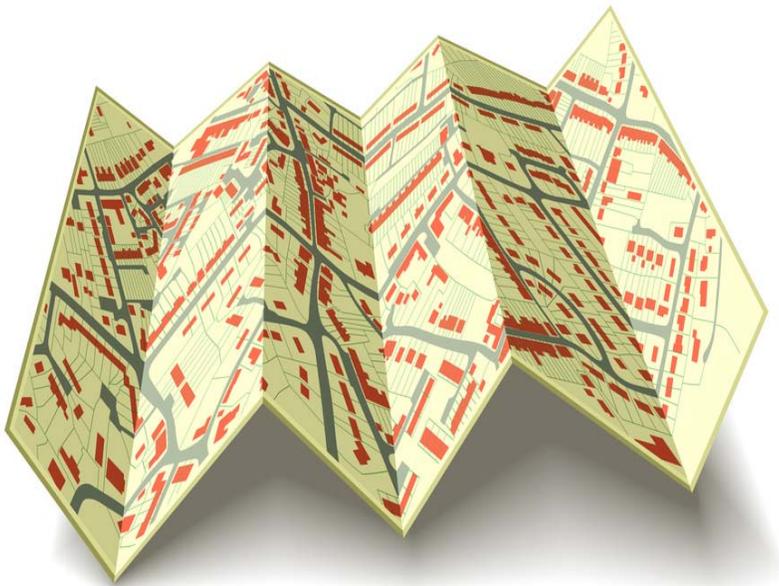


# Roadmap for Adapting to Coastal Risk Training



**NOAA Coastal Services Center**  
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

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## Chapter 1: Introduction

## Introduction

### Objectives

After taking this training, participants should be able to:

- List sources for acquiring hazard, climate, socioeconomic, and ecological data and information for your community
- Summarize the steps for creating roadmap profiles
- Recognize strategic approaches that can be used in decision-making
- Understand why collaboration across disciplines is most effective
- Identify a few next steps

### What is a Roadmap?

- The Roadmap for Adapting to Coastal Risk is a participatory assessment and planning process for integrating current and future hazard considerations into local planning and decision making. The Roadmap process results in a Roadmap action plan.

### The Roadmap Process

- Step 1: Identify Local Drivers
- Step 2: Build a Hazards Profile
- Step 3: Build a Societal Profile
- Step 4: Build an Infrastructure Profile
- Step 5: Build an Ecosystem Profile
- Step 6: Identify Strategic Actions



## What risk information should I use in the assessment?

A Media Gallery Approach

- **Maps:** portray elements spatially and help visualize connections
- Charts, tables
- Photographs
- Local stories
- Historical knowledge
- Perspectives

Remember, most if the information you will need already exists.



Choose information and data *depending on* what you are trying to accomplish

## Who should be involved?

- Multi-disciplinary approach
- Different perspectives strengthen the process
- Collaborate



For Notes

## **Chapter 2**

### **Step 1: Identify Local Drivers**

## Step 1: Identify Local Drivers

*Objective: Connect to relevant issues & ensure there are opportunities for integrating assessment into planning efforts*

- Why are doing an assessment? Define why you are interested and/or involved in hazard risk and vulnerability assessment and planning.
  - Are their high priority issues the community is dealing with such as water supply concerns?
  - Are their current planning efforts, such as a capital improvements or comprehensive plan updates that could incorporate risk and vulnerability priorities?

**Why are you doing an assessment?**

### Step 1a: Identify relevant, ongoing issues

- Connect to relevant issues
- What issues need to be addressed?
  - hazard or climate trends and impacts
  - significant or repetitive local hazard events
  - water supply availability and quality as impacted by climate or hazards
  - infrastructure failures or issues
  - environmental/natural resources threats as impacted by climate or hazards
  - growth management in high risk areas

### Step 1b: Identify integration opportunities

**Can the results be integrated into planning?**

- economic development
- transportation
- recreation
- historic preservation



- housing
- land use
- capital improvements
- infrastructure
- stormwater management
- open space and recreation
- cultural resources
- natural resources

## Explore Miami-Dade County Example

Why is Miami-Dade County so vulnerable?

- Historic wetlands
- Surrounded by water
- Large, dense population
- Limited areas where population can live

What are its key economic drivers?

- Tourism
- Agriculture



### **Miami-Dade County Local Issues** (*Step 1a: Identify relevant, ongoing issues*)

- Identifying impacts of current and projected climate trends (precipitation, temperature, severe storm events, sea level rise) on county operations.
- Protecting the aquifer from salt water intrusion and preventing or minimizing flooding in low-lying areas as sea level rises.
- Identifying adaptation planning strategies that can provide multiple benefits and result in “no regrets” regardless of the uncertainties in local climate projections.
- Integrating hazards and climate risk considerations and adaptation strategies into local actions policies, codes, programs, and capital investments.

### Miami-Dade Integration Opportunity (*Step 1b: Identify integration opportunities*)

- Sustainability assessment planning
- Miami-Dade is currently developing a sustainability plan through their Office of Sustainability. They wanted to incorporate risk and vulnerability priorities into this planning process. The Roadmap workshop enabled them to determine and prioritize several key priorities to focus their efforts.

To learn more about this process visit, Miami-Dade County – GreenPrint [www.miamidade.gov/greenprint/home.asp](http://www.miamidade.gov/greenprint/home.asp)  
**For Notes**



**GOALS**

- Improve regional collaboration in adaptation planning
- Create climate change scenarios for planning within 6 months
- Educate & engage community & elected officials to obtain buy-in in planning process
- Analyzing Cost of Action vs. Inaction
- Shifting population from “Prepare & Recover” mode, to long-term adaptation mode

green.miamidade.gov

## Activity



*We want to hear from you.*

### Directions

1. What drivers or local issues are your community trying to address related to hazards and climate change?
2. In the “Chat”, answer the following question:

For Notes

## **Chapter 3**

### **Step 2: Build a Hazards Profile**

## Step 2: Build a Hazards Profile

### Objective:

#### Step 2a: Identify and examine current and past hazard risks

- Identify past hazards events and impacts
- Identify current hazard risks and high risk areas



The big disaster events always seem to get everyone's attention, however those are usually tied with Federal funding to help in recovery. What about those small, routine events (like flooding from high tides) that your community has to deal with. Don't forget about operational impacts and costs of those smaller, routine events, they add up and impact your budgets.

#### What do you need to know about current and future hazards?

- Current risks
- Actual and potential impacts
- Trends likely to affect these impacts

#### Step 2b: Explore climate trends and issues

- Climate trends and considerations
- Climate projections and potential impacts

#### Using climate trends in planning

- What relevant trends have we observed and what can we reasonably expect?
- How do these trends affect key hazard risks?
- What information can help inform decision-making?

#### Climate Trends and Projections

**Global atmosphere and ocean temperatures** are **rising** – all observations confirm this trend although there are regional differences in amounts. Global temperature increases affect weather in numerous ways.



**Precipitation** is likely to both increase and decrease. Most projections indicate that rainfall intensity is likely to increase (increasing flood threats) while total precipitation is likely to decrease (especially in some regions).



Projected effects on **hurricanes and storms** are also mixed. There will **continue to be variability and extreme events**.



**Sea levels are rising** and **will continue to rise**. All observations confirm this trend and there are indicators that sea levels are rising at rates in the higher ranges of the conservative IPCC estimates.



**Consider effects on variability, extremes, and hazard risks**

- What are the anticipated impacts of climate change?
- The challenge is to get to enough information about likely impacts that you can determine if, how, and when they should be considered in your hazards planning.
- When it comes to considering climate effects, it is all about the anticipated impacts – what does the information REALLY mean in terms of affecting risks of hazards, locations of high hazard areas, and overall vulnerability to them?
- Planning to a “new normal” doesn’t automatically mean changing current decisions or priorities.

- What level of risk are you willing to manage?

### **Step 2c: Identify relevant decision processes that can be better informed about risks**

- Hazards are linked to a wide range of community issues and impacts
- What decisions need to be better informed and how?

#### **Possibilities...**

- Public safety
- Public health
- Infrastructure
- Transportation
- Land use planning
- Coastal permitting
- Development standards
- Public works
- Economic development
- Building codes
- Engineering
- Water quality
- Water availability
- Energy
- Social services
- Agriculture
- Port operations
- Tourism & recreation
- Insurance availability
- Public housing
- Natural resources
- Education

### **Step 2d: Identify gaps in information**

- What are the gaps in information needed to make better-informed decisions?
  - Information and data

- Visualization & communication – the risks and their impacts may not be reaching audiences
- Uncertainty and change
  - Trends (what's being suggested or modeled to happen)
  - Using identified vulnerabilities to help understand the impacts
  - Scenarios, what if's or how much

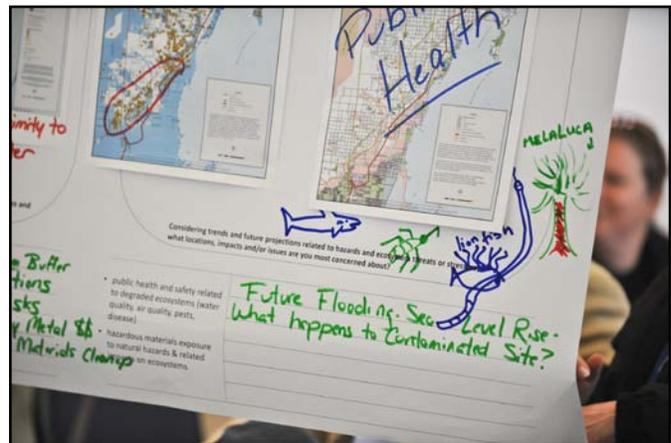
## Explore Miami-Dade County Example

### 1. Miami-Dade County Priority Current (Step 2a: Identify and Examine Current and Past Hazard Risks)

- Shallow coastal flooding
- Storm surge inundation
- Salt water intrusion
- Flooding
- Erosion
- Sea level rise impacts on above hazards

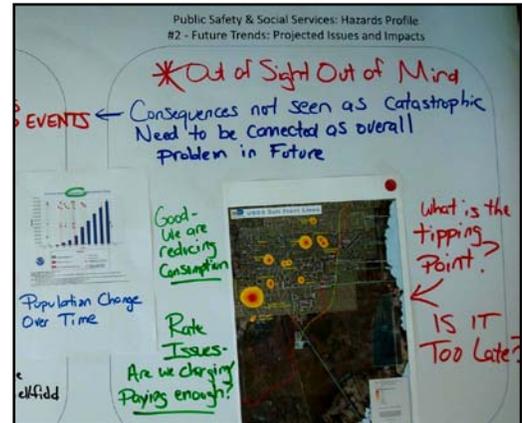
### 2. Miami-Dade County Priority Future Hazard Concerns (Step 2b: Explore Future Conditions and Step 2c: Consider how future conditions may impact hazards)

- Sea level rise impacts on above hazards
- Salt water intrusion
- More frequent rain events



### 3. Miami-Dade County Hazards Information Gaps, Needs, and Issues (Step 2d: Identify hazard risk information needs, gaps, and issues)

- **Data gaps:** Standardized sea level rise planning scenarios
- **Communication issues:**
  - Consequences not seen as catastrophic or urgent
  - Current and future hazards not in the forefront of people's minds
  - Certain data (i.e. salt front line) does not get people's attention like a storm surge zone map



## Activity



*We want to hear from you.*

1. Is your community considering climate change impacts in its current planning efforts?
2. Which hazards is your community most concerned about?
  - Flooding
  - Sea level rise
  - Salt water intrusion
  - Storm surge
  - Winter storms
  - Other – please specify

## What Resources Are Available to Help?

### Start with your state or location

- Hazard mitigation plan or floodplain management plan. [www.fema.gov/about/contact/shmo.shtm](http://www.fema.gov/about/contact/shmo.shtm) These plans provide hazards information such as location of hazard risks, location of past events, number of occurrences, impacts, and estimated losses. Contact your state hazard mitigation officer for more information
- View FEMA flood data in Google Earth  
<https://hazards.fema.gov/femaportal/wps/portal/NFHLWMSkmzdownload>
- Coastal County Snapshots [www.csc.noaa.gov/digitalcoast/tools/snapshots/index.html](http://www.csc.noaa.gov/digitalcoast/tools/snapshots/index.html) – Provides local officials with a quick look at a county's demographics, infrastructure, and environment within the flood zone.
- Historical Hazard Information and Impacts <http://webra.cas.sc.edu/hvri/products/sheldus.aspx> – Spatial Hazard Events and Losses Database for the United States (SHELDUS) – provides by county number of hazard occurrences, property and crop losses in dollars, injuries, and fatalities.
- FEMA flood data – <http://msc.fema.gov/>

### Requires GIS Software

- Create your own inundation maps – Digital Coast Inundation Toolkit  
[www.csc.noaa.gov/digitalcoast/inundation/map/index.html](http://www.csc.noaa.gov/digitalcoast/inundation/map/index.html)

**Local knowledge** on hazard events and impacts (library, newspaper, personal interviews)

### Weather and Climate Information and Data

- National Weather Service Weather Forecast Office or State Climatologist – [www.stateclimate.org/](http://www.stateclimate.org/)
- U.S. Global Change Research Program Regional Climate Information – [www.globalchange.gov/](http://www.globalchange.gov/)
- NOAA Sea Level Trends – <http://tidesandcurrents.noaa.gov/sltrends/sltrends.shtml>
- Regional modeling or scenario/projections – The Consortium for Atlantic Regional Assessment – [www.cara.psu.edu/climate/models.asp](http://www.cara.psu.edu/climate/models.asp)
- IPCC Fourth Assessment Report – [www.globalchange.gov/publications/reports/ipcc-reports](http://www.globalchange.gov/publications/reports/ipcc-reports)
- Coastal Climate Adaptation Website – <http://community.csc.noaa.gov/climateadaptation/>

## Possible Next Steps

- Identify existing data or information sources: Hazard mitigation plans, floodplain management plans
- Learn your hazards history: start with the Spatial Hazard Events and Losses Database for the United States <http://webra.cas.sc.edu/hvri/products/sheldus.aspx>
- Talk to people in your community to see what's going on related to planning or hazards they have experienced (planners, hazards planners, citizens, elected officials, natural resource managers, etc.)
- Visit the Digital Coast Inundation Toolkit to learn more about resources to help you address inundation issues [www.csc.noaa.gov/digitalcoast/inundation/](http://www.csc.noaa.gov/digitalcoast/inundation/)
- Use the NACo County Issue Brief to learn how tools can be used to address current and future hazard issues and impacts [www.naco.org/digitalcoastbrief](http://www.naco.org/digitalcoastbrief)

For Notes

## **Chapter 4**

### **Step 3: Build a Societal Profile**

## Step 3: Build a Societal Profile

*Objective: Identify societal vulnerabilities, future trends, relevant policies, and priority actions*

### Step 3a: Identify local societal vulnerability concerns

#### 1. Identify factors affecting population vulnerability

- Poverty & resource availability
- Elderly populations
- Children
- Health & disabilities
- Transportation access
- Exposure in high hazard area



#### 2. Identify local resilience factors & conditions

- Community engagement
- Cultural cohesion
- Social networks
- Sense of place
- Community identity

### Step 3b: Identify trends and future conditions affecting societal vulnerability

- Considering projected population conditions along with projected climate trends and effects, what locations, impacts and/or issues are you most concerned about?

### Step 3c: Identify relevant policies and decisions

- What policy areas directly affect societal vulnerability and resilience?

### Step 3d: Identify overall strategies and near-term actions that can help reduce societal vulnerabilities

- What are the key actions needed to address your main concerns?

## Explore Miami-Dade County Example

### **Miami-Dade Current and Future Societal Vulnerabilities and Concerns** (*Step 3a: Identify local societal vulnerability concerns and Step 3b: Identify trends and future conditions affecting societal vulnerability*)

- Large portions of the county have economic issues that impact the ability to recover or be resilient against hazards impacts
- Population growth – Will there be enough services available as development increases?
- Environmental justice impacts – hazardous materials located in densely populated, poor areas
- Correlation between repetitive loss and special needs populations
- Not a common message across the county. Community members look to County for leadership
- Diversity and cultural difference (e.g. Native American population) and their influence in decision-making. Better connect with these groups
- As resources become scarcer or more expensive, will all populations have access or be able to afford to basic utilities (water, sewer, transportation)?

### **Miami-Dade Improving Decisions Ideas** (*Step 3c: Identify relevant policies and decisions*)

- Sustainability Planning – could become the framework for a positive message to take action (a no regrets approach)
- Learn what sustainability means to different populations and determine how to incorporate that into mechanism for lessening issues and impacts
- Maintain the urban development boundary to contain expansion of services

### **Miami-Dade Action Ideas** (*Step 3d: Identify overall strategies and near-term actions that can help reduce societal vulnerabilities*)

- Need to take a county-wide approach to addressing the issues
- Create a common message and outreach on the issues and impacts

- Better use of the Community Rating System program to reduce vulnerabilities and help citizens (elevate houses)

### Activity



We want to hear from you...

#### Activity 1: Current Concerns

##### Directions

1. Open the file named **roadmap\_activities.ppt**
2. Navigate to slide 10 “Activity 3: Build a Societal Profile; Step 3a: Current Concerns”
3. Toggle between slide 11 and 12 (*Maps: % population in poverty and flood zones*)
4. Answer the following question: what are some issues or impacts of impoverished populations exposed to flooding?
5. Type your answer in the “Chat.”

#### Activity 2: Future Concerns

##### Directions

1. In the **roadmap\_activities.ppt**
2. Navigate to slide 13, “Activity 3: Build a Societal Profile, Step 3b: Future Concerns”
3. Toggle between slide 14 and 15 (*Maps: population density and sea level rise potential*)
4. Answer the following question: What are some future concerns or impacts associated with population density and sea level rise potential?
5. Type your answer in the “Chat.”

#### Activity 3: Decision-Process

1. In the **roadmap\_activities.ppt**

2. Navigate to slide 16, “Activity 3: Build a Societal Profile, Step 3c: Identify relevant policies and decisions”
3. Answer the following question: List a planning process or program that would be better informed by societal vulnerability information.
4. Type your answer in the “Chat.”

### Activity 4: Next Steps and Actions

1. In the **roadmap\_activities.ppt**
2. Navigate to slide 17, “Activity 3: Build a Societal Profile, Step 3d: Next Steps and Actions”
3. Answer the following question: What are some actions you can take to begin to address societal vulnerabilities?
4. Type your answer in the “Chat.”

## What Resources Are Available to Help?

### Nationally Available Population Vulnerability Information Resources

- Coastal County Snapshot – [www.csc.noaa.gov/digitalcoast/tools/snapshots/](http://www.csc.noaa.gov/digitalcoast/tools/snapshots/)
- Social Vulnerability Index (SOVi) – [http://webra.cas.sc.edu/hvriapps/SOVI\\_Access/SoVI\\_Access\\_Page.htm](http://webra.cas.sc.edu/hvriapps/SOVI_Access/SoVI_Access_Page.htm)
- *Census.gov* – 2000 Census data
- Spatial Trends in Coastal Socioeconomics <http://marineeconomics.noaa.gov/socioeconomics/>

### Requires GIS Software

- Digital Coast Inundation Toolkit – create your own socio-economic data  
[www.csc.noaa.gov/digitalcoast/inundation/pdf/census\\_methodology.pdf](http://www.csc.noaa.gov/digitalcoast/inundation/pdf/census_methodology.pdf)

**Local Population Vulnerability Information Resources** – usually the most accurate and up-to-date socio-economic information is available through local, regional and/or state planning organizations, data centers and GIS organizations. The following resources are likely to provide the types of information and the organizations responsible will generally have access to the GIS data in addition to hard copy maps and information resources.

### Possible next steps

- Contact your county social services department to learn about population vulnerabilities and programs that may be available to help vulnerable populations.
- Start learning who is exposed to hazards and what causes societal vulnerabilities

### For Notes

## **Chapter 5**

### **Step 4: Build an Infrastructure Profile**

## Step 4: Build an Infrastructure Profile

*Objective: Identify infrastructure vulnerabilities, future development trends & issues, relevant policies, and actions for reducing impacts*

### Step 4a: Identify local infrastructure vulnerability factors and conditions

What locations, impacts and/or issues are you most concerned about?

#### 1. Key infrastructure to consider assessing

- Transportation (e.g. roads, bridges, transit, multimodal)
- Emergency facilities (e.g. shelters, hospitals, police stations)
- Special population facilities (e.g. nursing homes, homeless shelters, etc.)
- Public infrastructure & utilities (e.g. water, sewer, communications, solid waste, flood control structures, stormwater structures)
- Economic infrastructure (e.g. major employers, economic sectors, economic resources)
- Housing Infrastructure (e.g. neighborhoods, homes, apartments, etc.)



#### 2. Identify factors affecting vulnerability

- Location relative to hazards
- Function or service demands/importance
- Construction practices
- Age of structure
- Major employer or economic sector
- Housing type, age
- Repetitive losses
- Density, zoning
- Redundancy

### Step 4b: Identify trends and issues affecting future infrastructure vulnerability

- Considering climate trends and their projected effects on hazards, what locations, impacts and/or issues are you most concerned about?

### Step 4c: Identify relevant policies and decisions

- What policy areas directly affect infrastructure vulnerability?
- Considering your main concerns and responsibilities, what are some of the key decision-making processes that need to be better informed about risks?
- The incremental cost of infrastructure improvement to handle future growth and climate variation is usually minimal compared to the total cost of the project.
- Adaptation is an ongoing process that will take years – it does not need to be done all at once – make it part of routine planning, infrastructure maintenance and improvements.

### Step 4d: Identify overall strategies and near-term actions that can help reduce infrastructure vulnerabilities

- What are the key actions needed to address your concerns?

## Explore Miami-Dade County Example

### **Miami-Dade infrastructure vulnerabilities and concerns** (*Step 4a: Identify local infrastructure vulnerability factors and conditions*)

- Aging infrastructure
- Impacts to storm water management
- Drinking water supply/treatment plants
- \$6 million spent each year on beach renourishment
- Port in a high risk area

### **Miami-Dade future infrastructure vulnerabilities and concerns** (*Step 4b: Identify trends and issues affecting future infrastructure vulnerability*)

- What is the life of the current structures?
- Planned development

### **Miami-Dade Improving Decisions Ideas** (*Step 4c: Identify relevant policies and decisions*)

- Create ordinances that limit development in hazard prone areas
- Climate change is showing up in plans, but is not always enacted on in decision-making
- Educate permitting staff and commissioners about placing new facilities in hazardous areas
- Look at long term vulnerability in county master plans
- Engineering processes need to have hazards and sea level rise as a criteria in engineering and design standards

### **Miami-Dade Action Ideas** (*Step 4d: Identify overall strategies and near-term actions that can help reduce infrastructure vulnerabilities*)

- Prioritize infrastructure funding based on climate change information
- Institutionalize green spaces and redevelop green spaces along coast
- Implement more green infrastructure solutions
- Alter zoning to consider hazards
- Integrate climate change into master planning process and engineering processes
- Capital improvement considerations – include vulnerability assessment
- Funding – consider rates and fees, leverage funding sources from other departments, since many issues are interconnected

## Activity



We want to hear from you...

### **Directions**

1. Open the file named **roadmap\_activities.ppt**
2. Navigate to slide 19, “Activity 4: Build an Infrastructure Profile, Step 4a: Current Concerns”
3. Toggle between slide 20 and 21 (*Maps: critical infrastructure and FEMA flood zones*)
4. Answer the following question: What are some issues or impacts associated with infrastructure exposed to flooding?

5. Type your answer in the “Chat”

## Activity 2: Future Concerns

### Directions

1. In the **roadmap\_activities.ppt**
2. Navigate to slide 22, “Activity 4: Build an Infrastructure Profile, Step 4a: Future Concerns”
3. Toggle between slide 23 and 24 (*Maps: water supply infrastructure and sea level rise potential*)
4. Answer the following question: What are some future concerns associated with water supply infrastructure exposed to flooding from sea level rise?
5. Type your answer in the “Chat.”

## Activity 3: Decision-Process

1. In the **roadmap\_activities.ppt**
2. Navigate to slide 25, “Activity 4: Build an Infrastructure Profile, Step 4c: Identify relevant policies and decisions”
3. Answer the following question: what are some plans or policies that could help improve infrastructure vulnerabilities?
4. Type your answer in the “Chat.”

#### Activity 4: Actions

1. In the **roadmap\_activities.ppt**
2. Navigate to slide 26, “Activity 4: Build an Infrastructure Profile, Step 4d: Next Steps and Actions ”
3. Answer the following question: what are some actions or next steps that could help reduce infrastructure vulnerabilities?
4. Type your answer in the “Chat.”

## What Resources Are Available to Help?

1. *Nationally Available Information Resources* – **HAZUS**: FEMA’s Methodology for Estimating Potential Losses from Disasters. Potential loss estimates analyzed in HAZUS-MH include:

- Physical damage to residential and commercial buildings, schools, critical facilities, and infrastructure;
- Economic loss, including lost jobs, business interruptions, repair and reconstruction costs; and
- Social impacts, including estimates of shelter requirements, displaced households, and population exposed to scenario floods, earthquakes and hurricanes.
- Federal, State and local government agencies and the private sector can order HAZUS-MH free-of-charge from the FEMA Publication Warehouse. <http://www.fema.gov/plan/prevent/hazus/index.shtm>

2. *Local Information Resources* – usually the most accurate and up-to-date facility information is available through **local, regional and/or state planning, emergency management and GIS organizations**. The following resources are likely to provide the types of information and the organizations responsible will generally have access to the GIS data in addition to hard copy maps and information resources.

- Hazard Mitigation Plans – shows locations and types of critical facilities including emergency services, special needs facilities, and other relevant facilities and infrastructure.
- Transportation Plans – shows locations and types of transportation systems as well as locations for future projects
- Land Use Plans – shows current and future land uses

- Capital Improvements Plans – shows locations and types of capital improvements as well as locations for future projects

**For Notes**

## **Chapter 6**

### **Step 5: Build an Ecosystem Profile**

## Step 5: Build an Ecosystem Profile

*Objective: Identify ecosystem resources & stressors, future trends, relevant policies, and priority actions*

### Step 5a: Identify key natural resources & conditions

- Key natural resources providing **protective functions**: storm buffering, flood protection, erosion control (saltwater and freshwater marshes, mangroves, dunes, barrier islands, etc.), and climate regulation
- Key natural resources providing other **critical economic and societal value**
  - drinking water supply
  - water quality
  - wildlife habitat
  - food production
  - recreation and culture
  - livelihoods



**Ecosystem services?  
Resources the natural environment provides us**

### Step 5b: Identify ecosystem resource stressors

- Hazardous materials
- Incompatible land uses
- Habitat fragmentation
- Environmental degradation
- Stormwater runoff
- Development practices

Just like a person who gets sick or injured...if you're healthy before you get sick or injured, your recovery is generally easier and faster than if you're already in poor health at the time that you're injured. The same is true for the environment and for communities as a whole.

**Step 5c: Identify trends and issues affecting the future health & sustainability of key natural resources**

- Where is future development going to occur?
- How will future conditions impact the health of natural resources?

**Step 5d: Identify relevant policies and decisions**

- What policy areas directly affect the health & sustainability of key natural resources?

**Step 5e: Identify overall strategies and near-term actions that can help improve the health & sustainability of key natural resources**

- What can you do now to protect current natural resource health and sustainability?

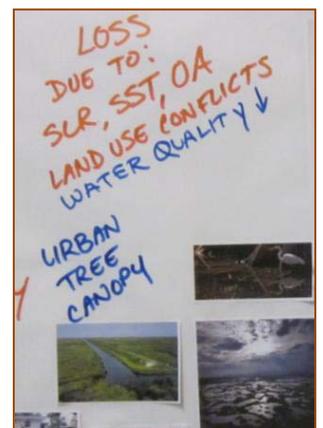
Explore Miami-Dade County Example

**Miami-Dade ecosystem vulnerabilities and concerns** (Step 5a: Identify key natural resources & conditions and Step 5b: Identify ecosystem resource stressors)

- Water quality
- Protective functions
- Economic impacts (tourism, agriculture production, beach access, maintaining functioning floodplains and wetlands)

**Miami-Dade future ecosystem vulnerabilities and concerns** (Step 5c: Identify trends and issues affecting the future health & sustainability of key natural resources)

- Current situations will only get worse with sea level rise, increased population and natural resource demands
- Changing ecosystems and their ability to respond to climate change



### **Miami-Dade Improving Decisions Ideas** (Step 5d: Identify relevant policies and decisions)

- Collaboration among agencies to protect and sustain natural resources
- Need to help others better understand linkages between natural resources benefits to society and economy
- Better connect future development demands with natural resources
- Stricter policies on urban development boundary

### **Miami-Dade Action Ideas** (Step 5e: Identify overall strategies and near-term actions that can help improve the health & sustainability of key natural resources)

- Reduce conflicts by using an ecosystem based management style land use planning
- Modify current codes to enable alternative development styles and greener practices
- Incentives for sustainable development
- Better connect natural and built environments – Green infrastructure planning
- Create more open and natural spaces

## Activity



We want to hear from you...

### **Activity 1**

#### **Directions**

1. Open the file named **roadmap\_activities.ppt**
2. Navigate to slide 28, “Activity 5: Build an Ecosystem Profile, Step 5a: Current Concerns”
3. Toggle between slide 29 and 30 (*Maps: natural areas and flood zones*)
4. Answer the following question: What are some issues or impacts associated with natural areas exposed to flooding?
5. Type your answer in the “Chat”

#### **Directions**

1. In the **roadmap\_activities.ppt**

2. Navigate to slide 31, “Activity 5: Build an Ecosystem Profile, Step 5a: Current Concerns”
3. Toggle between slide 32 and 33 (*Maps: land cover and drinking water protection areas*)
4. Answer the following question: What are some issues or impacts associated with ecosystem resources and land use practices?
5. Type your answer in the “Chat”

### Activity 2: Future Concerns

#### Directions

1. In the **roadmap\_activities.ppt**
2. Navigate to slide 34, “Activity 5: Build an Ecosystem Profile, Step 5c: Future Concerns”
3. Toggle between slide 35, 36, (*Maps: drinking water supply areas and sea level rise potential*)
4. Answer the following question: what are some future concerns associated with water supply and sea level rise?
5. Type your answer in the “Chat.”

### Activity 3: Decision-Process

1. In the **roadmap\_activities.ppt**
2. Navigate to slide 25, “Activity 5: Build an Ecosystem Profile, Step 4d: Identify relevant policies and decisions”
3. Answer the following question: what are some plans that could help improve the health & sustainability of key natural resources?
4. Type your answer in the “Chat.”

### Activity 4: Actions

1. In the **roadmap\_activities.ppt**
2. Navigate to slide 26, “Activity 5: Build an Ecosystem Profile, Step 4d: Next Steps and Actions ”
3. Answer the following question: what are some actions or next steps that could help reduce ecosystem vulnerabilities?
4. Type your answer in the “Chat.”

## What Resources Are Available to Help?

- CCAP Land cover atlas – [www.csc.noaa.gov/digitalcoast/data/ccaphighres/index.html](http://www.csc.noaa.gov/digitalcoast/data/ccaphighres/index.html)
- Habitat Priority Planner – [www.csc.noaa.gov/digitalcoast/tools/hpp/index.html](http://www.csc.noaa.gov/digitalcoast/tools/hpp/index.html)
- Sea Level Affecting Marshes Model – [www.csc.noaa.gov/digitalcoast/tools/slamm/index.html](http://www.csc.noaa.gov/digitalcoast/tools/slamm/index.html)
- Coastal geospatial data sets – [www.csc.noaa.gov/digitalcoast/](http://www.csc.noaa.gov/digitalcoast/)
- Green Infrastructure – [www.greeninfrastructure.net](http://www.greeninfrastructure.net)
- The Value of Open Space: How Preserving North Carolina’s Natural Heritage Benefits Our Economy and Quality of Life  
[http://cdn.publicinterestnetwork.org/assets/oSOvKX4zqDh5BDq01IZDw/Value\\_Open\\_Spaces.pdf](http://cdn.publicinterestnetwork.org/assets/oSOvKX4zqDh5BDq01IZDw/Value_Open_Spaces.pdf)
- Economic Benefits of Natural Land Conservation: Case Study of Northeast Florida  
[www.economicimpact.ifas.ufl.edu/publications/NE%20Fla%20Project%20Final%20Report.pdf](http://www.economicimpact.ifas.ufl.edu/publications/NE%20Fla%20Project%20Final%20Report.pdf)

- An Ecological Economic Assessment of King County's Flood Hazard Management Plan  
[www.floods.org/npublicdocumentlibrary/dkfiledownload.asp?ftpfile=committees%5CEcological\\_Economics\\_Assessment\\_of\\_King\\_County\\_Flood\\_Hazard\\_Management\\_Plan.pdf](http://www.floods.org/npublicdocumentlibrary/dkfiledownload.asp?ftpfile=committees%5CEcological_Economics_Assessment_of_King_County_Flood_Hazard_Management_Plan.pdf)
- Putting A Price on Riparian Corridors As Water Treatment Facilities  
[www.waterboards.ca.gov/sanfranciscobay/water\\_issues/programs/watershed/Riley\\_2009.pdf](http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/watershed/Riley_2009.pdf)
- Contact your Department of Natural Resources or Coastal Management Program

### For Notes

## **Chapter 7**

### **Step 6: Identify Strategic Actions**

## Identify Strategic Actions

- Identify strategic approaches for pursuing long-term goals and near-term actions
- How can you enable better decisions and still move forward?

### “Win-Win” with higher standards

- Coastal No Adverse Impacts (CNAI)
  - “Do no harm” legal framework
  - Basic, Better, NAI-level standards
  - Higher standards save money on losses and address future risks

### “Win-Win” with conservation

- Green Infrastructure – regional scale approaches can manage stormwater and preserve key ecosystem services

### “Win-Win” with smart growth

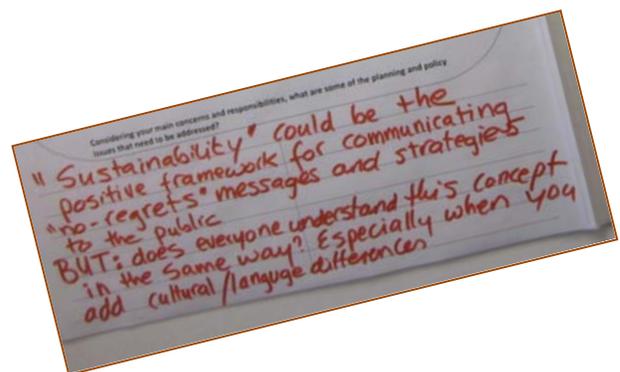
- Take advantage of compact building design
- Foster distinctive, attractive communities with a strong sense of place
- Preserve open space, farmland, natural beauty, and critical environmental areas

### Is it Actionable?

- When it comes to the information you produce as a result of this process, you will especially want to consider this. Can you use it; actually use it to help you make better decisions? If it doesn’t contribute to improved decision-making, it is likely to dilute your message and may create unnecessary confusion or even conflict.
- Use your hazard and vulnerability information wisely or it will be viewed as laundry list of problems or potential problems that are simply too overwhelming to address.

## Explore Miami-Dade Example

- GreenPrint will help bring together all the issues identified in the workshop
- Prioritize the actions
- No regrets through sustainability framework



## Activity



We want to hear from you...

Identify options your community is implementing or considering implementing that can help address risk and vulnerability issues.

- Smart Growth
- Green Infrastructure
- Higher flood management standards
- Other – please describe your approach or an idea

## Next steps

### Taking the first steps

- Improve existing processes
- Strengthen current initiatives
- Build effective collaborations

## Activity



We want to hear from you...

1. Use the “Polling” to answer the following question
2. Which next step will you take to begin addressing hazard and climate change concerns in your community?
  - Talk to a planner about available hazards data and information
  - Check out some of the resources provided in the training manual
  - Identify what others are doing related to this topic and identify potential collaboration opportunities
  - Learn more climate extremes, variability, and impacts to hazards
  - Take a training or learn more about one of the strategic “win-win” approaches (green infrastructure, CNAI, smart growth) mentioned in this training

## What Resources Are Available To Help?

- The Conservation Fund's Green Infrastructure Leadership Program – <http://www.greeninfrastructure.net/>
- Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways – <http://www.unl.edu/nac/bufferguidelines>
- GIS Tools for Strategic Conservation Planning Training – teaches students how to apply geographic information system (GIS) tools, methodologies, and analyses to strategic conservation planning using a "green infrastructure" approach. [http://www.csc.noaa.gov/training/gis\\_tools.html](http://www.csc.noaa.gov/training/gis_tools.html)
- Coastal No Adverse Impact Handbook – <http://www.floods.org/index.asp?menuid=340>
- Roadmap for Adapting to Coastal Risk Training – [www.csc.noaa.gov/digitalcoast/inundation/assess.html](http://www.csc.noaa.gov/digitalcoast/inundation/assess.html)
- No Adverse Impact Approaches to Floodplain Management Using the Digital Coast – [www.csc.noaa.gov/digitalcoast/inundation/pdf/CNAI\\_approaches.pdf](http://www.csc.noaa.gov/digitalcoast/inundation/pdf/CNAI_approaches.pdf)
- Coastal Community Planning and Development Training –teaches participants about planning processes, current coastal development patterns and trends, and alternatives to conventional patterns of growth and development. <http://www.csc.noaa.gov/training/ccpd.html>
- Smart Growth Online Network – <http://www.smartgrowth.org/Default.asp?res=1280>

### For Notes