



## Ruins of a Forgotten Highway

### Constricting the River!

Beginning in the years following the Civil War, the Army Corps built wing dams, jetties, closing dams, and shore revetments to constrict waterways, thereby deepening channels, throughout the Mississippi River watershed. Closing dams cut off side channels between islands while jetties guided the main channel away from slack water. Wing dams were barbs built against the current that were designed to train the channel to scour toward the opposite bank and narrow the river. These structures required the opposite banks to be reinforced with shore revetments to prevent erosion, a process known as bank armoring. Through these means, the St. Croix was systematically modified from a winding and shallow river into a commercial highway.

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### Structures to do the work

With instructions from an 1875 report and an approximate calculus, dams were built of alternating layers of brush mats and quarry rock to achieve desired results. Sand and sawdust dredged from the river, as well as other obstructions which had been removed, were frequently used to backfill and reinforce these structures. On Lake St. Croix, which had fewer but much larger structures, steam-driven log pile dams were built.

These projects on the St. Croix were largely carried out by a local crew of 14 men, supervised by Oscar Knapp, a steamboat builder and captain commissioned by the Corps. At times Knapp supervised two crews while the Corps also dredged the lake. Diaries suggest that the crew members spent most of their time assembling mats and quarrying rock for building the structures. They also spent time clearing the river of obstructions like deadheads, snags, and leaning trees. The crews carried out the work from the fall over the winter and into the spring, alternatively using steamboats and barges or sleds on the ice, as conditions allowed.  
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*Remains of a water control structure on the St. Croix River.*

NPS/Schaeppi

The Corps constructed 3.6 miles of “improvements” to focus the river’s channel and eliminate islands, sand bars, and sloughs. They also cut down thousands of trees that leaned over the river and “cleaned out” all manner of artificial and natural obstructions to make way for steamboats on the channel. In 1887 the district engineer at St. Paul in charge of the St. Croix projects commented, **“Navigation has been rendered permanent where formerly uncertain and in other places been made practicable where before it was impossible.”**

### **Experimental Technology**

In the 19<sup>th</sup> century, wing dams and dikes were an experimental technology seen as the most efficient means to change the course of a river. Corps engineers believed that they could use these structures to bend rivers to their will, forcing hydrological changes that scoured deeper channels without costly dredging and making rivers better for all forms of navigation. While they often succeeded, there were many instances in which particular water features, currents, and channels were too powerful to control. The river did not respond as hoped, causing structures to fail and wash away or to shift in unanticipated ways.

The district engineer warned Captain Knapp in 1878 of the possible consequences of tampering with the hydrology too much – “If the state of affairs in a river like the St. Croix once becomes disarranged [sic], there is no means of predicting what the end will be.”



*Oscar Knapp and crew work to construct a water control structure.*  
U.S. Army Corps of Engineers