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Underwater 'workhorse' gives kids a lesson in remote technology

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When the federal government decided to put a dock at Fort Hancock in Sandy Hook Bay, it needed to explore what environmental habitat it might disturb in the process.

Yesterday, scientists from Rutgers University provided a high-tech answer, sending an unmanned torpedo-shaped vehicle under the bay to give a precise picture of what lives beneath the surface.

Researchers have been using the submersible -- equipped with a camera -- up and down the East Coast and beyond to go places man cannot easily go. And yesterday they used their research as a teaching tool, inviting along a group of curious students who may one day build their own version of the Remote Environmental Monitoring Units, better known as REMUS.

Tom Thues, a research scientist at Rutgers, said that to manage the resources under its jurisdiction, the National Parks Service first has to know what's there.

"A map is the first step in understanding the distribution and abundance of those resources," he said.

"The more we know, the more we can get information about what's out there," said David Avrin, superintendent of Gateway National Recreation Area, where Sandy Hook is located.

REMUS has been around in some form since the 1980s, but has never been so widely employed and in such demand than within the past decade or so, Thues said. Some units, still widely used by the U.S. Navy to sweep for mines, are as large as cars. But the REMUS that's owned by Rutgers is slightly less than 6 feet long, weighs about 86 pounds and can go in some pretty shallow water.

Operating on a battery and directed by a computer program, REMUS can stay submerged for anywhere from nine to 20 hours, depending on its speed. Used at least twice a month for about five months out of the year, REMUS is a "workhorse," Thues said.

It's mapped grouper habitats in the Gulf of Mexico, sturgeon habitats in the Hudson River, scallop beds in the Atlantic Ocean off Point Pleasant and weakfish habitats in the Mullica River. It's even been used to help with the study of how an invasive species of mussel is depleting oxygen in Lake Erie.

It can tell researchers about the features of the bottom of a body of water and whether that seascape can support life. It's been able to document marks left by the nets of dredges. It can tell scientists where fish like to feed. It can tell scientists where habitats are dying.

Yesterday, REMUS was directed to map several acres of the bay near Fort Hancock and a nearby cove to observe fish habitats. The Jacques Cousteau National Estuarine Research Reserve, headquartered in Tuckerton and managed by Rutgers, decided to use the event as a teaching experience by inviting students from Neptune Middle School, the Marine Academy of Technology and Environmental Science (MATES) in Manahawkin and the Marine Academy of Science and Technology (MAST) at Sandy Hook.

The students watched as Joe Dobarro, director of underwater operations at Rutgers, and Rose Petrecca, director of marine operations at the university, stood in the frigid bay to launch REMUS. Then, Douglas Levin, habitat specialist for the National Oceanic and Atmospheric Administration, took them inside to help them build a prototype from PVC pipe, plastic cosmetic containers, computer fans and stereo speaker wire.

Ana Rubio, Emily Millaway and Amie Wuchter, all 11-year-old sixth-graders at Neptune Middle School, thought they had theirs working until Levin pointed out that their operating switches didn't correspond to the appropriate propellers. Their MATES mentor, Priya Uppal, 15, of Bayville, encouraged them to make some changes.

Amie said she initially was intimidated by the task. But her opinion changed halfway through the project.

"Now that I'm doing it, it's not as hard as I thought it would be," she said.

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