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Managing Water in the West

Overview of Bureau of Reclamation Climate Change and Water Activities

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ACWI Climate Change and Water Resources Workgroup Meeting,
February 19-20, 2014, Arlington, VA

*Panel: Snapshots of Federal Agency Actions for Water Resources
Adaptation to Climate Change*



U.S. Department of the Interior
Bureau of Reclamation

Reclamation Mission

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.



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Where we've been... 2003-present

- **2003: build technical networks**
 - CA DWR & Reclamation Mid-Pacific Region form climate change work team
 - ad hoc, technical focus, developing capacity to use information
- **2005: address litigation risk**
 - failure to address climate change in environmental compliance (CA examples)
 - Triggered 2006 internal discussion on addressing climate variability
- **2007: draft guidance (High Level)**
 - “options” for level of analysis
- **2006-2007: initiate research**
 - Build on 2003 effort, demonstrate risk assessment framework
 - Develop downscaled climate projections for western U.S.
- **2008-present: applications**
 - MP, CVP OCAP (2008), first ESA BA
 - MP, SJRRP PEIS (2009), first NEPA
 - PN, RMJOC (2010-2011)
 - UC/GP (2008-2009), Demonstration to bend paleoclimate & projected climate
 - GP, OK Reservoir Yield Study (2010)
 - MP, Klamath Dam Removal (2010+)
- **2009: respond to new legislation & administration priorities**
 - 2009 SECURE legislation
 - 2009 DOI SO 3289 + DOI CSCs/LCCs
 - → **Reclamation WaterSMART Program**
 - Basin Studies, West Wide Climate Risk Assessments, LCC engagement, Grants
 - → **Reclamation S&T Program**
 - USGS Circular 1331, CCAWWG, collaborative R&D
- **Present: Mainstreaming CC**
 - DOI 523 DM 1 (Dec 2012); Pres. CAP (June 2013); EO 13653 (Nov 2013)

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WaterSMART - Basin Study Program



- **WWCRAs**
 - Help Reclamation implement **§ 9503 of the Secure Water Act (SWA)**
 - Apply a **consistent approach** throughout the west to assess impacts of climate change to water supplies, demands and operational risks
 - Key baseline assessments leading towards more in-depth analyses performed through future Basin Studies
- **Basin Studies**
 - Reclamation works on a cost-shared basis with **state and local partners** to develop potential **adaptation strategies** to meet future demands in light of imbalances in supply & demand
- **SECURE Studies**
 - Support state and local partners to **determine feasibility and impacts to ecological resiliency** of adaptation strategies identified in Basin Studies
- **Desert and Southern Rockies LCCs**
 - Partnerships to **develop applied science tools** to help resource managers address landscape-scale threats.
 - Provides a forum to share information developed through the Basin Study Program and to benefit from complementary activities by other agencies

Funded Basin Studies

	BasinStudyName	Year
1	Los Angeles Basin Stormwater Conservation Study	2012
2	Lower Rio Grande Basin Study	2011
3	Niobrara River Basin Study	2010
4	Republican River Basin Study	2012
5	Santa Ana River Watershed Basin Study	2010
6	Sante Fe Basin Study	2011
7	Upper Washita Basin Study	2012
8	Southeast California Regional Basin Study	2010
9	Pecos River Basin Study	2012
10	Hood River Basin, Oregon Water Supply and Demand Study	2011
11	Henrys Fork of the Snake River Basin Study	2010
12	Yakima River Basin Study	2009
13	Sacramento-San Joaquin River Basin Study	2012
14	Klamath River Basin Study	2011
15	Truckee River Basin Study	2010
16	Colorado River Basin Water Supply and Demand Study	2009
17	Milk-St. Mary River Basin Study	2009
18	San Diego Watershed Basin Study	2013
19	West Salt River Valley Basin Study	2013



Science & Technology (S&T) Program: Research to Improve Methods/Tools

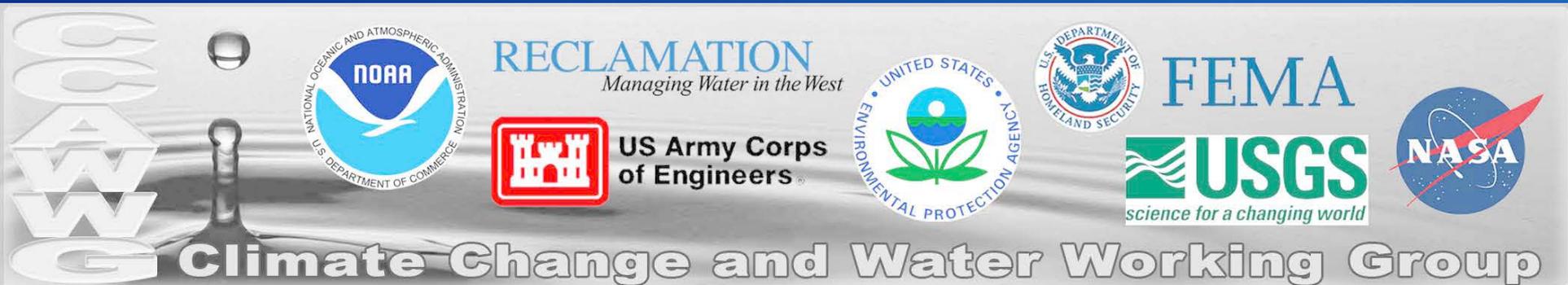
- Developing solutions for water & power management
 - Traditional areas
 - Environmental Stewardship for Water Delivery and Management
 - Water and Power Infrastructure Reliability
 - Water Operations Decision Support
 - Conserving or Expanding Water Supplies
 - Themes cutting across areas:
 - **climate change and variability**
 - zebra/quagga mussels
 - advanced water treatment
 - renewable energy
 - S&T Portfolio: ~150 projects, ~8M per year
 - **recent Climate Change and Variability activity: ~1.5M/yr.**

<http://www.usbr.gov/research/climate>

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S&T Climate Change investments:

prioritized by user needs collaboratively identified by the
Climate Change and Water Working Group



<http://www.ccawwg.us>

- Defining User Needs, Developing Research Strategy
- Fostering collaborative R&D
- Developing Training Resources (addresses NAP Action 21)
- Hosting Workshops on Emerging Topics (e.g., 2010 workshops on Nonstationarity, Portfolio of Assessment Approaches)

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S&T & WaterSMART Collaboration: Downscaled Climate & Hydrology Projections

http://gdo-dcp.ucInl.org/downscaled_cmip_projections/

- Collaboratively hosted web data-service
- Goal
 - Develop and maintain a projections-rich information resource consistently developed over contiguous U.S. that supports risk-based climate adaptation planning.
- Content
 - climate: monthly BCSD, daily BCCA), CMIP3 (issued 2007 & 2012), CMIP5 (issued 2013)
 - hydrology: BCSD CMIP3 western U.S. (issued 2012); BCSD CMIP5 contiguous U.S. + transboundary basins in Canada (Spring 2014)
- Collaborators
 - Climate Analytics Group
 - Climate Central
 - LLNL Green Data Oasis
 - NCAR Research Applications Laboratory
 - Reclamation (S&T, WaterSMART)
 - Santa Clara University
 - Scripps Institution of Oceanography
 - USACE Institute for Water Resources
 - USGS Center for Integrated Data Analytics

The screenshot shows the website's header with logos for RECLAMATION, Santa Clara University, USGS, CLIMATE CENTRAL, and SCRIPPS INSTITUTION OF OCEANOGRAPHY. The main title is 'Downscaled CMIP3 and CMIP5 Climate and Hydrology Projections'. A note states: 'This site is best viewed with Chrome (recommended) or Firefox. Some features are unavailable when using Internet Explorer. Requires JavaScript to be enabled.' The navigation menu includes 'Welcome', 'About', 'Tutorials', 'Projections: Subset Request', 'Projections: Complete Archives', 'Feedback', and 'Links'. The main content area features a section for 'Downscaled CMIP5 climate projections' with a 'Summary' section. The summary text describes the archive's content, including spatial resolution translations of climate and hydrologic projections. To the right, there is a figure caption: 'Figure 1. Central Tendency Changes in Mean-Annual Precipitation over the contiguous U.S. from 1970-1999 to 2040-2069 for BCSD3, BCSD5, and Difference.' Below the caption is a map of the contiguous U.S. showing precipitation changes, with a color scale from -20 to 20 percent.

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New Climate Change Plans, Directives, and Policies

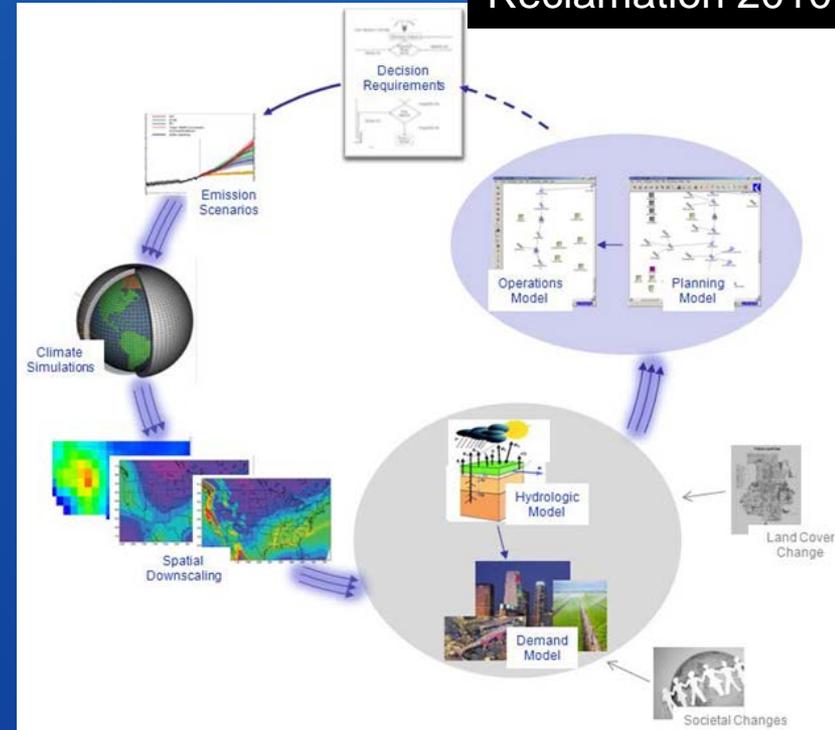
- Department's **Climate Adaptation Policy**, 523 DM1, Dec. 2012
 - Use best available science to inform decision making and integrate adaptation strategies into policies, planning, programs, and operations
- Department's **Climate Adaptation Plan**, February 2013
 - High level adaptation plan with contributions from all Interior agencies
- President's Climate Action Plan (**President's Plan**), June 2013
 - Identifies actions for Federal agencies to “Prepare the United States for the Impacts of Climate Change,” e.g., “Managing Drought,” “Preparing for Future Floods,” “Using Sound Science to Manage Climate Impacts”
- **Executive Order 13653** – “Preparing the United States for the Impacts of Climate Change,” November 2013
 - Implements the President's Plan

New Reclamation Planning Directive (9/30/2012)

Water and Related Resources Feasibility Studies

Reclamation 2010

- Previous: discretionary use of climate change in feasibility studies
- Sep 2012: required consideration...
 - Reclamation Manual CMP-09-02
 - establishes responsibilities, requirements, and procedures for conducting a planning study for the purpose of recommending congressional authorization or funding of a water and related resources implementation plan.
 - presents requirements that will be used to implement the P&Gs
 - “The **potential impacts of climate change will be considered** when developing projections of environmental conditions, water supply and demand, and operational conditions at existing facilities as part of the **without-plan future condition.**”



Questions

- Which types of climate change?
- Which approaches are reasonable?

Developing CC Guidance (2013-2014)

- For feasibility studies, environmental compliance and other long-term studies
- Promotes flexible consideration of relevance, reliability, practicality when selecting an approach for using CC information in the study

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