Enriching K-12 Education through ESF in the High School

M. Brady, V. Collins, L. Cray, N. Patterson Jr., Y. Rivera, K.B. Searing, A. Stewart, J. Townsend, N. Werner, D.J. Leopold, R. Beal, S.S. Shannon, C. Spuches, D.J. Raynal, T. Majanen. ESF Outreach, 221 Marshall Hall, SUNY-College of Environmental Science and Forestry, 1 Forestry Drive, Syracuse, NY 13210

INTRODUCTION

The National Science Foundation (NSF) GK-12 program provides graduate students in science, technology, engineering, and math disciplines an opportunity to work in K-12 education. By interacting with teachers and students at high schools, graduate students improve communication and teaching skills, while enriching K-12 education and creating partnerships between high schools and higher education. Through a NSF GK-12 grant awarded to SUNY ESF, nine graduate students (Fellows) are working with the Syracuse City School District and other schools in New York State to infuse scientific research and inquiry learning into science education.

The ESF in the High School (ESFH) program is offered to 25 schools - spanning from New York City to Rochester to Rome, NY. The Global Environment is a college credit course offered through ESFH. NSF Graduate Fellows, faculty, and undergraduates comprise the core of the ESF Science Corps team that works with ESFH.

GRADUATE STUDENT RESEARCH IN THE CLASSROOM

A major component of the program called "Road Shows," are activities that promote inquiry learning and hands-on experiences for the students in The Global Environment class. During the 2007-2008 academic year, Fellows engaged over 240 students at 16 schools through the presentation of more than 60 "Road Shows".

These traveling lessons are often based on topics having roots in the graduate Fellows' research area of expertise. Graduate Fellows perform research in diverse areas such as winter ecology of migratory birds, evolutionary responses of mammals to climate change and health in Ecuador. Topics that Fellows presented include stream bio-assessment, energetics of flight, nitrogen cycling, human population growth, lifeboat philosophy and food miles.

STUDENTS AS SCIENTISTS

The Global Environment students design scientific research projects, then collect and analyze data from observations of natural phenomena, field and laboratory experiments, databases, and peer-reviewed journals. Students present their research to an audience of professionals and peers at the ESF Environmental Summit, a research symposium held on ESF's campus in the spring.

Environmental problems make headlines everyday. How can we help to develop participatory citizens who understand the complex scientific and social issues behind the headlines, make informed decisions, and meet these environmental challenges?

The ESF Science Corps supports campus-based, in-school, workplace and field-based STEM learning and professional development experiences for middle and high school students and teachers.

Speaker Series - Faculty and graduate students from ESF are invited to give presentations on their research at the high schools. Students from science classes attend the presentations as part of extra-curricular and extra-credit activities and participate in Q&A sessions with the presenters.

Onondaga Nation - ESF students and staff conduct environmental education activities with the Onondaga Nation School and community which incorporate Traditional Ecological Knowledge concepts and local Haudenosaunee history. 2007-2008 projects include Onondaga Creek fish sampling, an American Eel restoration meeting, plant material workshops, Onondaga "eco-caching," and having students build a 3-D topographic model of their community.