# NOAA's National Climatic Data Center
# Sectoral Engagement Fact Sheet
# Marine and Coastal Ecosystems

## OVERVIEW

Marine and coastal ecosystems include estuaries and coastal waters and lands. Within these systems are sensitive habitats, marine sanctuaries, national parks, aquaculture, fisheries, and tourism activities. Informed and responsible stewardship of natural marine and coastal resources is critical to the survival of the many threatened and endangered species living within these ecosystems. Coastal and marine ecosystems are intimately linked to climate. Biodiversity and ecosystem health are directly related to surrounding environmental conditions and are sensitive to atmospheric conditions. Both rapid and gradual climate changes and variations can strongly impact natural ecosystems and the economies that depend on this environment. In order to develop appropriate adaptation and mitigation strategies, it is important to have information on how weather and climate trends affect ecosystems, local communities, regulatory requirements, and day-to-day operations.

## KEY STAKEHOLDERS

NOAA's National Climatic Data Center (NCDC) works with various groups, both as an information provider and as an applied research partner, to examine the effects of weather and climate on marine and coastal ecosystems. This type of information can help decision makers and planners in both public and private entities within this sector determine practical responses to climate change and variations. There are many different governmental and non-governmental organizations, public and private groups and businesses, and individuals that can benefit from using pertinent climate and weather-related information. Some major groups include:

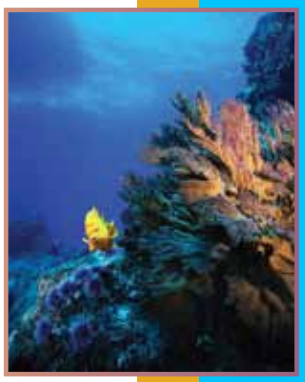
- International, federal, state, regional, and local governments
- Aquaculture and coastal agriculture businesses
- Government, commercial, and sport fisheries
- Academia and other researchers
- Tourism groups and businesses
- Transportation departments and businesses
- Gas, oil, and renewable energy industries

## SECTOR NEEDS

Climate information is often available only as raw observations or in the form of tables, graphs, or written summaries, which may be difficult for users who are not well-versed in climate science to fully interpret. To bridge this gap, NCDC is partnering with the marine and coastal ecosystems sector to translate climate data into accessible, useful, and accurate products; and to leverage NCDC's climate expertise to better understand what the information means and how it can be used most effectively.

Climate information can be used in a variety of ways. Some examples include:

- Using sea surface temperature data to determine the impact on the distribution, mobility, and health of many aquatic species.
- Using sea-level rise and storm surge data to assess the exposure or inundation of sensitive coastal ecosystems.
- Using precipitation data over land to examine and analyze near-shore sediment deposition and changes in water chemistry, such as salinity.
- Using climate data related to frequency, intensity, and duration of extreme climate events, such as hurricanes, to assess potential mitigation and adaptation strategies.

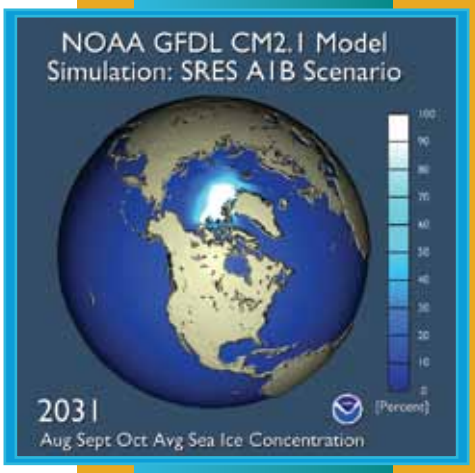


- Using long-term climate data to help identify and understand factors, such as warming ocean temperatures, that threaten the health of the coral reef ecosystem.

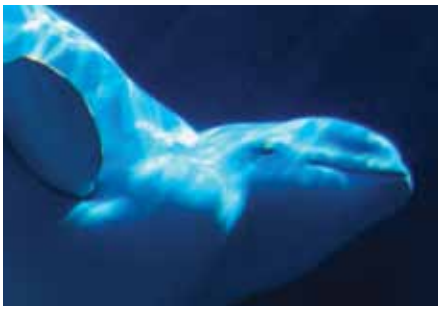
## NCDC DATA AND PRODUCTS

There are many different types of useful climate information available. Some examples include:

- Satellite-based *Coral Bleaching Products*, which include nighttime-only sea surface temperatures, sea surface temperature anomalies, regions of extreme warm water that can be harmful to reefs (called hotspots), and degree heating weeks, which indicate the thermal stress experienced by coral reefs.
- Marine observations made at fixed surface locations, both unmoving and drifting buoys, and on ships.
- *Sea ice* chart information and database, which provides sea ice extent.
- The *Global Historical Climate Network*, which contains historical temperature, precipitation, and pressure data for thousands of land stations around the world.
- CD-ROM/DVDs, such as the *Integrated Surface Data* database, which contains climate information for about 10,000 weather stations, with some dating as far back as 1901.
- Global tropical cyclone positions and intensities in the *International Best Track Archive for Climate Stewardship* (IBTrACS) tropical cyclone database.
- Oceanic data satellite observations, which provide data on sea surface winds, sea surface temperatures, wave heights, ocean color, internal waves, sea ice features, and ocean topography.




Collaboration between climate scientists and the marine and coastal ecosystems community is essential in helping to build the necessary bridges that will transform climate science into information that is relevant and credible. Ongoing communication is important to ensure that the information NCDC provides is appropriate and applicable to coastal and marine ecosystems sector needs. As climate changes in the years ahead and the effects become more noticeable, new information needs will emerge. NCDC will work closely with this sector, attending trade meetings and sponsoring future workshops and conferences, in order to better understand, address, and anticipate these needs.



Additional details about available NOAA products and the economic benefits of these products are provided at:
http://www.economics.noaa.gov

For further information on obtaining NCDC climate services and products related to marine and coastal ecosystems please contact:

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**NOAA Satellite and Information Service**
**National Environmental Satellite, Data, and Information Service (NESDIS)**
**National Climatic Data Center (NCDC)**
***U.S. Department of Commerce***

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