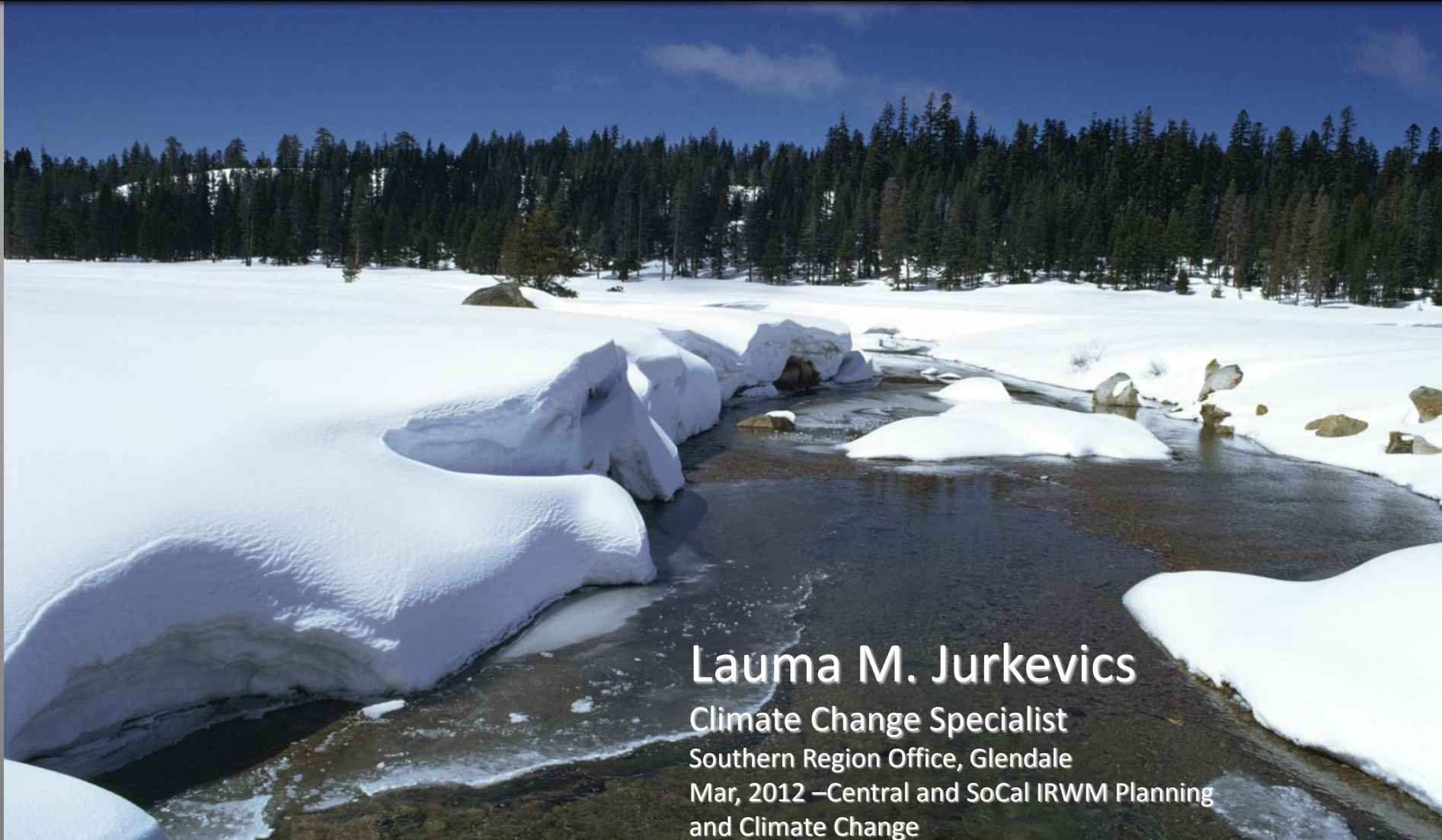




California, Water, and Climate Change

Overview of Climate Change and IRWM Planning Processes



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Climate Change Specialist

Southern Region Office, Glendale

Mar, 2012 –Central and SoCal IRWM Planning

and Climate Change

Topics to Cover

- ❖ **Laws, regulations, standards – climate change and GHGs**
- ❖ **DWR's climate change program**
- ❖ **Video: “A Climate of Change”**
- ❖ **Mitigation and adaptation**
- ❖ **Integrated approaches and resources (e.g., handbook)**
- ❖ **Other DWR activities to mitigate and adapt (sustainability, CEQA, climate action plan, research)**

State Laws and Regulations

Legislation/ Policy Name	Signed into Law/ Ordered	Description
SB 1771	09/2000	Establishes California Climate Registry to develop protocols for voluntary accounting and tracking of GHG emissions
EO S-20-04	07/2004	Commits state agencies, departments, and other entities under the direct executive authority to reducing grid-based energy purchases by 20 percent
SB 1078 SB 107 EO S-14-08	09/2002 09/2006 11/2008	Establish renewable energy mandates and goals as a percentage of total energy supplied in the State
EO S-3-05 AB 32	06/2005 09/2006	Establish statewide GHG emissions reduction mandates and targets
SB 97	08/2007	Directs OPR to develop guideline amendments for the analysis of climate change in CEQA documents

EO S-3-05 vs. AB32

Applies directly to state agencies and departments

EO S-3-05

Applies to the entire state and all businesses within it

AB32

EO S-3-05 vs. AB32

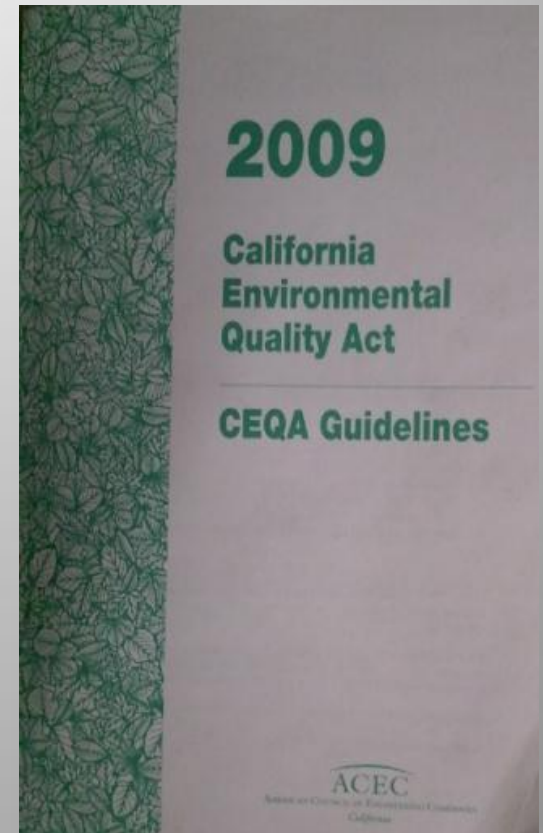
Establishes a goal of reducing statewide GHG emissions to 1990 levels by 2020

Both

SB97

Senate Bill 97

GHGs are explicitly required to be analyzed for CEQA



IRWM Climate Change Requirements

Water Code Section 10541

(e) The guidelines shall **require that integrated regional water management plans** include all of the following:

(9) **Consideration of greenhouse gas emissions** of identified programs and projects.

(10) **Evaluation of the adaptability to climate change** of water management systems in the region.

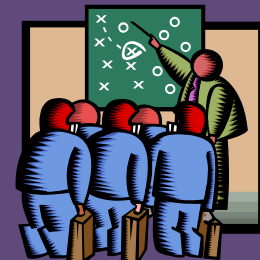
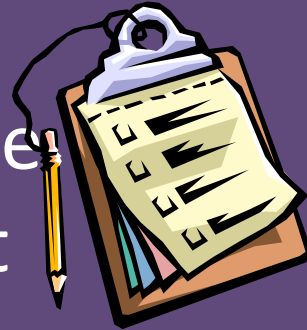
Climate Change Standard and IRWMPs

In recognition of the vast variability among IRWM regions in the degree and type of vulnerability to the effects of climate change, **the Climate Change standard** of Proposition 84 & Proposition 1E Guidelines for the IRWM Grant Program **was intentionally written broadly.**

With the release of the *Climate Change Handbook for Regional Water Planning* as well as other guidance such as Ocean Protection Council's Interim Guidance on Sea Level Rise, **the time has come to set the Climate Change standard** for rounds 2 and 3 of the Implementation Grant.

Climate Change in IRWMPs

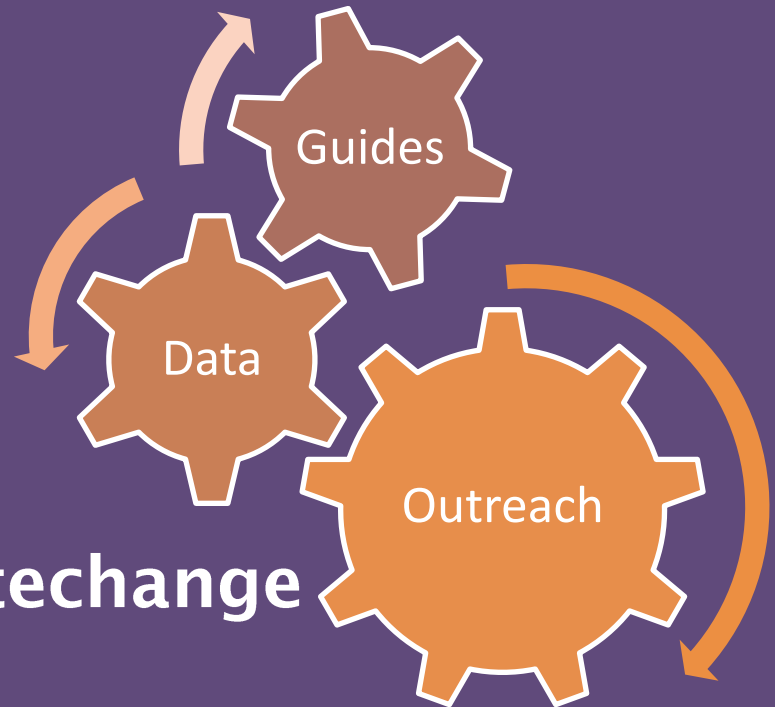
- a regional climate change vulnerability assessment
- a list of prioritized vulnerabilities
- a plan for data gathering/analyzing the prioritized vulnerabilities



DWR Climate Program

Team of managers, scientists, engineers, administrators, and interns from headquarters and the regional offices

- Develops guidance on addressing CC & GHGs
- Provides outreach & technical assistance



www.water.ca.gov/climatechange

Climate Change

- Climate Change Home
- Climate Change 101
- Climate News
- Current Perspectives Blog
- Publications
- Local and Regional Resources
- Videos
- Events
- Related Links
- Internal CC Website
- Contact Us
- Contact Us for Local and Regional Resources Assistance



Climate change is having a profound impact on California water resources, as evidenced by changes in snowpack, sea level, and river flows. These changes are expected to continue in the future and more of our precipitation will likely fall as rain instead of snow. This potential change in weather patterns will exacerbate flood risks and add additional challenges for water supply reliability.

The Sierra snowpack provides as much as 65 percent of California's water supply by accumulating snow during our wet winters and releasing it slowly when we need it during our dry springs and summers. Warmer temperatures will cause what snow we do get to melt faster and earlier, making it more difficult to store and use. By 2050, scientists project a loss of at least 25 percent of the Sierra snowpack. This loss of snowpack means less water will be available for Californians to use.

Climate change is also expected to result in more variable weather patterns throughout California. More variability can lead to longer and more severe droughts. In addition, the sea level will continue to rise threatening the sustainability of the Sacramento-San Joaquin Delta, the heart of the California water supply system and the source of water for 25 million Californians and millions of acres of prime farmland.

The Department of Water Resources (DWR) is addressing these impacts through mitigation and adaptation measures to ensure that Californians have an adequate water supply, reliable flood control, and healthy ecosystems now and in the future. Below are some of DWR's climate change activities.

- DWR released summaries of its climate change achievements as a [Poster](#) and [Brochure](#) (2010)
- DWR adopted its own [Sustainability Policy](#) to promote a departmental change in the way DWR does business (2009), and established clear and measurable [Goals](#) for sustainability implementation (2010).
- DWR is a member of the California Climate Action Registry and has made the list as a [Climate Action Leader](#) for three straight years by reporting its GHG emissions and having the data verified through a third party audit. (2007, 2008, 2009)
- DWR adopted a [Climate Change Adaptation Strategy](#) (2008)
- DWR announced plans to use lower carbon fuel sources for State Water Project energy supplies instead of a coal fired power plant, currently being used (2007)

[Other Climate Change Activities](#)

Adapting to the current and future effects of climate change is essential for DWR and California's water managers. DWR addresses climate change in its California Water Plan, which is updated every five years. The California Water Plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. DWR continues to improve and expand the analysis of climate change in the California Water Plan. The [2009 California Water Plan Update](#) includes multiple scenarios of future climate conditions and stresses the inclusion of uncertainty, risk, and sustainability.

[Climate Change Technical Advisory Group](#)

- [DWR Proposal for Climate Change Technical Advisory Group \(October, 2011\)](#)
- [DWR Invites Statements of Qualifications for Climate Change Technical Advisory Group \(November, 2011\)](#)



Climate ACTION TEAM

Department of Water Resources
 1416 Ninth Street
 Sacramento, CA 95814
 Mailing Address:
 P. O. Box 942836
 Sacramento, CA 94236

Featured Link

Climate Change Handbook for Regional Water Management

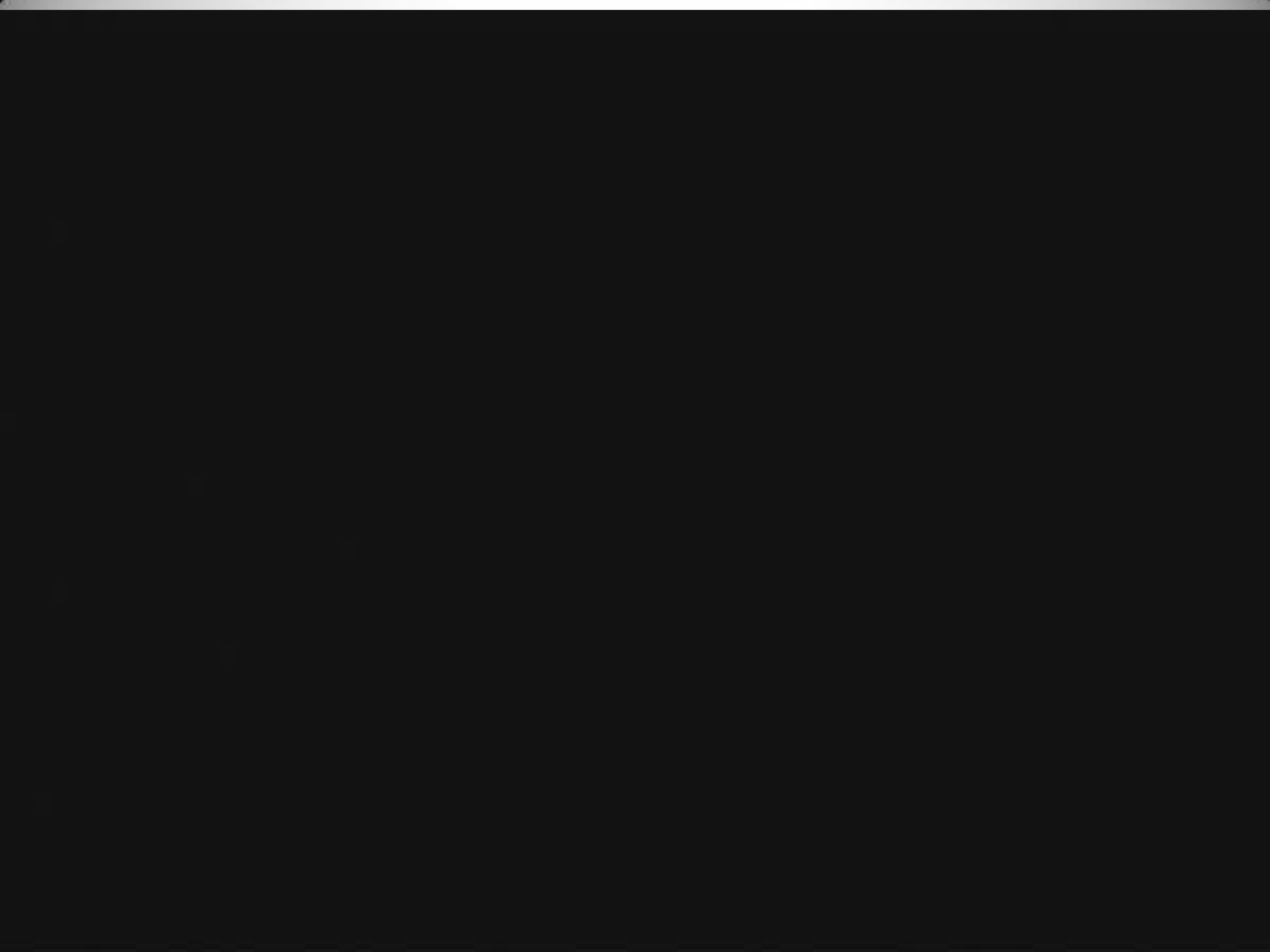
RESOURCES LEGACY FUND

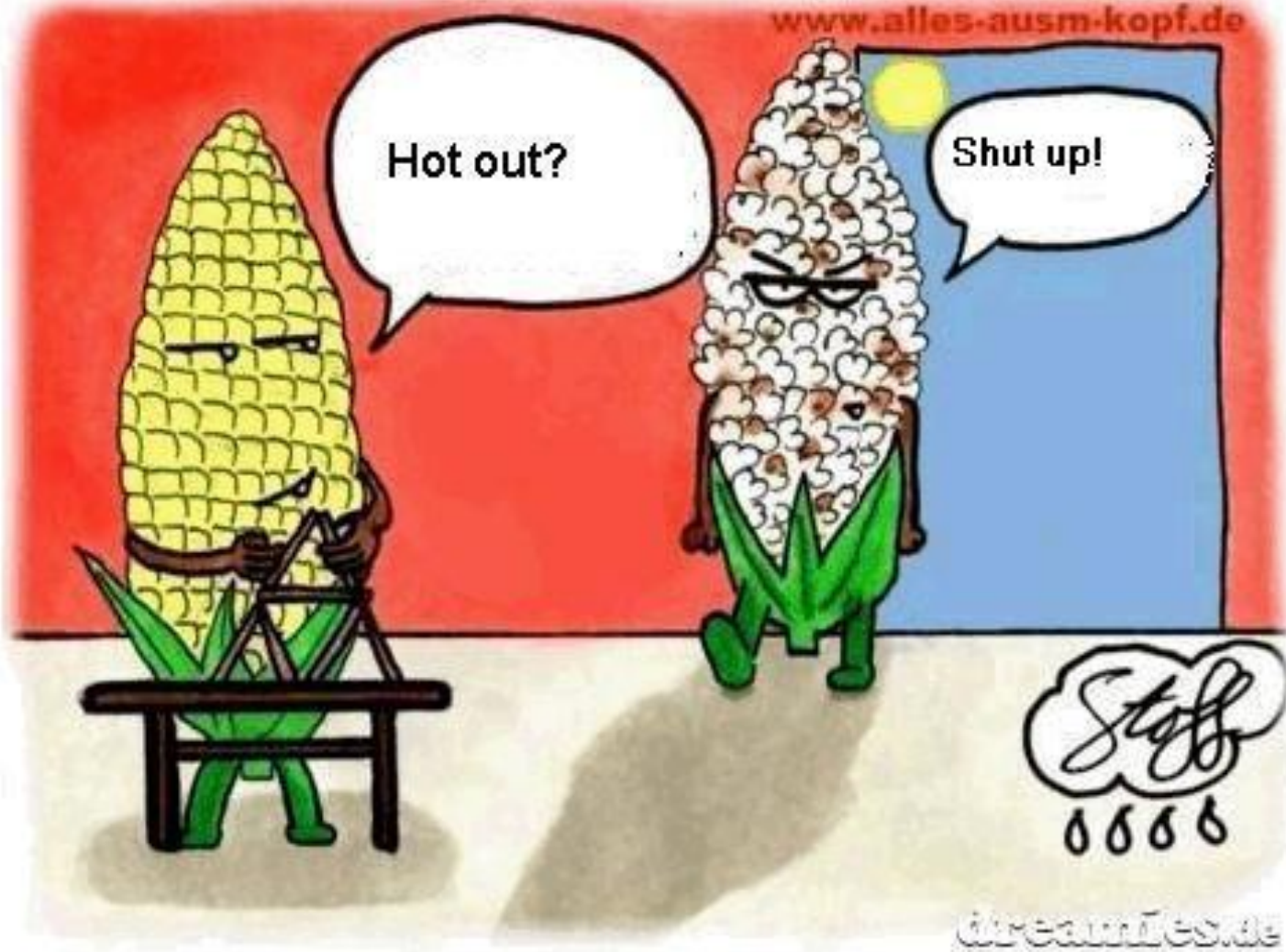
Climate Change Handbook for Regional Water Planning

The Climate Change Handbook for Regional Water Planning provides key decision considerations, resources, tools, and decision options that will guide resource managers and planners as they develop their own solutions for how to adapt their programs to a changing climate.

VIDEO

"A CLIMATE OF CHANGE"





Hot out?

Shut up!

Stoff
0000

Mitigation & Adaptation

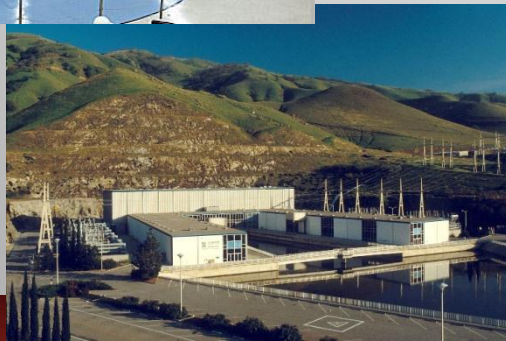
Mitigation

Actions that reduce or eliminate impacts
(reduce emissions of CO₂ from construction to reduce our contribution to global warming)

Adaptation

Actions that adjust to existing or anticipated conditions (respond to rising sea levels when building levees)

Water, Energy, and Climate Change



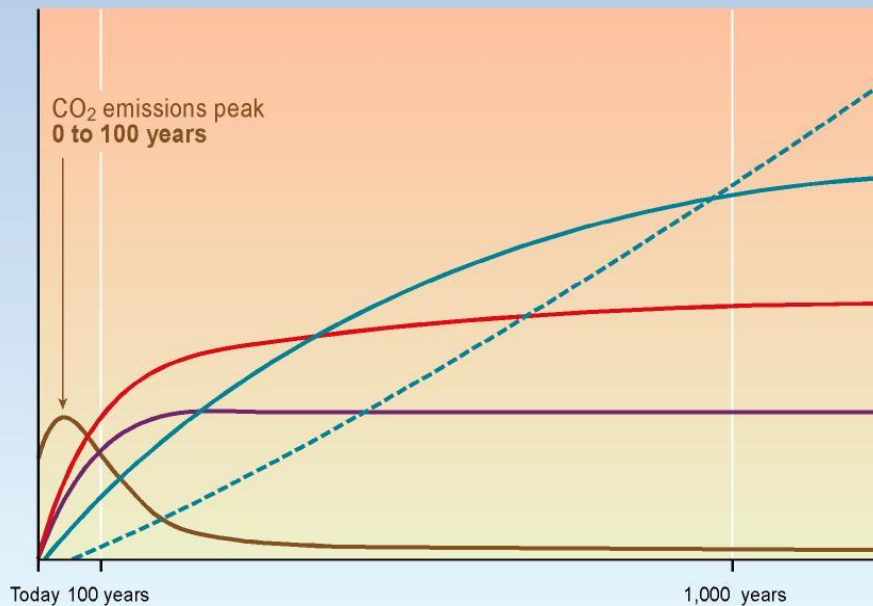
MITIGATION

*Manage water
in a way that reduces
emissions of greenhouse
gases (mostly CO₂)*

Adaptation is a Necessity

CO₂ concentration, temperature, and sea level continue to rise long after emissions are reduced

Magnitude of response



Time taken to reach equilibrium

Sea-level rise due to ice melting:
several millennia

Sea-level rise due to thermal expansion:
centuries to millennia

Temperature stabilization:
a few centuries

CO₂ stabilization:
100 to 300 years

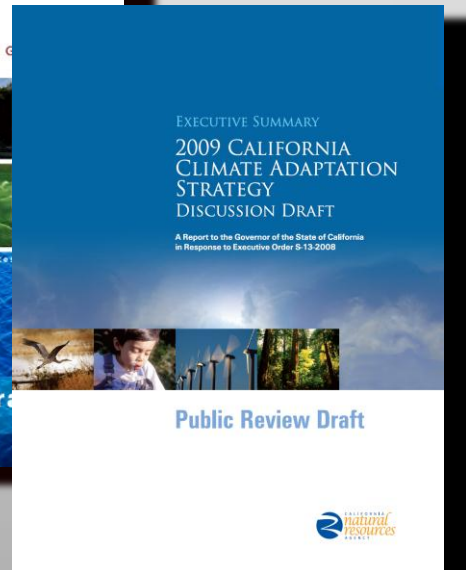
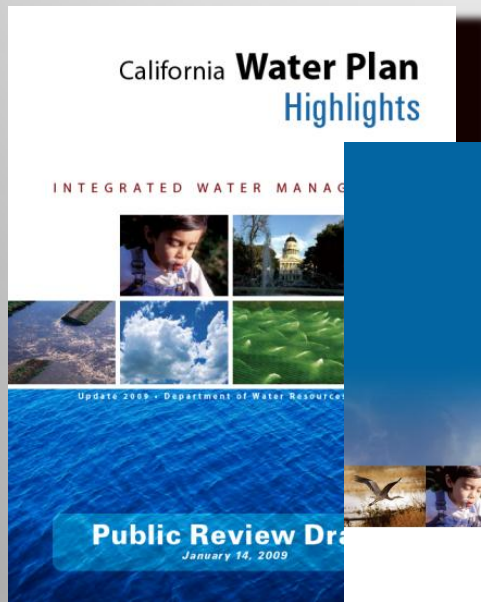
CO₂ emissions

SYR - FIGURE 5-2

Planning for Adaptation

www.waterplan.water.ca.gov

www.climatechange.gov/adaptation



DWR White Paper on Climate Change Adaptation Strategies



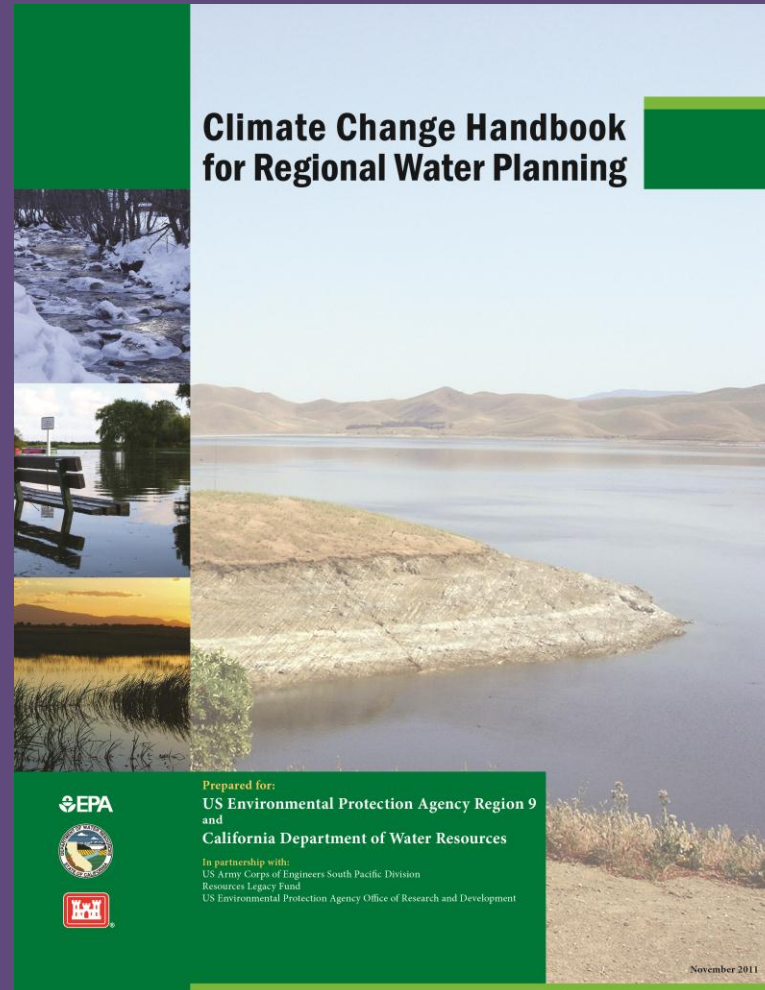
[www.
water.ca.gov/
climatechange/](http://www.water.ca.gov/climatechange/)

Climate Change Guidance for IRWM

- Requiring those who want money for water projects to prepare for climate change
- Providing online clearinghouse of documents on climate change planning, mitigation, adaptation, and research
- Providing an **on-line handbook** to assist IRWM groups in adapting to climate change



Climate Change Handbook for Water Planning



What the Handbook is NOT

- **A cookbook**
- **A one-size-fits-all methodology or approach**
- **An extension of or an addition to the IRWM Guidelines**
- **A requirement**

Handbook's Purpose

- Outline the general process for accounting for climate change in water planning
- Synthesize available literature in a way that is useful for regional water planning
- Support IRWM planning in California

Climate Change Analysis

- **Assess Vulnerability**
- **Measure Impacts**
- **Inventory Greenhouse Gas Emissions**
- **Evaluate Strategies (including adaptation and mitigation)**
- **Implement Under Uncertainty**

Sustainability Policies to Mitigate and Adapt



- Foundation of DWR “greening” activities
- Env stewardship & business practices foundational policies
- Pending guidelines for purchasing, water, and waste

Sustainability Targets

- Reduce water use by 20% per capita
- Incorporate wastewater reuse into facilities when technically feasible and cost effective
- Acquire 360 GWh/yr of renewable energy resources by 2020 and reduce grid-based retail energy demand 20% by 2015
- Reduce carbon emissions to 50% below 1990 levels by 2020 and 80 percent below 1990 levels by 2050
- Divert 50% of waste by 2020

Implementing 20 X 2020 Water Conservation Plan

- Reduce urban water use by 20% per capita by 2020
- Report on water use efficiency by agriculture
- Monitor groundwater levels



Sustainability Projects to Mitigate & Adapt



- **Buying renewable energy**
- **Printing double-sided**
- **Checking tire pressures**
- **Evaluating where we use water in our buildings, and reducing its use**

Looking for Green Energy



- **State Water Project, >50% of power from hydroelectricity (zero carbon)**
- **Replacing coal fired electricity with natural gas and renewable energy**

Complying with Environmental Laws



- Identifying, quantifying GHG emissions from DWR projects
- Developing a plan to reduce emissions
- Documenting progress

CEQA guidance

2010 DWR CEQA GHG Internal Guidance

- For addressing GHGs in DWR CEQA documentation
- Quantifying GHG emissions & determining their significance to global climate change
- Project-by-project analysis

Appendix B, pg 14

Mitigation measures that could be applied to DWR projects

- Energy efficiency
- Renewable energy
- Water conservation
- Solid waste measures
- Transportation
- Carbon offsets
- Blended cements

Climate Action Plan

Draft Phase 1: GHG Reduction Plan

- Addressing GHGs on a programmatic level for DWR CEQA documents
- Complying with legislation
- Including measures into the project design or plan
 - Construction BMPs
 - Equipment & Fuel Regulations

Draft Phase 2: Climate Change Analysis for Planning

- Developing measurable goals to achieve objectives from CA's *Climate Adaptation Strategy*
- Guiding DWR in choosing approaches and tools to address adaptation in planning documents

Climate Action Plan

Phase 1: GHG Reduction Plan

- Comprehensive analysis of DWR's GHG emissions past, present, and future
- GHG emissions reduction goals
- 10 GHG emissions reduction measures to meet the goals

DWR: Climate Action Leader

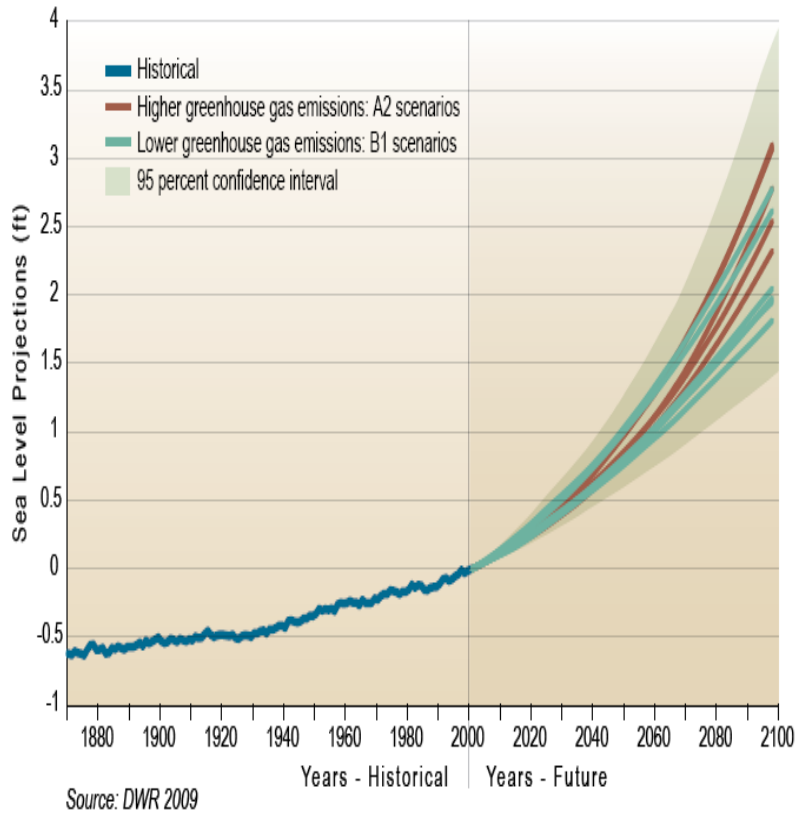
- **Verified & reported “carbon footprint” to CA Climate Action Registry since 2007**
- **Ahead of schedule in meeting state goals for reducing GHG emissions**



GHG Emission Reduction Measures	2020 Annual Emission Reduction (mtCO₂e)
OP-1 Reid Gardner Power Substitution	920,000
OP-2 Energy Efficiency Improvements	48,500
OP-3 Renewable Energy Procurement Plan	101,500
OP-4 Distributed Renewable Generation	10
OP-5 Carbon Sequestration Actions	Unknown
CO-1 Construction Best Management Practices	1,950
CO-2 Statewide Equipment and Fuel Regulations	900
BP-1 SMUD Commercial Greenergy Program	1,020
BP-2 SMUD Carbon Offset Program	2,580
BP-3 Implement DWR Sustainability Initiatives	Not quantified
Total Annual Reductions	1,076,450

Collecting and Understanding Data to Better Adapt

- **Sharing resources for monitoring and collecting data**
- **Working with Ocean Protection Council**
- **Focusing research on sea level rise and other topics to narrow uncertainty**



Sea Level Rise projection

Sea Level Rise Study

- **Partnering with others (CA, OR, WA, National Research Council)**
- **Evaluating the range in sea level rise and its impacts to California's coast**
- **Planning for future sea level rise**



Moving Forward for DWR

- Nearly every part of DWR is involved in climate change in some way
- DWR is moving towards a more sustainable future to adapt to changes that affect the way we live with water and each other



Moving Forward in IRWMPs

- It is now time for the RWMGs to factor in climate change in IRWM planning
- DWR is here to help



Questions?

Comments?

Discussion?

