College of Engineering
Summer Research Experience for Undergraduates Program

Request for an Engineering Student for Summer 2013 Research

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Brief description of Summer Research Project (please explain the interdisciplinary nature of this project).

Natural aquatic organic matter (NOM) is ubiquitous in all surface water and groundwater. Its presence is problematic as NOM reacts with disinfectants such as chlorine that are used in the treatment of drinking water. This results in the formation of carcinogenic disinfection byproducts (DBPs); organic compounds which are believed to cause 10,000 bladder cancer deaths per year in the US. The concentration and reactivity of NOM in raw drinking water is changing as a result of land use changes and possibly global climate change. This project would complete the development and testing of our high performance size exclusion (HPSEC) with organic carbon detection (OCD). The HPSEC-OCD is a new technology that can be used to follow NOM changes as a result of build-out and climate change. This capability would add value to some existing funded projects, and allow the REU candidate to work with some funded graduate student.

The student will be co-mentored by Baoshan Xing in Plant, Soil and Insect Sciences

Brief description of what the student will be doing:
The student will work to complete the development and conduct testing of our high performance size exclusion (HPSEC) with organic carbon detection (OCD) by:

- Conducting a literature review to gather key information on how HPSEC is used for characterizing NOM
- Establishing a useful computer interface for the OCD so that data can be automatically acquired and analyzed using established algorithms.
- Testing a broad range of natural waters in NY State and several locations in the southeast US using the HPSEC-OCD for which additional data are being collected
- Comparing the HPSEC-OCD data with companion data on the various samples containing NOM
- Making preliminary conclusions on how NOM differs between NY state and more southern climates, thereby allowing for some projections as to impacts of global warming.

Is this a CASA-related project?  Yes ___ No _x__

Preferred background of student (major(s), class, GPA, pre-requisites, etc.):
Environmental Engineering, Soil Science, Mechanical Engineering, Electrical Engineering or Analytical Chemistry
Student between junior and senior year

Did you mentor a student last summer in the College REU Program?
Yes___  No _X___
If yes, please describe the outcomes for that student (i.e. Honor’s thesis, conference presentations, manuscripts, papers, etc. Describe accomplishments to date as well as plans for the spring semester if the work has continued):