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TITLE: Exploring the relation between sea level rise and shoreline erosion using sea level reconstructions: an example in French Polynesia

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ABSTRACT:

Le Cozannet, G., Garcin, M., Petitjean, L., Cazenave, A., Becker, M., Meyssignac, B., Walker, P., Devilliers, C., Le Brun, O., , Lecacheux, S., Baills, A., Bulteau, T. Yates, M., and Wöppelmann, G., 2013. Exploring the relation between sea level rise and shoreline erosion using sea level reconstructions: an example in French Polynesia. The climate component of sea level variation displays significant spatial variability, and it is now possible to reconstruct how sea level varied globally and regionally over the past half century. The fact that sea level rose faster than the global mean since 1950 in the central Pacific stimulated a study of decadal shoreline changes in this region. Here, the study of Yates et al. (2013) was extended to two additional atolls (17 islets): Tetiaroa and Tupai in the Society islands. Both atolls remain stable on the whole from 1955 to 2001/02, however with significant differences in shoreline changes among their islets and within the period. A modeling of waves generated by historical cyclonic events in French Polynesia since 1970 reveals consistency between major shoreline changes and cyclonic and seasonal waves. As in previous studies, this suggests that waves' actions are a dominant cause of shoreline dynamics on relatively undeveloped atolls, even if affected by higher sea level rise rates. In such regions, numerous joint analyses of shoreline changes and their potential causes may help to explain the relation between erosion and sea level rise.

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