Hazard Mitigation Plan Update For Nantucket

Hurricane Sandy Town Pier Flooding
Photo: Nicole Harnishfeger / The Inquirer and Mirror

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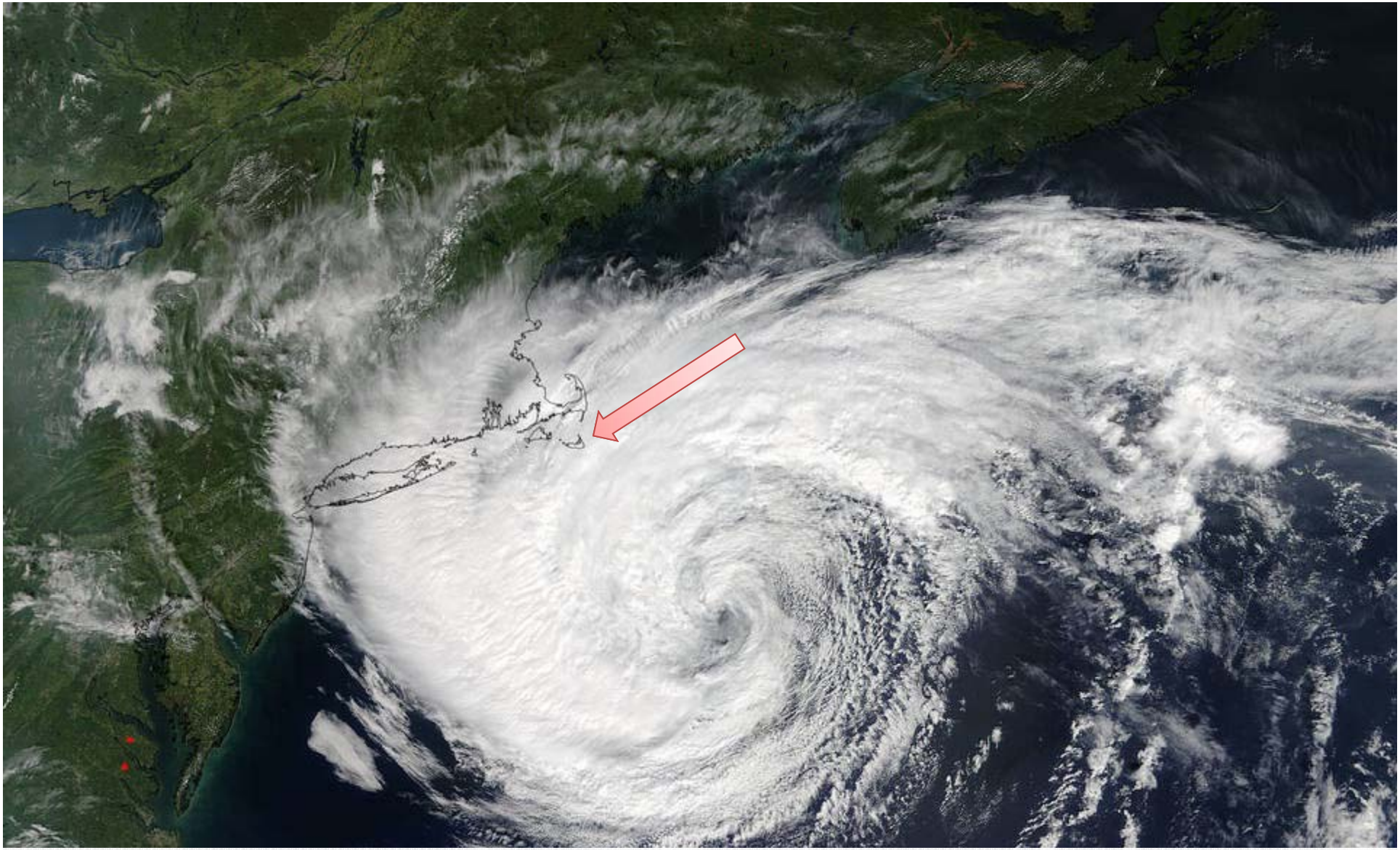
Agenda

- Hazard Mitigation Planning
- Benefits of Having Plan
- Developing a Plan
- Natural Hazards Facing the Island
- Mitigation Alternatives
- Plan Update
- Discussion



Hazard Mitigation Planning

Tropical Storm Jose, 2017
Image: NASA

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Hazard Mitigation Planning

Overview

- **Authority**
  - Disaster Mitigation Act of 2000
- **Goals**
  - Disaster preparedness
  - Hazard mitigation measures to reduce losses of life and property
- **Status of Plans in Massachusetts**
  - Most initial plans developed 2005 - 2011
  - Local plans updated every 5 years
  - Nantucket plan adopted in 2007
  - State plan being updated now

Hazard Mitigation Planning

What is a Natural Hazard?

- **Extreme natural event that poses a risk to people, infrastructure, and resources**

Hazard Mitigation Planning

What Plans DON'T Address:

- Terrorism and Sabotage
- Disaster Response and Recovery
- Human Induced Emergencies (some fires, hazardous spills and contamination, disease, etc.)

Hazard Mitigation Planning

What is Hazard *Mitigation*?

- **Actions that reduce or eliminate long-term risk to people, property, and resources from natural hazards and their effects**

Elevation in Madaket

Removal of Structures in Codfish Park

Hazard Mitigation Planning

- **But WHY should we plan?**
  - ✓ Lost residents and neighborhoods, eroded social fabric
  - ✓ Lost tax base and decreased economic activity nearby

Sheep Pond Road

Baxter Road

Hazard Mitigation Planning

- **Reduce**
  - **loss** of life
  - **damage** to property and infrastructure
  - **costs** to residents and businesses (taxes, insurance, repair costs, etc.)
  - municipal service costs (**long-term**, e.g. emergency response, infrastructure maintenance)
- **Educate**
  - residents
  - policy-makers
- **Connect**
  - hazard mitigation planning to other community planning efforts
- **Enhance**
  - and preserve natural resource systems in the community

Nantucket Harbor

Drainage Berm along Lovers Lane

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Benefits of Having a Plan

Image: Mark Mattoon

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Benefits of Having a Plan

A Hazard Mitigation Plan Provides:

- Comprehensive risk assessment to support proposed strategies
- Detailed action plan that the community may implement to reduce risk
- Coordination with local, regional, State, and Federal entities
- Provide State and FEMA with information to guide emergency response and post-event assistance

Benefits of Having a Plan

Municipalities <u>must</u> have a FEMA-approved Hazard Mitigation Plan in place to receive Federal Grant Funds for Hazard Mitigation Projects under three grant programs

- *PDM (Pre-Disaster Mitigation)*
- *HMGP (Hazard Mitigation Grant Program)*
- *FMA (Flood Mitigation Assistance)*

- Projects must be cost-effective to be eligible
- Grant funding typically covers 75% of project costs
- Eligible projects may already be identified in local plans and budgets
- Projects often provide long-term reductions in municipal service costs (e.g. emergency response, infrastructure maintenance)
- Can fund post-disaster mitigation of damaged structures and infrastructure

Developing a Plan

Nantucket Conservation Commission Public Meeting, 2015
Van Lieu Photograph

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Developing a Plan

- **Identify hazards that could occur in the region**
- **Assess Vulnerabilities and Risks**
  - What's Vulnerable? What is at Risk?
  - How bad would a disaster be? What losses could be expected?
- **Assess Capabilities**
  - What measures are in place to avoid or reduce losses?
  - Where is there room for improvement?
- **Outreach and Collaboration**
  - Public, Neighboring Communities
- **Recommendations**
- **Paperwork**
  - Develop plan document
  - State and FEMA approvals
  - Local adoption

Developing a Plan

Critical Facilities

- Shelters
- Emergency Operations Centers
- Municipal facilities such as Town Hall
- Fire and Police Departments
- Public Works and Highway Garages
- Hospitals
- Assisted Living and Nursing Homes
- Schools – when used as shelters
- Airport and Ferry Terminals
- Police & Coast Guard Barracks

Developing a Plan

Historic and Cultural Resources

- Often particularly vulnerable
- Mitigation and adaptation options limited
- Play an important role in anchoring community, building neighborhood cohesion, creating local identity
- Economic value through tourism, preservation and restoration work

Natural Hazards Facing the Island

Lightning: w1ack/Weather Underground
Erosion: Nicole Harnishfeger / The Inquirer and Mirror
Fire: Cape Cod Fire Department
Flood: abc news
Wave: Jim Powers/ The Inquirer and Mirror

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Natural Hazards

- **WHEN have you experienced hazards?**
- **WHICH concern you most?**
- **WHERE are the at-risk areas?**
- **WHAT mitigation actions would you like to see?**

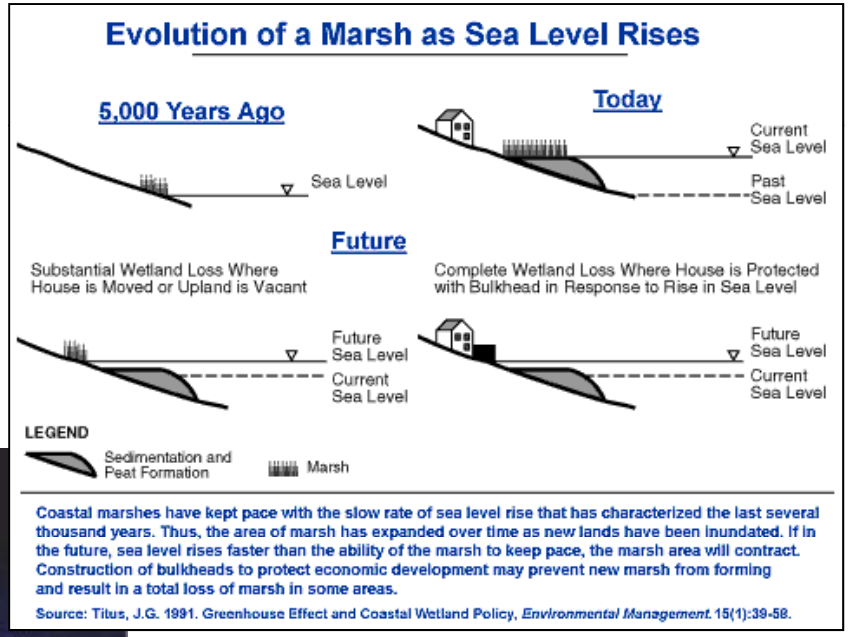
Inland Flooding

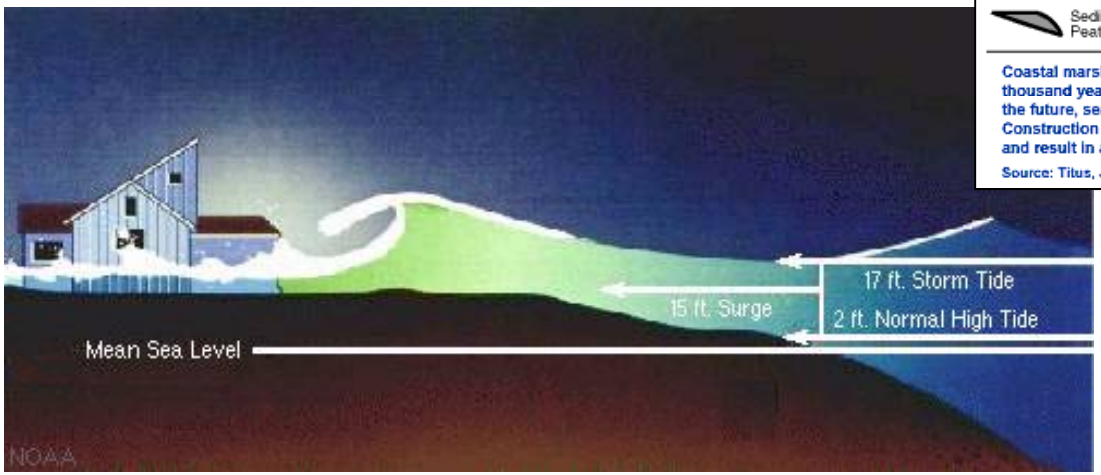
Inland Flooding

- **Phillips Run**
- **Sesachacha Pond**
- **Polpis Road**
- **Miacomet Pond**
- **Nuisance Flooding**
  - Easy Street
  - Orange Street
  - Pleasant Street near Post Office
  - Lovers Lane
  - Old South Road near Airport
  - Madacket Road – Hummock Pond Road

Coastal Flooding

- **Storm surge**
- **Sea level rise causes**
  - Accelerated coastal erosion
  - Inundation
  - Increased incidence of flooding





Coastal Flooding

- **Downtown & Brant Point**
- **Madaket Village**
- **Codfish Park**
- **Isolation:**
  - Madaket
  - Smith Point
  - Polpis
  - Wauwinet

Hurricane Sandy Inundation
Photo: Jim Powers/ The Inquirer and Mirror

Hurricanes and Tropical Storms

- **Strong winds**
- **Heavy rain**
- **Floods**

Hurricane Sandy snaps a utility pole, Surfside Road
Photo: Jim Powers/ The Inquirer and Mirror

Hurricane Sandy damage, Madaket
Photo: Nicolde Harnishfeger / The Inquirer and Mirror

Hurricanes and Tropical Storms

History of Storms

Hurricane Carol, 1954
Photo: Nantucket Historical Association

Coastal Erosion

- **Dynamic Coastal Environment**
- **Seasonal Cycles**
- **Accelerated by Sea Level Rise & Subsidence**

Sheep Pond Road House
Photo: Nantucket Chronicle

Area-Specific Erosion Problems

- Codfish Park
- Sconset Beach
- Low Beach
- Pebble Beach
- Cisco Beach
- Sheep Pond Road
- Madaket Beach
- Smith Point
- Cliff Beach

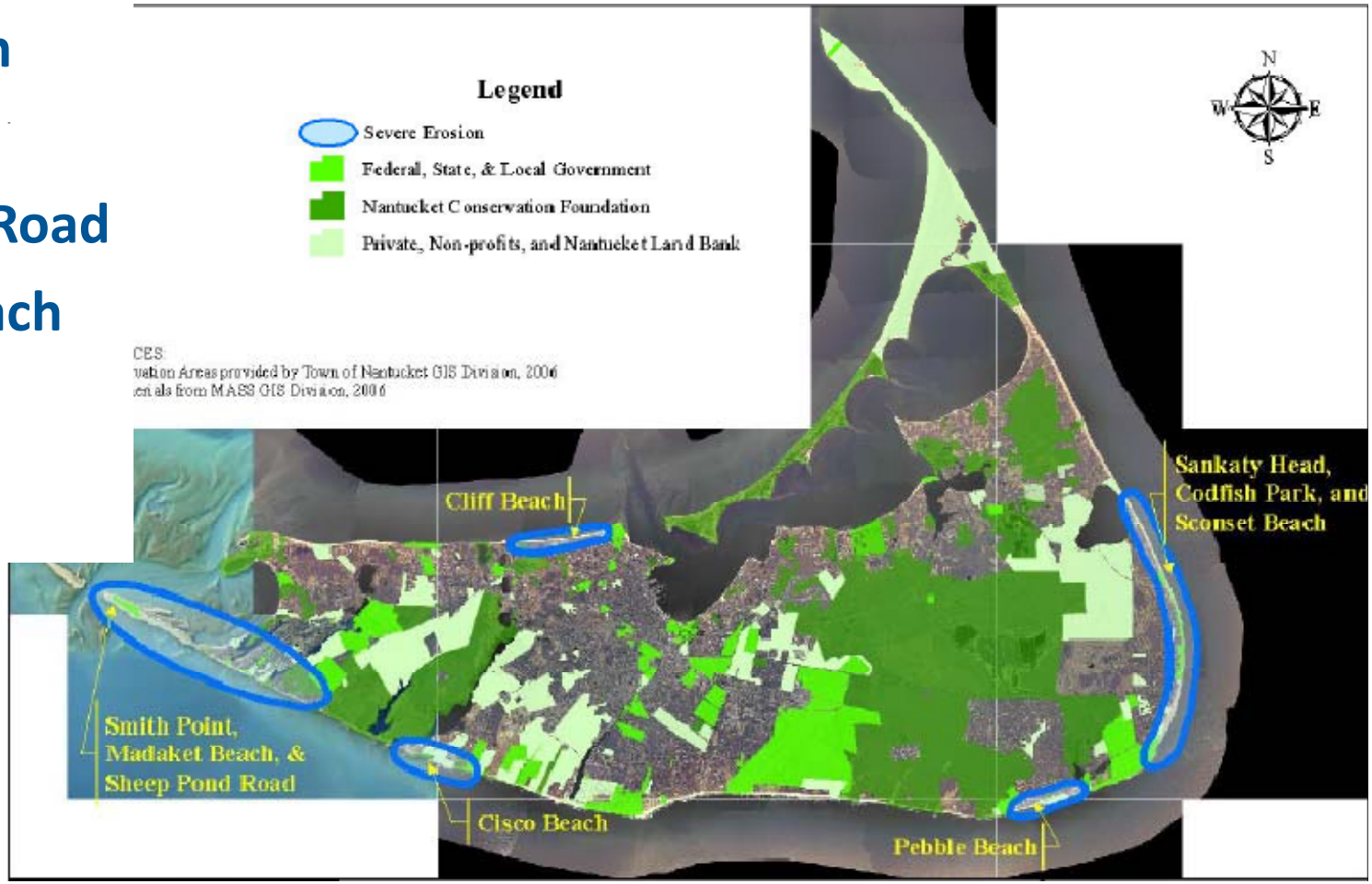


Figure 6-1

Thunderstorms and Tornadoes

- Tornadoes
- Downbursts
- Lightning
- Heavy rain
- Hail

Nantucket home struck by lightning
Photo: Nicole Harnishfeger

"Storm Over Nantucket"
Photo: Rachael Talibart, 2011

Winter Storms and Nor'easters

- **Blizzards and nor'easters**
- **Coastal Flooding**
- **Heavy snow and drifts**
- **Freezing rain and ice**
- **Downed trees**
- **Building Collapse**

Winter Storm Hercules, 2016
Photo: ack.net

Damage from January 2015 Blizzard
Photo: NBC News

Earthquakes

- **Massachusetts is prone to very low-energy earthquakes**
- **Can cause dam failure, shaking, liquefaction, slides/slumps**
- **Wood-frame buildings less susceptible**

Photos courtesy of FEMA

Wildfires

- **Fire**
- **Heat**
- **Smoke**
- **March – November Season**
  - *most occur in April & May*
- **2016 drought elevated risks throughout state**

33-acre brushfire, March 24 2016
Photo: Fire Dirstrict 1

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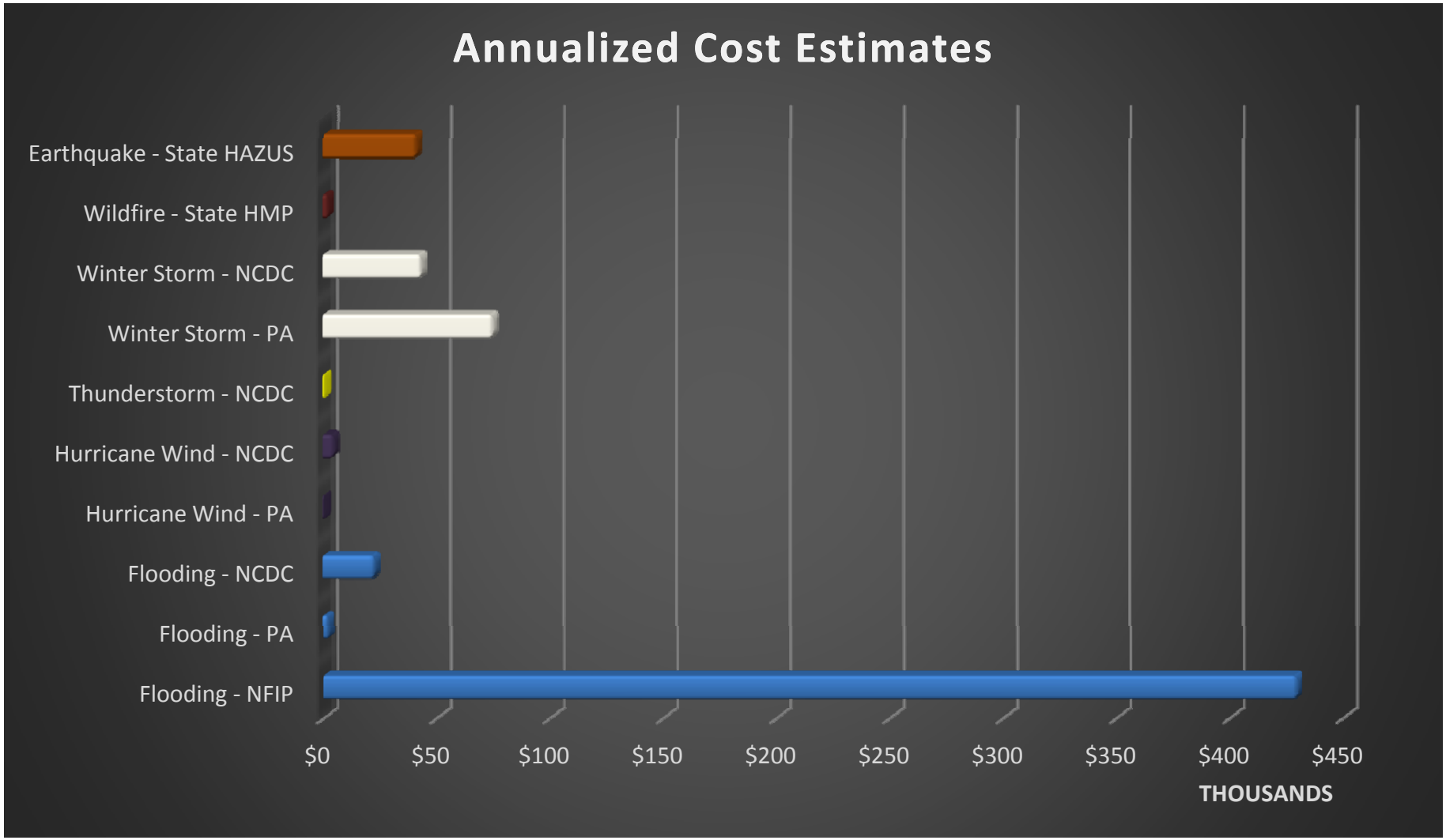
The Cost of Disasters



Mitigation Alternatives

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Hazard Mitigation Categories

Structural Projects

- What can we construct or reconstruct to reduce the occurrence of the hazard or impacts from the hazard?

Property Protection

- Can our property be protected to reduce losses?

Prevention

- How can losses be prevented through codes, regulations, etc.?

Public Education

- Can we help educate the public about hazard risks and encourage them to take action?

Natural Resources

- Can we set aside land or preserve natural resources to avoid losses that could occur, or to allow these resources to protect us?

Emergency Services

- Can we strengthen our capacity to evacuate, shelter people, and respond?

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Hazard Mitigation Options

Applied to Floods

Prevention

- Zoning
- Codes
- Regulations
- Plan of Conservation & Development

Natural Resources

- Acquire & Preserve Land
- Wetland Storage
- Reconnect Floodplains

Structural Projects

- Bridges and Culverts
- Levees and Walls
- Detention and Drainage

Flood Risks

Property Protection

- Floodproof
- Elevate
- Relocate

Public Education

- Newsletters & Meetings
- Web Site with Risk Maps
- Educate Municipal Staff

Emergency Services

- Improve Response Capacity
- Establish Shelters
- Evacuation Plans

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Hazard Mitigation Options

Other Typical Strategies

- Strengthen or reinforce shelters and critical facilities
- Create backup critical facilities
- Place overhead utilities underground
- Harden utilities and buildings
- Localized power grids ("microgrids")
- Expand tree maintenance programs
- Snow load removal and response plans
- Shutters, load path, and roof projects
- Backup systems and equipment
- Enhance fire suppression capabilities with dry hydrants, cisterns, etc.
- Bracing for potential earthquake damage
- Public education programs and resources

Hazard Mitigation Options

Middle Moors Firebreak

Emergency Preparedness Guide
Your family and home are important to you. The likelihood you and your family will survive an emergency largely depends on planning.
PREPARING FOR EMERGENCIES MAKES SENSE!
Ready
Emergency Supply List
FEMA
www.ready.gov
MANAGING YOUR FLOOD INSURANCE CLAIM

Plan Update

Plan Update

Next Steps

- Incorporate input from residents, business owners, and public officials
- Internet survey available – *see link on the next slide*
- Characterize hazard risks and potential losses
- Develop mitigation strategies and actions
- Prepare draft plans for review by the municipalities and the public
- Adopt and implement the plan
- Seek hazard mitigation funds

- What Hazards Concern You?
- Where Have You Seen Losses and Risks?
- What Actions Interest You?

www.surveymonkey.com/r/NantucketHazard

Discussion

Photo: Jonathan Nimerfroh

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Mitigation Alternatives

Categories of Strategies

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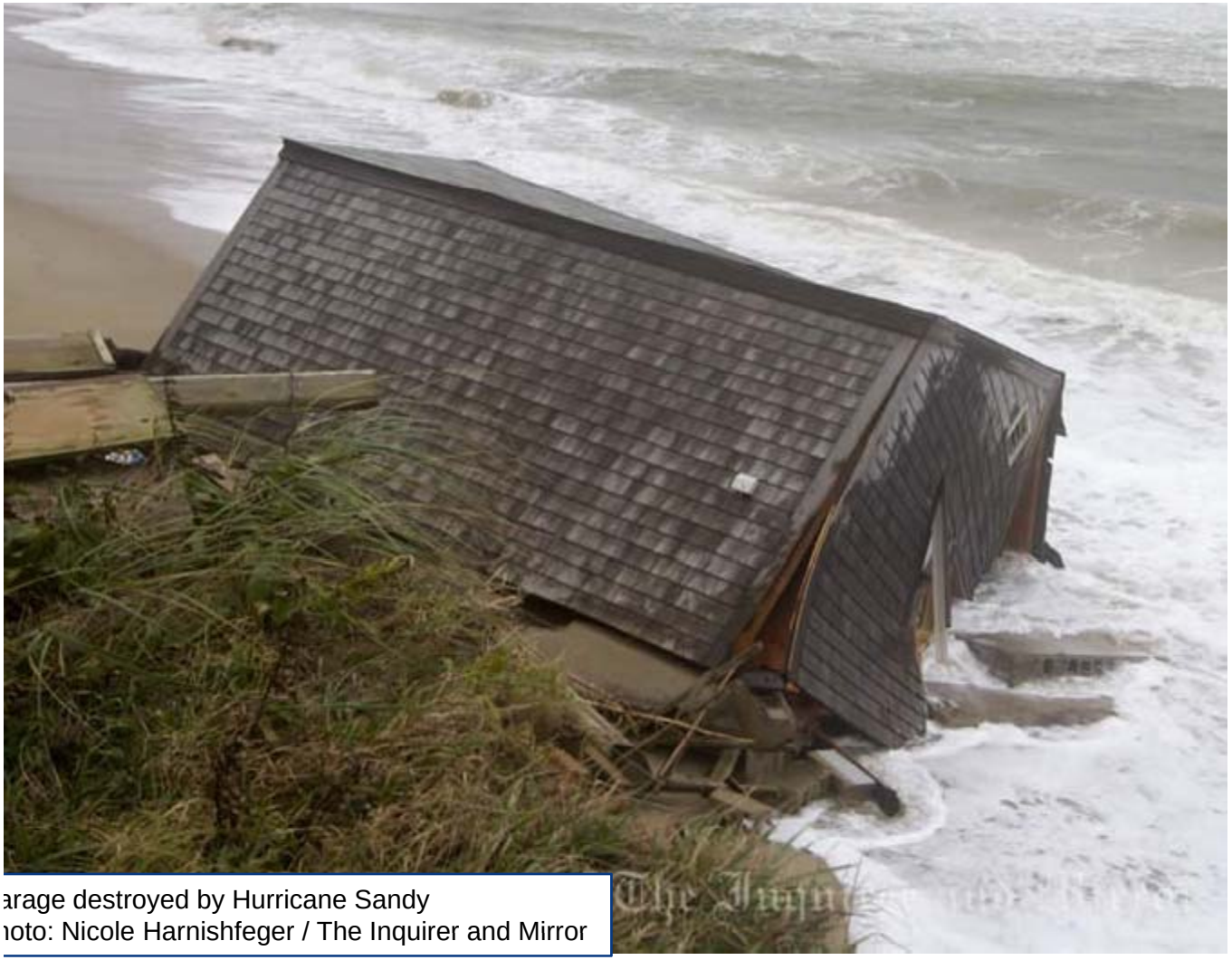

arage destroyed by Hurricane Sandy
hoto: Nicole Harnishfeger / The Inquirer and Mirror

Hurricane Sandy Damage
Photo: nantucketrealestate.com

Photo: Robert Levy