



nrlpao@nrl.navy.mil
202-767-2541

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Ship Island Used as Navy Lab



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The first of several planned Navy experiments integrating assorted platforms, sensors and models was held in the nearshore waters surrounding Ship Island, located near NRL-SSC, one of NRL's field sites, located on the Mississippi Gulf Coast.

With NRL as the lead agency, participants sharing a common interest of developing new techniques for environmental forecasting came together to form the Tactical Environmental Workshop - Littoral (TEW-L). Participants included NRL, the Naval Oceanographic Office (NAVOCEANO), the Fleet Survey Team (FST), and the Naval Oceanography Special Warfare Intelligence Surveillance and Reconnaissance Detachment Stennis (NOSWISRD Stennis).

This exercise required close collaboration and cooperation with the National Park Service enabling the experiment to be conducted in the Gulf Islands National Seashore, Mississippi District.

According to lead researcher, Dr. Todd Holland, the objective of the Ship Island exercise was to deploy, exercise, and critique the integration of various platforms, sensors and operational teams used to characterize oceanographic conditions in a near-to-shore setting, and to experiment with various approaches for rapid and effective characterization of the nearshore battlespace.

Platforms used included small unmanned aerial systems (SUAS), jet skis, and boats deploying cameras, echo sounders, wave buoys and current profilers while using uniquely skilled operators for data processing techniques, including on-site teams.

"Ship Island challenged the team with a dynamic, environmentally diverse setting, unimpeded by human activity, and served as a real-time laboratory uniquely suited for developing tactically-relevant capabilities," commented CMDR Monty Spearman, Military Deputy.

During the exercise, the FST collected bathymetry for "ground-truthing" other sensors and for use with area-specific, very shallow water (VSW) / surf zone (SZ) oceanographic models constructed for the experiment. They completed more than 80km of survey lines with a multibeam echo sounder and 23km of lines via jet ski sensing with singlebeam echo sounder.

NOSWISRD Stennis working with an assigned NOSW aircrew piloting the Raven B SUAS mapped over 26km of coastline and the corresponding nearshore waters surrounding Ship Island. While achieving this, they likewise developed tactical video

collection techniques and procedures with the UAS pilots to support an ongoing NRL project entitled 'Estimating Surf Zone Bathymetry Using SUAS'.

In-situ sensors also played a significant role in the experiment. A newly engineered wave buoy deployed by NOSWISRD collected over two days of continuous wave data that was used to assist in validating products from the aforementioned Delft3D VSW / SZ ocean model. An acoustic Doppler current profiler (ADCP) deployed by FST provided current data across a 21-day stretch spanning the experiment. Hindcasts were made for the entire time period sampled by the ADCP. These were then compared to Delft3D nearshore current model predictions initialized from the high-resolution bathymetry collected during experiment and using the observed area tides and waves to induce flow.

The TEW-L workshop objectives are to continue to integrate emerging technologies, adapt tested capabilities, continue localized experimentation, develop improved strategies, evaluate and transition data to operational use, and develop and demonstrate nearshore forecasting abilities.



Singlebeam survey conducted from NRL's hydrographic jet ski (Lowrance SBES and Trimble GPS w/ Real Time Kinematic (RTK) base station).