OCEANIA REGIONAL ENVIRONMENTAL SECURITY FORUM

24-27 MAY 2016

NADI, FIJI

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ACKNOWLEDGEMENTS

The U.S. Pacific Command would like to acknowledge the following planning team members that supported the successful execution of the 2016 Oceania Regional Environmental Security Forum.

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8. Mr. Justin Pummell, Geographer, U.S. Army Corps of Engineers, Institute for Water Resources

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FOREWORD

I would like to extend my sincere appreciation and congratulate the Republic of Fiji Military Forces (RFMF) for making the 2016 Oceania Regional Environmental Security Forum (RESF) a success. Through its leadership and guidance, RFMF planned and executed a professional and meaningful engagement that will shape future environmental security activities in the region. Thank you!

The 2016 RESF tackled issues related to sustainable ocean resources, coastal zone protection, and disaster resiliency. The RESF served as an outstanding platform to discuss these topics, and formulate future collaborative civil-military opportunities to move forward. I am hopeful that this After-Action Report will move these topics from discussion to action.

Herein you will find daily summaries, RESF activities, participant contact information, opportunities moving forward, and much more. I encourage you to explore this document, and the supporting content, to move environmental security initiatives in Oceania forward. There are many cooperative prospects, and through the Environmental Security Program, USPACOM and partners will move these opportunities from a community of interest to a community of action.

US Pacific Command remains committed to advancing environmental security in the Indo-Asia-Pacific theater. USPACOM will continue the annual Environmental Security Forum for partners to share best practices and lessons-learned; move combined project opportunities from the classroom to the field; and ensure an electronical platform is available for partners to advance environmental security initiatives.

Christopher Sholes
US Pacific Command
Environmental Manager

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EXECUTIVE SUMMARY

Discussion

The 2016 Oceania Regional Environmental Security Forum (RESF) was co-hosted by U.S. Pacific Command (USPACOM) and the Republic of Fiji Military Forces (RFMF) to increase environmental security awareness associated with Pacific and Indian Ocean countries, and identify collaborative projects in the future where militaries may be able to utilize their unique capabilities to assist civilian authorities. Each day of the event focused on a particular theme, and was chaired by a senior leader. The primary themes of the event were *Sustainable Ocean Resources, Protecting the Coastal Zone, Resiliency to Extreme and Frequent Weather Events,* and *Regional Project Collaboration*. The RESF included 105 participants from 18 countries. There were also several international organizations in attendance, including the Secretariat of the Pacific Community (SPC).

The RESF was able to identify future environmental security projects that militaries in the region can potentially support. This included project ideas associated with waste, water, energy, disaster risk reduction, maritime security and climate change adaptation. Project ideas will be prioritized, researched, refined and submitted for future funding consideration. The RESF planning team will post progress at the event's official web site, http://www.pesforum.org.

Deputy Assistant Secretary Russell Smith from the National Oceanic & Atmospheric Administration (NOAA) led the *Sustainable Ocean Resources* theme on Day 1. He introduced the theme, highlighting efforts in US civilian and military sectors that are pushing to achieve sustainability. Mr. Smith was followed by three subject matter expert speakers. Mr. Anthony Talouli from the South Pacific Regional Environmental Programme (SPREP) spoke on maritime pollution; Mr. Kelvin Passfield (Cook Islands) presented on the Marae Moana Marine Park; and LTC Ahmed Thohir from the Maldives National Defence Force (MNDF) described environmental sensitivity indexing (ESI), for which an atlas was recently completed for Laamu Atoll as a result of the 2014 RESF. All three speakers later sat on a panel session, and they were

joined by Ms. Jill Brandenberger from the Pacific Northwest National Laboratory (PNNL), SSGT Ibrahim Faisal (MNDF), and Mr. Ibrahim Naeem (Maldives Environmental Protection Agency [EPA]). Participants were able to ask the speakers questions, and productive discussion was held on current issues and best practices.

An Illegal, Unregulated or Unreported (IUU) Fishing Workshop was conducted on the afternoon of Day 1. The workshop was prepared by NOAA's Office of Law Enforcement, and was designed to see how various countries manage common IUU fishing issues. The workshop had participants exercise a scenario where a stateless vessel had been reported illegally fishing in an Exclusive Economic Zone (EEZ) by aerial reconnaissance. Participants were divided into ten work groups and used a Strengths, Weaknesses, Observations, and Threats (SWOT) analysis to identify the procedures necessary to seize and prosecute the vessel.

The RESF switched themes on Day 2 and focused upon *Protecting the Coastal Zone*. The theme leader was Dr. Sangeeta Mangubhai from the Wildlife Conservation Society located in Fiji and she introduced and moderated the theme. Three speakers were invited to the stage to share their expertise on common issues or approaches to coastal zone protection in the Pacific. First, Ms. Nicole Griffin from the US Marine Forces Pacific (MARFORPAC) spoke on Coastal Marine Spatial Planning. Ms. Griffin was followed by Mr. Alifereti Tawake from the Locally Managed Marine Area (LMMA) International Network. Mr. Tawake delivered an exceptional presentation on how community level work can protect the coastal zone, and how a local concept can grow to become a national approach. The final Day 2 speaker was Mr. Marc Wilson from SPC, who spoke on coastal climate change adaptation and the ridge-to-reef management approach. Similar to Day 1, all speakers returned to the stage to hold a panel session.
To experience Fiji's coastal zone firsthand, RFMF escorted participants to the Sigatoka Sand Dunes National Park. There, participants divided into four groups and park rangers guided them through the park. First, participants hiked uphill through a forested area to reach the tops of parabolic dunes. From there, participants descended loose sand to the coastal area to further experience Fiji's unique ecosystem. After leaving the coastline, participants competed the loop back to the busses through a reclaimed forest and fruit bat habitat.

The RESF's third day theme was *Resiliency to Extreme and Frequent Weather Events*. Commodore Ian Murray from the Australian Defence Force (ADF) chaired the day. He introduced the theme, and highlighted several lessons-learned from ADF's recent deployment to Fiji in support of Tropical Cyclone (TC) Winston. The first speaker was Mr. Luke Koroisave from the Government of Fiji. Mr. Koroisave presented on Fiji's response to TC Winston and the challenges the country faced responding and recovering from the second largest cyclone ever recorded. The second speaker was LTCOL Terry McDonald from the New Zealand Defence Force (NZDF). LTCOL McDonald shared his experience deploying to Tuvalu and Tokelau in response to the 2011 droughts in those countries. The final speaker was Mr. Justin Pummell from the US Army Corps of Engineers (USACE), who filled in for Mr. Iuni Savusa (American Samoa). Mr. Pummell delivered a presentation on the resiliency of American Samoa to recover from the 2009 tsunami that devastated the territory.
After the Day 3 presentations, Commodore Murray moderated a lively panel session with the aforementioned disaster resiliency speakers. Participants posed questions related to the presentations delivered, as well as other questions related to disaster response and recovery.

The *Resiliency to Extreme and Frequent Weather Events* theme concluded with two group activities. Participants were divided into ten groups and were asked to respond to two disaster activities. The first activity had groups identify what was wrong in pictures from recent large-scale disaster response missions. The second activity, the "Cup Game," featured scenarios from recent disasters in the Oceania region, and compete to identify the correct answer. The two group activities increased awareness of common disaster situations, shared lessons-learned, and allowed regional solutions to be identified to mutual challenges.

The final day of the RESF focused on *Regional Project Collaboration*. Mr. Christopher Sholes (USPACOM J445) introduced the theme, and emphasized that the RESF is not just a community of discussion, but a community of action. Therefore, he requested participants divide into six topical groups and prepare at minimum two project ideas that could potentially be implanted in the field in the future. The topics evaluated were water, waste, energy, maritime security, humanitarian assistance/disaster relief (HA/DR), and

climate change adaptation. Participants were given approximately 75 minutes to prepare their ideas, and the results were then shared with the plenary. Ideas generated included drought contingency planning, renewable energy installation, waste-to-energy development, establishing mass messaging systems, and seawall assessments.
Before closing the RESF, each country in attendance delivered their After-Action Review (AAR) comments. Countries were asked to identify future RESF topics. Biodiversity conservation, mining, pollution and military operations were common ideas that resonated amongst the countries.

BG Jeff Milhorn (USACE) and RADMR Viliame Naupoto (RFMF) officially closed the RESF. Both senior military leaders thanked the participants for their contributions throughout the week, and emphasized the importance of collaboration. BG Milhorn and RADMR Naupoto encouraged civil-military cooperation on future environmental security projects in the region.
A summary of the event can be reviewed at:

http://www.pacom.mil/Media/News/NewsArticleView/tabid/11348/Article/785269/securing-tomorrows-environment.aspx

Way Ahead

Multiple opportunities exist moving forward for USPACOM's environmental security program. First, the Pacific Environmental Security Forum (PESF) will continue. 2017 will be a Pan-Pacific event. The particular co-host has not been finalized yet, but potential candidates include the Philippines, Korea, Sri Lanka and the United States. The planning team has prepared draft letters of intent, and will distribute as soon as possible to gain a long-term commitment. Future themes could include resource extraction, wildlife trafficking and biodiversity conservation.

Beyond 2017, USPACOM will solidify commitments earlier than in previous years. The planning team has prepared letters of intent for 2018 in Mongolia, 2019 in China, and 2020 in Vietnam. These letters will be distributed in June 2016 to allow countries time to decide their interest and include requirements in their budgetary cycles. The planning team may also send warning notice letters to some non-Title 10 countries so they allotted enough time to plan for future participation using their own funds (ex. New Zealand).

In regards to fielding project concepts developed at this year's Oceania RESF, the team will take the prioritized list, conduct further research, and prepare refined scopes of work and budget estimates. These submittals will then be entered into US Department of Defense (DoD) funding systems to complete for available monies. Those that are funded will be assigned to a service component with USPACOM J445 oversight, and the project will be implemented in partnership with all interested stakeholders.

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AFTER ACTION REVIEW

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AFTER-ACTION REVIEW

1. EVENT DATES: 24-27 May 2016

2. EVENT LOCATION: Denarau Island, Nadi, Republic of Fiji

3. BACKGROUND: The 2016 RESF was the sixth Asia-Pacific environmental security event organized by USPACOM. Each year, the event alternates between Pan-Pacific and regional themes. The initial activity was held in Hawaii in 2011 and featured Pan-Pacific sessions on 1) climate change adaptation, 2) environmental sustainability, 3) water resource management, and 4) disaster preparedness. In 2012, the event moved to Jakarta, where the Indonesia Ministry of Environment hosted the event. There, fourteen countries met to evaluate Southeast Asia regional environmental security concerns related to pollution, global warming, deforestation, overfishing and water supply in an ASEAN (Association of Southeast Asian Nations) context. In 2013, USPACOM partnered with the Australian Department of Defence, involving 17 countries to discuss sustainable environmental management in military operations, lessons-learned from military support to disaster relief operations, managing bio-security risks in the military context, and emerging technologies and new approaches to mitigating and adapting to climate change impacts. In 2014, the Maldives National Defence Force hosted the PESF 2-5 June 2014, which focused on South Asia regional environmental security topics related to water, waste management, resource protection, and energy. Lastly, the 2015 Pacific Environmental Security Forum was hosted by the Royal Thailand Ministry of Defence, and featured a Pan-Pacific examination of climate change, protection of the commons, and military environmental programs. The 2015 event also included the first attempt to identify regional environmental security projects in which partners could collaborate upon.

4. MISSION: To execute the Oceania RESF from 24-27 May 2016 in partnership with RFMF.

5. PURPOSE: To advance civil-military cooperation in the areas of ocean sustainability, coastal zone protection, and disaster resiliency; to conceptualize future environmental security cooperation activities that potentially can be

achieved in the Oceania region; to increase awareness of environmental security best practices and lessons-learned throughout the Oceania region; and to advance military support to civilian authority in the areas of climate change adaptation and environmental stewardship.

6. VISION: To strengthen and advance alliances and partnerships by enhancing the capabilities of regional states in the Pacific theatre to assess causes and impacts of environmental security issues, develop response strategies to mitigate these issues, and conduct contingency planning for crisis response.

7. OBJECTIVES: The following objectives were set for the 2016 Oceania RESF:

- Identify sustainable approaches to regional resource protection;
- Evaluate best practices and lessons-learned in coastal zone management;
- Protect common ocean resources;
- Enhance regional environmental security cooperation; and
- Identify cooperative climate change adaptation projects.

8. POINT OF CONTACT: Mr. Christopher Sholes, Environmental Program Manager, J445, U.S. Pacific Command, christopher.sholes@uspacom.mil.

9. COUNTRIES INVOLVED: Australia, Cook Islands, Fiji, Kiribati, Maldives, Marshall Islands, Nauru, New Zealand, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Timor L'este, Tonga, Tuvalu, United States, and Vanuatu.

China, Federated States of Micronesia, Japan, Korea, New Caledonia, Niue, Palau and Tokelau were also invited to attend, but were unable to make the trip due to budgetary restraints or other commitments.

10. PARTICIPANTS: Please find below a generic list of all participants that attended the RESF.

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11. DAILY SUMMARY: The details found in the section below summarize the PESF's daily activities. They were recorded on the day, and reflect the current status at the time.

a. 24 May 2016

The RESF officially commenced with an "I Sevusevu" ceremony led by RFMF. A Fijian blessing was delivered to all participants, and the heads of delegation received a small bowl of kava and traditional garland. The ceremony concluded with best wishes for the event.

Mr. Douglas Sonnek, Deputy Chief of Mission (US Embassy, Suva), took the stage and delivered his opening speech. In his statement, DCM Sonnek highlighted climate change challenges that persist in the Oceania region. This included rising sea levels, ocean mining, and more frequent and intense natural disasters. DCM Sonnek raised the point to ask why the military would be involved in topics such as ocean sustainability and disaster resiliency. He emphasized that climate change was a threat multiplier, and with situations such as drought, cyclones, and resource competition, the military needs to be involved in some instances due to its unique capabilities. DCM Sonnek concluded his statement by mentioning USAID's ongoing work on coastal climate change adaptation, as well as the US Navy's Shiprider program.

Mr. Sonnek was followed by the Honorable Praveen Kumar Bala, Fiji Minister for Local Government, Housing, Environment, and Transport. Minister Bala thanked all participants for their willingness to travel to Fiji and share their expertise. He emphasized that all people are connected to Mother Nature, and that the current path humankind is blazing is concerning. He provided some examples how Fiji is impacted by climate change, including the recent devastation by Cyclone Winston. He highlighted the need for regional partners to work together to share data, obtain more accurate instrumentation, and identify collaborative mitigation strategies moving forward. The minister stated that Fiji has many lessons-learned from Cyclone Winston to share with the ORESF group, including the invaluable assistance the RFMF provided supporting the Fiji National Disaster Management Office.

Next, Deputy Assistant Secretary (DAS) Russell Smith (NOAA) introduced the Sustainable Ocean Resources theme. As DAS Smith spoke, footage from the OKEANOS deep-sea explorer showed scenes of fish, crabs, and other species recently recorded on the Pacific Ocean floor. DAS Smith highlighted recent policy efforts in the United States underway to ensure sustainable ocean resources are possible for future generations. This included action taken since the 2014 Our Oceans Forum held in Washington, DC by Secretary of State John Kerry. DAS Smith encouraged participants from nations to leverage, join, and contribute to existing regional mechanisms that promote environmental security. He also mentioned the US Navy's Great Green Fleet initiative, which uses alternative fuel to reduce environmental impacts.

Following the theme introduction, Mr. Anthony Talouli from the South Pacific Regional Environmental Programme (SPREP) presented on regional maritime waste management. He explained SPREP and how it is organized, then discussed regional pollution strategies that SPREP and others have employed, including the Pacific Ocean Pollution Prevention Strategy and the Pacific Islands Regional Marine Spill Contingency Plan. Mr. Talouli provided examples of ongoing oil spill concerns from WWII ship wrecks and recent local incidents. He also showcased regional waste reception facilities that provide temporary storage prior to shipping and disposal. Mr. Talouli concluded his presentation by listing common marine waste found in the Pacific, including Fish Aggregating Devices, plastics, and various other discharge.

Next, Mr. Kelvin Passfield briefed efforts to create the Marae Moana Marine Park in the Cook Islands. He said the park is still in the conceptual stage, and there are many hurdles still to be jumped for the park's full legal status. The park was launched in 2012 by the Cook Islands Prime Minister Henry Puna, but still does not have official legislation demarking its formal boundaries and designated use areas. The park will eventually have multiple-use zones in certain areas and an integrated management approach. Funding is still unresolved, and the Cook Islands are open to ideas from other countries. Mr. Passfield clarified that manganese nodule seabed mining and commercial fishing will require further negotiation.

The last speaker was LTC Ahmed Thohir from the Maldives National Defence Force (MNDF). He presented on a recent project the MNDF completed in partnership with USPACOM, Maldives Environmental Protection Agency (EPA), and the US Army Corps of Engineers (USACE). LTC Thohir explained how the Laamu Atoll Environmental Sensitivity Index (ESI) project was completed following the 2014 RESF. MNDF teamed with the Maldives EPA and USACE to collect biological, shoreline, and human-use data to prepare a Geographic Information System (GIS) atlas for Laamu Atoll. The final product can now be used to prioritize oil spill response targets in the atoll, which is adjacent to the One and a Half Degree shipping channel. The presentation demonstrated an actionable project that was completed following the 2014 South Asia RESF.

To conclude the morning session, Mr. Smith moderated a panel session on *Sustainable Ocean Resources*, with the three morning speakers joining Ms. Jill Brandenberger (PNNL), Mr. Ibrahim Naeem (Maldives EPA) and SSGT Faisal Ibrahim (MNDF). Participants asked the panelists questions for 45 minutes with discussion including 1) increased military involvement in marine resource protection, 2) leveraging tourism to fund environmental security shortfalls, and 3) sharing regional best practices to advance capabilities.

In the afternoon, participants were divided into ten work groups to conduct an IUU fishing workshop. NOAA's Office of Law Enforcement introduced the topic and provided an overview of IUU fishing statistics in the Pacific region. Mr. Chris Elvidge (NOAA) also delivered an overview of the Visible Infrared Imaging Radiometer Suite (VIIRS), a free tool that is capable of detecting the lights of boats in an Exclusive Economic Zone (EEZ). NOAA explained the IUU fishing scenario, which centered on a stateless fishing vessel detected within an EEZ and reported by air surveillance to be fishing illegally.

Aided by paired US and Fijian facilitators, participants worked through the scenario using a set of periodically inserted plot developments. Participants had time to share lessons-learned and best practices, and then outbrief key notes from the exercise. A majority indicated that they

would perform the following actions in response to the scenario: contact relevant agencies; deploy to the illegal vessel; board it; take control and separate the captain from the crew, make arrests, where appropriate; gather evidence; conduct an investigation; prosecute; and dispose of the vessel.

From the IUU fishing workshop, participants indicated that more regional maritime exercises would be beneficial. Furthermore, more surveillance capability, such as UAV systems and VIIRS, would add value. Additionally, identifying cost neutral approaches to enforcement is an important step to ensure local management can maintain control.

b. 25 May 2016

Day 2 RESF activities focused on Coastal Zone Protection and commenced with Dr. Sangeeta Mangubhai (Wildlife Conservation Society) showcasing the importance of coastal zones to economy, development, culture, and tourism. She explained that coastal zone biodiversity is critical to maintaining a healthy ecosystem, and requires both civilians and military involvement describing coral reefs' critical role to the nearshore environment, and that all Pacific Island nations should invest in the health of reefs to ensure future prosperity. She shared several local Fijian examples of coastal zone management, land-use planning and habitat restoration and stated that Fiji has a national coastal management plan, but it requires continuous updating to make it successful. For example, Fiji has expanded its coastal zone focus from 15 meters to the ridge-to-reef concept. Dr. Mangubhai concluded her opening statement stating that the military can do more to protect the coastal zone, and supporting enforcement and compliance issues would be a great starting point.

The first speaker was Ms. Nicole Griffin, Environmental & Energy Manager, US Marine Forces Pacific who spoke on Coastal and Marine Spatial Planning (CMSP). Ms. Griffin explained the U.S. National Ocean Council, and how it created the National Ocean Policy (NOP) to improve the stewardship of the United States' coasts and lakes. She also explained the NOP has nine core objectives, including Ecosystem-Based Management, CMSP. CMSP in the US is managed regionally, with the

Pacific Region covering Hawaii, American Samoa, Guam, and the Commonwealth of the Northern Marinas Islands. Each region has a planning board, which meets to set collaborative ecosystem-based management that promotes sustainable use of our Pacific Ocean resources, economic growth & stability, access, heritage and values. The American Samoa regional planning board will be the first to develop a CMSP. Ms. Griffin concluded by explaining that the CMSP will provide the DoD with ocean use information, understanding emerging ocean uses, natural resource permitting, and selecting new training areas.

The next presenter was Mr. Alifereti Tawake from the Fiji Local Managed Marine Area (LMMA) network who delivered an excellent presentation on how the LMMA network engages local communities to achieve sustainability and managed change. He summarized the LMMA network as a group of locally managed marine area practitioners who have joined to improve the success of their coastal management and conservation efforts. The LMMA network extends beyond Fiji, and is active in many of the Pacific Island nations. He described how the LMMA network started in Fiji, and how it has grown over the years from a village effort to a national effort. Typically, LMMAs cover areas from the mountain to the sea, and tackle issues related to water, waste, HA/DR, climate adaptation, agriculture, renewable energy, and more. Mr. Tawake concluded his presentation by showing statistics of how LMMAs are increasing fish stocks, governance, etc.

The final presentation was by Mr. Marc Wilson, Program Manager, Secretariat of the Pacific Community (SPC). Mr. Wilson presented on SPC's ridge-to-reef program. He started by providing background on the Global Environment Facility (GEF), which unites 183 countries in partnership with international institutions, civil society organizations, and the private sector to address global environmental issues while supporting sustainable national development initiatives. Mr. Wilson explained that the ridge-to-reef program combines into one effort integrated water resource management, integrated coastal management, eco-system based management, and ecosystem based adaptation. Overall, the ridge-to-reef program enhances Pacific Island countries' ecosystem goods and services through integrated approaches to land, water, forest, biodiversity and

coastal resource management that contribute to poverty reduction, sustainable livelihoods and climate resilience.

Following the presentations, a panel session with all speakers addressed several great questions. Participants were curious how enforcement factored into LMMAs, and how environmental crime was managed. Mr. Tawake answered that enforcement measures need strengthening and that environmental crime be taken as seriously as other crime. Participants also asked how small island nations can manage coastal zone issues when they lack manpower and resources. Panelists suggested that community-level approaches were the best way to tackle coastal zone issues, and LMMA and reef-to-ridge concepts should continue in the future to guide efforts.

In the afternoon, RESF participants traveled to Sigatoka Sand Dunes National Park. The park is Fiji's first national park and features parabolic sand dunes, cultural artifacts, native and introduced forests, and other local flora and fauna. Four groups hiked 2.5 kilometers led by park rangers who explained the history and natural features along the trail. Rangers also highlighted coastal zone issues currently impacting the area. Storm surge from Cyclone Winston, for example, unearthed an ancient burial ground in the dunes.

Upon conclusion of the tour, participants returned to Nadi.

c. <u>26 May 2016</u>

Commodore Ian Murray (Australia) kicked off Day 3 by introducing the Resiliency to Extreme and Frequent Weather Events theme by stating that Fiji's recent cyclone is an excellent example of the new normal we all face: more frequent and intense natural disasters. He stated that these events are threat-multipliers, undermining cultural, social, political, economic and environmental systems. As a consequence, the ability of vulnerable communities to manage, adapt and recover from these threats is greatly dependent on resilience. Commodore Murray emphasized that we cannot replace like with like; we must build back better. Next, Commodore Murray explained Australia's supporting response role to Cyclone Winston, which impacted Fiji in February. Initially, the focus

was military-delivered HADR relief and transitioned after several weeks to long-term reconstruction support to the Fijian Government and people. He highlighted geospatial intelligence sharing was critical to partnering with Fiji. To conclude his remarks, Commodore Murray defined resilience, provided examples of what it means to be resilient, and touched on factors for effective resilience. He stated:

- Resilience embraces complexity; works with the dynamic nature of cultural, social, ecological and economic systems – all of which are integrated.
- Planning and implementing effective resilience should think long and short term effects.
- Resilience brings change, risk, and uncertainty that must be balanced alongside community rights, needs and vulnerabilities.
- To operationalize resilience; we need to understand what it means.
- There are many different conceptualizations of resilience ranging from psychological, social and ecological to economic.
- And what may work for one community, may not work for another and therefore resilience building should not be considered a one-size-fits all.

Commodore Murray concluded his theme overview by introducing Mr. Peter Drysdale, who runs a local NGO in Fiji that builds cyclone-resistant housing, as an excellent example of what "right" looks like.

Following Commodore Murray's theme introduction, he introduced Mr. Luke Koroisave (Fiji) who presented on the Government of Fiji's response to Cyclone Winston, and the post-disaster needs-assessment his office conducted. He first provided a chronological summary of cyclone events, then the cyclone's impact to geography, population, infrastructure, etc. Next, he listed the responders and what they did, emphasizing the Fiji Government's guiding response principles of speed, cooperation, communication, economic recovery, concentration, flexibility, and accountability. He highlighted that priority response actions were shelter, food, water, and medical attention. To conclude his presentation, Mr. Koroisave explained the financial contributions Fiji received to respond and recover to Cyclone Winston, including the Flash Appeal and by sharing a few key lessons-learned. He described that census data needs to

be more accurate to support disaster responders, that the Government of Fiji needs to streamline and refine its processes to become more efficient, and more focus needs to be placed on disaster risk reduction.

Next, LTCOL Terry McDonald from the New Zealand Defence Force (NZDF) spoke on New Zealand's support to the 2011 drought that impacted Tokelau and Tuvalu. LTCOL McDonald stated that drought is a difficult hazard to forecast and respond too, especially when it impacts remote places. The slow onset of the situation developed as a result of 1) increasing development, 2) La Nina, and 3) the reliance on rainwater capture. Over the course of two months, NZDF provided assistance by first moving to American Samoa to support the Tokelau response, and worked from Samoa to support the Tuvalu response. LTCOL McDonald explained that Tokelau has no airfields, adding to the challenge. The NZDF used water purification systems and desalination procedures to produce clean drinking water for the drought-stricken areas. LTCOL McDonald emphasized that NZDF was never the lead responder, and their efforts were always in support of civilian authority and the impacted nation's needs. LTCOL McDonald concluded by delivering a few key lessons-learned from the experience including trust, communication, and collaboration.

The final morning speaker was Mr. Justin Pummell (USACE) who spoke on the 2009 American Samoa tsunami, and the resiliency measures that have been implemented since the disaster. Mr. Pummell commenced the presentation by providing background on America Samoa and the American Samoa Department of Homeland Security's mission. He explained the tsunami destruction was the highest on the main island of Tutuila. Mr. Pummell then described how the US' Federal Emergency Management Agency (FEMA) became involved. The remainder of the presentation focused on disaster resiliency related to key livelihood sectors such as energy, communications, ports, and medicine. Mr. Pummell explained how American Samoa has developed new tsunami evacuation maps that use improved data to clearly show potential impact zones. He described how the tsunami knocked out the Satala Power Plant, how a temporary solution was employed after the disaster, and how a permanent solution made the territory more resilient. Mr. Pummell also shared lessons learned in enhancing the communication network and

medical procedures to better support the local populace and concluded by highlighting civil-military cooperation, and how the Government of American Samoa utilized the military's unique capabilities to advance disaster recovery.

Commodore Ian Murray then conducted a disaster resiliency panel session with several questions related to improving preparedness. The panel consensus was that preparedness is critical to resiliency, and that multi-lateral exercises and pre-planning are important to success. The first steps in building lasting resiliency are more long-term, zoning, building codes, and the proper siting, engineering and construction of critical infrastructure. Another question asked about lessons learned from the various responses. All panelists agreed that allowing the affected nation to establish the requirements and priorities was critical. Responders also need to guard against scope growth/mission creep. Part of the recovery effort is for local business and community members to resume their roles and if responders are filling those, it may delay recovery and harm the local economy. Other questions related to measuring the effectiveness of relief aid, the increasing demand for military support for humanitarian assistance/disaster response, and pre-planning for debris and other solid/hazardous waste issues were addressed.

In the afternoon, two disaster resiliency group activities were conducted. The first activity featured photographs from recent disasters. Work groups collaborated to identify what was wrong in the pictures. A moderator afterwards explained what really happened and what lessons were learned.

The second disaster resiliency activity was a game where the groups were quizzed on disaster response and resiliency scenarios from recent events in Oceania. Each scenario was presented in a cup, and groups competed to collect as many cups as possible. At the end, the moderator provided answers and clarified the results.

d. <u>27 May 2016</u>

The final day of the 2016 RESF focused on regional project development and collaboration. Mr. Chris Sholes (USPACOM) said the purpose of

today's activities, as well as the RESF, is to identify potential environmental security projects that USPACOM and other partners can support in the Oceania region. He explained that participants are divided into topical groups to brainstorm environmental security project ideas related to waste, energy, water, HA/DR, climate change adaptation, and maritime security. He described that each topical group will be responsible for identifying 1-2 priority ideas and documenting the project location, scope, challenge statement, and magnitude. Mr. Sholes shared how the 2014 RESF in the Maldives was able to generate project ideas along theme topics, and how those projects have progressed since 2014.

With the help of facilitators, participants discussed potential environmental security project ideas spending 40 minutes brainstorming. Participants then refined their list and identified two prioritized project ideas. These projects were then discussed in further detail, and a project location, scope, challenge statement, and magnitude were developed. At the conclusion of the project development session, each topical group presented their results. A quick summary can be found below.

- Water: barge units, hydrological modeling and drought contingency planning.
- Energy: renewable energy road-mapping and a holistic approach to island resiliency
- HA/DR: regional support plan development, regional standard development, and mass messaging systems.
- Climate Change: Sea wall assessments
- Waste: development of waste & recycling markets, waste-to-energy solutions, and solid waste management planning.

Following the project concept development outbrief session, an After-Action Review (AAR) was conducted by each country answering the following questions.

1. What subjects or themes were not addressed this week that you prefer?

2. How do we include your country in future environmental security forums and activities?

Each country delivered their responses, and a summary can be found below.

- Australia
  1. The RESF themes were relevant. In the future, resiliency topics should be allocated more time. The planning team should look for linkages with past forums, and try to produce future topics that include specific military operations.
  2. Australia is committed to providing senior level engagement at future events.

- Fiji
  1. Future topics for consideration are wildlife crime, invasive species, and IUU fishing.
  2. Fiji would like to obtain more data on environmental security, leverage regional approaches, and include more regional institutions such as the Pacific Island Forum (PIF) and the International Union for Conservation of Nature (IUCN).

- Maldives
  3. The planning team should consider biodiversity conservation as a future RESF topic.
  4. The Maldives is ready to share their experience, especially as it relates to managing water shortages (ex. Male Power Plant crisis) and sustainable small-island waste management.

- Nauru
  1. Future topics could be sea-level rise and biodiversity conservation.
  2. There should be more time for the panel session. Nauru is willing to present in future events, if requested.

- New Zealand
  1. New Zealand would like to see more security force presentations. Future RESF themes could examine emissions and food/agriculture security.
  2. Future New Zealand invitations should be coordinated through the Ministry of Foreign Affairs & Trade and the US Embassy in Wellington. The team should consider live streaming the event over social media in the future.

- Papua New Guinea
  1. Future events can consider regional environmental security policy and IUU fishing as primary themes.
  2. The Papua New Guinea Navy can help manage invitations in the future. If invitations are sent to the Navy, then they can reach out to civilian institutions to ensure the right people travel to the event.

- Philippines
  1. A future RESF theme could be the management of industrial waste on military bases.
  2. The Philippines could potentially host the RESF in the future. A letter of intent should be sent to the Ministry of Foreign Affairs to coordinate the participation.

- Samoa
  1. Pollution should be considered as a future topic.
  2. Samoa will carry the lessons-learned from this event with them.

- Solomon Islands
  1. The Solomon Islands is interested in learning more about mining and logging in the future.
  2. The Solomon Islands recommends its Environment Department be invited to the next RESF.

- Sri Lanka
  1. Future topics could potentially be biodiversity, nuclear waste cleanup, ecotourism, and oil spill response.

2. Sri Lanka can potentially host the RESF in the future. A letter should be sent to the Ministry of Defense to request.

- Timor L'este
  1. Timor L'este would like to learn more about the distribution of aid after a large disaster, as well as IUU fishing.

- Tonga
  1. Tonga would like for each country in attendance to present on environmental issues that impact their country. This could take place on the first day of the event. Then, the remaining days can be driven by the topics presented on the first day.
  2. Tonga would like invitations delivered to the Ministry of Defense first.

- Tuvalu
  1. Tuvalu would like future RESF events to showcase the Incident Command System and logistics.
  2. The networking opportunities from this forum were tremendous. A similar approach should be continued in the future.

- United States
  1. Future topics could include climate change, renewable energy and unexploded ordinance cleanup.
  2. The US team felt that more time should be allocated to the panel sessions, and a "needs" focus should help drive task development. If more information can be shared on resources (ex. fact sheets on existing organizations and equipment that is already out there), then this would be most beneficial.

- Vanuatu
  1. Volcano disaster response, food security and mining could be future RESF topics.

The RESF concluded with the closing ceremony, beginning with BG Jeff Milhorn (USACE) providing the US' closing remarks. During his speech, BG Milhorn emphasized the importance of "why." Why was the RESF held? Why should we collaborate on environmental security issues? Why

is it important for the military to be involved in climate change? BG Milhorn explained that through sharing best practices, lessons learned (both good and bad), and the collaboration between both civilian and military expertise from across the international community, we all recognize the global significance of the Oceania region and understand that challenges are best met together. BG Milhorn went on to highlight that the RESF does not stop with the forum. Rather, it is now time to move forward to a "community of action" to collaborate in the field on environmental security projects that can make change. BG Milhorn concluded his remarks by thanking everyone.

RADMR Viliame Naupoto (RFMF) presented Fiji's closing statement. He first stated that RFMF immediately said "yes" to the opportunity to host the RESF. Tropical Cyclone Winston, however, was something that had not anticipated being part of the planning process for the event. RADMR Naupoto explained that TC Winston was the second largest cyclone ever recorded, and it required the largest military mobilization in the South Pacific since WWII to respond. As such, RFMF is tremendously grateful for the support they received from New Zealand Defence Forces and Australia Defence Forces. RADMR Naupoto then mentioned that more work is needed between civilians and military to cooperate and collaborate. He stated that the military does not know everything, and it cannot do everything on its own. Meaningful relationships, trust, respect and cooperation need to be maintained and nurtured. RADMR Naupoto concluded his remarks by thanking all of the participants for their hard work throughout the week.

At the conclusion of the closing ceremony, the Fijian delegation sent off the participants in song. Participants picked up their certificate, group photo, and a CD before departing.

12. PARTICIPANT EVALUATION SUMMARY: At the conclusion of the Oceania RESF, participant evaluation forms were disseminated to everyone to gain feedback on the event. Each question was ranked from 1 to 5, with 5 being the highest and 1 the lowest. The percentages, and/or grades, were calculated by assigning the following values/weights:

1 = 0
2 = 25
3 = 50
4 = 75
5 = 100

The value that is highlighted indicates the majority vote by the participants.

1) Was the Illegal, Unreported or Unregulated (IUU) Fishing workshop on Day 1 beneficial? **88.2%** **(↑ 2.7% increase from last year's Day 1 activity)**

1	2	3	**4.53**	5

2) Do you believe the Day 2 site visit was educational and worthwhile? **80.4%** **(↓ 9.5% decrease from last year's site visit)**

1	2	3	**4.22**	5

3) Did the Day 3 group activities increase your awareness of disaster response, recovery and resiliency? **86.1%** **(↓ 0.3% decrease from last year's Day 3 activity)**

1	2	3	**4.44**	5

4) Did the Day 4 Project Concept Development activity help identify potential environmental security activities that militaries in the region may be able to support?

Yes …Please see individual participant evaluation forms for more details.

(The number values were not printed on the participant evaluation form, so a score could not be applied this year.)

5) Do you believe this event helped you gain a better understanding of regional environmental issues and threats in Oceania? **91.2% (↑ 6.5% increase from last year's event)**

1	2	3	**4.65**	5

6) Were the themes of sustainable ocean resources, coastal zone protection, and disaster resiliency the most appropriate issues to highlight for the Forum? **87.7% (↓ 0.9% decrease from last year's event)**

1	2	3	**4.51**	5

7) Was the delivery of three subject matter expert presentations followed by a panel session an effective means of explaining the themes of the event? **86.6%**

1	2	3	**4.46**	5

8) Do you feel you were given an adequate amount of time to discuss your perspective on environmental security? **79.7% (↑ 2.1% increase from last year's event)**

1	2	3	**4.19**	5

9) Do you think the length of the forum was appropriate? **83.2% (↑ 0.7% increase from last year's event)**

1	2	3	**4.33**	5

10) Do you believe that the event was prepared and delivered in a professional and worthwhile manner? **91.2% (↑ 4.4% increase from last year's event)**

1	2	3	**4.65**	5

11) Would you want to conduct another Environmental Security Forum in the future? **90.2% (↑ 0.3% increase from last year's event)**

1	2	3	**4.61**	5

12) Will you take lessons learned from this event and apply them to your job in the future? **90.1% (↑ 1.9% increase from last year's event)**

1	2	3	**4.61**	5

13) Were there adequate recesses between sessions so you could interact with all other participants you wished to meet? **89.4% (↑ 2.6% increase from last year's event)**

1	2	3	**4.58**	5

14) Can you please list the primary environmental Point of Contact for your organization so RESF event planners can continue to work with your country?

a. Agentha V. Karamui, Chief Conservation Officer, Solomon Islands, agnethavkaramui@gmail.com, +677 26036
b. Ms. Moriana Phillip, General Manager, Environmental Protection Authority, Republic of Marshall Islands, morianaphilips@gmail.com

c. Mr. Lowell Alik, Director, Office of Environmental Planning and Policy Coordination, Republic of Marshall Islands, lowellalik@gmail.com
d. Mr. Aminiasi Qareqare, Acting Director, Dept of Environment, Fiji, aminiasi.qareqare@govnet.gov.fj
e. Mr. Raijele Taga, Acting Director General Development, Fiji, raijeli.taga@govnet.gov.fj, +679 990-6646
f. Mr. Anthony Talouli, Maritime Pollution Director, South Pacific Regional Environmental Programme (SPREP), anthonyt@sprep.org
g. Mr. Kelvin Passfield, Technical Director, Te Ipukarea Society, kelvin.passfield@gmail.com
h. Mr. Michael Aroi, Secretary for Department of Foreign Affairs & Trade, Nauru, +674 557-3040, mike.ario@gmail.com
i. Ms. Mavis Depaune, Assistant Secretary for DCIE, Nauru, monmave@gmail.com
j. COL Mike Goodyer, Australia Defence Force, mike.goodyer@defence.gov.au
k. LCDR Ian Brown, Royal Australian Navy Fleet Environment Officer, ian.brown4@defence.gov.au
l. Mr. Bill Pickering, NOAA, bill.pickering@noaa.gov
m. LCDR Kevin Yetamala, PNG Defence Force, Papua New Guinea, +675 73219824, kevyetamala@gmail.com
n. Col Joel Fernandez, Chief, Research and Special Project Division, Office of the Director, Joint Staff for Civil-Military Operations, Philippines, rscd.oj7.cfp@gmail.com, joelbfernandez21@yahoo.com.ph
o. Mr. Manuau Taufilo, Coastal Fisheries Management, Tuvalu Fisheries Department, Tuvalu, mtaufilo@gmail.com, +688 20 344, +688 20 690
p. Tuvalu Police Service: Land Force Commander – Laka Falefou, Maritime Commander – Talafou Esekia, talafoi@yahoo.com.au, +688 20178
q. Rear Admiral KKUPH Dr. Silva, Head of the Marine Conservation & Monetary Cell, Naval Headquarters, PO Box 593, Colombo Sri Lanka

r. Mr. Madhura Delpounitra Marine Environment Pollution Prevention, Sri Lanka, madhurathilina@gmail.com, Sri Lanka, +94 777410759
s. Fred.suhara@rsipf.gov.sb
t. Ms. Rhonda Robinson, Deputy Director, Water & Sanitation Programme, SPC, rhondar@spc.int
u. Mr. Paul Taylor, Disaster Reduction Programme, SPC, pault@spc.int
v. Mr. Kifle Kahsai, Renewable Energy, SPC, kiflek@spc.int
w. Mr. Mike Petterson, Climate Change, SPC, michaelp@spc.int
x. sgandrews@vanuatu.gov.vu
y. Kiribati Environment and Conservation Division, information@environment.gov.ki or putato@environment.gov.ki
z. Mr. Pedro Rodrigues, Chief of MCS Dept, Ministry of Agriculture & Fisheries, Timor L'este, pedro.rodriques@maf.gov.tl
aa. Mr. Ibrahim Naeem, Director, Environmental Protection Agency, Republic of Maldives, ibrahim.naeem@epa.mv

The overall participant results can be found in the below table:

	1	2	3	5	6	7	8	9	10	11	12	13	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	1	0	0	0	0	1	3	1	0	0	0	6
3	1	14	6	2	2	2	10	5	1	7	2	3	55
4	32	27	27	20	30	34	**33**	30	20	11	24	24	312
5	**39**	**32**	**37**	**46**	**37**	**35**	25	**35**	**49**	**46**	**45**	**44**	470
	72	**74**	**70**	**68**	**69**	**71**	**69**	**73**	**71**	**64**	**71**	**71**	
0	88.2	80.4	86.1	91.2	87.7	86.6	79.7	83.2	91.2	90.2	90.1	89.4	**87.0**

Overall, this year's event was rated 0.9% higher than last year, and 4% higher than two years ago.

13. COUNTRY EVALUATIION SUMMARY: In addition to individual participant evaluations, each country involved in the Forum provided their feedback on the following two questions:

1. What subjects or themes were not addressed this week that you prefer?

2. How do we include your country in future environmental security forums and activities, and what can the planners do to improve in the future?

- Australia
  1. Scales of resiliency, linkages with past forums, topics tied to military operations.
  2. Australia is committed to providing senior level engagement at future events.

- Fiji
  1. Wildlife trafficking, invasive species, IUU for intra-fisheries.
  2. Fiji would like to obtain more data on environmental security, leverage regional approaches, and include more regional institutions such as the Pacific Island Forum (PIF) and the International Union for Conservation of Nature (IUCN).

- Maldives
  1. Biodiversity conservation.
  2. The Maldives is ready to share their experience, especially as it relates to managing water shortages (ex. Male Power Plant crisis) and sustainable small-island waste management.

- Nauru
  1. Sea-level rise and biodiversity conservation.
  2. There should be more time for the panel session. Nauru is willing to present in future events, if requested.

- New Zealand
  1. Emissions and food/agriculture security.

2. Future New Zealand invitations should be coordinated through the Ministry of Foreign Affairs & Trade and the US Embassy in Wellington. The team should consider live streaming the event over social media in the future.

- Papua New Guinea
  1. Regional environmental security policy and IUU fishing.
  2. The Papua New Guinea Navy can help manage invitations in the future. If invitations are sent to the Navy, then they can reach out to civilian institutions to ensure the right people travel to the event.

- Philippines
  1. Industrial waste management for military bases.
  2. The Philippines could potentially host the RESF in the future. A letter of intent should be sent to the Ministry of Foreign Affairs to coordinate the participation.

- Samoa
  1. Pollution.
  2. Samoa will carry the lessons-learned from this event with them.

- Solomon Islands
  1. Resource extraction.
  2. The Solomon Islands recommends its Environment Department be invited to the next RESF.

- Sri Lanka
  1. Biodiversity, nuclear waste cleanup, ecotourism, and oil spill response.
  2. Sri Lanka can potentially host the RESF in the future. A letter should be sent to the Ministry of Defense to request.

- Timor L'este
  1. Disaster aid distribution and IUU fishing.

- Tonga
  1. Tonga would like for each country in attendance to present on environmental issues that impact their country. This could take place on the first day of the event. Then, the remaining days can be driven by the topics presented on the first day.
  2. Tonga would like invitations delivered to the Ministry of Defense first.

- Tuvalu
  1. Incident Command System (ICS) and logistics.
  2. The networking opportunities from this forum were tremendous. A similar approach should be continued in the future.

- United States
  1. Climate change, renewable energy and unexploded ordinance cleanup.
  2. The US team felt that more time should be allocated to the panel sessions, and a "needs" focus should help drive task development. If more information can be shared on resources (ex. fact sheets on existing organizations and equipment that is already out there), then this would be most beneficial.

- Vanuatu
  1. Volcano disaster response, food security and resource extraction.

OPPORTUNITIES

From the Oceania RESF, several emerging opportunities were gained. The presentations, workshops, panel sessions, group activities, and site visit all provided a medium where opportunities were revealed and expanded. Please find below some of the most prominent opportunities that were developed during the event. Items listed are not in any particular order.

a) General

1) **Issue:** Future event hosts

Discussion: In discussions with Sri Lanka, Philippines, and New Zealand, there may be emerging opportunities to expand participation with these countries and potentially have one of them host a future PESF. New Zealand's fiscal year starts in June, so they would not be able to host until 2018 or 2019. However, there may still be time to send a letter to the Philippines and Sri Lanka to have them host in 2017.

Recommendation(s): The planning team should prepare a host invitation letter to the Philippines and Sri Lanka to formally request they host the 2017 event. The team should also send a letter to New Zealand to see if they would be interested in hosting the RESF in 2019.

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2) **Issue:** Nasarawaga, Bua, Fiji Water Supply

Discussion: Deteriorating piping systems resulting in poor and contaminated water supply

Recommendation(s): Rebuild/replace entire system for 50 households (200 pax), 4K distance from water spring supply source, pipe 11/2

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3) **Issue:** Mass Messaging Systems

Discussion: Many of the Pacific Island nations in attendance at the RESF currently do not have an emergency mass messaging system. This makes notifying the public difficult when a non-notice event occurs, such as a tsunami, earthquake or flash flood. As a result, people are put at risk.

Recommendation(s): Research should be performed to determine what existing mass messaging systems may already be in place or easily replicated (ex. NOAA's Chatty Beetle). Further discussion with countries that currently do not have a mass messaging system should be conducted to determine approach and way forward.

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4) **Issue:** Waste Management Planning

Discussion: In several of the Pacific Island countries, there is a high volume of waste that sits for long periods of time taking up valuable land space and contaminating groundwater.

Recommendation(s): Waste management plans should be developed which identify hazardous waste, recycling, reuse, disposal, etc. strategies. Furthermore, parties are interested in learning how waste-to-energy solutions can be employed so that waste can be used for a meaningful purpose.

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5) **Issue:** Nauru shipping containers

Discussion: On Nauru, there are an excess amount of shipping containers that are brought into the country and then left. The containers sit and degrade, taking up valuable land space.

Recommendation(s): A waste subject matter expert should be sent to Nauru to evaluate the current problem and determine potential solutions to removing the containers.

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6) **Issue:** Renewable Energy Operation and Maintenance

Discussion: Fiji has implemented several solar energy projects, but does not have a routine operations and maintenance plan in place to ensure efficient operations after installation.

Recommendation(s): A renewable energy subject matter expert can assist with developing operation and maintenance planning documents that can be circulated to renewable energy users and owners.

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b) Sustainable Ocean Resources

1) **Issue:** Fish Aggregating Device (FAD) Clearance

Discussion: Throughout the Pacific Ocean, there are an estimated 80,000 FADs floating in the water. These FADS are typically made up of netting, and other loose materials that attract fish. However, they also cause entanglement for marine mammals. Fishermen typically will spend $100 – 800 USD on FAD materials, use it once, and then leave it floating in the ocean.

Recommendation(s): The US Navy, US Coast Guard, or NOAA may be able to use its vessels to start clearing loose FADs floating in the Pacific Ocean. This would clear marine debris and reduce entanglement for marine mammals. The US Navy's Third Fleet is going to look into the issue in greater detail.

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2) **Issue:** Maritime domain awareness

Discussion: Many countries in the Oceania region are lacking maritime domain awareness technology, capacity and capability.

Recommendation(s): 1) Determine existing technology capabilities (VMS, AIS, SAR, OHR, VIIRS etc.); 2) identify gaps; and 3) address these through training and information sharing. For example NOAA could provide VIIRS training some that Oceania countries can utilize the free resource to increase boat detection within EEZs.

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c) Protecting the Coastal Zone

1) **Issue:** Rapid Assessment of Coastal Risk Profiles

Discussion: The SPC's Ridge-to-Reef Program will be developing 14 "National State of the Coasts" diagnostic reports to assist in evidenced based decision making in relation to Disaster Risk, Climate Change and unplanned coastal development. A basis for this effort is to do rapid assessments. The assessments could be done by coastal engineers using satellite imagery and desk top evaluations. Coastal engineers could classify the shoreline on the basis of selected characteristics and then ascribe a risk profile. The results can then be leveraged to create a framework within each country.

Recommendation(s): This project would develop standard methodology that uses a combination of remote-sensing and ground-truthing to characterize the exposure levels of the coasts to selected risk variables. The scope and scale of such a project is flexible. A prototype could be done in Micronesia and used as an example throughout the region. The development of GIS layers would be the primary deliverable at the national level. SPC is willing to resource the field work required to refine the assessments. The military could assist with the field work.

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2) **Issue:** Ha'apai, Tonga Seawall Survey

Discussion: The Ha'apai island group in Tonga is at risk of tsunami. It is a densely populated area, and currently does not have a functioning seawall to adequately protect the population. A seawall survey has never been conducted to determine the feasibility or possibility of a protective zone.

Recommendation(s): An engineer from the Navy, US Army Corps of Engineers, or the Nevada State Partnership Program should visit Ha'apai and conduct a seawall assessment. The engineer can determine if seawall construction is even an appropriate measure, and what alternative approaches should also be considered. If within budget, physically engineering support could be provided to Tonga through an existing exercise, the State Partnership Program, or through a dedicated security cooperation project.

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3) **Issue:** Coastal Climate Adaptation Program (C-CAP) Infrastructure Priority Index (IPI)

Discussion: USAID has prepared C-CAP IPI assessments throughout the Pacific Islands, including Samoa, Papua New Guinea, Fiji, Tonga, Kiribati, Nauru, Tuvalu, Solomon Islands, and Vanuatu. These assessments provide tangible humanitarian construction activities in which militaries could fund and built in partnership with USAID, the local community, and its partners. USAID has already done the leg work, by meeting with local communities, rating potential priority projects, and evaluating these projects with other projects in the region.

Recommendation(s): Rather than spending a bunch of money to duplicate meaningful assessments that are already complete, USPACOM should consider using the existing C-CAP IPI to identify future projects and collaboration projects for humanitarian construction in the Pacific. By joining efforts with USAID, cost-

sharing can be accomplished and more of the priority projects listed can actually be completed. For example, the Nevada National Guard, through its existing State Partnership Program, could complete some of the projects listed for Tonga. The Navy Seebees and the US Army Corps of Engineers can work with USPACOM to tackle other projects listed in the report where a State Partnership Program does not exist.

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d) Resiliency to Extreme and Frequent Weather Events

1) Issue: Weather Forecasting/Modeling

Discussion: Prior to the commencement of the RESF, a discussion was held with the University of the South Pacific. Dr. Elizabeth Holland noted that many of the Pacific Island meteorological services have limited access to weather forecast models, and that a partnership with the Department of Defense's Joint Typhoon Warning Center (JTWC) could advance preparedness in the region, in particular the southwest Pacific basin.

Recommendation(s): RESF event planners should visit the Joint Typhoon Warning Center at Pearl Harbor and talk to their team to see what outreach and security cooperation opportunities may exist. If JTWC is available to support future environmental security efforts, then the team should program a pilot project to see what may be possible to assist Pacific Island meteorological offices.

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2) Issue: Seasonal Water Shortages

Discussion: Most inhabited islands in the Maldives and the South Pacific use rain water for drinking and other purposes. Groundwater is not suitable. Every year, during the dry seasons some islands run out of rain water, leading to a disaster situation. Governments end up having to transport desalinated water to the affected islands (Problem:

very costly & few vessels capable of carrying water). Challenge is to find a long-term solution to address this water shortage issue.

Recommendation(s): 1) Need to predict the weather/precipitation patterns more accurately in order to identify which islands/when are going to be affected. 2) Need to build infrastructure->rainwater collection systems, cheaper desalination plants on islands/atolls, water production/distribution vessels. 3) Water conservation- educating the community.

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3) **Issue:** Addressing water supply needs for climate refugee relocated villages in the Oceania region

Discussion: i) Reliable, Sustainable, Quality Water Supply for Relocation due to climate change impact; ii) Accessibility to clean water for remote islands due to climate change impact

Recommendation(s): Pilot villages then scaled up to regional level: hydrological, environmental, and infrastructure studies and implementation (hardware and software)

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4) **Issue:** El Nino drought contingency planning

Discussion: The effect of El Nino have brought drought to island nations, especially in the North Pacific. This has left sustainable water supplies used by the general public unreliable.

Recommendation(s): Prepare a drought contingency plan using shared vision planning techniques

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5) **Issue:** Regional disaster response planning

Discussion: Lessons learned from TC Winston have shown the lack of a regional response plan in Fiji to incorporate multi-national partners under the existing national disaster response plan. This hinders effective response from partner nations.

Recommendation(s): Develop a regional disaster response plan that incorporates foreign partners. Include a decision matrix so that the plan can be quickly utilized and understood.

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6) **Issue:** Holistic Approach to Island Resiliency

Discussion: Small islands are less resilient to natural disasters in the infrastructure, water, energy, and food security sectors, which leads to significant humanitarian disaster.

Recommendation(s): Develop a scalable framework to enhance small island resilience in Oceania

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e) Regional Project Collaboration

1) **Issue:** Regional Maritime Security Framework

Discussion: There is currently no regional framework addressing maritime security issues in the Oceania Region.

Recommendation(s): Working with existing regional institutions, a regional maritime security framework could be produced to standardize approaches and increase information sharing between partner countries. The framework could address trafficking (drug,

human and wildlife), money laundering, weapons, IUU, and prostitution.

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2) **Issue:** Energy Efficiency and Renewability Roadmap

Discussion: Roadmap to current distributed energy is neither cost-effective nor available in all regions. Implementing renewables is not prioritized for sustainability.

Recommendation(s): Develop a roadmap for energy efficiency and renewable implementation

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3) **Issue:** Distributed Energy Networks

Discussion: Small island nation energy projects are distributed, isolated, and often not interconnected.

Recommendation(s): Regional partners in the Pacific could collaborate on a micro-grid development project.

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4) **Issue:** Geothermal Energy

Discussion: There are many Pacific Island nations that could potentially use geothermal energy as a renewable resource to support isolated communities, or to connect as a clean energy to existing grids.

Recommendation(s): A geothermal energy team could be sent to Fiji, and regional partners could be brought to formulate a geothermal energy plan for potential application in the Oceania region.

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f) Administrative

1) **Issue:** Understanding Event Objectives

Discussion: As with any event being planned, there are always opportunities to make it better. One such area is the delivery of event objectives. During the RESF, some participants indicating they were unclear on what the overall event objectives were. The team had provided them in the event booklet, and the master of ceremony mentioned them on the first day. However, they were not repeated throughout the week.

Recommendation(s): The planning team should consider delivering an online questionnaire to participants as part of the registration process to better identify appropriate objectives for the event, as well as reinforce the objectives USPACOM hopes to achieve. The objectives should also be clearly delivered on the first day of the event, and repeated by the master of ceremony throughout the week.

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2) **Issue:** Environmental Security Storehouse

Discussion: With the development of the PESF web site (http://www.pesforum.org), the planning team has the ability to share information with participants and interested parties. Currently, the web site has a few project examples, and does not include resources, such as regional procedures, fact sheets, etc.).

Recommendation(s): The planning team should consider expanding the PESF web site to include a storehouse of environmental security resources. The storehouse could be organized by topic or geographic region, and include important documents, data, etc. that the environmental security community needs to readily access.

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3) **Issue:** Live Streaming/Blogging

Discussion: Many events now live-stream or provide real-time blogging/social media to extend participation beyond those that are in the room. This increases participation, allows subject matter expert reach to extend, and adds additional collaboration opportunities.

Recommendation(s): The planning team should consider whether or not the budget will allow potential live-streaming or real-time blogging of the event to promote further awareness and increase partnerships on environmental security.

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4) **Issue:** Breakout Sessions

Discussion: The current PESF format allows for three to four themes, and approximately three speakers per theme. This allows participants to be exposed to many subjects, but still limits potential collaboration, discussion and information-sharing.

Recommendation(s): At future PESF events, the planning team should consider holding breakout sessions for each theme. The breakout sessions could be in separate rooms, and would allow multiple topics to be evaluated under one theme. For example, if water security is the daily theme, then breakout sessions be conducted on multiple topics (water supply, water modeling, water conservation, etc.). Each topic could feature multiple speakers and separate panel sessions. This could greatly expand information-sharing and potentially add benefit to the overall goals of the PESF program. However, if this approach is taken, then participation levels may need to be evaluated to determine the right audience sizes.
