Bi-Monthly 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: *08.01.2019 to 09.30.2019*
Date: *September 30, 2019*

Overview:

A two-dimensional HEC-RAS model for the Mad River is currently being developed. Cross section and bathymetry data have been collected and incorporated in the model. Bridge, culvert and structure data have also been added. Boundary lines for roads and stream banks were created. Hydrograph data collected from the USGS gauge in Moretown are being used to run the model. Upper and lower limits for the model have been set. The downstream limit will be the USGS gauge in Moretown. The real time data will be used to help calibrate the model. The upstream location will be a temporary gauge set up within the Warren Falls area. The Green Mountain Vermont office has been contacted to place two pressure transducers within the Mad River. The data collected from the transducers will be used to create a hydrograph will be used for the upstream limit to calibrate the HEC-RAS model.

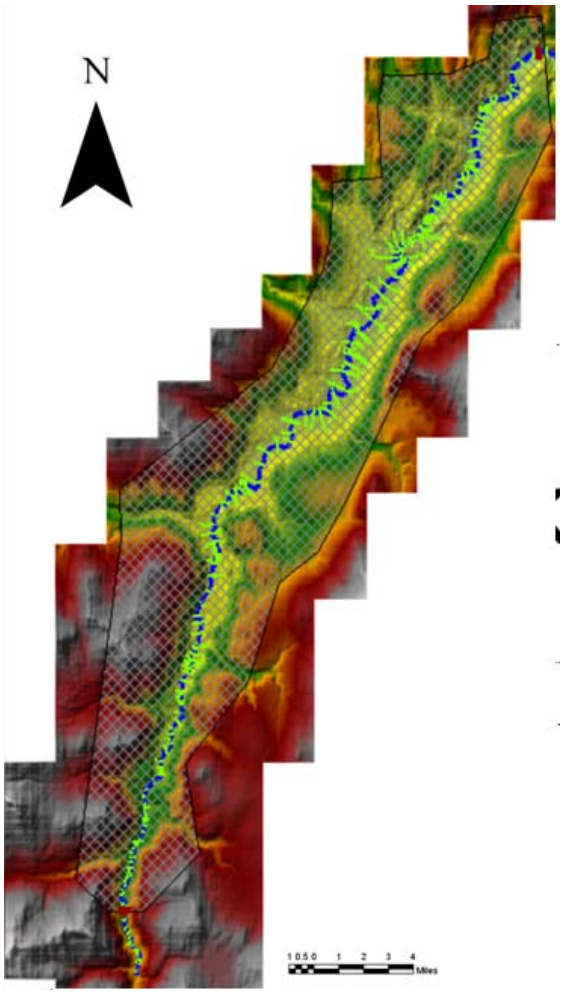

Figure 1 Left: 2D HEC-RAS Model showing flow area, cross sections, structures and river path

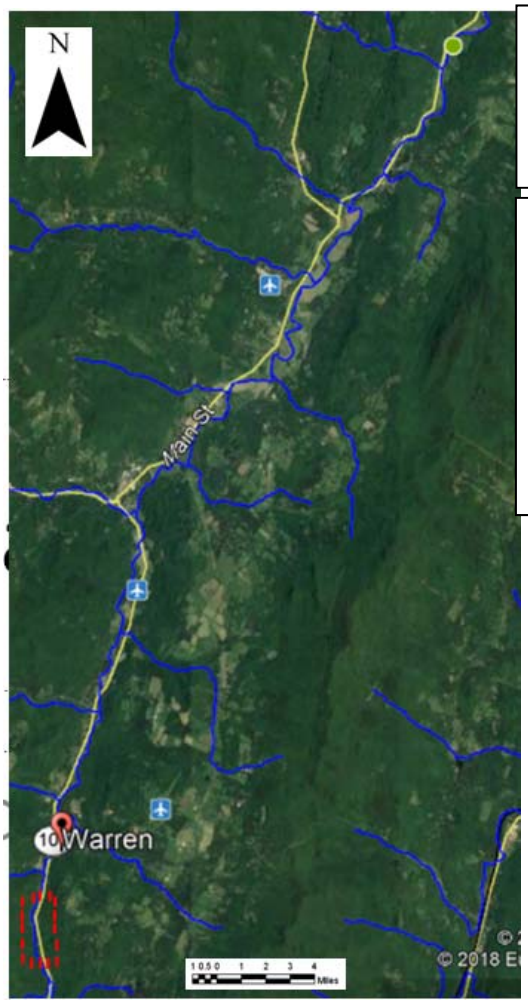

Figure 2 Right: Map showing the Mad River. Green dot in the North indicates the Moretown Gauge. The Red Box in the South indicates the potential location for the temporary gauge within Warren Falls.

Participants and Collaborators:

Professors Mandar Dewoolkar, Arne Bomblies and Donna Rizzo of UVM

Students:

Rachel Seigel, Graduate Student, Civil and Environmental Engineering, University of Vermont

Organizations:

Vermont Agency of Transportation (VTrans)
Vermont Agency of Natural Resources (VTANR)

Contacts:

Cassidy Cote, VTrans – Technical Advisor
Dr. Emily Parkany – Technical Advisor
Jaron Borg, VTANR – Technical Advisor

Changes:
One anticipated challenge will be collecting hydrograph data that reflects high flow incidents at the temporary gauge in Warren Falls. Flood events or high flow events collected at the temporary hydrograph would calibrate the HEC-RAS model to better represent possible outcomes for different structures during flood events. If no event is collected at the temporary gauge station, other USGS gauges will be used in the surrounding area to make an estimate for the possible upstream hydrograph values in the Mad River.

Planned Activities:
Collect data from the pressure transducers in the temporary location.
Use the data to calibrate the 2D HEC-RAS model for the Mad River.
Continue to look for potential locations for a 3rd 2D HEC-RAS model.