

# Implementation of the Coral Reef Conservation Program Fiscal Years 2020–2021

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Developed pursuant to the Coral Reef Conservation Act of 2000 (16 U.S.C. § 6407(b))



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## ABOUT THIS DOCUMENT

This report covers coral reef ecosystem-related research and management activities conducted by National Oceanic and Atmospheric Administration’s Coral Reef Conservation Program during Fiscal Years 2020-21 pursuant to the Coral Reef Conservation Act of 2000 (16 U.S.C. § 6407(b)) and the goals and objectives of the [NOAA Coral Reef Conservation Program Strategic Plan](#).

## ACKNOWLEDGMENTS

We would like to thank our partners at federal, state, territory, and local agencies; non-governmental organizations; academic institutions; and other organizations for their contributions and dedication to protect, conserve, and restore coral reef ecosystems.



## I. INTRODUCTION

In addition to being one of the most biodiverse and valuable ecosystems on Earth, coral reefs provide significant economic and social benefits. Coral reefs support subsistence, recreational, and commercial fisheries; tourism; protect shorelines and coastal infrastructure; and are increasingly being tapped for bio-pharmaceutical development. Millions of people rely on coral reefs for food, coastal protection, and their livelihoods. Coral reefs are estimated to provide over US\$350,000/hectare/year<sup>1</sup> (or US\$9.8 trillion/year) in 2007 U.S. dollars based on their values from recreation, fish habitat, and coastal protection, as well as cultural value. A more recent valuation<sup>2</sup> estimated the annual value of flood risk reduction provided by U.S. coral reefs at more than \$1.805 billion in 2010 U.S. dollars.

Unfortunately, an array of impacts severely threaten coral reef ecosystems and the services upon which we rely. Climate change, ocean acidification, fishing impacts, pollution, and other stressors are having widespread negative effects, some of which are more extensive and frequent than in the past. The decline and loss of coral reef ecosystems have significant social, cultural, economic, and ecological impacts on people and communities in the United States and around the world. However, with effective leadership and management, healthy, resilient coral reef ecosystems can continue to provide these valuable services to current and future generations.

The National Oceanic and Atmospheric Administration's (NOAA) [Coral Reef Conservation Program](#) (the Coral Program) provides leadership, supports management, and delivers resources to address coral reef threats and conserve and restore coral reef ecosystems throughout the states and territories. The Coral Program takes proactive measures to protect, conserve, and restore coral reefs by addressing strategic coral reef management needs in a targeted, cost-effective, and efficient manner.



Coral reef monitoring at Dry Tortugas National Park. Credit: Kevin Davidson.

## II. STRATEGIC PLAN

As part of ongoing efforts, the Coral Program implements its strategic plan aimed at restoring and preserving coral reefs; maintaining ecosystem functions; and improving coral habitat, water quality, and populations of key coral reef fishery species in target areas. The Coral Program’s activities include topic-based research, monitoring, mapping, social science, communications, and capacity building at local, national, and international scales. They are focused on abating the primary threats of climate change, unsustainable fishing, and land-based sources of pollution while also supporting coral reef restoration activities.

The Coral Program published its Strategic Plan in 2018 to focus on resilience-based management of U.S. coral reef ecosystems in partnership with the seven states and territories that have coral reefs. The plan’s focus is on abating and mitigating three primary threats (climate change, land-based sources of pollution, and unsustainable fishing), and an additional focus area that supports coral reef restoration research and implementation. Furthermore, the Coral Program conducts several cross-cutting functions (topic-based research, monitoring, mapping, social science, communications, and capacity building) to strengthen the multidisciplinary approach to coral reef conservation. The Coral Program’s goal is to provide increased continuity and predictability for coral reef conservation projects, which enhances coral reef partnerships throughout NOAA and with partners (Figure 1).



Figure 1. Coral Reef Conservation Program Strategic Plan Vision.



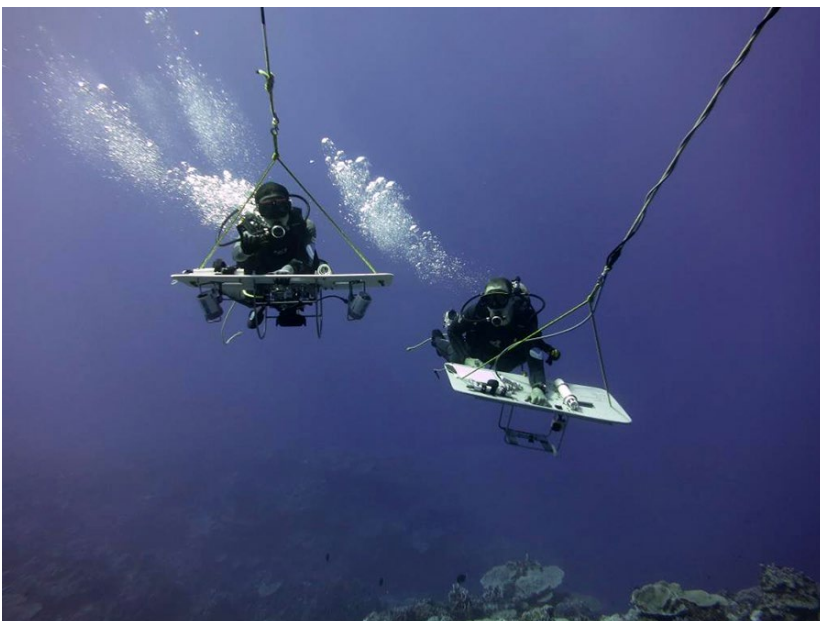
### III. IMPLEMENTATION OF STRATEGIC PLAN

This report highlights Coral Program research and management support activities for Fiscal Years (FY) 2020–21 that address issues that impact coral reef ecosystems and emphasizes collaborative efforts between NOAA and partners in federal, state, and territory agencies; non-governmental organizations (NGOs); academic institutions; and other organizations. These partnerships are essential to the design and implementation of effective management and conservation of coral reef ecosystems that span local, state, and federal authorities.

For example, in FY 2020–21, the Coral Program continued to adapt and respond to emerging issues, such as coral disease mitigation and restoration techniques. This included the development of a [NOAA Strategy for Stony Coral Tissue Loss Disease Response and Prevention](#), a framework to slow the spread of the disease and support the coral jurisdictions as part of a multifaceted response effort. Another significant resource developed by NOAA and partners was the [Manager’s Guide to Coral Reef Restoration Planning and Design](#). Additionally, the Coral Program increased its support of coral reef restoration efforts, including the [Mission: Iconic Reefs](#) effort—an unprecedented approach to restore seven iconic coral reef sites in the Florida Keys National Marine Sanctuary. Finally, the Coral Program established a Coral Emergency Response Fund to aid non-federal partners in rapid response to coral reef emergency events, such as hurricane damage and severe disease outbreaks.

While the COVID-19 pandemic and associated disruptions had an impact on coral reef conservation activities, the Coral Program continued to support many notable activities over the past two fiscal years. The activities highlighted in this report address strategic management needs to build coral resilience, improve understanding of reef ecosystems through science and monitoring, enhance local and national capacities to support conservation, and build partnerships to leverage resources and expertise.

For more information about NOAA’s Coral Reef Conservation Program, visit <http://coralreef.noaa.gov>.



Divers towed behind a surface ship survey a coral reef for fish. Credit: NOAA.

## IV. U.S. CORAL JURISDICTIONS

The Coral Program supports coral reef conservation activities by NOAA and its partners in the seven U.S. states and territories containing coral reefs (American Samoa, the Commonwealth of the Northern Mariana Islands, Florida, Guam, Hawai'i, Puerto Rico, and the U.S. Virgin Islands), the Flower Gardens Bank National Marine Sanctuary, and uninhabited islands including the northwestern Hawaiian Islands and the Pacific Remote Island Areas (Figure 2). Internationally, the Coral Program engages in coral reef conservation in four priority regions, including efforts in the Freely Associated States of Palau, Republic of the Marshall Islands, and the Federated States of Micronesia. Effectively conserving coral reefs in the U.S. can only be achieved by domestic and international efforts because nearly all U.S. coral reefs are ecologically connected to reefs abroad and the most significant threats are global in nature. The total number of Coral Program projects for Fiscal Years 2020 and 2021 for the Pacific, Atlantic, and Caribbean regions (Figure 2) are described in more detail under the highlight sections.

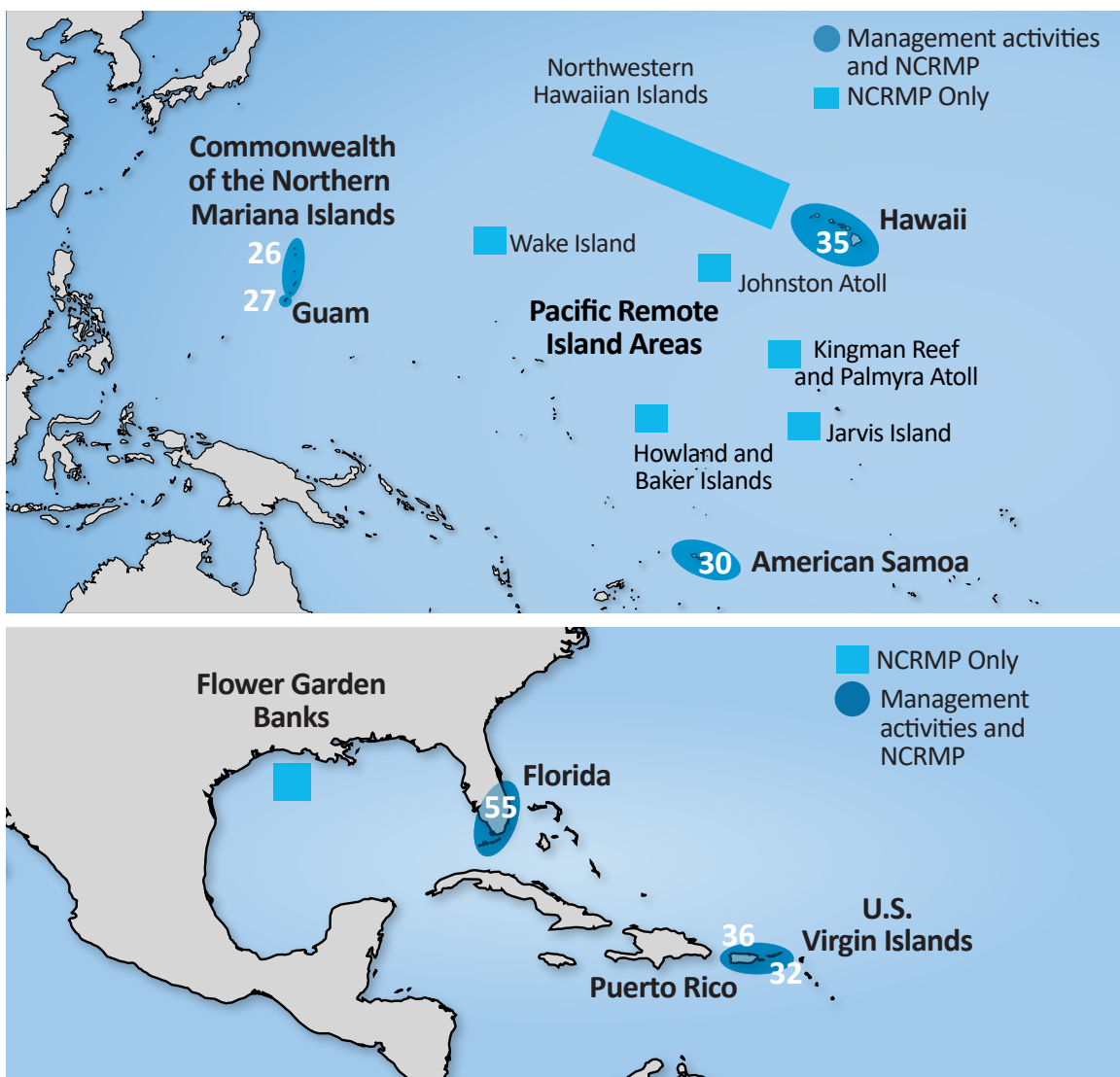
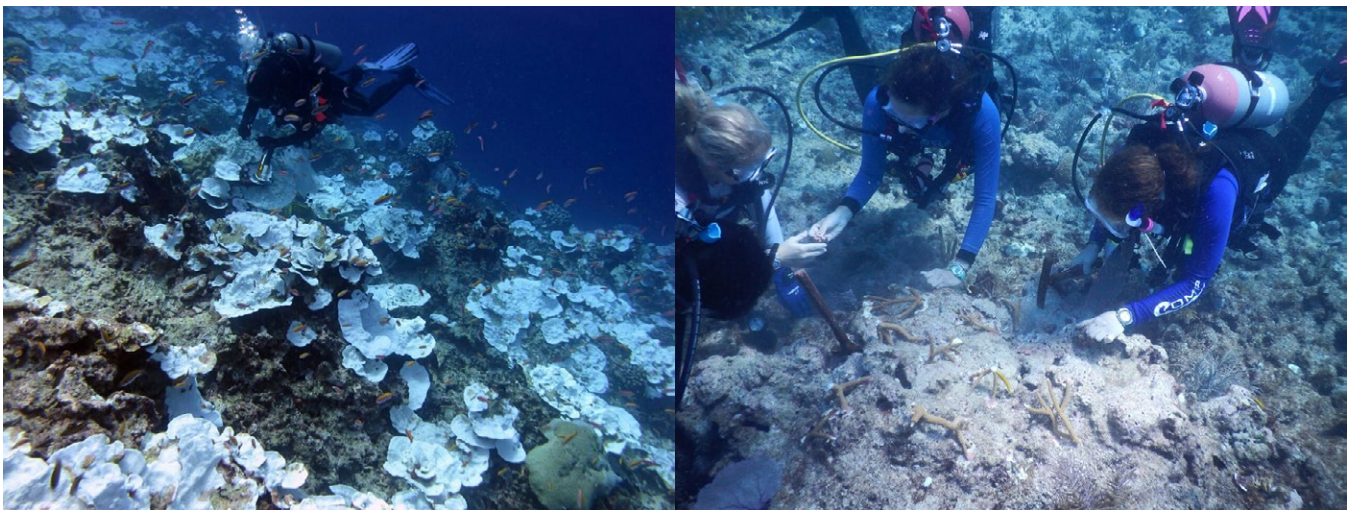


Figure 2. Number of Coral Reef Conservation Program projects in each U.S. Pacific jurisdiction (top) and Atlantic and Caribbean jurisdiction (bottom) for FY2020–21, including the National Coral Reef Monitoring Program (NCRMP).

## V. HIGHLIGHTS FOR INCREASE RESILIENCE TO CLIMATE CHANGE

The Coral Program works with partners to assess and address the impacts of climate change, including ocean acidification on coral reef ecosystems, emphasizing a resilience-based management approach. This view has been adopted as an effective approach for integrating climate change considerations into coral reef management by international and domestic partners.

In FY 2020–21, the climate pillar focused on supporting and enhancing strategic management of coral reef ecosystems by identifying, understanding, and communicating risks and vulnerabilities of U.S. coral reef ecosystems to climate change. A concerted effort was placed on translating observations and research results into decision-making tools and products and characterizing change in coral reef ecosystems by enhancing question-based monitoring to fill gaps in current observations.



A diver inspects bleached coral (left) and divers outplant nursery-grown corals (right) during restoration. Credit: NOAA/Kelli O’Donnell.

### **Near real-time satellite-based and modeled products for coral reef ecosystems**

NOAA delivers a suite of online satellite-based and modeled products that serve coral reef ecosystem managers, monitoring networks, scientific researchers, non-governmental organizations, and domestic and foreign government agencies. For more than 20 years, NOAA has utilized remote sensing, models, and in situ data to observe, predict, and report to its users on the coral reef environment worldwide. The products and data help users monitor climate change impacts (oceanic heat stress, marine heatwaves, bleaching, and disease) to coral reef ecosystems; understand links between environmental conditions and ecosystem impacts; and assess when reefs are vulnerable or resilient to climate change. Recently, coral bleaching heat stress monitoring officially entered a new era with next-generation daily global 5-km-resolution satellite products. This service is provided at or near reef-scales and allows direct monitoring of 95% of coral reefs globally.

### **A decision-support tool for management interventions to preserve essential habitat**

In FY 2020–21, NOAA developed a web-based evaluation tool to inform stakeholders, specifically restoration managers, about the impact of ocean acidification (OA) and temperature effects on coral



reefs. This accessible and interpretable tool gauges the present-day state of a reef of interest and forecasts how projected heat stress (e.g., bleaching) and OA are expected to impact the reef. The tool utilizes data collected as part of the National Coral Reef Monitoring Program along with the latest generation of climate models to provide crucial information to researchers, policymakers, and resource agencies in support of adequate conservation actions aimed to maintain and support the long-term resilience of coral reefs.

### **Hawai'i coral bleaching assessment and analysis**

In October 2019, Hawai'i experienced its third major bleaching event in the last six years. In FY 2020, NOAA leveraged a partnership with the Hawai'i Coral Bleaching Collaborative and conducted a multi-institution response to document the extent of coral bleaching across the Hawaiian Archipelago. This project laid the groundwork for tracking coral response and recovery through time. NOAA curated data from over 2,000 surveys into a database and led two workshops for partners across the Main Hawaiian Islands to train reef managers and monitoring practitioners. Workshops focused on how to evaluate bleaching and other metrics from the collection of digital in-water survey imagery and how to conduct post-bleaching surveys to assess long-term, post-bleaching impacts. NOAA is using the statewide bleaching database to identify which reefs and species are more susceptible to bleaching, assess the long-term impacts of bleaching, investigate drivers of bleaching patterns, and explore management strategies to mitigate future impacts. These outcomes contribute to understanding which regions of the state are likely to be the most resilient to bleaching caused by climate-induced thermal stress.

### **U.S. Virgin Islands reef resilience prioritization project**

In FY 2021, NOAA began working with partners in the U.S. Virgin Islands to develop information products and a tool to enhance prioritization of coral reefs and associated habitats for management and conservation actions. Local resource managers require reliable access to current data to help prioritize coral reef sites for risk assessments and conservation actions. The specific goal of this project was to develop standardized data products and model outputs that will help managers identify coral reefs or habitat areas with relatively high resilience that may have a chance to withstand anticipated climate-induced stressors such as elevated water temperatures, ocean acidification, and diseases. The information generated from the project will allow resource managers to better prioritize, evaluate, and target their conservation actions and, therefore, minimize vulnerability to the adverse impacts of climate change.



A scuba diver surveys bleached corals in the U.S. Virgin Islands. Credit: NOAA.



## VI. HIGHLIGHTS FOR IMPROVE FISHERIES SUSTAINABILITY

To support sustainable coral reef fisheries, the Coral Program is working closely with the fisheries management agencies of the seven states and territories, four regional fishery management councils, and NOAA Fisheries regional offices, as well as fostering engagement with fishers, local communities, and other key stakeholders. The Coral Program specializes in providing essential data and building local capacity for effective coral reef fisheries management.

In FY 2020–21, the fisheries pillar focused on increasing comparability and exchange of monitoring data to improve their utility; conducting assessments of key marine protected areas to understand their efficacy and inform adaptive management; filling knowledge gaps on coral reef fisheries life history and ecology to support successful stock assessments; and providing training and learning opportunities among managers. Collectively, these efforts foster effective coral reef fisheries management to maintain resilient coral reef ecosystems.



A school of yellowtail goatfish swim through the water. Credit: Dr. Dwayne Meadows, NOAA/NMFS/OPR.

### **Assessing benthic and reef-fish communities across Guam and the Northern Mariana Islands**

In FY 2020, NOAA successfully established a network of federal and local partners that monitor reefs in Guam and the Commonwealth of the Northern Mariana Islands. These partners committed to sharing their data for synthesis with NOAA's National Coral Reef Monitoring Program in order to analyze fish and coral community responses at scales useful for informing local management. In FY 2021, NOAA completed the cleaning and integrating of different partner datasets from surveys, applied a recently developed downscaling method to measure changes in coral communities at local scales more relevant for resource managers, and generated local summaries of key indicators to describe those changes. These efforts will allow more powerful analyses of fish and coral trends over time to better understand how they are responding to management actions in the context of climate change impacts. This work is a great example of how to gain more power and insight from existing monitoring data through partnerships.

## **Assessment of marine protected area boundaries and fish movements in the East End Marine Park, U.S. Virgin Islands**

In FY 2020–21, NOAA collected reef fish from the no-take areas of the East End Marine Park (EEMP) off the island of St. Croix in the U.S. Virgin Islands. These fish were tagged with transmitters in order to understand movements of important fisheries species like snappers, parrotfish, and groupers across no-take and fished areas of the park. The EEMP intends to update its management plan in 2022–23 and wants to know if the Park is adequately protecting and replenishing these species, including adjacent areas open to fishing. An array of receivers distributed in the no-take and offshore areas of the EEMP will record the movements of individual fish for up to one year. This information will be paired with fish surveys inside the no-take areas to provide a clearer picture of fish movement in the park, changes in fish communities since 2010, and whether the existing zoning rules are adequate to meet the Park's management goals.

## **Filling life history gaps for key coral reef fisheries species in Hawai'i and U.S. Virgin Islands**

Coral reef fisheries, from top predators like snappers and groupers to herbivores like parrotfish and surgeonfish, continue to be data-poor compared to other U.S. fisheries, resulting in management challenges. Many fishery management agencies lack dedicated capacity and depend on species biology information collected from other regions or on similar species as proxies when assessing the status of their fisheries. In FY 2020–21, NOAA provided a grant to the Hawai'i Division of Aquatic Resources to help fill remaining life history data gaps identified by the State. Starting in FY 2021, NOAA also partnered with the University of Virgin Islands and the University of South Carolina to collect life history data for Caribbean fisheries species that have upcoming stock assessments scheduled and serve key roles on coral reefs. These data will be combined with other monitoring data to assess exploited reef fish population status and review current regulations to improve coral reef fisheries management that supports increased fish populations, improved ecosystem health, and local economies.



Understanding the life history of fish who depend on coral reef ecosystems will help manage their populations more effectively. Credit: NOAA/Kelvin Gorospe.



## **MPAConnect and the Pacific Islands Managed and Protected Areas Community Peer-to-Peer Learning Networks**

In FY 2020–21, NOAA continued to build on successes from its programs to build capacity for effective site-based management. MPAConnect is a learning network of marine protected area (MPA) managers in the Caribbean that works to increase the effectiveness of MPA management by addressing specific capacity needs of individual MPAs. Similarly, the Pacific Islands Managed and Protected Area Community (PIMPAC) provides coral reef conservation capacity-building opportunities to partners in the Pacific Islands Region. Among the numerous capacity-building activities organized over these two years, MPAConnect provided follow-up support through competitive small grants to build management capacity on MPA sustainable financing, and PIMPAC placed environmental law interns with partner countries to assist with elements of rulemaking. Both programs have over a decade of demonstrated success in delivering tools and resources to enable effective management.

## **VII. HIGHLIGHTS FOR REDUCE LAND-BASED SOURCES OF POLLUTION**

The health of U.S. coral reef ecosystems depends on water quality, sustainable land use, and other resource management activities in adjacent coastal and upland regions. The Coral Program uses an integrated watershed management approach that includes comprehensive management plans to identify land-based pollutant sources, baseline characterizations to understand the full suite of impacts, prioritized management responses, and detailed plans regarding partner roles and responsibilities.



Land-based pollution, such as sediment and nutrient runoff from cities, negatively impact offshore coral reef ecosystems by increasing algal blooms, decreasing light, and smothering corals. Credit: NOAA.

In FY 2020–21, the pollution pillar focused on developing watershed management plans for some of its coral reef priority watersheds; installing best management practices to reduce sediment and nutrient loads to the nation’s nearshore coral habitats; providing technical assistance to support performance monitoring and assessments; building capacity; and, coordinating to advance multilateral watershed management efforts within the jurisdictions. Collectively, these efforts enhance conditions for effective management of land-based sources of pollution to improve water quality that will ultimately support resilient coral reef ecosystems.

### **Guam Manell-Geus Watershed Comprehensive Management Plan**

In FY 2021, NOAA provided technical and financial support to develop a comprehensive watershed management plan (WMP) for the Manell-Geus watershed on Guam. Once completed, the WMP will include a characterization of Guam’s priority watershed to identify pollution hotspots, as well as mitigation and restoration strategies to reduce impacts of land-based sources of pollution to coral reefs. Additionally, the WMP will incorporate input from various federal and jurisdictional partners and include the U.S. Environmental Protection Agency’s watershed planning criteria that allow local stakeholders to leverage financial and technical support for mitigating sediment and nutrient impacts to nearshore coral reefs and other coastal habitats.

### **Determining a protective turbidity criterion for Florida’s corals**

Florida requires all agencies not to exceed a specific threshold for turbidity when removing sediment during coastal dredging or construction projects. In FY 2021, NOAA provided technical and scientific assistance to refine the current threshold to ensure it addresses impacts to corals. As part of this project, NOAA will conduct laboratory-based sediment exposure experiments on adult fragments for two Endangered Species Act (ESA)-listed corals, *Orbicella faveolata* and *Acropora cervicornis*. Outcomes from this research will aid the state in their review of water quality criteria to include protection of corals and coral reef resources. Additionally, this study will inform NOAA when consulting on impacts to ESA-listed corals, designated critical habitat, and designated Essential Fish Habitat, which can be affected by dredging and other coastal activities that generate sediment plumes.

### **American Samoa best management practices effectiveness**

In FY 2020–21, NOAA worked with American Samoan coastal communities to strengthen local capacity and to improve the management of land-based sources of pollution and their impacts to coral reef ecosystems. This project focuses on local community engagement through outreach and education activities and community-based efforts (e.g., coastal clean-ups, mangrove restoration, wetland restoration). To improve understanding and support for management concepts, the project engages and collaborates with local schools and village communities. These efforts will assist with improved practices for the reduction in sediment and waste and help improve the health of American Samoa’s nearshore coral reef ecosystems.



## Reducing threats from unpaved roads on Culebra Island, Puerto Rico

In FY 2020–21 NOAA provided technical and financial support to implement management actions identified in the Culebra Watershed Management Plan. As a result of these investments, NOAA and its partners stabilized over 15 miles of unpaved roads; prevented approximately 51 metric tons of sediment delivery to the nearshore coastal habitats per year; trained municipal staff on how to properly maintain these unpaved roads; developed an [unpaved road standards and guidance manual](#) for the Caribbean and Pacific; and, demonstrated the efficacy of these best management practices to the extent that private landowners are requesting road construction and maintenance that meet these standards. Additionally, NOAA, in partnership with Puerto Rico’s Aqueduct and Sewage Authority, is piloting a floating treatment wetlands project at the Culebra Wastewater Treatment Plant to reduce nutrient loads entering Culebra’s nearshore coral reef ecosystems.



A sediment plume or discharge makes its way into the marine environment off the coast of Puerto Rico.  
Credit: NOAA.

## VIII. HIGHLIGHTS FOR RESTORE VIABLE CORAL POPULATIONS

Restoration builds and maintains resilience to threats and promotes recovery of coral reef ecosystems. It requires a multi-pronged approach with informed intervention strategies that keep coral reef ecosystems viable and functioning. The Coral Program is leading research, conservation, and restoration efforts to deliver sound scientific information and technical support to address management needs.

In FY 2020–21, the restoration pillar supported research to implement on-the-ground actions to develop techniques for creating resilient, genetically diverse, and viable populations of key coral species that can adapt to evolving environmental conditions. Additionally, the Coral Program supported the use of regulations to prevent loss of coral and coral reef habitat through technical knowledge transfer to permitting agencies, encouraging consistent use of best management practices, and informing mitigation options with appropriate restoration techniques.



A diver swims over a restored staghorn reef. Credit: Coral Reef Foundation.

### **Coral restoration implementation and capacity for Mission: Iconic Reefs**

Mission: Iconic Reefs ([MIR](#)) was established in FY 2020 as an ambitious initiative to restore seven key reefs along the Florida Keys reef tract through the outplanting of over 500,000 native stony coral species found in Florida, including two Endangered Species Act-listed species. Led by NOAA, the initiative is a public-private partnership bringing together nonprofit coral restoration and conservation organizations, multiple Florida state agencies, researchers from various local and national universities, and organizations and businesses in the local community. The goal is to restore seven ecologically and culturally significant reefs in the Florida Keys National Marine Sanctuary. Spanning two implementation phases and 20 years, MIR was developed based on years of scientific research and in-water restoration experience to increase coral outplant numbers success based on species-specific growth and mortality rates, overlaid with ground-truthed measures of restorable area at each chosen reef site. Federal funds in FY 2020-2021 have been focused on site preparation, coral and urchin nursery production, and baseline monitoring.



## Collaboration and capacity building for coral restoration in the Pacific Islands

Active coral reef restoration, including outplanting nursery-raised corals and seeding new reefs, is relatively new in the Pacific, where the focus of management has been on reducing local stressors. However, managers recognize that while reducing local stressors is necessary, it will not be sufficient to restore reef function and mitigate impacts such as climate change, and they are ready to begin active restoration on their reefs. This effort, utilizing the [Manager's Guide to Reef Restoration Planning and Design](#), is a multi-year partnership to build capacity for coral reef restoration planning and implementation in the U.S. Pacific Islands region. This project has engaged resource managers from Hawai'i, Guam, American Samoa, and Commonwealth of the Northern Mariana Islands (CNMI) in workshops, training, and technical assistance, and learning exchanges to increase the effectiveness of restoration projects throughout the Pacific.

### Saipan coral nursery pilot project

The in-water Saipan facility is the first coral nursery in the CNMI and the first nursery to work with any of the Endangered Species Act (ESA)-listed coral species found in the Pacific. The nursery was started in 2019 following the loss of more than 60% of CNMI corals during the 2017 global coral bleaching event. The nursery includes a combination of upright floating tree structures and anchored tables. During FY 2021, the nursery expanded its operations to host more than 1,400 coral fragments including 11 different coral species. This project will test and document various restoration approaches, gauge different coral species survival and growth performance, and provide practical regional guidance for increasing and expanding restoration efforts to benefit resilient reefs at a regionally meaningful scale.



Scientists maintain corals growing in a coral reef nursery. The coral fragments will later be used to restore a degraded reef. Credit: NOAA.

### Assessing the strengths and weaknesses of coral genotypes used in reef restoration

Coral nurseries and outplanting provide a means to restore dwindling wild populations impacted by numerous global and local stressors. This project will provide managers with actionable information on the performance of nursery-grown coral genotypes so managers can make data-driven decisions to increase the success of coral restoration. A restoration community database will include measurements from distinct coral genotypes of the ESA-threatened coral *Acropora cervicornis* to compare their survivability under varying conditions and develop parameters for resilience to two stressors (e.g., ocean warming and acidification). The advancement of this research and technology will support the efficiency and efficacy to identify resilient corals that may survive future stressors.

## IX. HIGHLIGHTS FOR THE NATIONAL CORAL REEF MONITORING PROGRAM

The Coral Program supports the National Coral Reef Monitoring Program (NCRMP) for biological, climate, and socioeconomic monitoring throughout all ten U.S. Pacific, Atlantic, Caribbean, and Gulf of Mexico coral reef areas. NCRMP is unique given its national scale across a vast geographic area and its integration of social science with biophysical science. NCRMP provides information about the status and trends of environmental conditions, natural resources, and the people and processes that interact with coral reef ecosystems. The overarching NCRMP goal is to collect the scientific data needed to evaluate changing conditions of U.S. coral reef ecosystems. Results are shared through periodic jurisdictional and national-level status and trends reports. Data are used to help evaluate the efficacy of place-based investments in coral reef conservation, which in turn help ensure that the Coral Program’s goals and objectives are achieved, and that U.S. coral reef ecosystems and the communities that depend on them benefit from conservation activities.

NCRMP delivered several notable products in FY 2020–21. The Coral Program updated the [National Coral Reef Monitoring Plan](#) to reflect changes in the state of science since the original 2014 plan. NCRMP completed its [Atlantic status reports](#) for Florida, Flower Garden Banks, Puerto Rico (English and Spanish versions), and U.S. Virgin Islands, as well as a [National Coral Reef Status Report](#) (Figure 3). These status reports, including the Pacific status reports that were produced in 2018, are the first of their kind to describe the process of scoring coral reef ecosystem status in a report-card style format designed to be easily understood by the public and policy makers. NCRMP also released two technical reports: a [socioeconomic trends analysis](#) for Florida and a [biological trends analysis](#) for the Caribbean that were designed for resource managers. The socioeconomic report outlines current human dimension information relevant to coral reef resources in South Florida, as well as trends between the first (2014) and second monitoring cycles. The biological report summarizes the status of coral reef biological data in the region from the most recent data collection in 2019.



Figure 3. Covers of the National and four NCRMP Atlantic-Caribbean status reports.



NCRMP monitors reefs across U.S. coral reef geographies. Credit: NOAA Fisheries/Morgan Winston.

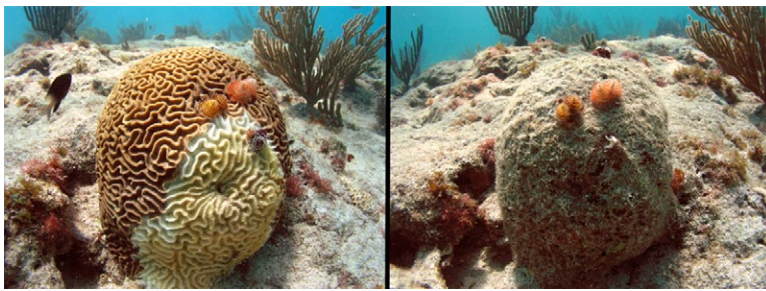


## X. HIGHLIGHTS FOR OTHER CROSSCUTTING ACTIVITIES

The Coral Program actively works with its partners to conduct research and support management activities intended to protect corals and the communities that depend on them by focusing on topics that build engagement, enhance partnerships, and leverage resources and expertise. To meet these needs, a multidisciplinary approach is taken that includes communications, social science, mapping, monitoring (as discussed in the previous section), capacity building, and international activities cutting across and supporting all four pillars. Collectively, this crosscutting work provides the necessary information and enabling conditions for effective coral reef conservation and management.

### International coral disease response capacity building

In FY 2021, support was provided to build capacity for the detection of and response to Stony Coral Tissue Loss Disease (SCTLD) in the wider Caribbean region. NOAA is collaborating with the Atlantic and Gulf Rapid Reef Assessment to review new reports of SCTLD and track its spread throughout the Caribbean region through an online geodatabase and reporting mechanism. Additionally, we are working with the Gulf and Caribbean Fisheries Institute and the Caribbean Cooperation Team on training for SCTLD detection and response for Caribbean resource managers and field researchers. We are also partnering to develop outreach products that can be shared with the coral reef conservation and stakeholder communities. This effort, in partnership with multiple organizations in the Caribbean, works to curb the spread of SCTLD, preserve healthy colonies of affected coral species, and educate communities on SCTLD.



Brain coral in Biscayne National Park in Florida infected with stony coral tissue loss disease in April 2015 (left) and completely dead by April 2016 (right). Increasing capacity in the wider Caribbean region is essential for combating Stony Coral Tissue Loss Disease.  
Credit: Ilsa B. Kuffner.

### Essential fish habitat mapping in the U.S. Atlantic and Caribbean to inform management

NOAA, in partnership with local academic, federal, and jurisdictional partners in the Atlantic and Caribbean, identified coral habitat mapping locations with significant data gaps. During FY 2020–21, NOAA coordinated with the Florida Coastal Mapping Program and identified two priority areas to survey around the Florida Keys and Dry Tortugas. In FY 2020, data were collected within the Tortugas South Ecological Reserve and Marquesas to Dry Tortugas National Park for a total of 134 square nautical miles mapped. During FY 2021, a total of 1,113 linear nautical miles was mapped, which equals 63 square nautical miles of multi-beam and split beam sonar data within the Florida Keys National Marine Sanctuary and Dry Tortugas National Park. Coral reefs are Essential Fish Habitat (EFH) for a number of federally managed fisheries species, and updated habitat maps are needed to inform habitat conservation efforts to support sustainable management of these species and other trust resources. This project helped to fill key gaps in habitat maps that will help better understand the EFH in these locations and connectivity to the rest of the Florida Reef Tract.

## Mapping gap analysis for U.S. shallow coral reef areas

NOAA is conducting a comprehensive, shallow-water mapping gap analysis within all seven U.S. coral jurisdictions. Results from this project will enable the Coral Program to determine priority locations for mapping, technology to be used, and align data needs to the four strategic plan pillars. The analysis will inform future research and monitoring activities that address management needs and maximize opportunities to leverage and complement existing regional efforts to meet mandates. During FY 2021, stakeholder engagement and data collection for Florida was completed. Data are undergoing analysis to refine priority locations for management needs.



NOAA researchers provide critical data for coral reef ecosystem management. Credit: NOAA, James Morioka.

## Comprehensive ecosystem services valuation of U.S. coral reefs

In FY 2021, the Coral Program began a comprehensive ecosystem services valuation of resources associated with the U.S. coral reef system. This project aims to scope, identify, estimate, and present economic data to describe the suite of economic values (goods and services) provided by U.S. coral reefs. This project will update the coral reef valuation estimates from the 2001–2011 studies and incorporate modern valuation approaches and econometric techniques. The expected outcomes from this project include the development of standardized ecosystem service valuation methodologies specific to U.S. coral reefs, economic values (in monetary terms) of the ecosystem services and benefits provided by reefs, and spatial analysis and value maps of U.S. coral reefs. During FY 2021, a literature review and gap analysis of previous coral reef valuation studies as well as a catalog of existing research and a meta-analysis of ecosystem services were completed in each jurisdiction. Additionally, two workshops with jurisdictional partners and stakeholders were completed that identified ecosystem services and goods of importance.

## National Coral Reef Management Fellowship

The coral reef management fellowship provides funding for two-year positions to address current capacity gaps as well as to build longer-term capacity in the seven U.S. coral jurisdictions by placing individuals whose education and work experience meet jurisdiction's specific management needs. This is a partnership between the Coral Program, the Department of Interior, All Islands Coral Reef Committee, and NOVA Southeastern University. During FY 2020–21, fellows supported partners with development of restoration plans and field efforts to restore corals; worked to integrate best management practices in watersheds for fire and sedimentation management; coordinated responses to the stony tissue coral loss disease to better understand and mitigate the threat; developed a visual tool for coral disease distributions and hotspots to inform management decision-making; and conducted outreach and education activities on protecting and restoring mangroves.

## XI. HIGHLIGHTS FOR GRANTS AND OTHER FINANCIAL ASSISTANCE

The Coral Program provides financial assistance to support projects through grants and cooperative agreements under six competitions and sponsorships, which is matched with non-federal funding by the grantees, to support conservation projects and scientific studies that benefit coral reef ecosystem management in seven U.S. states and territories (American Samoa, the Commonwealth of the Northern Mariana Islands, Florida, Guam, Hawai'i, Puerto Rico, and U.S. Virgin Islands), and internationally in the Caribbean, the Coral Triangle, the South Pacific, and Micronesia. In FY 2020–21, the Coral Program awarded more than US\$37.2 million through financial assistance programs. Project work is focused on the implementation of the strategic plan and awarded to state and territorial resource management agencies, non-governmental organizations, community groups, and academic partners. Additional financial assistance is provided through competitions administered by other NOAA offices, such as the Cooperative Institutes and Community-based Restoration programs, and some non-competitive announcements. Grant products are made available to the public on the [Coral Reef Information System](#).

See below for descriptions of the six Coral Program competitions and the appendices for a geographic breakdown of these awards and a full list of all financial assistance awards.

**State and Territorial Government Cooperative Agreements**—Support to sustain coral reef management capacity and monitoring and conservation projects that seek to improve the condition of coral reefs ecosystems resources in the seven U.S. coral jurisdictions.

**The Ruth Gates Coral Restoration Innovation Grants**—Address the decline in coral reefs through innovative science and research. Funding promotes long-term survival of corals by supporting innovative coral restoration research; the application of these innovative techniques to create resilient, genetically diverse, and reproductively viable populations of coral species; and the development of creative methods to improve coral outplanting efficiency and build resilient coral reef ecosystems.

**Coral International Grants and Cooperative Agreements**—Build local coral reef management capacity and support coral reef monitoring in the priority international geographies of the Caribbean, Coral Triangle, the South Pacific, and Micronesia.

**Non-governmental Organization (NGO) Partnership Cooperative Agreements**—Fund non-governmental organizations with specialized experience in supporting the ongoing coral reef conservation efforts of our state and territorial partners, primarily through capacity building and training.

**Fishery Management Council Cooperative Agreements**—Support sustainable coral fisheries management in cooperation with U.S. regional fishery management councils. Activities funded provide better scientific information to improve the management of coral reef fisheries and associated fish habitat, work collaboratively to build key stakeholders' capacity, and advance ecosystem-based fisheries management through the incorporation of existing data and tools.

**Public-Private Partnership with the National Fish and Wildlife Foundation**—The Coral Reef Conservation Fund is a competitive grant program created to support domestic projects that improve the health of coral reef ecosystems. The Coral Emergency Response Fund is a dedicated fund designed to rapidly respond to damage, disease, and stressors to corals and coral reefs that could not otherwise have been reasonably anticipated or avoided through non-competitive grants.

## XII. REFERENCES

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2. Storlazzi CD, Reguero BG, Cole AD, Lowe E, Shope JB, Gibbs AE, Nickel BA, McCall RT, van Dongeren AR, Beck MW. 2019. Rigorously valuing the role of U.S. coral reefs in coastal hazard risk reduction: U.S. Geological Survey Open-File Report 2019–1027. 42 p. <https://doi.org/10.3133/ofr20191027>.



## APPENDIX I: CORAL REEF CONSERVATION PROGRAM IMPLEMENTATION, FISCAL YEARS 2020–21

This table reflects the distribution of the annual budgets by general category. In addition to CRCP Competitive Grants, many categories utilize funding mechanisms, such as grants and contracts, to disburse funds externally. The budgets for programmatic categories listed here should not be directly compared to financial assistance categories in Appendix II and III (on following pages).

Category	FY2020 Funds (USD)	FY2021 Funds (USD)	Activities Supported
CRCP Competitive Grants	\$8,889,353	\$8,829,162	Competitive awards for coral reef research and conservation projects to address climate change, fisheries, land-based sources of pollution, and restoration activities; and grants administration.
Jurisdiction Support	\$1,580,336	\$1,238,741	Providing technical assistance and capacity building including coral reef management fellows in each of the seven U.S. coral jurisdictions. Supporting the U.S. Coral Reef Task Force and associated working groups, including support to the All Islands Committee.
Administration & Operations	\$2,584,385	\$2,486,490	Providing matrix management of the Coral Program including environmental compliance, records management, and performance measures tracking. Program-level data management, archiving, and public access. Program-wide communications and outreach.
Climate	\$2,481,262	\$2,502,870	Translating observations and research into decision-making tools and products. Characterizing change in coral reef ecosystems by enhancing question-based monitoring to fill gaps in current observations.
Fisheries	\$3,135,220	\$3,563,829	Leveraging monitoring data to inform stock assessments and rulemaking. Filling life history gaps for key taxa. Building marine protected area management capacity through networks of practitioners.
Land-Based Sources of Pollution	\$913,691	\$1,559,148	Creating watershed management plans for priority reef sites. Informing development of coral reef-related water quality targets for sediments and nutrients. Determining the efficacy of best management practices (BMPs) to reduce sediment and nutrient loads. Installing BMPs to reduce sediment and/or nutrient loads to nearshore habitats.
Restoration	\$4,513,844	\$6,439,554	Working with academic institutions and non-governmental research organizations to conduct innovative restoration projects. Conducting research and interventions related to coral disease. Implementing and planning active restoration in U.S. coral jurisdictions.
Monitoring	\$4,306,124	\$5,019,017	Collecting sustained observations of biological, climatic, and socioeconomic indicators in U.S. States and Territories to document status and trends. Research and development on technological solutions to monitoring challenges.
Mapping	\$560,023	\$672,462	Providing habitat characterization, charts, and maps of coral reefs ecosystems and Essential Fish Habitat in the coral jurisdictions. Improving habitat classification from updated benthic imagery.
Socioeconomic	\$535,762	\$688,727	Monitoring human use, knowledge, attitudes, and perceptions, and demographics of the populations living in and dependent on coral reef areas. Providing jurisdictional technical assistance with socioeconomic research.
<b>Total</b>	<b>\$29,500,000</b>	<b>\$33,000,000</b>	



**NOAA Coral Reef Conservation Program**  
Financial Assistance for Fiscal Year 2020

Award Number	Project Title/Activity	Applicant	Applicant Type	Region	Location	Federal Funding	Matching Funds
<b>CRCP Competition: State and Territorial Government Cooperative Agreements</b>							
NA19NOS4820055*	USVI Coral Reef Management Initiative	USVI DPNR, Division of Coastal Zone Management	Territorial Government	Atlantic/Caribbean	U.S. Virgin Islands	\$533,749	\$288,228
NA19NOS4820054*	Puerto Rico Coral Reef Conservation 2019-2020	Puerto Rico Department of Natural and Environmental Resources	Commonwealth Government	Atlantic/Caribbean	Puerto Rico	\$466,000	\$222,893
NA19NOS4820053*	Coral Reef Conservation Cooperative Agreement	Florida Department of Environmental Protection	State Government	Atlantic/Caribbean	Florida	\$765,000	\$765,000
NA19NOS4820051*	Hawaii FY19-20 Coral Reef Management Grant	Hawaii DLNR, Division of Aquatic Resources	State Government	Pacific	Hawaii	\$709,000	\$709,000
NA19NOS4820052*	CNMI's FY19-20 Coral Reef Conservation Cooperative Agreement	CNMI Division of Coastal Resources Management	Commonwealth Government	Pacific	CNMI	\$410,309	\$6,400
NA19NOS4820057*	Guam's FY 19-20 Coral Reef Conservation Program Cooperative Agreement Application	Guam Bureau of Statistics and Plans, Coastal Management Program	Territorial Government	Pacific	Guam	\$410,000	\$68,198
NA19NOS4820056*	Coral Reef Conservation Cooperative Agreement	American Samoa Department of Marine and Wildlife Resources	Territorial Government	Pacific	American Samoa	\$497,021	\$49,588
<i>*At the recipient's request, \$35,000 of the listed funds (\$45,000 for Florida) were transferred to a third party to support the All Islands Committee Secretariat, Coral Reef Management Fellowship Program, and other specific tasks for the recipient's direct benefit.</i>							
<b>CRCP Competition: Fishery Management Council Cooperative Agreements</b>							
NA20NMF4410263	FY20-21 Mapping and characterizing essential fish habitat in unknown mesophotic reef zones between 50 and 120 m in the U.S. Caribbean	Caribbean Fishery Management Council	Fishery Management Council	Atlantic/Caribbean	Puerto Rico, USVI	\$432,492	\$0
NA20NMF4410261	A proposal addressing changes in coral reef habitats and potential management implications to ensure the sustainability of coral reefs and associated fisheries habitats in the Gulf of Mexico.	Gulf of Mexico Fishery Management Council	Fishery Management Council	Atlantic/Caribbean	Florida, Gulf of Mexico	\$147,160	\$0
NA20NMF4410260*	South Atlantic Fishery Management Council Coral Reef Conservation Proposal Narrative FY 2020 - FY 2021	South Atlantic Fishery Management Council	Fishery Management Council	Atlantic/Caribbean	Florida	\$375,000	\$0
NA20NMF4410262	Western Pacific Coral Reef Ecosystem Fishery Resource Assessment and Management, FY 20-21	Western Pacific Regional Fishery Management Council	Fishery Management Council	Pacific	AS, HI, GU, CNMI	\$289,480	\$0
<i>*At the recipient's request, \$250,000 of the listed funds were transferred internally for mapping, diving, and data processing to be conducted by NOAA Principal Investigators for the recipient's direct benefit.</i>							
<b>CRCP Competition: International Grants and Cooperative Agreements</b>							
NA20NOS4820045	Strengthening Adaptive Management for Priority Caribbean Coral Reef Marine Protected Areas	Gulf and Caribbean Fisheries Institute	Nonprofit/NGO	Caribbean - International	Bahamas, Belize, BVI, Grenada, Honduras, Mexico, Netherlands Caribbean, St. Lucia, St. Vincent & Grenadines, Turks & Caicos, USVI	\$383,965	\$383,965
NA20NOS4820047	Expanding Locally Managed Marine Area Networks for Coral Reef Conservation in Indonesia	Conservation International	Nonprofit/NGO	Coral Triangle	Indonesia	\$150,972	\$138,552
NA20NOS4820048	Strengthening management capacity within Bay Islands and coastal Honduras Marine Protected Areas in order to secure the long-term health of coral reefs	The Coral Reef Alliance (CORAL)	Nonprofit/NGO	Caribbean - International	Honduras	\$80,000	\$80,000
NA20NOS4820041	Moving Towards Resilience-based Marine Resource Management in Malaysia	Reef Check Malaysia	Nonprofit/NGO	Coral Triangle	Malaysia	\$64,994	\$64,994
NA20NOS4820040	Advancing conservation and management of critical habitats, fisheries resources and life history function in Western Province, Solomon Islands, using an ecosystem approach to fisheries management	Wildlife Conservation Society	Nonprofit/NGO	South Pacific	Solomon Islands	\$79,915	\$79,915
NA20NOS4820046	MPAConnect Small Grants Program for Management Capacity Building in the Caribbean	Micronesia Conservation Trust	Nonprofit/NGO	Micronesia	Marshall Islands, Palau, Federated States of Micronesia	\$300,000	\$300,000
<b>CRCP Competition: Non-Governmental Organization (NGO) Partnership Cooperative Agreements</b>							
NA20NOS4820135	Herbivore alternatives: Restocking of Echinometra viridis and Tripneustes ventricosus, on coral reefs to reduce the abundance of nuisance species	Institute for Socio-Ecological Research	Nonprofit/NGO	Atlantic/Caribbean	Puerto Rico	\$105,412	\$108,709
NA20NOS4820134	Strengthening Coral Reef Management and Conservation in the Atlantic/Caribbean	The Nature Conservancy	Nonprofit/NGO	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$700,000	\$700,000
NA20NOS4820136	Rapid response to address the expansion of stony coral tissue loss disease (SCTLD) in Puerto Rico	Sociedad Ambiente Marino	Nonprofit/NGO	Atlantic/Caribbean	Puerto Rico	\$122,979	\$150,900
NA20NOS4820132	A Cooperative Agreement for Developing Sustainable Funding Strategies to Protect Coral Reefs in Hawaii	Conservation International Foundation	Nonprofit/NGO	Pacific	Hawaii	\$87,289	\$102,072
<b>CRCP Competition: Ruth Gates Coral Restoration Innovation Grants</b>							



**NOAA Coral Reef Conservation Program**  
Financial Assistance for Fiscal Year 2020

Award Number	Project Title/Activity	Applicant	Applicant Type	Region	Location	Federal Funding	Matching Funds
NA20NMF4820290	Enhancing Resilience in Existing Restoration Efforts Using Selectively Bred Corals	University of Hawaii	Institution of Higher Education	Pacific	Hawaii	\$344,620	\$386,941
NA20NMF4820288	Sowing the seeds of success: testing novel approaches to improve the efficiency of coral reef restoration using sexually propagated corals	Johnston Applied Marine Sciences	Small Business	Pacific	CNMI	\$134,269	\$127,172
NA20NMF4820289	Genetic Rescue of threatened elkhorn corals ( <i>Acropora palmata</i> ) in SE Florida from adjacent NW Bahamian populations	University of Miami	Institution of Higher Education	Atlantic/Caribbean	Florida	\$226,159	\$0
<b>CRCP Competition: Public-Private Partnership</b>							
NA18NOS4820181	National Fish and Wildlife Foundation-Coral Reef Conservation Fund Competitive Grants	National Fish and Wildlife Foundation, Competitive Programs	Institutional Partner/Nonprofit	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$653,496	\$653,496
NA18NOS4820181	National Fish and Wildlife Foundation-Coral Emergency Response Fund	National Fish and Wildlife Foundation, Competitive Programs	Institutional Partner/Nonprofit	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$500,000	\$0
<b>Other Awards: Community-Based Restoration Program Cooperative Agreements</b>							
NA19NMF4630259	Implementing the Florida Keys Coral Disease Response and Restoration Initiative	Mote Marine Laboratory, Inc.	Nonprofit/NGO	Atlantic/Caribbean	Florida	\$500,000	\$0
NA19NMF4630260	Large-scale Restoration of ESA Threatened Coral Species in the Florida Keys National Marine Sanctuary, Focusing on Five Reefs to be Restored to Criteria Outlined in the Acropora Recovery Plan	Coral Restoration Foundation, Inc.	Nonprofit/NGO	Atlantic/Caribbean	Florida	\$560,200	\$523,675
NA20NMF4630304	Jump-starting Mission: Iconic Reefs - sexually propagated Acropora corals and Diadema urchins for priority reefs in the Florida Keys	The Florida Aquarium, Inc.	Nonprofit/NGO	Atlantic/Caribbean	Florida	\$155,000	\$68,212
<b>Other Awards: Funding to Cooperative Institutes to Support Coral Conservation and Science</b>							
NA15OAR4320064	Technical capacity support to conduct disease, restoration, climate change and land-based sources of pollution projects.	Cooperative Institute for Marine and Atmospheric Studies (CIMAS) - University of Miami	Cooperative Institute - Institution of Higher Education	Atlantic/Caribbean	Florida, Puerto Rico, USVI, Gulf of Mexico	\$309,456	\$0
NA20OAR4320472	Technical capacity support to conduct disease, restoration, climate change and land-based sources of pollution projects.	Cooperative Institute for Marine and Atmospheric Studies (CIMAS) - University of Miami	Cooperative Institute - Institution of Higher Education	Atlantic/Caribbean	Florida, Puerto Rico, USVI, Gulf of Mexico	\$1,110,072	\$0
NA16NMF4320058	Technical capacity support to conduct fisheries, restoration, climate change and land-based sources of pollution projects.	Joint Institute for Marine and Atmospheric Research (JIMAR) - University of Hawaii	Cooperative Institute - Institution of Higher Education	Pacific	American Samoa, CNMI, Guam, Hawaii,	\$1,929,591	\$0
NA19NES4320002	Coral Reef Watch and Coral Reef Information System (CoRIS) Support	Cooperative Institute for Satellite Earth System Studies (CISESS) - University of Maryland, College Park	Cooperative Institute - Institution of Higher Education	Domestic, International	Domestic, International	\$1,496,879	\$0
<b>Other Awards: Funding to Other Organizations to Support Coral Conservation and Science</b>							
NA19NMF4630281	Coral Reef Restoration Planning and Implementation in the Pacific	The Nature Conservancy	Nonprofit/NGO	Pacific	American Samoa, CNMI, Guam, Hawaii,	\$436,720	\$0
NA19NOS4820059	Support for the 14th International Coral Reef Symposium (ICRS 2020) to be held at the Bremen Exhibition & Conference Center, Bremen, Germany, 5-10 July 2020	International Society for Reef Studies Corporation	Nonprofit/NGO	International	Germany	\$50,000	\$50,000
NA20NOS4820091	100 Yards of Hope. A project to significantly improve the public's awareness, understanding of and engagement with coral reef and ocean conservation.	Force Blue, Inc	Nonprofit/NGO	Atlantic/Caribbean	Florida	\$100,000	\$100,000
NA19NMF0080078	Detecting Reproductive Impairment from Senescence in ESA-Listed Elkhorn Coral ( <i>Acropora palmata</i> )	SCORE International, Inc.	Nonprofit/NGO	Caribbean - International	Curaçao	\$101,861	\$0
NA19NOS4290190	Mission: Iconic Reefs - Restoration Prep, Maintenance, and Monitoring	National Marine Sanctuary Foundation	Nonprofit/NGO	Atlantic/Caribbean	Florida	\$55,000	\$0
NA20NMF4630328	Mission: Iconic Reefs - Coral Restoration Implementation and Capacity, Herbivore Restoration	National Marine Sanctuary Foundation	Nonprofit/NGO	Atlantic/Caribbean	Florida	\$105,000	\$0

Award Number	Project Title/Activity	Applicant	Applicant Type	Region	Location	Federal Funding	Matching Funds
NA20OAR4170488	Regional Coral Disease Response Coordinator	University of Florida	Institution of Higher Education	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI, Gulf of Mexico	\$165,000	\$0
NA20NMF0080278	High-Resolution Projections of Coral Bleaching Conditions Using CMIP6 Climate Models; Implications for Ecosystem Service Provision, Management and Policy	SymbioSeas	Nonprofit/ NGO	Pacific	Hawaii	\$25,000	\$0
NA20OAR4170051	2021 Knauss Fellowship	University of Southern Mississippi	Institution of Higher Education	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$69,000	\$0
NA20NMF4520213	Hawaii Life History Research	Hawaii Department of Land and Natural Resources	State Government	Pacific	Hawaii	\$27,600	\$0
NA20NOS4820198*	Micronesia Environmental Law Fellowship Program	Micronesia Conservation Trust	Nonprofit/ NGO	Micronesia	Marshall Islands, Palau, Federated States of Micronesia	\$435,000	\$0

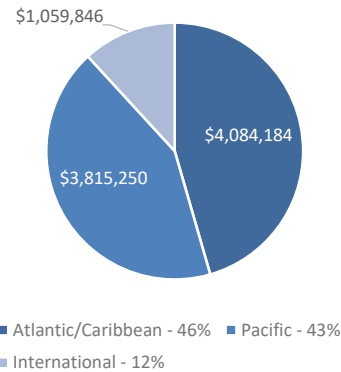
\*Awarded by NOAA CRCP with \$435,000 U.S. Department of State funding

CRCP Competitions Awards	\$8,969,281	\$5,386,023
Community-Based Restoration Awards	\$1,215,200	\$591,887
Cooperative Institute Awards	\$4,845,998	\$0
Other CRCP Awards	\$1,570,181	\$150,000
<b>TOTAL FY2020 CRCP FINANCIAL ASSISTANCE</b>	<b>\$16,600,660</b>	<b>\$6,127,910</b>

## SUMMARY: BY THE NUMBERS

RECIPIENT TYPE	TOTAL AWARDS	TOTAL FEDERAL FUNDING
Nonprofits	22	\$5,752,803
State and Territorial Governments	8	\$3,818,679
Cooperative Institutes	4	\$4,845,998
Fishery Management Councils	4	\$1,244,132
Institutions of Higher Education	4	\$804,779
Small Business	1	\$134,269
<b>TOTAL</b>	<b>43</b>	<b>\$16,600,660</b>

## CRCP COMPETITIONS Geographic Split







**NOAA Coral Reef Conservation Program**  
Financial Assistance for Fiscal Year 2021

Award Number	Project Title/Activity	Applicant	Applicant Type	Region	Location	Federal Funding	Matching Funds
<b>CRCP Competition: State and Territorial Government Cooperative Agreements</b>							
NA21NOS4820016*	USVI Coral Reef Management Initiative	USVI DPNR, Division of Coastal Zone Management	Territorial Government	Atlantic/Caribbean	U.S. Virgin Islands	\$438,576	\$265,826
NA21NOS4820014*	Puerto Rico Coral Reef Conservation 2019-2020	Puerto Rico Department of Natural and Environmental Resources	Commonwealth Government	Atlantic/Caribbean	Puerto Rico	\$499,945	\$212,488
NA21NOS4820020*	Florida's FY21-22 Coral Reef Conservation Cooperative Agreement	Florida Department of Environmental Protection	State Government	Atlantic/Caribbean	Florida	\$743,958	\$743,958
NA21NOS4820017**^	Hawaii FY21-22 Coral Reef Management Cooperative Agreement	Hawaii DLNR, Division of Aquatic Resources	State Government	Pacific	Hawaii	\$770,818	\$770,818
NA21NOS4820015*	CNMI's FY21-22 CRCP State and Territory Coral Reef Conservation Cooperative Agreement	CNMI Division of Coastal Resources Management	Commonwealth Government	Pacific	CNMI	\$652,529	\$15,715
NA21NOS4820018*	Guam FY 2021-2022 State and Territory Coral Reef Conservation Cooperative Agreement	Guam Bureau of Statistics and Plans, Coastal Management Program	Territorial Government	Pacific	Guam	\$499,779	\$46,162
NA21NOS4820019*	AS FY21-22 CRCP State and Territory Coral Reef Conservation Cooperative Agreement	American Samoa Department of Marine and Wildlife Resources	Territorial Government	Pacific	American Samoa	\$591,594	\$20,641
*At the recipient's request, \$35,000 of the listed funds (\$45,000 for Florida) were transferred to a third party to support the All Islands Committee Secretariat, Coral Reef Management Fellowship Program, and other specific tasks for the recipient's direct benefit.							
^Includes \$20,000 non-CRCP funds.							
<b>CRCP Competition: Fishery Management Council Cooperative Agreements</b>							
NA20NMF4410263	FY20-21 Mapping and characterizing essential fish habitat in unknown mesophotic reef zones between 50 and 120 m in the U.S. Caribbean	Caribbean Fishery Management Council	Fishery Management Council	Atlantic/Caribbean	Puerto Rico, USVI	\$444,773	\$0
NA20NMF4410261	A proposal addressing changes in coral reef habitats and potential management implications to ensure the sustainability of coral reefs and associated fisheries habitats in the Gulf of Mexico.	Gulf of Mexico Fishery Management Council	Fishery Management Council	Atlantic/Caribbean	Florida, Gulf of Mexico	\$150,420	\$0
NA20NMF4410260*	South Atlantic Fishery Management Council Coral Reef Conservation Proposal Narrative FY 2020 - FY 2021	South Atlantic Fishery Management Council	Fishery Management Council	Atlantic/Caribbean	Florida	\$357,668	\$0
NA20NMF4410262	Western Pacific Coral Reef Ecosystem Fishery Resource Assessment and Management, FY 20-21	Western Pacific Regional Fishery Management Council	Fishery Management Council	Pacific	American Samoa, CNMI, Guam, Hawaii	\$296,092	\$0
*At the recipient's request, \$232,668 of the listed funds were transferred internally for mapping, diving, and data processing to be conducted by NOAA Principal Investigators for the recipient's direct benefit.							
<b>CRCP Competition: International Grants and Cooperative Agreements</b>							
NA20NOS4820045	Strengthening Adaptive Management for Priority Caribbean Coral Reef Marine Protected Areas	Gulf and Caribbean Fisheries Institute	Nonprofit/ NGO	Caribbean - International	Bahamas, Belize, BVI, Grenada, Honduras, Mexico, Netherlands Caribbean, St. Lucia, St. Vincent & Grenadines, Turks & Caicos	\$286,865	\$290,290
NA20NOS4820047	Expanding Locally Managed Marine Area Networks for Coral Reef Conservation in Indonesia	Conservation International	Nonprofit/ NGO	Coral Triangle	Indonesia	\$150,490	\$163,146
NA20NOS4820048	Strengthening management capacity within Bay Islands and coastal Honduras Marine Protected Areas in order to secure the long-term health of coral reefs	The Coral Reef Alliance (CORAL)	Nonprofit/ NGO	Caribbean - International	Honduras	\$78,612	\$78,612
NA20NOS4820041	Moving Towards Resilience-based Marine Resource Management in Malaysia	Reef Check Malaysia	Nonprofit/ NGO	Coral Triangle	Malaysia	\$56,175	\$56,175
NA20NOS4820040	Advancing conservation and management of critical habitats, fisheries resources and life history function in Western Province, Solomon Islands, using an ecosystem approach to fisheries management	Wildlife Conservation Society	Nonprofit/ NGO	South Pacific	Solomon Islands	\$73,285	\$73,285
NA20NOS4820046	MPACConnect Small Grants Program for Management Capacity Building in the Caribbean	Micronesia Conservation Trust	Nonprofit/ NGO	Micronesia	Marshall Islands, Palau, Federated States of Micronesia	\$300,000	\$300,000
<b>CRCP Competition: Non-Governmental Organization (NGO) Partnership Cooperative Agreements</b>							
NA20NOS4820134	Strengthening Coral Reef Management and Conservation in the Atlantic/Caribbean	The Nature Conservancy	Nonprofit/ NGO	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$750,000	\$662,910
NA20NOS4820136	Rapid response to address the expansion of stony coral tissue loss disease (SCTLD) in Puerto Rico	Sociedad Ambiente Marino	Nonprofit/ NGO	Atlantic/Caribbean	Puerto Rico	\$93,290	\$118,550
NA20NOS4820132	A Cooperative Agreement for Developing Sustainable Funding Strategies to Protect Coral Reefs in Hawaii	Conservation International Foundation	Nonprofit/ NGO	Pacific	Hawaii	\$103,350	\$88,909

## NOAA Coral Reef Conservation Program

### Financial Assistance for Fiscal Year 2021

Award Number	Project Title/Activity	Applicant	Applicant Type	Region	Location	Federal Funding	Matching Funds
<b>CRCP Competition: Ruth Gates Coral Restoration Innovation Grants</b>							
NA20NMF4820290	Enhancing Resilience in Existing Restoration Efforts Using Selectively Bred Corals	University of Hawaii	Institution of Higher Education	Pacific	Hawaii	\$196,120	\$156,649
NA20NMF4820288	Sowing the seeds of success: testing novel approaches to improve the efficiency of coral reef restoration using sexually propagated corals	Johnston Applied Marine Sciences	Small Business	Pacific	CNMI	\$169,082	\$206,684
NA20NMF4820289	Genetic Rescue of threatened elkhorn corals ( <i>Acropora palmata</i> ) in SE Florida from adjacent NW Bahamian populations	University of Miami	Institution of Higher Education	Atlantic/Caribbean	Florida	\$85,123	\$0
NA20NMF4820320	Search for Genetic Regulators of Coral Resilience to Thermal Stress	Pennsylvania State University	Institution of Higher Education	Atlantic/Caribbean	USVI, Florida	\$169,884	\$0
NA21NMF4820302	Novel devices for the outplanting of sexual and asexual coral propagules	SCORE	Nonprofit/ NGO	Atlantic/Caribbean	Florida	\$57,950	\$57,984
NA21NMF4820301	Stress Hardening Interventions for Improved Coral Restoration: Benefits, Costs, and Biomarkers	The Florida International University	Institution of Higher Education	Atlantic/Caribbean	Florida	\$250,000	\$190,999
NA21NMF4820300	Towards the development of novel genomic techniques for identifying thermally tolerant <i>Acropora palmata</i>	University of Southern California	Institution of Higher Education	Atlantic/Caribbean	Florida	\$225,673	\$225,848
<b>CRCP Competition: Public-Private Partnership</b>							
NA18NOS4820181	National Fish and Wildlife Foundation-Coral Reef Conservation Fund Competitive Grants [Click <a href="#">here</a> to see 2021 selections]	National Fish and Wildlife Foundation, Competitive Programs	Institutional Partner/ Nonprofit	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$551,212	\$551,212
NA18NOS4820181	National Fish and Wildlife Foundation-Coral Emergency Response Fund	National Fish and Wildlife Foundation, Competitive Programs	Institutional Partner/ Nonprofit	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$250,000	\$0
<b>Other Awards: Community-Based Restoration Program Cooperative Agreements</b>							
NA19NMF4630259	Implementing the Florida Keys Coral Disease Response and Restoration Initiative	Mote Marine Laboratory, Inc.	Nonprofit/ NGO	Atlantic/Caribbean	Florida	\$500,000	\$0
NA19NMF4630260	Large-scale Restoration of ESA Threatened Coral Species in the Florida Keys National Marine Sanctuary, Focusing on Five Reefs to be Restored to Criteria Outlined in the <i>Acropora</i> Recovery Plan	Coral Restoration Foundation, Inc.	Nonprofit/ NGO	Atlantic/Caribbean	Florida	\$525,000	\$490,770
NA20NMF4630304	Jump-starting Mission: Iconic Reefs - sexually propagated <i>Acropora</i> corals and <i>Diadema</i> urchins for priority reefs in the Florida Keys	The Florida Aquarium, Inc.	Nonprofit/ NGO	Atlantic/Caribbean	Florida	\$289,903	\$153,628
<b>Other Awards: Funding to Cooperative Institutes to Support Coral Conservation and Science</b>							
NA20OAR4320472*	Technical capacity support to conduct disease, restoration, climate change and land-based sources of pollution projects.	Cooperative Institute for Marine and Atmospheric Studies (CIMAS) - University of Miami	Cooperative Institute - Institution of Higher Education	Atlantic/Caribbean	Florida, Puerto Rico, USVI, Gulf of Mexico	\$2,305,747	\$0
NA20OAR4320472*	Coral Reef Management Fellowship Program (NOAA Contribution)	Cooperative Institute for Marine and Atmospheric Studies (CIMAS) - University of Miami	Cooperative Institute - Institution of Higher Education	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$569,550	\$0
NA21NMF4320043	Technical capacity support to conduct fisheries, restoration, climate change and land-based sources of pollution projects.	Cooperative Institute for Marine and Atmospheric Research (CIMAR) - University of Hawaii	Cooperative Institute - Institution of Higher Education	Pacific	American Samoa, CNMI, Guam, Hawaii,	\$1,982,171	\$0
NA19NES4320002	Coral Reef Watch and Coral Reef Information System (CoRIS) Support	Cooperative Institute for Satellite Earth System Studies (CISESS) - University of Maryland, College Park	Cooperative Institute - Institution of Higher Education	Domestic, International	Domestic, International	\$1,721,476	\$0
NA21NOS4780131	Bathymetric Lidar Waveform Analysis and Algorithm Development for Characterizing Coral Reef Morphologies	Cooperative Institute for Marine Resources Studies (CIMRS) - Oregon State University	Cooperative Institute - Institution of Higher Education	Pacific	CNMI	\$76,375	\$0
<i>*Includes both FY 2020 and FY 2021 allocations (FY 2020 could not be obligated by the end of the fiscal year deadline and was delayed into early FY 2021)</i>							
<b>Other Awards: Funding to Other Organizations to Support Coral Conservation and Science</b>							

Award Number	Project Title/Activity	Applicant	Applicant Type	Region	Location	Federal Funding	Matching Funds
NA19NMF4630281	Coral Reef Restoration Planning and Implementation in the Pacific	The Nature Conservancy	Nonprofit/ NGO	Pacific	American Samoa, CNMI, Guam, Hawaii,	\$665,000	\$0
NA21NOS4820196*	Broadening MPACConnect Engagement with Priority Marine Protected Areas in the Caribbean Region	Gulf and Caribbean Fisheries Institute	Nonprofit/ NGO	Caribbean - International	Wider International Caribbean	\$689,482	\$0
NA20NMF4630328	Mission: Iconic Reefs - Coral Restoration Implementation and Capacity, Herbivore Restoration	National Marine Sanctuary Foundation	Nonprofit/ NGO	Atlantic/ Caribbean	Florida	\$1,635,097	\$0
NA20OAR4170488	Regional Coral Disease Response Coordinator	University of Florida	Institution of Higher Education	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI, Gulf of Mexico	\$202,000	\$0
NA21OAR4170064	2021 Knauss Fellowship	NC State University	Institution of Higher Education	Domestic	American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, USVI	\$59,000	\$0
NA20NMF4720145	Demographic Monitoring and Population Enhancement of Acropora Palmata Along the Florida Reef Tract	Fish & Wildlife Conservation Commission, Florida	State Government	Atlantic/ Caribbean	Florida	\$40,643	\$0
NA21NMF4630484	Support of the Coral Restoration Consortium	Coral Restoration Foundation	Nonprofit/ NGO	Domestic, International	Domestic, International	\$57,000	\$0
NA19NOS4290190A	Mission: Iconic Reefs - Restoration Prep, Maintenance, and Monitoring	National Marine Sanctuary Foundation	Nonprofit/ NGO	Atlantic/ Caribbean	Florida	\$46,889	\$0
NA20NMF4520213	Hawaii Life History Research	Hawaii Department of Land and Natural Resources	State Government	Pacific	Hawaii	\$40,000	\$0

\*Includes \$634,482 from U.S. Agency for International Development (USAID) for an Interagency Agreement with NOAA.

CRCP Competitions Awards	\$9,293,263	\$5,296,861
Community-Based Restoration Awards	\$1,314,903	\$644,398
Cooperative Institute Awards	\$6,655,319	\$0
Other CRCP Awards	\$3,435,111	\$0
<b>TOTAL FY2021 CRCP FINANCIAL ASSISTANCE</b>	<b>\$20,698,596</b>	<b>\$5,941,259</b>

## SUMMARY: BY THE NUMBERS

RECIPIENT TYPE	TOTAL AWARDS	TOTAL FEDERAL FUNDING
Nonprofits	19	\$7,159,600
State and Territorial Governments	9	\$4,277,842
Institutions of Higher Education	7	\$1,187,800
Fishery Management Councils	4	\$1,248,953
Cooperative Institutes	4	\$6,655,319
Small Business	1	\$169,082
<b>TOTAL</b>	<b>44</b>	<b>\$20,698,596</b>

## CRCP COMPETITIONS Geographic Split

