

RECLAMATION

Managing Water in the West

Incorporating Climate Change into Management Actions and Project Planning



U.S. Department of the Interior
Bureau of Reclamation

Reclamation Mission Statement

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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348 Reservoirs

245 Million acre-feet of water storage

254 Diversion dams

16,000 Miles of canals

\$9 Billion annual agricultural benefits

M&I benefits to more than 31 million people

58 Hydropower facilities powering over 6 million homes

308 public recreation areas visited by more than 90 million people each year

More than \$12 billion avoided flood damages since 1959

By its mere presence and ownership of facilities, Reclamation directly influences water use and supply patterns in most major western river basins

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Bureau Regions and Facilities

- Bureau Regions
- Regional Offices



RECLAMATION

Bureau Regions and Facilities

- Bureau Regions
- Regional Offices
- Power Plants
- Dams



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Climate Change Challenges

- Understanding how climate variability and climate change scenarios can affect Western water supply and demand is central to forming effective water management strategies.
- The need for this new knowledge is a high priority across federal, state, and local water management interests.
- Developing this new knowledge requires research that spans the physical and anthropogenic influences on the hydrologic cycle.

Climate Change Challenges

“Resource managers have limited guidance from their agencies about how to address climate change in management actions and planning efforts”

GAO

United States Government Accountability Office
Report to Congressional Requesters

August 2007

CLIMATE CHANGE

Agencies Should
Develop Guidance for
Addressing the Effects
on Federal Land and
Water Resources



GAO-07-863

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Climate Change Challenges

“Discovery science and understanding of the climate system are proceeding well, but the use of that knowledge to support decision making and to manage risks and opportunities of climate change is proceeding slowly.”

EVALUATING PROGRESS OF THE U.S.
CLIMATE CHANGE SCIENCE PROGRAM

METHODS AND PRELIMINARY RESULTS

Committee on Strategic Advice on the
U.S. Climate Change Science Program

Division on Earth and Life Studies

Division of Behavioral and Social Sciences and Education

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

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Climate Change Challenges

“The need for effective communication, public outreach, and education to increase support for policy, collective action, and behavior change is ever present, and is perhaps most pressing in the context of anthropogenic climate change.”

“...real opportunity in facilitating conversation across disciplines and with practitioners.”

- Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change, Moser and Dilling, 2007

How are we attacking these challenges?

Five-Front Strategy:

1. Draw on our experience
2. Utilize a sensible process to identify vulnerabilities, opportunities, and manage risks
3. Project-specific applications
4. Stakeholder participation
5. Multi-agency, collaborative research

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Climate Change and Western Water R&D Group (CCAWWG)

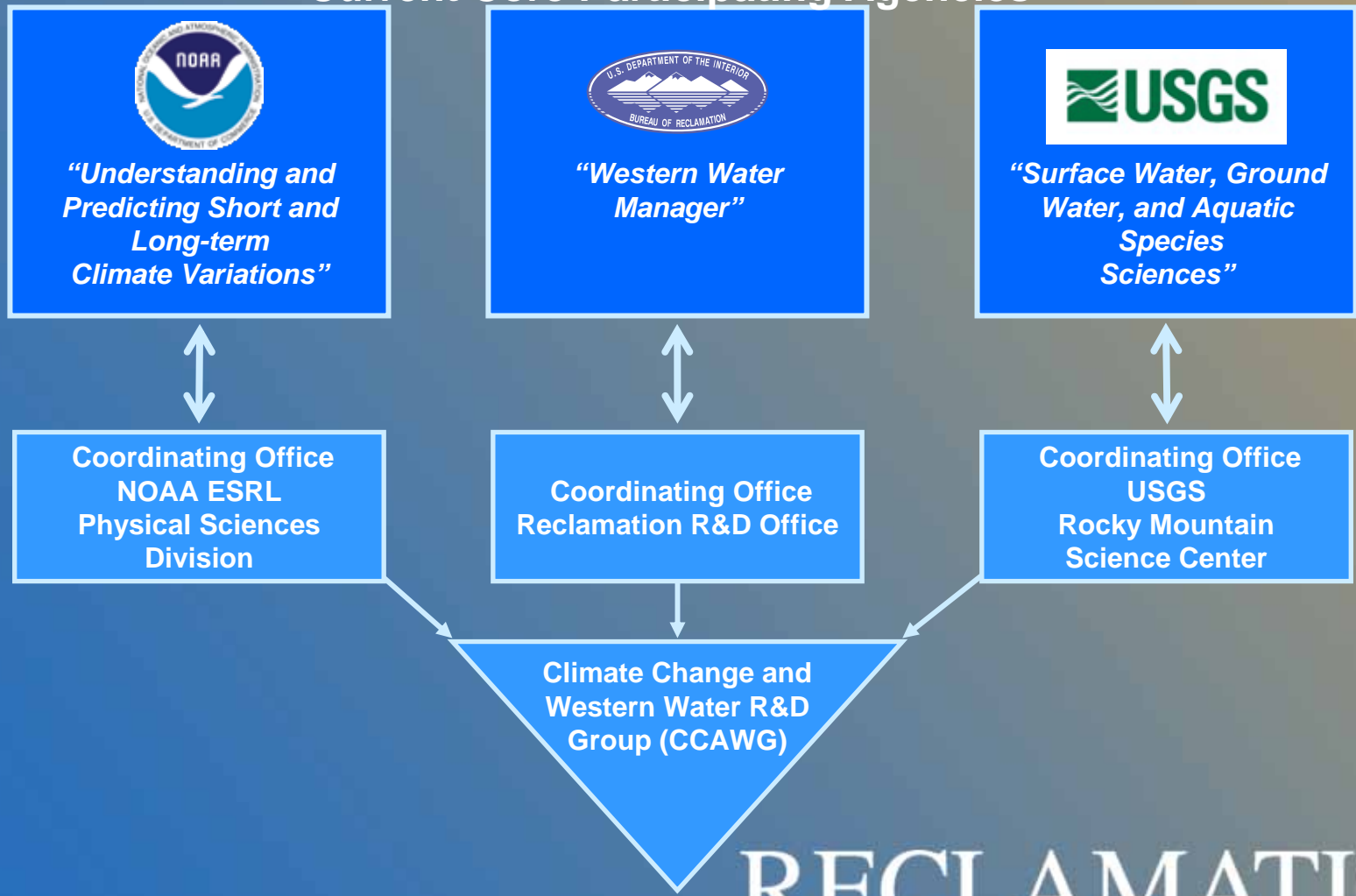
Purpose: A federal interagency R&D workgroup providing scientific collaborations in support of Western water management as climate changes

Action: Developing and implementing a multi-agency research and knowledge transfer agenda that spans the hydrologic cycle and is driven by Western water management and planning decisions

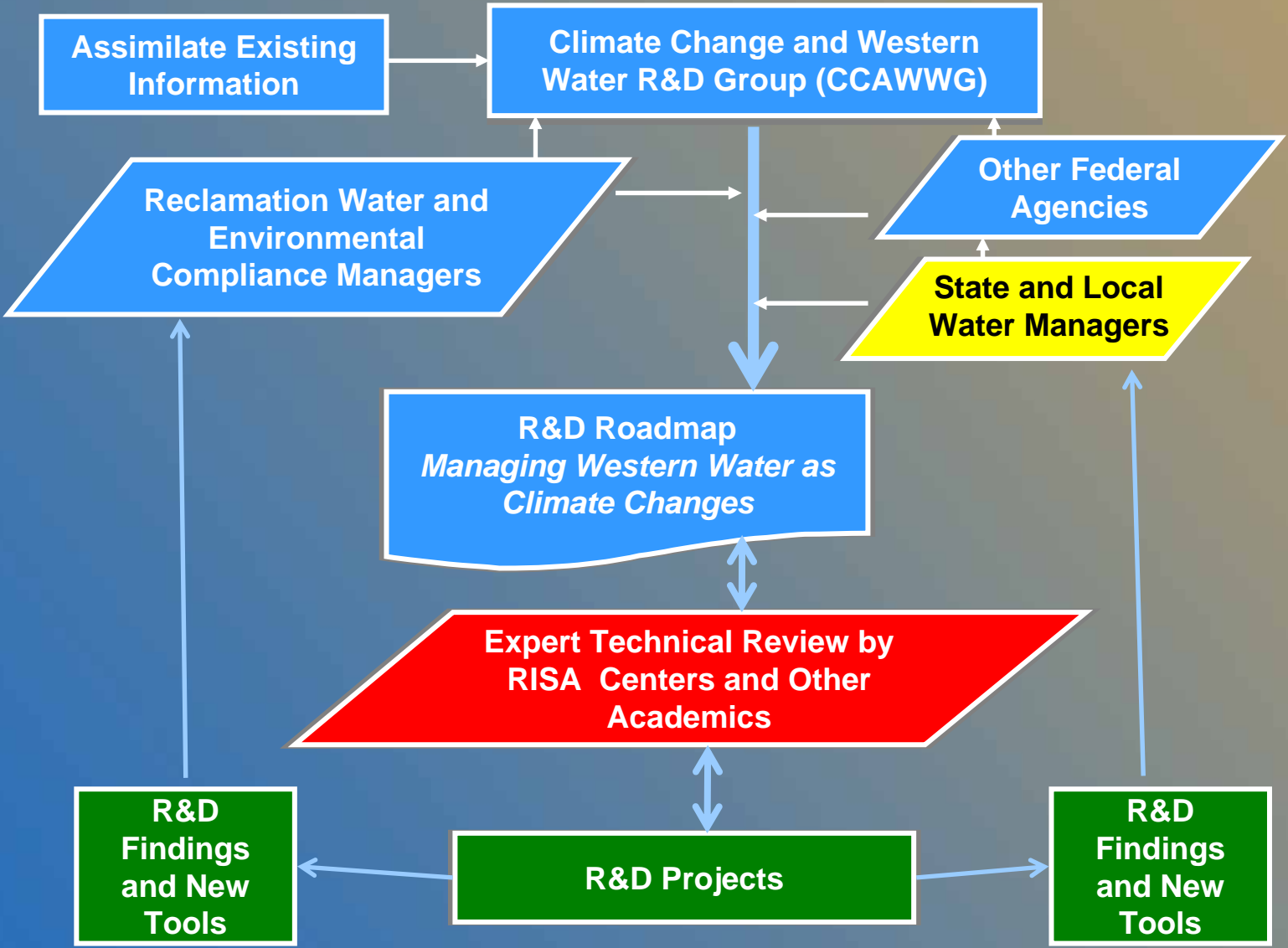
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Climate Change and Western Water R&D Workgroup....*Spanning the Hydrologic Cycle*

Current Core Participating Agencies



General CCAWWG Process.....



CCAWWG Status and Next Steps

- Engaged Reclamation water operation and environmental compliance officers and jointly developed a draft research roadmap. Information available at: <http://www.esrl.noaa.gov/psd/workshops/mwwcc/index.html>
- Research roadmap is framed by the decisions and actions that Reclamation commonly undertakes in accomplishing their Western water management mission.
- Conducting ongoing, and planning new research efforts for 2008 and 2009

CCAWWG Next Steps

- **Evolve the R&D roadmap** and research efforts through future engagements with Western states, municipal, and agricultural water supply organizations using existing venues such as Western States Water Council, Water Utility Climate Alliance, et al
- **Develop structured training program** for integrating contemporary climate change science information into the mainstream capabilities and responsibilities of Western water and water related resource managers.
- **Develop structured climate change science peer review** resource that provides forum for expert review and “*honest broker*” of climate change information

Climate Predictions Applications Postdoctoral Program

- Offered by the University Corporation for Atmospheric Research
 - See <http://www.vsp.ucar.edu/> for details.
- Mainlines postdoctoral fellowships within climate science institutions and decision-making institutions through joint sponsorships
- Postdoctoral fellows conduct research on climate related science relevant to the sponsoring organizations
- Builds the pool of future scientists that can transfer the advances of climate change science into climate-related decision frameworks

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Climate Predictions Applications Postdoctoral Program, Continued

- Reclamation, NOAA, and Southern Nevada Water Authority are jointly sponsoring a postdoctoral fellow to:
 - Compare observed variability of precipitation and the variability of precipitation simulated by Global Circulation Models for an overlap historical period.
 - Assess the potential future changes in temporal precipitation variability in the Colorado River Basin

Conclusion

There are no absolutes...it's really all about risk management:

- Understand climate change processes
- Understand physical responses to climate change scenarios
- Consider societal responses to climate change
- Recognize uncertainty and deal with it
- Communicate with stakeholders and across disciplines throughout the risk analysis process
- Develop solutions that are flexible and guided by risk management objectives

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