

A GIS Approach to Mapping Oil Spills in the Marine Environment

Andrei Yu. Ivanov and Victoria V. Zatyagalova

P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences [*ivanoff@ocean.ru*](mailto:ivanoff@ocean.ru)

A variety of phenomena such as biological surfactants, upwelling, algal blooms, shoals, floating vegetation, man-made spills from ships, platforms or pipelines can create the slick signatures on the synthetic aperture radar (SAR) images of the sea surface. Manifestations of oceanic and atmospheric phenomena or, so-called, look-alikes, as well as natural slicks have to be removed from consideration based on the appearance of the slick (size, shape, contrast, etc.), their location relative to surrounding objects (rigs, ships, etc.), their orientation relative to wind & current features and their link with oceanic or atmospheric processes. An important help to correctly interpreting the significance of dark signatures is Geographic Information Systems (GIS) and GIS-based databases that include the geographical information about water basin (coastline, bathymetry etc.) as well as locations of oil fields, platforms, pipelines, major shipping lanes, bottom seepages, etc. The GIS provides a framework for careful analysis.

Geoinformation approach to a problem of oil spill mapping, where a GIS is considered to be the core of the oil spill monitoring system, is presented. It will be responsible for the integration of SAR images, other remote sensing data and in situ measurements as well as making the final products, i.e. end user's oil spill distribution maps.

This approach has been applied to mapping oil spills in the Caspian Sea, Black Sea, Yellow Sea and East China Sea and in the Gulf of Thailand. Examples of oil spill distribution maps are presented and discussed.