National Oceanic and Atmospheric Administration
U.S. Department of Commerce

NOAA Knows...

Coral Reefs

Essential to human well-being, healthy coral reefs are some of the most valuable ecosystems on the planet. They are among the oldest communities of life on Earth and take thousands of years to grow into the immense and complex habitats we see today.

Healthy coral reefs are home to enormous riches of beautiful and awe-inspiring biological diversity. And every year, they provide an estimated $375 billion in economic and environmental services[1] such as food, protection for coasts, and tourism. Reef-supported tourism alone generates an estimated $30 billion[2].

Coral reefs also offer the promise of medical advances — bone grafts, virus-treating chemicals, and possible cancer treatments from reef-dwelling species — that may be realized if healthy coral reefs can be sustained.

An Ecosystem in Crisis

The current status of coral reefs is alarming. Rapid warming, accelerating pollution, and destructive fishing are decimating corals faster than they can adapt and regenerate. Individually, each of these three top threats is devastating corals. Collectively, they are a "perfect storm." The damages inflicted by climate change make corals more susceptible to further degradation from pollution and fishing threats, and vice-versa.

Effective, science-based management can preserve, sustain, and restore valuable coral reef ecosystems for future generations. Making the most of limited resources and maximizing improvements to coral reef health requires us to prioritize on-the-ground and in-the-water actions that address the top three threats to coral reef ecosystems.

Climate change effects – Warmer and more acidic oceans — a result of elevated greenhouse gases — cause mass bleaching in corals[3] and inhibit the growth of coral skeletons[4]. Reducing greenhouse gases is essential to corals' long-term survival. In the meantime, boosting the resilience of coral reef ecosystems and reducing local stresses, such as ship groundings and pollution, are short-term bridges necessary for keeping coral reef ecosystems intact until the overarching climate threat is alleviated.

Fishing effects – Bottom trawl nets, blast fishing, cyanide fishing, and overexploitation of species essential for ecosystem balance are severely damaging coral reefs. Thousands of species rely on reefs for survival. And coral rely on fish to remove algae and help stimulate regrowth. Minimizing destructive effects from overfishing and achieving responsible, ecosystem-based stewardship of reef fisheries pays lasting dividends.

Effects from land-based sources of pollution – Coral reefs suffer major damage from sediment runoff and from surges in algal cover caused by nutrient pollution. Identifying and controlling land-based sources of pollution are a win for coral reefs and the water quality of watersheds draining to them.

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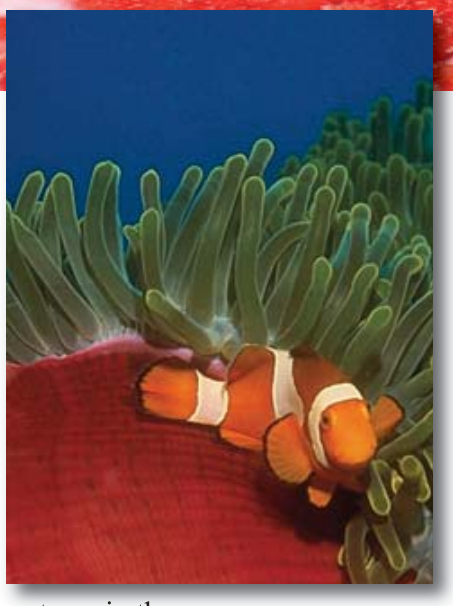
International Conservation Efforts



NOAA's Coral Reef Conservation Program is a cross-cutting program that brings together expertise from a wide array of NOAA programs and offices. In strong partnership with coral reef managers, CRCP works to protect and restore coral reefs, including deep-water corals, by addressing priority national threats and local management priorities.

CRCP funding supports reef conservation activities by NOAA and its partners in the seven U.S. states and jurisdictions containing coral reefs (American Samoa, the Commonwealth of the Northern Mariana Islands, Florida, Guam, Hawaii, Puerto Rico, and the U.S. Virgin Islands), uninhabited islands including the Northwestern Hawaiian Islands and Pacific Remote Island Areas, and internationally, including the Pacific Freely Associated States.

CRCP also provides coral reef managers, scientists, and other users worldwide with information about reef health and forecasts of coral bleaching events using sea surface temperature data from satellites.

Public outreach & education – CRCP partners with citizens and local government officials to improve coral reef health globally. CRCP provides information that empowers its public partners to act. This includes posting informative signs in coastal areas and distributing educational information to coastal businesses and the public.

Coral Reef Conservation Grants Programs – Matching grants for privately-funded coral conservation projects from NOAA provided $21 million for reef conservation from 2002-2005.

Coral Reef Conservation Fund – Administered by the National Fish and Wildlife Foundation. Builds public-private partnerships and leveraged NOAA's $4.7 million into more than $12 million for 140 projects in 28 countries.

CRCP serves as the Secretariat for the U.S. Coral Reef Task Force (www.CoralReef.gov), which includes leaders of 12 federal agencies, seven U.S. states and jurisdictions, and Freely Associated States.

For more information about coral reefs, visit http://www.coralreef.noaa.gov. Or visit NOAA's Coral Reef Information System, home to all data, products, and publications generated by CRCP-funded projects, at http://www.coris.noaa.gov.

To learn more about NOAA, visit http://www.noaa.gov.

1. Robert Costanza et al., "The Value of the World's Ecosystem Services and Natural Capital," *Nature* 387 (May 15, 1997), 256.
2. Millennium Ecosystem Assessment.
3. Ove Hoegh-Guldberg et al., "Coral Reefs Under Rapid Climate Change and Ocean Acidification," *Science* 318 (December 14, 2007), 1737-1742.
4. Glenn De'ath et al., "Declining Coral Calcification on the Great Barrier Reef," *Science* 323 (January 2, 2009), 116-119.