ENVISAT Applications Demonstrations: Alaska SAR Demonstration and Gulf of Mexico Hurricane Studies

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Abstract

Coastal and hydrologic applications of ENVISAT Advanced SAR (ASAR) imagery have been developed for ENVISAT–AO Project 431: Operational Demonstration of CoastWatch Coastal Oceanographic and Hydrologic Applications of ENVISAT ASAR Imagery. Applications include ocean surface winds for weather and storm forecasts, vessel positions for fisheries monitoring and enforcement, oil spill analyses for hazard response activities, and river ice information for analysis of ice and flood hazards. These applications are now being implemented for demonstration in a routine near–real–time environment, within National Oceanic and Atmospheric Administration (NOAA) environmental offices, for (1) the waters around Alaska as part of the Alaska SAR Demonstration (AKDEMO), and (2) the Gulf of Mexico for hurricane wind and post–landfall oil–spill response. Products derived from SAR sensor measurements include: (1) automated high–resolution SAR winds using the CMOD5 algorithm which provides improved accuracy of high–wind–speed retrievals, (2) automated vessel detection with a constant false–alarm rate algorithm, (3) automated sea ice classification, (4) identification of potential oil spill regions, and (5) analysis of Alternating Polarization ASAR imagery for detection of spring river ice breakup and flooding associated with ice jams for large Alaskan rivers. This paper highlights initial results of the incorporation of ENVISAT ASAR products into the AKDEMO within the context of a two–satellite applications demonstration (i.e. ENVISAT and Radarsat–1) in support of the NOAA National Weather Service and the U.S. Coast Guard. Also highlighted are Gulf of Mexico hurricane studies including ENVISAT ASAR hurricane wind measurements and use of ENVISAT ASAR imagery for post–hurricane oil spill response in support of the NOAA Office of Response and Restoration. Results from the 2005 hurricane season for Hurricane Katrina and Hurricane Rita are presented.