

DAILY NEWS TRIBUNE CLASSROOM



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Eighth-grader Robbie Quinn, above, uses a Dat, on loan from Boston College, to record sounds out in the field. Students at McDevitt School are learning about bioacoustics in their Earth Science class. Below, eighth-grader Amanda MacDonald listens to Meredith Houle, a doctoral student from BC, demonstrate how to use a Dat recorder.

LOUD and CLEAR

McDevitt students participate in bioacoustics research with BC

By Carrie Simmons
DAILY NEWS STAFF

WALTHAM - Eighth graders at McDevitt Middle School are using high-end equipment to collect cutting-edge scientific data this term in a partnership with Boston College.

As part of a \$1.35 million grant from the National Science Foundation, a group of Boston College scientists and educators is piloting a bioacoustics curriculum at McDevitt.

Using the same equipment as research scientists, including recording decks, directional microphones, headphones and decibel meters, students in Heidi Sardina's science classrooms have been conducting audio recordings of birds living in the environ-

captured background noise like traffic and rustling leaves.

"You guys are no longer just learning science, you are doing science," Sardina told her students. "Not only are we acting like scientists, we are breaking new scientific frontiers."

Boston College has designed the bioacoustics curriculum to improve students' understanding of the uses of information technology in science, as well as their understanding of potential careers in information technology and the sciences.

The bioacoustics project focuses on recent findings by scientists in the Netherlands that birds in urban areas sing at a higher pitch than their corresponding species in rural areas to compensate for the ambient noise. The findings were published in 'Nature' in



Students recording birds around Waltham

BIOACOUSTICS, From B4
plore exactly the same thing," said Michael Barnett, an assistant professor of science education and technology at Boston College who is leading the project. "That is what is exciting for students. They are collecting real data."

Students will be analyzing their recordings using Raven, a software developed by scientists at Cornell University to analyze the bird song. The software gives students a visual representation of the sound waves.

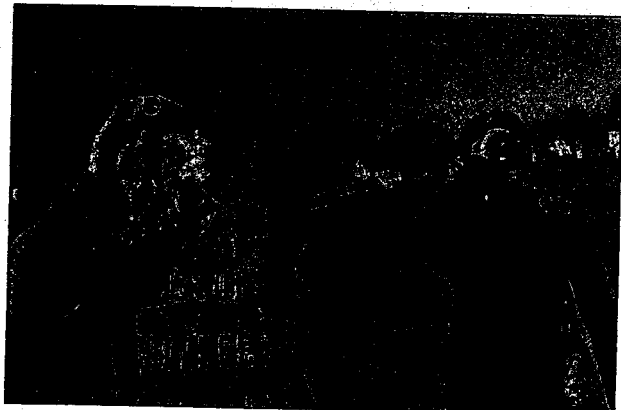
One of the goals of the bioacoustics curriculum is to help students understand how scientists interpret things that cannot be seen. A skill students are tested on during MCAS exams.

"Graphical interpretation is very difficult for kids," said Barnett, a Waltham resident. "Just being able to interpret that amount of data is a good skill for them to have."

McDevitt students will eventually post their data on the Internet and compare it with other cities and states. Barnett's team has also piloted the curriculum in three Boston high schools and the Barnstable school district on the bioacoustics project.

"The main goal is to learn about sound waves," said Meredith Houle, a graduate student at BC who is leading the bioacoustics curriculum project at McDevitt. "Bird song is something they hear and see. But they are more interested in the sound than the actual birds."

The projects also have a career component. As part of Boston College's Tools for Tomorrow program which helps middle school and high school



McDevitt Middle School eighth-graders Jenna Ernst, left, and Cana DeFina search for birds to then record the bird sounds for a bioacoustics study with Boston College.

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students learn about how school work translates into careers, another graduate student from BC's counseling site is training Sardina in career development.

"By eighth grade if girls aren't interested in science or they don't see it, their interest is pretty much squashed," said Barnett. "Helping them to begin to think about what they might want to do early on is a good idea."

Sardina wants girls in particular to get involved in math and science because that is where the jobs are, she said.

"I don't believe that girls are math challenged but at this age they are already starting to turn off," she said. "We are finding that physics one of the areas they are afraid of."

Eighth graders do not necessarily realize they are

learning physics this term. Sardina would like to capture their interest with hands-on projects like the bioacoustics project before they become intimidated by the terminology.

Last week, Amy Saran found the research subjects more challenging than the subject matter.

"The birds were going so fast," said 13-year-old Saran, who helped her team spot the birds with binoculars. "We didn't find the seagull but we recorded the leaves and the car going by."

BC's bioacoustics pilot should be completed in the spring. Once the curriculum is finalized, school districts will be able to choose from a number of 2-3 week curriculum units. BC will then provide teacher training on the tech-

nologies at the college's summer institute.

The partnership between Boston College and Waltham Public Schools started a few years ago after Sardina met Barnett while taking his educational technology class.

Under a separate grant from the National Science Foundation, BC piloted a seismology curriculum that allowed Sardina's students studying electricity and magnetism to build a seismograph. They compared their local seismograph readings with real-time data on the U.S. Geological Survey's Web site.

The seismology curriculum module is now being used in 25 districts.

Sardina said the collaboration provides amazing learning opportunities for

Waltham students.

"Boston College comes in and is able to loan us equipment that the city of Waltham would never be able to afford," she said. "This is something that the kids are really going to remember."

All of the projects fit into the state's eighth-grade earth sciences frameworks.

In addition to the bioacoustics project, Boston College will also be leading an urban tree inventory in the spring. Using handheld computers, students will create a GIS map of neighborhood trees. That data will be shared with the Massachusetts Department of Forestry, which wants to map the trees in Waltham. Students will also work to calculate environmental impact of trees in the area.

As part of the National Science Foundation grant, Boston College will also be hosting a 4-week summer science camp for girls and students of color from Boston and Waltham. They will work with other students, scientists and teachers to learn how to use information technology to conduct scientific investigations.

In Waltham, Barnett is targeting students of color because they are so underrepresented in the sciences. Minorities account for 35 percent of the U.S. population but only 3 percent of the scientific workforce, according to Barnett.

"Everything that applies for girls applies for minorities in many cases," he said.

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