Moving towards Resilience
helping communities adapt to hazards and change...

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Local Solutions: NE Climate Change Preparedness
The Nature Conservancy

60+ years

3,500 staff - 50 states & 34 Countries

1 million members

Science-based & solution driven

Risk Reduction & Resilience
Coastal Resilience Network

CRN aims to provide **science, tools, process and policy** to foster decision-making on adaptive solutions, emphasizing the important role of ecosystems in risk reduction and resilience.

www.coastalresilience.org
Coastal Resilience Network

www.coastalresilience.org

10 States - 7 Nations
Coastal Resilience Program

Objective: To lend a helping hand to communities and ecosystems to safely accommodate hazards and change...

Awareness
Risk
Choices
Action
TNC’s Hazards and Community Resilience Workshops

- All Hazards – Community-Driven Approach
- Strengths and Mitigation Emphasis
- Links NHMP with Master Plans
Hazards and Community Resilience Workshops

With more complete information and a process, towns can make more informed decisions to reduce risk and improve resilience.

Michael Millane

TS Irene Madison, CT
TNC’s Hazards and Community Resilience Workshops

- Planner
- Fire Chief
- Tree Warden
- Elected Official
- Wetlands
- Business Owner
- PW
- Health Officer
The Nature Conservancy’s Risk Matrix

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Vulnerability</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Flooding</td>
<td>Cred. &amp; Comm.</td>
<td>Dominion</td>
</tr>
<tr>
<td>Riverine Flooding</td>
<td>Cred. &amp; Comm.</td>
<td>CL&amp;P/Dominion</td>
</tr>
<tr>
<td>High Winds</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>Frozen Precipitation</td>
<td>Same</td>
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</tr>
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**Vulnerability and Strengths**

- Infrastructure vulnerabilities/assets
- Power Transmission
- Water Transmission
- Bridges and Roads
- New London WWTP
- Lake Konkowoc - Water Treatment Plant
- Isolation Points (156/211, Gardners Wood; Niles Hill)
- Ridgewood, Bloomfield, RL, Hills Brook
- Railroads - Amtrak & Canadian RR
- Fire House Team Approach (decentralized)
- New Generator in School

**Societal vulnerabilities/assets**

- Vulnerable Populations
- Recreational Facilities (BB Fields; Beaches, etc...)
- Critical Social Facilities (Camp Harkness; Cultural Historic Districts; Private Schools)
- Shared Regional Cooperation (Fmsc; Facilities)
- Commodities/Goods Distribution Points
- Special Needs Coord. (group homes, care fac.)
- Emergency Comm. System - Interoperability

**Ecosystem vulnerabilities/assets**

- Railroad - Transportation (Cranberry Pond Culvert)
- Jordan Cove Area (underdrained storage)
- Goshen & Aleeves Cove (ecosystem conversion)
- Channel Envision
- Open Space (Maintain and Obtain)
- Miller Pond (need flood storage, water source, base flow for Stony Brook)
- Barrier Beaches & Dune System

**Choices**

- Coastal Flooding: Eliminate coastal erosion at grade crossings
- Riverine Flooding: Tree cutting along lines
- High Winds: No specific actions mentioned
- Frozen Precipitation: No specific actions mentioned

**Prioritized List of Actions**

Useful Anywhere: Inland-Coastal; Urban-Suburban-Rural; Large-Small
The Nature Conservancy’s Risk Matrix


Vulnerabilities by hazards

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<th>Location</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Millstone Power Plant</td>
<td>Rt 156</td>
<td>Dominion Power</td>
<td>Cord. &amp; Comm. w/ Dominion/FEMA/DOHS</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
</table>

V Storm water system flooding Town-wide Flood proof manhole covers to 500 yr. H S

Map Arrows:
- Red – Infrastructure
- Blue – Societal
- Green - Ecological
Hazards and Community Resilience Workshops

- Since 2007, we have helped 21 communities and 5 COG/RPAs

- Strong Testimonials from Electeds, Town Staff, Residents, Business Owners and Employers

- Tried and True Process with Municipalities
Examples from Communities like yours...
### Challenge of Community Resilience – Choices to Action

#### Technical
- Community Wastewater
- Abandonment of Roads
- Establish Alternate Egress
- Hard Shoreline Protection
- Marsh Advancement Zones

#### Regulations
- Building Codes
- Zoning Amendments
- Zoning Overlays
- Acquire Properties

#### Governance
- Norms

#### People Perspectives
- Key individuals
- Affected communities
- Specialist advisors
- Influential organizations

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**A Challenge for “Action” is Integration Planning – Governance - Design**

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Thought Credit: Yale – UE&D Lab
Management of Coastal Real Estate and Structures

- Building Codes (freeboard, etc.)
- Zoning Amendments
- Zoning Overlays
- Acquire Damaged Properties

Hazard Mitigation Commission

- Planning and Zoning Commission
- Board of Selectmen
- Coastal Development Authority

Coastal Realignment

- FEMA mitigation funds
- Other funds
Guilford Coastal Resilience Planning
Guilford, Connecticut

www.coastalresilience.org
Guilford, Connecticut – Storm Sandy (Source: FEMA)

www.coastalresilience.org
Neighborhood Plan Example
Seaside Avenue
Neighborhood Plan Example
Seaside Avenue

- Coastal Development Area tie-in with Town Center South
- Marsh advancement zones
- Private Marina with Public Access Easement
- Living shorelines with active marsh management zones
- High Marsh Habitat Zone
- Convert former R.O.W. into living shoreline
- Enhance programming accessible by Coastal Boardwalk
- Build tide gate to protect Town Center development
- Living shorelines
- Consider Parking Area for Beach and Boardwalk
- Public Boardwalk
- Create Bridge
- MARSH (Higher Elevation)
- MARSH
- OPEN WATER
- PUBLIC OPEN SPACE
- HARD PROTECTIVE INFRASTRUCTURE
- SOFT/LIVING PROTECTIVE INFRASTRUCTURE

STAGE 3 EXAMPLE
500 feet
200 meters

UEDLAB
Guilford’s Coastal Resilience Program

http://www.ci.guilford.ct.us/town-documents.htm
“More than ever, it is critical that when we build for the future, we do so in a way that makes communities more resilient to emerging challenges such as rising sea levels, extreme heat, and more frequent and intense storms.”

Shaun Donovan
Chair, Hurricane Sandy Rebuilding Task Force
Secretary, U.S. Department of HUD

"Resilient Bridgeport"

1. **RIVER's EDGE**
   - Pequonnock River as Armature for Revitalization
   - Main to East Main Streets

2. **COAST**
   - Building on Backbones
   - Strengthening Peninsulas and Islands to protect lowlands and critical infrastructure

3. **RESILIENCE CENTER PROTOTYPE**
   - Transitional, Catalytic Projects
   - Renovation, Addition and New Construction

4. **SOUND/CITY**
   - Bridgeport as Prototype for Coast Region
   - Regional Economics, Ecology and Infrastructure

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**BRIDGEPORT**
- 146,425 Population
- 3,334 Commuters per Day

**PEQUONNOCK RIVER**
- 29 SQ MI
Build Up Thick Adaptive Edges; Green Corridors; Revitalization
Take Home: Moving to Resilience

- Not only existing development and transit but future economic growth and redevelopment

- Pre-disaster **planning, governance and design** is in fact post-storm prevention

- Natural Infrastructure can be a cost effective part of the solution

- Optimism: Proactive **planning, governance and design** increases our flexibility & avoids future costs
Sincere Thanks

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