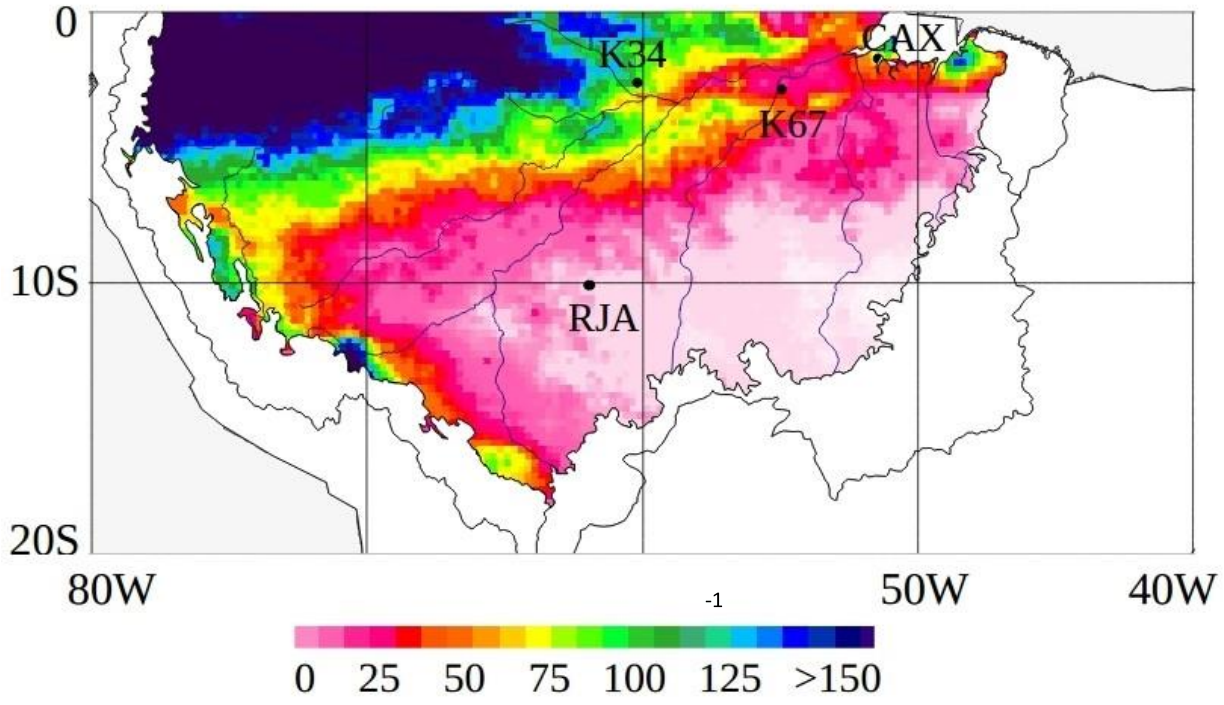

Figure 1. Locations of eddy covariance tower study sites at the Amazon Basin *sensu-stricto* (Eva and Huber (eds), 2005). Minimum monthly precipitation (mm month^{-1}) from the Tropical Rainfall Measuring Mission (TRMM) (NASA, 2014) based on an annual composite for the years 1998 to 2013.

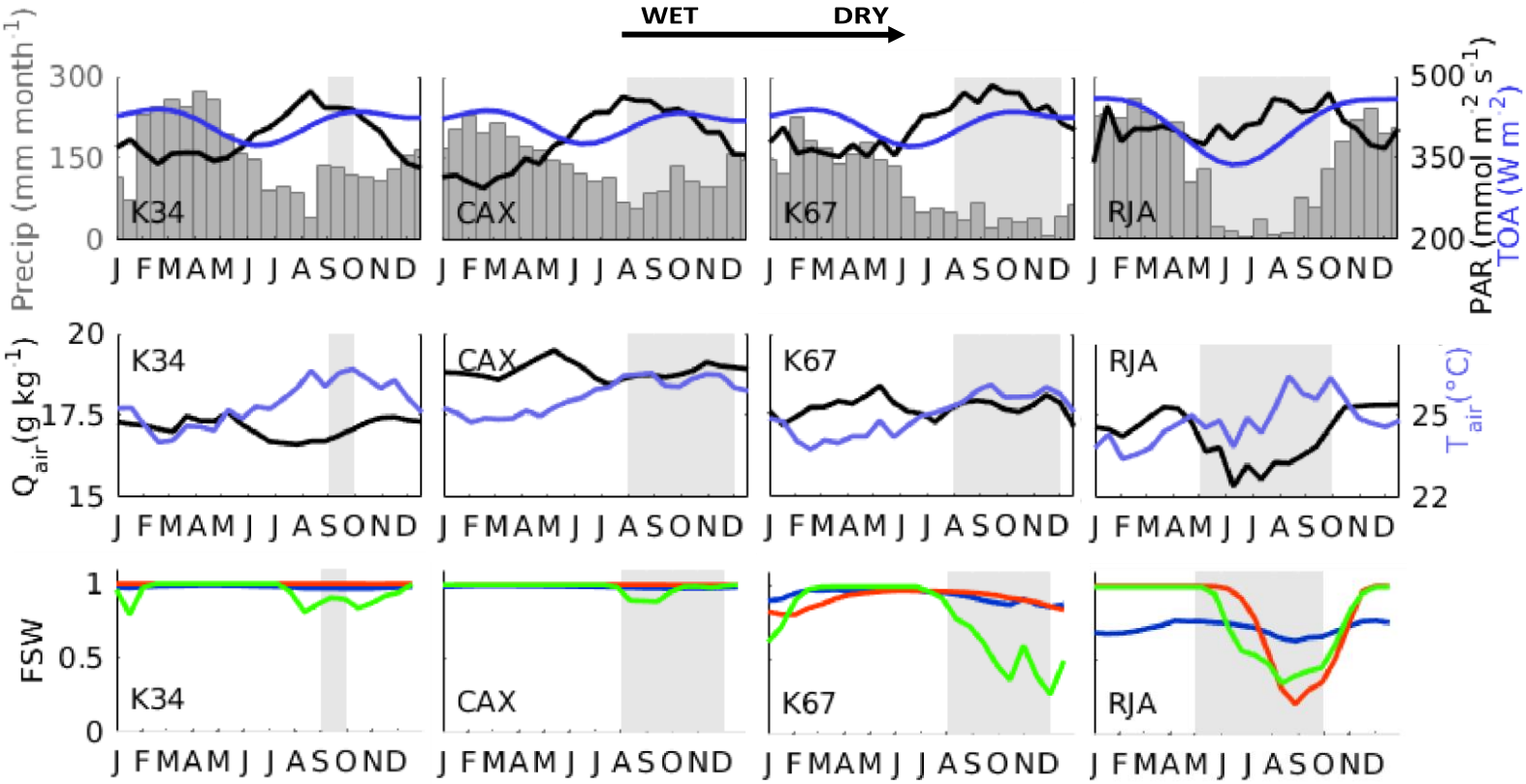

Figure 2. From top to bottom annual cycle of daily average observed climatic variables: incoming photosynthetic active radiation (*PAR*; µmol m^{-2} s^{-1}, black line right y-axis) and precipitation (*Precip*; mm $month^{-1}$, dark gray bars left y-axis), top of the atmosphere incoming radiation (*TOA*; W m^{-2}, blue line right y-axis) (not a driver). From left to right study sites (from wet to dry) near Manaus (K34), Caxiuanã (CAX), Santarém (K67), and Reserva Jarú southern (RJA) forests. Gray shaded area is dry season as defined using satellite derived measures of precipitation (TRMM: 19982013). Second row LSM drivers: near surface specific humidity (Q_{air}; g kg^{-1}, black line left y-axis) and temperature (T_{air}; °C, blue line right y-axis). Lower panel depicts model ecosystem-scale of model soil moisture "stress" (*FSW*, where 1=no stress). Simulations from ED2 (blue), IBIS (red), CLM3.5 (green), and JULES (purple).

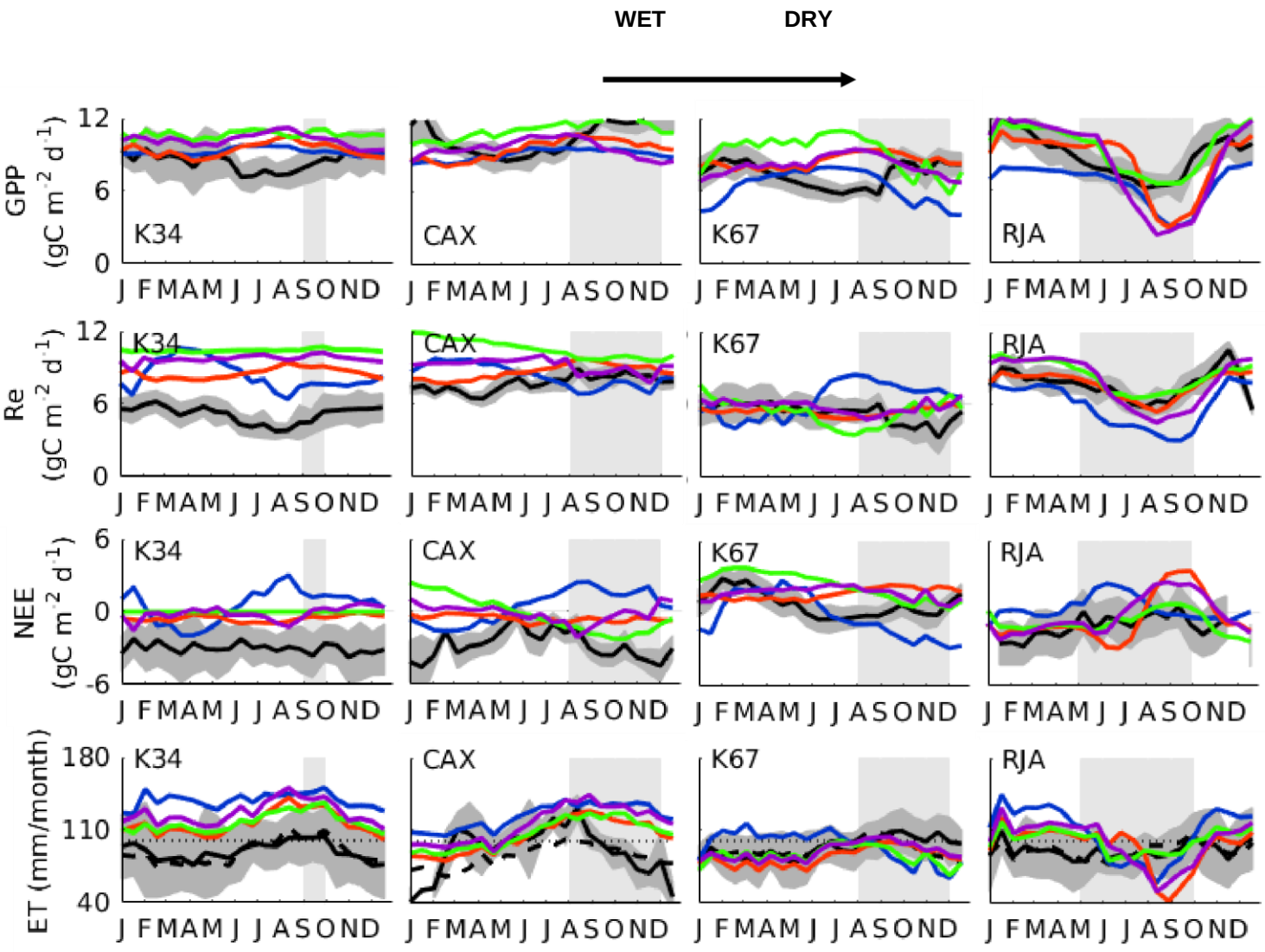

Figure 3. Annual cycle of daily average ecosystem-scale photosynthesis (*GPP*; gC m^{-2} d^{-1}), ecosystem respiration (R_e; gC m^{-2} d^{-1}), net ecosystem exchange (*NEE*; gC m^{-2} d^{-1}) and evapotranspiration (*ET*; mm $month^{-1}$). From left to right study sites (from wet to dry) near Manaus (K34), Caxiuanã (CAX), Santarém (K67), and Reserva Jarú southern (RJA) forests. Observed (black + dark gray uncertainty) and simulated by models (colors). Dashed black line at ET panels corresponds to a linear model where the independent variable is incoming radiation (SW_{down}). Gray shaded area is dry season as defined using satellite derived measures of precipitation (TRMM: 1998-2013). Simulations from ED2 (blue), IBIS (red), CLM3.5 (green), and JULES (purple).

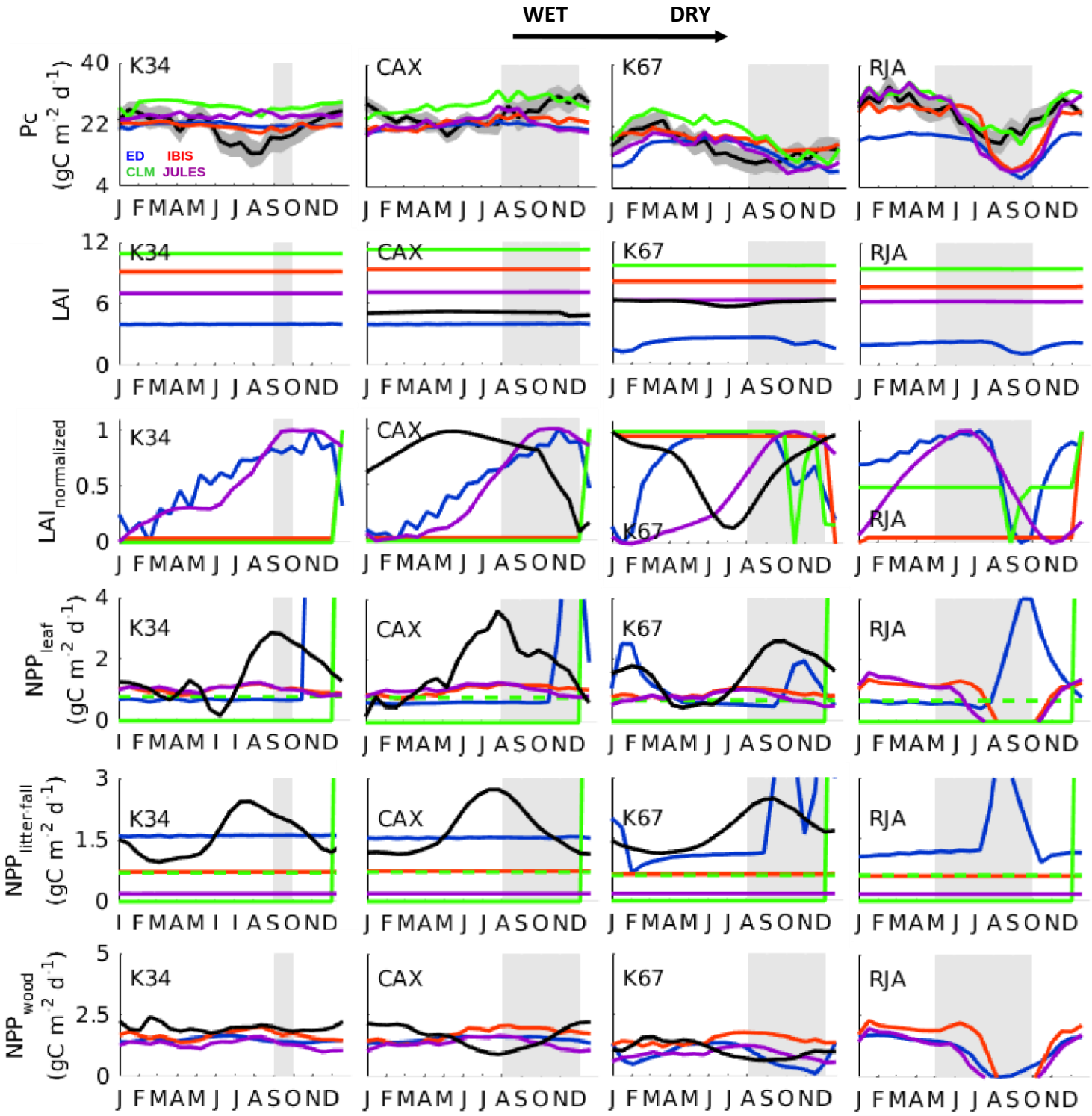

Figure 4. From top to bottom annual cycle of daily average ecosystem photosynthetic capacity (*Pc*; gC m^{-2} d^{-1}), leaf area index (*LAI; m^2 m^{-2}*), normalized *LAI* (its value constrained between 0 and 1 in order to better track its changes), net primary productivity (*NPP;* gC m^{-2} d^{-1}) allocated to leaves -leaf flush (NPP_{leaf}; gC m^{-2} d^{-1}), *NPP* allocated to litter-fall ($NPP_{litter\text{-}fall}$; gC m^{-2} d^{-1}). Lower row *NPP* allocated to wood (NPP_{wood}; gC m^{-2} d^{-1}). Gray shaded area is dry season as defined using satellite derived measures of precipitation (TRMM: 1998-2013). From left to right study sites (from wet to dry) near Manaus (K34), Caxiuanã (CAX), Santarém (K67), and Reserva Jarú southern (RJA) forests. Observed (black) *versus* simulated by models (colors). Simulations from ED2 (blue), IBIS (red), CLM3.5 (green), and JULES (purple). Dashed green lines (CLM3.5) at NPP_{litter}*fall* and *NPPleaf,* indicate average values for comparison purposes (models allocated at the end of the year as indicated by continuous line).

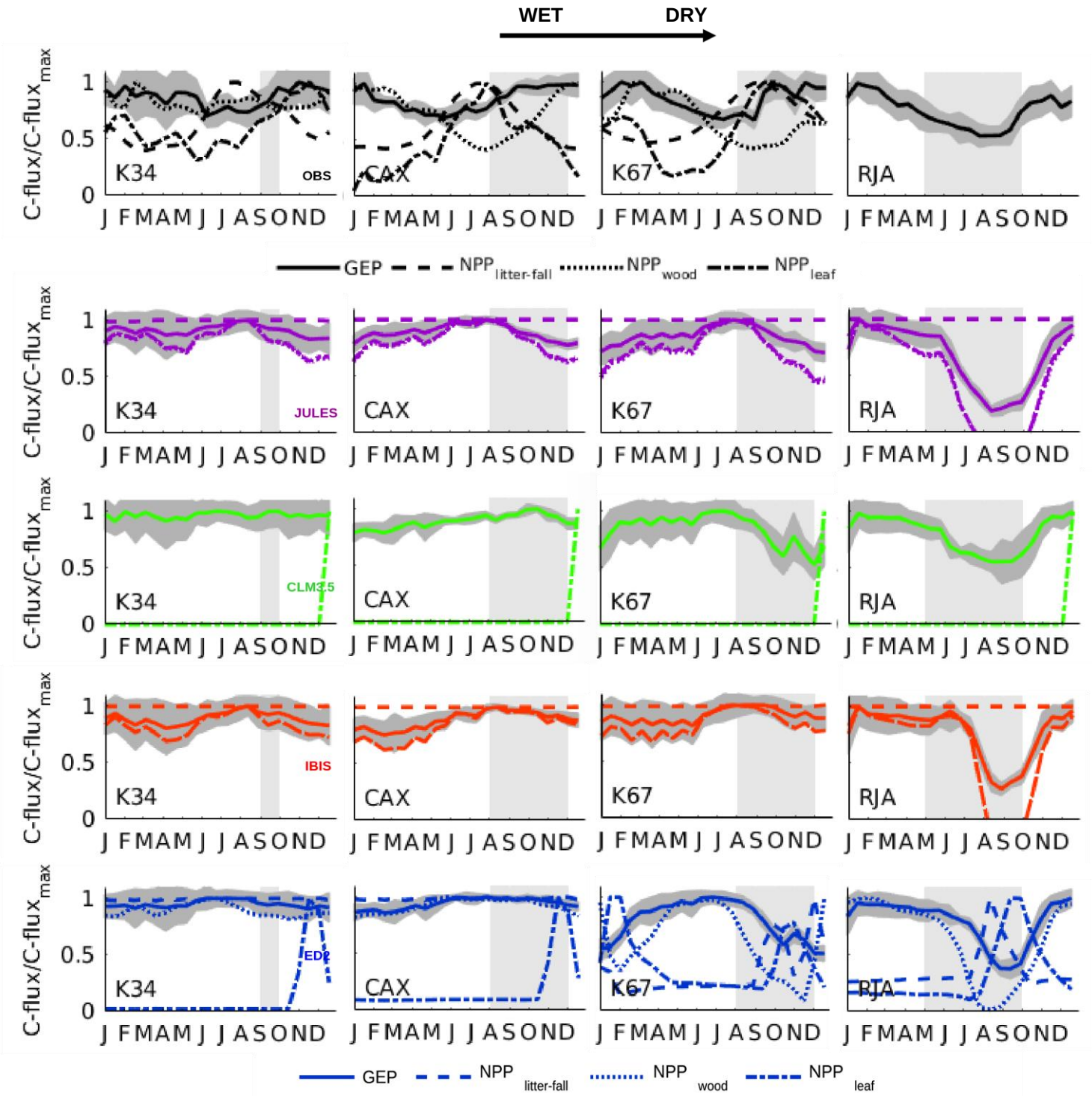

Figure 5. From top to bottom, annual cycle observed (black) and model simulations from JULES (purple), CLM3.5 (green), IBIS (red), and ED2 (blue). Normalized (by its seasonal maximum) annual cycle of daily average ecosystem-scale photosynthesis (*GPP/GPP$_{max}$*) (continuous line), net primary productivity (*NPP*) allocated to leaves -leaf flush (*NPP$_{leaf}$ /NPP$_{leaf\ max}$*), *NPP* allocated to litter-fall (*NPP$_{litter\text{-}fall}$ /NPP$_{litter\text{-}fall\ max}$*), and *NPP* allocated to wood (*NPP$_{wood}$ /NPP$_{wood\ max}$*). From left to right study sites (from wet to dry) near Manaus (K34), Caxiuanã (CAX), Santarém (K67), and Reserva Jarú southern (RJA) forests. Gray shaded area is dry season as defined using satellite derived measures of precipitation (TRMM: 1998-2013).

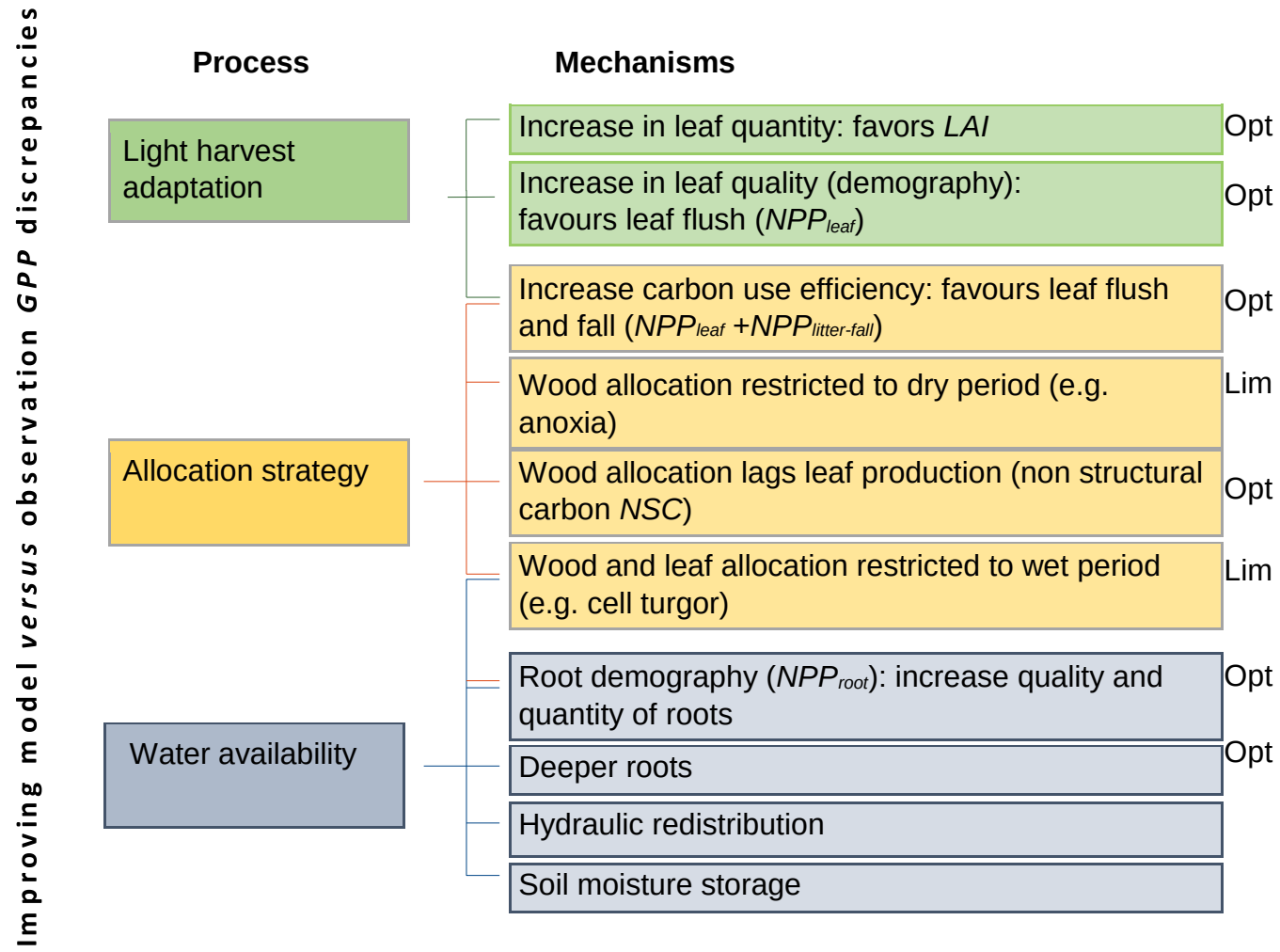

Figure 6. Ecosystem response to climate seasonality –selection of biological adaptive mechanisms: light harvest adaptations (green tones), allocation strategies (orange tones), and water limitation (blue tones). Mechanisms classified when possible into resource optimization (Opt) and biophysical limitations (Lim).