N.H. Sea Grant Research Project Progress Report
For time period 2/1/15 – 1/31/16

Today's date: 30 March 2016

Project number: R/RCE-1

Project title: Analysis and communications of flood damage cost avoidance in the Lamprey River watershed of New Hampshire

Project initiation date: 2/1/2014

Project completion date: TBD

Principal investigator: Cameron Wake

Affiliation: UNH, Institute for the Study of Earth, Oceans and Space

Associate investigator(s) and affiliation(s):
Robert Roseen, private engineering practice

Technician(s) and affiliation(s):
David Roman and Peter Tu, Geosyntec Consultants, Inc. (Portsmouth, NH)
Fay Rubin, ESRC/EOS, UNH
Julia Peterson, NH Sea Grant and UNH Cooperative Extension
Julie LaBranche, Rockingham Planning Commission

Partner(s) and affiliation(s) (List any collaborators, sponsors, industry partners, municipalities, etc., associated with this project):

NOTE: For each partner, include SCALE (local, state, regional, national, international) and TYPE (gov’t, NGO, industry/business, academic institution, other)

Newmarket, Raymond, Epping, Lee (local government); Roger Stephenson (regional communication consultant), Amy Sterndale (local UNH), Jill Farrell (local PREP)

Brief project overview/Abstract:
Building upon previous research regarding flood risk in the Lamprey River watershed and associated legal analysis, we propose a three-part follow-up project to build community resilience to future freshwater flooding by: (1) estimating potential flood damage and cost avoidance resulting from different land use management strategies in the Lamprey River watershed; (2) training municipal officials and regional planners on the use of our “new” 100-year floodplain maps, the key findings from the Vermont Law School legal analysis, and the new economic flood damage and cost avoidance analyses; and (3) developing and implementing an innovative communication effort to broadly disseminate the results to key audiences within the watershed.

Objectives:
The primary product of the proposed project will be the analysis and dissemination (via reports, presentations, trainings, and the 100yearfloods.org website) of the potential losses associated with the
physical, social, and economic impacts from flooding on the Lamprey River. Reports will be developed for focus areas within three watershed communities. They will include existing floodplain maps generated by the previous study, combined with cost and damage avoidance data. These report products will take the form of data tables and figures illustrating cost curves by the type of damage. This will be translated into Average Annualized Loss tables, which as noted, are the summation of damages for each individual event multiplied by the probability of occurrence. Collectively, the damage information will be directly relevant to help guide planning, zoning, and management strategies.

The expected outcomes include: an improved understanding on the part of municipal officials and regional planners regarding the use and application of current and potential future 100-year floodplain maps in the Lamprey River watershed and awareness of the legal aspects for municipalities using the maps; an increased awareness by officials and residents in the watershed (specific audience still to be determined) regarding the economic and social costs associated with future flooding events; an understanding of the potential cost avoidance resulting from implementing LID; and an awareness of options to mitigate costs of future flooding events. We expect the ultimate impact will be a movement towards land development practices that increase community resilience to future flooding.

**Research findings/progress during 2/1/15 – 1/31/16:**

None yet. The delay in obtaining the Hazus model with updated 2010 Census data, combined with personnel changes at Geosyntec (Renee Bordeau left Geosyntec in December 2015). However, we have made substantial progress on Hazus modeling and expect final results soon.

**Accomplishments during 2/1/15 – 1/31/16** (Accomplishments are the key actions, activities or products resulting from Sea Grant research projects. They are distinct from impacts in that they reflect ongoing activities or key results that may not yet have had a significant economic, societal and/or environmental benefit but lay the foundation for such a benefit. Accomplishments may evolve into impacts in the future.):

- 2, 5, 10, 25, 50, 100 year 24-hr precipitation events calculated for multiple climate scenarios using three different statistical models.
- Hazus model tested and verified. Ready for final simulations now.
- Survey of municipal officials developed and tested.

**Impacts during 2/1/15 – 1/31/16** (Impacts are significant economic, societal and/or environmental benefits of research.):

**NOTE:** Include quantitative data to validate the impact, if possible.

None yet

**Economic benefits realized during 2/1/15 – 1/31/16** (businesses retained or created, jobs retained or created, market and non-market economic benefits):

**NOTE:** Please quantify and provide supporting data if possible.

None yet
Tools, technologies or information services resulting from this project that were developed or used during 2/1/15 – 1/31/16 to improve ecosystem-based management (i.e., products that address the management of land, water and living resources in coastal areas, for example that reduce contaminants that harm coastal ecosystems and seafood consumers; that track changes in ecosystem processes, biological responses and conditions, etc.):

None

**Patents:**

None

**Technology transfer** (Has a private company utilized this research successfully?):

Partially. Geosyntec has developed knowledge and data to run Hazus model for Lamprey River watershed.

**Related grants and contracts** (Other grants and contracts that funded this research or that were obtained as a result of this research.):

None

**Leveraged funding** (leveraged funding comes from outside sources and is used to accomplish the goals and objectives of your project. Match associated with your project is not leveraged funding). Provide amount, source, purpose, and start and end date.

None

**Problems encountered:**

Personnel change at Geosyntec have slowed Hazus analysis. However, we are now on track run Hazus simulations for multiple scenarios now.

**Publications to date** (please cite and attach PDF or send a hardcopy, or provide possible title, authors, journal and status if not yet published)

Peer reviewed publications:


**Theses/Dissertations:**

none

**Other communications products** (non peer-reviewed pubs, manuals, tech reports, videos, etc.):

None

**Presentations to date, with published abstract citation if applicable:**

NOTE: For presentations please include number of attendees.


**Awards:**

none

**Additional information:**

none

**Students Supported** (see next page)  
*All fields are required*
**Students Supported  All fields are required**

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<thead>
<tr>
<th>Student Name</th>
<th>Institution</th>
<th>Cont’d or New for 2015?</th>
<th>Where is he/she now?</th>
<th>Dates of support</th>
<th>Type of degree: Undergrad Master’s PhD</th>
<th>Year degree awarded</th>
<th>Title of thesis (if supported by N.H. Sea Grant)</th>
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