Cornell Cooperative Extension of Ulster County
REQUEST FOR PROPOSALS
Ashokan Watershed Stream Management Program
Stream Management Implementation Fund

HEC-RAS Training Workshop for Modeling Bridges & Culverts

Cornell Cooperative Extension of Ulster County (CCEUC) is seeking proposals for the delivery of a multi-day workshop to provide training on the use and application of the Hydrologic Engineering Center's River Analysis System (HEC-RAS). Specialized attention will be paid to modeling bridges and culverts, including hydraulics and water surface elevations under current and proposed conditions. The workshop will consist of both classroom and field sessions so that students will understand both the capabilities of the software, as well as best practices for collecting high quality input data. A focus on local applicability to the Ashokan Reservoir watershed, including field data collection and hydrologic inputs, is expected.

The Ashokan Watershed Stream Management Program (AWSMP) is a collaboration between CCEUC, Ulster County Soil and Water Conservation District (UCSWCD), and the New York City Department of Environmental Protection (NYCDEP). A field office for the AWSMP is located in Shokan, NY. CCEUC manages the AWSMP's Stream Management Implementation Program (SMIP) to support stream and floodplain management in the watershed. Funding for the SMIP is provided by the NYC Department of Environmental Protection. This training meets a 2017-2019 Action Plan goal for the AWSMP to offer trainings that improve understanding of stream and floodplain management practices for local stakeholders.

For more information on the AWSMP, visit: www.ashokanstreams.org

Before responding to this request, carefully review information on SMIP Insurance Requirements, Copyright, and Subcontractor Approval policies, online at:
http://ashokanstreams.org/projects-funding/smip-project-insurance-requirements-2/
http://ashokanstreams.org/projects-funding/copyrights-and-access-to-information/
http://ashokanstreams.org/projects-funding/subcontractor-approval-policy

Please submit proposals to Leslie Zucker at laz5@cornell.edu by Friday, April 12, 2019 before 5:00pm.
This Request for Proposals can be downloaded from the AWSMP website at:
http://ashokanstreams.org/projects-funding/

Background Information:

HEC-RAS is a powerful software platform capable of modeling open-channel flow in river systems. One use of the software is to model stream flow and water surface elevations through road-stream crossings (RSX). This training workshop will enable participants to use HEC-RAS as a tool in managing RSX. It will provide a thorough introduction to HEC-RAS including its capabilities and limitations, the effects of

input data quality on model results, and the appropriate use of outputs in decision making. These objectives will be accomplished through local studies that include hands-on experience collecting high quality input data, modeling current conditions at local RSXs, modeling alternative structures, and interpreting the results.

The primary audience for this workshop is municipal officials with little to no experience with HEC-RAS, including civil engineers and other highway department staff. A secondary audience will be project managers and stream resource managers. The workshop will span up to three days in order to cover the large amount of material, enable field excursions to bridges and culverts in order to perform data collection, and to use the collected data as inputs for example problems in the classroom.

The training will be locally specific. Classroom sessions will take place in or near Kingston, NY with field exercises within the Ashokan Reservoir watershed, northwest Ulster County. The Ashokan is one of two reservoirs in [NYC's Catskill Water Supply System](). The watershed is 95% forested and mountainous. Streams normally transport large wood and fine to boulder-sized sediment during flood events. The Ashokan Reservoir is primarily fed by the upper Esopus Creek and Bush Kill rivers. Stream valleys are relatively high-gradient and narrow. There are approximately 500 RSX in the watershed with drainage areas greater than 0.1 mi^2. Flash flooding is common during spring and fall seasons. Temperature, discharge, and turbidity are monitored at multiple USGS stream gage stations (for reference see the Coldbrook station at https://waterdata.usgs.gov/usa/nwis/uv?01362500). The flood of record occurred in late August 2011 following Tropical Storm Irene and resulted in erosion, overtopping, and loss of numerous RSX within the watershed. Since then, multiple agencies including the AWSMP, have funded flood mitigation projects to enlarge and enhance RSX to increase resilience.

Through its SMIP, the AWSMP provides funding and technical resources to local municipalities to increase the flood conveyance capacity of RSX. AWSMP also funds assessment of the causes of flooding and erosion to develop recommendations and design solutions. Municipalities who receive SMIP funding may develop design solutions in-house or contract with a qualified engineering firm and provide oversight of the project. Currently, 17 projects to replace under-sized bridges and at least 5 culvert replacements are underway or recently completed in the watershed.

Project Goals and Scope of Services:

This training will prepare up to 20 participants to use HEC-RAS in evaluating project impacts on the Special Flood Hazard Area (SFHA) and flood risks at RSX. The training is also intended to prepare municipal staff to develop technical information for a FEMA Letter of Map Amendments (LOMA) or Letter of Map Revision (LOMR) to request a change in the flood zone after RSX projects are completed.

CCEUC/AWSMP will provide training locations for classroom and field components, rent a training facility, transport participants to field sites, and provide logistical support, including advertising the workshop, registration, projection screen and projector, workshop evaluation, and catering. CCEUC will obtain landowner agreements or access permits for fieldwork sites as needed.

Please identify if your organization is a NYSED-approved New York State sponsor (provider) of Continuing Education Hours and could obtain approval for this training course (see:

). The consultant will coordinate closely with CCEUC/AWSMP to develop training logistics and should plan for project coordination meetings with AWSMP. Meetings may be conducted in person or via internet or conference call.

The consultant should prepare a supplies and materials list for the project, including guidance for participants on needed personal and safety gear in collaboration with AWSMP. The consultant is asked to supply field data collection equipment for use during the training, such as stadia rods, measuring tapes, and laser levels. If the consultant is unable to provide all necessary field equipment without use of SMIP funds, CCEUC/AWSMP will arrange to cover the deficit. Expendable project supplies and materials may be purchased using SMIP funds. Participants will be expected to provide their own computers with the latest version of HEC-RAS. CCEUC/AWSMP will coordinate computer access with registrants and ensure an adequate number of computers are available.

The applicant may propose completing the training objectives described below over a two- to three-day training workshop. Upon completion of the workshop, attendees will:

- Understand the basic theories of open channel, bridge, and culvert flow used by HEC-RAS.
- Understand HEC-RAS capabilities, limitations, input needs, sources, and output options.
- Be able to select appropriate bridge and culvert modeling methods.
- Create and execute a HEC-RAS project using collected field data at local sites.
- Be aware of any local characteristics (e.g., hydrologic or topographic) that may impact results.
- Identify input errors and modeling problems to help ensure accurate and reasonable outputs.
- Be confident in their abilities to review and evaluate RSX project designs that include HEC-RAS model outputs.
- Understand how HEC-RAS outputs inform FEMA flood hazard areas and LOMA/Rs.
- Understand sediment transport mechanics at RSX and be aware of HEC-RAS sediment transport modeling capabilities.

The following is an example agenda for a three-day workshop. Applicants are encouraged to submit the most effective agenda that meets all learning objectives, even if the agenda differs from the example below.

DAY ONE (classroom):
- Introduction to open-channel flow
- Understanding hydraulic model output such as water surface elevations, cross sections, river profiles, inundation areas, and flood velocities
- In-depth discussion of HEC-RAS 1D model and capabilities
- Mechanics of setting up flows, boundary conditions, and geometry
- Defining hydraulic data (roughness, expansion, contraction, ineffective flow areas)
- File management (plans, geometry, flow, and output files)
- Basic case examples

DAY TWO (classroom and field)
- Basic theory of bridge hydraulics
- Modeling structures (bridges, culverts)

- Developing accurate flow estimates using the best and most recent data available
- Understanding how to collect the best field input data
- Field Work: collect data for one culvert and one bridge within a FEMA mapped flood zone
- Input flow and measured data into HEC-RAS to model existing conditions

DAY THREE (classroom)
- Model different proposed structures for each site and interpret impacts
- Evaluate impacts of structures on water surface and base flood elevation
- Go over proper process to send any change to FEMA to update their maps
- Briefly discuss capabilities and applications of 2D modeling
- Discuss the impacts of sediment dynamics at RSX and review steady/unsteady sediment transport modeling capabilities of HEC-RAS

The consultant will supply the following deliverables for this project:

- Deliver a training workshop on HEC-RAS modeling of RSXs, time and location agreed upon by CCEUC/AWSMP and the applicant
- Workshop agenda
- Workshop binder or digital repository of educational materials
- Practical field and classroom exercises using local data
- Pre-arrange NYSED approval for Continuing Education Hours (if applicable)
- Coordination with CCEUC/AWSMP to prepare the workshop

Evaluation Criteria:

Proposals will be evaluated and scored for reasonableness of costs, appropriateness of methods, project timeline, reasonableness of budget, applicant qualifications, and partnerships and coordination with stakeholders. AWSMP requires the consultant to provide proof of expertise in the area of hydraulic modeling and HEC-RAS application, and delivery of trainings. This could include examples of previous successful workshops, as well as biographies/resumes/CVs of presenters with relevant knowledge and expertise.

Project Timeline and Selection Schedule:

The workshop will be held in August 2019 during the work week (Monday-Friday). The exact dates will be determined in consultation with CCEUC/AWSMP.

The anticipated selection schedule is as follows:

Request for RFP: March 20, 2019

Deadline for Applicants to Submit Questions: March 29, 2019

CCEUC Responds to Applicant Questions: April 3, 2019

Application Due Date: April 12, 2019 by 5:00pm

Selection and Notification of Award / Notification to Unsuccessful Applicants: April 26, 2019

Estimated Contract Execution: June 30, 2019

Project End Date: August 30, 2019

Applicants may submit questions in writing to Leslie Zucker at laz5@cornell.edu by April 3, 2019. Answers to questions will be posted online at: http://ashokanstreams.org/projects-funding/

Proposal Format and Instructions:

The proposal should include a cover page with contact and project summary information, pages with detailed information about the proposed project, and a budget and budget narrative. Additional pages should outline the qualifications of the individuals and organizations involved.

The budget should include a detailed cost statement showing proposed project staff, billing rates, and estimated hours to complete the scope of work and deliverables. Also include an itemized listing of other expenses or fees that are anticipated, such as travel and clerical time, printing and materials costs, and project supplies. Provide a budget narrative with detail on how cost estimates were determined. Also include a presentation or work sample of a similar project for review.

Proposal Submission:

Submit proposals in hard copy and electronic format by 5:00 pm on April 12, 2019 to:

Ashokan Stream Management Program
Attn: Leslie Zucker
P.O. Box 667
Shokan, NY 12481
laz5@cornell.edu