

# Operational Observation Networks for Ports, a Large Estuary and an Open Shelf

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## Introduction

This paper describes the goals, capabilities and accomplishments of three operational coastal ocean observation networks. In the companion paper in this volume, the authors discuss reasons for the rapid proliferation of coastal ocean observation networks. Any attempt to discuss the goals, capabilities and accomplishments of the many established and emerging sites is well beyond the scope of this paper. Because many observation networks are local, the goals are often local. Because they are not static, but are constantly being improved, upgraded, and used, the capabilities and accomplishments are also constantly changing and are often several years ahead of descriptions and results available in the published literature. It therefore would be a disservice for the authors to attempt to accurately portray the current state of an observation system in which we were not directly involved.

Rather than limit our discussions to generalities, the authors instead chose to highlight here three specific observation systems that span the scales from ports, to a large estuary, and on to the open coast. The Physical Oceanographic Real-Time System (PORTS) is operated by the NOAA National Ocean Service in five of the busiest U.S. harbors. The Chesapeake Bay Observing System (CBOS), operated by the University of Maryland, covers the entire Chesapeake Bay. The Long-term Ecosystem Observatory (LEO-15) is operated by Rutgers University on the open coast offshore of Tuckerton, New Jersey. Each system is considered representative of the state of the art for its application region. The systems share many common

qualities. They all have long-term goals, but real-time applications seem to be paying most of the bills. They observe on relatively local scales, while recognizing the need to expand regionally. They all strive to make their data accessible over the World Wide Web to the general public as well as the scientific community. They have all benefited from partnerships between university researchers, government agencies and commercial enterprises through programs such as the National Ocean Partnership Program (NOPP).

## An Observation Network for Harbors—PORTS

### Setting

The Physical Oceanographic Real-Time System (PORTS) is a centralized data acquisition and dissemination system that provides real-time observations (updated every 6 minutes) of water levels, currents, water temperature and salinity, wind speed and direction, and atmospheric pressure from numerous locations around a bay or harbor (Figure 1). Nowcasts and 24-hour forecasts of these parameters from numerical oceanographic models driven by real-time data and forecast meteorological fields from weather models are also being implemented.

PORTS systems were designed and installed by NOAA's National Ocean Service (NOS) and are operated in partnership with the local marine community for each bay or harbor. Full PORTS systems are presently operating in the Tampa Bay (5 locations, 15

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