DEVELOPING A WEB-BASED SYSTEM FOR LARGE SCALE ENVIRONMENTAL HYDRAULICS PROBLEMS WITH AN APPLICATION TO OIL SPILL MODELING

Hao Xie¹ and Poojitha D. Yapa²

ABSTRACT

Oil spill models are used for decision making during emergencies, contingency planning, and risk assessment. Many of these oil spill models are desktop based. A typical desktop model system is served by an input and output interface to communicate with the user. In a desktop model system, all components reside in the user's computer. The development of a Web-based model system for large-scale environmental hydraulics problems with an application to oil spill modeling is presented in this paper. The Web-based model system provides a number of advantages and features that are not available through a desktop system. It helps users to access the model, improves user-developer communication, gives the user access to distributed data, restricts some user access to data (e.g. direct transfer of data from third party sites to the model system without allowing user access), classifies users with different levels of accessibility, and allows multiple users to access the same data. Other examples where a similar Web-based system could be useful include modeling sediment plumes and deepwater oil well blowouts.

INTRODUCTION

Numerical models have evolved from being research-oriented tools to tools that are used not only by the research scientists but also by users with non-scientific backgrounds. This paper focuses on environmental hydraulics models such as oil spill fate and trajectory simulations, impact assessments from oil or chemical spills, deepwater blowout simulations of oil and gas, and impact assessments due to deep-water mining. These models are used for decision making during emergencies, response planning, and policy making. Most of these models are available as desktop versions that run on a high-end personal computer or workstation. These

¹ Post-Doctoral Associate, Dept. of Civil and Envir. Engrg., Clarkson University, Potsdam, NY 13699, U.S.A.

² Professor, Dept. of Civil and Envir. Engrg., Clarkson University, Potsdam, NY 13699, U.S.A.

e-mail:pdy@clarkson.edu