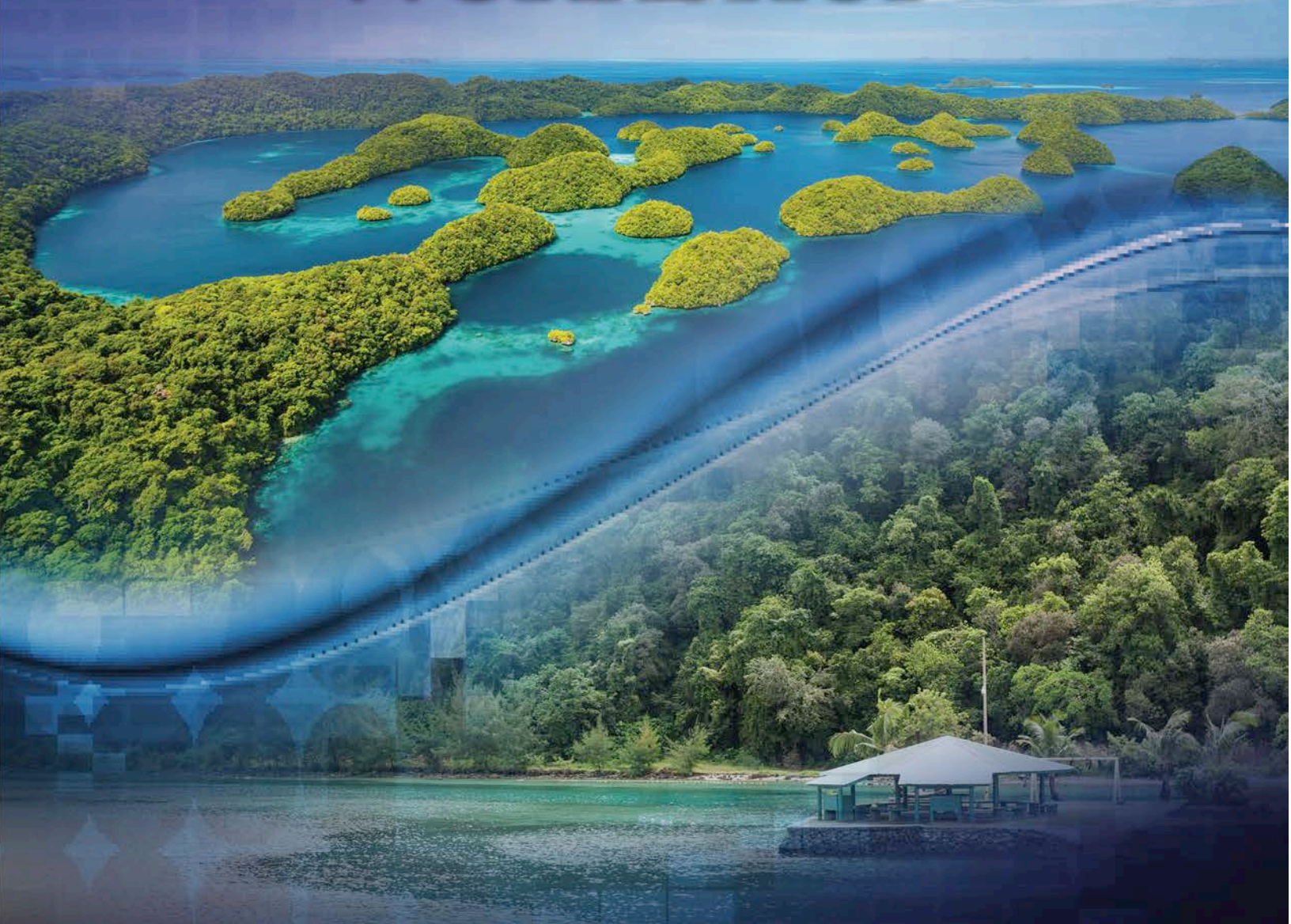




COASTAL RESILIENCE WORKSHOP



12-14 SEPTEMBER 2023
KOROR, PALAU



September 2023

2023 COASTAL RESILIENCE WORKSHOP

Dear Workshop Participant,

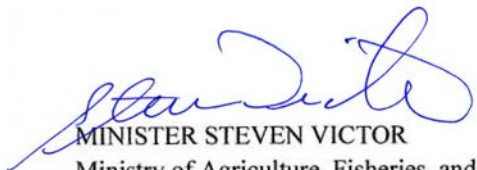
Welcome to Koror, Republic of Palau. The Palau Ministry of Agriculture, Fisheries, and Environment (MAFE) and United States Indo-Pacific Command are pleased to co-host the 2023 Coastal Resilience Workshop (CRW), in partnership with the U.S. National Oceanic and Atmospheric Administration (NOAA) and the Strategic Environmental Research and Development Program (SERDP).

Coral reef, seagrass, mangrove, salt marsh, and other coastal ecosystems are critical to biodiversity, addressing climate change, food security, economic well-being, and coastline stability for many countries in the Indo-Pacific region. The workshop's program over three days provides a valuable opportunity to comprehensively explore coastal resilience challenges and solutions through multiple lenses, including defense and civilian, and to identify knowledge gaps in research and development and technology for more resilient coastal ecosystems.

The relationships built and the knowledge shared as part of this workshop will strengthen the path forward towards holistic solutions for more resilient coastlines and ecosystems into the future. Fostering a strong civil-military community of subject matter experts will have a multiplier effect in building coastal resilience and capacity across the Region. Enhancing mutual trust, collaboration and alignment on shared coastal ecosystem protection and restoration challenges will help underpin cohesion and partnership between states.

Please take full advantage of your time at the Coastal Resilience Workshop and enjoy all that Palau has to offer.

With warmest regards,

A blue ink signature of Minister Steven Victor, written in a cursive style.

MINISTER STEVEN VICTOR
Ministry of Agriculture, Fisheries, and
Environment
Palau

A blue ink signature of Gavin J. Gardner, written in a cursive style.

GAVIN J. GARDNER
Brigadier General, U.S Army
Director, Logistics and Engineering

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SUBJECT: Coastal Resilience Workshop (CRW)

1. Purpose: To provide stakeholders with the concept, background, description and objectives of the CRW.
2. Background: Coral reef, seagrass, mangrove, salt marsh and other coastal ecosystems are critical to biodiversity, addressing climate change, food security, economic well-being, and coastline stability for many countries in the Indo-Pacific region. Compared with the Atlantic, the Pacific Ocean has twice as many coral species, which also play an important role in the earth's carbon cycle as carbon dioxide is drawn out of the atmosphere when corals build their exoskeletons. The health of these habitats impacts not only national security but also regional security. Unsustainable fishing, land-based sources of pollution, and increasing ocean temperatures and acidification can significantly and negatively impact coastal ecosystems and local, national, and regional economies, increasing potential for hunger, poverty, instability, and conflict. From a military perspective, coral reef, seagrass, mangrove, and salt marsh ecosystem preservation are important because of the protection against storm surge and severe weather events for military installations and civilian communities.

The CRW is a direct result of discussions between the Strategic Environmental Research and Development (SERDP) and USINDOPACOM on the importance of addressing coastal resiliency challenges at the 2019 Indo-Pacific Environmental Security Forum (IPESF) held in Wellington, New Zealand.

USINDOPACOM believes security for all improves by sharing lessons-learned and encouraging governments and their militaries to plan, operate, and execute activities in an environmentally sustainable manner. Collaborative forums support regional cooperation and contribute to the development of resilient communities and practices. The CRW will engage military and civilian agencies on research and development topics concerning coastal ecosystem preservation, conservation, and restoration as well as our mutual environmental stewardship obligations. SERDP is interested in 1) identifying the most pressing coastal resilience and environmental security needs that are not currently being addressed and 2) developing concepts for research and development.

3. General Description:

WHO:

- USINDOPACOM will organize the CRW and work closely with Palau's Ministry of Agriculture, Fisheries, and Environment (MAFE) and Palau International Coral Reef Center (PICRC).
- SERDP will help fund the CRW and support USINDOPACOM.
- Subject Matter Experts (SMEs) from National Oceanic and Atmospheric Administration (NOAA), in the Indo-Pacific Region, and Internationally will speak at the CRW and spark discussions around how to best address coral reef and seagrass degradation challenges.

The CRW is co-funded by U.S. Indo-Pacific Command (USINDOPACOM), Department of Defense's (DoD) Strategic Environmental Research & Development Program (SERDP), and Environmental Security Technology Certification Program (ESTCP).

- Participants will be SMEs in coral reef, seagrass, mangrove, salt marsh, and other coastal ecosystems and military partners.

WHAT:

- The CRW will be a three-day event with presentations from SME's, exercises and training, and possibly field activities.

WHEN:

- 12-14 September 2023

WHERE:

- Koror, Palau

4. CRW Objectives: The initial objectives and targeted outcomes of the CRW throughout the planning process are to:
 - a. Present and discuss the most pressing needs that are NOT already being addressed in the Indo-Pacific region in order to protect and restore important coastal ecosystems.
 - b. Gather relevant Subject Matter Experts (SMEs) in the Indo-Pacific Region and internationally to speak at the CRW and spark discussions around how to best address coral reef, seagrass, mangrove, and salt marsh degradation challenges, such as through research, training, and policy solutions.
 - c. Identify gaps in science for coral reef, seagrass, mangrove, salt marsh, and other coastal ecosystems in the Indo-Pacific Region.
 - d. Identify research needs and develop best practices and SOPs for addressing the security challenges faced by degrading coastal ecosystems, and develop potential concepts for collaborative research and development projects that SERDP and/or ESTCP could fund.
 - e. Improve partner capacity related to biodiversity, coral reef and other ecosystem health, economic impacts, and long-term sustainability on islands.
 - f. Improve collaboration among partners in coastal ecosystem conservation, preservation, and restoration.
5. Event Organization: Organizers from the host nation (MAFE and PICRC), USINDOPACOM, NOAA, and SERDP have formed a planning team. They will develop an agenda and invitation list collaboratively throughout the planning process.
6. Points of Contact:
 - Mr. Christopher Sholes, Environmental Officer, USINDOPACOM, +1 (808) 477-9420
 - Ms. Hannah Thompson, Forum Coordinator/Project Manager, Tellus Civic Science (Tellus), +1 (415) 314-5530
 - Ms. Adrienne Taylor, Senior Scientist/Forum Support, Tellus, +1 (808) 782-9052
 - Ms. Lynda Arakelian, Program Coordinator/Forum Support, Tellus, +1 (415) 216-3018



Day One: R&D for Resilient Coastal Ecosystems





2023 Coastal Resilience Workshop

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Agenda – Day 1, 12 September 2023 (Tuesday)

THEME: Research & Development for Resilient Coastal Ecosystems

Master of Ceremonies: Ms. Symone Esichang Ubedei, Chief of the Division of East Asia, Bureau of Foreign Affairs and Trade, Ministry of State, Republic of Palau

Moderator for the Session: Dr. Chris Kitalong, Vice President, Palau Community College

0730-0800	REGISTRATION
0800-0810	PRAYER
0810-0825	Welcome Remarks Honorable Minister Steven Victor, Palau Ministry of Agriculture, Fisheries, and Environment
0825-0840	Remarks on Coastal Ecosystem Connectivity & Resilience Dr. Yimnang Golbuu, Coral Resilience Director, The Nature Conservancy, Palau
0840-0900	SERDP/ESTCP Program Overview and Coastal Resilience: Past Investments & Future Directions Dr. John Hall, Consultant, Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP)
0900-0910	Remarks and CRW Agenda Summary Mr. Christopher Sholes, Environmental Security Program Manager, U.S. Indo-Pacific Command (USINDOPACOM)
0910-0915	Group Photo
0915-0945	BREAK
<u>Panel Session - R&D Priorities for Coastal Ecosystem Protection, Restoration, and Incorporating Traditional Methodologies</u>	
0945-1005	A Cross-Disciplinary Approach to Engineering a Living, Coastal Breakwater System in Hawai'i Dr. Robert J. Toonen, Professor & Ruth D. Gates Endowed Chair of Coral Reef Systems, Hawai'i Institute of Marine Biology, University of Hawai'i at Mānoa, and Dr. Ben Jones, Director, Ocean Science and Technology, Applied Research Laboratory, University of Hawai'i
1005-1025	Lessons Learned from Mangrove Restoration in Indonesia Dr. Frida Sidik, Senior Researcher, Research Center for Oceanography, National Research and Innovation Agency, Indonesia
1025-1055	Complementary Methods for Responding to and Treating Stony Coral Tissue Loss Disease (SCTLD) Dr. Marilyn Brandt, Research Professor, Director, Reef Response, Center for Marine and Environmental Studies, University of the Virgin Islands and Ms. Erin Papke, Researcher, University of North Carolina Wilmington
1055-1115	Connecting Blue Carbon, Resiliency & Environmental Security Dr. Gabrielle Johnson, Senior International Program Manager on contract to National Oceanic & Atmospheric Administration (NOAA) - Marine Protected Area (MPA) Center
1115-1200	Panel Session Q&A Moderated by Dr. Chris Kitalong
1200-1210	DAY 1 WORKING GROUP OVERVIEW AND LOGISTICS Ms. Symone Esichang Ubedei
1210-1310	LUNCH BREAK



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1310-1440	Coastal Ecosystem R&D Working Groups: 1) Coastal Ecosystem Protection <u>Facilitators</u> Ms. Elchung Hideyos, Senior Extension Agent - Youth and Community, Palau Community College Dr. Robert J. Toonen, Professor & Ruth D. Gates Endowed Chair of Coral Reef Systems, Hawai'i Institute of Marine Biology, University of Hawai'i at Mānoa Dr. Derek Manzello, Coordinator, NOAA Coral Reef Watch, Center for Satellite Applications and Research, Satellite Oceanography & Climatology Division Dr. Yimnang Golbuu, Coral Resilience Director, The Nature Conservancy, Palau 2) Coastal Ecosystem Restoration <u>Facilitators</u> Dr. Adam Smith, Founder and Chief Executive Officer, Reef Ecologic, Australia Dr. Richard Page, Researcher, Palau Community College Dr. Ben Jones, Director, Ocean Science and Technology, Applied Research Laboratory, University of Hawai'i Ms. Yvonne Ueda, Palau Conservation Manager, The Nature Conservancy 3) Ridge to Reef/ Traditional Practices <u>Facilitators</u> Ms. Ann Kloulechad-Singeo, Executive Director of Ebiil Society Inc. Dr. Jessica Carilli, PhD, Scientist, Naval Information Warfare Center, Pacific Mr. Phal Mantha, Director of Agriculture and Sustainability, Ridge to Reefs, Inc. Ms. Andrea Uchel, Chief Resilience Officer, Koror State Government
1440-1510	BREAK
1510-1640	Coastal Ecosystem R&D Working Groups (continued)
1640-1650	Administrative Notes - Ms. Symone Esichang Ubedei
1650-1710	TRAVEL BACK TO HOTEL FOR SOCIAL HOUR
1800-2000	Social Hour at Palau Pacific Resort, Beachside



Master of Ceremonies

Ms. Symone Esichang Ubedei, Chief of the Division of East Asia, Bureau of Foreign Affairs and Trade, Ministry of State, Republic of Palau

BIO



Ms. Symone Esichang Ubedei is the Chief of the Division of Asia-Pacific under the Bureau of Foreign Affairs and Trade, Ministry of State of the Republic of Palau. Ms. Ubedei graduated from Ming Chuan University, Taipei Campus with her graduate's degree in International Affairs. With her educational background and vast work experience, she serves as a great asset to the Ministry of State and the Government of Palau. Ms. Ubedei passionately seeks to improve international collaborations between Palau and her allies through cooperative efforts.

Welcome Remarks

Honorable Minister Steven Victor, Palau Ministry of Agriculture, Fisheries, and the Environment

BIO



The Honorable Steven Victor is a Palauan native who became the Minister of Agriculture, Fisheries, and the Environment for the Republic of Palau in 2021. He has served the environment and conservation sector in Palau and the Micronesia region for more than 20 years. Mr. Victor has managed regional projects in Palau, the Federated States of Micronesia, the Republic of the Marshall Islands, American Samoa, and the Commonwealth of the Northern Mariana Islands. He has taken a leading role in facilitating the convergence of scientists, conservation

practitioners, managers, and resource users to address issues in areas such as data-poor small-scale fisheries, marine protected areas network design, management effectiveness evaluations, tuna fisheries reform, and securing livelihood opportunities. He is a strong advocate of the role of robust science in achieving win-win strategies for people and nature.



Remarks on Coastal Ecosystem Connectivity & Resilience

Dr. Yimnang Golbuu, Coral Resilience Director, The Nature Conservancy, Palau

BIO



Dr. Yimnang Golbuu is currently the Coral Resilience Director at The Nature Conservancy, Micronesia and Polynesia. Before joining The Nature Conservancy, Micronesia and Polynesia, he was the Chief Researcher at the Palau International Coral Reef Center (PICRC) for 10 years before becoming its CEO, holding the CEO position for 11 years. In 2012, he received a commendation by the Palau National Congress for his contributions to the sustainability of Palau's natural resources, and in 2013 he was awarded a Pew Fellowship in Marine Conservation. Dr. Golbuu has been, and continues to be, engaged in various marine-

related initiatives at the local and international levels. He has served as a board member of Palau Conservation Society, Chairman of the Northern Reef Management Planning Team, Member of the Northern Reef Co-Management Committee, the Palau National Commission of UNESCO, Palau National Marine Sanctuary Executive Committee and Chairman of the Protected Areas Network Technical Committee. His engagement at the international level includes being one of the Lead Authors for the Intergovernmental Panel on Climate Change (IPCC) 6th Assessment Report, Chapter 15, Working Group II. At present, Dr. Golbuu serves as Palau's Point of Contact (POC) for the US Coral Reef Task Force, Palau's Focal Point for the International Coral Reef Initiative (ICRI), Board Member of the Micronesia Conservation Trust (MCT), member of Palau National Commission of UNESCO and member of the Expert Group for the High-Level Panel for a Sustainable Ocean Economy. Dr. Golbuu received his B.S. in Biological Sciences from the University of California at Davis, M.S. in Biology from the University of Guam, and Ph.D. in coral reef ecology at Southern Cross University in Lismore, Australia.

SERDP/ESTCP Program Overview and Coastal Resilience: Past Investments & Future Directions

Dr. John Hall, PhD, Consultant, Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP)

BIO



Dr. Hall currently provides science-related consultation services to the Department of Defense's (DoD) Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP) as a subcontractor to Noblis. Dr. Hall previously managed the Resource Conservation and Climate Change (RC) program area under both SERDP and ESTCP between April 2006 and April 2016. Climate change research relevant to DoD, including research relative to the Pacific Islands, was initiated under Dr. Hall's tenure. He also was the DoD representative to the 3rd National Climate Assessment and the Convening Lead Author for the sustained assessment chapter. Finally, Dr. Hall was the lead for developing the Interagency Defense Regional Sea Level Technical



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Support Document and Database that now serves as an authoritative source of sea-level change information for DoD decision-making. Dr. Hall is a graduate of the U.S. Naval Academy and served as a nuclear-trained officer in the U.S. submarine force. His graduate degrees (MS in Biology and PhD in Zoology) are from Washington State University.

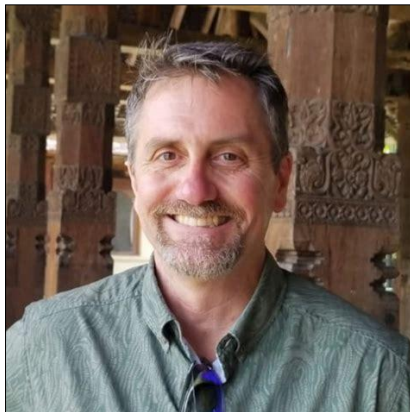
ABSTRACT

The Department of Defense (DoD) recognizes that the emerging climate crisis is and will continue to impact its installations, equipment, and human resources. Executive Order (EO) 14008, Tackling the Climate Crisis at Home and Abroad, establishes climate considerations as essential elements of U.S. foreign policy and national security. Climate change poses a direct and immediate threat to DoD installations. DoD's mission in the coastal environment relies on built and natural infrastructure that are being threatened by rising sea levels and other effects of a changing and variable climate. This presentation will describe how the Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP) are investing in research and demonstration projects to develop end-user relevant solutions to reduce the impacts of climate change on military installations and the natural and physical infrastructure that support critical DoD missions and stewardship activities, specifically related to coastal, coral reef, and marine ecosystem conservation and resilience.

Remarks and CRW Agenda Summary

Mr. Christopher Sholes, Environmental Security Program Manager, U.S. Indo-Pacific Command

BIO



Chris Sholes is the Environmental Security Program Manager within the USINDOPACOM Engineering Division. His duties include overseeing environmental compliance for bilateral exercises (e.g. Talisman Saber), and planning the Pacific Environmental Security Conferences and international environmental workshops. He also monitors environmental impact assessments developed by the service components and coordinates projects with State of Hawaii offices and others on environmental matters. His previous experience includes project management of various environmental remediation projects throughout Hawaii and the Pacific including soil and water remediation and UXO clearance in Saipan, Guam, Japan and Korea, Palmyra and other remote islands. He has five degrees including two from the London School of Economics in International Relations and Economics and an MS in Systems Engineering from the Naval Postgraduate School. He is a certified contracts manager (CPCM) and certified project manager (PMP) from the respective US national certifying organizations.

Since its inception in 2010 he has developed the Environmental Security Program as a means for the U.S. Army Corps of Engineers, IWR, 130th Prime Power and other DoD components to engage internationally and innovatively, furthering the USPACOM engagement strategy to enhance partner nation resilience, capacity building, facilitate interoperability, and build trust and access for occasions of mutual benefit.

The goal of the USINDOPACOM ENSEC Engagement Program, incorporating the Commander USPACOM's lines of operation, is to strengthen relationships and partner-nation capacity development. This program, as part of the Defense Environmental International Cooperation (DEIC) program, is an effective and cost-efficient way to also support the SECDEF's Security Cooperation



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Guidance goals of: (i) Build defense relationships that promote specific U.S. security interests, (ii) Develop allied and friendly military capabilities and willingness for coalition operations with the U.S. military, and (iii) Improve force interoperability.

From the Pacific Environmental Security Forum series, USINDOPACOM has spun-off oil spill response workshops in South and Southeast Asia, has funded environmental management and alternative energy solutions to remote locations, and established environmental stewardship practices with Australia and other partner nations.

Introduction to Theme: Research & Development for Resilient Coastal Ecosystems

Moderator for the Session: Dr. Chris Kitalong, PhD, Vice President, Palau Community College

BIO



Dr. Christopher U. Kitalong, PhD, is a Palauan-American resident of Palau who has focused most of his work on the pharmacology of Palauan traditional plant medicines as well as the sustainable use of natural and human resources of Palau. Dr. Kitalong received his Bachelor of Science Degree in Science-Business from the University of Notre Dame, his Master of Science Degree in Pharmacology and Traditional Plant Medicines from the Toyama Medical and Pharmaceutical University in Japan, and his PhD in Biology from the City University of New York. Dr. Kitalong is an adjunct science faculty member and Vice President at Palau Community College (PCC). He serves on the Palau National Scholarship Board as chairman, serves on the Board for the Pacific Academic Institute for Research, is the founder/president of the Palau Boxing Federation, and is currently working as a Cooperative Extension Senior Researcher. Dr. Kitalong is also a courtesy faculty member at Oregon State University, and Research Affiliate at the University of Guam. Dr. Kitalong is focused on developing education and

capacity in the Pacific in order to enhance health and natural resources through cultural and modern scientific research and implementation of sustainable development goals.



A Cross-Disciplinary Approach to Engineering a Living, Coastal Breakwater System in Hawai'i

Dr. Robert J. Toonen, Professor & Ruth D. Gates Endowed Chair of Coral Reef Systems, Hawai'i Institute of Marine Biology, University of Hawai'i at Mānoa

BIO



Rob is an interdisciplinary coral reef researcher seeking to answer questions that matter to local community members, resource managers, and policy makers throughout the State. He works to develop collaborative partnerships that promote community engagement, honor people and place, and expand professional development opportunities for local students. Originally from Canada, he is now proud to call the ahupua'a of Kāne'ohe his home. He started his career at HIMB in 2003, during which time he has published over 275 scientific papers and been awarded over 100 competitive research grants. He was recently recognized among the Top 1000 Scientists in Ecology & Evolution and the Top 2% of World's Leading Researchers. He has received the Board of Regents Medal for

Excellence in both Research and Graduate Mentorship. He was the science lead for the designation of the He'eia National Estuarine Research Reserve (NERR) and served as its first interim Reserve Manager. He continues to serve our community as a member of the Board of Directors for Paepae o He'eia and the He'eia NERR Reserve Advisory Board. He has been appointed to advisory rolls for both State and Federal agencies, and currently serves on the Hawai'i Department of Land and Natural Resources Holomua Marine 30x30 Scientific Advisory Board, the Hawai'i Division of Aquatic Resources Coral Restoration Task Force, Coral Restoration Permitting and Policy *ad hoc* Committee, Aquatic Invasive Species Advisory group, and Aquatic Invasive Species Response Team. He is the lead for the Adaptive Biology portion (Technical Area 3) of the UH Rapid Resilient Reefs for Coastal Defense (R3D) team.

Dr. Ben Jones, Director, Ocean Science and Technology, Applied Research Laboratory, University of Hawai'i

BIO



Ben Jones is the Director of Ocean Science and Technology for the Applied Research Laboratory at the University of Hawai'i. He is a physical oceanographer with a specialty in ocean acoustics. At ARL Ben has led a variety of applied projects supporting Department of Defense initiatives ranging from sea-turtle habitat studies in Pearl Harbor to the first drone delivery to a US nuclear submarine. Most recently, Ben has been involved leading large, interdisciplinary research projects including developing an engineered, living reef to provide coastal protection for DoD infrastructure and rapid-prototyping support of undersea systems for Naval Special Warfare.

Prior to ARL, Ben served as a Naval Officer for 21 years including seven years as a helicopter pilot and mission commander during which he deployed in support of Operation Enduring Freedom following the tragic events of Sept 11th, 2001. He transitioned into the Naval Oceanography community in 2006 and completed tours as the Oceanographer aboard the USS Bonhomme Richard,



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the US Submarine Force Oceanographer, and the Fifth Fleet Oceanographer where he oversaw all survey operations and environmental support for US Naval Forces in the US Central Command area of operations. His final active-duty assignment was as the Deputy Technical Director to the Oceanographer of the Navy where he managed the Naval Oceanography research, development, testing and evaluation portfolio for future Naval Oceanography capabilities.

Ben is a 1997 graduate with distinction from the U.S. Naval Academy and holds a SM in Oceanographic Engineering from the MIT-Woods Hole Joint Program in Oceanography and a PhD in Physical Oceanography from the Naval Postgraduate School. Ben currently resides in Kailua, Hawai'i, with his wife, Sylvie, and two daughters.

ABSTRACT

Tropical coral reefs are in decline globally from a combination of anthropogenic impacts on the planet. The loss of reefs affects both marine ecosystems and the human communities that rely upon them for sustenance and protection. In June of 2022, eight US ocean-research laboratories began an ambitious effort to engineer a more thermally tolerant coral reef designed to protect coastlines from storms and sea-level rise. Led by the University of Hawai'i (UH), Rapid Resilient Reefs for Coastal Defense (R3D) is a collaboration between UH, the University of California San Diego, Florida Atlantic University and Makai Ocean Engineering. As an inherently multi-disciplinary challenge, the project spans three disciplines—breakwater engineering, coral reef ecology, and adaptive biology. We will provide an overview of the various thrusts of the project and progress to date. This includes employing state of the art techniques in engineering design and fabrication to develop a breakwater system inspired by fringing coral reefs; leveraging large-scale, high resolution coral reef surveys and recent advances in the biomedical field to create realistically complex habitats and accelerate settlement; and finally, applying decades of research on coral husbandry to develop technological and biological interventions to ensure corals reefs in Hawaii can survive a warmer century.

Lessons Learned from Mangrove Restoration in Indonesia

**Dr. Frida Sidik, Senior Researcher, Research Center for Oceanography,
National Research and Innovation Agency (BRIN), Indonesia**

BIO



Dr. Frida Sidik is currently a senior researcher at Research Centre for Oceanography - National Research and Innovation Agency (BRIN), and she was an Adjunct Fellow at the University of Queensland for 3 years, and worked as a researcher at the Ministry of Marine Affairs and Fisheries – Indonesia for more than 20 years. Her works are mainly involved in mangrove ecology, marine conservation, and blue carbon. She is involved in several international collaborations, including working on developing an operational system for mangrove biodiversity and mangrove change detection and investigating mangrove connectivity with IRD France and assessing mangrove adaptation to sea level rise and carbon sequestration under the APN for Global Change Research. She led a project of Partnerships for Enhanced Engagement in

Research of USAID-NAS to understand the adaptation of wetlands in Indonesia to projected sea level rise. She is now a member of the International Partnerships for Blue Carbon (IPBC) and the executive group of United Nations Global Ocean Decade Programme for Blue Carbon (GO-BC). She is also involved in IUCN Mangrove Specialist for South East Asia Mangrove Ecosystem Networks.



ABSTRACT

There is increasing awareness of mangrove conservation as the result of rapid loss of mangrove area worldwide. Restoration and protection of mangroves bring a range of benefits, such as reducing erosion of beaches, mitigating the effect of climate change (blue carbon) and improving catches of fish by artisanal fishers. However, the efforts in mangrove restoration may be questionable if it is not undertaken in right way. Here, we present the assessment of mangrove restoration to ensure the success of this effort. By using remote sensing data and in situ measurement, we investigate the turnaround from mangrove loss due to land conversion to an apparent gain in the area covered by restored mangroves. In this presentation we explore challenges and opportunities of mangrove restoration, particularly in abandoned aquaculture ponds. The implications of the study for understanding restoration are discussed in the context of sediment and hydrology, which are important for achieving blue carbon benefits and climate change adaptation.

Complementary Methods for Responding to and Treating Stony Coral Tissue Loss Disease (SCTLD)

Dr. Marilyn Brandt, PhD, Research Professor, Director, Reef Response, Center for Marine and Environmental Studies, University of the Virgin Islands

BIO



Marilyn Brandt is a Research Professor of Marine and Environmental Science at the University of the Virgin Islands (UVI). She has a bachelor's degree in Biology from New York University and a Ph.D. in Marine Biology and Fisheries from the University of Miami. She moved to St. Thomas to join the research faculty in the Center for Marine and Environmental Studies at UVI in 2010. Her research focuses on understanding how disease is damaging coral reefs and how coral conservation and restoration can reverse that damage. Dr. Brandt is a co-founder, Research Team Lead, and an Executive Team member for the U.S. Virgin Islands Coral Disease Advisory Committee and she leads a National Science Foundation-funded Ecology and Evolution of Infectious Disease collaborative project focused on the transmission dynamics of stony coral tissue loss disease. She is also the Director of Reef Response (reefresponse.org), a science-based coral restoration program for the northern U.S. Virgin Islands.

Presentation Title: Understanding and Responding to the Emergence of Stony Coral Tissue Loss Disease (SCTLD) in the US Virgin Islands

ABSTRACT

Disease outbreaks are an increasing threat to coral reef ecosystems. In early 2019, the highly virulent stony coral tissue loss disease (SCTLD) emerged off of St. Thomas, in the US Virgin Islands (USVI). This threat created a unique challenge for scientists and managers in this small (< 100,000 people), relatively isolated territory of the United States. Days after the disease was identified, a committee was established to organize a coordinated disease response effort. The Virgin Islands Coral Disease Advisory Committee (VI-CDAC), composed of local scientists, managers, volunteers, and other interested parties began meeting weekly and organized itself following the Florida Disease Advisory Committee model. VI-CDAC acquired resources for treating SCTLD and adapted an existing platform



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for reporting bleaching to track its spread. Researchers at the University of the Virgin Islands received grant funding to understand its transmission dynamics and compare its characteristics to previous diseases and to SCTLD samples from other locations. While the pathogenic agent of SCTLD remains unidentified, current research from the USVI and elsewhere suggests it targets the coral's symbionts and may have a viral component. Antibiotic treatment is often successful at halting lesions on individual corals, but new lesions often emerge, and there is not definitive evidence that treatment of a reef results in lower spread of disease. A primary lesson learned by VI-CDAC from the emergence of SCTLD was that regular, verbal communication among local managers, scientists, and other stakeholders is essential for an effective response.

Ms. Erin Papke, Researcher, University of North Carolina Wilmington

BIO



Erin attended the University of Delaware where she worked on harmful algal blooms and coral-algal symbiosis. She graduated with a bachelor's in marine science. After graduation, she worked at Mote Marine Laboratory where she gained experience in coral husbandry and coral restoration. She then worked at the University of Pittsburgh in a human microbiology lab focusing on bacterial pathogenesis and pneumonia. Erin started in the Ushijima Lab as a Ph.D. student at the University of North Carolina Wilmington in January of 2021. Currently, her dissertation encompasses various work central to stony coral tissue loss disease (SCTLD). She is developing diagnostic tools, mainly transmission electron microscopy with manipulative experiments, to aid in SCTLD identification. She is also narrowing down the etiological agent of SCTLD through a variety of methods. Erin actively participates in all aspects of field work including coral and probiotic collections. She is the lead author on a review paper on SCTLD that will be submitted for publication in the next month.

Presentation Title: Developing Methods for Studying and Treating Stony Coral Tissue Loss Disease

ABSTRACT

Stony coral tissue loss disease (SCTLD) is a tissue loss disease that was first observed near Miami, Florida in 2014. Since its emergence, it has spread to at least 28 countries and territories and infects at least 22 coral species across the Caribbean. The etiological agent(s) is still unknown, causing diagnostic tool and treatment development to be severely restricted. Current tools for generally identifying SCTLD are histology and field observations, but without an identified viral or bacterial pathogen these methods are limited. Therefore, our research group is applying a multi-focused approach to investigate SCTLD using a variety of technologies. We use transmission electron microscopy instead of histology to provide details of coral ultrastructure and have identified viral-like particles in healthy and disease corals using this method. Though there is no definitive evidence viruses are involved in SCTLD, bacteria are hypothesized to be involved in disease progression. To aid in narrowing down the etiological agent, we are developing methods to selectively remove bacteria from the microbiome, allowing us to determine function or virulence of the bacteria in SCTLD lesions. In contrast, we are developing the use of probiotics for SCTLD treatment using a high-



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throughput isolation and testing pipeline. With increasing anthropogenic and global stressors, it is likely that SCTLD will not be the last coral disease outbreak, so establishing new tools to aid in disease identification and response will provide a guide for the future of coral disease research.

Connecting Blue Carbon, Resiliency & Environmental Security

Dr. Gabrielle L. Johnson, PhD, PMP, Senior International Program Manager, on contract to National Oceanic & Atmospheric Administration (NOAA) – Marine Protected Area (MPA) Center

BIO



Gabrielle has been leading international capacity building efforts for the past 15 years with a focus on marine and coastal natural resource management. This has included the design and delivery of capacity building efforts focused on providing problem solving and practical solutions to management issues. These programs have covered topics such as sustainable tourism, sustainable fisheries, planning for climate resiliency and marine spatial planning, as well as other key marine and coastal management themes. This included support to the NOAA USAID partnership in both project development and management. Most recently, providing technical assistance to the Blue Carbon Inventory Project led by NOAA and Department of State that leverages on-going

work with the Environmental Protection Agency (EPA), the U.S. Department of Agriculture's Forest Service (USDA/FS), the Smithsonian Environmental Research Center (SERC) and Silvestrum Climate Associates. Her expertise spans project management as well as instructional design and facilitation of capacity building activities.

ABSTRACT

Coastal wetlands, such as mangroves, salt marshes, and seagrasses, play a significant role in carbon storage and sequestration around the world, providing some of the highest density stores of carbon in the biosphere. This long-term storage is known as "coastal blue carbon." Marine Protected Areas provide an opportunity to contribute further to increasing blue carbon reserves globally. In addition, a strong network of healthy coastal wetlands can protect coastal communities from storms, waves, erosion, and flooding; protect biodiversity; and provide ecosystem services that support livelihoods, culture, food security, water quality, recreation, and tourism. The NOAA Blue Carbon Inventory Project is a collaboration between NOAA, Dept of State, EPA and SERC with emerging focal points in Southeast Asia, the Pacific and Central America. Working side by side with in-country partners including government counterparts and NGOs, the project aims to provide technical support for incorporating blue carbon into national greenhouse gas inventories (NGGI), as well as practical solutions for coastal resource management to strengthen resilience and support the value of coastal wetlands in carbon storage and sequestration. These solutions take a boots-on-the-ground approach focusing at the community and local-level. This presentation will share progress to date, case studies, and strategies for MPAs to contribute to Blue Carbon including highlighting the unique partnerships that support the success of such an initiative.



Day Two: Technology for Resilient Coastal Ecosystems





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Agenda – Day 2, 13 September 2023 (Wednesday)

THEME: Technology for Resilient Coastal Ecosystems

Moderator for the Session: Ms. E. Ikelau Otto, Chief Researcher, Palau International Coral Reef Center

0800-0830	NEW REGISTRATIONS/ PARTICIPANTS ARRIVAL
0830-0835	Administrative Remarks / Theme Introduction Ms. E. Ikelau Otto, Chief Researcher, Palau International Coral Reef Center
<u>Panel Session – Key Technology Applications and Applying Lessons Learned for Coastal Ecosystem Protection, Restoration, and Incorporating Traditional Methodologies</u>	
0835-0855	“Using Early Warning Systems for Coastal Ecosystem Protection – Coral Reef Watch and WaveForce” Dr. Derek Manzello, Coordinator, NOAA Coral Reef Watch, Center for Satellite Applications and Research, Satellite Oceanography & Climatology Division
0855-0915	Coral Restoration in Southeast Asia: Lessons Learned and How to Move Forward by Using Low Technologies Dr. Suchana (Apple) Chavanich, Professor, Chulalongkorn University, Thailand
0915 -1000	Science and Technology to Support Healthy Coral Reefs, and the People Who Depend on Them Mr. David Mead, Executive Director of Strategy and Development, Australian Institute of Marine Science (AIMS)
1000-1030	BREAK
1030 – 1050	Nature-based Solutions for Mitigating Sediment and Nutrient Transport into Sensitive Coastal Ecosystems Mr. Phal Mantha, Director of Agriculture and Sustainability, Ridge to Reefs, Inc.
1050-1140	Panel Session Q&A Moderated by Ms. E. Ikelau Otto
1140-1150	DAY 2 WORKING GROUP OVERVIEW AND LOGISTICS Ms. Symone Esichang Ubedei
1150-1300	LUNCHTIME SESSION - SERDP & ESTCP PROGRAM FUNDING PROCESS OVERVIEW Dr. John Hall
1300-1430	Coastal Ecosystem Technology Working Groups: 1) Coastal Ecosystem Protection 2) Coastal Ecosystem Restoration 3) Ridge to Reef/ Traditional Practices Facilitators and Participant Working Group assignments are the same as Day 1.
1430-1500	BREAK
1500-1630	Coastal Ecosystem Technology Working Groups (continued)
1630-1640	Administrative Notes - Ms. Symone Esichang Ubedei
1640-1700	TRAVEL BACK TO HOTEL



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Introduction to Technology for Resilient Coastal Ecosystems

Moderator for the Session: Ms. E. Ikelau Otto, Chief Researcher, Palau International Coral Reef Center

BIO



As the Chief Researcher for the Palau International Coral Reef Center (PICRC), Ms. E. Ikelau Otto coordinates research activities, supervises researchers and research assistants, and conducts research at the Center. She has conducted coral bleaching surveys and established the ocean acidification (OA) lab at the Center, which included implementing a monitoring protocol to track marine environment fluctuations over time. She received a Master of Science in Chemistry, Biology, and Marine Sciences from the University of the Ryukyus in Japan, where she focused on evaluating the impacts of sewage outflow on the health of surrounding coral reefs. This involved transplanting corals near the sewage outflow and outside of the sewage outflow area to observe their changes.

Using Early Warning Systems for Coastal Ecosystem Protection – Coral Reef Watch and WaveForce

Dr. Derek Manzello, PhD, Coordinator, NOAA Coral Reef Watch, Center for Satellite Applications and Research, Satellite Oceanography & Climatology Division

BIO



A coral reef ecologist, with a Ph.D. in Marine Biology and Fisheries from the Rosenstiel School of the University of Miami, Dr. Manzello is Coordinator of NOAA's Coral Reef Watch program, an effort focused on the monitoring of coral reef ecosystems through satellite and in situ observations. Coral Reef Watch is a part of the NESDIS Center for Satellite Applications and Research and uses NOAA satellite data to monitor environmental conditions that lead to coral bleaching and other marine ecological disturbances. NOAA's Coral Reef Watch provides the only source of satellite-based monitoring, alerts, and warnings of upcoming coral mass bleaching events. From 2001-2020, Derek worked at NOAA's Atlantic Oceanographic and Meteorological Laboratory in Miami, FL, where he led the development and implementation of the climate change and ocean acidification monitoring of the NOAA

National Coral Reef Monitoring Program for U.S. coral reef ecosystems. Dr. Manzello has published on multiple topics in coral reef ecology, and he regularly conducts research that spans the disciplines of biology, chemistry, and geology. His primary research interest is understanding the impact of climate change and ocean acidification to coral reef ecosystems. Manzello has conducted over 1000 scientific dives while researching coral reefs in all U.S. jurisdictions, as well as international locations



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in the Pacific (Galapagos, Panama, French Polynesia, Fiji, Palau, Papua New Guinea) and Indian Ocean (Chagos Archipelago).

ABSTRACT

The U.S. National Oceanic and Atmospheric Administration (NOAA) utilizes two data-driven early warning systems for coral reef protection. This session will explain NOAA's Coral Reef Watch (CRW) program that uses satellite and modeled data to deliver an online global decision-support-system that helps marine resource managers, researchers, decision makers, and the public prepare for and respond to coral reef environmental stress, particularly heat stress that leads to mass coral bleaching. Weekly to seasonal forecasts project future reef conditions, directly informing: timely, effective conservation planning, adaptation actions and resource allocation; communication with decision makers, the media, and the public leading up to, during and after major stress events; environmental management response; and impact monitoring.

This session will also explain WaveFoRCE, a simplified wave-driven flood forecasting on reef-lined coasts early warning system. WaveFoRCE is designed to be implemented as an operational flood forecasting system on all coral reef-lined coasts throughout the world. The core WaveFoRCE team consists of NOAA, the U.S. Geological Survey, and Deltares. WaveFoRCE's goal is to provide coastal flood forecasts 7.5 days in advance, at 3 to 6 hourly increments. WaveFoRCE will combine satellite data, hydrodynamic models and reef profiles to produce 61 flood forecasts, updated 4 times per day, for each point, at intervals of 200 meters for every coral reef-lined coast in the world. This tool will help coastal communities minimize loss of life from drowning, reduce damage to property and infrastructure, and adapt to the reduction of livable land due to increased erosion and salt-water intrusion.

Coral Restoration in Southeast Asia: Lessons Learned and How to Move Forward by Using Low Technologies

Dr. Suchana Apple Chavanich, Professor, Chulalongkorn University, Thailand

BIO



Dr. Suchana Apple Chavanich has a broad base of ecological research interests that involve the study of nearshore species from tropical to polar regions. In addition, her research focuses on conservation and restoration of marine ecosystems and impact of climate change and marine debris on marine ecosystems. Currently, she is also the Project Leader of Coral Reef Conservation in the Western Pacific under the UNESCO/IOC Sub-Commission for the Western Pacific, and serves as a Thailand Reef Check Coordinator that teaches and stimulates local communities to protect and monitor coral reef

health using ecologically sound and economically sustainable solutions. She is also considered to be Thailand's first female scientist to go diving in Antarctica and the Arctic. Her research work on Arctic-Antarctica and coral reefs has inspired Thai and young people on the value of marine ecosystems. Because of her work, she has received several awards and recognitions both nationally and internationally such as ASEAN Biodiversity Heroes Award (2022) and Explorer Award by National Geographic Magazine, Thailand (2018).



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ABSTRACT

Coral reef restoration has long been practiced in the Southeast Asia region. Coral restoration not only maintains and increases genetic diversity, but also may help corals to cope with changes in the environment, such as temperatures. However, for an efficient restoration and for a large-scale restoration, some factors need to be considered. Those factors include production cost, maintenance cost, and knowledge availability. In addition, for an intergovernmental organization, UNESCO IOC Sub-Commission for the Western Pacific (IOC-WESTPAC) has been supporting and promoting coral reef conservation in the region since it is one of the high priority interest issues among member states. International cooperation and coordinating programs in coral conservation including capacity building have been initiated. In this presentation, lessons learned from long-time practices, benefits, limitations, and challenges of coral restoration in the region and the possibility to extend and expand in a large scale using the low technology for conservation plan and management strategies will be discussed.

Science and Technology to Support Healthy Coral Reefs, and the People Who Depend on Them

Mr. David Mead, Executive Director of Strategy and Development, Australian Institute of Marine Science (AIMS)

BIO



David Mead is the Executive Director of Strategy and Development at the Australian Institute of Marine Science (AIMS). David was also the RRAP R&D Program Director following his previous role as Director of RRAP's Concept Feasibility Program. Previously, David spent 12 years as the AIMS Chief Operating Officer leading operations, corporate, business growth and government funding. He also oversaw areas of research and the development of research infrastructure. He developed the concept of the world-class [National Sea Simulator](#) overseeing the design and establishment of the facility. He has an honours degree in mechanical engineering, a Master of Business Technology and is a graduate of the Oxford University Advanced Leadership Program.

Prior to joining AIMS, David was a senior manager at Snowy Hydro Limited for 14 years, overseeing strategic planning and business development, new business ventures and leading functions responsible for asset management, maintenance and production operations. During this time, he was the inaugural recipient of the Australian Institute of Engineers Steve Maxwell Asset Management Leadership Award. David began his career with New Zealand Electricity, moving to BHP where he spent several years as a research engineer working on mining automation, explosives and blasting.

ABSTRACT

Global impacts to coral reefs from climate change are increasing, and compounding existing impacts from local pressures, with flow on consequences for the hundreds of millions of people who depend on reefs for food, economy, and coastal protection. The best future for coral reefs to be able to survive these stressful conditions requires a reduction in global greenhouse emissions to stabilize



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temperatures, best practice management of local pressures, and the development of interventions to help boost climate tolerance and ecosystem resilience. All three of these endeavors need strong science and technological development to support and drive them. At the Australian Institute of Marine Science, we operate across Australia's entire tropical marine estate, conducting research, monitoring, and technological development to improve marine park management; crown-of-thorns starfish control; reef health monitoring and reporting; coral restoration; and use of blue carbon. We are also growing our network of international partners to improve regional reef health monitoring as part of the Global Coral Reef Monitoring Network.

Nature-based Solutions for Mitigating Sediment and Nutrient Transport into Sensitive Coastal Ecosystems

Mr. Phal Mantha, Director of Agriculture and Sustainability, Ridge to Reefs, Inc.

BIO



Mr. Phal Mantha is the Director of Agriculture and Sustainability at Ridge to Reefs (RTR) and has worked to implement innovative solutions to complex agricultural and environmental challenges in globally diverse regions including North America, Asia-Pacific, and the Caribbean. He has worked internationally with hundreds of agricultural producers and a diverse array of underserved communities to improve the productivity, performance, and sustainability of agricultural models and environmental projects. Throughout his career, he has designed, operated, and led numerous agricultural operations producing thousands of tons of food and generating tens of millions of dollars in revenue. Phal has provided strategic guidance and advisory services to leading

multinational corporations, NGOs, government agencies, world renowned chefs/restaurateurs, and small business owners. In his role at RTR, Phal has worked closely with staff, leadership, and community organizations to design, develop, implement, and monitor numerous innovative nature based green engineering treatment systems. Phal holds a Bachelor of Science in Agriscience from Michigan State University and a Masters of Natural Resource Management from Virginia Tech's Center for Leadership in Global Sustainability. Phal serves on the Board of Directors for The National Center for Appropriate Technology (NCAT) and is a member of the Development and Personnel Committees in this role.

ABSTRACT

This presentation will review methods and strategies for utilizing nature based solutions to mitigate sediment and nutrient transport into sensitive ecosystems. The use of diverse biomass sources and waste streams for mitigating nutrient pollution will be highlighted. Considerations for utilizing low cost de-nitrification and phytoremediation systems will be an additional area of focus. Low-cost strategies for mitigation of pollution from animal agriculture will be highlighted, as will opportunities for nutrient recovery in example systems. In addition, this presentation will cover innovative techniques for mitigating erosion on agricultural lands and dirt roads.



Day Three: Holistic Management for Resilient Coastal Ecosystems





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Agenda – Day 3, 14 September 2023 (Thursday)

THEME: Holistic Management for Resilient Coastal Ecosystems

Moderator for the Session: Ms. Yvonne Ueda, Palau Conservation Manager, The Nature Conservancy

0730-0800	NEW REGISTRATIONS/ PARTICIPANTS ARRIVAL
0800-0805	Administrative Remarks / Theme Introduction Ms. Yvonne Ueda, Palau Conservation Manager, The Nature Conservancy
<u>Panel Session - Holistic Management for Resilient Coastal Ecosystems</u>	
0805-0815	Sharing of a Palauan Traditional Story around the Importance of Conserving Coastal Ecosystems Ms. Maked Besebes, Independent Consultant & Member, Ebiil Society, Palau
0815-0835	A Resilience Strategy for the Rock Islands Southern Lagoon – Our Heritage: Our Key to Resilience Ms. Andrea Uchel, Chief Resilience Officer, Koror State Government
0835-0855	Integrated Landscape Management - The Fiji Ridge to Reef (R2R) Project Approach Mr. Jalesi Mateboto, Programme Leader, Sustainable Forests and Landscapes, Land Resources Division, The Pacific Community (SPC)
0855-0905	Advancing Coastal Ecosystem Restoration and Protection through Indigenously Driven Adaptive Strategies Mr. William Kostka, Executive Director, Micronesia Conservation Trust
0905-0950	Panel Session Q&A Moderated by Ms. Yvonne Ueda
0950-1005	BREAK
1005-1130	Working Groups Gather <u>to Develop</u> Out-brief to the Plenum
1130-1230	Working Group Sessions Out-brief: 1) Coastal Ecosystem Protection 2) Coastal Ecosystem Restoration 3) Ridge To Reef/ Traditional Practices (15-20 mins each) Led by Ms. Symone Esichang Ubedei
1230-1235	PARTICIPANT SURVEY
1235-1245	Closing Remarks
1245-1300	BOX LUNCH DISTRIBUTION & GATHER FOR SITE VISIT
1300-1800	Site Visit to Palau International Coral Reef Center Coral Reef Monitoring Site at Rock Island, Coral Nursery, and Lighthouse Reef

Introduction to Holistic Management for Resilient Coastal Ecosystems

Moderator for the Session: Ms. Yvonne Ueda, Palau Conservation Manager, The Nature Conservancy, Palau

BIO



Ms. Ueda is currently the Palau Conservation Manager and is based in Palau. Ms. Ueda's role provides day-to-day management, leadership, and implementation of the projects in the Republic of Palau. Ms. Ueda was formerly the Coastal Fisheries Project Manager overseeing coastal fisheries projects in Palau. She also served as Tuna Project Manager overseeing some aspects of The Nature Conservancy's Indo-Pacific Tuna Program in Micronesia, serving as the principle day-to-day contact for governments, tuna fishery managers, the fishing industry, and other stakeholders. She provided day-to-day project management, leadership and implementation of tuna program activities in the Republic of Palau, Federated States of Micronesia and Republic of the Marshall Islands, including on electronic monitoring, tuna

fisheries domestication, and innovative approaches to increasing coastal community benefits from pelagic tuna fisheries. Prior to The Nature Conservancy, Ms. Ueda served 12 years in the Government, in the Ministry of State as the Foreign Service Officer coordinating activities with various countries, regional and international organizations to support Palau, negotiating treaties, aids and other technical support ensuring Palau's interests and policies are represented. Ms. Yvonne Ueda was born and raised in the island of Palau and is married and blessed with two kids.

Sharing of an Indigenous Story Around the Importance of Conserving Coastal Ecosystems

Ms. Maked Besebes, Independent Consultant & Member, Ebiil Society, Palau

BIO



Ms. Maked Besebes is an independent consultant in communication, project management, and cultural heritage. Ms. Besebes has a BA in communication and an MA in Anthropology-Cultural Heritage and Museum. Since 2005, she has worked in various positions as an ethnographer and researcher with the Belau National Museum and Palau Historical Preservation Office. In 2018, she expanded her work experience to community development, gender issues, and social inclusion. She is a member of the Global Network of Facilitators for Safeguarding Intangible Cultural Heritage.

Ms. Besebes is married with two children and believes that storytelling is integral to any society in ensuring that voices are heard. She is inspired by the material cultures that serve as an agency for communicating ideas and stories. Similarly, she believes that the expression of culture through different art media is crucial to community



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building. Currently, she is working on a social protection project with the Asian Development Bank to address the needs of vulnerable groups in Palau.

A Resilience Strategy for the Rock Islands Southern Lagoon – Our Heritage: Our Key to Resilience

Ms. Andrea Uchel, Chief Resilience Officer, Koror State Government

BIO



Ms. Uchel holds a Master's of Arts in Educational Leadership focusing on Public Administration and Human Resource Development. Prior to her current role as Chief Resilience Officer for the Koror State Government, she worked for 5 years as a Policy Development Officer at the Palau International Coral Reef Center. She works to ensure that resilience is understood, built, and best interpreted in the local context of her community. Ms. Uchel's level of interest in learning and understanding the world of science has grown due to her professional experiences, as well as networking. Because of her career, which she feels

fortunate to have, her love for her country's rich biodiversity has grown immensely.

ABSTRACT

'A Resilience Strategy for the Rock Islands Southern Lagoon' stems from nearly two years of dedicated collaboration at all levels of the Koror State Government, the Resilient Reefs Initiative (RRI), partners, and community groups. The Strategy seeks to look back to Palau's heritage to draw lessons and design a resilient pathway to move forward living with climate change. The RRI was developed to support reef managers and local communities in the face of change and identify innovative and adaptive solutions to the threats facing coral reefs. The RRI officially commenced in Palau in May 2021 through a partnership between the Great Barrier Reef Foundation and the Koror State Government. The Resilience Strategy presents a way forward to bolster resilience in the management authority and for Koror State Government to lead the community through tough times ahead. The strategies and actions are spread across three themes: Elevating Community and Institution; Keeping Values, Legacy and Identity; and Strong Social and Economic Well-being. Strategies within these are centered around community, protection of diversity, commercial fisheries management, cultural and historical preservation, tourism and economic development and Koror State Government institutional capacity development. Several partners, agencies and NGOs that bring a wealth of experience and expertise from their fields have committed to assist and support the successful implementation of these strategies.



Integrated Landscape Management – The Fiji R2R Project Approach

Mr. Jalesi Mateboto, Natural Resources Management Advisor, Sustainable Forests and Landscapes, Land Resources Division (LRD), The Pacific Community (SPC)

BIO



Mr Jalesi Mateboto is the NRM advisor and currently leading the Sustainable Forests and Landscapes Management work pillar of the SPC Land Resources Division (LRD). A forester by training, his current role is to provide strategic advice, analysis, and direction to LRD and SPC member countries and territories on a range of issues relating to forestry and landscape management. Jalesi had been serving the Pacific region for the past 21 years. Prior to joining SPC he worked with Fiji's Forestry Department, the private sector (logging and sawmilling industries) and a regional NGO working on community forestry.

ABSTRACT

The Ridge to Reef project, launched in 2016 and ended in June 2022, aims to preserve biodiversity, provide ecosystem services, sequester carbon, improve climate resilience, and sustain livelihoods through ridge-to-reef management of priority water catchments on Fiji's two main islands, Viti Levu and Vanua Levu. Its primary goal was to ensure an integrated approach to land, water, forest, biodiversity, and coastal resource management in a way that helps reduce poverty and support sustainable livelihoods in local communities.

This presentation will look at how the Ridge to Reef project contributed to a review of policies and regulatory frameworks, promotion of best practices, and stakeholder engagement to achieve landscape-level watershed management and village livelihood improvement. Integrated landscape management provides a basic framework for balancing competing demands and integrating policies for multiple land uses within a given area. This project provided the opportunity to investigate balancing conservation with production using the principles and science of island ecosystems.

The presentation will submit that sectorial approaches to land management are no longer sufficient to meet global challenges such as poverty alleviation, biodiversity conservation, and food production. Nor is the thinking that landscapes and seascapes can be managed separately. For the small island nations of the Pacific, a whole island approach integrating landscape and seascape management is the key to sustainable development.

Advancing Coastal Ecosystem Restoration and Protection through Indigenously Driven Adaptive Strategies

Mr. William Kostka, Executive Director, Micronesia Conservation Trust

BIO



Mr. William (Willy) Kostka is the Executive Director of the Micronesia Conservation Trust. He is a senior leader with over 20 years' management experience in natural resource conservation, ecosystem-based adaptation and sustainable livelihoods development. Adept at leading diverse teams to develop and implement strategic and innovative programs, his work has resulted in measurable conservation outcomes. He is a strong fund raiser with a proven track record of balancing budgets. Recipient of the Pew Marine Fellowship in 2006, Mr. Kostka is Micronesian with lifelong personal, family, and career experience in the Pacific.

ABSTRACT

The paramount custodians of climate adaptation within communities are those whose heritage is deeply intertwined with the lands and coastal ecosystems that sustain them today. The Micronesia Conservation Trust (MCT) was established with a distinct purpose: to champion community-based conservation endeavors that fortify ecosystem and communal resilience against the escalating adversities of climate change. While the coastal communities of Micronesia bear the brunt of climate change's detrimental effects, it is important to acknowledge that they bear minimal responsibility for its onset. Locally Led Adaptation (LLA) fosters a pivotal paradigm shift, vesting communities with the authority to devise and execute interventions through their indigenous decision-making processes. This transformative approach not only augments the resilience of ecosystems but also empowers the populace, affording them the agency to effectuate meaningful change.

The forthcoming discourse will delve into the pivotal role of locally led adaptation in enhancing the resilience and rehabilitation of coastal ecosystems. Director Kostka will inaugurate the session by expounding upon MCT's foundational tenets, subsequently underscoring the significance of embracing and endorsing traditional and local collaborative strategies in executing interventions at the community echelon. The presentation will further elucidate MCT's innovative Small Grants Mechanism model, drawing insights from years of collaborating with communities across the region. The presentation will culminate in the exposition of specific instances of traditional and locally rooted projects hailing from regions within Micronesia.



Working Group Facilitators

1. Coastal Ecosystem Protection Working Group

Ms. Elchung Hideyos, Senior Extension Agent - Youth and Community, Palau Community College

BIO



Ms. Elchung Gladys Hideyos is from the Republic of Palau and graduated from Chaminade University of Honolulu, Hawaii in 2018 with a Bachelor of Science in Environmental Studies. After undergraduate school, she worked for a year in Palau with a non-profit organization called Ebiil Society where her focus was using traditional knowledge in natural resource management, environmental education and awareness, and conservation. In September of 2021, Elchung graduated with a Master of Arts degree in Global Environmental Studies from Sophia University in Tokyo, Japan, through a full scholarship called the Bill Raynor Micronesia Challenge (BRMC) scholarship. Her thesis focused on women's fisheries management, conservation, and policy in Palau, which is part of the coastal and nearshore fisheries.

Elchung currently works at Palau Community College-Cooperative Research and Extension (CRE) as the Senior

Extension Agent-Youth and Community. As a young professional, Elchung enjoys working with children and local community members to understand their challenges and to work together to come up with solutions and mitigate the effects of climate change, biodiversity loss, and traditional knowledge loss. She understands the importance of incorporating traditional knowledge in modern sciences and passing down knowledge to the next generation. Elchung wants to positively influence others, especially the youth, to become better stewards and managers of the environment for a better future for the next generations.

Dr. Robert J. Toonen, Professor & Ruth D. Gates Endowed Chair of Coral Reef Systems, Hawai'i Institute of Marine Biology, University of Hawai'i at Mānoa

Biography included above in Speaker section.

Dr. Derek Manzello, PhD, Coordinator, NOAA Coral Reef Watch, Center for Satellite Applications and Research, Satellite Oceanography & Climatology Division

Biography included above in Speaker section.

Dr. Yimnang Golbuu, Coral Resilience Director, The Nature Conservancy, Palau

Biography included above in Speaker section.

2. Coastal Ecosystem Restoration Working Group

Dr. Adam Smith, Founder and Chief Executive Officer, Reef Ecologic, Australia

BIO



Dr. Adam Smith is the founder and chief executive officer of Reef Ecologic, an Australian based company and social enterprise that provides research and monitoring, strategic advice, and capacity building to facilitate sustainable outcomes. He has led the organization to become a 3-star ecoBiz company, an Ecotourism Australia climate action business and a BCorp Best for the World Environment. Reef Ecologic's tagline is "For a better planet" as everything they do is centered around making a positive environmental impact and empowering people. The organization is involved in the science of coral reef restoration throughout multiple locations to support ecological and socio-ecological values

of reefs and associated communities. Team members work with local communities to collect coral, grow it in nurseries before returning it to degraded sites to help restore the areas. Adam also initiated the "International Coral Reef Leadership and Management Course" and developed the "Museum of Underwater Art" to share knowledge about ocean conservation. Adam holds a BSc (Hons), PhD, and MBA, and has authored over 100 scientific papers, books, and reports. Between 1999 and 2014, Adam worked as director of the Great Barrier Reef Marine Park Authority, and he has held several voluntary board positions with the Australian Underwater Federation, Recfish Australia, Environment Institute of Australia and New Zealand (EIANZ), Reef Restoration Foundation, and Museum of Underwater Art. In his leisure time, Adam is a keen ocean sportsman, naturalist, freediver and kayaker.

Dr. Richard Page, Researcher, Palau Community College

BIO



Richard joined Palau Community College (PCC) as an aquaculture researcher after exiting China in 2022. Prior to that, he was Professor of Political Science with an appointment to the Ocean Institute from 2016 until 2021 where he taught Ocean Sociology, Political Science and lectured in Environmental policy. He worked with local fishing communities and the fishing industry to transition from offshore fishing to coastal aquaculture and recirculating aquaculture systems (RAS) development with partners from the Ocean Institute. This work helped preserve and develop the area surrounding Laoshan Ecological Area with Qingdao MoF and was supported by an extremely talented group of researchers and students. Richard was yearly judge and evaluator of innovative technology at the Qingdao Fisheries Forum at the annual Fishtech awards program and contributed to the development of local seaweed, fish, shrimp and sea cucumber farms with a regional market reach. In 2022, Richard was appointed Island Innovation Ambassador to Palau by the Island Innovation Forum of

the Small Islands Developing States (SIDS) working group. Some of his projects in China, for example on sturgeon and other freshwater species, were extremely important to industry. He advocates for transitions to sustainability planning, done in a community-driven, market-oriented manner that is resilient and scalable. Prior to this, Richard was a recipient of an honorary award from Open



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University of Vietnam, and has worked in several countries on problems related to the nexus between aquaculture, marine ecology and human ecology. Richard has undergraduate degree and awards from the University of Delaware, and a graduate degree from Colorado Technical University. Most recently Richard authored a forthcoming paper discussing the importance of marine protected areas (MPAs) in Palau and contributed to the COP28 planning guide.

Dr. Ben Jones, Director, Ocean Science and Technology, Applied Research Laboratory, University of Hawai'i

Biography included above in Speaker section.

Ms. Yvonne Ueda, Palau Conservation Manager, The Nature Conservancy

Biography included above in Speaker section.

3. Ridge To Reef/ Traditional Practices Working Group

Dr. Jessica Carilli, PhD, Scientist, Naval Information Warfare Center, Pacific

BIO



Dr. Jessica Carilli is a Scientist in the Energy and Environmental Sciences Branch at the Naval Information Warfare Center (NIWC) Pacific with a background in geochemistry and ecology.

Dr. Carilli focuses on conducting applied research that will benefit coastal environments and the communities that rely on them. She is particularly interested in coral reefs, climate change, and contaminants. She conducts field and laboratory-based research to understand environmental processes and the influence of human activities. Her studies have spanned a wide range of locations including Puerto Rico, US Virgin Islands, Belize, Honduras, Kiribati, Guam, Hawaii, and the US west coast.

Dr. Carilli has published over 20 peer-reviewed journal articles and co-wrote the Scitable blog “Saltwater Science” as part of her interest in communicating science to broad audiences. She received her PhD from the Scripps Institution of Oceanography, was a postdoctoral scholar at the Australian Nuclear Science and Technology Organization, and held a professorship at the University of Massachusetts Boston, prior to joining NIWC Pacific.



2023 Coastal Resilience Workshop

**DAY
3**

Ms. Ann Kloulechad-Singeo, Executive Director of Ebiil Society Inc.

BIO



Ann Kloulechad-Singeo became the Executive Director of Ebiil Society Inc., in January 2011. She is a co-founder of Ebiil Society and served on the Board of Directors from 2007-2010. A graduate of the University of Texas at El Paso with a master's degree in communications for Social Change, she works with communities to initiate innovative solutions that promote sustainable resources for livelihood support. She has acquired diverse work experience from various management positions, such as an Executive Director for Palau Primary

Health Care, Chief for Palau's Gender Division, and as a private consultant in the local and regional areas of the Pacific. Her publication includes the UNESCO-EIU award winning monograph for Camp Ebiil-Cultivating Indigenous Knowledge towards Environmental Conservation, Palau Cultural Mapping with the Secretariat of the Pacific Community, and with the UNESCO Palau Knowledge of the Sea, Palau Mesei Epistemology, Palau Intangible Cultural Heritage, Palau Gender and Natural Resource 2020, and various environmental papers, including women fisheries.

Mr. Phal Mantha, Director of Agriculture and Sustainability, Ridge to Reefs, Inc.

Biography included above in Speaker section.

Ms. Andrea Uchel, Chief Resilience Officer, Koror State Government

Biography included above in Speaker section.

Site Visit to Palau International Coral Reef Center (PICRC)

Ms. E. Ikelau Otto, Chief Researcher for PICRC, will lead participants on a field visit to the PICRC Coral Reef Monitoring Site at Rock Island, Coral Nursery, and Lighthouse Reef.