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THE UTILITY OF SATELLITE IMAGERY DURING THE 2010 DEEPWATER HORIZON OIL SPILL

Abstract

This presentation will provide participants with a case study demonstrating the value of activation of the International Charter Space and Major Disasters for a large-scale offshore oil spill emergency, specifically the Deepwater Horizon (DWH) incident in the U.S. Gulf of Mexico in 2010.

The Deepwater Horizon (DWH) oil spill began on 20 April 2010 when an explosion occurred on a drilling platform approximately 50 miles southeast of Venice, Louisiana, USA. The platform burned for two days before capsizing and sinking on 22 April 2010. By the time responders capped the well three months later, the catastrophic oil leak spilled approximately 134 million gallons of oil into the Gulf, the largest offshore oil spill in U.S. history. As the lead U.S. science agency for coastal oil spills, the U.S. National Oceanic and Atmospheric Administration (NOAA) was on the scene of the Deepwater Horizon oil spill from the earliest moments to help guide the emergency response to the spill. The oil perimeter rapidly grew in size and soon it was not feasible to map the affected areas with overflight data or in-situ observations and the focus shifted to satellite analysis.

Typically, the NOAA's National Environmental Satellite Data and Information Service (NESDIS) Satellite Analysis Branch uses openly available, non-licensed satellite imagery and Synthetic Aperture Radar (SAR) to develop their products and services; however, much higher spatial resolutions are required to detect marine oil sheens. This left a significant gap in satellite coverage due to smaller imaging footprints. Without a budget to purchase commercial imagery, NOAA risked being unable to provide satellite assessments of the oil location and extent during a large-scale oil spill emergency like Deepwater Horizon. After activation of the International Charter, members provided imagery collected from more than fifteen sensors, of which about half were proprietary datasets. The Satellite Analysis Branch used this information to generate "daily composite" maps, in which the analyst overlaid all available satellite imagery and produced a collective delineation of the extent of oil. These maps were key in the actionable decision-making process, of where to deploy containment, removal, and mitigation resources.

The U.S. response to the Deepwater Horizon oil spill was significantly enhanced by access to the Charter constellation assets that were made available free of charge by the Charter Member Agencies/Data Contributors.