

## CLIMATE CHANGE PROFILE



**REPUBLIC OF PALAU**

**VERSION 2**

**SECRETARIAT OF THE PACIFIC COMMUNITY  
GLOBAL CLIMATE CHANGE ALLIANCE: PACIFIC SMALL ISLAND STATES PROJECT  
FUNDED BY THE EUROPEAN UNION**





# Palau (Belau)



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## CONTENTS

<b>OBJECTIVES OF THE CLIMATE CHANGE PROFILE .....</b>	<b>5</b>
<b>COUNTRY BACKGROUND .....</b>	<b>5</b>
<b>Government .....</b>	<b>5</b>
<b>National Strategy for Sustainable Development .....</b>	<b>6</b>
<b>Economy .....</b>	<b>7</b>
<b>Financial Management .....</b>	<b>7</b>
Aid Management.....	8
<b>RESPONSE TO CLIMATE CHANGE .....</b>	<b>8</b>
<b>Current and Future Climate .....</b>	<b>Error! Bookmark not defined.</b>
Current Climate .....	8
Expected Future Climate .....	9
<b>Institutional Arrangements for Climate Change.....</b>	<b>10</b>
<b>Ongoing Climate Change Adaptation Activities in Palau .....</b>	<b>10</b>
<b>National Climate Change Priorities.....</b>	<b>15</b>
<b>Gaps and Constraints.....</b>	<b>16</b>
<b>References .....</b>	<b>18</b>

## Acronyms

ADB	Asian Development Bank
ADF	Asian Development Fund
AusAID	Australia Agency for International Development
CCCPIR	Coping with Climate Change in the Pacific Island Region project implemented in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ)
CCPF	Climate Change Policy Framework
CCVAM-DRM	CC Vulnerability and Adaptation Management and Disaster Risk Management
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCCEE	Department of Climate Change and Energy Efficiency (Australia)
EEZ	Exclusive Economic Zone
ENSO	El Niño Southern Oscillation
FFA	Forum Fisheries Agency
FIC	Financial Institutions Commission
FSM	Federated States of Micronesia
GCCA: PSIS	Global Climate Change Alliance: Pacific Small Island States Project
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GoP	Government of Palau
IMF	International Monetary Fund
IUCN	International Union of Conservation of Nature
JNAP	Joint National Action Plan for Climate Change and Disaster Risk Management
MC	Micronesia Challenge
MCT	Micronesia Conservation Trust
MDG	Millennium Development Goals
MTDS	Medium Term Development Strategy
NCCCT	National Climate Change Country Team
NDBP	National Development Bank of Palau
NGO	National Governmental Organisation
ODS	Ozone Depleting Substances
OERC	Office of Environmental Response and Coordination
PACC	Pacific Adaptation to Climate Change Project
PACCSAP	Pacific Australia Climate Change Science and Adaptation Planning Project
PALARIS	Palau Automated Land and Resources Information Systems
PCAA	Palau Community Action Agency
PCC-CRE	Palau Community College Cooperative Research and Extension
PEFA	Public Expenditure and Financial Accountability Framework Assessment
PFM	Public Financial Management system
PIFS	Pacific Islands Forum Secretariat
SLM	Sustainable Land Management
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Environment Programme
TNC	The Nature Conservancy
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

## OBJECTIVES OF THE CLIMATE CHANGE PROFILE

This second version of the climate change profile for Palau has been prepared as part of the Secretariat of the Pacific Community's (SPC) Global Climate Change Alliance: Pacific Small Islands States (GCCA: PSIS) project. The Coping with Climate Change in the Pacific Island Region (CCCPIR) project funded by Germany (GIZ also assisted with the preparation).

The goal of the GCCA: PSIS project is to support the governments of nine Pacific smaller island states, namely Cook Islands, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Niue, Palau, Tonga and Tuvalu, in their efforts to tackle the adverse effects of climate change. The purpose of the project is to promote long term strategies and approaches to adaptation planning and pave the way for more effective and coordinated aid delivery on climate change, including the delivery of streamlined adaptation finance, at the national and regional level.

This climate change profile is specific in nature and seeks to inform the GCCA: PSIS project as well as the larger SPC climate change support team. It commences with a section on the country's background, including geography, economy, financial management and aid delivery. This is followed by a section focusing on the country's response to climate change, including climate change projections, institutional arrangements, ongoing adaptation activities and climate change priorities. The profile is a work in progress and will be revised and enhanced as the project develops.

## COUNTRY BACKGROUND

Country Information	
Geographic coordinates	Lat. 3°N–9°N, Long. 131°E–135°E
Total land area	488 km <sup>2</sup>
Length of coastline	1,519km <sup>i</sup>
Exclusive Economic Zone area	3,120,000 km <sup>2</sup>
Population (2011 estimate)	20,643
Population forecast (2015)	21,168
Annual Population Growth rate	0.6 %
Population density	41 people per km <sup>2</sup>
Access to improved water supply (2010 est.)	85% of population <sup>ia</sup>
Access to improved sanitation facilities (2010 est.)	100% <sup>ib</sup>
Human development index	0.791 <sup>11</sup>

### Introduction

Palau is located in the north-west tropical Pacific, 500 miles (800 km) east of the Philippines. There are over 500 islands in Palau most of which are the small, uninhabited Rock Islands. Only nine islands are currently inhabited and divided into 16 states. The total land area is 206 square miles (535 km<sup>2</sup>). About

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<sup>11</sup> The human development index (HDI) is a comparative measure of life expectancy, literacy, education, and standards of living for countries worldwide. It is a standard means of measuring well-being, especially child welfare. It is used to distinguish whether the country is a developed, a developing or an under-developed country, and also to measure the impact of economic policies on quality of life. The HDI score indicates that Tonga is in the medium human development category.

80% of the population live on Koror Island, also regarded a state. The capitol is in the state of Melekeok, centrally located on Babeldaob while Koror remains the center for commerce.

## Government

Palau was administered by Spain, Germany, Japan and the United States of America (USA) until it opted for a constitutional government under a Compact of Free Association with the USA. In accordance with the terms of the Compact, the USA remains responsible for Palau's defense for 50 years but, in all other respects the country is an independent nation and conducts its own foreign relations.

The system of governance is similar to the USA with federal and state level democratic representation. The Executive Branch consists of the President, Vice-President, and the Council of Chiefs. Assisting the top executives are the cabinet ministers and their supporting staff. The Vice President serves as one of the ministers. There are eight ministries, see Table 1.

Table 1: Ministries of Government

Ministry of Finance
Ministry of State
Ministry of Health
Ministry of Education
Ministry of Public Infrastructure, Industries and Commerce
Ministry of Community and Cultural Affairs
Ministry of Natural Resources, Environment and Tourism
Ministry of Justice

The National Congress or Legislative Branch is known as the Olbiil Era Kelulau, which means "House of Whispered Decisions." The Congress consists of two houses which sit for four-year terms. The House of Delegates has 16 members, one from each state. The Senate has 9 members selected in a nationwide election. The most recent election was in November 2012 and resulted in a change of Government.

## National Strategy for Sustainable Development

Palau's Medium Term Development Strategy (MTDS), Action for Palau's Future 2009–2014, sets out key strategies and actions to help achieve economic, social, environmental and cultural goals and is linked to the National Master Development Plan – Palau 2020. Underpinning the MTDS is the overall goal of *a sustained and widespread improvement in general standards of living while preserving cultural and environmental value for the people of Palau*. The following five priority policy actions have been identified to ensure meaningful focus and effective commitment:

- Fostering sustainable agriculture and fisheries income opportunities.
- Positioning Palau as an island of choice for environmentally conscious visitors and realizing higher returns to the nation from tourism.
- Making critical investments in sanitation, water and power with a prioritization of maintenance.

- Refining foreign investment and foreign worker policies to generate maximum sustainable benefits for Palau.
- Undertaking reforms to ensure a cost conscious and highly productive government.

Within each of these priority areas, action plans have been developed.

## Economy

<b>Economic Information</b>	
Gross Domestic Product (GDP (2008))	US\$180 million
GDP per capita (2008)	US\$8,812.3
Annual growth (2007)	2.5%
Inflation rate (2007)	2.3%
Unemployment rate (est. 2005)	4.2%

Palau has one of the highest standards of living among Pacific island countries. Its per capita GDP of \$8812 (2008) makes it one of the wealthier Pacific Island States. Tourism, government services and fishing are the main forms of formal economic activity in Palau. The service sector dominates the economy, contributing more than 80% of GDP and employing around half of the population. Government employs nearly 26% of the work force. The principal economic challenge confronting the country is to ensure the long-term viability of its economy in the face of decreasing external support.

Agriculture is mainly on a subsistence level. Fishing is a significant source of revenue, but the island's tuna output dropped by over one third during the 1990s. Palau's economic performance has been strongly driven by robust tourism. The near-term prospect is positive, albeit with some risks due to Palau's heavy reliance on tourism, grants, and food and fuel imports. While development of additional tourism infrastructure is a major priority of government, attention is also given to preserving the country's renowned pristine environment. Hence, promotion has been largely geared toward high-yielding, low-volume tourism. The country's efforts to preserve a pristine marine environment have recently received positive worldwide publicity.

## Financial Management

According to International Monetary Fund (IMF) findings (2012), authorities in Palau have made commendable efforts to reduce the current fiscal deficit (excluding grants) during FY2010–11, but the deficit remains sizable. Further reductions for FY2012 and 2013 have been hampered by the Typhoon Bopha recovery expenditure. Beyond FY2012, an average annual consolidation of 1.5% of GDP through the rest of the decade is needed to achieve fiscal sustainability. This would require comprehensive tax reform and sizable reductions in wage bills and subsidies. Promoting private sector development is key to sustaining growth in view of the needed fiscal consolidation.

In terms of public financial management, efforts are underway to implement a medium-term budget framework, as well as ongoing commercialization of water and sewer services with support from ADB. There is also considerable scope to further strengthen budget execution and cash management. The banking system is sound and the Financial Institutions Commission (FIC) has made progress in

strengthening banking supervision. To safeguard stability, a priority is to bring non-bank financial institutions, including the National Development Bank, under the FIC's oversight.

Palau's Public Expenditure and Financial Accountability (PEFA) assessment and initial Public Finance Management (PFM) consultations were scheduled for 2013. This process should provide detailed analysis of Palau's PFM and provide an opportunity to review climate change finance options.

### Aid Management

Palau currently relies on development partners to supplement its national budget. Palau's financial grant arrangement and relationship with the USA is formalised through the Compact of Free Association (Compact), an agreement that went into effect in 1994 and was subject to a bilateral review in 2009. The Compact provides funding for government services; building basic infrastructure (such as roads, power and communication facilities) and creating a Compact Trust Fund. An important element of the Compact is that the USA remains responsible for Palau's defense for 50 years.

Under the Compact, the US Government agreed to pay grants to Palau totaling around USD450 million spread over the period 1994 to 2009. USD70 million has been set aside in a trust fund, the balance of which now stands at more than USD140 million. Within the Compact, there are also provisions for major infrastructure projects, including the recent construction of a road around Babeldoab, the largest island. Additional provisions cover continuation of more than 40 US federal programs. In addition, a number of subsidiary agreements commit the US to continued provision, at no cost to Palau, of many vital services, such as air safety, weather forecasting, health services and natural disaster relief.

Development aid inclusive of the Compact funds plays a key role in the social and economic development of Palau. International and regional development partners provide approximately 50% of the annual government budget expenditures, equivalent to more than one-third of GDP. Multilateral and regional development agencies with which the government of Palau engages include a broad range of United Nations agencies; CROP agencies, including SPC and the Forum Fisheries Agency (FFA); and other regional commissions such as the Western and Central Pacific Tuna Commission. Key bilateral development partners include Australia, the European Union, Japan, Taiwan/ROC and the USA. Other development partners include the Asian Development Bank, the IMF and the World Bank.

## **RESPONSE TO CLIMATE CHANGE**

### Current Climate

Temperatures in Palau have very little seasonal variation. In Koror the mean daily air temperature is about 82°F (28°C) throughout the year and there is only a 1.5°F (0.8°C) difference between the hottest and coolest month. The average relative humidity is 82%. Being a small island surrounded by ocean, air temperatures in Koror are closely related to the sea-surface temperatures. February, March and April are the driest months in Koror and the main wet season is from May to October.

The West Pacific Monsoon is usually most active and brings heavy rainfall between June and August. Average rainfall remains above 8 inches (200 mm) in all months of the year due to Palau's location within the West Pacific Warm Pool and the year-long influence of the Inter-tropical Convergence Zone (ITCZ). Winds are generally moderate, and the north-easterly trades prevail from December through to March. During April, the frequency of trade winds decreases, and there is an increase in frequency of easterly winds. In May, the winds are predominantly from south-east to north-east.

The inter-annual variability in rainfall at Koror is high and is mainly influenced by the El Niño-Southern Oscillation (ENSO). Generally, El Niño years are drier than average and La Niña years are wetter. A



shortened wet season is usual for Koror during El Niño and a prolonged wet season is normal during La Niña years. The extended dry season can lead to water rationing, as was the case during El Niño events in 1997/98 and the first half of 2010.

Palau is south of the normal typhoon belt of the Western North Pacific, and consequently typhoons rarely hit Palau. Typhoon Bopha, in December 2012, caused significant damage but no casualties. Highest tides tend to occur around the equinoxes, with the September peak the larger of the two. There is a strong ENSO influence, with sea levels higher by over 0.3 ft (0.1 m) during La Niña years; and the increase is most pronounced from July to January.

### Expected Future Climate

Based on the Pacific Climate Change Science Program, projections for all emissions scenarios show that temperatures will continue to rise in Palau, as will sea level and ocean acidification. The intensity and frequency of days of extreme rainfall are projected to increase (high confidence) and tropical cyclone numbers are projected to decline in the tropical North Pacific Ocean basin (0–15°N, 130°E – 180°E) (moderate confidence).

While there is no consistency in ENSO projections, interannual variability in temperature for the region is expected to continue as a result of ENSO activity.

Table 2: Climate change projections for Palau for 2030 and 2055 under the high emissions scenario (A2).

Climate variable	Expected Change	Projected change 2030 (A2)	Projected change 2055 (A2)	Confidence level
Annual surface air temperature	Average air temperature will increase	+0.4 – 1.0°C	+1.0 – 1.8°C	High
Maximum temperature 1-in-20-year event	Increased number of very hot days	N/A	+0.9 – 1.9°C	Low
Minimum temperature 1-in-20-year event	Fewer cool nights	N/A	+1.0 – 1.8°C	Low
Annual total rainfall	Annual and seasonal mean rainfall will increase	+1 ± 11%	+2 ± 10%	Moderate
Dry season rainfall November - April	The incidence of drought is projected to decrease	+1 ± 15%	+2 ± 17%	Moderate
Wet season rainfall May - October		+1 ± 11%	+3 ± 9%	Moderate
Annual sea-surface temperature	Sea surface temperature will increase	+0.2 – 1.0°C	+0.8 – 1.6°C	High
Annual max. aragonite saturation	Ocean acidification will continue to	+3.2 – 3.6 Ωar	+2.8 – 3.2 Ωar	Moderate

Climate variable	Expected Change	Projected change 2030 (A2)	Projected change 2055 (A2)	Confidence level
state	increase			
Annual mean sea level (cm)	Sea level will continue to rise	+9 (4–15) cm	+20 (11–29) cm	Moderate

### Institutional Arrangements for Climate Change

The Office of Environmental Response and Coordination (OERC) is the National Focal Point for all climate change issues in Palau. The OERC functions as an autonomous agency under the Office of the President. In response to the requirement that OERC, as focal point for the UN Conventions, interact with a local environmental council of public and private stakeholders, the President created the National Environmental Protection Council (NEPC) in August 2003. After ten years of limited action, OERC is leading an effort to rejuvenate the NEPC through a supplemental Executive Order to be issued in the near future.

The OERC established a working group or National Climate Change Country Team (NCCCT), comprised of 16 state focal points, national government offices, non-government organizations (NGOs), the private sector, and traditional leaders, to engage stakeholders on climate change and environmental matters. The Palau Energy Office (under the responsibility of the Ministry of Public Infrastructure, Industries and Commerce), and the National Emergency Management Office (NEMO) under the Office of the Vice President, are two areas that did not appear to be included in the team in the published documentation. The team has not officially met for some time.

OERC is currently overseeing the development of a National Climate Change Policy Framework with the support of SPC GCCA:PSIS (EU) and CCCPIR (GIZ), as well as USAID. This effort includes consideration of designating an enhanced multidisciplinary team which may serve for both climate change and disaster risk management coordination and oversight.

The OERC has been engaged in the development of Palau's Second National Communication to the UNFCCC and Climate Change Action Plan and with the Grants Office and Ministry of Finance, have initiated the process to carry out a Climate Public Expenditure and Institutional Review (CPEIR) to assess Palau's readiness to be National Implementing Entity (NIE) to the Kyoto Protocol Adaptation Fund. Individual climate change projects such as PACC food security and SPC GCCA:PSIS water sector adaptation have steering committees.

The Palau Automated Land and Resource Information Systems (PALARIS) is the national geographic information system (GIS) for Palau. It can support cross-cutting initiatives such as climate change by integrating multiple sector data for remote sensing and risk management planning.

### Ongoing Climate Change Adaptation Activities in Palau

Title	Description, country focus and agencies responsible
Micronesia Challenge (MC)	Sub-regional conservation initiative which enhances community resiliency by using traditional knowledge and ecosystem strategies to conserve vulnerable coastal land resources by 2020; goals are to effectively conserve at least 30% of near shore resources and 20% of terrestrial resources.

Title	Description, country focus and agencies responsible
<i>2006 - ongoing</i>	<p>The MC includes: Micronesians in Island Conservation Network (MIC); Pacific Islands Managed and Protected Area Community (PIMPAC); Locally Managed Marine Area Network – Micronesia Node (LMMA); Micronesia Challenge Young Champions</p> <p>Agencies responsible: Micronesia Chief Executives (Guam, Marianas Islands, FSM, Palau and RMI); The Nature Conservancy (TNC); NOAA. Micronesia Conservation Trust (MCT)</p>
<p>Micronesia Conservation Trust (MCT)</p> <p><i>2002 - ongoing</i></p>	<p>MCT was formally established by TNC in 2002 as a charitable and irrevocable corporation organized to manage and provide funds for the accomplishment of the following mission: “to support biodiversity conservation and related sustainable development for the people of Micronesia by providing long term sustained funding.”</p> <p>In 2006, MCT was selected as the financial mechanism for the MC and has since fully regionalized its Board and organizational structure and services.</p> <p>Registered under FSM law, Board of Trustees. Palau MNRET, PCS</p>
<p>Pacific Islands Climate Education Partnership (PCEP)</p> <p><i>2011 Ongoing</i></p>	<p>Educates students and citizens across the Pacific about the urgency of climate change impacts in ways that exemplify modern science and honor indigenous cultures and environmental knowledge. This project, funded by the National Science Foundation (NSF), serves the United States-affiliated Pacific Islands</p> <p>Agencies responsible: US National Science Foundation (NSF), WestEd, Pacific Resources for Education and Learning (PREL), Palau OERC, Palau MoE.</p>
<p>Schools of the Pacific Rainfall Climate Experiment (SPaRCE)</p> <p><i>1995 - ongoing</i></p>	<p>The SPaRCE programme is to increase awareness of younger generations on global environmental issues such as climate change. Training and educational initiatives: students in the Pacific islands are being educated with hands-on experience on an important environmental subject, climate change, by involving them in the data collection of rainfall.</p> <p>Agencies responsible: University of Oklahoma and Palau MoE</p>
<p>Pacific Regional Integrated Sciences and Assessments (Pacific RISA)</p> <p><i>1995 -ongoing</i></p>	<p>Strives to enhance Pacific Island communities’ abilities to understand, plan for, and respond to a changing climate. Emphasizes the engagement of communities, governments, businesses, and scientists by translating scientific research into information and materials that are valuable for stakeholders in key sectors such as water resources. Climate focused water sector education and outreach is part of Pacific RISA’s core mission .</p> <p>Agencies responsible: National Oceanic and Atmospheric Administration (NOAA) and Palau Weather Office.</p>
<p>Pacific Adaptation to Climate Change Project (PACC)</p> <p><i>2009 - 2013</i></p>	<p>The PACC Project is designed to promote climate change adaptation as a key pre-requisite to sustainable development in Pacific Island countries. Its objective therefore is to enhance the capacity of the participating countries to adapt to climate change and climate variability in key development sectors. Mainstreaming, demonstration and communications are implemented at the community and country levels. In Palau PACC focuses on the food security sector, working to identify alternative solutions to farming patterns to ensure that food production is able to cope with climate change in the future. For example, PACC is working with farmers in Ngatpang state to identify and test varieties of taro which can grow in saltier water</p> <p>Agencies responsible: UNDP (implementing agency); GEF, AUSAID (funding agencies); SPREP (implementing partner), Palau OERC, Palau Bureau of Agriculture, Palau Community College</p>

Title	Description, country focus and agencies responsible
	(PCC)
<p>Pacific - Australia Climate Change Science and Adaptation Planning Program (PACCSAP)</p> <p>2011 - 2013</p>	<p>PACCSAP: supporting the government of Palau to develop improved climate change projections and adaptation planning activities. 2012-2013. Palau and 14 other Pacific countries are part of this A\$32 million project which builds on the foundation of the Pacific Climate Change Science Programme and the Pacific Adaptation Strategy Assistance Programme.</p> <p>Agencies responsible: USAID; Australian Department of Climate Change and Energy Efficiency (DCCEE); Australian Bureau of Meteorology, CSIRO, Palau Weather Service Office.</p>
<p>Asia Pacific Climate Change Adaptation Project Preparation Facility</p> <p>2011 - 2016</p>	<p>Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up. Overall available funding: 18m USD</p> <p>Agencies responsible: USAID (Funding), WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA (Implementation)</p>
<p>Implementing Sustainable Water Resources and Wastewater Management in Pacific Island Countries (Pacific IWRM)</p> <p>2008–2013 with Phase 2 (2013-2015) and 3 (2015-2018) being planned</p>	<p>Pacific IWRM is developing “Ridge to Reef – Community to Catchment” integrated water resource management (IWRM) activities in the 14 participating Pacific Island Countries. It aims to improve water resource and wastewater management and water use efficiency in Pacific Island Countries. This will balance overuse and conflicting uses of scarce freshwater resources through policy and legislative reform and implementation of applicable and effective Integrated Water Resource Management (IWRM) and Water Use Efficiency plans. This is based on best practices and demonstrations of IWRM approaches.</p> <p>In Palau the main focus has been on development of water policy, legislation and a watershed management demonstration activity. Phase 2 likely to focus on total marine preservation of Palau’s EEZ, leading to replenishing of fisheries in international waters</p> <p>Agencies responsible: Global Environment Facility (GEF), SPC Applied Geosciences Division. Palau Environmental Quality Protection Board</p>
<p>Pacific Environment Community Fund (PEC)</p> <p>2012–2014</p>	<p>Will establish a solar-powered desalination project, to ensure a regular and reliable supply of safe drinking water to residents in Peleliu, Palau. The project includes the installation of a solar-powered Reverse Osmosis plant that desalinates brackish groundwater using solar energy, producing fresh water. Overall available Funding for Palau is US\$4 million</p> <p>Agencies responsible: Government of Japan through the Pacific Islands Forum Secretariat (PIFS), Palau Ministry of Public Infrastructure, Industries and Commerce, Energy Office, and Bureau of Public Works.</p>
<p>SIDS DOCK Solar PV System for Kayangel State water resources,</p> <p>2013–2015.</p>	<p>To promote renewable energy, energy efficiency, and contribute towards sustainable development. Activities in Kayangel include technical evaluation and engineering design of the solar powered water pumping systems, including the water storage tank, procurement of required hardware and components, and installation, testing, commissioning, operation, monitoring and evaluation of the solar power water pumping system, as well as development of a sustainable follow-up plan.</p> <p>Agencies responsible: UN Development Programme (UNDP), World Bank and the Government of Denmark, Palau Energy Office</p>

Title	Description, country focus and agencies responsible
Water Sector Improvement Program, 2011-2015	To address regulatory, management, technical and pricing problems that currently result in high water losses and undermine cost recovery in the states of Arai and Koror. This project supported the merging of the PWSC with the Palau Public Utilities Corporation and will provide other training and technical assistance in areas such as leak detection that could be expanded to the outer island states with the support of the GCCA: PSIS project. Overall Funding Available: A loan fund equivalent to \$16 million USD  Agencies responsible: ADB, Palau PUC/PWSC
Global Climate Change Alliance: Pacific Small Island States (GCCA:PSIS) 2011 - 2014	The overall objective of the GCCA:PSIS is to support the governments of nine Pacific smaller island states, including Palau, in their efforts to tackle the adverse effects of climate change. The purpose of the project is to promote long term strategies and approaches to adaptation planning and pave the way for more effective and coordinated aid delivery on climate change at the national and regional level. Overall available funding is 11m EUR.  In Palau, the project mainstreaming component in partnership with CCCPIR is supporting the development of a National Climate Change Policy Framework, towards which a Gaps and Needs Assessment and Community Engagement Strategy has been undertaken, with further work on a Policy Framework and Adaptation Action Investment Plan planned for 2013/14. The adaptation activity is addressing water sector climate change vulnerabilities in the outlying island states of Palau. Other activities include training for media, input into the regional Climate Change Portal and project proposal writing using a logical framework approach.  Agencies responsible: EU, SPC (Implementation), SPREP, Palau MoS, OERC, PWSC
USP-EU GCCA Project 2011 - 2014	The USP-EU GCCA project addresses the challenges of climate change impacts in the 15 Pacific ACP countries, including Palau, through Capacity Building, Community Engagement, and Applied Research. Overall available funding is 8m EUR.  Agencies responsible: European Union (EU), University of the South Pacific (USP); Palau: Palau International Coral Reef Centre
North Pacific ACP Renewable Energy and Energy Efficiency Project (North-REP) 2010 - 2014	The overall objective of North-REP is to improve the quality of life on the outer islands by increasing access to basic electricity and reducing dependency on fossil fuels through energy efficiency and increased penetration of matured renewable energy technologies in the North-REP countries (FSM, RMI and Palau). Technical Assistant to Palau is conducting wind monitoring project. Overall available funding is 10m USD.  Agencies responsible: EU, SPC (implementing agency) Palau Energy Office
Palau Sustainable Economic Development for Renewable Energy Application (SEDREA) 2008 - 2013	The project addresses an increased access to financing of renewable energy projects, establishment and implementation of regulatory frameworks that are supportive of renewable energy, and productive uses of renewable energy in line with enhancing socio-economic growth in Palau's rural areas. In Palau, the project makes National Development Bank loans for renewable energy available to homeowners Total budget: 975,000 USD  Agencies responsible: GEF, UNDP. Palau Energy Office
Coping with Climate Change in the Pacific Island Region (CCCPIR)	CCCPIR covers 12 Pacific Island Countries and six components ranging from regional and national mainstreaming of climate change, implementation of adaptation activities on the ground, and climate change related to tourism, energy and education. In Palau CCCPIR focuses on integrated land and marine resources on the national and on coastal impacts on the local level. In addition CCCPIR will support community tourism initiatives and support reducing of greenhouse gas

Title	Description, country focus and agencies responsible
2009 - 2015	<p>emissions through public private partnership in the tourism sector. Overall available funding is 17m EUR.</p> <p>Agencies responsible: German Ministry for Economic Cooperation and Development (BMZ, funding), German International Cooperation (GIZ, implementing agency), SPC (regional partner), OERC</p>
Palau Sustainable Land Management Project 2005 - 2012	<p>The project provides support for sustainable land management technologies to minimize land degradation problems; and stabilize the rural community socially, economically and environmentally. Consultations undertaken and community management plans developed are now contributing to climate change planning and policy framework development.</p> <p>Total budget: 500,000 USD</p> <p>Agencies responsible: UNDP, PALARIS</p>
National Climate Change and Health Action Plan (NCCHAP)	<p>Regional Framework for action to protect human health from effects of climate change in the South East Asia and Pacific region.</p> <p>Agency responsible: WHO, WSO, Palau MOH</p>
Asia Climate Change Adaptation Support Facility (ADAPT Asia-Pacific), 2011-2016	<p>Provides capacity building and governance support for adaptation planning and implementation in 13 Asian countries including Timor-Leste, and 14 Pacific Islands countries to: (i) strengthen human and institutional capacity to prepare high-quality climate change adaptation investment proposals; (ii) accelerate and ensure sustained access to financial resources for climate change adaptation investment projects; and (iii) support and strengthen a regional knowledge platform to share and replicate best practices.</p> <p>Responsible Agencies USAID/RDMA program under IAA with State/OES AECOM, Palau OERC</p>
Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) 2007- 2015	<p>Aims to provide the Pacific Island Countries (PICs) with disaster risk modeling and assessment tools to help them better understand, model, and assess their exposure to natural disasters, and to engage in a dialogue on integrated financial solutions for the reduction of PICs financial vulnerability to natural disasters and to climate change. The initiative is part of the broader agenda on disaster risk management and climate change adaptation in the Pacific region.</p> <p>Responsible Agencies: SPC, WB and ADB, Japan, Pacific Disaster Centre, with technical inputs from GNS Science, Geoscience Australia, and AIR Worldwide</p>
Coastal Community Adaptation Project (C-CAP), 2013-2017	<p>This project aims to build the resiliency of vulnerable coastal communities in the Pacific region to withstand more intense and frequent weather events and ecosystem degradation in the short-term, and sea level rise in the long-term. The project has three components: (1) rehabilitating or constructing new, small-scale community infrastructure; (2) building capacity for community engagement for disaster prevention and preparedness; and (3) integrating climate resilient policies and practices into long-term land use plans and building standards</p> <p>Responsible Agencies USAID Implementing Organization: Development Alternatives, Inc. (DAI), University of the South Pacific (USP); Kramer Ausenco Papua New Guinea Limited, Palau OERC</p>

Title	Description, country focus and agencies responsible
Assistance with National Climate Change Strategy and Road Map for implementation.  <i>2013-2016</i>	Assistance in developing an appropriate climate change roadmap that is responsive to local cultural, economic, and technical needs, including fostering cooperation and consensus on climate change priorities among government, local environmental non-governmental organizations, state governments, and impacted communities, drawing on their prior experience and identified needs. Building on the Climate Change Policy Framework development being undertaken in 2013/14 with the support of SPC GCCA:PSIS (EU) and CCCPIR (GIZZ) this project will engage an Associate Climate Change Coordinator as liaison with the U.S. Embassy to work within OERC to assist in identifying immediate, mid, and long-term prioritized needs, and formulate a clear, comprehensive, and practical strategy for addressing them through follow-on government, community, and international donor and/or lending institution actions.  Responsible Agencies: U.S. Government, Palau Ministry of State, OERC
Palau Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management  <i>2013-2018</i>	Following a request by Palau in 2013, CROP agencies are organising assistance for Palau with the development of this plan which will be closely linked to the Climate Change Policy Framework currently being developed with support from GCCA: PSIS and CCCPIR, and the US supported "Roadmap"
Science and Technology Research Partnership for Sustainable Development (SATREPS) Project for Sustainable Management of Coral Reef and Island Ecosystems: Responding to the Threat of Climate Change  <i>2013-2018</i>	Through studies on biodiversity, ocean acidification, sea level rises, economical evaluation of ecosystems, and sustainable management of ecosystems in watershed areas, the project will make significant contributions by strengthening scientific research and human resource development in Palau, which are both necessary for the sustainable maintenance of island ecosystems. Demonstrating a scientific backbone of deeper understanding of ecosystem services in terms of tourism, biological resources, bio-remediation etc. In addition, the project is expected to produce policy options for Palauan government authorities that will lead to the integrated sustainable management of ecosystems and the implementation of proposals. These options will be based on scientific information, and discussions with researchers and government officials in Palau about possible countermeasures against the impacts of both climate change and local scale human activities. Funding available is approximately \$1,000,000 per year.  Agencies responsible: Japan Science and Technology Agency (JST), Japan International Cooperation Agency (JICA) University of the Ryukyus, Palau International Coral Reef Center (PICRC) and Palau Community College (PCC).

### National Climate Change Priorities

In its National Communications to the UNFCCC, Palau has identified its main vulnerabilities due to climate change as being related to: increased drought and storm activity; extreme high tides; sea level rise; coastal erosion; habitat fragmentation; sea surface temperature rise; and coral bleaching. In subsequent work including the recent draft Gaps and Needs Analysis supported by GCCA:PSIS and CCCPIR, Palau has identified a number of potential adaptation actions in the areas of water,

agriculture, coastal systems, marine resources, forestry, human health and policy and planning, including building on the Protected Areas Network framework:

- 1) Water: improved management and maintenance of existing water supply systems is a high priority; centralized water treatment in urban centres; catchment protection and conservation; and drought and flood preparedness strategies.
- 2) Agriculture: identify and document the uses, potential uses and preferred growing environment for trees and plant species in order to better enable selection of species suited to a particular physical environment; introduction of salt-tolerant root crops for use in low-lying areas; breeding more drought resistant cultivars and crops for use in drought prone upland areas; introduction of alternative cultivation practices such as use of irrigation and raised-bed systems; improved soil and water conservation practices; promote use of agroforestry; preservation and dissemination of traditional knowledge; and diversification of subsistence crops.
- 3) Coastal systems: enhance protection of mangrove forest areas and sensitive coral reef systems to help maintain their natural storm and erosion protection capacity while also sustaining their productivity; protection of foreshore resources through re-vegetation and the establishment of setbacks; establishment of sea walls in very specific areas (due to their high costs); and pollution control measures.
- 4) Marine resources: development and extension of marine breeding and restocking programs for fish, giant clams and corals; expansion of marine reserves and protected areas; enhanced monitoring and enforcement of marine related legislation; and strengthening the monitoring of migratory fish stocks.
- 5) Forestry: expansion of community based forest conservation projects and conservation focused forestry activities.
- 6) Human Health: public awareness programs related to malaria, dengue fever and other diseases; and reduction in mosquito breeding sites.
- 7) Policy and Planning: develop an overall vulnerability and adaptation strategy that also addresses wider development, social and environmental issues that includes: a national policy framework for adaptation; capacity building and institutional strengthening; public awareness and education; and community-based management.

A 2009 ADB study suggests identified gaps may be partly addressed by reducing uncertainty and increasing resilience through the practical introduction of:

- Improved short-term weather forecasting of extreme weather events.
- Development of longer-term downscaled climate change models (both projections and predictive) and impact and risk scenarios.
- Blending of traditional (reactive and anticipatory) adaptation knowledge and practices with contemporary (science-based) knowledge and adaptation toolkits.
- Localized GIS-based risk mapping of vulnerable sites; and targeted V&AA pilots
- Climate proofing of infrastructure

The SPC GCCA: PSIS project in Palau will be addressing water sector climate change vulnerabilities in the outlying states of Palau. The project will include the following: assessment of water sources and climate-related risks; reduction of leakages; upgrading and installation of appropriate water harvesting, storage facilities and additional water sources; training of operators and other stakeholders; examination of options to incentivise sustained best water management practices in the face of climate change; and a public awareness and education campaign for the residents to enable community empowerment and ownership of water resources.

### **Key Challenges to Adaptation**



A study by the ADB showed that the Government of Palau (GoP) is generally committed to climate change adaptation principles and activities under its United Nations Framework Convention on Climate Change (UNFCCC) Second National Communication, and this is reflected in the requests for assistance to the international community in developing a Climate Change Policy Framework and Joint National Action Plan for Climate Change and Disaster Risk Management. However, some key challenges still remain and will compromise future long term efforts unless effectively addressed.

Multi-sectoral and line ministry consultations have demonstrated a key gap in the GoP's understanding of the anticipated impacts of climate change extremes and variability on overall economic development, including livelihood security, food security and infrastructure resilience. Moreover, a review of line ministry documents and multiple agency consultations demonstrate that there is limited actual adaptation mainstreaming in GoP policies and actions, or within private sector and NGO circles.

There is not a dedicated climate change implementing unit mandated to take on on-going responsibility of planning and response to climate change issues.

Some reviews, e.g. by ISDR and ADB, have noted a gap between the Government's centralized climate change agenda on the one hand and the understanding of environmental networks, the private sector tourism industry and communities on the other hand. Some sectoral plans are in development but strong mechanisms to coordinate, monitor and evaluate the progress towards climate change resilience need to be established. Growing complexity of emerging political climate change issues such as relocation along with a lack of leadership across the sectors are also cited as a challenge.

Given that many climate change activities implemented in Palau are project based, with 3-5 year time frames, the results and outcomes may not always be sustainable. The impact of Typhoon Bopha highlighted the lack of building codes and integrative planning at the local, state and national levels that include vulnerability and adaptive assessment. Palau is already making efforts or/considering ways to prepare a financing strategy for disaster risk management and climate change activities and to tailor new projects to address specific gaps in their national agenda, and this approach needs to be maintained and expanded.

Raising public awareness about climate change risks is another important activity that needs to be implemented through a planned process, thereby moving away from ad hoc approaches that risk mixed messaging at the village level. Limited availability of user friendly reliable climate data and information is also a major challenge.

Of particular note are technical capacity constraints. There is a general lack of highly skilled personnel in permanent positions to take on the task of managing climate change risks over the near and long term. Short term personnel and project personnel only go some way to addressing this gap. Climate change education at primary, secondary and tertiary levels, short term training, on-the-job training and job attachments are critical to address the capacity gap. So, too, is the need to develop innovative ways to retain skilled personnel in country through appropriate levels of remuneration and other means.

Another key challenge for Palau is to ensure that gender-sensitivity and disability inclusiveness are addressed in its climate change programmes, projects and activities. Climate change affects communities and individuals in different ways and it is important to ensure that climate change activities are fully inclusive of these special groups. The active participation of communities and NGOs in resilience building such as the Protected Areas Network and Local Early Adaptation Planning has helped, but social aspects of climate change need further work. Integration of climate change into national, sector and community programs, projects and activities is needed on a continual basis over

the long term; and there is a need to create an enabling environment for engaging with both local communities and national level government. This includes the need for predictable resources.

## References

<sup>i</sup><http://www.nationsencyclopedia.com/geography/Morocco-to-Slovakia/Palau.html>. Retrieved from the Internet April 26 2013

<sup>ia</sup><http://data.worldbank.org/indicator/SH.H2O.SAFE.ZS>. Retrieved from the Internet April 26, 2013

<sup>ib</sup><http://data.worldbank.org/indicator/SH.STA.ACSN/countries/PW?display=graph>. Retrieved from the Internet April 26, 2013.

Asian Development Bank – Pacific Department. 2009. *Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)*. Project No. 43071: Regional – Capacity Development Technical Assistance.

Asian Development Bank. 2011. *Environmental Laws and Regulations in ADB Developing Member Countries*. Environmental Laws and Regulations. Available at: <http://www.adb.org/Environment/laws-regulations.asp#Palau>

Asian Development Bank. 2009. *Climate Change and Adaptation Road Map: Palau – Country Partnership Strategy (2009 – 2013)*. May, 2009

Asian Development Bank. 2009. *Technical Assistance Report: Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase I)*. ADB TA 7394-REG

Asian Development Bank. 2007. *Technical Assistance Report: Republic of Palau – Facility for Economic and Infrastructure Management*. Project No: 40595; May, 2007.

Barnett, J., 2001: Adapting to climate change in Pacific Island Countries: The problem of uncertainty. *World Development*, 29, 977-993

Burns, W.C.G., 2002: Pacific island developing country water resources and climate change. In *The World's Water (3rd Edition)*. P. Gleick (ed), pp. 113-132.

Hayes, S. 2011. *Palau and Sea Level Rise*. ICE case study number 242. (October 08, 2011)  
Available at: <http://www1.american.edu/ted/ice/palau.htm>

Hay, J. and Bells, G. 2007. *Technical Assistance Consultant's Report – Regional: Mainstreaming Environmental Considerations in Economic and Development Planning Processes in Selected Pacific Developing Members Countries*. Project No. 38031. April, 2007.

International Monetary Fund. *Republic of Palau – 2012 Article IV Consultation*. IMF Country Report No. 12/54. IMF, Washington, D.C.

Kloulechad-Singeo, A. 2011. *Cultural Mapping – Republic of Palau*. Secretariat of the Pacific Community, Ministry of Culture and Community Affairs – Government of the Republic of Palau.).

Meyn, M. 2008. *Working Paper 288: Economic Partnership Agreements: A 'historic step' towards a 'partnership of equals'?*. Overseas Development Institute, London

Ngemaes, D., Ngirengkoi, D. and Sisor, G. (n.d.) *Climate, climate variability and change of Republic of Palau*. NOAA National Weather Services. Pacific Climate Change Science Program.

Pacific Climate Change Science Program. Australian Bureau of Meteorology and CSIRO, 2011. *Climate Change in the Pacific: Scientific Assessment and New Research*. Volume 1 Regional Overview, Volume 2 Country Reports.

Republic of Palau. 2006. *Workshop on Climate Variability and Change in the Republic of Palau*. Republic of Palau Workshop summary.

Republic of Palau Government and United Nations Development Programme *Capacity Building for Sustainable Land Management for Mitigation of Land Degradation*. Palau Automated Land and Resources Information System (PALARIS).

Republic of Palau and United Nations Development Programme. 2009. *Republic of Palau – Country Snapshot*.

Republic of Palau - Office of Environment, Response and Coordination. OERC Grant Status. Updated June, 2011.

Republic of Palau Office of the Environmental Response and Coordination. UNFCCC Second National Communication. 2008. A Preparatory Workshop on Vulnerability and Adaptation Assessment for the Republic of Palau. Unpublished report.

Republic of Palau and Secretariat of the Pacific Community (SPC). 2010. *National Disaster Risk Management Framework 2010*.

Republic of Palau and Secretariat of the Pacific Community. 2009. *Joint Country Strategy 2009 – 2013*. Secretariat of the Pacific Community: Noumea, New Caledonia. (February 07, 2012).

Republic of Palau and Strategic Engagement, Policy and Planning Facility. *Palau and SPC Joint Country Strategy*. October 2011 report.

Republic of Palau and UNDP. (n.d.) *Country Programme Action Plan (CPAP) 2008 – 2012 between the Government of Palau and United Nations Development Programme Fiji Multi-country office*

Republic of Palau – Office of Environment, Response and Cooperation-Climate Change Division. *Republic of Palau Vulnerability and Adaptation Assessment report*. Draft. (April 25, 2012).

Republic of Palau and World Health Organization. 2011. *National Climate Change and Health Action Plan for Republic of Palau*. (February 07, 2012).

Stevens, C. 2006. *Briefing Paper. Economic Partnership Agreements (EPAs): Where We Are*. Overseas Development Institute, London.

UNDP, SPREP Developed in collaboration with the Office of Environmental Response and Coordination *Pacific Adaptation to Climate Change: Palau Project Proposal*.

*PACC Survey Report (Part 2)*. 25 August 2011.

*Partnership for Development between The Government of the Republic of Palau and the Government of Australia*.

United Nations Environment Programme. *Climate Change – EA: Enabling Activities; Palau: Preparation of the First National Communication under UN Framework Convention on Climate Change (UNFCCC)*. Main project No. IMIS: GFL-2328-2724-4769; PMS: GF-2010-04-06. Subproject No. IMIS: GFL-2328-2724-4896; PMS: GF-2010-04-08. (October 10, 2011).

*The Medium Term Development Strategy: Actions for Palau's Future 2009 – 2014*. (October 12, 2011).

World Bank, 2002: *Cities, Seas and Storms: Managing Change in Pacific Island Economies*. World Bank, Washington, D.C

World Bank, 2006: *Not If, But When: Adapting to Natural Hazards in the Pacific islands Region: A Policy Note*. World Bank, Washington, D.C., USA, 60 pp.