

# CLIMATE CHANGE

AT THE CALIFORNIA DEPARTMENT OF  
WATER RESOURCES

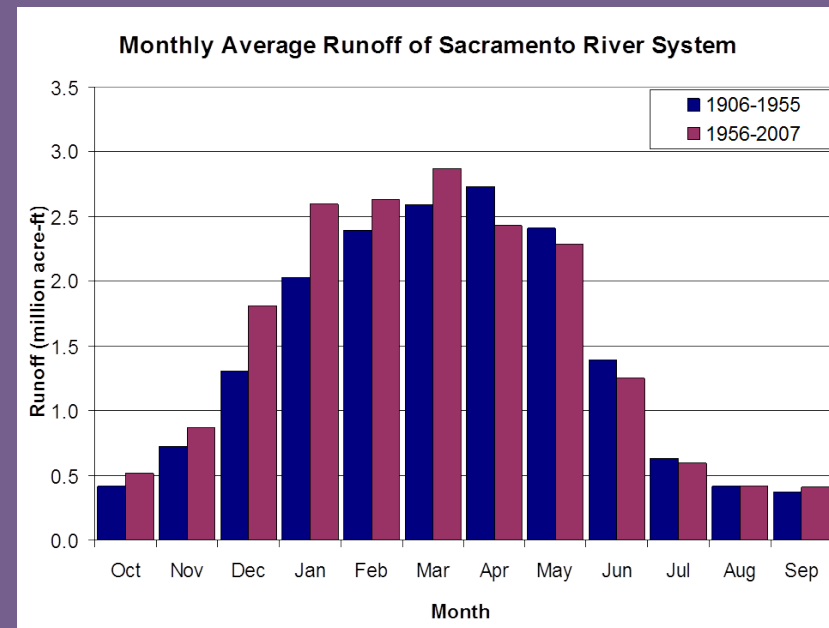


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**Regional Climate Change Specialist**

**Capitol Region  
Climate Readiness Collaborative  
September 9<sup>th</sup>, 2014**

# In the Past 100 years...

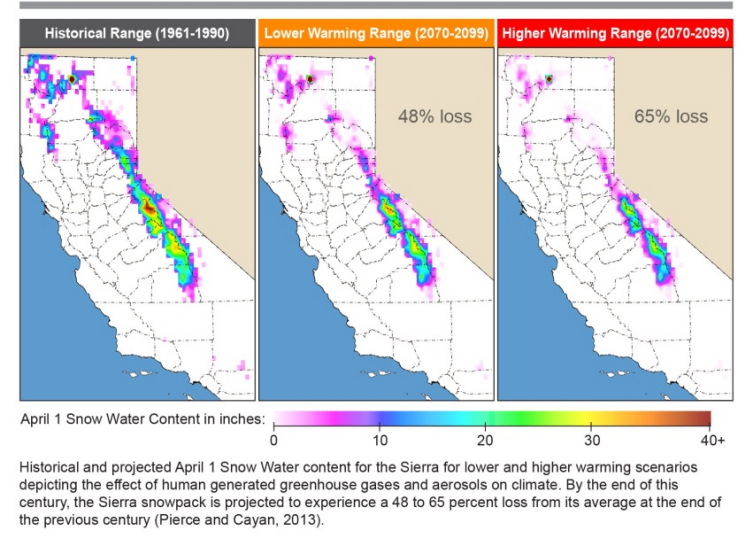
- ❖ 1°F rise in average temperatures
- ❖ 10% overall loss of snowpack in the Sierra Nevada
- ❖ Changes in runoff timing
- ❖ An average sea level rise of 7" along the California coast



# In the Next 40 years...

- ❖ 1 – 3.6°F temperature rise
- ❖ 25 - 40 % reduction in snowpack
- ❖ Sea level rise: 5-24”
- ❖ Less summer/fall runoff
- ❖ More intense wet and dry periods

Figure 3-22 Historical and projected California snowpack





# Sac/Delta Climate Change Projections

## ❖ Sea level rise

- 2050 5-24"; 2100 17-66"
- Increase in number & duration of extreme SL events

## ❖ Fire

- Longer fire season
- Increase in risk
- Longer fire season

## ❖ Precipitation

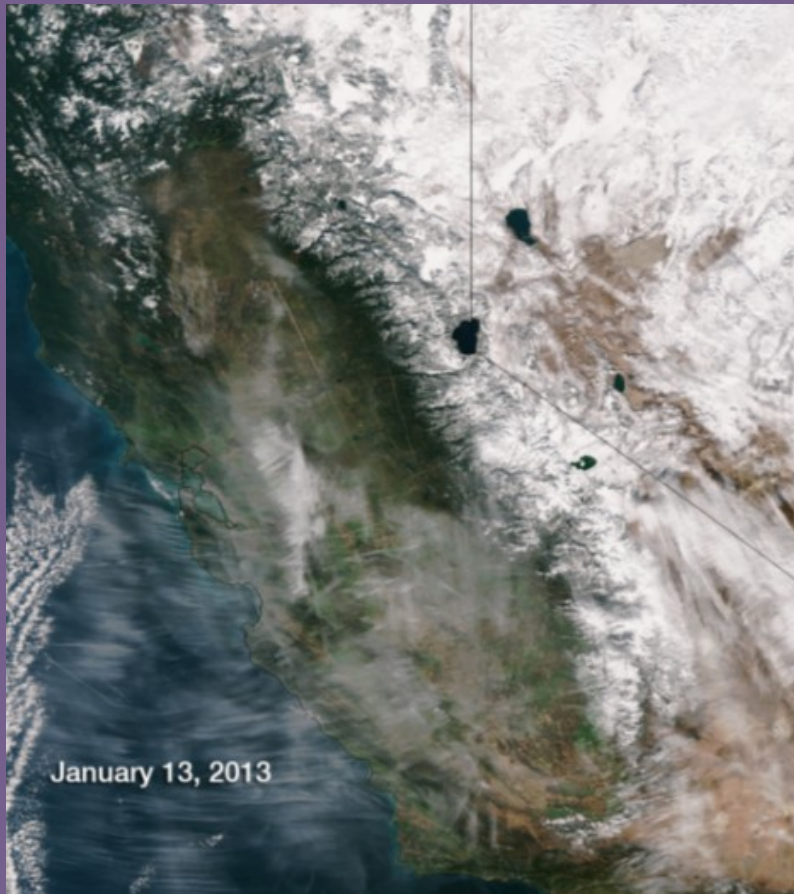
- Annual total relatively unchanged
- Increase in frequency & intensity of extreme storms

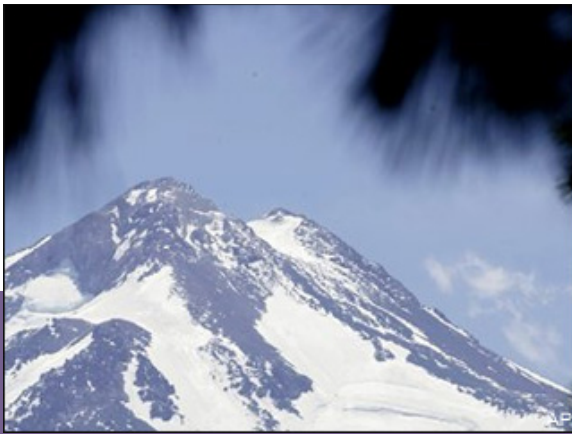
## ❖ Temperature

- 2060 4°F; 2100 6-9°F
- Longer period of heat extremes (June-Sept)



# California Water Supply Impacts





# Potential Impacts Reduced Snowpack

- ❖ **Some Increase in Delta Salinity Intrusion due to Reduced Snowpack**
  - Smaller snowpack mean less surplus snowmelt runoff at reservoirs and in the Delta in spring
  - Longer effective dry season for the Delta will require more freshwater releases to repel ocean salinity and maintain suitable water quality with some additional loss in average export yield

# Regional Water Supply Impacts

- **Sacramento Valley**

- ❖ Timing and quantity of precipitation/snowpack
- ❖ Changes in local groundwater supplies



- **Delta – Sac+**

- ❖ Water quality
- ❖ Regulatory constraints





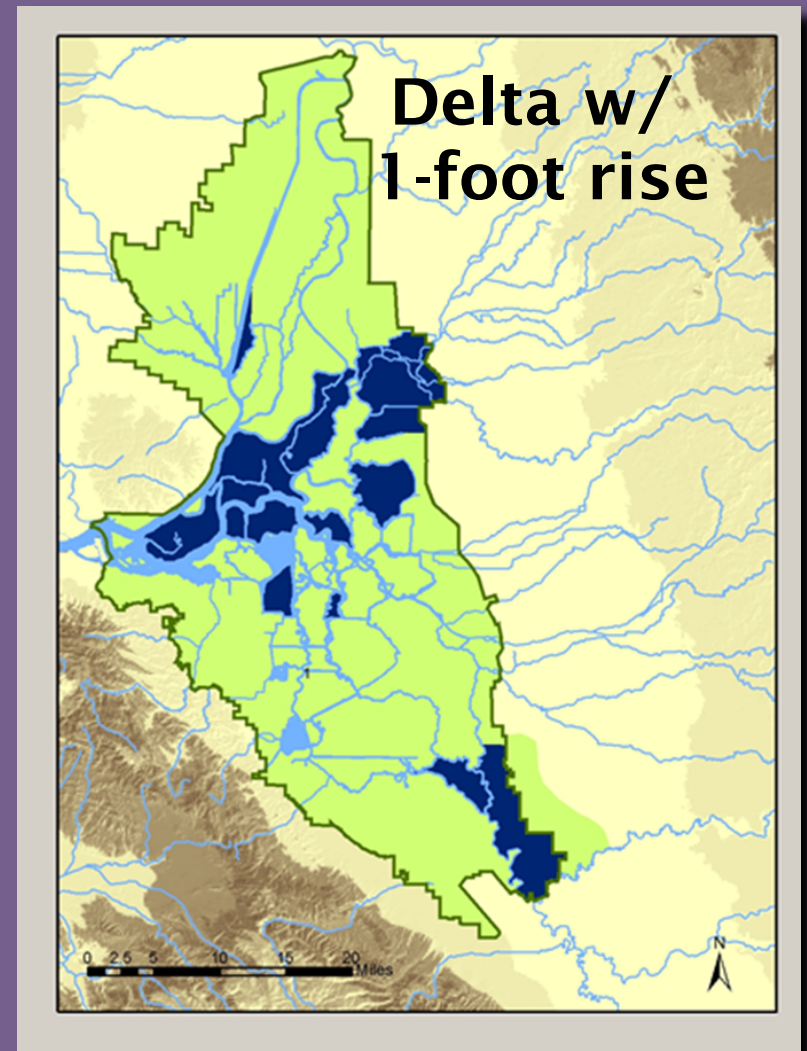
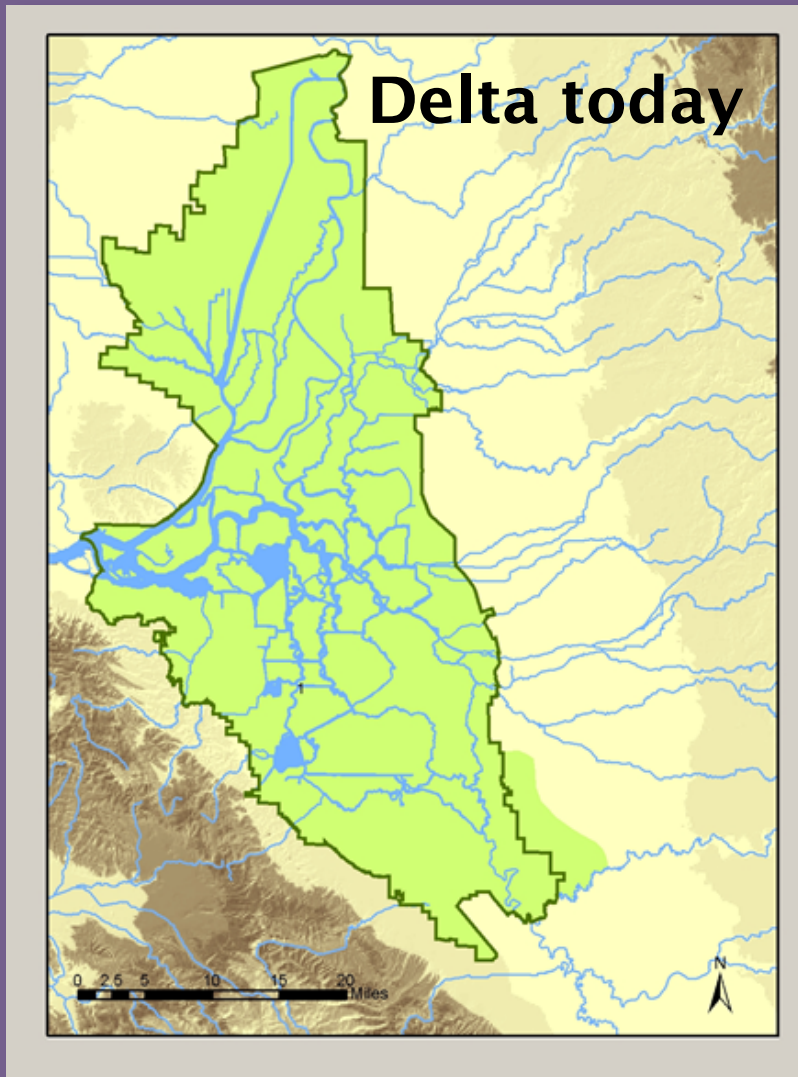
# Potential Impacts Sea Level Rise



## ❖ Increase in Flood Risk and Salinity due to Sea Level Rise

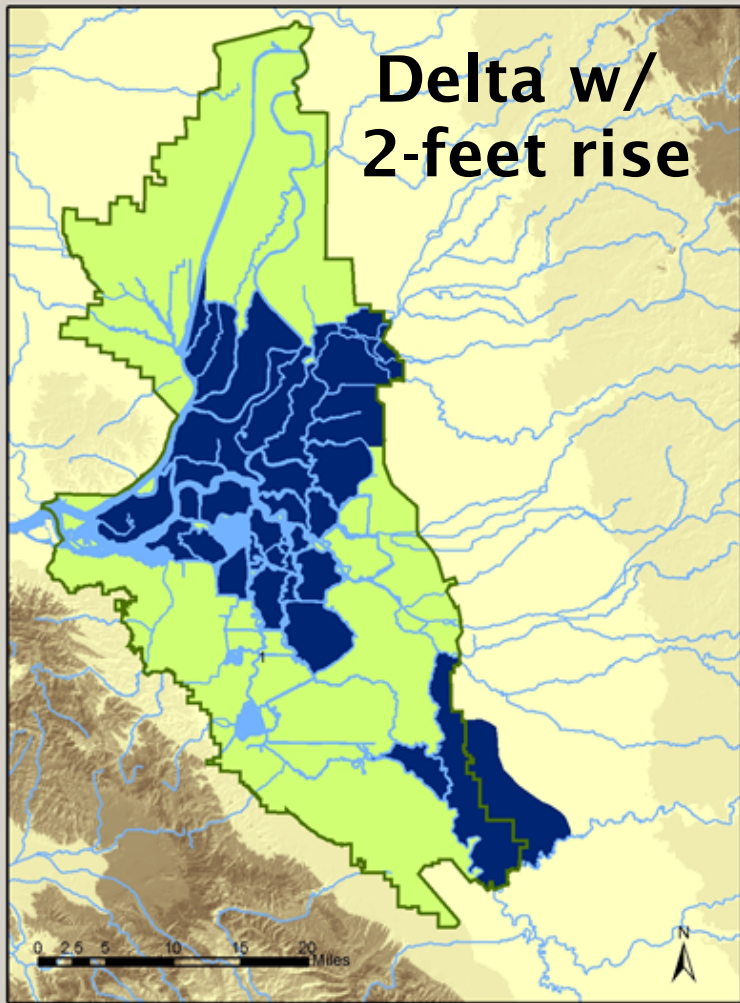
- Would require more freshwater releases from upstream reservoir to repel ocean salinity and maintain suitable water quality
- Combination of rising sea levels and subsidence will increase pressure on Delta levees and contribute to higher risk of failure
- Higher risk of overtopping or failure of levees when storm surges combine with rising mean sea levels
- Bigger floods due to larger winter flood producing areas and more water vapor in atmosphere

# Sea Level Rise

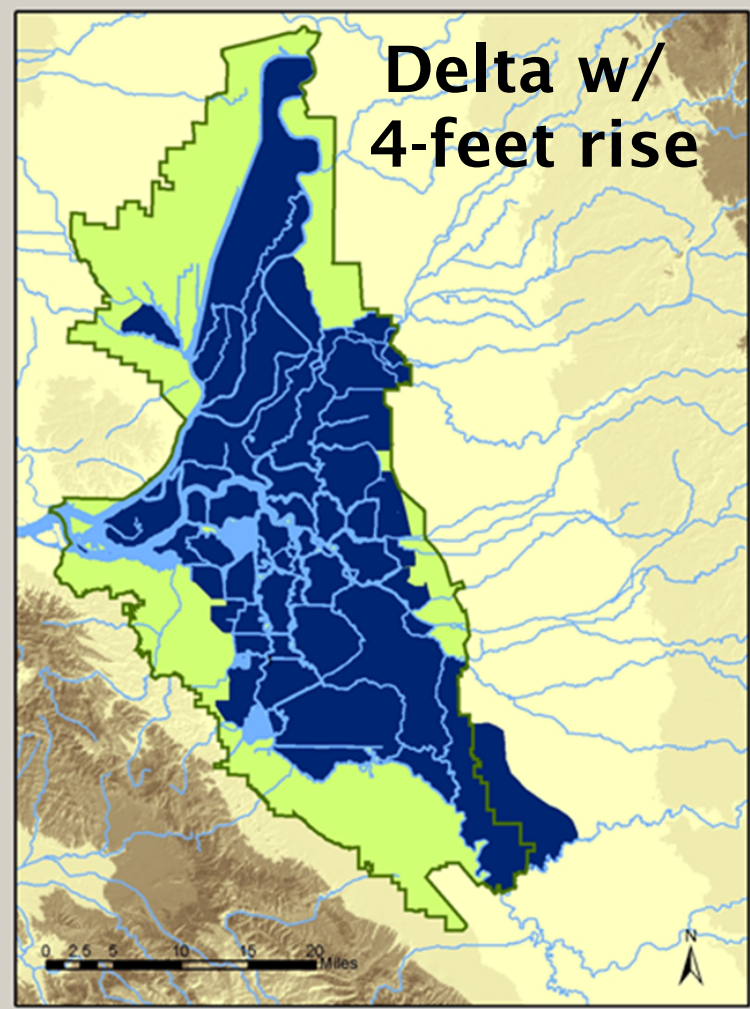


# Sea Level Rise

**Delta w/  
2-foot rise**

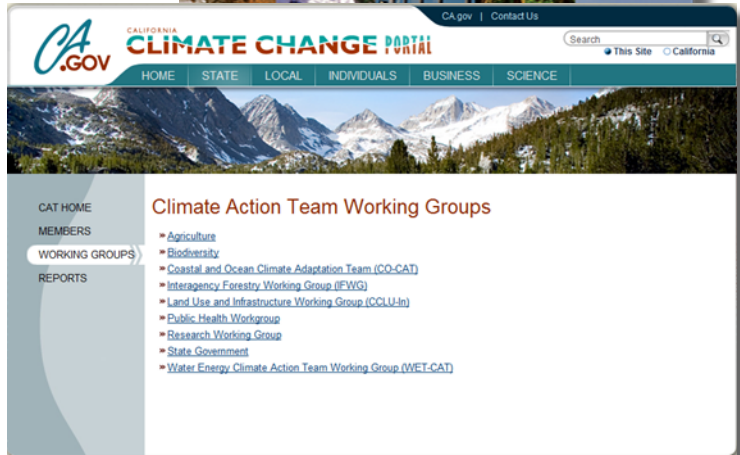
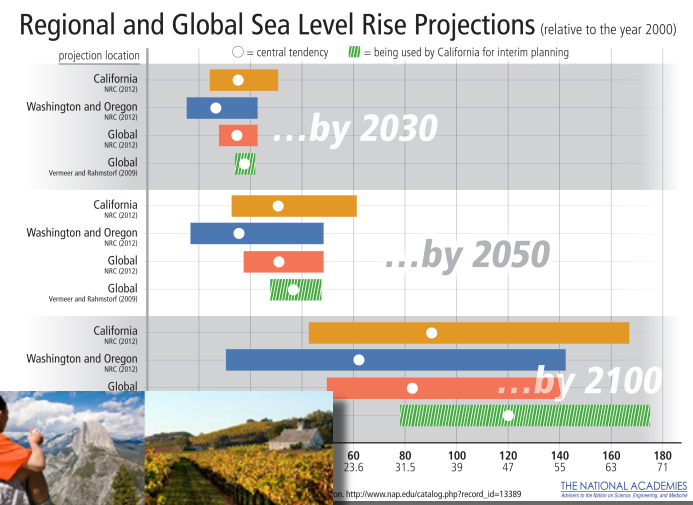
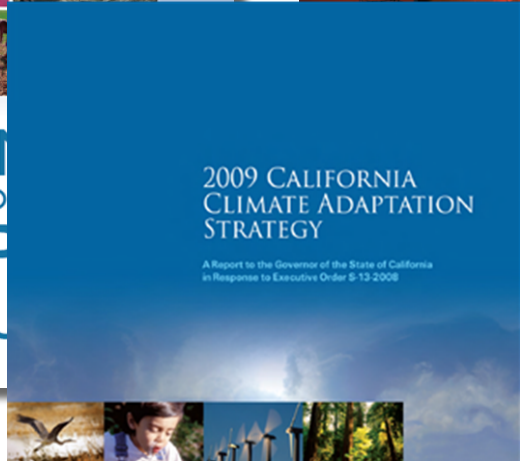
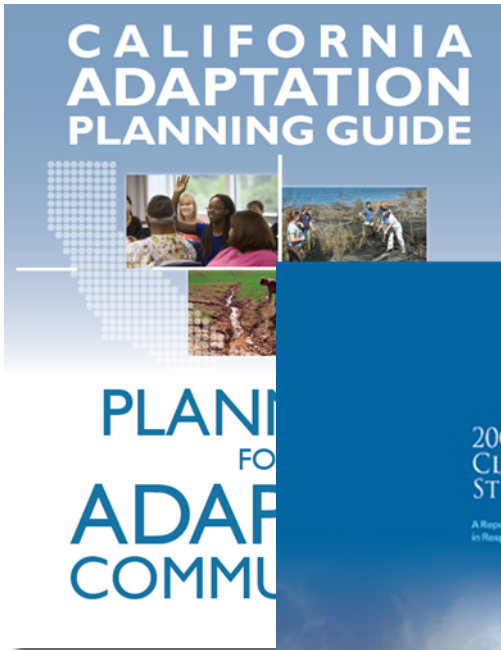


**Delta w/  
4-foot rise**



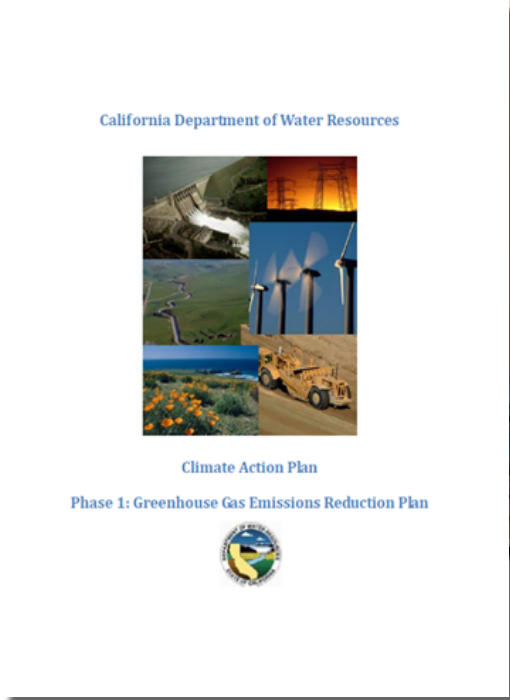
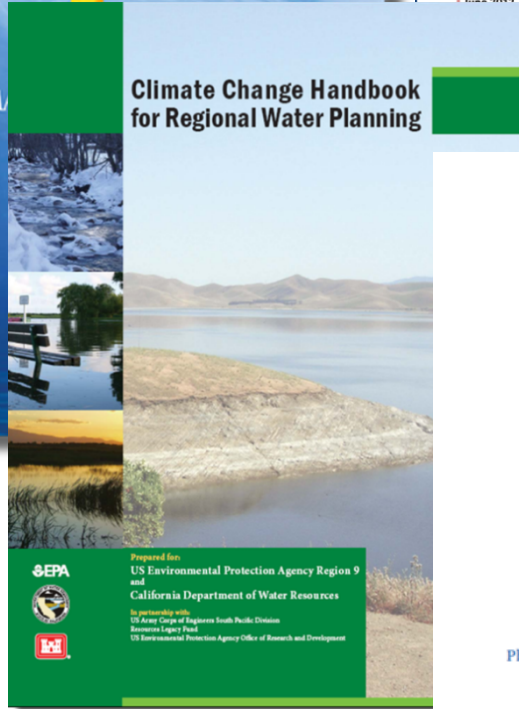


# Mitigation & Adaptation Efforts Statewide



# Mitigation & Adaptation Efforts

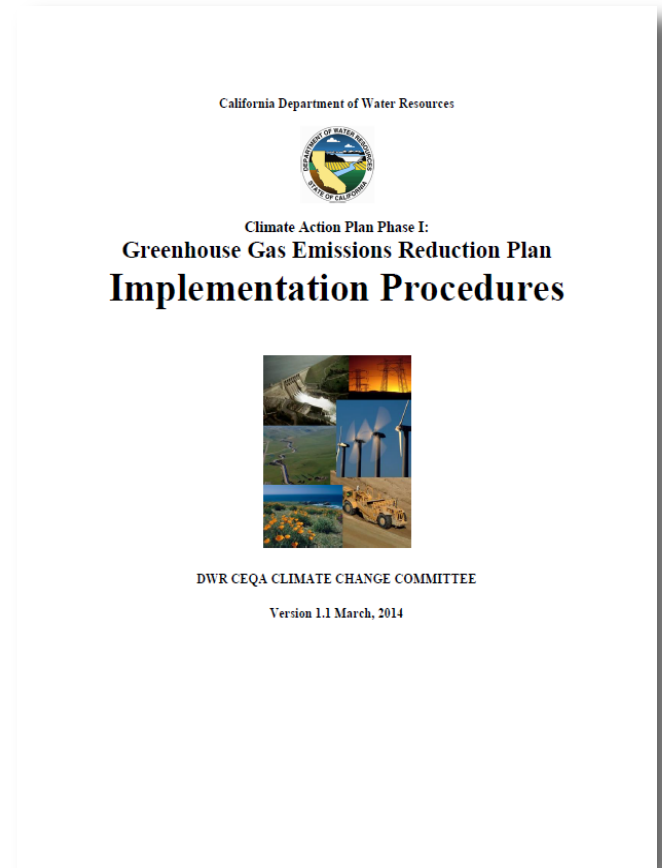
## DWR



# DWR's Comprehensive Response

## Climate Action Plan:

- **Phase 1: Greenhouse Gas Emission Reduction Plan – *Completed!***
- **Phase 2: Climate Analysis Framework and Guidance – *Nearing Completion***
- **Phase 3: Vulnerability Assessment and Adaptation Plan – *Under Development***





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