

STONY CORAL TISSUE LOSS DISEASE

ANNUAL NEWSLETTER

Sharing Coral Disease Knowledge and Experience
across U.S. Coral Jurisdictions | Spring 2024



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Hot Topic: The Interaction between SCTL D and Bleaching

Alexis Sturm, Ph.D., NOAA Coral Reef Conservation Program

Since its discovery in 2014, stony coral tissue loss disease (SCTL D) has been top of mind for most Caribbean coral reef researchers and managers. However, 2023 was a different story. During the spring and summer of 2023, the Caribbean region faced a formidable thermal stress event, resulting in record-breaking sustained high water temperatures, widespread bleaching, and in many cases, coral mortality. As researchers monitored and responded to the bleaching event, an interesting pattern emerged – SCTL D activity decreased noticeably. In some areas, the prevalence of diseased corals decreased so much that researchers faced challenges in locating colonies with active SCTL D to be used for experiments.

At the height of the thermal stress event last September, research labs led by Nova Southeastern University's Dr. Karen Neely and Dr. Brian Walker observed significant coral bleaching in southeastern Florida and the Florida Keys. Intriguingly, the prevalence of active SCTL D during this same time period was limited. While the analysis of this data is still underway, an earlier study in the Virgin Islands by Sonora Meiling (University of the Virgin Islands) and colleagues similarly found that many SCTL D lesions stopped during peak thermal stress.

So why does a coral bleaching event seem to drive down SCTL D prevalence? Studies suggest that SCTL D primarily impacts the coral's algal symbionts, the photosynthetic algae that give corals their color and provide them with the food they need to survive. As bleaching is essentially the loss of algal symbionts in a coral colony, there may be fewer targets for the SCTL D pathogen to infect, potentially driving a decline in its prevalence.

With temperatures cooling, surviving colonies will hopefully begin to recover. However, they are likely still stressed, with depleted energy stores and weakened immune systems. Only time will tell if there is a resurgence of SCTL D or some other coral disease. Notably, some studies have suggested that SCTL D emerges in warmer months and is more active with increased temperatures, up until bleaching occurs, when SCTL D activity sharply declines. Studies on other coral diseases have also found they are more prevalent with increased temperatures and following bleaching events. Continued monitoring of the coral reefs and rapid responses in case of outbreaks will be critical to prevent further coral loss in the aftermath of bleaching events.



Working Groups Collaborate to Address Thermal Stress

Alexis Sturm, Ph.D., NOAA Coral Reef Conservation Program

The U.S. Coral Reef Task Force (USCRTF) leads efforts to build partnerships, strategies, and support for on-the-ground action to conserve coral reefs. It is a partnership of Federal agencies, U.S. States, territories, commonwealth states, Freely Associated States and fisheries management councils and is coordinated through smaller, issue-specific working groups.

In 2023, significant heat stress began building across multiple ocean basins in early spring, driven by a severe El Niño event. Before long, bleaching was observed across reefs in the Eastern Tropical Pacific and the Indian Ocean. However, bleaching was most widespread across the Caribbean. In response to this stress event, the Climate Change and Coral Disease Working Groups decided to join forces during the fall. The combination of these two groups was critical for information sharing. It allowed members with coral bleaching expertise to better access the capacity and networks built initially for SCTLD response. These networks are now expanding to include other disturbances and coral reef emergencies.

The groups discussed the 2023 heat stress event and heard from jurisdictions on what they were observing and how they were responding. In response to this stress event, NOAA Coral Reef Watch enhanced station reporting at specific locations across Puerto Rico, USVI, and Florida for use in coral bleaching response planning, triage, communication, and restoration.

Most restoration activities were paused and instead, efforts were focused on evacuating coral colonies from in-water nurseries to land-based facilities or deeper waters. Intervention activities included shading of some individual coral colonies, removal of corallivores, and of course, extensive monitoring.

In-water intervention activities included shading of some individual coral colonies, removal of corallivores, and of course, extensive monitoring.

By November, temperatures were beginning to cool in the Caribbean and the jurisdictions had a chance to share what approaches they were using to return corals from land-based facilities back to in-water nurseries and what they had learned from this event. While the Pacific jurisdictions have (so far) been spared from much of this thermal stress event, they also began to share how they were preparing for potential future events, including hiring disturbance response coordinators and developing bleaching response plans. In facing the challenges of the 2023 bleaching event, the synergy between the Coral Disease and Climate Change Working Groups highlighted the strength in collaboration, fostering adaptive strategies, and sharing knowledge to safeguard coral ecosystems.



STRENGTH IN NUMBERS

IN THE CARIBBEAN

Capacity Building for Coral Rescue

Emma Doyle & Gabriela Ochoa, MPACConnect & Dana Wusinich-Mendez, NOAA Coral Reef Conservation Program

Since it first appeared in Florida in 2014, SCTLD has now spread to 30 countries and territories in the Caribbean region. In response to this emerging issue, MPACConnect with NOAA's Coral Reef Conservation

Program and the Atlantic and Gulf Rapid Reef Assessment

Program (AGRRA) focused on sharing knowledge and experience among coral reef managers regionally. From coordinating the first learning exchanges to preparing factsheets, posters, videos and webinars, MPACConnect has increased important capacity for SCTLD

monitoring, reporting, treatment of affected corals, and engagement of communities and stakeholders in responding to the disease.



Most recently, on Caribbean reefs affected by SCTLD, there has been a shift from epidemic to endemic phase of the disease. Accordingly, Caribbean coral reef managers are seeking tools to safeguard reefs through coral rescue. MPACConnect has taken an active and holistic approach to support managers and expand capacity for coral rescue. The field of coral rescue is evolving rapidly with some approaches focused on establishing land-based facilities that can house surviving corals or fragments, while other approaches involve in-water monitoring of coral spawning and the collection of gametes for assisted fertilization, either in the field or in a lab setting.

Continued on next page ...



CORAL COLLABORATIONS

Florida Shifts to ‘Disturbance Response & Recovery’

Maurizio Martinelli, Florida Sea Grant

Florida partners have been discussing a path forward for their highly collaborative SCTL D Response. While the Response was successful in mobilizing people and resources, it was intentionally and necessarily narrow in its focus. As SCTL D settled into endemism, terms like ‘emergency’ and ‘crisis’ felt less apt to be used, and the community wrestled with questions about how to support long-term, successful management of the ecosystem with SCTL D as one of many stressors.

initiative that has worked to identify and track coral reef health and status, understand underlying factors that lead to and maintain resilience, and inform efforts to reduce impacts and stressors on Florida reefs. Partners recognized that the strengths of these two collaborations complemented each other and represented a great opportunity to advance conservation and management on multiple fronts.

These two collaborations are a great opportunity to advance conservation and management on multiple fronts.

MPACConnect developed coral rescue planning tools and brought together managers and experts to participate in face-to-face workshops to help managers identify the most appropriate approaches to SCTL D response and coral rescue for their unique settings. A multi-country learning exchange sponsored by USAID brought coral management practitioners from the Eastern Caribbean — from Barbados, Grenada and Dominica — together in Roatan, Honduras, to learn hands-on about SCTL D response and the assisted fertilization of corals. Upon their return home, the participants are working on implementing their own coral rescue activities.



MPACConnect has sought to ground SCTL D response and coral rescue planning in the financial reality of Caribbean coral reef managers. Through peer-to-peer sharing of lessons learned by the network about sustainable financing, MPACConnect helps managers to ensure long-term, reliable, and resilient funding for these regionally important coral reef conservation efforts.

Despite the unprecedented loss of coral diversity in the region due to SCTL D, there have been some positive outcomes from the capacity-sharing that the disease has prompted. New regional collaborations have been established that now provide a platform for a shared response to new threats to coral reefs including sea urchin (*Diadema*) die-offs, coral bleaching, and an octocoral (*Unomia*) that has recently invaded the Caribbean. In the context of ever-increasing ocean threats, important lessons have been learned about the need for contingencies for monitoring and response to emerging threats to coral reefs, about the importance of partnerships and multi-stakeholder coordination in coral reef management, and about the evolving role of strategic coral rescue and restoration.

In May 2023, roughly 70 partners met for a workshop at Nova

Southeastern University to discuss the evolution of the SCTL D Response. Participants discussed means to maintain a network of working groups for fast mobilization in response to disturbances while also tackling ecosystem recovery. The workshop conversations spanned broad topics – like how to capitalize on the successful elements of our collaborations while minimizing the pitfalls of our structure – down to specifics of our teams – like how best to reorient our working groups to tackle additional, high-priority issues.

Based on the outcomes of this workshop, Florida’s SCTL D Response agreed to merge with the Florida Reef Resilience Program – an

The new initiative is called Florida’s Coral Reef Resilience Program (FCRRP). The goal of FCRRP is to facilitate the recovery of Florida’s Coral Reef into a resilient, self-sustaining ecosystem by addressing four focal areas: disturbance response, ecosystem restoration, water quality, and climate adaptation. FCRRP will continue to operate with a team structure while encouraging and supporting more cross-team collaborations. In the end, FCRRP aims to operate as a hub for planning, building collaborations, and implementing actions to ensure that Florida’s Coral Reef will persist and thrive well into the future.



Coast to Coast Coral Rescue

Beth Firchau, Association of Zoos & Aquariums

In 2018, the Association of Zoos and Aquariums (AZA) joined forces with the Florida Fish and Wildlife Conservation Commission and the National Oceanic and Atmospheric Administration Fisheries Service in an unprecedented response to the collapse of a precious ecosystem, Florida's Coral Reef. Since then, AZA-accredited facilities across the country have opened their doors and hearts to coral "reefugees" as part of the AZA Florida Reef Tract Rescue Project.

To date, nearly 80% of all corals rescued from the reef have found homes in 20 AZA facilities across the United States.

AZA and its over 235 international members consider Florida's Coral Reef a national, natural treasure. To date, nearly 80% of all corals rescued from the reef have found homes in 20 AZA facilities across the United States. Recently, AZA's efforts have gone coast-to-coast with the addition of new coral holding facilities in North Carolina and California at SEALIFE Charlotte-Concord and SEALIFE Aquarium at LEGOLAND® California Resort. SEALIFE San Antonio is preparing to receive corals later in 2024. With their participation, the AZA Florida Reef Tract Rescue Project involvement in Florida coral rescue is now coast-to-coast — a nationwide tour de force.

For Becca Thomas, Curator at SEALIFE Charlotte-Concord, distance doesn't make a difference in conservation impact. "Our SEALIFE Charlotte-Concord team is excited to participate in

a national, multi-agency effort to provide a home for Florida's rescued corals. Our hope is to make a positive and lasting impression on Florida's Coral Reef, even if we are 700 miles away." It's personal for Lauren Marcon, Curator at SEALIFE Michigan. "Many Michiganders visit Florida every year, making the straight shot drive down Interstate 75! This is a very personal project since Florida is a second home to so many of us."

SEALIFE maintains conservation at the heart of its mission, both globally and locally. Across its 50+ international aquariums, and working alongside marine conservation charity the SEALIFE TRUST, SEALIFE pioneers global conservation initiatives to support our oceans and inspire conservation stewardship through education and engagement, reaching more than 23 million visitors a year. Marie Collins, Head of Conservation, Welfare and Education for SEALIFE North America, sees the big picture when considering participation in the AZA-FRTRP and Florida coral rescue. "Our organizations support a wide variety of projects across the globe. Here at home, Florida's Coral Reef is the largest bank reef in the continental US and it's important for us to protect global and local ecosystems alike. We're proud to partner and work alongside dozens of AZA institutions and other partners as a collaborative conservation effort. We know our efforts are stronger together."



PUERTO RICO

2023 Coral Bleaching

Maria Vega-Rodriguez, PhD & Darimar Davila, Puerto Rico Department of Natural and Environmental Resources

DURING THE SUMMER of 2023, Puerto Rico experienced the warmest sea surface temperatures recorded in the last 20+ years. Alerted by the 2023 bleaching events that started in Florida during the early summer, the Puerto Rico Department of Natural and Environmental Resources (PR DNER) Coral Reef Conservation and Management Program encouraged its Coral Disease Response Team (composed of field staff and partner organizations and created initially with the focus of monitoring SCTL) to monitor our reefs for coral paling or bleaching observations in June 2023. At the time, satellite-derived sea surface temperatures had not exceeded the maximum monthly mean, and only a watch level was alerted for our reef environments despite the massive coral bleaching observed in the Florida Keys. Warm water temperatures at this level can result in significant coral bleaching when corals expel their algal symbionts and lose color. While corals can survive bleaching events, they are under more stress, vulnerable to disease, and more susceptible to mortality when bleaching occurs.

Preemptively, coral reef restoration practitioners in Puerto Rico started bleaching response efforts in June 2023. Some of these efforts included updating the Institute for Socio-Ecological Research's land-based nurseries on the island's western side and preparing those on the eastern side to uphold rescued coral fragments. Important rescued coral fragments

FIGURE 1. In-situ coral trees that were relocated to deeper waters (15 meters) by NOAA Restoration Center and Sea Ventures.



(particularly of the *Acorpora* and *Dendrogyra* spp.) were relocated into these land-based nurseries. Separately, shallow water in-situ coral nurseries were relocated into deeper water in an effort to avoid the warmer surface water temperatures (Figure 1).

Shortly after these early response efforts began, water temperatures increased significantly, and Bleaching Alert Level 2 was reached islandwide by October. The first informal coral paling and bleaching reports were received in August 2023 along the southwestern side of the island. Particularly, soft corals and anemones were impacted. Paling on *Agaricia* spp. and fire corals was observed in Mona Island, and yellow-band disease observations were recorded in *Orbicella faveolata* coral species in El Eco, Vega Baja, Puerto Rico. By August 25, 2023, satellite-derived sea surface temperatures had exceeded the maximum monthly mean, Degree Heating Weeks (DHW) of 4, and Bleaching Alert Levels of 1, indicating that significant bleaching is expected. By October 2023, NOAA Coral Reef Watch issued Bleaching Alert Levels of 2 and record-breaking DHW values of 17-18 for many reef environments around Puerto Rico. Field reports confirmed sites with significant bleaching, the most severe observed in the southwestern region. Other areas with major paling or severe bleaching included sites in Culebra (eastern region) (Figure 2). Significant mortality of *Acropora* coral species was reported and documented in the southwestern region of the archipelago, specifically Cayo San Cristobal within La Parguera Marine Reserve in Lajas, Puerto Rico.

Currently, the Coral Reef Conservation and Management Program is monitoring reefs as they recover from this unprecedented bleaching event, as well as continuing to support SCTLD intervention, mitigation and coral rescue efforts. The program is evaluating coral reef restoration efforts in the near future as part of island-wide coral restoration planning.

FIGURE 2. 2023 Coral Bleaching events as documented within the SCTLD Dashboard developed by DNER's Coral Reef Conservation & Management Program and Puerto Rico Sea Grant.



DNER Coral Program, AmandOceano and Crystal Clear Vieques citizen scientists monitoring the Rompeolas reef in Vieques

COMMUNITY-BASED CONSERVATION

Puerto Rico Launches Citizen Science Effort

Ashley Pérez, Puerto Rico Coral Reef Management Fellow 2022-2024

As part of Puerto Rico's SCTLD Emergency Response Strategic Plan, the Puerto Rico Department of Natural and Environmental Resources (DNER) launched its first-ever Coral Reef Health Citizen Science Efforts in October 2023. Initially conceived as a means to increase surveillance of SCTLD, it has evolved into a comprehensive initiative

dedicated to monitoring all aspects of reef health islandwide, including other coral diseases. visits to selected reef sites. Upon completing training, stakeholders are encouraged to visit their respective sites, collect valuable data on coastal and oceanographic conditions and water quality, note the presence of any observable diseases, and report on the overall condition of the reefs. All data will be uploaded onto our current SCTLD Dashboard which was developed in collaboration between DNER and Puerto Rico Sea Grant.



Ashley Pérez introducing materials needed for monitoring.

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This initiative is currently undergoing testing through a focus group

that includes local nonprofits and environmental organizations like Crystal Clear Vieques, Grupo VIDAS, Para La Naturaleza, HJR Reefscaping, AmandOceano, and students from the University of Puerto Rico. The objective is to engage diverse stakeholders who will commit to monthly

The objective is to engage diverse stakeholders who will commit to monthly visits to selected reef sites.

The first field training sessions to assess the reefs and compile data regarding the impacts of 2023's extensive bleaching event started in November 2023. The information collected through these efforts will help develop Puerto Rico's Coral Reef Health Citizen Science guidebook, which will align with other outreach, response, volunteer and coral restoration efforts spearheaded by the Coral Reef Conservation and Management Program.

Collaborating with Invasive Species Experts on SCTL D

Val Brown, NOAA Office of National Marine Sanctuaries

When you think of marine invasive species, you might think of lionfish or alien algae, but pathogens like SCTL D can also be invasive. Recent research suggests that SCTL D is behaving like an invasive species, as it is likely moving with ships and may be transmitted via ballast water, biofilms, or sediments.

With this information in hand, the U.S. Coral Reef Task Force Coral Disease Working Group Pacific Preparedness and Transmission Teams have started to collaborate with partners focused on addressing invasive species, including the Aquatic Nuisance Species Task Force (ANSTF). The ANSTF was established in 1990 to protect U.S. waters by creating a coordinated, unified network that raises awareness and takes action to prevent and manage aquatic nuisance species.

Active engagement ... has created new collaborations that will help protect the Pacific Islands.

In January 2023, the Pacific Preparedness and Transmission Teams presented at the ANSTF annual meeting. Dr. Nicholas Rosenau (U.S. EPA) provided an overview of SCTL D's origins and movement across the Caribbean and highlighted the latest research on transmission. Val Brown (NOAA) provided an overview of the Pacific Preparedness team's efforts to build response capacity. These presentations set the stage for further collaboration with member organizations.

Invasive species were also highlighted at the Territorial

Climate and Infrastructure Workshop hosted by the Office of Insular Affairs in May 2023. The focus was primarily on terrestrial invasive species, but discussions on SCTL D highlighted the need to build capacity to address marine invasive species in the Pacific Islands Region. The Department of Interior, particularly the Office of Insular Affairs, is working with the territories to bolster capacity for marine invasive species work through training and the development of biosecurity plans.

The Department of Defense's US Indo-Pacific Command then hosted an Invasive Species Forum in July 2023 on Guam. Members of the U.S. Coral Reef Task Force Coral Disease Working Group attended this forum and facilitated the marine biosecurity working group sessions. The sessions raised awareness of marine biosecurity issues like SCTL D and participants developed priorities for research funding under the Department of Defense's research grant programs. The result was the specific inclusion of marine invasive species research in the Department's FY25 grant programs for the first time. This opportunity was passed on to SCTL D researchers and will hopefully fund additional research on SCTL D transmission, response, and control.

Through these active engagements with invasive species organizations, new collaborations that will help protect Pacific Islands have been created. New collaborations that will help protect the Pacific Islands from marine invasive species through capacity building, planning, and funding.

PACIFIC PREPAREDNESS



Vessel Traffic in American Samoa

Alisha Gill, NOAA Office of National Marine Sanctuaries

WHILE SCTL D has not yet been detected in the Pacific, the rapidity with which the disease spreads and the fact that it may be transmitted by vessels through ballast water, biofouling, and/or sediments is cause for concern. Most islands in the Pacific rely heavily on imported goods and shipping routes link the islands together. Understanding vessel traffic patterns and ballasting behaviors is the first step towards identifying their biosecurity risk. One such analysis was recently completed for commercial traffic in the port of Pago Pago, American Samoa. American Samoa is the only U.S. Territory in the South Pacific and because this small port receives relatively little U.S. commercial vessel traffic, it is often left out of national assessments. Additionally, its close proximity and trade connections with many other coral reef jurisdictions in the South Pacific is of particular concern for rapid spread if SCTL D is established here.

The analysis indicated that a total of 2,478 commercial vessels arrived in American Samoa from 2004 to 2021. The last port calls of these vessels were scattered across the globe, though the vast majority of commercial vessels both came from (91%) and remained (77%) in the Tropical South Pacific (Figure 1). The most common last port calls were Samoa, Fiji, French Polynesia, Hawai'i, and Tonga. The most common next port calls were Samoa, French Polynesia, Tonga, California, and New Zealand.

The US Coast Guard reported 59 ballast water discharge events from 25 different vessels for American Samoa from 2008 to 2021. Most discharges were from container ships and tankers. The ballast water discharged in American Samoa was sourced from all over the world, though most came from the West Coast of the U.S. and the Indo-Pacific region (Figure 2). Generally, container and cargo ships source ballast from various locations throughout the Pacific, tankers source from the Indo-Pacific region, passenger ships from North America's

ADOBES STOCK



FIGURE 1: A map showing the next port of commercial vessels arriving in American Samoa from 2004 to 2021.



FIGURE 2: A map showing the NBIC reported source locations of discharged ballast water in American Samoa from 2004 to 2021.

West Coast and Hawai'i, and reefers are the only commercial vessels that source from the Atlantic. These ships are of particular concern as some ballast and transit through areas affected by SCTLD.

American Samoa is remote, biodiverse, and resilient to change; however, the potential for introducing new species via commercial vessels remains high. Preventative measures are the most effective way to reduce the impact of marine invasive species, but regulations cannot be applied uniformly across all ports and all vessel types. Although we only looked at commercial traffic from the United States, this analysis calls attention to the high connectivity between Pacific Islands. It would be beneficial for Pacific island jurisdictions to review local and regional marine biosecurity risks and consider policy options regarding ballast water and biofouling.

You can access the article at: <https://repository.library.noaa.gov/view/noaa/56140>.



MITIGATING THE SPREAD

Hawai'i Emergency Regulations

Elizabeth Monaghan, Hawai'i Division of Aquatic Resources

The State of Hawai'i is exploring emergency rule-making to help prevent the transmission of SCTLD to Hawai'i waters through vessel traffic. Ballast water and hull fouling, two potential vectors for disease spread, have represented a major concern for the State of Hawai'i and the Pacific at large. Hawai'i receives some direct vessel traffic from the Caribbean area and may also act as a gateway to other Pacific jurisdictions if the disease is introduced. Hawai'i has approximately 60 species of reef-building coral, of which 16 are endemic; the introduction of SCTLD has the potential to be devastating.

The proposed emergency rule will use the Hawai'i Department of Land and Natural Resources' authority to regulate ballast water in commercial vessels and hull fouling on recreational vessels to add additional restrictions to vessels traveling from SCTLD-affected waters within the previous five ports. An analysis was conducted using past arrival data for ports in Hawai'i to determine how many commercial vessels this emergency rule would affect. 47 unique vessels carrying ballast water from SCTLD-affected areas arrived in Hawai'i ports from 2014–2022; these vessels made 84 trips and discharged ballast water 10 times. In October 2022, a scoping meeting was conducted, bringing together

environmental managers and stakeholders in the shipping industry to increase awareness regarding SCTLD and gain feedback on the proposed rule and regulations.

Commercial vessels would be required to treat their ballast water using a ballast water treatment system.

Proposed regulations would prohibit commercial vessels traveling from SCTLD-affected areas from discharging ballast water or cleaning or performing hull maintenance in Hawai'i waters. Additionally, commercial vessels would be required to treat their ballast water using a ballast water treatment system. Recreational vessels would be required to conduct a full hull cleaning prior to arrival in Hawai'i.

If enacted, these regulations would help mitigate the risk of SCTLD spread to Hawai'i through vessel traffic, and help protect the Pacific from this devastating disease. However, robust federal legislation and enforcement to protect the Pacific and other jurisdictions against SCTLD would be the most effective defense against vessel traffic as a vector.



37TH GENERAL MEETING OF THE INTERNATIONAL CORAL REEF INITIATIVE (ICRI)

TURNING THE TIDE*

Erica K. Towle, Ph.D., NOAA Coral Reef Conservation Program and Global Coral Reef Monitoring Network Data Task Force Co-Chair

The United States hosted the 37th General Meeting of the International Coral Reef Initiative (ICRI) from September 18th-23rd, 2023 in Kailua-Kona, Hawai'i. ICRI is a global partnership working to preserve and protect coral reefs. The key goals of the meeting were to discuss the achievements of ICRI and its members, share knowledge and experiences, and drive the implementation of the **2021 - 2024 Plan of Action: Turning the Tide for Coral Reefs**.

The U.S. is the current chair of the International Coral Reef Initiative, and the chair is shared between NOAA Coral Reef Conservation Program (CRCP) and the U.S. Department of State. The theme of the meeting was centered around Theme Four of the ICRI Plan of Action: Diversity and inclusion in the coral reef community and was supported by the countries of Monaco and Sweden, the United Nations Environment Programme, and the U.S. Department of State.

Global Coral Reef Monitoring Network Steering Committee Meeting

The **Global Coral Reef Monitoring Network (GCRMN)** is an operational network of ICRI, and convened its Steering Committee for a two-day meeting at the beginning of the week of the ICRI general meeting to reflect on lessons learned from the GCRMN 2020 global report, and brainstorm how to improve future global reports. GCRMN aims to provide the best available scientific information on the status and trends of coral reef ecosystems for their conservation and management.

Welcoming ceremony and Indigenous and local knowledge listening session

The General Meeting started with a listening session about the importance of indigenous and local knowledge, values, and traditions in coral reef conservation. In the afternoon of the first day, learning about Hawaiian culture expanded with a visit to Kaloko-Honokōhau National Historical. Since a major theme of the meeting was incorporating traditional

ecological knowledge into our modern coral reef management, this was an incredible way to learn about traditional native Hawaiian ecological management practices.

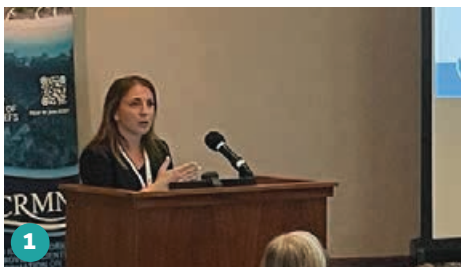
Actionable science

The sessions over the rest of the meeting days were characterized by significant progress in taking action for coral reefs and identifying next steps. One example was the adoption of the motion to launch the Coral Reef Breakthrough. The Coral Reef Breakthrough is an initiative to align the coral reef community under two global targets and action points for the conservation, protection, and restoration of coral reefs, in partnership with the Global Fund for Coral Reefs and the High-Level Climate Champions. The Breakthrough aims to secure the future of at least 125,000 square kilometers of shallow-water tropical coral reefs with investments of at least US\$12 billion to support the resilience of more than half a billion people globally by 2030.

Additional highlights included two distinct panels that generated rich discussions. The first was a panel about coral reef response plans. The panelists shared their perspectives on responding to threats like SCTLD, invasive lionfish, El Niño marine heatwaves, and bleaching. Many panelists highlighted the need for an adaptive management framework to maximize lessons learned, which lead to better management outcomes. The last panel of the meeting was a youth panel, which included panelists under the age of 35. The panel shared fresh perspectives on how the coral reef community can better engage young people and to ensure that early career scientists, managers, and policymakers have a seat at the ICRI table.

**Article adopted from NOAA CRCP website*

1. Erica Towle, GCRMN Data Task Force Co-Chair presents on the Task Force; 2. Incorporating diverse youth voices is a goal in ICRI's Plan of Action; 3. Participants were given flower leis and created kukui nut bracelets, a traditional welcoming gift to visitors to Hawai'i.



PHOTOS BY NOAA CRCP

U.S. CARIBBEAN REGIONAL SCTLD WORKSHOP

Synergize Disease Response Strategies

Ashley Pérez, Puerto Rico Coral Reef Management Fellow 2022-2024 & **Kennedy Wall**, Florida Sea Grant

THE 2023 U.S. Caribbean Regional SCTLD Workshop convened experts from the U.S. Virgin Islands (USVI), Puerto Rico, and Florida to synergize disease response strategies and foster collaborations across the region. Held in San Juan, Puerto Rico, the 2023 event provided a platform for participants to discuss important topics such as the establishment of a unified communication strategy for SCTLD and share updates on coral restoration plans in each jurisdiction.

The workshop also provided an opportunity for the development of a framework for a regional coral rescue plan and the alignment of regional coral disease priorities with priorities in the NOAA SCTLD Implementation Plan. The highlight of the week was an enlightening visit to the newly-built Center for Research and Restoration of Marine Organisms (CIROM) in Ceiba. Led by Dr. Stacy Williams, CIROM's founder, participants gained insights into holistic approaches to Caribbean coral reef restoration. The visit provided a firsthand look at how to manage such facilities, the pivotal role of herbivores like the long-spined sea urchin (*Diadema antillarum*) in coral reef health, and ongoing efforts in coral outplanting and rearing.

The 2024 workshop was held in St. Croix, USVI at The Nature Conservancy's Estate Little Princess facility. The workshop focused on reevaluating regional coral rescue priorities, debriefing the 2023 thermal stress event and subsequent bleaching, and restoration planning and implementation. This included shifting focus from coral disease to wider coral disturbances. We heard SCTLD updates from researchers all across the region and discussed intervention steps moving forward. The Nature Conservancy hosted an in-depth, behind-the-scenes tour of their coral rescue operations, including water tables housing rescued endangered species, microscopy lab, and plans for their forthcoming larval-based propagation expansion. Despite some of the challenges of 2023, participants left with new connections, fresh ideas for collaboration, and hope for the future of Caribbean coral reefs.



2023 Workshop participants at CIROM in Ceiba.



CAROLINE McLAUGHLIN, FLORIDA SEA GRANT

2023 SEA GRANT WORKSHOP

JOINING FORCES

Sea Grant Programs Promote Coral Health for Community Health

Caroline McLaughlin, Florida Sea Grant

In December 2023, staff from Florida Sea Grant, Puerto Rico Sea Grant, and Virgin Islands Marine Advisory Service (VIMAS)* met on Isla Magueyes, a tiny island off the southwest coast of Puerto Rico, to discuss the fate of coral reefs and how Sea Grant can help protect these corals and the communities that depend on them.

For more than 50 years, the National Sea Grant College Program, which includes programs in all 34 coastal and Great Lakes states, Puerto Rico, and Guam, has supported coastal communities through research, extension, and education. Coral reefs are unique ecosystems in that they are only found off the coast of a handful of U.S. states and territories and are some of the most endangered places on the planet. For years, Sea Grant programs have worked with communities in their respective jurisdictions to help protect coral reefs. However, regional collaboration has been fairly limited until now.

The December workshop provided Sea Grant staff with a better understanding of the status of coral reefs and the challenges associated with their management. Sea Grant staff shared information about existing programs before brainstorming opportunities for regional collaboration that would enhance the reach and impact of

these programs. One idea was to share communications resources and collaborate on translating and distributing these resources in different jurisdictions. Florida Sea Grant and VIMAS pledged to work together to develop a regional proposal for coral rescue in the U.S. Caribbean, supporting outreach programs like Youth Ocean Explorers, which provides field-based conservation opportunities for students in the U.S. Virgin Islands.

The workshop provided a better understanding of the status of coral reef management and associated challenges.

The workshop strengthened relationships between Sea Grant staff in Florida, Puerto Rico, and the U.S. Virgin Islands and laid the groundwork for future collaborative programs aimed at protecting coral health for community health in the Atlantic Caribbean region.

**Note: No Sea Grant program currently exists in the U.S. Virgin Islands. However, Puerto Rico Sea Grant coordinates with the Virgin Islands Marine Advisory Service to implement research, extension, and education programs in the Virgin Islands.*



BUCK ISLAND

Exploring Coral Disease

Courtney Tierney, U.S. Virgin Islands Department of Planning and Natural Resources

AS PART OF THE EFFORT to confront the growing crisis facing coral reefs, members of the U.S. Coral Reef Task Force embarked on a site visit to witness firsthand the impact of coral disease on corals in the U.S. Virgin Islands (USVI). Coral managers, practitioners, and prominent government leaders from around the globe, including American Samoa Governor Lemanu Peleti Mauga and USVI Governor Albert Bryan Jr., came together to visit Buck Island, off the coast of St. Thomas.

Dr. Marilyn Brandt, an esteemed coral expert with the University of the Virgin Islands, kicked off the day by shedding light on the interactions between coral disease and bleaching. Despite the grim reality, Dr. Brandt emphasized that pockets of hope still exist, reminding everyone the revival of coral reefs is still possible.

Exploration began with a snorkel around old, shallow elkhorn coral (*A. palmata*) reef structures and continued along the coastline of Buck Island to observe the reef ecosystem. While there was no active disease due to high water temperatures, the devastating impacts of disease could be seen through the presence of coral skeletons. Though bleaching was evident, pockets of healthy corals, including elkhorn, thrived amid the stressors of disease and bleaching.

Upon returning to the vessel, historic photographs of Buck Island were displayed, offering a visual narrative of change between the past and the present and underscoring the urgency of the situation. Though the focal point of this expedition was to delve into the intricacies of coral disease, the most striking element of the visit was the resilience of these ecosystems and the potential for recovery.

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Meeting in St. Thomas

Kennedy Wall, Florida Sea Grant

The USCRTF unites experts from the federal government, states, territories, freely associated states, Fishery Management Councils, and partners to better understand and mitigate threats to coral reefs. The 47th jurisdictional meeting was held in St. Thomas, U.S. Virgin Islands from October 21st - 28th, 2023. The meeting centered on strategies to improve the management and restoration of coral reef ecosystems and to tackle challenges affecting both corals and the communities linked to them.

The week included several sessions focused on disease response and mitigation, including a site visit to Buck Island to evaluate the impacts of coral disease, an interagency panel focused on collaborative responses to SCTL, approval of a national resolution on coral disease, and a Pacific preparedness workshop led by local Caribbean coral managers and practitioners.

2023 U.S. CORAL REEF TASK FORCE



SARAH VONHOENE



The group gathered back on the boat for a reflective session featuring representatives from Florida, Puerto Rico, and the USVI. Each shared poignant insights into how coral disease has altered their respective reefs, and perhaps more importantly, what the collective direction forward should be. The discussion highlighted the gravity of the situation while focusing on future strategies and next steps. The conversations articulated the need for collaborative action, a multi-faceted approach to disturbance response, and knowledge-sharing among regions.

Amidst the challenges, the collaborative spirit and dedication exhibited by the Task Force and other stakeholders showcased a unified commitment to addressing this pressing issue. The site visit to Buck Island served as a reminder of both the fragility and resilience of coral reefs. It underscored the need for innovative strategies to protect and restore these ecosystems. Collaboration between government officials, scientists, local communities, and conservation organizations remains crucial in implementing strategies to mitigate the impacts of coral diseases and bleaching. The journey was not only an observational expedition but also a platform for dialogue and collaboration. Despite the challenges posed by coral disease and bleaching, the expedition instilled a sense of hope for recovery. It is imperative that this sense of hope translates into concrete action.

Panel of Agency Leaders Focused on Action to Address Coral Disease

Kennedy Wall, Florida Sea Grant

In late October, principal members of the U.S. Coral Reef Task Force met to discuss strategies for reducing threats to coral reefs, including continuing a coordinated response to the devastating impacts of SCTLD. A panel of agency leaders presented on efforts by their respective agencies to address the disease and priorities for action moving forward. This panel set the stage for consideration of a resolution on national action for coral disease.

Panelists included Jennifer Koss (National Oceanic & Atmospheric Administration Coral Reef Conservation Program Director), Matt Warham (U.S. Virgin Islands Department of Planning & Natural Resources Coral Reef Initiative Coordinator), Dr. Camille Hopkins (U.S. Geological Survey Wildlife Disease Specialist), Dr. Wade Lehmann (U.S. Environmental Protection Agency Supervisory Toxicologist), Dr. Nicholas Rosenau (U.S. Environmental Protection Agency Biologist), Dr. Ryan Okano (Hawai'i Division of Aquatic Resources Program Manager), and Elizabeth Monaghan (Hawai'i Division of Aquatic Resources Aquatic Biologist).



USCRTF Passes Landmark Resolution on National Coral Disease Action

Caroline McLaughlin, Florida Sea Grant

In recognition of the continued, severe threat posed by SCTLD and other coral diseases to the long-term health and vitality of America's coral reefs, the U.S. Coral Reef Task Force unanimously passed a resolution focused on national action to combat the impacts of coral disease. The resolution, "*National Action for Coral Disease Outbreak Prevention, Rescue, and Recovery*," highlights two priority areas for interagency coordination and action: 1) preventing coral disease transmission, including the spread of SCTLD to the Pacific and, 2) enhancing coral rescue and restoration in areas impacted by coral disease, particularly along SCTLD-affected reefs in the U.S. Atlantic-Caribbean. The Coral Disease Working Group is currently working on next steps to implement priorities included in the resolution.

Full text of the resolution can be found online at www.coralreef.gov.

CONGRATULATIONS
USCRTF Awards:
Caroline McLaughlin
and Dr. Marilyn Brandt
 Kennedy Wall, Florida Sea Grant



DANA WUSINICH-MENDEZ, NOAA

The U.S. Coral Reef Task Force celebrated the work of two outstanding women with awards for their dedication to addressing SCTLD and leading efforts in research and coordination. Florida Sea Grant's National Coral Disease Coordinator, Caroline McLaughlin, was honored for her efforts leading the Coral Disease Working Group and facilitating the work of partners in the national response to coral disease. Dr. Marilyn Brandt from the University of the Virgin Islands and Reef Response was honored for her innovative research on coral disease and coral restoration in the U.S. Virgin Islands, as well as her support for local communities and students.

SCTLD Pacific Preparedness Workshop

Courtney Tierney, U.S. Virgin Islands Department of Planning & Natural Resources

DURING THE 2023 U.S. Coral Reef Task Force held in St. Thomas, U.S. Virgin Islands (USVI), Pacific coral practitioners convened with local Caribbean practitioners for a workshop focused on Pacific preparedness. The gathering brought together geographically diverse stakeholders and fostered collaborative efforts to combat major threats to coral reefs, including SCTLD.

USVI natural resource managers provided local context on the history of SCTLD and led discussions on permitting, funding, and goal setting for effective intervention. Participants learned about coral rescue efforts and the urgency and complexity of current interventions.

Local experts led group activities that focused on identifying various coral afflictions beyond SCTLD. This included understanding the differences between predation, bleaching, SCTLD, other coral diseases, and the critical decision-making processes involved in treatment strategies. Facilitators guided attendees through hands-on sessions, demonstrating how to apply treatments to coral skeletons for practical skills to combat SCTLD effectively.

The workshop also featured insightful presentations from the University of the Virgin Islands, The Nature Conservancy, and Coral World Ocean and Reef Initiative that emphasized the importance of capacity building for coral rescue and evacuation efforts. Strategies for bolstering resources, knowledge exchange, and collaborative partnerships were highlighted as ways to safeguard coral reef ecosystems.

During jurisdiction breakouts, participants engaged in in-depth planning discussions



DANA WUSINICH-MENDEZ

Facilitators demonstrated how to apply treatments to coral skeletons for practical skills to combat SCTLD effectively.

tailored to their specific region. These sessions allowed for a comprehensive evaluation of current capacities and laid the groundwork for targeted strategies to address challenges unique to each jurisdiction.

USVI natural resource managers highlighted the need for genetic management and discussed current approaches to ensuring diverse populations during restoration, underscoring the importance of genetic diversity in building resilient reefs.

By harnessing collective expertise and fostering partnerships, the workshop laid a foundation for coordinated and impactful interventions, which are vital to ensuring the longevity and health of our coral reef ecosystems.

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