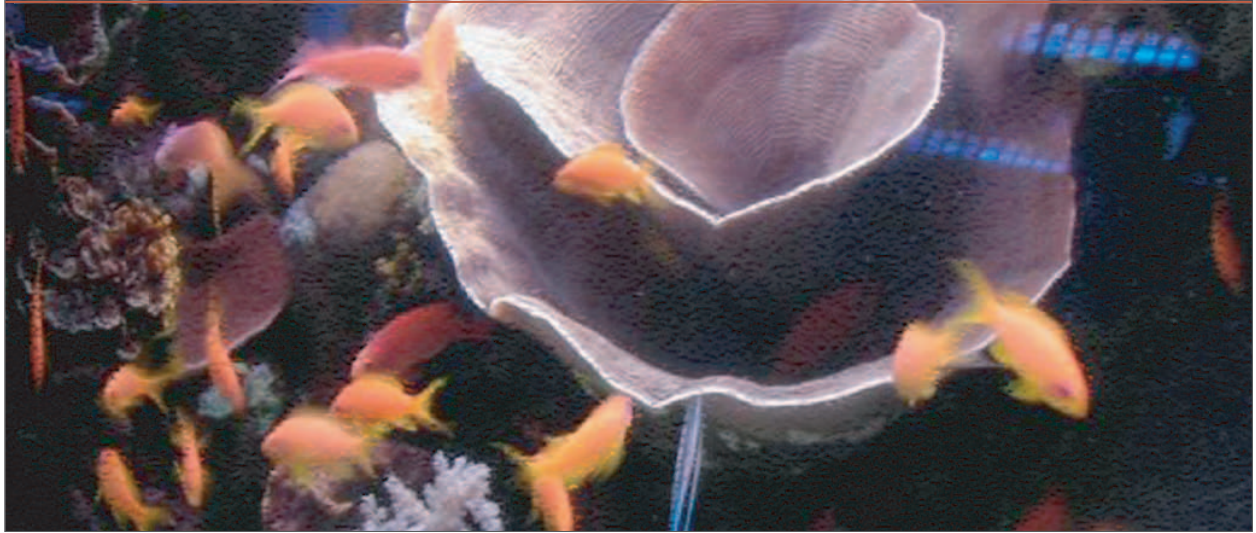


# NOAA CORAL REEF CONSERVATION PROGRAM



## S U M M A R Y O F 2 0 0 4 A C C O M P L I S H M E N T S

**I**n fiscal year (FY) 2004, the National Oceanic and Atmospheric Administration (NOAA) Coral Reef Conservation Program (CRCP) received \$26.85 million to support activities to conserve, manage, and understand coral reef ecosystems in the U.S. and around the world. The funding allowed NOAA to implement over 200 projects that address priorities identified by the U.S. Coral Reef Task Force (Task Force), and in the *U.S. National Action Plan to Conserve Coral Reefs* (NAP), the *U.S. National Coral Reef Action Strategy* (NAS), Executive Order 13089: Coral Reef Protection, and the Coral Reef Conservation Act of 2000 (CRCA). These projects were conducted by staff in the NOAA Ocean Service, NOAA Fisheries Service, NOAA Research, and NOAA Satellites and Information Service, and involved hundreds of NOAA and non-NOAA partners, as well as collaboration among numerous offices. The CRCP also served as the Executive Secretariat for the Task Force, helping to lead and coordinate the coral reef conservation efforts of twelve federal agencies, seven U.S. states and territories, and three Freely Associated States.\*

Data products and publications listed in this report can be accessed through NOAA's Coral Reef Information System (CoRIS) at <http://coris.noaa.gov>. In addition, current news and highlights of NOAA's recent coral reef activities can be found on the NOAA Coral Reef Conservation Program Web site (<http://coralreef.noaa.gov>). This report summarizes some of the many accomplishments of the NOAA CRCP in FY2004.

\* The seven participating U.S. states and territories are: American Samoa, the Commonwealth of the Northern Mariana Islands, Florida, Guam, Hawaii, Puerto Rico, and the U.S. Virgin Islands. The Freely Associated States participate in the Task Force as observers. They are: the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau. Visit <http://coralreef.gov> for a full list of Task Force members.



**In 2004,  
NOAA's Coral Reef Conservation Program  
provided funding and other support for activities  
in the following NOAA offices...**

**National Ocean Service (NOS)**

- Office of Response and Restoration
- National Centers for Coastal and Ocean Science
- Office of Ocean and Coastal Resource Management
- National Marine Sanctuary Program
- Coastal Services Center
- Pacific Services Center
- Special Projects Office
- International Program Office
- National Geodetic Survey
- Office of Coast Survey

**National Marine Fisheries Service (NMFS)**

- Office of Habitat Conservation
- Southeast Regional Office
- Southeast Fisheries Science Center
- Pacific Islands Regional Office
- Pacific Islands Fisheries Science Center
- Office of Protected Resources
- Office of Sustainable Fisheries
- Office of Science and Technology
- Office of Law Enforcement

**Oceanic and Atmospheric Research (OAR)**

- Atlantic Oceanographic and Meteorological Laboratory
- National Sea Grant College Program
- NOAA's Undersea Research Program
- Office of Ocean Exploration

**National Environmental Satellite, Data, and Information Service (NESDIS)**

- Office of Research and Applications
- National Oceanographic Data Center
- National Climatic Data Center
- National Geophysical Data Center
- Office of Satellite Data Processing and Distribution

## MAP CORAL REEFS

**Maps** provide important information about the extent and structure of coral reef ecosystems. These maps are key tools for effectively managing coastal resources, designing research activities, identifying essential fish habitat, conducting damage assessments, tracking status and trends, and evaluating results of management efforts. In 2004, NOAA continued efforts to fulfill the NAP goal of mapping and characterizing all U.S. reefs. NOAA:

- *Conducted cruises to map benthic habitat in the Commonwealth of the Northern Mariana Islands (CNMI), Guam, American Samoa, and the Pacific Remote Island Areas (Johnston Atoll, Howland and Baker Islands, and the U.S. Phoenix Islands), by collecting high-resolution multibeam bathymetry and imagery data for more than 500 square kilometers.*
- *Completed review of new shallow water (<30 meters) benthic habitat maps of the U.S. Pacific Territories. The maps were generated through the visual interpretation of satellite imagery.*
- *Completed phase two of three in the effort to complete shallow water benthic habitat maps of the Main Hawaiian Islands.*
- *Awarded a two-year cooperative agreement with the National Defense Center of Excellence for Research in Ocean Science to accelerate benthic habitat mapping and classification in the waters of the Hawaiian Islands and the surrounding Exclusive Economic Zone and to support the initial mapping cruise of the new NOAA research vessel HI'IALAKAI.*
- *Completed moderate-depth mapping and characterization of National Monuments, Parks, and selected territory waters of U.S. Virgin Islands (USVI).*
- *Began development of a Southern Florida Shallow Water Coral Reef Ecosystem Mapping Implementation Plan, and obtained high-resolution satellite imagery for part of south Florida.*

### Newest NOAA Vessel Commissioned for Coral Reef Research

With support from the CRCP, the newest NOAA vessel, *HI'IALAKAI* (Hawaiian for "embracing pathways to the sea"), was commissioned in Hawaii to support NOAA science and outreach needs in the Northwestern Hawaiian Islands (NWHI) and elsewhere in the Pacific. This vessel is designed and equipped to support diving operations and multi-beam sonar mapping of the ocean floor. The vessel undertook its inaugural mission in September and October 2004 to conduct coral reef ecosystem monitoring and assessment in the NWHI Coral Reef Ecosystem Reserve. The cruise conducted over 800 safe dives and produced a suite of biological, habitat, and oceanographic data, which will improve our understanding of these unique resources.

## MONITOR AND ASSESS REEF CONDITION

**Monitoring** allows managers to assess reef conditions, diagnose reef problems, prioritize and implement solutions, evaluate the results of management decisions, and forecast future conditions. The NAP calls for an integrated, nationwide coral reef monitoring system to profile and track the health of U.S. coral reef ecosystems. This system can be used to measure the effectiveness of management actions. NOAA conducted a number of activities to enhance monitoring and assessment of U.S. coral reef resources in 2004. NOAA:

- *Implemented the fourth year of a program that combines continuous oceanographic monitoring using in-situ moorings with intensive oceanographic field surveys. To date, 97 monitoring sites have been established in the NWHI, Guam, CNMI, American Samoa, and the Pacific Remote Island Areas.*

### Coral Reef Ecosystems Integrated Observing System Established

Knowledge of oceanographic and biological processes is fundamental to understanding the structure and function of coral reef ecosystems. In FY2004, the CRCP established the Coral Reef Ecosystem Integrated Observing System (CREIOS) to better integrate NOAA observing capabilities in coral reef ecosystems. CREIOS activities include a range of NOAA coral reef mapping, monitoring, and assessment efforts and will help NOAA better meet reef managers' needs for information on coral reef health. CREIOS is integrating observations from local to global scales, including in-situ monitoring, mapping, and global satellite data processing.

- Expanded access to coral reef data and information through the NOAA Coral Reef Information System (CoRIS) Web site by adding access to over 680 new data and information products (over 6,200 total), and over 1,500 glossary terms (over 3,000 total).
- Completed four research cruises to conduct spatial monitoring of reef fish and benthic habitats in the Pacific Remote Island Areas and in American Samoa.

### Biological Monitoring of Marine Reserves in South Florida Shows Increases in Fish Populations

The CRCP completed the third year of a project that monitors and assesses changes to coral reef fish and invertebrate populations in a region of southern Florida containing protected areas. On a twenty-day research cruise, SCUBA divers surveyed fish, lobsters, and conch within coral reef habitats in and around the Florida Keys National Marine Sanctuary (FKNMS) and the Dry Tortugas National Park (DTNP). Preliminary analyses showed significant changes in 2004, including increased occurrence and abundance of red grouper and black grouper, two ecologically important and economically valuable species. The highest densities were found within the FKNMS Tortugas North Ecological Reserve and the DTNP. Researchers observed a record ten goliath grouper, a species that is protected within both the DTNP and the Tortugas North Ecological Reserve.

- Performed fish surveys and benthic habitat surveys in Puerto Rico and USVI, integrating the data to estimate abundances for over 175 species of fish, 40 species of coral, and 80 species of algae.

### Coral Reef Watch Provides Real-Time Data on the Condition of Coral Reefs

As part of CREIOS, NOAA Coral Reef Watch (CRW) continued its work to combine in-situ and satellite monitoring to provide real-time meteorological and oceanographic data on coral reef bleaching and other coral reef conditions. Highlights of CRW activities in 2004 include: deployed new hourly data recording instruments at two sites in the Atlantic/Caribbean; established partnerships to install Coral Reef Early Warning System stations in Jamaica and Australia; established a new sea surface temperature buoy site at Johnston Atoll; completed initial analysis of cores from two sites in the FKNMS to produce a historical analysis of coral bleaching; and continued efforts to complete modeling of the reefs of Palau, in order to identify areas that are highly sensitive to coral bleaching.

- Continued to strengthen the National Coral Reef Monitoring Program through grants and enhanced partnerships with states, territories, and other federal agencies for monitoring and assessment of coral reefs.
- Completed a draft of the second biennial “State of the Coral Reef Ecosystems of the United States and Pacific Freely Associated States,” a collaborative report on the condition of U.S. coral reef ecosystems. The report is used to evaluate the effectiveness of coral reef conservation and management practices.

## CONDUCT STRATEGIC RESEARCH

**Research** is critical to understanding how coral reef ecosystems function, how human activities impact reef processes, and how managers and the public can reduce or eliminate these impacts, and sustain healthy coral reef ecosystems. The NAP calls for strategic research to help identify the causes, consequences, and solutions to coral reef decline. Strategic research includes understanding the social and economic factors necessary for effective conservation of coral reef ecosystems. NOAA:

- Continued funding for the National Coral Reef Institute (located in Florida), the Hawaii Coral Reef Initiative-Research Program, and the Caribbean Coral Reef Institute (located in Puerto Rico). These programs conduct and support important coral reef research efforts in the Pacific and Caribbean.
- Continued a cooperative research program to study large-scale distribution and habitat characteristics of groupers in the Florida Keys.
- Completed the first stage in an on-going research effort by obtaining a suite of microchemical signatures of the inner ear bones of important reef fish, which can be used to identify nursery areas in the Florida Keys.
- Tested and implemented coral recovery models to generate litigation-quality estimates for the recovery of coral habitats that sustain injury from vessel groundings.
- Established twelve new elkhorn coral (*Acropora palmata*) monitoring plots in the Key Largo area, and conducted an experiment to test whether lesions appearing as White Pox disease on elkhorn coral are transmissible to staghorn coral (*Acropora cervicornis*).

- *Provided technical assistance on the economic valuation of local coral reefs and other coastal resources to local agencies in CNMI, Guam, and Puerto Rico, the first three states and territories to begin the study.*

### **Predicting, Responding to, and Preventing Disease Outbreaks in Coral Reefs**

The CRCP supports and participates in the work of the multi-partner Coral Disease and Health Consortium (CDHC), which leads the effort to study diseases in coral reef ecosystems. The goal of the CDHC is to create tools for early warning and identification of the causes of disease outbreaks, and to identify potential solutions to prevent and mitigate future outbreaks. In 2004, CDHC participants began developing a web-based tool to guide investigators in the process of diagnosing a coral disease, and will soon publish a comprehensive diagnostic guide. The CDHC also sequenced over 3000 cDNA clones from several coral species. This DNA research expands our knowledge of the genes that regulate normal coral functions, as well as those genes that help corals respond to disease and environmental disturbances.

- *Successfully tested a prototype camera bait station that will be used to conduct long-term monitoring of exploited bottom fish populations in the U.S. Pacific.*
- *Completed a socioeconomic assessment of commercial bottom-fishing in the NWHI to support the sanctuary designation process for the NWHI Coral Reef Ecosystem Reserve. The report includes information on benefit and cost estimates, an estimate of the full market value of the bottomfishing industry, opinions and perceptions of the fishermen and others involved in the industry, as well as a summary of existing socioeconomic related information.*

### **Quantifying the Value of our Nation's Coral Reefs**

Greater understanding of the social and economic value of coral reefs is critical to the long-term success of all coral reef management programs. The CRCP worked with local and federal partners to complete a coral reef survey instrument to quantify the value of Hawaiian coral reef ecosystems to the U.S. population. The survey tools were developed using input from focus groups and survey research experts, and can be used in the future to quantify the value of coral reefs in other areas. The survey will be carried out in FY2005 to help Hawaii's coastal managers develop effective coral reef management strategies and help educators address citizen concerns.

## **INCREASE EFFECTIVENESS OF EXISTING CORAL REEF MARINE PROTECTED AREAS (MPAS)**

**Coral reef protected areas** can help safeguard these unique and important resources by protecting important coral reef habitats. NOAA works with stakeholders to strengthen the effectiveness of existing protected areas and to design new protected areas. In an effort to improve coral reef protected areas, NOAA:

- *Completed the final NWHI Coral Reef Ecosystem Reserve Operations Plan, which will guide the functioning of the Reserve during the sanctuary designation process and will form the foundation of the draft sanctuary management plan.*
- *Catalyzed an effort to develop management plans for Puerto Rico's Marine Natural Reserves.*
- *Refined data and completed sensitivity analysis routines in Ecopath to model the effectiveness of marine reserves in Puerto Rico.*
- *Supported a new effort by the National Marine Protected Area Center to conduct a nationwide inventory of de facto marine protected areas.*
- *Completed the second year of an ongoing effort to monitor coral reef fish utilization of protected areas and recruitment connectivity between the Florida Keys and Meso-American reefs by identifying fish spawning aggregations and sampling newly settled recruits.*

### **Reef Fish Monitoring Studies Translate to Management Action**

The Madison-Swanson and Steamboat Lumps MPAs on the West Florida Shelf were established in 1999 as a management alternative to improve skewed sex ratios and decreased population levels in gag grouper. A project was designed to evaluate the effectiveness of these areas to increase reproductive output and act as refuges for mature male gag grouper. In addition to the two protected areas, a similar area open to fishing (Twin Ridges) was studied to separate natural population fluctuations from any effect of the fishing closures. The three areas were sampled during multi-leg cruises between 2001 and 2004. Information from this study was used by the Gulf of Mexico Fishery Management Council to extend the closure of the Madison-Swanson and Steamboat Lumps MPAs or the next six years.

- Continued efforts to characterize and quantify fishing activity within and adjacent to the Madison-Swanson and Steamboat Lumps protected areas in the Gulf of Mexico.
- Completed studies of benthic habitat use in two natural reserves in Puerto Rico that are dominated by coral reef and seagrass areas to determine human impacts to these habitats and, in coordination with the reserve managers, develop potential management strategies to eliminate or reduce these impacts.



## REDUCE ADVERSE IMPACTS OF FISHING

**Overfishing** is one of the most common threats to coral reef ecosystems worldwide. NOAA strives to increase stakeholder awareness and participation in fishery management and to strengthen permitting and enforcement of current regulations. The NAP calls for reducing adverse impacts of fishing and increasing sustainable management of coral reef fisheries through improved scientific information, coordination, enforcement, and management approaches. To address this issue, NOAA:

- Continued surveys of the distribution of trap fishing and its effects on coral reef ecosystems in Puerto Rico and the USVI and presented preliminary results to the Caribbean Fishery Management Council.
- Initiated a socio-cultural assessment of the fishing communities in Haiti that exploit the resources of Navassa Island.
- Interviewed stakeholders in Puerto Rico and the USVI to collect socioeconomic data on fisheries management measures in these jurisdictions.
- Worked with the Puerto Rico Department of Natural and Environmental Resources (DNER) to create a Coral Reef Ranger Team. The goal of establishing the Team is to improve enforcement of regulations that protect coral reefs in Puerto Rico. The Ranger Team participated in trainings and exchanges with the staff of the FKNMS.

## Working with Commercial and Recreational Fishers of Puerto Rico to Conserve Coral Reef Ecosystems

In partnership with the Puerto Rico DNER, NOAA held workshops for commercial and recreational fishers around Puerto Rico and its surrounding islands focusing on the new Puerto Rico fishing regulations and NOAA Fisheries highly migratory species regulations. As a result of recommendations made by fishers during the workshops, DNER has expanded fisher participation in the panel reviewing and drafting amendments to the fishery regulations. DNER is also circulating educational materials from the workshop including laminated sheets and calipers as part of the new commercial licensing process. The materials were also provided to enforcement officials within DNER.

- Compiled commercial and recreational landing statistics for Florida's east coast.
- Analyzed data from surveys of large coral reef fish across fourteen islands and five shoals of the Marianas Archipelago to assess the status of their populations. Results indicate that large fish (all taxa pooled) occurred in relatively higher densities around the essentially uninhabited northernmost islands of the archipelago.
- Hired a coral reef ecologist in CNMI as a NOAA liaison to provide technical expertise to enhance coral reef management efforts.
- Supported community-based fishery management efforts in American Samoa.
- Supported a new initiative in Guam to increase the enforcement capacity of local rangers through a conservation officer reserve program.
- Continued to examine the extent of larval transport from reserves in the Main Hawaiian Islands and the NWHI by analyzing the presence of trace elements found in fish ear bones. Initial data indicate a slower larval growth rate in the cooler waters of the distant NWHI.

## REDUCE HABITAT DESTRUCTION

**Coastal uses**, such as recreational boating, beach renourishment, and laying new pipelines or cables, can have negative impacts on coral reef ecosystems.

For example, vessel groundings can cause injury to coral reef ecosystems by destroying habitat, releasing pollutants, and entrapping wildlife. The NAP calls for initiation of actions to reduce the impacts of vessel groundings, development, and other coastal uses. To support activities that enable U.S. states and territories to respond to and reduce habitat destruction, NOAA:

- *Initiated a project to integrate coral reef locations, marine protected areas boundaries, and other pertinent environmental features into navigation systems for the Florida Keys and the Dry Tortugas in order to reduce the risk of physical destruction to reefs from groundings and pollution from ships.*

### Addressing the Impact of Abandoned Vessels on Coral Reef Ecosystems

In 2004, the Abandoned Vessel Project (AVP) completed a comprehensive database documenting the location of hundreds of abandoned vessels throughout the U.S. Caribbean and Pacific islands. The AVP also collected information on how coastal states manage vessel impacts for inclusion in a web resource for coastal managers. Additionally, a final report on the 2003 vessel surveys in Guam and CNMI was released.



## REDUCE POLLUTION

**Both land-based and sea-based pollution** can cause coral reef loss and degradation by increasing the amount of sediments, nutrients, and debris in the water column. To improve the health of the nation's coral reef ecosystems, the concentration and cumulative impacts of pollutants needs to be reduced. The NAP calls for action to reduce the quantity of sediments, nutrients, debris, and other pollutants entering coral reef ecosystems and to mitigate their impacts on the ecosystem. NOAA:

- *Held workshops for coral reef scientists and managers in the Pacific and Atlantic to share advances in the science of land-based pollution impacts on reefs, and to explore the technical approaches needed to address the issue.*

### Tons of Marine Debris Removed from Northwestern Hawaiian Islands

A large amount of derelict fishing gear and other debris becomes entangled in the coral reefs of the NWHI every year. Much of the fishing gear can be traced back to the distant fisheries of the North Pacific Rim. Through the coordinated efforts of offices across the CRCP, over 112 metric tons of debris were removed from the NWHI in FY2004. To date, over 440 metric tons have been removed and documented in a database by debris type, size, and other physical characteristics that may assist in identifying presumed fishery origins.

- *Supported a seminar in partnership with the Department of State and the Asian-Pacific Economic Cooperation Economies on derelict fishing gear and related marine debris.*
- *Created high-resolution shoreline maps for use in response to hazardous materials spills as part of Environmental Sensitivity Index (ESI) maps for Guam and CNMI.*
- *Supported the development and implementation of Local Action Strategy (LAS) projects to reduce impacts to coral reefs from land-based sources of pollution in the U.S. states and territories. Projects include watershed mapping and planning, reforestation with native species to reduce erosion and sedimentation, and quantification and characterization of sources of pollution.*
- *Began development of GIS management tools to address land-based sources of pollution in Puerto Rico and USVI.*

## RESTORE INJURED HABITATS

**At times, active restoration** is needed to help prevent further degradation or to enhance the natural restoration process in injured or damaged coral reef habitats. The NAP calls for increased capability of managers to effectively and efficiently restore injured or degraded coral reefs where appropriate. To support activities that enable states and territories to assess and restore damaged coral reef areas, NOAA:

- *Collected, reared, and settled over 1000 *Acropora palmata* larvae on reef rubble and planted approximately 400 three-week old juvenile corals at the Wellwood restoration site in Florida.*

- Completed research expeditions to Mona Island, Desecheo Island, and La Parguera, Puerto Rico. Surveys of fragment survival, growth, reattachment, and health, as well as reef fish densities at the M/V FORTUNA REEFER grounding site were completed, as well as surveys of benthic cover, and occurrence of coral disease at La Parguera shelf edge reefs, Desecheo Island, Gallardo, and Mona Island.

### Restoration of Coral Reefs and Seagrass Beds

The Restoration and Assessment of Coral Ecosystems (RACE) Program works with the State of Florida to assess and restore natural resources injured by small vessel groundings within the FKNMS. The RACE process includes injury assessment, restoration planning, case settlement, restoration of the damaged site, and monitoring of the restoration effectiveness. In 2004, the RACE Program completed twenty-six seagrass injury assessments and twenty-five restoration plans; another five plans were drafted. The claims associated with the restoration plans total \$1.8 million in damages. Seven cases were settled totaling a quarter of a million dollars.

- Continued to monitor the fish community for recovery and restoration effectiveness at both the R/V ISELIN grounding at Looe Key Reef in the Florida Keys and the M/V FORTUNA REEFER grounding at Mona Island, Puerto Rico.

## REDUCE GLOBAL THREATS

Throughout the world, coral reefs are threatened directly and indirectly by a number of natural and anthropogenic stresses such as increased storm activities, coral bleaching and mortality, resource extraction, and coastal development. Healthy coral reefs are critical to U.S. efforts to promote economic stability, to improve human health, and to conserve biodiversity in other countries. The NAP calls on the U.S. to reduce threats to coral reef ecosystems internationally and promote sustainable management of reef resources worldwide. NOAA:

- Assessed the location, extent, and impact of current live rock harvesting practices in Fiji and developed recommendations to ensure the sustainability of the trade. The project provided recommendations for sustainable harvest and mariculture alternatives that were used by the government of Fiji to develop a management plan for sustainable live rock harvest and trade.

### Workshop and CITES Listing of Seahorses

In partnership with the Mexico Authority of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), NOAA and U.S. Fish and Wildlife Service (USFWS) led the first International workshop on the implementation of the CITES Appendix II listing for seahorses. Recommendations on monitoring and management needs were developed to make non-detriment findings for the sustainable export of seahorses. Workshop participants identified the need for a series of management measures that should be applied through an adaptive management process. NOAA also worked with the USFWS to develop a successful listing proposal for the humphead wrasse, the first coral reef fish to be listed under CITES.

- Helped establish cyanide detection laboratories in Malaysia, Philippines, and Vietnam, to monitor, verify, and test marine aquarium fish for the presence of cyanide. The project provided supplies, equipment, and training for government fisheries agencies. The facilities will be turned over to the respective governments once the detection protocol is successfully implemented.
- Provided content and funding support for two Global Coral Reef Monitoring Network (GCRMN) reports: Status of Coral Reefs of the World: 2004 and Methods for Ecological Monitoring of Coral Reefs.
- Supported the translation of Global Socioeconomic Monitoring Program documents for coral reef managers into Spanish to facilitate the expansion of the program into Spanish-speaking countries in Latin America and the Caribbean.
- Provided funding for the senior scientist position at the Palau International Coral Reef Center.
- Supported the release of How is Your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness. This guidebook is meant to aide protected area managers and practitioners to better achieve the goals and objectives of the areas they manage.

## INFORM PUBLIC

A key element of coral reef protection is a strong outreach effort to inform the public about the value of coral reef ecosystems and how to minimize the threats they face. Effective outreach requires reliable access to and efficient sharing of information with all stakeholders.



The NAP calls for increased awareness and understanding of the ecological, cultural, and socioeconomic importance of coral reef ecosystems among the widest possible audience. NOAA:

- Continued to Chair and support the activities of the U.S. Coral Reef Task Force Education and Outreach Working Group. This included efforts to increase outreach to and coordination with local coral reef stakeholders during Task Force meetings, as well as efforts to foster increased networking and collaboration among the national coral reef outreach community. The Working Group also compiled and released a CD of coral reef outreach and education materials from over 20 organizations in 8 languages.
- Developed a poster to provide information aimed at limiting noncompliance and illegal activity in the Madison-Swanson and Steamboat Lumps marine reserves off the West Florida Shelf.
- Developed an on-line education module on coral bleaching through the Coral Literature, Education and Outreach Program. In addition, over two hundred new abstracts and scanned documents related to coral reef research from Puerto Rico and the Caribbean were made available.
- Initiated an effort to raise awareness of deep sea corals, particularly those found in the Oculina Bank Habitat Area of Particular Concern off the east coast of Florida.

- Launched a new CRCP website and established a new monthly newsletter, NOAA Coral Reef News, which attracted over 700 subscribers in its first year.
- Expanded efforts to share information on coral reef conservation through brochures, exhibits, and participation in conferences and other workshops that build on NOAA resources and activities.



## STATE AND TERRITORY MANAGEMENT CAPACITY BUILDING

The states and territories have indicated that targeted technical assistance will help them address nine of the top ten threats to coral reef ecosystems including tourism and recreational overuse, overfishing, and land-based pollution. In an effort to help build capacity at the local level, NOAA:

- Provided support for the All Islands Coral Reef Secretariat to interface with federal agencies and other partners regarding All Islands priorities and to provide planning assistance.

### New Educational Partnership to Increase Coral Reef Education in Puerto Rico

The CRCP partnered with the University of Puerto Rico's Science on Wheels Educational Center to develop a Coral Reef Education Team for schools to promote awareness of coral reefs. Graduate students visited K-9 schools and provided information about coral reef ecosystems to students. Teachers were provided with additional coral reef educational resources, such as maps, videos, and activity books. The Coral Reef Education Team will provide participating schools with additional training activities and follow-up workshops.

- Produced posters and laminated pamphlets for commercial, recreational, and aquarium trade fishers regarding the new Puerto Rico Fishing Regulations.
- Created a bilingual pamphlet about the importance of coral reef ecosystems to be distributed at hotels, dive shops and tourist information centers in Puerto Rico.
- Created educational materials and lesson plans regarding coral reef ecosystems and conservation to be used by schools in the U.S. Caribbean.

### Local Action Strategy Projects Advance Coral Reef Conservation

NOAA and the Task Force assisted the seven U.S. coral reef jurisdictions with the development of Local Action Strategies (LAS) to address key local threats to coral reefs including overfishing, lack of awareness, recreational overuse, land-based sources of pollution, climate change, and disease. The LAS were developed through extensive workshops, briefings and public meetings designed to engage local stakeholders, including local and international non-governmental organizations, academia, industry, and concerned citizens. Selected LAS were completed by all seven jurisdictions, and several were finalized before the end of 2004, which allowed NOAA to more clearly identify local needs, connect local priorities to national goals, and coordinate agency actions to better support each local jurisdiction's management of their coral reef resources. NOAA is continuing to work with each jurisdiction to implement priority coral reef conservation projects outlined in the LAS.

- Supported two meetings and other efforts of the U.S. Coral Reef Task Force, including the creation of additional Task Force outreach materials, and development of the first biennial progress report to Congress on implementation of the NAS.
- Supported the second year of the Coral Reef Management Fellowship Program. This fellowship places graduates of masters degree programs with resource management agencies in the U.S. Flag islands for two-years to complete activities such as: local website updates, education projects, establishment of internship programs, and support for development and implementation of LAS in each jurisdiction.
- Built capacity to address reef resilience to climate change through local management action. NOAA collaborated with leading experts on coral reefs and bleaching to develop displays and flyers about reef resilience, provide training opportunities, and support the development of A Manager's Guide to Coral Bleaching.
- Funded a cooperative agreement with The Nature Conservancy Hawaii Chapter to support: 1) the Hawaii Marine Gap program, 2) the Coastwatch program, and 3) a meeting of representatives from the commercial tourism industry to establish a "voluntary fund" that will be used for conservation purposes.
- Awarded and administered cooperative agreements with seven U.S. states and territories, the Republic of Palau, and Kosrae (in the Federated States of Micronesia) to conduct long term monitoring of coral reef ecosystems as part of the National Coral Reef Monitoring Program.
- Awarded eighteen research grants through the Coral Reef Ecosystem Research Grants Program, which leverages funds with the National Undersea Research Program for increased coral reef ecosystem research.
- Awarded sixteen grants under the International Coral Reef Conservation Grant Program to local community-based NGOs as well as international NGOs. Federal funds were leveraged with non-federal matching funds for over \$1 million to support international coral reef conservation projects. Selected projects addressed the following topics: 1) management effectiveness in MPAs, 2) regional approaches to marine reserves in the Caribbean and Southeast Asia, and 3) Socio-Economic monitoring in coral MPAs.
- Administered four cooperative agreements for projects to Improve or Amend Coral Reef Fishery Management Plans with the Western Pacific Regional Fisheries Management Council, the South Atlantic Fisheries Management Council, the Gulf of Mexico Fisheries Management Council, and the Caribbean Fisheries Management Council.
- Awarded fourteen grants to Universities, NGOs, and private organizations as part of the General Coral Reef Conservation Grants, leveraging non-federal funds for over \$1 million in conservation projects. Supported activities included fisheries and marine protected area enforcement, improvement of fisheries management, outreach and education, and community-based management and monitoring.
- Supported priority management projects in American Samoa, CNMI, Florida, Guam, Hawaii, Puerto Rico, and the USVI, which addressed LAS projects, marine protected area management, fisheries enforcement, and education and outreach as part of the State and Territory Coral Reef Management Grants.



## CORAL REEF CONSERVATION GRANT PROGRAM

**The Coral Reef Conservation Act of 2000** requires that NOAA establish and administer the Coral Reef Conservation Grant Program as part of a national effort to conserve coral reefs. This program is supported in part by the U.S. Department of Interior and provides grants to U.S. state, territory and the Freely Associated States governments, regional fishery management councils, non-governmental organizations (NGOs), and academia for local on-the-ground work. In 2004 almost \$5 million was awarded in grants for coral reef conservation and research activities. NOAA:



## CORAL REEF CONSERVATION FUND

The **Coral Reef Conservation Fund** (Fund) is a four-year-old partnership between NOAA and the National Fish and Wildlife Foundation (NFWF) to build partnerships for coral reef conservation. The partnerships created through this grant program, mandated under the Coral Reef Conservation Act, are important for on-the-ground conservation of coral reefs throughout the world. Through the partnerships, grant recipients are able to generate substantial matching funds for the conservation of coral reefs. Through the Fund, NOAA:

- Supported 26 on-the-ground projects with a total value of \$2.4 million in 2004. Grants were awarded to organizations in six U.S. states and territories and thirteen countries, for restoration of coral reefs and mangroves; reduction of land-and marine-based pollution; outreach and education; monitoring, research and training; establishing mooring buoys; and improving the effectiveness of coral reef protected areas. Since 2000, the Fund has provided nearly \$10 million in federal and non-federal matching funds for 116 projects in the U.S. and abroad.



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