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# Assessment of morphodynamic evolution and changes in a mangrove wetland under current and future climate change scenarios

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Pacific Islands are one of the regions in the world most vulnerable to climate change, mainly due to sea level rise (SLR) and tropical cyclones (TC). Coastal wetlands play a crucial role as a buffer between the ocean and the inland areas. Recent research has shown that accretion and adaptation capacity to SLR of coastal wetlands is intrinsically related to the sediment supply from the upstream catchments and the tidal regime, which is also affected by the hydrodynamic and the vegetation of the system. Modelling the feedback among these systems and their evolution is still challenging.

In this work, we present the case of a coastal wetland at the mouth of Dreketi River catchment, located in Vanua Levu, Fiji. This area belongs to the Great Sea Reef, and it was declared as Ramsar site in 2018. The framework proposed includes the modelling of hydro-sedimentological behaviour of the upstream catchment and its validation using remotely sensed images; and the hydrodynamic-sediment transport model of the tides. These outputs are linked with an ecogeomorphological model (EGM) of the mangrove wetlands used to predict wetland evolution. We have evaluated the catchment response under current scenarios assessing the impact of TC in the last 45 years; and under future scenarios of land use, TC and SLR. We have analysed the same scenarios on the tidal system to then run the EGM incorporating the changes in sediment supply from both the catchments and the tides due to SLR and TC projected by the end of the century. Our approach combining modelling and remote sensing can be extended to other coastal areas in the region and has enormous potential to assess the evolution of wetlands under climate change throughout the Pacific islands.