

Pacific Islands Climate Services Forum Outcomes and Final Report

*University of the South Pacific (USP), Laucala Campus, Suva, Fiji
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The views expressed in this document are those of the authors and the participants of the workshop, and do not necessarily reflect the official views or policies of the U.S. Government or NOAA.

Front Cover Images: (Top) Group photo of the PICSF participants (Credit: C. Ward); (Bottom Left) Session 1 Panelists (Credit: B. Parker) (Bottom Right); Participants taking part in break out session discussion (Credit: C. Ward).

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Executive Summary

Addressing the impacts of climate change and variability has been recognized as an urgent issue at the very highest level of government in the Pacific islands. While great strides have been made by the communities, countries and through regional organizations, the Pacific leaders continue to call for assistance as they strive to understand, predict, and adapt to a changing climate.

“Climate services” refers to the timely production and delivery of useful climate data and information to decision-makers or anyone who uses climate data and information in the decision process (government and business planners, small business owners, communities, health care providers, farmers, etc.). The transformation of climate-related data and information into actionable knowledge is essential to many aspects of policy, planning, and decision-making, and the demand for it is growing. The 14th Regional Meteorological Services Directors meeting in 2011, for example, recognized that the provision of climate services was critical to the sustainable development of Pacific Island countries.

The Pacific Islands Climate Services Forum was held on 21 – 25 January 2013 at the University of the South Pacific (USP) Laucala Campus in Suva, Fiji. Hosted by the Pacific Climate Information System (PaCIS) through the National Oceanic and Atmospheric Administration (NOAA) and the USP Pacific Centre for Environment and Sustainable Development (PACE-SD), the Forum brought together over 200 participants from the Pacific Islands and the world. The intent of the Pacific Islands Climate Services Forum was to raise the awareness of and engage in a dialogue about climate services, and thereby advance climate services in the Pacific Islands. The Forum was also intended to strengthen and build new relationships between producers and users of climate information to address issues of critical importance to the region.

FOR THE FORUM AGENDA, PRESENTATIONS AND BREAKOUT SESSION SUMMARIES

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The Pacific Islands Climate Services Forum was organized around three components; a Training, Workshop and Dialogue, and Partners Meeting. A one-day Training focused on how to access and use available data, products, and tools to help inform community-based climate adaptation strategies. The three-day Workshop served as a means to share local knowledge on climate change and impacts and implementation of adaptation projects, review the state of climate science and resources, and to inform the development and delivery of new or improved products and services that support near and long term decision-making. The Forum culminated in a one-day Partners meeting where representatives from almost 30 agencies, institutions, and organizations

involved in climate services in the region met to exchange information on and align projects and activities. These discussions were placed in the context of the World Meteorological Organization (WMO) Global Framework for Climate Services (GFCS) and the outcomes of the Workshop as a way to minimize duplication of effort, maximize the use of resources in the Pacific, and foster continued growth in the regional culture of cooperation.

As a result of the Forum, participants are able to more easily access and make better use of information to support their specific interest and need. Local/regional policy and decision-makers have an increased awareness of best practices they can take back and act upon to address climate issues critical to them. Researchers and program managers have an understanding of product and services requirements that take into account local/regional variation in climate drivers, issues, capacities, and cultures.

Guiding Principles and Lessons Learned from the Workshop held on 22-24 January include:

- Create an ‘enabling environment’ that empowers communities by driving projects, products, and services from a grassroots level; community ownership and participation from the beginning leads to more sustainable and successful outcomes.
- Tailor products and services to the user by making them specific to sector and locale as well as keyed to the nature and timing of decision-making; affinities that can be leveraged do exist.
- Tailor products and services to the user by placing them within the local context and way of understanding and through translation into local languages and dialects: scientific integrity must be preserved.
- Use trusted messengers and established pathways to translate and disseminate information (e.g. Met Service Directors as entry points): these respected mechanisms can be improved.
- Scientific information rests on a foundation of traditional knowledge; traditional knowledge should be gathered and preserved.
- Engagement of underrepresented and vulnerable community members is a key part of the process.
- Build long-term capacity in the region through educational and professional mentorships.
- Cross-sector approaches that support integration (e.g. disaster risk reduction in coordination with climate change adaptation planning in coordination with sustainable development) are necessary in a changing climate.
- It is essential that existing donors, program managers, communities, NGOs, etc. coordinate in order to avoid duplication, build and leverage existing partnerships, and address the disparity between funding cycles and the reality of implementing what are long-term projects and the lack of continuity this creates; recognize that “things take time in the islands”. Success depends on long term relationships.

The Forum is one in a series of activities NOAA is conducting over the next two years to support climate change adaptation in the Pacific Small Island Developing States (PSIDS) by enhancing scientific and technical capacity. The outcomes of the Forum will be used to inform the development and delivery of targeted products and services, including in-country trainings throughout the region.

Among Key findings from the Partners meeting held on 25 January:

- The GFCS is a robust framework for investigating organizational structures and functions that already exist in the region, thereby harmonizing the development and delivery of new or improved products and services that meet the needs of local, national, and regional decision-makers for actionable information.
- Considerable climate-related information exists in the region. However, improved coordination is needed to ensure that this information is consistent (e.g., through enhanced data sharing and integration of portal content) and that it reaches end-users in a form that is meaningful (e.g., through capacity building of national met services and the enhancement of their distribution networks).
- There is a high demand for seasonal forecasts that are both sector and community-specific.
- There is a need to increase donor interest in assisting the development and maintenance of existing monitoring networks to understand change and manage resources.

Additional opportunities to increase awareness on the importance of climate services in the Pacific were identified, and included messaging with a one-region voice to the SPREP/SPC Ministerial meetings, the Pacific Island Forum, and utilizing the Pacific Met Council. Next steps include follow up communications with Partners to move forward on the actions and needs identified during this meeting.

The Forum

Background

Located across a vast expanse of Ocean, the Pacific Islands are exposed to changes in climate and weather that affect every aspect of life. As documented in recent regional assessments, ocean and island ecosystems are changing with warming air and ocean temperatures, shifting rainfall patterns, changing frequencies and intensities of storms, decreasing base flow in streams, rising sea levels, and changing ocean chemistry. Fresh water supplies for natural systems, communities and businesses are at risk. Food security is threatened through impacts on both agriculture and fisheries. Communities on low-lying atolls are particularly at risk and the built environment on all islands is at risk from coastal inundation. Loss of critical terrestrial and coastal habitat is expected along with increased coral bleaching episodes, adversely impacting the distribution and survival of the areas' biodiversity. Together, these changes will make it increasingly difficult for many Pacific Islanders to sustain their unique communities and cultures.

Addressing the impacts of climate change and variability has been recognized as an urgent issue at the very highest level of government in the Pacific islands. While great strides have been made by the communities, countries and through regional organizations, the Pacific leaders continue to call for assistance as they strive to understand, predict, and adapt to a changing climate.

“Climate services” refers to the timely production and delivery of useful climate data and information to decision-makers or anyone who uses climate data and information in the decision process (government and business planners, small business owners, communities, health care providers, farmers, etc.). The transformation of climate-related data and information into actionable knowledge is essential to many aspects of policy, planning, and decision-making, and the demand for it is growing. The 14th Regional Meteorological Services Directors meeting in 2011, for example, recognized that the provision of climate services was critical to the sustainable development of Pacific Island countries.

Approach

The Pacific Islands Climate Services Forum was held on 21 – 25 January 2013 at the University of the South Pacific (USP) Laucala Campus in Suva, Fiji. Hosted by the Pacific Climate Information System (PaCIS) through the National Oceanic and Atmospheric Administration (NOAA) and the USP Pacific Centre for Environment and Sustainable Development (PACE-SD), the Forum brought together over 200 participants from the Pacific Islands and the world to raise the awareness of and engage in a dialogue about climate services.

Participants included climate scientists, meteorological service representatives, resource and disaster risk managers, community planners and other decision-makers, representatives of government ministries, postgraduate students, and the greater climate services community, as

well as and other program managers, donors and policy makers. It was the largest gathering of climate-related technical experts and community practitioners that participants recalled within the region to date.

The Pacific Islands Climate Services Forum was organized around three components; a Training, Workshop and Dialogue, and Partners Meeting. A one-day Training focused on how to access and use available data, products, and tools to help inform community-based climate adaptation strategies. The three-day Workshop which consisted of a series of speaker panels and breakout group discussions served as a means to share local knowledge on climate change and impacts and implementation of adaptation projects, review the state of climate science and resources, and to inform the development and delivery of new or improved products and services that support near and long term decision-making. The Forum culminated in a one-day Partners meeting where representatives from almost 30 agencies, institutions, and organizations involved in climate services in the region met to exchange information on and align projects and activities. These discussions were placed in the context of the World Meteorological Organization (WMO) Global Framework for Climate Services (GFCS) and the outcomes of the Workshop as a way to minimize duplication of effort, maximize the use of resources in the Pacific, and foster continued growth in the regional culture of cooperation.

PACIFIC ISLANDS CLIMATE SERVICES FORUM OBJECTIVES

- RAISE AWARENESS OF THE CAPABILITIES OF METEOROLOGICAL, OCEANIC AND ATMOSPHERIC KNOWLEDGE AVAILABLE AND USED IN VILLAGES AND COMMUNITIES TO SUPPORT CLIMATE ADAPTATION PLANNING AND DISASTER RISK MANAGEMENT.
- RAISE AWARENESS OF THE STATE OF KNOWLEDGE OF CLIMATE SCIENCE, IMPACTS, AND ADAPTATION AND AVAILABLE CLIMATE AND WEATHER SERVICE PRODUCTS AND SERVICES.
- IDENTIFY WHAT CAPABILITIES, INCLUDING RESEARCH AND MODELS, PRODUCTS AND SERVICES, AND TRAINING, ARE NEEDED TO SUPPORT COMMUNITY-BASED CLIMATE ADAPTATION PLANNING AND DISASTER RISK MANAGEMENT.
- INVESTIGATE ORGANIZATIONAL STRUCTURES AND FUNCTIONS AT THE REGIONAL LEVEL TO SUPPORT CLIMATE SERVICES, CONSISTENT WITH THE WMO GLOBAL FRAMEWORK FOR CLIMATE SERVICES (GFCS) AND CONSIDERING USER REQUIREMENTS AND USER FEEDBACK, TO MINIMIZE GAPS AND OVERLAPS AND TO ALIGN CLIMATE SERVICE ACTIVITIES THAT ALREADY EXIST IN THE REGION.
- ESTABLISH SUPPORT FOR PEER-TO-PEER LEARNING NETWORKS.
- CULTIVATE THE GROWTH OF A SUSTAINED CLIMATE ASSESSMENT PROCESS THAT IS GROUNDED IN AN ITERATIVE 'CO-PRODUCTION OF KNOWLEDGE' THROUGH DIALOGS BETWEEN LOCAL EXPERTS, KEY DECISION MAKERS, AND SCIENTISTS.

Training Day – 21 January

Purpose

The desired outcomes of the training day were that participants were aware of, able to more easily access and make better use of available data, products, and tools to help inform community-based climate adaptation strategies.

Approach

Six training topics were presented in concurrent but repeated sessions to allow all participants to take part in each. While short, the 60-minute sessions allowed exposure to the tools and products and introduction to a network of instructors available to answer follow-up questions and inquiries.

PACIFIC ISLANDS CLIMATE SERVICES FORUM TRAINING MODULES

SESSION A: ACCESSING LARGE DATASETS - JIM POTEIRA (HAWAII INSTITUTE OF GEOPHYSICS AND PLANETOLOGY (HIGP) AT THE UNIVERSITY OF HAWAII) FOCUSED ON WEB-BASED TOOLS THAT PROVIDE EASY ACCESS TO LARGE, CLIMATE-RELEVANT DATA FROM THE ASIA-PACIFIC DATA RESEARCH CENTER (APDRC) AT THE UNIVERSITY OF HAWAII'S INTERNATIONAL PACIFIC RESEARCH CENTER (IPRC).

SESSION B: TOOLS FOR CORAL REEF MANAGERS - SIMON DONNER (UNIVERSITY OF BRITISH COLUMBIA) AND BRITT PARKER (NOAA) FOCUSED ON THE NOAA CORAL REEF WATCH (CRW) SATELLITE SEA SURFACE TEMPERATURE (SST) PRODUCTS WHICH PROVIDE CURRENT REEF ENVIRONMENTAL CONDITIONS TO QUICKLY IDENTIFY AREAS AT RISK FOR CORAL BLEACHING.

SESSION C: TROPICAL CYCLONE CLIMATOLOGIES - NICOLAS FAUCHEREAU (NEW ZEALAND NATIONAL INSTITUTE FOR WATER AND ATMOSPHERE) AND HOWARD J. DIAMOND (WORLD DATA CENTER FOR METEOROLOGY AND U.S. GCOS PROGRAM MANAGER) FOCUSED ON THE RECENT DEVELOPMENT OF THE SOUTH PACIFIC ENHANCED ARCHIVE FOR TROPICAL CYCLONES (SPEARTEC) DATASET WHICH HAS PROVIDED THE OPPORTUNITY TO FORMULATE A MORE COMPLETE CLIMATOLOGICAL STUDY OF TROPICAL CYCLONES IN THE SOUTHWEST PACIFIC, IMPROVING THE DOCUMENTATION OF TC IMPACTS ON SPECIFIC SMALL ISLAND NATIONS IN THE REGION

SESSION D: SEASONAL OUTLOOKS & SCOPIC JANITA PAHALAD AND AMANDA AMJADALI OF THE AUSTRALIAN BUREAU OF METEOROLOGY FOCUSED ON DETERMINING RAINFALL PREDICTABILITY AND RAINFALL OUTLOOK FOR A SITE USING SCOPIC (SEASONAL CLIMATE OUTLOOK IN THE PACIFIC ISLAND COUNTRIES).

SESSION E: 'PAYING FOR PREDICTIONS' - REBECCA McNAUGHT (RED CROSS RED CRESCENT CLIMATE CENTRE) DEMONSTRATED THE INTERACTIVE 'PAYING FOR PREDICTIONS' GAME, WHERE PLAYERS BECOME HUMANITARIAN WORKERS, WHO FACE CHANGING CLIMATE RISKS WHO MUST USE SEASONAL FORECASTS TO MAKE DECISIONS THAT WILL HAVE CONSEQUENCES.

SESSION F: SOPAC TOOLS - KELENI RAQISIA, ZULFIKAR BEGG, AND JENS KRUGER (SPC/SOPAC) DISCUSSED SOPAC CLIMATE AND DISASTER MANAGEMENT TOOLS AND ACCESSING GEO-SPATIAL BASELINE DATA.

Approach

The workshop consisted of five sessions that explored key questions through a series of plenary and panel speakers to introduce concepts and provide best practices to implement adaptation projects and actions, the latest climate science, outlooks and scenarios, and examples of

PACIFIC ISLANDS CLIMATE SERVICES FORUM THEMES AND KEY QUESTIONS

SESSION 1: SHARING LOCAL CLIMATE KNOWLEDGE & CURRENT ADAPTATION ACTIVITIES

1. WHAT IS THE STATE OF CLIMATE ADAPTATION PLANNING AND IMPLEMENTATION FROM THE NATIONAL TO COMMUNITY LEVELS IN THE PACIFIC ISLANDS?
2. HOW ARE YOU OR YOUR ORGANIZATION USING CLIMATE OUTLOOKS AND SCENARIOS COMBINED WITH LOCAL KNOWLEDGE TO INFORM ADAPTATION EFFORTS?
3. WHAT ARE THE ELEMENTS THAT CONTRIBUTE TO THE SUCCESS OF IMPLEMENTING ADAPTATION PROJECTS? WHAT ARE WAYS TO OVERCOME BARRIERS TO IMPLEMENTING ADAPTATION ACTIONS?
4. HOW CAN SCIENTISTS PROVIDE CLIMATE INFORMATION, RESEARCH/MODELING, CLIMATE/WEATHER OBSERVATIONS, OR CAPACITY TO BETTER SUPPORT ADAPTATION PLANNING AND IMPLEMENTATION?

SESSION 2: SHARING THE LATEST CLIMATE SCIENCE – INDICATORS AND IMPACTS

1. WHAT IS THE LATEST SCIENCE AND UNDERSTANDING ON INDICATORS AND IMPACTS OF CLIMATE CHANGE?
2. ARE THERE GAPS IN CLIMATE SERVICE INFORMATION, RESEARCH/MODELING, OBSERVATION, OR CAPACITY AND HOW MIGHT WE USE THE GLOBAL FRAMEWORK CLIMATE SERVICES TO HELP IDENTIFY THESE GAPS?
3. HOW DO WE ACCOUNT FOR LOCAL/REGIONAL VARIATION IN CLIMATE DRIVERS, ISSUES, CAPACITIES, AND CULTURES IN THE DELIVERY OF CLIMATE INFORMATION?

SESSION 3: IMPROVING COMMUNITY DECISION MAKING FOR SHORT-TERM PLANNING – THE ROLE CLIMATE SCIENCE & SERVICES (EARLY WARNING SYSTEMS AND SEASONAL OUTLOOKS)

1. DO THE CURRENTLY AVAILABLE CLIMATE SERVICES, OBSERVATIONS, AND RESEARCH/MODELS PROVIDE THE RIGHT INFORMATION TO ADDRESS KEY IMPACTS AND ISSUES OF COMMUNITY CONCERN FOR SHORT-TERM PLANNING (LESS THAN 1 YEAR)? WHAT ARE THE GAPS?
2. WHAT IS THE BEST WAY TO SHARE INFORMATION TO MAKE IT RELEVANT, USEFUL, AND USABLE (E.G., PACKAGING, PEER-TO-PEER NETWORKS, NODES OF COMMUNICATION, TRUSTED BROKERS OF INFORMATION, ETC.)?
3. WHAT ARE THE GAPS IN OUR CAPACITY TO PROCESS AND USE CLIMATE INFORMATION FOR SHORT-TERM PLANNING?

SESSION 4: IMPROVING COMMUNITY DECISION MAKING FOR LONG TERM PLANNING – THE ROLE CLIMATE SCIENCE & SERVICES (PROJECTIONS AND SCENARIOS)

1. DO THE CURRENTLY AVAILABLE CLIMATE SERVICES, OBSERVATIONS, AND RESEARCH/MODELS PROVIDE THE RIGHT INFORMATION TO ADDRESS KEY IMPACTS AND ISSUES OF COMMUNITY CONCERN FOR LONG-TERM PLANNING (DECADE OR LONGER)? WHAT ARE THE GAPS?
2. WHAT IS THE BEST WAY TO SHARE INFORMATION TO MAKE IT RELEVANT, USEFUL, AND USABLE (E.G., PACKAGING, PEER-TO-PEER NETWORKS, NODES OF COMMUNICATION, TRUSTED BROKERS OF INFORMATION, ETC.)?
3. WHAT ARE THE GAPS IN OUR CAPACITY TO PROCESS AND USE CLIMATE INFORMATION FOR LONG-TERM PLANNING?

SESSION 5: STRATEGY FOR MOVING FORWARD TOGETHER & SUPPORTING PEER-TO-PEER LEARNING NETWORK

1. WHAT WE HAVE LEARNED?
2. WHAT GAPS AND NEEDS WERE IDENTIFIED?
3. WHAT STEPS CAN BE TAKEN TO IMPROVE THE DELIVERY OF CLIMATE AND WEATHER SERVICES TO THE REGION TO INFORM COMMUNITY BASED CLIMATE ADAPTATION?
4. HOW BEST CAN THE PEER-TO-PEER LEARNING NETWORK BE SUPPORTED?

climate information that was informing action in communities to spark discussion in breakout sessions. The full Forum Agenda is attached in Appendix A.

Breakout groups around food security, water resources, disaster risk reduction, ecosystem health, human health, and cultures and livelihoods then met to explore the key issues for managers, decision-makers, and the community and what types of decisions are made within each area over short (months to year) and long-term (years to decades) timeframes. Based on these issues the groups then discussed the climate information that was currently available to inform these decisions, needed improvements, and what early warning systems, seasonal outlooks, projections and scenarios were needed. These discussions were framed using the pillars of the WMO Global Framework for Climate Services (GFCS).

Though the iterative dialogue with panel speakers and during breakout sessions, researchers and program managers gained an outline of product content and format requirements that take into account local and regional variation in climate drivers, issues, capacities, and cultures. This information will be used to inform the development and delivery of new or improved products and services.

Alignment with the WMO Global Framework for Climate Services

The WMO Global GFCS is a globally coordinated collective of organizations that are already engaged in producing and using climate information and services. This Framework aims to enable producers, researchers, and user organizations to join forces to lift the quality and volume of climate services worldwide, particularly for developing countries.

The GFCS has five main Pillars that represent essential components for effective end-to-end climate service delivery to decision makers. These Pillars are:

- **User Interface Platforms** to provide ways for climate service users and providers to interact and improve the effectiveness of the Framework and its climate services. Specifically climate services should meet user needs and should promote effective decision-making. Mechanisms should be established to gather feedback on current products and services, dialogues to gather user requirements, outreach to inform proper use and evaluation of the products and services.
- **Climate Services Information System** to produce and distribute climate data and information according to the needs of users and agreed upon standards through global centers, regional networks and to the national and local levels through meteorological and hydrological services.
- **Observations and Monitoring** through agreements and standards for generating the necessary climate data; physical and chemical variables of the atmosphere, land and oceans and socioeconomic, biological and environmental data. These data must be integrated to develop and provide climate services. Many key regions and climatic zones remain poorly observed.
- **Research, Modeling and Prediction** to harness the science capabilities and results to meet the needs of climate services; existing knowledge must be converted into practical solutions and this will require a shift in how climate research is done.
- **Capacity Building** to support the systematic development of the institutions, infrastructure, and human resources needed for effective climate services, including both the capacity of countries to apply and generate climate information and products relevant to their particular concerns.

Given the alignment of the pillars of the GFCS with the needs to improve climate services in the Pacific Islands, and the benefits of fitting the outcomes of the Pacific Islands Climate Services Forum into a larger global context that has been adopted by the international community, the GFCS was a logical context in which to articulate the needs of the Pacific Islands for climate products and information. The Pacific Islands are considered climate vulnerable countries, which are a high priority for implementing the GFCS. The goals of this Forum and GFCS are similar – to increase access and use of climate information in decision-making. Finally, the Framework is to be built through partnerships. Numerous long-standing partnerships and a strong collaborative environment exist as an integral way of life in the Pacific Islands, and the Forum offers an opportunity to strengthen and build upon that foundation.

Outcomes

The rich discussions that occurred in the breakout sessions of the Forum were captured and summarized (Appendix B). This information was further distilled and is presented here as guiding principles and best practices for delivering actionable climate information and implementing successful adaptation projects, approaches to achieving those principles and specific needs for new or improved climate information and products.

Guiding Principles and Lessons Learned

These guiding principles are shared here with the hope that we can learn from the work that has come before and apply those lessons when addressing the needs of the peoples of the Pacific for climate services.

- 1. Create an ‘enabling environment’ that empowers communities by driving projects, products, and services from a grassroots level; community ownership and participation from the beginning leads to more sustainable and successful outcomes.** Consider the entry point when interacting with the community, the importance of “eyeball-to-eyeball” interactions and spending time with the community to nurture a long-term relationship, building trust by respecting the diversity in culture, traditional authority and ways, and building understanding and capacity of the community to understand climate change and make their own decisions about managing what is important to them. Communities want to lead by example by implementing pilot projects and sharing with their neighboring communities who can then build on the learning. How is as important as what.
- 2. Tailor products and services to the user by making them specific to sector and locale as well as keyed to the nature and timing of decision-making; affinities that can be leveraged do exist.** While there are many experiences and approaches that unify the Pacific Islands, generalized content is typically insufficient to meet community or individual needs. Management questions and responses are very different among islands due to culture, geography, capacity, etc. For instance, water resource issues and management vary greatly between high islands and low islands, and are affected by water source (rainwater, aquifer lens, desalination), population, and infrastructure (storage capacity, collection mechanisms). Furthermore, for information to be sector-specific it needs to be crop or species-specific, tied for example to cycles of planting, fertilizing, harvesting or breeding, nesting, and migration respectively. Consideration needs to be given to relevant

timescales (generations, seasons, etc.). Opportunities for information to be packaged for multiple audiences should also be explored. For example, with minor modification, one set of products could be directed simultaneously to a national agency, a local manager and community member for the purposes of efficiency of use and consistency of communication.

- 3. *Tailor products and services to the user by placing them within the local context and way of understanding and through translation into local languages and dialects: scientific integrity must be preserved.*** Attention must be paid to the format as well as the content of the information. Visuals and pictures are necessary. To be meaningful, information on climate change and variability needs to be connected to social and environmental impacts. Valuable information can be conveyed through stories and anecdotes so as to link to traditional knowledge. Consideration should be given to the different needs of urban versus rural communities, cultural backgrounds, literacy levels, languages, etc.
- 4. *Use trusted messengers and established pathways to translate and disseminate information (e.g. Met Service Directors as entry points): these respected mechanisms can be improved.*** Someone who has the same values and understanding of the community should deliver information. Honoring these pathways is also an opportunity for mentoring and building capacity. However, improvements are needed to information is consistent (e.g., through enhanced data sharing and integration of portal content) and that it reaches end-users in a form that is meaningful (e.g., through capacity building of national met services and the enhancement of their distribution networks).
- 5. *Scientific information rests on a foundation of traditional knowledge; traditional knowledge should be gathered and preserved.*** Tying climate information to the experiential knowledge of the community forms the basis for a dialogue that leads to self-discovery of the issues and potential solutions. Scientific information, such as the rate and magnitude of change that is expected, can fill gaps in the community's understanding and inform strategies to develop and cope. Science can also provide information to support traditional management approaches. The exchange of traditional knowledge and scientific information, where traditional knowledge can assist in the validation of the scientific information and the past experiences of the communities in dealing with climate and natural disaster impacts can speak to their adaptive capacity, is an integral part of process of development and delivery of climate services. Participatory vulnerability assessments are one way to access this knowledge and are also a good mechanism for integrating awareness and education for the community. New tools and products would be more easily accepted and applied if they emulated traditional science tools that are currently being used.
- 6. *Engagement of underrepresented and vulnerable community members is a key part of the process.*** Bringing women, youth groups, church groups, etc. into the conversation is just as important as engaging the chiefs and leaders. The youth offer a unique opportunity as it is often they that drive initiatives to cope with climate change that can transform community perception. This broad engagement will also help to address some of the cultural and religious barriers to the acceptance of climate information. This is especially important as many of the long-term issues of relocation and migration will affect different populations differently.
- 7. *Build long-term capacity in the region through educational and professional mentorships.*** Training and awareness building programs should be offered repeatedly as part of a strategic plan; they need

to be consistent, regular and repeated in order to build capacity. Met Service Offices should be involved in research (not just used for data), local translators of climate information must be trained. Climate change should be integrated into the school curriculum to prepare future leaders. Guidebooks and manuals on specific adaptation options would be helpful (e.g. the Vanuatu examples).

8. ***Cross-sector approaches that support integration (e.g. disaster risk reduction in coordination with climate change adaptation planning in coordination with sustainable development) are necessary in a changing climate.*** This may require a broadening of the scope of our planning teams and movement towards ecosystem-based management, looking ridge-to-reef across the natural and built environment to truly build resilient communities.
9. ***It is essential that existing donors, program managers, communities, NGOs, etc. coordinate in order to avoid duplication, build and leverage existing partnerships, and address the disparity between funding cycles and the reality of implementing what are long-term projects and the lack of continuity this creates; recognize that “things take time in the islands”.*** Consider that the issues that climate change brings are different in temporal and spatial scale than we are accustomed. This requires that we build new partnerships and work with teams that bring together a broad range of perspectives. The lack of flexibility and the “in and out” nature of projects undermine the necessity for an ongoing dialogue as a means to improve climate products and services and affect the change necessary for adaptation. Opportunities for projects and activities to build on one another require that information and data sharing is regular and robust.

Improving Existing and Creating New Products and Services

The following needs were discussed during the Forum and are presented here to encourage the continuation of the dialogue between the communities and the partners and program managers to identify areas where we can move forward to deliver on these needs. More details on these needs can be found in full notes in Appendix B. It is only through these strong partnerships, across the local, national, regional and global initiatives that we will be able to address these needs.

- Scale of seasonal outlooks – what is the largest scale appropriate to inform island and community scale activities?
- Information on water retention, soil moisture, and evaporation rates to inform crop and agricultural decisions
- Regionally specific, downscaled projections (e.g. rainfall to inform crop and agricultural decisions, location of hydroelectric infrastructure, etc.)
- Long-term predictions of ENSO and its impacts to inform water resource management
- Products to predict crop, livestock and fisheries response to climate change (heat stress, stock redistribution, invasive species, etc.)
- Climate science training for crop scientists, fisheries scientists, adaptation project officers, extension agents, etc.

- Decision-support tools that overlay multiple types of information (e.g. current agriculture production, soil analysis, with climate projections or rain and temperature for human health applications)
- Wind, wave and current predictions incorporated into weather forecasts
- Couple storm and wave driven inundation information (operational seasonal forecasts)
- Pacific-wide strategy to address observation and monitoring issues (guidance for standard instrumentations, calibration facility access, climate reference stations, etc.)
- Threshold or “trigger-point” products; improve knowledge to better link climate parameters with ecosystem function and response to define threshold and “tipping-points
- Short-term products to improve pre/post-impact monitoring (coral bleaching, runoff, soil and water content, nutrient loading, etc.)
- Guidance on ecological, ecosystem-specific adaptation options
- Impact projection products for habitats (e.g. forests, mangroves like the coral bleaching products)
- Capacity and training to use existing and new products and services
- Models that combine climate parameters with disease vector and economic information
- Risk scenarios for decision-makers
- Community seasonal calendars incorporating scientific knowledge as a means to integrate traditional ecological and scientific knowledge
- Develop climate glossaries translating terms into local dialect (e.g. Fijian Affairs Board publication)

Evaluations and Reactions

Ninety-five percent of participants that completed the survey found the Forum extremely or moderately useful and 99% said they would participate in an activity such as the Forum again. Participants expressed the desire to: explore more of the intersection between traditional knowledge and scientific knowledge and modeling; have more opportunities to share lessons learned and the community experiences and to vigorously examine those case studies to maximize transferability of knowledge; have smaller follow up meetings to work with smaller teams to design and develop tools for improved climate services resulting in a tangible plan; add a day for climate change donors to present grant schemes and how to obtain funding; hold smaller meetings with in the regions of the Pacific; have more multimedia and creative sharing of the climate information; have more breakout group discussions where country representatives and scientists can sit and work together on specific issues; and consider more small group (global café) sessions to match scientists and users. The majority of comments were very positive and requests were made for this type of Forum to become a regular event. Additionally, participants also highlighted the ongoing challenge of wanting climate information in forms that are more accessible and the need to really drive the conversation from the users, from the community and to hear the voices and the stories of the Pacific Islanders.

Partners Meeting – 25 January

Purpose

The final day of the Forum was intended to bring together program and project managers from government ministries and non-government organizations in the region with the goal of enhanced communication, coordination, and collaboration directed towards the transformation of climate-related information into actionable knowledge in a way that minimizes duplication of effort, maximizes the use of agency resources in the Pacific, and fosters the growth of a regional culture of cooperation.

Background

The Pacific Regional Meteorological Services Directors Workshop in Support of Climate Adaptation Planning in the Pacific Islands held in Majuro, Republic of the Marshall Islands (8 August 2011) called for further investigation on organizational structures and functions at the regional level to support climate services consistent with the GFCS, to minimize gaps and overlaps, and to align climate service activities that already exist in the region. This is consistent with WMO RA V Resolution 2 (XV-RA V) "Establishment of Regional Climate Centres (RCC)" which calls for an assessment of current RCC functions that occur within the region and a subsequent gap analysis. Such a gap analysis is to be placed within the GFCS framework, which identifies the four GFCS priority areas (Agriculture and Food Security; Disaster Risk Reduction; Health; Water Resources) and also the five GFCS Pillars (User Interface Platform; Climate Services Information System; Observations and Monitoring; Research, Modeling, and Prediction; Capacity Building).

Approach

Over 50 participants attended this meeting, representing regional institutions, development banks, national entities, NGOs and UN organizations. The Partners meeting was divided into two sessions. The objective of the first session was to share amongst the partners represented what climate services or climate adaptation planning programs and activities are underway or planned by each agency, institution, or organization in the region, and then to get a sense of how these activities align with regional needs and the WMO Global Framework for Climate Services. This was accomplished by brief presentations from 27 different entities represented in the meeting. Framing ongoing and planned projects and activities in a GFCS context, the objective of the second session was to focus on what actions could be taken by these entities to minimize gaps and overlaps and thereby harmonize the development and delivery of new or improved products and services that meet the needs of local, national, and regional decision-makers for actionable information. This was accomplished through a group discussion that built upon the presentations to identify specific 'Centers of Action' that address key opportunities and needs in the region. Once these were identified, break-out discussions were held to further explore opportunities and actions to support enhanced alignment of efforts to advance climate services in the Pacific Islands

Outcomes

The five 'Centers of Action' identified collectively by the group were:

1. Increasing access, compatibility and awareness of **observations/monitoring networks and data management tools**;
2. **Water/food security sector**-related forecasts, downscaling, and communication,;
3. **Sea level/coastal infrastructure and inundation projections and outlooks** to support coastal infrastructure-related decision-making
4. **Ecosystem and coral reef management**-related climate information; and
5. **Capacity-building** of and **communication** of climate information to stakeholders at all levels.

The breakout group discussion notes are attached in Appendix C. Key findings of these discussions include:

- The GFCS is a robust framework for investigating organizational structures and functions that already exist in the region, thereby harmonizing the development and delivery of new or improved products and services that meet the needs of local, national, and regional decision-makers for actionable information.
- Considerable climate-related information exists in the region. However, improved coordination is needed to ensure that this information is consistent (e.g., through enhanced data sharing and integration of portal content) and that it reaches end-users in a form that is meaningful (e.g., through capacity building of national met services and the enhancement of their distribution networks).
- There is a high demand for seasonal forecasts that are both sector and community-specific.
- There is a need to increase donor interest in assisting the development and maintenance of existing monitoring networks to understand change and manage resources.

Additional opportunities to increase awareness on the importance of climate services in the Pacific were identified, and included messaging with a one-region voice to the SPREP/SPC Ministerial meetings, the Pacific Island Forum, and utilizing the Pacific Met Council. Next steps include follow up communications with Partners to move forward on the actions and needs identified during this meeting.

Appendix A: Forum Workshop Agenda

Tuesday 22 January 2013

Time	Session/Activity
Location: ICT Multipurpose Theatre	
8:00-8:45am	Registration (ICT Theatre Foyer)
8:45-9:30am	<p>Formal Opening of the Forum</p> <p>Col. Samuela Saumatua, Hon. Minister for Local Government, Urban Development, Housing and Environment</p> <p>Dr. Esther Norman, Acting Vice-Chancellor and Deputy Vice Chancellor Administration and Regional Campuses, University of the South Pacific</p> <p>Dr. Norman Barth, Regional Environmental Officer for the Pacific, US Embassy Suva</p> <p>Tierry Cateau, Delegation of the European Union for the Pacific, Environment and Natural Resources</p> <p>Prayer: Mr. Tapuloloo Tuailmafua (Samoa)</p>
9:30-10:00am	Overview, Desired Outcomes, & Process: Elisabeth Holland (USP PACE-SD) & John Marra (NOAA)
<p>SESSION 1: SHARING LOCAL CLIMATE KNOWLEDGE & CURRENT ADAPTATION ACTIVITIES</p> <p>Key Questions:</p> <ol style="list-style-type: none"> 1. What is the state of climate adaptation planning and implementation from the national to community levels in the Pacific Islands? 2. How are you or your organization using climate outlooks and scenarios combined with local knowledge to inform adaptation efforts? 3. What are the elements that contribute to the success of implementing adaptation projects? What are ways to overcome barriers to implementing adaptation actions? 4. How can scientists provide climate information, research/modeling, climate/weather observations, or capacity to better support adaptation planning and implementation? 	
10:00-10:30am	Session 1a: Plenary: <i>State of Adaptation in Pacific Islands</i> - Peniamina Leavai (SPREP)
10:30-10:45am	Tea/Coffee Break (Tents)
10:45-12:30pm	<p>Session 1b: Plenary Panel and Discussion</p> <p>Panelist 1: <i>Fiji's Path to Climate Change Resilience: Challenges, Opportunities and Best Practices</i> – Jone Driu & Clare Bastable for Mr. Timoci Namotu (Fiji I’Taukei Affairs Board)</p> <p>Panelist 2 & 3: <i>Climate Science: Use, Challenges, and On-Ground Impacts in the Republic of Vanuatu</i> - Philip Malsale (Vanuatu Met Service), Christopher Barlett (SPC-GIZ) and William Bani Arudovo (Vanuatu)</p> <p>Panelist 4: <i>Sharing Local Knowledge and Current Adaptation Activities from Tonga</i> - Tevita Robertson (Tonga)</p> <p>Panelist 5: <i>Adaptation Activities Update for Niue</i> - Birtha Togahai (Niue)</p> <p>Plenary Discussion</p>
12:30-1:30pm	Lunch (Tents)
1:30-3:30pm	<p>Session 1c: Breakout by Country Groups</p> <p><i>Introduction for Breakout Session</i> – Britt Parker (NOAA)</p> <p>1: Micronesia 1 (Kiribati, Nauru, Palau) – Pelenise Alofa & Carol Emaurois</p> <p>2: Micronesia 2 (FSM, RMI, CNMI, Guam) – Tamara Greenstone & Liz Terk</p>

	3: Polynesia 1 (Niue, Samoa, American Samoa) – Birtha Togahai & Tapu Tuaillemafua 4: Polynesia 2 (Cook Is, Tonga, Tuvalu) – Tevita Robertson & Teuleala Manuella 5: Melanesia 1 (Fiji, Timor-Leste) – Naushad Yakub & John Walenenea Jr 6: Melanesia 2 (Vanuatu, Solomon Is, PNG) – Moses Asitarau & Christopher Bartlett
3:30-4:00pm	Tea/Coffee Break (Tents)
4:00-5:30pm	Session 1d: Plenary Report Out & Wrap Up: Dean Solofa (SPC) Prayer: Mr. Tapulolou Tuaillemafua (Samoa)
5:30-7:30pm	Poster Session and Reception (Tents)

Wednesday 23 January 2013

Time	Session/Activity
SESSION 2: SHARING THE LATEST CLIMATE SCIENCE – INDICATORS AND IMPACTS Key Questions: 1. What is the latest science and understanding on indicators and impacts of climate change? 2. Are there gaps in climate service information, research/modeling, observation, or capacity and how might we use the Global Framework Climate Services to help identify these gaps? 3. How do we account for local/regional variation in climate drivers, issues, capacities, and cultures in the delivery of climate information?	
Location: ICT Multipurpose Theatre	
8:45-9:15am	Welcome Prayer: Mr. Tapulolou Tuaillemafua (Samoa) Review of Day 1: Beth Holland (USP PACE-SD)
9:15-10:30am	Session 2a: Plenary Global Framework for Climate Services: Recent Developments and a Way Forward – Alan Porteus (NIWA) for Rupa Kumar Kolli (WMO) Climate Service Center – Germany: Lessons Learned in Developing Climate Services - Irene Fischer-Bruns (CSC) Climate Science and Services: A Framework for the Forum - John Marra (NOAA)
10:30-10:45am	Tea/Coffee Break (Tents)
10:45-12:00pm	Session 2b: Plenary Panel Panelist 1: The Pacific Islands Regional Climate Assessment - Victoria Keener (East West Center) Panelist 2: Climate Change in the Pacific: Scientific Assessment and New Research - Kasis Inape (PNG Met Service) Panelist 3: The Pacific Environment and Climate Change Outlook - Tepa Suaesi (SPREP) Panelist 4: SPC's Climate Change Programme and Resilience Building Using Climate Science Information - Dean Solofa (SPC) Panelist 5: Pacific Islands Climate Science Assessment – Ana Ake (USP PACE-SD) Panelist 6: Adapting to a Changing Climate Toolkit - Liz Terk (MCT)
12:00-12:30pm	Session 2c: Open Discussion & Plenary Wrap- up
12:30-1:30pm	Lunch (Tents)
SESSION 3: IMPROVING COMMUNITY DECISION MAKING FOR SHORT-TERM PLANNING – THE ROLE CLIMATE SCIENCE & SERVICES (EARLY WARNING SYSTEMS AND SEASONAL OUTLOOKS) Key Questions: 1. Do the currently available climate services, observations, and research/models provide the right information to address key impacts and issues of community concern for short-term planning (less than 1 year)? What are the gaps? 2. What is the best way to share information to make it relevant, useful, and usable (e.g., packaging, peer-to-peer networks, nodes of communication, trusted brokers of information, etc.)? 3. What are the gaps in our capacity to process and use climate information for short-term planning?	
1:30-1:45pm	Session 3a: Plenary Introduction
1:45- 3:00pm	Session 3b: Panel Panelist 1: Climate and Oceans Support Program in the Pacific – Seasonal Outlooks - Janita Pahalad (Australia BOM) Panelist 2: The Island Climate Update: a seasonal forecasting platform, forum and bulletin for

	<p>the Pacific Islands - Nico Fauchereau (NZ NIWA)</p> <p>Panelist 3: Kosrae Extreme Tide Calendar - Doug Ramsey (NZ NIWA)</p> <p>Panelist 4: Pacific ENSO Application Center - Chip Guard (NOAA NWS) Supplement – The Evolution of PEAC</p> <p>Panelist 5: NOAA Coral Reef Watch Seasonal Bleaching Thermal Stress Outlook - Britt Parker (NOAA)</p> <p>Plenary Discussion</p>
3:00-3:15pm	Tea/Coffee Break (Tents)
3:15-5:00pm	<p>Session 3c: Breakout by Tracks</p> <p>Introduction for Breakout Session – Britt Parker (NOAA)</p> <p>1: Track A Food Security – Morgan Wairiu</p> <p>2: Track A Water Resources – Christopher Bartlett & Luke Paeniu</p> <p>3: Track B Ecosystem and Human Health – Carol Emaurois & Jyotishma Naicker</p> <p>4: Track C Disaster Risk Reduction 1 – Tapu Tuaillemafua & Ben Lintner</p> <p>5: Track C Disaster Risk Reduction 2 – Helene Jacot Des Combes & Cecelia Amosa</p> <p>6: Track D Livelihoods and Culture – Britha Togahai & Teuleala Manuella</p>
5:00-6:00pm	<p>Session 3d: Plenary Report Out and Discussion: John Marra (NOAA)</p> <p>Closing Prayer: Mr. Tapulolou Tuaillemafua (Samoa)</p>

Thursday 24 January 2013

Time	Session/Activity
SESSION 4: IMPROVING COMMUNITY DECISION MAKING FOR LONG TERM PLANNING – THE ROLE CLIMATE SCIENCE & SERVICES (PROJECTIONS AND SCENARIOS) Key Questions: 1. Do the currently available climate services, observations, and research/models provide the right information to address key impacts and issues of community concern for long-term planning (decade or longer)? What are the gaps? 2. What is the best way to share information to make it relevant, useful, and usable (e.g., packaging, peer-to-peer networks, nodes of communication, trusted brokers of information, etc.)? 3. What are the gaps in our capacity to process and use climate information for long-term planning?	
Location: ICT Multipurpose Theatre	
8:45-9:15am	Welcome Prayer: Mr. Tapulolou Tuaillemafua (Samoa) Review of Day 2: John Marra (NOAA)
9:15-9:30am	Session 4a: Plenary Regional Climate Outlook Forum Process: Perspectives for the Pacific Islands Region Rupa Kumar Kolli (WMO) Building a Dialogue Between Modelers and the User Community - Lawrence Buja (UCAR)
9:30-10:30am	Session 4b: Plenary Panel Panelist 1: Information Needs for Adaptation from Physical Climate Scientists - Scott Power (Australia BOM/CSIRO) Panelist 2: Inundation scenarios for the Cook Islands - Doug Ramsay (NIWA) Panelist 3: Coral Reef Scenarios – Simon Donner (University of British Columbia) Panelist 4: Building Climate Resilient Communities in American Samoa - Fatima Sauafea –Leau (NOAA - American Samoa)
10:30-10:45am	Tea/Coffee Break (Tents)
10:45-12:30pm	Session 4c: Breakout by Tracks Introduction for Breakout Session – Britt Parker (NOAA) 1: Track A Food Security – Morgan Wairiu 2: Track A Water Resources – Christopher Bartlett & Luke Paeniu 3: Track B Ecosystem and Human Health – Carol Emaurois & Jyotishma Naicker 4: Track C Disaster Risk Reduction 1 – Tapu Tuaillemafua & Ben Lintner 5: Track C Disaster Risk Reduction 2 – Helene Jacot Des Combes & Cecelia Aмоса 6: Track D Livelihoods and Culture – Britha Togahai & Teuleala Manuella
12:30-1:30pm	Lunch (Tents)
1:30-3:00pm	Session 4d: Plenary Report Out and Discussion
3:00-3:15pm	Tea/Coffee Break (Tents)
SESSION 5: STRATEGY FOR MOVING FORWARD TOGETHER & SUPPORTING PEER-TO-PEER LEARNING NETWORK Key Questions: 1. What we have learned? 2. What gaps and needs were identified? 3. What steps can be taken to improve the delivery of climate and weather services to the region to inform community based climate adaptation? 4. How best can the Peer-to-Peer learning network be supported?	

3:15-4:30p	Plenary Presentation: PICSF by the Numbers - Pualele Penehuro Lefale (NZ Met Service) Facilitated Discussion: John Marra (NOAA) and Beth Holland (USP PACE-SD)
4:30-5:00p	CLOSING of the FORUM: Norman Barth (US Embassy – Suva) Closing Prayer: Mr. Tapulolou Tuaillemafa (Samoa)

Appendix B: Workshop Breakout Session Notes

22 January Summary - Session 1 (Plenary, Breakout, and Discussion)

[Breakout group indicated; MEL = Melanesia 1 and 2, MIC = Micronesia, POL = Polynesia 1 and 2]

Climate Information

- Lack of availability of climate information and data (not flowing from high-level agencies to regional and local decision-makers); data and information gaps or no data [MEL1, MEL2, POL1]
- Deliver climate and other scientific monitoring data BACK to the community where it was collected, must be a two way relationship [MEL2]
- Deliver localized information; downscaling, tied to local experience and knowledge then extrapolate to future, tie information to livelihoods, make locally relevant [MEL2, POL1]
- Use rapid vulnerability assessments to inform more comprehensive vulnerability assessments – saves resources, identifies information needed, etc.) [MEL2]
- Balance the simplification of information with maintenance of scientific integrity [MEL2]
- Met Service as entry point (not always directly to community level but to those working with the community) [MEL1, POL2]
- Develop programs to engage the community in monitoring and stewardship (e.g. Vanuatu rainfall network), Ask local communities in what they have been experiencing (how is it going to affect them now and how will it affect them in the future), co-production of knowledge leads to empowered communities [MEL2, POL1, POL2]
- Participatory vulnerability assessments are good ways to combine TEK with climate outlooks and scenarios [MIC]
- Climate information and services should be driven by community/manager needs not by research projects and funding objectives [MIC]
- Generational timelines instead of scientific projections (when your grandchildren are your age vs. by 2100) when speaking to local communities [MIC]

NEEDS:

Short term information (this disaster) v long term (50-100 yr projections) based on different crops [MEL2]

Short-term information (outlooks) in simple, local terms (guidelines should be based on feedback from communities and improved over time [POL1]

Need climate information tied to long-term ecosystem health to inform decisions [POL2]

Governance

- Funding cycles (short-term) versus reality of implementing long-term projects (project timeframe incongruent with funding timeframe) – consider developing capacity around local/provincial/national funding sources/sustainable funding and invest and build on local, existing capacity that has shown previous success versus new team [MEL1, MEL2, POL1]
- Create enabling conditions from the top down to empower community driven projects; grassroots driven; work within the system for each place [MEL2, POL1]

- Work within the LMMA, LMCCA type networks and use existing committees, etc.; incorporate traditional governance structure and processes; community driven laws and policies have more buy in [MEL2, POL2]
- Coordination between donors/provincial offices/villages to avoid duplication; NGO consortium and collaboration to avoid duplication and waste of resources [MEL1, MEL2]
- Maintain regional capacity (PACE-SD), Pacific Islands' students doing research to inform [MEL2]
- Recognize and address conflict between traditional ways and market economies/governance structures (traditional land tenure, conversation vs. indigenous community needs (lack of land that can be set aside for conservation) [MEL2]
- Use creative finance mechanisms (tourist fees, exit tax, etc.) [MIC]
- Consistent framework and tool for conservation across all communities; incorporation of climate info into existing management process (PIMPAC, Reimaanlok) then donors also work through those frameworks [MIC]
- Form networks/working groups for Climate Change when multiple agencies have overlapping jurisdiction [MIC]
- Consider the need for new types of relationships/collaboration (Met Service-Climate People, CCA-DRR) [MIC]
- Legal frameworks may not exist – when developed must be communicated and translated to the communities [MIC]
- Community based enforcement can be very successful [POL2]

Community Engagement

- Community participation from the beginning; with proper ownership communities have chosen to implement with their own funds; donors should meet needs of the community not come with a plan before consultation [MEL2, MIC, POL1, POL2]
- Use TEK – example; work with local fishers/divers to document changes; teach local communities to collect the information needed to fill gaps; gather info about the impact of climate variability/change from community especially with respect to fishing and agriculture [MEL1, POL1]
- Trusted champion from the community is key to success; grassroots communication [MEL1, MEL2, POL1]
- Transparency [MEL2, POL1]
- Lessons learned from the past is foundational to adaptive capacity [MEL2]
- Engage not only the chiefs/leaders but women, youth and church groups [MEL2]
- Build community-level skills (monitoring, project management, etc.) [MEL2, POL1]
- Adaptation efforts can actually restore traditional conservation and resource management knowledge and techniques; empower communities to look after and manage their own resources [POL2]

Communication

- Adapt (and translate into local languages and dialects) information for the community but maintains integrity [MEL1, MEL2, POL1]
- Focus on benefits to the community that are relevant to them, focus on benefit to the individual [MEL2, POL2]
- Disseminate lessons learned and best practices [MEL2, POL1]

- Use pictures, DVDs, plays, radio shows, songs, flipcharts, chatty beetles, texting, social media, comic books, games, board games, art competitions (student calendars with winners), climate updates for dummies for general outreach but some things work for early warning also [MEL2, MIC]
- Climate Field Schools for dissemination of information and developing capacity [MEL2]
- Peer-to-peer networks are important [MIC]
- Incorporation of climate change into the current education curriculum vs. climate change as a separate topic [MIC]
- Consistent messaging [MIC]
- Effective communication between scientists and villagers (careful consideration needs to be taken when talking about the impacts of climate change and important to remain unbiased). [POL1]

Other

- Lead by example start with one village (pilot project) then build on that learning with subsequent villages (enhances village ownership of project); inexpensive, successful pilot projects can open doors to more funding [MEL1, MEL2, POL1]
- “Eyeball to eyeball” is key and travel is challenging in the Pacific Islands (distance/cost) both within nations and between nations; lessons learned: stay within community, take meals together, know people by name, hold meeting when community members available (evenings), provide food (challenge with US Federal dollars), folks from multiple sectors working together at the same time on outreach to pool resources, etc. [MEL1, MEL2, MIC]
- Challenge of passing on not only traditional knowledge but knowledge of the older generation of scientists who have been working in the islands and with communities; mentorship – programs where young people can work with the more experienced scientists and community members [MIC]
- No regrets strategies work when we don’t have all the information, still must act, can always tweak activities later; win-win strategies also key (be opportunistic [MIC]
- Need continued coordination among donors, programs, jurisdictions, etc. building on this Forum [POL1]

23-24 January – Climate Service Needs by Sector (Outlooks/Forecasts/Early Warning & Projections/Scenarios)

Water Resources

Short-term Outlooks/Forecasting and Early Warning

- Management question and responses very different for different islands depending on water sources (high v. low islands; rainwater, aquifer, lens, desalination, etc.; population; infrastructure – storage capacity, desalination plant, wells)
- Short-term outlooks/forecasts could also inform decisions regarding system maintenance
- There are currently seasonal forecasts for rain and some tools for translating that information (water tank tool – convert mm of rain into liters in tank and relates to number in household) but need to be tailored for each place and combined with information from the community level that is currently used to make decisions (actionable information with capacity to apply)
 - Community knowledge /observations that inform water management include – reservoir level, days since last rain, number of people gathered around tanks v using wells
 - Observation that the entire character of rainfall has changed in the Western Pacific since 2000 – no typhoons or large storms, much less rainfall
- Communication and dissemination are issues to address –
 - The forecasts would not be directly useful to the communities, need a translator
 - “Above or Below Average” alone is not helpful, need ranges
 - Once forecasts/outlooks formatted into actionable information how to reach remote islands and even everyone in the more populated areas
 - Establish mechanism for two-way dialogue to get feedback from community users for product improvement
 - Perception challenge with regards to conservation measures like composting toilets or treated sewer with reverse osmosis
- Specific Information Needs
 - Forecasted duration of rainfall – but difficult for areas dominated by convective rain where avoidance of capture of initial drops is preferable (salt)
 - Forecasted character of precipitation
 - Scale question – tools for managers v community
 - Scale question – are seasonal forecasts at country scale enough or would they need to be island or community scale (effort is drastically different)
 - Water retention/soil moisture/evaporation other parameters of interest for crops (swamp taro/coconut trees)

Long-term Projections and Scenarios (combined with Food Security Breakout Group)

- Specific Application of Information
 - Regionally Specific Downscaled Projections of Rainfall – inform location of agriculture production, hydroelectric plants, etc.
 - Long term ENSO projections and drought/flood impacts needed – for many islands it is not a supply issue it is a collection/distribution/infrastructure maintenance issue, but strong El Niño DO cause droughts that are a big issue
 - Rainfall Extreme Projections on a yearly and decadal scale
 - Indices (dry days, extremes) derived from raw data

- Observation and Monitoring Issue – need to address this issue in order to have the information needed for downscaled models, etc. (stream gauges, precipitation stations)
 - Citizen science and monitoring opportunities (supplies, maintenance, consistency)
 - Need sustainable funding, data repository/access, data sharing agreements/regional data platform, and dissemination of data back to the communities and agencies that assist in collection
 - Involve Met Offices in the research, do not just use them for data (builds regional capacity also)
- Capacity development and education is needed - many of the great examples of things working in places like Vanuatu is due in part to an educator building a cadre of interested students in combination with the Met Service and other partnerships
- Communication and Dissemination – again there is the need to package information in a way that is useful for multiple users, there are traditional knowledge and observations for long term forecasting that would be combined with the scenarios/projections for the community but there is also a challenge and opportunity in communicating long term scenarios/projections in the context of the religious beliefs within the region

Food Security

Short-term Outlooks/Forecasting and Early Warning

- Natural Resource Management is fundamental to Food Security (soil, water, coral reefs, etc.) to prevent issues now and increase resilience under a changing climate
- Options for diversification of livelihoods, income sources (producing high income crops (in addition to subsistence farming) so they can buy the consumables needed in the face of CC (income diversification))
- Specific Information Needs – information needs to be targeted high islands and atolls will have different issues, do not generalize (around Ag there are many partnerships and networks useful for dissemination)
 - Products to better understand/predict how crops/livestock/fisheries will respond to climate change (heat stress, fish stock redistribution, invasive species, etc.)
 - Products to inform decisions with regards to Agriculture and Livestock
 - Agriculture* – seasonal forecasts related to crop cycles (for crops like sugarcane info need 18 months out 1 month before planting), to inform planting and harvesting techniques and timing, timing of fertilizer application, crop species and variety choices, crop health/quality - food borne illnesses consideration in post harvest production, toxic fungal growth on crops, etc.
 - Livestock* - storage of food/water to mitigate drought impacts to livestock,
 - Products to inform coral reef and fisheries management –
 - Coral Reef* - coral bleaching prediction to reduce additional stresses (siltation, pollution, overharvesting, nutrient runoff) and inform ridge to reef management of watershed, locally marine managed area management)
 - Fisheries* – water temp related to species reduction/changes
- Observations and Monitoring – need more network weather stations and more rainfall data by sub-regions within the islands so it is truly useful (30-60 year historical rainfall trends)
- Research – crop modeling, climate resilient crop options, soil management (nutrients) under climate change, fisheries impacts (new distributions of fish stocks, reduction/movement of stocks), impacts to livestock
- Capacity needs – climate science training for crop scientists, fisheries scientists, trained extension agents to get information to the community, training the next generation (losing knowledge due to retirement)

Long-term Projections and Scenarios (combined with Water Resources Breakout)

- Specific Information Needs
 - Products related to Agriculture - Crop models with growing degree days, consecutive dry days and Decision-support tools overlaying Ag production, soil analysis, current climate variability and future projections to inform long-term decisions
 - Regionally specific downscaling to related water resources to agriculture decisions – move sago palm product based on changing rainfall patterns

Disaster Risk Reduction

Short-term Outlooks/Forecasting and Early Warning

- Early Warning for key issues including; coastal hazards and storm driven inundation, drought, water resources (ground, fresh, rainwater), tsunamis, flooding/flash flooding, food security, tropical cyclones, fires, coral bleaching, swell waves/storm tides/storm surges, heat waves
- Communication and dissemination - Information must be in a format that is simple and useful to the community (actionable), multiple sectors need to come together (example – Met Service drought warning applicable to water resource management but also to prepare Fire Fighters for increased chances of fire), dialogue to define shortcomings of current tools and articulate needed research to improve, remove jargon and consider multiple mediums of communication.
- Specific Information Needs
 - Downscaled climate models for the region
 - Wind, wave and current predictions incorporated into weather forecasts
 - Tool to translate global wave height models into inundation models for a particular coastline
 - Coupled storm and wave driven inundation information – generation of seasonal forecasts for Pacific sub-regions (e.g., stronger Westerlies in South Pacific during El Nino -> higher probability of inundation on west-facing shores) but no one is doing this on an operational basis
 - Documentation and revival of traditional knowledge and its intersection with science
- Observations/Monitoring Needs
 - Need accurate bathymetry and/or topography to inform wave run up modeling, lack in-situ wave measurements (buoys) and network is too sparse
 - Obs/monitoring coordination needed to identify (1) where obs/monitoring instrumentation is being maintained, (2) where are the gaps, (3) who is effectively sharing data → development of a Pacific-wide strategy between major governments (Australia, NZ, US, EU) – recommendation to emerge from this forum?
- Capacity Needs
 - Course for Disaster Mangers to identify level of information needs and appropriate communication
 - Workshop to develop list of community training requirements and needs for information to drive communication training and strategies (understanding climate variability is one such need)
 - Collaboration between research institutions and Met Services with more capacity (e.g., NIWA, NOAA) to build capacity (training, data sharing and accessibility) of Met Services to run storm/wave models
 - Identify the “bits and pieces” that would need to be brought together to make operational a Coastal Forecasting System across agencies/jurisdictions in the Pacific Islands Region

Long-term Projections and Scenarios

- Political timelines versus long-term climate change planning is a challenge, CC planning and adaptation is not a budgetary priority (is not embedded into the business plan) -

- Need a new model that supports development of integrated DRM and CC adaptation (similar to UNDP approach), including partnerships across these sectors (i.e., in addition to policy and political changes)
- Specific Information Needs
 - Products that define the thresholds or trigger points and timing (e.g., do we have a decade to prepare, two decades, more?)
 - Communication and dissemination needs
 - Long-term issues are social (relocation and migration) and therefore we need to help communities understand the risk and develop consent on how they want to respond
 - Tier-two products that provide an opportunity for translating complex outputs into user-friendly information
 - Capacity needs
 - Train local climate science translators
 - Need access to modeling resources (supercomputers, bandwidth, etc)
 - Identify existing methodologies/approaches/tools to help decision-makers/communities and what timelines they address to help community choose the one that best fits their needs

Ecosystems

Short-term Outlooks/Forecasting and Early Warning

- Relatively few ecosystem management decisions depend on short-term forecasts/seasonal outlooks with the exception of coral bleaching and fire risk management
- Specific Information needs -
 - Ecosystem management could benefit from short-term products to improve pre/post impact monitoring (coral bleaching, runoff, soil and water content, nutrient loading to oceans)
 - Products should be shaped by operational models of multi-agency communication
- Research needs -
 - Need to better link climate parameters and ecosystem functions and impacts to define key thresholds to inform product development

Long-term Projections and Scenarios

- Projections from GCMs can be used to motivate adaptation action in the sense of reducing local stressors but for local guidance and decision support, site specific information (downscaled or matched to a local site) is needed so options can be weighed
- Communication and dissemination
 - Hold meetings within each country to link regional, national and NGO information to community and traditional decision-makers ultimately aiming to generate knowledge together
 - Information is not reaching resources users, owners, and managers
- Observation and Monitoring – coordinated, locally-based, low-cost ecosystem monitoring; need the baseline ecosystem data and then integration between that and model projections to understand impacts
- Research needs – define ecological thresholds or develop ecosystem specific adaptation guidance from the existing science
- Specific Information needs – Develop impact projection products for forests, mangroves, etc. in addition to coral reefs
- Capacity needs
 - Centralized location for climate information for the country with capacity to share the information and how to use it with the communities (communities would know where to go for information)
 - Much of the available information (Coral Reef Watch) is not being used, need capacity to apply the information with management options based on the information
 - Locally managed MPAs are good end users for products and monitoring programs

Human Health

Short-term Outlooks/Forecasting and Early Warning

- Current outlooks/forecasts provide helpful information that affect human health heat waves, floods, drought but Met forecasts need to be translated for Health Ministry applications and then considerations of how to disseminate that information to the community
- Specific information needs – rainfall, temperature, humidity and wind;
 - Early warning system for health department (dengue outbreaks)
 - Info on ENSO and extreme events can help in planning (address stagnant water, freshwater resources, etc.);
 - Multi-parameter products - combinations of information that is more informative than the two individual pieces of information (example rain and temperature in specific combinations could indicate potential issues with certain diseases)
 - We have much of the required information it is more a question of repackaging for a specific application

Long-term Projections and Scenarios

- Communication, Dissemination and Capacity
 - Different communication tools for climate outlooks for different audiences (health policy maker, health care providers, communities)
 - Develop a toolkit containing simple information on preventative measures, what CC can do to the health of the people directly or indirectly, tools for different target groups (decision makers, communities, health care providers), water security resource details, meeting with different stakeholders in order to dialogue that come from different approaches (encourage dialogue among different sectors), find out needs of what they prefer how they want to be informed, encourage more people to be involved in the health sector in relation to climate change
 - Build capacity of community leaders to share information using traditional structures
 - Training for health care providers, in schools, and community and traditional leaders
 - Gather traditional knowledge on impacts and also traditional treatment (Palau-ciguatera example)
- Research, Modeling and Information needs
 - Update SimCLIM with new IPCC scenarios, current sectorial information, and seasonal and extreme events
 - New models that explore social and environmental determinants of health (e.g. hydrology, poverty, environmental sanitation, etc.), models that combine climate with disease causing vectors, economic models that demonstrate long-term costs and benefits of adaptation versus not
 - Risk scenarios for decision-makers

Livelihoods and Culture

Short-term Outlooks/Forecasting and Early Warning

- There is an opportunity to understand the interaction between traditional and scientific knowledge especially since people already know much of what science is rediscovering using different terminology. Traditional and scientific knowledge can be used in positive and negative ways; opportunity to document the traditional and community knowledge and compare it with scientific knowledge; education can serve as a bridge between TEK and science
- Specific Information and Products
 - Early warning for bleaching events to inform MPA management and Response Plan for coral bleaching (consider hotline to report bleaching to relevant agency)
 - Educational products incorporating marine environment knowledge
 - Seasonal calendars (understanding how communities design their traditional calendars and incorporating these with the scientific data) (TK calendar for fishing, and agricultural products, honey bees) – means to integrate TEK and scientific data
- Communication and dissemination
 - Consult community on needs; data and information will need to be translated and best delivered by someone with the same values and understanding as the community
 - Link climate information to an impact that the community would notice
 - Communities already have means of preparing for extreme events, learn from these approaches and build off of them
 - Idea of different tiers or levels of the same product for different audiences/contexts
- Capacity Development
 - Establish community ownership of the process (development) and activities (implementation)
 - Record TEK for future generations in a way that respects the knowledge
 - Integrate climate change into education to build capacity of future community leaders

Long-term Projections and Scenarios

- Information and training/capacity are not enough, needs to be a motivation and desire to utilize the information we have to do things differently
- Young people are the best drivers of initiative to cope with climate change because they will start to be role models and will drive change and transform community perception
- Governments and communities and the organizations that work with them (NGOs) need to work together to solve these issues. Need to avoid duplication, work to create a jumping off point with funding not a dependency ; Approach community carefully, and with a plan for a sustainable program (e.g., what happens when the money runs out for a stewardship program that is based on monetary rewards)
- Communication and Dissemination/Capacity needs
 - Tie future modeling to a community's experiential knowledge; Promote self-knowledge, empower, local experiences and terminology
 - Develop "climate glossaries" for each island for local knowledge, perspectives.

- Need to document (and live) traditional knowledge. TK is the baseline of what a community knows and how it understands various natural systems and events. Scientific knowledge can be built on a foundation of TK to help communities understand climate changes, projections, etc. This ensures (a) no replication of traditional knowledge (i.e., telling the community what they already know in different words and (b) scientific understanding is built from a perspective already held by the community.
- A discussion that allows for self-discovery of the issues and potential solutions will help to create an enabling environment. Document these experiences and then explore the scientific information to fill gaps in knowledge - Science provides detailed projections how long the changes will be and what should be done to cope with the changes. Science informs them the spawning times of fishes, lack of scientific knowledge in communities. Important to merge it with science
- Repeat trainings and awareness programs as part of a strategic plan. Consistent, regular, ongoing, repeated.
- There are cultural barriers that will impact communication, especially with regards to long-term scenarios and projections.

Appendix C: Partners Meeting Breakout Notes

‘Centers of Action’ for Regional Collaboration and Suggested Actions

I. OBSERVATIONS/MONITORING, DATA MANAGEMENT

- 1. Lack of donor interest.** There is a general lack of donor interest in assisting the development and maintenance of existing monitoring networks to understand change and manage resources. Donors need to be convinced that this saves them money, you can’t manage what you don’t measure (same with adaptation) you need the baselines before you can design and fine tune adaptation measures.
Action: Need venue to have interaction on these issues (these are difficult discussions to have); need to keep hammering this point via discussions as opportunities arise. Targeted socio-economic analyses of benefits would be helpful.
- 2. Region-wide observation system compatibility/consistency.** There is a need to ensure compatibility/consistency with existing systems when there are new observations systems being installed, as well as among existing systems through enhanced communication and coordination.
Action: A WMO RAV – Information System Working Group can help coordinate. A ‘data management’ meeting every three months might also be helpful.
- 3. Data portal compatibility/consistency** – While there are many different portals, increasing their compatibility/consistency via increased coordination on data sharing and portal content would be helpful. This should not be a big challenge because many are open source and should be able to share data. Efforts placed on making data portals interoperable – rather than the data itself – could be the best use of time and resources.
Action: WMO RAV – Information System Working Group can help coordinate portal capability.
- 4. Data access and withholding of data** – CROP data is owned by country members.
Action: An ‘awareness campaign’ is needed (e.g. case studies) to increase the understanding of how shared data benefits their country, and also increase awareness of all that is already freely available.
- 5. Ongoing maintenance of existing monitoring systems.** Even with capacity building at the national level, the only place sustained maintenance has been effective is with a regional approach. Melanesia countries currently support each other with a sub-regional hub.
Action: Suggestion to develop a regional technical support unit, which could be led by SPREP.

6. **Lack of awareness of existing products.** There are many affordable and easy to use products that countries are not aware of.
Action: Hold hands-on trainings of opportunity in conjunction with workshops and other such events to improve awareness and build capacity.
7. **Decline in freshwater observation data.** While many of the ocean observation systems are increasing, or at least the remote sensing ability, rainfall stations and stream gauges are decreasing throughout the region. This data is only relevant to some islands.
Action: Can WMO RAV assist?

II. WATER/FOOD SECURITY (Surface Temperature, Rainfall)

1. **Linkages with Regional Met Service Directors.** Recognizing that the Regional Met Service Reps were not represented at the meeting, there was a suggestion that the RMSDs would benefit from further training on information, tools and models that are currently available, and that greater attention to using them link information to end-users is warranted (see below).
Action: Hold hands-on trainings of opportunity in conjunction with workshops and other such events to improve awareness and build capacity.
2. **Downscaling of Climate Models.** There is a strong demand for regional/local scale downscaled climate models.
Action: Establish a regional downscaling group/modeling hub that could start with compiling all existing work on this topic. This is more of a research-based activity. It may be possible to align this effort with the existing Asia Pacific Regional Climate Projections Consortium (APRCP)
Action: Evaluate the existing regional models for local applicability in the Pacific Islands.
Action: Include the Pacific Island Countries as a domain for CORDEX.
 Faculty at USP offered to contact the WCRP and to write a declaration for support to be signed from partners across the region.
3. **Seasonal Forecasts – building capacity for translation.** While considerable information exists (e.g. ICU, PEAC), there is a need to broaden the network of subscribers to this information beyond the Met Services, improve coordination at the local level to disseminate the information, and build capacity within the region to translate and package/communicate this information to users.
Action: Targets Met Services for training on the use and of communication climate forecasts (perhaps through PACCSAP). CSIRO has done some capacity development on this path in Asia (Indonesia, Vietnam, etc)

Action: PEAC calls on a monthly scale might be a good model to extend – SCOPIC and ICU could do the same thing. Perhaps include a few more key people in these discussions via web sign up. Webinars may be another vehicle to disseminate information and build capacity.

Action: ICCs would be helpful because they work with students, and are involved in a grid composed of different nodes of communication. However, where the information plugs into that grid to make the translation to the community level, it is important to respect the existing modes of communication (role of Met Services).

4. **Conflicts when communicating forecasts.** When a forecast gets disseminated that might impact tourism, economic activities, etc. (dengue fever outbreak, bleaching outlooks reducing tourism) businesses and governments could become “unhappy customers”

Action: Need to identify right message and messenger. Cost-benefit analysis might be helpful.

III. COASTAL INFRASTRUCTURE/WATER LEVEL PROJECTIONS AND PRODUCTS (SLR/Inundation-waves and water levels)

1. **Applied Research and Product Evaluation – Projections.** There is considerable interest in products that provide long term/multi-decadal projections of inundation extremes. A coordinated/collaborative effort is needed to establish methodologies and practices for projections of total water levels (accurately and consistently) and the application of this information to visualization/mapping and decision-support.

Action: A workshop is needed to evaluate and compare the different methods and approaches to establish best practices.

2. **Applied Research and Product Evaluation – Outlooks.** There is considerable interest in products that provide short term/seasonal outlooks of inundation extremes. Monthly calls between NOAA and NIWA among others currently exist to increase regional coordination and collaboration, but more could be done.

Action: Continue monthly phone calls on the seasonal outlooks with the goal of creating an implementation plan that describes a shared vision forward. Release the proof-of-concept product currently under development and circulate it for review and comment via a dialog with decision-makers on outlook products.

IV. ECOSYSTEMS/Coral Reefs (SST, pH)

Identified as ‘Center of Action’, but break-out discussions to further explore opportunities and actions did not occur.

V. CAPACITY DEVELOPMENT/COMMUNICATION

1. **Utilizing existing networks.** Technically accurate information is getting stuck at the Met Service level, and existing networks are not being utilized effectively to 'reach the last mile' (see above).
 - Action:* Met services are crucial partners in communication chain, and needs to be engaged in the process. Can we talk to Met Service Council in July re: the how to disseminate multiple types of information?
 - Action:* Need for stakeholder and network mapping which will be different for different places and need for two-way communication. If a large-scale analysis were completed, how would we maintain the database (documenting existing networks)? Who is filling the role of the middle 'translation' piece? Could a data portal also be used to pull in info from the other end to identify who is using the data and where it goes?
2. **Prioritize needs.**
 - Action:* Base information and delivery on things that have already been done and areas that are most vulnerable. Capitalize on ecosystem knowledge.
3. **Digital access.**
 - Action:* The issue of bandwidth, electricity, etc. should be considered when online products are developed.
4. **Standardization** How do we standardize climate messages, content, and methods?
 - Action:* SPREP, GIZ, etc. discussing informally

General Awareness for Climate Services in the Pacific

How do we plug decision makers into this maturing dialogue?

- *Action:* Increase the visibility of climate services at **the biannual SPREP/SPC ministerial meetings**, so that the ministers are aware of the importance to regional and national-level resilience building. Provide regular updates and assessments, since projections/forecasts will improve and adaptation planning is an iterative process. Also have to consider how to do things differently.
- *Action:* Role of the **Pacific Island Forum** is an important in that they make statements about the priority issues for the region. This mechanism could create a pathway forward (declaration of need). Provision of the Pacific Plan is an overarching strategic plan for the region and it is up for review – we should try to get high-priority issues discussed during the Partners Meeting and the Pacific Islands Climate Services Forum into that plan.
- *Action:* The **Pacific Met Council** is another forum in which this community of practice could articulate climate service needs in the region. This can ensure linkages between regional frameworks and the GFCS, as well as increasing visibility of priority issues.

Additional Overarching Gaps

1. Validation/Certification of products
2. Monitoring and utilizing socioeconomic, cultural data, sectorial data
3. Economic Valuation (cost benefit analysis, socioeconomic indicators, lack resource economists in the region). We lack resource economists in the region, which could address many key needs.
4. Equipment Integration
5. Databases vs. Data Portals – standardized data formats are essential.
6. Access to topography maps. USP students need to access maps for adaptation planning, and need to understand if certain analysis on the maps has already been done in order to ensure no duplicity of work.
7. Transferability of information, methodologies, technologies. How easy would it be to replicate in your location? For this, product metadata/transferability process (what info you had access to, what you had to generate, how easy would it be to replicate, etc.) would be helpful.
8. A shared Regional Annual Calendar is needed that is easily accessible and updated in real time. Can include who, where, what, when, why, and contact details. This could help enhance coordination and awareness of programs and activities to support regional needs. This could also be sourced from existing organizational calendars (SPC, SPREP, etc.) and perhaps hosted on one of the regional portals. Would need to identify target end users and a real need to justify the work required.

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