

**Geographic Surveillance and Hotspot Detection for Homeland Security:
Disaster Management: Oil Spill Detection, Monitoring, and Prioritization**

Short Description The scan statistic hotspot delineation and poset prioritization tools will be used in combination with our oil spill detection algorithm to provide for early warning and spatial-temporal monitoring of marine oil spills and their consequences.

Full Description Damage produced by marine oil spills includes soiled beaches, bird and mammal mortality, destruction of fisheries, impaired recreational facilities, and catastrophic impairment to entire ecosystems. Remote sensing can be used for oil spill detection and prevention of further damage. For example, the Exxon Valdez slick was detected through SPOT satellite data, the Ixtoc I well blowout slick in Mexico was detected using GOES and AVHRR on the NOAA polar series satellites, and oiled ice on Gabarus Bay (Kurdistan) was detected using LANDSAT data. We will use hyperspectral image analysis of Airborne Visible/Infrared Imaging Spectrometer (AVIRIS) and Synthetic Aperture Radar (SAR) data to conduct case studies of the Patuxent River in Maryland and the Santa Barbara shoreline of California for oil spill detection on sea water and associated mitigation. The main objective of using AVIRIS is to identify, measure, and monitor constituents of the Earth's surface and atmosphere based on molecular absorption and particle scattering signatures. SAR's ability to penetrate cloud cover, to illuminate the Earth's surface with its own signal, and to precisely measure distances, makes it especially useful for detecting and monitoring oil spills. The project's scan statistic hotspot delineation and poset prioritization tools will be used in combination with our oil spill detection algorithm to provide for early warning and spatial-temporal monitoring of marine oil spills and their consequences (Fingas, 1991; Kafatos and Chi, 2002; Salem and Kafatos, 2001).

Strategic Cycle Crisis Management
Elements

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