

## **USGS Monitoring Data Confirm Submerged Vanes Help Stabilize Eroding Bluffs, Fish Creek, Wisconsin**

A detailed geomorphic assessment of North Fish Creek by the USGS in the mid 1990s identified bluff erosion along the upper main stem as a major source of sediment and cause of sedimentation problems in downstream reaches. North Fish Creek is an important recreational sport fishery and provides spawning habitat for several important Lake Superior fish species such as coho salmon, steelhead, and coaster brook trout. Fish habitat in North Fish Creek has been affected by accelerated sedimentation rates. The University of Wisconsin-Madison Civil Engineering Department installed submerged vanes (Odgaard-type) at two bluff sites on North Fish Creek in 2000 and 2001 in a demonstration study that ran from 2000-2003. The vanes are installed in the channel bed and deflect flow away from the base of the bluff. Through a cooperative effort with the Wisconsin Department of Natural Resources, Bayfield County, the U.S. Fish and Wildlife Service, and the University of Wisconsin, the U.S. Geological Survey has been monitoring flow and geomorphic conditions at both sites since the mid 1990s. The vanes survived floods in 2000 and 2001 with recurrence intervals of approximately 50-75 years. Some maintenance of the vanes was required after the floods, but channel cross section data from 2000-2003 indicate that the vanes have moved the channel away from the base of the bluff and allowing the bank toe to build out into the channel. The initial demonstration study ended in 2003 but funding for installation of the vanes at other bluff sites and monitoring will continue into 2004. Wisconsin DNR staff will receive training for installing the vanes at other tributaries to Lake Superior with similar bluff erosion problems. The vanes were showcased in a Lake Superior Restoration Workshop in September 2003 sponsored by the UW-Extension.



North Fish Creek, site 1, before vanes, April 7, 2000. Flow is from left to right in photo, base of bluff is in foreground.



North Fish Creek, site 1, after vanes, January 7, 2003. Note dark rectangles (vanes) and sedimentation at the base of the bluff.

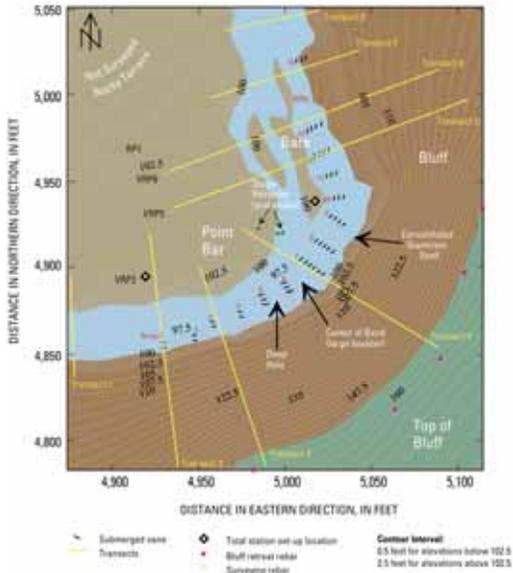
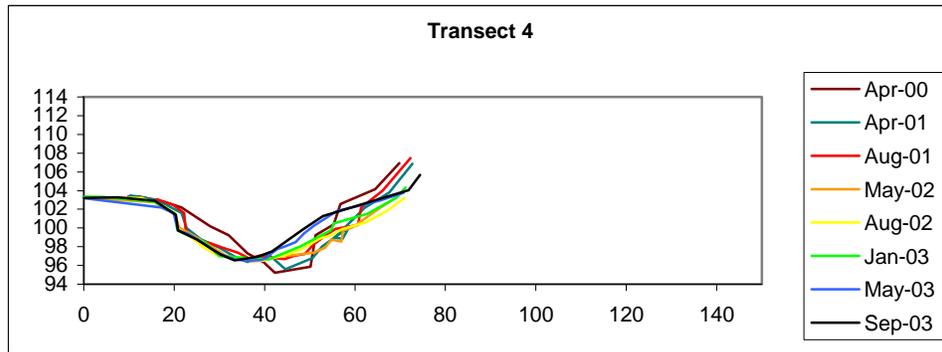


Diagram of North Fish Creek vanes site 1 showing location of vanes and channel cross sections.



Channel cross-section data from 2000-2003 for one transect at site 1 on North Fish Creek. Base of bluff is on right side of cross section.

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