

EPA Climate Change Mitigation and Adaptation Tools and Funding Sources

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Some Water-Related Effects of Climate Change



1979



2003

Photographic record of South Cascade Glacier retreat.

•Snow Pack Loss

•Water infrastructure flooding



•Increases in tropical storm intensity

•Increased wildfires and soil erosion



•Drought



•Sea level rise



•Ocean and coastal changes

The Effect on Water Resources

Sea Level Rise



- Displacement of coastal wetlands and habitat
- Increased coastal erosion
- Salt water intrusion in drinking water supplies
- Inundation of wastewater treatment infrastructure
- Salinity changes in estuaries
- Ocean temperature rise and acidification



Mitigation: Hidden Energy Costs in Water Use



- Running a hot water faucet for 5 minutes consumes the same energy as a 60W light that's on for 14 hours!



Municipal water/sewer plant energy use



- U.S. annual total* = 75 billion kilowatt hours per year
- 3% of total U.S. consumption of electricity
- Equal to entire residential electricity demand of California
- More than entire energy-intensive pulp/paper and petroleum sectors *combined*
- Public bill = Already \$4B/yr. Increasing
- Residential water heating uses 104 Bkwh annually!



•* 60,000 drinking water treatment plants + 15,000 sewage treatment plants

•Sources: US EPA, Alliance to Save Energy, Pacific Institute & NRDC

Energy and Water Connection at Home



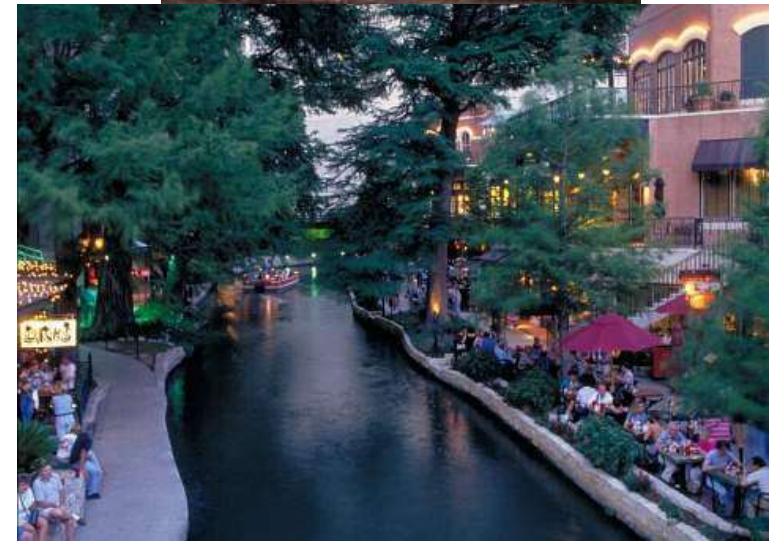
- If just 1% of US homes were retrofitted with water efficient fixtures, 100 million KWh of electricity could be saved each year
- Avoids release of 80,000 tons of greenhouse gases into the atmosphere





Water Efficiency Opportunities

- WaterSense Program
- Water Conveyance and Leak Detection Remedies
- Industrial and Agricultural Water Conservation and Reuse
- Gray water





Consumer Choices



How Does a Tankless Water Heater Work?

The Process:

1. A hot water tap is turned on.
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3. The water flow sensor detects the water flow.
4. The computer automatically ignites the burner.
5. Water circulates through the heat exchanger.
6. The heat exchanger heats the water to the designated temperature.
7. When the tap is turned off, the unit shuts down.





Adaptation Strategies

- Climate Ready Water Utilities & Vulnerability Assessment Tools
- Climate Ready Estuaries
- Green Infrastructure/
Low Impact Development
- Region 6 Inventory of Mitigation and Adaptation Projects



Building Resilience in the Water Sector





CRWU - Current Activities



Climate Resilience Evaluation & Awareness Tool

Risk assessment tool designed to build climate change knowledge and support adaptation planning in the water sector.



CRWU Toolbox

Searchable resource containing information to support the “Climate Ready” process, including government and utility activities, workshops, publications, funding, and tools.



Tabletop Exercise Tool for Water Systems

Customizable materials for designing exercises for utilities to consider long-term planning measures in order to adapt to the potential impacts of climate change.



CREAT Release

- Software is available for download

Download at

<http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm>

- Training and Outreach
- CREAT version 2.0



Toolbox Interface

www.epa.gov/safewater/watersecurity/climate



Water Security

U.S. ENVIRONMENTAL PROTECTION AGENCY



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You are here: [Water](#) » [Water Infrastructure](#) » [Water Security](#) » [Climate Ready Water Utilities](#) » CRWU Toolbox - beta version

Climate Ready Water Utilities Toolbox - beta version



The Climate Ready Water Utilities (CRWU) Toolbox provides access to resources containing climate-related information relevant to the Water Sector. These resources include several categories of information and can be searched by geographic region, water utility type and size, water resources, climate change impact, and climate change response strategies. These resources will be updated frequently to provide the most current Water Sector climate change information.

Begin using the Toolbox by selecting one or more information categories (buttons), then selecting items of interest under each heading. Resources that apply across utility types, sizes, or regions can be found by selecting the "Not Type/Size/Region Specific" option under the appropriate heading. The third column presents five climate change strategies with specific actions listed under each strategy. For each strategy, please select the actions of interest. Strategy definitions can be reviewed by clicking the "Show Help" button below. Click the "Select/Deselect All" button to either select all items or clear selections under a heading. A selection needs to be made under each heading for the Toolbox to function. Once you have finished selecting search criteria, click "Show Results" to begin reviewing the resources that address the selected topics.

Please e-mail any questions or comments to CRWUHelp@epa.gov.

Show Results

Show Help

Which categories of information would you like to search?

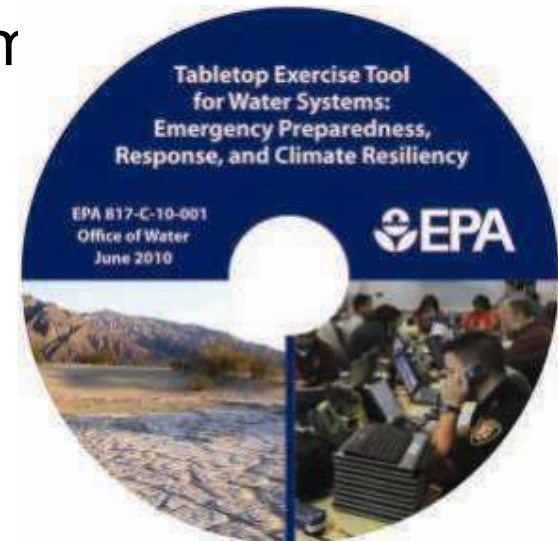
Current Activities Funding Opportunities Publications & Reports Tools & Models Workshops & Seminars

Who are you?	What are your concerns?	How do you want to respond?
Utility Type <input type="button" value="Select All"/> <input type="checkbox"/> Not Type Specific <input type="checkbox"/> Drinking Water <input type="checkbox"/> Storm Water <input type="checkbox"/> Wastewater <input type="checkbox"/> Combined	Water Resource Type <input type="button" value="Select All"/> <input type="checkbox"/> Groundwater <input type="checkbox"/> Surface water <input type="checkbox"/> Desalinated water <input type="checkbox"/> Reclaimed water Climate Impact <input type="button" value="Select All"/> <input type="checkbox"/> Sea level <input type="checkbox"/> Temperature <input type="checkbox"/> Precipitation	Reduce carbon / water footprints <input type="button" value="Select All"/> Reduce greenhouse gas emissions <input type="button" value="Select All"/> Enhance operational flexibility <input type="button" value="Select All"/> Expand capacity <input type="button" value="Select All"/> Develop alternative resources <input type="button" value="Select All"/> <input type="checkbox"/> Changes to operations and maintenance <input type="checkbox"/> Response planning <input type="checkbox"/> Water efficiency <input type="checkbox"/> Energy efficiency
Utility Size <input type="button" value="Select All"/> <input type="checkbox"/> Not Size Specific <input type="checkbox"/> Small (up to 3300)		



Tabletop Exercise Tool for Water Systems: Emergency Preparedness, Response, and Climate Resiliency

- Mini-DVD with materials that assist users in developing and conducting customized tabletop exercises
- Utilities can use these scenarios to raise awareness of potential climate change in and examine approaches to respond
 - Extreme Flooding
 - Extreme Drought
 - Sea Level Rise
 - Intense Fire in Protected Catchment
 - Impact of Freeze Thaw Shift on Main Breaks





Building Resilience in the National Estuary Program

Climate Ready Estuaries



CRE Vision and Mission

Vision

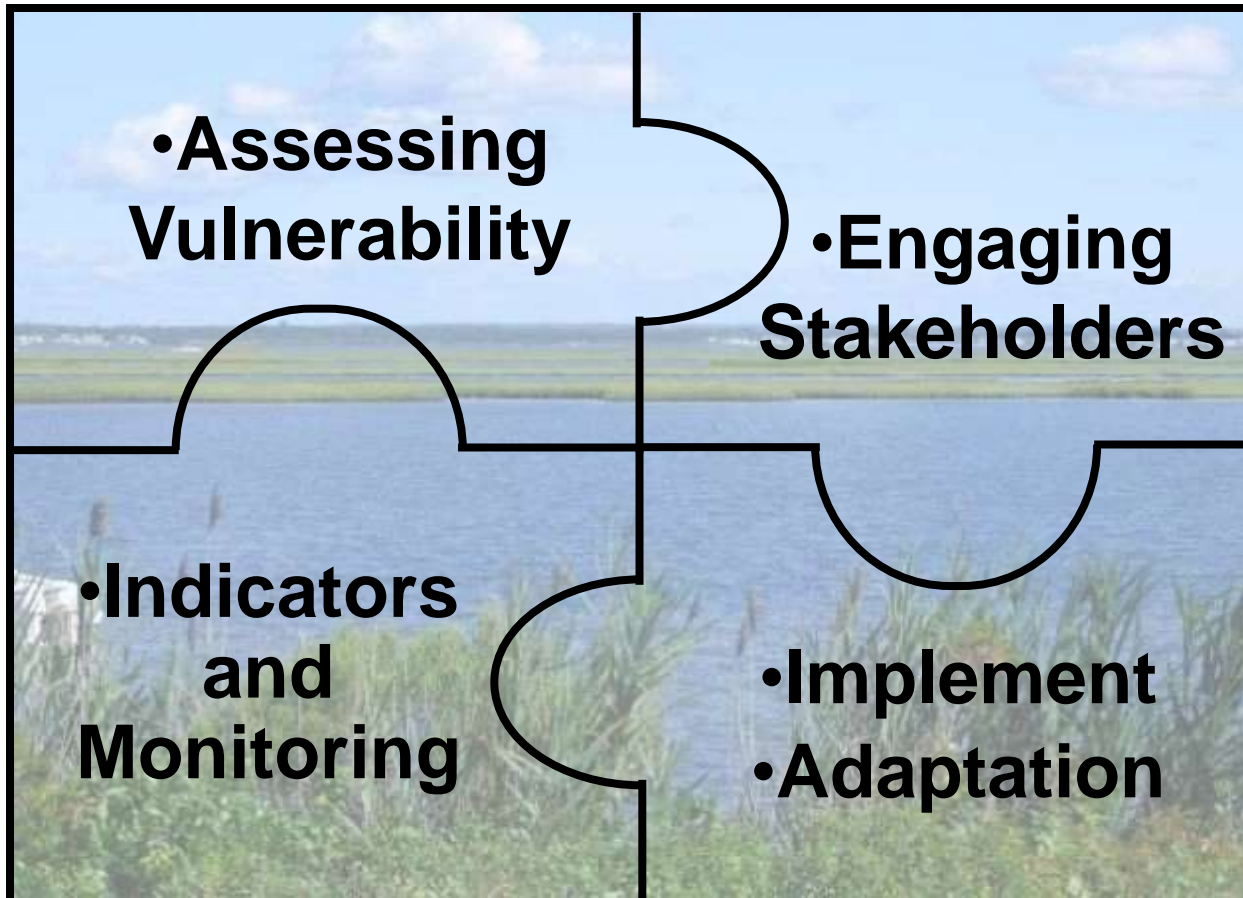
- CRE is supporting and spurring a vibrant community of practice made up of capable coastal managers all around the U.S. who are assessing climate change risks to sustainability and healthy environments, and are implementing adaptation measures that are appropriate for their situations.

Mission

Help our coastal partners raise the adaptive capacity of their communities so they can effectively identify risks and adapt to the impacts of climate change.



CRE Adaptation Planning and Implementation: Putting the Pieces Together





Climate Ready Estuaries

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Coastal Toolkit

The Climate Ready Estuaries Coastal Toolkit provides resources for estuaries and coastal programs that are interested in learning more about climate change impacts and adaptation. The Toolkit pages below provide information and links to websites, reports, and other resources related to the following areas:



[Monitoring Climate Change](#)



[Where to Find Data](#)



[Coastal Vulnerability and Adaptation Tools](#)



[Adaptation Planning](#)



[Smart Growth in the Context of Climate Change](#)



[Sustainable Financing Options](#)



[Communications and Outreach Materials](#)

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Climate Ready Estuaries

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Sustainable Financing Options

The following resources may be useful in developing and implementing strategies to obtain, diversify, and leverage sustainable sources of funding for adaptation to climate change.

[EPA Watershed Funding](#)

EPA provides a central portal of tools, databases, and information about sources of funding to practitioners and funders that seek to protect watersheds. Resources are available on this website for:

- [State and Local Governments](#)
- [Nonprofit Organizations](#)
- [Funders](#)

Other resources available on this website include:

- [Searchable Databases of Funding Opportunities](#)
- [Requests for Proposals](#)
- [Finance Training Opportunities and Archived Webcasts](#)

[Developing a Sustainable Finance Plan](#)

This EPA website provides a training module designed to help in developing and implementing a sustainable funding plan. Resources include:

- [Sample Finance Plans](#)
- [Case Studies of Alternative Finance Mechanisms](#)



Want More Information?

CRWU website:

<http://water.epa.gov/infrastructure/watersecurity/climate>

CRE website:

<http://www.epa.gov/cre>

Sign up for e-newsletters:

EPA Climate Change and Water News: Send a blank email to water_and_climate_change_listserve-subscribe@lists.epa.gov

EPA climate change activities:

<http://epa.gov/climatechange>



Questions?



Climate Ready Water Utilities

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John Whitler

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General CRWU Questions

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Climate Ready Estuaries

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EPA Region 6 Climate Change Mitigation and Adaption Inventory

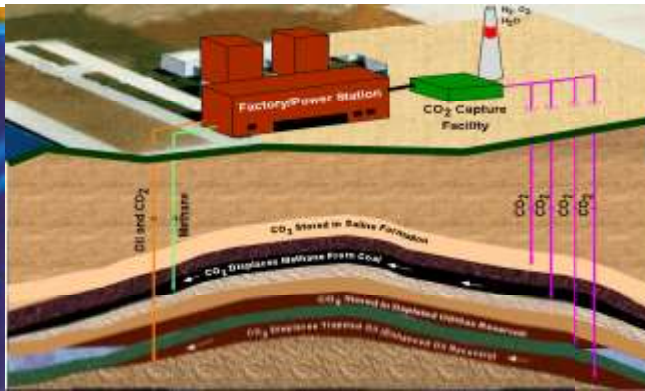
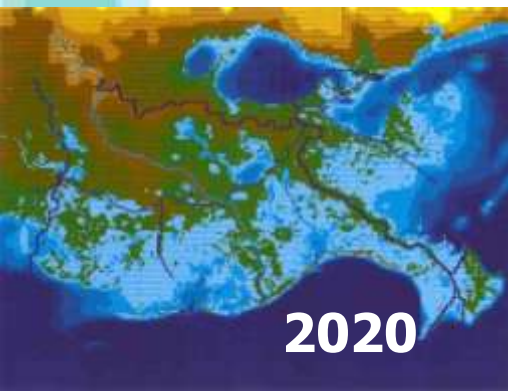
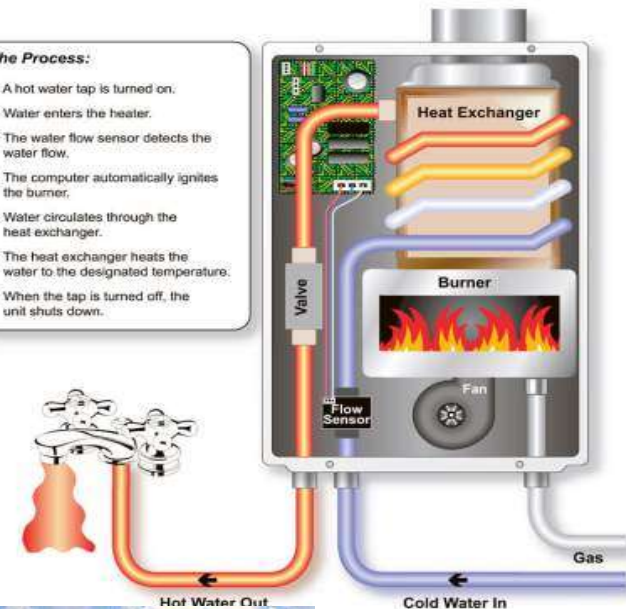


- Improve understanding & awareness of climate change mitigation & adaptation projects
- Provide linkages to foster collaboration opportunities
- Advance environmental science
- Support regulatory and policy decisions

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Climate Change Projects

(Total of 577)



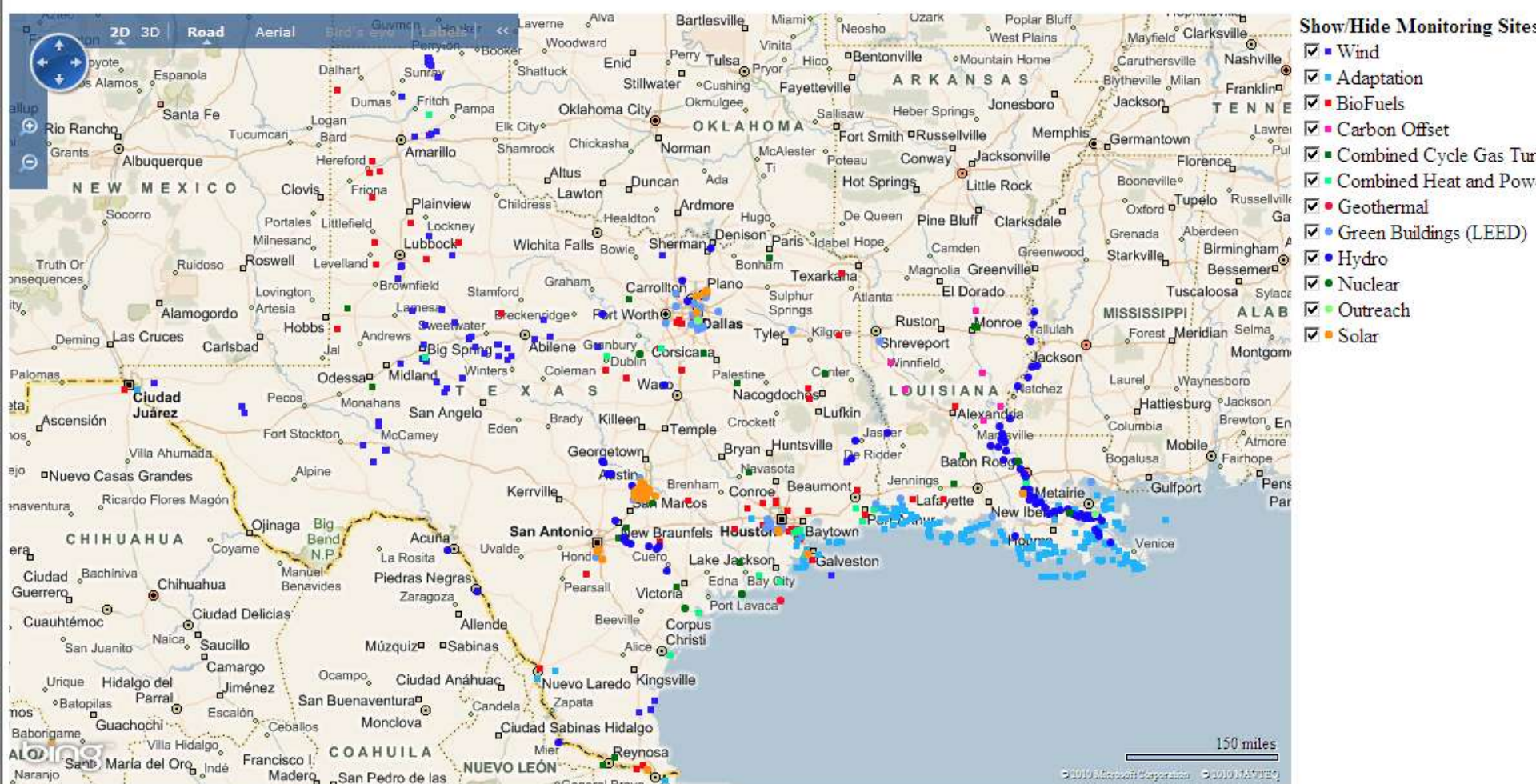
Adaption (166)

- – Infrastructure Upgrades (4)
- – Habitat Restoration/Protection (162)

GHG Mitigation (411)

- – Biomass Fuels (90)
- – Energy/Water Efficiency (103)
- – Geothermal Power (1)
- – Hydroelectric Power (27)
- – Hydrokinetic Power (52)
- – Nuclear Power (8)
- – Solar Power (57)
- – Terrestrial Carbon Sequestration (8)
- – Wind Power (65)

Climate Change Inventory GIS



For questions, please contact kirkland.robert@epa.gov

Below is a summary of the annual kilo Watt hours and annual tons of CO2 saved by project type. This highlights the importance and effectiveness of climate “friendly” projects.

	kilo Watt hours (kWh)	CO2 Saved (tons)
Wind	26,605,102,872	17,683,747
Adaptation	-	-
Biofuels	1,707,937,200	12,851,857
Carbon Offset	-	1,644,600

refine the search area for a project
map by moving the mouse while le
es.

JC Penny - Fairfield, TX

Type: Green Buildings (LEED Certified)

Sponsor: JC Penney Company Inc.

Contact Name: Robert Keller

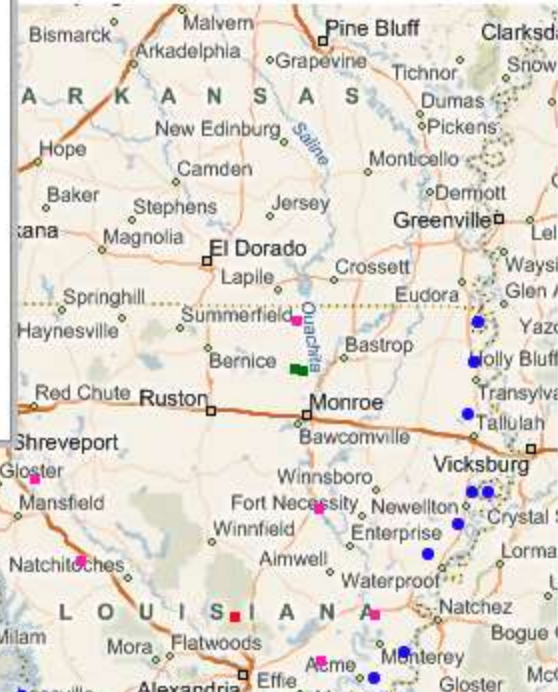
Contact Number: 972-431-1788

URL: [Click for more information on this site, if available.](#)

kWh: 808,910

CO2 Tons: 537.662075029308

side of the map or the mouse wheel. You can also move any directi
can select types of climate change projects by checking or un-check



- Show/Hide Monitoring Sites**
- Wind
 - Adaptation
 - BioFuels
 - Carbon Offset
 - Combined Cycle Gas Turbine
 - Combined Heat and Power
 - Geothermal
 - Green Buildings (LEED)
 - Hydro
 - Nuclear
 - Outreach
 - Solar

•Rain Garden – Fayetteville AR



•Green Parking Lot – Houston, TX



•Rainwater Harvesting – Austin, TX



•Open Space Preservation – Tulsa, OK



EPA Region 6 Green Infrastructure



•Infiltration Swale – Albuquerque, NM



•Porous Pavement & Infiltration Islands – McKinney, TX



•Living Roof - Webster, TX





New EPA Adaptation Workgroup

- Cross-EPA Climate Change Adaptation Planning Workgroup
- Develop and Implement an Adaptation Plan for EPA
- Mainstream Climate Adaptation into existing programs
- Established in response to Interagency Climate Change Adaptation Task Force Report (Oct. 5, 2010)



FUNDING: Extreme Event Impacts on Air Quality and Water Quality with a Changing Global Climate

- U.S. Environmental Protection Agency
<http://epa.gov/ncer/>
Office of Research and Development
National Center for Environmental Research
Science to Achieve Results (STAR) Program
- **Solicitation Opening Date: January 21, 2011**
Solicitation Closing Date: April 18, 2011, 11:59:59 pm EST
- **GOAL:** develop assessment tools and techniques, and demonstration of innovative technologies for providing information and capacity to adequately prepare for climate-induced changes
- **Awards:** Approximately \$6 *million* total
Ranges ~ \$375,000 to \$750,000, maximum duration of 3 years.
Cost-sharing is not required.



CARE FUNDING

<http://www.epa.gov/care/agreements.htm>

Community Action for a Renewed Environment (CARE)

community-based, community-driven, multimedia demonstration program designed to help communities understand and reduce risks due to toxic pollutants and environmental concerns from all sources.

Closing Date: March 22, 2011

Eligibility: Local, public non-profit institution/organizations, federally-recognized Indian tribal government, Native American organizations, private non-profit institution/organization, quasi-public nonprofit institution/organization both interstate and intrastate, local government, colleges, and universities could be eligible to apply for CARE funds.

Funding Levels: \$75,000 to \$300,000

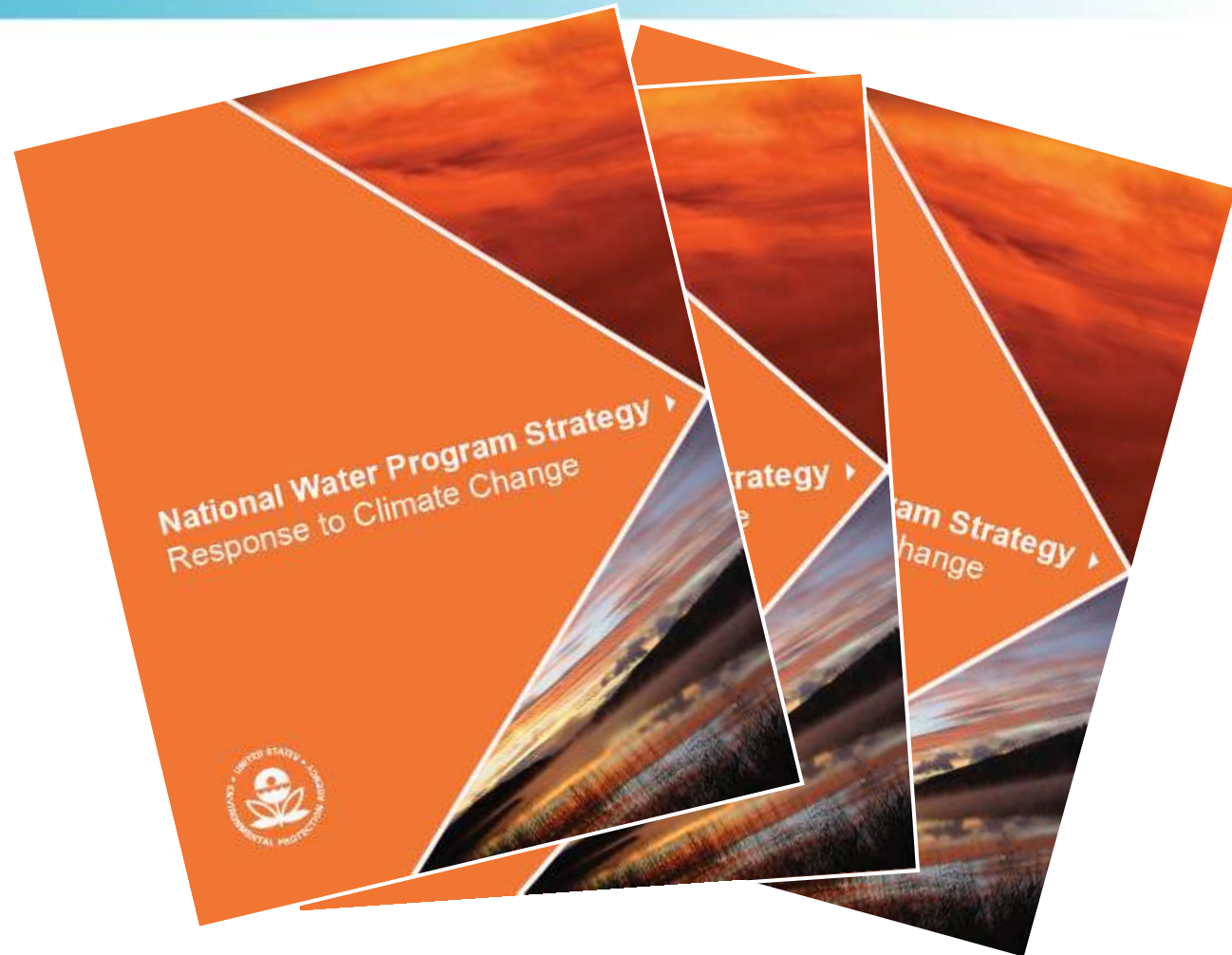
National Webcasts: Feb 8, Feb 23, and Mar 2, 2010; 1:00 p.m. - 3:00 p.m. EST



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

- Climate change will affect every aspect of the national water program
- Impacts are local, adaptation is local – requires multi-jurisdictional cooperation
- We need to use risk management to adapt while building understanding
- This will require a flexible and iterative approach that does not assume that hydrologic cycles of the future will be like the past

National Water Program Strategy: Response to Climate Change



<http://www.epa.gov/water/climatechange/>



NOAA CLIMATE SERVICES

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Prototype

Explore:

ClimateWatch Magazine

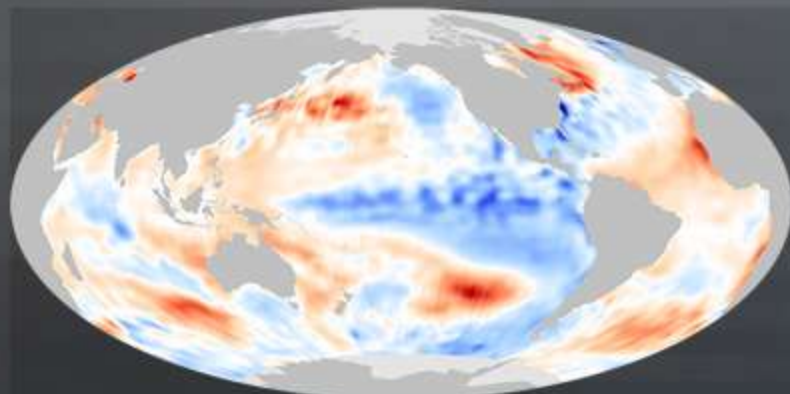
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Articles



2010 La Nina Continues in the New Year

Featured Article, December 31, 2010

by Rebecca Lindsey

A La Nina event that is cooling the central and eastern tropical Pacific is expected to peak sometime between November 2010 and January 2011, but it will continue through spring.

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Meet NOAA's climate scientists and get their perspectives on



Predicting El Nio and La Nia Events

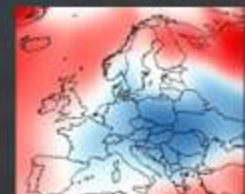


Impacts of La Nia in Africa

Images

► Bro

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EPA Office of Water

www.epa.gov/ow/climatechange

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Water





“Hundreds Gather to Protest Global Warming”

