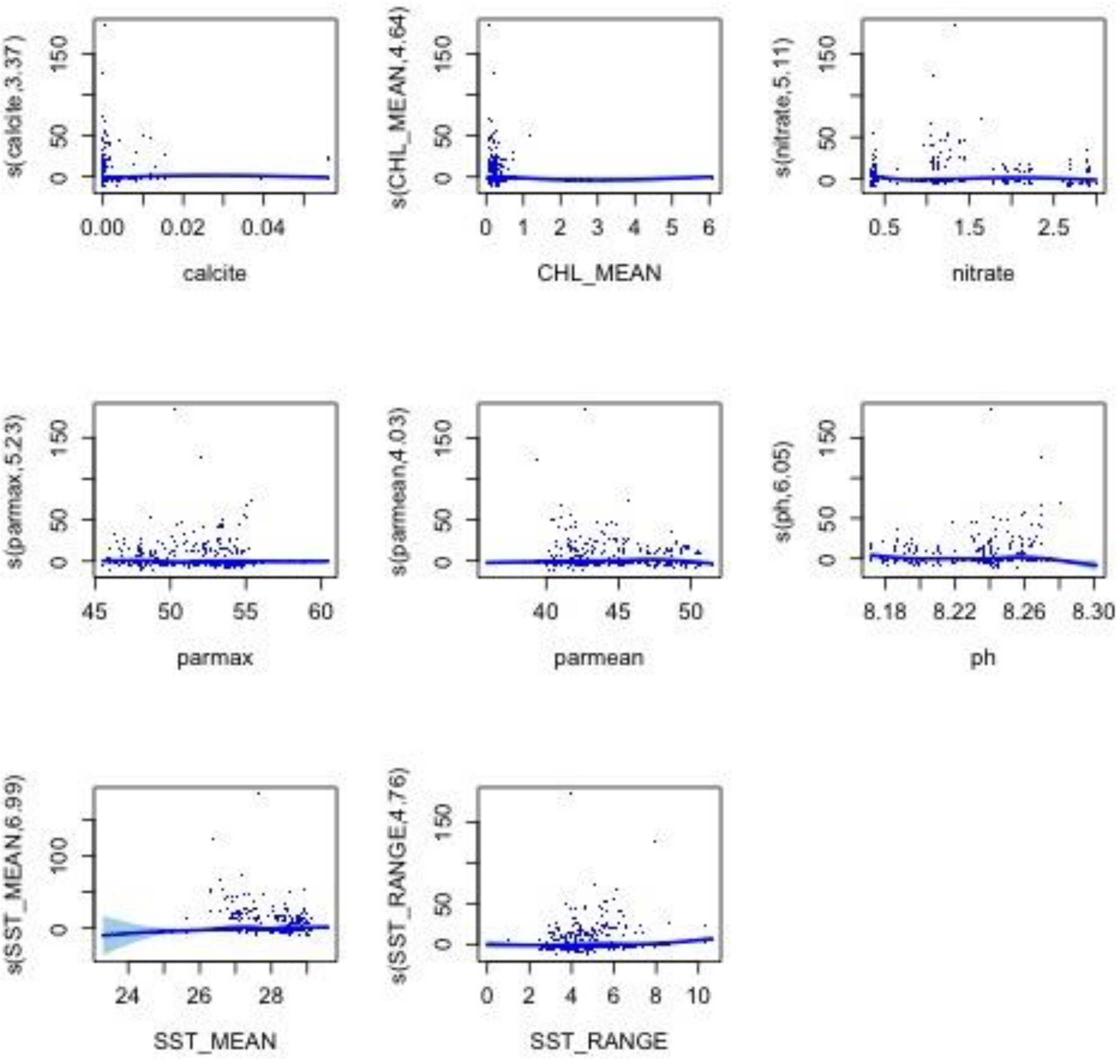
80 Cephalopholis cyanostigma, n = 73 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.927474e+00	9	9.041815e+00	0.005526681
s(CHL_MEAN)	6.118527e-01	9	1.409186e+00	0.120358499
s(nitrate)	1.731023e+00	9	3.885288e+00	0.089690264
s(parmax)	8.595540e-01	7	5.241092e+00	0.009986231
s(parmean)	6.660058e-04	9	7.202355e-04	0.274536652
s(ph)	1.705397e+00	9	1.033731e+01	0.001138466
s(SST_MEAN)	3.899877e-06	9	4.067753e-07	1.000000000
s(SST_RANGE)	7.092217e-06	9	7.825488e-07	1.000000000



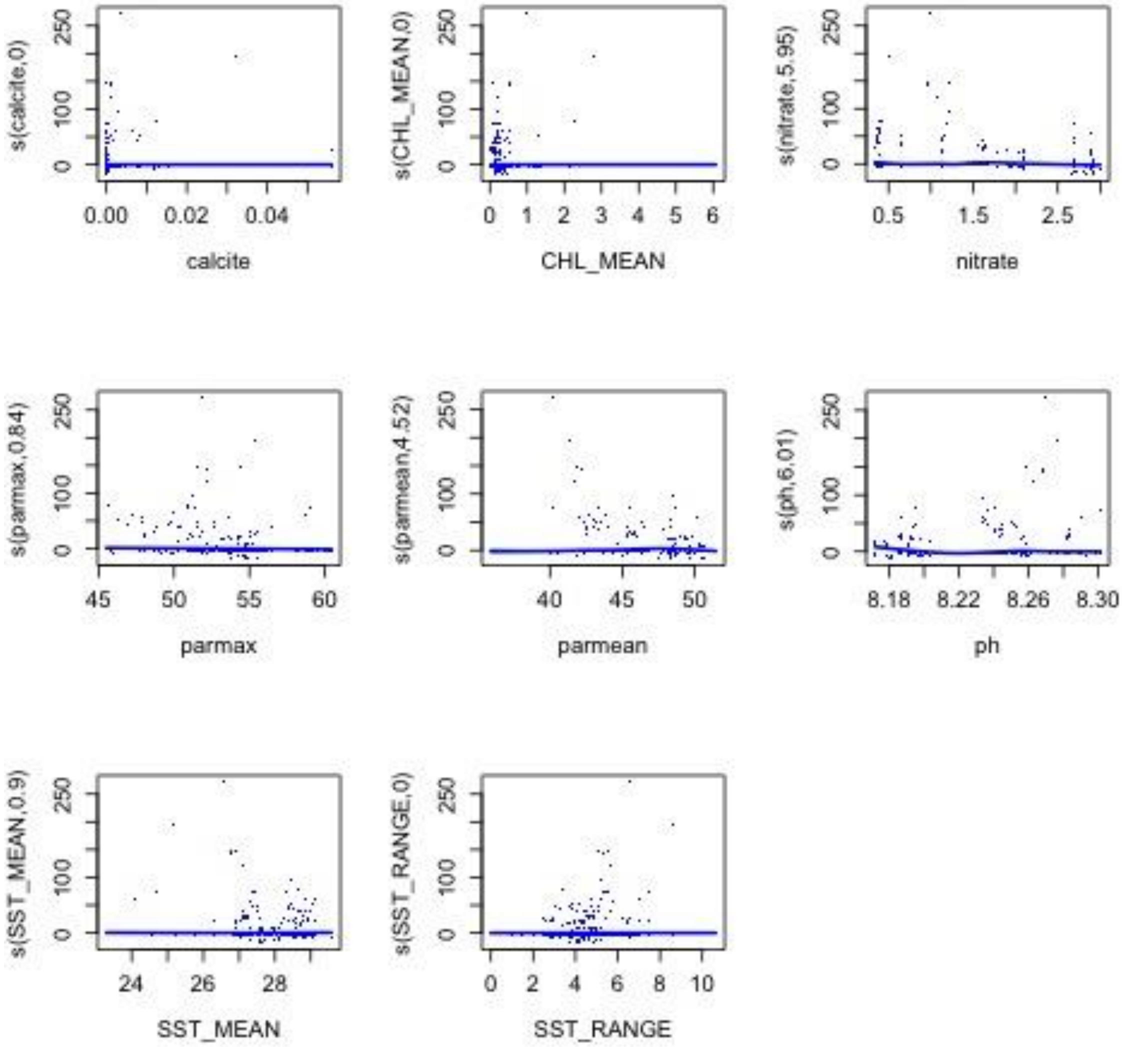
81 Cephalopholis leopardus, n = 285 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.365169	9	19.46706	1.003183e-04
s(CHL_MEAN)	4.636672	9	19.47877	4.065584e-04
s(nitrate)	5.107592	9	88.15032	1.327051e-22
s(parmax)	5.232848	9	25.73541	1.187952e-05
s(parmean)	4.026531	9	42.60313	3.800302e-11
s(ph)	6.053847	9	52.75265	1.983178e-12
s(SST_MEAN)	6.985297	9	54.74573	1.446914e-11
s(SST_RANGE)	4.756081	9	25.28985	1.079019e-05



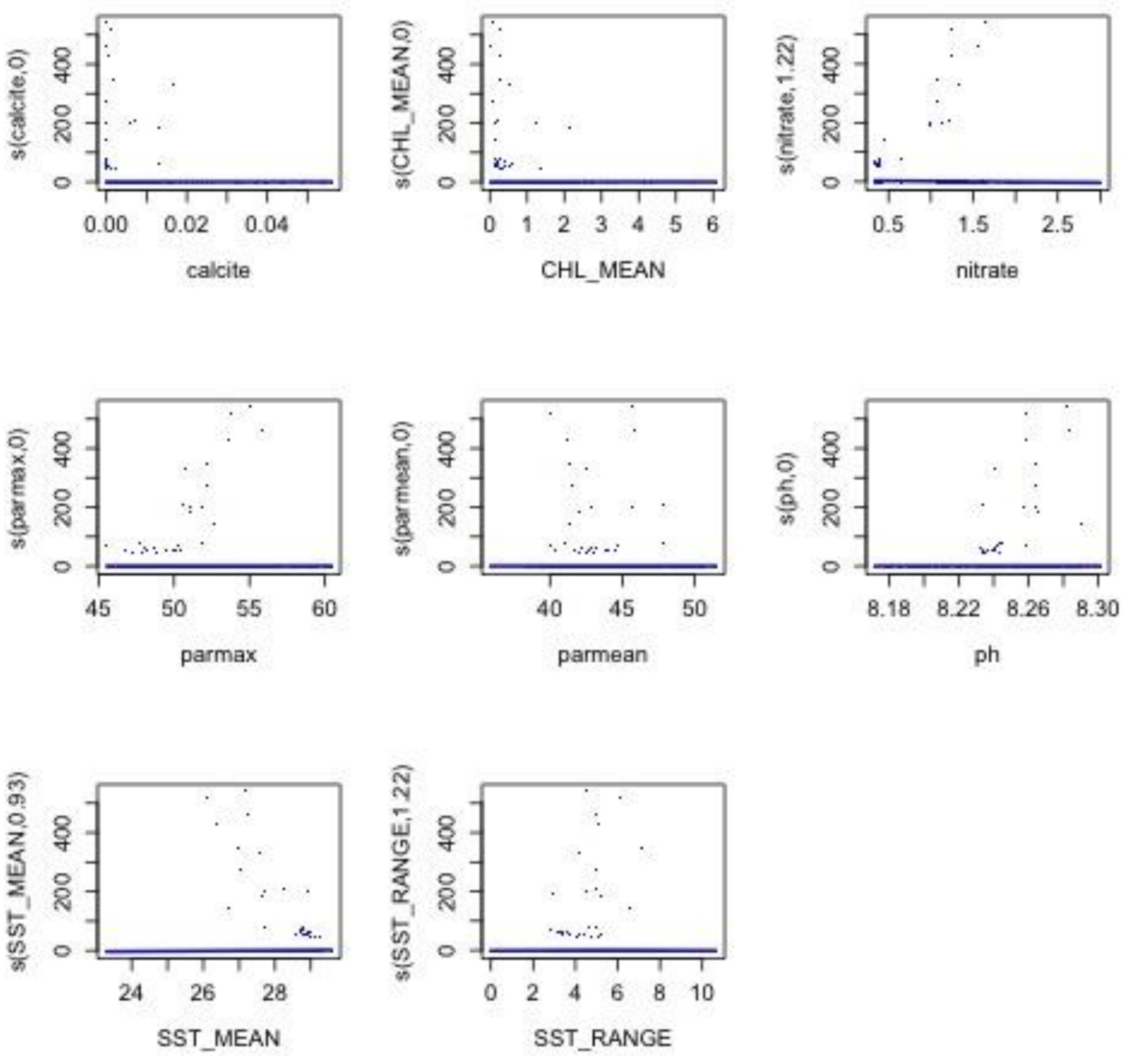
82 Cephalopholis miniata, n = 295 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.562486e-06	9	6.302122e-07	7.624498e-01
s(CHL_MEAN)	2.660052e-06	9	1.153392e-06	5.135114e-01
s(nitrate)	5.950021e+00	9	6.357088e+01	7.899936e-15
s(parmax)	8.366378e-01	8	5.007012e+00	9.980630e-03
s(parmean)	4.517298e+00	9	7.554847e+01	1.335603e-18
s(ph)	6.005181e+00	9	1.030057e+02	6.092174e-26
s(SST_MEAN)	8.979667e-01	9	1.722144e+00	1.063186e-01
s(SST_RANGE)	3.615631e-06	9	2.292586e-06	4.914668e-01



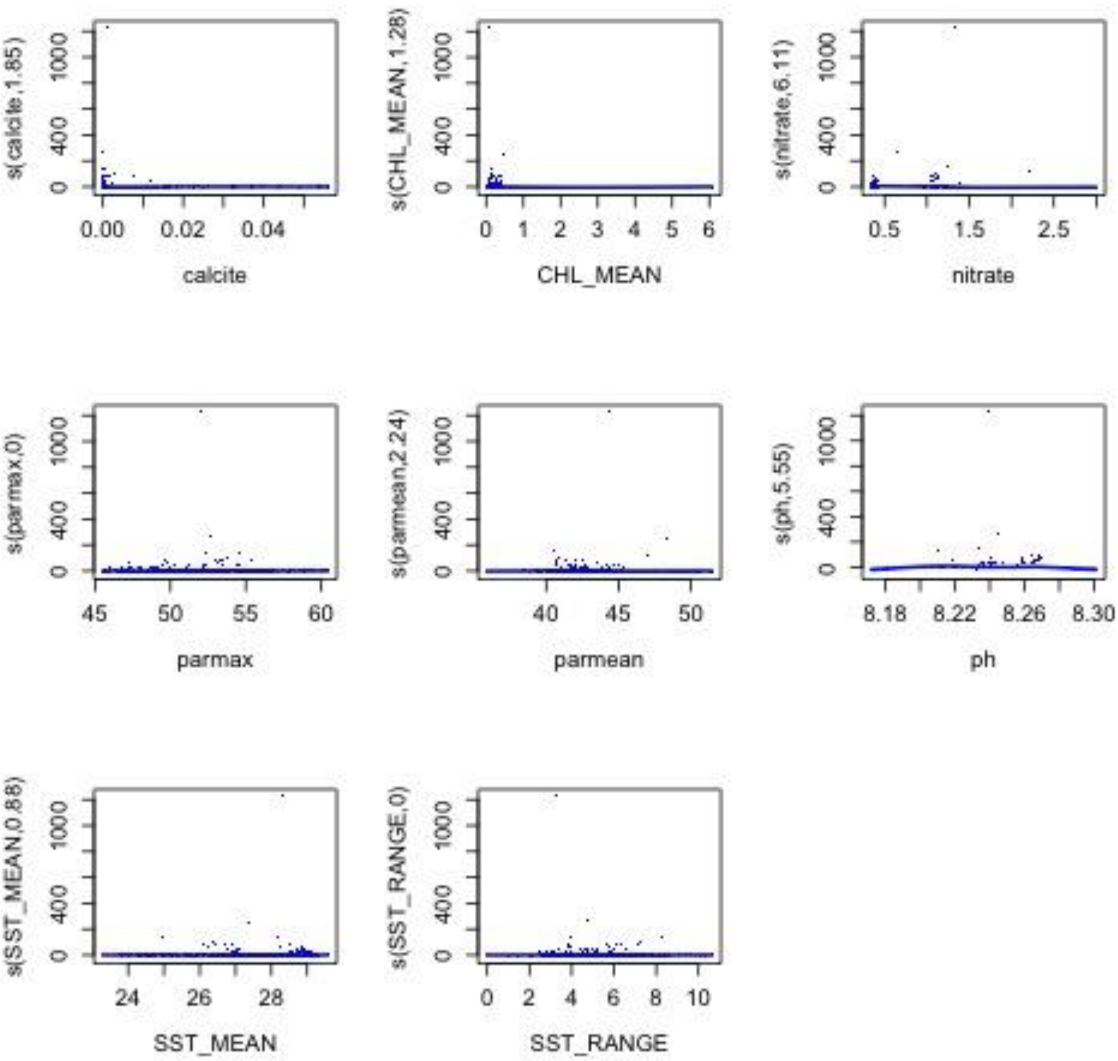
83 Cephalopholis sexmaculata, n = 43 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.362842e-06	9	3.118025e-07	8.122772e-01
s(CHL_MEAN)	4.497685e-06	9	1.946303e-06	5.089901e-01
s(nitrate)	1.220506e+00	9	3.589871e+01	7.744984e-10
s(parmax)	2.484360e-06	9	5.012600e-07	8.700885e-01
s(parmean)	2.386526e-06	9	3.712388e-07	9.490849e-01
s(ph)	1.273385e-04	9	8.151162e-05	4.398315e-01
s(SST_MEAN)	9.257862e-01	9	1.173871e+01	1.358097e-04
s(SST_RANGE)	1.220632e+00	9	2.223128e+00	1.404409e-01



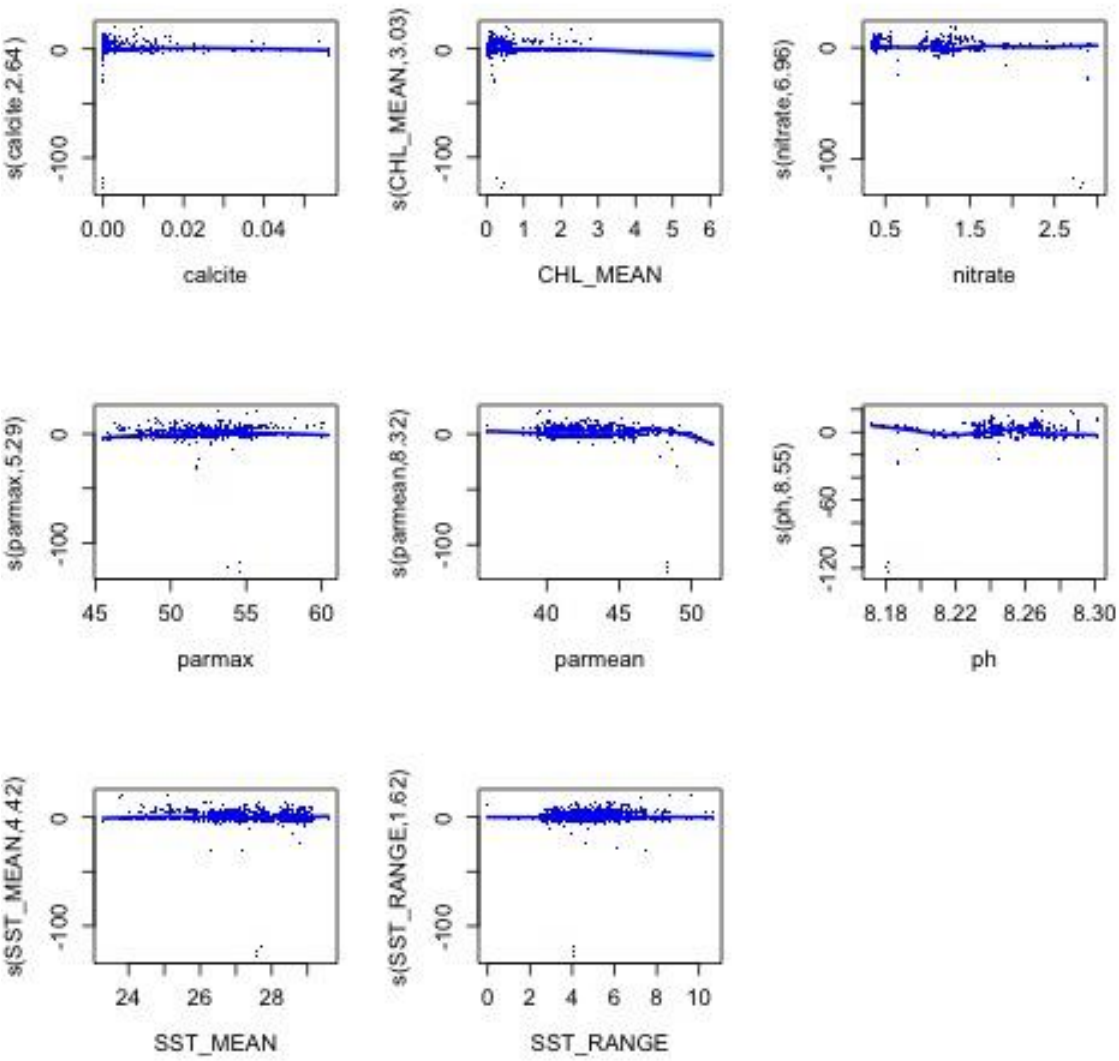
84 Cephalopholis spiloparaea, n = 93 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.849786e+00	9	8.426297e+00	8.009976e-03
s(CHL_MEAN)	1.283819e+00	9	8.054110e+00	3.543375e-03
s(nitrate)	6.114248e+00	9	6.966417e+01	1.124080e-16
s(parmax)	5.732332e-05	9	1.409583e-05	7.853896e-01
s(parmean)	2.237562e+00	9	7.198730e+00	1.391853e-02
s(ph)	5.550184e+00	9	3.057397e+01	6.531487e-07
s(SST_MEAN)	8.806910e-01	9	1.408221e+00	1.653552e-01
s(SST_RANGE)	5.888494e-05	9	1.173961e-05	8.865370e-01



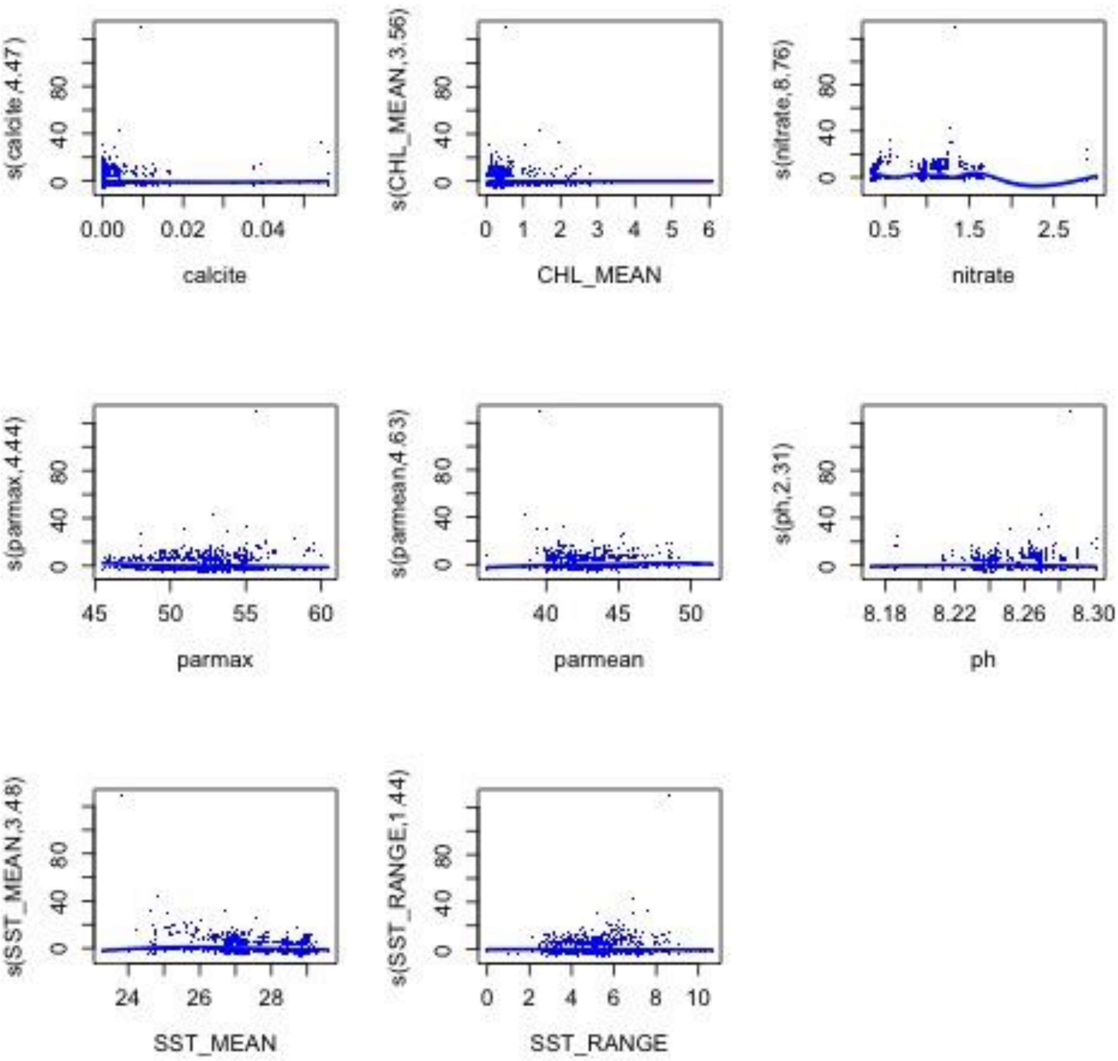
85 Cephalopholis urodeta, n = 2299 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.641174	9	14.351526	7.283116e-04
s(CHL_MEAN)	3.025612	9	26.884500	1.109013e-06
s(nitrate)	6.964639	9	225.796998	8.771034e-52
s(parmax)	5.294802	9	112.162760	3.944851e-27
s(parmean)	8.318456	9	354.713333	7.702719e-80
s(ph)	8.546548	9	345.817140	8.742294e-78
s(SST_MEAN)	4.416847	9	18.698493	1.812292e-04
s(SST_RANGE)	1.624960	9	3.147644	1.099928e-01



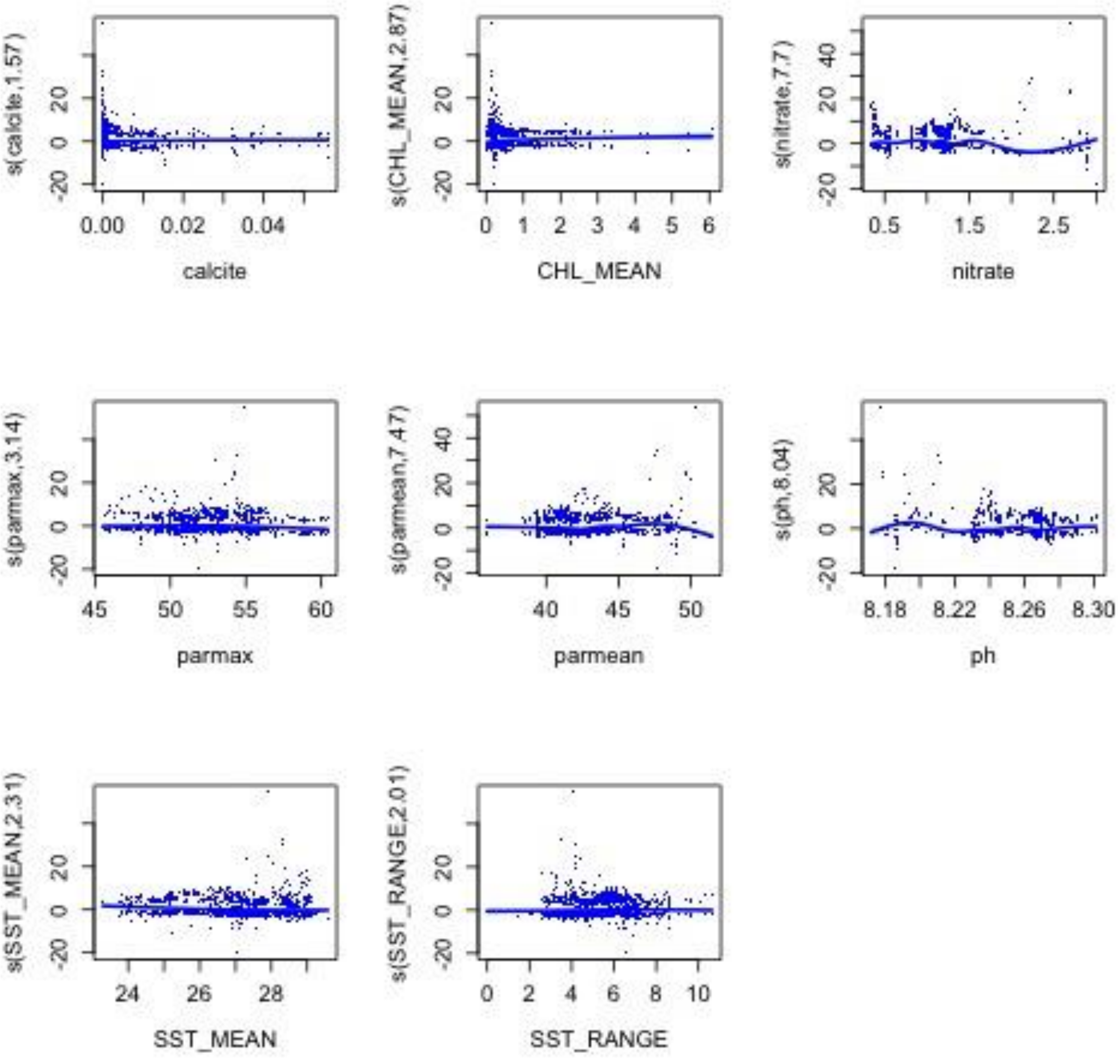
86 Cetoscarus ocellatus, n = 588 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.473042	9	30.930781	1.273093e-06
s(CHL_MEAN)	3.555963	9	21.321309	5.374559e-05
s(nitrate)	8.762861	9	223.372719	4.779636e-50
s(parmax)	4.444100	9	37.177412	4.008006e-09
s(parmean)	4.625499	9	30.075090	3.988120e-07
s(ph)	2.307814	9	7.272901	1.234642e-02
s(SST_MEAN)	3.480694	9	26.297492	3.890601e-07
s(SST_RANGE)	1.440262	9	3.321084	6.500450e-02



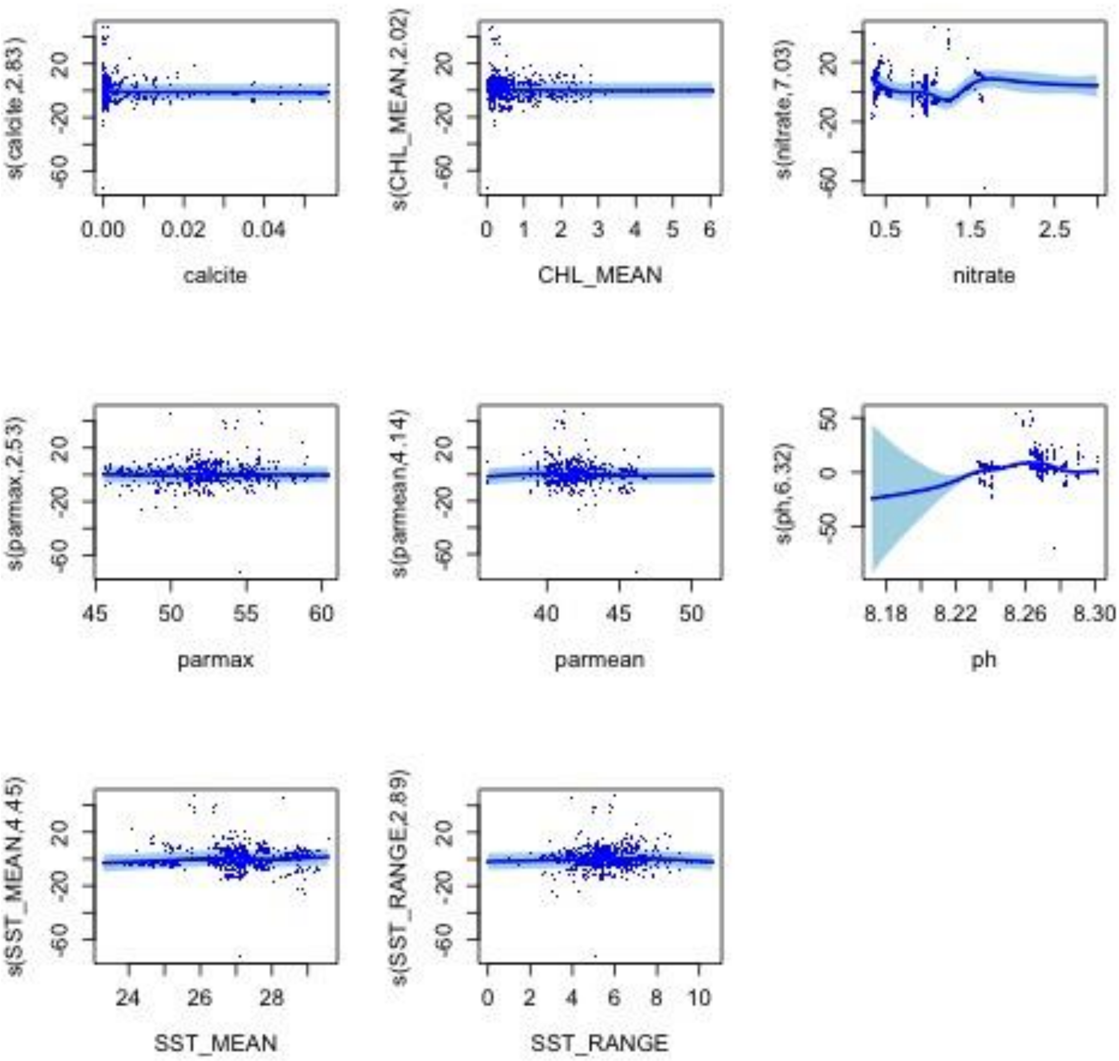
87 Chaetodon auriga, n = 1212 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.571307	9	10.369279	1.011331e-03
s(CHL_MEAN)	2.870990	9	46.216759	8.622473e-12
s(nitrate)	7.698470	9	141.224515	4.760361e-30
s(parmax)	3.144481	9	24.618754	9.920156e-07
s(parmean)	7.465142	9	134.037407	1.543943e-29
s(ph)	8.038591	9	118.686784	2.907157e-25
s(SST_MEAN)	2.305721	9	19.678713	3.288074e-06
s(SST_RANGE)	2.010769	9	5.145097	4.253808e-02



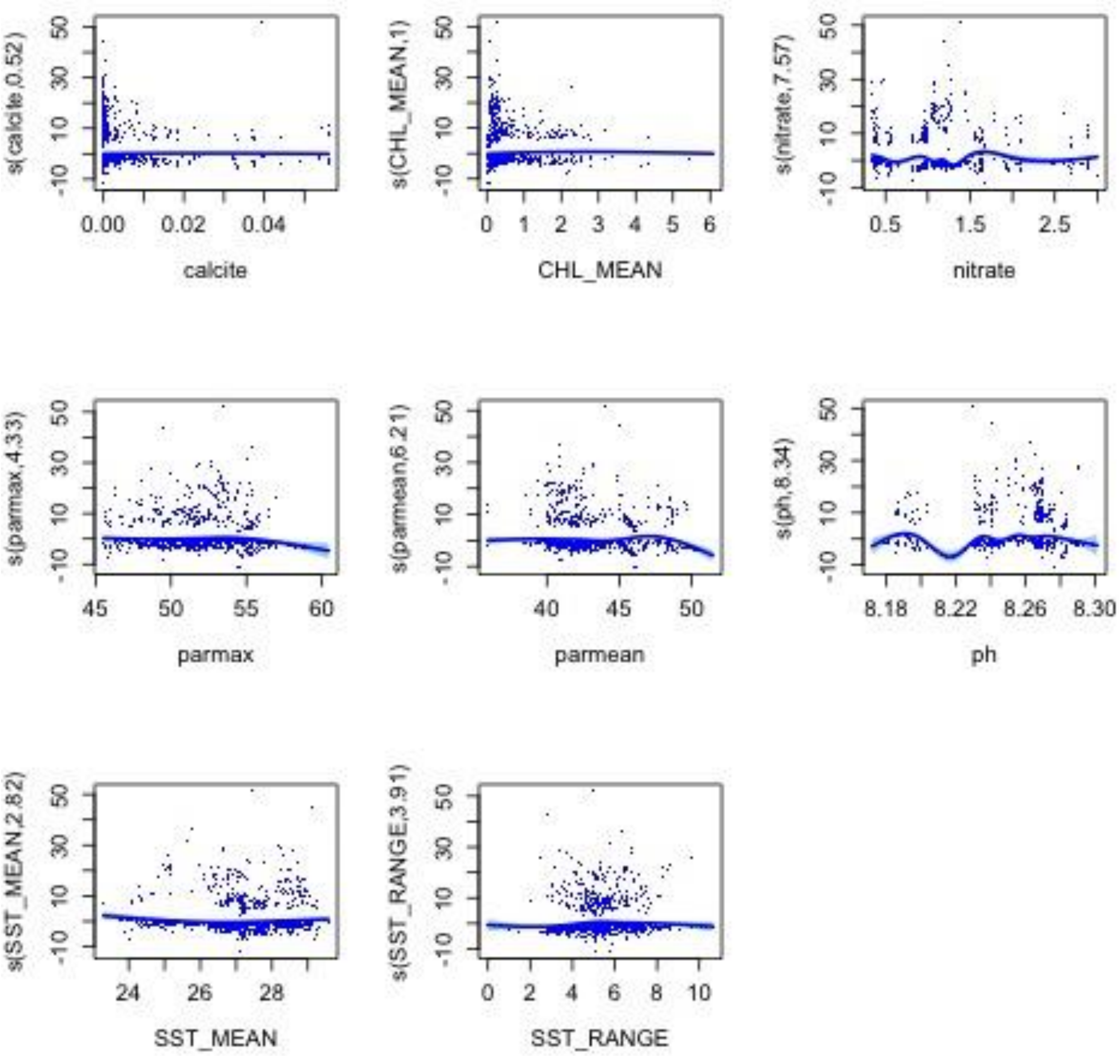
88 Chaetodon baronessa, n = 664 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.826891	9	33.966480	1.978491e-08
s(CHL_MEAN)	2.016306	9	9.223122	5.467566e-03
s(nitrate)	7.032105	9	194.710456	9.024647e-47
s(parmax)	2.532272	9	5.099224	7.677795e-02
s(parmean)	4.139361	9	25.562808	3.992124e-06
s(ph)	6.316938	9	82.003025	1.311627e-18
s(SST_MEAN)	4.450325	9	26.277172	2.373565e-06
s(SST_RANGE)	2.891243	9	11.798184	2.583655e-03



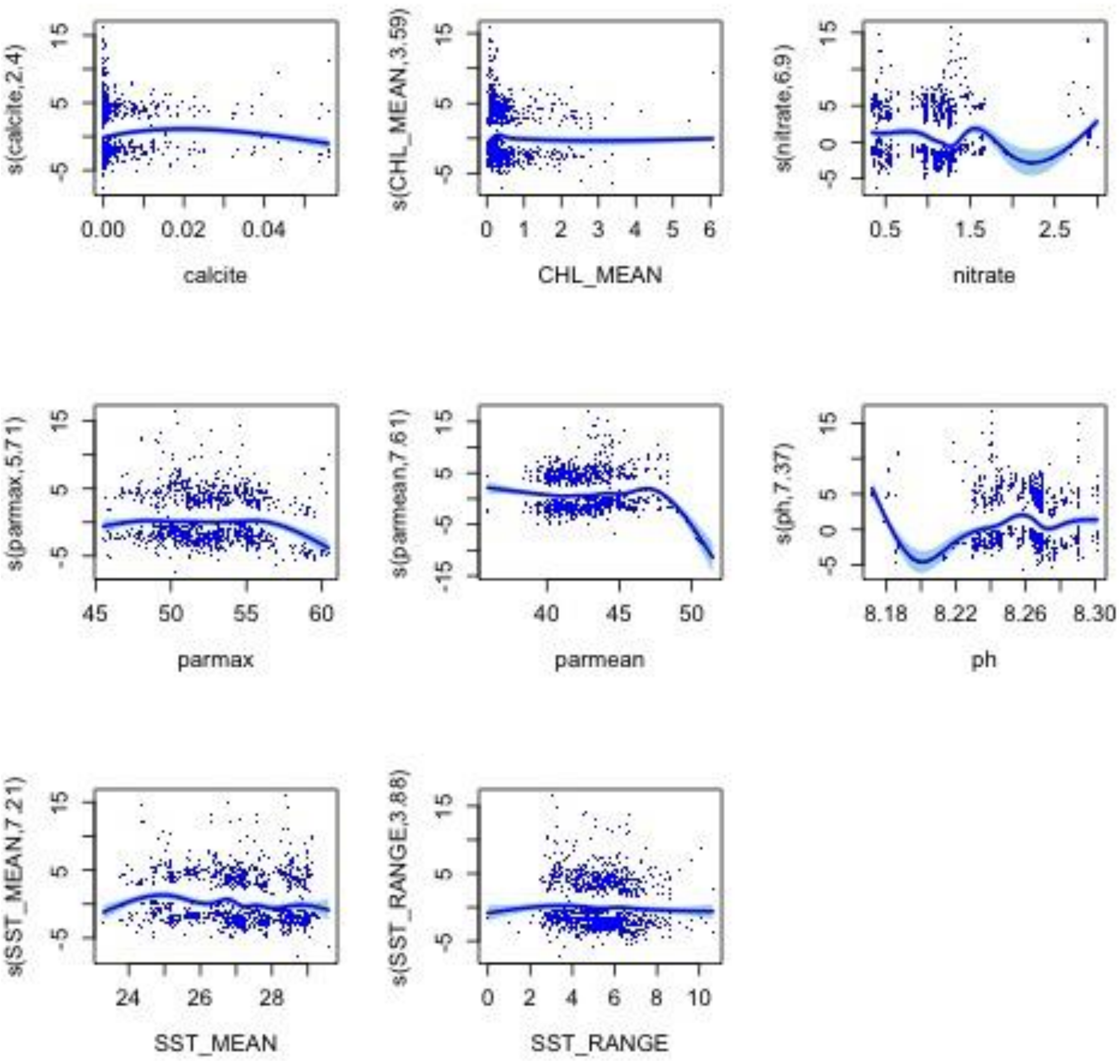
89 Chaetodon bennetti, n = 403 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.5185181	9	0.9907577	1.459652e-01
s(CHL_MEAN)	0.9987754	9	6.5185313	4.154648e-03
s(nitrate)	7.5722115	9	126.0359622	1.553424e-26
s(parmax)	4.3338824	9	20.6319599	8.116187e-05
s(parmean)	6.2142620	9	45.5549528	1.957705e-09
s(ph)	8.3357905	9	68.7990759	5.059727e-13
s(SST_MEAN)	2.8215325	9	14.5981895	1.873978e-04
s(SST_RANGE)	3.9092970	9	31.5000704	1.174923e-07



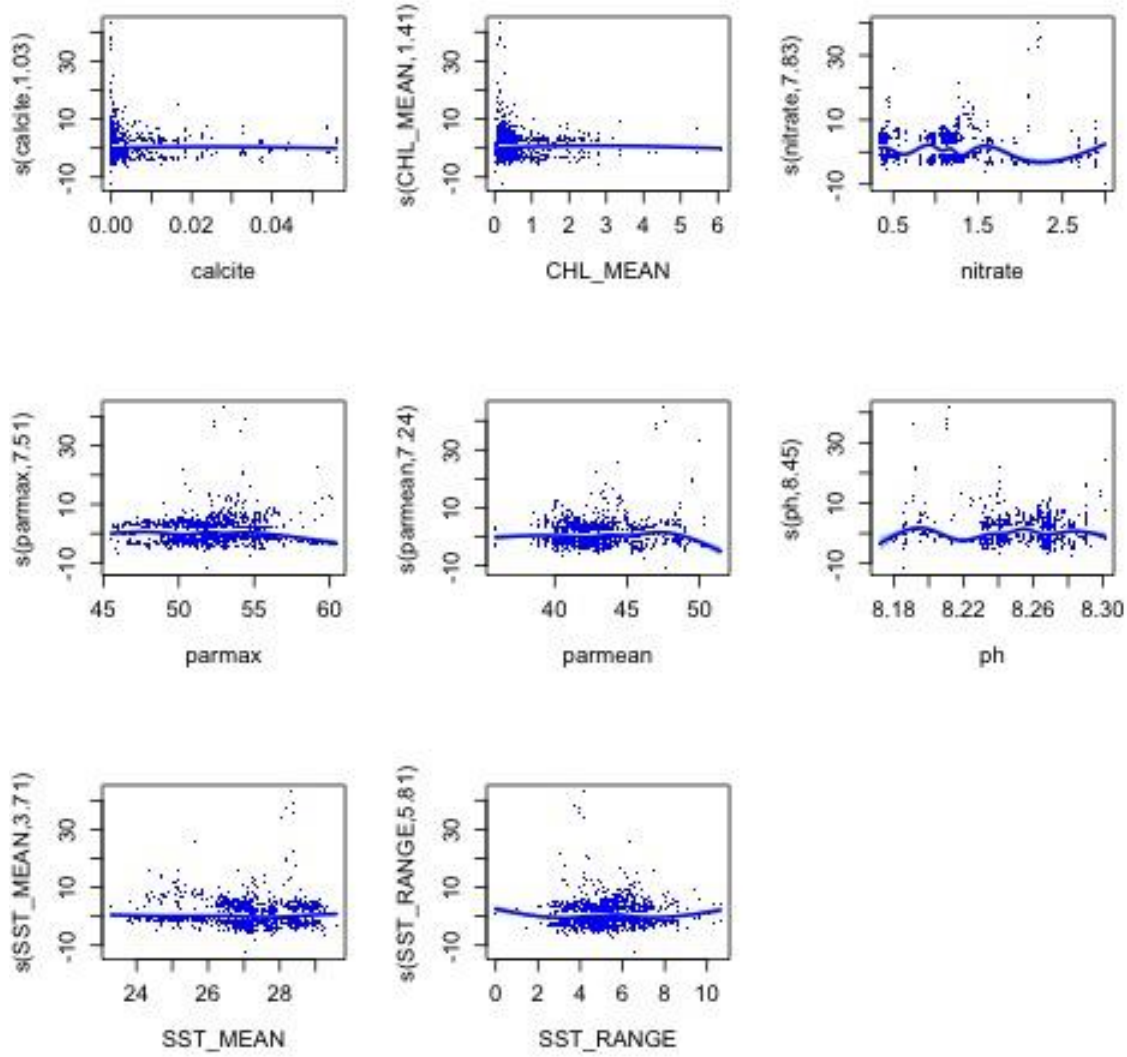
90 Chaetodon citrinellus, n = 1201 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.401339	9	37.52064	6.990512e-10
s(CHL_MEAN)	3.588560	9	38.82395	4.680146e-09
s(nitrate)	6.897515	9	122.79668	2.284618e-27
s(parmax)	5.706240	9	53.74734	6.816161e-12
s(parmean)	7.609037	9	83.73742	2.776593e-17
s(ph)	7.367345	9	151.54169	2.347228e-33
s(SST_MEAN)	7.214509	9	56.68579	3.176850e-11
s(SST_RANGE)	3.875525	9	10.92645	1.388745e-02



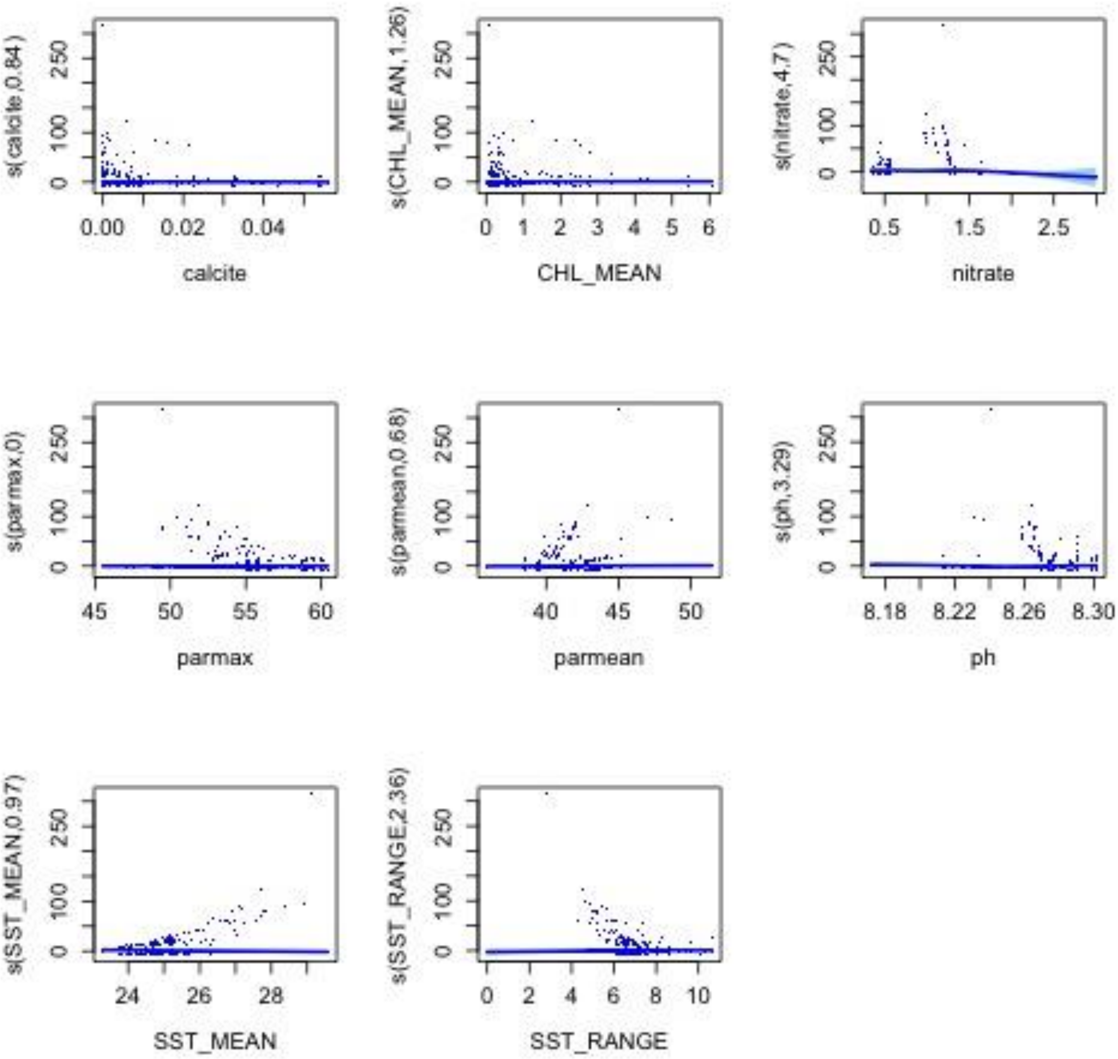
91 Chaetodon ephippium, n = 1257 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.033148	9	6.474318	6.244809e-03
s(CHL_MEAN)	1.407983	9	16.023272	2.658778e-05
s(nitrate)	7.825095	9	257.350483	2.533119e-55
s(parmax)	7.510772	9	61.312912	7.551553e-12
s(parmean)	7.237477	9	65.662900	4.374765e-13
s(ph)	8.447840	9	138.947805	1.234526e-28
s(SST_MEAN)	3.713334	9	17.888282	2.022707e-04
s(SST_RANGE)	5.811878	9	55.642557	1.483416e-11



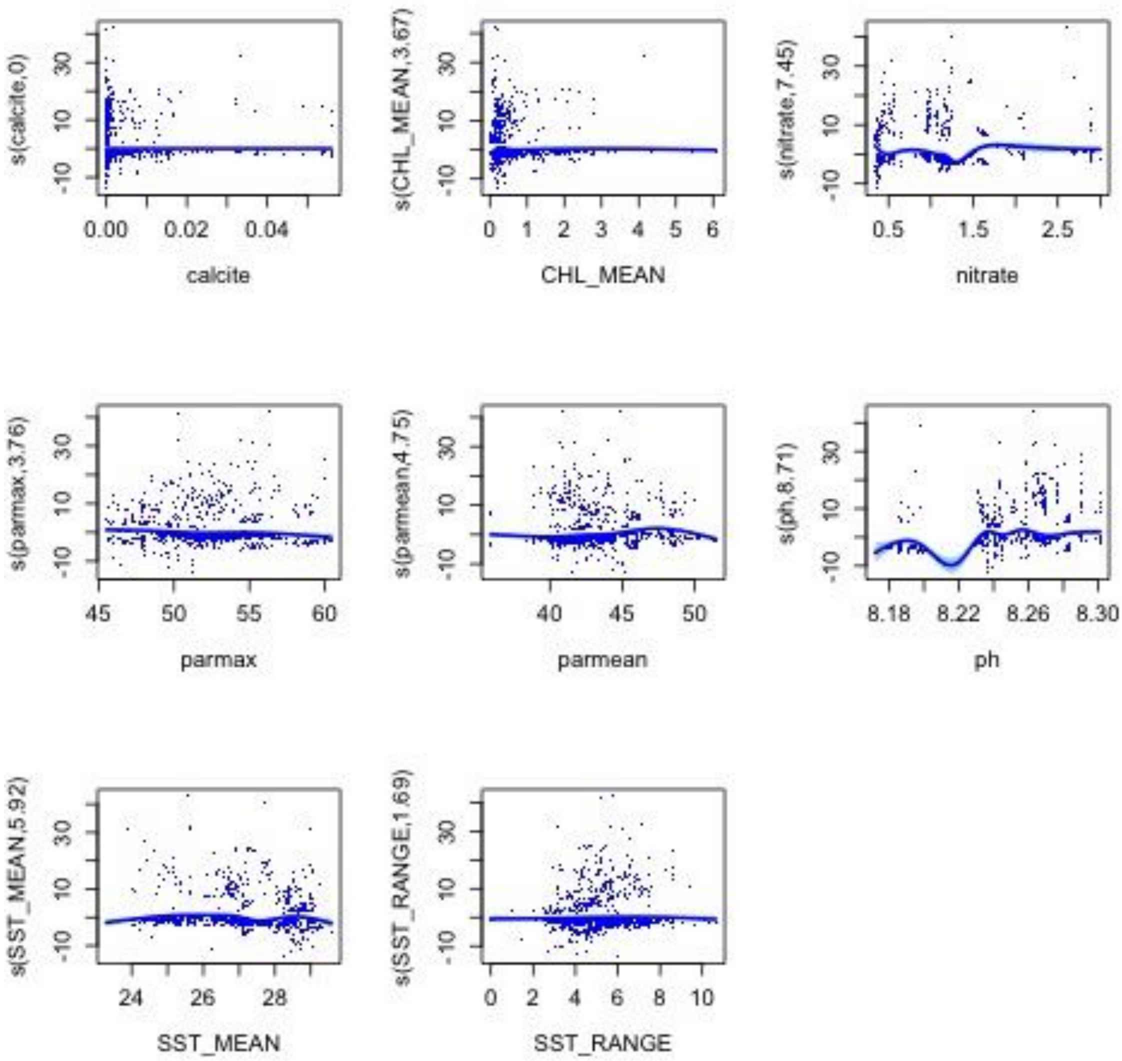
92 Chaetodon flavirostris, n = 162 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8392110595	9	2.752155e+00	4.791154e-02
s(CHL_MEAN)	1.2615803728	9	5.161987e+00	1.054819e-02
s(nitrate)	4.6950599699	9	1.794955e+01	2.775739e-04
s(parmax)	0.0001743435	9	6.273126e-05	6.610859e-01
s(parmean)	0.6838021806	9	2.153548e+00	6.674567e-02
s(ph)	3.2868152111	9	1.231312e+01	2.311833e-03
s(SST_MEAN)	0.9734094750	9	2.412792e+01	1.138551e-07
s(SST_RANGE)	2.3630145013	9	9.896125e+00	3.865877e-03



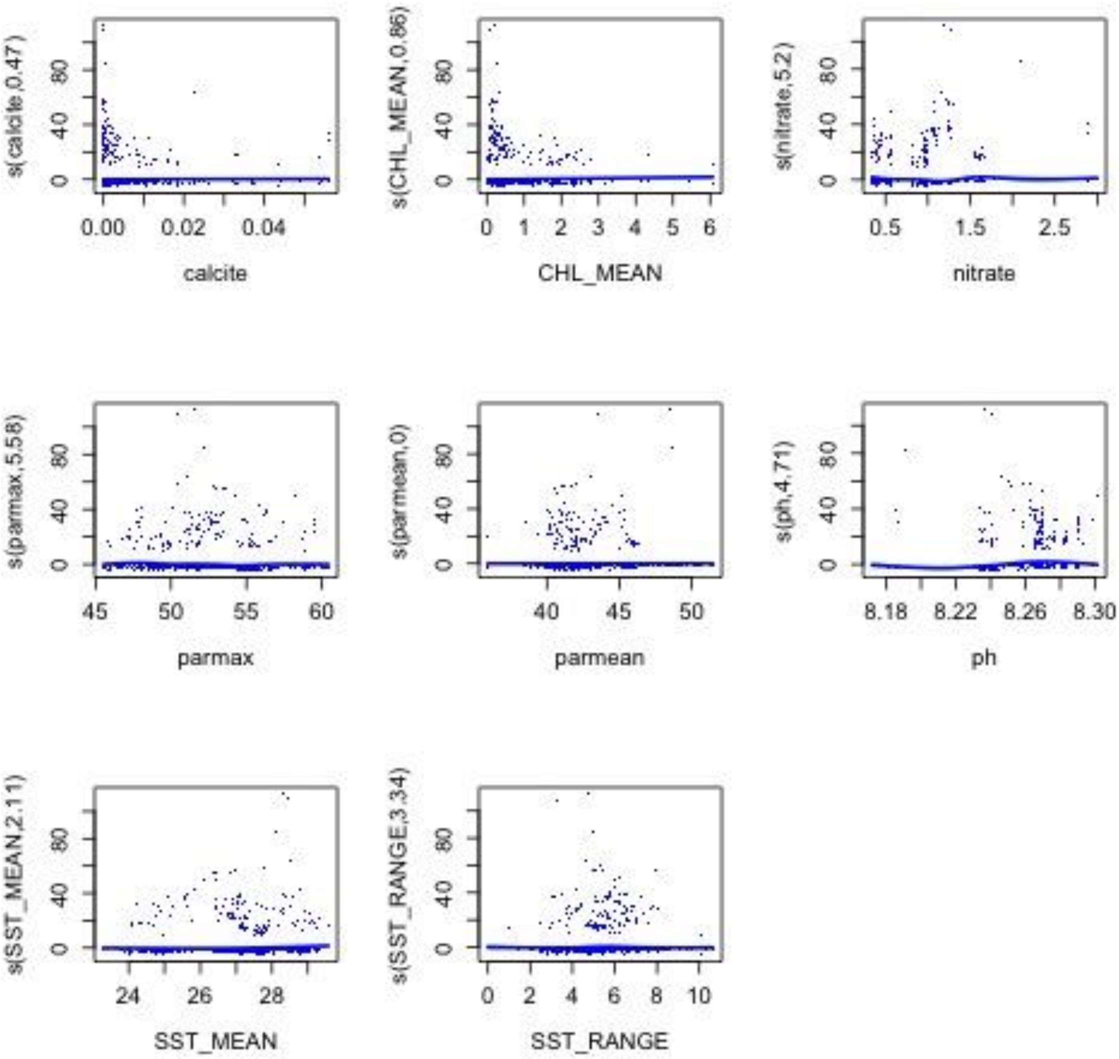
93 Chaetodon kleinii, n = 484 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.374752e-05	9	1.034074e-05	6.017570e-01
s(CHL_MEAN)	3.668004e+00	9	3.219556e+01	2.007971e-07
s(nitrate)	7.454082e+00	9	1.761896e+02	3.297189e-39
s(parmax)	3.759723e+00	9	1.813673e+01	1.599344e-04
s(parmean)	4.747644e+00	9	5.622837e+01	3.066744e-13
s(ph)	8.707746e+00	9	1.453859e+02	6.527729e-30
s(SST_MEAN)	5.922110e+00	9	5.217872e+01	2.900994e-11
s(SST_RANGE)	1.693557e+00	9	3.679295e+00	8.120014e-02



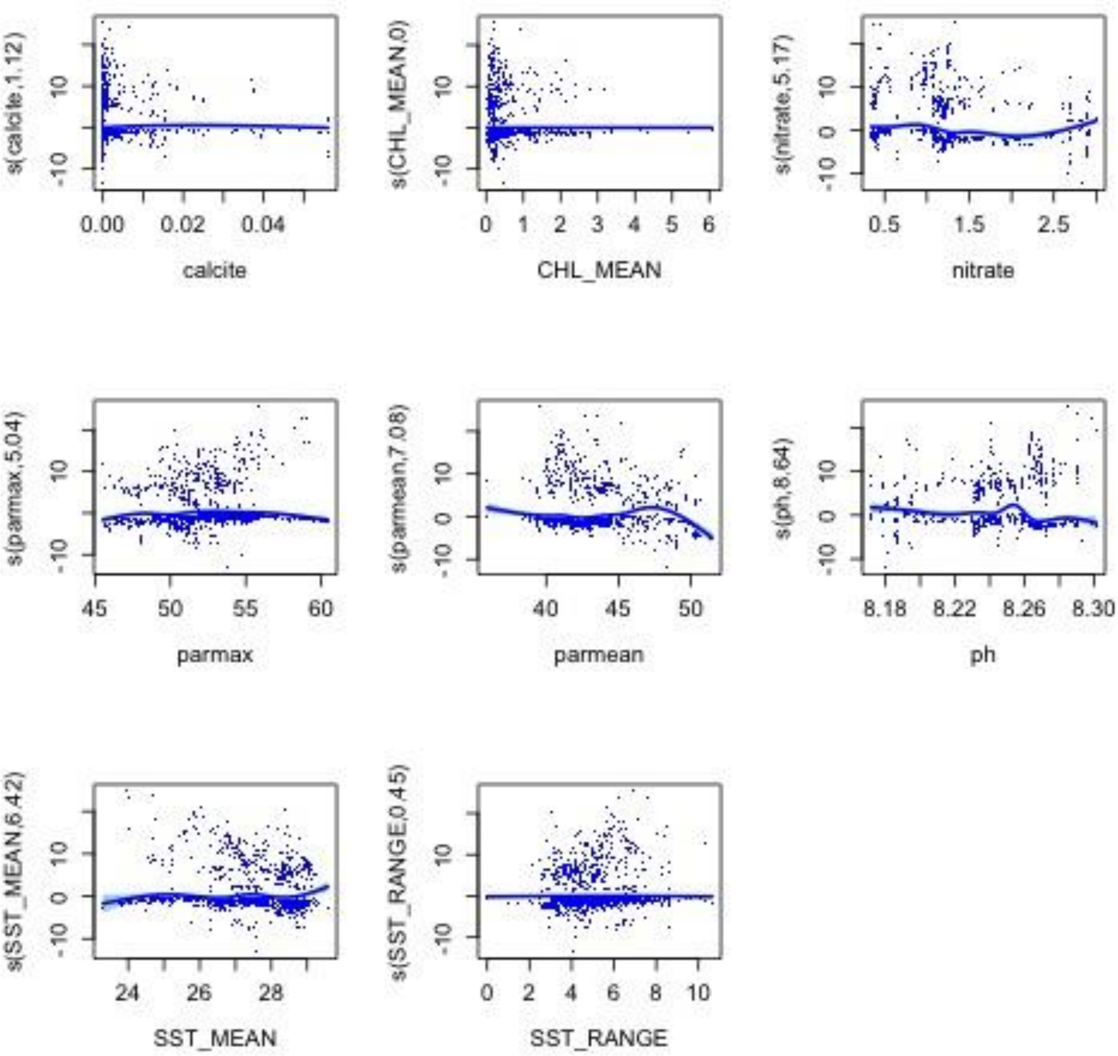
94 Chaetodon lineolatus, n = 156 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.651606e-01	6	8.754049e-01	1.600642e-01
s(CHL_MEAN)	8.583750e-01	9	5.859753e+00	5.835889e-03
s(nitrate)	5.198869e+00	9	3.997386e+01	1.028547e-09
s(parmax)	5.579049e+00	9	1.731490e+01	1.841605e-03
s(parmean)	3.000692e-05	9	1.060193e-05	7.036200e-01
s(ph)	4.712252e+00	9	4.824848e+01	1.196366e-12
s(SST_MEAN)	2.108997e+00	9	6.951548e+00	8.747719e-03
s(SST_RANGE)	3.338543e+00	9	1.323967e+01	1.716421e-03



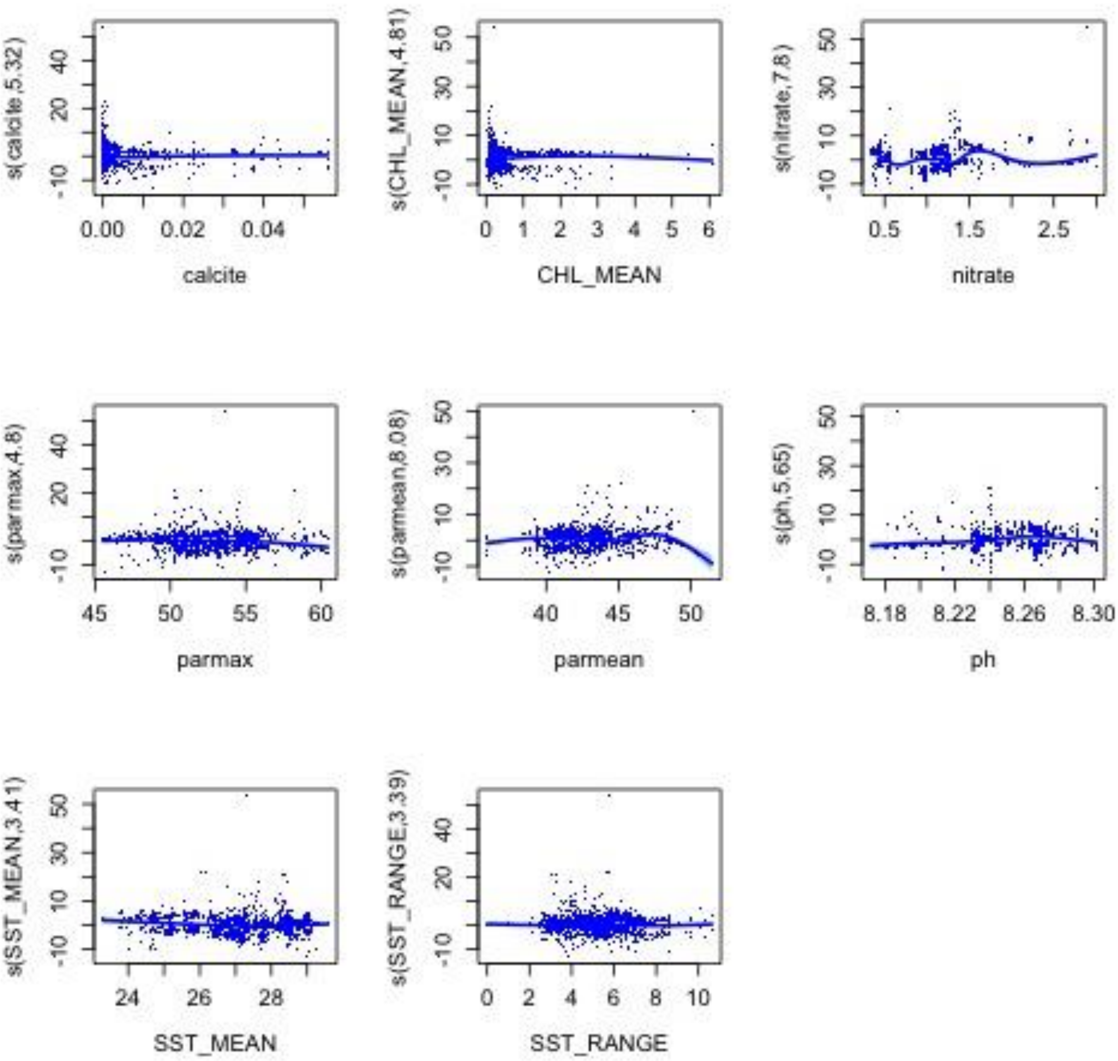
95 Chaetodon lunula, n = 1014 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.1185799162	9	7.091892e+00	5.156190e-03
s(CHL_MEAN)	0.0007161696	9	2.188132e-04	5.962348e-01
s(nitrate)	5.1746426110	9	7.505581e+01	2.998533e-17
s(parmax)	5.0410236161	9	3.109300e+01	9.868736e-07
s(parmean)	7.0768192550	9	1.591471e+02	2.386083e-35
s(ph)	8.6426912076	9	2.237725e+02	6.038878e-49
s(SST_MEAN)	6.4241017844	9	3.869127e+01	6.353631e-08
s(SST_RANGE)	0.4471985963	9	5.959623e-01	2.397485e-01



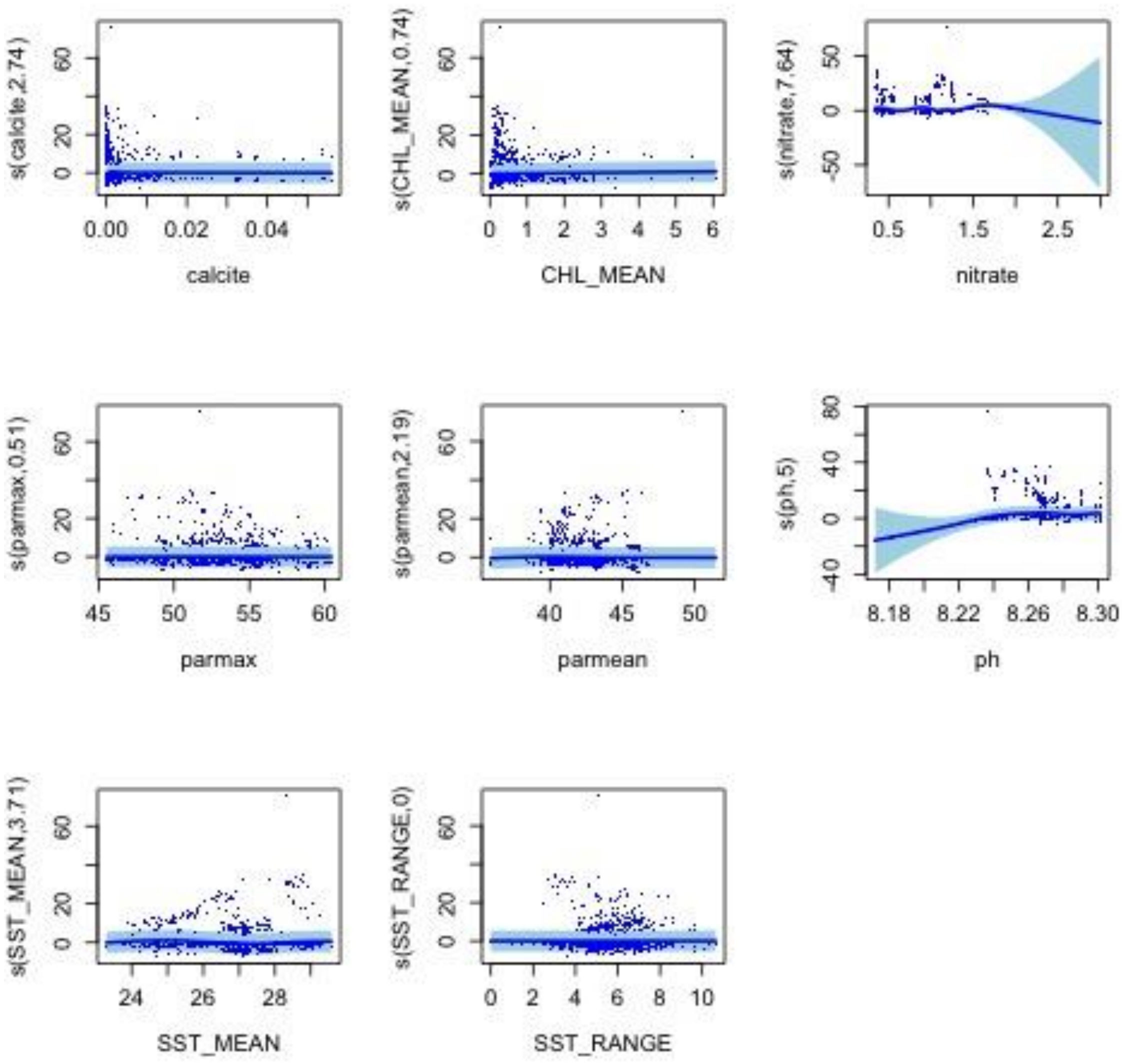
96 Chaetodon lunulatus, n = 1786 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.324474	9	41.974722	1.523464e-08
s(CHL_MEAN)	4.813686	9	107.652619	3.504043e-24
s(nitrate)	7.797922	9	391.570144	3.587416e-92
s(parmax)	4.804480	9	32.522460	2.176059e-07
s(parmean)	8.083054	9	82.933952	1.373286e-16
s(ph)	5.647886	9	71.950239	3.592866e-17
s(SST_MEAN)	3.414549	9	36.660260	3.836610e-10
s(SST_RANGE)	3.390710	9	9.609044	1.572817e-02



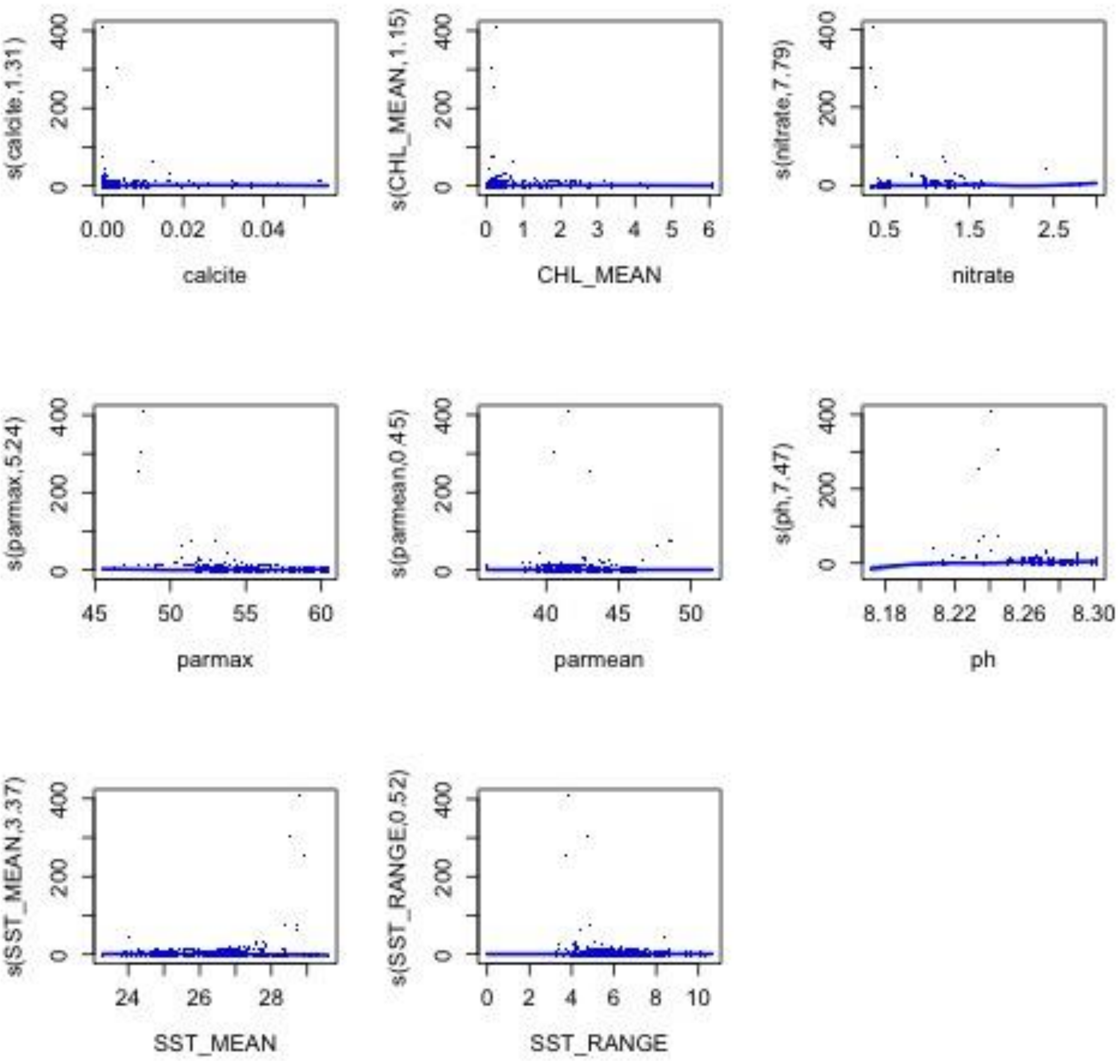
97 Chaetodon melannotus, n = 392 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.744906e+00	9	1.027875e+01	8.081899e-03
s(CHL_MEAN)	7.439184e-01	9	2.829243e+00	4.609056e-02
s(nitrate)	7.643918e+00	9	1.692474e+02	1.511813e-37
s(parmax)	5.069761e-01	9	6.376699e-01	2.441539e-01
s(parmean)	2.189281e+00	9	5.678271e+00	3.854827e-02
s(ph)	5.001375e+00	9	4.930510e+01	1.367712e-11
s(SST_MEAN)	3.705827e+00	9	2.908290e+01	2.321380e-07
s(SST_RANGE)	4.440715e-05	9	2.293153e-05	5.560307e-01



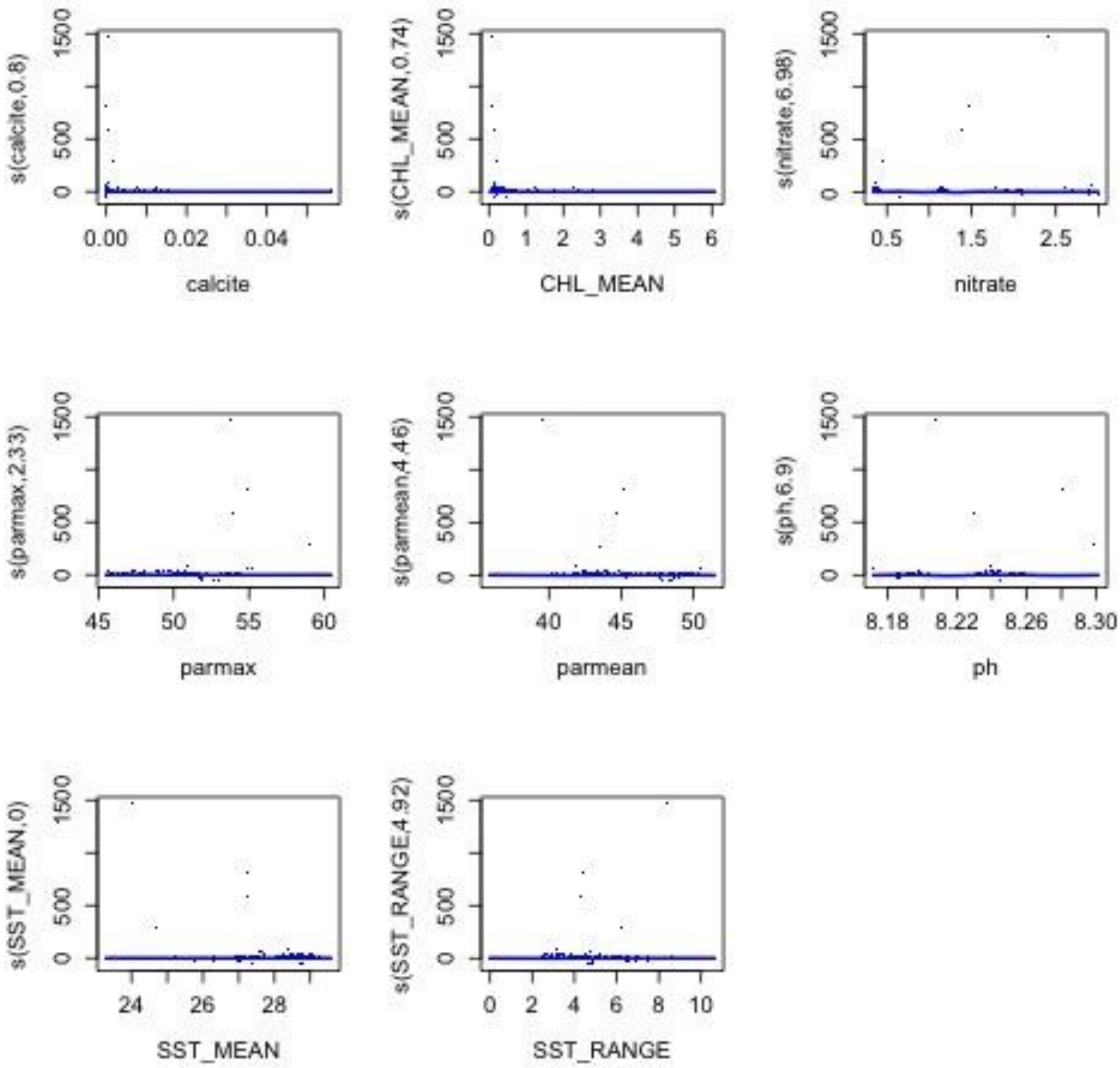
98 Chaetodon mertensii, n = 561 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.3118836	9	12.888377	1.409644e-04
s(CHL_MEAN)	1.1509196	9	9.903122	6.462810e-04
s(nitrate)	7.7863783	9	129.066876	2.457999e-28
s(parmax)	5.2422165	9	54.864985	1.363016e-12
s(parmean)	0.4489837	9	0.615216	2.114215e-01
s(ph)	7.4671348	9	112.546097	7.474605e-25
s(SST_MEAN)	3.3744879	9	29.589008	4.237546e-08
s(SST_RANGE)	0.5223508	9	1.088857	1.394805e-01



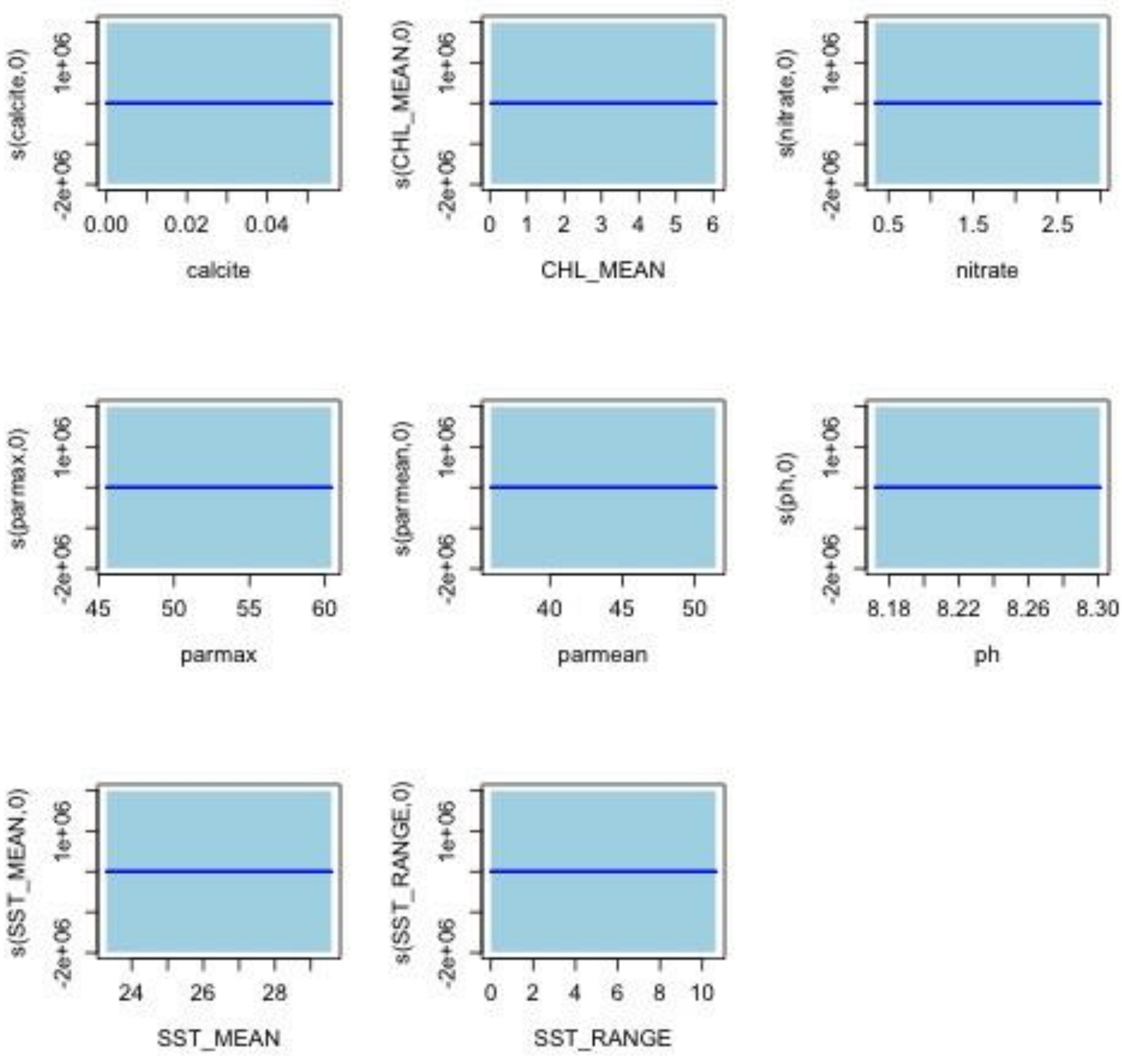
99 Chaetodon meyeri, n = 405 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.960395e-01	5	3.816518e+00	2.512035e-02
s(CHL_MEAN)	7.430649e-01	9	2.047890e+00	8.416609e-02
s(nitrate)	6.981241e+00	9	5.871074e+01	7.796316e-12
s(parmax)	2.333008e+00	9	3.049341e+01	1.880113e-09
s(parmean)	4.463078e+00	9	6.326690e+01	1.975408e-16
s(ph)	6.901463e+00	9	7.525235e+01	2.203441e-16
s(SST_MEAN)	4.547628e-05	9	3.667314e-05	3.634936e-01
s(SST_RANGE)	4.920361e+00	9	3.205072e+01	5.726763e-07



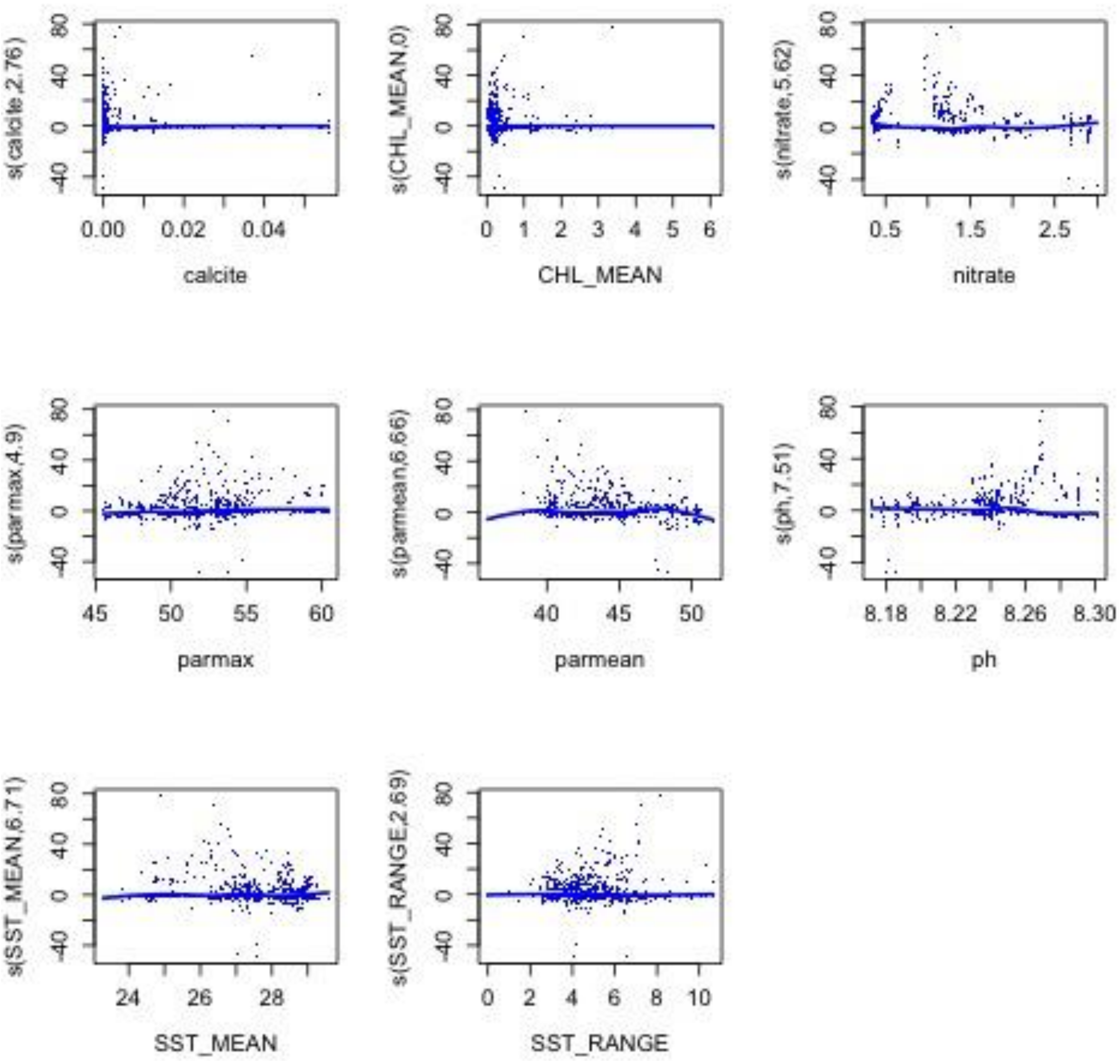
100Chaetodon multicinctus, n = 48 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.161775e-09	8	5.529831e-50	1
s(CHL_MEAN)	2.593060e-11	9	1.314850e-52	1
s(nitrate)	2.498755e-12	9	2.614132e-51	1
s(parmax)	6.848125e-13	9	1.571652e-52	1
s(parmean)	1.123517e-12	9	7.084192e-53	1
s(ph)	6.219119e-13	9	3.095587e-51	1
s(SST_MEAN)	6.316176e-13	9	8.543518e-53	1
s(SST_RANGE)	7.132266e-13	9	3.085867e-51	1



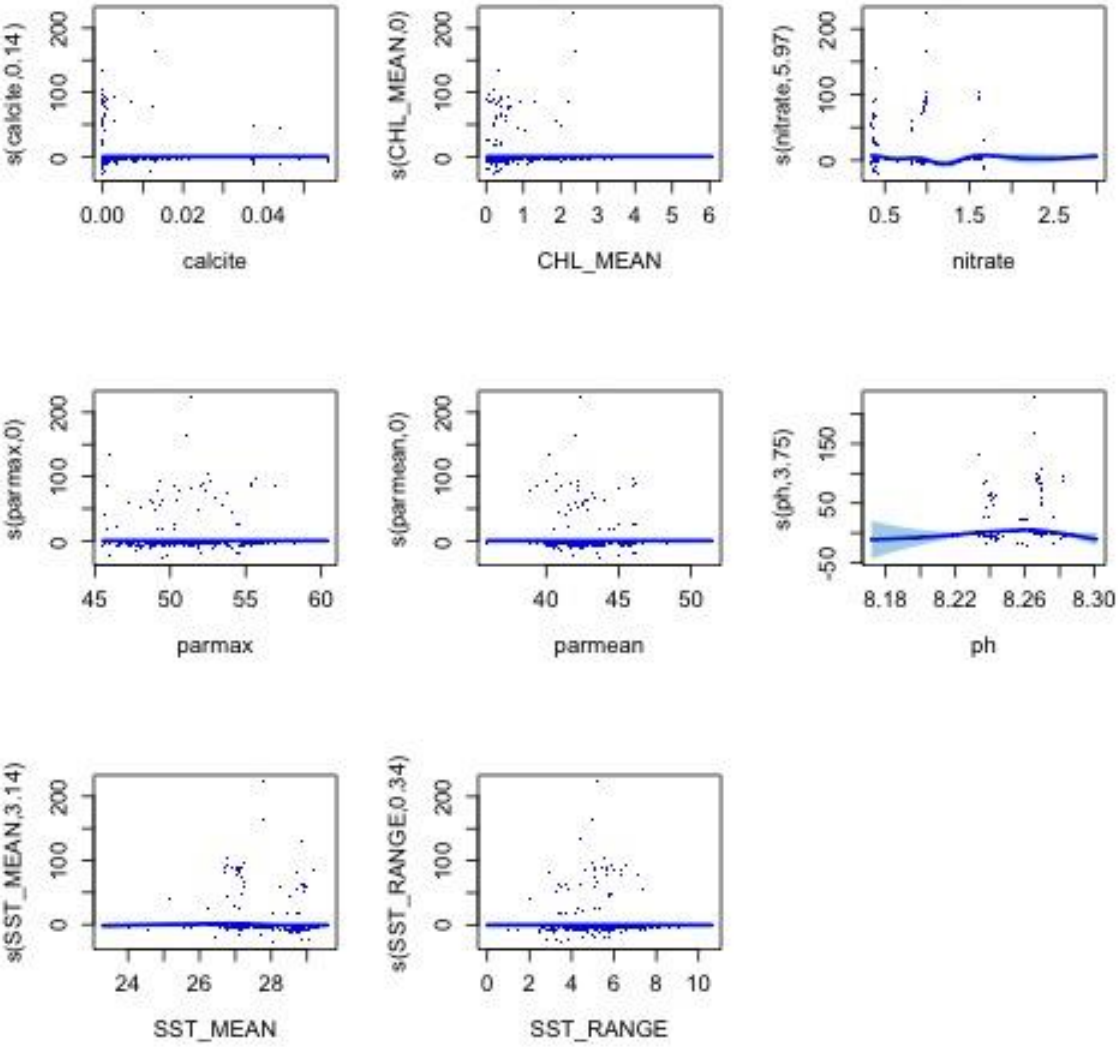
101Chaetodon ornatissimus, n = 983 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.755336612	9	1.868543e+01	6.588852e-05
s(CHL_MEAN)	0.003826553	9	3.720096e-03	3.130824e-01
s(nitrate)	5.617694287	9	2.273406e+02	1.563998e-55
s(parmax)	4.903175767	9	4.291411e+01	5.350816e-10
s(parmean)	6.663432675	9	1.919301e+02	5.321024e-45
s(ph)	7.514670593	9	1.606791e+02	4.571404e-37
s(SST_MEAN)	6.706933814	9	4.064190e+01	2.362174e-08
s(SST_RANGE)	2.692567521	9	9.962694e+00	5.063119e-03



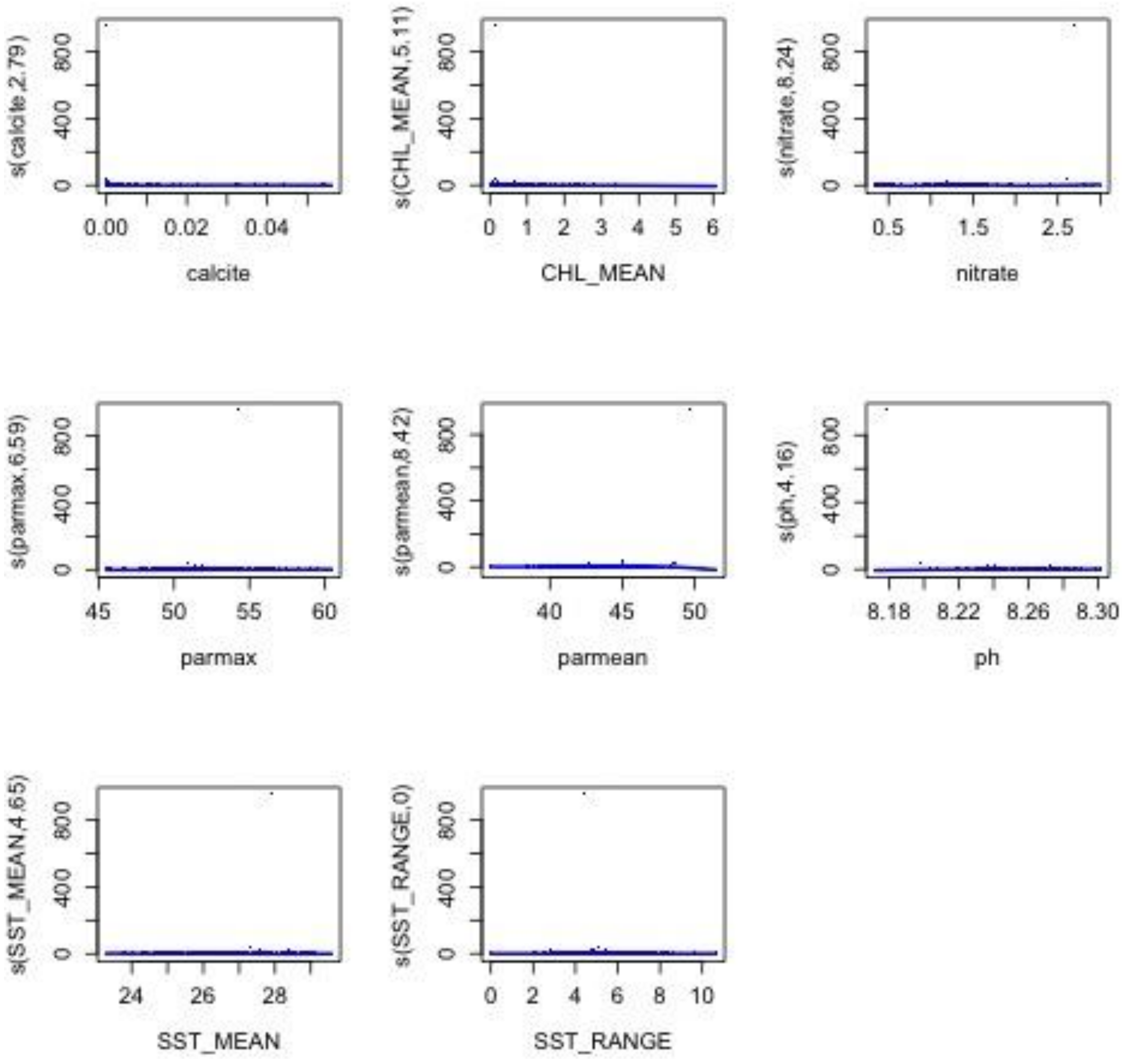
102Chaetodon oxycephalus, n = 52 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.393449e-01	9	1.564604e-01	2.848228e-01
s(CHL_MEAN)	4.999126e-05	9	1.697988e-05	5.595948e-01
s(nitrate)	5.972537e+00	9	6.249357e+01	1.092584e-14
s(parmax)	6.026448e-05	9	3.378913e-05	5.261862e-01
s(parmean)	3.016887e-05	9	9.355405e-06	7.270477e-01
s(ph)	3.747476e+00	9	3.007457e+01	1.465797e-07
s(SST_MEAN)	3.144417e+00	9	1.196310e+01	2.631092e-03
s(SST_RANGE)	3.385276e-01	9	3.931659e-01	2.904534e-01



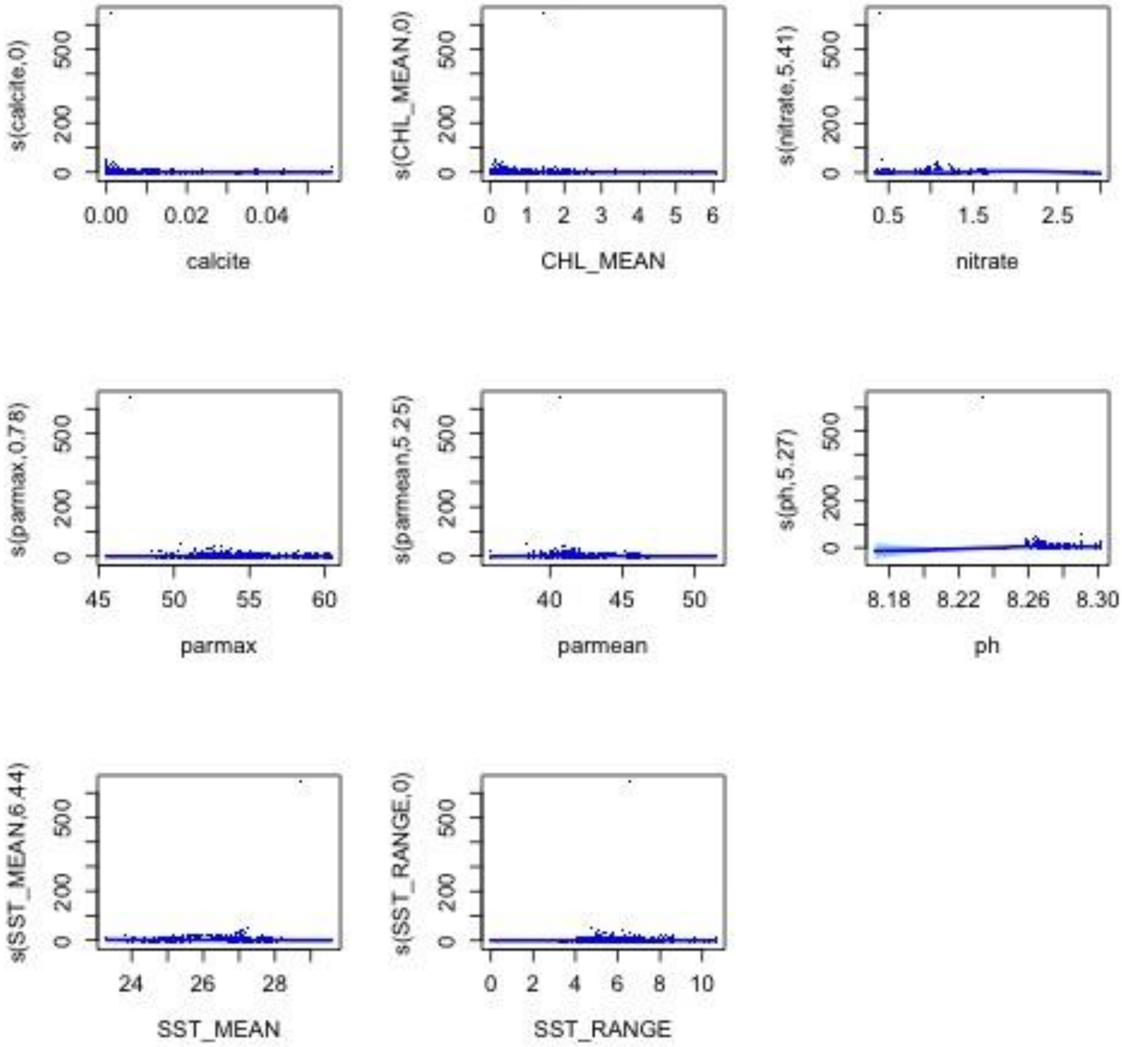
103Chaetodon pelewensis, n = 1489 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.791168232	9	2.766988e+01	4.668113e-07
s(CHL_MEAN)	5.112447039	9	3.312859e+01	8.567182e-07
s(nitrate)	8.243814492	9	2.051356e+02	1.068778e-47
s(parmax)	6.590545784	9	8.815275e+01	3.198020e-19
s(parmean)	8.416795989	9	6.194823e+01	2.470176e-11
s(ph)	4.157207683	9	2.388235e+01	5.387223e-06
s(SST_MEAN)	4.646670205	9	3.723070e+01	1.003833e-08
s(SST_RANGE)	0.000670711	9	1.686398e-04	8.273979e-01



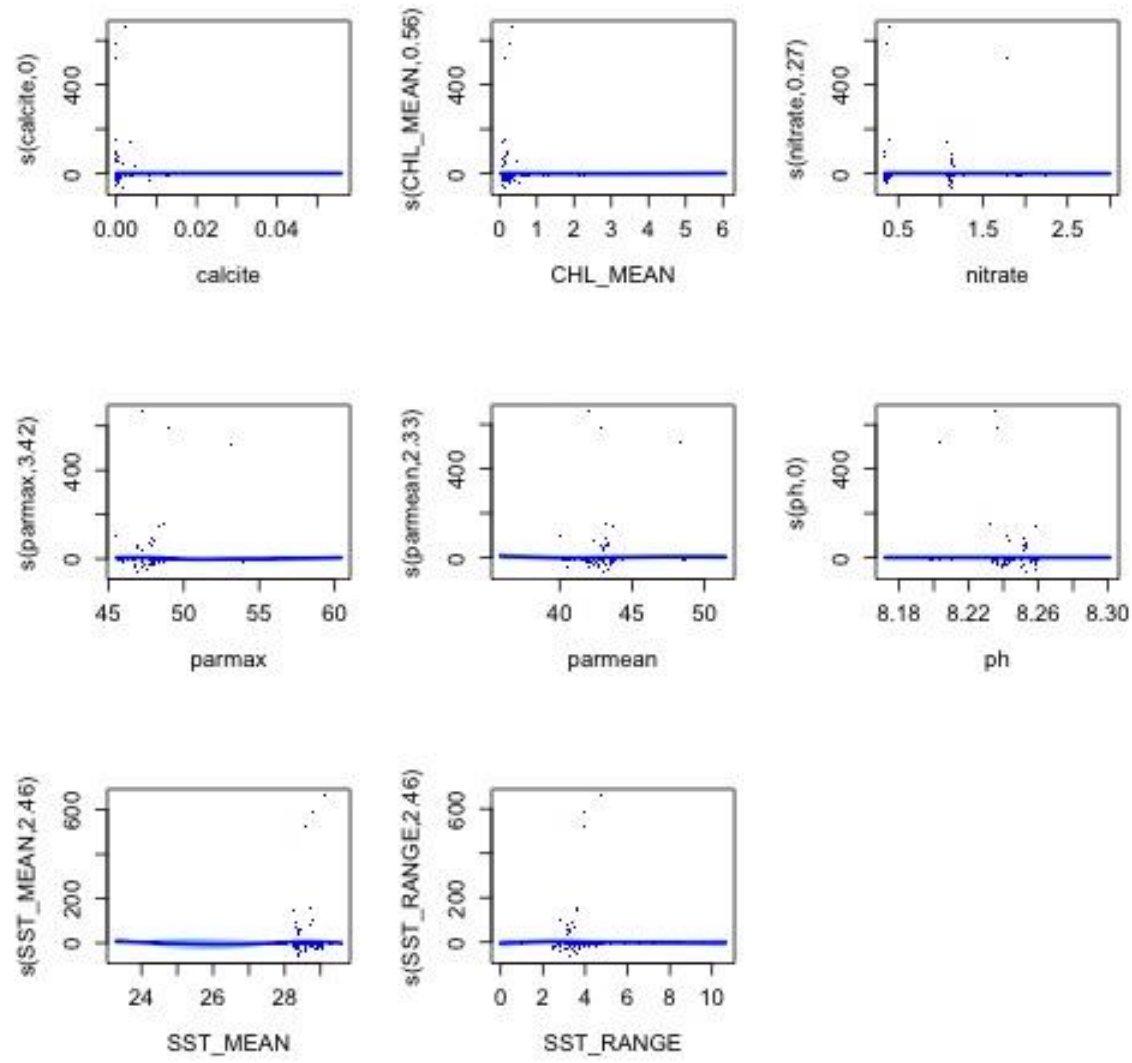
104Chaetodon plebeius, n = 372 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.571100e-05	8	1.266961e-05	6.901308e-01
s(CHL_MEAN)	9.910904e-05	9	8.258968e-05	3.601728e-01
s(nitrate)	5.409879e+00	9	7.928599e+01	3.522948e-19
s(parmax)	7.830149e-01	9	1.323649e+00	1.521818e-01
s(parmean)	5.248410e+00	9	2.914059e+01	3.632323e-06
s(ph)	5.273275e+00	9	6.130777e+01	2.701741e-14
s(SST_MEAN)	6.440473e+00	9	5.024557e+01	1.162029e-10
s(SST_RANGE)	3.988458e-04	9	1.763231e-04	5.849126e-01



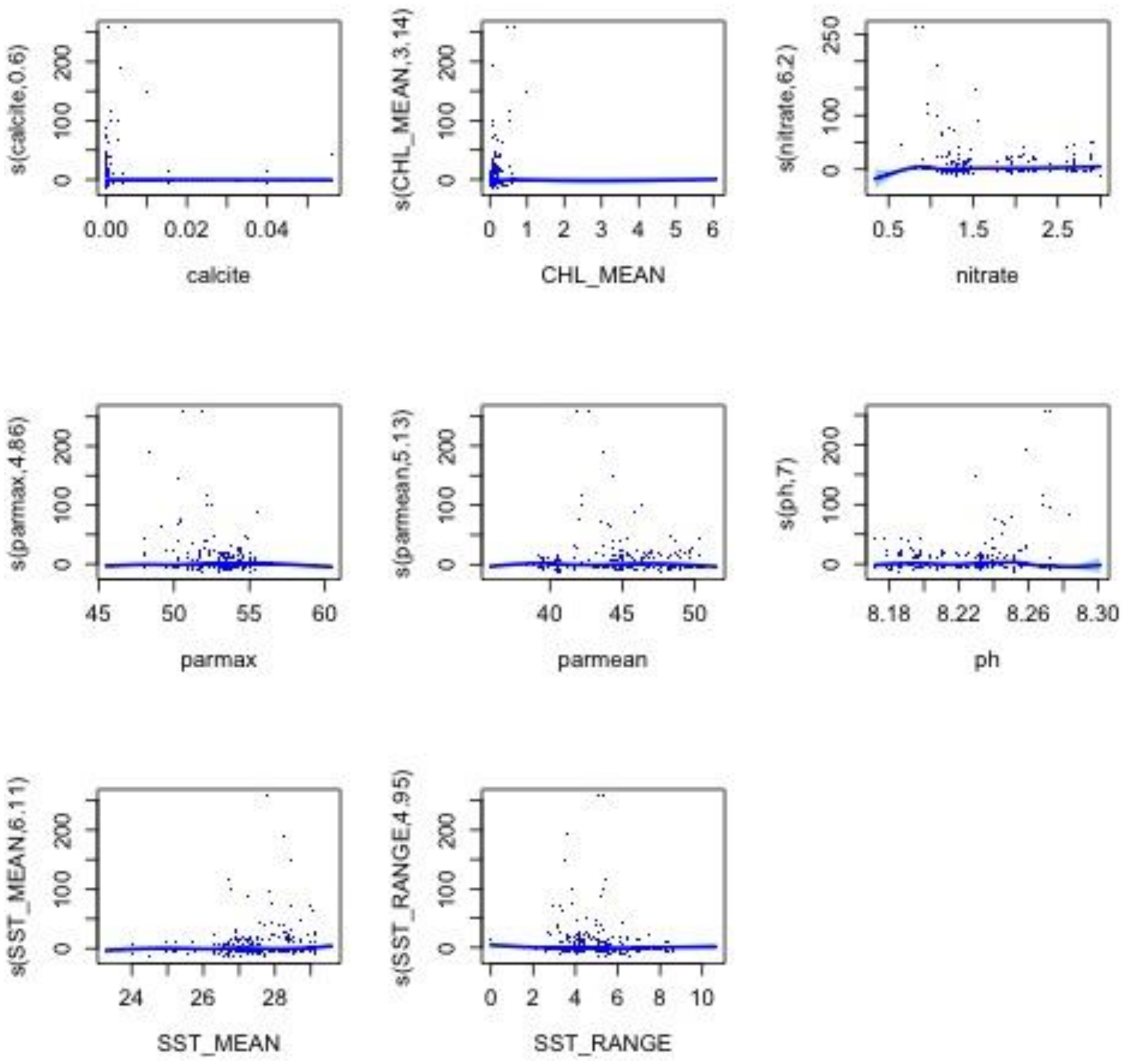
105Chaetodon punctatofasciatus, n = 155 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.137583e-06	9	1.657947e-06	6.369676e-01
s(CHL_MEAN)	5.575369e-01	9	7.508764e-01	2.348377e-01
s(nitrate)	2.693271e-01	6	3.631844e-01	2.015372e-01
s(parmax)	3.418694e+00	9	3.044447e+01	1.563570e-08
s(parmean)	2.332423e+00	9	5.396896e+00	3.620688e-02
s(ph)	8.961488e-06	9	2.418048e-06	6.970055e-01
s(SST_MEAN)	2.455623e+00	9	8.486166e+00	6.786449e-03
s(SST_RANGE)	2.464053e+00	9	9.525467e+00	6.581737e-03



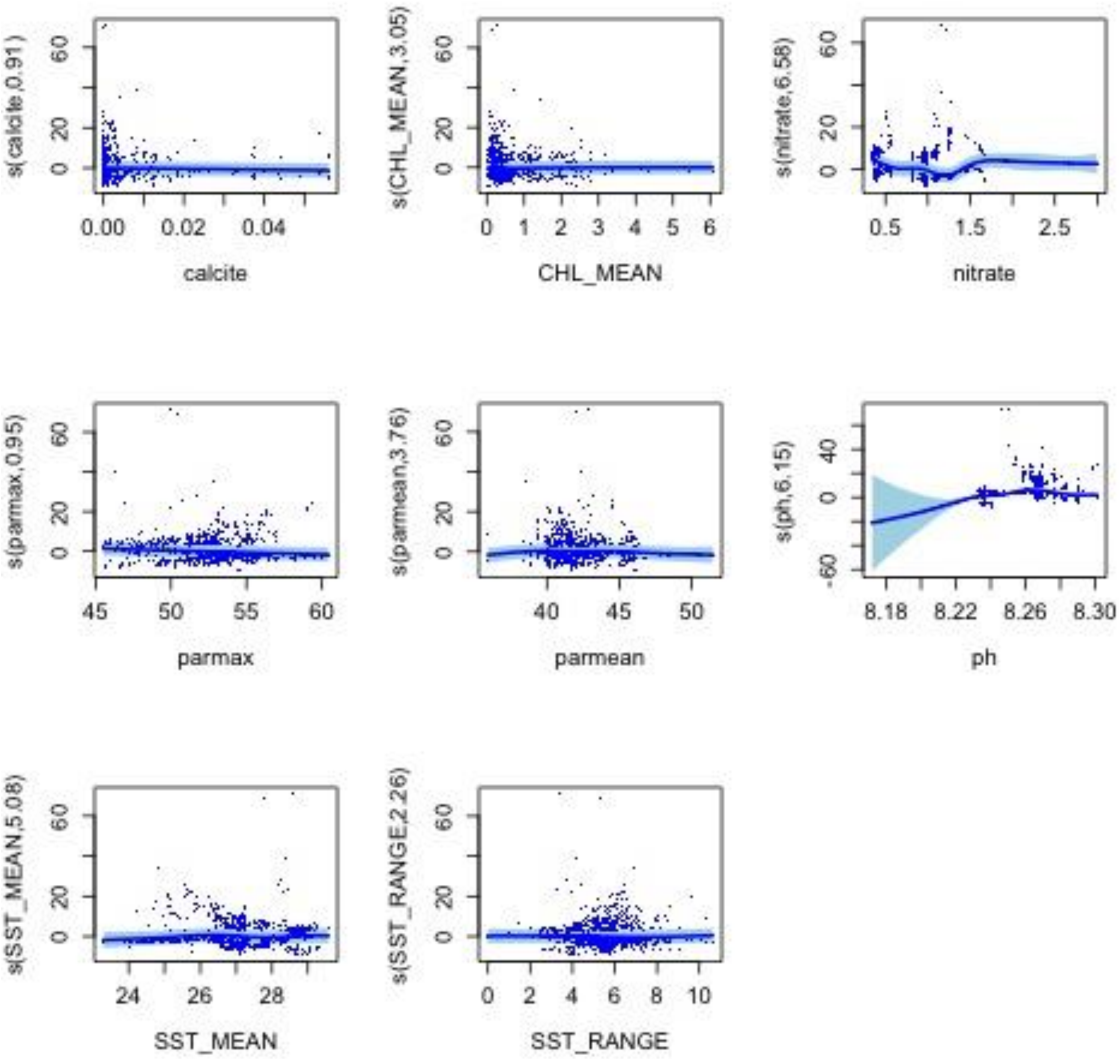
106Chaetodon quadrimaculatus, n = 509 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6006969	6	1.337407	1.319082e-01
s(CHL_MEAN)	3.1448581	9	23.549299	7.978657e-06
s(nitrate)	6.1993114	9	29.324040	5.883228e-06
s(parmax)	4.8628009	9	39.986918	1.134992e-09
s(parmean)	5.1254693	9	64.736941	8.147919e-16
s(ph)	6.9966835	9	99.382033	3.222364e-22
s(SST_MEAN)	6.1121943	9	33.524329	4.474018e-07
s(SST_RANGE)	4.9465133	9	20.653357	1.587876e-04



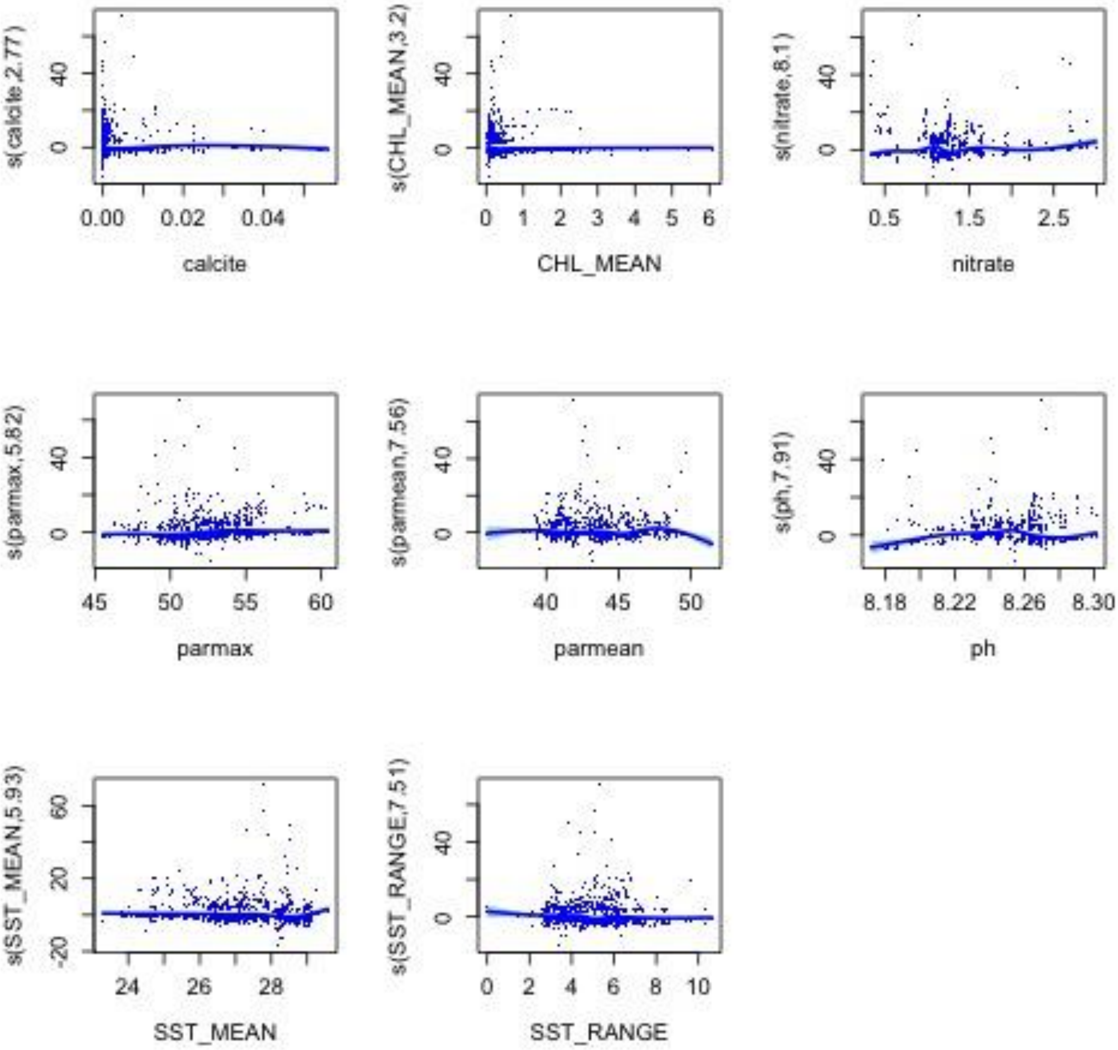
107Chaetodon rafflesii, n = 635 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9112749	7	9.804487	9.208390e-04
s(CHL_MEAN)	3.0531757	9	12.141348	3.873705e-03
s(nitrate)	6.5822745	9	180.131294	1.600429e-43
s(parmax)	0.9546894	9	19.387952	3.097212e-06
s(parmean)	3.7550627	9	19.118940	1.050261e-04
s(ph)	6.1529489	9	89.025474	2.454140e-20
s(SST_MEAN)	5.0826021	9	36.464111	1.709620e-08
s(SST_RANGE)	2.2648390	9	7.953113	1.132095e-02



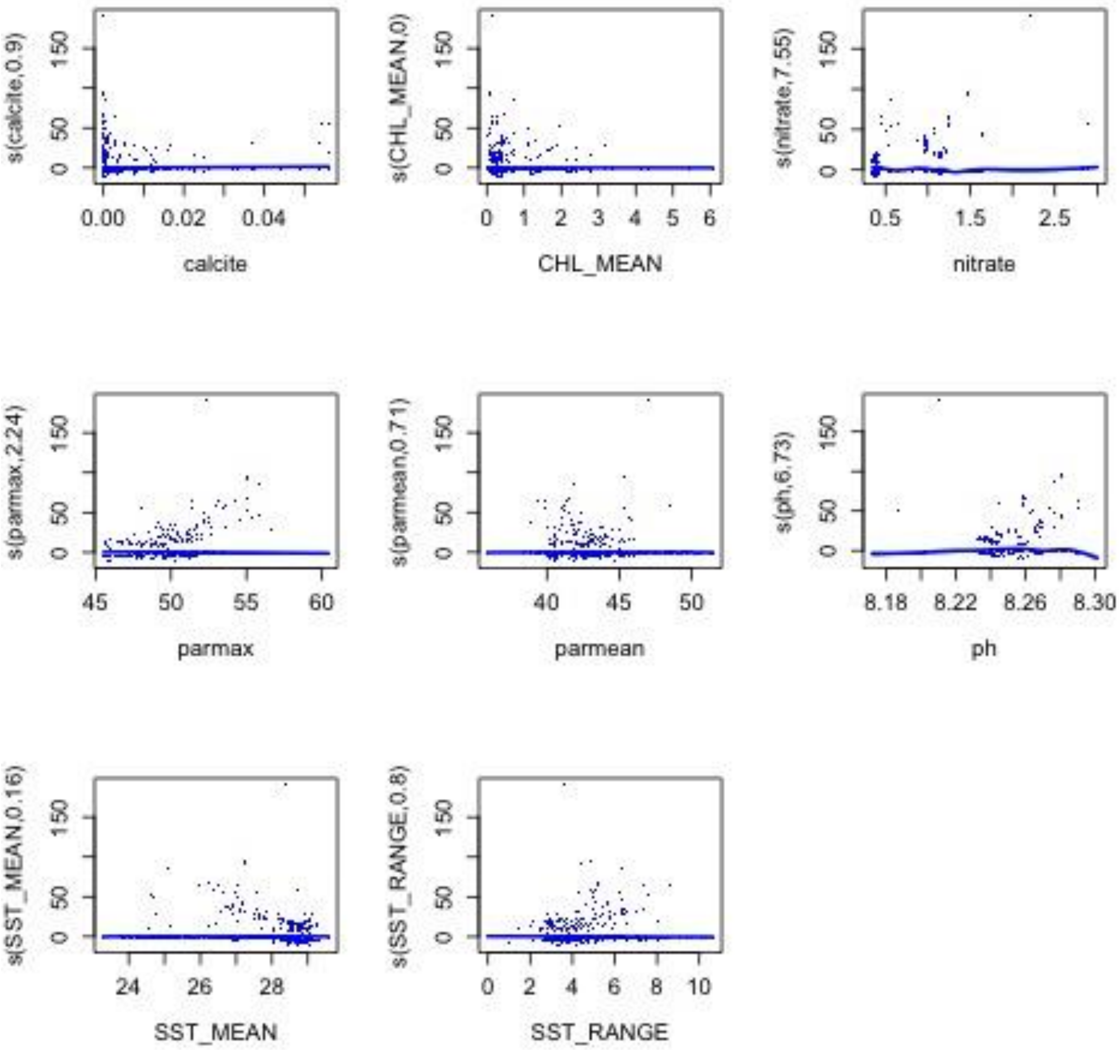
108Chaetodon reticulatus, n = 1410 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.769809	9	21.72188	1.296663e-05
s(CHL_MEAN)	3.198728	9	34.78332	2.149016e-08
s(nitrate)	8.102213	9	203.60526	1.616098e-45
s(parmax)	5.815765	9	74.86033	6.519775e-17
s(parmean)	7.560201	9	80.96632	7.508352e-17
s(ph)	7.906383	9	167.07125	1.241971e-37
s(SST_MEAN)	5.934300	9	38.31016	6.590841e-08
s(SST_RANGE)	7.513585	9	66.59315	6.880516e-13



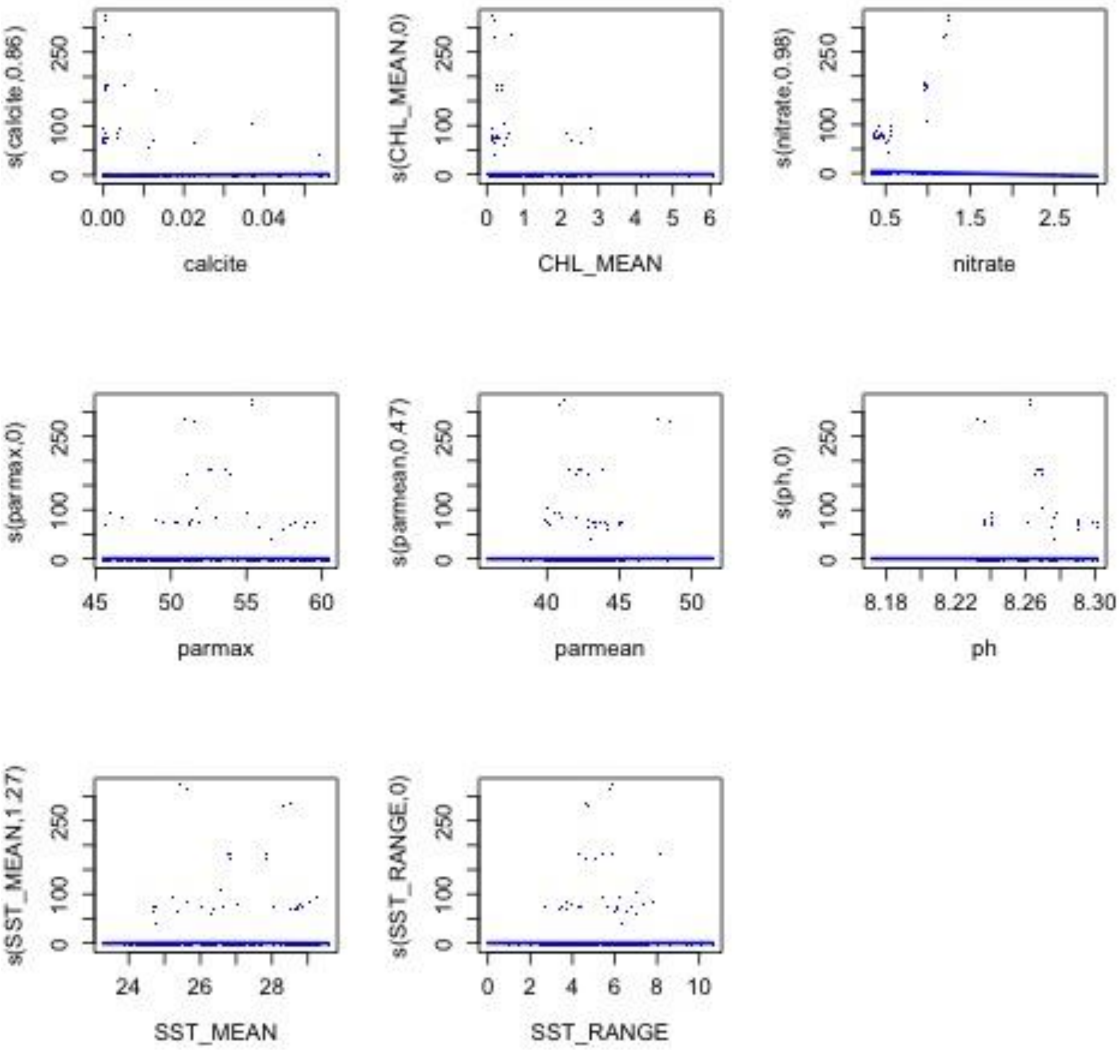
109Chaetodon semeion, n = 191 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8954815342	8	8.696621e+00	1.493657e-03
s(CHL_MEAN)	0.0001332004	9	2.885063e-06	1.000000e+00
s(nitrate)	7.5495359764	9	1.087908e+02	3.703559e-23
s(parmax)	2.2373289115	9	5.504330e+00	4.389208e-02
s(parmean)	0.7077217660	9	9.335835e-01	2.209264e-01
s(ph)	6.7281013763	9	5.720317e+01	7.321966e-12
s(SST_MEAN)	0.1551623600	9	1.775459e-01	2.591310e-01
s(SST_RANGE)	0.8029875353	9	1.766188e+00	9.964901e-02



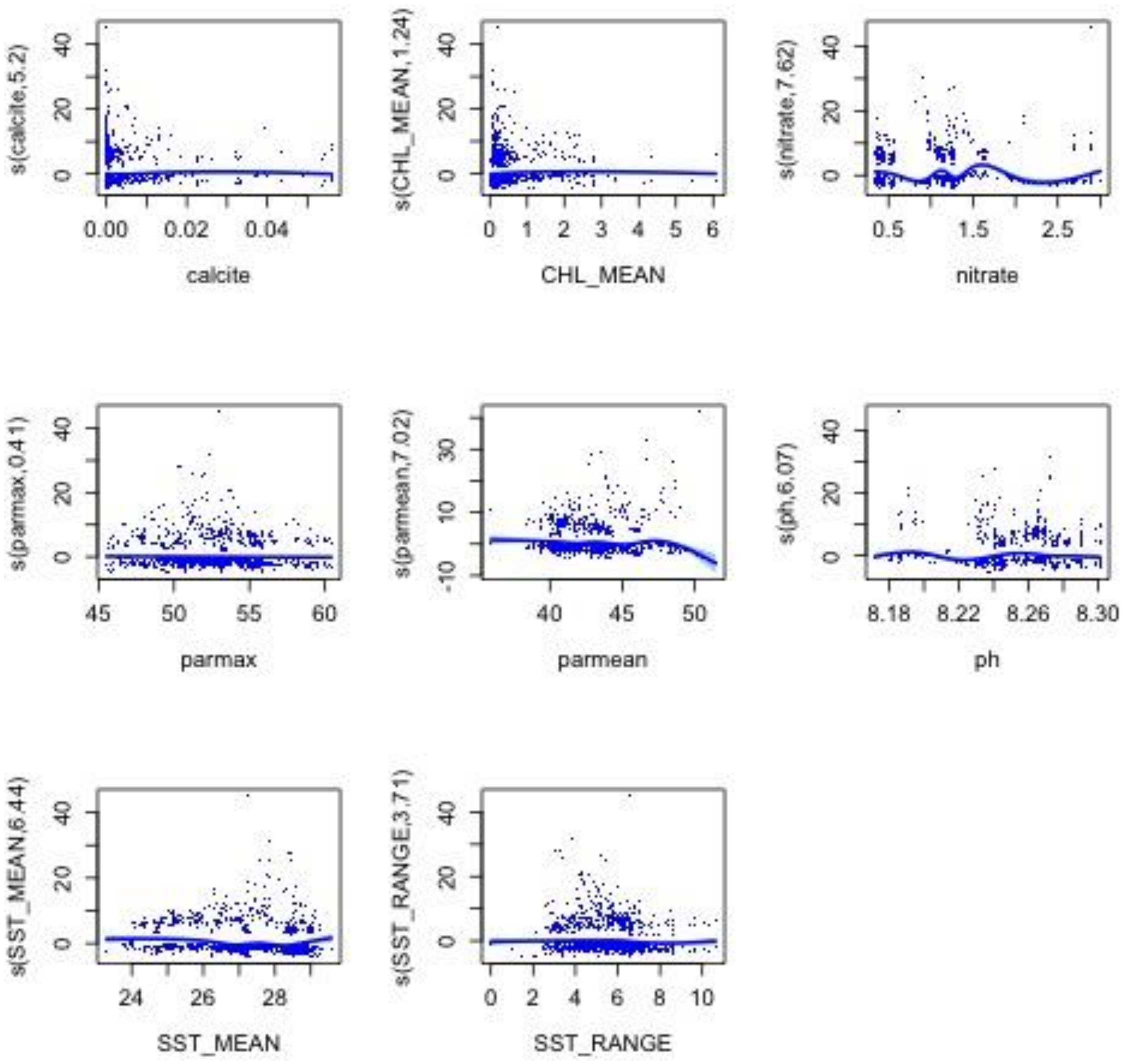
110Chaetodon speculum, n = 37 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.612590e-01	6	6.735159e+00	4.876120e-03
s(CHL_MEAN)	6.904020e-06	9	6.490220e-07	1.000000e+00
s(nitrate)	9.781527e-01	7	4.330837e+01	1.039490e-11
s(parmax)	1.137663e-05	9	4.617463e-06	6.206565e-01
s(parmean)	4.655188e-01	9	9.042747e-01	1.595988e-01
s(ph)	7.352924e-06	9	2.363953e-07	1.000000e+00
s(SST_MEAN)	1.270572e+00	9	2.950796e+00	8.442161e-02
s(SST_RANGE)	1.023075e-05	9	2.661907e-06	7.914948e-01



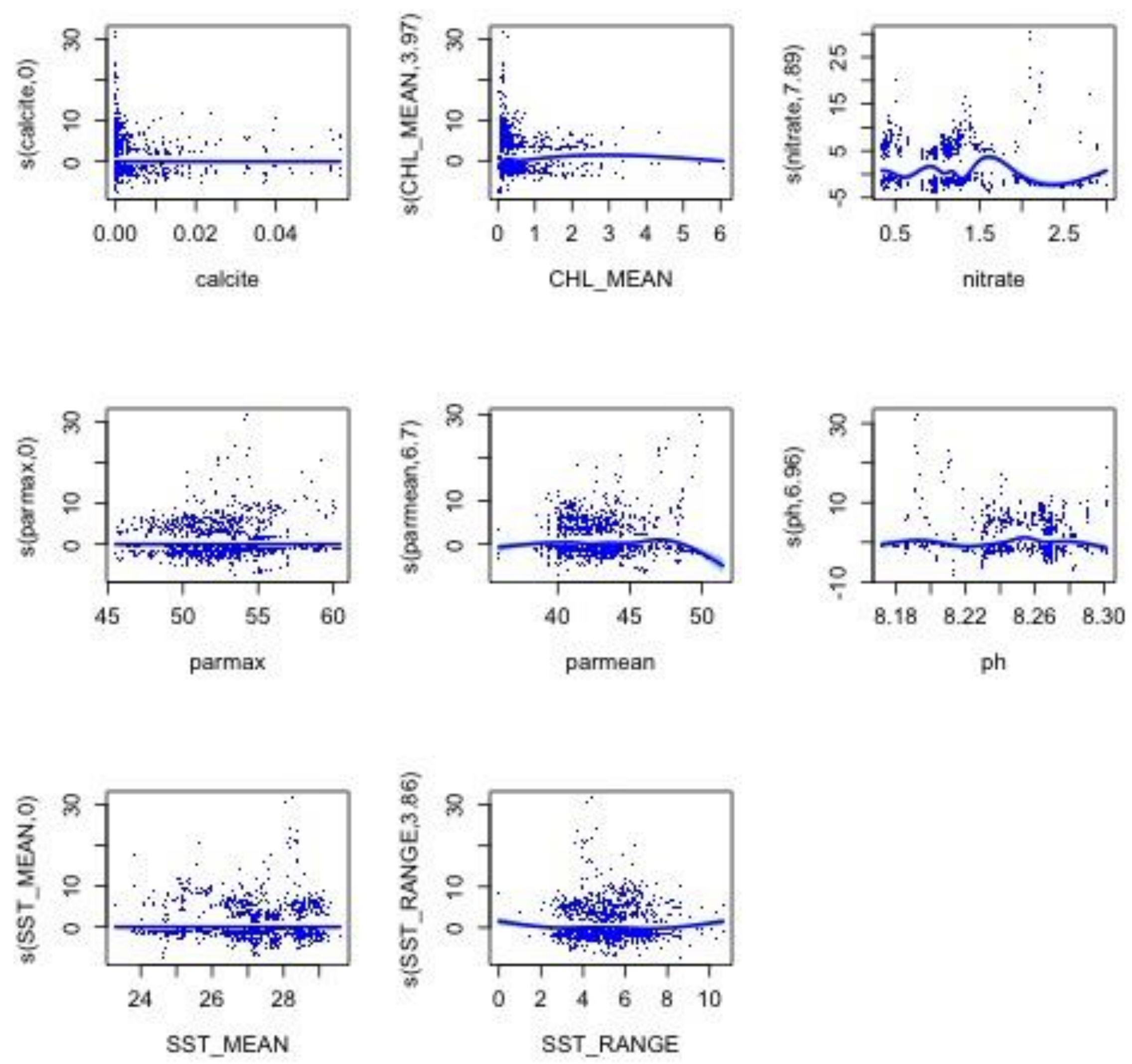
111Chaetodon trifascialis, n = 892 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.2048847	9	32.0857266	2.421537e-06
s(CHL_MEAN)	1.2362565	9	6.6765024	7.693041e-03
s(nitrate)	7.6239878	9	244.1411223	1.270589e-55
s(parmax)	0.4079749	9	0.6820675	1.690122e-01
s(parmean)	7.0193607	9	32.8991392	4.003104e-06
s(ph)	6.0730123	9	50.2655902	7.711888e-11
s(SST_MEAN)	6.4379021	9	75.2051667	4.216447e-17
s(SST_RANGE)	3.7089918	9	18.5192691	1.770070e-04



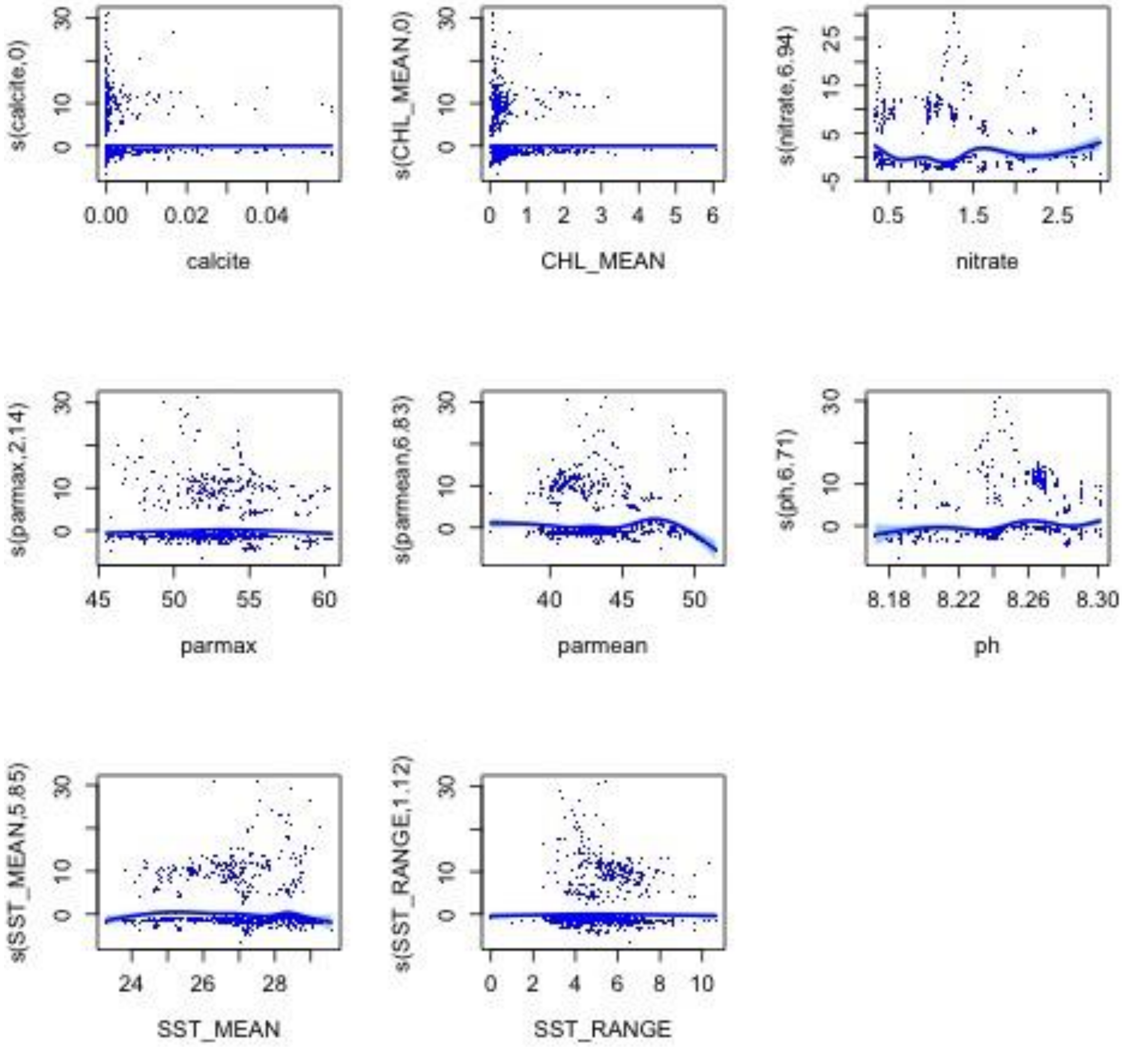
112Chaetodon ulietensis, n = 942 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0001064474	9	4.947637e-05	5.608433e-01
s(CHL_MEAN)	3.9701352887	9	7.012170e+01	6.715570e-16
s(nitrate)	7.8924383891	9	3.676936e+02	5.868201e-81
s(parmax)	0.0001959629	9	1.517674e-04	4.229093e-01
s(parmean)	6.6983262220	9	4.381918e+01	1.774901e-08
s(ph)	6.9627978255	9	6.700893e+01	1.099746e-13
s(SST_MEAN)	0.0010097503	9	6.746499e-04	4.503403e-01
s(SST_RANGE)	3.8648619597	9	1.646639e+01	7.713750e-04



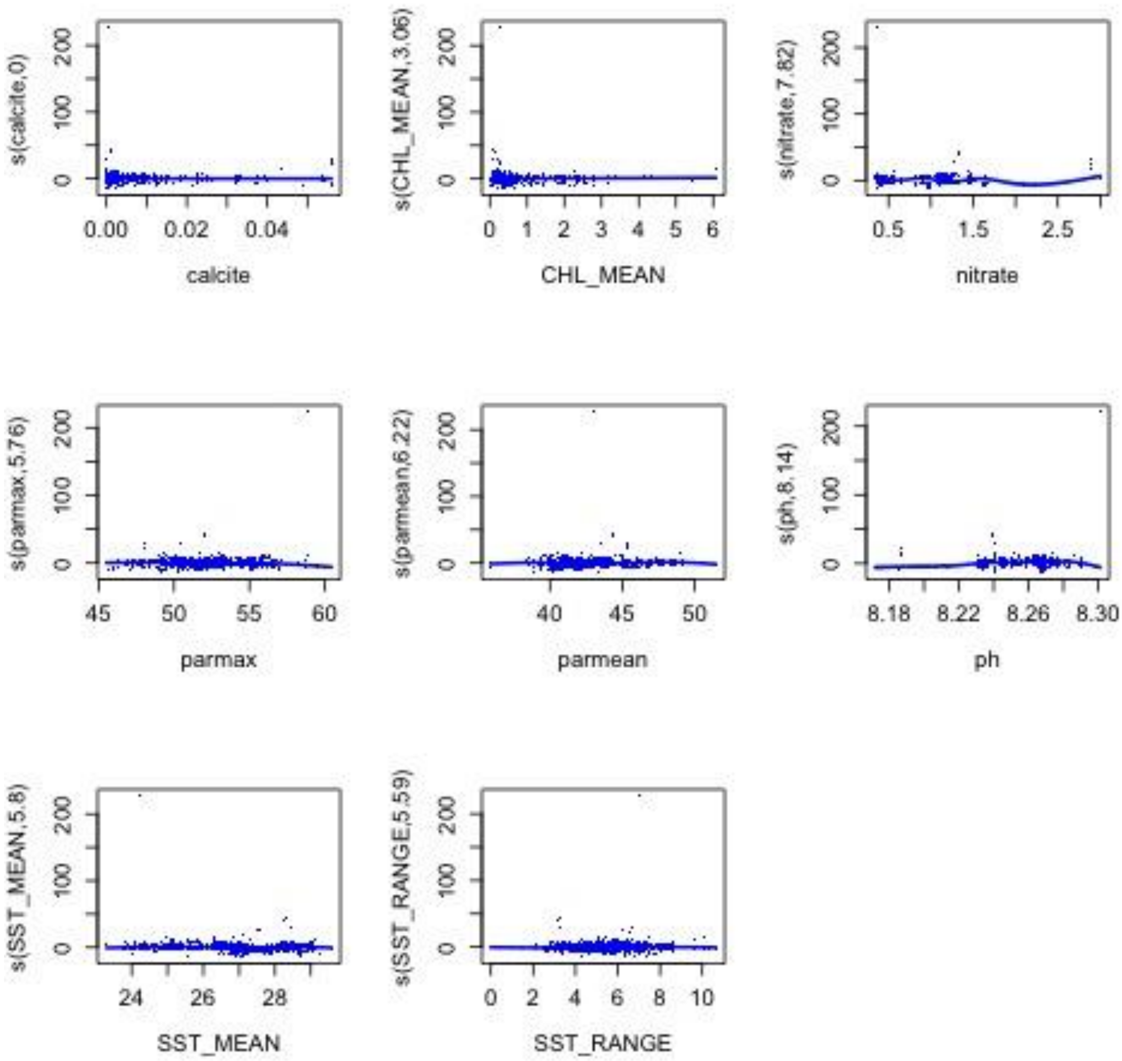
113Chaetodon unimaculatus, n = 670 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.106429e-04	9	3.680053e-05	8.503641e-01
s(CHL_MEAN)	3.651261e-05	9	4.315524e-06	8.131265e-01
s(nitrate)	6.944607e+00	9	1.214113e+02	7.871935e-29
s(parmax)	2.136275e+00	9	8.317407e+00	4.689139e-03
s(parmean)	6.834569e+00	9	7.038007e+01	4.011905e-15
s(ph)	6.706097e+00	9	4.774075e+01	1.043504e-10
s(SST_MEAN)	5.851321e+00	9	2.324730e+01	8.474927e-05
s(SST_RANGE)	1.115020e+00	9	2.126985e+00	1.229041e-01



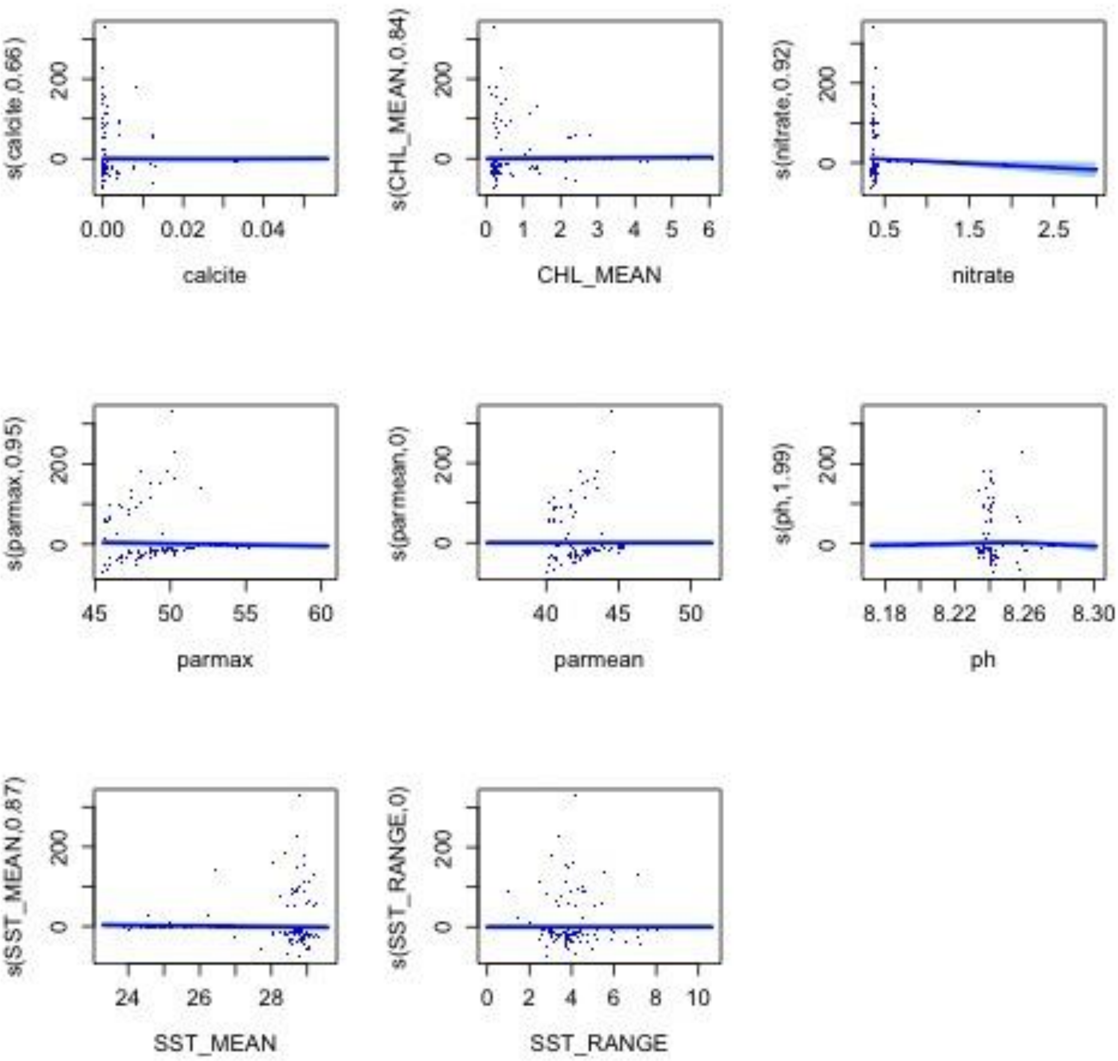
114Chaetodon vagabundus, n = 1319 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.310543e-05	8	4.911095e-06	7.697858e-01
s(CHL_MEAN)	3.059964e+00	9	2.730485e+01	8.445715e-07
s(nitrate)	7.823622e+00	9	3.029653e+02	1.083155e-66
s(parmax)	5.756098e+00	9	4.864270e+01	1.897374e-10
s(parmean)	6.222627e+00	9	5.683412e+01	8.689352e-12
s(ph)	8.137122e+00	9	1.632996e+02	1.639533e-35
s(SST_MEAN)	5.804559e+00	9	3.806896e+01	7.461974e-08
s(SST_RANGE)	5.589619e+00	9	3.872689e+01	8.303389e-08



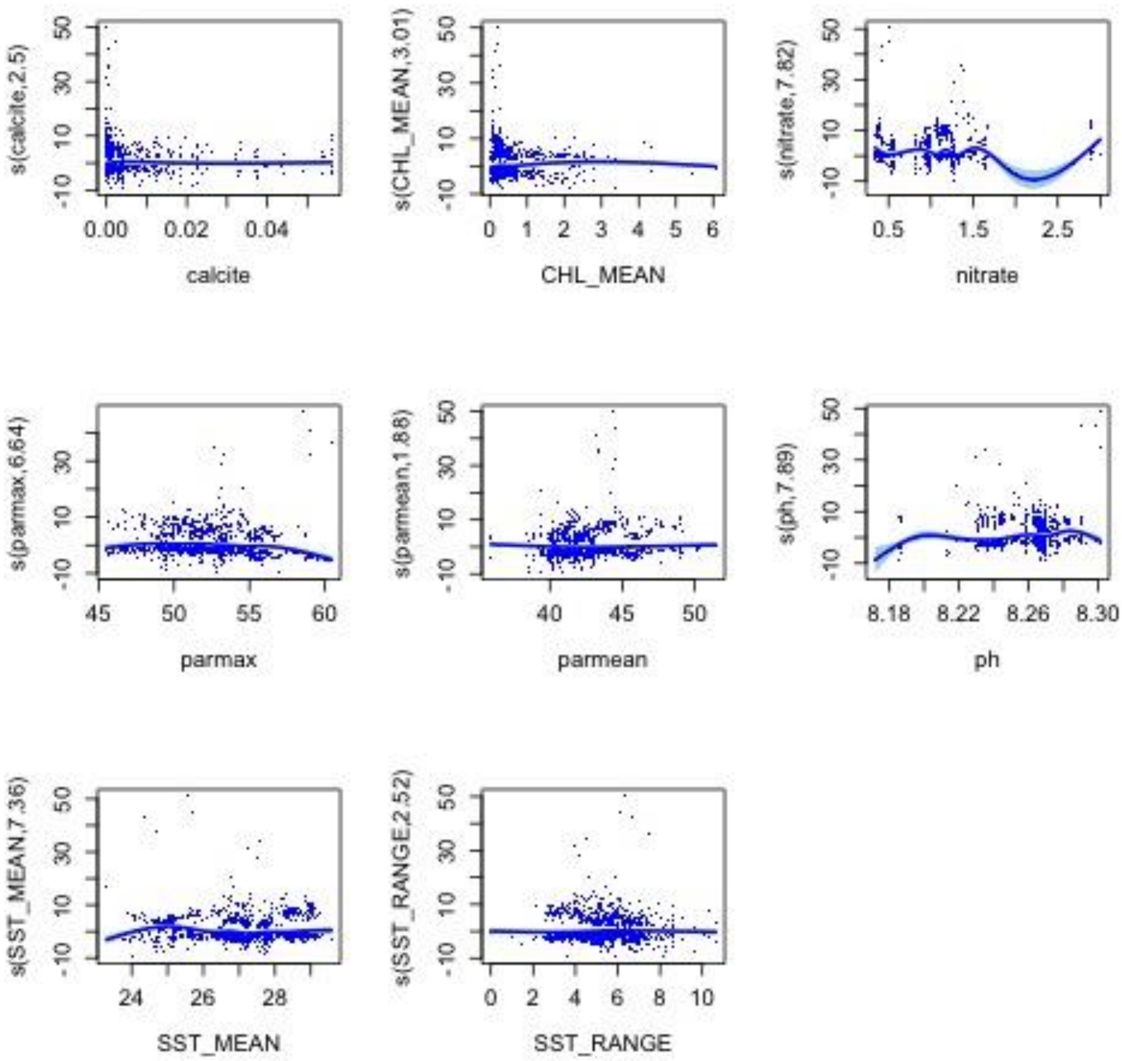
115Chaetodontoplus mesoleucus, n = 34 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.617538e-01	9	1.446215e+00	1.184303e-01
s(CHL_MEAN)	8.407179e-01	4	4.625931e+00	1.200080e-02
s(nitrate)	9.201016e-01	9	7.211375e+00	4.484346e-03
s(parmax)	9.523766e-01	7	1.674044e+01	1.523148e-05
s(parmean)	8.702769e-06	9	6.729052e-06	4.040123e-01
s(ph)	1.990443e+00	9	4.387292e+00	8.369458e-02
s(SST_MEAN)	8.681155e-01	8	5.609577e+00	9.252852e-03
s(SST_RANGE)	9.706650e-06	9	4.799930e-06	5.682428e-01



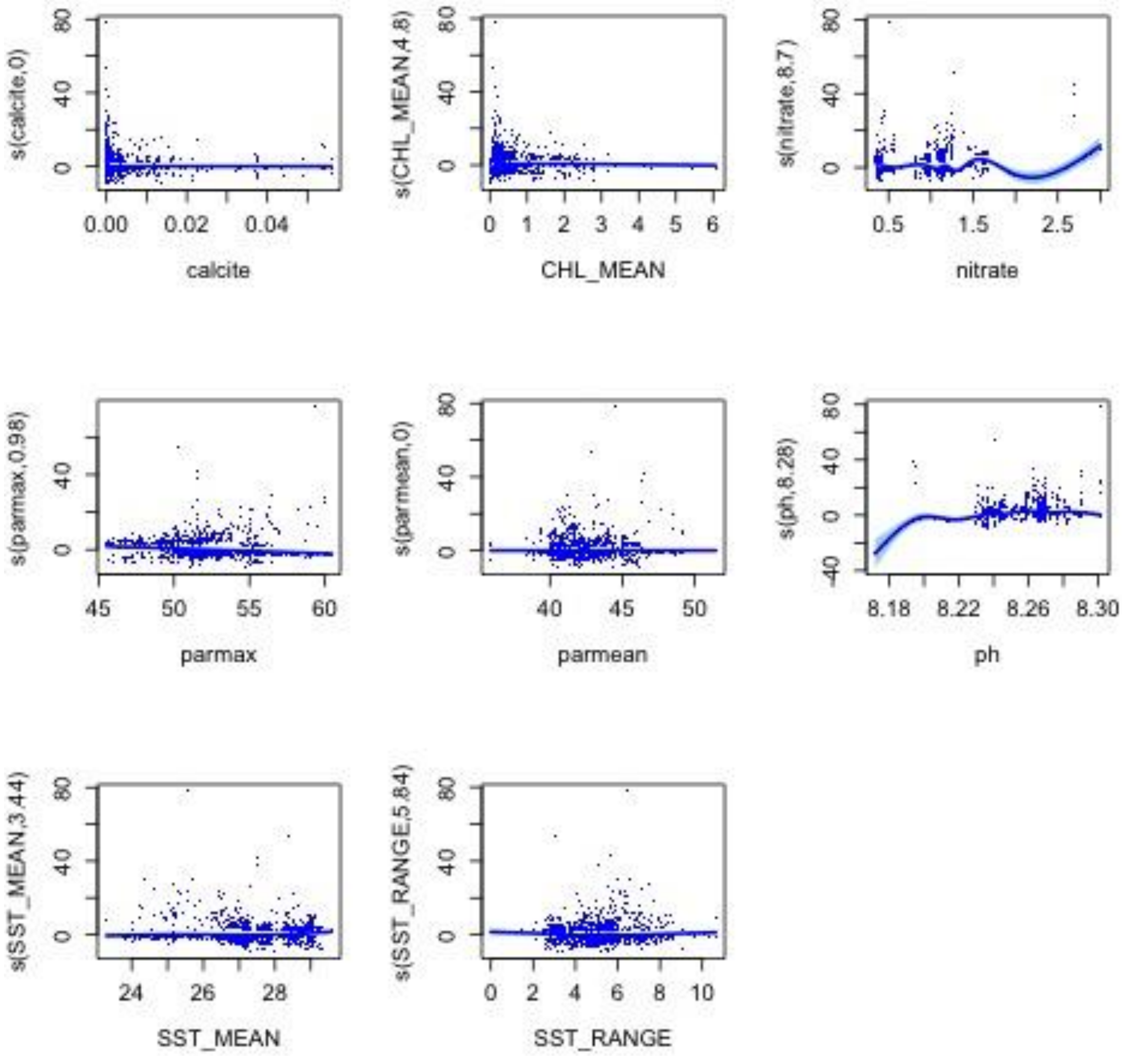
116Cheilinus chlorourus, n = 838 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.500721	9	11.563407	2.591960e-03
s(CHL_MEAN)	3.013625	9	41.441829	4.941040e-10
s(nitrate)	7.823602	9	139.610029	5.293172e-29
s(parmax)	6.639130	9	75.966368	2.323488e-16
s(parmean)	1.877225	9	9.511999	1.344653e-03
s(ph)	7.894832	9	137.214916	1.200975e-29
s(SST_MEAN)	7.359371	9	91.447243	1.427554e-19
s(SST_RANGE)	2.518403	9	7.720083	1.757296e-02



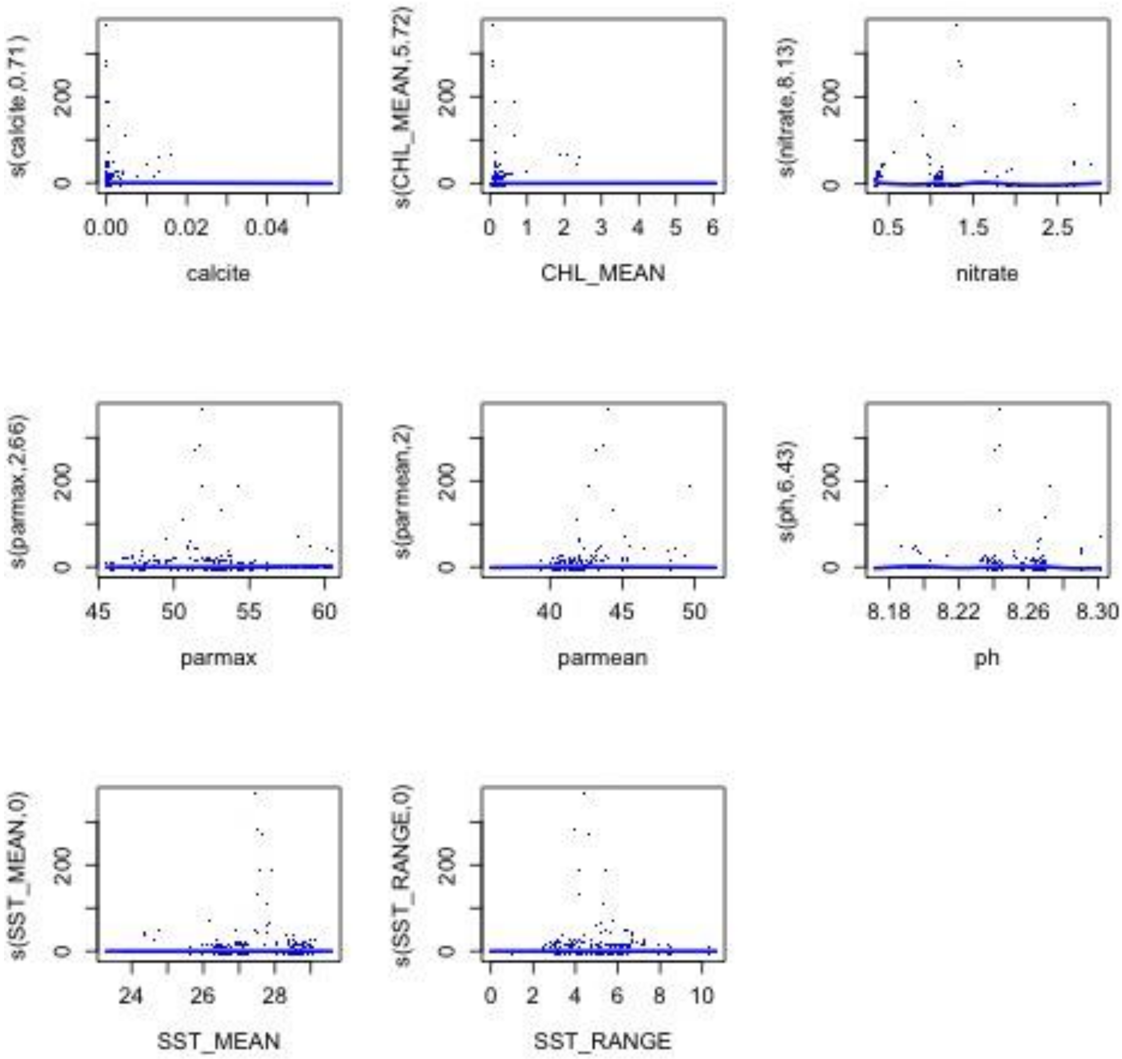
117Cheilinus fasciatus, n = 690 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0005564784	8	3.770719e-04	4.096157e-01
s(CHL_MEAN)	4.7997146395	9	6.515947e+01	4.698973e-14
s(nitrate)	8.7037303212	9	2.331821e+02	3.976223e-50
s(parmax)	0.9816982614	9	5.167433e+01	1.200681e-13
s(parmean)	0.0006627048	9	1.486616e-04	8.810711e-01
s(ph)	8.2791989140	9	1.252004e+02	9.104873e-26
s(SST_MEAN)	3.4382590916	9	1.235231e+01	3.399563e-03
s(SST_RANGE)	5.8442441448	9	2.985487e+01	9.292159e-06



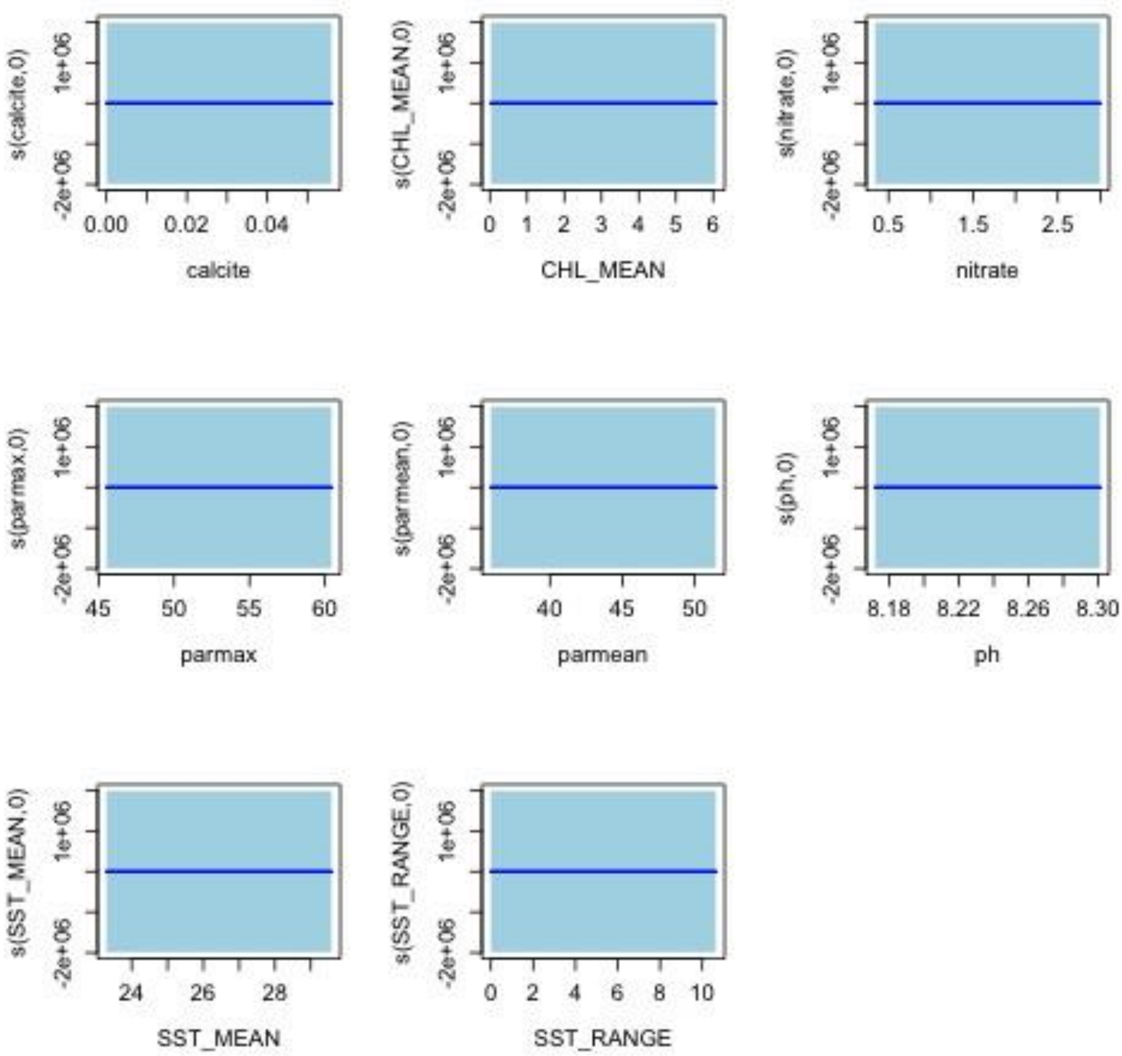
118Cheilinus oxycephalus, n = 337 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7104239538	6	1.817577e+00	1.076955e-01
s(CHL_MEAN)	5.7223651797	9	3.458860e+01	1.069558e-06
s(nitrate)	8.1285609777	9	1.630119e+02	3.649894e-36
s(parmax)	2.6646634150	9	1.109354e+01	1.852988e-03
s(parmean)	1.9995571063	9	4.810775e+00	4.511349e-02
s(ph)	6.4323318815	9	2.663635e+01	2.340722e-05
s(SST_MEAN)	0.0003056529	9	1.202348e-04	6.581650e-01
s(SST_RANGE)	0.0002967815	9	9.833266e-05	7.166536e-01



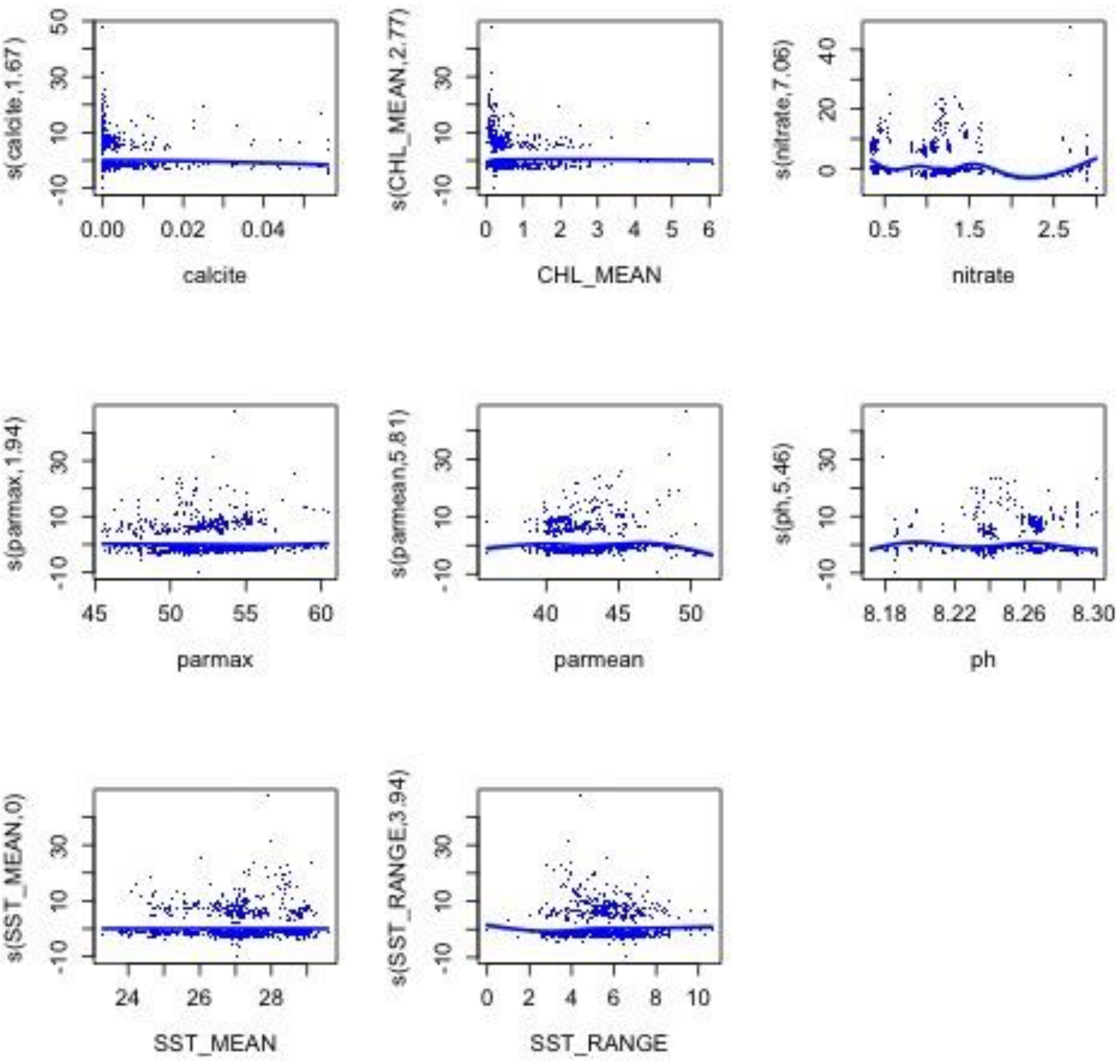
119Chlorurus perspicillatus, n = 33 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.161775e-09	8	5.529831e-50	1
s(CHL_MEAN)	2.593060e-11	9	1.314850e-52	1
s(nitrate)	2.498755e-12	9	2.614132e-51	1
s(parmax)	6.848125e-13	9	1.571652e-52	1
s(parmean)	1.123517e-12	9	7.084192e-53	1
s(ph)	6.219119e-13	9	3.095587e-51	1
s(SST_MEAN)	6.316176e-13	9	8.543518e-53	1
s(SST_RANGE)	7.132266e-13	9	3.085867e-51	1



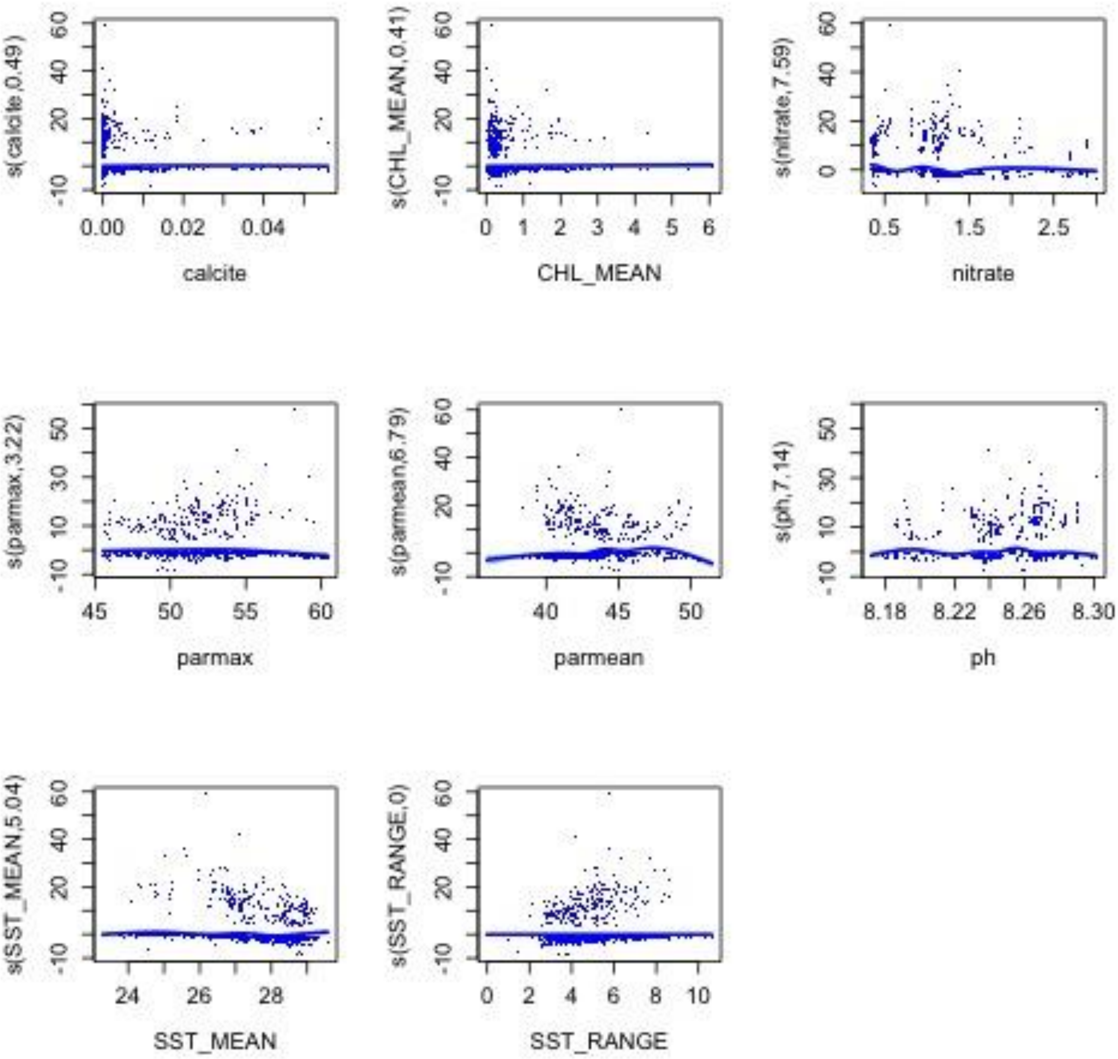
120Cheilinus trilobatus, n = 821 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.66826740	9	1.761988e+01	2.116085e-05
s(CHL_MEAN)	2.77206558	9	1.630041e+01	2.440853e-04
s(nitrate)	7.06310765	9	1.852856e+02	9.137110e-44
s(parmax)	1.94176196	9	3.438974e+00	1.236679e-01
s(parmean)	5.81498628	9	5.106311e+01	3.651722e-11
s(ph)	5.45804991	9	4.369853e+01	5.066127e-10
s(SST_MEAN)	0.00215423	9	1.693247e-03	3.865775e-01
s(SST_RANGE)	3.93536777	9	2.156531e+01	4.824528e-05



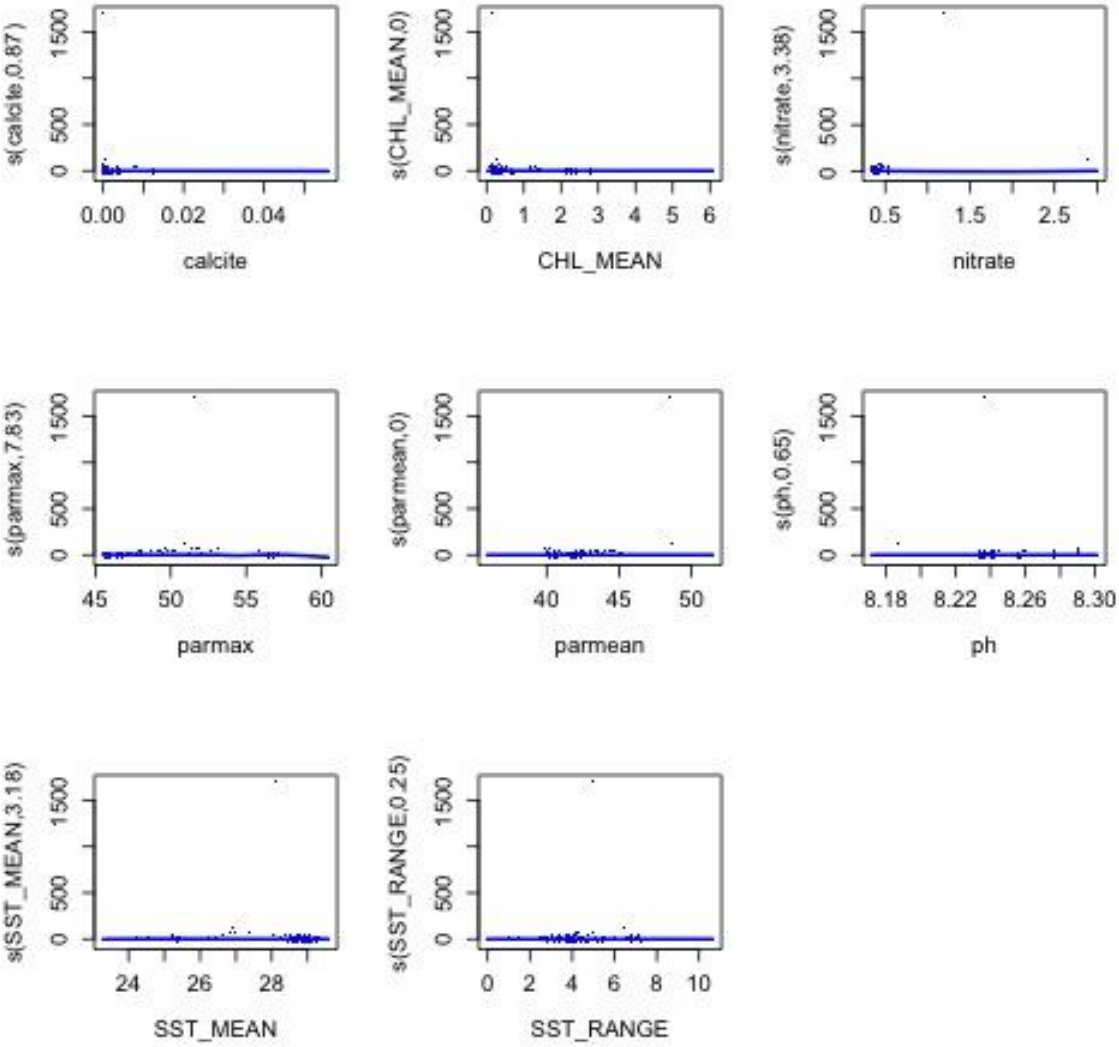
121Cheilinus undulatus, n = 378 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.4864767571	9	9.234254e-01	1.400082e-01
s(CHL_MEAN)	0.4125056777	8	7.563338e-01	1.497876e-01
s(nitrate)	7.5897248761	9	1.342528e+02	8.702775e-30
s(parmax)	3.2195764355	9	1.835246e+01	5.688509e-05
s(parmean)	6.7942853427	9	1.032633e+02	1.289463e-22
s(ph)	7.1359575330	9	5.799147e+01	6.238809e-12
s(SST_MEAN)	5.0371450123	9	2.402630e+01	2.988692e-05
s(SST_RANGE)	0.0002209297	9	1.583959e-04	4.719821e-01



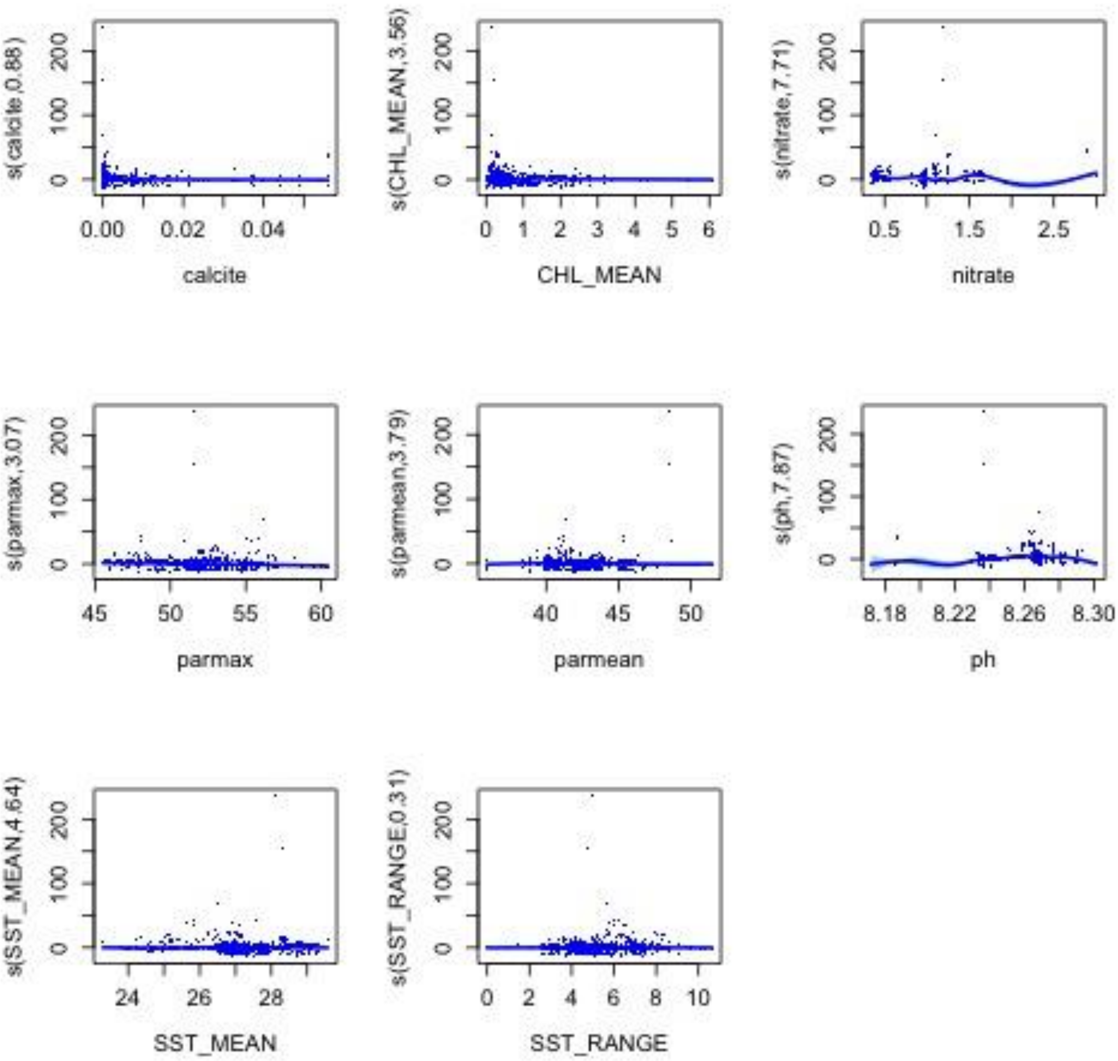
122Choerodon anchorago, n = 96 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.684280e-01	6	5.059450e+00	1.501622e-02
s(CHL_MEAN)	2.980904e-05	9	1.927370e-05	4.016704e-01
s(nitrate)	3.381952e+00	9	6.092755e+01	2.545824e-15
s(parmax)	7.826341e+00	9	3.731321e+01	1.613962e-06
s(parmean)	2.093470e-04	9	9.297074e-05	6.120363e-01
s(ph)	6.534740e-01	9	1.192662e+00	1.198614e-01
s(SST_MEAN)	3.178713e+00	9	1.007987e+01	6.612178e-03
s(SST_RANGE)	2.533544e-01	8	3.236051e-01	2.499348e-01



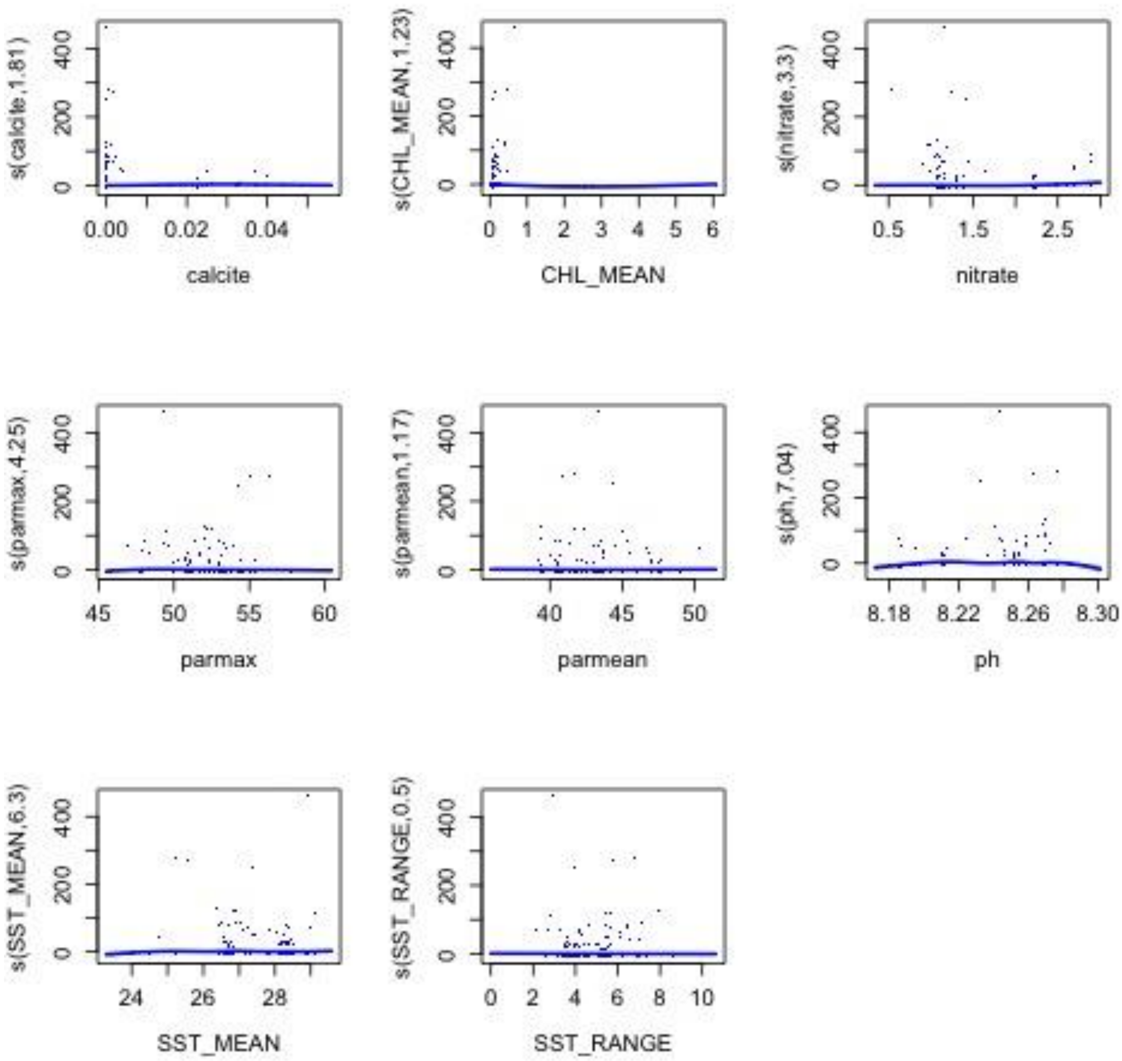
123Chlorurus bleekeri, n = 653 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8750248	7	6.6290268	5.216189e-03
s(CHL_MEAN)	3.5649160	9	23.4348602	1.894260e-05
s(nitrate)	7.7146398	9	238.2943670	3.508667e-53
s(parmax)	3.0685285	9	40.5052137	1.269714e-10
s(parmean)	3.7932456	9	16.6594123	4.877051e-04
s(ph)	7.8669983	9	146.1899084	2.657075e-32
s(SST_MEAN)	4.6422331	9	14.3960635	3.832409e-03
s(SST_RANGE)	0.3139752	9	0.3569125	2.996183e-01



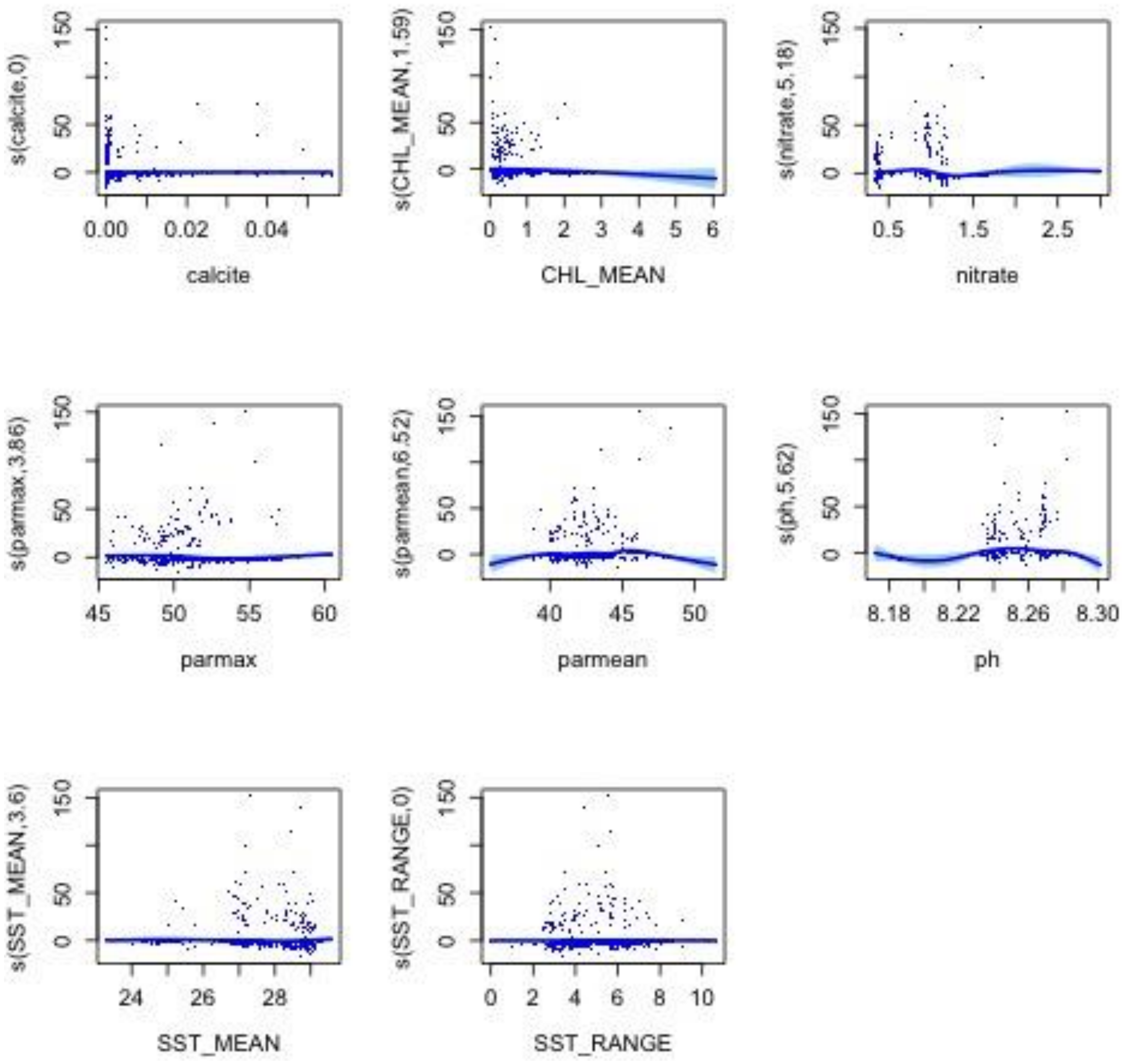
124Chlorurus frontalis, n = 227 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.8133519	9	23.231710	2.733317e-07
s(CHL_MEAN)	1.2309749	9	14.297413	5.837485e-05
s(nitrate)	3.2981544	9	12.939805	1.191058e-03
s(parmax)	4.2548912	9	12.425435	6.337426e-03
s(parmean)	1.1727820	9	3.043601	4.192732e-02
s(ph)	7.0441195	9	78.357435	1.683938e-18
s(SST_MEAN)	6.2976530	9	25.059933	3.700533e-05
s(SST_RANGE)	0.5020969	9	1.013158	1.466924e-01



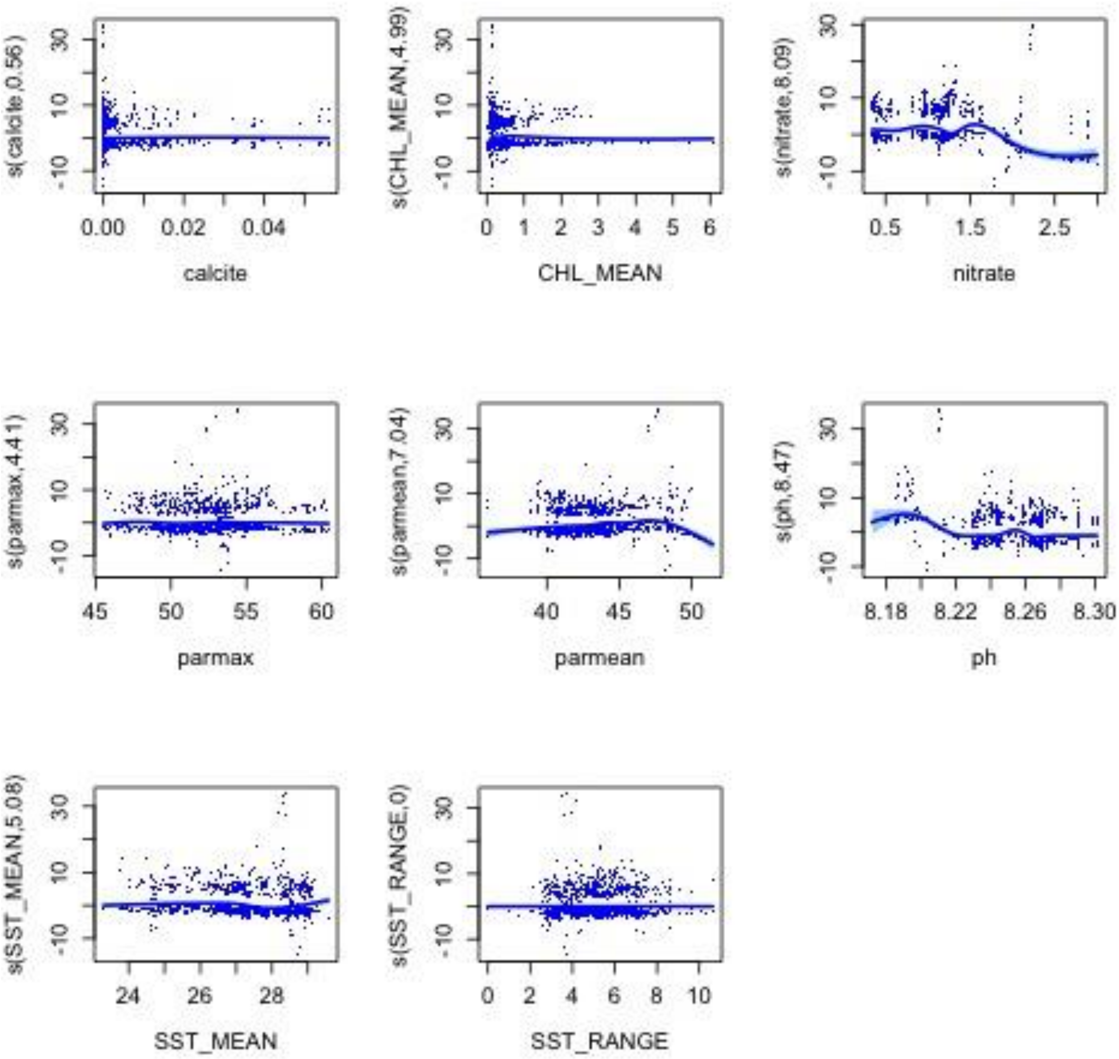
125Chlorurus japanensis, n = 355 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0001643121	9	4.267669e-05	7.468818e-01
s(CHL_MEAN)	1.5947457087	9	1.261612e+01	3.410586e-04
s(nitrate)	5.1813399259	9	7.623153e+01	8.435620e-20
s(parmax)	3.8645244478	9	3.904152e+01	5.107272e-10
s(parmean)	6.5200338440	9	5.449463e+01	1.790532e-11
s(ph)	5.6234405078	9	4.419903e+01	2.749849e-10
s(SST_MEAN)	3.5966038598	9	1.284693e+01	2.426721e-03
s(SST_RANGE)	0.0001236941	9	2.530822e-05	8.916408e-01



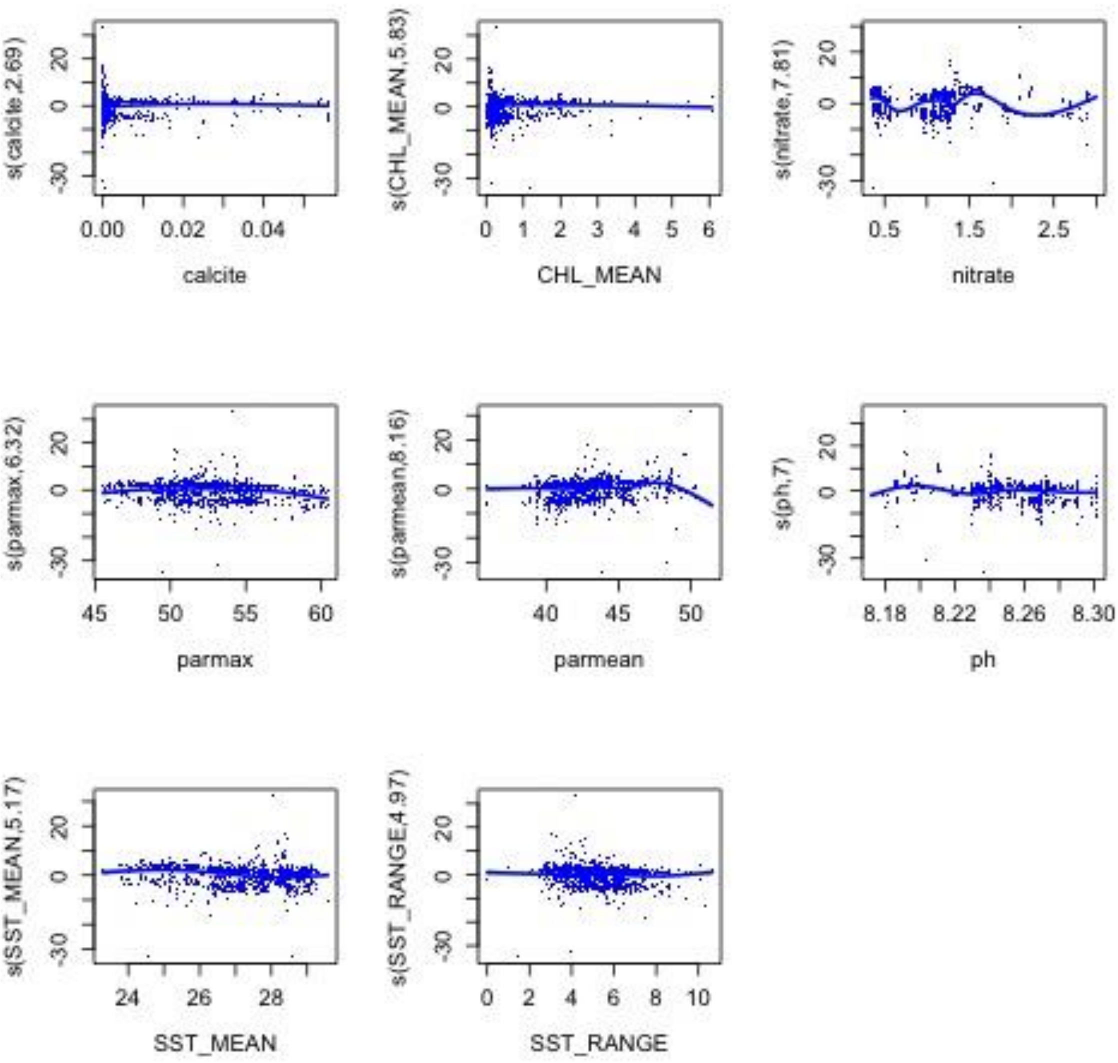
126Chlorurus microrhinos, n = 1092 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.557197089	9	1.155105e+00	1.372162e-01
s(CHL_MEAN)	4.990614624	9	7.087177e+01	1.220917e-15
s(nitrate)	8.088928044	9	2.021919e+02	5.735642e-45
s(parmax)	4.411617830	9	1.001785e+01	3.190814e-02
s(parmean)	7.036603232	9	9.890710e+01	2.340530e-21
s(ph)	8.474329885	9	1.323109e+02	1.590734e-27
s(SST_MEAN)	5.081354638	9	6.460464e+01	6.974756e-15
s(SST_RANGE)	0.000271372	9	1.817930e-04	5.027589e-01



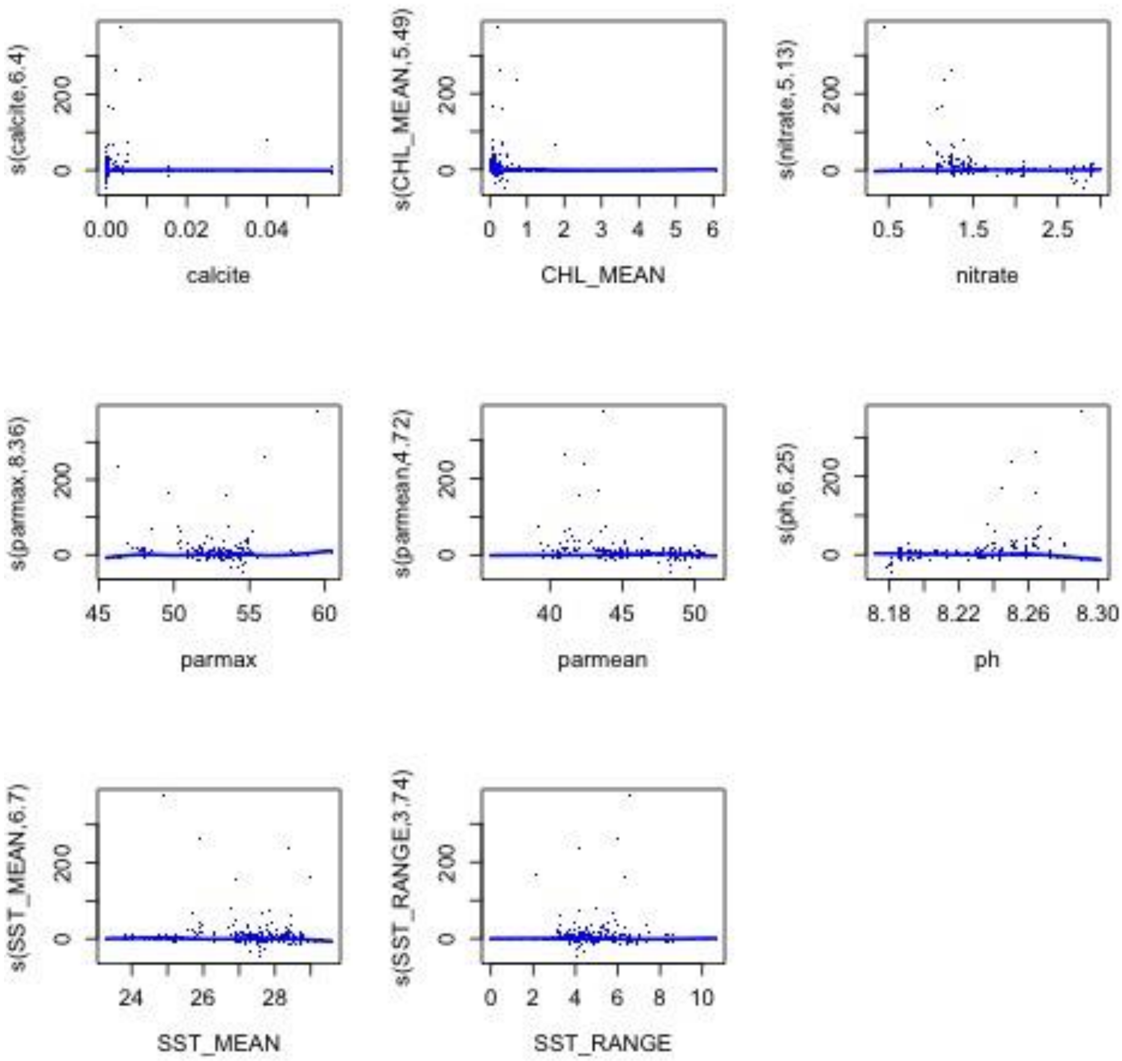
127Chlorurus sordidus, n = 2877 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.687574	9	19.33999	6.842234e-05
s(CHL_MEAN)	5.832010	9	126.69832	1.169770e-27
s(nitrate)	7.808394	9	388.99297	9.058975e-88
s(parmax)	6.315968	9	91.71073	2.859684e-20
s(parmean)	8.156046	9	140.00805	4.723688e-29
s(ph)	7.001650	9	111.33281	3.872486e-24
s(SST_MEAN)	5.168549	9	87.39666	1.094425e-20
s(SST_RANGE)	4.969043	9	25.06149	3.447072e-05



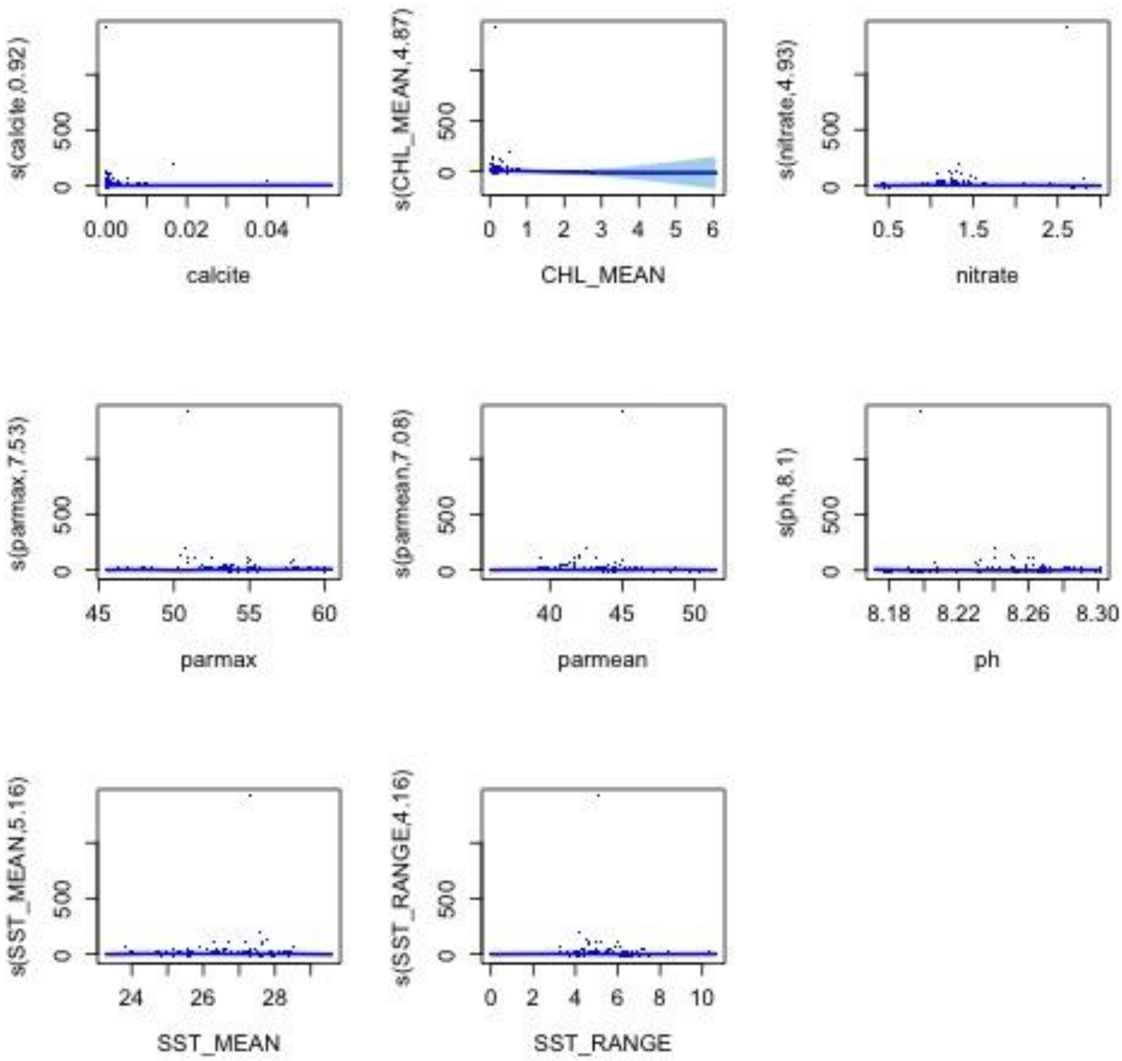
128Chromis acares, n = 1074 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.397558	9	47.36424	2.424709e-09
s(CHL_MEAN)	5.491423	9	65.34063	2.814303e-14
s(nitrate)	5.125241	9	20.46448	1.144804e-04
s(parmax)	8.363416	9	76.54515	1.175843e-15
s(parmean)	4.724420	9	77.58083	1.172654e-19
s(ph)	6.250325	9	70.28825	9.123137e-17
s(SST_MEAN)	6.695174	9	62.58027	5.861852e-14
s(SST_RANGE)	3.737354	9	21.94113	1.198263e-05



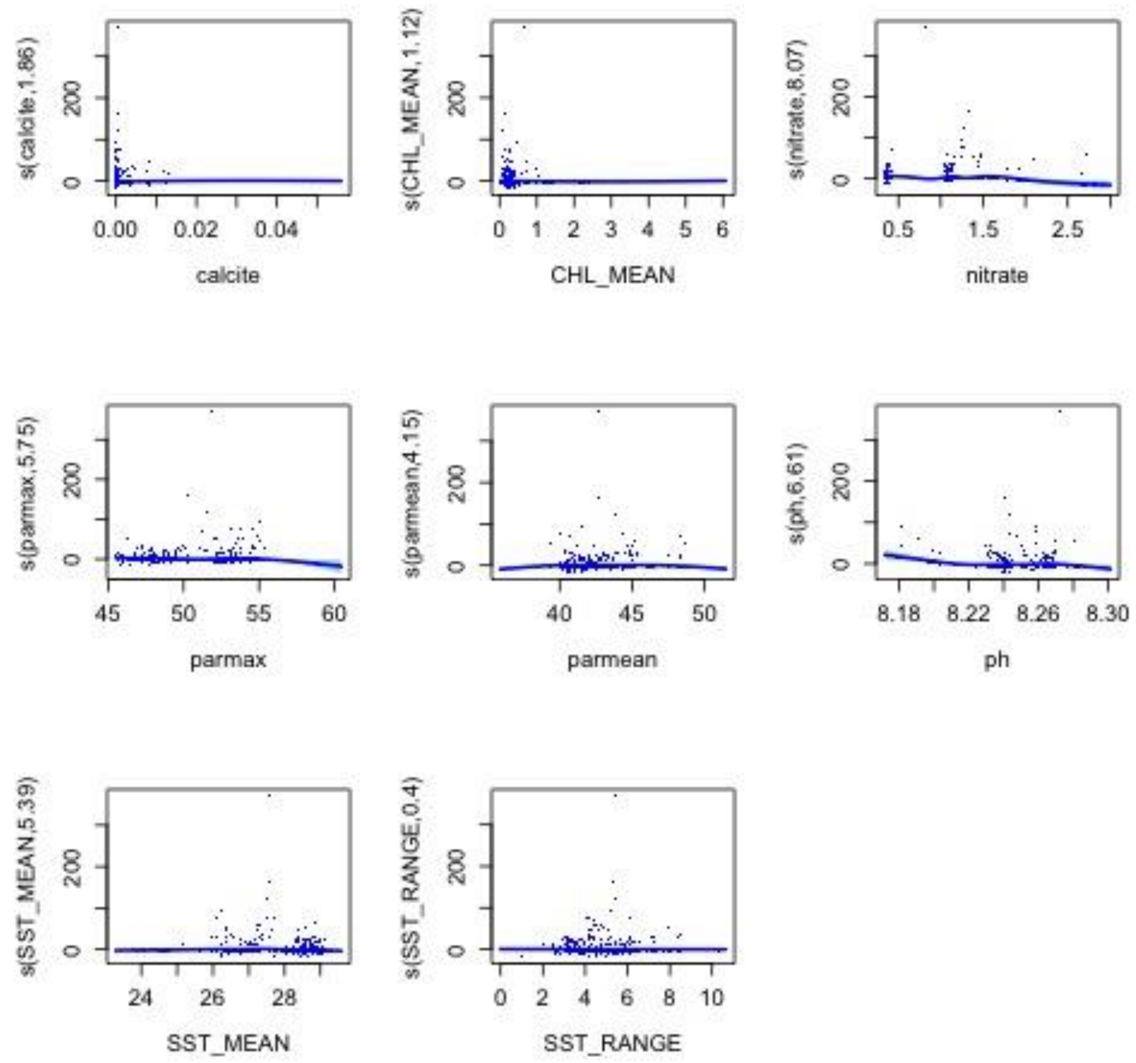
129Chromis agilis, n = 569 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9193561	6	12.07016	2.391004e-04
s(CHL_MEAN)	4.8715061	9	50.17210	3.523507e-11
s(nitrate)	4.9286458	9	53.66107	4.498891e-13
s(parmax)	7.5262781	9	89.16142	7.329308e-19
s(parmean)	7.0778552	9	63.31874	2.381535e-13
s(ph)	8.1012573	9	109.13106	9.184328e-24
s(SST_MEAN)	5.1589920	9	38.80729	6.342626e-09
s(SST_RANGE)	4.1577187	9	33.54952	4.633262e-08



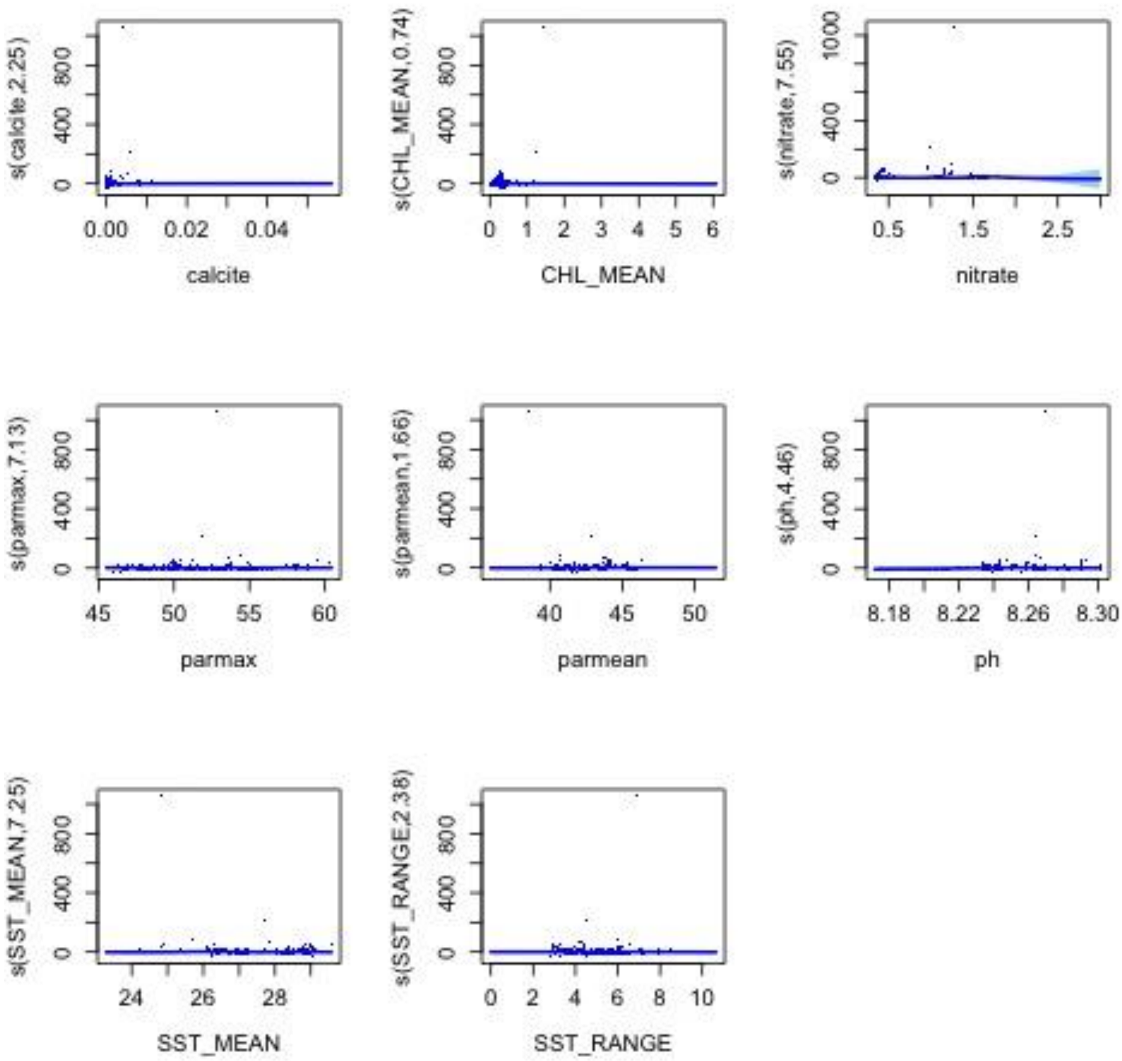
130Chromis alpha, n = 185 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.8554128	9	8.7881130	5.741153e-03
s(CHL_MEAN)	1.1155704	9	8.4723776	1.928226e-03
s(nitrate)	8.0740206	9	127.4372314	1.019039e-28
s(parmax)	5.7464354	9	39.3714117	1.935061e-08
s(parmean)	4.1533918	9	11.3368475	8.965085e-03
s(ph)	6.6108932	9	40.2293573	2.262075e-08
s(SST_MEAN)	5.3927021	9	22.5123783	8.645640e-05
s(SST_RANGE)	0.3969151	9	0.6608596	1.904293e-01



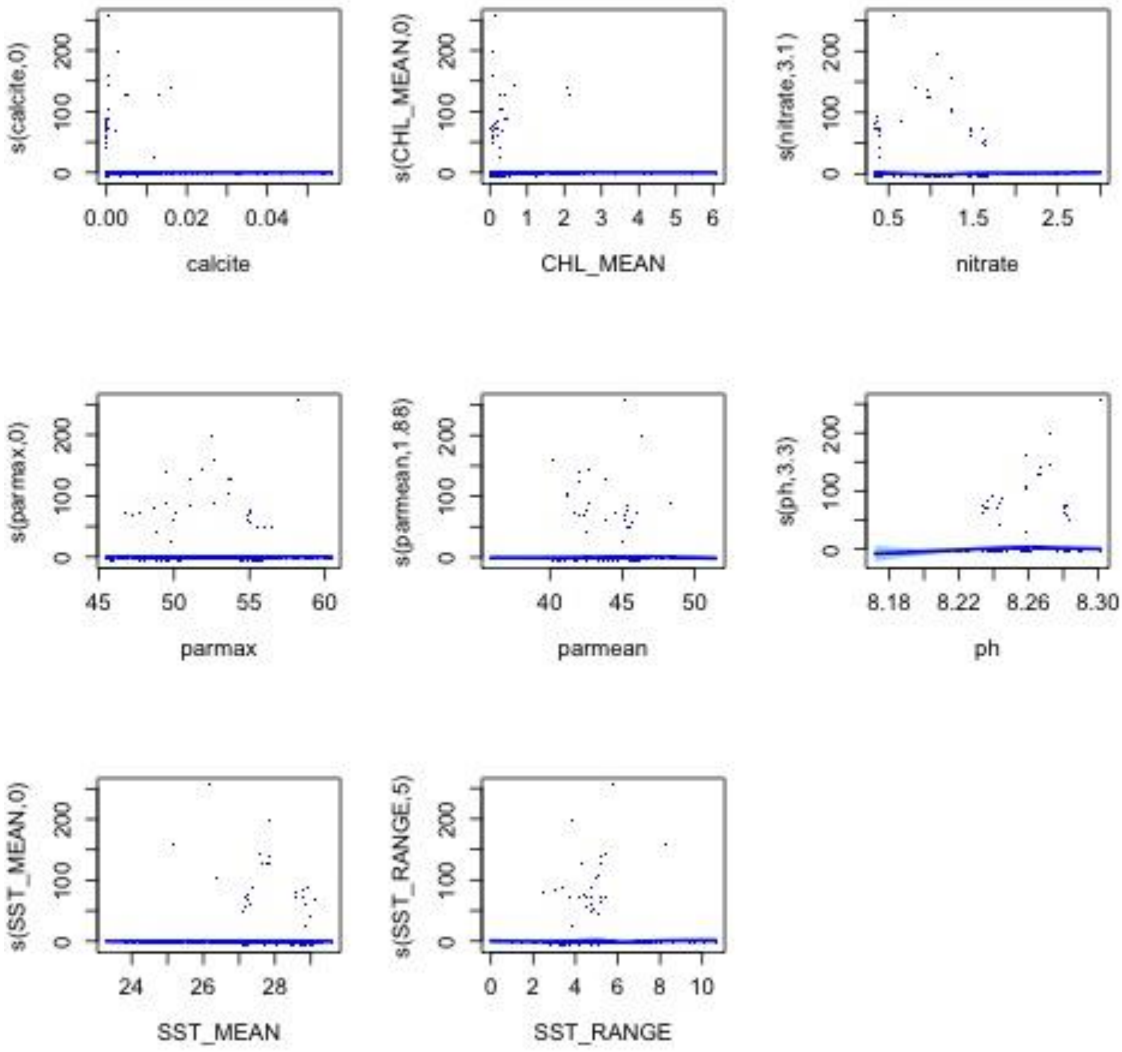
131Chromis amboinensis, n = 369 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.2455072	9	16.042476	1.686410e-04
s(CHL_MEAN)	0.7388036	9	2.479197	6.256090e-02
s(nitrate)	7.5453801	9	206.883454	5.692983e-48
s(parmax)	7.1301261	9	91.418344	6.733557e-19
s(parmean)	1.6645224	9	5.898282	1.308517e-02
s(ph)	4.4550479	9	22.949167	2.523915e-05
s(SST_MEAN)	7.2506170	9	50.590684	5.639713e-10
s(SST_RANGE)	2.3781157	9	5.307602	6.262384e-02



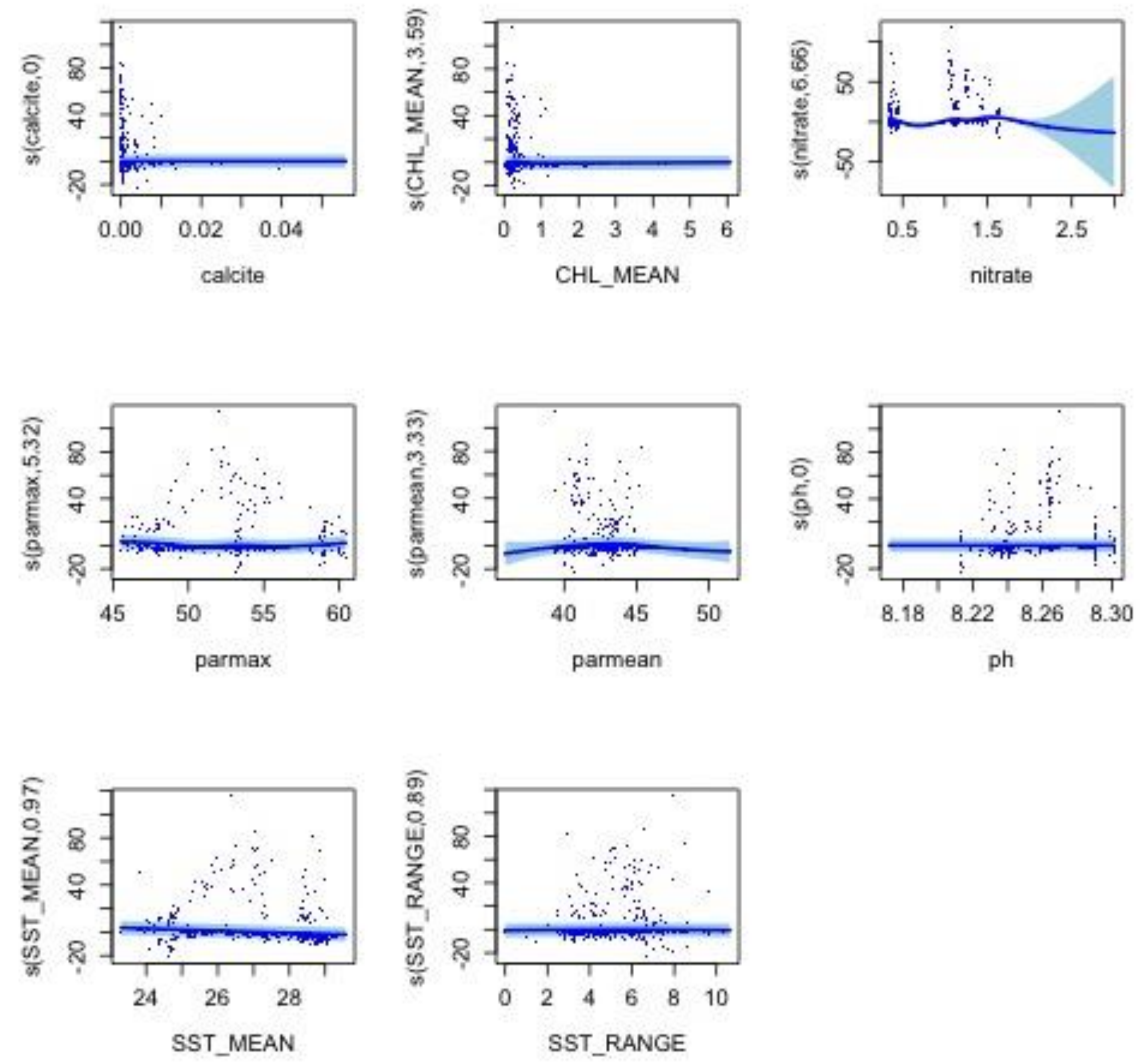
132Chromis analis, n = 36 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.681326e-05	9	2.998684e-06	8.779104e-01
s(CHL_MEAN)	1.202213e-05	9	3.726519e-06	6.361537e-01
s(nitrate)	3.102354e+00	9	3.320813e+01	2.417853e-09
s(parmax)	1.728264e-05	9	9.098585e-06	5.307084e-01
s(parmean)	1.877764e+00	9	6.432230e+00	1.147398e-02
s(ph)	3.304475e+00	9	1.668075e+01	1.333879e-04
s(SST_MEAN)	7.771643e-06	9	2.203782e-06	7.813391e-01
s(SST_RANGE)	5.003551e+00	9	1.896586e+01	7.659705e-04



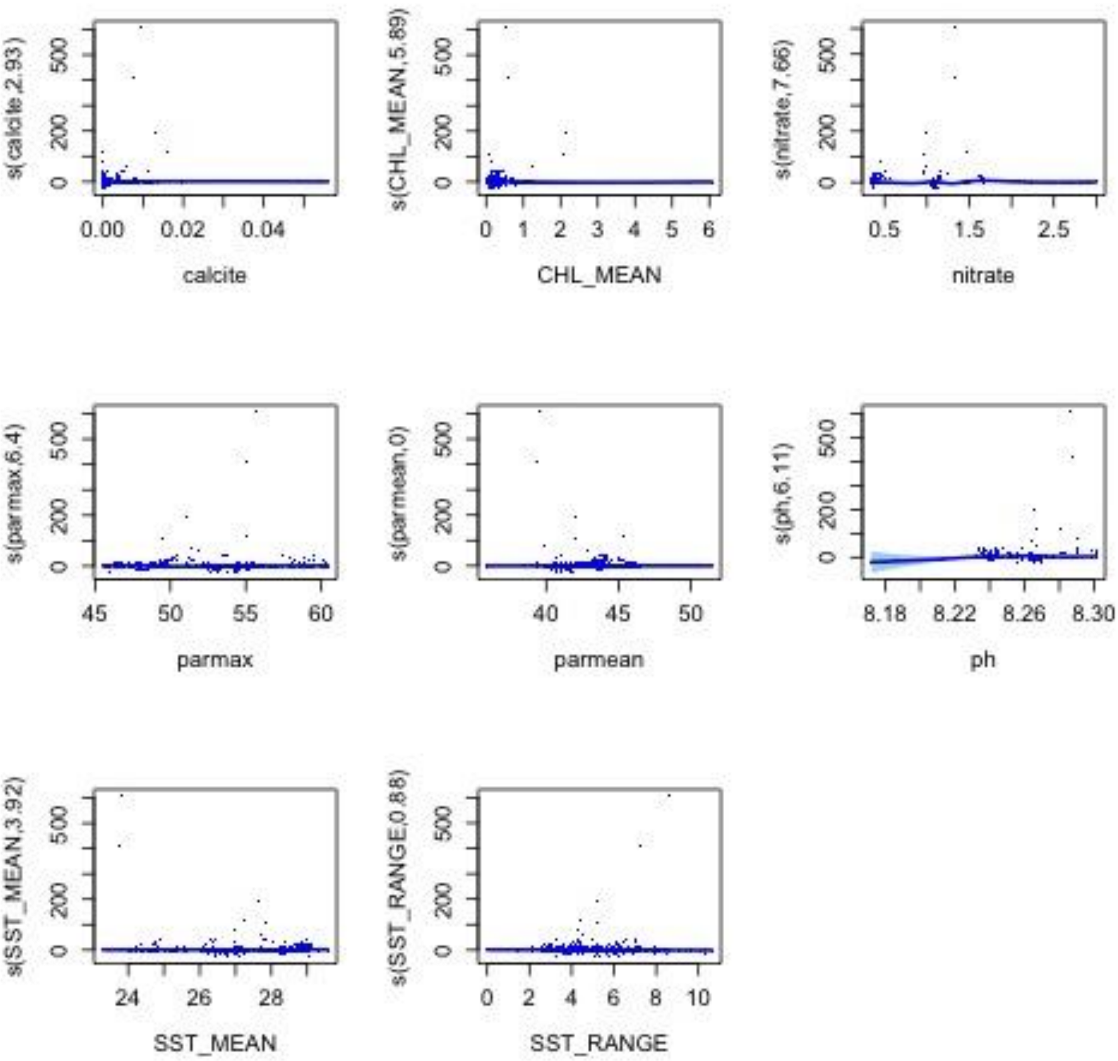
133Chromis atripectoralis, n = 154 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.000215713	8	1.317898e-04	4.438117e-01
s(CHL_MEAN)	3.590191185	9	3.509661e+01	3.380754e-08
s(nitrate)	6.657100947	9	9.904638e+01	8.462648e-22
s(parmax)	5.315034790	9	5.996318e+01	4.603007e-14
s(parmean)	3.325255190	9	2.016736e+01	1.676939e-05
s(ph)	0.000129126	9	3.890019e-05	6.612643e-01
s(SST_MEAN)	0.969734706	9	2.934991e+01	8.973103e-12
s(SST_RANGE)	0.887706388	9	1.649378e+00	1.274643e-01



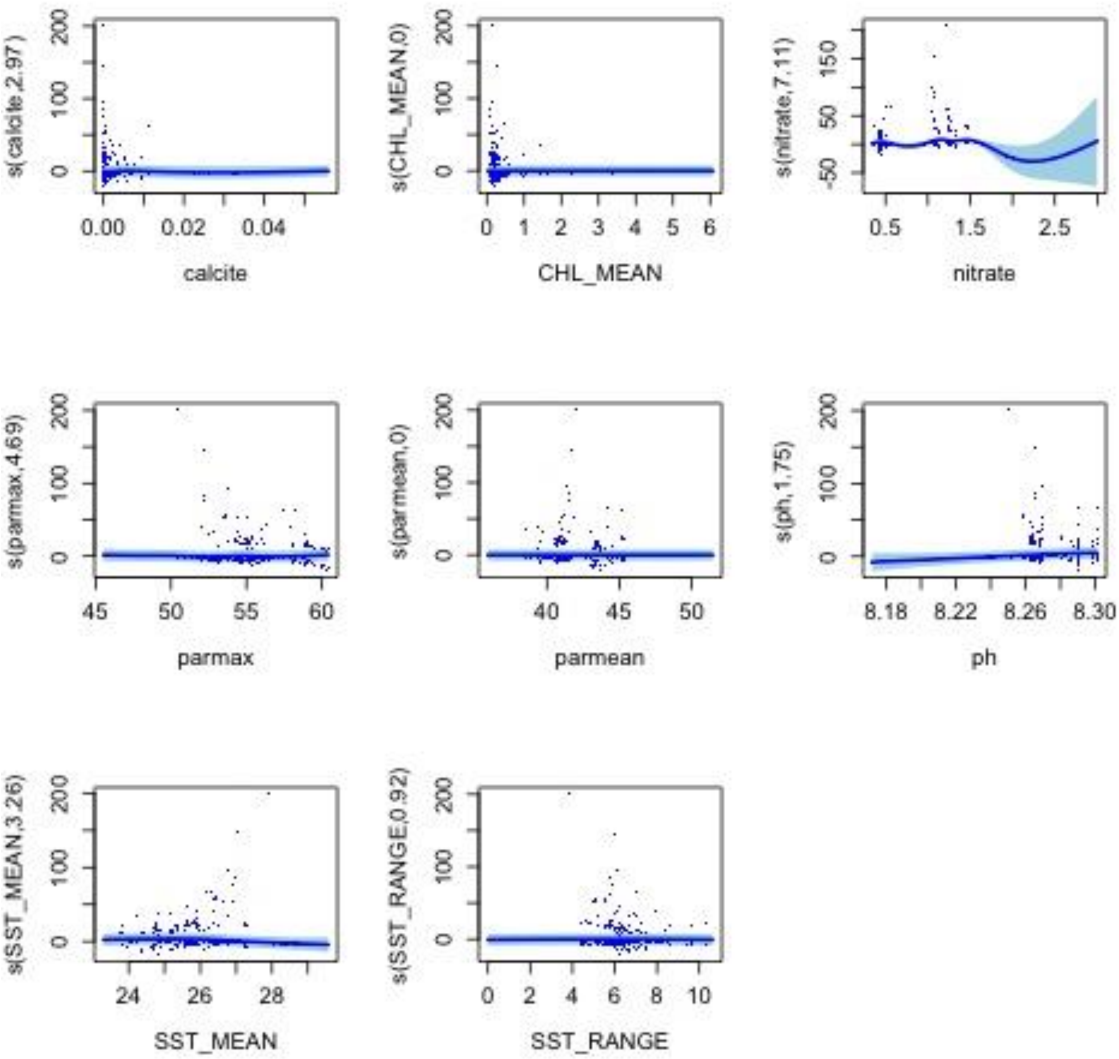
134Chromis atripes, n = 397 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.930484e+00	9	3.057202e+01	2.539274e-07
s(CHL_MEAN)	5.885324e+00	9	4.620678e+01	3.777735e-09
s(nitrate)	7.657488e+00	9	2.636760e+02	9.111576e-60
s(parmax)	6.404930e+00	9	8.118252e+01	7.589811e-18
s(parmean)	7.718824e-05	9	4.122167e-06	1.000000e+00
s(ph)	6.111515e+00	9	5.078746e+01	5.777443e-11
s(SST_MEAN)	3.921157e+00	9	2.189440e+01	2.336710e-05
s(SST_RANGE)	8.770957e-01	9	6.721599e+00	4.790628e-03



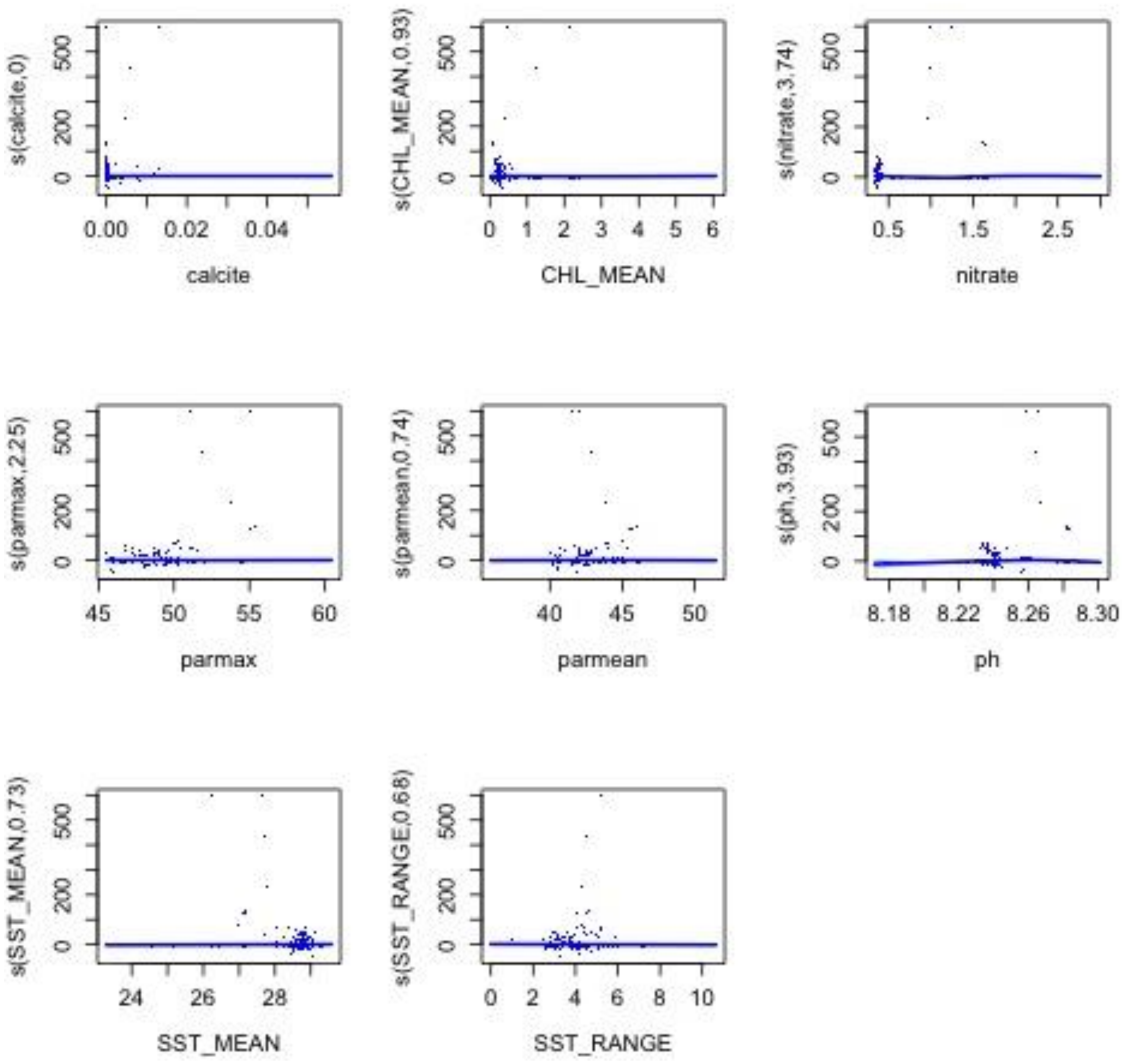
135Chromis chrysura, n = 178 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.971156e+00	9	1.325166e+01	2.245591e-03
s(CHL_MEAN)	8.665097e-06	9	1.860519e-06	6.698320e-01
s(nitrate)	7.112349e+00	9	7.021585e+01	9.673865e-15
s(parmax)	4.690157e+00	9	3.560268e+01	5.160530e-08
s(parmean)	1.147931e-03	9	7.049143e-04	4.681784e-01
s(ph)	1.748833e+00	9	1.677219e+01	2.381133e-05
s(SST_MEAN)	3.261125e+00	9	4.229820e+01	1.218240e-11
s(SST_RANGE)	9.219079e-01	9	1.903940e+00	1.140118e-01



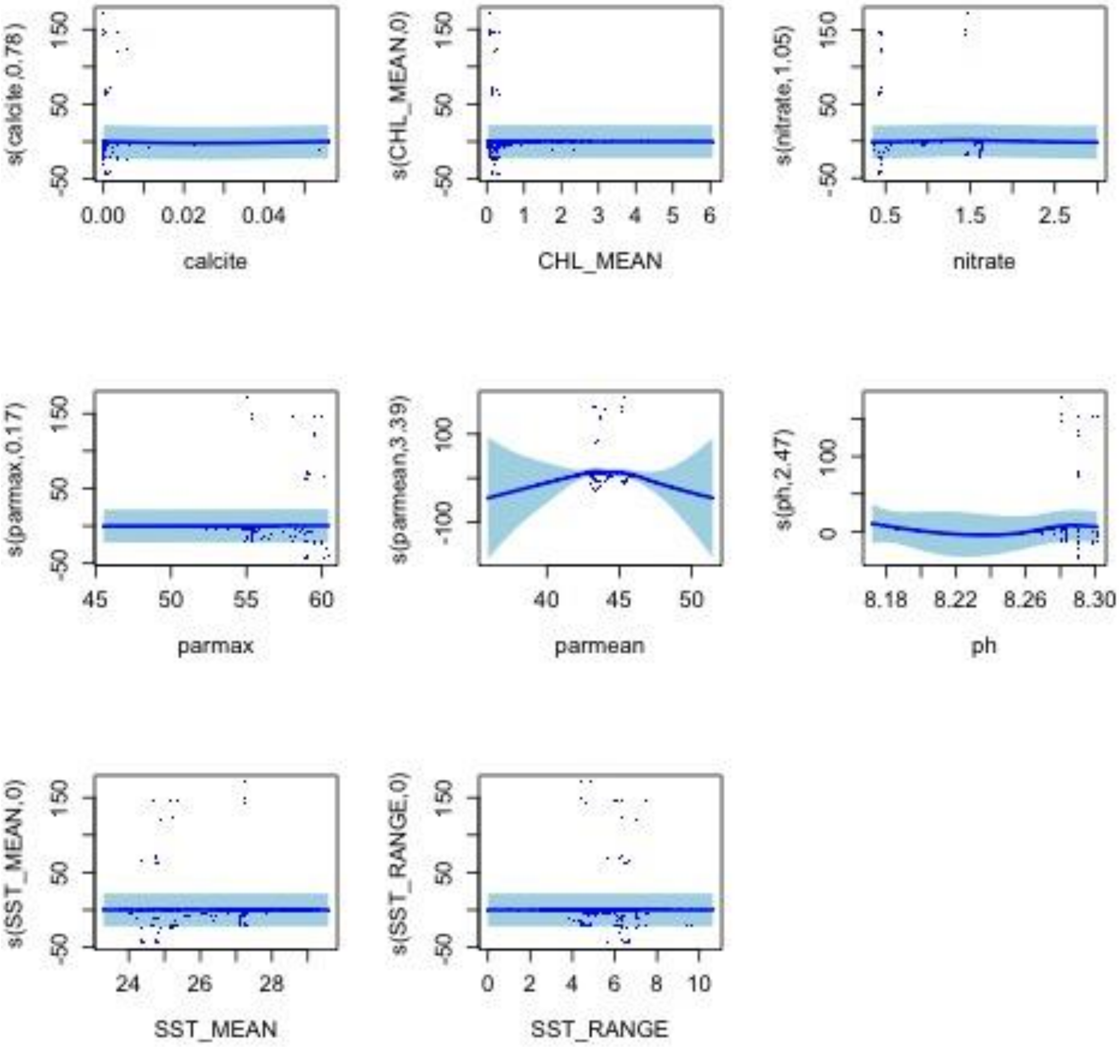
136Chromis delta, n = 48 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.877306e-07	9	4.759581e-07	5.204311e-01
s(CHL_MEAN)	9.279103e-01	9	4.858733e+00	1.593982e-02
s(nitrate)	3.740570e+00	9	7.134137e+01	1.282289e-19
s(parmax)	2.245123e+00	9	5.354798e+00	3.763224e-02
s(parmean)	7.364751e-01	9	9.987083e-01	2.101316e-01
s(ph)	3.926223e+00	9	2.767663e+01	2.269837e-07
s(SST_MEAN)	7.316865e-01	9	2.018639e+00	7.810999e-02
s(SST_RANGE)	6.846830e-01	6	2.057921e+00	7.398568e-02



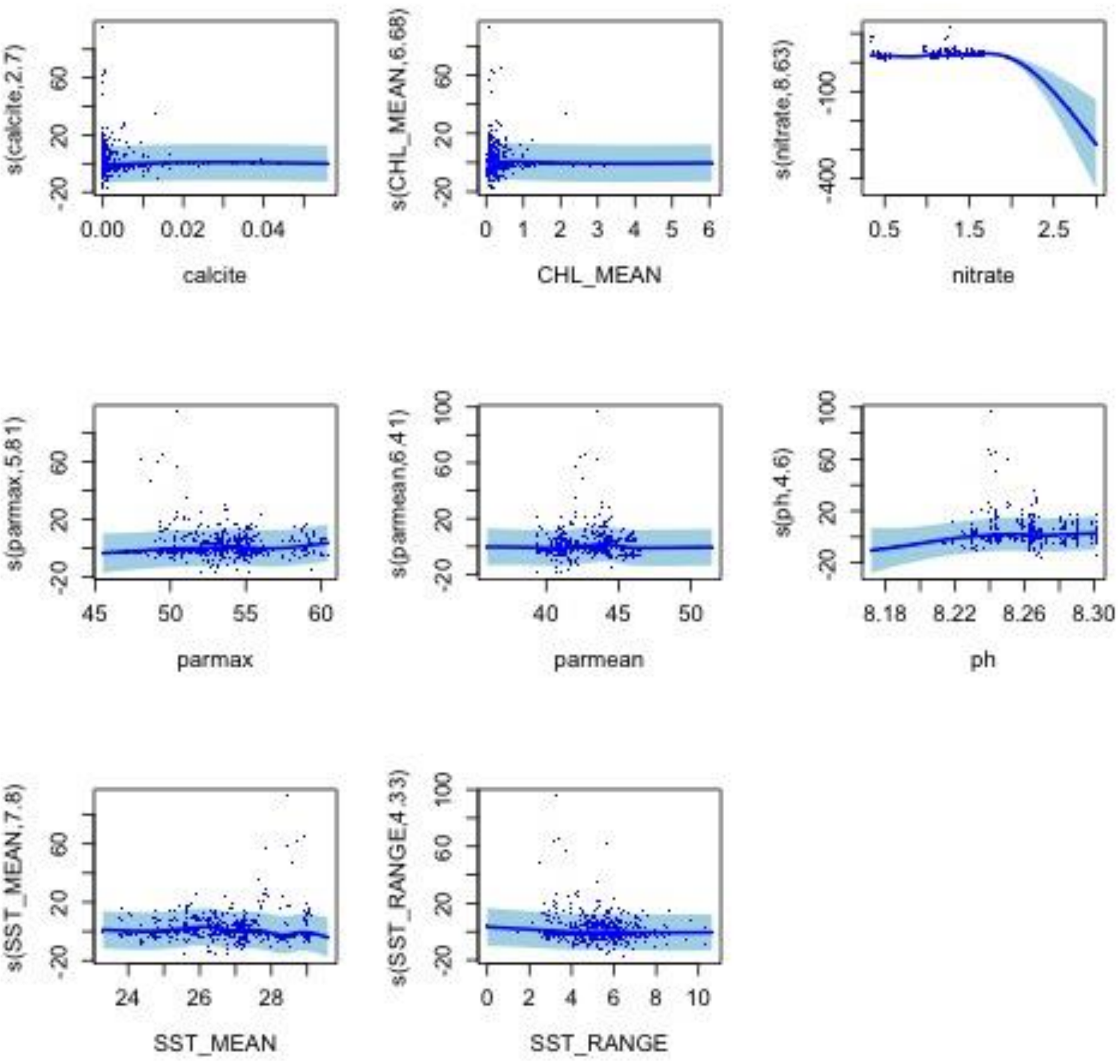
137Chromis flavomaculata, n = 34 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.770746e-01	9	2.282208e+00	0.0741737481
s(CHL_MEAN)	5.104617e-06	9	8.550307e-07	0.7019638741
s(nitrate)	1.048035e+00	9	1.484431e+00	0.1658498873
s(parmax)	1.650835e-01	7	8.430531e-02	0.4519803057
s(parmean)	3.388549e+00	9	1.440819e+01	0.0006330231
s(ph)	2.466135e+00	9	1.113971e+01	0.0013337411
s(SST_MEAN)	7.253847e-06	9	3.849684e-06	0.4883457111
s(SST_RANGE)	4.350623e-06	9	1.912898e-06	0.5652395456



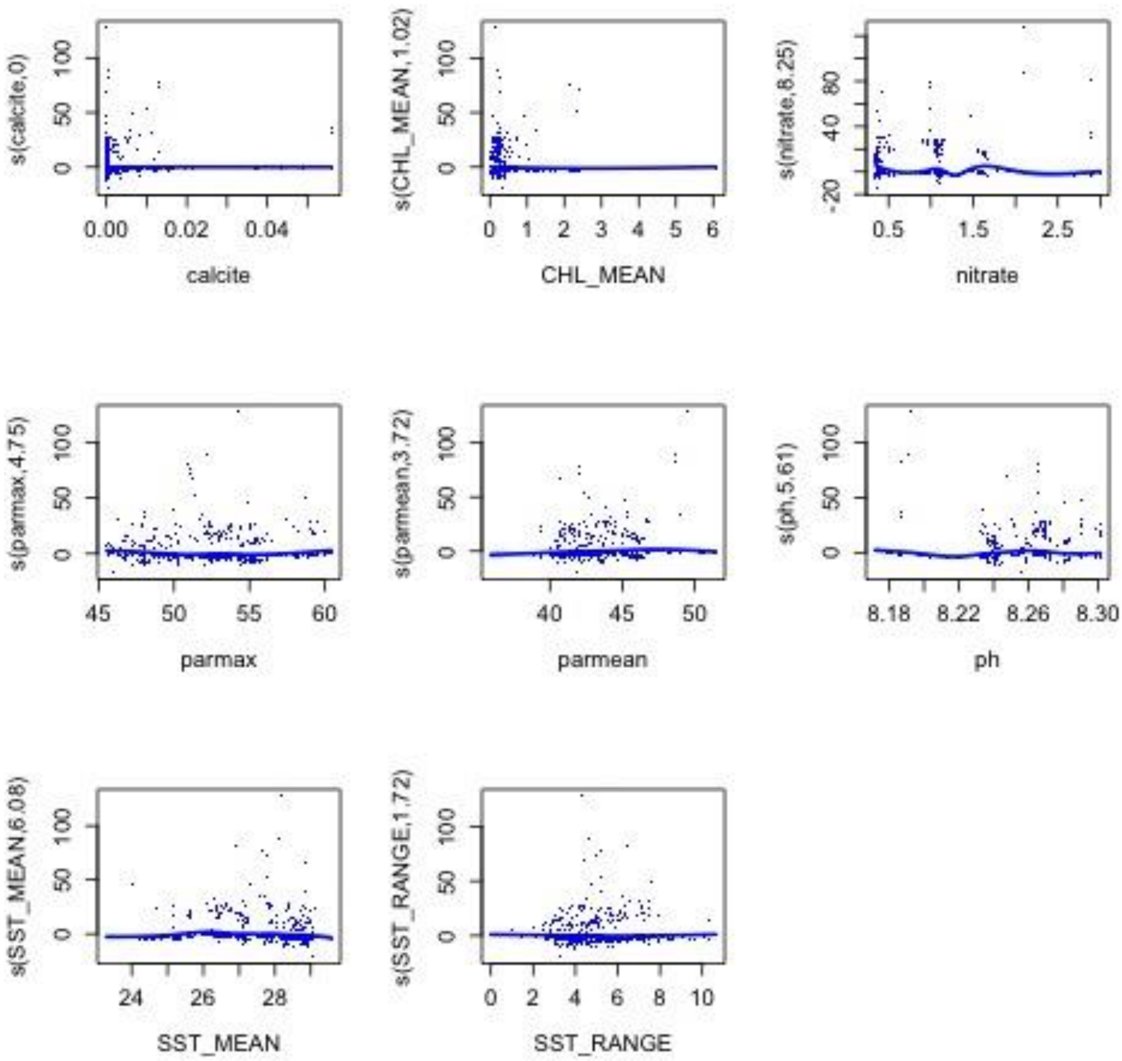
138Chromis iomelas, n = 1036 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.695543	9	16.35915	3.372158e-04
s(CHL_MEAN)	6.681150	9	89.36629	2.786319e-18
s(nitrate)	8.634099	9	324.81016	2.162419e-74
s(parmax)	5.807914	9	59.04955	5.539851e-13
s(parmean)	6.410273	9	60.31327	8.151915e-13
s(ph)	4.604357	9	28.87501	7.227651e-07
s(SST_MEAN)	7.798419	9	124.33681	7.937325e-28
s(SST_RANGE)	4.328273	9	15.48383	1.812132e-03



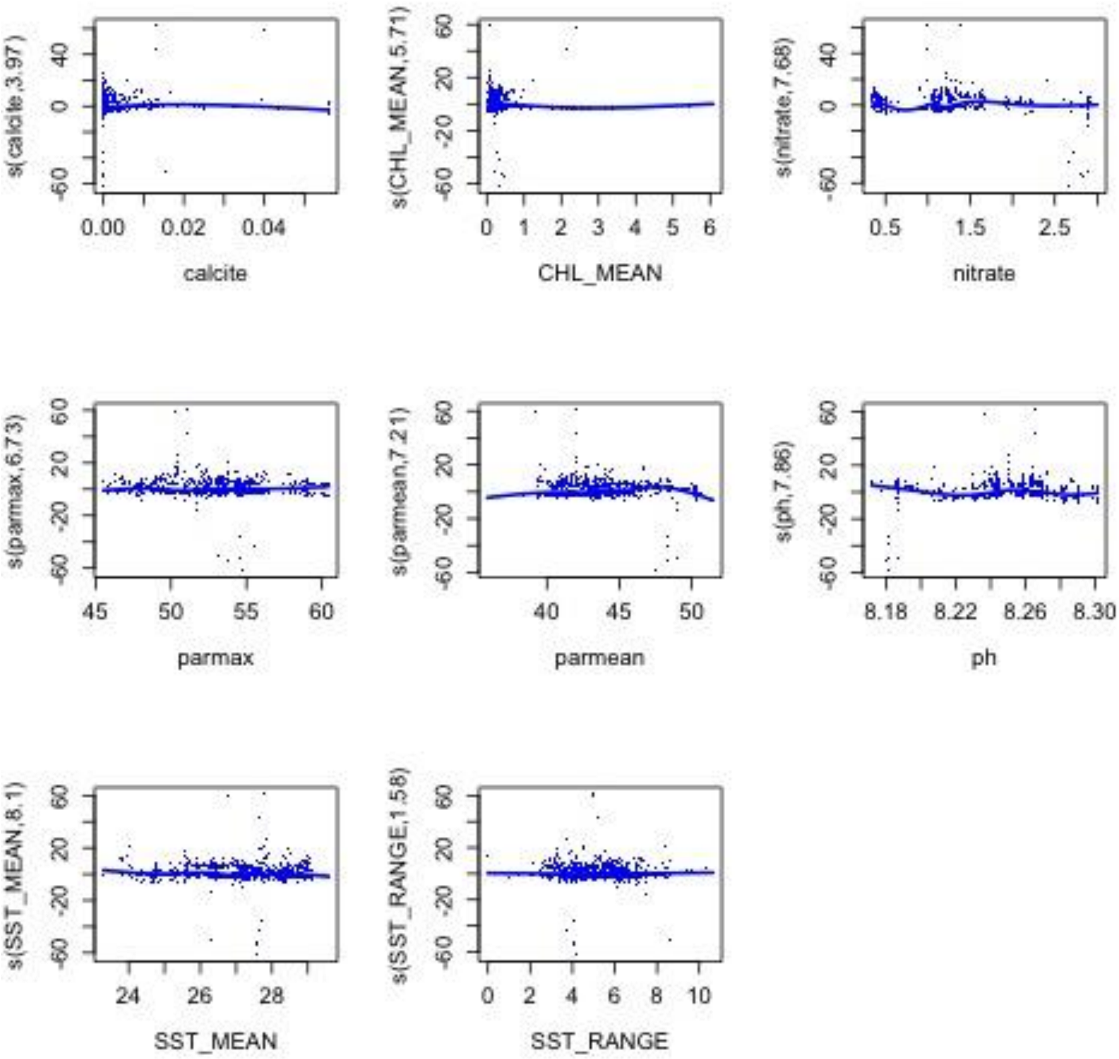
139Chromis lepidolepis, n = 204 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.670634e-05	9	6.661349e-06	9.002501e-01
s(CHL_MEAN)	1.022058e+00	9	6.765197e+00	4.608445e-03
s(nitrate)	8.253499e+00	9	1.377167e+02	6.282244e-31
s(parmax)	4.751863e+00	9	4.784665e+01	2.563169e-11
s(parmean)	3.723289e+00	9	2.385587e+01	3.190830e-06
s(ph)	5.611190e+00	9	2.794521e+01	6.395771e-06
s(SST_MEAN)	6.078064e+00	9	4.050828e+01	8.965817e-09
s(SST_RANGE)	1.723709e+00	9	5.321328e+00	2.396604e-02



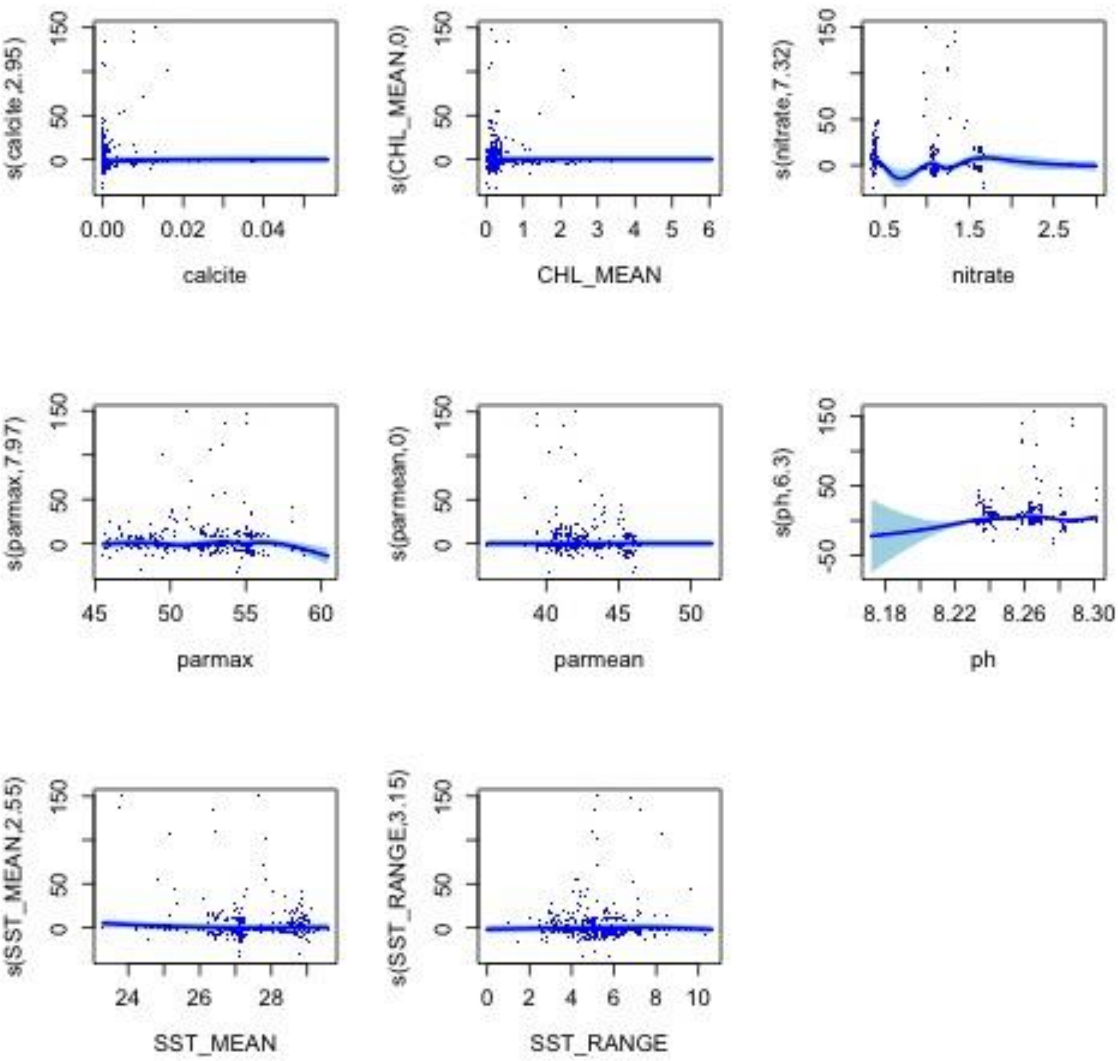
140Chromis margaritifer, n = 1812 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.972366	9	58.084372	7.589199e-13
s(CHL_MEAN)	5.709806	9	73.206995	1.948854e-15
s(nitrate)	7.682482	9	231.342320	3.768433e-51
s(parmax)	6.727377	9	47.008047	2.453239e-09
s(parmean)	7.214594	9	238.323319	6.464006e-54
s(ph)	7.855081	9	176.283773	3.051175e-39
s(SST_MEAN)	8.104764	9	61.450888	1.020759e-11
s(SST_RANGE)	1.578222	9	3.208505	9.455791e-02



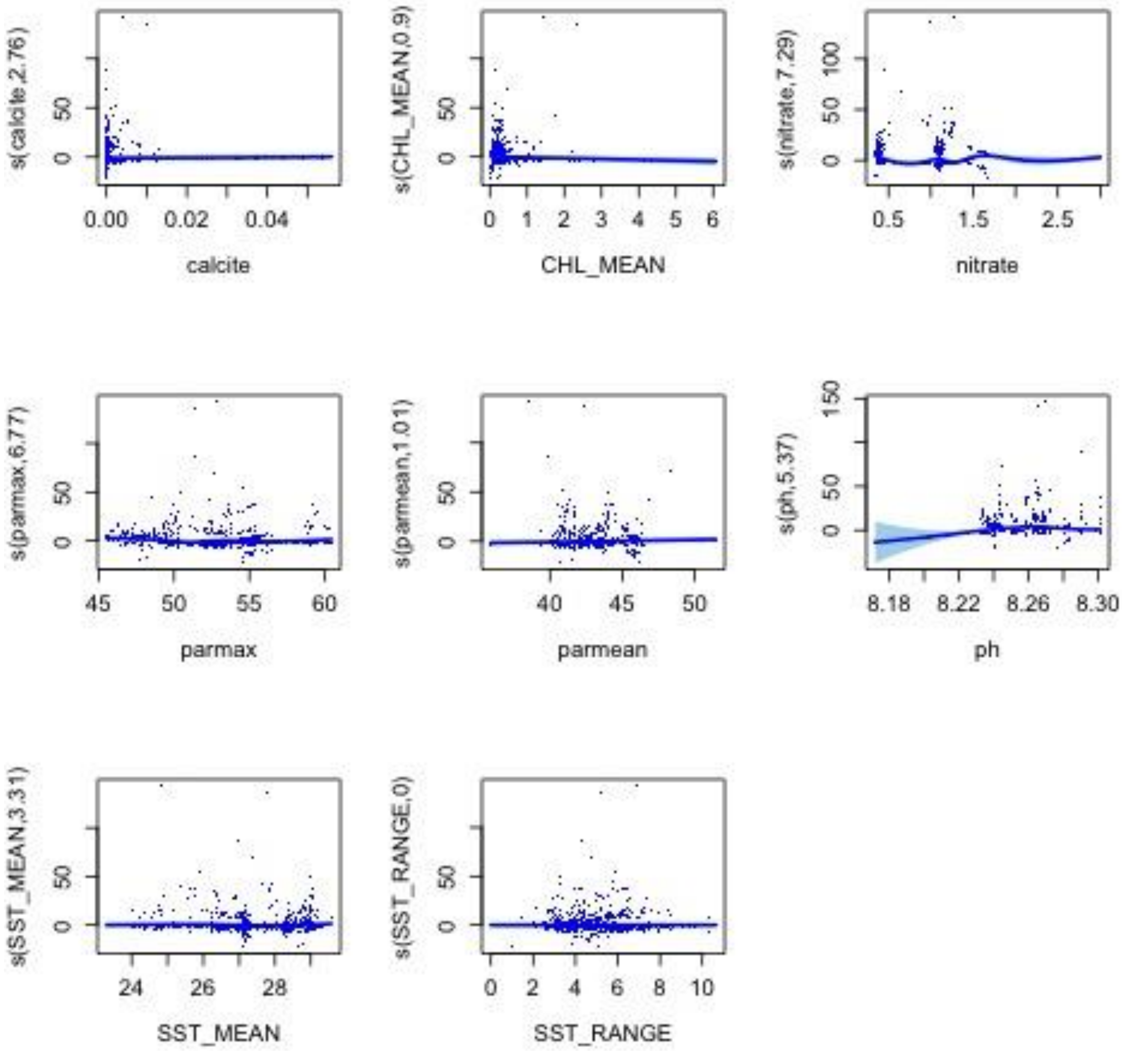
141Chromis retrofasciata, n = 272 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.953361e+00	9	3.740951e+01	6.615215e-09
s(CHL_MEAN)	2.066698e-05	9	9.688963e-06	4.987018e-01
s(nitrate)	7.318351e+00	9	1.996462e+02	3.643680e-44
s(parmax)	7.966669e+00	9	7.410451e+01	2.190826e-14
s(parmean)	6.685135e-05	9	3.388607e-05	5.505210e-01
s(ph)	6.304835e+00	9	5.780568e+01	3.616186e-12
s(SST_MEAN)	2.554565e+00	9	1.311341e+01	4.088521e-04
s(SST_RANGE)	3.152454e+00	9	1.130235e+01	4.331702e-03



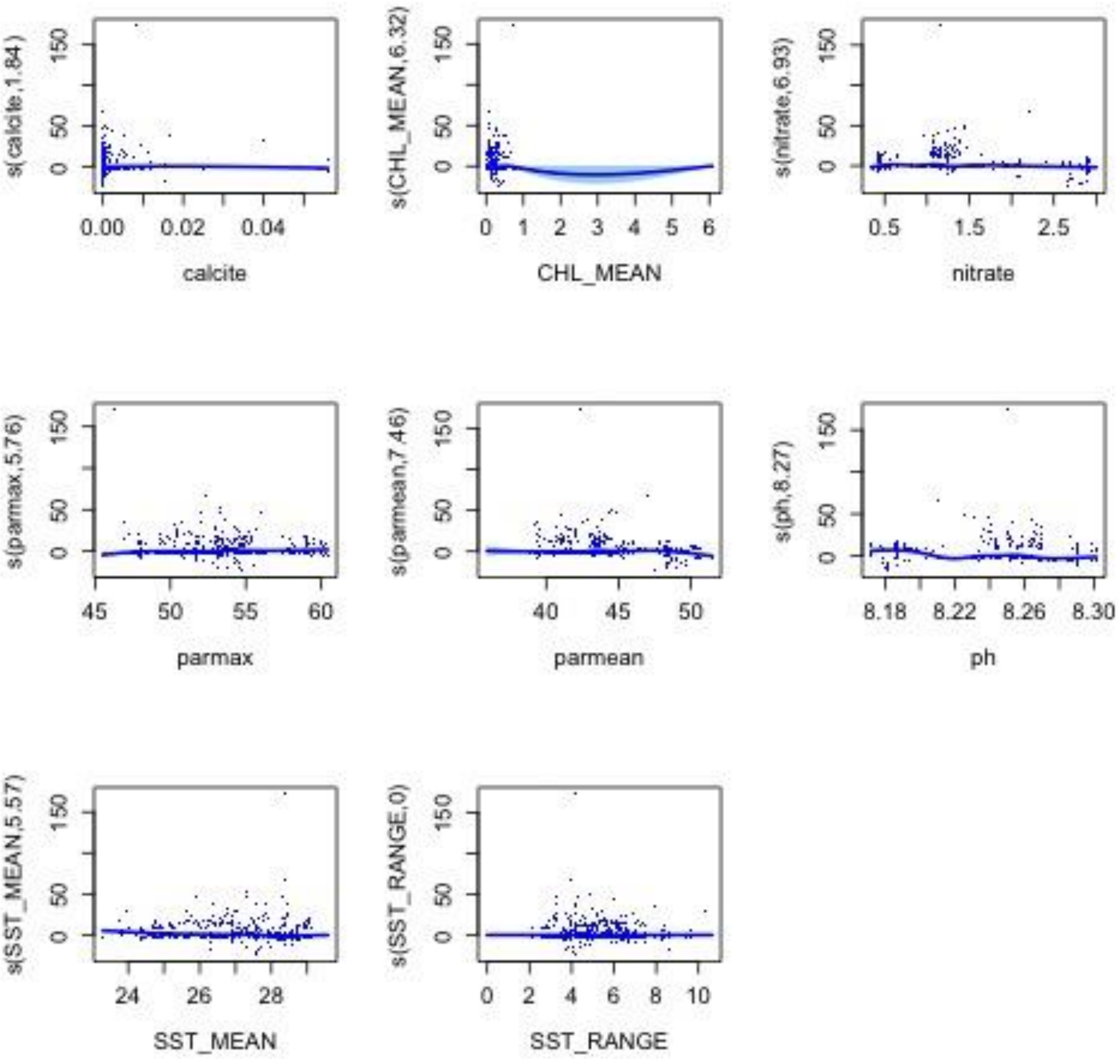
142Chromis ternatensis, n = 366 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.762509e+00	9	3.524765e+01	1.245904e-08
s(CHL_MEAN)	8.976472e-01	9	7.999053e+00	2.276697e-03
s(nitrate)	7.291551e+00	9	2.601566e+02	1.423693e-60
s(parmax)	6.774530e+00	9	8.954252e+01	9.171022e-20
s(parmean)	1.013349e+00	9	8.438306e+00	1.137541e-03
s(ph)	5.370895e+00	9	5.382735e+01	1.419890e-12
s(SST_MEAN)	3.309225e+00	9	1.448351e+01	5.698793e-04
s(SST_RANGE)	6.845988e-05	9	3.272231e-05	6.035248e-01



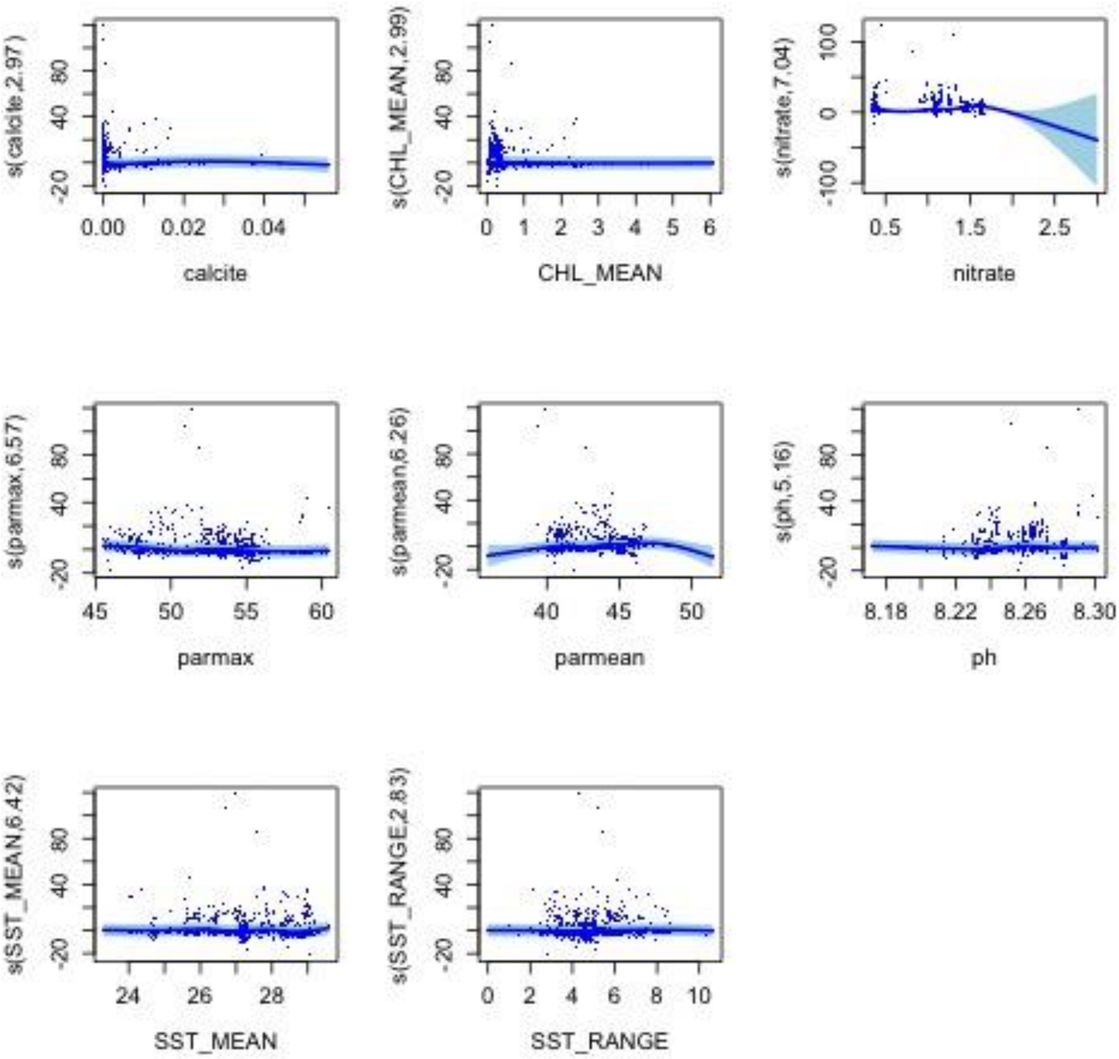
143Chromis vanderbilti, n = 908 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.8392801862	9	1.055166e+01	1.776511e-03
s(CHL_MEAN)	6.3163307555	9	6.024940e+01	3.412666e-12
s(nitrate)	6.9266192325	9	5.897585e+01	2.315390e-12
s(parmax)	5.7589364630	9	3.130561e+01	1.590053e-06
s(parmean)	7.4574501478	9	1.274907e+02	1.083891e-28
s(ph)	8.2742384134	9	1.618541e+02	1.440523e-36
s(SST_MEAN)	5.5742501885	9	4.098121e+01	5.121942e-09
s(SST_RANGE)	0.0004130938	9	1.010477e-05	9.826481e-01



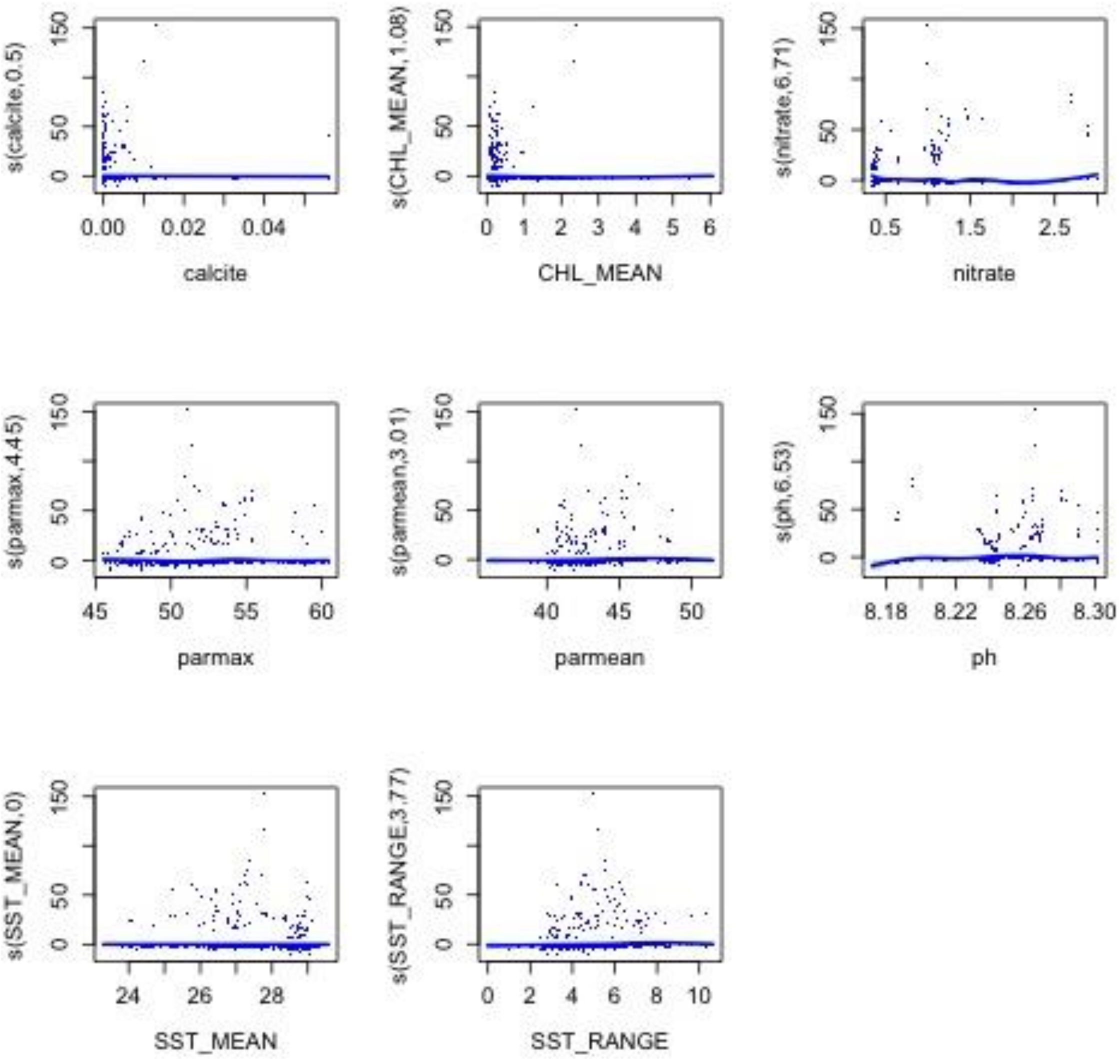
144Chromis viridis, n = 368 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.972308	9	26.87249	9.522124e-07
s(CHL_MEAN)	2.994422	9	22.40309	1.261381e-05
s(nitrate)	7.043214	9	135.40893	1.679696e-31
s(parmax)	6.573497	9	73.82104	5.288327e-16
s(parmean)	6.255803	9	56.16456	4.317801e-12
s(ph)	5.157585	9	46.16630	5.054311e-11
s(SST_MEAN)	6.422860	9	36.69071	1.766567e-07
s(SST_RANGE)	2.825721	9	11.40585	2.627373e-03



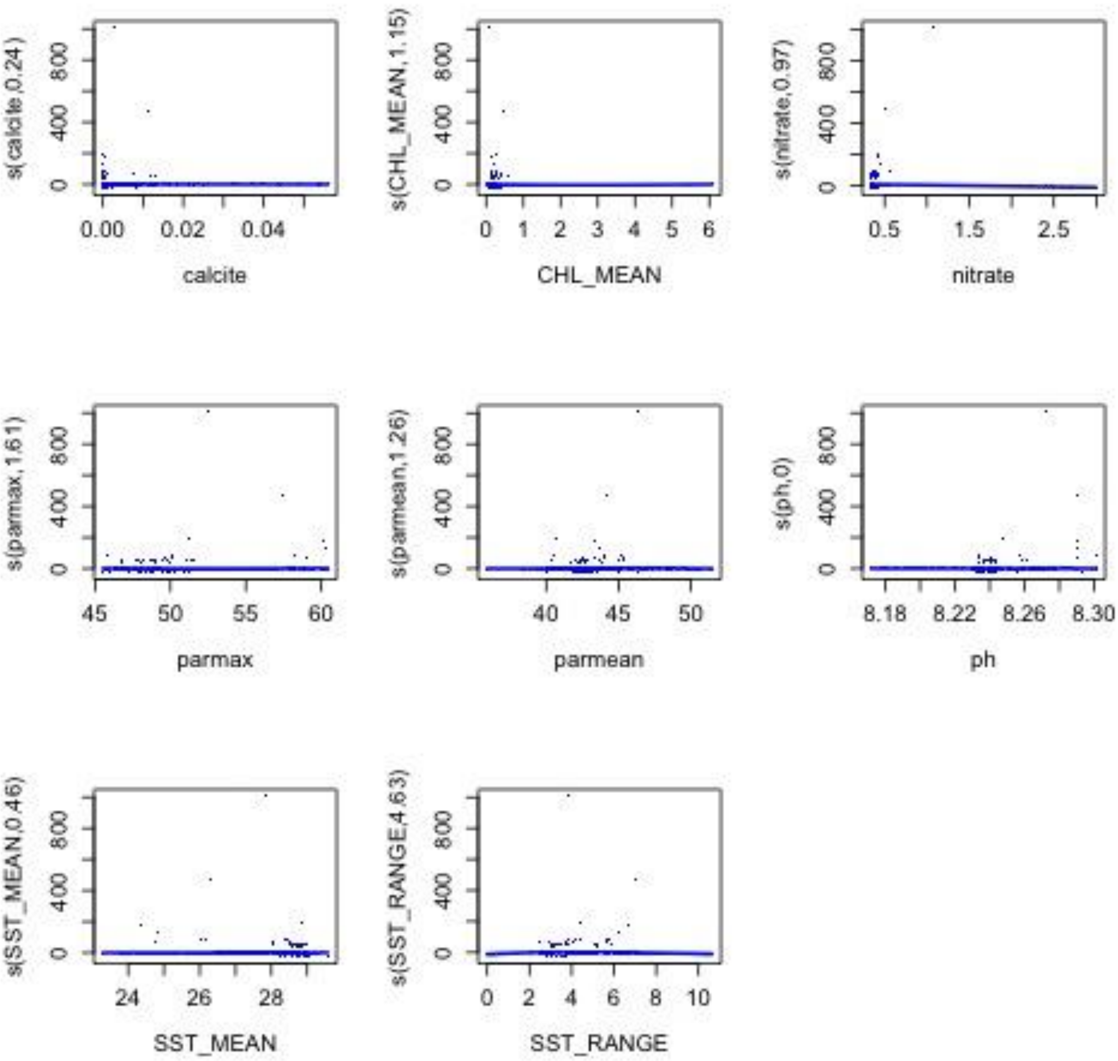
145Chromis weberi, n = 142 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.975200e-01	5	8.693461e-01	1.807714e-01
s(CHL_MEAN)	1.080236e+00	9	7.381631e+00	3.713919e-03
s(nitrate)	6.707415e+00	9	1.244966e+02	2.816690e-29
s(parmax)	4.450565e+00	9	2.470096e+01	8.390192e-06
s(parmean)	3.009232e+00	9	1.548154e+01	1.326088e-04
s(ph)	6.531423e+00	9	6.311999e+01	2.785237e-14
s(SST_MEAN)	6.927212e-05	9	3.148868e-05	5.983901e-01
s(SST_RANGE)	3.766412e+00	9	2.366280e+01	7.778456e-06



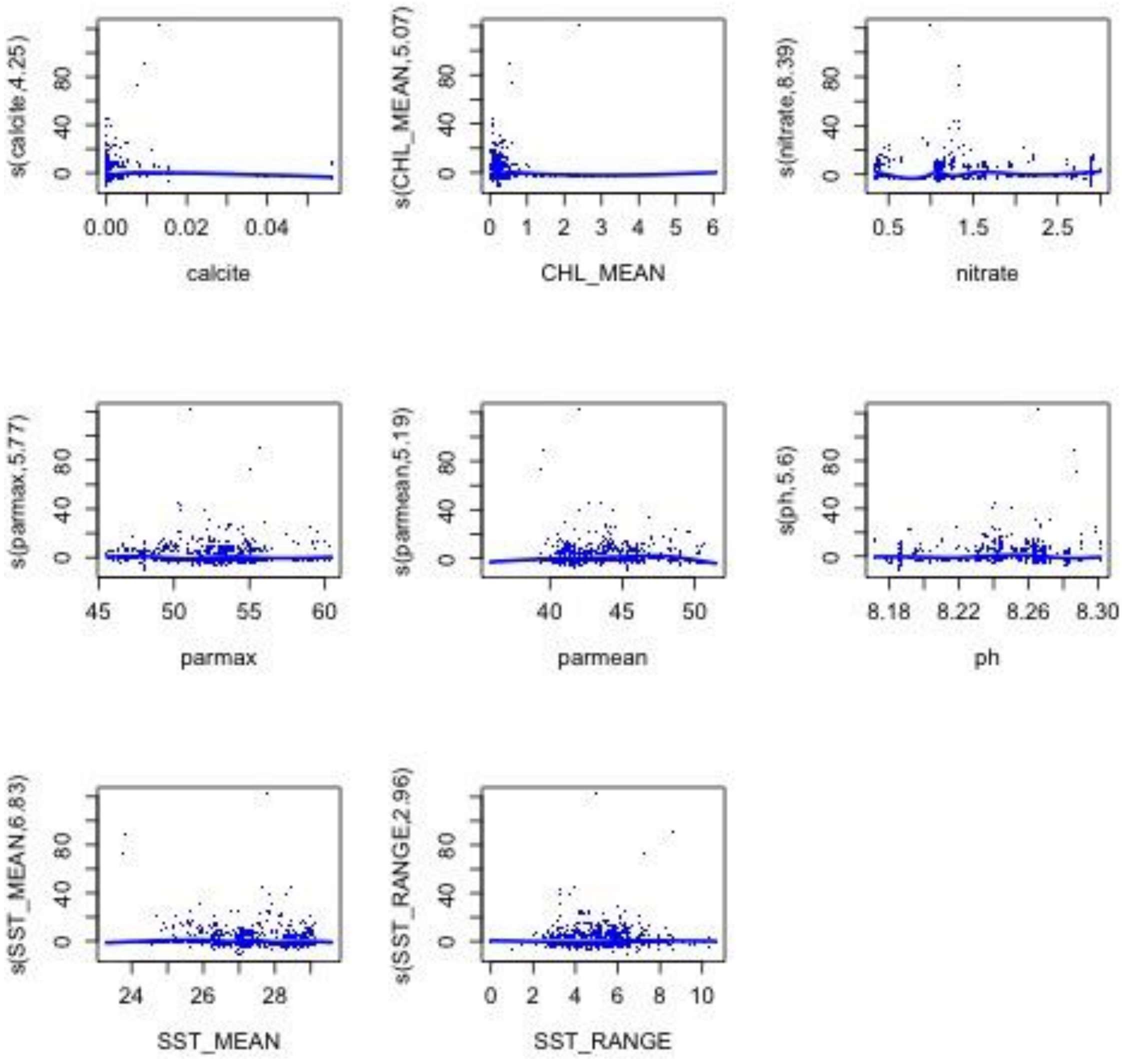
146Chromis xanthochira, n = 34 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.385882e-01	9	2.869941e-01	2.626776e-01
s(CHL_MEAN)	1.146758e+00	9	6.655372e+00	6.483802e-03
s(nitrate)	9.749912e-01	9	3.303968e+01	3.390921e-09
s(parmax)	1.614744e+00	9	6.729113e+00	7.483899e-03
s(parmean)	1.264533e+00	9	2.617749e+00	8.552019e-02
s(ph)	2.434239e-05	9	1.133784e-05	4.814303e-01
s(SST_MEAN)	4.600115e-01	9	9.080308e-01	1.478031e-01
s(SST_RANGE)	4.627861e+00	9	1.548023e+01	1.506593e-03



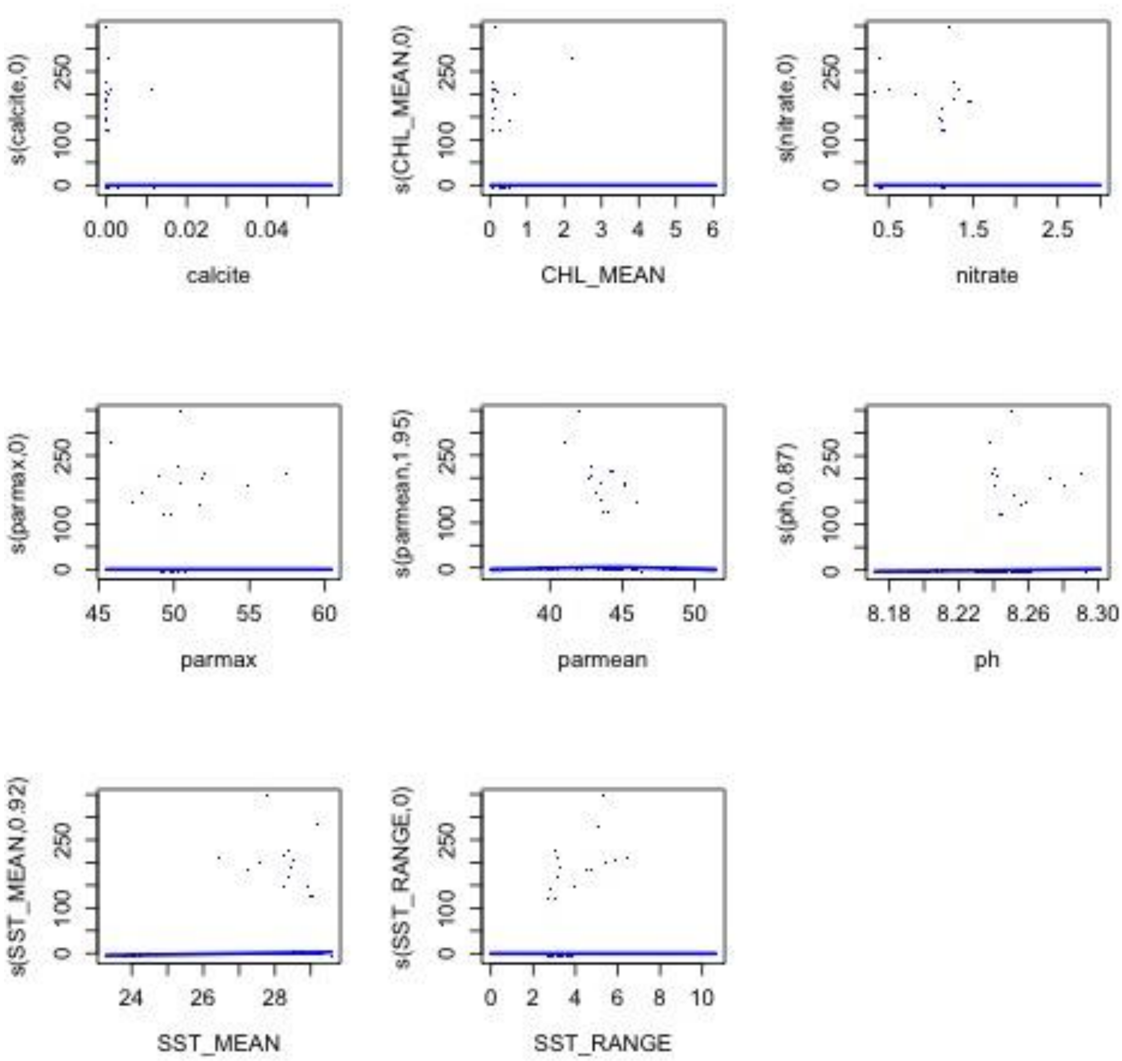
147Chromis xanthura, n = 1211 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.246613	9	77.14976	5.930849e-17
s(CHL_MEAN)	5.071819	9	38.69601	4.462241e-08
s(nitrate)	8.394177	9	241.15112	3.233440e-55
s(parmax)	5.765396	9	64.23432	2.755435e-14
s(parmean)	5.193470	9	120.11943	2.550063e-29
s(ph)	5.596218	9	38.99048	1.066710e-08
s(SST_MEAN)	6.831960	9	43.29248	1.278089e-08
s(SST_RANGE)	2.958665	9	13.46698	8.952748e-04



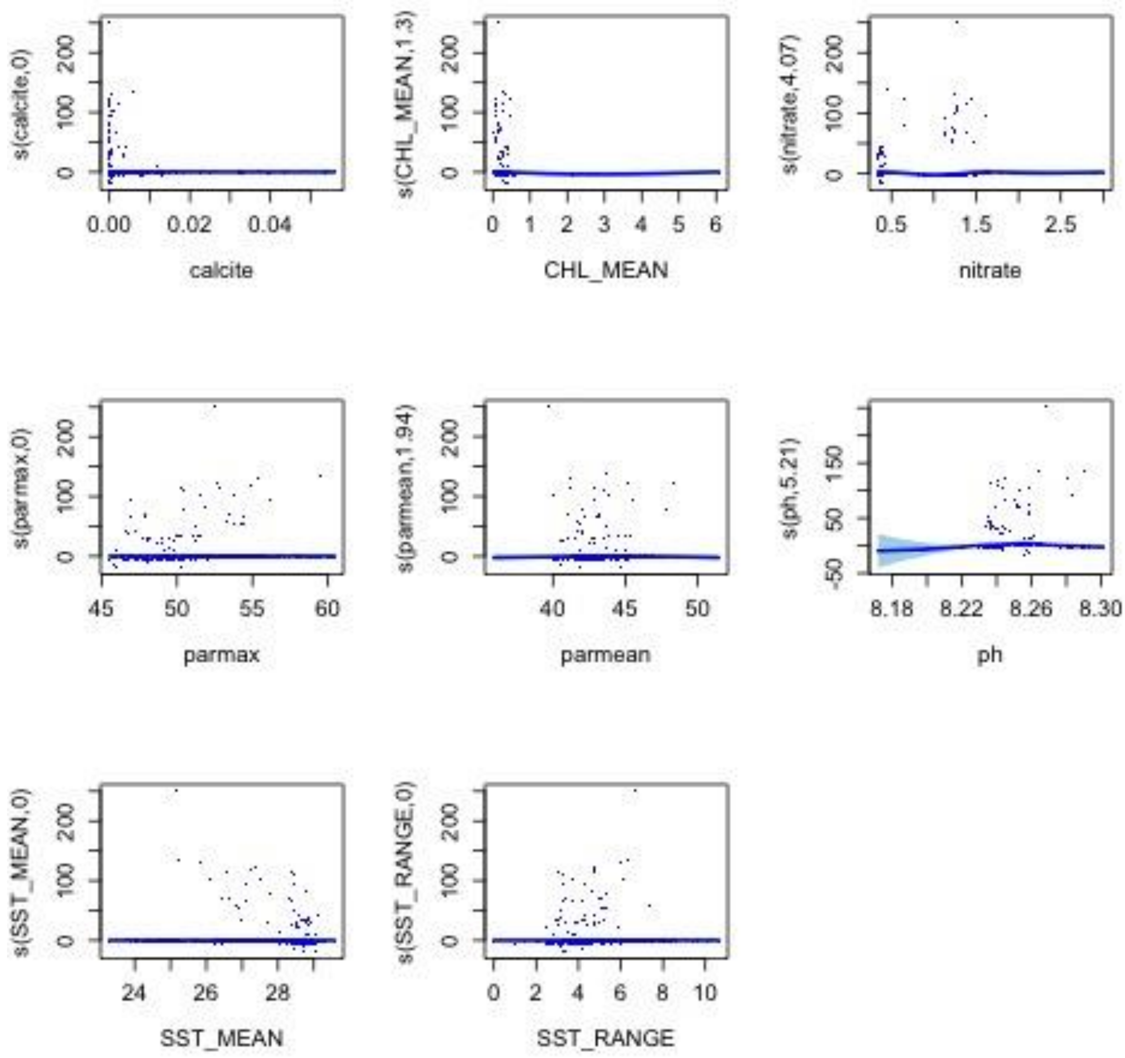
148Chrysiptera biocellata, n = 49 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.067203e-06	9	4.761938e-06	0.3813260908
s(CHL_MEAN)	1.269312e-06	9	4.883600e-08	0.9091906305
s(nitrate)	3.812135e-05	9	2.906553e-06	0.7842270997
s(parmax)	4.829634e-06	9	3.846071e-06	0.3820139845
s(parmean)	1.954804e+00	9	5.794283e+00	0.0315424440
s(ph)	8.685820e-01	9	6.246927e+00	0.0056880517
s(SST_MEAN)	9.168962e-01	8	9.925255e+00	0.0006269998
s(SST_RANGE)	1.052836e-05	9	8.788405e-06	0.3876145439



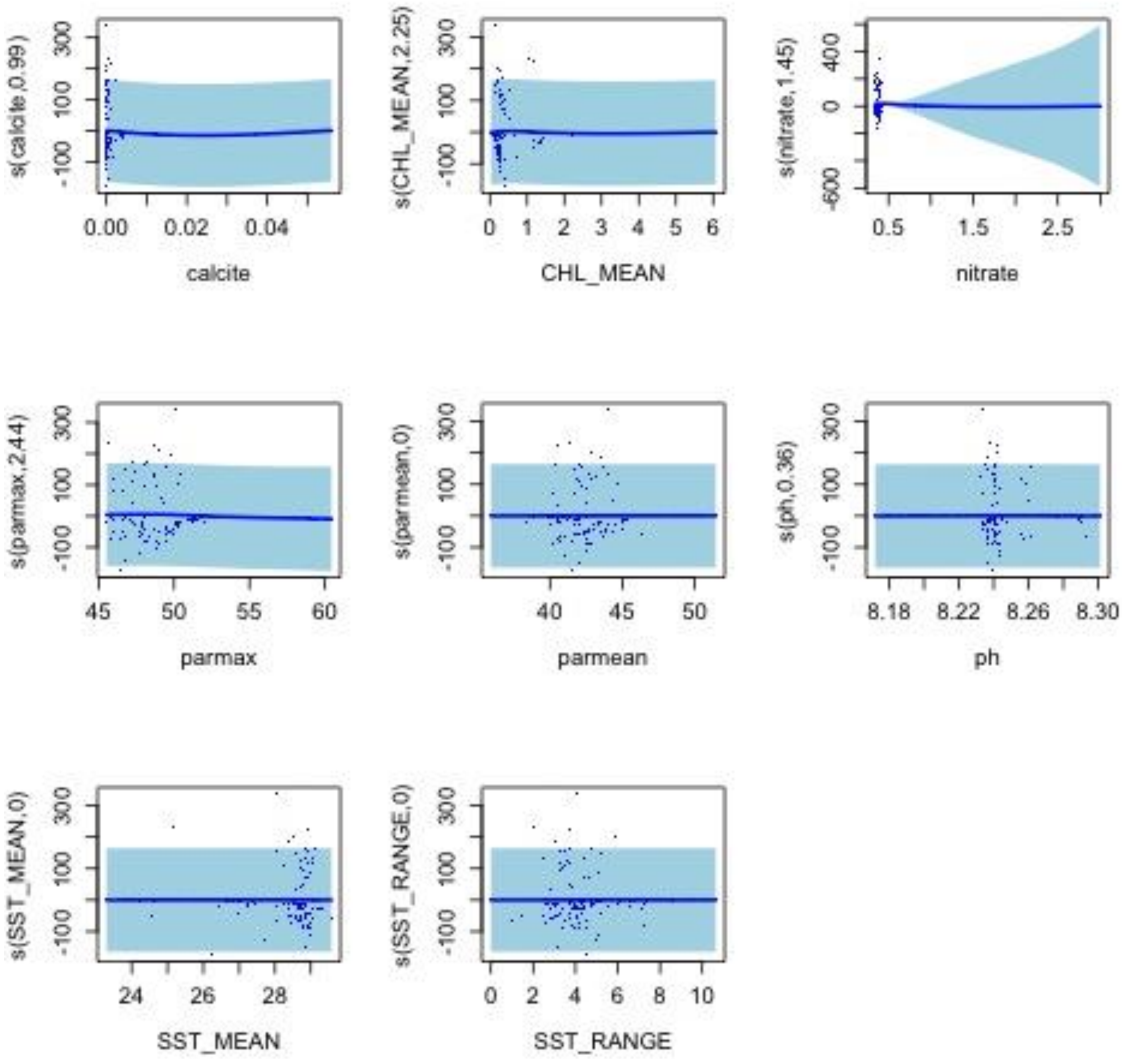
149Chrysiptera brownriggii, n = 251 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.682764e-06	9	2.300104e-06	5.699402e-01
s(CHL_MEAN)	1.300804e+00	9	5.697375e+00	1.747471e-02
s(nitrate)	4.072436e+00	9	8.192431e+01	5.598772e-22
s(parmax)	5.575905e-06	9	2.245260e-06	6.445321e-01
s(parmean)	1.940663e+00	9	6.853214e+00	1.154495e-02
s(ph)	5.206540e+00	9	4.889887e+01	2.059408e-11
s(SST_MEAN)	6.890242e-06	9	3.058519e-06	5.946562e-01
s(SST_RANGE)	3.907410e-06	9	4.815657e-07	1.000000e+00



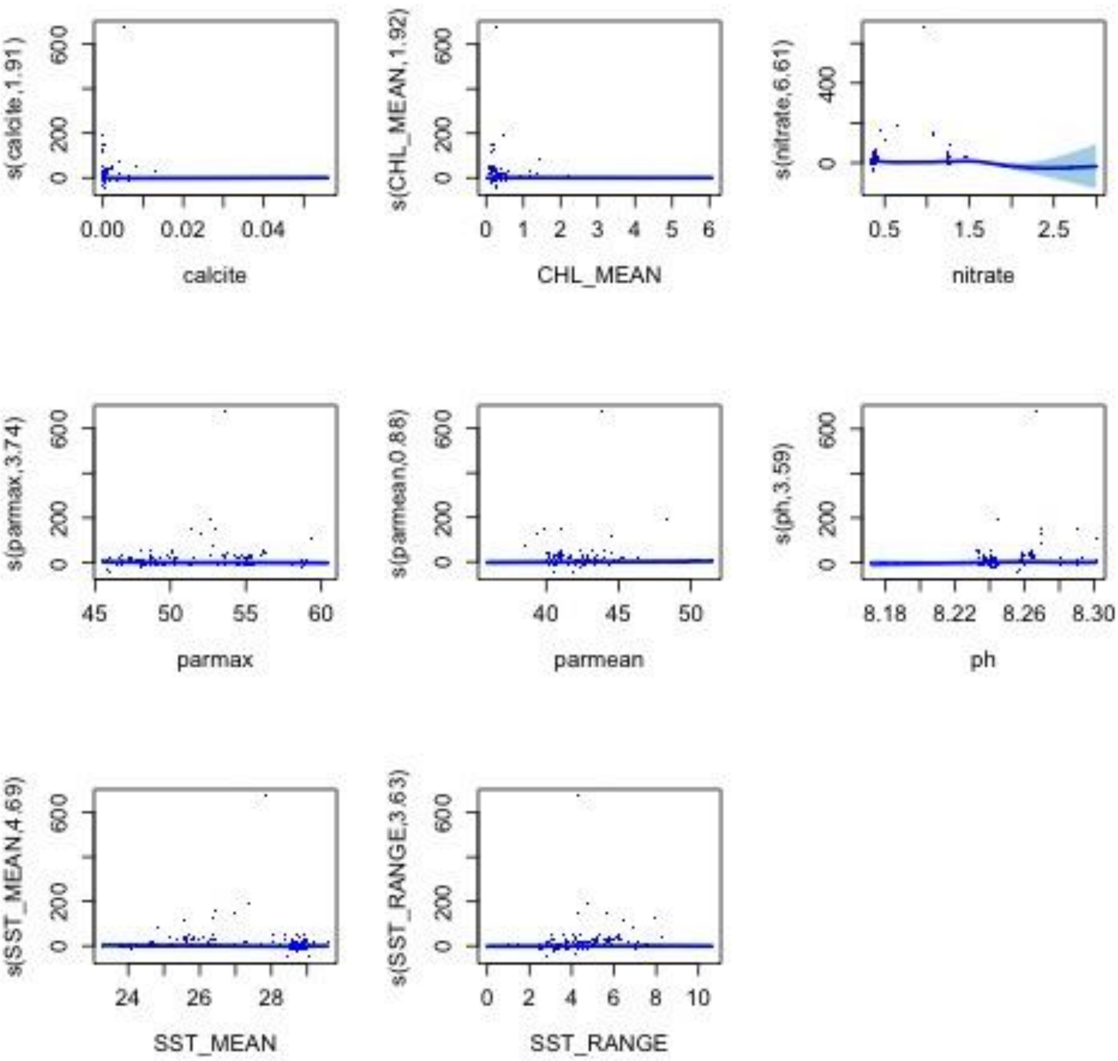
150Chrysiptera cyanea, n = 45 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.900968e-01	9	7.202091e+00	0.0038832503
s(CHL_MEAN)	2.246946e+00	9	1.334340e+01	0.0008298591
s(nitrate)	1.454168e+00	9	2.104425e+00	0.1966854963
s(parmax)	2.437319e+00	9	1.262050e+01	0.0012725538
s(parmean)	8.357776e-06	9	4.434936e-06	0.4753561462
s(ph)	3.649109e-01	9	5.109895e-01	0.2178234063
s(SST_MEAN)	9.919066e-06	9	1.569667e-06	0.8485299053
s(SST_RANGE)	3.084222e-05	9	2.030839e-05	0.4275788212



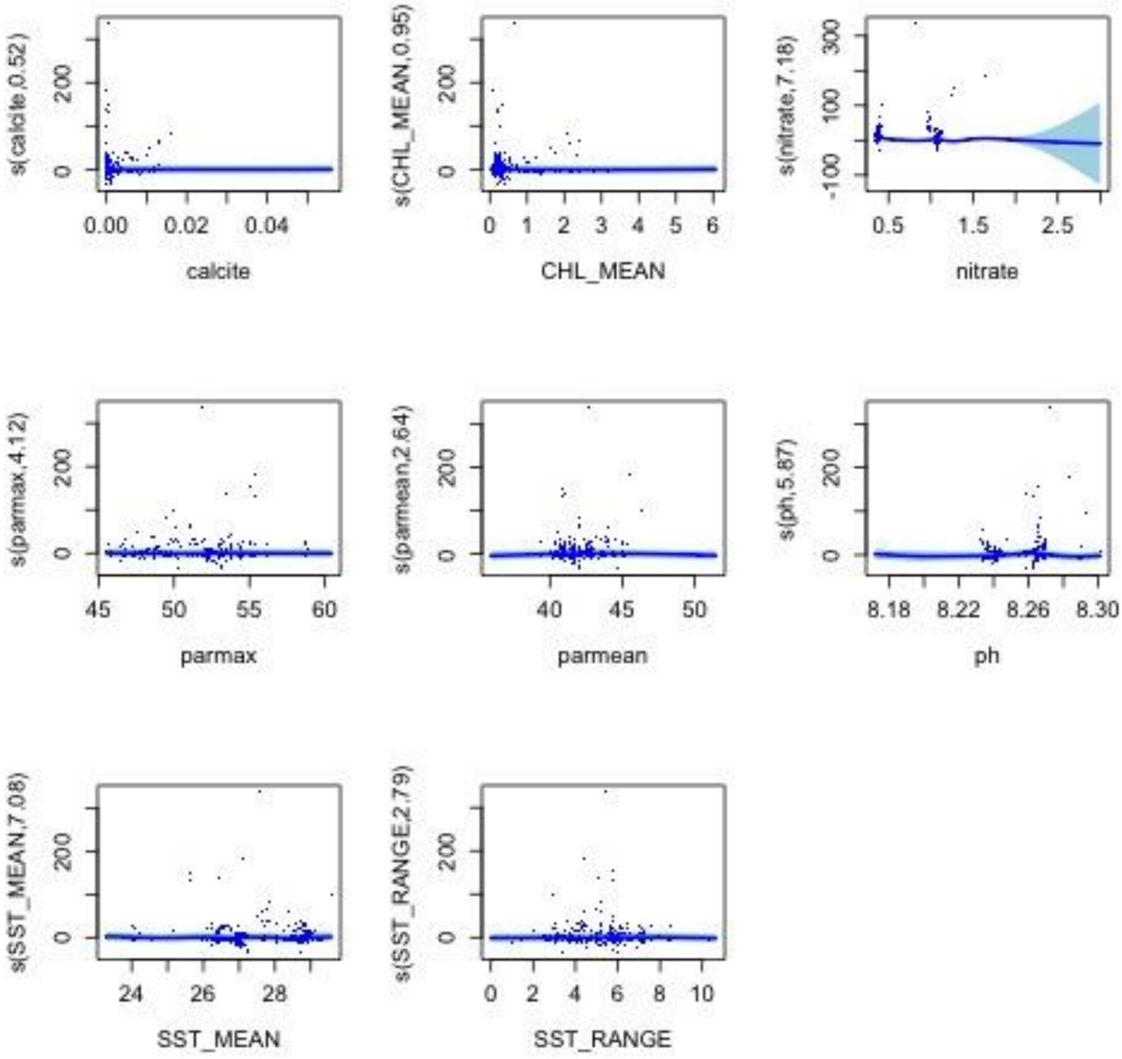
151Chrysiptera rollandi, n = 134 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.9148331	9	19.522109	1.351738e-05
s(CHL_MEAN)	1.9225192	9	7.860294	1.023306e-02
s(nitrate)	6.6117049	9	140.590411	1.019270e-33
s(parmax)	3.7383723	9	18.770493	6.463578e-05
s(parmean)	0.8833492	9	6.944370	2.307966e-03
s(ph)	3.5910548	9	22.194400	9.670295e-06
s(SST_MEAN)	4.6918627	9	24.112579	1.106722e-05
s(SST_RANGE)	3.6265848	9	7.747403	5.293239e-02



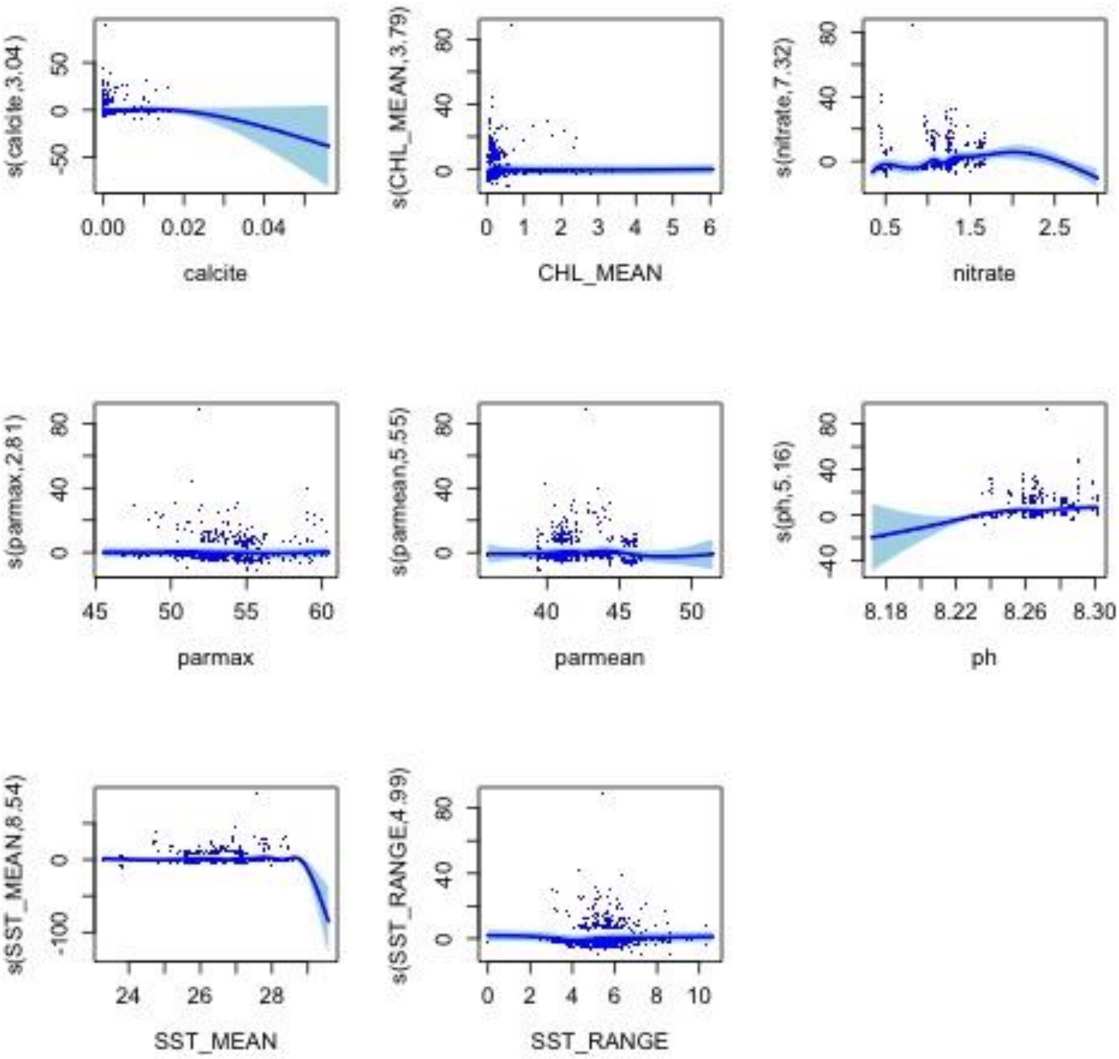
152Chrysiptera talboti, n = 252 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.5171195	9	0.8348381	1.778214e-01
s(CHL_MEAN)	0.9538113	9	5.0939520	8.371986e-03
s(nitrate)	7.1821372	9	132.3647391	1.312484e-30
s(parmax)	4.1236624	9	15.2390336	1.352607e-03
s(parmean)	2.6359159	9	11.6699733	1.215618e-03
s(ph)	5.8674190	9	54.4376443	2.519806e-12
s(SST_MEAN)	7.0810465	9	40.6961177	2.857900e-08
s(SST_RANGE)	2.7881864	9	10.1974598	4.690806e-03



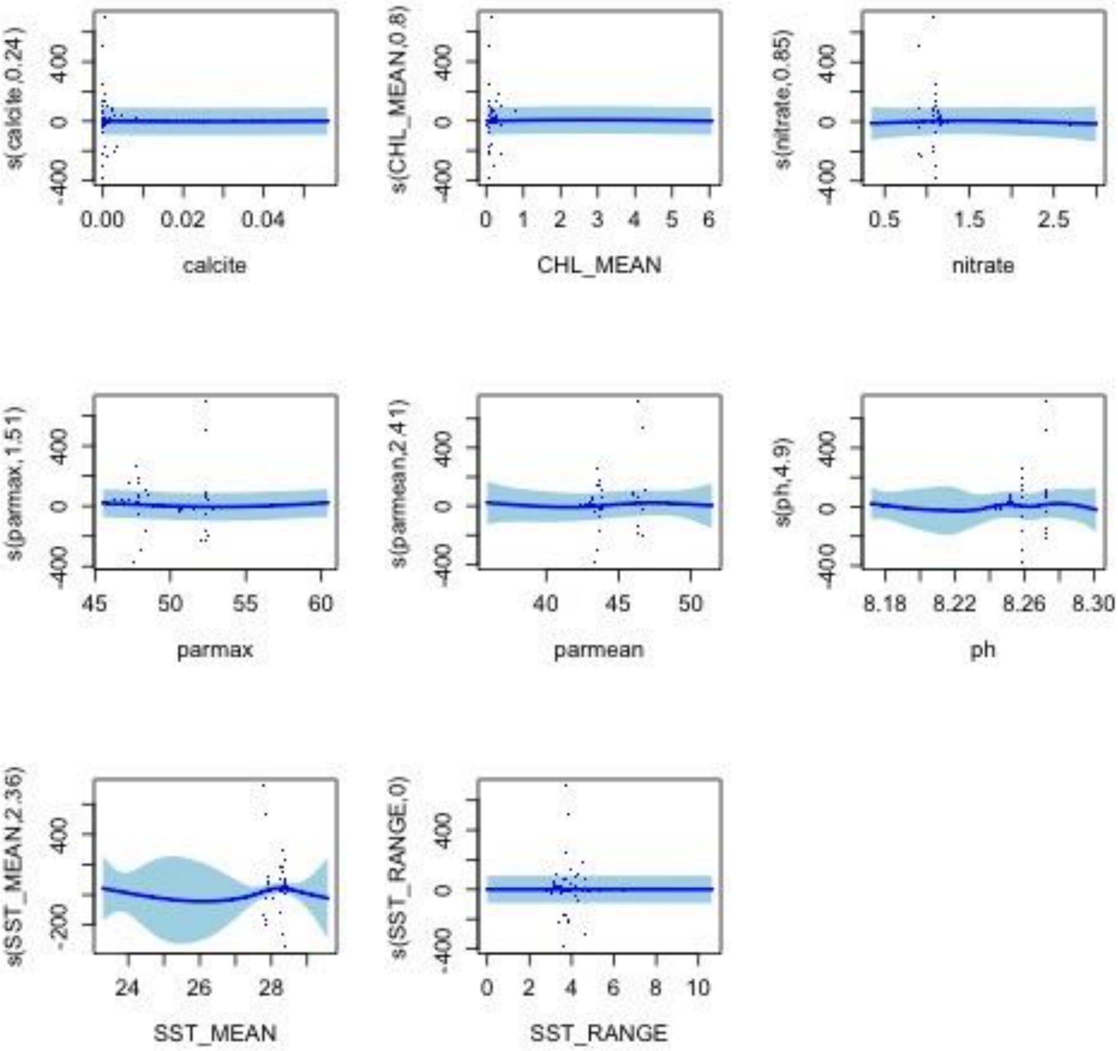
153Chrysiptera taupou, n = 632 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.040534	9	14.352775	1.085252e-03
s(CHL_MEAN)	3.788375	9	39.660204	3.610983e-09
s(nitrate)	7.320853	9	100.292574	5.777794e-22
s(parmax)	2.813956	9	7.558947	2.339111e-02
s(parmean)	5.545878	9	25.994976	1.661899e-05
s(ph)	5.160448	9	63.010218	5.744162e-15
s(SST_MEAN)	8.536125	9	67.558405	4.652752e-13
s(SST_RANGE)	4.992729	9	26.688649	1.228012e-05



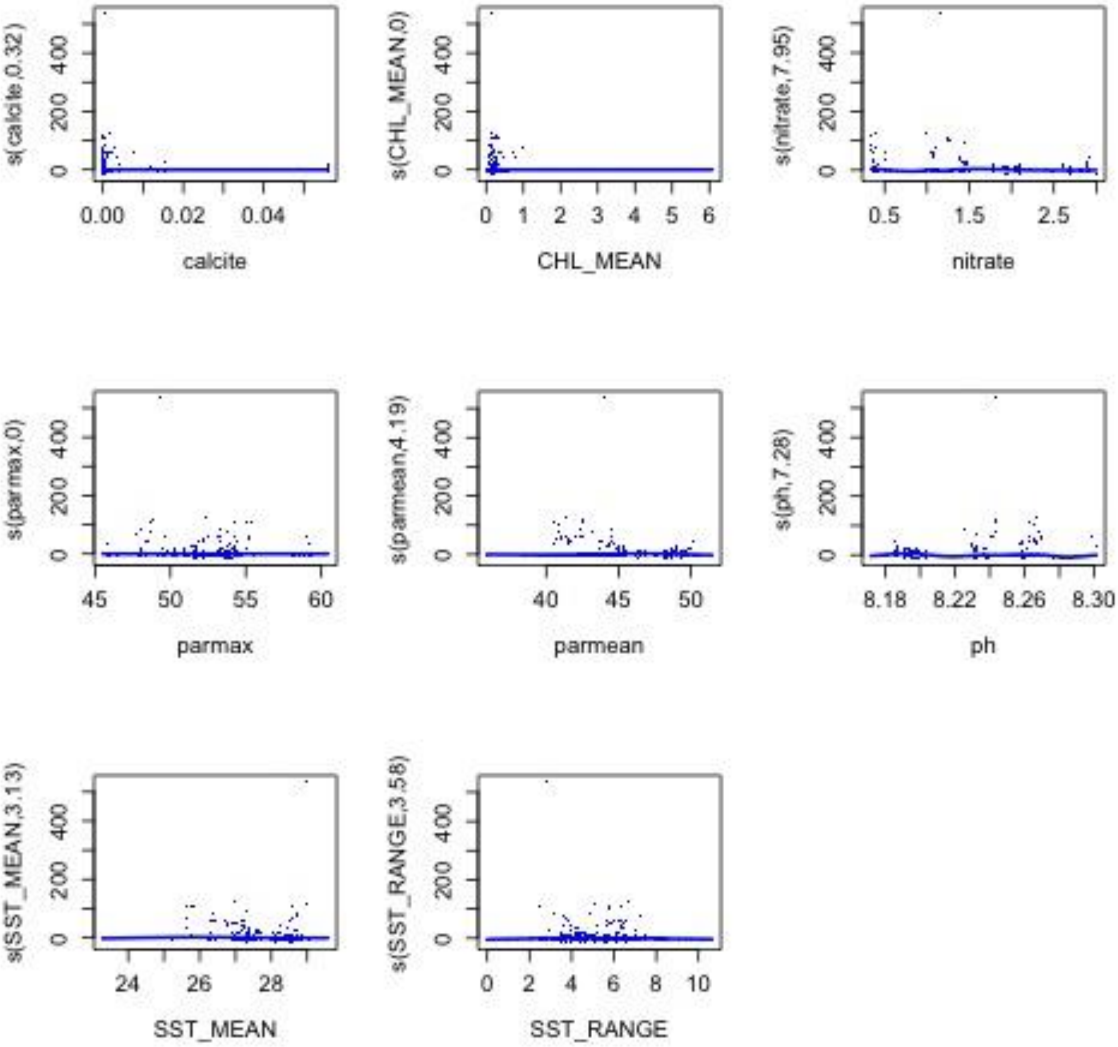
154Chrysiptera traceyi, n = 40 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.375810e-01	9	6.796138e-01	0.077627874
s(CHL_MEAN)	8.034554e-01	9	1.764459e+00	0.097116126
s(nitrate)	8.473771e-01	9	6.020296e-01	0.212479560
s(parmax)	1.514918e+00	8	2.904694e+00	0.085656465
s(parmean)	2.407930e+00	9	2.405602e+00	0.222404604
s(ph)	4.898784e+00	8	5.395127e+00	0.083051330
s(SST_MEAN)	**2.362527e+00**	**8**	**8.761728e+00**	**0.007692773**
s(SST_RANGE)	3.984801e-05	9	9.391081e-07	1.000000000



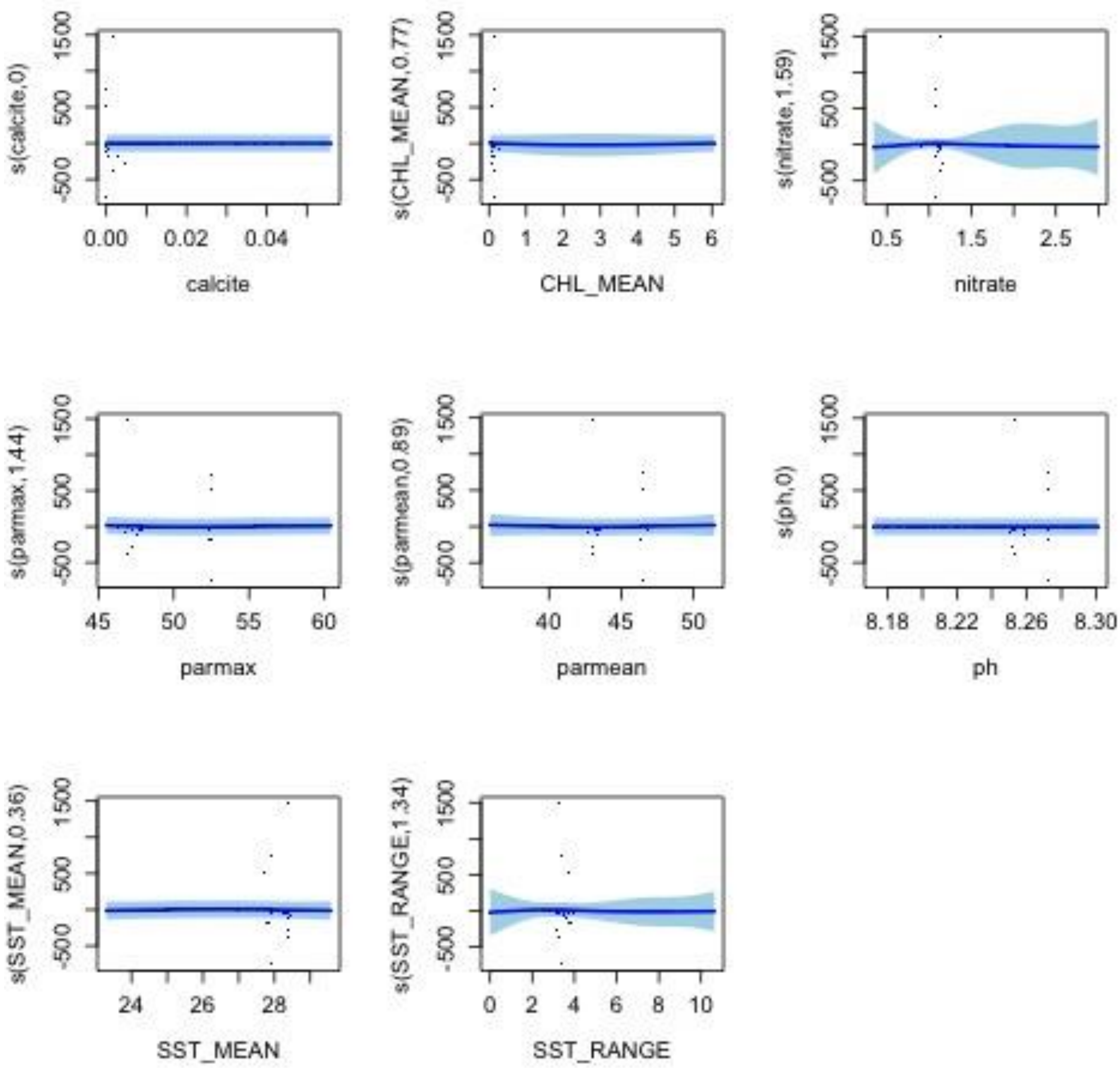
155Cirrhilabrus exquisitus, n = 218 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.163978e-01	6	4.280209e-01	2.341206e-01
s(CHL_MEAN)	4.009175e-05	9	5.802272e-07	1.000000e+00
s(nitrate)	7.945965e+00	9	6.941365e+01	5.489174e-14
s(parmax)	3.953526e-04	9	2.720434e-04	4.410054e-01
s(parmean)	4.188454e+00	9	5.225498e+01	8.812536e-13
s(ph)	7.284732e+00	9	8.391107e+01	8.061481e-18
s(SST_MEAN)	3.125303e+00	9	2.003852e+01	8.640216e-06
s(SST_RANGE)	3.579042e+00	9	1.227320e+01	3.710808e-03



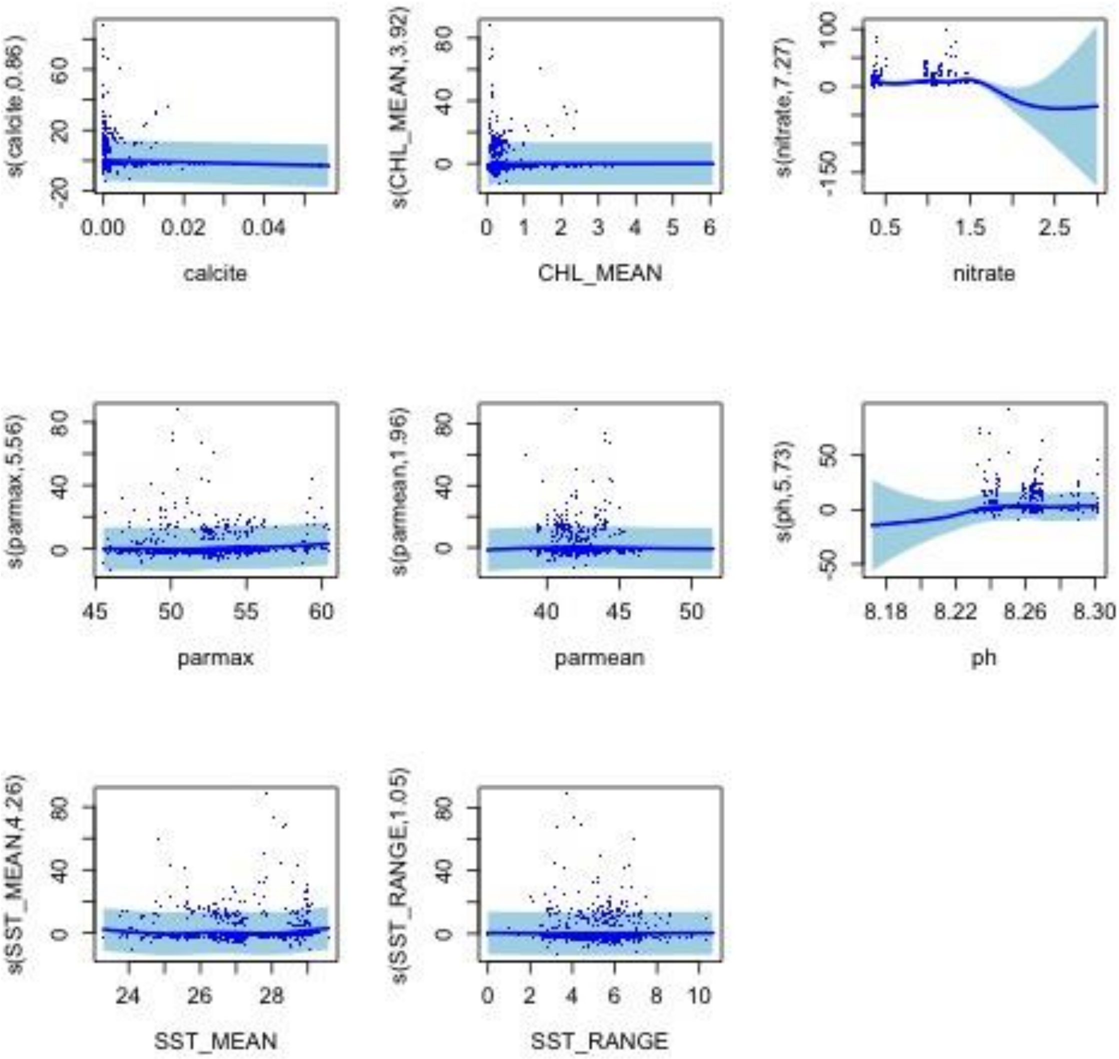
156Cirrhilabrus katherinae, n = 44 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.256211e-07	8	4.205146e-07	0.3255389
s(CHL_MEAN)	7.724850e-01	8	6.509334e-01	0.3039963
s(nitrate)	1.591707e+00	9	1.009804e+00	0.4768933
s(parmax)	1.438125e+00	9	1.393654e+00	0.2472210
s(parmean)	8.898320e-01	9	5.039635e-01	0.4560422
s(ph)	9.038759e-05	9	2.869644e-06	1.0000000
s(SST_MEAN)	3.593180e-01	8	4.441634e-01	0.1940690
s(SST_RANGE)	1.340117e+00	8	1.557680e+00	0.1736654



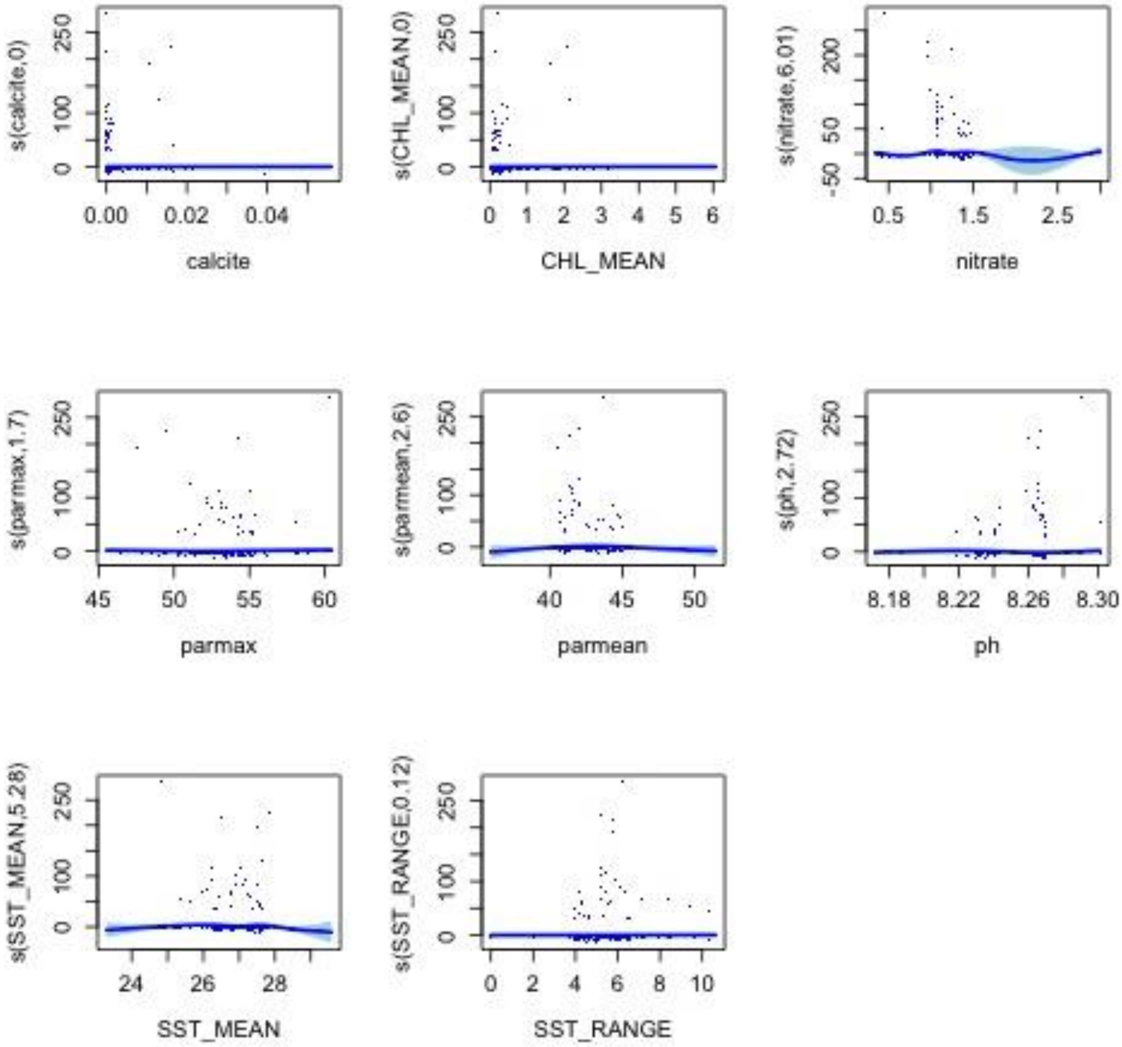
157Cirrhilabrus punctatus, n = 344 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8578677	7	5.039621	1.410598e-02
s(CHL_MEAN)	3.9211819	9	36.758597	2.226522e-08
s(nitrate)	7.2749812	9	126.402229	2.764885e-28
s(parmax)	5.5567464	9	37.379204	4.382844e-08
s(parmean)	1.9644213	9	5.048457	3.688711e-02
s(ph)	5.7295005	9	58.101672	9.599773e-13
s(SST_MEAN)	4.2649613	9	31.675572	7.847588e-08
s(SST_RANGE)	1.0492415	9	2.117491	1.071009e-01



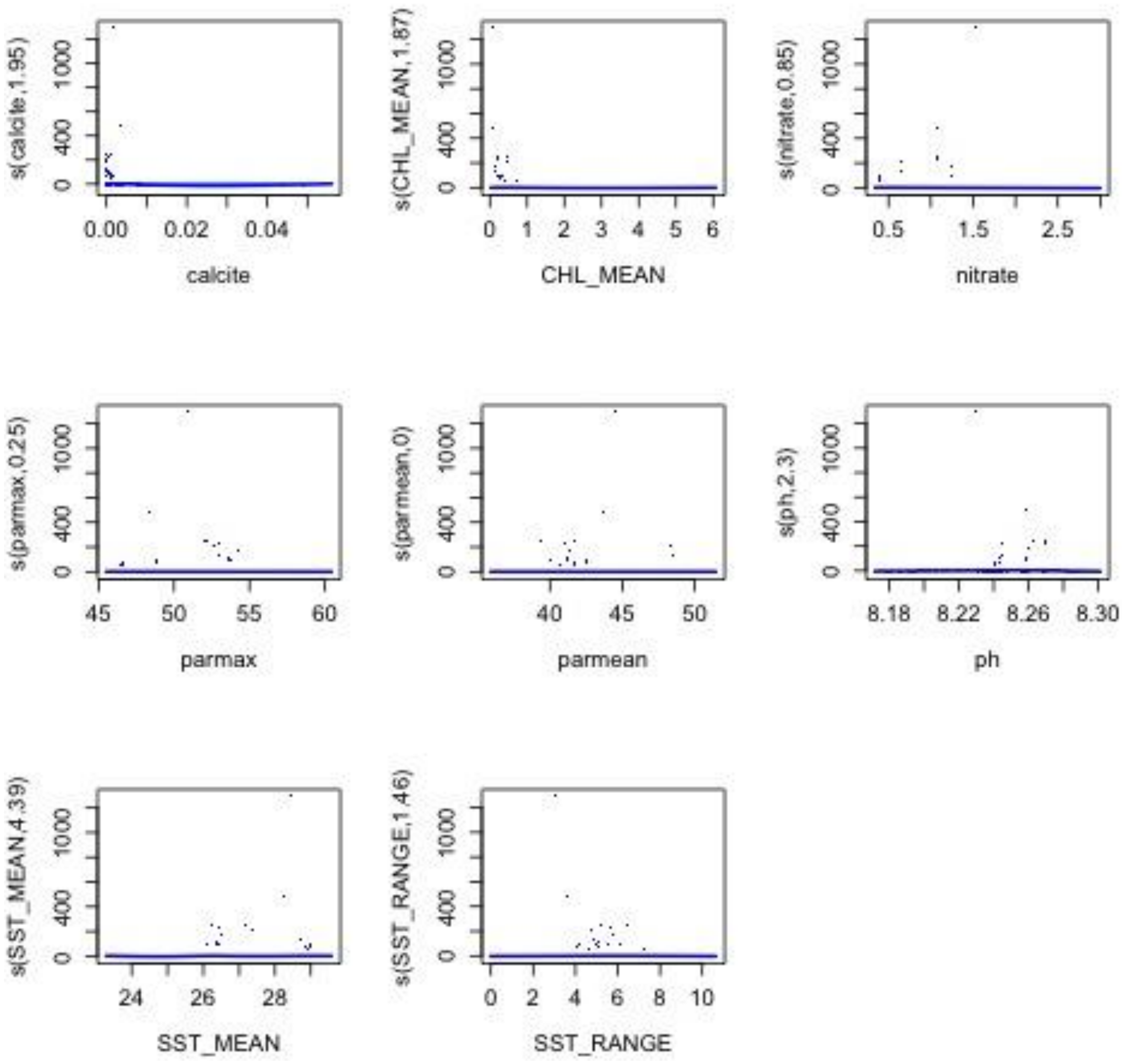
158Cirrhilabrus scottorum, n = 48 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.700494e-06	9	5.043152e-07	7.646783e-01
s(CHL_MEAN)	2.030559e-06	9	3.276588e-07	7.233276e-01
s(nitrate)	6.009265e+00	9	3.456572e+01	8.705587e-08
s(parmax)	1.704166e+00	9	3.956697e+00	5.102910e-02
s(parmean)	2.602891e+00	9	1.055006e+01	2.035802e-03
s(ph)	2.719490e+00	9	9.350327e+00	4.055910e-03
s(SST_MEAN)	5.284733e+00	9	3.210537e+01	2.985454e-07
s(SST_RANGE)	1.238456e-01	9	1.512094e-01	2.555076e-01



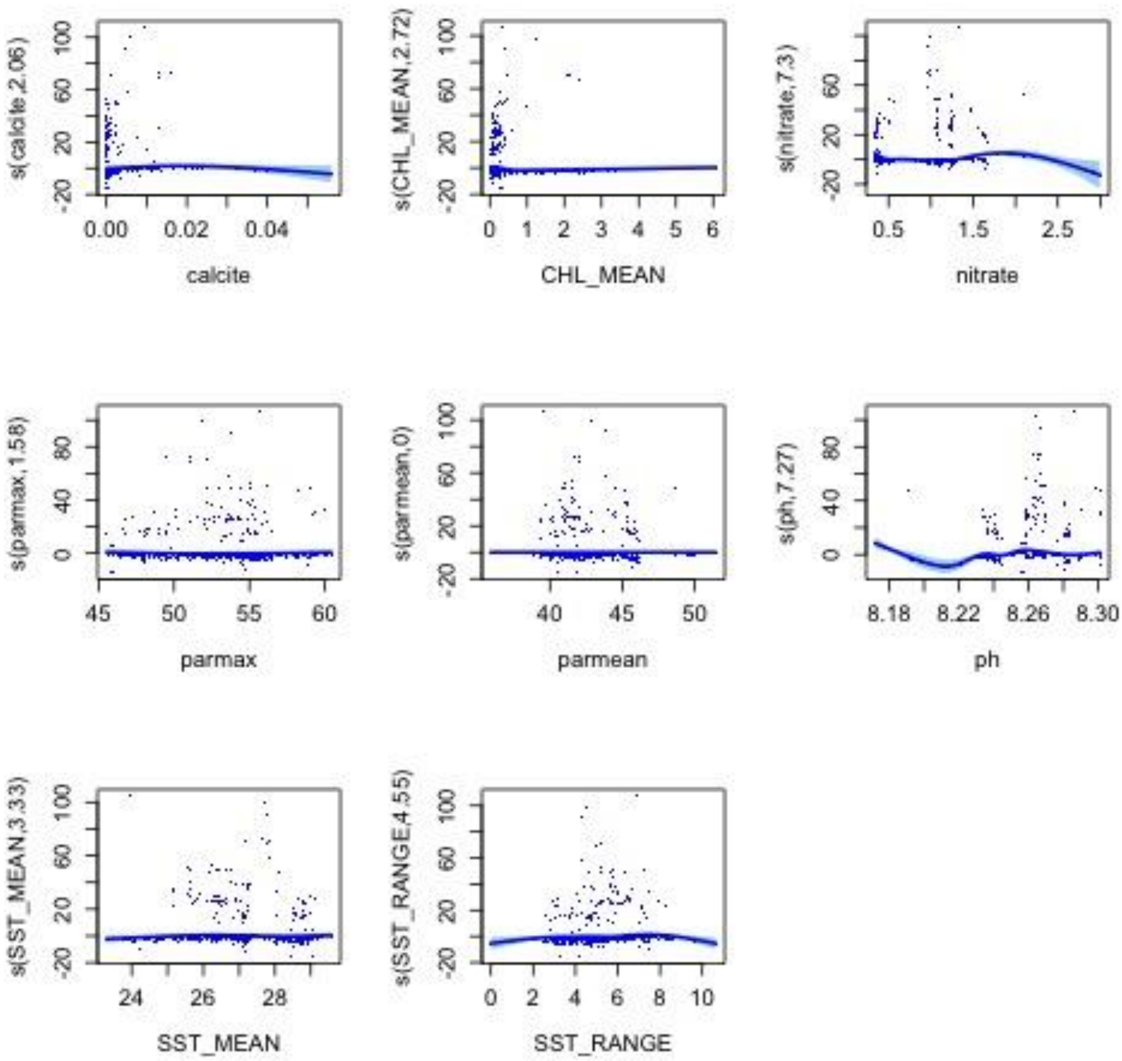
159Cirrhilabrus sp, n = 83 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.945835e+00	9	2.959233e+00	0.191691795
s(CHL_MEAN)	1.865888e+00	9	4.419792e+00	0.073283906
s(nitrate)	8.495821e-01	9	4.808006e+00	0.010698734
s(parmax)	2.547406e-01	8	3.090221e-01	0.259524279
s(parmean)	4.246865e-06	9	3.869857e-07	1.000000000
s(ph)	2.298785e+00	9	7.815412e+00	0.011598397
s(SST_MEAN)	4.387850e+00	9	1.434612e+01	0.003006917
s(SST_RANGE)	1.464251e+00	9	3.744178e+00	0.054690240



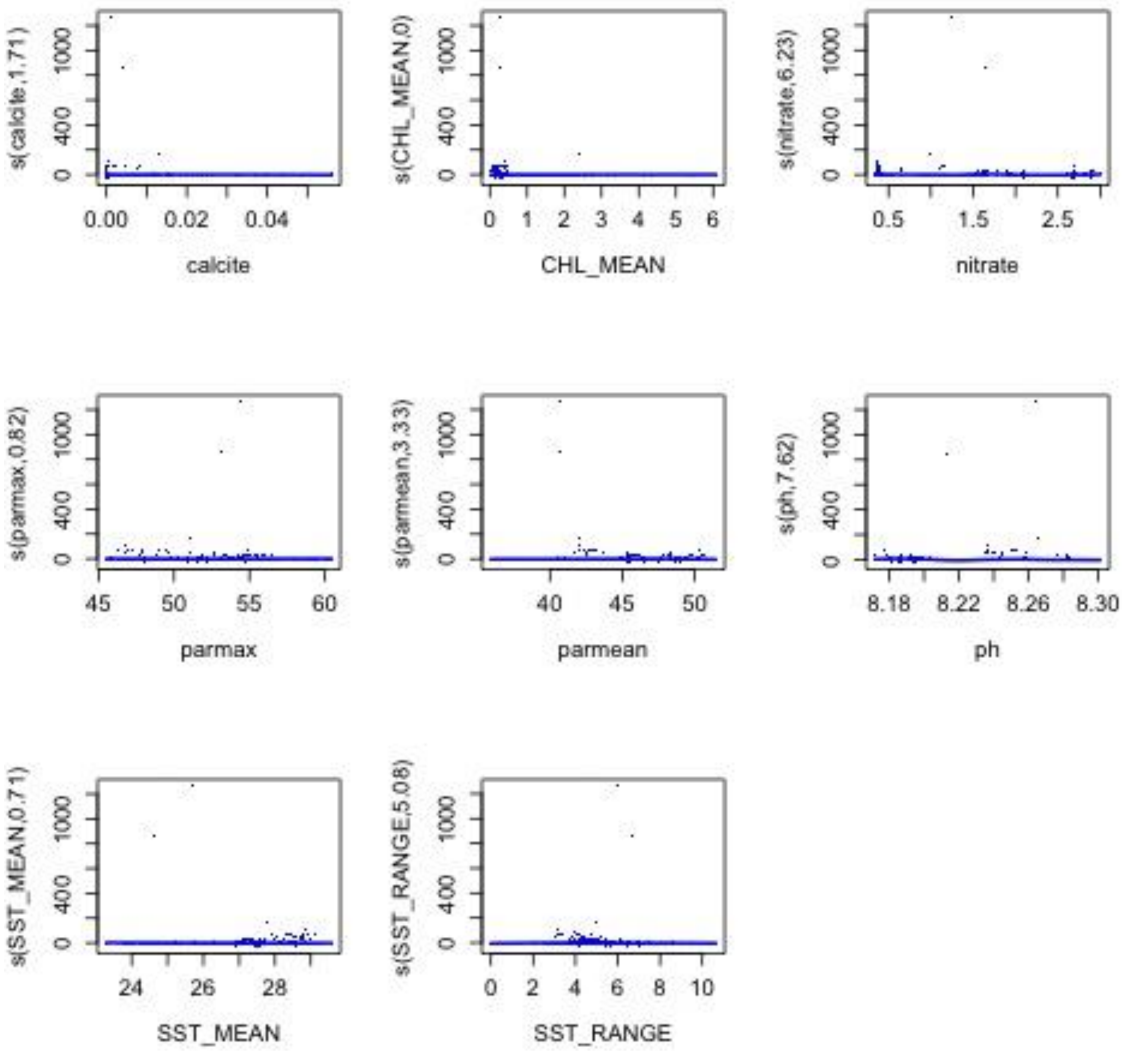
160Cirrhitichthys falco, n = 184 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.0622411047	9	1.002642e+01	3.218699e-03
s(CHL_MEAN)	2.7244616667	9	2.117609e+01	1.885319e-05
s(nitrate)	7.3038230212	9	1.039812e+02	3.099978e-23
s(parmax)	1.5753597883	9	3.865851e+00	5.127131e-02
s(parmean)	0.0000835483	9	4.249960e-05	5.577515e-01
s(ph)	7.2690017868	9	6.172300e+01	9.926815e-13
s(SST_MEAN)	3.3321246960	9	1.143559e+01	3.221091e-03
s(SST_RANGE)	4.5540704049	9	2.578550e+01	8.794722e-06



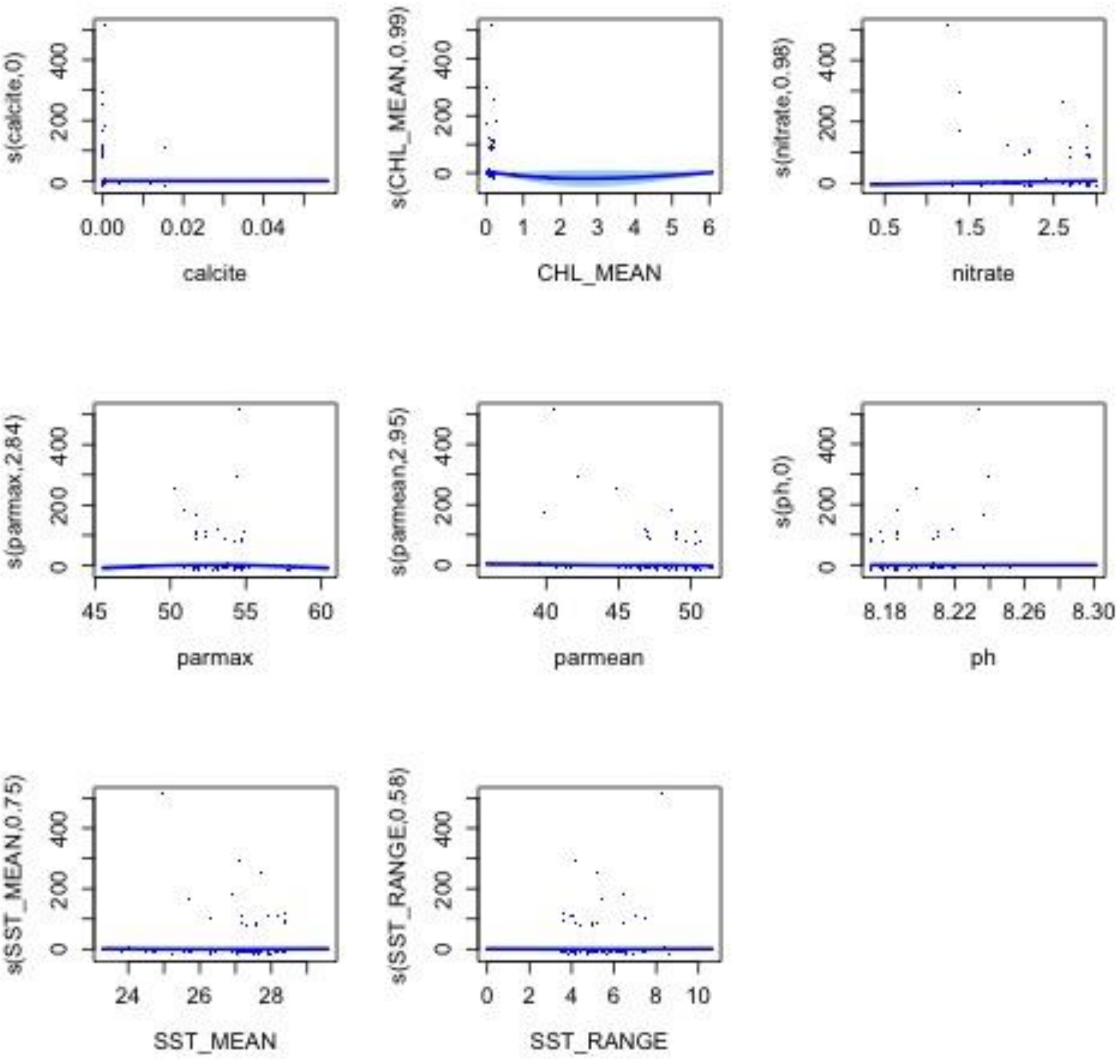
161Cirrhitichthys oxycephalus, n = 333 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.7133748859	9	1.312453e+01	2.228510e-04
s(CHL_MEAN)	0.0000312442	9	4.698612e-06	7.073796e-01
s(nitrate)	6.2303403100	9	7.083247e+01	2.211898e-16
s(parmax)	0.8226493410	9	1.355296e+00	1.404196e-01
s(parmean)	3.3346632014	9	5.079626e+01	5.633171e-15
s(ph)	7.6201246984	9	8.153075e+01	2.770729e-18
s(SST_MEAN)	0.7058038270	9	2.377838e+00	5.519475e-02
s(SST_RANGE)	5.0807138567	9	2.905541e+01	1.819238e-06



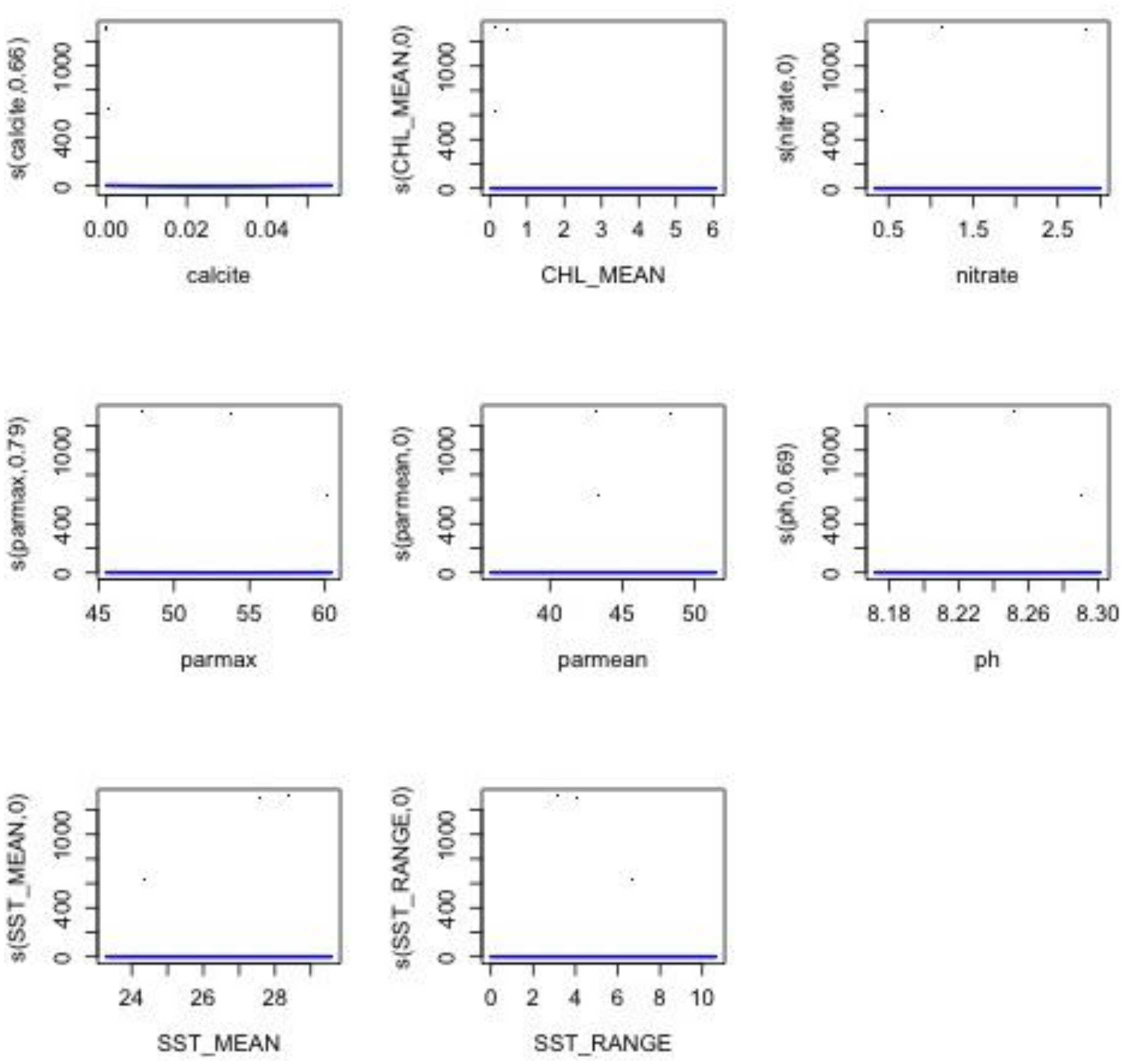
162Cirrhitops hubbardi, n = 87 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.839841e-05	9	4.030834e-07	1.000000e+00
s(CHL_MEAN)	9.917369e-01	9	8.013310e+00	1.933142e-03
s(nitrate)	9.764521e-01	7	3.567347e+01	6.731994e-11
s(parmax)	2.839416e+00	9	8.660820e+00	1.060670e-02
s(parmean)	2.950847e+00	9	1.229663e+01	1.348922e-03
s(ph)	1.941764e-04	9	1.592407e-04	3.674474e-01
s(SST_MEAN)	7.548997e-01	9	1.254085e+00	1.334938e-01
s(SST_RANGE)	5.781132e-01	9	7.009521e-01	2.322019e-01



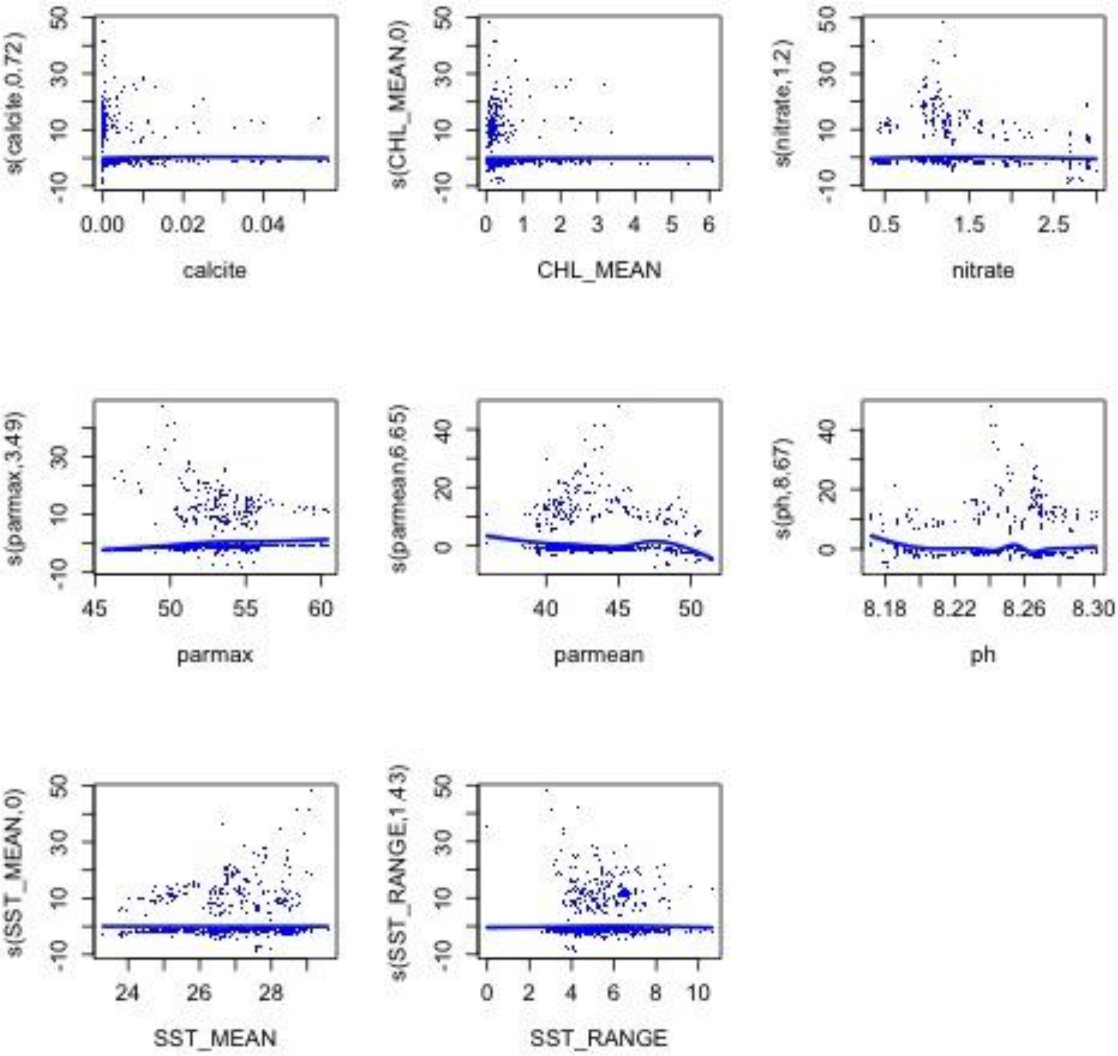
163Cirrhitus pinnulatus, n = 85 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.628263e-01	9	5.861227e-01	0.34794719
s(CHL_MEAN)	5.905077e-06	9	1.607269e-07	1.00000000
s(nitrate)	4.455866e-05	9	4.193984e-05	0.27765434
s(parmax)	7.884170e-01	9	1.849105e+00	0.08813732
s(parmean)	8.503669e-06	9	3.192699e-06	0.64981574
s(ph)	6.913392e-01	9	1.426085e+00	0.11455251
s(SST_MEAN)	1.532791e-03	9	1.690158e-03	0.27218863
s(SST_RANGE)	1.557016e-05	9	9.364941e-06	0.47152329



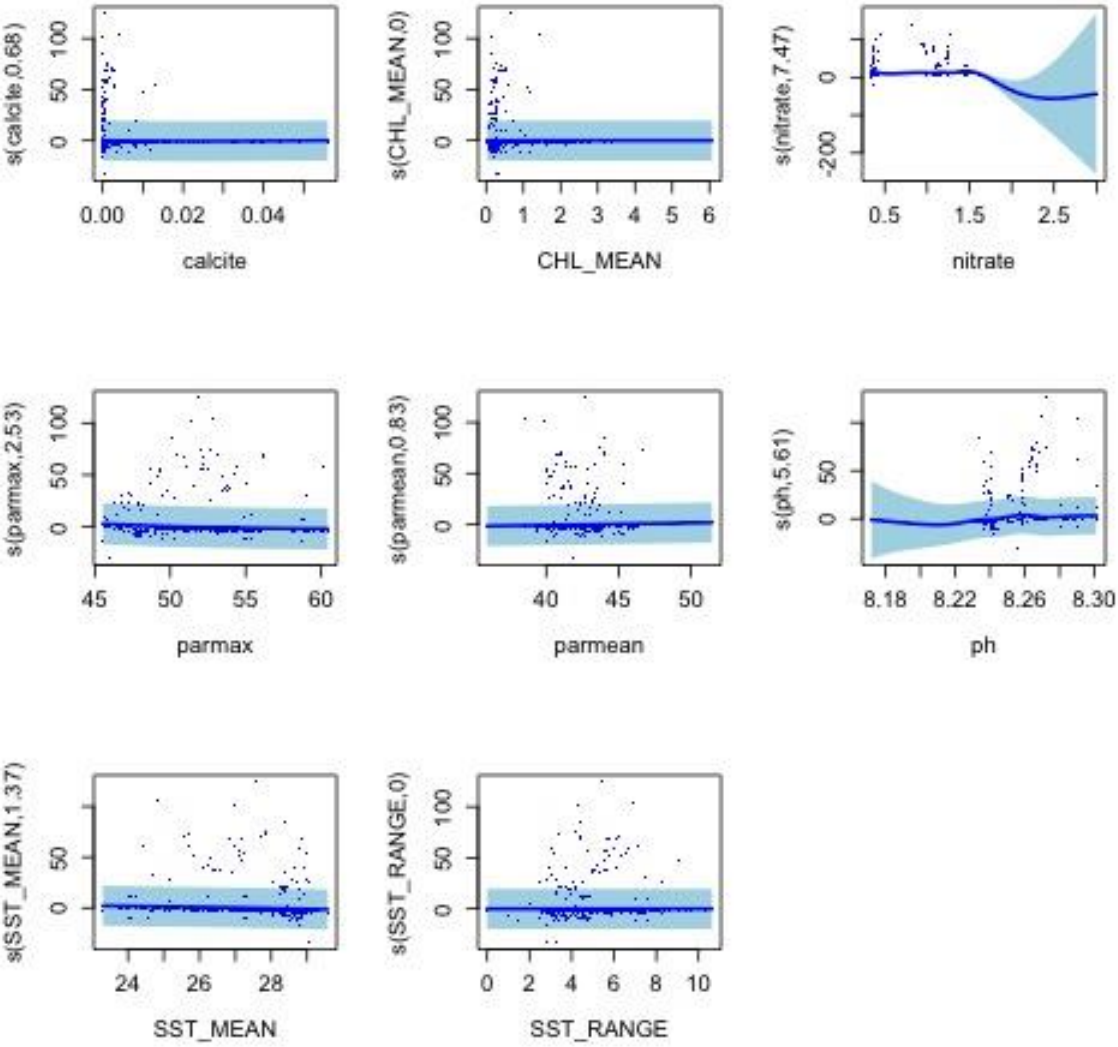
164Coris aygula, n = 654 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7249781493	9	2.289686e+00	6.423481e-02
s(CHL_MEAN)	0.0005821441	9	3.051026e-04	4.547004e-01
s(nitrate)	1.1990068734	9	4.714356e+00	1.746175e-02
s(parmax)	3.4862991057	9	4.132204e+01	9.603458e-11
s(parmean)	6.6531982562	9	1.327969e+02	1.006509e-29
s(ph)	8.6730368837	9	1.407666e+02	1.320469e-29
s(SST_MEAN)	0.0028720696	9	1.875829e-03	4.358190e-01
s(SST_RANGE)	1.4312392646	9	3.227855e+00	7.880684e-02



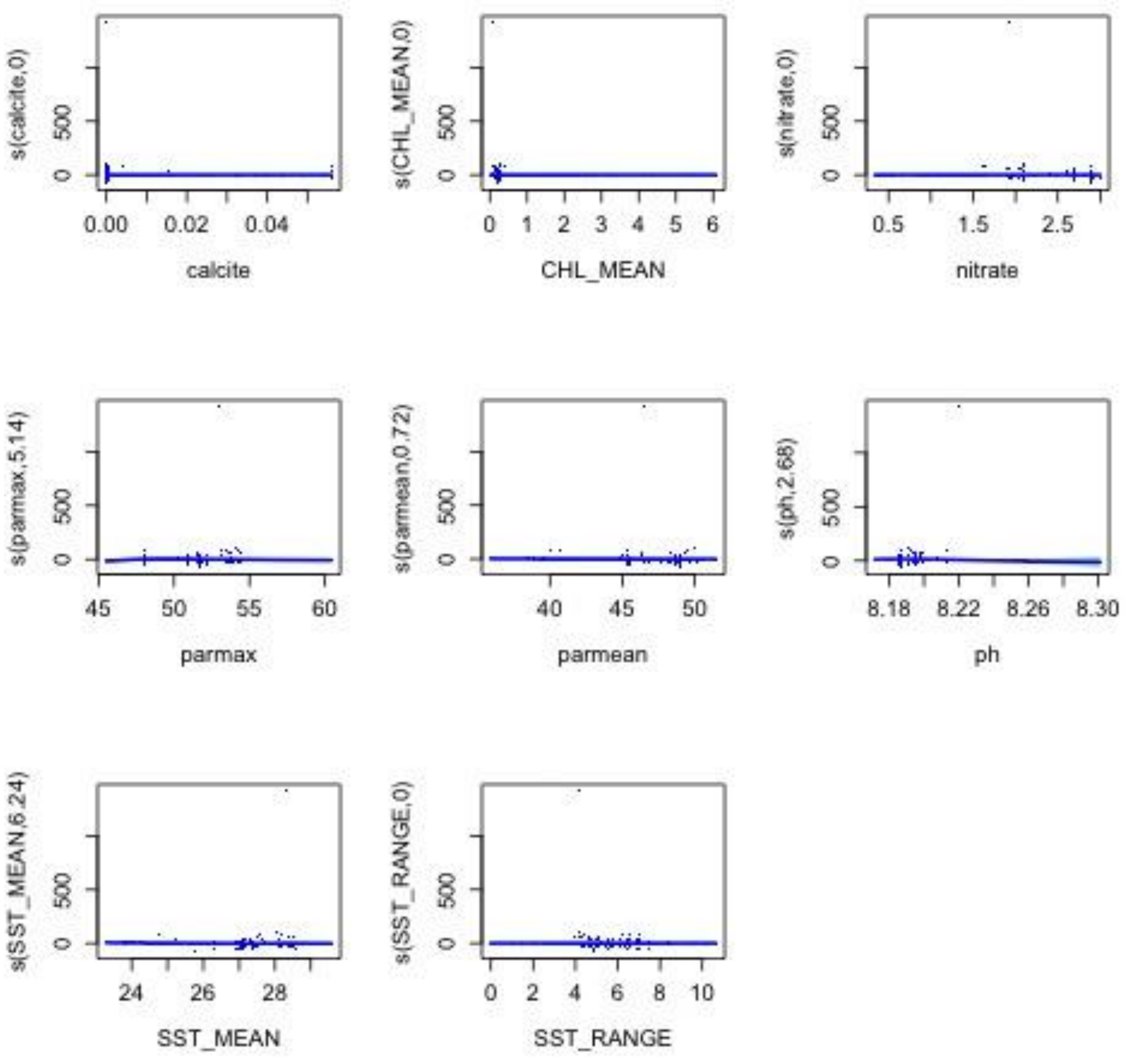
165Coris batuensis, n = 110 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6846418440	9	1.586740e+00	1.151247e-01
s(CHL_MEAN)	0.0002242821	9	1.371484e-04	4.204418e-01
s(nitrate)	7.4748040464	9	1.204976e+02	1.245319e-25
s(parmax)	2.5259263627	9	2.680455e+01	8.700171e-08
s(parmean)	0.8295773271	9	4.800170e+00	1.089996e-02
s(ph)	5.6127543175	9	7.535436e+01	8.188853e-17
s(SST_MEAN)	1.3683505307	9	9.103116e+00	9.340363e-04
s(SST_RANGE)	0.0001081474	9	3.091760e-05	7.879343e-01



166Coris centralis, n = 183 observations

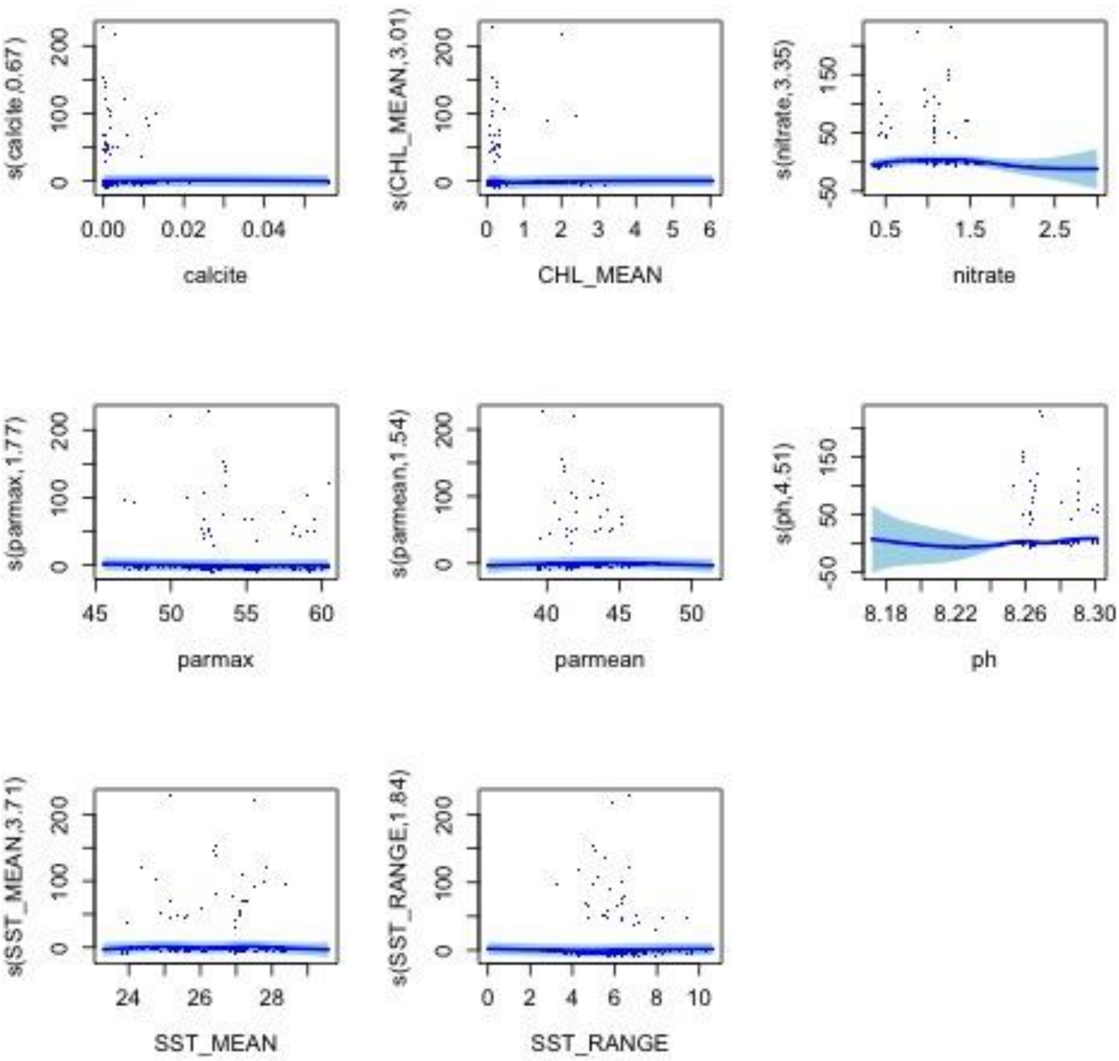
	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.095114e-05	9	5.030818e-06	6.061627e-01
s(CHL_MEAN)	4.132689e-06	9	2.743824e-06	4.104161e-01
s(nitrate)	4.493020e-06	9	3.604230e-07	8.605658e-01
s(parmax)	5.142224e+00	9	4.139098e+01	8.946468e-10
s(parmean)	7.225153e-01	9	2.265965e+00	5.355030e-02
s(ph)	2.681068e+00	9	4.735409e+01	8.604094e-13
s(SST_MEAN)	6.235138e+00	9	3.818796e+01	5.156535e-08
s(SST_RANGE)	6.236338e-06	9	2.373712e-06	6.641745e-01



Occurs in Line Islands only!

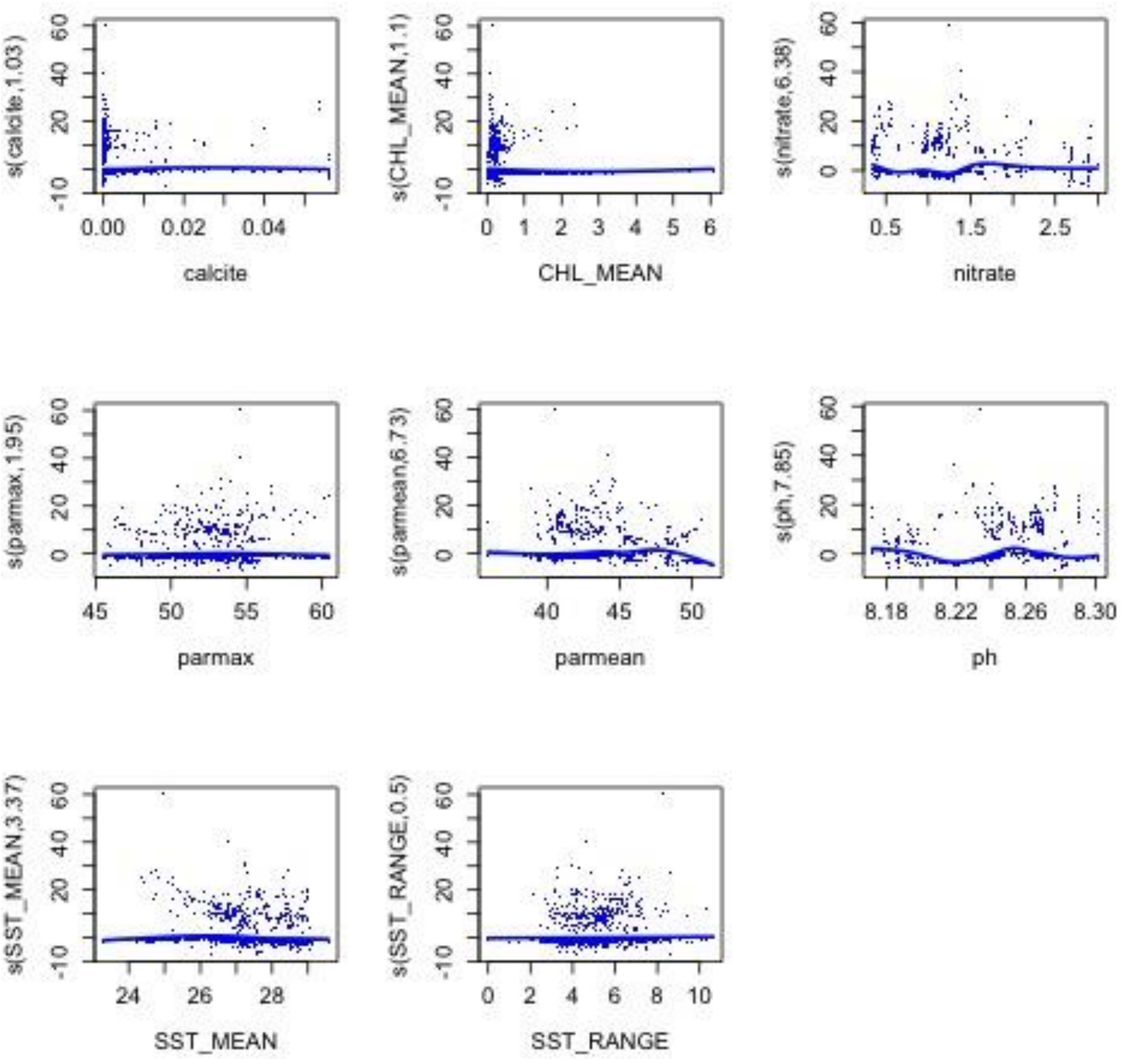
167Coris dorsomacula, n = 47 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6693112	9	1.723661	8.954099e-02
s(CHL_MEAN)	3.0063130	9	10.258633	6.385693e-03
s(nitrate)	3.3539094	9	18.021962	8.541449e-06
s(parmax)	1.7715081	9	3.624037	5.943981e-02
s(parmean)	1.5399123	9	4.491808	1.520181e-02
s(ph)	4.5074174	9	29.486326	1.788181e-07
s(SST_MEAN)	3.7054325	9	12.228135	1.038007e-03
s(SST_RANGE)	1.8421958	9	9.384732	1.512082e-03



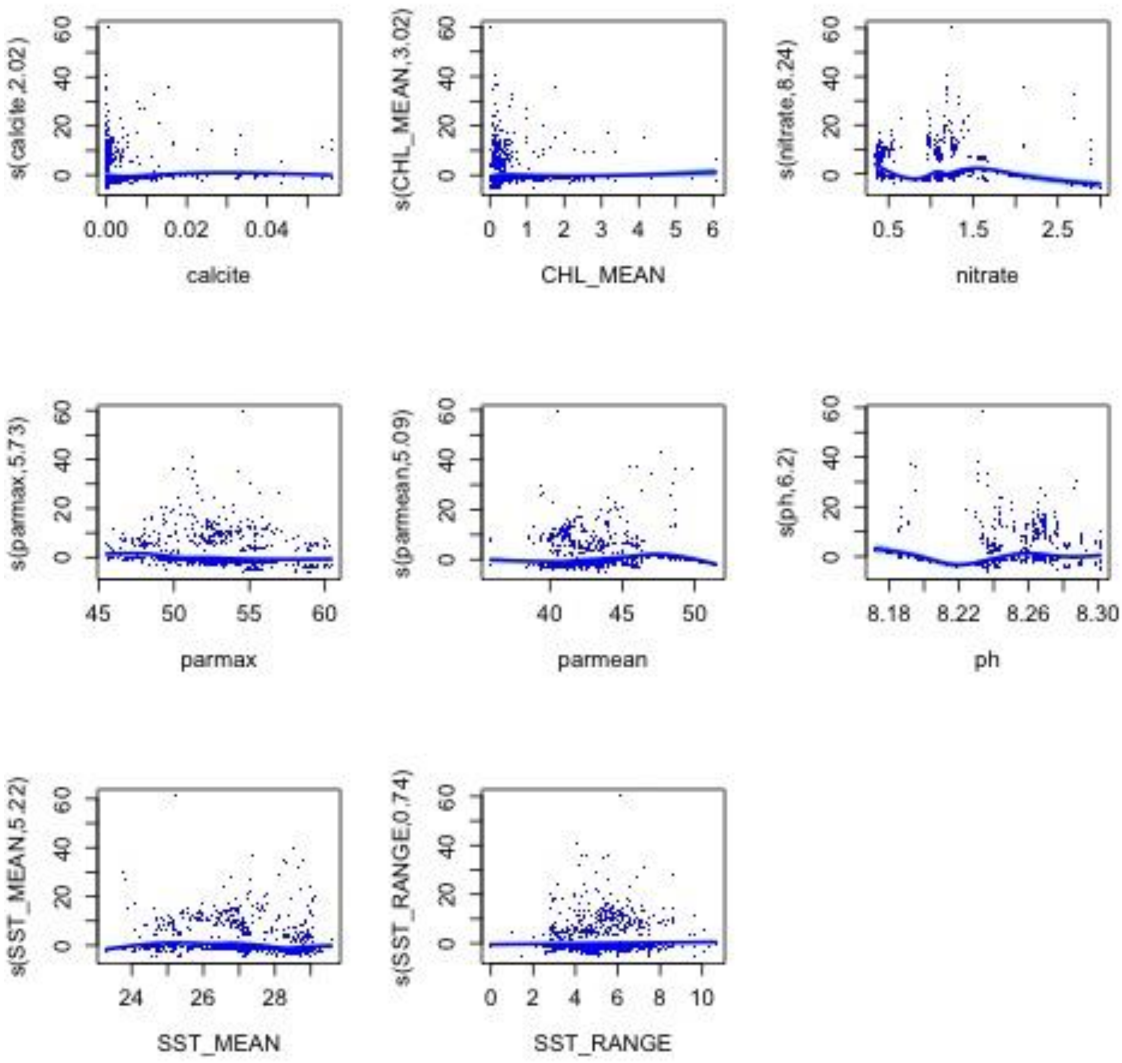
168Coris gaimard, n = 713 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.0252308	9	4.113353	2.935242e-02
s(CHL_MEAN)	1.0996400	9	7.457476	2.972532e-03
s(nitrate)	6.3769436	9	125.615176	1.332473e-29
s(parmax)	1.9507692	9	6.884230	1.068564e-02
s(parmean)	6.7325486	9	105.582487	8.559148e-24
s(ph)	7.8452240	9	156.562447	4.571781e-36
s(SST_MEAN)	3.3699536	9	23.854617	1.490993e-06
s(SST_RANGE)	0.5012481	9	1.000037	1.475918e-01



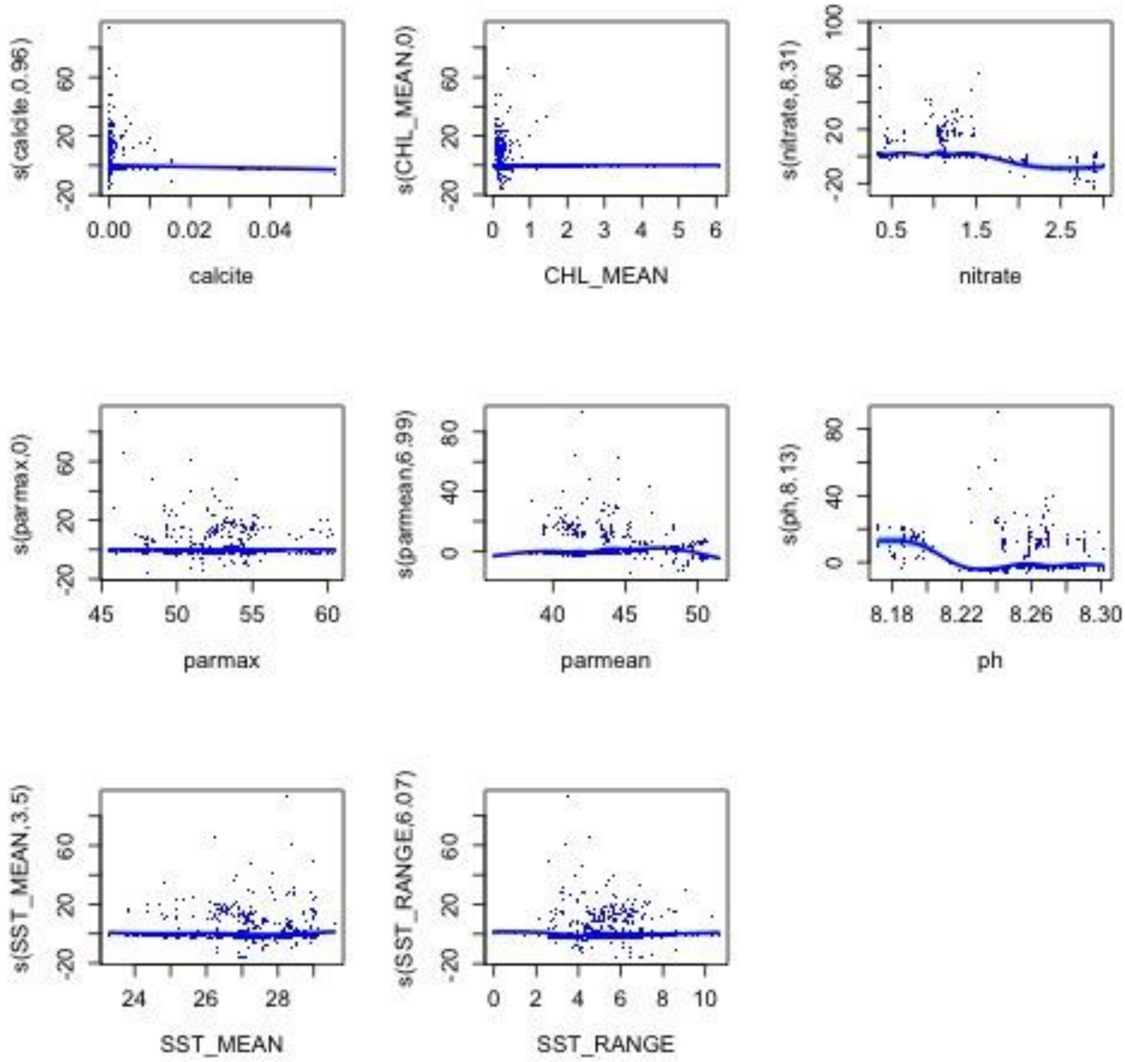
169Ctenochaetus binotatus, n = 564 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.0156815	9	13.757405	5.061472e-04
s(CHL_MEAN)	3.0202777	9	11.112179	5.536619e-03
s(nitrate)	8.2370438	9	200.091325	4.211646e-47
s(parmax)	5.7291098	9	49.175795	6.960618e-11
s(parmean)	5.0925953	9	59.413113	6.607891e-14
s(ph)	6.2012306	9	78.213808	3.164250e-18
s(SST_MEAN)	5.2220159	9	36.858235	3.485269e-08
s(SST_RANGE)	0.7387211	8	2.793358	4.879104e-02



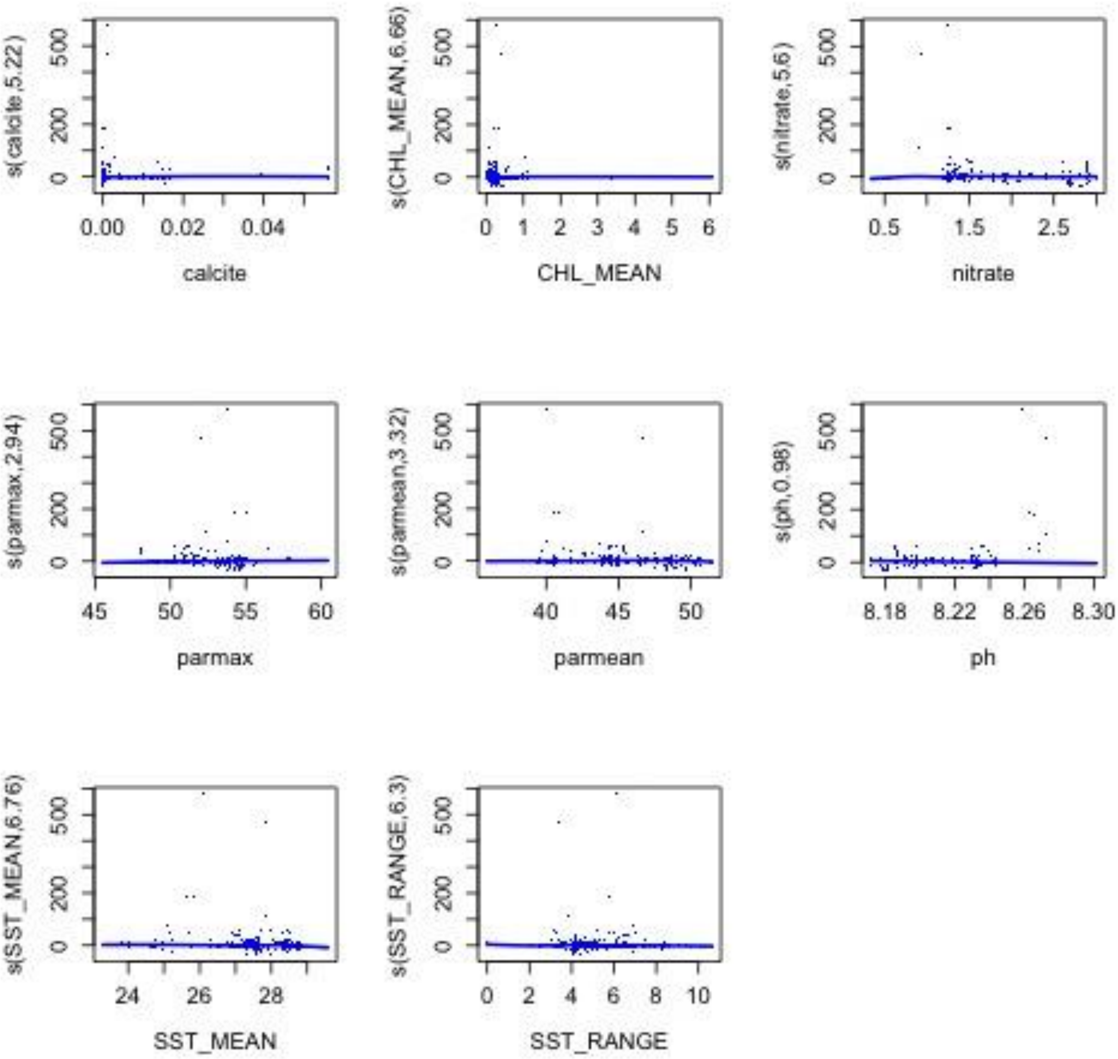
170Ctenochaetus cyanocheilus, n = 1215 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.624184e-01	7	2.315367e+01	5.420632e-07
s(CHL_MEAN)	3.883164e-05	9	1.011519e-05	6.328420e-01
s(nitrate)	8.313465e+00	9	9.327024e+01	1.468991e-18
s(parmax)	4.454311e-05	9	1.487792e-05	7.490611e-01
s(parmean)	6.988794e+00	9	1.436713e+02	3.815268e-31
s(ph)	8.125046e+00	9	1.433239e+02	1.089707e-30
s(SST_MEAN)	3.503255e+00	9	1.290145e+01	2.451528e-03
s(SST_RANGE)	6.071214e+00	9	3.192804e+01	4.124380e-06



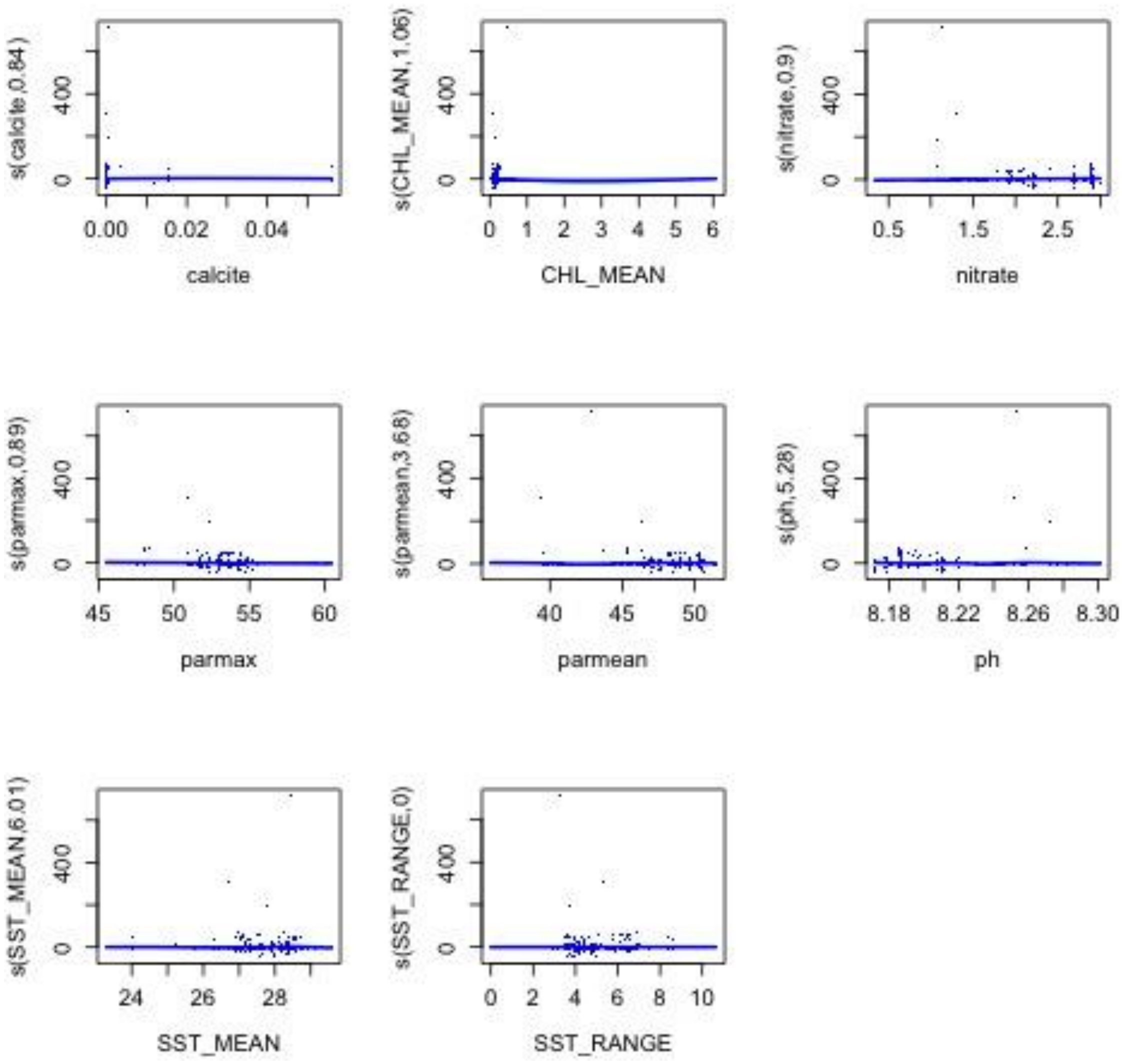
171Ctenochaetus flavicauda, n = 491 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.2224576	9	39.36194	5.943486e-08
s(CHL_MEAN)	6.6648361	9	50.83440	5.172127e-10
s(nitrate)	5.6046373	9	28.34170	6.260506e-06
s(parmax)	2.9389588	9	27.30027	4.188264e-08
s(parmean)	3.3193989	9	42.60713	7.685922e-12
s(ph)	0.9770131	9	36.66549	4.318237e-11
s(SST_MEAN)	6.7607425	9	36.00641	3.200487e-07
s(SST_RANGE)	6.2998169	9	38.88759	6.414265e-08



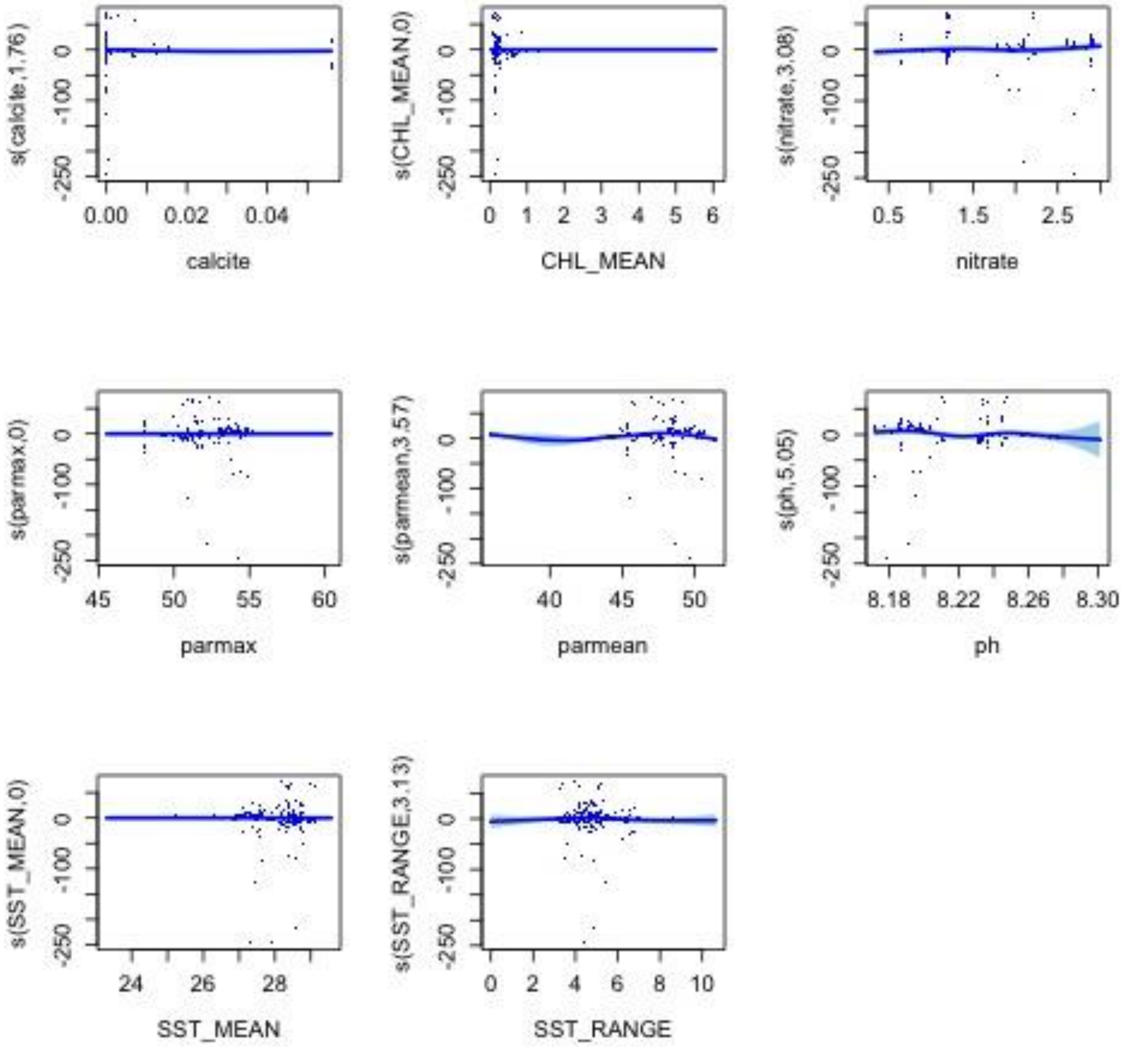
172Ctenochaetus hawaiiensis, n = 313 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.416365e-01	9	4.094749e+00	2.191609e-02
s(CHL_MEAN)	1.056903e+00	9	8.960840e+00	1.345411e-03
s(nitrate)	9.003666e-01	8	7.398965e+00	9.728895e-04
s(parmax)	8.913825e-01	9	7.253957e+00	2.607235e-03
s(parmean)	3.679215e+00	9	4.227129e+01	8.285472e-11
s(ph)	5.283251e+00	9	5.118186e+01	1.198623e-11
s(SST_MEAN)	6.006194e+00	9	2.911358e+01	5.674420e-06
s(SST_RANGE)	9.793692e-05	9	5.115437e-05	4.801461e-01



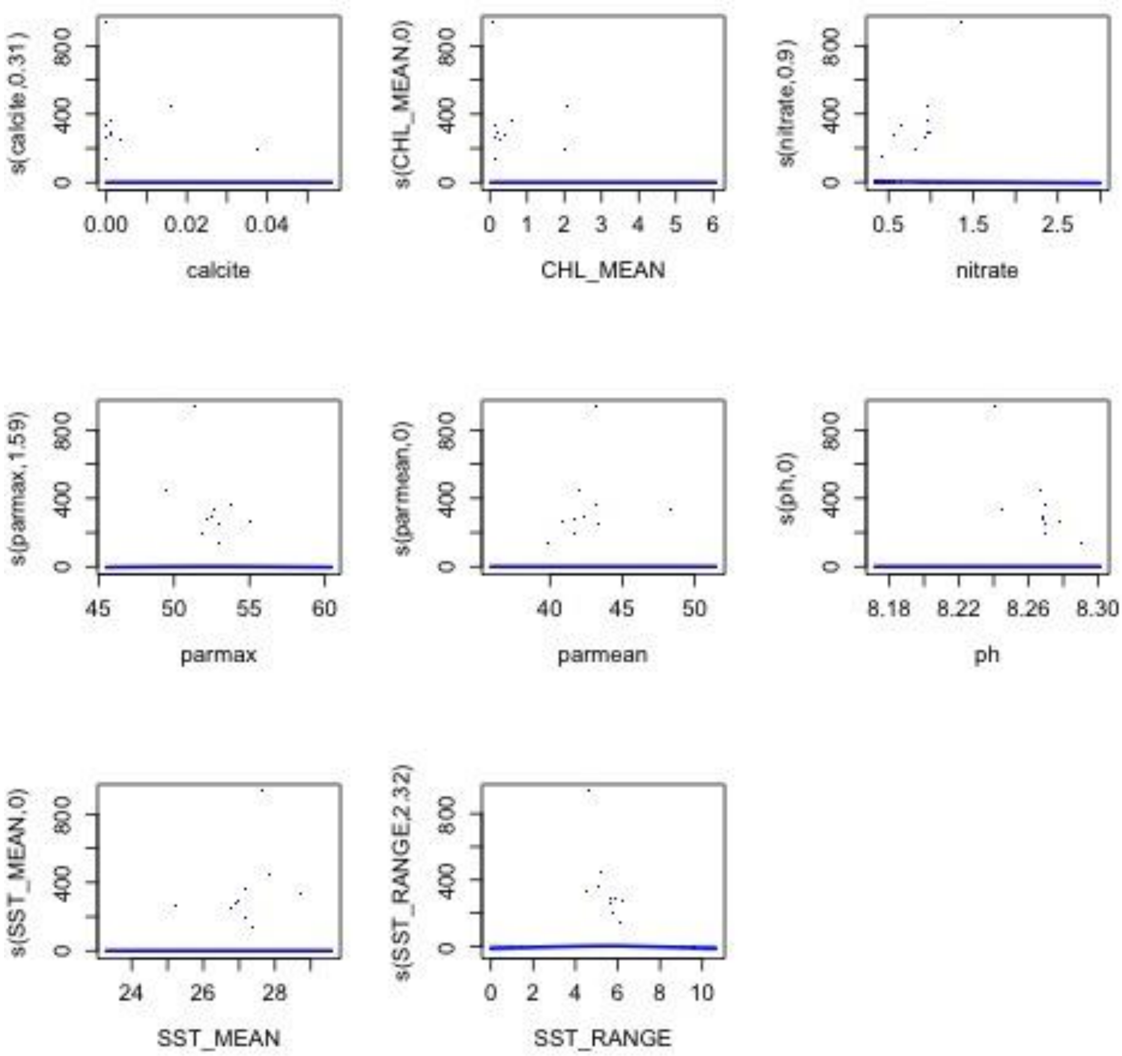
173Ctenochaetus marginatus, n = 783 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.758913e+00	9	1.428955e+01	1.291959e-04
s(CHL_MEAN)	3.242102e-05	9	6.953389e-07	9.038317e-01
s(nitrate)	3.081315e+00	9	1.896803e+01	1.992234e-05
s(parmax)	6.540037e-05	9	1.730428e-05	7.990479e-01
s(parmean)	3.574248e+00	9	9.016168e+01	8.156667e-23
s(ph)	5.048426e+00	9	8.604112e+01	6.430850e-22
s(SST_MEAN)	5.528904e-05	9	3.457467e-06	8.485135e-01
s(SST_RANGE)	3.134984e+00	9	1.679120e+01	8.823182e-05



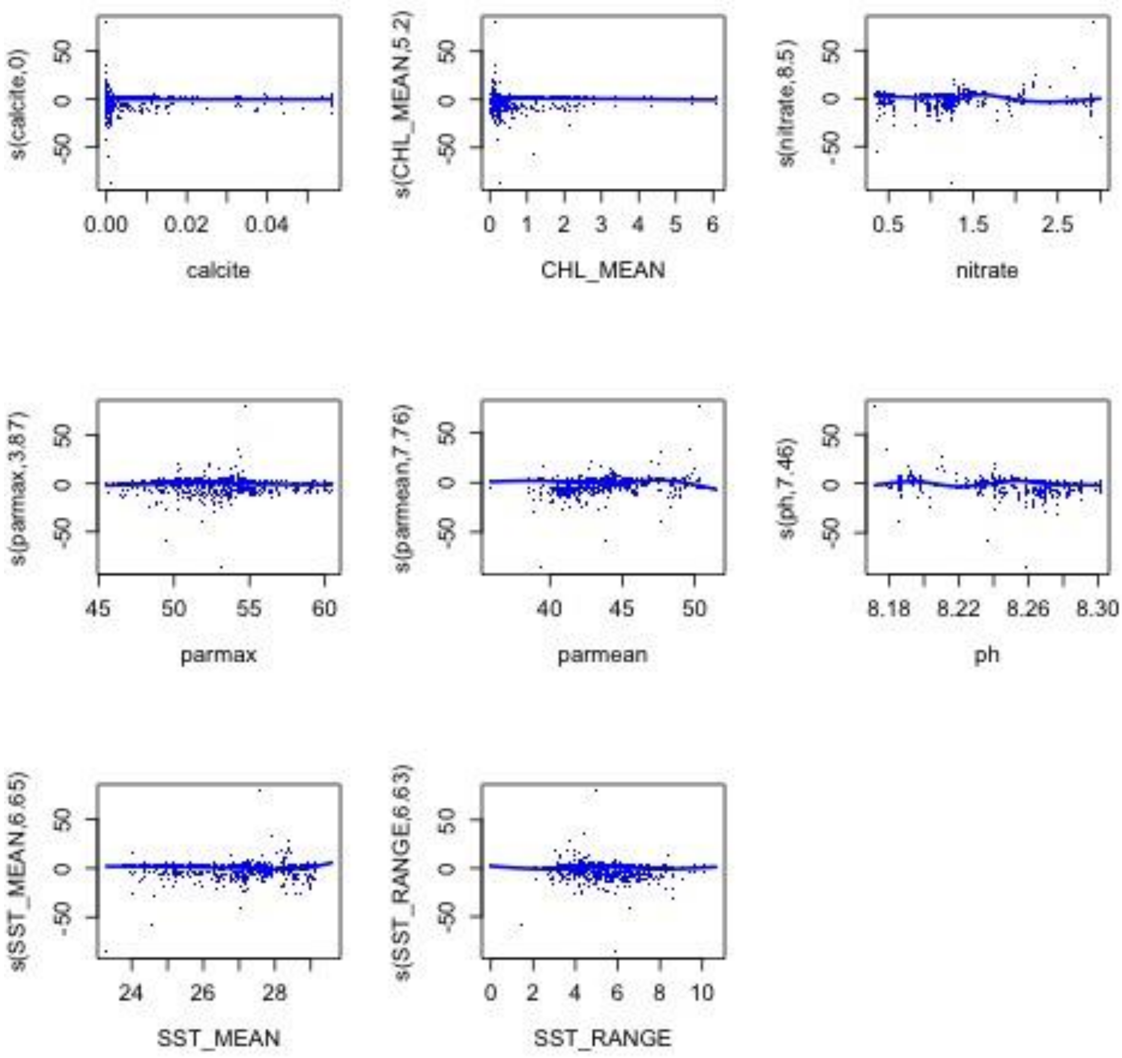
174Ctenochaetus sp, n = 35 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.130202e-01	9	4.890091e-01	0.202169976
s(CHL_MEAN)	2.392917e-04	9	1.920021e-04	0.334222141
s(nitrate)	8.999174e-01	6	8.595598e+00	0.001589335
s(parmax)	1.594403e+00	9	4.035720e+00	0.056005381
s(parmean)	6.976660e-06	9	4.863551e-06	0.484193183
s(ph)	2.854930e-06	9	2.439911e-07	1.000000000
s(SST_MEAN)	5.988874e-06	9	4.102406e-06	0.422020462
s(SST_RANGE)	2.320844e+00	9	6.003864e+00	0.043697477



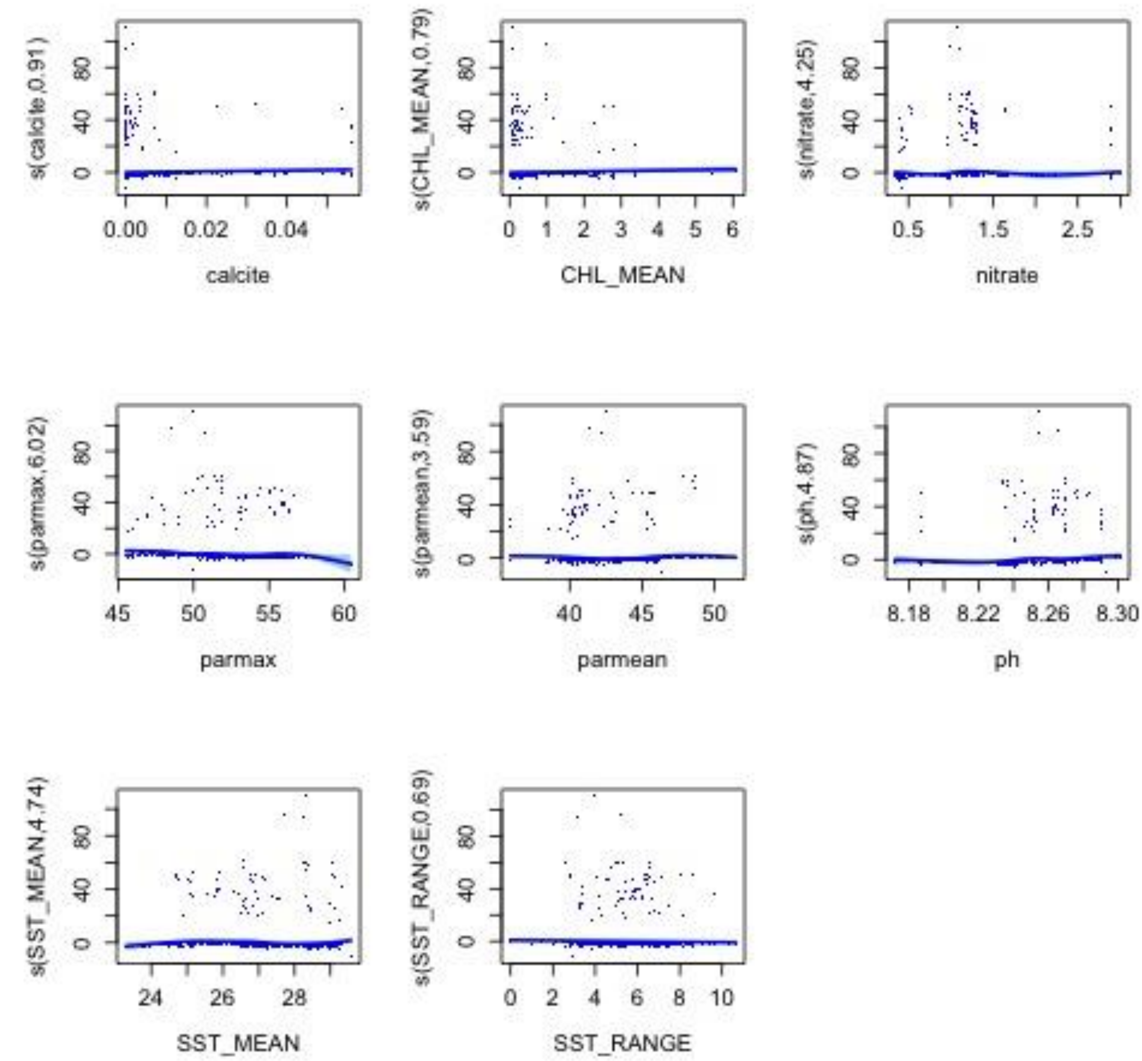
175Ctenochaetus striatus, n = 3374 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0006914367	9	2.658782e-04	5.456998e-01
s(CHL_MEAN)	5.1985097786	9	1.097259e+02	3.800542e-24
s(nitrate)	8.4970923796	9	3.221618e+02	2.107052e-71
s(parmax)	3.8711462862	9	6.592990e+01	8.682440e-17
s(parmean)	7.7588961273	9	1.632997e+02	5.774494e-35
s(ph)	7.4580555821	9	2.419131e+02	4.085978e-53
s(SST_MEAN)	6.6468031821	9	9.803188e+01	4.309330e-21
s(SST_RANGE)	6.6336378905	9	1.034388e+02	1.047362e-21



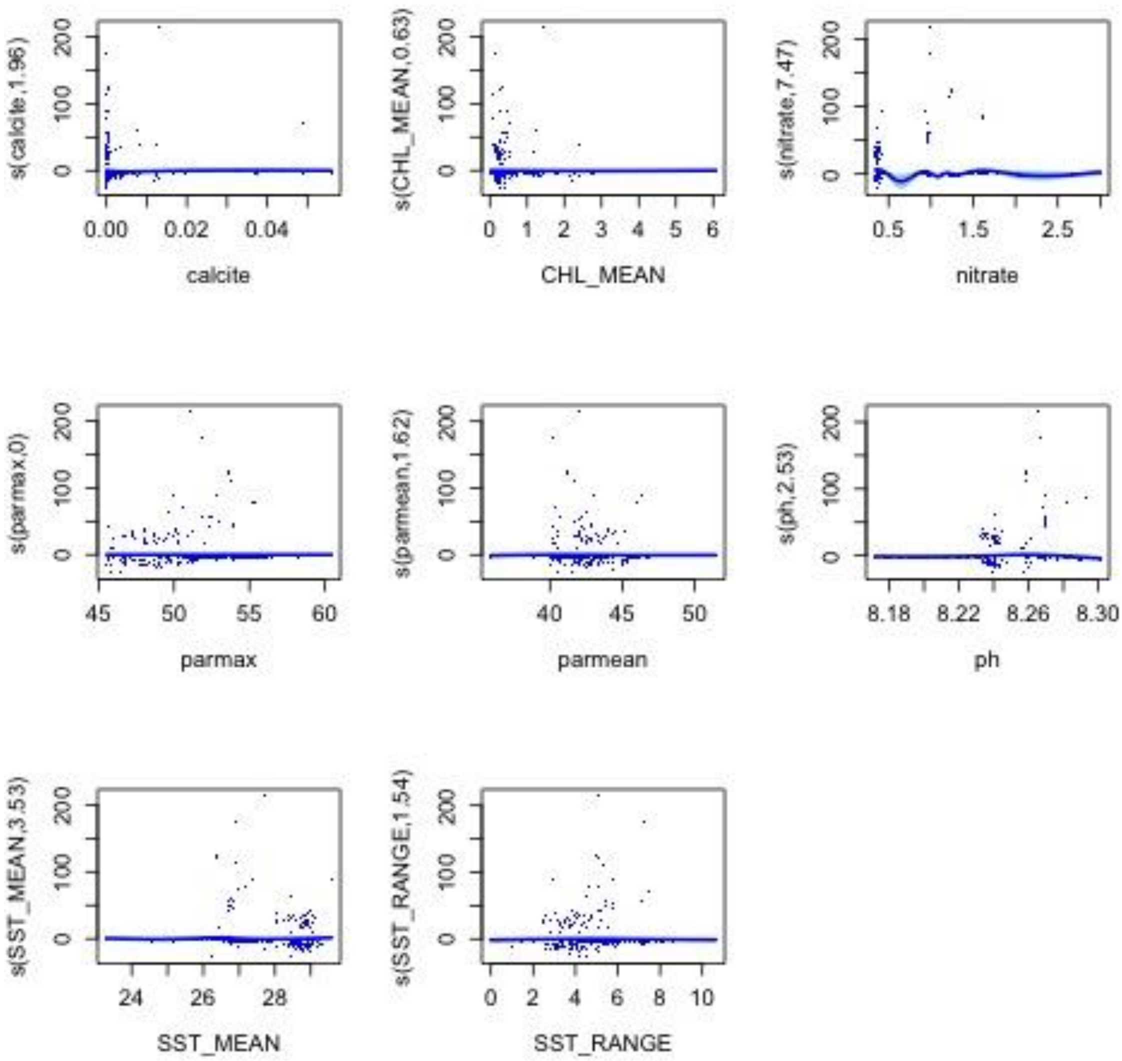
176Ctenochaetus strigosus, n = 186 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9110869	5	9.722496	6.838140e-04
s(CHL_MEAN)	0.7898560	9	3.638247	2.626048e-02
s(nitrate)	4.2534723	9	14.886135	8.840551e-04
s(parmax)	6.0239498	9	27.165466	1.244169e-05
s(parmean)	3.5890991	9	24.579982	1.085442e-06
s(ph)	4.8711608	9	29.541458	1.335318e-07
s(SST_MEAN)	4.7353051	9	19.793486	9.797853e-05
s(SST_RANGE)	0.6944467	9	2.147186	7.055260e-02



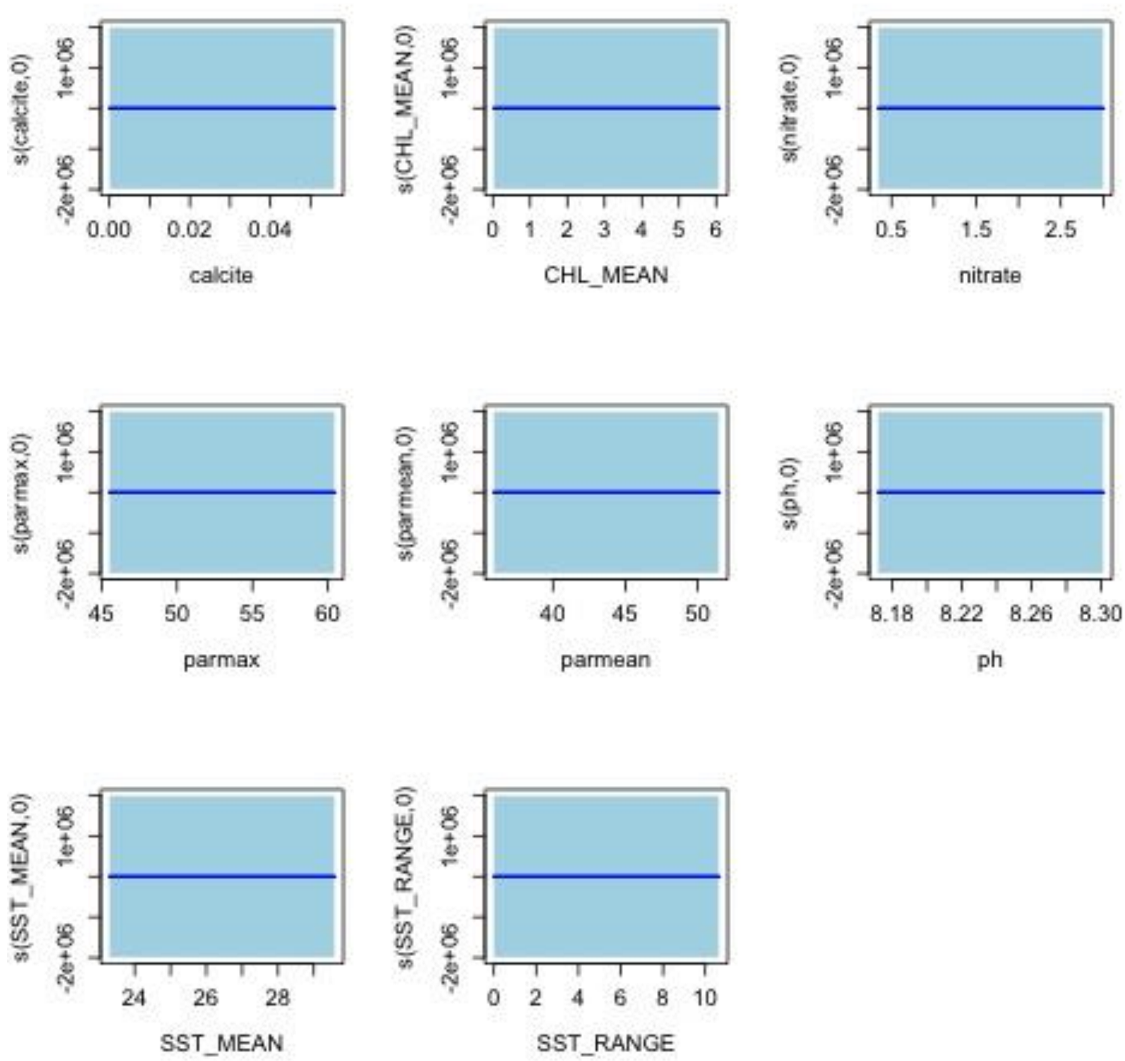
177Ctenochaetus tominiensis, n = 65 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.961442e+00	9	9.057599e+00	5.909002e-03
s(CHL_MEAN)	6.255212e-01	9	1.455558e+00	1.114635e-01
s(nitrate)	7.469874e+00	9	7.511680e+01	8.888650e-16
s(parmax)	7.181897e-05	9	9.066032e-06	1.000000e+00
s(parmean)	1.620281e+00	9	3.038884e+00	1.123733e-01
s(ph)	2.529354e+00	9	1.323603e+01	5.952736e-04
s(SST_MEAN)	3.531499e+00	9	1.054411e+01	8.827275e-03
s(SST_RANGE)	1.538707e+00	9	3.134337e+00	1.000995e-01



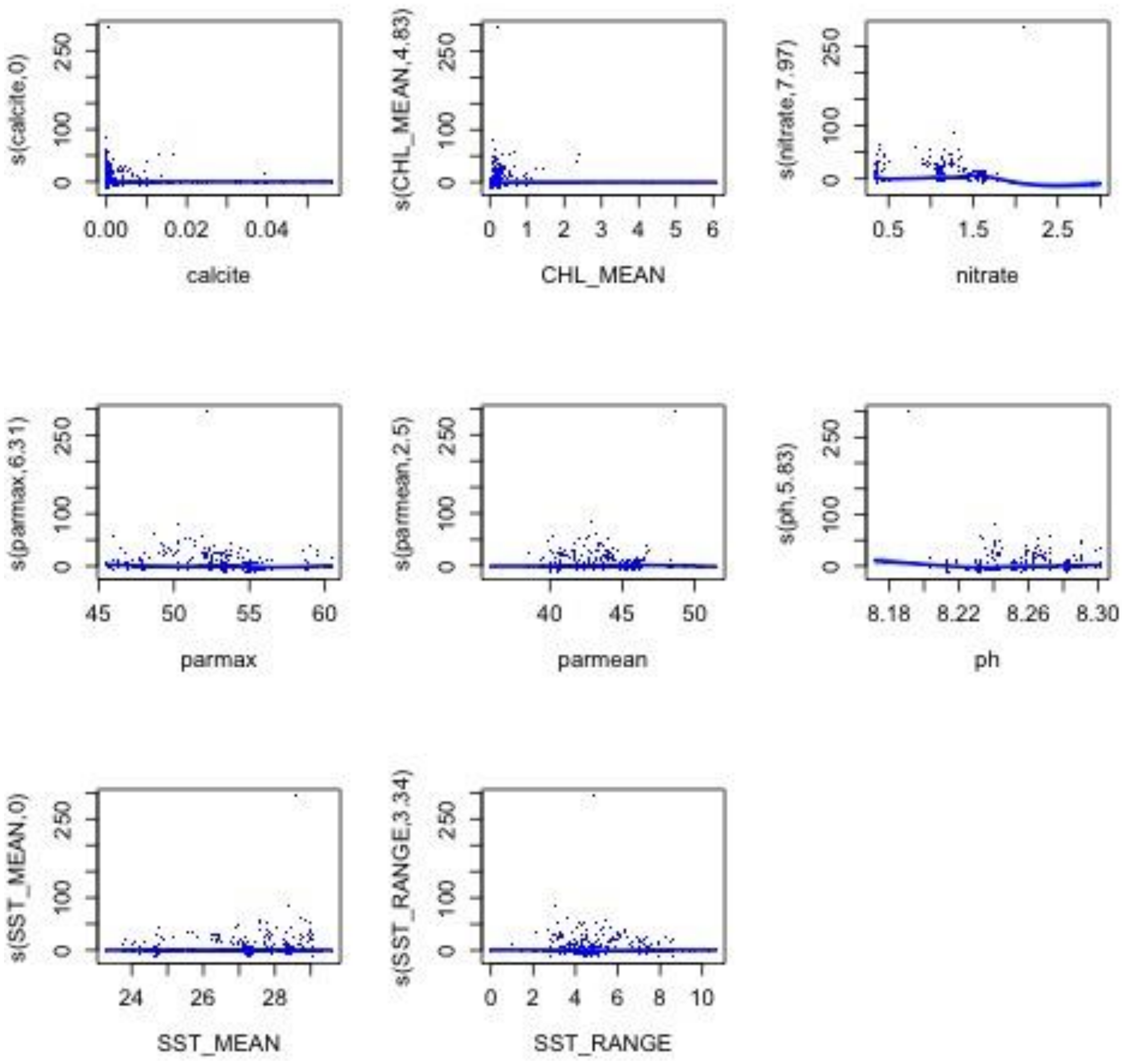
178Dascyllus albisella, n = 57 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.161775e-09	8	5.529831e-50	1
s(CHL_MEAN)	2.593060e-11	9	1.314850e-52	1
s(nitrate)	2.498755e-12	9	2.614132e-51	1
s(parmax)	6.848125e-13	9	1.571652e-52	1
s(parmean)	1.123517e-12	9	7.084192e-53	1
s(ph)	6.219119e-13	9	3.095587e-51	1
s(SST_MEAN)	6.316176e-13	9	8.543518e-53	1
s(SST_RANGE)	7.132266e-13	9	3.085867e-51	1



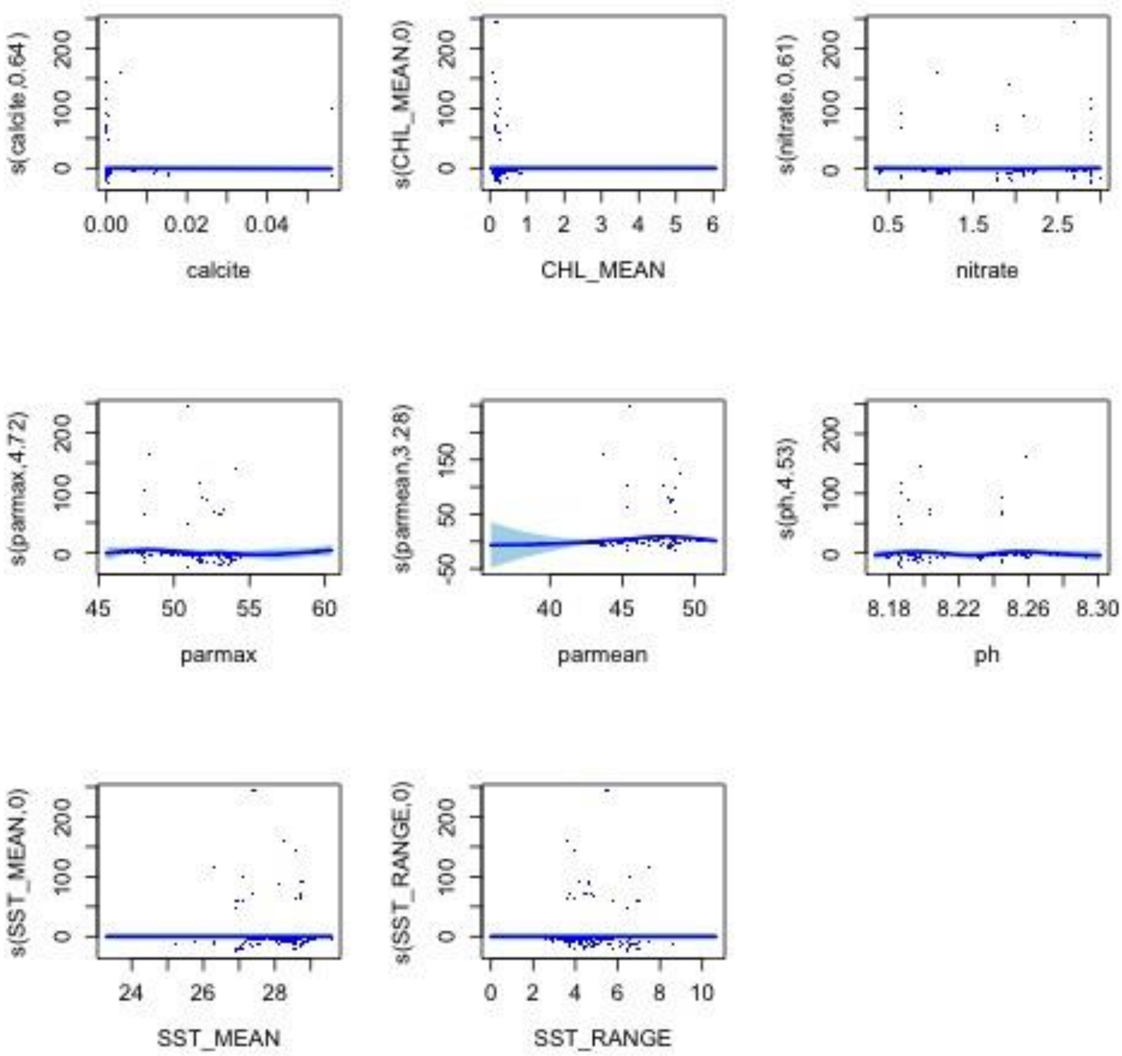
179Dascyllus aruanus, n = 281 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0001645762	9	9.222800e-05	4.721060e-01
s(CHL_MEAN)	4.8336983260	9	4.165711e+01	6.183526e-09
s(nitrate)	7.9676563370	9	1.207440e+02	1.852184e-27
s(parmax)	6.3090288559	9	5.038252e+01	6.803829e-11
s(parmean)	2.5030399004	9	1.402662e+01	1.414964e-04
s(ph)	5.8337552442	9	6.013754e+01	2.606940e-14
s(SST_MEAN)	0.0007918487	9	5.263280e-04	4.246155e-01
s(SST_RANGE)	3.3355271978	9	1.350032e+01	1.090000e-03



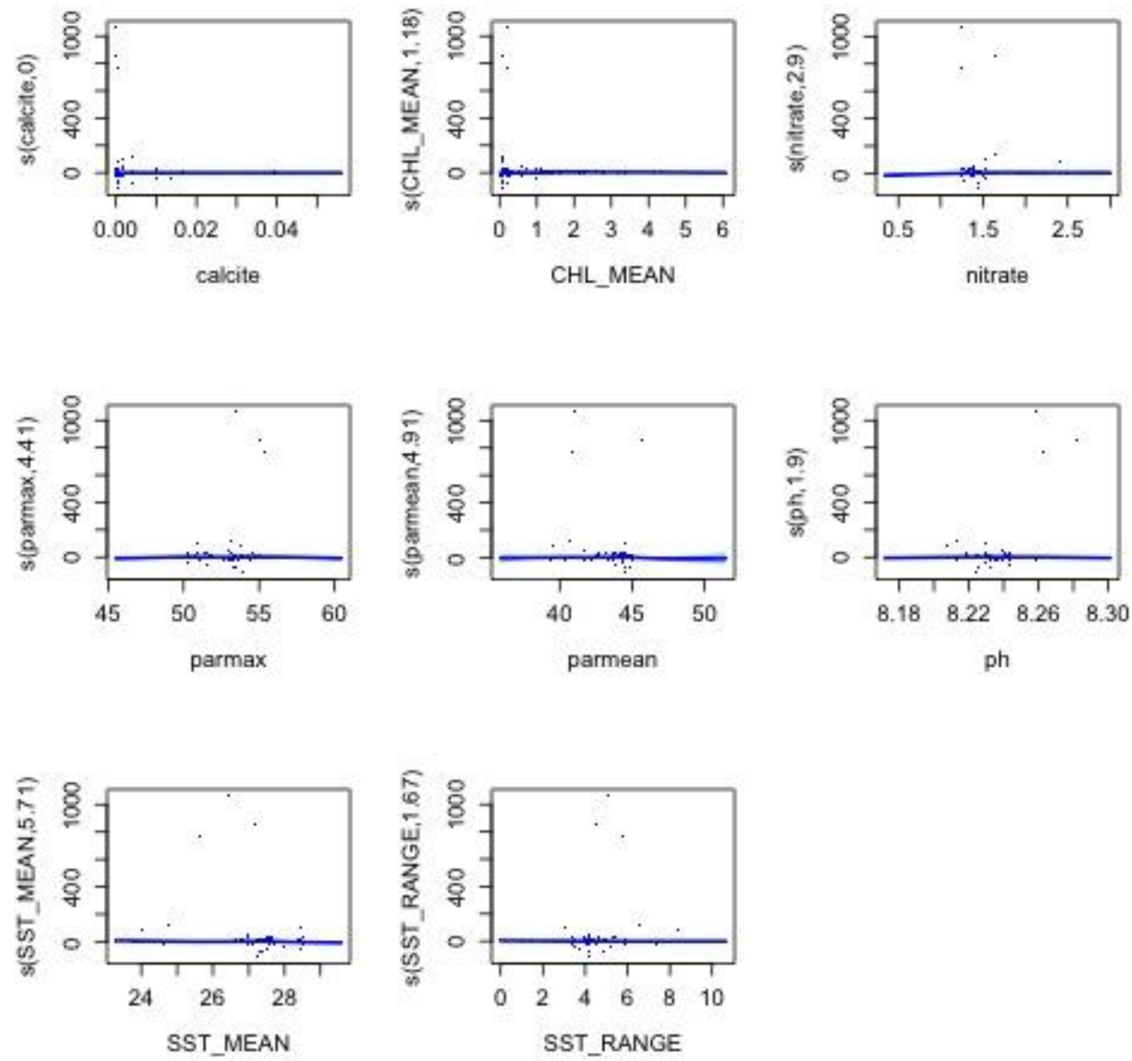
180Dascyllus auripinnis, n = 235 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.356656e-01	7	1.715947e+00	9.576906e-02
s(CHL_MEAN)	2.479361e-05	9	3.119783e-06	7.248397e-01
s(nitrate)	6.132093e-01	9	8.446543e-01	2.070827e-01
s(parmax)	4.717339e+00	9	2.190741e+01	5.016526e-05
s(parmean)	3.277834e+00	9	3.014186e+01	1.412643e-07
s(ph)	4.527167e+00	9	1.596029e+01	7.664418e-04
s(SST_MEAN)	3.732593e-05	9	5.074642e-06	7.895498e-01
s(SST_RANGE)	4.089489e-05	9	1.176553e-05	7.502004e-01



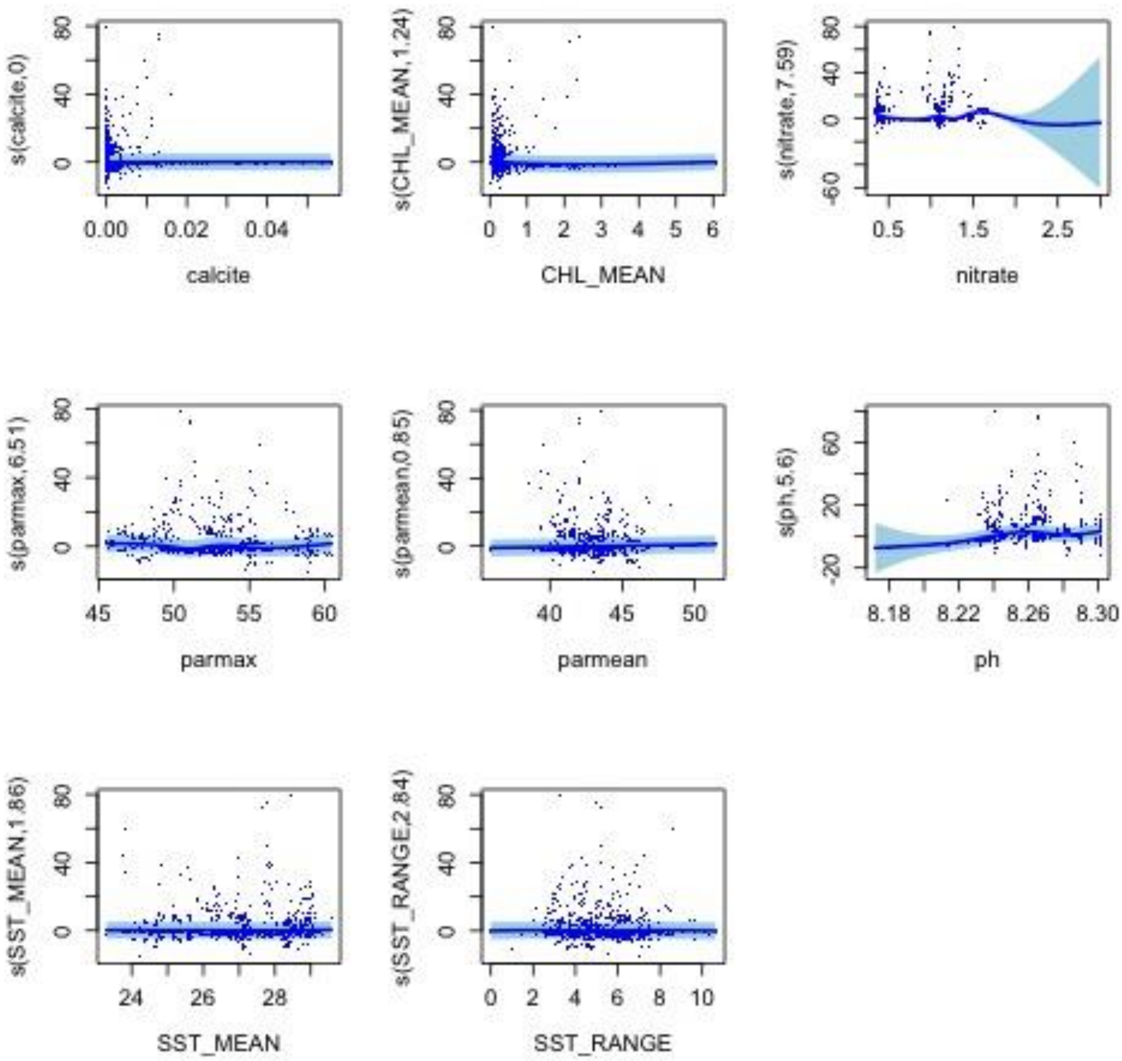
181Dascyllus flavicaudus, n = 78 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.815546e-05	8	6.431720e-07	1.000000e+00
s(CHL_MEAN)	1.175055e+00	9	1.816646e+01	8.477390e-07
s(nitrate)	2.901526e+00	9	1.738274e+01	5.447024e-06
s(parmax)	4.405249e+00	9	9.729131e+00	2.444094e-02
s(parmean)	4.914099e+00	9	2.527834e+01	4.269508e-06
s(ph)	1.903624e+00	9	1.192917e+01	8.770712e-05
s(SST_MEAN)	5.712280e+00	9	6.336334e+01	1.575920e-16
s(SST_RANGE)	1.667213e+00	9	3.958349e+00	4.748203e-02



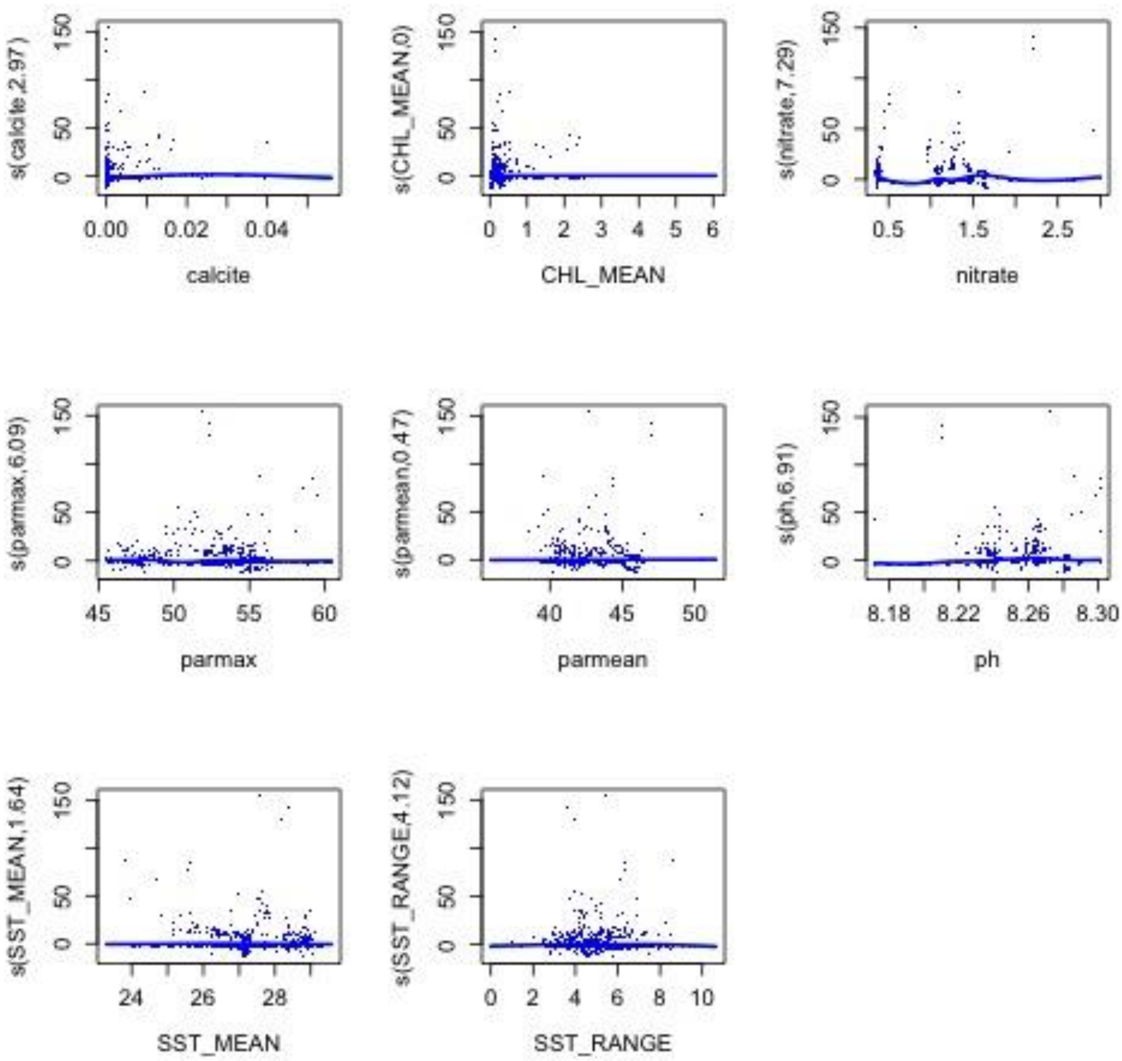
182Dascyllus reticulatus, n = 574 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.191353e-05	8	2.782374e-05	4.869346e-01
s(CHL_MEAN)	1.242581e+00	9	1.533354e+01	3.355445e-05
s(nitrate)	7.587052e+00	9	2.783967e+02	3.939093e-64
s(parmax)	6.507465e+00	9	1.100213e+02	2.396814e-24
s(parmean)	8.511932e-01	9	5.504207e+00	6.766971e-03
s(ph)	5.601821e+00	9	1.101777e+02	2.215278e-26
s(SST_MEAN)	1.858004e+00	9	3.348609e+00	1.100162e-01
s(SST_RANGE)	2.835031e+00	9	6.844812e+00	3.739645e-02



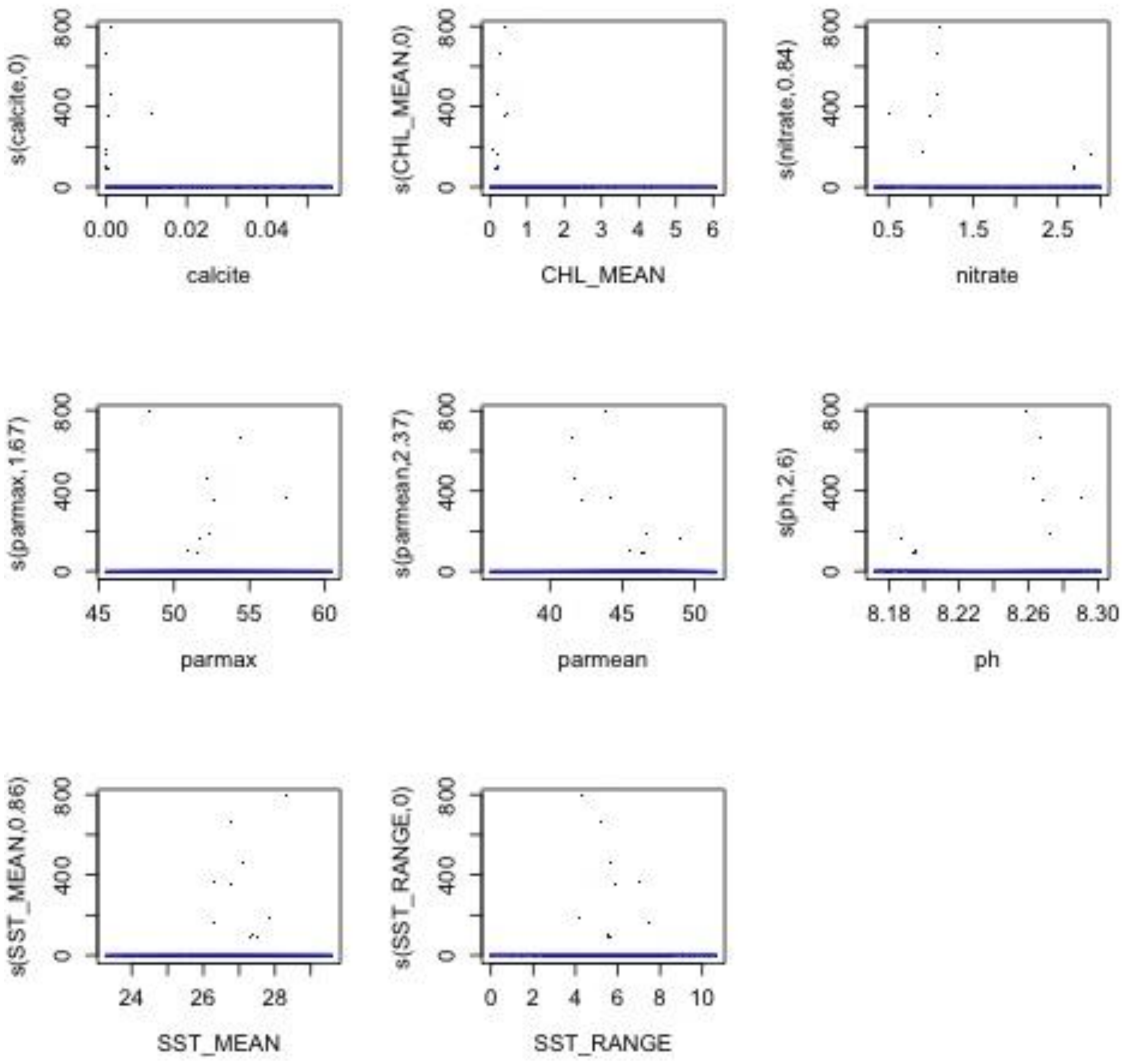
183Dascyllus trimaculatus, n = 417 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.966461e+00	9	3.313070e+01	2.540111e-08
s(CHL_MEAN)	7.713035e-06	9	3.201885e-06	5.322801e-01
s(nitrate)	7.288086e+00	9	2.660781e+02	1.043387e-62
s(parmax)	6.086689e+00	9	7.615612e+01	1.054655e-16
s(parmean)	4.732584e-01	9	9.306663e-01	1.321353e-01
s(ph)	6.908553e+00	9	8.232607e+01	2.001041e-18
s(SST_MEAN)	1.643592e+00	9	4.288304e+00	3.744945e-02
s(SST_RANGE)	4.117960e+00	9	1.215664e+01	6.522629e-03



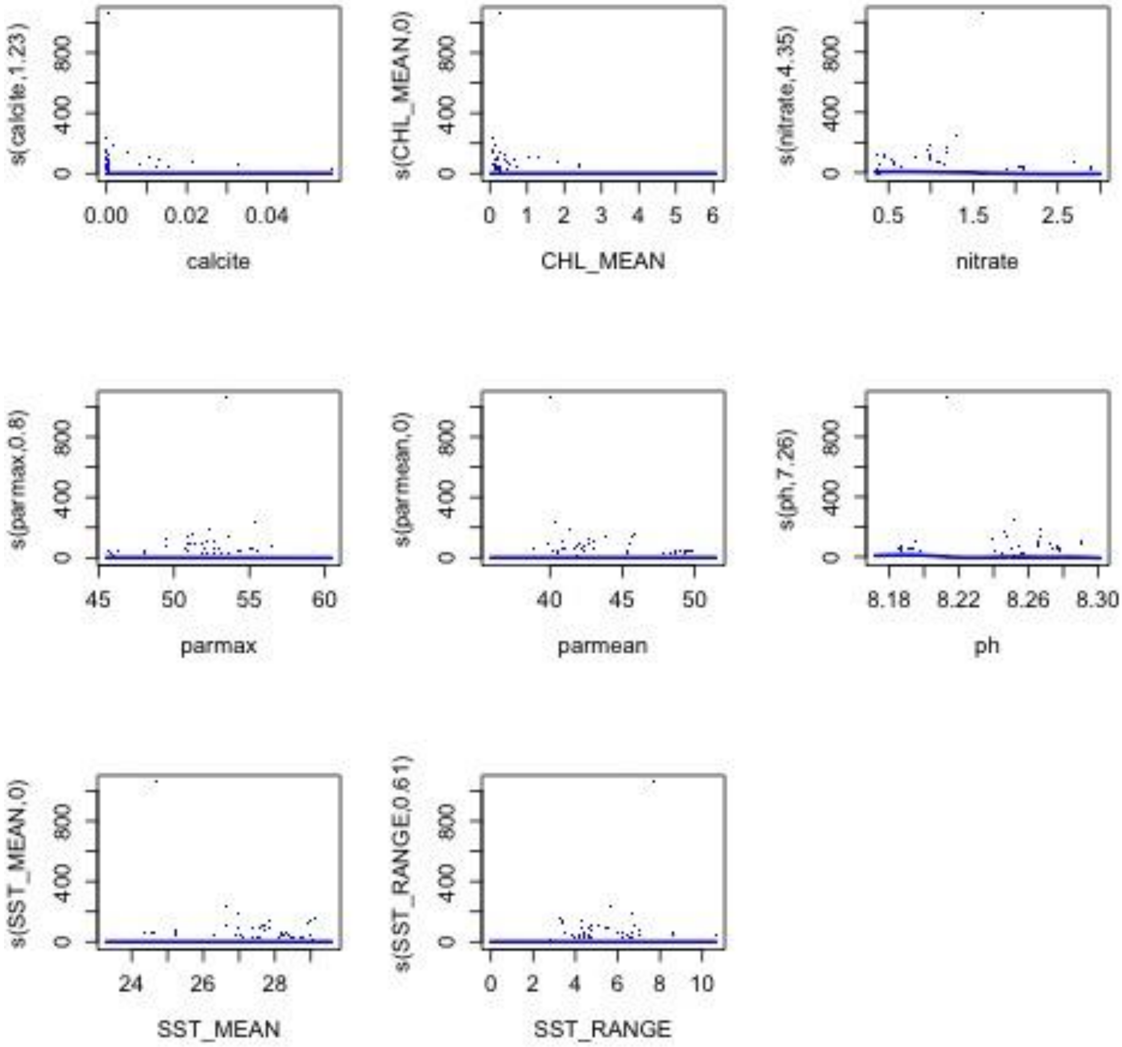
184Decapterus macarellus, n = 37 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.297052e-05	9	8.486158e-07	1.000000000
s(CHL_MEAN)	2.221786e-05	9	4.635980e-06	0.654439365
s(nitrate)	8.381174e-01	9	1.584797e+00	0.094096482
s(parmax)	1.667835e+00	9	4.438872e+00	0.030299648
s(parmean)	2.374797e+00	9	9.558602e+00	0.002883775
s(ph)	2.600257e+00	9	4.926920e+00	0.053138718
s(SST_MEAN)	8.619780e-01	9	1.215806e+00	0.196436785
s(SST_RANGE)	6.828274e-05	9	3.731285e-05	0.548759124



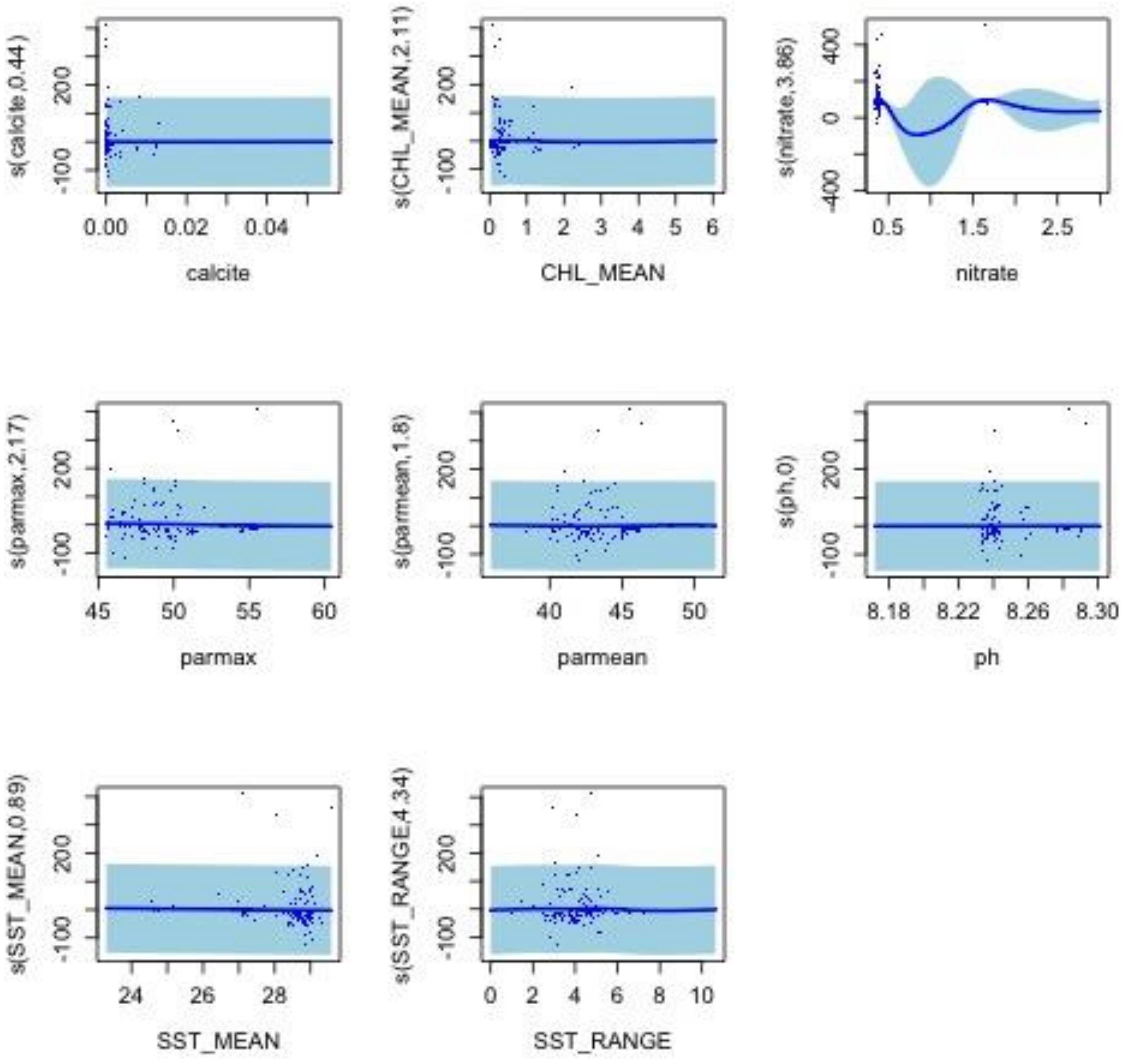
185Diodon hystrix, n = 67 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.229684e+00	9	4.048299e+00	3.300695e-02
s(CHL_MEAN)	1.307846e-05	9	2.435946e-06	7.564940e-01
s(nitrate)	4.346252e+00	9	5.406877e+01	2.410610e-13
s(parmax)	7.964562e-01	8	3.781044e+00	2.117811e-02
s(parmean)	2.354230e-04	9	2.824161e-04	2.276133e-01
s(ph)	7.257141e+00	9	5.791275e+01	1.436831e-12
s(SST_MEAN)	1.532700e-05	9	2.725243e-06	9.410608e-01
s(SST_RANGE)	6.129715e-01	9	1.028269e+00	1.622001e-01



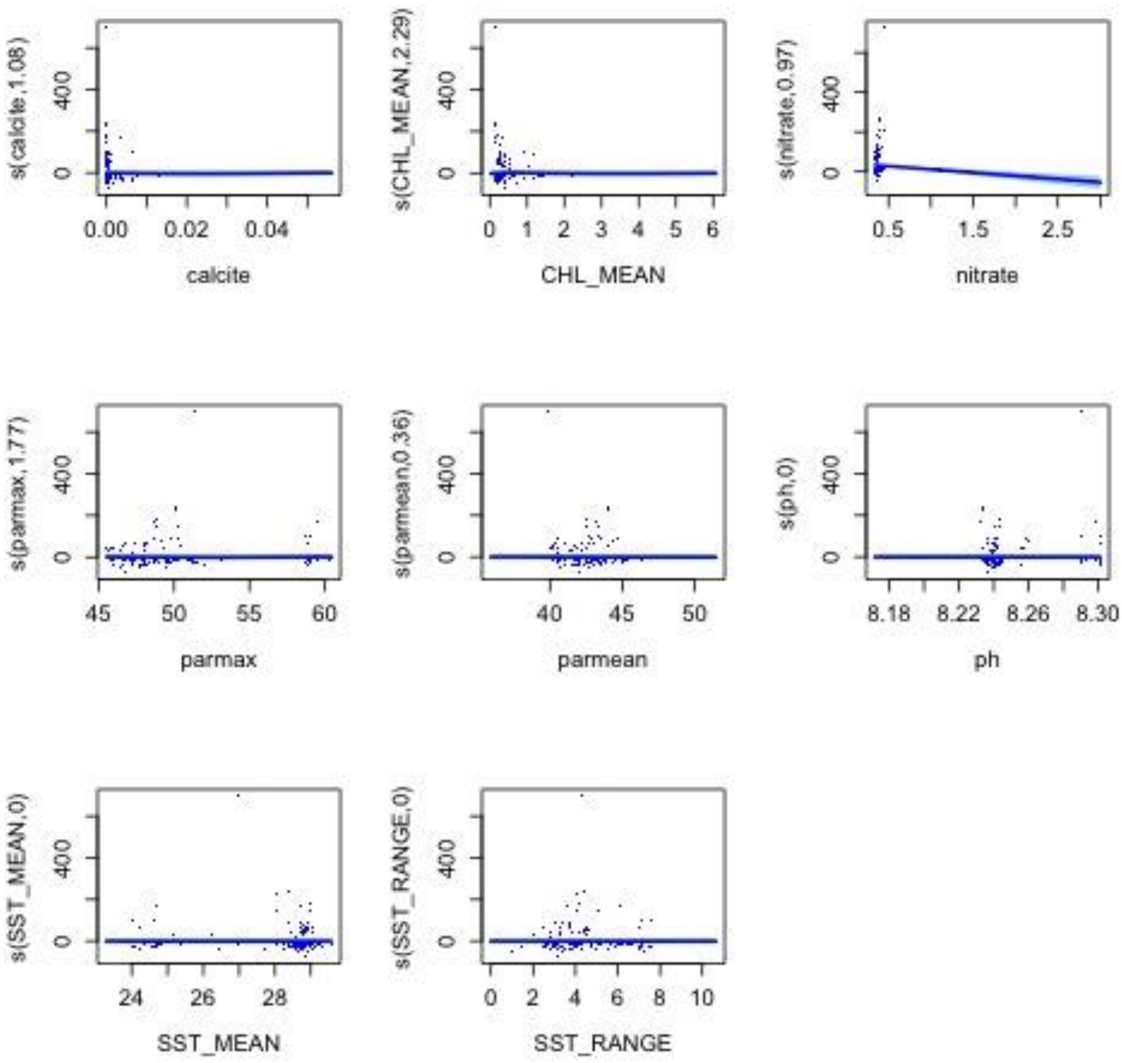
186Diproctacanthus xanthurus, n = 38 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.365756e-01	9	5.042295e-01	0.274078861
s(CHL_MEAN)	2.106188e+00	9	1.218580e+01	0.001275044
s(nitrate)	3.862584e+00	8	1.119390e+01	0.008486857
s(parmax)	2.165478e+00	9	1.094592e+01	0.000475990
s(parmean)	1.795710e+00	9	3.987073e+00	0.054485874
s(ph)	6.654662e-05	9	6.345938e-05	0.298103225
s(SST_MEAN)	8.922247e-01	9	5.279946e+00	0.010461668
s(SST_RANGE)	4.343570e+00	9	1.282936e+01	0.008045551



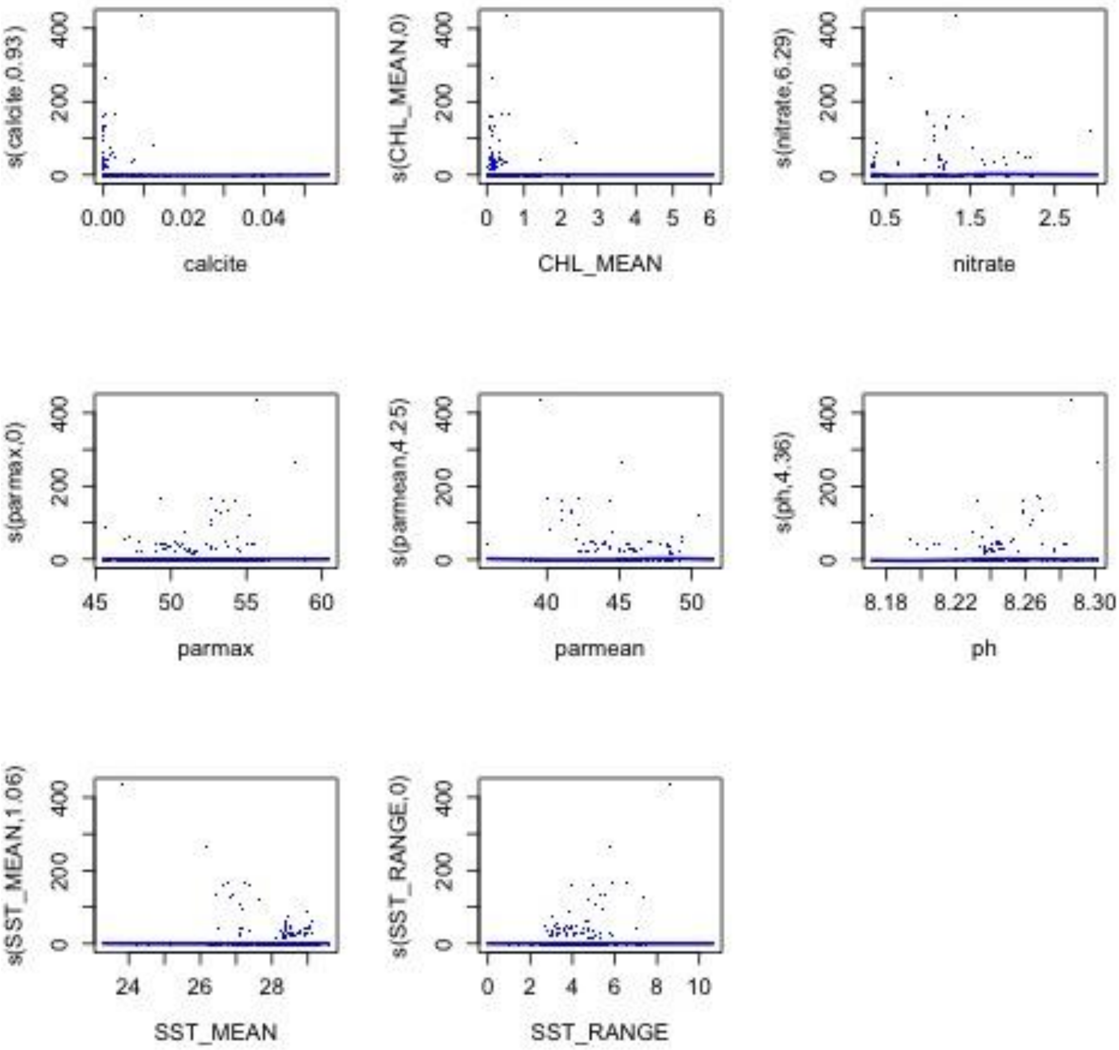
187Dischistodus melanotus, n = 40 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.077738e+00	9	1.158197e+01	2.138452e-04
s(CHL_MEAN)	2.291688e+00	9	1.731722e+01	8.803738e-05
s(nitrate)	9.680534e-01	6	2.654908e+01	7.094368e-08
s(parmax)	1.773652e+00	9	1.129472e+01	5.279488e-04
s(parmean)	3.552539e-01	9	5.972380e-01	1.730617e-01
s(ph)	3.726076e-05	8	2.705848e-05	3.698612e-01
s(SST_MEAN)	2.933488e-05	9	1.573509e-05	5.240287e-01
s(SST_RANGE)	1.300975e-05	9	4.384189e-06	7.190235e-01



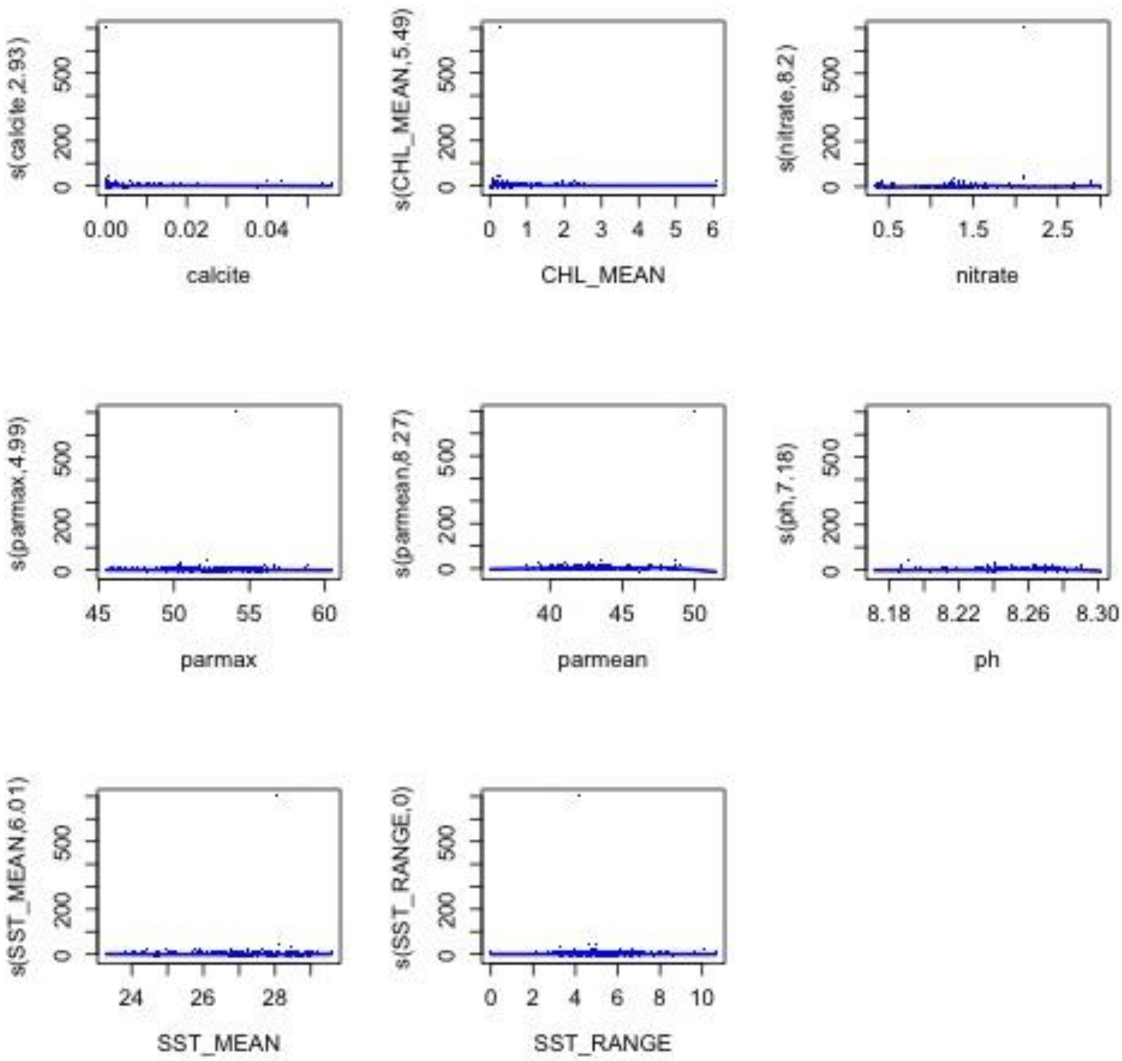
188Elagatis bipinnulata, n = 141 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.282502e-01	9	4.442858e+00	2.067958e-02
s(CHL_MEAN)	1.765164e-05	9	2.059641e-06	7.590292e-01
s(nitrate)	6.291656e+00	9	6.071812e+01	5.664996e-14
s(parmax)	1.317850e-05	9	2.946096e-06	8.344825e-01
s(parmean)	4.252701e+00	9	5.052509e+01	9.523259e-13
s(ph)	4.359242e+00	9	2.544113e+01	2.325263e-06
s(SST_MEAN)	1.062905e+00	9	2.746614e+00	5.358312e-02
s(SST_RANGE)	1.979056e-05	9	8.538412e-06	6.166835e-01



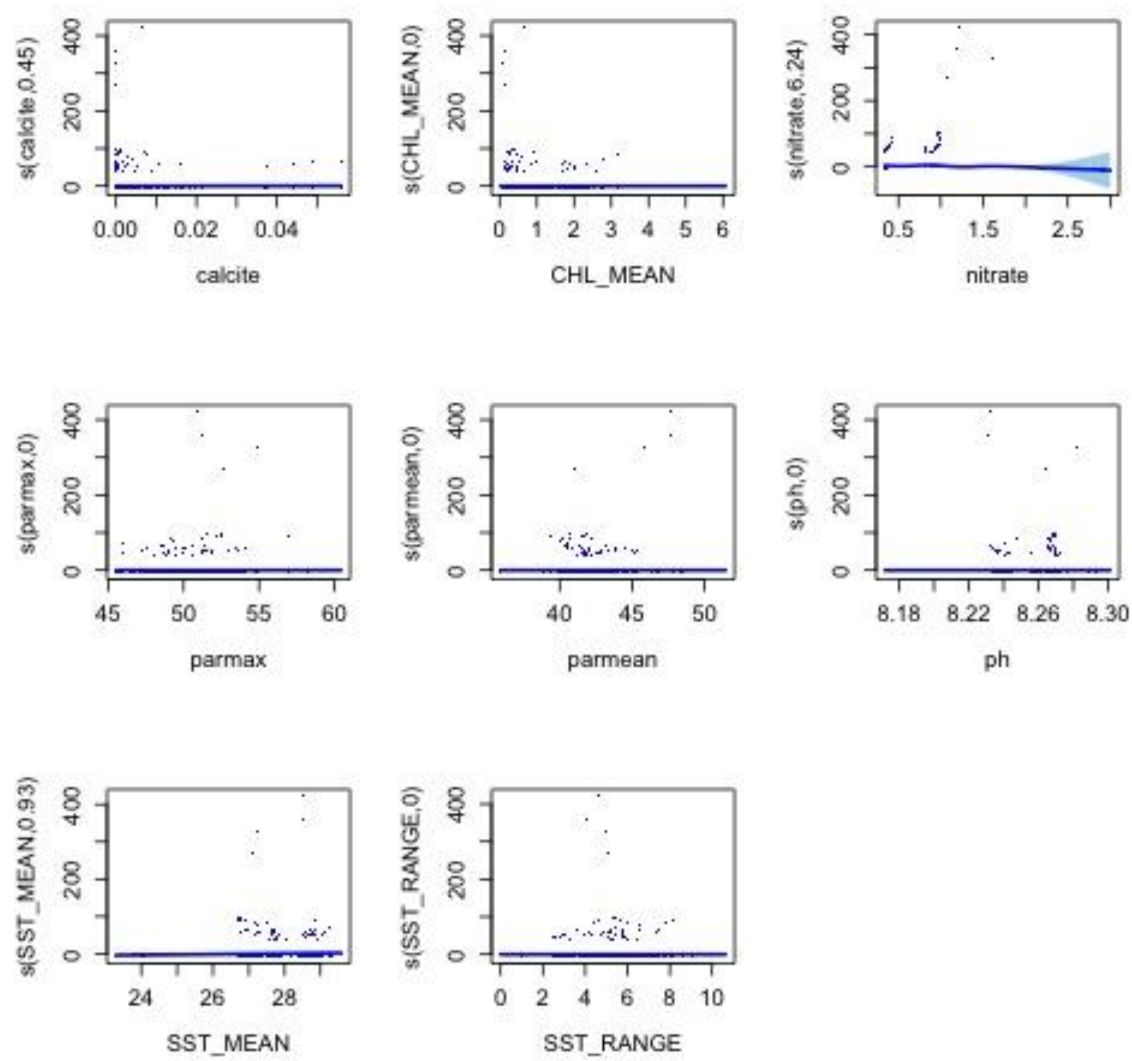
189Epibulus insidiator, n = 1137 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.9316932997	9	2.265207e+01	1.529186e-05
s(CHL_MEAN)	5.4943951346	9	5.343834e+01	4.877631e-11
s(nitrate)	8.1971677006	9	2.890093e+02	5.178101e-66
s(parmax)	4.9942780799	9	1.853292e+01	6.110884e-04
s(parmean)	8.2708186800	9	7.821574e+01	4.696484e-15
s(ph)	7.1814739983	9	8.013024e+01	4.812341e-17
s(SST_MEAN)	6.0139410369	9	4.987980e+01	8.308851e-11
s(SST_RANGE)	0.0004762157	9	4.154381e-04	3.976010e-01



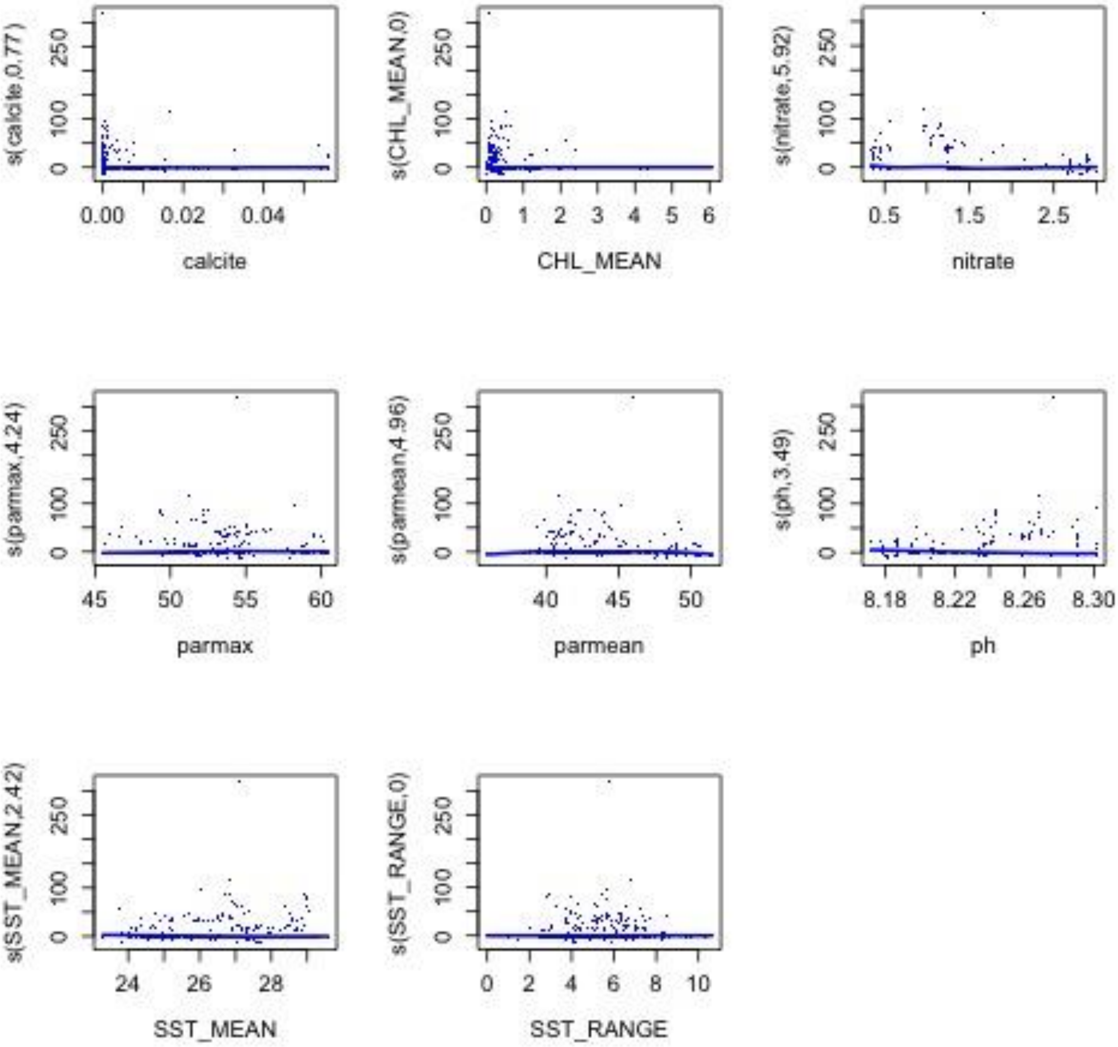
190Epinephelus caeruleopunctatus, n = 49 observations8

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.479808e-01	5	8.777955e-01	1.605343e-01
s(CHL_MEAN)	3.110557e-06	9	1.295904e-06	5.164100e-01
s(nitrate)	6.244512e+00	9	6.695756e+01	8.285028e-14
s(parmax)	4.560462e-06	9	1.201471e-06	7.608627e-01
s(parmean)	3.848953e-06	9	1.617057e-06	6.407506e-01
s(ph)	1.351620e-04	9	1.610749e-05	8.019161e-01
s(SST_MEAN)	9.348631e-01	9	1.327563e+01	1.376821e-04
s(SST_RANGE)	7.948906e-05	9	7.580741e-05	3.227359e-01



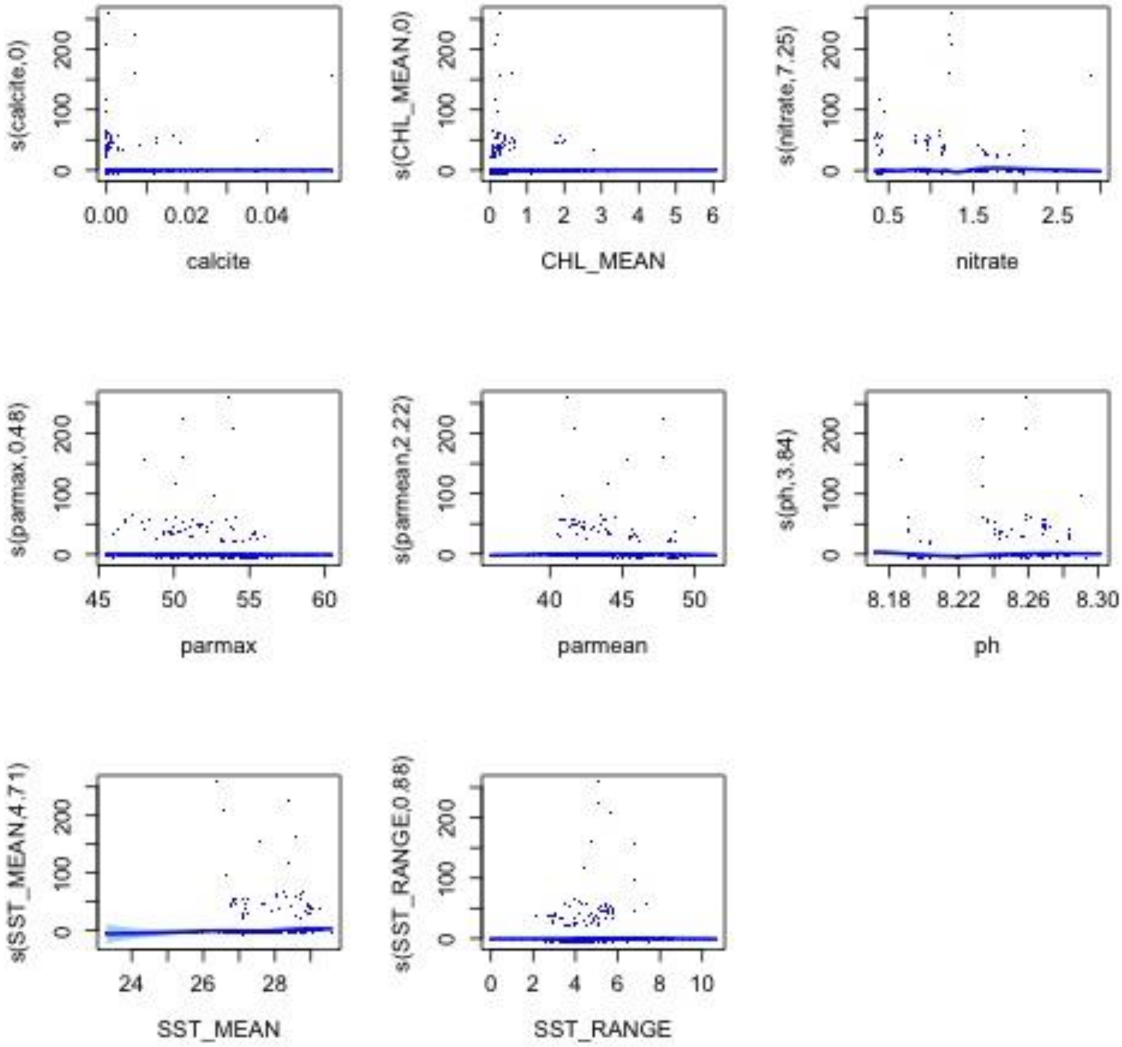
191Epinephelus fasciatus, n = 261 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7718991147	9	2.318836e+00	6.925464e-02
s(CHL_MEAN)	0.0002705250	9	6.790573e-05	6.226028e-01
s(nitrate)	5.9206881098	9	8.617628e+01	4.795702e-21
s(parmax)	4.2417399855	9	3.330333e+01	2.518003e-08
s(parmean)	4.9602213138	9	6.622349e+01	1.136769e-15
s(ph)	3.4910872017	9	3.371627e+01	1.136643e-09
s(SST_MEAN)	2.4225167215	9	2.083741e+01	1.753284e-06
s(SST_RANGE)	0.0001660628	9	8.926462e-05	5.471853e-01



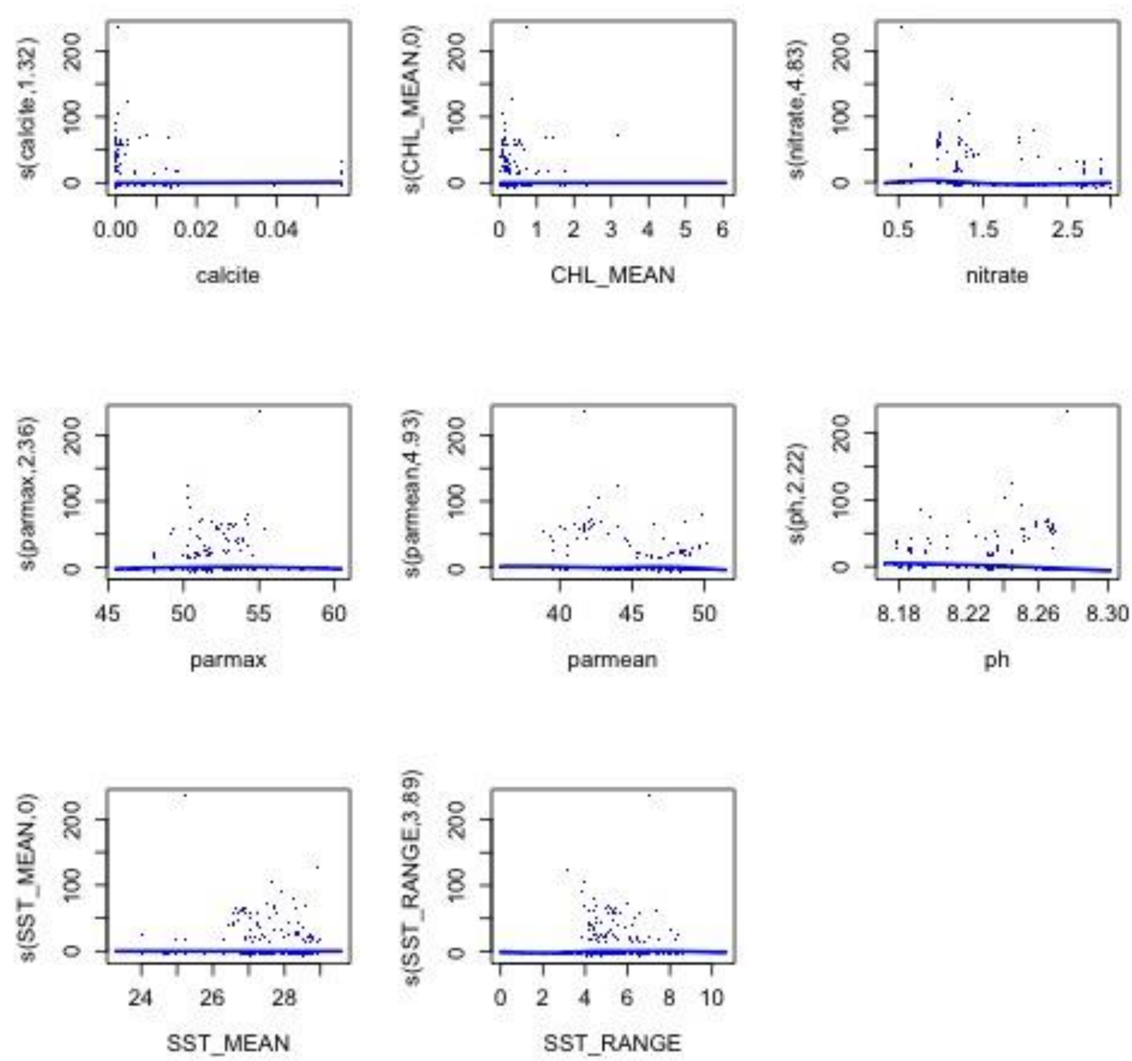
192Epinephelus fuscoguttatus, n = 75 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.322342e-05	8	7.554538e-06	8.133347e-01
s(CHL_MEAN)	4.314298e-05	9	2.744307e-06	8.421905e-01
s(nitrate)	7.250000e+00	9	4.461213e+01	2.638590e-09
s(parmax)	4.817333e-01	9	9.242180e-01	1.387200e-01
s(parmean)	2.219317e+00	9	8.179735e+00	5.255358e-03
s(ph)	3.838150e+00	9	2.668655e+01	5.336313e-07
s(SST_MEAN)	4.712235e+00	9	2.964608e+01	1.999096e-07
s(SST_RANGE)	8.793518e-01	9	1.419280e+00	1.704820e-01



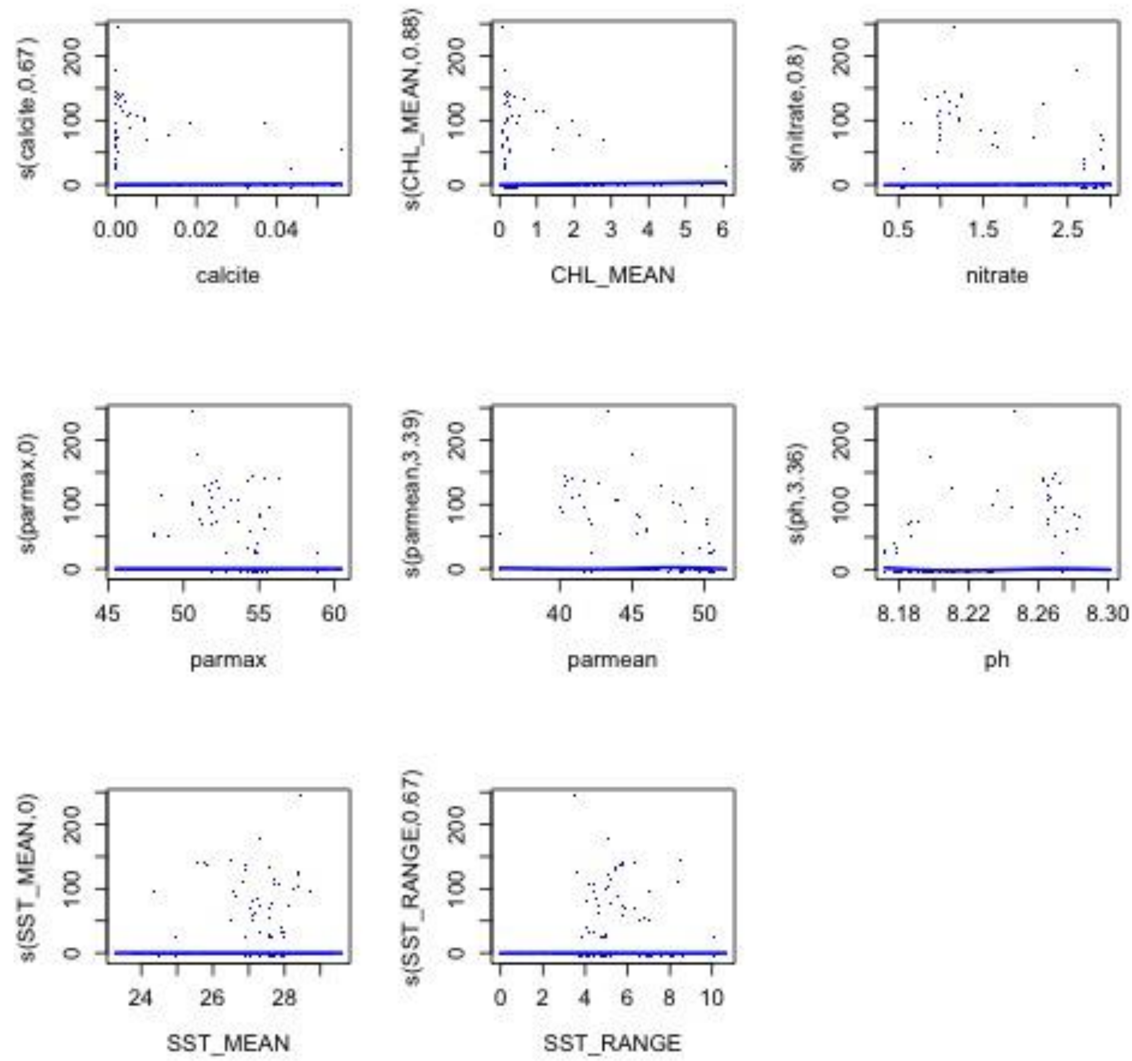
193Epinephelus hexagonatus, n = 156 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.3232814508	9	3.702655e+00	5.416646e-02
s(CHL_MEAN)	0.0001967805	9	1.356429e-04	3.828617e-01
s(nitrate)	4.8267560407	9	3.559362e+01	2.459585e-09
s(parmax)	2.3588831981	9	1.256875e+01	3.498561e-04
s(parmean)	4.9283263518	9	4.114387e+01	1.012726e-09
s(ph)	2.2240338807	9	3.582149e+01	1.192768e-12
s(SST_MEAN)	0.0002903342	9	2.190759e-04	3.971414e-01
s(SST_RANGE)	3.8940782638	9	1.539945e+01	8.282634e-04



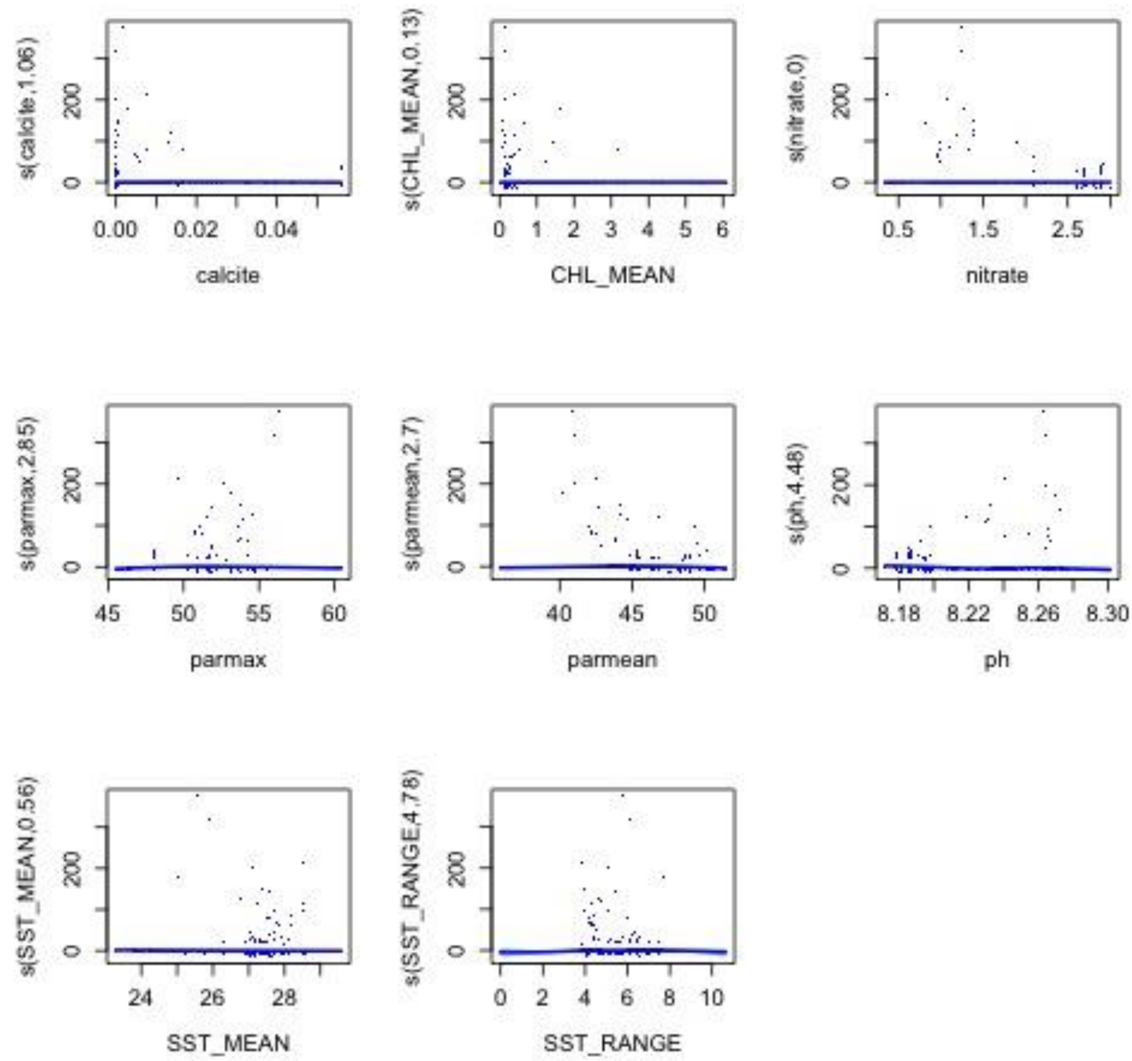
194Epinephelus howlandi, n = 63 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.745824e-01	6	2.357642e+00	5.375400e-02
s(CHL_MEAN)	8.751158e-01	7	7.380709e+00	1.693032e-03
s(nitrate)	8.040653e-01	8	3.395937e+00	2.596238e-02
s(parmax)	6.858366e-05	9	1.834774e-05	8.092121e-01
s(parmean)	3.392081e+00	9	2.420785e+01	2.426597e-06
s(ph)	3.363130e+00	9	3.176817e+01	2.142260e-08
s(SST_MEAN)	3.016709e-03	9	2.746270e-03	3.048987e-01
s(SST_RANGE)	6.708125e-01	9	8.102034e-01	2.628526e-01



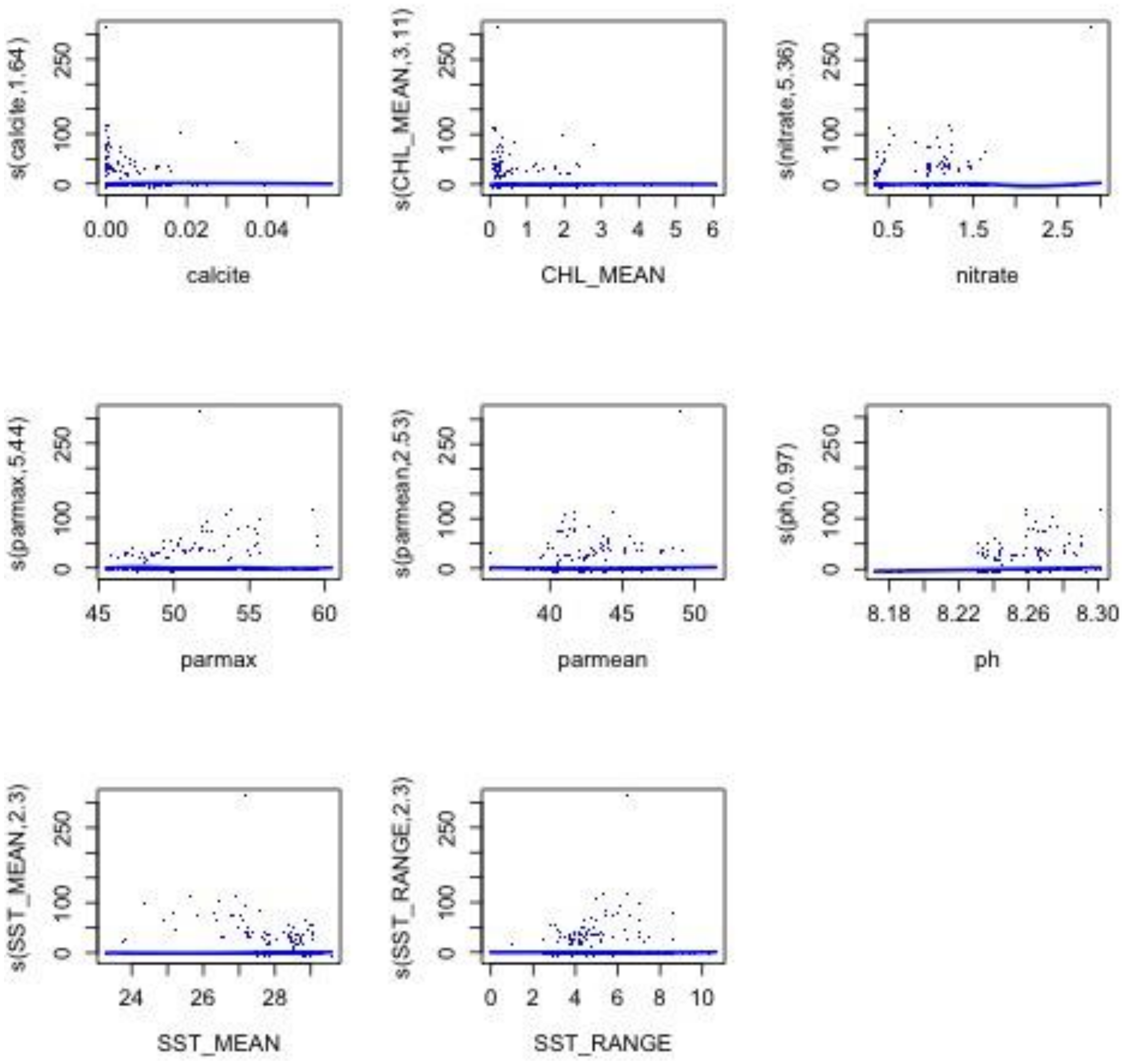
195Epinephelus macrospilos, n = 106 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.059740e+00	9	2.077295e+00	1.253206e-01
s(CHL_MEAN)	1.285458e-01	9	1.418178e-01	2.651109e-01
s(nitrate)	6.208254e-06	9	1.381330e-06	8.101845e-01
s(parmax)	2.850552e+00	9	2.448466e+01	1.444722e-07
s(parmean)	2.702339e+00	9	3.060431e+01	3.130145e-09
s(ph)	4.482543e+00	9	6.512147e+01	1.046862e-16
s(SST_MEAN)	5.606710e-01	9	1.383148e+00	9.631541e-02
s(SST_RANGE)	4.781822e+00	9	1.438664e+01	3.280948e-03



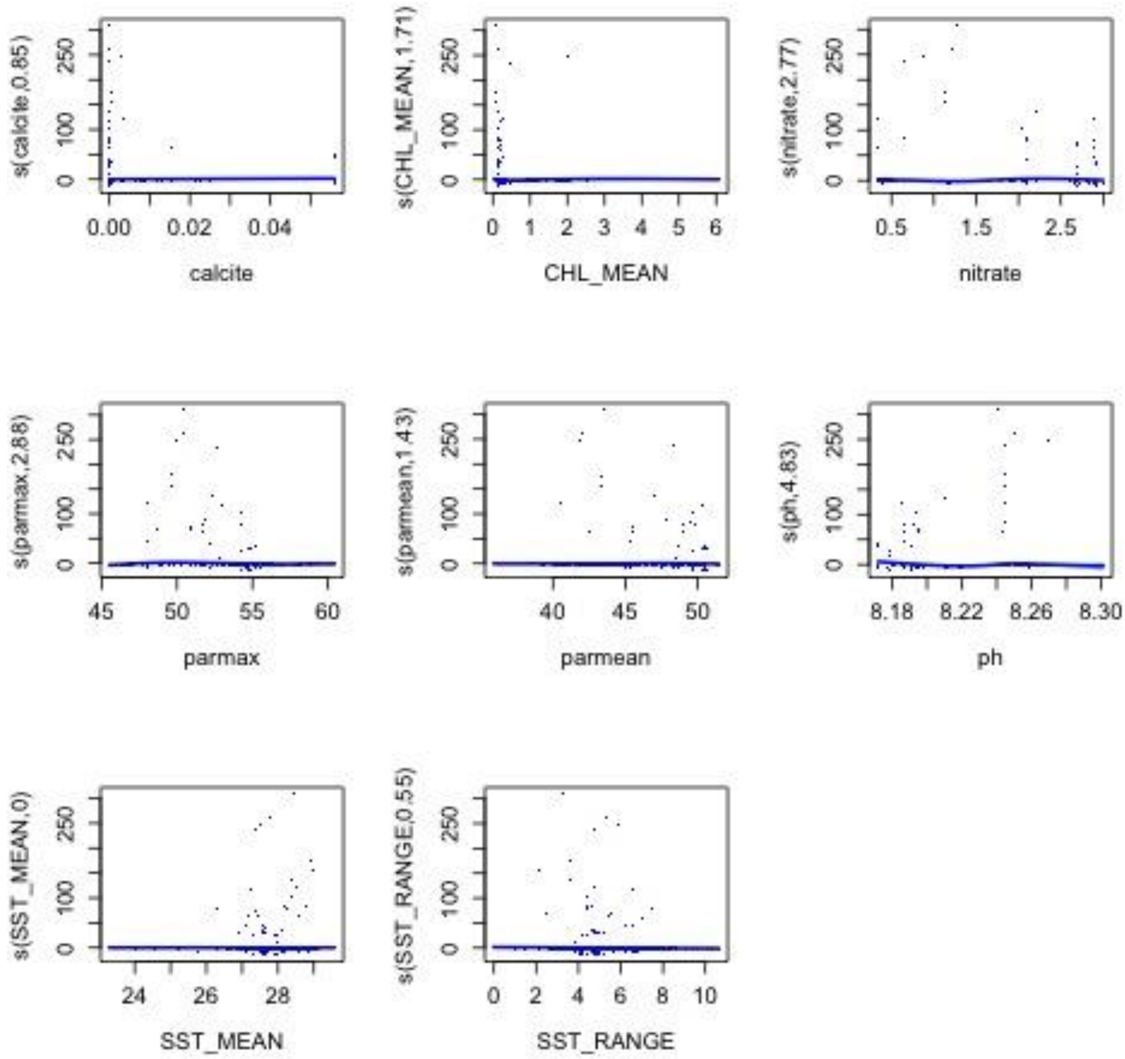
196Epinephelus maculatus, n = 91 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.6352780	9	14.344690	1.201792e-04
s(CHL_MEAN)	3.1078865	9	13.262624	2.093369e-03
s(nitrate)	5.3558015	9	14.279421	6.687899e-03
s(parmax)	5.4364962	9	30.840702	1.376217e-06
s(parmean)	2.5324248	9	14.529582	1.094656e-04
s(ph)	0.9742729	9	33.562131	3.973244e-11
s(SST_MEAN)	2.3046676	9	8.129677	5.193951e-03
s(SST_RANGE)	2.3048298	9	5.576544	4.016077e-02



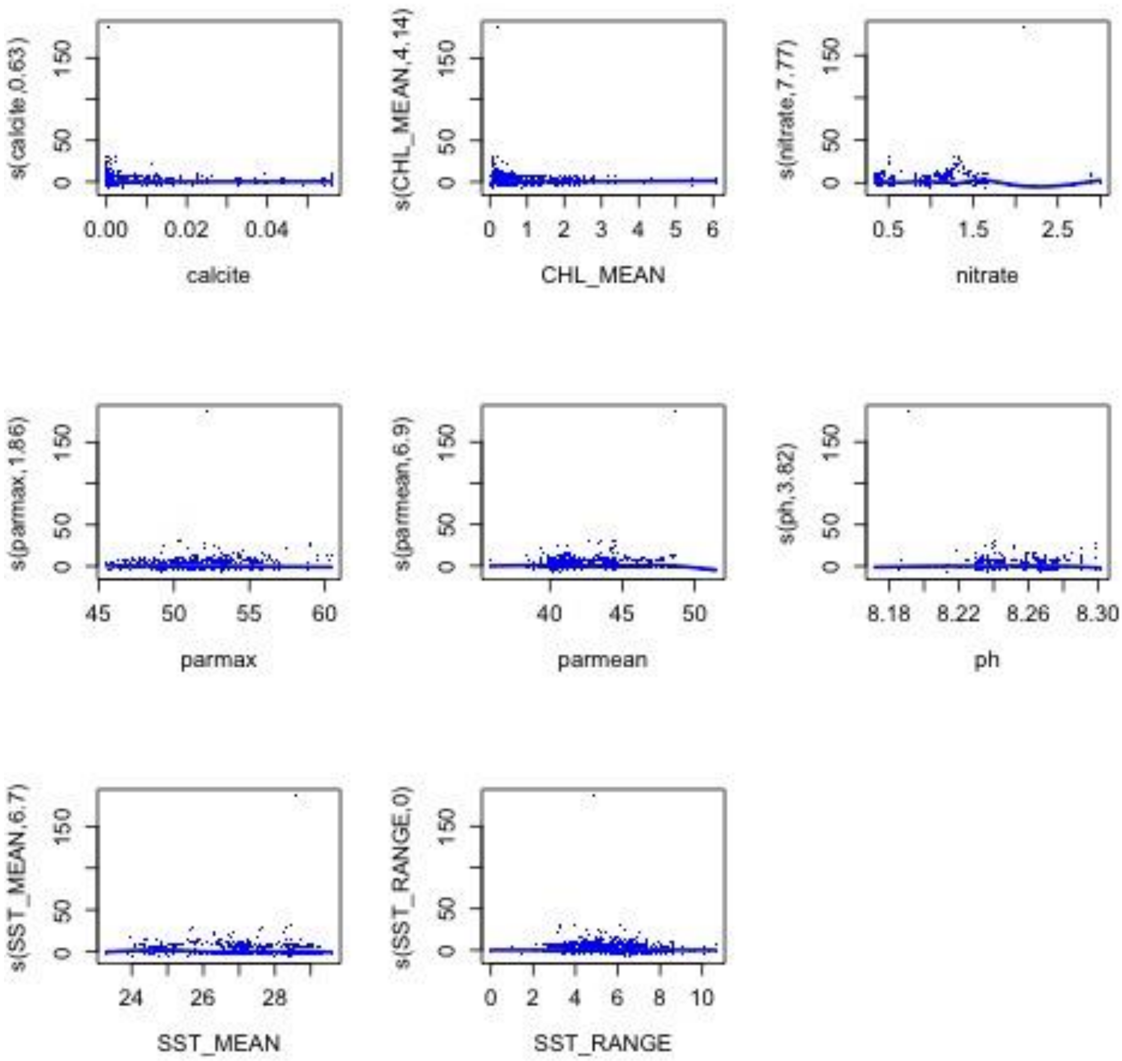
197Epinephelus melanostigma, n = 112 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.846220856	4	4.690605e+00	1.276944e-02
s(CHL_MEAN)	1.707189332	9	4.393169e+00	5.718302e-02
s(nitrate)	2.765989054	9	1.809443e+01	1.699963e-05
s(parmax)	2.878842491	9	1.175048e+01	9.249355e-04
s(parmean)	1.431894211	9	2.968605e+00	6.405575e-02
s(ph)	4.830092651	9	3.122872e+01	5.872797e-08
s(SST_MEAN)	0.000302353	9	1.025332e-04	5.354133e-01
s(SST_RANGE)	0.552651537	9	1.160715e+00	1.100068e-01



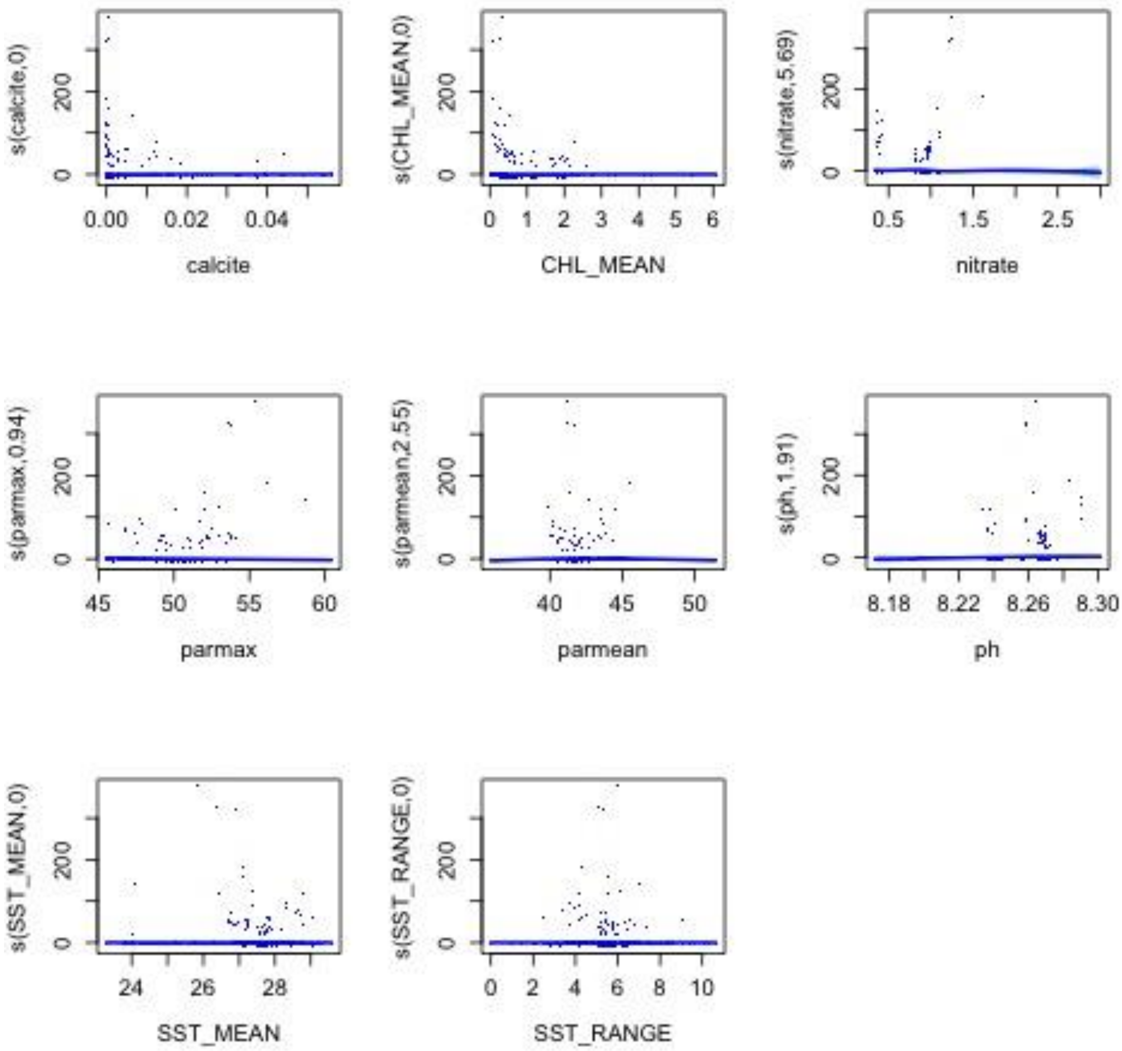
198Epinephelus merra, n = 646 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6309092166	7	1.704588e+00	9.373700e-02
s(CHL_MEAN)	4.1434783237	9	3.503667e+01	5.388786e-08
s(nitrate)	7.7711066119	9	1.639820e+02	6.042278e-36
s(parmax)	1.8569231016	9	1.139568e+01	4.171184e-04
s(parmean)	6.8986200923	9	3.309540e+01	4.036875e-06
s(ph)	3.8219398607	9	1.639705e+01	3.441244e-04
s(SST_MEAN)	6.6964194416	9	7.198176e+01	2.558252e-15
s(SST_RANGE)	0.0001935316	9	1.024323e-04	5.783488e-01



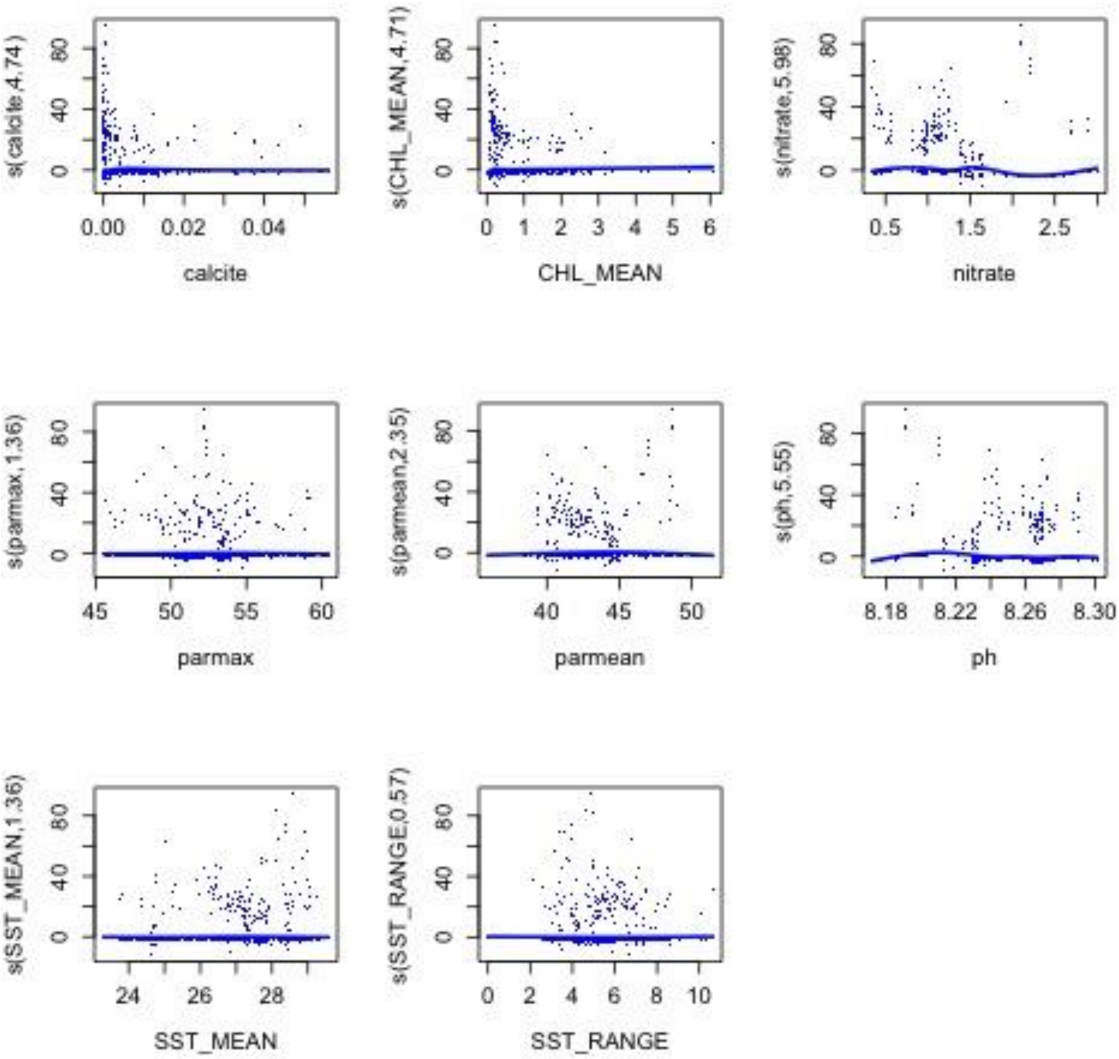
199Epinephelus ongus, n = 57 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.676022e-05	9	2.857502e-06	8.147870e-01
s(CHL_MEAN)	3.390750e-05	9	2.227632e-05	4.147171e-01
s(nitrate)	5.688972e+00	9	3.770736e+01	8.146037e-09
s(parmax)	9.363764e-01	9	1.391738e+01	6.166142e-05
s(parmean)	2.547351e+00	9	8.550824e+00	1.076121e-02
s(ph)	1.910779e+00	9	8.281045e+00	3.977620e-03
s(SST_MEAN)	1.474078e-04	9	2.841975e-05	9.862316e-01
s(SST_RANGE)	3.516720e-05	9	2.698967e-05	4.442221e-01



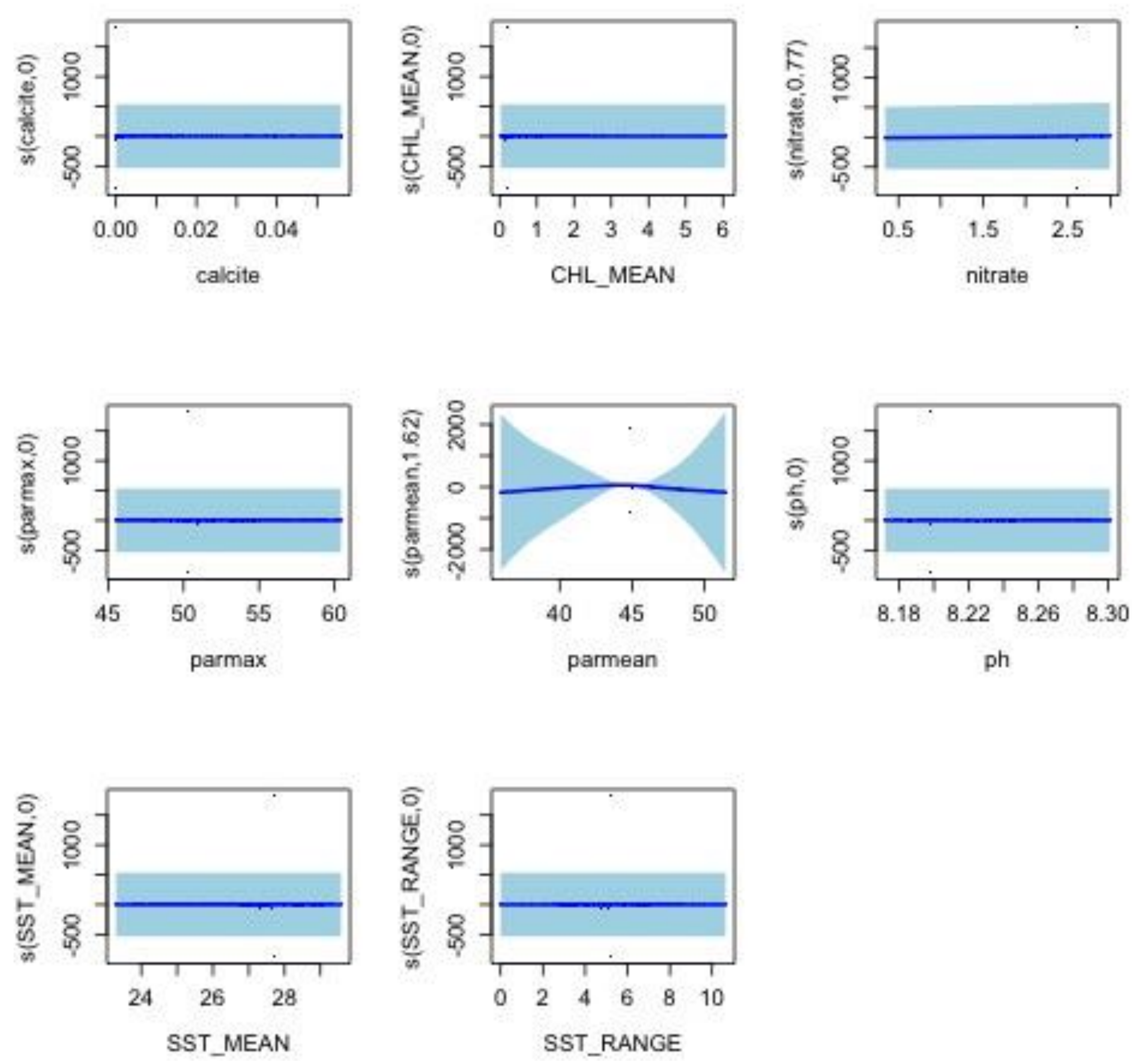
200Epinephelus polyphekadion, n = 253 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.7400075	9	30.5981380	2.705159e-06
s(CHL_MEAN)	4.7065127	9	33.7038413	2.324725e-07
s(nitrate)	5.9760358	9	77.4221121	2.473942e-18
s(parmax)	1.3625460	9	3.2288986	6.126384e-02
s(parmean)	2.3453444	9	13.3760185	1.848418e-04
s(ph)	5.5547880	9	31.7823219	3.351227e-07
s(SST_MEAN)	1.3594568	9	2.5877315	9.469422e-02
s(SST_RANGE)	0.5727287	9	0.8896399	1.678760e-01



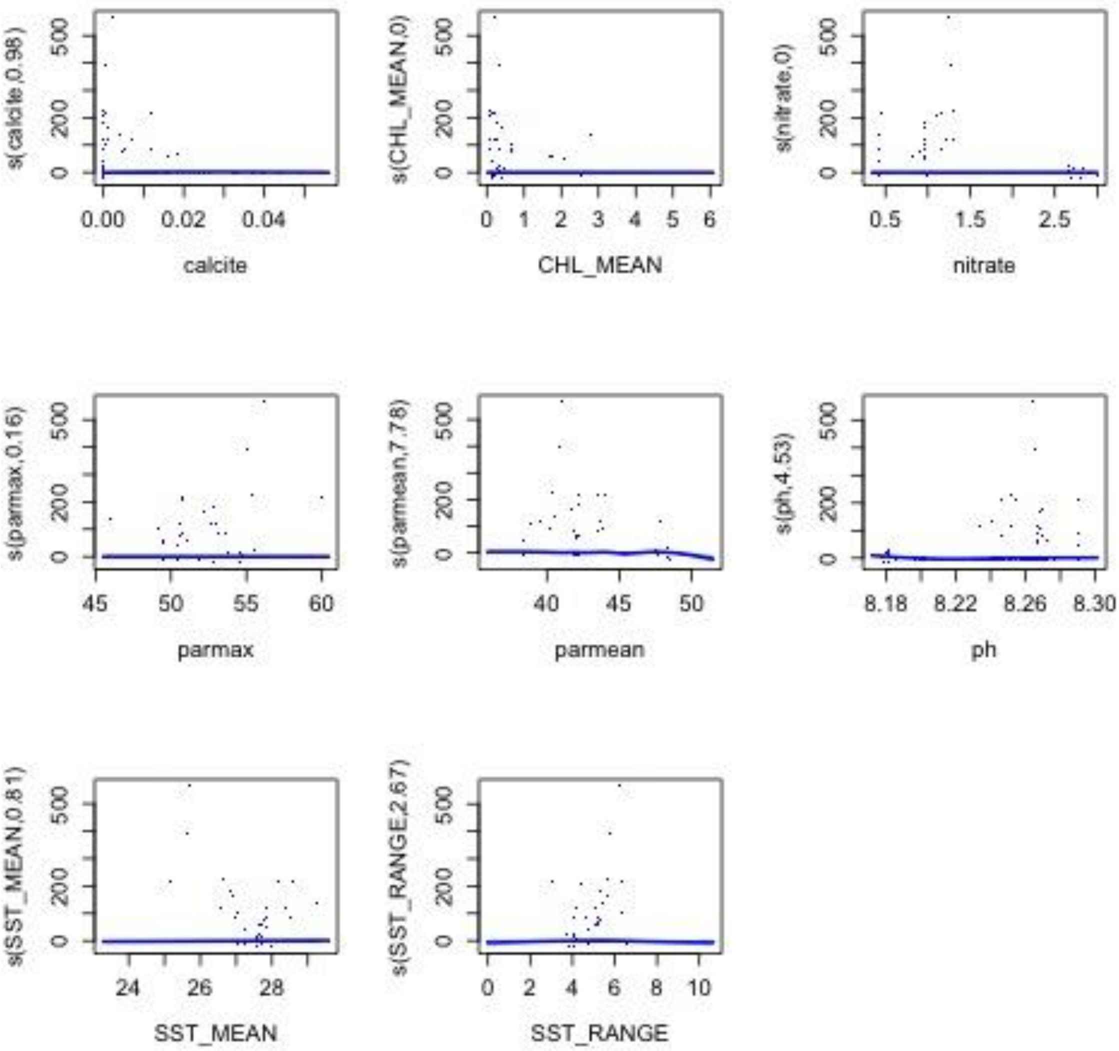
201Epinephelus retouti, n = 50 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.400344e-06	9	2.580284e-08	0.9688580
s(CHL_MEAN)	7.600935e-08	9	1.862588e-10	1.0000000
s(nitrate)	7.684330e-01	6	4.759918e-01	0.3661989
s(parmax)	1.829531e-08	9	4.244219e-11	1.0000000
s(parmean)	1.621876e+00	9	7.699036e-01	0.5763843
s(ph)	2.751907e-08	9	2.495817e-09	0.8502058
s(SST_MEAN)	1.024870e-08	9	9.375759e-11	1.0000000
s(SST_RANGE)	1.897454e-08	9	6.528605e-10	1.0000000



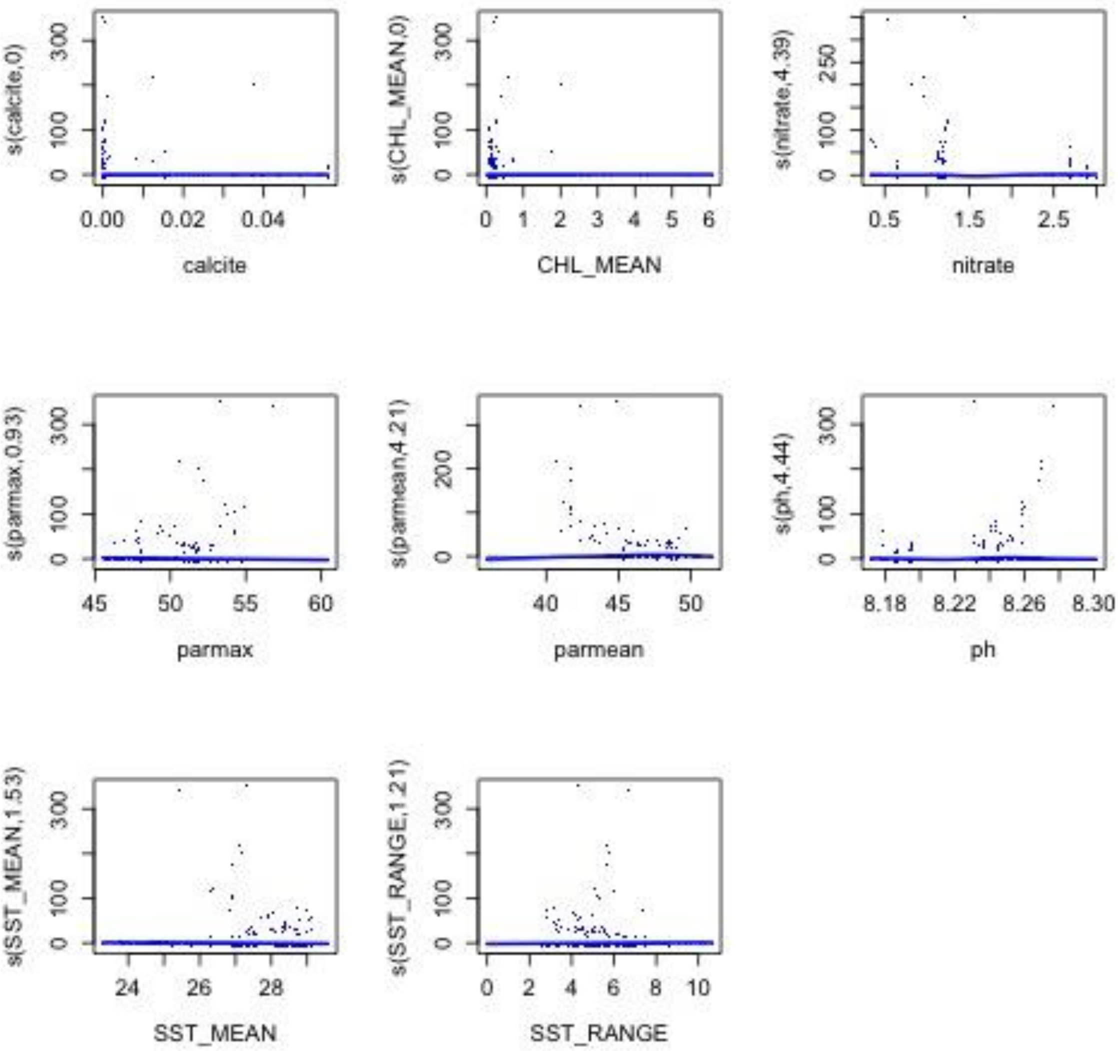
202Epinephelus sp, n = 101 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.782146e-01	9	6.934231e+00	4.224907e-03
s(CHL_MEAN)	4.843624e-05	9	1.486475e-05	5.700065e-01
s(nitrate)	2.492771e-05	9	3.834957e-06	7.661893e-01
s(parmax)	1.575703e-01	9	2.117160e-01	2.240276e-01
s(parmean)	7.777302e+00	9	2.493339e+01	5.644202e-04
s(ph)	4.534167e+00	9	4.074446e+01	1.426753e-09
s(SST_MEAN)	8.055755e-01	9	3.622279e+00	2.960608e-02
s(SST_RANGE)	2.666828e+00	9	1.113428e+01	2.544443e-03



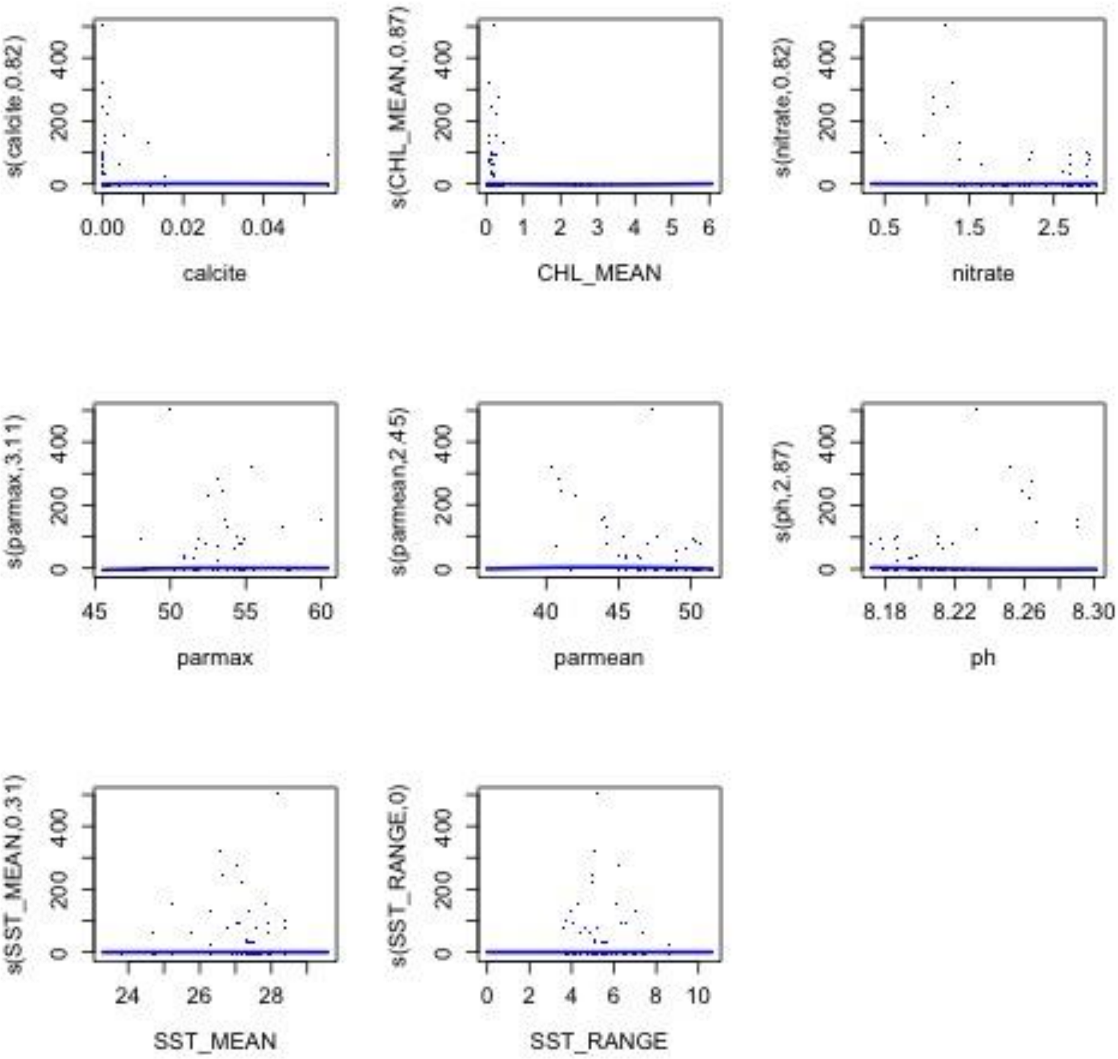
203Epinephelus spilotoceps, n = 141 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.701186e-06	9	4.882633e-07	7.374926e-01
s(CHL_MEAN)	2.149444e-06	9	5.078636e-07	6.453556e-01
s(nitrate)	4.391900e+00	9	1.056042e+01	1.525236e-02
s(parmax)	9.269625e-01	9	1.181788e+01	1.604644e-04
s(parmean)	4.205775e+00	9	7.412265e+01	5.817792e-19
s(ph)	4.440882e+00	9	2.511246e+01	2.491666e-06
s(SST_MEAN)	1.534752e+00	9	7.442086e+00	3.162600e-03
s(SST_RANGE)	1.208844e+00	9	3.946089e+00	2.853911e-02



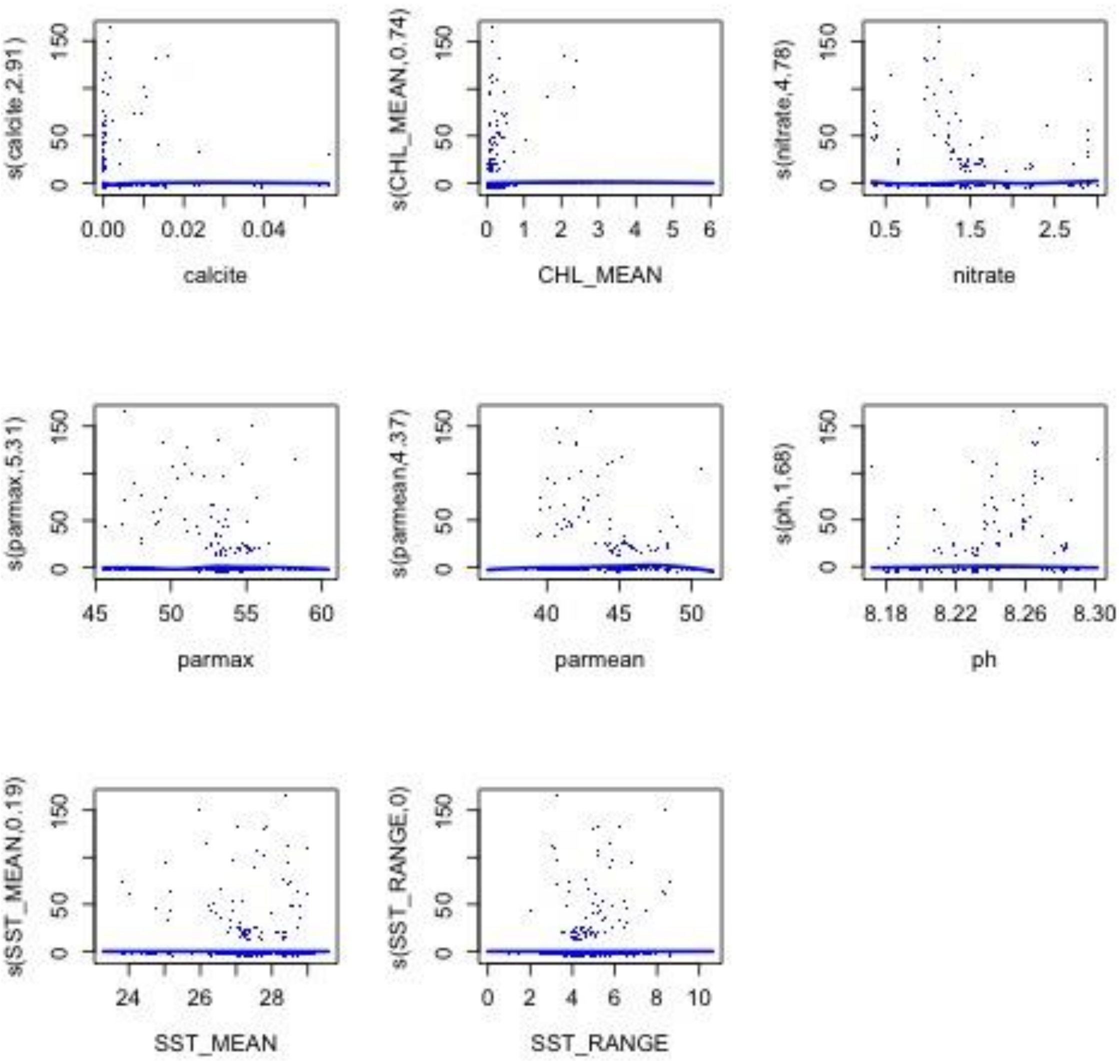
204Epinephelus tauvina, n = 77 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.201221e-01	9	3.733645e+00	2.497994e-02
s(CHL_MEAN)	8.682828e-01	9	2.789403e+00	5.530947e-02
s(nitrate)	8.193750e-01	9	1.884252e+00	6.293799e-02
s(parmax)	3.112714e+00	9	1.703769e+01	5.060095e-05
s(parmean)	2.447884e+00	9	2.198744e+01	6.087772e-07
s(ph)	2.873501e+00	9	2.618231e+01	1.204249e-08
s(SST_MEAN)	3.134910e-01	9	3.262123e-01	2.790677e-01
s(SST_RANGE)	4.642426e-05	9	4.510682e-06	1.000000e+00



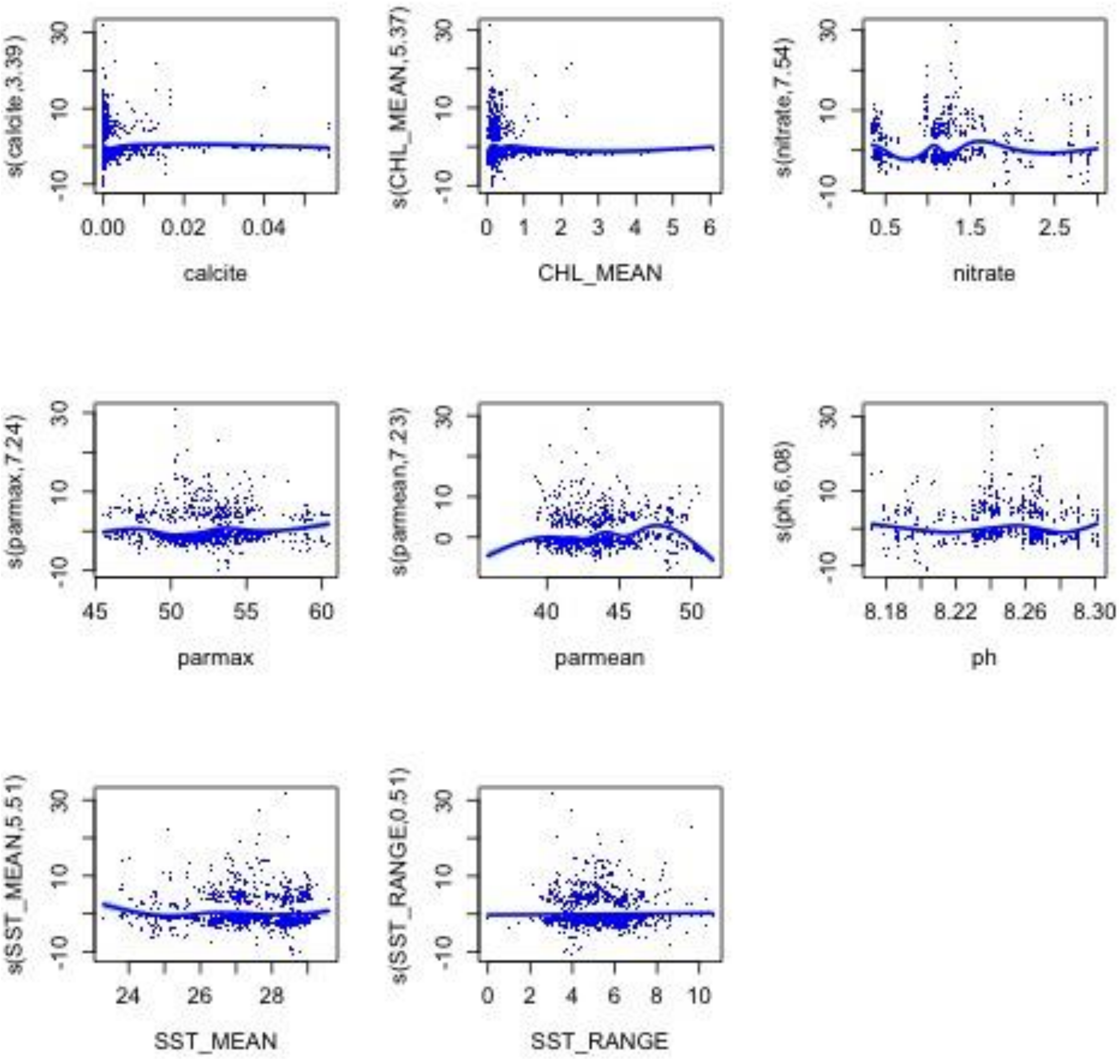
205Fistularia commersonii, n = 121 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.911948089	9	2.046077e+01	3.213434e-05
s(CHL_MEAN)	0.736819636	9	2.241164e+00	6.731597e-02
s(nitrate)	4.782689943	9	2.471041e+01	4.174243e-06
s(parmax)	5.311554472	9	4.677484e+01	1.185693e-10
s(parmean)	4.366042808	9	4.824938e+01	4.618069e-12
s(ph)	1.675315966	9	8.219723e+00	1.711102e-03
s(SST_MEAN)	0.185026765	9	1.941380e-01	2.866058e-01
s(SST_RANGE)	0.000272704	9	2.004081e-04	3.900266e-01



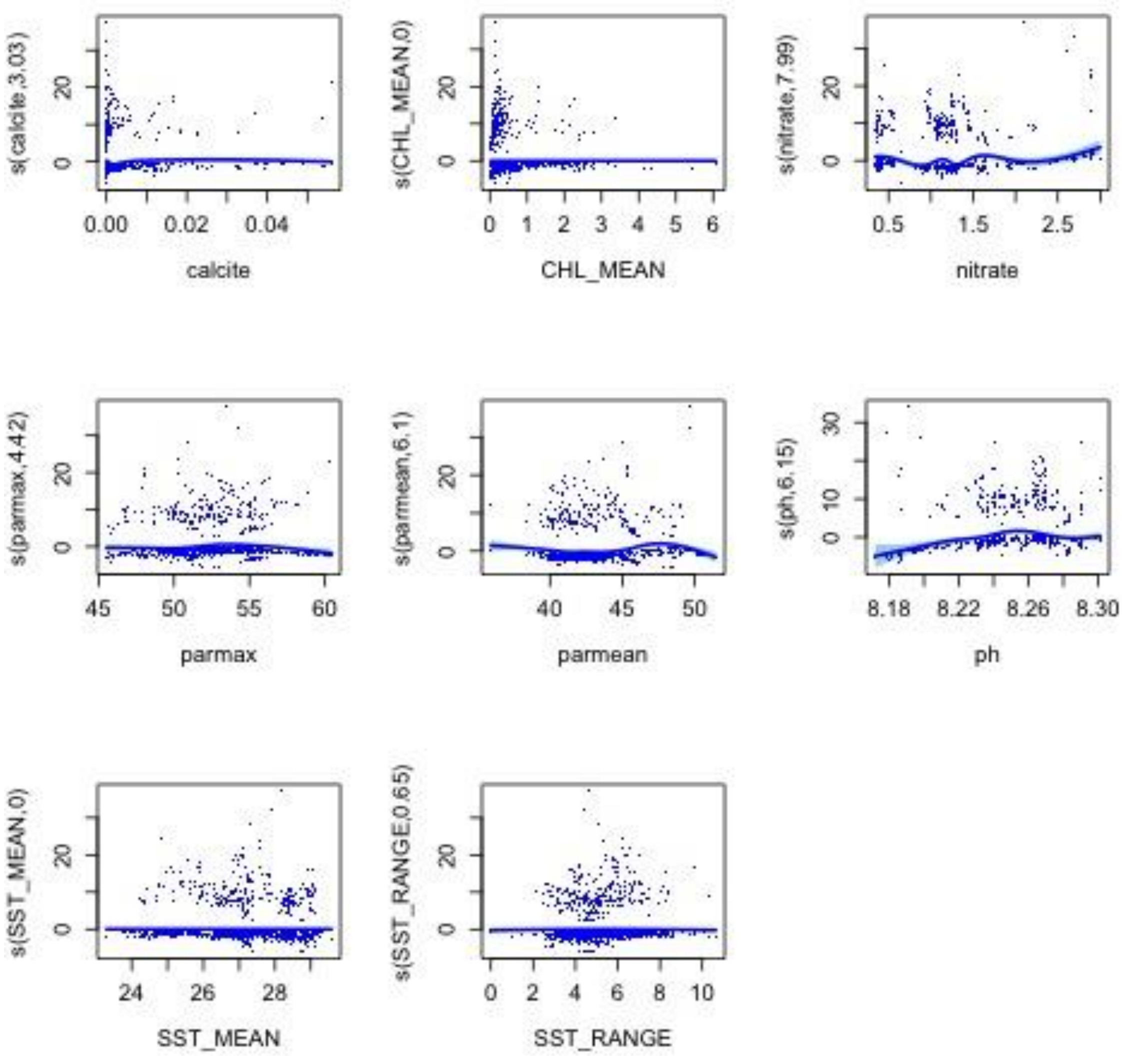
206Forcipiger flavissimus, n = 1122 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.3908108	9	22.8731770	2.101540e-05
s(CHL_MEAN)	5.3707413	9	48.2097041	4.982452e-10
s(nitrate)	7.5394264	9	219.4716648	3.719116e-50
s(parmax)	7.2357512	9	91.4571312	2.343216e-19
s(parmean)	7.2331246	9	194.3451423	1.838687e-43
s(ph)	6.0790466	9	56.2960595	2.260129e-12
s(SST_MEAN)	5.5059130	9	25.0800245	3.100926e-05
s(SST_RANGE)	0.5055785	9	0.9745582	1.578867e-01



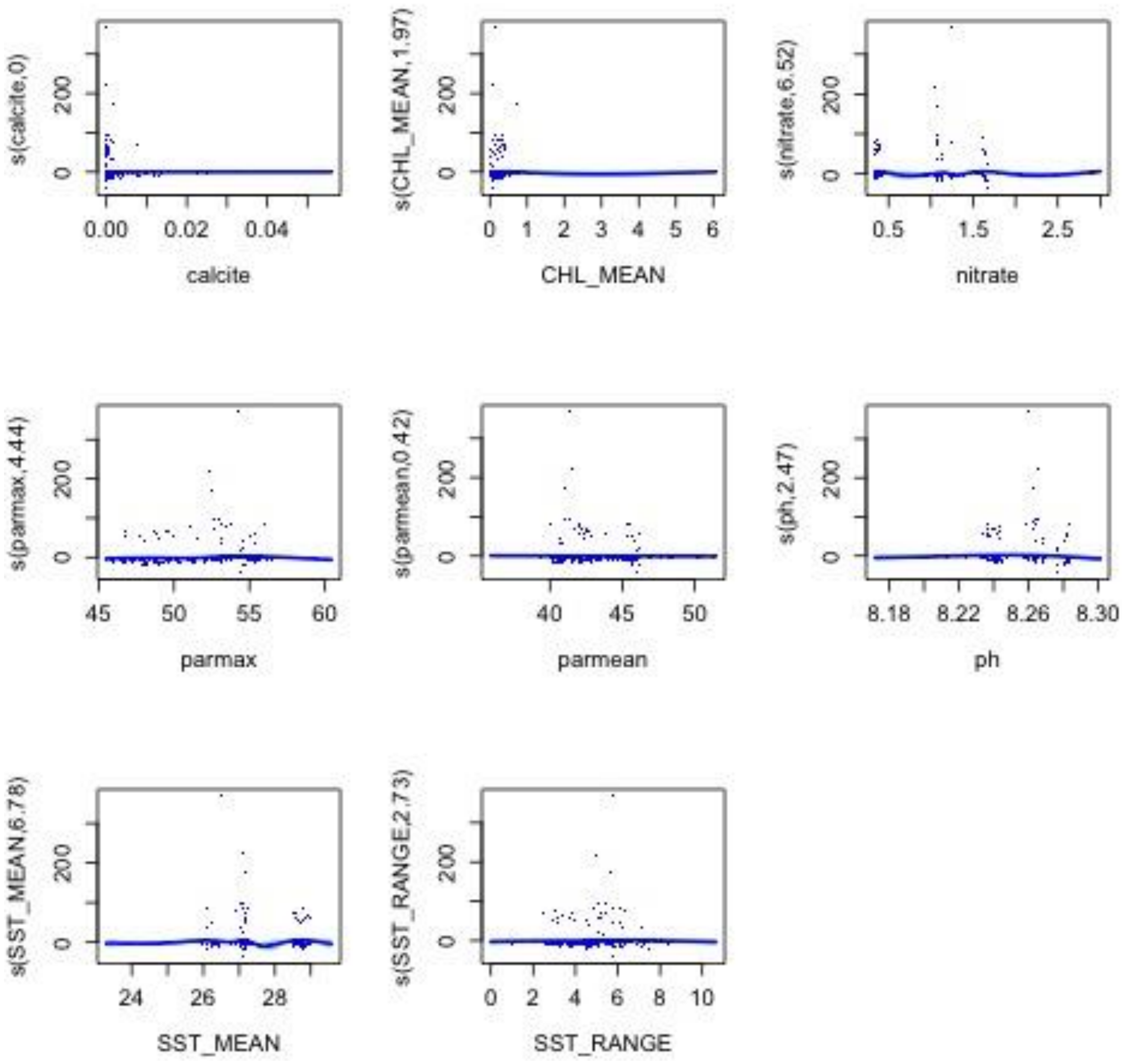
207Forcipiger longirostris, n = 617 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.029680e+00	9	2.951905e+01	4.716374e-07
s(CHL_MEAN)	4.925584e-05	9	1.097189e-05	6.890574e-01
s(nitrate)	7.991078e+00	9	1.136649e+02	5.336716e-25
s(parmax)	4.424907e+00	9	2.793418e+01	9.107169e-07
s(parmean)	6.098171e+00	9	8.939073e+01	3.273629e-21
s(ph)	6.146413e+00	9	5.998185e+01	1.101928e-14
s(SST_MEAN)	2.167644e-04	9	1.232578e-04	4.870584e-01
s(SST_RANGE)	6.536587e-01	9	9.742339e-01	1.966137e-01



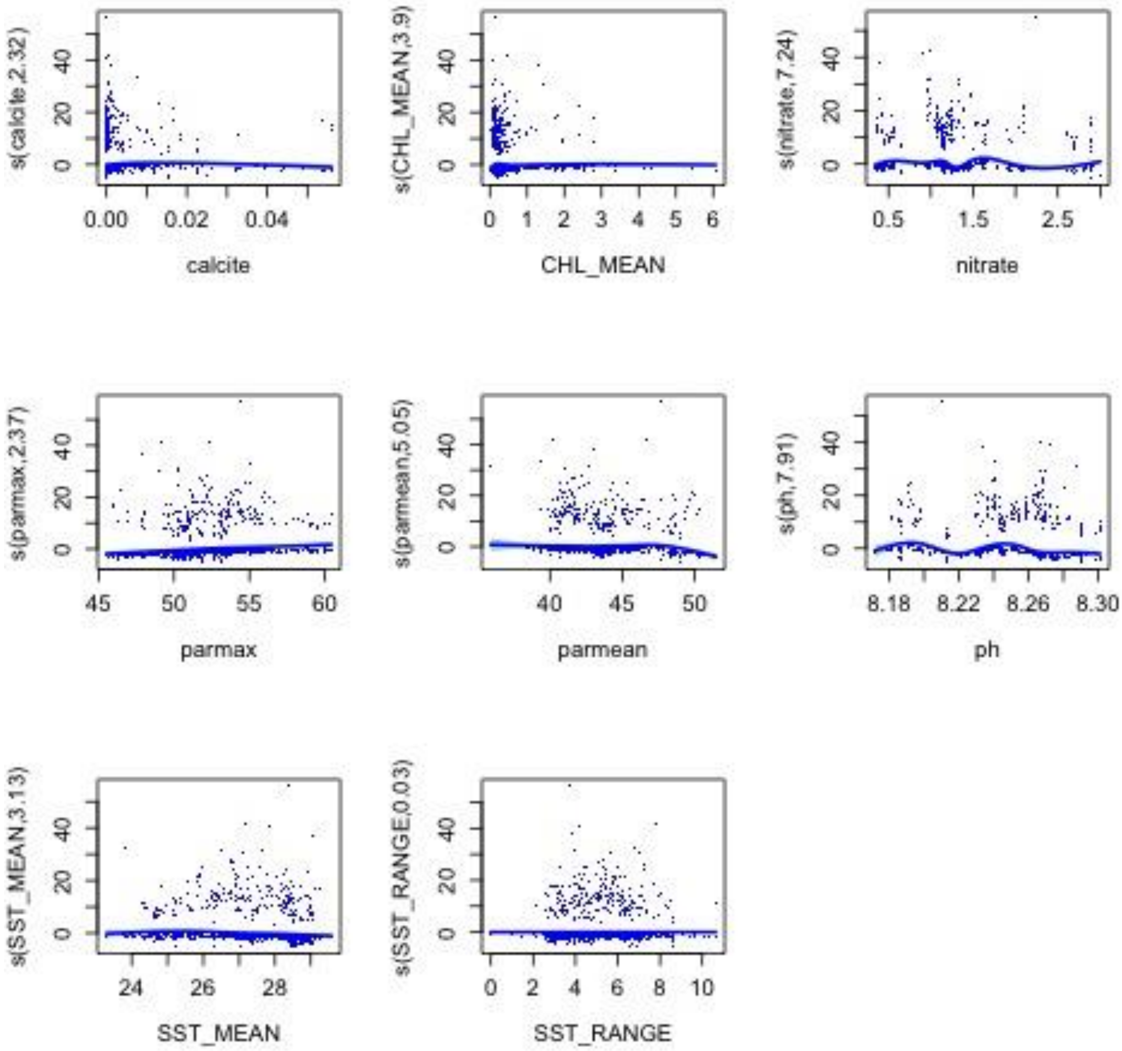
208Genicanthus melanospilos, n = 48 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.317077e-05	9	6.351789e-06	4.941196e-01
s(CHL_MEAN)	1.965406e+00	9	4.774782e+00	6.670364e-02
s(nitrate)	6.522922e+00	9	3.495929e+01	1.716459e-07
s(parmax)	4.444450e+00	9	1.727966e+01	4.569554e-04
s(parmean)	4.169691e-01	9	5.614359e-01	2.132258e-01
s(ph)	2.471051e+00	9	9.459381e+00	3.684168e-03
s(SST_MEAN)	6.782415e+00	9	2.715282e+01	5.899270e-05
s(SST_RANGE)	2.734729e+00	9	7.083161e+00	3.019358e-02



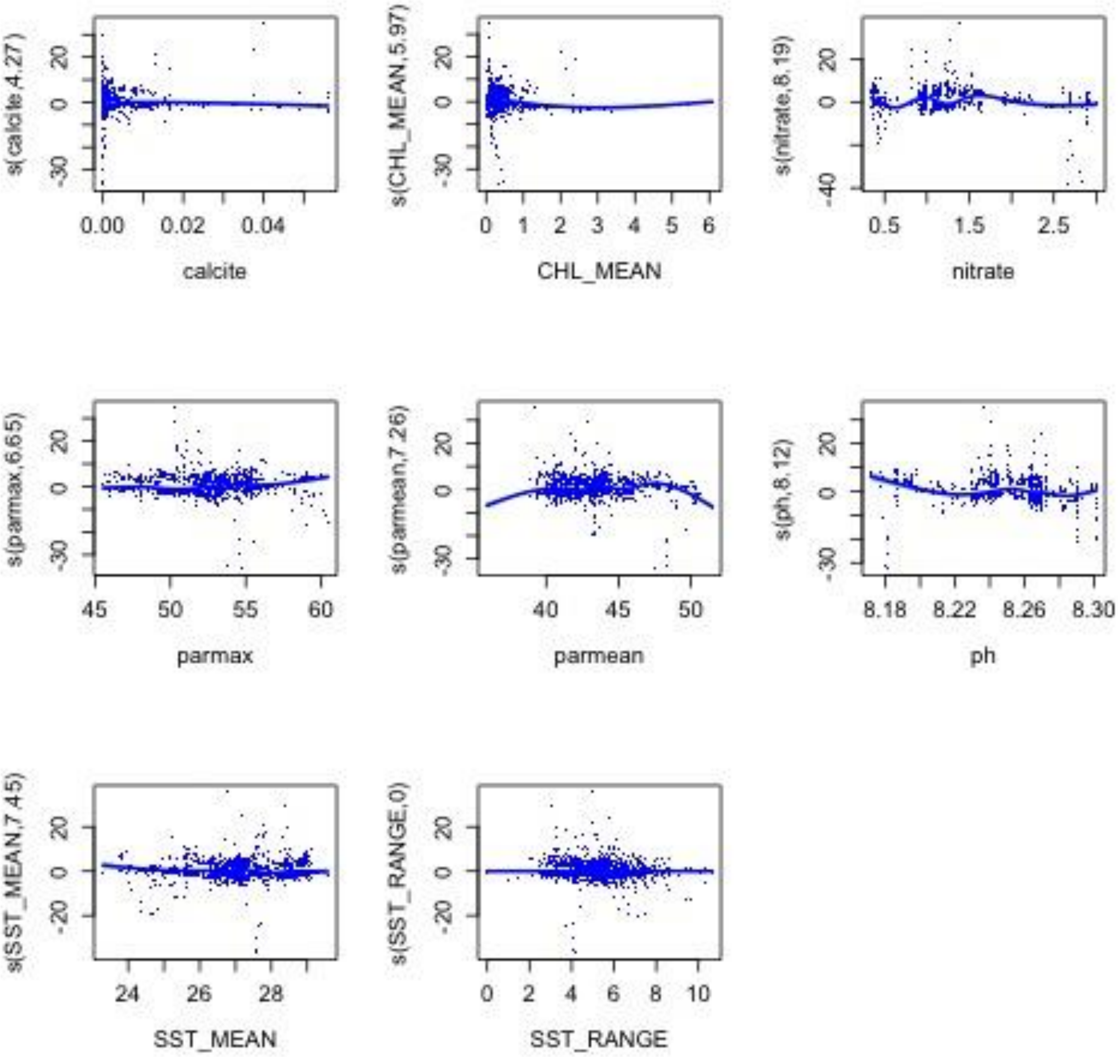
209Gnathodentex aureolineatus, n = 440 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.32002244	9	12.26118746	1.221272e-03
s(CHL_MEAN)	3.89842850	9	23.88129307	1.990702e-05
s(nitrate)	7.23773572	9	113.80591986	3.233337e-25
s(parmax)	2.37303756	9	25.29949761	1.071747e-07
s(parmean)	5.05417996	9	39.94600143	1.720837e-09
s(ph)	7.90944514	9	98.23025442	3.875863e-21
s(SST_MEAN)	3.12615322	9	10.94315202	3.493312e-03
s(SST_RANGE)	0.02827151	9	0.03130561	2.861024e-01



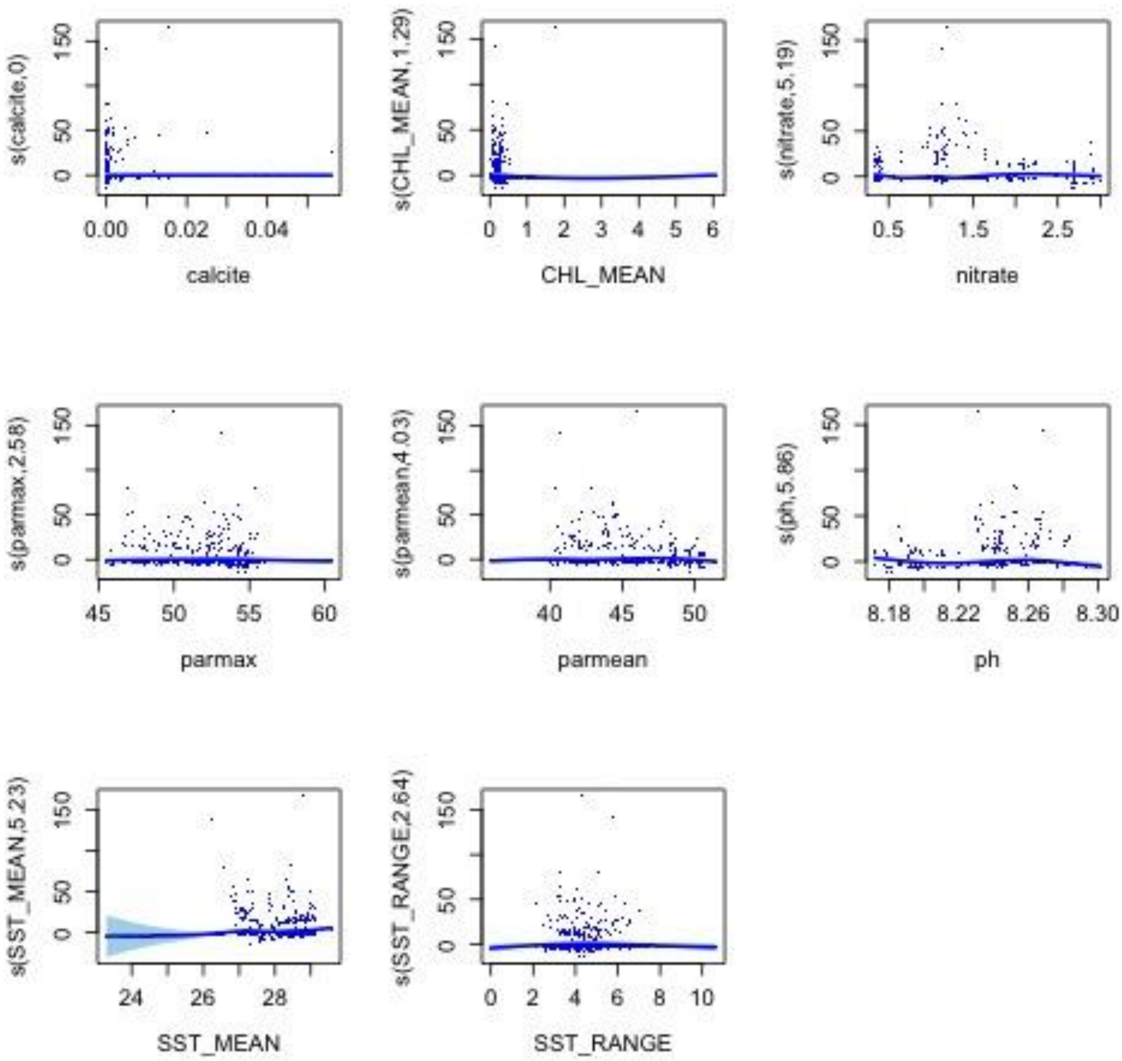
210Gomphosus varius, n = 2354 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.270237464	9	7.615933e+01	1.222434e-16
s(CHL_MEAN)	5.968483779	9	9.795920e+01	7.985910e-21
s(nitrate)	8.187912222	9	3.122632e+02	4.610987e-71
s(parmax)	6.645783789	9	1.046513e+02	8.769480e-23
s(parmean)	7.264013631	9	2.334948e+02	4.940258e-52
s(ph)	8.119102061	9	1.306370e+02	2.965739e-28
s(SST_MEAN)	7.451545592	9	4.990202e+01	1.805832e-09
s(SST_RANGE)	0.001768072	9	8.223629e-04	6.338589e-01



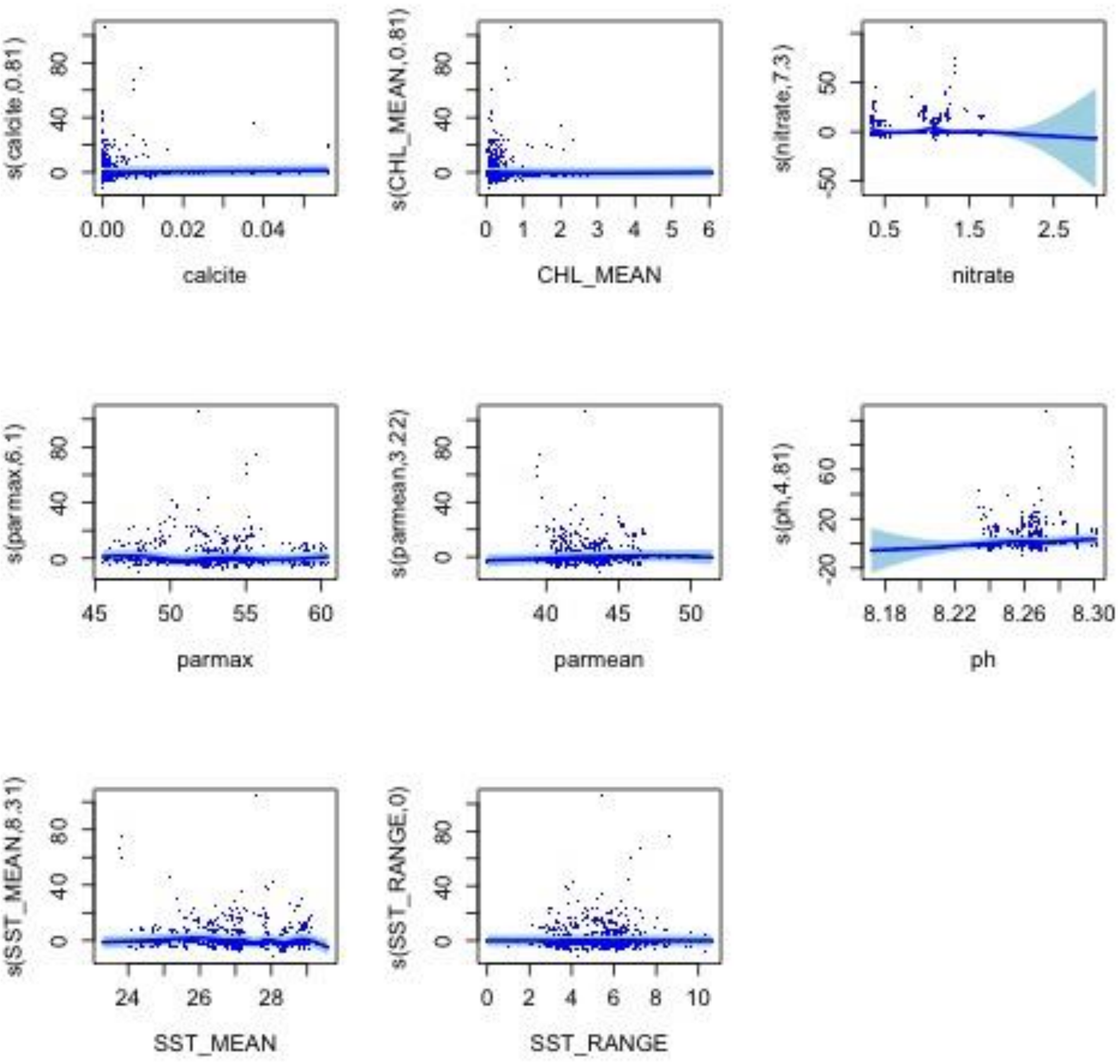
211Gracila albomarginata, n = 376 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0001002677	9	8.427445e-05	3.569531e-01
s(CHL_MEAN)	1.2930341474	9	1.591281e+01	2.139522e-05
s(nitrate)	5.1900171362	9	8.440506e+01	1.950940e-21
s(parmax)	2.5802569129	9	8.844844e+00	4.789649e-03
s(parmean)	4.0312777672	9	4.309697e+01	1.620800e-11
s(ph)	5.8585644475	9	5.690007e+01	1.642978e-13
s(SST_MEAN)	5.2325000195	9	4.454960e+01	1.289255e-10
s(SST_RANGE)	2.6389209945	9	1.478516e+01	2.268455e-04



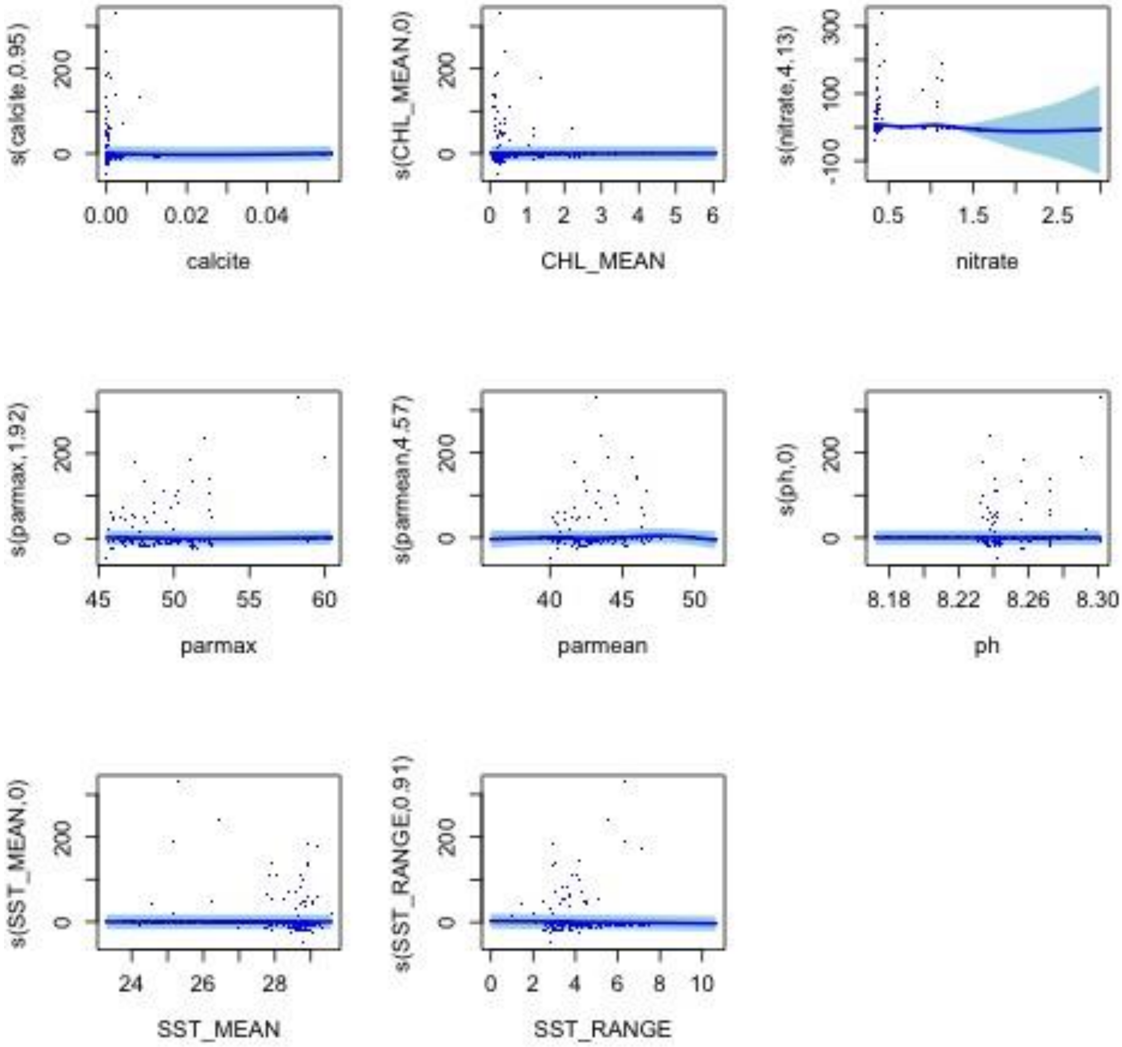
212Halichoeres biocellatus, n = 460 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8070681410	6	4.485870e+00	1.605825e-02
s(CHL_MEAN)	0.8107316495	9	2.560555e+00	6.037462e-02
s(nitrate)	7.3022741970	9	1.585861e+02	5.804963e-37
s(parmax)	6.0967815923	9	7.993942e+01	1.657028e-17
s(parmean)	3.2187383907	9	2.631728e+01	3.382010e-07
s(ph)	4.8054320406	9	4.156867e+01	7.973483e-10
s(SST_MEAN)	8.3062524296	9	7.841246e+01	2.199660e-15
s(SST_RANGE)	0.0005942967	9	3.219509e-04	5.433166e-01



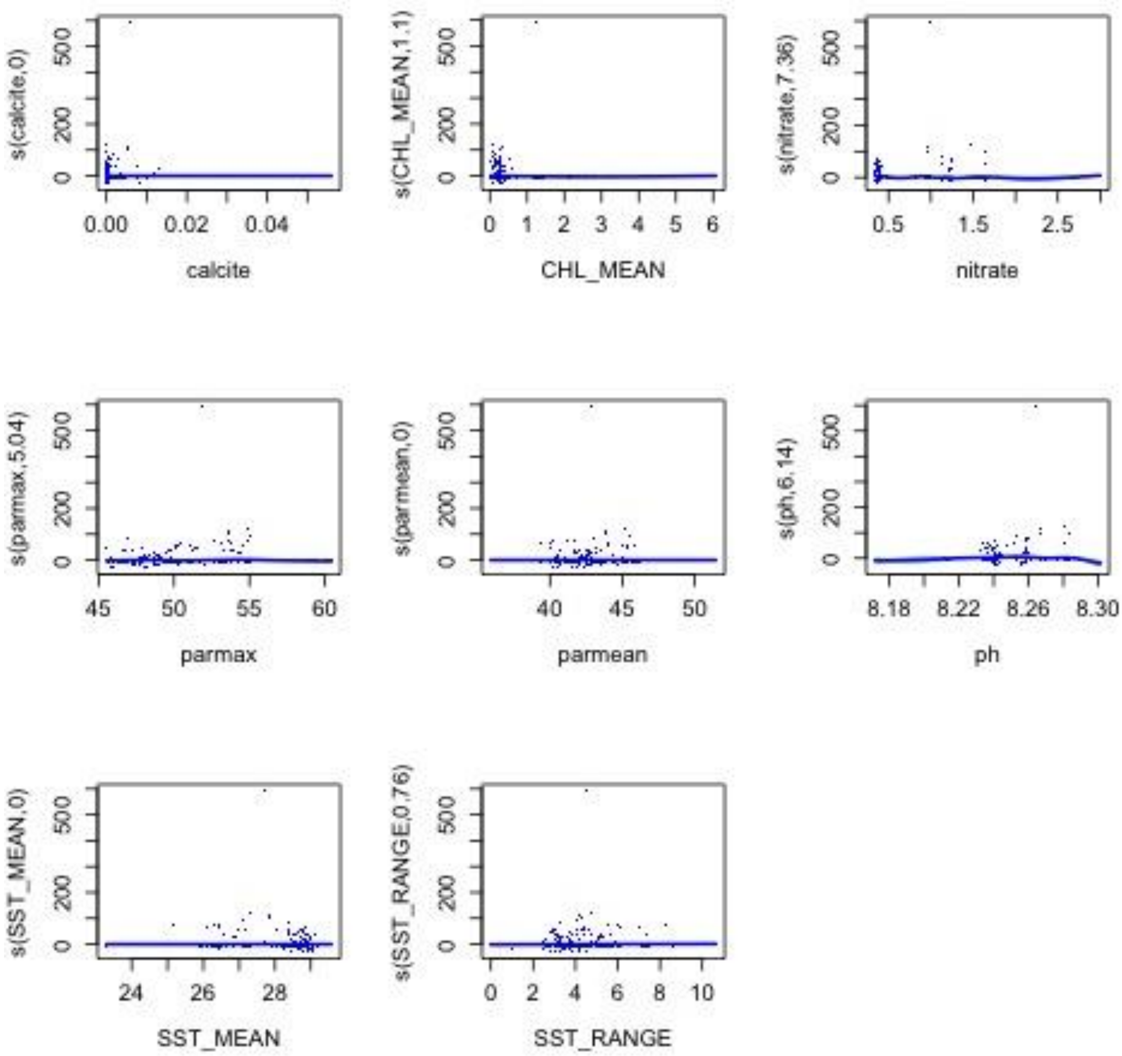
213Halichoeres chloropterus, n = 33 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.519688e-01	9	4.514802e+00	1.993484e-02
s(CHL_MEAN)	4.653862e-06	9	6.438440e-07	7.222879e-01
s(nitrate)	4.133009e+00	9	3.018686e+01	4.948808e-07
s(parmax)	1.918261e+00	9	1.176755e+01	4.838538e-04
s(parmean)	4.569447e+00	9	2.462062e+01	9.370473e-06
s(ph)	4.080233e-06	9	1.462151e-08	1.000000e+00
s(SST_MEAN)	5.873162e-06	9	2.878698e-06	5.440429e-01
s(SST_RANGE)	9.073023e-01	9	8.568185e+00	1.616330e-03



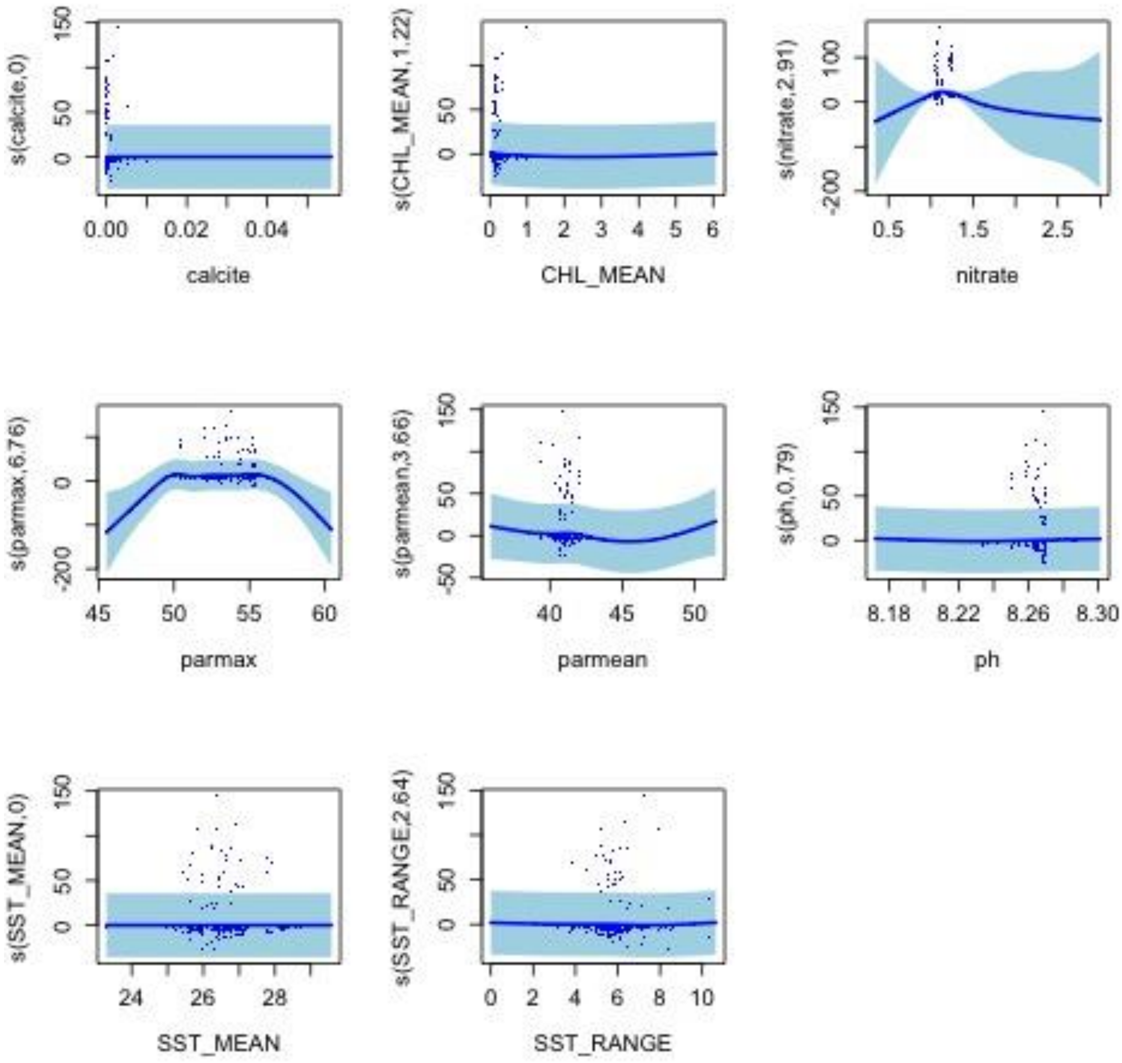
214Halichoeres chrysus, n = 63 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.604707e-06	9	7.084932e-07	7.366812e-01
s(CHL_MEAN)	1.096125e+00	9	8.953597e+00	1.634838e-03
s(nitrate)	7.364607e+00	9	7.513558e+01	2.942563e-15
s(parmax)	5.040987e+00	9	3.017376e+01	2.213824e-06
s(parmean)	8.713086e-04	9	9.795330e-04	2.844695e-01
s(ph)	6.139572e+00	9	3.921560e+01	1.044898e-07
s(SST_MEAN)	3.047010e-06	9	9.467149e-07	7.571350e-01
s(SST_RANGE)	7.642429e-01	9	2.994803e+00	4.441254e-02



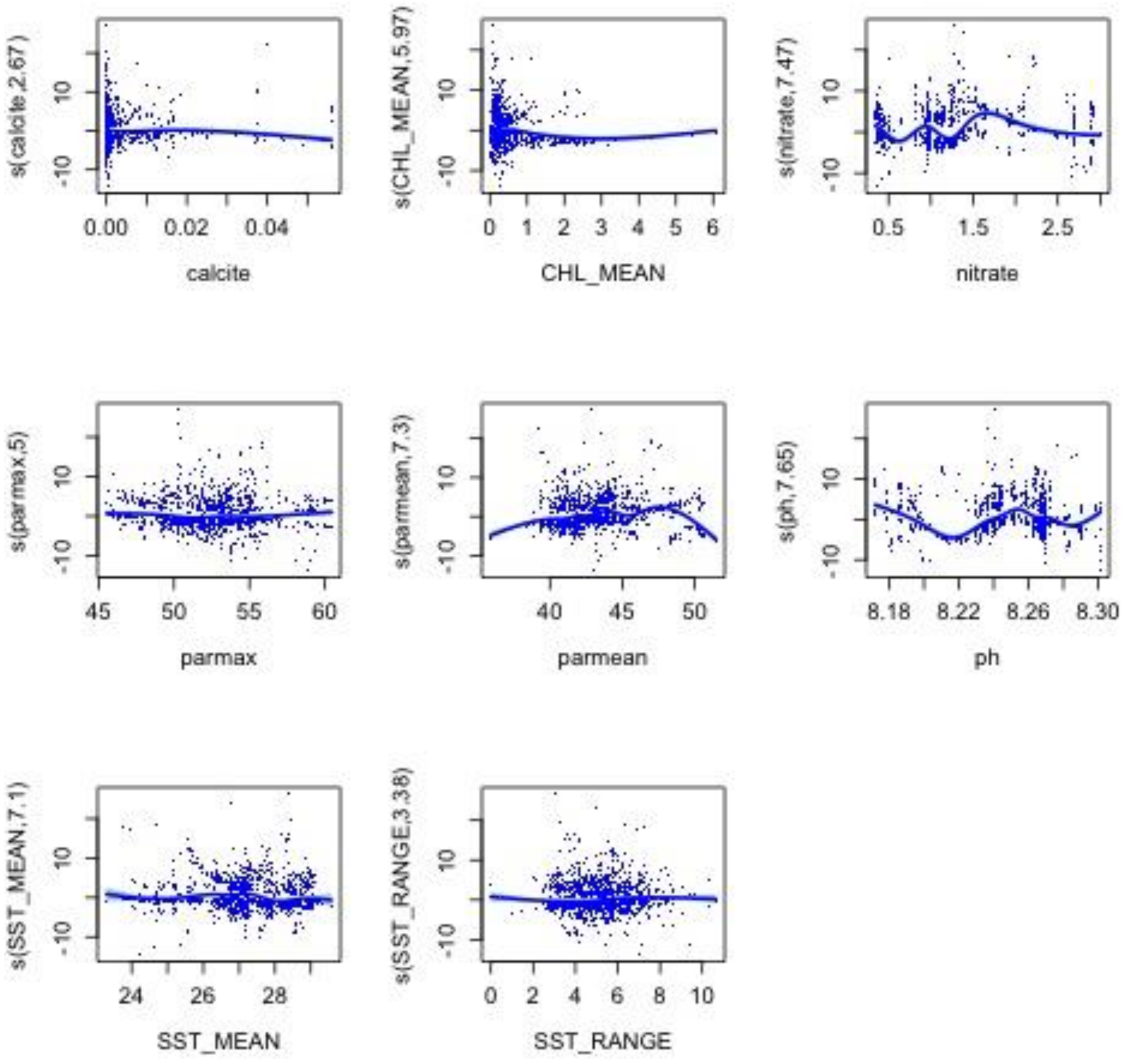
215Halichoeres claudia, n = 76 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0003338146	9	1.451122e-04	5.056006e-01
s(CHL_MEAN)	1.2245380954	9	1.053005e+01	7.913976e-04
s(nitrate)	2.9104161640	9	3.274355e+01	3.852835e-09
s(parmax)	6.7578141954	9	3.309066e+01	3.347776e-06
s(parmean)	3.6599457752	9	8.225758e+00	3.864219e-02
s(ph)	0.7931705737	8	1.166029e+00	1.929924e-01
s(SST_MEAN)	0.0006496643	9	6.475272e-04	2.696772e-01
s(SST_RANGE)	2.6364455656	9	9.339270e+00	8.615281e-03



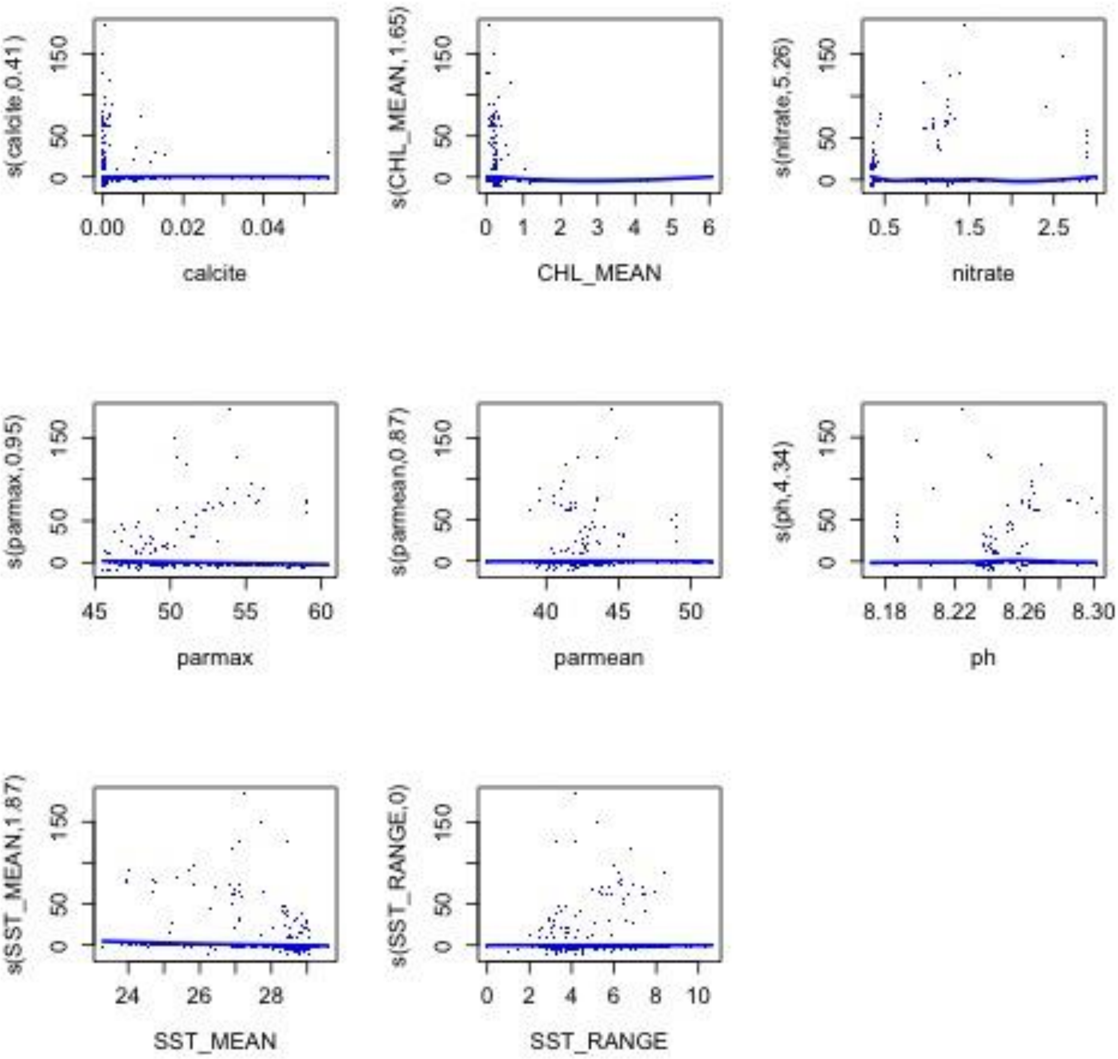
216Halichoeres hortulanus, n = 1923 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.668912	9	30.19465	1.715970e-07
s(CHL_MEAN)	5.967216	9	100.12329	2.443871e-21
s(nitrate)	7.469144	9	347.49951	6.416462e-79
s(parmax)	5.003918	9	31.05396	7.280960e-07
s(parmean)	7.299504	9	216.04808	1.296190e-47
s(ph)	7.647591	9	235.66577	9.944740e-52
s(SST_MEAN)	7.104114	9	68.47618	2.023202e-14
s(SST_RANGE)	3.377966	9	21.07631	2.086993e-05



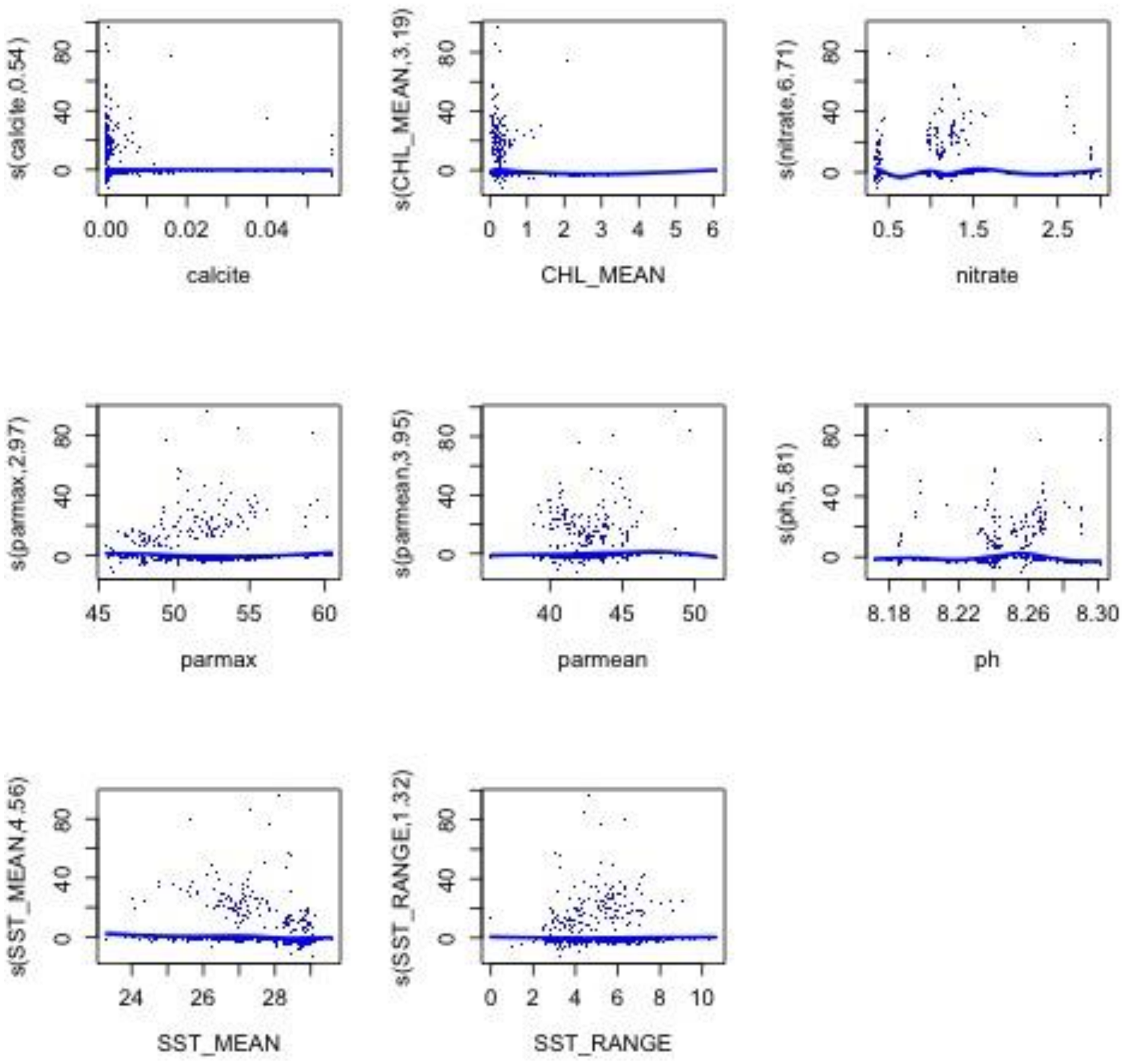
217Halichoeres margaritaceus, n = 226 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.407340165	9	7.208306e-01	1.744290e-01
s(CHL_MEAN)	1.651703648	9	1.195639e+01	4.353682e-04
s(nitrate)	5.257806660	9	8.767440e+01	3.955141e-22
s(parmax)	0.949226414	9	1.747145e+01	6.519560e-06
s(parmean)	0.866684351	9	1.452215e+00	1.447375e-01
s(ph)	4.343400733	9	2.076596e+01	2.667065e-05
s(SST_MEAN)	1.868815486	9	2.339160e+01	1.191810e-07
s(SST_RANGE)	0.000548753	9	4.928351e-04	3.657730e-01



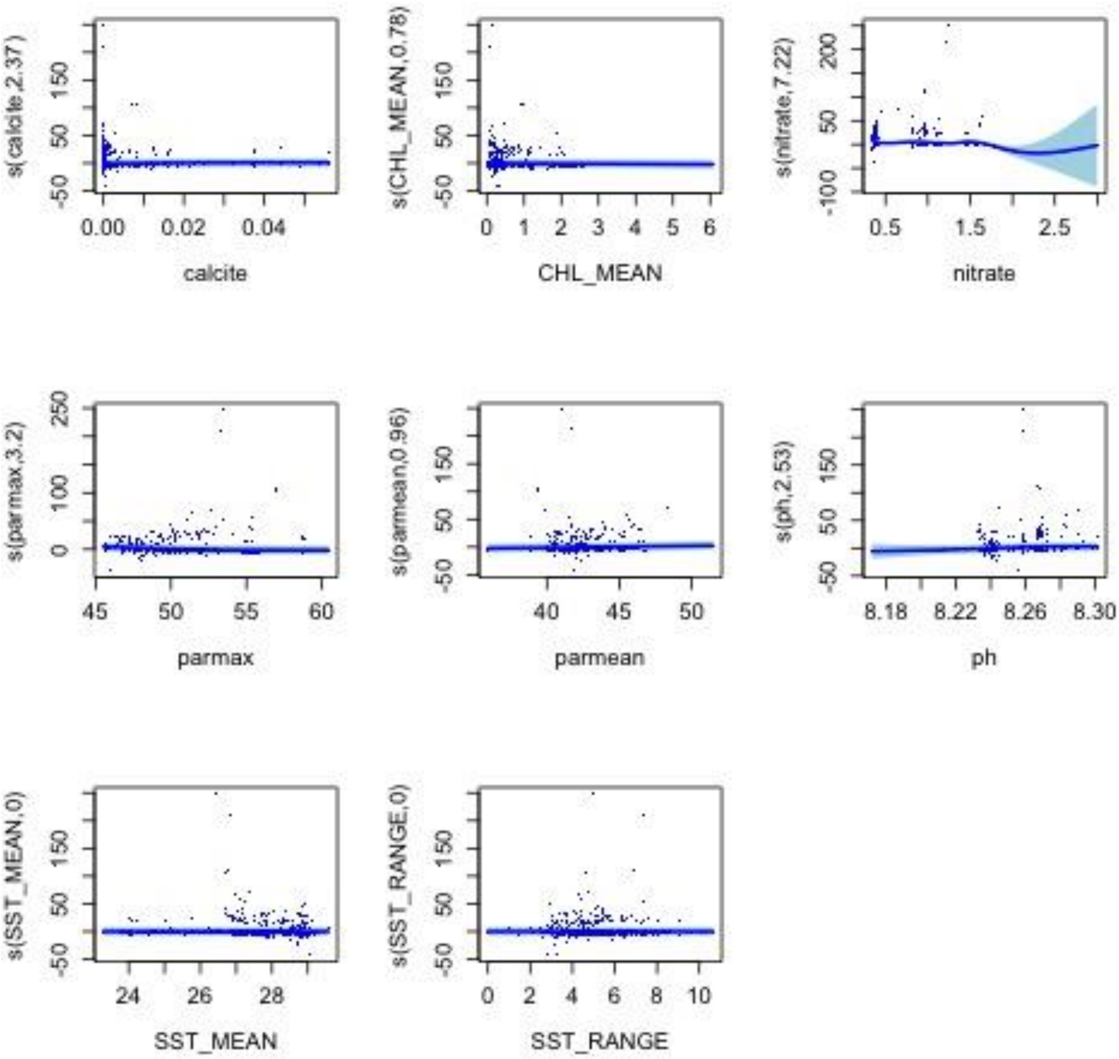
218Halichoeres marginatus, n = 292 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.5381788	6	1.068522	1.512841e-01
s(CHL_MEAN)	3.1895769	9	26.579082	1.727204e-06
s(nitrate)	6.7099809	9	90.842488	2.469956e-21
s(parmax)	2.9682653	9	23.726871	7.753678e-07
s(parmean)	3.9517574	9	20.264533	4.504246e-05
s(ph)	5.8118602	9	69.482476	1.394452e-16
s(SST_MEAN)	4.5618578	9	20.725197	6.019766e-05
s(SST_RANGE)	1.3201422	9	2.872070	8.323734e-02



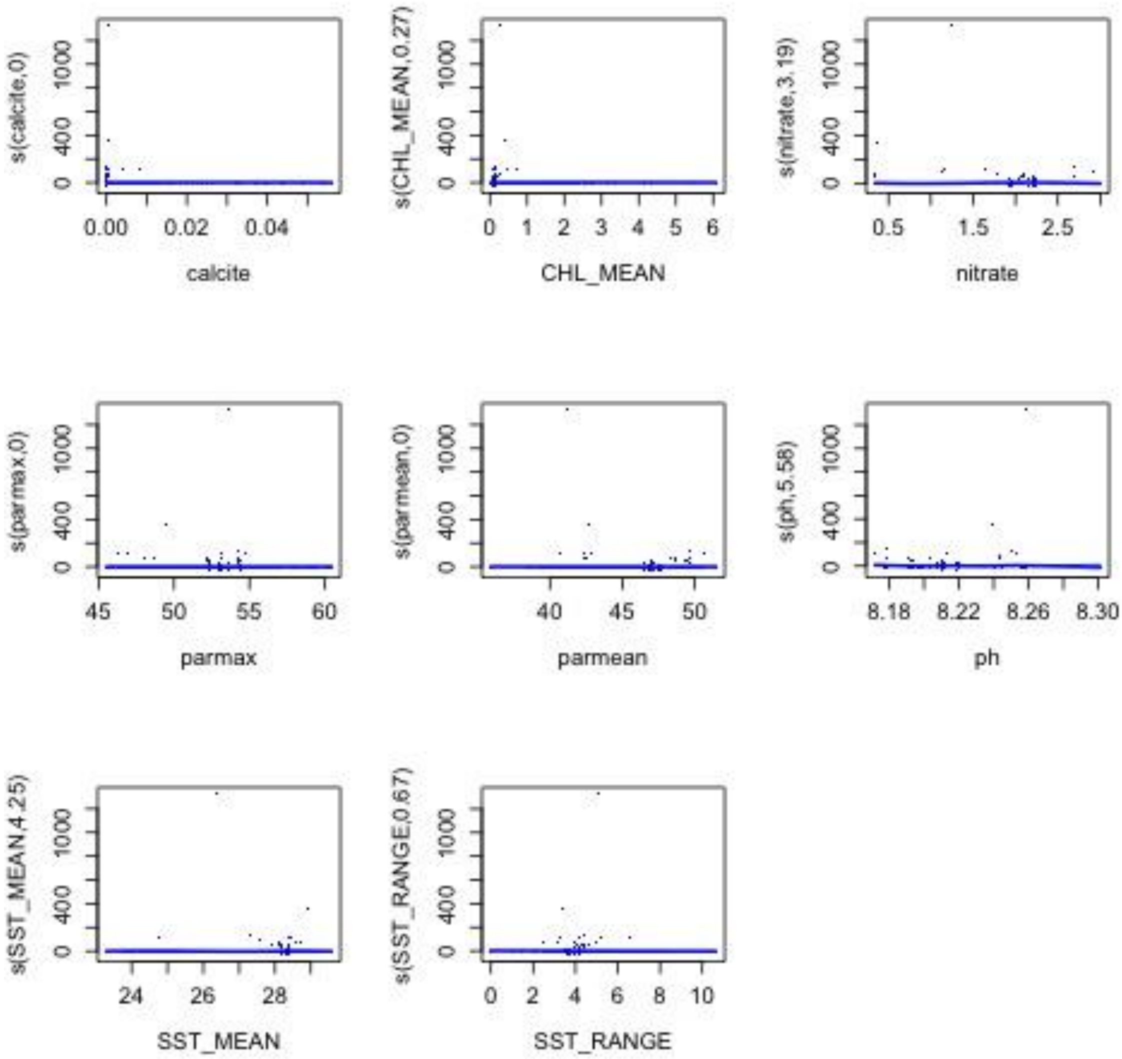
219Halichoeres melanurus, n = 151 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.373667e+00	9	9.938895e+00	5.020466e-03
s(CHL_MEAN)	7.847825e-01	8	3.446043e+00	3.429215e-02
s(nitrate)	7.216120e+00	9	1.501698e+02	4.220507e-34
s(parmax)	3.199070e+00	9	8.509881e+01	2.009825e-22
s(parmean)	9.602025e-01	9	2.323225e+01	4.393166e-07
s(ph)	2.534980e+00	9	4.394962e+01	2.656699e-12
s(SST_MEAN)	3.053032e-05	9	1.950614e-05	4.544014e-01
s(SST_RANGE)	1.591639e-05	9	8.619909e-07	1.000000e+00



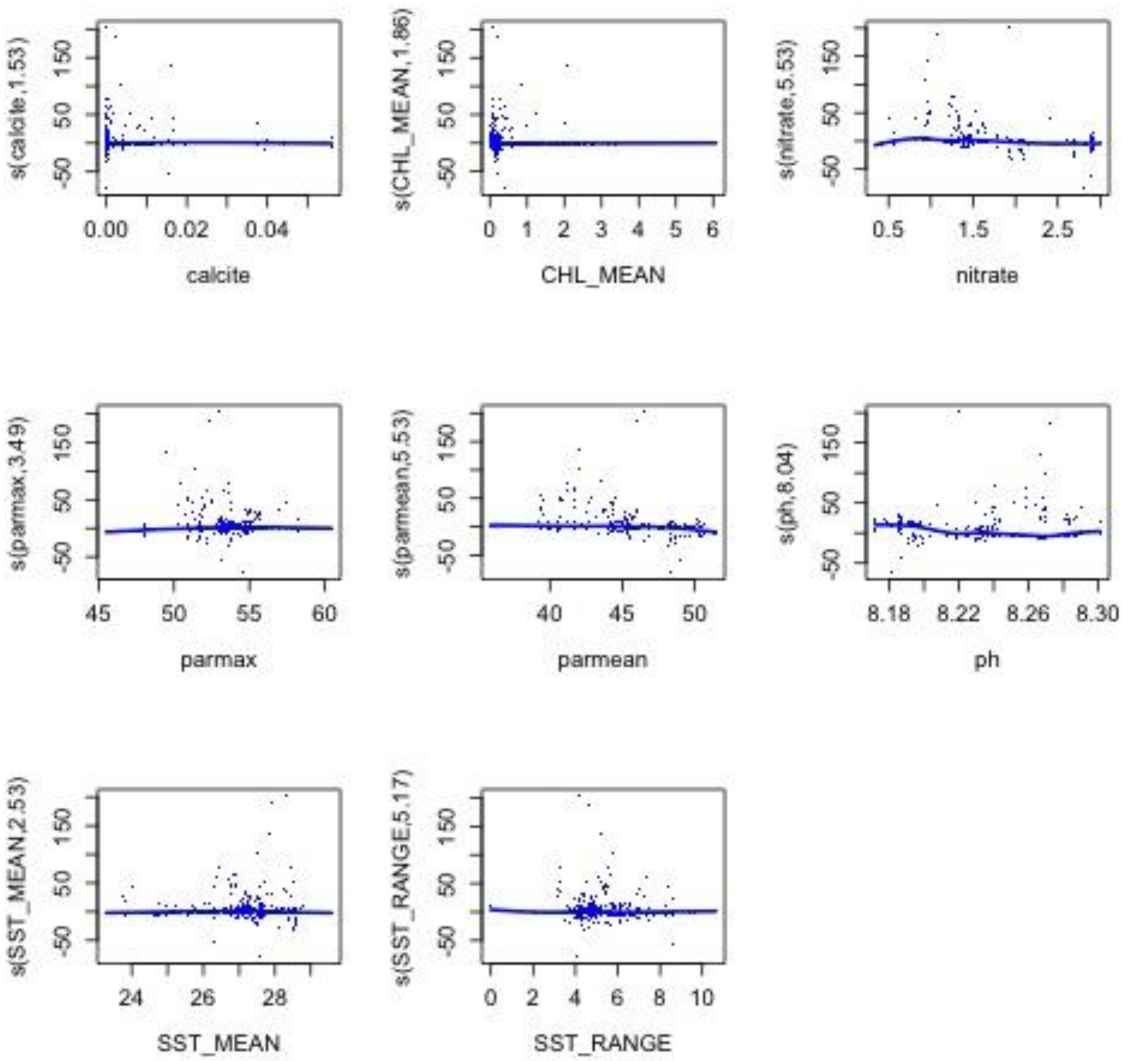
220Halichoeres melasmapomus, n = 126 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.953119e-05	9	3.995174e-06	6.609399e-01
s(CHL_MEAN)	2.749465e-01	9	4.405314e-01	1.968762e-01
s(nitrate)	3.193785e+00	9	2.491840e+01	1.065232e-06
s(parmax)	1.562777e-05	9	4.273141e-06	7.143429e-01
s(parmean)	4.462081e-05	9	2.554254e-05	4.933849e-01
s(ph)	5.581860e+00	9	4.758269e+01	1.139185e-10
s(SST_MEAN)	4.246656e+00	9	3.548716e+01	1.764330e-08
s(SST_RANGE)	6.660301e-01	9	1.691575e+00	9.373120e-02



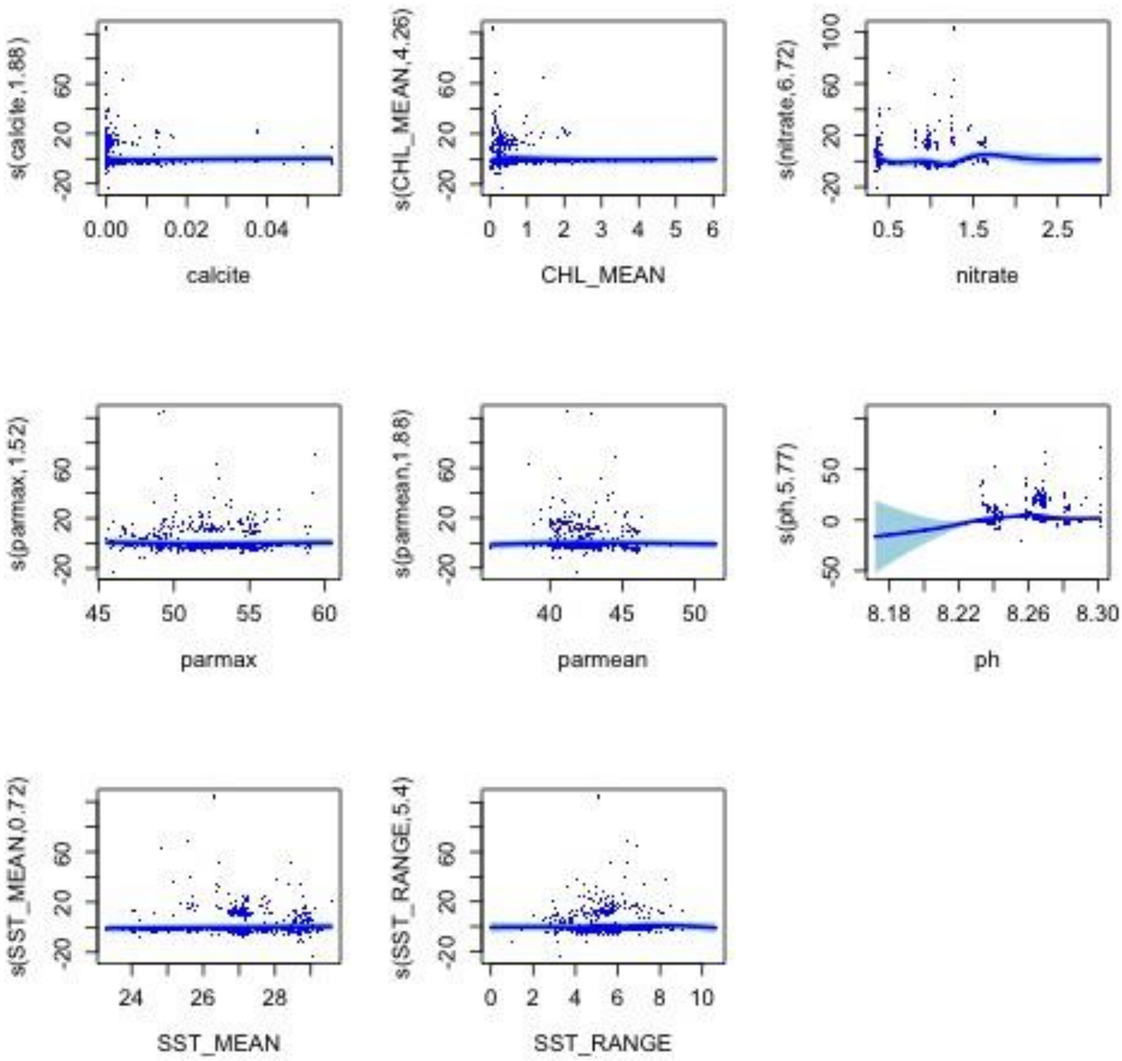
221Halichoeres ornatissimus, n = 973 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.529958	9	5.880181	1.630992e-02
s(CHL_MEAN)	1.857477	9	7.420160	1.089404e-02
s(nitrate)	5.527206	9	55.068206	1.134290e-12
s(parmax)	3.490652	9	64.615693	1.134898e-17
s(parmean)	5.531181	9	145.136329	1.156689e-36
s(ph)	8.043770	9	205.543564	5.302403e-49
s(SST_MEAN)	2.534306	9	16.417860	2.296745e-05
s(SST_RANGE)	5.166835	9	19.669816	2.907434e-04



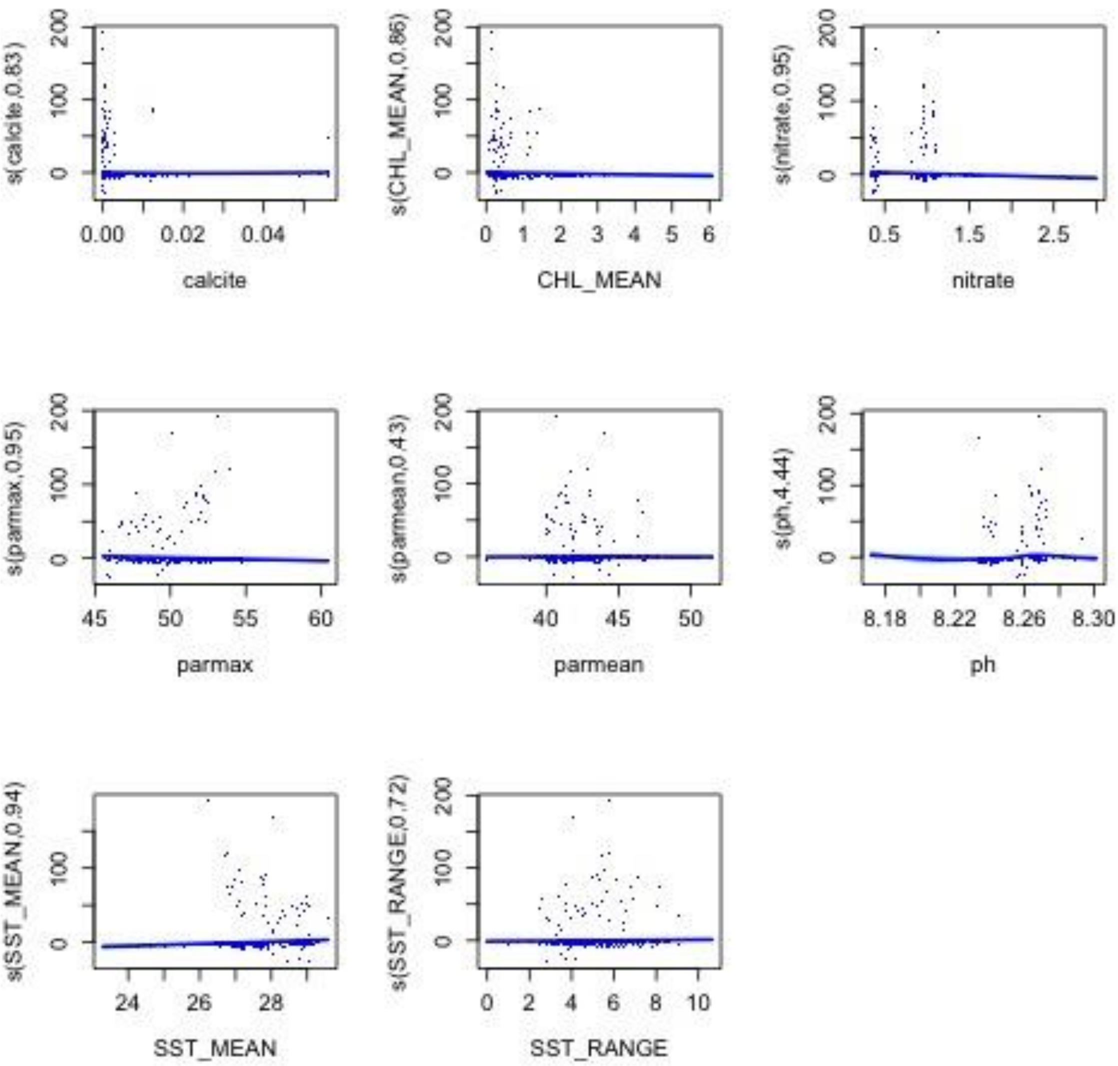
222Halichoeres prosopeion, n = 282 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.8817340	9	14.846180	2.305337e-04
s(CHL_MEAN)	4.2645259	9	38.014205	2.353859e-08
s(nitrate)	6.7165304	9	147.763738	2.505877e-35
s(parmax)	1.5203173	9	4.584380	2.795948e-02
s(parmean)	1.8774555	9	4.793687	4.693558e-02
s(ph)	5.7739869	9	71.811306	1.163185e-16
s(SST_MEAN)	0.7181684	9	2.323603	6.204704e-02
s(SST_RANGE)	5.4003842	9	20.750067	4.379067e-04



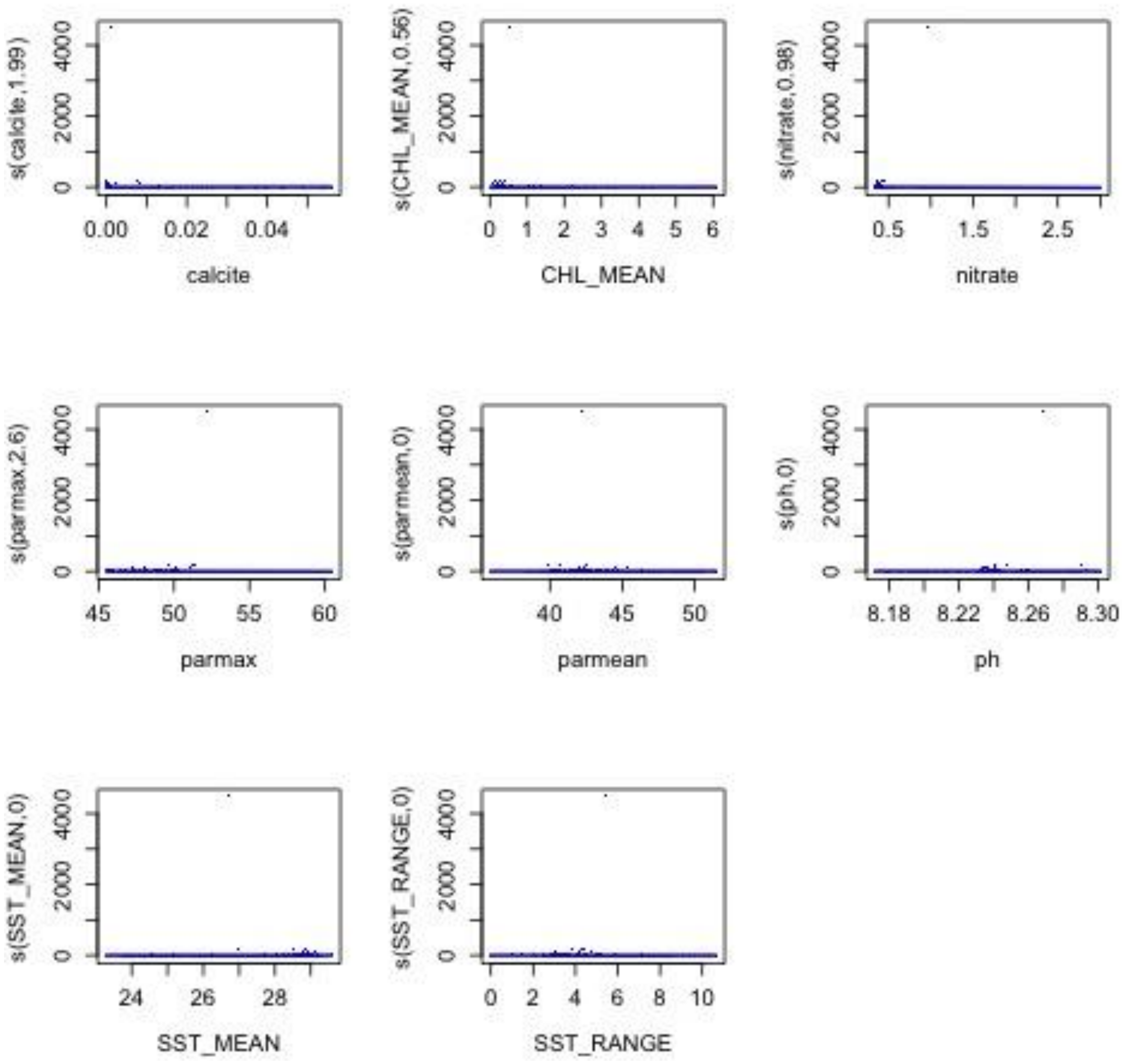
223Halichoeres richmondi, n = 55 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8254612	9	2.6981111	5.575197e-02
s(CHL_MEAN)	0.8582658	7	5.4815668	8.695472e-03
s(nitrate)	0.9535062	7	17.4079191	1.282535e-05
s(parmax)	0.9486339	9	18.1540107	3.349411e-06
s(parmean)	0.4267707	9	0.4810682	2.776536e-01
s(ph)	4.4444433	9	68.2032922	5.613397e-16
s(SST_MEAN)	0.9365994	9	14.1091298	2.193569e-05
s(SST_RANGE)	0.7227726	9	2.5006315	5.543996e-02



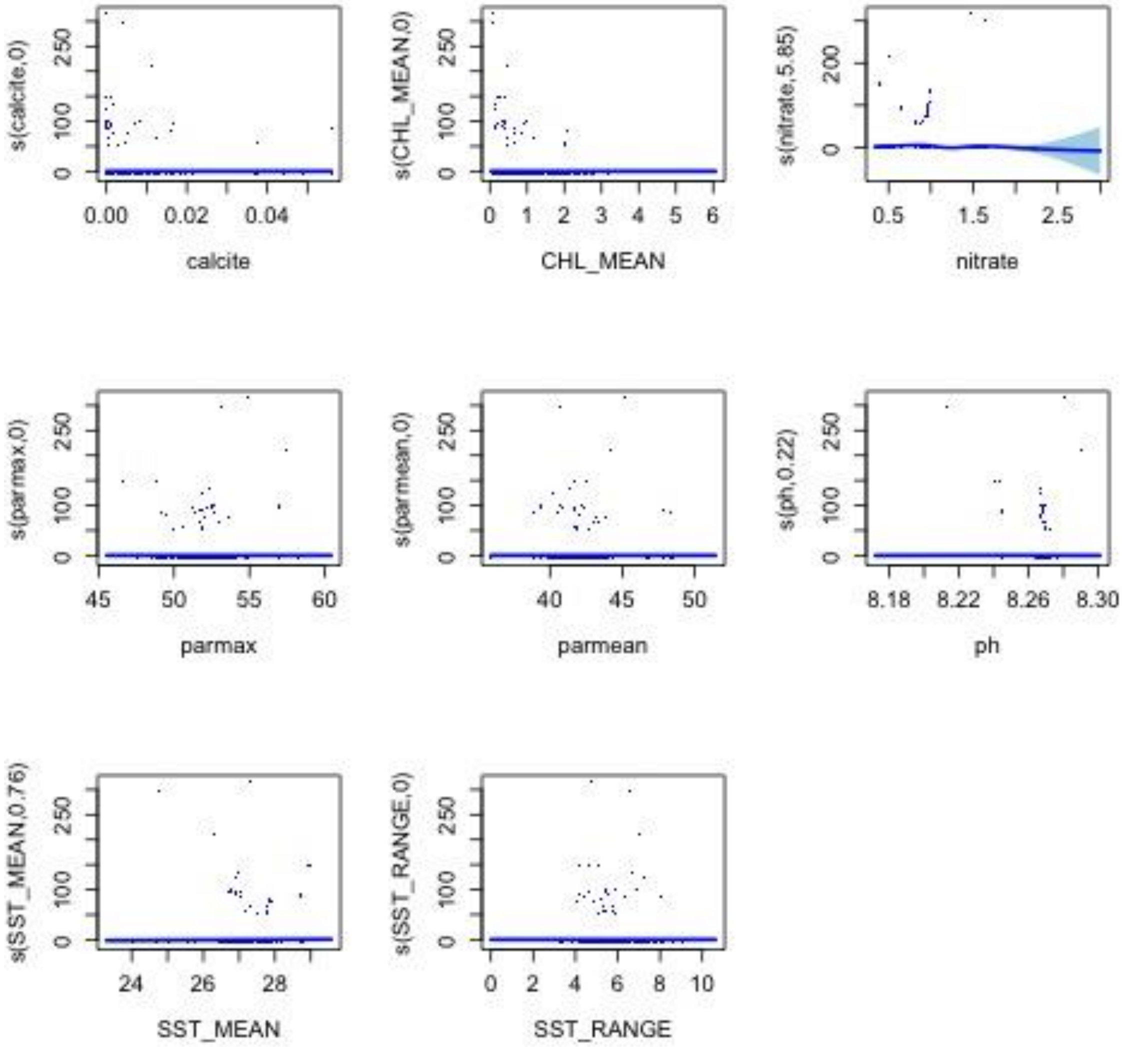
224Halichoeres scapularis, n = 44 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.992746e+00	9	1.293611e+01	6.222392e-04
s(CHL_MEAN)	5.619187e-01	9	1.195093e+00	1.398932e-01
s(nitrate)	9.752495e-01	7	3.317403e+01	5.056534e-09
s(parmax)	2.602834e+00	9	3.065114e+01	3.678027e-08
s(parmean)	3.414418e-06	9	1.215495e-06	6.233700e-01
s(ph)	7.867194e-06	9	5.315143e-06	4.115026e-01
s(SST_MEAN)	1.579598e-05	9	1.368886e-05	3.532064e-01
s(SST_RANGE)	1.909772e-05	9	1.469370e-05	3.857334e-01



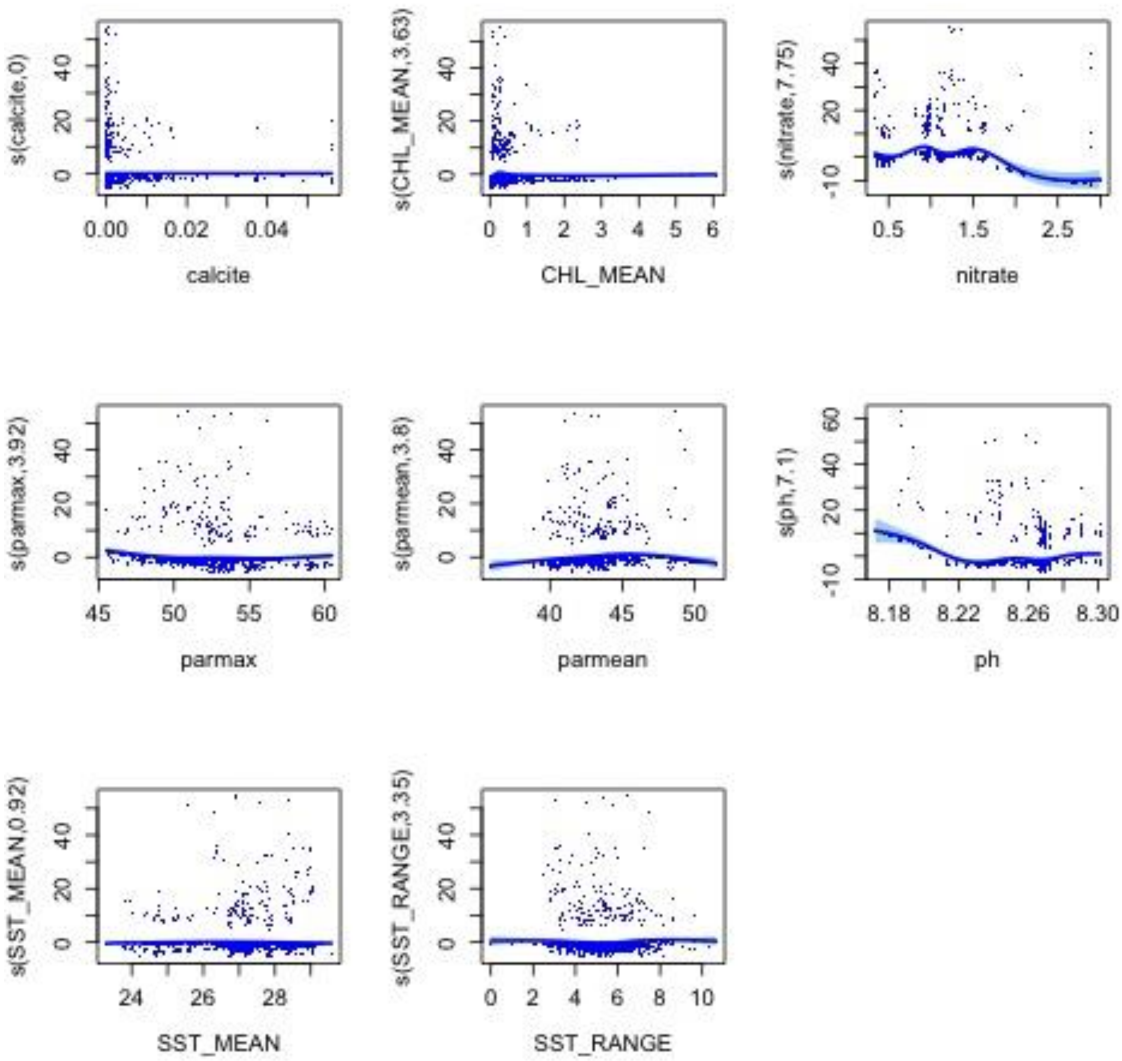
225Halichoeres sp, n = 53 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.264781e-04	8	7.586232e-05	4.465395e-01
s(CHL_MEAN)	3.878868e-03	9	3.809806e-03	3.181910e-01
s(nitrate)	5.848139e+00	9	4.872728e+01	5.933639e-10
s(parmax)	2.330031e-05	9	4.974714e-06	8.431699e-01
s(parmean)	2.148492e-05	9	8.424311e-06	6.759581e-01
s(ph)	2.217125e-01	9	2.806864e-01	2.089969e-01
s(SST_MEAN)	7.594479e-01	9	3.056050e+00	3.124501e-02
s(SST_RANGE)	3.038394e-05	9	1.772282e-05	5.408087e-01



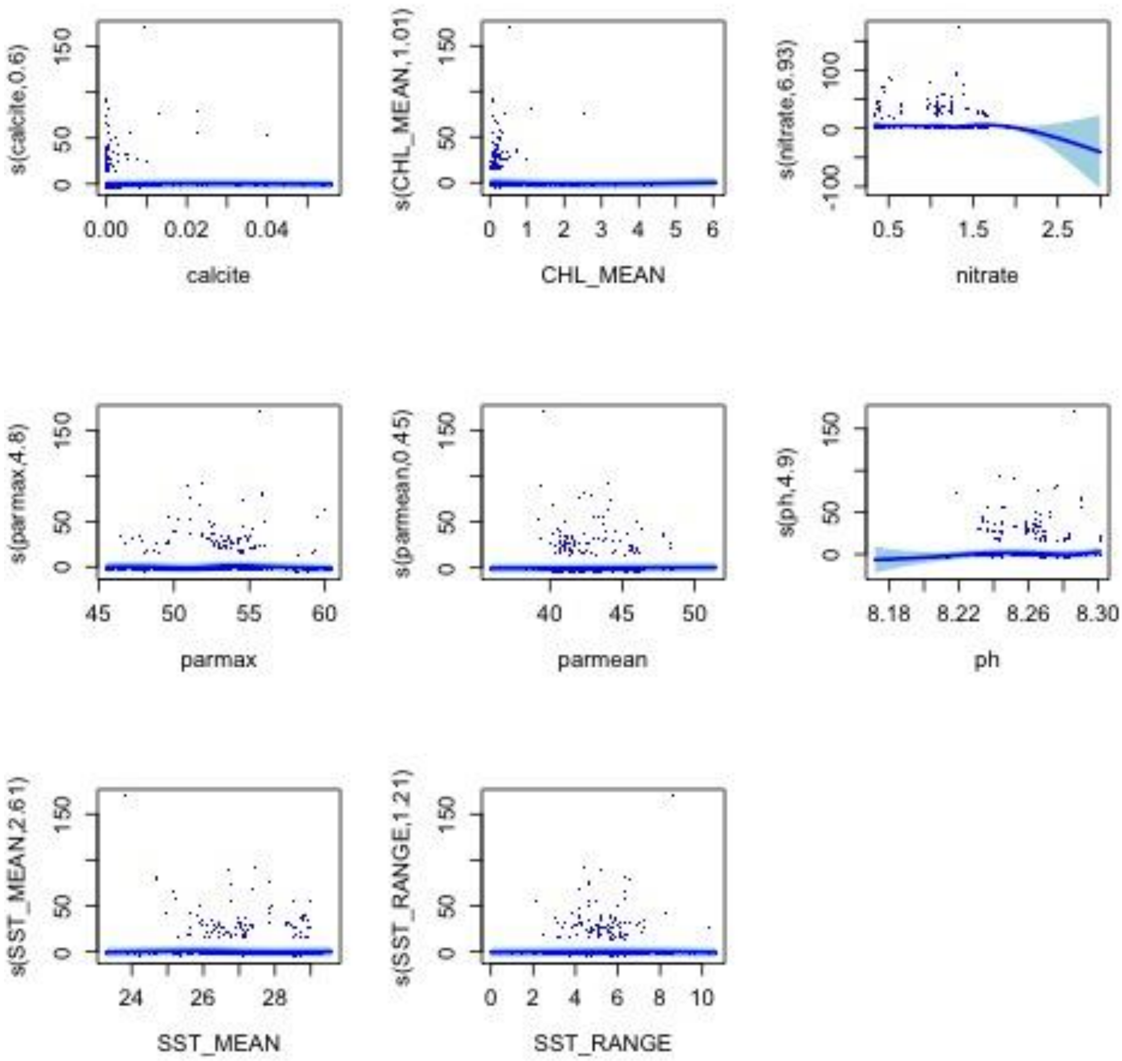
226Halichoeres trimaculatus, n = 300 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0003487269	9	1.361010e-04	6.007306e-01
s(CHL_MEAN)	3.6320014353	9	3.030616e+01	4.249320e-07
s(nitrate)	7.7510126353	9	1.182646e+02	3.259613e-27
s(parmax)	3.9249571776	9	1.873488e+01	7.844341e-05
s(parmean)	3.7993882143	9	3.591167e+01	8.051268e-10
s(ph)	7.0990621909	9	6.795175e+01	4.108308e-15
s(SST_MEAN)	0.9206693410	9	1.868650e+00	8.831773e-02
s(SST_RANGE)	3.3493264530	9	1.966487e+01	3.076302e-05



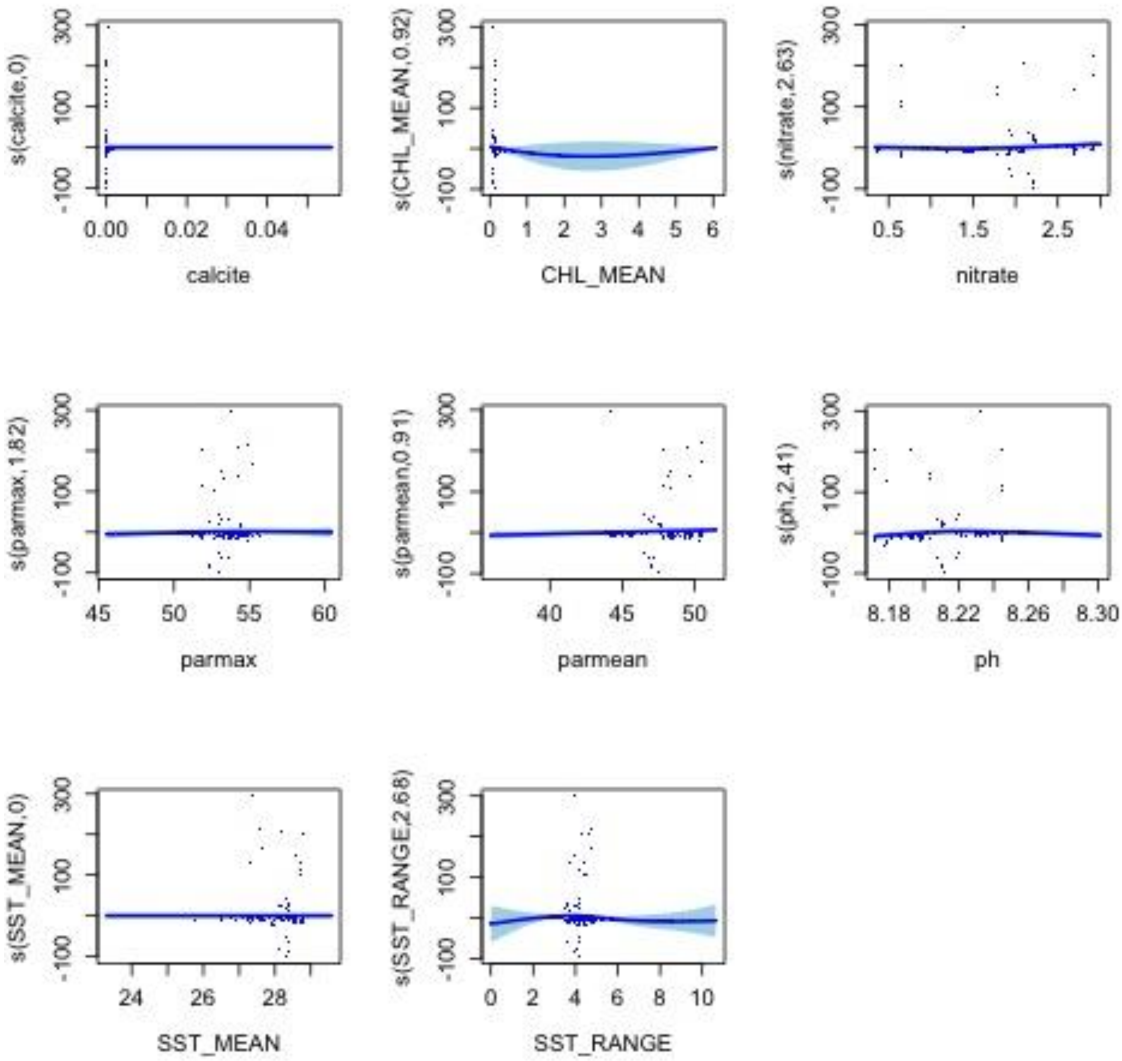
227Hemitaurichthys polylepis, n = 160 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.5957839	9	1.365187	1.107095e-01
s(CHL_MEAN)	1.0134917	9	5.742911	6.963288e-03
s(nitrate)	6.9342804	9	60.330813	2.387345e-13
s(parmax)	4.7977793	9	33.465410	1.257709e-07
s(parmean)	0.4459543	9	0.730079	1.603835e-01
s(ph)	4.8996855	9	26.719544	1.973588e-06
s(SST_MEAN)	2.6094376	9	7.567594	1.343552e-02
s(SST_RANGE)	1.2090610	9	2.539593	9.097716e-02



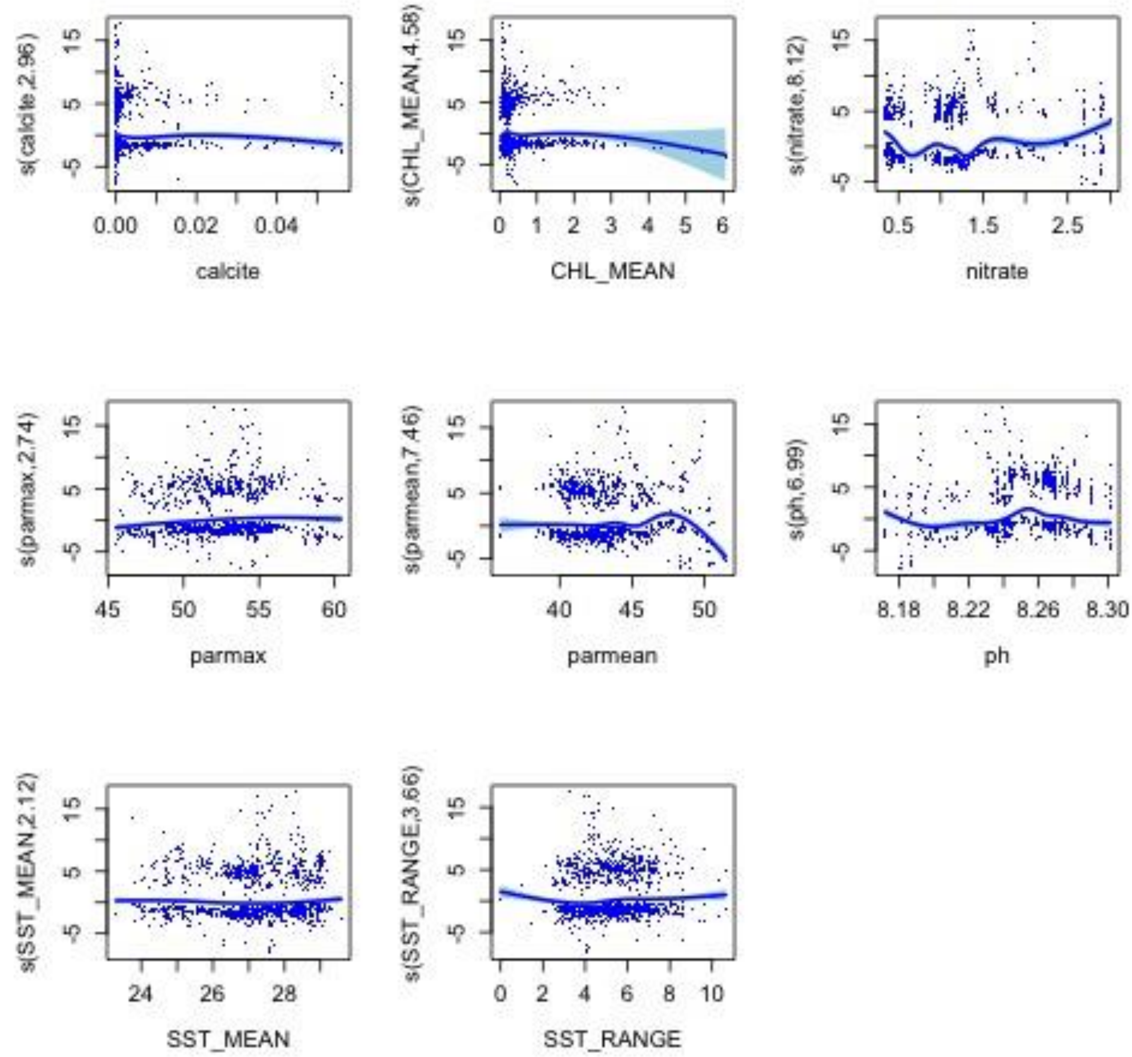
228Hemitaurichthys thompsoni, n = 157 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.272698e-06	9	2.142864e-07	7.259649e-01
s(CHL_MEAN)	9.218799e-01	8	3.535988e+00	3.456008e-02
s(nitrate)	2.628490e+00	9	2.387527e+01	4.520810e-08
s(parmax)	1.824714e+00	9	4.039180e+00	6.971948e-02
s(parmean)	9.127335e-01	9	6.620262e+00	2.090775e-03
s(ph)	2.410889e+00	9	2.268546e+01	8.414552e-09
s(SST_MEAN)	2.449907e-06	9	8.169690e-07	5.968249e-01
s(SST_RANGE)	2.676539e+00	9	1.767820e+01	5.593958e-05



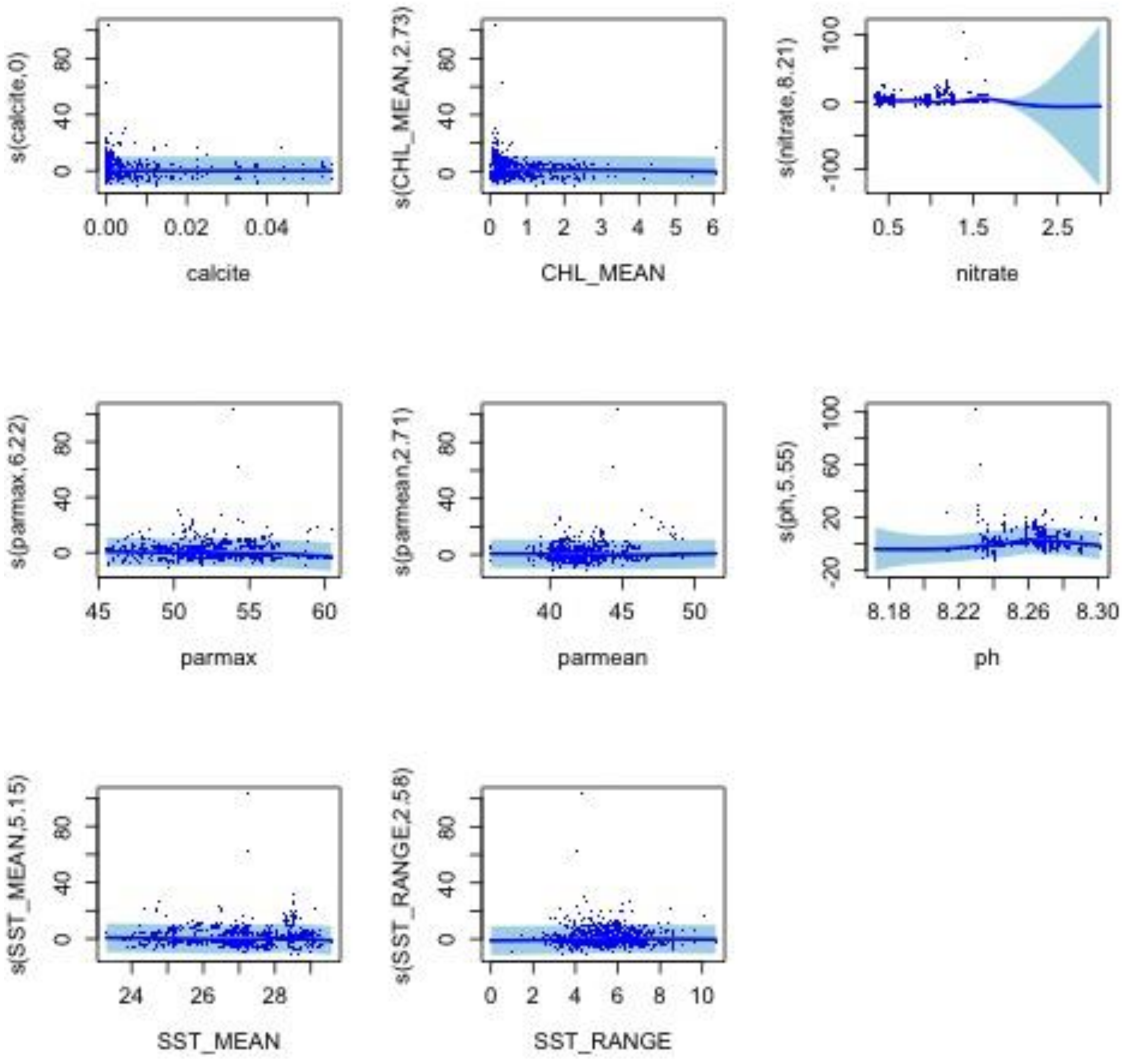
229Hemigymnus fasciatus, n = 1295 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.964377	9	21.522584	3.261655e-05
s(CHL_MEAN)	4.582064	9	17.981945	8.426494e-04
s(nitrate)	8.121670	9	214.541951	7.933183e-49
s(parmax)	2.744814	9	19.340007	1.086419e-05
s(parmean)	7.461170	9	159.239902	1.131615e-35
s(ph)	6.986246	9	80.304972	2.651209e-17
s(SST_MEAN)	2.118257	9	7.349074	8.773708e-03
s(SST_RANGE)	3.658985	9	17.151573	2.905168e-04



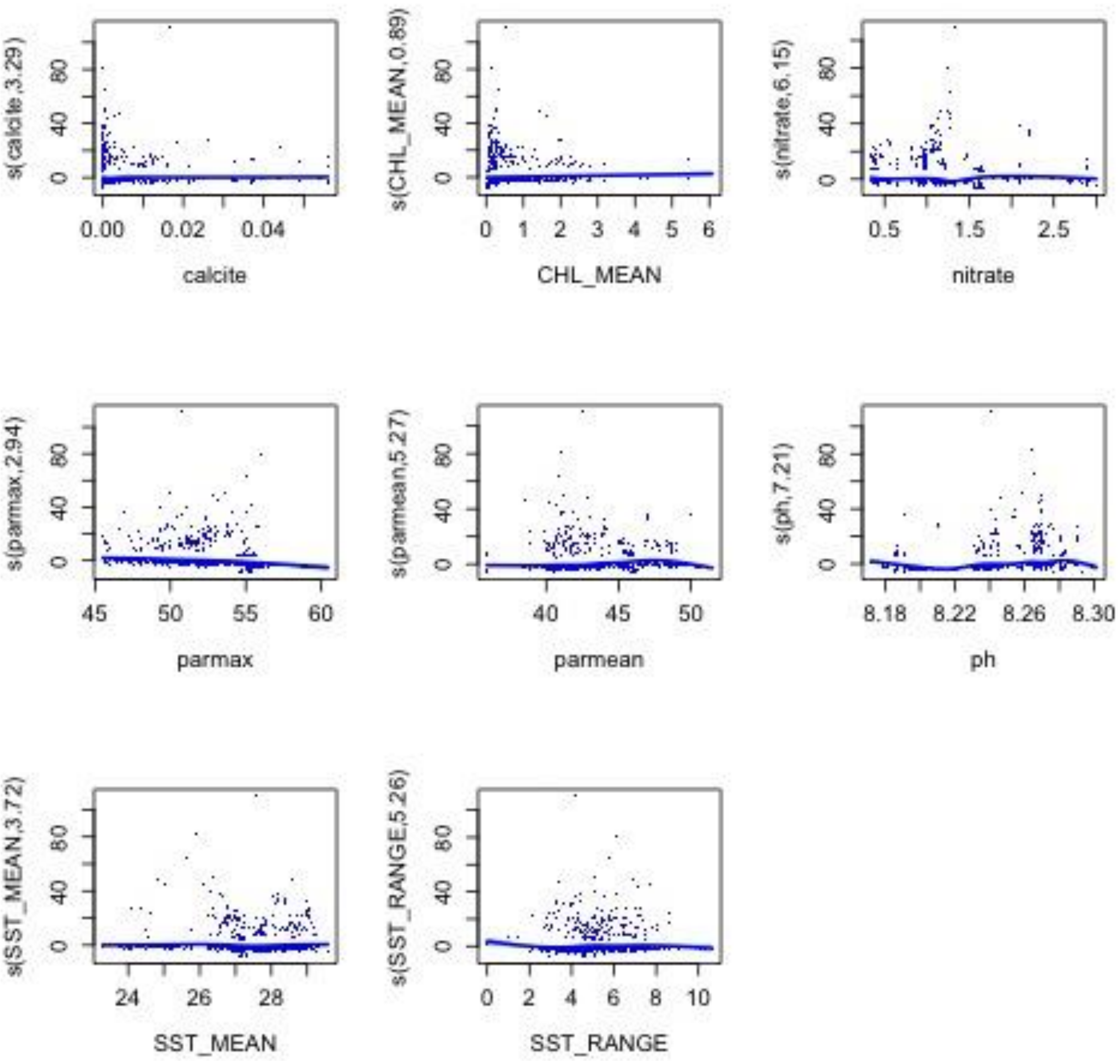
230Hemigymnus melapterus, n = 752 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0004821237	8	3.016355e-04	4.578107e-01
s(CHL_MEAN)	2.7300143459	9	3.727095e+01	2.338106e-09
s(nitrate)	8.2097573573	9	2.740850e+02	1.444749e-62
s(parmax)	6.2244414578	9	5.480061e+01	7.439359e-12
s(parmean)	2.7116293843	9	1.266426e+01	8.185716e-04
s(ph)	5.5527899755	9	1.034177e+02	3.756296e-25
s(SST_MEAN)	5.1544901931	9	2.521801e+01	1.374959e-05
s(SST_RANGE)	2.5801281886	9	9.731176e+00	5.182109e-03



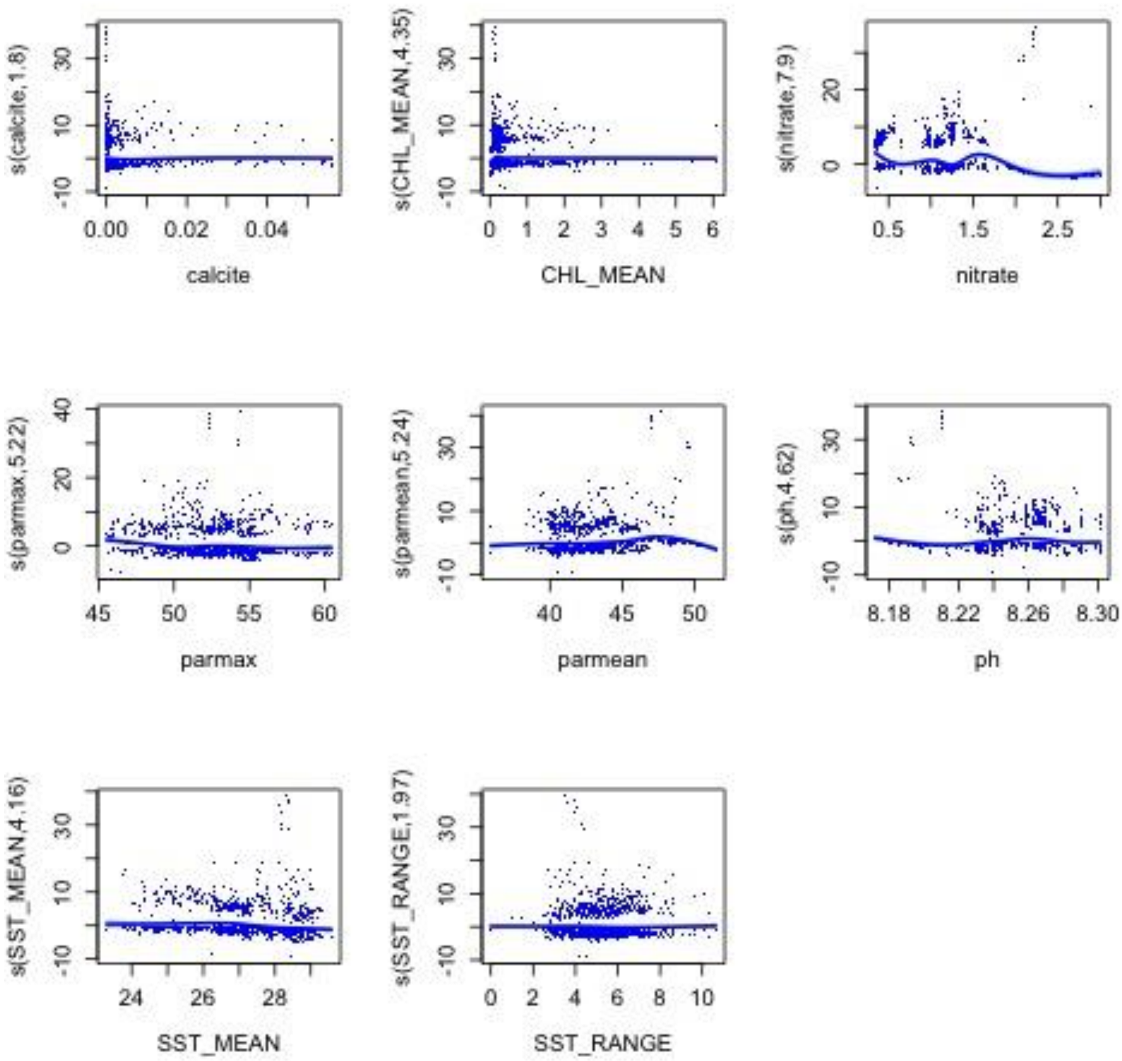
231Heniochus acuminatus, n = 270 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.2912636	9	9.531515	1.770027e-02
s(CHL_MEAN)	0.8949084	9	8.180829	1.832881e-03
s(nitrate)	6.1463499	9	56.182742	1.533925e-12
s(parmax)	2.9431695	9	50.264479	9.740945e-14
s(parmean)	5.2667937	9	96.031914	3.852797e-23
s(ph)	7.2134164	9	62.194854	3.016556e-13
s(SST_MEAN)	3.7215055	9	16.124485	3.909451e-04
s(SST_RANGE)	5.2589779	9	23.718407	6.118453e-05



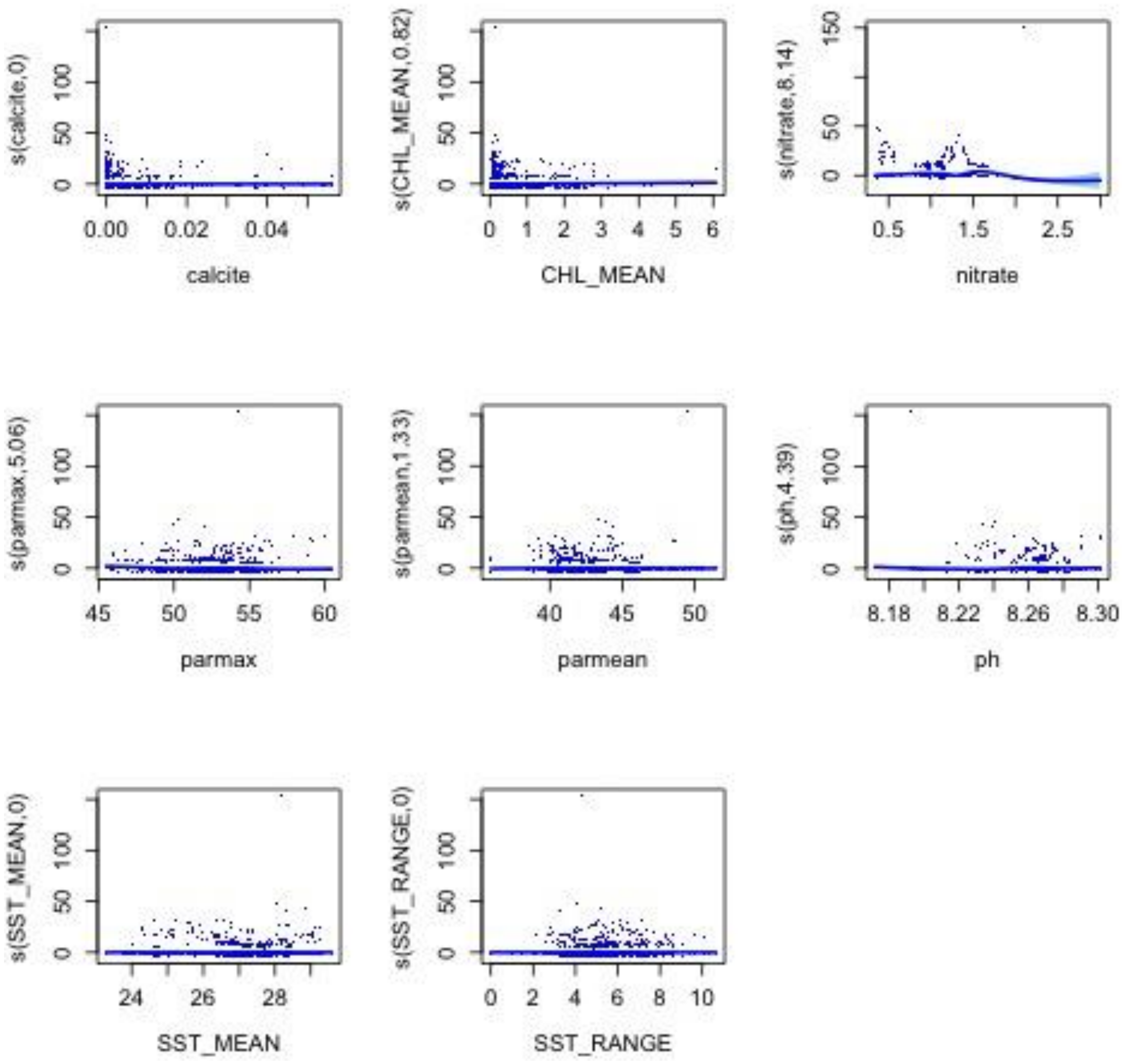
232Heniochus chrysostomus, n = 744 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.798881	9	6.363487	2.375843e-02
s(CHL_MEAN)	4.352141	9	28.277848	3.422172e-06
s(nitrate)	7.904492	9	226.026918	2.814158e-54
s(parmax)	5.218176	9	34.440395	9.786152e-08
s(parmean)	5.239060	9	49.172172	2.739416e-11
s(ph)	4.618595	9	24.196148	6.100181e-06
s(SST_MEAN)	4.159796	9	29.911140	1.068244e-07
s(SST_RANGE)	1.966396	9	3.832900	1.019787e-01



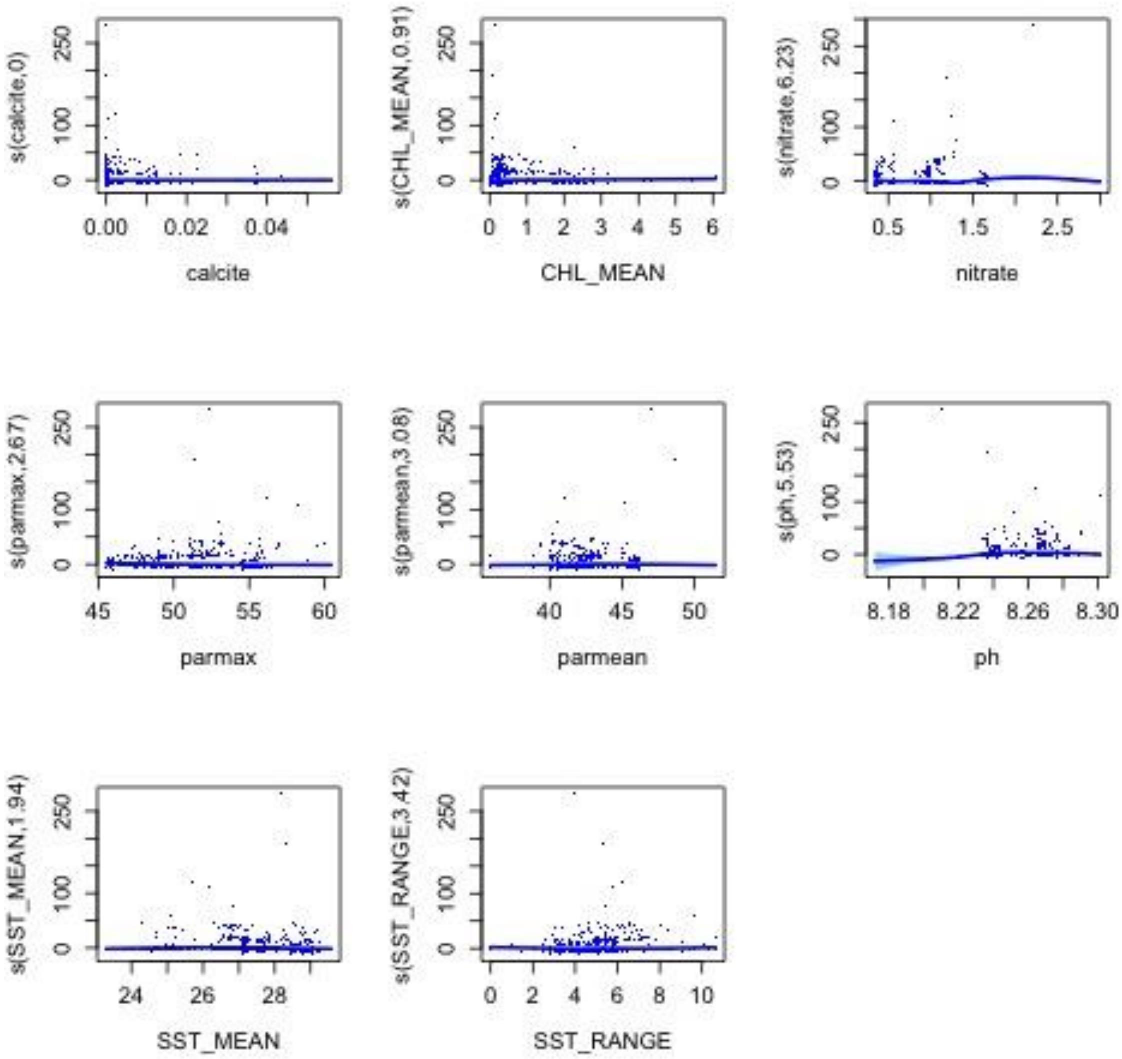
233Heniochus monoceros, n = 441 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.143315e-05	9	4.109628e-06	8.172222e-01
s(CHL_MEAN)	8.234027e-01	9	4.761451e+00	1.434424e-02
s(nitrate)	8.142895e+00	9	1.591962e+02	1.303383e-35
s(parmax)	5.058791e+00	9	2.750489e+01	5.150226e-06
s(parmean)	1.333478e+00	9	2.717120e+00	9.936986e-02
s(ph)	4.387053e+00	9	2.798292e+01	6.115105e-07
s(SST_MEAN)	6.761016e-05	9	5.983619e-05	2.804274e-01
s(SST_RANGE)	2.702893e-05	9	1.939447e-05	3.835470e-01



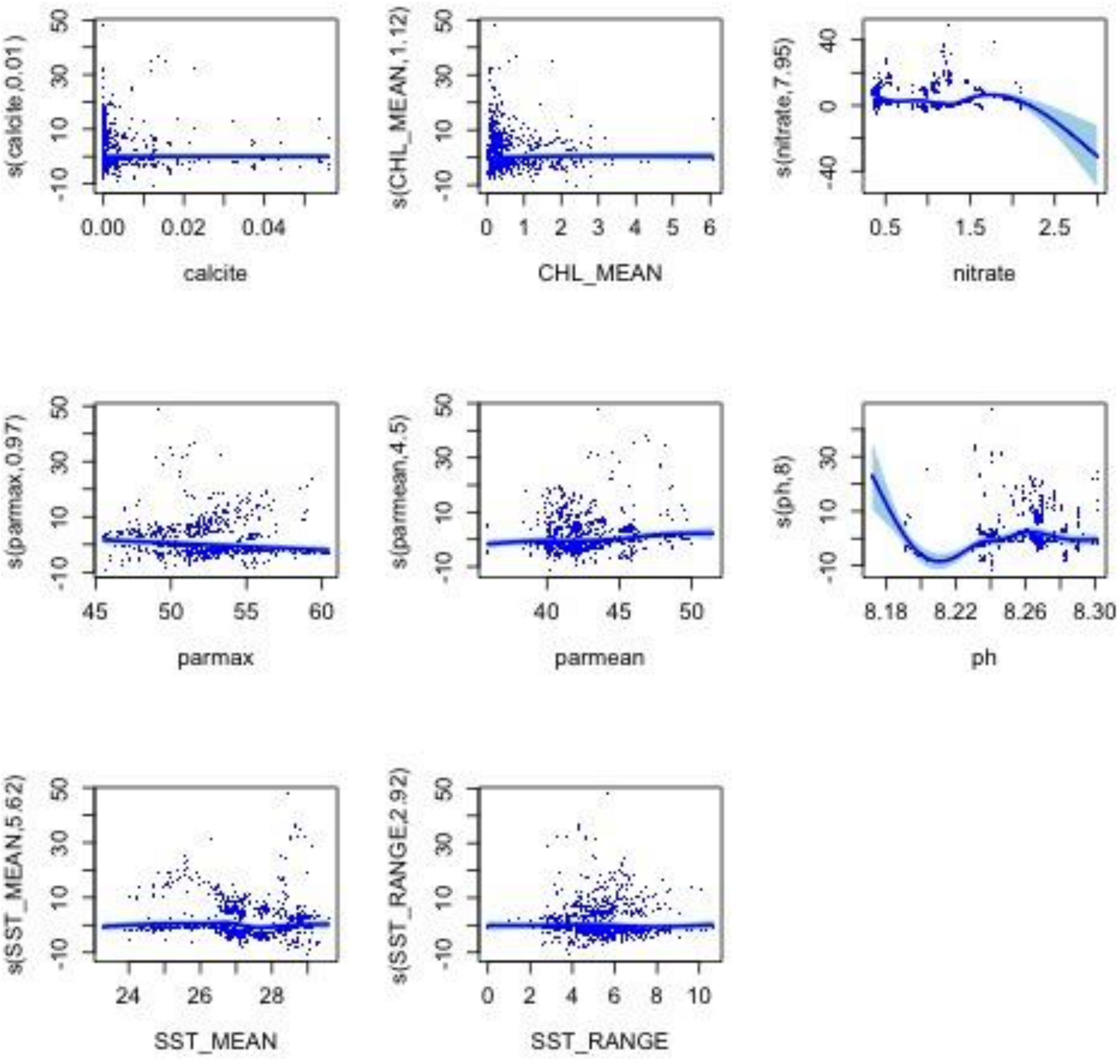
234Heniochus singularius, n = 223 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0006375429	8	4.318784e-04	3.981411e-01
s(CHL_MEAN)	0.9073002406	7	9.438773e+00	7.924834e-04
s(nitrate)	6.2299633724	9	1.187047e+02	5.449534e-30
s(parmax)	2.6742828700	9	2.918554e+01	6.496494e-09
s(parmean)	3.0797993940	9	1.353252e+01	7.959970e-04
s(ph)	5.5322666892	9	4.530854e+01	5.719473e-11
s(SST_MEAN)	1.9404675997	9	7.845847e+00	3.622063e-03
s(SST_RANGE)	3.4236966185	9	1.105061e+01	6.751778e-03



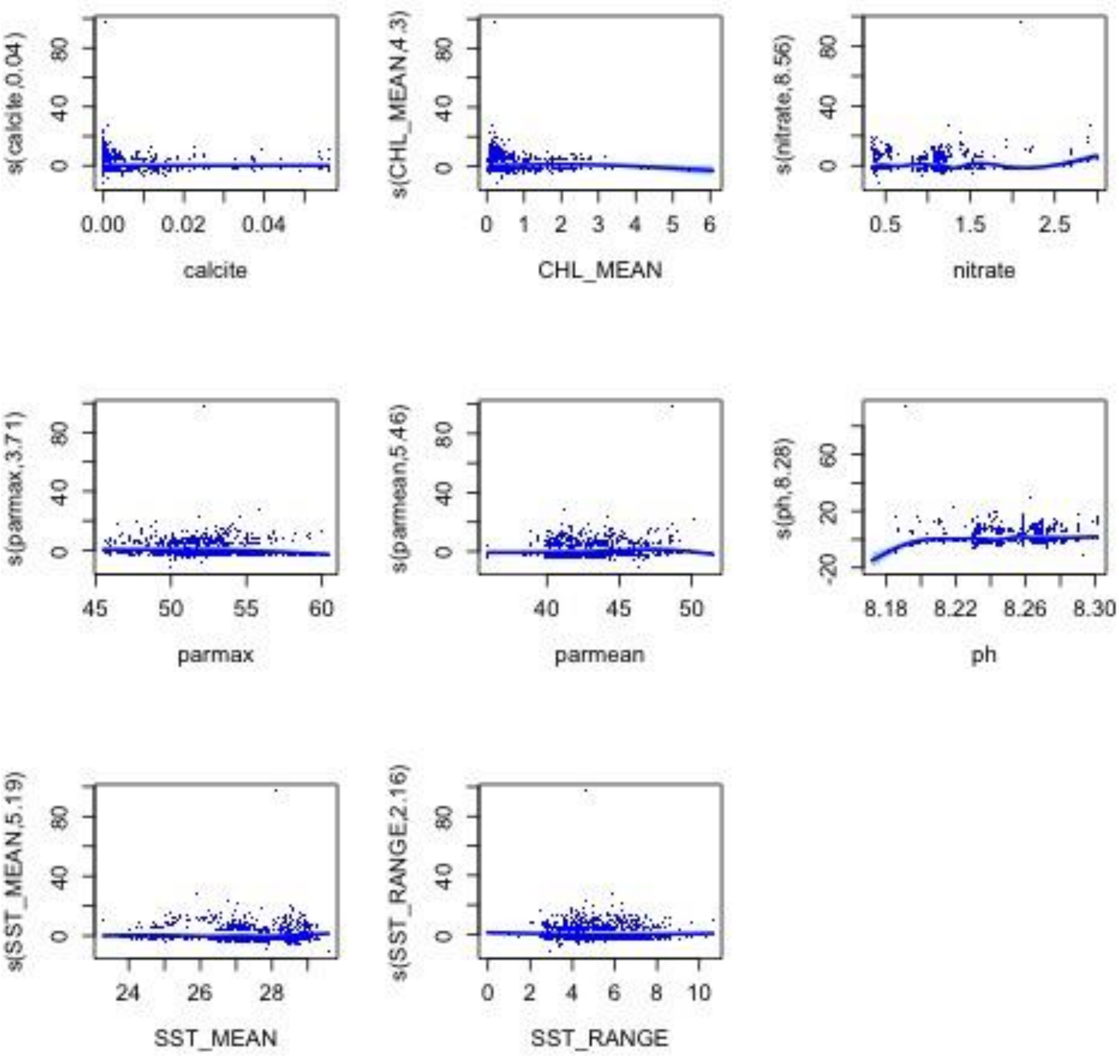
235Heniochus varius, n = 693 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.008511111	8	7.926409e-03	3.277840e-01
s(CHL_MEAN)	1.120326638	9	5.151592e+00	1.328348e-02
s(nitrate)	7.946679683	9	2.592748e+02	1.067981e-60
s(parmax)	0.970608301	9	3.136546e+01	5.184334e-09
s(parmean)	4.502347609	9	4.077704e+01	1.300340e-09
s(ph)	7.995785722	9	1.218354e+02	7.495558e-26
s(SST_MEAN)	5.620715091	9	4.721162e+01	2.757538e-10
s(SST_RANGE)	2.922154539	9	1.616123e+01	2.027726e-04



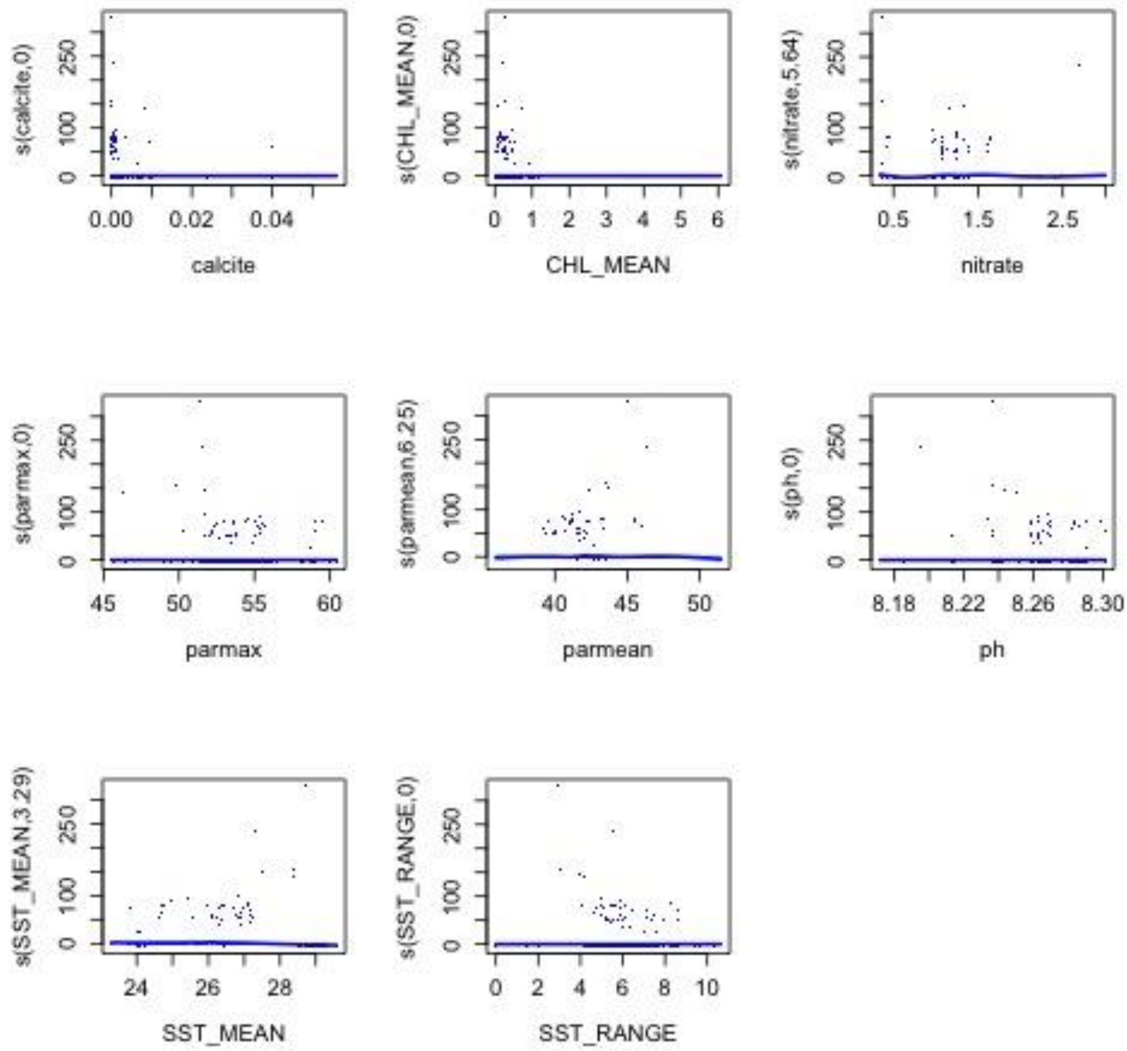
236Hipposcarus longiceps, n = 650 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.04437366	6	0.04432016	3.106313e-01
s(CHL_MEAN)	4.30265816	9	63.34002550	1.118546e-14
s(nitrate)	8.55600486	9	132.79911168	8.062216e-28
s(parmax)	3.70829021	9	32.65057199	2.393363e-08
s(parmean)	5.45676272	9	43.36876644	1.616589e-09
s(ph)	8.28028659	9	74.92951397	7.059306e-15
s(SST_MEAN)	5.18597659	9	25.17111247	1.379921e-05
s(SST_RANGE)	2.15832312	9	6.15593828	2.642353e-02



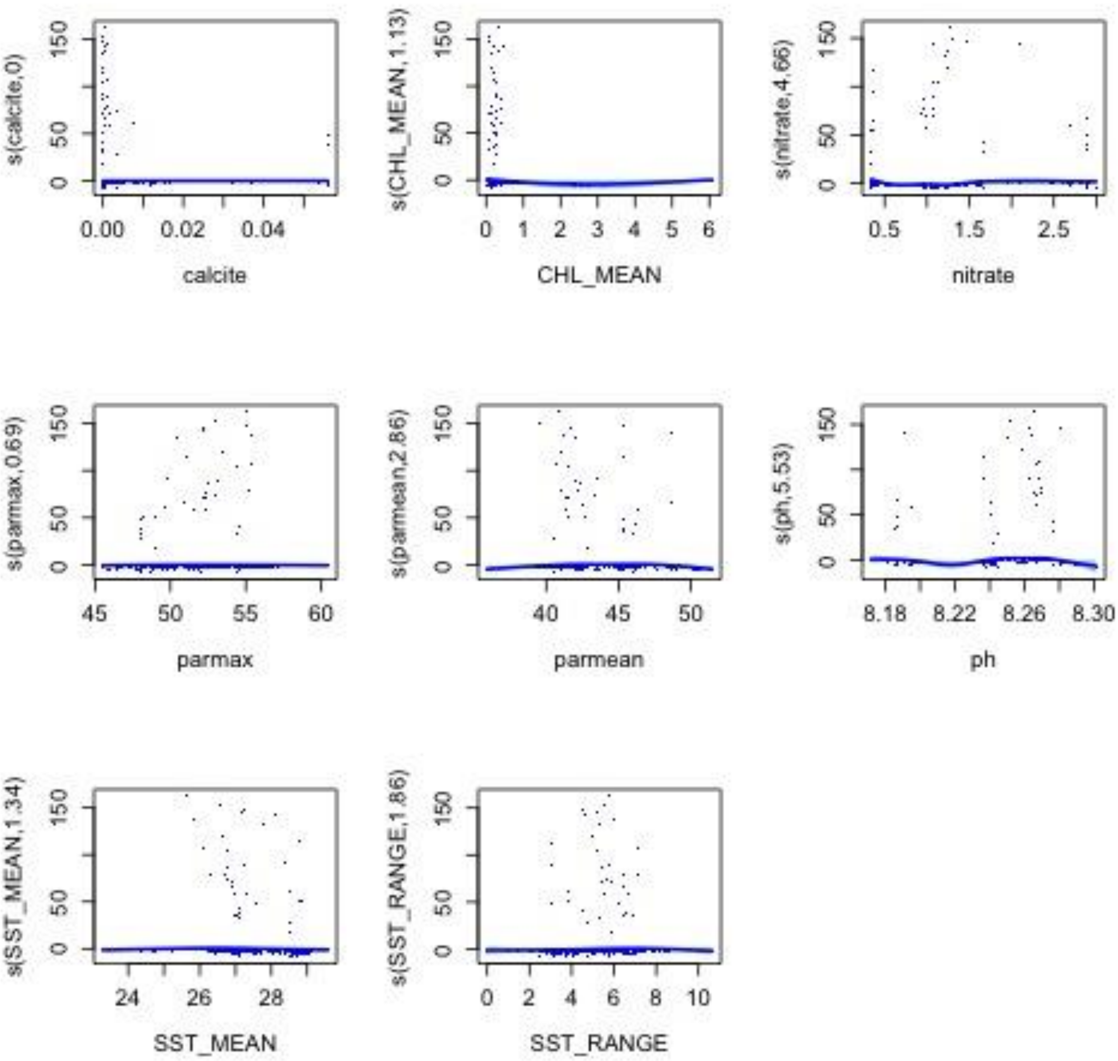
237Hologymnosus annulatus, n = 53 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.019858e-05	9	1.275755e-06	9.313848e-01
s(CHL_MEAN)	1.649473e-05	9	9.276250e-06	4.551945e-01
s(nitrate)	5.643064e+00	9	2.661992e+01	3.001409e-05
s(parmax)	1.827643e-05	9	3.449286e-06	8.457009e-01
s(parmean)	6.254872e+00	9	2.154392e+01	6.087897e-04
s(ph)	3.101530e-05	9	4.385352e-06	1.000000e+00
s(SST_MEAN)	3.285392e+00	9	3.235702e+01	2.961663e-08
s(SST_RANGE)	1.831029e-05	9	4.110758e-06	8.539818e-01



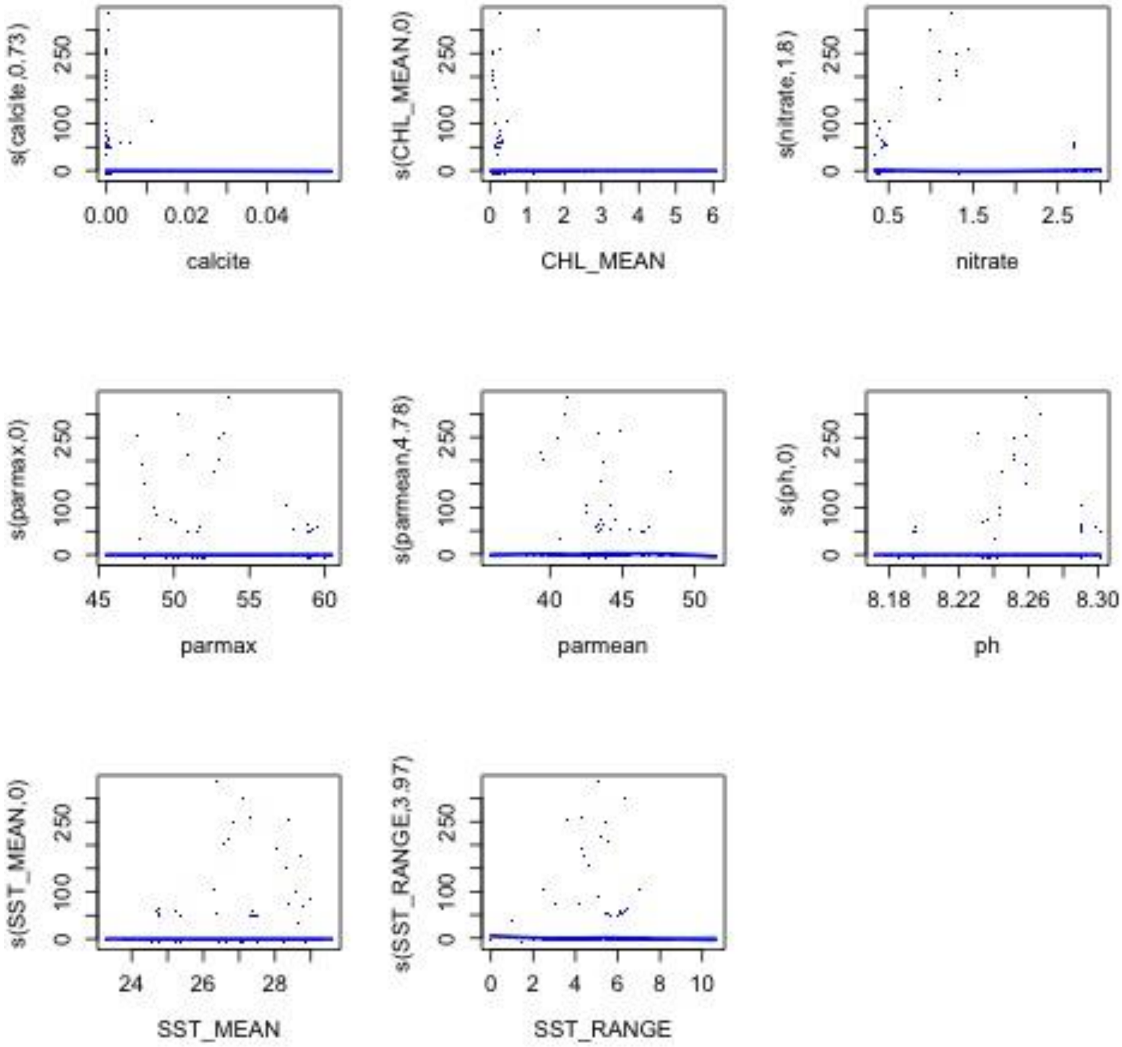
238Hologymnosus doliatus, n = 79 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.208465e-05	9	3.155503e-06	8.903915e-01
s(CHL_MEAN)	1.127680e+00	9	5.496759e+00	1.272560e-02
s(nitrate)	4.664132e+00	9	3.879965e+01	1.939190e-10
s(parmax)	6.924720e-01	9	9.701874e-01	1.791049e-01
s(parmean)	2.858120e+00	9	1.228760e+01	5.454333e-04
s(ph)	5.533826e+00	9	1.754926e+01	4.693879e-04
s(SST_MEAN)	1.340191e+00	9	2.699864e+00	7.576362e-02
s(SST_RANGE)	1.858010e+00	9	5.060636e+00	3.428195e-02



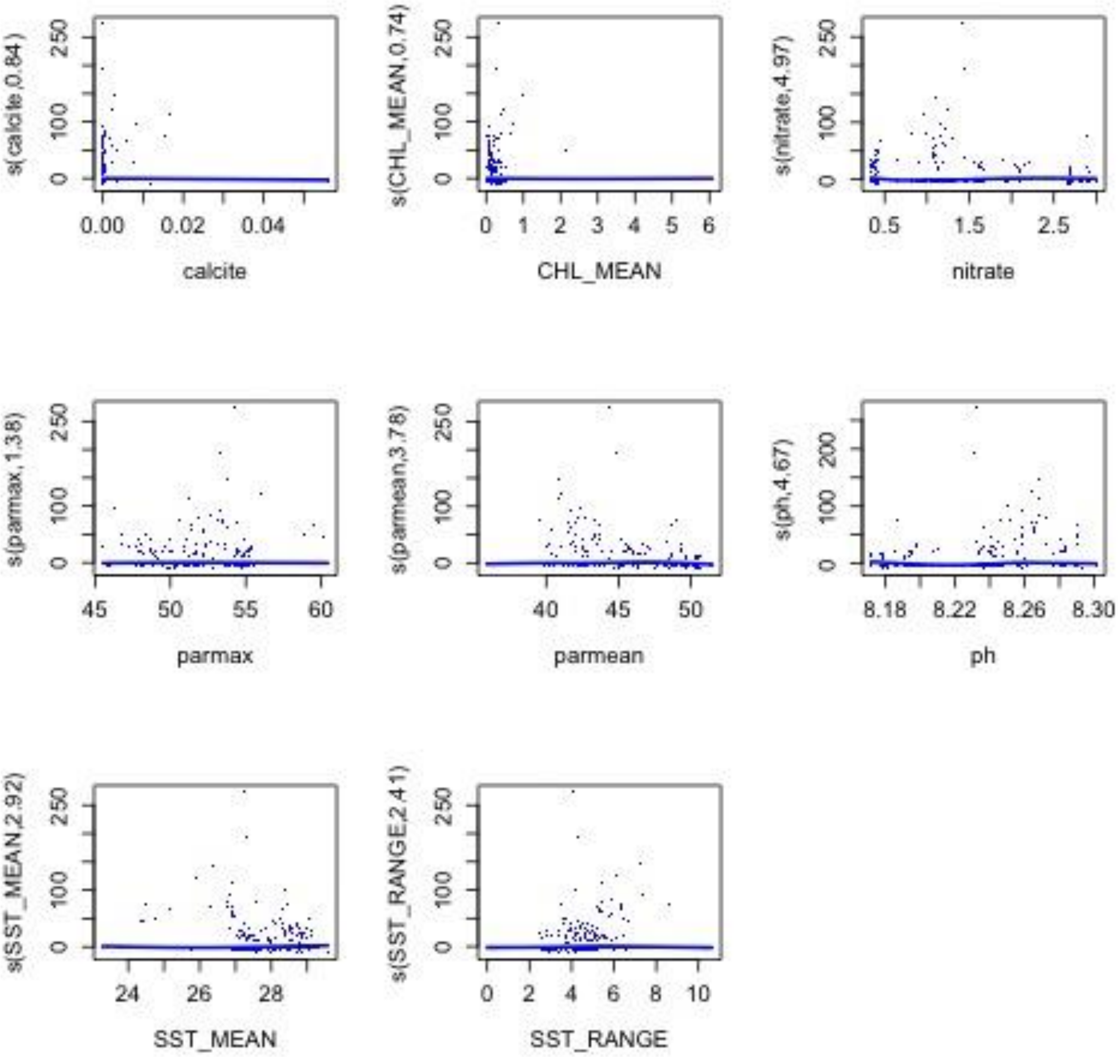
239Kyphosus bigibbus, n = 33 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.250948e-01	5	1.780380e+00	1.144382e-01
s(CHL_MEAN)	2.284109e-05	9	7.515247e-06	5.753028e-01
s(nitrate)	1.797751e+00	9	2.846325e+01	1.637903e-08
s(parmax)	1.283915e-05	9	1.737406e-06	9.495053e-01
s(parmean)	4.781371e+00	9	1.858948e+01	6.605798e-04
s(ph)	2.632402e-05	9	7.354289e-06	7.421669e-01
s(SST_MEAN)	1.248575e-05	9	3.048754e-06	8.059514e-01
s(SST_RANGE)	3.970134e+00	9	1.626241e+01	8.175256e-04



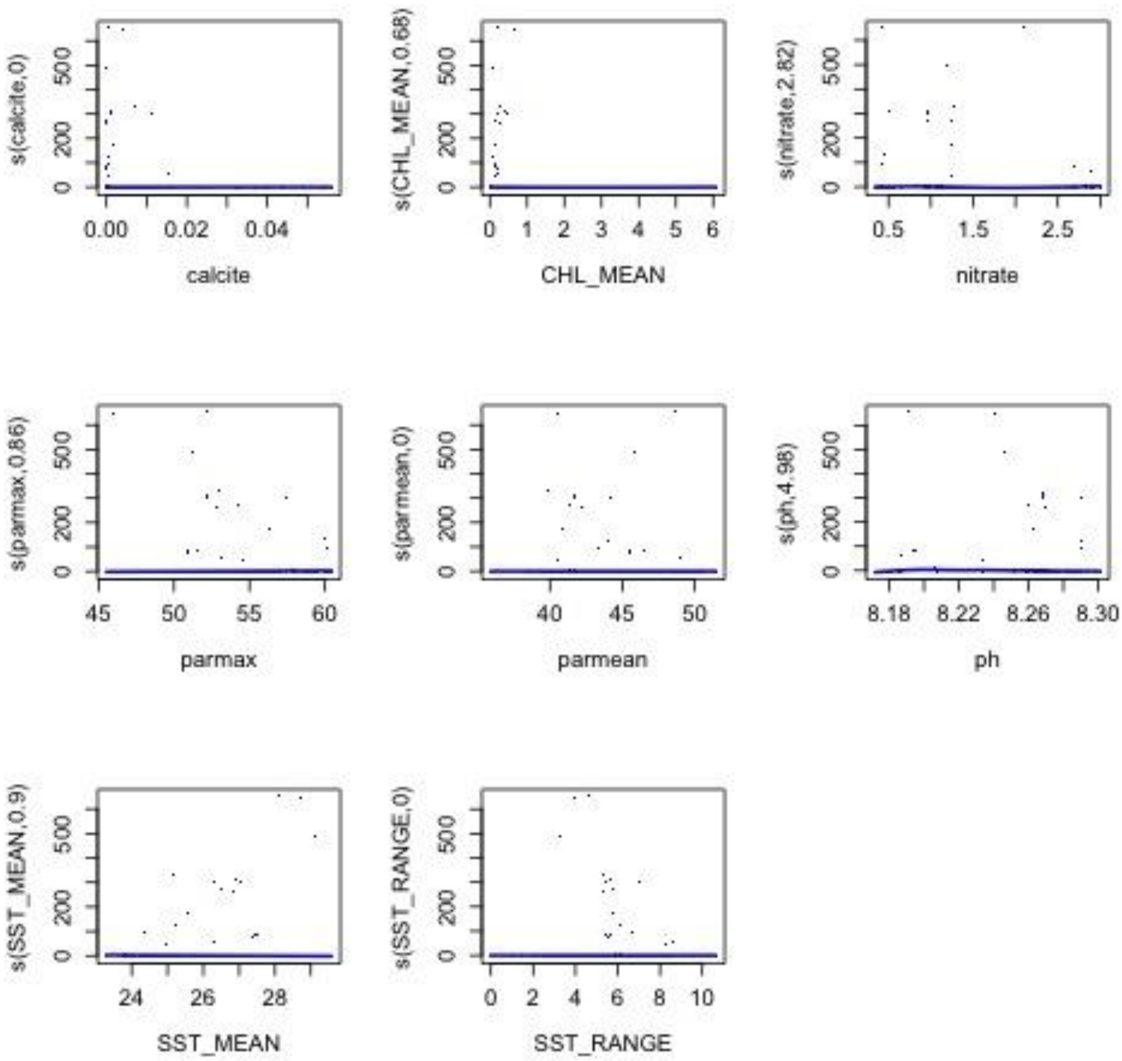
240Kyphosus cinerascens, n = 146 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8380570	6	3.499422	3.852356e-02
s(CHL_MEAN)	0.7428548	9	2.083202	7.548405e-02
s(nitrate)	4.9704891	9	73.324424	2.530091e-19
s(parmax)	1.3819891	9	4.111178	3.000058e-02
s(parmean)	3.7778688	9	44.353610	3.106171e-12
s(ph)	4.6662598	9	52.832504	3.024546e-14
s(SST_MEAN)	2.9171832	9	18.996891	4.575829e-06
s(SST_RANGE)	2.4082366	9	11.711721	7.909221e-04



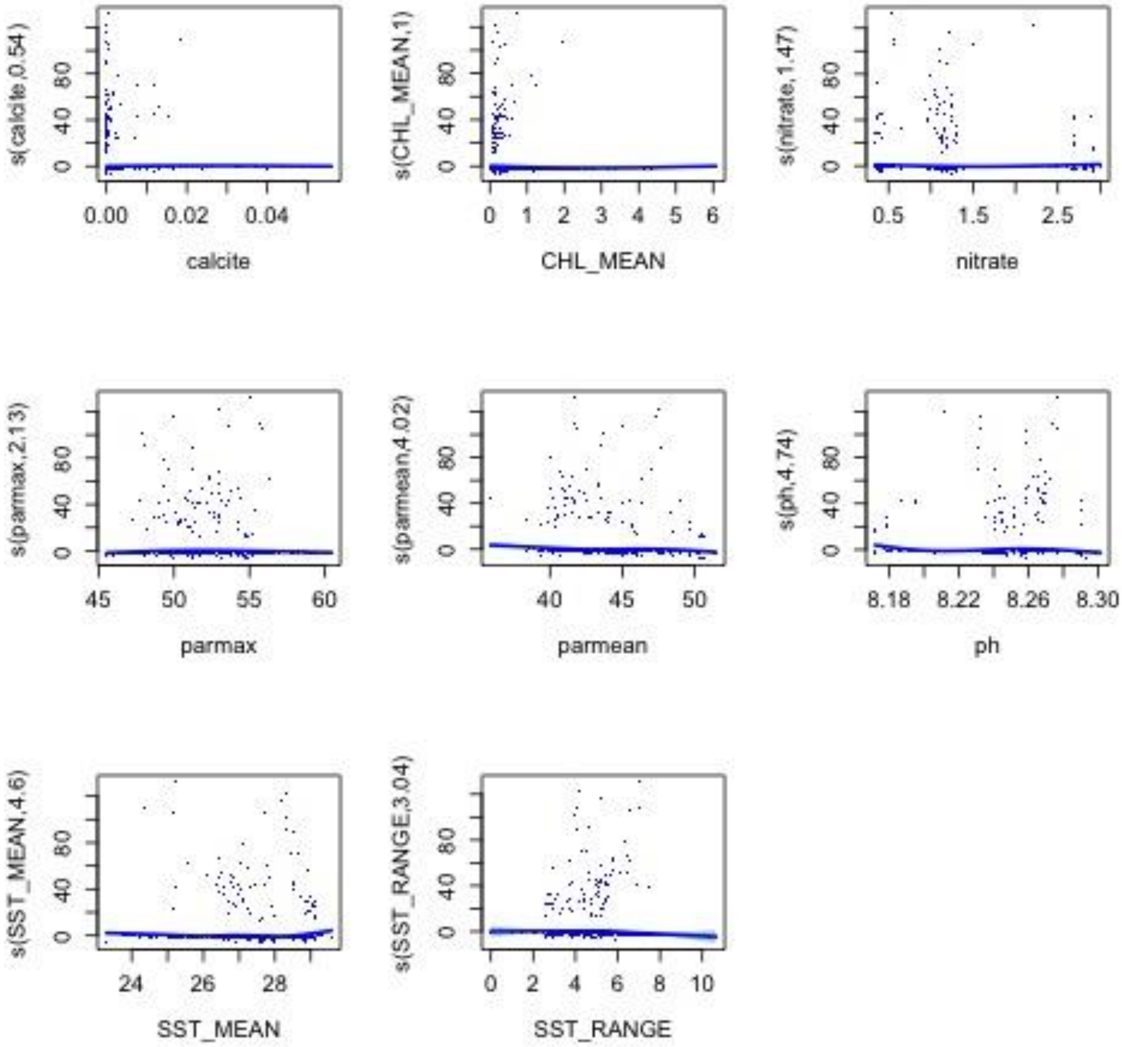
241Kyphosus sp, n = 178 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.779674e-04	9	4.413373e-04	2.629919e-01
s(CHL_MEAN)	6.800778e-01	9	1.223689e+00	1.643202e-01
s(nitrate)	2.821341e+00	9	1.298469e+01	6.264466e-04
s(parmax)	8.587850e-01	6	5.485970e+00	7.947961e-03
s(parmean)	5.222575e-06	9	4.069057e-06	3.771485e-01
s(ph)	4.978924e+00	9	3.000609e+01	4.971478e-07
s(SST_MEAN)	8.960533e-01	6	8.325365e+00	1.068541e-03
s(SST_RANGE)	6.637241e-05	9	1.881843e-05	7.635095e-01



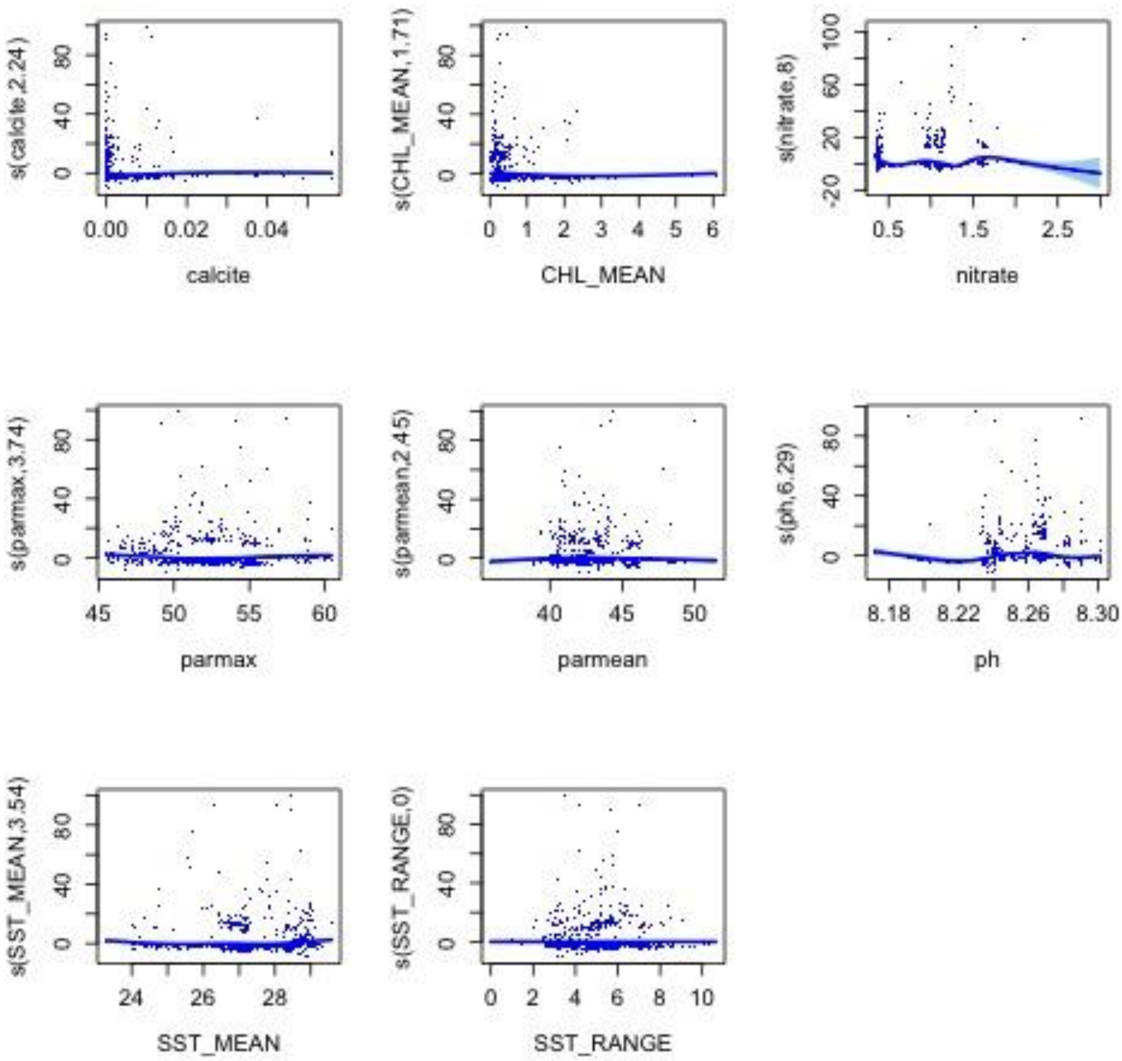
242Kyphosus vaigiensis, n = 107 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.5391686	9	1.195896	1.209357e-01
s(CHL_MEAN)	1.0039878	9	5.519424	7.282125e-03
s(nitrate)	1.4680249	9	10.022160	4.845816e-04
s(parmax)	2.1255931	9	8.826861	2.878923e-03
s(parmean)	4.0232796	9	24.898282	1.963062e-06
s(ph)	4.7371743	9	34.084103	7.039321e-09
s(SST_MEAN)	4.5950678	9	36.753979	7.419591e-09
s(SST_RANGE)	3.0408216	9	16.495965	1.233457e-04



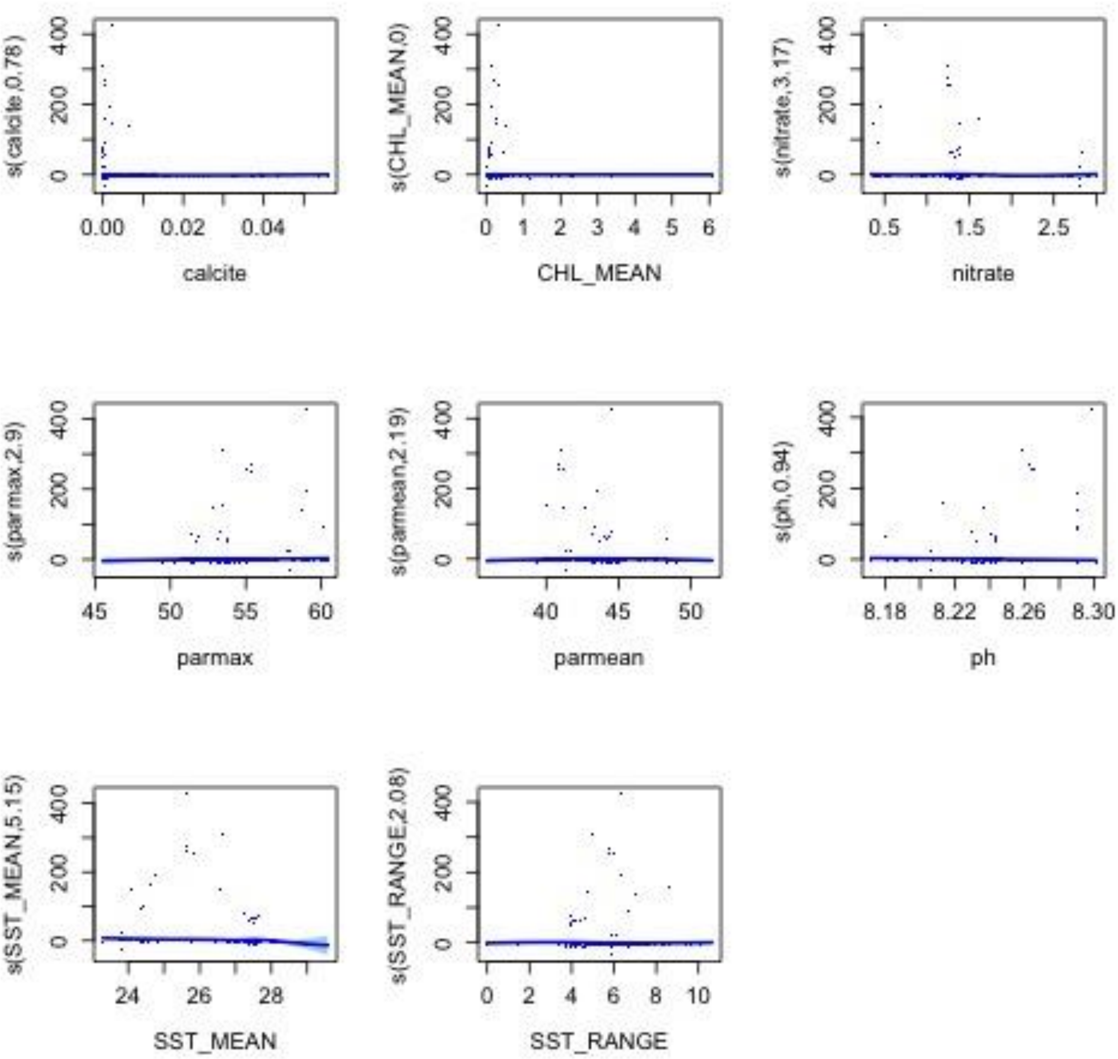
243Labrichthys unilineatus, n = 323 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.235551e+00	9	2.200903e+01	6.826675e-06
s(CHL_MEAN)	1.707419e+00	9	1.529628e+01	8.657837e-05
s(nitrate)	7.998897e+00	9	1.817100e+02	4.673198e-42
s(parmax)	3.743448e+00	9	3.592837e+01	2.294041e-09
s(parmean)	2.447545e+00	9	1.017058e+01	2.223666e-03
s(ph)	6.288000e+00	9	5.115518e+01	2.509438e-11
s(SST_MEAN)	3.544510e+00	9	2.128737e+01	1.069526e-05
s(SST_RANGE)	6.416689e-05	9	3.546563e-05	5.641446e-01



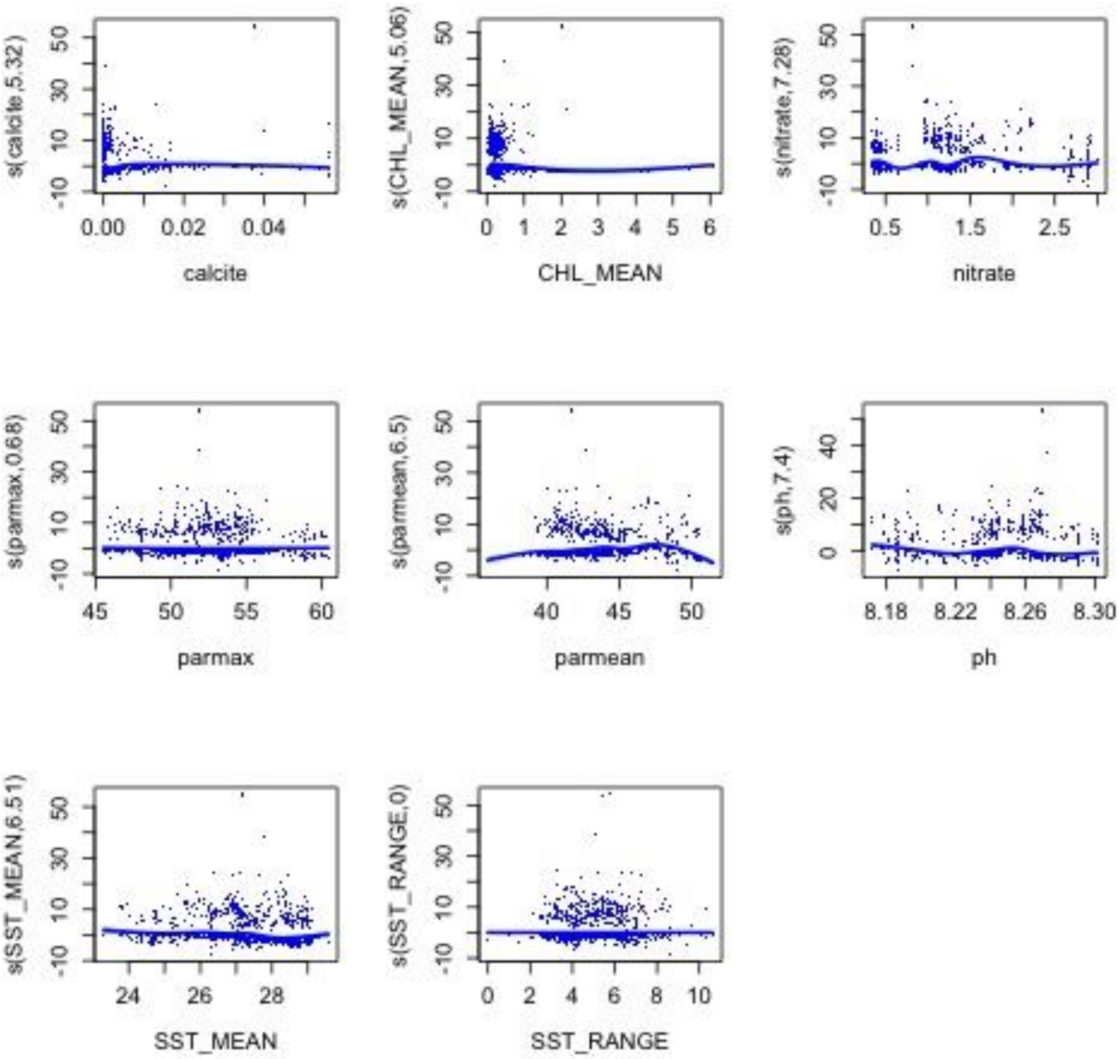
244Labrid sp, n = 88 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.820421e-01	9	1.883396e+00	0.1026738676
s(CHL_MEAN)	1.896614e-05	9	2.906440e-06	0.8678324853
s(nitrate)	3.173760e+00	9	7.566977e+00	0.0272222002
s(parmax)	2.902096e+00	9	6.461950e+00	0.0475327868
s(parmean)	2.193930e+00	9	6.856479e+00	0.0130192117
s(ph)	9.398618e-01	9	1.219713e+01	0.0001301378
s(SST_MEAN)	5.153951e+00	9	1.959212e+01	0.0003075307
s(SST_RANGE)	2.077187e+00	9	4.936653e+00	0.0545092672



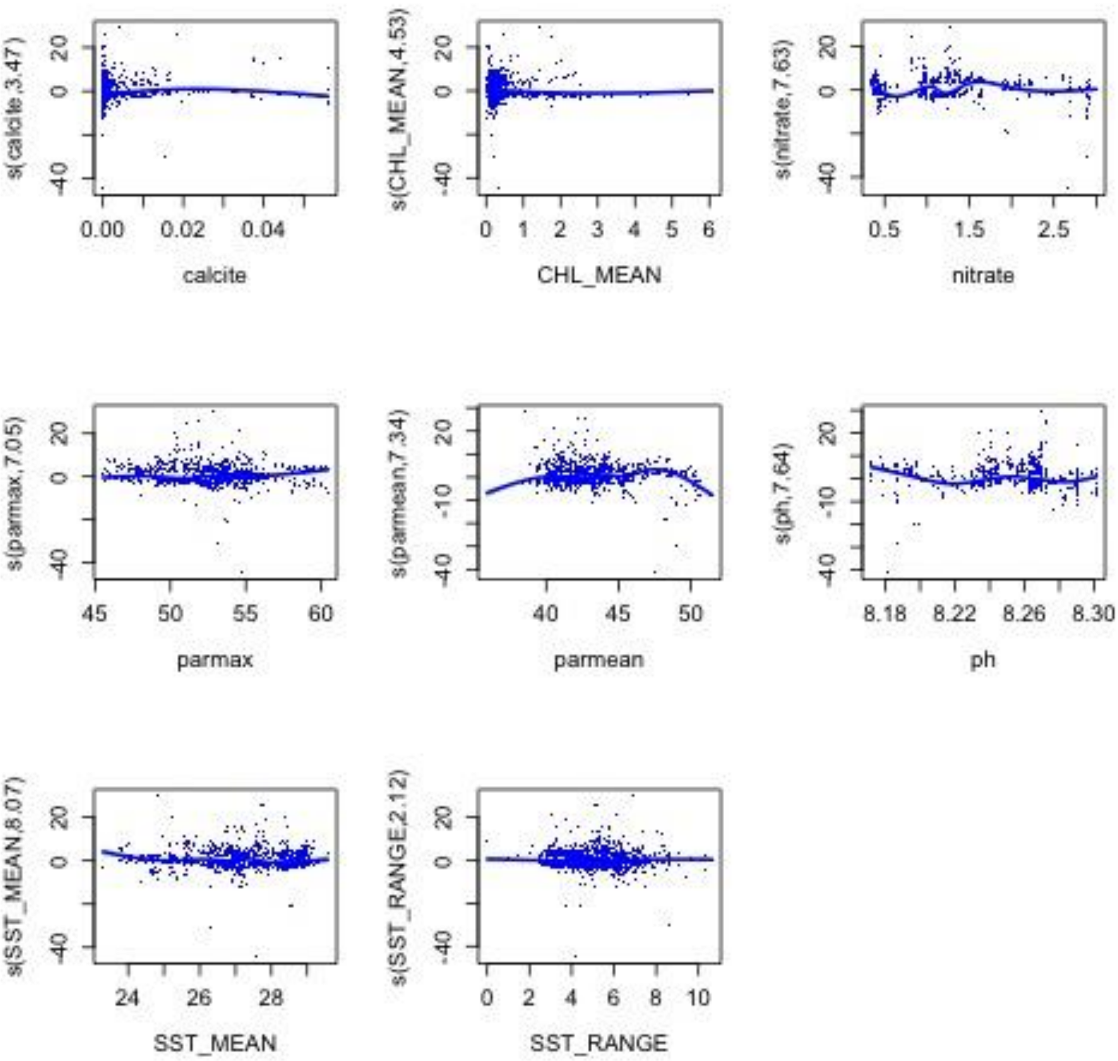
245Labroides bicolor, n = 915 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.3162177548	9	4.798242e+01	7.551353e-10
s(CHL_MEAN)	5.0583748885	9	6.098362e+01	4.306863e-13
s(nitrate)	7.2772829269	9	1.318933e+02	1.697493e-29
s(parmax)	0.6813369288	9	1.132872e+00	1.634428e-01
s(parmean)	6.5018407870	9	1.313335e+02	1.545061e-29
s(ph)	7.3973723918	9	7.826414e+01	1.527808e-16
s(SST_MEAN)	6.5147663078	9	7.341498e+01	4.527979e-16
s(SST_RANGE)	0.0004957116	9	4.144233e-04	3.689925e-01



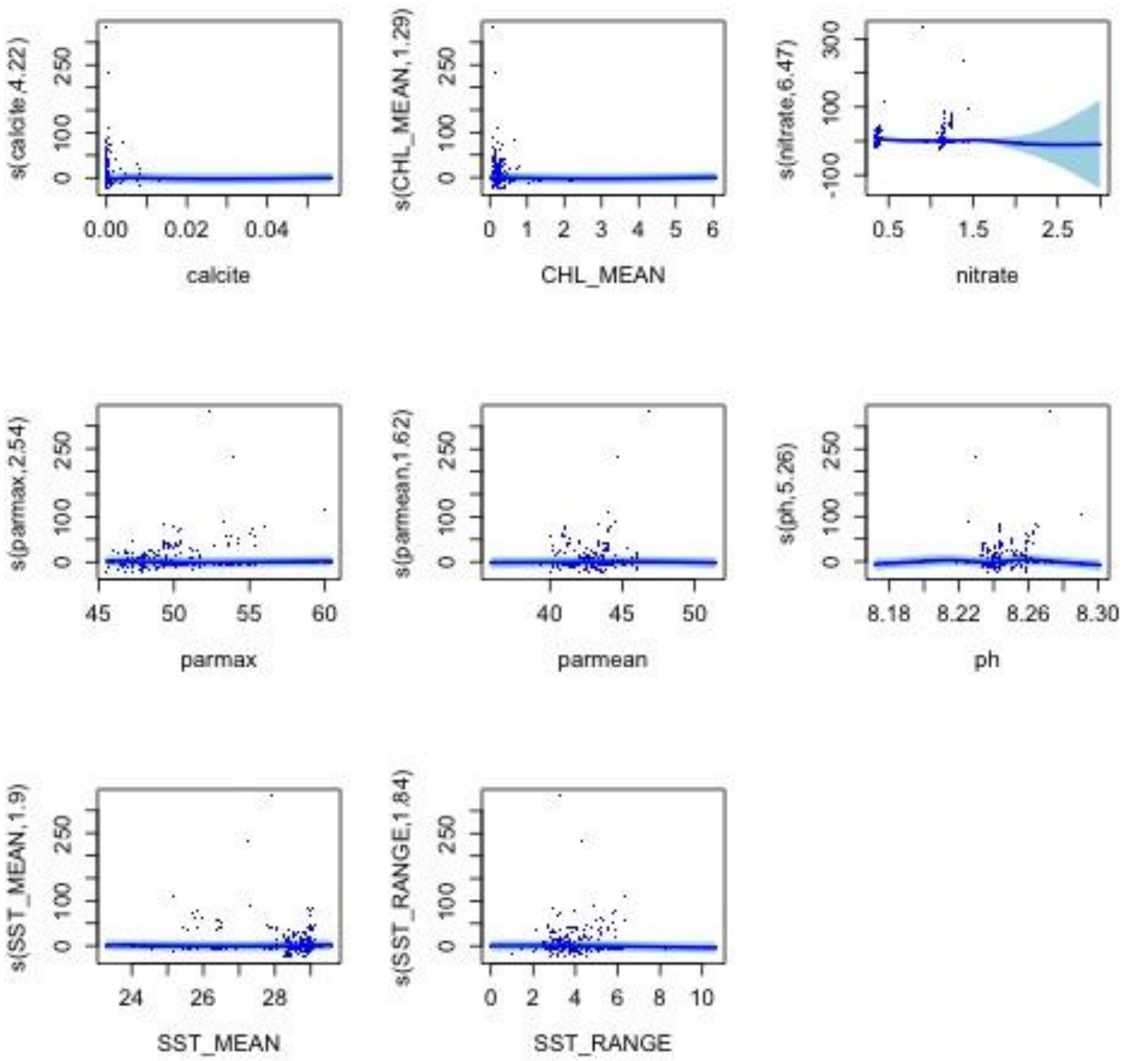
246Labroides dimidiatus, n = 2065 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.469311	9	50.617363	1.373734e-11
s(CHL_MEAN)	4.532397	9	29.310673	3.166142e-06
s(nitrate)	7.633497	9	425.615978	2.198984e-97
s(parmax)	7.054703	9	75.550008	1.531825e-15
s(parmean)	7.344858	9	230.132123	5.314047e-51
s(ph)	7.637654	9	148.407854	9.949761e-33
s(SST_MEAN)	8.074791	9	63.535178	4.250410e-12
s(SST_RANGE)	2.123783	9	7.228071	1.302492e-02



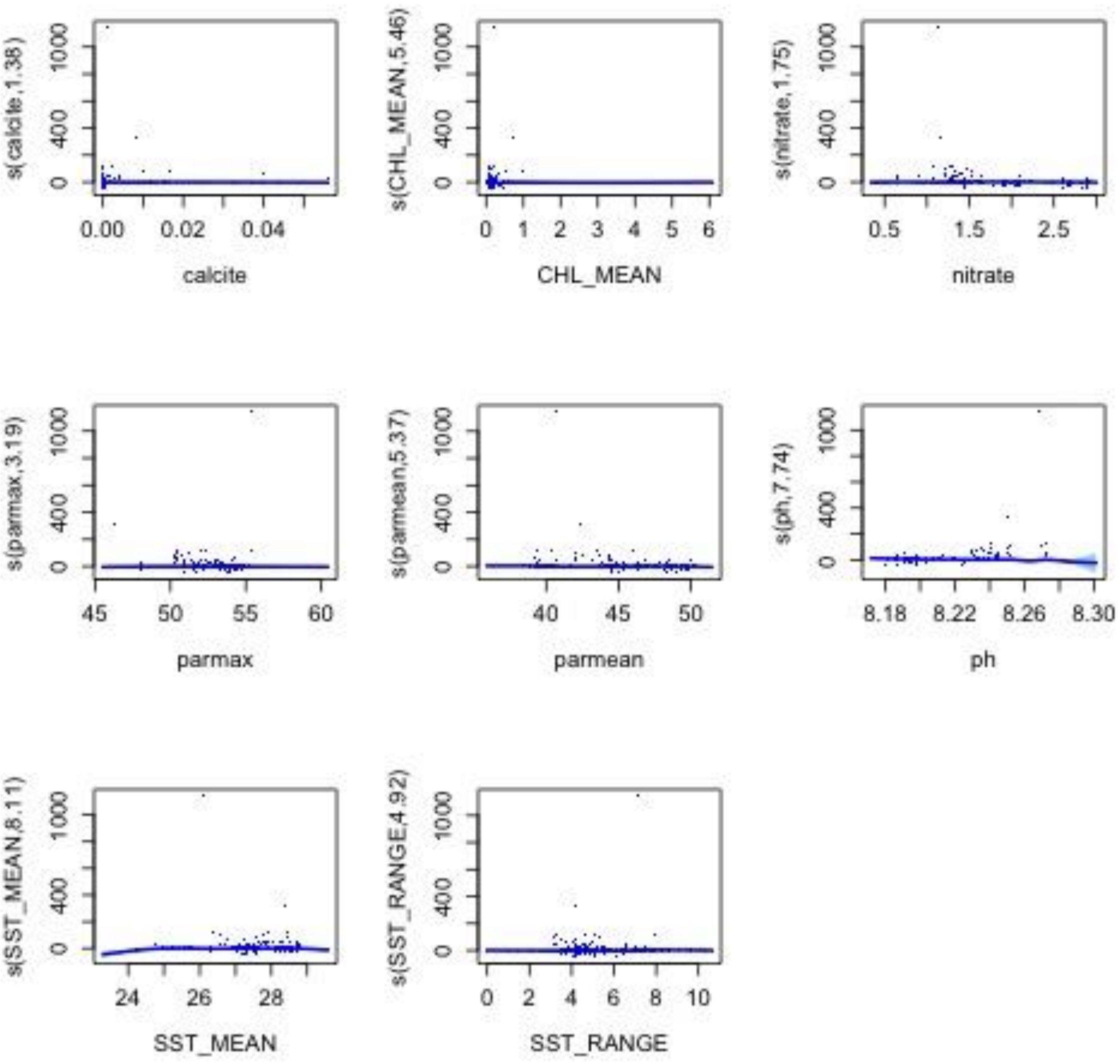
247Labroides pectoralis, n = 112 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.215483	9	26.250818	1.225204e-05
s(CHL_MEAN)	1.291226	9	8.449685	2.771148e-03
s(nitrate)	6.466952	9	75.183888	4.225110e-18
s(parmax)	2.537260	9	26.672499	1.942859e-08
s(parmean)	1.621469	9	4.701952	2.255480e-02
s(ph)	5.263526	9	78.219951	3.422142e-20
s(SST_MEAN)	1.899076	9	8.476375	1.657798e-03
s(SST_RANGE)	1.839882	9	6.448270	1.405208e-02



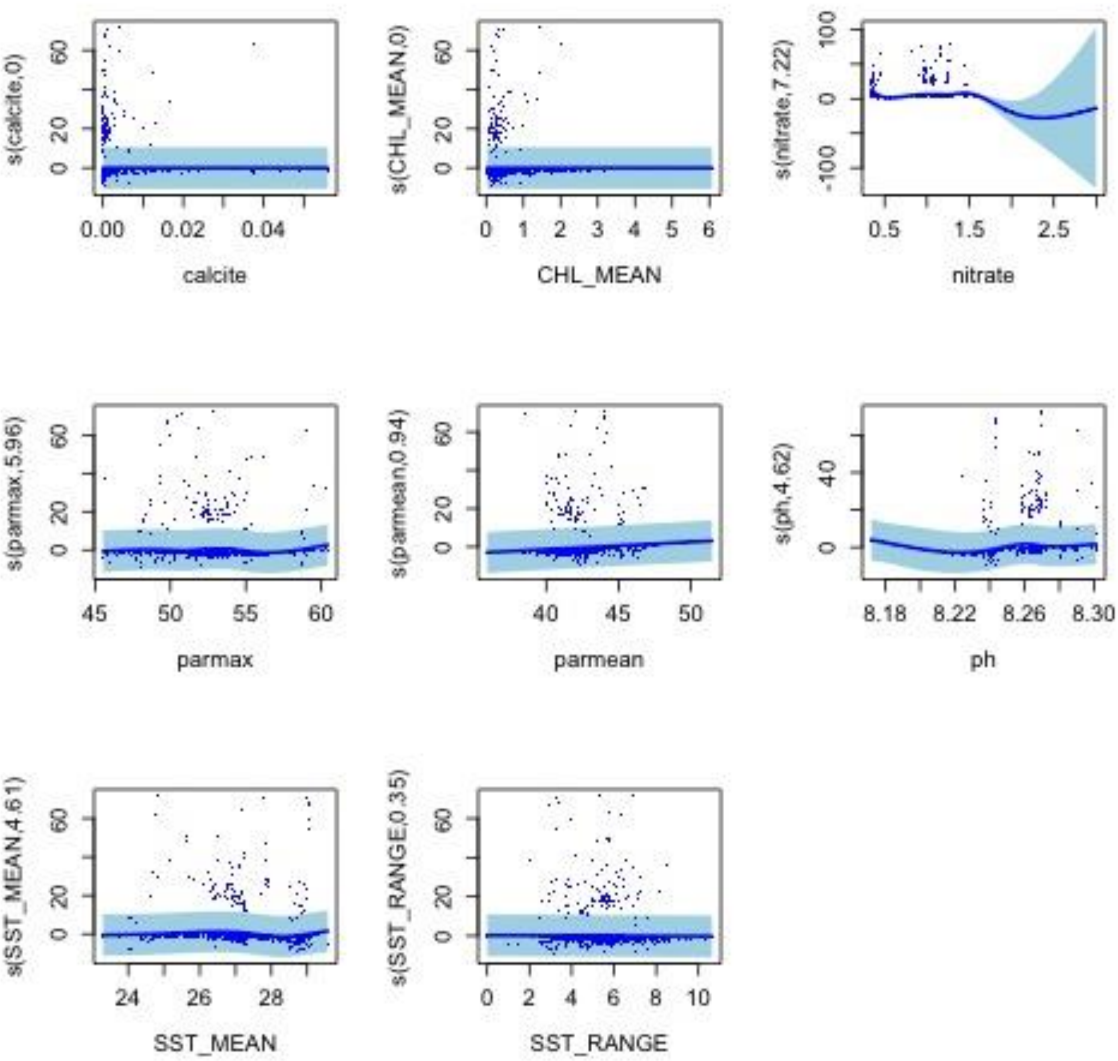
248Labroides rubrolabiatus, n = 1104 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.381547	9	6.340772	1.003830e-02
s(CHL_MEAN)	5.462583	9	66.921715	7.635345e-15
s(nitrate)	1.746324	9	6.731578	8.130605e-03
s(parmax)	3.191563	9	25.481208	2.211330e-07
s(parmean)	5.367689	9	73.743820	5.218945e-18
s(ph)	7.740859	9	109.953034	1.941045e-24
s(SST_MEAN)	8.106705	9	106.571182	4.616869e-23
s(SST_RANGE)	4.916964	9	32.758082	1.889130e-07



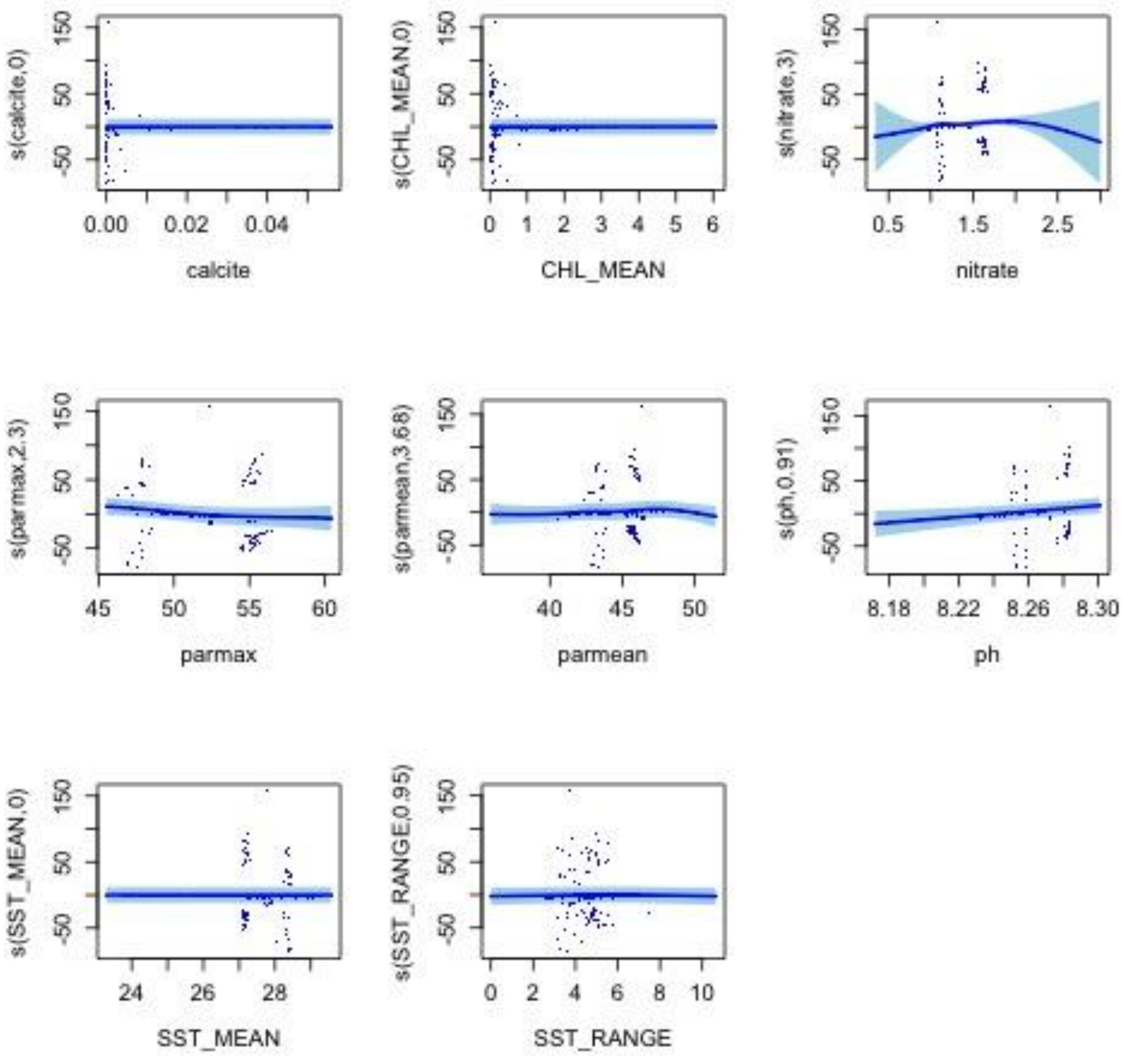
249Labropsis australis, n = 172 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.978450e-06	8	1.210635e-06	8.781556e-01
s(CHL_MEAN)	6.103249e-06	9	8.908837e-07	7.253109e-01
s(nitrate)	7.222123e+00	9	1.113303e+02	1.000314e-24
s(parmax)	5.956941e+00	9	3.125220e+01	2.125707e-06
s(parmean)	9.370626e-01	9	1.398207e+01	3.508206e-05
s(ph)	4.622972e+00	9	5.052010e+01	3.031099e-12
s(SST_MEAN)	4.608290e+00	9	2.632790e+01	4.656094e-06
s(SST_RANGE)	3.537317e-01	9	5.085839e-01	2.205437e-01



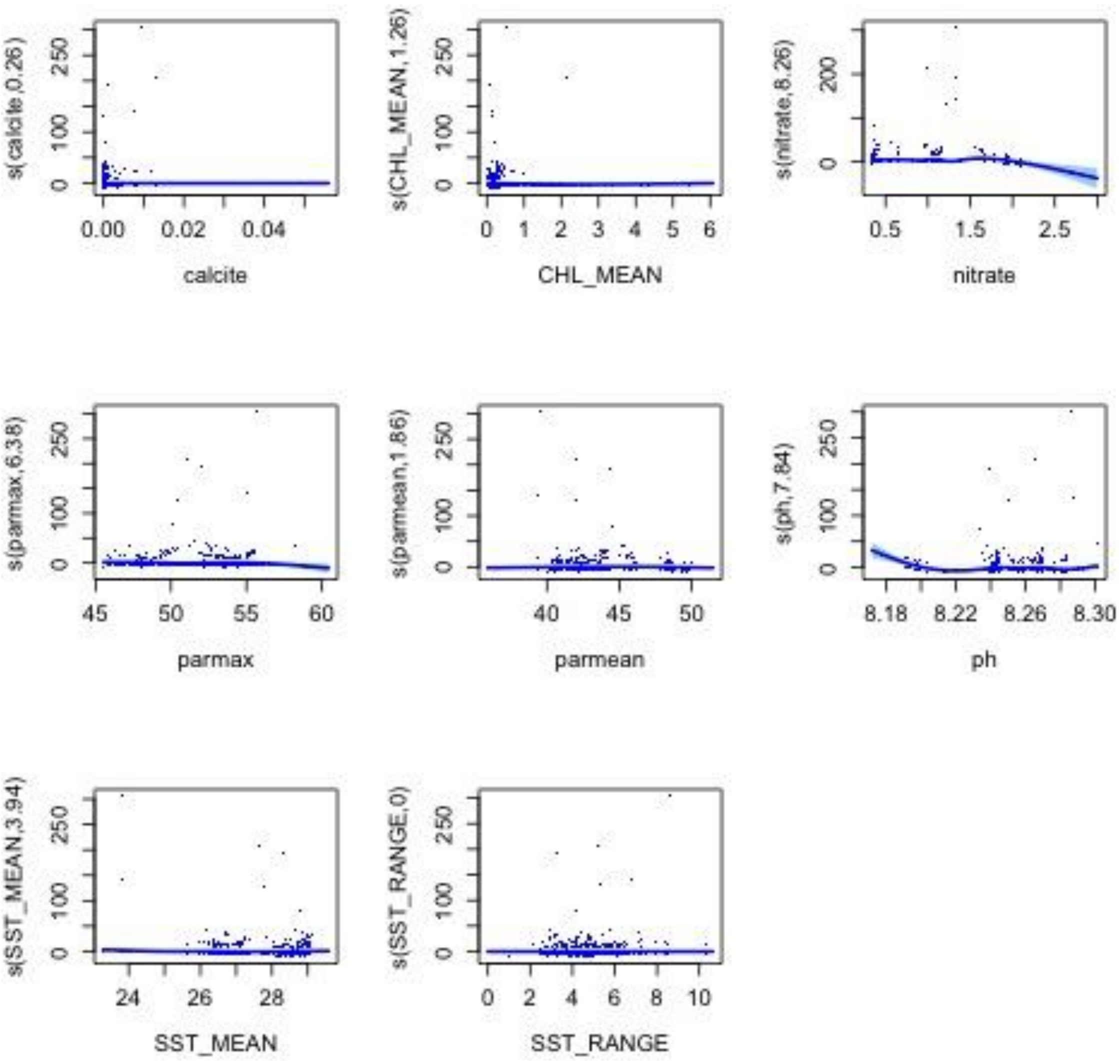
250Labropsis micronesica, n = 46 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.962696e-06	9	2.818795e-06	3.738149e-01
s(CHL_MEAN)	2.260042e-06	9	1.490964e-07	8.407427e-01
s(nitrate)	3.002705e+00	9	1.187792e+01	1.448600e-03
s(parmax)	2.304844e+00	9	2.411894e+01	1.036616e-07
s(parmean)	3.682782e+00	9	9.968024e+00	1.031221e-02
s(ph)	9.057045e-01	9	6.990915e+00	1.906539e-04
s(SST_MEAN)	3.783212e-06	9	9.575818e-07	6.699503e-01
s(SST_RANGE)	9.491934e-01	9	1.434744e+00	1.863319e-01



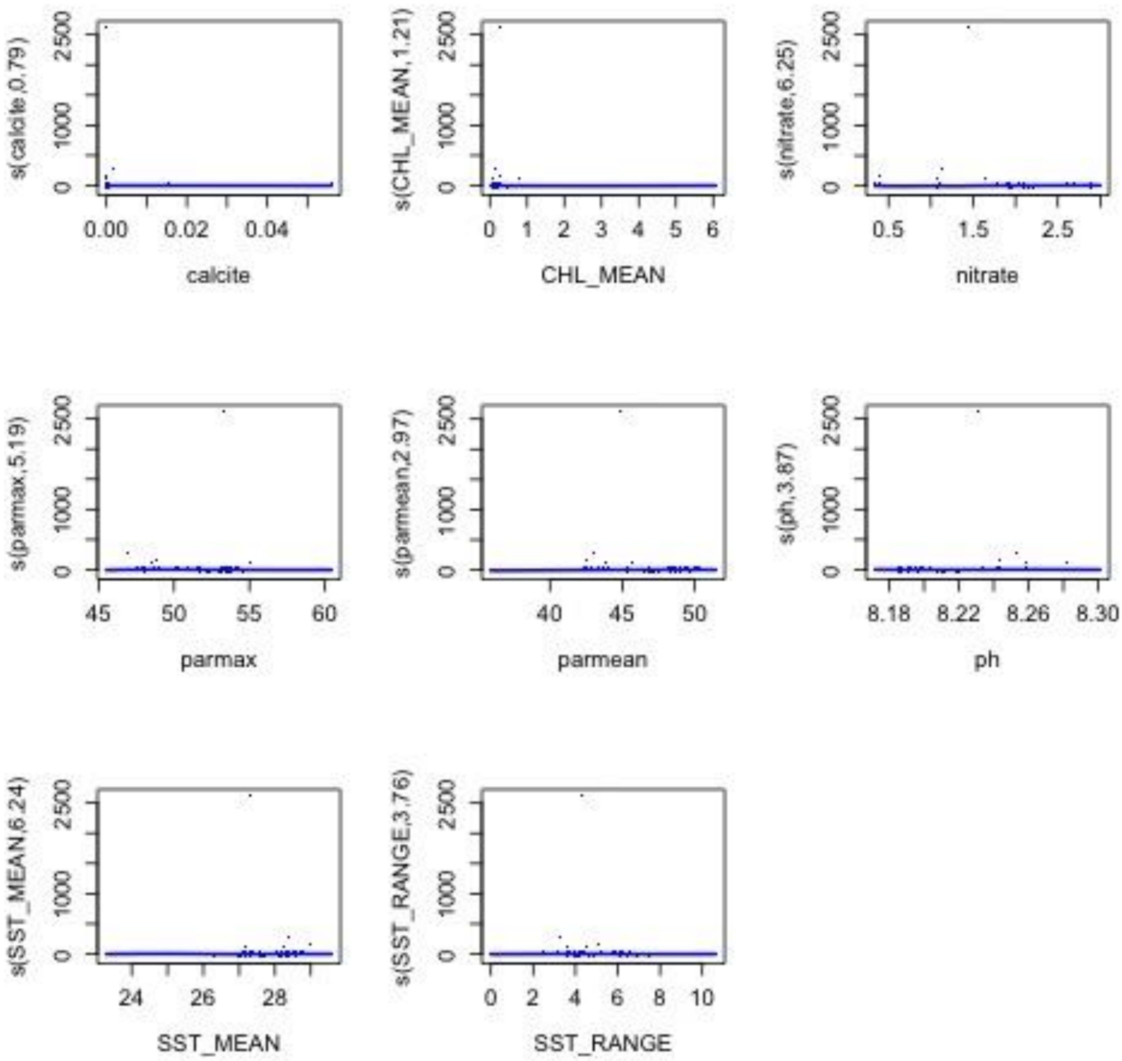
251Labropsis xanthonota, n = 529 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.2625662998	9	3.241237e-01	2.523105e-01
s(CHL_MEAN)	1.2636417279	9	1.278476e+01	1.316695e-04
s(nitrate)	8.2621216865	9	1.260560e+02	3.015796e-28
s(parmax)	6.3773148959	9	4.509844e+01	2.498352e-09
s(parmean)	1.8643607083	9	5.023920e+00	2.635748e-02
s(ph)	7.8362153668	9	4.642442e+01	2.709911e-09
s(SST_MEAN)	3.9418504491	9	1.186109e+01	4.278674e-03
s(SST_RANGE)	0.0001959872	9	1.522034e-04	4.198756e-01



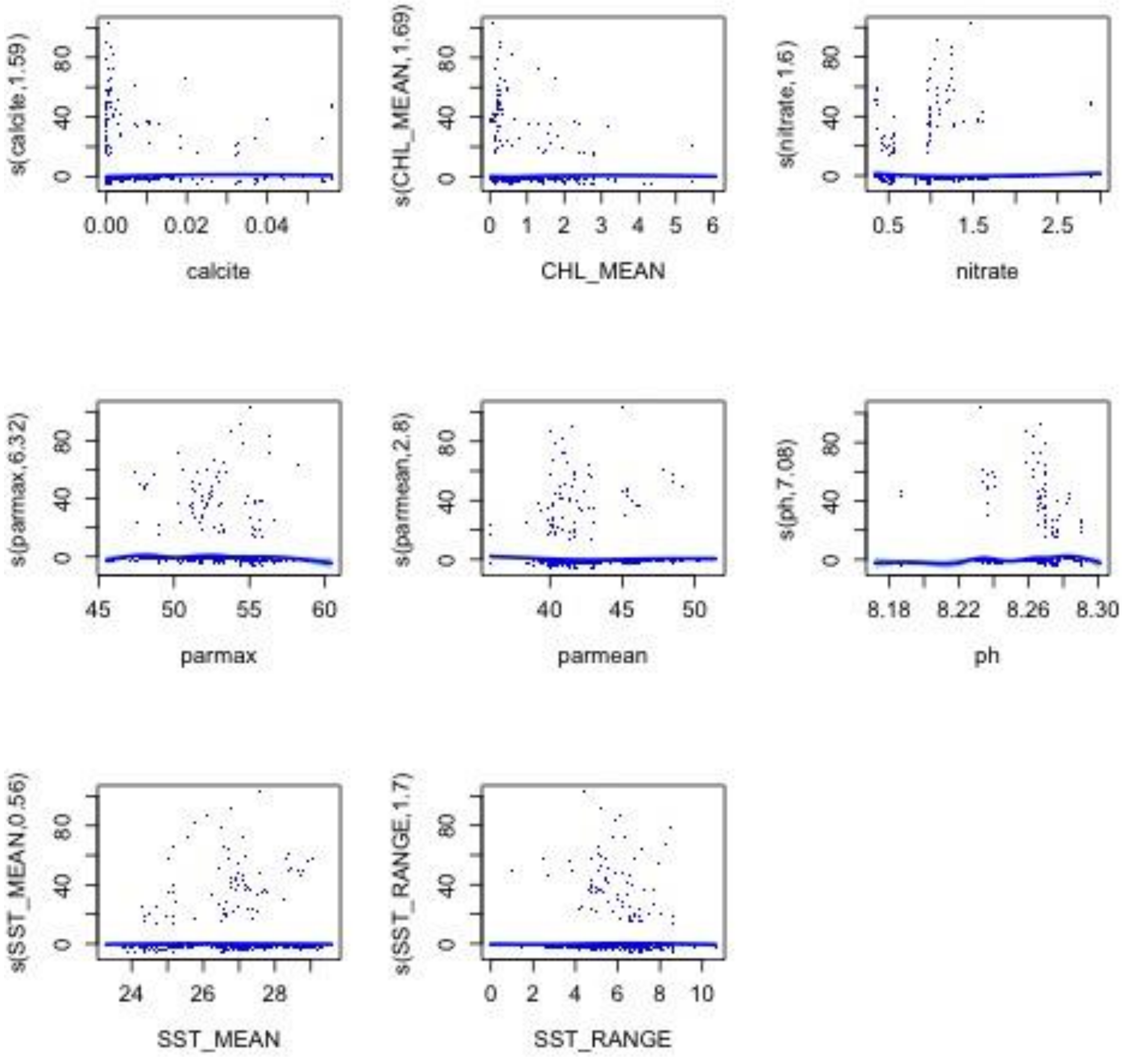
252Lepidozygus tapeinosoma, n = 356 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7853022	5	3.419055	2.819025e-02
s(CHL_MEAN)	1.2117843	9	10.374101	6.522083e-04
s(nitrate)	6.2527664	9	52.939829	9.590545e-13
s(parmax)	5.1889010	9	28.757694	6.973260e-07
s(parmean)	2.9731340	9	21.941377	1.562642e-06
s(ph)	3.8711042	9	16.260159	1.496134e-04
s(SST_MEAN)	6.2427814	9	27.634966	6.535906e-06
s(SST_RANGE)	3.7624674	9	13.782960	1.262405e-03



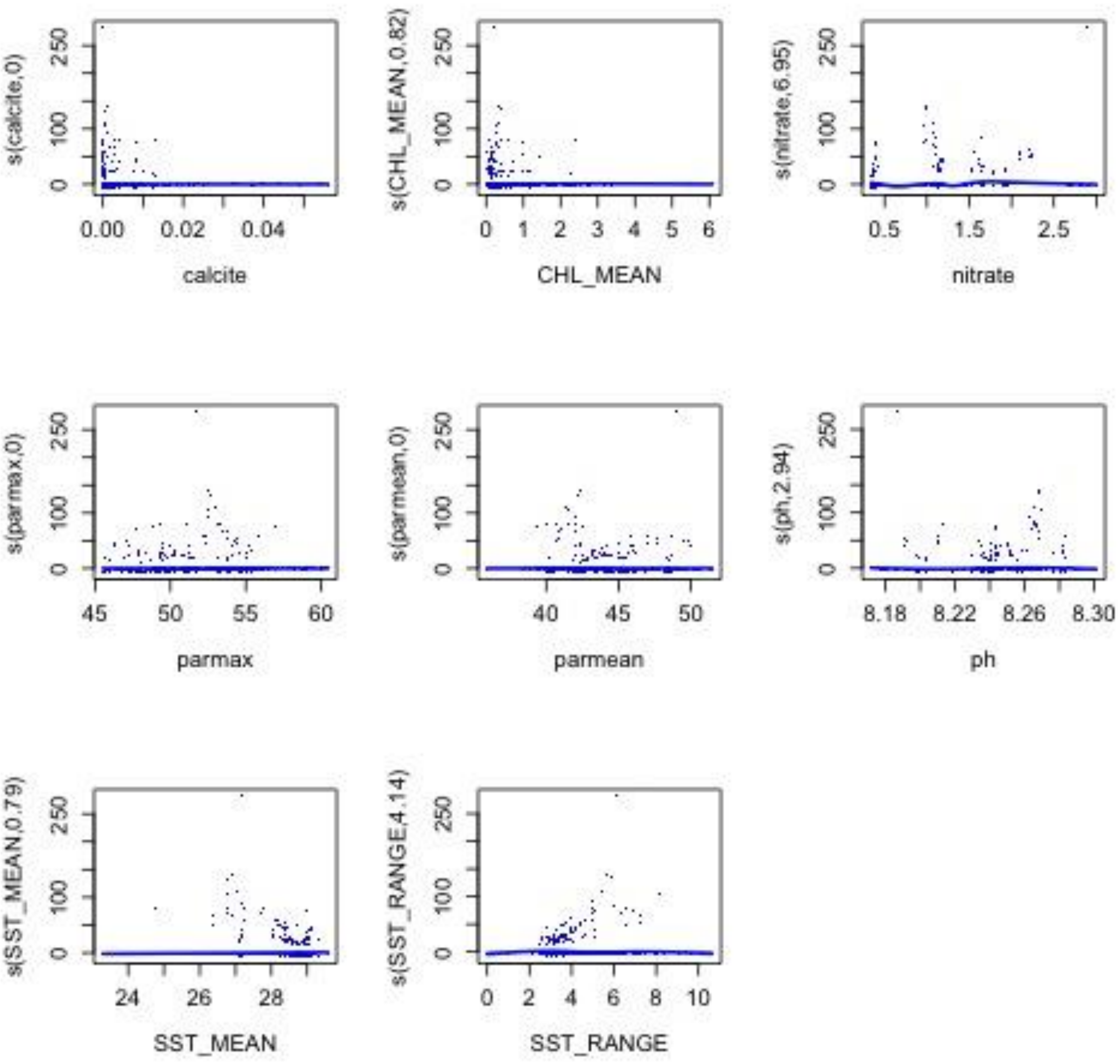
253Lethrinus atkinsoni, n = 103 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.5863366	9	9.7704453	1.322799e-03
s(CHL_MEAN)	1.6884988	9	6.3613851	1.597013e-02
s(nitrate)	1.5965680	9	12.1876320	1.390187e-04
s(parmax)	6.3225193	9	23.8317834	1.076839e-04
s(parmean)	2.7986015	9	14.3259857	1.614472e-04
s(ph)	7.0845974	9	35.0140542	2.151590e-07
s(SST_MEAN)	0.5609015	9	0.7263003	2.199732e-01
s(SST_RANGE)	1.6983550	9	3.6964267	7.952366e-02



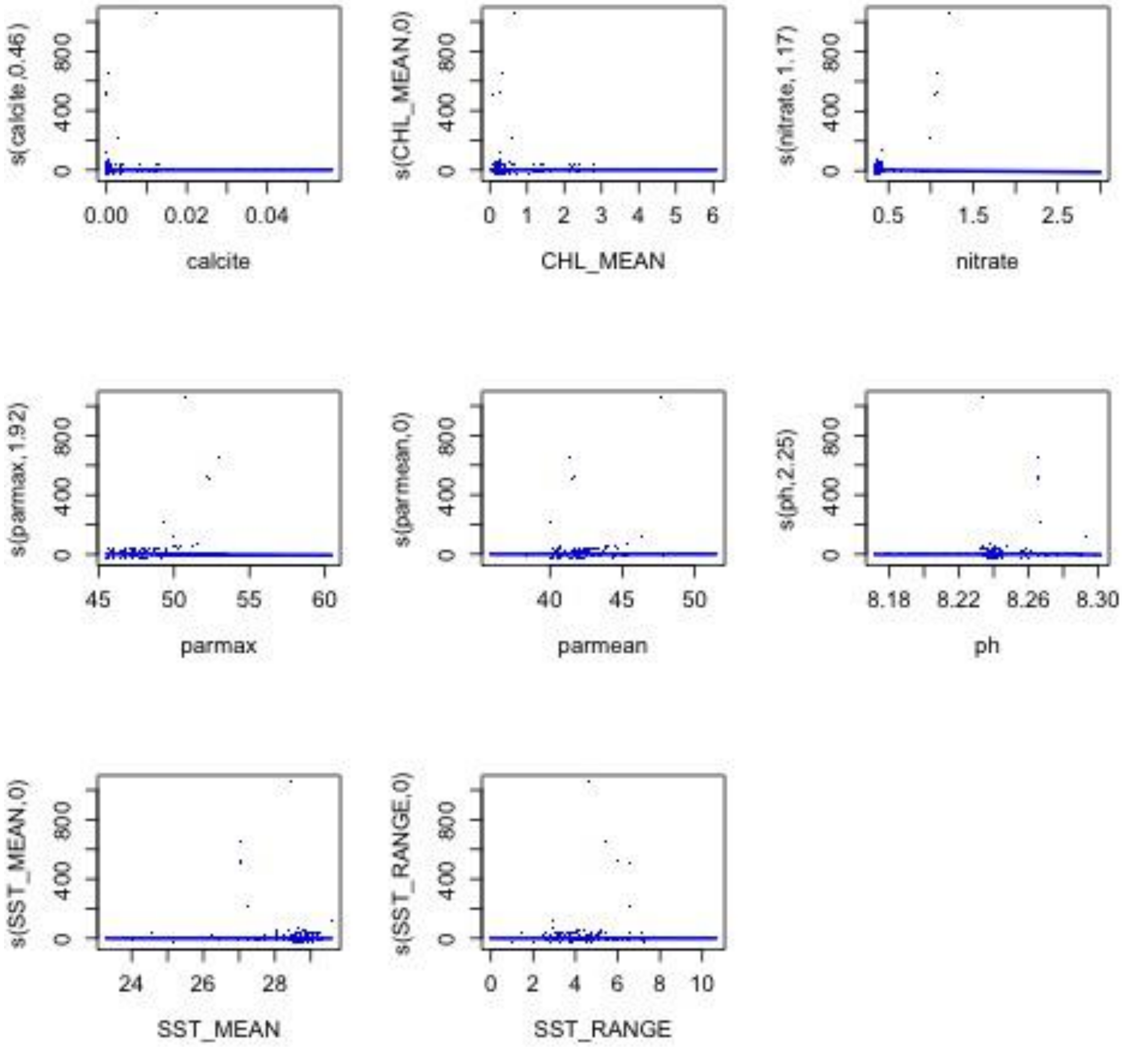
254Lethrinus erythracanthus, n = 94 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.387146e-05	8	7.731383e-06	6.244049e-01
s(CHL_MEAN)	8.172698e-01	9	2.875499e+00	4.923534e-02
s(nitrate)	6.950390e+00	9	8.708308e+01	7.775683e-20
s(parmax)	1.681622e-05	9	5.186148e-06	6.657099e-01
s(parmean)	1.462309e-05	9	6.111171e-06	6.561324e-01
s(ph)	2.938171e+00	9	8.423192e+00	1.301311e-02
s(SST_MEAN)	7.948477e-01	9	3.341394e+00	2.996491e-02
s(SST_RANGE)	4.142441e+00	9	2.855559e+01	1.104302e-06



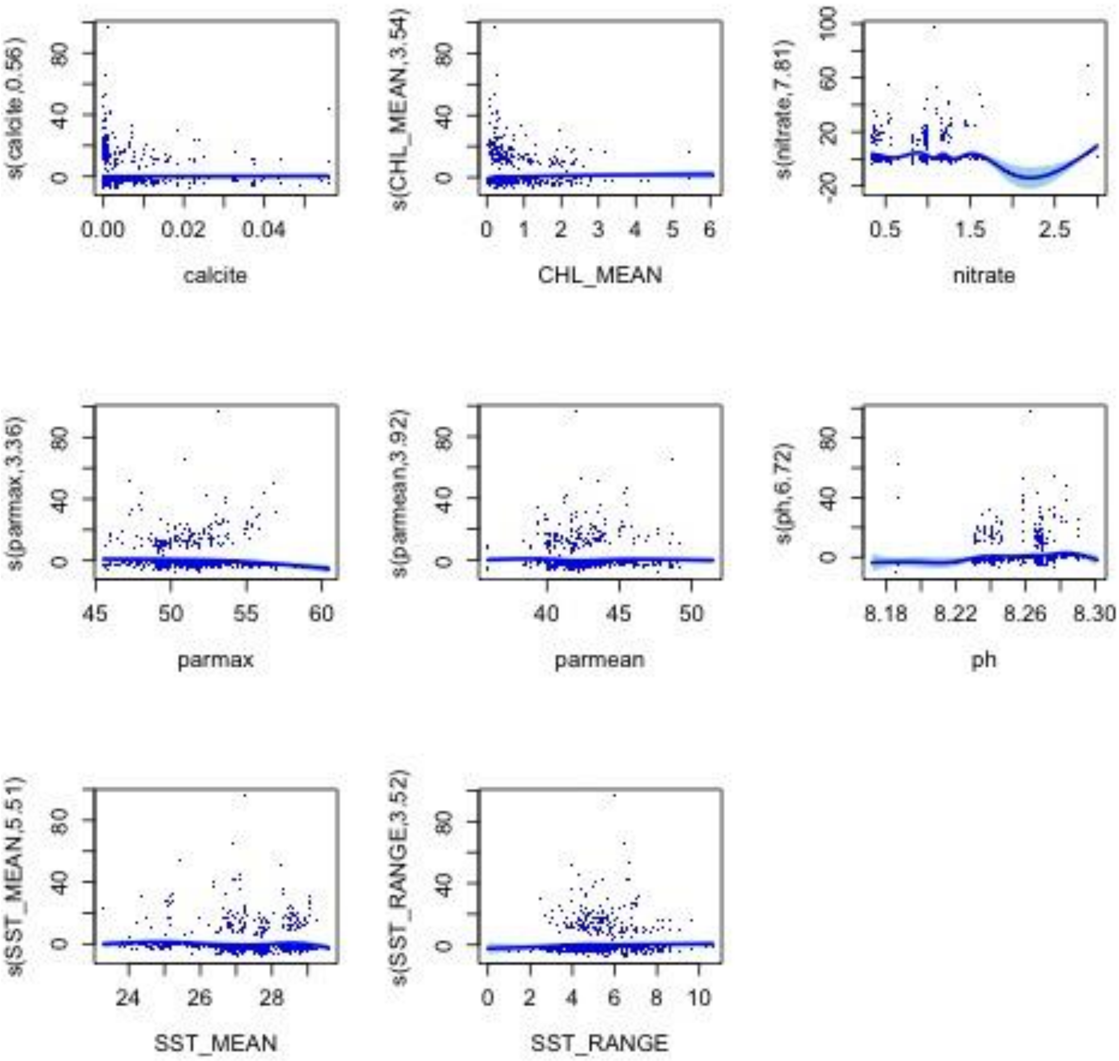
255Lethrinus erythropterus, n = 58 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.629355e-01	9	7.244183e-01	2.030063e-01
s(CHL_MEAN)	6.201742e-05	9	1.731852e-05	5.880595e-01
s(nitrate)	1.165303e+00	9	5.930622e+01	7.137248e-16
s(parmax)	1.918612e+00	9	2.057210e+01	3.932386e-06
s(parmean)	5.001296e-05	9	1.342458e-05	7.449408e-01
s(ph)	2.247342e+00	9	7.788226e+00	1.405279e-02
s(SST_MEAN)	4.485519e-05	9	1.133721e-05	7.719510e-01
s(SST_RANGE)	5.575483e-05	9	8.747838e-06	9.595892e-01



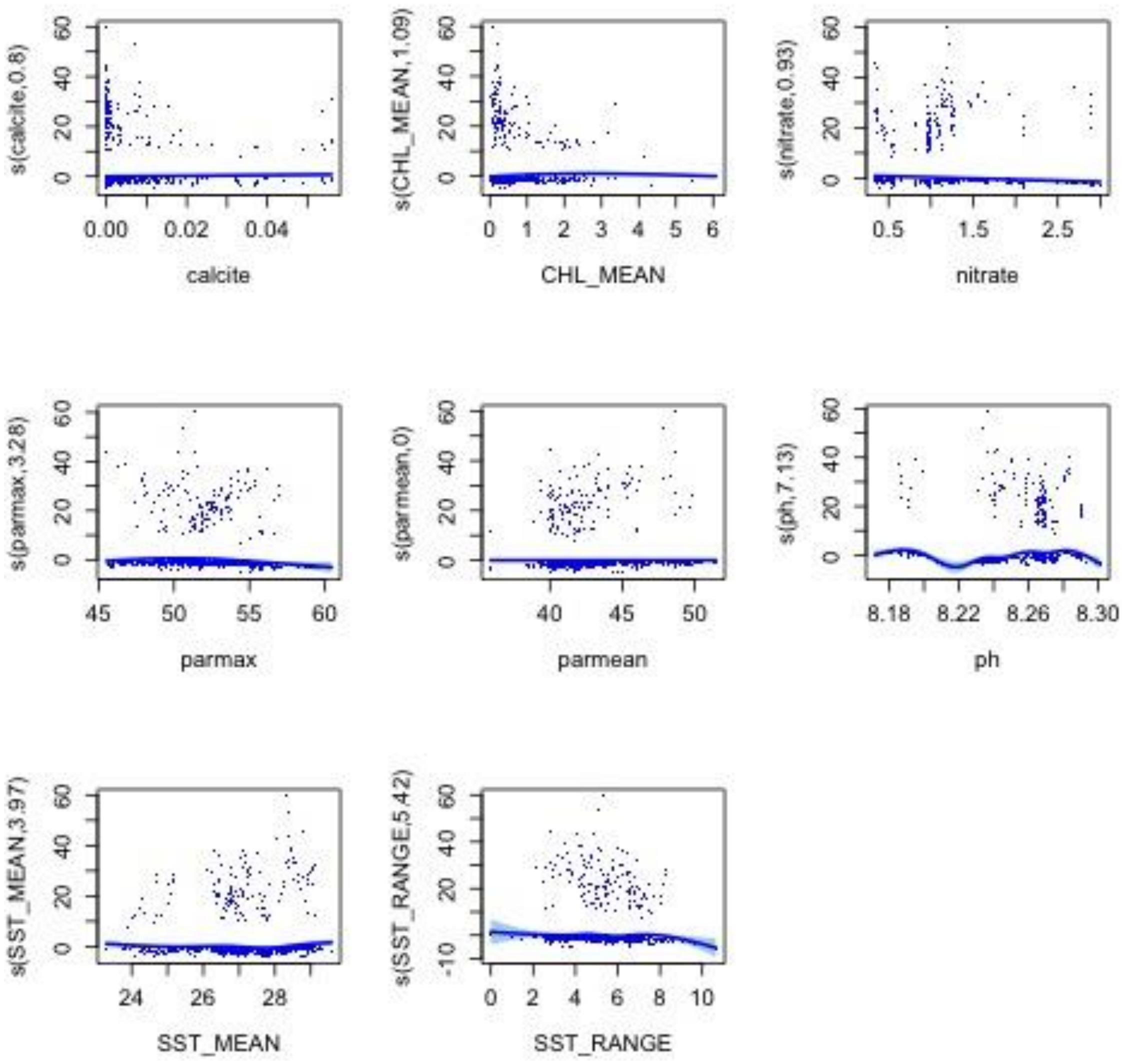
256Lethrinus harak, n = 254 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.555898	7	1.222136	1.281639e-01
s(CHL_MEAN)	3.537009	9	21.830974	2.658644e-05
s(nitrate)	7.809601	9	100.114301	8.922716e-21
s(parmax)	3.357302	9	32.180482	1.721610e-08
s(parmean)	3.917083	9	17.234799	3.256644e-04
s(ph)	6.718732	9	38.877462	5.996173e-08
s(SST_MEAN)	5.507638	9	27.011526	9.410685e-06
s(SST_RANGE)	3.523602	9	11.007095	8.395080e-03



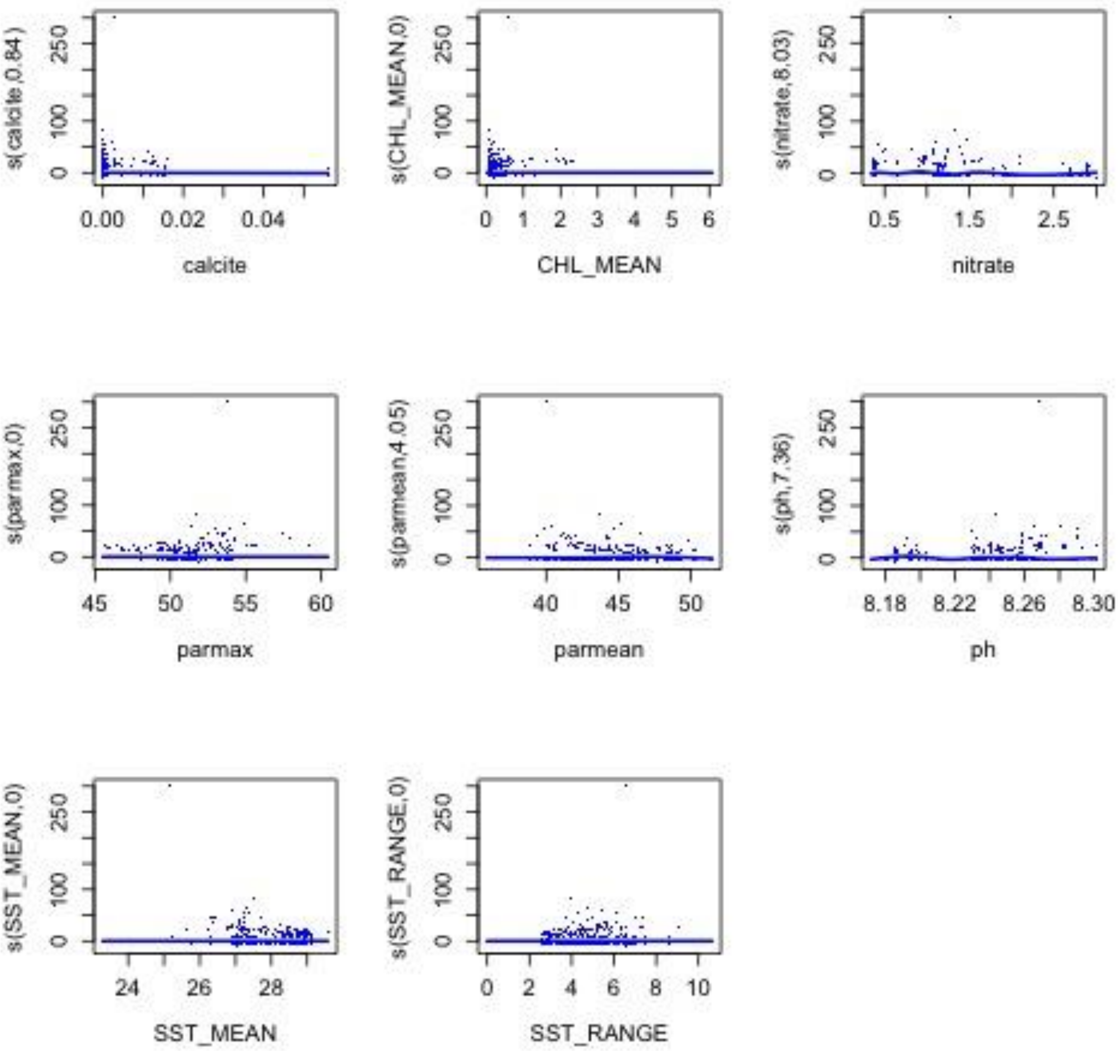
257Lethrinus obsoletus, n = 208 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8035828808	8	4.108426435	2.223720e-02
s(CHL_MEAN)	1.0894450180	9	11.159124142	3.574711e-04
s(nitrate)	0.9276875689	9	11.921576139	1.640176e-04
s(parmax)	3.2757034162	9	27.845870718	3.091769e-07
s(parmean)	0.0003510594	9	0.000216304	5.419227e-01
s(ph)	7.1295612180	9	56.197928469	5.597106e-11
s(SST_MEAN)	3.9735851739	9	18.247240874	2.590390e-04
s(SST_RANGE)	5.4240729090	9	16.232804975	3.946918e-03



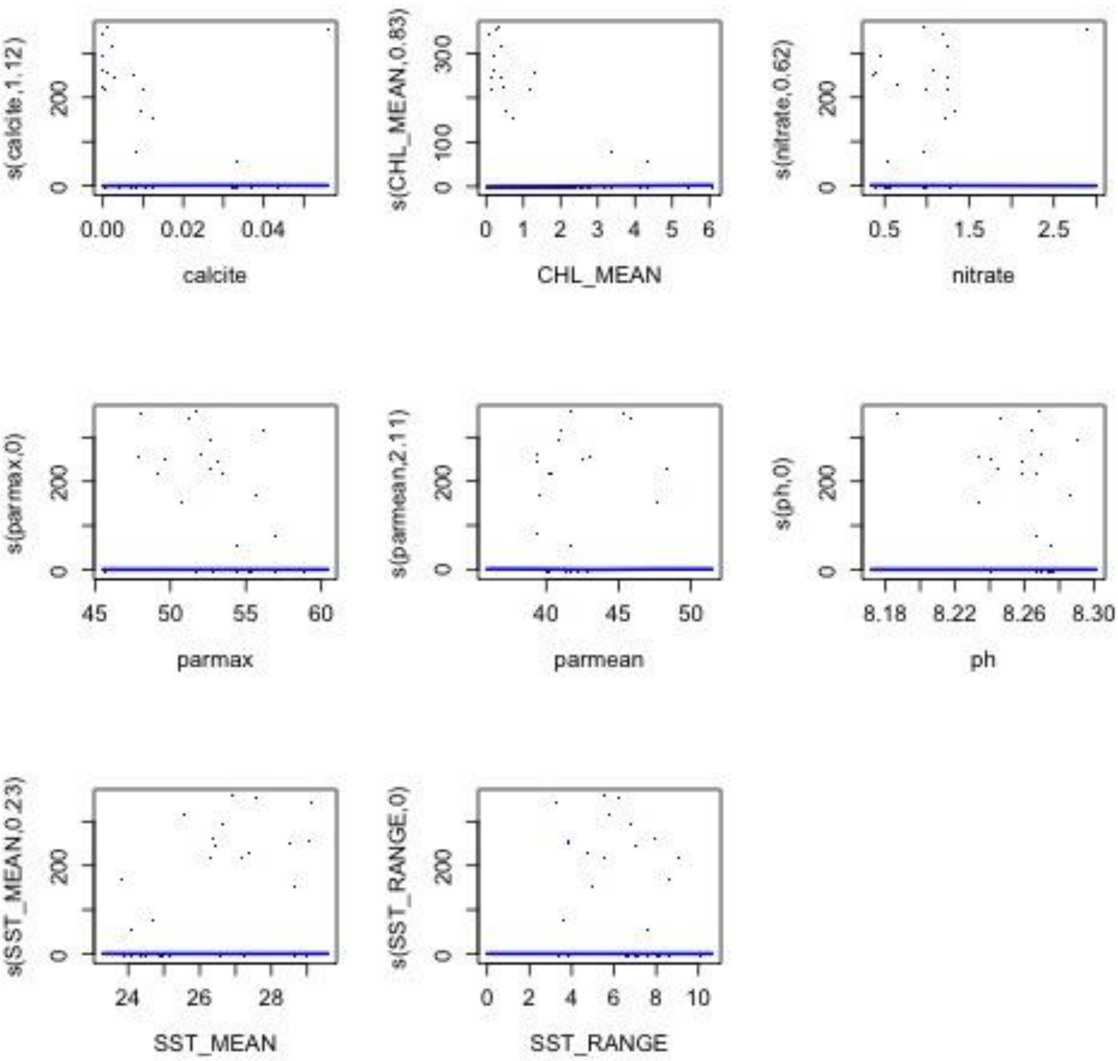
258Lethrinus olivaceus, n = 241 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.408459e-01	7	4.938625e+00	1.465767e-02
s(CHL_MEAN)	5.237079e-05	9	1.492128e-06	1.000000e+00
s(nitrate)	8.026936e+00	9	1.322046e+02	8.975061e-27
s(parmax)	1.883926e-04	9	1.464491e-04	3.719566e-01
s(parmean)	4.050822e+00	9	4.999102e+01	5.088606e-12
s(ph)	7.359808e+00	9	9.736920e+01	2.175556e-20
s(SST_MEAN)	2.262761e-03	9	2.032783e-03	3.499929e-01
s(SST_RANGE)	6.312340e-05	9	1.003516e-05	9.470707e-01



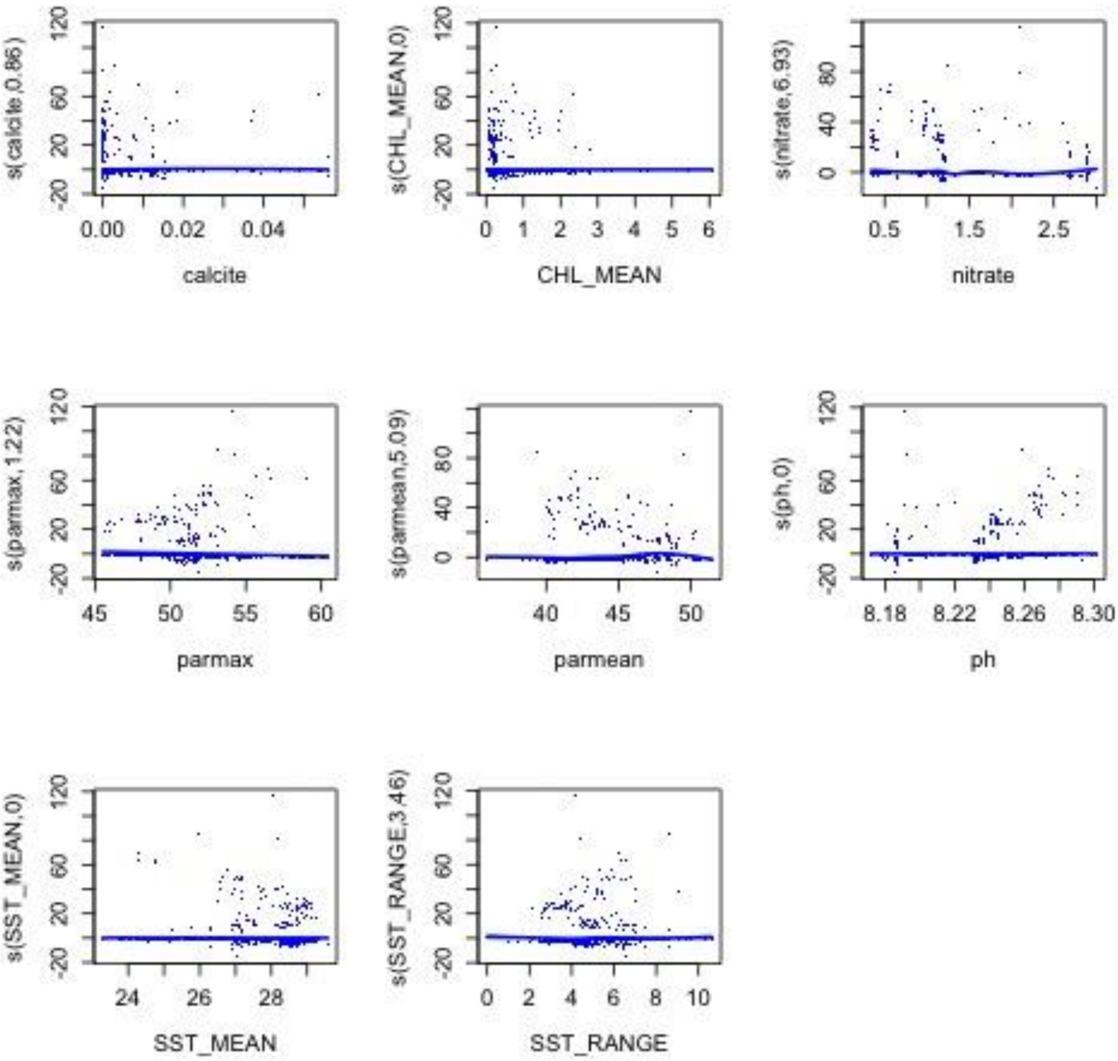
259Lethrinus sp, n = 65 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.119186e+00	9	3.714214e+00	0.030988082
s(CHL_MEAN)	8.332961e-01	7	5.300997e+00	0.006444939
s(nitrate)	6.229272e-01	6	1.478167e+00	0.113010756
s(parmax)	2.086669e-06	9	4.315266e-07	0.880374951
s(parmean)	2.107090e+00	9	4.706595e+00	0.069125610
s(ph)	1.800195e-06	9	2.588355e-07	0.950873749
s(SST_MEAN)	2.288909e-01	9	2.658290e-01	0.269693392
s(SST_RANGE)	8.493226e-05	9	6.953650e-05	0.412506791



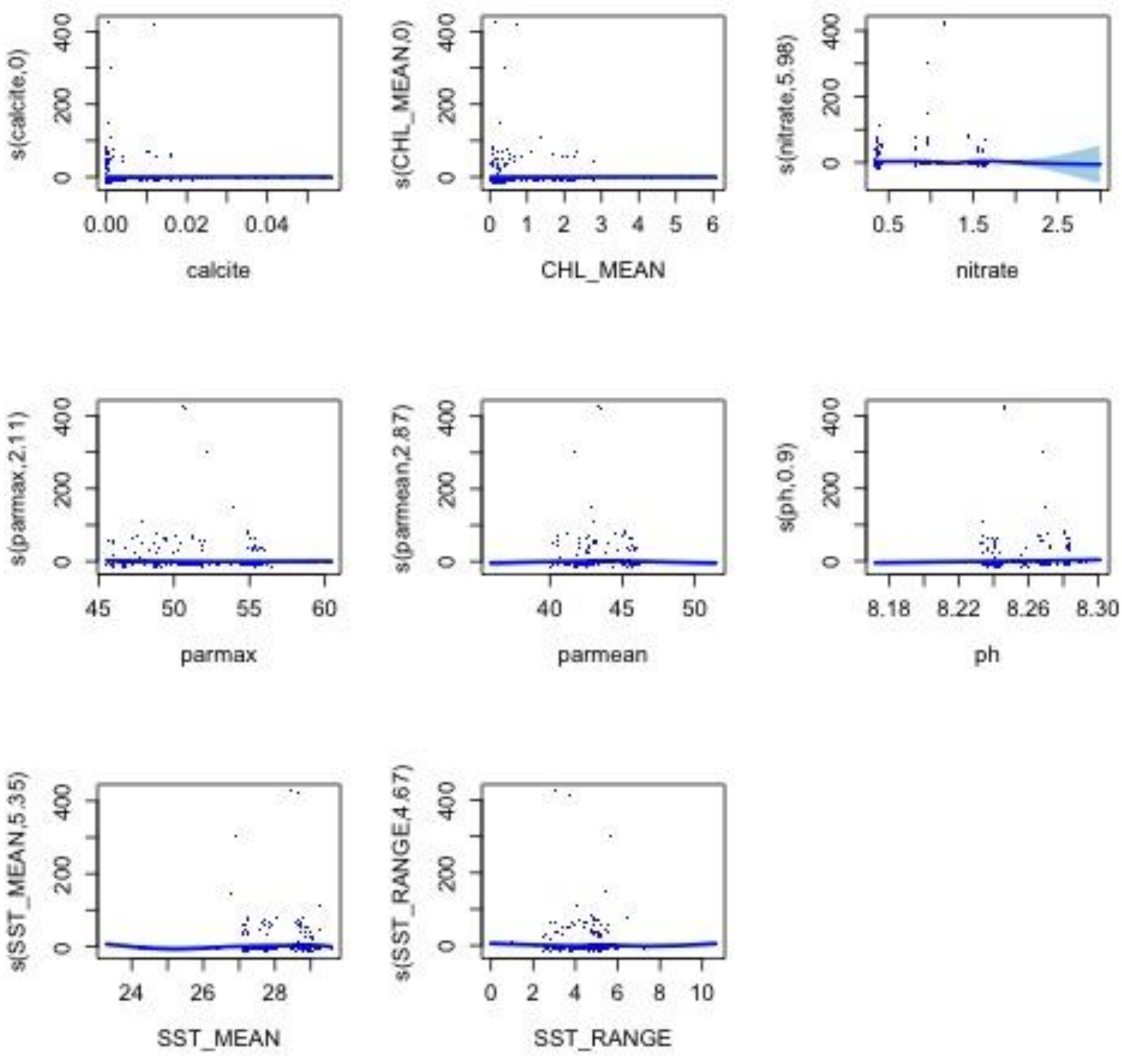
260Lethrinus xanthochilus, n = 195 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.644850e-01	9	4.196887e+00	2.052110e-02
s(CHL_MEAN)	7.392613e-05	9	4.596779e-06	9.082192e-01
s(nitrate)	6.931996e+00	9	6.910995e+01	9.563494e-14
s(parmax)	1.217291e+00	9	3.264921e+01	2.693071e-09
s(parmean)	5.089218e+00	9	1.298868e+02	9.654524e-31
s(ph)	3.476303e-04	9	5.233851e-04	1.878624e-01
s(SST_MEAN)	6.782828e-05	9	2.065385e-05	6.317651e-01
s(SST_RANGE)	3.464726e+00	9	1.071596e+01	1.029355e-02



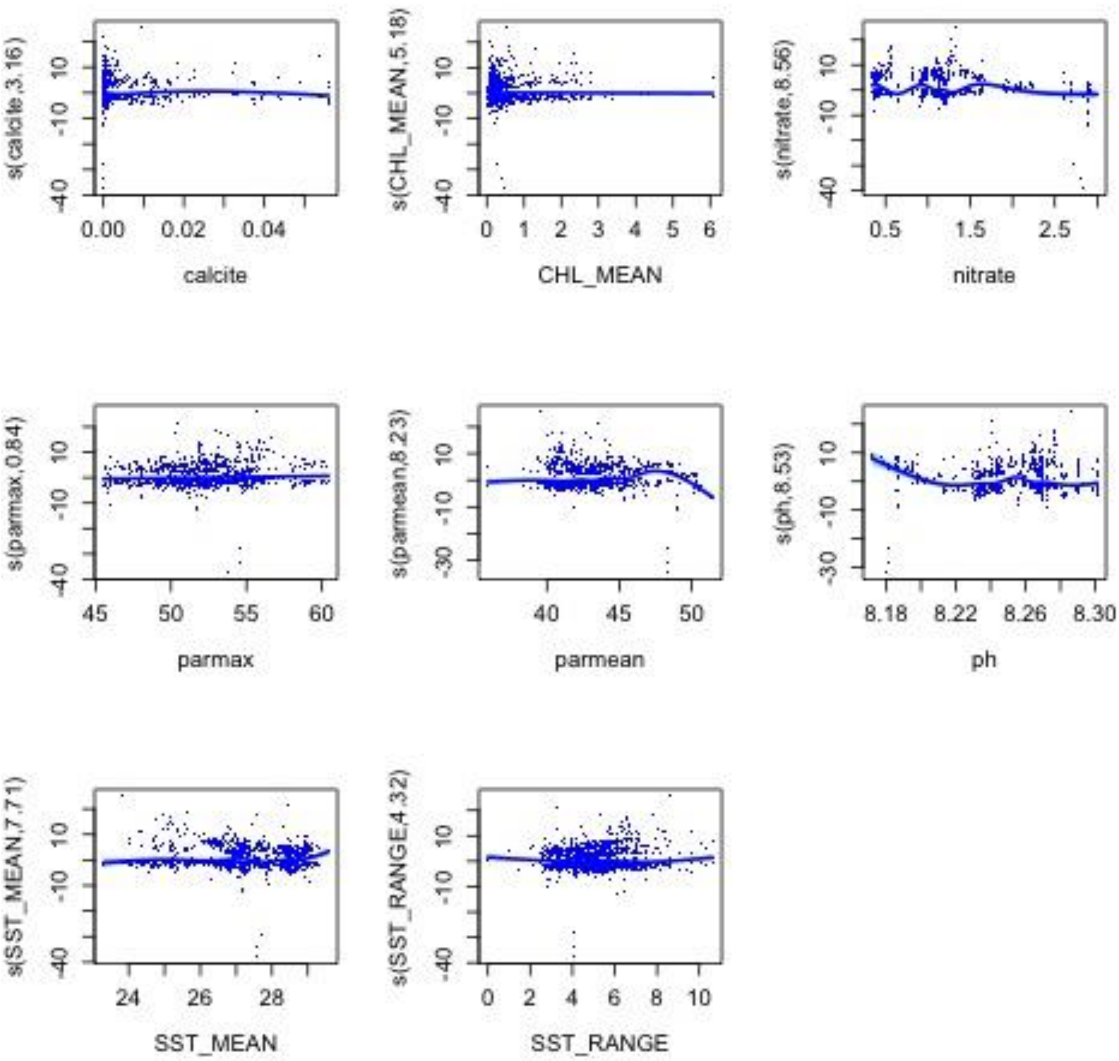
261Lutjanus biguttatus, n = 54 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.959676e-05	8	4.252654e-05	3.929918e-01
s(CHL_MEAN)	1.487127e-05	9	7.798441e-07	8.625926e-01
s(nitrate)	5.977730e+00	9	3.880345e+01	1.956325e-08
s(parmax)	2.109487e+00	9	9.828319e+00	9.686907e-04
s(parmean)	2.870258e+00	9	1.131810e+01	1.448170e-03
s(ph)	9.006302e-01	9	7.162355e+00	2.586358e-03
s(SST_MEAN)	5.354362e+00	9	1.844457e+01	5.328873e-04
s(SST_RANGE)	4.666742e+00	9	2.265362e+01	5.499410e-05



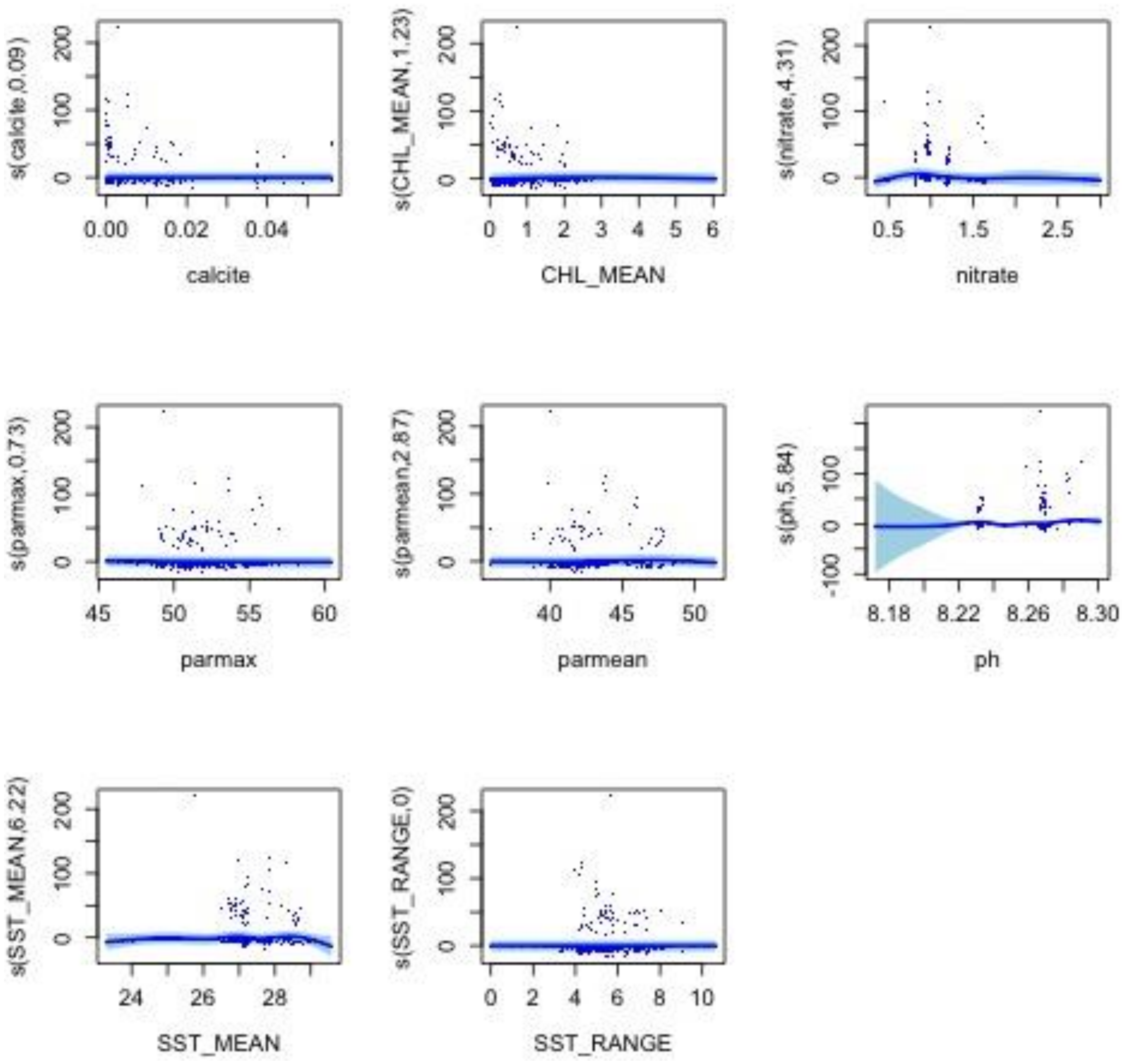
262Lutjanus bohar, n = 1807 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.1644308	9	26.923030	2.699983e-06
s(CHL_MEAN)	5.1791915	9	30.466825	4.309736e-06
s(nitrate)	8.5571018	9	260.807010	1.871367e-56
s(parmax)	0.8398271	9	5.088012	1.155354e-02
s(parmean)	8.2267054	9	278.740955	4.480187e-61
s(ph)	8.5250812	9	149.553973	5.499554e-31
s(SST_MEAN)	7.7063979	9	63.348374	2.544979e-12
s(SST_RANGE)	4.3215777	9	19.422214	2.808666e-04



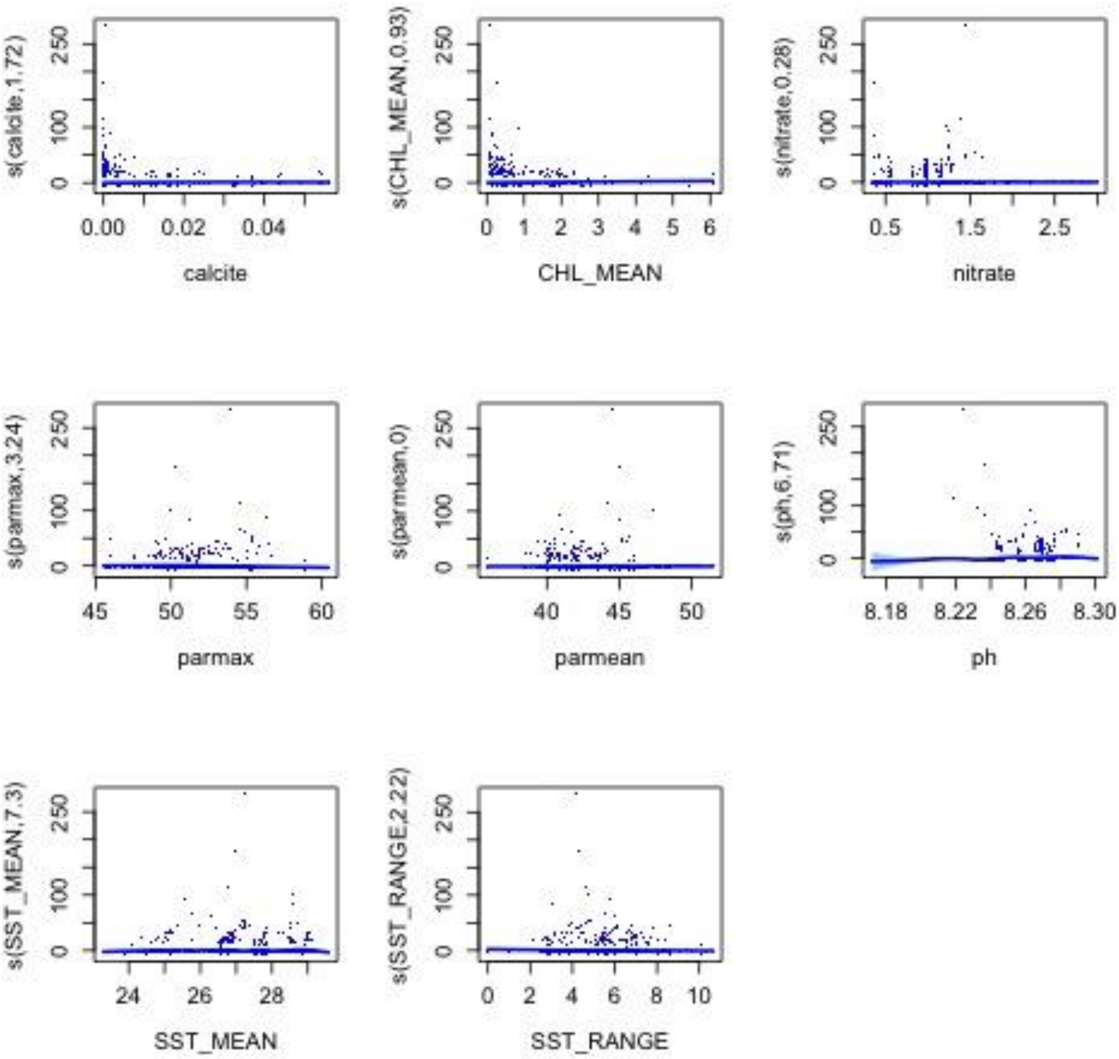
263Lutjanus ehrenbergii, n = 71 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.872063e-02	7	8.651799e-02	3.136729e-01
s(CHL_MEAN)	1.226575e+00	9	1.599699e+01	1.277251e-05
s(nitrate)	4.307594e+00	9	2.129887e+01	2.281528e-05
s(parmax)	7.326086e-01	9	1.653838e+00	1.054306e-01
s(parmean)	2.871575e+00	9	6.981916e+00	2.908796e-02
s(ph)	5.835988e+00	9	1.684860e+01	1.797763e-03
s(SST_MEAN)	6.217138e+00	9	3.293272e+01	1.105213e-06
s(SST_RANGE)	6.183111e-05	9	3.488135e-05	5.163130e-01



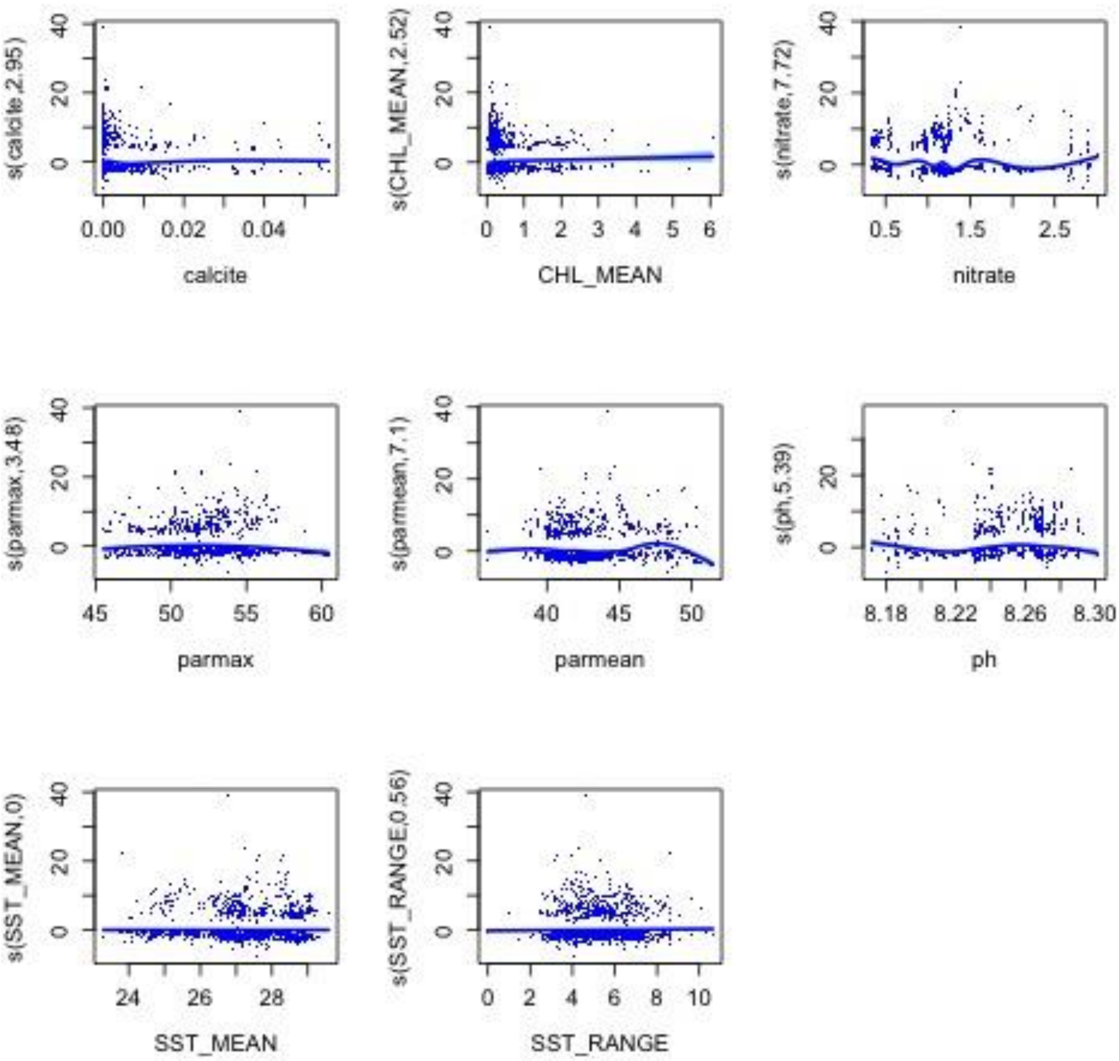
264Lutjanus fulviflamma, n = 162 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.7241633906	9	1.671392e+01	2.574586e-05
s(CHL_MEAN)	0.9349528546	7	1.353360e+01	7.789429e-05
s(nitrate)	0.2836082606	9	3.686769e-01	2.350764e-01
s(parmax)	3.2386497441	9	2.943759e+01	9.364733e-08
s(parmean)	0.0004698032	9	2.114355e-04	6.387228e-01
s(ph)	6.7144123562	9	7.227166e+01	1.477167e-15
s(SST_MEAN)	7.2984507871	9	4.030158e+01	1.769183e-07
s(SST_RANGE)	2.2231492865	9	5.307218e+00	5.413746e-02



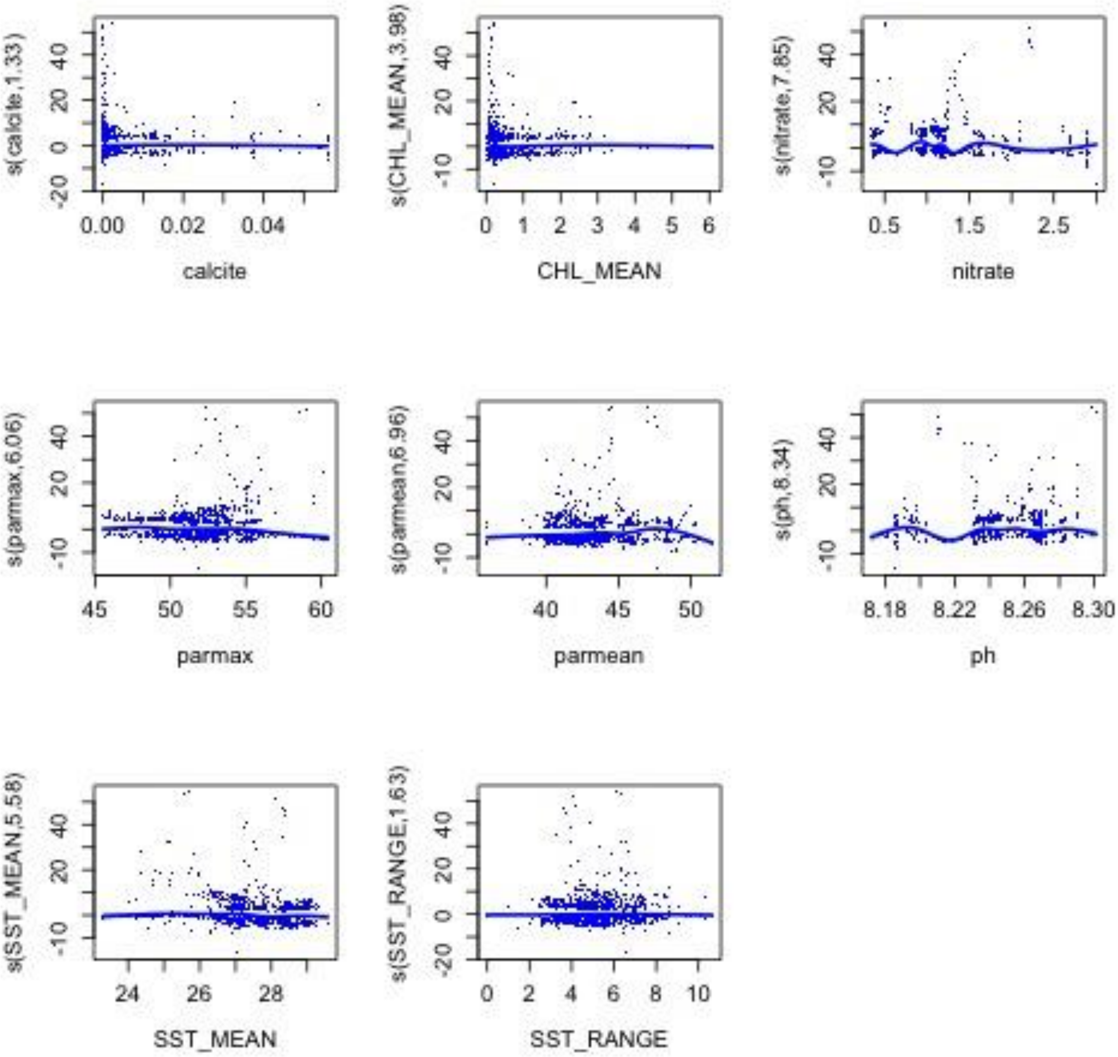
265Lutjanus fulvus, n = 779 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.9474887502	9	1.334225e+01	1.825342e-03
s(CHL_MEAN)	2.5209595506	9	1.533826e+01	2.957269e-04
s(nitrate)	7.7231051418	9	1.505398e+02	7.667629e-33
s(parmax)	3.4840304650	9	2.500853e+01	1.364305e-06
s(parmean)	7.1007565087	9	1.380343e+02	5.967402e-31
s(ph)	5.3874239086	9	3.169924e+01	3.684761e-07
s(SST_MEAN)	0.0001888231	9	4.394751e-05	8.328491e-01
s(SST_RANGE)	0.5568992393	9	1.270125e+00	1.192535e-01



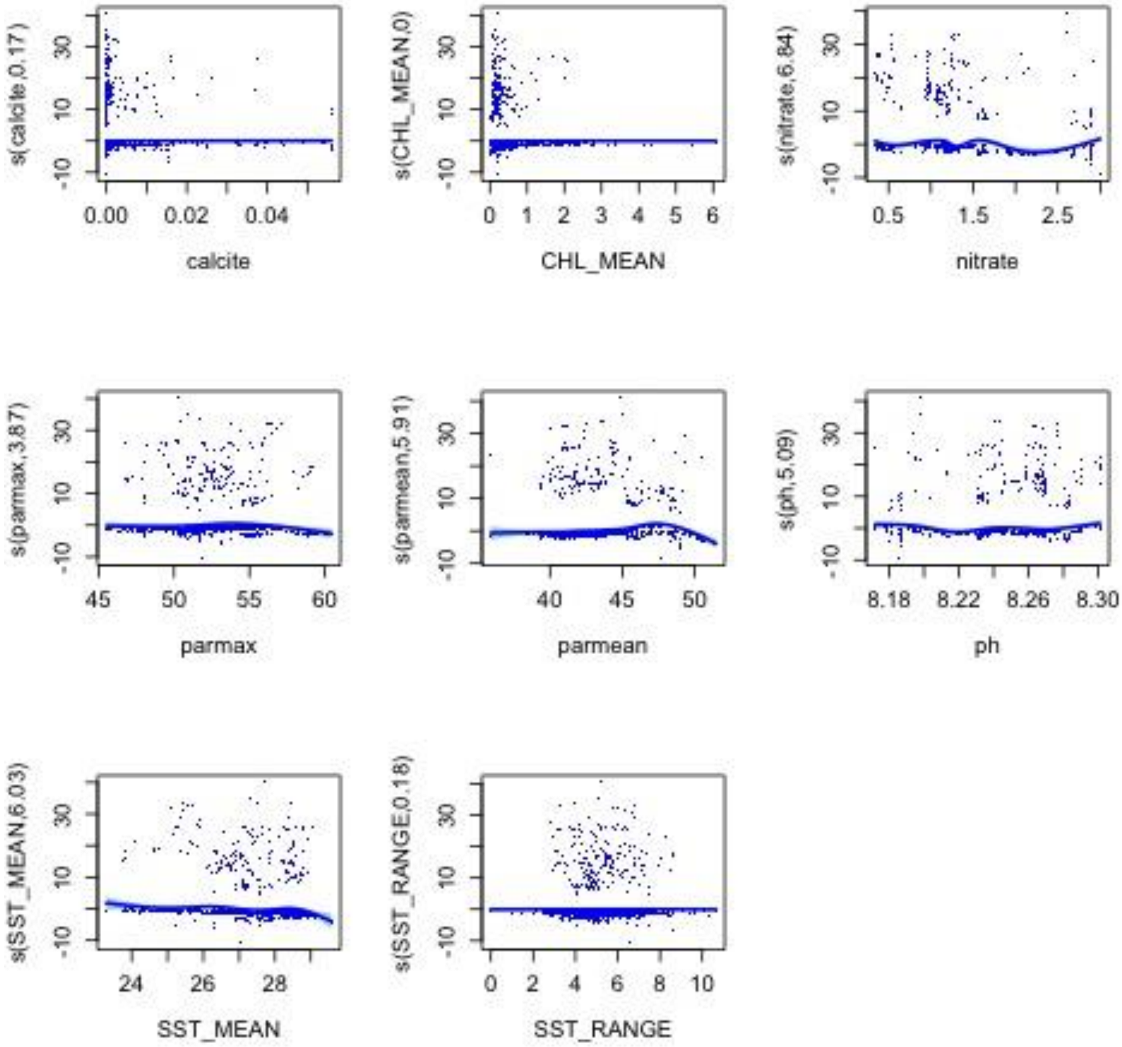
266Lutjanus gibbus, n = 997 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.327745	9	3.467065	6.470632e-02
s(CHL_MEAN)	3.980804	9	24.991515	1.236685e-05
s(nitrate)	7.847351	9	252.545579	1.537965e-54
s(parmax)	6.060270	9	47.240629	4.373288e-10
s(parmean)	6.959417	9	100.863972	3.980851e-22
s(ph)	8.340081	9	71.365773	1.160648e-13
s(SST_MEAN)	5.579725	9	27.624893	6.659631e-06
s(SST_RANGE)	1.625193	9	3.744328	6.959366e-02



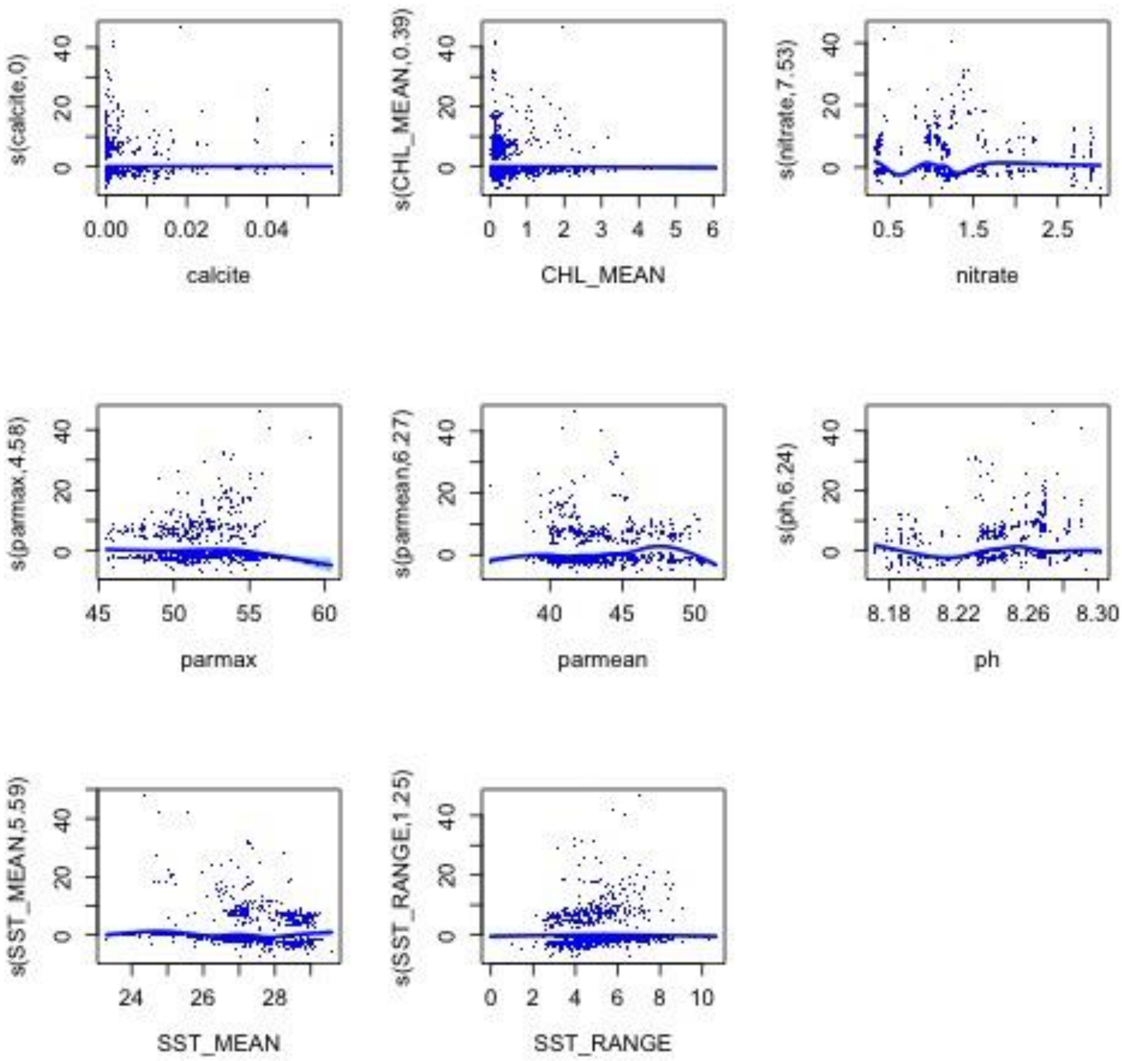
267Lutjanus kasmira, n = 426 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.1684332113	8	1.942000e-01	2.750668e-01
s(CHL_MEAN)	0.0002908539	9	2.686388e-05	8.572341e-01
s(nitrate)	6.8397352401	9	7.069246e+01	1.185059e-15
s(parmax)	3.8726497855	9	1.982926e+01	4.285214e-05
s(parmean)	5.9114137343	9	7.302281e+01	3.724897e-17
s(ph)	5.0920150319	9	2.379610e+01	1.858763e-05
s(SST_MEAN)	6.0298359238	9	2.743544e+01	1.565054e-05
s(SST_RANGE)	0.1763861358	9	1.826973e-01	3.201890e-01



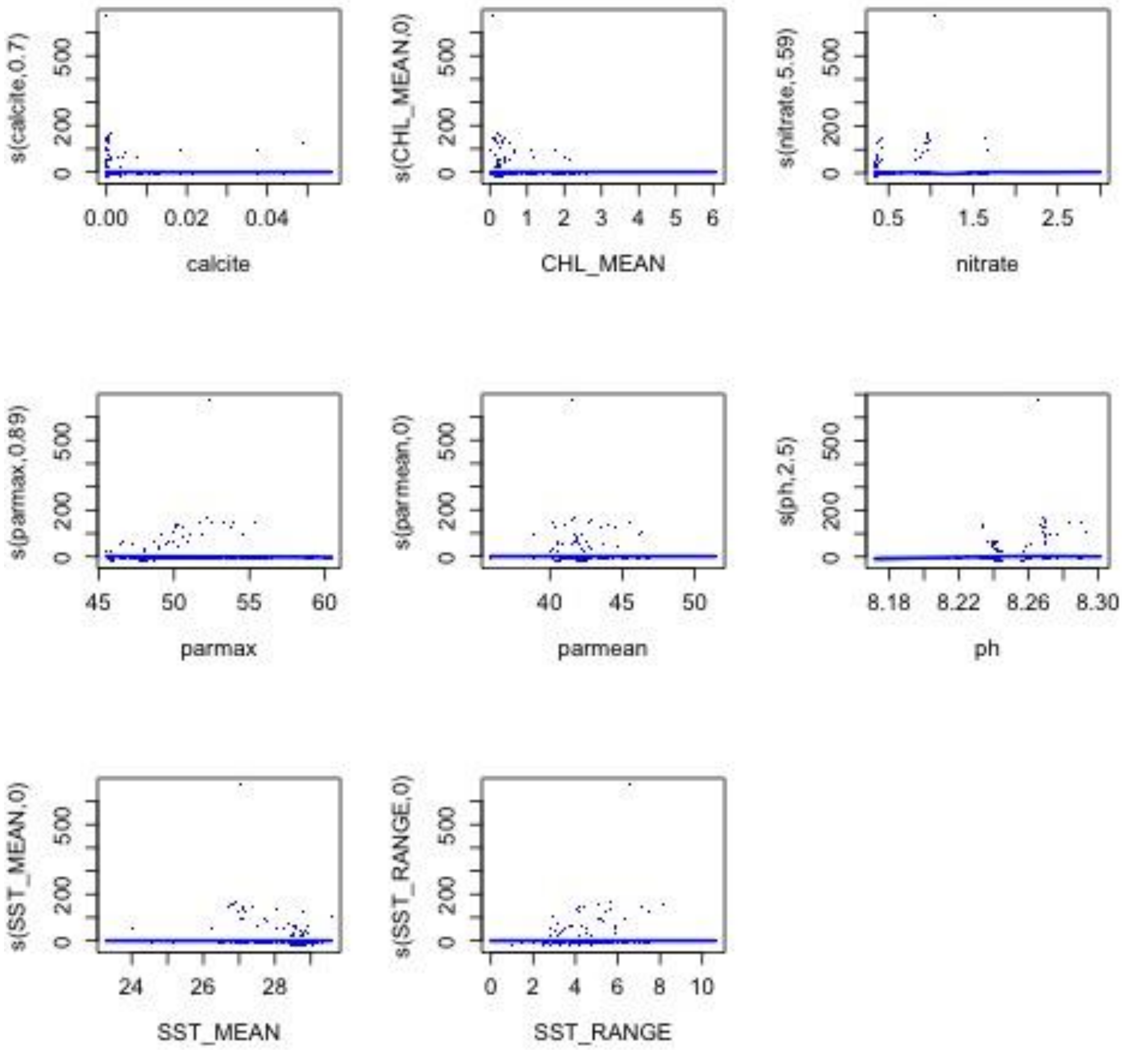
268Lutjanus monostigma, n = 699 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0005492218	9	6.515861e-04	2.536156e-01
s(CHL_MEAN)	0.3907538534	8	6.027857e-01	2.018103e-01
s(nitrate)	7.5305346785	9	1.891895e+02	1.134639e-42
s(parmax)	4.5804659094	9	3.294488e+01	1.373123e-07
s(parmean)	6.2726442772	9	1.500031e+02	6.095289e-35
s(ph)	6.2397662335	9	6.815105e+01	3.975685e-15
s(SST_MEAN)	5.5858294232	9	3.885143e+01	1.558492e-08
s(SST_RANGE)	1.2502220303	9	2.833042e+00	7.774356e-02



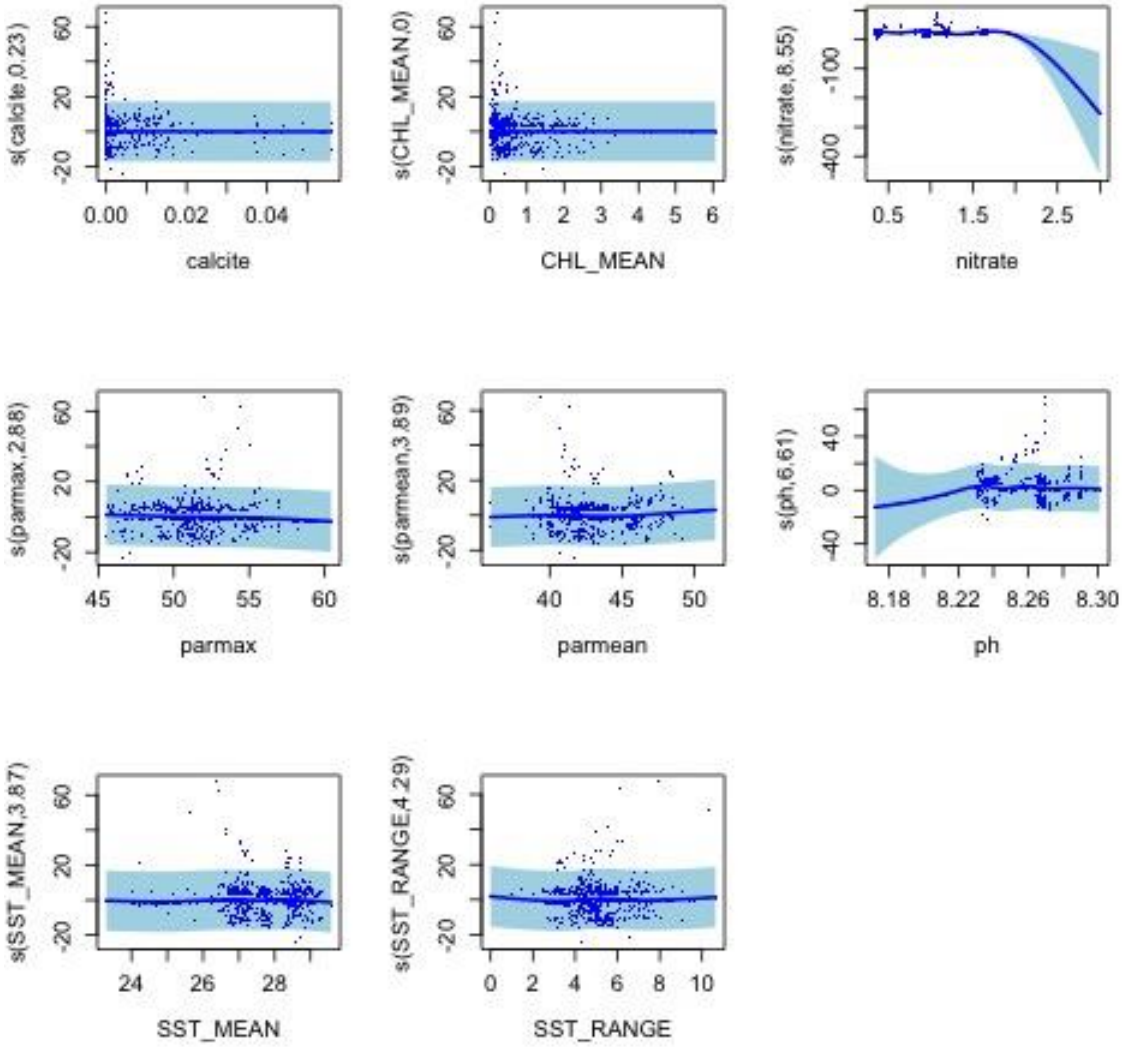
269Lutjanus rivulatus, n = 39 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.027511e-01	9	1.747559e+00	1.074585e-01
s(CHL_MEAN)	4.783157e-06	9	3.952429e-06	3.383210e-01
s(nitrate)	5.587174e+00	9	4.055455e+01	3.552073e-09
s(parmax)	8.914747e-01	8	7.509152e+00	2.853971e-03
s(parmean)	1.248421e-04	9	6.135971e-05	5.744157e-01
s(ph)	2.497284e+00	9	1.094291e+01	1.972571e-03
s(SST_MEAN)	1.496842e-06	9	1.830442e-07	9.857998e-01
s(SST_RANGE)	2.111054e-06	9	2.959923e-07	1.000000e+00



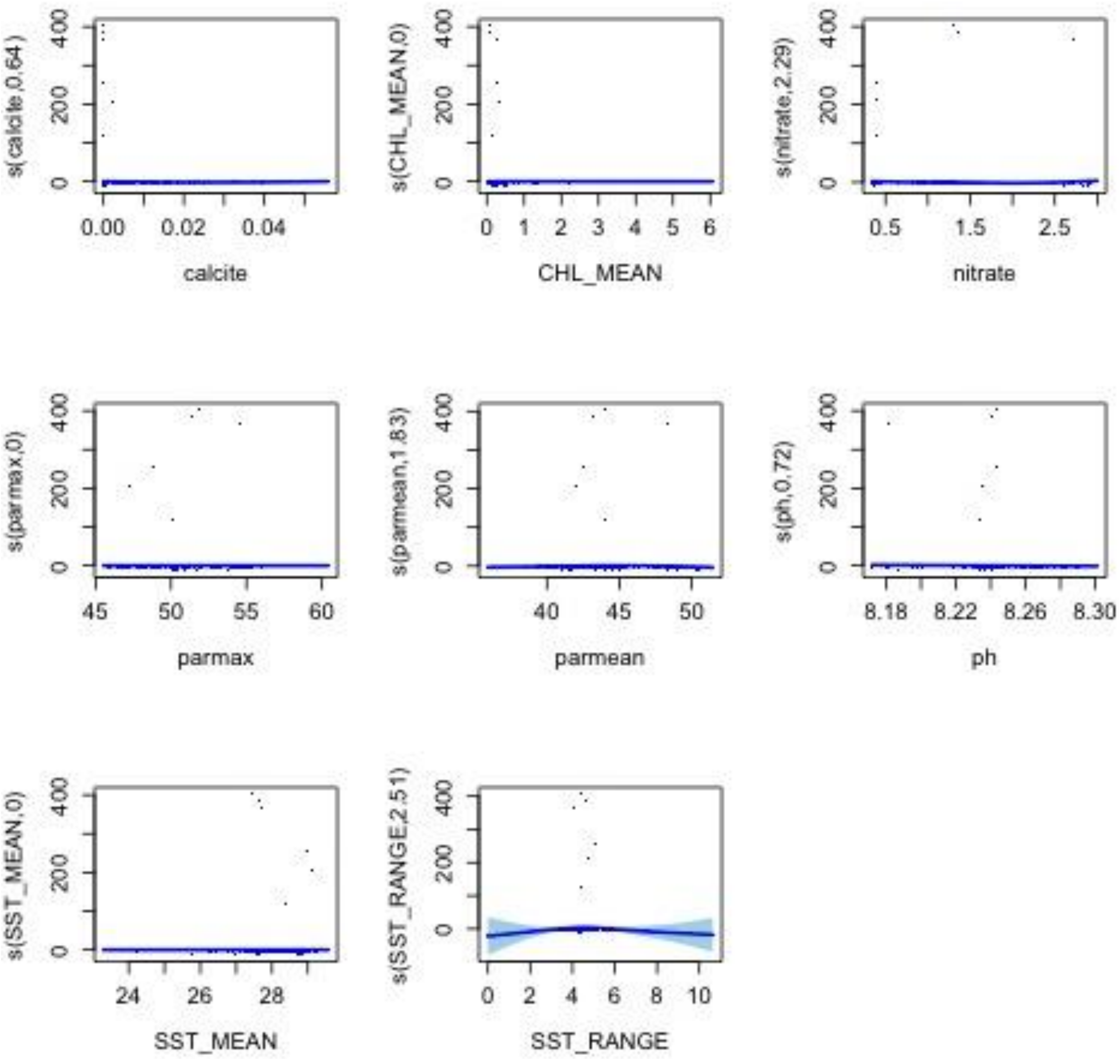
270Lutjanus semicinctus, n = 605 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.2330711176	7	3.079332e-01	2.424780e-01
s(CHL_MEAN)	0.0000667437	9	2.932642e-05	5.011812e-01
s(nitrate)	8.5485134022	9	2.746131e+02	6.118159e-61
s(parmax)	2.8772171784	9	1.525659e+01	2.669969e-04
s(parmean)	3.8857945349	9	1.973910e+01	7.946206e-05
s(ph)	6.6125639760	9	3.206803e+01	3.662027e-06
s(SST_MEAN)	3.8727946509	9	1.007435e+01	1.633620e-02
s(SST_RANGE)	4.2930527019	9	2.473822e+01	1.112998e-05



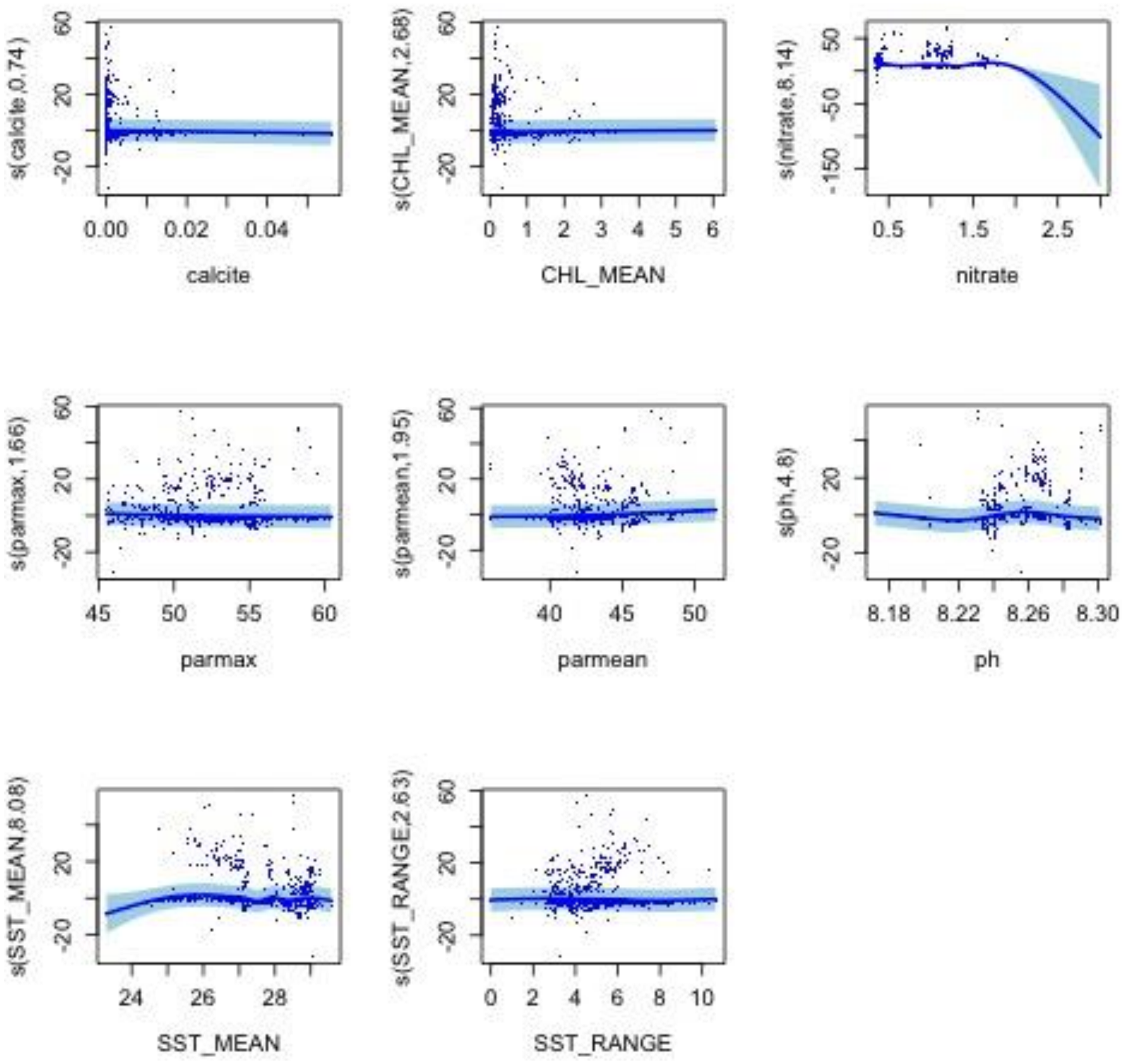
271Luzonichthys sp, n = 149 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.426164e-01	9	9.309522e-01	0.2216546415
s(CHL_MEAN)	5.541505e-06	9	3.981362e-06	0.3713640451
s(nitrate)	2.293982e+00	9	1.184947e+01	0.0009190899
s(parmax)	3.296660e-04	9	3.682263e-04	0.2349721186
s(parmean)	1.826083e+00	9	5.198299e+00	0.0239214861
s(ph)	7.242426e-01	9	2.310554e+00	0.0477446222
s(SST_MEAN)	2.121712e-06	9	3.569365e-07	0.8008713324
s(SST_RANGE)	2.514554e+00	8	7.312297e+00	0.0246907140



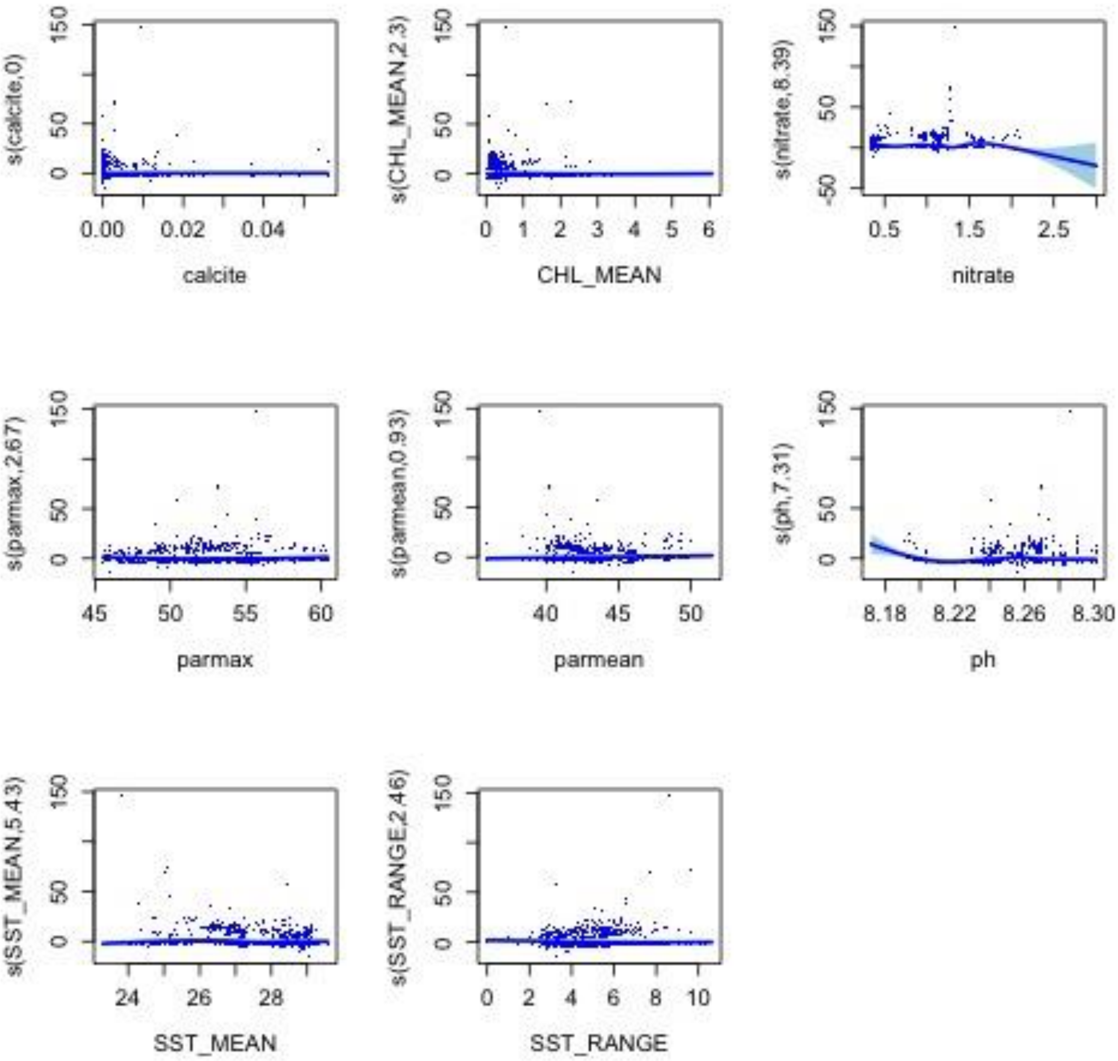
272Macolor macularis, n = 373 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7387709	7	2.288233	7.602795e-02
s(CHL_MEAN)	2.6810946	9	8.709871	1.586648e-02
s(nitrate)	8.1360419	9	182.178970	1.187668e-42
s(parmax)	1.6566612	9	4.910601	2.736834e-02
s(parmean)	1.9517221	9	13.847031	6.366472e-05
s(ph)	4.8002429	9	41.274040	3.546674e-10
s(SST_MEAN)	8.0777826	9	55.031413	1.496082e-10
s(SST_RANGE)	2.6348326	9	9.126321	8.084319e-03



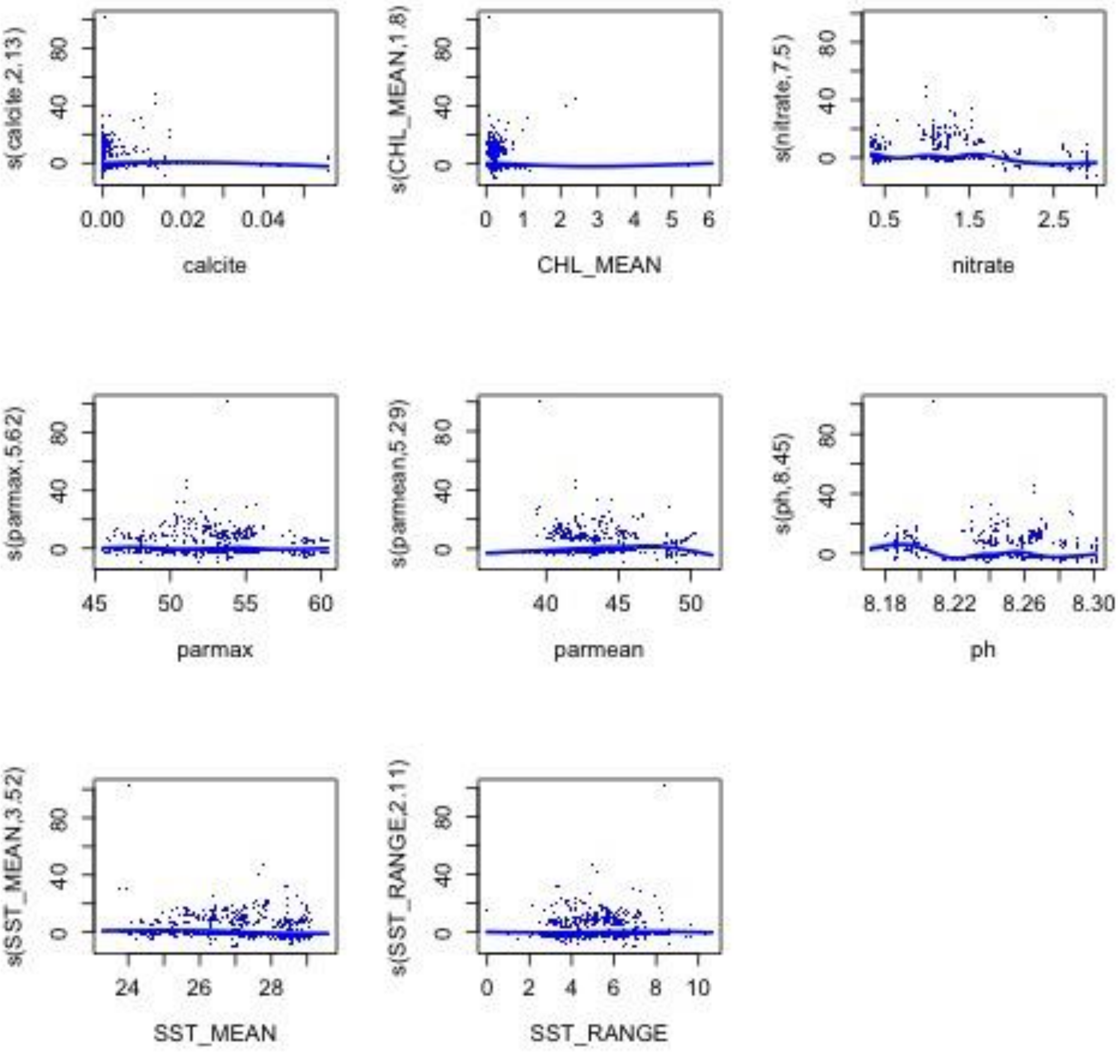
273Macolor niger, n = 547 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.321472e-05	9	9.688679e-06	8.241781e-01
s(CHL_MEAN)	2.298404e+00	9	1.649946e+01	1.421341e-04
s(nitrate)	8.386366e+00	9	1.430834e+02	2.787405e-31
s(parmax)	2.672726e+00	9	1.867870e+01	1.640928e-05
s(parmean)	9.280123e-01	9	1.203108e+01	1.623330e-04
s(ph)	7.311692e+00	9	8.819925e+01	5.162126e-19
s(SST_MEAN)	5.431870e+00	9	3.335235e+01	2.347906e-07
s(SST_RANGE)	2.463480e+00	9	9.573902e+00	5.426707e-03



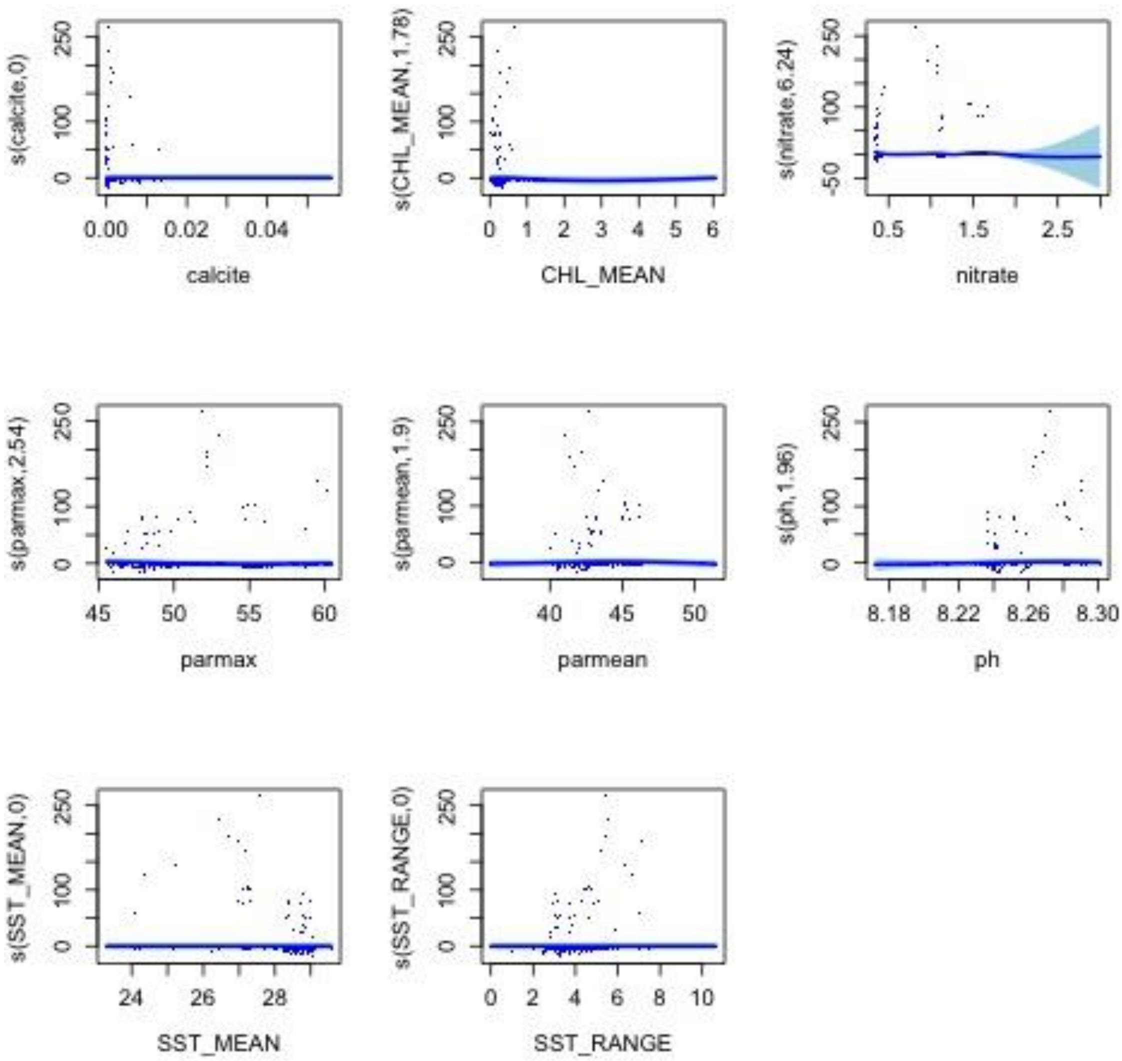
274Macropharyngodon meleagris, n = 795 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.127906	9	19.866633	1.488425e-05
s(CHL_MEAN)	1.796415	9	12.293320	6.239441e-04
s(nitrate)	7.500546	9	149.162850	1.881960e-33
s(parmax)	5.619943	9	35.275766	2.136676e-07
s(parmean)	5.286941	9	106.451309	1.362441e-25
s(ph)	8.448684	9	177.732747	7.739604e-39
s(SST_MEAN)	3.519249	9	27.077607	1.893078e-07
s(SST_RANGE)	2.114601	9	6.570041	1.827763e-02



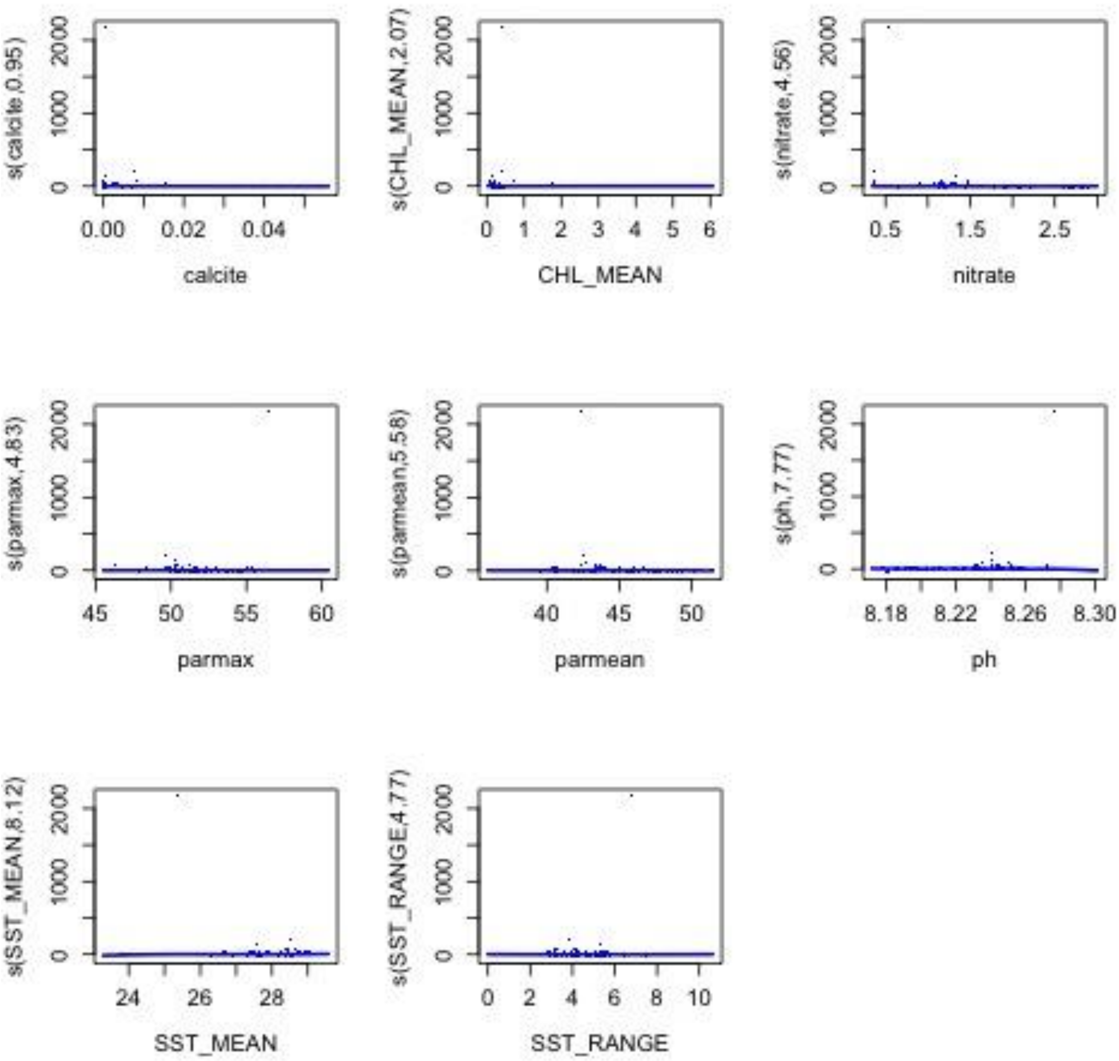
275Macropharyngodon negrosensis, n = 38 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.838132e-04	9	5.747736e-04	3.554784e-01
s(CHL_MEAN)	1.778159e+00	9	4.529496e+00	6.601024e-02
s(nitrate)	6.240698e+00	9	4.600054e+01	1.712607e-10
s(parmax)	2.540326e+00	9	1.866509e+01	5.753872e-06
s(parmean)	1.901900e+00	9	7.623220e+00	6.161340e-03
s(ph)	1.955973e+00	9	5.859715e+00	1.640545e-02
s(SST_MEAN)	4.572168e-06	9	4.368682e-07	1.000000e+00
s(SST_RANGE)	8.600158e-06	9	1.853377e-06	8.408544e-01



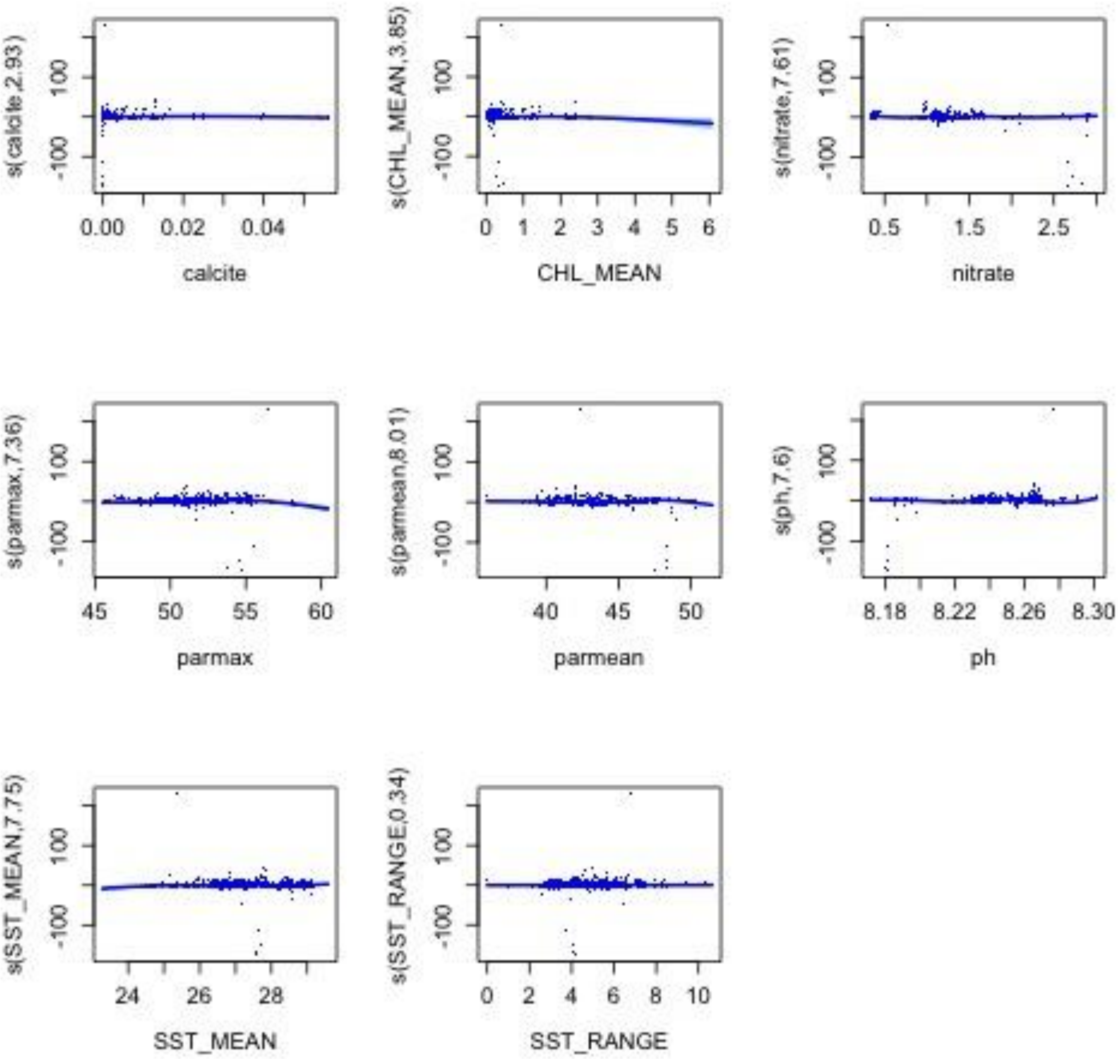
276Melichthys niger, n = 989 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9485855	8	17.12100	1.365681e-05
s(CHL_MEAN)	2.0747585	9	25.67591	3.139322e-07
s(nitrate)	4.5601192	9	18.46757	3.050305e-04
s(parmax)	4.8324488	9	23.65789	2.548240e-05
s(parmean)	5.5843223	9	159.80938	3.162890e-39
s(ph)	7.7681790	9	84.02633	2.690419e-18
s(SST_MEAN)	8.1179276	9	67.19708	2.180118e-13
s(SST_RANGE)	4.7733660	9	15.89015	2.179684e-03



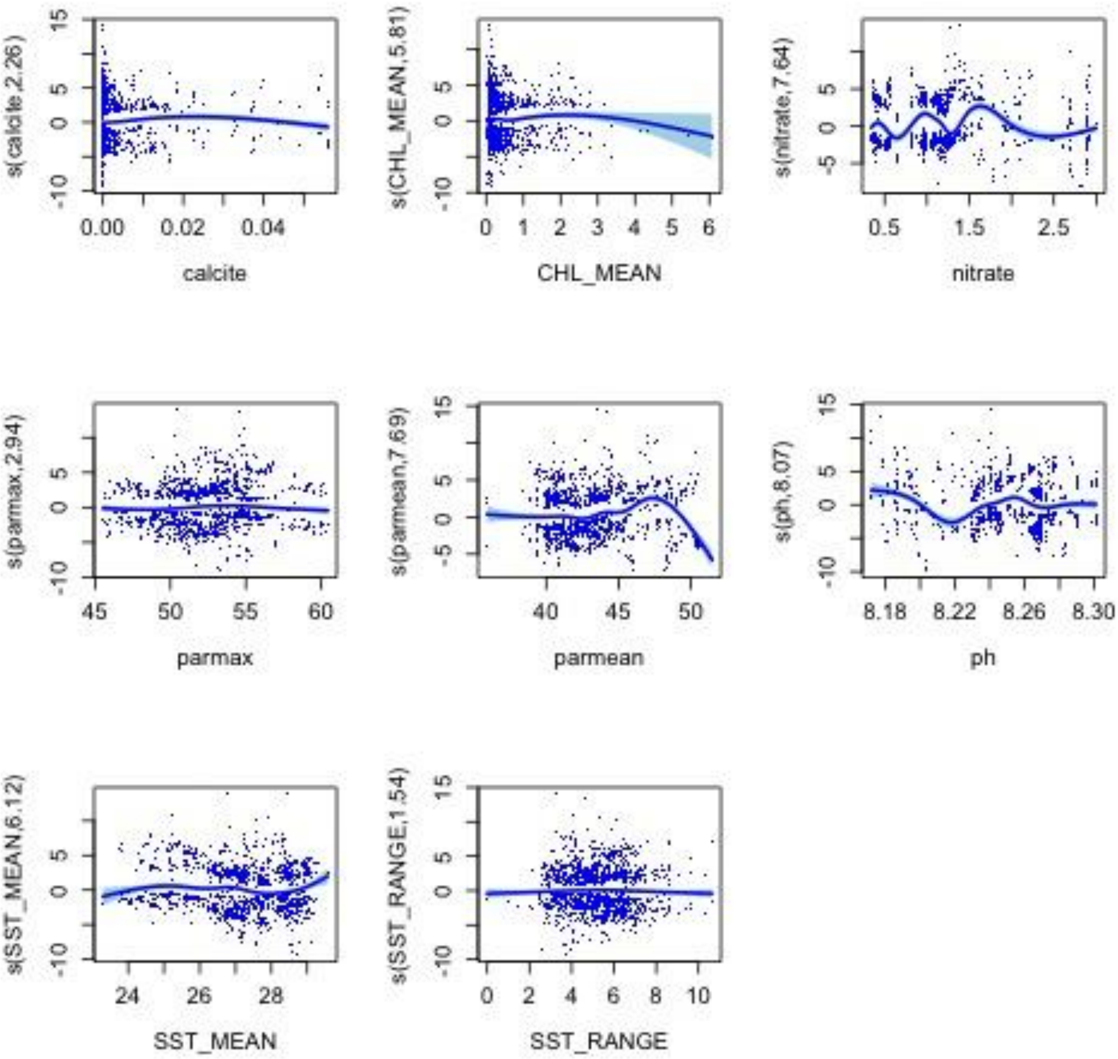
277Melichthys vidua, n = 2112 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.9337657	9	23.9921134	7.959039e-06
s(CHL_MEAN)	3.8518729	9	54.9407727	6.599023e-13
s(nitrate)	7.6110670	9	221.2513259	2.957403e-50
s(parmax)	7.3624213	9	97.4159855	7.525692e-21
s(parmean)	8.0134612	9	395.9498079	1.537149e-90
s(ph)	7.5995337	9	266.6838045	1.426335e-60
s(SST_MEAN)	7.7539945	9	41.8414227	1.390324e-07
s(SST_RANGE)	0.3396469	9	0.4980869	2.215825e-01



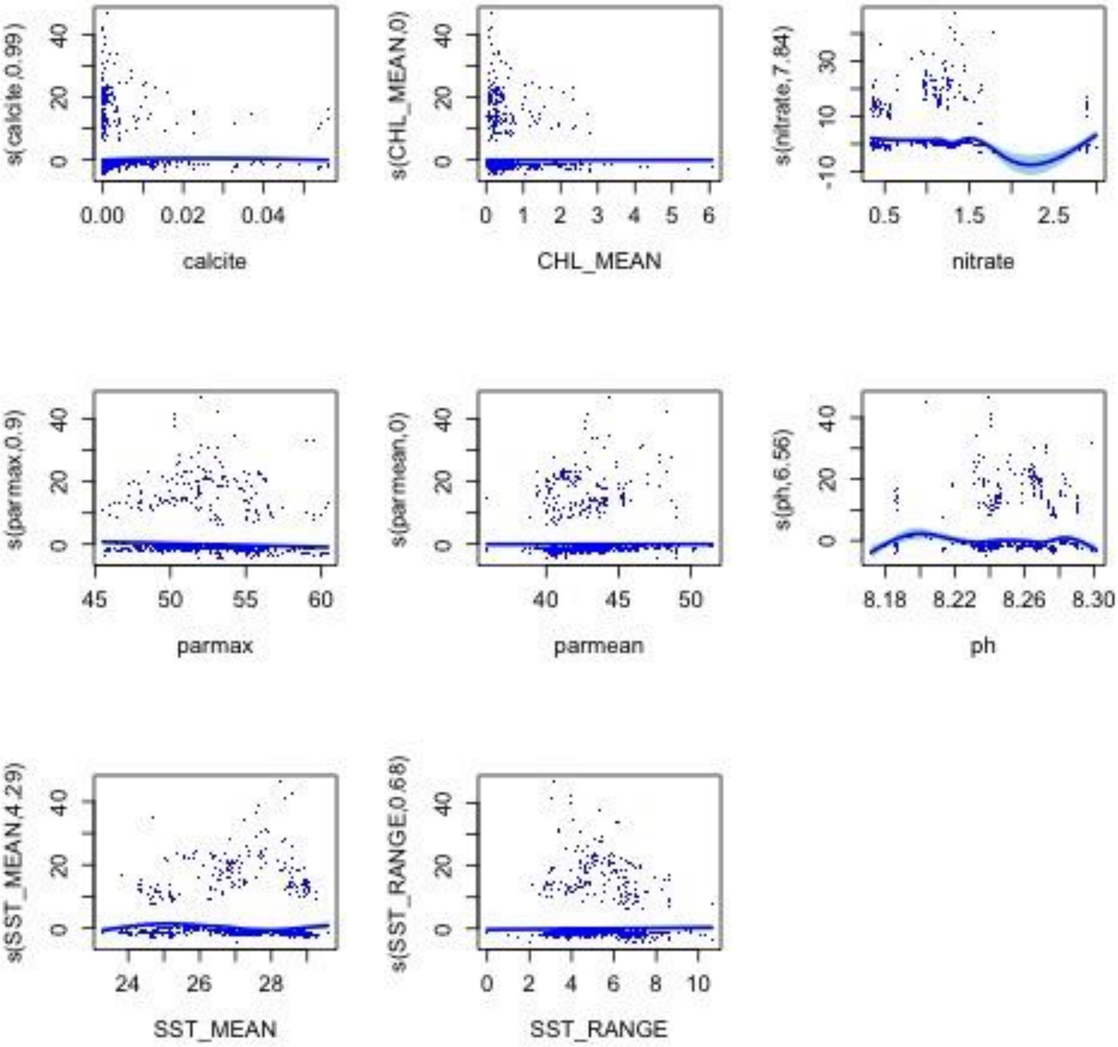
278Monotaxis grandoculis, n = 1948 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.256416	9	17.995044	3.708136e-05
s(CHL_MEAN)	5.805578	9	58.702384	1.958019e-12
s(nitrate)	7.642065	9	280.946045	1.172142e-63
s(parmax)	2.939014	9	12.726389	1.232176e-03
s(parmean)	7.694814	9	214.430829	5.565805e-48
s(ph)	8.072822	9	152.341822	3.112193e-33
s(SST_MEAN)	6.117273	9	49.680813	7.700274e-11
s(SST_RANGE)	1.539380	9	4.057624	4.667988e-02



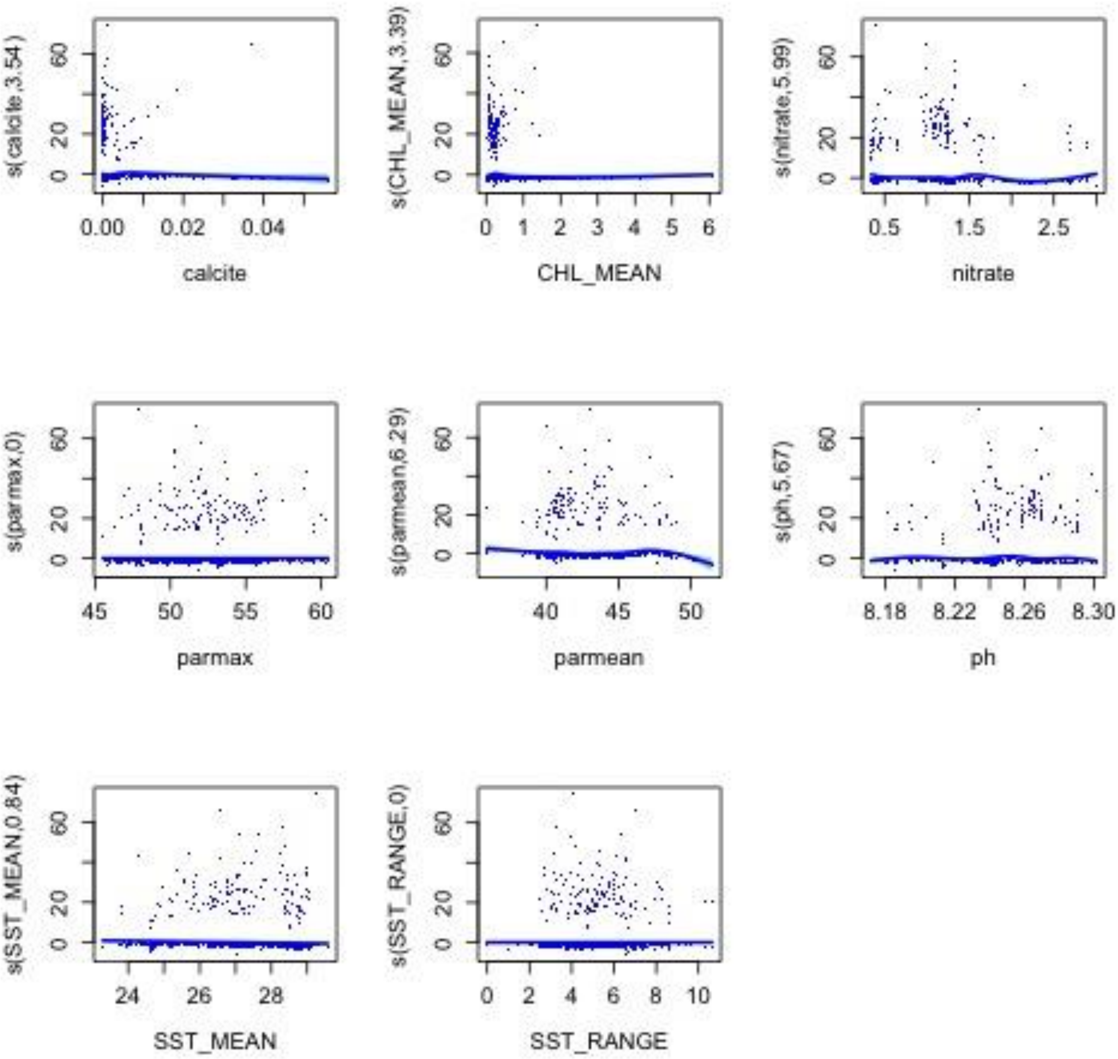
279Mulloidichthys flavolineatus, n = 302 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.940782e-01	9	4.791237e+00	1.835543e-02
s(CHL_MEAN)	2.459624e-04	9	2.044550e-04	3.420650e-01
s(nitrate)	7.841823e+00	9	5.626267e+01	5.551135e-11
s(parmax)	9.039230e-01	8	9.206789e+00	1.043206e-03
s(parmean)	6.886002e-05	9	2.122142e-05	6.349749e-01
s(ph)	6.561700e+00	9	2.740244e+01	3.344585e-05
s(SST_MEAN)	4.287547e+00	9	3.759292e+01	6.978644e-09
s(SST_RANGE)	6.786832e-01	9	1.480059e+00	1.210955e-01



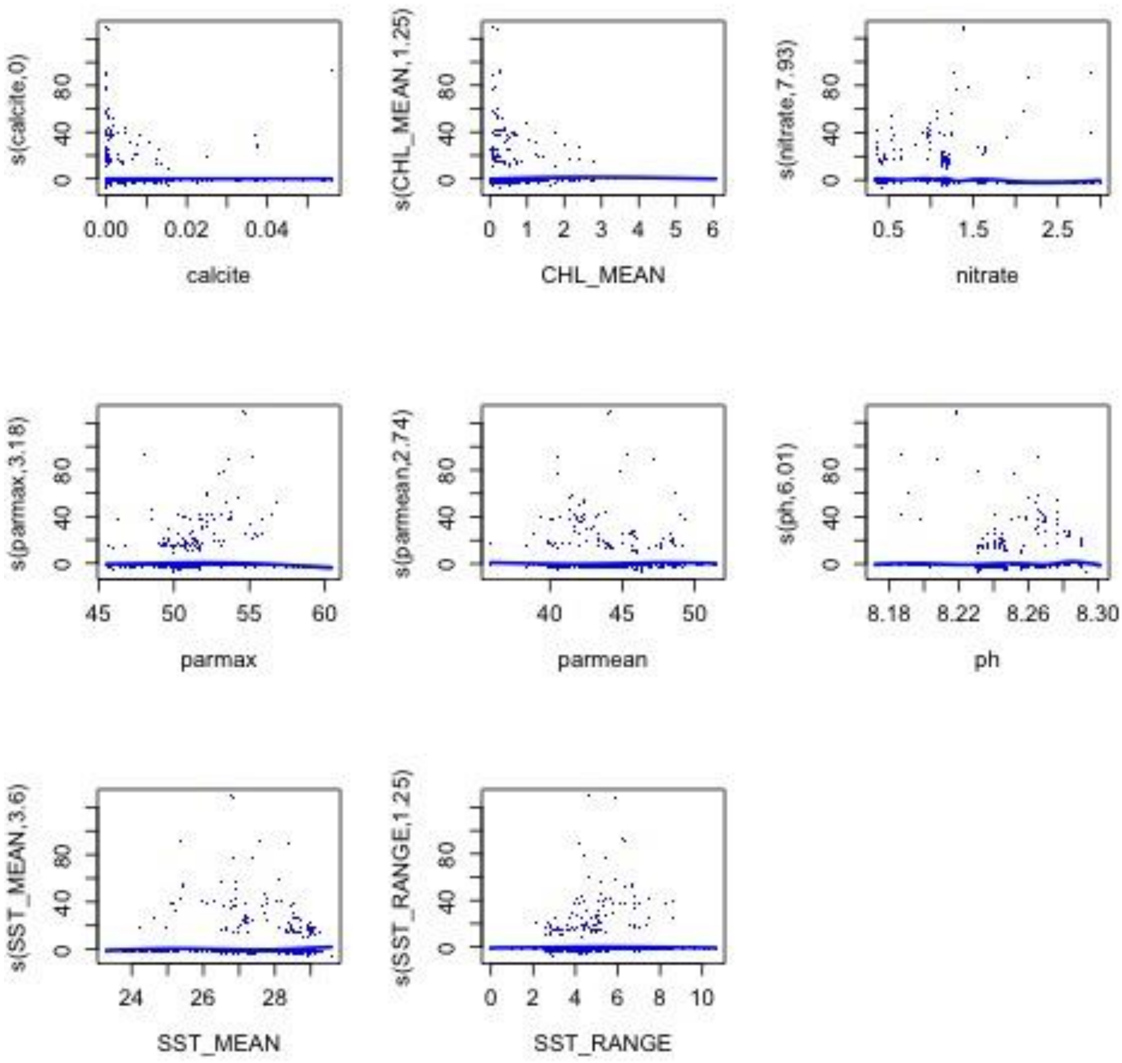
280Mulloidichthys vanicolensis, n = 284 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.541442e+00	9	1.363734e+01	3.503201e-03
s(CHL_MEAN)	3.386896e+00	9	2.335296e+01	1.509355e-05
s(nitrate)	5.992278e+00	9	4.538987e+01	6.828871e-10
s(parmax)	3.100206e-05	9	9.043691e-06	7.850019e-01
s(parmean)	6.289702e+00	9	3.265345e+01	2.129691e-06
s(ph)	5.673083e+00	9	2.144190e+01	1.881229e-04
s(SST_MEAN)	8.383393e-01	9	5.094043e+00	9.287587e-03
s(SST_RANGE)	3.873157e-05	9	7.798957e-06	8.606631e-01



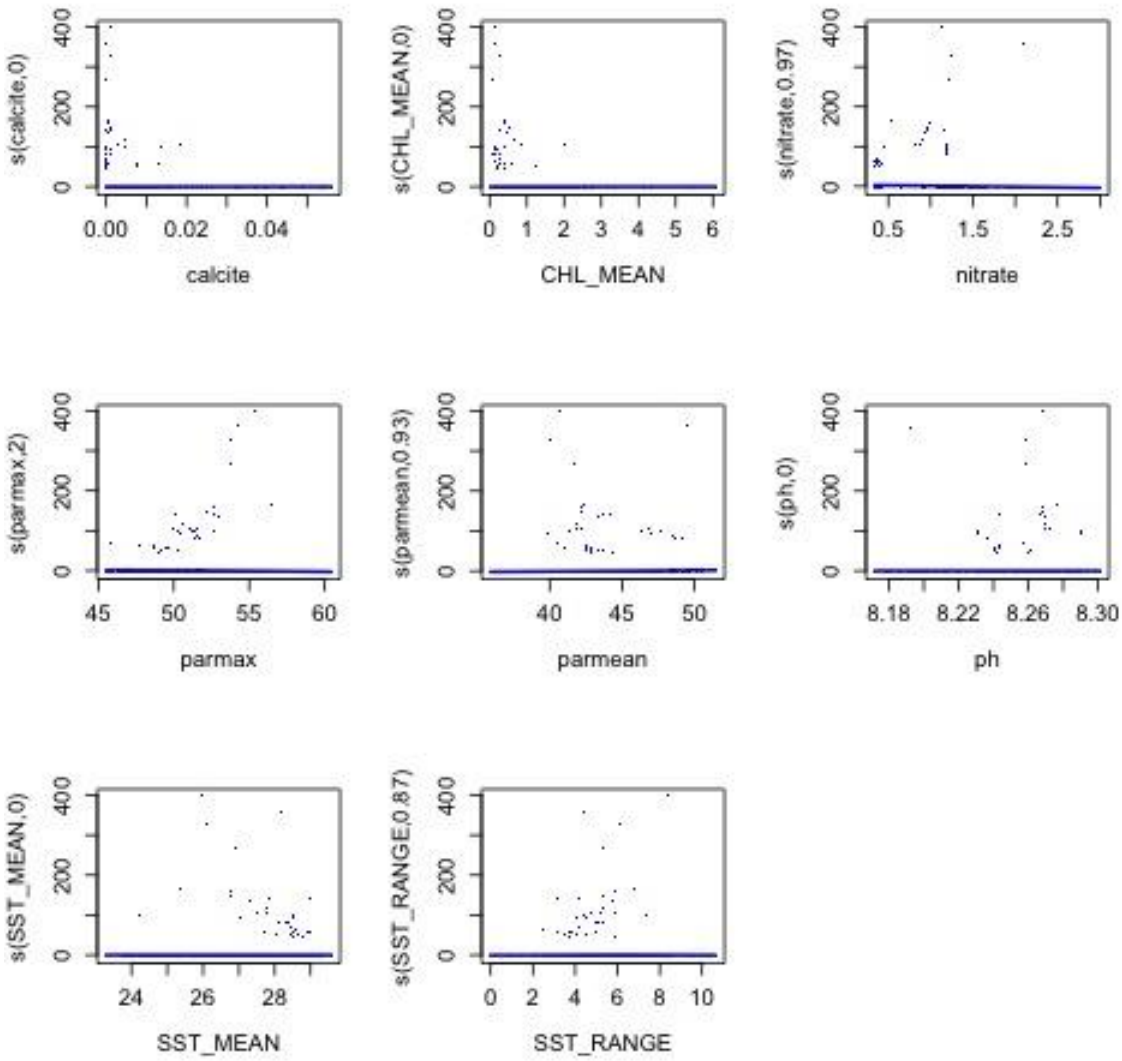
281Naso annulatus, n = 160 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0003863356	9	1.573473e-04	5.154901e-01
s(CHL_MEAN)	1.2474182155	9	1.481132e+01	4.512104e-05
s(nitrate)	7.9343524955	9	3.886262e+01	1.870960e-07
s(parmax)	3.1849231768	9	1.927919e+01	1.965687e-05
s(parmean)	2.7439322060	9	1.547932e+01	9.000245e-05
s(ph)	6.0060299450	9	2.090487e+01	2.095307e-04
s(SST_MEAN)	3.6026924564	9	1.706912e+01	9.699863e-05
s(SST_RANGE)	1.2487478035	9	2.618054e+00	8.822479e-02



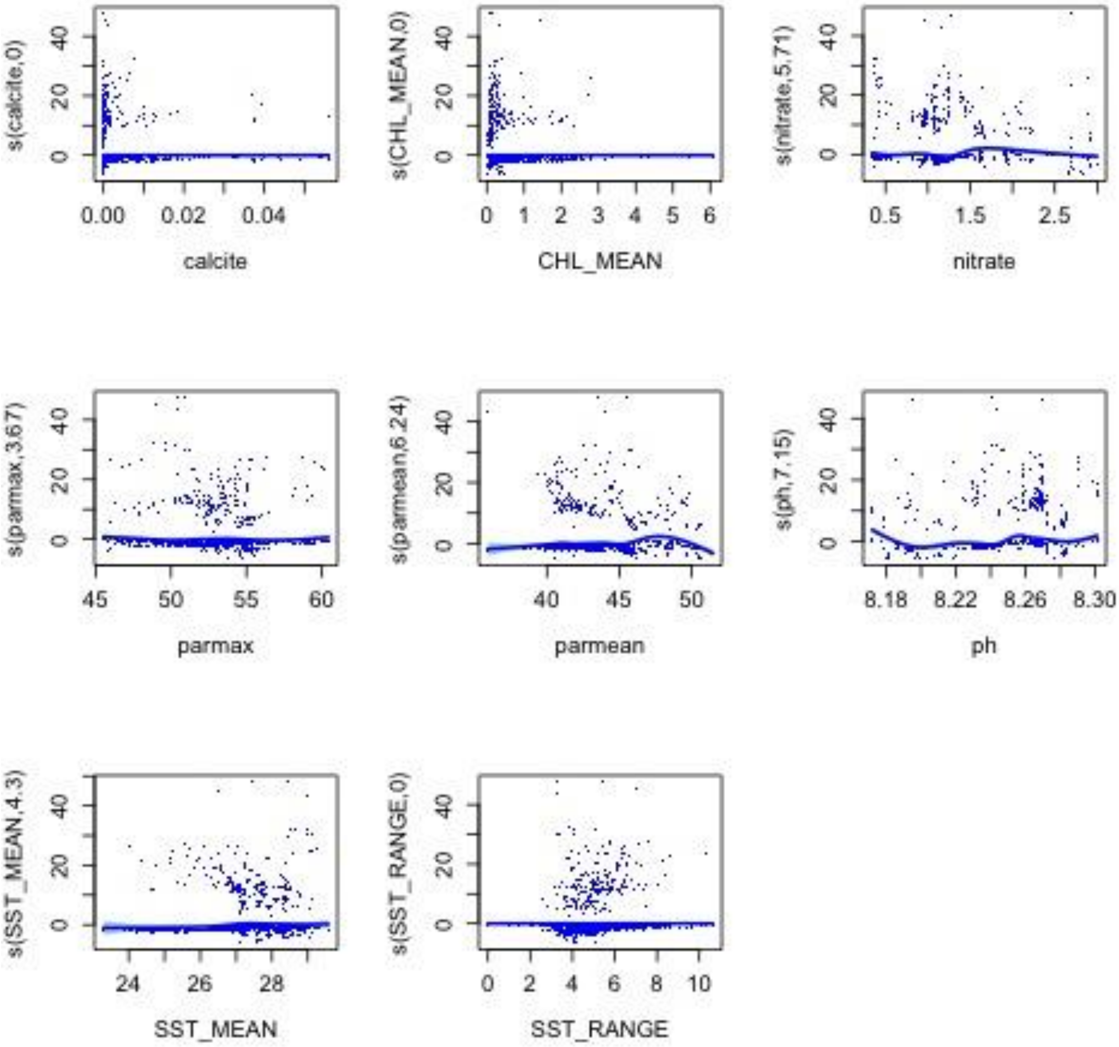
282Naso brachycentron, n = 42 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.128854e-06	9	1.288316e-06	5.629124e-01
s(CHL_MEAN)	6.384883e-05	9	2.119988e-05	5.643091e-01
s(nitrate)	9.747539e-01	6	3.782544e+01	3.236521e-10
s(parmax)	1.996621e+00	9	1.096670e+01	9.525686e-04
s(parmean)	9.269067e-01	9	1.274977e+01	1.070928e-04
s(ph)	3.151183e-06	9	5.938898e-07	8.692942e-01
s(SST_MEAN)	8.471909e-05	9	3.488572e-05	5.533123e-01
s(SST_RANGE)	8.655130e-01	9	1.535851e+00	1.487087e-01



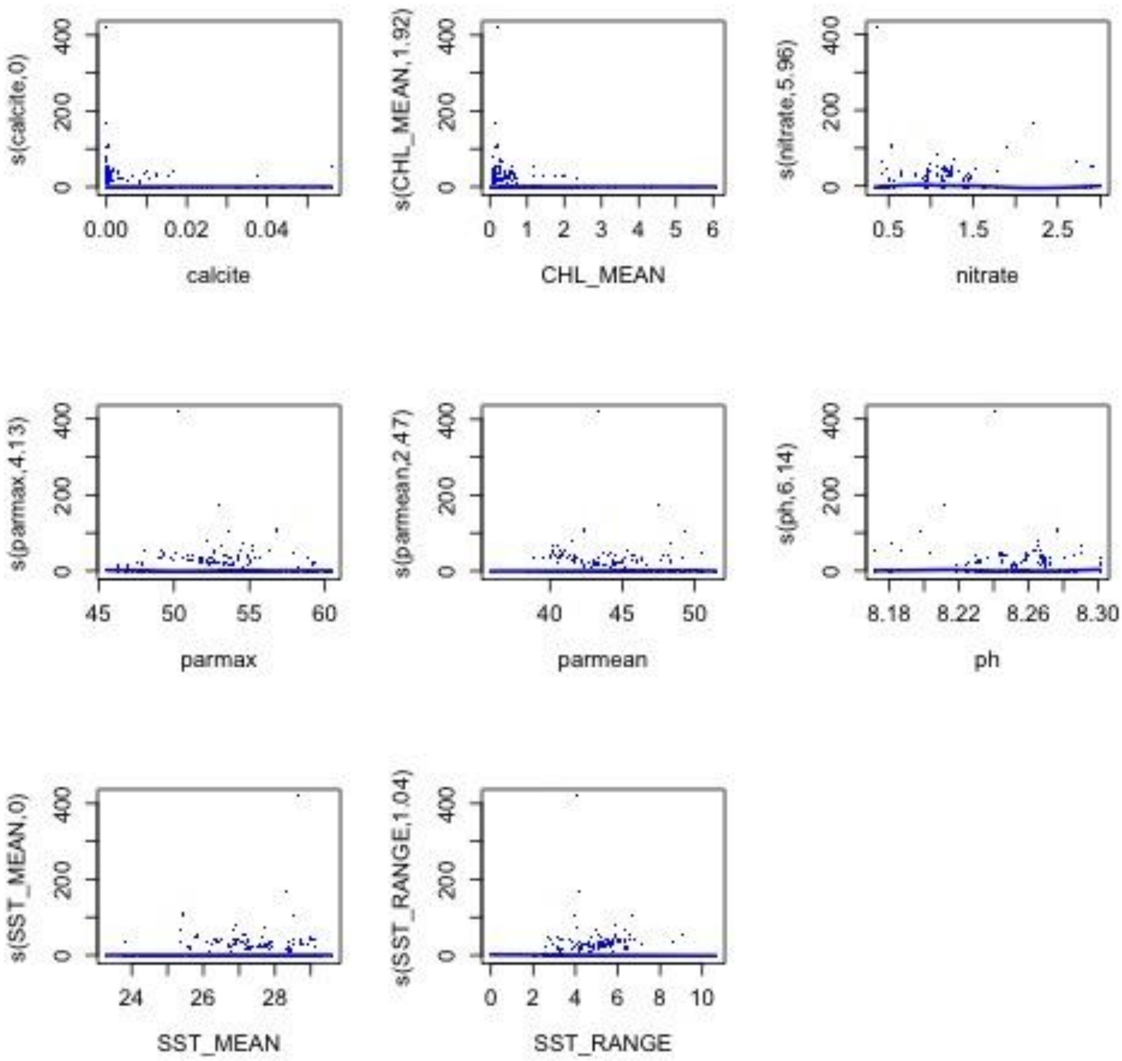
283Naso brevirostris, n = 418 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0004601957	9	2.105959e-04	5.337650e-01
s(CHL_MEAN)	0.0002940372	9	1.037197e-04	5.606659e-01
s(nitrate)	5.7054553597	9	4.859433e+01	7.846868e-11
s(parmax)	3.6731815179	9	1.065874e+01	1.073537e-02
s(parmean)	6.2412890728	9	9.058533e+01	2.706106e-20
s(ph)	7.1521138818	9	1.166941e+02	5.564600e-26
s(SST_MEAN)	4.3043982733	9	2.161164e+01	3.268909e-05
s(SST_RANGE)	0.0003473742	9	9.730283e-05	7.945952e-01



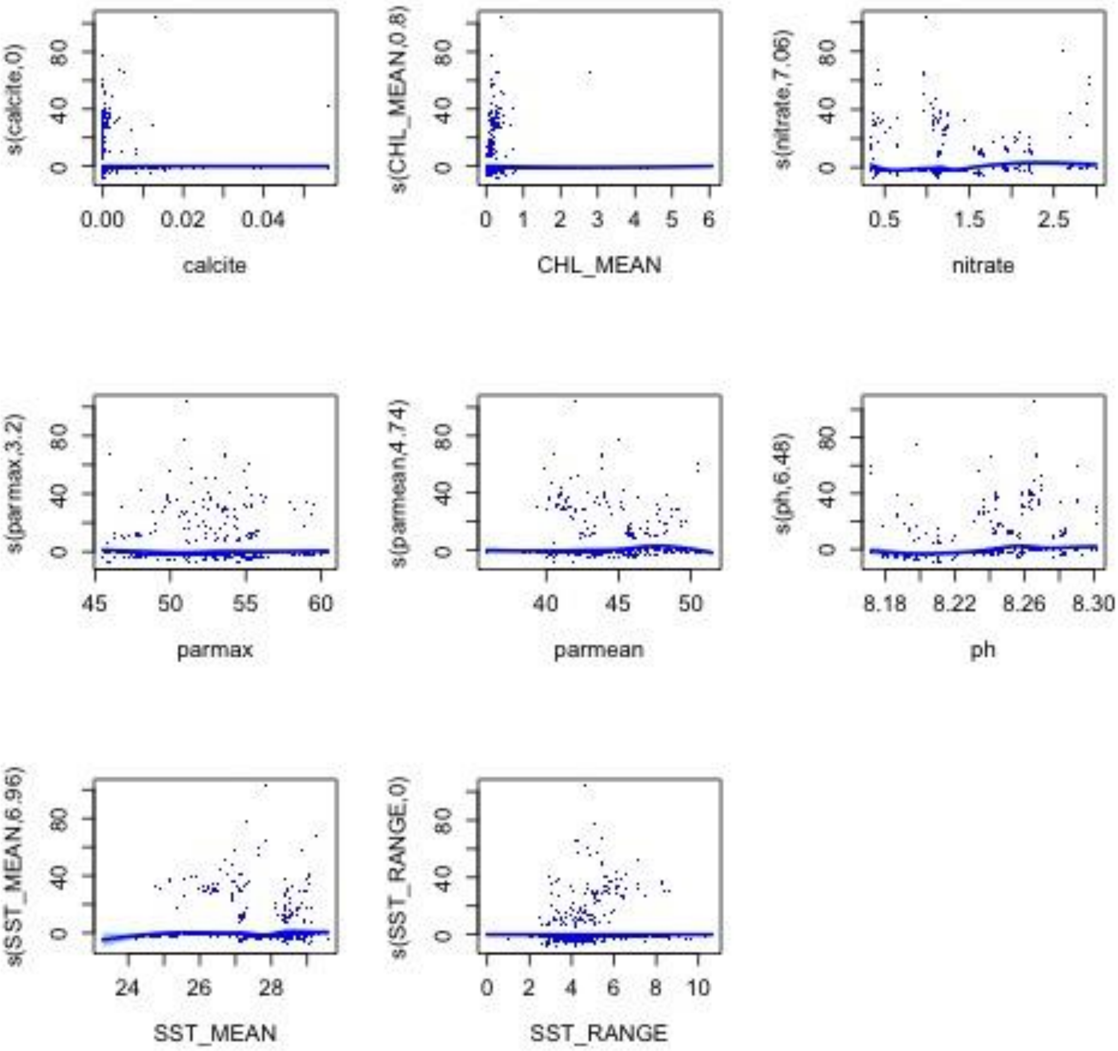
284Naso caesius, n = 119 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.908931e-05	9	7.618340e-06	8.732075e-01
s(CHL_MEAN)	1.922396e+00	9	9.232960e+00	4.984986e-03
s(nitrate)	5.957724e+00	9	6.049624e+01	9.436112e-14
s(parmax)	4.126214e+00	9	2.495459e+01	4.775049e-06
s(parmean)	2.465212e+00	9	7.138801e+00	1.532393e-02
s(ph)	6.138065e+00	9	3.934662e+01	1.715417e-08
s(SST_MEAN)	1.175259e-04	9	9.178137e-05	4.095256e-01
s(SST_RANGE)	1.035656e+00	9	5.744303e+00	6.536432e-03



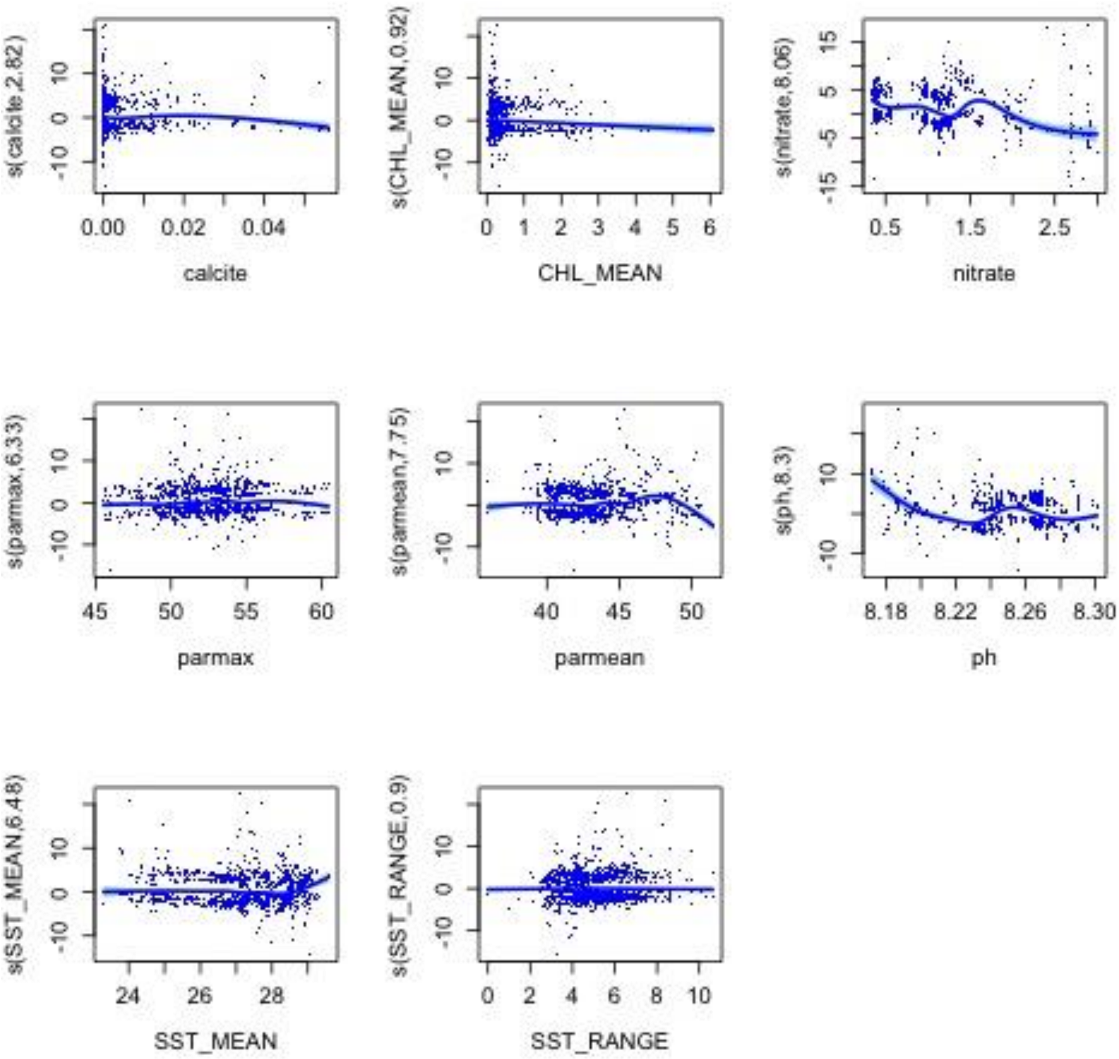
285Naso hexacanthus, n = 387 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.995679e-05	9	1.696203e-05	6.251286e-01
s(CHL_MEAN)	8.005204e-01	9	2.125184e+00	8.729000e-02
s(nitrate)	7.057116e+00	9	4.906739e+01	1.253164e-10
s(parmax)	3.204788e+00	9	1.139969e+01	3.221585e-03
s(parmean)	4.741068e+00	9	4.527590e+01	7.200212e-11
s(ph)	6.480677e+00	9	6.963000e+01	2.356481e-16
s(SST_MEAN)	6.957590e+00	9	3.039044e+01	7.705039e-06
s(SST_RANGE)	2.275854e-03	9	3.011151e-03	2.409196e-01



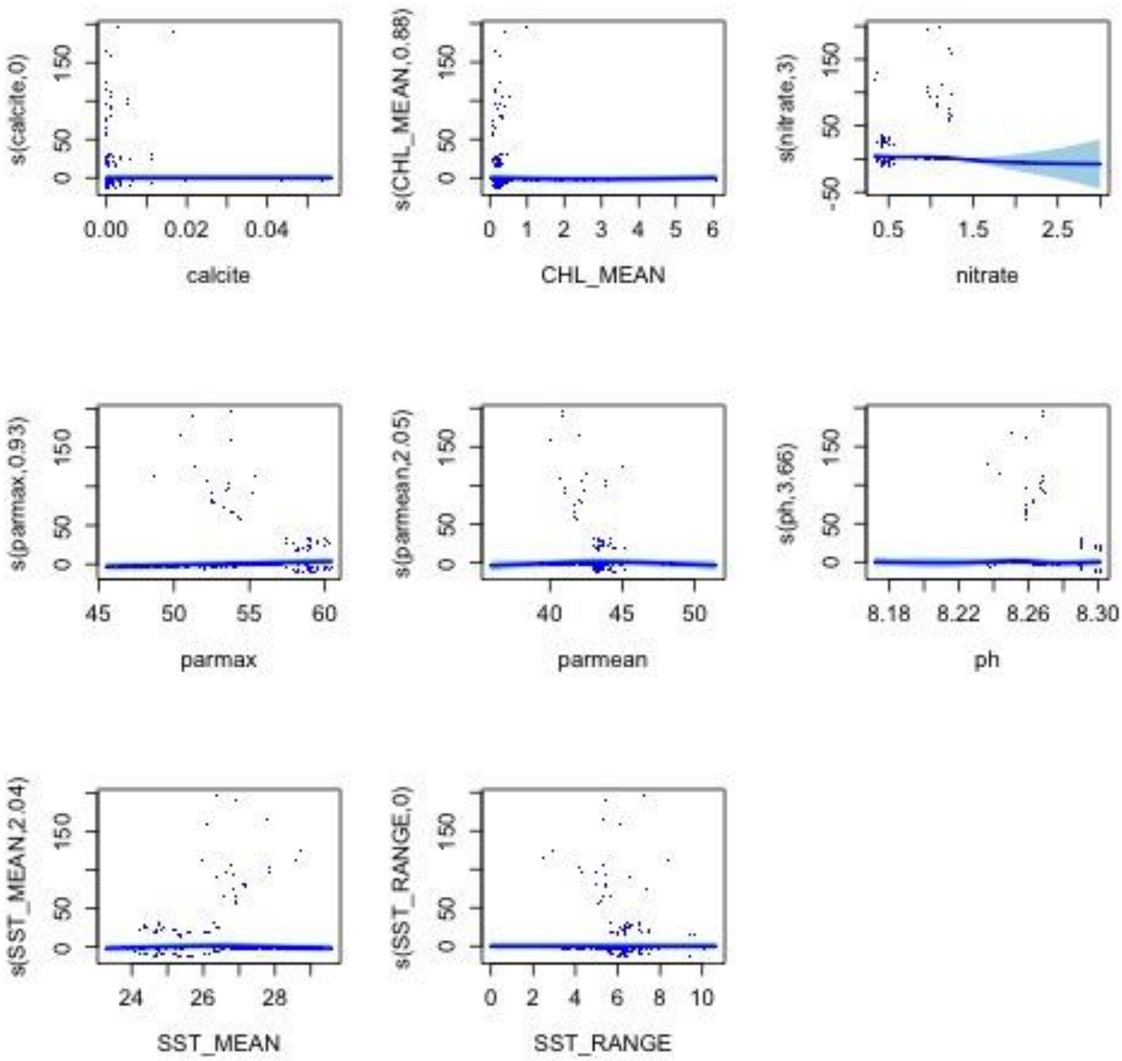
286Naso lituratus, n = 2042 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.8152437	9	18.050978	1.460195e-04
s(CHL_MEAN)	0.9224996	9	11.025039	4.283764e-04
s(nitrate)	8.0615640	9	312.725867	8.881509e-71
s(parmax)	6.3349527	9	33.321063	2.444323e-06
s(parmean)	7.7497582	9	150.744625	2.917437e-32
s(ph)	8.3039429	9	318.087594	6.651255e-72
s(SST_MEAN)	6.4806990	9	69.443000	3.241909e-15
s(SST_RANGE)	0.8959366	9	1.521012	1.600523e-01



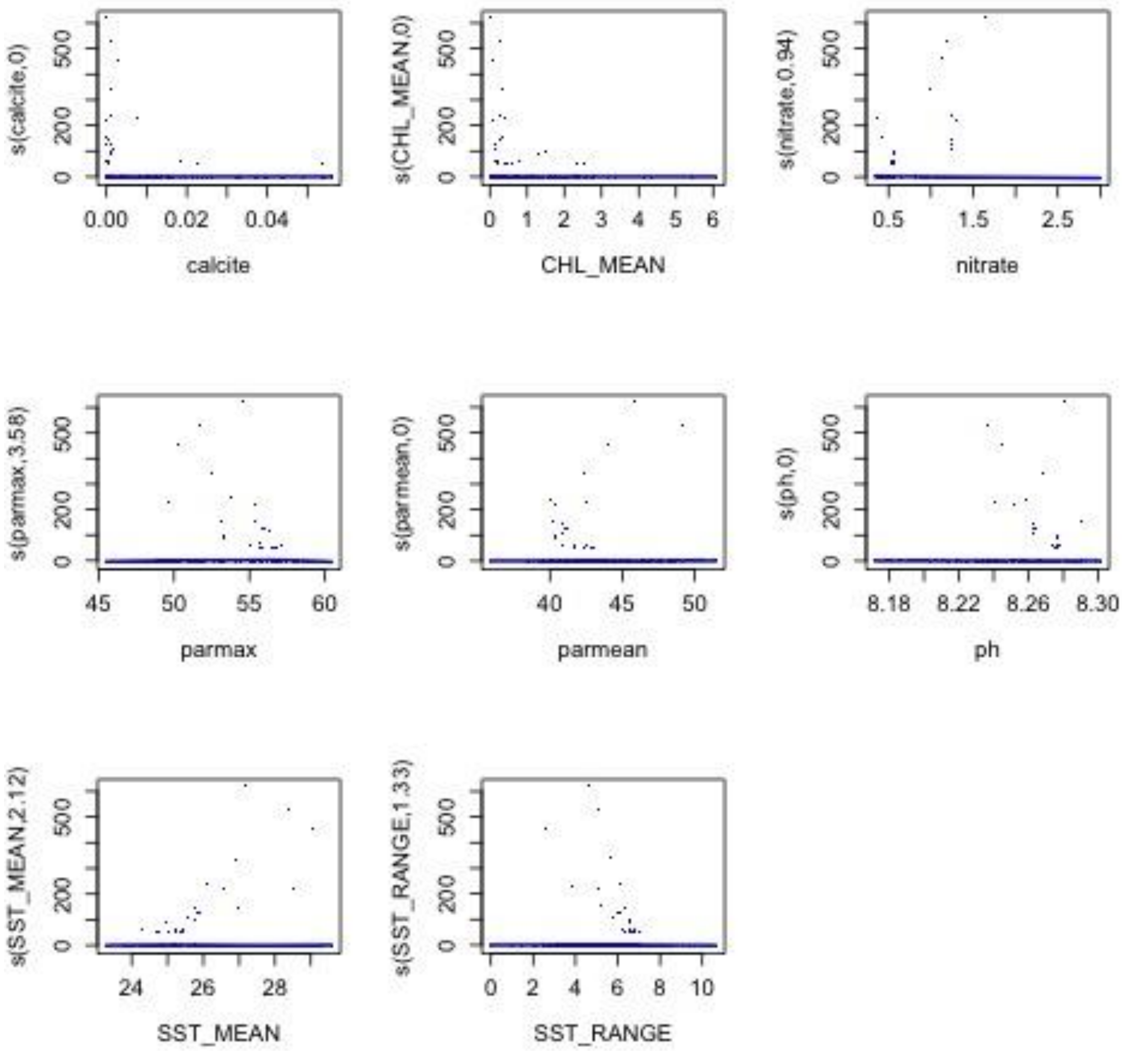
287Naso tonganus, n = 85 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.543438e-06	9	7.465043e-07	8.257081e-01
s(CHL_MEAN)	8.781603e-01	9	2.923756e+00	5.114490e-02
s(nitrate)	2.996247e+00	9	1.489908e+01	1.758020e-04
s(parmax)	9.338637e-01	9	1.291025e+01	3.547606e-05
s(parmean)	2.053657e+00	9	7.300352e+00	7.455244e-03
s(ph)	3.657205e+00	9	1.780916e+01	1.429372e-04
s(SST_MEAN)	2.036676e+00	9	1.282309e+01	1.004407e-04
s(SST_RANGE)	5.665654e-05	9	4.864113e-05	3.601067e-01



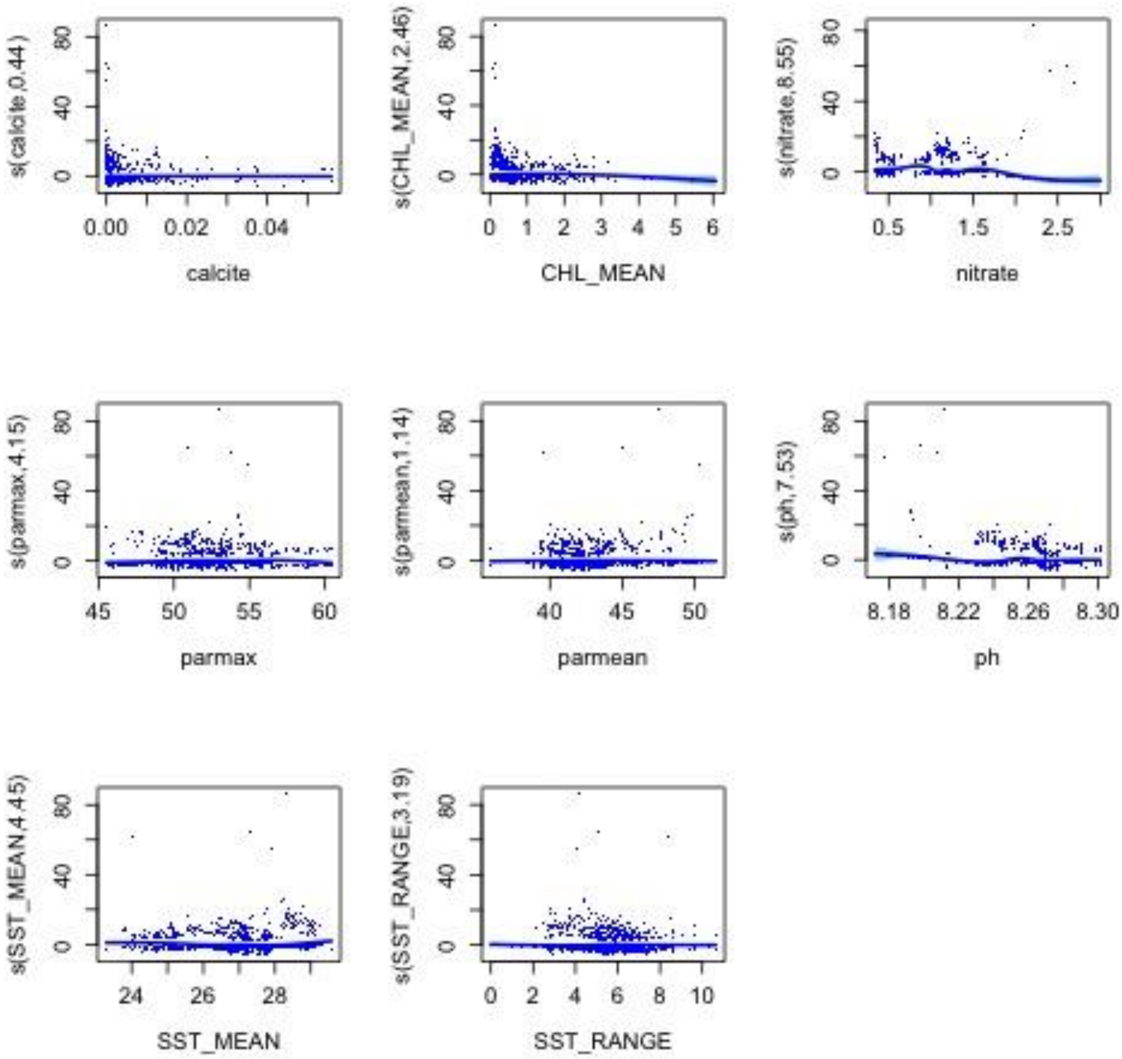
288Naso tuberosus, n = 31 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.909270e-05	9	3.463288e-05	3.894171e-01
s(CHL_MEAN)	1.014112e-05	9	5.609928e-07	1.000000e+00
s(nitrate)	9.425361e-01	9	1.546895e+01	2.522402e-05
s(parmax)	3.581164e+00	9	1.599285e+01	4.876425e-04
s(parmean)	1.019713e-05	9	1.247145e-06	1.000000e+00
s(ph)	2.196589e-05	9	1.003440e-05	5.381112e-01
s(SST_MEAN)	2.123646e+00	9	6.896345e+00	1.554655e-02
s(SST_RANGE)	1.326516e+00	9	2.418727e+00	1.284286e-01



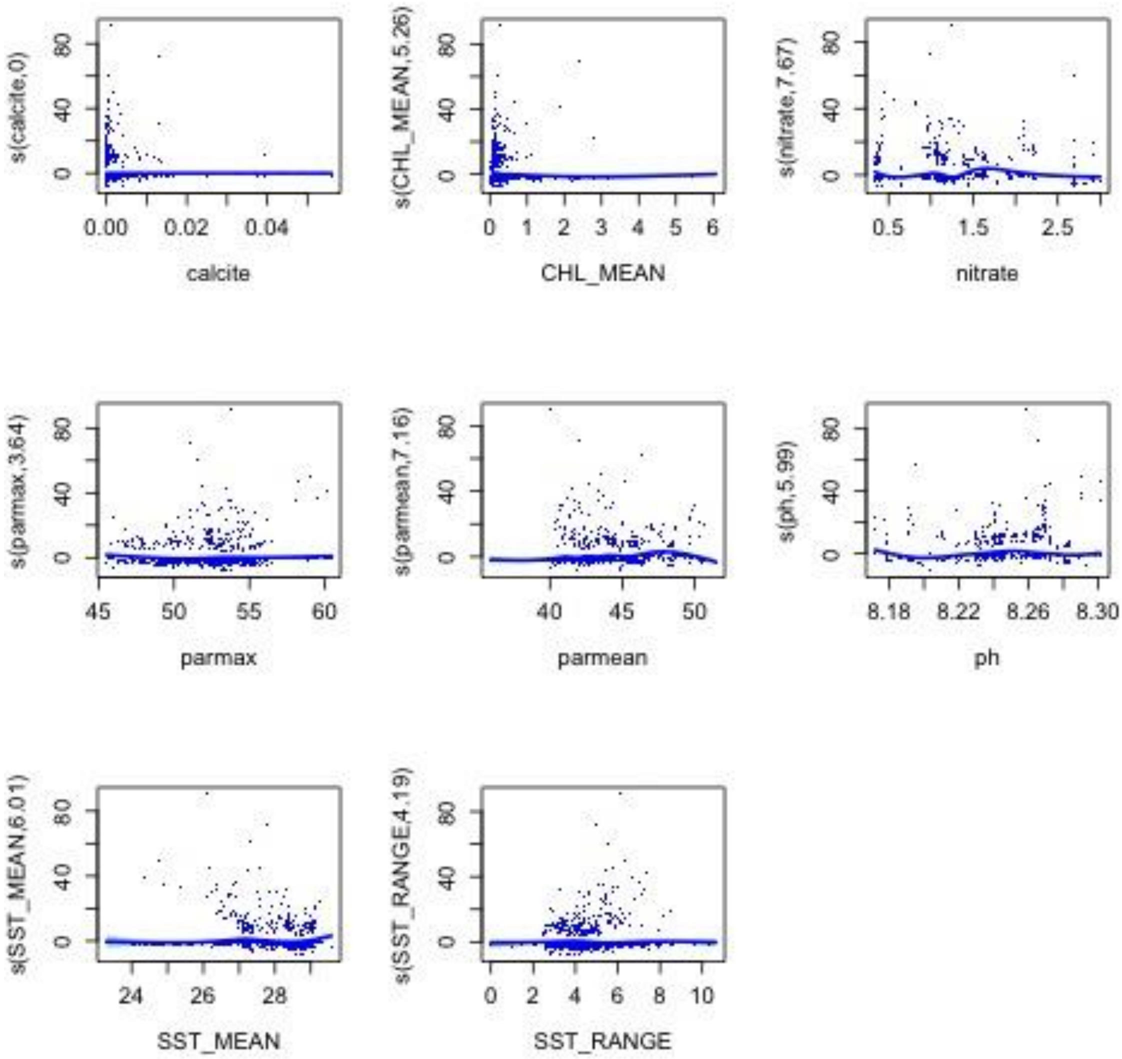
289Naso unicornis, n = 637 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.4426325	7	0.7868259	1.747765e-01
s(CHL_MEAN)	2.4623546	9	13.9957167	5.423863e-04
s(nitrate)	8.5547247	9	157.7278015	1.619885e-34
s(parmax)	4.1454978	9	20.4890980	8.115468e-05
s(parmean)	1.1392501	9	2.2485722	1.039721e-01
s(ph)	7.5297303	9	66.0397779	1.134140e-13
s(SST_MEAN)	4.4536400	9	41.8413863	4.336814e-10
s(SST_RANGE)	3.1857408	9	8.9412654	1.782693e-02



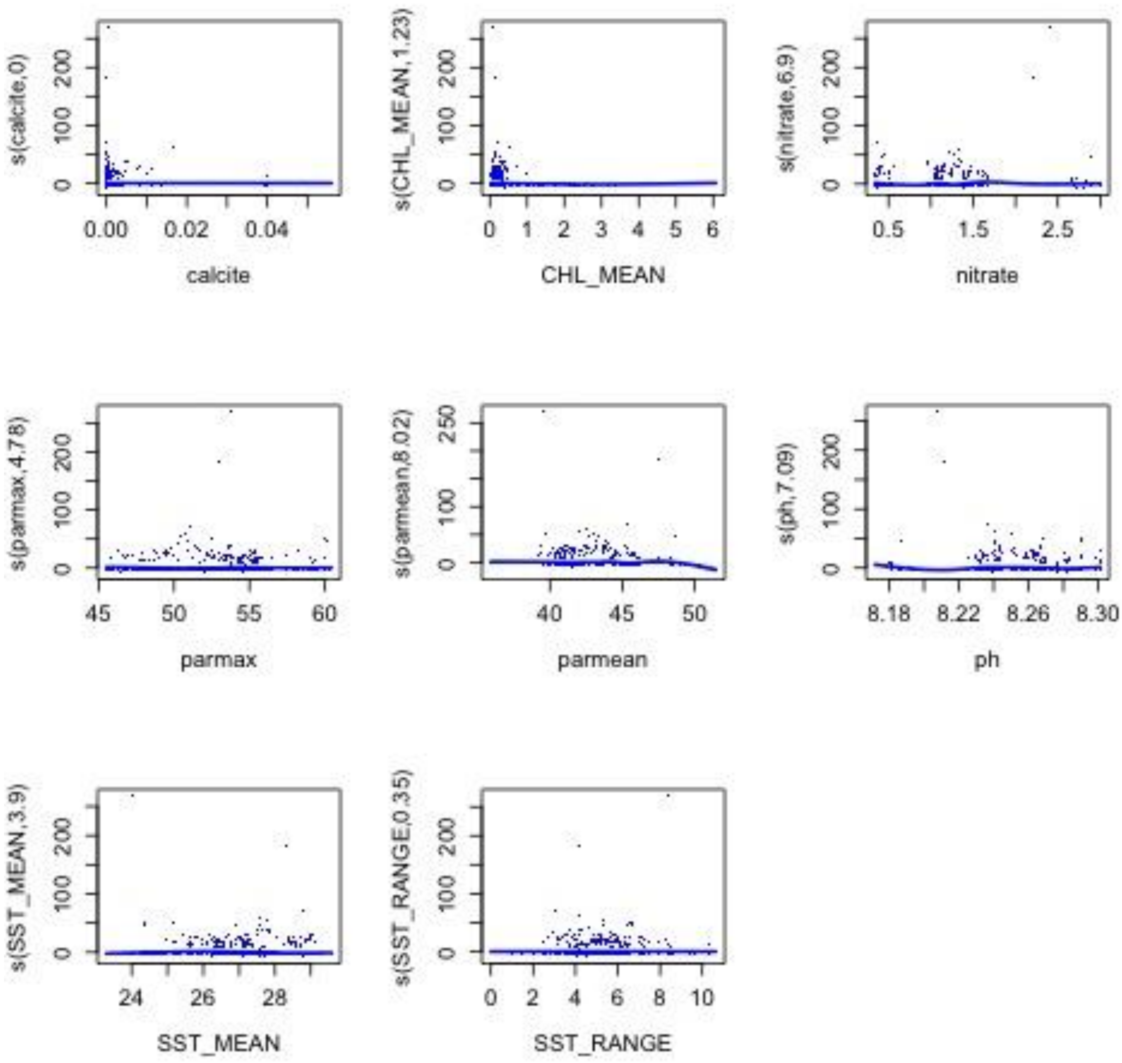
290Naso vlamingii, n = 547 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.987122e-05	9	2.848366e-05	7.061841e-01
s(CHL_MEAN)	5.258822e+00	9	4.779921e+01	4.717580e-10
s(nitrate)	7.666797e+00	9	1.451724e+02	1.145217e-33
s(parmax)	3.643768e+00	9	2.346810e+01	4.045571e-06
s(parmean)	7.157900e+00	9	7.753643e+01	5.253834e-16
s(ph)	5.993671e+00	9	5.656389e+01	3.873698e-13
s(SST_MEAN)	6.007467e+00	9	5.604849e+01	9.215756e-13
s(SST_RANGE)	4.193115e+00	9	1.764544e+01	4.962841e-04



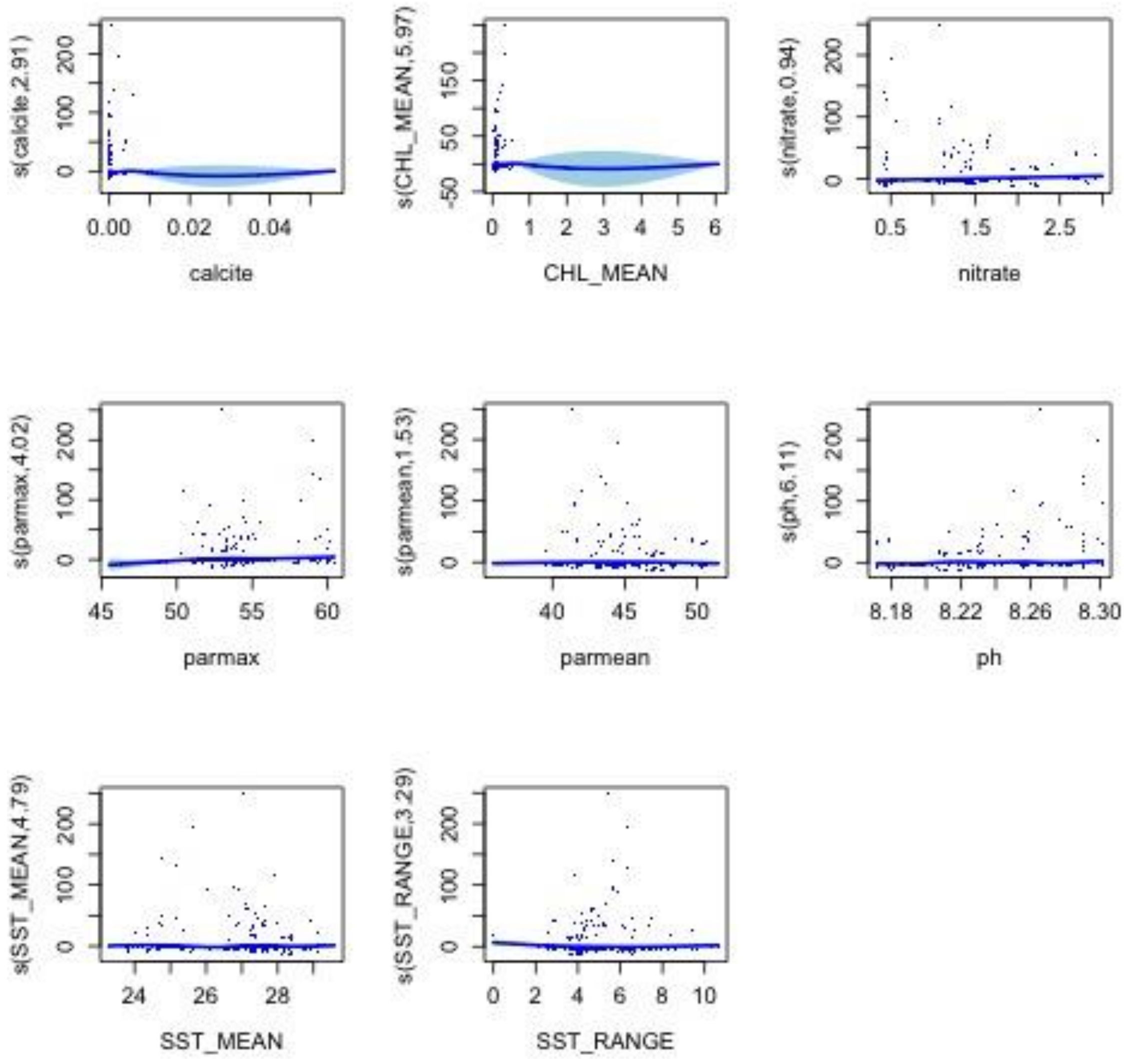
291Nemateleotris magnifica, n = 356 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.912445e-05	9	4.729920e-06	7.369212e-01
s(CHL_MEAN)	1.227471e+00	9	1.171112e+01	3.200309e-04
s(nitrate)	6.900954e+00	9	9.702456e+01	1.776255e-21
s(parmax)	4.775523e+00	9	4.138677e+01	1.579958e-09
s(parmean)	8.023330e+00	9	4.561345e+01	3.025032e-08
s(ph)	7.089267e+00	9	4.821569e+01	7.315440e-10
s(SST_MEAN)	3.902767e+00	9	3.200509e+01	6.537018e-08
s(SST_RANGE)	3.523119e-01	9	4.392339e-01	2.567628e-01



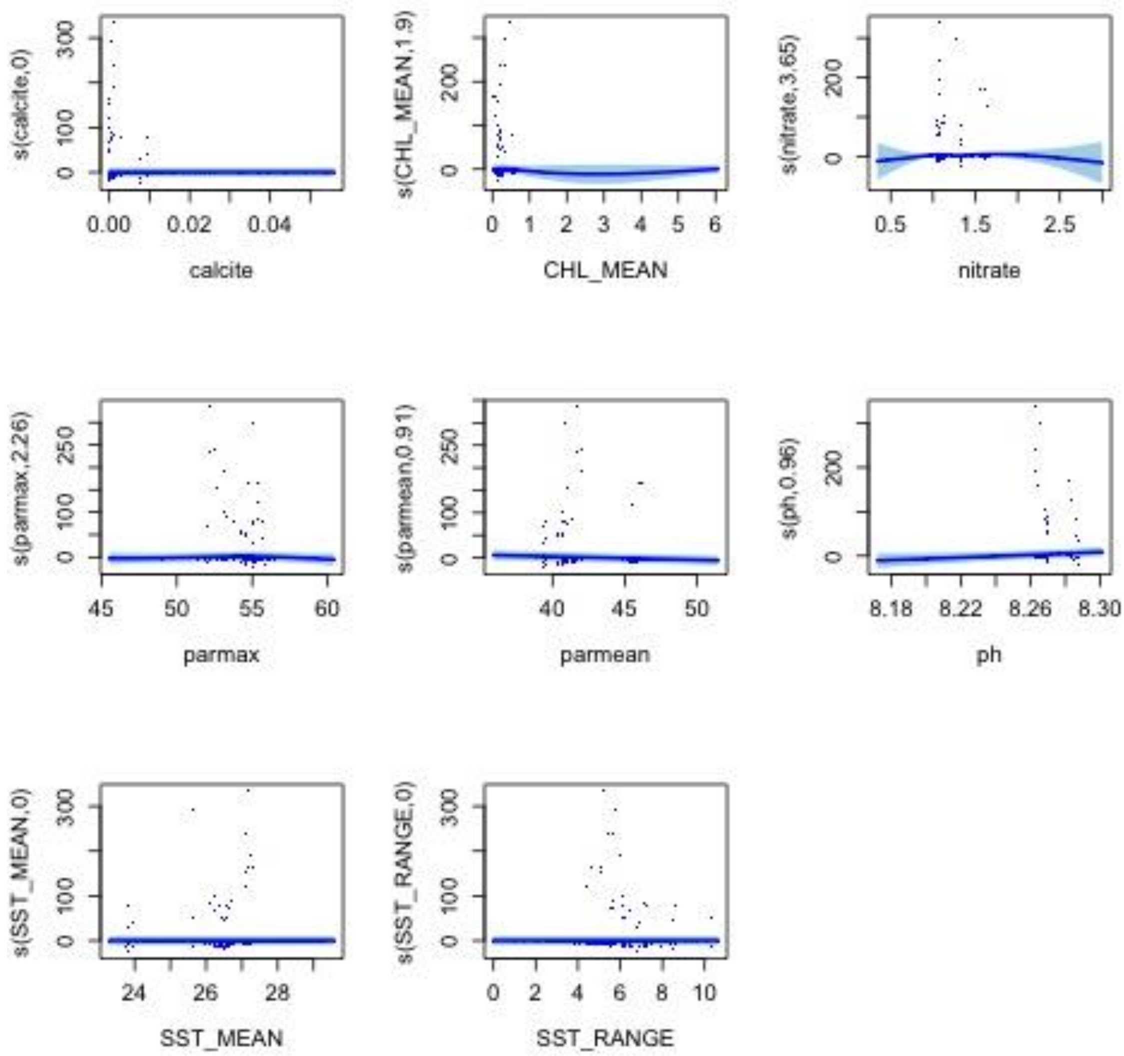
292Neocirrhites armatus, n = 125 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.9079863	9	14.265266	9.999300e-04
s(CHL_MEAN)	5.9660069	9	25.171744	8.213237e-05
s(nitrate)	0.9362584	9	13.196418	4.388654e-06
s(parmax)	4.0175908	9	27.429173	3.938984e-07
s(parmean)	1.5252589	9	4.156831	2.400977e-02
s(ph)	6.1063895	9	23.420099	4.505380e-05
s(SST_MEAN)	4.7892610	9	22.860202	1.692816e-05
s(SST_RANGE)	3.2937697	9	17.126983	8.628391e-05



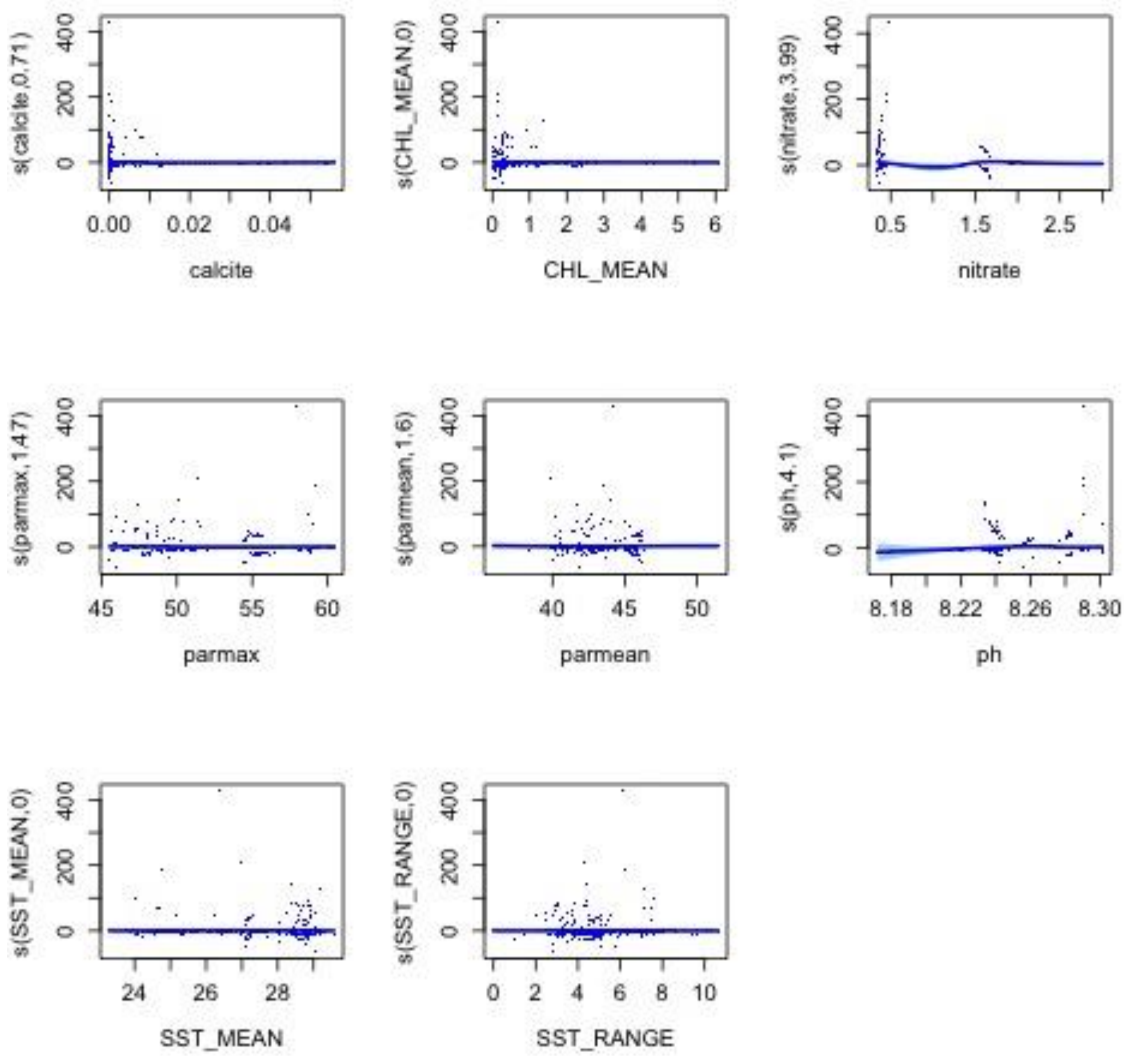
293Neoglyphidodon carlsoni, n = 38 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.480891e-06	9	2.615094e-06	0.5323965290
s(CHL_MEAN)	1.904337e+00	9	4.215413e+00	0.0861692395
s(nitrate)	3.648832e+00	9	1.796577e+01	0.0001897437
s(parmax)	2.256264e+00	9	1.020032e+01	0.0030564513
s(parmean)	9.117350e-01	9	9.711285e+00	0.0003194093
s(ph)	9.641571e-01	9	9.078279e+00	0.0004834814
s(SST_MEAN)	4.482789e-04	9	5.401936e-04	0.2312812884
s(SST_RANGE)	2.313617e-03	9	2.485685e-03	0.2880517773



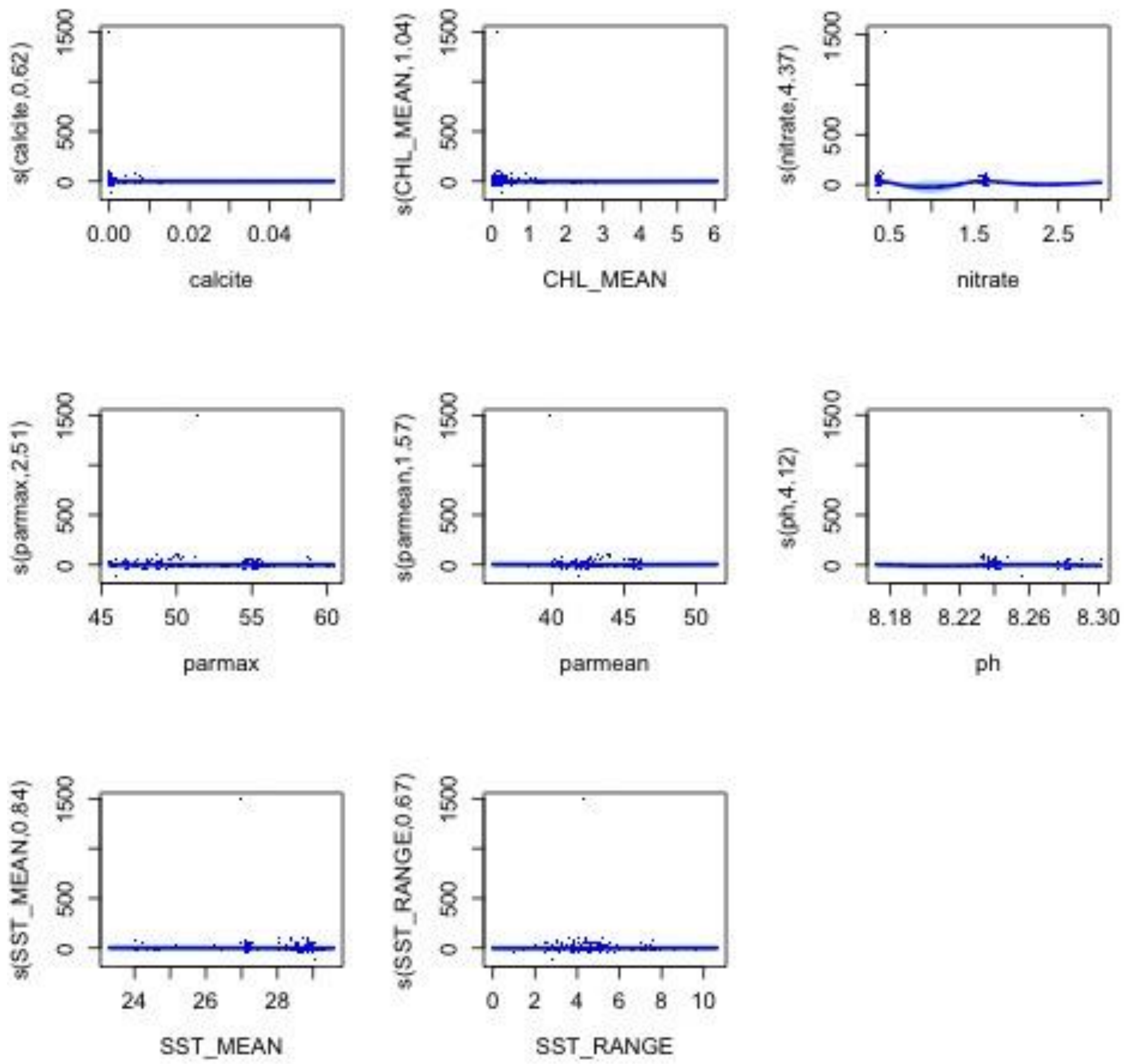
294 Neoglyphidodon melas, n = 68 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.109630e-01	9	1.848405e+00	9.642394e-02
s(CHL_MEAN)	2.023837e-04	9	2.704345e-04	2.105916e-01
s(nitrate)	3.992210e+00	9	3.863744e+01	7.518344e-10
s(parmax)	1.473693e+00	9	3.323596e+00	5.984590e-02
s(parmean)	1.603481e+00	9	3.522485e+00	5.076645e-02
s(ph)	4.101598e+00	9	2.806165e+01	2.584812e-07
s(SST_MEAN)	1.998450e-05	9	8.033624e-06	6.236290e-01
s(SST_RANGE)	1.484643e-05	9	2.103230e-06	1.000000e+00



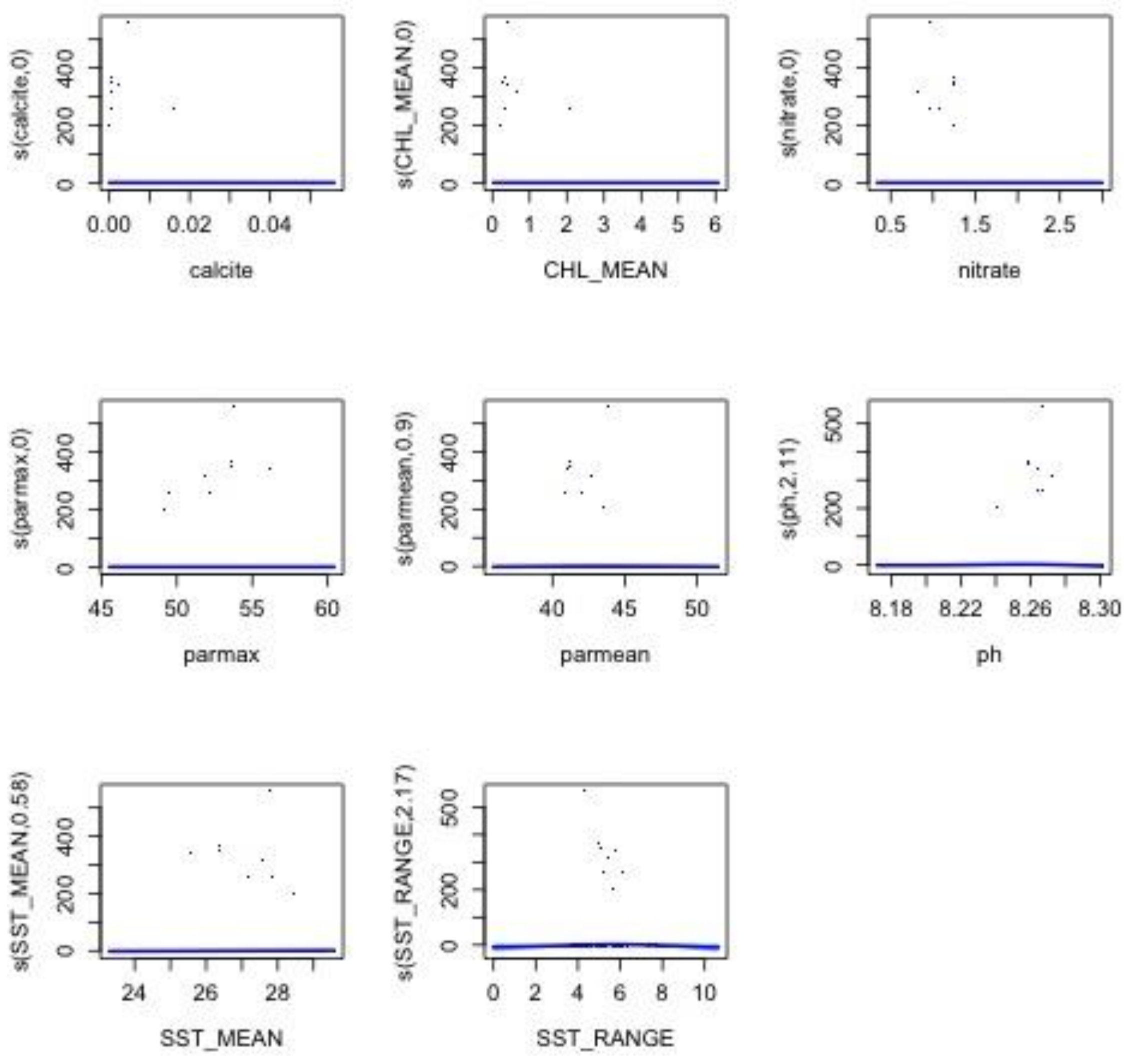
295 Neoglyphidodon nigroris, n = 79 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6213646	9	1.297029	1.310929e-01
s(CHL_MEAN)	1.0353069	9	6.894832	3.767442e-03
s(nitrate)	4.3724396	8	18.377013	1.508729e-04
s(parmax)	2.5134863	9	8.728853	5.796475e-03
s(parmean)	1.5676534	9	5.763918	7.554620e-03
s(ph)	4.1225363	9	31.538531	7.957636e-08
s(SST_MEAN)	0.8409608	8	5.260695	5.661555e-03
s(SST_RANGE)	0.6736386	9	2.012954	7.718748e-02



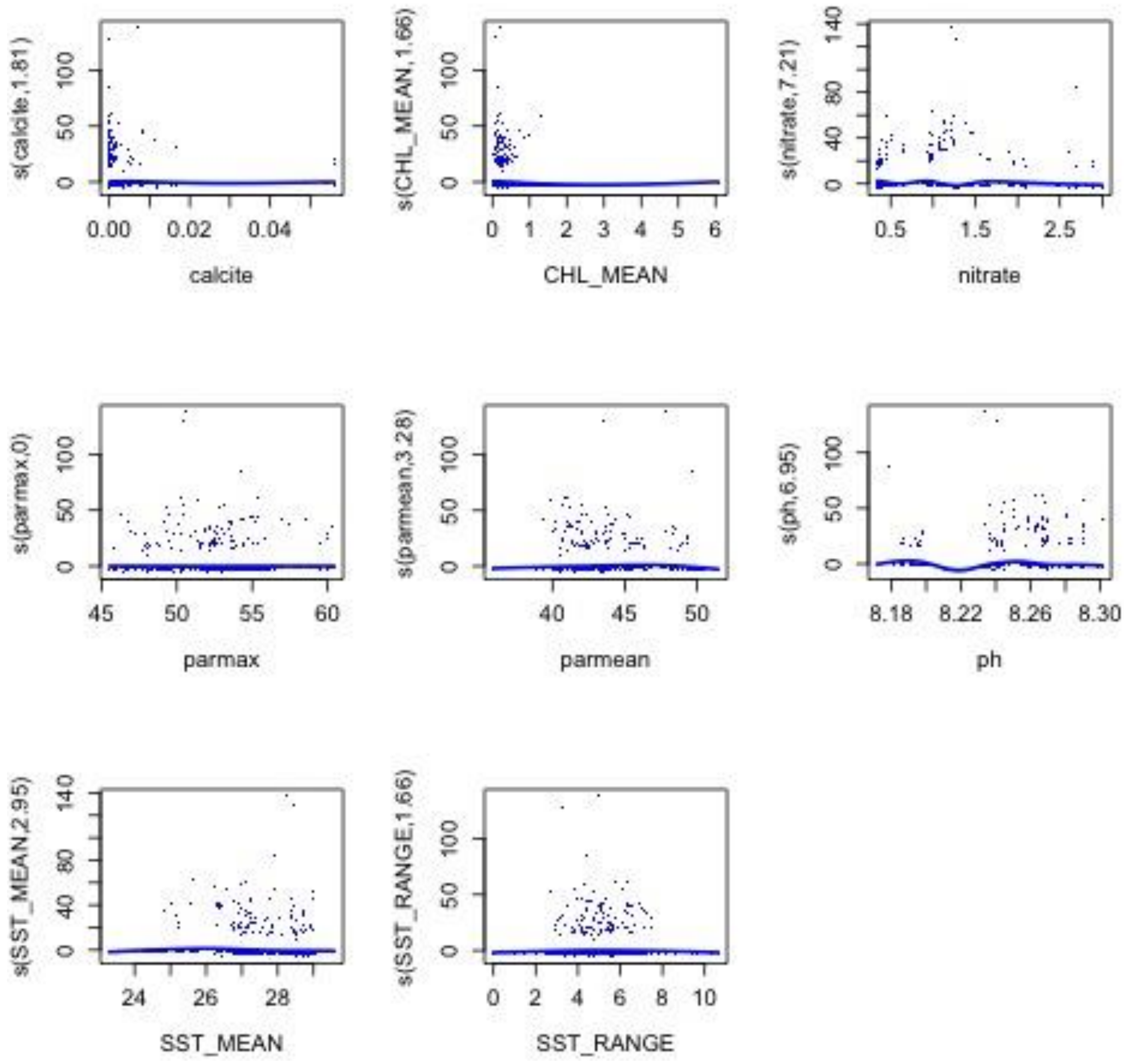
296 Neopomacentrus metallicus, n = 47 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.568213e-06	9	1.887515e-07	1.00000000
s(CHL_MEAN)	1.610643e-04	9	1.147708e-04	0.38486618
s(nitrate)	4.348369e-06	9	1.255722e-06	0.66322343
s(parmax)	3.887565e-06	9	1.165605e-06	0.74917551
s(parmean)	9.000689e-01	9	1.188175e+00	0.22554925
s(ph)	2.109246e+00	9	3.764156e+00	0.11492054
s(SST_MEAN)	5.846040e-01	8	1.446745e+00	0.09339663
s(SST_RANGE)	2.168499e+00	9	6.690394e+00	0.02136863



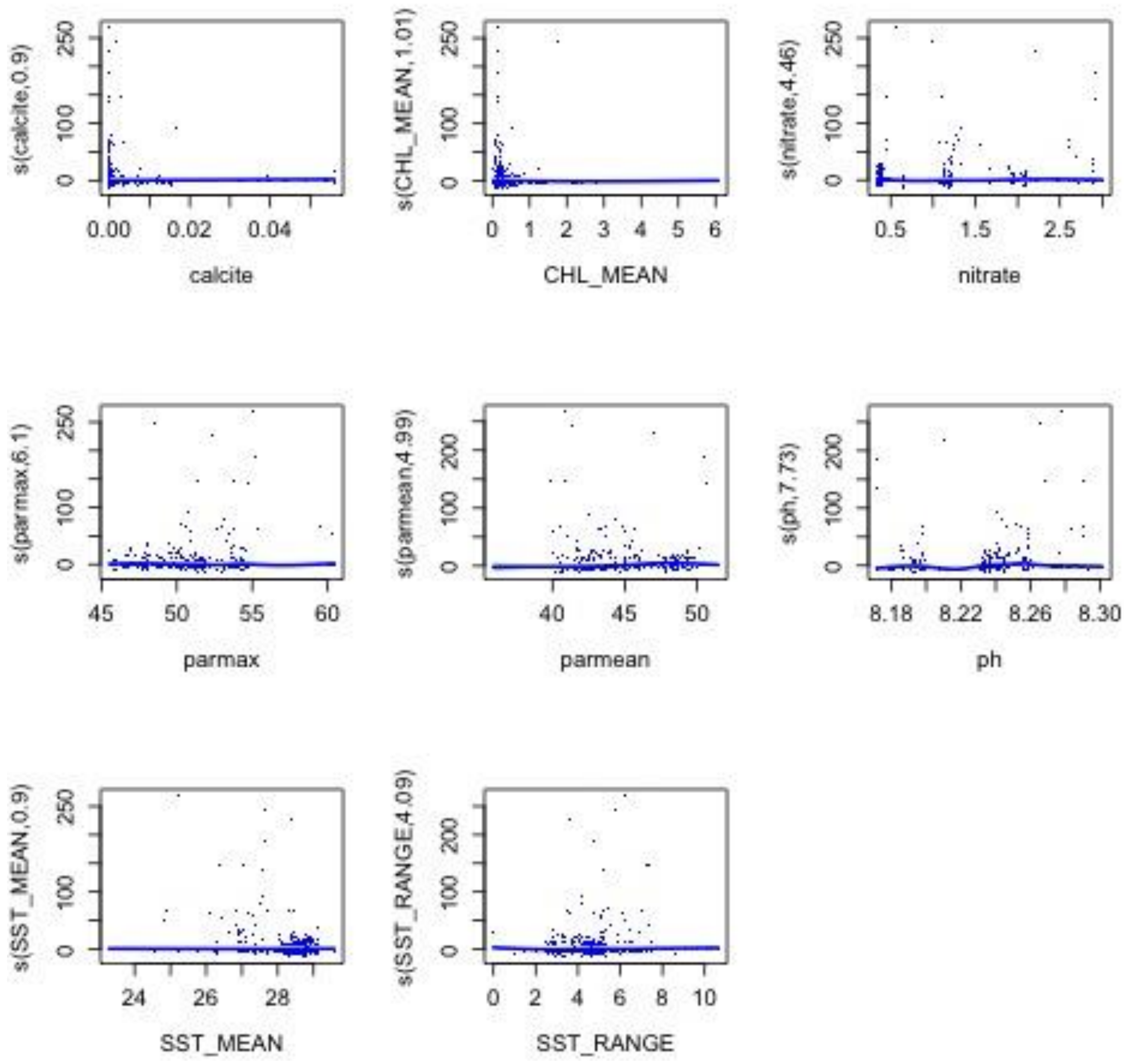
297 Novaculichthys taeniourus, n = 180 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.813537e+00	9	5.960072e+00	3.125853e-02
s(CHL_MEAN)	1.657580e+00	9	8.616471e+00	4.276635e-03
s(nitrate)	7.213017e+00	9	8.422320e+01	9.029740e-19
s(parmax)	7.738231e-05	9	7.963483e-06	1.000000e+00
s(parmean)	3.278801e+00	9	2.485376e+01	9.448873e-07
s(ph)	6.948401e+00	9	5.365167e+01	3.591420e-11
s(SST_MEAN)	2.950675e+00	9	1.599637e+01	9.111824e-05
s(SST_RANGE)	1.663825e+00	9	4.263505e+00	4.699726e-02



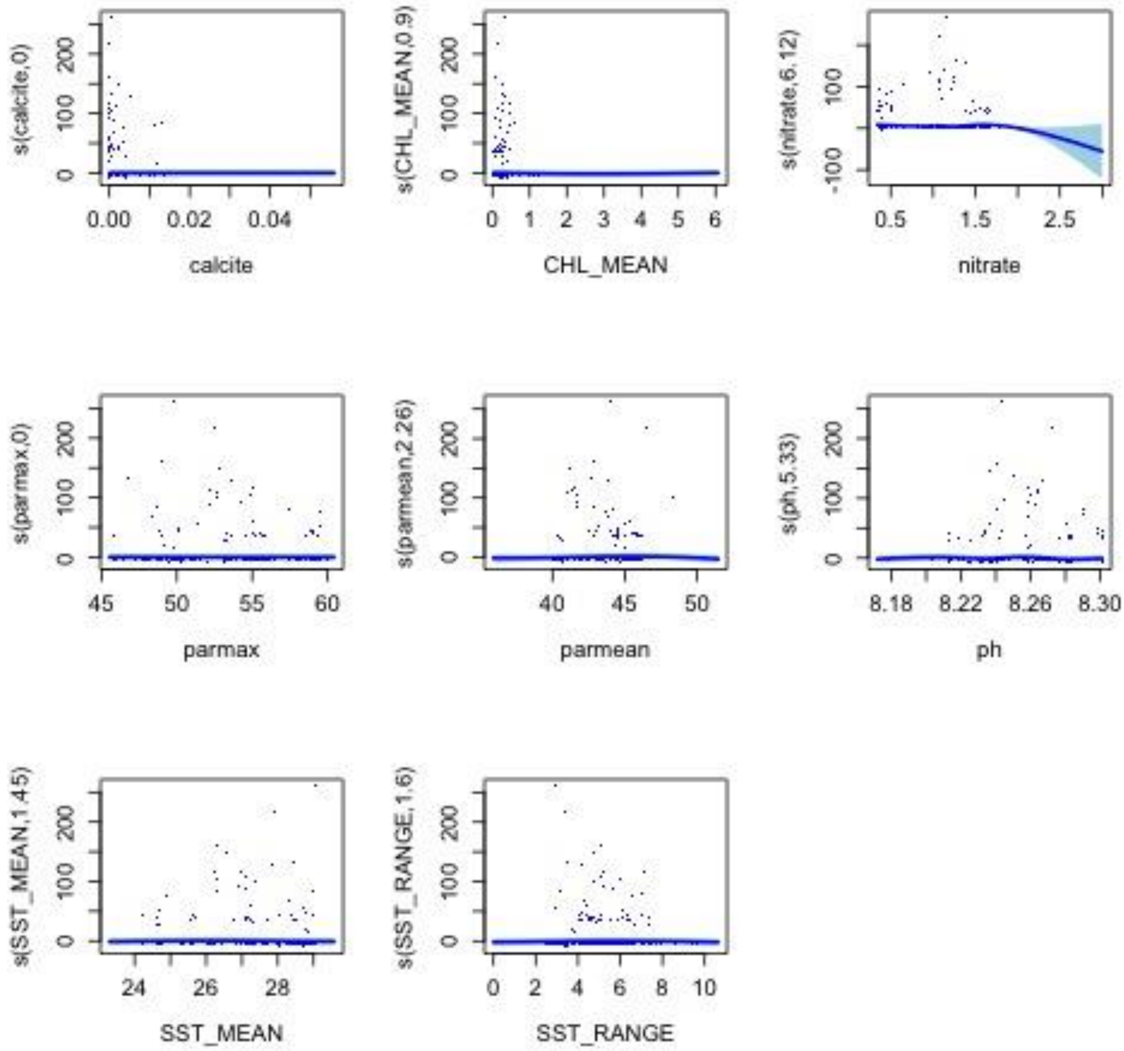
298 Odonus niger, n = 307 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9018093	8	8.641502	1.428461e-03
s(CHL_MEAN)	1.0116917	9	6.173913	7.208639e-03
s(nitrate)	4.4622408	9	77.755055	4.848744e-20
s(parmax)	6.1010215	9	31.699741	2.583158e-06
s(parmean)	4.9856046	9	137.413648	1.925209e-34
s(ph)	7.7337478	9	90.285540	2.851192e-20
s(SST_MEAN)	0.8996261	9	1.879634	9.655676e-02
s(SST_RANGE)	4.0905182	9	16.862433	5.309138e-04



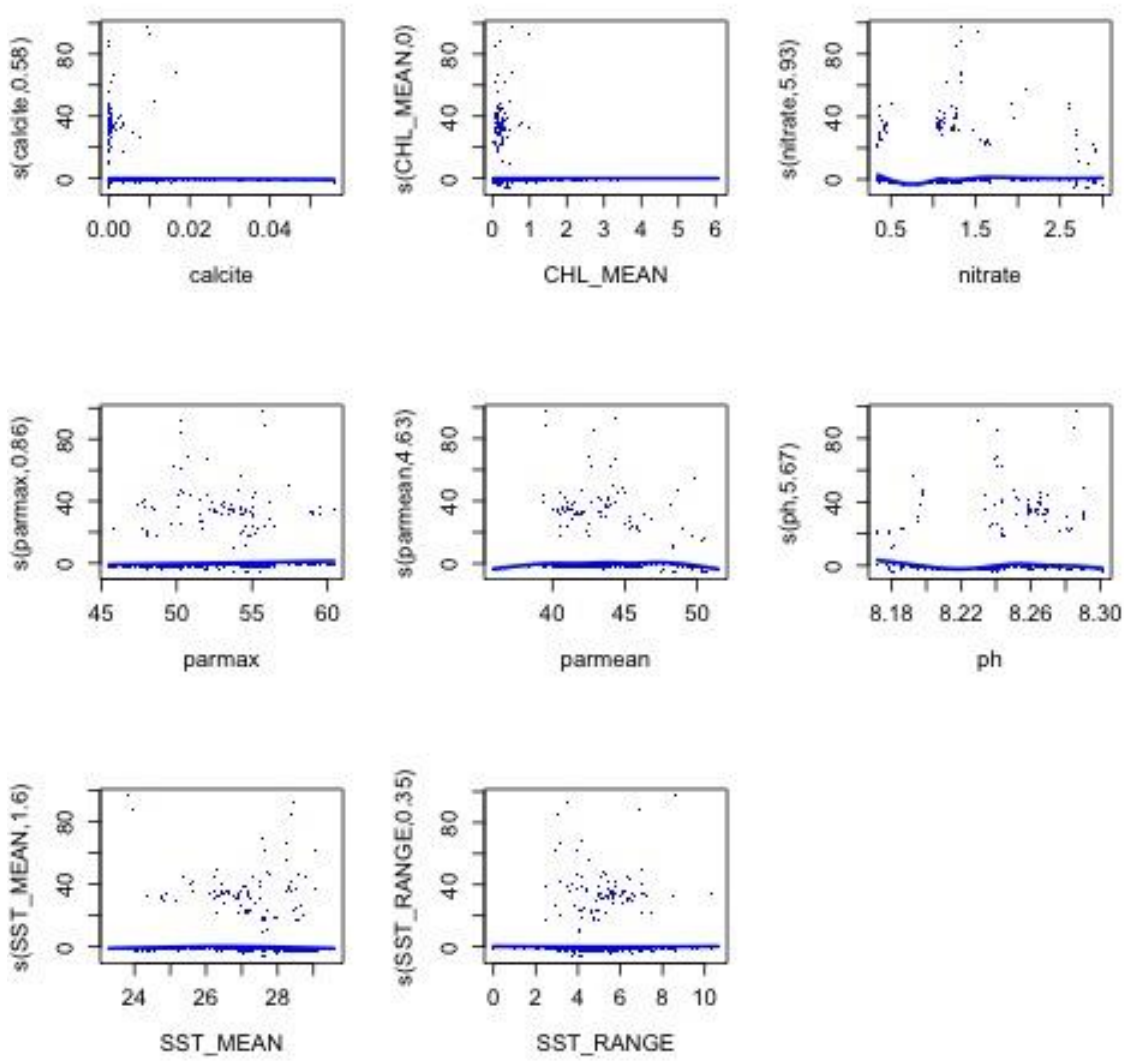
299 Ostracion cubicus, n = 59 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.600246e-05	9	1.810094e-06	1.000000e+00
s(CHL_MEAN)	8.994245e-01	9	2.518638e+00	7.655645e-02
s(nitrate)	6.121080e+00	9	6.702707e+01	2.010174e-15
s(parmax)	7.188265e-04	9	9.565062e-04	2.030352e-01
s(parmean)	2.259926e+00	9	1.328180e+01	1.060955e-04
s(ph)	5.333380e+00	9	3.356797e+01	5.831262e-08
s(SST_MEAN)	1.450020e+00	9	4.036253e+00	2.840956e-02
s(SST_RANGE)	1.598342e+00	9	3.338617e+00	7.917058e-02



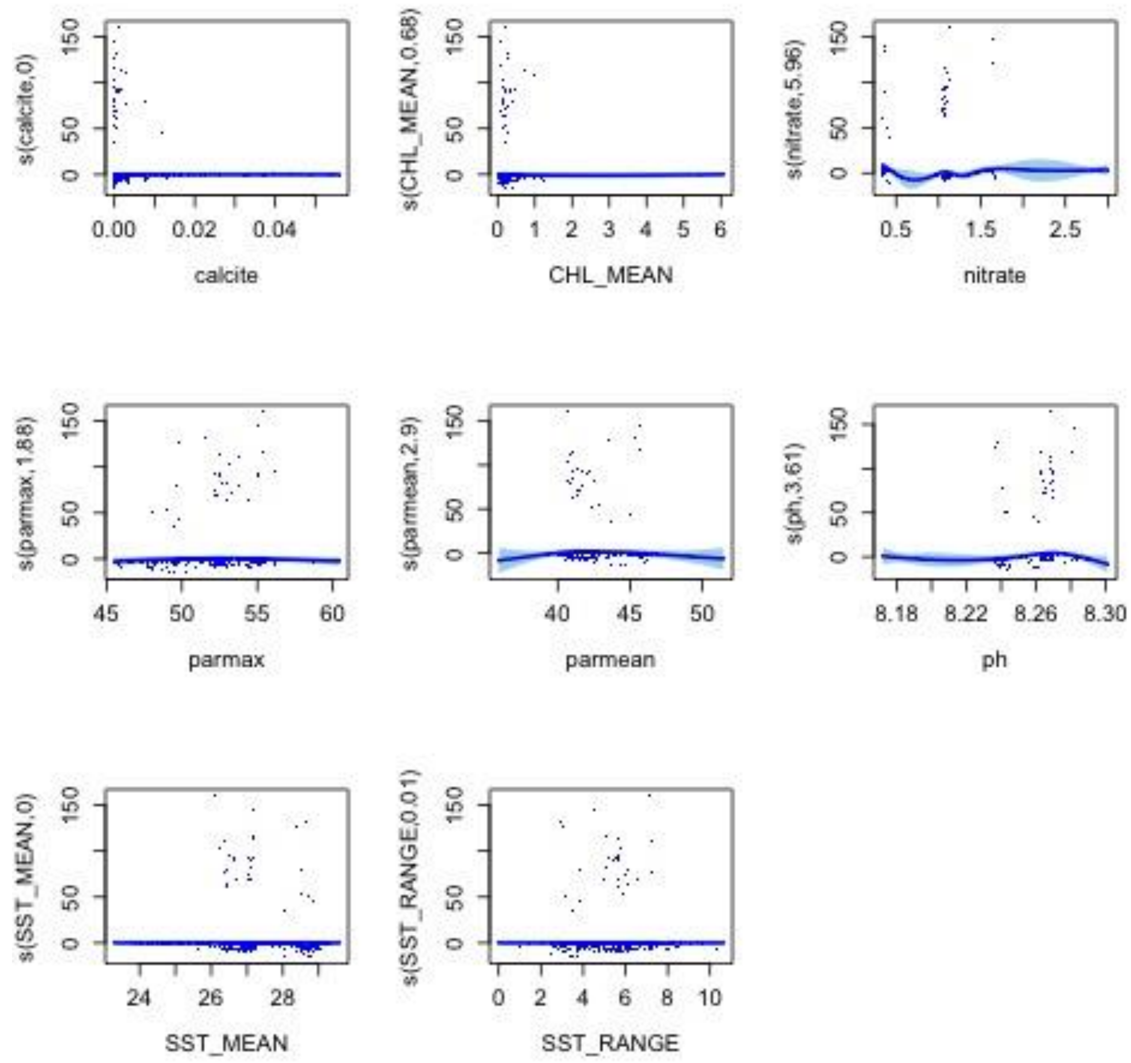
300 Ostracion meleagris, n = 233 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.782947e-01	6	1.074852e+00	1.681001e-01
s(CHL_MEAN)	7.316751e-05	9	2.668041e-05	5.514094e-01
s(nitrate)	5.934802e+00	9	5.012879e+01	2.045028e-11
s(parmax)	8.622703e-01	9	5.974257e+00	3.568135e-03
s(parmean)	4.629399e+00	9	2.916742e+01	6.699447e-07
s(ph)	5.667962e+00	9	3.258477e+01	1.875911e-07
s(SST_MEAN)	1.599776e+00	9	5.845425e+00	9.519905e-03
s(SST_RANGE)	3.493114e-01	9	4.362939e-01	2.452090e-01



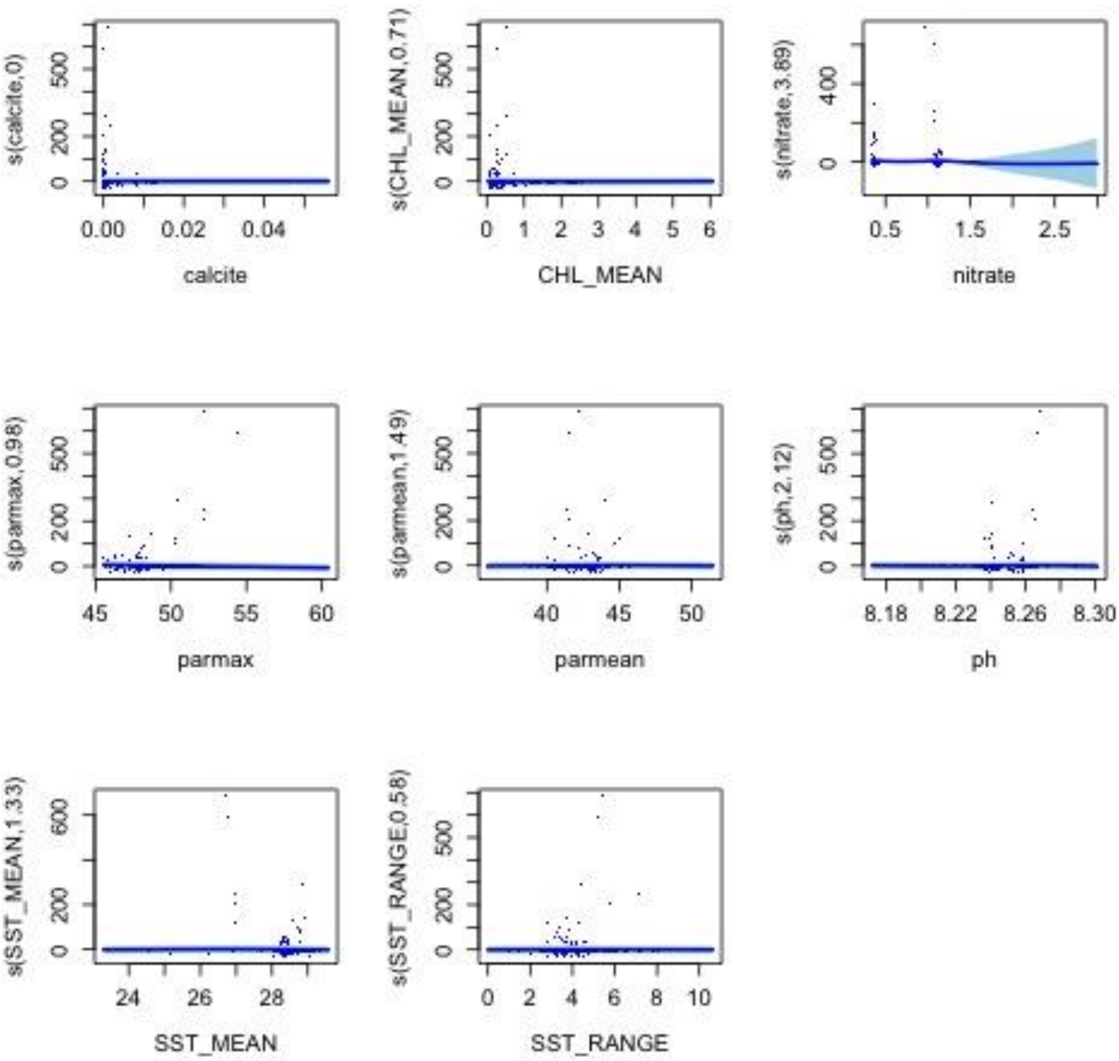
301 Ostracion solorensis, n = 40 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.015993e-05	9	1.090961e-05	7.291819e-01
s(CHL_MEAN)	6.802948e-01	9	1.528679e+00	1.199960e-01
s(nitrate)	5.961200e+00	9	3.536754e+01	5.440272e-08
s(parmax)	1.884927e+00	9	4.726899e+00	3.670548e-02
s(parmean)	2.897096e+00	9	7.147703e+00	3.048741e-02
s(ph)	3.605950e+00	9	1.857382e+01	4.941970e-05
s(SST_MEAN)	1.445575e-04	9	7.587899e-05	5.446567e-01
s(SST_RANGE)	7.030427e-03	9	7.772706e-03	2.815217e-01



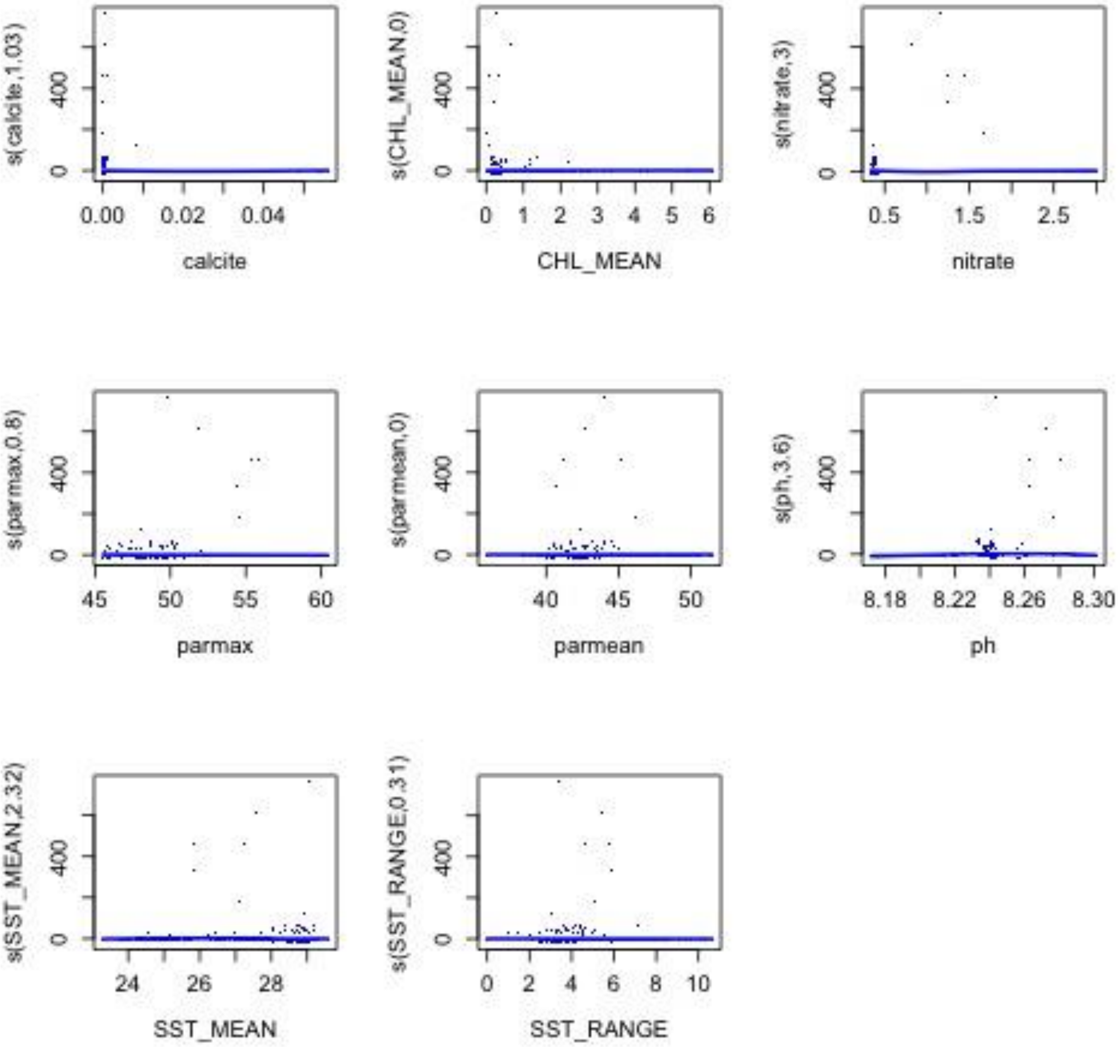
302Oxycheilinus bimaculatus, n = 35 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.687653e-05	8	1.025145e-05	4.312810e-01
s(CHL_MEAN)	7.090326e-01	9	1.444127e+00	1.369841e-01
s(nitrate)	3.886409e+00	9	1.986894e+01	6.985376e-05
s(parmax)	9.761161e-01	9	3.811727e+01	5.118575e-12
s(parmean)	1.491766e+00	9	4.397669e+00	2.435539e-02
s(ph)	2.116186e+00	9	7.661396e+00	8.825156e-03
s(SST_MEAN)	1.325710e+00	9	3.654341e+00	3.859128e-02
s(SST_RANGE)	5.786135e-01	9	7.584948e-01	2.256399e-01



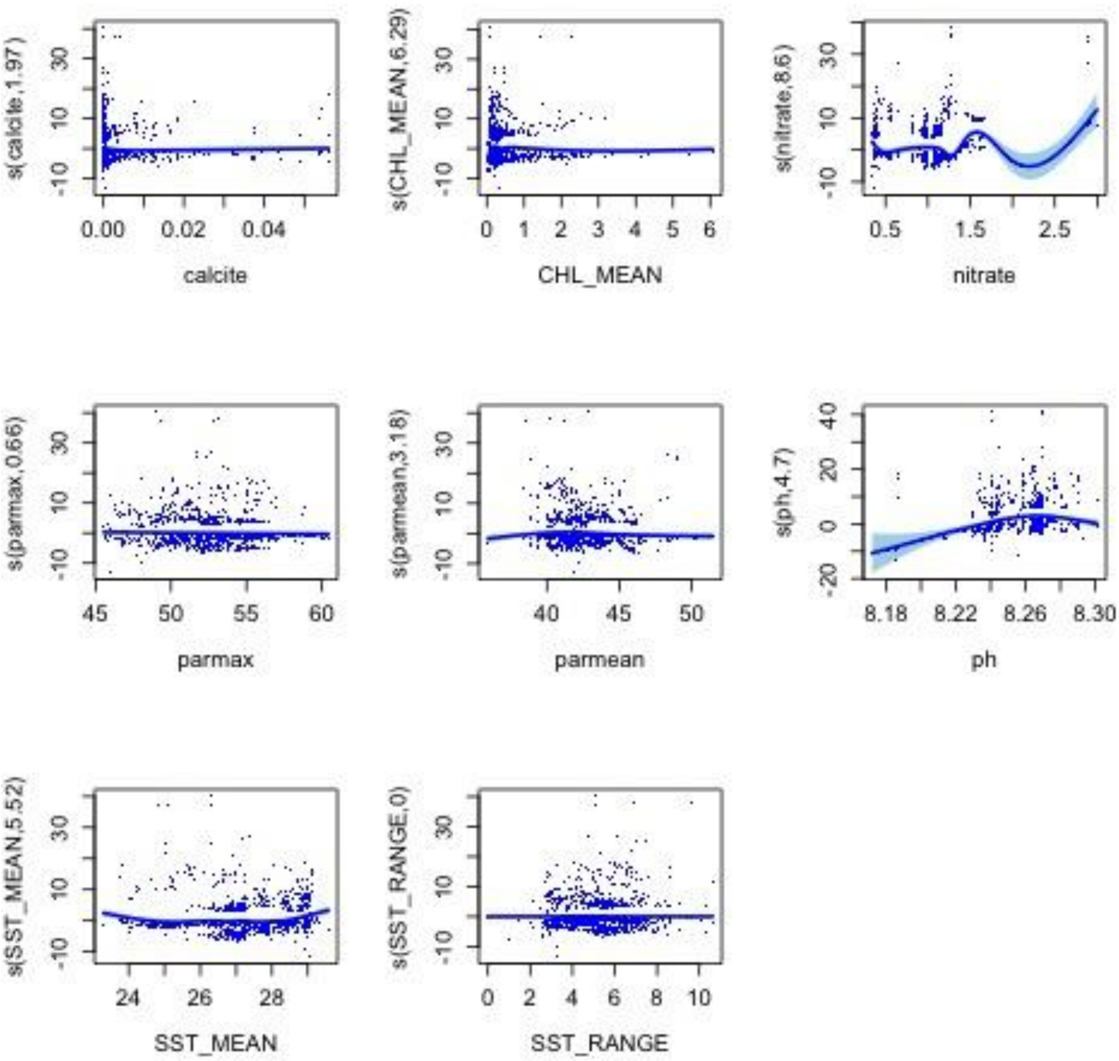
303Oxycheilinus celebicus, n = 35 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.034934e+00	9	6.128251e+00	8.294764e-03
s(CHL_MEAN)	6.713539e-06	9	2.334137e-06	5.411827e-01
s(nitrate)	2.999951e+00	9	5.826074e+01	4.501351e-16
s(parmax)	7.972524e-01	9	3.659223e+00	2.625255e-02
s(parmean)	1.342659e-05	9	7.550036e-06	5.366099e-01
s(ph)	3.600501e+00	9	1.327995e+01	1.586160e-03
s(SST_MEAN)	2.315666e+00	9	7.778170e+00	1.115404e-02
s(SST_RANGE)	3.081266e-01	8	4.385850e-01	2.224822e-01



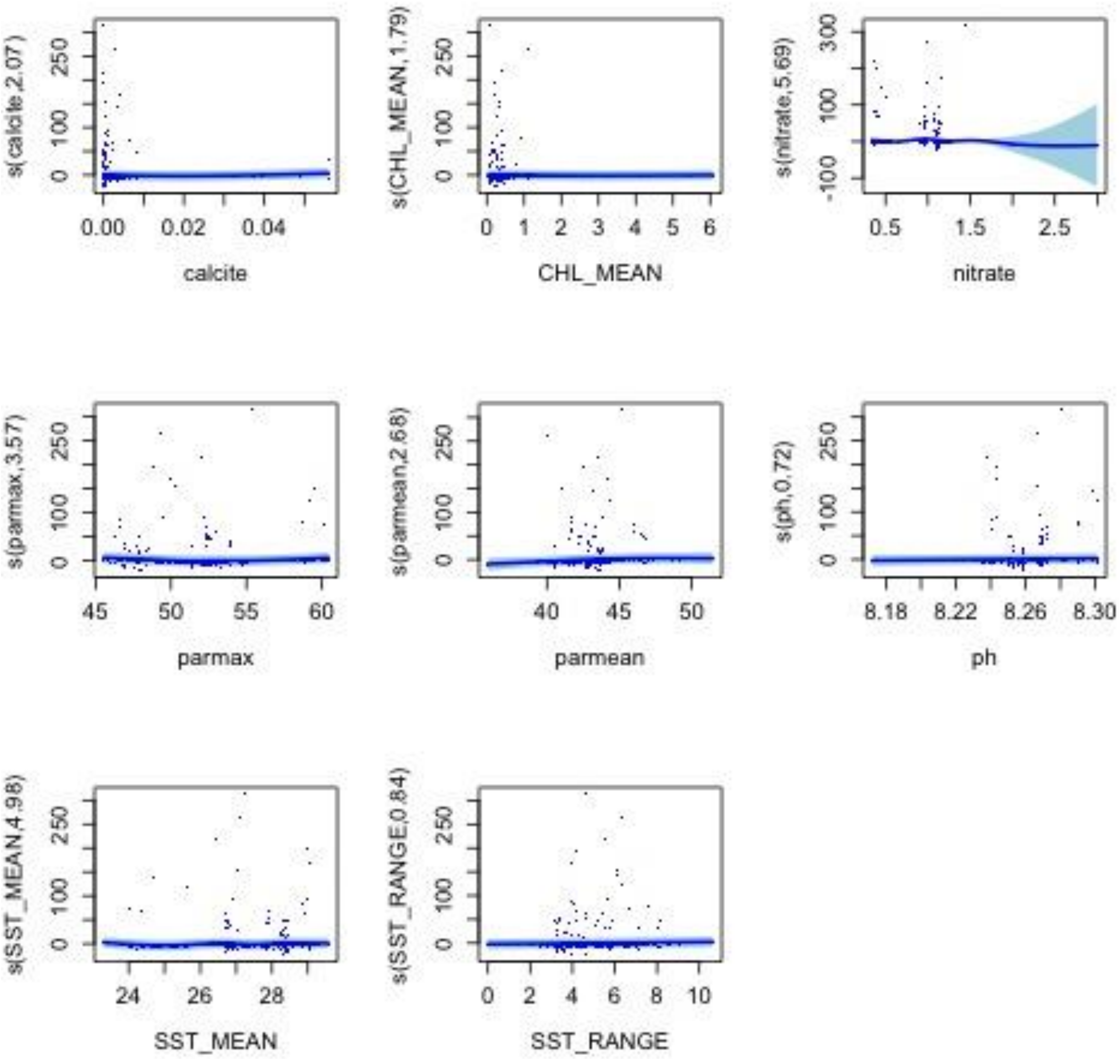
304Oxycheilinus digramma, n = 834 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.9707593336	9	1.438206e+01	3.008328e-04
s(CHL_MEAN)	6.2947387689	9	8.454994e+01	1.719692e-17
s(nitrate)	8.5980099364	9	2.218512e+02	4.757957e-51
s(parmax)	0.6595175651	9	1.753182e+00	9.295439e-02
s(parmean)	3.1822933469	9	2.427291e+01	1.322632e-06
s(ph)	4.7030866259	9	7.935569e+01	1.876008e-21
s(SST_MEAN)	5.5198954239	9	5.976430e+01	1.103705e-13
s(SST_RANGE)	0.0001893273	9	5.406625e-05	7.909821e-01



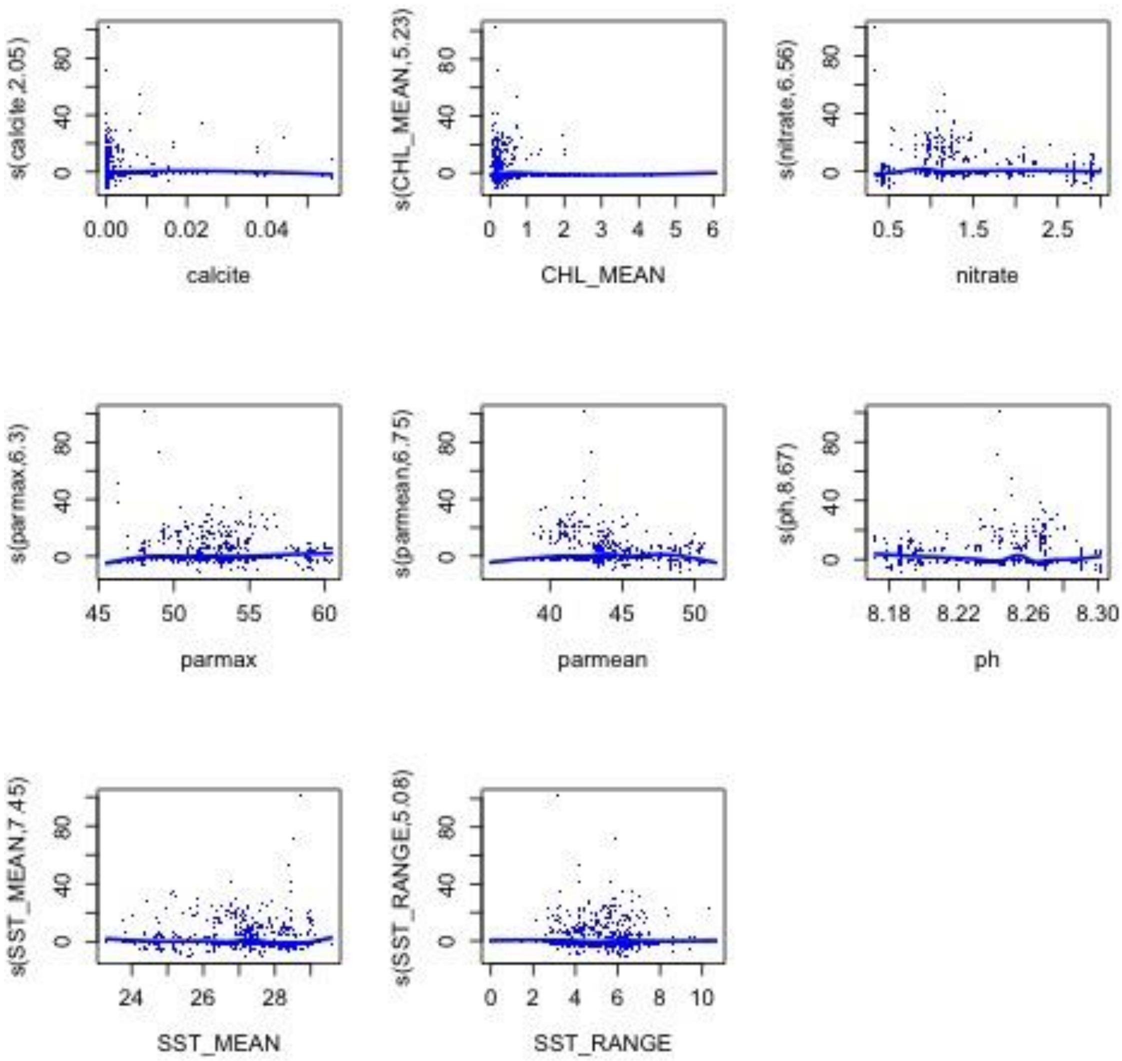
305Oxycheilinus orientalis, n = 49 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.0740205	9	19.995462	6.552915e-06
s(CHL_MEAN)	1.7881760	9	4.324965	6.943597e-02
s(nitrate)	5.6906142	9	25.930011	2.063311e-05
s(parmax)	3.5669256	9	33.448037	2.766540e-09
s(parmean)	2.6760853	9	24.826812	1.868179e-07
s(ph)	0.7233138	8	1.970995	5.243274e-02
s(SST_MEAN)	4.9839686	9	21.229361	7.617987e-05
s(SST_RANGE)	0.8366077	9	4.936743	1.167824e-02



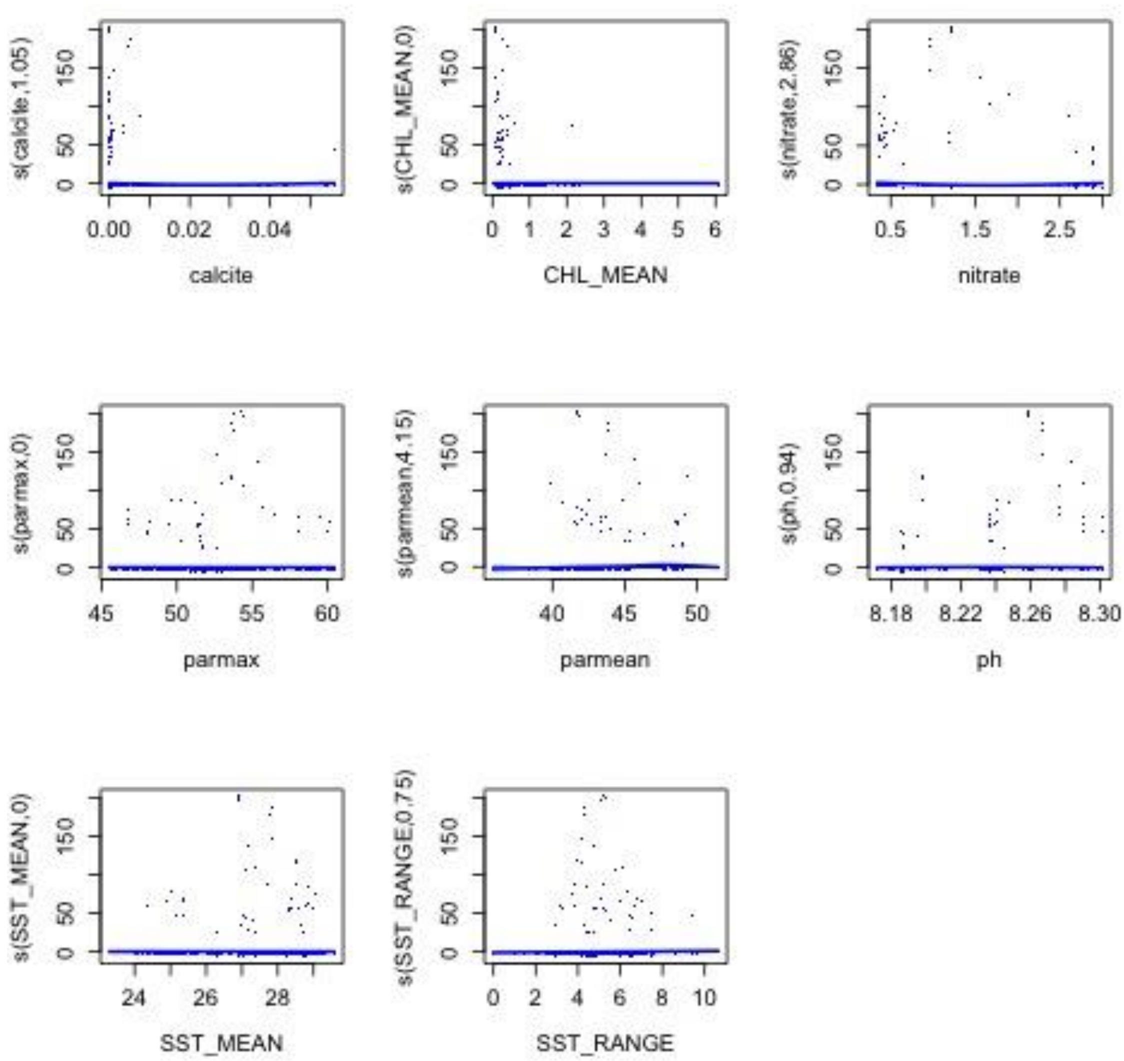
306Oxycheilinus unifasciatus, n = 1181 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.052348	9	12.27467	1.065841e-03
s(CHL_MEAN)	5.232562	9	50.99173	8.091869e-11
s(nitrate)	6.562985	9	30.06347	8.570057e-06
s(parmax)	6.296682	9	32.95878	1.317989e-06
s(parmean)	6.750584	9	103.99157	4.880939e-23
s(ph)	8.672161	9	190.11611	4.348624e-41
s(SST_MEAN)	7.450070	9	58.57674	1.030063e-11
s(SST_RANGE)	5.081945	9	22.23267	1.352573e-04



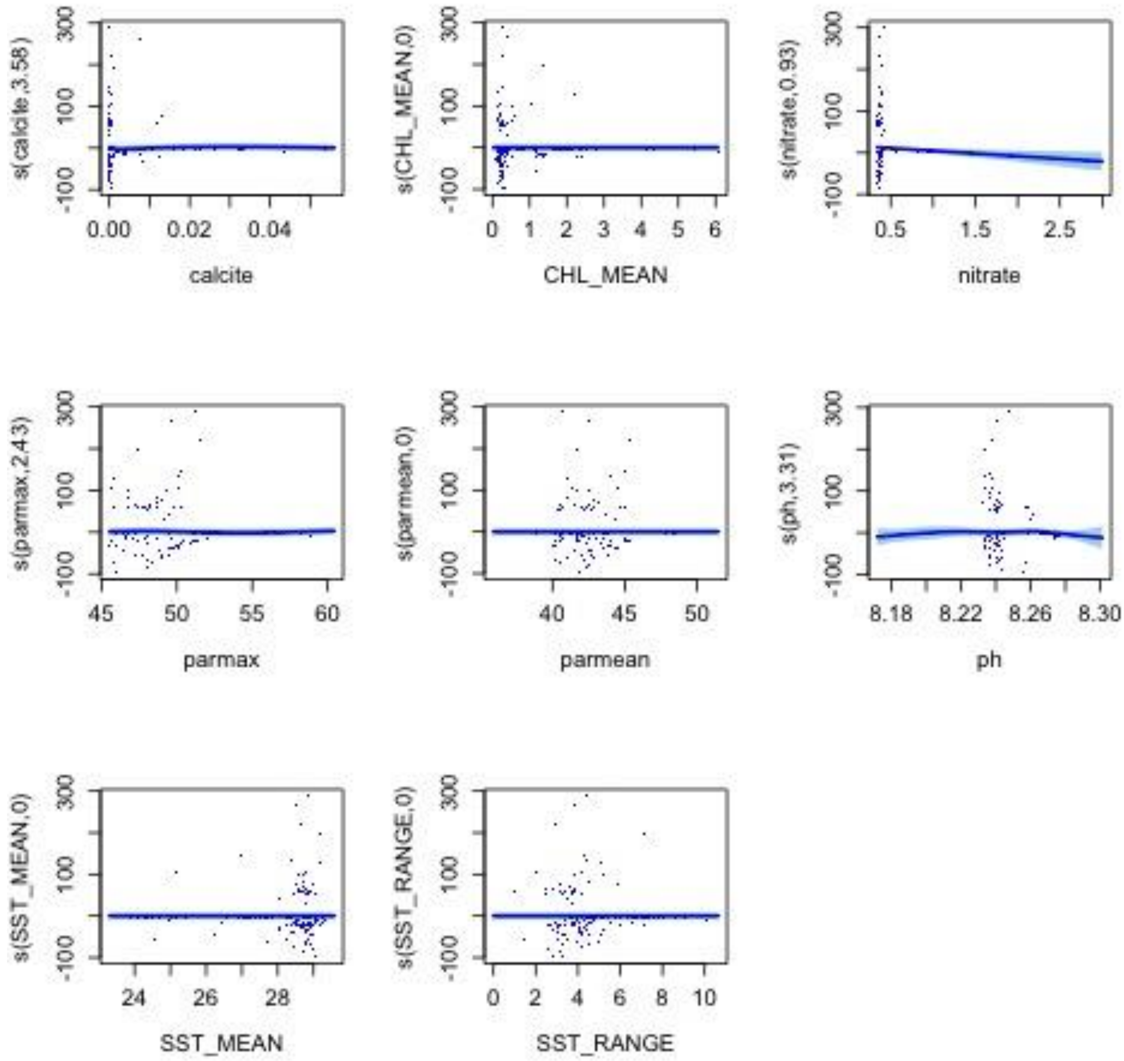
307 Paracanthurus hepatus, n = 73 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.054646e+00	9	4.268974e+00	2.724367e-02
s(CHL_MEAN)	2.292384e-05	9	1.349964e-06	1.000000e+00
s(nitrate)	2.864477e+00	9	4.836391e+01	2.296502e-13
s(parmax)	2.960228e-05	9	6.296172e-06	8.233221e-01
s(parmean)	4.146866e+00	9	5.470642e+01	1.374355e-13
s(ph)	9.398293e-01	9	2.403033e+00	6.063217e-02
s(SST_MEAN)	1.804541e-05	9	4.825879e-06	7.707499e-01
s(SST_RANGE)	7.481250e-01	9	2.946719e+00	3.585748e-02



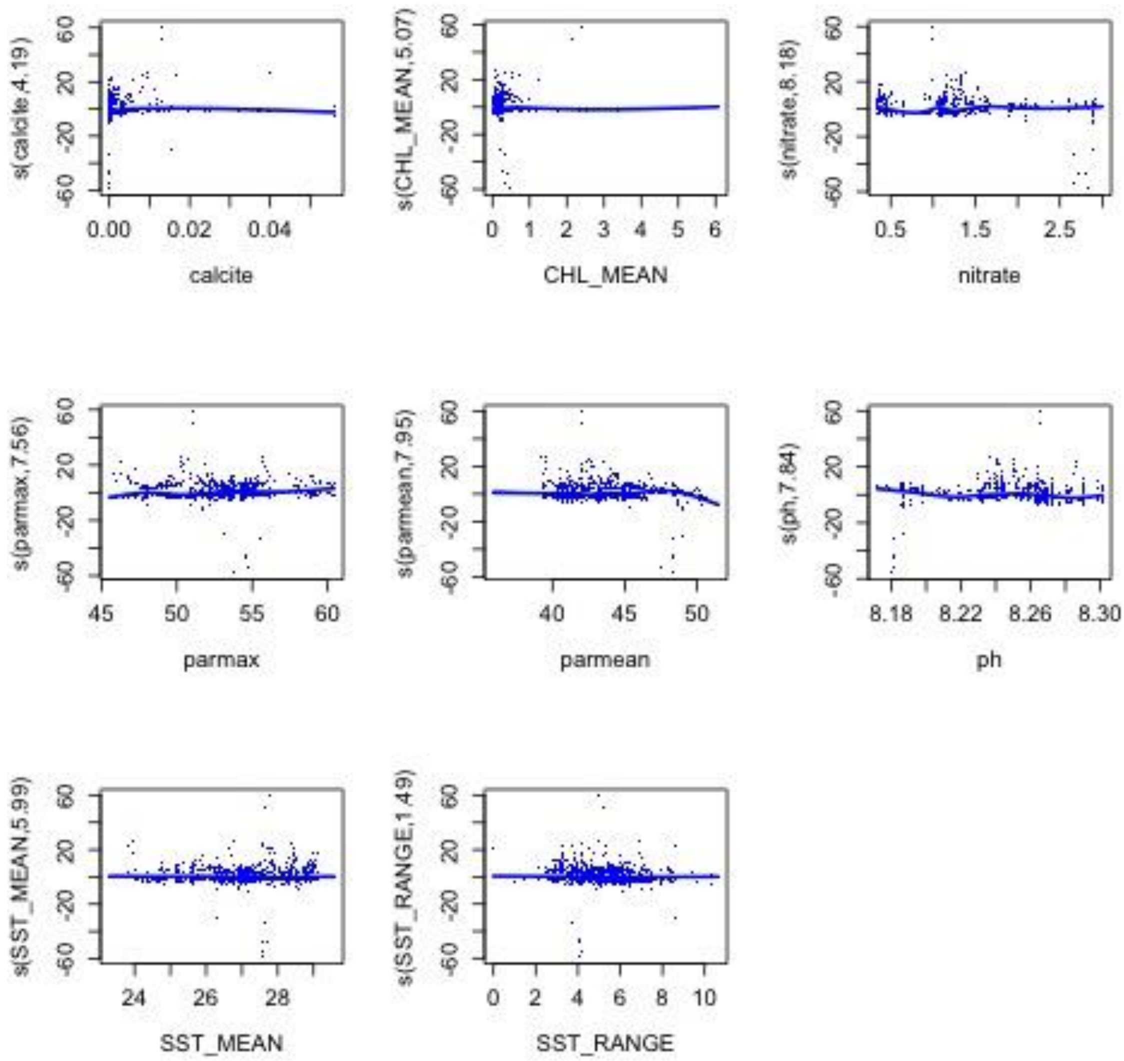
308 Paracheilinus filamentosus, n = 33 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.580474e+00	9	1.691767e+01	0.0007186192
s(CHL_MEAN)	8.344296e-07	9	7.163155e-08	1.0000000000
s(nitrate)	9.317619e-01	9	8.188117e+00	0.0022151249
s(parmax)	2.427841e+00	9	1.266941e+01	0.0010364285
s(parmean)	7.409640e-07	9	2.091258e-07	0.7710006208
s(ph)	3.312115e+00	9	9.867919e+00	0.0135333797
s(SST_MEAN)	4.828075e-07	9	1.535186e-08	1.0000000000
s(SST_RANGE)	1.069968e-06	9	1.452522e-07	1.0000000000



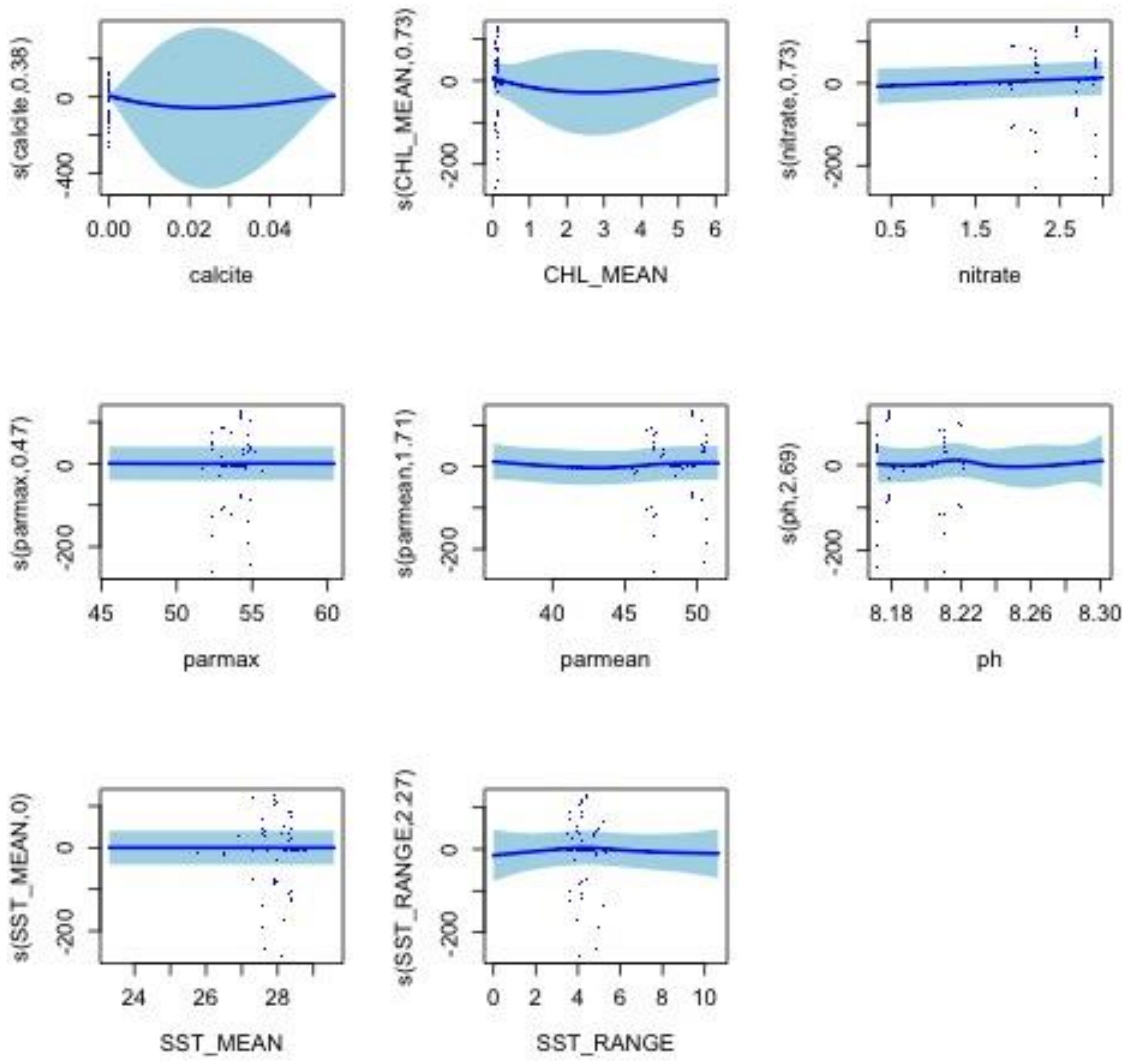
309 Paracirrhites arcatus, n = 1888 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.186053	9	49.582092	9.071612e-11
s(CHL_MEAN)	5.073106	9	56.534997	3.450577e-12
s(nitrate)	8.181893	9	197.478257	1.734831e-44
s(parmax)	7.556192	9	130.659219	1.455576e-28
s(parmean)	7.950375	9	231.762136	1.823802e-52
s(ph)	7.840616	9	104.490300	8.442456e-23
s(SST_MEAN)	5.992549	9	15.558912	6.303001e-03
s(SST_RANGE)	1.485770	9	2.654223	1.320395e-01



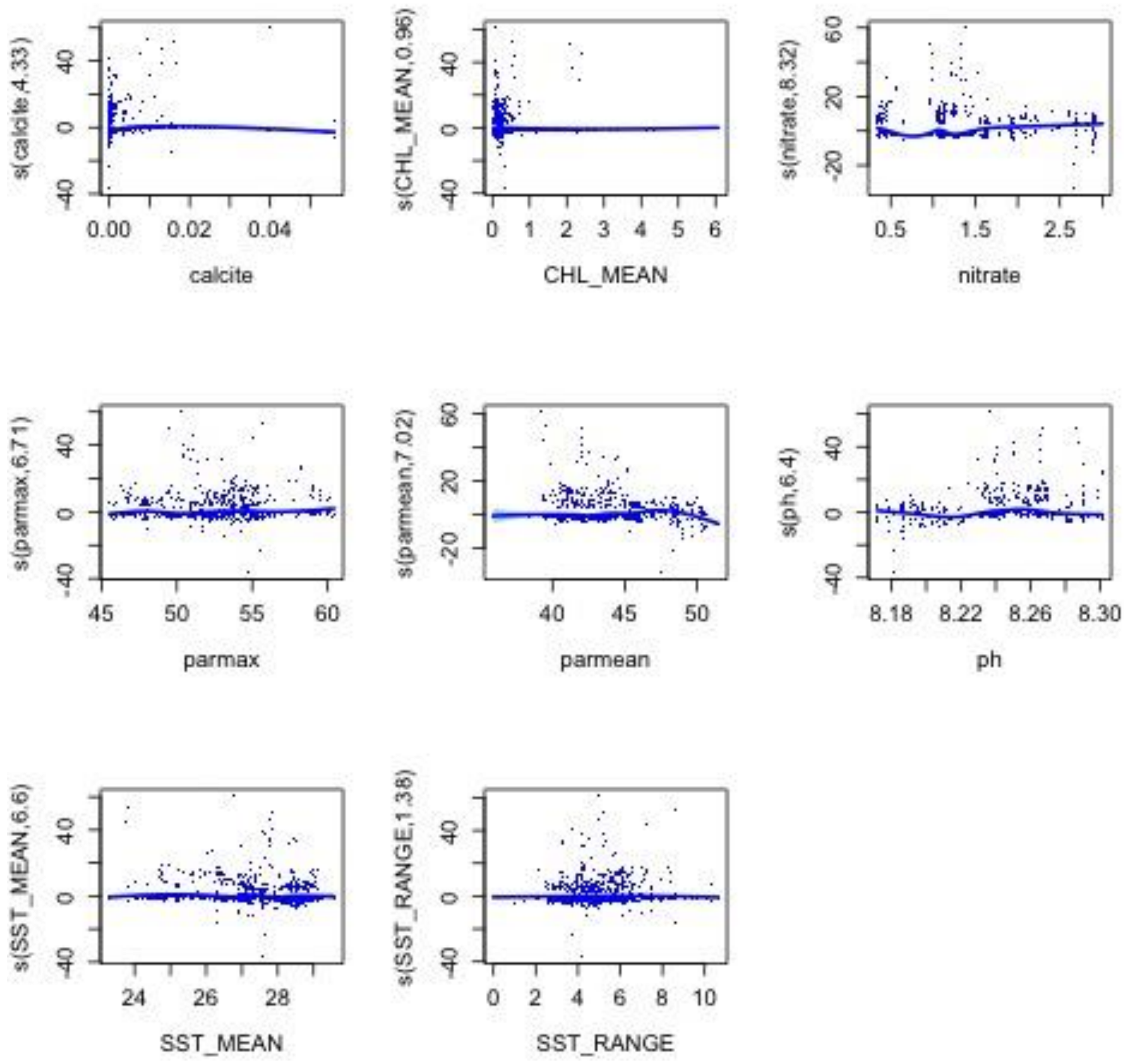
310 Paracirrhites bicolor, n = 62 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.797655e-01	9	1.440306e-01	4.725723e-01
s(CHL_MEAN)	7.317422e-01	8	8.434797e-01	2.393586e-01
s(nitrate)	7.342176e-01	6	2.516366e+00	3.213564e-02
s(parmax)	4.653663e-01	9	4.723005e-01	2.403400e-01
s(parmean)	1.706286e+00	9	2.579336e+00	1.594372e-01
s(ph)	2.694045e+00	9	1.696322e+01	1.479615e-05
s(SST_MEAN)	2.839877e-06	9	1.674261e-06	4.109189e-01
s(SST_RANGE)	2.269470e+00	9	5.404776e+00	4.286586e-02



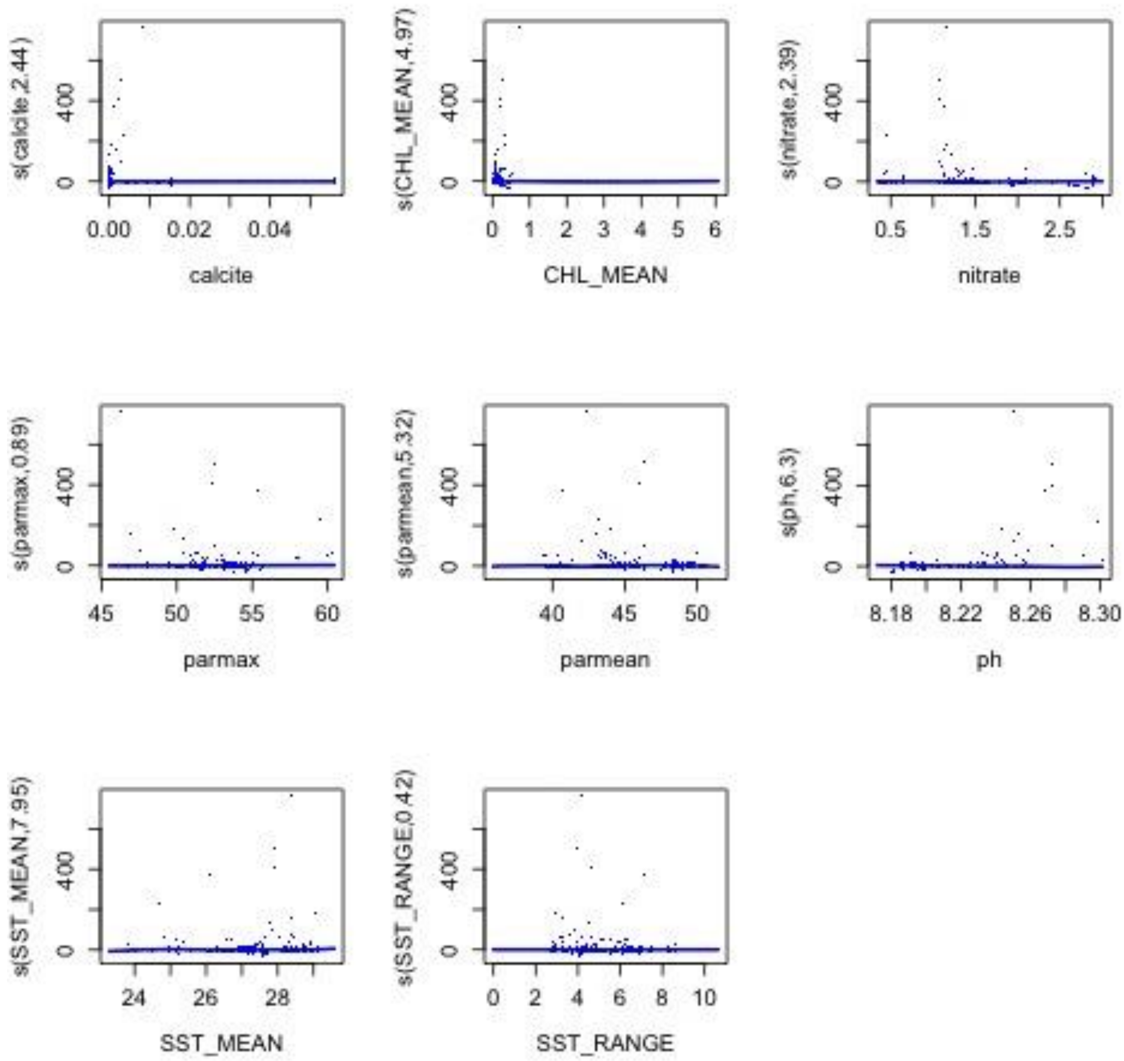
311 Paracirrhites forsteri, n = 1188 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.3315084	9	56.073983	2.654984e-12
s(CHL_MEAN)	0.9615834	9	3.875385	2.929484e-02
s(nitrate)	8.3183270	9	246.640978	9.950940e-56
s(parmax)	6.7062385	9	43.505926	1.158628e-08
s(parmean)	7.0177124	9	169.685940	1.403593e-39
s(ph)	6.4044077	9	87.329978	1.502888e-19
s(SST_MEAN)	6.6022087	9	29.360575	1.405980e-05
s(SST_RANGE)	1.3814411	9	3.422438	5.793997e-02



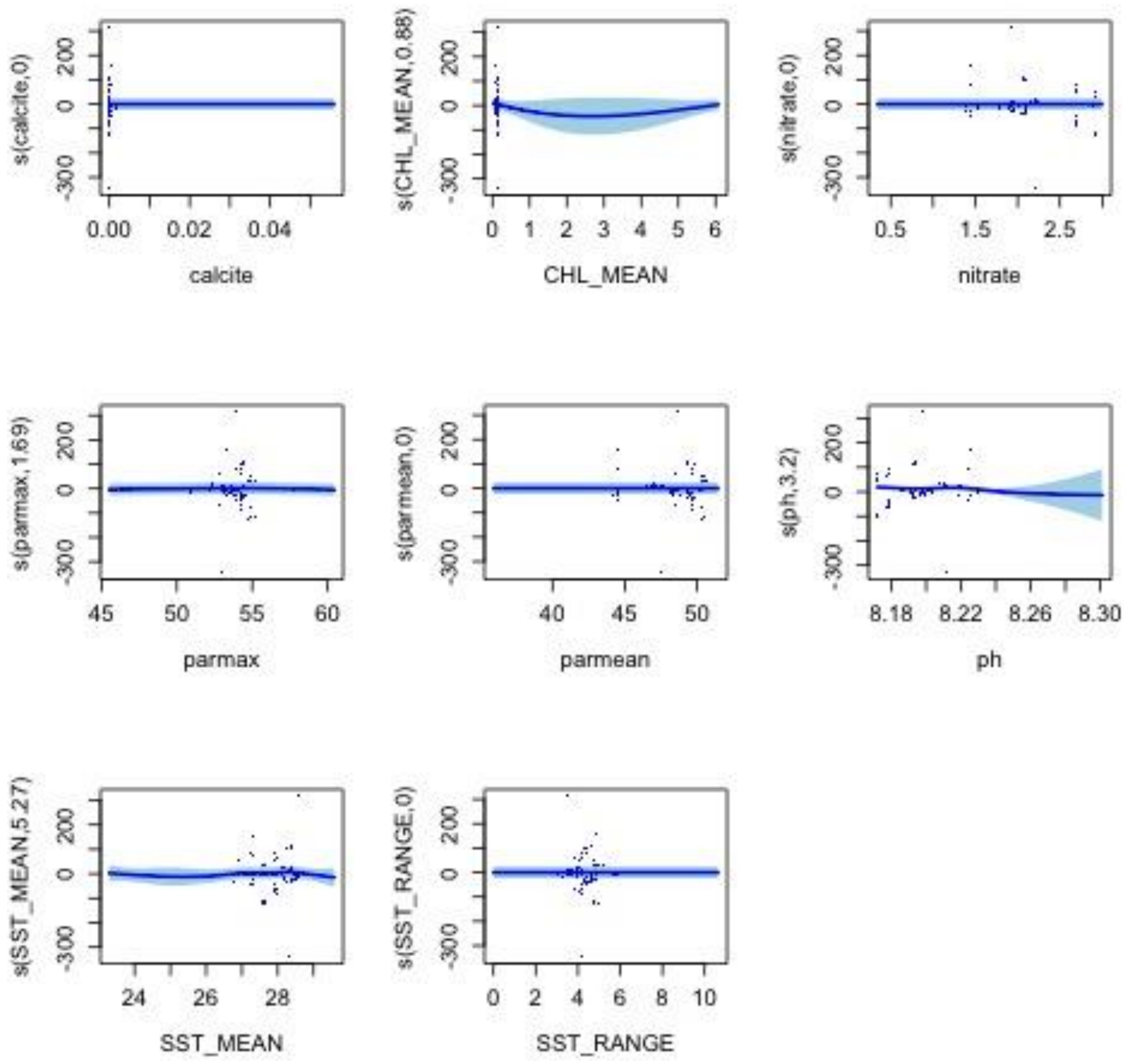
312 Paracirrhites hemistictus, n = 784 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.4392381	9	12.6556339	1.085679e-03
s(CHL_MEAN)	4.9733275	9	45.1809615	6.074089e-10
s(nitrate)	2.3893732	9	9.7701207	1.996279e-03
s(parmax)	0.8885022	9	7.7184209	1.123718e-03
s(parmean)	5.3208737	9	132.7572969	1.399670e-32
s(ph)	6.3003471	9	64.4039151	1.404461e-15
s(SST_MEAN)	7.9489430	9	76.8492250	2.831467e-16
s(SST_RANGE)	0.4249080	9	0.5676761	2.188794e-01



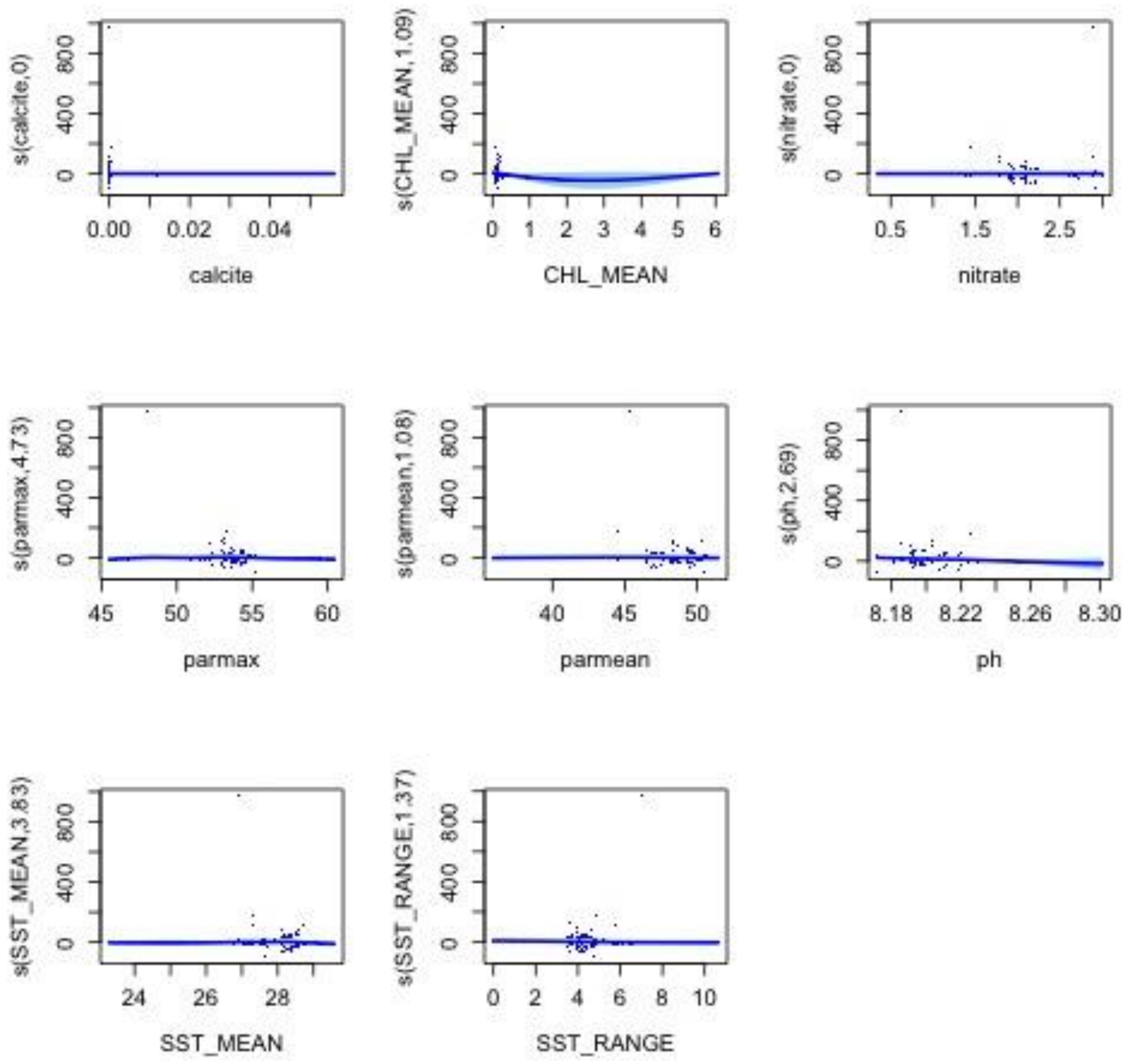
313 Paracirrhites nisus, n = 83 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.267354e-07	9	4.700837e-08	9.033481e-01
s(CHL_MEAN)	8.833985e-01	8	5.015834e+00	9.692772e-03
s(nitrate)	2.607516e-05	9	1.496423e-05	3.813864e-01
s(parmax)	1.692153e+00	9	3.107287e+00	1.215799e-01
s(parmean)	7.923908e-06	9	8.230476e-07	7.234657e-01
s(ph)	3.195094e+00	9	4.365049e+01	6.954085e-12
s(SST_MEAN)	5.274183e+00	9	2.832561e+01	6.079616e-06
s(SST_RANGE)	1.146360e-06	9	4.758266e-07	5.773235e-01



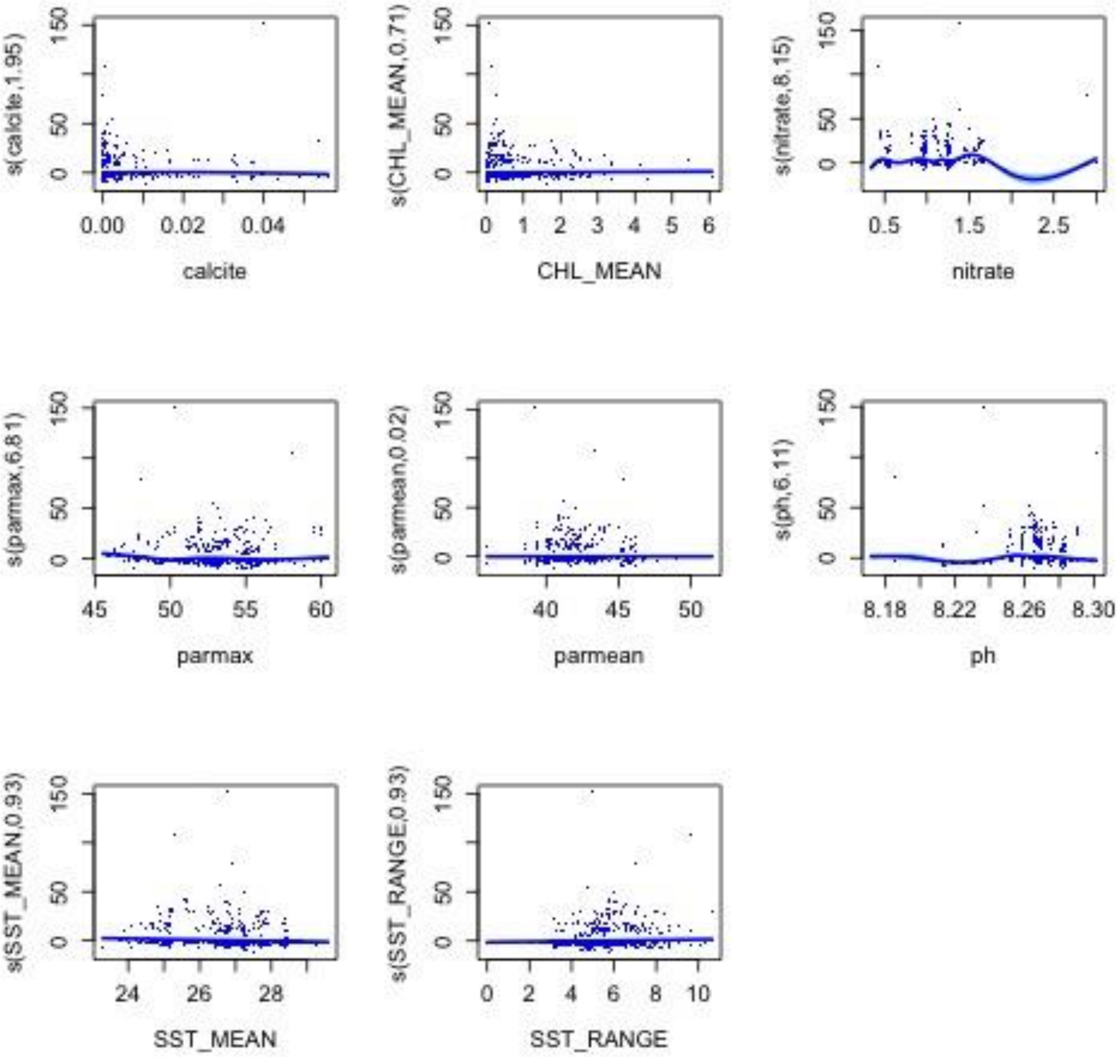
314 Paracirrhites xanthus, n = 113 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.983607e-07	9	6.466356e-08	8.820899e-01
s(CHL_MEAN)	1.093024e+00	9	1.697724e+01	2.858359e-06
s(nitrate)	1.027355e-05	9	4.619726e-08	1.000000e+00
s(parmax)	4.727725e+00	9	1.582829e+01	6.788960e-04
s(parmean)	1.083939e+00	9	4.805414e+00	8.111520e-03
s(ph)	2.691648e+00	9	4.128063e+01	2.844543e-13
s(SST_MEAN)	3.828942e+00	9	1.793179e+01	5.590854e-05
s(SST_RANGE)	1.365726e+00	9	7.012237e+00	2.735325e-03



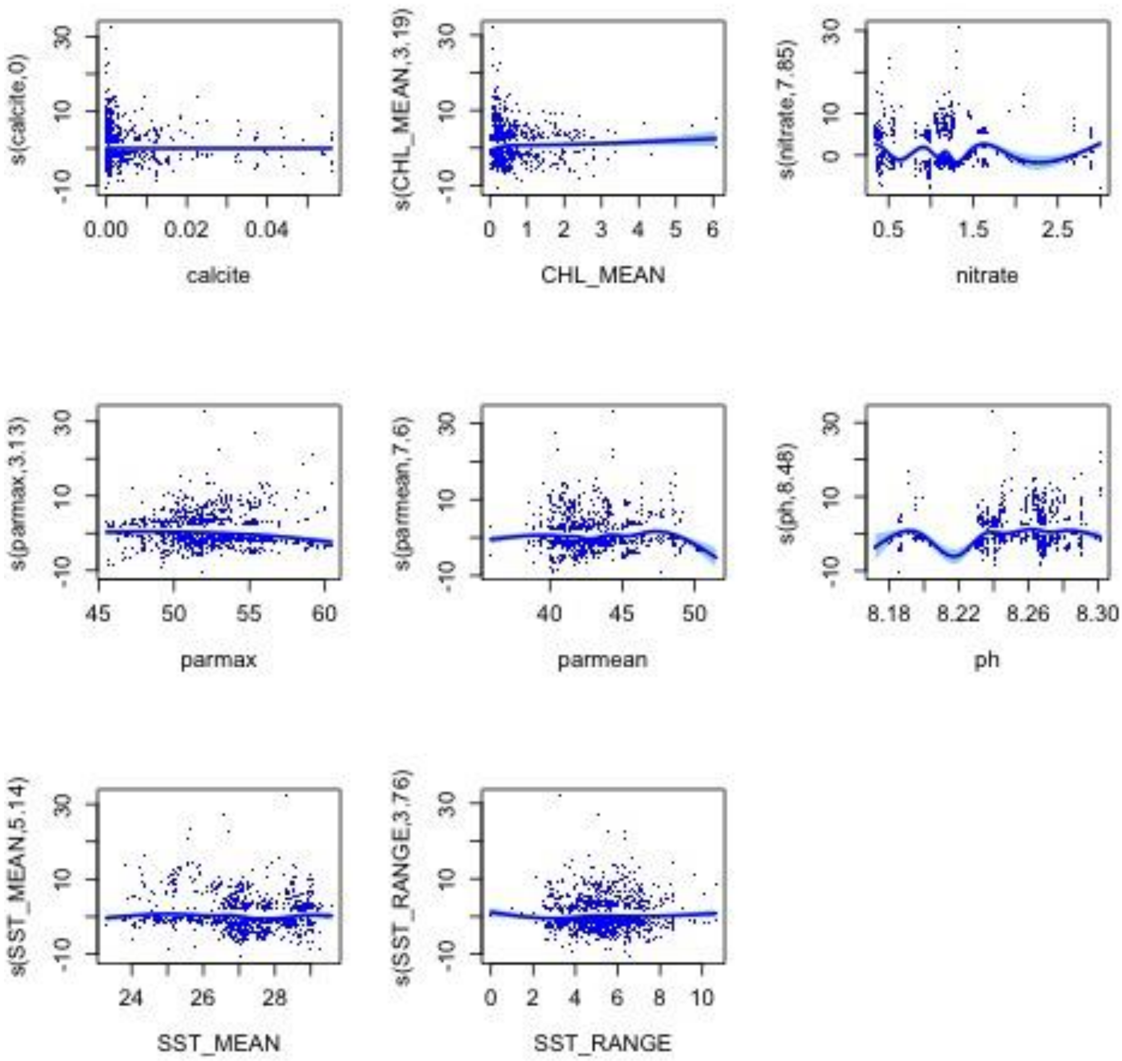
315 Parupeneus barberinoides, n = 267 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.95220058	9	9.64071824	3.383857e-03
s(CHL_MEAN)	0.71474089	6	2.49619001	5.773302e-02
s(nitrate)	8.14915903	9	159.14424155	1.341173e-33
s(parmax)	6.81381078	9	69.70386327	1.530342e-14
s(parmean)	0.01770682	9	0.01705768	3.240746e-01
s(ph)	6.10814505	9	72.06260931	1.181380e-15
s(SST_MEAN)	0.93388058	9	13.44735285	8.697406e-05
s(SST_RANGE)	0.93048217	6	13.18860861	1.233028e-04



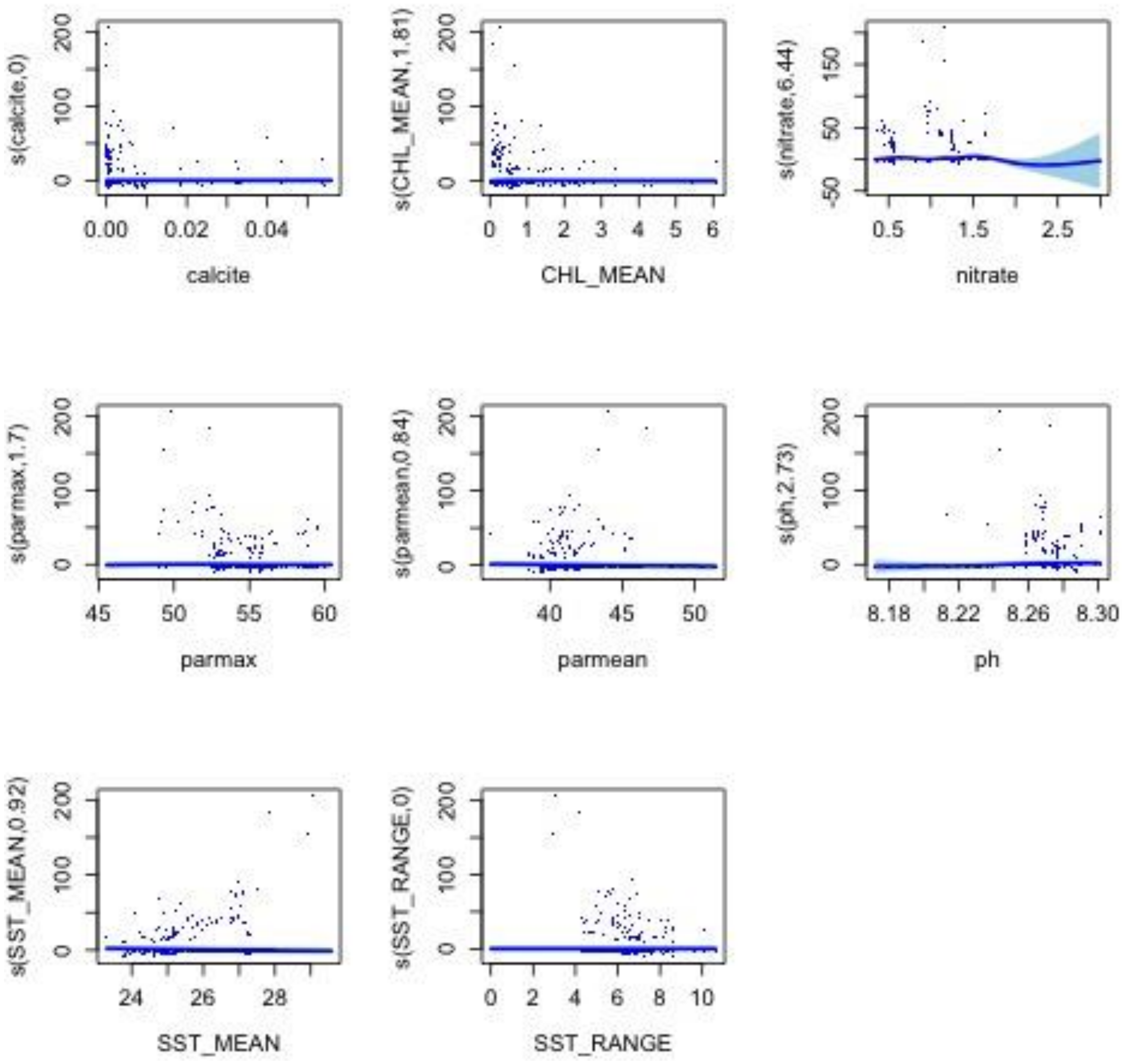
316Parupeneus barberinus, n = 891 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0004605508	8	1.091634e-04	7.737443e-01
s(CHL_MEAN)	3.1916416628	9	4.598904e+01	5.791514e-11
s(nitrate)	7.8458647722	9	2.622929e+02	9.802644e-57
s(parmax)	3.1314495406	9	3.098574e+01	3.778541e-08
s(parmean)	7.5992942986	9	5.409237e+01	3.363993e-10
s(ph)	8.4836106509	9	7.149813e+01	2.237889e-13
s(SST_MEAN)	5.1438957970	9	2.873117e+01	3.527477e-06
s(SST_RANGE)	3.7561174716	9	1.163070e+01	8.552948e-03



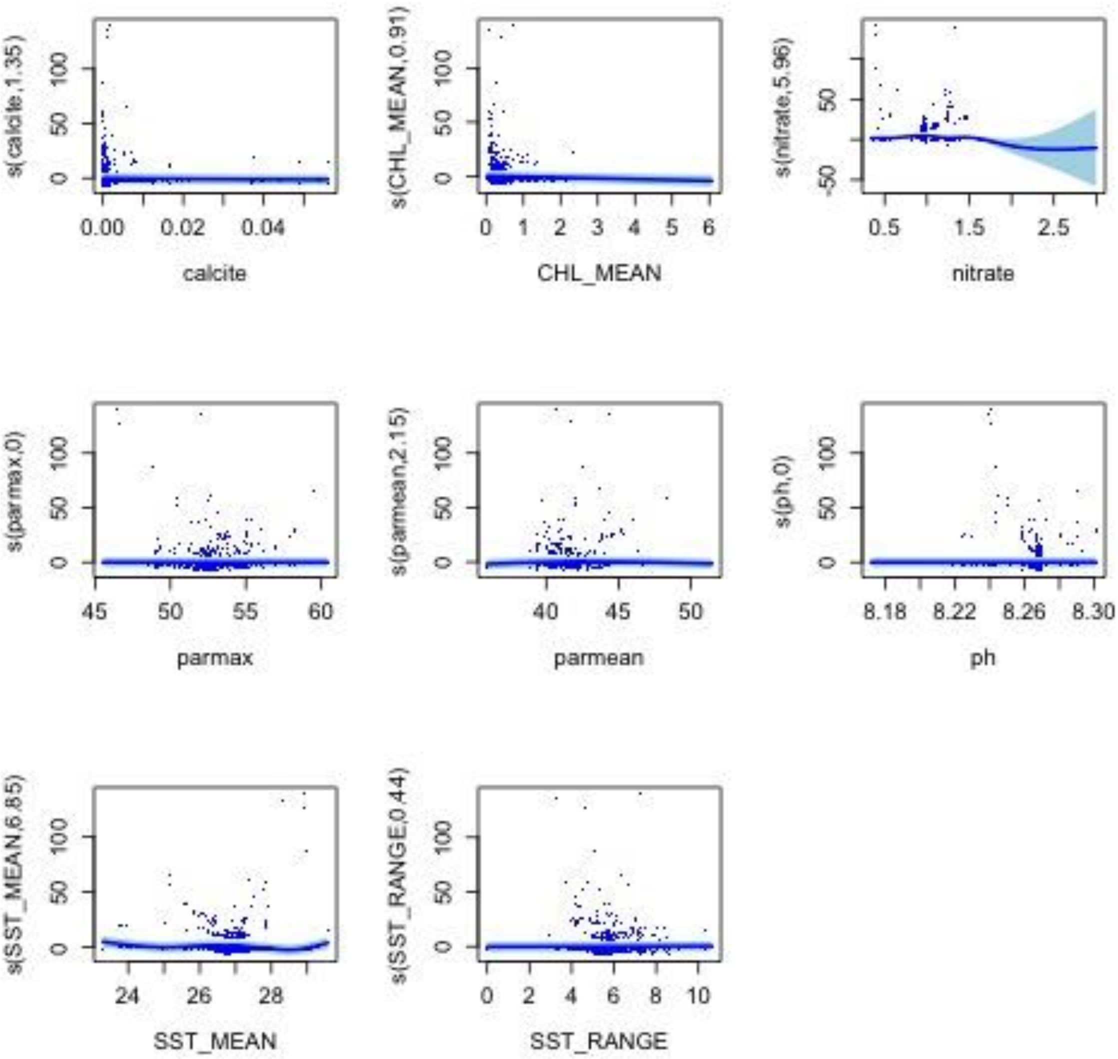
317Parupeneus ciliatus, n = 123 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.615244e-05	8	8.886337e-06	4.954417e-01
s(CHL_MEAN)	1.806937e+00	9	6.645722e+00	1.996573e-02
s(nitrate)	6.443693e+00	9	4.960649e+01	1.262668e-10
s(parmax)	1.701969e+00	9	4.758837e+00	3.255815e-02
s(parmean)	8.426969e-01	9	5.217219e+00	7.387683e-03
s(ph)	2.729907e+00	9	2.838662e+01	5.730321e-08
s(SST_MEAN)	9.171803e-01	9	1.075700e+01	1.552673e-04
s(SST_RANGE)	1.396319e-03	9	1.245661e-03	3.520859e-01



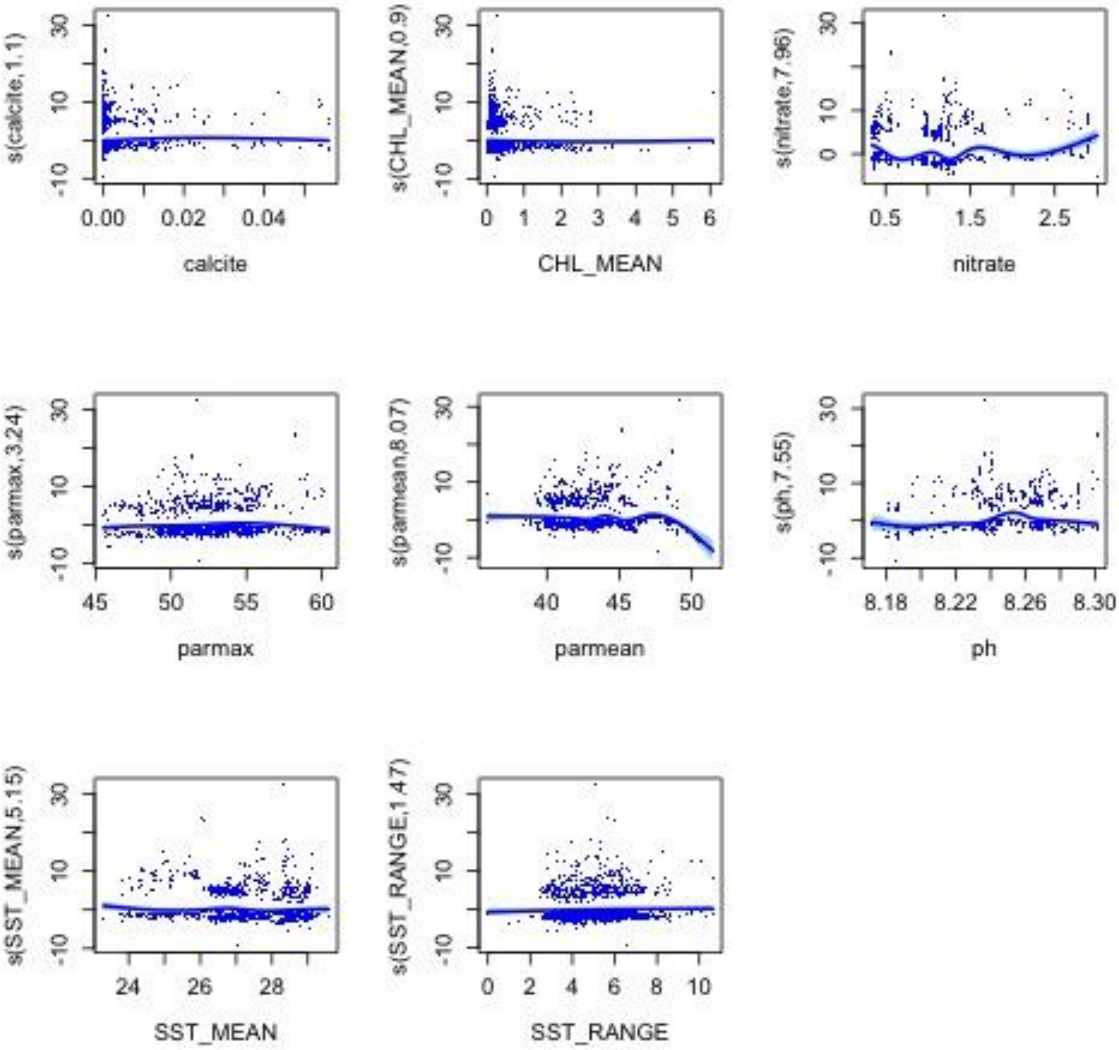
318Parupeneus crassilabris, n = 300 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.354712e+00	9	9.847126e+00	1.078524e-03
s(CHL_MEAN)	9.113590e-01	9	9.629259e+00	7.330495e-04
s(nitrate)	5.961647e+00	9	1.066687e+02	6.051357e-24
s(parmax)	2.478567e-06	9	1.006687e-06	6.468674e-01
s(parmean)	2.151808e+00	9	1.105800e+01	9.759658e-04
s(ph)	6.151255e-06	9	1.732952e-06	6.508381e-01
s(SST_MEAN)	6.854498e+00	9	7.820181e+01	2.604901e-16
s(SST_RANGE)	4.433053e-01	7	7.965956e-01	1.712535e-01



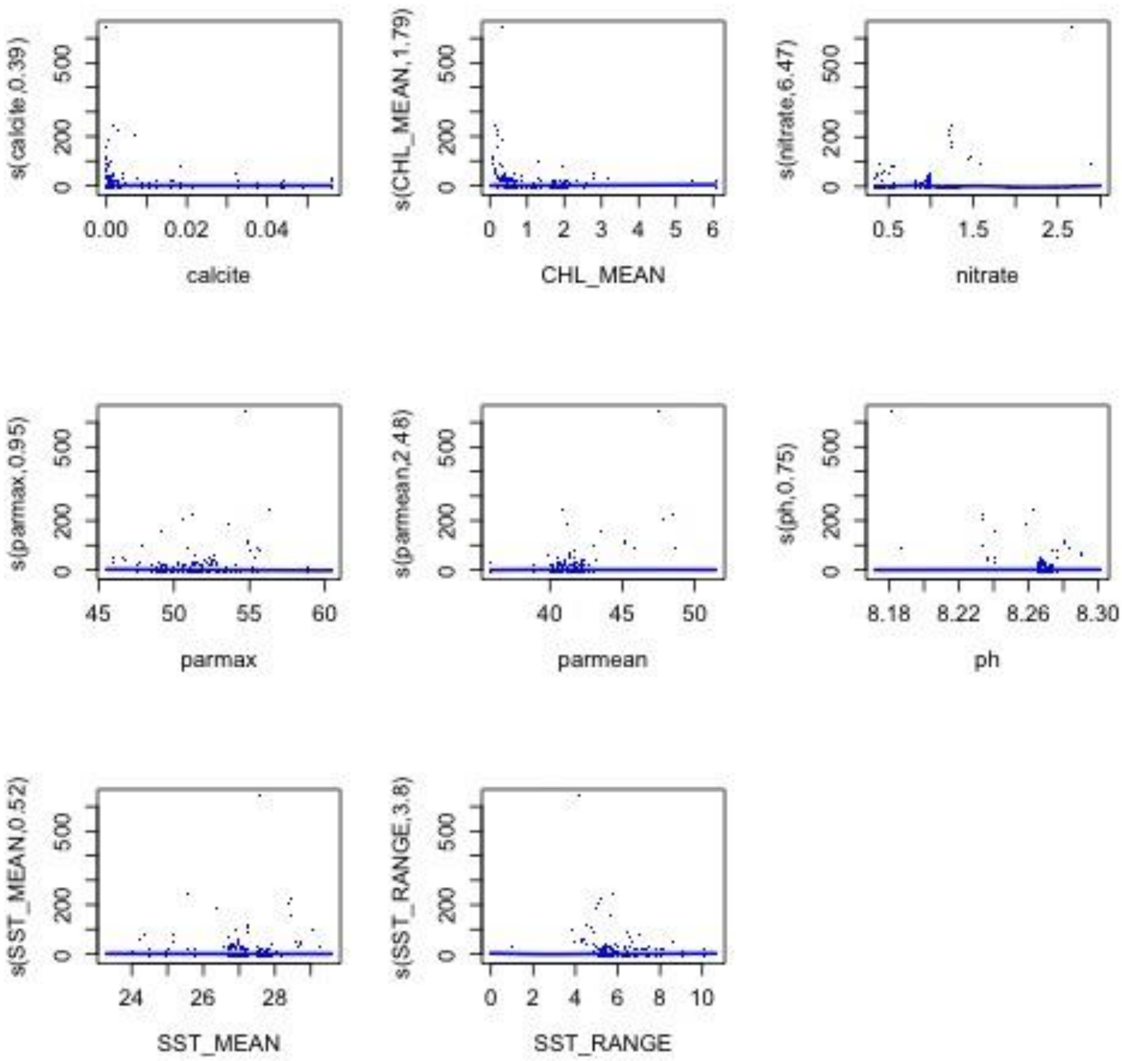
319Parupeneus cyclostomus, n = 1083 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.099646	9	8.139196	1.859805e-03
s(CHL_MEAN)	0.902411	9	2.761169	5.884957e-02
s(nitrate)	7.956555	9	214.426993	7.785784e-50
s(parmax)	3.243477	9	18.182174	7.052046e-05
s(parmean)	8.073446	9	59.963248	2.989092e-11
s(ph)	7.546379	9	123.191908	4.014582e-28
s(SST_MEAN)	5.152489	9	20.200333	2.244560e-04
s(SST_RANGE)	1.474041	9	3.280301	8.404441e-02



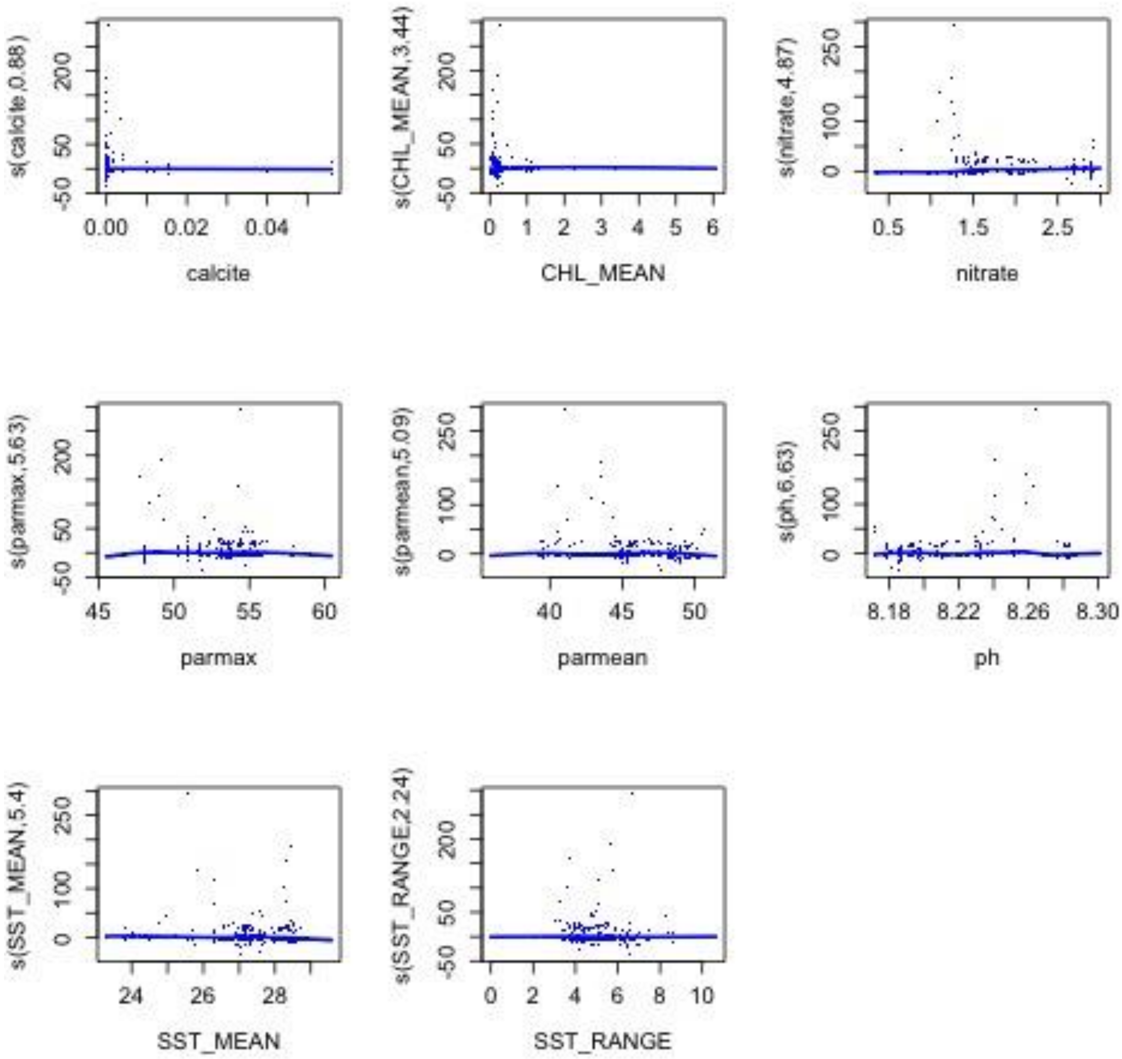
320Parupeneus indicus, n = 110 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.3888421	5	0.6052515	2.047848e-01
s(CHL_MEAN)	1.7933013	9	9.6375109	3.139636e-03
s(nitrate)	6.4709597	9	90.1952619	4.118573e-19
s(parmax)	0.9518662	9	18.5312826	1.526817e-06
s(parmean)	2.4810816	9	7.4354414	1.905338e-02
s(ph)	0.7496320	9	2.4013897	5.698575e-02
s(SST_MEAN)	0.5245424	9	1.1482236	1.286147e-01
s(SST_RANGE)	3.8020792	9	13.7744724	2.576670e-03



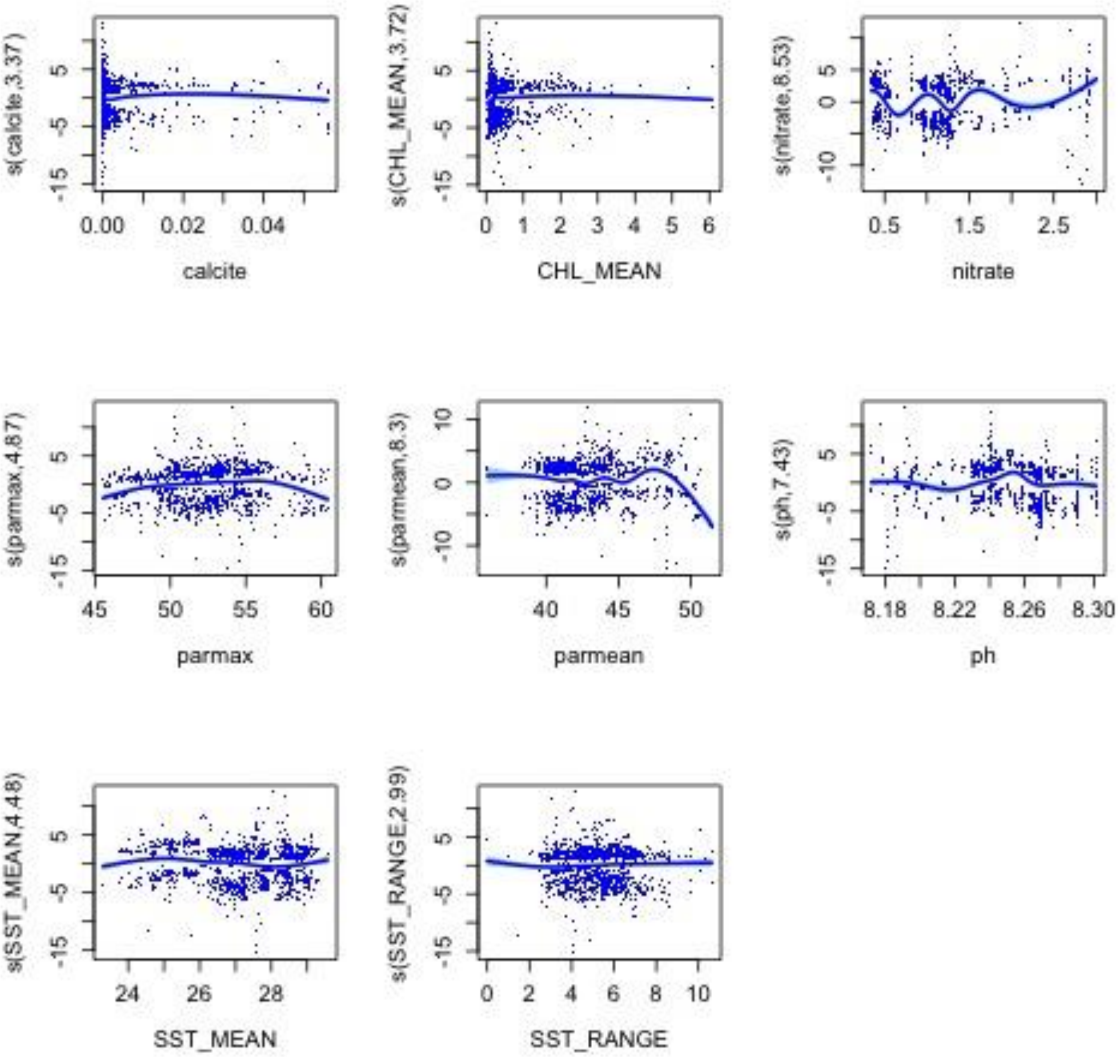
321Parupeneus insularis, n = 757 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8772383	6	6.547056	5.201744e-03
s(CHL_MEAN)	3.4446331	9	18.450674	1.333634e-04
s(nitrate)	4.8712179	9	41.142049	5.193394e-10
s(parmax)	5.6301190	9	23.588511	5.776265e-05
s(parmean)	5.0861740	9	74.100388	4.655097e-18
s(ph)	6.6308274	9	72.251679	1.924833e-16
s(SST_MEAN)	5.3988775	9	24.600730	2.283654e-05
s(SST_RANGE)	2.2384697	9	5.159213	4.556969e-02



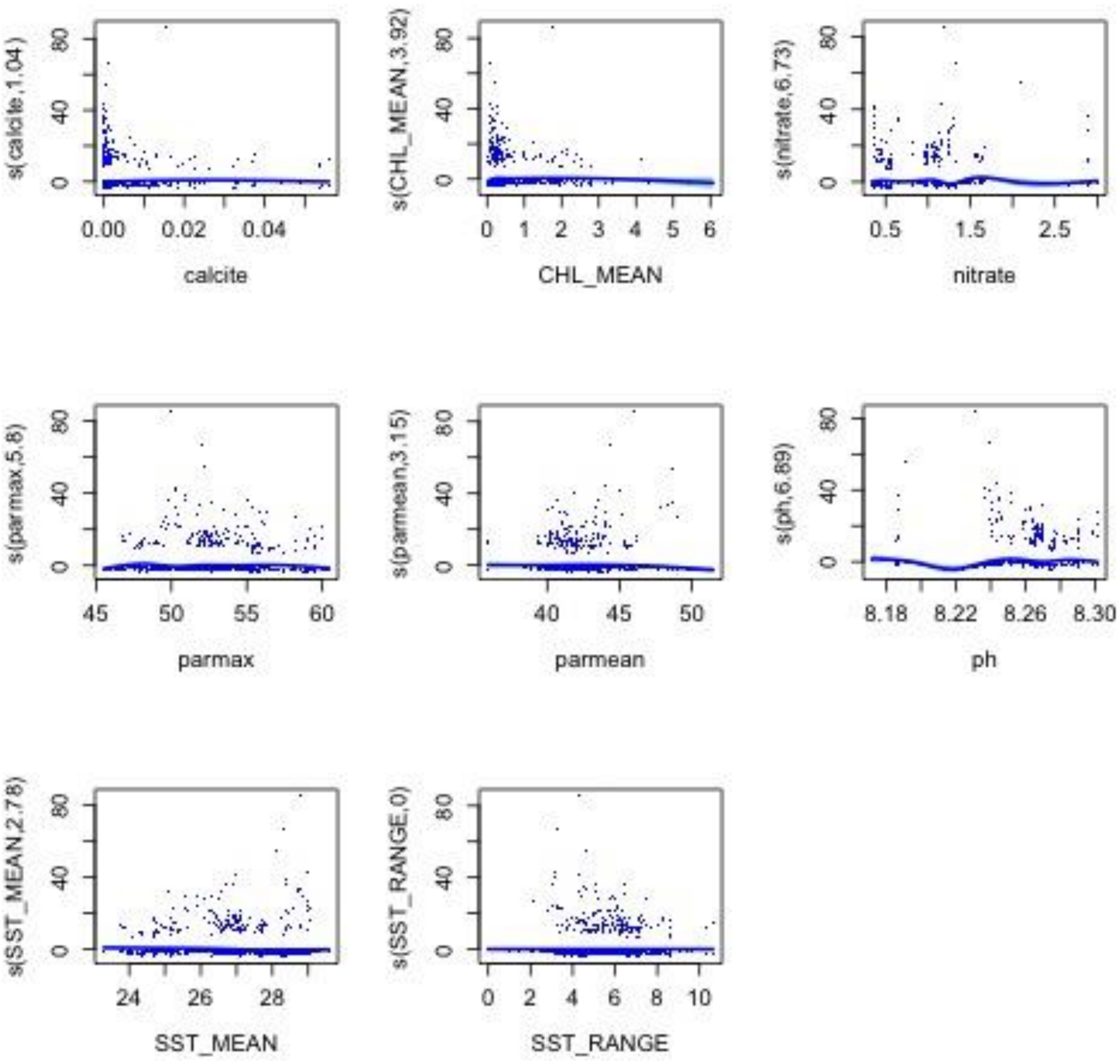
322Parupeneus multifasciatus, n = 2765 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.368910	9	23.523653	1.257661e-05
s(CHL_MEAN)	3.718763	9	32.856176	1.502483e-07
s(nitrate)	8.527433	9	351.218525	1.611628e-78
s(parmax)	4.865470	9	94.505623	1.263599e-22
s(parmean)	8.304796	9	225.019540	1.189554e-48
s(ph)	7.426170	9	116.575362	1.719967e-24
s(SST_MEAN)	4.476481	9	33.984303	5.399949e-08
s(SST_RANGE)	2.993977	9	8.506472	1.920760e-02



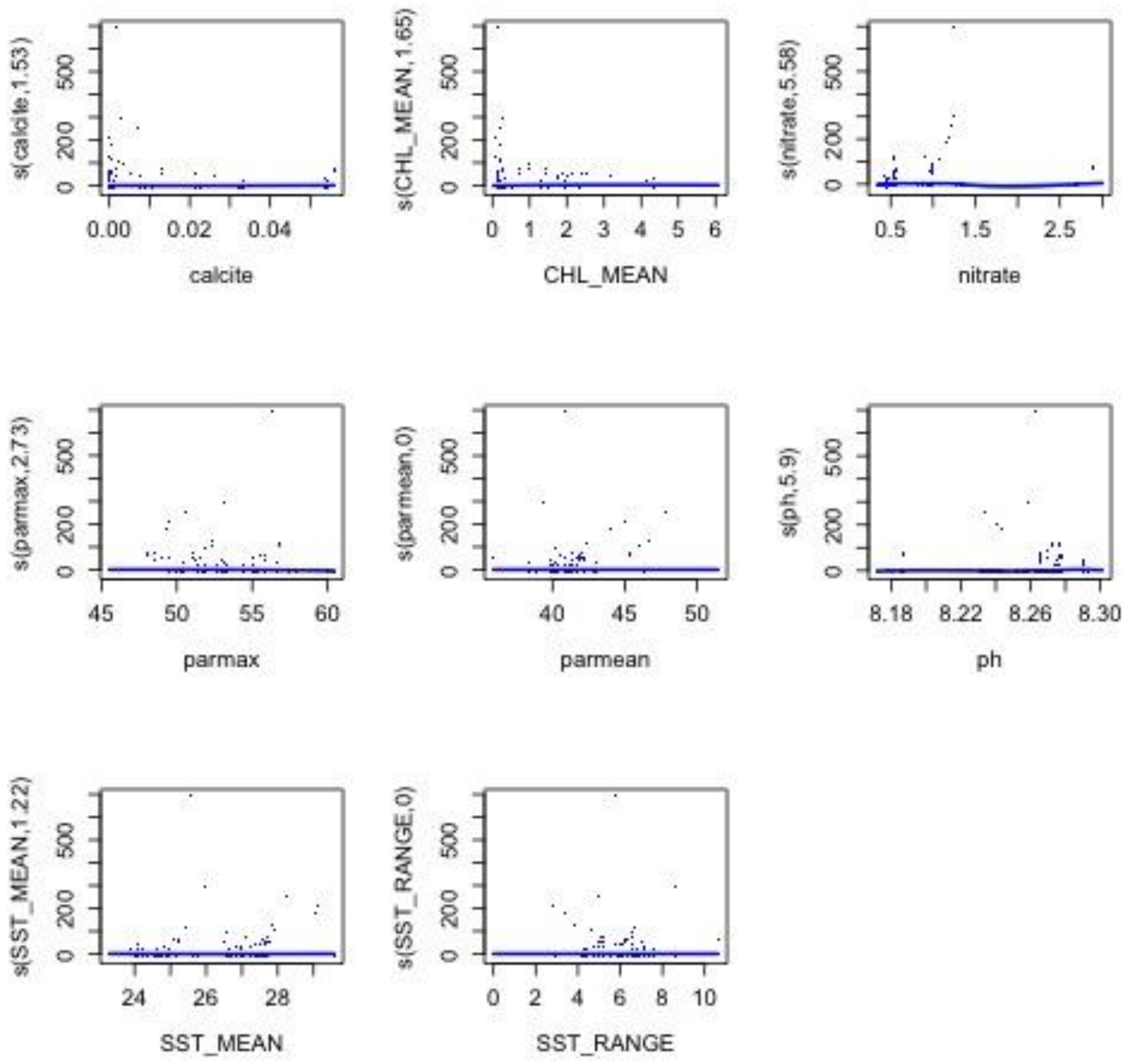
323Parupeneus pleurostigma, n = 319 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.044114e+00	9	8.524592e+00	1.594638e-03
s(CHL_MEAN)	3.923710e+00	9	2.154390e+01	5.057816e-05
s(nitrate)	6.733326e+00	9	5.920781e+01	4.685007e-13
s(parmax)	5.795188e+00	9	2.209888e+01	2.508494e-04
s(parmean)	3.150933e+00	9	1.268187e+01	1.048060e-03
s(ph)	6.894423e+00	9	4.722137e+01	3.159612e-10
s(SST_MEAN)	2.775030e+00	9	9.531646e+00	5.204597e-03
s(SST_RANGE)	2.051615e-05	9	8.167852e-06	6.262421e-01



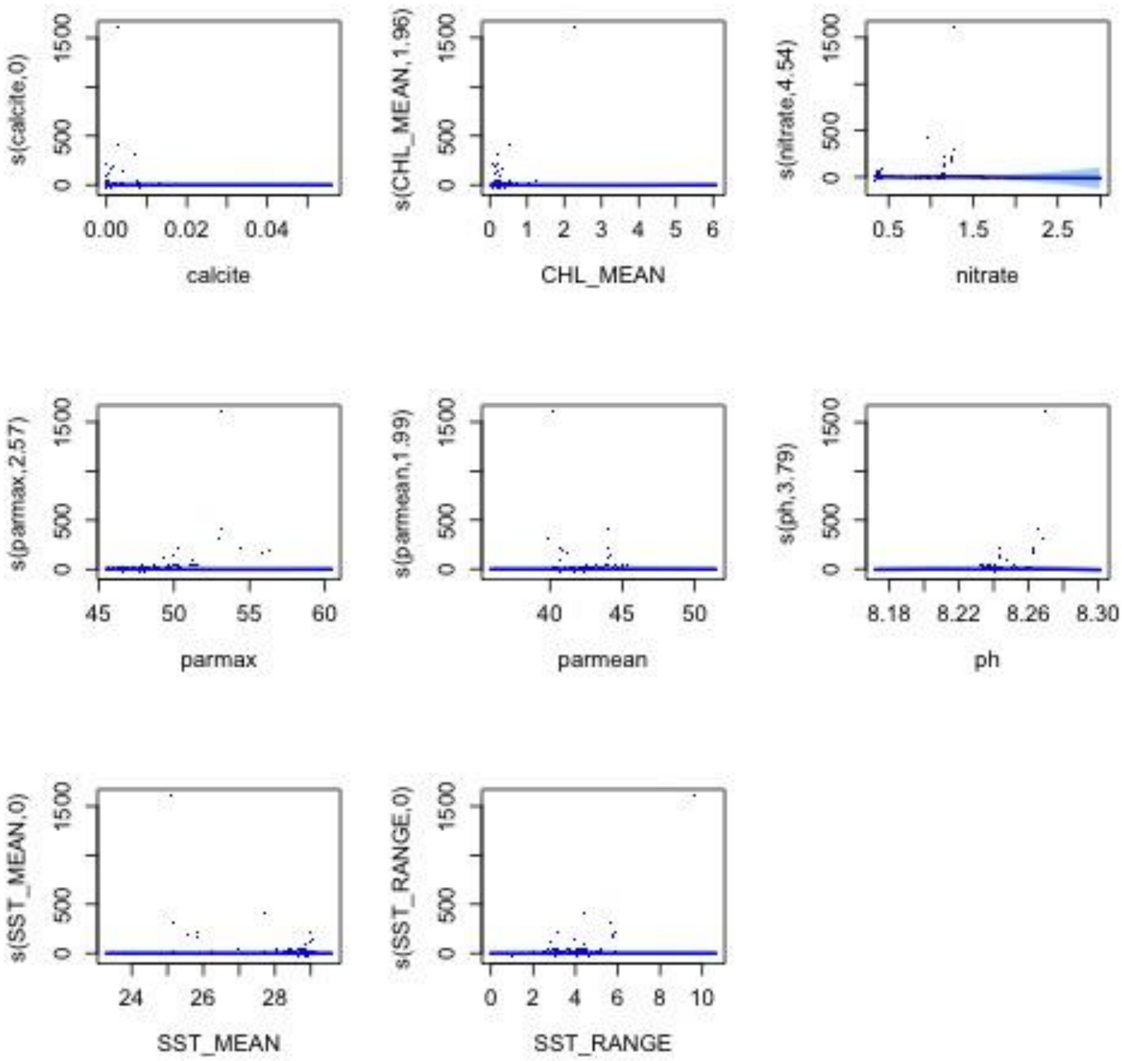
324 Parupeneus spilurus, n = 64 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.530326e+00	9	4.419412e+00	4.101481e-02
s(CHL_MEAN)	1.651277e+00	9	1.735887e+01	5.217176e-06
s(nitrate)	5.580800e+00	9	1.919399e+01	5.667105e-04
s(parmax)	2.728304e+00	9	1.924555e+01	1.373793e-05
s(parmean)	9.824745e-06	9	9.487008e-07	1.000000e+00
s(ph)	5.903210e+00	9	2.706983e+01	4.244539e-06
s(SST_MEAN)	1.220063e+00	9	3.213247e+00	5.120200e-02
s(SST_RANGE)	1.335492e-05	9	6.027598e-06	6.135685e-01



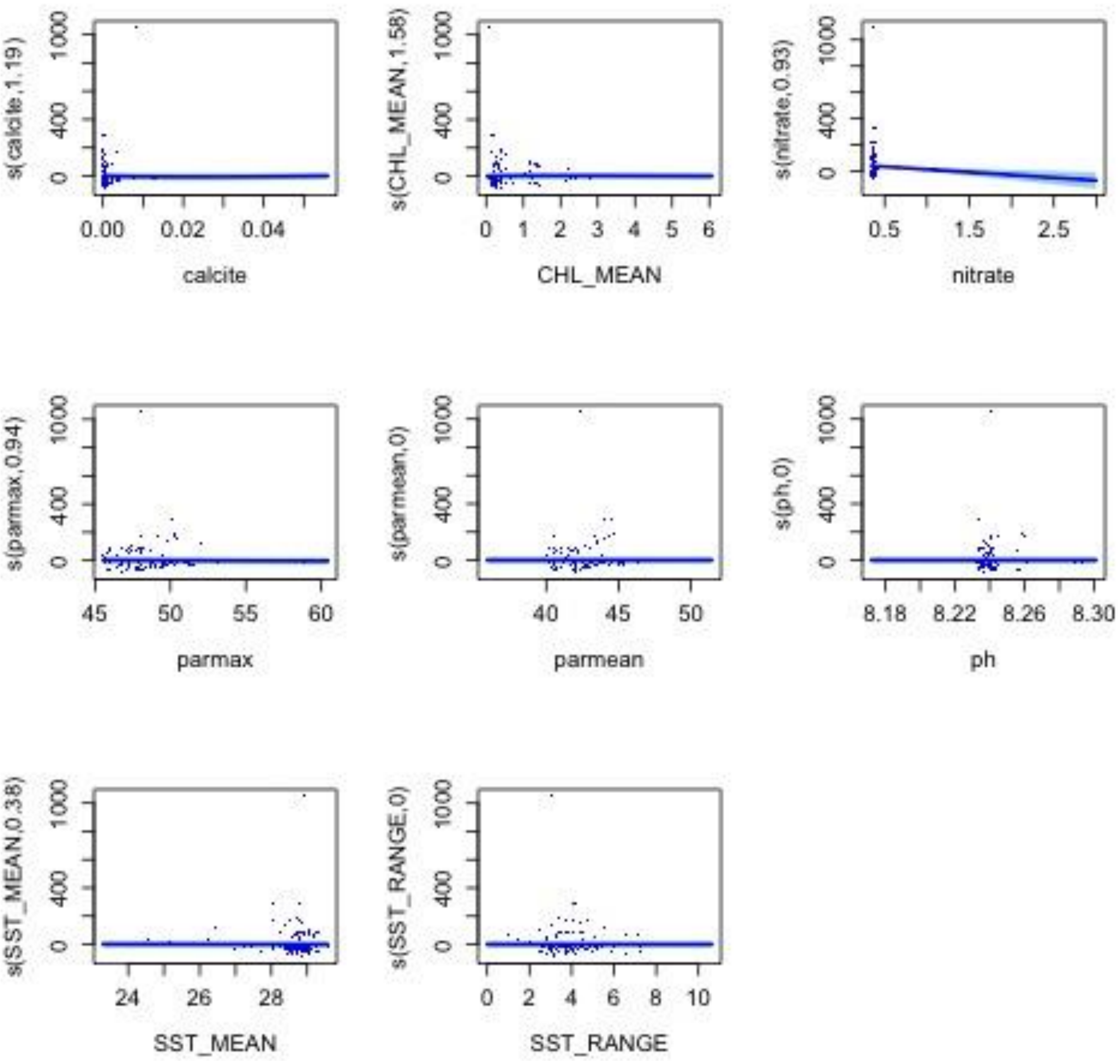
325Parupeneus trifasciatus, n = 83 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.605662e-06	9	4.903392e-07	7.387725e-01
s(CHL_MEAN)	1.956726e+00	9	1.495713e+01	2.253612e-04
s(nitrate)	4.536362e+00	9	9.177189e+01	6.704490e-24
s(parmax)	2.565941e+00	9	4.075431e+01	8.329063e-13
s(parmean)	1.991582e+00	9	6.611704e+00	1.199989e-02
s(ph)	3.794753e+00	9	2.829424e+01	1.483978e-07
s(SST_MEAN)	6.585621e-06	9	6.890661e-06	2.910795e-01
s(SST_RANGE)	1.824222e-03	9	1.655488e-03	3.616902e-01



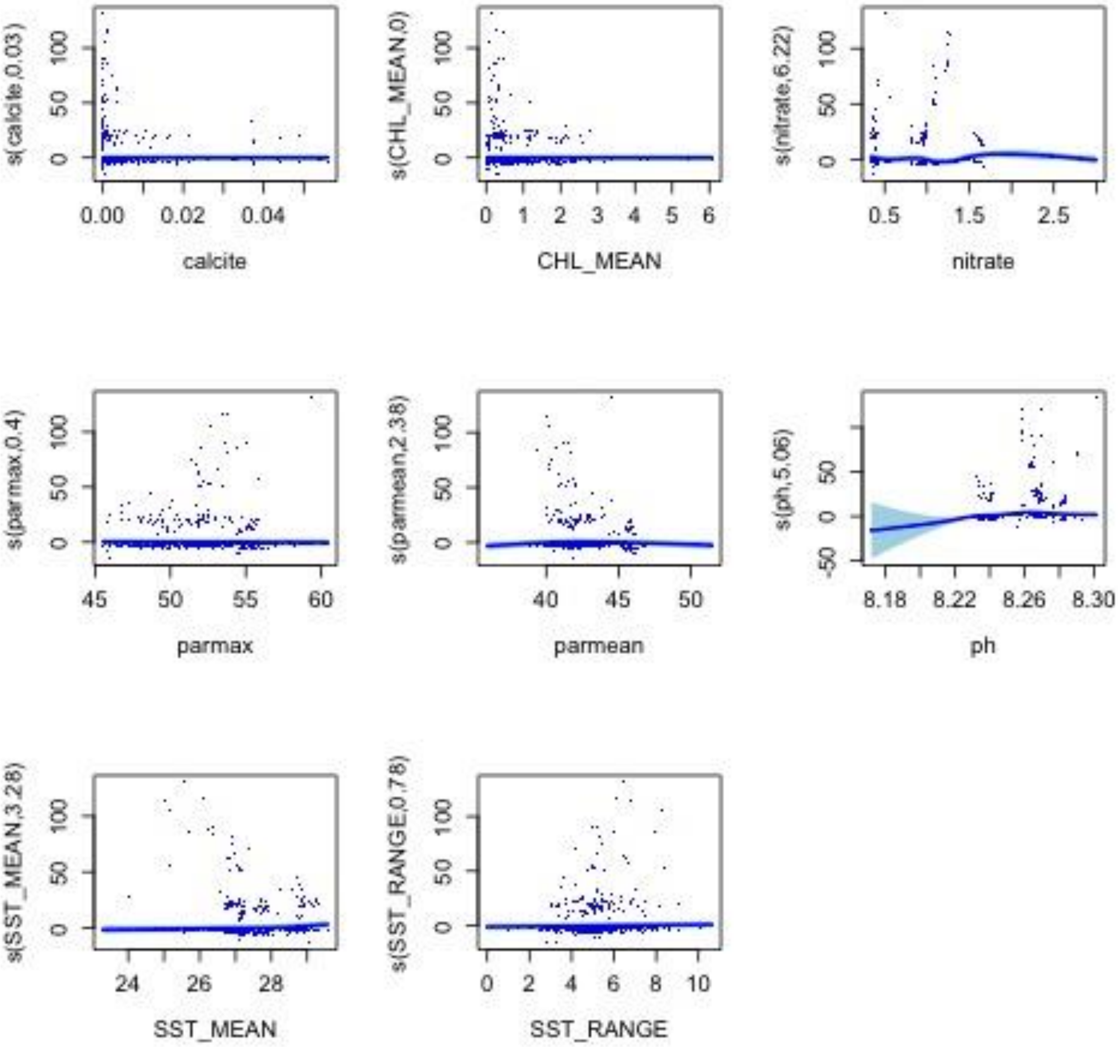
326Pentapodus trivittatus, n = 36 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.189105e+00	9	1.103772e+01	0.0005933345
s(CHL_MEAN)	1.584681e+00	9	1.227949e+01	0.0004321855
s(nitrate)	9.344544e-01	4	1.216055e+01	0.0002830326
s(parmax)	9.357713e-01	9	1.288388e+01	0.0001556518
s(parmean)	3.307474e-05	9	1.707529e-05	0.5027807570
s(ph)	3.554852e-05	8	1.687068e-05	0.5037404961
s(SST_MEAN)	3.820932e-01	9	6.292880e-01	0.1943918255
s(SST_RANGE)	4.143227e-05	9	1.622609e-05	0.6412047411



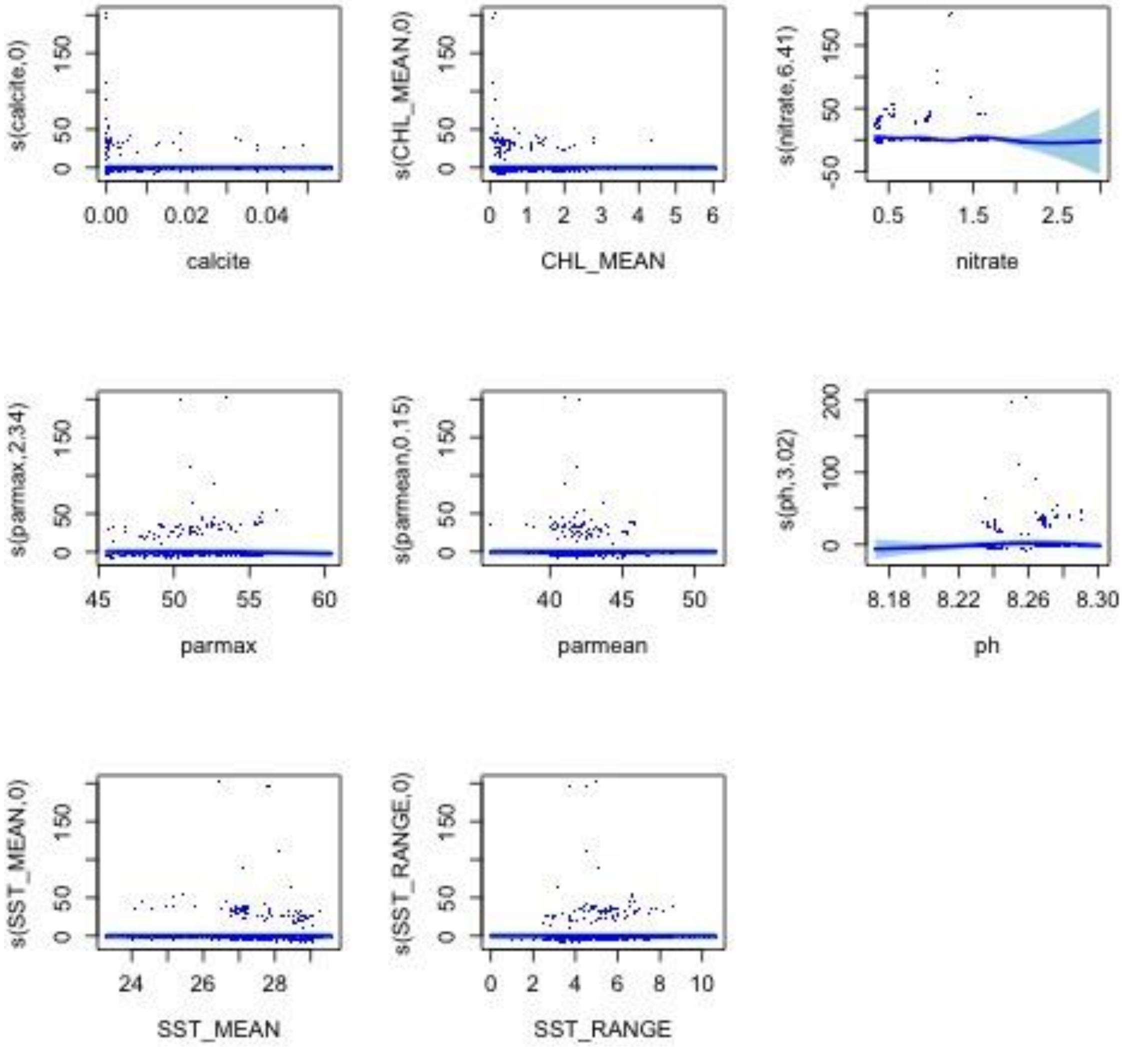
327Plectorhinchus chaetodonoides, n = 147 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.262476e-02	7	3.418786e-02	3.000171e-01
s(CHL_MEAN)	4.292229e-05	9	5.841535e-06	7.613275e-01
s(nitrate)	6.217377e+00	9	9.462813e+01	9.125670e-23
s(parmax)	4.002672e-01	9	6.583987e-01	1.687881e-01
s(parmean)	2.376063e+00	9	1.039401e+01	1.534493e-03
s(ph)	5.061887e+00	9	4.518397e+01	1.169086e-10
s(SST_MEAN)	3.281979e+00	9	1.370449e+01	6.666735e-04
s(SST_RANGE)	7.841686e-01	9	3.554755e+00	2.962282e-02



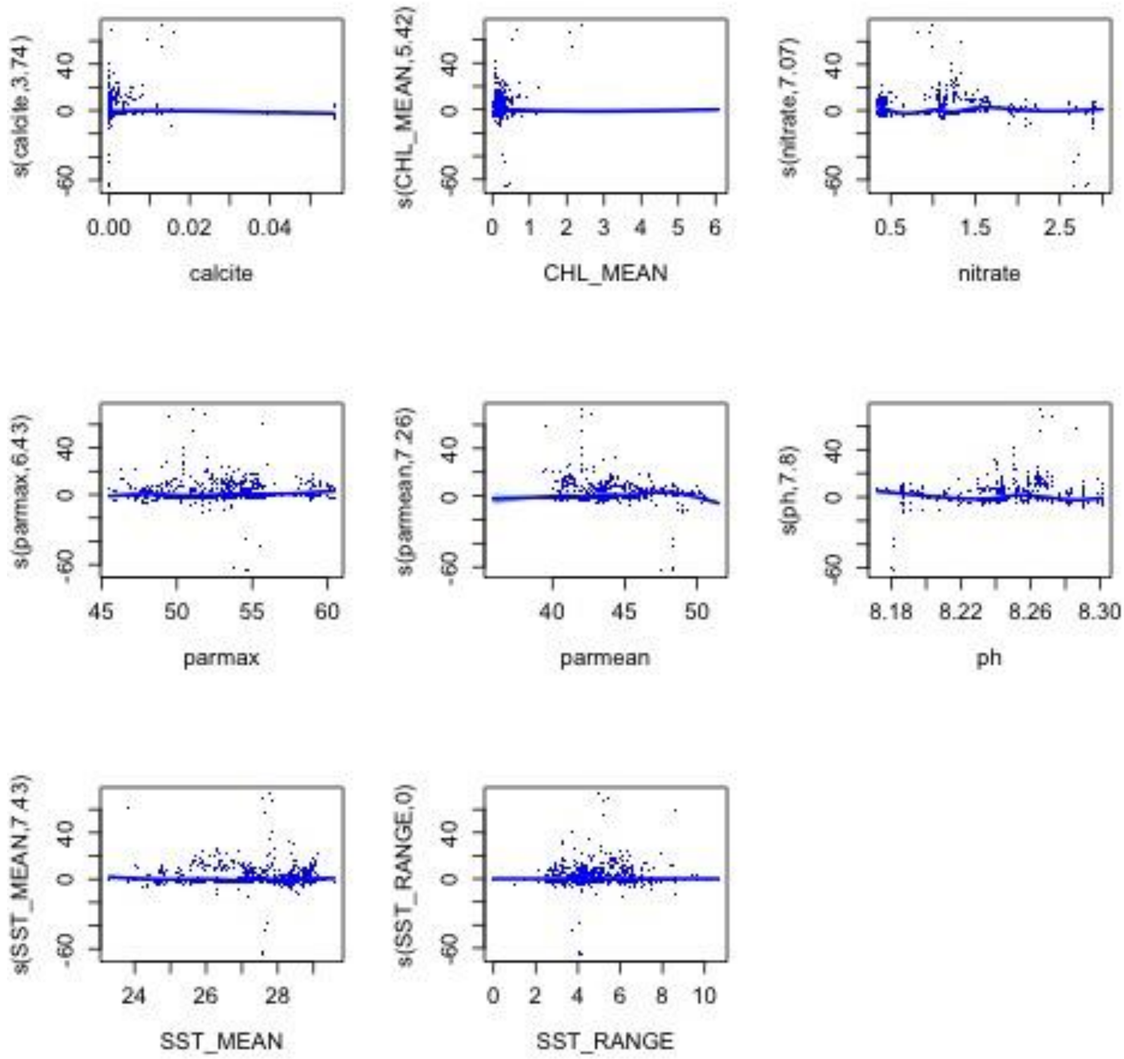
328Plectorhinchus vittatus, n = 154 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.680990e-06	8	1.118947e-06	8.060023e-01
s(CHL_MEAN)	5.389845e-06	9	8.064679e-07	7.444278e-01
s(nitrate)	6.409948e+00	9	8.933368e+01	2.888512e-20
s(parmax)	2.336333e+00	9	8.444080e+00	7.763614e-03
s(parmean)	1.493365e-01	9	1.555513e-01	3.109805e-01
s(ph)	3.020526e+00	9	1.706548e+01	7.758734e-05
s(SST_MEAN)	4.730953e-06	9	1.933484e-07	1.000000e+00
s(SST_RANGE)	8.574172e-06	9	2.829298e-06	7.479210e-01



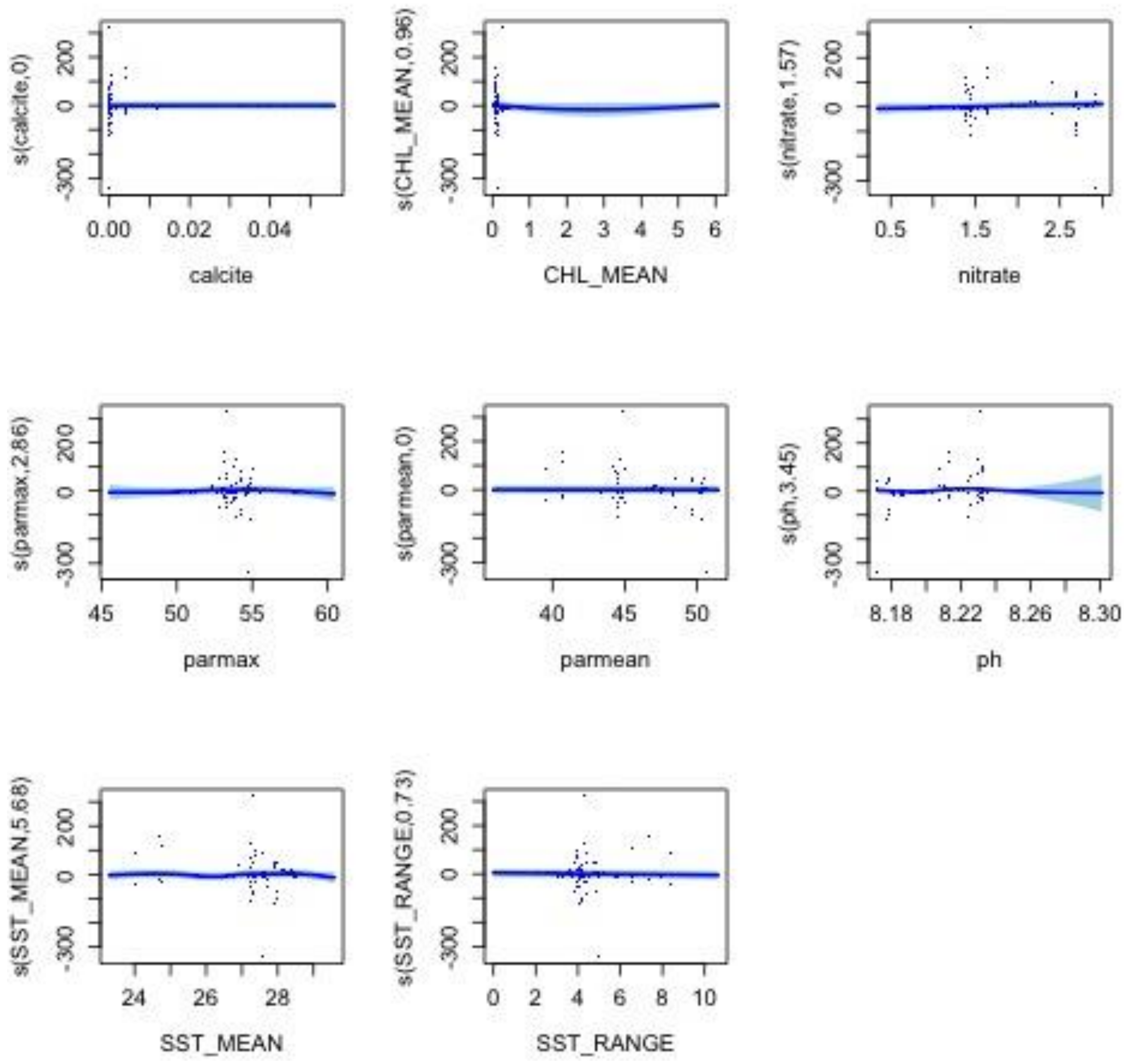
329 Plectroglyphidodon dickii, n = 1564 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.743765e+00	9	3.659314e+01	3.711993e-08
s(CHL_MEAN)	5.422154e+00	9	4.331052e+01	6.984059e-09
s(nitrate)	7.072612e+00	9	1.669516e+02	6.655996e-38
s(parmax)	6.434013e+00	9	5.171305e+01	7.013238e-11
s(parmean)	7.259677e+00	9	2.078106e+02	4.329658e-47
s(ph)	7.796975e+00	9	1.709628e+02	1.749706e-38
s(SST_MEAN)	7.434692e+00	9	4.520368e+01	1.894779e-08
s(SST_RANGE)	2.955102e-05	9	1.919632e-05	5.308163e-01



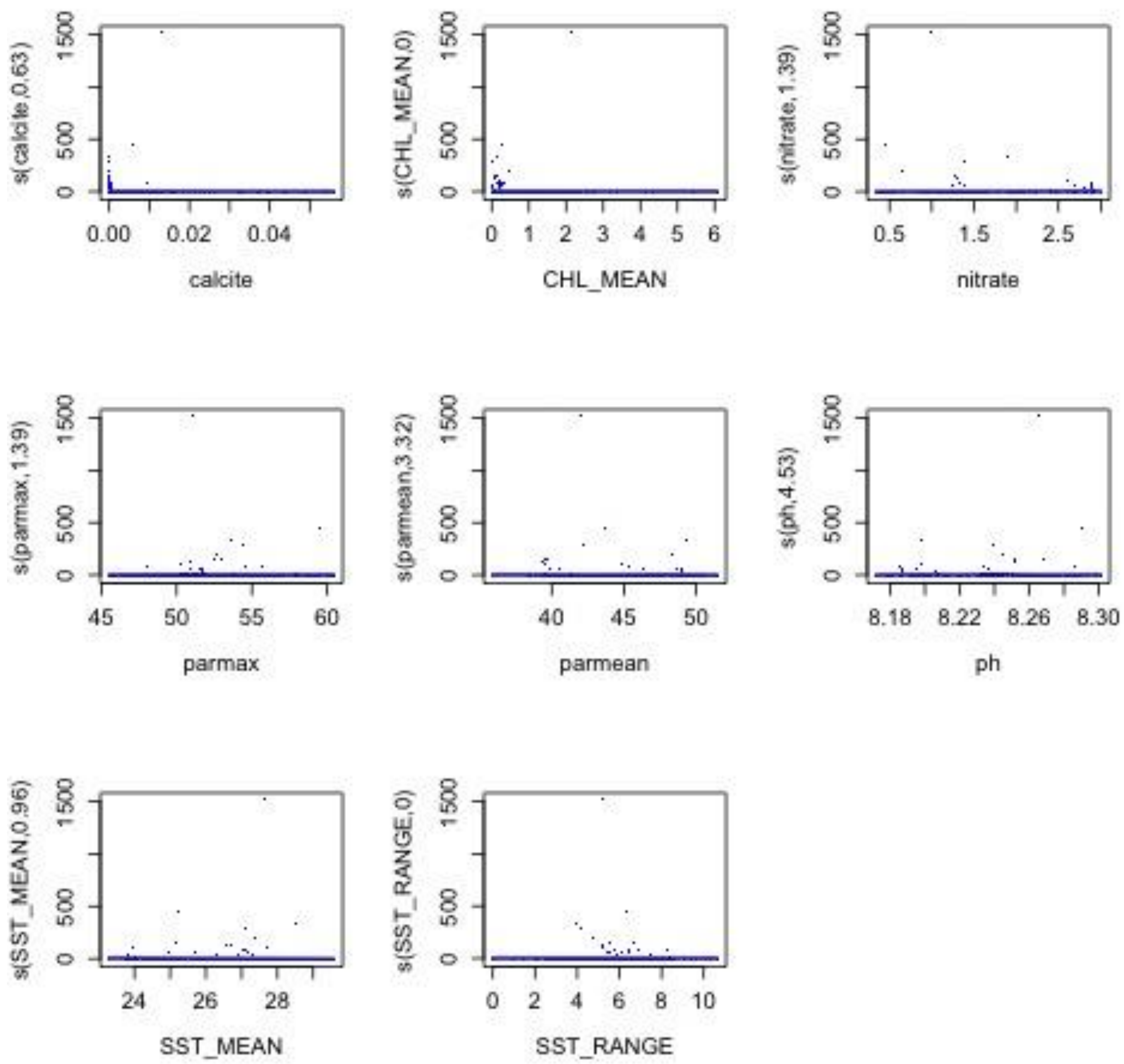
330 Plectroglyphidodon flaviventris, n = 98 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.065129e-06	9	2.510085e-06	5.796358e-01
s(CHL_MEAN)	9.605483e-01	8	7.703552e+00	3.208390e-03
s(nitrate)	1.566852e+00	9	1.015994e+01	5.788921e-04
s(parmax)	2.856305e+00	9	8.993994e+00	1.093537e-02
s(parmean)	3.137232e-05	9	6.738586e-06	6.393799e-01
s(ph)	3.450188e+00	9	3.606399e+01	8.322313e-10
s(SST_MEAN)	5.683572e+00	9	3.397538e+01	1.582501e-07
s(SST_RANGE)	7.258111e-01	9	2.299066e+00	4.887104e-02



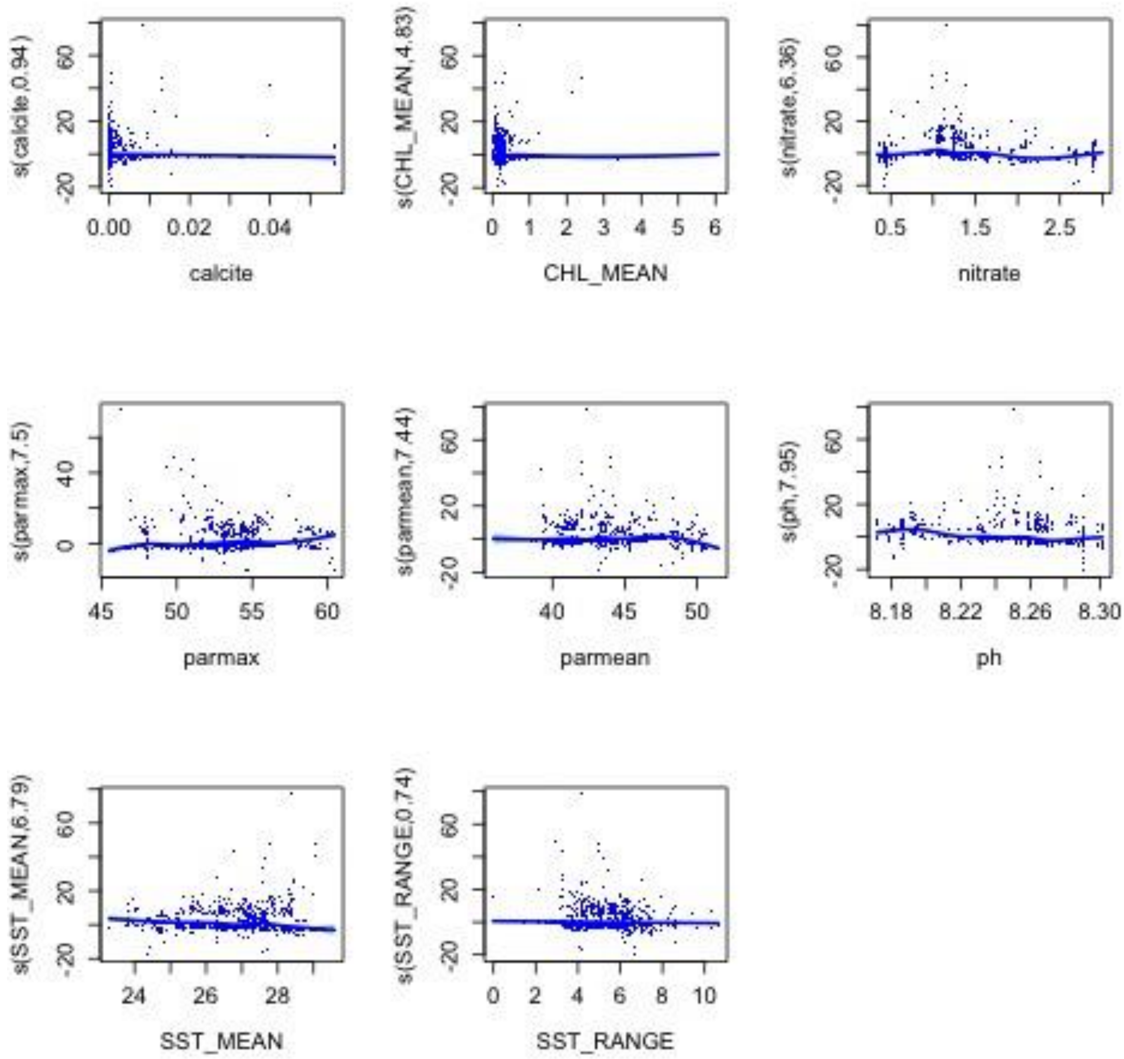
331 Plectroglyphidodon imparipennis, n = 160 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.281535e-01	6	1.059335e+00	1.910514e-01
s(CHL_MEAN)	1.282782e-05	9	6.707877e-07	1.000000e+00
s(nitrate)	1.394116e+00	9	8.243884e+00	1.452633e-03
s(parmax)	1.392110e+00	9	2.568757e+00	1.016675e-01
s(parmean)	3.318684e+00	9	8.595213e+00	1.813813e-02
s(ph)	4.525812e+00	9	1.412291e+01	2.260105e-03
s(SST_MEAN)	9.616413e-01	9	2.312322e+01	2.696709e-08
s(SST_RANGE)	2.053771e-05	9	1.091825e-05	5.195674e-01



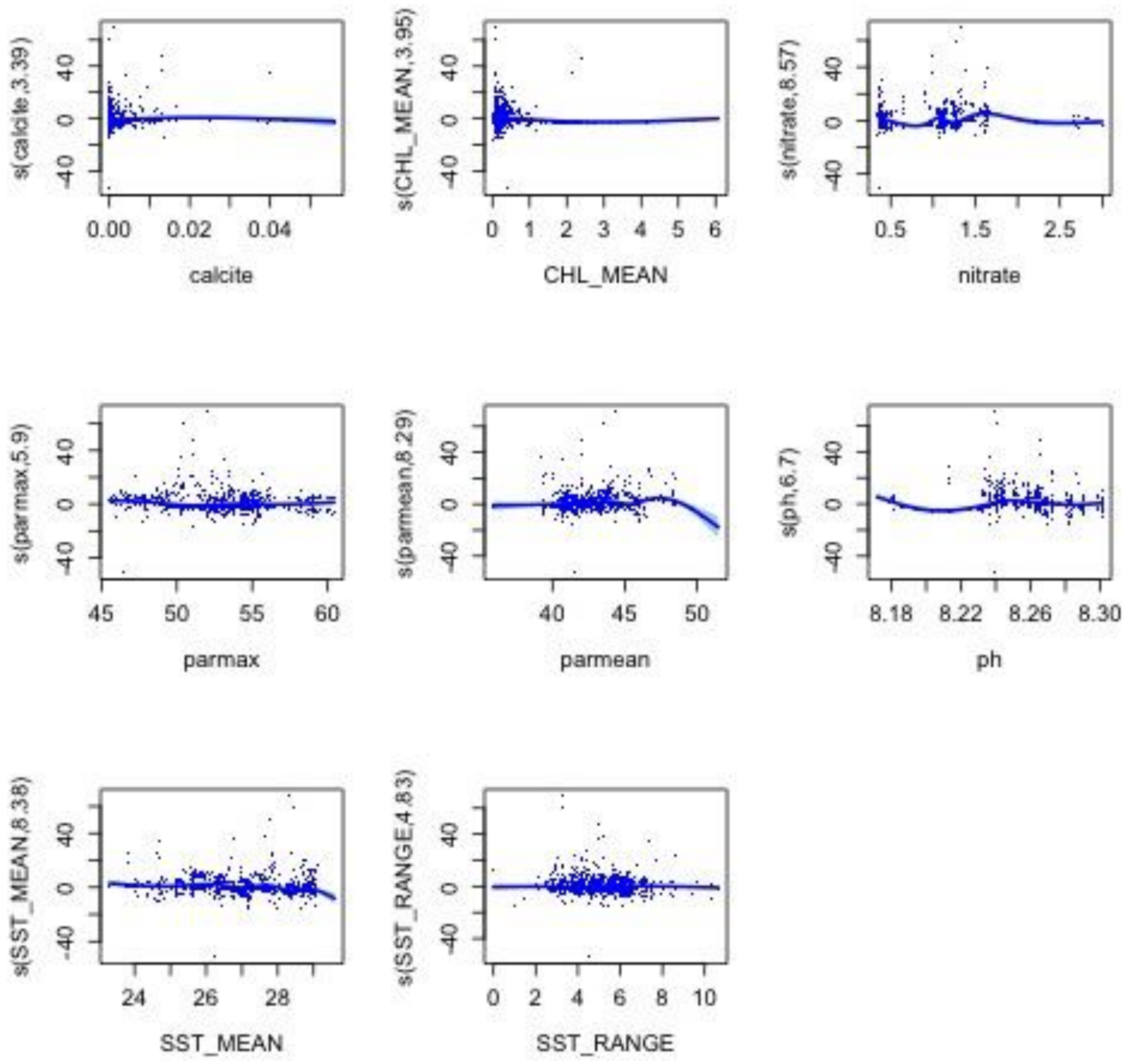
332 Plectroglyphidodon johnstonianus, n = 1436 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9369323	6	13.961530	8.522567e-05
s(CHL_MEAN)	4.8334398	9	45.936241	7.674141e-10
s(nitrate)	6.3645624	9	104.896390	1.689278e-23
s(parmax)	7.4972371	9	93.723236	1.117787e-19
s(parmean)	7.4423577	9	134.703820	6.147509e-30
s(ph)	7.9478611	9	168.459361	1.438664e-37
s(SST_MEAN)	6.7865970	9	75.066758	4.732265e-16
s(SST_RANGE)	0.7353253	9	2.715354	5.080712e-02



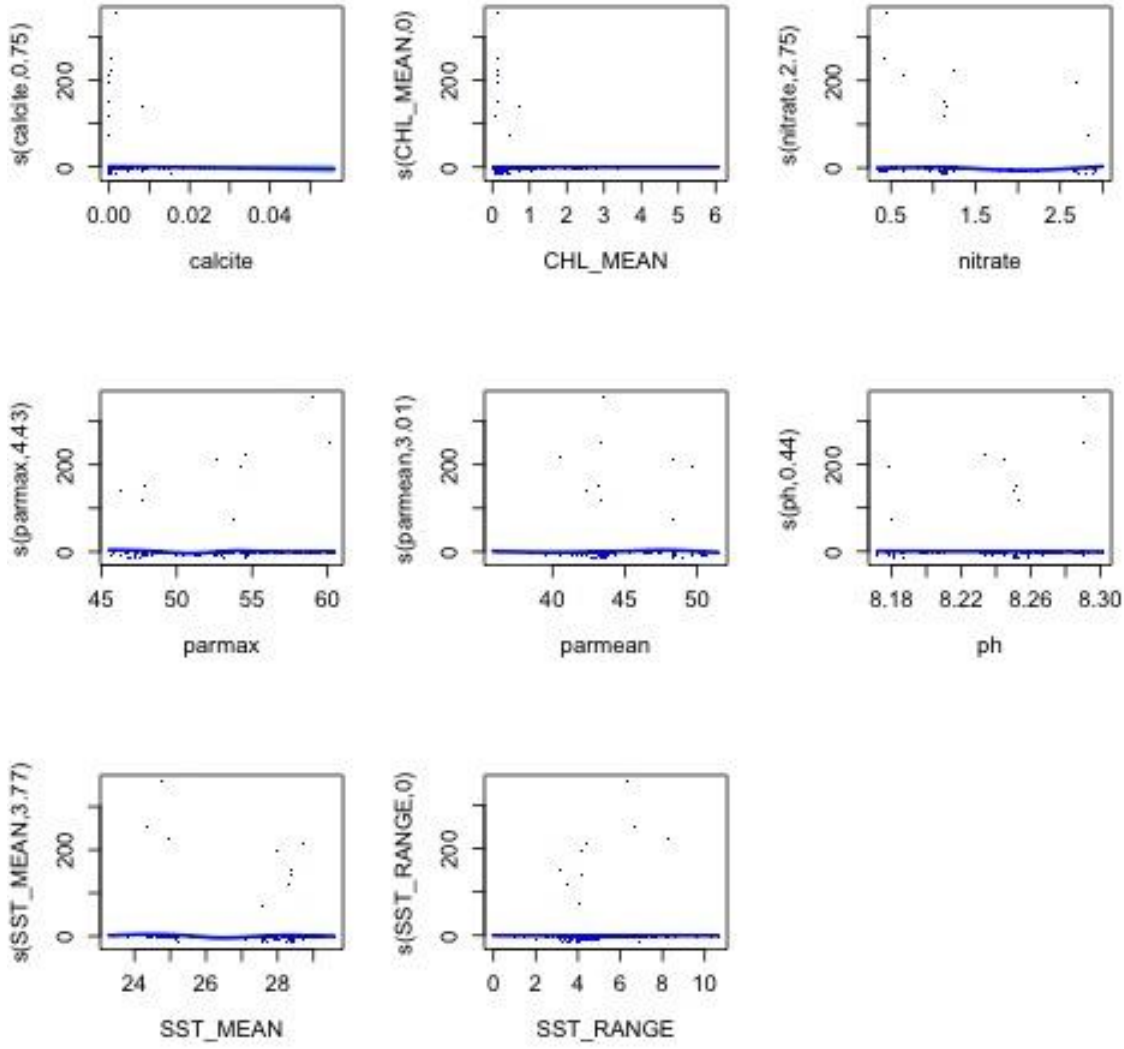
333 Plectroglyphidodon lacrymatus, n = 1028 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.389408	9	23.32359	1.600195e-05
s(CHL_MEAN)	3.950036	9	33.21561	1.816610e-07
s(nitrate)	8.565773	9	368.07450	3.772948e-83
s(parmax)	5.903078	9	95.67034	4.012144e-22
s(parmean)	8.286265	9	80.12806	1.534870e-15
s(ph)	6.697048	9	98.43381	1.029978e-21
s(SST_MEAN)	8.382724	9	140.55034	1.209453e-29
s(SST_RANGE)	4.826071	9	20.35299	3.117485e-04



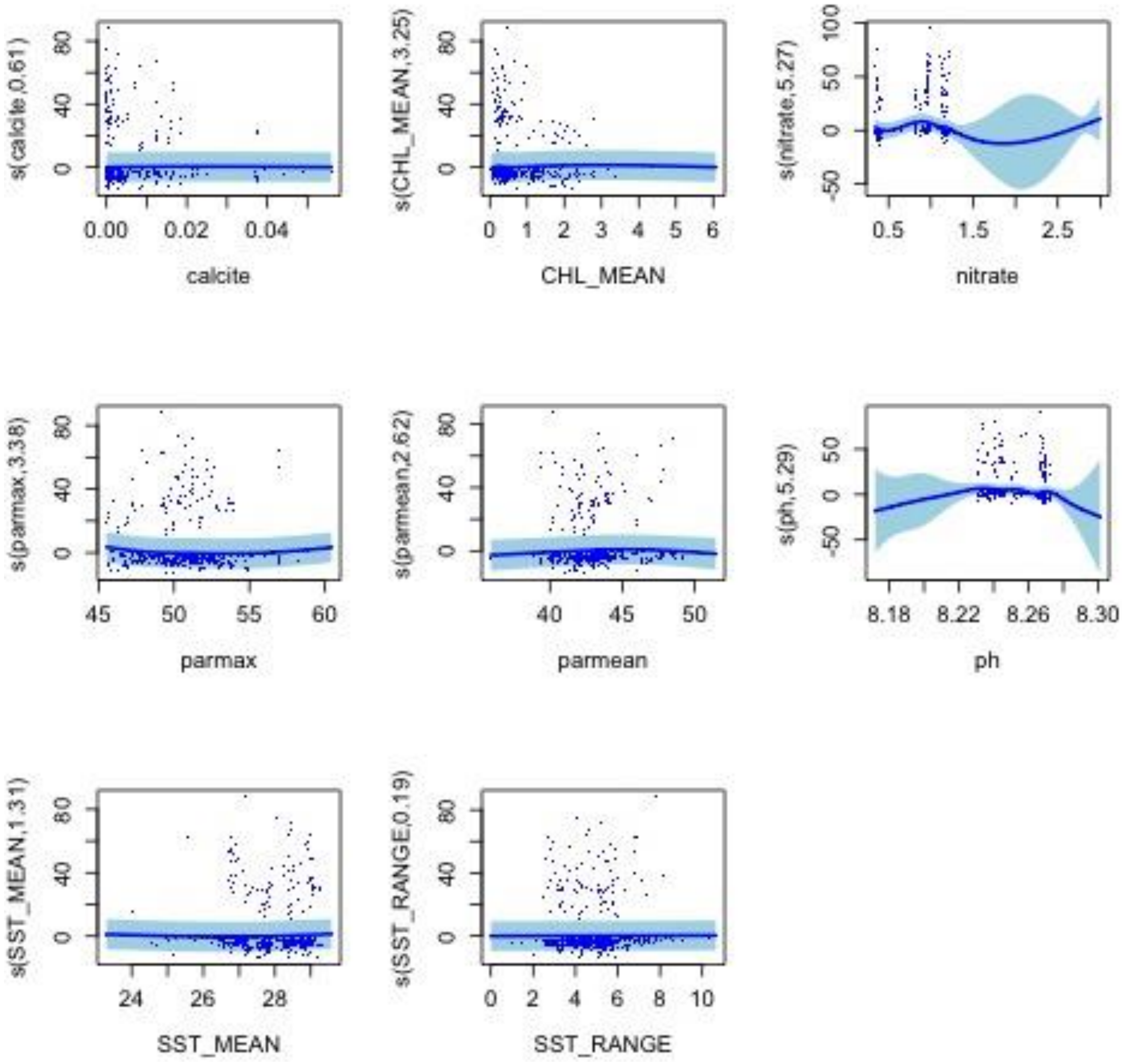
334 Plectroglyphidodon phoenixensis, n = 151 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.484081e-01	5	1.188341e+00	0.1973958200
s(CHL_MEAN)	1.021147e-05	9	1.941433e-06	0.6891017409
s(nitrate)	2.750911e+00	9	1.308961e+01	0.0003621063
s(parmax)	4.428984e+00	9	1.678933e+01	0.0004948560
s(parmean)	3.007151e+00	9	1.037830e+01	0.0040876547
s(ph)	4.401315e-01	9	6.446960e-01	0.1709110135
s(SST_MEAN)	3.766593e+00	9	1.015055e+01	0.0099731378
s(SST_RANGE)	2.993829e-05	9	1.909807e-05	0.4946931420



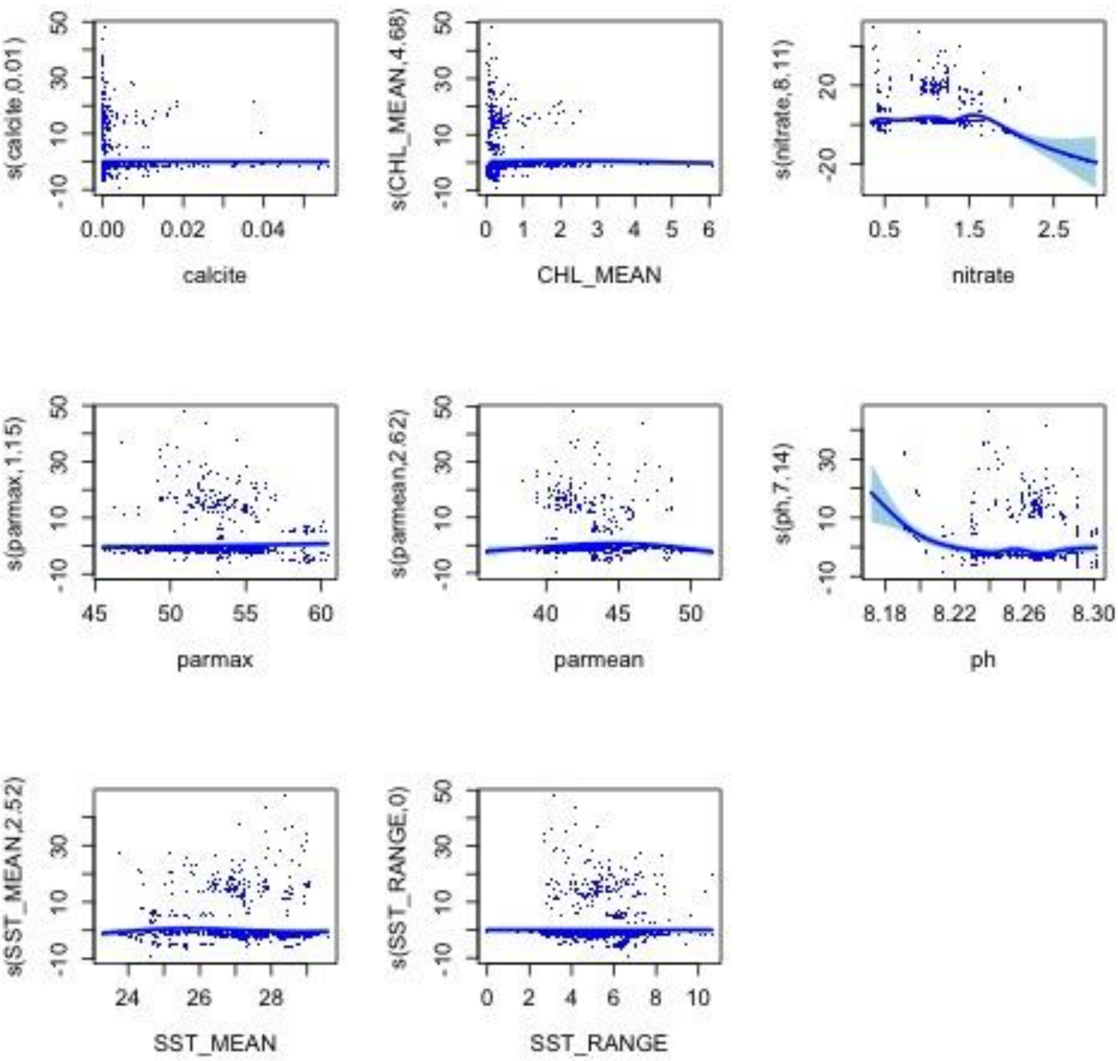
335Plectropomus areolatus, n = 109 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6087651	9	1.3413564	1.188444e-01
s(CHL_MEAN)	3.2490323	9	13.3034674	2.291070e-03
s(nitrate)	5.2676325	9	36.9412065	4.111368e-08
s(parmax)	3.3759394	9	21.5044800	4.649562e-06
s(parmean)	2.6151685	9	11.8411318	6.134190e-04
s(ph)	5.2941946	9	26.4724307	1.124989e-05
s(SST_MEAN)	1.3057755	9	3.7628963	3.037658e-02
s(SST_RANGE)	0.1923071	9	0.2413196	2.398008e-01



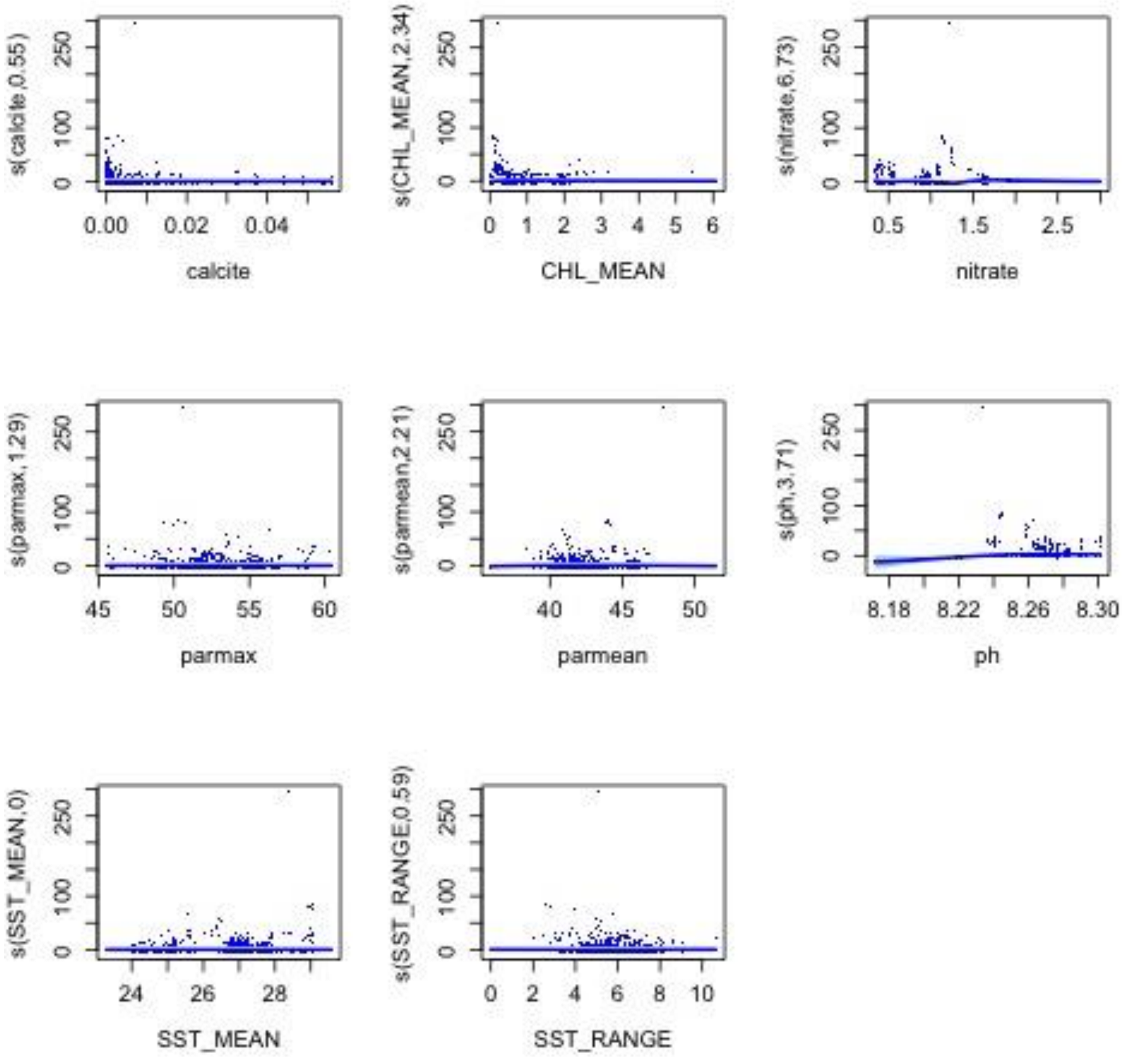
336Plectropomus laevis, n = 361 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0077447413	7	7.180839e-03	3.328186e-01
s(CHL_MEAN)	4.6816585183	9	4.059518e+01	1.033383e-08
s(nitrate)	8.1054878307	9	1.096298e+02	4.181469e-24
s(parmax)	1.1530180662	9	4.752817e+00	1.177064e-02
s(parmean)	2.6244945473	9	2.032458e+01	2.316138e-06
s(ph)	7.1388419241	9	5.960602e+01	1.711376e-12
s(SST_MEAN)	2.5208110715	9	9.240031e+00	4.119554e-03
s(SST_RANGE)	0.0002033303	9	1.658256e-04	3.990268e-01



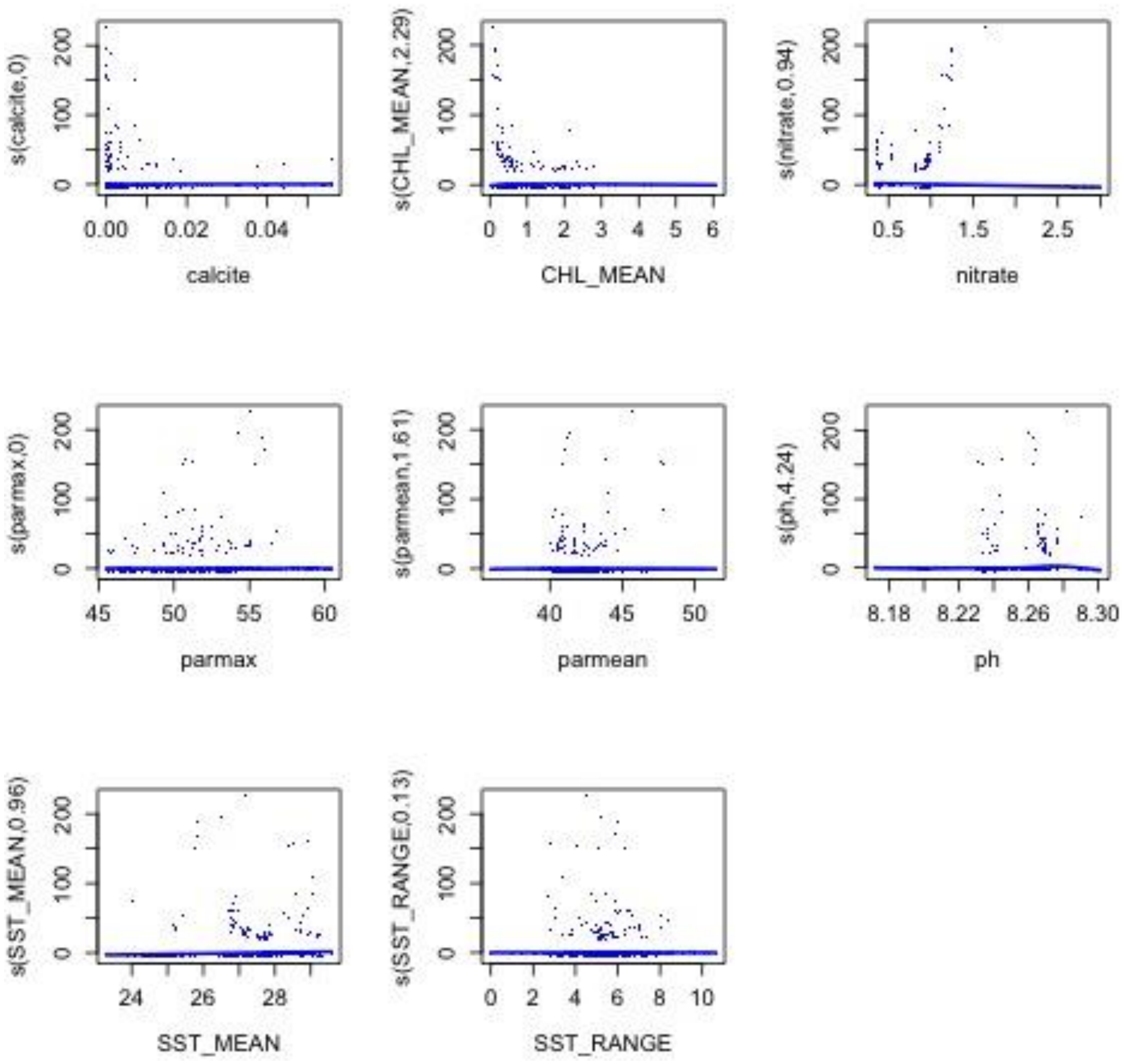
337Plectropomus leopardus, n = 264 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.5467123639	9	1.109804e+00	1.463634e-01
s(CHL_MEAN)	2.3420430935	9	2.634298e+01	3.528191e-07
s(nitrate)	6.7296507021	9	1.128923e+02	3.182379e-27
s(parmax)	1.2889672414	9	2.884602e+00	7.908633e-02
s(parmean)	2.2139534982	9	8.199119e+00	7.225066e-03
s(ph)	3.7124406984	9	4.516100e+01	3.562876e-12
s(SST_MEAN)	0.0005637805	9	4.803669e-04	3.603464e-01
s(SST_RANGE)	0.5914038269	9	8.313646e-01	2.178300e-01



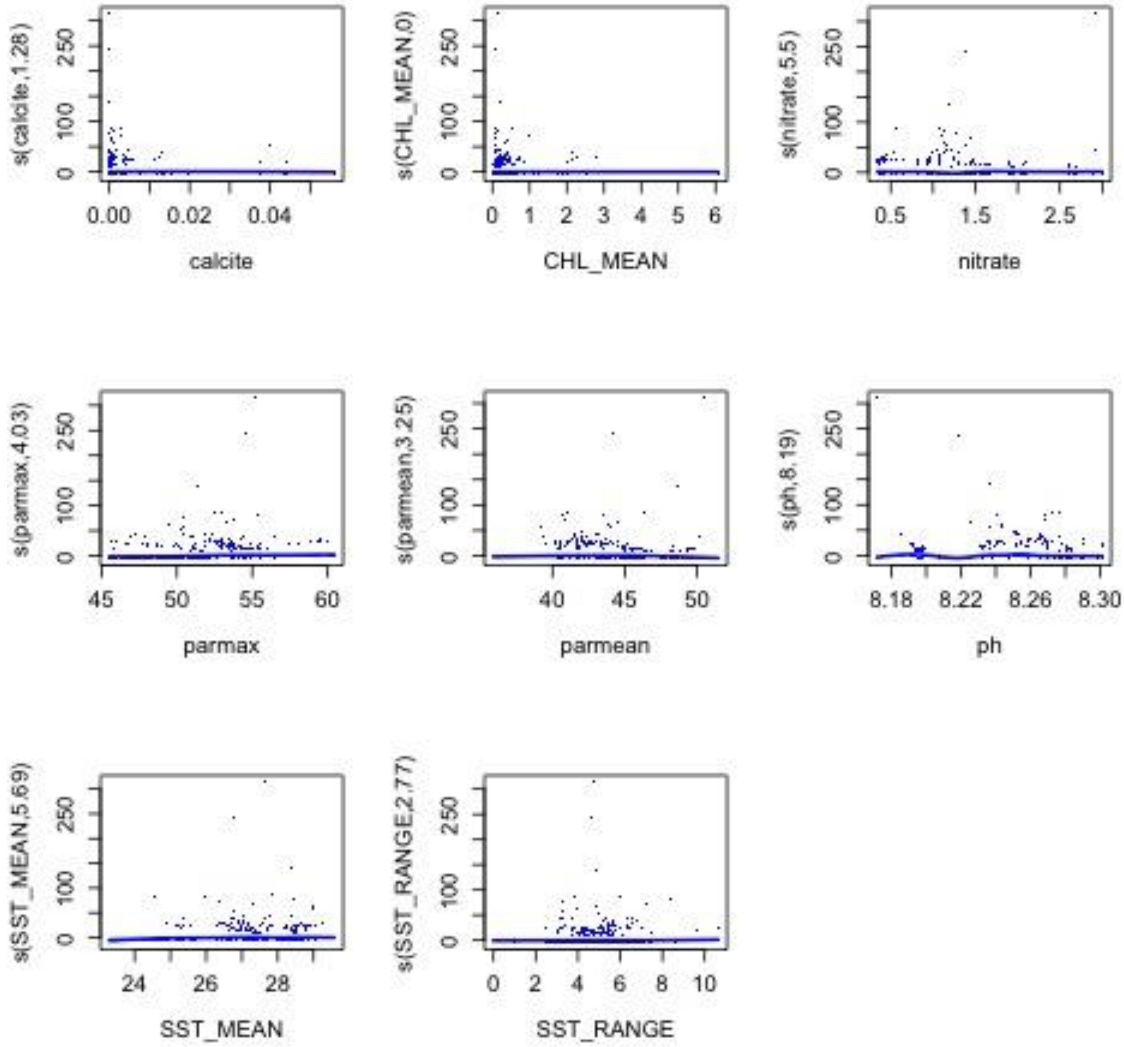
338Plectropomus maculatus, n = 87 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.497219e-06	8	4.360708e-06	5.689433e-01
s(CHL_MEAN)	2.292728e+00	9	1.942686e+01	3.449073e-05
s(nitrate)	9.430362e-01	9	1.512326e+01	1.611332e-05
s(parmax)	1.967796e-05	9	9.494692e-06	6.193345e-01
s(parmean)	1.606086e+00	9	2.530246e+00	1.765340e-01
s(ph)	4.236452e+00	9	3.655143e+01	1.261076e-08
s(SST_MEAN)	9.552436e-01	9	2.073953e+01	1.012955e-06
s(SST_RANGE)	1.347860e-01	9	1.372218e-01	3.281741e-01



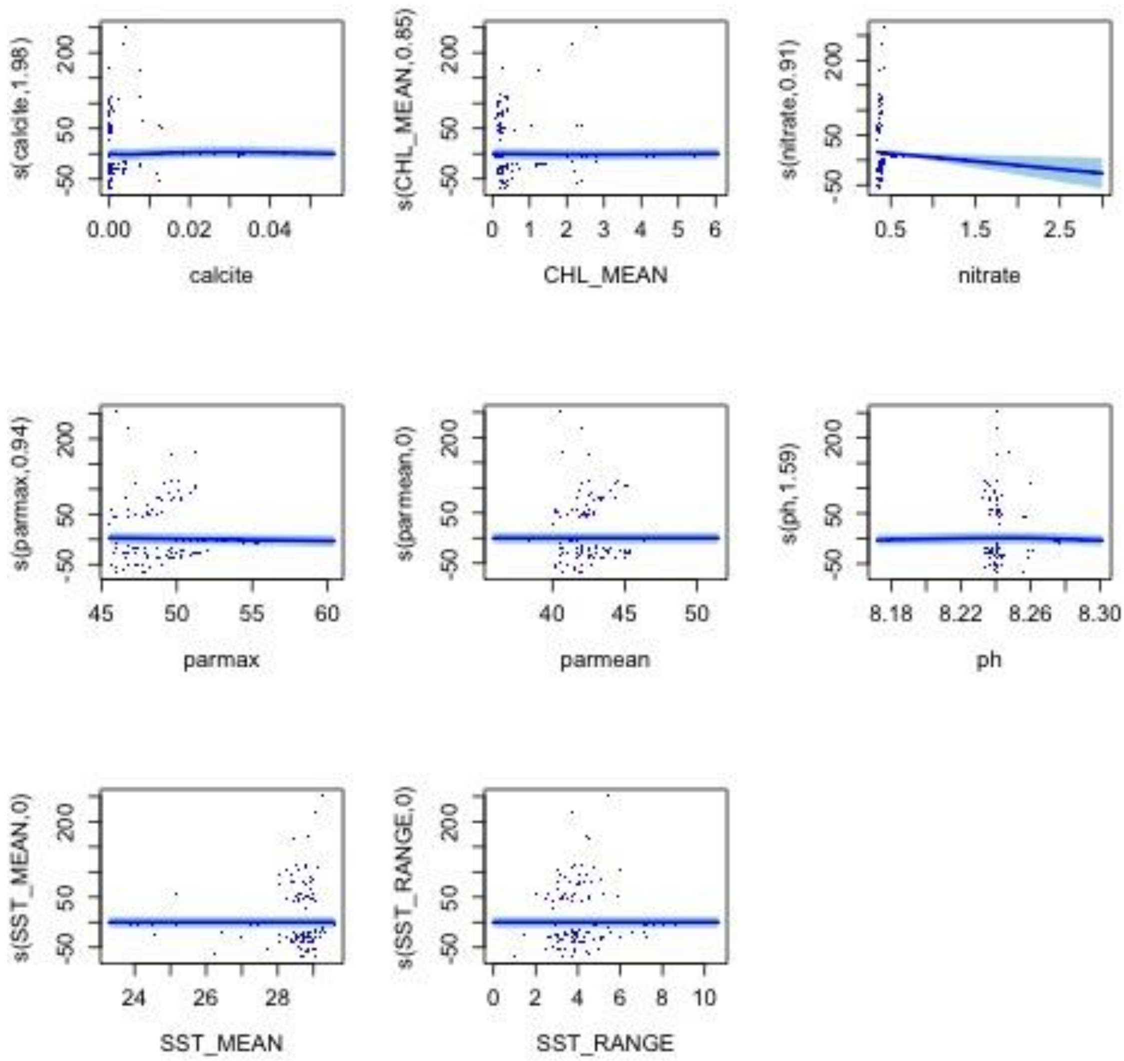
339 Pomacanthus imperator, n = 435 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.2754777903	9	3.042525e+00	8.052764e-02
s(CHL_MEAN)	0.0000589325	9	4.110631e-06	1.000000e+00
s(nitrate)	5.5000622314	9	5.633681e+01	5.200696e-13
s(parmax)	4.0311751424	9	3.253379e+01	2.383154e-08
s(parmean)	3.2483576651	9	3.349946e+01	1.391932e-09
s(ph)	8.1860395871	9	9.057321e+01	3.030694e-19
s(SST_MEAN)	5.6860826343	9	1.972705e+01	4.109458e-04
s(SST_RANGE)	2.7714164043	9	5.634466e+00	7.599904e-02



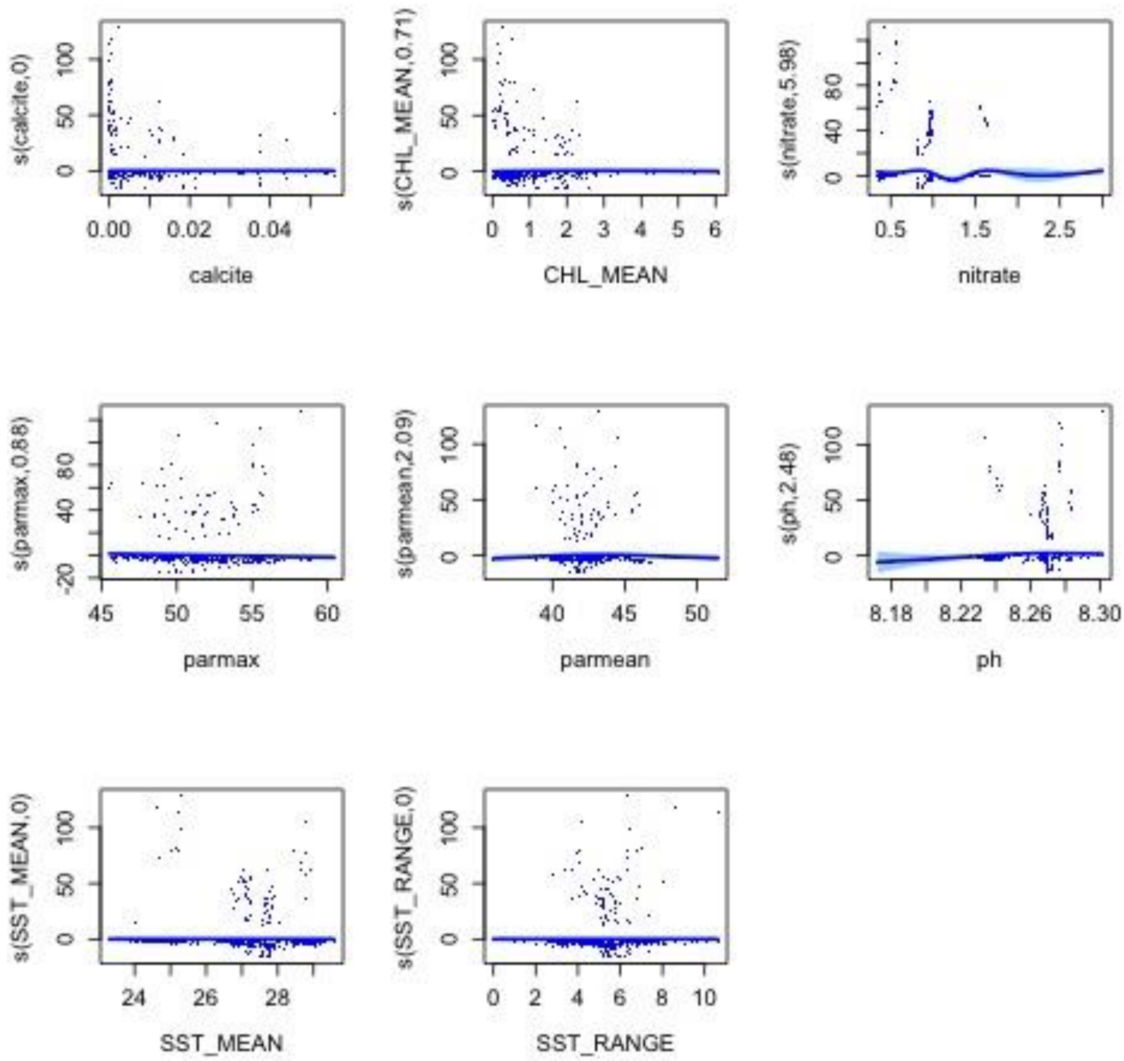
340 Pomacanthus navarchus, n = 46 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.976138e+00	9	9.955690e+00	3.723729e-03
s(CHL_MEAN)	8.548777e-01	9	3.633536e+00	3.148995e-02
s(nitrate)	9.125851e-01	9	7.003015e+00	4.739589e-03
s(parmax)	9.390216e-01	8	1.325562e+01	9.914421e-05
s(parmean)	3.476787e-06	9	1.147959e-06	7.017453e-01
s(ph)	1.594345e+00	8	4.226907e+00	5.491323e-02
s(SST_MEAN)	6.298785e-06	9	1.029390e-06	8.692817e-01
s(SST_RANGE)	7.275457e-06	9	2.437384e-06	6.852736e-01



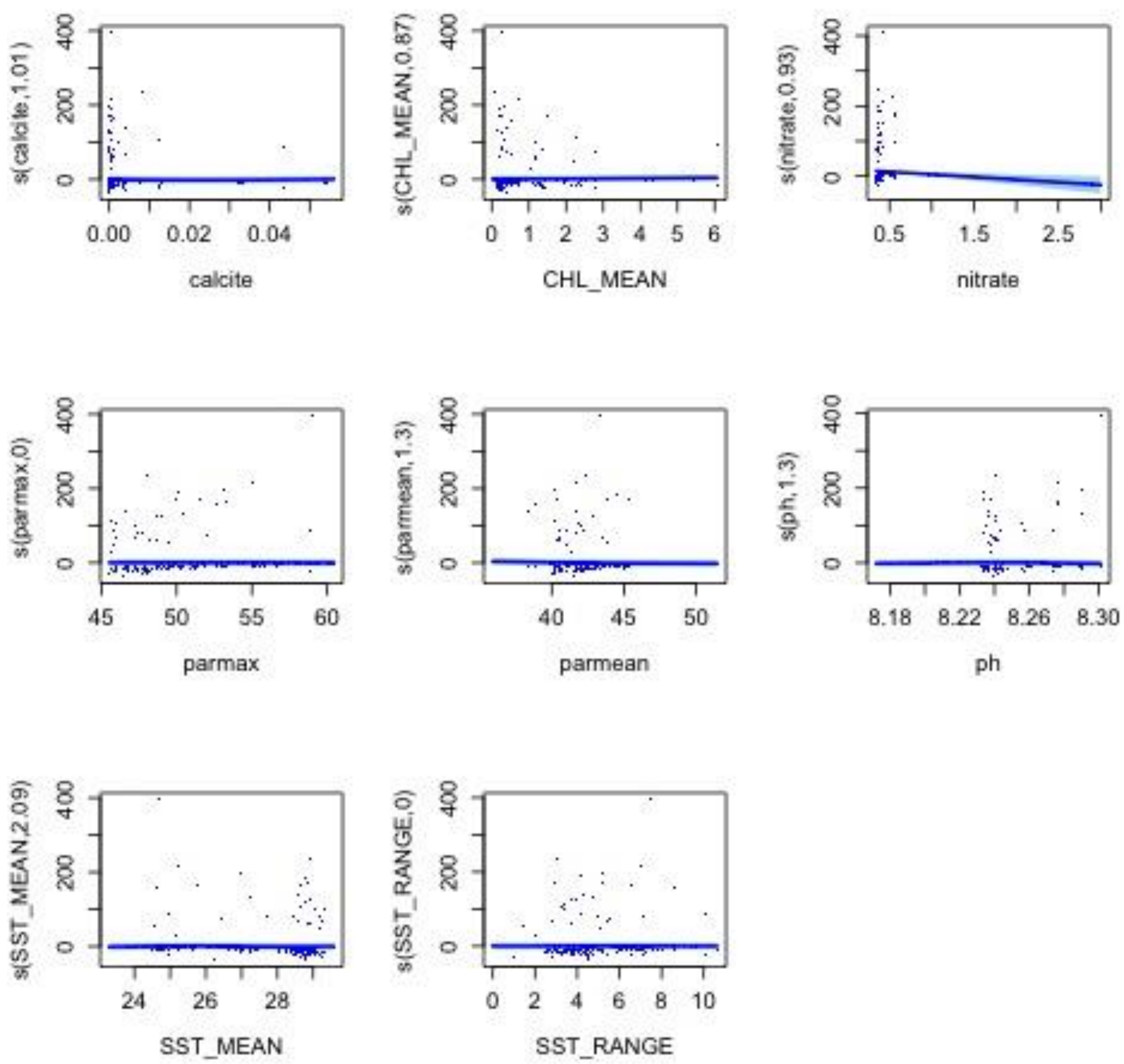
341 Pomacanthus semicirculatus, n = 86 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.035741e-05	8	1.512818e-06	8.325096e-01
s(CHL_MEAN)	7.093584e-01	9	2.242819e+00	6.793344e-02
s(nitrate)	5.982615e+00	9	4.925369e+01	3.829650e-11
s(parmax)	8.844512e-01	9	7.301511e+00	2.239357e-03
s(parmean)	2.093655e+00	9	9.724801e+00	1.984699e-03
s(ph)	2.482149e+00	9	1.069160e+01	2.022166e-03
s(SST_MEAN)	3.113391e-04	9	2.511589e-04	3.808194e-01
s(SST_RANGE)	1.608373e-05	9	9.704525e-06	4.679000e-01



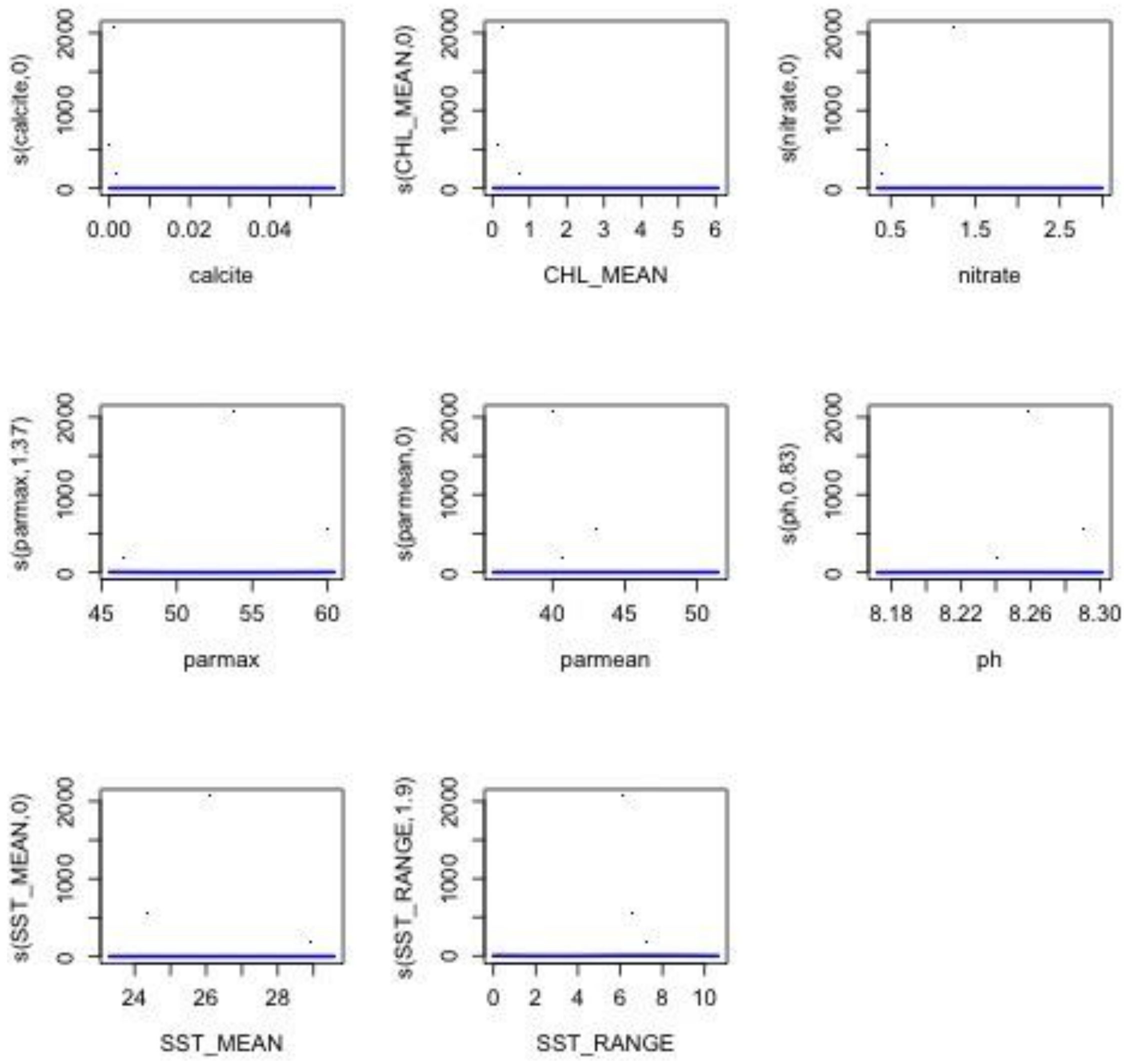
342 Pomacanthus sexstriatus, n = 33 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.005050e+00	9	4.598927e+00	0.0168754949
s(CHL_MEAN)	8.682926e-01	4	6.188791e+00	0.0045041689
s(nitrate)	9.299899e-01	6	9.915701e+00	0.0002688179
s(parmax)	4.880692e-06	9	7.896768e-07	0.8635026619
s(parmean)	1.304115e+00	9	9.395171e+00	0.0010463260
s(ph)	1.301957e+00	8	8.225665e+00	0.0014027934
s(SST_MEAN)	2.089007e+00	9	4.871883e+00	0.0528443857
s(SST_RANGE)	4.160575e-03	9	4.604114e-03	0.2868688355



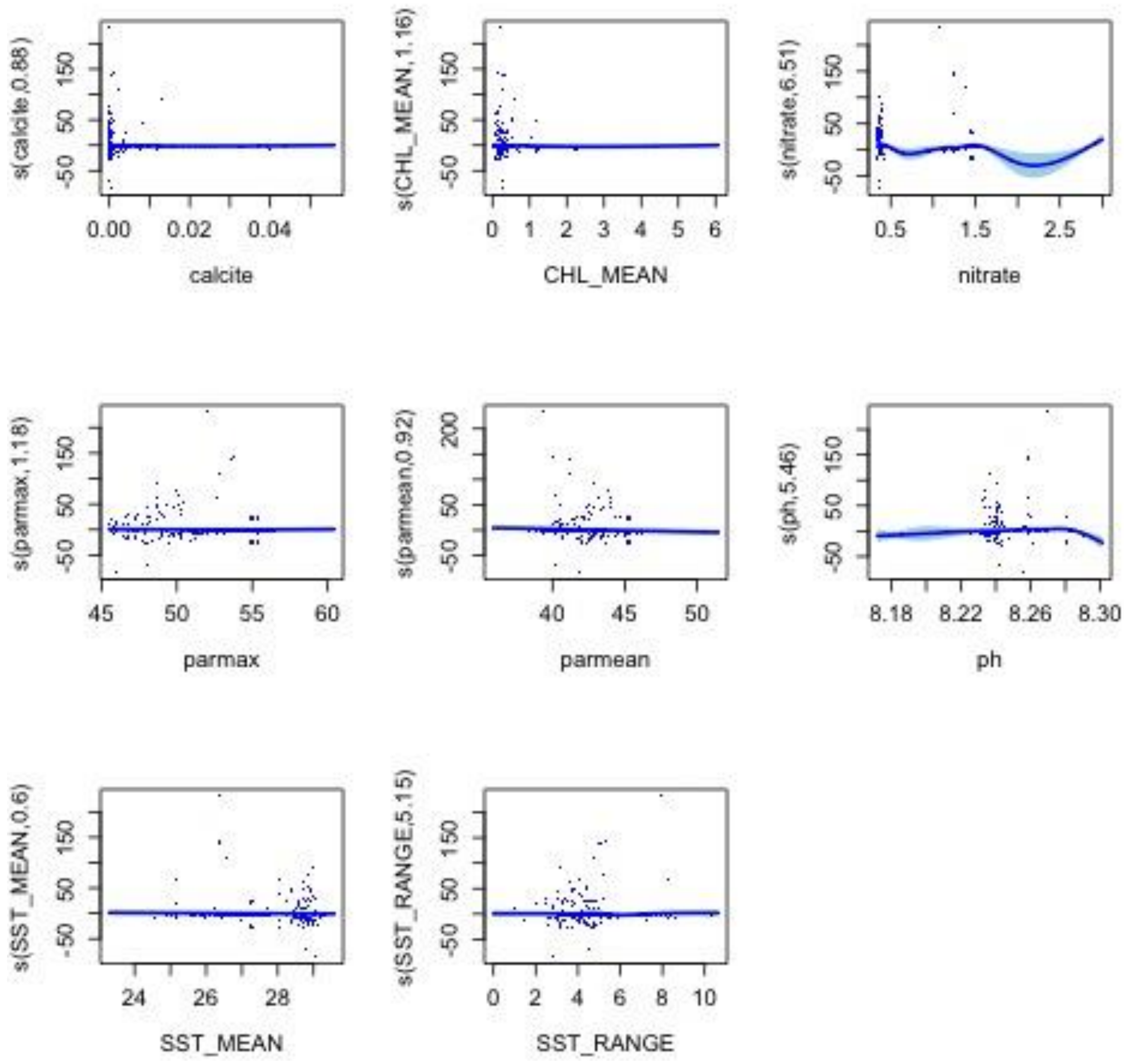
343 Pomacentrid sp, n = 42 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.906131e-06	8	1.958564e-06	0.54246801
s(CHL_MEAN)	1.418372e-06	9	1.877191e-07	0.72526694
s(nitrate)	4.772137e-06	9	6.601051e-07	0.88726581
s(parmax)	1.373493e+00	9	6.415865e+00	0.00501616
s(parmean)	3.032118e-06	9	1.467963e-06	0.61837520
s(ph)	8.335802e-01	9	2.270954e+00	0.06108697
s(SST_MEAN)	9.120075e-07	9	5.612588e-07	0.47393915
s(SST_RANGE)	1.899183e+00	9	4.656339e+00	0.06267637



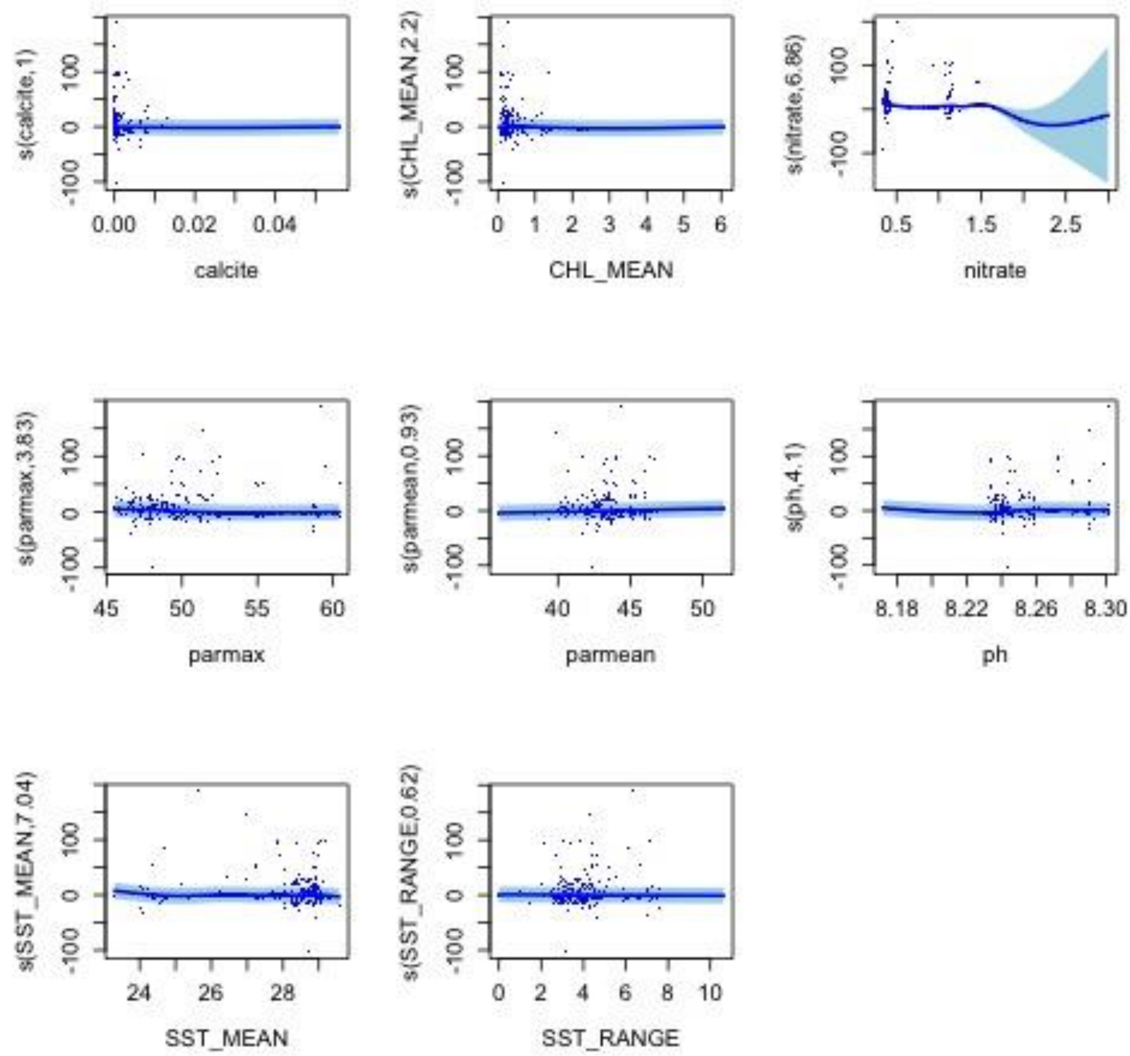
344 Pomacentrus adelus, n = 70 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8767042	9	2.847126	5.843041e-02
s(CHL_MEAN)	1.1645975	9	6.836366	6.273955e-03
s(nitrate)	6.5068451	9	61.709163	2.115275e-13
s(parmax)	1.1785151	9	2.531032	8.662166e-02
s(parmean)	0.9214038	9	9.313473	6.325366e-04
s(ph)	5.4646477	9	35.139998	1.644992e-07
s(SST_MEAN)	0.5993213	7	1.701685	8.343154e-02
s(SST_RANGE)	5.1534027	9	14.891730	6.111191e-03



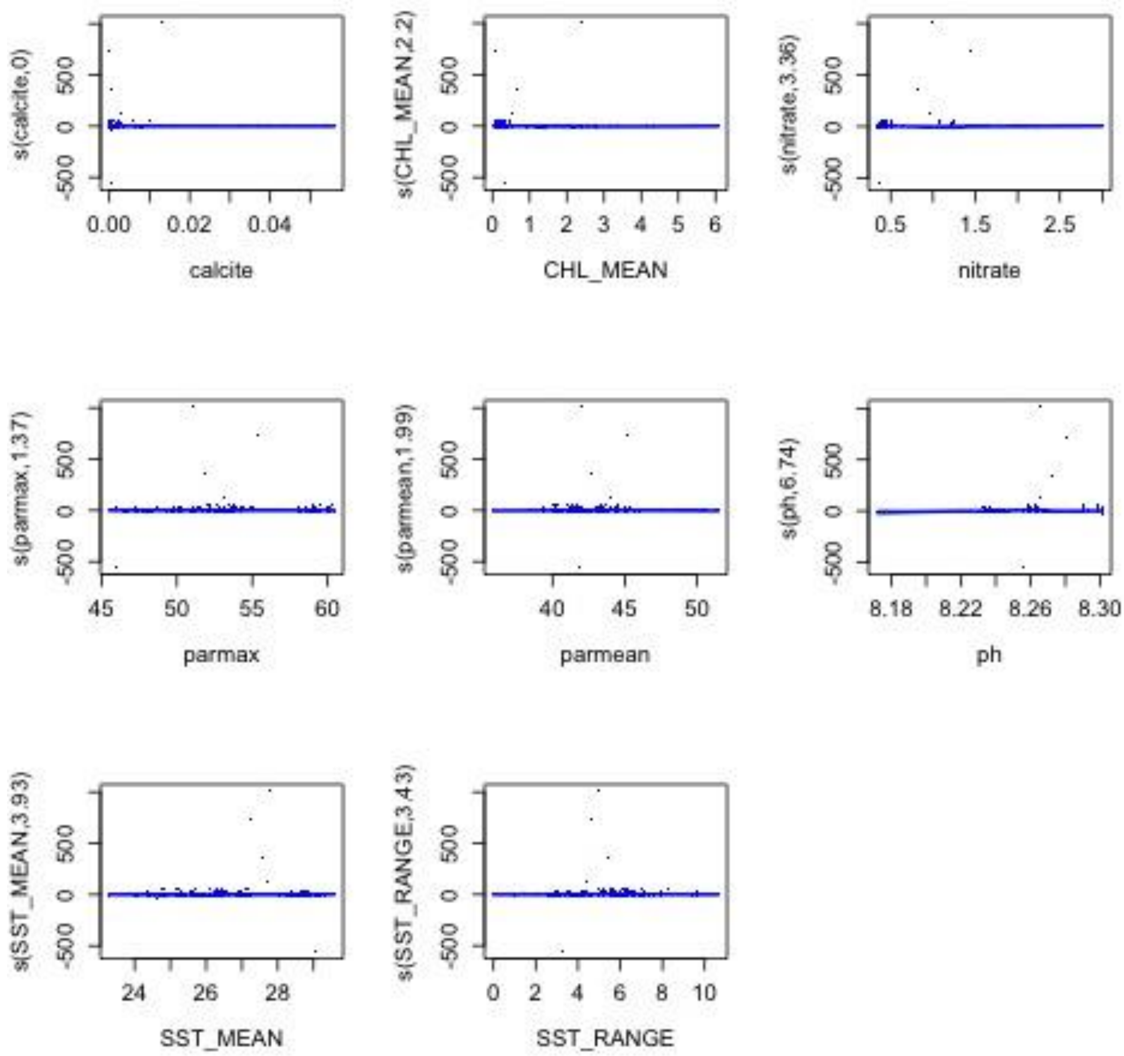
345 Pomacentrus amboinensis, n = 115 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9984295	9	5.92436	8.601200e-03
s(CHL_MEAN)	2.2044687	9	14.49053	3.879254e-04
s(nitrate)	6.8606694	9	97.55032	3.211147e-22
s(parmax)	3.8330541	9	49.11155	5.674570e-13
s(parmean)	0.9293147	9	11.40745	1.577324e-04
s(ph)	4.0971532	9	35.08712	1.522528e-08
s(SST_MEAN)	7.0420110	9	33.30802	3.170275e-06
s(SST_RANGE)	0.6157256	9	1.35996	1.283032e-01



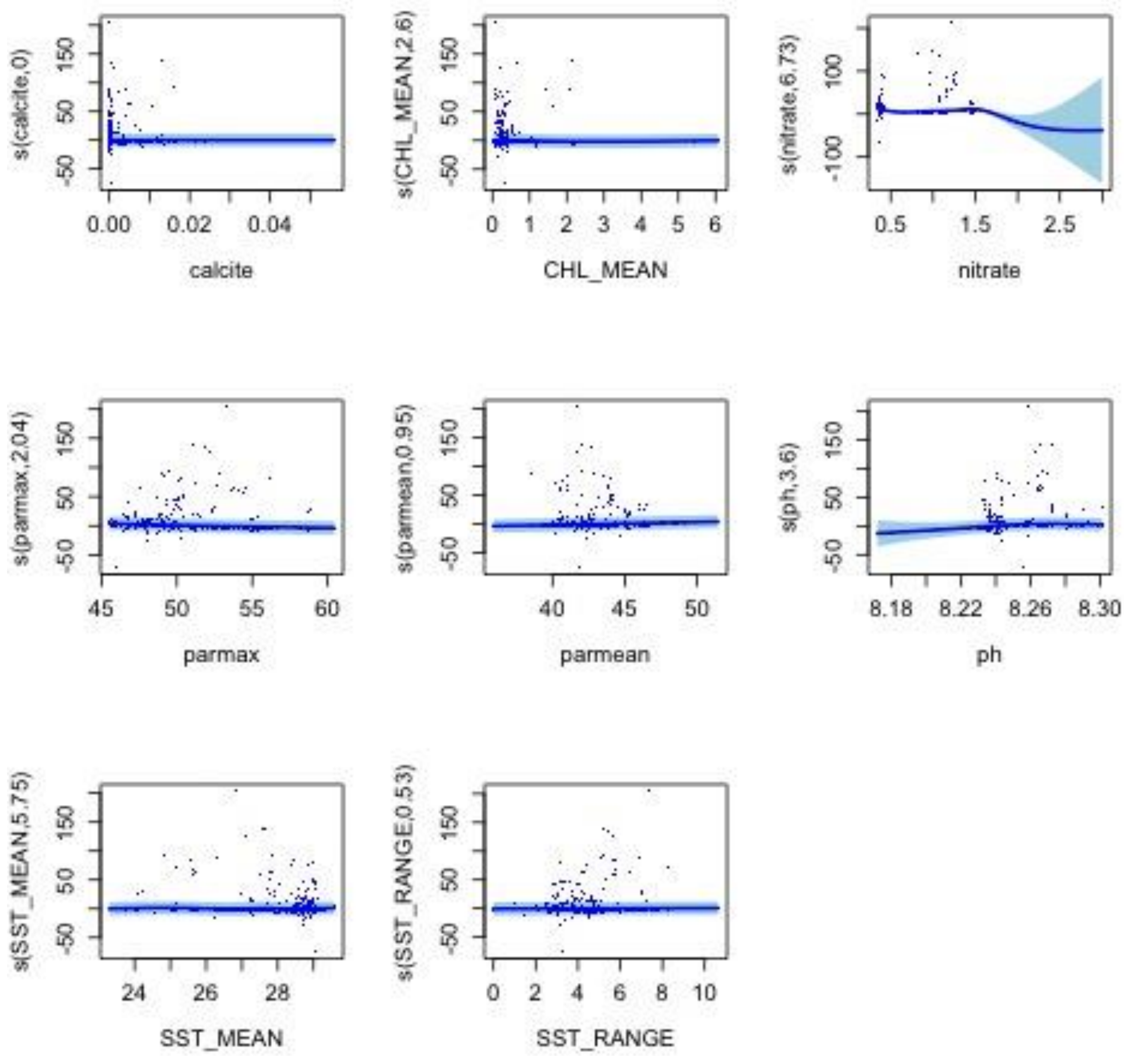
346 Pomacentrus bankanensis, n = 126 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.586867e-05	8	1.814142e-06	1.000000e+00
s(CHL_MEAN)	2.198103e+00	9	1.697168e+01	8.206347e-05
s(nitrate)	3.358188e+00	9	5.640728e+01	1.103939e-16
s(parmax)	1.373274e+00	9	4.857290e+00	1.497050e-02
s(parmean)	1.992679e+00	9	9.252187e+00	1.862934e-03
s(ph)	6.737148e+00	9	6.617417e+01	4.526092e-15
s(SST_MEAN)	3.927077e+00	9	2.065926e+01	1.833609e-05
s(SST_RANGE)	3.428459e+00	9	1.783010e+01	1.408137e-04



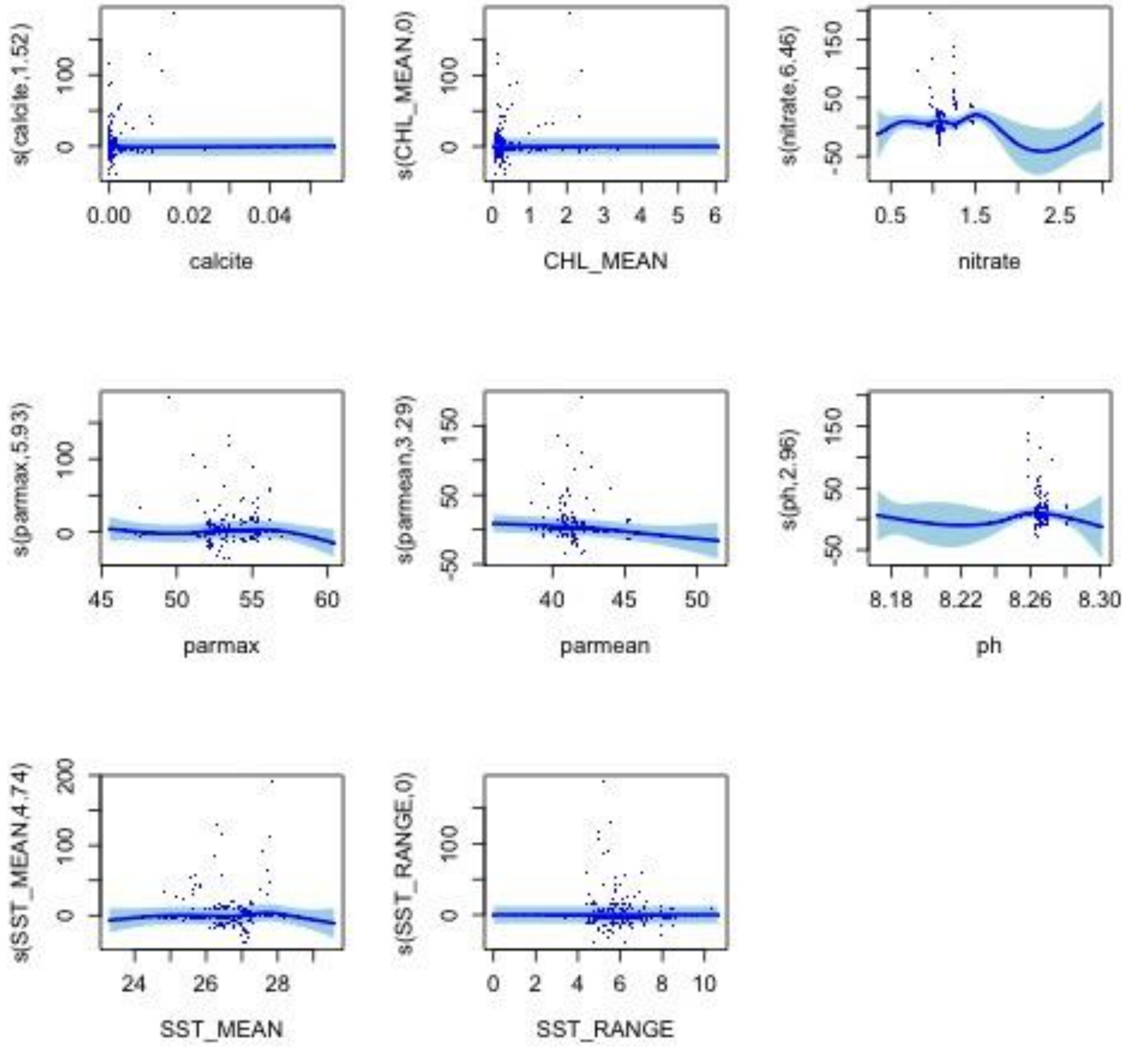
347 Pomacentrus brachialis, n = 344 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.423652e-05	9	2.297886e-05	5.957845e-01
s(CHL_MEAN)	2.598173e+00	9	1.753449e+01	1.294307e-04
s(nitrate)	6.727233e+00	9	1.472567e+02	5.430993e-35
s(parmax)	2.039953e+00	9	3.899990e+01	3.023626e-11
s(parmean)	9.532756e-01	9	1.887973e+01	2.256370e-06
s(ph)	3.599280e+00	9	4.942851e+01	5.529408e-13
s(SST_MEAN)	5.754234e+00	9	2.982084e+01	4.686880e-06
s(SST_RANGE)	5.301527e-01	9	1.296171e+00	1.112021e-01



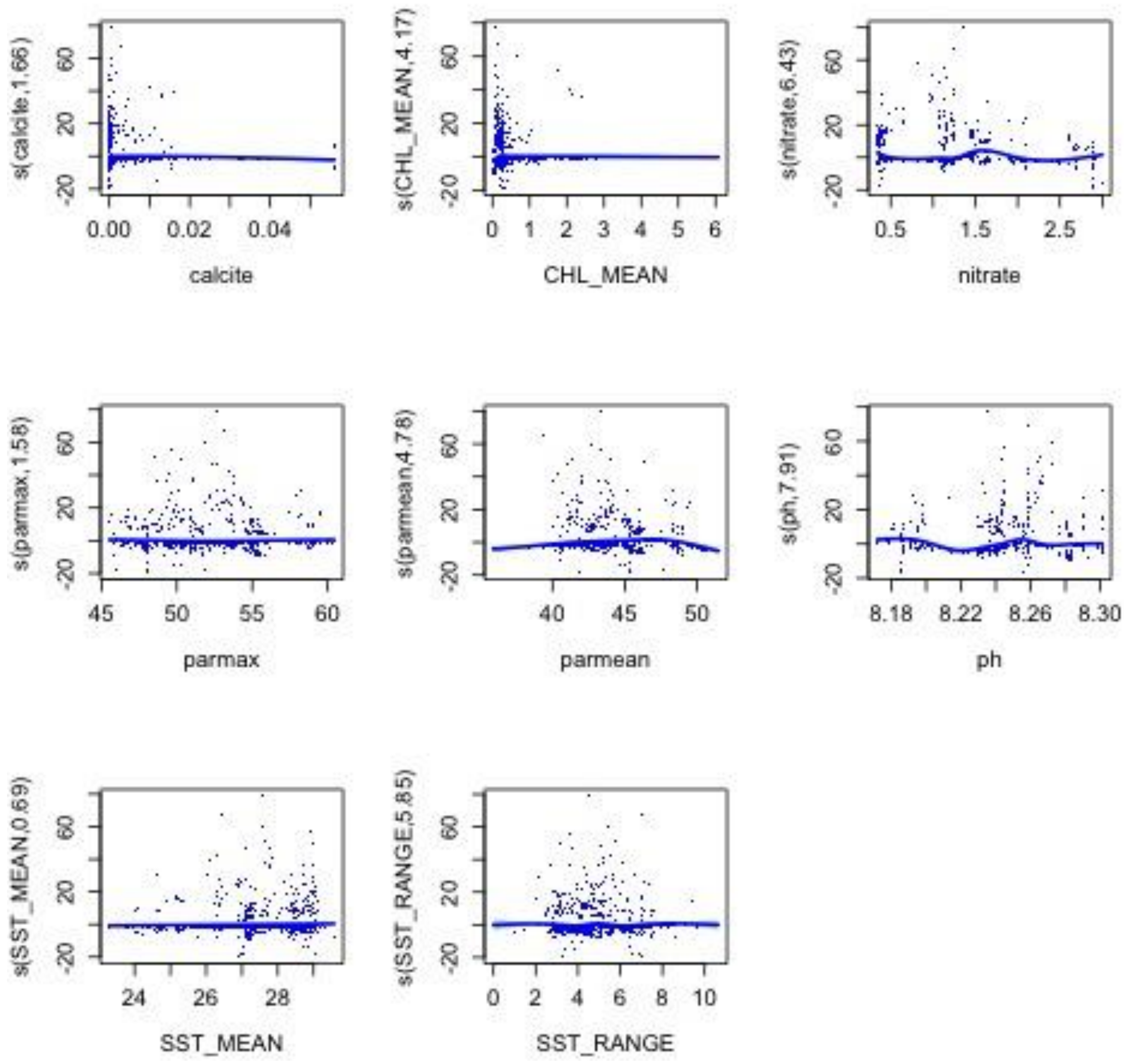
348 Pomacentrus callainus, n = 283 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.515489e+00	9	7.679755e+00	5.438367e-03
s(CHL_MEAN)	1.213039e-05	9	5.872925e-06	4.808318e-01
s(nitrate)	6.457888e+00	9	1.088908e+02	7.153992e-25
s(parmax)	5.926818e+00	9	4.810259e+01	3.366773e-10
s(parmean)	3.292670e+00	9	3.140826e+01	2.379504e-08
s(ph)	2.960768e+00	9	1.036849e+01	3.516042e-03
s(SST_MEAN)	4.738906e+00	8	3.548938e+01	2.997220e-08
s(SST_RANGE)	2.289883e-05	9	6.065615e-06	7.271112e-01



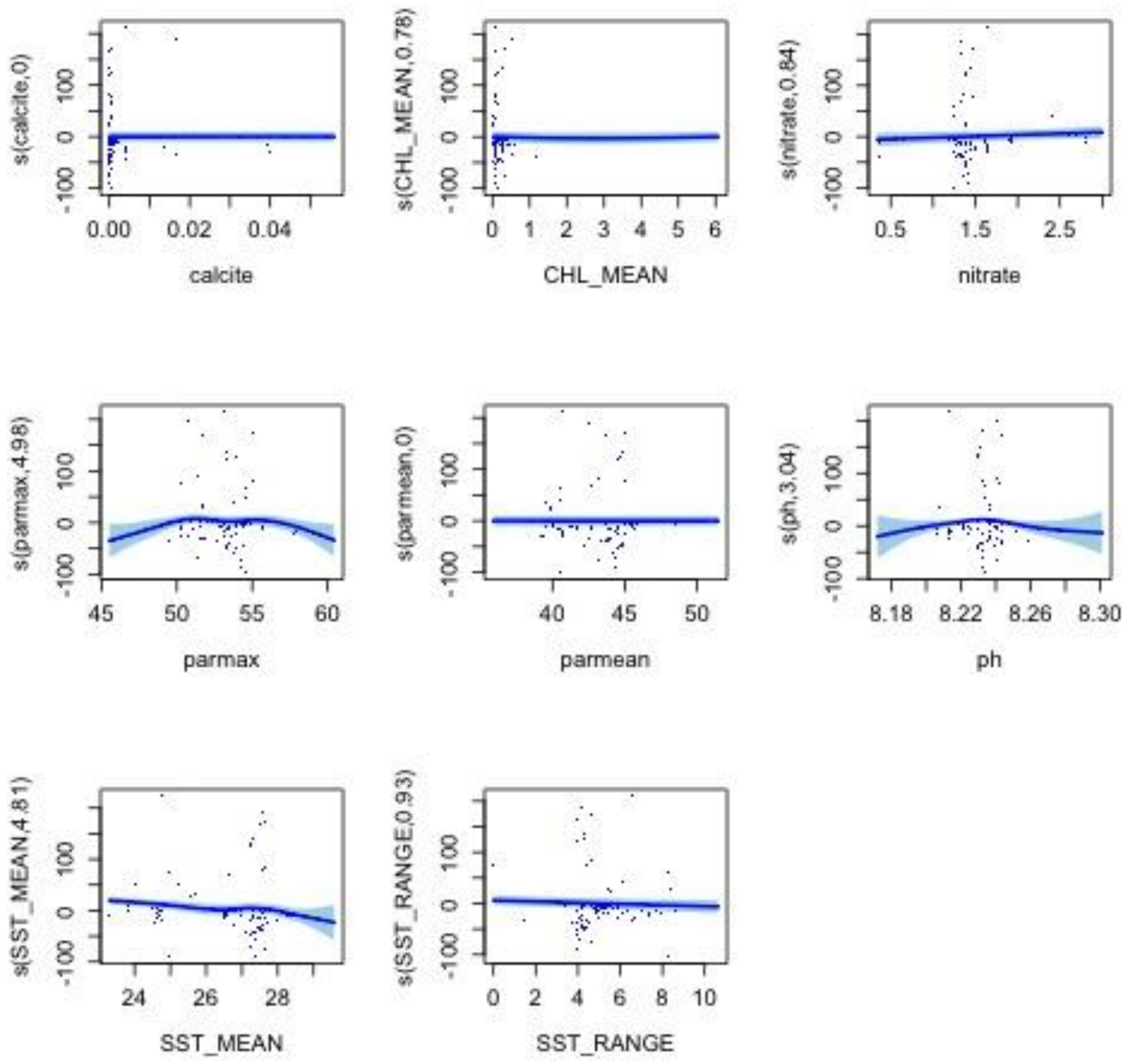
349 Pomacentrus coelestis, n = 527 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.6638069	9	15.934032	4.400001e-05
s(CHL_MEAN)	4.1657807	9	52.805580	3.126583e-12
s(nitrate)	6.4286005	9	159.119162	1.189145e-37
s(parmax)	1.5756532	9	4.837667	2.639692e-02
s(parmean)	4.7775950	9	75.390407	9.997896e-19
s(ph)	7.9058415	9	145.102085	5.181943e-33
s(SST_MEAN)	0.6920501	9	2.160380	6.545268e-02
s(SST_RANGE)	5.8475361	9	33.423933	1.036113e-06



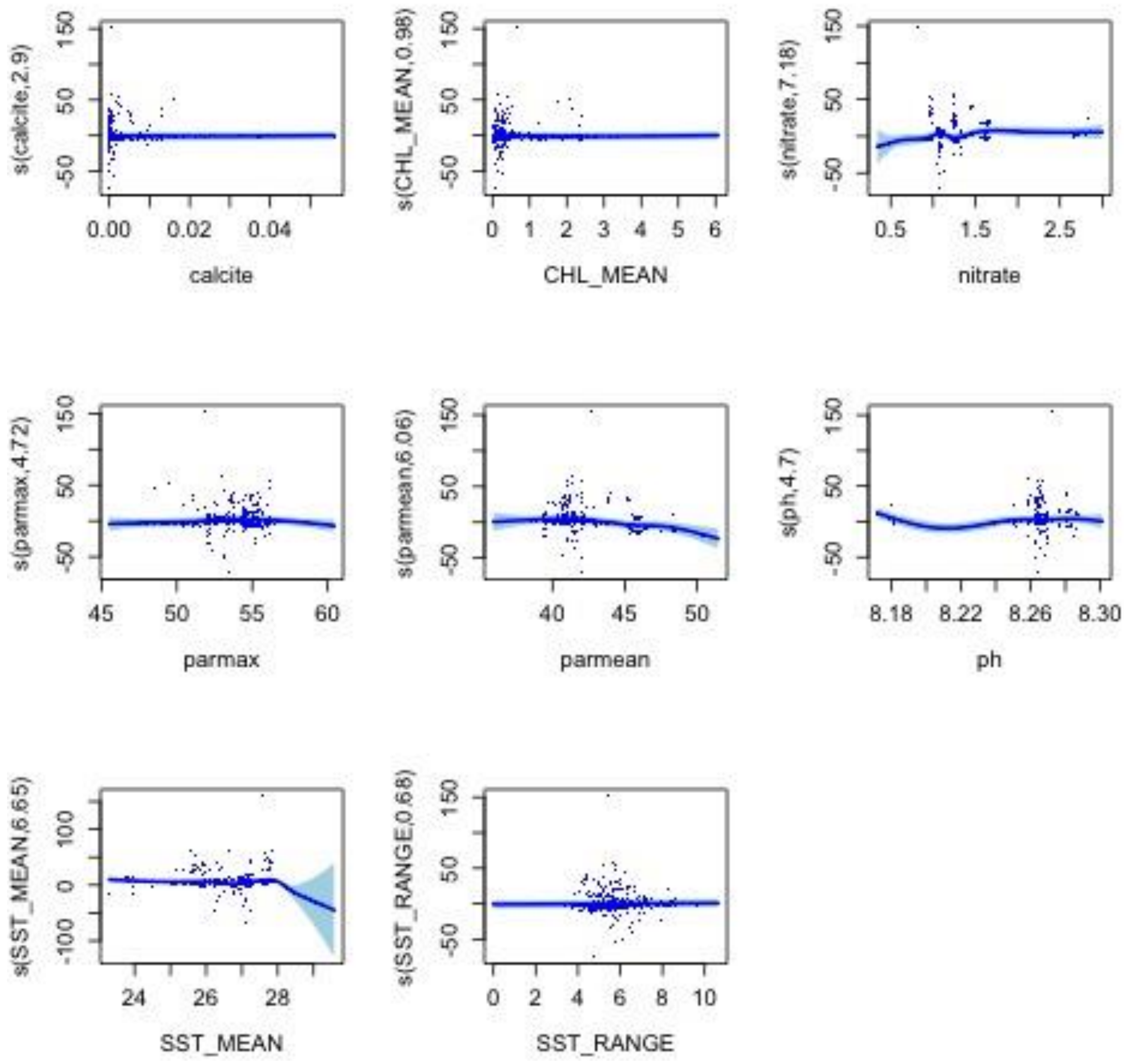
350 Pomacentrus fuscidorsalis, n = 31 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.266497e-06	8	8.416844e-06	2.779698e-01
s(CHL_MEAN)	7.788768e-01	9	1.933936e+00	9.570628e-02
s(nitrate)	8.442517e-01	6	3.153756e+00	9.074549e-03
s(parmax)	4.984427e+00	9	1.379615e+01	5.069909e-03
s(parmean)	1.156103e-05	9	4.654311e-07	1.000000e+00
s(ph)	3.036001e+00	9	2.292422e+01	1.359886e-06
s(SST_MEAN)	4.812760e+00	9	3.190248e+01	1.030148e-07
s(SST_RANGE)	9.300933e-01	9	8.642138e+00	7.204185e-04



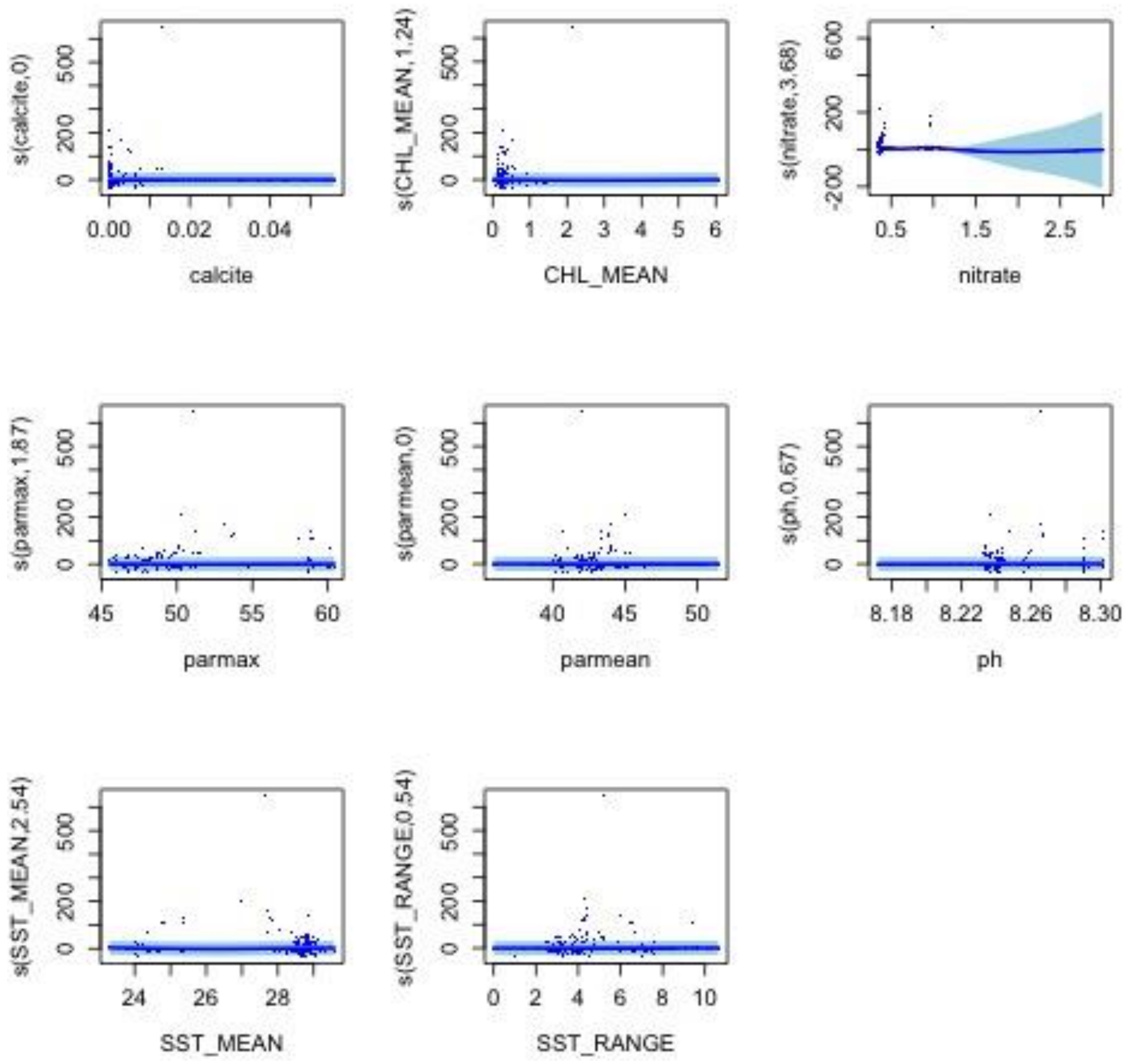
351 Pomacentrus imitator, n = 447 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.8984455	9	25.784684	2.165672e-06
s(CHL_MEAN)	0.9849397	9	4.087879	2.567696e-02
s(nitrate)	7.1772735	9	170.319006	7.076979e-40
s(parmax)	4.7191660	9	44.217910	2.120546e-10
s(parmean)	6.0586980	9	48.939018	5.299754e-11
s(ph)	4.6978590	9	37.932014	7.675610e-09
s(SST_MEAN)	6.6497517	9	107.575590	1.537326e-23
s(SST_RANGE)	0.6815455	9	2.125380	7.223760e-02



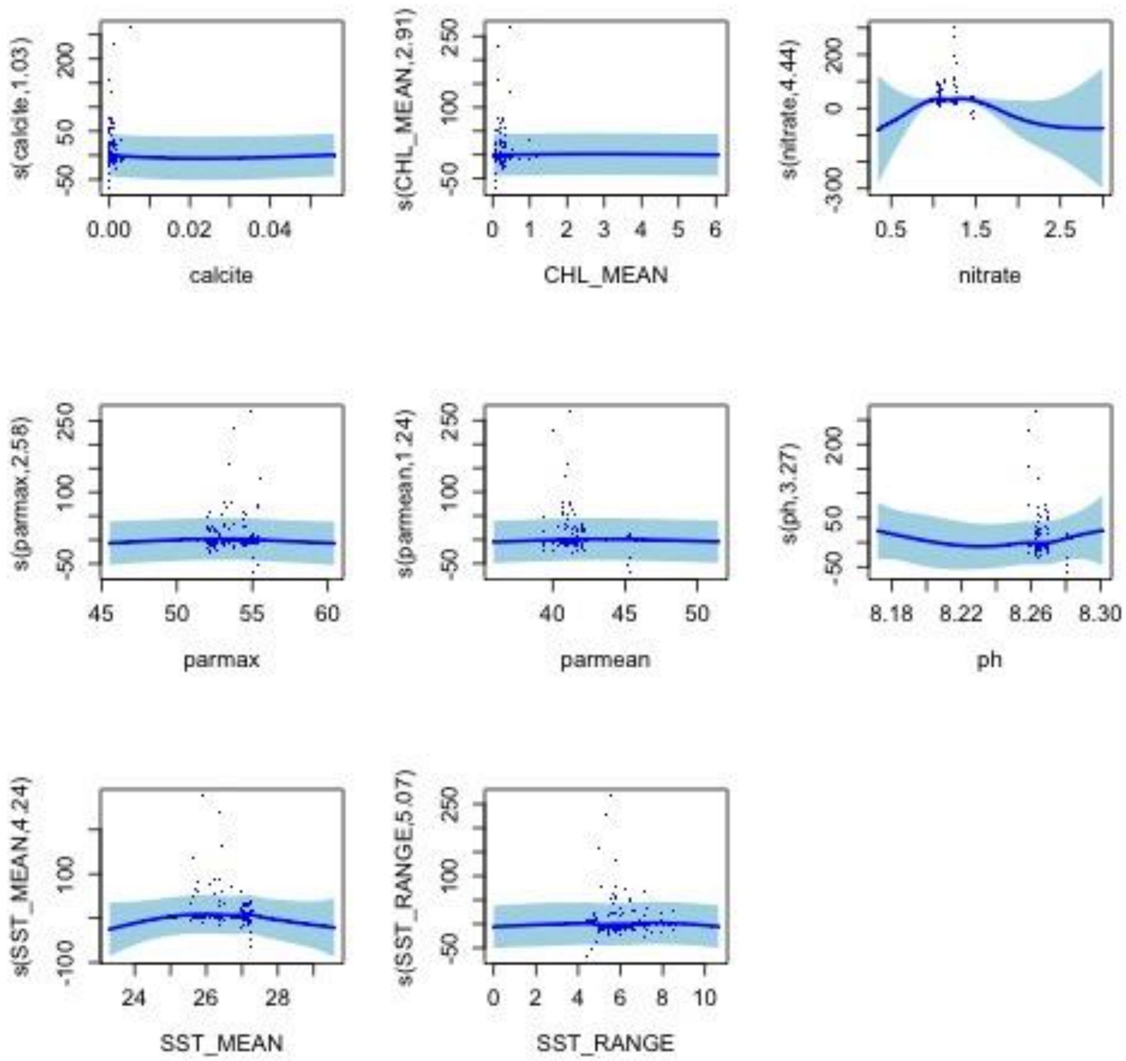
352 Pomacentrus lepidogenys, n = 67 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.145742e-05	9	5.745943e-06	8.072539e-01
s(CHL_MEAN)	1.237545e+00	9	1.397469e+01	7.868010e-05
s(nitrate)	3.676988e+00	9	2.841581e+01	8.164119e-07
s(parmax)	1.874821e+00	9	8.119113e+00	4.814011e-03
s(parmean)	1.437784e-03	9	1.223991e-03	3.718859e-01
s(ph)	6.653552e-01	8	1.902901e+00	4.076204e-02
s(SST_MEAN)	2.541760e+00	9	1.485787e+01	1.248153e-04
s(SST_RANGE)	5.431813e-01	8	1.097453e+00	1.326633e-01



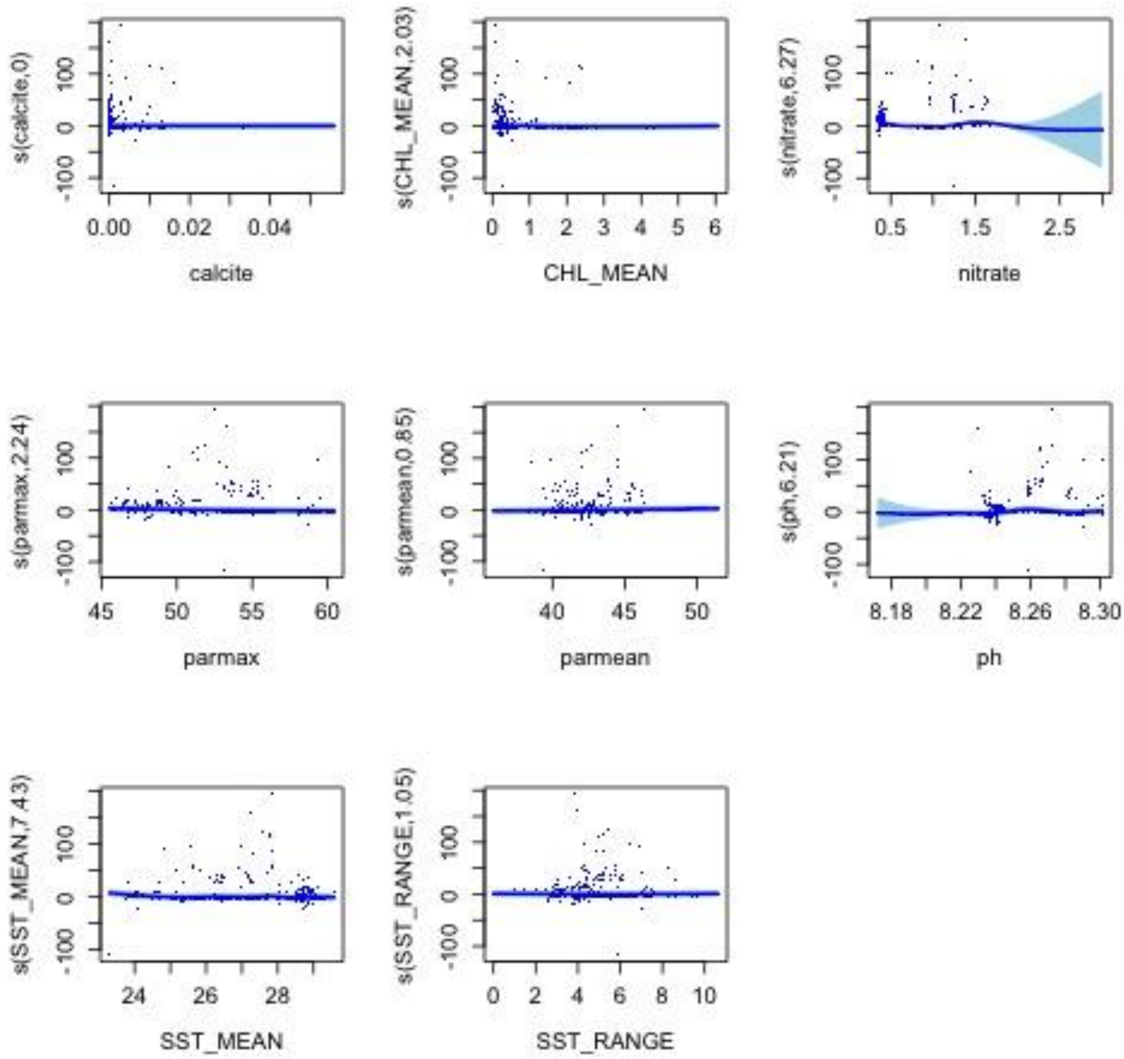
353 Pomacentrus maafu, n = 139 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.027338	9	10.544453	6.350552e-04
s(CHL_MEAN)	2.914632	9	13.740453	1.145491e-03
s(nitrate)	4.444826	8	20.241528	6.074028e-05
s(parmax)	2.581864	9	12.530996	9.627835e-04
s(parmean)	1.241468	9	4.589719	2.072541e-02
s(ph)	3.269835	8	5.494126	9.198611e-02
s(SST_MEAN)	4.244918	9	23.059182	1.978846e-05
s(SST_RANGE)	5.068216	9	44.041743	1.482460e-09



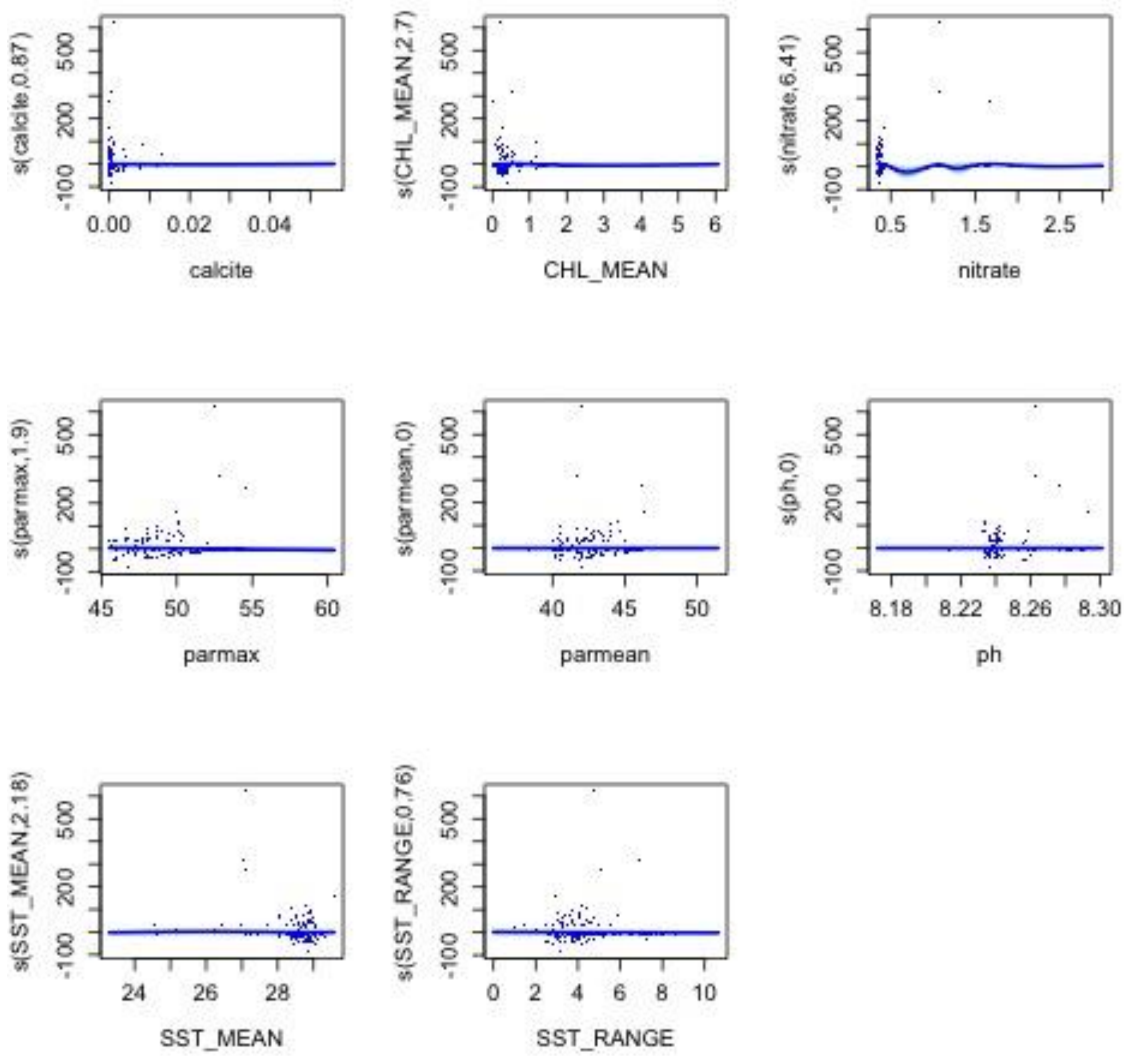
354 Pomacentrus moluccensis, n = 142 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.036809e-05	9	1.442203e-06	8.655208e-01
s(CHL_MEAN)	2.030832e+00	9	1.081853e+01	2.452313e-03
s(nitrate)	6.265410e+00	9	1.291457e+02	1.116854e-31
s(parmax)	2.240355e+00	9	1.547458e+01	5.190357e-05
s(parmean)	8.507887e-01	9	5.791537e+00	4.362616e-03
s(ph)	6.210779e+00	9	5.852048e+01	3.817222e-13
s(SST_MEAN)	7.432082e+00	9	4.386080e+01	1.373062e-08
s(SST_RANGE)	1.051479e+00	9	2.178310e+00	9.946402e-02



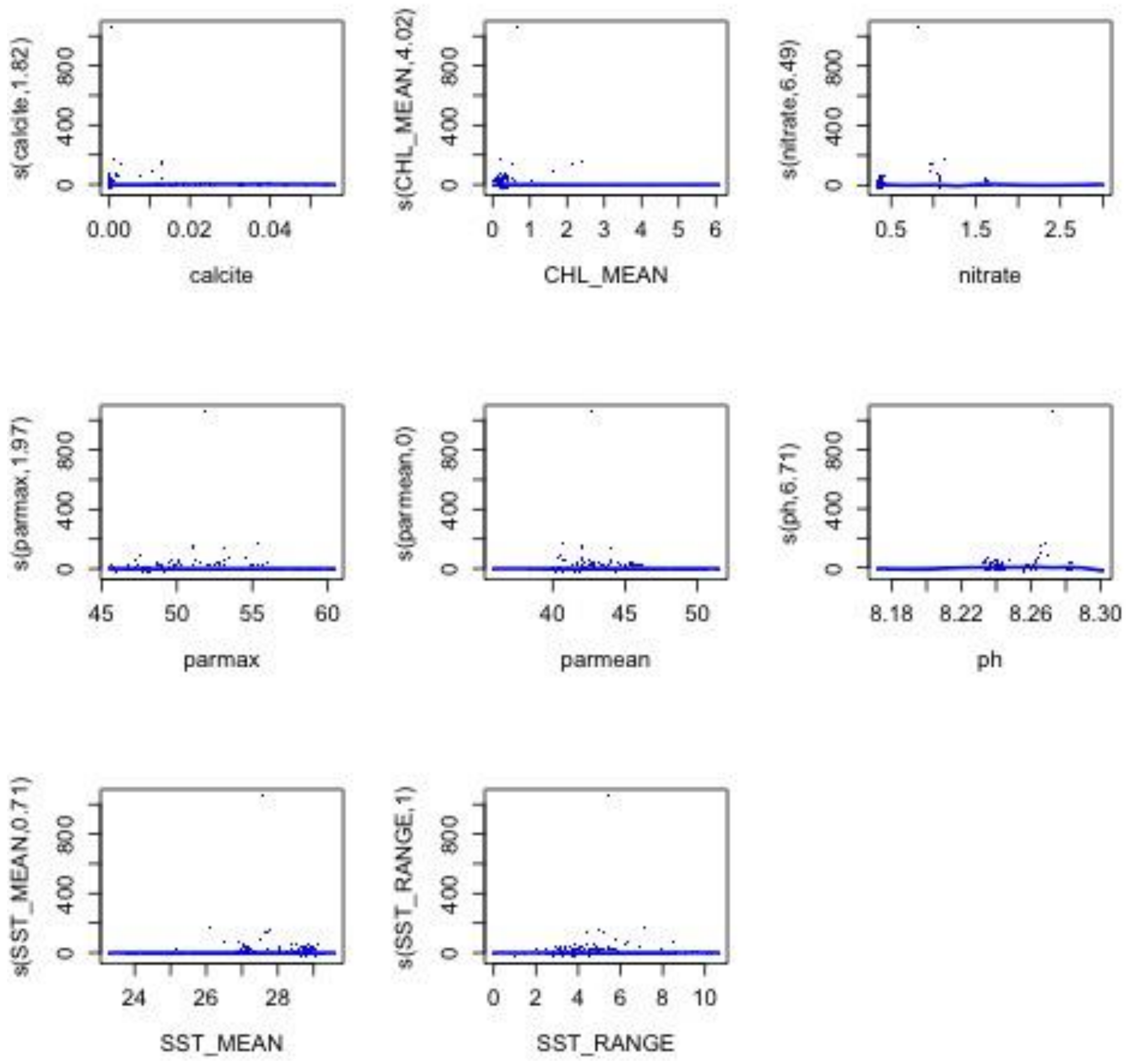
355 Pomacentrus nigromanus, n = 42 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.677465e-01	9	3.464587e+00	3.581050e-02
s(CHL_MEAN)	2.701314e+00	9	1.311895e+01	1.400378e-03
s(nitrate)	6.410829e+00	9	2.959476e+01	1.164519e-05
s(parmax)	1.895791e+00	9	1.741041e+01	2.137608e-05
s(parmean)	4.783271e-04	9	6.945963e-04	2.055029e-01
s(ph)	8.357888e-05	9	1.986018e-05	7.207294e-01
s(SST_MEAN)	2.179241e+00	9	7.607387e+00	1.005964e-02
s(SST_RANGE)	7.626044e-01	9	2.586881e+00	6.198576e-02



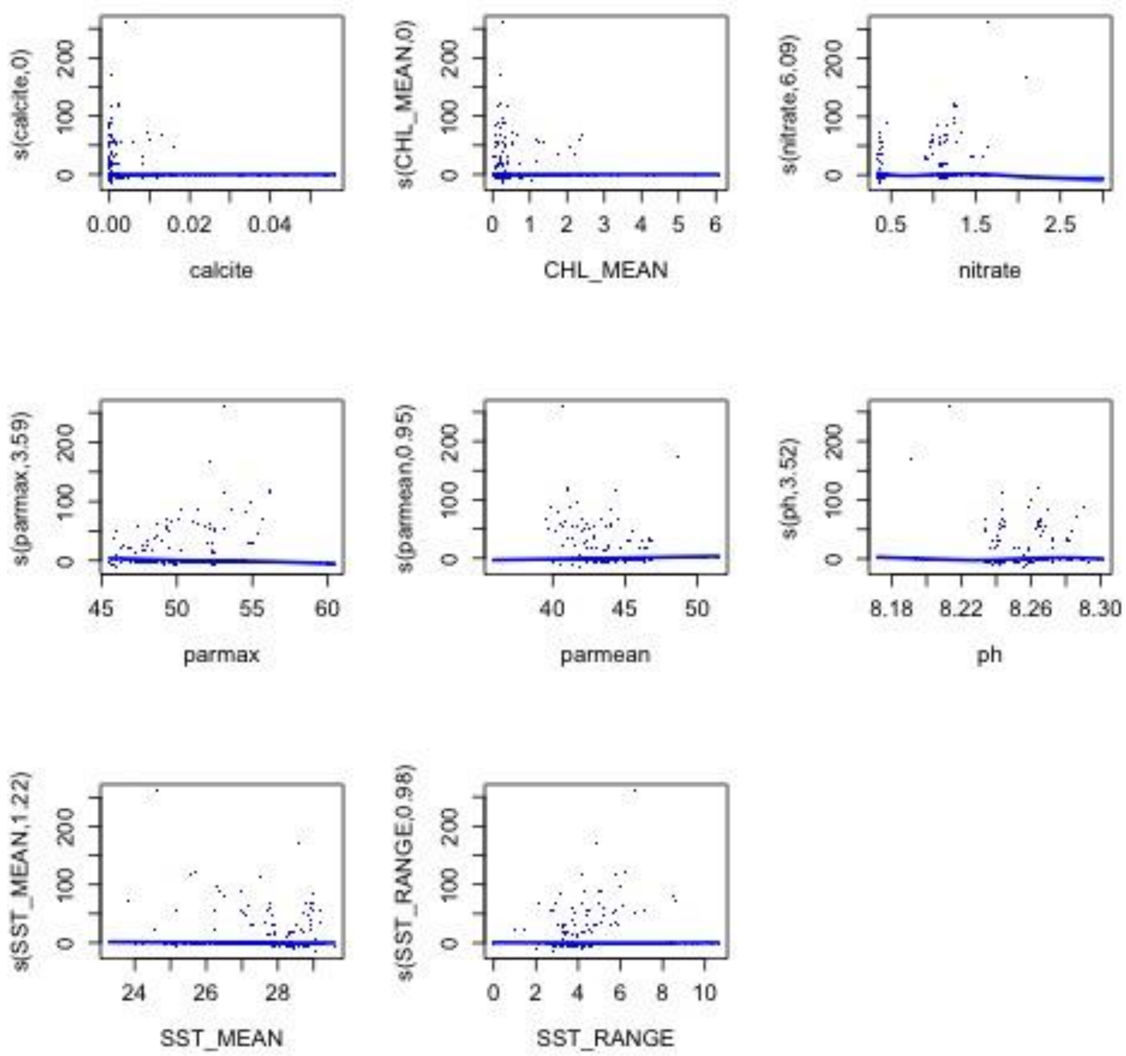
356 Pomacentrus nigromarginatus, n = 89 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.824546e+00	9	6.646255e+00	2.183362e-02
s(CHL_MEAN)	4.015369e+00	9	2.111750e+01	1.231964e-04
s(nitrate)	6.488324e+00	9	4.603794e+01	1.304266e-09
s(parmax)	1.967687e+00	9	6.202493e+00	1.910343e-02
s(parmean)	3.082081e-05	9	7.306515e-06	8.161686e-01
s(ph)	6.713205e+00	9	4.466000e+01	5.474500e-09
s(SST_MEAN)	7.063657e-01	9	1.118007e+00	1.642333e-01
s(SST_RANGE)	9.977493e-01	9	1.896193e+00	1.243105e-01



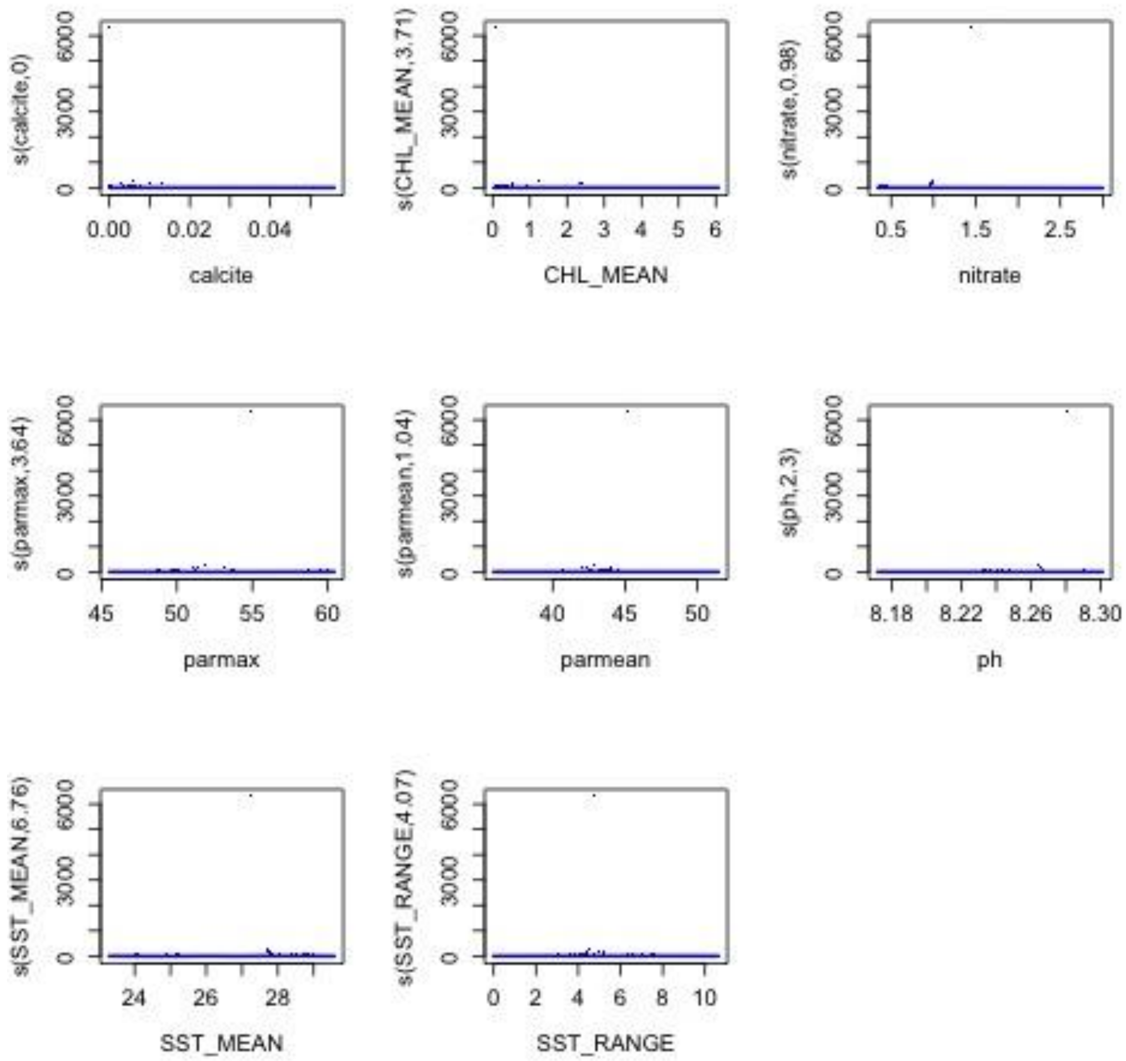
357 Pomacentrus pavo, n = 82 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.700461e-05	9	4.329140e-06	6.965441e-01
s(CHL_MEAN)	2.265282e-05	9	7.350099e-06	5.718699e-01
s(nitrate)	6.087838e+00	9	3.890891e+01	1.061851e-08
s(parmax)	3.593240e+00	9	4.464759e+01	6.629893e-12
s(parmean)	9.540013e-01	9	2.104058e+01	6.542129e-08
s(ph)	3.516614e+00	9	3.950391e+01	6.228913e-11
s(SST_MEAN)	1.221165e+00	9	3.113884e+00	4.682715e-02
s(SST_RANGE)	9.803027e-01	9	1.565987e+00	1.638823e-01



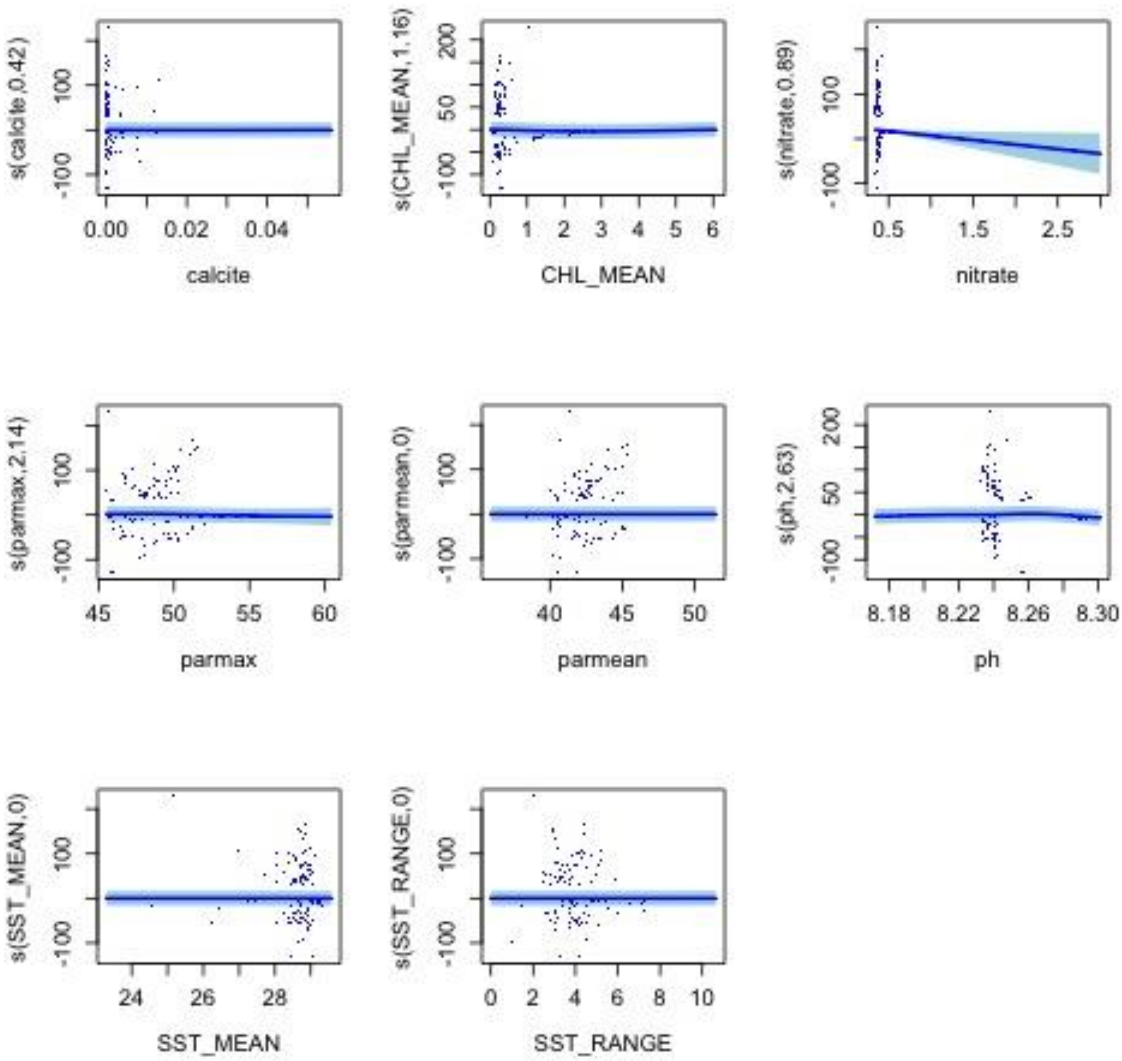
358 Pomacentrus philippinus, n = 157 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.488590e-06	9	3.699956e-06	5.318611e-01
s(CHL_MEAN)	3.710671e+00	9	3.085945e+01	2.645710e-07
s(nitrate)	9.779203e-01	9	3.583010e+01	2.391463e-10
s(parmax)	3.635887e+00	9	2.273260e+01	3.164103e-06
s(parmean)	1.042802e+00	9	1.349782e+00	2.221310e-01
s(ph)	2.302288e+00	9	1.093678e+01	1.393123e-03
s(SST_MEAN)	6.761429e+00	9	6.855762e+01	5.814003e-15
s(SST_RANGE)	4.069186e+00	9	9.508936e+00	3.103920e-02



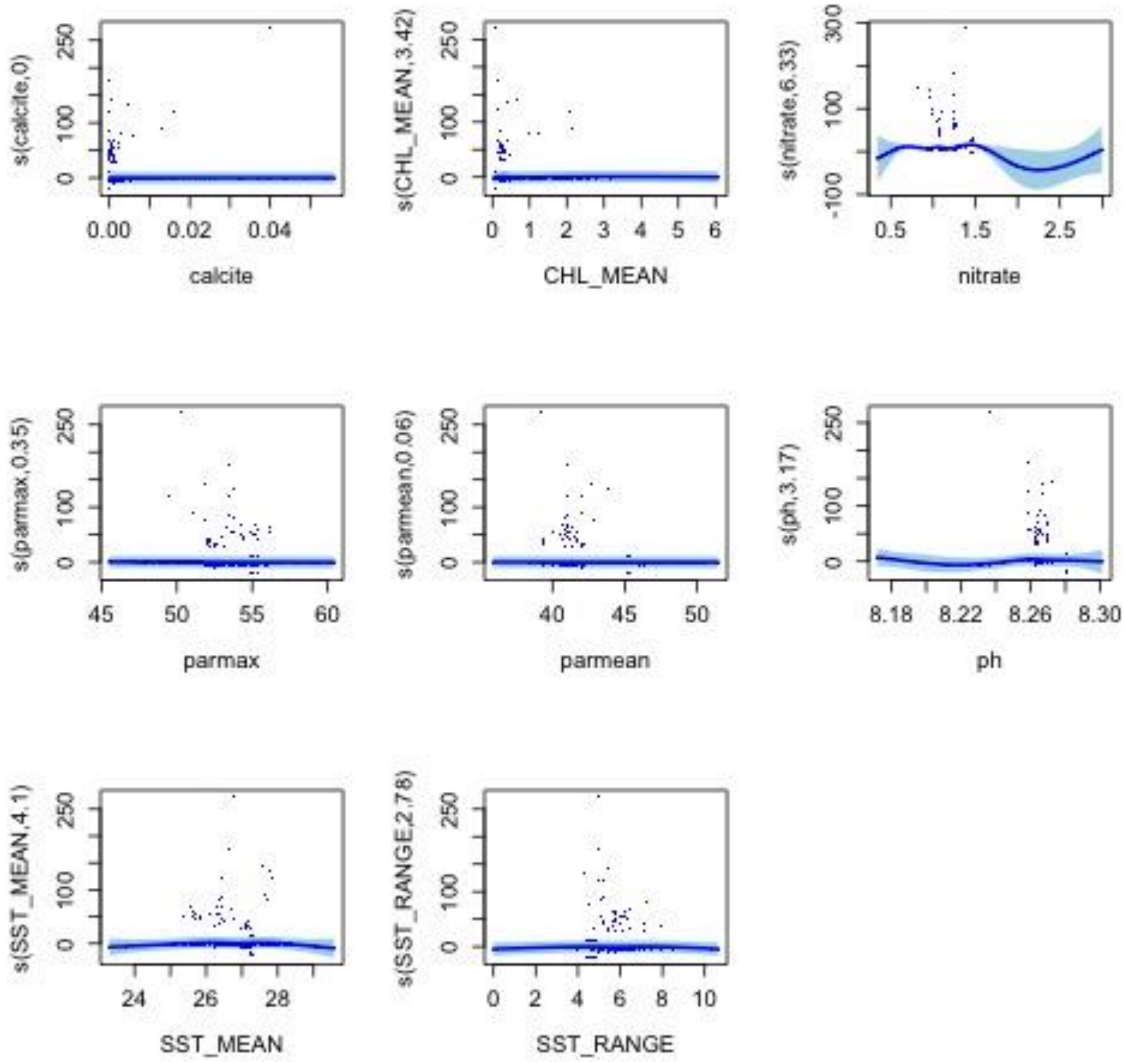
359 Pomacentrus reidi, n = 50 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.221449e-01	9	6.504634e-01	0.2053858057
s(CHL_MEAN)	1.159698e+00	9	1.038506e+01	0.0007791019
s(nitrate)	8.913752e-01	5	5.209269e+00	0.0134686548
s(parmax)	2.144198e+00	9	1.019752e+01	0.0030432978
s(parmean)	1.057154e-05	9	6.224246e-06	0.4583064568
s(ph)	2.631370e+00	8	1.038679e+01	0.0062268925
s(SST_MEAN)	1.034373e-05	9	8.027235e-06	0.3820452414
s(SST_RANGE)	1.012711e-05	9	3.967315e-06	0.6038744935



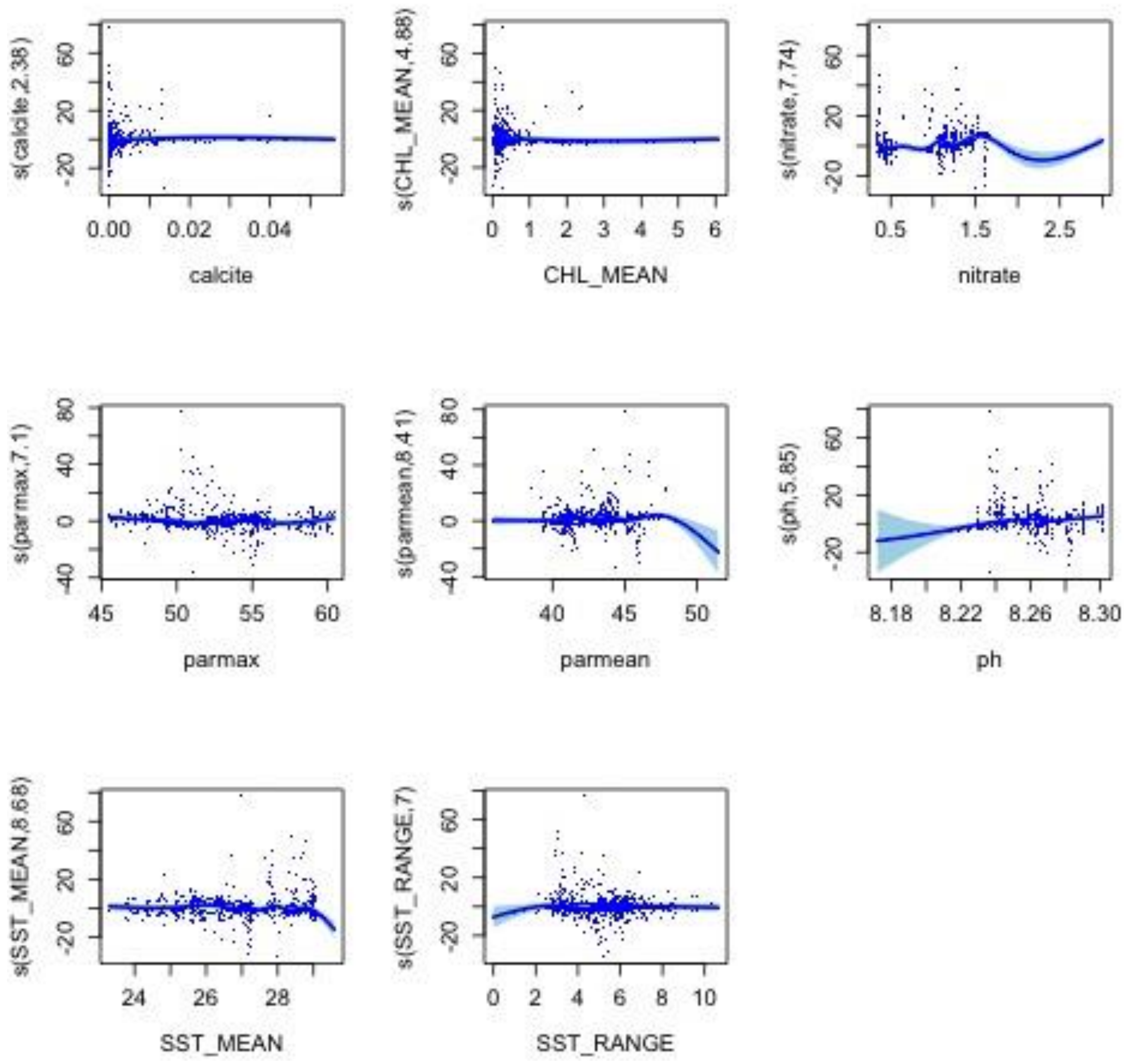
360 Pomacentrus spilotoceps, n = 89 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.706422e-06	9	2.907149e-06	6.807916e-01
s(CHL_MEAN)	3.418915e+00	9	2.121131e+01	4.386490e-05
s(nitrate)	6.331667e+00	9	3.552435e+01	2.311376e-07
s(parmax)	3.517276e-01	9	4.811670e-01	2.303557e-01
s(parmean)	5.863462e-02	9	1.349270e-01	9.737863e-02
s(ph)	3.174663e+00	9	3.273361e+01	2.183975e-09
s(SST_MEAN)	4.100644e+00	9	1.454793e+01	1.135928e-03
s(SST_RANGE)	2.778125e+00	9	4.126301e+00	1.843901e-01



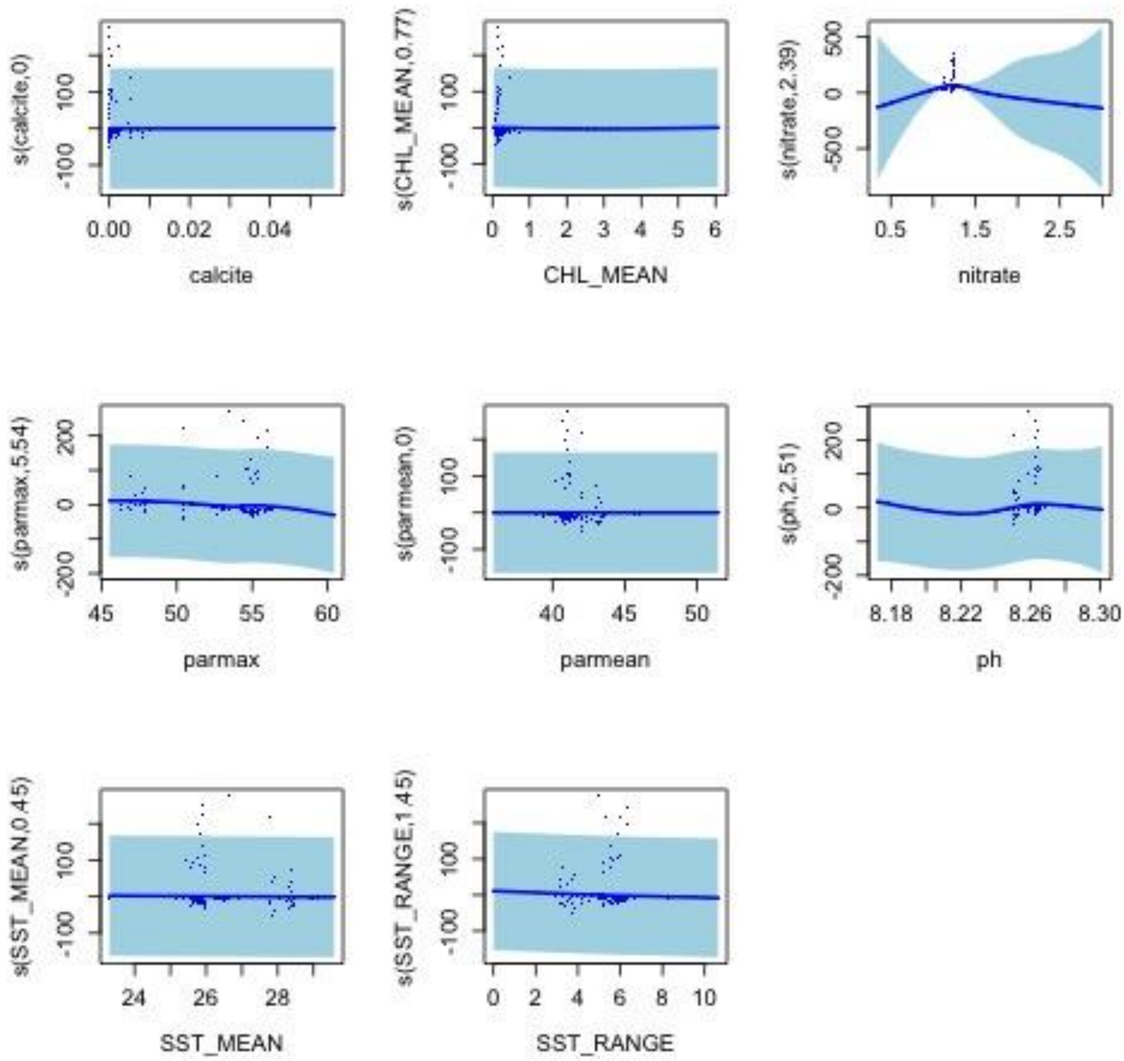
361 Pomacentrus vaiuli, n = 1417 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.375124	9	15.11419	4.610008e-04
s(CHL_MEAN)	4.878615	9	43.64298	3.494356e-09
s(nitrate)	7.738682	9	374.21282	1.260214e-83
s(parmax)	7.103404	9	143.48628	1.010673e-30
s(parmean)	8.410679	9	81.25071	2.724394e-15
s(ph)	5.847894	9	103.66214	2.340533e-23
s(SST_MEAN)	8.683160	9	123.78196	1.508460e-24
s(SST_RANGE)	6.998651	9	51.97488	5.941692e-10



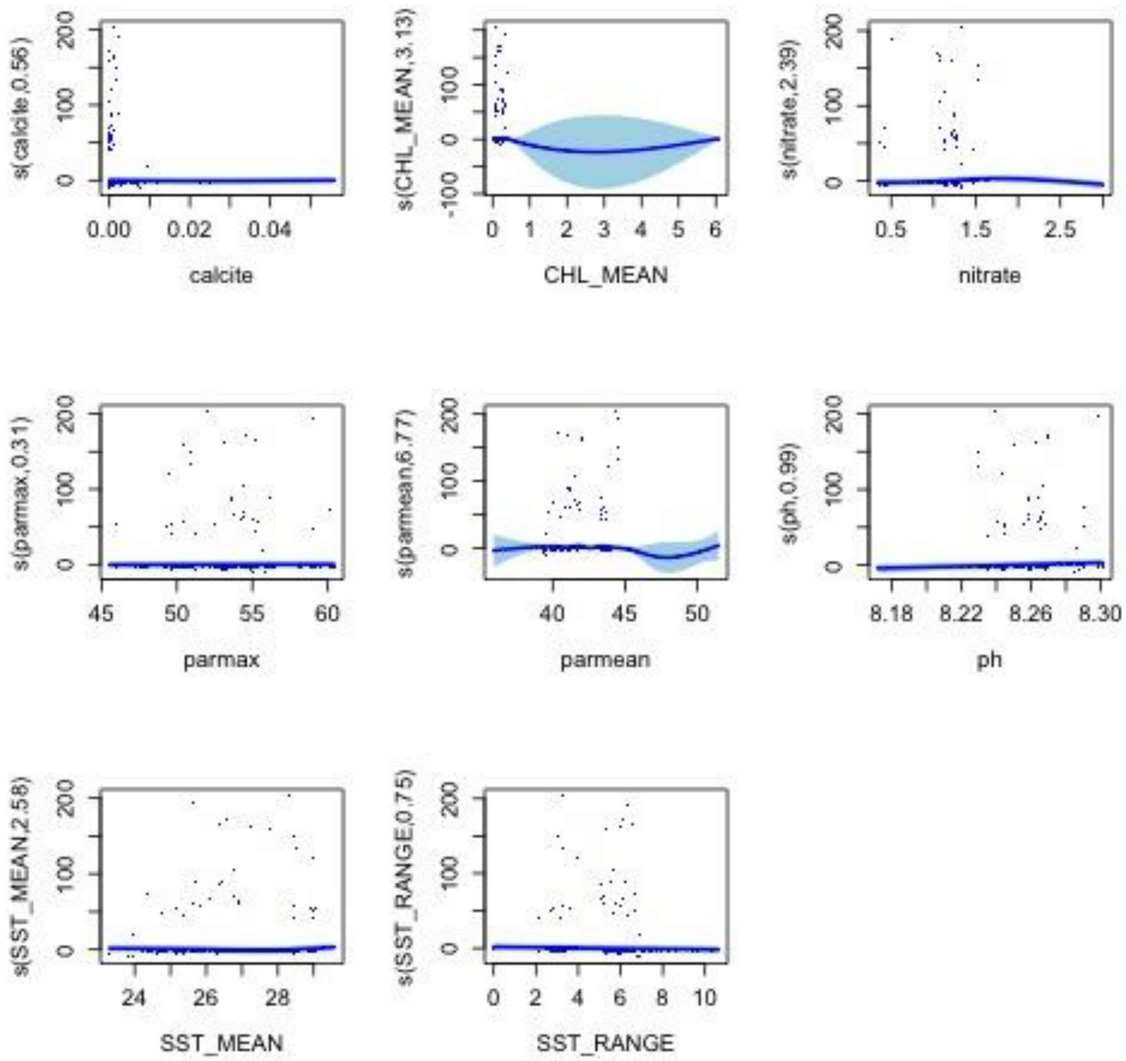
362 Pomachromis exilis, n = 33 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0000106745	9	8.191832e-07	7.875255e-01
s(CHL_MEAN)	0.7670108107	9	2.363021e+00	7.100561e-02
s(nitrate)	2.3865453401	8	1.247955e+01	3.359381e-04
s(parmax)	5.5424145980	9	2.528463e+01	1.602361e-05
s(parmean)	0.0029083839	9	1.619734e-03	4.410648e-01
s(ph)	2.5097174979	8	1.141335e+01	1.077686e-03
s(SST_MEAN)	0.4484618995	9	7.586506e-01	1.662000e-01
s(SST_RANGE)	1.4539374492	9	1.040111e+01	8.944380e-04



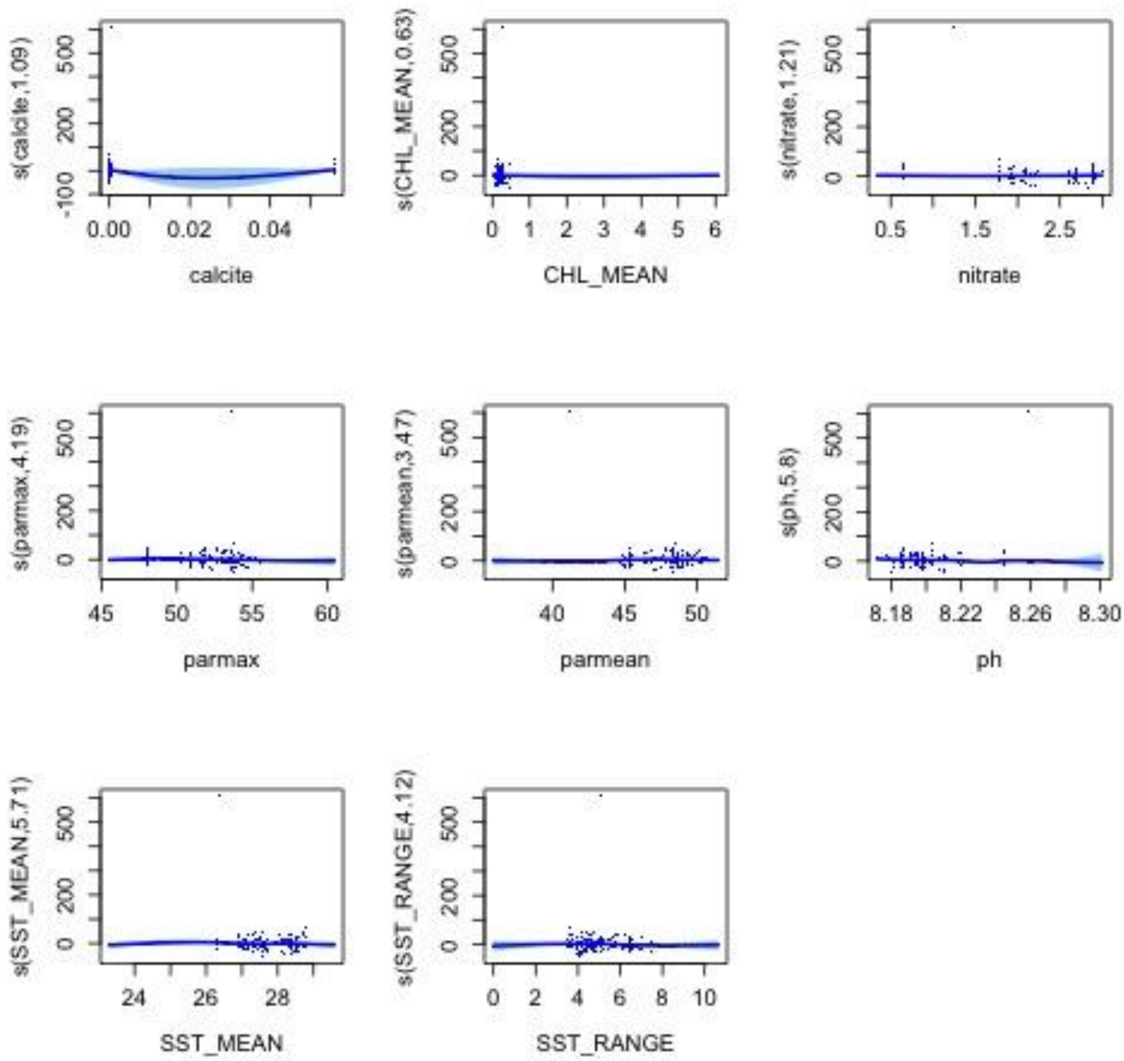
363 Pomachromis richardsoni, n = 235 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.5634245	9	1.0988687	1.529281e-01
s(CHL_MEAN)	3.1259683	9	8.1881580	2.848525e-02
s(nitrate)	2.3926730	9	18.1100124	1.567720e-05
s(parmax)	0.3106822	9	0.4192092	2.063671e-01
s(parmean)	6.7707827	9	31.6998490	6.409639e-06
s(ph)	0.9943467	9	8.8248861	4.897634e-04
s(SST_MEAN)	2.5786406	9	13.6158444	3.899547e-04
s(SST_RANGE)	0.7519818	9	3.1796849	3.192957e-02



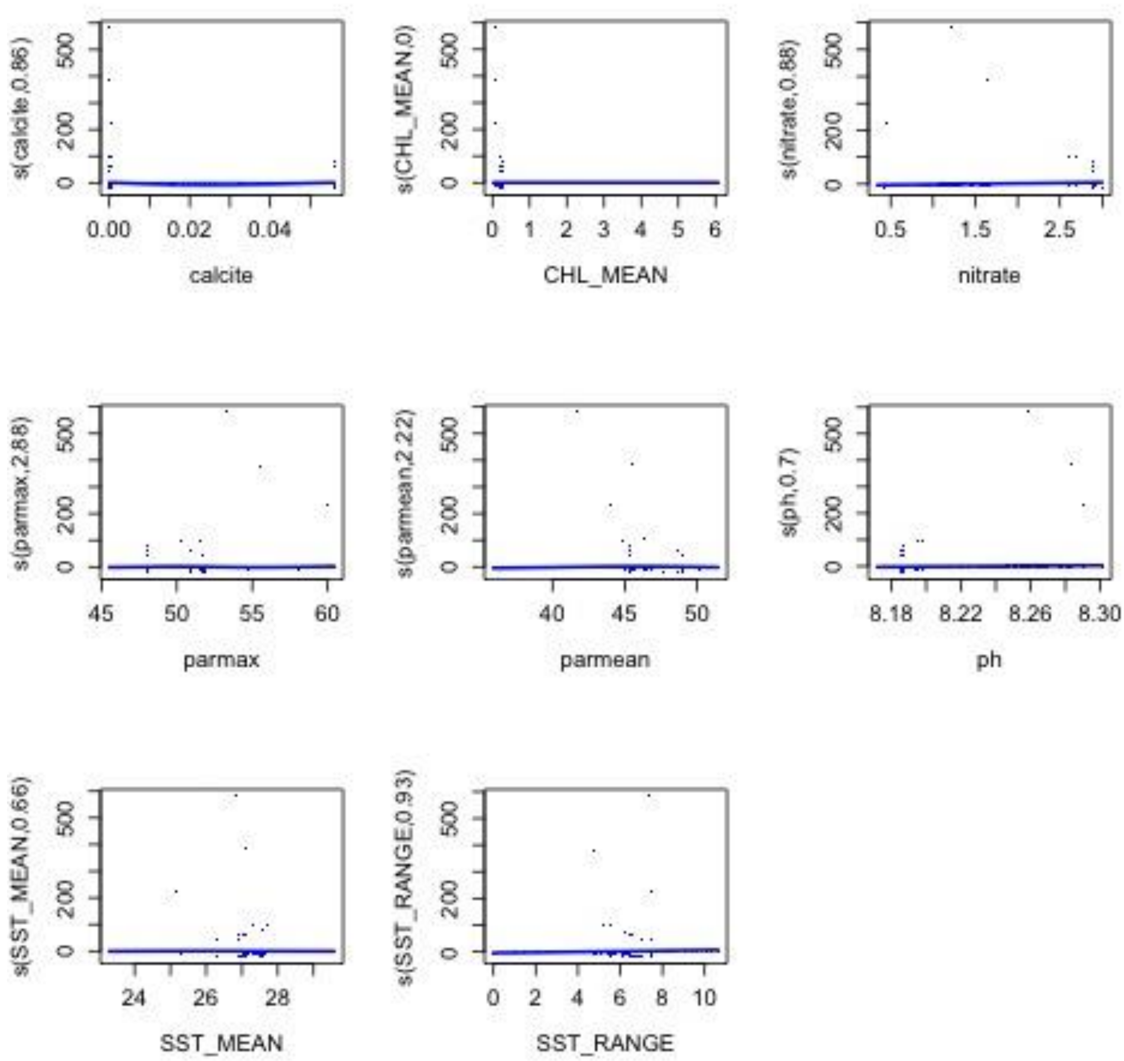
364 Pseudanthias bartlettorum, n = 415 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.0932466	9	4.748340	1.474584e-02
s(CHL_MEAN)	0.6334779	9	1.456526	9.482676e-02
s(nitrate)	1.2090250	9	4.860985	8.633970e-03
s(parmax)	4.1862872	9	16.630549	2.696078e-04
s(parmean)	3.4654515	9	30.789412	6.102334e-09
s(ph)	5.8033522	9	42.552267	1.794199e-10
s(SST_MEAN)	5.7136574	9	33.777405	1.391807e-08
s(SST_RANGE)	4.1169275	9	33.307140	3.767317e-09



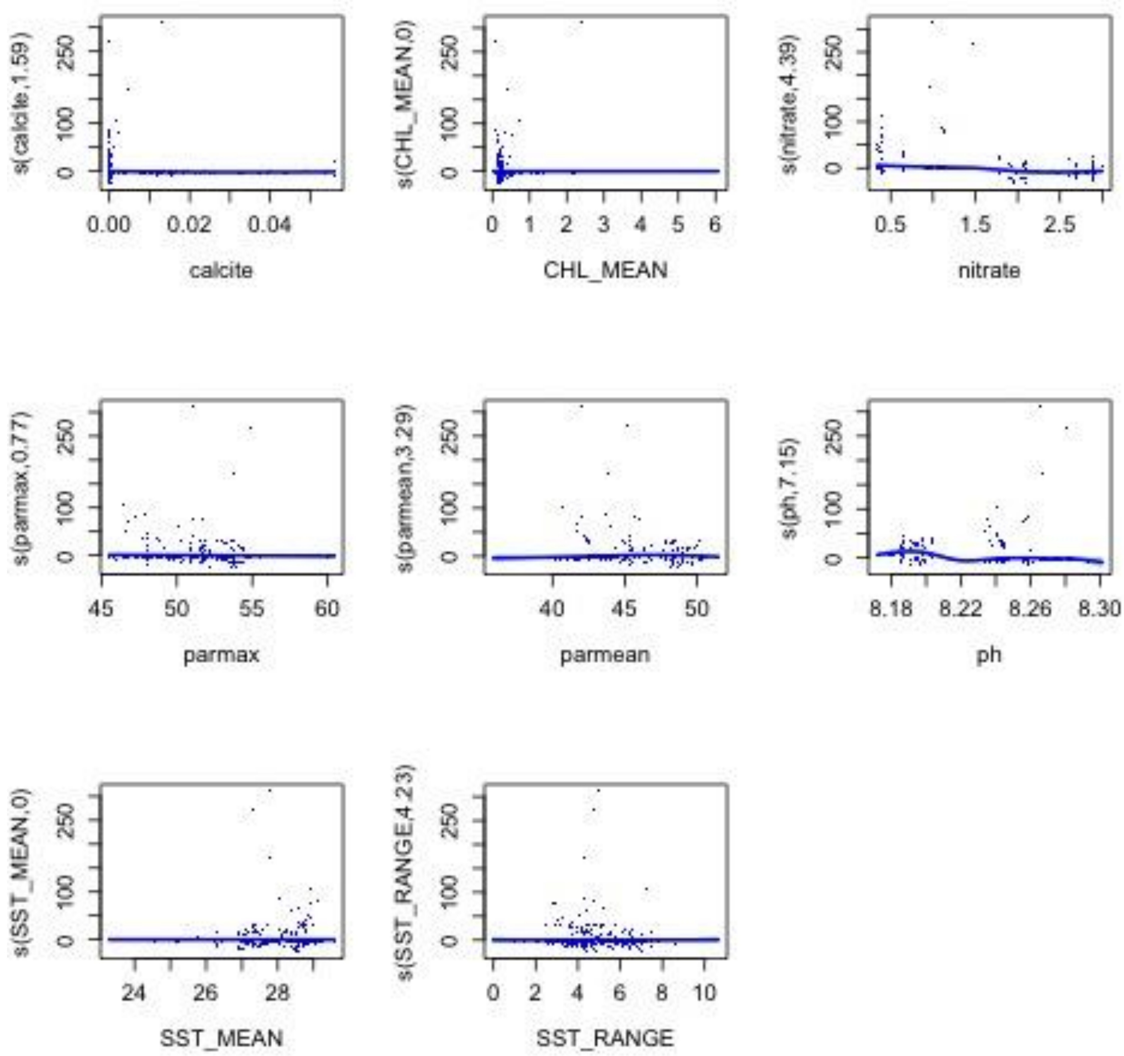
365 Pseudanthias cooperi, n = 37 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.586923e-01	9	1.007197e+00	2.731023e-01
s(CHL_MEAN)	2.391883e-06	9	1.020638e-06	5.070392e-01
s(nitrate)	8.826510e-01	5	6.925109e+00	2.273592e-04
s(parmax)	2.876629e+00	9	9.641635e+00	3.912298e-03
s(parmean)	2.219545e+00	9	7.446274e+00	7.813899e-03
s(ph)	7.010202e-01	7	2.348799e+00	3.068802e-02
s(SST_MEAN)	6.559787e-01	9	6.602776e-01	3.250917e-01
s(SST_RANGE)	9.311076e-01	9	1.251884e+01	4.257191e-05



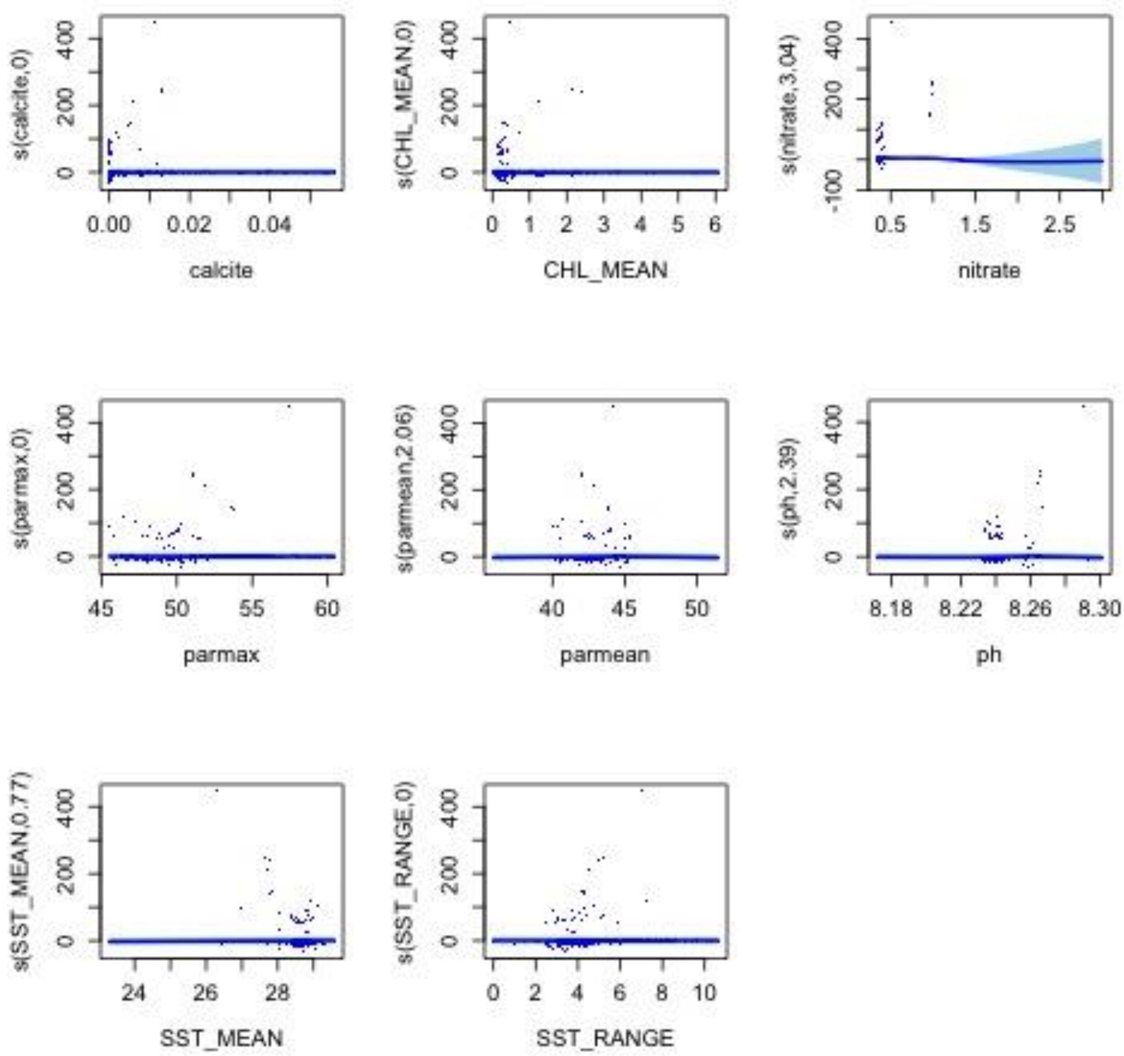
366 Pseudanthias dispar, n = 136 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.594097e+00	9	9.548090e+00	1.833328e-03
s(CHL_MEAN)	2.926941e-05	9	3.418791e-06	7.676823e-01
s(nitrate)	4.386539e+00	9	7.039256e+01	2.898458e-17
s(parmax)	7.740201e-01	9	3.016277e+00	3.952041e-02
s(parmean)	3.294114e+00	9	3.564085e+01	9.676332e-10
s(ph)	7.153993e+00	9	7.181332e+01	8.980828e-16
s(SST_MEAN)	3.643669e-04	9	2.175285e-04	4.538960e-01
s(SST_RANGE)	4.230792e+00	9	1.066181e+01	1.796158e-02



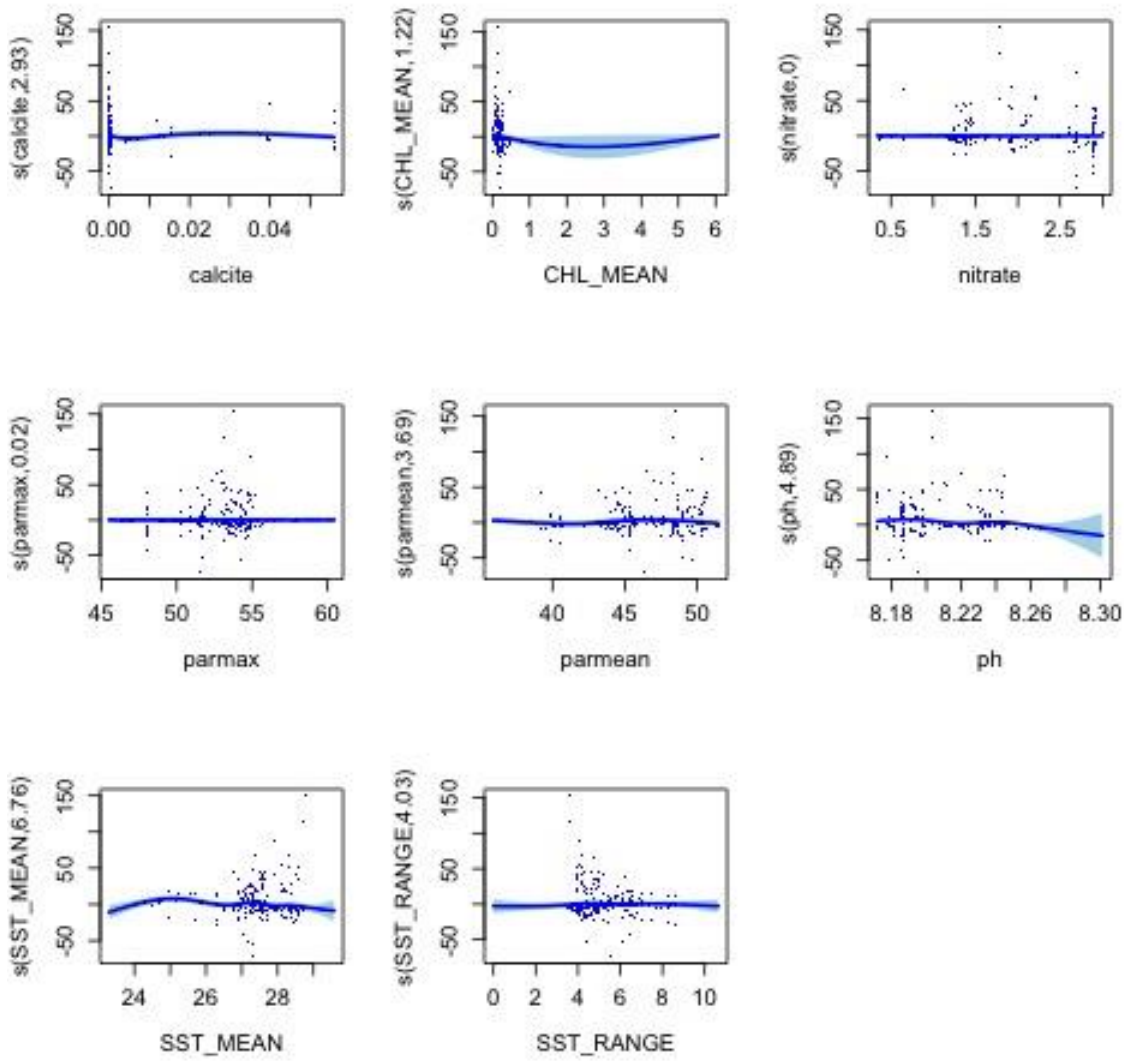
367 Pseudanthias huchtii, n = 31 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.591306e-05	8	4.214169e-05	3.851546e-01
s(CHL_MEAN)	1.112594e-04	9	9.045543e-05	3.520218e-01
s(nitrate)	3.041157e+00	9	2.874886e+01	6.078537e-08
s(parmax)	3.102192e-05	9	6.800145e-06	8.259710e-01
s(parmean)	2.058786e+00	9	8.907795e+00	4.374252e-03
s(ph)	2.387730e+00	9	1.058123e+01	2.241546e-03
s(SST_MEAN)	7.688537e-01	9	2.945421e+00	4.298260e-02
s(SST_RANGE)	1.068573e-05	9	9.971782e-07	1.000000e+00



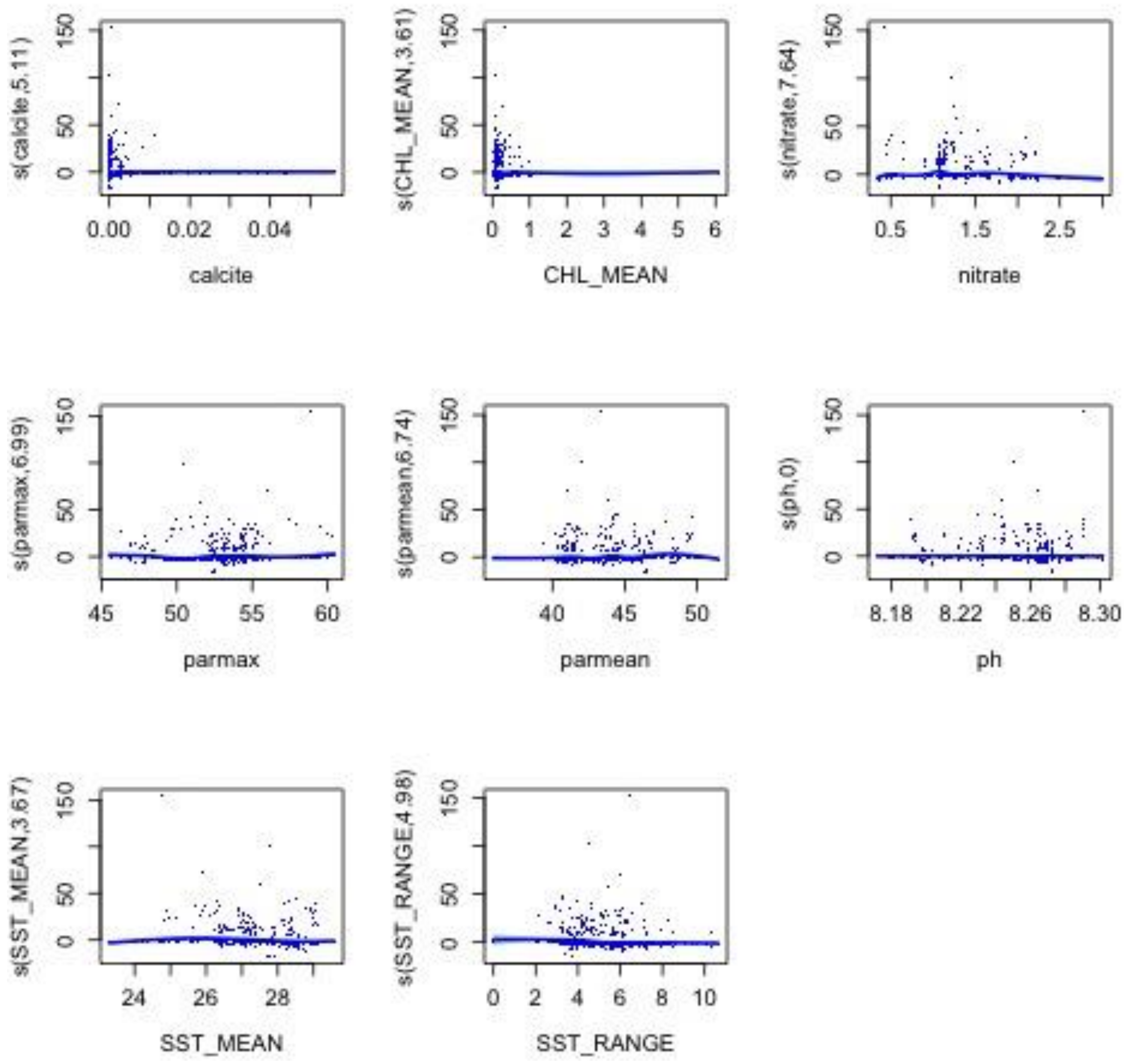
368 Pseudanthias olivaceus, n = 484 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.9305327135	9	1.853906e+01	7.706752e-05
s(CHL_MEAN)	1.2227329619	9	3.238059e+01	1.948823e-09
s(nitrate)	0.0001111404	9	3.863194e-05	6.652538e-01
s(parmax)	0.0159903083	9	1.620627e-02	2.902674e-01
s(parmean)	3.6914219454	9	6.967198e+01	1.552236e-17
s(ph)	4.8893757498	9	8.635258e+01	3.996921e-20
s(SST_MEAN)	6.7556245806	9	8.868460e+01	5.269405e-20
s(SST_RANGE)	4.0293595739	9	1.677067e+01	4.398669e-04



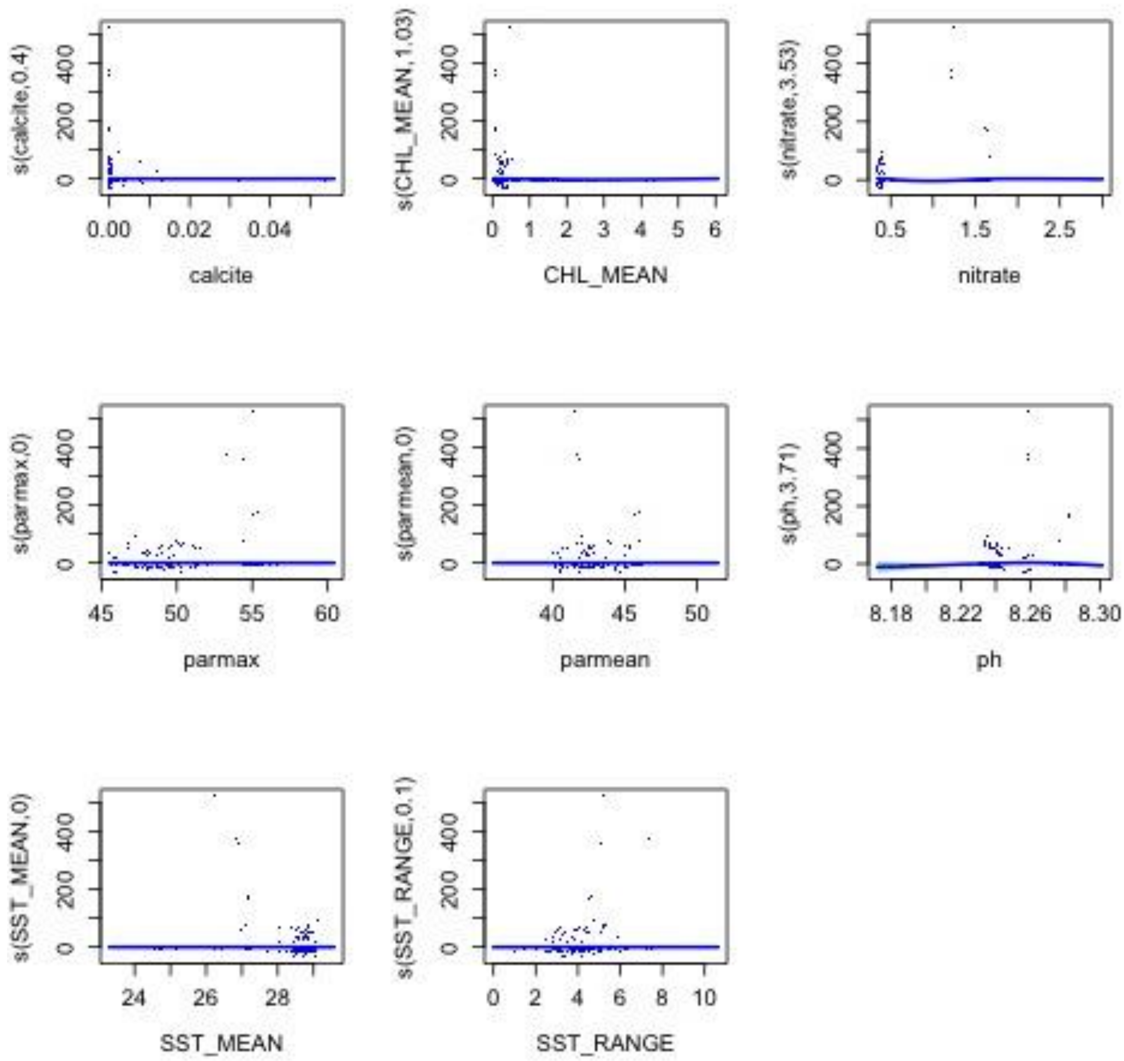
369 Pseudanthias pascalus, n = 463 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.1148676963	9	2.893606e+01	9.725130e-06
s(CHL_MEAN)	3.6088565147	9	1.738959e+01	4.932345e-04
s(nitrate)	7.6353375477	9	1.485550e+02	6.438255e-33
s(parmax)	6.9940680995	9	4.490283e+01	6.848592e-09
s(parmean)	6.7407807908	9	5.874147e+01	4.348999e-12
s(ph)	0.0002962341	9	3.146489e-04	2.675505e-01
s(SST_MEAN)	3.6724584638	9	2.782601e+01	2.409657e-07
s(SST_RANGE)	4.9788029162	9	4.253302e+01	8.524613e-10



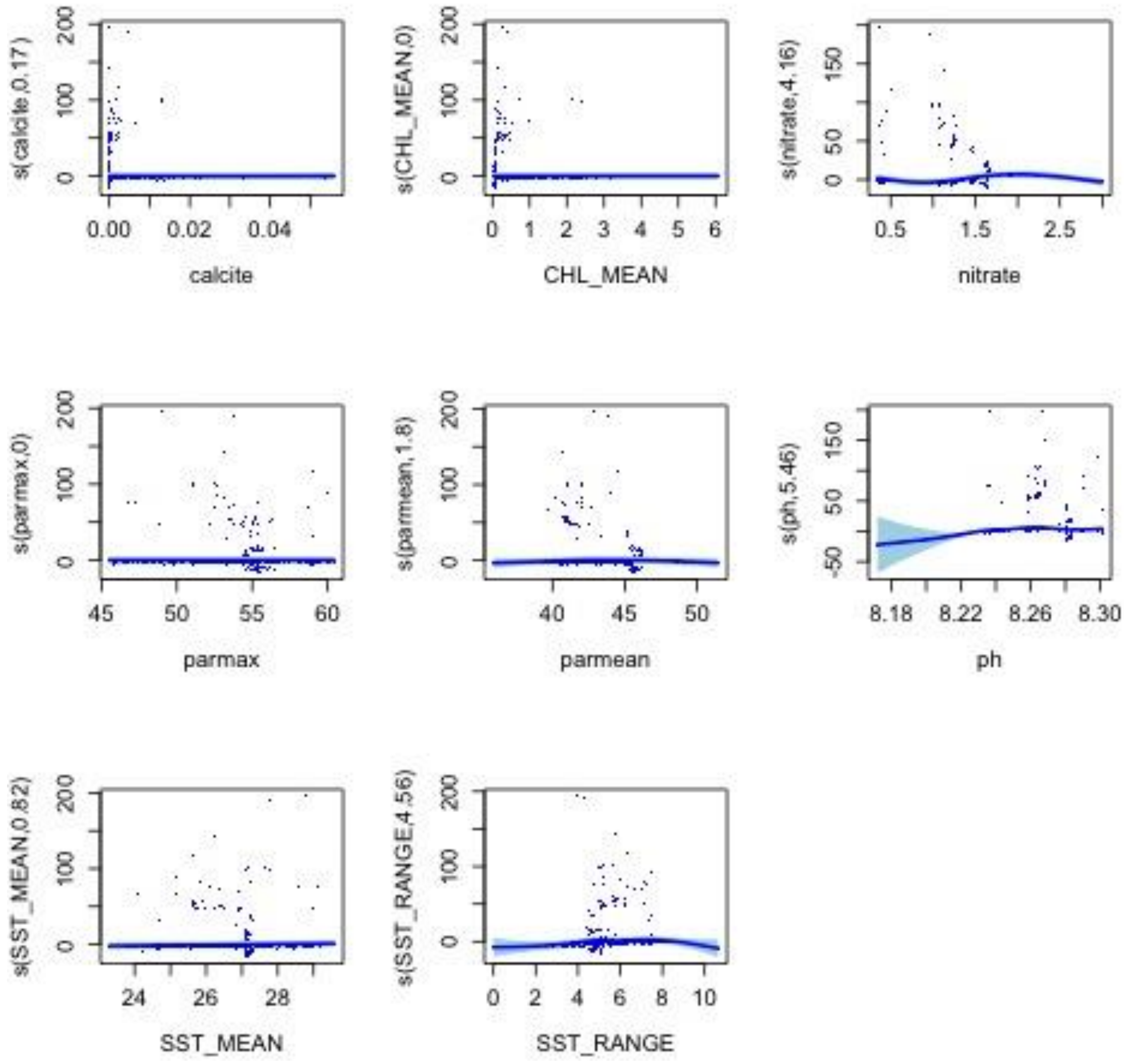
370 Pseudanthias pleurotaenia, n = 35 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.984350e-01	9	5.700835e-01	2.247228e-01
s(CHL_MEAN)	1.025026e+00	9	4.785605e+00	1.807487e-02
s(nitrate)	3.532942e+00	9	8.955216e+01	4.208258e-24
s(parmax)	1.970470e-05	9	1.746776e-05	3.480532e-01
s(parmean)	6.172571e-06	9	8.510854e-07	1.000000e+00
s(ph)	3.712152e+00	9	2.732703e+01	4.054671e-07
s(SST_MEAN)	1.043940e-05	9	9.349418e-06	3.263318e-01
s(SST_RANGE)	9.630499e-02	9	1.003746e-01	3.189597e-01



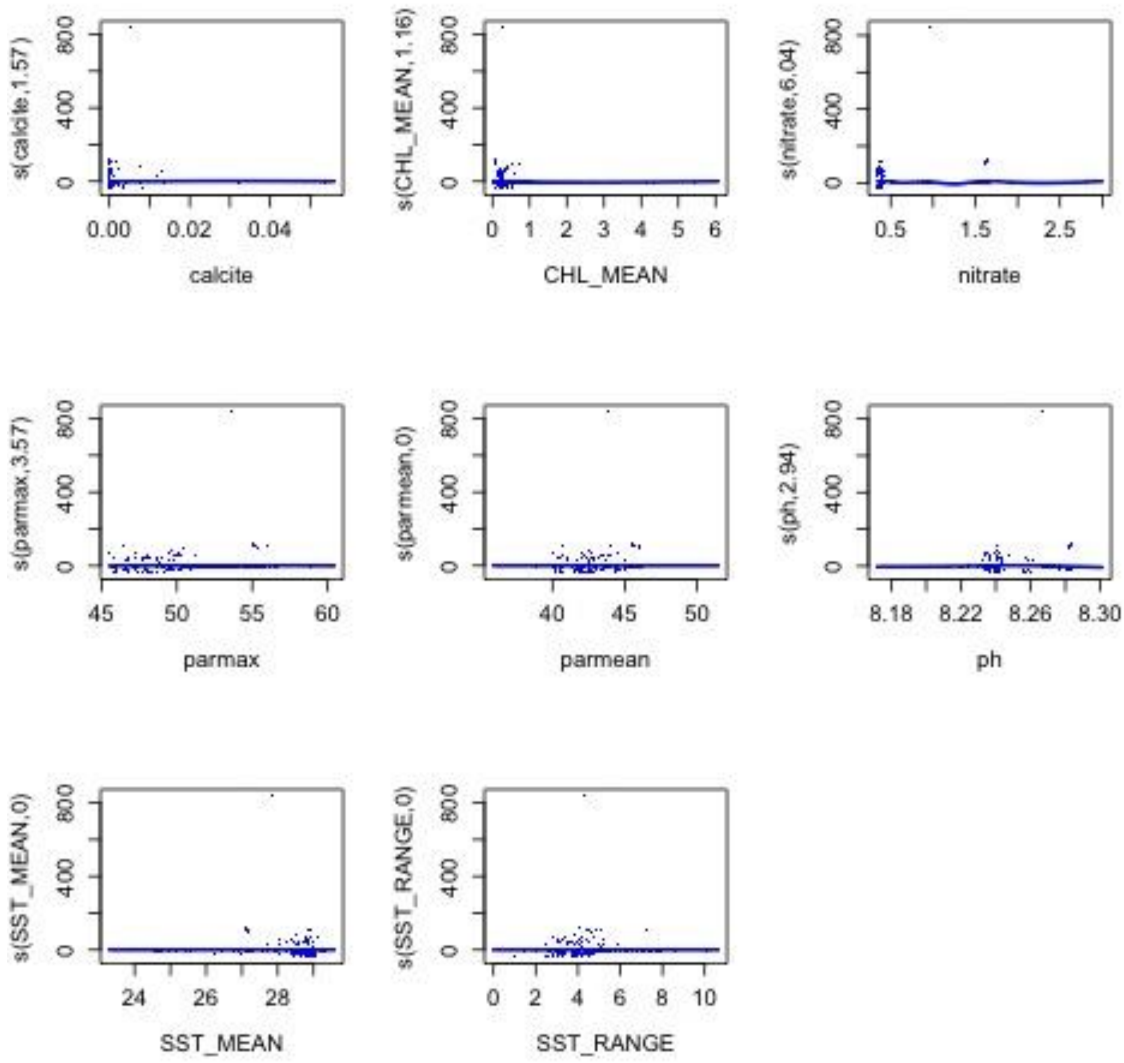
371 Pseudanthias squamipinnis, n = 83 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.677258e-01	9	1.854056e-01	2.835591e-01
s(CHL_MEAN)	3.045378e-05	9	3.552548e-07	1.000000e+00
s(nitrate)	4.160325e+00	9	6.513612e+01	9.481371e-18
s(parmax)	4.111595e-05	9	2.223601e-05	5.506718e-01
s(parmean)	1.803893e+00	9	6.437335e+00	1.225016e-02
s(ph)	5.462415e+00	9	4.884986e+01	1.426671e-11
s(SST_MEAN)	8.190475e-01	9	4.230893e+00	1.203988e-02
s(SST_RANGE)	4.557163e+00	9	2.291081e+01	3.808160e-05



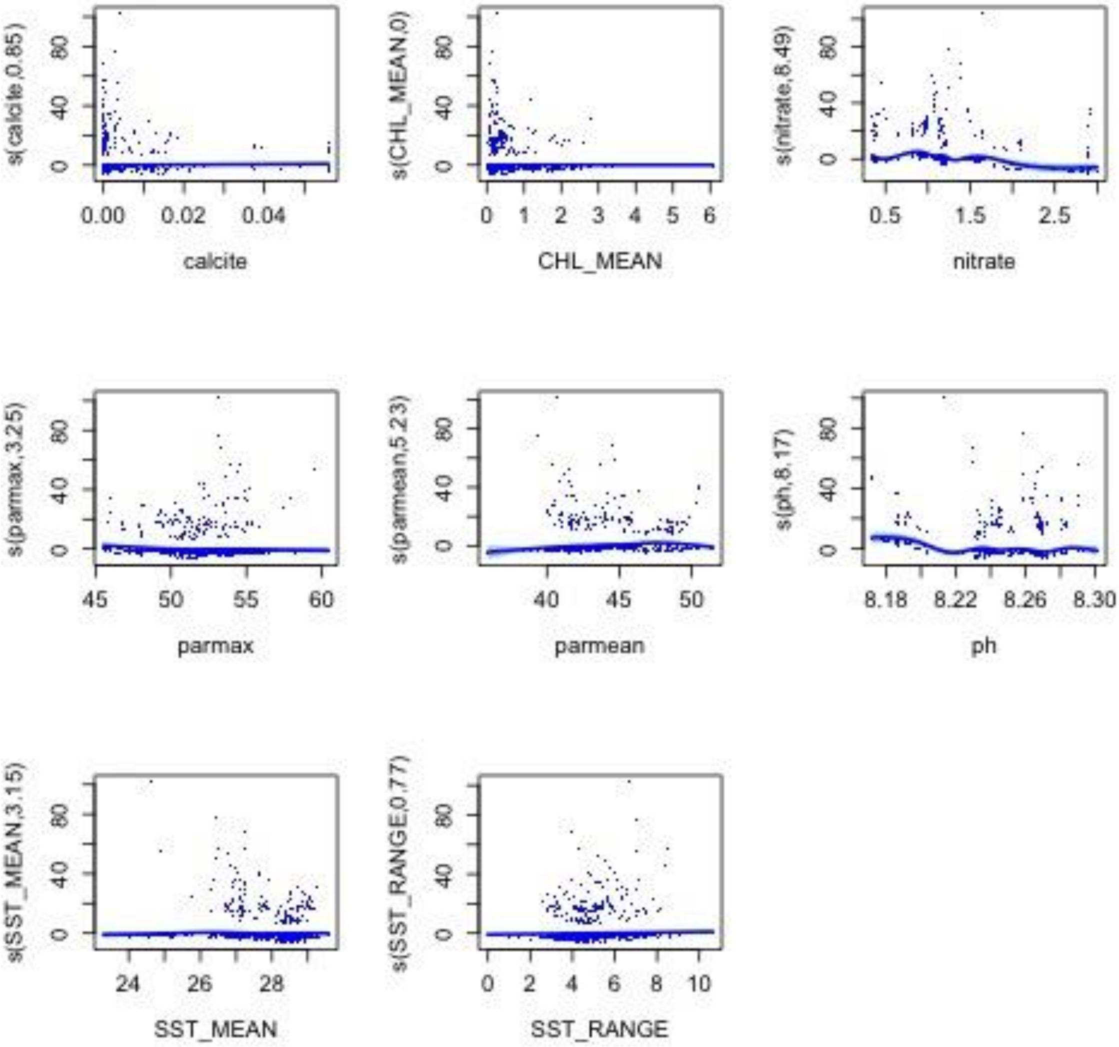
372 Pseudanthias tuka, n = 44 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.569276e+00	9	3.604564e+00	0.0963196553
s(CHL_MEAN)	1.163939e+00	9	9.608061e+00	0.0012301631
s(nitrate)	6.039836e+00	9	2.373598e+01	0.0001285670
s(parmax)	3.570246e+00	9	1.362524e+01	0.0020812316
s(parmean)	3.208720e-05	9	5.268571e-06	0.9630422428
s(ph)	2.936830e+00	9	1.819900e+01	0.0000389982
s(SST_MEAN)	6.788722e-05	9	3.990617e-05	0.4669817750
s(SST_RANGE)	3.331760e-04	9	2.957104e-04	0.3706446160



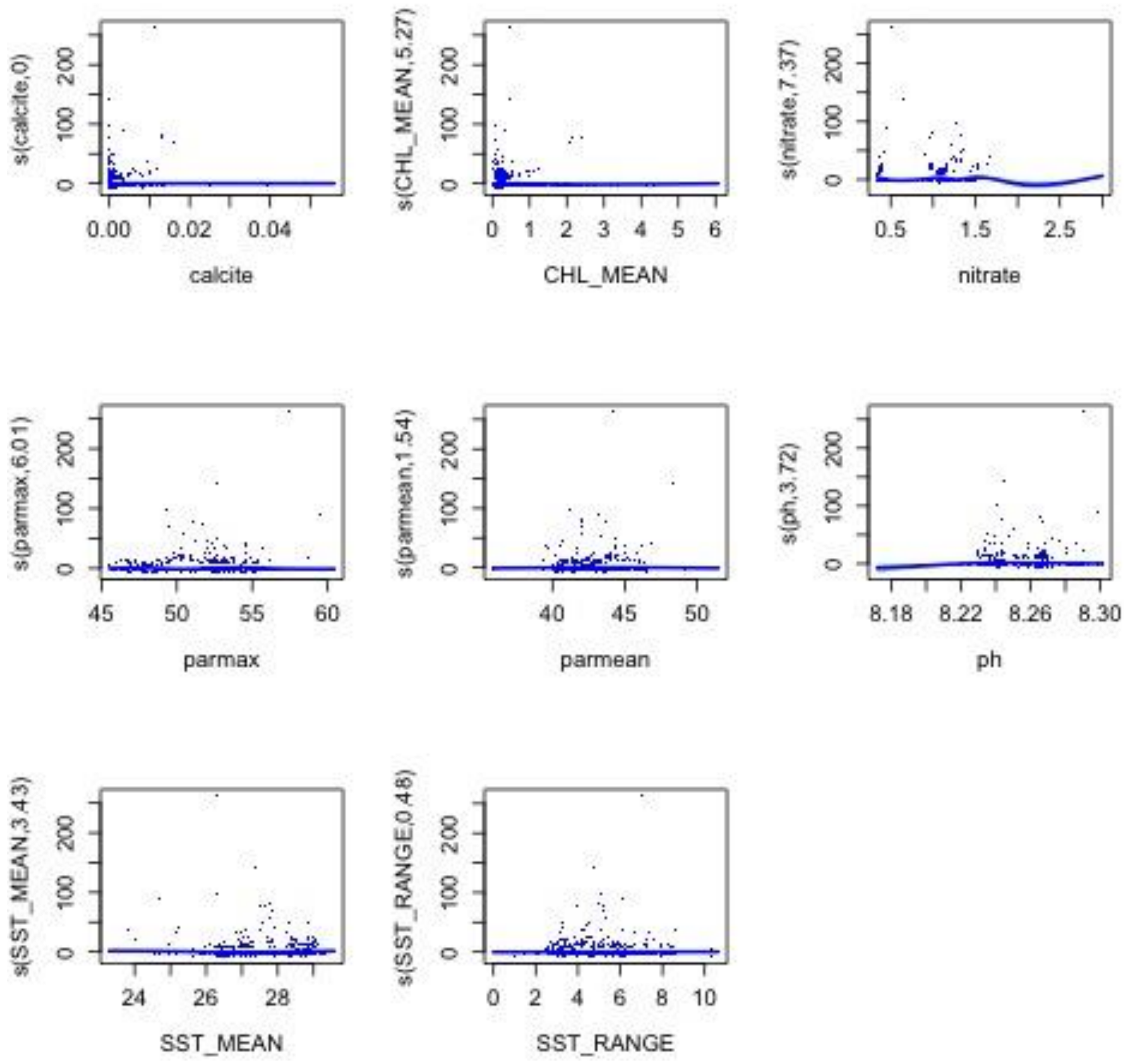
373Pseudobalistes flavimarginatus, n = 284 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8471168428	5	5.255368e+00	1.107635e-02
s(CHL_MEAN)	0.0004115379	9	9.415252e-05	6.377497e-01
s(nitrate)	8.4937806561	9	9.817462e+01	6.156423e-20
s(parmax)	3.2512384275	9	2.053586e+01	1.198990e-05
s(parmean)	5.2264785210	9	4.369773e+01	5.616278e-10
s(ph)	8.1707221864	9	4.183093e+01	1.567624e-07
s(SST_MEAN)	3.1523609920	9	7.470920e+00	3.182186e-02
s(SST_RANGE)	0.7748135682	9	3.302371e+00	3.507897e-02



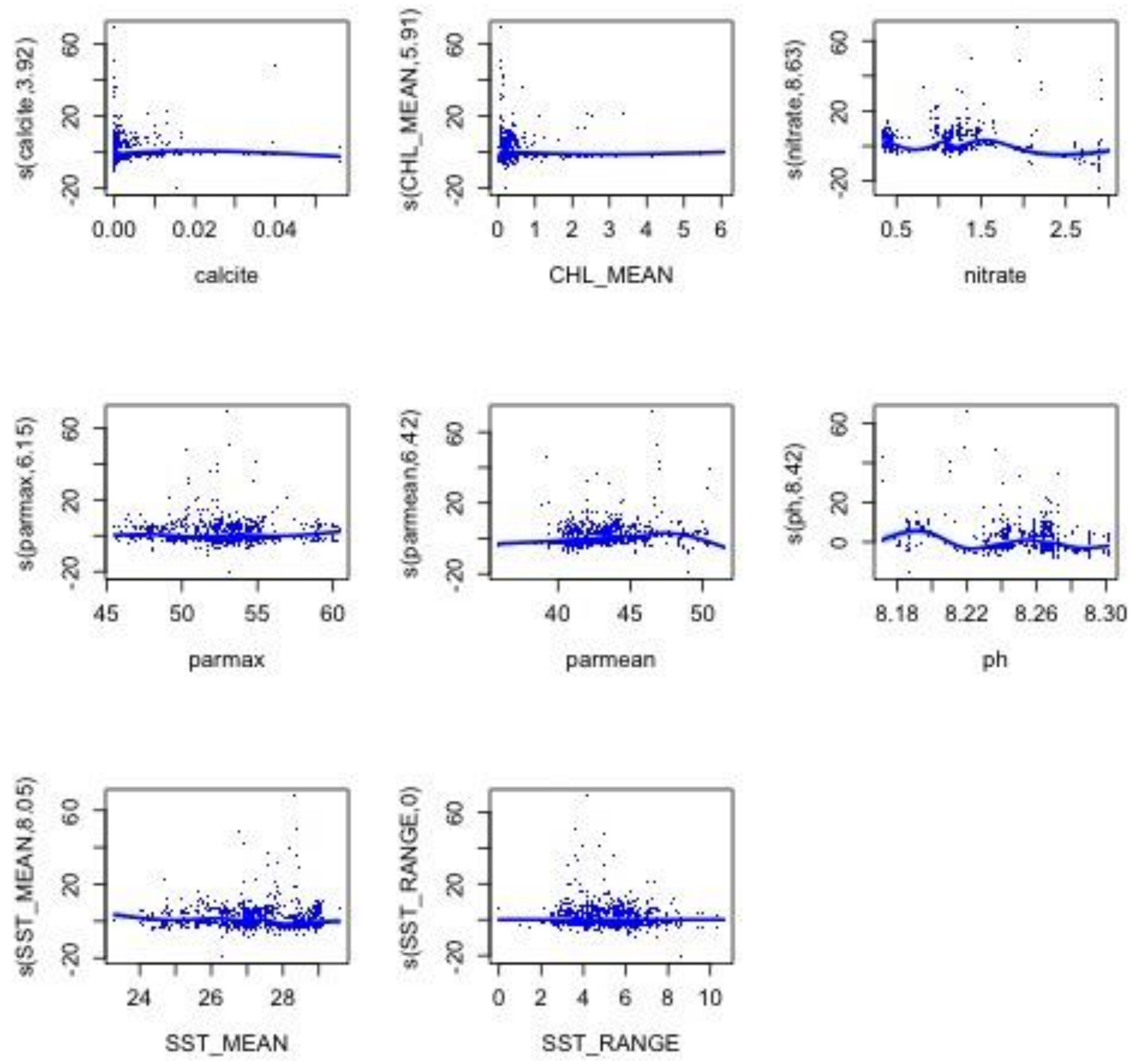
374 Pseudocheilinus evanidus, n = 427 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.307334e-06	9	1.519456e-06	7.810486e-01
s(CHL_MEAN)	5.269810e+00	9	2.925509e+01	7.597642e-06
s(nitrate)	7.365175e+00	9	2.001841e+02	2.286760e-46
s(parmax)	6.007632e+00	9	6.238141e+01	1.199435e-13
s(parmean)	1.541273e+00	9	3.321246e+00	6.595202e-02
s(ph)	3.722647e+00	9	1.022828e+01	9.386701e-03
s(SST_MEAN)	3.431185e+00	9	2.315004e+01	1.469182e-06
s(SST_RANGE)	4.779908e-01	9	8.746079e-01	1.557841e-01



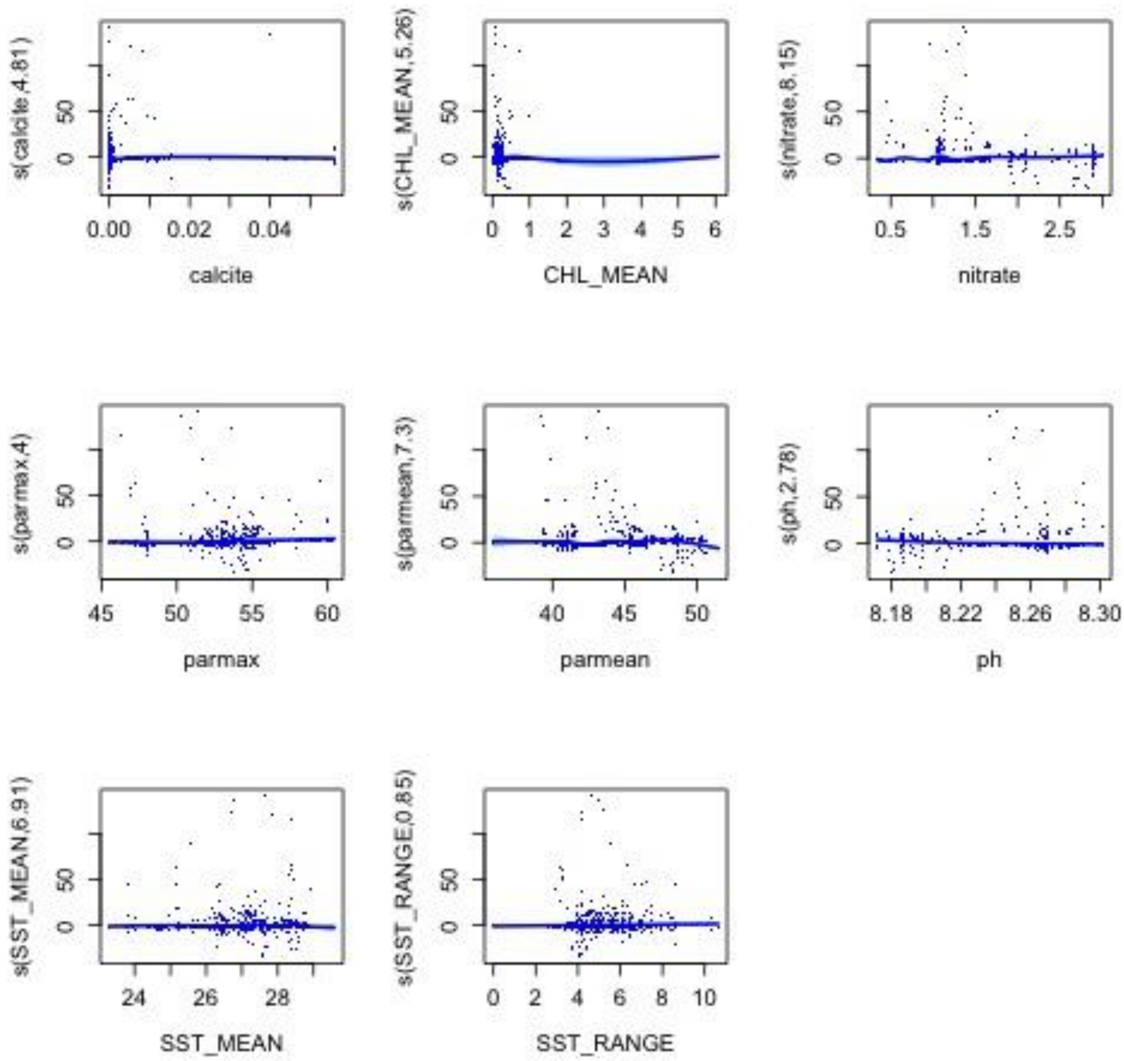
375 Pseudocheilinus hexataenia, n = 1399 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.924429335	9	4.387960e+01	1.192805e-09
s(CHL_MEAN)	5.911766218	9	8.679859e+01	3.150394e-18
s(nitrate)	8.628223932	9	3.021343e+02	4.240193e-66
s(parmax)	6.147081439	9	4.691824e+01	9.689794e-10
s(parmean)	6.421351643	9	1.609391e+02	1.189735e-36
s(ph)	8.421750591	9	1.795880e+02	2.296517e-38
s(SST_MEAN)	8.046142235	9	8.728103e+01	2.681312e-17
s(SST_RANGE)	0.001819451	9	7.924364e-04	6.418599e-01



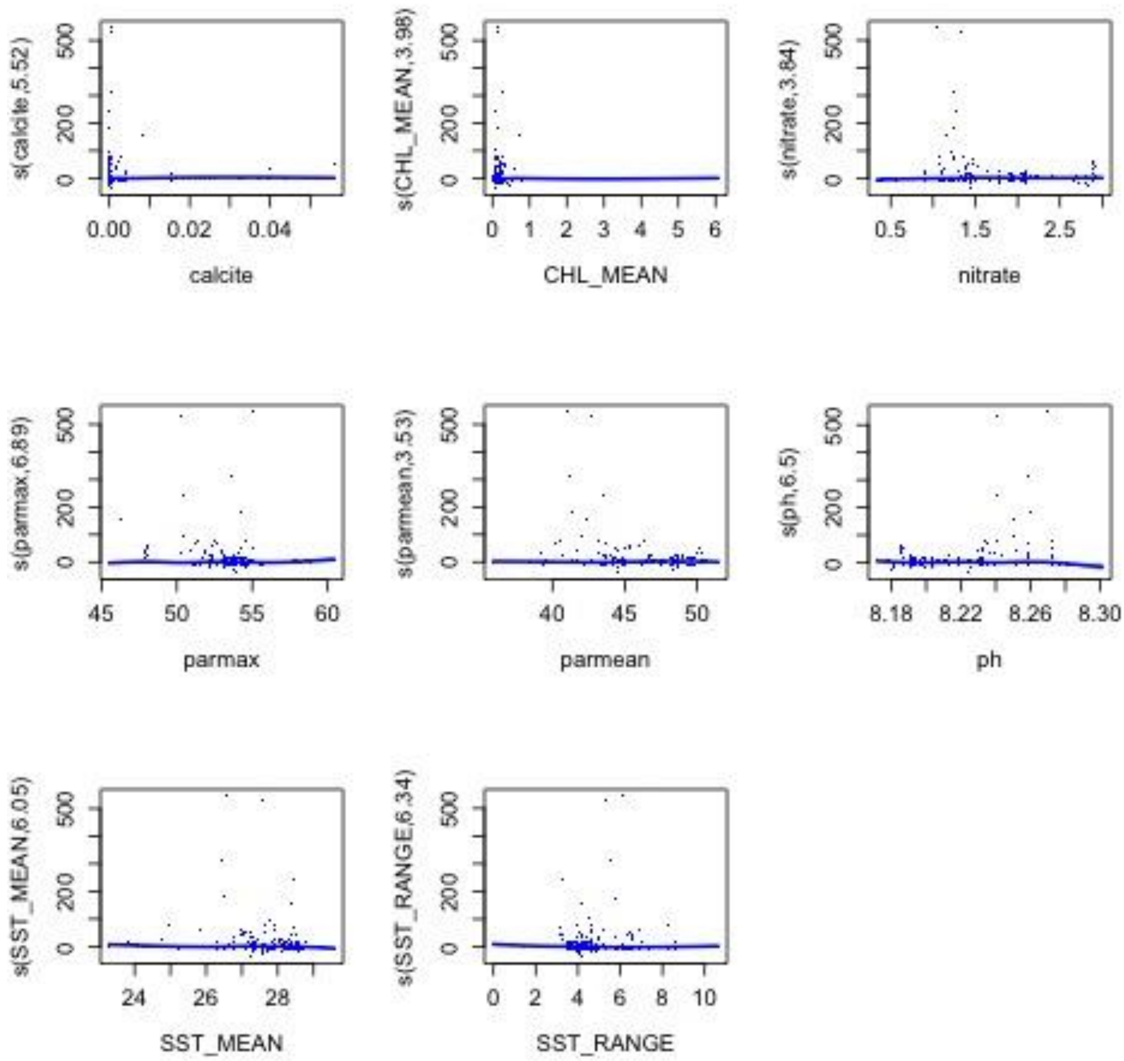
376 Pseudocheilinus octotaenia, n = 1058 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.8133843	9	43.448475	3.047373e-09
s(CHL_MEAN)	5.2615095	9	49.328415	1.489716e-10
s(nitrate)	8.1451435	9	110.585563	1.285765e-24
s(parmax)	4.0022425	9	41.187103	5.799980e-11
s(parmean)	7.2957709	9	184.414617	9.739618e-44
s(ph)	2.7753255	9	12.118042	6.116569e-04
s(SST_MEAN)	6.9067547	9	39.360238	1.401341e-07
s(SST_RANGE)	0.8505879	9	5.567163	8.740228e-03



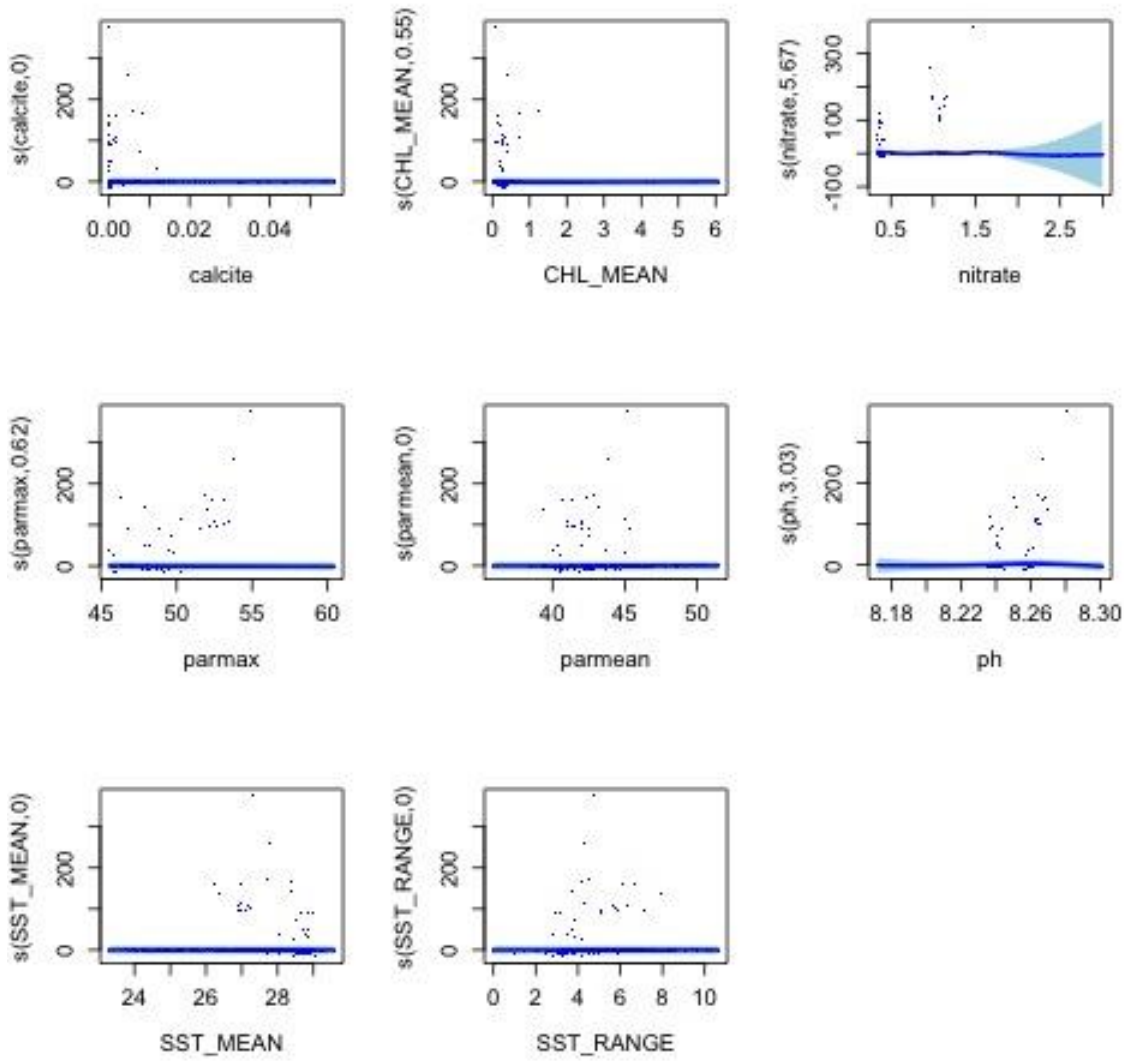
377 Pseudocheilinus tetrataenia, n = 434 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.515048	9	26.00351	3.463106e-05
s(CHL_MEAN)	3.984978	9	30.89271	4.649741e-07
s(nitrate)	3.838130	9	13.70780	1.557265e-03
s(parmax)	6.893120	9	29.08381	1.215848e-05
s(parmean)	3.525285	9	25.29478	6.986574e-07
s(ph)	6.496752	9	55.10512	8.479622e-13
s(SST_MEAN)	6.052670	9	37.91430	3.205384e-08
s(SST_RANGE)	6.340635	9	46.69056	8.451660e-10



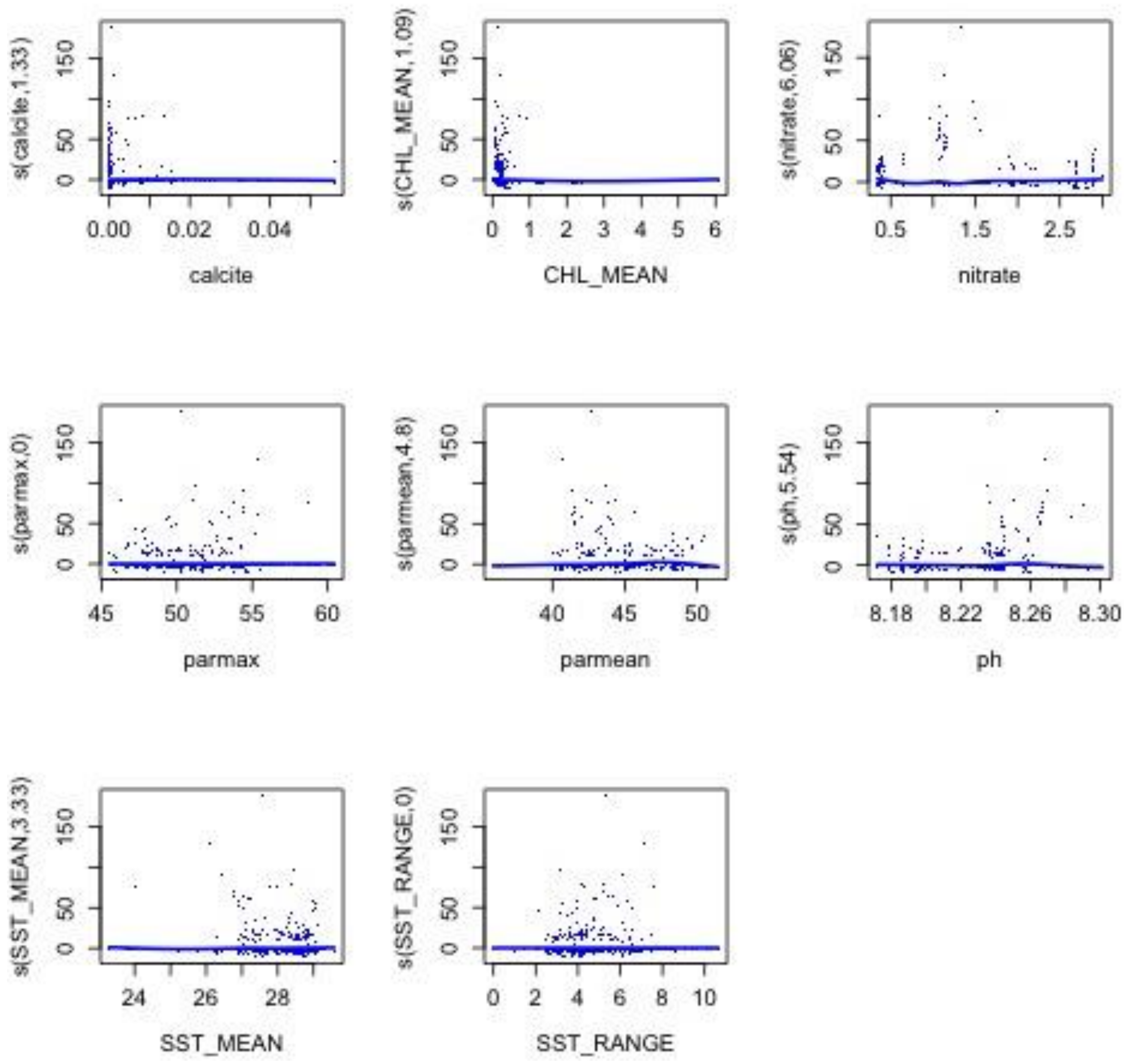
378 Pseudocoris yamashiroi, n = 31 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.852715e-05	9	3.769154e-06	1.000000e+00
s(CHL_MEAN)	5.481530e-01	9	1.074852e+00	1.491469e-01
s(nitrate)	5.666533e+00	9	3.752382e+01	4.566081e-08
s(parmax)	6.155629e-01	9	1.508242e+00	1.035712e-01
s(parmean)	4.174613e-05	9	6.157155e-06	1.000000e+00
s(ph)	3.029693e+00	9	1.625959e+01	1.660169e-04
s(SST_MEAN)	2.371822e-04	9	2.122733e-04	3.348360e-01
s(SST_RANGE)	1.445251e-04	9	9.023879e-05	5.389236e-01



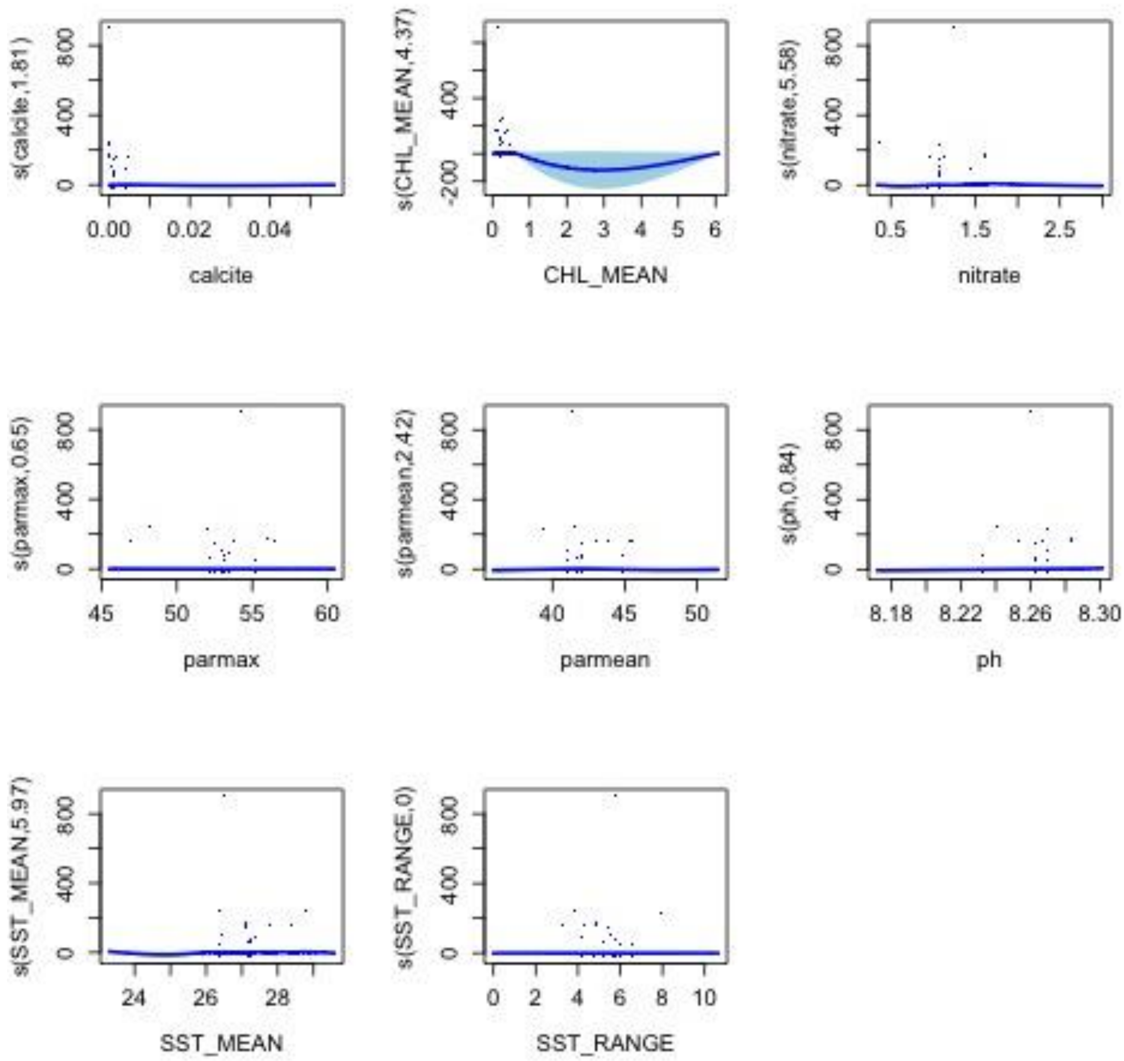
379 Pseudodax moluccanus, n = 295 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.328983e+00	9	3.685237e+00	5.797239e-02
s(CHL_MEAN)	1.091247e+00	9	6.719375e+00	4.765496e-03
s(nitrate)	6.061909e+00	9	1.343506e+02	1.364878e-32
s(parmax)	4.750159e-05	9	1.572355e-05	6.948208e-01
s(parmean)	4.804906e+00	9	8.953441e+01	1.841976e-21
s(ph)	5.544634e+00	9	2.802561e+01	4.933534e-06
s(SST_MEAN)	3.326077e+00	9	8.224467e+00	2.548564e-02
s(SST_RANGE)	2.844462e-04	9	2.409098e-04	3.963388e-01



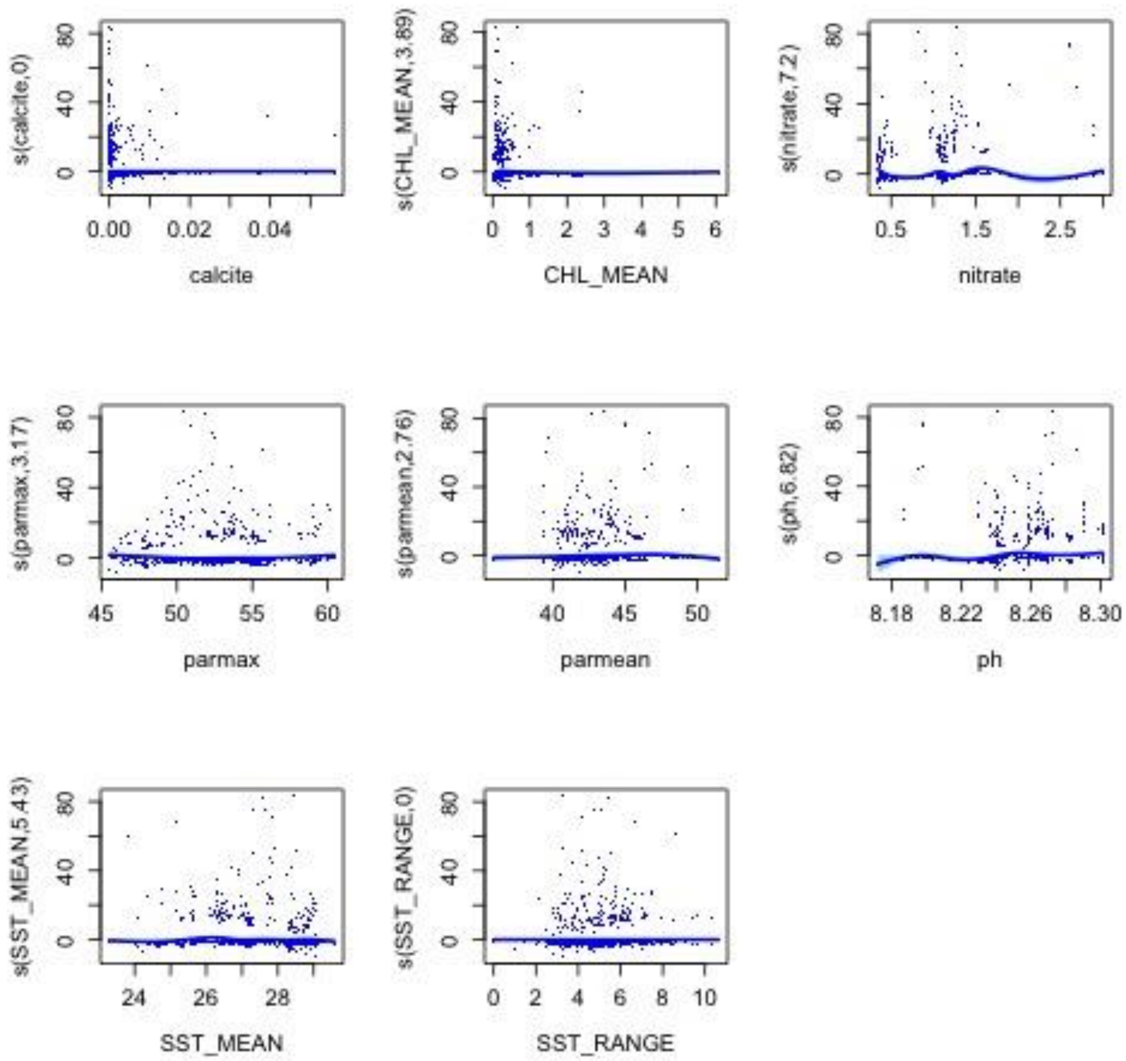
380 Pseudojuloides cerasinus, n = 58 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.805220e+00	9	4.007711e+00	0.0913695372
s(CHL_MEAN)	4.369382e+00	9	1.451526e+01	0.0031884381
s(nitrate)	5.577823e+00	9	1.866070e+01	0.0005500421
s(parmax)	6.473752e-01	9	8.477664e-01	0.2215406360
s(parmean)	2.424963e+00	9	9.434315e+00	0.0040005892
s(ph)	8.368013e-01	9	4.452012e+00	0.0057015849
s(SST_MEAN)	5.967187e+00	9	1.403936e+01	0.0095425049
s(SST_RANGE)	1.451308e-06	9	9.953248e-08	1.0000000000



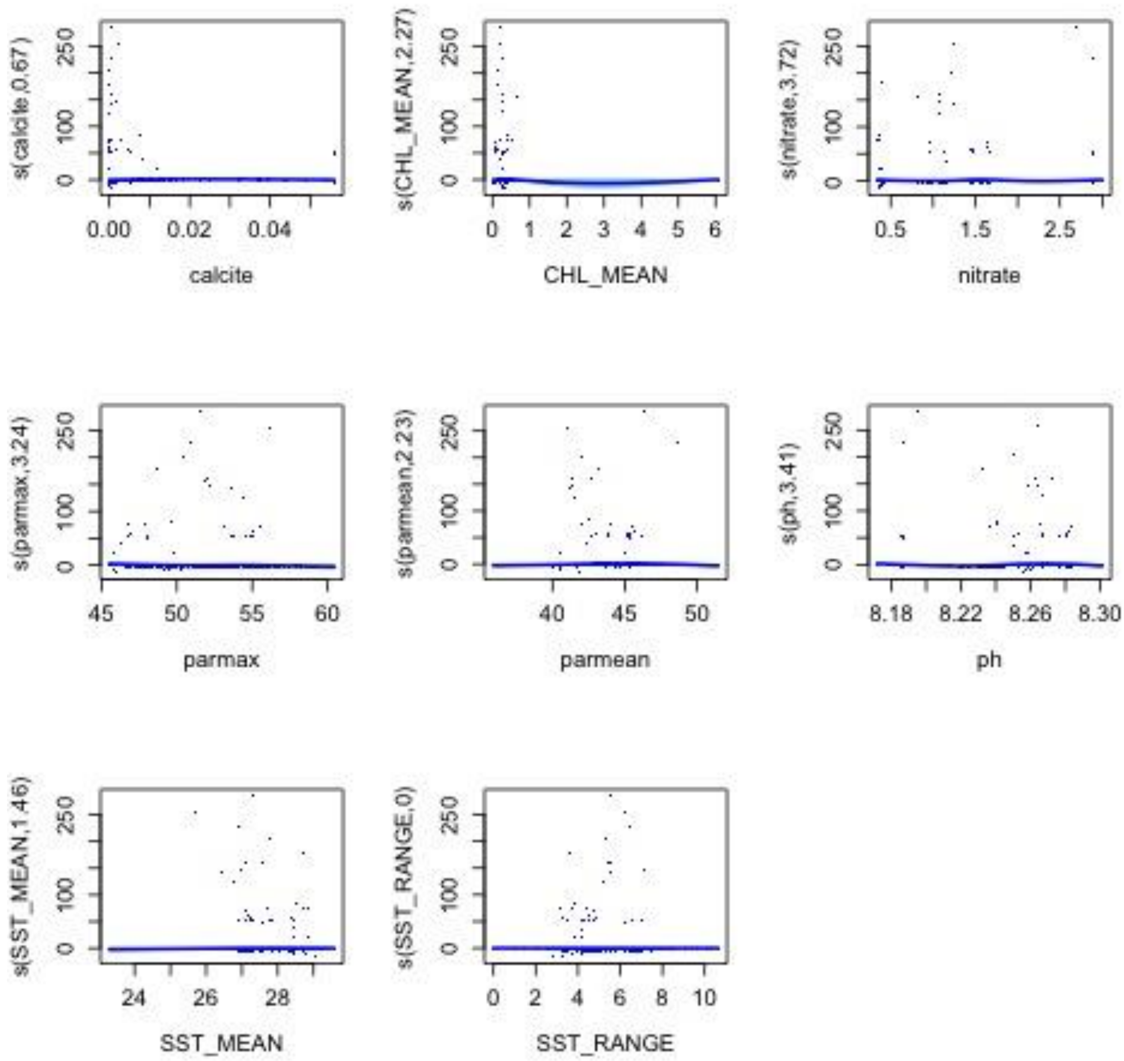
381 Ptereleotris evides, n = 396 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.618078e-04	9	3.562871e-05	7.093700e-01
s(CHL_MEAN)	3.885353e+00	9	2.808602e+01	2.176524e-06
s(nitrate)	7.204601e+00	9	1.280640e+02	8.877718e-30
s(parmax)	3.166871e+00	9	1.994446e+01	1.787351e-05
s(parmean)	2.763523e+00	9	1.258478e+01	8.773461e-04
s(ph)	6.815013e+00	9	6.137426e+01	2.263218e-13
s(SST_MEAN)	5.432536e+00	9	2.946963e+01	2.629694e-06
s(SST_RANGE)	4.652532e-05	9	2.526280e-05	5.765682e-01



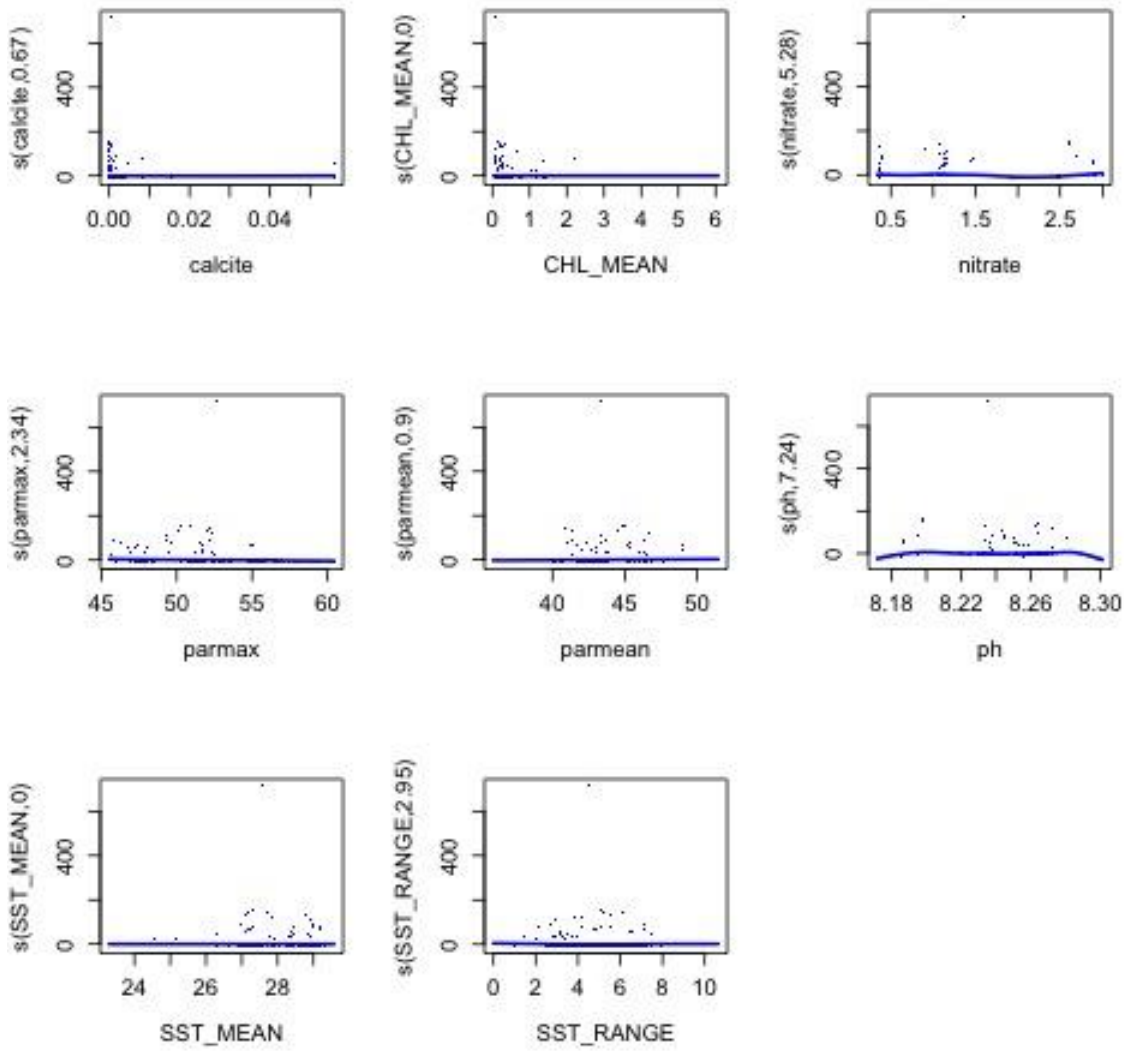
382 Ptereleotris heteroptera, n = 87 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.749302e-01	9	1.963415e+00	7.697217e-02
s(CHL_MEAN)	2.270461e+00	9	6.145459e+00	3.666842e-02
s(nitrate)	3.719626e+00	9	1.403454e+01	4.623177e-04
s(parmax)	3.236926e+00	9	1.173474e+01	1.691621e-03
s(parmean)	2.228250e+00	9	1.002308e+01	9.501601e-04
s(ph)	3.410958e+00	9	1.920587e+01	6.346438e-06
s(SST_MEAN)	1.461802e+00	9	2.467655e+00	1.115349e-01
s(SST_RANGE)	1.707729e-05	9	1.074118e-05	5.148311e-01



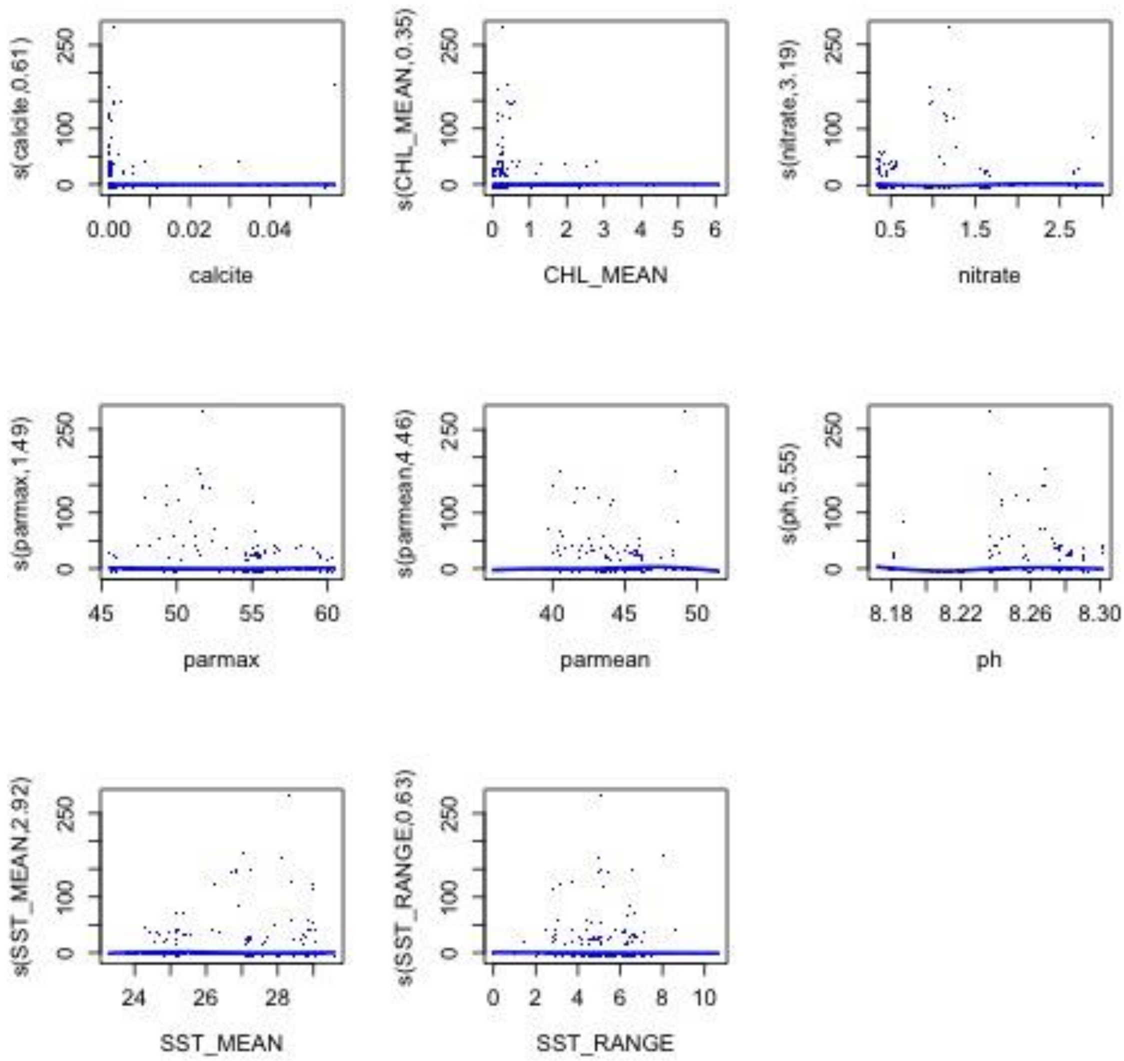
383 Ptereleotris microlepis, n = 39 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.651619e-01	9	1.370269e+00	1.400940e-01
s(CHL_MEAN)	7.178060e-04	9	5.459501e-04	3.674967e-01
s(nitrate)	5.283109e+00	9	2.726141e+01	5.296499e-06
s(parmax)	2.343135e+00	9	1.828270e+01	1.245421e-05
s(parmean)	8.957629e-01	9	8.020128e+00	1.199520e-03
s(ph)	7.242005e+00	9	2.926822e+01	1.674146e-05
s(SST_MEAN)	2.655549e-05	9	2.088702e-05	3.870461e-01
s(SST_RANGE)	2.947591e+00	9	1.309941e+01	8.943342e-04



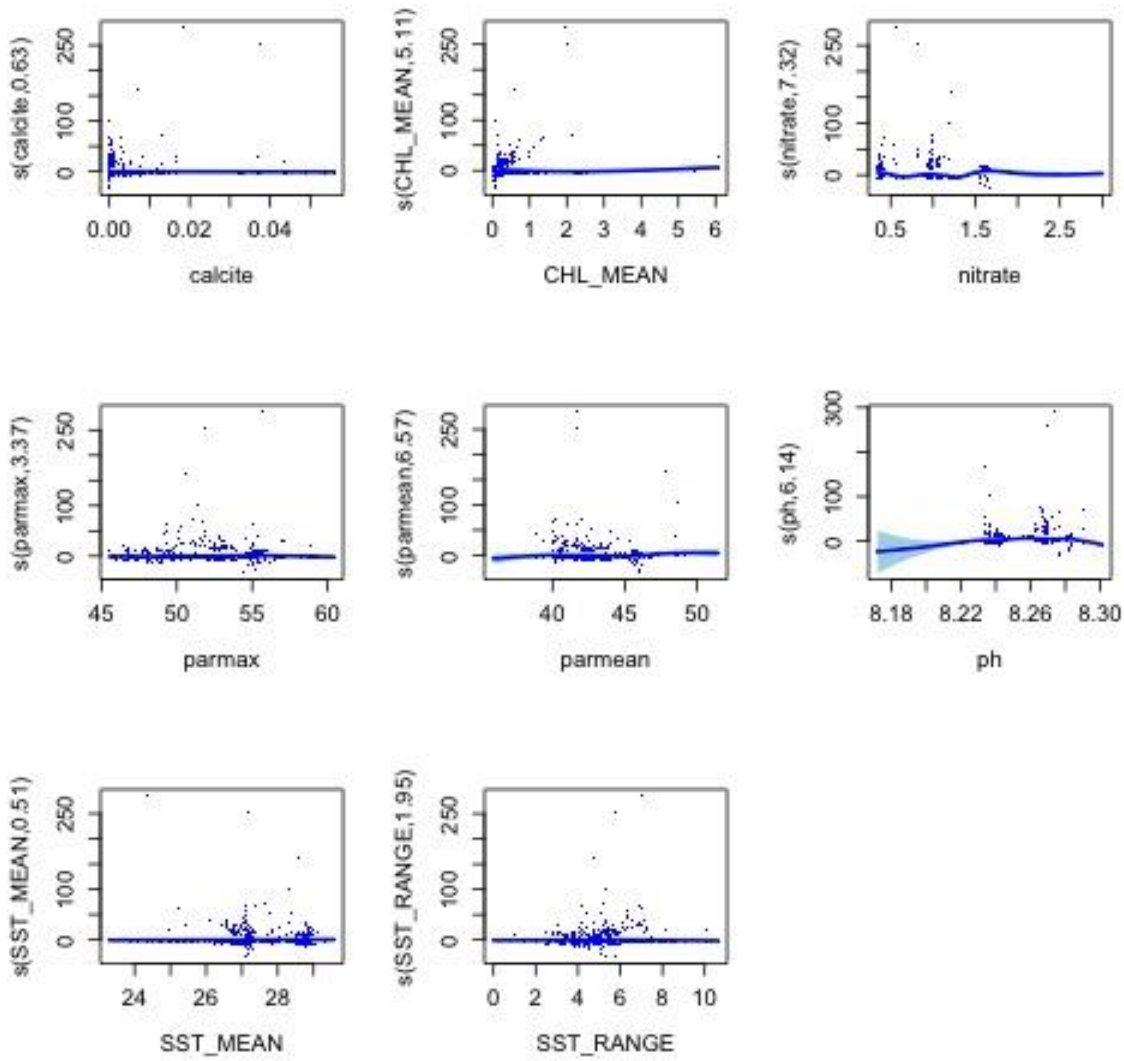
384 Pterocaesio marri, n = 114 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6061406	9	1.2430342	1.225656e-01
s(CHL_MEAN)	0.3547360	9	0.5770419	1.637220e-01
s(nitrate)	3.1874313	9	34.7098199	4.825274e-10
s(parmax)	1.4946565	9	5.2162975	1.553030e-02
s(parmean)	4.4561737	9	43.0668892	3.855529e-11
s(ph)	5.5494436	9	41.1226978	3.065541e-10
s(SST_MEAN)	2.9162228	9	16.3169940	7.095419e-05
s(SST_RANGE)	0.6308675	9	1.6602086	9.219631e-02



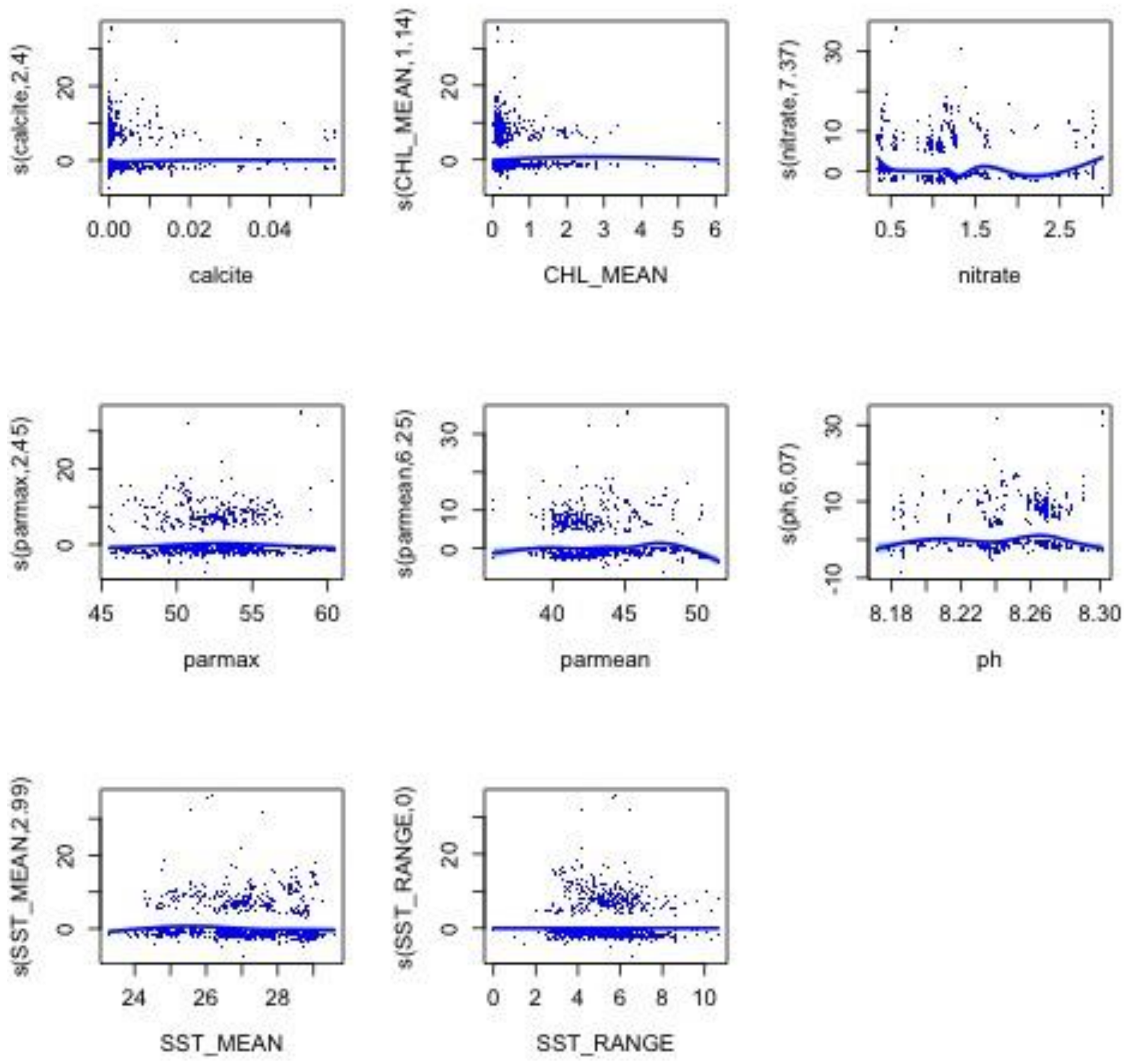
385 Pterocaesio pisang, n = 217 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6255368	6	1.4415412	1.208232e-01
s(CHL_MEAN)	5.1106636	9	58.3672455	1.601463e-12
s(nitrate)	7.3156473	9	133.6998169	2.105219e-30
s(parmax)	3.3670848	9	16.7709779	1.984567e-04
s(parmean)	6.5740968	9	42.0571775	1.094593e-08
s(ph)	6.1371776	9	48.9721662	1.121392e-10
s(SST_MEAN)	0.5090715	9	0.8595684	1.735438e-01
s(SST_RANGE)	1.9545837	9	5.3248972	3.256194e-02



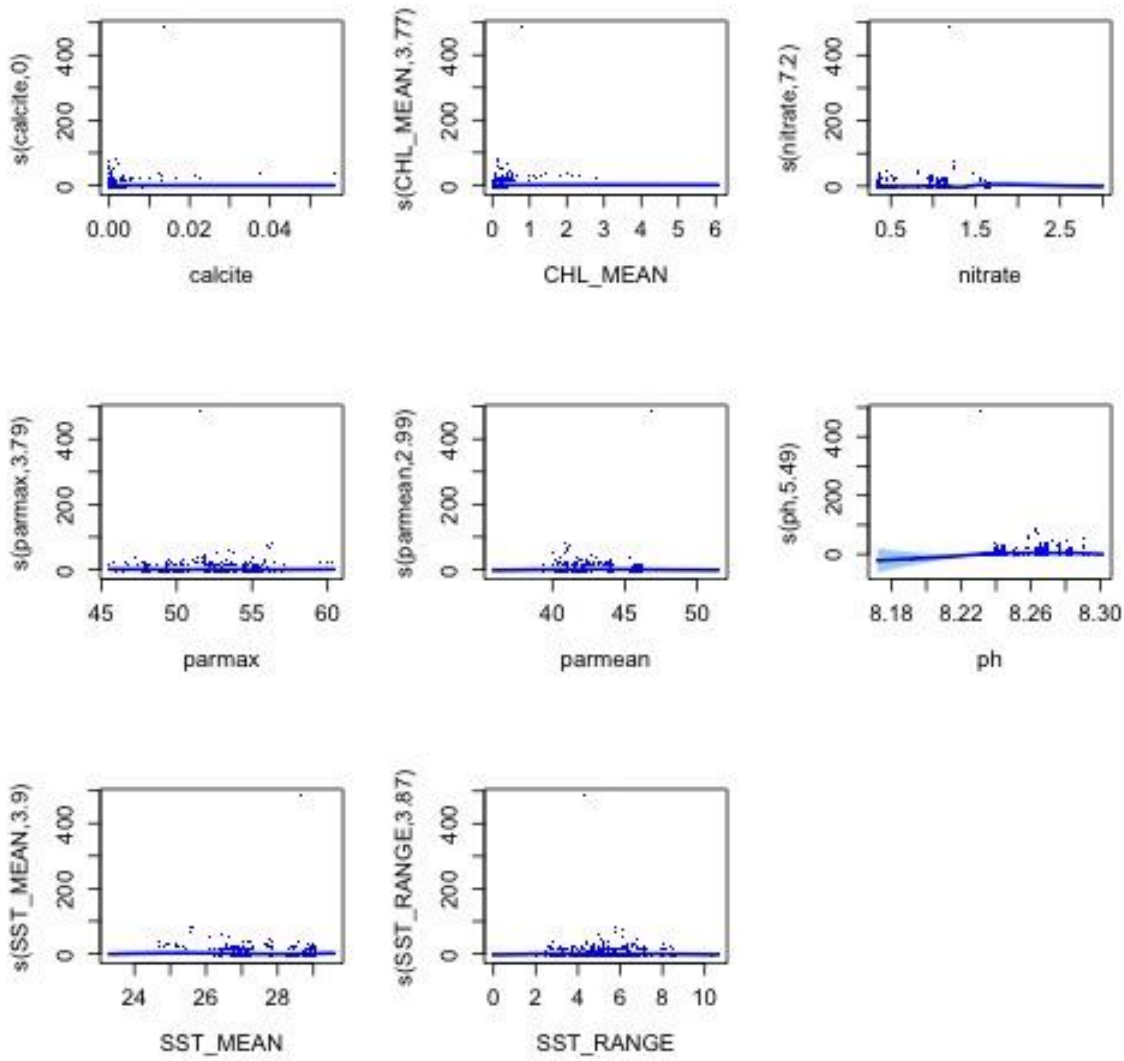
386 Pterocaesio tile, n = 634 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.4023468993	9	1.051008e+01	4.671607e-03
s(CHL_MEAN)	1.1389632515	9	9.328571e+00	1.167416e-03
s(nitrate)	7.3748170087	9	1.935806e+02	2.156445e-45
s(parmax)	2.4497986777	9	1.919791e+01	6.363955e-06
s(parmean)	6.2524338052	9	4.781528e+01	3.843109e-10
s(ph)	6.0654920264	9	4.731862e+01	7.942343e-11
s(SST_MEAN)	2.9914427297	9	1.470546e+01	3.335525e-04
s(SST_RANGE)	0.0003744882	9	1.545198e-04	6.673584e-01



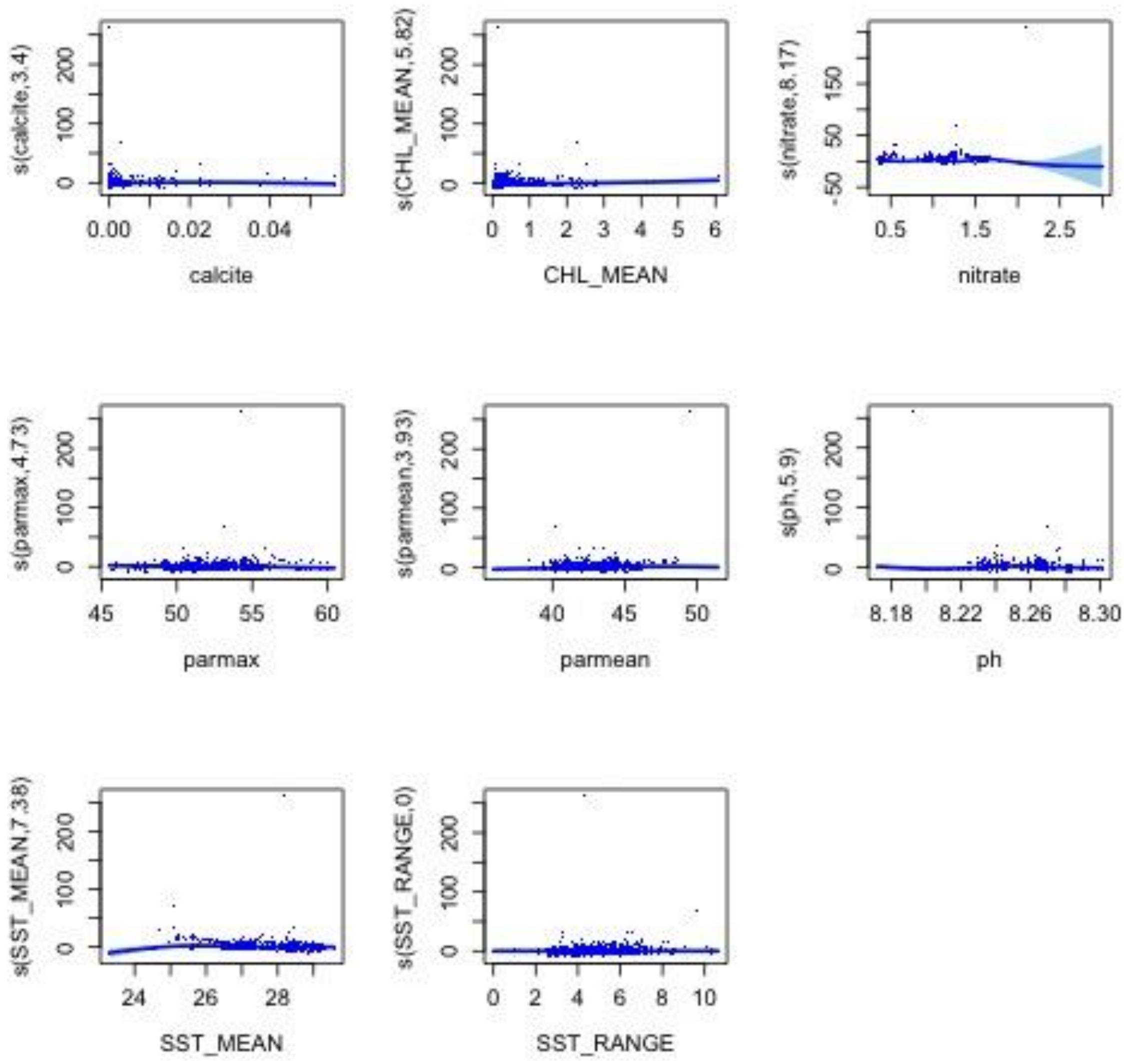
387 Pterocaesio trilineata, n = 243 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.795117e-05	8	3.536309e-05	4.736889e-01
s(CHL_MEAN)	3.769634e+00	9	2.819377e+01	1.955537e-06
s(nitrate)	7.201723e+00	9	1.109223e+02	1.102998e-25
s(parmax)	3.790430e+00	9	1.014391e+01	1.556752e-02
s(parmean)	2.994520e+00	9	1.437440e+01	3.935392e-04
s(ph)	5.490735e+00	9	2.814250e+01	4.203201e-06
s(SST_MEAN)	3.900856e+00	9	2.986524e+01	1.135948e-07
s(SST_RANGE)	3.873400e+00	9	1.076587e+01	1.339827e-02



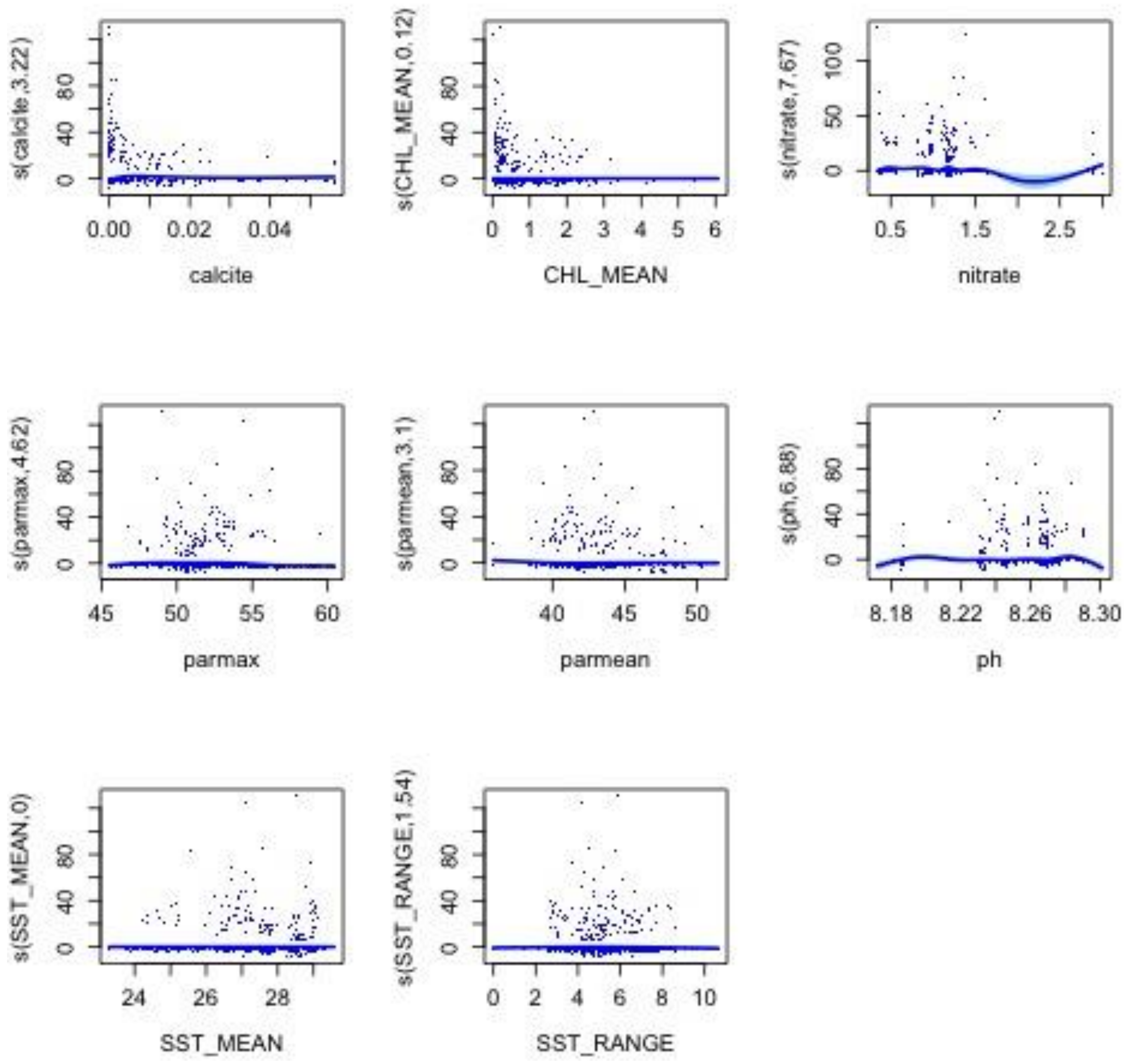
388 Pygoplites diacanthus, n = 1176 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.4034863596	9	2.330088e+01	1.783318e-05
s(CHL_MEAN)	5.8219199401	9	5.698574e+01	8.890273e-12
s(nitrate)	8.1705798702	9	3.061190e+02	1.627599e-72
s(parmax)	4.7292481030	9	3.414241e+01	7.918586e-08
s(parmean)	3.9331932985	9	5.493724e+01	2.557234e-14
s(ph)	5.8983748779	9	8.157118e+01	1.251624e-19
s(SST_MEAN)	7.3750530127	9	6.416635e+01	3.156009e-13
s(SST_RANGE)	0.0002296859	9	1.131314e-04	6.181552e-01



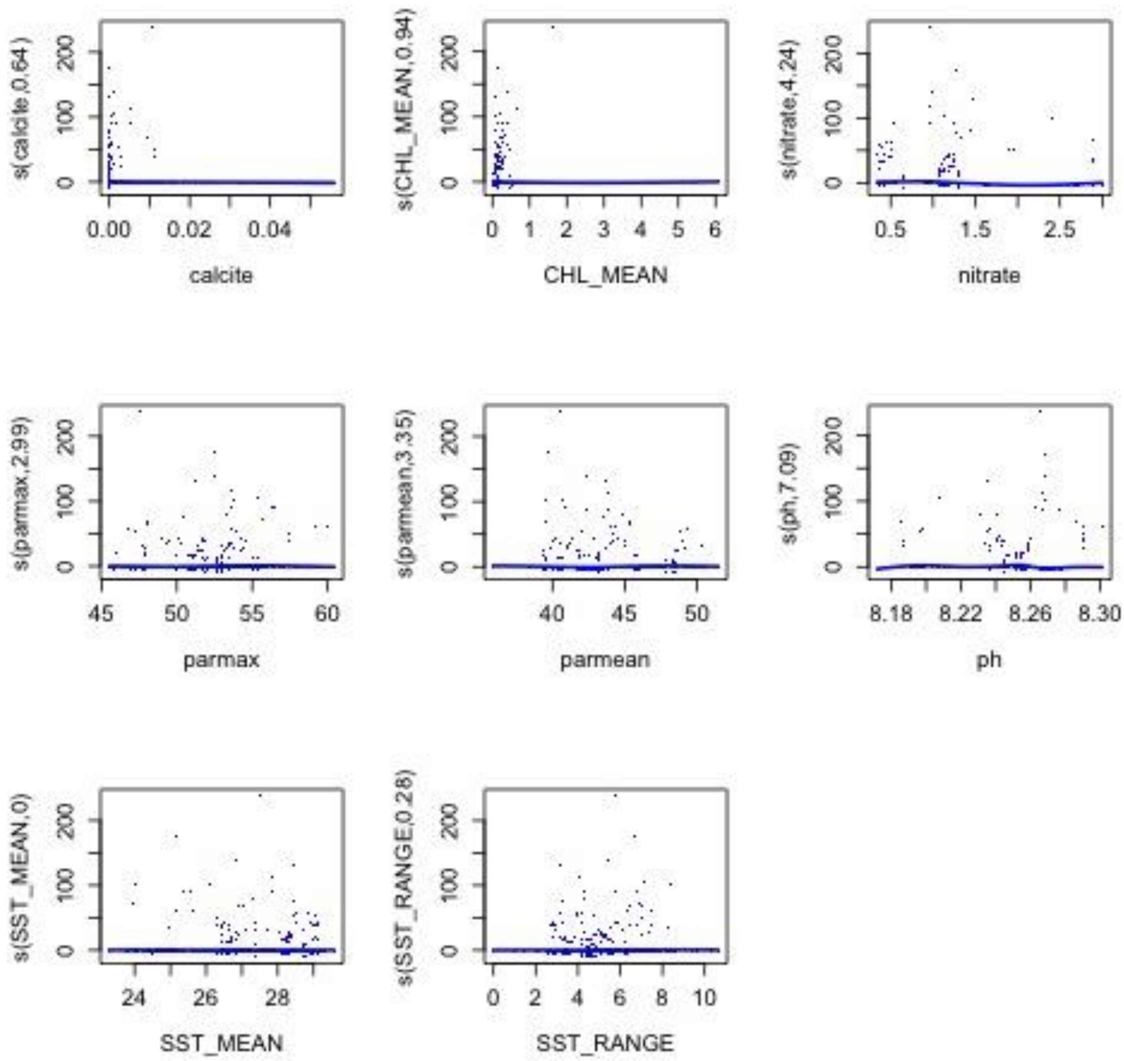
389 Rhinecanthus aculeatus, n = 228 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.222196459	9	8.492620e+01	1.420060e-20
s(CHL_MEAN)	0.124437009	9	1.384711e-01	2.846784e-01
s(nitrate)	7.671980526	9	6.826977e+01	2.095619e-13
s(parmax)	4.623441397	9	3.356284e+01	4.759805e-08
s(parmean)	3.095391087	9	1.454227e+01	2.682243e-04
s(ph)	6.881569138	9	2.875906e+01	2.182684e-05
s(SST_MEAN)	0.000169691	9	1.619116e-04	3.086230e-01
s(SST_RANGE)	1.539045368	9	3.936052e+00	4.624545e-02



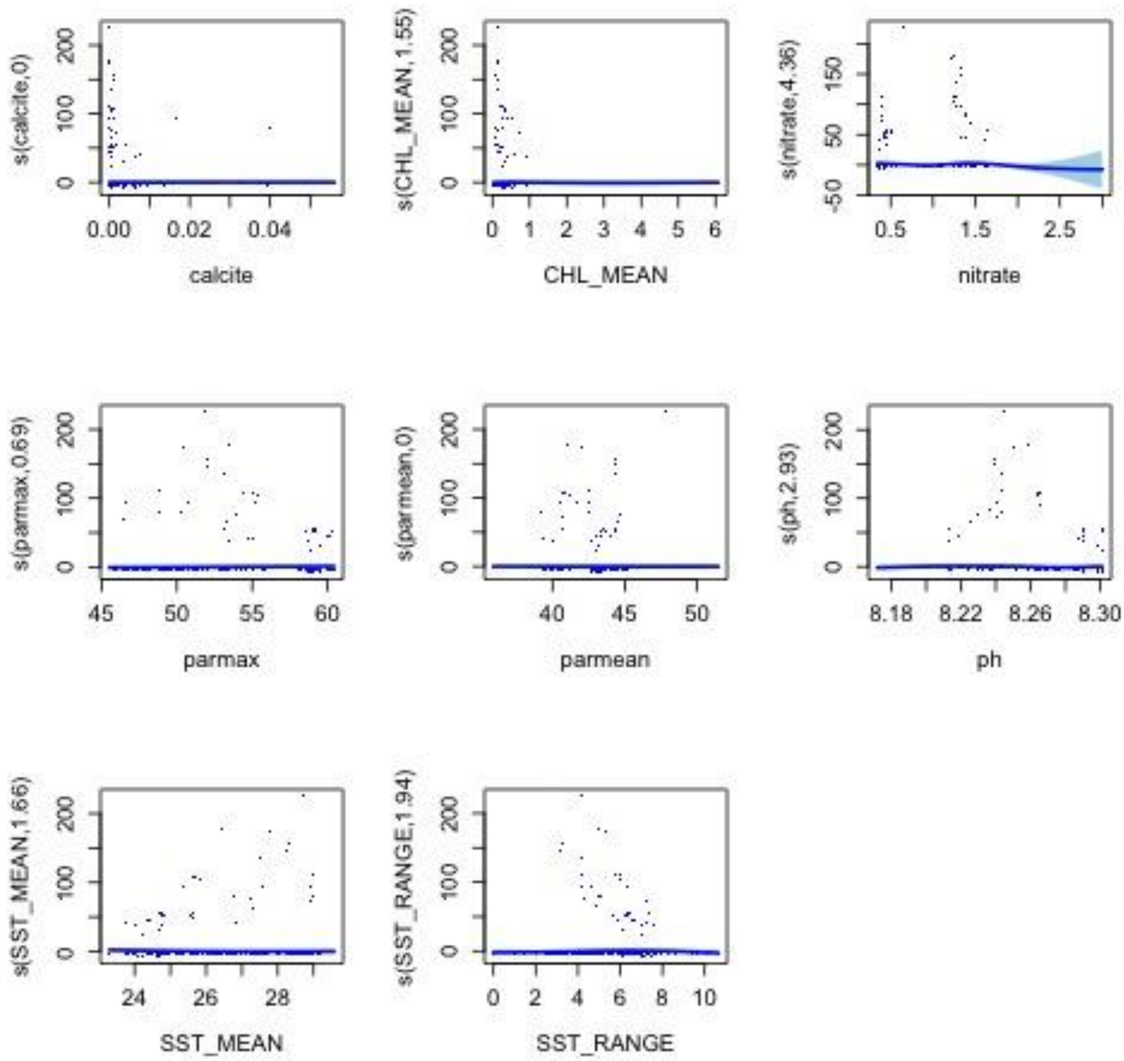
390 Rhinecanthus rectangulus, n = 283 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.426792e-01	6	1.275464e+00	1.535799e-01
s(CHL_MEAN)	9.376851e-01	9	4.116764e+00	2.336652e-02
s(nitrate)	4.239303e+00	9	3.248074e+01	3.177833e-08
s(parmax)	2.987380e+00	9	1.321120e+01	8.868509e-04
s(parmean)	3.345536e+00	9	2.776649e+01	8.856077e-08
s(ph)	7.085987e+00	9	1.303932e+02	7.406096e-31
s(SST_MEAN)	2.374721e-05	9	4.648986e-06	8.680256e-01
s(SST_RANGE)	2.832921e-01	9	3.981750e-01	2.179338e-01



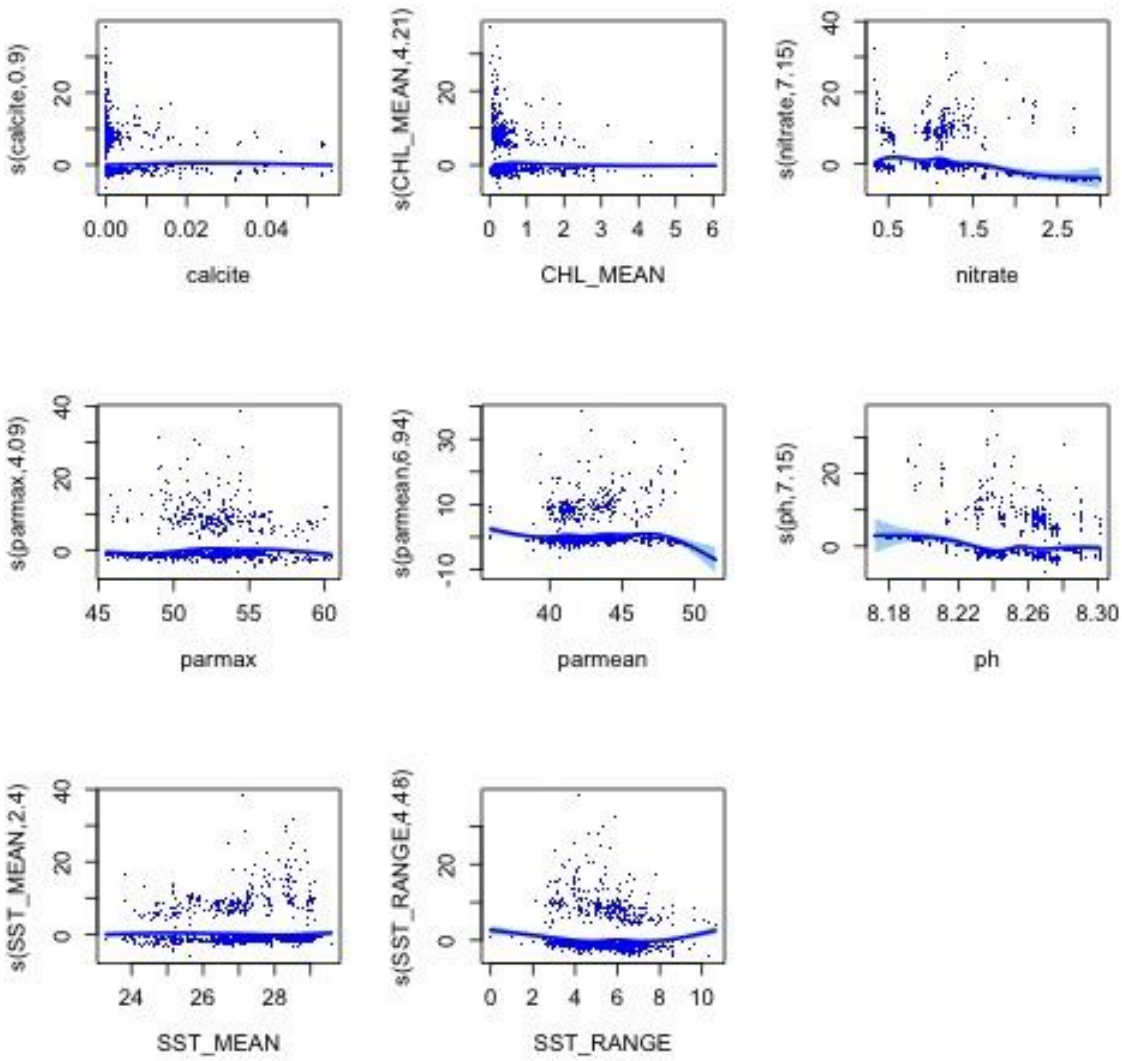
391 Scarid sp, n = 184 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.065643e-06	9	1.263315e-06	0.781867325
s(CHL_MEAN)	1.545881e+00	9	2.772059e+00	0.145905393
s(nitrate)	4.355949e+00	9	1.502473e+01	0.001303596
s(parmax)	6.933011e-01	9	1.890382e+00	0.079656636
s(parmean)	1.281523e-05	9	4.358865e-07	1.000000000
s(ph)	2.928606e+00	9	1.081096e+01	0.002910286
s(SST_MEAN)	1.657873e+00	9	4.766061e+00	0.019346699
s(SST_RANGE)	1.942572e+00	9	6.779226e+00	0.009854262



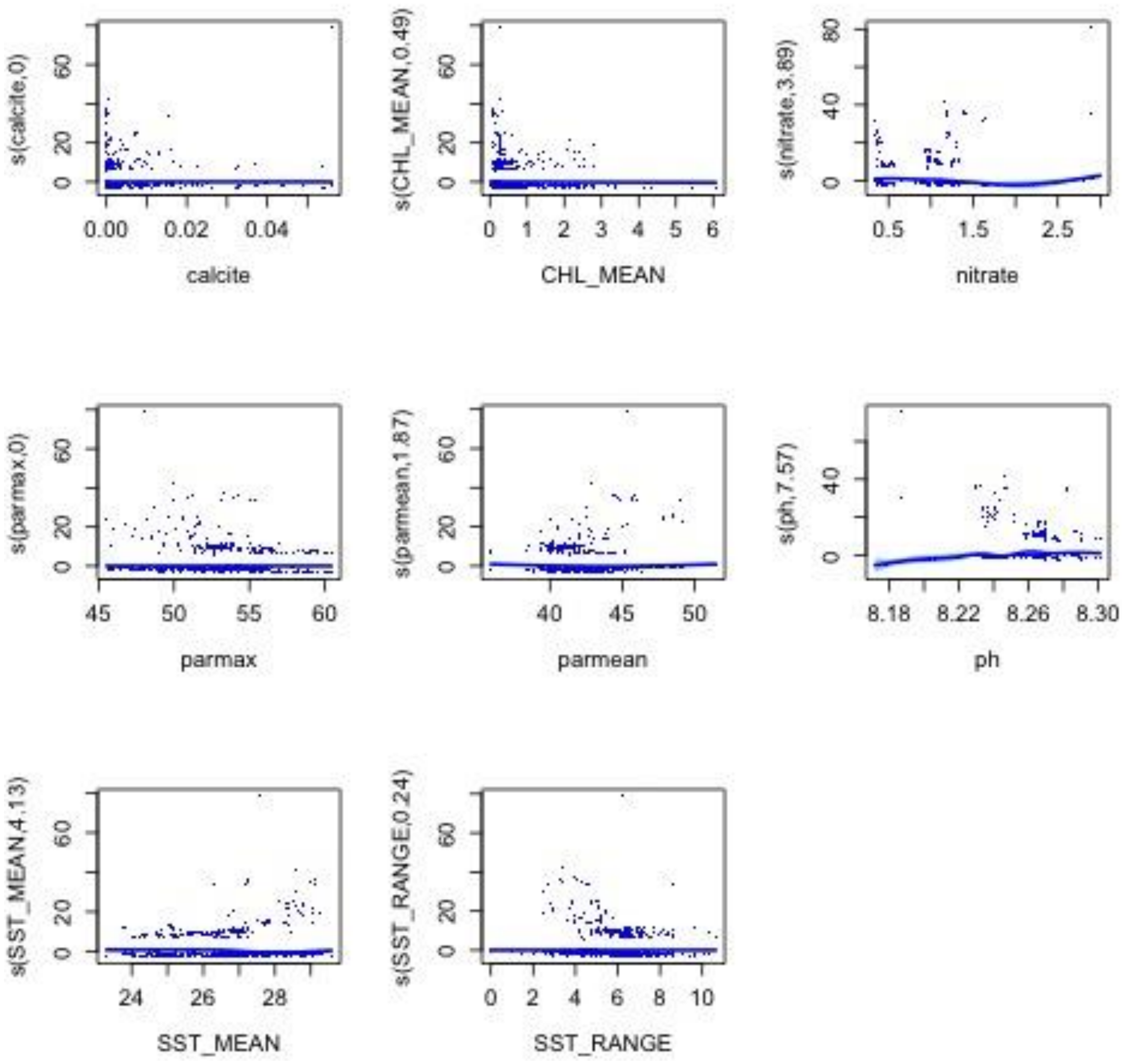
392Scarus altipinnis, n = 523 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.901632	9	4.031078	2.347686e-02
s(CHL_MEAN)	4.209724	9	31.069970	6.402974e-07
s(nitrate)	7.153205	9	67.740883	7.839888e-15
s(parmax)	4.092350	9	30.267036	2.093354e-07
s(parmean)	6.944014	9	39.261293	9.388849e-08
s(ph)	7.145666	9	38.555695	9.238879e-08
s(SST_MEAN)	2.397068	9	4.419172	9.259795e-02
s(SST_RANGE)	4.483785	9	34.182341	6.988123e-08



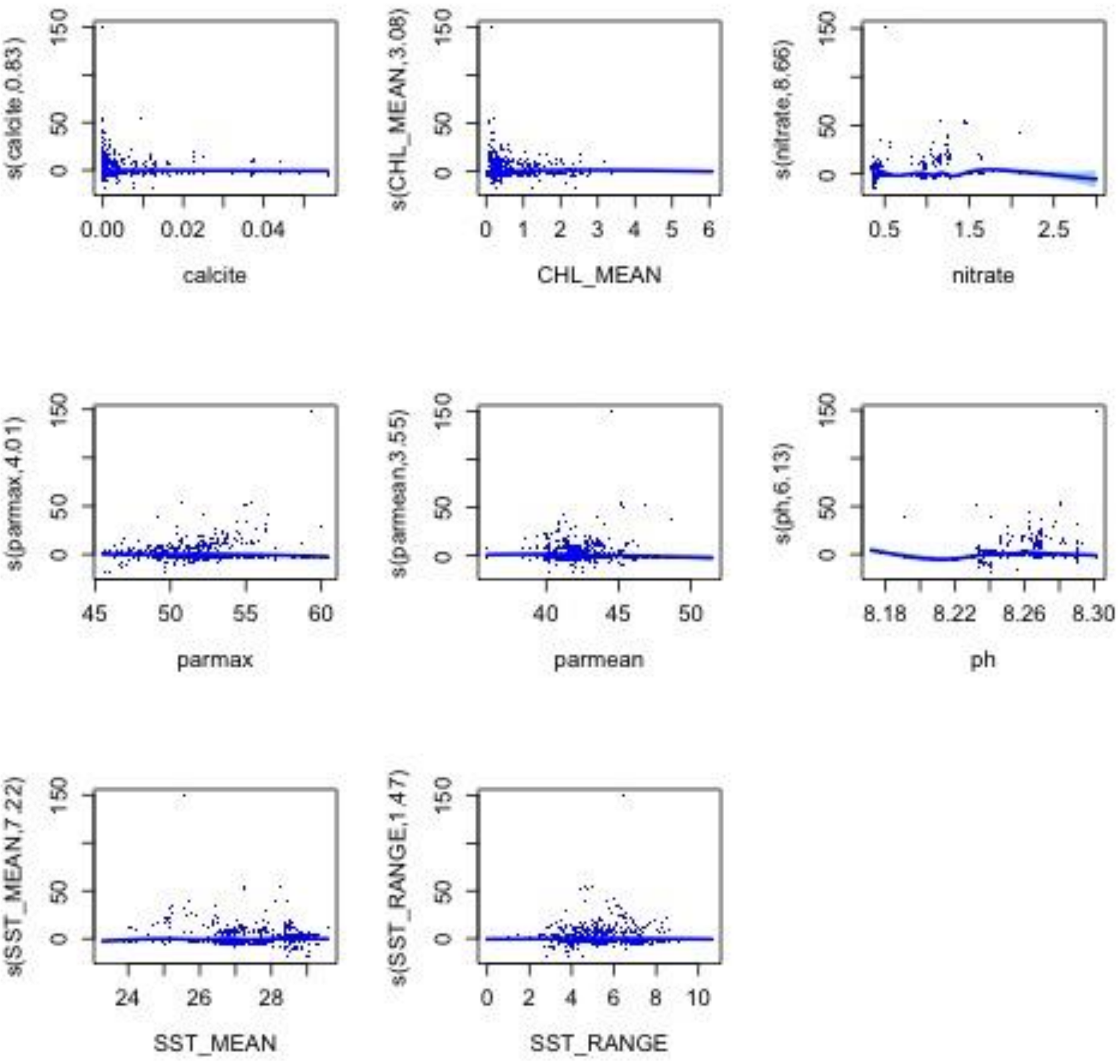
393Scarus chameleon, n = 413 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.568827e-05	8	1.954301e-05	6.124492e-01
s(CHL_MEAN)	4.916975e-01	8	9.333444e-01	1.585826e-01
s(nitrate)	3.885039e+00	9	3.568703e+01	2.486609e-09
s(parmax)	6.208009e-05	9	3.642250e-05	5.322008e-01
s(parmean)	1.872454e+00	9	9.102773e+00	2.294748e-03
s(ph)	7.574685e+00	9	7.826753e+01	1.229365e-16
s(SST_MEAN)	4.131072e+00	9	3.023053e+01	1.211559e-07
s(SST_RANGE)	2.355132e-01	9	2.565932e-01	2.997495e-01



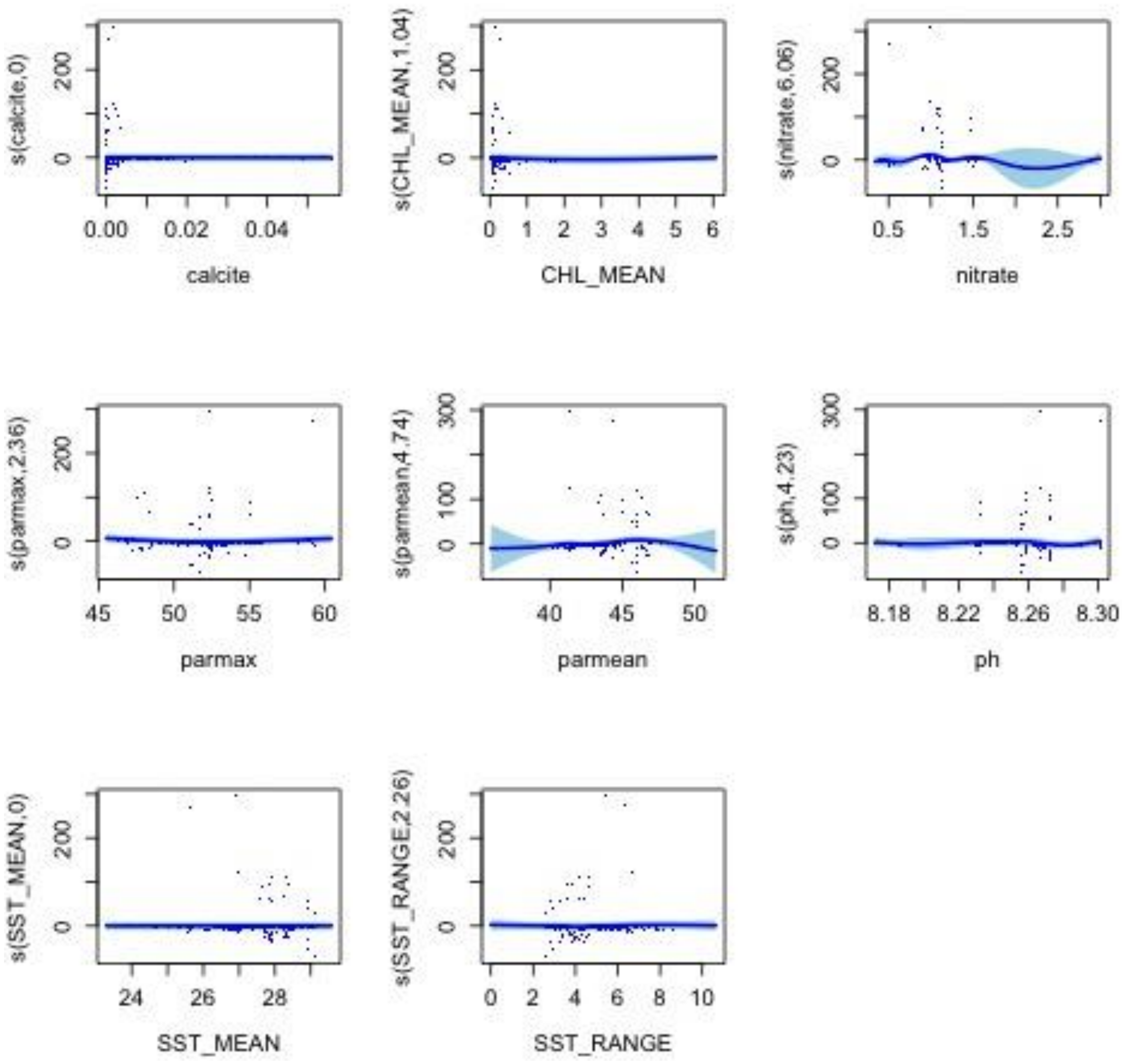
394 Scarus dimidiatus, n = 481 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8313977	5	4.673342	1.582679e-02
s(CHL_MEAN)	3.0779739	9	31.550540	1.173475e-07
s(nitrate)	8.6571264	9	198.334220	6.315152e-44
s(parmax)	4.0148155	9	22.792719	1.468023e-05
s(parmean)	3.5516538	9	17.395382	1.662839e-04
s(ph)	6.1332321	9	47.381163	2.473431e-10
s(SST_MEAN)	7.2232413	9	37.217372	4.931566e-07
s(SST_RANGE)	1.4695248	9	3.795544	5.321933e-02



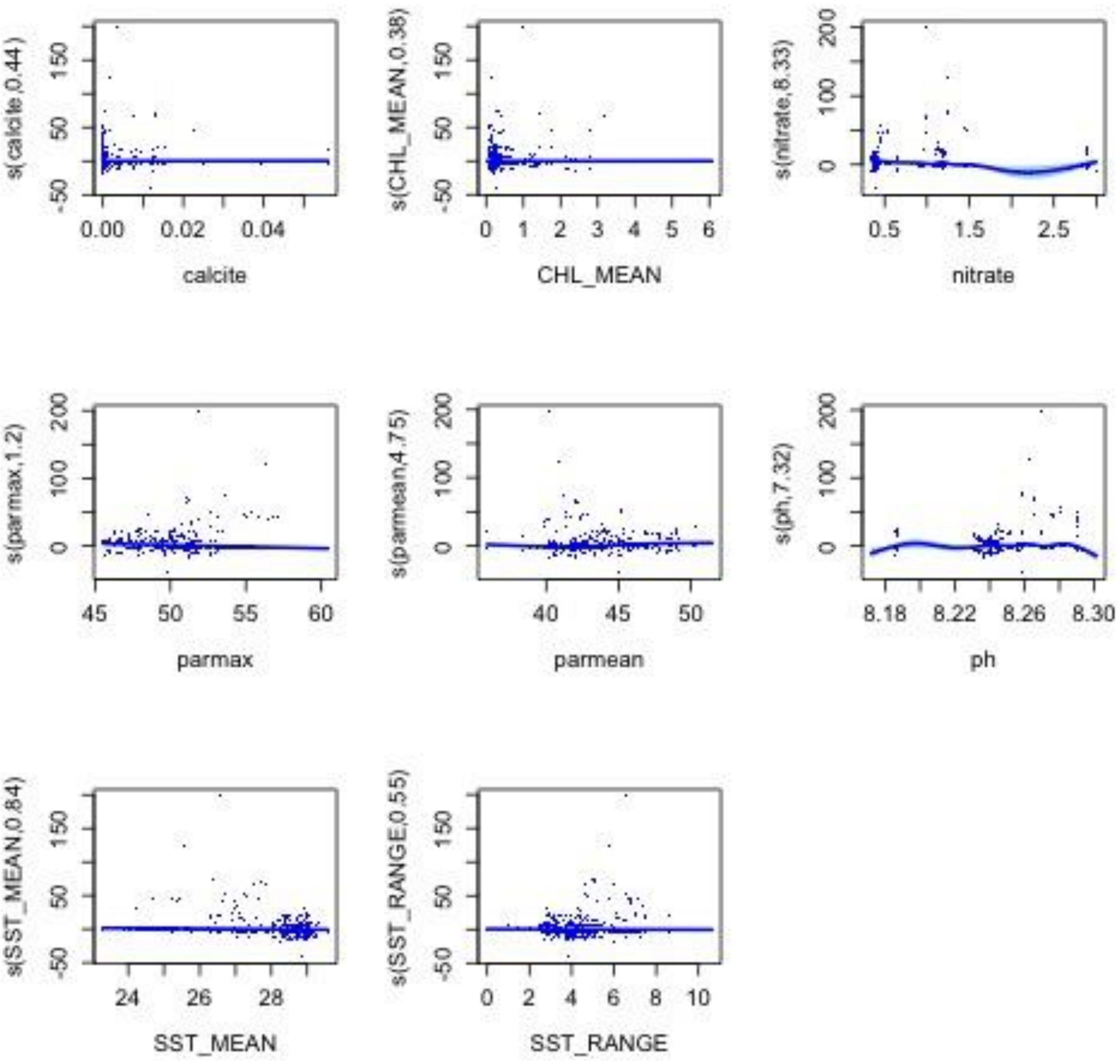
395Scarus festivus, n = 39 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.820226e-05	9	3.630458e-06	7.900284e-01
s(CHL_MEAN)	1.044254e+00	9	5.119203e+00	1.434536e-02
s(nitrate)	6.063816e+00	9	1.979484e+01	1.965892e-04
s(parmax)	2.364176e+00	9	1.029213e+01	1.450679e-03
s(parmean)	4.743123e+00	9	3.445040e+01	5.928460e-09
s(ph)	4.234308e+00	9	1.881941e+01	2.875106e-05
s(SST_MEAN)	2.552015e-05	9	4.475134e-06	9.067810e-01
s(SST_RANGE)	2.262302e+00	9	5.583038e+00	3.952412e-02



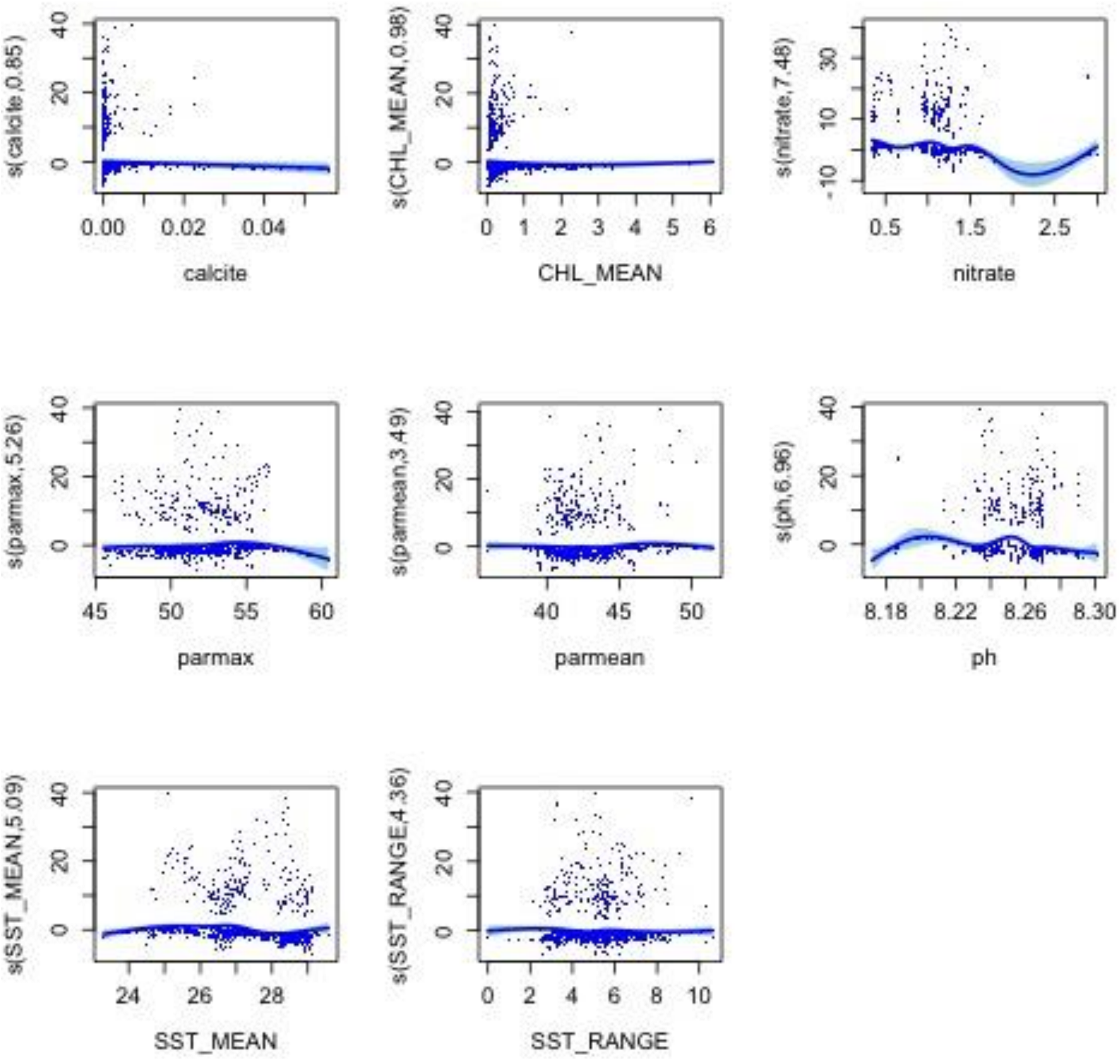
396Scarus flavipectoralis, n = 276 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.4433047	7	0.7781587	1.779268e-01
s(CHL_MEAN)	0.3752137	9	0.5579727	2.109311e-01
s(nitrate)	8.3252924	9	202.2630271	7.587171e-45
s(parmax)	1.1950817	9	32.2424488	6.400325e-10
s(parmean)	4.7468955	9	96.8937998	3.482502e-24
s(ph)	7.3158319	9	50.1685191	7.606730e-10
s(SST_MEAN)	0.8388446	9	4.9105419	1.237132e-02
s(SST_RANGE)	0.5523188	9	1.2086475	1.324998e-01



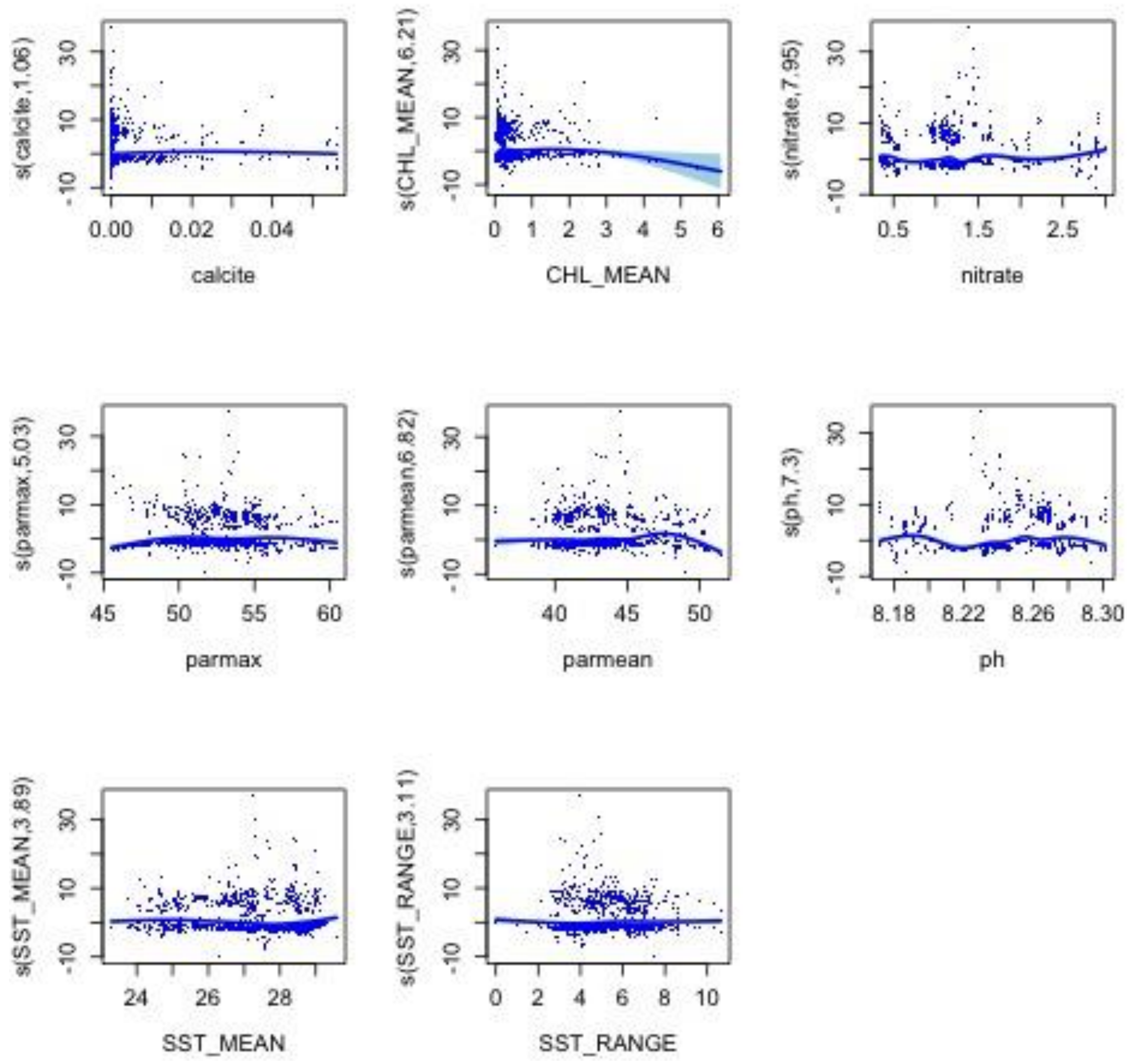
397Scarus forsteni, n = 775 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8529776	7	4.812844	1.598122e-02
s(CHL_MEAN)	0.9786832	9	5.056467	1.296386e-02
s(nitrate)	7.4793374	9	87.039772	3.085568e-19
s(parmax)	5.2592435	9	24.068814	4.061908e-05
s(parmean)	3.4941347	9	11.854816	3.473110e-03
s(ph)	6.9649683	9	136.909046	4.148264e-32
s(SST_MEAN)	5.0893274	9	51.025222	6.590162e-12
s(SST_RANGE)	4.3648465	9	13.880910	4.875310e-03



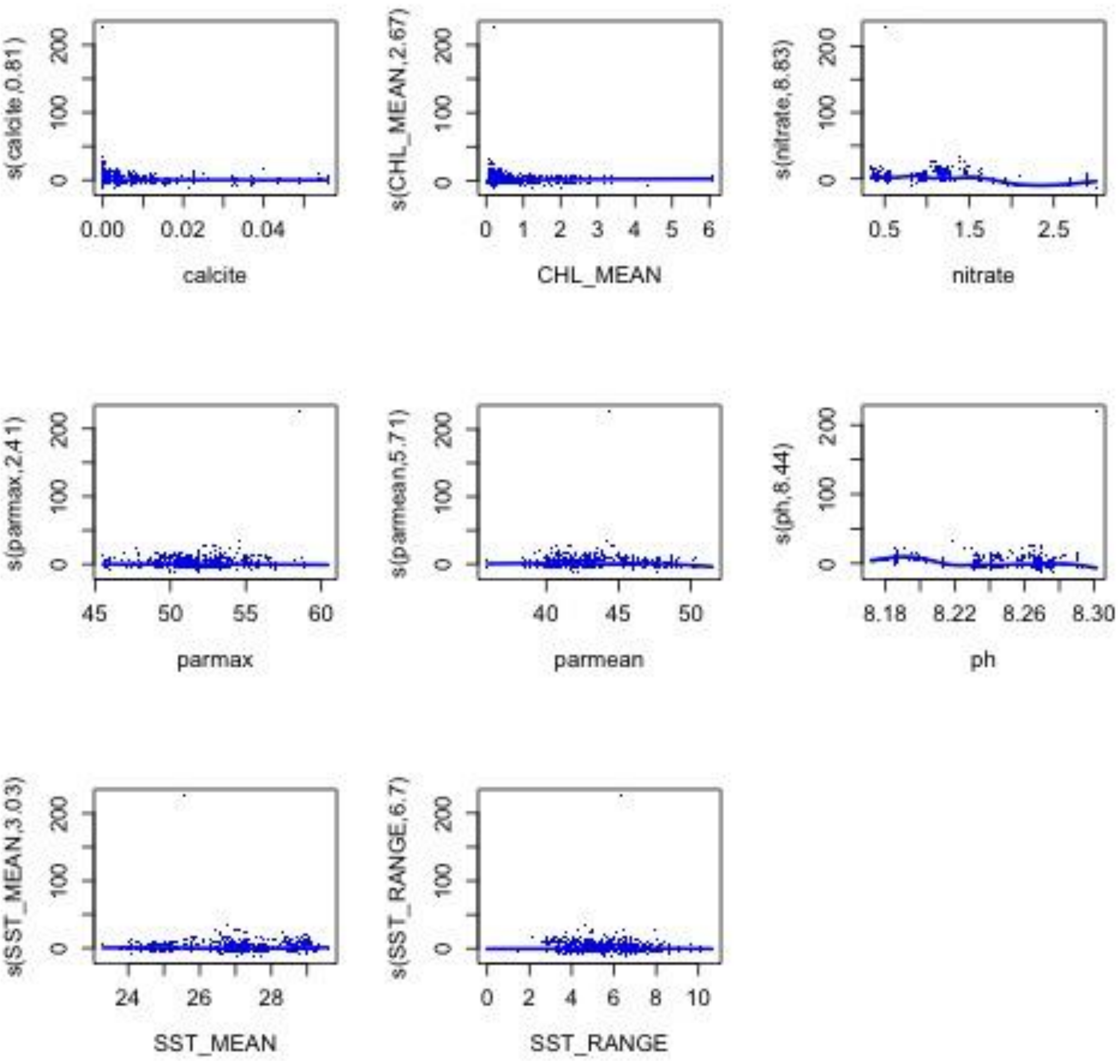
398Scarus frenatus, n = 1073 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.059513	9	6.327273	7.044348e-03
s(CHL_MEAN)	6.207291	9	30.937198	7.798678e-06
s(nitrate)	7.950767	9	68.212452	1.069057e-13
s(parmax)	5.034756	9	45.381518	9.700101e-11
s(parmean)	6.819155	9	126.119517	3.233804e-29
s(ph)	7.300751	9	107.423134	2.533444e-23
s(SST_MEAN)	3.889432	9	28.754008	2.072787e-07
s(SST_RANGE)	3.110674	9	8.005457	2.822930e-02



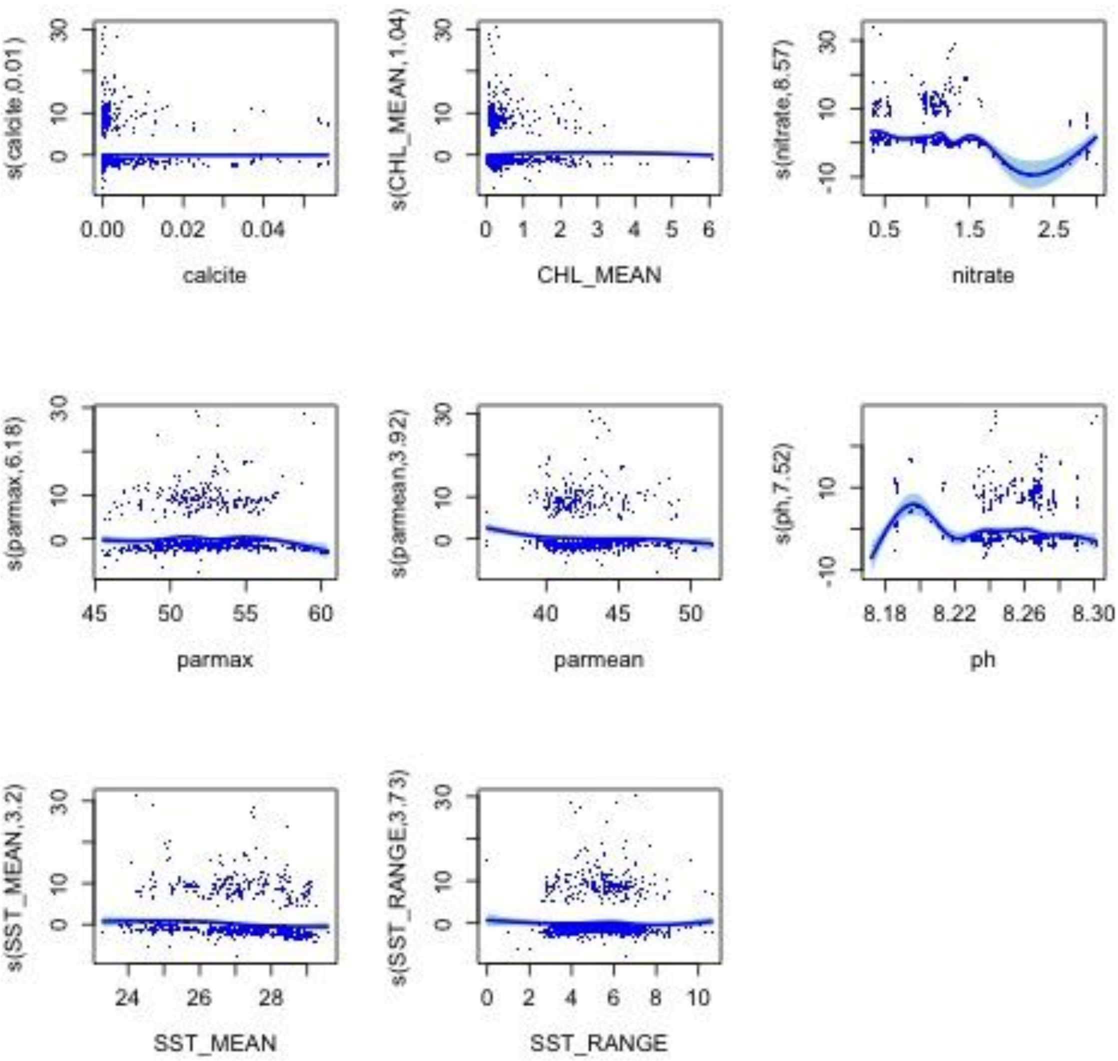
399Scarus ghobban, n = 658 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.8124438	9	2.955283	4.494850e-02
s(CHL_MEAN)	2.6665177	9	47.468172	2.847837e-12
s(nitrate)	8.8290925	9	229.337763	5.708393e-49
s(parmax)	2.4079144	9	9.129572	5.003374e-03
s(parmean)	5.7061247	9	44.592403	1.391472e-09
s(ph)	8.4399221	9	104.139199	4.066978e-21
s(SST_MEAN)	3.0291362	9	13.943684	5.948222e-04
s(SST_RANGE)	6.6999583	9	29.420783	3.132492e-05



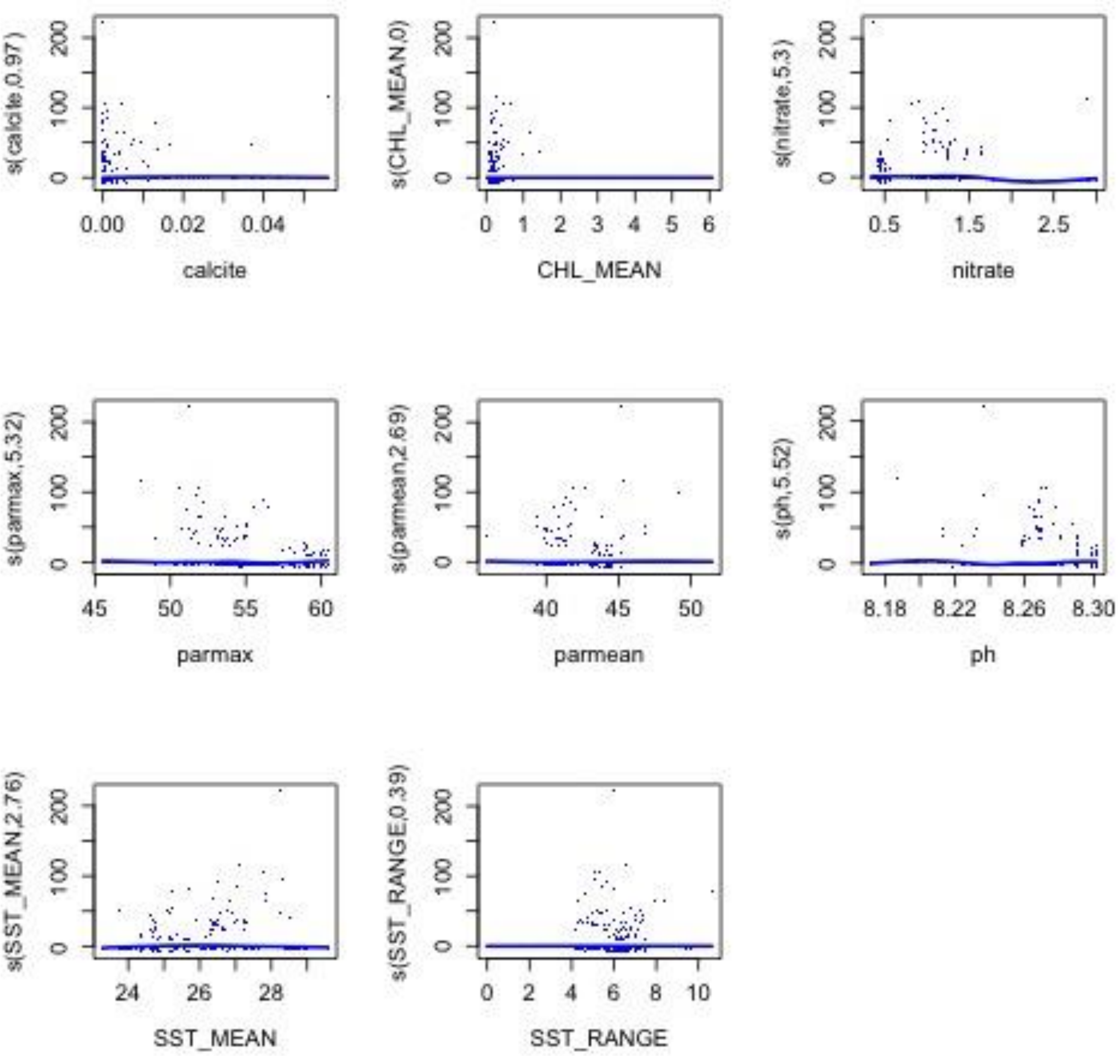
400Scarus globiceps, n = 567 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.009520993	9	8.384324e-03	3.327141e-01
s(CHL_MEAN)	1.036256851	9	6.617980e+00	5.425710e-03
s(nitrate)	8.566517076	9	1.756706e+02	3.105258e-38
s(parmax)	6.184585323	9	3.638813e+01	2.122820e-07
s(parmean)	3.917770470	9	2.277016e+01	1.245391e-05
s(ph)	7.517545323	9	4.717287e+01	7.935130e-09
s(SST_MEAN)	3.199866722	9	1.355361e+01	7.706519e-04
s(SST_RANGE)	3.731573939	9	1.233354e+01	5.028260e-03



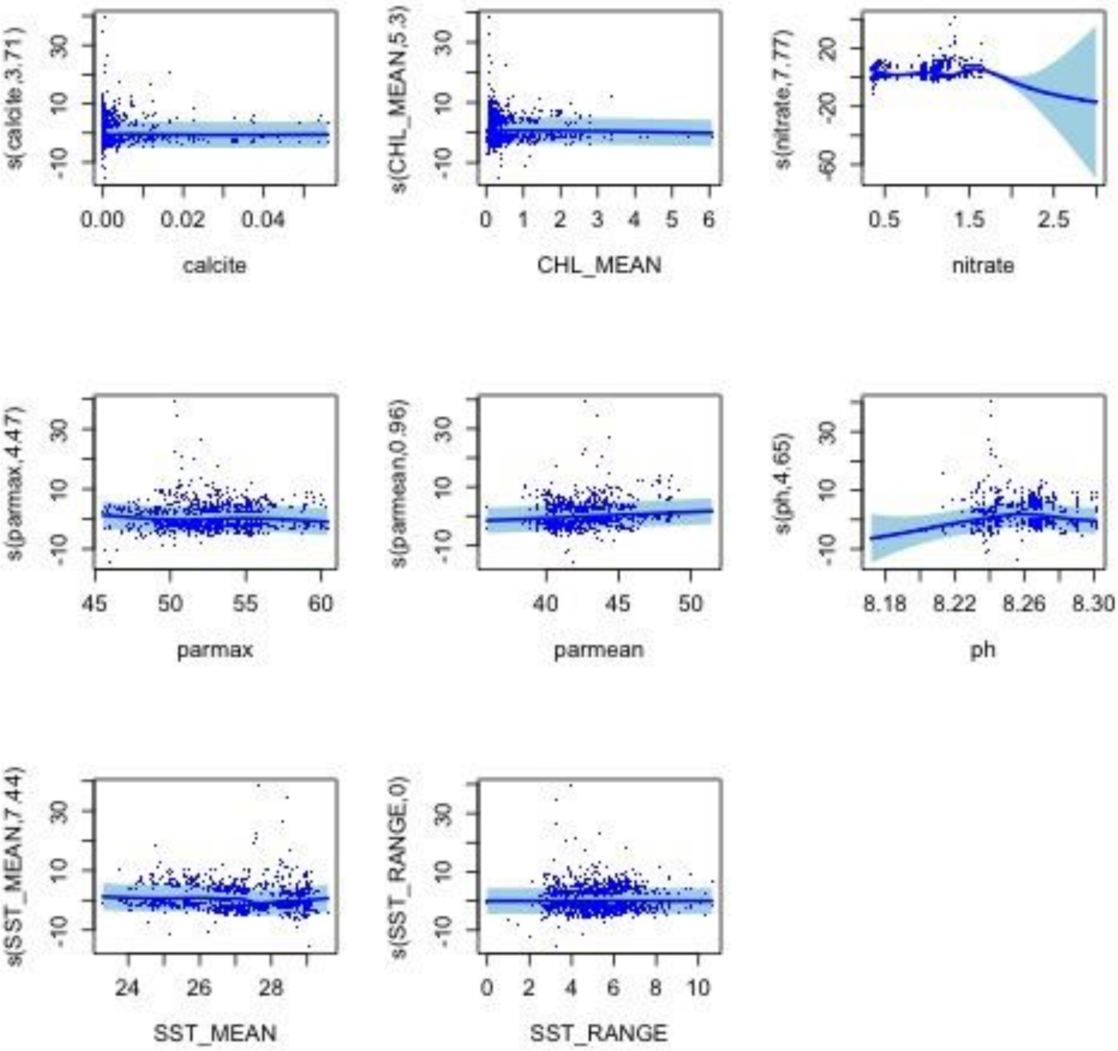
401Scarus longipinnis, n = 115 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9725412076	9	6.150526374	5.529806e-03
s(CHL_MEAN)	0.0001946635	9	0.000131998	3.965805e-01
s(nitrate)	5.3044709888	9	26.574677278	2.360804e-06
s(parmax)	5.3203175094	9	31.454461260	2.712870e-07
s(parmean)	2.6946717310	9	7.367968072	1.885444e-02
s(ph)	5.5190505315	9	25.994168184	8.148777e-06
s(SST_MEAN)	2.7630717328	9	17.891853566	1.294567e-05
s(SST_RANGE)	0.3927808053	9	0.427877664	2.986589e-01



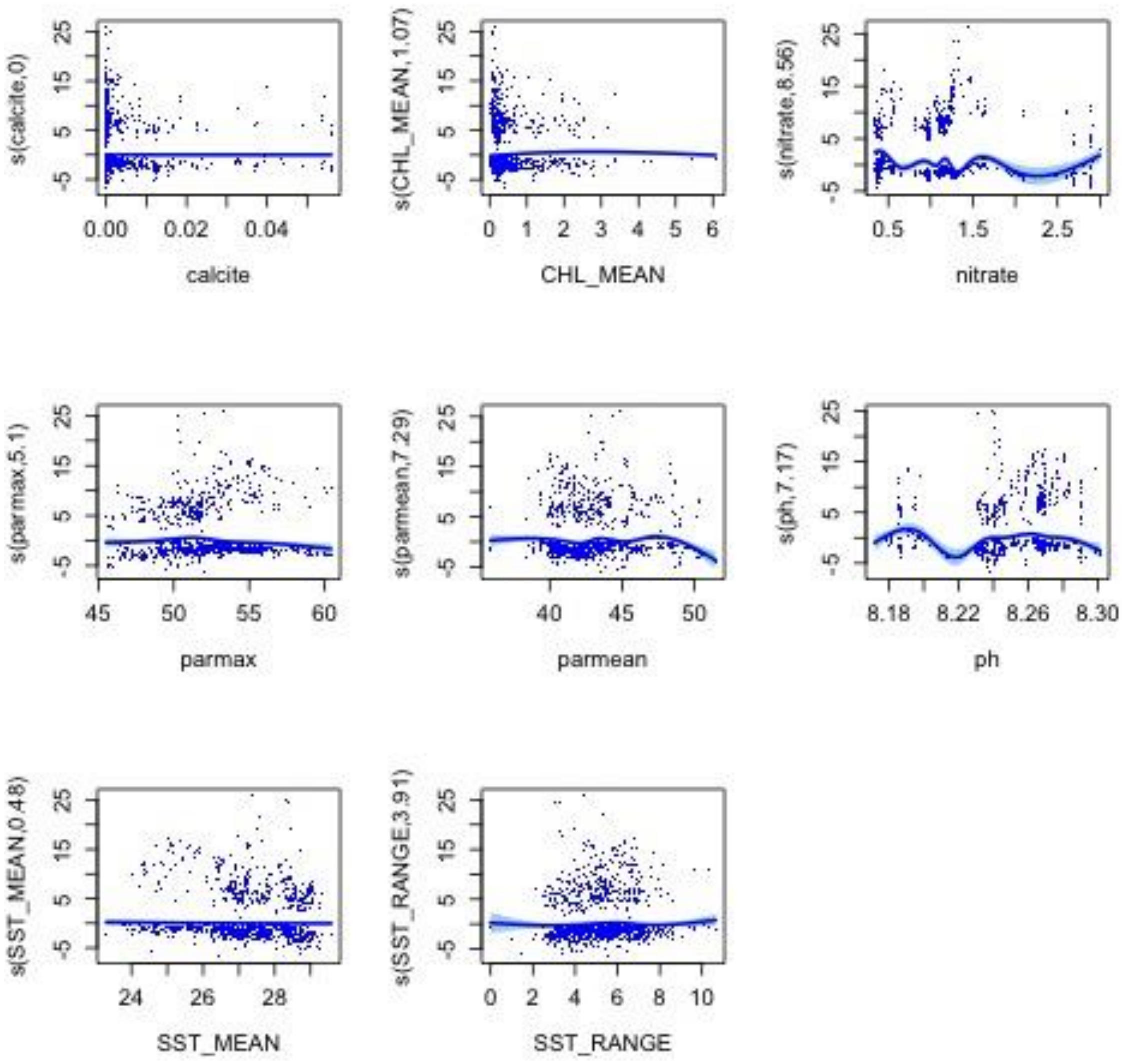
402Scarus niger, n = 1061 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.7140343154	9	3.633128e+01	2.671532e-08
s(CHL_MEAN)	5.3012012474	9	8.709060e+01	6.846286e-19
s(nitrate)	7.7686058217	9	2.406073e+02	2.730315e-55
s(parmax)	4.4654804681	9	2.782624e+01	1.675083e-06
s(parmean)	0.9638398379	9	2.323520e+01	1.464586e-07
s(ph)	4.6452243121	9	6.098042e+01	2.731377e-15
s(SST_MEAN)	7.4381859898	9	5.580483e+01	6.293352e-11
s(SST_RANGE)	0.0004211553	9	2.939302e-04	4.757220e-01



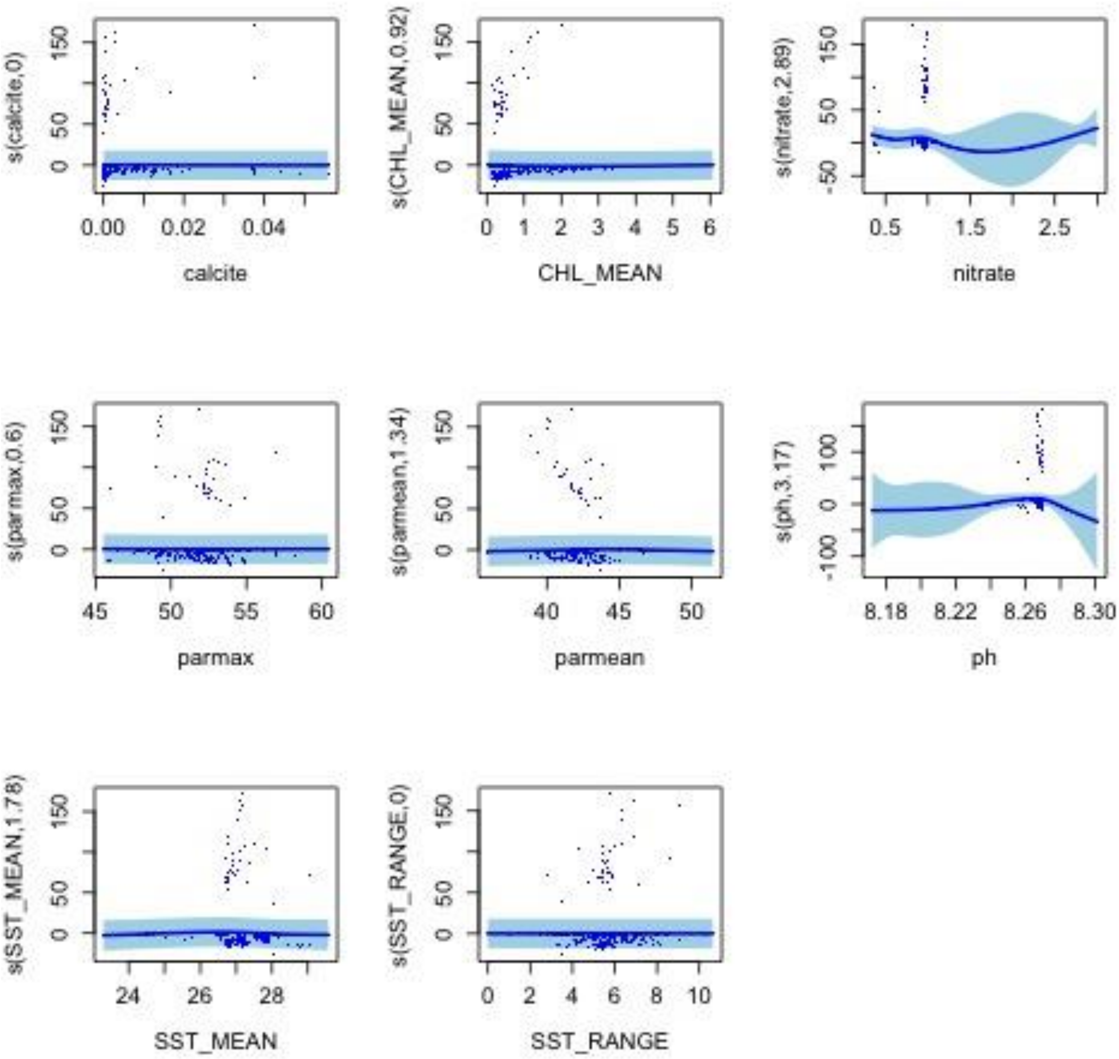
403Scarus oviceps, n = 763 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.197525e-05	9	1.224614e-05	5.019153e-01
s(CHL_MEAN)	1.070565e+00	9	1.002668e+01	7.494473e-04
s(nitrate)	8.561004e+00	9	2.156342e+02	1.814635e-46
s(parmax)	5.101161e+00	9	4.804449e+01	4.590351e-11
s(parmean)	7.289748e+00	9	5.423029e+01	1.482951e-10
s(ph)	7.169603e+00	9	4.994818e+01	9.060983e-10
s(SST_MEAN)	4.800534e-01	9	6.587642e-01	2.105919e-01
s(SST_RANGE)	3.912207e+00	9	1.238499e+01	6.016303e-03



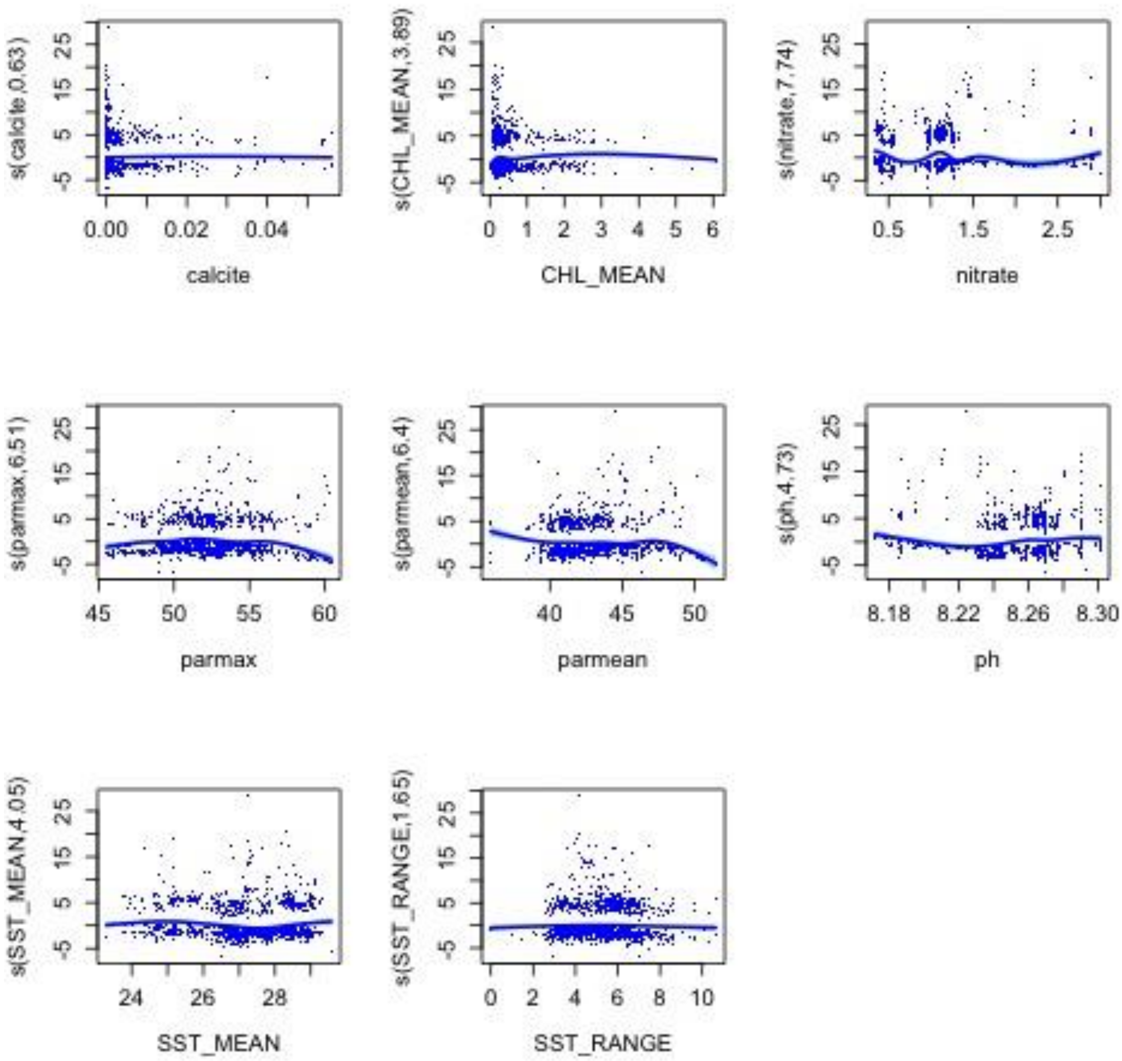
404Scarus prasiognathos, n = 41 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.706967e-05	9	9.165379e-06	8.372278e-01
s(CHL_MEAN)	9.172333e-01	9	3.304792e+00	4.126391e-02
s(nitrate)	2.886598e+00	9	2.155708e+01	8.126840e-06
s(parmax)	6.033706e-01	9	7.784279e-01	2.001612e-01
s(parmean)	1.340129e+00	9	4.027461e+00	2.030487e-02
s(ph)	3.167874e+00	9	5.499350e+00	9.020690e-02
s(SST_MEAN)	1.784191e+00	9	6.610311e+00	6.736072e-03
s(SST_RANGE)	5.034343e-05	9	1.457478e-05	6.976819e-01



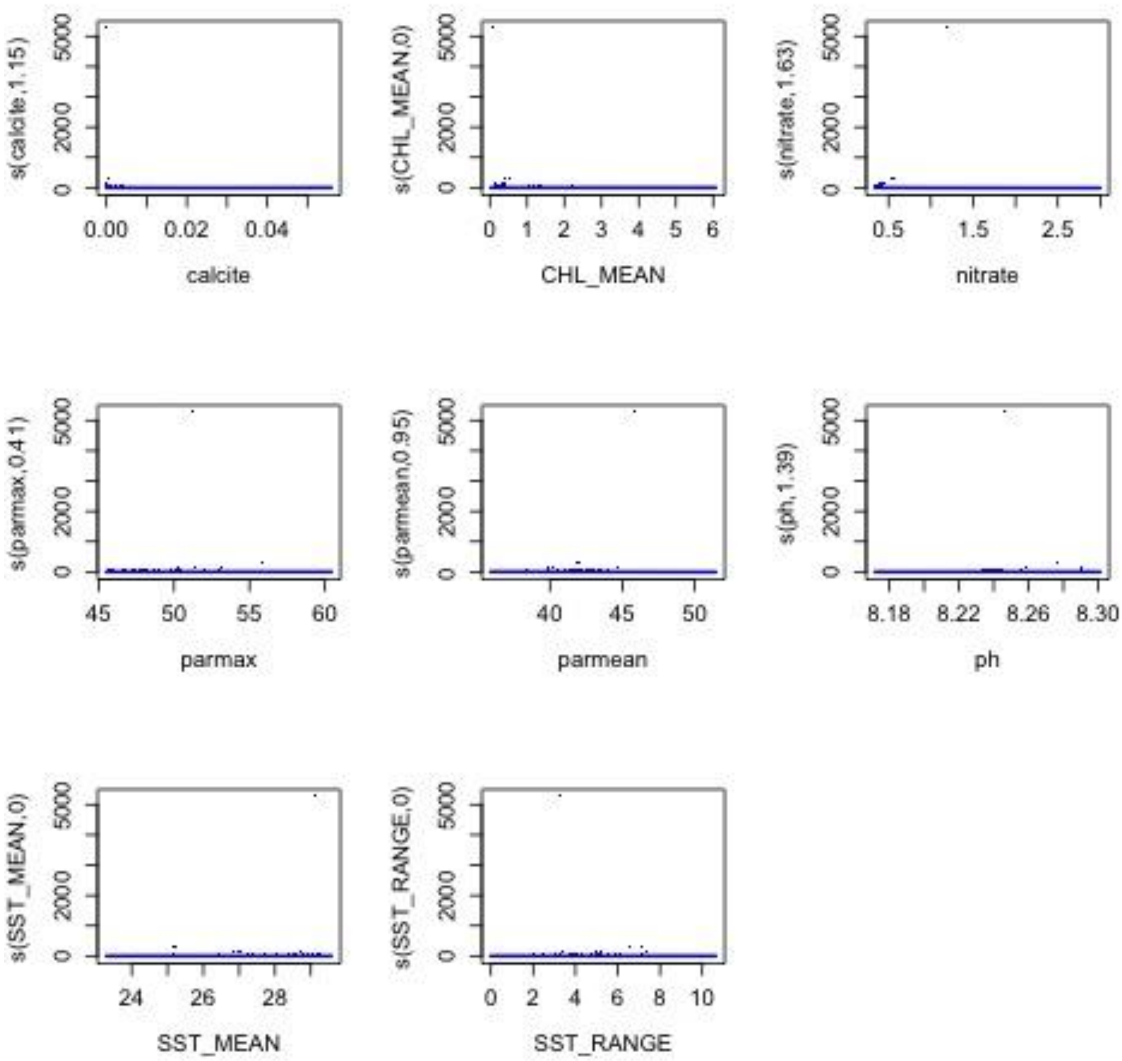
405Scarus psittacus, n = 1030 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6282612	9	1.510069	1.086029e-01
s(CHL_MEAN)	3.8853237	9	52.291427	2.086637e-12
s(nitrate)	7.7367748	9	143.286984	1.390327e-33
s(parmax)	6.5098167	9	84.830146	5.134585e-19
s(parmean)	6.3984666	9	47.946747	3.835770e-10
s(ph)	4.7308545	9	39.293603	5.335960e-10
s(SST_MEAN)	4.0464945	9	41.364178	1.123665e-10
s(SST_RANGE)	1.6482344	9	5.265308	2.212048e-02



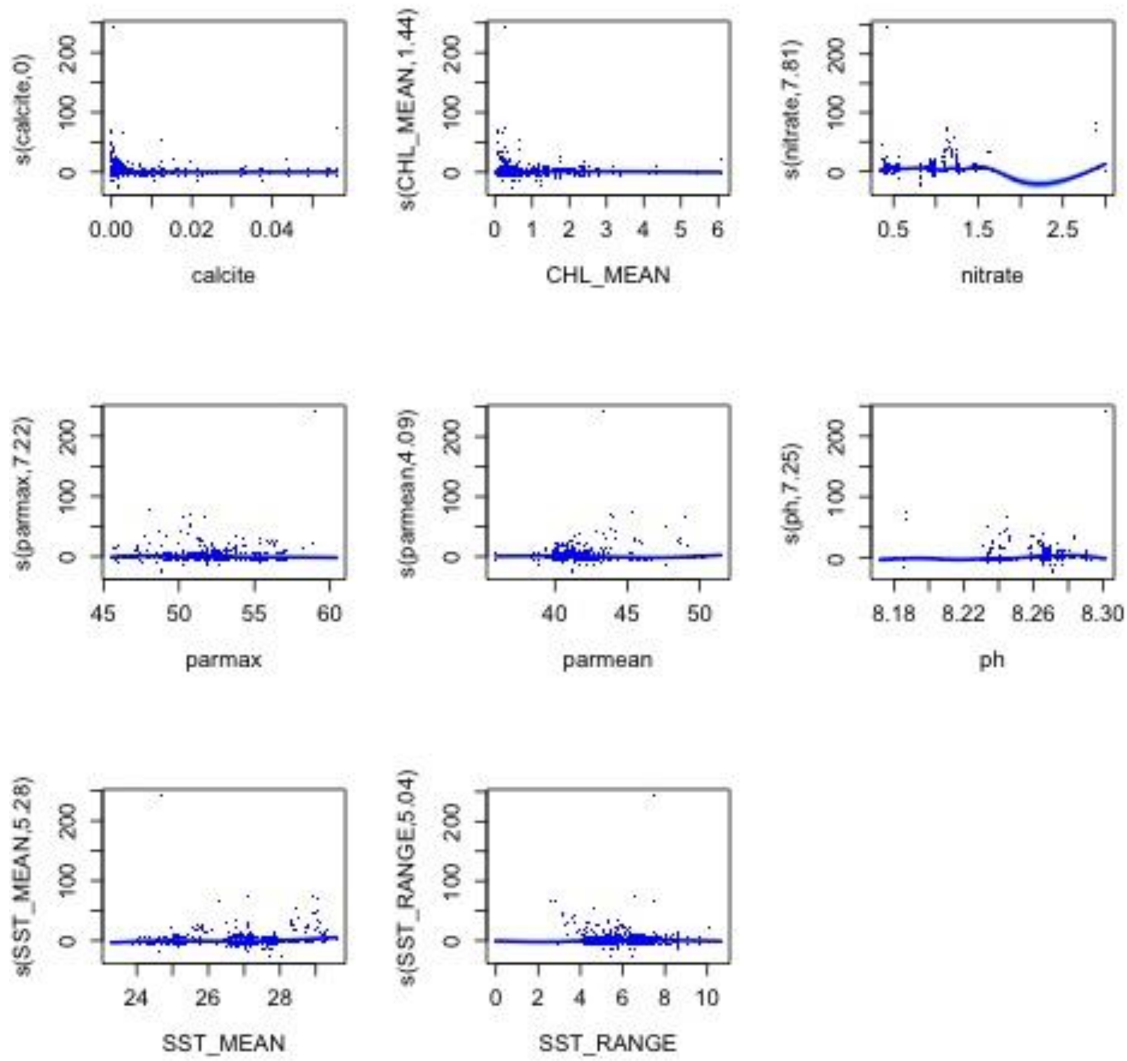
406Scarus quoyi, n = 50 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.147065e+00	9	1.055048e+01	6.126685e-04
s(CHL_MEAN)	6.157723e-07	9	5.452991e-08	7.897992e-01
s(nitrate)	1.627834e+00	9	4.026762e+01	3.668741e-12
s(parmax)	4.122974e-01	9	5.839059e-01	1.882586e-01
s(parmean)	9.486149e-01	7	1.706156e+01	2.503512e-06
s(ph)	1.394236e+00	9	1.086591e+01	4.028411e-05
s(SST_MEAN)	5.308472e-07	9	3.658880e-08	1.000000e+00
s(SST_RANGE)	6.603706e-07	9	1.842054e-07	7.053191e-01



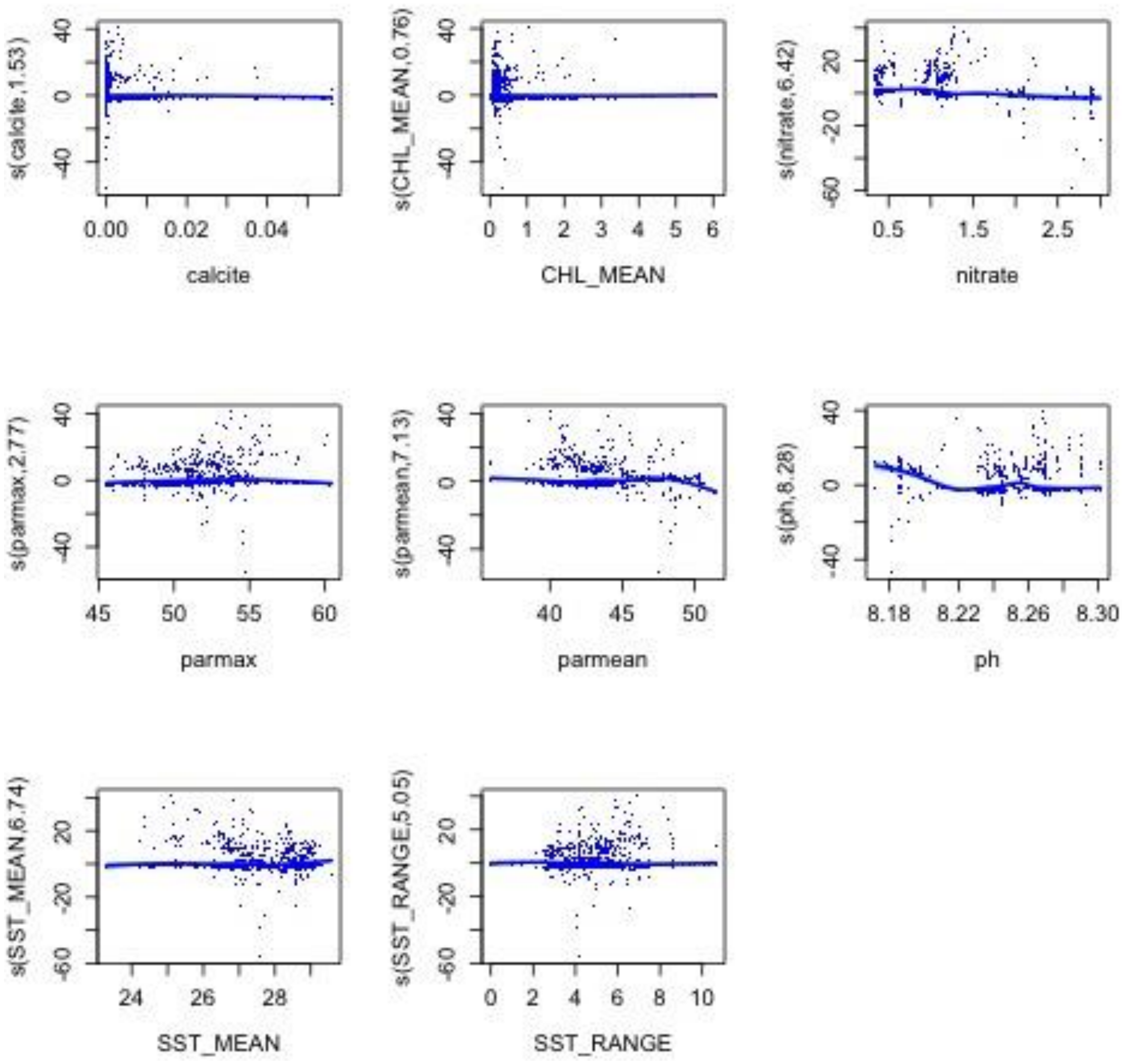
407Scarus rivulatus, n = 487 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.362712e-05	8	4.302786e-05	5.007922e-01
s(CHL_MEAN)	1.442971e+00	9	1.977354e+01	3.398029e-06
s(nitrate)	7.811183e+00	9	1.255682e+02	2.582777e-26
s(parmax)	7.220016e+00	9	8.482771e+01	3.632733e-18
s(parmean)	4.086015e+00	9	3.288241e+01	5.582063e-08
s(ph)	7.249079e+00	9	7.860353e+01	6.497652e-17
s(SST_MEAN)	5.280959e+00	9	5.024135e+01	1.464009e-11
s(SST_RANGE)	5.044603e+00	9	2.724245e+01	1.178998e-05



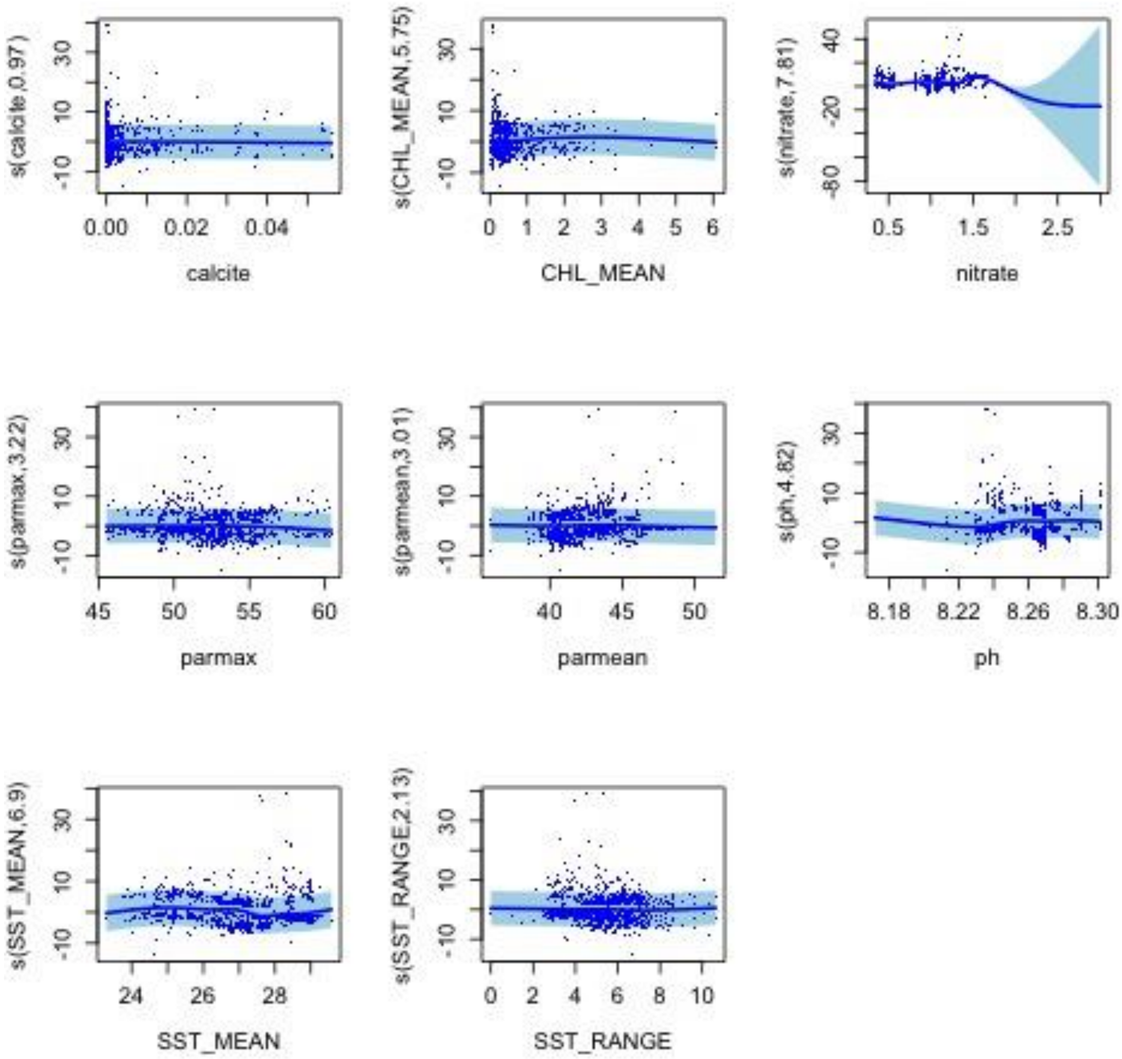
408Scarus rubroviolaceus, n = 1101 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.533413	9	6.819821	9.507302e-03
s(CHL_MEAN)	0.760622	9	1.989410	7.935787e-02
s(nitrate)	6.417863	9	121.985652	1.684345e-28
s(parmax)	2.774300	9	29.453132	1.761157e-08
s(parmean)	7.125353	9	168.451958	3.175077e-38
s(ph)	8.282269	9	213.274163	1.027296e-48
s(SST_MEAN)	6.738871	9	33.473663	1.439275e-06
s(SST_RANGE)	5.052572	9	24.396729	5.124816e-05



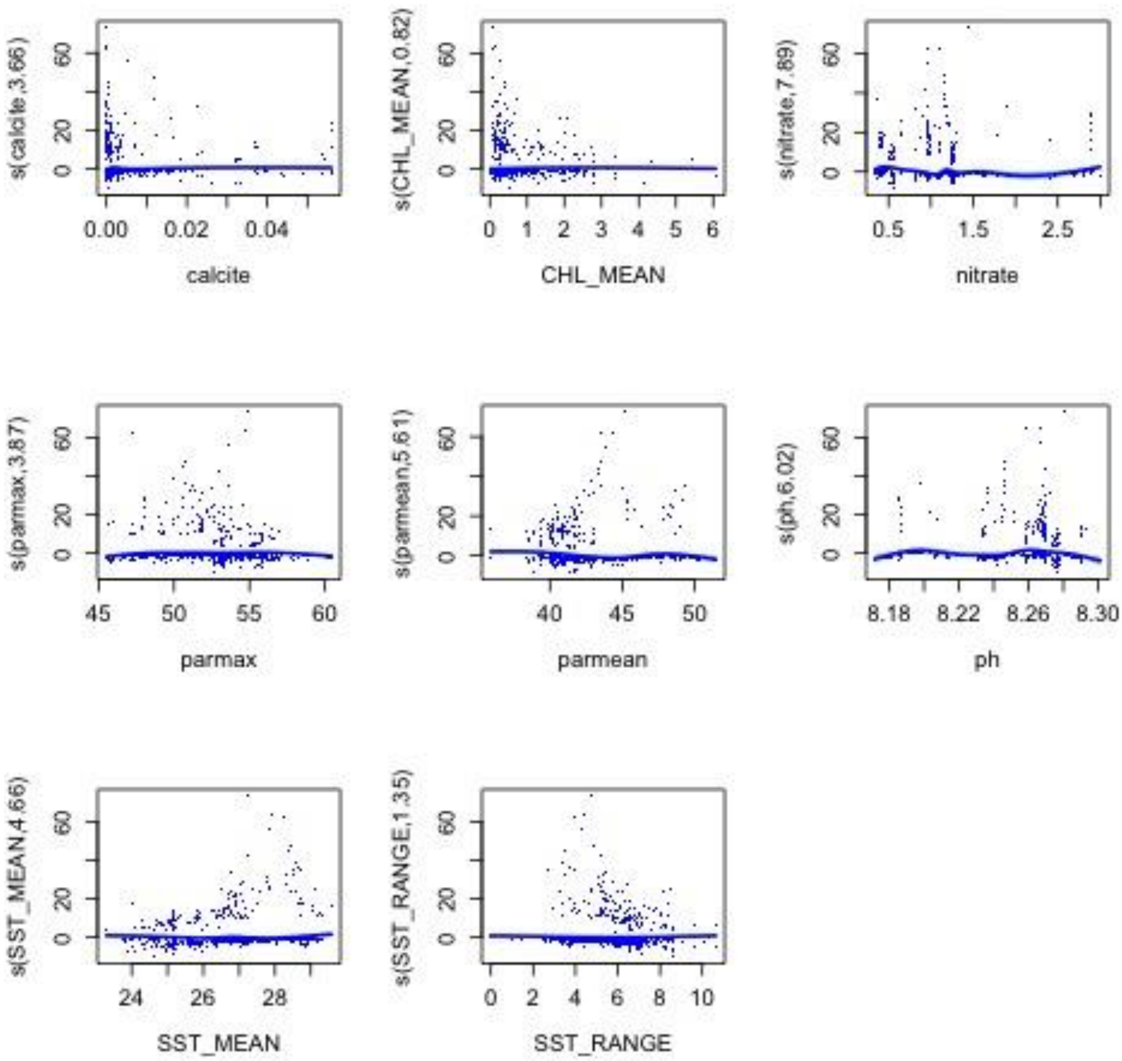
409Scarus schlegeli, n = 1241 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.9676673	9	2.605066	7.512231e-02
s(CHL_MEAN)	5.7510480	9	126.803824	5.027622e-28
s(nitrate)	7.8102134	9	235.095385	1.744121e-54
s(parmax)	3.2238290	9	14.543295	4.559988e-04
s(parmean)	3.0052105	9	6.816929	4.028305e-02
s(ph)	4.8159159	9	54.110977	1.688277e-13
s(SST_MEAN)	6.8971942	9	92.286220	6.221783e-21
s(SST_RANGE)	2.1323103	9	5.205537	4.933840e-02



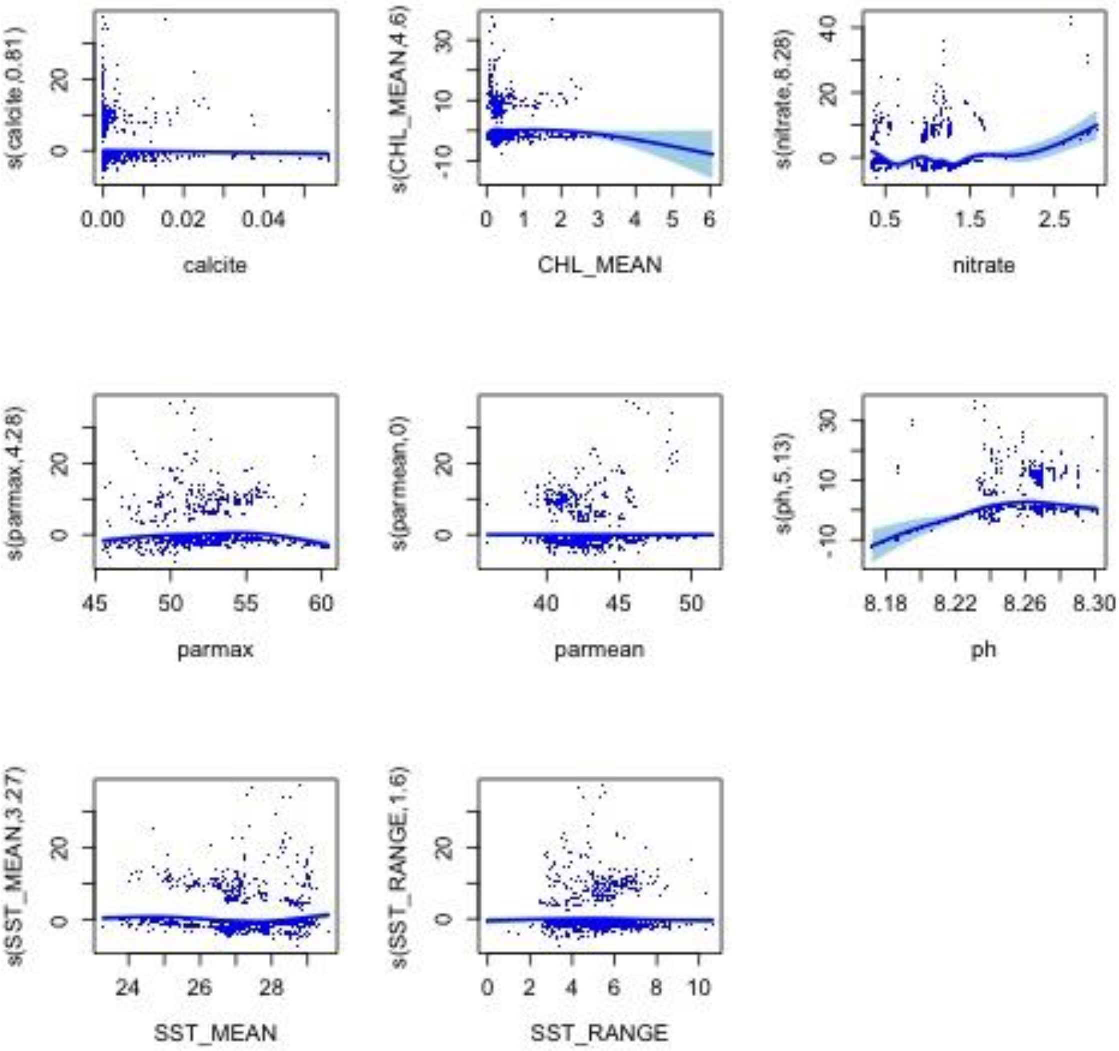
410Scarus sp, n = 350 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.6630100	9	17.675544	3.439018e-04
s(CHL_MEAN)	0.8169544	9	3.055199	4.021933e-02
s(nitrate)	7.8939726	9	78.108182	2.844149e-16
s(parmax)	3.8661430	9	12.907939	3.668191e-03
s(parmean)	5.6122687	9	71.011955	1.138084e-16
s(ph)	6.0163700	9	59.774688	4.704534e-14
s(SST_MEAN)	4.6632866	9	18.430069	4.510442e-04
s(SST_RANGE)	1.3462973	9	3.952308	3.861761e-02



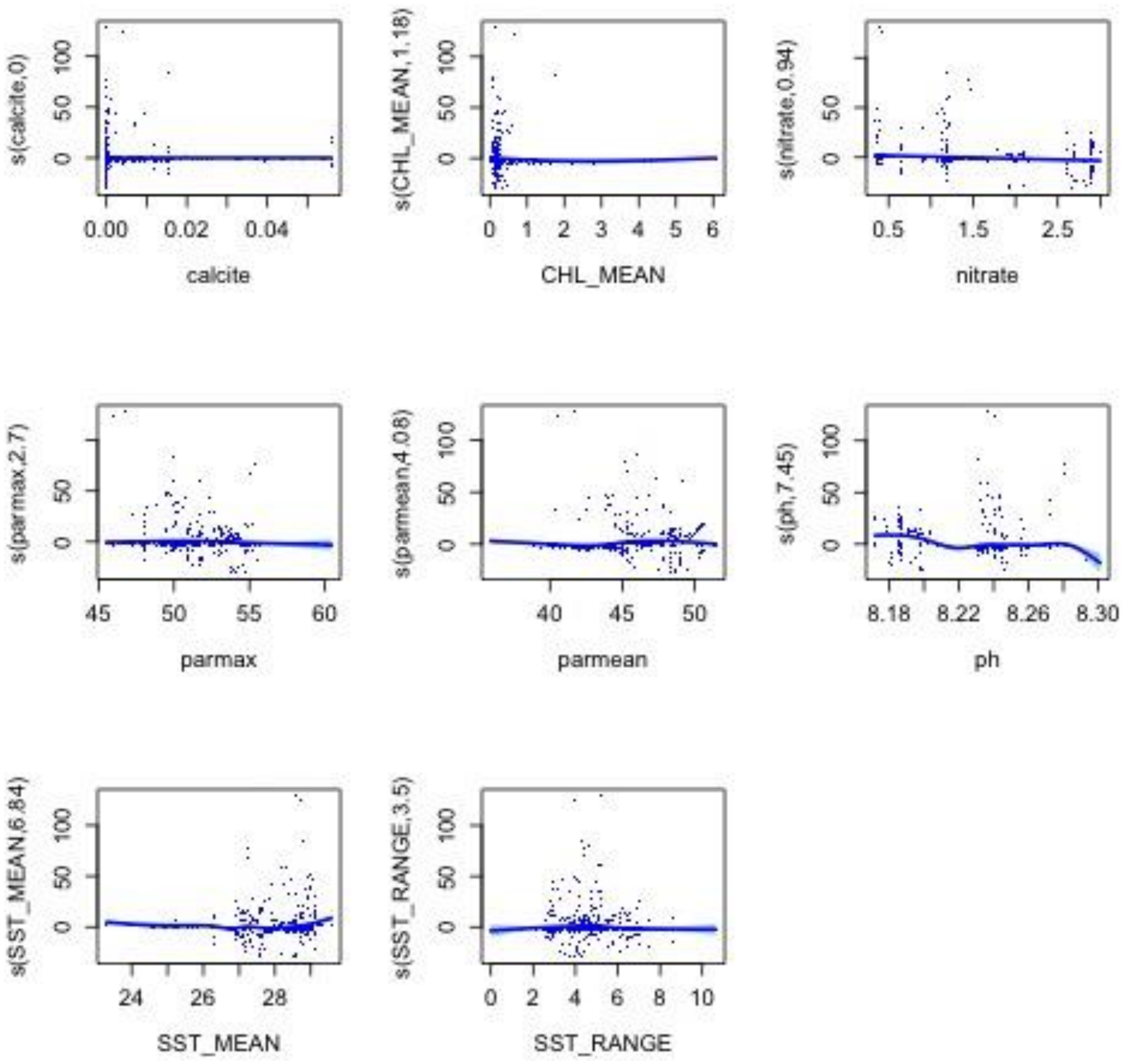
411Scarus spinus, n = 523 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.805857383	4	3.855014e+00	2.716153e-02
s(CHL_MEAN)	4.600054287	9	2.233494e+01	1.022180e-04
s(nitrate)	8.284392530	9	1.642284e+02	3.072399e-38
s(parmax)	4.276269507	9	3.460247e+01	1.353215e-08
s(parmean)	0.001148532	9	9.240662e-04	3.871815e-01
s(ph)	5.131301994	9	5.444048e+01	6.865051e-14
s(SST_MEAN)	3.265934293	9	2.477019e+01	6.784897e-07
s(SST_RANGE)	1.602398415	9	4.337677e+00	4.092226e-02



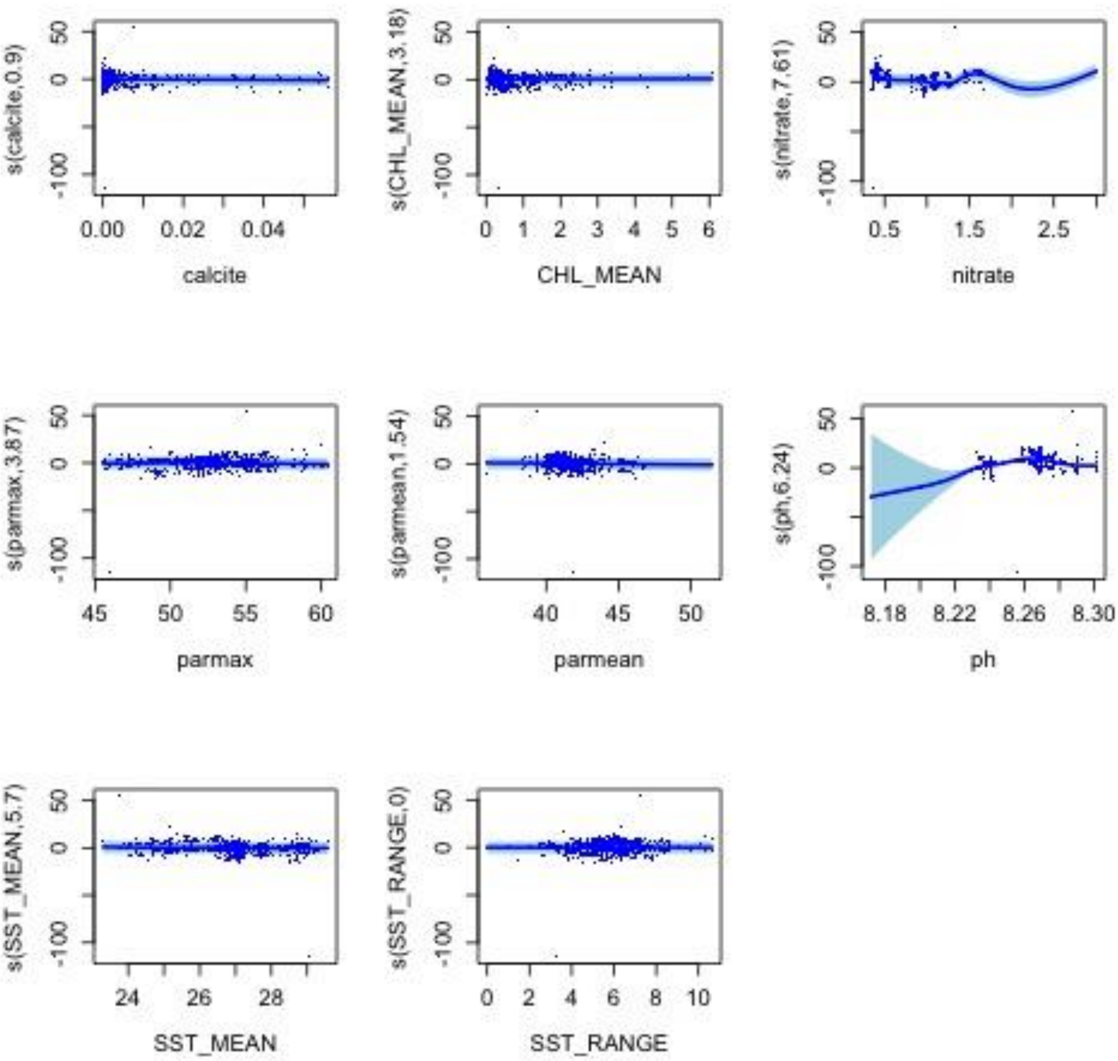
412Scarus tricolor, n = 462 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0003091149	8	3.682365e-04	2.538990e-01
s(CHL_MEAN)	1.1793946214	9	1.003808e+01	7.329347e-04
s(nitrate)	0.9426292698	9	1.624155e+01	8.071327e-06
s(parmax)	2.6987561384	9	9.992178e+00	3.601123e-03
s(parmean)	4.0754286273	9	8.625989e+01	5.600685e-23
s(ph)	7.4533573026	9	1.346292e+02	4.679920e-30
s(SST_MEAN)	6.8383936147	9	8.058204e+01	8.489175e-18
s(SST_RANGE)	3.4981375323	9	1.921761e+01	4.472561e-05



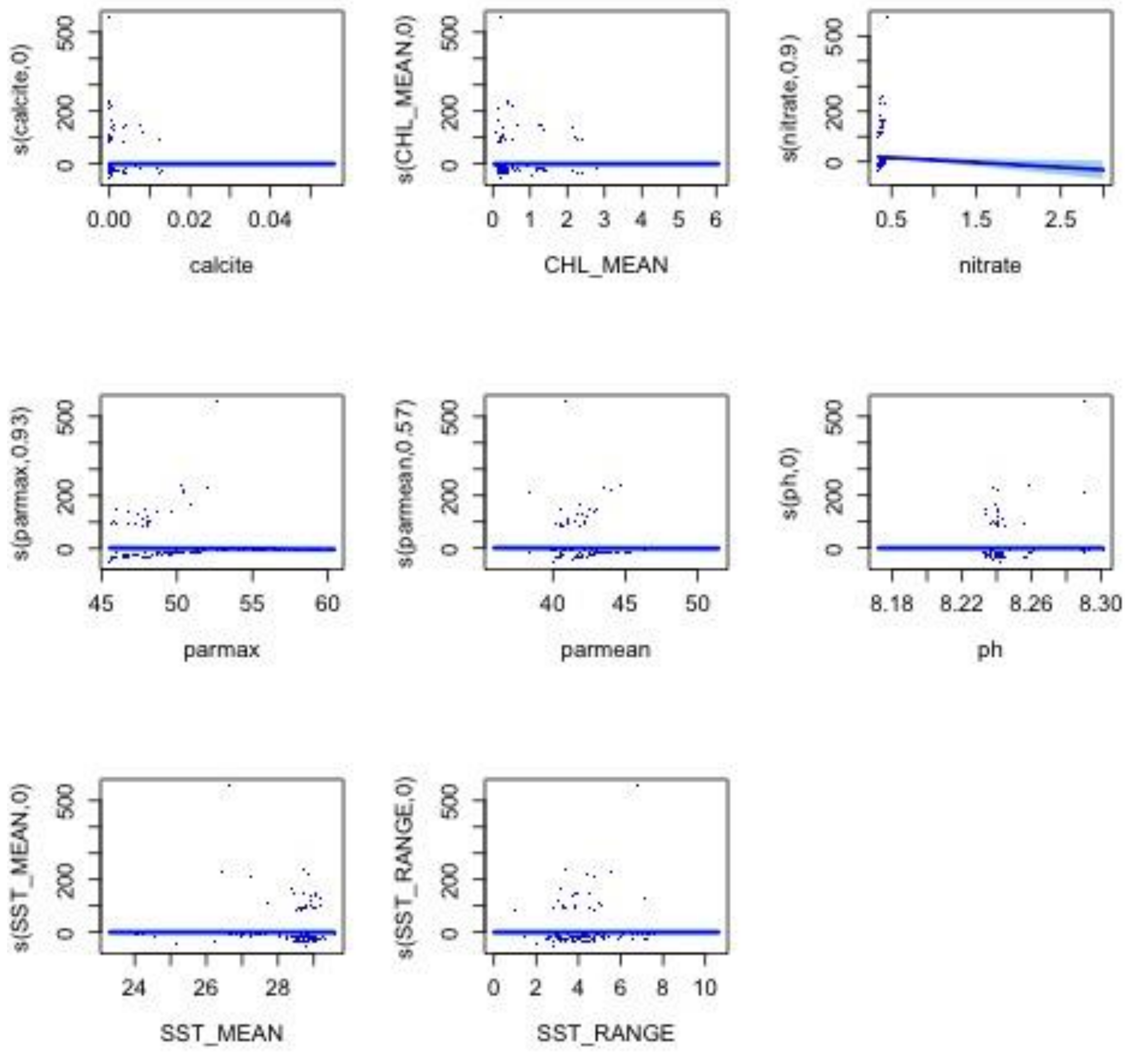
413Scolopsis bilineata, n = 962 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.901771358	6	8.967718e+00	1.325361e-03
s(CHL_MEAN)	3.183078368	9	2.029927e+01	4.568766e-05
s(nitrate)	7.606024950	9	2.391137e+02	1.166111e-53
s(parmax)	3.874331656	9	2.526430e+01	1.673521e-06
s(parmean)	1.542134321	9	6.299418e+00	8.166302e-03
s(ph)	6.239297806	9	1.317849e+02	5.923679e-30
s(SST_MEAN)	5.697414590	9	2.954892e+01	3.335344e-06
s(SST_RANGE)	0.004143054	9	4.067237e-03	3.153312e-01



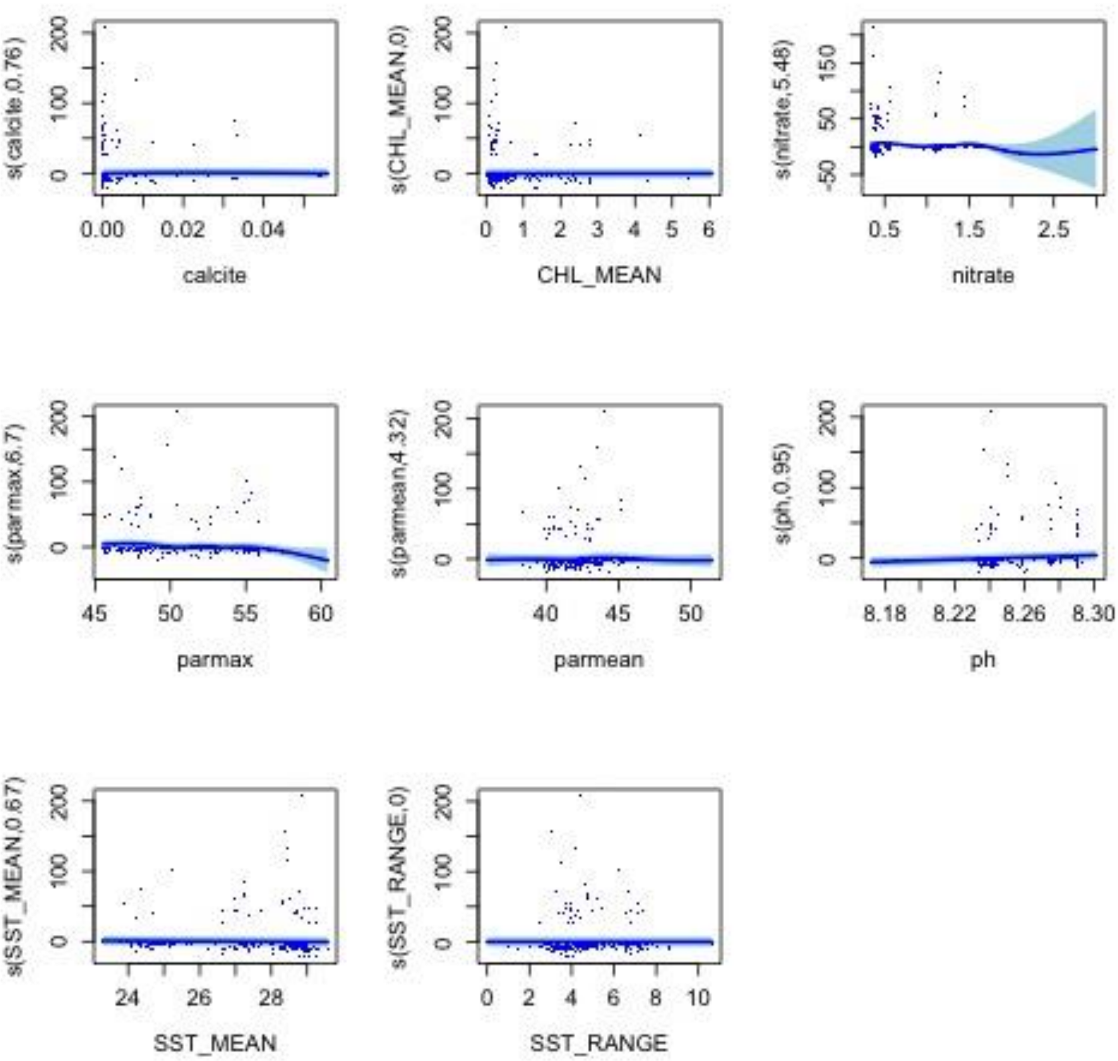
414Scolopsis ciliata, n = 34 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.036478e-06	9	2.300775e-09	1.0000000000
s(CHL_MEAN)	1.174746e-05	9	5.769072e-06	0.4800942597
s(nitrate)	8.990424e-01	6	7.729619e+00	0.0024796981
s(parmax)	9.280096e-01	6	1.145227e+01	0.0002856207
s(parmean)	5.679296e-01	8	1.281399e+00	0.1258981342
s(ph)	3.286993e-05	9	1.601431e-05	0.4624255424
s(SST_MEAN)	4.806043e-05	9	2.352701e-05	0.4690076925
s(SST_RANGE)	1.292498e-06	9	3.406321e-07	0.7236443238



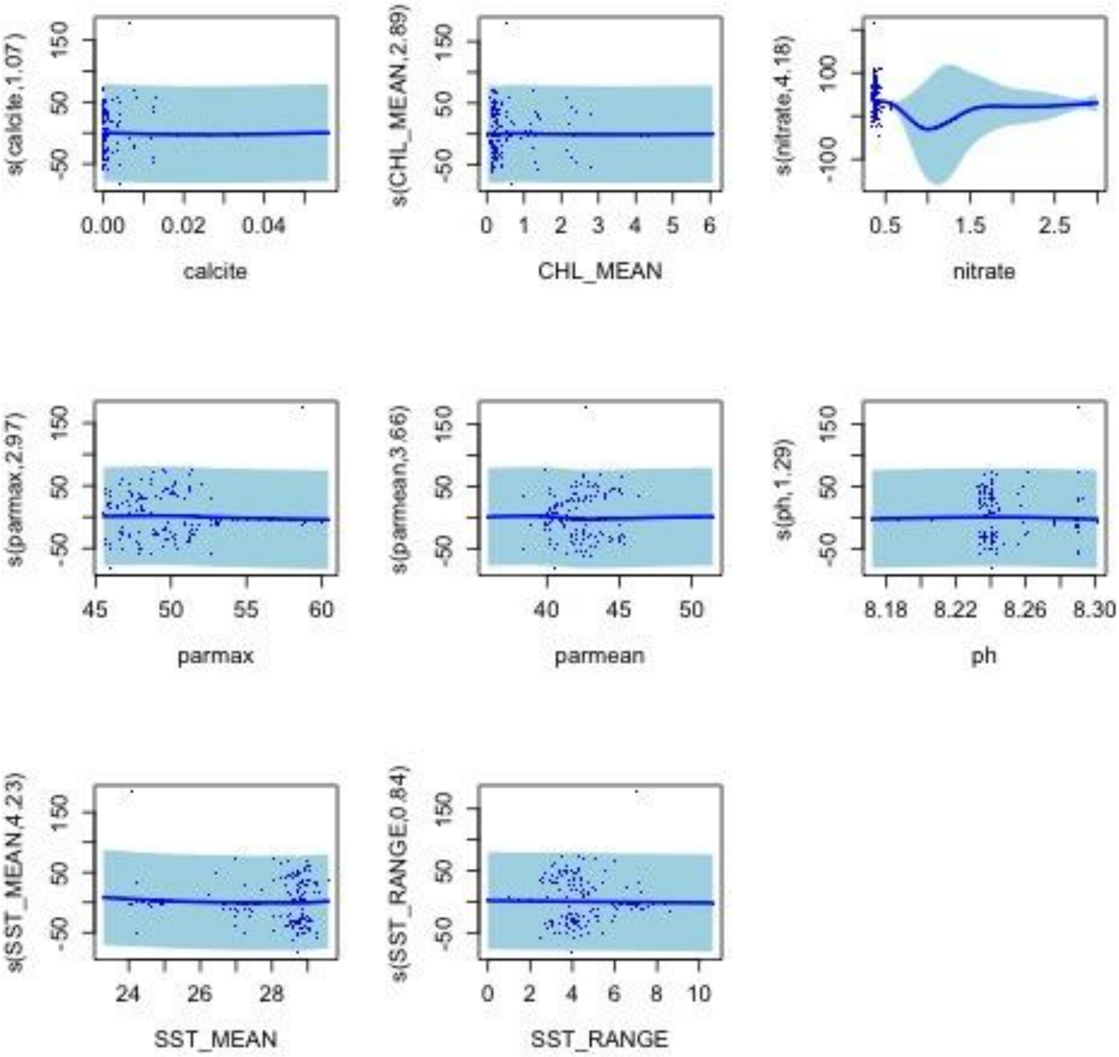
415Scolopsis lineata, n = 67 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.562972e-01	9	2.523327e+00	5.719234e-02
s(CHL_MEAN)	5.441914e-05	9	1.726030e-05	6.005531e-01
s(nitrate)	5.478632e+00	9	5.616151e+01	9.507068e-13
s(parmax)	6.696044e+00	9	4.539624e+01	2.359821e-09
s(parmean)	4.319038e+00	9	1.674554e+01	7.171596e-04
s(ph)	9.505657e-01	9	1.575347e+01	7.085467e-06
s(SST_MEAN)	6.725461e-01	9	1.979246e+00	7.048376e-02
s(SST_RANGE)	7.155803e-05	9	9.532797e-05	2.414593e-01



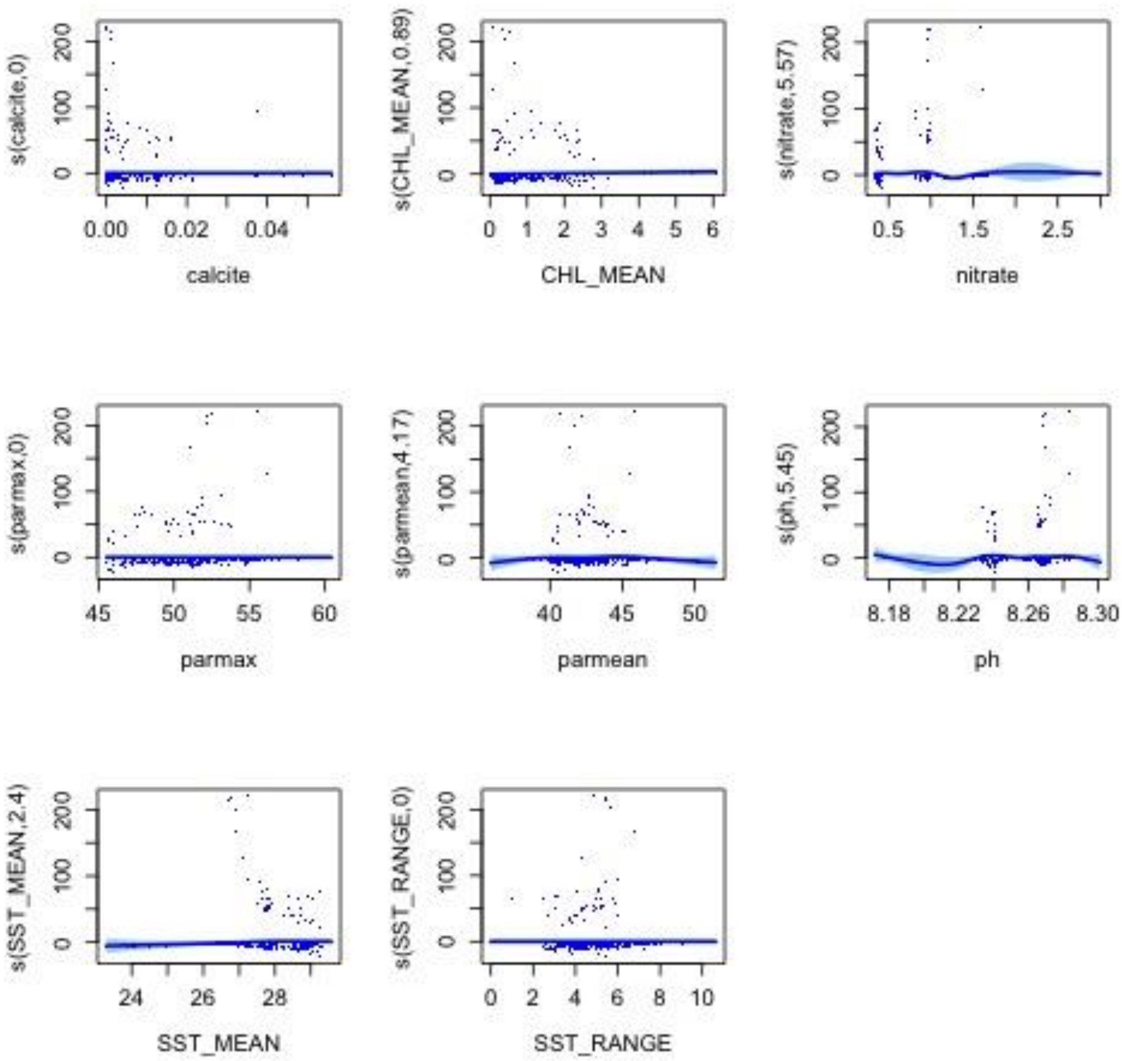
416Scolopsis margaritifera, n = 107 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.074733	9	8.448414	1.415527e-03
s(CHL_MEAN)	2.886536	9	8.621538	1.686979e-02
s(nitrate)	4.180098	8	11.471443	1.252689e-02
s(parmax)	2.967566	9	10.547582	3.558928e-03
s(parmean)	3.656445	9	21.656028	6.482403e-06
s(ph)	1.286698	9	4.571264	1.591352e-02
s(SST_MEAN)	4.229117	9	22.819102	8.024578e-06
s(SST_RANGE)	0.837175	9	4.516028	1.578780e-02



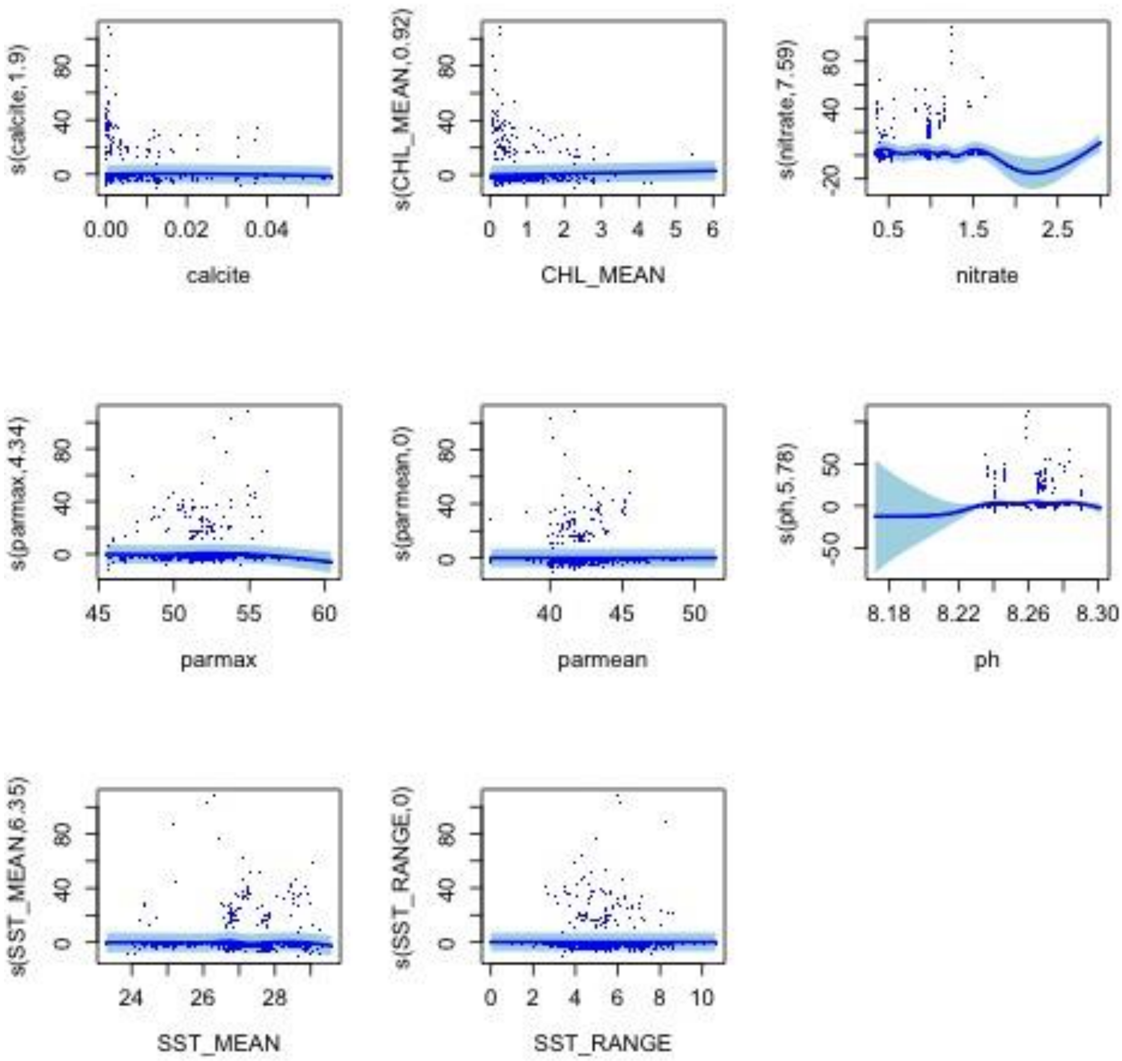
417 Scolopsis temporalis, n = 54 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.852604e-06	8	7.571726e-07	1.0000000000
s(CHL_MEAN)	8.907847e-01	7	7.524437e+00	0.0023490987
s(nitrate)	5.571712e+00	9	2.406145e+01	0.0000342659
s(parmax)	1.055107e-05	9	6.017290e-06	0.5377164453
s(parmean)	4.166724e+00	9	1.030559e+01	0.0206148978
s(ph)	5.450817e+00	9	1.143225e+01	0.0281464530
s(SST_MEAN)	2.402263e+00	9	9.745109e+00	0.0037619223
s(SST_RANGE)	1.528255e-05	9	8.176805e-06	0.5474699890



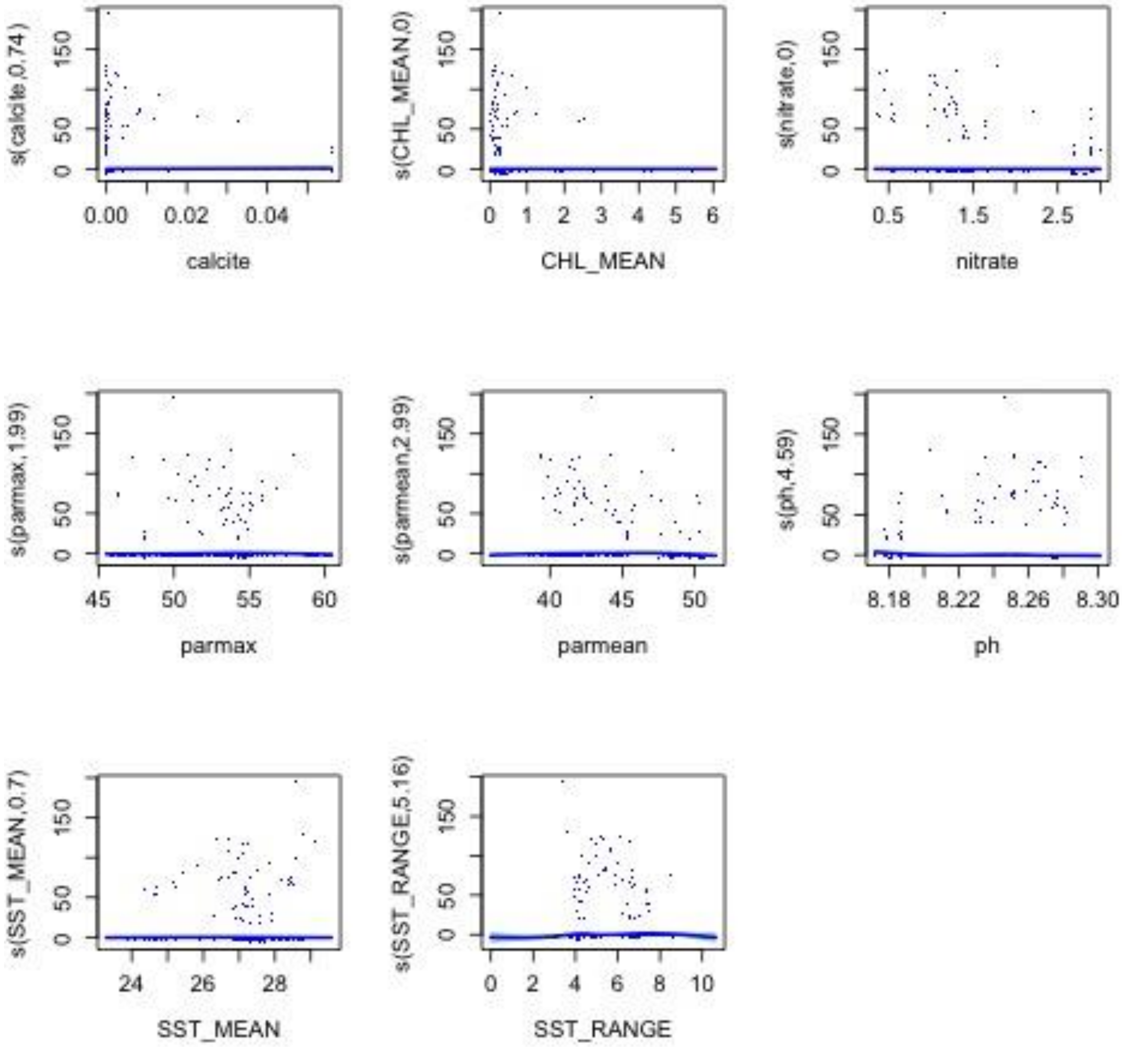
418Scolopsis trilineata, n = 168 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.902546e+00	9	5.446979e+00	3.909598e-02
s(CHL_MEAN)	9.176726e-01	7	1.040553e+01	4.710357e-04
s(nitrate)	7.592054e+00	9	5.984473e+01	2.136224e-11
s(parmax)	4.339908e+00	9	2.482114e+01	1.199903e-05
s(parmean)	1.369917e-04	9	6.545313e-05	6.253343e-01
s(ph)	5.776461e+00	9	2.343709e+01	1.362392e-04
s(SST_MEAN)	6.354938e+00	9	2.879295e+01	1.621365e-05
s(SST_RANGE)	2.219537e-05	9	3.814498e-06	9.517866e-01



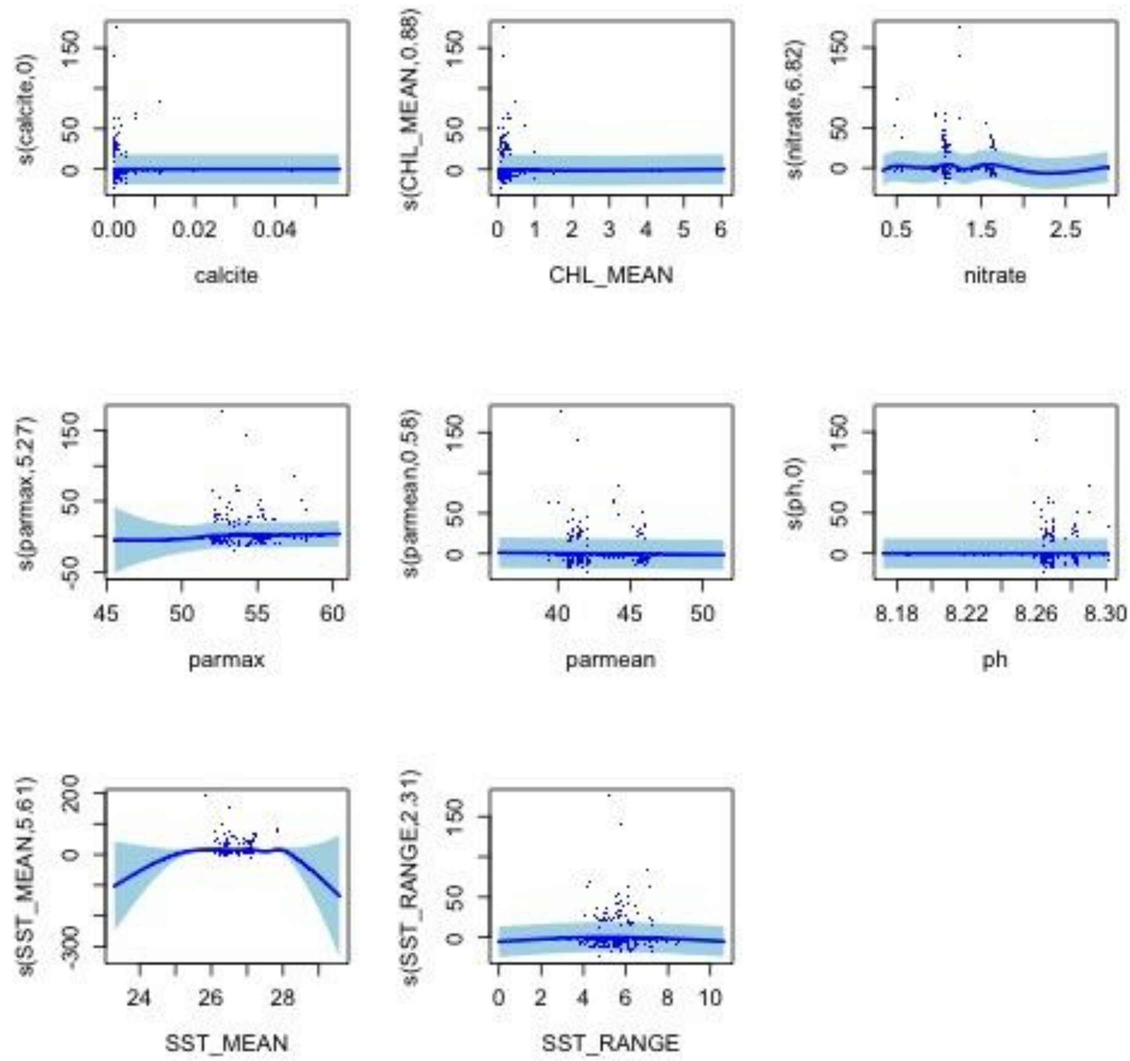
419Scomberoides lysan, n = 104 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.417563e-01	5	2.885450e+00	4.324615e-02
s(CHL_MEAN)	1.198257e-06	9	4.292398e-07	5.719267e-01
s(nitrate)	5.869461e-04	9	4.305652e-04	3.714817e-01
s(parmax)	1.993590e+00	9	6.481436e+00	1.202828e-02
s(parmean)	2.991647e+00	9	1.887165e+01	1.713656e-05
s(ph)	4.585468e+00	9	3.298120e+01	4.533860e-08
s(SST_MEAN)	6.983755e-01	9	1.090030e+00	1.692590e-01
s(SST_RANGE)	5.157304e+00	9	2.377817e+01	4.304676e-05



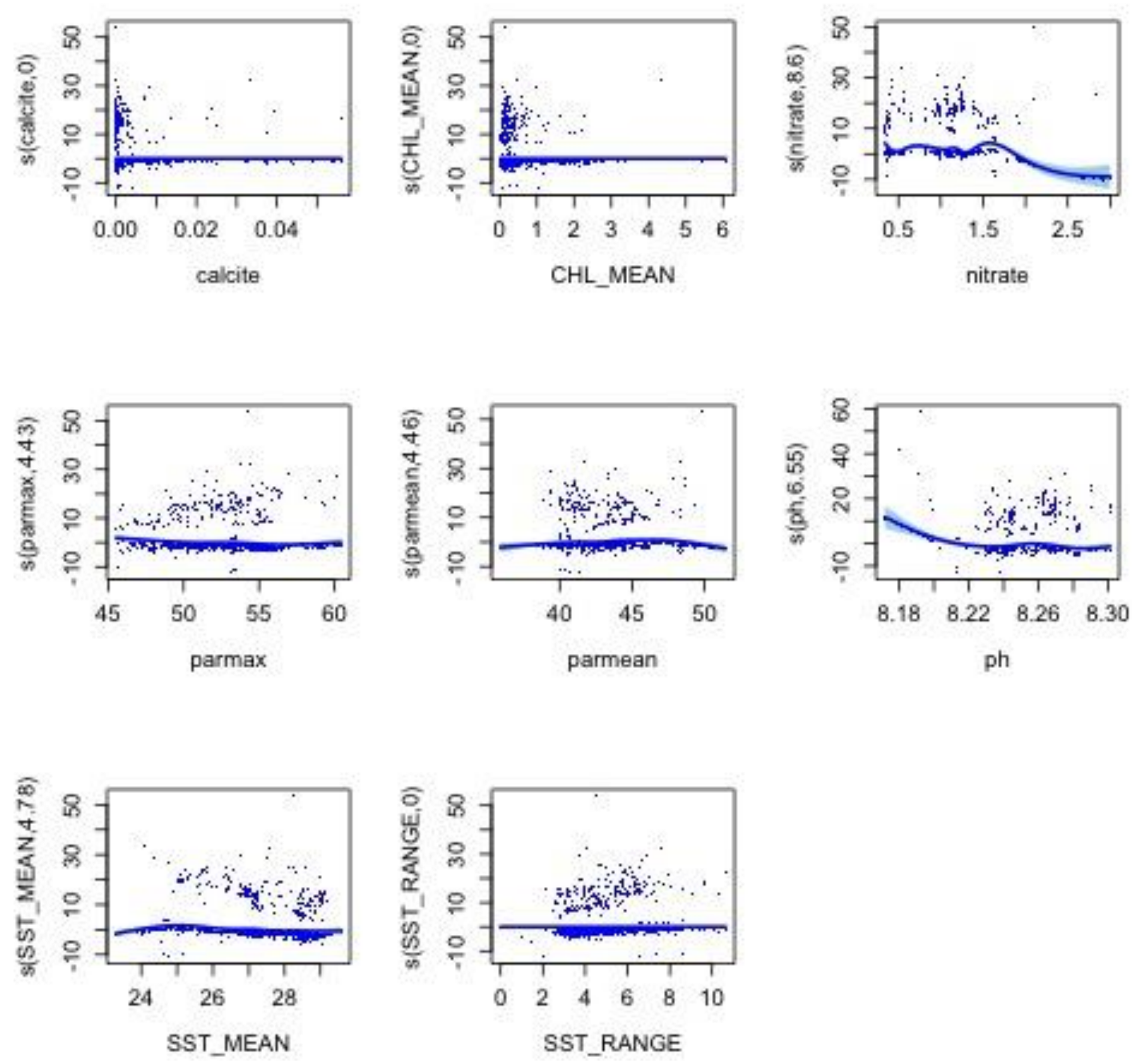
420 Serranocirrhitus latus, n = 124 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.305658e-06	9	3.494108e-07	6.768109e-01
s(CHL_MEAN)	8.753257e-01	9	3.061140e+00	4.807060e-02
s(nitrate)	6.822483e+00	9	7.700652e+01	4.279389e-16
s(parmax)	5.273529e+00	9	3.742657e+01	7.405489e-08
s(parmean)	5.788474e-01	9	1.127093e+00	1.453434e-01
s(ph)	5.426124e-06	9	1.854247e-06	6.286344e-01
s(SST_MEAN)	5.609605e+00	9	3.176602e+01	2.208059e-06
s(SST_RANGE)	2.310957e+00	9	1.254583e+01	6.943098e-04



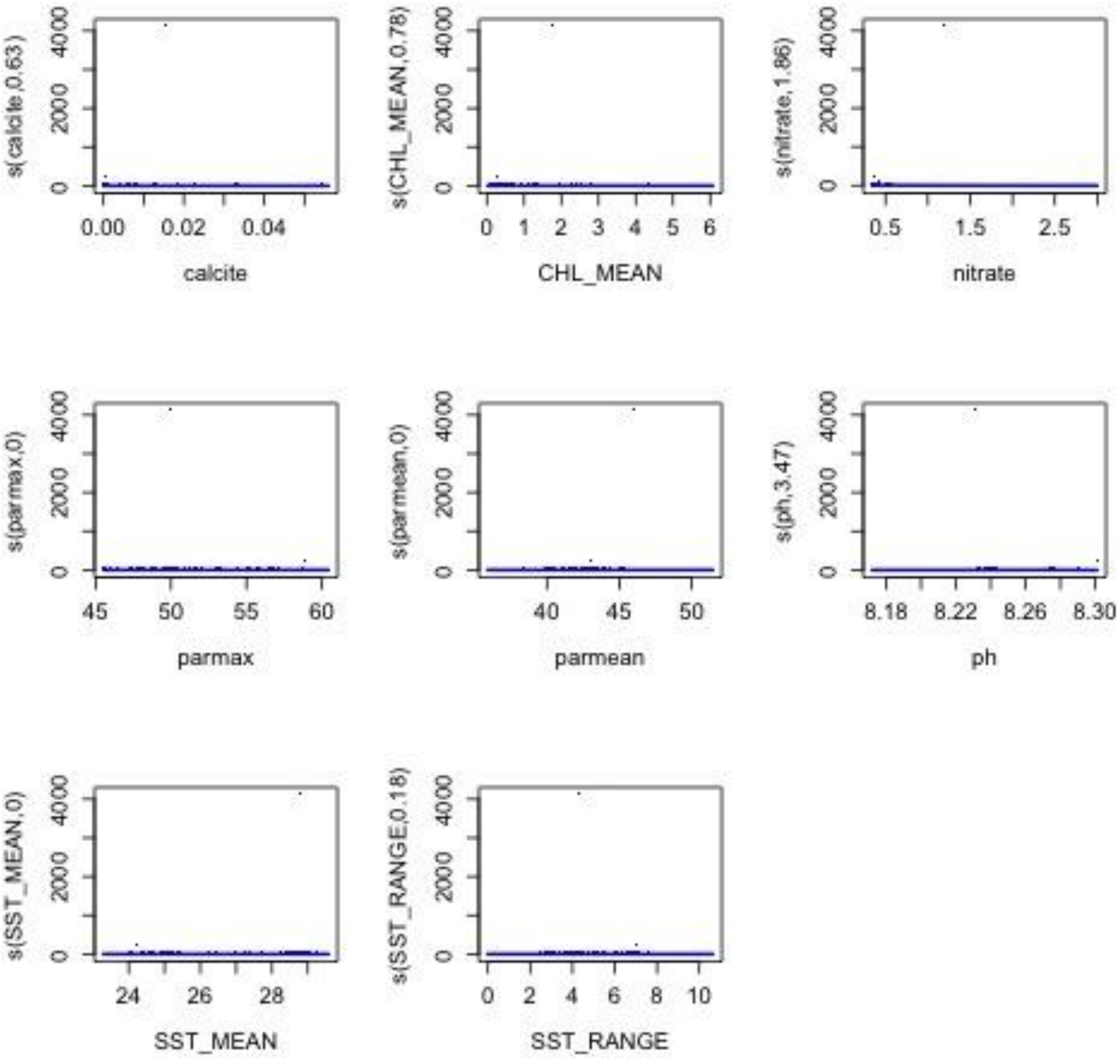
421Siganus argenteus, n = 319 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.397998e-05	9	1.370783e-06	1.000000e+00
s(CHL_MEAN)	2.785379e-04	9	3.014968e-05	7.714802e-01
s(nitrate)	8.598100e+00	9	1.681186e+02	7.126428e-37
s(parmax)	4.429881e+00	9	2.389176e+01	1.348518e-05
s(parmean)	4.459950e+00	9	2.037259e+01	1.144907e-04
s(ph)	6.549320e+00	9	4.991720e+01	7.457256e-11
s(SST_MEAN)	4.778205e+00	9	2.741247e+01	3.708919e-06
s(SST_RANGE)	1.575654e-05	9	8.372121e-06	5.929295e-01



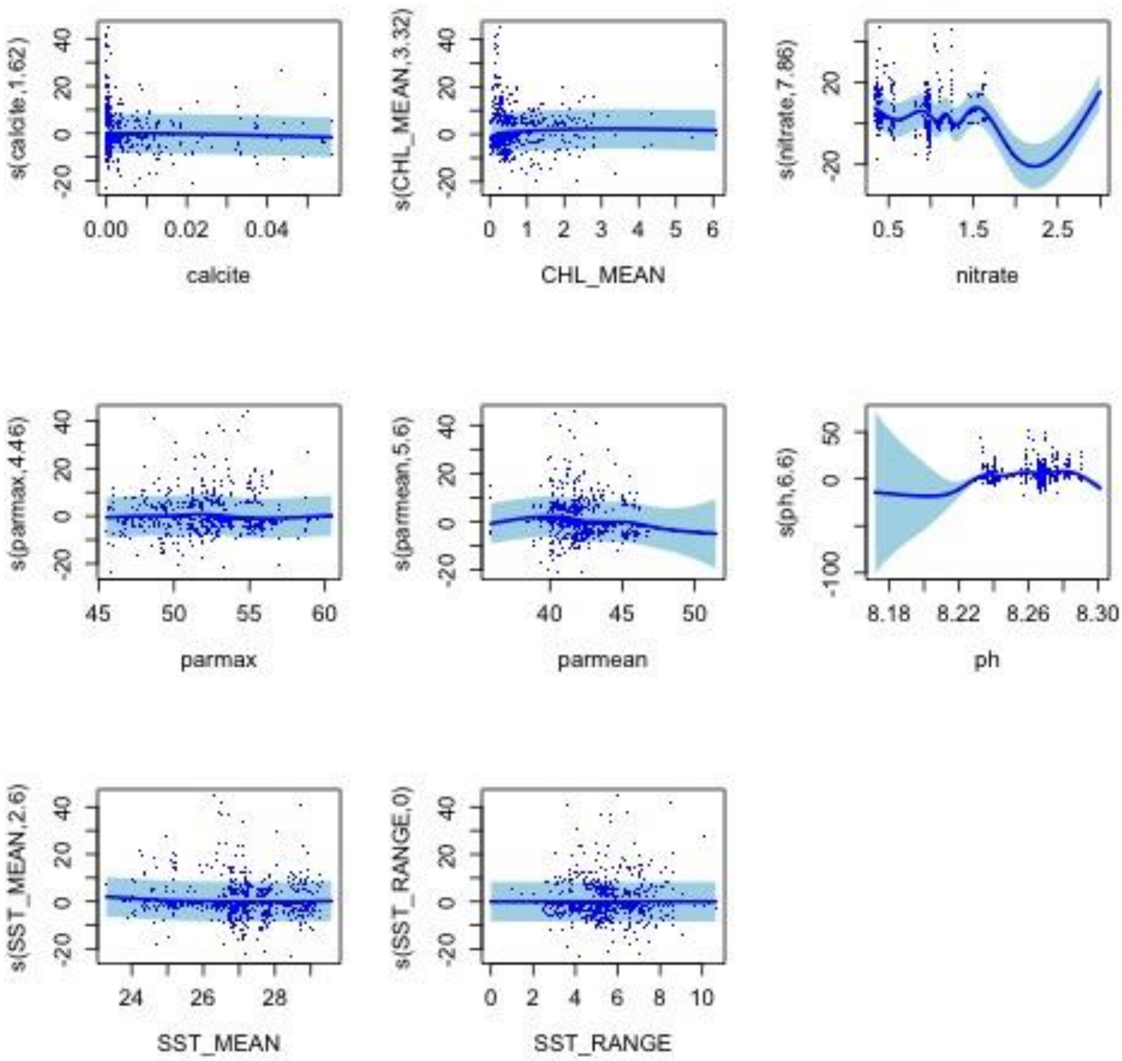
422Siganus corallinus, n = 94 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.318809e-01	6	1.516214e+00	1.082509e-01
s(CHL_MEAN)	7.775131e-01	9	2.445138e+00	6.005890e-02
s(nitrate)	1.859040e+00	9	7.101226e+01	2.687859e-20
s(parmax)	1.715676e-04	9	1.066229e-04	4.403241e-01
s(parmean)	1.493779e-05	9	5.679583e-06	6.348321e-01
s(ph)	3.474588e+00	9	4.703215e+01	3.505573e-12
s(SST_MEAN)	4.987964e-04	9	7.394472e-04	1.994269e-01
s(SST_RANGE)	1.755192e-01	9	1.855150e-01	3.168961e-01



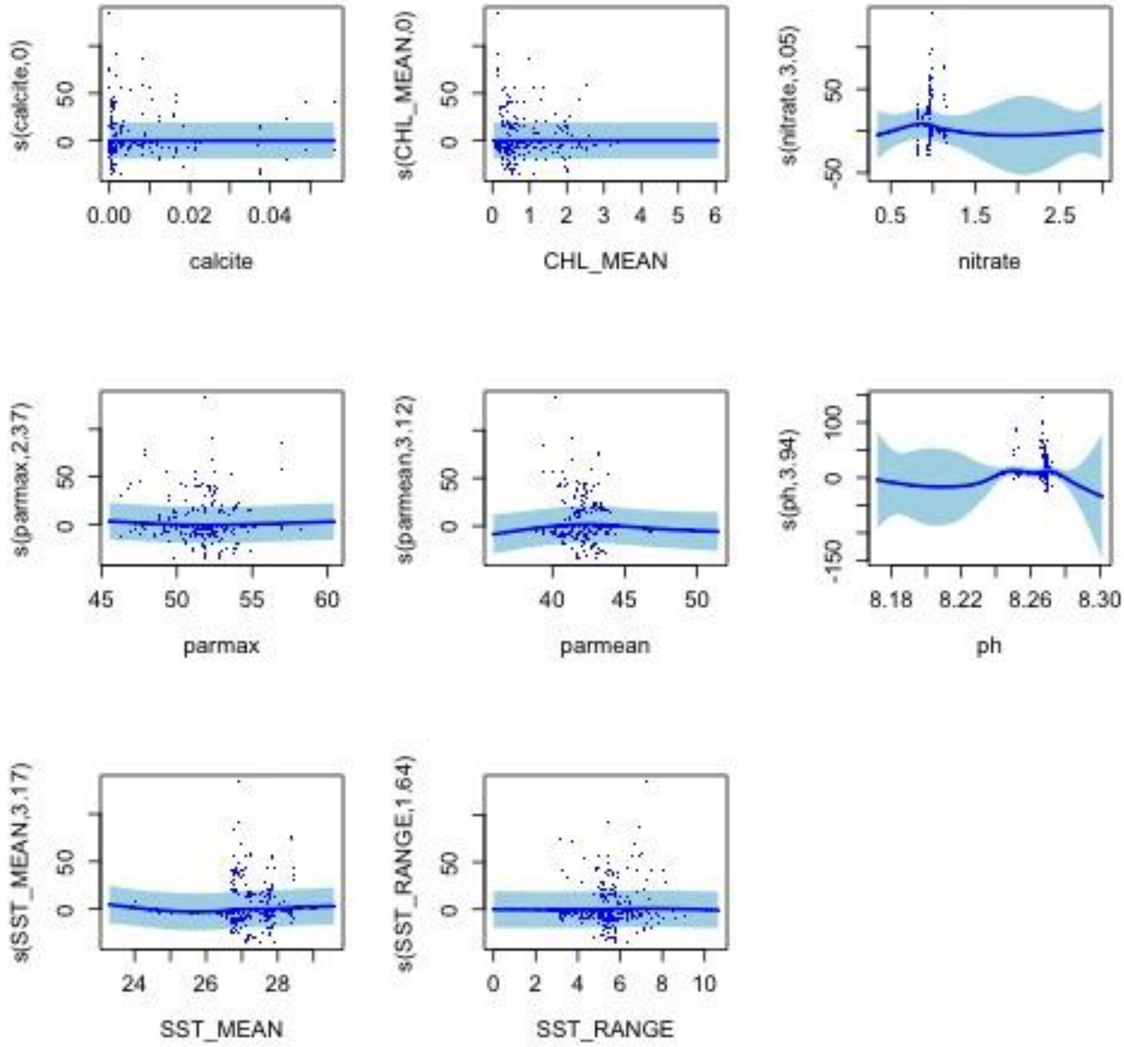
423Siganus doliatus, n = 494 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.6198670347	9	1.352607e+01	1.899612e-04
s(CHL_MEAN)	3.3212704322	9	5.579792e+01	5.507497e-14
s(nitrate)	7.8614014051	9	1.911096e+02	8.991185e-41
s(parmax)	4.4570819805	9	3.486212e+01	3.876271e-08
s(parmean)	5.5950053343	9	9.720585e+01	2.390276e-22
s(ph)	6.6045484191	9	9.387059e+01	8.202716e-20
s(SST_MEAN)	2.6037976283	9	8.921034e+00	7.611321e-03
s(SST_RANGE)	0.0001023061	9	3.171742e-05	7.409907e-01



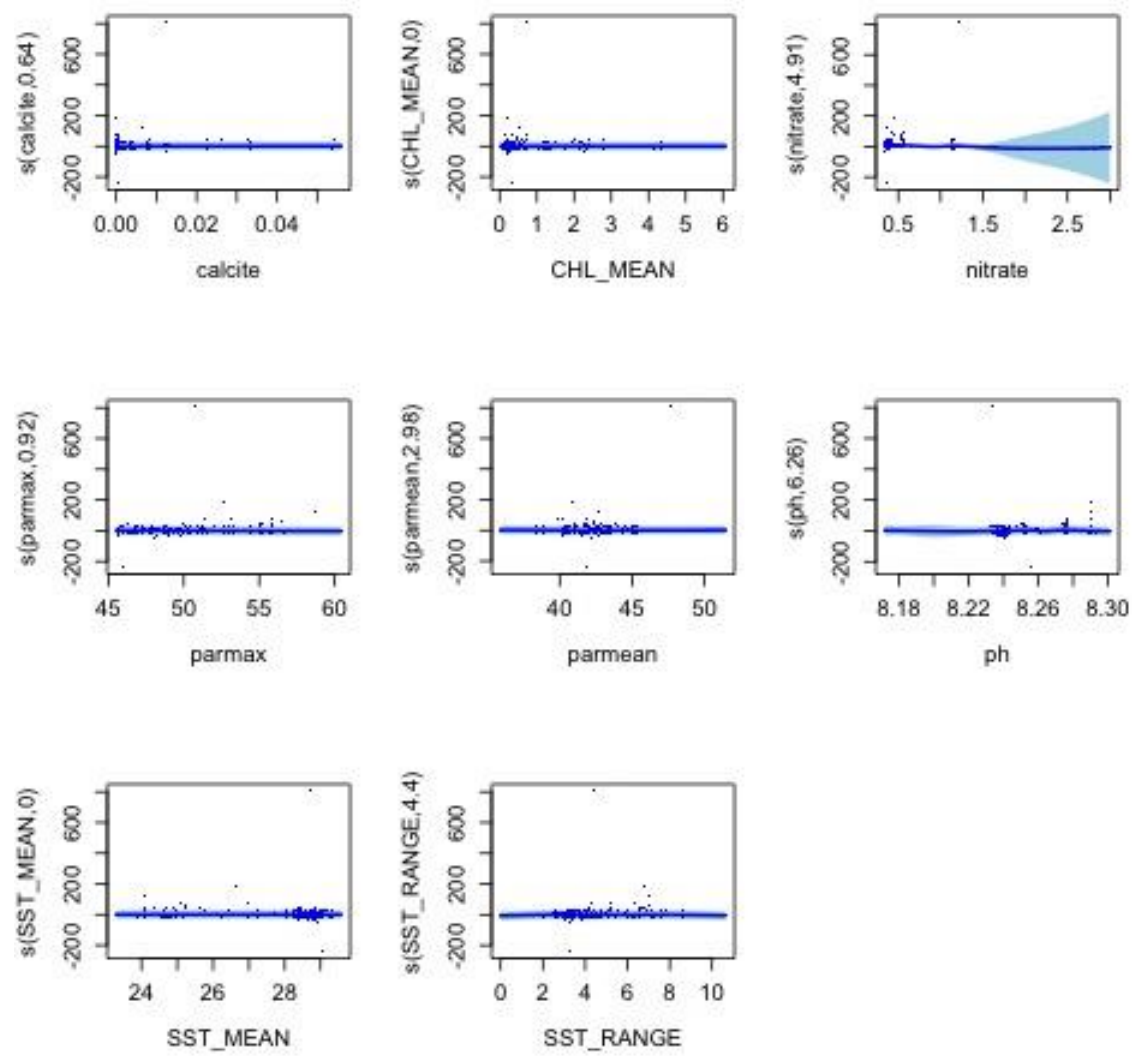
424 Siganus guttatus, n = 131 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0003067635	8	3.331700e-04	2.763952e-01
s(CHL_MEAN)	0.0000369529	9	4.066236e-06	7.566727e-01
s(nitrate)	3.0536017878	9	2.406480e+01	1.752695e-06
s(parmax)	2.3739707325	9	1.308020e+01	1.366286e-04
s(parmean)	3.1182467939	9	2.390390e+01	2.035715e-07
s(ph)	3.9400247809	8	1.919063e+01	6.801964e-05
s(SST_MEAN)	3.1666035902	9	7.665241e+00	2.538467e-02
s(SST_RANGE)	1.6376088238	9	3.967905e+00	6.154435e-02



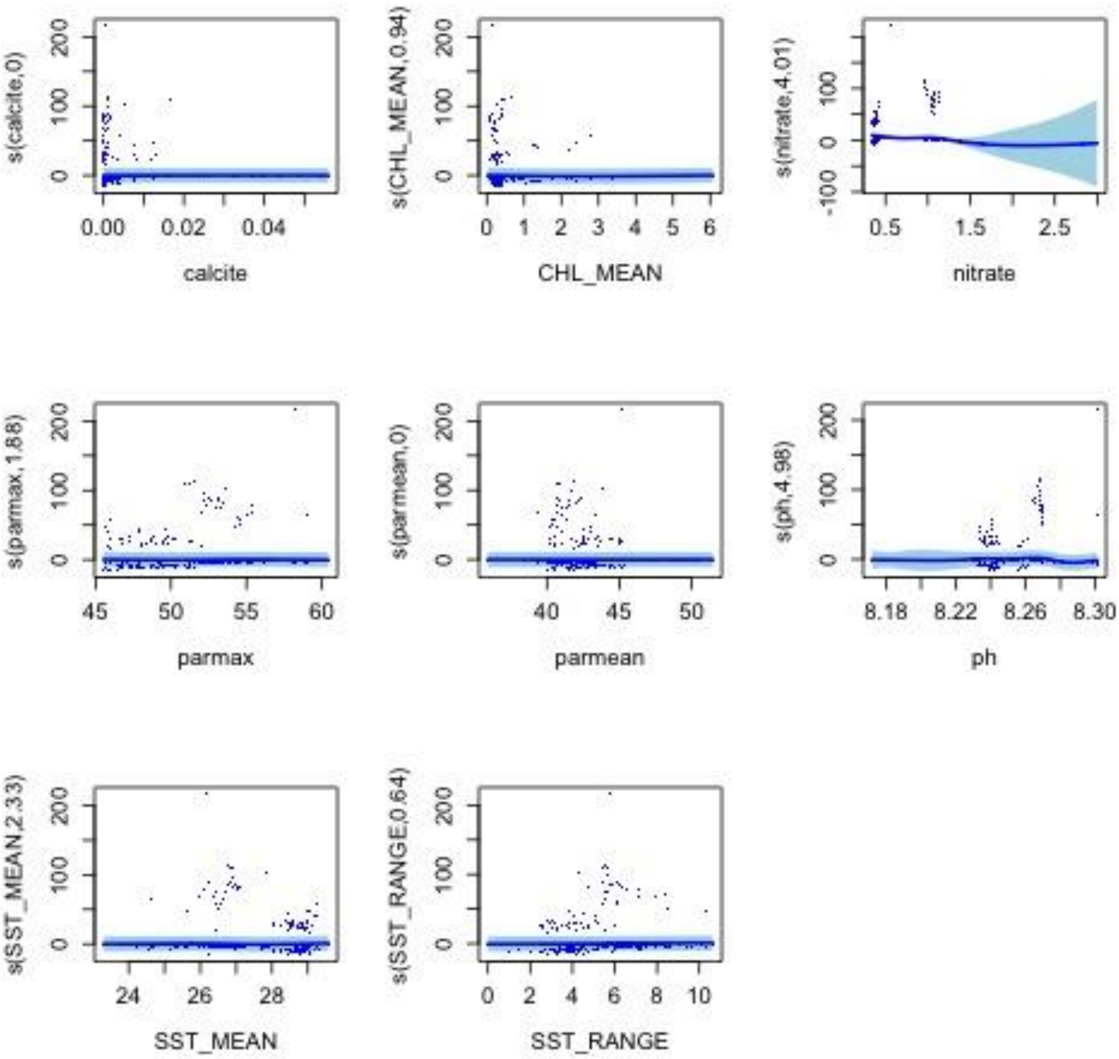
425Siganus puellus, n = 125 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.6413353580	6	1.646678e+00	1.026207e-01
s(CHL_MEAN)	0.0000131243	9	1.248798e-06	9.593706e-01
s(nitrate)	4.9097072034	9	7.576834e+01	1.523842e-17
s(parmax)	0.9217730779	9	1.102086e+01	2.689294e-04
s(parmean)	2.9812829251	9	1.065693e+01	4.164565e-03
s(ph)	6.2617092094	9	3.930080e+01	9.335326e-08
s(SST_MEAN)	0.0000363048	9	2.514932e-05	4.645710e-01
s(SST_RANGE)	4.3959172226	9	1.060610e+01	2.729661e-02



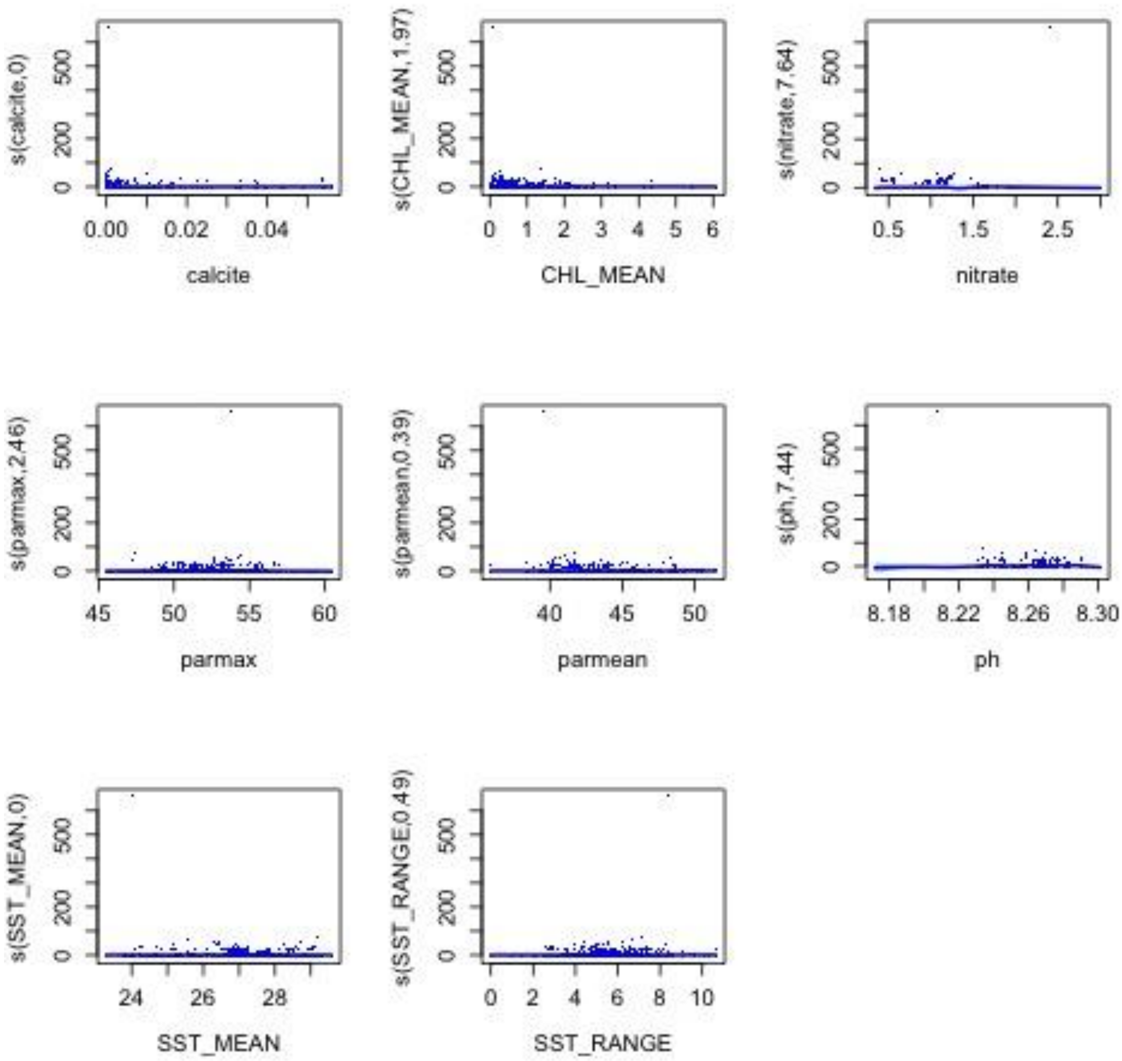
426Siganus punctatissimus, n = 69 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.193923e-05	9	5.309175e-06	5.699542e-01
s(CHL_MEAN)	9.415369e-01	9	5.764298e+00	7.976094e-03
s(nitrate)	4.010818e+00	9	4.348347e+01	4.004594e-11
s(parmax)	1.879885e+00	9	3.636841e+00	9.725506e-02
s(parmean)	9.630012e-05	9	1.133069e-05	1.000000e+00
s(ph)	4.984467e+00	9	1.651396e+01	1.654850e-03
s(SST_MEAN)	2.328885e+00	9	5.128921e+00	5.728988e-02
s(SST_RANGE)	6.419034e-01	9	1.708740e+00	9.671108e-02



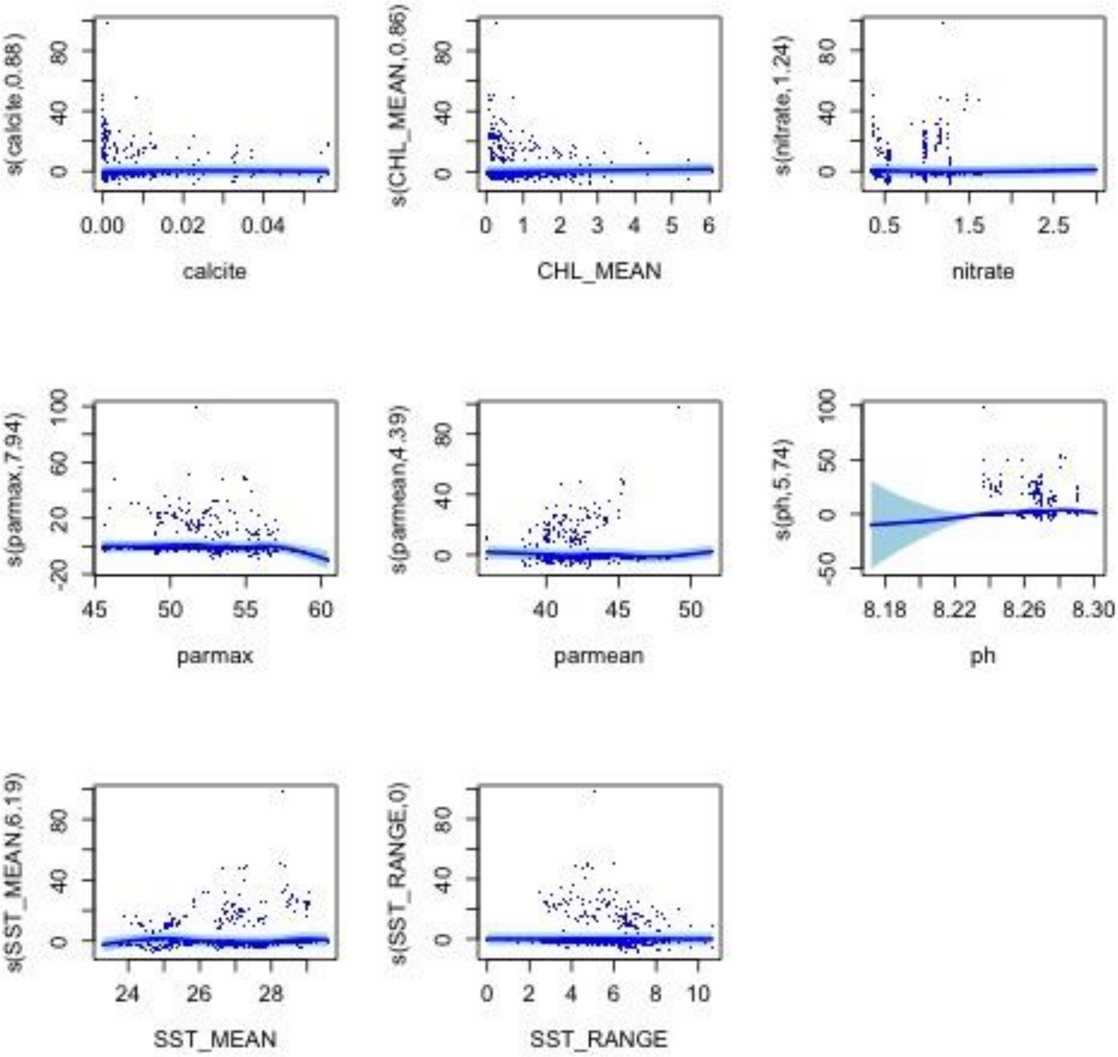
427Siganus punctatus, n = 190 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.488867e-04	8	6.164453e-04	3.230883e-01
s(CHL_MEAN)	1.966189e+00	9	1.042542e+01	3.057513e-03
s(nitrate)	7.636306e+00	9	8.556864e+01	3.352495e-17
s(parmax)	2.457867e+00	9	1.064976e+01	2.219497e-03
s(parmean)	3.862927e-01	9	5.172139e-01	2.145155e-01
s(ph)	7.436704e+00	9	4.490723e+01	1.693736e-08
s(SST_MEAN)	4.722493e-05	9	4.450981e-05	3.061715e-01
s(SST_RANGE)	4.945073e-01	9	1.018921e+00	1.375469e-01



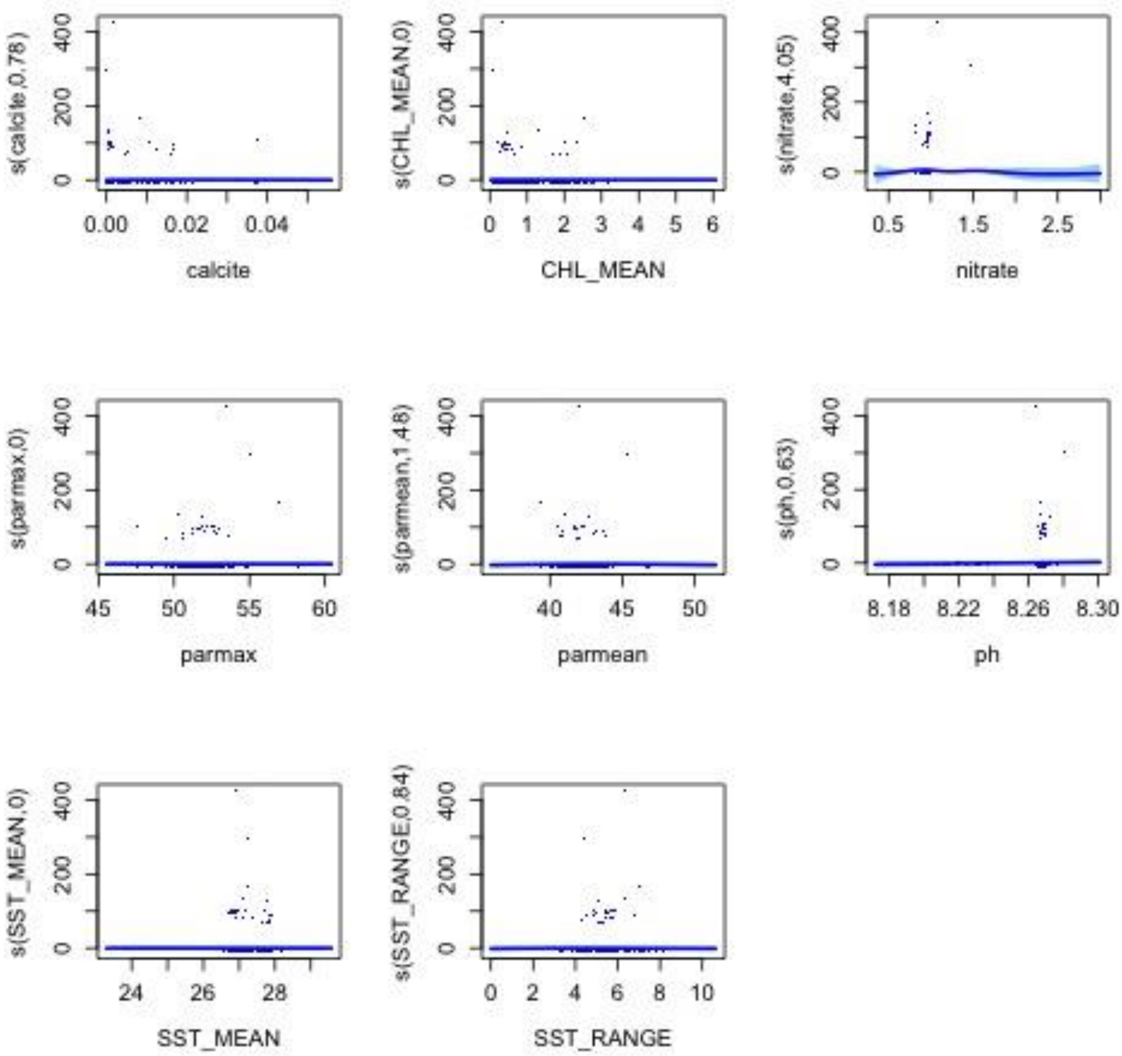
428Siganus spinus, n = 237 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.837875e-01	9	3.152412e+00	4.366116e-02
s(CHL_MEAN)	8.554919e-01	9	5.472333e+00	9.063431e-03
s(nitrate)	1.242373e+00	9	8.443498e+00	1.453406e-03
s(parmax)	7.937158e+00	9	4.062101e+01	3.610217e-07
s(parmean)	4.389867e+00	9	1.961216e+01	1.883814e-04
s(ph)	5.742616e+00	9	3.304273e+01	3.145621e-07
s(SST_MEAN)	6.194305e+00	9	6.265833e+01	6.018039e-14
s(SST_RANGE)	6.852029e-05	9	4.919175e-05	4.373909e-01



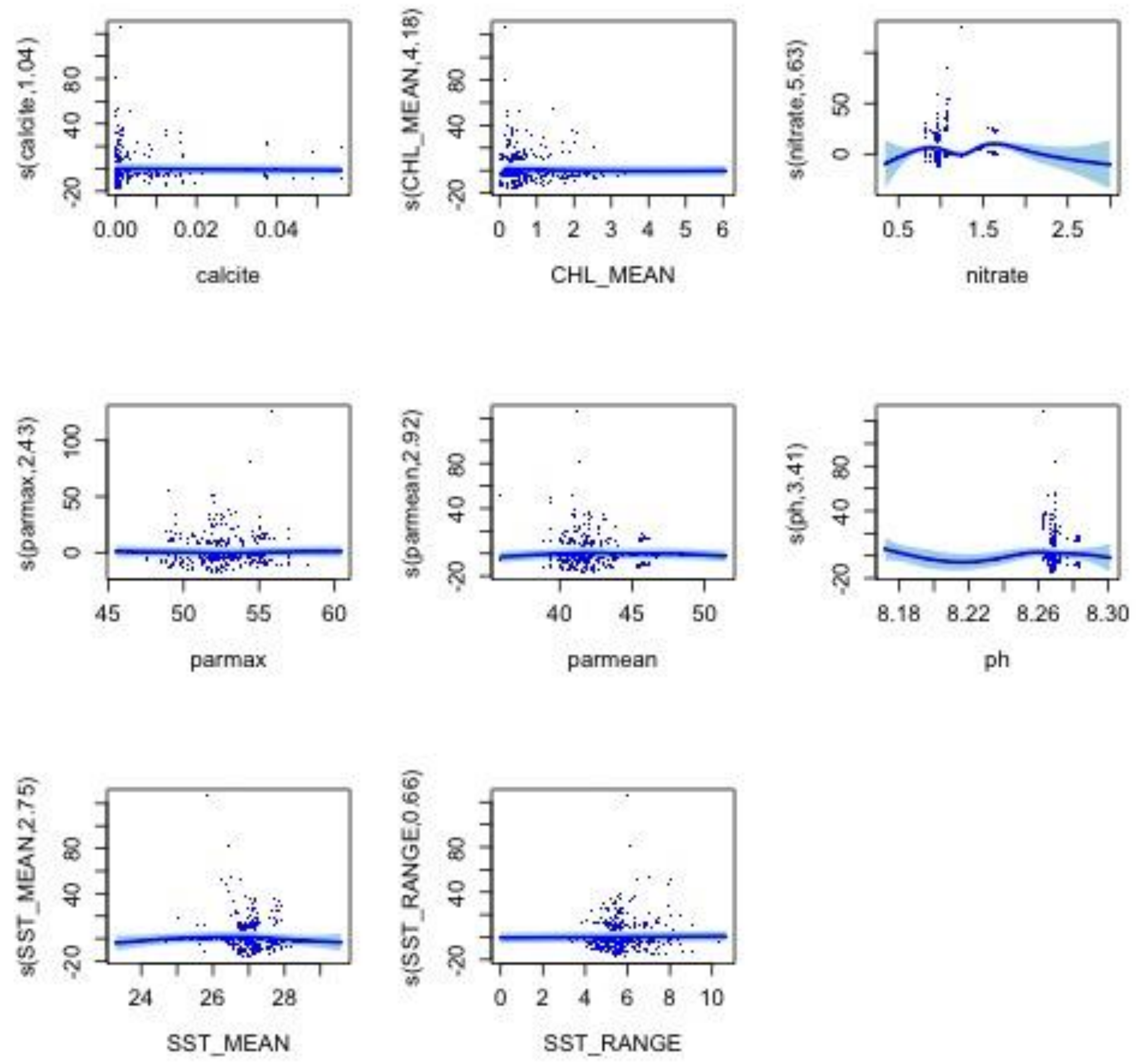
429Siganus stellatus, n = 31 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.820202e-01	9	2.833332e+00	4.993811e-02
s(CHL_MEAN)	1.393146e-06	9	9.992036e-08	8.176985e-01
s(nitrate)	4.054152e+00	9	2.601864e+01	3.945135e-06
s(parmax)	9.553840e-07	9	4.916216e-07	5.748613e-01
s(parmean)	1.484374e+00	9	3.306092e+00	6.190115e-02
s(ph)	6.288262e-01	9	1.222063e+00	1.454374e-01
s(SST_MEAN)	2.815273e-06	9	1.294027e-06	5.194631e-01
s(SST_RANGE)	8.399373e-01	9	1.171454e+00	1.961523e-01



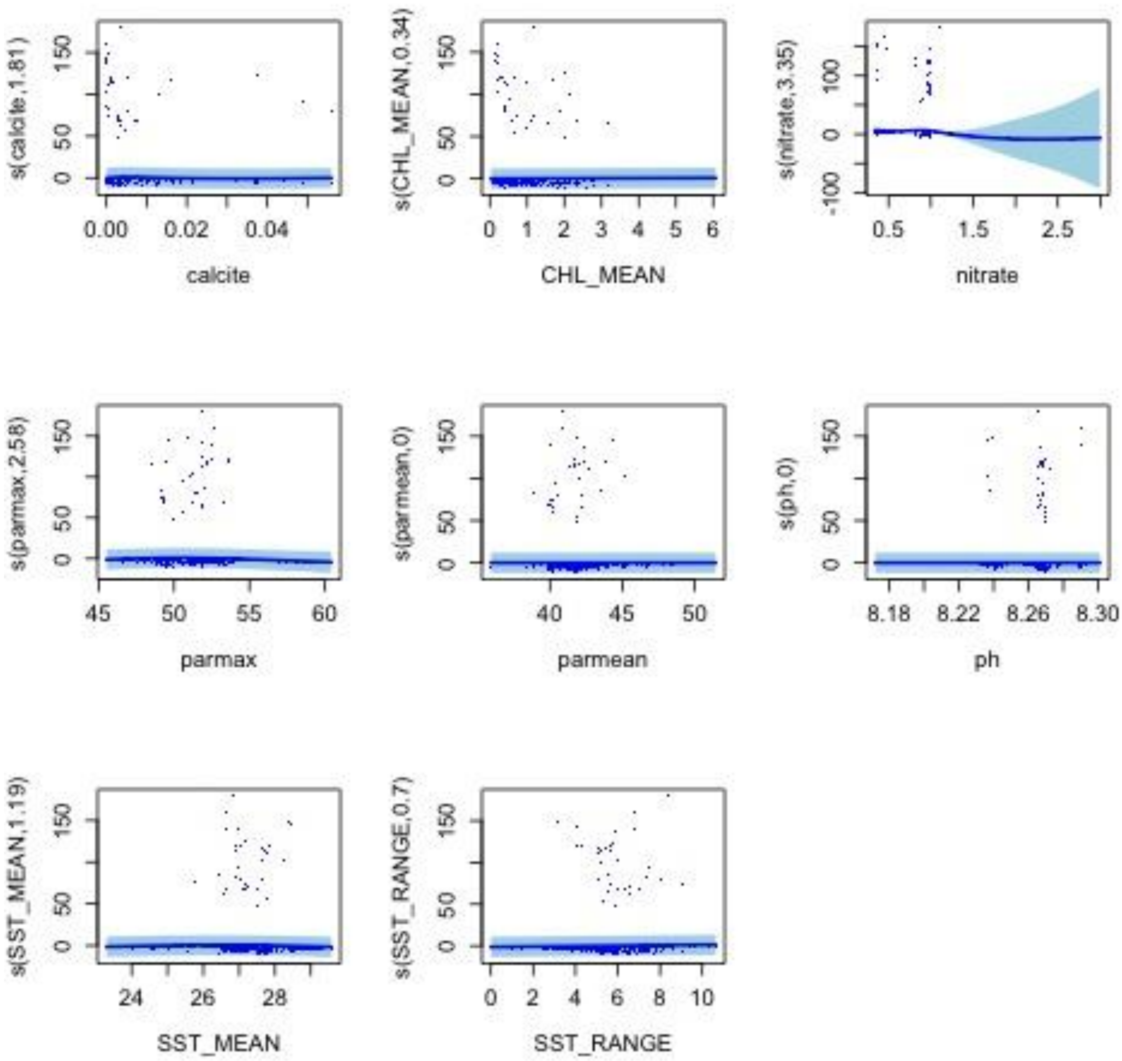
430Siganus uspi, n = 250 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.0379383	9	8.389186	1.707184e-03
s(CHL_MEAN)	4.1769783	9	30.906718	8.882231e-07
s(nitrate)	5.6265265	9	74.450682	6.500430e-18
s(parmax)	2.4330608	9	8.334473	7.063033e-03
s(parmean)	2.9215275	9	17.500886	4.181385e-05
s(ph)	3.4058469	9	10.566227	5.218277e-03
s(SST_MEAN)	2.7545832	9	18.862013	1.090830e-05
s(SST_RANGE)	0.6561459	9	1.901617	7.958997e-02



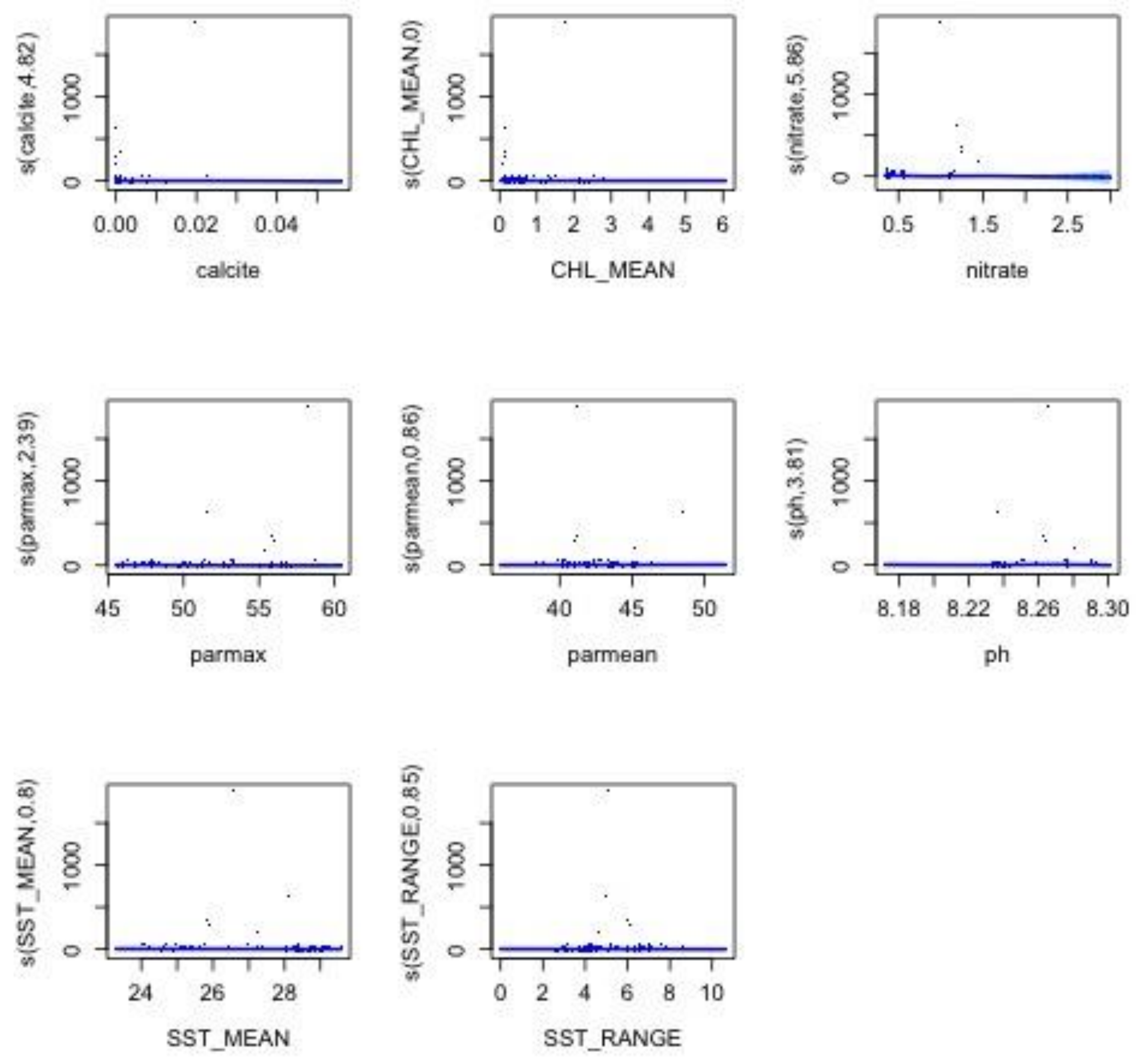
431Siganus vermiculatus, n = 36 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.811222e+00	9	6.997786e+00	0.0142175579
s(CHL_MEAN)	3.352851e-01	8	5.133149e-01	0.2064208124
s(nitrate)	3.352406e+00	9	1.638248e+01	0.0003451241
s(parmax)	2.577023e+00	9	7.374596e+00	0.0196503457
s(parmean)	9.666643e-07	9	1.752390e-07	0.8547647227
s(ph)	2.425954e-06	9	1.757684e-06	0.3228354182
s(SST_MEAN)	1.186555e+00	9	2.030879e+00	0.1334284952
s(SST_RANGE)	7.000342e-01	7	2.360706e+00	0.0531304105



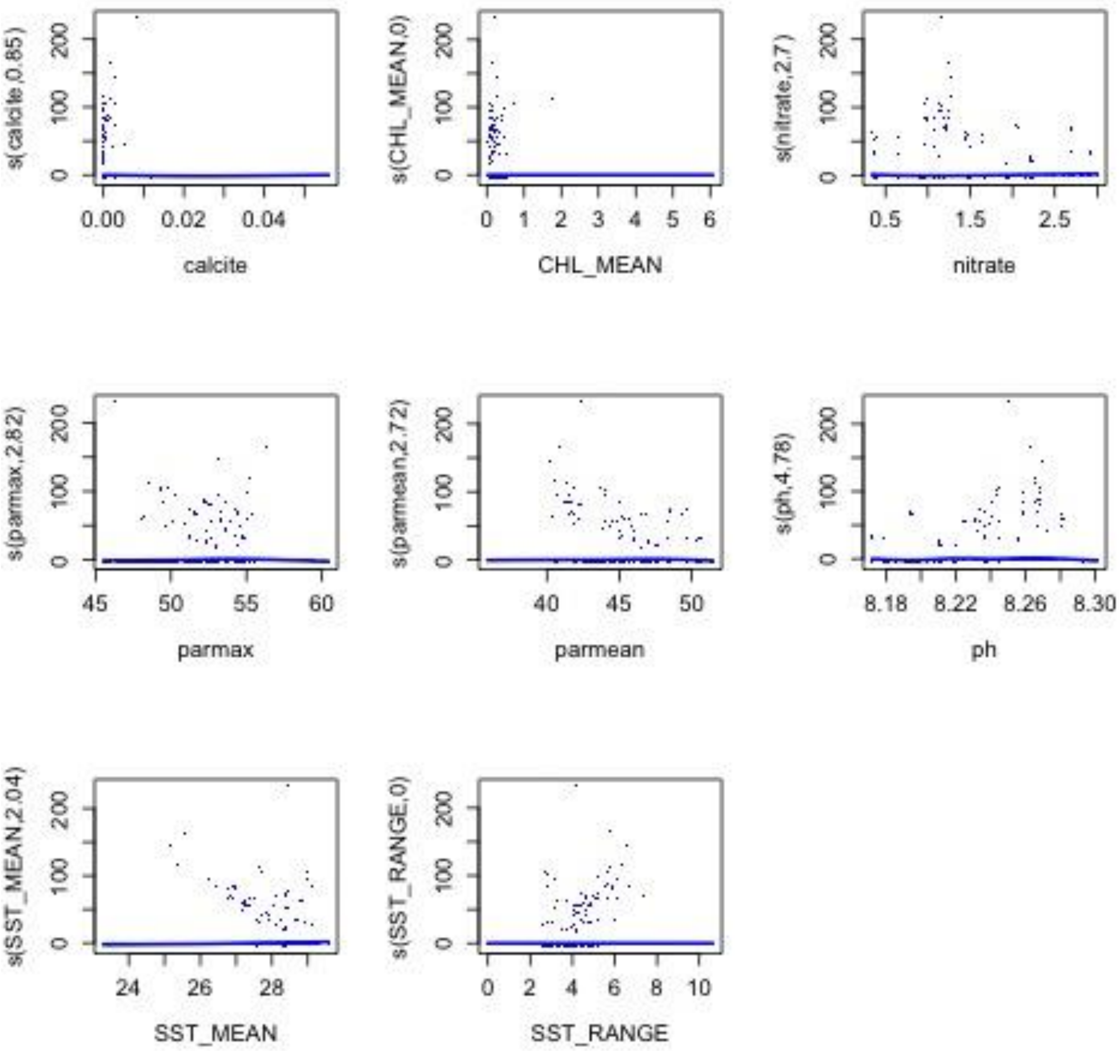
432Siganus vulpinus, n = 148 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.817441e+00	9	3.637239e+01	1.025718e-07
s(CHL_MEAN)	4.678922e-05	9	4.746872e-06	7.997230e-01
s(nitrate)	5.857918e+00	9	1.184381e+02	6.948686e-30
s(parmax)	2.387986e+00	9	3.978168e+01	5.026941e-12
s(parmean)	8.589266e-01	9	5.642229e+00	6.310626e-03
s(ph)	3.805724e+00	9	2.981171e+01	4.726230e-08
s(SST_MEAN)	8.023993e-01	9	4.135718e+00	1.745639e-02
s(SST_RANGE)	8.466555e-01	9	5.129830e+00	1.239309e-02



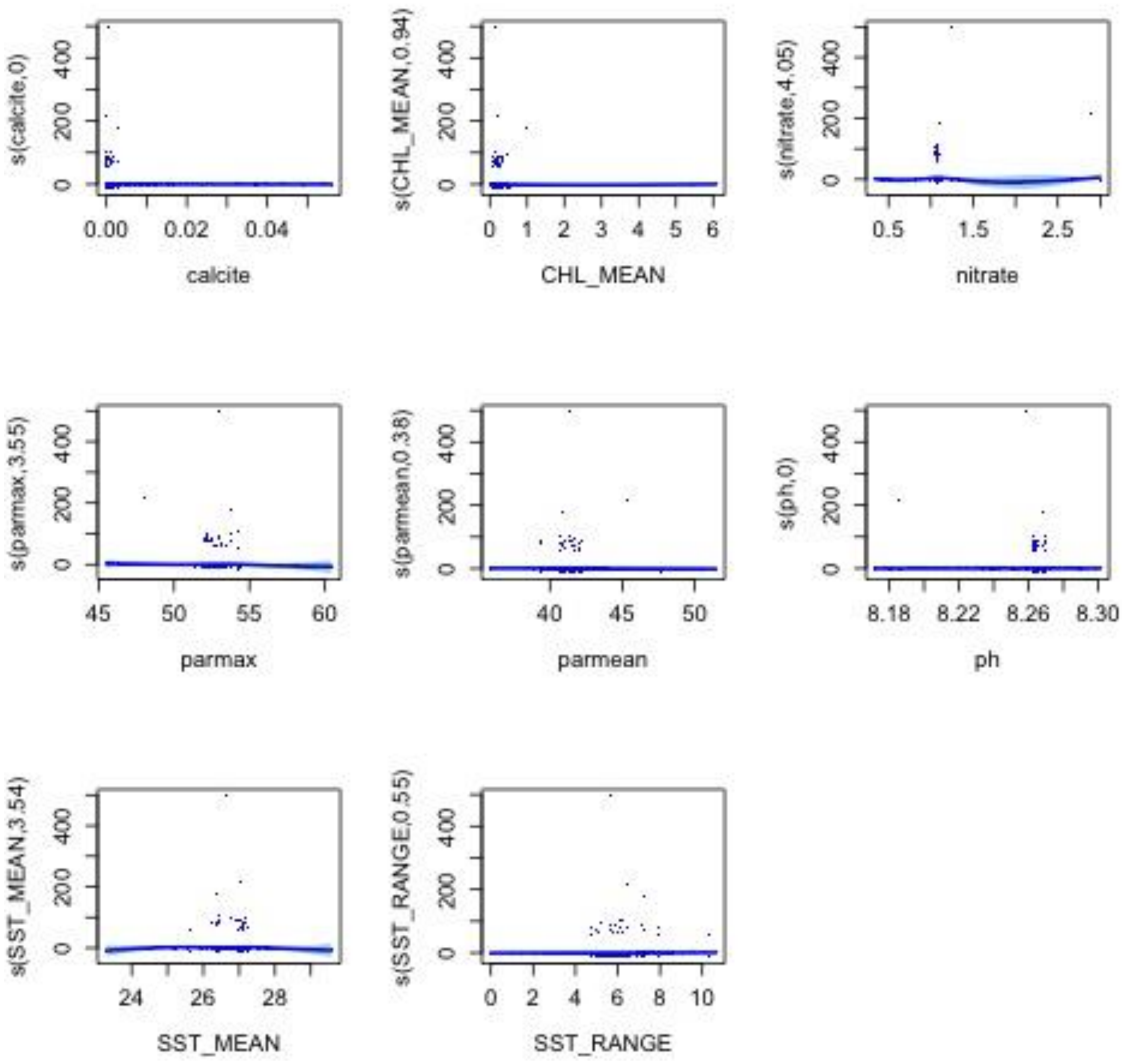
433Sphyraena barracuda, n = 96 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.548413e-01	9	2.703235e+00	6.058789e-02
s(CHL_MEAN)	2.491378e-03	9	2.134455e-03	3.295974e-01
s(nitrate)	2.697436e+00	9	1.277019e+01	4.085876e-04
s(parmax)	2.823981e+00	9	1.197891e+01	1.076042e-03
s(parmean)	2.717823e+00	9	1.034115e+01	2.438175e-03
s(ph)	4.777193e+00	9	1.969412e+01	4.382941e-05
s(SST_MEAN)	2.040502e+00	9	1.553523e+01	1.528745e-05
s(SST_RANGE)	3.064143e-05	9	8.829918e-06	7.804976e-01



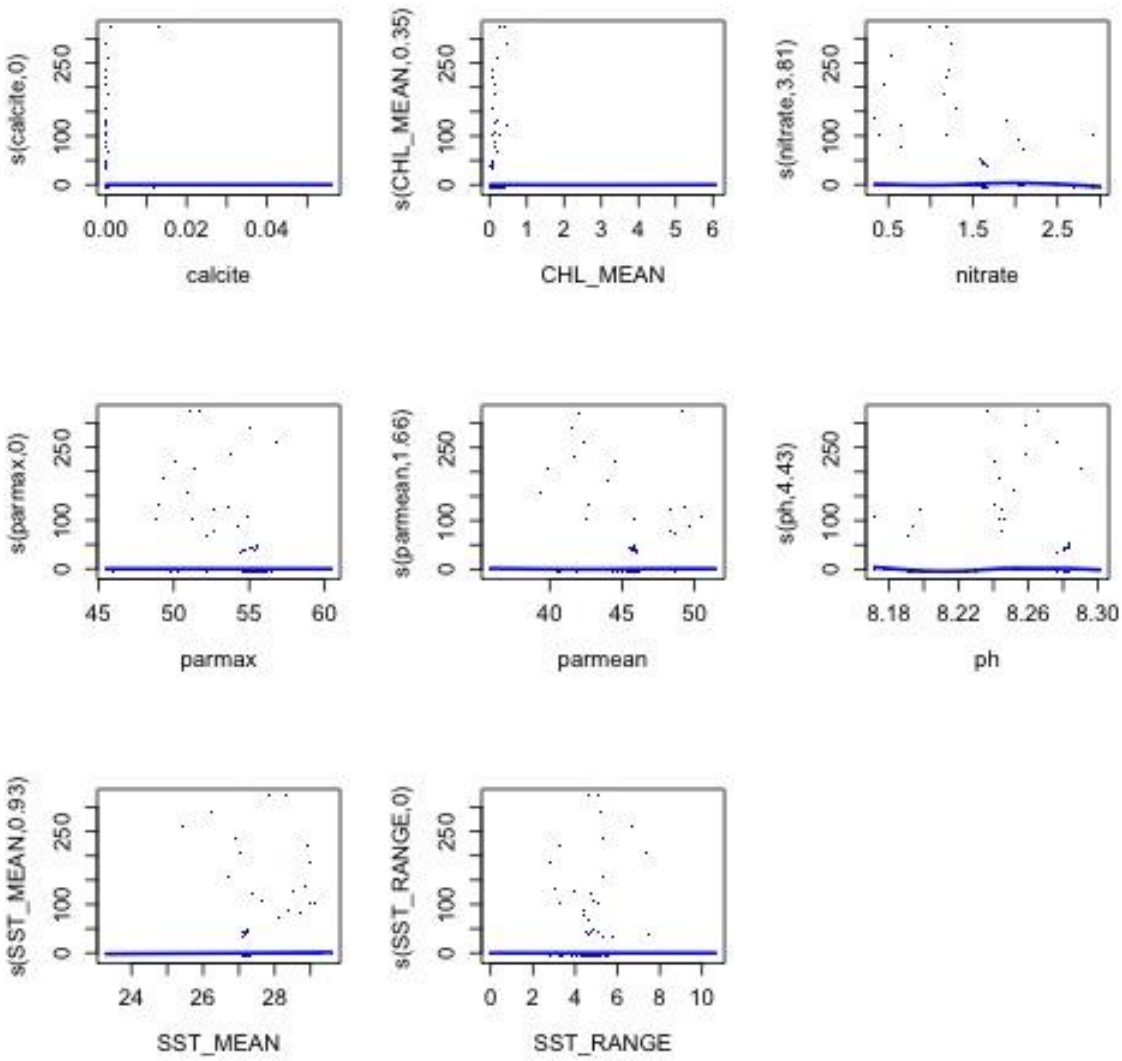
434Sphyraena helleri, n = 39 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.663976e-05	9	9.453165e-06	0.6869619435
s(CHL_MEAN)	9.368448e-01	9	4.055834e+00	0.0251929742
s(nitrate)	4.045595e+00	9	1.904779e+01	0.0001154766
s(parmax)	3.548082e+00	9	8.681545e+00	0.0270850370
s(parmean)	3.814649e-01	9	7.011852e-01	0.1520773988
s(ph)	8.200604e-05	9	3.216987e-05	0.6274747548
s(SST_MEAN)	3.542766e+00	9	7.903106e+00	0.0361276205
s(SST_RANGE)	5.455756e-01	9	1.009574e+00	0.1568314080



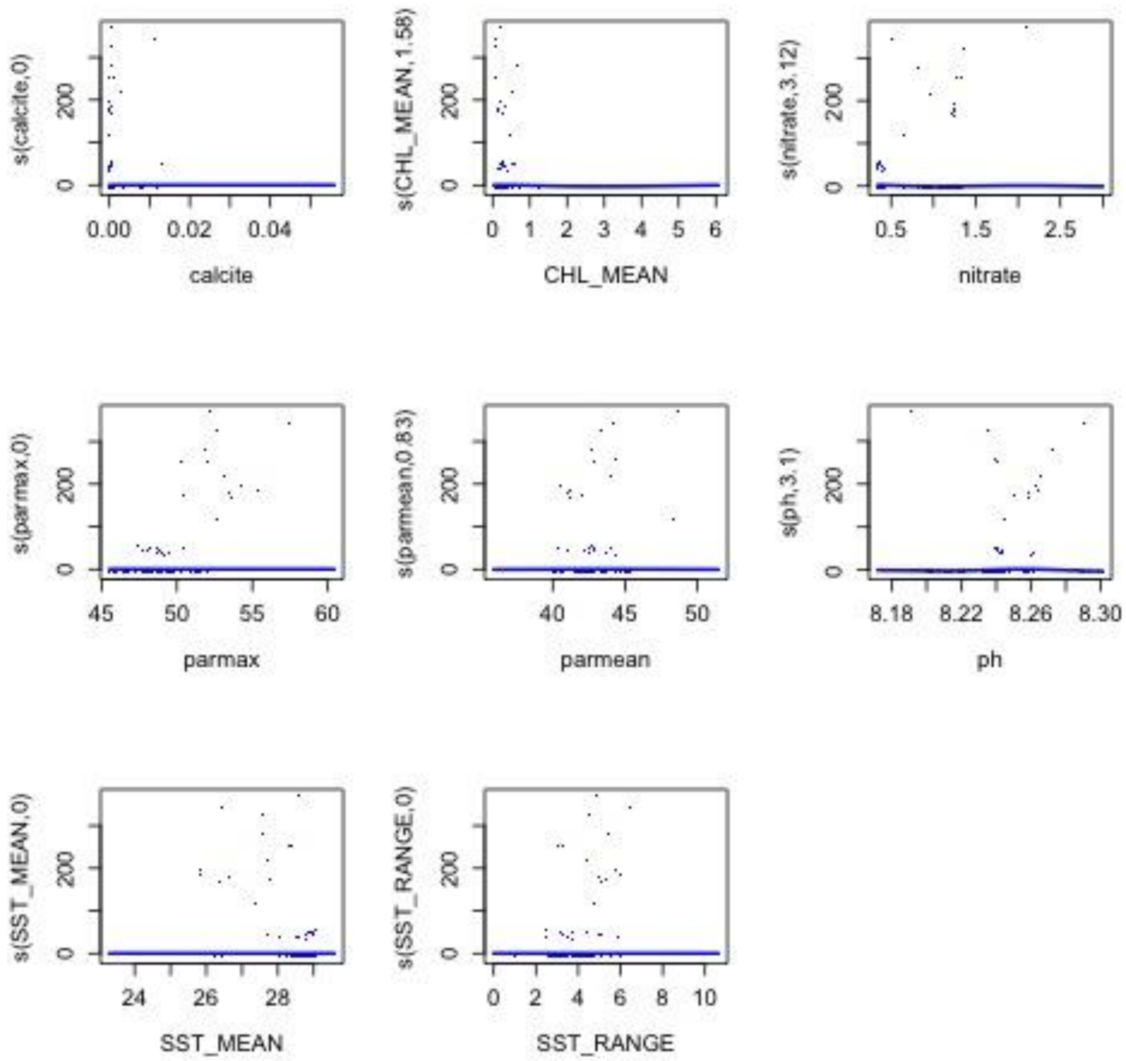
435Sphyraena qenie, n = 47 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.911953e-06	9	1.898328e-06	6.884753e-01
s(CHL_MEAN)	3.542649e-01	9	3.990542e-01	2.762761e-01
s(nitrate)	3.809120e+00	9	1.811802e+01	5.490290e-05
s(parmax)	7.353049e-06	9	3.236771e-06	6.315771e-01
s(parmean)	1.662895e+00	9	4.037711e+00	3.624573e-02
s(ph)	4.431578e+00	9	2.527473e+01	6.281156e-07
s(SST_MEAN)	9.348285e-01	9	3.264542e+00	3.006526e-02
s(SST_RANGE)	7.903334e-06	9	5.284111e-06	4.824110e-01



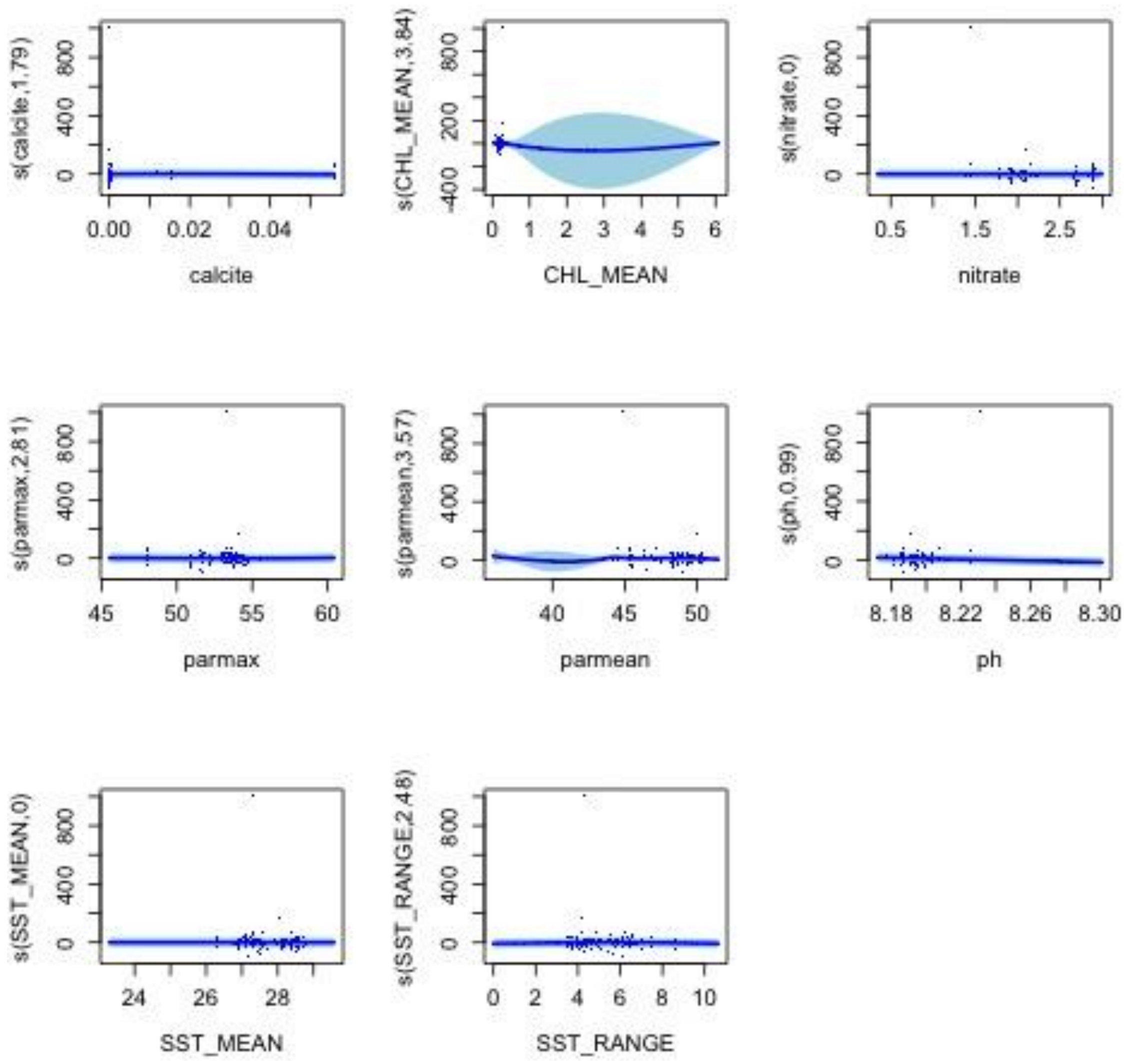
436 Stegastes albifasciatus, n = 55 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.542019e-05	9	5.202919e-06	1.000000e+00
s(CHL_MEAN)	1.578763e+00	9	3.318197e+00	1.107879e-01
s(nitrate)	3.117695e+00	9	3.983993e+01	8.060372e-12
s(parmax)	2.432636e-05	9	8.869743e-06	6.722297e-01
s(parmean)	8.257324e-01	9	1.130565e+00	2.149117e-01
s(ph)	3.101327e+00	9	1.669919e+01	8.265360e-05
s(SST_MEAN)	2.653233e-05	9	1.512237e-05	4.911623e-01
s(SST_RANGE)	4.115238e-05	9	2.710784e-05	4.690623e-01



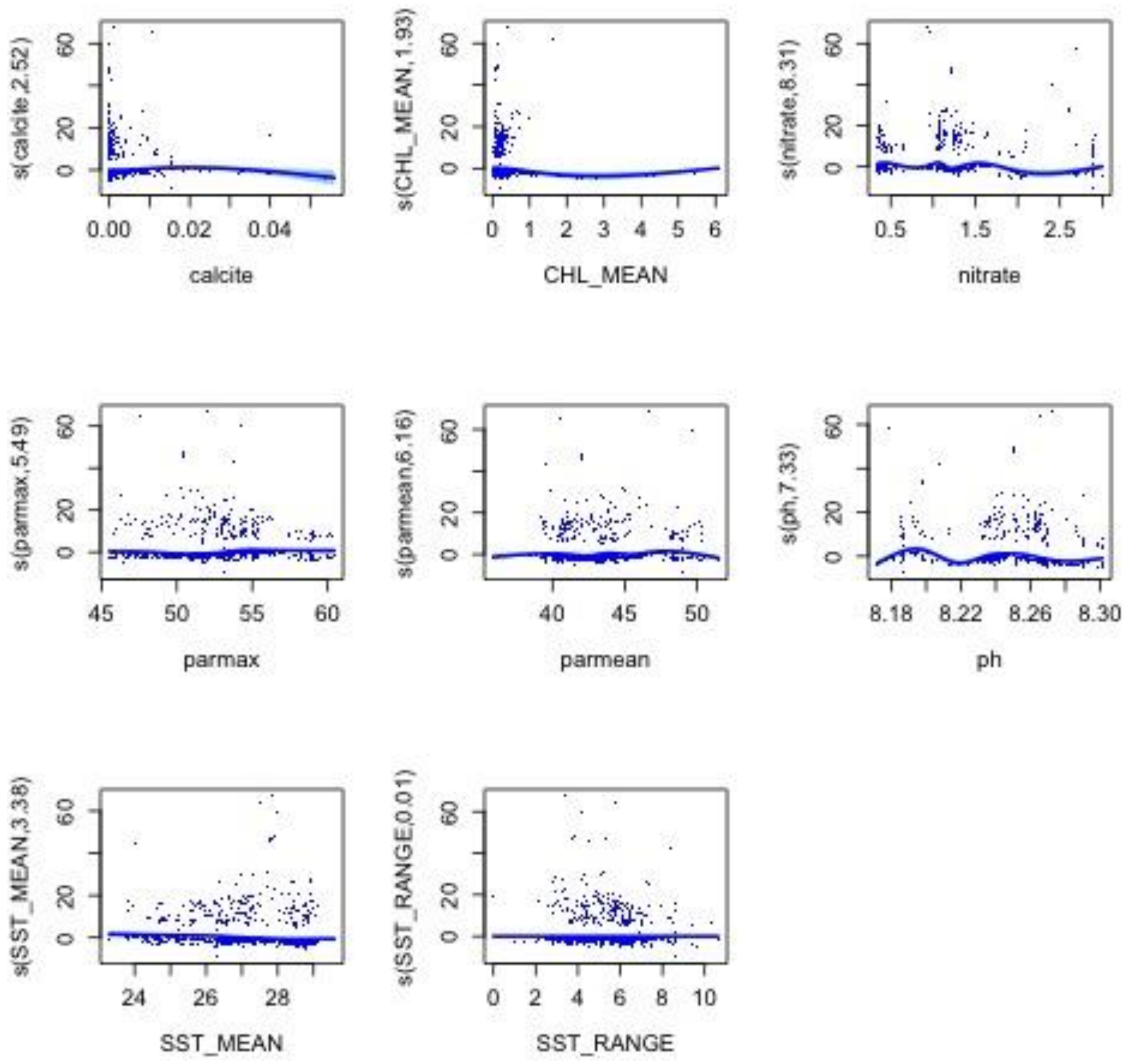
437 Stegastes aureus, n = 563 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.787730e+00	9	1.733121e+01	2.217216e-05
s(CHL_MEAN)	3.840562e+00	9	4.244226e+01	2.244828e-10
s(nitrate)	7.815426e-06	9	2.052651e-06	6.495946e-01
s(parmax)	2.806666e+00	9	7.137834e+00	2.891492e-02
s(parmean)	3.565659e+00	8	4.935582e+01	1.063065e-12
s(ph)	9.864714e-01	7	6.389149e+01	1.743504e-18
s(SST_MEAN)	6.418058e-06	9	1.981117e-06	6.550372e-01
s(SST_RANGE)	2.482855e+00	9	1.428289e+01	1.913623e-04



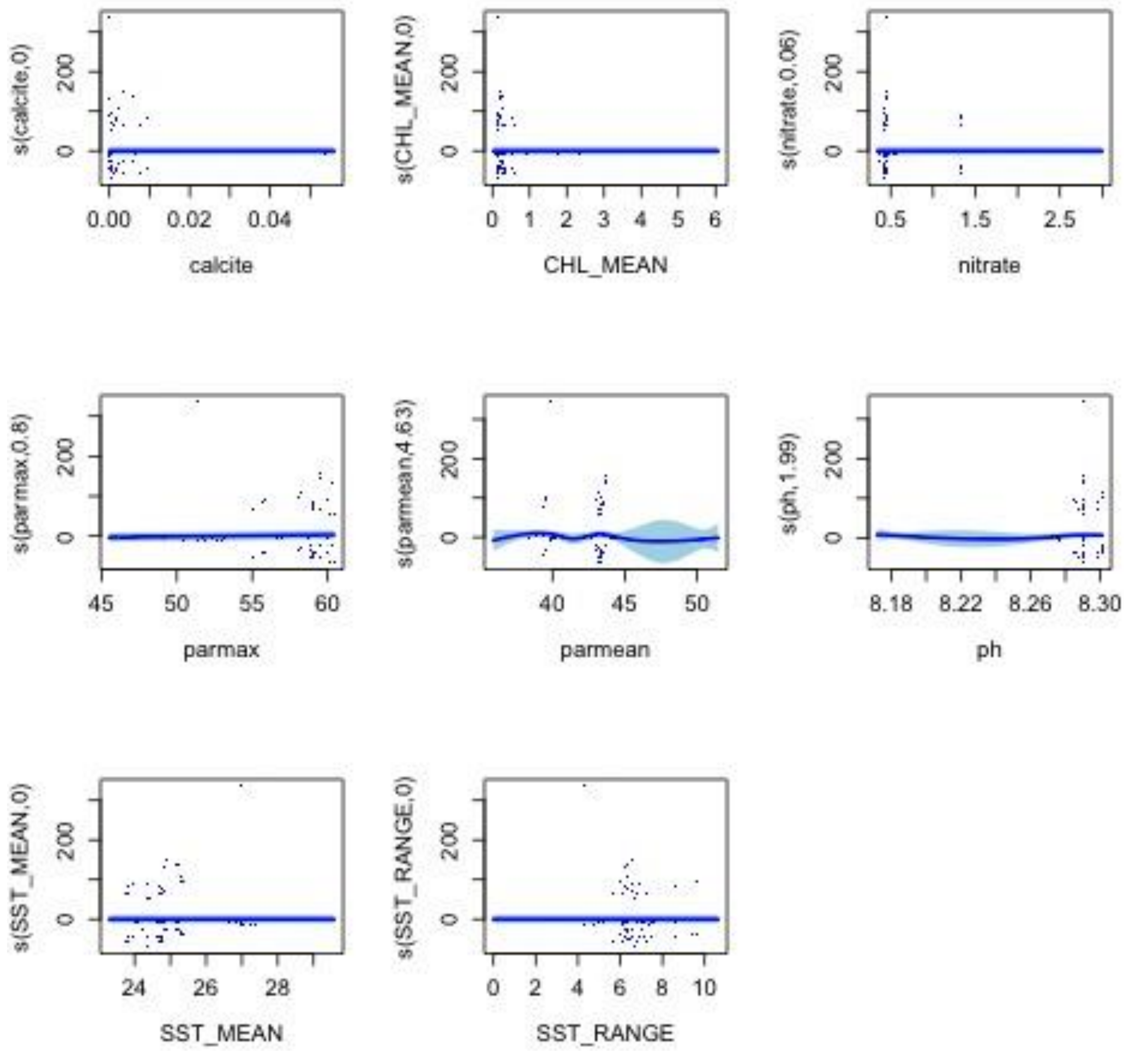
438 Stegastes fasciolatus, n = 736 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.52282180	9	10.10040680	6.541538e-03
s(CHL_MEAN)	1.93251282	9	18.47014604	1.834167e-05
s(nitrate)	8.31446568	9	120.62749492	1.687633e-25
s(parmax)	5.49297198	9	56.42890780	8.021742e-13
s(parmean)	6.15963374	9	44.77719674	2.668873e-09
s(ph)	7.32996753	9	85.09237992	1.007027e-17
s(SST_MEAN)	3.38206060	9	18.27464681	6.595388e-05
s(SST_RANGE)	0.01164435	9	0.01058834	3.529744e-01



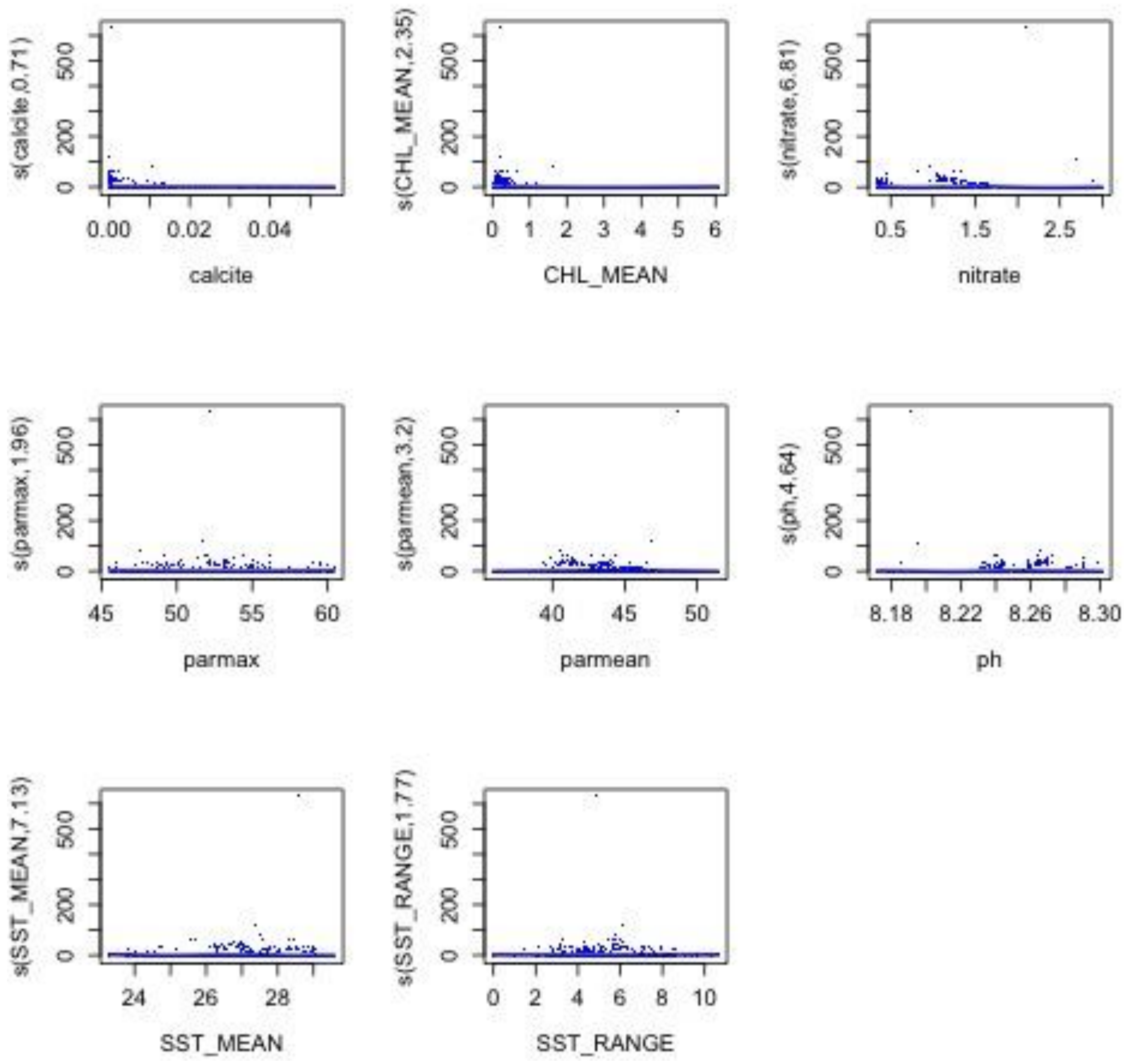
439 Stegastes gascoynei, n = 44 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.170903e-06	9	7.857522e-07	5.703060e-01
s(CHL_MEAN)	1.007240e-06	9	3.536636e-07	5.559914e-01
s(nitrate)	5.684191e-02	9	6.550505e-02	1.980382e-01
s(parmax)	7.968822e-01	8	3.675553e+00	1.807289e-02
s(parmean)	4.633948e+00	9	2.652343e+01	8.933596e-06
s(ph)	1.989478e+00	9	6.169897e+00	3.436061e-02
s(SST_MEAN)	1.561801e-06	9	1.372849e-07	8.475828e-01
s(SST_RANGE)	6.325009e-06	9	5.159049e-06	3.621693e-01



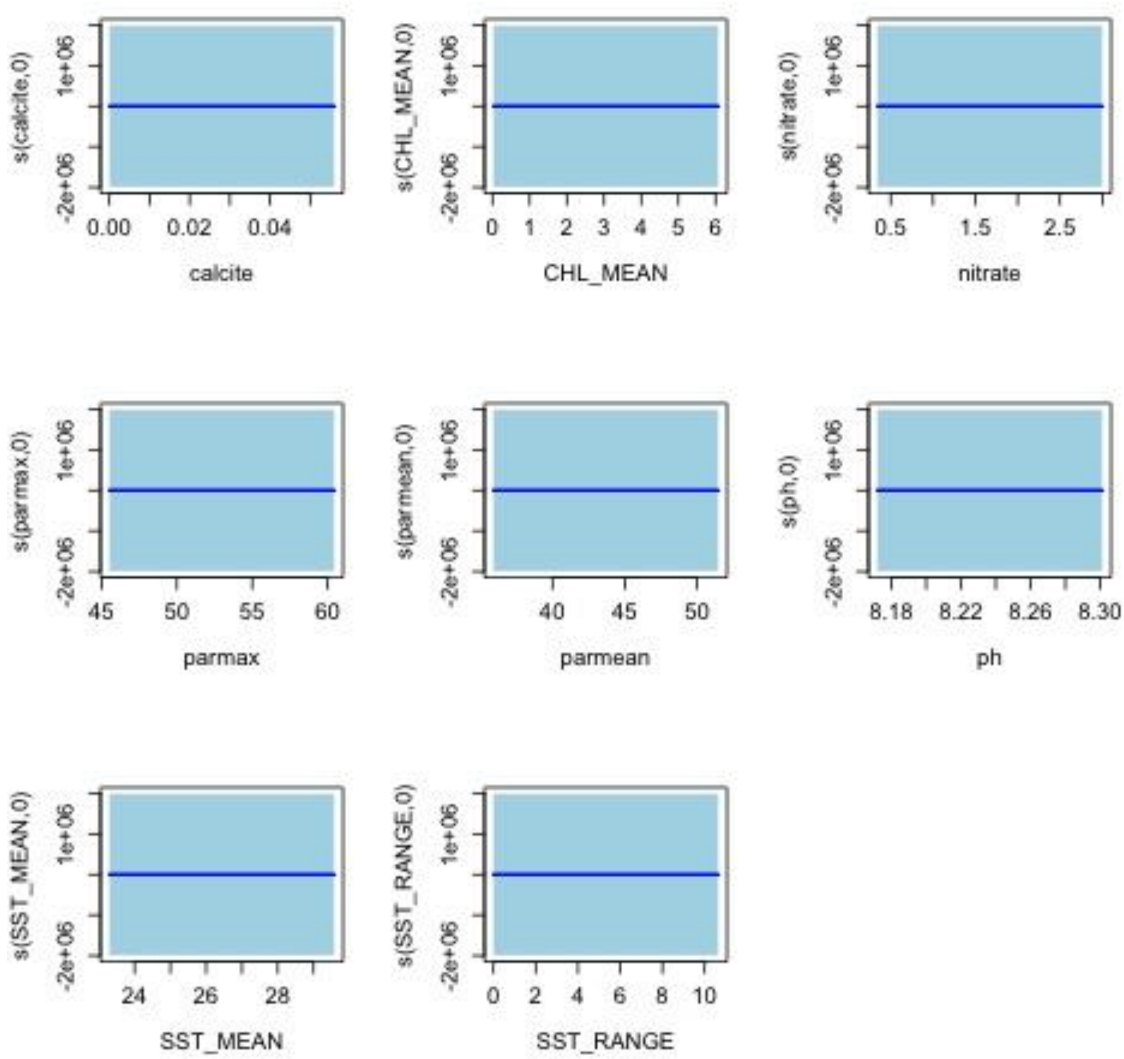
440 Stegastes nigricans, n = 181 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7116366	5	1.939972	9.371301e-02
s(CHL_MEAN)	2.3521734	9	11.887932	1.781946e-03
s(nitrate)	6.8100415	9	47.137456	9.601201e-11
s(parmax)	1.9606975	9	9.215652	1.867295e-03
s(parmean)	3.2016562	9	20.142772	1.314907e-05
s(ph)	4.6428755	9	21.686392	2.246897e-05
s(SST_MEAN)	7.1349352	9	54.276738	1.630270e-11
s(SST_RANGE)	1.7658220	9	6.738163	8.743912e-03



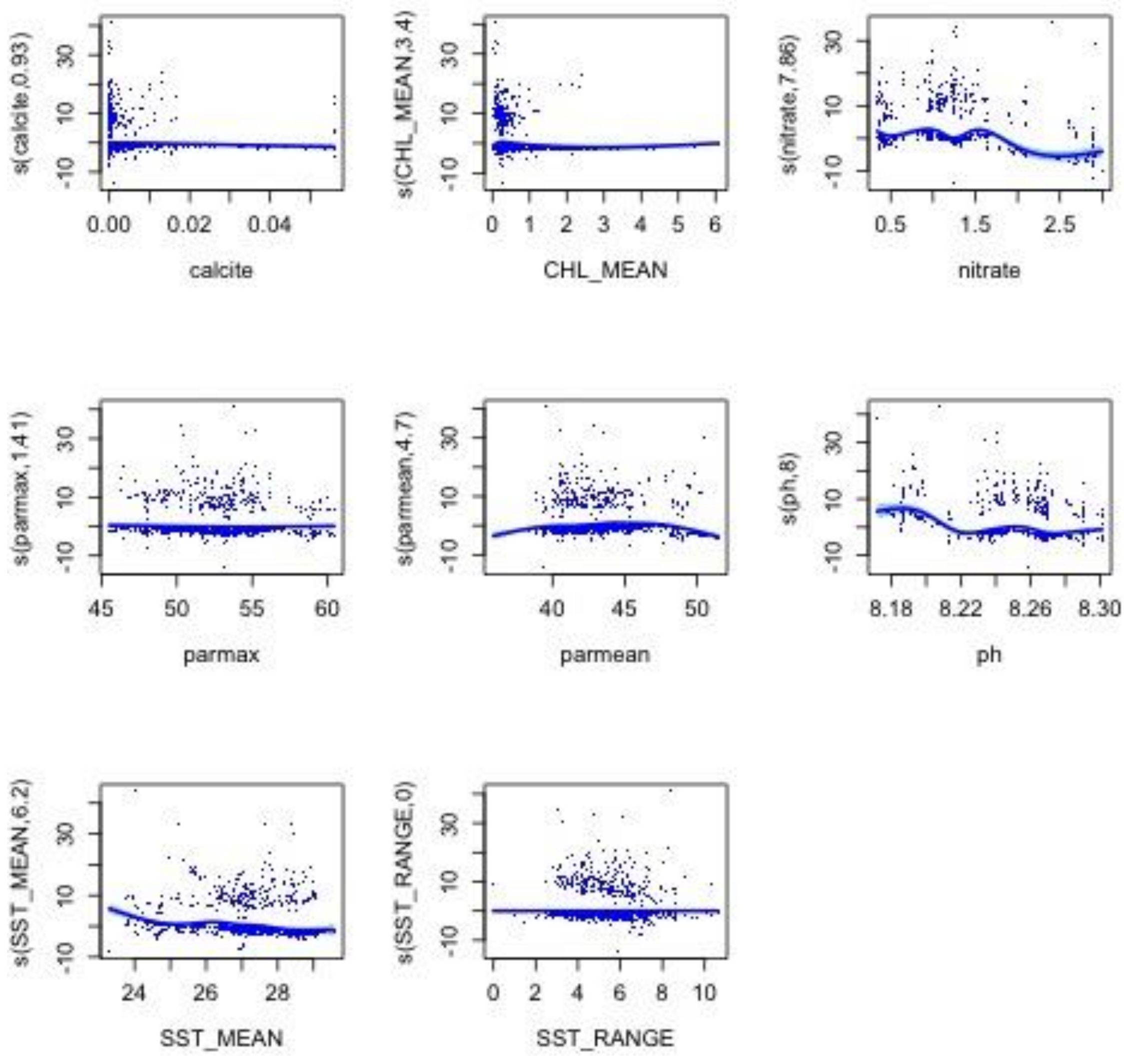
441 Stethojulis balteata, n = 46 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.161775e-09	8	5.529831e-50	1
s(CHL_MEAN)	2.593060e-11	9	1.314850e-52	1
s(nitrate)	2.498755e-12	9	2.614132e-51	1
s(parmax)	6.848125e-13	9	1.571652e-52	1
s(parmean)	1.123517e-12	9	7.084192e-53	1
s(ph)	6.219119e-13	9	3.095587e-51	1
s(SST_MEAN)	6.316176e-13	9	8.543518e-53	1
s(SST_RANGE)	7.132266e-13	9	3.085867e-51	1



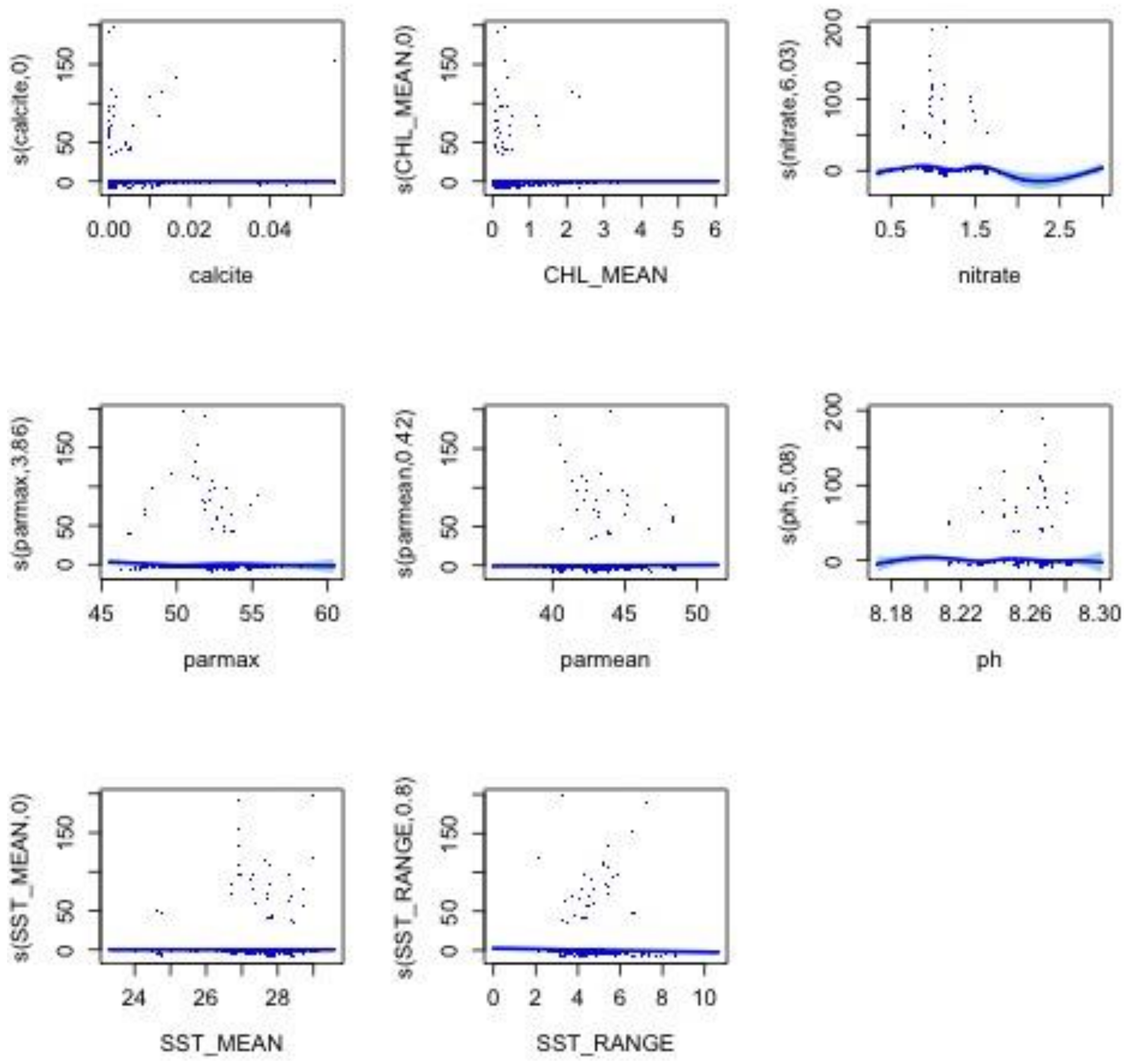
442 Stethojulis bandanensis, n = 592 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.925046482	5	1.160798e+01	3.149219e-04
s(CHL_MEAN)	3.398594626	9	3.313387e+01	7.503267e-08
s(nitrate)	7.861702656	9	1.619772e+02	1.152138e-36
s(parmax)	1.411111372	9	2.964113e+00	8.104717e-02
s(parmean)	4.703223254	9	6.756278e+01	1.054785e-16
s(ph)	8.002927654	9	1.140102e+02	6.912748e-25
s(SST_MEAN)	6.203083872	9	7.947477e+01	3.248394e-18
s(SST_RANGE)	0.002089431	9	1.798087e-03	3.960693e-01



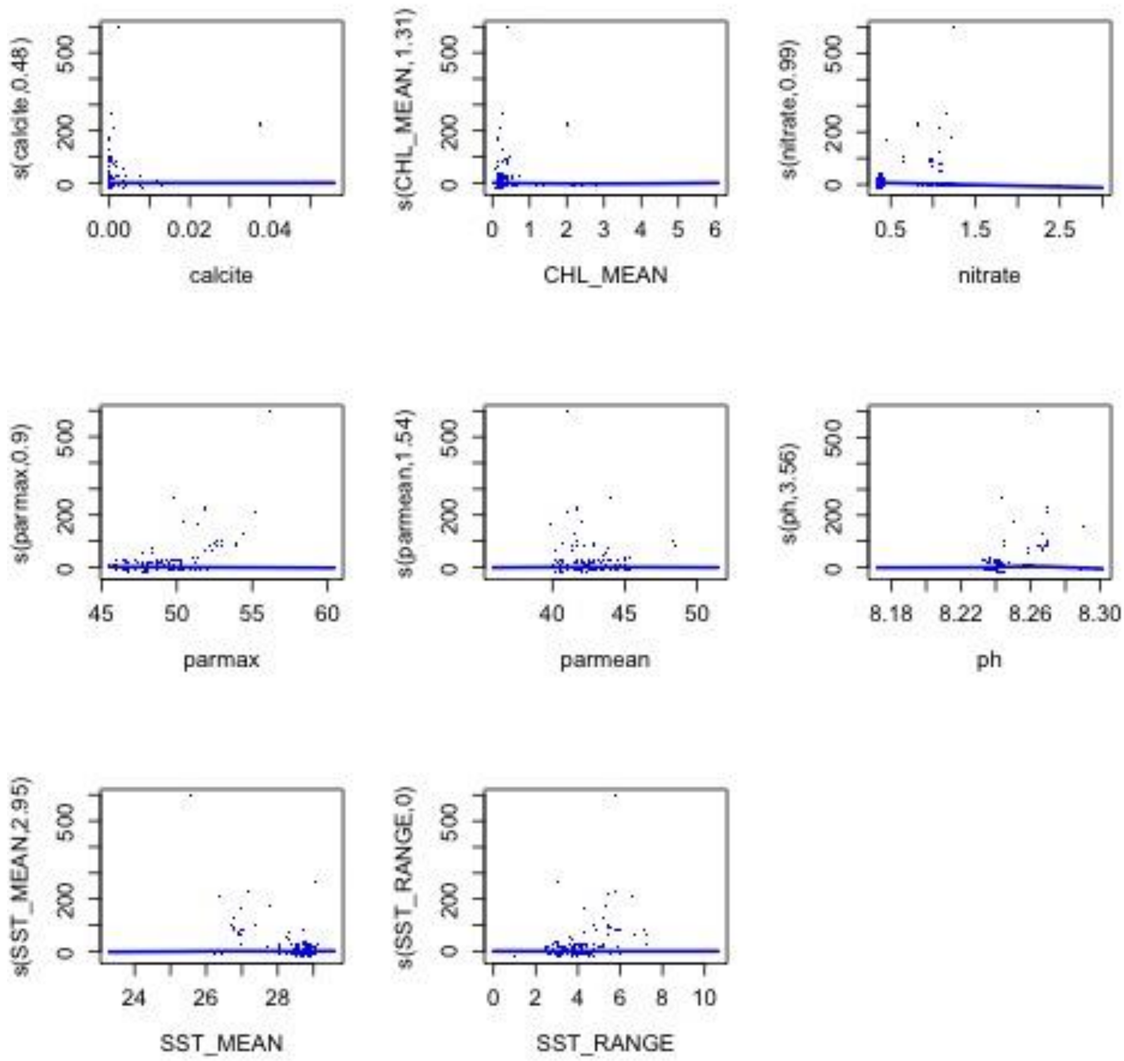
443 Stethojulis strigiventer, n = 55 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	6.935465e-06	9	2.960653e-06	5.551815e-01
s(CHL_MEAN)	7.667910e-06	9	1.378116e-06	6.905951e-01
s(nitrate)	6.033870e+00	9	3.219444e+01	3.510623e-07
s(parmax)	3.860680e+00	9	1.680953e+01	3.801957e-04
s(parmean)	4.225601e-01	9	5.724192e-01	2.037011e-01
s(ph)	5.080136e+00	9	1.654565e+01	9.727902e-04
s(SST_MEAN)	5.156031e-06	9	9.711999e-07	8.747319e-01
s(SST_RANGE)	7.981905e-01	9	4.459869e+00	8.344499e-03



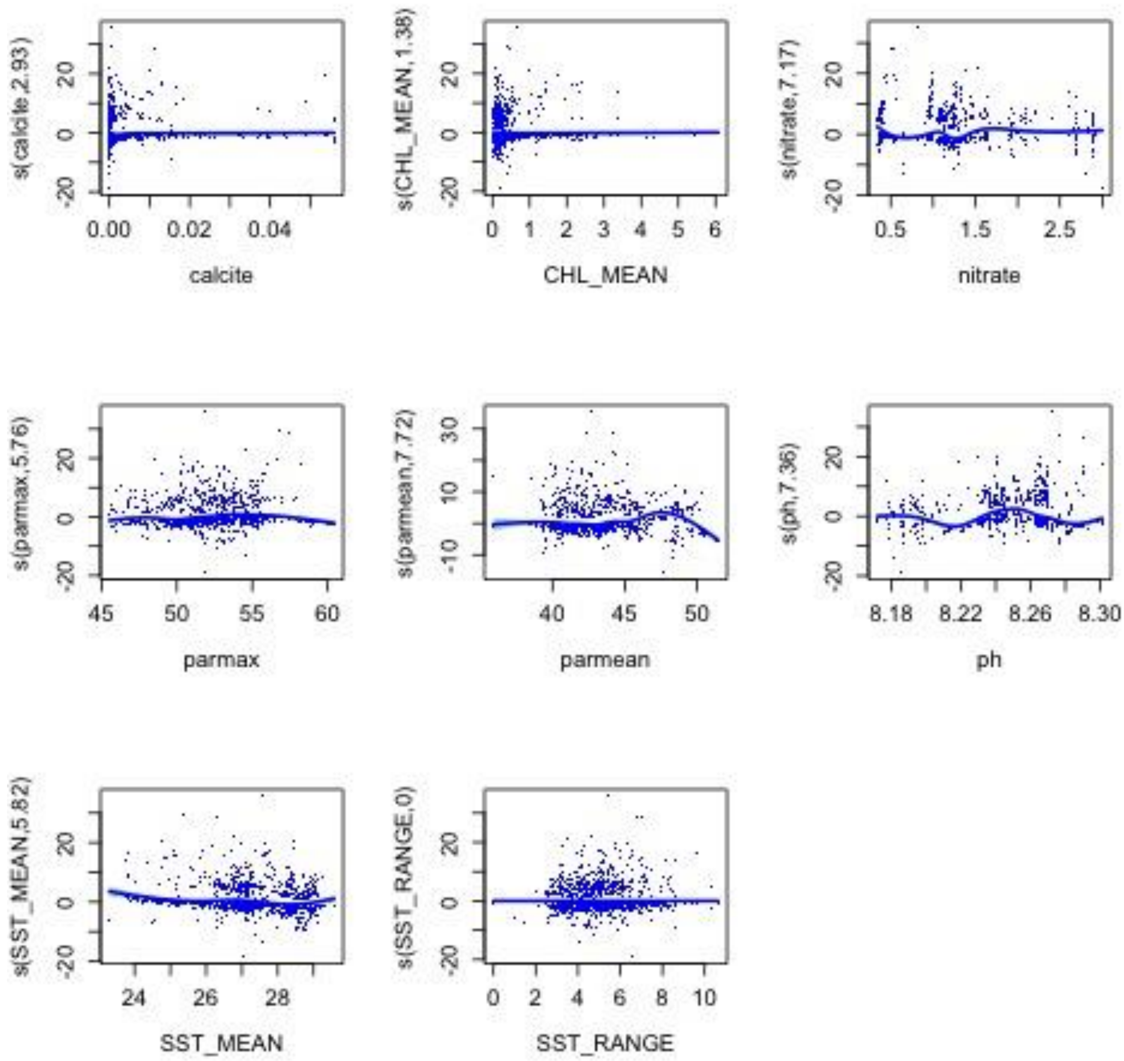
444 Stethojulis trilineata, n = 80 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.781986e-01	9	7.650166e-01	1.967158e-01
s(CHL_MEAN)	1.309841e+00	9	1.761719e+01	6.438655e-06
s(nitrate)	9.878173e-01	9	7.404695e+01	7.842720e-20
s(parmax)	8.967832e-01	7	8.362162e+00	8.548632e-04
s(parmean)	1.543208e+00	9	4.494281e+00	2.882386e-02
s(ph)	3.556932e+00	9	3.489876e+01	1.059714e-08
s(SST_MEAN)	2.950620e+00	9	6.007547e+00	6.316897e-02
s(SST_RANGE)	3.172361e-06	9	1.323152e-06	6.777158e-01



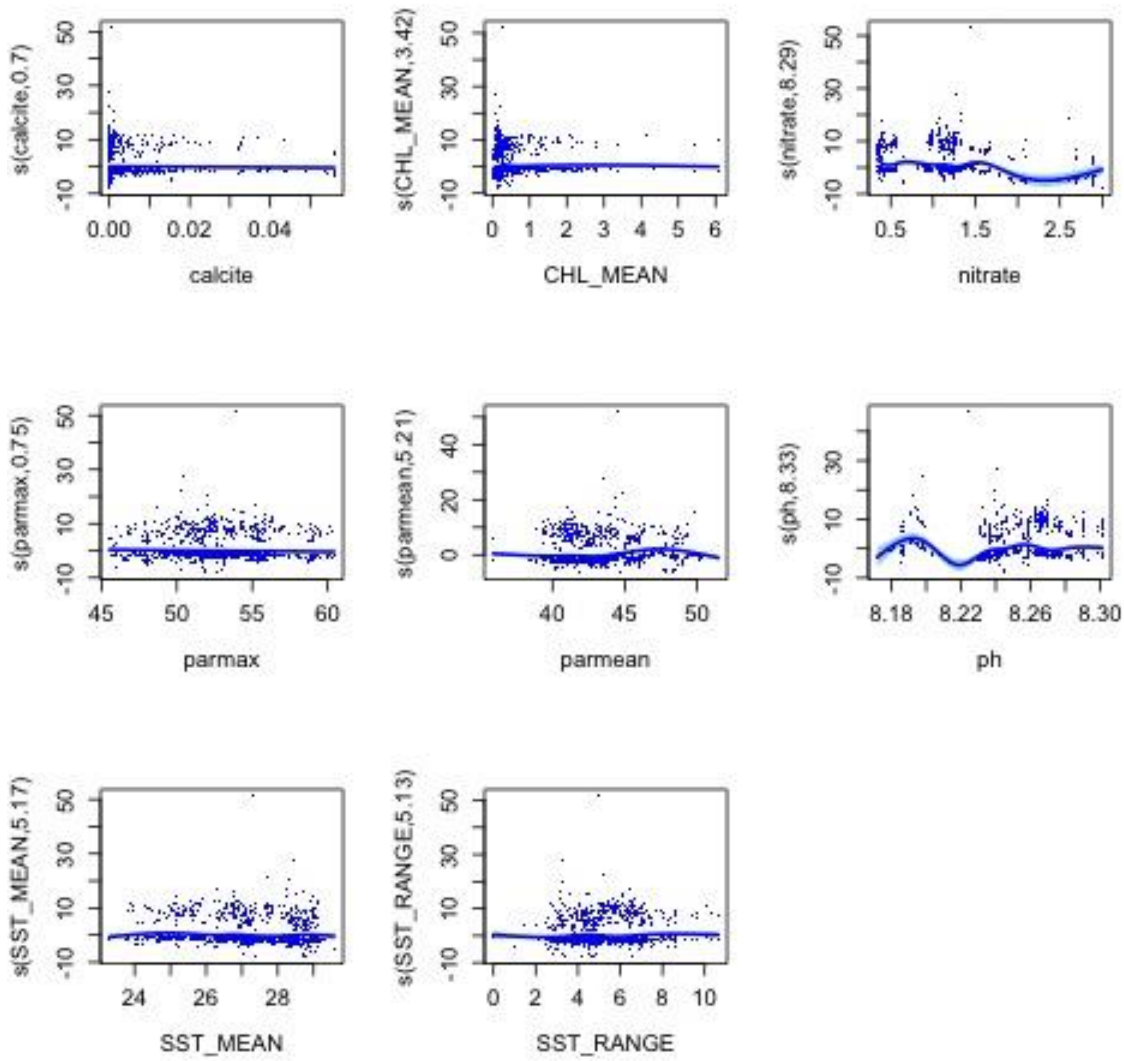
445 Sufflamen bursa, n = 1290 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.933020028	9	2.336326e+01	1.111808e-05
s(CHL_MEAN)	1.379241222	9	3.249882e+00	9.143619e-02
s(nitrate)	7.166321618	9	2.339150e+02	1.063651e-52
s(parmax)	5.759505960	9	5.549929e+01	7.039351e-12
s(parmean)	7.716638772	9	2.489918e+02	6.410360e-56
s(ph)	7.356419246	9	1.937503e+02	8.587932e-43
s(SST_MEAN)	5.818163710	9	5.924605e+01	5.007584e-13
s(SST_RANGE)	0.001724421	9	7.022250e-04	6.597008e-01



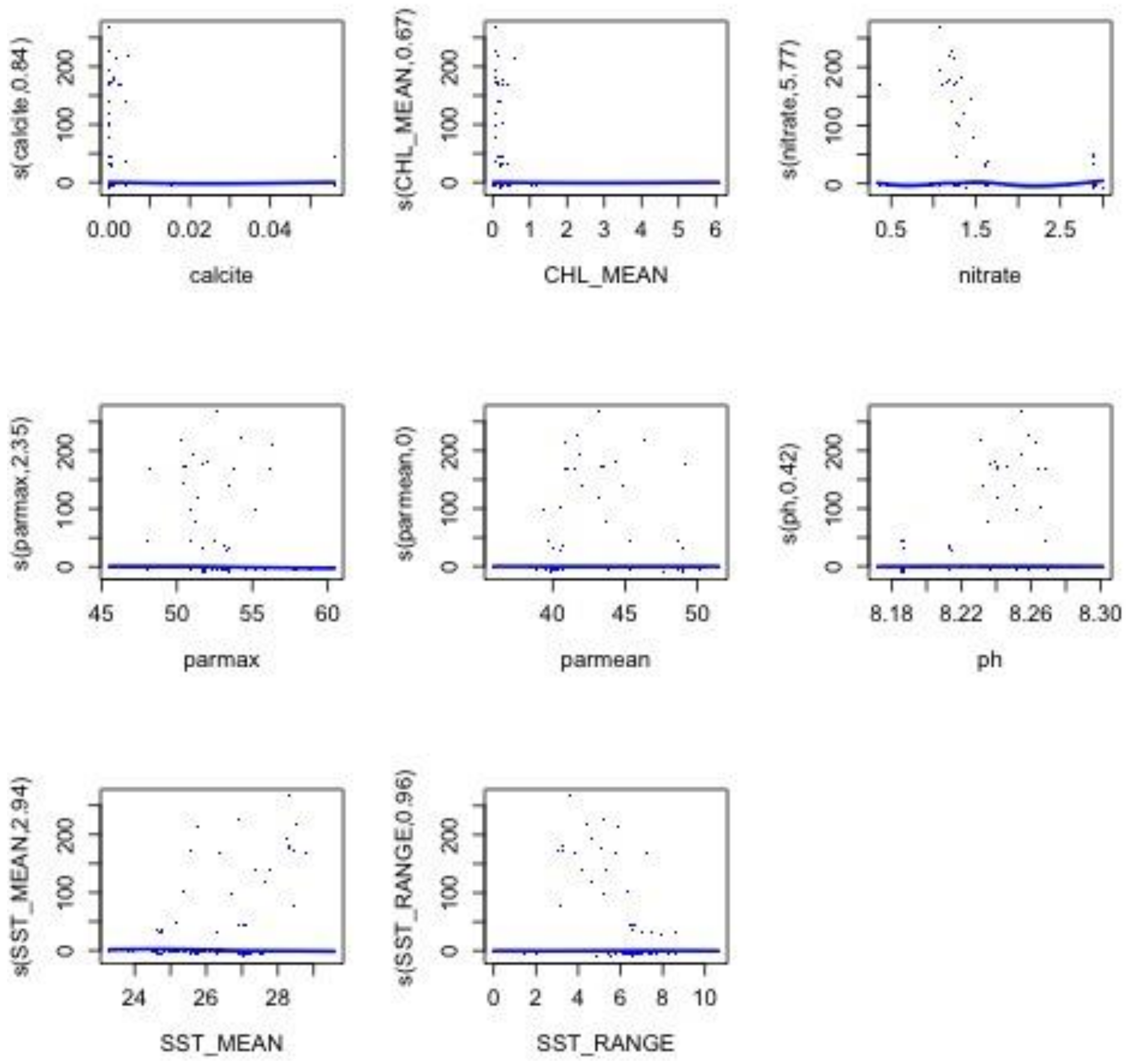
446 Sufflamen chrysopterum, n = 765 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.7002552	7	2.231522	7.185391e-02
s(CHL_MEAN)	3.4160258	9	33.792113	6.371273e-08
s(nitrate)	8.2892834	9	107.667391	1.481291e-22
s(parmax)	0.7471326	9	2.863216	4.319482e-02
s(parmean)	5.2127504	9	91.620236	1.439892e-21
s(ph)	8.3337523	9	132.120721	9.090328e-28
s(SST_MEAN)	5.1672002	9	19.740820	4.473970e-04
s(SST_RANGE)	5.1252197	9	34.014689	3.901183e-07



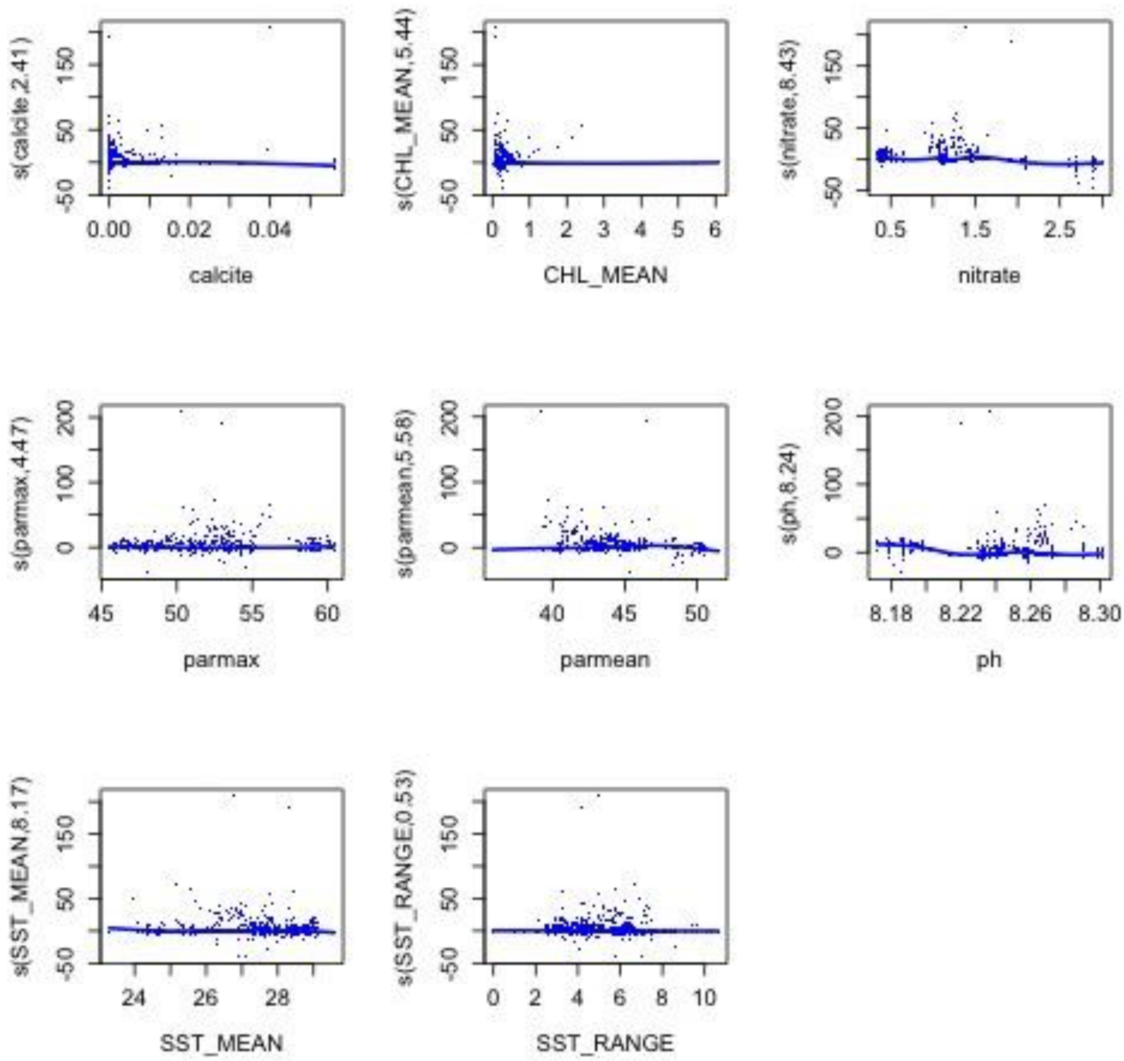
447 Sufflamen fraenatum, n = 65 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.405904e-01	9	2.195681e+00	8.836249e-02
s(CHL_MEAN)	6.715560e-01	9	1.243899e+00	1.526694e-01
s(nitrate)	5.765086e+00	9	3.023882e+01	1.115472e-06
s(parmax)	2.353347e+00	9	1.096988e+01	1.519859e-03
s(parmean)	6.056417e-05	9	4.158134e-05	4.409708e-01
s(ph)	4.215475e-01	9	4.902321e-01	2.427814e-01
s(SST_MEAN)	2.943685e+00	9	2.004667e+01	2.428812e-06
s(SST_RANGE)	9.577952e-01	9	1.069398e+00	2.861541e-01



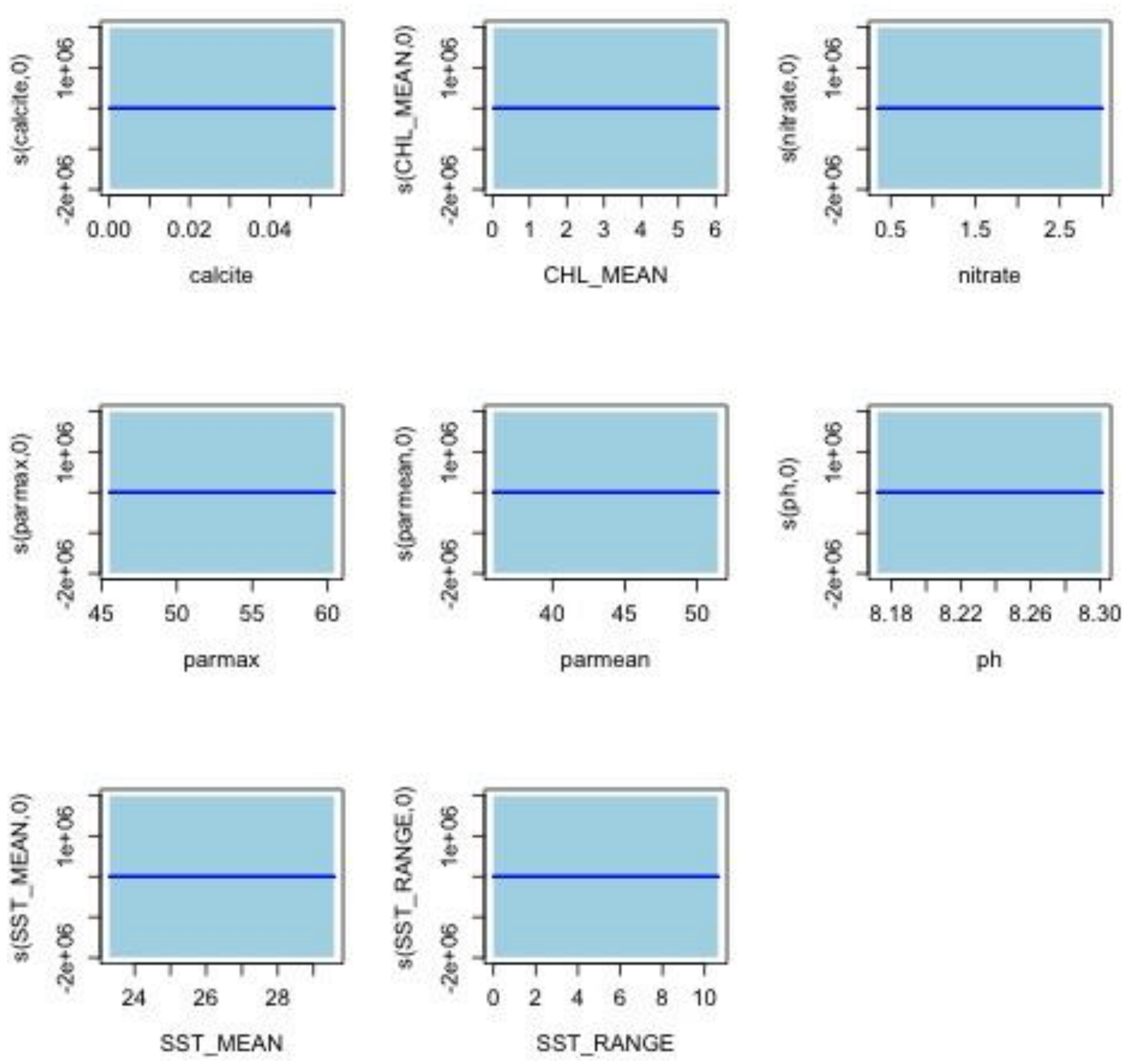
448 Thalassoma amblycephalum, n = 979 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.4086171	9	49.08495	1.274789e-12
s(CHL_MEAN)	5.4446849	9	58.64418	2.873634e-12
s(nitrate)	8.4289203	9	174.63879	1.686558e-37
s(parmax)	4.4749273	9	39.35032	3.089302e-09
s(parmean)	5.5792434	9	154.64507	2.328285e-37
s(ph)	8.2419752	9	167.81165	1.532087e-36
s(SST_MEAN)	8.1703809	9	55.94249	2.266263e-10
s(SST_RANGE)	0.5293393	9	1.09121	1.453667e-01



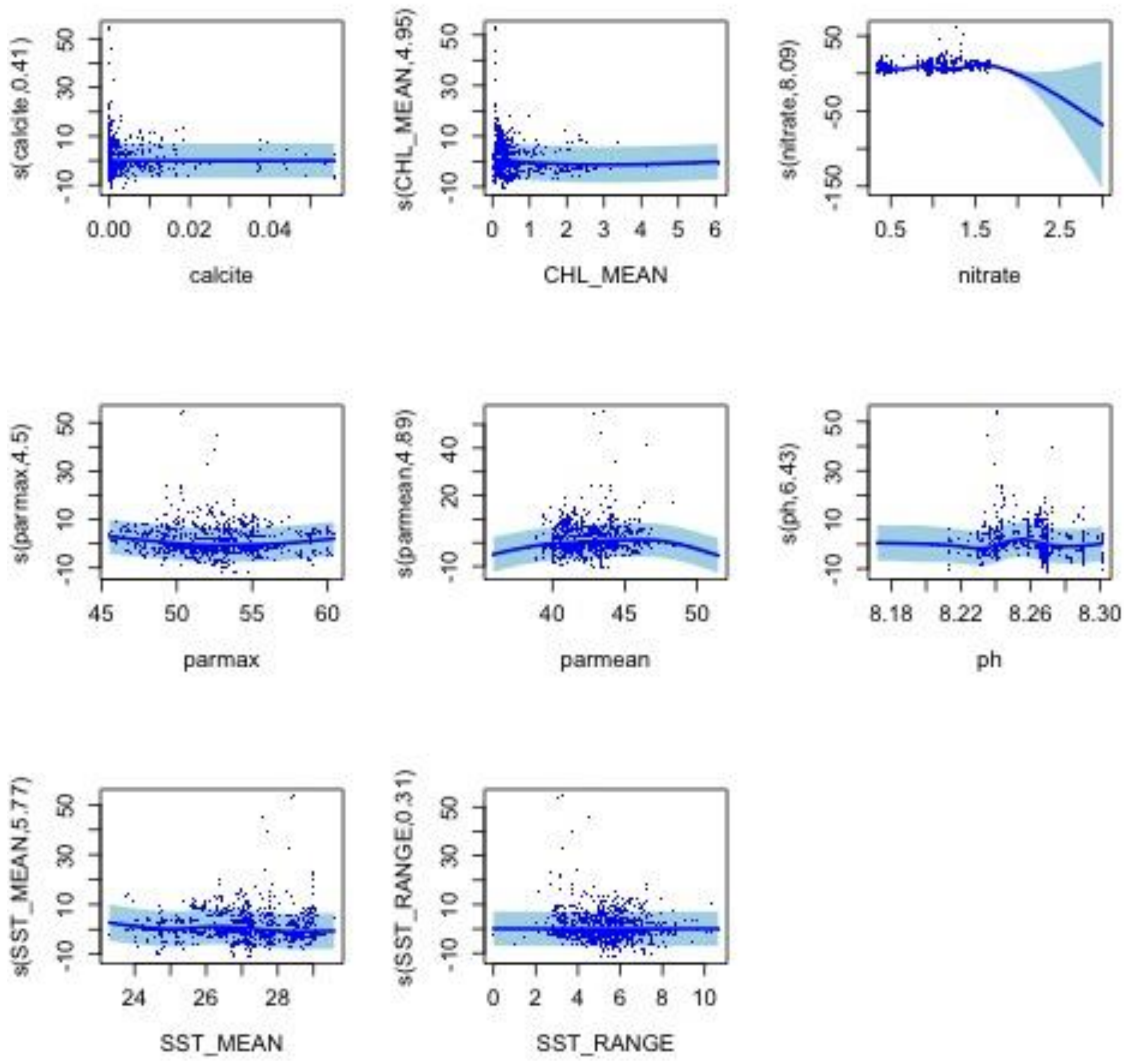
449 Thalassoma duperrey, n = 84 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	5.161775e-09	8	5.529831e-50	1
s(CHL_MEAN)	2.593060e-11	9	1.314850e-52	1
s(nitrate)	2.498755e-12	9	2.614132e-51	1
s(parmax)	6.848125e-13	9	1.571652e-52	1
s(parmean)	1.123517e-12	9	7.084192e-53	1
s(ph)	6.219119e-13	9	3.095587e-51	1
s(SST_MEAN)	6.316176e-13	9	8.543518e-53	1
s(SST_RANGE)	7.132266e-13	9	3.085867e-51	1



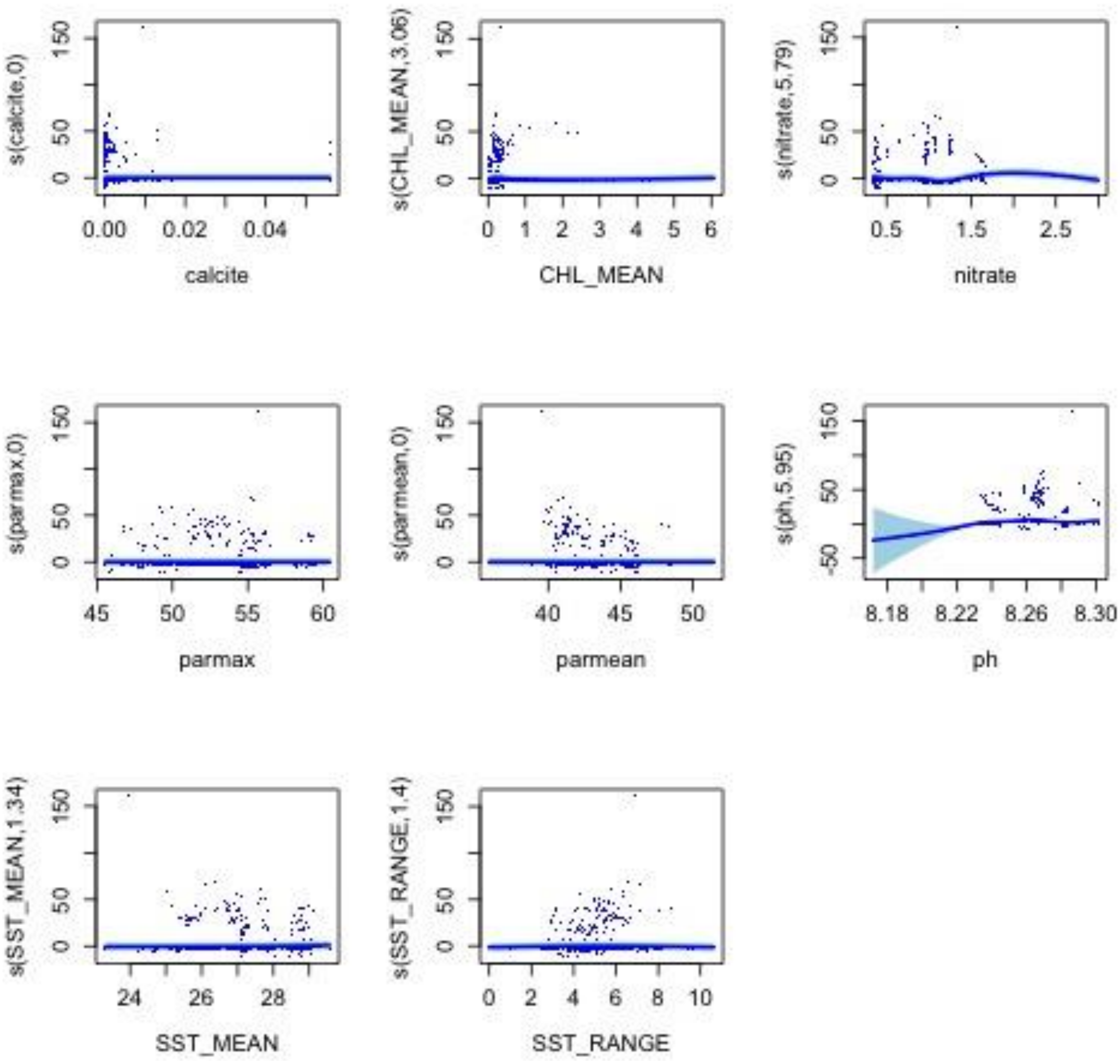
450 Thalassoma hardwicke, n = 872 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.4084996	9	0.6271101	2.027329e-01
s(CHL_MEAN)	4.9531626	9	126.3727951	4.617896e-29
s(nitrate)	8.0875982	9	320.4467539	1.641649e-74
s(parmax)	4.5001772	9	90.1029483	3.875972e-23
s(parmean)	4.8936586	9	48.3868552	1.704125e-11
s(ph)	6.4259126	9	92.6469977	4.164335e-21
s(SST_MEAN)	5.7694881	9	48.7701059	6.472884e-11
s(SST_RANGE)	0.3071466	9	0.3529467	2.887581e-01



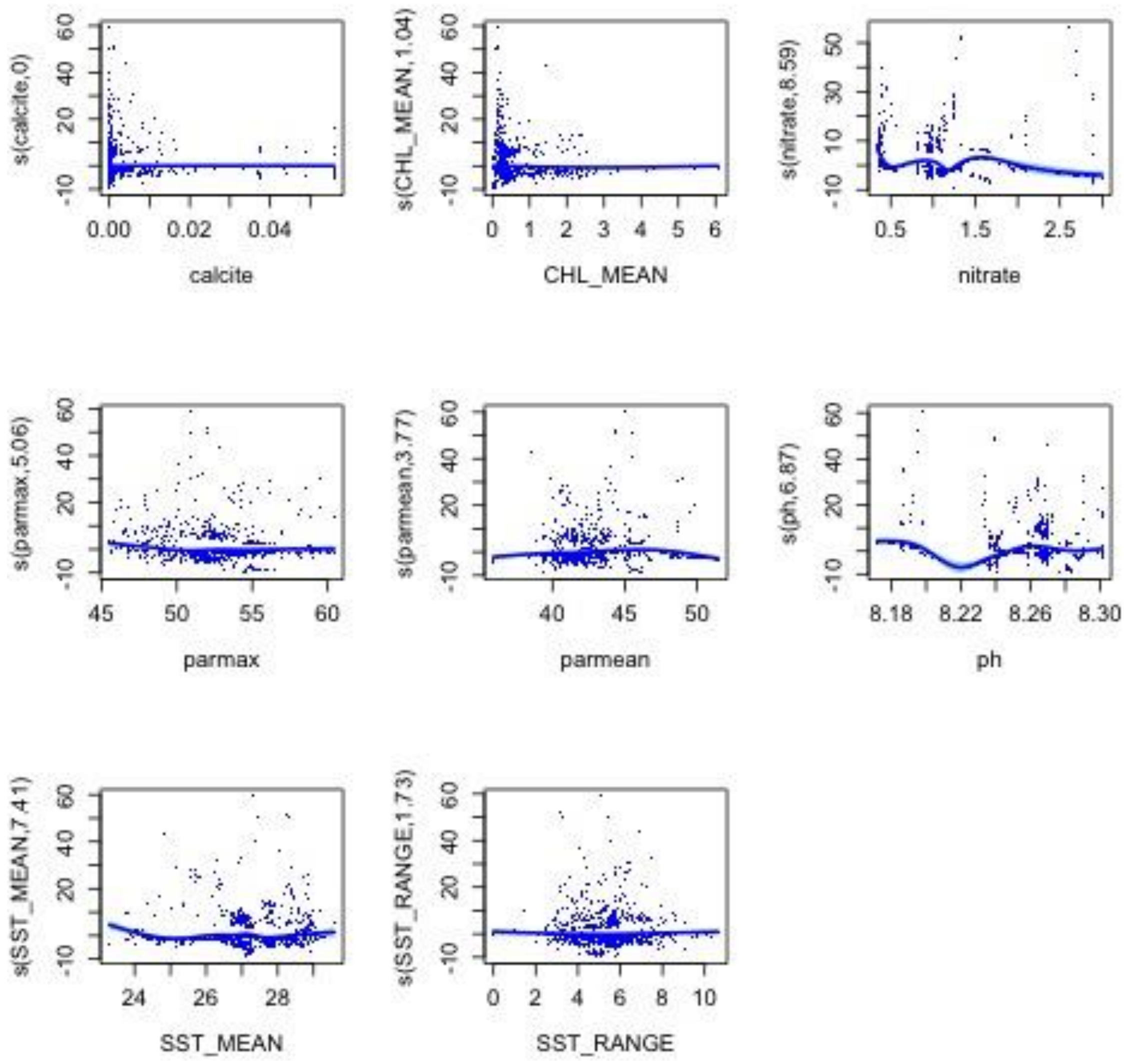
451 Thalassoma jansenii, n = 126 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	4.722696e-05	9	7.514706e-06	8.611998e-01
s(CHL_MEAN)	3.058501e+00	9	2.396935e+01	7.254603e-06
s(nitrate)	5.786943e+00	9	1.091504e+02	3.624439e-27
s(parmax)	3.730121e-05	9	1.828844e-05	6.316798e-01
s(parmean)	4.739845e-05	9	1.085485e-05	8.344880e-01
s(ph)	5.952051e+00	9	7.353158e+01	7.764305e-17
s(SST_MEAN)	1.342631e+00	9	2.738811e+00	8.360871e-02
s(SST_RANGE)	1.395751e+00	9	3.247361e+00	6.585709e-02



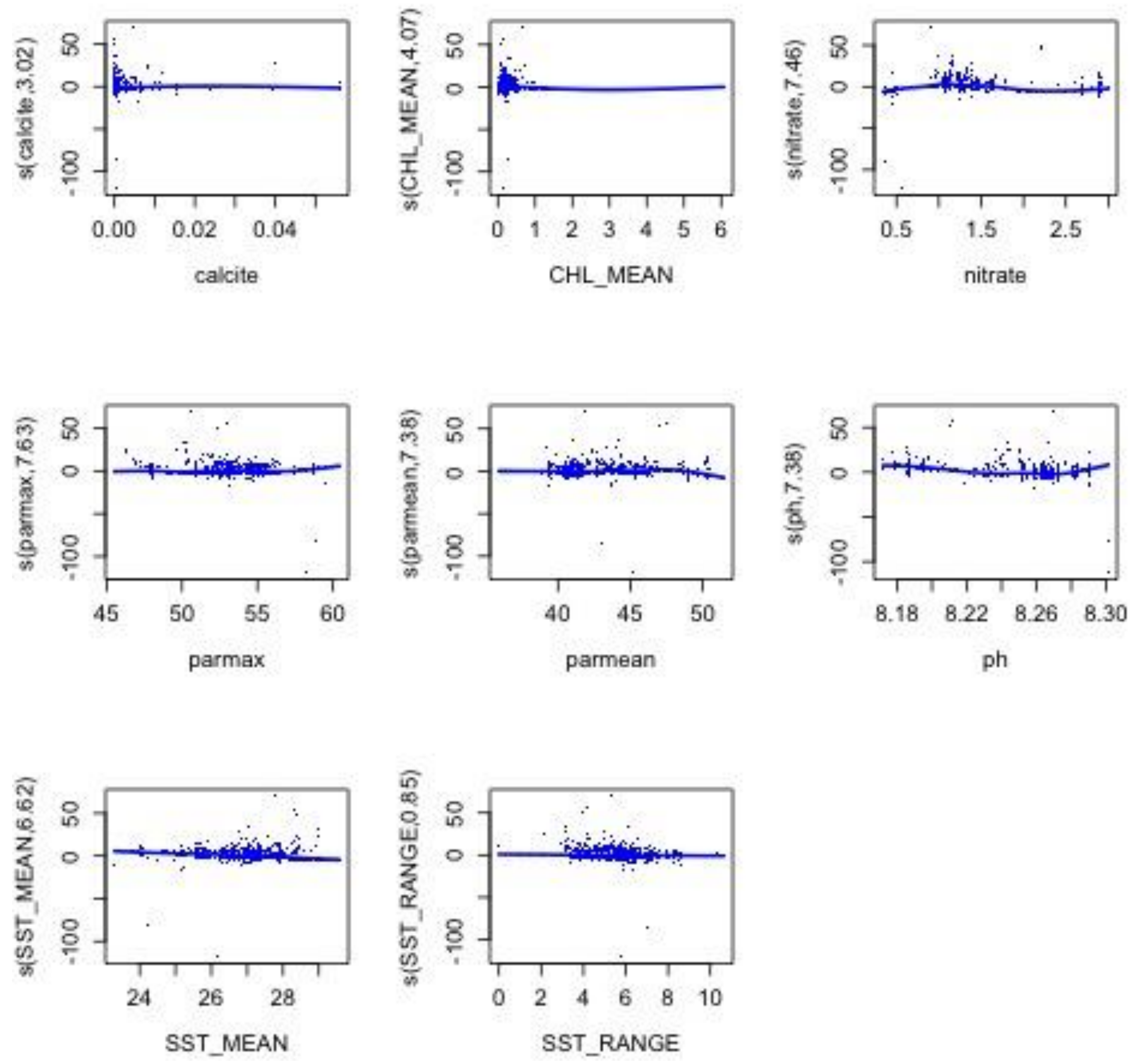
452 Thalassoma lunare, n = 548 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.0005885638	9	4.121116e-04	4.169177e-01
s(CHL_MEAN)	1.0371528653	9	5.506500e+00	1.136210e-02
s(nitrate)	8.5904036131	9	2.731547e+02	8.252266e-62
s(parmax)	5.0600573530	9	4.222961e+01	1.035640e-09
s(parmean)	3.7733324066	9	3.096656e+01	7.838562e-08
s(ph)	6.8656598052	9	1.002482e+02	6.395464e-22
s(SST_MEAN)	7.4084664861	9	6.602668e+01	1.176107e-13
s(SST_RANGE)	1.7292272605	9	6.335568e+00	1.200887e-02



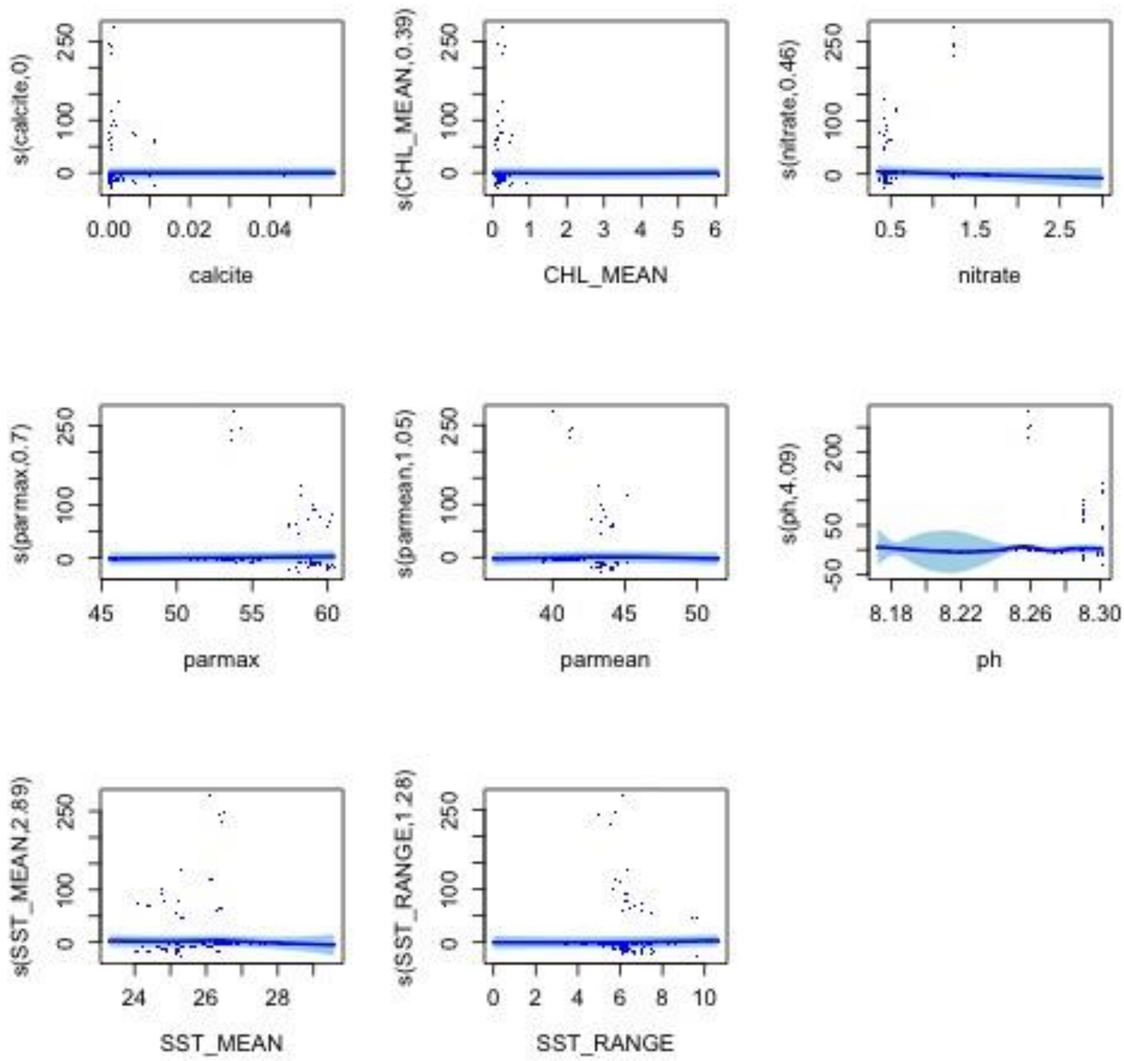
453 Thalassoma lutescens, n = 1281 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.0200363	9	22.350737	2.065068e-05
s(CHL_MEAN)	4.0727261	9	21.071356	1.155935e-04
s(nitrate)	7.4575751	9	232.512913	3.428952e-55
s(parmax)	7.6299691	9	75.687013	1.943659e-15
s(parmean)	7.3836320	9	95.001499	1.619078e-20
s(ph)	7.3839288	9	100.756678	5.617625e-23
s(SST_MEAN)	6.6209208	9	100.427438	1.791488e-22
s(SST_RANGE)	0.8542998	9	5.595009	9.290148e-03



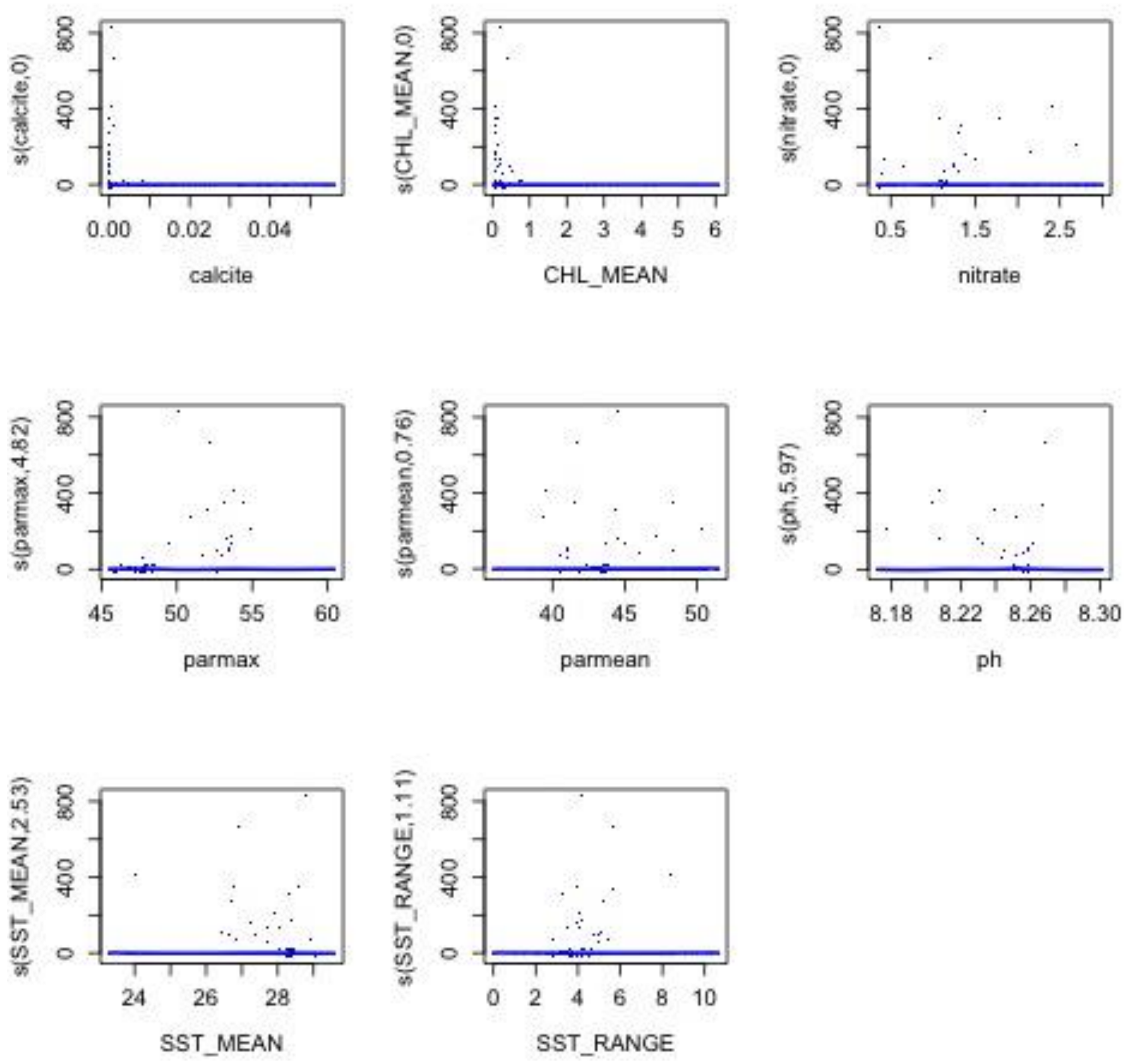
454 Thalassoma nigrofasciatum, n = 38 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	7.016794e-06	8	8.360967e-07	0.761198393
s(CHL_MEAN)	3.870389e-01	9	6.627031e-01	0.153191920
s(nitrate)	4.630772e-01	7	1.238605e+00	0.069148035
s(parmax)	7.005614e-01	9	1.507502e+00	0.067801453
s(parmean)	1.048040e+00	9	1.728215e+00	0.117066856
s(ph)	4.090655e+00	9	1.275412e+01	0.003347972
s(SST_MEAN)	2.893656e+00	9	7.136333e+00	0.012835500
s(SST_RANGE)	1.276333e+00	9	6.775934e+00	0.005136885



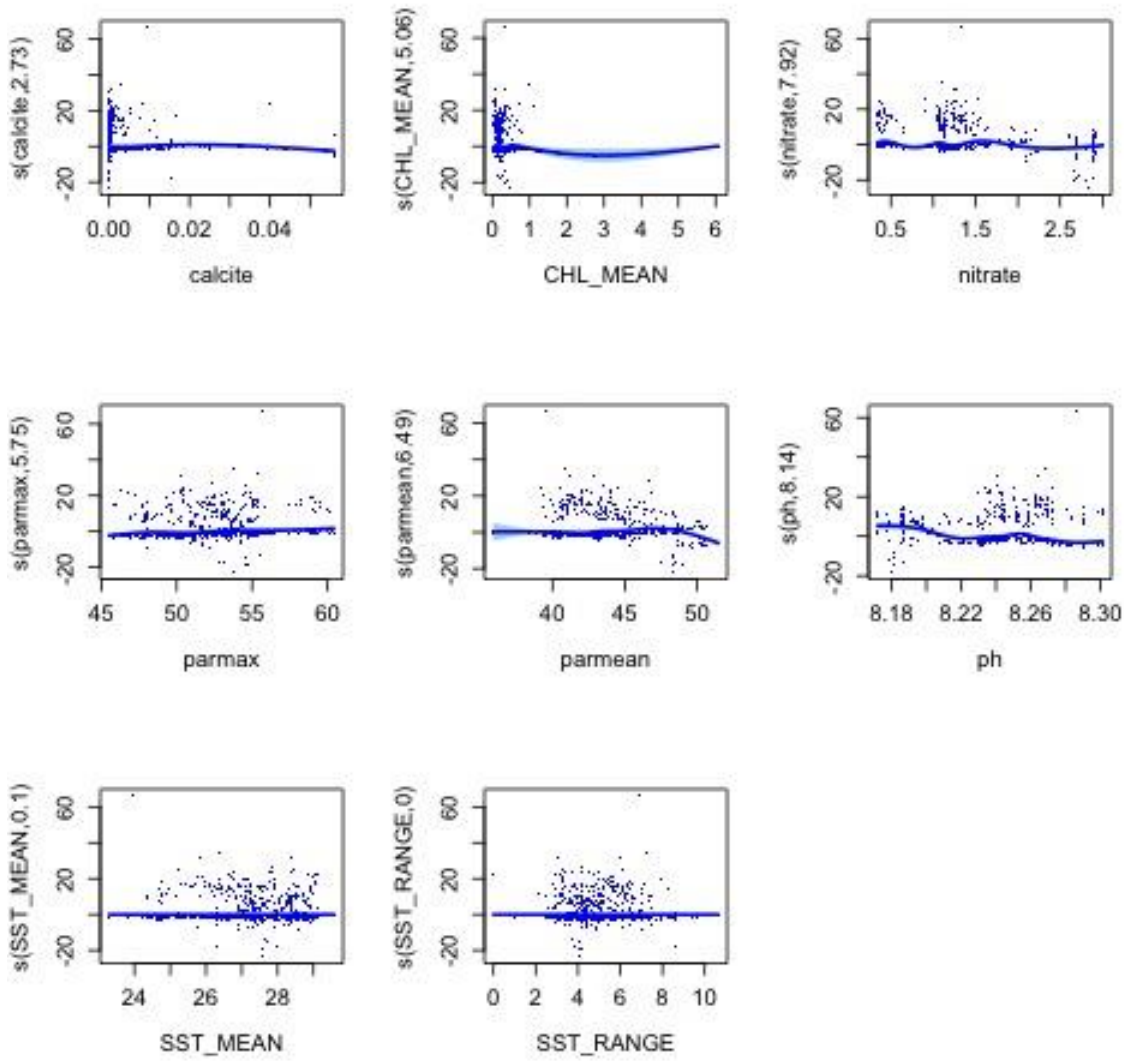
455 Thalassoma purpureum, n = 117 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.124120e-06	9	4.119170e-06	5.074149e-01
s(CHL_MEAN)	8.433106e-06	9	1.985045e-07	1.000000e+00
s(nitrate)	3.612250e-05	9	2.747172e-05	3.662746e-01
s(parmax)	4.816900e+00	9	4.782814e+01	3.940880e-11
s(parmean)	7.620290e-01	9	2.773932e+00	4.345571e-02
s(ph)	5.965966e+00	9	8.629958e+01	2.076214e-19
s(SST_MEAN)	2.531834e+00	9	6.808323e+00	2.198944e-02
s(SST_RANGE)	1.108609e+00	9	2.127598e+00	1.134530e-01



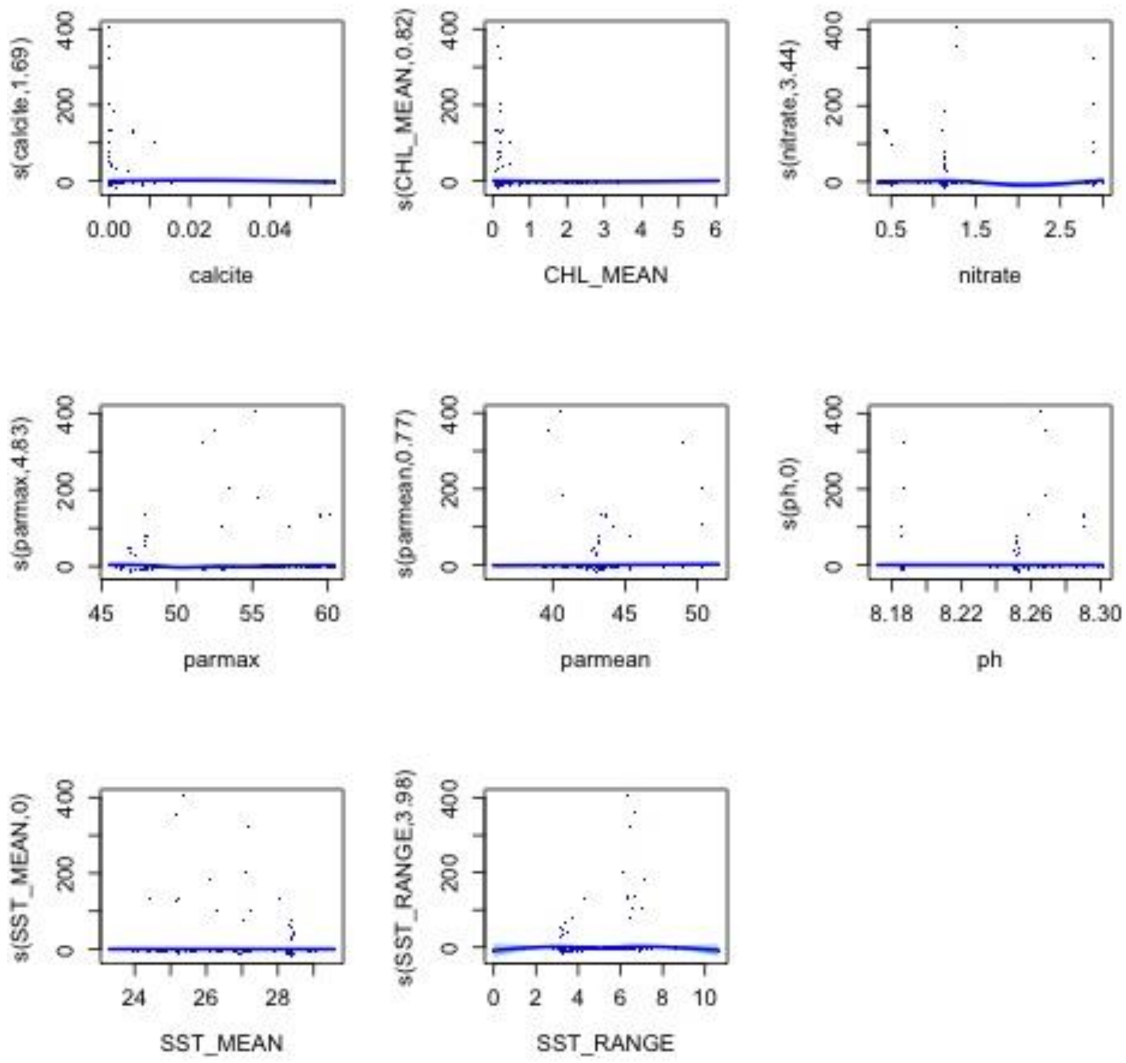
456 Thalassoma quinquevittatum, n = 1444 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.7324431853	9	2.258887e+01	1.111187e-05
s(CHL_MEAN)	5.0550728073	9	3.585347e+01	1.932793e-07
s(nitrate)	7.9207210386	9	1.104887e+02	2.751219e-23
s(parmax)	5.7499523361	9	4.447522e+01	1.552046e-09
s(parmean)	6.4855792869	9	1.871716e+02	2.563781e-44
s(ph)	8.1438117181	9	1.832030e+02	6.343729e-41
s(SST_MEAN)	0.1015709934	9	1.011790e-01	3.077546e-01
s(SST_RANGE)	0.0004257687	9	4.076217e-04	3.175644e-01



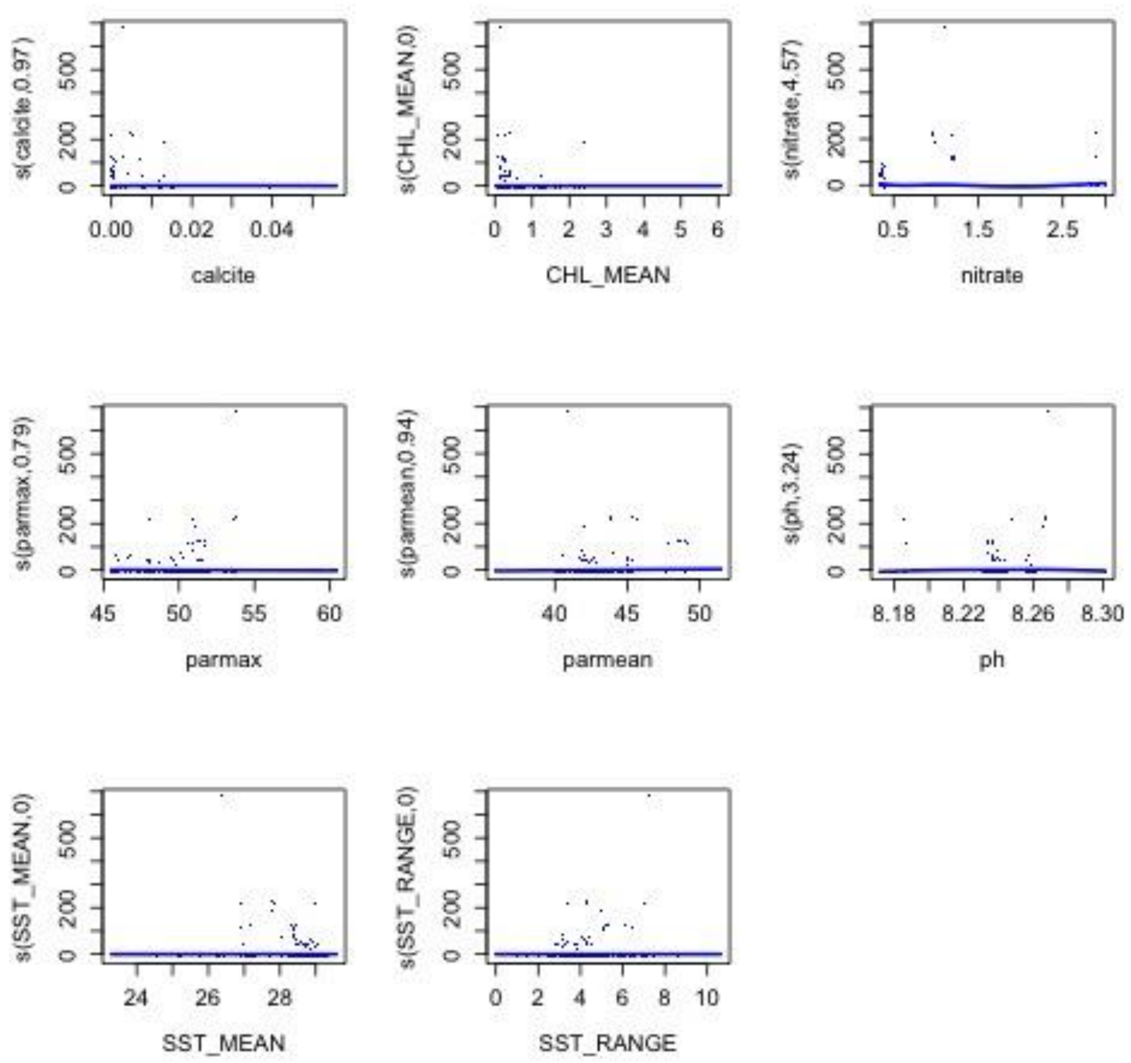
457 Thalassoma trilobatum, n = 95 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.694655e+00	9	4.171400e+00	6.914939e-02
s(CHL_MEAN)	8.162688e-01	9	1.854122e+00	1.085160e-01
s(nitrate)	3.436598e+00	9	1.068416e+01	6.379844e-03
s(parmax)	4.826572e+00	9	3.200667e+01	1.939542e-07
s(parmean)	7.657218e-01	9	2.257394e+00	6.986863e-02
s(ph)	1.413128e-05	9	4.136006e-06	7.247456e-01
s(SST_MEAN)	6.999924e-04	9	4.376601e-04	4.633637e-01
s(SST_RANGE)	3.979588e+00	9	1.251405e+01	6.314962e-03



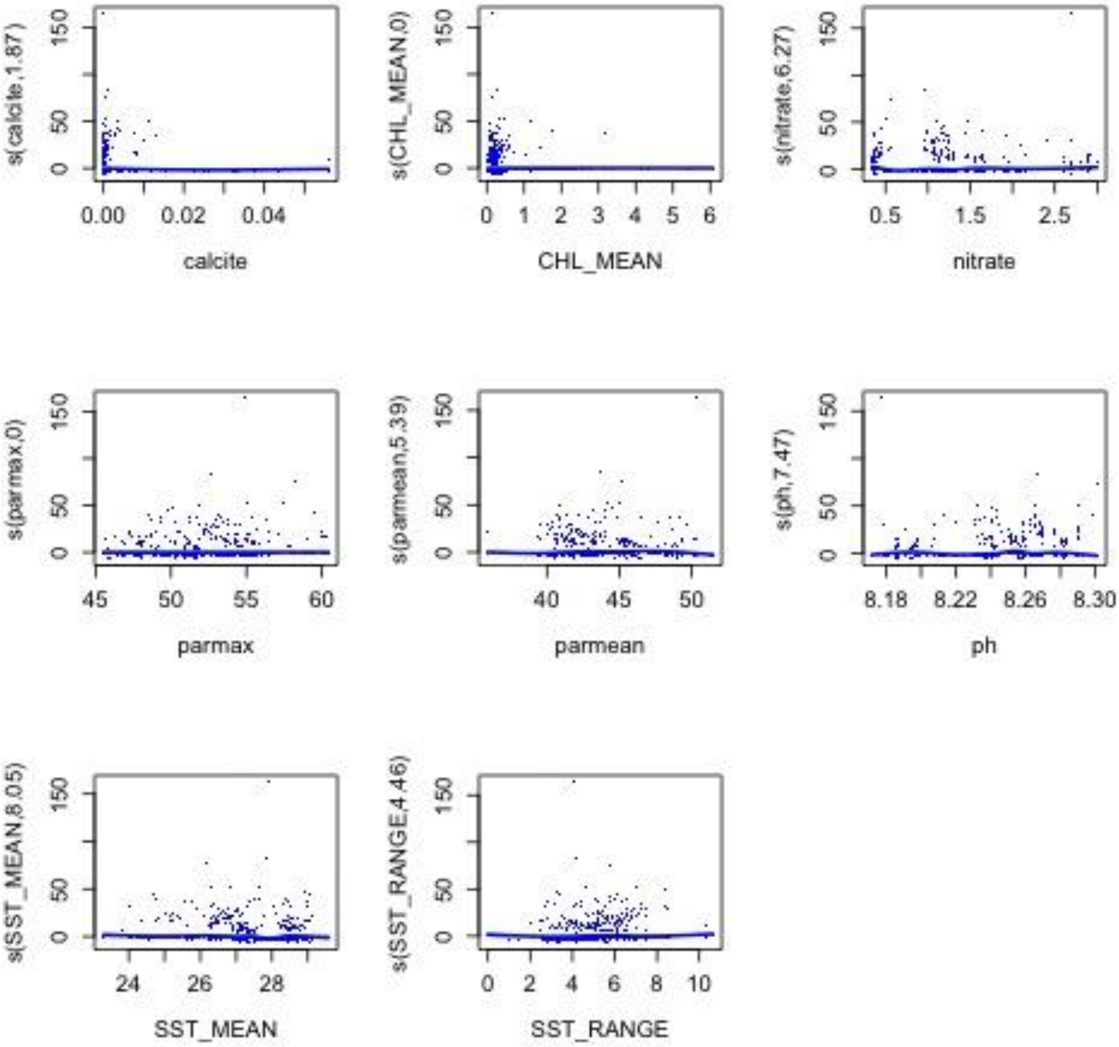
458Variola albimarginata, n = 37 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	9.739083e-01	9	5.620370e+00	1.158899e-02
s(CHL_MEAN)	1.196832e-06	9	4.470514e-07	5.348954e-01
s(nitrate)	4.570722e+00	9	6.487809e+01	5.091900e-16
s(parmax)	7.931623e-01	9	3.443562e+00	2.707085e-02
s(parmean)	9.421840e-01	9	1.492075e+01	1.017286e-05
s(ph)	3.242476e+00	9	1.759810e+01	4.744337e-05
s(SST_MEAN)	5.016448e-06	9	4.340574e-06	3.501566e-01
s(SST_RANGE)	2.712564e-06	9	9.083464e-07	7.108859e-01



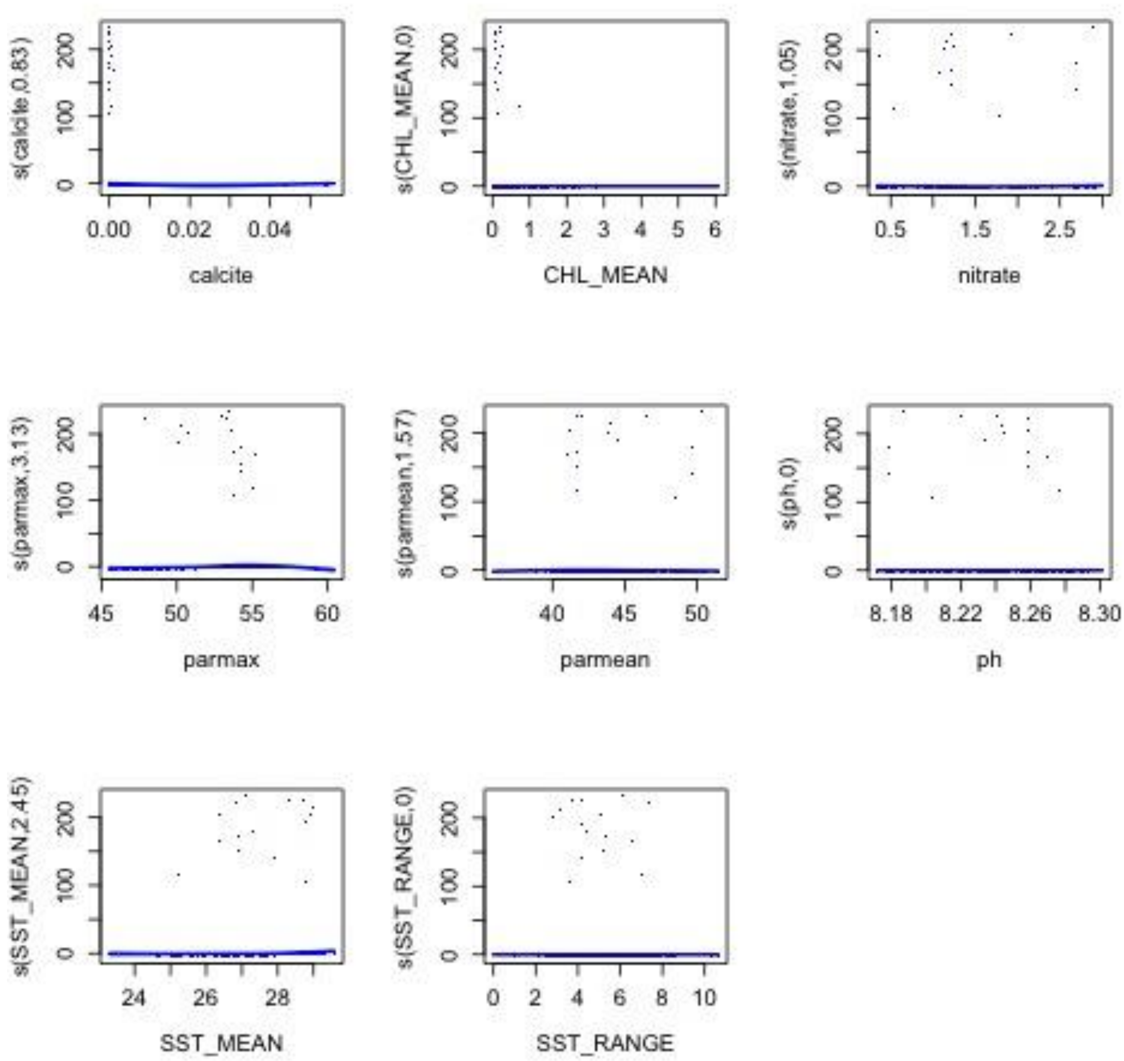
459Variola louti, n = 434 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.869557e+00	9	1.416963e+01	1.829463e-04
s(CHL_MEAN)	4.881205e-05	9	1.021409e-05	7.136203e-01
s(nitrate)	6.266677e+00	9	7.550147e+01	1.283070e-16
s(parmax)	1.685243e-04	9	8.891301e-05	4.823813e-01
s(parmean)	5.392113e+00	9	4.108370e+01	3.663680e-09
s(ph)	7.470077e+00	9	1.192244e+02	6.561195e-26
s(SST_MEAN)	8.051582e+00	9	4.540212e+01	2.849387e-08
s(SST_RANGE)	4.460182e+00	9	2.062400e+01	1.291667e-04



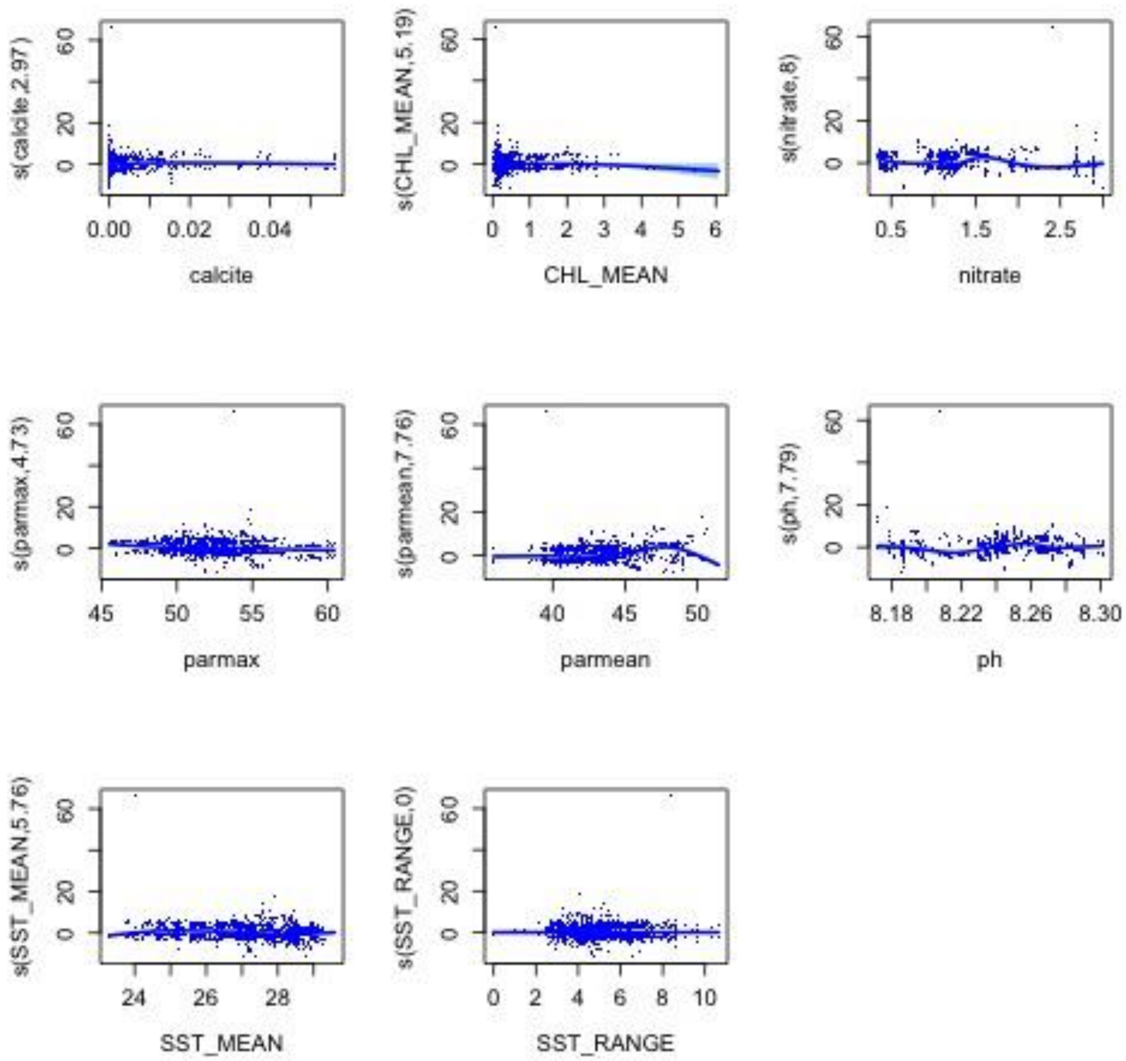
460 Xanthichthys auromarginatus, n = 44 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	8.340769e-01	9	1.572451e+00	0.1533464582
s(CHL_MEAN)	2.686275e-05	9	4.370154e-06	0.7165430871
s(nitrate)	1.053821e+00	9	3.890551e+00	0.0214211900
s(parmax)	3.131707e+00	9	1.537792e+01	0.0001995928
s(parmean)	1.572248e+00	9	4.339259e+00	0.0333443972
s(ph)	2.410253e-05	9	6.582450e-06	0.7708282250
s(SST_MEAN)	2.453893e+00	9	8.411748e+00	0.0050047005
s(SST_RANGE)	6.219175e-05	9	3.537048e-05	0.5426263708



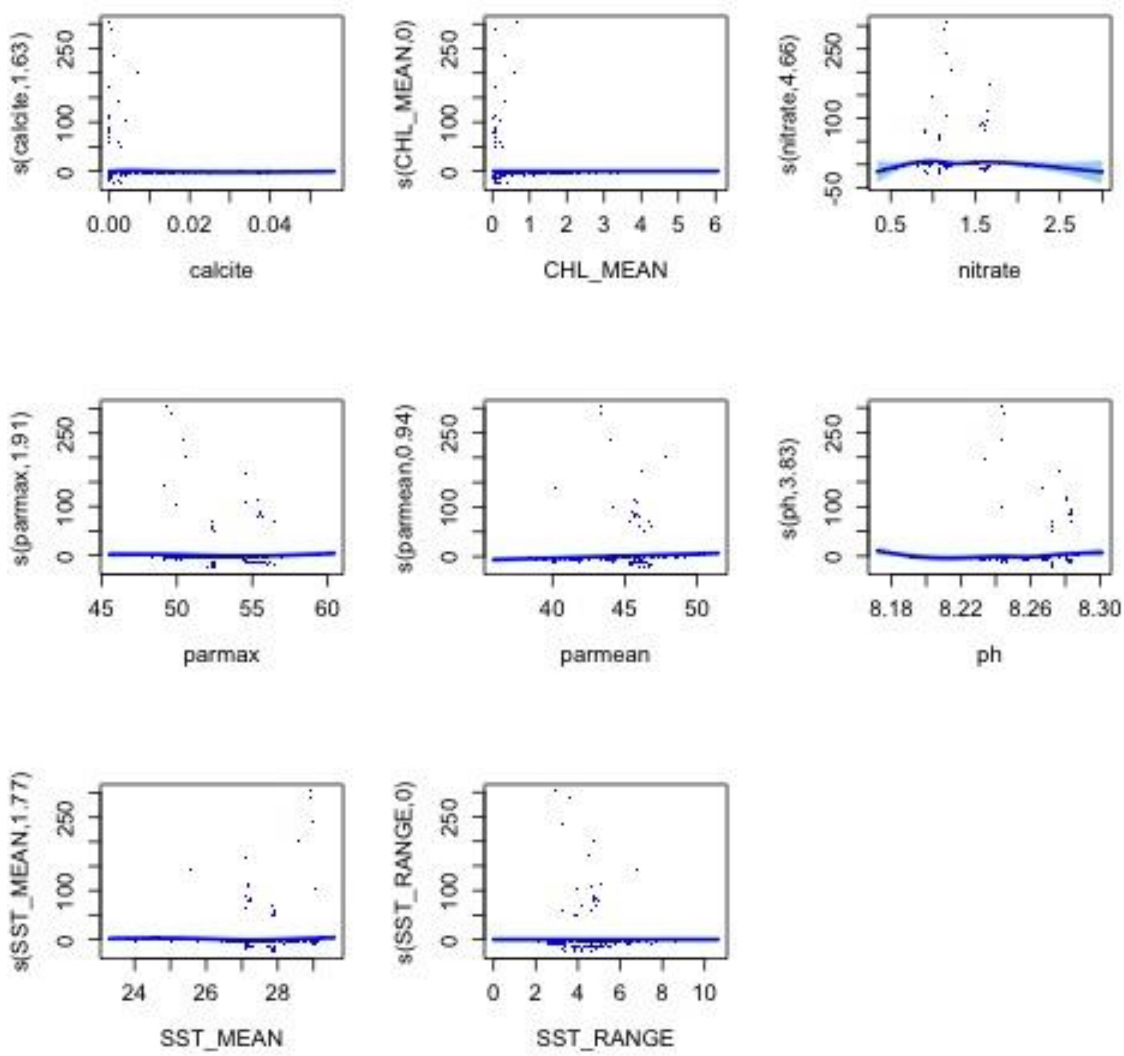
461 Zanclus cornutus, n = 1909 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	2.9711125569	9	2.658049e+01	2.423535e-06
s(CHL_MEAN)	5.1851531373	9	3.424578e+01	4.213353e-07
s(nitrate)	7.9963434521	9	2.179342e+02	6.047275e-50
s(parmax)	4.7258146209	9	3.923072e+01	4.464504e-09
s(parmean)	7.7575406344	9	3.102383e+02	1.063288e-71
s(ph)	7.7917133078	9	1.605162e+02	3.938706e-36
s(SST_MEAN)	5.7612936349	9	5.935490e+01	4.403780e-13
s(SST_RANGE)	0.0002290021	9	1.335952e-04	5.501123e-01



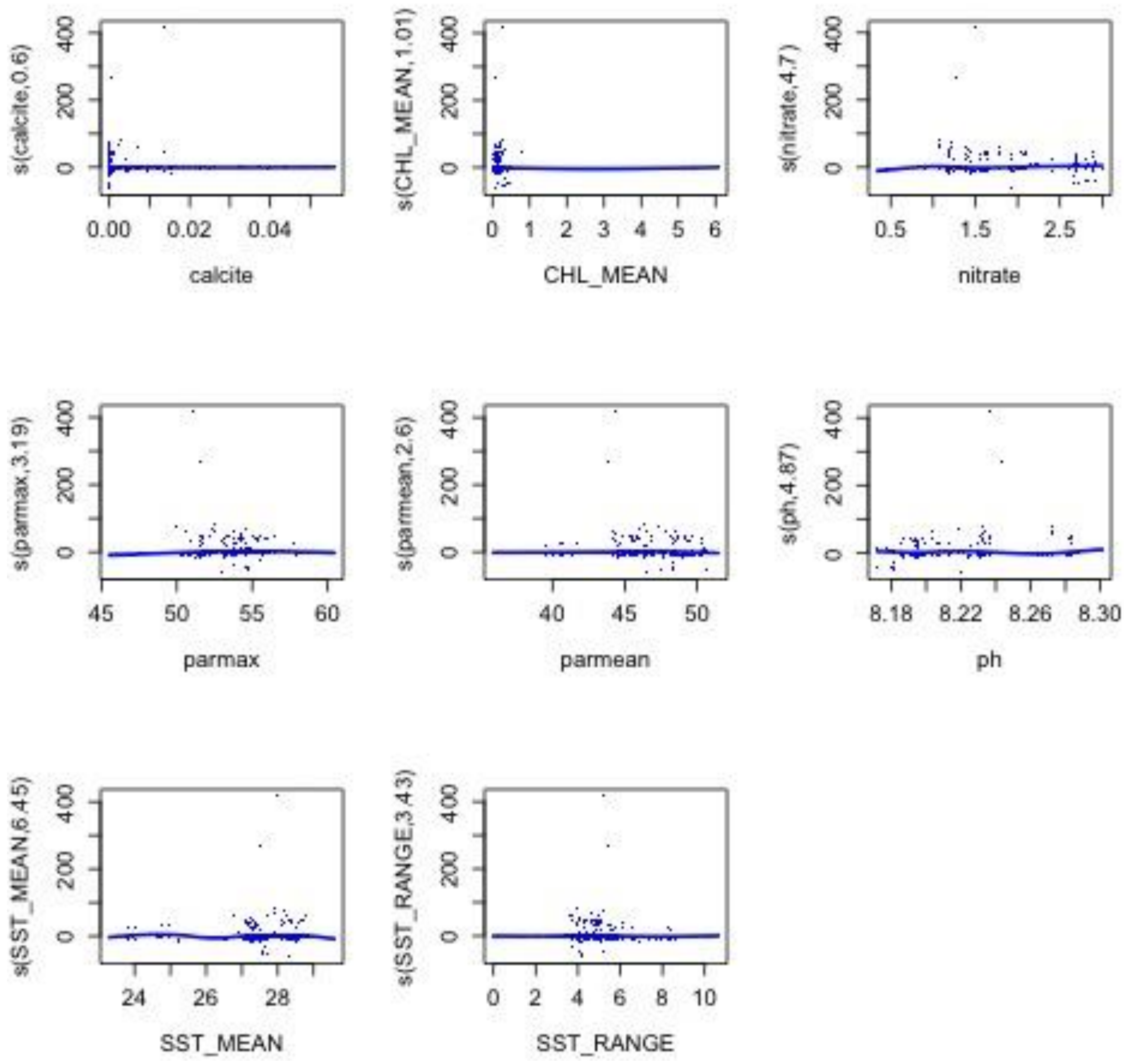
462 Zebrasoma flavescens, n = 166 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.626996e+00	9	3.852911e+00	7.969082e-02
s(CHL_MEAN)	2.843799e-05	9	9.444068e-06	5.763525e-01
s(nitrate)	4.658734e+00	9	1.051358e+01	1.139962e-02
s(parmax)	1.912672e+00	9	4.159927e+00	6.195400e-02
s(parmean)	9.399424e-01	9	1.155204e+01	2.565469e-05
s(ph)	3.834607e+00	9	1.453967e+01	2.971526e-04
s(SST_MEAN)	1.774542e+00	9	5.833447e+00	1.039457e-02
s(SST_RANGE)	2.740521e-05	9	4.709991e-06	9.424326e-01



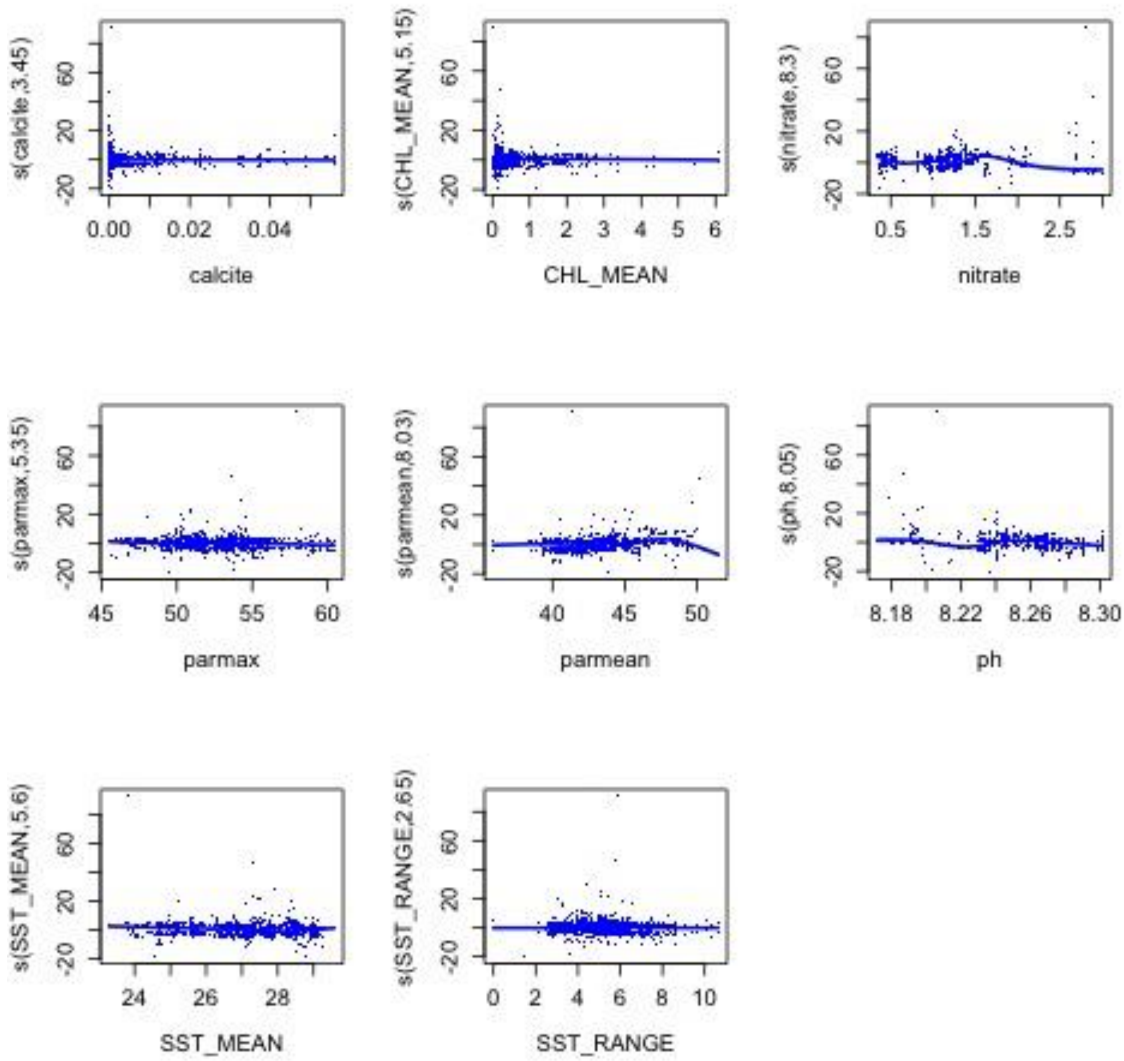
463 Zebrasoma rostratum, n = 282 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	0.5975273	9	1.227657	1.295384e-01
s(CHL_MEAN)	1.0093099	9	6.202179	5.738114e-03
s(nitrate)	4.7033357	9	53.551860	2.893661e-14
s(parmax)	3.1906092	9	21.946669	1.811267e-06
s(parmean)	2.6048106	9	22.911288	9.730458e-08
s(ph)	4.8703493	9	60.827758	2.068080e-16
s(SST_MEAN)	6.4494851	9	42.923116	1.053993e-09
s(SST_RANGE)	3.4252771	9	11.918543	2.156945e-03



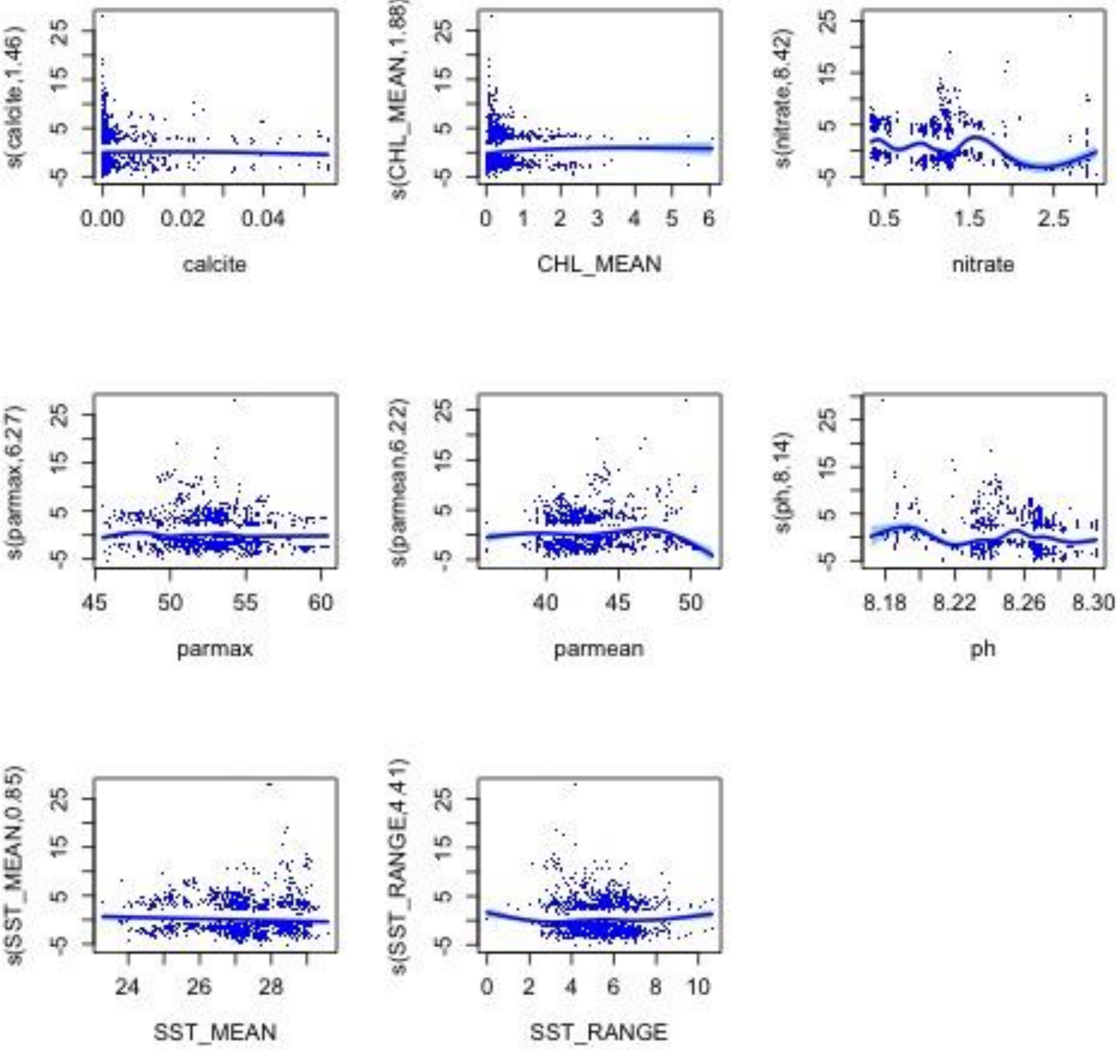
464 Zebrasoma scopas, n = 2034 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	3.452079	9	20.662366	6.518352e-05
s(CHL_MEAN)	5.152519	9	83.513716	2.726520e-18
s(nitrate)	8.300314	9	348.487092	6.445567e-81
s(parmax)	5.345305	9	32.986545	4.522286e-07
s(parmean)	8.029553	9	169.545073	6.156627e-37
s(ph)	8.052507	9	198.816395	1.945551e-44
s(SST_MEAN)	5.599176	9	83.073206	1.021034e-19
s(SST_RANGE)	2.649154	9	8.187274	1.586952e-02



465 Zebrasoma velifer, n = 1199 observations

	edf	Ref.df	Chi.sq	p-value
s(calcite)	1.463130	9	3.622458	7.414554e-02
s(CHL_MEAN)	1.878077	9	19.171862	3.904897e-06
s(nitrate)	8.418280	9	274.900442	3.854942e-61
s(parmax)	6.265976	9	25.963274	9.138564e-05
s(parmean)	6.217861	9	65.218688	4.804874e-14
s(ph)	8.143562	9	133.574783	1.436046e-27
s(SST_MEAN)	0.846527	9	5.417499	9.139945e-03
s(SST_RANGE)	4.407088	9	18.011172	6.287462e-04


s(calcite,1.46)
calcite
s(CHL_MEAN,1.88)
CHL_MEAN
s(nitrate,8.42)
nitrate
s(parmax,6.27)
parmax
s(parmean,6.22)
parmean
s(ph,8.14)
ph
s(SST_MEAN,0.85)
SST_MEAN
s(SST_RANGE,4.41)
SST_RANGE

Supplementary Material S4. Names and description of deepwater bioregions across the Southwestern Pacific region**.**

Code	Name	Countries	Summary description
0	Gilbert Ridge	KIR	Comprised mostly of abyssal plains and hills cutting across ridges and seamounts. Sea surface temperature is moderate and variable, while temperature at 1000m is high for Fiji. Chlorophyll-a concentrations are high, with even higher levels around islands. 20 degree isotherm and hgt2000 are middling. Mixed layer depth is shallow. Silicate, phosphorous and nitrate levels are moderate. Dissolved oxygen is low but increases moving west. Calcite levels are low except around Tarawa and Maiana Atolls, which have high concentrations. Solar irradiance is high. Contains 1 seamount type 3 (intermediate size, large tall and deep), 1 seamount type 2 (small with deep peak, most common type); intersect 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth) and 1 seamount type 3. Include 5 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 4000m and the lower depth is 4500m.
1	Guam Micronesia & Mariana High Seas	GUM,FSM,MNP	Very large bioregion, elongated shape cutting through a number of large seamounts both on eastern and western side of the bioregion with middle section consisting of mainly basins with underlying Hadal base. Sea surface temperature moderate and stable. Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is medium, 20°C isotherm is deep, and MLD is moderate. Solar irradiance is moderate; PH, silicate, phosphate, nitrate and calcite are low. Contains 3 seamount type 2 (small with deep peak, most common type); 7 seamount type 3 (intermediate size, large tall and deep); intersect 3 seamount type 6 (very large and tall with low escarpment); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 9 (Large and tall with shallow peak, larger); 4 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5500m and the lower depth is 6000m.

Cod e	Name	Countries	Summary description
3	North Micronesia-Marshall Island Abyssal Range	MHL,FSM	Seamounts concentrated along the eastern side of the bioregion with a deeper western basin with underlying Hadal section. SST high and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is medium, 20°C isotherm is deep, and MLD is moderate. Solar irradiance is moderate; PH, silicate, phosphate, nitrate and calcite are low. Contains 2 seamount type 2 (small with deep peak, most common type); 2 seamount type 6 (very large and tall with low escarpment); 1 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 9 (Large and tall with shallow peak, larger); 4 seamount type 10 (large and tall with shallow peak: shallow); Includes 10 Blind canyon type and 4 Shelf incising canyon type. The upper depth is 5500m and the lower depth is 6000m.
4	Solomon, Tuvalu Seamounts	SLB,TUV	Bioregion consists of chain of deeper and larger seamounts formed on abyssal mountains and sloping abyssal hills and underlying abyssal plains. SST high and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is shallow, 20°C isotherm is deep, MLD is low and pH is high. Solar irradiance is moderate, silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 4 seamount type 7 (small and short with very deep peaks, shortest); 17 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
6	Marshall & Wake Island High Seas	MHL,UMI	Contains large, medium and small size seamounts formed on abyssal hills and mountains. Deep basin and Hadal covers most of the middle section of the bioregion. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is moderate, 20°C isotherm is deep, and MLD is moderate. Solar irradiance, pH, silicate, phosphate, nitrate and calcite are low. Contains 11 seamount type 2 (small with deep peak, most common type);13 seamount type 3 (intermediate size, large tall and deep); 7 seamount type 6 (very large and tall with low escarpment); 2 seamount type 7 (small and short with very deep peaks, shortest); 10 seamount type 8 (small and short with very deep peaks, deepest type); 10 seamount type 9 (Large and tall with shallow peak, larger); 6 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 6000m.

Code	Name	Countries	Summary description
7	Cape Johnson & Solomon Trench	SLB	Deep bioregion that contains the Solomon Trench and Cape Johnson Trough. Underlying basin, abyssal hills and mountains and deep seamounts ridges. Canyons also on the north western side. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is moderate, 20°C isotherm, pH, and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Contains 9 Blind canyon type. Contains 1 active, confirmed and 2 active, inferred hydrothermal vents. The upper depth is 2500m and the lower depth is 4500m.
9	Palau Abyssal Range	FSM,PLW,PHL	Contains mostly abyssal hills and mountains. Basins formed on abyssal plains are also included. SST high and stable, Chlorophyll-a, Salinity and dissolved oxygen are low. Temperature at 1000m is moderate. 20°C isotherm, pH, and Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains NO Seamounts. The upper depth is 5500m and the lower depth is 6000m.
10	Nauru Marshal Islands Basin	MHL,FSM,NRU	Contains three seamounts and large basin on abyssal plains. SST moderate and stable. Chlorophyll-a concentrations are low. Salinity and dissolved oxygen are low and variable. Temperature at 1000m and 20°C isotherm are moderate. Solar irradiance is high and MLD is shallow. pH, Silicate, phosphate, nitrate and Calcite are low. Contains 1 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 4500m.
11	Marshall Islands Abyssal Range & Ratak Ridges	MHL	Non-contiguous with deep seamounts scattered across the bioregion. Abyssal mountains form the base of the seamounts, canyons on the eastern side, and the Ratak ridges that form the base of the Marshall Islands and slopes into the deep. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are moderate and variable. Temperature at 1000m is moderate. 20°C isotherm is shallow, MLD and solar irradiance are moderate and pH is high. Silicate, phosphate, nitrate and calcite are moderate. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 3 seamount type 7 (small and short with very deep peaks, shortest); 6 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Contains 10 Blind canyon type and 4 Shelf incising canyon type. The upper depth is 2000m and the lower depth is 5000m.

Code	Name	Countries	Summary description
13	Fiji-Tonga-Vanuatu Plateau and Basins including Moore Ridge	FJI,TON,VUT	Bioregion dominated by plateau and basins with spreading ridges and rift valleys. Southern end of bioregion consist of one seamount. Area includes large abyssal hills, large plateau towards the east and isolated pockets of seamounts, spreading ridges and Moore Ridge. Sea surface temperature very unstable, low. Chlorophyll-a concentrations are high with a large bloom in the NW corner, extending into bioregion 165. Salinity and dissolved oxygen are high. Temperature at 200m is low. Deepwater temperatures are high. MLD quite low in NW part. Silicate and phosphorous levels are high. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 4 (small with deep peak, most isolated type); 3 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); Contains 11 Blind canyon type. Contains 4 active, confirmed and 10 active, inferred hydrothermal vents. The upper depth is 2000m and the lower depth is 3500m.
14	American Samoa - Cook Islands Abyssal Mountains	ASM,COK,WSM,TON	Forms on the northern tip of the Tonga EEZ on a basin and abyssal mountain. Sea surface temperature is high; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are low. Mixed layer depth, salinity and pH levels, nitrate and solar irradiance are moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the Northeast. Contains 5 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 7 (small and short with very deep peaks, shortest); 5 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); Contains 1 active, confirmed hydrothermal vent. The upper depth is 5000m and the lower depth is 5500m.
19	Southern Fiji Flats	NCL,FJI,VUT	Deep bioregion with a mostly flat seafloor, a few small isolated seamounts and spreading ridges. SST is low, CHL low and stable, Salinity is high and variable, Dissolved Oxygen is moderate and stable, Deepwater temp is moderate, 20°C isotherm is shallow, mixed layer depth is shallow, Solar irradiance is low, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 4 (small with deep peak, most isolated type); 2 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 5 seamount type 10 (large and tall with shallow peak: shallow); 6 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Contains 2 Blind canyon type. The upper depth is 3500m and the lower depth is 4500m.

Code	Name	Countries	Summary description
20	Kiribati - High Seas Line Island Group & Menard Ridge	KIR,UMI	Consist lots of seamounts in the eastern side, deep abyssal plains, hills and mountains, few escarpments features and cuts through a number of ridges including the Menard ridge in the Line Island Group of Kiribati. Sea surface temperature is low and variable. Chlorophyll-a concentrations are high and variable. Dissolved oxygen, silicate, and pH levels are low. Salinity, phosphorous, solar irradiance, and nitrate levels are high. Temperature at depth is high but variable. 20 degree isotherm is deep. Mixed layer depth is shallow but variable. Contains 6 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 6 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.
22	Marshall Islands Jaluit & Ailinglaplap Ridges	MHL	Cuts through large seamounts in the north and eastern side of bioregion. Majority consist of abyssal plains, hills and mountains that form the base of seamounts, the large ridges where the Jaluit and Ailinglaplap Atoll islands of Marshall Islands are also included. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Calcite and dissolved oxygen levels are low. PH, silicate, phosphorous, salinity, and nitrate levels are moderate. Solar irradiance is low. Mixed layer depth is shallow. Temperature at 1000m is high. Contains 3 seamount type 2 (small with deep peak, most common type); 6 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 10 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 3000m and the lower depth is 5000m.

Code	Name	Countries	Summary description
24	Fiji - Tonga Chains	FJI,TON,VUT	Dominated by plateau with a combination of features. Chain of seamounts on the northern part forming on ridges. Rift valleys on spreading ridges. SST is low and stable, CHL low and variable, Salinity is moderate and variable, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is generally shallow but deep in the east towards Tonga, Solar irradiance is low, pH level is moderate, silicate level is moderate to high towards east (within Fiji and Tongan waters), phosphate level is low, nitrate level is moderate, Calcite is low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 8 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow); Includes 8 Blind canyon type. Contains 9 active, confirmed and 12 active, inferred hydrothermal vents. The upper depth is 1500m and the lower depth is 3000m.
25	FSM - Palau Sea Mount Range	GUM,FSM,PLW	FOUR non-contiguous parts of bioregion. Western part contains 1 large seamount, the most eastern part cuts through two big deep seamounts formed on abyssal mountains. The two parts in the center includes large ridges, abyssal mountains and includes part of the Mariana Trench and Challenger Deep. SST moderate and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contains 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Intersect1 Blind canyon type. The upper depth is 2500m and the lower depth is 5000m.
29	New Caledonia Flats	NCL	Small non-contiguous bioregion consisting of mostly plateau with canyons and ridges. SST moderate and stable, Chlorophyll-a concentrations are high to moderate. Deepwater temperature is moderate. Solar irradiance and MLD are moderate. Silicate, pH, Calcite and phosphorous levels are low. Intersect 1 seamount type 9 (Large and tall with shallow peak, larger) and 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 9 Blind canyon type and 2 Shelf incising canyon type. The upper depth is 500m and the lower depth is 1500m.

Cod e	Name	Countries	Summary description
30	New Caledonia Southern Plateaus	NCL	Mostly plateau with two seamounts and ridges and few canyons. SST moderate and stable, Chlorophyll-a concentrations are low. Salinity is high, DO is moderate, Deepwater temperature is shallow, 20 Degree Isotherm is shallow, Solar irradiance is low and MLD is shallow. Silicate, pH, Calcite, Nitrate and phosphorous levels are low. Contains 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 7 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 1000m and the lower depth is 2000m.
32	Northern Marshall Islands - High Seas Range	MHL,UMI	This bioregion consists of a lot of large deeper water seamounts formed on top of abyssal mountains. Other features include abyssal hills, plains, escarpments and Deepwater basin. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. silicate, phosphate, nitrate and calcite are low. Contains 7 seamount type 2 (small with deep peak, most common type); 8 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 3 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 9 seamount type 9 (Large and tall with shallow peak, larger); 9 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type. The upper depth is 4000m and the lower depth is 5500m.
35	South Polynesian Range	COK,PYF,TON ,NIU	Dominated by slope from ridges, and plateaus with sloping towards the trench. Sea surface temperature is moderate. Chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are low. Salinity, pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the North. Contains 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 2 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 3 Blind canyon type. The upper depth is 4500m and the lower depth is 5500m.

Cod e	Name	Countries	Summary description
36	Southern Marshall Island Abyssal Range	MHL,FSM,KIR	Mostly dominated by abyssal plains, hills, mountains and seamounts. Other minor features escarpments and basin. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low. Calcite and dissolved oxygen levels are low. PH, silicate, phosphorous, salinity, and nitrate levels are moderate. Solar irradiance is low. Mixed layer depth is shallow. Temperature at 1000m is high, moderate at 200m. Contains 2 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type. The upper depth is 4000m and the lower depth is 5000m.
38	Southern French Polynesia High Seas	PYF	Deep bioregion abyssal plains, hills and mountains with few seamounts and ridges, SST and Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is very high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 6 seamount type 2 (small with deep peak, most common type); 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
39	Kiribati - Howard and Baker Island Abyssal Range	KIR,UMI	Bioregion runs through Kiribati and Howard and Baker Islands EEZ. Mostly consist of abyssal plains, hills and mountains and Basin Features. Cuts across few medium size seamounts. Sea surface temperature is low and variable. Chlorophyll-a concentrations are high, variable. Mixed layer depth is deep in the north and shallow in the south. Temperature at 1000m and 200m is moderate. 20 degree isotherm is average depth. Solar irradiation is high; pH, nitrate, and silicate levels are moderate. Phosphorous and salinity are high. Dissolved oxygen and calcite levels are low, but calcite is highly concentrated around islands. Contains 4 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 5000m and the lower depth is 5500m.

Code	Name	Countries	Summary description
42	North Micronesian Sea Mount Range	MHL,FSM	Long thin bioregion north of Micronesia. Dominated by seamounts on both the eastern and western ends of the bioregion. Other features includes ridge and slopes, and abyssal features (hills, plains and mountains) SST high and stable, CHL is low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is moderate, Solar irradiance is moderate, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low and variable. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 5 seamount type 9 (Large and tall with shallow peak, larger); 4 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 3000m and the lower depth is 5000m.
43	Cook Island - Tokelau Sea Mounts	WLF,ASM,COK,TKL	Bioregion falls mostly within Tokelau and the Cook Islands. Dominant feature are seamounts. Other features includes abyssal features (hills, plains and mountains). SST high and stable, CHL is low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is moderate, Solar irradiance is moderate, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low variable. Contains 4 seamount type 1 (small with deep peak, short with moderately deep peak); 12 seamount type 2 (small with deep peak, most common type); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 10 (large and tall with shallow peak: shallow); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 4500m.

Code	Name	Countries	Summary description
44	Cook Island - Kiribati Abyssal Range	COK,KIR	Thin and pointed bioregion that falls mainly within the Phoenix and Line islands (Kiribati) and the Cooks. Dominated by abyssal hills with seamounts formed on top of abyssal mountains. Other features include Trough, ridges and escarpments. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low to moderate. Dissolved oxygen, phosphorous, solar irradiation, pH, nitrate levels are moderate. Salinity levels are high, and silicate and calcite levels are low. Temperatures at depth are quite high. Mixed layer and 20 degree isotherm are deep. Contains 10 seamount type 2 (small with deep peak, most common type); 6 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 10 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 9 (Large and tall with shallow peak, larger); 9 seamount type 10 (large and tall with shallow peak: shallow); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
45	FSM Abyssal Range	FSM	Non-contiguous 3 parts bioregion that falls within the FSM. Mostly contains large ridges and abyssal hills and mountains with escarpments. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contains 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); Includes 1 Blind canyon type. The upper depth is 1500m and the lower depth is 3000m.
47	Cook Islands, Tokelau - High Seas Sea Mounts	COK,TKL	Bioregion falls mostly in the high seas but cuts through Tokelau and Cook Islands EEZ. Mostly dominated by seamounts and abyssal hills and mountains. Other features include plateau, trough, ridge and escarpments. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low. Very deep mixed layer and a more shallow 20 degree isotherm. 1000m temperature is low. Temperature at 200m is high and stable. Silicate, nitrate, dissolved oxygen, calcite, and phosphorous levels are low. Salinity is high. Solar irradiation and pH are high to moderate. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 8 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 5000m.

Code	Name	Countries	Summary description
48	Marshall Islands Sea Mounts	MHL	Marshall islands bioregions. Mostly dominated by seamounts (medium and large) with abyssal features (hills and mountains). SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 6 (very large and tall with low escarpment); 1 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 4 seamount type 9 (Large and tall with shallow peak, larger); 7 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
50	French Polynesia & Cook Islands - High Seas Abyssal Range	COK,PYF	Most of the bioregion falls within the French Polynesia EEZ but also cuts through Cooks and the high seas. Dominant feature are abyssal hills and mountains with seamounts. Other features include basin, escarpment, plateau and ridge. SST moderate and stable, Chlorophyll-a concentrations are low. Calcite, solar irradiance, phosphorous, silicate, and nitrate levels are low. Dissolved oxygen, salinity, and pH levels are high. Temperature at 200m is high, while at 1000m it is moderate and variable. Mixed layer is deep; 20 degree isotherm is shallow and variable. Contains 4 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 3 seamount type 7 (small and short with very deep peaks, shortest); 5 seamount type 8 (small and short with very deep peaks, deepest type); 7 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type. The upper depth is 4000m and the lower depth is 5000m.
51	New Caledonia Trough	NCL	Bioregion falls within New Caledonia. Mostly consist of the New Caledonia Trough. Other minor features include canyons, plateau. SST low and stable, Chlorophyll-a concentrations are high to moderate. Deepwater temperature is moderate. Solar irradiance and MLD are moderate. Silicate, pH, Calcite and phosphorous levels are low. Contains no seamounts. Includes 7 Blind canyon type and 9 Shelf incising canyon type. The upper depth is 0m and the lower depth is 3500m.

Code	Name	Countries	Summary description
52	Nauru Marshall and Gilbert Abyssal	MHL,NRU,KIR	Bioregion cuts through Nauru, Marshall Islands, and Kiribati EEZ. Mostly abyssal plain. Sea surface temperature is low to moderate and stable. Chlorophyll-a concentrations are low, with blooms around islands. Deepwater temperatures are moderate. Mixed layer depth is low and variable. Solar irradiance is high. PH, silicate, phosphorous, salinity, and nitrate levels are moderate. Dissolved oxygen levels are low to moderate. Calcite is low with high levels around Abailang. Contains 1 seamount type 3 (intermediate size, large tall and deep); Includes 4 Blind canyon type and 2 Shelf incising canyon type. The upper depth is 4000m and the lower depth is 4500m.
53	Starbuck and high seas	COK,KIR	Falls within the Line Islands Group EEZ (Kiribati) and the high seas. Mostly abyssal features (Hills, plains and mountains) including seamounts. Other minor features: Basin, Ridge and escarpment. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are moderate. Shallow 20 degree isotherm and deep mixed layer. Moderate 1000m temperature and high 200m temperature. Salinity, solar irradiance, nitrate, dissolved oxygen, and phosphorous levels are high. PH, silicate, and calcite levels are low. Contains 4 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 2 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
55	Mussau Trench, Ayu Seamounts and associated trough and abyss	FSM,PLW,IDN ,PNG	Non-contiguous bioregion. One western part falls within Palau and dominated by seamounts and abyssal mountains. Other features include ridges, spreading ridges, and basin. Others parts include mostly abyssal plain and hills. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, and nitrate are low. Calcite is moderate. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 10 (large and tall with shallow peak: shallow); 6 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 7 Blind canyon types. The upper depth is 3000m and the lower depth is 4000m.

Code	Name	Countries	Summary description
57	Hammondsport seamount and basin	SLB	Solomon Islands bioregion just north east of Rennell and Bellona. Includes Hammondsport seamount and part of the San Cristobal Trench with abyssal plain, hill, ridge, a seamount and basin. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is deep, 20°C isotherm is deep, MLD is shallow, and PH is low. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 3500m and the lower depth is 5000m.
58	Pitcairn Deep	PYF	Contains chain of seamounts and deep abyssal plains, hills and mountains across the Pitcairn and French Polynesia EEZ. SST moderate and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 7 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 4000m and the lower depth is 4500m.
59	Central Gilbert	KIR	Includes a number of islands in the Gilbert Group. Geomorphology dominated by seamounts on abyssal mountains and ridges which form the base of the islands. Canyons and escarpments also overlap with the ridges. Sea surface temperature is low and variable. Chlorophyll-a concentrations are high, with even higher levels around islands. Mixed layer depth is deep in the north and shallow in the south. Temperature at 1000m and 200m is moderate. 20 degree isotherm is average depth. Solar irradiation is high; pH, nitrate, and silicate levels are moderate. Phosphorous and salinity are high. Dissolved oxygen and calcite levels are low, but calcite is highly concentrated around islands. Contains 1 seamount type 2 (small with deep peak, most common type); 7 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 10 (large and tall with shallow peak: shallow); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 5000m.

Code	Name	Countries	Summary description
61	South Solomon Trench	SLB,VUT	Includes the South Solomon Trench which is the dominant feature. Also includes ridges, canyons and abyssal features. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is deep, 20°C isotherm is deep, MLD is shallow, and PH is low. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains NO Seamounts. Includes 7 Blind canyon type. The upper depth is 1500m and the lower depth is 6000m.
63	West Caroline and South Sorol Trough	FSM,PLW	Falls mostly within the Palau and Micronesia EEZ and non-contiguous. Western part of bioregion contains mostly spreading ridges and rift valleys. The Eastern part contains mostly seamounts and abyssal features. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m, MLD and 20°C isotherm are shallow, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contains 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 4 (small with deep peak, most isolated type); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 10 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.
65	East Line Islands and French Polynesia Northern Tip	PYF,KIR	Contains mostly abyssal hills and plains. Bioregion includes part of the Line Islands Group EEZ (Kiribati) and French Polynesia EEZ. Sea surface temperature is moderate and variable. Chlorophyll-a concentrations are moderate and variable. Shallow 20 degree isotherm and deep mixed layer. Moderate 1000m temperature and low 200m temperature. Silicate, salinity, solar irradiance, nitrate, dissolved oxygen, and phosphorous levels are high. PH and calcite levels are low. Contains 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5000m.

Code	Name	Countries	Summary description
66	Kingsman Basin and Magellan Rise	KIR,UMI	Non-contiguous bioregion and includes the Line Group EEZ (Kiribati). Western part contains mainly plateau whereas the middle and eastern parts are dominated by abyssal hills and plains. Sea surface temperature is moderate and variable. Chlorophyll-a concentrations are low. Shallow 20 degree isotherm and mixed layer depth. Temperature is high at 1000m and low at 200m. Silicate, phosphorous, calcite, nitrate, solar irradiance, and salinity levels are low. PH levels are high. Dissolved oxygen is high to moderate. Contains 4 seamount type 2 (small with deep peak, most common type); 1 seamount type 4 (small with deep peak, most isolated type); 2 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
67	American Samoa Basin and North Tonga Trench	ASM,COK,WSM,TON,NIU	Contains Tonga trench and abyssal hills and cuts through Tonga, Niue and American Samoa. Sea surface temperature is high, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are low. Mixed layer depth, salinity and pH levels, nitrate and solar irradiance are moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the Northeast. Contains 8 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 5500m.
69	East Nelson Reef and South French Polynesia	PYF	Contains deep seamounts on abyssal habitats in French Polynesia's low and stable, Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 4 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 4 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate

Cod e	Name	Countries	Summary description
			size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 4500m.
70	Malden and Schlanger	KIR,UMI	Contains deep basins on abyssal plains, hills and Schlanger seamounts on abyssal mountains. Includes the Line Group EEZ of Kiribati. Sea surface temperature is moderate and variable. Chlorophyll-a concentrations are low with high concentrations in the NE corner. Shallow 20 degree isotherm and deep mixed layer. Moderate 1000m temperature and low 200m temperature. Silicate, salinity, solar irradiance, nitrate, dissolved oxygen, and phosphorous levels are high. PH and calcite levels are low. Contains 2 seamount type 2 (small with deep peak, most common type); 8 seamount type 3 (intermediate size, large tall and deep); 4 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 4500m and the lower depth is 5500m.
71	Utarik Deep	MHL	Large bioregion within Marshall Islands medium to large size seamounts on abyssal mountains. Cuts across a number of ridges with underlying abyssal hills and plains. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are moderate and variable. Temperature at 1000m is moderate. 20°C isotherm is shallow, MLD and solar irradiance are moderate and pH is high. Silicate, phosphate, nitrate and calcite are moderate. Contains 4 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 2 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 4 Blind

Code	Name	Countries	Summary description
			canyon type and 1 Shelf incising canyon type. The upper depth is 3500m and the lower depth is 5000m.
73	Bougainville Canyons and Bradley Deep	SLB,PNG	Four non-contiguous parts of bioregion within Solomon Islands and PNG. Mainly contains canyons and escarpments on slopes. The most eastern part includes mainly plateaus. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is deep, MLD is shallow. Solar irradiance and pH, silicate, phosphate, and nitrate are low. Calcite is moderate. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak) and 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); Includes 27 Blind canyon type and 23 Shelf incising canyon type. The upper depth is 0m and the lower depth is 2500m.
74	Moses Reef and Austral Seamounts	COK,PYF	Contains mainly abyssal features (plains, hills and mountains) with seamounts and runs across Cook Islands and French Polynesia. SST low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 6 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.

Code	Name	Countries	Summary description
75	Line, Cooks and French Polynesia High Seas	COK,PYF,KIR	Contains basins and abyssal features with very few seamounts. Runs across the Cooks, Line Group - Kiribati and French Polynesia. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Calcite, solar irradiance, phosphorous, silicate, and nitrate levels are low. Dissolved oxygen, salinity, and pH levels are high. Temperature at 200m is high, while at 1000m it is moderate and variable. Mixed layer is deep; 20 degree isotherm is shallow and variable. Contains 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 4 (small with deep peak, most isolated type); 3 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); The upper depth is 4500m and the lower depth is 5500m.
78	South Fabert and McGee Seamount	COK,PYF,TON	Small bioregions with canyons, ridges, plateau and slope. Non-contiguous and falls within Tonga's, Cooks and French Polynesia EEZ. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are moderate and variable. Dissolved oxygen concentrations are moderate and stable. Strong sea surface currents generally from the North West. Contains 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon types. The upper depth is 4500m and the lower depth is 5000m.
79	Northwest Niue and north Arutanga (Cooks)	ASM,COK,PYF,TON,NIU	Non-contiguous bioregion contains plateau, ridges and abyssal mountains. Sea surface temperature is high, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are low. Mixed layer depth, salinity and pH levels, nitrate and solar irradiance are moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the Northeast. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 6 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 4500m and the lower depth is 5000m.

Code	Name	Countries	Summary description
80	Capricorn and Eclipse Deep	COK,PYF,TON,NIU	Contains the biggest seamount “the Capricorn Seamount" and Eclipse Seamount with Cook Islands on abyssal hill and trench. Sea surface temperature is high, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are low. Salinity is variable. and pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is low. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Moderate sea surface currents generally from the North northeast. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 7 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 6 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type. The upper depth is 4000m and the lower depth is 5500m.
81	Yap Trench and Patches	FSM,PLW	Mostly contains ridges, abyssal mountains and the Yap Trench. Also includes few canyons and seamounts. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m, MLD and 20°C isotherm are shallow, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 7 Blind canyon type. The upper depth is 2000m and the lower depth is 4500m.
82	Ambae Trough and North Fiji Basin	SLB,FJI,VUT	Contains Trough and abyssal features with Basin and plateau in the north of the Fiji main islands. Also includes spreading ridge and ridge with escarpments. Sea surface temperature moderate, mildly variable. Chlorophyll-a concentrations are low, with scattered blooms around Maewo Island. Mid-depth temperatures very high while temperature at 1000m is low. 20 degree isotherm is exceptionally low. Silicate and phosphorous levels are high. PH is high. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 10 (large and tall with shallow peak: shallow); Includes 10 Blind canyon type and 1 Shelf incising canyon type. Contains 3 active, inferred and 1 inactive, hydrothermal vents. The upper depth is 2500m and the lower depth is 3500m.

Cod e	Name	Countries	Summary description
83	Nukuoro Deep and Dmitri Seamount	FSM	Mostly plateau and abyssal plain features. Includes also the Dmitri Seamount in Micronesia. SST high and stable, Chlorophyll-a concentrations are low. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance, Silicate, phosphate, and nitrate are low. Calcite is moderate. Intersect 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3000m and the lower depth is 4000m.
84	North Strakhov Seamount	MHL	Contains seamounts on abyssal mountains, hills and plains. Also includes basin and a few ridges. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contains 3 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth).The upper depth is 5500m and the lower depth is 6000m.
87	South Tonga North New Zealand Patches	TON,NZL	Contains ridges, abyssal mountains and plateau. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are low and variable. Dissolved oxygen concentrations are moderate and stable. Moderate sea surface currents generally from the North West. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 9 (Large and tall with shallow peak, larger); Includes 9 Blind canyon type. The upper depth is 2000m and the lower depth is 4000m.

Cod e	Name	Countries	Summary description
88	West Caroline and Mussau Ridge	FSM,PLW,IDN ,PNG	Five non-contiguous bioregion containing abyssal mountains, hills, plains AND ridges, spreading ridges and trough. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, and nitrate are low. Calcite is moderate. Contains 4 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 6 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 4000m and the lower depth is 4500m.
91	Palau Trench and Philippines, Indonesia Boarder	FSM,PLW,PHL ,IDN	Contains part of the Philippine trench and ridges in the west and the Yap trench and ridges in the east. Other features include deep abyssal features and seamounts. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contains 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 3 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 11 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 5000m and the lower depth is 6000m.
93	Dolmah	KIR,UMI	Consist of Ridges that cuts across from the southern to the north eastern side, trough and seamounts mainly in the eastern side including Dolmah seamount. Sea surface temperature is low and variable. Chlorophyll-a concentrations are high. Mixed layer depth and 20 degree isotherm are shallow. Temperatures at 1000m and 200m are moderate. Silicate and phosphorous levels are high. Salinity, calcite, and dissolved oxygen levels are moderate. PH is low. Solar irradiance and nitrate levels are high. Contains 1 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 5 seamount type 7 (small and short with very deep peaks, shortest); 16 seamount type 8 (small and short with very deep peaks, deepest type); The upper depth is 5000m and the lower depth is 5500m.

Cod e	Name	Countries	Summary description
95	East Emden Deep	PLW,PHL	Mostly abyssal plains and hills with western side including tiny part of the Philippine Trench. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contains 1 seamount type 2 (small with deep peak, most common type) and 1 seamount type 7 (small and short with very deep peaks, shortest); The upper depth is 5500m and the lower depth is 6000m.
98	Santa Isabel Slope	SLB,PNG	Consist of canyons on ridge and slope bottoms. Escarpment is also well featured. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is deep, MLD is shallow. Solar irradiance and pH, silicate, phosphate, and nitrate are low. Calcite is moderate. Intersect 1 seamount type 3 (intermediate size, large tall and deep); Includes 21 Blind canyon type and 10 Shelf incising canyon type. Contains 2 active, inferred hydrothermal vents. The upper depth is 0m and the lower depth is 3000m.
99	West Nauru High Seas	NRU,PNG	Mostly abyssal hills including one/two seamounts and plateaus high and stable, Chlorophyll-concentrations are low. Salinity and dissolved oxygen are low and variable. Temperature at 1000m and 20°C isotherm are moderate. Solar irradiance is high and MLD is shallow. PH, Silicate, phosphate, nitrate and Calcite are low. Contains 1 seamount type 4 (small with deep peak, most isolated type); and Intersect1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3000m and the lower depth is 4500m.
100	South Challenger Deep	GUM,FSM,PL W	Narrow and long, no contiguous containing seamounts in the east part north Yap trench in the west and cuts through few ridges and basins. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); 8 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 4000m and the lower depth is 5500m.

Cod e	Name	Countries	Summary description
102	Macdonald Seamount	PYF	Contains seamounts, ridges, escarpments, abyssal hills, abyssal plains and abyssal mountains that form the base of the seamounts. SST and Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is very high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 3 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 4 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 4 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Contains 1 active, confirmed hydrothermal vent. The upper depth is 3500m and lower depth is 4500m.
104	North French Polynesia	PYF,KIR	Mainly abyssal plains and abyssal hills with few ridges and seamounts. SST moderate and stable, Chlorophyll-a concentrations and Silicate are moderate and variable. DO is low. 20 degree isotherm and mixed layer are deep. Temperature at 1000m is moderate and low at 200m. Solar irradiance is high. Salinity, nitrate, and phosphorous levels are high. PH and calcite levels are low. Contains 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.
106	Torres Rise	SLB,VUT	Contains Plateaus, ridges and canyons and the north New Hebrides Trench. Other feature include: trough, escarpment and basin. Sea surface temperature stable and relatively high for Vanuatu. Chlorophyll-a concentrations are moderate, stable. Salinity and dissolved oxygen are low but higher in east of region. Mid-depth temperatures very high while temperature at 1000m is low. 20 degree isotherm is exceptionally low. Solar irradiance is quite high. Contains NO Seamounts Includes 20 Blind canyon type and 11 Shelf incising canyon type. The upper depth is 500m and the lower depth is 3500m.
107	Mellish Rise	NCL,AUS	Mainly plateaus and abyssal hills and mountains with few canyons, a seamount, a ridge and part of a trough. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD is shallow, and PH is high. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 2 seamount type 9 (Large and tall with shallow peak, larger), and one intersected. Includes 6 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 2000m and the lower depth is 3000m.

Code	Name	Countries	Summary description
108	West Guam Basin	GUM,FSM,MNP	Deep feature with large seamounts in the west, large spreading ridges and basin in the central part and non-contiguous parts in the east contain northern Mariana and Guam trough, ridges and seamounts. SST moderate and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contains 10 seamount type 2 (small with deep peak, most common type); 6 seamount type 3 (intermediate size, large tall and deep); 4 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 10 (large and tall with shallow peak: shallow); 6 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 8 Blind canyon type and 1 Shelf incising canyon type. Contains 2 active, confirmed hydrothermal vents. The upper depth is 3500m and the lower depth is 5000m.
109	Northern Tonga Trench	WSM,TON	Forms on the northern part of the Tongan trench. Seamounts formed on ridges sitting on abyssal hills and mountains. Sea surface temperature is high, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are low. Mixed layer depth, salinity and pH levels, nitrate and solar irradiance are moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the Northeast. Intersect 1 seamount type 3 (intermediate size, large tall and deep) and 1 seamount type 10 (large and tall with shallow peak: shallow); Contains 1 active, confirmed; 1 active, inferred and 1 inactive, hydrothermal vents. The upper depth is 3500m and the lower depth is 7500m.
111	Marshall Patches	MHL	Four parts and tiny non-contiguous bioregion scattered across the Marshall Islands and high seas. Three bioregion parts contain ridges and one bioregion part contains seamounts. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 6 (very large and tall with low escarpment); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 1500m and the lower depth is 4500m.

Cod e	Name	Countries	Summary description
112	Ujelang chain	MHL,FSM	Contains seamounts, abyssal mountains, basins and abyssal plains. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are moderate and variable. Temperature at 1000m is moderate. 20°C isotherm is shallow, MLD and solar irradiance are moderate and pH is high. Silicate, phosphate, nitrate and calcite are moderate. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5000m.
113	Jarvis Deep	KIR,UMI	Contains Seamounts with escarpments and deep abyssal mountains, hills and plains. Sea surface temperature is low and variable. Chlorophyll-a concentrations are high and variable. Dissolved oxygen, silicate, and pH levels are low. Salinity, phosphorous, solar irradiance, and nitrate levels are high. Temperature at depth is high but variable. 20 degree isotherm is deep. Mixed layer depth is shallow but variable. Contains 3 seamount type 2 (small with deep peak, most common type); 6 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth).The upper depth is 4500m and the lower depth is 5500m.
115	Solomon Sea Spread	SLB,PNG	Contains the northern tip of the South Solomon Trench, medium size seamounts, Solomon sea spreading ridges and rift valleys, basin canyons and the Rennell and Bellona Plateau, SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is deep, 20°C isotherm is deep, MLD is shallow, and PH is low. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 3 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 28 Blind canyon type. Contains 2 active, inferred hydrothermal vents. The upper depth is 2500m and the lower depth is 4000m.

Cod e	Name	Countries	Summary description
116	Sylvania Tablemount	MHL	Contains mostly large ridges with escarpments and cuts across few seamounts within the Marshall islands. SST high and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contains 2 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 3 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 1500m and the lower depth is 4500m.
117	Northern Cooks Plateau	COK	Contains Plateaus in the eastern side with few large seamounts. Trough runs through the center of bioregion and deep abyssal hills and mountains to the west. Bioregion falls within the Cook Islands. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low. Very deep mixed layer and a more shallow 20 degree isotherm. 1000m temperature is low. Temperature at 200m is high and stable. Silicate, nitrate, dissolved oxygen, calcite, and phosphorous levels are low. Salinity is high. Solar irradiation and pH are high to moderate. Contains 3 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 2500m and the lower depth is 4000m.
119	Satawan Parallel	FSM	Contains Plateaus, ridges, basins and seamounts and Helena Shoal and Lady Elgin Bank with overlying escarpments. SST high and stable, Chlorophyll-a concentrations are low. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance, Silicate, phosphate, and nitrate are low. Calcite is moderate. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 9 (Large and tall with shallow peak, larger); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth).The upper depth is 1500m and the lower depth is 3500m.

Code	Name	Countries	Summary description
120	North Solomon High Seas	SLB	Mostly abyssal hills and plains and cuts across two large seamounts formed on abyssal mountains and also a plateau in the east. SST high and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is shallow, 20°C isotherm is deep, MLD is low and pH is high. Solar irradiance is moderate, silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3000m and the lower depth is 4000m.
121	North Mussau Trench, South Palau and Micronesia	FSM,PLW,IDN,PNG	Non-contiguous region split into 4 parts. Most eastern side contains trough, ridges and few smaller seamounts. The middle is mainly abyssal features whereas the most western region contains seamounts and the southern tip of the Philippines Trench. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contains 8 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 5 Blind canyon type. The upper depth is 4000m and the lower depth is 5500m.
122	Southern French Polynesia	PYF	Mostly abyssal hills and abyssal plain with basins and few seamounts in the western part of region. SST and Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is very high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 5 seamount type 2 (small with deep peak, most common type); 1 seamount type 4 (small with deep peak, most isolated type); 2 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.

Cod e	Name	Countries	Summary description
123	South (Banaba) Ocean Island	NRU,KIR	Bioregion contains only abyssal hills and abyssal plains. Sea surface temperature is high and stable. Chlorophyll-a concentrations are moderate. Calcite is low. Dissolved oxygen is moderate and increases towards the NW. Salinity is moderate. Nitrate, phosphorous, and silicate levels are low to moderate. PH levels are high. Solar irradiation is high. Mixed layer depth is variable. Temperatures at 1000m and 200m start high and decrease greatly as one moves north. 20 degree isotherm is deep. Contains NO Seamounts. The upper depth is 3500m and the lower depth is 4500m.
125	Temotu and Lord Howe Cluster	SLB,VUT	Contains the Solomon Plateau and large ridges with escarpments. Canyons and seamounts run through the region with deep water basins on abyssal features. Sea surface temperature very high and stable. Chlorophyll-a concentrations are moderate, with large bloom in southern region. Salinity, dissolved oxygen, silicate and phosphorous levels are low. Solar irradiance is high. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 5 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 22 Blind canyon type and 2 Shelf incising canyon type. Contains 1 active, confirmed; 2 active inferred hydrothermal vents. The upper depth is 1000m and the lower depth is 3500m.
127	South New Caledonia High Seas and Norfolk	NCL,NFK,AUS	Two parts bioregion with mostly plateaus and canyons with a ridge in the eastern part. SST very low and stable, Chlorophyll-a concentrations are low. Salinity is high, DO is moderate, Deepwater temperature is shallow, 20 Degree Isotherm is shallow, Solar irradiance is low and MLD is shallow. Silicate, pH, Calcite, Nitrate and phosphorous levels are low. Contains NO Seamounts. Includes 16 Blind canyon type . The upper depth is 1000m and the lower depth is 2000m.
128	Northeast Gilbert	KIR,UMI	Mostly abyssal habitat (hills and plains with deep basin). Cuts across a ridge and few seamounts in the east. SST moderate and stable, Chlorophyll-a concentrations are high, variable. Mixed layer depth is deep. Temperature at 1000m and 200m is moderate. 20 degree isotherm is moderate depth. Solar irradiation is high; pH, nitrate, and silicate levels are moderate. Phosphorous and salinity are high. Dissolved oxygen and calcite levels are low, but calcite is highly concentrated around islands. Contains 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 5500m.

Code	Name	Countries	Summary description
129	Funafuti, Tokelau and Tema Deep (Cooks)	TUV,WLF,ASM,COK,TKL	Contains small to medium size deep seamounts formed on abyssal mountains. Seamounts have steep escarpments. SST high and stable, Chlorophyll-a concentrations are low. Very deep mixed layer and a more shallow 20 degree isotherm. 1000m temperature is low. Temperature at 200m is high and stable. Silicate, nitrate, dissolved oxygen, calcite, and phosphorous levels are low. Salinity is high. Solar irradiation and pH are high to moderate. Contains 15 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 4 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type and 4 Shelf incising canyon type. The upper depth is 4000m and the lower depth is 5000m.
132	Penrhyn Basin	COK,PYF,KIR	Mostly abyssal hills and plains with basin. Sea surface temperature is high to moderate and stable. Chlorophyll-a concentrations are moderate. Shallow 20 degree isotherm and deep mixed layer. High temperature at 1000m and 200m depths. Salinity, solar irradiance, nitrate, dissolved oxygen, and phosphorous levels are moderate to high. PH, silicate, and calcite levels are low. Contains 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 4 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 5500m.
134	Negonego to Tureia Atolls Deep	PYF	Contains seamounts formed on plateaus and abyssal mountains, sloping escarpments, few canyons, ridges on top of plateaus and underlying basins. SST low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 5 Blind canyon type. The upper depth is 3000m and the lower depth is 4500m.

Code	Name	Countries	Summary description
137	Atuona far Eastern Boarder of French Polynesia	PYF	Abyssal features with basin on plains. SST moderate and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Intersect 1 seamount type 8 (small and short with very deep peaks, deepest type); The upper depth is 4000m and the lower depth is 4500m.
138	Phoenix Seamounts	KIR,UMI	Large region cutting through trough, seamounts with steep escarpments, deep basins and abyssal features (mountains, hills and plains). Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are moderate. Temperatures at depth are moderate to high. Depth of mixed layer and 20 degree isotherm are both middling. Phosphorous, dissolved oxygen and salinity are high. Silicate, calcite, and pH levels are low. Nitrate and solar irradiance levels are moderate. Contains 9 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 2 seamount type 7 (small and short with very deep peaks, shortest); 6 seamount type 8 (small and short with very deep peaks, deepest type); 5 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 6000m.
140	Tonga NZ High Seas	TON,NZL	Contains ridges, canyons, basins, troughs, plateaus and abyssal plains, hills and mountains. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are low and variable. Dissolved oxygen concentrations are moderate and stable. Moderate sea surface currents generally from the North West. Contains NO Seamounts. Includes 5 Blind canyon type. Contains 1 active, confirmed; 1 active inferred hydrothermal vents. The upper depth is 1000m and the lower depth is 2500m.

Cod e	Name	Countries	Summary description
142	US and Line Islands Group High Seas	KIR,UMI	Contains seamounts on abyssal mountains, hills and plains. Sea surface temperature is low and variable. Chlorophyll-a concentrations are moderate. Mixed layer depth and 20 degree isotherm are deep. Temperature at 200m is low, but high at 1000m. Silicate, phosphorous, salinity, and solar irradiance levels are high. Nitrate, pH, dissolved oxygen, and calcite levels are low. Contains 2 seamount type 2 (small with deep peak, most common type); 12 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 3 seamount type 7 (small and short with very deep peaks, shortest); 5 seamount type 8 (small and short with very deep peaks, deepest type); The upper depth is 5000m and the lower depth is 5500m.
143	Tahiti and Society Deep	PYF	Contains chain of large seamounts on southern end of bioregion and few ridges with slope and steep escarpments. SST moderate and stable, Chlorophyll-a concentrations are low. Calcite, solar irradiance, phosphorous, silicate, and nitrate levels are low. Dissolved oxygen, salinity, and pH levels are high. Temperature at 200m is high, while at 1000m it is moderate and variable. Mixed layer is deep; 20 degree isotherm is shallow and variable. Contains 4 seamount type 1 (small with deep peak, short with moderately deep peak); 9 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 10 seamount type 10 (large and tall with shallow peak: shallow); Includes 10 Blind canyon type and 2 Shelf incising canyon type. Contains 1 active, confirmed; 1 active, inferred and 1 inactive, hydrothermal vent. The upper depth is 2500m and the lower depth is 4500m.
145	Hereheretue and YOTO Seamount	PYF	Contains chain of seamounts on northern end of bioregion and few ridges with slope and steep escarpments. Basin also featured in the east. SST low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 8 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 5 seamount type 8 (small and short with very deep peaks, deepest type); 6 seamount type 10 (large and tall with

Code	Name	Countries	Summary description
			shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 4500m.
146	East West Kingman and Palmyra	KIR,UMI	Two parts bioregion with abyssal features in the west and deep seamounts on abyssal mountains and ridges in the east. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Deep 20 degree isotherm and shallow mixed layer depth. Temperature is low at depth. Silicate, phosphorous, calcite, nitrate, solar irradiance, and salinity levels are low. PH levels are high. Dissolved oxygen is high to moderate. Contains 3 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.
148	South Christmas Island	KIR,UMI	Contains mostly seamounts, ridges and abyssal mountains with steep escarpments. Sea surface temperature is low and variable. Chlorophyll-a concentrations are high and variable. Dissolved oxygen, silicate, and pH levels are low. Salinity, phosphorous, solar irradiance, and nitrate levels are high. Temperature at depth is high but variable. 20 degree isotherm is deep. Mixed layer depth is shallow but variable. Contains 3 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 2 seamount type 10 (large and tall with shallow peak: shallow); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 3000m and the lower depth is 5000m.

Cod e	Name	Countries	Summary description
149	North Napuka Atoll	PYF	Mostly abyssal plains and hills and mountains. SST moderate and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.
150	Marshall and Gilbert High Seas	KIR	Contains Hadal base and cuts across few seamounts in the west. Mostly abyssal habitat in the east. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low. Calcite and dissolved oxygen levels are low. PH and salinity levels are moderate. Solar irradiance is low. Mixed layer depth is shallow in the north and deep in the south. Silicate, phosphorous, and nitrate levels are high. Solar irradiance is high in the southern regions but low in the north. Temperatures at 1000m and 200m are moderate. Contains 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5500m and the lower depth is 6000m.
153	Six Ocean Realms	PYF,PCN	Mostly abyssal hills and plains. SST and Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is very high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains NO Seamounts. The upper depth is 3500m and the lower depth is 4000m.
157	Central Micronesia cluster	FSM	Complex features including plateaus, basin, seamounts, and ridges, spreading ridges, slopes and steep escarpments. SST high and stable, CHL is low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is moderate, Solar irradiance is moderate, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low variale.Contains 4 seamount type 1 (small with deep peak, short with moderately deep peak); 5 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); 8 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type. The upper depth is 3000m and the lower depth is 4500m.

Code	Name	Countries	Summary description
159	North East Christmas Boarder	KIR	Contains abyssal features and a seamount. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are moderate. Mixed layer depth and 20 degree isotherm are deep. Temperature at 200m is low, at 1000m is low as well but with warmer scattered areas. Silicate, dissolved oxygen, phosphorous, salinity, pH, and solar irradiance levels are moderate. Nitrate and calcite levels are low. Contains 2 seamount types 2 (small with deep peak, most common type).The upper depth is 4500m and the lower depth is 5000m.
160	North Enyu and Bikini	MHL	Cuts across a large seamount with steep escarpments and a rise. Abyssal features form the base. SST high and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 3500m and the lower depth is 5000m.
162	East Reao Atoll	PYF,PCN	Mostly abyssal hills and cutting across a number of small seamounts and ridges. SST low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 2 seamount types 1 (small with deep peak, short with moderately deep peak); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 11 intermediate size, largest basal area and deepest peak depth). The upper depth is 3000m and the lower depth is 4500m.
164	South Loyalty Basin	NCL,SLB,VUT	Large bioregion containing plateaus in the southern end, one large seamount featured with two morphology types and few smaller seamounts. Few ridges, basin and deep abyssal habitat. Sea surface temperature moderate, variable. Chlorophyll-a concentrations are high to moderate. Deepwater temperature is deep, Solar irradiance and MLD is moderate. Silicate, pH, Calcite and phosphorous levels are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 12 Blind canyon type and 3 Shelf incising canyon type. The upper depth is 3500m and the lower depth is 4500m.

Cod e	Name	Countries	Summary description
165	East Shefa, Fiji Central and Maui's Stone Place.	FJI,TON,VUT	Contains 1 intermediate and 2 small seamounts formed on spreading ridges and basins. Rift valleys also form the base of the seamounts with plateau also featured. Sea surface temperature moderate, variable. Chlorophyll-a concentrations are high with a large bloom in the west region. MLD quite low in SW part. Silicate, PH, and phosphorous levels are high. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 8 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); Includes 24 Blind canyon type and 9 Shelf incising canyon type. Contains 2 active, confirmed; 5 active, inferred hydrothermal vents. The upper depth is 500m and the lower depth is 3000m.
166	Woleai to Satawal Deep	FSM	Contains mostly ridges and spreading ridges from east to west and rift valleys. Included are a lot of smaller and medium size seamounts with steep escarpments. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m, MLD and 20°C isotherm are shallow, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contains 5 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 6 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 10 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 1500m and the lower depth is 4000m.
167	Battle of the Coral Sea	SLB,AUS,PNG	Mostly abyssal features and a seamount with canyons and bits of plateaus. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD is shallow, and PH is high. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 4 (small with deep peak, most isolated type). Includes 3 Blind canyon type. The upper depth is 3000m and the lower depth is 4500m.
170	Marosszeky Gap	NCL,AUS	Contains three seamounts, four canyons and ridge. Includes slope base with steep escarpments into abyssal habitats. SST low and stable, Chlorophyll-a concentrations are high to moderate. Deepwater temperature is moderate. Solar irradiance and MLD are moderate. Silicate, pH, Calcite and phosphorous levels are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type

Code	Name	Countries	Summary description
			11 (intermediate size, largest basal area and deepest peak depth). Includes 9 Blind canyon type. The upper depth is 1500m and the lower depth is 3000m.
175	Tiki Basin	PYF	Bioregion cuts across a long ridge in the north with couple of seamounts in the southern end. Mostly abyssal features with deep basins. SST moderate and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 3 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); The upper depth is 4000m and the lower depth is 4500m.
176	Raivavae Southwest and Southeast	PYF	Long non-contiguous bioregion with mostly abyssal features and basin in the east. West part contains seamounts and abyssal features. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.

Cod e	Name	Countries	Summary description
177	Rungata, Tamana and Arorae DeeP	TUV,KIR,UMI	Contains medium to large seamounts on abyssal mountains. Large trough included in the south eastern side of bioregion. Other features include basin, escarpments and ridges. Sea surface temperature is high but moderate in the north and stable. Chlorophyll-a concentrations are moderate. 20 degree isotherm and mixed layer are deep. Temperature at 1000m is high but greatly decreases in the north. At 200m, temperature is steadily high. Solar irradiance is high. PH levels are low. Phosphorous, nitrate, silicate, and salinity levels are high. Dissolved oxygen and calcite level are low, but dissolved oxygen increases significantly towards the east. Contains 3 seamount type 2 (small with deep peak, most common type); 1 seamount type 4 (small with deep peak, most isolated type); 3 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 3 Blind canyon type. The upper depth is 5000m and the lower depth is 6000m.
179	Southern Niue and High Seas	COK,TON,NIU	Mostly dominated by abyssal plains and hills with basin. Other features include escarpment and ridges. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are moderate and variable. Dissolved oxygen concentrations are moderate and stable. Strong sea surface currents generally from the North West. Intersect 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 6000m.
181	Northeast Tuvalu to Southern Phoenix Boarder	TUV,TKL,KIR	Contains trough in north western end of region, cuts across few chain of seamounts ad a ridge, other feature are abyssal hills. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Very deep mixed layer and a more shallow 20 degree isotherm. 1000m temperature is low in eastern regions and much higher in the western region. Temperature at 200m is high and stable. Silicate, nitrate, dissolved oxygen, calcite, and phosphorous levels are low. Salinity is high. Solar irradiation and pH are high to moderate. Contains 4 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 4 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 6000m.

Cod e	Name	Countries	Summary description
182	Fabert and McGee Seamount	COK,PYF,TON	Small bioregions with canyons, ridges, plateau and slope. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are moderate and variable. Dissolved oxygen concentrations are moderate and stable. Strong sea surface currents generally from the North West. Contains 2 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 7 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 4500m and the lower depth is 5000m.
183	Boudeuse Ridge	KIR,UMI	Long and narrow bioregion stretched across east to west. Contains few ridges, small seamounts and few small basins. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are moderate. Shallow 20 degree isotherm and deep mixed layer. Moderate 1000m temperature and low 200m temperature. Salinity, solar irradiance, nitrate, dissolved oxygen, and phosphorous levels are high. PH, silicate, and calcite levels are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 3 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
184	East Temotu and Northwest Rotuma Seamounts and the Vityaz trench	SLB,FJI	Mostly abyssal with several seamounts and ridges. Deep abyss mountains form the base of the seamounts. Vityaz Trench bisects the two ridges and connects to the Cape Johnson Trough with steep escarpments. SST moderate and stable, CHL low and variable, Salinity increases eastward and stable, DO low and stable, Deepwater temp is moderate, 20°C isotherm is shallow, mixed layer depth is shallow closer to land, Solar irradiance is moderate, pH level is moderate and variable, silicate level is low, phosphate level is low, nitrate level is low, Calcite is low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 3 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 3 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 3000m and the lower depth is 4500m.

Cod e	Name	Countries	Summary description
185	East West Christmas Islands Boarders	KIR,UMI	Contains abyssal features with few seamounts in the western end. Sea surface temperature is high to moderate and variable. Chlorophyll-a concentrations are moderate. Mixed layer depth and 20 degree isotherm are deep. Temperature at 200m is low, but high at 1000m. Silicate, phosphorous, salinity, and solar irradiance levels are high. Nitrate, pH, dissolved oxygen, and calcite levels are low. Contains 1 seamount type 2 (small with deep peak, most common type); 6 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); Includes 2 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 4000m and the lower depth is 5000m.
187	Sibylla and Kamwome	MHL,UMI	Large bioregion with lots of seamounts with sizes ranging from small - medium to large, other feature are mostly abyssal hills, mountains and plains with basins. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contains 6 seamount type 2 (small with deep peak, most common type); 8 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 6 (very large and tall with low escarpment); 4 seamount type 7 (small and short with very deep peaks, shortest); 14 seamount type 8 (small and short with very deep peaks, deepest type); 13 seamount type 9 (Large and tall with shallow peak, larger); 6 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
189	Oeno Island Deep	PYF,PCN	Mostly abyssal plains and hills with few seamounts with steep escarpment in the east. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 3 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 3 seamount type 7 (small and short with very deep peaks, shortest); The upper depth is 3500m and the lower depth is 4500m.

Code	Name	Countries	Summary description
190	Malaguana-Gadao Rise	GUM,FSM	Bioregion cuts across few large ridges, a trough and a spreading ridge. Canyons are included in the north western side with few large seamounts. Other feature includes steep escarpments and deep basins. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 18 Blind canyon type. Contains 4 active, confirmed; 1 active, inferred hydrothermal vents. The upper depth is 2500m and the lower depth is 4000m.
191	Manihi West to Raroia East	PYF	Mostly includes plateaus, ridges and few canyons with steep escarpments. SST moderate and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 3 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 7 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow).Includes 11 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 1500m and the lower depth is 3500m.
192	Solomon Australia Boarder and Plateau	NCL,SLB,AUS	Contains plateaus, deep ridges, basin and a seamount with steep escarpment. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD is shallow, and PH is moderate. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 4 (small with deep peak, most isolated type). The upper depth is 2500m and the lower depth is 3500m.

Code	Name	Countries	Summary description
196	Lakina to Northern Tokelau Submerged Seamounts	TUV,TKL,KIR	Contains deep seamounts with steep escarpments on abyssal mountains and hills. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Dissolved oxygen, silicate, phosphorous, nitrate, solar irradiance, and calcite levels are low. PH and salinity levels are high. Temperature is low at 1000m and high at 200m. Mixed layer is shallow and 20 degree isotherm is very deep. Contains 6 seamount type 2 (small with deep peak, most common type); 6 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 8 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 8 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
199	Manihiki and Tokelau to South Phoenix	ASM,COK,TKL,KIR	Non-contiguous region with mostly seamounts and plateaus in the east. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Very deep mixed layer and a more shallow 20 degree isotherm. 1000m temperature is low. Temperature at 200m is high and stable. Silicate, nitrate, dissolved oxygen, calcite, and phosphorous levels are low. Salinity is high. Solar irradiation and pH are high to moderate. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 5000m.
200	South Nukuoro, Mussau Trench and Eauripik Rise	FSM,PNG	Mostly plateau in the east, trough in the middle region and abyssal hills and mountains in the west. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, and nitrate are low. Calcite is moderate. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest). The upper depth is 2500m and the lower depth is 3500m.

Code	Name	Countries	Summary description
202	East Pohnpei, Kosrae and west Namorik Atoll	MHL,FSM	Mostly basin, abyssal plains and hills with steep escarpments. SST high and stable, CHL is low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is moderate, Solar irradiance is moderate, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low variale.Contains 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.
204	Northern Hunga and Wallis plateaus and North Viti and Vanua Levu basin	WLF,FJI,TON	Bioregion exists in the two Niua islands, sits on a plateau north of Tonga's EEZ with numerous large and intermediate size seamounts. Non-contiguous bioregion which extends into Fiji's EEZ. SST is moderate and variable, CHL is high closer to land (Viti Levu and Vanua Levu - Fiji) and low towards the east, Salinity is low and variable, Dissolved Oxygen is low and variable, Deepwater temp is deep, 20°C isotherm is deep, mixed layer depth is shallow, Solar irradiance is moderate, pH level is moderate, silicate level is high, phosphate level is moderate, nitrate level is moderate, Calcite is generally low but high close to land (Fiji main islands - Viti Levu and Vanua Levu). Contains 7 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 3 (intermediate size, large tall and deep); 14 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 10 (large and tall with shallow peak: shallow); Includes 9 Blind canyon type and 11 Shelf incising canyon type. Contains 9 active, confirmed; 17 active, inferred hydrothermal vents. The upper depth is 0m and the lower depth is 2500m.
205	West Melanesian Trench	FSM,PNG	Dominated by Trench and Trough with steep escarpments and deep basin. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, and nitrate are low. Calcite is moderate. Contains 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 6 (very large and tall with low escarpment); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 16 Blind canyon type. The upper depth is 4000m and the lower depth is 5500m.

Code	Name	Countries	Summary description
206	South Ceva-I-Ra Deep and Southern Cliff from Kalau	FJI,TON,VUT	Small bioregion dominated by abyssal hills and mountains with few seamounts. SST is low and stable, CHL low and stable, Salinity is moderate, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is shallow, Solar irradiance is low, pH level is moderate, silicate level is moderate, phosphate level is low, nitrate level is moderate, Calcite is low. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 10 (large and tall with shallow peak: shallow); Includes 2 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 2500m and the lower depth is 4000m.
207	Torres Canyons Deep	SLB,VUT	Region dominated by canyons and deep basin. Other features include a seamount and steep escarpment. Sea surface temperature mildly variable and relatively high for Vanuatu. Chlorophyll-a concentrations are moderate, stable. Salinity and dissolved oxygen are low. Mid-depth temperatures very high while temperature at 1000m is low. MLD is high. Silicate and phosphorous levels are low. PH is very low. Contains 1 seamount type 4 (small with deep peak, most isolated type); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 13 Blind canyon type. The upper depth is 3000m and the lower depth is 4500m.
208	East of Minneapolis Ridge	KIR	Mostly abyssal plain and hills. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Mixed layer depth and 20 degree isotherm are deep. Temperature at 200m is low, at 1000m is low as well but with warmer scattered areas. Silicate, dissolved oxygen, phosphorous, salinity, pH, and solar irradiance levels are moderate. Nitrate and calcite levels are low. Contains 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 6 (very large and tall with low escarpment); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5000m.

Cod e	Name	Countries	Summary description
210	West Bouchard Seamount	PYF,TON,NZL	Non-contiguous bioregion dominated by abyssal hills and mountains. Other features include seamounts with steep escarpments. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are moderate and variable. Dissolved oxygen concentrations are moderate and stable. Strong sea surface currents generally from the North West. Contains 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
211	South Gilbert Boarder	TUV,KIR	Deep seamounts on abyssal mountains with steep escarpments. Basin on abyssal plains and cuts across few ridges. Sea surface temperature is high and stable. Chlorophyll-a concentrations are moderate. Calcite is low. Dissolved oxygen is moderate. Salinity is high. Nitrate, phosphorous, pH, and silicate levels are high to moderate. PH levels decrease towards the east. Solar irradiation is high. Mixed level and 20 degree isotherm are deep. Temperature at 1000m is high but greatly decreases in the north. At 200m, temperature is steadily high. Contains 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 4500m and the lower depth is 5000m.
216	Malampa and Loyalty Basin	NCL,SLB,VUT	mostly deep abyssal hills and mountains with overlying basins, and cuts across few seamounts, ridges and trench. Sea surface temperature moderate, variable. Chlorophyll-a concentrations are high to moderate, variable. Salinity and dissolved oxygen are low. Temperature at 200m is low. Solar irradiance is quite high in the north. Contains 1 seamount type 2 (small with deep peak, most common type); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type and 3 Shelf incising canyon type. The upper depth is 3500m and the lower depth is 5000m.

Code	Name	Countries	Summary description
218	Rarotonga and the Byus Seamount	COK,PYF	Long thin with deep seamounts formed on abyssal habitats scattered across the bioregion with steep escarpments. SST low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 2 seamount type 2 (small with deep peak, most common type); 6 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 4 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 3 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5000m.
220	Nukutipipi Deep	COK,PYF	Mostly abyssal hills and two seamounts. SST low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); The upper depth is 4000m and the lower depth is 4500m.
221	North Ahe and Manihi	PYF,KIR	Deep abyssal mountains and hills with seamounts with steep escarpments. Few canyons and ridges are also featured in the west end. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low. Calcite, solar irradiance, phosphorous, silicate, and nitrate levels are low. Dissolved oxygen, salinity, and pH levels are high. Temperature at 200m is high, while at 1000m it is moderate and variable. Mixed layer is deep; 20 degree isotherm is shallow and variable. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 5 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 3 Blind canyon type. The upper depth is 3000m and the lower depth is 4500m.

Code	Name	Countries	Summary description
222	North of Solomon and Cape Johnson Troughs and Duff Islands	SLB,PNG	Contains part of a Trench and Trough in the north Solomon, and plateaus and canyons, steep escarpments and abyssal features. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is deep, MLD is shallow. Solar irradiance and pH, silicate, phosphate, and nitrate are low. Calcite is moderate. Contains 3 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 7 (small and short with very deep peaks, shortest); 4seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 19 Blind canyon type and 3 Shelf incising canyon type. The upper depth is 2500m and the lower depth is 4000m.
226	Rennell and Pocklington Troughs	SLB,PNG	Two parts region with trough, canyons, plateau, ridges, basin, escarpments, and abyssal mountains. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD is shallow, and PH is moderate. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contains Intersect1 seamount type 4 (small with deep peak, most isolated type); Includes 13 Blind canyon types. The upper depth is 2500m and the lower depth is 4000m.
228	Norfolk and High Seas Deep	NCL,NFK,FJI, VUT	Contains trough and basin in the western end and abyssal plains, hills and mountains with few seamounts formed with steep escarpments. SST is low and stable, CHL is low and stable, Salinity is high, Dissolved Oxygen is moderate and variable, Deepwater temp is low, 20°C isotherm is shallow, mixed layer depth is medium, Solar irradiance is low, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 3500m and the lower depth is 4500m.

Code	Name	Countries	Summary description
229	North Palau and Yap Trenches and Miklukho-Maklaya Seamount	FSM,PLW,PHL	Contains mostly the Palau ridge, trench and seamounts formed on abyssal mountains. Steep escarpments and deep basin also featured. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m, MLD and 20°C isotherm are shallow, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 5 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 15 Blind canyon type and 3 Shelf incising canyon type. The upper depth is 3500m and the lower depth is 5000m.
231	Marokau to Reao	PYF	Contains seamounts, plateau in the west and cuts across a chain of ridges. Steep escarpments and deep basin, and abyssal features included. SST low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contains 20 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 7 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 3 Blind canyon type. The upper depth is 2500m and the lower depth is 4000m.
232	Far West Marshall and North East Micronesia	MHL,FSM	Large seamounts in the east and mostly deep abyssal basin in the west. SST high and stable, CHL is low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is moderate, Solar irradiance is moderate, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low variale.Contains 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 9 (Large and tall with shallow peak, larger); 5 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 5500m.

Code	Name	Countries	Summary description
233	Swains Atoll and Nassau Island Deep	WLF,ASM,COK,WSM,TKL	Mostly seamounts, abyssal features (plains, hills and mountains), basin and steep escarpments. SST moderate and stable, CHL low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is deep, 20°C isotherm is deep, mixed layer depth is medium, Solar irradiance is high, pH level is low, silicate level is moderate, phosphate level is moderate, nitrate level is moderate, Calcite is low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 18 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 13 seamount type 8 (small and short with very deep peaks, deepest type); 6 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 7 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 4500m and the lower depth is 5500m.
234	Wallis, Samoa and American Samoa	WLF,ASM,COK,WSM,TON	Includes medium size seamounts, northern bits of the Tonga trench, ridges that form the base of American Samoa with lots of canyons. Sea surface temperature is high, CHL low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is deep, 20°C isotherm is deep, mixed layer depth is medium, Solar irradiance is high, pH level is low, silicate level is moderate, phosphate level is moderate, nitrate level is moderate, Calcite is low. Contains 1 seamount type 1 (small with deep peak, short with moderately deep peak); 7 seamount type 2 (small with deep peak, most common type); 9 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 9 (Large and tall with shallow peak, larger); 10 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 16 Blind canyon type and 12 Shelf incising canyon type. The upper depth is 2000m and the lower depth is 5000m.

Code	Name	Countries	Summary description
236	Nova Trough and Celestial Seamount	KIR,UMI	Contains few large seamounts in the west end and ridges in the east. Other feature is mostly abyssal. Sea surface temperature is low to moderate and variable. Chlorophyll-a concentrations are moderate. Calcite and pH levels are low. Solar irradiance, nitrate, phosphorous silicate, salinity, and dissolved oxygen levels are high. Temperatures at depth are moderate to low. Mixed layer is quite deep; 20 degree isotherm is on the shallow end. Contains 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 9 (Large and tall with shallow peak, larger); 4 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 5500m.
237	Melanesian Basin High Seas	FSM	Mostly abyssal hills and plains and plateau. SST high and stable, Chlorophyll-a concentrations are low. Salinity and dissolved oxygen are low and variable. Temperature at 1000m and 20°C isotherm are moderate. Solar irradiance is high and MLD is shallow. PH, Silicate, phosphate, nitrate and Calcite are low. Contains 1 seamount type 4 (small with deep peak, most isolated type); The upper depth is 3000m and the lower depth is 4000m.
238	Ile Haute Bagao Deep and New Hebrides Ridge	NCL,VUT	Shallow region on Vanuatu plateau and ridges with canyons featured comprehensively. Also includes a trough in the east and seamounts in the west part. Sea surface temperature reduces significantly moving south, relatively stable. Chlorophyll-a concentrations are high, variable, with very high concentrations around Efate and Epi islands. Calcite concentration is high in this area as well. Salinity and dissolved oxygen are high, lower in the north. Deepwater temperatures are high. MLD is low. Solar irradiance is low, especially around islands. Contains 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 31 Blind canyon type and 4 Shelf incising canyon type. Contains 2 active, confirmed; 1 active, inferred hydrothermal vents. The upper depth is 500m and the lower depth is 3000m.
239	South Kosrae Deep	MHL,FSM,NRU	Mostly abyssal plains with basins. SST high and stable, Chlorophyll-a concentrations are low. Salinity and dissolved oxygen are low and variable. Temperature at 1000m and 20°C isotherm are moderate. Solar irradiance is high and MLD is shallow. pH, Silicate, phosphate, nitrate and Calcite are low. Contains NO Seamounts. The upper depth is 4000m and the lower depth is 4500m.

Code	Name	Countries	Summary description
240	Abyssal plain, seamounts and Vityaz trench bordering Fiji (NW), Tuvalu (SW) and Solomon Islands (SE)	SLB,TUV,FJI	Very deep bioregion with abyssal plains, vityaz trench and ridges with few chain of seamounts. SST high and stable, CHL low and variable, Salinity is moderate and stable, DO is low and stable, Deepwater temp is moderate, 20°C isotherm is deep, mixed layer depth is shallow, Solar irradiance is moderate, pH level is variable, silicate level has a left to right gradual increase, phosphate level is low, nitrate level is low, Calcite is low. Contains 4 seamount type 2 (small with deep peak, most common type); 3 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 4 Blind canyon type. The upper depth is 4000m and the lower depth is 5000m.
241	Tuvalu Nui, Boarder and Cooper Seamount	TUV,ASM,TKL,KIR	Deep bioregion with seamounts on abyssal mountains, hills and basin formed on abyssal plain. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Dissolved oxygen, silicate, phosphorous, nitrate, solar irradiance, and calcite levels are low. PH and salinity levels are high. Temperature is low at 1000m and high at 200m. Mixed layer is shallow and 20 degree isotherm is very deep. Contains 5 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 6 seamount type 7 (small and short with very deep peaks, shortest); 8 seamount type 8 (small and short with very deep peaks, deepest type); Includes 1 Blind canyon type. The upper depth is 5000m and the lower depth is 5500m.
242	Line and North French Polynesia	PYF,KIR	Seamounts formed on abyssal mountains with steep escarpments. Other features include abyssal hills with a few abyssal plain patches, and a ridge in the east. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low to moderate. Calcite, solar irradiance, phosphorous, silicate, and nitrate levels are low. Dissolved oxygen, salinity, and pH levels are high. Temperature at 200m is high, while at 1000m it is moderate and variable. Mixed layer is deep; 20 degree isotherm is shallow and variable. Contains 2 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 3 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5000m.

Code	Name	Countries	Summary description
243	East Temotu,Banks and West of Rotuma Seamounts and the Vityaz trench	SLB,FJI,VUT	Contain large spreading ridge in the western part and a number of seamounts in the north and eastern part of the bioregion. Ridges and steep escarpments are also featured and the south of the Vityaz trench. Sea surface temperature high and stable. Chlorophyll-a concentrations are low, except for high concentration in NW corner. Mid-depth temperatures very high while temperature at 1000m is low. MLD is high. Silicate and phosphorous levels are high. PH is high. Contain 7 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 8 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 7 seamount type 10 (large and tall with shallow peak: shallow); 6 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 18 Blind canyon type and 1 Shelf incising canyon type. Contain 2 inactive, hydrothermal vents. The upper depth is 2000m and the lower depth is 3500m.
244	Mysteries of Ontong Java	SLB,PNG	Mostly plateaus and abyssal hills. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is deep, MLD is shallow. Solar irradiance and pH, silicate, phosphate, and nitrate are low. Calcite is moderate. Contain NO Seamounts. The upper depth is 2000m and the lower depth is 3000m.
247	Flint and Vostok Islands Deep	COK,PYF,KIR	Contain many smaller seamounts formed on abyssal mountains, steep escarpments and underlying basins. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Calcite, solar irradiance, phosphorous, silicate, and nitrate levels are low. Dissolved oxygen, salinity, and pH levels are high. Temperature at 200m is high, while at 1000m it is moderate and variable. Mixed layer is deep; 20 degree isotherm is shallow and variable. Contain 9 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 7 (small and short with very deep peaks, shortest); 5 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 9 (Large and tall with shallow peak, larger); 7 seamount type 10 (large and tall with shallow peak: shallow); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.

Cod e	Name	Countries	Summary description
251	South Pitcairn High Seas	PYF	Contain few seamounts in the west and mostly abyssal plain and hill in the east side. SST and Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is very high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); The upper depth is 4000m and the lower depth is 4500m.
252	Daisu and West Marshall Cluster	MHL	Mostly seamounts with steep escarpments on abyssal mountains and also ridges. SST high and stable, CHL is low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is moderate, Solar irradiance is moderate, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low variale.Contain 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 1500m and the lower depth is 4500m.
254	South President Thiers Bank	PYF	Contain a number of seamounts on the western side with east mostly abyssal habitat. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contain 2 seamount type 1 (small with deep peak, short with moderately deep peak); 6 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 4500m.

Cod e	Name	Countries	Summary description
257	North Western and Marshall Boarder and South Thomas Guyots	MHL,UMI	Mostly seamounts with steep escarpments on abyssal mountains and hills. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contain 4 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 4 seamount type 7 (small and short with very deep peaks, shortest); 8 seamount type 8 (small and short with very deep peaks, deepest type); 5 seamount type 9 (Large and tall with shallow peak, larger); 5 seamount type 10 (large and tall with shallow peak: shallow); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 5500m.
258	Tepoto, Napuka and Pukapuka Deep	PYF	Small bioregion with five seamounts, escarpments on abyssal mountains and hills. Ridge and Plateau is also part in the south end. SST moderate and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contain 3 seamount types 2 (small with deep peak, most common type); 2 seamount types 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); The upper depth is 3000m and the lower depth is 4000m.
259	Southwest Adamstown	PYF,PCN	Mostly abyssal hills and plains. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contain 1 seamount type 7 (small and short with very deep peaks, shortest); The upper depth is 3500m and the lower depth is 4000m.
260	Manokwari Abyss	PLW,IDN	Contain abyssal mountains and hills, spreading ridges, ridge seamounts, canyons, basin and steep escarpments. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, and nitrate are low. Calcite is high. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 6 Blind canyon type. The upper depth is 2500m and the lower depth is 4000m.

Code	Name	Countries	Summary description
261	Victoria Fracture Zone	MHL,KIR	Mostly abyssal habitat that cuts through few seamounts and ridges. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low, with blooms around islands. 20 degree isotherm is mid-depth. Temperature at 1000m is quite high, while 200m temperature is moderate. Mixed layer depth is average. Solar irradiance is low. PH is low, silicate, phosphorous, nitrate levels are high. Salinity, dissolved oxygen, and calcite levels are low. Contain 1 seamount type 2 (small with deep peak, most common type); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type and 2 Shelf incising canyon type. The upper depth is 4500m and the lower depth is 5000m.
262	North Palau and Mariana Deep	GUM,FSM,PLW,PHL	Non-contiguous with east part including the Mariana Trench and west side abyssal hills and patches of Hadal base. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contain 3 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Contain 1 inactive, hydrothermal vent. The upper depth is 5500m and the lower depth is 6000m.
263	Avon Islets Group, Fairway Plateau and South Ile Surprise	NCL	Mostly plateaus, ridges and canyons. SST very low and stable, Chlorophyll-a concentrations are high to moderate. Deepwater temperature is moderate. Solar irradiance and MLD are moderate. Silicate, pH, Calcite and phosphorous levels are low. Contain NO Seamounts. Includes 7 Blind canyon type and 4 Shelf incising canyon type. The upper depth is 0m and the lower depth is 2500m.

Code	Name	Countries	Summary description
265	Tonga Ridge, Beveridge Reef Deep and west Cooks	COK,TON,NIU	Deep bioregion with mostly abyssal hills and plains extending towards the Tongan trench and ridges. Sea surface temperature is moderate, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are low. Salinity, pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the North. Contain 1 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 4 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 5500m.
266	Gifford Tablemount	NCL,AUS	Mostly plateau with few canyons and seamounts. SST very low and stable, Chlorophyll-concentrations are low. Salinity is high, DO is moderate, Deepwater temperature is shallow, 20 Degree Isotherm is shallow, Solar irradiance is low and MLD is shallow. Silicate, pH, Calcite, Nitrate and phosphorous levels are low. Contain 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 5 Blind canyon type. The upper depth is 2500m and the lower depth is 3500m.
267	Durand Reef and South Aneityum Deep	NCL,VUT	Two parts region with plateau, ridges and canyons in the west part and seamounts, ridges and canyons in the east. Sea surface temperature very unstable, low. Chlorophyll-a concentrations are high, stable. Salinity and dissolved oxygen are high. Temperature at 200m is low while Deepwater temperatures are high. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 23 Blind canyon type and 4 Shelf incising canyon type. Contain 1 active, confirmed; 1 active inferred hydrothermal vents. The upper depth is 0m and the lower depth is 2500m.
268	North Eiao and Hatutu Deep	PYF	Mostly abyssal plains. Other features include basin and hills. SST moderate and stable, Chlorophyll-a concentrations and Silicate are moderate and variable. DO is low. 20 degree isotherm and mixed layer are deep. Temperature at 1000m is moderate and low at 200m. Solar irradiance is high. Salinity, nitrate, and phosphorous levels are high. PH and calcite levels are low. Contain 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 4000m and the lower depth is 4500m.

Code	Name	Countries	Summary description
269	North-East Rotuma, Futuna, Tuvalu abyssal mountains and seamounts	TUV,WLF,FJI	Large bioregion with abyssal hills and mountainous area consisting of ridges and seamounts. Few canyons also featured in the west region. SST moderate and stable, CHL low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is deep, 20°C isotherm is deep, mixed layer depth is medium, Solar irradiance is high, pH level is low, silicate level is moderate, phosphate level is moderate, nitrate level is moderate, Calcite is low. Contain 2 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 20 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 2500m and the lower depth is 4500m.
270	Rotuma-Futuna-Tuvalu-abyssal mountains and seamounts	TUV,WLF,FJI	Large bioregion with abyssal hills and mountainous area consisting of ridges and seamounts. SST is high and stable, CHL is low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is deep, mixed layer depth is medium, Solar irradiance is moderate, pH level is low, silicate level is moderate, phosphate level is moderate, nitrate level is moderate, Calcite is low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 3 (intermediate size, large tall and deep); 5 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 5 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 11 Blind canyon type and 3 Shelf incising canyon type. The upper depth is 1000m and the lower depth is 3500m.
271	South Bouchard Seamount	PYF	Mostly abyssal hills and mountains with ridges. Few seamounts are also featured in the east. SST and Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is very high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contain 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 8 (small and short with very deep peaks, deepest type); The upper depth is 4500m and the lower depth is 5000m.

Code	Name	Countries	Summary description
274	South Nauru and Gilbert Boarder	NRU,KIR,PNG	Mostly abyssal plains and hills with ridges on top of abyssal mountains. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. 20 degree isotherm is quite deep; temperature at 200m is high. At 1000m, temperature is low in the north and high in the south. Solar irradiation is moderate, pH is high. Silicate phosphorous, nitrate, calcite, and salinity are low. Dissolved oxygen is moderate and variable. Contain 1 seamount type 4 (small with deep peak, most isolated type); The upper depth is 3000m and the lower depth is 4000m.
275	Nuku Hiva West and Ua Huka East	PYF	Contains abyssal plains and hills. Bioregion including a number of chains of seamounts with steep escarpments. SST moderate and stable, Chlorophyll-a concentrations and Silicate are moderate and variable. DO is low. 20 degree isotherm and mixed layer are deep. Temperature at 1000m is moderate and low at 200m. Solar irradiance is high. Salinity, nitrate, and phosphorous levels are high. PH and calcite levels are low. Contain 3 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 5 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 5 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 4000m and the lower depth is 5000m.
276	Line East West Boarders and High Seas	KIR	Mostly ridges with steep escarpments on abyssal mountainous areas. Two or so seamounts also included. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are moderate. Shallow 20 degree isotherm and deep mixed layer. Moderate 1000m temperature and high 200m temperature. Salinity, solar irradiance, nitrate, dissolved oxygen, and phosphorous levels are high. PH, silicate, and calcite levels are low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 6 (very large and tall with low escarpment); 1 seamount type 8 (small and short with very deep peaks, deepest type).The upper depth is 3000m and the lower depth is 5000m.
277	North New Hebrides Trench and Trough	VUT	Includes the north New Hebrides Trench. Sea surface temperature very high and stable. Chlorophyll-a concentrations are moderate, stable. Salinity and dissolved oxygen are low. Mid-depth temperatures very high while temperature at 1000m is low. MLD is high. Silicate and phosphorous levels are low. Solar irradiance is quite high. PH is relatively low. Contain NO Seamounts. Includes 1 Blind canyon type. The upper depth is 3500m and the lower depth is 6500m.

Code	Name	Countries	Summary description
280	South New Caledonia Boarder	NCL	Contains trough, plateau and deep abyssal hills and plains with canyons featured. SST very low and stable, Chlorophyll-concentrations are low. Salinity is high, DO is moderate, Deepwater temperature is shallow, 20 Degree Isotherm is shallow, Solar irradiance is low and MLD is shallow. Silicate, pH, Calcite, Nitrate and phosphorous levels are low. Contain 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 3 Blind canyon type. The upper depth is 2500m and the lower depth is 3500m.
281	Eiao and Hatutu	PYF	Small bioregion containing seamounts, steep escarpments, ridges on abyssal mountains. SST moderate and stable, Chlorophyll-a concentrations and Silicate are moderate and variable. DO is low. 20 degree isotherm and mixed layer are deep. Temperature at 1000m is moderate and low at 200m. Solar irradiance is high. Salinity, nitrate, and phosphorous levels are high. PH and calcite levels are low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 10 (large and tall with shallow peak: shallow). Includes 1 blind canyon type. The upper depth is 1000m and the lower depth is 4000m.
284	North Cooks, Line and High Seas	COK,KIR	Contain seamounts, ridges, trough, plateau and abyssal hills and mountains. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are moderate. Shallow 20 degree isotherm and deep mixed layer. High temperature at 1000m and 200m depths. Salinity, solar irradiance, nitrate, dissolved oxygen, and phosphorous levels are moderate to high. PH, silicate, and calcite levels are low. Contain 2 seamount type 1 (small with deep peak, short with moderately deep peak); 3 seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 5 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3000m and the lower depth is 4500m.
287	East Caroline Basin	FSM	Mostly abyssal hills and mountains cutting through spreading ridges and rift valleys. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m, MLD and 20°C isotherm are shallow, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contain 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 7 (small and short with very deep peaks, shortest); 2 seamount type 11

Cod e	Name	Countries	Summary description
			(intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 4500m.
289	Minto Reef Deep	MHL,FSM	Contain abyssal plains with basin, abyssal hills and mountains with small to medium size seamounts. SST high and stable, CHL is low and variable, Salinity is low, Dissolved Oxygen is low and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is moderate, Solar irradiance is moderate, pH level is low, silicate level is low, phosphate level is low, nitrate level is moderate, Calcite is low variale.Contain 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 3 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 5000m and the lower depth is 5500m.
290	North of Yap Trench and Northwest Micronesia	FSM,PLW	Contain some medium size seamounts in the east with steep escarpments, cuts across ridges and spreading ridges with rift valleys. Deep basin also featured with abyssal mountains. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 5 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 2seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 5500m.

Cod e	Name	Countries	Summary description
292	Gardner Island and North Cooks Boarder	COK,KIR	Two parts bioregion with troughs, seamounts, ridges, basin and abyssal mountains and hills featured in the right side. The left part mostly includes deep abyssal habitats with seamounts. Sea surface temperature is high and stable. Chlorophyll-a concentrations are moderate. Dissolved oxygen, phosphorous, solar irradiation, pH, nitrate levels are moderate. Salinity levels are high, and silicate and calcite levels are low. Temperatures at depth are quite high. Mixed layer and 20 degree isotherm are deep. Contain 7 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 7 (small and short with very deep peaks, shortest); 7 seamount type 10 (large and tall with shallow peak: shallow); 5 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 5500m.
294	Northeast Phoenix and High Seas	KIR,UMI	Mostly abyssal features (hills and mountains) with seamounts. Basin represented also in the eastern side on abyssal plains. Sea surface temperature is low to moderate and variable. Chlorophyll-a concentrations are moderate with generalized blooms. Calcite and pH levels are low. Solar irradiance, nitrate, phosphorous silicate, salinity, and dissolved oxygen levels are high. Temperatures at depth are moderate to low. Mixed layer is quite deep; 20 degree isotherm is on the shallow end. Contain 5 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 5 seamount type 8 (small and short with very deep peaks, deepest type).The upper depth is 5000m and the lower depth is 5500m.
298	Matthew and Hunter, South Fiji and Telekom Outbound Deep	NCL,FJI,TON, VUT	Contains trough and plateau with rift valleys forming on spreading ridges and basins. Western side of bioregion contain part of the New Hebrides trench and ridges. SST is low and stable, CHL low and stable, Salinity is moderate, Dissolved Oxygen is low and variable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is shallow, Solar irradiance is low, pH level is moderate, silicate level is moderate, phosphate level is low, nitrate level is moderate, Calcite is low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 9 Blind canyon type. Contain 1 active, inferred hydrothermal vent. The upper depth is 2000m and the lower depth is 4000m.

Cod e	Name	Countries	Summary description
299	Keats Reef Deep	MHL,KIR	Mostly abyssal plains and few big seamounts in both west and eastern sides. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low. 20 degree isotherm is shallow; temperature at 1000m is high, low at 200m. Solar irradiance is low. PH is moderate, silicate, phosphorous, and nitrate levels are high. Salinity, dissolved oxygen, and calcite levels are low. Contain 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 9 (Large and tall with shallow peak, larger); 11 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 4500m and the lower depth is 5500m.
301	South Tonga Eastern Lookout, South Cooks and High Seas	COK,TON	Contains deep Tonga ridge, abyssal hills and seamounts on abyssal mountains. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are moderate and variable. Dissolved oxygen concentrations are moderate and stable. Strong sea surface currents generally from the North West. Contain 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 7 (small and short with very deep peaks, shortest); 3 seamount type 8 (small and short with very deep peaks, deepest type); 11 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5000m and the lower depth is 6000m.
302	Tonga Passage from Trench	TON	Dominated by chain of canyons formed on ridges and plateau. Sea surface temperature is moderate, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are deep. Salinity, pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the North. Contain NO Seamounts. Includes 9 Blind canyon type and 5 Shelf incising canyon type. The upper depth is 1500m and the lower depth is 4500m.
303	Southwest Macdonald Seamount	PYF	Contain abyssal hills mostly and few smaller seamounts. SST and Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is very high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contain 3 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type).The upper depth is 4000m and the lower depth is 5000m.

Code	Name	Countries	Summary description
304	Southeast Tagula and Louisiade Plateau	SLB,AUS,PNG	Mostly canyons on slope with escarpments and canyons on plateaus. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD is shallow, and PH is high. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contain NO Seamounts. Includes 14 Blind canyon type. The upper depth is 2000m and the lower depth is 3000m.
306	North Marshalls Guyots Cluster (SIO,Harvey,HIG, Allen)	MHL,UMI	Contain some of the medium and large seamounts and deep ridges formed on abyssal mountains. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contain 4 seamount type 1 (small with deep peak, short with moderately deep peak); 5 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 4 seamount type 7 (small and short with very deep peaks, shortest); 5 seamount type 10 (large and tall with shallow peak: shallow); 7 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 2500m and the lower depth is 4500m.
307	North New Caledonia	NCL	Contain canyons on ridges and plateaus with trough in the center of bioregion. SST low and stable, Chlorophyll-a concentrations are high to moderate. Deepwater temperature is moderate. Solar irradiance and MLD are moderate. Silicate, pH, Calcite and phosphorous levels are low. Contain 1 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 23 Blind canyon type and 10 Shelf incising canyon type. The upper depth is 0m and the lower depth is 3500m.
311	King Seamount	KIR,UMI	Mostly abyssal hills, plains with basin, and few mountains with seamounts. SST moderate and stable, Chlorophyll-a concentrations are high, variable. Mixed layer depth is deep. Temperature at 1000m and 200m is moderate. 20 degree isotherm is moderate depth. Solar irradiation is high; pH, nitrate, and silicate levels are moderate. Phosphorous and salinity are high. Dissolved oxygen and calcite levels are low, but calcite is highly concentrated around islands. Contain 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 2 seamount type 7 (small and short with very deep peaks, shortest); 4 seamount type 8 (small and short with very deep peaks, deepest type); The upper depth is 5500m and the lower depth is 6000m.

Code	Name	Countries	Summary description
312	Seamounts of Micronesia	MHL,KIR	Mostly abyssal plain with few seamounts, ridges and canyons included in the east. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low, with blooms around islands. 20 degree isotherm is mid-depth. Temperature at 1000m and hgt2000 are quite high, while 200m temperature is moderate. Mixed layer depth is quite low, as is solar irradiance. PH, phosphorous, nitrate, and silicate levels are moderate, salinity are low. Dissolved oxygen is low to moderate; calcite levels are low except around Makin Island. Contain 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); Includes 3 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 4000m and the lower depth is 4500m.
315	South New Caledonia and Norfolk Boarder	NCL,NFK	Three parts bioregion. Most western side includes trough, plateau with deep hills. The Central region is dominated with canyons on Plateau and the far eastern side contains large plateau with deep ridges on abyssal mountains. SST very low and stable, Chlorophyll-a concentrations are low. Salinity is high, DO is moderate, Deepwater temperature is shallow, 20 Degree Isotherm is shallow, Solar irradiance is low and MLD is shallow. Silicate, pH, Calcite, Nitrate and phosphorous levels are low. Contain 1 seamount type 4 (small with deep peak, most isolated type); 3seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 18 Blind canyon type. The upper depth is 2000m and the lower depth is 3000m.
317	Suwarrow Atoll Deep	COK	Mostly plateau with ridge. SST moderate and stable, Chlorophyll-a concentrations are low. Calcite, solar irradiance, phosphorous, silicate, and nitrate levels are low. Dissolved oxygen, salinity, and pH levels are high. Temperature at 200m is high, while at 1000m it is moderate and variable. Mixed layer is deep; 20 degree isotherm is shallow and variable. Contain 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 7 (small and short with very deep peaks, shortest); The upper depth is 2500m and the lower depth is 3500m.

Code	Name	Countries	Summary description
318	Woodlark Basin	SLB,PNG	Slope with steep escarpments containing canyons and ridges, plateau, spreading ridges and rift valleys in deep abyssal hills with basin. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD and solar irradiance are low. PH is moderate. Silicate, phosphate, and nitrate are low. Calcite is high. Contain 3 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); Includes 19 Blind canyon type and 1 Shelf incising canyon type. Contain 1 active, confirmed hydrothermal vent. The upper depth is 0m and the lower depth is 3000m.
320	Ontong Java Rise and Melanesian Basin	FSM,PNG	Mostly plateau. SST high and stable, Chlorophyll-a concentrations are low. Salinity and dissolved oxygen are low and variable. Temperature at 1000m and 20°C isotherm are moderate. Solar irradiance is high and MLD is shallow. PH, Silicate, phosphate, nitrate and Calcite are low. Contain 1 seamount type 6 (very large and tall with low escarpment); Includes 1 Shelf incising canyon type. The upper depth is 2000m and the lower depth is 3000m.
324	Strakhov Seamount	MHL	Deep basin on abyssal plain, three seamounts on abyssal mountains. SST moderate and stable, Chlorophyll-a concentrations are low stable. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contain 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 5500m and the lower depth is 5500m.
325	South New Hebrides trench and South Eastern Ceva-I-Ra seamounts abyssal hills	NCL,FJI,VUT	Includes part of the New Hebrides Trench, few seamounts, spreading ridges and rift valleys and deep abyssal features. SST is low and stable, CHL low and variable, Salinity is moderate and variable, Dissolved Oxygen is low and variable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is medium, Solar irradiance is low, pH level is moderate, silicate level is low, phosphate level is low, nitrate level is low, Calcite is low. Contain 2 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 10 (large and tall with shallow peak: shallow); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 4000m and the lower depth is 4500m.

Code	Name	Countries	Summary description
327	Mejit Island Deep	MHL	Mostly deep abyssal plains with overlying basins, and abyssal hills and mountains with again basin, few seamounts and ridges. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are moderate and variable. Temperature at 1000m is moderate. 20°C isotherm is shallow, MLD and solar irradiance are moderate and pH is high. Silicate, phosphate, nitrate and calcite are moderate. Contain 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 4500m and the lower depth is 5500m.
328	North Cooks Spot	COK	Mostly abyssal hills. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Very deep mixed layer and a more shallow 20 degree isotherm. 1000m temperature is low. Temperature at 200m is high and stable. Silicate, nitrate, dissolved oxygen, calcite, and phosphorous levels are low. Salinity is high. Solar irradiation and pH are high to moderate. Contain 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 4500m.
330	Pocklington Ridge and Louisiade Plateau with Hammondsport Seamount and Rennell Ridge	SLB,PNG	Two parts bioregion. West side contains ridge, seamounts and canyons. East side contains plateau, large ridge and canyons. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is deep, 20°C isotherm is deep, MLD is shallow, and PH is low. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Intersect 2 seamount type 10 (large and tall with shallow peak: shallow) Includes 14 Blind canyon type. The upper depth is 1500m and the lower depth is 3000m.
331	Ailuk Atoll Deep	MHL	Contain ridges on slopes with steep escarpments. Canyons run on slopes into deep abyssal habitats, seamounts on mountainous areas and east side includes deep abyssal plain with basin. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are moderate and variable. Temperature at 1000m is moderate. 20°C isotherm is shallow, MLD and solar irradiance are moderate and pH is high. Silicate, phosphate, nitrate and calcite are moderate. Contain 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 4 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 3500m and the lower depth is 5500m.

Cod e	Name	Countries	Summary description
333	North New Hebrides Trench	SLB,VUT	Includess the north New Hebrides Trench. Sea surface temperature very high and stable. Chlorophyll-a concentrations are moderate, stable. Salinity and dissolved oxygen are low. Mid-depth temperatures very high while temperature at 1000m is low. MLD is high. Silicate and phosphorous levels are low. PH is very low. Contain NO Seamounts. Includes 3 Blind canyon type. The upper depth is 4500m and the lower depth is 8000m.
334	North Kingman Reef	KIR,UMI	This bioregion consists of a lot of large deeper water seamounts formed on top of abyssal mountains and lot of smaller seamounts as well. Other features include abyssal hills, plains, and escarpments. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Shallow 20 degree isotherm and mixed layer depth. Temperature is high at 1000m and low at 200m. Silicate, phosphorous, calcite, nitrate, solar irradiance, and salinity levels are low. PH levels are high. Dissolved oxygen is high to moderate. Contain 4 seamount type 1 (small with deep peak, short with moderately deep peak); 12 seamount type 2 (small with deep peak, most common type); 8 seamount type 3 (intermediate size, large tall and deep); 8 seamount type 7 (small and short with very deep peaks, shortest); 6 seamount type 8 (small and short with very deep peaks, deepest type); 7 seamount type 9 (Large and tall with shallow peak, larger); 5 seamount type 10 (large and tall with shallow peak: shallow); 7 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 5000m.
335	Ono-i-Lau, South Lau Ridge and Halved Ridge	FJI,TON	Non-contiguous bioregion dominated by ridges forming the base of a chain of canyons along the Tonga ridge. Also contain terraces and plateau. SST moderate and stable, CHL low generally but high close to land (Tongatapu - Tonga and Southern Lau - Fiji), Salinity is moderate and stable, Dissolved Oxygen is moderate and stable, Deepwater temp is moderate, 20°C isotherm is medium, mixed layer depth is medium, Solar irradiance is generally low, pH level is moderate, silicate level is moderate, phosphate level is low, nitrate level is moderate, Calcite is low generally but high close to land (Tongatapu - Tonga and Southern Lau - Fiji). Contain 4 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); Includes 10 Blind canyon type and 2 Shelf incising canyon type. Contain 1 active, confirmed; 2 active inferred hydrothermal vents. The upper depth is 500m and the lower depth is 2000m.

Cod e	Name	Countries	Summary description
337	North New Ireland and Ontong Java Atoll	SLB,PNG	Two parts bioregion, east side contain plateau and the west part contain ridges, slope with canyon on escarpments and abyssal mountains. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD and solar irradiance are low. PH is moderate. Silicate, phosphate, and nitrate are low. Calcite is high. Contain NO Seamounts. Includes 14 Blind canyon type and 5 Shelf incising canyon type. Contain 1 active, confirmed; 2 active, inferred and 1 inactive, hydrothermal vent. The upper depth is 500m and the lower depth is 2000m.
342	West Shefa	NCL,VUT	Mostly includes the New Hebrides Trench. Sea surface temperature moderate, variable. Chlorophyll-concentrations are moderate to high, stable. Contain 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 6000m.
344	Kena Guyot	PYF	Contains seamounts on slopes with steep escarpments. Ridges on slopes are also featured. SST moderate and stable, Chlorophyll-a concentrations and Silicate are moderate and variable. DO is low. 20 degree isotherm and mixed layer are deep. Temperature at 1000m is moderate and low at 200m. Solar irradiance is high. Salinity, nitrate, and phosphorous levels are high. PH and calcite levels are low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 5 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 1000m and the lower depth is 3500m.
346	Maloelap and Aur East	MHL	contain deep ridges and seamounts with steep escarpments on abyssal mountains and hills. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are moderate and variable. Temperature at 1000m is moderate. 20°C isotherm is shallow, MLD and solar irradiance are moderate and pH is high. Silicate, phosphate, nitrate and calcite are moderate. Contain 1 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 8 (small and short with very deep peaks, deepest type); 1 seamount type 9 (Large and tall with shallow peak, larger); 2 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 3 Blind canyon type. The upper depth is 4500m and the lower depth is 5500m.

Cod e	Name	Countries	Summary description
349	Bellona Plateau and Minerva Shoal	NCL,AUS	Contain ridges and canyons on plateaus. SST very low and stable, Chlorophyll-concentrations are high to moderate. Deepwater temperature is moderate. Solar irradiance and MLD are moderate. Silicate, pH, Calcite and phosphorous levels are low. Contain 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group) Includes 11 Blind canyon type and 2 Shelf incising canyon type. The upper depth is 500m and the lower depth is 2500m.
350	Northern Micronesia Patches	FSM,PLW	Mostly deep abyssal plains with basins and few seamounts on mountains. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contain 2 seamount type 2 (small with deep peak, most common type); 2 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 1seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4500m and the lower depth is 6000m.
354	Kiritimati Deep	KIR	Mostly ridges and canyons with steep escarpments on plateau. Sea surface temperature is moderate and variable. Chlorophyll-a concentrations are moderate with high concentrations around the island. Mixed layer depth is shallow but varied, and 20 degree isotherm is deep. Temperature at 200m is low, but high at 1000m. Silicate, phosphorous, salinity, and solar irradiance levels are high. Nitrate, pH, and dissolved oxygen levels are low. Calcite is low except for high levels around Kiritimati. Intersect 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 3 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 2000m and the lower depth is 4000m.
357	Northwest New Caledonia	NCL,AUS	Ridges on plateau and abyssal habitats SST low and stable, Chlorophyll-concentrations DO and Salinity is low. Temperature at 1000m is high, 20°C isotherm is deep, MLD is shallow, and PH is high. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contain NO Seamounts. Includes 3 Blind canyon type. The upper depth is 3000m and the lower depth is 4000m.

Code	Name	Countries	Summary description
358	Tematagi Group of Atolls	PYF	Deep abyssal hills, ridges and seamounts on abyssal mountains. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 4 (small with deep peak, most isolated type); 1 seamount type 8 (small and short with very deep peaks, deepest type); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 4000m and the lower depth is 4500m.
359	Guam's Challenger Deep	GUM,FSM	Contain the Mariana Trench. SST moderate and stable, Chlorophyll-concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contain NO Seamounts. The upper depth is 6000m and the lower depth is 10000m.
360	Loyalty Ridge and Chamois Bank	NCL	Contain canyons and ridges on plateau and deep abyssal hills and mountains. SST very low and stable, Chlorophyll-a concentrations are high to moderate. Deepwater temperature is moderate. Solar irradiance and MLD are moderate. Silicate, pH, Calcite and phosphorous levels are low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); Includes 8 Blind canyon type and 2 Shelf incising canyon type. The upper depth is 1000m and the lower depth is 4500m.
364	Pikelot Banks Cluster	FSM	Large ridges with escarpments and few canyons on abyssal hills and mountains. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m, MLD and 20°C isotherm are shallow, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contain NO Seamounts. Includes 3 Blind canyon type. The upper depth is 0m and the lower depth is 2500m.
365	Maturei Vavao to Tenararo split	PYF	Contain seamounts and canyons on plateau. Also ridges and canyons on abyssal mountains. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Intersect 2 seamount type 10 (large and tall with shallow peak: shallow) Includes 3 Blind canyon type. The upper depth is 500m and the lower depth is 3500m.

Cod e	Name	Countries	Summary description
368	Washington Island and Christmas Ridge	KIR,UMI	Contain seamounts and ridges o plateaus. Deeper seamounts on abyssal mountains. Other features include abyssal hills and plains. Sea surface temperature is high and stable. Chlorophyll-a concentrations are moderate. Mixed layer depth and 20 degree isotherm are deep. Temperature at 200m is low, at 1000m is low as well but with warmer scattered areas. Silicate, dissolved oxygen, phosphorous, salinity, pH, and solar irradiance levels are moderate. Nitrate and calcite levels are low. Contain 2seamount type 2 (small with deep peak, most common type); 4 seamount type 3 (intermediate size, large tall and deep); 3 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 3 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 8 (small and short with very deep peaks, deepest type); 4 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 3500m and the lower depth is 5000m.
369	Far North-eastern Boarder of French Polynesia	PYF	Contain ridge and abyssal hills and plains. SST moderate and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); The upper depth is 3500m and the lower depth is 4500m.
370	Marshall eastern boarder to high seas	MHL	Mostly abyssal plain basins and hills. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are moderate and variable. Temperature at 1000m is moderate. 20°C isotherm is shallow, MLD and solar irradiance are moderate and pH is high. Silicate, phosphate, nitrate and calcite are moderate. Contain NO Seamounts. The upper depth is 5000m and the lower depth is 5500m.
373	West Palau to South Philippine Trench	PLW,IDN	Contain the Philippine trench, ridges and seamounts in the east. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, nitrate are low. Calcite is moderate. Contain 4 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 10 (large and tall with shallow peak: shallow) Includes 3 Blind canyon type. The upper depth is 4500m and the lower depth is 6000m.

Code	Name	Countries	Summary description
377	Yap Island non contiguous	FSM,PLW	Seven parts bioregion containing deep ridges and seamounts on abyssal mountain areas. SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 2 (small with deep peak, most common type); 3 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 3 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 4 Blind canyon type. The upper depth is 2500m and the lower depth is 4500m.
378	Minerva to South Ata plateaus	FJI,TON	Contains 2 seamounts. Contains trough and plateau with rift valleys forming on spreading ridges and basins. Towards the east is a chain of ridges which forms the Tonga ridge with canyons in between the ridges. SST is low and stable, CHL is low and variable, Salinity is high, Dissolved Oxygen is moderate and stable, Deepwater temp is moderate, 20°C isotherm is moderate, mixed layer depth is shallow, Solar irradiance is low, pH level is moderate, silicate level is moderate, phosphate level is low, nitrate level is moderate, Calcite is low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group) Includes 5 Blind canyon type. Contain 2 active, confirmed; 3 active, inferred hydrothermal vents. The upper depth is 500m and the lower depth is 2500m.
382	Southern Lau and the Ha'apai Tofua Ridge and Trough	FJI,TON	3 non-contiguous bioregion splits between Fiji and Tonga. Boundary within Tonga is dominated by plateau with ridges and canyons around the Ha'apai region. The west region contains plateau and ridges on slopes. SST moderate and variable, CHL is generally moderate but high close to land (Southern Lau group - Fiji and Ha'apai Group - Tonga), Salinity is moderate, Dissolved Oxygen is moderate and variable, Deepwater temp is medium, 20°C isotherm is medium, mixed layer depth is medium, Solar irradiance is moderate, pH level is moderate, silicate level is moderate, phosphate level is low, nitrate level is moderate, Calcite is generally low but high closer to land (Southern Lau group - Fiji and Ha'apai Group - Tonga). Contain 3 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group) Includes 3 Blind canyon type and 7 Shelf incising canyon type. Contain 2 active, inferred hydrothermal vents. The upper depth is 500m and the lower depth is 2000m.

Cod e	Name	Countries	Summary description
387	Marutea Atoll and Northwest Pitcairn	PYF,PCN	Mostly abyssal hills and plains with ridges and steep escarpment in the west. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 1 Blind canyon type. The upper depth is 3500m and the lower depth is 4000m.
392	Nova and Argo Banks	NCL,AUS	Contain mostly plateau with few seamounts on the center of bioregion and ridges and canyons in the west. SST very low and stable, Chlorophyll-a concentrations are low. Salinity is high, DO is moderate, Deepwater temperature is shallow, 20 Degree Isotherm is shallow, Solar irradiance is low and MLD is shallow. Silicate, pH, Calcite, Nitrate and phosphorous levels are low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 9 (Large and tall with shallow peak, larger); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 17 Blind canyon type. The upper depth is 1500m and the lower depth is 2500m.
393	Challenger Deep	GUM,FSM	Mostly contain the Marianas Trench (Challenger Deep) SST high and stable, Chlorophyll-a concentrations, salinity and dissolved oxygen are low and variable. Temperature at 1000m, 20°C isotherm, MLD and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are all low. Contain NO Seamounts. Includes 2 Blind canyon type. The upper depth is 5000m and the lower depth is 8000m.
395	Gilbert, Tuvalu High Seas	TUV,KIR	Mostly abyssal hills and plains. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. 20 degree isotherm is quite deep, temperature at depth is high. Mixed layer depth is shallow. Solar irradiation is moderate, pH is high. Silicate, phosphorous, salinity, dissolved oxygen, and nitrate levels are moderate. Calcite levels are low. Contain NO Seamounts. The upper depth is 4000m and the lower depth is 4500m.
396	Sonsorol and East Kayangel	FSM,PLW	Shallow non-contiguous bioregion consisting of ridges, spreading ridges with rift valleys and a couple of seamounts with steep escarpments. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contain 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 10 (large and tall with

Code	Name	Countries	Summary description
			shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 2 Blind canyon type. The upper depth is 3000m and the lower depth is 4500m.
397	Ahurei Deep	PYF	Two parts bioregion with west part containing ridges on plateau and seamounts. The east part contains mostly ridges and seamounts on abyssal mountains with escarpments. SST very low and stable, Chlorophyll-a concentrations are very low. Salinity is moderate and dissolved oxygen is high. Temperature at 1000m and MLD are moderate, 20°C isotherm is shallow, and PH, Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 3 (intermediate size, large tall and deep); 7 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow); 7 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 1500m and the lower depth is 3500m.
398	Tuamotu Atolls Deep	PYF	Mostly ridges and canyons with steep escarpments on plateau. SST moderate and stable, Chlorophyll-concentrations are low. Calcite, solar irradiance, phosphorous, silicate, and nitrate levels are low. Dissolved oxygen, salinity, and pH levels are high. Temperature at 200m is high, while at 1000m it is moderate and variable. Mixed layer is deep; 20 degree isotherm is shallow and variable. Contain 1 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 10 (large and tall with shallow peak: shallow) Includes 7 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 0m and the lower depth is 2500m.
400	Rongelap Atoll Deep	MHL	Contain ridges on slopes with steep escarpments. Also contain a seamount in the east. SST high and stable, Chlorophyll-a concentrations are low and high around the islands. Salinity and dissolved oxygen are low. Temperature at 1000m is high, 20°C isotherm is deep, MLD, PH, moderate and Solar irradiance are moderate. Silicate, phosphate, nitrate and calcite are low. Contain 1 seamount type 6 (very large and tall with low escarpment); Includes 1 Blind canyon type. The upper depth is 0m and the lower depth is 4000m.

Code	Name	Countries	Summary description
407	West Aneityum and New Hebrides Trench	NCL,VUT	Contain mostly the south of the New Hebrides Trench. Sea surface temperature very unstable, low. Chlorophyll-a concentrations are high, scattered. Salinity and dissolved oxygen are high. Deepwater temperatures are high. Contain NO Seamounts. Includes 5 Blind canyon type. The upper depth is 4000m and the lower depth is 6000m.
410	Majuro, Arno and Mili Atolls	MHL,KIR	Contain ridges on slopes with escarpments and canyons on seamounts with escarpment. Sea surface temperature is moderate and stable. Chlorophyll-a concentrations are low. High temperatures at 1000m, moderate at 200m. Mixed layer depth and solar irradiance are low. PH, silicate, phosphorous, and nitrate levels are moderate. Salinity is low. Dissolved oxygen and calcite levels are low. Contain 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth).Includes 11 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 0m and the lower depth is 4500m.
412	North Fiji and Tuvalu ridge chain	TUV,WLF,FJI	Non-contiguous region featuring mostly ridges with few canyons and seamounts on slopes and escarpments. SST is high and stable, CHL is generally low but high toward west, Salinity is low and variable, Dissolved Oxygen is low and stable, Deepwater temp is medium, 20°C isotherm is deep, mixed layer depth is medium, Solar irradiance is moderate, pH level is moderate, silicate level is moderate, phosphate level is moderate, nitrate level is moderate, Calcite is low. Contain 1 seamount type 1 (small with deep peak, short with moderately deep peak); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 9 (Large and tall with shallow peak, larger); Includes 5 Blind canyon type and 4 Shelf incising canyon type. The upper depth is 500m and the lower depth is 2500m.

Code	Name	Countries	Summary description
413	Gambier Islands Deep	PYF,PCN	Contain seamounts on abyssal mountains in the east and southern side with escarpments and deep ridges on abyssal mountainous areas in the north-western side. Other features include canyons. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contain 6 seamount type 1 (small with deep peak, short with moderately deep peak); 4 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 2 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); Includes 2 Blind canyon type. The upper depth is 2500m and the lower depth is 4000m.
415	South New Hebrides and Tu'a Tele'a	TON,VUT	Contains deep trench, ridge, abyssal hills and abyssal mountains. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are moderate and variable. Dissolved oxygen concentrations are moderate and stable. Strong sea surface currents generally from the North West. Contain NO Seamounts. The upper depth is 5500m and the lower depth is 6500m.
416	Kingman, Palmyra and North Line Group	KIR,UMI	Contain ridges and seamounts on plateau with few deep ridges and seamounts on abyssal mountains. Sea surface temperature is high and stable. Chlorophyll-a concentrations are low. Shallow 20 degree isotherm and mixed layer depth. Temperature is high at 1000m and low at 200m. Silicate, phosphorous, calcite, nitrate, solar irradiance, and salinity levels are low. PH levels are high. Dissolved oxygen is high to moderate. Contain 3 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 7 (small and short with very deep peaks, shortest); 1 seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 1500m and the lower depth is 4000m.

Code	Name	Countries	Summary description
417	Tabuaeran/Fanning Deep	KIR,UMI	Mostly ridges and intermediate seamounts on plateau and abyssal mountains. Sea surface temperature is high and stable. Chlorophyll-a concentrations are moderate. Mixed layer depth and 20 degree isotherm are deep. Temperature at 200m is low; at 1000m it is high. Silicate, dissolved oxygen, phosphorous, salinity, pH, and solar irradiance levels are moderate. Nitrate and calcite levels are low. Contain 4 seamount type 3 (intermediate size, large tall and deep); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 1500m and the lower depth is 4000m.
420	Lala 'i Moana	TON	Slope into Tonga trench with extending canyon features. Sea surface temperature is moderate, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity, pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is moderate. Calcite is also moderate and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the North Northeast. Contain NO Seamounts. Includes 3 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 4500m and the lower depth is 9000m.
424	South Raivavae and President Thiers Bank	PYF	Small bioregion with large and intermediate size seamounts, ridges and escarpments on slopes and abyssal features. SST very low and stable, Chlorophyll-a, DO, concentrations are generally low. Salinity is high and dissolved oxygen is low and variable. Temperature at 1000m and 20°C isotherm are deep, MLD is moderate. pH is low. Silicate, phosphate, nitrate and calcite are moderate. Contain 1seamount type 9 (Large and tall with shallow peak, larger); 1 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). The upper depth is 2000m and the lower depth is 4000m.
425	Winslow Reef Deep	KIR,UMI	Mostly seamounts with escarpments. Sea surface temperature is low to moderate and variable. Chlorophyll-a concentrations are moderate. Calcite and pH levels are low. Solar irradiance, nitrate, phosphorous silicate, salinity, and dissolved oxygen levels are high. Temperatures at depth are moderate to low. Mixed layer is quite deep; 20 degree isotherm is on the shallow end. Contain 1 seamount type 3 (intermediate size, large tall and deep); 1 seamount type 9 (Large and tall with shallow peak, larger); 2 seamount type 10 (large and tall with shallow peak: shallow); The upper depth is 1000m and the lower depth is 4500m.
426	Tele'a Moana	TON	Deep bioregion with mostly trench. Sea surface temperature is moderate, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity, pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is moderate. Calcite is also moderate and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents

Code	Name	Countries	Summary description
			generally from the North Northeast. Contain NO Seamounts. Includes 1 Blind canyon type. The upper depth is 6000m and the lower depth is 9000m.
429	Falakoni	TON	Deep bioregion on trench and abyssal hills and mountains. Also includes 2 canyons and a small ridge on basin. Sea surface temperature is high, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are low. Salinity is variable. and pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is low. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Moderate sea surface currents generally from the North northeast. Contain NO Seamounts. Includes 2 Blind canyon type. The upper depth is 4000m and the lower depth is 8500m.
430	Likukoloa and High Seas	TON	Contains mostly sloppy basins and deep trench. Non-contiguous region. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are moderate and variable. Dissolved oxygen concentrations are moderate and stable. Strong sea surface currents generally from the North West. Contain NO Seamounts. Shelf incising canyon type. The upper depth is 4500m and the lower depth is 8000m.
431	Southwest Espiritu Santo Deep	NCL,VUT	Contain ridges, seamounts and canyons on plateau and abyssal features with escarpments. Sea surface temperature moderate, mildly variable. Chlorophyll-a concentrations are moderate, stable. Silicate and phosphorous levels are low. Solar irradiance is quite high. Contain 1 seamount type 2 (small with deep peak, most common type); 1 seamount type 10 (large and tall with shallow peak: shallow); 2 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 7 Blind canyon type and 4 Shelf incising canyon type. The upper depth is 1000m and the lower depth is 4000m.
434	Makira/Ulawa Deep	SLB	Contain canyons on slopes and escarpments with a ridges included. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is deep, 20°C isotherm is deep, MLD is shallow, and PH is low. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Intersect 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth). Includes 7 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 0m and the lower depth is 3000m.

Cod e	Name	Countries	Summary description
439	Solomon PNG Boarder	SLB,PNG	Contain the New Britain Trench. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD and solar irradiance are low. PH is moderate. Silicate, phosphate, and nitrate are low. Calcite is high. Contain NO Seamounts. Includes 3 Blind canyon type. The upper depth is 4000m and the lower depth is 7500m.
440	San Cristobal Trench	SLB	Contain the San Cristobal Trench with few canyon features. SST moderate and stable, Chlorophyll-a concentrations, DO and Salinity are low. Temperature at 1000m is deep, 20°C isotherm is deep, MLD is shallow, and PH is low. Solar irradiance, silicate, phosphate, nitrate and calcite are low. Contain NO Seamounts. Includes 2 Blind canyon type. The upper depth is 4000m and the lower depth is 7000m.
446	Tele'a 'Ata	TON	Deep bioregion which contains ridges, basins that slopes into the Tongan trench. Sea surface temperature is low and stable; chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are moderate. Salinity and pH levels are high. Nitrate and solar irradiance are moderate to low. Mixed layer depth and calcite are moderate and variable. Dissolved oxygen concentrations are moderate and stable. Strong sea surface currents generally from the North West. Contain NO Seamounts. The upper depth is 5000m and the lower depth is 9500m.
449	Vava'u Archipelago	TON	Contain ridges and canyons on plateaus with steep escarpments. SST low and stable, chlorophyll-a concentrations, 20°C Isotherm and the deep water temperature are deep. Salinity, pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the North. Contain NO Seamounts. Includes 5 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 500m and the lower depth is 3000m.
450	Southeast Malaita and Maramasike	SLB	Contain slopes, basin and escarpment on deep abyssal mountain area and part of ridge. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is deep, MLD is shallow. Solar irradiance and pH, silicate, phosphate, and nitrate are low. Calcite is moderate. Contain NO Seamounts. The upper depth is 0m and the lower depth is 3000m.
451	Ulava Deep	SLB	Contain canyons, ridges and deep Cape Johnson Trough and trench. SST moderate and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is deep, MLD is shallow. Solar irradiance and pH, silicate, phosphate, and nitrate are low. Calcite is moderate. Contain NO Seamounts. Includes 3 Blind canyon type and 2 Shelf incising canyon type. The upper depth is 1500m and the lower depth is 6000m.

Code	Name	Countries	Summary description
452	Eua East	TON	Mostly ridge and canyon on Plateau. SST low and stable, chlorophyll-concentrations, 20°C Isotherm and the deep water temperature are deep. Salinity, pH levels, nitrate and solar irradiance are moderate. Mixed layer depth is moderate. Calcite is low and variable and dissolved oxygen concentrations are low and stable. Strong sea surface currents generally from the North. Contain NO Seamounts. Includes 2 Blind canyon type and 1 Shelf incising canyon type. The upper depth is 2000m and the lower depth is 3500m.
454	Southeast Rotuma, Isle De Horne, Futuna,Samoa and Niuas plateau	TUV,WLF,FJI, WSM,TON	Bioregion north of the Niua Islands and includes two seamounts forming on ridges and escarpments. Other dominant features includes plateau and spreading ridges. SST is high and stable, CHL low and stable, Salinity is low and variable, Dissolved Oxygen is low and stable, Deepwater temp is deep, 20°C isotherm is deep, mixed layer depth is medium, Solar irradiance is moderate, pH level is moderate, silicate level is moderate, phosphate level is moderate, nitrate level is moderate, Calcite is low. Contain 2 seamount type 3 (intermediate size, large tall and deep); 4 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 7 seamount type 10 (large and tall with shallow peak: shallow); Contain 1 active, confirmed; 2 active, inferred hydrothermal vents. The upper depth is 2000m and the lower depth is 5500m.
455	East Temotu and North Fiji Ridge	SLB,FJI	Deep bioregion containing large seamounts, ridges and canyons and part of the Vityaz trench. SST is high and stable, CHL low and stable, Salinity is moderate, Dissolved Oxygen is low and stable, Deepwater temp is medium, 20°C isotherm is deep, mixed layer depth is medium, Solar irradiance is moderate, pH level is moderate, silicate level is moderate, phosphate level is moderate, nitrate level is low, Calcite is low. Contain 3 seamount type 3 (intermediate size, large tall and deep); 6 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); 1 seamount type 9 (Large and tall with shallow peak, larger); 3 seamount type 10 (large and tall with shallow peak: shallow); 1 seamount type 11 (intermediate size, largest basal area and deepest peak depth).Includes 7 Blind canyon type and 2 Shelf incising canyon type. The upper depth is 1500m and the lower depth is 3000m.
458	North Eauripik Rise	FSM	Mostly abyssal hills and a patch of abyssal mountain area. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m, MLD and 20°C isotherm are shallow, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contain NO Seamounts. The upper depth is 2500m and the lower depth is 3500m.

Code	Name	Countries	Summary description
459	Sonsorol and Tobi Ridge	PLW	Contain deep ridges and an intermediate seamount with steep escarpments and spreading ridges and rift valleys on abyssal mountains. SST high and stable, Chlorophyll-a concentrations are low but high around the islands. Salinity and dissolved oxygen are low and variable. Temperature at 1000m is moderate. 20°C isotherm is moderate; MLD, pH and solar irradiance are low. Silicate, phosphate, nitrate and calcite are low. Contain 1 seamount type 3 (intermediate size, large tall and deep); The upper depth is 2000m and the lower depth is 4000m.
460	Vanuatu and Fiji Plateau High Seas	FJI,VUT	Deep abyssal hills, spreading ridges, rift valleys and a seamount all with escarpment features. SST moderate and variable, CHL is low and stable, Salinity is moderate, Dissolved Oxygen is moderate and stable, Deepwater temp is deep, 20°C isotherm is deep, mixed layer depth is shallow, Solar irradiance is low, pH level is low, silicate level is low, phosphate level is moderate, nitrate level is low, Calcite is low. Contain 1 seamount type 4 (small with deep peak, most isolated type); Contain 2 active, confirmed; 1 inactive, hydrothermal vents. The upper depth is 2500m and the lower depth is 3000m.
461	Central Lau to Northwest Vava'u plateau and hydrothermal vents	FJI,TON	Non-contiguous bioregion. Western part of bioregion is big and dominated by spreading ridges formed on plateaus. Also includes rift valleys formed on basins. The eastern bioregion is mainly dominated by plateau. SST moderate and stable, CHL is low and stable, Salinity is low and variable, Dissolved Oxygen is low and stable, Deepwater temp is deep, 20°C isotherm is deep, mixed layer depth is medium, Solar irradiance is medium, pH level is low, silicate level is moderate, phosphate level is low, nitrate level is moderate, Calcite is low but high closer to land (Lau Islands Group-Fiji).Contain 4 seamount type 1 (small with deep peak, short with moderately deep peak); 1 seamount type 5 (intermediate size, small, moderately tall and shallowest peak depths of this group); Includes 3 Blind canyon type and 4 Shelf incising canyon type. Contain 2 active, inferred hydrothermal vents. The upper depth is 1000m and the lower depth is 2500m.
462	North New Hebrides Ridge	VUT	Bioregion contains canyons and trough with escarpments on plateau and including deep abyssal hills and mountainous features on the eastern side. Sea surface temperature moderate, variable. Chlorophyll-a concentrations are high, with scattered blooms throughout. Mid-depth temperatures very high while temperature at 1000m is low. 20 degree isotherm is exceptionally low. Solar irradiance is quite varied, low around Ambrym and high towards Espiritu Santo. PH is high. Contain NO Seamounts. Includes 2 Blind canyon type and 2 Shelf incising canyon type. Contain 1 active, confirmed; 1 active inferred hydrothermal vents. The upper depth is 0m and the lower depth is 3000m.

Supplementary Material S5. Names of reef-associated bioregions across the Southwestern Pacific region.

Code	Name	Countries
1	Vila and Tafea Fringe	Vanuatu
2	Ata Reefs and Associated	Tonga
3	Tuvalu and Wallis Chain	Tuvalu, Wallis and Futuna
4	Polynesian associated reefs	Tuvalu; Wallis and Futuna; Samoa; American Samoa; Niue; French Polynesia
5	Niue and Niuas Reefs	Niue; Tonga
6	Tongatapu, Ha'apai and Butaritari associated reefs	Tonga; Kiribati
8	Manihiki and Rakahanga	Cook Islands
9	Daisu and Nauru	Marshall Islands; Nauru
10	Oroluk	Micronesia
11	Ailuk to North Kamwome	Marshall Islands
12	Bikini to Kwajalein Atolls	Marshall Islands
13	Enewetak Atoll	Marshall Islands

Code	Name	Countries
15	Northwest Fiji Continental Shelf and West Marshall	Fiji; Marshall Islands
16	Majuro to west Likiep Atolls Chain	Marshall Islands
17	Aur to Likiep Atolls	Marshall Islands
18	Falalop and Fais Islands	Micronesia
19	Central Palau reefs	Palau
20	Yap Island and Outer reef	Micronesia
21	Ailinglaplap, Lae and Ujae Atolls	Marshall Islands
22	Orairuguron Islands	Micronesia
23	Moen cluster and Satawal isolated islands	Micronesia
24	Numurus and Igup and micronesia Banks	Micronesia
25	Fayu and Magererik chain of islands	Micronesia
26	Micronesia west and Minto reef	Micronesia
27	North and South Palau	Palau
28	Western Munda and Atonn island	Micronesia; Solomon Islands

Code	Name	Countries
29	Etal, Lukunor and Satawan Group	Micronesia
30	Rennell Bellona and Isabel Oceanic influenced	Solomon Islands
31	Small Islands Influenced	Fiji
32	Pohnpei to Kosrae Reefs	Papua New Guinea
33	West Pohnpei and East Sepik outer islands	Micronesia; Papua New Guinea
35	Washington Island	Kiribati
36	Sapwuahfik Atoll and West Manus outer islands	Micronesia; Papua New Guinea
37	Jaluit, Namorik and Ebon	Marshall Islands
38	Iles de Horne to South Tuvalu Banks	Tuvalu; Wallis and Futuna
39	Sonsorol, Pulo Anna, Dongosaro and Fana Islands	Palau
41	Tobi and Helen Reef	Palau
43	East Nukuoro Atoll	Micronesia

Code	Name	Countries
44	Fanning and Tautua Islands	Cook Islands; Kiribati
45	Nukuoro Atoll and Solomon Land Influenced	Micronesia; Solomon Islands
46	North Gibert Atolls	Kiribati
51	Christmas Islands and nearby Atolls	USA Minor Outlying Islands; Kiribati
53	Northern islands of French Polynesia	French Polynesia
59	West Kapingamarangi Atoll	Micronesia
60	East Kapingamarangi Atoll and Indispensable and Shortland reefs	Micronesia; Solomon Islands
63	Nonouti and South Gilbert Atolls	Kiribati
64	Winslow Reef	USA Minor Outlying Islands; Kiribati
65	Kapingamarangi, South Bougainville and North Choiseul Reefs	Micronesia; Papua New Guinea; Solomon Islands
68	Ocean Island	Kiribati
74	Canton to Phoenix Islands Chain	Kiribati

Code	Name	Countries
75	Bougainville and Lord Howe Islands Cluster	Papua New Guinea; Solomon Islands
76	Lyra Reef and Lord Howe Islands Cluster	Papua New Guinea; Solomon Islands
78	New Hanover, West Bougainville and South Tafea Island	Papua New Guinea; Solomon Islands
81	Mapua and Treasures Islands Cluster	Papua New Guinea; Solomon Islands
83	Malabou peninsula	New Caledonia
84	Central New Caledonia	New Caledonia
88	Rewa River Mouth	Fiji
89	Vanuatu Big1	Vanuatu
90	Vanuatu Big2	Vanuatu
92	Vanuatu Big3	Vanuatu
93	Mckean to Manra cluster	Kiribati
94	Efate to Epi cluster	Vanuatu
97	PNG Vanuatu Ocean Influenced	Papua New Guinea; Vanuatu
100	Ndeni and Tinakula Islands	Solomon Islands
101	Sikaiana	Solomon Islands

Code	Name	Countries
102	Ontong Java and Eastern Solomon	Papua New Guinea; Solomon Islands
105	Tikopia, Anuta and Fatutaka Reefs	Solomon Islands
106	Nanumanga and Nanumea Moriapepe	Tuvalu
107	Malaita and Makira cluster	Solomon Islands
109	Vuna Peninsula, Taveuni	Fiji
110	Solomon Big1	Solomon Islands
111	Solomon Big2	Solomon Islands
117	Solomon Big3	Solomon Islands
119	South New Caledonia and Aneityum	New Caledonia; Vanuatu
120	Boigu Saibai and Fiji Land influenced	Fiji; Papua New Guinea
125	North Cooks and East Tahiti Chain of Atolls	French Polynesia; Cook Islands
129	Fakaofo and Tahiti Northeastern Atolls	French Polynesia; Tokelau
130	Ahe Atolls Cluster	French Polynesia
131	Flint and South Islands	Kiribati
132	Mitiaro to Anaa	French Polynesia; Cook Islands

Code	Name	Countries
133	Rotuma and Outer Banks	Fiji
134	Northwest Tahiti	French Polynesia
135	Mataiva Lagoon and Atoll	French Polynesia
136	Tepoto, Napuka and Pukapuka	French Polynesia
138	Far Eastern Atolls Chain	French Polynesia
137	Northern Lau Islands	Fiji
138	Far Eastern Atolls Chain	French Polynesia
139	Fiji Reef Influenced	Fiji
140	Hao Amanu Cluster	French Polynesia
141	Rarotonga and South Cooks	Cook Islands
142	Central Lau	Fiji
143	South Eastern Atolls Cluster	French Polynesia
144	Nawi and Kioa Peninsula	Fiji
145	Negonego Cluster	French Polynesia
146	Bellona Reefs and Islets	New Caledonia
147	Hakau Nimenima	Tonga
148	Ile Pott and Atoll de Huon cluster	New Caledonia

Code	Name	Countries
149	Ile Art and Atoll de la Surprise	New Caledonia
150	Iles Maria to Raivavae and Hereheretue cluster	French Polynesia
151	Rikitea and Southeast Atolls Cluster	French Polynesia
152	Astrolabe Reefs	New Caledonia
154	Ouvea and Lifou	New Caledonia
157	Far South and Ahurei Atolls cluster	French Polynesia