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General Program Description

NOAA's coral reef research and management efforts are realized primarily through its <u>Coral Reef</u> <u>Conservation Program</u> (CRCP). The program brings together the expertise of the offices working on coral reef issues in NOAA's <u>National Ocean Service</u>, <u>National Marine Fisheries Service</u>, <u>Oceanic</u> <u>and Atmospheric Research</u>, and <u>National Environmental Satellite and Information Service</u>. Through this program, NOAA partners with scientific, private, government, and nongovernmental organizations at the local, state, federal, and international levels to support effective management and sound science to preserve, sustain and restore valuable coral reef ecosystems.

As co-chair of the <u>U.S. Coral Reef Task Force</u> (Task Force), and as directed by the Coral Reef Conservation Act of 2000 (CRCA), NOAA has the responsibility and expertise to conserve coral reef ecosystems. To achieve the goals of the program, the CRCP conducts and supports: mapping, monitoring, and assessment; natural and socioeconomic research and modeling; outreach and education; and management and stewardship efforts. NOAA's work on coral ecosystems is focused on the activity areas listed below.

Explore the links below to learn more about NOAA's coral reef activities or visit <u>www.coralreef.noaa.gov</u> to view recent news from the NOAA Coral Reef Conservation Program.

NOAA Coral Reef Activities

<u>Assess and Characterize U.S. Coral Reefs</u> - Mapping and monitoring are key to understanding the locations of coral reef ecosystems, how they function, how human activities impact reef processes, and how managers and the public can reduce or eliminate these impacts.

<u>Reduce Impacts of Coastal Uses</u> - Human use of coastal areas can have negative impacts on nearby coral reef ecosystems. Efforts to prevent or minimize these impacts are important to coral reef conservation. In some cases, active restoration is needed to repair damaged areas.

<u>Reduce Adverse Impacts of Fishing</u> - Improved management of coral reef fisheries is an important component of the effort to protect and restore coral reef ecosystems. Efforts to reduce the adverse impacts of fishing include increased enforcement and outreach as well as research to increase the understanding of fisheries' impacts on coral reef ecosystems.

<u>Reduce Impacts of Pollution & Coral Disease</u> - Pollution from the land and the sea can cause harm to corals by making them more susceptible to diseases and other stressors. Reducing or eliminating pollutants in reef areas is an important step towards maintaining healthy reefs.

<u>Improve Use and Effectiveness of Marine Protected Areas</u> - Protected areas in coral reef ecosystems can provide important shelter from some of the threats that reefs face and can provide researchers with key sites for coral reef ecosystem research and monitoring. Improving the effective use of these areas is important to coral reef management efforts.

<u>Reduce Threats to International Coral Reefs</u> - Supporting global and international initiatives to understand and protect coral reefs is essential to the protection of coral reefs in U.S. waters and throughout the world.

Reduce Impacts of Climate Change - Coral reefs are highly sensitive to temperature fluctuations

and when amplified by climate change, these fluctuations can result in coral bleaching. Efforts to increase local managers' ability to respond to bleaching events are important to minimize their impact and reduce the loss of healthy coral reefs.

<u>Address Deep Coral Communities</u> - Deep coral communities are under threat from human activities such as fishing and mineral exploration. The primary conservation measures for deep corals in the U.S. consist of managing the impacts of fishing and providing protection for a broader set of impacts by protecting certain areas.

<u>Increase Awareness: Education and Outreach</u> - A strong outreach and education effort is a key element of coral reef protection. Effective outreach requires reliable access to and efficient sharing of information with all stakeholders.

<u>Northwestern Hawaiian Islands Marine National Monument</u>—The Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve was created on December 4, 2000. On June 15, 2006, President Bush signed a proclamation that created the Northwestern Hawaiian Islands Marine National Monument.

<u>Coral Reef Research Institutes and Programs</u> The CRCP supports coral reef research institutes in Hawaii, Florida, and the Caribbean.

<u>Coral Reef Grants Programs</u> Each year, subject to the availability of funds, the CRCP awards a number of grants for coral reef conservation activities.

NOAA and the U.S. Coral Reef Task Force

Learn more about NOAA's participation and work with the U.S. Coral Reef Task Force.

NOAA Line Offices Working on Coral Reefs

Read more about the NOAA Line Offices that work to understand and protect coral reefs.

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NOAA's Efforts to Assess and Characterize U.S. Coral Reef Ecosystems

NOAA and its partners are working together to map and monitor U.S. coral reefs in order to provide valuable baseline and long-term data on the health and status of coral reef ecosystems. Monitoring programs can track trends in coral reef health to reveal patterns in their condition before irreparable harm occurs. Long-term monitoring is also essential to the efforts to evaluate the effectiveness of management actions.

In 2004, the NOAA Coral Reef Conservation Program established the Coral Reef Ecosystem Integrated Observing System (CREIOS) to join together NOAA capabilities in coral reef observation. CREIOS includes a range of NOAA coral reef observation efforts and helps NOAA better meet the needs of reef managers for information on the condition of coral reef health by integrating observations from local to global scales, including in-situ monitoring, mapping, and global satellite image processing.

Mapping

Detailed maps provide important information about the extent and structure of coral reef ecosystems. These maps are a critical aspect of effectively managing coastal resources, designing research activities, identifying essential fish habitat, conducting damage assessments, tracking status and trends, and evaluating results of management efforts. NOAA and its partners are using a variety of technologies to map all U.S. shallow water coral reef ecosystems and associated deeper reefs. The <u>National Coral Reef Action Strategy</u> (NAS) calls for the completion of U.S. shallow water coral reef mapping by 2009.

NOAA has made significant progress towards this goal. In the U.S, comprehensive coral reef habitat maps for Puerto Rico, the U.S. Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, and American Samoa have been completed. In the Main Hawaiian Islands and Florida, NOAA and its partners are developing comprehensive digital coral reef ecosystem benthic habitat maps, and in the Northwest Hawaiian Islands (NWHI), NOAA is updating positional accuracy data for several atolls and islands in the area to provide more accurate navigational charts.

Currently, digital shallow water benthic habitat maps have been published and distributed for over 10,500 km² of shallow water coral reef ecosystem habitat. These maps are being used by coastal managers, scientists, and educational groups in the jurisdictions. NOAA's deeper water mapping and characterization activities have revealed tropical reefs at greater depths than previously known and improved our understanding of the contribution of these habitats to fisheries.

Monitoring

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 NAS calls for an integrated, nationwide coral reef monitoring system to profile and track the health of U.S. coral reefs ecosystems. This system will be used to measure the effectiveness of management actions. NOAA has completed a number of actions to enhance monitoring and assessment of U.S. coral reef resources.

NOAA conducts annual and biennial coral reef ecosystem monitoring cruises to a number of coral reef areas in the U.S. In addition, both large-scale satellite monitoring programs, such as Coral Reef Watch (CRW), and small-scale local monitoring projects are conducted each year to track changes in coral reef ecosystems and to increase predictive capabilities.

As part of coral reef monitoring efforts and to meet the requirements of the Coral Reef Conservation Act of 2000, NOAA reports biennially on the status of coral reefs in the United States. To date, two reports have been released which provide comprehensive information on reefs throughout the U.S. These reports are produced with numerous partners at the local, state and territory, and federal level. The reports can be accessed at CoRIS Data & Publications.

Data Dissemination

An important component of any effort to collect data is the corresponding effort to share the data with managers, researchers and the interested public. As data becomes available and is processed into usable forms, the CRCP shares that data through workshops, newsletters, reports and other publications. Data and information products from the CRCP are available on-line through the NOAA Coral Reef Information System (CoRIS).

Categories of Activities:

Mapping Monitoring Data Dissemination

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NOAA's Efforts to Reduce Impacts of Coastal Uses on Coral Reef Ecosystems

Activities in coastal areas, such as recreational boating, coastal development, beach re-nourishment, and laying new pipelines or cables, can have negative impacts on nearby coral reef ecosystems. For example, vessel groundings can cause injury to coral reef ecosystems by destroying habitat, releasing pollutants, and entrapping wildlife. The <u>National Action</u> <u>Strategy</u> (NAS) calls for initiation of actions to reduce the adverse impacts from vessel groundings, coastal development and other coastal uses. NOAA supports activities that enable States and Territories to respond to and reduce habitat destruction.

At times, active restoration is needed to help prevent further degradation or enhance the natural restoration process in injured or damaged coral reef habitats. The NAS calls for increased capability of managers to effectively and efficiently restore injured or degraded coral reefs where appropriate. NOAA both conducts and supports activities that assess and restore damaged coral reef areas.

The NOAA Coral Reef Conservation Program supports a number of activities to reduce the impact of coastal uses on coral reef ecosystems. These activities include efforts to reduce recreational overuse of coral reefs, as well as efforts to reduce the impacts of coastal development and maritime activities. NOAA has supported efforts to restore damaged coral reef and seagrass areas and conducted research to determine which restoration techniques are the most effective.

Categories of Activities

General Coastal Uses (Address Multiple Impacts) Restore Injured Habitats Reduce Impacts of Recreational Overuse Reduce Impacts of Coastal Development

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NOAA's Efforts to Reduce Adverse Impacts of **Fishing on Coral Reef Ecosystems**

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 National Action Strategy (NAS) calls for reducing adverse impacts of fishing and increasing sustainable management of coral reef fisheries through improved scientific information, coordination, enforcement and management approaches.

The NOAA Coral Reef Conservation Program has conducted numerous research and management activities in an effort to reduce the adverse impacts of fishing. As part of this effort, NOAA scientists are working to identify and protect important fish spawning aggregations in coral reef areas. NOAA also conducts research to better understand connectivity, habitat utilization patterns, and essential fish habitats for commercially important species in coral reef ecosystems. Projects are also underway to increase the effectiveness of management efforts to reduce overfishing and to minimize the impacts of fishing gear on coral reef ecosystems. NOAA researchers also conduct socioeconomic studies of commercial and recreational fishing activities in coral reef areas.

In addition, NOAA supports efforts to increase awareness and enforcement of fisheries and other laws in coral reef areas, and supports the efforts of the regional fishery management councils to incorporate ecosystem-scale management techniques into their fishery management plans for reef areas.

Categories of Activities

Identify and Protect Spawning Aggregations Reduce Impacts of Overfishing and Gear on Reefs Socioeconomic Studies of Fishing Impacts on Reefs Management Implementation to Reduce Fishing Impacts on Reefs Support Fisheries Enforcement and Outreach Understand Connectivity, Habitat Utilization, and Essential Fish Habitats

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http://coris.noaa.gov/activities/fishingimpacts.html



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NOAA's Efforts to Reduce Impacts of Pollution & Coral Disease

Both land-based and sea-based pollution can cause coral reef degradation or loss by increasing the amount of sediment, 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 must be reduced. The <u>National Action Strategy</u> (NAS) calls for action to reduce the quantity of sediments, nutrients, debris, and other pollutants entering coral reef ecosystems, and to mitigate their impacts to the ecosystem. The NOAA Coral Reef Conservation Program has worked to reduce the sources and impacts of marine and land-based pollution as well as the impacts of coral disease.

Many U.S. reefs are being severely impacted by diseases that weaken or kill corals and other reef species. In many cases, little is known about the source of, or treatment for these diseases. Working with its partners, NOAA established the interagency Coral Disease and Health Consortium (CDHC), which tracks and predicts coral disease outbreaks, and supports research aimed at finding solutions to these problems. The CDHC has created tools for early warning and identification of the cause of disease outbreaks, and has identified potential solutions to prevent and mitigate future outbreaks.

Since 2000, NOAA has collaborated with the State of Hawai'i, U.S. Fish and Wildlife Service, and numerous other partners to remove over 440 metric tons of derelict fishing gear from coral reefs in the Northwestern Hawaiian Islands. NOAA researchers also assess and monitor marine debris accumulation, identify potential sources, and evaluate the impacts of the debris on coral reefs and other protected species. In addition, NOAA works to enhance public awareness about the debris affecting these remote islands and atolls.

NOAA scientists have worked with their partners to develop Environmental Sensitivity Index (ESI) maps for U.S. coral reef areas. The maps are now complete for the Main and Northwestern Hawaiian Islands, American Samoa, and Puerto Rico. Draft maps for Guam and CNMI are also complete. The ESI maps consolidate information on shoreline habitats, sensitive biological resources and human resources to help managers respond to emergencies such as hazardous materials spills in reef areas.

Categories of Activities:

Reduce Marine-Based Sources of Pollution Reduce Land-Based Sources of Pollution Reduce Impacts of Coral Disease Revised August 10, 2010 by CoRIS Webmaster | About CoRIS Data | User Survey | Report Error On This Page Site hosted by NOAA Coral Reef Conservation Program, National Oceanic and Atmospheric Administration, U.S. Department of Commerce http://coris.noaa.gov/activities/pollution.html



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NOAA's Efforts to Improve Use and Effectiveness of MPAs

Coral reef protected areas can safeguard these unique and important resources by protecting important habitats from human impacts. Protected areas can also serve as important sources of coral larvae and juvenile reef fish for the surrounding ecosystem. The <u>National Action</u> <u>Strategy</u> (NAS) calls on NOAA and its partners to improve the use and effectiveness of existing marine protected areas. NOAA works with local, state, and federal partners and stakeholders to strengthen the effectiveness of existing protected areas.

NOAA and its partners are working to build and support networks of coral reef protected areas in the U.S., and to improve the effectiveness of protected area management. NOAA scientists conduct research to support protected area design and adaptive management. NOAA scientists also work to better understand the use of protected areas by a variety of species, including commercially important fish species. In addition, NOAA and its partners conduct studies on the socioeconomic impact and the effectiveness of coral reef protected areas.

Categories of Activities:

Build and Support Systems and Networks of MPAs Improve MPA Management Effectiveness Conduct Science in Support of MPA Design and Adaptive Management

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http://coris.noaa.gov/activities/protectedareas.html



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NOAA's Efforts to Reduce Threats to International Coral Reefs

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, resource extraction, and coastal development. Healthy coral reefs throughout the world are critical to U.S. efforts to promote economic stability, to improve human health, and to conserve biodiversity in other countries. The <u>National Action Strategy</u> (NAS) calls for U.S. action to reduce international threats to coral reef ecosystems and promote to sustainable management of reef resources worldwide.

NOAA has supported a number of international efforts to conserve coral reefs. For the past several years, these projects have been focused on the following categories of activities: Increasing the use and effectiveness of marine protected areas throughout the world; reducing the impacts of land-based sources of pollution on reefs; and reducing the impacts of international trade on coral reef species.

Categories of Activities:

General International Increase Use and Effectiveness of MPAs Reduce Land-Based Sources of Pollution Reduce Impacts of International Trade

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http://coris.noaa.gov/activities/international.html



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NOAA's Efforts to Reduce the Impacts of **Climate Change on Coral Reefs**

NOAA's Efforts to Reduce the Impacts of Climate Change on Coral Reefs

Coral reefs are highly sensitive to temperature fluctuations, and when amplified by climate change, these fluctuations can result in bleaching events. Efforts to increase local managers' ability to respond to bleaching events are important to minimize the impact of these events and to reduce the loss of healthy coral reefs.

As part of the NOAA Coral Reef Watch Program, a variety of data and alert products are available such as Sea Surface Temperature Anomaly Charts, Degree Heating Weeks Charts, and Coral Bleaching Indices.

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http://coris.noaa.gov/activities/climate.html



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NOAA's Efforts to Address Deep Coral Communities

In order to better respond to the emerging issues surrounding deep coral communities, NOAA formed a Deep Coral Communities Team in 2004 to coordinate NOAA's activities and responses to external inquiries regarding deep coral communities.

During its first year, the cross-NOAA team responded to Congressional questions, generated Geographic Information System maps describing known deep coral community locations, contributed to international reports on deep coral communities and corals in general, began compiling a Status of U.S. Deep Coral Communities report, and created an inventory of NOAA's deep coral community work to date. This inventory, titled "Profiles of NOAA's Activities on Deep Coral Communities," can be downloaded at the CoRIS Library.

NOAA also supports deep sea research through its National Undersea Research Program and the Office of Ocean Exploration. Both past and upcoming projects funded through these offices have supported research on deep coral communities.

For additional information visit:

NOAA Coral Reef Conservation Program's Deep Coral Web site: http://coralreef.noaa.gov/deepseacorals/

National Undersea Research Program Deep Coral Web site: http://www.nurp.noaa.gov/DSCorals.htm

NOAA Ocean Explorer Web site: http://oceanexplorer.noaa.gov /explorations/explorations.html

CoRIS Deep Coral essay

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http://coris.noaa.gov/activities/deepcoral.html



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NOAA's Efforts to Increase Awareness of Coral **Reef Ecosystems: Education and Outreach**

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 impacts to them. Effective outreach requires reliable access to and efficient sharing of information with all stakeholders. The National Action Strategy (NAS) calls for increased awareness and understanding of ecological, cultural, and socioeconomic importance of coral reef ecosystems among the widest possible audience.

The NOAA Coral Reef Conservation Program supports projects that address national awareness of the issues that face coral reefs, as well as projects to promote understanding and stewardship at the local level. The CRCP also participates in and supports formal education activities that incorporate coral reefs into various classroom curricula.

A variety of coral related education materials for students and teachers are available at http://www.coralreef.noaa.gov/outreach/. Additional information on coral reef biology are can be found on this site.

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http://coris.noaa.gov/activities/outreach.html



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Northwestern Hawaiian Islands Marine National Monument

The Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve was created on December 4, 2000, by Executive Order 13178. The Executive Order was amended on January 18, 2001, by Executive Order 13196, completing the establishment of the Reserve. On June 15, 2006, President Bush signed a proclamation that created the Northwestern Hawaijan Islands Marine National Monument. The Northwestern Hawaijan Islands Marine National Monument is the single largest conservation area under the U.S. flag, and the largest marine conservation area in the world. It encompasses 137,792 square miles of the Pacific Ocean - an area larger than all the country's national parks combined. The CRCP participates in and provides support for the activities of the Monument. Visit the Monument's web site at: http://www.hawaiireef.noaa.gov.

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http://coris.noaa.gov/activities/nwhi_crer.html



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Coral Reef Research Institutes and Programs

The NOAA Coral Reef Conservation Program has supported research and monitoring efforts in the Pacific and the Caribbean by supporting the National Coral Reef Institute (located in Florida), the Hawaii Coral Reef Initiative - Research Program (located in Hawaii), and the Caribbean Coral Reef Institute (located in Puerto Rico). More information on these programs is available at http://www.cop.noaa.gov/ecosystems/coralreefs/

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NOAA Coral Reef Conservation Grants Program

The Coral Reef Conservation Act authorizes the Secretary of Commerce, through the NOAA administrator, to issue matching grants of financial assistance for broad-based coral reef conservation activities, consistent with the purposes of the Act.

The CRCP supports six categories of grants through its NOAA Coral Reef Conservation Grant Program, as well as the two programs listed below:

The Coral Reef Conservation Fund – The Coral Reef Conservation Fund is a partnership between NOAA and the National Fish and Wildlife Foundation (NFWF), which provides matching grants to build publicprivate partnerships for coral reef conservation.

NOAA Coral Reef Management Fellowship – This Fellowship was established to respond to the need for additional coral reef management capacity and capability in the U.S. Flag islands.

Visit <u>www.coralreef.noaa.gov/funding</u> for more information on these grant programs.

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