

Oceanographic monitoring data are used to prepare ecoforecasts

James C. Hendee and Lewis J. Gramer

From the early 1990s – 2012, the National Oceanic and Atmospheric Administration (NOAA) Atlantic Oceanographic and Meteorological Laboratory (AOML) collaborated with the Florida Institute of Oceanography and the Florida Fish and Wildlife Research Institute in the management of data from the Sustained Ecological Research Related to the Management of the Florida Keys Seascape (SEAKEYS) Network. The network consisted of seven instrument-enhanced Coastal-Marine Automated Network (C-MAN) stations, cooperatively managed with the NOAA National Data Buoy Center (NDBC).

Instruments and data transmission equipment are still attached to all stations to measure standard meteorological variables such as wind velocity and direction, gusts, and air and dew point temperatures. Oceanographic variables, including salinity, sea temperature, tide height, and light attenuation (related to visibility) were formerly also measured throughout the network. However, due to budget constraints, the SEAKEYS components of the program have been decommissioned as of 2012, and only the station at Molasses Reef Lighthouse is still fully instrumented by AOML and NDBC. Data are collected hourly and transmitted to AOML from these stations via satellite. Scientists process and archive these data, then integrate them in time and space with other sources, such as satellite-derived sea surface temperatures and chlorophyll, and outputs from numerical computer models of the atmosphere and the coastal ocean.

Integrated data are used to develop marine ecosystem models called ecoforecasts, which assess changes in environmental conditions that trigger events such as coral bleaching, coral spawning, changes in water clarity and quality, larval drift, and other ecosystem

phenomena. Ecoforecasts are validated, whenever possible, through observations from personnel in the field. Ecoforecasts allow managers at the Florida Keys National Marine Sanctuary to anticipate and understand changes to the ecosystem due to climatic and meteorological events. The knowledge gained from these forecasts support informed management decisions. These stations also provide the public with high quality, real-time information on air temperature, wind speed and direction (ndbc.noaa.gov), including sea temperature, salinity, and light data from Molasses Reef. To learn more about the network and to access the ecological forecasting database, please visit ecoforecast.coral.noaa.gov.



Real-time oceanographic data are collected from instruments fastened to the Molasses Reef Lighthouse and transmitted by satellite to the NOAA Atlantic Oceanographic and Meteorological Laboratory for analysis.