Coastal Non-Regulatory RiskMap Products

Jeff Gangai
Introduction

- Changes Since Last FIRM
- Flood Depth and Analysis Grids
- Coastal Specific DataSets
- Estimated Flood Loss
- Areas of Mitigation Interest
Moving Beyond the FIRM

- Utilize FIS Study Data and other existing data sets to determine “risk”
  - Mine underlying data
  - Use geo-processing to create value-added products
  - Categorize risk for each hazard
  - Determine aggregate hazard
  - Overlay on parcel data, building footprints to evaluate vulnerability
Non-Regulatory Flood Risk Products and Datasets

Flood Risk Database

Changes Since Last FIRM Data
Areas of Mitigation Interest
Flood Risk Assessment Data
Flood Depth & Analysis Grids

Flood Risk Map

Ad-Hoc Flood Risk Analyses

Flood Risk Report
Flood Risk Assessment

- Identifies flood-prone areas and vulnerable people and property
- Provides estimate of potential damage
Areas of Mitigation Interest

- Dataset that shows items that may have an impact (positive or negative) on the identified flood hazards and/or flood risks

- Examples include:
  - Riverine and coastal flood control structures (e.g. dams, levees, coastal berms, etc.)
  - At risk essential facilities and emergency routes that could overtopped
  - Stream flow constrictions (e.g. undersized culverts and bridge openings, etc.)
  - Previous assistance and claims “Hot Spots” (clusters of IA and PA claims, RL, SRL)
  - Significant land use changes
  - Significant riverine or coastal erosion
  - Locations of successful mitigation projects

- Enhanced/optional product
Taking Action

- Hazard Mitigation Planning
- Mitigation Activities
- Grant Programs
- Risk Communication

- Adopted a wellhead protection ordinance.
- Vulnerability assessment of water and wastewater infrastructure.
- Elevate, move and acquire flood damaged structures.
- Identify vulnerable critical facilities.
- Implement mitigation measures for repetitive loss properties.
- Require elevation of new structures and substantially improved structures.
- Natural stream restoration
Categories of Flood Mitigation Activities

- **Property Protection Measures**
  - Buy outs
  - Flood proofing
  - Relocation
  - Structure elevation

- **Education and Outreach Measures**
  - Brochures
  - Booths at fairs and festivals
  - Annual meetings

- **Prevention Measures**
  - Flood ordinance
  - Stormwater programs
  - Building codes

- **Natural Resource Protection Measures**
  - Wetland and stream restoration
  - Riparian buffer ordinances

- **Structural Project Measures**
  - Levees
  - Dikes
  - Floodwalls
  - Culvert replacement
  - Bridge Replacement
  - Stream maintenance

- **Emergency Services Measures**
  - Reverse 911
  - Swift water rescue equipment
Coastal RiskMap

- Changes Since last FIRM
- Increased Inundation
- Depth Grids
- Wave Height Grids
- Dune Vulnerability
- Velocity Grids
Project Location
Changes Since Last FIRM

Coastal Non-Regulatory RiskMap Products

June 4, 2014
Changes Since Last FIRM
1% Depth Grid
1% Depth Grid
% Annual Chance of Flooding
Wave Height Grid
Wave Height Grid
Wave Height Severity Areas
Increased Inundation
Dune Heel, Peak, and Toe Lines
Storm Dune Erosion
Storm Dune Erosion
Areas of Mitigation Interest
Putting the Picture Together
Putting the Picture Together

- Higher Waves and Great % chance of annual Flooding
Aggregate Risk Analysis

- Parcels
- Future Shoreline
- Probabilistic Floodplains
- Water Velocity
- Wave Hazard Zones
- Water Depths
- BFE Surface
- Topography
Relative Risk Assessment

Lower Risk

- 100-yr Floodplain
- Low Velocity Zone

Higher Risk

- 3 ft Wave Hazard Zone
- 20-yr Erosion Hazard Zone
- High Wave Velocity Area
- 50-yr Floodplain
Leveraging External Data

Shoreline Change
Sea Level Rise
Dune Failure
Sediment Deposition
Structure Failure
Winds

Debris
Tornados
Earthquakes
Subsidence
Tsunami
Assigning Risk Levels
HAZUS Update – Total Losses
### Community Name Information

<table>
<thead>
<tr>
<th>Community Name</th>
<th>CID</th>
<th>Total Community Population</th>
<th>Percent of Population in Floodplain</th>
<th>Total Community Land Area (sq mi)</th>
<th>Percent of Land Area in Floodplain</th>
<th>NFIP</th>
<th>CRS Rating</th>
<th>Mitigation Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franklin County Unincorporated Areas</td>
<td>120088</td>
<td>8,192</td>
<td>82%</td>
<td>544.6</td>
<td>92%</td>
<td>Y</td>
<td>7</td>
<td>Y</td>
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<tr>
<td>City of Apalachicola</td>
<td>120089</td>
<td>2,230</td>
<td>71%</td>
<td>5.9</td>
<td>68%</td>
<td>Y</td>
<td>10</td>
<td>Y</td>
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<td>City of Carrabelle</td>
<td>120090</td>
<td>1,351</td>
<td>87%</td>
<td>2.5</td>
<td>88%</td>
<td>Y</td>
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### Area of Study

<table>
<thead>
<tr>
<th>Area of Study</th>
<th>Total Area (mi²)</th>
<th>Increase (mi²)</th>
<th>Decrease (mi²)</th>
<th>Net Change (mi²)</th>
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</thead>
<tbody>
<tr>
<td>Within SFHA</td>
<td>553.3</td>
<td>48</td>
<td>14.3</td>
<td>33.7</td>
</tr>
<tr>
<td>Within CHHA (Zone VE or V)</td>
<td>115.7</td>
<td>79.5</td>
<td>2.7</td>
<td>76.8</td>
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</table>

### Coastal Wave Hazard Severity

<table>
<thead>
<tr>
<th>Coastal Wave Hazard Severity</th>
<th>Total Area (mi²)</th>
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</thead>
<tbody>
<tr>
<td>High</td>
<td>100.6</td>
</tr>
<tr>
<td>Moderate</td>
<td>60</td>
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<tr>
<td>Minimal</td>
<td>186.9</td>
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</table>

### Area of Additional Inundation (mi²)

<table>
<thead>
<tr>
<th>Flood Event Frequency</th>
<th>1-ft Increase</th>
<th>2-ft Increase</th>
<th>3-ft Increase</th>
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<tbody>
<tr>
<td></td>
<td>Newly Inundated</td>
<td>Total</td>
<td>Newly Inundated</td>
</tr>
<tr>
<td>1%-annual-chance</td>
<td>17.10</td>
<td>24.40</td>
<td>41.5</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>24.58</td>
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</tbody>
</table>

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Summarizing the Data
## Summarizing the Data

### Estimated Potential Losses for Flood Event Scenarios

<table>
<thead>
<tr>
<th>Total Inventory</th>
<th>10% (10-yr)</th>
<th>2% (50-yr)</th>
<th>1% (100-yr)</th>
<th>0.2% (500-yr)</th>
<th>Annualized ($/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimated Value</td>
<td>% of Total</td>
<td>Dollar Losses</td>
<td>Loss Ratio</td>
<td>Dollar Losses</td>
</tr>
<tr>
<td>Residential Building and Contents Losses</td>
<td>$976,900,000</td>
<td>71%</td>
<td>$29,900,000</td>
<td>4%</td>
<td>$103,200,000</td>
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<tr>
<td>Commercial Building and Contents Losses</td>
<td>$251,000,000</td>
<td>18%</td>
<td>$5,200,000</td>
<td>2%</td>
<td>$29,700,000</td>
</tr>
<tr>
<td>Other Building and Contents Losses</td>
<td>$140,500,000</td>
<td>10%</td>
<td>$6,700,000</td>
<td>6%</td>
<td>$21,800,000</td>
</tr>
<tr>
<td>Total Building and Contents Losses</td>
<td>$1,368,400,000</td>
<td>100%</td>
<td>$41,800,000</td>
<td>3%</td>
<td>$154,700,000</td>
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<tr>
<td>Business Disruption</td>
<td>N/A</td>
<td>N/A</td>
<td>$1,600,000</td>
<td>N/A</td>
<td>$5,200,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$1,368,400,000</td>
<td>100%</td>
<td>$43,400,000</td>
<td>3%</td>
<td>$159,900,000</td>
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### Type of Mitigation Interest

<table>
<thead>
<tr>
<th>Type of Mitigation Interest</th>
<th>Number of Areas</th>
<th>Data Source</th>
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<tbody>
<tr>
<td>Coastal Structures</td>
<td>3,032</td>
<td>FL DEP</td>
</tr>
<tr>
<td>Significant Land Use Changes</td>
<td>17</td>
<td>FL DEP</td>
</tr>
<tr>
<td>Areas of Significant Erosion</td>
<td>17</td>
<td>FEMA</td>
</tr>
<tr>
<td>At Risk Essential Facilities</td>
<td>71</td>
<td>FL DEM</td>
</tr>
<tr>
<td>Other Flood Risk Areas</td>
<td>1,316</td>
<td>FL DEP, FDOT</td>
</tr>
<tr>
<td>Area of Mitigation Success</td>
<td>1</td>
<td>FL DEP</td>
</tr>
</tbody>
</table>
Questions