

Using Side-scan Sonar to Characterize and Map Physical Habitat and Anthropogenic Underwater Features in the St. Louis River.

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Characterizing underwater habitat and other features is difficult and costly, especially in large river systems. The St. Louis River is the largest US tributary to Lake Superior and the lower portion consists of a 48.5 km² complex of wetlands, tributaries, and bays. We surveyed 82 km of shoreline habitat in the St. Louis River using recreational grade side-scan sonar (SSS) in the recording mode. Sonar TRX software 13.1 was used to extract the data and generate georeferenced images at a 10cm resolution. GIS tools were used to highlight homogeneous and heterogeneous areas (texture) of the image followed by measuring aspect from bathymetry data to highlight areas facing the same direction. GeniePro software 2.4 was used to classify this 3-band composite image by adaptive feature extraction resulting in a 1m resolution output. We used ArcGIS 10.3 to post-classify areas of smooth and rough substrate, aquatic vegetation, woody debris, and a variety of anthropogenic features (docks, piling, and sunken ships). When fully developed our method will help resource managers prioritize habitat management projects and further develop the concept of Remediation to Restoration to Revitalization of Great Lakes Areas of Concern. *This abstract does not necessarily reflect EPA policy.*