

NOAA IN THE CARIBBEAN

CONNECTING NOAA & PARTNERS ACROSS THE CARIBBEAN



Volume 4 | Issue 1

September | 2015

Virgin Islands SCUBA Divers Help Map Priority Reefs

New NOAA tool will help managers rank coral reef importance

A team of NOAA ecologists, social scientists and tool developers are working with staff from the Virgin Islands Department of Planning and Natural Resources (DPNR), using information collected from occupational SCUBA divers across the U.S. Virgin Islands, to develop a map-based tool to support strategic coral reef management. The decision support tool, which will be available online in 2016, will support managers by identifying, mapping and ranking coral reefs based on a range of ecological and human use values, as well as threats to reef health and resilience.

Caribbean coral reef ecosystems have deteriorated dramatically in the past few decades, reducing the value and sustainability of the many goods and services provided to people.

The decline is widespread, but not all coral reefs have declined equally. Some 'reefs of hope' exist and knowing why and where they exist is essential for managers to help design and prioritize effective actions.

"We start with a perspective that all reefs are valuable, but recognize the need to help managers prioritize actions to those of highest value and vulnerability.

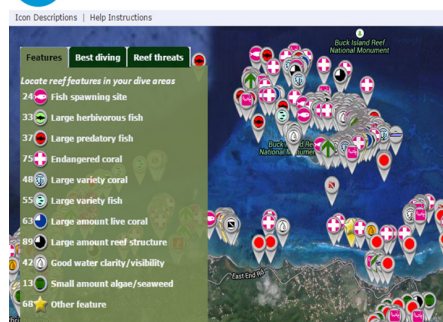
information in the hands of decision makers" said Christopher Jeffrey, Project Manager at National Centers for Coastal Ocean Science NCCOS Biogeography Branch.

To harness the knowledge of reefs held by occupational SCUBA divers, NCCOS scientists collaborated with the University of Queensland in Australia to implement the first ever marine-focused survey using the online Google Earth mapping tool created by the Land Values Institute of the University of Queensland. Over 80 professional SCUBA divers, some with more than 30 years of experience in the USVI, shared their knowledge by mapping the locations of coral reefs that are special to them.

The data that divers provided through the survey has enabled the team to provide information to support coral reef conservation in a way that could not have been possible using existing NOAA survey data alone. Other biological and physical information being incorporated into the tool includes environmental data such as biodiversity and seafloor complexity, and mapped stressors like runoff of pollutants from land and thermal stress from exposure to high water temperature. The tool will support risk assessments for coastal development, strategic marine spatial planning and guiding investments in coral reef conservation. For more information visit our [project page](#).



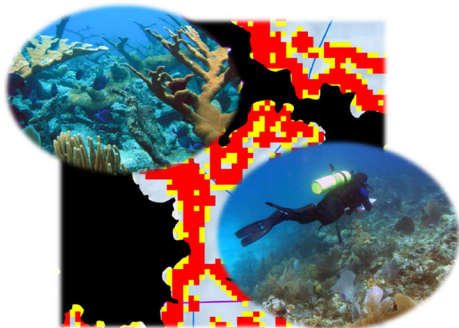
U.S. Virgin Islands Coral Reef Study



Online tool to survey SCUBA divers knowledge

Thousands of data points were collected on reefs the divers believe are ecologically important, including locations where threats occur, the observed resilience of those reefs to stress, and the way the reefs are used and valued by divers, personally and for their businesses.

Individuals in the SCUBA diving community provide eyes in the ocean. "Occupational divers, especially, know these reefs better than anyone because they spend a great deal of time diving on them. We value the knowledge that they hold and are really grateful that so many divers shared that knowledge with us" said Theresa Goedeke, a sociologist with NCCOS.



Maps of important reefs will help managers prioritize actions

Our tool integrates the latest NOAA data together with new surveys of local knowledge, to develop a map-based decision support tool which places reliable

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Hurricane Hunting Across the Caribbean

NOAA National Hurricane Center tours Caribbean to increase awareness

It's Hurricane Season and NOAA National Hurricane Center has been busy collecting data to improve forecasting and deepen our understanding of hurricane behavior. Earlier this year the [Hurricane Center](#) team embarked on a six-nation Caribbean tour to increase awareness of hurricanes and the work of the Center. As part of the St. Christopher Air-and-Sea Ports Authority's 2015 Hurricane Awareness initiative, this past April St. Kitts and Nevis hosted an Air Force Reserve Command's WC-130J "Hurricane Hunter", a high-wind,

medium-range aircraft used in weather reconnaissance missions. The U.S. Air Force Reserve's Caribbean Hurricane Awareness Tour (CHAT), co-sponsored by NOAA, also hosted open-house visits in Mexico, Bonaire, Dominican Republic, St Eustatius and Puerto Rico. Military air crews fly 10 of the state-of-the-art WC-130J aircraft directly into the core of tropical cyclones to gather data that are critical for forecasting a hurricane's intensity and landfall. The data

are sent in real time via satellite from the aircraft directly to the National Hurricane Center for analysis and use by hurricane forecasters. During the 2014 hurricane season, the Hurricane Hunters flew 52 missions, including 13 investigative flights over the Atlantic for the National Hurricane Center. "The tour of the Hurricane Hunter provided a crucial opportunity to work with our partners throughout the Caribbean to prepare for the next hurricane and reduce the human and economic toll" said Rick Knabb, U.S. National Hurricane Center Director. This marks the 72nd year that the Air Force Reserve Command's 53d Weather Reconnaissance Squadron has supported the National Hurricane Center and United States Hurricane Warning Program to help mitigate the hurricane threat within the Atlantic basin. ■

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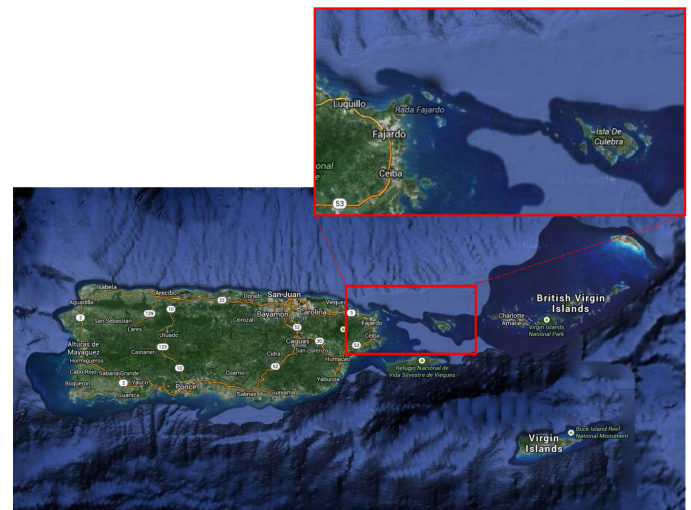
Hurricane Hunter aircraft on tour of the Caribbean

Habitat Blueprint Focus Area in Puerto Rico

Research directed at Northeast Reserves and Culebra

Four years ago NOAA launched the [Habitat Blueprint](#) initiative, a framework to integrate habitat conservation efforts throughout NOAA in specific high priority focus areas. The inclusive approach leverages internal and external collaborations to achieve measurable benefits within key habitats throughout the United States. In 2014, NOAA selected Puerto Rico's Northeast Reserves and Culebra Island as a NOAA Habitat Focus Area (HFA) to demonstrate the principles of the Blueprint. The area encompasses a combination of urban and protected lands that are home to coastal forests, wetlands, a bioluminescent lagoon, seagrass beds, shallow and deep coral reefs, and miles of pristine beaches. A team comprising members from five NOAA line offices and Puerto Rico's Department of Natural Environmental Resources are developing the HFA Implementation Plan that will include objectives and activities linked to performance measures. A final draft for public comment will be presented at the U.S. Coral Reef Task Force meeting in Puerto Rico in October 2015. ■

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Habitat Blueprint Focus Area in northeast Puerto Rico



News from Around the Caribbean

Connecting you with news and updates from NOAA and partners around the U.S. and international Caribbean

U.S. Caribbean News

NOAA contributes to new multi-agency Conservation Action Teams

The Steering Committee of the Caribbean Landscape Conservation Cooperative (CLCC), of which NOAA is a member recently approved two new Conservation Action Teams (CATs). CATs use the best available science to develop strategies and coordinate actions that will facilitate the long-term conservation of landscapes and seascapes in the U.S. Caribbean and beyond. The Protected Areas CAT is developing an open-access protected areas database and a conservation strategy that details existing and potential mechanisms for protection. NOAA is a leading partner of the Cay Systems CAT, where we are working to develop a landscape conservation design for cays as an interconnected network. Questions, comments, or interest to join a team should be directed to Kasey Jacobs, CLCC Partnership and Communications Coordinator. ■

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NOAA scientists investigate connectivity of Virgin Islands coral reefs

The functioning of coral reef ecosystems, including their resilience to disturbance, is linked to their connectivity with

neighboring habitats, but we know very little about these critical processes. Scientists from NOAA Atlantic Oceanographic and Meteorological Laboratory and Southeast Fisheries Science Center, with collaborators from the University of the Virgin Islands and the Virgin Islands Department of Planning and Natural Resources, have been conducting ship-based surveys across the coastal shelf of eastern Puerto Rico and the U.S. and British Virgin Islands. The field study was designed to help improve our understanding of oceanic circulation and the biological and physical connectivity between managed and non-managed U.S. Caribbean coral reef ecosystems and adjacent regions. Measurements collected while aboard the NOAA ship R.V. Nancy Foster provide a more comprehensive understanding of regional spawning aggregations, larval abundance, transport, and overall larval recruitment of economically important grouper, snapper, and parrotfish species. Results from this work will support the Caribbean Fishery Management Council in science-based management decisions critical to the restoration and sustainability of these species. Additionally this research will support improvements to stock assessments in the region. Such assessments are necessary for meeting annual catch limit requirements of the Magnuson-Stevens reauthorization. The ongoing project, Coral Reef Ecosystem Research (CRER): Interdisciplinary

Oceanographic Observations in the Coastal Waters of the U.S. Caribbean and the surrounding region, deploys equipment to quantify patterns in circulation, as well as measure the biological, chemical and optical properties of the water. These data are paired with catches of larval fish from towed nets and satellite data on ocean height, color and temperature. While working in the region, the research team also collects data for a longer-term assessment of deep inflow to the Caribbean via Anegada Passage and the Virgin Island Basin (one of only two deep inflow pathways to the Caribbean, the other being Windward Passage). Monitoring the variability of Atlantic inflow through the Caribbean island passages is important for understanding the variability of the upper limb of Meridional Overturning Circulation (MOC) in the North Atlantic, a key component of the global climate system. ■

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The research team onboard NOAA ship RV Nancy Foster

Questions or Comments?

We want to hear from you! Please e-mail us to [subscribe/unsubscribe to the newsletter](mailto:CaribbeanNews@noaa.gov) or to submit any questions, comments and story ideas at: CaribbeanNews@noaa.gov.

Editorial Note: blue underlined text indicates a live hyperlink. When viewing pages in an Adobe PDF, click to open relevant web pages.



News from Around the Caribbean

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U.S. Caribbean

News (continued from page 3)

2nd Climate Change in the Caribbean Conference

In 2011, leaders, practitioners, and experts from agencies and organizations in Puerto Rico, the U.S. Virgin Islands, and the wider Caribbean met in San Juan for the 1st Climate Change in the Caribbean Puerto Rico and U.S. Virgin Islands Conference to share the current state of climate science and discuss options for climate mitigation and adaptation activities. Much has happened in the ensuing four years; new climate analyses have been conducted, Executive Orders are being implemented, new initiatives are underway, and businesses and communities are committing to working together. This November 17-18th, the conversation will be continued at the 2nd edition of this conference in San Juan, Puerto Rico. For more information visit the Caribbean Landscape Conservation Cooperative [website](#). ■

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Recovery plan for threatened corals

NOAA Fisheries announced the adoption of a final Endangered Species Act (ESA) Recovery Plan for elkhorn (*Acropora palmata*) and staghorn coral (*A. cervicornis*). Recovery plans describe actions beneficial for the conservation and recovery of species listed under the ESA. The goal, objectives, and criteria of the plan represent NOAA Fisheries' expectation of conditions to recover elkhorn and staghorn corals so they no longer need the protective measures provided by the ESA. The Recovery Plan can be accessed here on the NMFS [website](#). ■

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International Caribbean News

New Caribbean Coral Bleaching Bulletin

From 27 May through 3 June, 2015, NOAA [Coral Reef Watch](#) (CRW) participated in the Caribbean Climate Outlook Forum (CariCOF) in St. Lucia to train climate forecasters, disaster managers, and other stakeholders in the use of NOAA coral bleaching alert products. The meeting resulted in the development of a collaborative bleaching bulletin, to be issued monthly, specific to the CariCOF nations with input provided by NOAA Coral Reef Watch. The Caribbean outreach meetings in St. Lucia successfully expanded awareness of NOAA Coral Reef Watch products and services to a wider community. ■

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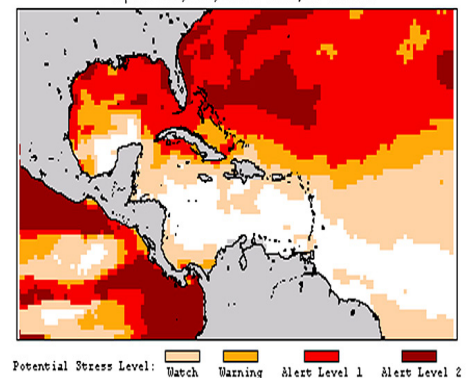
LEAP from Pacific to the Caribbean

Caribbean communities are now mirroring the successes of local community driven action plans implemented in the Indo-Pacific region through the Local Early Action Planning (LEAP) process. Belizean partners in the FY 2014-2015 Cooperative Agreement between NOAA and the Gulf and Caribbean Fisheries Institute kicked off the first LEAP efforts to help build the resilience of coastal communities to climate change. Marine protected area staff and community representatives associated with Port Honduras Marine Reserve and the Blue Hole/Half Moon Caye Natural Monuments took part in a four-day workshop that focused on building communications skills about climate change and fostering adaptation planning. The workshop was carried out in partnership with the Toledo Institute for Development and Environment (TIDE), the Belize Audubon Society, and the Belizean communities

of Monkey River, Punta Negra, Sarteneja, Chunox, and Copper Bank. The next phase of LEAP will support participants as they develop local early action plans in these communities and identify priority steps the communities wish to take to build resilience to climate change and to other threats to their social and natural systems. Micro-grant funding to assist with implementation of community-based adaptation measures is also a component of the Cooperative Agreement. ■

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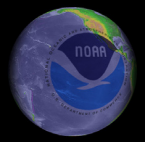
2015 Jun 9 NOAA 60% Probability Bleaching Thermal Stress for Jun-Sep 2015
Experimental, v3.0, CFSv2-based, 28-member



Coral bleaching likely in 2015 Caribbean warm season

After record high temperatures in 2014 and severe bleaching in the Pacific Ocean, 2015 has started off hot and a fully formed El Niño has led to a forecast of hot, dry conditions in the Caribbean. Along with it, NOAA Coral Reef Watch (CRW) Four-Month Bleaching Outlook predicts a high likelihood of bleaching in the Gulf of Mexico and northern Caribbean in 2015. Thermal stress that may cause coral bleaching is currently most likely around Florida, Cuba, and the Bahamas but may extend farther south. Visit [Coral Reef Watch](#) for updates as the season progresses. ■

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Data Zone

Here we connect you with NOAA data portals and datasets for the Caribbean that are easily accessible via the internet

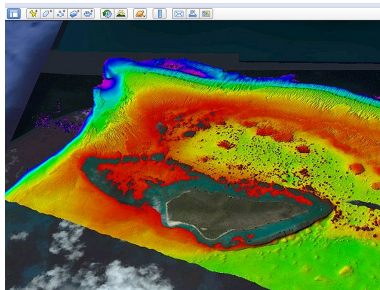
Updated Land Cover Data for the U.S.

Virgin Islands

NOAA Office for Coastal Management recently released the latest update to its Coastal Change Analysis Program land cover data in the U.S. Virgin Islands. This new data adds 2012 to the existing 2002-2007 land cover products, and provides change information over a ten year period. The data is available free of charge through NOAA's [Digital Coast](#). ■

New high resolution bathymetry for nearshore waters of U.S. Virgin Islands

Airborne bathymetric LiDAR for the south shore of St. Thomas and portions of Buck Island Reef National Monument and nearby Lang Bank St. Croix, USVI is now available. The data, collected by USGS in 2014 using the EAARL-B sensor, was funded by CRCP and fills important nearshore data gaps in water depths 0 - 45 m. Seafloor reflectivity derived from the Lidar signal should be available later this year.



Mapping storm surges

NOAA's National Hurricane Center has developed an experimental graphic to highlight those areas along the Gulf and Atlantic coasts of the United States most at risk for life-threatening inundation by storm surge from a tropical cyclone. Storm surge is often the greatest threat to life and property from a tropical cyclone, and it can occur at times and locations separate from a storm's hazardous winds. The areas at risk will also be identified in Hurricane Local Statements issued by NOAA's National Weather Services. To read more about the prototype storm surge warning graphic see [here](#). ■

Lionfish Web Portal

The new Lionfish [webportal](#) provides updated information on all things lionfish. New features include live feeds on the front page and a searchable database of lionfish related literature, images and video content, myth busters, fact sheets and more. The site has a forum where researchers can interact and share questions and answers. For managers and fishers there are links to guidance on harvesting and eating lionfish, as well as links to lionfish management plans. ■



Online guidance for controlling lionfish

Profiles in Partnership

Research highlights from the Caribbean with a focus on collaborations between NOAA and partners

NOAA National Coral Reef Monitoring Program

Multi-sectoral partnering to track the status and trends of coral reef health

In partnership with local agencies and institutions, NOAA's Coral Reef Conservation Program established the National Coral Reef Monitoring Program ([NCRMP](#)) in 2013 to integrate coral reef monitoring efforts across the U.S., including long-term monitoring work conducted in the Caribbean. This program is a standardized framework for conducting observations and tracking the long-term status and trends of biological, climatic and socioeconomic indicators in the U.S. states and territories. NCRMP biological monitoring in the Atlantic and Caribbean is co-led by NCCOS and the NMFS Southeast Fisheries Science Center and includes many partners including the National Park Service, University of the Virgin Islands, University of Puerto Rico, HJR Reefscaping, U.S. Virgin Islands Department of Planning and Natural

Resources, Puerto Rico Department of Natural and Environmental Resources, U.S. Fish and Wildlife Service, The Nature Conservancy and U.S. Environmental Protection Agency.

"The diverse partnership has been valuable in establishing closer ties among academic and management groups in the territories and provides educational opportunities for graduate students to interact with local and federal scientists" said Professor Marilyn Brandt, Director of the University of the Virgin Islands' Master of Science in Marine and Environmental Science program.

The 2015 NCRMP Caribbean biological field effort will focus on data collection at approximately 500 coral reef and hardbottom habitats throughout St. Croix, St. Thomas and St. John. In preparation for this large-scale and complex sampling work, NCCOS

scientists trained partners in fish and coral data collection. Over 70 scientists from USVI, Florida, North Carolina and Maryland, representing multiple agencies and institutions, received classroom and practical instruction focusing on protocol execution, in situ implementation and data management.

"It's awesome to get so many people from different agencies, academia and NGO's together. We all have the common goal of protecting our coral reefs and we can accomplish more if we team up rather than do it by ourselves. Now more than ever we need to know more about our reefs and how they are doing" said NCCOS marine biologist Randy Clark.

Monitoring data from this summer's field efforts will supplement local monitoring efforts and provide information about the status and trends of environmental conditions, living resources and the



Profiles in Partnership (continued from page 5)

Research highlights from the Caribbean with a focus on collaborations between NOAA and partners

people and processes that interact with coral reefs.

"The NCRMP efforts, and data products they produce, help us as a management agency make better informed decisions regarding our natural resources in the USVI" stated a USVI DPNR representative. The Environmental Protection Agency is an important partner in coral reef monitoring and conservation due to

its emphasis on water quality. "Data generated from this monitoring program is valuable to EPA needs" said EPA scientist Charles Lobue.

Surveys will end in late July. Fish and coral data will be posted to an online database in early 2016. ■

Randy Clark

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NOAA and community respond to major ship grounding

Successful collaboration to rescue corals

The M/V Aubi, a 49' powered catamaran, ran aground on a coral reef on 14 May 2015 near La Cueva del Indio, Arecibo, Puerto Rico, within a newly established Marine Reserve. The hulls of the vessel contained integrated fuel tanks, and the USCG (in coordination with NOAA's National Ocean Service Emergency Response Division & Assessment and Restoration Division and NOAA NMFS Southeast Regional Office & Restoration Center) ordered the fuel removed prior to moving the vessel to minimize the risk of an oil spill.



MV Aubi aground on Acropora reefs near Arecibo

While an oil spill was prevented, the grounding resulted in significant impacts to coral reef resources, flattening almost 400 m² of reef and creating two large berms of coral and rubble. The rubble posed an immediate risk since it buried many live corals and, when mobilized by swells, would impact areas containing healthy colonies of ESA listed elkhorn coral (*Acropora palmata*) and other species. "The damage at this site is on par with damage seen at some tanker grounding sites and certainly the worst coral damage from a recreational vessel seen in many years" said Tom Moore of NOAA Restoration Center. Immediately following the removal of the vessel, 20 people worked together for two days to collect detached live corals and remove rubble before the swells increased. The group included personnel from NOAA Restoration Center, Puerto Rico's Department of Natural and Environmental Resources, Sea Ventures Inc.,

NGO volunteers from Caribbean Reef Life Conservation, VIDAs (Vegabajeños Impulsando Desarrollo Ambiental Sustentable) and Yo Amo el Tinglar (I Love Turtles), and members of the local community. Using buckets and their hands, the team filled kayaks with corals and rubble to transport them offshore into deeper water. Once the seas improved, the Restoration Center mobilized a restoration crew led by Sea Ventures using an emergency response fund set up with support from the NOAA NMFS Southeast Regional Office, Coral Reef Conservation Program, and Assessment and Restoration Division. Approximately 1,500 corals, including 100 fragments of *Acropora palmata*, were reattached and 10 m³ of material were removed from the site during the restoration. Thanks to the efforts of everyone involved, impacts to coral resources were minimized after the grounding. ■

Sean Griffin

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Multi-agency effort on vulnerability of coral cays to climate change

NOAA teams up with U.S. Fish & Wildlife to address impact of sea-level rise

A project aimed at addressing the possible effects of sea level rise due to climate change on small islands and cays and the potential effects of habitat loss on natural resources was developed by the U.S. Fish and Wildlife Service (USFWS) Caribbean Ecological Services Field Office in collaboration with the Caribbean Landscape Conservation Cooperative (CLCC), NOAA, Puerto Rico Government, Puerto Rico Sea Grant College

Program, and the Applied Coastal Research Laboratory of Georgia Southern University. The USFWS signed a Cooperative Agreement with HJR Reefscaping to collect ecological information at land and seascape levels in and around at least 10 cays in Puerto Rico and the U.S. Virgin Islands. The information will be used to: 1) assess Federal trust species' vulnerability to coastal hazards and climate change impacts; 2) help identify restoration

needs and implement management strategies to protect these resources; 3) assess potential habitat loss in spatial and temporal contexts; and 4) assess the level of severity of these hazards by developing coastal zone vulnerability models. ■

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Profiles in Partnership

CARIBE WAVE/LANTEX 2015 Regional Tsunami Exercise

On March 25, 2015, two regional tsunami exercises took place in the Caribbean and Adjacent Regions: CARIBE WAVE/LANTEX (Panama Scenario) and LANTEX (Florida Scenario). Thirty-two countries and 16 territories from the Caribbean and Adjacent Regions from Bermuda thru Brazil, as well as Central America participated in the fourth regional tsunami exercise. This represents a participation rate of 100% of all the members of the UNESCO Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions. Participants included Tsunami Warning Focal Points and National Contacts, in addition to more than 1,000 other international, state, territorial, and local emergency management organizations, government agencies, academic institutions, private businesses, health facilities, media, as well as communities and individuals. This year 191,420 people were reported to have participated, including over 80,000 people in Puerto Rico, 31,000 people in Venezuela, 8,600 people in Martinique, and 4,700 in the U.S. Virgin Islands. ■



Puerto Rico State Emergency Management Facility

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Upcoming Events & Announcements

A preview of upcoming important events and happenings around the Caribbean and beyond

Events

September

21-24: The 6th [Offshore Mariculture Conference](#), Ensenada, Baja California, Mexico.

October

29-30: 2nd iTAG Integrated Tracking of Aquatic Animals in the Gulf of Mexico, St. Petersburg, Florida This [meeting](#) will focus on the theme Telemetry in the 21st Century: new methods and applications to management.

November

9-13: 68th [GCFI Annual Conference](#), Panama City, Panama - The theme of the conference is "Two Oceans. Same Coastal Issues".

17-18: 2nd Climate Change in the U.S. Caribbean Conference, Inter-American University Law School San Juan, Puerto Rico.

18-20: Fish at night: An [international](#) symposium, Miami, Florida.

Announcements

Bluefin Tuna Research Program (BTRP)
[FY2016 Federal Funding Opportunity](#)

Tinker Foundation Incorporated. The [Tinker Foundation's](#) work on the environment is focused on efforts that support sustainable management of habitat and resources and incorporate social and economic dimensions affecting the well-being of

local communities. Proposals are due for institutional grants by September 15th and field research grants by October 1st.

Inter-America Foundation. The IAF [supports projects](#) in independent countries of Latin America and the Caribbean.

Marine Fisheries Initiative [MARFIN](#) promotes and endorses programs which seek to optimize economic and social benefits from marine fishery resources through cooperative efforts that evoke the best research and management talents of the Southeast Region.

NOAA Saltonstall-Kennedy Grant Program

NOAA in the Caribbean Newsletter Editorial Team

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