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)
<table>
<thead>
<tr>
<th>Legislation/ Policy Name</th>
<th>Signed into Law/ Ordered</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB 1771</td>
<td>09/2000</td>
<td>Establishes California Climate Registry to develop protocols for voluntary accounting and tracking of GHG emissions</td>
</tr>
<tr>
<td>EO S-20-04</td>
<td>07/2004</td>
<td>Commits state agencies, departments, and other entities under the direct executive authority to reducing grid-based energy purchases by 20 percent</td>
</tr>
<tr>
<td>SB 1078</td>
<td>09/2002</td>
<td>Establish renewable energy mandates and goals as a percentage of total energy supplied in the State</td>
</tr>
<tr>
<td>SB 107</td>
<td>09/2006</td>
<td>Establish renewable energy mandates and goals as a percentage of total energy supplied in the State</td>
</tr>
<tr>
<td>EO S-14-08</td>
<td>11/2008</td>
<td></td>
</tr>
<tr>
<td>EO S-3-05</td>
<td>06/2005</td>
<td>Establish statewide GHG emissions reduction mandates and targets</td>
</tr>
<tr>
<td>AB 32</td>
<td>09/2006</td>
<td></td>
</tr>
<tr>
<td>SB 97</td>
<td>08/2007</td>
<td>Directs OPR to develop guideline amendments for the analysis of climate change in CEQA documents</td>
</tr>
</tbody>
</table>
EO S-3-05 vs. AB32

EO S-3-05
Applies directly to state agencies and departments

AB32
Applies to the entire state and all businesses within it
Establishes a goal of reducing statewide GHG emissions to 1990 levels by 2020

Both
GHGs are explicitly required to be analyzed for CEQA

SB97

Senate Bill 97
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.
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
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 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 California 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](https://www.dwr.ca.gov/poster) and [Brochure](https://www.dwr.ca.gov/brochure) (2010)
- DWR adopted its own [Sustainability Policy](https://www.dwr.ca.gov/sustainability) to promote a departmental change in the way DWR does business (2009), and established clear and measurable [Goals](https://www.dwr.ca.gov/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](https://www.ccar.org/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 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 2005 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 Proposes Climate Change Technical Advisory Group (October, 2011)
- DWR Invites Statements of Qualifications for Climate Change Technical Advisory Group (November, 2011)
VIDEO

"A CLIMATE OF CHANGE"
Hot out?

Shut up!
**Mitigation**
Actions that reduce or eliminate impacts
(reduce emissions of $\text{CO}_2$ 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

Manage water in a way that reduces emissions of greenhouse gases (mostly CO₂)
Adaptation is a Necessity

CO$_2$ concentration, temperature, and sea level continue to rise long after emissions are reduced.

<table>
<thead>
<tr>
<th>Magnitude of response</th>
<th>Time taken to reach equilibrium</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO$_2$ emissions peak</td>
<td>Sea-level rise due to ice melting: several millennia</td>
</tr>
<tr>
<td>0 to 100 years</td>
<td>Sea-level rise due to thermal expansion: centuries to millennia</td>
</tr>
<tr>
<td></td>
<td>Temperature stabilization: a few centuries</td>
</tr>
<tr>
<td></td>
<td>CO$_2$ stabilization: 100 to 300 years</td>
</tr>
<tr>
<td></td>
<td>CO$_2$ emissions</td>
</tr>
</tbody>
</table>

Today 100 years 1,000 years
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/
Using Regional and Statewide Integrated Approaches

- Creating flexible water operations
- IRWM
- Efficient water use
- Enhanced flood systems
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
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
<table>
<thead>
<tr>
<th>GHG Emission Reduction Measures</th>
<th>2020 Annual Emission Reduction (mtCO$_2$e)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OP-1</strong> Reid Gardner Power Substitution</td>
<td>920,000</td>
</tr>
<tr>
<td><strong>OP-2</strong> Energy Efficiency Improvements</td>
<td>48,500</td>
</tr>
<tr>
<td><strong>OP-3</strong> Renewable Energy Procurement Plan</td>
<td>101,500</td>
</tr>
<tr>
<td><strong>OP-4</strong> Distributed Renewable Generation</td>
<td>10</td>
</tr>
<tr>
<td><strong>OP-5</strong> Carbon Sequestration Actions</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>CO-1</strong> Construction Best Management Practices</td>
<td>1,950</td>
</tr>
<tr>
<td><strong>CO-2</strong> Statewide Equipment and Fuel Regulations</td>
<td>900</td>
</tr>
<tr>
<td><strong>BP-1</strong> SMUD Commercial Greenergy Program</td>
<td>1,020</td>
</tr>
<tr>
<td><strong>BP-2</strong> SMUD Carbon Offset Program</td>
<td>2,580</td>
</tr>
<tr>
<td><strong>BP-3</strong> Implement DWR Sustainability Initiatives</td>
<td>Not quantified</td>
</tr>
<tr>
<td><strong>Total Annual Reductions</strong></td>
<td><strong>1,076,450</strong></td>
</tr>
</tbody>
</table>
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 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?