Preparing the United States for the Impacts of Climate Change

Presentation to
Clean Air Act Advisory Committee

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The Need to Adapt

- The climate is changing at an increasingly rapid rate, outside the range to which society has adapted in the past.
- Many of the outcomes communities are trying to attain (*e.g.,* clean air, safe drinking water, economic growth) are sensitive to changes in climate.
- Until now, communities have been able to assume climate is relatively stable and future climate will mirror past climate.

  ➨ But the past is no longer a good predictor of the future.

- **Communities must adapt.**
  - They must anticipate and plan for future changes in climate.
  - They must transform the way they do business.

Examples of the Importance of Climate Adaptation for EPA's Mission

Potential Impacts of Climate Change on U.S. Regional Air Quality

(EPA report released April 17, 2009)

Fundamentally: Is climate change something we have to pay attention to going forward?

Answer: Yes

Climate change should be considered by air quality managers as they develop air pollution control strategies. Climate change has the potential to produce significant increases in ground-level ozone in many regions.

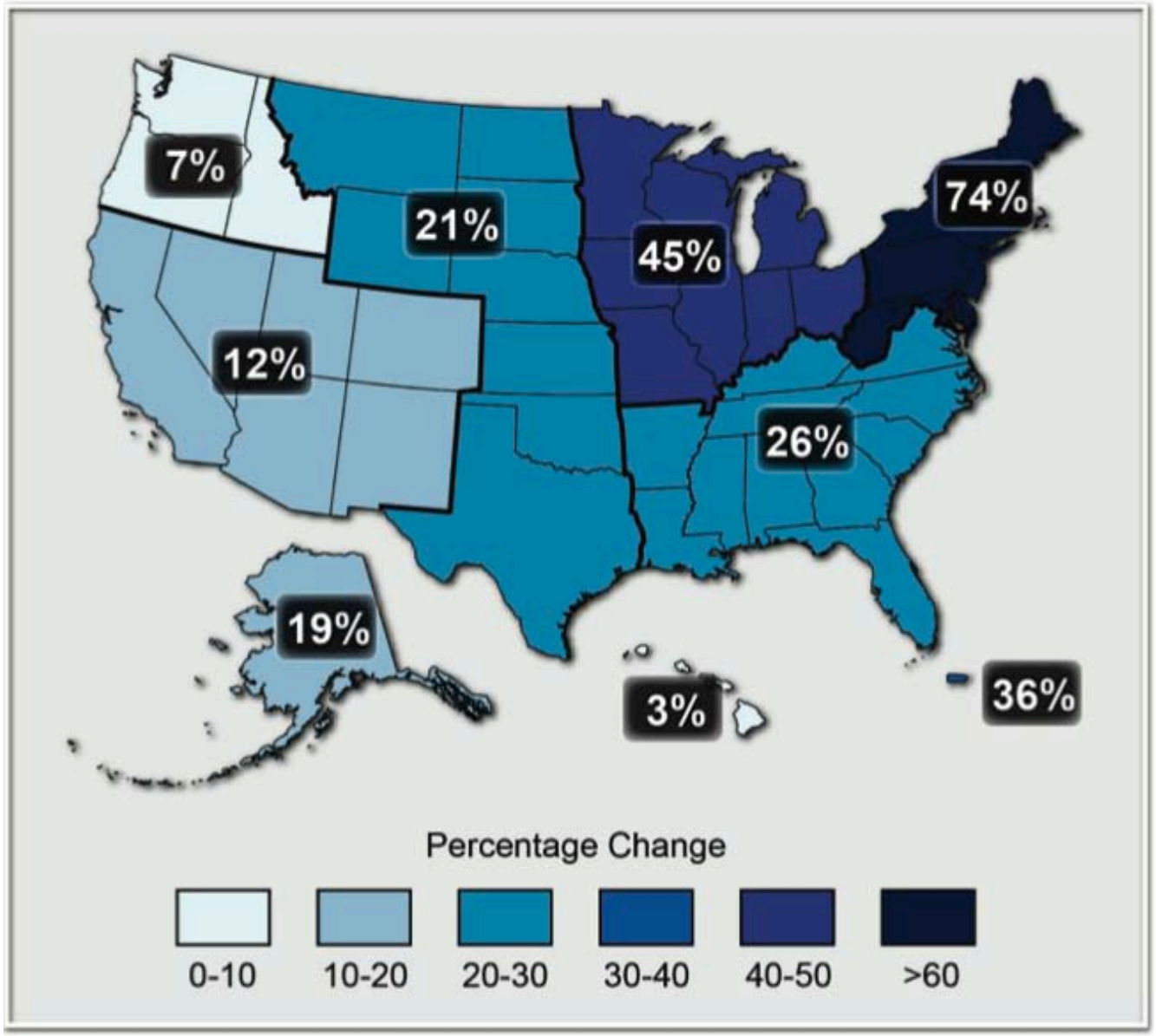
http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=203459

USA: Combined sewer overflows

1.2 trillion gal of sewage & stormwater a year discharged during combined sewer overflows – would keep Niagara Falls roaring for 18 days

(Source: Center for Water & Health, JHU Bloomberg School of Public Health)

Percentage Change in Very Heavy Precipitation



1958-2011

Combined Sewer Overflow in the Great Lakes Region

(EPA report released February 2008)

- Issue: There are 182 combined sewer systems in the Great Lakes Region. Billions of dollars are being spent redesigning and rebuilding these systems.
- Does climate change matter to the redesign of combined sewer systems in the Great Lakes Region?
- If combined sewer systems are designed to meet the EPA's CSO Control Policy design standard of 4 events per year, but fail to plan for climate change:
  - ✓ climate change may result in failure to meet the standard
  - ✓ **there could be an average of 237 events per year above the control policy's objectives across 182 communities**
- Communities must transform the way they plan for the future and design combined sewer systems.

Examples of the Importance of Climate Adaptation for EPA's Mission

- **Water:**
  - ✓ Increased risk of sewer overflows and wastewater bypasses
  - ✓ Integrity of coastal water infrastructure systems could be put at increased risk
  - ✓ Saltwater intrusion in surface water and ground water, placing increased demands on drinking water treatment
  - ✓ Increased pollutant loads to water bodies could increase annual POTW treatment costs
- **Air:**
  - ✓ Increased tropospheric ozone pollution in certain regions could make it more difficult to attain NAAQS for ozone in many areas with existing ozone problems
- **Clean-up of Contaminated Sites and Waste Management:**
  - ✓ Increased risk of contaminate release from EPA sites due to increasing heavy precipitation events, increasing risk of floods, and sea level rise
- **EPA Facilities and Operations:**
  - ✓ Increased risks to EPA facilities in coastal or flood-prone areas

Climate adaptation planning must be “mainstreamed” into EPA’s programs, policies, rules, and operations to ensure they remain effective under future climatic conditions.

THE PRESIDENT'S CLIMATE ACTION PLAN

Executive Office of the President

June 2013

Executive Order 13653:
"Preparing the United States for the Impacts of Climate Change"

November 1, 2013

Key Mechanisms to Support Adaptation

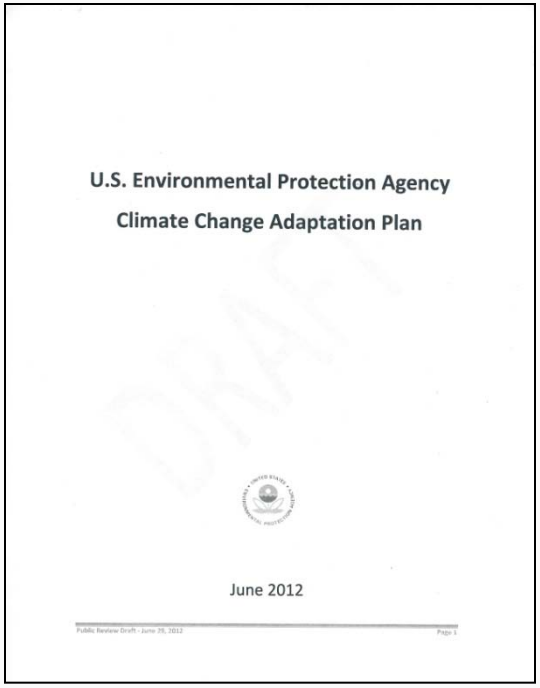
- Support climate-resilient investments in communities across the country (by modernizing Federal programs)
- Provide states, tribes, and local communities with the information, data, tools, and training they need to increase resilience and prepare for climate change.

State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience established to inform Federal efforts.

Additional Directives

- Manage lands and waters for climate preparedness and resilience
- Federal agency planning for climate change related risk
- Establish Federal Council on Climate Preparedness and Resilience

EPA *Climate Change Adaptation Plan*


U.S. Environmental Protection Agency

Climate Change Adaptation Plan

June 2012

http://epa.gov/climatechange/pdfs/EPA-climate-change-adaptation-plan-final-for-public-comment-2-7-13.pdf

EPA *Climate Change Adaptation Plan*

- Part 1: Vision of the Future EPA
- Part 2: **Identifies known Vulnerabilities** to EPA's Mission from Climate Change
- Part 3: Mainstreaming Climate Change Adaptation in EPA: **Agency-wide priorities**
- Part 4: Measuring and Evaluating Performance

Central Element of EPA's Efforts: Building Adaptive Capacity

EPA is:

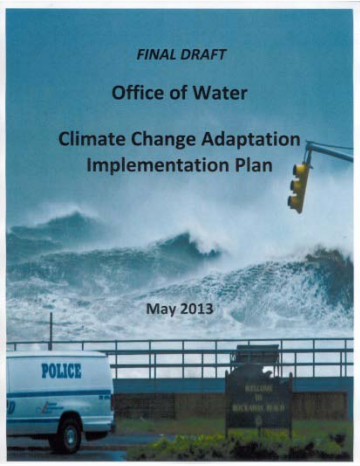
- Building and strengthening the "adaptive capacity" of partners in the states, tribes, and local communities
- Supporting their efforts to integrate climate adaptation into the work they do by:
  - ✓ increasing awareness of ways climate change may affect their ability to implement effective programs
  - ✓ supporting climate-resilient investments
  - ✓ providing necessary data, information and tools

Empowering communities through partnerships!

Agency-wide Priorities

1. Fulfill Strategic Measures in FY 2011-2015 EPA *Strategic Plan*
2. Protect Agency facilities and operations
3. Factor legal considerations into adaptation efforts
4. Strengthen adaptive capacity of EPA staff and partners through training
5. Develop decision-support tools that enable EPA staff and partners to integrate climate adaptation planning into their work
6. Identify cross-EPA science needs related to climate adaptation
7. Partner with tribes to increase adaptive capacity
8. Focus on most vulnerable people and places
9. Measure and evaluate performance
10. Develop Program and Regional Office *Implementation Plans*

Implementation Plans



- Draft Climate Change Adaptation *Implementation Plans* developed by every National Environmental Program Office and all 10 Regional Offices
- Purpose: To provide more detail on the work they will do to address the Agency-wide priorities on climate adaptation

EPA and the President's *Climate Action Plan*: Adaptation

- All EPA commitments contained in the President's Plan are drawn from the Agency's *Climate Change Adaptation Plan* and the Program and Regional Office *Implementation Plans*.

Considerations in Determining OAR Priority Actions

- The strength of the science
- The extent of the threat to the program
- Complexity in implementation
- How easily OAR can integrate climate change adaptation into a particular program
- Legal authorities

Office of Air and Radiation:
Programmatic Vulnerability Summary Table

CLIMATE CHANGE IMPACTS [b]		EPA PROGRAMMATIC IMPACTS [c]		
Climate Change Impact [d]	Likelihood of Impact [e]	Focus of Associated EPA Program	Likelihood EPA Program will be Affected by Impact [f]	Example of Risks if Program were Impacted
• Increased tropospheric ozone pollution in certain regions	• Likely[1]	• Protecting public health and the environment by setting National Ambient Air Quality Standards (NAAQS) and implementing programs to help meet the standards	• High	• Could become more difficult to attain NAAQS for ozone in many areas with existing ozone problems
• Increased frequency and intensity of wildfires	• Likely[2]	• Protecting public health and the environment by setting National Ambient Air Quality Standards (NAAQS) and implementing programs to help meet the standards	• Medium	• Could complicate Agency efforts to protect public health and the environment from risks posed by particulate matter (PM) pollution in areas affected by more frequent wildfires
• Increasing extreme temperatures • Increasing heavy precipitation events	• Very Likely[3] • Likely[3]	• Protect public health by promoting healthy indoor environments through voluntary programs and guidance	• Medium	• Could increase public health risks, including risks for the young, the elderly, the chronically ill, and socioeconomically disadvantaged populations
• Effects on the stratospheric ozone layer	• Likely[4]	• Restoring the stratospheric ozone layer • Preventing UV-related disease • Providing a smooth transition to safer alternatives	• High	• Unable to restore ozone concentrations to benchmark levels as quickly at some latitudes
• Effects on response of ecosystems to atmospheric deposition of sulfur, nitrogen, and mercury	• Likely[6]	• Ecosystem protections from Agency emissions reduction programs	• Low	• Based on evolving research, could have consequences for the effectiveness of ecosystem protections under those programs
• Increased frequency and severity of severe weather events	• Very Likely[7]	• Monitoring and assessing the benefits and effectiveness of Agency emissions reduction programs • Agency disaster response planning	• Medium	• Could decrease the amount and/or quality of data collected by the Agency

Categories of OAR priority actions

- Category 1: Outreach and Education

  These actions are considered achievable in the short-term by leveraging and building on existing OAR efforts, e.g.:

  - ✓ Update existing indoor air guidance to incorporate climate change adaptation strategies and equip stakeholders to build adaptive capacity in communities.

- Category 2: Research and Collaboration

  These actions are stepping stones that will inform potential future actions, e.g.:

  - ✓ Collaborate with the environmental research community on climate change interactions with atmospheric deposition of pollutants and ecosystem impacts.

Categories of OAR priority actions (cont.)

- Category 3: Modeling and Analysis

  These actions require additional considerations prior to implementation; they constitute potential long-term actions for OAR, e.g.:

  - ✓ Incorporate the latest research on ozone, PM, and climate change into National Ambient Air Quality Standards (NAAQS) development and implementation.

Progress is Already Being Made

Supporting Climate-Resilient Investments

- State Revolving Loan Funds: EPA's National Water Program is recognizing and encouraging consideration of climate change in the management of Clean Water and Drinking Water State Revolving Loan Funds. **(Commitment in the President's *Climate Action Plan*.)**

- Brownfield Grants: The EPA Office of Solid Waste and Emergency Response is requiring brownfield grant recipients to take potential changing climate conditions into consideration when evaluating cleanup alternatives. **(Commitment in the President's *Climate Action Plan*.)**

- EPA Region 2: Working with stakeholders to build climate resiliency into Hurricane Sandy recovery activities.

- EPA Region 5: Integrating consideration of climate impacts and adaptation into Great Lakes Restoration Initiative-funded projects.

Decision Support Tools and Resources

EPA has been producing data, information, and tools
that are already available
to inform adaptive management decisions.

National Stormwater Calculator and Climate Assessment Tool Package

- Released January 30, 2014
- Commitment in President's *Climate Action Plan*
- Estimates the annual amount of stormwater runoff from a specific location
- Includes projected climate impacts:
  - ✓ changes in seasonal precipitation levels
  - ✓ effects of more frequent high-intensity storms
  - ✓ changes in evaporation rates

http://www.epa.gov/nrmrl/wswrd/wq/models/swc/

CLIMATE READY WATER UTILITIES

EPA

Climate Resilience Evaluation & Awareness Tool (CREAT)

CREAT

CLIMATE READY WATER UTILITIES

EPA

About CREAT

- Software tool for conducting **risk assessment** of potential climate change impacts at your utility
- Multiple climate scenarios provided to help **capture uncertainty**
- Assessments will help inform **adaptation planning**
- Results from CREAT help utilities compare potential **costs, risk reduction and energy implications** of different options

Climate adaptation helps ensure that investments (*e.g.*, water infrastructure) made with scarce taxpayer dollars are effective even as the climate changes.

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