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Coral Reef News



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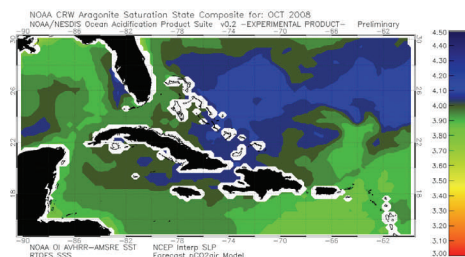
The Coral Reef Conservation Program (CRCP) is a partnership between the NOAA Line Offices working on coral reef issues, including the National Ocean Service (NOS), the National Marine Fisheries Service (NMFS), the Office of Oceanic and Atmospheric Research (OAR) and the National Environmental Satellites, Data and Information Service (NESDIS). From mapping and monitoring to managing reef resources and removing harmful debris, the CRCP addresses the priorities laid out in both the [National Action Plan to Conserve Coral Reefs](#) and the [National Coral Reef Action Strategy](#).

Volume 6, No. 2

November 2008

Announcements

New Product Models Ocean Acidification in the Caribbean. Ocean acidification is the altering of surface ocean chemistry in response to rising levels of atmospheric carbon dioxide; the oceans have absorbed about half the carbon dioxide released from human activities since the start of the industrial age. Ocean acidification has caused an increase in surface ocean acidity over the past century of about 30 percent, perhaps the most dramatic in 20 million years. Many studies have now demonstrated that under increased carbon dioxide levels, many reef-building corals slow or cease production of their shell material, potentially compromising the ability of coral reefs to withstand erosion, disease, bleaching, and rising sea-level. A new NOAA [Coral Reef Watch](#) (CRW) [Experimental Ocean Acidification Product Suite Version 0.2](#) is now available on-line that will help advance the science in this rapidly emerging field. The new satellite-based product monitors the extent of ocean acidification throughout the greater Caribbean region and examines the changes that have transpired over the past two decades. The Web site provides regional maps and time-series of ocean acidification and offers an educational overview of the topic. Scientists are using this data to determine how fast acidification is occurring, study local variability, and develop testable hypotheses about the ability of coral to adapt to its effects. This product is one result of a larger study; see the **Publications** section of this issue to learn more.



Caribbean basin ocean acidification model for October 2008., part of the new experimental ocean acidification product suite.

Coral Bleaching Highlighted in New NOAA Podcast. On October 31, NOAA [National Ocean Service](#) (NOS) released its [debut audio podcast](#) in a new series, 'Making Waves.' Each week, three new topics will be highlighted to bring listeners the latest NOS news and information. In addition, each week includes an in-depth focus on a larger issue related to one of the episode's topics. The premier episode covered the topics of using sonar to track threatened sea turtles, the NOAA Ocean Today Kiosk at the new Smithsonian [Sant Ocean Hall](#), and the expansion of the [Coral Reef Watch](#) 'Virtual Station' coral monitoring network. After highlighting the satellite-based global monitoring for coral bleaching and the satellite bleaching alert system, this episode wraps up with an in-depth look at the issue of coral bleaching. The ['Making Waves' Web-page](#) provides access to additional episodes, related Web-based resources, and RSS feed subscription information.

FGBNMS Condition Report Now Available. Sanctuary condition reports are the latest in a new series of publications by NOAA's [Office of National Marine Sanctuaries](#) (ONMS) to inform the public about the condition of each marine sanctuary every five years. Condition reports provide a synthesis of the health of each sanctuary and are meant to set the stage for reviewing their respective management plans. ONMS is pleased to announce the release of the [Flower Garden Banks National Marine Sanctuary: Condition Report 2008](#). Located in the northwestern Gulf of Mexico, the [Flower Garden Banks National Marine Sanctuary](#) (FGBNMS) includes three separate areas known as East Flower Garden Bank, West Flower Garden Bank, and Stetson Bank. The banks support several of the most productive and unique habitats in the Gulf of Mexico, including the northernmost coral reefs in the continental United States. This report summarizes the conditions and trends for the sanctuary's water, habitat, and living resources.

In general, the report rates the health of most FGBNMS resources as either (*continued on page 2*)

UPCOMING EVENTS

November 2008

28: Public comment deadline for Convention on International Trade in Endangered Species of Wild Fauna and Flora [Federal Register Notice](#) (pdf, 64 kb).

December 2008

3: Caribbean Coral Reef Institute: The 2008 End of the International Year of the Reef Symposium, San Juan, PR. Contact [CCRI](#) for details.

31: End of International Year of the Reef 2008.

January 2009

15: Public comment deadline for Draft NOAA Deep-Sea Coral and Sponge Research and Management Strategic Plan [Federal Register Notice](#) (pdf, 45 kb).

15: Registration deadline for [Coral Genomics for the Non-Genomics Scientist Workshop](#)

Click [here](#) to find IYOR 2008 events in your area.

Announcements continued...

“good” or “good/fair.” One current concern is the recent finding of high levels of several contaminants in fish in and around the sanctuary. This has caused the Food and Drug Administration to issue a seafood advisory to seafood processors about fish caught around the sanctuary. Also of concern is the decreased abundance of certain fished species, including grouper, jacks, and snapper, which are dominant predators in the ecosystem. The report points to the need for continued research on how the removal of predatory fish species can affect the rest of the ecosystem.

New Reef Resilience Toolkit Includes USCRF Product. The Reef Resilience Toolkit is a product developed by [The Nature Conservancy](#) for coral reef managers to provide guidance on building resilience to climate change into the design of marine protected areas and

daily management activities. Guidance provided ranges from conserving fish spawning aggregations to developing coral reef monitoring programs. The first Reef Resilience Toolkit (v1) was produced in 2003, with a second version developed and more widely distributed in 2004 (v2). The [current version](#) seeks to capture the tremendous growth in coral reef resilience science. Along with new discoveries, managers have worked to build resilience into their management activities on the ground and in the water. The [Coral Reef Conservation Program](#) (CRCP) is pleased to announce that the 2008 Coral Reef Educational Resources CD, a product of the [U.S. Coral Reef Task Force's Education and Outreach Working Group](#) that was compiled by the CRCP, has been included in this version of the toolkit. To access the CD through the Reef Resilience Toolkit (v3), click [here](#). You can also access it directly on the CRCP Web site.

Updates from Headquarters

CRW Conducts Outreach at National Dive Industry Show 2008. From October 22-25, NOAA's [Coral Reef Watch](#) (CRW) attended the annual [Dive Equipment & Marketing Association](#) (DEMA) [Show 2008](#) in Las Vegas, NV. CRW's Coordinator met with representatives from the scuba diving industry and participated in a teacher training seminar on coral reefs and climate change. At the training event, science teachers from the Las Vegas area were introduced to CRW's satellite-based system, other NOAA tools, and educational resources from NOAA and the [U.S. Coral Reef Task Force](#). CRW's director was the co-presenter of a seminar entitled “Coral Bleaching: From Satellites to the Ocean to the Classroom.” In addition, [Project AWARE Foundation](#) co-presented

with CRW on the [CoralWatch](#) and [AWARE Kids](#) educational programs. CoralWatch is an inexpensive, simple, non-invasive method for the monitoring of coral bleaching and assessment of coral health. The associated Coral Health Chart is basically a series of sample colors, with variation in brightness representing different stages of bleaching and recovery, based on controlled experiments. Dive operators from around the world were encouraged to engage in data collection using the CoralWatch program. CRW's partnership with CoralWatch will promote NOAA coral reef products and bring together international and domestic experts to improve understanding and management of coral reef resources.

Updates from the Atlantic/Caribbean

CRCP Seafloor Data Used to Update NOAA Nautical Charts. Shallow water bathymetric data of critical benthic habitats in select areas off the west coast of Puerto Rico will be used to upgrade NOAA nautical charts of the area. The data is a product of the [Nancy Foster Sea Floor Characterization study](#) lead by NOAA's [National Centers for Coastal Ocean Science](#) (NCCOS) and funded by the [Coral Reef Conservation Program](#). Data from multibeam surveys and underwater imagery were combined with biological coral ecosystem and fish census

data to produce maps of the sea floor topography and habitats. The surveys and reports were determined to be of good quality and as a result were chosen to supersede all prior surveys in the area. This is the third set of approved hydrographic data collected by NCCOS to support integrated ocean mapping, Caribbean seafloor characterization, and Caribbean coral ecosystem monitoring projects. This work was done in cooperation with the USVI and Puerto Rico.

(continued on page 3)

Atlantic/Caribbean continued...

Lionfish Monitoring in St. Croix, USVI.

Lionfish are indigenous to the Indo-Pacific region and are considered an [invasive species](#) outside of this range. Since 2000, they have been reported in offshore habitats along the southeast coast of the U.S., from Florida to North Carolina, and also throughout the Bahamas, Bermuda and Cuba. They are considered a major threat to coral reef ecosystems and coastal communities in the Caribbean. NOAA's [National Centers for Coastal Ocean Science](#) (NCCOS) and National Park Service (NPS) scientists recently responded to a potential lionfish sighting on the north shore of St Croix, U.S. Virgin Islands. No lionfish were detected during the October 25-29 interviews and underwater surveys, and except for those identified by the initial observer, no lionfish have been detected on the north shore of St Croix. The lionfish survey was appended to a biannual census of Buck Island Reef National Monument (BIRNM) which was already underway. NCCOS and NPS will continue lionfish

monitoring in BIRNM as this provides a perfect baseline to assess lionfish impacts in the US Caribbean.



Lionfish observed off the coast of North Carolina during the 2006 Lionfish Cruise.
Courtesy: Doug Kesling, NOAA Undersea Research Center



Be a Reef-
Hugger

Corals are
already a gift.
Don't give them
as presents this
holiday season.

Updates from the Pacific Region

New Technique Allows for Rapid, Low-Cost Assessment of MPA Effectiveness.

Researchers funded by NOAA's [National Centers for Coastal Ocean Science](#) (NCCOS) at the [Hawaii Coral Reef Initiative](#) have developed a tool to assist in the evaluation of marine protected areas (MPAs). Building upon past research that established the relationship between size and age for the populations of several fish species in Kaneohe Bay, scientists now have a non-invasive method for determining the age of these species. Laser videogrammetry is a technique in which fish length is estimated by projecting two parallel laser beams onto the body of a fish while it is being photographed or videotaped. This technique can be used alone or in combination with traditional methods such as the examination of fish otoliths. Fish otoliths, a structure within the ear, accrete layers of calcium carbonate and gelatinous matrix throughout a fish's life. In most species, this accretion alternates on a daily cycle, making it possible to determine fish age.

Scientists have separately found that changing catch limits, such as increasing the minimum legal size and thus age of fish that can be caught in a particular region, results in higher number of offspring for angelfish (*Centropyge potteri*) and goatfish (*Parupeneus multifasciatus*), although not for damselfish (*Dascyllus albisella*). Using the fish age data collected by laser videogrammetry, the

potential for offspring and growth rates of reef fish can be made. By applying this technique to populations within and outside of an MPA; in combination with other methods of analysis, managers are able to evaluate the success of MPAs. This innovative, easy-to-use technique can also be used to construct predictive models that determine if current fisheries practices are sustainable and identify populations that have been overexploited.

MHI-RAMP Cruise Returns to Port. Researchers from NOAA's [Coral Reef Ecosystem Division](#), the [Hawaii Division of Aquatic Resources](#) (DAR), the [University of Hawaii](#), [San Diego State University](#), and [National Geographic](#) completed the 2008 Main Hawaiian Island Reef Assessment and Monitoring Program (MHI-RAMP) cruise on November 14. During the cruise, integrated ecosystem assessments of fish, corals, macroinvertebrates, and algae, as well as oceanographic and water quality assessments, were conducted around the islands of Hawai'i, Māui, Lana'i, Moloka'i, O'ahu, Kaua'i, Ni'ihau, and Lehua Rock. The cruise primarily focused on reef areas not monitored by DAR. For the first time on a MHI-RAMP cruise, the microbial community was surveyed. In addition, a National Geographic DropCam system was tested, 36 Autonomous Reef Monitoring Structures were deployed to monitor indices of cryptic invertebrate biodiversity, and (*continued on page 4*)



The International Year of the Reef (IYOR) 2008 is a worldwide campaign to raise awareness about the value and importance of coral reefs and threats to their sustainability, and to motivate people to take action to protect them.

Are you or your organization participating in events for IYOR 2008?

Want to learn more about what you can do to support the goals of IYOR 2008?

Download free educational ads [here](#).

Be an agent of change: Every act counts.



Coral Reefs support more species per unit area than any other marine environment. Courtesy: Dave Burdick

Even if you don't live near a reef, you can [help protect coral reefs](#) in the U.S.A. and around the world

Pacific continued...

water samples were collected to assess carbonate chemistry associated with ocean acidification. Consistent with prior MHI-RAMP observations, abundance of apex predators, such as sharks and jacks, was low; prevalence of coral disease was low; and there were signs of coral community deterioration in some populated areas. Additional results of this cruise may be reported after data analysis is complete.

Enhanced Scientific Knowledge of Coral Disease Increases Ability to Contain Outbreaks. Researchers funded by NOAA's [National Centers for Coastal Ocean Science](#) (NCCOS) at the [Hawaii Coral Reef Initiative](#) (HCRI) are studying the coral disease *Montipora*

white syndrome (MWS). Their recent discoveries about its occurrence and transmittance will help managers move towards the containment and future eradication of this disease. MWS was found to occur in all regions of Kaneohe Bay, Oahu, shows no seasonality, and tissue loss in coral progresses slowly but steadily. Researchers documented further eroding of the coral skeleton occurs as algae and boring animals invade a diseased colony. MWS is transmissible either through direct contact between corals or through the water column. Little is known about devastating coral diseases and HCRI's support of coral disease research will increase Hawai'i's capacity to better manage coral reef habitats.

International Updates

Development of International Standards for Displaying Environmental Data on Electronic Navigational Charts Continues.

The [International Hydrographic Organization](#) (IHO) [Committee on Hydrographic Requirements for Information Systems](#) (CHRIS) reauthorized the Marine Environmental Protection Product Specification Task Group to continue to develop a method of integrating marine environmental data, such as coral reef information, into developing IHO technical standards. This will provide a standardized approach to display environmental data on navigational products, such as Electronic Navigational Charts (ENC), as well as supplemental navigational information for use in Electronic Chart Display Information Systems (ECDIS). The availability of this marine environmental information will ensure sound decision-making, and help protect the marine environment. NOAA's continued efforts in this arena are part of the [Protecting Corals Saving Ships](#) project.

Senate Staff Learns About NOAA's Collaborative Coral Reef Research. On October 24 and 25, three U.S. Senate Professional Staff Members traveled to Townsville, Australia to learn about Australian coral reef research and management collaborations with NOAA. Two Australia-based NOAA [Coral Reef Watch](#) (CRW) scientists accompanied the delegation as they met with senior staff from the [Great Barrier Reef Marine Park Authority](#) and the CEO and senior staff of the [Australian Institute of Marine Science](#). The purpose of these meetings was to gather information about research and management strategies for the Great Barrier

Reef in a rapidly changing climate. The delegation were especially interested to hear about the many collaborative projects that NOAA has with these and other Australian research and management agencies.



Scott Bainbridge describes one of the systems deployed as part of the Great Barrier Reef Ocean Observing System, of which NOAA is a participant, to Senate Staff. Courtesy: Coral Reef Watch

After a day of meetings, the CRW staff accompanied the delegation as they embarked on a trip to the Great Barrier Reef to learn more about the effects of coral bleaching, climate change, and the management of a coral reef system. NOAA's partnerships with Australian scientists in coral reef research have already leveraged Australian funds to help promote collaborations that will ultimately make our domestic reef conservation activities more efficient.

New Data in CoRIS

| Product Name | Description |
|--|--|
| Continuous bottom temperature measurements in strategic areas of the Florida Reef Tract Link to sample metadata for this product | The purpose of this project is to document bottom seawater temperature in strategic areas of the Florida Reef Tract on a continuing basis. This ongoing project began in 1988. A total of 38 subsurface recording thermographs have been deployed in the Florida Keys National Marine Sanctuary (FKNMS) and at other selected locations on the Florida Reef Tract and associated hydrologic ecosystems. An archival copy of these data is maintained and available from the U.S. NODC. |
| CRED 2008 Shallow Water CTDS for American Samoa and the PRIAs. Link to sample metadata for this product | CRED Shallow Water Conductivity-Temperature-Depth (CTD) casts are vertical profiles of temperature, salinity, and turbidity providing indications for water masses and local sea water chemistry changes. |
| Coral Reef Temperature Anomaly Database (CoRTAD) Link to sample metadata for this product | The Coral Reef Temperature Anomaly Database (CoRTAD) is a collection of sea surface temperature (SST) and related thermal stress metrics, developed specifically for coral reef ecosystem applications. The CoRTAD contains global, approximately 4 km resolution SST data on a weekly time scale from 1985 through 2005. |
| Coral Reef Surveys at 21 Sites in American Samoa during 2002 Link to sample metadata for this product | Transects of the coral colonies at 21 sites in American Samoa were surveyed during an underwater swim in March 2002. Data for each coral species include abundance and size distribution of the colonies. |
| Sediment Processes on the Coral Reefs of Kahoolawe Link to sample metadata for this product | The nearshore coral ecosystems of Kahoolawe were assessed in 1993. Surveys were made of the coral coverage, fish communities, and sediment types from 19 locations. |
| Biodiversity of marine communities in Pearl Harbor, Oahu, Hawaii Link to sample metadata for this product | The marine and estuarine invertebrate and fish communities in Pearl Harbor, Oahu, Hawaii were surveyed between January and October, 1996. Samples were taken and observations were made at fifteen stations throughout the harbor. All organisms were identified to species or the highest practicable taxonomic level. |
| Grain Size Distribution and Fate of Transplanted Corals at Kawaihae, Hawaii: Field work of 1996-1997 Link to sample metadata for this product | A harbor expansion was planned in the early 1990s for Kawaihae, Hawaii on the northwest shore of the Big Island. To offset the habitat loss, select corals were transplanted. This study looked at the effects of sedimentation on the transplanted and non-transplanted corals. |
| Marine Species Survey of Johnston Atoll, Central Pacific Ocean, June 2000 Link to sample metadata for this product | The marine biota of Johnston atoll was surveyed for non-indigenous species in June, 2000 with observations and collections made by investigators using SCUBA. |

(continued on page 6)

Every Act Counts

Corals are already a gift. Don't give them as presents.

Corals are popular as souvenirs, for home decor and in costume jewelry, yet corals are living animals that eat, grow and reproduce. It takes corals decades or longer to create reef structures, so leave corals and other marine life on the reef.

Whether you live one mile or one thousand miles from a coral reef, your actions affect the reefs' future – and the reefs' future affects yours. As the natural guardians of our shores, reefs play a vital role in our global ecosystem. With climate change, pollution, and overfishing contributing to coral reef degradation, we can all play a role in protecting our land, sea and sky. And all it takes is a few simple changes to your daily routine.

New Data in CoRIS continued...

| Product Name | Description |
|--|---|
| Hawaii Coral Reef Assessment and Monitoring Program (CRAMP): Fish Data from 2000 Link to sample metadata for this product | This dataset consists of CRAMP surveys taken in 2000 and includes quantitative estimates of fish species richness, abundance, and biomass. There are 32 survey sites, with most of these sites having both a shallow and deep transect. |
| 1998 Inventory of Endangered Species and Wildlife Resources at the US Army Kwajalein Atoll Link to sample metadata for this product | This report summarizes the results of the second United States Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands (UES) inventory of endangered species and wildlife resources at USAKA, which was conducted in 1998. |
| Surveys of coral reefs on the main volcanic islands of American Samoa Link to sample metadata for this product | 2002 status of coral reefs on the main volcanic islands of American Samoa: a resurvey of long term monitoring sites including benthic communities, fish communities, and key macroinvertebrates |
| 1995 Quantitative Survey of the Corals of American Samoa Link to sample metadata for this product | A survey of coral communities was carried out in the American Samoa Archipelago to assess the status of coral reefs. Five replicate belt transects were used to estimate the size structure, density and percent cover of corals at 29 locations around Tutuila and Manu'a Islands during October and November, 1995. |

Publications

Publication Highlights Ocean Acidification in the Caribbean. Ocean acidification is the altering of surface ocean chemistry in response to rising levels of atmospheric carbon dioxide; the oceans have absorbed about half the carbon dioxide released from human activities since the start of the industrial age. Ocean acidification has caused an increase in surface ocean acidity over the past century of about 30 percent, perhaps the most dramatic in 20 million years. Many studies have now demonstrated that under increased carbon dioxide levels, many reef-building corals slow or cease production of their shell material, potentially compromising the ability of coral reefs to withstand erosion, disease, bleaching, and rising sea-level.

A study lead by a NOAA [Coral Reef Watch](#) (CRW) scientist was released in the latest issue of the [Journal of Geophysical Research - Oceans](#), showing significant ocean acidification across much of the Caribbean and Gulf of Mexico over

the last decade. Through an innovative approach of combining observations from ships and satellites, a detailed picture of ocean acidification across much of the Caribbean and Gulf of Mexico was obtained. The study reveals ocean acidification rates that are likely to reduce coral reef growth to critical levels before the end of this century unless atmospheric carbon dioxide emissions are reduced. The study also finds that variability in ocean chemistry in waters around the Florida Keys might help these reefs better adapt to future ocean acidification. However, how ocean acidification is expressed in the coastal waters where coral reefs reside is currently poorly understood and the NOAA [Coral Reef Conservation Program](#), together with CRW, is actively working to better monitor these environments. This research led to the development of an [experimental ocean acidification product suite](#), as described in the Announcements section of this issue. Read the full [NOAA press release](#) to learn more.

We value your feedback. Feel free to [email](#) us comments on the new format.

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The CRCP supports effective management and sound science to preserve, sustain and restore valuable coral reef ecosystems.

