Adaptation levels of towns towards flood hazards responses in the Winooski River Basin

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Introduction

As consequence of climate change, many places, including Vermont, will face stronger and more frequent storms. Climate data shows that Vermont is experiencing more extreme rain events, and that trend is predicted to continue (Pealer, 2012). With an increase in large storms and precipitation come more frequent and bigger floods. In order to protect public health, safety and welfare, threatened areas must begin to adapt or risk will increase economic damages, and loss of life. Higher intensity hurricanes significantly increase the economic damages (Zia, 2012).

Source: NASA-Hurricanes archives, Irene 2011

Source: Burlington free-press.com-Wardsboro in Windham County

If towns are able to meet FEMA minimum requirements and have a current plan they are aggressive in the adoption of HMP and consequently they are with a step forward in the adaptation level to flood hazards responses.

Research Questions

- Are the towns more affected by Tropical Storm Irene (TSI) the more aggressive in adoption of Hazard Mitigation Plans (HMPs)?
- What are the best practices for HMPs? Are the templates of the Central Vermont Regional Planning Commission (CVRPC) and the Chittenden County Regional Planning Commission (CCRPC) sufficient? How is the quality?
- How the ideal HMP looks like? What is not in these plans?

Hypothesis

The towns more vulnerable to flood events would be the more aggressive in adoption of Hazard mitigation plans. Tropical Storm Irene had stimulated the adaptation process of these towns.

Methods: Study area

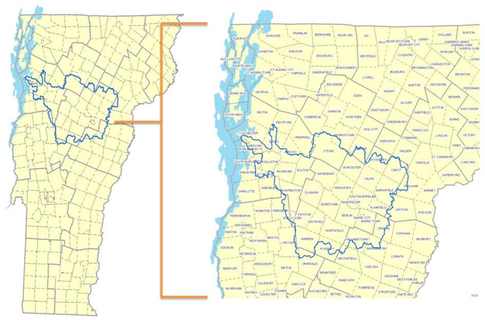

Figure 1: Study area. 35 towns in the Winooski River Watershed in Vermont.

Methods: Procedure

- Literature review of hazard mitigation plans and study slightly the content and structure of several of them.
- Prepared an excel worksheet matrix for the hazard mitigation plans for the 35 towns located in the Winooski River basin. The table includes the following elements:

✓ Planning Process
✓ Planning update Process
✓ Planning maintenance
✓ Risk Assessment- How they identify the risk?
✓ Mitigation- How they deal with the risk?
✓ Maps, Appendixes and Other comments

- Identify which items plans have or do not have. What elements they have in common and what types of patterns they follow.
- Interview the executive director of the Mad River Valley Planning District, Joshua Schwartz, to obtain information about his perception of Hazard Mitigation planning.
- I conducted an analysis about the planners' strategies for planning process and maintenance, risk assessment and mitigation. Also, identify which towns are aggressive in adoption of those plans based on the inventory.

Results

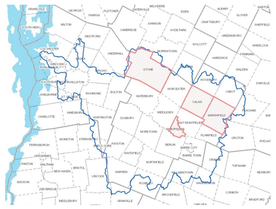

Figure 2: Plan status. The towns in pink have an expired Hazard Mitigation Plan: Stowe, Calais, Marshfield and Montpelier. The rest of them have an approved plan.

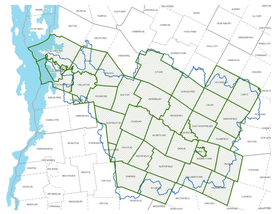

Figure 3: Flood as a major threat. The towns in green identify Flood as a major threat in their HMPs. 35/35

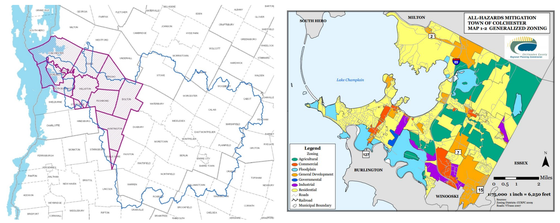

Figure 4: Zoning Element. The towns in purple include a Zoning Element and map in their HMPs. These towns belong to the CCRPC. Figure 5: Town of Colchester. Generalized Zoning Map.

Conclusion

Hazard Mitigation Planning is relatively new. Planners and responsible entities are still in the transition of moving from a rapid response planning (short term) to a mitigation planning (long term). The long term planning requires a multi-sectorial collaboration to succeed, including those that are use to a rapid response, and emergency planning. That's one of the biggest challenges for Hazards Mitigation Planning.

As expected, Tropical Storm Irene has stimulated the adaptation process of towns toward extreme weather events, especially floods. The towns in the Winooski River Basin are aggressive in the adoption of Hazard Mitigation Plan in order to meet the standards FEMA requires to applications for aid grants. Future study is needed to compare these with other towns from another watersheds less affected by Irene in order to conclude the towns more affected by TSI are the most aggressive in adoption of HMPs.

Key Findings

1. Each Regional planning commission follows a specific template which is already established, not by FEMA but by each Regional Planning Commission.
2. The Mitigation matrix is one of the best elements these plans have. This information is required by FEMA but the way they presented it, is innovative and friendly to the reader. This table format is part of the template of the Regional Planning Commissions.

Hazard Mitigated	Mitigation Action	Local Leadership[3]	Prioritization (High, Med)	Possible Resources[4]	Time Frame
Flooding, Severe Storms/ Hurricanes, Landslide	Install additional culvert under Main St/Rte 215	Road Foreman, SB	High	HMGP	1 year
Flooding, Severe Storms /hurricanes	Upgrade and replace bridge at Ennis Rd	Road Foreman, SB	High	HMGP, VTrans	2 years
Flooding, Severe storms/ Hurricanes, Landslide	Upgrade and expand culverts on Danville Hill, Mac Mountain Road, White Road, West Shore Road, Bolton Road	Road Foreman, SB	Med	HMGP, VTrans, Town Funds	2-3 years
Flooding, Severe storms/ Hurricanes, Landslide	Prohibit development on slopes greater than 25% and regulate development on slopes over 15%	PC, Zoning Admin., SB	High	Town Funds	1-2 years

Figure 6: Hazard Mitigation Programs, Projects & Activities Matrix. Town of Cabot, 2012 Hazard Mitigation Plan. (CVRPC)

3. No mention of HMPs explicitly in the available minutes. In the Regional Planning Commission monthly meetings, the topics and issues discussed are typically transportation, education and land use, among others. Indirectly, many of these issues are connected with adaptation to climate change and consequently is an implicit way of mitigation planning.
4. They are moving from-to:

Works Cited

- FEMA. (2011). Local Mitigation Plan Review Guide.
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- Pealer, S. (2012, January 4). Lessons from Irene: Building resiliency as we rebuild. Vermont Agency of Natural Resources, Climate Change Team.
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