Geophysical Research Abstracts
Vol. 15, EGU2013-10629, 2013
EGU General Assembly 2013

An integrated weather and sea-state forecasting system for the Arabian Peninsula (WASSF)

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Nowadays, large industrial conglomerates such as the Saudi ARAMCO, require a series of weather and sea state forecasting products that cannot be found in state meteorological offices or even commercial data providers. The two major objectives of the system is prevention and mitigation of environmental problems and of course early warning of local conditions associated with extreme weather events. The management and operations part is related to early warning of weather and sea-state events that affect operations of various facilities. The environmental part is related to air quality and especially the desert dust levels in the atmosphere. The components of the integrated system include: (i) a weather and desert dust prediction system with forecasting horizon of 5 days, (ii) a wave analysis and prediction component for Red Sea and Arabian Gulf, (iii) an ocean circulation and tidal analysis and prediction of both Red Sea and Arabian Gulf and (iv) an Aviation part specializing in the vertical structure of the atmosphere and extreme events that affect air transport and other operations. Specialized data sets required for on/offshore operations are provided ate regular basis.
State of the art modeling components are integrated to a unique system that distributes the produced analysis and forecasts to each department. The weather and dust prediction system is SKIRON/Dust, the wave analysis and prediction system is based on WAM cycle 4 model from ECMWF, the ocean circulation model is MICOM while the tidal analysis and prediction is a development of the Ocean Physics and Modeling Group of University of Athens, incorporating the Tidal Model Driver. A nowcasting subsystem is included. An interactive system based on Google Maps gives the capability to extract and display the necessary information for any location of the Arabian Peninsula, the Red Sea and Arabian Gulf.