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Harbor tracking system proposed

By RAY HENRY, Standard-Times staff writer

A flashing red message on his computer screen immediately alerts the technician.

His computer, linked to an electronic harbor monitoring network, cycles through a list of oil barges expected to transit Buzzards Bay, comparing ships' anticipated positions to information from radar. It finds one discrepancy.

Oil barge 235 -- a mere dot on the display -- has veered off course and toward a reef capable of shredding its hull. The tug boat pilot isn't responding to radio warnings.

Without leaving his seat, the technician alerts the Coast Guard, which dispatches a plane. The aircraft beams a live video feed to the command center, where authorities are already tapping into meteorological data to predict which way an oil slick might spread.

This hypothetical tracking system could become a reality for New Bedford and four other state ports if scientists win a \$937,000 grant from the U.S. Department of Homeland Security.

Researchers at the UMass Advanced Technology and Manufacturing Center in Fall River expect to hear this month whether the government will fund the project, which could help authorities respond to terrorist attacks or waterfront fires and even watch for drug smuggling.

While a handful of government agencies already track local waterways, the information they generate is decentralized and unavailable to the municipal police and fire departments who might need it in a crisis.

What's needed to complete the picture is a computer system that sorts an updated stream of data from many different sources to create a real-time view of activity in the state's five largest ports, including New Bedford and Fall River.

"That's absolutely a capacity we don't have," said New Bedford Deputy Police Chief David Provencher, whose department is often the first to arrive at waterfront emergencies.

"It's do-able"

"It's do-able. I've done it in the Navy," said researcher John S. Davis. He started his career at the Naval Undersea Warfare Center in Newport, R.I. "The challenge is accessing the data sources and laying them into a picture you can digest."

While Mr. Davis' proposed system would be a first for Massachusetts ports, similar systems have been hurriedly constructed or revamped nationwide since the Sept. 11 terrorist attacks.

The specter of terrorism was especially palpable in Hampton Roads, Va., site of the world's largest naval station and home to 870 warships. While naval vessels are armed with guided missiles and torpedoes, the 2000 attack on the USS Cole in Yemen proved a suicide bomber steering an explosive-laden skiff could nearly sink an Aegis missile cruiser.

In response, the Navy joined forces with the Coast Guard to build a computerized surveillance network called the Joint Harbor Operations Center, said Jerry Crooks, a spokesman for the Coast Guard Marine Safety Office in Hampton Roads.

"9/11 was clearly the trigger," he said. "We don't talk too much about specifics. It essentially gives us an image of the entire harbor offshore to about 150 miles."

Nationwide, the Coast Guard spent \$34 million this fiscal year to expand the Maritime Domestic Awareness (MDA) program, an effort to monitor waterway

activity starting at the dockside and extending to ships more than 2,000 miles from the shoreline, said Dana Goward, head of the MDA program's architecture office.

The backbone of an early MDA system in Boston -- which is about 60 percent complete -- is a geospatial map of the harbor. From there, users can add additional information, known as layers, taken from harbor radar, video cameras, orbiting satellites and transponders attached to fire and police boats.

With the vast array of data, programmers strive to keep the computer displays simple.

"You can put in as many layers as you want until you can't see anything anymore," Mr. Goward said.



Hefty pricetag

New technology, however, comes with a pricetag that cash-strapped municipalities can't afford, Mr. Davis said. Considering that a Coast Guard monitoring system in New York is only 75 percent complete, he believes small cargo ports like New Bedford must seek scaleable alternatives.

The easiest way to drive down costs is to buy commercial computer systems rather than spending money to develop a proprietary technology, he said.

Already, UMass researchers have identified a swath of existing data. In New Bedford, where Mr. Davis hopes to build a prototype, he has a three-dimensional harbor map and will seek access to computerized vessel databases maintained by the Coast Guard and the state Environmental Police.

The Naval Undersea Warfare Center has agreed to connect the proposed system to its NITES II computer system, which supplies a constant stream of meteorological data. The program can calculate radar performance and model the path of smoke plumes.

Mr. Davis said the network software could incorporate existing assets such as the radar set positioned on the hurricane barrier. The radar set is capable of detecting objects up to 20 miles at sea in clear weather and feeds into a larger traffic control system at the Cape Cod Canal, said Steven Fluegel, a flood control manager for the U.S. Army Corps of Engineers.

In addition, the Corps of Engineers maintains two video cameras pointed at both the harbor and the ocean. Federal customs and immigration authorities maintain a third harbor camera.

"There ought to be a system that links all that together," Mr. Davis said. "The real advantage for this ... is that it becomes the kernel for what you want to add."

Of course, the fact that information exists doesn't mean its holder can share.

For example, all New England fishing vessels must carry a radio transponder that broadcasts their positions to the National Marine Fisheries Service.

But federal law generally prohibits the agency from using the data for purposes other than enforcing fishery regulations, said Linda Galvin, a monitoring specialist for the National Oceanographic and Atmospheric Administration.

"Coordinating body"

The head of the Seaport Advisory Council, the state agency responsible for port security, couldn't envision installing the UMass system without establishing a government agency to oversee it.

"You do need some sort of coordinating body," said Executive Secretary Rick Armstrong. "You've got to build the institutional fabric before you think about the research."

Even in the age of terrorism, he said an electronic monitoring system in a New Bedford-sized port should be geared more toward detecting smuggling rather than responding to a terrorist attack.

He said terrorists are more likely to pick up an unnoticed container of contraband in a port like New Bedford rather than attacking it directly, just as the 9/11 hijackers passed through security at smaller airports on their way to flights in major cities.

"The kind of homework you do under (this) project we endorse," he said. "I think we have to be realists that this isn't going to happen tomorrow."

While creating the system could take a year, Mr. Davis said he believes even a simple model could allow authorities to scan ships as they crossed the hurricane barrier. From there, users could track how long a ship is at sea or determine how heavy its load is.

If a fishing boat returns after just 16 hours at sea, the computer could note

the discrepancy. Investigators would then have to determine whether the explanation owes to an equipment failure at sea or something more nefarious, like drug smuggling.

"We know he didn't go fishing," Mr. Davis said.

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This story appeared on Page A1 of The Standard-Times on September 9, 2004.



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