

RISK AND VULNERABILITY ASSESSMENT WITH CLIMATE CHANGE: MANCHESTER-BY-THE-SEA HAZARD MITIGATION PLAN ENHANCEMENT



Description

Manchester-by-the-Sea has a current Hazard Mitigation Plan (HMP) that was approved by the Federal Emergency Management Agency (FEMA) on October 18, 2012. Although the HMP is current, it does not include an analysis of the potential impacts of climate change. The Town would like to begin planning for these impacts as soon as possible by incorporating new risk assessment content into the current HMP, consistent with 44 CFR Part 201. The new content will characterize flooding impacts resulting from sea level rise, storm surge and extreme precipitation and their potential effects on critical sectors of the Town (e.g., drinking water, stormwater infrastructure, energy, etc.). The resulting vulnerability and risk assessment (VRA) will serve as the basis for an analysis of mitigation strategies to be incorporated into a future version of the HMP.

The Town was awarded a FEMA Pre-Disaster Mitigation Grant in the amount of \$47,000 to enhance the current Town HMP. This grant will enable the Town to take the first step towards identifying adaptation projects to maintain and protect critical sectors from more frequent and intense flooding events.

The Town has contracted with Tighe & Bond's team of flood plain specialist, stormwater engineers and hydrologist to complete the project, supported by the Coastal Resilience Advisory Group (CRAG). The 20-month long project will be based upon future climate change conditions using existing models for 25, 50 and 100 year planning horizons. The Town and the CRAG will work together to determine what are the most critical sectors to include for further analysis such as town facilities, vulnerable populations, natural and cultural resources among others. Tighe & Bond will collect data about these sectors to identify elements that may be impacted by climate change and assess sensitivity. The CRAG and public will be engaged through a series of workshops and meetings to provide local knowledge and gain consensus on risk factors. In addition to meetings and workshops, opportunities for the public to be informed and engaged in decision making will include surveys, website information and media articles. The results of the VRA will be incorporated as an addendum to enhance the Town's current HMP.

The Project Team & Contact Information

MANCHESTER-BY-THE SEA

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**Coastal Resilience Advisory
Group**

Tighe&Bond

PROJECT MANAGEMENT

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TECHNICAL ASSISTANTS

Ryan Kymetz, Climate
Characterization and Risk
Assessment

Maggie Hernandez, Data
Collection and Sector Analysis

Grant Tasks, Description and Deliverables

Task	Description	Deliverable	Deliverable Due Date
1 Public Engagement and Planning Process	Hold public meetings and workshops, provide content for public surveys, communicate project updates to the public through newspaper articles, mailings and website communications, and document the planning process, including regular summary reports and the addendum to the Hazard Mitigation Plan	Meeting summaries, workshop materials, content for media communications, progress reports on plan development and stakeholder process	Ongoing through the Grant
2 Characterize Future Climate Change Scenarios	Identify critical sectors that will be included in the Risk/Vulnerability Assessment, evaluate up to five global models for predicting sea level rise, storm surge and extreme precipitation events and existing localized projections, complete impact analysis on selector sectors, prepare a technical memo that summarizes potential climate change impacts to identified sectors in Manchester	Summary of identified sectors and components, summary matrix of five models with evaluation parameters, and technical memo on potential climate change impacts to identified sectors	September 30, 2015
3 Vulnerability and Risk Assessment	Collect available data on existing conditions and operations of each of the critical sectors, create a Vulnerability/ Risk Assessment (VRA) analysis to include a systematic analysis of the impact of sea-level rise, storm surge and extreme precipitation, capture results in a matrix, GIS Maps and graphic visualizations and prepare VRA	Matrix showing sector specific results of the Vulnerability and Risk Assessment, map and Graphics with results of the analysis, draft, final draft, and final VRA	August 30, 2016
4 Update Hazard Mitigation Plan	Update the existing Hazard Mitigation Plan	Draft, Final Draft, and final Enhanced Mitigation Plan	December 30, 2016

Concurrent Grant Projects

Manchester-by-the-Sea has undertaken numerous studies and planning efforts in recent years to address the impacts of flooding, including hydrologic evaluations of portions of the Sawmill Brook, visual assessment of the Brook conditions, and inspections of the tidal dam, emergency culvert repairs, and GIS flood zone expansion mapping. There are also multiple concurrent or pending projects that overlap with this grant including:

- A current CZM Coastal Pollution Remediation grant for downtown improvements;
- A current CZM Coastal Resilience Grant for Sawmill Brook Culvert and Green Infrastructure Analysis; and
- A potential Massachusetts Environmental Trust grant for tide gate management and a sedimentation survey of Sawmill Brook

The FEMA Hazard Mitigation Plan Enhancement project will benefit from information generated by the concurrent grants.

Combined Grant Meeting Schedule for CRAG, Town Staff, Stream Team and Public Forums

DATE	CZM	FEMA	MET
Feb-15	CRAG-Kickoff		
Apr-15	Public Forum #1		
May-15	Town Staff		
May-15	Stream Team	CRAG- Kickoff	
Jul-15	DMR	CRAG*	CRAG*
Oct-15	Town Staff	CRAG*	CRAG*
Dec-15	CRAG*		CRAG*
Jan-16	Town Staff		
Jan-16	Public Forum #2	Public Forum #2	Public Forum #2
Apr-16		CRAG	
May-16	Public Forum #3		
Jul-16		CRAG	
Sep-16		Public Forum #4	
Oct-16		CRAG	

*Meetings that are highlighted in blue will have combined grant agendas.

**Manchester-by-the-Sea Grant
Proposed Master Schedule**

5/11/2015

- Meeting
- Milestone- Deliverable
- Task Activity
- Field Effort

Jan-15 Feb-15 Mar-15 Apr-15 May-15 Jun-15 Jul-15 Aug-15 Sep-15 Oct-15 Nov-15 Dec-15 Jan-16 Feb-16 Mar-16 Apr-16 May-16 Jun-16 Jul-16 Aug-16 Sep-16 Oct-16 Nov-16 Dec-16

FEMA GRANT- Climate Change Risk/Vulnerability Assessment

	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
TASK 1 Planning Process and Public Engagement																								
1.1.1 Climate Change Working Group- establish group and hold up to 6 meetings					CRAG		CRAG			CRAG				FORUM		CRAG			CRAG			CRAG		
1.1.2 Public outreach meeting- report on characterization activities and solicit input																								
1.1.3 Planning Workshop- draft materials, hold workshop and summarize findings of VRA																						FORUM		
1.2 Public Outreach																								
1.2.1 Media communication- press release, articles, website materials																								
1.2.2 Direct outreach- interviews, surveys and other public participation opportunities																								
1.3 Document Planning Process																								
1.3.1 Prepare summary progress reports on plan development and stakeholder process (8)						1		2		3		4		5		6		7		8				
TASK 2 Characterize Future Climate Change Scenarios for Manchester																								
2.1 Modeling Tools and Localized Projections- Research, Evaluate and Select																								
2.2 Analysis of impacts																								
2.3 Prepare Technical Memo on Potential Climate Change Impacts to Manchester																								
TASK 3 Vulnerability Risk Assessment																								
3.1 Data Collection- evaluate range of data for specific sectors																								
3.2 Critical Sectors focused analysis; define components to be analyzed																								
3.3 Vulnerability/Risk Assessment Analysis- complete for each sector																								
3.3.1 Draft VRA- including production of graphics and maps																								
3.3.2 Final Draft VRA - respond to comments and distribute																								
3.3.3 Final VRA- submit to BOS																								
TASK 4 Update Hazard Mitigation Plan																								
4.1 Draft Enhanced Hazard Mitigation Plan																								
4.2 Final Draft Enhance Hazard Mitigation Plan																								
4.4 Final Enhance Hazard Mitigation Plan																								

