### 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 another is learning to do statistics on 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 were staffing the lab for high school students two days per week. During the school year, they come in on a weekend afternoon.

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

We have statements from three of the students.

**Mariam Bility**

I was born in West Africa in 1999 in the country of Liberia. I left war torn Liberia, and arrived in Syracuse, NY in 2005, with my mother and three brothers. I am currently a freshman at The Institute of Technology in the Syracuse City School District. I have an 88 average and I play three sports a year: volleyball, basketball, and Lacrosse.

My interests involve a broad spectrum of the life sciences, including biology, chemistry, forestry and agriculture. My interests in ecosystems, biodiversity and animals has led to a program at the Rosamond Gifford Zoo, in which I am being trained to conduct presentations to the visiting public, describing the various ecosystems and animals at the zoo. I am fascinated by nature and I like to search for answers to questions. In my volunteer work at SUNY ESF, sorting and categorizing different leaves, I have begun to learn about what questions the students and professors are attempting to answer. I have also learned that I enjoy working in the laboratory environment, and particularly the challenge of trying to solve how and why the trees are influenced by fertilizers.

My career goal is to study science in college and to return to Liberia to apply what I have learned to help alleviate the poverty and suffering in my country of origin.

**Nicholas Jerge**

I am currently a sophomore at Manlius Pebble Hill School in Dewitt, New York, and I currently live with my mom and grandmother. In addition to my interest in the sciences, I also enjoy participating in many theater productions through my school, community theater, and professional environments. I maintain an A/A+ average in school, and I am enrolled in the Advanced Placement Calculus program at MPH. This year is my second year as a member of the MPH Model United Nations team, and I have earned many accolades for my work as a delegate including the Malala Yousafzai Award for Advocacy in Central New York Model United Nations  2014 and the Lester B. Pearson award for Peacemaking at the Secondary Schools Model United Nations Symposium 2014 in Montreal, Quebec. I look forward to participating in this program to enrich my knowledge of the scientific procedure and the laboratory experience.

**Luam Asfaw**

I am 15 years old, born in 1999. I have one brother and one sister.  My mother and my father were born in Ethiopia and came as immigrants where they met here in Syracuse.

               At school, my favorite subject is science, but I also enjoy math.  For science I especially like the life science, especially biology.  I have like it for a long time because I have always wanted to be a Doctor when I grow up. Because of this, I participate in the county science fairs, and in science Olympiad.  Over the summer, I also volunteer at St. Joseph hospital and next summer will additionally volunteer at Crouse Hospital.  It is also the reason that I decided to work here at this lab, and also why I enjoy it.

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

The current RAHSS supplement is my first. We have been very pleased with our experience in the last year. One student presented her work on soil pH at the Annual Cooperators Meeting at Hubbard Brook. One is conducting her senior thesis project on snails that she collected in our sites last summer. One is analyzing data sets (and finding problems; on Saturday he went with an undergraduate student to search our archives for samples with suspicious values). None of our high school students have yet gone on to college.

In 2012 I had a supplement to support a regular employee, a high school graduate from Syracuse who was Asian-American, female, and wheelchair bound. She was involved in laboratory activities in my lab and in others at ESF; she was interested in microscopy and worked in the ultrastructure lab in the wood science and engineering group. She went on to Yale University, where she is active in the Yale Medical Professions Outreach undergraduate program **and the Korean American Students at Yale. She also** serves as a Student Representative on the **Provost’s Advisory Committee on Resources for Students and Employees with Disabilities.**