EGUsphere, author comment AC1
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Reply on CC1

Carolina M. L. Camargo et al.

Author comment on "Regionalizing the sea-level budget with machine learning techniques" by Carolina M. L. Camargo et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-876-AC1, 2022

Dear Paul Pukite,

Thank you for your comment.

The line highlighted in your comment is about the propagation of ENSO signal through the Pacific, possibly by coastally trapped waves (Lines 207-208). The role of coastal and equatorial Kelvin waves and Rossby waves in propagating sea-level signals has been demonstrated in several studies (e.g., Hsieh & Bryan, 1996; Federov and Brown, 2009; Hughes et al., 2019). An example visualization of Rossby waves in sea-level anomalies records can be found in Figure 4 of Chelton et al. (1996). The comment, however, does not question the propagation of ENSO signal, but the impact of ENSO on sea-level change.

ENSO events are characterized by a larger warming (in case of El Niño) or cooling (La Niña) in the Central Pacific. These variations in ocean heat content have a direct effect on sea surface height due to thermosteric effects (Wang & Picaut, 2004; Domingues et al., 2008). The influence of ENSO on sea level is not only clearly visible on regional steric sea-level maps (e.g., Figure 8 of Camargo et al. (2020)), but also on global mean sea-level curves (e.g., Figure 1 of Boening et al. (2012)). Therefore, the ENSO signal does not appear in sea level only via the inverse barometer effect.

Kind regards,

Carolina Camargo, on behalf of the authors

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