



Clean Water
State Revolving Fund



Water Infrastructure Resiliency

Mike Shapiro

Council of Infrastructure Financing Authorities
April 2014

Definitions

- **Adaptation:** Adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects.
- **Resilience:** A capability to anticipate, prepare for, respond to, and recover, from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment.

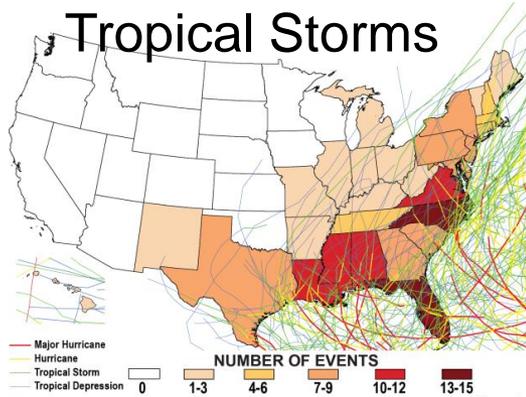


Clean Water
State Revolving Fund

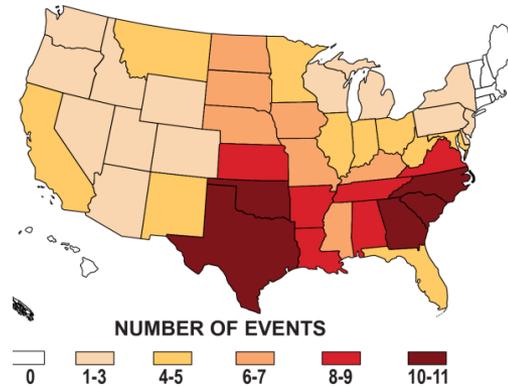
Weather and Climate Disasters (1980-2011)



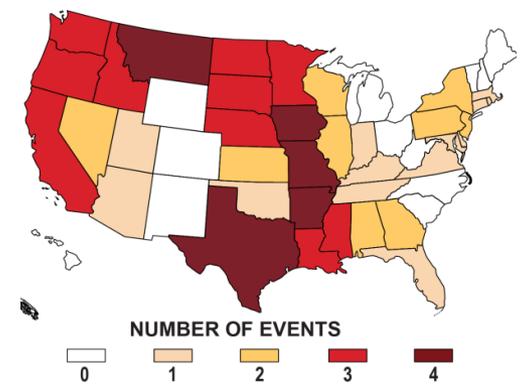
Hurricanes and Tropical Storms



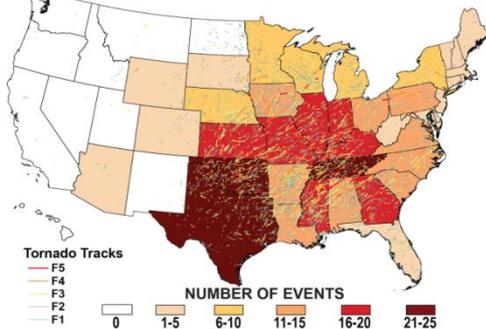
Drought and Heat Wave



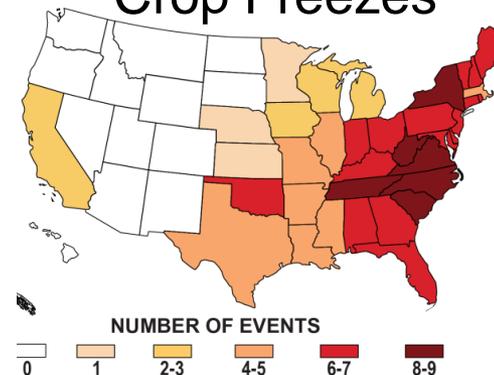
Flooding



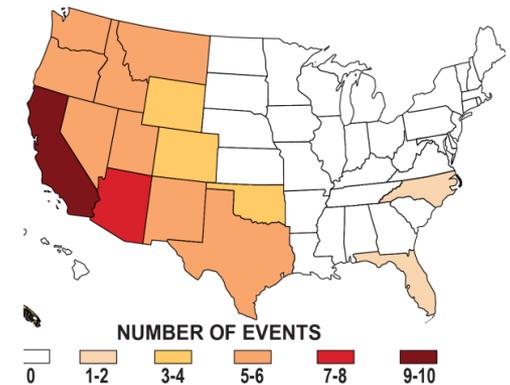
Severe Local Storms and Tornadoes



Winter Storm and Crop Freezes



Wildfires





- Climate change impacts are occurring and can affect water resource quantity and quality

Climate Change 2014: Impacts, Adaptation and Vulnerability (IPCC)

- Severe and pervasive impacts of climate change will be felt everywhere
- Responding to climate change involves making choices about risks in a changing world

Colorado floods: Water-treatment plants struggle to keep up

By *Yesenia Robles*
The Denver Post

POSTED: 09/14/2013 12:01:00 AM MDT | UPDATED: ABOUT A MONTH AGO

Late Friday, the Boulder announced that a 300-foot breach has opened in its main wastewater pipeline, but said it was no threat to drinking water in Boulder or Lafayette.

In Arvada, silt levels in the city reservoir skyrocketed 950 units from the typical 4 and forced the shutdown of the water treatment plant for a few hours Friday .

News

Colorado Flooding Update: E. Coli Found in Town's Drinking Water

P. Solomon Banda and Manuel Valdes | Published: Sep 20, 2013, 2:59 PM EDT | Associated Press

Millions of gallons of sewage have been released around the state because of septic systems and sewer lines torn out by flood waters and flooded waste treatment plants, said Steve Gunderson, director of the state's water quality control division. People in some communities have had to boil their

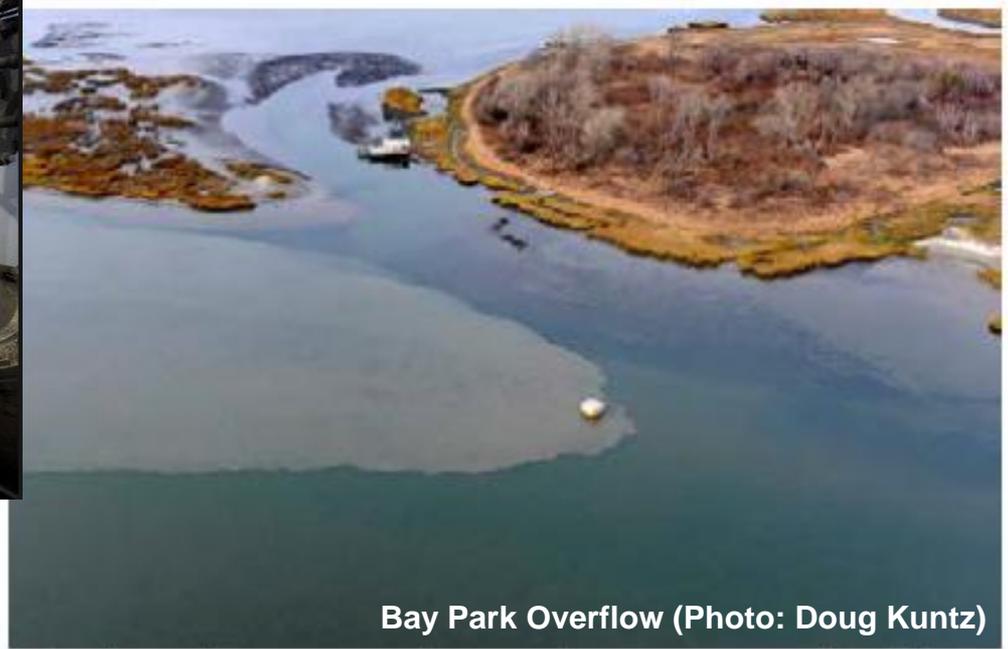
Clean water, working toilets continue to be Colorado flood issues

By *Joey Bunch*
The Denver Post

POSTED: 09/21/2013 12:01:57 PM MDT | UPDATED: 30 DAYS AGO

"Crews and contractors are working day and night to repair blocked or damaged sanitary sewer lines that were compromised during the flood and then filled with debris," the city of Boulder

Superstorm Sandy (2012)



Bay Park Overflow (Photo: Doug Kuntz)



Continuous stream of human waste hits NY harbor following Hurricane Sandy

Tuesday, November 27, 2012 by: Jonathan Benson, staff writer
Tags: [human waste](#), [NY harbor](#), [Hurricane Sandy](#)

In Parched California, Town Taps Run Nearly Dry Until the Wells Run Dry

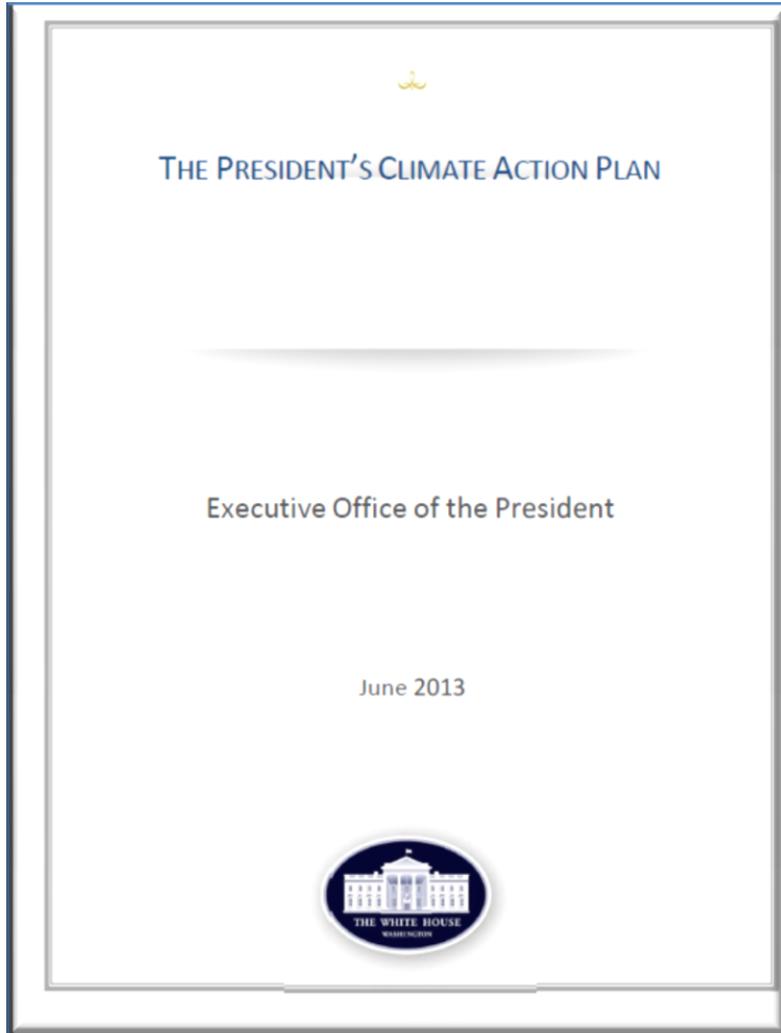
Lake of the Woods, a small community north of Los Angeles, is running dry amid a deep California drought. Residents are changing water habits, but many worry about the future.



Georgia: Upper Apalachicola- Chattahoochee-Flint River Basin

- 2007-08 – Drought
- 2009, September – “epic” 500 year flood
- 2009, Winter – heavy rain caused flooding from over-saturation
- 2011-12 – Drought





Climate change is no longer a distant threat - we are feeling its impacts across the country and the world. (Climate Action Plan)

President's Plan:

- Directs agencies to support climate-resilient investment
- CW and DWSRF programs to integrate climate change considerations

Water Sector Assessment and Planning Tools

- **Climate Ready Water Utilities initiative:** www.epa.gov/climatereadyutilities
 - Promotes a clear understanding of climate science and adaptation options by translating complex climate projections into accessible formats, such as
 - **Climate Resilience Evaluation and Awareness Tool**
 - **Adaptation Strategies Guide**
- **Vulnerability Self Assessment Tool (VSAT)**
 - Allows drinking water and wastewater systems to conduct all-hazards risk assessments and identify cost-effective actions to reduce risk
- **Flood Resilience Guide:** to be released summer 2014
 - Helps utility personnel understand the flooding threat, identify vulnerable assets and evaluate mitigation options
- **Federal Disaster Funding Tool (Fed FUNDS):** www.epa.gov/fedfunds
 - Provides utility personnel with tailored information to help understand and apply for federal disaster and mitigation funding

Resiliency CW/DW SRF Projects

- Projects identified in response to the Disaster Relief Appropriations Act of 2013
 - Projects to prevent flooding or reduce the damage if flooding does occur
 - Projects that reduce vulnerability to a power outage
 - Projects to create redundancy at a facility or interconnections with other utilities
 - Planning projects

Resiliency CW/DW SRF Projects

- Green infrastructure is a great tool for making water utilities more resilient to wet weather
- A number of projects can incorporate green infrastructure:
 - Flood attenuation/diversion/retention infrastructure
 - permeable pavement, green roofs and walls, bioretention infrastructure, stream daylighting, and downspout disconnection
 - Natural systems to mitigate storm surges
 - barrier beach and dune systems, tidal wetlands, living shorelines, and natural berms/levees

Ideas for States

1. Educate utilities about resiliency—why it's important and how it can be achieved
 - Share resources
2. Encourage utilities to evaluate their current vulnerabilities and consider mitigation options
 - Promote planning
3. **Fund projects that improve resiliency to extreme weather**
 - Encourage utilities to consider building resilience into projects currently planned
 - Encourage new resiliency projects
 - Prioritize resilience