THEME **Coastal and Marine**

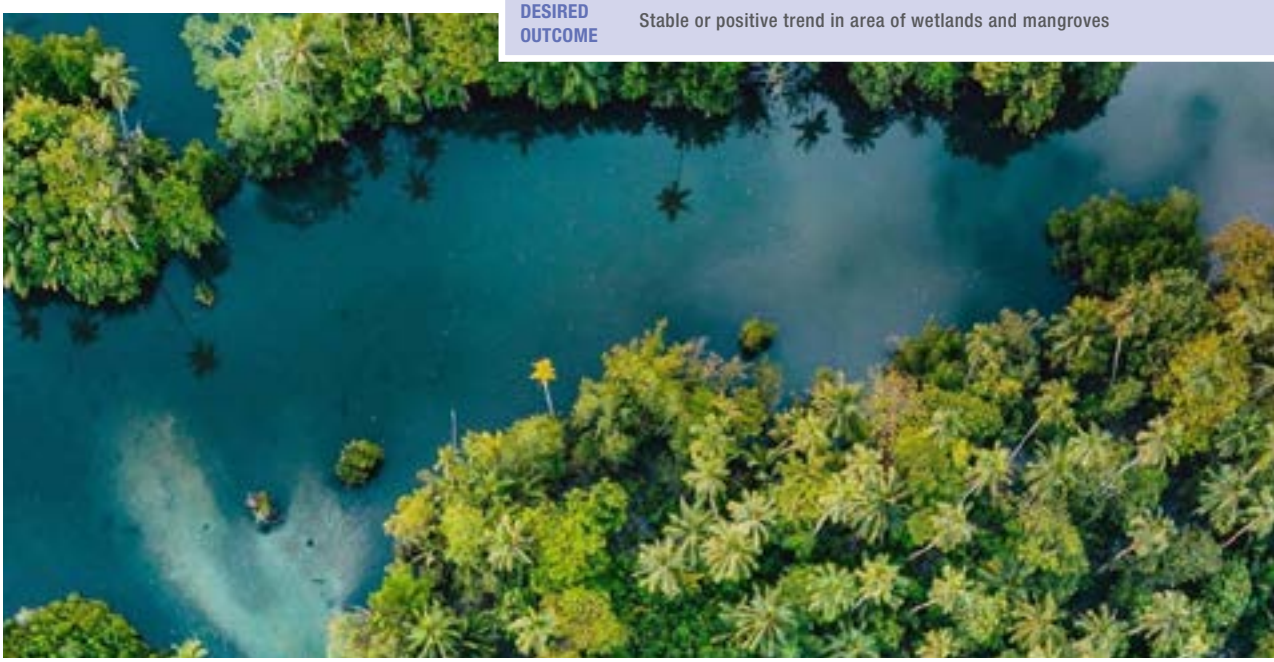
INDICATOR **Wetlands**

DEFINITION	% cover of wetlands, mangroves, and seagrass
PURPOSE	Wetlands, mangroves and seagrass provide ecosystem services not provided by other ecosystems (such as nurseries for economically important fish species, natural flood mitigation and water filter systems). They also support plants and animals not found in other ecosystems.
DESIRED OUTCOME	Stable or positive trend in area of wetlands and mangroves

Status
Fair

Trend
Deteriorating

Data confidence
Low



Mangroves, Samoa.
© David Unoi

PRESENT STATUS

The Pacific island region has diverse wetlands, such as the classic coastal ecosystems of mangrove forests, salt marshes, coral reefs, and seagrass beds along with rivers, freshwater lakes, and swamps (SPREP 2016). However, these wetlands are understudied. Land-use change and environmental change can alter the areal extent and condition of wetlands, and the pace of these changes vary among Pacific islands.

The amount of the region's wetland cover was deemed fair relative to an island baseline with intact forests and watersheds. Wetland records across the region are patchy, leading to a low data confidence ranking. With significant threats, especially from land-use change and climate change, the overall trend in the extent of wetland coverage is considered to be deteriorating.

Ten sites in six Pacific island countries are listed as Ramsar Convention on Wetlands sites, meeting nine criteria for identifying Wetlands of International Importance. These six countries are Fiji, Kiribati, Marshall Islands, Palau, Papua New Guinea, and Samoa.

Mangroves and coral reefs are arguably the Pacific wetlands with the most data and monitoring. For more about Pacific reefs, see Regional Indicator: Live coral cover. Mangrove areas were mapped in part under the MACBIO - Marine and Coastal Biodiversity Management in Pacific Island Countries and the Mangrove Ecosystems for Climate Change Adaptation & Livelihoods (MESCAL) projects, with national reports available via the Global Mangrove Alliance.[1]

The tropical Pacific contains 25% of the world's coral reefs and 3% of the world's mangroves (Gilman et al. 2006).

[1] http://www.mangrovealliance.org/, with the Global Mangrove Data Portal at https://gma-panda.opendata.arcgis.com/

CRITICAL CONNECTIONS

Wetlands support many Pacific communities and countless cultural traditions. Nearshore wetlands are uniquely important for Pacific women, who harvest food and use wetland resources for art, such as dyed barkcloth (tapa).

Wetlands provide a broad range of ecosystem services, across the full spectrum of supporting, provisioning, regulating, and cultural services. The difficulty in quantifying all wetland ecosystem services in economic terms should not stop us from protecting those services and acknowledging their value. The impacts of Pacific wetlands on our societies, identity, and wellbeing are valid, with socioeconomic flow-on effects.

Healthy wetlands are valuable and save money that would otherwise be lost to storm and flood damages. Upland wetlands can help prevent erosion and spread of pollution, protecting sensitive downstream wetlands. Connected by water, wetlands manifest the availability and quality of freshwater and links to coastal nearshore systems.

Wetlands that are protected from local stressors are considered more resilient to chronic impacts of climate change. Healthy, connected local ecosystems can support climate resilience: for example, healthy wetlands can buffer pH changes and temperature extremes as well as contribute to lower erosion and better water quality during storm events.

Given the economic, cultural, and livelihood reliance on wetlands and the economic drivers of wetland degradation, efforts to conserve and restore wetlands must begin with addressing the needs and values of Pacific communities.

HOW MUCH OF OUR WETLANDS ARE PROTECTED?

There is no coherent, single dataset for a comprehensive regional assessment of Pacific wetland coverage. Existing mapping attempts have been uncoordinated and haphazard (or driven by opportunity).

For this report, SPREP conducted a spatial analysis comparing wetland coverage and protected area coverage across the Pacific islands region (Table 7.1).

At the time of writing (July 2020), the most comprehensive coverage of corals, seagrasses, and mangroves for the Pacific islands region is provided in the global distribution maps managed by the UN Environment World Conservation Monitoring Centre (UNEP-WCMC):

1. Coral reefs (2018 v4): http://data.unep-wcmc.org/datasets/1 *The data are a compilation from multiple sources including the Millennium Coral Reef Mapping Project, IMaRS-USF and IRD (2005), IMaRS-USF (2005), and Spalding et al. (2001).
2. Mangroves (2010 v3): https://data.unep-wcmc.org/datasets/5 *A collaborative project of the International Tropical Timber Organization, International Society for Mangrove Ecosystems, Food and Agriculture Organization of the United Nations, UNEP-WCMC, United Nations Educational, Scientific and Cultural Organization's Man and the Biosphere Programme, United Nations University Institute for Water, Environment and Health, and The Nature Conservancy.
3. Seagrasses (2018 v6): https://data.unep-wcmc.org/datasets/7 *The sixth update to the data layer used by Green and Short (2003).

These spatial datasets were used because these datasets are both (1) available at a regional scale and (2) updated on a regular basis, which allows for monitoring over time. That said, the existing global and regional datasets have limitations regarding accuracy, completeness, scale, boundaries, and other factors, particularly in the rapidly changing Pacific region. National datasets are more accurate but, in most cases, not publicly available for this type of regional analysis. To increase the accuracy of monitoring, it will be important to share national datasets on wetlands, including mangroves, corals, and seagrass.

TABLE 7.1: Share of Pacific island wetlands in existing designated protected areas in 2020. Source: SPREP, UNEP-WCMC, and WDPA

WETLAND TYPE	SHARE OF WETLAND IN DESIGNATED PROTECTED AREAS (%)	DATA CONFIDENCE
Coral reefs	31%	Medium
Mangroves	12%	Medium
Seagrass	17%	Low

Note: The seagrass map was based on suitable habitat zones, not confirmed presence of seagrass. The spatial map of protected areas is based on the 2020 World Database of Protected Areas and does not include the newly designated marine protected area in Niue (2020).

The Allen Coral Atlas team is currently working on a more detailed dataset for coral reefs and seagrasses, with a target of providing data for the whole region in 2021.

The level of protection afforded by existing formal protected areas varies across the Pacific islands region. Enforcement, monitoring, and adaptive management to conserve and restore protected ecosystems remain as priority areas of action (see Regional Indicators: Protected Areas).

PRESSURES AND OPPORTUNITIES

Wetlands are essential to humans and nature. About 40% of the world's known species are associated with wetlands (Ramsar 2018). One-fifth of the world's largest fisheries depend on seagrass, and 10% of the organic carbon sequestered in the ocean is buried in seagrass beds (Unsworth et al. 2019, Fourqurean et al. 2012). Coral reefs are the marine ecosystem most threatened by climate-related ocean change, especially ocean warming and acidification (IPCC 2019).

Pacific wetlands are particularly important for local fisheries, cultural uses, and carbon cycling. Wetlands support many iconic Pacific species. Coral reefs are themselves a major tourism draw in addition to stabilising island shorelines and supporting fisheries.

Wetlands regulate the local and global climate. Like many natural ecosystems, wetlands both suffer and buffer the effects of climate change. Carbon storage in wetlands, such as mangrove forests and seagrass beds, can rival or exceed the carbon storage of non-wetland forests (Ramsar 2018). The destruction of wetlands can release greenhouse gasses. Quantification and valuation of wetland and 'blue' carbon storage is in early stages in the Pacific; for one example, USD 1.3 million worth of carbon was estimated to be stored in the mangroves of the Solomon Islands, calculated as part of the MACBIO project.

The pace of wetland loss is extreme. Around the world, wetlands are being destroyed three times faster than forests (Ramsar 2018). As one example, seagrass beds are essential to species like turtles and dugongs but about 7% of the global seagrass beds is disappearing each year (UNEP 2020).

In the context of the strong dependence of wetlands on local conditions and local management decisions, regional partnerships are also important to address the transboundary threats to wetlands of ocean warming, ocean acidification, and pollution. Freshwater wetlands are subject to rapid changes during extreme weather events.

With Pacific population increases and the demand for altered land-use, potentially with more hard-scaping, most pressures on wetlands are likely to rise. Policy visions and listed protections are underway, including spatial protection, but defining protected areas does not necessarily protect wetlands from direct threats and does not protect them from transboundary hazards. For more about spatial protection of Pacific ecoregions, including wetlands, see Regional Indicators: Protected Areas.

Pacific capacity for wetland measurement, monitoring, and management has been addressed in multiple, but uncoordinated projects. There are significant logistical challenges to mapping wetland coverage, at least ground-truthing remotely sensed measurements.

Afulilo, Samoa. © Charles Netzler

REGIONAL RESPONSE RECOMMENDATIONS

Because wetland health is closely linked with human health and water quality, global climate, and physical disturbance, the required actions for managing healthy wetlands must extend from global to local levels. Diverse, healthy Pacific wetlands require joint action within an integrated management structure to effectively address the findings of the scientific community and the expertise of Pacific people.

Coherent management plans from land to sea will be essential for Pacific wetland health. The use of a watershed as a management unit has specific benefits for wetland management.

At the regional level, countries can commit to:

- Measure wetland area over repeated time increments;
- Control pollution and human-derived physical disturbance;
- Plan to protect wetlands for inclusive food security, shoreline protection, and social and cultural functions;
- Enforce protection, building partnerships among sectors with jurisdiction over the elements of wetland areas and resources, such as the fisheries and tourism sectors, as well as between land and marine managers; and
- Partner for protection and restoration of wetlands.

INDICATOR IN ACTION SDG 14.2, 14.5 · Ramsar Convention on Wetlands · SAMOA Pathway (Article 58e) · Noumea Convention · Regional Environment Objectives 2.1, 2.2 · Pacific Islands Framework for Nature Conservation Objective 4

FOR MORE INFORMATION

GCRMN (2018) *Status and Trends of Coral Reefs in the Pacific*. Global Coral Reef Monitoring Network

Gilman et al. (2006) Pacific island mangroves in a changing climate and rising sea. UNEP Regional Seas Reports and Studies No. 179.

IPCC (2019) *Special Report on the Ocean and Cryosphere in a Changing Climate*.

MACBIO project summaries: see http://macbio-pacific.info/

Ramsar (2018) Global wetland outlook. Ramsar Convention on Wetlands.

Spalding M, Kainuma M, Collins L (2010) World Atlas of Mangroves (version 3). A collaborative project of ITTO, ISME, FAO, UNEP-WCMC, UNESCO-MAB, UNU-INWEH and TNC. London (UK): Earthscan, London.

SPREP (2016) State of conservation in Oceania: regional report. Apia: Secretariat of the Pacific Environment Programme.

United Nations Environment Programme (2020) Out of the Blue: The value of seagrasses to the environment and to people. Nairobi: UNEP.

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UNEP-WCMC, Short FT (2018) Global distribution of seagrasses (version 6.0). Sixth update to the data layer used in Green and Short (2003). Cambridge (UK): UN Environment World Conservation Monitoring Centre.

SPREP PROE

The Secretariat of the Pacific Regional Environment Programme (SPREP) supports 14 countries and 7 territories in the Pacific to better manage the environment. SPREP member countries and members of the Pacific Roundtable on Nature Conservation (PIRT) have contributed valuable input to the production of this indicator.
www.sprep.org

National and regional environment datasets supporting the analysis above can be accessed through the Pacific Environment Portal.
pacific-data.sprep.org

For protected areas information, please see the Pacific Islands Protected Area Portal.
pipap.sprep.org