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Naval Oceanographic Office Activities Related to the Deepwater Horizon Oil Spill

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As a result of the oil spill that followed the explosion of the Deepwater Horizon (DWH) drilling platform on 20 April 2010, the Naval Oceanographic Office (NAVOCEANO) accelerated implementation of an operational high resolution Navy Coastal Ocean Model (NCOM) that had been planned for the Gulf of Mexico and Caribbean Sea region later in the year. In accordance, NAVOCEANO deployed and assimilated the conductivity, temperature, and ocean currents data collected from two Seagliders, eleven APEX profiling floats, and eighteen drifting buoys into the model regime. In addition, the Seagliders that were originally equipped with WET Labs Environmental Characterization Optics (ECO) pucks™ designed to measure optical backscatter and chlorophyll fluorescence, were quickly outfitted with ECO pucks™ specific for colored dissolved organic matter (CDOM) fluorescence. These sensors measure CDOM by emitting light at a wavelength of 370 nm and measure the resulting fluorescence at a wavelength of 460 nm. While the CDOM sensor can effectively determine the presence of crude oil per the WET Labs Client Advisory, the signal is in addition to background levels of CDOM in the natural environment, and the measurements were intended to be used solely as a proxy indicator for subsurface oil. The two Seagliders deployed on 25 May 2010 by the R/V Thomas Jefferson were operated remotely by pilots at the NAVOCEANO Glider Operations Center for a total of 86 days and collected over 1700 ocean profiles to a maximum depth of 1000 meters. While there was no indication that the Seagliders had encountered subsurface oil, the ECO pucks™ did reveal a stratified ocean structure with enhanced CDOM fluorescence at depth throughout the deployment. This value-added optics information and the ocean circulation forecasts and model output from NCOM were provided to the National Oceanic and Atmospheric Administration (NOAA) Office of Response and Restoration daily to support recovery operations and other research and operational activities. All observational data from NAVOCEANO's response were made available in near real-time to participants involved in the recovery effort through the NOAA National Coastal Data Development Center and via the Integrated Ocean Observing System (IOOS) website maintained by Rutgers University. The two Seagliders were recovered on 19 August 2010 by the R/V Bigelow.