

# MISSISSIPPI MAKEOVER

## A Plan for Restoration, Just Around the Bend

### Indicator: Sedimentation



*Confluence of St. Croix River with Mississippi River*

**Sedimentation** is the deposition of soil (sand, silt and clay) and organic matter (decomposing plant material) in rivers and their floodplains. Sediment comes from tributary watersheds, and from within the river's channel and floodplain. Lake Pepin is a natural sink for sediment. The slow current allows most of the sediment coming into Lake Pepin to settle on the bottom. Common measurements for sedimentation are **load**, **rate**, and **composition**.

**Sediment load** is a measure of how much sediment is transported past a specific location over a set time period. In the case of Lake Pepin, almost all the sediment moving past Red Wing is deposited in Lake Pepin. The sediment load to Lake Pepin currently averages about 1,000,000 metric tons per year compared to the natural background rate of 80,000 metric tons per year. The current load is equivalent to about one city block covered by 100 ft of sediment. The Lake Pepin TMDL Study currently estimates that 75% of the sediment load to Lake Pepin comes from the Minnesota River.

**Sedimentation rate** is a measure of how fast sediment is accumulating. Under the natural background sedimentation rate it would take 4,000 years to fill Lake Pepin while the current sedimentation rate will fill Lake Pepin 12 times faster, or in just 300 years.

**Sediment composition** is a measure of the proportion of different sediment particle sizes in a sample. Larger sediment particles, like cobble and gravel, move under very high flows and are usually found along the main channel and larger side channels. Sand is usually the dominant substrate in most of the continuously flowing channels. Silt and clay are lighter and settle out in calm areas such as backwaters. About 95% of the sediment deposited in Lake Pepin is silt or clay. Nutrients like nitrogen and phosphorous are often attached to silt and clay particles. Different mixtures of sand, silt, and clay are desirable to provide a diversity of substrates for the establishment of aquatic plant beds and for variety in habitat conditions within the floodplain.

