

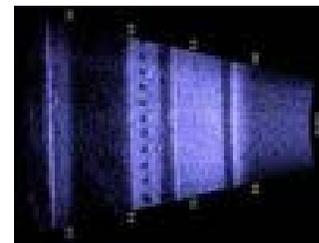


**US Army Corps
of Engineers®**
Engineer Research and
Development Center

High-Resolution Acoustic Imaging System

Technology

A simple yet sophisticated system developed by the Applied Physics Laboratory of the University of Washington is being adapted and enhanced by Engineer Research and Development Center (ERDC) engineers from the Information Technology Laboratory, Environmental Laboratory, and Geotechnical and Structures Laboratory to help with inspection of underwater structures in turbid water and aid in surveys of endangered marine species. This high-resolution acoustic imaging system includes an acoustic video camera with a 1- to 1.8-MGHz range, a boat with environmental controls, at least one remotely operated vehicle, global positioning system, roll-and-pitch equipment, and side-scanner sonar. In laboratory demonstrations, the acoustic camera provided images at high-enough resolution to distinguish between a cat fish and a sturgeon. In field demonstrations conducted jointly with ERDC and the St. Louis and Louisville Districts, the camera allowed clear viewing of small (about ½ inch) structural details of steel and concrete structures in turbid water.



Acoustic image of casing end-plate

Problem

Divers are frequently used in the inspection, maintenance, construction, and placement phases of underwater construction projects. However in turbid water, the lack of visibility severely reduces their effectiveness and subjects them to potentially dangerous operational conditions. Turbidity also prevents easy identification of endangered species or cultural artifacts that might exist within the construction site. In addition, the diver must wait until he returns to the surface before sketching what he saw or felt with his hands while underwater.

Benefits/Savings

The acoustic imaging system can be used to:

- Expedite construction, repair, and maintenance of underwater structures.
- Provide safer conditions for employees engaged in environmental, wet construction, and structural inspection activities.
- Enable identification of endangered species, aid in underwater recovery operations, and detect cultural artifacts prior to construction projects.
- Determine proper placement of riprap.
- Inspect levees for failure sites.
- Enable the user to immediately and permanently log underwater images from inspections.

Status

A prototype acoustic camera was successfully demonstrated at Cape Girardeau and Olmstead Lock and Dam in March 2002.

ERDC POC

James Evans, Senior Project Engineer, Information Technology Laboratory
Telephone: 601-634-2535
James.A.Evans@erdc.usace.army.mil

Distribution Sources

Some early uses of the acoustic camera can be arranged on a case-by-case, reimbursable basis.