

OIL SPILL TRAJECTORY ANALYSIS FOR U.S. COASTAL WATERS

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Under Section 4111(b)(7) of the Oil Pollution Act of 1990 (OPA 90), the U.S. Coast Guard must evaluate whether areas of navigable waters and the Exclusive Economic Zone should be designated as zones where the movement of tankers should be limited or prohibited. The legislative history of OPA 90 specifies that the "tanker-free zone" evaluation should particularly include areas where oil and gas leasing, exploration, or development are presently prohibited by legislative action. The Minerals Management Service (MMS) and the Coast Guard have combined efforts to provide offshore oil spill trajectory estimates in support of that evaluation.

Multiple runs of the MMS Oil Spill Risk Analysis (OSRA) model were used to characterize potential movements of tanker oil spills in

U.S. coastal waters off the east and west coasts and in the eastern Gulf of Mexico. The mapped locations of 220 sensitive environmental resources were provided for the analysis by coastal academic institutions under subcontract to the Coast Guard. More than 3 million oil-spill trajectories were simulated in a stochastic analysis over all seasons. The modeled spills were moved in increments of 3 hours for up to 30 days at sea, based on a suite of wind and oceanographic data and models. Trajectory results from multiple spill sites offshore are expressed as mapped "risk contours" showing the chance of seasonal contacts with coastal resources, assuming spill occurrence. Examples of the information used and the results of the simulations are shown in Figures 1-4.

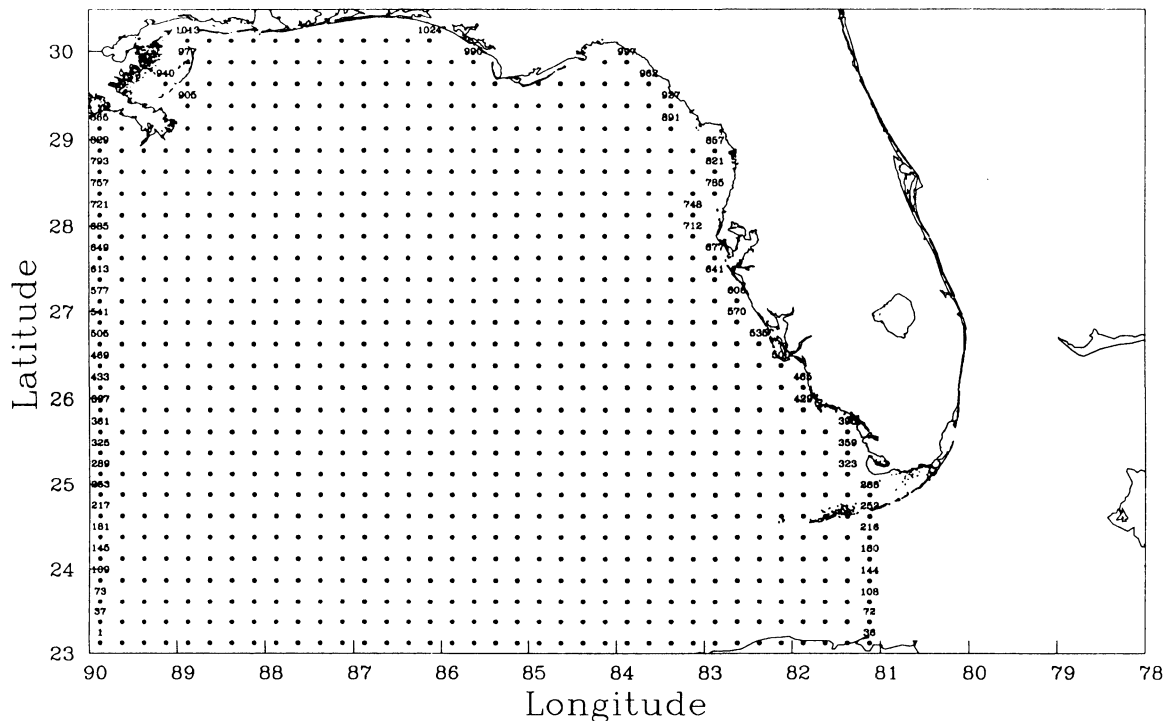


Figure 1. Eastern Gulf of Mexico study area shown with overlay of gridded oil spill simulation launch sites

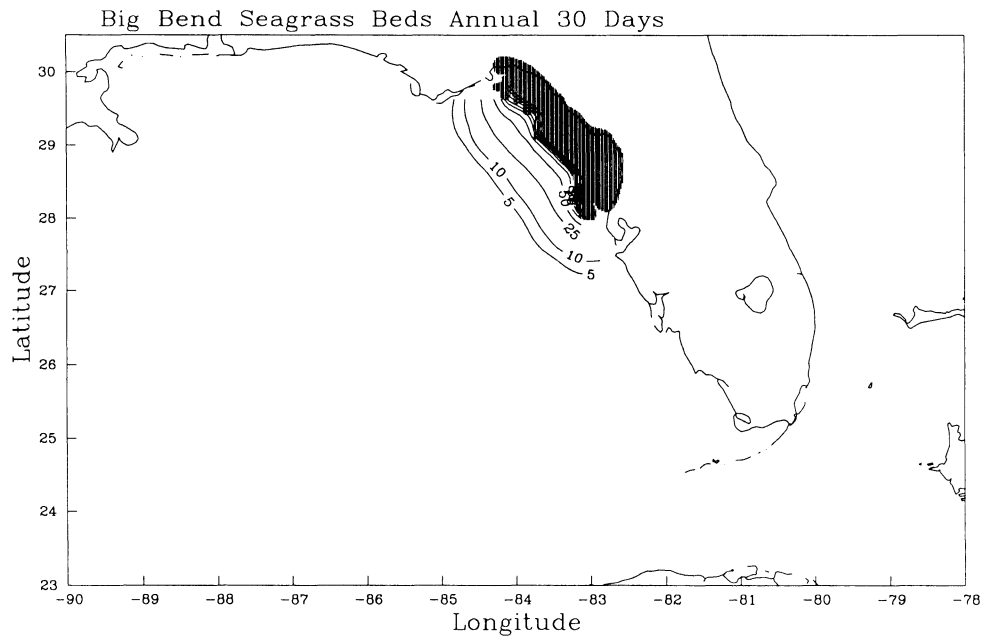


Figure 2. Big Bend seagrass beds resource shown with risk contours (percentage probability of spill contact within 30 day travel times, over all seasons)

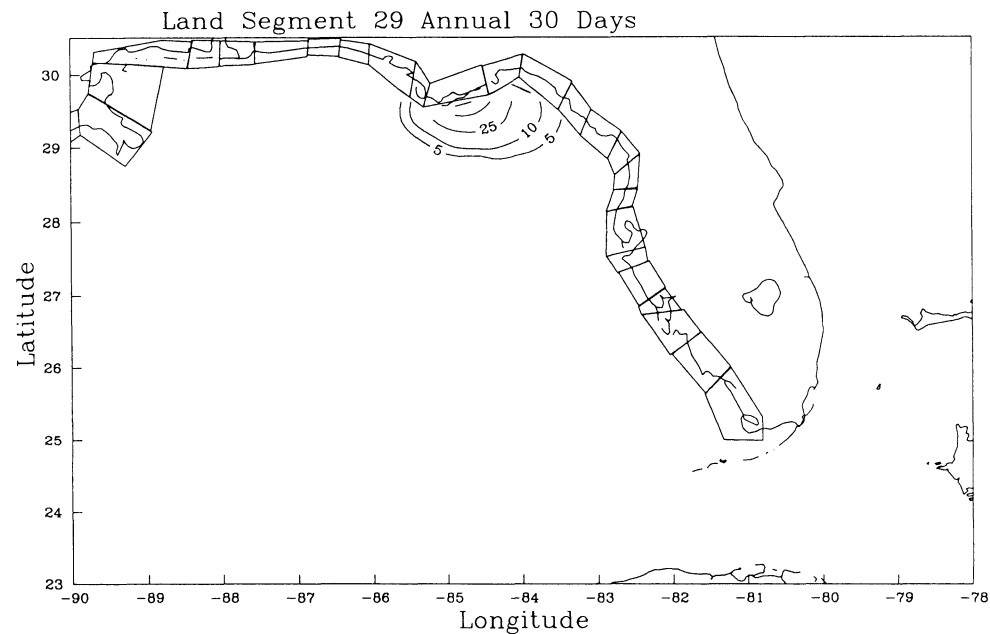


Figure 3. Risk contours for a coastal land segment (percentage probability of spill contact within 30 day travel times, over all seasons)

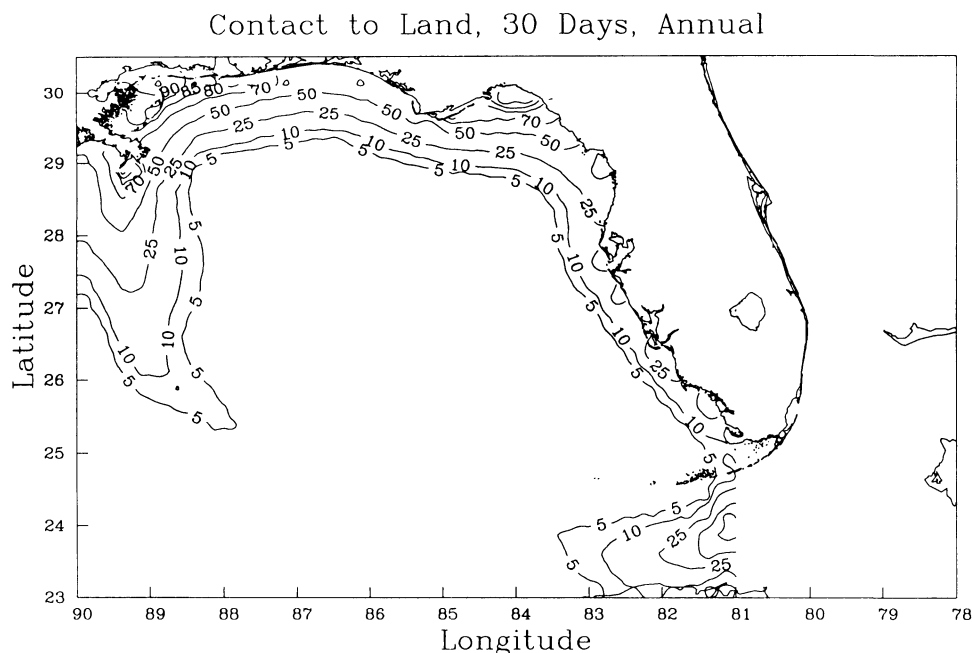


Figure 4. Overall risk contours (percentage probability of spill contact to land within 30 day travel times, over all seasons) for all spill launch sites shown in Figure 1

THE OIL POLLUTION ACT OF 1990: A REGIONAL CHALLENGE

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The Oil Pollution Act of 1990 requires the President to divide the nation into "areas" and to appoint a committee for each area, to develop an area contingency plan. The President delegated these responsibilities to EPA and U.S. Coast Guard (USCG). Each agency chose a different rationale for designating the areas for which it is responsible. The Coast Guard directed its effort towards its Captains of Ports or designated harbors. Fortunately, these boundaries are very distinct and centralized, providing for a fundamental approach for area contingency planning purposes. EPA was not quite so fortunate, in that its rationale for designation of areas was driven by many diverse issues, involving political, economic, and environmental concerns, all of which have a common denominator, the Oil Pollution Act.

Two main issues are addressed by the Oil Pollution Act of 1990 (OPA 90): (a) area designation and area planning and (b) the review and approval of facility response plans. The U.S. Environmental Protection Agency (EPA) has been given these tasks for the inland zone. The constraints imposed by the statutory deadlines of OPA 90 and the lack of sufficient resources presented many major obstacles. EPA Region 6 (Arkansas, Louisiana, New Mexico, Oklahoma and Texas) has the greatest concentration of oil facilities in the United States. To implement the OPA 90 requirements, Region 6 has developed a goal-oriented strategy that is both dynamic and flexible.

On April 24, 1992, EPA published a *Federal Register* notice designating its 13 Regional Response Team (RRT) areas under the National Contingency Plan (NCP) as the inland zone areas. The 13 RRT regions generally coincide with the 10 EPA regions. It was generally agreed by the EPA regions that this division of responsibilities was the most expedient compromise that could be reached within the statutory time frame.

Furthermore, the compromise somewhat satisfies the OPA 90 requirement that all navigable waters and adjoining shoreline be subject to area contingency plans. The notice also states that the RRTs will serve as the initial area committees that will prepare contingency plans under the direction of the regional on scene coordinators.

To further satisfy the requirements of OPA 90, the Regional Administrator will be able to subdivide the inland zone areas, which would result in a larger number of geographically smaller areas, and thus more area committees and area contingency plans. If further designations are made, then the RRT will serve as the area committee for the balance of the original area designation. According to the notice, further designations should be based on (a) the pattern of past spills and the likelihood of future spills; (b) the presence and proximity of natural resources, environmentally sensitive areas, population concentration, and water supplies; (c) the concentration of facilities, pipelines, and transportation routes within the region; (d) the location of drainage basins and pertinent geographic and/or topographic features; and (e) the locations and capabilities of existing preparedness and response organizations.

1. Senior on-scene coordinator