

# NH Coastal Adaptation Workgroup (CAW)



# NH Coastal Adaptation Workgroup Partners





September 27, 2012  
Coastal Adaptation  
Workshop #5

## Local Stories: What Adaptation Looks Like

Julie LaBranche - Rockingham Planning Commission

Steve Miller – Great Bay NERRS

Sherry Godlewski – NH Dept. of Environmental Services

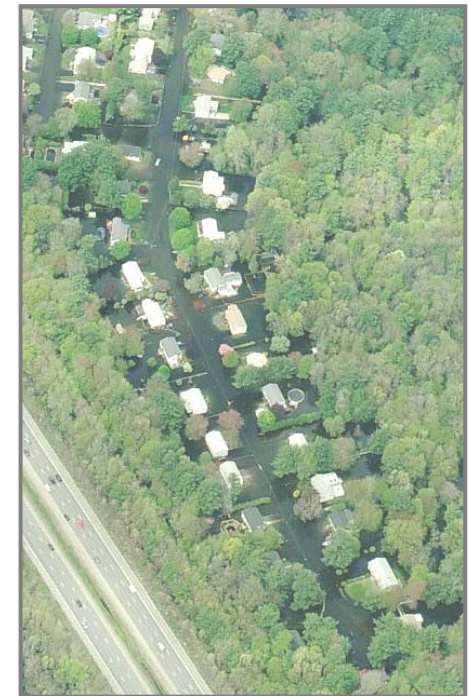
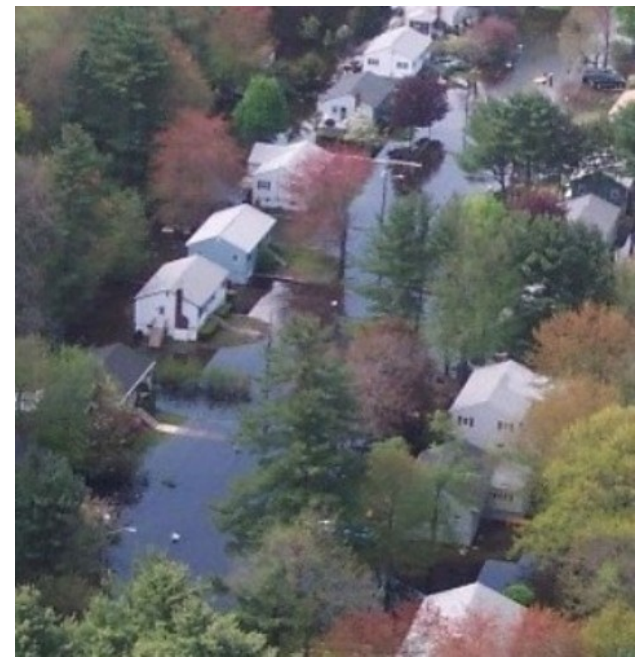


# Case Study: Salem, NH

## **Acquisition of Nine Properties on Haigh Avenue**

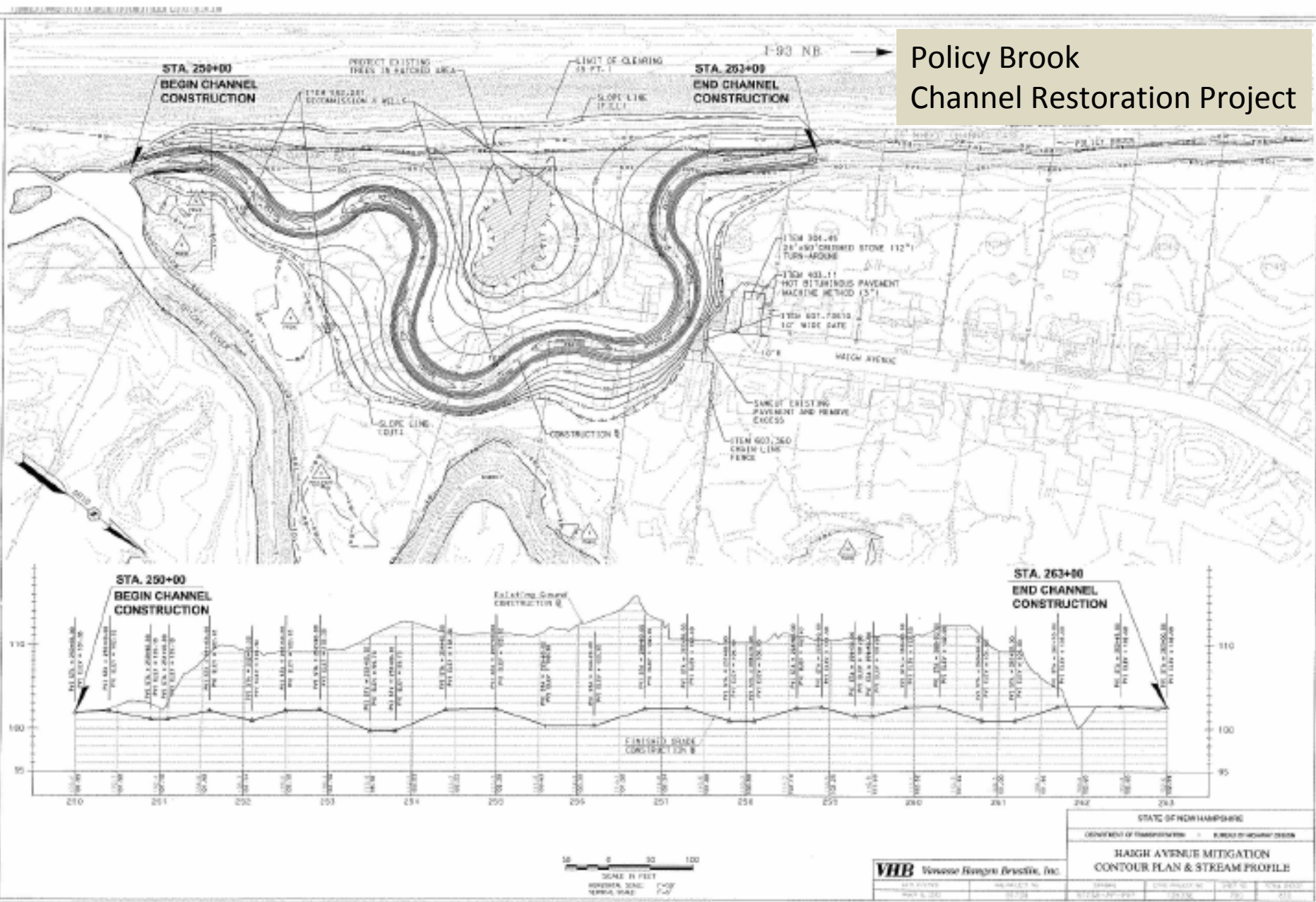
- ❑ FEMA grant award for \$1,889,802 in Flood Mitigation Assistance Program funds (from the U.S. Department of Homeland Security, Federal Emergency Management Agency)
- ❑ Acquisition of nine properties in flood-prone areas adjacent to the Spickett River
- ❑ Ensure protection, preventing further development within these areas that have experienced severe flooding for decades
- ❑ Portions of the Haigh Avenue properties are designated wetlands mitigation sites for impacts associated the I-93 expansion project
- ❑ Future acquisition of 14 homes pending negotiations with homeowners

**Lessons Learned:** economic impact of flooding, psychological impacts on the community





# Policy Brook Channel Restoration Project

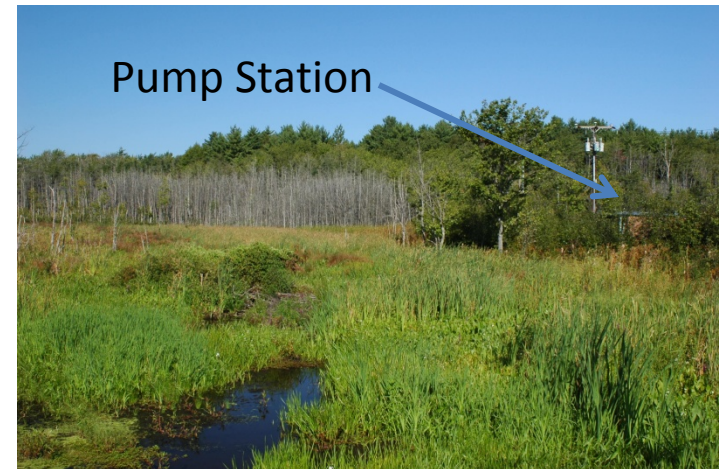


# Case Study: Portsmouth, NH

## **Pump Station Expansion Project**

- ❑ In 2008 the City needed to expand an existing pump station on Route 1
- ❑ The project provided the opportunity to “elevate” the old structure and addition over 3 feet to reduce flooding
- ❑ The site had experienced some flooding due to Beavers in the adjacent wetland
- ❑ Source of funding was the City Budget

***Lessons Learned*** – adaptation does not have to be rocket science, it can be done as part of routine upgrades and scheduled improvements, It is just good planning!













# Case Study: Somersworth, NH

## Water Treatment Facility









# May 14<sup>th</sup>, 2006



First flood  
Sunday  
(Mother's Day)























# What Happened?

- Floodwaters encroached rapidly!
  - What does an operator do when the facility could be offline (permanently) ?
  - How will they ensure potable water supply and fire protection to the community?
- Floodwaters had never been as high in recorded history. Exceeded 100 & 500 year flood marks.
- Emergency response plan was available but lacking.
- Relied on teamwork, ingenuity, and dedication.
- Established interconnection with City of Dover.
- Facility was operational within 4 days.
- Began recovery and repairs.....

# April 16<sup>th</sup>, 2007

- Second flood
- Monday
- Staff on regular duty
- Watched the waters encroach
- Second event worse
- Facility undergoing construction
- Open pits, no garage door, debris and materials on site
- Floodwaters higher and faster
- Lost more equipment (pumps, blowers, PLC, generator, HVAC)
- Debris was throughout entire facility













# Fuel Oil Spill

- Water entered vault and underground tank
- Tank lifted from bottom and ruptured lines
- Approximately 4000 gallons of fuel oil escaped
- Cleanup over several acres cost \$170,000
- Most was contained by sand, river flow carried away from clear well
- Contacted spill response team and Clean Harbors while grounds still inundated









# Adaptation Actions Put in Place

- Elevated and sealed equipment
- Switched to LPG for building heat
- New generator, elevated, self contained with raised fuel storage
- Protection for windows & doors
- Relocated or sealed HVAC systems, louvers, pipework
- Propane tanks strapped to cement pad



# Elevated Generator





# Propane Tanks strapped to Cement Pad





# Covers for air intakes





# Front Door Dam



Ian Rohrbacher



# Garage Door Dam









# Funding Repairs & Upgrades

- Costs were approximately \$7,000,000
- Some FEMA funding
- Some insurance funds
- Some was budgeted for upgrades - city
- Some renovations saved money – worked with engineering firm



# Performance to date

- Have had additional floods
- Floods not as high
- Plan in place to activate generator in advance
- Biggest flood February 2010
- No damage since these upgrades



# Lessons Learned

- Review Emergency Response Plan yearly or after any process changes
- Develop protocols for notification, defense & when to abandon
- Maintain customer confidence
- Foster and cultivate cooperation with neighbors & vendors
- Simple solutions can solve big problems







# Case Study: Newmarket, NH

## ***Moving Forward One Action at a Time***

- ❑ 2006-2007 - Water Supply, Lamprey River Recharge Study, Drought/Flood issues
- ❑ 2009 – Update of the Water Resources Chapter of the Master Plan (NHCP grant)
- ❑ 2010 – DPW Drainage Study completed to evaluate effect of tidal flooding on freshwater systems (culvert upgrades completed)
- ❑ 2011 – Adoption of new stormwater management regulations (PREP grant)
- ❑ 2012 – Update of Land Use and Future Land Use Chapters of Master Plan - focus on climate adaptation and resiliency, identify community vulnerabilities and establish goals to protect coastal infrastructure and resources (NHCP)

***Lessons Learned:*** iterative process, educate and inform decision makers, work within local process and initiatives, identify priority issues





# Case Study: Newfields, NH

## **A Community-Driven Adaptation Process**

- ❑ Winter-Spring 2012: Pre-meeting with Planning Board and Emergency Management
- ❑ June – Kick-off meeting with a dinner, local climate assessment, and a World Café exercise:
  - ❑ How do flooding, extreme heat, and more frequent storms affect \_\_\_\_\_ in Newfields?
  - ❑ What actions can be taken to address these impacts?
- ❑ July-August: Action Planning – developing strategies and identifying actors, resources, and timelines.
- ❑ September-October: Review progress, ID key strategies to focus on near-term.
- ❑ November: Incorporate community input into master plan update.

**Lessons Learned:** Match process with community, harness local knowledge and leadership via broad engagement, link adaptation with regular planning



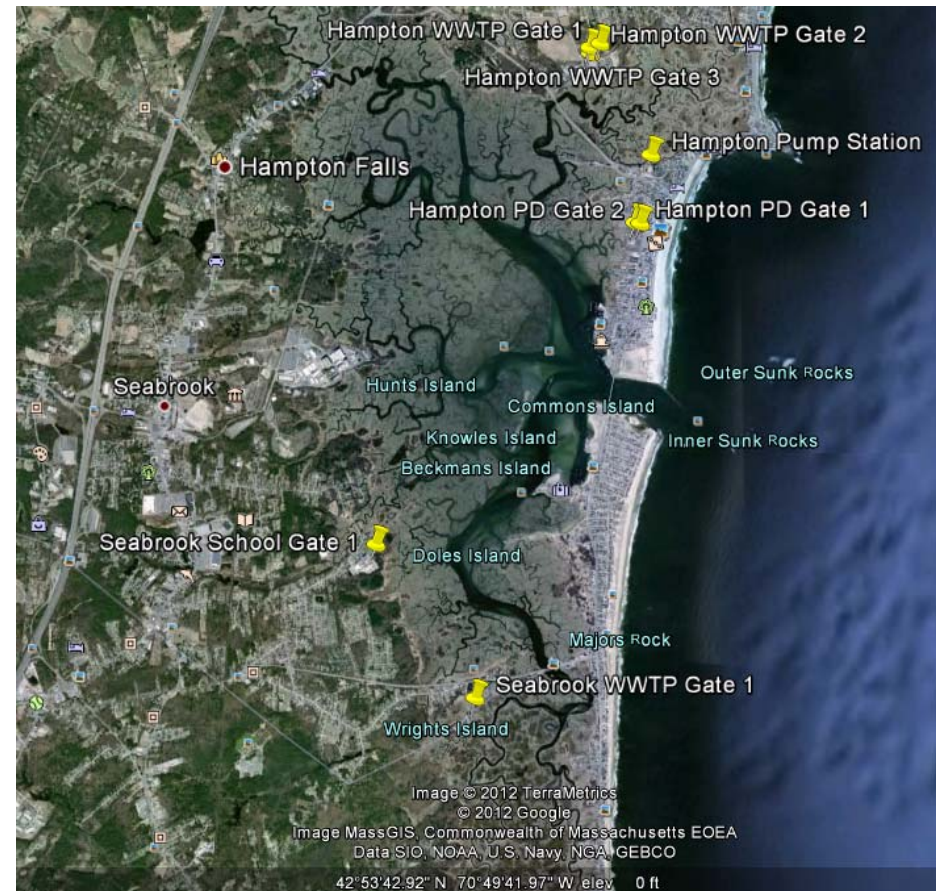


# Case Study: Climate Ready Estuaries COAST Project in the Hampton-Seabrook Estuary

## Gathering of the Community Champions

- ❑ 2010 - 2012. Study of adaptation focused on 3 communities engaged in a stakeholder-driven investigation of the impacts of sea level rise and storm surge upon public and private real estate
- ❑ First data reflecting economic impacts to the municipality
- ❑ “Here and Now” actions and “Prepare and Monitor” actions
- ❑ Preserve, Protect, Accommodate, Retreat
- ❑ First collaborative project for CAW

## *Coastal Adaptation to Sea Level Rise Tool*



***[Content from CRE-COAST Adaptation Project Case Study by Chris Keeley]***



# Case Study: Climate Ready Estuaries COAST Project in the Hampton-Seabrook Estuary





# Case Study: Climate Ready Estuaries COAST Project in the Hampton-Seabrook Estuary

Summary of Priority Actions

Asset	Threshold (ft, NAVD), 100 Year Flood	Time of Occurrence (High SLR)	Time of Occurrence (Low SLR)
Hampton Sewage Pump Station	6.6	now	now
Hampton Police Station	8.2	now	now
Hampton Wastewater Treatment Plant	9.8	now	now
Seabrook Wastewater Treatment Plant	9.8	now	now
Seabrook Middle/Elementary School	14.8	~2080	>2100
NextEra Nuclear Power Plant	19.7	>2100	>2100
Hampton High School	23.0	>2100	>2100

Seabrook – Critical Public Assets

Scenario	Action	2050 Expected Value, Cumulative, Discounted Damage Costs (\$ Million)	Adaptation Costs, Not Discounted (\$ Million)	Net Benefits (\$M)	Benefit: Cost
High SLR	No Adaptation	\$40.4	0	-\$40.4	
	Protect to 2100 Flood	0	\$4.2	\$36.2	10:1
Low SLR	No Adaptation	\$39.4	0	-\$39.4	
	Protect to 2100 Flood	0	\$1.6	\$37.8	25:1

***A major finding if the CRE-COAST analysis was that the economic benefits of action (damages avoided) exceeded costs under the most conservative flood scenarios (i.e. most severe).***





Figure . Hampton Seawall. Photo credit: Chris Keeley/NH Sea Grant.

## An identified need for wider community engagement

- ☐ Need to effectively communicate project's process and results
- ☐ Education around sea-level rise and storm surge impacts
- ☐ Decision-makers need citizen support
- ☐ Appeal of local stories to communicate the issue surrounding climate impacts
- ☐ Frame adaptation as an important strategy that offers solutions

## A foundation for informed discussion

- ☐ A multi-jurisdictional project
- ☐ Provided a unique learning opportunity for local decision-makers, citizens, and the region's technical assistance providers
- ☐ First multi-community, stakeholder-driven, economic analysis of potential damages and adaptation strategies in the New Hampshire seacoast region.

***“The information reinforces the trust that they know there is someone they can depend on.”***

***– Sam Merrill***

***Lessons Learned:*** trust, relationships, focus on educating and informing decision makers, prioritize actions critical in the short-term