# CLIMATE CHANGE RISK TO MARITIME BOUNDARIES: A TAILORED METHODOLOGY FOR THE BLUE PACIFIC

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## INTRODUCTION

Climate change and sea-level rise threatens the wellbeing and security of the peoples of the Pacific, as it poses a major challenge to ocean jurisdictions and rights over critical resources for large ocean Pacific Islands Countries (PICs).

The United Nations Convention on the Law of the Sea (UNCLOS), considered as the constitution for the ocean, is the international agreement that establishes a relationship between land and sea by defining types of natural features and the maritime zones they can generate. Many of these features often consist of low elevation islands, sand cays, and their associated reef systems, as in the case of PICs. The continuity of these features might be at risk from coastal submergence and other coastal impacts driven by relative sea level rise, extreme events or ocean warming and acidification. Since maritime zones are generated from these land features, losses of or changes to them may ultimately deflate Exclusive Economic Zones (EEZ).

Noting PICs have planned their development in reliance on the rights guaranteed in the Convention, the Pacific Island Forum (PIF) Leaders declared their intention to maintain maritime zones established in accordance with the Convention notwithstanding the impacts of climate-change in 2021.

Increasing concerns on challenges posed by climate change to maritime boundaries in the Pacific, and the need for decision-ready products motivated the development of a methodology of climate change risk assessment tailored for the Blue Pacific.

## OBJECTIVE

The aim of this work is to develop a methodology to address the implications of climate change on maritime zones considering technical, scientific, and legal aspects.

## METHODOLOGY

The methodology consists of a climate change risk assessment to the maritime features used to generate maritime zones by the states under analysis. The aim of this assessment is to identify and prioritise features with the highest risk of destabilising maritime zones, to conduct in-depth analysis, and to recommend adaptation options. This approach has the advantage of optimising the detection of these risk features at a national/regional level, and subsequently prioritising resources and capacities to carry out a high-resolution analysis that allows for adaptive actions.

The risk assessment follows the IPCC risk framework in which risks result from dynamic interactions between climate-related hazards with the exposure and vulnerability of the affected systems. Future risk is addressed by introducing changes in the hazard component, while adaptation measures, including the legal and political context such as the 2021 PIF Leaders' Declaration on Preserving Maritime Zones can be introduced as a reduction of risk. The impacts of climate change considered to threaten the stability and continuity of the features are coastal submergence due to relative sea level rise, erosion, and coastal flooding due to the compound effect of long-distant swell, extreme sea levels or tropical cyclones. In addition, the degradation of coral reefs due to ocean warming and acidification is considered to have a cascading effect enhancing those impacts. The area of maritime zone established around each feature, as well as the critical resources found therein fit into the exposed assets. The vulnerability dimension is informed by thresholds of physical change linked to the relevant provisions in the Convention. Information about the type of baselines drawn around features and the existence of treaties and their status are also considered in the analysis. The integration of the three elements provides the risk profile under climate change scenarios, based on consequences that can be measured in terms of discrepancy between the maritime zones as established and future scenarios as well as the associated marine resources present in them.

The application of the methodology at the national/regional level is based on aggregated data and uses impact indicators from simplified models. This allows it to be applied to a wide range of features. Conversely, the in-depth assessment requires high-resolution data and uses process-based models to inform risk contributors while trying to constrain the cascading uncertainty of climate change scenarios, global circulation models, and impact model data. The in-depth analysis allows for tailored adaptation measures, including the development of legal options and management strategies.

The methodology proposed is applied to the Blue Pacific under the Resilient Boundaries for the Blue Pacific (RBBP) project to assist and provide information to 14 PICs about the implications of climate change in the context of their maritime boundaries. The methodology is applicable to small island nations worldwide and can be generalised for application in other coastal states.

## ACKNODWLEDGEMENTS

The authors acknowledge the financial support of the Department of Foreign Affairs and Trade (DFAT) of Australia.