

NEW ZEALAND COUNTRY REPORT

Reporting on activities supporting the National Priority Actions of the Pacific Islands Meteorological Strategy (PIMS) 2017-2026

This Report is presented to the Fourth Pacific Meteorological Council (PMC-5) Meeting held in Samoa from 7 to 9 August 2019



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Summary

This paper outlines activities contributing to the activities supporting the National Priority Actions of the Pacific Islands Meteorological Strategy (PIMS) 2017-2026 being funded, supported or conducted by the following:

- Activities funded by the New Zealand Ministry of Foreign Affairs and Trade (MFAT) as part of the aid programme.
- Activities being supported by the Meteorological Service of New Zealand Ltd (MetService).
- Activities being supported by the National Institute of Water and Atmospheric Research Ltd (NIWA).
- Activities supported by the Civil Aviation Authority of New Zealand (CAA NZ)

New Zealand's support to Pacific Island Meteorology and Hydrology Services continues to cover all 5 priority action areas of the Pacific Island Meteorological Strategy 2012-2021, supporting both national and regional priority actions and contributing to all eleven key outcome areas.

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PRIORITY 1: Improved weather services

PACIFIC KEY OUTCOME (PKO) 1: Improved meteorological services for air navigation				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
1. Participation in an ICAO volcanic ash exercise, to test and improve the provision of information to aviation on airborne volcanic ash.	APAC VOLCEX 19/01	Fiji	CAA NZ, MetService NZ	Completed in May 2019
2. Provision of half-hourly METAR AUTO reports for Rarotonga International Airport (NCRG). Undertaking annual maintenance of the Rarotonga Airport AWS.	Rarotonga Airport AWS	Cook Islands	MetService NZ, Cook Islands CAA	Since 2018 - ongoing
3. Annual calibration and exchange of temperature and pressure sensors for the Hanan Airport AWS	Niue Airport AWS	Niue	MetService NZ, Niue Meteorological Service	Since 2015 – ongoing.
4. Installation of telemetered AWS at airports within country to service local weather needs	Carried out under various CLEWS projects	Cook Is, Fiji, PNG, Tonga	NIWA & NMHS	2008 - Ongoing
5. Installation of software to assist weather coded reporting (METAR, SYNOP) within CLiDEsc	Development of weather coded reporting within CLiDEsc	Vanuatu, Cook Is	NIWA (funder) / NIWA	2016 - Ongoing
6. Installation of Automated Weather Station at Munda Aerodrome	Munda Airport Upgrade	Solomon Islands	GECI	Commissioned February 2019

Summary and Update:

1. The Civil Aviation Authority of New Zealand has led the planning and implementation of a volcanic ash exercise (APAC VOLCEX 19/01), simulating the eruption of Raoul Island in the Kermadecs region of the South Pacific, with ash spreading north to affect Fiji airspace and

airports. The exercise was conducted as part of the International Civil Aviation Organization (ICAO) Asia-Pacific Volcanic Ash Exercises Steering Group (APAC VOLCEX SG) exercise programme.

APAC VOLCEX 19/01 provided an opportunity for participants (including aviation meteorological service providers and air navigation service providers in both NZ and Fiji) to build new and strengthen existing relationships within the aviation industry, to practice their volcanic ash related procedures and to collaborate in finding ways to improve the provision of information on airborne volcanic ash across the South Pacific.

A follow up exercise is planned for 2020, for a Tongan volcano scenario, to help address current ICAO APAC air navigation deficiencies regarding the provision of volcanic eruptive information by Tonga and SIGMET provision by the Solomon Islands.

PACIFIC KEY OUTCOME (PKO) 2: Improved Marine weather services and establishment of ocean services				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
1. Building resilience of ecosystems and communities to ocean acidification in the Pacific region	New Zealand Pacific Partnership on Ocean Acidification	Tokelau, Kiribati, Fiji	SPREP, SPC, USP, NIWA, NOAA	Implementation, completing in 2020
2. Marine early warning wave forecast and tsunami generation monitoring system for Tonga EEZ to support inter-island shipping and other marine users.	Climate Sector Resilience Project (CRSP)	Tonga	ADB, Government of Tonga / NIWA	2018-2019
3. Continued provision of local language monthly tide and sea level fluctuation tables	Kosrae Tide and sea-level fluctuation tables	Kosrae, FSM	NIWA	2008 - Present
4. Continued involvement in the development of improved mean sea-level anomaly forecast	Multi-model ensemble sea-level forecasts for the tropical Pacific Islands	Regional	NOAA, BoM, NIWA	2015 – Present

5. Development of regional marine outlook covering SST, Coral bleaching and 'king tides'. Due to be operational in 2019.	Marine Climate Update	Regional	NOAA, NIWA	2019-present
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Summary and Update:

1. New Zealand has partnered with SPREP (working with SPC and USP) to deliver an initiative on building the resilience of ecosystems and communities to OA in the Pacific region over five years (NZ\$2.1m over 2015-2020). The “New Zealand Pacific Partnership on Ocean Acidification” aims to build resilience through practical adaptation actions, capacity building and awareness raising, along with a small component on research and monitoring. As part of this programme, a regional vulnerability analysis has been carried out and pilot sites in Tokelau, Kiribati and Fiji are being identified, including community priorities actions. Work to implement community priority actions will begin shortly.

SPREP have been active in global monitoring networks for ocean acidification, and have established, along with support from The Ocean Foundation, a Pacific Island OA monitoring network (PI-TOA), including providing direct support to several PICs in monitoring OA levels. The US National Oceanic and Atmospheric Administration (NOAA) and New Zealand’s National Institute of Water and Atmospheric Research (NIWA) provide technical input to this programme.

2. NIWA have been assisting the Tongan Meteorological Service to implement the meteorological, climate and marine monitoring component of the ADB funded Climate Sector Resilience Project (CRSP) across Tonga. This has included supplying and working with TMS technical staff to install and commission:
 - 22 permanent telemetred Automatic Weather Stations (AWS);
 - Two permanent sea level recorders;
 - Eight temporary sea-level and wave monitoring buoys for a period of seven months

All AWS data is telemetered back to the TMS main office in Nuku’alofa and ingested in to CliDE, with initial climate sector products being generated by CliDEsc. Sea-level data is similarly transferred back and stored in Tideda. A number of airport locations have real time weather displays also installed.

The wave and water level data is being used to calibrate and verify a high resolution wave model covering the whole of Tonga. Boundary conditions for the wave model are being provided from NIWA's Pacific-wide wave model. This will enable improved marine forecasts to be provided by TMS for inter-island shipping, ferries and the fishing sector.

PACIFIC KEY OUTCOME (PKO) 3: Improved Public weather services				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
1. Regional operational forecasting	Wellington Regional Specialised Meteorological Centre (RSMC)	PICTs	RSMC Wellington (MetService)	On-going
2. Supporting PICTs NMSs to establish their own severe weather programmes through a mix of training and operational guidance.	Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (SWFDDP)	Solomon Islands, Vanuatu, Kiribati, Tuvalu, Fiji, Tonga, Niue, Samoa and Cook Islands	MetService, Met Office UK, NOAA NWS, JMA, Bureau of Meteorology, ECMWF, MeteoFrance	Initiated 2009 and ongoing
3. Development of real time weather data displays from CLEWS local monitoring systems.	Real time weather displays from CLEWS	Cook Is, Fiji, Kiribati, PNG, Samoa, Solomon Is, Tonga, Vanuatu	NIWA (funder) / NIWA	2017 - Ongoing

Summary and Update:

1. MetService operates the Wellington Regional Specialised Meteorological Centre (RSMC Wellington), as part of New Zealand's contribution to the World Meteorological Organization Global Data-processing and Forecasting System (GDPFS).

RSMC Wellington maintains a weather watch over the southwest Pacific all year round and publishes routine weather analysis products daily. During the tropical cyclone season, RSMC Wellington publishes a daily tropical cyclone potential bulletin.

During the tropical cyclone season, RSMC Wellington provides routine and at-request information to the New Zealand Ministry of Foreign Affairs on the forecast onset and path of cyclones in the southwest Pacific region.

At the meeting of the WMO Executive Council in June 2018 (EC-70) RSMC Wellington received designation as an RSMC with specialised activities with the following new designations, as per the revised Manual on the GDPFS: for Regional Severe Weather Forecasting; and for marine meteorological services. RSMC Wellington's designation as a centre with geographic specialisation ceased after the World

Meteorological Congress in June 2019 (Cg-18); under the revised manual on the GDPFS, “geographic specialisation” is no longer a designation.

2. Twice daily, RSMC Wellington issues severe weather forecasting guidance, to nine Pacific countries, for the likelihood of heavy rain, strong winds and damaging waves out to five days ahead.

Besides the specialised guidance described above, as part of its contribution to SWFDDP, RSMC Wellington also makes available, to the same nine Pacific countries, relevant deterministic and ensemble numerical weather prediction and remote sensing-based guidance products.

While well established and having operated successfully since November 2009, this project remains in “full demonstration” phase and has not yet transitioned to “continuing development” phase. Transition would require some different governance and funding arrangements from those currently in place.

PRIORITY 2: Disaster Risk Reduction

PACIFIC KEY OUTCOME (PKO) 4: Strengthened NHMS capacity to implement Multi-Hazard Early Warning Systems (MHEWS) for tropical cyclones, coastal inundation and tsunamis				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
1. Improve risk-based decision making through the use of multi-hazard risk mapping and modelling	Pacific Risk Tool for Resilience (PARTner)	Samoa, Vanuatu, Republic of Marshall Islands and Tuvalu	NIWA, GNS	Implementation 2016-2019 (to be extended to early 2020)
2. Weather, climate (CLEWS) and marine early warning monitoring and system including wave forecast system for Tonga EEZ to support inter-island shipping and other marine users.	Climate Sector Resilience Project (CRSP)	Tonga	ADB, Government of Tonga / NIWA	2018-2019
3. Bumbu flood warning system	Enhancing Adaptive Capacity of Communities to Climate Change-related Floods in the North Coast and Islands Region of PNG project	PNG	UNDP / NIWA	2017-2019
4. Nadi River and coastal flood warning system	WMO Coastal Inundation Forecast Demonstration Project (CIFDP)	Fiji	WMO / NIWA	2018-2019
5. Vaisigano Flood Warning System	Green Climate Fund-Vaisigano Catchment Project	Samoa	GCF / NIWA	2019 - 2020
6. Support the Red Cross Red Crescent Climate Centre to reduce the impacts of climate change and extreme-weather events	NZ Red Cross strategic partnership	Pacific wide	NZRC	2018 -2023

Summary and Update:

1. This pilot project, PaRTneR, tailors a NZ-developed disaster impact mapping and modelling tool, called RiskScape, to use in the Pacific. The pilot works with National Disaster Management Offices and other government departments to deliver three components:

- A co-designed natural hazards mapping and modelling tool for the Pacific, based on the RiskScape tool
- Integrated disaster risk data management systems
- Sustainable targeted and tailored training and skills development

The tool will enable Pacific government ministries and stakeholder organisations to effectively develop and use risk-based information for decision making. The tool brings together natural hazard risk with the potential impact (economic and social) on a range of assets to provide information on the potential impact of a natural disaster to inform mitigation and management decisions.

The pilot started with developing case studies (covering ashfall, tropical cyclone, drought/extreme rainfall, tsunami, and landslide) and training in Vanuatu and Samoa and has been extended to trial drought modelling in the Republic of the Marshall Islands and Tuvalu.

The pilot will be extended by nine months, to early 2020, to embed the training and allow time for an evaluation and next steps to be confirmed.

2. NIWA has assisted the PNG Conservation and Environment Protection Agency and National Weather Service implement an operational flood warning system for the Bumbu catchment in Lae as part of the UNDP-led *Enhancing Adaptive Capacity of Communities to Climate Change-related Floods in the North Coast and Islands Region of PNG project*. The project includes supply and support to install 5 AWS, 3 automatic water level recorders and five automatic rain gauges, all with real-time telemetry, management system for weather, climate and hydrology data (which integration with CliDE, installation of CliDEsc and development of PNG's CLEWS system), development of flood warning thresholds, standard operational procedures and warning dissemination procedures and ongoing maintenance support
3. NIWA has recently delivered an operational trigger-based flood warning interface based on rainfall, river level and sea level triggers for the Nadi basin in Fiji as part of the WMO Coastal Inundation Forecast Demonstration Project (CIFDP)
4. NIWA will shortly commence working with the Ministry of Natural Resources and Environment in Samoa to develop an improved flood warning system for the Vaisigano catchment. This will involve the Supply and installation of EWS Flood Monitoring Equipment in the Vaisigano Catchment, real-time flood telemetry, and a system to provide timely data collection to a Flood Decision Support System (FDSS) from which alarm activation decisions can be determined The project will involve the development of flood warning thresholds, standard operational procedures and capacity development for MNRE staff (SMS, WRD & NDMO). Potential integration of available high resolution weather model forecast data over Samoa and delivery of impact forecasts will also be developed.

PACIFIC KEY OUTCOME (PKO) 5: NHMS contribution to climate change activities				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
Supporting initiatives to develop atmospheric greenhouse measurement station and capability under WMO GAW programme (1)	WMO Global Atmospheric Watch	Regional	WMO / NIWA	Ongoing
Supporting greenhouse gas emissions and mitigation research from landfills in collaboration with USP including field assessment of waste to energy feasibility	Green house gas emissions from Landfills in Fiji	Fiji	Netherlands / USP , NIWA	2018-2019

Summary and Update:

1. WMO GAW programme supported attendance of Dr. Francis Mani (USP) at Greenhouse Gas Measurement Techniques (GGMT-2017) meeting for discussions with WMO, NZ and others to further development of new regional monitoring station in Fiji following previous discussions with Fiji Meteorological Service and USP.
2. Landfill waste to energy mitigation at Naboro determined from prior study incorporated into Ministry of Economy (2018) Fiji Low Emission Development Strategy (2018-2050). Capability development - Support/co-supervision of research degrees includes: Zahra Nizbat (2018) Assessment of nitrous oxide flux from sugarcane fields in Fiji (MSc, USP) Co-supervised Mani, F and Harvey, M

PRIORITY 3: Improved climate and hydrological services

PACIFIC KEY OUTCOME (PKO) 6: Improved climate information and prediction services through the implementation of the Pacific Roadmap for Strengthened Climate Services				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
1. Support to improve the capture, storage, analysis and communication of climate and ocean data to Meteorological Services	Climate and Ocean Support Program in the Pacific, Phase 2 (COSPPac)	All Pacific Island Countries and Territories	DFAT, MFAT (funding partners), BOM, NIWA (implementing partners)	Implementation 2019 - 2021
2. System development and implementation to deliver the WMO Framework for Climate Services / Pacific Roadmap for strengthened Pacific Services and customisation of climate service products and services for sectors and end-users	Climate Early Warning System (CLEWS)	All Pacific countries (currently operation in Samoa, Fiji, Tonga, Cook Islands, Kiribati, PNG, Solomon Islands and Vanuatu)	Funding partners: UNDP, World Bank (GFDRR), NIWA. Future: DFAT/MFAT (COSPPac). NIWA & NMHS (implementation)	2008 - ongoing
3. Continued delivery of the monthly island climate update and coordination of the annual Tropical Cyclone Outlook	Island Climate Update	All Pacific countries	Funding (NIWA) / NIWA & NMHS	1999 - ongoing

Summary and Update:

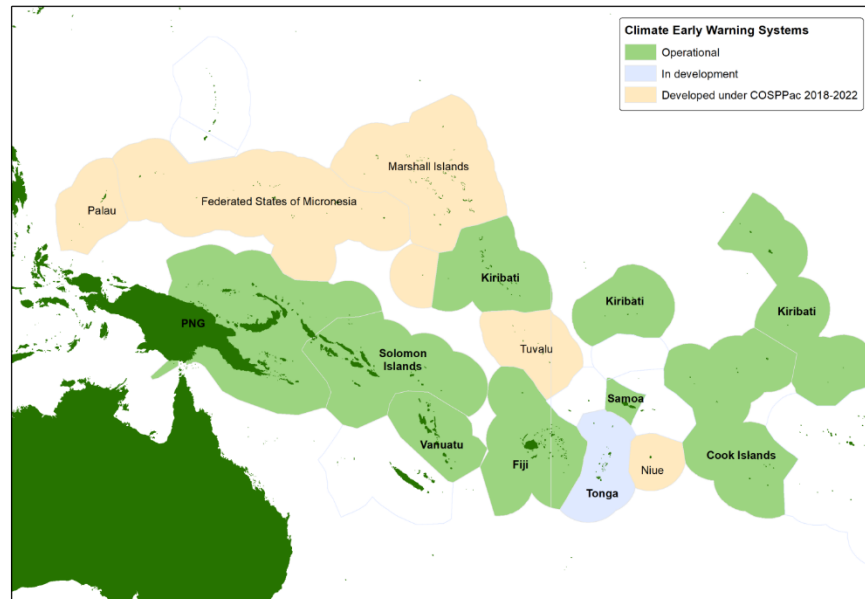
1. In 2019 MFAT became a funding partner with DFAT on phase 2 of the COSPPac programme. The multi-country programme supports Pacific Meteorological Offices to use climate, ocean and sea level data to develop useful information products and services for government and communities to build resilience to the impacts of climate change, climate variability and disasters. The three project components are:

- Pacific Sea Level and Geodetic Monitoring Project;

- Climate Data for the Environment (CLiDE) and associated product generation system (CLiDEsc);
- A seasonal prediction project.

New Zealand will provide funding for the CLiDEsc component, delivered by NIWA. The CLiDEsc system brings together data from a range of databases and sources, including CLiDE, to produce tailored reports and information products for a range of audiences. The component includes installation and customisation of the system and tailored training to meet Met Office information needs.

2. The Climate Early Warning System (CLEWS) was initiated by the Samoa Meteorological Division with technical support for its development provided by NIWA. It has been developed in a way to provide a system for Pacific Island Meteorological Services to fully deliver on the Global Framework for Climate Services.



To date over 240 rain gauges, automatic weather stations, hydrology stations, groundwater monitoring and three sea level gauges, all of which are telemetered to enable real-time access to monitored data. CLEWS has also included the development of the CLiDEsc (Climate Data for the Environment Services Application Client) open-source software platform that links to the Bureau of Meteorology CLiDE (Climate Date for the Environment) database operational in all Pacific Islands, to enable real time generation of sector focused climate products. CLEWS

systems are now operating in Samoa, Fiji, Solomon Islands, Vanuatu, PNG, Kiribati and the Cook Islands and under the COSPPac project will be rolled out to all other PINMS.

The Island Climate Update has been providing operational one to three month seasonal outlooks for the Pacific region since 1999. The regional and country level forecasts are based on a consensus forecast derived objectively from the seasonal climate forecasts from ECMWF, UKMO, MeteoFrance, DWD and CMCC available on the Copernicus Climate Data Store. The ICU has been funded since 2000 by NZ MFAT, in recent years via New Zealand’s multi-year funding package to SPREP with technical support provided by NIWA. In July 2016, operational funding for the ICU was discontinued by SPREP.

Since this time NIWA has provided interim funding to ensure the ICU, in a revised format, continues to be produced and disseminated, including:

1. Production of monthly Pacific ENSO outlook, rainfall outlook and water stress outlook bulletin and disseminated via email, web and Facebook distribution.
2. Production of a short monthly ENSO/Rainfall/Water Stress forecast video via Facebook and twitter
3. Coordination of the Pacific seasonal cyclone outlook including bulletin and cyclone outlook video.
4. Continued involvement in development of multi-model Ensemble Sea Level Forecasts for Tropical Pacific Islands product developed in partnership with the University of Hawaii Sea Level Centre, NOAA’s NCEI (Pacific Region) and Pacific ENSO Applications Climate Center, and BoM (<http://uhslc.soest.hawaii.edu/sea-level-forecasts/>).
5. Continued support to Kosrae to produce monthly enhanced tide charts incorporating sea level forecasts.
6. Technical support, input and workshop facilitation of the third Pacific Island Climate Outlook Forum.
7. Development, with NOAA, of a trial Island Marine Outlook to be launched in 2019.

PACIFIC KEY OUTCOME (PKO) 7: Strengthen collaboration between meteorological and hydrological services to better manage water resources and reduce the impact of water related hazards				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
1. Strengthening water security in selected atoll countries and islands.	Water Security in Atolls	Tuvalu, Tokelau, Kiribati, Cook Islands and the Republic of the Marshall Islands	SPC	Implementation 2015-2020
2. Development of a drought risk assessment module for RiskScape	RiskScape Modelling Drought for Atolls project	RMI, Tuvalu	MFAT / NIWA	2018-2020

Summary and Update:

1. New Zealand is supporting a five year (2014 to 2019), NZD 5 million Programme to strengthen water security in five low-lying Pacific islands and atolls that are subject to drought and water shortages. The key components of the Programme are:
 - Embedding water security officers in relevant government departments,
 - Improving knowledge of available water resources and water-related infrastructure,
 - Raising awareness of water security challenges,
 - Establishing management plans to protect water security and manage water shortage, and
 - Demonstrating appropriate technologies to improve water security (SODIS disinfection, solar stills, and hydrogeological survey instruments).
2. The RiskScape Modelling Drought for Atolls Project was a proof-of-concept project funded by the New Zealand Ministry of Foreign Affairs and Trade (MFAT). The project expanded the capability and applicability of the RiskScape multi-hazard risk assessment and vulnerability mapping tool, by improving its value as a tool to assess Pacific drought impacts. The results contribute towards disaster risk reduction, emergency response, and long-term water infrastructure planning. Specifically, the project delivered the RiskScape Drought Module for three atolls in the Marshall Islands that enabled key stakeholders to:
 - Visualize drought impact and risk on water resources
 - Locate key hotspots and evaluate response options

The pilot module was developed and tested in the Marshall Islands and Tuvalu and is currently operation in the RMI with further work planned in both countries to expand coverage to further outer islands and operationalise it in Tuvalu.

PRIORITY 4: Integrated observing and communications systems

PACIFIC KEY OUTCOME (PKO) 8: Integrated observing and communication systems				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
1. Provision of specialised technical resources in-country to perform periodic maintenance of GCOS Upper Air Network (GUAN) station equipment at Funafuti and Tarawa.	Met Office Pacific Fund	Tuvalu and Kiribati	Met Office UK, SPREP and MetService NZ	Since 2013
2. Reactivation of silent stations - installation of a new AWS at Nukunono Tokelau	Nukunono AWS installation	Tokelau	MetService NZ, NZ Ministry of Civil Defense and Emergency Management (MCDEM).	March 2019
3. Installation of 240+ AWS, Rain, Hydrology, Groundwater and sea-level monitoring equipment all telemetered in near-real time and integrated with CliDE or Tideda databases	Climate Early Warning Systems and various other projects	Cook Is, Fiji, Kiribati, PNG, Samoa, Solomon Is, Tonga, Vanuatu, FSM	UNDP, ADB, GIZ, Fiji Government, SPREP, SPC (funders) / NIWA & NMHS	2008 - ongoing

PRIORITY 5: Coordinated support for NMHS and PMC

PACIFIC KEY OUTCOME (PKO) 9: NMHS institutional strengthening and capacity development				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
Ongoing climate and hydrological technical support	NIWA NMHS Buddy support programme	Regional	NIWA	Ongoing
Development of competency-based training for climate services	Competency-based training modules for delivery of climate services	Regional	NIWA	Ongoing
In-country on the job training on AWS, rain gauge and hydrology station site selection, installation, calibration, telemetry, and maintenance for meteorology and hydrology staff	Technical training in meteorology, climate and hydrology monitoring equipment	PNG, Solomon Islands, Vanuatu, Fiji, Samoa, Kiribati and Cook Islands	NIWA	Ongoing
Distance learning in field hydrology	WMO Field Hydrology Technicians Course for the Small Island Developing State countries of WMO RA V	Regional	WMO / UCAR COMET, NIWA	Ongoing

Summary and Update:

NIWA provides significant training, capacity development and mentoring support to PI National Meteorological and Hydrological services. Since the last PMC:

- Continuation of our buddy system where PI climate and hydrology technician staff are supported by a country-specific NIWA mentor who can assist with ad hoc queries and technical issues.
- AWS, rain gauge, water level gauge and telemetry instrumentation training at NIWA's instrumentation facility in Christchurch. 2-4 week training has been provided to technical staff from PNG, Samoa, Tonga, Fiji and Cook Islands.
- In-country on the job training on AWS, rain gauge and hydrology station site selection, installation, calibration, telemetry, and maintenance for meteorology and hydrology staff in PNG, Solomon Islands, Vanuatu, Fiji, Samoa, Kiribati and Cook Islands.

- Development of competency-based training modules for delivery of climate services in the Pacific including: 1. Climate services: strategic overview; 2. Instruments and measurements; 3. Data transfer, telemetry and integration; 4. Data storage and quality management; 5. Climate monitoring, products and client services; 6. Sector engagement, decision support and risk management
- Development with WMO UCAR's COMET Program a distance learning WMO Field Hydrology Technicians Course for the Small Island Developing State countries of WMO RA V. This was offered for the first time in 2017 with participants from Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Vanuatu.

PACIFIC KEY OUTCOME (PKO) 10 : Support to NMHSs is coordinated				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
ClIDesc to be made fully operational in 14 COSPPac partner countries in the Pacific	COSPPac -Climate and Oceans Support Programme in the Pacific	Regional	MFAT, COSPPac	2018-2022

PACIFIC KEY OUTCOME (PKO) 11 : PMC is an efficient and effective body				
Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
Members of PICI, PICS, PIETR and Hydrology panels	PMS Panel involvement	Regional	NIWA	Ongoing
Member of the WMO RA-V Pacific Regional Climate Centre (RCC) Network	RCC Implementation team	Regional	NIWA	Ongoing

Other support

Current Action Description	Project Title	Beneficiary Country/Territory	Implementing/Executing Partner(s)	Action Timeline
1. Improving access to climate finance	Improving Pacific Access to the Green Climate Fund (IPAGCF)	Pacific Island Countries	SPREP PCU	Implementation 2016-2021
2. Installation of a lightning detection network for the Pacific. Data is being provided to Pacific Island NMSs.	South Pacific Lightning Detection Network	PICTs	MetService NZ, TOA Systems	Since 2018

1. The Improving Pacific Access to the Green Climate Fund (previously known as the Technical Assistance for Pacific Access (TAPA) programme) supports Pacific SIDS in developing GCF proposals. One element of this programme aims to facilitate SPREP Project Coordination Unit's provision of technical assistance to PICs to develop funding proposals. MFAT has been supporting SPREP to develop proposals to the GCF to:
 - Strengthen weather and climate services for resilient development for Pacific Islands. The aim is to enhance cooperation among Pacific countries to strengthen National Meteorological and Hydrological service (NHMS) develop relevant and targeted weather, climate and hydrological communication and knowledge products and enhance weather, climate and hydrological services governance and coordination mechanism for resilient development planning and decision making. The project, if approved, would last three years.
 - Enhance early warning systems to build greater resilience to hydro and meteorological hazards in Pacific Small Islands Developing States (Vanuatu, Fiji, Solomon Islands, PNG are immediate beneficiaries). The proposed scope of these systems is severe weather including cyclones, floods and drought and the project, if approved, would last four years.

The IPAGCF also provides support to strengthen SPC's capability to provide technical assistance to PICs to develop funding proposals for water security. On 28 February 2019, SPC became an accredited entity for GCF proposal development and it is currently supporting PICs in the following project proposals for climate finance:

- Vanuatu for the development and strengthening of the GCF proposal: Enhancing Adaptation and Community Resilience by Improving Water Security;
- Kiribati for the development the Adaptation Fund proposal - Enhancing the Resilience of the Outer Islands of Kiribati;
- The Pacific Meteorological Council for the development of proposals to strengthen the capacity of Pacific Hydrological

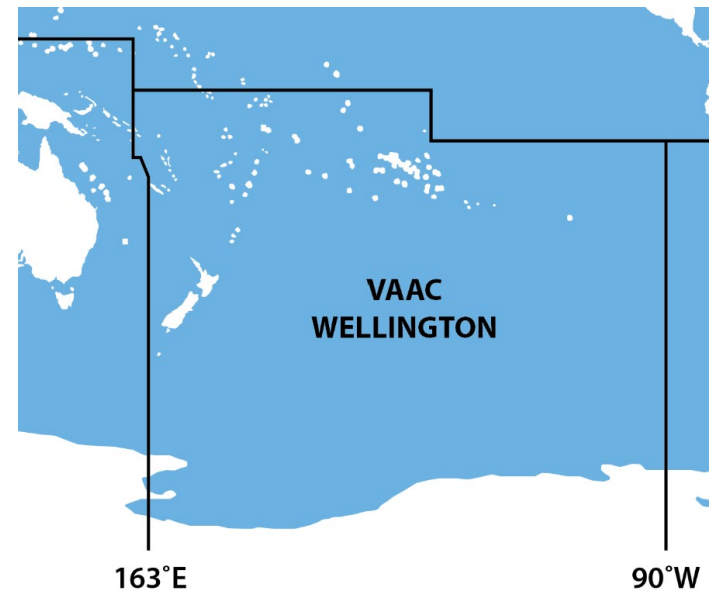
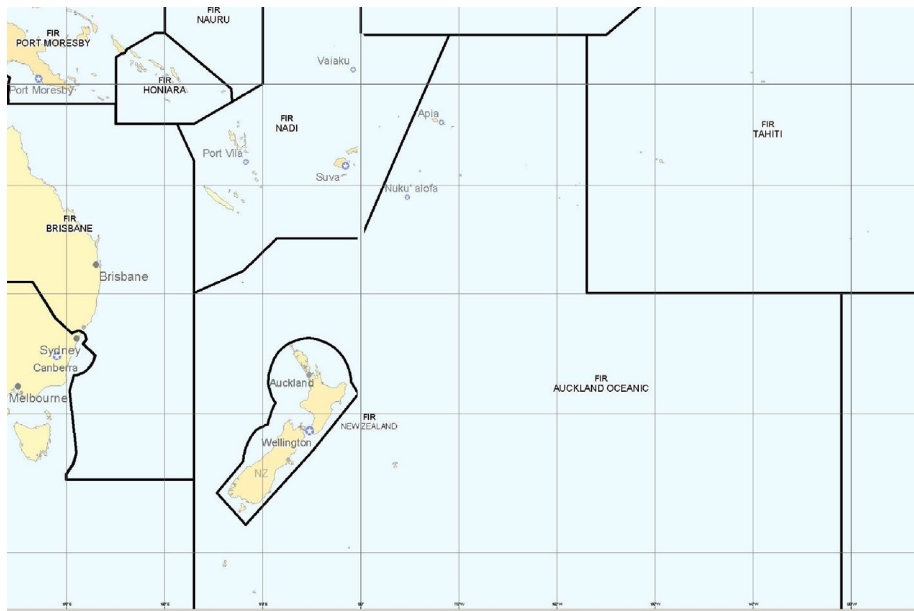
Services.

Other MetService NZ activities that support the operation of NMSs in the Pacific:

1. Regional Telecommunication Hub (RTH) Wellington provides connectivity to the WMO Global Telecommunication System (GTS), and facilitates the transfer of observations from South Pacific National Meteorological Centres (NMCs) to other NMHS around the world, including global modelling centres. RTH Wellington also relays selected observations, forecasts, analyses and other products from global centres to these NMCs.
2. Funding from the US National Oceanic and Atmospheric Administration (NOAA) GCOS office for maintenance and technical support of GUAN stations and for support of Bodeker Scientific's services to the GCOS ceased in August 2017 (associated technical assistance and administration was carried out by MetService).
3. MetService produces analysis and forecast maps covering the southwest Pacific and broadcasts them via RadioFax.



4. MetService produces high-seas marine forecasts and warnings for WMO METAREA XIV (see figure above left) and undertakes their broadcasting, via HF and Inmarsat.
5. MetService provides weather forecasting support – on an as-required basis – for New Zealand’s Rescue Coordination Centre which covers the area of responsibility shown in the figure above right.



6. Through its Memorandum of Understanding with the CAA NZ, MetService provides the following services to meet New Zealand's obligations to the ICAO Annex 3 for weather services for international aviation:

- Production of warnings (SIGMET bulletins) of weather conditions aloft that are hazardous to aviation (e.g., severe turbulence, severe icing, thunderstorms, etc.) over an area of responsibility encompassing the Auckland Oceanic Flight Information Region (NZZO FIR; see figure above left – note, region extends to the pole); and
- Operation of the Wellington Volcanic Ash Advisory Centre (VAAC) responsible for tracking airborne volcanic ash, and issuing Volcanic Ash Advisories, for the area of responsibility shown in the figure above right.