

Charting a New Course in Learning



Smithfield High School hosts its first virtual oceanography expedition

By Ron Scopelliti

For one week in the beginning of March, the media center at Smithfield High School had students and their parents glued to three 46-inch video screens, gasping, gaping, and cheering as if they were watching a fireworks display or an IMAX presentation. As children and adults held up cell phones to photograph what they were seeing, it was evident that they were experiencing something greater than a fleeting visual spectacle. They were experiencing the thrill of scientific discovery as it happened, live, before their eyes.

They were given this opportunity through a high-tech hook-up between Smithfield High School and oceanographer Dr. Robert Ballard.

Ballard, a veteran of more than 100 ocean expeditions, is best known as the man who discovered the wreck of the Titanic. He also tracked down the wrecks of the German battleship Bismark, the "lost fleet" of Guadalcanal, and the American aircraft carrier Yorktown, sunk during the Battle of Midway. A 1977 expedition he led to the Galapagos Rift found hydrothermal vents that supported exotic ecosystems deep below the surface of the ocean – a major scientific discovery.

From March 5 through 9, students and residents of Smithfield got their first taste of a new partnership between Dr. Ballard, the town, and the University of Rhode Island. Ballard, a professor of oceanography at URI and president of the Institute for Exploration at the Mystic Aquarium, chose Smithfield High School as the first school in the world to receive a science console identical to that at URI's Inner Space Center.

The console consists of three 46-inch plasma video screens, and a telecommunications system that allows students to interact live with scientists in the field.

Speaking with *Your Smithfield Magazine* during the February unveiling of the console, Ballard said this system would be the prototype for similar systems that would be installed

nationwide. There were several reasons for choosing to start the program in Rhode Island, including the state's capability to use the "Internet 2" (I-2) computer communications protocol in its schools.

"This is the prototype," said Ballard. "Rhode Island's ahead of everybody because they're I-2. They're the only state in America that's I-2, K to 12, so they're stepping up to the plate, as well."

"Plus, it's the Ocean State, plus, the new [National Oceanographic and Atmospheric Administration] ship of exploration's going to be based here, plus, we're building the inner space center here," he added. "All the ducks aligned."

He says that Smithfield was chosen as the first town to receive the system because of the administrators' enthusiasm and commitment to the project.

"They wanted to do it," said Ballard. "They stepped up to the plate, and that's my kind of place."

"I don't want to push this on anybody," he said. "You have to want to do it, and they want to do it. I've got people stacked in behind them though, that were just one nanosecond slower."

Announcing the unveiling, school superintendent Robert O'Brien stated "I have the same vision that Robert Ballard has, and I'm just as excited about it. This technology is so natural because it's the way kids learn today. This will really engage our students to learn about the oceans. After all, we are the Ocean State."

The equipment will be used to integrate oceanic learning into the town's curriculum for grades K-12, and the teachers have already begun aligning the program with the state's science frameworks. Other disciplines, such as art and social science will follow suit.

Smithfield students got their first chance to use the system on March 5. For the next four days, they tagged along with Ballard's expedition to the Flower Garden Banks National



Smithfield High School recently became the first school in the world to install a science console connecting them with oceanographer Bob Ballard's Institute for Exploration at the Mystic Aquarium. Above: Smithfield School Department Technology Coordinator Ed Hill speaks to students from Old Country Road School as they watch the progress of the Remotely Operated Vehicle Argus along the bottom of the Gulf of Mexico. (Your Smithfield Magazine photo) Top: Students also had a live connection with the crew of the research vessel Carolyn Chouest during the Gulf of Mexico expedition (Photo courtesy of the U.S. Navy)



Oceanographer Robert Ballard (on screen) fields a question from fifth-grader Cassandra Duffy of Anna McCabe School, via the newly-installed science console in the Smithfield High School Media Center. (Your Smithfield Magazine photo)

Marine Sanctuary in the Gulf of Mexico, 115 miles of the Texas/Louisiana coast.

Ballard coordinated the mission remotely, from the Mystic Aquarium, communicating with the scientists in the field through a system like the one at Smithfield High.

In the Gulf were the United States Navy's nuclear research submarine NR-1, and the 238-foot support ship Carolyn Chouest, towing the remotely operated, underwater research vehicle (ROV) Argus.

The vessels explored coral reefs, brine seeps, mud volcanoes, and other geological features on the sea floor, also searching for Native American artifacts along the now-submerged ancient shorelines.

A session on the penultimate day of the expedition found the anticipation building among students, parents, and faculty as the ROV Argus traveled methodically toward a mud volcano on the floor of the Gulf.

Students from Old County Road School attending in the morning arrived to see a rather barren seascape, as the Argus transmitted images from 140 meters below the surface, just feet off the ocean floor, illuminating the area with its onboard lights.

"I expected the sea to be more crowded," chimed a student from Old County Road School.

Ed Hill, the school department's technology coordinator, and a longtime science teacher at the High School, reminded him, "The ocean is a really big place."

As the Argus moved along the children's excitement came through as they began seeing fish and coral formations.

"This is live video no one in the world has ever seen before," Mr. Hill told the children. "This is the real, true bottom of the ocean."



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Speaking briefly with the Old County Road School students, Ballard told them "I've been on 120 expeditions, but this is the first one ever that I've done through telepresence. So I'm looking at the same console you're looking at, but I have communications with the ship, and I can talk to the pilot. This is really cool, because I can do much more exploring than I ever thought I could."

During an afternoon session attended by Anna McCabe School students and their parents, the excitement built. Ballard held a longer interactive session with the students, tracking the progress of the Argus along with them.

"Periodically, I'm going to look over my shoulder to see if that mud volcano's coming up," he told them as he began to field questions from the students.

The students came to the event well-prepared. Teachers have been attending workshops as the program developed, getting students ready for the expedition. Fifth-grade teacher Deb Cote of McCabe School noted that students have been doing background research on oceanography, and taking part in experiments that simulated mapping the ocean floor.

"We had children doing experiments that had to do with salt mounds – how a salt mound is formed," she said. "They also read and discussed how coral reefs are formed."

They came to their session at the High School prepared to act as part of the crew, armed with observation sheets to record what they were seeing, and questions for Dr. Ballard. The questions included queries about the effects of Hurricane Katrina on

the sanctuary, the top speed of the Argus, and the eating habits of sea turtles.

One student offered the question, "After this exploration, what do you expect to accomplish?"

This gave Ballard a chance to explain the patience and hard work behind the glamour of the big discoveries.

"You realize," he said, "that we are collecting this data 24 hours a day, and no one can go ten days without sleep. So quite honestly, no one has seen all the data. We're going to bring it back here to Mystic, to the Institute for Exploration, and we're going to look at all of it."

"I want to ask you a question," the explorer asked the students, "Can you identify the hat I have on my head?"

He was answered with cheers as the children realized it was a Smithfield Sentinels baseball cap.

The cheers continued after Ballard signed off and the Argus finally reached the mud volcano, and the audience watched it spewing gas from beneath the ocean floor, creating plumes of mud.

Speaking after the event, Superintendent O'Brien said, "This has worked just the way they hoped."

"The reaction of the kids has been phenomenal," he said, though he noted that there is much more to come, including an expedition Ballard is leading this summer to explore Phoenician shipwrecks in the Black Sea. The environmental conditions at the location have left the ancient vessels remarkably well-preserved.

"He'll come up with things that are unbelievable, said O'Brien. "This is just the beginning."

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