



Photo: Susan Vincent

## Thinking Like Scientists



Photo: Andrew Shaw

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Programs like the Lamont-Doherty Secondary School Field Research Program and LEEFs (above) provide opportunities for K-12 students and public school teachers to study the natural world and improve science education.

“Teaching students to think like scientists is key to helping our environment,” says Nancy Degnan, director of the Center for Environmental Research and Conservation (CERC), a Columbia-based consortium of five organizations that includes Columbia University, the American Museum of Natural History, New York Botanical Garden, Wildlife Conservation Society and Wildlife Trust. Learning the principles of scientific inquiry can broaden students’ perspectives and give them the tools they need to understand environmental issues.

“Too much stress has been put on natural resources, and the services of our ecosystems have been overlooked,” says Degnan. “We often examine these issues in a patchwork manner, but a sustainable approach requires us to think in a systemic, big-picture way. We need better science-based inquiry to find sustainable, systems-based solutions. And we need all students to understand their role in shaping the future of this planet.”

From the classroom to the field, Columbia programs are bringing scientific inquiry to students of all ages, from elementary school through graduate school. “It’s not just about making students more knowledgeable,” says Degnan, “it’s about making them better problem solvers.” When students experience the living laboratories in parks, rivers and estuaries, they become more aware of the natural world, question and hypothesize, gather and assess field-based data, and make informed conclusions.

The new Learning through Ecology and Environmental Field Studies (LEEFS) program, which builds on the ecosystem education expertise of CERC and the Lamont-Doherty Earth Observatory, with funding from the National Science Foundation, links Columbia graduate students with classrooms in low-income New York City public schools. The program gives graduate fellows the opportunity to think about new ways to communicate their research and learn innovative strategies to teach science in grades 6 through 12; the younger students benefit from improved science education and can become inspired to pursue careers in science themselves.

Now in its tenth year, CERC’s Summer Ecosystem Experiences for Undergraduates (SEE-U) program aims to help build the scientific thinking skills of non-science majors and broaden their worldviews while they experience the ecosystems of New York, the Dominican Republic or Brazil. “I’ve spoken with SEE-U students who have said that the experience has changed them and the way they think,” says Degnan, “not only about their own discipline but about environmental sustainability. This is what CERC is about. Our job is to equip, teach and guide these students as future environmental decision makers.”

The Lamont-Doherty Secondary School Field Research Program brings students and their teachers to work side by side on projects with Lamont scientists, with activities ranging from collecting mud samples in Piermont Marsh to measuring air quality around New York City. Students gain a better understanding of the world around them as a result, says Bob Newton, the Lamont-Doherty researcher who launched the internship program. In learning about the natural world, “they become much more effective citizens and are better able to address the environmental choices we have to make as a culture over the next generation.” ■



Undergraduates in the SEE-U program travel to Brazil (above) and the Dominican Republic to study different natural ecosystems.