

Weather and Climate Information for Adaptation

(Ofa Fa'anunu, Director of Meteorology, Tonga)





Tonga Drought 2014/15



**Food sold in Vila Market after
Severe TC PAM (Cat 5) Jan 2015**



RMI King Tides 2014



Role of a National Meteorological Service

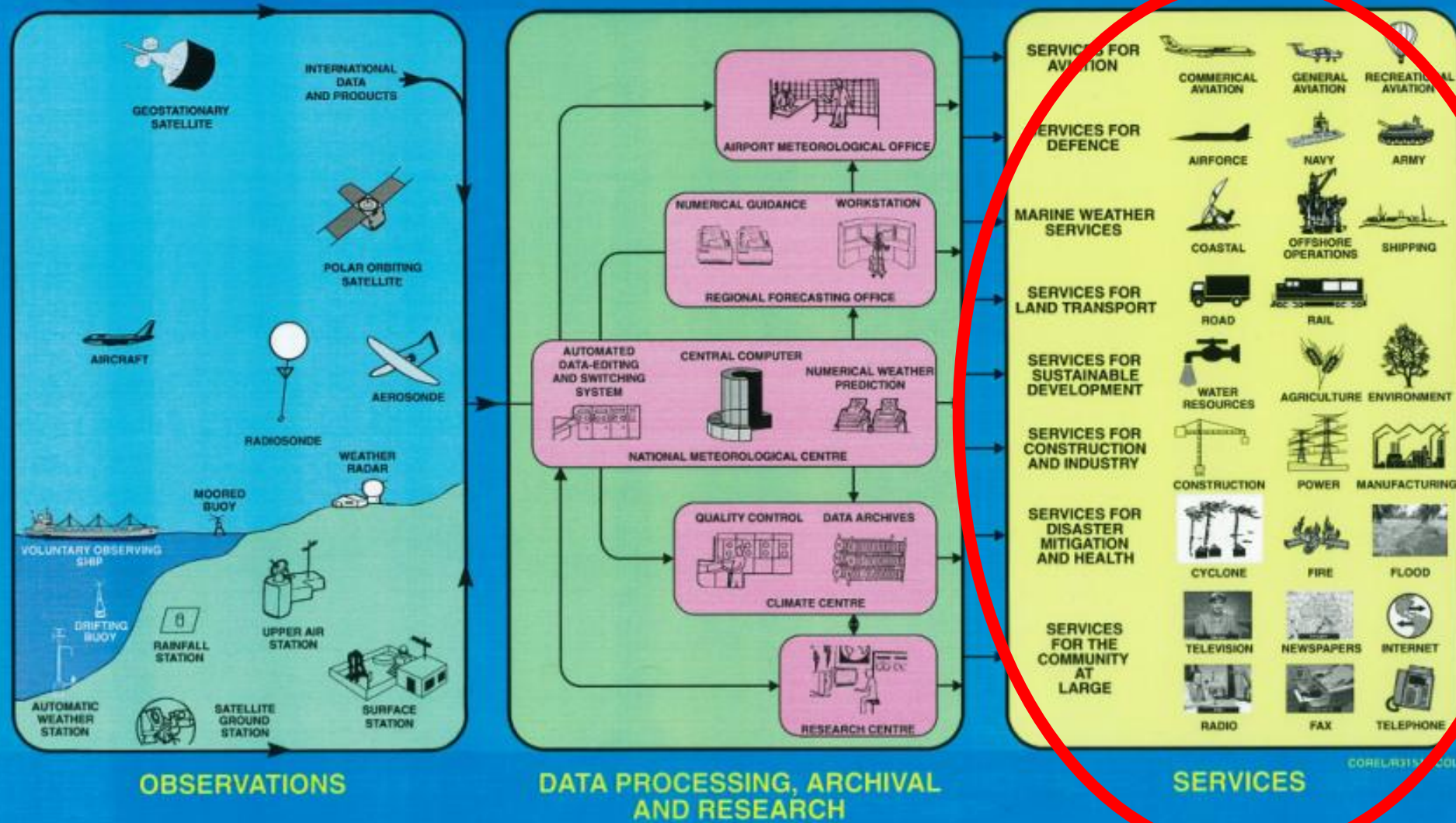
- To provide advise on the state of the atmosphere and oceans to inform development and to save lives and property.....

Time scales

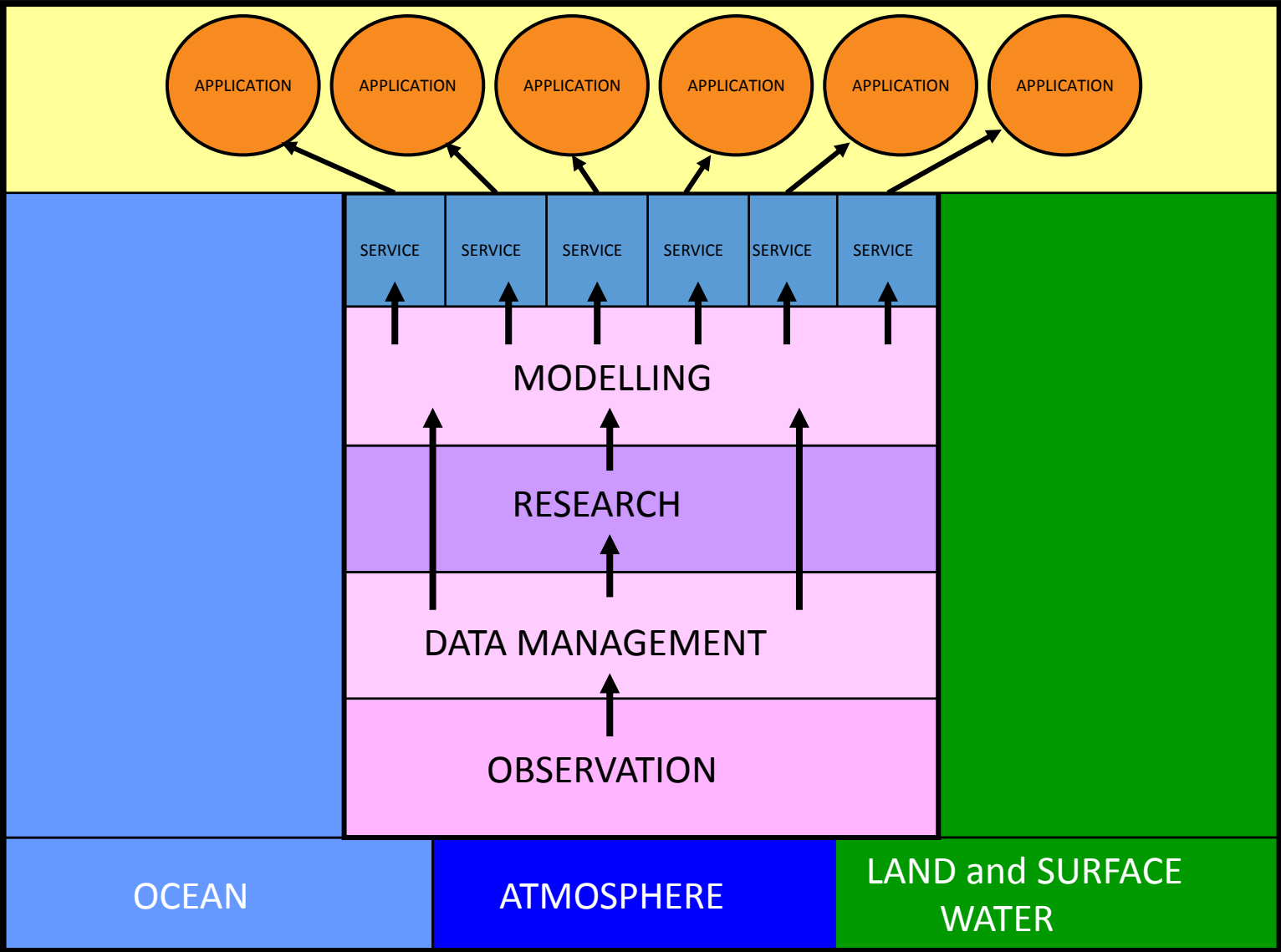
Now → Hours → Weeks → Months → Years → Decades → Centuries



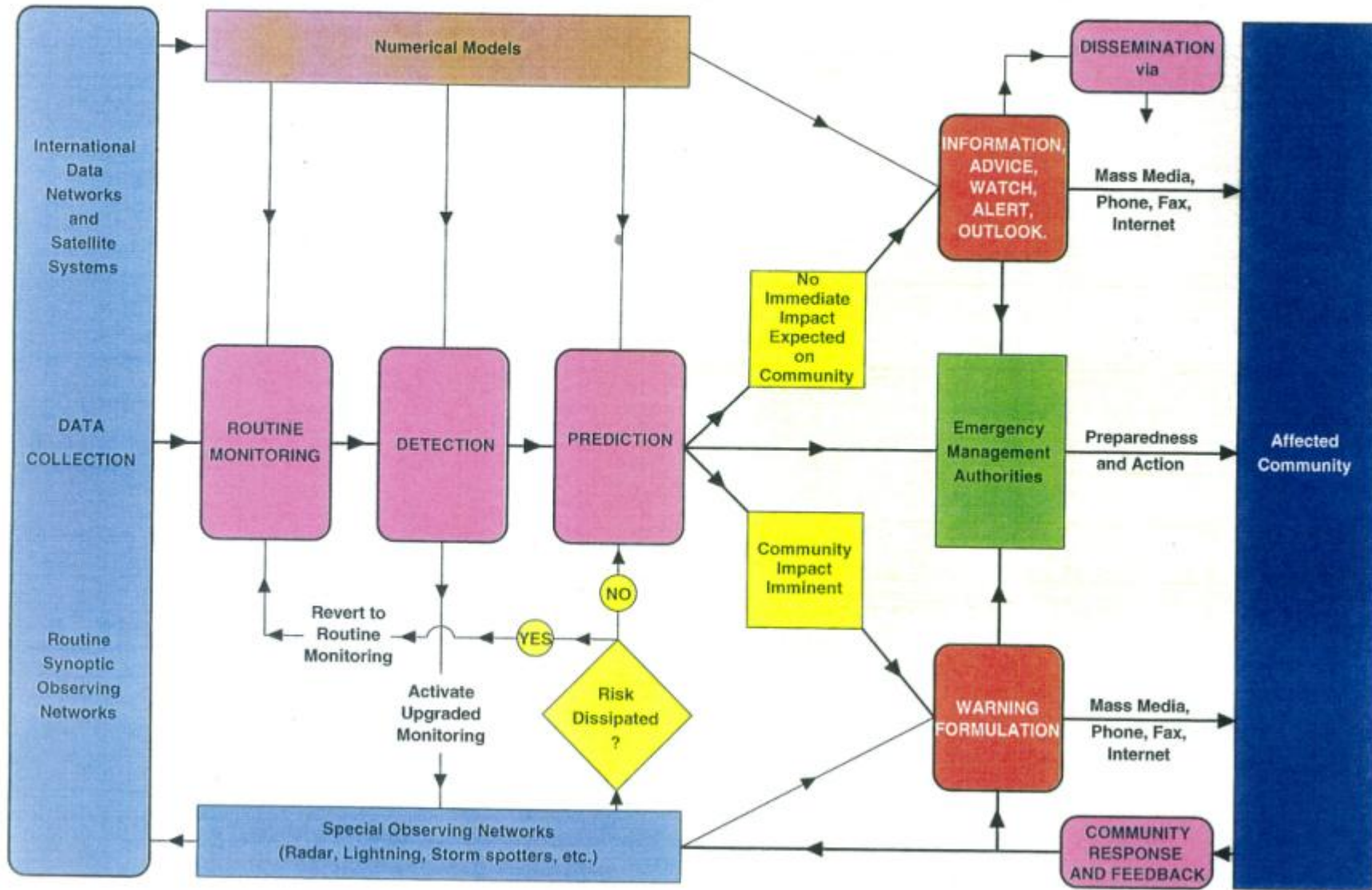
OPERATION OF A NATIONAL METEOROLOGICAL SERVICE



THE NATIONAL METEOROLOGICAL SERVICE

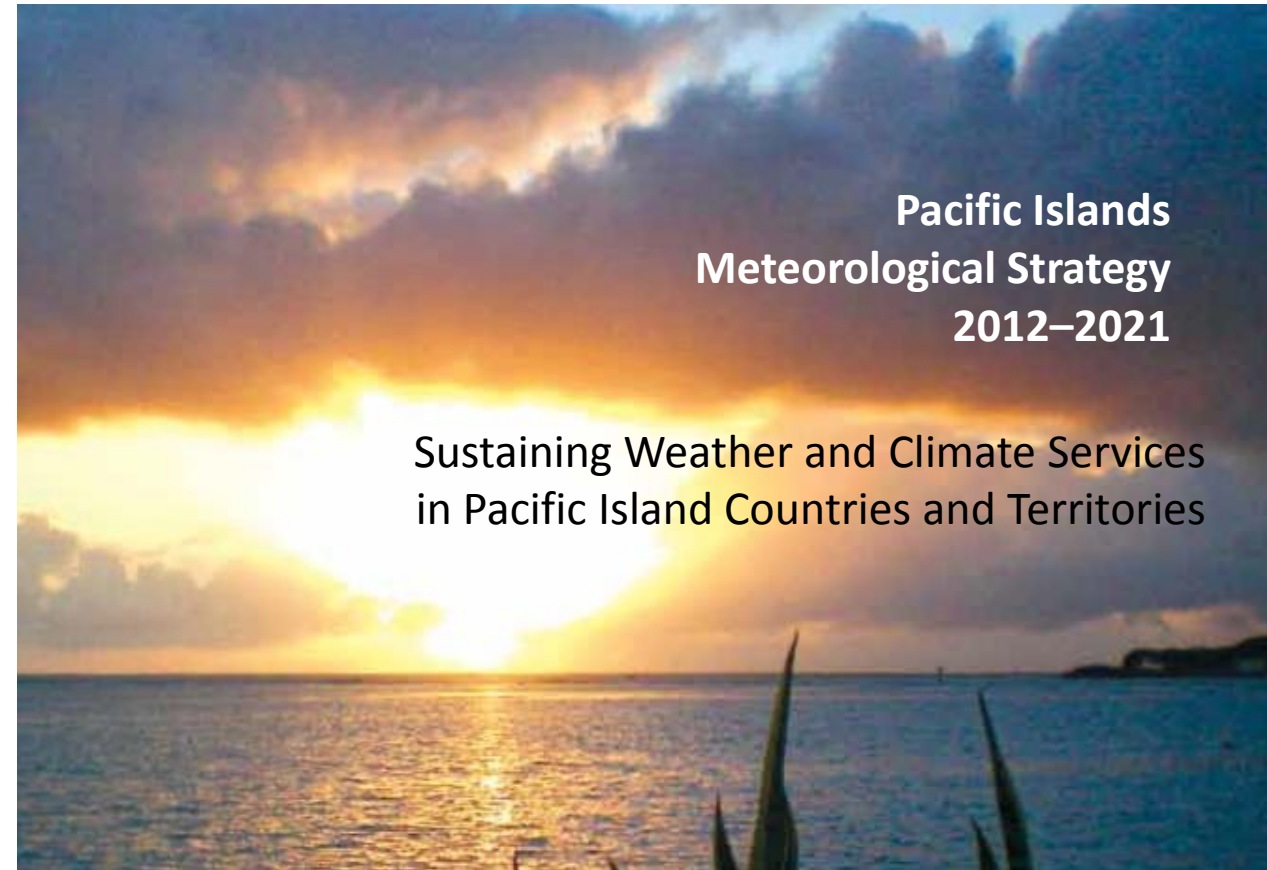


OPERATION OF A WARNING SYSTEM



Strategic Guidance – Pacific Islands Meteorological Strategy (PIMS) created by the Pacific Meteorological Council & Partners

- Improved weather services, in particular, aviation, marine and public weather services.
- Improved end-to-end Multi-Hazard Early Warning Systems (MHEWS).
- Enhanced infrastructure (data and information services) for weather, climate and water.
- Enhanced development of climate services.



Climate in the Pacific: A Regional Summary of New Science and Management Tools (2015)

Rainfall

The timing and amount of rain in all partner countries there is seasons. A large portion of rain are where the warm ocean surface winds converge. Tropical cyclones for water resources and agricultural human health.



Rainfall in the Pacific is highly variable.

Over the past 30 years the south-west Pacific has become wetter and the central Pacific has become drier, mostly due to natural decadal climate variability.

Average rainfall is projected to increase in the future in many locations across the Pacific.

Extreme rainfall events are projected to be more frequent and more intense in the future.

Time spent in drought may decrease in the future in some locations.



Use the Pacific Climate Change Data Portal to examine historical rainfall data from across the region. See page 36.

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IN A WETTER



- Increased risk of water excess specifications and rural drainage systems, causing incidence of related loss and disturbance and national economies as well as telecommunications.
- Greater hydro potential but solar energy.



- Reduced risk of reduced stored water.
- Increased risk of freshwater resources, groundwater, altered hydrology, reducing risk of aquifers from the ocean.
- Reduced risk of green algae and associated infrastructure, tourism and health.
- Increased risk of flooding and impacts for food, health and biodiversity.



A DRIER CL



- Reduced risk of water excess specifications and rural drainage systems, causing incidence of related loss and disturbance and national economies as well as telecommunications.
- Greater hydro potential but solar energy.



- Increased risk of stored water which could supply in both rural and urban areas.
- Decreased risk of freshwater resources, groundwater, altered hydrology, reducing risk of aquifers from the ocean.
- Increased risk of green algae which would water quality.
- Decreased risk of flooding and impacts for food, health and biodiversity.

Future climate a



Cook Islands



- El Niño and to occur in the consensus of will change.



- Annual mean extremely hot will continue.



- Average annual to stay similar except for a season in the under the hot with more frequent.
- Drought frequency remain similar, the Southern slightly in the under the hot.



- Sea level will rise.
- Ocean acidity expected to increase.
- The risk of coral expected to increase.
- Wave climate to change.



- Tropical cyclones be less frequent.



III. TOOLS FOR PLANNING AHEAD

PACCSAP (and the PCCSP) have developed a suite of climate tools and portals to assist Pacific Island countries and Timor-Leste to better understand their climate and, more specifically, to support communities and governments to make the decisions necessary to manage and adapt to a changing climate.

Climate science tools and portals



Pacific Climate Futures

Pacific Climate Futures is a web-tool developed in collaboration with Pacific Island countries that provides free and easy access to climate projections data. These data can be used for risk assessment and adaptation planning.

The tool groups projections from individual models into a small set of internally consistent climate futures, such as 'warmer and wetter' or 'hotter and drier'. Each climate future is given a likelihood so the user can readily identify the most likely future, as well as less likely futures that might represent a 'best case' or 'worst case'. Users can select a small set of climate models that represent key climate futures, then download data from these models into an Excel spreadsheet. Observed climate data can be imported into the spreadsheet and combined with model data to create synthetic future climate data for use in climate impact assessments.

Access to the basic and intermediate levels of this tool is available to the public, while advanced level access is subject to training and accreditation.

The tool can be found at www.pacificclimatefutures.net



The Pacific Climate Change Data Portal

The Pacific Climate Change Data Portal allows users to visualise historical monthly temperature and rainfall data and to explore trends from more than 100 individual observation sites across the Pacific Islands and Timor-Leste. As the largest web-based data source for the Pacific region, this tool allows users to plot time-series graphs, linear trends, multi-year running averages and long-term averages. In PACCSAP, this web tool has been updated with to include trends in daily rainfall and temperature extremes.

This tool is available to users approved by relevant national governments and can be found at www.bom.gov.au/climate/pccsp/



CLIDE: Climate Data for the Environment

CLIDE is a PC-based, desktop climate database management system installed in National Meteorological Services in 15 countries to support day-to-day operations, including the archiving and basic analysis of historical and recent meteorological data. CLIDE provides a reliable and functional platform for countries to rescue and secure hard copy and electronic data, the former of which in some countries date back more than 100 years. Accurate climate records are critical for building an understanding of how the climate is changing and for verifying climate projections, monitoring and comparing droughts and other extreme events.

CLIDE is used by the National Meteorological Services of each of the PACCSAP Program's partner countries. More information can be found at www.bom.gov.au/climate/pacific/about-clide.shtml

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Investing in Meteorological Services is building Resilience

- Tonga is investing 16.5M over next 5yrs in building resilience to natural disasters. 70% of that is going into improving MHEWS
- PPCR Tonga Project 2M into upgrading observation systems



Strategy for Climate and Disaster Resilient Development in the Pacific (SRDP)

Recommendation to include in the Guiding Principles of SRDP that

➔ Responses to addressing climate change and managing disaster risks should be based or built on Good Science.

Good Adaptation ← Good Planning ← Good Science ← Good Data
(Projections)

← Good Meteorological Services →

