

**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 Vermont

**Co-PI(s):** Donna Rizzo and Arne Bomblies, University of Vermont

**Reporting Period:** 07.01.2021 to 09.30.2021

**Submission Date:** 09.30.2021

**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** ....

- Preparing the final project report

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

- The final report will conclude the project

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)...

| <b>Table 1: Task Progress</b>     |                   |                 |                   |
|-----------------------------------|-------------------|-----------------|-------------------|
| <b>Task Number</b>                | <b>Start Date</b> | <b>End Date</b> | <b>% Complete</b> |
| Task 1: Data Collection           | 07/01/2018        | 09/30/2019      | 100%              |
| Task 2: Sensitivity Analysis      | 06/01/2019        | 03/31/2020      | 100%              |
| Task 3: Network Model Development | 01/01/2020        | 06/30/2020      | 100%              |
| Task 4: Transferability           | 03/01/2020        | 06/30/2020      | 95%               |
| Overall Project:                  | 07/01/2018        | 05/01/2021      | 98%               |

| <b>Table 2: Budget Progress</b> |                                |                           |
|---------------------------------|--------------------------------|---------------------------|
| <b>Project Budget</b>           | <b>Spend – Project to Date</b> | <b>% Project to Date*</b> |
| \$374,716                       | \$367,389                      | 97.8%                     |

**\*Include the date the budget is current to: 06/24/21**

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)               |
|--|--|---------------------|----------|-----------------------|
| Flood analysis of bridge-stream interactions using two-dimensional modeling of Vermont river reaches | 2021 Virtual Research & Innovation Symposium, Vermont Agency of Transportation | Poster presentation | Online   | September 08-09, 2021 |

**Table 4: Publications and Submitted Papers and Reports**

| Type                           | Title  | Citation  | Date | Status |
|--------------------------------|--|---|------|--------|
| <i>Abstract of the poster:</i> | Flood analysis of bridge-stream interactions using two-dimensional modeling of Vermont river reaches |   |      |        |
|                                |  | <a href="https://vtrans.vermont.gov/planning/research/2021-symposium/cm7">https://vtrans.vermont.gov/planning/research/2021-symposium/cm7</a>   |      |        |
| <i>Fact sheet:</i>             |  |   |      |        |
|                                |  | <a href="https://vtrans.vermont.gov/sites/aot/files/2021%20FACT%20SHEET%20-%20TIDC%20-%20PGA%20Project%2008-06-21.pdf">https://vtrans.vermont.gov/sites/aot/files/2021%20FACT%20SHEET%20-%20TIDC%20-%20PGA%20Project%2008-06-21.pdf</a> |      |        |
| <i>Video:</i>                  |  |   |      |        |
|                                |  | <a href="https://www.youtube.com/watch?v=kiNWR91dNDs">https://www.youtube.com/watch?v=kiNWR91dNDs</a>   |      |        |

**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 (graduated) |

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

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 |
|                            |                  |        |                 |
|                            |                  |        |                 |
|                            |                  |        |                 |
|                            |                  |        |                 |
|                            |                  |        |                 |
|                            |                  |        |                 |
|                            |                  |        |                 |
|                            |                  |        |                 |
|                            |                  |        |                 |

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 |
|   |          |                             |                 |            |                        |                     |

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 | 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:**

No changes were made during this quarter

**Planned Activities:**

Most of the project work has been completed and the final report is being written.