

US Navy

Monumental advances in the field of hydrography over the past decade have forever changed how we look at and think about a nautical chart. From high-resolution multi-beam sonars to kinematic GPS, moored tidal buoys and airborne laser hydrographic systems, the US Navy has embraced a multitude of technologies that improve both the safety of navigation and the war-fighting capability of our warships.

The challenge with high-resolution survey data and electronic presentation formats is to determine how and what information is retained. Today, the US Navy and our partners at the National Oceanic and Atmospheric Administration's Office of Coast Survey (NOAA OCS) and the National Geospatial-Intelligence Agency (NGA) are capturing and retaining these high-resolution data on what we are calling the 'navigation surface'. This concept was pioneered by the University of New Hampshire's Center for Coastal and Ocean Mapping (CCOM) and provides a bottom model at the best resolution the sonar will support. Soundings for charting are then taken from generalised grids from the surface. With the depth layer of the navigation surface, a layer of uncertainty is created. This layer is the result of horizontal and vertical error in the survey system combined using a technique called the Combined Uncertainty Bathymetric Estimator (CUBE). This layer provides a quantitative value of quality for every cell in the bottom model. This surface then provides the foundation for chart production.

The flagship of the US Navy's hydrographic programme is the Naval Oceanographic Office (NAVOCEANO) and its seven multi-mission survey vessels that conduct a variety of surveys year-round, from deep water into the littorals, in support of the Navy's worldwide mission. Technology improvements have not only increased the volume of data, but also provided the mechanism for rapid transport of the data back to NAVOCEANO. Each week, hundreds of gigabytes of hydrographic data are returned via satellite communications for processing and validation, dramatically improving the turnaround time of this critical information.

NAVOCEANO is also home to the Compact Hydrographic Airborne Rapid Total Survey (CHARTS) system, which provides the ability to collect high-resolution data at high speed in remote areas worldwide. This leading-edge LIDAR system not only collects hydrography, but also topography, hyperspectral imagery and visual imagery.

The Fleet Survey Team (FST), formerly a department at NAVOCEANO, evolved into its own command and expanded to include the former Hydrographic Cooperation Program (HYCOOP). The FST now combines the rich history and expertise of HYCOOP with the rapid deployment capability of our military hydrographers to provide a military survey element also available for co-operative surveys and training through mobile training teams. FST can provide our allies with subject-matter experts in every aspect of hydrographic surveying to enhance their capabilities.

Training is also available to other countries via the International Hydrographic Management and Engineering Program (IHMEP), an IHO Category B certified course, and the International Hydrographic Applied Science Program, certified as IHO Category A. Both of these programmes are educating a new generation of hydrographers to take full advantage of today's technology.

Never has there been a more dynamic time to be a hydrographer. In these ways and more, the US Navy remains committed to remaining a leader in hydrography, to working with our partners around the world to share these technologies and concepts, and to further explore the next generation of new technologies that can improve the quality of information derived from the sea.