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Preface

This Special Issue focuses on oil spill modeling. This type of modeling calculates the trajectory of oil slicks on water and several components of oil behaviour over a period of hours to days. The major inputs are the base map, ocean currents and wind field, and predicted values of these. Additional inputs include the oil properties which are used to calculate the evaporation, dissolution, dispersion and sometimes water-in-oil emulsification. Some models include additional oil behaviour components and some are fully integrated with a GIS that can show oil impacts on specific wildlife colonies. Several models include sub-models that enhance the overall output. Examples of this include the addition of a 3D component to calculate water dispersion and dissolution, the addition of a shoreline-interaction model to calculate oil retained on specific shoreline types, and the addition of sub-surface blowout models to include oil inputs from sub-surface sources.

Oil spill modeling is a developing technology and art. Over the past 30 years, we have seen the state-of-the-art proceed from very simple hand and computer trajectory calculations to the current state where full-colour GIS-compatible outputs are generated. In the editor's opinion, the state of the art in algorithms behind the modeling has not kept pace with the computer software and hardware improvements over the same time. In many cases, algorithms date from 30 years ago, even though the current understanding has produced entirely new concepts of oil behaviour models. Some new algorithms are presented in this special issue.

The first paper of this issue is by Bill Lehr and Debra Simecek-Beatty who describe the development of a new model to predict the spreading, burning and smoke generation of LNG and fuel oil fires on water. The second is by Deborah French and associates and is a summary of the development of a resource damage assessment model. The third paper by Merv Fingas describes an alternate empirical-based oil evaporation model. The fourth paper by Merv Fingas and Ben Fieldhouse describes a new empirical-based water-in-oil formation model. The fifth paper by Nikolaos Ventikos et al. describes a decision-based model dealing with oil spill response equipment and countermeasure techniques. The sixth paper by Nikolaos Ventikos and Harilaos Psaraftis describes the use of an event-decision network to assess risk from oil spills.

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