

ENV Report 42 – *Upper Mississippi River – Illinois Waterway System Models Report – Physical Effects Models* by Stephen T. Maynard, Sandra K. Knight, Scott Bourne, Mark R. Graves, and Kevin J. Landwehr.

ABSTRACT

The Upper Mississippi River – Illinois Waterway (UMR-IWW) system model is comprised of the NAVEFF and NAVSED models and determines the physical forces for the entire UMR-IWW reach as well as the fleet of tows using the waterway. This report documents the geographical information system components of the system models, input and output files formats, and assumptions used in the application of the models to the UMR-IWW. The NAVEFF portion of the system model determines the maximum velocity change, tow drawdown of water level, wave height, bed scour, and bed shear stress. Many of these physical parameters provided input to various ecological models used in the System Feasibility study. NAVEFF output is also input to the NAVSED model that provides the time-history of sediment concentration as a result of tow passage. The NAVSED output also serves as input to various ecological models as well as sedimentation of secondary channels and backwaters.