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GULF OF MEXICO DEEPWATER HORIZON OIL SPILL DISASTER: STUDY OF THE USE OF ASTER, MODIS, AND LANDSAT ETM+ COMBINED WITH UAVSAR L-BAND RADAR TO MONITOR OIL IN COASTAL WETLANDS FROM THE DEEPWATER HORIZON SPILL

Abstract

The Deepwater Horizon oil spill has released an unprecedented volume of oil into the Gulf of Mexico. The environmental impact of the spill is expected to be extensive, covering vast areas of the ocean and numerous ecologically sensitive coastal areas. This research focuses on extending Earth science research results to the existing decision-making systems of The Department of Homeland Security's Science and Technology Directorate division, and The United States Coast Guard for disaster management, monitoring, and mitigation. One key to assessing the full environmental and societal impact will be in identifying the dispersion of oil from the spill as it spreads in the water and on land. Remote sensing radar, which can see below cloud cover, could be instrumental in reaching this goal. This paper will be derived from the innovative use of the optical sensors ASTER and MODIS onboard NASA's Terra satellite, as well as Landsat ETM+ and in situ field surveys of Louisiana wetland sites in order to validate NASA's UAVSAR L-band data in the assessment of the impact of the oil spill on these coastal areas. NASA has funded a campaign to image the Deepwater Horizon oil spill with the UAVSAR L-band synthetic aperture radar. Data was collected in June 2010 covering the Gulf coastline and several open ocean regions in the Gulf of Mexico with the scientific goal of developing algorithms to better characterize both oil slicks on water and their ecological impact on vegetation from L-band radar returns. This study will provide an innovative analysis through a combination of data from satellite-based sensors and in situ field surveys to validate oil detection, particularly on vegetation and in small water channels, and is needed to substantiate results in order to characterize oil from the spill.