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Impacts of climate change in Pacific Islands catchments: sediment contribution due to tropical cyclones and depressions

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Pacific Islands Countries are among the most vulnerable to climate change impacts, mainly due to the effects of sea-level rise and tropical cyclones. The Republic of Fiji has an extended history of flooding linked to tropical cyclones and depressions, and those floods export a considerable amount of sediment to coastal wetlands. Because long-term measurements of sediments are not available in most cases, hydro-sedimentological models became a valuable tool to quantify and predict the impacts on critical natural resources.

This contribution presents a hydro-sedimentological model for the Dreketi catchment, which has been calibrated based on ground and satellite information for current conditions. The model is used to set up four scenarios based on climate change projections and considering changes in vegetation cover due to changes in land use. We analysed the sediment export from the catchment and the changes in the storage of sediment within the catchment.

On average, we observed that the daily sediment export increases up to 5% in a warmer world. The contribution of tropical cyclones and depressions to the annual sediment budget rises by a similar amount. The wet or cyclone season (Nov – April) presents a higher increasing trend on sediment export than the dry season (May-Oct).