VHB Engineering, Surveying and Landscape Architecture, P.C.

Climate Adaptation Planning Webinar

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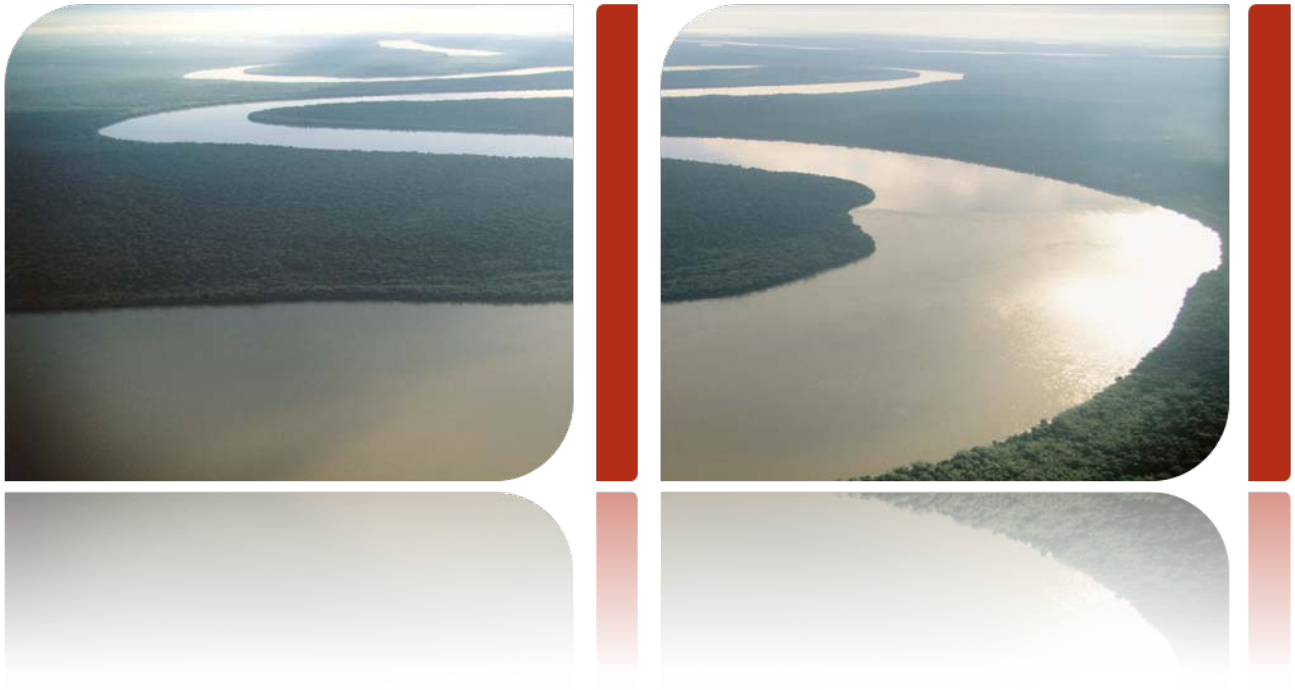
VHB



October 10, 2012

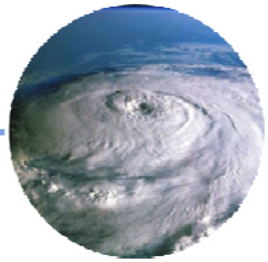
Overview

- What is Adaptation Planning?
- Why do It?
- How can *My Community* do it?

What is Adaptation Planning?

The process of planning for the changes in climate that are expected to occur and that will impact individuals, communities, and natural and physical systems

Vulnerability to climate change impacts



Exposure

Sensitivity

Adaptive Capacity

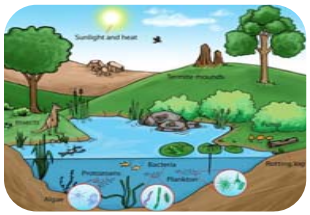
Why adapt?

Agriculture

Forests

Coasts

Energy



Ecosystems

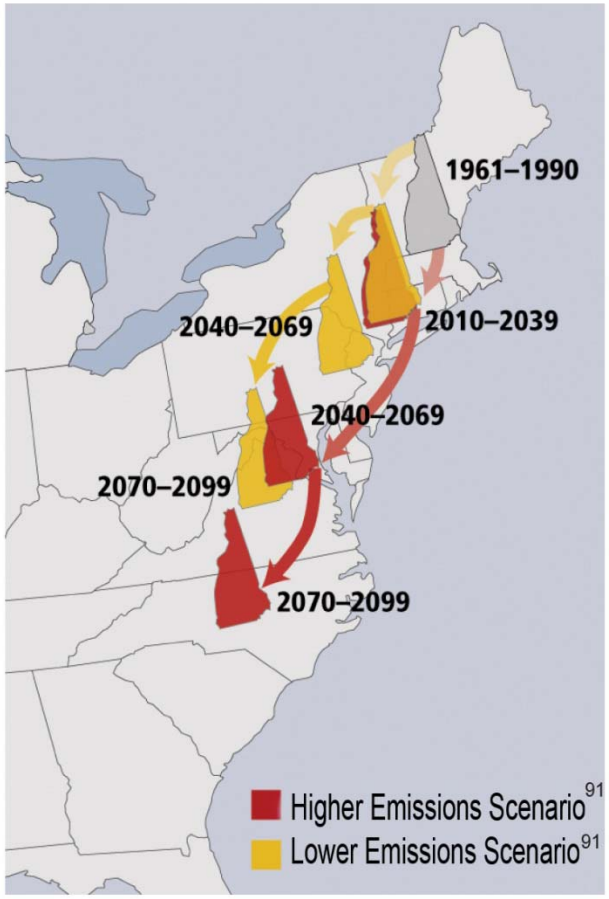
Human Health

Society

Transportation

Water Resources

Changing Summer Temperatures



Source: USGCRP 2009

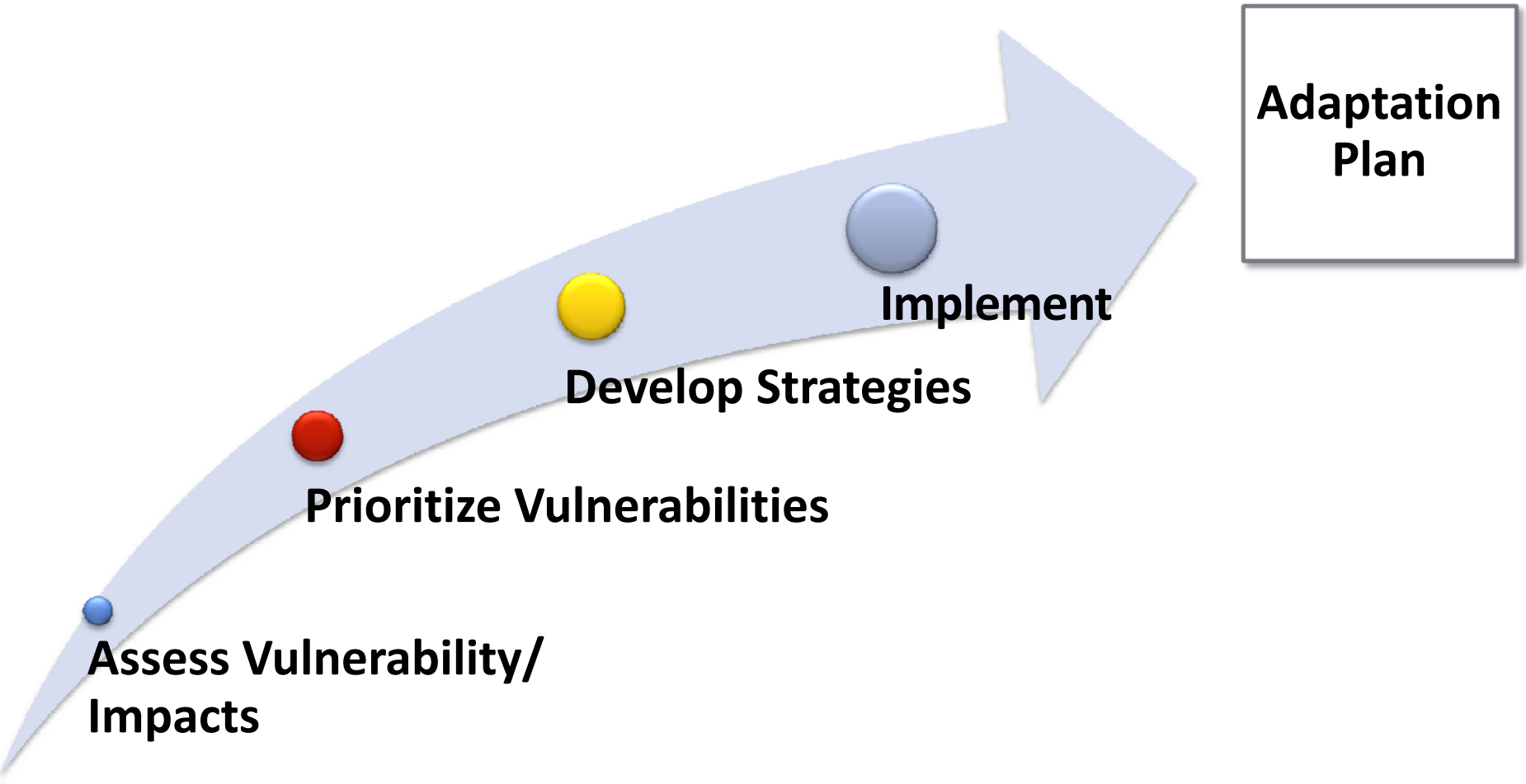
Progress and Challenges in Adaptation Planning

Source: ICLEI + MIT

Survey of Cities Worldwide:

- 74% of U.S. cities have perceived changes in the climate:
  - increased storm intensity (31%), higher temperatures (30%) and more precipitation (28%).
- 19% have completed an assessment; 19% are in the process
- 68% are pursuing adaptation planning
  - U.S. had the lowest rate of engagement - 59%
- 18% are working on implementing adaptation plans
- Top 3 challenges
  - Securing funding for adaption
  - Communicating the need for adaptation to elected officials and local departments
  - Gaining commitment and generating appreciation from national government for the realities of local adaptation challenges

The Process


Adaptation Plan
Implement
Develop Strategies
Prioritize Vulnerabilities
Assess Vulnerability/ Impacts

Agency and Public Stakeholders

- Involve in planning process
- Consult when developing adaptation strategies
- Stakeholders can include:
  - Planning staff
  - Stormwater management staff
  - Emergency management staff
  - Public health staff
  - Public works
  - Utility companies
  - Transportation agencies
  - Local environmental organizations
  - Community groups

Assess Vulnerability/Impact

Goal: Understand the how climate is projected to change how the change would impact your community's social, ecological, and infrastructure systems

Baseline Climate Conditions

- What is the climate like today?
- Existing vulnerabilities
- *Sources:*
  - ClimAID
  - NOAA NOW Data
  - Local Hazard Mitigation Plans

Historic Trends

- How has the climate changed over the past 100 years?
- *Sources:*
  - ClimAID
  - Northeast Regional Climate Center

Future Projections

- What is projected for the future?
- *Sources:*
  - ClimAID
  - Northeast Climate Impacts Assessment

Effects on the Community

- Identify sectors
- Compile (GIS) data
- Look at effects of past weather events
- *Sources:*
  - Stakeholders and Public
  - Existing Plans

Assess Vulnerability/Impact → Prioritize Vulnerabilities → Develop Strategies → Implement Strategies

Potentially Vulnerable Sectors

Social

- Public Health
- Cultural Resources/ Recreation

Ecological

- Water/ Coastal Resources
- Forestry
- Upland Habitats

Infrastructure

- Transportation
- Wastewater
- Critical Facilities
- Agriculture/Food
- Telecommunications/ Energy

Assess Vulnerability/Impact

Climate Effects

Social

- Public Health
  - Air quality
  - Vector-bourn diseases
  - Death/injury from extreme weather
- Cultural Resources
  - At risk of flooding or SLR?
  - Snow/ ice dependent recreation

Ecological

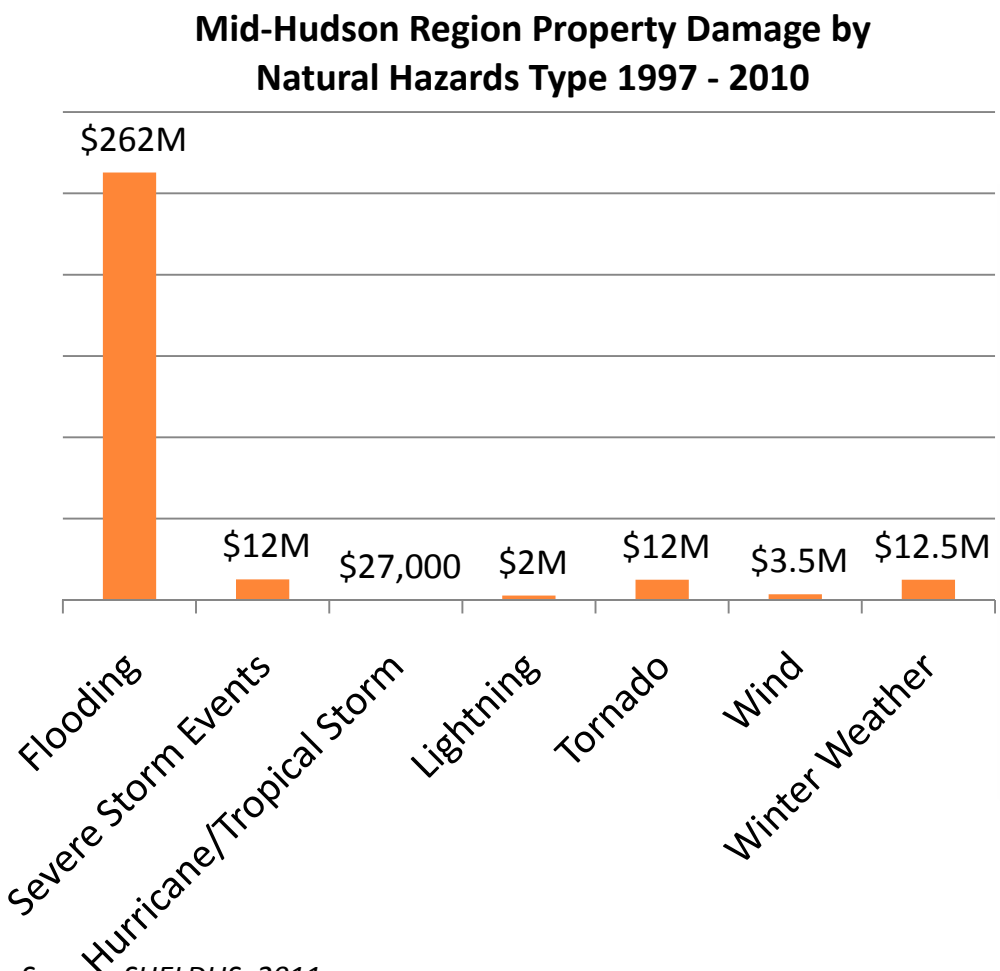
- Loss of natural habitat including wetland and other protective buffers
- Loss of native species
- Changes to the forest
  - Urban forest
  - Logging/maple syrup production

Infrastructure

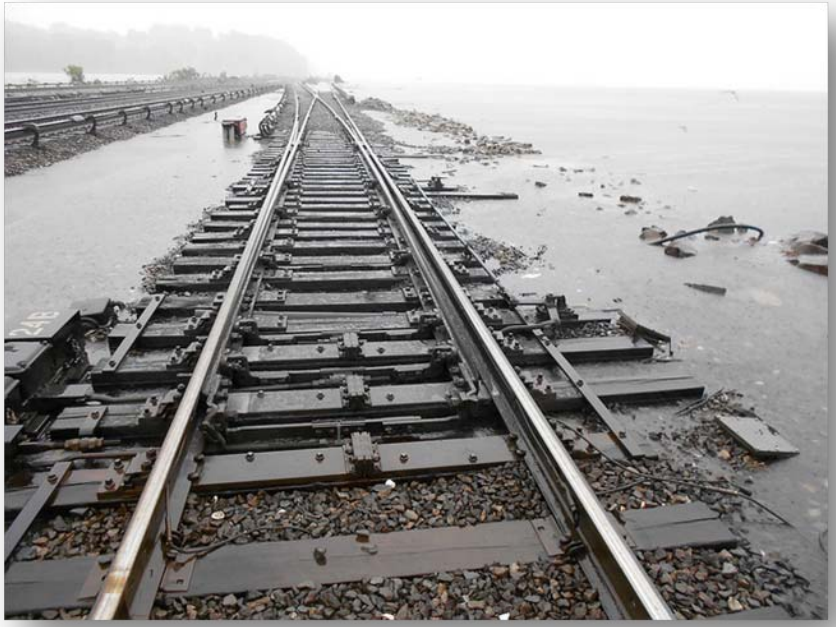
- Infrastructure at risk of flooding/ inundation
  - Transportation
  - Water Facilities
  - Critical Facilities
- Operational/Maintenance impacts
  - Extreme heat damages infrastructure
  - Public transit passenger comfort
  - Less plowing, more potholes
- Agriculture/Food
  - Crop damage from flood/drought
  - Rise in cost of food
- Telecommunications/Energy
  - Disruption of services from extreme weather including heat waves
  - Decrease productivity (hydropower)
  - Less water availability
  - Increased demand during summer months

Assess Vulnerability/Impact

Impacts of past weather events



Source: SHELDUS, 2011



The Hudson River encroaches on Metro North Railroads at Croton Harmon.
Photo Credit: Michael Hermance, MTA.

Resources/ Data Sources for Vulnerability Assessment

Impacts to Social Systems

- Demographics (US Census)
  - Vulnerable populations
  - Social Vulnerability Index
- Land Use/Zoning (Coastal Change Analysis Program)
- Cultural Resources
  - Historic buildings (NYS GIS Portal)
  - Recreational areas
  - Cemeteries
  - Other landmarks
- Public Health
  - Air quality
    - EPA AirNOW
    - American Lung Association
  - Asthma rates (NYS Dept. of Health)
  - Vector-borne diseases
    - Lyme (NYS County Health Indicator Profiles)
    - West Nile Virus Rates (NYS DOH)

Note: *Hyperlinks embedded as orange underlined text*

Resources/ Data Sources for Vulnerability Assessment

Impacts on Ecological Systems

- Sensitive Ecosystems, Habitats, and Species
  - Forest Composition (US Forest Service) Service Forest Inventory Analysis National Program
  - Wetlands (EPA/State GIS layers)
- Open Space Plans

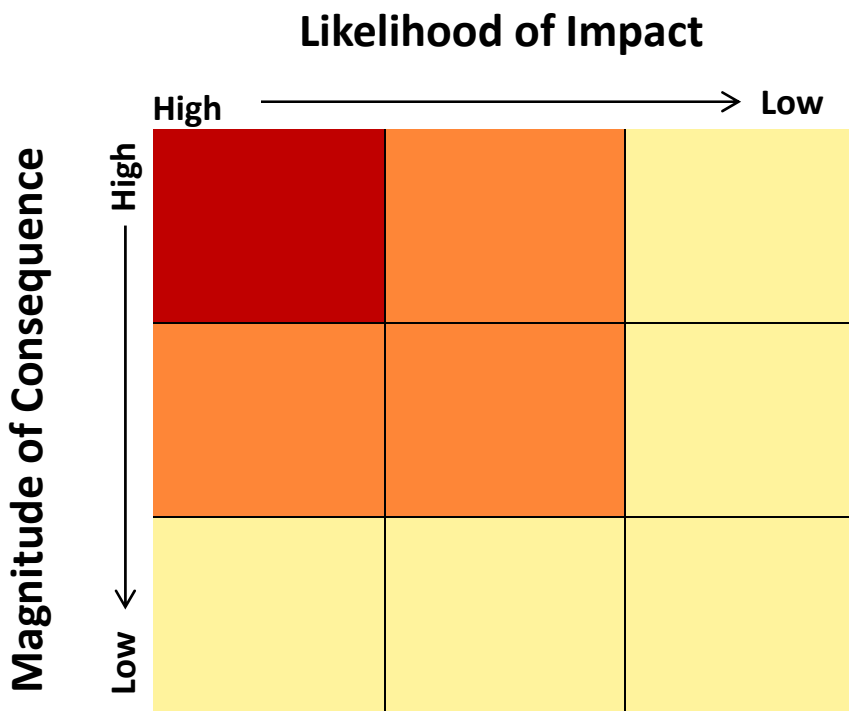
Note: *Hyperlinks embedded as orange underlined text*

Resources/ Data Sources for Vulnerability Assessment

Impacts to Infrastructure

- Transportation
  - Roads
  - Rail and Public Transit
  - Airports
- Water Facilities
  - Pumps
  - WWTF
  - Outfalls
- Telecommunications
- Energy
- Critical Facilities
  - Police
  - Fire
  - Hospitals
  - Schools
- Agriculture/Food (USDA)
  - Farms
  - Markets
  - What is being produced

Prioritize Vulnerabilities



Magnitude of consequence

- Disruption to internal operations
- Capital and operating costs
- Number of people impacted -- including vulnerable populations
- Public health
- Economy (city economy; changing prices)
- Environment

Engage stakeholders & community in prioritization of vulnerabilities

Develop Strategies

- Strategy Types:
  - Changes in management and operations
  - Infrastructure improvements
  - Policy adjustments
  - Education/ Outreach
- Examine co-benefits between existing planning efforts and adaptation
- Investigate other communities' adaptation strategies
- Create menu of options that respond to the impacts of climate change
- Prioritize strategies:
  - Feasibility
  - Cost
  - Co-benefits
  - Potential for vulnerability reduction

Develop Strategies

Example Climate Impacts and Associated Strategies for the Mid Hudson Valley

Asset	Climate Impacts	Climate Effect	Potential Response / Strategy
Farmland	Sea Level Rise and Flooding	Crop loss from flooding	• Provide flood recovery assistance to farmers
	Increase annual average temperature	Pests (new pests, longer breeding seasons)	• Provide education, outreach, and assistance to farmers to help them address pests
Waste Collection	Flooding and Storm events	Increased post-storm debris	• Establish a storm reserve fund for municipal waste utilities (if already existing, consider expanding. • Conduct county-wide tree risk assessments and prioritization schedules, particularly targeting hazardous trees. • Expand budget for tree trimming and vegetation management practices • Develop a public awareness campaign targeting private landowners, to enhance tree management activities
	Flooding; Sea level rise; Storm events	Disruption to transportation/ collection	• Proactively maintain vulnerable roads • Implement flood mitigation controls (e.g. enlarging culvert capacities, enhancing drainage in vulnerable areas)

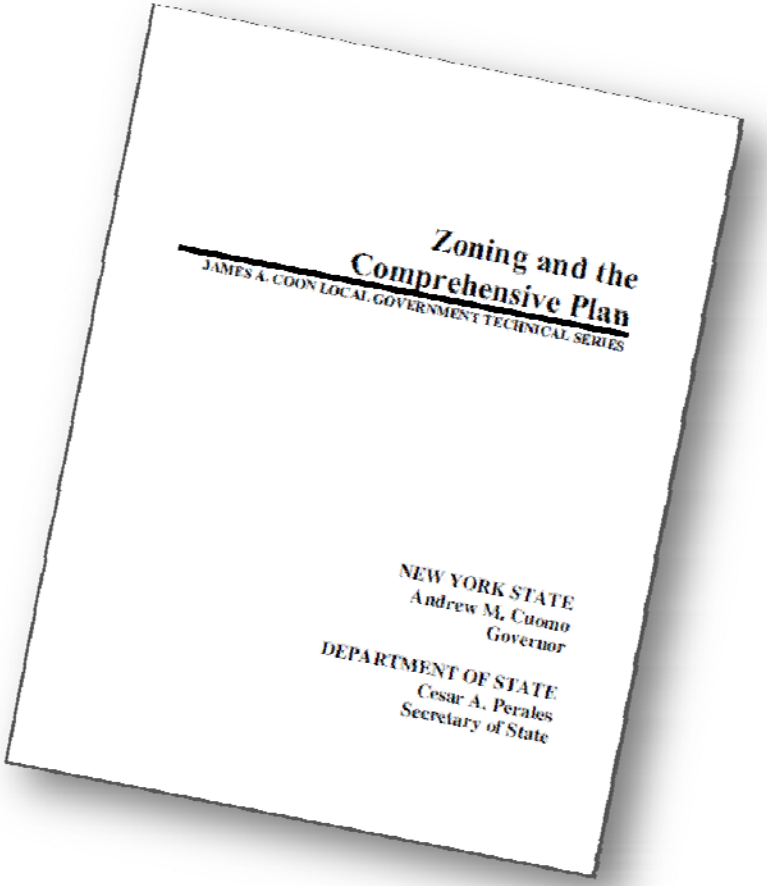
Implement Strategies

- Align strategies with existing funding streams and/or planning processes if possible
- Create action plans for identified strategies
  - Assign responsibility (private vs. public sector?)
  - Develop timeline

Implement Strategies

Integrating Adaptation Planning into Existing Processes

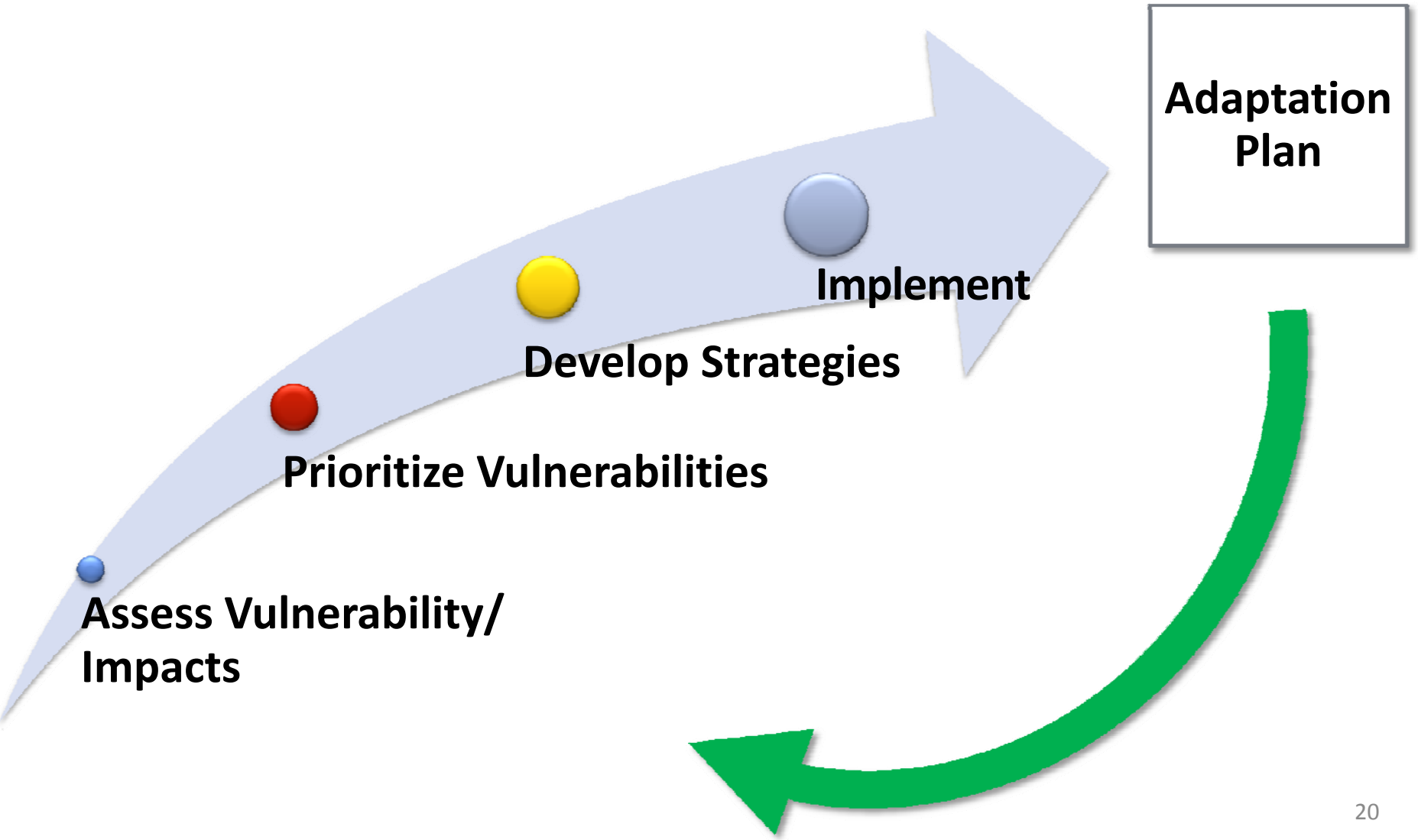
- Comprehensive/Master plans
- Emergency management
- Public health
- Water resource plans
- Hazard mitigation planning
- Waterfront revitalization
- etc…


Zoning and the Comprehensive Plan
JAMES A. COON LOCAL GOVERNMENT TECHNICAL SERIES

NEW YORK STATE
Andrew M. Cuomo
Governor

DEPARTMENT OF STATE
Cesar A. Perales
Secretary of State

Monitor and Reassess



Case Study: Albany 2030 Plan

- City's first comprehensive plan
- Appendix D: Climate Action Plan
  - Identified strategies from the plan that have both mitigation and adaptation co-benefits
- Led to a city-wide vulnerability assessment to identify even more specific strategies
- City is now working on a long-term waterfront redevelopment plan and will be incorporating results of the vulnerability assessment

Albany Examples Strategies

- Restore and maintain high quality natural habitats
- Support local food production as a means of economic development and local food security
- Create a green infrastructure system to better absorb stormwater runoff and filter pollutants
- Reduce impervious surfaces through land development regulations

Source: Albany 2030 Appendix D

Links to Resources

- Adaptation Plans:
  - Boulder County, CO Climate Change Preparedness Plan (May 2012)
  - City of Lewes, DE Hazard Mitigation and Climate Adaptation Action Plan (June 2011)
  - Chula Vista, CA
  - Albany 2030 Plan (Albany, NY)
- General Resources:
  - NOAA Coastal Services Center Resources
  - Climate Adaptation Knowledge Exchange (CAKE)
  - Georgetown Climate Center - Adaptation Clearinghouse

Note: Hyperlinks activate when slides are in presentation view

Questions?

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