



17th SPC Heads of Fisheries Meeting
24 April–2 May 2025 (Hobart, Tasmania)



Pacific
Community
Communauté
du Pacifique

Original: English

Paper reference	Working paper 8
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Summary

This Working paper provides HoF17 with:

- a summary of progress towards achieving the HoF13 endorsed “climate” work programme;
- highlights from key regional climate change projects.

Recommendations:

- members and partners are invited to note and review SPC FAME’s climate change activity report and provide any feedback.
- members are reminded that actions to support climate change awareness and development of adaptation options remains poorly resourced for coastal fisheries in comparison to those allocated to oceanic fisheries.
- members are reminded the NZD 25 million CSEPTA project is scheduled to complete its technical work in December 2025.

Highlights

Climate Awareness Workshop (CLAW)

1. The first Climate Awareness workshop was held in Wellington, New Zealand in February 2024 with 88 Pacific Island attendees. The workshop brought fisheries managers, science officers and climate expert together to increase knowledge across Pacific fisheries on the impacts of climate and climate change whilst strengthening regional networks on these issues.
2. The feedback was very positive with participants responding to post workshop surveys that the CLAW should be held annually with an increasing focus on issues and adaptations where they are able to exert greatest influence on management decisions.
3. The CLAW compliments existing SPC FAME regional workshops (Stock Assessment Workshop (SAW), Tuna Data Workshop (TDW), R-Assistance Workshop (RAW), WCPFC Pre-Assessment Workshop (PAW), Tuna Research & Applications Workshop (TRAW)), that combined, deliver strengthen member capacity in fisheries science and management.
4. CLAW, RAW and TRAW are initiatives of the New Zealand Government supported Climate Science for Ensuring Pacific Tuna Access (CSEPTA) project.

Scaling-up fisheries and ocean monitoring

5. Expanding regional fisheries and ocean monitoring is foundational to better understanding the impacts of climate change on WCPO tuna fisheries. This includes transitioning existing processes and protocols to include molecular based methods and adopting innovative approaches to fill critical data gaps.
6. Transitioning fisheries and ecosystem monitoring to include molecular methods (“omics”) enables more accurate assessment of fish abundances, environmental tolerances and a deeper understanding of population structures which are crucial to managing the increased uncertainties created by climate change.
7. CSEPTA trained 179 Pacific Islanders in 2023-2024 in molecular based sampling methods. This training resulted in the collection of 44,081 samples in 2024 which accounted for 80% of all samples contributed to the Pacific Marine Specimen Bank last year. This was a 1734% increase in the number of molecular samples collected in 2023.
8. The capacity for sampling should result in new information on the population structure of South Pacific albacore this year.
9. The importance of understanding the physical processes occurring in the ocean is well recognised by meteorologists, oceanographers, fisheries managers and scientists. Unfortunately, there is a global paucity of sub-surface data for oceanic environmental variables such as temperature, particularly in the Western and Central Pacific Ocean (WCPO) that underpin these important applications.
10. There have been, and continue to be, numerous attempts to address this universally recognised need, particularly in light of a changing ocean environment as a consequence of

climate change. In this endeavour, ocean observations of temperature, salinity, currents, sea level, wind speed, wave height and length, atmospheric pressure and other ocean conditions are currently collected via increasingly sophisticated sensors mounted on a growing array of mobile and fixed platforms, including autonomous underwater vehicles (AUVs), profiling and surface floats, drifting buoys, moorings, fish aggregating devices (FADs), drones, ships of opportunity (including fishing vessels) (SOOPs), marine animals and satellites.

11. The acquisition of in situ subsurface oceanic variable data has wide applications across a range of disciplines including weather and ocean forecasting, describing and mapping ocean processes and fisheries science and modelling. Cost-effective and sustainable data are needed to help improve our understanding of the role of the oceans in Earth's climate and so improve projections of how the ocean and the climate will change in the future.
12. Data collected during normal fishing operations are now used worldwide for a diversity of scientific, security and industrial applications. It includes applications to improve the understanding of climate-induced impacts on the marine ecosystem. This knowledge, which links fisheries and distribution of fish resources to ecosystem health and oceanographic conditions, improves our understanding of the environmental conditions that influence the distribution of fish populations
13. Ocean observations also have broader benefits. They are essential for forecasting and planning responses to the impacts of severe weather events like cyclones, marine heatwaves, local rises in sea level due to changes in ocean circulation, atmospheric pressure and drought - events that can have major adverse implications for communities and economies particularly those on small islands in the Pacific.
14. The CSEPTA initiative to establishment of a Fishing Vessel Observation Network in 2024 has resulted in a policy framework (developed with FFA) to facilitate fishing vessels to passively engage in monitoring of ocean conditions in the WCPO.
15. This framework has facilitated the commitment of National Fisheries Development Pty Ltd to commit their new purse-seine vessel build to utilise its acoustic instruments to continuously record tuna prey as part of the day to day operations of this vessel and provide these records to the Global Ocean Observing Systems (specifically the WCPO Pacific branches; PI-GOOS & IMOS).
16. It has also facilitated, in collaboration with the fishing industry, the trial of 50 autonomous water temperature profilers to be deployed across a variety of Pacific Island flagged tuna vessels. These sensors, attached to the fishing gear, profile the temperature of the water column on every set, and on gear retrieval transmit the data to an autonomous data recorder which then transmits the collected information back to the Australian Ocean Data Network for distribution to ocean and meteorological service providers.
17. This innovative approach to improving ocean monitoring has resulted in trial support by both CSEPTA and the New Zealand Government Funding with Intent programme.

Climate Intelligence System

18. The underlying model (SEAPODYM) for the Climate Intelligence System for Pacific Tuna has been continuously improved in readiness for the next set of climate change projections to be completed. This has included code improvement to include more information in the model optimisation phase to more accurately estimate the parameters that describe the population dynamics of each tuna species. New environmental forcings at 1 degree resolution for climate projection have also been prepared.
19. These two significant developments should allow for an initial set of new climate projections to be completed before the end of the 2025.
20. This work is supported by both CSEPTA and the Global Environment Facility “Common Oceans Project” administered by the FAO.

Climate indicators

21. Work to establish climate indicators for WCPFC is nearing completion. These are currently split into two categories: those that describe the environmental features of the WCPO; and those that have direct relevance to tuna fisheries. The latter provide an additional benefit of estimating the distribution of bycatch species which can be incorporated into the Climate Intelligence System to project future changes in distribution of bycatch species.

Expanding research capacity

22. Post graduate programmes in climate science have been supported by both CSEPTA and the Pacific European Union Marine Partnership (PEUMP). These include:
 - a. Categorising and modelling Marine Heatwaves in the Pacific Ocean (PhD)
 - b. Improving modelling of lower and mid trophic level processes (PhD)
 - c. Establishing protocols for using tuna stomach sampling to detect climate impacts (PhD)
 - d. Developing biochronology methods to establish environmental histories of Pacific fish populations (PhD)
 - e. Establishing baselines for measuring change in reproductive biology (PhD), and
 - f. Reproductive biology baselines for yellowfin tuna (MSc).
23. Item (d) has recently been completed with (a), (c), and (e) expected to complete in 2025. Items (b) and (c) are expected to complete in 2026.

Establishing long-term collaborations

24. Long-term collaborations have been strengthened including those with CSIRO, NIWA, University of Otago, ANU, University of New South Wales, University of Adelaide, University of Melbourne, University of Canberra, IRD, Mercator Oceans, NOAA, Cornell University, Fisheries Research Institute and FAO and IATTC.

Climate finance

25. The 41st Meeting of the Board of the Green Climate Fund (GCF), in February 2025, approved the Funding Proposal for the Regional Tune Programme (RTP) for 14 Pacific Island countries. It is supported by a total budget of USD 156.8 million with the GCF providing USD 107.4 million as a grant. The balance is co-financing.
26. HoF17 is advised that the technical work of the CSEPTA project will finish December 2025.

Progress towards 2021 plan

27. The Annex of this working paper summarises the progress towards achieving the identified work areas in the SPC FAME Climate Work Programme.

Annex 1. Progress reporting – SPC FAME’s Climate Work Programme

Theme: Knowledge Generation		Theme: Generation of Regional and National Capability		Theme: Solutions	
KRA	Progress	KRA	Progress	KRA	Progress
Fishery Vulnerability		Information Systems		Responsive Monitoring Systems	
Species Vulnerabilities		Attachments		Indicators	
Range Shifts		Post Graduate Qualification		MSE Compatible products	
Marine Heatwave Impacts		Short course curriculum		Economic Forecasts	
Adaptive Capacity		Partnerships		Decision ready products	
Data Systems		Secondment, Visiting Fellows, Resident Thinkers		Small-scale tuna fisheries	
Stock Dynamics					
Fishery Forecasting					
Ocean Forecasting					
Adaptation triggers					
Gear innovation					
Food Systems					

Progress key
Significant progress Progress towards results met or exceeded target last year or reported more outcomes and impacts
Some progress made Some progress has been made towards meeting target last year (50-99%) or reported more outputs and few outcomes or impacts
No overall progress No overall progress has been made in this KRA last year (1-49%) or there is no data available in this reporting period
Moving away from making progress There is negative progress towards this KRA last year or there is no data available in this reporting period