

Whitepaper on Joint U.S./Australian Climate Activities
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It is widely recognized that the Pacific Island region is a critically vulnerable area of the world when it comes to the issue of climate change. Furthermore, given that the Pacific is the home of the El Niño Southern Oscillation (ENSO) phenomenon, an understanding of the science behind climate in the region has significant global implications. Climate change is science based so it is vitally important any climate change policies must be based on sound scientific advice. Since at least 2000, several scientists from the Australian Bureau of Meteorology (BoM); Commonwealth Scientific and Industrial Research Organization (CSIRO); and National Oceanic and Atmospheric Administration (NOAA) have been involved in a wide range of operational and research related science and capacity building activities with respect to the climate change science in the Pacific Islands region.

Much of this work has been documented under the Australia/U.S. Climate Action Partnership (CAP) bilateral first signed in July 2002. In addition, this work has been augmented by cooperation with New Zealand, as well as regional (e.g., SPREP and SOPAC) and national (e.g., Pacific Islands National Meteorological Services) organizations across the region. The scope of this proposed work has helped to raise awareness and the visibility of this invaluable work being done across the Pacific Islands region to improve overall climate services including: (1) improving climate observing infrastructure; (2) enhancing the exchange of critical climate data; and (3) exploring what further opportunities exist to further and enhance the work in the region.

Finally, many of these activities support the World Meteorological Organization's Global Framework for Climate Services that was agreed to at the 3rd World Climate Conference in September 2009, where it was agreed to strengthen production, availability, delivery and application of science-based climate prediction and services via:

- The Global Climate Observing System
- The World Climate Research Program
- A Climate services information systems
- Various climate-user interface mechanisms which link providers and users of climate services
- An efficient and enduring capacity-building strategy achieved through education, training, outreach, and communication

A summary of on-going projects is as follows:

- 1) **GCOS Technical Support Project** – Since 2003, this is the flagship bilateral climate observing effort co-sponsored by the U.S. GCOS Program Office at NOAA/NCDC and the New Zealand MetService. This facility has been instrumental in improving the operation of GCOS observing systems across the region by providing logistics, maintenance, data management, and training support to developing nations across the region. This work also involves a capacity building aspect that involves supporting a regional Pacific Island GCOS Program Leader based in Apia, Samoa, and a web interface at <http://pi-gcos.org> which provides a platform for regional meteorological services to run their own national web sites.
- 2) **Pacific Climate Information System PaCIS** – Dating back to regional planning begun in the late 1990s, this effort between the NOAA Integrated Data and Environmental Applications (IDEA) Center, the NWS in Hawaii, the U.S. GCOS Program Office, BoM, the New Zealand National Institute of Water and Atmosphere (NIWA), and various national meteorological services across the Pacific Islands region. PaCIS provides a programmatic framework to

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integrate ongoing and future climate observations, operational forecasting services and climate projections, research, assessment, data management, outreach, and education to address the needs of American Flag and U.S.-Affiliated Pacific Islands (USAPI). PaCIS and the concept of a Pacific Regional Climate Centre trace their roots back to the 1997-1998 El Niño season and initial discussions of Pacific climate services at a workshop held in conjunction with the 1999 Pacific Regional Environment Program's (SPREP) meeting of the Pacific Regional Meteorological Services Directors (RMSD). These early discussions identified a regional vision for *resilient and sustainable communities using climate information to manage risks and support practical decision-making in the context of climate variability and change*. PaCIS has embraced this same vision. PaCIS cooperation provides a way forward for establishing the foundation of a virtual Regional Climate Center for WMO Region V for the benefit of the entire Pacific Islands Region.

- 3) **Pacific Climate Change Science Program (PCCSP)** – The U.S. GCOS Program has partnered with Australia on the PCCSP. The PCCSP is part of the Australian Government's commitment to meet high priority climate change adaptation needs in vulnerable countries in the Asia-Pacific region, especially the Pacific island countries and East Timor. The PCCSP is delivered by the BoM and CSIRO, through their research partnership in The Centre for Australian Weather and Climate Research (CAWCR). PCCSP scientists are working closely with partner countries as well as with NOAA scientists in five key areas: (a) Past and current climate trends: scientists are working closely with partner countries to retrieve and analyze observed climate data to provide an accurate picture of past and current climate trends in partner countries; (b) Understanding the climate: investigating how features such as the El Niño-Southern Oscillation affect partner countries and how this might change with future climate change; (c) Climate change projections: developing projections for what the climate in partner countries may look like around the years 2030, 2055 and 2090; (d) Oceans and sea-level rise: scientists are working to understand how climate change is already affecting and will affect the oceans in areas such as sea-level rise and ocean acidification; and (e) Engagement and capacity building: working closely with partner countries to deliver research findings in practical and relevant ways.
- 4) **Historical Data Rescue and Associated Climate Research Efforts** – NOAA and BoM have worked collaboratively in a number of important climate efforts that include the spin-up of an Atmospheric Circulations for the Reconstruction of the Earth (ACRE) Pacific program [see <http://www.met-acre.org/>] that works to rescue and digitize previous paper-only climate records that can be incorporated in global climate databases to enhance the ability of climate models for producing better climate outlooks and associated products. Related work in this area includes collaborative work in improving the region's tropical cyclone climatology work via the International Best Tracks Archive for Climate Stewardship (IBTrACS) work done under the auspices of the World Data Center for Meteorology at NOAA's National Climatic Data Center at <http://www.ncdc.noaa.gov/oa/ibtracs/>.

In conclusion, the over decade-long cooperation between various parts of NOAA with climate science colleagues from both BoM and CSIRO have resulted in many positive interactions and outcomes that has resulted in benefits for the Pacific Islands region as well as for the international climate science community.