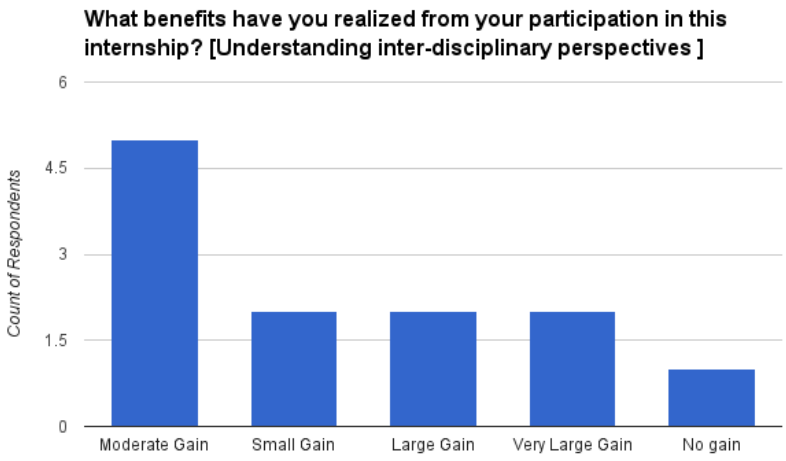
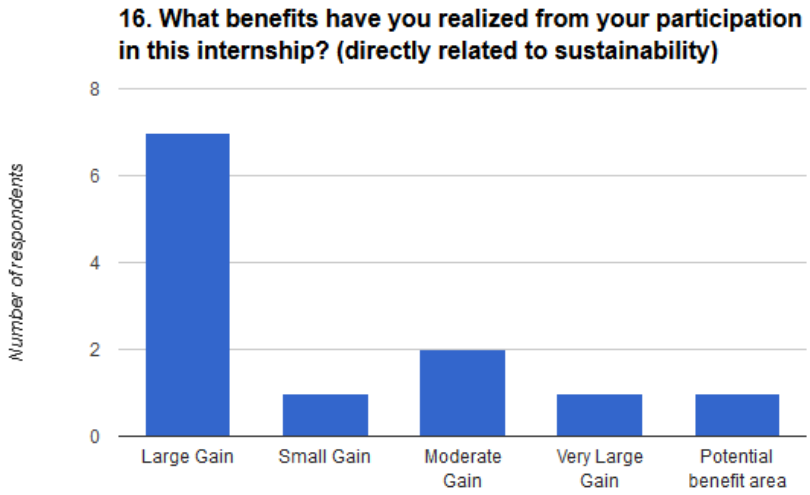
Impact 9: Joint Faculty-Student Research, Internships & Career Education:

As indicated in our InTeGrate proposal and through our Academic Master Plan, internships form a critical component of our co-curricular programming. Students in Geography & Earth Science majors are required to complete an internship for graduation. Students in other majors are also allowed to take an internship. Through our InTeGrate activities this spring and summer, we have encouraged more students to complete internships with an emphasis on sustainability. Thirty-eight students found placements with one of 23 different internship partners (see below for list of partners).

Of the 38 *students* registered for internships, 13 students (4 in spring semester and 9 this summer) completed the Student Internship Assessment Survey. For all but one of these students, it was their first internship experience, and 100% indicated that their internship was directly or indirectly related to sustainability. When asked for the "inspiration for getting this specific internship" students identified the following reasoning: 1) I was inspired by a field trip or service-learning experience, 2) I think hands-on learning is more rewarding than course work, 3) I was asked/encouraged by a faculty/staff member, 4) I have always been interested in this career field, 5) I was inspired by my college-level course work and decided to explore it more fully.





In this same survey, students were asked to rate the "gains" they experienced through the internship. Most students (7/12) reported large gains in the benefits of their internship relative to understanding sustainability and 4/12 additional students reported very large, moderate and small gains. Further, when

asked if the internship inspired students to improve their academic outcomes through a variety of strategies to build their resumes, 7/12 indicated that they agreed or strongly agreed. Further, students were asked to rank their gains in a range of additional skill areas ranging from data collection, to field/laboratory work, to interpretation of results, and other hard and soft skills necessary in the workplace. Most students reported moderate, large, or very large gains in the skills matrix. Finally, with respect to their gains relative to understanding the dimensions of sustainability and understanding interdisciplinary perspectives 7/12 reported some level of increased understanding of sustainability with 4/12 indicating large to moderate gains. With regard to interdisciplinary perspectives, 11/12 students reported moderate to very large gains as a result of their internship. These data collectively indicate that students are not only becoming more aware of the dimensions and interdisciplinary nature of sustainability, but they are doing so within the context of real, on-the-job training in professional work environments. The fact that such a high percentage of students are reporting gains is promising for continuation of our efforts moving forward. As the goal in our original proposal was to have a minimum of 5 students complete internships in a placement related to sustainability, we are excited to report that we have had more interns than this report some level of internship activity related to sustainability. Some students are still working at their internships and will be encouraged to complete the survey in the coming weeks.

Joint Faculty-Student Research: A growing emphasis at SU has been joint faculty-student research, and in some cases course-embedded research. In the last year, three specific research projects were initiated within the domain of sustainability. One project was initiated to develop a photogrammetric method for measuring and ultimately monitoring growth of

oyster castles at the Chincoteague Bay Field Station sites (see: https://sketchfab.com/models/e99ef8c249314b28a194f23910fef6bb), an independent but course-embedded research project focused on evaluating the relative percent of recyclable materials being thrown in the trash around campus, and the third was focused on the sustainability of potatoes at the Campus Community Farm. All of these projects were developed in collaboration with faculty mentors and were presented to diverse audiences. One was presented at a regional conference, and one was a major highlight of Earth Day and a report was written and shared with the campus-wide Environmental Steering Committee. It was particularly eye opening because our campus went to “single-stream” recycling which

resulted in the removal of sorting stations in favor of larger capacity recycling cans. Surprisingly our tonnage of recycled materials went down, not up. This particular student research project revealed that students were throwing away items that could be recycled, but his attitudinal survey of students found that most were confused about what single stream meant and many thought that trash and recycling were to go together. Through this project, the partners can now work on a plan to reverse and improve the education of students, and to encourage an improvement of recycling across campus.

Finally, the third research project focused on supporting a community initiative through innovation in food production. As an effort to improve yield, reduce harvest time, and reduce pest infestation, the "potato" project was undertaken at the Campus Community Farm to explore the potential for growing potatoes in raised cages. Much of the produce raised at the campus farm (now in its 3rd summer of operation) is donated to a local food outreach program (Shippensburg Produce and Outreach). This research was expanded and improved this year to maximize production of the most sustainable starch crop in the world. Although the growing season is not complete, initial results show promise for use of cages. Potatoes are more uniform, less impacted by infestation from ground pests, and most importantly much quicker and easier to harvest. See http://www.theslateonline.com/article/2016/04/students-project-aids-in-future-for-agriculture for more details on this project.

All of these projects exposed students to experimentation, data collection, analysis, and reporting and further helped students to develop a deeper understanding of sustainability and its applications to many different disciplines. In fact, students reported that their research was more meaningful because they were able to take ownership of the project, and learned clear linkages between their project's outcomes and real world applications. Although one student graduated, the other two students will return to campus this fall and have already requested assistance to continue their work. In the coming months, we hope to encourage more student participation in independent and course-embedded research projects building on these successes.