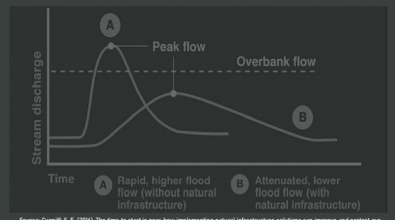
NATURE-BASED MUNICIPAL FLOOD RESILIENCE

LAND CONSERVATION STRATEGIES IN NEW HAMPSHIRE'S COASTAL WATERSHED

MICHAL ZAHORIK, CATHERINE ASHCRAFT, Ph.D.
ENVIRONMENTAL POLICY, PLANNING, AND SUSTAINABILITY LAB, UNIVERSITY OF NEW HAMPSHIRE

CURVE-FLATTENING

Protecting areas where floodwaters are stored helps to prevent inundation of downstream communities.



Source: Cunniff, S. E. (2016). The time to start is now: how implementing natural infrastructure solutions can improve and protect our coasts.*Shore & Beach,84*(1), 29.

Land Conservation as nature-based approach to Flood Risk management offers an opportunity to:[1]

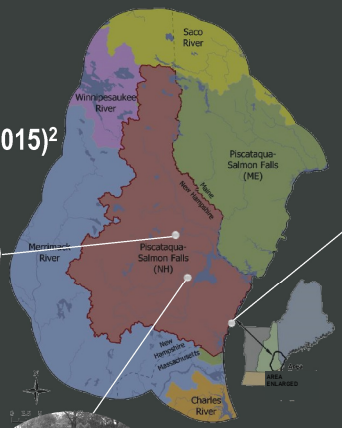
- Adapt to the effects of sea-level rise
- Reduce fluvial flooding
- Reduce coastal storm flooding
- Mitigate climate change impacts

RESEARCH QUESTIONS

1. How do New Hampshire's communities cope with a substantial increase in flood risk?
2. Do municipalities in NH deploy land protection and conservation to reduce flood risks? Do municipalities in NH have criteria for land protection and conservation?
3. How do local decision-makers and stakeholders perceive the limits of the flood defense approach? Do they want resilient water systems?
4. What are the institutional changes needed to facilitate nature-based flood risk management?

ONGOING RESEARCH

46 MUNICIPALITIES
990 SQUARE MILES
15% OF LAND CONSERVED
38% POPULATION GROWTH (1990-2015)[2]



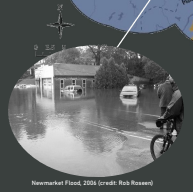
Steve Bird, Planner, City of Dover, NH *"We have some conservation easement lands on the Cocheco River that flood whenever there's a flood... It's not a threat to houses or anything like that, but it's just a natural floodplain area. The fact that it's conserved helps maintain that natural area .*


City of Dover Flood, 2007 (credit: City of Dover)


Hampton Beach Flood, 2019 (credit: Dan Tuchy)

Jay Diener, Conservation Commission, Hampton, NH .
"I was at a site last week, and the owner has done stuff to protect his structure, but his land is flooding, his cars are getting damaged, his land is sinking. In his mind, there was a very simple solution: "Build a wall, and fill in my land, and I'm good because I'm keeping the water out from the marsh." But what he doesn't understand is the reason his land is sinking is because the peat underneath is compacting, it's not having the natural functions above it, it's asphalt above it."

Diane Hardy, Planner, Newmarket, NH *"So it's sort of there's a balancing act between what makes sense today for us to do in terms of cost. We don't really have the resources to go around and oversize culverts. And we have enough problem with the baseline [laughter] just trying to get by day-to-day."*


Newmarket Flood, 2006 (credit: Rob Roseen)

PRIORITIES & HIERARCHY

NH Watersheds Natural Resources Conservation Service, D. Richard, 2004

7 IDENTIFIED APPROACHES

1. Stakeholder engagement	Consensus-building approach which fosters dialogue among stakeholders such as citizens, land trusts, and local organizations. Example: **Durham**
2.Commission/ Committee level	The priorities for land conservation are set by conservation commission or open space committee based on local knowledge. Example: **Exeter, NH**
3. Local natural inventory and reoccurrence	The purpose of co-occurrence analysis and mapping is to identify areas where resources are "co-located. Example: **Brentwood, NH**
4. Regional level	The local priorities are set based on regional/state level land conservation plans. Example: **Farmington, NH**
5. Land Trust	The priorities for land conservation used on the municipal level are set and maintained by a local land trust. Example: **Greenland, NH**
6. Combination of multiple approaches	Combination of the above mentioned approaches. Example of towns with this approach: **Newmarket, NH**
7. No conservation priorities	The municipality doesn't use any comprehensive land conservation priorities. Example of towns with this approach. Example: **Seabrook, NH**

SELECTED PRELIMINARY FINDINGS

FLOOD RISK IS A PRIORITY, BUT LITTLE ACTION
Towns and cities have been increasingly adding flood risk mitigation and water retention as a land conservation priority; however, there are not many land conservation projects primarily focused on flood risk reduction.

OPPORTUNISTIC NOT STRATEGIC
There is a disparity between land conservation priorities and priority areas and actual conserved land – land conservation is predominantly opportunistic not strategic

CONSERVATION AND HAZARD MITIGATION DISCONNECTED
Conservation commissions have a low level of involvement in hazard mitigation planning and generally don't contribute to hazard mitigation plans.

METHODS

This qualitative research aims to analyze data on:

1. Flood-related land conservation priorities on a local, regional and state level.
DATA COLLECTION: Semi-structured interviews with individuals in NH representing a broad range of professional roles. Representatives from municipalities, land trusts, environmental and planning organizations, and state agencies.

2. Approaches to green infrastructure and nature-based water retention measures in New Hampshire.
DATA COLLECTION: Review of the existing studies, plans and reports on flood risk management practices in New Hampshire.


Semi-structured interviews


Review of existing documents

EXPECTED OUTCOMES

1. Advance understanding of flood hazard mitigation in New Hampshire and provide insights to help communities become more resilient to flooding.
2. Contribute to discussions about diversification and decentralization of flood risk management policies and broader engagement of stakeholders in flood risk management efforts.
3. Help planning professionals engage in ongoing and future land conservation efforts at the local and regional level.

References:
1. Beatley, T. (2012). Planning for coastal resilience: Best practices for calamitous times. Island Press.
2. Piscataqua Region Estuaries Partnership, "State of Our Estuaries Report 2018" (2017).*PREP Reports & Publications*. 391. https://scholars.unh.edu/prep/391
3. Cunniff, S. E. (2016). The time to start is now: how implementing natural infrastructure solutions can improve and protect our coasts.*Shore & Beach,84*(1), 29.

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