

NOAA's Integrated Coral Observing Network (ICON)

The U.S. National Oceanic and Atmospheric Administration's (NOAA) Integrated Coral Observing Network (ICON) is a project of the Atlantic Oceanographic and Meteorological Laboratory's (AOML) Coral Health and Monitoring Program (CHAMP) in Miami, Florida. The ICON Program is funded through NOAA's Coral Reef Conservation Program (CRCP) and High Performance Computing and Communication's Office. The CHAMP Program also conducts research on ocean acidification, sclerochronology, coral reef hydrography, and coral bleaching; it is also the home of the very popular Coral-List listserv (<http://coral.aoml.noaa.gov/mailman/listinfo/coral-list>).

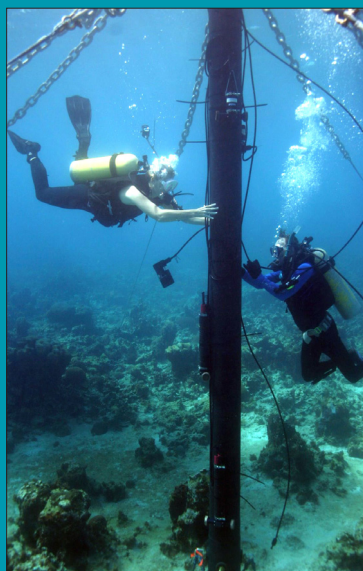
The ICON Vision—The ICON vision is to serve as a model for all of NOAA in establishing a high quality *in situ* coral reef monitoring network and for the integration of near real-time *in situ*, satellite, radar, and other data for ecological forecasting in coral reef ecosystems.

Goals—For the next few years, the ICON Program will be focusing upon:

- Integrating data from diverse independent sources, especially for developing ecological forecasting models for use by marine protected area managers and researchers.
- Ensuring consistency with NOAA's Integrated Ocean Observing System.
- Forging international partnerships.
- Facilitating development and transition to operations of promising relevant *in situ* instrumentation.



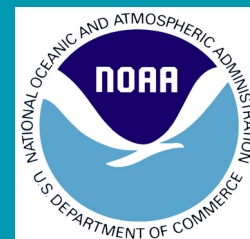
An International Network of Meteorological and Oceanographic Monitoring Stations



The growing ICON network is currently comprised of stations in St. Croix, U.S. Virgin Islands; La Parguera, Puerto Rico; Little Cayman Island, Cayman Islands; Lee Stocking Island, Bahamas; and Saipan, CNMI (in 2010-2011). New stations, including in Belize, are planned for the Caribbean through collaboration with the Caribbean Community Climate Change Center. The stations are designed to deliver hourly measurements of important meteorological and oceanographic variables and will eventually serve to establish long-term databases at the world's most threatened and important coral reef areas.

What do the Stations Measure?

The standard meteorological station measures air temperature, wind speed and gusts, wind direction, barometric pressure, precipitation, light (above and below water), sea temperature, salinity, and state of tide. Other instruments, such as the Pulse Amplitude Modulating Fluorometer, and a sensor for measuring partial pressure of carbon dioxide, have been deployed for research on coral stress and growth at the Bahamas and Puerto Rico stations.

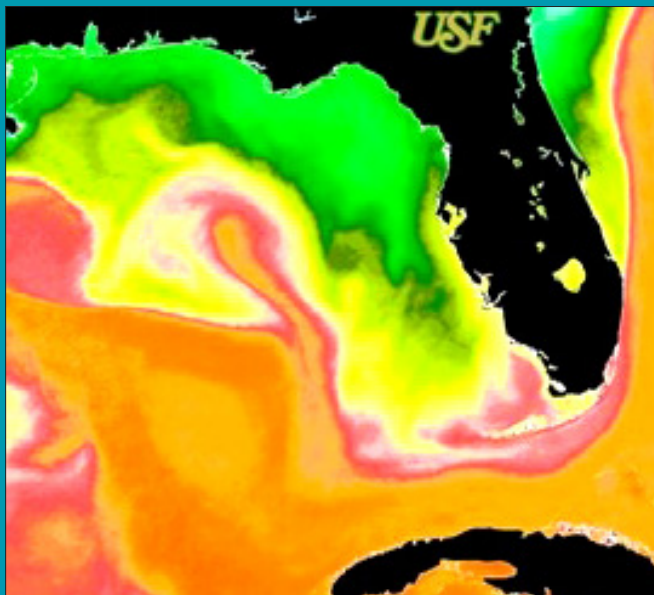
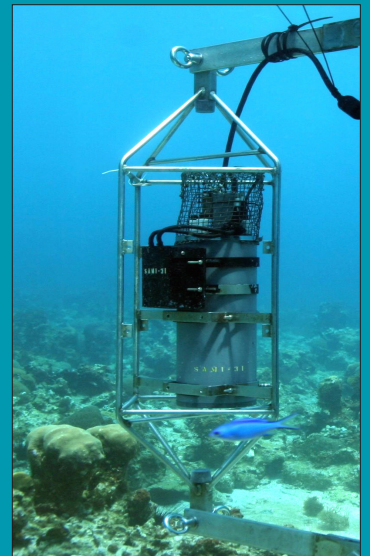


The Integration of Data for Research

Integration of coral data is one of the recommendations by the U.S. Commission on Ocean Policy:

- Recommendation 15-4: NOAA should ensure that water quality monitoring data are translated into timely and useful information products for the Integrated Ocean Observing System (IOOS).
- Recommendation 21-4: The U.S. Coral Reef Task Force should identify critical research and data needs for the IOOS.
- Recommendation 26-9: Congress should fund the IOOS.

The ICON Program is heavily engaged in integrating data, not only from the stations we deploy throughout the world, but also through matching data from our government agency and academic partners.



Partnerships Help Data Integration

- Satellite data for sea temperature and chlorophyll (University of South Florida/IMaRS, and various commercial sources).
- Satellite data for winds (National Environmental Satellite, Data, and Information Service).
- WERA ocean surface currents (University of Miami/Rosenstiel School of Marine and Atmospheric Science).
- Clouds (National Climatic Data Center).
- In situ data from ICON and other partners: SEAKEYS network (Florida Keys); AIMS network (Australia); and NMFS Coral Reef Ecosystems Division Buoys (Pacific Ocean).
- Aquarius habitat (Florida Keys).

Ecological Forecasting

Ecological forecasts predict the impacts of physical, chemical, biological, and human-induced change on ecosystems and their components. The ICON program is taking advantage of the many data sources to produce forecasts such as those for coral bleaching, larval drift, spawning, migration, upwelling, and other marine behavioral events and phenomena for the benefit of Marine Protected Area (MPA) managers and researchers. These forecasts are very difficult to research and produce, due to the very complex nature of marine ecosystems. With the help of our agency and academic partners, we have begun to produce some effective daily products which will eventually help the MPA managers better understand and help regulate their MPAs.

Want to Learn More?

To learn more, contact Dr. Jim Hendee (Jim.Hendee@noaa.gov), or visit these sites:

- <http://www.coral.noaa.gov>
- <http://ecoforecast.coral.noaa.gov>