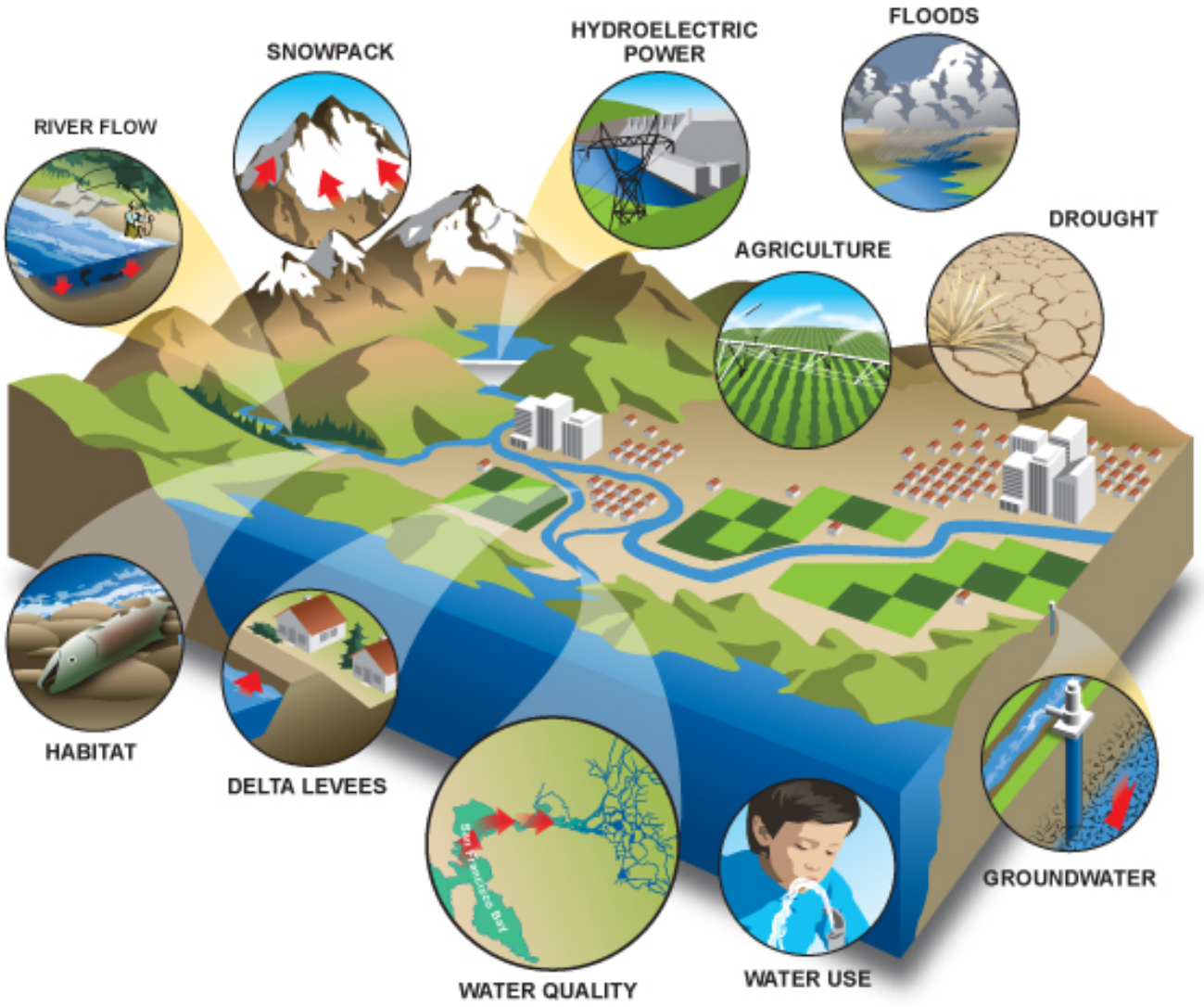
CENTRAL VALLEY
CLIMATE CHANGE WORK PLAN
BOARD WORKSHOP MEETING
JUNE 1, 2017


RIVER FLOW
SNOWPACK
HYDROELECTRIC POWER
FLOODS
AGRICULTURE
DROUGHT
HABITAT
DELTA LEVEES
WATER QUALITY
WATER USE
GROUNDWATER

Background

- Assembly Bill No. 32 (2006)

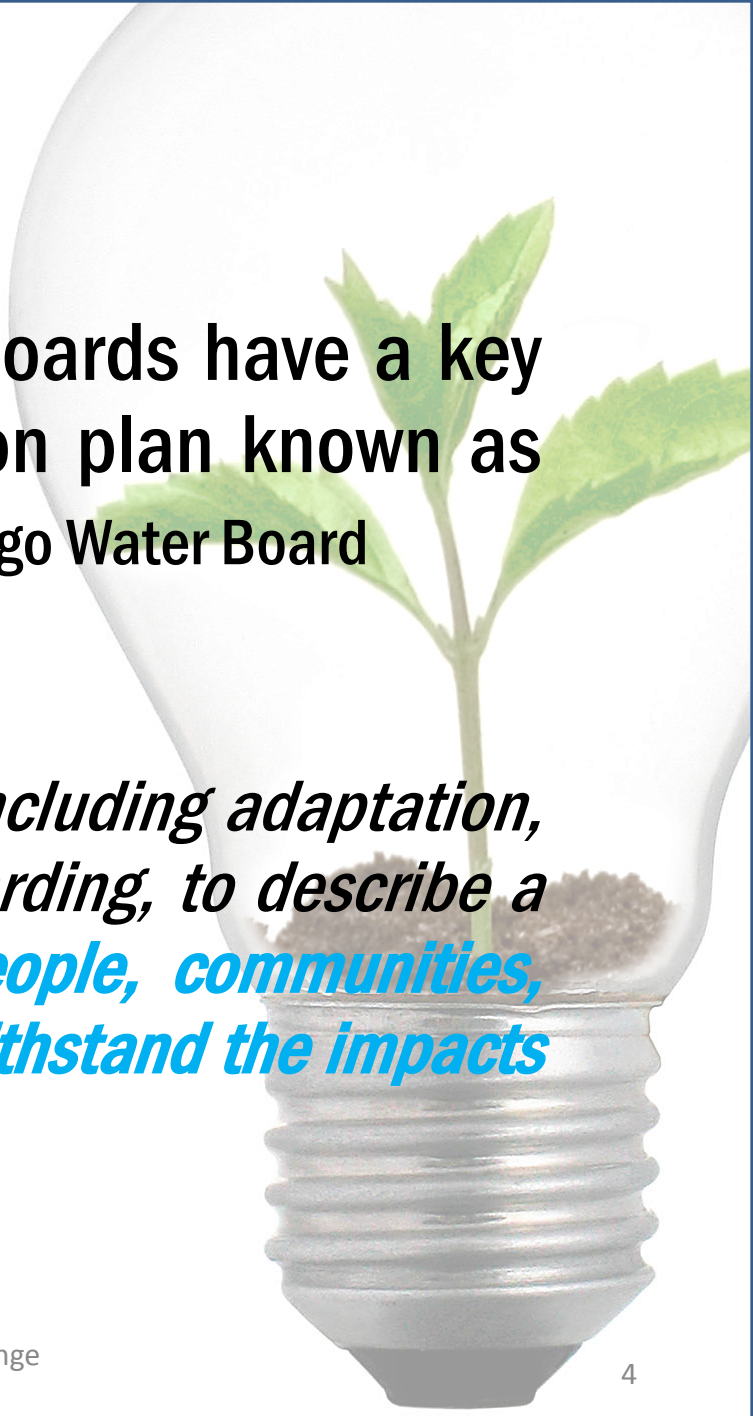
  *"Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include… **a reduction in the quality and supply of water to the state…**"*

Background

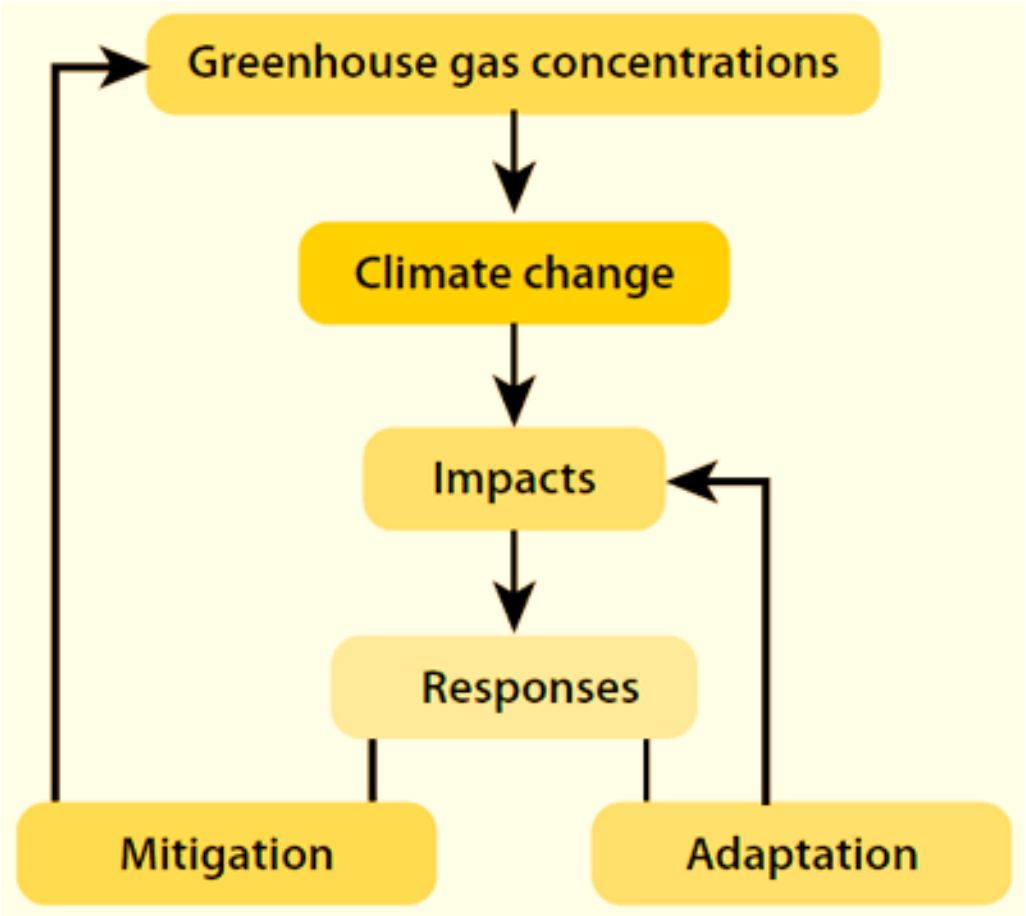
"The State and Regional Water Boards have a key role in the State's implementation plan known as Safeguarding California." – San Diego Water Board

- Safeguarding California (2016)

  *"We use a number of words, including adaptation, resilience, readiness, and safeguarding, to describe a simple concept: **ensuring that people, communities, and natural systems are able to withstand the impacts of climate disruption.**"*



Adaptation and Mitigation



Mitigation

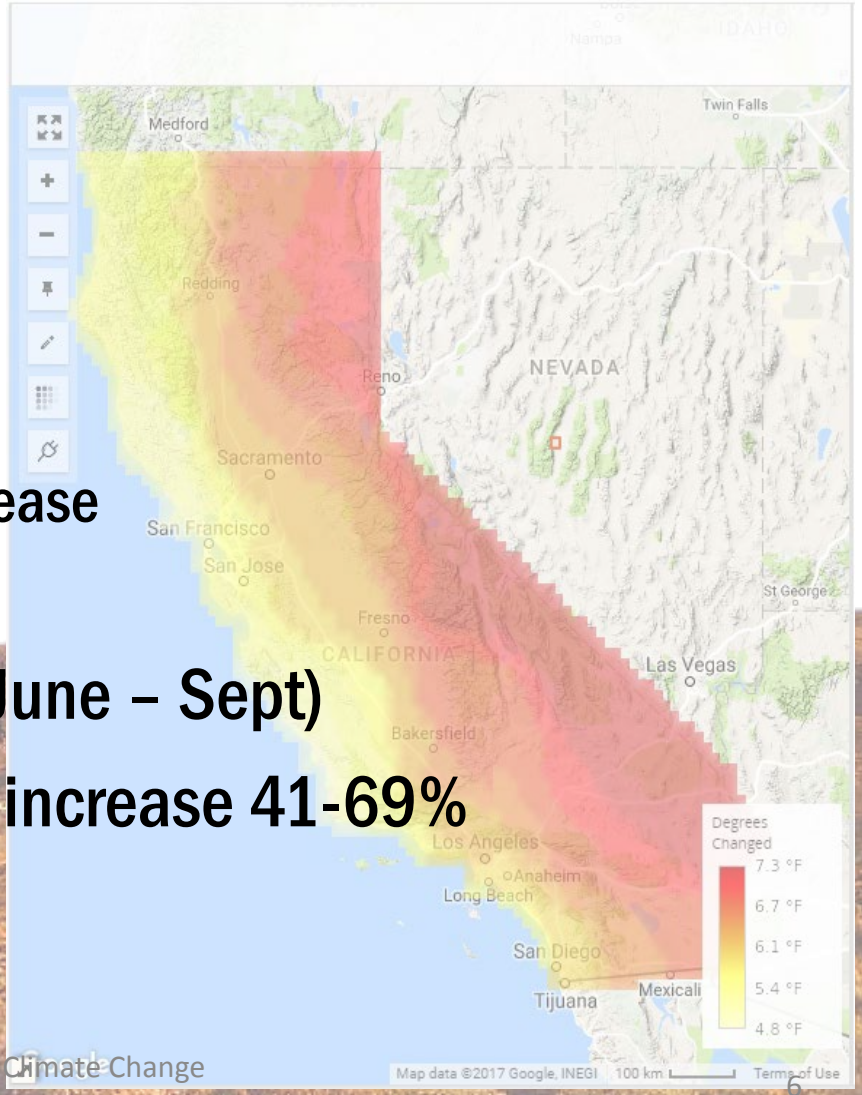
- Reduce Emissions
- Enhance Sinks

Adaptation

- Address Impacts
- Promote Resiliency

Potential Impacts on the Central Valley

- **Temperature**
  - More arid landscape
  - Projected 5-6ºF increase
  - Increase in heatwave days
    - Sacramento: 90-140% increase
    - Fresno: 40-60% increase
  - Heat period twice as long (June – Sept)
  - Burned area from wildfires increase 41-69%



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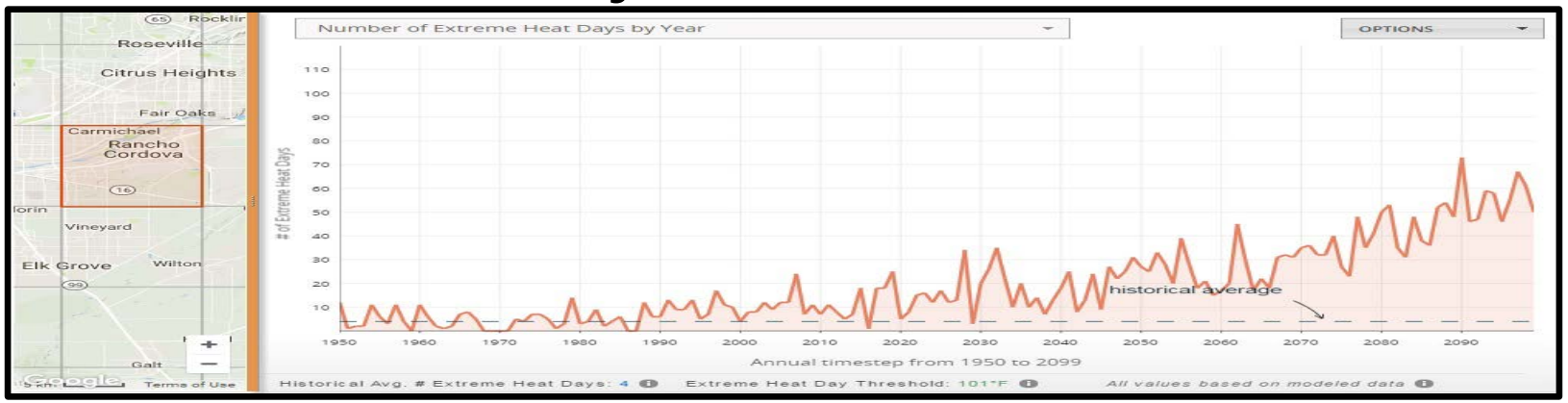
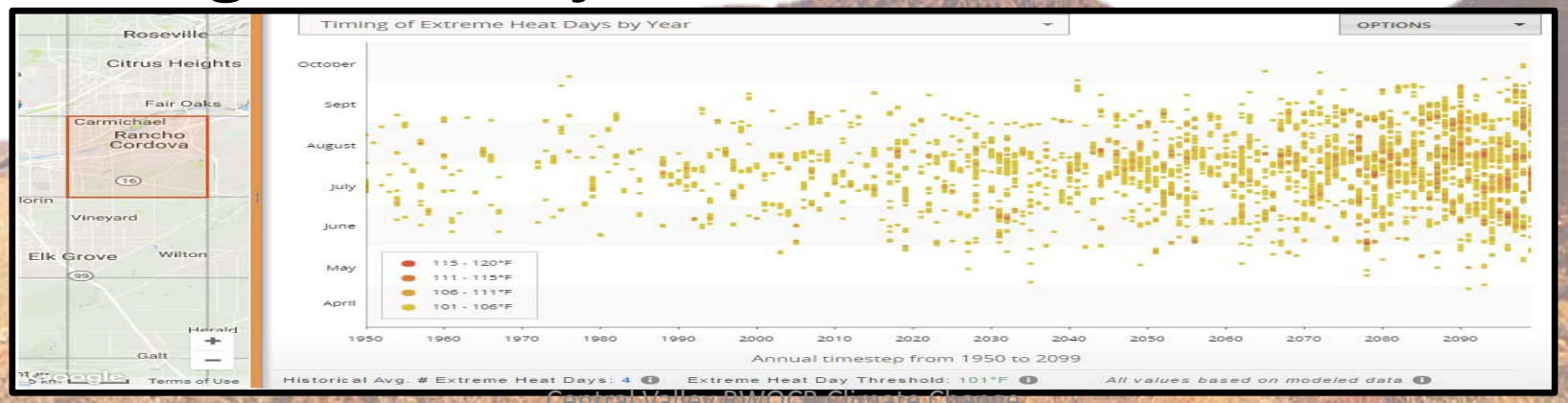
Potential Impacts on the Central Valley

- **Number of Heat Days**



- **Timing of Heat Days**



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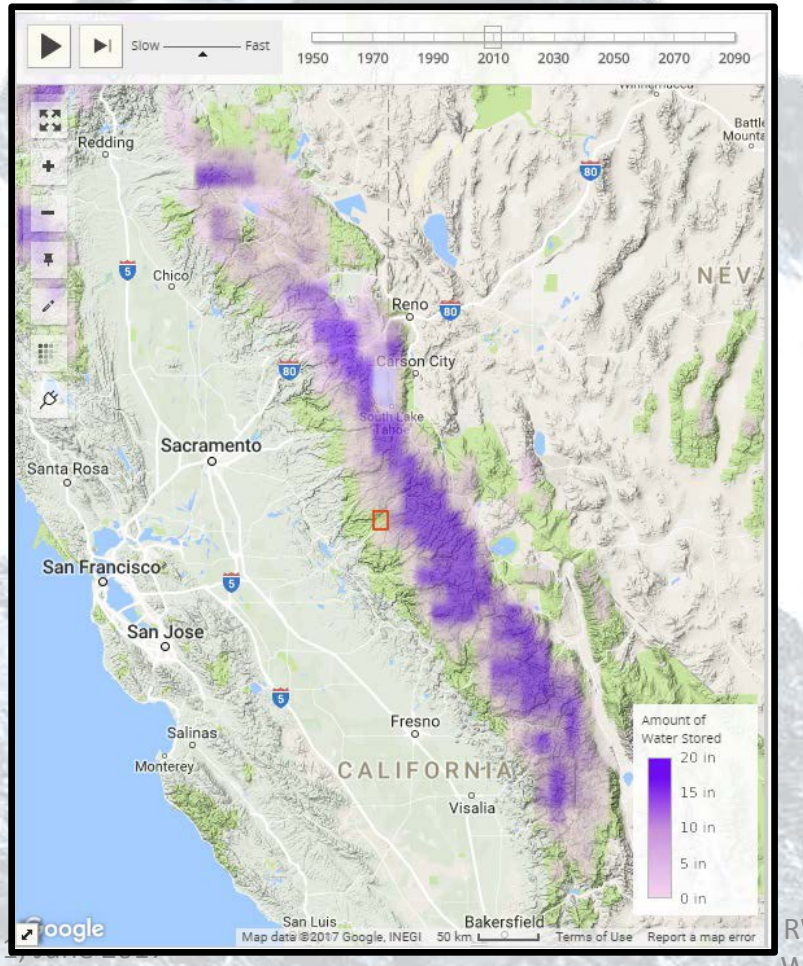
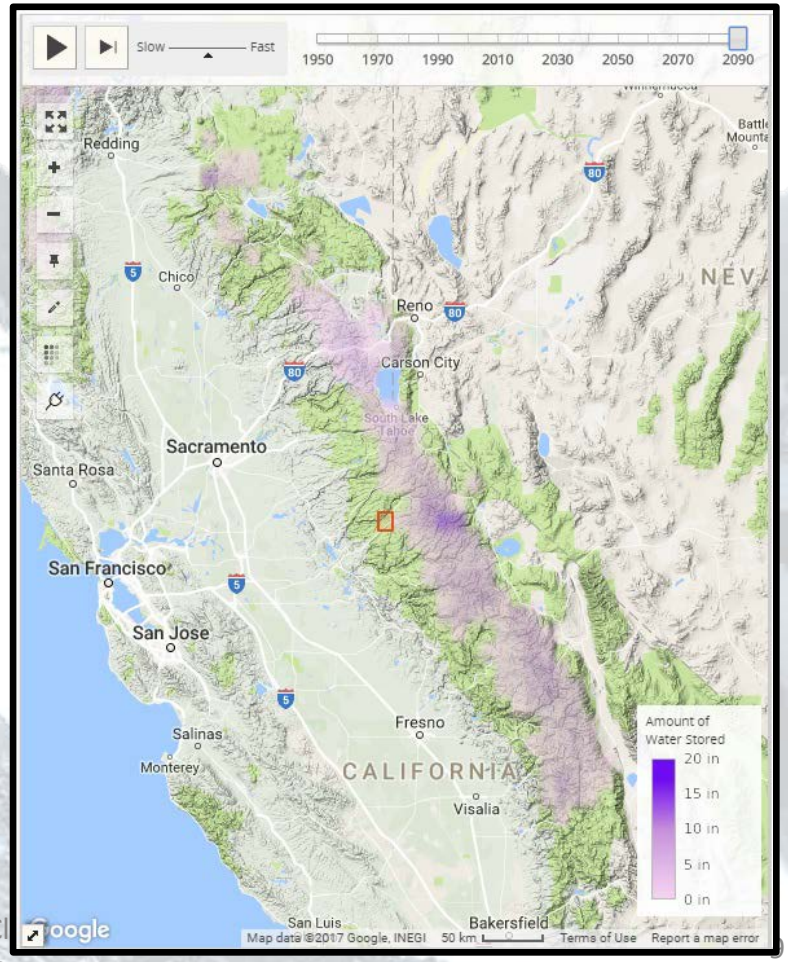
Potential Impacts on the Central Valley

- **Precipitation and Snowpack**
  - Decrease in Sierra Nevada snowpack
  - More precipitation to fall as rain rather than snow
  - Increased risk of extreme precipitation and flooding
  - Average winter rainfall decrease 15-30%
  - Decrease in “wet” years by 17%

Potential Impacts on the Central Valley

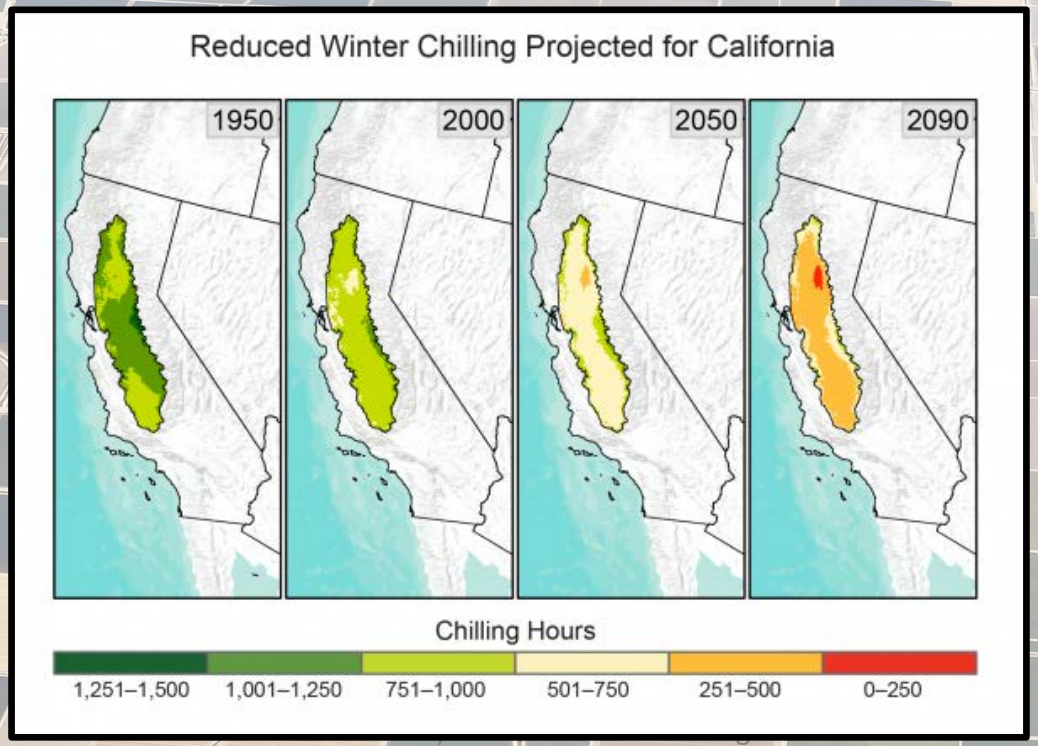
- **Snowpack: 2010** **2090**





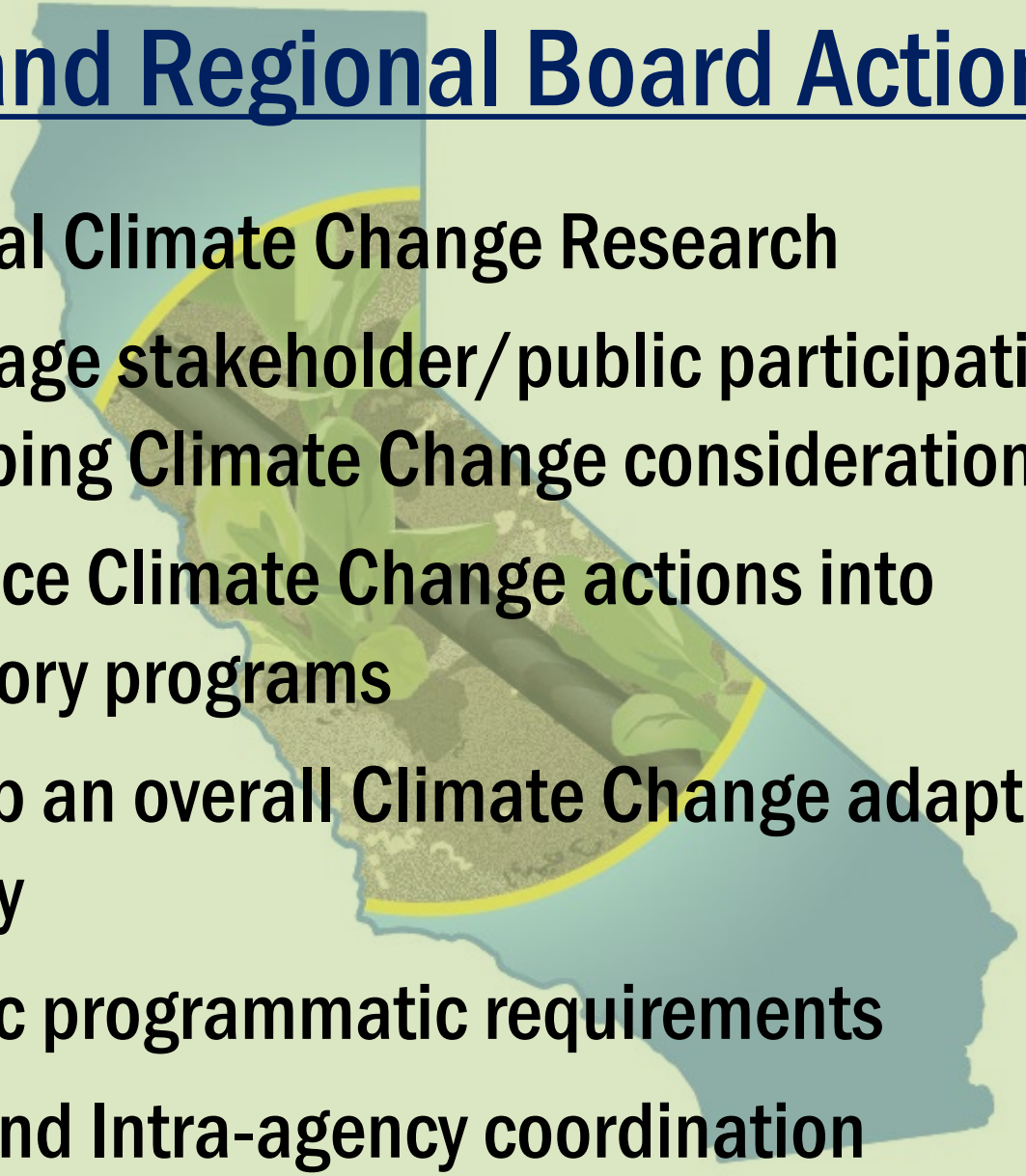
Potential Impacts on the Central Valley

- **Agriculture**
  - Increased evapotranspiration rates
  - Decrease in winter chill hours



Water Boards' Climate Actions

State and Regional Board Actions



- Regional Climate Change Research
- Encourage stakeholder/public participation in developing Climate Change considerations
- Introduce Climate Change actions into regulatory programs
- Develop an overall Climate Change adaptation strategy
- Specific programmatic requirements
- Inter- and Intra-agency coordination

Regional Board Actions to Date

- **Region 2—San Francisco Bay**
  - Basin Plan 2015 Triennial Review, Priority Item #2
    - Integrating Climate Change considerations into Basin Plan
- **Region 4—Los Angeles**
  - Framework for Climate Change Adaptation and Mitigation (2015)
    - Climate Change impacts on regional water supply and quality
    - Discusses issues to be considered and tackled by R4 programs
    - Region 5 plan will use similar format

Regional Board Actions to Date

- **Region 6—Lahontan**
  - Public Workshops & Stakeholder Participation
  - Board Meeting (Jan 2017)
    - Consolidated 25 potential adaptation concepts and/or actions
  - Currently developing a Climate Change Adaptation Strategy

- **Region 9—San Diego**
  - Draft Climate Change Resolution
    - Addressing Threats to Beneficial Uses from Climate Change

State Board Climate Change Resolution

- Greenhouse Gas Reduction
  - Short lived climate pollutants, water and energy efficiency, renewable energy, recycling, storm water
- Ecosystem resilience
- Response to Climate Impacts
  - Drinking water, ground and surface water storage, wildfires, permit and regulatory changes
- Modeling and Analysis
- Funding
- Direction to Divisions, Coordination with Regions

Work Plan Process

- March 2015 – Board Workshop
  - Generated basic ideas and areas of concern
- 2016 – Coordination on State Board Resolution
- 2017 – Region 5 efforts leading to Work Plan
  - Input from Programs
  - Public meetings, Stakeholder input
  - Board input and approval

Work Plan Time Line

- March 28: Stakeholder Meeting – Review work plan outline, Gather initial input
- April 21: Initial Comment Deadline
- May 12: Release of Initial Draft
- June 1: Board Workshop – Presentation of Initial Draft
- June 23: Comment Deadline on Initial Draft work plan
- August : Stakeholder Meeting
- August 30: Release of Proposed Work Plan
- September 29: Comment Deadline for Proposed Work Plan
- October 19: Board Hearing (**held in Clio, CA**)

Work Plan: 1st Draft Structure

- Summary of Climate Change impacts on the environment and beneficial uses
- Review of State-wide climate change response actions
- Analysis of individual Water Board program responses to climate adaptation & mitigation
  - Planning
  - Groundwater
  - Surface Water
- Prioritization of efforts and timeline
  - Short term (Eg. : Permitting, data collection)
  - Medium term (Eg.: Modeling, guidance)
  - Long term (Eg.: Basin Planning)

Region 5 Climate Change Work Plan

- The Climate Change Work Plan delivers…
  - A summary of Climate Change impacts to Central Valley
  - Summary of current and proposed efforts for each Region 5 program
  - Prioritization and time-line for major efforts
    - Framework – regulatory efforts that can work in the face of Climate Change

- Ultimate Goal
  - Developing programmatic priorities and an overall framework that promotes resiliency in response to Climate Change

Work Plan Background and Structure Discussion

Central Valley Water Board Programs

- **Planning Programs**
  - Basin Planning, TMDLs, Delta Program, SWAMP, CV-SALTS
- **Surface Water Regulation**
  - NPDES, Storm Water, Water Quality Certs, Forest Activities, Mining, Cannabis, Nonpoint Sources, Irrigated Lands
- **Groundwater Regulation**
  - Title 27, WDRs (Non-15), Site Cleanup, USTs, Confined Animals, Irrigated Lands, Oil Fields

Timeline for Major Efforts

- **Short Term (0 to 3 years)**
  - Permitting programs consider addressing climate change
  - Focus SWAMP data collection on climate change indicators
- **Medium Term (3 to 5 years)**
  - CV-SALTS Salt and Nitrate Management Plan
  - Support state and federal climate change modelling initiatives
  - Potential General Orders to address climate change
- **Long Term (greater than 5 years)**
  - Consider climate change implications during Basin Plan triennial review and amendment review process
  - Basin Plan Amendments
  - Changes in permit requirements

Region 5 Planning Program Considerations
Basin Planning

1. In the future, Basin Planning staff will consider climate change-related implications and concerns during:
   - Review process for future Basin Plan amendments; and
   - Basin Plan triennial review (scheduled for 2017).

2. In collaboration with SWAMP, Basin Planning staff will update background data used to evaluate beneficial uses as new data becomes available.

Region 5 Planning Program Considerations
TMDLs

1. In collaboration with other planning programs, TMDL staff will begin tracking changes in ambient surface water characteristics and responding to potential changes by :
   - Updating the definition of "background conditions", OR
   - Reassess TMDLs for changing environmental conditions.

2. Staff will consider adoption of "re-opener clauses" to improve program responsiveness.

3. Staff may lengthen planning assessment periods in the future so environmental variability and trends can be better understood.

Region 5 Planning Program Considerations
Delta Program

1. The Delta Program is currently considering climate change-related research needs as part of *Delta Nutrient Research Plan*.
   - Document will propose modeling to assist in testing climate change scenarios and potential management strategies.

2. Delta Program staff will promote wetland restoration projects to enhance habitat and GHG sinks.

3. In collaboration with SWAMP, Delta Program staff will focus monitoring resources on the drivers of harmful algal blooms.

Region 5 Planning Program Considerations
SWAMP

1. In 2016, SWAMP staff were trained in the identification and sampling of toxic algae.
   - Initial algal bloom response monitoring is being planned in collaboration with State Water Board.

2. In 2017/2018, SWAMP staff will deploy continuous temperature loggers in several headwater streams.

3. In the future, SWAMP will adjust its monitoring approach to ensure that changes in climate change indicators are captured.

4. SWAMP may expand its laboratory resources to enhance examination of chemical/biological surface water changes.

Region 5 Planning Program Considerations
CV-SALTS

1. In 2016, CV-SALTS staff prepared a draft *Drought & Conservation Policy* and *AGR Salinity Policy*
   - Policies will enhance CV-SALTS' responsiveness to drought and improve salinity management practices.

2. In the future, CV-SALTS staff will consider climate change impacts as part of long-term salt/nitrate loading planning.

3. CV-SALTS will monitor ambient temperature changes and associated changes in growing season length and annual pesticide/herbicide loading.

Planning Program Considerations Discussion

Region 5 Surface Water Program Considerations *NPDES*

1. NPDES staff recommend updating permits in response to:
   - Findings of the *Delta Nutrient Research Plan* (currently in development);
   - Potential changes to ambient surface water characteristics;
   - Potential changes to discharge characteristics associated with water conservations efforts; and
   - Need for weather-dependency discharge component (e.g., during drought or extreme weather events).

2. In the future, will require Climate Change action plans outlining responses to Climate Change and GHG reduction strategies.
   - In the short term, staff will request *voluntary* climate change action plans.

Region 5 Surface Water Program Considerations
Storm Water

1. In collaboration with planning programs, Storm Water Program staff will begin tracking major storm frequency and intensity.

2. In response to observed storm pattern changes, the program will consider regulatory requirement changes, including:
   - BMPs to incorporate new technologies and Low Impact Development techniques; and
   - Construction of larger storm water detention systems.

Region 5 Surface Water Program Considerations
Water Quality Certification

1. Certification demand is expected to increase in response to changes in flood frequency, sea level rise, and wetland conservation efforts.

2. Changes to regulatory requirements for large construction projects, similar to Construction Stormwater

Region 5 Surface Water Program Considerations
Forest Activities Program

1. Assessment of the Battle Creek Watershed-Based Management Plan.
   - Evaluating potential benefits of more holistic approach to water quality and fire response management.

2. A number of program areas will change as statewide greenhouse gas reduction requirements evolve.
   - Eg.: Changes in Forest Practice Rules

3. The program's regulatory approach will evolve in response to observed changes in precipitation and wildfire trends.
   - Expanded surface water monitoring and protection measures;
   - Increased staff participation in post-fire response; and
   - Greater focus on Emergency and Exempted plans for harvests.

Region 5 Surface Water Program Considerations
Mining

1. In collaboration with planning programs, Mining Program staff will begin tracking, and responding to, changes in major storm and flood trends.
   - Address mine sites that no longer meet siting criteria (e.g., within updated flood zones);
   - Evaluate potential increases in the risk of release (e.g., acid mine drainage or tailings pile discharges); and
   - Require upgrades to infrastructure and BMPs at sites where surface water is no longer being managed effectively.

2. Staff will continue to assess the adequacy of groundwater monitoring networks relative to local groundwater levels.

Region 5 Surface Water Program Considerations *Cannabis*

1. Update discharge requirements in response to potential changes in:
   - Ambient surface water characteristics; and
   - Discharge characteristics associated with cultivator water conservations efforts.

2. Need to monitor industry evolution and adapt regulatory practices in response to:
   - Potential shifts in cultivation areas in response to observed climate changes;
   - Development of industry-wide water/wastewater management practices.

Region 5 Surface Water Program Considerations
Nonpoint Sources

1. In collaboration with planning programs, monitoring major storm and flood frequencies.
   - Require dischargers to update existing erosion-control BMPs, as needed.

2. Adapt to increased uncertainty in monitoring data used for effectiveness assessments.
   - Consider lengthening the grant period to better characterize baseline conditions and BMP effectiveness; and
   - Increased efforts to better evaluate background conditions and monitor BMP effectiveness over project lifetimes.

Region 5 Surface Water Program Considerations
Irrigated Lands

1. Ongoing research on the nitrogen content of various compost sources.

2. In collaboration with planning program staff, tracking changes in ambient surface water characteristics.
   - Update General Order requirements in response to changes in surface water characteristics and associated impairment risk.

3. Modifying the Management Practices Evaluation Programs to address the need for robust BMPs.

4. Collaboration with Healthy Soils Initiative to encourage growers to build soil carbon and reduce GHG emissions.

Surface Water Program Considerations Discussion

Region 5 Groundwater Program Considerations
Title 27

1. Currently Title 27 staff are incorporating anaerobic digester requirements into some WDRs.
   - In the future, encourage use of fully enclosed digesters versus "dry tomb" containment cells; and
   - Collaboration with CARB and CalRecycle to encourage landfill digester use.

2. Response to changing climate patterns.
   - During droughts, adjust regulations and BMP requirements to maintain vegetative cover performance; and
   - If heavy storms become more frequent, require larger surface impoundments and modified storm water management practices.

Region 5 Groundwater Program Considerations
WDRs (Non-15)

1. Working with wastewater facilities to plan for changing environmental conditions.
   - Increased risk of flood water inundation at some facilities; and
   - Changes in discharge receiving water background conditions.

2. Additional steps to accelerate the use of anaerobic digester technology.
   - General Orders for non-dairy industries (e.g., food processors and wineries).

Region 5 Groundwater Program Considerations
Site Cleanup

1. Updating regulatory approach for sites where the monitoring well network has become dry.

2. Encouraging the use of "green" remedial technologies.

3. GHG reduction strategies will increase pressure to put contaminated sites back into productive use.

4. Assessing how expanded use of Low Impact Development and new storm water management approaches may impact groundwater recharge.

Region 5 Groundwater Program Considerations *USTs*

1. Site Cleanup Program considerations also apply to UST Program.

2. Potential climate change-related shifts in the energy industry (i.e., changes in fuel composition).

3. Storm related complications associated with:
   - USTs potentially becoming buoyant; and
   - Surfacing of impacted groundwater

Region 5 Groundwater Program Considerations
Confined Animals

1. Assessing the impact of water conservation / restrictions on discharges.
   - Water conservation may concentrate waste streams; and
   - Water restrictions may lead facility managers to change cropping patterns or import feed.

2. Working with dairies to:
   - Mitigate flooding risk;
   - Encourage participation in the Healthy Soils Initiative; and
   - Encourage use of anaerobic digester technology under General Order No. R5-2011-0039.

3. Supporting ongoing research efforts into the optimization of manure digester gas and fertilizer production.

Region 5 Groundwater Program Considerations
Oil Fields

1. Encouraging and/or requiring water efficiency and recycling applications in the future.
   - WDRs will be re-examined to ensure that they remain protective of receiving waters.

2. Depending on the outcome of the region's Food Safety Panel efforts, there may be additional permitting related to oil field recycled water use.

Groundwater Program Considerations Discussion

Recurring Considerations

- Changes to background conditions
- Changes to discharge flow rates and concentrations
- Shifts in land use that may affect program operations
- Challenges existing regulations
- Added complexity to future regulatory actions
- Challenges to infrastructure design and BMPs
- Increased noncompliance & cost of compliance
- Extra capital (human, monetary, etc.) may be required

Timeline for Major Efforts (Review)

- **Short Term (0 to 3 years)**
  - Permitting programs consider addressing climate change
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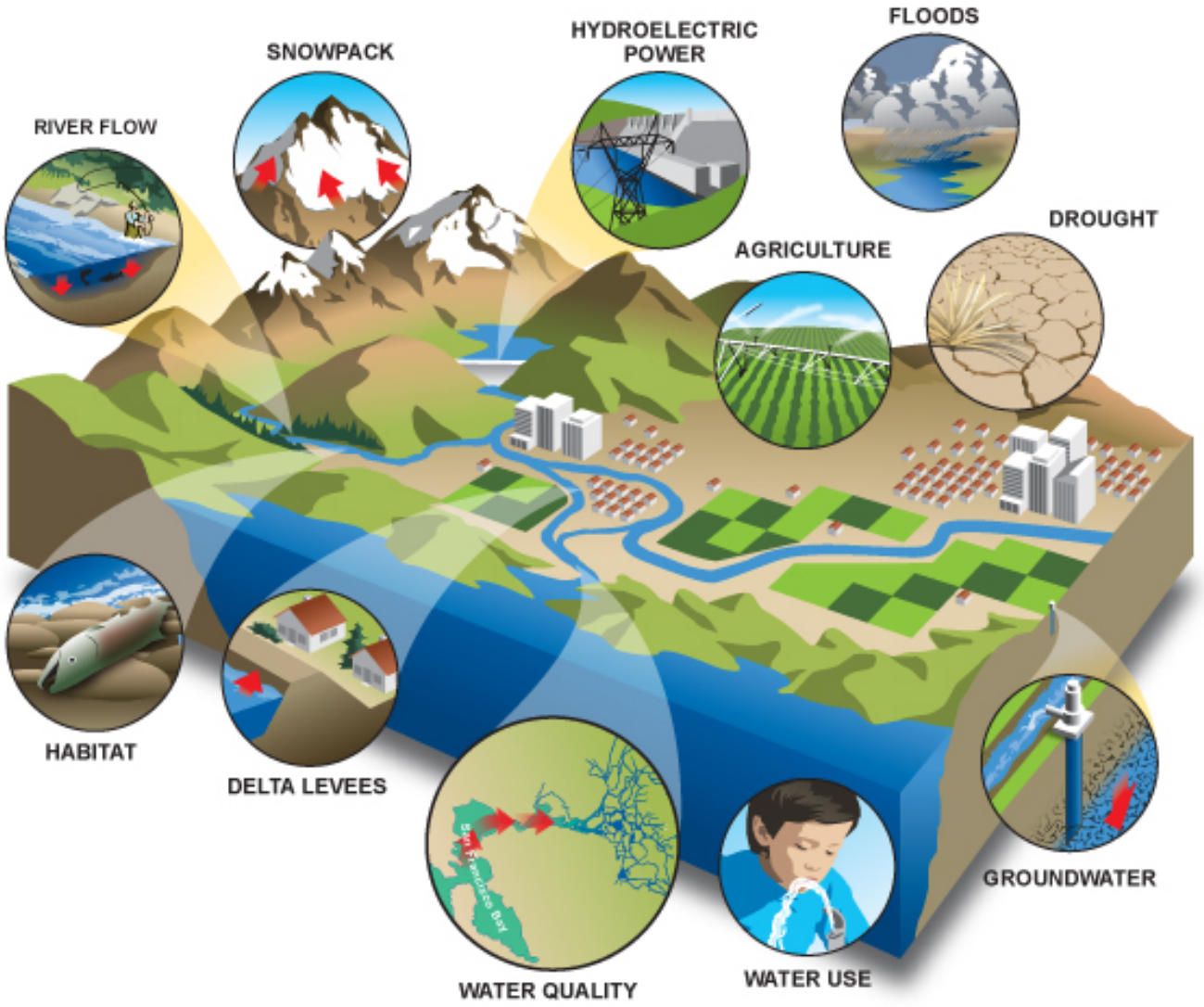
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