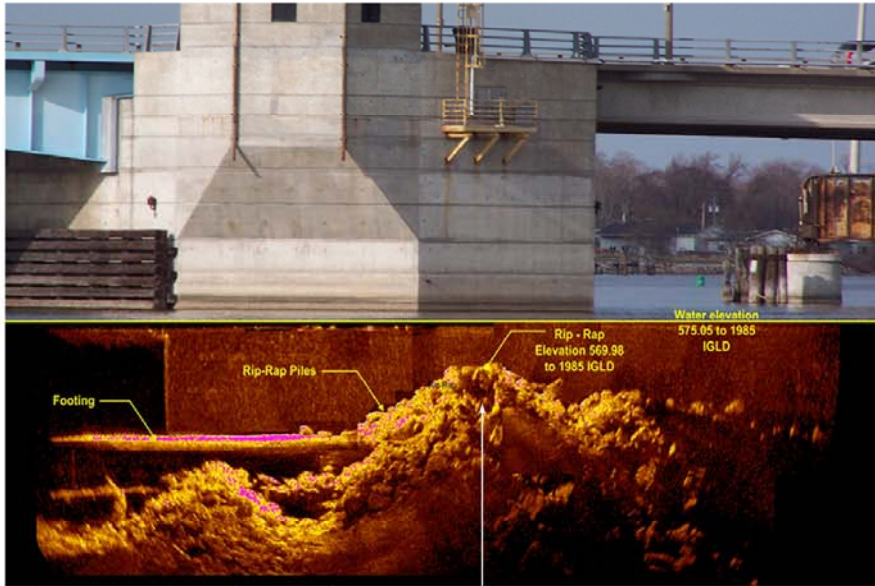




QA of RIP-RAP Placement Using Scanning Sonar

Data collection: **Nautilus Marine Group** (Lansing, Michigan) & **Kongsberg Mesotech Ltd.**



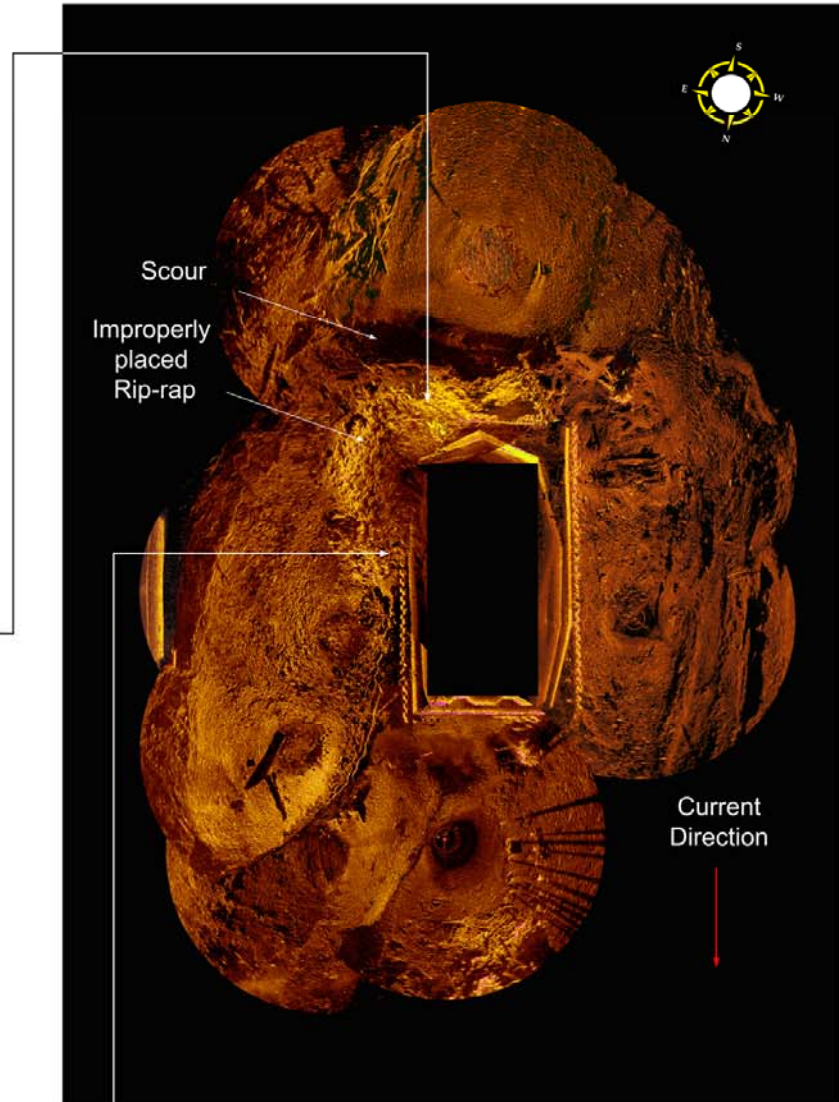
Vertical Visualization Upstream View of Pier Bullnose



Vertical Visualization East Side View of Pier

Rip-Rap Countermeasures was designed for 100-year flood event and to be placed no higher than top of footing elevation, and at a 1 to 3 slope out from footing.

Bridge Pier Plan View and River bed Mosaic



Improper placement of rip-rap increases the potential for further scour.