



Cumulative Effects Study of Sedimentation Impact, Upper Mississippi River

WEST Consultants, Inc. was contracted to quantify the cumulative man-made and natural effects on sedimentation, stream morphology and ecology along the UMR and IWW and predicted future conditions for the year 2050. The study area involves 5 states, 3 Army Corps of Engineer's Districts, and about 1,200 river miles.

The geology and glacial history of the study area was analyzed to define the influences and controls on channel morphology. Hydrologic records were examined to identify changes in discharge and stage along the UMR. Available research was reviewed to define potential impacts of global warming on basin hydrology. The history and extent of human influences on the fluvial system were characterized. Historic plan form and channel geometry data were analyzed to quantify changes in channel morphology. The sources and sinks of sediment along the UMR were quantified and a sediment budget developed to estimate backwater sedimentation rates in navigation pools. Historic changes in nine geomorphic categories were characterized throughout the study area. Predictions of geomorphic conditions along the UMR and IWW in the year 2050 were developed based on trends identified from historic geomorphic data and results of the sediment budget. Ecological conditions in the year 2050 were predicted based on ecological guilds and the trends established for aquatic habitat.

The study tasks required the collection, organization, and analysis of large volumes of previous studies, historic aerial photographs, topographic data, hydrologic records, and geographical information system coverages. Computer-based databases of information were used extensively. GIS products were developed to analyze geomorphic changes, and project conditions for the year 2050. A variety of on-line computer systems, and off-line systems were used to manage the metadata for the project.



Project Owner:

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