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Homeland Security

Science and Technology

Seeing Underwater: Passive Acoustic Detection Systems

A DHS Science and Technology Center of Excellence Solution

Monitoring Underwater Threats

The Maritime Security Center of Excellence (MSC) is developing **Passive Acoustic Detection Systems** that can help the U.S. Coast Guard and other law enforcement entities detect illegal vessel traffic and intruders in maritime and port security zones.

How It Works

Passive Acoustic Detection Systems employ acoustic recording platforms to acquire statistical data to assess surface vessel and underwater activities in areas of interest and concern. They are deployable in a variety of remote and/or hidden locations and can provide the forensic information needed to determine if intrusions have occurred and the likely source of the intrusion (e.g., small boat, swimmer, or unmanned undersea vehicle). System users can monitor and analyze vessel traffic at U.S. seaports and in coastal zones around national landmarks and other critical infrastructure areas.

Increasing Surveillance Capabilities

The next phase of development builds upon existing acoustic recording platforms to detect, track and classify vessels on the surface or submerged underwater.

Unlike other acoustic recorder systems that operate on full-size computers, the MSC's next-generation Passive Acoustic Recorder would operate on a small lightweight microcomputer that enables the system to process passive acoustic data in near real-time. Other features in development include: mobile and modular system design, customizable new sensor integration, on-board data processing, and satellite-based alert transmissions. The envisioned systems could be used as a stand-alone or in conjunction with other maritime and port security systems.



Joint test and evaluation exercise of MSC-developed Passive Acoustic Detection Systems with the U.S. Coast Guard and the Plum Island Animal Disease Center.

Working with End Users

MSC has tested its passive acoustics systems in exercises and field deployments in conjunction with the U.S. Coast Guard and other law enforcement entities. MSC has also employed the systems for forensic analysis to determine if intruders have been present in areas where suspected illegal vessel traffic and activities may occur.



Stevens Passive Acoustic Recorder (SPAR) was successfully deployed to detect remotely operated underwater vehicles (ROVs) in an experiment held at the U.S. Merchant Marine Academy in Kings Point, NY.