

Emerging Trends in Public Works: Impact of Climate Change on Water Resources & Infrastructure

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Session Goals

- Identify the impacts of climate change on water resources and infrastructure in regions across the nation
- Discuss the challenges faced by local public works directors in preparing for and adapting to more frequent and severe weather events
- Learn from the Climate Action Plans and Strategies of selected cities
- Identify sources of funding to build more resilient cities & counties

Warming of Climate

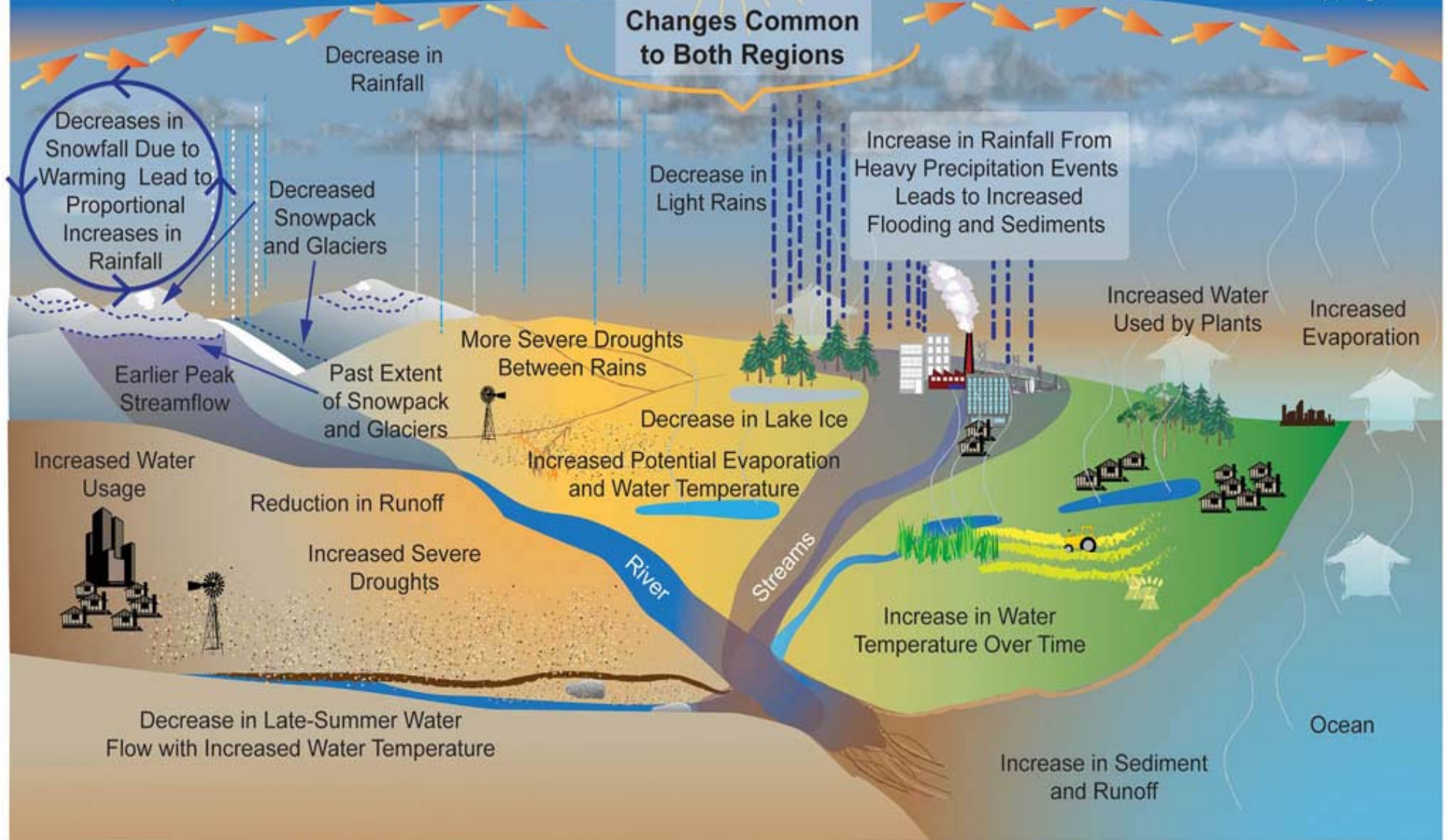
- Warming of the climate is definitely occurring and can be observed by the:
 - Increases in global sea and air temperatures
 - Widespread melting of snow and ice
 - Rising global sea level
 - Species are moving
 - Glaciers are retreating

Hotter/Drier Conditions (Interior West)

Heat Trapped by the Atmosphere Causes more Evaporation and More Precipitation

Hotter/Wetter Conditions (NE and Coasts)

A Warmer Atmosphere Holds More Water Vapor, Which is Also a Heat Trapping Gas



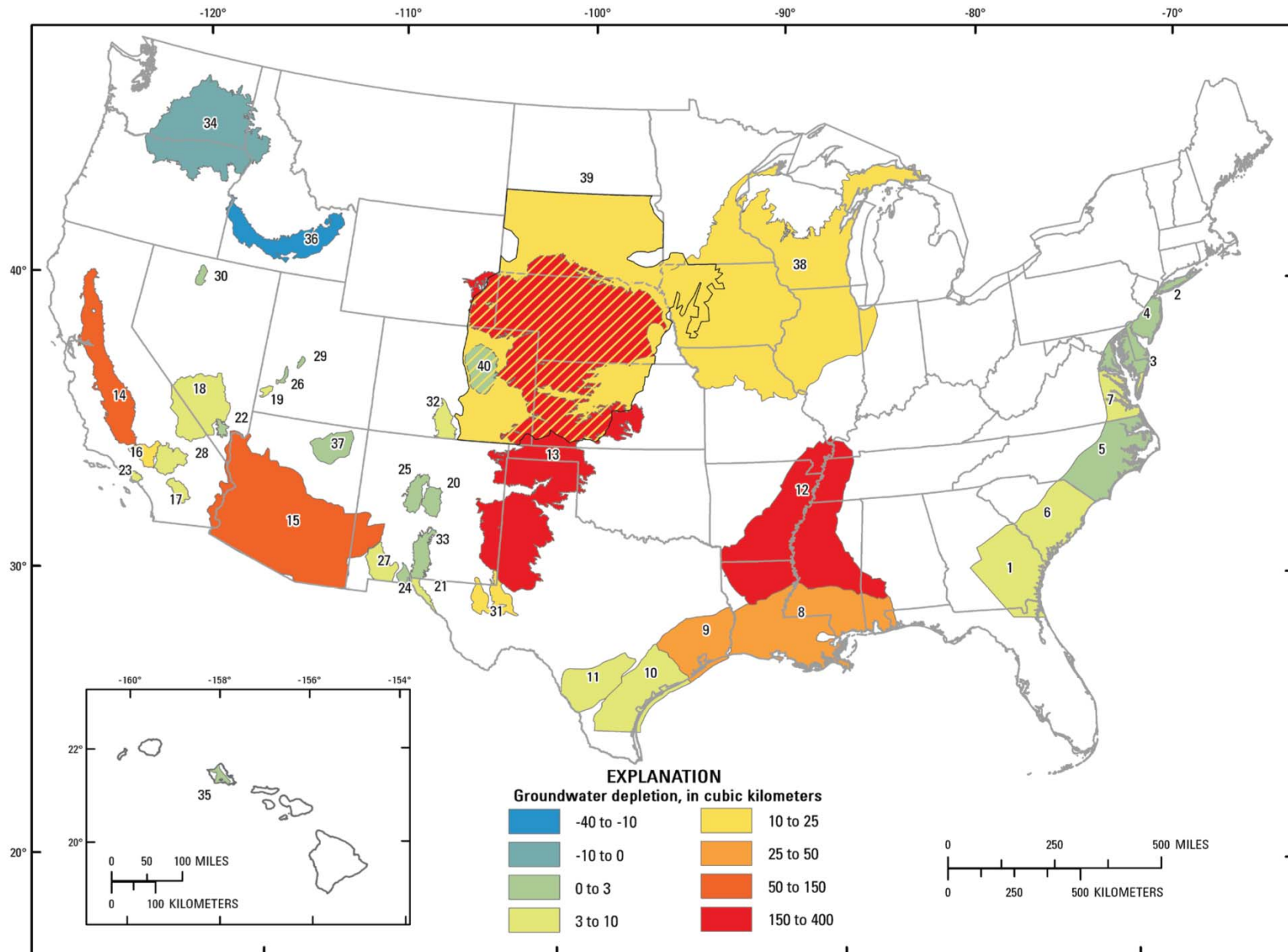
Impact on Water Cycle

- Significant Impact on the Water Cycle
- Floods & Droughts more common
- Increase in precipitation & runoff in NE and MW in winter and spring
- Quality of surface water and ground water will be impacted
- Additional burden on water systems

Our Depleting Aquifers

- Nearly 70% of groundwater stored in U.S high plains aquifer (covering 8 states) could be depleted within 50 years. Provides 30% of nation's irrigated groundwater and would take 500 to 1,300 years to refill
- In CA, aquifer depletion and diversion of water to cities, has reduced irrigated area from 9 million acres in 1997 to 8 million in 2014.
- Sea level rise is expected to increase saltwater intrusion into coastal freshwater aquifers, making them unusable.

Groundwater Depletion in the United States (1900–2008)

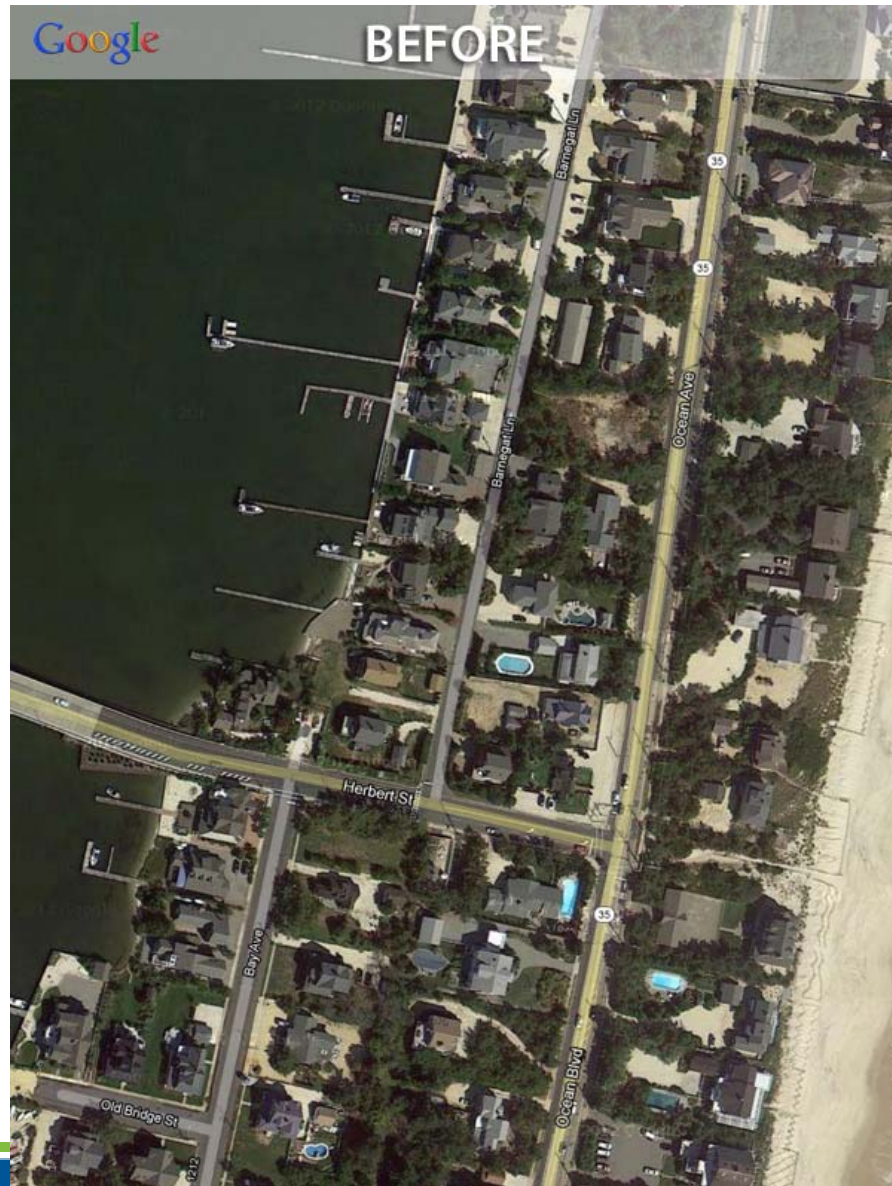


Base from U.S. Geological Survey digital data, 1972, 1:2,000,000
Albers Equal-Area Conic Projection
Standard parallels 29° 30' N and 45° 30' N, central meridian 96° 00' W

Impact on Water Resources

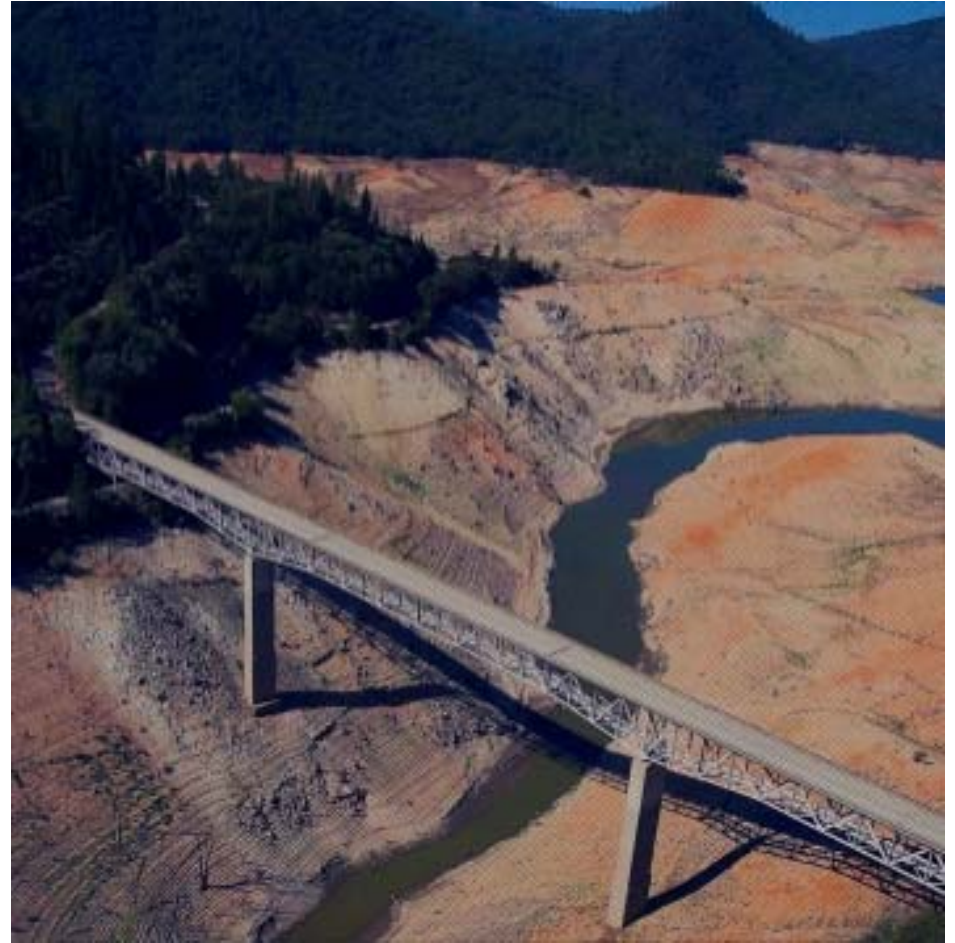
- Increase in water pollution problems due to warmer air and water temperatures, and changes in precipitation patterns
- Extreme weather events will impact physical infrastructure of water utilities
- Changes in availability of drinking water supplies
- Water boundary movement from sea level rise and changes in water flows

Impact of Sandy on NJ Town



Strategies for Addressing CC

- Proactive Condition Assessments or Vulnerability Assessments
- Green Infrastructure
- Green Building Standards
- Additional Storage
- Public Education/Outreach
- Water Restrictions/Plans
- Climate Assessments and Adaptation Planning
- **What is your community Doing?**



Adapting to Climate Change

I. Green Infrastructure

- Downspout Disconnection (Milwaukee, WI & Portland, OR)
- Rainwater Harvesting (Portland, OR; Tucson, AZ; NYC)
- Rain Gardens & Bioswales (Kansas City, MO, Seattle, WA)
- Permeable Pavements (Chicago, IL)
- Green Roofs and Urban Tree Planting



Programs & Resources

- National Water Program-EPA
- Climate Ready Water Utilities Program-EPA
- Regional Climate Centers-NOAA
- Climate Ready States and Cities Initiative-HHS
- Hazard Mitigation Assistance-FEMA
- U.S. Global Change Research Program
- Climate Science Centers-USGS



Lessons Learned

- Substantial adaptation planning and programs are occurring at all levels of govt. but change has been incremental
- No one size fits all approach but there are best practices we can share information and learn from one another
- Implementing CC strategies is a collaborative process that needs to involve various stakeholders
- Vulnerability to CC is exacerbated by other stress such as poverty, pollution and habitat destruction
- Barriers to implementation include: limited funding, policy and legal impediments, lack of community support, lack of data about climate impacts at local scales

Questions/Comments?

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