

Contribution of SPC (the Pacific Community) to the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, on the theme “Ocean Observation”

This contribution provides information on “ocean observation” in the Pacific Region, as a contribution from SPC. The contribution is in response to letter LOS/SGR/2021/1/IGO, and is structured as suggested to provide information on 3 themes. SPC is conducting ocean observations activities through its technical divisions, mainly FAME (Fisheries Aquaculture and Marine Ecosystems) and GEM (Geoscience, Energy and Maritime).

(i) Types of ocean observation tools and their existing and potential contributions to science-based decision-making, such as to ensure resilient fisheries and to improve understanding of the role of the ocean in climate, including blue carbon initiatives;

- SPC is maintaining and operating tide gauges in 13 Pacific Island countries in partnership with the Australian Bureau of Meteorology and Geoscience Australia, for long term relative sea level monitoring and early warning systems. Most of these stations are also equipped with GNSS (Global Navigation Satellite Systems) to monitor vertical land movements, which can play a major role in local sea level dynamics.
- SPC is routinely conducting temporary deployments of in-situ instruments for model calibration for early warning systems. Parameters measured include waves, currents and temperature.
- Over the last few years, SPC has been conducting surface waves measurements with wave buoys in partnership with National Meteorological and Hydrological Services, with the long term goal of helping countries and partners maintaining these systems operationally. These wave buoys provide real-time wave information that are critical for coastal inundation early warning systems.
- SPC has completed a study on wave climate which supports decision makers on potential locations for wave-power Marine Renewable Energy systems.
- SPC owns and operates shallow water and mid-ocean depth multibeam echosounder systems to collect bathymetric data that are a critical baseline for coastal and ocean modeling as well as modernizing navigational charts.
- Through its Pacific Tuna Tagging Program, SPC is monitoring tuna migration patterns and life cycle. Some of the tags used are also collecting water temperature data.
- SPC is a primary member of the Data Collection Committee (since 1995), which aim is to develop standardized tuna fishery collection forms to reduce the complexity of data collection, processing and analysis.
- SPC is curating public domain and confidential data on pelagic fisheries catches and biodiversity in the Western and Central Pacific Ocean.
- SPC is conducting regular scientific cruises to monitor and study the open ocean ecosystem. Examples of these cruises include the NECTALIS cruise series (<https://doi.org/10.18142/243>) and the WARMALIS cruises series (<https://doi.org/10.18142/250>).
- SPC curates and coordinates the Pacific Marine Specimen Bank, a biobank of pelagic organism for scientific research (since 2001).
- SPC is Integrating satellite remote sensing data into tuna ecosystem models.
- SPC has generated historical time-series of micronekton abundance estimates.

- Through its Coastal Fisheries Information database, SPC is collecting and curating public domain and confidential data on coastal fisheries, coastal field surveys or coral reefs and socio-economic surveys, in the different Pacific Islands Countries and Territories.

(ii) Challenges in ocean observation, including but not limited to filling gaps in observational data; integrating new technologies; collaborating with underrepresented communities and the private sector to maximize integration of observations to facilitate data sharing, data compatibility and interoperability; expanding capabilities to measure different variables and utilize resulting data; addressing environmental risks and attendant societal impacts; and relating to data storage, assimilation, full and open access and use;

- In the Pacific Region, one of the main challenge remains the capacity of small countries to conduct ocean observation. The challenge in capacity include human resources in-country (which was exacerbated by the COVID crisis), financial resources for instrumentation purchase and maintenance, and assets needed to deploy and recover instrumentation (boats, ships etc...).
- Near real-time data collection of fisheries or ocean data can be difficult in the Pacific because of limited connectivity/low bandwidth.
- The private sector in Pacific Islands is not yet a major actor in observations, although the Fiji Tourism industry has provided support for some operations by making available their boats for instrument deployments.
- The Fishing industry does also provide some data, especially in support of the Pacific Tuna Tagging Program, although it is often confidential and sensitive, which can limit its usage.
- Data sharing is essential for early warning systems and (tide gauges for tsunami warning for examples). There is currently good sharing of data for tide gauges and wave buoy.
- Fisheries data are often sensitive and the data needed to conduct regional stock assessments comes from all SPC members, so the SPC/FAME division has a policy on the governance of fisheries, aquaculture and marine ecosystems data provided to SPC by its members to ensure member confidence in data security and appropriate use.
- Data compatibility and interoperability is essential for efficient data sharing and exploitation of data between different provider.
- SPC supports Pacific Island Countries and Territories in their implementation of UNCLOS, specifically with regards to the mapping and delimitation of maritime zones and extended continental shelf areas using satellite technology and GIS (Geographic Information Systems). Defining maritime zones underpins the governance, peace and security, and natural resource management. SPC is currently heavily investing in further developing an open access operational earth observation system (Digital Earth Pacific) to help us understand the changes in our environment such as the impact sea-level rise has on our communities.

(iii) Opportunities to expand and strengthen the global ocean observation framework, including through cooperation, coordination and collaboration at all levels, such as among international organizations, as well as with under-represented communities, and the private sector, and through establishing partnerships and engaging with holders of traditional knowledge; leveraging parallels within and between the United Nations Decades of, respectively, Ocean Science for Sustainable Development and Ecosystem Restoration; expanding Biological Observing Networks and Marine Biodiversity Observations; innovation and making use of advanced technologies for low-cost, large-scale automated multidisciplinary observations; improving global ocean observation data sharing and processing infrastructure; and promoting best practices for addressing environmental challenges and risks.

- Ocean observation is coordinated at the global level through the Global Ocean Observing System (GOOS) under IOC/UNESCO. SPC is represented in the several GGOS committees. The GOOS Regional Alliance for the Pacific Islands (PI-GOOS) was coordinated by SPREP but is no longer active. In the Pacific Region, the Pacific Island Marine and Ocean Service (PIMOS) panel was created to improve coordination between Ocean observation activities and Meteorological Services in the region. PIMOS is a panel of the Pacific Meteorological Council, a subsidiary body of SPREP.
- SPC is increasingly collaborating with the Pacific Island Ocean Observing System PaCIOOS, which is a branch of the US GOOS Regional Alliance.
- SPC is actively engaging with the UN Decade of Ocean Science for Sustainable development. SPC is coordinating a regional endorsed program on Integrated Ocean Management, and will apply to become a regional Decade Collaboration Center.
- There is a growing awareness of the importance of traditional and local ocean knowledge in Pacific Island countries, and efforts are underway to include this knowledge into ocean management practices and consultations.
- SPC and other regional partners created a regional training center for ocean acidification monitoring in the Pacific. This center will help provide more data on Ocean acidification that will be shared with the global community, and that enable studies on the impacts of ocean acidification on the ocean ecosystem.
- SPC is developing the concept of smart Fish Aggregating Devices (FADs). Anchored FADs are routinely deployed throughout the Pacific by fisheries agencies, and SPC will assist partners for the addition of ocean sensors (waves, temperature, sonar ...) on these anchored FADs

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