### Justification for Supplement

We have been involving high school students in our research on nutrient co-limitation, based at Hubbard Brook, Bartlett, and Jeffers Brook, NH. The overall project is well suited to participation by high school students because of the variety of tasks required to support the many research efforts there. So far, high school students have been involved in the field with measurements of soil pH, snail abundance and diversity, and nutrient uptake by tree roots. In the lab, students have been involved with processing leaf litter, roots, and soils. They are offered challenges according to their interests and abilities. For example, one student found it difficult to estimate the moisture content of paper bags, while others have implemented statistical analyses of our long-term data sets. Students have designed the systems to organize our samples and track the results. One student has already been acknowledged in a publication. Another is conducting her senior thesis on samples she collected in our field plots.

Mentoring is provided by the PI and the graduate and undergraduate students associated with the lab. During the summer, we staff the lab for high school students two to three days per week. During the school year, they come in mainly on weekends; some come in during the week if they have free time.

The broader impacts of this project include the training of future researchers, including those from underrepresented groups, and the broadened horizons of the members of overrepresented groups who interact with them.

### Biographical Information

This academic year, we have 11 high school students volunteering in the lab, of which 9 have received fellowships from the current RAHSS supplement. The students come from four different high schools in the Syracuse area, including inner city, suburban, and independent schools, and include freshmen, sophomores, juniors, and seniors. Six of them are immigrants or children of immigrants from West Africa, the Middle East, Southeast Asia, or Eastern Europe. The conversations in the lab include topics of culture and race in addition to leaf identification, sample organization, statistics, and peer review.

Plan for encouraging the advancement of the RAHSS students beyond participation in the
research program

We will continue to communicate with these students beyond their participation in this research program. We will write letters of recommendation to supplement their college applications, as we can detail their many contributions to the scientific enterprise. We can also expose them to opportunities beyond this project, at SUNY-ESF and through our collaborators in New Hampshire.

The PI's previous experience with involving high school students in research

Thirty-seven high school students have participated over the last two years in research in my lab, through a partnership with “ESF in the High School,” a program run by Outreach at the SUNY College of Environmental Science and Forestry. The majority of the students were from underrepresented groups, including many first-generation immigrants, reflecting the rich diversity of the city of Syracuse. Many of the students devoted enough time to the project to earn a college credit. The students processed root samples from various soil depths, evaluated herbivory by insects on leaves from different nutrient treatments, analyzed soils, identified snails, built sap flow sensors, and learned to do data entry and analysis. Eight students also traveled to New Hampshire to conduct research in the field. One student presented her work on soil pH at the Annual Cooperators Meeting at Hubbard Brook. One conducted her senior thesis project on snails that she collected in our sites. Seniors have gone on to public and private universities and colleges, including ESF.