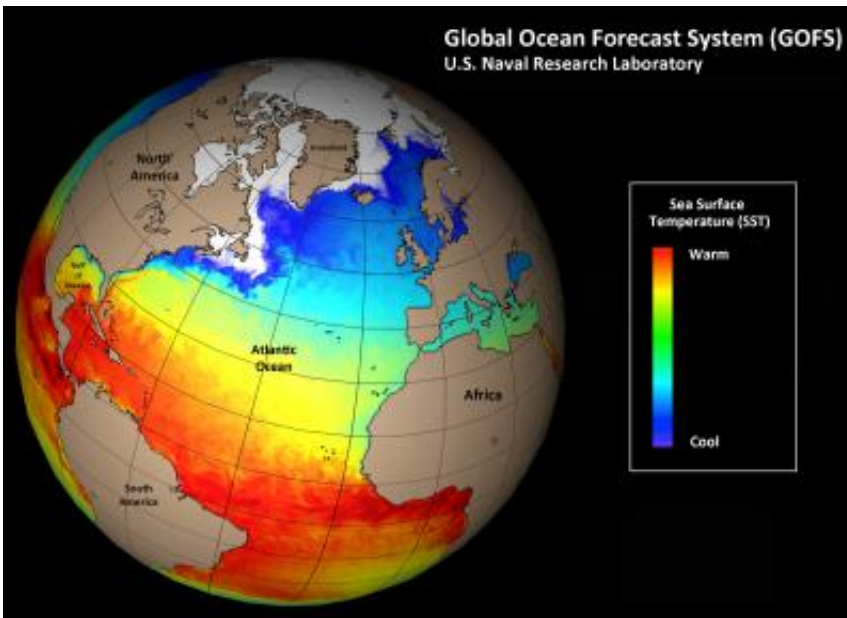


Navy transitions global ocean forecast system for public use

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This Image from the Navy Global Ocean Forecast System (GOFS) portrays sea surface temperature (SST) on Jan. 15, 2014. The warm tropical waters can be seen to flow through the Gulf of Mexico and northward along the eastern US seaboard where the Gulf Stream separates at Cape Hatteras, off the coast of North Carolina, and flows to the east. This warm water "conveyor-belt" alters the ice cover across the north Atlantic. Without the ocean transport of heat, global climate and weather would be dramatically changed. Credit: U.S. Naval Research Laboratory-Oceanography Division

The U.S. Naval Research Laboratory (NRL) and the National Center for Environmental Prediction (NCEP) within the National Ocean and

Atmospheric Administration (NOAA) have entered into a formal agreement that results in NCEP using Navy developed global ocean forecast model technology to make environmental ocean forecasts for public use.

"Development of an advanced [global ocean](#) prediction system has been a long-term Navy interest," said Dr. Gregg Jacobs, head, NRL Ocean Dynamics and Prediction Branch. "This use of Navy developed systems for global ocean forecasting represents dual use technology that will benefit civilian interests and is an excellent example of the [cutting edge research](#) that is enabled through Navy sponsored investments."

The ability to operationally predict the ocean environment and provide this critical information had been developed within the Navy through the Office of Naval Research (ONR) and NRL research and development (R&D) investments along with Oceanographer of the Navy investments resulting in the transition of systems to the Naval Oceanographic Office (NAVOCEANO).

The Naval Meteorology and Oceanography Command that oversees NAVOCEANO is responsible for providing ocean environment forecasts utilizing meteorology and oceanography, satellite and in situ monitoring systems and geospatial information and services to enable the Navy to leverage the environment and make successful strategic, tactical, and operational battle space utilization around the globe at any time.

The Navy has had requirements for predicting the ocean environment for its purposes including estimating acoustic propagation, placement of sonar arrays, determining currents for mine drift and burial, drift for search and rescue, and safety of operations on and under the ocean surface. NRL has enabled Navy operational ocean prediction of tactically relevant information.

To accomplish this task, Jacobs says three critical components are necessary to predict the open [ocean environment](#). "The first is access to satellite observations that measure precise sea surface height, sea surface temperature and ice concentration with in situ observations from public sources and Navy ships; second, numerical models representing the dynamical processes capable of understanding the physics of the ocean and numerical methods for efficiently representing those physics; and lastly, the third critical component is the technology to correct the numerical models using the observations through data assimilation." These components have been implemented at the Naval Oceanographic Office for daily global [ocean](#) prediction.

Within NCEP, the observational components from satellite and from NOAA buoys around U.S. coasts are available publicly. For the dynamical model, NCEP has adopted the Hybrid Coordinate Ocean Model (HYCOM) numerical model system developed through the National Ocean Partnership Program (NOPP) that NAVOCEANO runs to construct seven-day forecasts each day of the year. The third critical piece provided to NCEP through the new agreement enables application of Navy technology to the civilian sector.

NOAA's NCEP has a mission to provide environment forecasts to the U.S. public and has provided meteorological information for many years. The new agreement will allow NCEP to use software developed by NRL to assimilate data necessary to maintain daily forecast accuracy that enables safe, at-sea operations, hazard mitigation, resource management, and emergency response. "This is an example of complementary missions across agencies that through coordinated application leads to protecting our service personnel, who ensure the high seas are safe, and protecting our resources and citizens at home." Jacobs said.

Provided by Naval Research Laboratory

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