

## Scientific research and capacity building

As part of the Pacific-Australia Climate Change Science and Adaptation Planning (PACCSAP) program the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Australian Bureau of Meteorology, together with collaborative partners, are undertaking a range of research and capacity building activities across the Pacific.

### **Past climate change, trends in extreme weather events and seasonal predictions in a changing climate**

PACCSAP scientists are working closely with partner countries to rescue, collate and analyse records from meteorological observation stations in the region. A more complete and accurate historical climate record will improve the understanding of long-term variability and changes in rainfall, temperature and pressure across partner countries. In particular, scientists are focusing on examining historical trends in extreme weather events.

In the context of a changing climate, scientists are working to better understand climate variability and improve short-term predictions of extreme events (one – nine months in advance), such as tropical cyclones and unusually warm ocean temperatures and associated coral bleaching events. Scientists are analysing the output from the Predictive Ocean-Atmosphere Model for Australia (POAMA) in order to help estimate climatic variability. Prototype seasonal prediction tools are being developed to better predict short-term changes in sea-surface temperatures and coral bleaching.

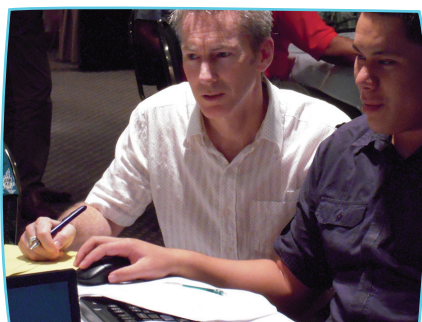
### **Increasing knowledge of the current climate and natural variability**

In order to understand what may happen in the future it is essential we understand the natural patterns of variability affecting the current climate and how these may change in the future. Understanding the major climate features of the region is fundamental to better understanding future climate projections used to inform adaption solutions for the Pacific. In this context, PACCSAP is specifically looking at the effects of the El Niño-Southern-Oscillation (ENSO), the South Pacific Convergence Zone (SPCZ), the

Inter-Tropical Convergence Zone (ITCZ) and the West Pacific Monsoon (WPM). Key questions underpinning scientific research include: How do these climate features influence partner countries? How well do climate models simulate these features? How might these patterns and their impacts change from decade to decade and in the longer-term in response to global warming?

### **Future climate of the Pacific**

PACCSAP will be providing updated climate projections including changes in temperature, rainfall, wind, evaporation, solar radiation, ocean salinity and ocean





circulation from 2030 – 2090. These projections will be based on a new set of up to 50 global climate models driven by various emission scenarios. The ability of global climate models to simulate natural variability from decade to decade will be evaluated, and near-term projections (the next 20 years) will be provided for temperature and rainfall. Models with finer resolution will be assessed for their ability to provide more detailed projections. Extreme events often have large impacts in the region. PACCSAP will provide extreme event projections for daily temperature and rainfall, drought and cyclones. Version 2 of the Pacific Climate Futures Web

Tool ([www.pacificclimatefutures.net](http://www.pacificclimatefutures.net)) is being developed by PACCSAP scientists in order to better provide regional stakeholders with easy access to national and localised climate projections.

### **Improving our understanding of the Pacific Ocean**

The ocean is a key life source of the Pacific region. Undertaking research on the effects of climate change on the ocean is therefore integral to future adaptation planning. Scientific research into areas such as sea-level rise, ocean acidification, extreme sea-levels and coastal impacts, coral bleaching, fisheries' biology and productivity

as well as ocean and wind-wave climate projections will generate better understanding of ocean variability and future change in the Pacific.

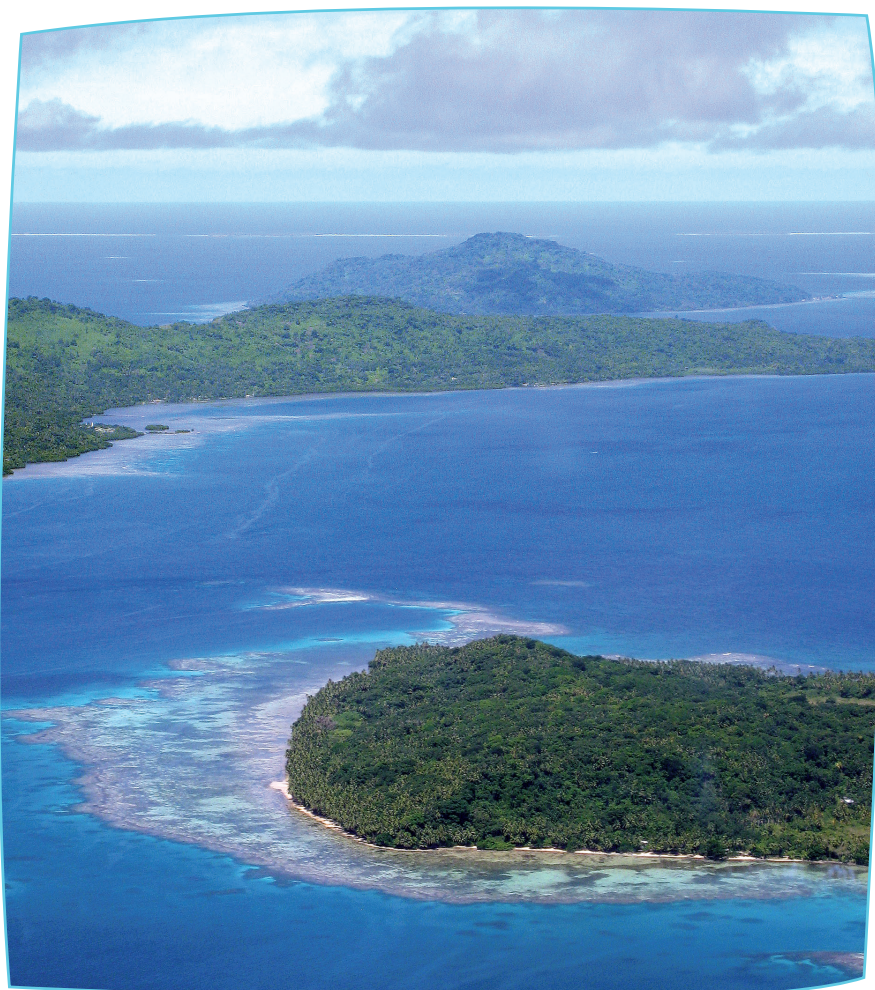
### **Capacity Building for a more resilient future**

Scientific research is one part of the solution; understanding and communicating the research is another. Increasing the understanding of climate change science in partner countries is important to ensuring evidence-based decision-making. In-country training is being provided in the use of the Pacific Climate Futures Tool and the Climate Data for the Environment (CliDE) data management system. The PACCSAP science team is holding an advanced climate science course (PAdClim) for Pacific Islander and East Timorese stakeholders in October 2012, and a regional workshop in the Solomon Islands in March 2013.

These activities aim to develop regional science capacity to support in-country engagement between key stakeholders in government and industry, donor agencies, the media and the general community. Through PACCSAP science attachment and mentoring activities, Australian scientists are working with partner country representatives and regional university students to undertake specific and relevant research projects to build scientific capacity in the region.

New and updated science will be communicated through a supplement to the PCCSP country reports an additional report will also synthesise the latest Pacific climate science knowledge in a user-friendly, non-technical way to a broader audience of key stakeholders.

It is intended that PACCSAP will provide a legacy of scientific knowledge and capability sufficient to ensure that Pacific island countries are better able to plan for and implement effective and efficient climate change adaptation.



**Australian Government**  
**Department of Climate Change**  
**and Energy Efficiency**  
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