



## Corals Roadmap to Resources

These online resources are meant to guide students and educators to topics presented in the online coral tutorial. Many of the Web pages listed reside within larger Web sites. You may wish to browse each Web site to examine other available resources.

Please note: The Web links provided have been checked at the time of this page's publication, but the linking sites may become outdated or non-operational over time. If you should come across a non operational link please contact NOAA Ocean Service Education at [oceanserviceseducation@noaa.gov](mailto:oceanserviceseducation@noaa.gov)

- [Coral Biology](#)
- [Deep Water Corals](#)
- [Coral Reef Ecosystems](#)
- [Benefits from Reefs](#)
- [Threats to Coral Reefs](#)
- [Things You Can Do](#)
- [Glossary](#)
- [Data from Coral Reef Research](#)
- [Images](#)
- [Maps](#)
- [Information about NOAA Programs Relevant to Coral Reefs](#)

### Coral Biology

[http://www.coris.noaa.gov/about/what\\_are](http://www.coris.noaa.gov/about/what_are)

"What are Coral Reefs" An essay providing a general description of the individual coral animal; from NOAA's Coral Reef Information System (CoRIS).

<http://www.coris.noaa.gov/about/biology>

"Coral Reef Biology" An essay providing an overview of the major reproductive, feeding, and competitive behaviors in many species of hermatypic (reef-building) corals; from NOAA's Coral Reef Information System (CoRIS).

### Deep Water Corals

<http://www.coris.noaa.gov/about/deep>

"Deep Water Corals" An essay presenting an overview of the solitary and reef-forming corals that inhabit deep, cold waters, at lightless depths that may exceed 2000 meters, and temperatures as cold as 4° C; from NOAA's Coral Reef Information System (CoRIS).

[http://www.coris.noaa.gov/activities/deepcoral\\_rpt](http://www.coris.noaa.gov/activities/deepcoral_rpt)

"The State of Deep Coral Ecosystems of the United States" A report assessing deep coral ecosystems in U.S. waters including: the biology of

This site      NOAA

[Corals Tutorial](#)

[Corals Roadmap](#)

[Corals Lesson Plans](#)

deep corals and their associated species, their spatial distribution, the stressors that may threaten their survival, current management measures, and regional priorities for future research.

[\(top\)](#)

## **Coral Reef Ecosystems**

[http://www.coris.noaa.gov/about/eco\\_essays](http://www.coris.noaa.gov/about/eco_essays)

"Coral Reef Ecosystems Essays" A series of essays on coral reef ecosystems in United States jurisdictions in the Atlantic and Pacific Oceans, and the Gulf of Mexico; from NOAA's Coral Reef Information System (CoRIS).

<http://marinelife.noaa.gov/>

"Encyclopedia of the National Marine Sanctuaries" An online marine life field guide, which videos and information about habitat, distribution, diet and much more.

<http://www.sanctuaries.noaa.gov/education/students/free.html>

"Free Materials" These include coral reef posters from NOAA's National Marine Sanctuary Program.

<http://www.coral.noaa.gov/faq.shtml>

Frequently Asked Questions about Coral Reefs, from NOAA's Coral Health and Monitoring Program; includes What Are Coral Reefs?, Coral Reef Biology, Government and Private Programs, Schools and Higher Learning, Economic Importance, and Internet Links

## **Benefits from Reefs**

<http://coralreef.noaa.gov/outreach/protect>

"Protect Coral Reefs: Learn More" Information to accompany posters about the benefits of reefs; topics include economic benefits, habitat, recreation, medicines, and coastal protection; from NOAA's Coral Reef Conservation Program.

## **Threats to Coral Reefs**

<http://www.coris.noaa.gov/about/hazards>

"Hazards to Coral Reefs" An essay providing an overview of natural and anthropogenic factors threatening many reef systems; from NOAA's Coral Reef Information System (CoRIS).

<http://www.coris.noaa.gov/about/diseases>

"Major Reef- building Coral Diseases" An essay providing descriptions of the known major coral diseases, including Black Band Disease, Coral Bleaching, Discoloring Spots, Rapid Wasting Disease, Red Band Disease, White Band Disease, White Plague Disease, White Pox Disease and Yellow Blotch/Band Disease; from NOAA's Coral Reef Information System (CoRIS).

[http://www.coris.noaa.gov/activities/cdhc\\_histo\\_II](http://www.coris.noaa.gov/activities/cdhc_histo_II)

"Coral Disease and Health Workshop: Coral Histopathology II" A report from a workshop on coral pathologies including coral anatomy descriptions and figures, a description of the approach to coral tissue histopathological examination, a recommended format for describing the histology and histopathology of coral tissue, and a glossary of coral anatomy and histopathology terms with relevant references.

[http://www.coris.noaa.gov/activities/reef\\_managers\\_guide](http://www.coris.noaa.gov/activities/reef_managers_guide)

"A Reef Manager's Guide to Coral Bleaching" Information on the causes and consequences of coral bleaching, as well as management strategies to help local and regional reef managers reduce this threat to coral reef ecosystems.

[\(top\)](#)

## Things You Can Do

<http://coralreef.noaa.gov/outreach/thingsyoucando.html>

"Things You Can Do to Protect Coral Reefs," even if you don't live near a reef; from NOAA's Coral Reef Conservation Program

## Glossary

<http://www.coris.noaa.gov/glossary>

"Online Coral Reef Glossary" Definitions of nearly 3,000 technical and scientific terms and acronyms related to coral reefs; from NOAA's Coral Reef Information System (CoRIS).

## Data from Coral Reef Research

<http://www.coris.noaa.gov/data>

"NOAA's Coral Reef Data," providing three access paths to NOAA's coral data and information: Browse Data Descriptions, Text Search, and Map Search; from NOAA's Coral Reef Information System (CoRIS).

<http://www.osdpd.noaa.gov/PSB/EPS/SST/climohot.html>

Coral Bleaching HotSpots; from NOAA's National Environmental Satellite, Data, and Information Service, Office of Satellite Data Processing and Distribution

<http://www.osdpd.noaa.gov/PSB/EPS/SST/SST.html>

Sea Surface Temperature Images from NOAA's National Environmental Satellite, Data, and Information Service, Office of Satellite Data Processing and Distribution.

[http://www.osdpd.noaa.gov/PSB/EPS/CB\\_indices/coral\\_bleaching\\_indices.html](http://www.osdpd.noaa.gov/PSB/EPS/CB_indices/coral_bleaching_indices.html)

Tropical Ocean Coral Bleaching Indices from NOAA's National Environmental Satellite, Data, and Information Service, Office of Satellite Data Processing and Distribution.

## Images

<http://www.photolib.noaa.gov/reef>

The NOAA Coral Kingdom Photo Library, including high-resolution images of fish, invertebrates and scuba divers from Caribbean, Pacific and Red Sea coral reefs.

<http://www.ncdc.noaa.gov/paleo/slides/slideset/#coral>

Coral Paleoclimatology slide set.

<http://www.hawaiireef.noaa.gov/imagery>

Photos, Maps, Satellite Images, and a Quicktime Movie Slideshow of images taken by professional wildlife photographer James Watt; from the

Papahānaumokuākea Marine National Monument (Hawaii).

[http://oceanexplorer.noaa.gov/gallery/livingocean/livingocean\\_coral.html](http://oceanexplorer.noaa.gov/gallery/livingocean/livingocean_coral.html)

Slide shows and videos of many deep sea corals from NOAA's Ocean Explorer Web site designed to provide the public with information on NOAA's ocean exploration activities.

<http://ccma.nos.noaa.gov/products/biogeography>

"Biogeography Team Products" from NOAA's Center for Coastal Monitoring and Assessment; includes links to online reports, maps, and imagery; the "Reef Fish Photo Browser" provides links to a large collection of images of fishes and other reef species, all in the public domain and available for download

[\(top\)](#)

## Maps

<http://www.coris.noaa.gov/metadata/map-search/viewer.htm>

The map-based access path for retrieving data through CoRIS, including various habitat and bathymetric maps; a link to a brief tutorial is provided on the upper right hand side of the page to help learn how to use the Map Search functions.

<http://www.hawaiireef.noaa.gov/imagery/graphicmaps.html>

Maps from the Papahānaumokuākea Marine National Monument (Hawaii)

[http://www.coral.noaa.gov/reef\\_maps/index.shtml](http://www.coral.noaa.gov/reef_maps/index.shtml)

Links to maps of coral reef locations around the world, from the book Coral Reefs of the World by Susan M. Wells, published by IUCN Conservation Monitoring Center and United Nations Environment Programme

<http://flkeysbenthicmaps.noaa.gov/maps.html>

"Benthic Habitats of the Florida Keys;" 32 full-color plates showing the distribution of benthic habitats in the Florida Keys, accompanied by descriptions of bottom habitats

<http://www.soest.hawaii.edu/pibhmc/>

Provides access to maps of benthic habitats in coral reef ecosystems throughout the U.S. Pacific Islands, including the Hawaiian and Mariana archipelagos, American Samoa and the remote, U.S.-affiliated islands such as Johnston and Palmyra Atolls; from the Pacific Islands Benthic Habitat Mapping Center

## Information about NOAA Programs Relevant to Coral Reefs

[http://www.coris.noaa.gov/library/noaa\\_coralreefs.html](http://www.coris.noaa.gov/library/noaa_coralreefs.html)

Links to descriptions of the coral reef activities conducted by various NOAA line offices

<http://ccma.nos.noaa.gov/ecosystems/coralreef/cres.html>

Description of NOAA's Coral Reef Ecosystem Studies project, which include Water Column Transport Processes, Physical Oceanography, Transport of Watershed-based materials; Coral Diseases; Demographic Studies in Coral Reef Communities; Species and Habitat Coupling; Socioeconomic Studies; Ecological and Socioeconomic Coupling; Marine Protected Area and Marine Reserve Studies; and Database Management.

[http://www.coris.noaa.gov/activities/coral\\_research\\_plan](http://www.coris.noaa.gov/activities/coral_research_plan)

NOAA's Coral Reef Ecosystem Research Plan for Fiscal Years 2007 to 2011

<http://www.cop.noaa.gov/ecosystems/coralreefs>

Links to descriptions of current coral reef research programs of the Center for Sponsored Coastal Ocean Research; from NOAA's National Centers for Coastal Ocean Science

<http://www.sanctuaries.nos.noaa.gov>

Links to web pages for NOAA's National Marine Sanctuary Program, which includes four sanctuaries that contain coral reefs (the Florida Keys, Flower Garden Banks, Fagatele Bay, and Gray's Reef National Marine Sanctuaries); information is also provided for the Northwest Hawaiian Islands Coral Reef Ecosystem Reserve, which is in the process of designation as a National Marine Sanctuary

<http://www.mpa.gov>

Web site for the National Marine Protected Areas Center, with information about the nation's MPAs; from NOAA's Office of Ocean and Coastal Resource Management

<http://response.restoration.noaa.gov>

Web site for the NOAA's Office of Office of Response and Restoration (OR&R), a primary partner in NOAA's Coral Reef Conservation Program; OR&R also conducts the Abandoned Vessels Program which maintains a comprehensive database of abandoned vessels that could potentially threaten coral ecosystems in U.S. waters, as well as the Damage Assessment and Restoration Program which is involved with assessing and restoring coastal and marine resources injured by oil spills, hazardous substance releases, and vessel groundings

<http://www.nos.noaa.gov/programs>

Links to web pages for NOAA's Ocean Service Program Offices:

- Coastal Services Center which specializes in geographic information systems, training, remote sensing, and data and information;
- International Program Office which conducts projects to help promote coral reef ecosystem conservation and improved management for global coral reef areas;
- National Geodetic Survey which provides fundamental control for mapping coral and other coastal features through the National Spatial Reference System, and provides consultation and advice on use of the Global Positioning System and remote sensing technologies for coral mapping activities;
- Office of Coast Survey which produces nautical charts for U.S. waters including its possessions and territories; and
- Pacific Services Center which develops and delivers coastal management information and services to the State of Hawai'i, Territories of American Samoa and Guam, and the Commonwealth of the Northern Mariana Islands.

<http://www.oceanexplorer.noaa.gov>

Web site for NOAA's Office of Ocean Exploration which searches, investigates, and documents unknown and poorly known areas of the ocean; includes links to education activities and lesson plans; including several expeditions devoted to shallow- and deepwater coral reefs

<http://www.nmfs.noaa.gov>

Web site for NOAA's National Marine Fisheries Service, with links to:

- Office of Habitat Conservation which conducts research and management actions directed toward sustainable coral reef fisheries and coral reef habitat protection and restoration; works to evaluate the impact of aquarium trade on coral reef ecosystems; and leads the Fisheries and Extractive Uses Working Group of the U.S. Coral Reef Task Force; the Ecosystem Assessment Division develops and applies interdisciplinary approaches to studying, monitoring, and managing integrated marine and estuarine systems
- Office of Protected Resources which is responsible for leadership on endangered and threatened species and marine mammals in coral reef ecosystems
- Pacific Islands Fisheries Science Center which is responsible for habitat mapping and characterization, physical and biological monitoring, assessment and research on Pacific reef systems, and evaluation of the impacts of fishing on coral habitats; also participates in the inter-agency effort to remove marine debris from reef areas in the U.S. Pacific
- Regional Fishery Management Councils which are responsible for creating management plans for fishery resources in U.S. waters
- Office of Law Enforcement which enforces laws and regulations affecting coral reef resources
- Office of Science and Technology which coordinates coral reef science conducted by NOAA offices
- Office of Sustainable Fisheries which evaluates and approves Fishery Management Plans related to coral reef ecosystems and fisheries, and evaluating the status of coral reef fisheries
- Pacific Islands Regional Office which is responsible for management of coral reef fisheries in Federal waters of Hawai'i and the Central & Western Pacific, as well as essential fish habitat (EFH), and coral reef ecosystem protected species
- Southeast Regional Office which is responsible for management of coral reef fisheries in Federal waters around Florida, the Gulf of Mexico and the U.S. Caribbean, as well as essential fish habitat (EFH), and coral reef ecosystem protected species
- Southeast Fisheries Science Center which is responsible for monitoring and research support for coral reef ecosystems in Florida, the Gulf of Mexico and the U.S. Caribbean

<http://www.nesdis.noaa.gov>

Web site for NOAA's National Environmental Satellite, Data, and Information Service, including links to:

- Coral Reef Watch (<http://coralreefwatch.noaa.gov/>)
- National Climatic Data Center's Coral Paleoclimatology site: (<http://www.ncdc.noaa.gov/paleo/outreach/coral/>) and Coral Paleoclimatology slide set: (<http://www.ncdc.noaa.gov/paleo/slides/slideset/#coral>)
- The NOAA Library Catalog
- Coral Bleaching HotSpots (<http://www.osdpd.noaa.gov/PSB/EPS/SST/climohot.html>)
- Sea Surface Temperature Images (<http://www.osdpd.noaa.gov/PSB/EPS/SST/SST.html>)
- Tropical Ocean Coral Bleaching Indices ([http://www.osdpd.noaa.gov/PSB/EPS/CB\\_indices/coral\\_bleaching\\_indices.html](http://www.osdpd.noaa.gov/PSB/EPS/CB_indices/coral_bleaching_indices.html))

<http://www.nurp.noaa.gov>

Web site for NOAA's Undersea Research Program which conducts peer-reviewed research and supports advanced underwater research through six centers: North Atlantic and Great Lakes; Mid-Atlantic Bight; Southeastern U.S. and Gulf of Mexico; Caribbean; West Coast and Polar Regions; and Hawaii and the Western Pacific.

<http://www.oar.noaa.gov>

Web site for Office of Oceanic and Atmospheric Research, with links to

- Atlantic Oceanographic and Meteorological Laboratory
- Coral Disease and Health Consortium
- Coral Health and Monitoring Program
- Coral Health and Monitoring Program Literature Server
- Coral-List Listserve
- SEAKEYS Program
- NOAA's Undersea Research Program

[\(top\)](#)

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