College keeps ears peeled for dangers from the sea

Wave-forecasting project monitors coastal storms

By PATRICIA ALEX
STAFF WRITER

The experts have assured us that it’s not likely to happen here – a powerful tsunami leaving death and destruction in its path. But on the East Coast, in a state with more than 120 miles of coastline and a series of tidal rivers rimmed by populous cities, we ignore the ocean at our peril.

Here the dangers come from storms and pollution. “We’re pretty safe from tsunami, but we’re not safe from hurricane, and that is a lot of what our research focuses in on,” said Professor Alan Blumberg, deputy director of the Center for Maritime Systems at Stevens Institute of Technology.

Most bathers or shoreline homeowners may not have thought about it, but New Jersey has a series of sensors in place – the type used for tsunami warning systems – that presumably will prepare us for major waves or contamination at the shore.

Acoustical sensors transmit from the ocean floor to heavy-duty buoys at locations down the coast and in tidal harbors, like those at the mouth of the Hudson and Raritan rivers. They measure waves, water quality and currents and beam the information every 10 seconds to computers in a warren of offices at Stevens’ Hoboken campus.

Information about significant changes

See WAVES Page A-6
Waves: Coastal lookout

From Page A-1
that could spell trouble would be relayed quickly to emergency preparedness people in the state.

The prep time could be crucial. Remember Floyd? And he was only a tropical storm. When Hurricane Donna hit the shore with 105 mph winds in 1960, nine people died in New Jersey and there was extensive property damage. The coastline is much more developed now.

“Our biggest threat is a nor’easter or winter hurricane and we’ve not had a bad one in a long, long time,” Blumberg said.

Statistically we’re due. It doesn’t mean it’s going to happen here, but we should be thinking about it.”

The scientists at Stevens, in fact, spend many waking hours thinking about it and other threats to the coast.

The school, and the state, are hooked up to a coastal monitoring system of sensors that line the entire East Coast. Other projects include port security and wind studies, which would be crucial in the event of a biochemical attack.

Wave forecasting is an up-and-coming science and Stevens is on the forefront, using the undersea sensors in concert with information from the National Weather Service.

“The technology allows the Stevens scientists to predict how a storm off the coast of Africa could affect waves in New Jersey,” Blumberg said.

Stevens has recently developed a “storm surge warning system” — scheduled to be in place by this summer — that will automatically page emergency management personnel in coastal counties when significant changes in wave height are detected.

A second grant from the federal Office of Emergency Management will create a similar system for river gauges in the state, said Thomas Herrington, an ocean engineering professor.

Although a tsunami could strike New Jersey, the possibility is remote, Blumberg said.

The coast’s earthquake fault lines are generally calm and our shoreline features a long shallow shelf, rather than an abrupt drop into deep ocean, meaning that large waves are slowed before coming to shore.

“We focus on storm surges as opposed to plate tectonic surges,” Blumberg said.

By now most who have read the Asian tsunami disaster are familiar with plate tectonics — the 10-foot underwater shift in the earth’s crust that created the tsunami waves and registered a magnitude 9.0 earthquake. From their offices at Stevens, scientists view computer models that show how the tsunami waves dispersed throughout the oceans of the world.

“If you know of an earthquake of magnitude 9, just get out of the [ocean] water, no matter where you are,” said Blumberg.

“Like the atmosphere, the ocean connects us all.”

It may seem odd that Blumberg lives in landlocked Mahwah because he is enamored with water. He grew up along the Panama Canal and, as an ocean physicist, has spent much of his adult life following the water, studying its power and vulnerabilities.

At Princeton University, he co-developed one of the foremost models for mapping ocean climate systems. In private industry, he worked for HydroQual in Mahwah, a consulting firm that develops cleanup strategies for water pollution. Now, he has landed his dream job at Stevens.

“Stevens is all about water,” he enthuses about the school, named for a pioneer of steamboat technology. The campus, perched on the bluffs over the mouth of the Hudson, suits Blumberg just fine. But this day he is underground — in Stevens’ Davidson Laboratory built into the bluff on the campus’ western edge.

Here in the basement is one of the world’s largest wave tanks, built with Navy money in the 1940s to test seaplanes used in World War II. Its 313 feet long — more than a city block — and 12 feet wide. The buoyancy of an Apollo space capsule was tested here in the 1960s and now the tank is used to test the seaworthiness of engineering models of craft big and small — from New York Harbor ferries to America’s Cup yachts. Blumberg also does wake pollution and sand erosion studies in the tank.

His work centers on what he likes to call “the urban ocean” — areas like New York harbor and the Newark and Raritan bays. He monitors sensors from the George Washington Bridge to Cape May and even has a sensor on a New York Waterways ferry. And he has undertaken a crusade to get newspapers to publish more tidal and water information on their weather pages.

The way Blumberg sees it, knowing the power and quality of the water lapping at our shores is crucial.

E-mail: alex@northjersey.com