

Dewberry



City of Milford COASTAL RESILIENCE PLAN

Presentation of Adaptation Options

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City of Milford, Connecticut | March 29, 2016

Presentation Agenda

Adaptation

Options

Feedback

Resilience

Review

Progress

Review

- Progress and Status
- Resilience Concepts
- Adaptation Concepts
- Options for Milford
 - Feedback
 - Recommendations
 - Planning Examples
 - Neighborhood Concepts
 - Infrastructure Designs
- Conclusions
- Next Steps
- Discussion



Recommend

Examples



Next

Discussion

Summary









Review: Progress and Status

Adaptation

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Adaptation

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Resilience

Desiliense	Reduce Recovery Time Decrease Damage										
Resilience											
Prepare	Increase Capacity										
Adapt											
Withstand	INFRASTRUCTURE	RECOVERY TIME									
Recover	Critical Facilities	Days 0	Days 1	Days 1-3	Wks 1-4	Wks 4-8	Wks 8-12	Mos 4	Mos 4-24	Mos 24+	
	Buildings	90%							X		
	Transportation		90%	X							
	Energy		90%	x							
	Water			90%		x					
	Wastewater				90%				x		
	Communication		90%		Х						

Feedback

Examples

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Review: Adaptation Concepts

Options

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Examples

Adaptation

3 General Types of Adaptation (IPCC, 1990)

• Retreat

Review

- No shoreline protection
- Abandon vulnerable area
- Accommodation
 - No shoreline protection
 - Remain in vulnerable area
 - Adjust structures, infrastructure, etc.
- Protection
 - Shoreline protection
 - Remain in vulnerable area
 - No adjustment of structures, infrastructure, etc.





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Summary





Review: Adaptation Concepts

Adaptation

7 Updated Categories of Adaptation (NOAA, 2010)

Options

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Examples

- 1. Impact Identification and Assessment Know the facts
- 2. Awareness and Assistance -

Share the facts

3. Growth and Development Management

Prevent creation of new vulnerabilities

4. Loss Reduction

Decrease existing vulnerabilities

5. Shoreline Management

Protect natural, aesthetic, & economic benefits of beach & shore

6. Coastal Ecosystem Management

Protect natural, aesthetic, & economic benefits of coastal ecosystems

7. Water Resource Management

Decrease unique risks to drainage & water supply infrastructure



Summary

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Discussion

Review: Adaptation Concepts

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Adaptation



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Options for Milford: Feedback

Options

Feedback

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Examples

Community Engagement

Resilience Adaptation

Online Survey

69 respondents:

You care about:

 Homes, Recreation, Water Utilities, Drainage, Natural Systems, Safety

You're worried about:

• Wind, water, waves, erosion, debris

You're asking for:-

- Town projects, technical assistance, enable independent action
- Beaches, dunes, strong utilities, drainage

Indicate your level of support for the following actions:

Summary

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Options

Category	Specific Options				
	Seawalls	_			
	Bulkheads				
Hard Drotaction	Revetments				
Hard Protection	Dikes				
	Groins				
	Breakwaters				
Soft Protection	Beach Nourishment				
Son Protection	Dune Restoration				
Hybrid Protection	Bioengineered Banks				
	Artificial Reefs				
	Drainage Improvements				
Infrastructure	Road Elevation	_			
mnastructure	Wastewater Treatment Plants				
	Sewer Pumping Stations				
Home Protection	Elevation				
	Flood Damage Prevention :				
	Freeboard				
Pagulatory Tools	• V zone standards in Coastal A zones				
Regulatory loois	Zoning Modifications:				
	Height Limit Flexibility				
	Reconstruction Flexibility				
Coastal Poalignment	Road Retirement				
	Property Acquisitions				



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<u>Examples</u>

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Options

WARDER A	10 - 54	Structu	ures & Infras	structure	Realignment						
	Hard Protection	Nourish Beaches	Restore Dunes	Hybrid Protection	Bio- engineered Banks	Improve Drainage	Elevate Roads	Elevate Structures	Retire Roads	Develop Alternate Routes	Acquire Property
Cedar Beach		х	x				x	х			
Laurel Beach		x						x			
Wildemere Beach	х	x	x	x				x			
Walnut Beach		x	x	х			x			x	
Silver Beach		x	x	х			x	x	x		x
Fort Trumbull	х			х	х						
Gulf Beach	x	х	х	x	х		x				
Bayview Beach	x	x	x	х		x	x	x			
Calf Pen Meadow		x				x	x	x	x		х
Point Beach	x				х	x		x			х
Morningside	x			x	х						
Hillside Avenue	x					x	x	x			
Burwells Beach		x					x	x			
Woodmont	х	x		х	х			x			



Feedback

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Options

http://www.ci.milford.ct.us

Examples

NEWS **EVENTS** Coastal Resilience Public Plan Meeting Naugatuck Avenue Detour Map Coastal Resilience Workshop Presentation Now Available Click here to view a copy of the presentation shared at the January 28th Coastal Resiliency Plan Workshop held at City ... Home > Home > News and Announcements > Coastal Resilience Public Plan Meeting

Resilience > Adaptation >

The Plan

Coastal Resilience Public Plan MEETING

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Posted on: March 24, 2016 - 4:06pm

Attachment	Size
coastal_resilience_public_plan_meeting.pdf	89.6 KB
milford_coastal_resilience_plan_draft_for_public_review_small.pdf	7.05 MB



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CONNECTIC Department of Housing

Discussion

DRAFT

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This plan was prepared under a Community Development Block Grant Disaster Recovery (CDBG-DR) grant awarded to the Town of Branford, Connecticut for coastal resilience planning in Branford, Madison, and Milford, Connecticut.







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Options

Zoning Flexibility

<u>Resilience</u> Adaptation

Eliminate Reconstruction Restrictions

Sailor Lane Pumping Station Floodproofing Enclose in Pump House Floodproof Components

> Wildemere Beach Sediment Management Beach Nourishment Create Dune Ridge Groins or Offshore Breakwater

Beachland Avenue Tidal Wetland Restoration Road Retirement Property Acquisitions Conversion to Wetland

Recommend

Examples

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Point Beach Drive Condos Bioengineered Bank

Bayview Beach Protection & Drainage Improvements Beach Nourishment Hard Protection Drainage Backflow Prevention Stormwater Pumping Station





Examples: Point Beach

Resilience

Options



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Examples: Point Beach

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Resilience

2080s Daily High Tide



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Examples: Point Beach

Options

2080s Category 2 Hurricane



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Examples: Walnut Beach

Progress Resilience Adaptation Options Feedback Recommend Examples

Walnut Public Beach MACBROOM

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Examples: Walnut Beach

Progress Resilience Adaptation Options Feedback Recommend Examples



Base Flood

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Examples: Wildemere Beach

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Wildermere Beach Church

Resilience Adaptation Options



Options



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Examples: Beaverbrook Wastewater Plant

Feedback

Options



Resilience Adaptation



Examples

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Conclusions

Milford has the capacity to decrease vulnerabilities and therefore decrease risks

 From daily high tide flooding, storm surges, erosion, and sea level rise

Resilience 🔪 Adaptation 🔪 Options 🍃 Feedback 💙 Recommend 🔪 Examples 义

Milford can adapt

- At the City, neighborhood, and parcel scale
- Utilities & infrastructure can be strengthened
- Access can be maintained
- Beaches and dunes can be nourished/restored
- Drainage can be upgraded
- Homes will continue to be elevated
- Residents can relocate if desired

Milford has the capacity to increase its Resilience

• Prepare, Adapt, Withstand, Recover



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Next Steps

- Review the Draft Plan
- Provide Input
- Prepare Final Document
- City has options for formalizing the plan:
 - Adopt as a stand-alone plan
 - Accept as a working/living document to be maintained by the Hazard Mitigation Committee or other board

Resilience > Adaptation > Options > Feedback > Recommend > Examples >

- Append to Hazard Mitigation Plan
- Append to Plan of Conservation and Development
- Implementation
 - Execute existing grants from NRCS, CIRCA, CDBG, and others
 - Keep securing grants from those along with FEMA, NOAA, and others
 - Become more resilient!

http://www.ci.milford.ct.us

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Discussion

Resilience



Feedback Recommend Examples

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ImagePaige Miglio, watercolor Milfordarts.org

Bonus Slide: Adaptation Summary

Measure	Summary	Benefits	Barriers to Implementation						
Structural Measures									
Hard Shore- Protection	Structure parallel to shore (seawall, levee, bulkhead, revetment)	Long-lastingEffective	 False sense of security Expensive maintenance Ecosystem damage 						
Sediment Management Structures	Structures reduce wave energy & manage sediment	Long LastingSupport natural processes	Does not address stillwater inundationSecondary Impacts						
Soft Shore- Protection	Replenish sediment and dunes	 Support natural processes Support ecosystems Aesthetic 	Regular maintenanceMay not be long-lasting						
Bioengineered Banks	Natural elements reduce wave energy and trap sediment	 Support natural processes Support ecosystems Aesthetic 	Somewhat limited areas of applicability						
Marsh Management	Creation/restoration of tidal marsh	Reduce wave energyCritical habitat	Limited areas of applicabilityDoes not address stillwater inundation						
Stormwater Management	Drain low areas while preventing backflow	Support other protection methods	 May be expensive Requires maintenance Doesn't address direct hazards 						
Transportation Infrastructure	Elevate roads or create alternative egresses	 Protect emergency access and evacuation 	• Elevation may increase hazards for neighbors						
Elevation	Raise structure above flood level	 Reduce insurance premium Open to residences Permitted in V zones 	 Harder to access "Dead space" under structure Difficult for some buildings 						
Wet Floodproofing	Abandon Lowest Floor, Remove all contents	Relatively inexpensive	• Extensive post-flood cleanup						
Dry Floodproofing	Waterproof structure, install barriers at openings	Relatively inexpensiveDoes not require additional land	 Manual barrier installation Subject to storm predictions Vulnerable to flow & waves 						
Floodwalls & Levees	Concrete or earthen barriers protection	 Prevent water contact Avoid structural retrofits	May require large areaObstructs views						
Temporary Flood Barriers	Plastic or metal barrier	 Prevent water contact Relatively inexpensive	 Manual installation Subject to storm predictions Short-term only 						
Relocation	Move structure to safer location	All vulnerability removedOpen to residences	Decreased value of new siteExpensive						
Regulatory Tools									
Building Code	Increase standards for structures	Protect new & improved construction	Older structures often exempt						
Zoning Regulations	Prevent hazardous development patterns	 Control degree of risk in hazardous areas 	Balance with economic pressures						
Easements	Control activities on private land	 Work with landowners for mutual benefit 	 Private landowner may not be willing partners 						