

## **Ocean Prediction Center Overview**

The Ocean Prediction Center (OPC), established in 1995, was one of the National Centers for Environmental Prediction's (NCEP's) original six service centers. However, the basis for OPC's mission can be traced back to the sinking of the Titanic in April 1912. In response to that tragedy, an international commission was formed to determine requirements for safer ocean voyages. In 1914, the commission's work resulted in the Safety of Life at Sea Convention; the United States is one of the original signatories. The National Weather Service (NWS), through OPC, assumed the U.S. obligation to issue warnings and forecasts for portions of the North Atlantic and North Pacific oceans.

OPC's Ocean Forecast Branch issues warnings and forecasts in print (bulletins) and graphical formats, on a 24×7 basis up to five days in advance. Over 100 of these products are issued daily. They cover the North Atlantic Ocean from the west coast of Europe to the U.S. and Canadian east coast and the North Pacific Ocean from the U.S. and Canadian west coast to the east coast of Asia. OPC weather forecasts and warnings for these areas primarily ensure the safety of ocean-crossing commercial ships and other vessels on the high seas. Imbedded in these high seas areas are smaller offshore zones off the Atlantic and Pacific coasts. These zones extend from near the coast seaward to just beyond the U.S. Exclusive Economic Zones, out to about 250 nm. OPC services ensure the safety of the extensive commercial and recreational fishing, boating, and shipping activities in these offshore waters.

In 1994, OPC began to quality control global surface marine observations. Using an automated algorithm and interactive system, forecasters examine the latest observations from Voluntary Observing Ships and drifting and moored platforms and compare them against short projection model runs. Worldwide surface marine observations come to OPC via the World Meteorological Organization's global telecommunications system in real time. These quality control measures remove spurious data before the data are ingested into models to initialize forecasts. Several hundred of these observations are interactively examined daily. In addition, the quality controlled data are used by OPC forecasters to determine if gale, storm, or hurricane force wind warnings are warranted.

OPC's Ocean Applications Branch plays a critical role in transitioning science and technological advancements into enhanced OPC operations and services. One example is the adaptation of ocean surface vector wind observed from the QuikSCAT satellite in early 2000. Prior to the QuikSCAT launch, NWS did not have the ability to observe, verify, and warn of hurricane force (HF) wind conditions, areas where wind speed exceeds 64 knots, associated with strong winter ocean storms. With QuikSCAT data routinely available in 2000, OPC began to issue HF wind warnings. In the 2006-2007 winter storm season, over 100 HF warnings were issued for North Pacific and North Atlantic oceans to warn ships of these most severe weather hazard conditions over major shipping routes. Preliminary results from a recent study estimates that in the absence of good information about extra-tropical ocean storms, the annual loss to container and dry bulk shipping would be on the order of more than \$500 million. Operational marine warnings and forecasts reduce the above estimated annual loss by nearly a half.

Advancements in science and technology continue to drive OPC's service improvements. OPC began to produce experimental gridded significant wave height forecast in 2006, a first step toward digital marine service for high seas and offshore areas. Additional gridded products such as surface pressure and winds are under development. Recently, OPC began to use the NWS operational extratropical storm surge model output to provide experimental extratropical storm surge guidance for coastal weather forecast offices to assist them in coastal flood warning and forecast operations. OPC has a number of ongoing research-to-operations transition efforts that will lead to a suite of new oceanographic analysis and forecast products such as ocean temperatures and currents based on real time observations and advanced global and basin scale ocean forecasting models. The first of these will be coming online in late 2008.