The primary goal of the Center for Ocean, Seafloor, and Marine Observing Systems (COSMOS) is to establish a sustained, comprehensive, integrated observing system in the coastal ocean off the Northeastern United States. This region includes the historically rich fishing grounds of the Gulf of Maine and Georges Bank, as well as the diverse and economically important continental shelf, bays, and sounds of southern New England.

The observing system was conceived to enable interdisciplinary scientific research and to provide information required to address societal issues such as harmful algal blooms, coastal flooding, degradation of water quality, and protection and wise use of marine resources. Some elements of this Northeast observing system are operational; others have received funding but are not yet built or deployed; still others are in the planning stages.

COSMOS is responsible for the operation and maintenance of the Martha's Vineyard Coastal Observatory (MVCO), which was established in 2000 off the south coast of the island. Exposed to the open Atlantic, MVCO functions as a basic research facility, an engineering testbed, and a continuously operating monitoring station. The facility includes a shore laboratory, an onshore meteorological mast, an undersea node, and an air-sea interaction tower, each of which is connected by a cable providing electrical power and rapid communications. With this infrastructure, technologies that were previously used only in laboratories or on ships can make sustained *in situ* measurements of ocean conditions.

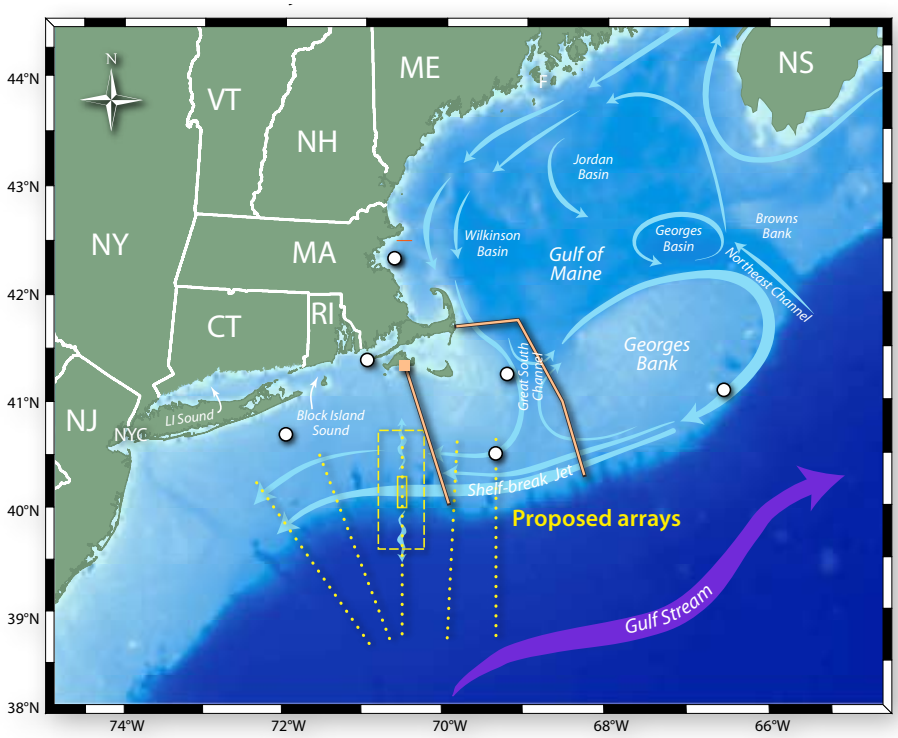
Heidi Sosik (BIO) serves as chief scientist for MVCO; Janet Fredericks (AOP&E) is project manager; Jay Sisson and Andy Girard (both AOP&E) provide operational and engineering support; and numerous other WHOI personnel provide short-term operations and engineering expertise. Since its establishment in 2001, MVCO has hosted several experiments each year, with funding from the National Science Foundation (NSF), the Office of Naval Research (ONR), the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration, the National Renewable Energy Laboratory, industrial and commercial interests, private donors, and WHOI.

A primary focus for COSMOS in 2007 was the Northeastern component of the Integrated Ocean Observing System (IOOS), an applications-oriented program spearheaded by NOAA. COSMOS engaged numerous regional partners in work that will lead to the formal establishment of the Northeastern Regional Association of Coastal Ocean Observing Systems, one of eleven regional associations. An important element of this work is the establishment of a state-based consortium to bring together academic institutions, government agencies, and industry to serve IOOS and other regional programs.

Working with regional partners—including the Bedford Institute of Oceanography, the Gulf of Maine Ocean Observing System, the NOAA Northeast Fisheries Science Center, and the state universities of Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island—WHOI was successful in winning grants for two IOOS proposals. One grant supports existing infrastructure for three years, while the other supports long-range regional planning (also for three years). In addition, several WHOI investigators won individual IOOS grants: Janet Fredericks, to integrate quality assurance and quality control procedures into the Open-Geospatial Consortium Sensor Web Enablement framework; Scott Gallager (BIO), to establish the Northeast Benthic Observatory in support of fisheries and ecosystem management; and Hauke Kite-Powell (MPC), to determine how to maximize the economic return from the Northeast regional observatories.

COSMOS also played a vital role in other WHOI efforts toward ocean observing networks. The most spectacular was a successful proposal and resulting contract with NSF to establish a WHOI-led Implementing Organization for the coastal and global components of the national Ocean Observatories Initiative. Bob Weller (PO) is serving as the lead principal investigator for that effort, with Libby Signell (AOP&E) as project manager and Al Plueddemann (PO) as the project scientist for the Pioneer Array. Many other WHOI scientists and engineers have and will contribute to this transformative initiative.

— John Trowbridge, Center Director



Jack Cook, WHOI

A WHOI-led science and engineering team will design and deploy permanent and transportable arrays of buoys and autonomous vehicles off the Mid-Atlantic Bight and Pacific Northwest to study coastal processes and to monitor changes in coastal systems. The team—which includes Oregon State University and the Scripps Institution of Oceanography—also will develop buoys to address global-scale problems in critical high latitude locations in the Northern and Southern hemispheres.