**Project Title:** Bioswale Effectiveness and Suitability/Topics in Stormwater Management

**Project Description:** Evaluate the impacts of existing bioswales on the University of Iowa campus and identify areas of campus where bioswales or other stormwater management solutions could be installed.

**Background:** According to the attached Natural Resources Conservation Service brief on bioswales, “bioswales are storm water runoff conveyance systems that provide an alternative to storm sewers. They can absorb low flows or carry runoff from heavy rains to storm sewer inlets or directly to surface waters. Bioswales improve water quality by infiltrating the first flush of storm water runoff and filtering the large storm flows they convey.”

The campus master plan focuses in part on incorporating solutions like “rain gardens, bioswales, and natural landscapes” in renovation and construction projects. Several bioswales already exist on campus, which you can identify on the campus sustainability map. To study the effectiveness of swales and make a project out of it, there are many options available to you depending on the scale of the project, interest, and expertise. Examples of activities include, but are not limited to:

* Environmental Monitoring: Using the inspection check list created by the Ramsey-Washington Metro Watershed District, students will answer the following questions:
  + Do you detect the presence of weeds or invasive plants? Is there sediment accumulation? Are leaves, grass clippings, trash or other debris present? Is anything blocking or clogging inlets or outlets? Are there areas of bare soil or erosion? Is there standing water 48 or more hours after a rainfall? Provide quantification of data wherever possible. Given the answers to these questions, prepare documentation on its performance, provide recommendations on maintenance – preventative, routine, or required. If allowed, students may find it valuable to implement the solutions (replanting, removal of sediment/debris, etc.).
* GIS Modelling: Use what you know about the requirements of bioswale or other environmentally sound stormwater management systems to construct a map that highlights spaces on campus that would be good candidates for future implementation.
* Ecosystem Services analysis: Describe and analyze the value added by existing/future bioswales in terms of stormwater reduction, water quality, biodiversity, or other environmental contributions. Attempt quantification of benefits whenever possible and use applicable software.
* Hands-On Rain Garden Planting: Identify a space, get permission, and grow native plants suitable for stormwater management on campus.

**Helpful Readings:**

* NRCS, Bioswales <https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_029251.pdf>
* Map of Sustainability on Campus to ID locations of Swales, <http://www.arcgis.com/home/webmap/viewer.html?webmap=34611e0fa8984fafa418b921da4af933&extent=-91.5582,41.6538,-91.5265,41.6684> (You may also find this by going to <https://sustainability.uiowa.edu/campus-initiatives/campus-sustainability-map>)

**Desired Outcomes:**

* Outputs will vary. Some projects may be satisfied by hands-on execution of stormwater solutions. Across topics, a written report or visual presentation summarizing and analyzing the project, its findings, and implications would be useful.

**Potential Collaborators/Stakeholders:**

* Office of Sustainability and the Environment
* Facilities Management

**Evaluation:**

* Will vary based upon how the topic is approached or which project is selected. Successful preparation of a report based upon the outlined outcomes in “background.”

**Course Relevance:**

* Intro to Sustainability, Environmental Engineering courses, Environmental Sciences, Sustainable Systems, Sustainability Major or Certificate Coursework, GIS, Ecosystem Services