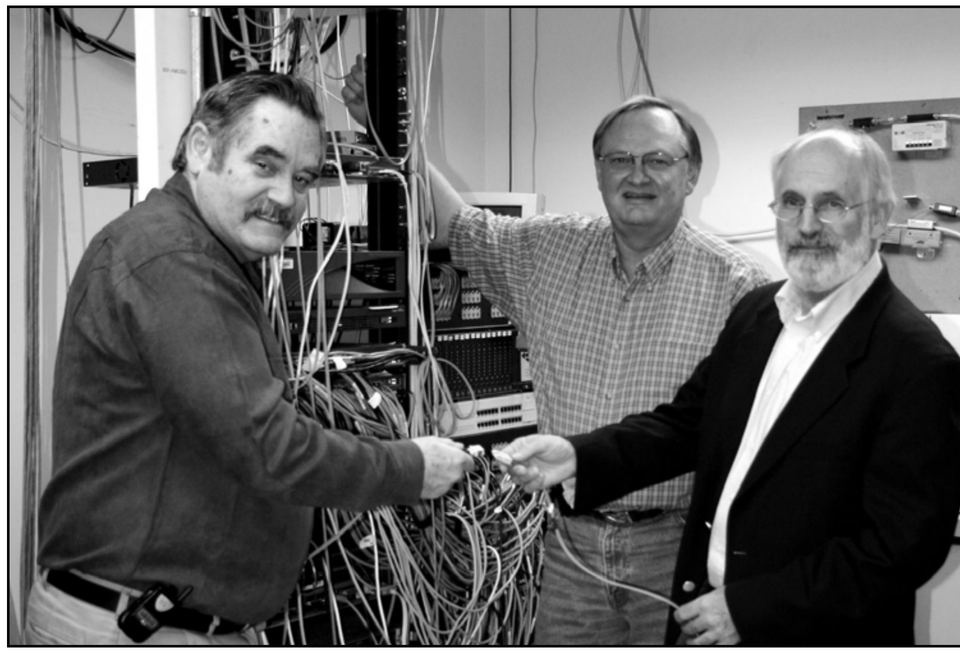
VIMS Sees the Light

On December 2nd of last year, Information Technology and Networking Services Assistant Director Gary Anderson ran a length of fiber optic cable into the Customer Service Center at VIMS, thus completing a multi-year project to replace the campus' original copper network cabling.

The new fiber-optic cabling makes possible high-bandwidth connections among all VIMS buildings, labs, offices, and classrooms. VIMS' Internet bandwidth is now 700 times larger than it was in 1997.

However, the biggest immediate benefit of the new network is that fiber optic cable does not conduct electricity. Lightning will thus no longer damage the VIMS data network and connected equipment and computers via their network connection.

"In addition to providing higher connection speeds, the network will be much more reliable and be much easier for the ITNS staff to maintain," says ITNS Director Newt Munson.



VIMS Information Technology and Networking Services Director Newt Munson (L) and Asst. Director Gary Anderson (C) join Dean and Director John Wells (R) in ceremoniously connecting the final link in VIMS' new fiber optic network.

The new fiber-optic network will allow VIMS to implement new technologies, such as VoIP, or Voice over Internet Protocol, which brings the power of the web to telephone systems. The additional bandwidth will also facilitate more widespread use of video conferencing and collaboration technology.

The next step in VIMS' ongoing efforts to increase Internet access is pursuit of a high-speed connection to William and Mary, which will increase external connection speed by a factor of 20.

"This will provide access to the National LambaRail network, which will better serve the VIMS community, especially our research faculty and students," says Munson.

VIMS Dean and Director John Wells adds that "VIMS now sees the 'light at the end of the fiber,' which is the foundation for the future information technology that we need to remain a world-class research, education, and advisory service organization."

Breakwaters
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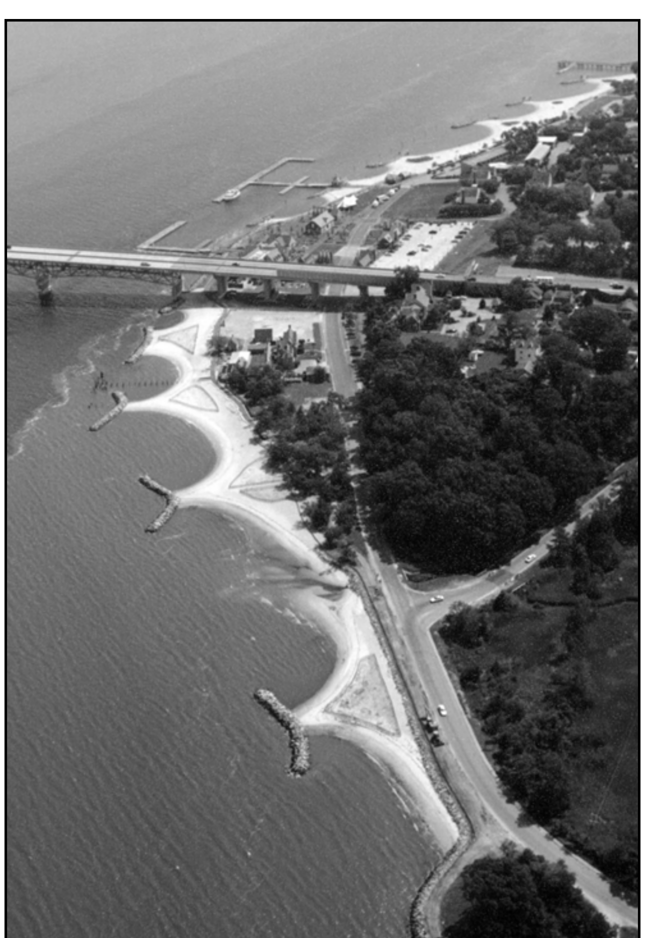
ral sediment supply was depleted by "hardening" of the shoreline upstream due to emplacement of riprap and bulkheads.



An aerial view of the Yorktown waterfront shows the breakwaters that protect the new Riverwalk development.

"By the 1970s and 80s, the Yorktown beach was easily overwashed during storms, and continued to erode," says Hardaway.

VIMS scientists entered the picture in 1985 after a particularly damaging nor'easter, when they were asked to become technical advisors to York County's Public Beach board. Hardaway and colleagues have partnered with the County ever since, helping to design and monitor all four phases of Yorktown's current system, which now features 12 separate breakwaters that range from 80-150 feet long.

VIMS has also advised on nourishing and stabilizing the Yorktown beach. A common misconception, explains Hardaway, is that breakwaters trap sand to form the adjacent beaches. Instead, he says, the beaches are created by sand brought in from upland sources. In Yorktown, some of the beach sands were obtained during dredging for Coleman Bridge widening in 1996.

Once created, the beaches are stabilized by planting cord grasses in the sandy ridge, or tombolo, that connects the breakwater to the shore.

Breakwater systems at Yorktown and elsewhere around the Bay weathered a severe test when Hurricane Isabel blew ashore in 2003. At Yorktown, Isabel produced a 7-foot storm tide topped by 6-foot waves. During the height of the storm, waves of 4 feet or higher were breaking across Yorktown's breakwater system and into the adjacent walkway, road, and buildings.

Although Yorktown's waterfront suffered considerable damage from Isabel, Hardaway notes that the breakwaters did provide an important service, by preventing even worse damage.

"The breakwater system significantly reduced wave action, which likely ensured the structural integrity of the buildings on Water Street," says Hardaway. "The system experienced sand losses and local scour but maintained its overall integrity and performed above expectations. It was designed for a 50-year event and sustained what many consider a 100-year event in this part of the Bay."

Hardaway notes that trade-offs between protection and cost are an integral part of any breakwater design. "The Yorktown breakwater system minimized Isabel's damage, hastened post-storm recovery, and provides the benefits of beach and dune habitat. Higher breakwaters and more sand would give more protection, but at what cost?"

Local officials will continue to grapple with that question during the coming years, as many hurricane experts predict that the current period of enhanced hurricane activity in the Atlantic will continue for a decade or more.

In addition to breakwaters, the Shoreline Studies group at VIMS can choose from several other alternatives when advising localities on shoreline protection.

Bulkheads are vertical wooden structures parallel to shore that reflect the energy of breaking waves. They commonly promote scour on the seaward side.

Revetments are inclined piles of stone riprap that protect the base of eroding banks. The slope of a revetment minimizes wave reflection and seaward scour.

Groins are built perpendicular to the shore to trap sand for beaches. In areas with insufficient sand supply, they can starve existing beaches "downdrift."

Sills are elongate, wedge-shaped piles of rock built near-shore to help establish a marsh fringe or "living shoreline."

During the last few decades, there has been a move from traditional "hardened" structures like bulkheads and revetments toward breakwaters and sills, as shoreline managers promote the benefits of a living shoreline.