



**Naval Research Laboratory
Stennis Space Center
Mississippi 39529**

www7320.nrlssc.navy.mil/

Ocean dynamics and prediction includes basic and applied research in computer modeling of ocean system representing dynamics, thermodynamics, currents, sound speed, tides, surface waves from deep water to shore, wave and surf, nearshore currents, computational numerical techniques, data assimilation and the analysis of satellite oceanographic data as related to the development of modeling and data assimilation capabilities. Deep ocean basins, marginal and semi-enclosed seas, coastal and estuarine regions are of interest. Research in computational techniques include the study of efficient solutions to partial differential equations arising in oceanography with special focus on efficient utilization of massive parallel processing technology. The ocean nowcast/forecast and simulation systems have broad and direct application to issues related to Naval operations (antisubmarine warfare, naval special warfare, expeditionary warfare, mine warfare, intelligence surveillance and reconnaissance, search and rescue operation).

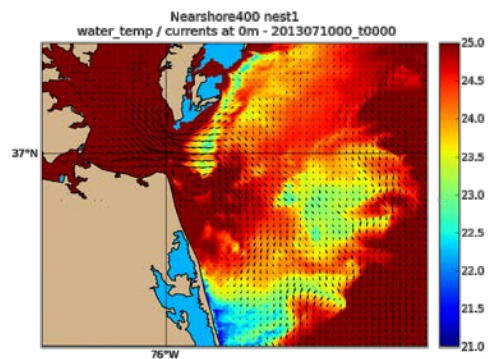
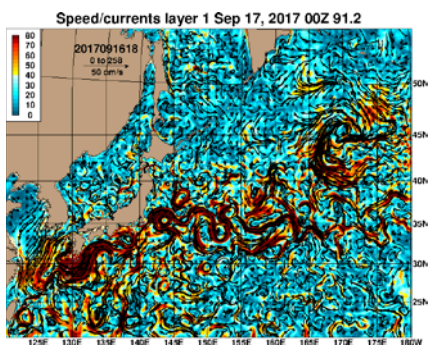
Welcome to the Oceanography Division of the U.S. Naval Research Laboratory. Code 7320 Ocean Dynamics and Prediction Branch

Ocean prediction technology

The Naval Research Laboratory (NRL) is the US Navy corporate laboratory, dedicated to addressing Navy unique problems and enabling the Navy to operate efficiently and safely. Unique to the Navy is the need to monitor and predict the ocean. Currents, surface waves, temperature structure, tides and other properties affect the ability to safely navigate and operate in the global oceans. The NRL Oceanography division conducts research from understanding basic ocean physics to constructing operational ocean prediction systems similar to those employed for atmospheric weather prediction.

This is an opportunity to work with the nation's largest group of cutting edge researchers focused on bringing new technology to ocean prediction. The work involves building numerical model systems that represent ocean physics, constructing processing systems that feed satellite observations of a wide range of ocean parameters, and assimilating both satellite and in water observations into numerical models. The scales of ocean features involve global circulation to currents in estuaries and rivers. NRL research leads to prediction systems that are implemented operationally and provide forecasts to users throughout the Navy, academic, government and commercial community. Examples of a few ongoing projects may be seen at: <https://www7320.nrlssc.navy.mil/projects.php>

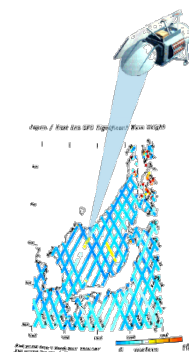
NRL is closely connected to the High Performance Computing network with access to DoD supercomputers across the nation. Researchers at NRL apply the Navy DoD Supercomputing Resource Center (Navy DSRC) computers to both research and operational systems.



This is an exciting time in oceanography with the first global prediction systems now coming on line and providing a wide range of products (<https://www.ocean.nrlssc.navy.mil>). Global ocean systems provide currents and temperature throughout the world (<https://www7320.nrlssc.navy.mil/GLBHycom1-12/>). The next generation of numerical ocean models is under construction (<https://www7320.nrlssc.navy.mil/dynamic/gofs/gofs.php>). High resolution circulation systems are being implemented to provide detailed information in local areas (http://www7320.nrlssc.navy.mil/IASNFS_WWW/).

Initial satellite data feeds are in place (<http://www7320.nrlssc.navy.mil/altimetry/>), and new feeds are coming online in the near future. Surface waves are being predicted up to the shores around the globe (<https://www7320.nrlssc.navy.mil/SWANFAR/>).

You have the potential to implement the processing of these new observations and to ensure the ocean systems assimilate them properly. Appropriate data quality control and statistical analysis of the observations is needed. The most critical part in providing accurate ocean forecasts is the proper use of observations in the ocean model data assimilation. This requires your understanding of the proper application of statistical techniques to develop covariances between observations and ocean fields to provide optimal estimation of the ocean state given the observations. You can apply your PhD or Masters degree in Oceanography, meteorology, physics, computer science, mathematics or engineering with your years of experience in research, programming, visualization and statistical analysis to solve these problems and build the systems that will be used operationally by people throughout the world. The Naval Research Laboratory is an Equal Opportunity Employer.



Employment

Recent PH.D., Faculty Members, and College Graduate Programs

The National Research Council Cooperative Research Associateship Program

The NRL/ASEE Postdoctoral Fellowship Program

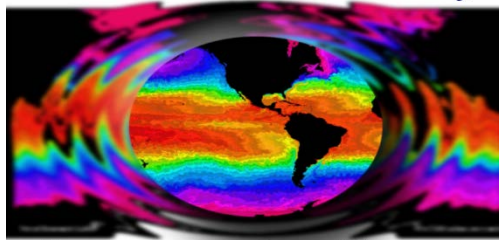
The Navy/ASEE Summer Faculty Research and Sabbatical Leave Program

The National Defense Science and Engineering Graduate Fellowship Program

The **College Student Career Experience Program** employs students in study-related occupations. The primary focus is on the pursuit of a bachelors degree in engineering, computer science or the physical sciences.

The **College Student Temporary Employment Program** allows students to work in the laboratory while they are going to school.

Naval Research Laboratory



Keeping an eye on the world's oceans...
<http://www.ocean.nrlssc.navy.mil>

<http://www7320.nrlssc.navy.mil/jobs.php>

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