Real-World Science Comes Alive For Newtown High School Senior

By Larissa Lytwyn

Newtown High School senior Margaret Boushell doesn't remember a time when she wasn't fascinated by science, or, as she puts it, "the way things work."

"Science has always been one of my favorite subjects," she said.

Margaret's passion for science led her to top honors in a number of science fairs and expositions throughout her four years at NHS, including the Connecticut Junior Science and Humanities Symposium.

The National Honor Society student's current endeavor brings an exciting new intimacy to her work.

Margaret is in the beginning of her independent study project, an opportunity NHS offers exclusively to seniors, analyzing Deep Brook River's water quality after last year's oil spill at Canaan House.

Margaret explained that Senior Projects, typically run through the school's Career Center, allows seniors to pursue an internship with a company or individual in their field of interest.

"Last year, [Newtown High School biology teacher] Frank LaBanca came into our AP [advanced placement] chemistry class and told us that he was willing to work with anyone who wanted to do a senior project in the science area," Margaret remembered. "I was excited about the opportunity."

Initially, she had planned to continue a project she had begun for a science exposition called "Optimizing Cytochrome 54 as a Biological Indicator."

"Cytochrome 54 is an enzyme that can be used to detect the presence of outside pollutants," she explained.

She had been testing the process with fish to measure the ecological quality of their environment.

Then, the oil spill at Fairfield Hills' Canaan House occurred last December.

"I knew that I definitely wanted to explore the consequences of the spill," she said. "It would be perfect for me, because it was right in Newtown. It had a real-world applicability that was really exciting."

"Some of the oil [from the spill] went into part of [nearby] Deep Brook," she said. "It was cleaned up within a day or so, but I believe there may still be some evidence of the spill in that area of the river."

She water compare water samples from the river's oil-affected area to water further upstream.

Assisting her along the way will be entomologist Chris Sullivan of the state Department of Environmental Protection (DEP) and Jerry DeMenna of Buck Scientific, a science instrument and accessory outlet based in East Norwalk.

"At this point, I've been collecting insects for identification at Deep Brook," said Margaret. "Soon, I'll be meeting Mr Sullivan to identify them."

She said that the kinds of insects there are, as well as their physical appearance, could indicate the environmental quality of the surrounding habitat.

In addition, she needs to collect water and soil samples before severe winter weather arrives.

"The biggest challenge is getting those soil samples," she said, "before it gets too cold!"

Working with Mr LaBanca to design an outline of the project, she said, has been a most fortuitous one.

"It's been wonderful working with Mr LaBanca because he's so accessible and open to ideas," she said. "He also has a lot of great connections with the DEP and scientific firms in the area, which is great!"

Mr LaBanca, who has been a member of the Fairfield County Research Teachers' Consortium, spoke with similar enthusiasm about Margaret, as well as her Deep Brook project.

"Margaret has a lot of fine qualities," he said, "she's personable and especially self-driven." Her self-motivation, he continued, was arguably one of her strongest characteristics.

The oil spill at Canaan House last December spilled into part of Deep Brook. —Bee Photos, Lytwyn

The project will be concluded by March 2005.

Expanding Opportunity

Margaret's independent senior project has actually become the pilot for a recently school board approved course, the one-year Applied Science Research elective.

"The Applied Science Research program existed at the prior school I taught at, Stamford High School," Mr LaBanca explained.

When he joined the NHS staff a few years ago, he was looking forward to implementing a similar program.

"The Applied Science Research program allows high school students to connect with top professionals in the community," he said.

Further, it takes its "real-world" application a step further.

"It allows actual, really needed work to get done," he said. "Frankly, the DEP doesn't have the manpower available to do this kind of analysis Margaret is currently conducting at Deep Brook River. This program is an extraordinary opportunity for all those involved!"

He compares the course as somewhat akin to the NHS Career Center-managed senior project.

The Applied Science Research program, however, beginning next fall, will be open to students on all grade levels and even academic aptitudes.

The key, Mr LaBanca, was to provide real, self-initiated internship-like opportunities for students —ones that would leave an indelible impression on their community.

The cost of offering the course will be approximately $1,000 to $2,000. No textbooks are necessary. Additional equipment costs, Mr LaBanca said, could be minimal.

Newtown High School senior Maggie Boushell is comparing samples of upstream Deep Brook and its lower portion, which, despite a thorough cleanup, may still bear evidence of last year's oil spill.

"A lot of these companies are eager to provide their resources to students, especially when they can get the exposure and some of their work done in return," said Mr LaBanca.

Buck Scientific, for example, is providing its equipment for Margaret without charge.

At the end of the course, student progress will be measured using Leo Klumfer's Test on Understanding Science.

They will also be expected to present their work at area science fairs, competitions and symposiums.

Newtown will join a number of other prestigious Connecticut schools currently offering research programs, including Darien High School, Greenwich High School and Staples High School in Westport.