Sustainable Systems Mapping/Modeling

Blog posted submitted to the SLS FEWS Fellows Program, May 2016, by Sabrina Grossman, CEISMC; Cassandra Telenko, School of Mechanical Engineering; Malte Weiland, Campus Services

Sabrina Grossman:
Working with Cassandra Telenko and Malte Weiland, the focus of our SLS project is to plan and implement an analysis of the existing waste and recycling systems at Georgia Tech. Through Dr. Telenko's spring graduate course, students will examine the inputs into Georgia Tech and then map their output with what materials are recycled, reused, composted, and/or brought to a landfill. Malte Weiland, the sustainability project manager for campus services, will facilitate the project and organize meetings for the students with various stakeholders throughout campus. As Georgia Tech has only participated in building level audits of their waste system, but never as a whole campus, this work is extremely important in understanding the interconnected web of waste management and how each sector affects the other. The expected outcomes will greatly benefit Georgia Tech's understanding of these systems and allow for information for decision-making on improvements to them.

Through my role at CEISMC as a program director in science education, I have the opportunity to run a sustainability science camp for high school students every summer. The theme of the camp changes every year, but we try to focus on specific themes of research across the Georgia Tech campus. I will be connecting the work from Dr. Telenko's course to our camp themes this year and will hopefully have a student from the course work with our students to expose them to systems mapping and modeling. In addition to focusing just on waste and just on Georgia Tech's campus, we will take a broader view and look at specific inputs and outputs in the students' community (school, home, neighborhood) related to food, energy , water, and materials. Students will spend two weeks on campus looking at how to reduce our footprint and focus on the reuse and recycling of our resources. Dr. Telenko's students will provide an example of basic system mapping which will be able to show students how data can inform decisions. Malte Weiland will connect the students to campus resources that can demonstrate how these systems can change to reduce waste. Students will attend field trips to the Waterhub at Emory (inspired by the FEWS Fellowship), The Robert C. Williams Museum of Papermaking, and the Center for Hard to Recycle Materials, just to name a few. By the end of the camp, students complete a basic system map of their assigned resource in their community and use the data from that investigation to develop a campaign to change behaviors on how we use and dispose of our resources. There is still a lot of planning to be done, but hopefully with the partnership formed from the FEWS Fellowship, we can expose high school students to systems thinking as they become more sustainable citizens.

Cassandra Telenko:
As part of my work in FEWS and the CTL Teaching Fellows program and my own research, I will be examining "systems thinking" of students enrolled in the cross-college course "Sustainable Systems Design". Multiple assessments throughout the course will be used to examine development of systems thinking by the students from the Colleges of Engineering and Design while participating in a campus community project with campus services to map out the food waste and material waste systems on campus. Learning objectives for the activity are to: (1) identify agents and other variables within a food, energy, and water (FEW) system; (2) map relationships between variables (e.g. socio-technical); (3) synthesize stakeholder needs; (4) hypothesize and critique opportunities for meaningful change within the FEW system. Malte Weiland will act as a client and partner within the project, and final deliverables will be a video presentation of the findings as well as a graphic and data-driven report outlining the findings. The final deliverables will be utilized to share the findings of the project as a model for other communities and to solicit future community partnerships. The results and lessons from this project can then be revised to be used for K-12 outreach programs with Sabrina Grossman, and perhaps students from my class can work as counselors or help with the program in other ways.

Malte Weiland:
Our SLS project involved the planning and eventual implementation of an analysis of the existing waste and recycling systems at Georgia Tech. There are multiple stakeholders and processes in the current system that will benefit from a detailed review and mapping exercise. The expected outcomes will greatly benefit Georgia Tech's understanding of these systems, allow for information decision making on improvements to them, and help meet the learning outcomes of related to Lifecycle Assessments (LCAs) and Circular Economies. As a Sustainability Project Manager for Campus Services, this topic was of direct interest to me, as all the departments for which I develop sustainability initiatives are stakeholders in this process. The outcomes generated from this partnership will provide real impact and benefits to these stakeholders. The SLS FEWS Fellowship allowed me to meet Georgia Tech Faculty and Staff that were in a position to help with this work and greatly shaped the direction in which my fellowship went. They provided access to resources that I otherwise would not have been able to utilize in my current position. I was very pleased to work with the other participants in the program and look forward to continuing the project next semester.