HISTORY AND HAZARDS

MULTIDISCIPLINARY PLANNING IN THE FACE OF RISING SEAS AND DISAPPEARING LANDS

Anna Sierra, Caroline Dept of Emergency Services
Brian Soper, Dorchester Dept of Planning and Zoning
Objectives

➢ Demonstrate the benefits of multi-disciplinary coordination and planning.

➢ Discuss the political and social challenges of flood plain management in historic areas.

➢ Identify strategies and best practices for community engagement for long-term planning.
Maryland’s Eastern Shore

- Heart of the Chesapeake
- Formation of County in 1669
- Harriet Tubman was born and lived until self-emancipation

- 9 Counties
- <450,000 people
- First peoples were the Nanticoke
- First English settlers in 1631
Dorchester Demographics
At A Glance

THE PEOPLE

- 32k people
- 20% over 65
- 63% white, 29% black or African American, 5% Hispanic or Latino, 1% Asian, 0.5% American Indian
- Average of 2.4 people per household
- 85% high school graduate
- 21% BA or higher
- Median income $47,907
- 17% poverty rate

THE LAND

- 540.77 sq miles
- 636 miles of road
- Highest elevation: 57’ above sea level
  - 50% lay below 4.9’
  - 60% in tidal floodplain
- 60.3 pop density
  - Drops to 33 when City of Cambridge is taken out; 19 without Hurlock
- Largest City: Cambridge (13k)

Source: US Census 2016 Estimates
### The Hazards

<table>
<thead>
<tr>
<th>HAZARD</th>
<th>High</th>
<th>Medium High</th>
<th>Medium</th>
<th>Medium Low</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricane</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nor'easter</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Flooding</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoreline &amp; Sea Level Rise</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riverine Flooding</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Weather</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drought</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tornado</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiological</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Thunderstorm/Hail</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epidemics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildfires</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Hazardous Material Incident</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation &amp; On-site</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Extreme Heat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail Accident Hazmat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire/Explosion</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Dam Failure</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Earthquake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Dorchester County 2017 Hazard Mitigation Plan
Hurricanes, Nor’Easters, and Tides – Oh MY!

- Vulnerable to most storm directions
- Fran (‘96): $1M property damage. 4-6’ of storm surge
- Isabel (‘03): $2.5M property damages
- Hurricane Irene (‘11): $100k property; $500k crop

Source: Dorchester County 2017 Hazard Mitigation Plan
Flood Zones

1,270 flood insurance policies for a total of $311M in coverage as of 7/10/2019

$16M in claims paid since 1978 (2017)

Large landmass, relatively small population in most vulnerable area

- Socioeconomically depressed area
- Generational homes/land

Source: Dorchester County 2017 Hazard Mitigation Plan
Flood Risk Reduction

➢ Tidal flooding will increase as sea level changes
➢ Flooding is not limited to tidal; extreme rain events can cause localized flooding
  ➢ Improve drainage around structures
➢ Homeowner education on risks
Sea Level Change: The Third Rail

- National discussion versus local observations

- Multiple factors create significant vulnerability:
  - Global sea level rise
  - Land Subsidence (thanks for nothing, glaciers!)
  - Erosion
  - Warming oceans

Source: Dorchester County 2017 Hazard Mitigation Plan
Shoreline Change

➢ All the Data!
➢ ESCAP Discussions
➢ Critical Area Commission funded
Nuisance Flooding

- Sandy ('12): $750k damages, 3-4’ above normal tide
- Not always associated with storms
  - “King Tides”
  - “Tuesday”
- Difficult to track and quantify

Source: Dorchester County 2017 Hazard Mitigation Plan
Photo Credit: Anna Sierra
Nuisance for everyone but the deer.

Source: Roger Short, Taylor’s Island
CHRONIC INUNDATION

Defined by UCS as flooded once every two weeks.
This is too much.
How Do You Eat An Elephant?

A Sense of Urgency –
High Tide in Dorchester

1. Create a sense of urgency
2. Build a Guiding Coalition
3. Form a Strategic Vision & Initiatives
4. Enlist a Volunteer Army
5. Enable Action by Removing Barriers
6. Generate Short-Term Wins
7. Sustain Acceleration
8. Institute Change

Source: John Kotter’s 8 Steps for Change Management
Build a Coalition

- New eyes & veterans
- Non-traditional partnerships
- Passion, skillsets, connections
- Get to know your audience!
  - Religious and political views
  - Local traditions and culture
  - Community values

1. Create a sense of urgency
2. Build a Guiding Coalition
3. Form a Strategic Vision & Initiatives
4. Enlist a Volunteer Army
5. Enable Action by Removing Barriers
6. Generate Short-Term Wins
7. Sustain Acceleration
8. Institute Change
Form Strategic Initiatives

- Where a diverse coalition can make the difference!

- Our vision:
  - Ensure a **resilient** community through planning, code development, and hazard mitigation projects
  - Provide **education** and **technical assistance** to affected communities
  - Support **historical** and **cultural** mitigation projects
  - Identify and implement **economic strategies** to enhance resiliency

1. Create a sense of urgency
2. Build a Guiding Coalition
3. Form a Strategic Vision & Initiatives
4. Enlist a Volunteer Army
5. Enable Action by Removing Barriers
6. Generate Short-Term Wins
7. Sustain Acceleration
8. Institute Change
Enlist a Volunteer Army

- They came to us! (All we had to do was listen.)
- Broad, diverse coalition!
- Education/research/academic institutions, state agencies, non-profits with technical expertise
  - Maryland Extension/Sea Grant
  - MDE, MDP
  - Georgetown Climate Center
  - Eastern Shore Climate Adaption Partnership
  - Local municipalities, Dorchester Citizens for Planned Growth

1. Create a sense of urgency
2. Build a Guiding Coalition
3. Form a Strategic Vision & Initiatives
4. Enlist a Volunteer Army
5. Enable Action by Removing Barriers
6. Generate Short-Term Wins
7. Sustain Acceleration
8. Institute Change
Removing Barriers

- Streamlined government
- Hazard mitigation planning committee
- Take the meetings to your community
- New Revived Methodist Church meetings
- Making time
- Gathering Data (Shoreline Change, ESCAP Initiatives, 911 Center)

1. Create a sense of urgency
2. Build a Guiding Coalition
3. Form a Strategic Vision & Initiatives
4. Enlist a Volunteer Army
5. Enable Action by Removing Barriers
6. Generate Short-Term Wins
7. Sustain Acceleration
8. Institute Change
Short Term Wins

- County hazard profile review process
- Authorization to address *High Tide*, coordinated messaging
- Including sea level rise/climate change in adopted hazard mitigation plan
- Cultural and Historic Mitigation Plan discussions
Sustaining Acceleration

- Change in leadership
- Economic sustainability - make a half empty glass half full?
  - FEMA changes in mitigation prioritization
- Interest between crises (welcome to the life of an EM!)

1. Create a sense of urgency
2. Build a Guiding Coalition
3. Form a Strategic Vision & Initiatives
4. Enlist a Volunteer Army
5. Enable Action by Removing Barriers
6. Generate Short-Term Wins
7. Sustain Acceleration
8. Institute Change
Institute Change

- CRS (grassroots, improved and sustained – CRS 6, 20% discount – only County on the shore!)
- Local awareness & understanding
- Plans: Comp, Cultural & Historic
- Transfer Development Rights Program
- Mitigation Projects (government and self-funded)
- Community engagement

1. Create a sense of urgency
2. Build a Guiding Coalition
3. Form a Strategic Vision & Initiatives
4. Enlist a Volunteer Army
5. Enable Action by Removing Barriers
6. Generate Short-Term Wins
7. Sustain Acceleration
8. Institute Change
Example: Critical Area

- Flood risk reduction is a benefit to the Critical Area
- Modified planting standards based on site conditions to adapt to increased flooding
  - Salt tolerate plants
  - Trees planted on higher ground or further back to allow establishment
  - Vegetative strips behind revetments to reduce the risk of failure
Flooding and the Critical Area in Dorchester

Encouraging the planting or growth of existing habitat
- Pollinator gardens
- Reducing mown areas
- Shoreline plantings above mean high water to reduce erosion and capture debris when flooding recedes
Resources for Flooding

- www.mdfloodmaps.net
- www.dorchestercountymd.com/planning-zoning/floodplain-information/
- Surveyors/Engineers
- FEMA
- MEMA
- MDE
- SHA
- Academia, Federal programs (Sea Grant, Extension)
- Local non-profits, community organizations/groups
Questions?