

ENV Report 8 - Bank Erosion Field Survey Report of the Upper Mississippi River and Illinois Waterway by Nani Bhowmik, David Soong, and Tatsuaki Nakato

ABSTRACT

This report summarizes findings from several phases of the Upper Mississippi River/Illinois Waterway (UMR/IWW) Bank Erosion Study. Tasks completed to date include a literature study of bank erosion, an aerial reconnaissance survey, and a field survey trip organized and conducted by the lead agency, the U.S. Army Corps of Engineers, Rock Island District. Major emphasis of this report is given to the findings from the field survey.

During the field survey, the team selected 72 erosion sites (29 sites on the Illinois Waterway and 43 sites on the Mississippi River) for further study. For the selected sites on the IWW (80 bank sections from 29 sites), the research team observed multiple erosion processes at most of the selected bank sections. The most frequently identified erosion mechanisms are seepage, stage fluctuations, flood flows, navigation traffic, wave activities, and eddies and disturbed flows.

Bank failure and erosion conditions on the Upper Mississippi River also showed significant flood impacts. Analyses of surficial soil samples showed the banks were mantled by primarily sand and gravel in the upper reach of the river, silt and sand in the middle reach, and clay and silt in the lower reach. Most of the bank failure and erosion sites showed flood damage as the dominating erosion cause. Surficial, wave-induced erosion and erosion associated with direct barge impact, propeller wash and cabling to trees was present at some fleeting and mooring and lock approach sites.

Approximately fifty-one sites out of seventy-five of the UMR study sites (including observation sites) were within the upper portion of the navigation pools. Many of these active erosion sites are also historically dredged material placement sites. Below St. Louis, historical flood flow reworking of the channel margins was also observed.

A measurement of the length of severely eroded reaches, as marked on the navigation charts (appendix J), shows that there are approximately 115 bank miles on the IWW and 240 bank miles on the UMR. This represents that approximately 20 percent of the total bank length of the IWW and 14 percent of the UMR are actively eroding.