



# ***Climate Change and the National Water Program: Tribal Consultation***

## ***Part 2***

**U.S. Environmental Protection Agency  
Region IX**

**November, 2010**



## Part 2:

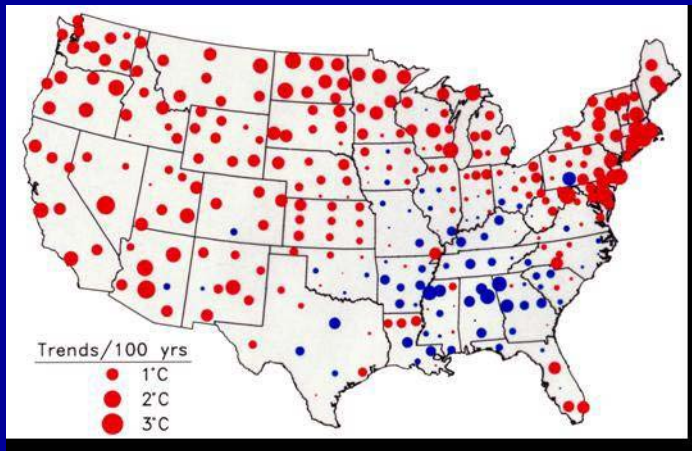


# Federal, EPA, and the National Water Program - Climate Change Activities -

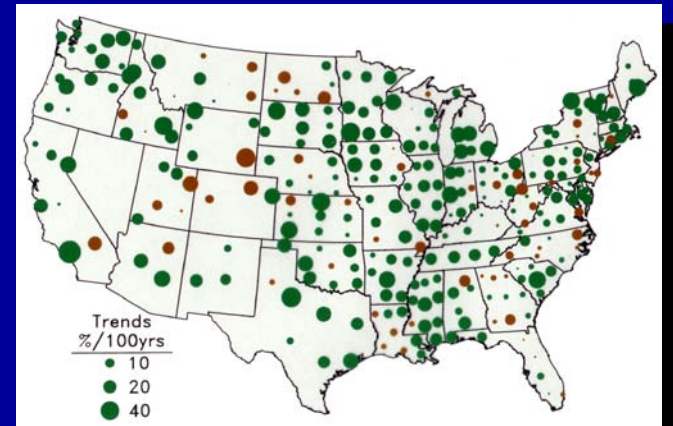


# The Climate is Changing

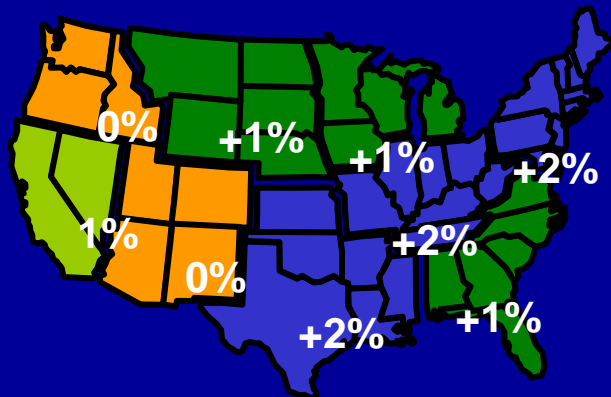
Temperature Trends: 1901 to 1998



Precipitation Trends: 1901 to 1998



More Rainfall Occurring  
in Intense Downpours

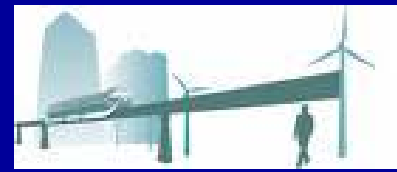


Regional 50% Probability Estimates of  
Sea Level Rise in 2100 and 2200 (in inches)





# Climate Change is Affecting Human Health and the Environment



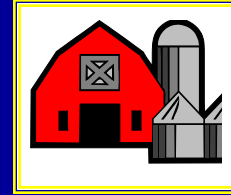
## Infrastructure

Water  
Transportation  
Energy Supply & Use



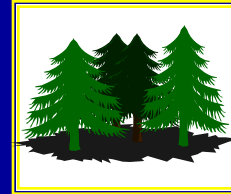
## Health

Weather-related Mortality  
Infectious Diseases  
Air Quality -Respiratory Illnesses



## Agriculture

Crop yields  
Irrigation demands



## Forest

Change in forest composition  
Shift geographic range of forests  
Forest Health and Productivity



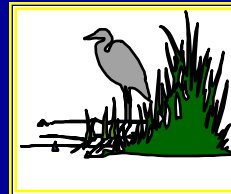
## Water Resources

Changes in water supply  
Water quality  
Increased competition for water



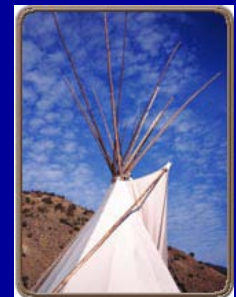
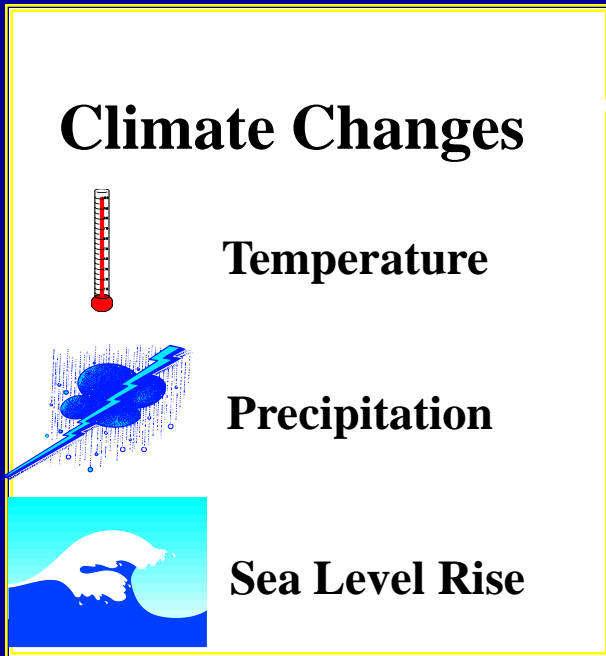
## Coastal Areas

Erosion of beaches  
Inundate coastal lands  
Costs to defend coastal communities




## Wildlife and Ecosystems

Shift in ecological zones  
Loss of habitat and species  
Damage to Coral Reefs



**Cultural Resources**

**Economic Disruption**



# Executive Order 13514 (Oct. 2009)

## **Sec. 16.**

[T]he agencies **shall participate actively** in the interagency Climate Change Adaptation Task Force . . . and **shall develop approaches** . . . compatible with [its] strategy.

# Interagency Climate Change Adaptation Task Force

- Report to the President released Oct. 14, 2010
- Discusses implications of climate change for Agencies' missions & recommends actions
- TF will continue to work toward a 'national strategy', and monitor progress implementing recommendations
  - Agencies are being asked to develop adaptation strategies
  - Partnership Committee to be formed with Stakeholders to develop concepts for a 'national strategy'
- New and Ongoing Workgroups:
  - Water
  - Health
  - Insurance
  - Fish, Wildlife, and Plants
  - Oceans and Coastal
- 2nd Progress Report to the President due Oct. 2011

# Other Federal Climate Adaptation Activities

- U.S. National Climate Assessment
  - Mandated by Congress every 4 years – Due 2013
  - FACA being formed
- U.S. Global Change Research Program
  - Interagency federal research program
  - Formerly focused on impacts, now supporting adaptation
- NOAA Climate Service – Information Services
  - not the ‘National’ Climate Service
- Climate Roundtable – CEQ, OSTP, NOAA
  - discussion of a ‘National Climate Service’

# Taking Action on Climate Change



“[C]limate change will affect other parts of **our core mission...** and we must include those considerations in **our future plans.**”

Lisa P. Jackson, Administrator,  
U.S. EPA



# Why Climate Change Matters to EPA

- Outcomes EPA is trying to attain (e.g., clean air, safe drinking water) are sensitive to changes in climate.
- Climate change is making it more difficult for EPA – and our partners – to fulfill our statutory and programmatic mission:
  - ✓ Clean Water Act
  - ✓ Safe Drinking Water Act
  - ✓ Clean Air Act
  - ✓ Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
  - ✓ Tribal Trust Responsibilities
  - ✓ Other statutes...
- **Adaptation is essential if EPA, and the communities we serve, are to attain desired environmental, human health, and economic outcomes**

**But opportunities exist to address (adapt to) the anticipated impacts within the provisions of these Acts**

# A Smart Policy Portfolio

- Must consist of a mix of strategies to **mitigate** GHG emissions and to **adapt** to a changing climate
- **Mitigation**: essential to slow the rate of change
- **Adaptation**: essential because climate will continue to change
  - regardless of actions taken to mitigate
  - due to **natural variability** in climate
  - as well as **human-induced** climate change

# Adapting the EPA's Work to Climate Change Will Pose Challenges

- It is impossible to ***predict*** future climate with certainty.
- ***Projections*** of future climate are ***scenarios*** (plausible “storylines”).
- We can bound the likely range of ***plausible*** futures - it is impossible to choose one scenario as the best estimate or most likely to occur.
- A ***Risk Management framework*** for decision making must be developed.

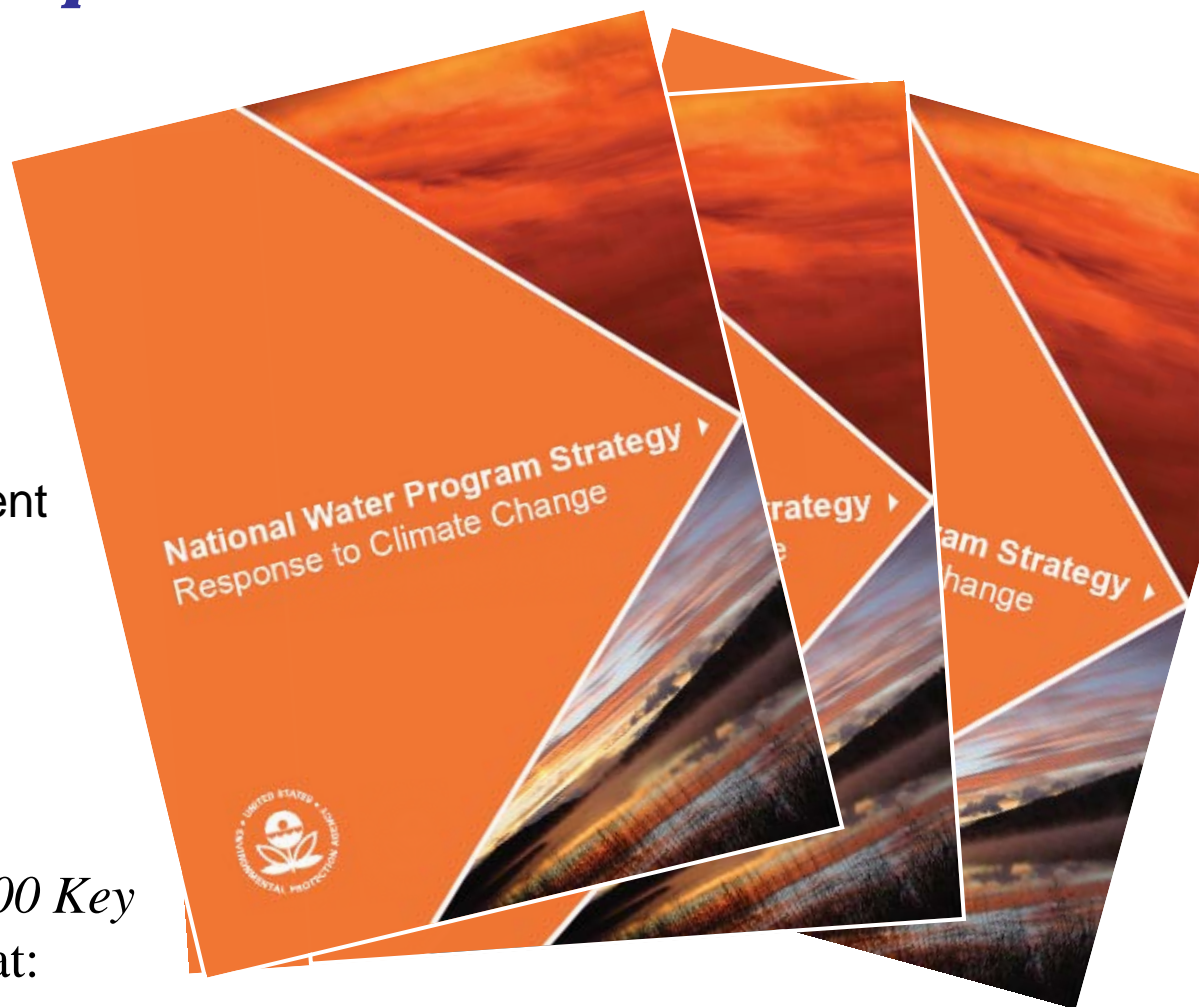
# ***National Water Program Strategy: Response to Climate Change***

## ***September 2008***

- **Goal 1:** GHG Mitigation
- **Goal 2:** Adaptation
- **Goal 3:** Research
- **Goal 4:** Education
- **Goal 5:** Program Management

*2008 Strategy and 2010-20100 Key  
Action Update* are available at:

**<http://water.epa.gov/scitech/climatechange/>**



# ***Greenhouse Gas Mitigation Strategies***

- Energy conservation & energy generation at water facilities
- Water conservation, water reuse, leak detection
- Green infrastructure and low impact development
- Carbon sequestration
- ARRA 'Green Set-Aside'



# ***Adaptation Strategies***

- Climate Ready Water Utilities
- Climate Ready Estuaries
- Evaluation of elements of the CWA and SDWA
  - Nutrient Criteria, Flow Standards, Health risks
  - NPDES (National Pollutant Discharge Elimination System) tools;
  - TMDL (Total Maximum Daily Loads) evaluations
  - Coastal Wetlands Initiative....



# Climate Ready Water Utilities

## ☐ **CREAT – Climate Resilience Evaluation and Awareness Tool**

- ☐ Builds knowledge and guides assessment for planning
- ☐ Free software available online

## ☐ **Tabletop Exercise Tool for Emergency Preparedness, Response, and Climate Resiliency (TTX Tool)**

- ☐ Customizable exercises for regional needs or concerns
- ☐ Climate scenarios (fire, drought, flood, freeze/thaw, and sea level rise) for long-term planning measures

## ☐ **CRWU Toolbox**

- ☐ searchable toolbox with more than 400 resources
- ☐ utility activities, workshops, publications, funding, tools

☐ <http://www.epa.gov/safewater/watersecurity/climate/> 15

# Climate Ready Estuaries

## part of the National Estuary Program

- Growing demand for coastal adaptation
  - Limited alternatives for coasts: armor, elevate, retreat, or “wait and see”
- Begins with a fundamental premise/reality that every estuary is unique – ecologically, politically, and socially
- Supports coastal communities to develop and implement adaptation plans
  - Partnered with 15 NEPs in 2008-2010 on 24 projects





# ***Research, Education & Management Strategies***

## **EPA Office of Research and Development – Water & Climate**

- Integrated Climate-Land Use Study
- 20 Watersheds Study
- BASINS-CAT, SWIM-CAT, CAT-CAT
- and more

## **EPA Office of Water**

- Regional forums
- Webinars
- Bi-weekly E-Newsletter
- Strategic Planning Measures and performance tracking



## ***EPA Regions***

- Each Region has a variety of activities underway
  - Use of the SRFs to promote energy efficiency & green infrastructure
  - Climate Ready Estuaries partnerships
  - Carbon sequestration
  - Workshops to educate and collaborate
  - Etc.
- Several are working with Federal, State, Tribal and local partners to develop local capacity for adaptation



# ***Region IX***

- Region 9 Water Division Created New Infrastructure Office, New Focus on Sustainability
- New Website:  
[www.epa.gov/region09/waterinfrastructure](http://www.epa.gov/region09/waterinfrastructure)
- Eight Energy Workshops Held for Wastewater and Water Utilities
- New Vulnerability Handbook soon



# What Have We Learned



- Climate change is the new context for existing programs and must be incorporated into all planning decisions
- Must be attentive to local conditions and needs and focus on local impacts and knowledge
- Communicate with stakeholders
  - Involve the community early (workgroups, listening sessions, etc.)
  - Convey local vulnerabilities and use examples that are valued by the public to build understanding (e.g., ice-out date, lobsters)
- “Adaptive Adaptation”
  - Practice “Robust” Decision-making
  - Start with available data
  - What actions have positive outcomes, regardless of the scenario?
  - Create flexible structure to revise plan as better information and more resources become available
- Prioritize and move beyond assessment to implementation

## ***Summary: Implications of Climate Change for the EPA National Water Program***

- Climate change will affect every aspect of our national water program
- We need to use risk management to adapt while building understanding
- This will require a flexible and iterative approach that does not assume the hydrologic cycles of the future will be like the past



***Thank you!***

U.S. ENVIRONMENTAL PROTECTION AGENCY  
Office of Water