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TITLE: Lagoon islets as indicators of recent environmental changes in the South Pacific ? The New Caledonian example

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ABSTRACT:

The question of the impacts of climate change and sea level rise on small islands is currently much discussed. The many thousands of Pacific islands in their different contexts (geodynamic, climatic, etc.) and the insufficient data available explain why it is difficult to clearly discern the specific role of climate change in the recent evolution of these islands. To address this question, we investigated the recent changes affecting 21 islets in New Caledonia's lagoon. These islets are either located on small patch-reefs inside the New Caledonia Island lagoon or lie directly on the barrier reef. Based on the studies we conducted (field surveys, reconstruction of changes in the islets over the last decades, shoreline changes) we were able to define a typology of the islets that includes 6 stages and a life expectancy index. Using the life expectancy index, we found that of the 21 islets studied, 19% are in a highly critical situation, meaning they are very likely to be endangered in the short term (within the next few years), 9.5% are in a critical situation, i.e., likely to disappear in the near future and very likely to disappear in the medium term (next few decades), 19% are evolving rapidly, which could lead to their disappearance in the medium term but not in the short term, 9.5% are not endangered in the short and medium term and 43% are not endangered at all (stable or accreting, large area, relatively higher altitude). In this context, the rise in sea level induced by climate change is an adverse factor which is likely to lower the resilience of the islets to erosion processes. Other factors like the degradation of the reef ecosystem due to variations in ocean salinity, temperature and acidity, lower sediment stocks on the beaches and foreshores, human visitors, coastal development and so on are other adverse factors that could modify the capacity for resilience of these islets. Due to their variety and sensitivity, New Caledonia's islets could thus serve as integrative indicators of environmental and climatic change for New Caledonia.

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