2022 COOPERATIVE SUMMER FELLOWSHIP PROGRAM – PROJECT PROPOSAL

APPLICANT TYPE: ANY;

PROJECT TITLE: NEAR REAL-TIME WATER-QUALITY MONITORING AND MODELING IN YORK COUNTY, PENNSYLVANIA

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Discipline: Surface Water;Water Quality;Modeling;

PROJECT DESCRIPTION

BACKGROUND

This project is designed to implement in-stream monitoring to evaluate water-quality change as land management actions and land conversions occur throughout York County, Pennsylvania. York County developed a countywide Watershed Implementation Plan (WIP) in 2013 in support of Pennsylvania's statewide WIP with the goals of reducing total nitrogen, total phosphorous, and total suspended-sediment loads to the Chesapeake Bay.

The primary objectives of this project are to monitor in-stream water-quality continuously, and to develop surrogate regression model equations to predict concentrations of select water-quality constituents. The in-stream continuous water-quality parameters that will be measured are water temperature, specific conductance, pH, dissolved oxygen, turbidity, and nitrate plus nitrite with the use of an optical nitrate sensor. Using these measured parameters and discrete manual monthly samples, predictions of suspended-sediment (SSC), total phosphorus, and total nitrogen concentrations can be developed with best fit statistical regression models at the same interval of data collection (e.g. if turbidity, nitrate, and other environmental variables are collected every 15 minutes, then a prediction of SSC, total phosphorus, and total nitrogen can be estimated every 15 minutes). Combining the predicted SSC, total phosphorus, total nitrogen concentrations, and measured nitrate plus nitrite concentrations with concurrent streamflow measurements results in SSC, total phosphorus, total nitrogen, and nitrate load and yield estimates.

INTERN TASKS

The incumbent will assist senior level staff with collection of surface water samples, calibration and servicing of multi-parameter sondes, and measurement of streamflow at gaging stations.

BENEFITS TO INTERN

The intern will develop skills in surface water and water-quality monitoring. They will gain valuable field experience with equipment and techniques used to collect streamflow measurements and water-quality samples. The intern will work as part of a team of hydrologic technicians and other scientists who are experts in the collection of surface water and water-quality data and gain a fundamental understanding of the methods used to collect data and prepare those data for publication while maintaining strict USGS quality assurance protocols.

MENTORING PLAN

The intern will participate in bi-weekly meetings with their supervisor to discuss progress on tasks and to provide resources for successful completion of tasks. The supervisor and other experienced scientists will also be available on an ad-hoc basis between the bi-weekly meetings to discuss career goals and other topics the intern may have interest in pursuing. The intern will be offered opportunities to gain experience on a wide array of activities in the Center as interest and time allows.

ADDITIONAL DETAILS

STUDENT SKILLS AND INTERESTS

The Pennsylvania Water Science Center seeks candidates with interests in surface-water hydrology and water-quality monitoring. Candidates should be comfortable with fieldwork and with software packages such as Microsoft Word, Excel, and Access. Familiarity with set-up, calibration, and use of water-quality instruments for collection of environmental data in field settings is preferred but not required.

LOCATION: Central Pennsylvania, Primarily in York County

ACTIVITY LEVEL:

Level 8-2: The work requires some physical exertion such as long periods of standing, walking over rough, uneven, or rocky surfaces; recurring bending, crouching, stooping, stretching, reaching, or similar activities; or recurring lifting of moderately heavy items. The work may require specific, but common, physical characteristics and abilities such as above-average agility and dexterity.

FIELD WORK	75-100%	VIRTUAL?	No
LAB WORK	0-25%		
OFFICE WORK	0-25%		
OTHER	0-25%		

PROJECTED START DATE	5/1/2022
EXPECTED DURATION	3 to 5 months