The Application of Remote Sensing and Geographic Information System to determine the location and to Map Oil Pollution at the Libyan Coastal Zone

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Oil spills have become critical in most countries, especially countries like Libya that have sea coasts. Most oil spills happen in coastal and marine environments that make the emergency response to the accident very difficult and complicated.

To management of oil spill and to reduce the environment damages during oil spills it is necessary to   study and analysis the cause and the factors that lead to disaster of oil spill.

GIS has proven to be an excellent management tool for resource assessment, oil spill response and planning, and damage assessment. The approach to the problem of oil spill mapping includes the integration in GIS of the geographical and remote sensing data, information on oil and gas production/infrastructure, and slick signatures detected by satellite images. Compiled from data from several sources including nautical maps, geo-databases, and ground truth and remote sensing data, GIS allows the retrieval of key information, for purposes such as predicting oil spill locations, revealing offshore/onshore sources, and estimating the intensity of oil pollution. Remote sensing and GIS technologies can improve the identification and classification of oil spills, leading to construction of the final product, an oil spill distribution map. This approach has been applied to oil spill mapping on the Libyan coast. We conclude that the combination of GIS and remote sensing (RS) technologies provides an ideal solution for understanding the spatial/temporal distribution of oil spills in the marine environment and is considered as the core of the oil spill monitoring system.

This paper presents methods of applying remote sensing data and GIS technology for oil spill management in coastal areas and illustrates the oil spills and the major indicators to oil spills assessment onshore oil spill mapping over the study area, using mainly remotely sensed data and a geographic information system (GIS). This oil map can be continuously updated to provide information which supports the establishment of the response strategy and makes it possible to recognize the features of polluted areas and to distribute response resources.

Keywords: Oil spill, Geographic Information System, Remote Sensing Data.