Researchers Link Beach Erosion to Ice Age Channels

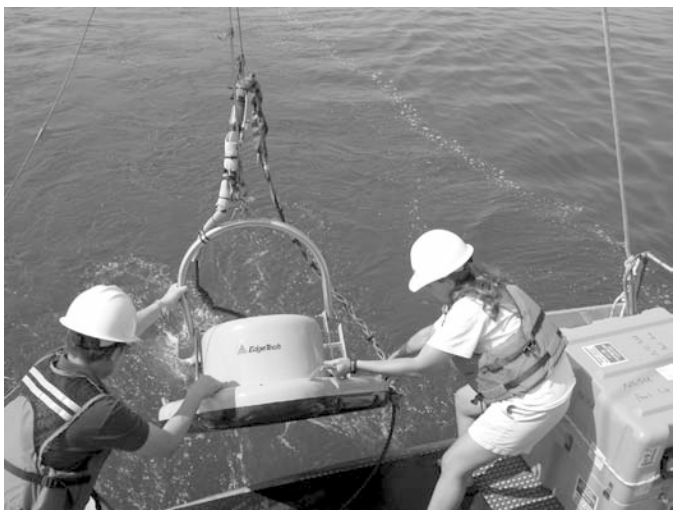
If Outer Banks beachgoers give any thought to ice, it's probably a wish to have more in their coolers. But a new study by VIMS researchers shows that ice plays a much greater role on the Outer Banks than just a means to beat the heat.

The study, conducted by VIMS marine geologist Dr. Jesse McNinch and graduate students Grace Browder and Jennifer Miselis, indicates that Outer Banks beaches likely owe their very shape and behavior to now-buried river channels that formed during the last Ice Age.

Browder presented the team's findings during a recent meeting of the Geological Society of America.

The research extends an earlier VIMS study of Outer Banks beaches. During that study McNinch discovered a transient phenomenon in which short stretches of sandy beach suffer severe erosion during storms, then quickly refill with sand. These "erosional hotspots" are of great interest to the Army Corps of Engineers and other shoreline management agencies, as they can damage seawalls, hinder beach replenishment efforts, and disrupt military maneuvers.

McNinch's current research is to better understand the geologic factors that control hotspot formation. It's based on his previous discovery that hotspots are commonly associated with bends in the offshore sand bars that normally parallel Outer Banks beaches. During storms, these bends act like open gates that allow large waves to pound and quickly erode the shore.



Dr. Jesse McNinch (L) and graduate student Grace Browder deploy a "chirp" sonar device to map the geology underlying the Outer Banks seafloor.

The new research helps explain what causes the bends. Using side-scan sonar, (which uses "acoustic shadows" cast by seafloor objects to map the sea bottom), McNinch and his team discovered that the bends typically occur near where gravel patches interrupt the otherwise sandy seafloor. They then used a high-resolution "chirp" sonar system to "see" beneath the seafloor–and found that the gravel continues beneath the surface in the shape of a stream channel.

The researchers hypothesize that the channels formed during the last Ice Age, when sea level was lower and streams coursed across what is now beach and shallow sea floor. As the ice sheets melted and sea level rose, the gravel-filled channels were buried beneath a thin layer of beach sand.

The team's next challenge is to understand how a buried stream channel can affect the behavior of overlying sediments and sand bars. "One idea," says McNinch, "is that groundwater follows these buried channels, and is somehow affecting the behavior or characteristics of the sediments."

Funding for the work is provided by the three-year grant from the Army Research Office. The study area stretches along the barrier-island beaches of southern Virginia and northern North Carolina.

Heritage Tourism Workshop Draws Local Businesses

VIMS' Virginia Sea Grant program, the Virginia Foundation for the Humanities, and the Eastern Shore Chamber of Commerce held a workshop on April 29th in Wachapreague to help Eastern Shore businesses identify and capitalize on marketing the region's unique cultural heritage. More than 35 people attended the "Heritage Tourism Marketing" program, representing various travel-related businesses such as motels, restaurants, B&B's, campgrounds, kayak outfitters and eco-tour guides, and real estate agencies.

The informal program was designed to educate owners and employees of the hospitality and travel service sectors about the marketing opportunities associated with maritime traditions. Speakers included experts in Eastern Shore maritime history, architecture, commercial fishing, farming practices, and cultural heritage.

"This was a good opportunity for tourism-related businesses to learn first-hand about the region's distinct heritage and become aware of the growing interest in heritage travel. A business with better-informed employees always becomes a better business," said program sponsor Dr. Bill DuPaul, who heads the Sea Grant Marine Advisory Program at VIMS.

Workshop evaluations from participants were excellent, and all attendees expressed interest in future programs of this nature.

–by Charlie Petrocci

ATTENTION: High School Biology & Marine Biology Teachers!

A three-day course, ***"The Application of Molecular Markers in Marine Science,"*** will be offered **July 12-14** at the VIMS campus in Gloucester Point. Through lab and classroom activities taught by VIMS faculty, teachers will explore how developments in molecular genetics and bioinformatics have spawned exciting techniques used in marine fisheries science. Topics to be covered include the use of molecular markers for analyses of stock structure, forensic identifications, and screening fish and shellfish for disease organisms.

Emphasis will be on professional development as well as activities that can be transferred to the high school classroom. Topics will correlate with Biology standards and AP Biology content.

Enrollment is limited to 12, and a basic understanding of genetics is required. One graduate credit in marine science will be offered (optional). For more information, contact Susan Haynes at shaynes@vims.edu or Vicki Clark at vclark@vims.edu.

Recovered Tag Provides Data Windfall

A pop-up satellite tag attached to a white marlin off Venezuela in Fall 2003 by a VIMS research team was retrieved in Aruba by a beachcomber in late March.

"It's pretty amazing when someone actually finds one of these tags, considering all they go through" says David Kerstetter, who conducts the tagging research along with advisor Dr. John Graves and fellow graduate student Andrij Horodysky.

The tags log the habitat preferences of white marlin and their rate of survival following release by anglers. They gather behavioral and geographic information for days to months at a time, then automatically release, float to the surface, and transmit the stored data via satellites to scientists on land.

Although these tags represent a significant technological leap, they are not without limitations. One drawback is that satellite data streams typically only transmit about 60% of the information that a tag stores.

The recently recovered tag transmitted only 19% of its more than 9,000 archived data points to the satellites. However, the researchers have successfully downloaded 100% of the data after the tag was returned.

"That's why physically recovering a tag is such a windfall," says Kerstetter. To date, 3 of the 70 tags deployed by Graves' team have been recovered.

A researcher releases a white marlin tagged with a pop-up satellite tag (white arrow).