Quarterly Progress Report:
Project Number and Title: 4.4 Bridge-Stream Network Assessments to Identify Sensitive Structural, Hydraulic, and Landscape Parameters for Planning Flood Mitigation
Research Area: Thrust 4 Connectivity for Enhanced Asset and Performance Management
PI: *Mandar Dewoolkar, University of Verrmont*
Co-PI(s): *Donna Rizzo and Arne Bomblies, University of Vermont*
Reporting Period: *01.01.2020 to 03.31.2020*
Submission Date: *03.30.2020*

Overview: (Please answer each question individually)

*Provide **BRIEF** overview and summary of activities performed during the reporting period. This summary should be written in lay terms for a general audience to understand. This should not be an extensive write up of findings (those are to be included in the final report), but a high-level overview of the activities conducted during the last three months **no more than 3 bullet points no more than 1 sentence each** ….*

- A 2D HEC-RAS model was built for the Mad River site in Vermont and calibrated for the 2011 Tropical Storm Irene extreme event.
- A sensitivity analysis was started to examine how localized perturbations to bridge, road, culvert, stream and landscape features affect the network.

Provide context as to how these activities are helping achieve the overarching goal(s) of the project…

- Calibrating the HEC-RAS model allows the sensitivity analysis.
- Beginning a sensitivity analysis helps in identifying structural, hydrogeological and landscape features of importance to the bridge-stream network.

Complete the following tables to document the work toward each task and budget (add rows/remove rows as needed, make sure you complete the Overall Project progress row and include all tasks even if they have ended or have not been started)…

Table 1: Task Progress

Task Number	Start Date	End Date	% Complete
Task 1: Data Collection	07/01/2018	09/30/2019	60%
Task 2: Sensitivity Analysis	06/01/2019	03/31/2020	40%
Task 3: Probabilistic Network Model Development	01/01/2020	06/30/2020	0%
Task 4: Transferability	03/01/2020	06/30/2020	0%
Overall Project:	*07/01/2018*	*05/01/2021*	35% (over two years)

Table 2: Budget Progress

Project Budget	Spend – Project to Date	% Project to Date*
$207,582 (for Year 1)	$130,884 (Year 1)	63% (Year 1)

***Include the date the budget is current to.**

Describe any opportunities for training/professional development that have been provided…

Describe any activities involving the dissemination of research results (be sure to include outputs, outcomes, and the ways in which the outcomes/outputs have had an impact during the reporting period. Please use the tables below for any Publications and Presentations in addition to the description of any other technology transfer efforts that took place during the reporting period.)… Use the tables below to complete information about conferences, workshops, publications, etc. ***List all other outputs, outcomes, and impacts after the tables*** *(i.e. patent applications, technologies, techniques, licenses issued, and/or website addresses used to disseminate research findings).*

Table 3: Presentations at Conferences, Workshops, Seminars, and Other Events

Title	Event	Type	Location	Date(s)
4.4 Bridge-Stream Network Assessments to Identify Sensitive Structural, Hydraulic, and Landscape Parameters for Planning Flood Mitigation	TIDC Group 4 Quarterly Presentations	Zoom Presentations	Online	02/14/2020

Table 4: Publications and Submitted Papers and Reports

Type	Title	Citation	Date	Status
No new publications.				

Participants and Collaborators:

Use the table below to list all individuals who have worked on the project.

Table 5: Active Principal Investigators, faculty, administrators, and Management Team Members

Individual Name	Email Address	Department	Role in Research
Mandar Dewoolkar	Mandar.Dewoolkar@uvm.edu	Civil and Environmental Engineering	Primary Investigator
Donna Rizzo	Donna.Rizzo@uvm.edu	Civil and Environmental Engineering	Co-Primary Investigator
Arne Bomblies	Arne.Bomblies@uvm.edu	Civil and Environmental Engineering	Co-Primary Investigator

Use the table below to list all students who have participated in the project during the reporting. (This includes all paid, unpaid, intern, independent study, or any other student that participated in this project.)

Table 6: Student Participants during the reporting period

Student Name	Email Address	Class	Major	Role in research
Rachel Seigel		Master's	Environmental Engineering	Graduate Research Assistant

Use the table below to list any students who worked on this project and graduated during this reporting period.

Table 7: Student Graduates

Student Name	Role in Research	Degree	Graduation Date
N/A			

Use the table below to list organizations have been involved as partners on this project and their contribution to the project.

Table 8: Research Project Collaborators during the reporting period						
Organization	Location	Contribution to the Project				
		Financial Support	In-Kind Support	Facilities	Collaborative Research	Personnel Exchanges
N/A						

List all other outputs, outcomes, and impacts here (i.e. patent applications, technologies, techniques, licenses issued, and/or website addresses used to disseminate research findings). Please be sure to provide detailed information about each item as with the tables above.

Have other collaborators or contacts been involved? If so, who and how? (This would include collaborations with others within the lead or partner universities; especially interdepartmental or interdisciplinary collaborations.)

Table 9: Other Collaborators			
Collaborator Name and Title	Contact Information	Organization and Department	Contribution to Research
Jaron Borg	Vermont Department of Environmental Conservation, 1 National Life Drive, Main 2, Montpelier, VT 05620-3522	Jaron Borg, River Management Engineer Watershed Management Division, Rivers Program	VT-DEC's representative on the technical advisory committee

Who is the Technical Champion for this project?

Name: Cassidy Cote (Cassidy has left VTrans and we are in the process of finding a replacement from VTrans)
Title: Hydraulics and Structures Engineer
Organization: Vermont Agency of Transportation
Location (City & State): Montpelier, Vermont
Email Address: Cassidy.Cote@vermont.gov

Changes:

Because majority of the work is computational, we expect to have minimal disruption from the COVID-19 remote working. However, some of the field work may be impacted.

Planned Activities:

In the next few months, the 2D HEC-RAS model for the Mad River will run different scenarios to represent a variety of changes in bridge and dam structures along the river. Pressure transducers will be placed in the field to collect more data on stage-discharge relationship for the Mad River. A high-gradient river corridor will be chosen as another study location. The previous steps will be repeated to create a 2D HEC-RAS model for the high-gradient river.