Mid-Atlantic Metocean Data Portal

Delivering real-time metocean data and tools to reduce risks and lower costs

George Hagerman, Virginia Tech
Jeff Orrock, National Weather Service
Jeff Hanson, WaveForce Technologies LLC
Robert Fratantonio, RPS

Sources of Measured and Modeled Data

Measured data sources include observations from the National Data Buoy Center (NDBC) and the Center for Operational Oceanographic Products and Services (CO-OPS), satellite imagery and active tropical storm tracks. Modeled results for winds, waves, water levels and surface currents are available in map form, in which users can create a “virtual buoy” for plotting and downloading modeled time series.

Two of the different wave model domains are mapped below:

Wind Model Nowcast Comparison

Surface Current Model Nowcast Comparison

Wave Model Forecast Skill Comparison

A New Data Portal

The Mid-Atlantic Metocean Data Portal provides real-time access to observations and forecasts of winds, waves, currents, and water levels to support offshore wind development and other maritime activities in the Mid-Atlantic region. Users can interactively select points of interest, model layers (CBOFS water level, NWPS surface currents, and NDFD surface winds), together with a global sea surface temperature (SST) 14-day composite from AVHRR satellite measurements, and locations of validation stations.

The data portal is built on the OceanMap front end web framework and a backend consisting of the Environmental Data Service (EDS). It leverages powerful Python based web services that accesses model forecasts and metocean observations via the EDS API. Web services provide a dynamic table of contents, advanced plotting features, analysis tools, and data download all through a user-friendly, web-based GUI. The EDS is comprised of a central data server (with mirroring) that stores archive data and collects data from designated sources (e.g., numerical models, sensors). It is designed to be scalable and modular and utilizes a Service Oriented Architecture (SOA) that provides Simple Object Access Protocol (SOAP), Representational State Transfer (REST) and Web Map Service (WMS) interfaces for client applications.

Features

Users can view model-based model fields and interactively select specific grid points (“virtual buoys”) for customised plotting of modelled time series data, including comparison with nearby measurements. A dedicated validation tool enables robust statistical validation of wind and wave forecasts from 00 hours out to 96+ hours.

Additional Applications

Although initially focused on the Virginia wind lease area, the Portal’s geographic domain also includes the offshore wind lease areas off Maryland and Kitty Hawk, North Carolina. We anticipate that the Data Portal also will benefit coastal engineers (planning offshore sand mining and dredge spoil disposal), commercial shipping and fishing interests, emergency responders, and recreational users.

Access to the portal is freely and publicly available at http://oceansmap.com/midatlanticportal