

ENV Report 20 - *Wave-Induced Sediment Resuspension Near the Shorelines of Upper Mississippi River Study* by Nani Parchure

ABSTRACT

Part of the Upper Mississippi River-Illinois Waterway System navigation Study deals with estimation of environmental impacts caused by an increase in navigation traffic. Resuspension and deposition of fine clayey sediment have a significant impact on aquatic plants and animals. The objective of the study described in this report was to estimate the sediment resuspension resulting from waves generated by towboats and recreational craft. The scope of this study was limited to (a) generalization of wave patterns for the event of vessel passage, (b) estimation of maximum suspension concentration caused by individual events of vessel passage, (c) deposition of suspended sediment, and (d) interference effect on the suspended sediment concentration caused by the passage of another vessel.

The Coastal and Hydraulics Laboratory, Vicksburg, MS, U.S. Army Engineer Research and Development Center, conducted field measurements for wave heights, current, and suspended sediment concentration at various sites during November 1995, July 1996, and September 1996. The wave heights were measured with a pressure sensor, currents with a current meter, and suspended sediment concentration with Optical Backscatter sensors (OBS). The following conclusions are drawn: (a) large vessels generate large drawdown and small wave heights but a high suspended sediment concentration, and (b) small vessels such as a yacht generate small drawdowns and large wave heights. At high speed, small vessels also cause a substantial increase in suspended sediment concentration.