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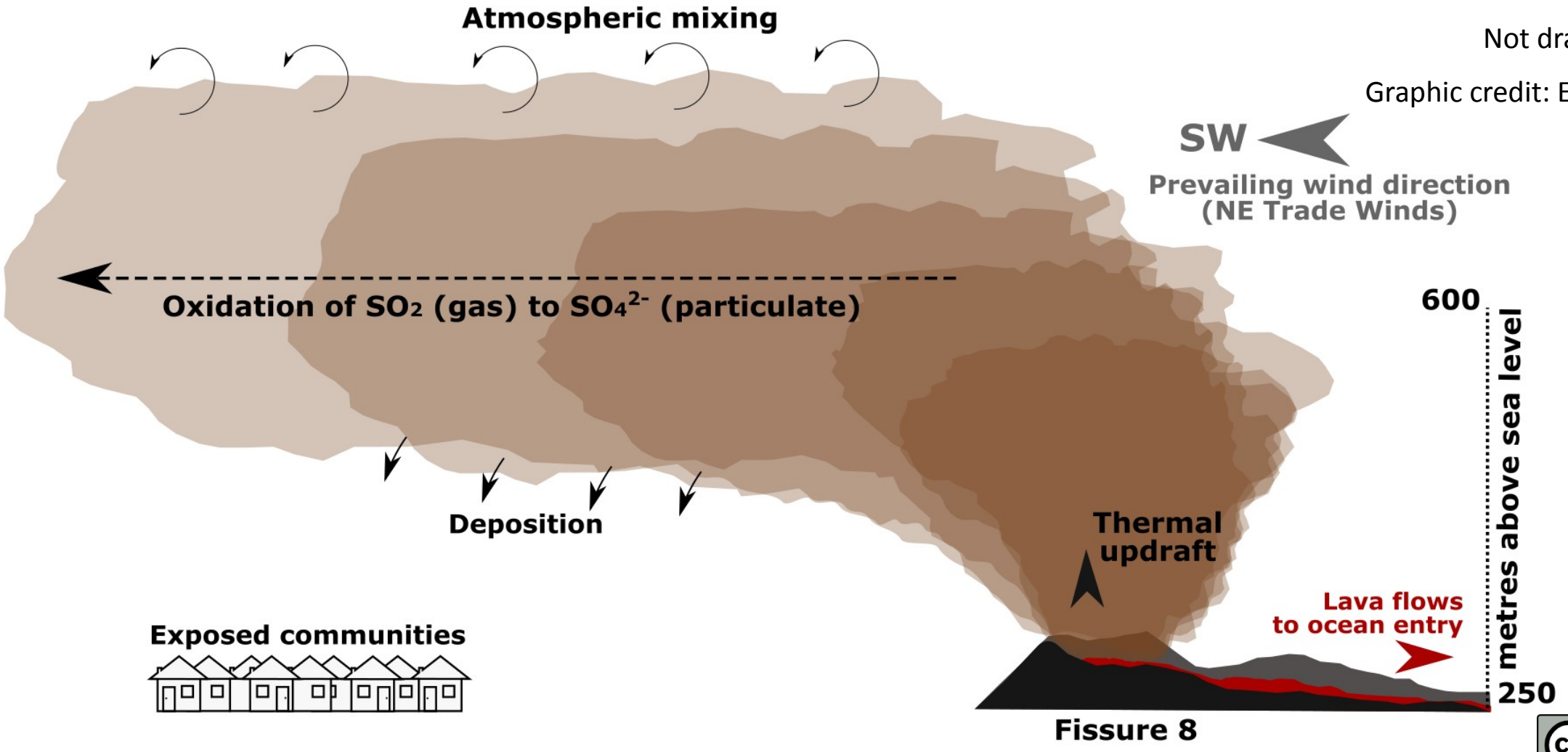
Open on computer or laptop for audio narration

Schematic overview of Kīlauea 2018 LERZ eruption

Not drawn to scale

Graphic credit: Emily Mason



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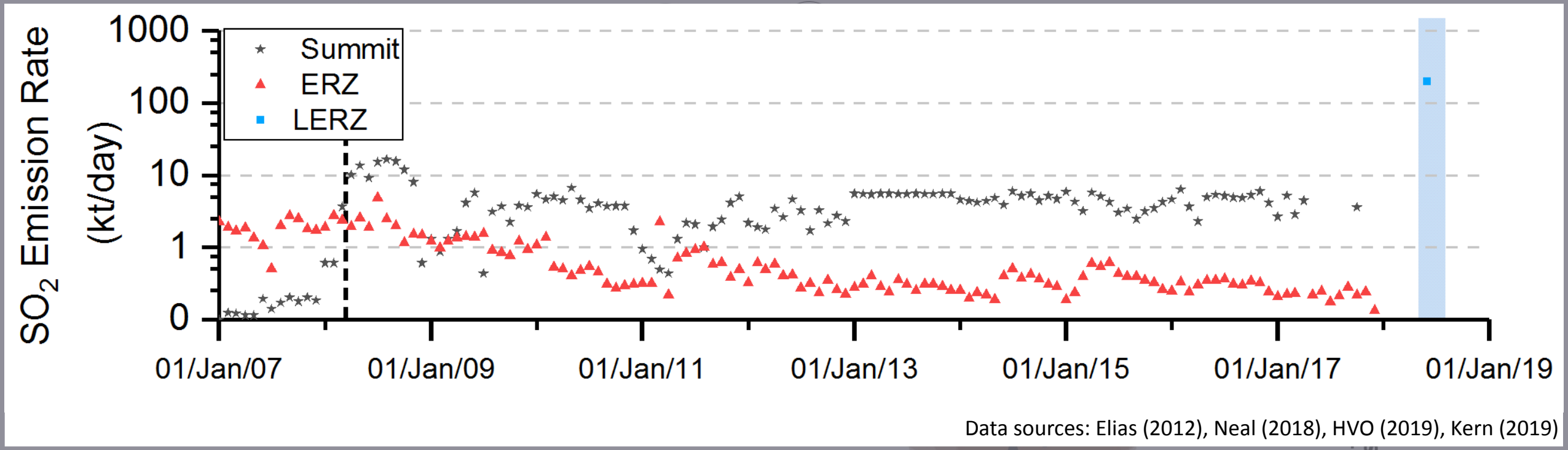
Kīlauea emissions



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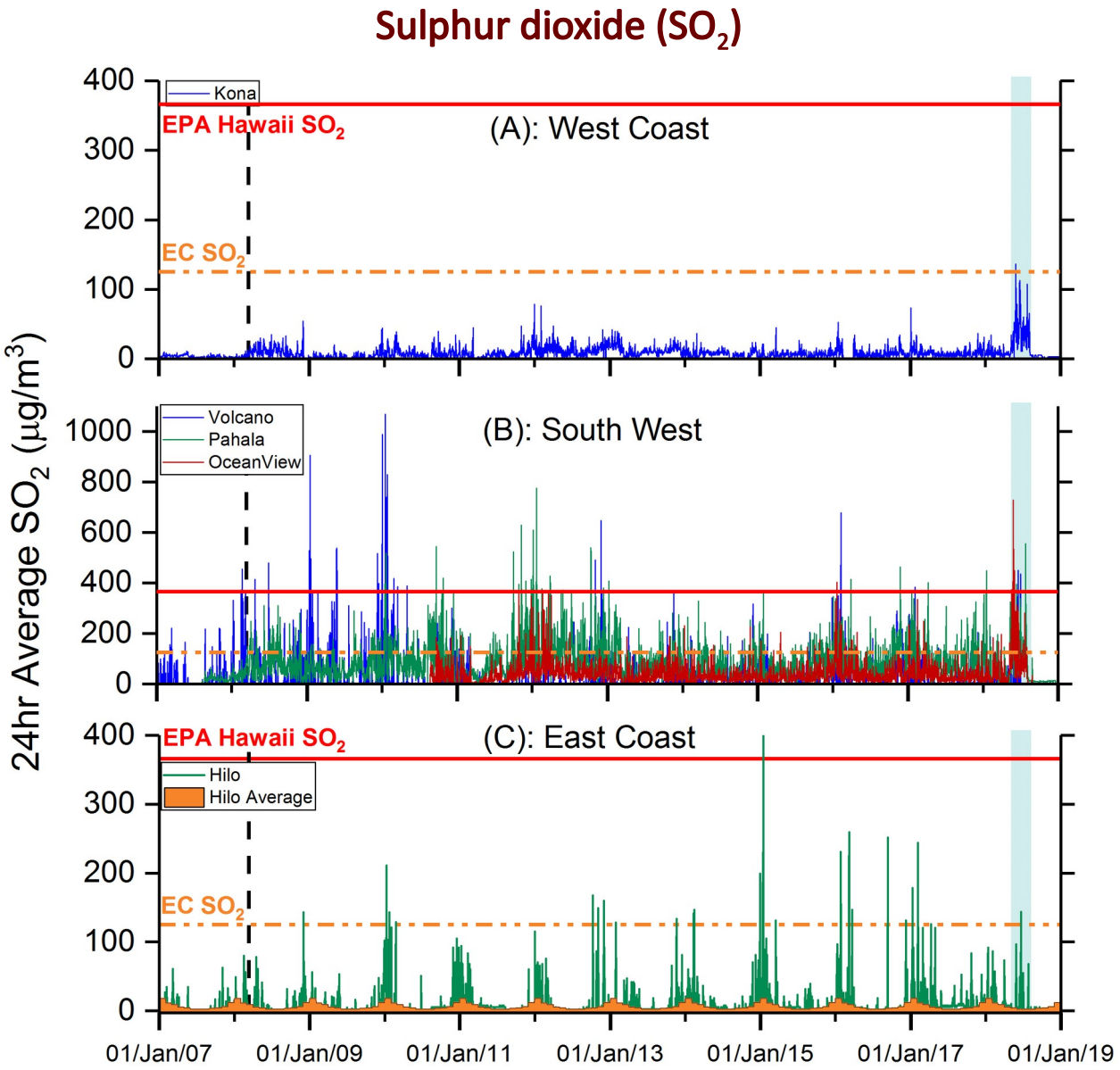

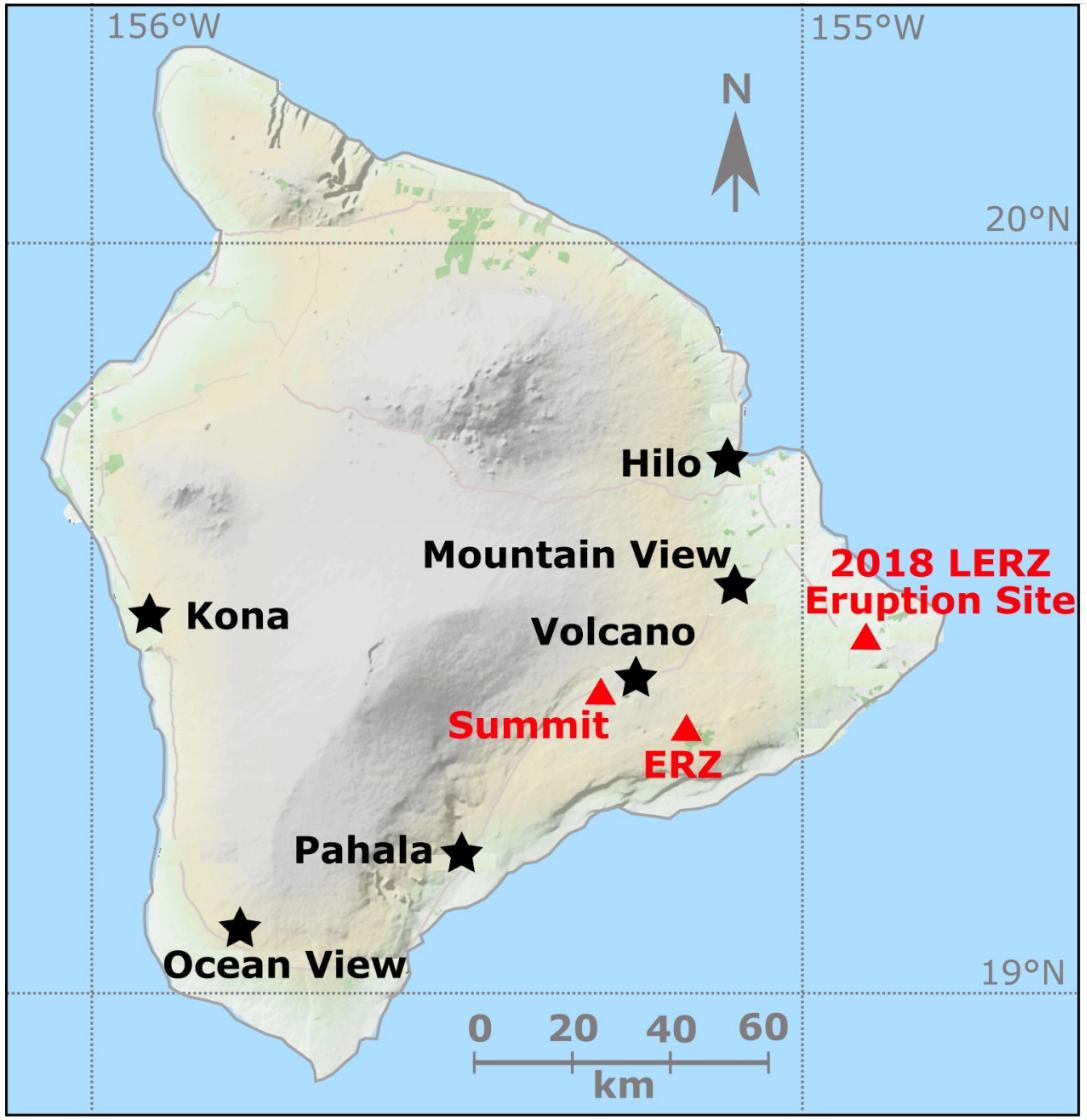

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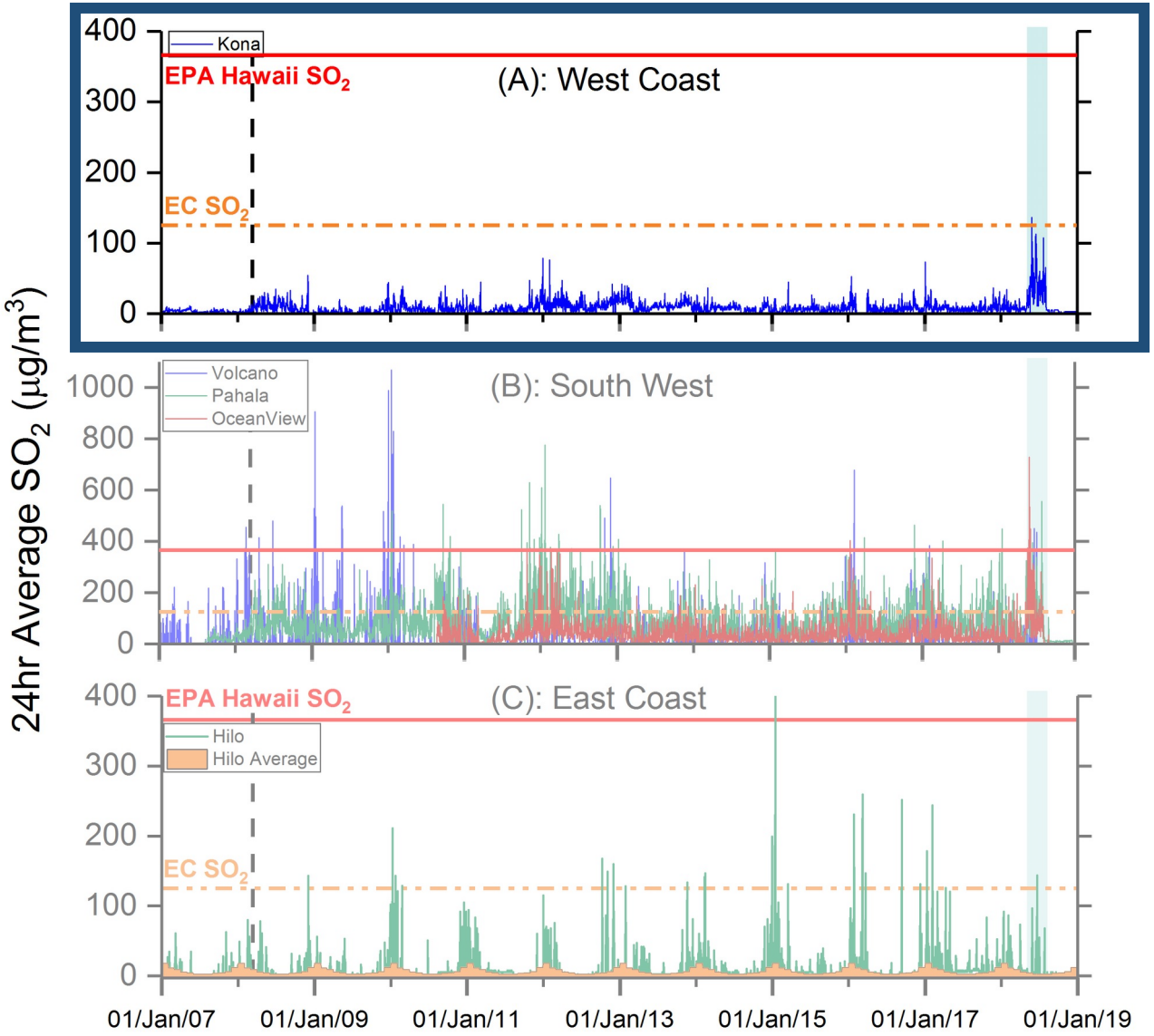
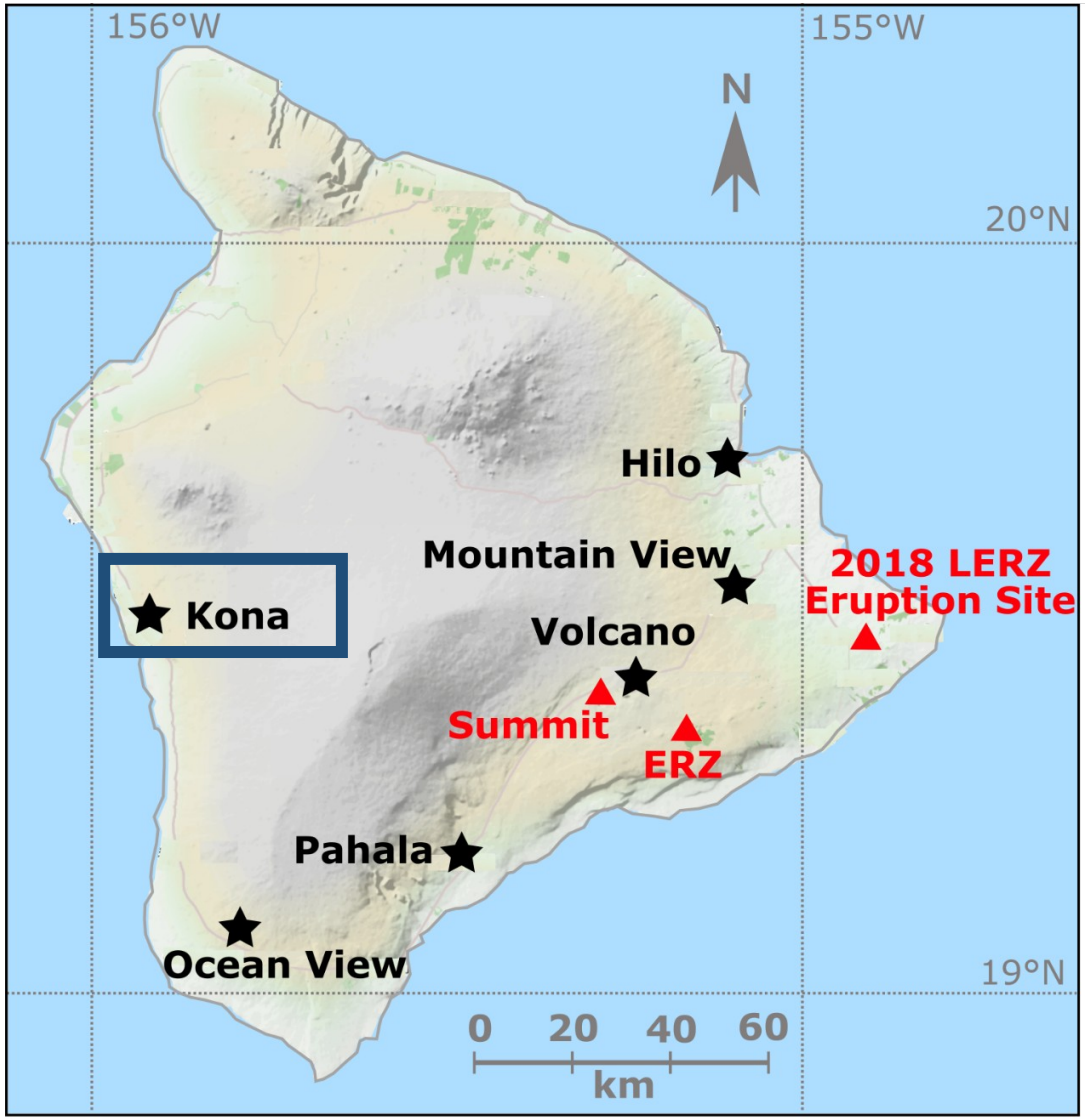
Sulphur dioxide (SO_2)





★ Monitoring station ▲ Kīlauea emission point

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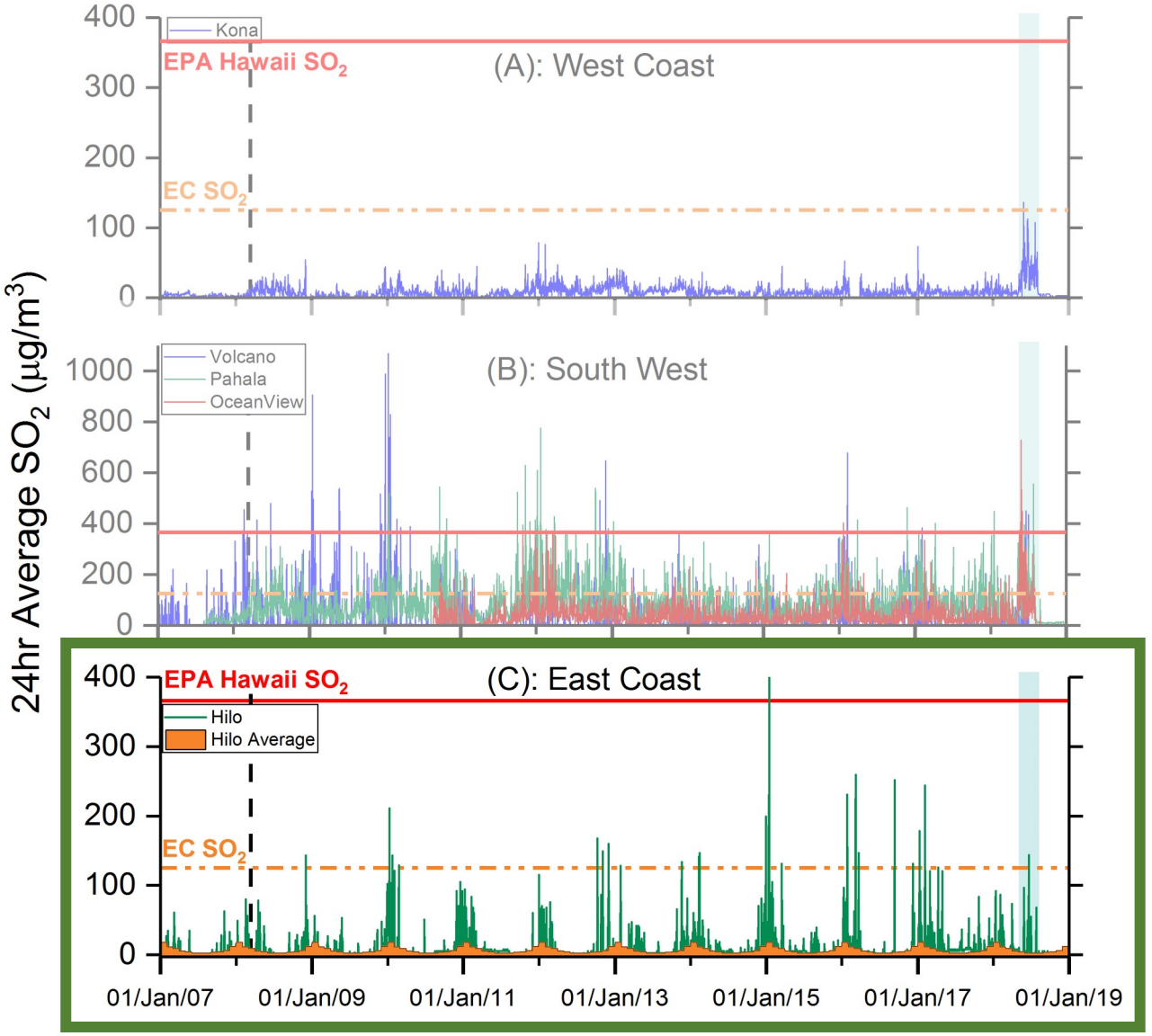

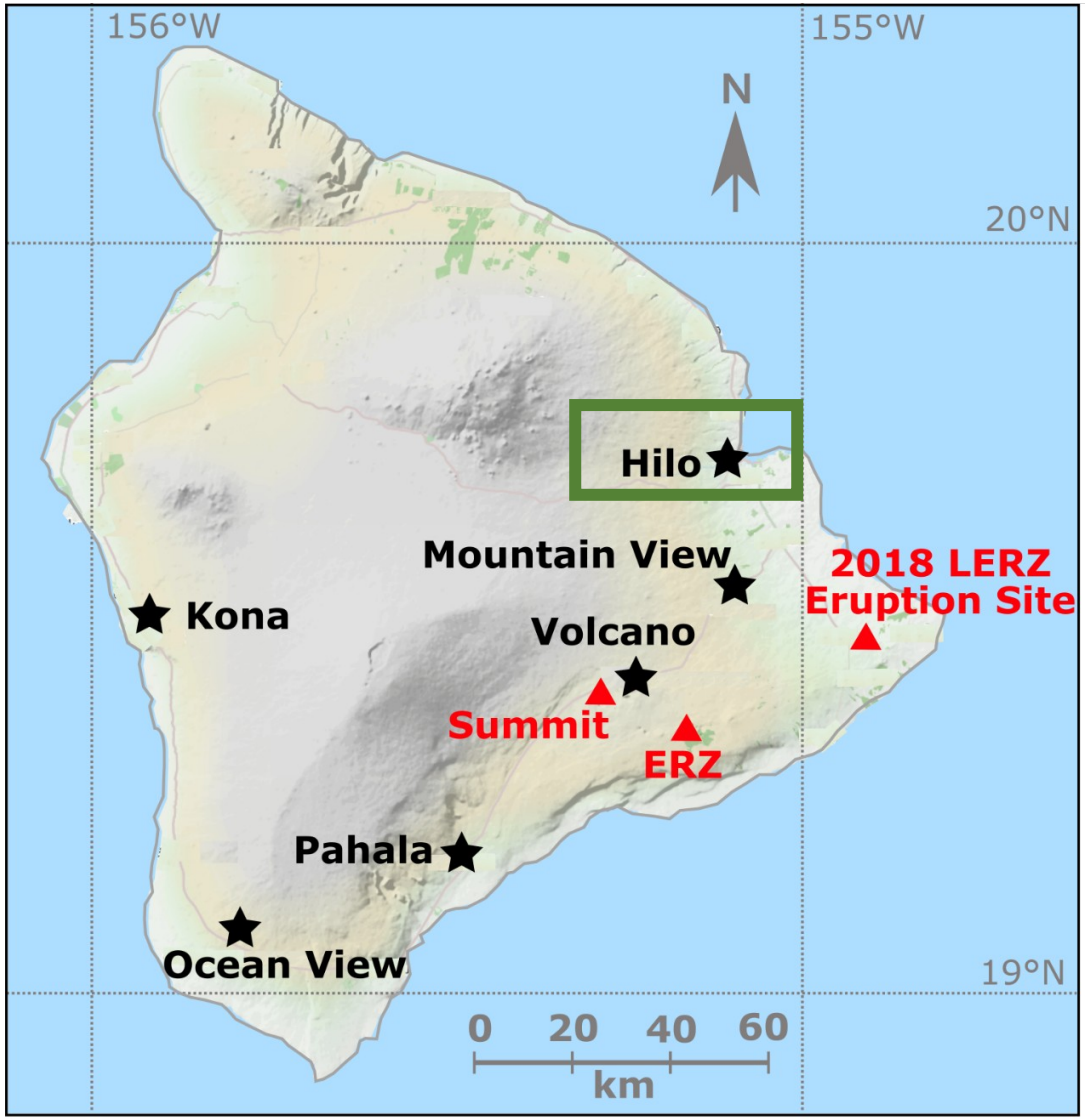

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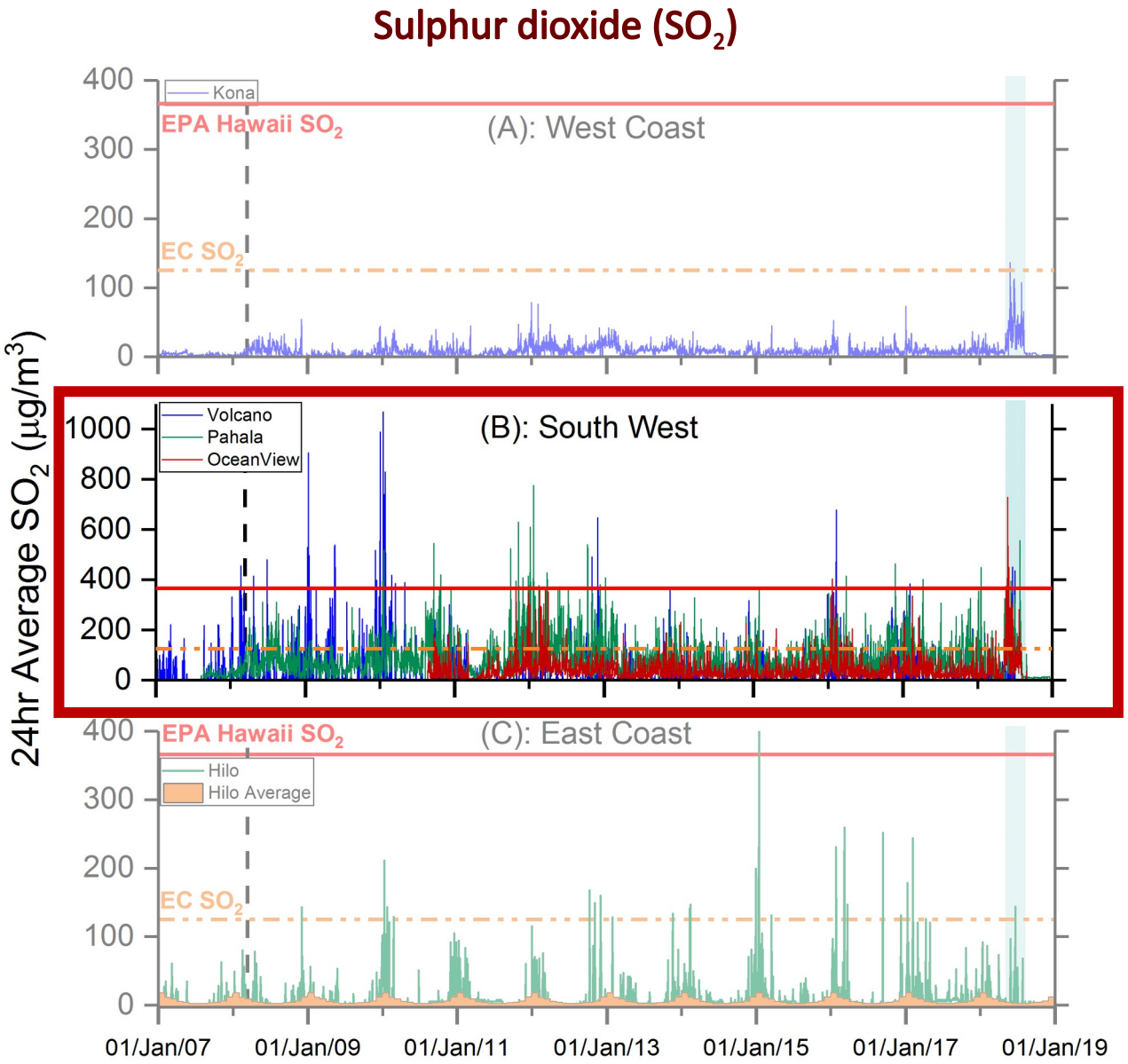

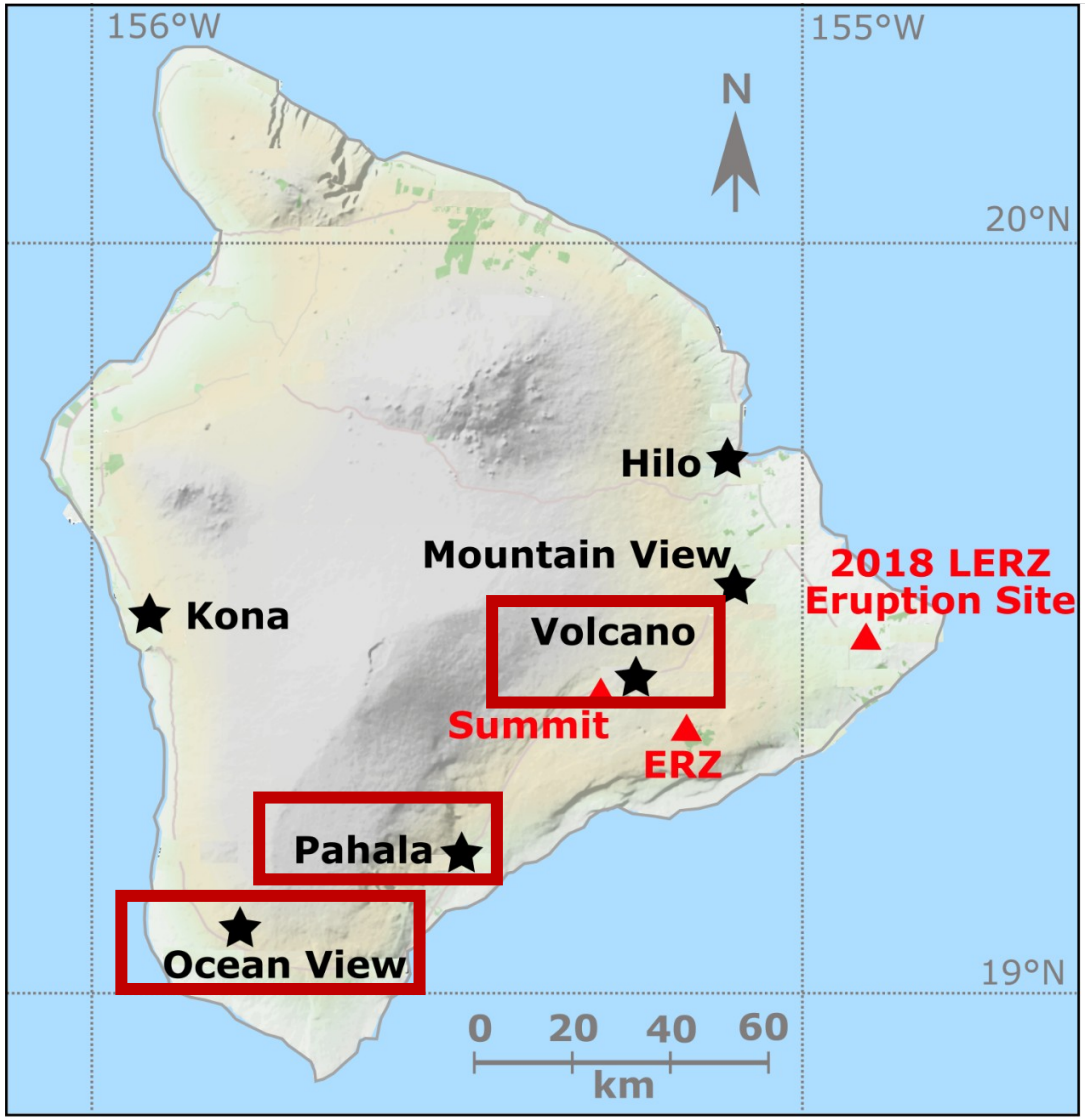

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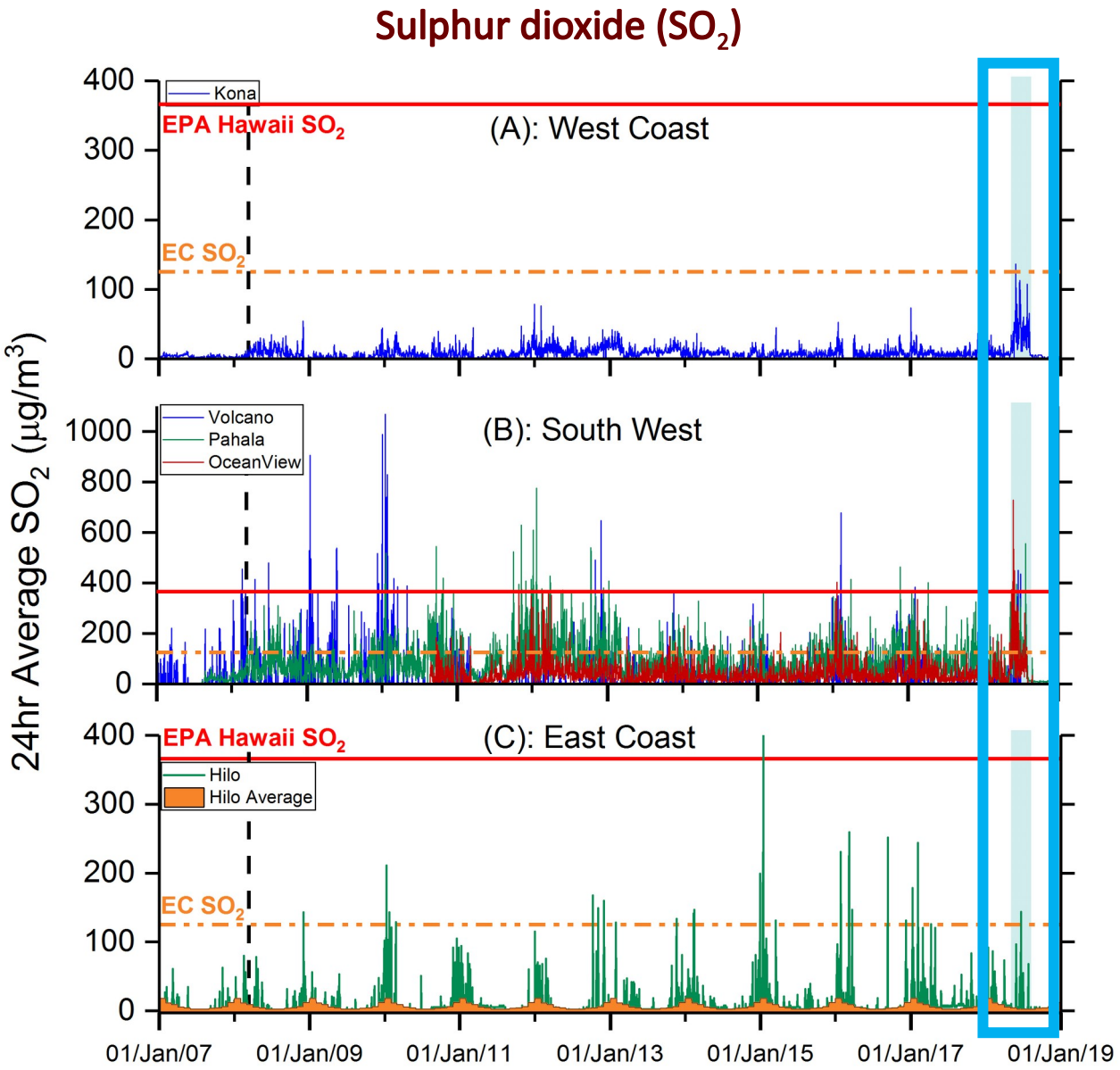

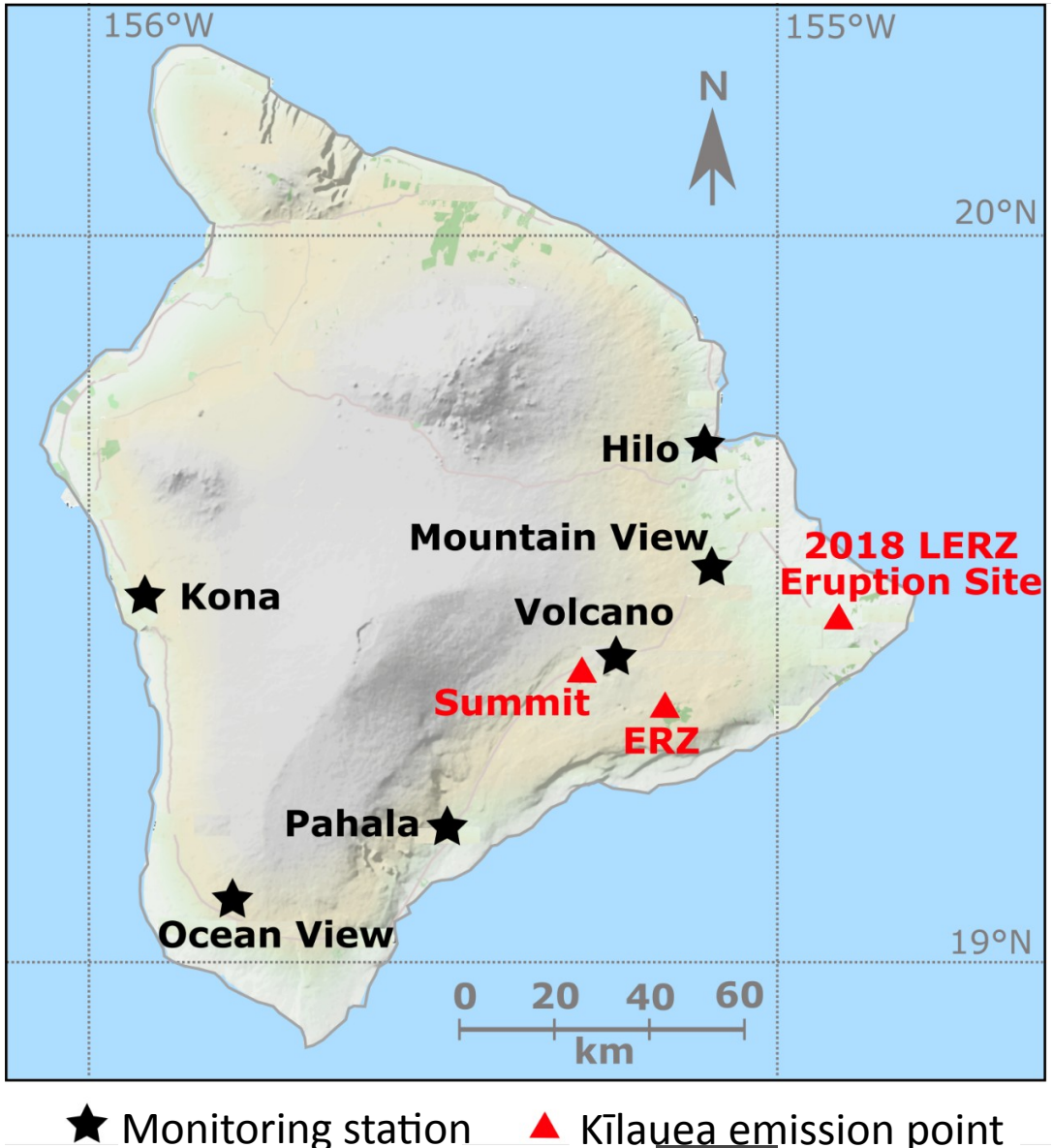

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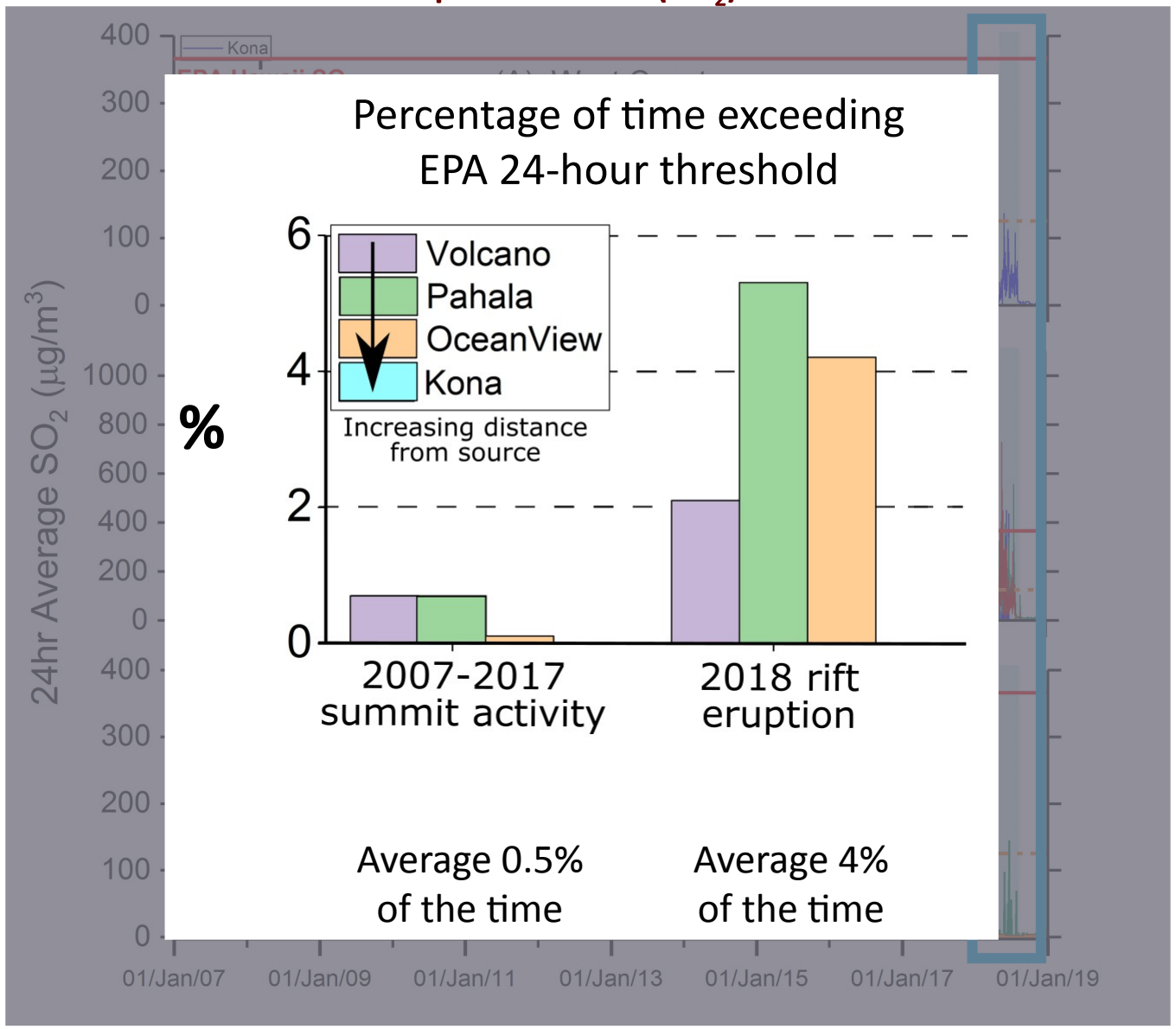

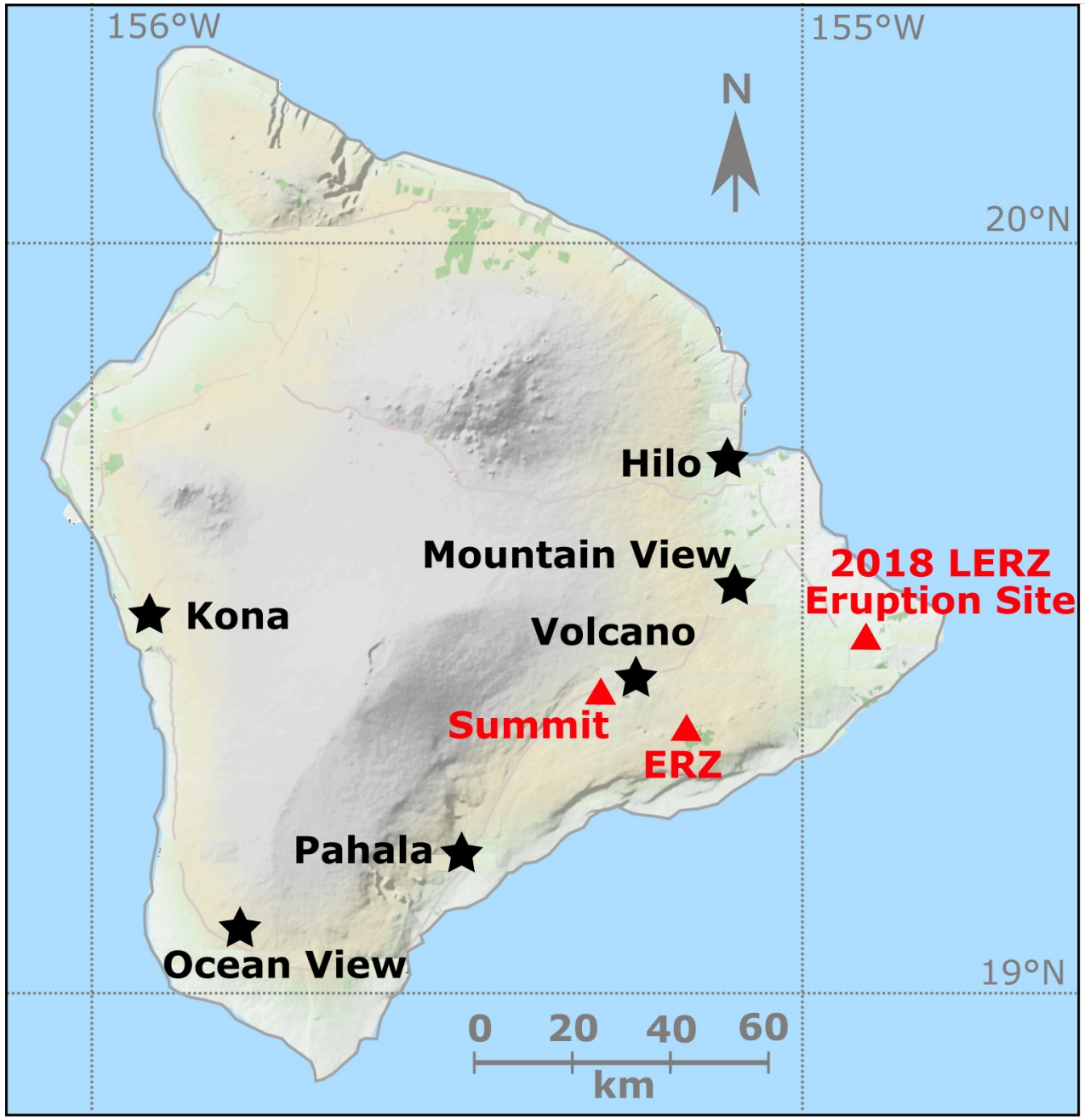

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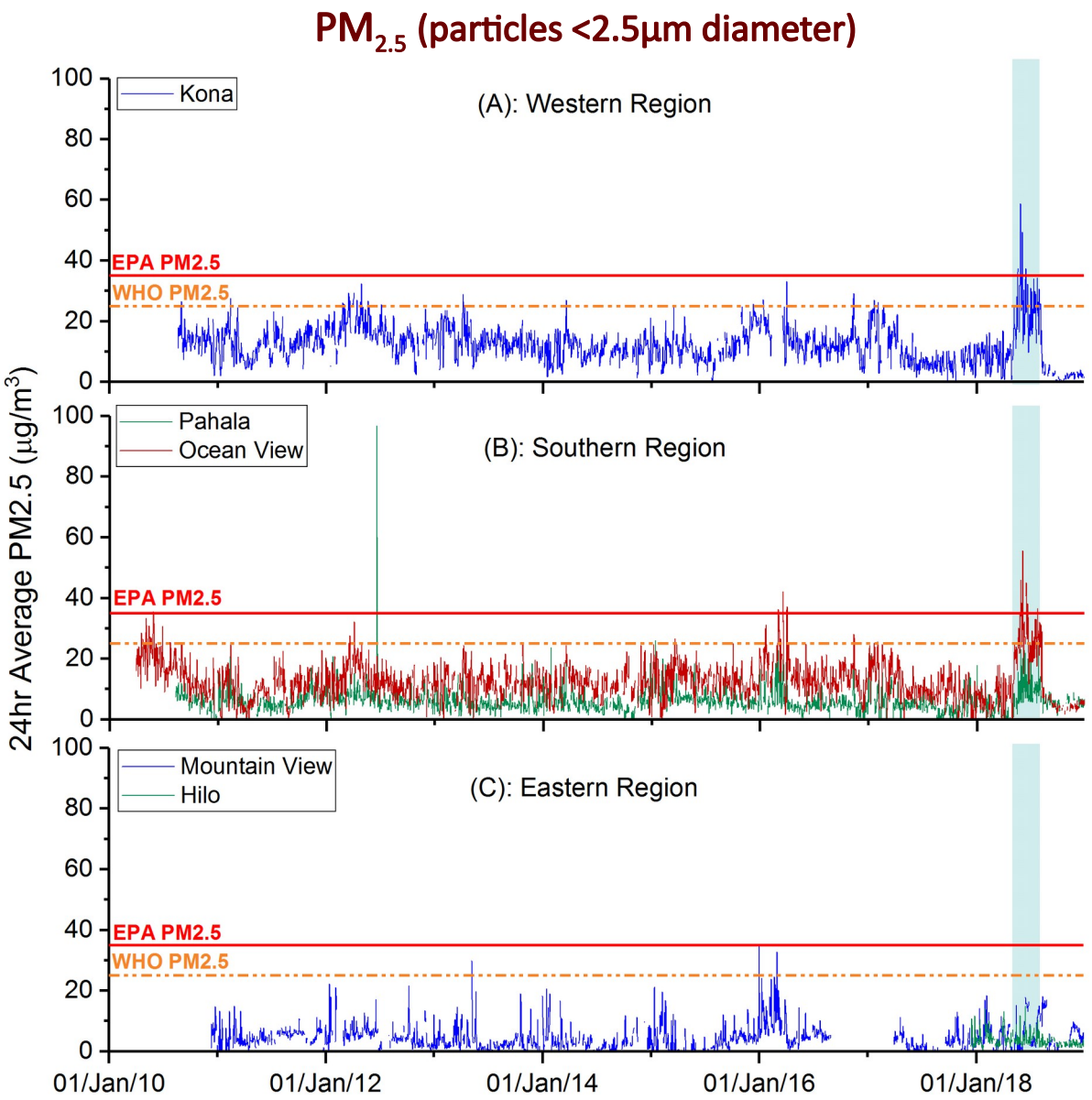

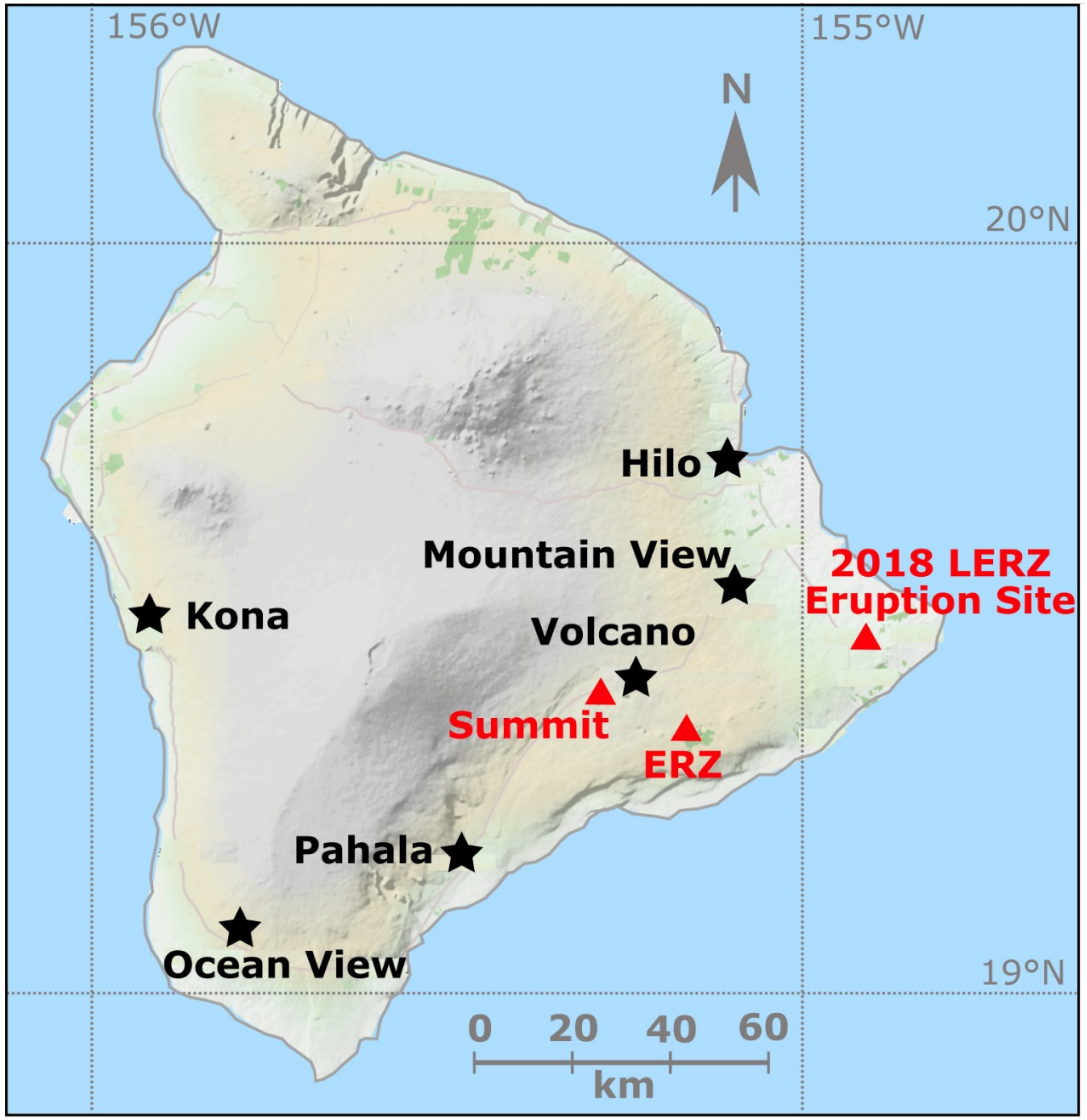

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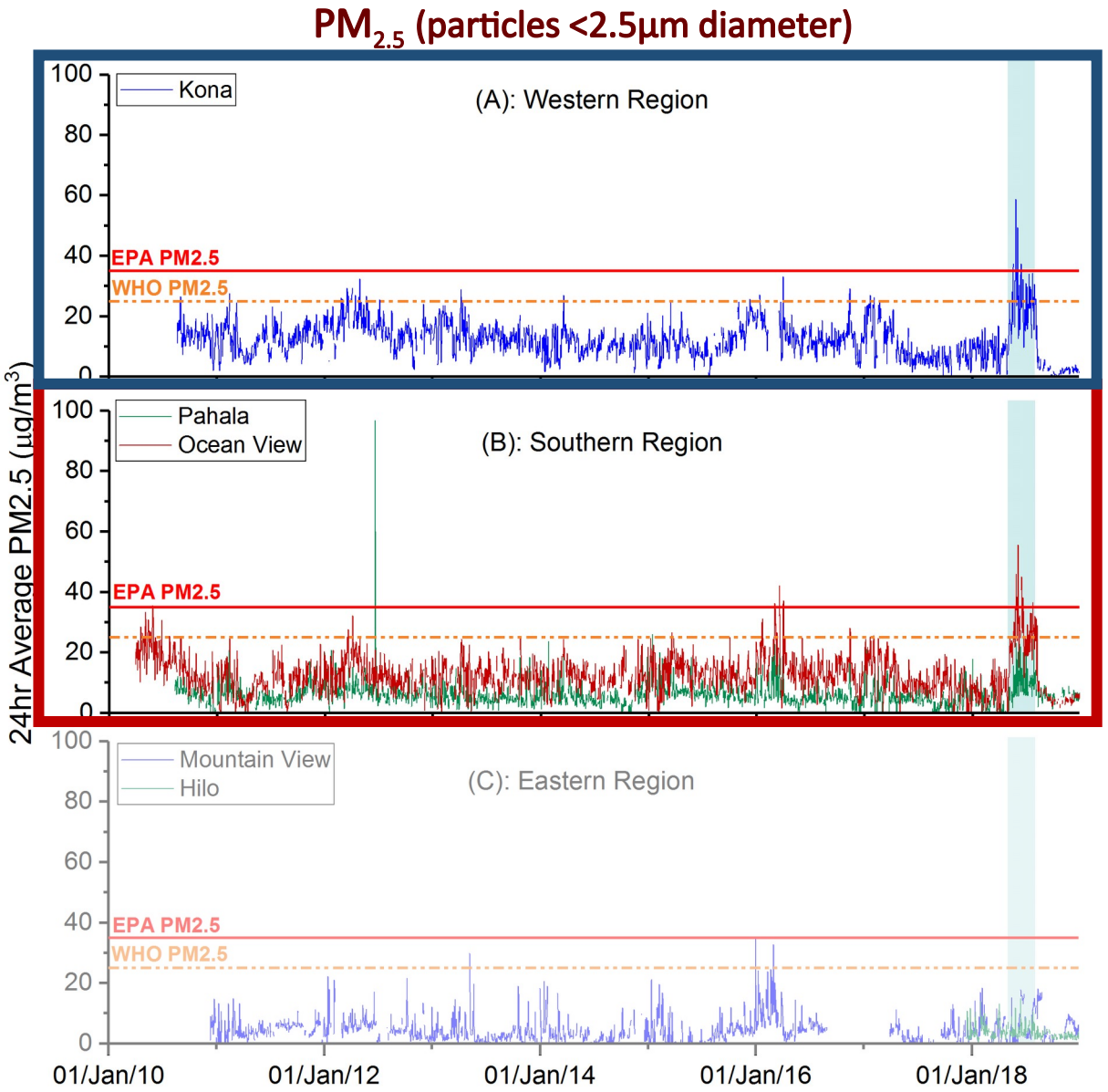

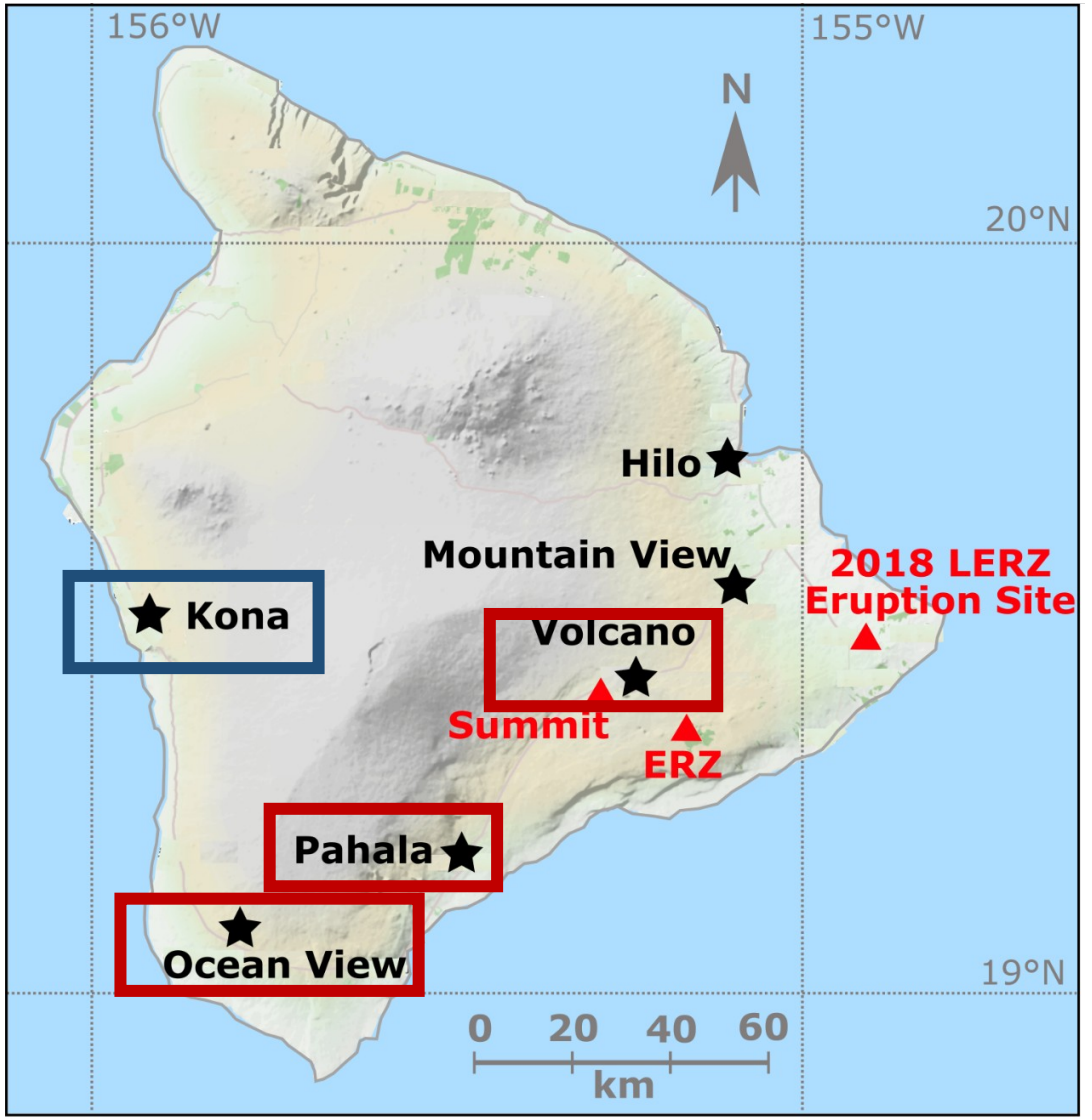

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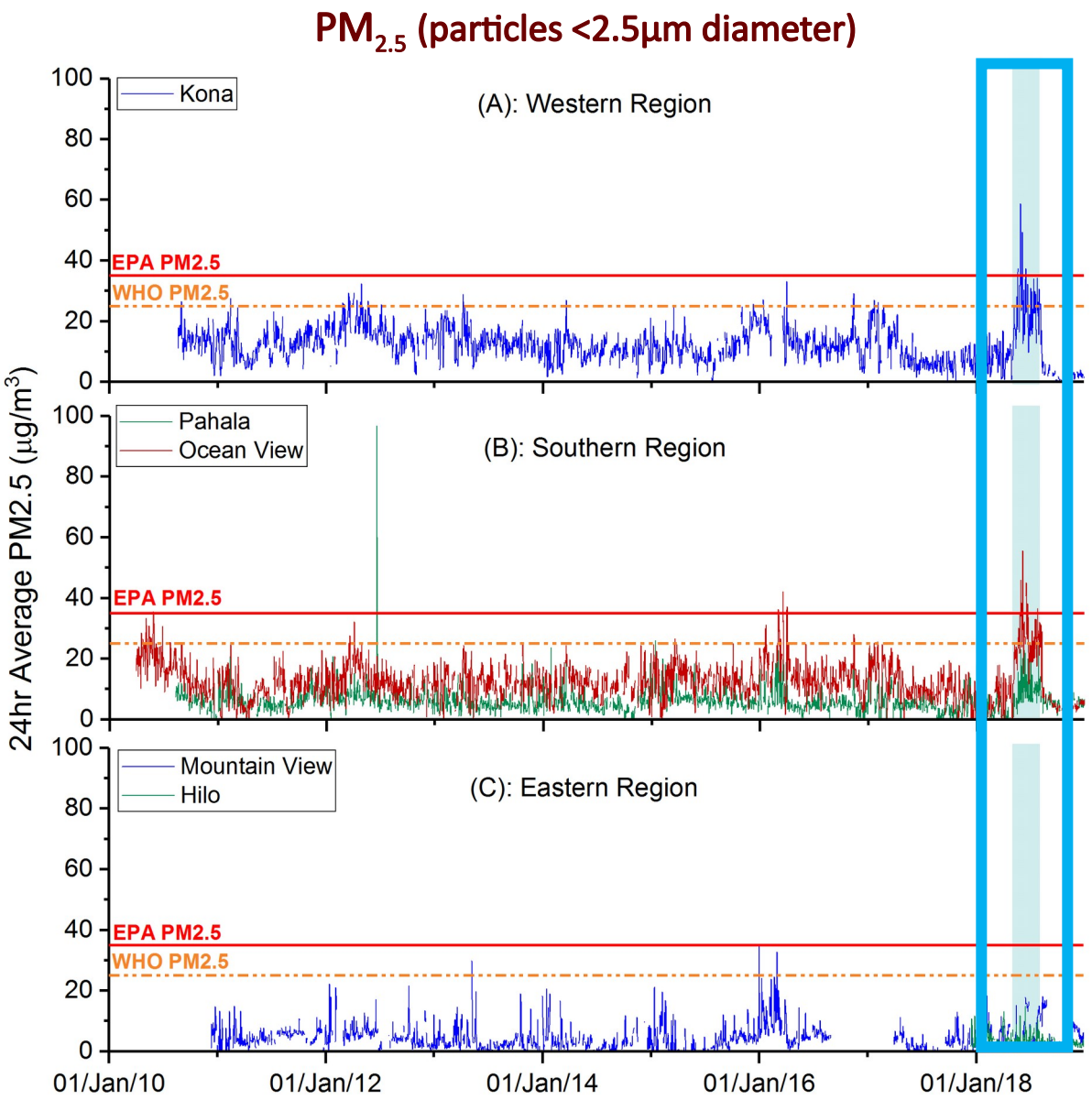

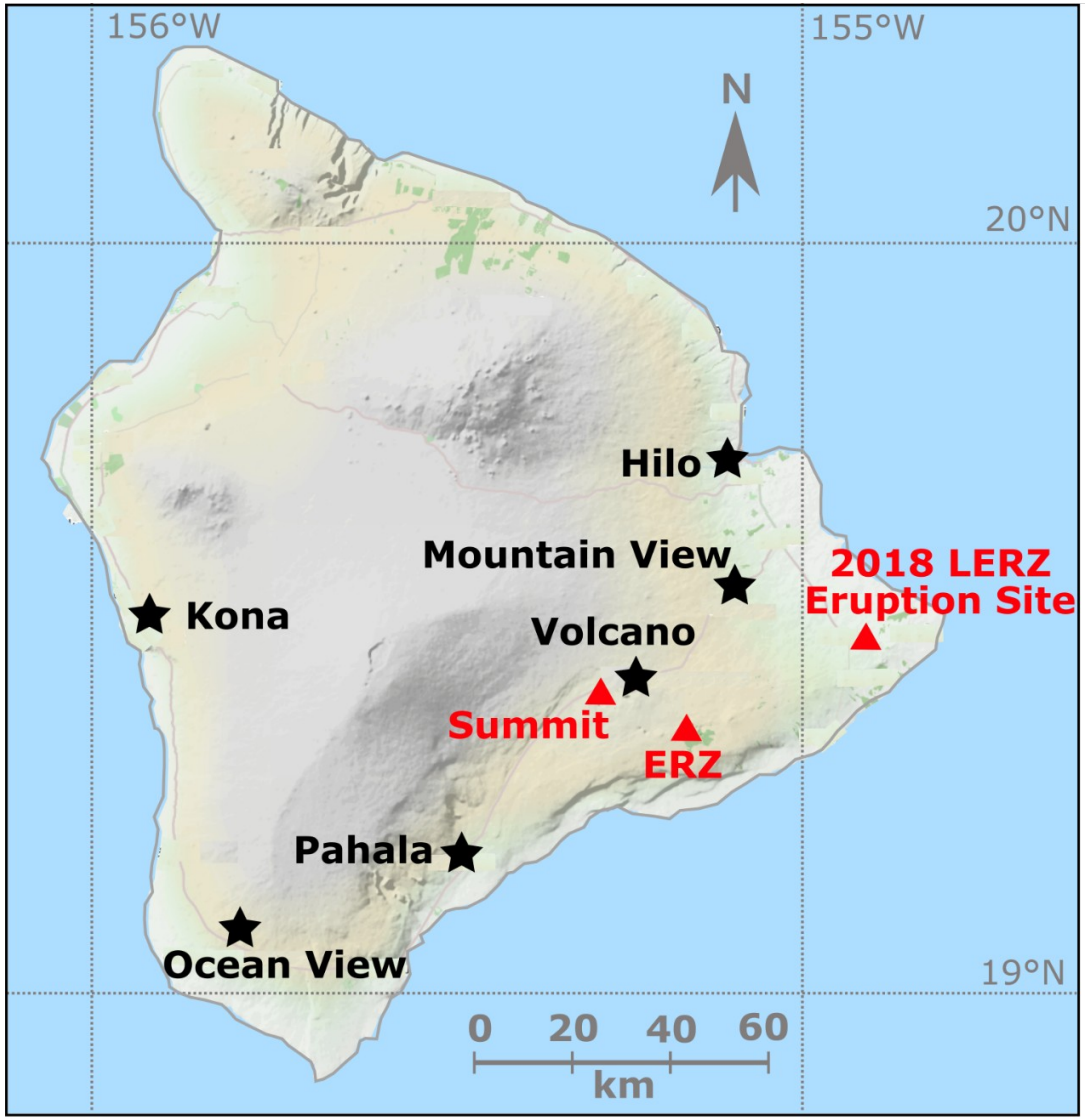

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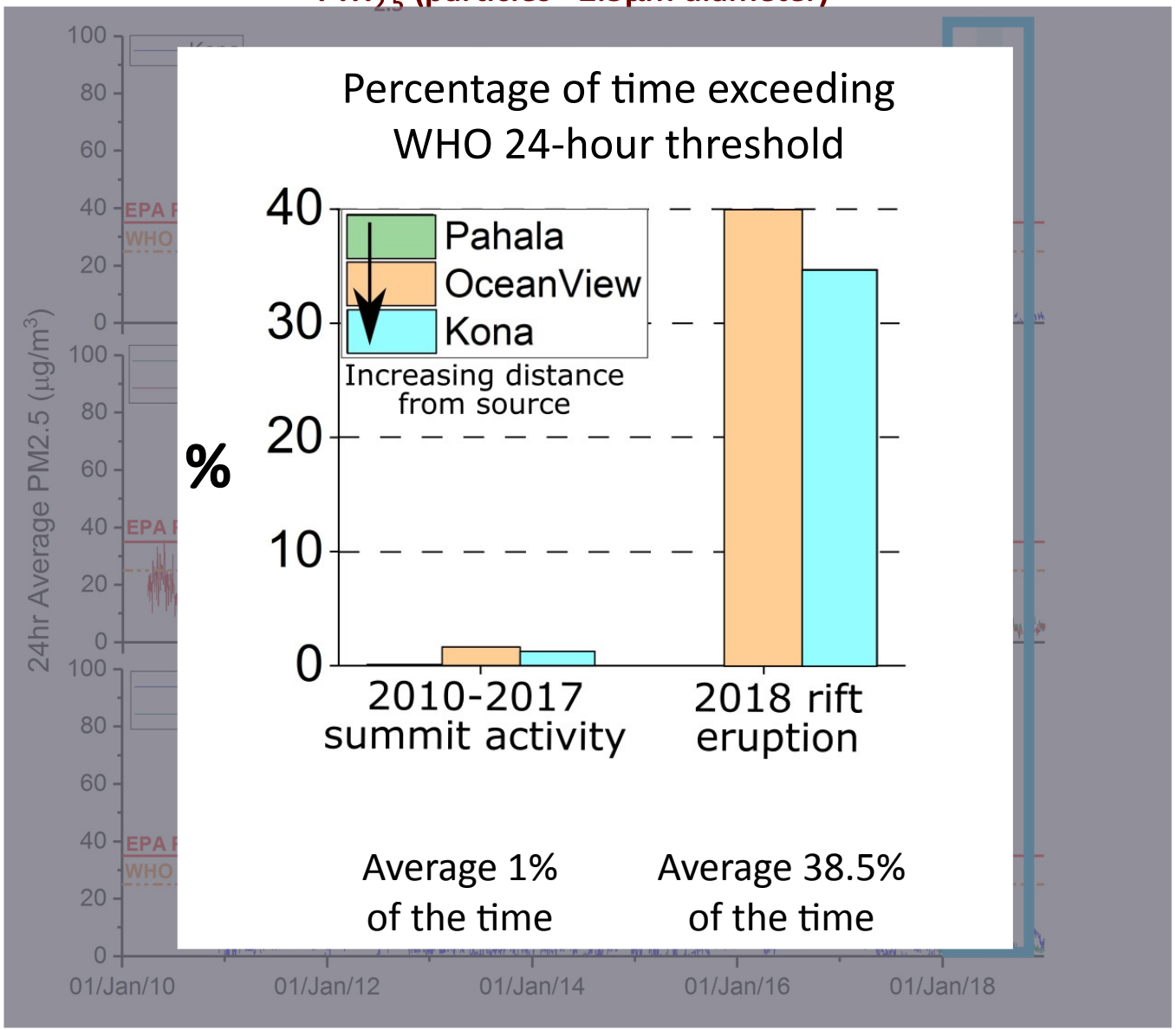
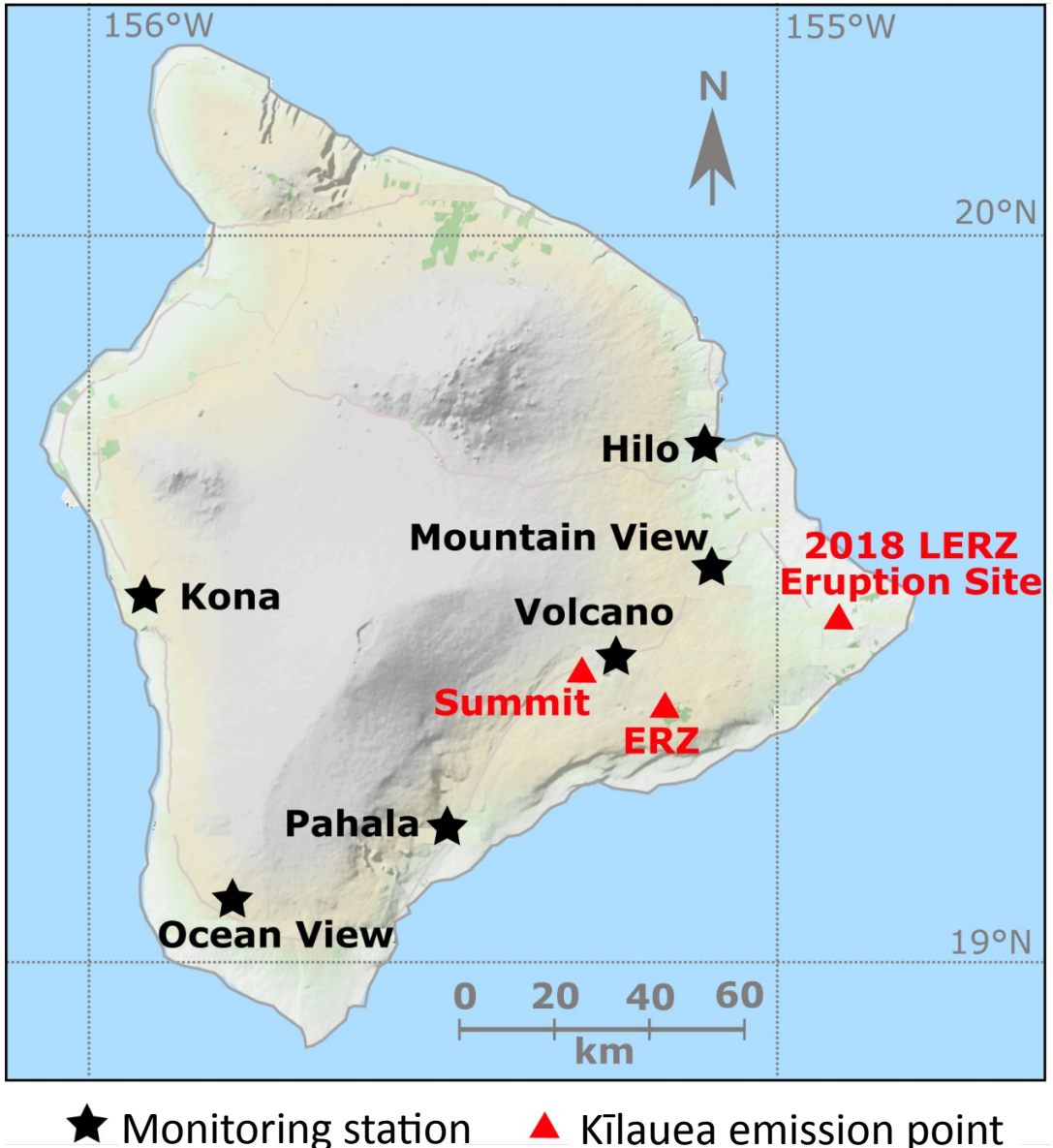
$PM_{2.5}$ (particles <2.5µm diameter)





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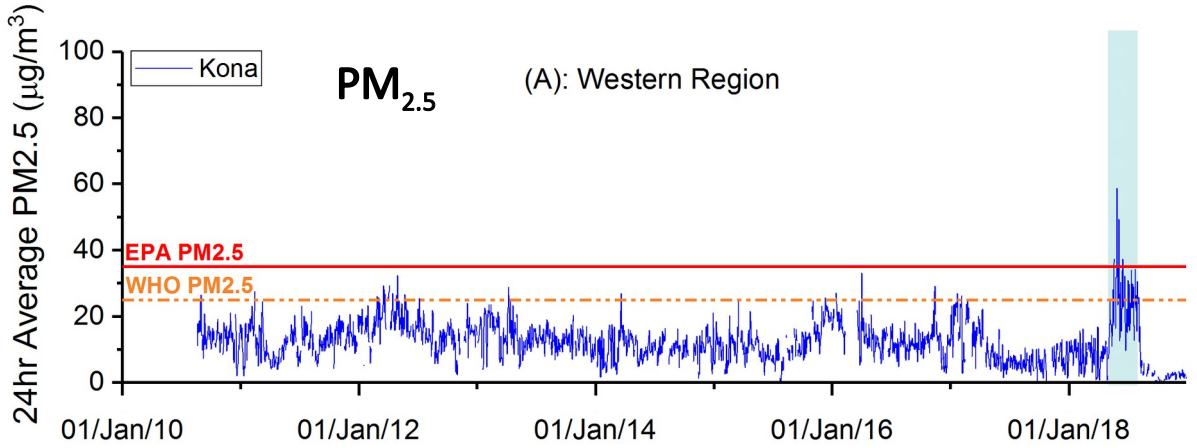
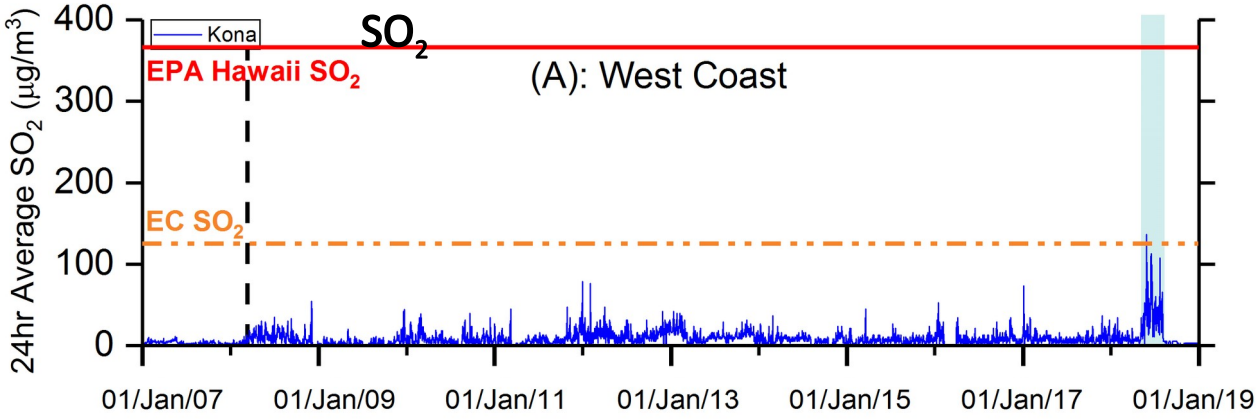
Estimation of Gas to Aerosol Conversion Rate

$$\ln\left(\frac{S_{gas}}{S_{total}}\right) = -kt$$

where:

- S_{gas} is the sulfur component of volcanic SO_2 gas
- S_{total} is the sum of sulfur components of volcanic SO_4^{2-} ($PM_{2.5}$) and SO_2 gas
- t is the age of the volcanic plume
- $-k$ is a first-order decay constant





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First-order decay constant (-k) considering only relative amounts of SO_2 gas and SO_4^{2-} aerosol, not considering:

- Dispersion and dilution of the plume
- Deposition of SO_2 and SO_4^{2-}

$-k = 3.8 \times 10^{-6}\ s^{-1}$

Similar to maximum SO_2 oxidation rate calculated by Kroll et al (2015) of $2.4 \times 10^{-6}\ s^{-1}$

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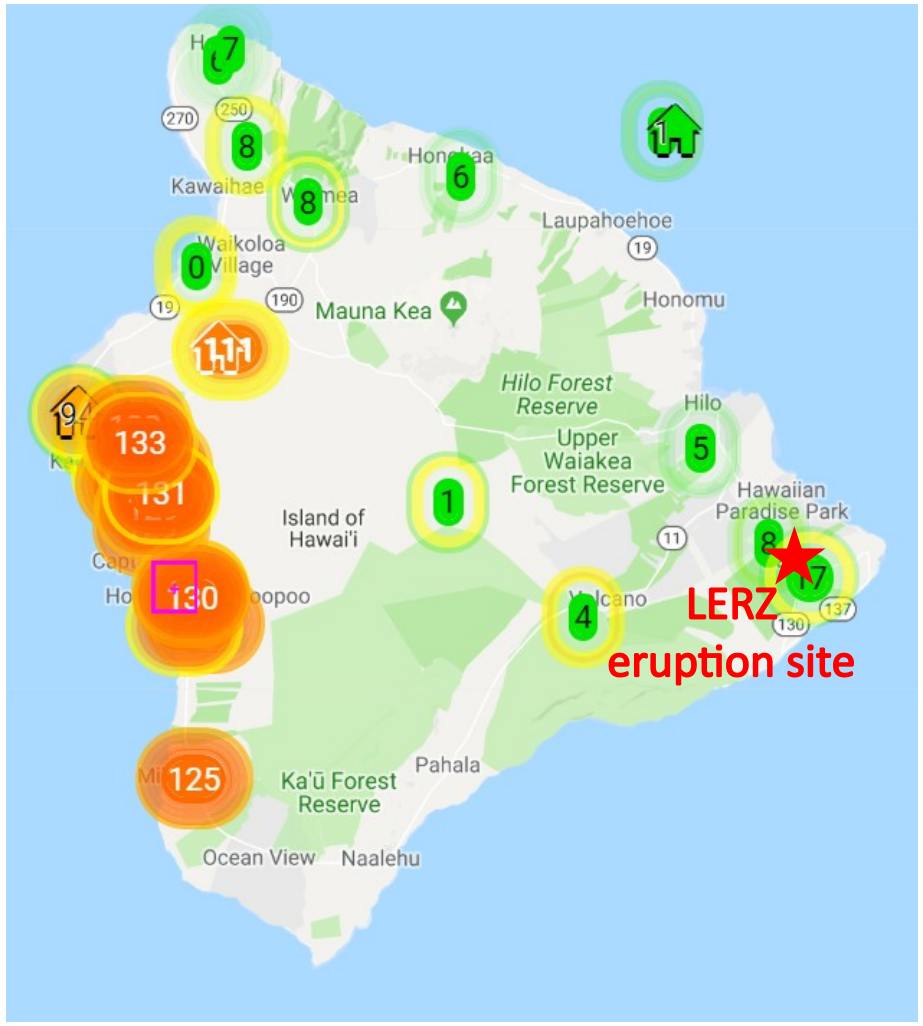
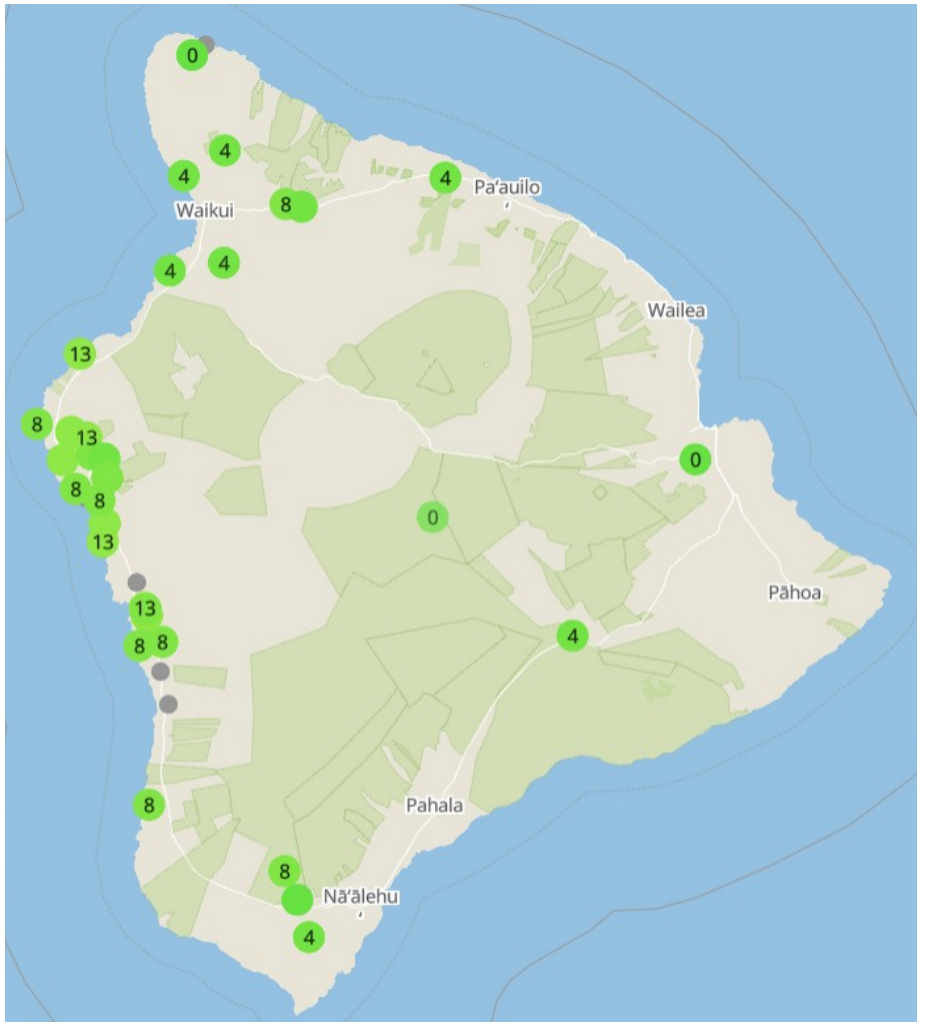
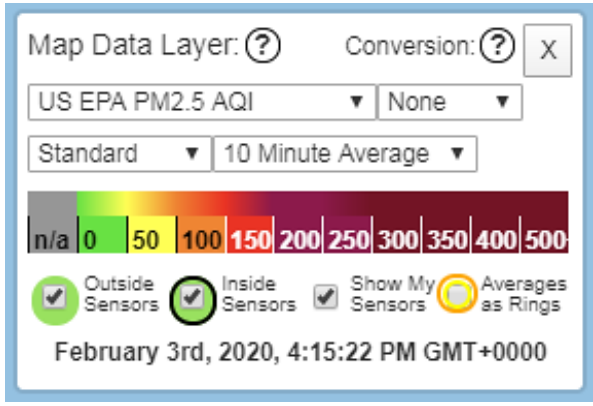
July 2018; During LERZ eruption



October 2018; 2 months after eruption ended



www.purpleair.com



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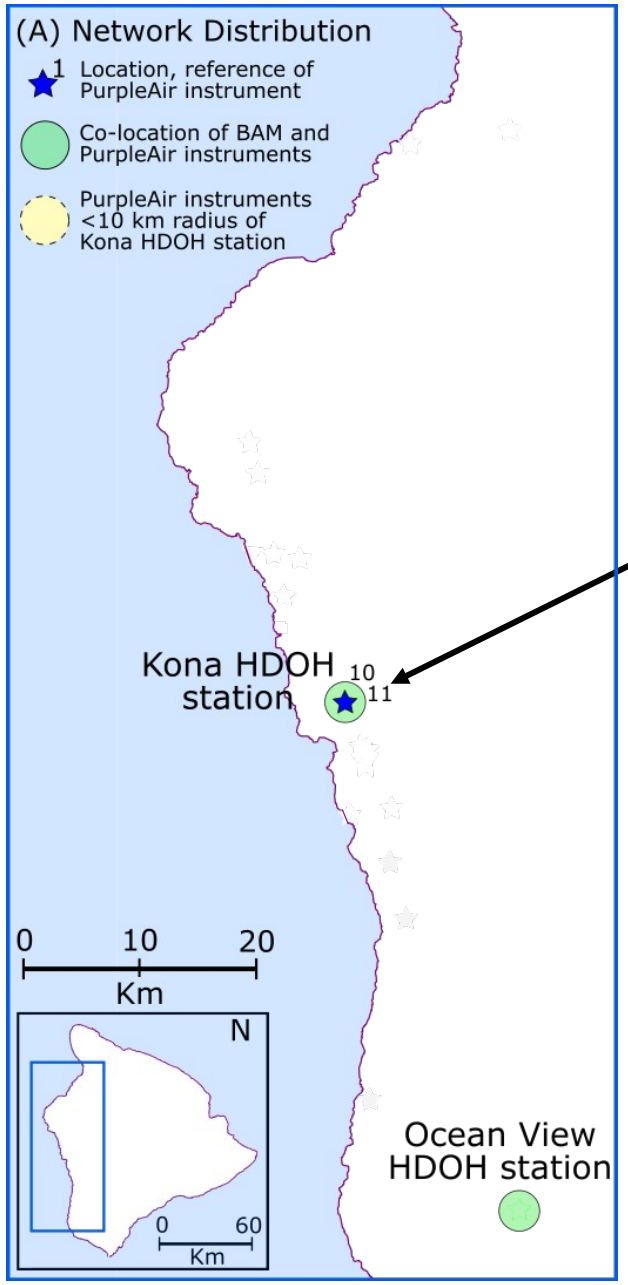
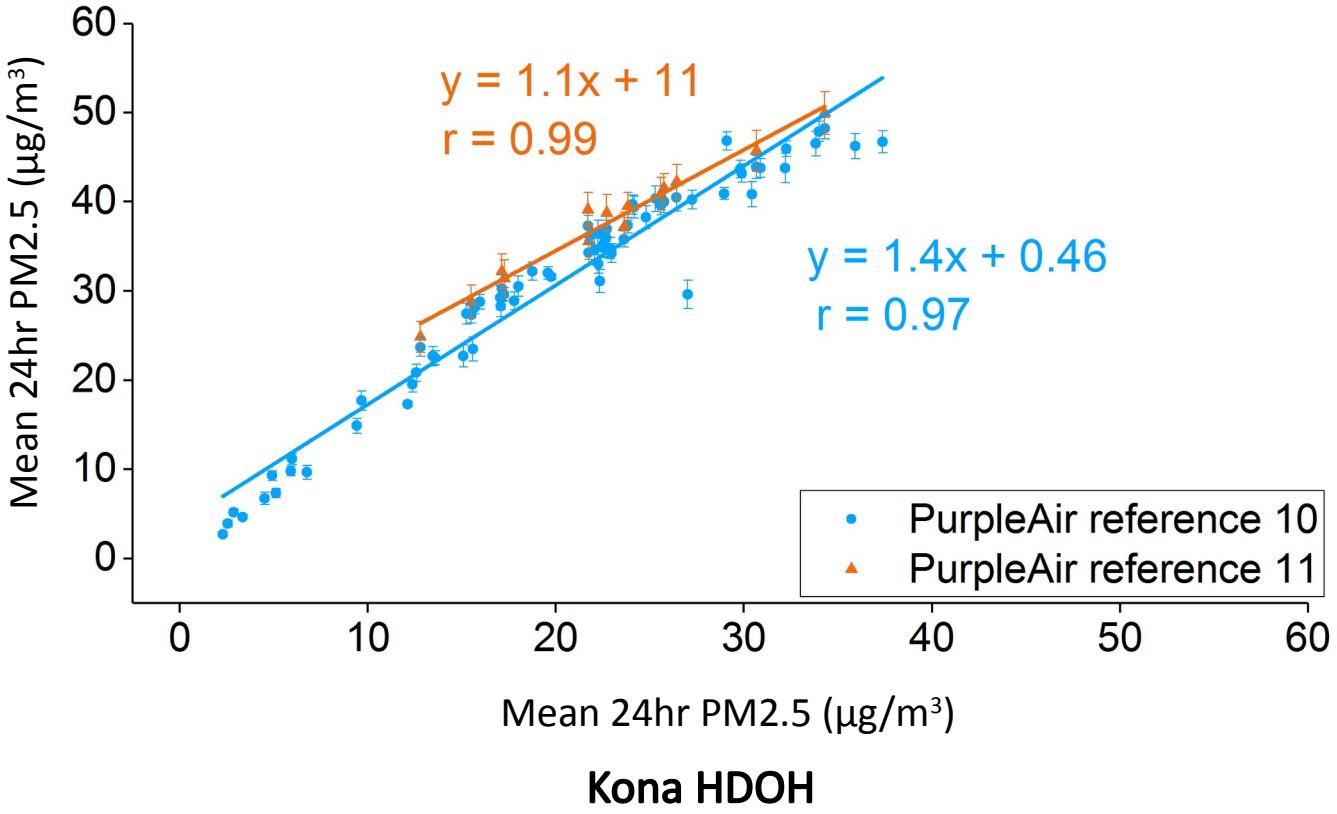


Kona PurpleAirs



Kona HDOH

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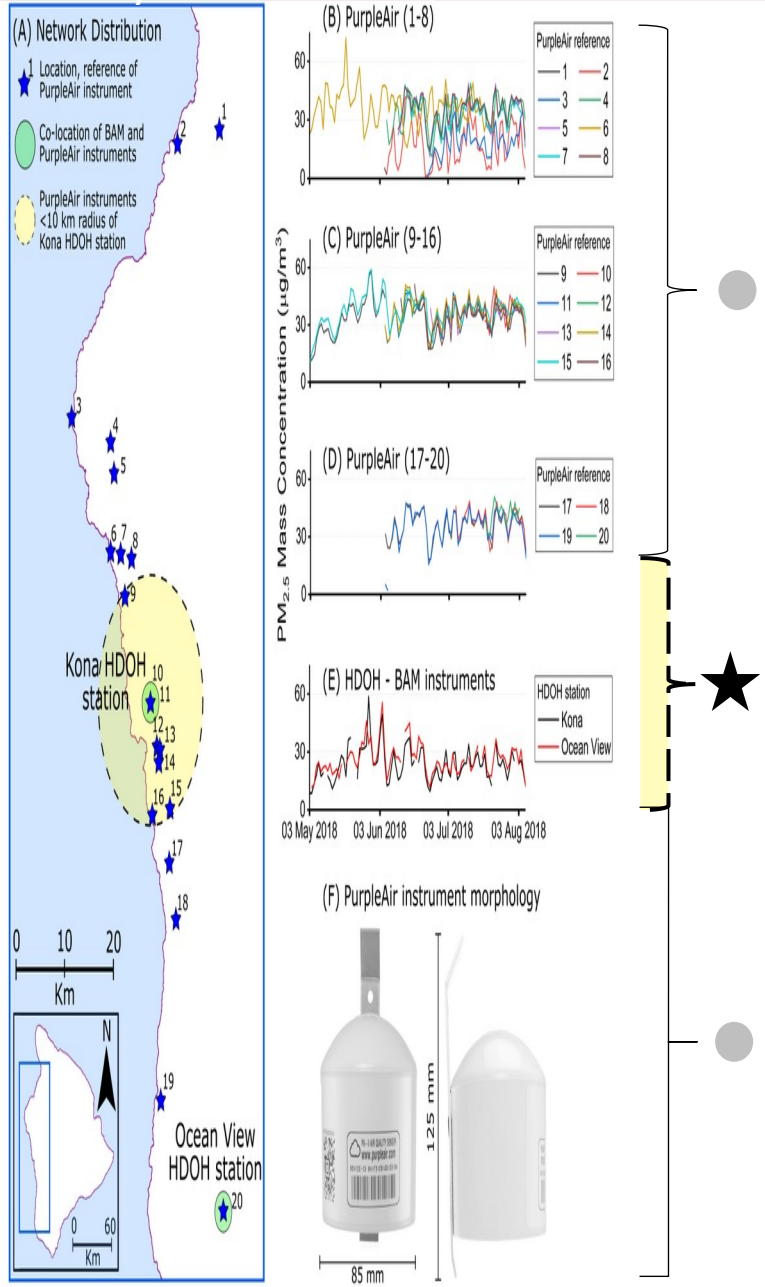

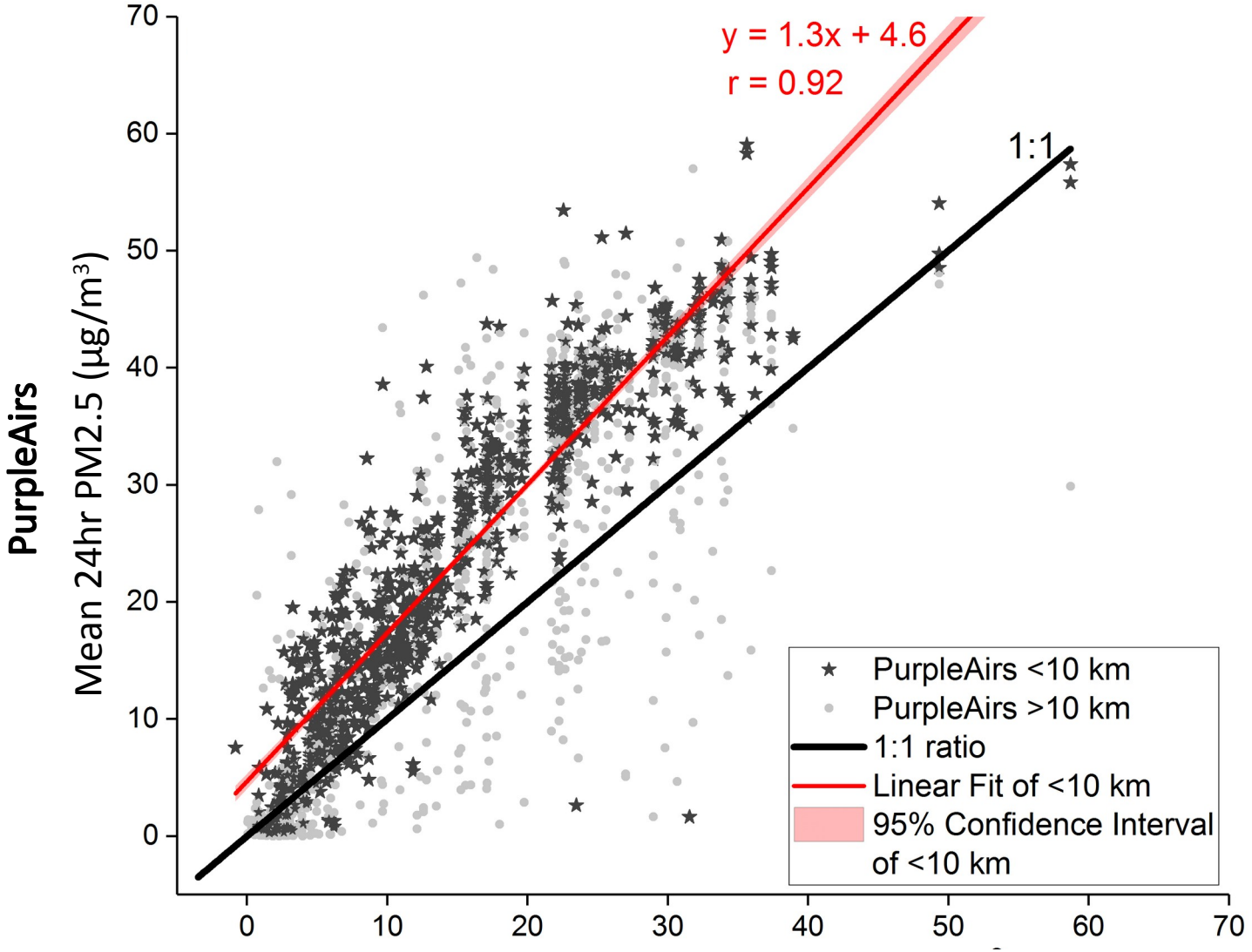

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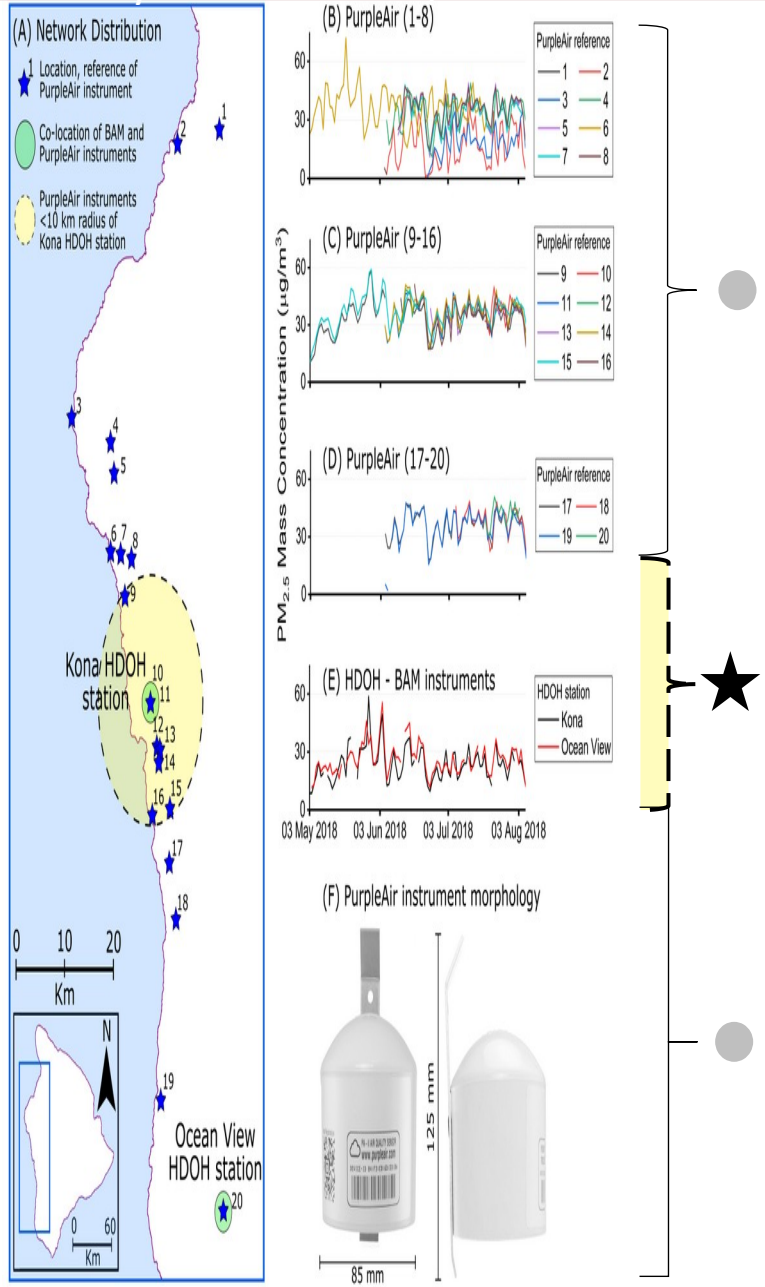

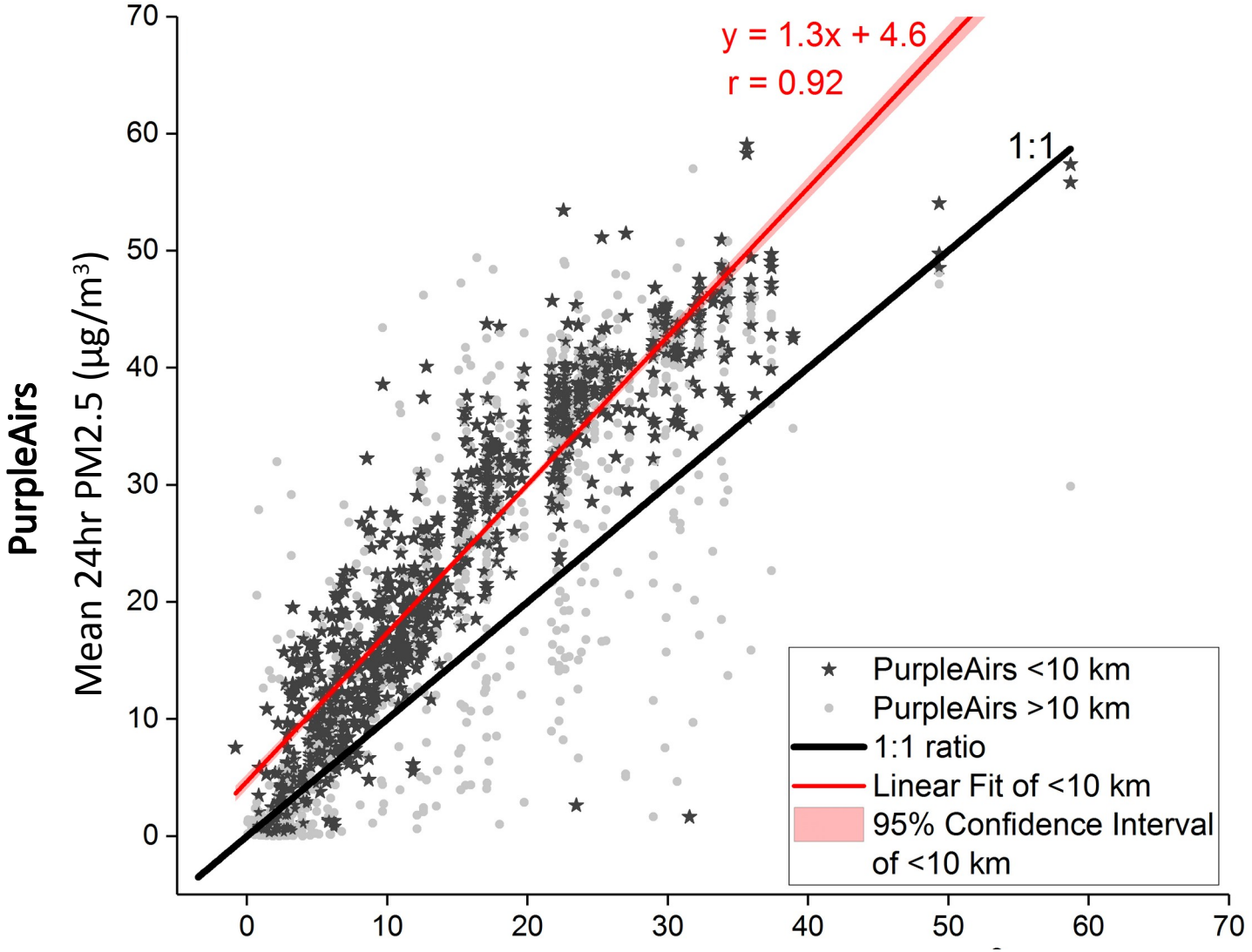

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