ENVIRONMENTAL KNOWLEDGE AND OPERATIONAL EFFECTIVENESS

MISSION IN BRIEF

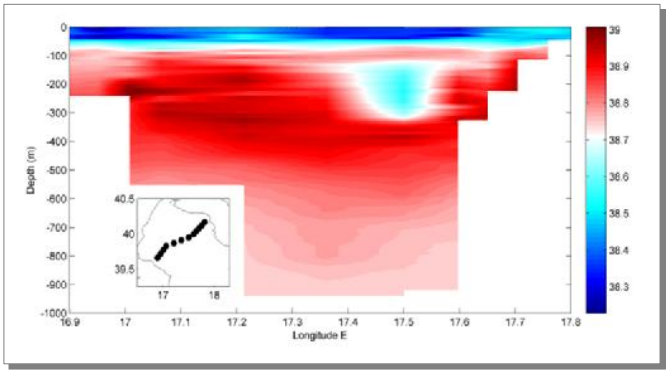
Develop techniques and tools for characterizing the marine environment, including the uncertainties of data gathered in that environment and the impact of those uncertainties on military operations.

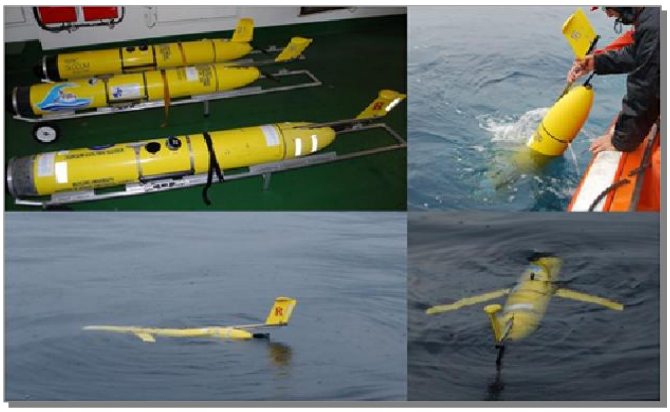
OVERVIEW

When making decisions during operations, naval commanders, planners and operators rely on meteorological and oceanographic data and forecasts. However, in the coastal zone, where NATO navies typically operate, the environment can change dramatically over short distances and lengths of time. In addition, resources to gather meteorological and oceanographic data are typically limited as is our understanding of complex ocean processes. These limitations create uncertainties. Researchers at the Centre are trying to quantify these uncertainties in three related efforts to develop:

- Tools and techniques to characterize the environment in a cost-effective and scalable manner, including the use of autonomous vehicles and remote sensing
- Numerical models to make tactical predictions based on current and near-future environmental conditions
- Decision support algorithms to provide timely and objective assessments of risk to decision makers

The goal of these efforts is to assess the level of uncertainty so that naval personnel can gauge their confidence in the success of a particular action.
A longer term goal is to reverse this process, first defining the level of uncertainty that can be tolerated for a particular mission and then determining a data gathering strategy based on that requirement.





Top: Physical properties of the ocean, such as temperature and salinity, can affect military operations, such as sonar performance. This graph shows a pool of low-salinity water in a profile across the Gulf of Taranto collected by ship-based and glider-based instrumentation. Bottom: Slocum gliders are used to gather oceanographic data. Easily deployed, gliders are powered by buoyancy engines instead of propellers, so they operate quietly and have minimal energy requirements, allowing them to stay at sea for months gathering and transmitting data in near real-time.

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