

**STATE WATER RESOURCES CONTROL BOARD  
RESOLUTION NO. 2017-0012**

**COMPREHENSIVE RESPONSE TO CLIMATE CHANGE**

WHEREAS:

1. Sharp rises in the atmospheric concentration of greenhouse gases over the last century and a half, due to human activity, have led to an increase in global average temperature, and associated climate change.
2. Climate change is affecting and will affect different regions in different ways. Current and future impacts include increasing frequency of extreme weather events, prolonged fire seasons with larger and more intense fires, increased tree mortality, heat waves, sea-level rise and storm surges. Changes in hydrology include declining snowpack and more frequent and longer droughts, more frequent and more severe flooding, changes in the timing and volume of peak runoff, and consequent impacts on water quality and water availability. Vulnerabilities of water resources include, but are not limited to, changes to water supplies, subsidence, increased amounts of water pollution, erosion, flooding, and related risks to water and wastewater infrastructure and operations, degradation of watersheds, alteration of aquatic ecosystems and loss of habitat, multiple impacts in coastal areas, and ocean acidification.

Examples of water quality impacts include, but are not limited to: dry periods and drought lowering stream flow and reducing dilution of pollutant discharges, harmful algal blooms due to a combination of warm waters, reduced ability of warm water to hold dissolved oxygen, and nutrient pollution, more erosion and sedimentation caused by intense rainfall events, especially following wildfire, and increased velocity of stream flow, potential sewer overflows due to more intense precipitation and increased storm water runoff, rising sea levels inundating lowlands, displacing wetlands, and altering tidal ranges, and increasing areas subject to saltwater intrusion into groundwater, and water pollution and increased absorption of carbon dioxide creating coastal zone "hotspots" of acidification and hypoxia.

3. The risks of abrupt or irreversible changes increase as the magnitude of the warming increases. The [Intergovernmental Panel on Climate Change](#) in its [Fifth Assessment Report](#) indicates that limiting global average temperature increase to below 2 degrees Celsius is necessary in order to minimize the most catastrophic climate disruptions. The [California Climate Change Assessments](#) have provided a strong foundation of research addressing the impacts of climate change on the state, as well as potential response strategies.
4. Mitigation, in the context of climate change, refers to actions taken to reduce concentration of greenhouse gases in the atmosphere. The most effective way to reduce greenhouse gas concentrations in the atmosphere is to reduce emission sources.

In the water sector, the principal source of greenhouse gas is the fossil fuel-based energy used to pump, convey, and treat water, and for end-uses of water. Therefore, mitigation can be accomplished through reducing the energy intensity of the water sector, replacing fossil fuels with renewable energy, improving efficiency, and reducing water consumption. Many water and wastewater agencies have already reduced their carbon footprint by deploying renewable energy. The potable and non-potable use of recycled water, the use of storm water, and the use of natural or green infrastructure for storage, movement and treatment, have the potential to reduce greenhouse gas emissions if replacing an existing or future, higher carbon water supplies. Other mitigation includes long-term carbon storage in the environment, and ecosystem management and restoration to ensure that the environmental carbon sink is resilient and grows over time.

5. Adaptation, in the context of climate change, refers to actions taken to build resilience, and to adjust to the impacts of climate change on society and the environment.
6. [Assembly Bill 32 \(AB 32\)](#), The California Global Warming Solutions Act of 2006, requires all state agencies to consider and implement strategies to reduce greenhouse gas emissions through 2020. Key components of AB 32 include establishment of a statewide greenhouse gas emissions cap, and development of a Scoping Plan to define how emissions reductions will be achieved. [Senate Bill 32](#) sets the state on the path for additional greenhouse gas emission reductions by 2030.
7. The AB 32 [Scoping Plan](#) is the core of California's climate mitigation efforts. Water-related AB 32 mitigation measures target reducing energy requirements associated with providing reliable water supplies (water use efficiency, water recycling, and reuse of urban runoff), and reducing the amount of non-renewable energy associated with conveying and treating water and providing adequate wastewater treatment (energy efficiency, and increased renewable energy production). The greenhouse gas emissions reductions from these measures may be indirectly realized through reduced energy requirements, and these actions often also have adaptation co-benefits of improving water quality and water supply reliability.
8. To help track, evaluate, and report on the climate change impacts the state is working to address, as well as outcomes of those efforts, the Office of Environmental Health Hazard Assessment has developed [indicators of climate change in California](#), including drivers, environmental changes, and impacts of climate change.
9. Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases are reduced or stopped. Therefore, California is making efforts to adapt to a changing climate. A principle of the state's adaptation strategy document, [Safeguarding California](#), is to prioritize actions that not only mitigate greenhouse gas emissions, but also help the state prepare for climate change impacts. Improved coordination, implementation, and integration of adaptation planning efforts and funding of the state's climate policies can directly protect the state's natural and built infrastructure, communities, environmental quality, public health, safety and security, natural resources, and economy from the unavoidable impacts of climate change.

10. [Executive Order B-30-15](#) directs the state to continue its rigorous climate change research program focused on understanding the impacts of climate change and how best to prepare and adapt to such impacts. The Executive Order directs State agencies to integrate climate change into all planning and investment, and sets the following principles to guide planning and investment: prioritize actions that both build climate preparedness and reduce greenhouse gas emissions, take flexible and adaptive approaches to prepare for uncertain climate impacts, protect the state's most vulnerable populations, and prioritize natural infrastructure solutions.

Coordination and working collaboratively with state, regional, and local agencies will be vital to ensure effective planning and implementation. Local and regional agencies are critical partners in implementing on-the-ground adaptation, and have an important role to play in California achieving its long-term climate change mitigation and adaptation goals.

11. Sustainable groundwater management provides a buffer against drought and climate change. The [Sustainable Groundwater Management Act](#) of 2014 provides new authorities for local agencies to directly manage groundwater resources, and requires that local groundwater sustainability plans consider changing conditions over a 50-year planning and implementation period. [Regulations](#) require that sustainable groundwater management plans account for population growth, climate change, and sea level rise. When local groundwater management efforts are not successful, the State Water Resources Control Board (State Water Board) may step in to help protect local groundwater resources.
12. The [California Water Action Plan](#) is a suite of actions developed to build resiliency into California water management and the ecosystems it supports. The Water Action Plan directives include conservation, integrated management, ecosystem protection, drought planning, expanded water storage, recycled water use, and sustainable and integrated financing. The Water Action Plan also emphasizes diversified regional supply portfolios which provide resiliency to drought, flood, population growth, and climate change, and multiple-benefits projects, which are integral to climate mitigation and adaptation.
13. On September 18, 2007, the State Water Board adopted [Resolution No. 2007-0059](#), which identified initial actions for climate change response.
14. The State Water Board and Regional Water Quality Control Boards (collectively referred to as Water Boards) have played a collaborative and substantive leadership role in promoting water measures that mitigate greenhouse gas emissions and contribute to adaptation to the effects of climate change primarily through issuing permits, developing policies and regulations, and providing financing. These measures include water recycling, water conservation and use efficiency, storm water capture and use, ecosystem protection, enhancement and restoration, drought response, and groundwater recharge.
15. Since 2007, the State Water Board has taken on additional responsibilities and functions, including the addition of the Division of Drinking Water, implementation of the Sustainable Groundwater Management Act, and adoption of statewide drought response and water conservation regulations. The State Water Board has also [identified the human right to water as a top priority](#) and core value across all programs and activities, and has taken multiple implementation actions to provide safe, accessible and affordable drinking water for all Californians.

THEREFORE BE IT RESOLVED THAT

Given the magnitude of climate change impacts on California's hydrology and water systems, our response to climate change must be comprehensive and integrated into all Water Boards' actions. This resolution lays the groundwork for a robust response that will support California's ongoing climate leadership.

In order to mitigate greenhouse gases the following shall be addressed:

**I. Reduce Greenhouse Gas Emissions**

**A. Methane Capture/Short-lived Climate Pollutants**

1. Division of Water Quality (DWQ) shall, and Regional Water Quality Control Boards (Regional Water Boards) are encouraged to, support the development and implementation of the Air Resources Board's [Short-Lived Climate Pollutant \(SLCP\) Reduction Strategy](#). Specifically, DWQ shall collaborate with Regional Water Boards, Air Resources Board, CalRecycle, and California Department of Food and Agriculture, to assess opportunities for reducing methane emissions from landfills through organic waste diversion, and co-digestion at existing or new anaerobic digesters, or through composting, while achieving water quality objectives. As a part of the SLCP effort, DWQ and Regional Water Boards are also encouraged to identify opportunities to reduce methane emissions from dairies and concentrated animal feeding operations while achieving water quality objectives.

DWQ shall report on its progress supporting SLCP implementation by December 15, 2017. Regional Water Boards should provide information on their activities to reduce methane emissions in the Water Boards' 2017-18 [annual Performance Report](#).

**B. Water Conservation and Efficiency**

2. Office of Research, Planning, and Performance shall, in coordination with the Department of Water Resources, manage the development and implementation of the water efficiency and conservation regulations identified in [Executive Order B-37-16](#), which are critical to making conservation a California way of life.

**C. Recycled Water**

3. DWQ shall coordinate with the Regional Water Boards to make annual reporting of recycled water data a requirement of waste discharge permits and water reclamation requirements, and work with the Division of Information Technology to develop an online data entry system to track recycled water use. Starting with the 2017-18 annual Performance Report, DWQ shall include a summary on the volume of recycled water used, and types of use.

**D. Storm Water**

4. Storm water capture and use provides flood protection, augments local water supplies, and increases water supply reliability as a climate adaptation strategy, in addition to water quality benefits, and enhanced aquatic habitats. DWQ shall collaborate with the Department of Water Resources, and other state and local land use agencies to prioritize storm water detention and infiltration.

DWQ shall collaborate with the Office of Information Management and Analysis (OIMA), and the Department of Water Resources to establish a methodology to estimate the amount of storm water captured and used statewide. Starting with the 2017-18 annual Performance Report, DWQ shall include a summary of the information collected.

E. Energy Efficiency and Renewable Energy

5. Division of Financial Assistance, and Division of Drinking Water, as a part of existing technical assistance programs for disadvantaged communities, shall include assistance to finance, construct, upgrade, and operate energy-efficient drinking water and wastewater treatment systems, and to power those systems with zero-carbon and low-carbon renewable energy technologies.

THEREFORE BE IT FURTHER RESOLVED THAT

In order to prepare for and adapt to impacts of climate change the following shall be addressed:

**II. Improve Ecosystem Resilience**

6. Division of Water Quality (DWQ), Division of Water Rights, Division of Financial Assistance, and Office of the Delta Watermaster shall, and Regional Water Boards are encouraged to, update plans, permits, and policies, and coordinate with other agencies to enhance ecosystem resilience to the impacts of climate change, including but not limited to actions that protect headwaters, facilitate restoration, enhance carbon sequestration, build and enhance healthy soils, and reduce vulnerability to and impacts from fires. Staff shall also collaborate with the California Department of Food and Agriculture, CalRecycle, and other agencies to advance carbon sequestration.

DWQ, Division of Water Rights, and the Delta Watermaster shall, and Regional Water Boards are encouraged to, document climate resilience benefits of ecosystem protection and restoration actions.

7. The Executive Director shall engage in dialogue with the United States Environmental Protection Agency (U.S. EPA), external experts, and interested stakeholders on how best to address meeting water quality standards given climate change impacts that contribute to or exacerbate degradation of water quality, including but not limited to increased surface water temperatures, altered surface water flows, changes in water chemistry (such as increases in salinity, bacteria, and nutrient concentrations), hydrology, and ecology.
8. Office of Information Management and Analysis (OIMA) shall, by July 1, 2017, coordinate with the Surface Water Ambient Monitoring Program, the Water Quality Monitoring Council and other relevant entities to include climate change impacts as stressors in relevant future analyses and assessments of ecosystems.
9. To assist with implementation of the co-equal goals for protecting, restoring, and enhancing the Sacramento-San Joaquin Delta (Delta) ecosystem, development of a more reliable water supply, and implementation of state policy to reduce reliance on the Delta in meeting California's future water supply needs, the Delta Watermaster, Division of Water Rights, and Division of Water Quality shall maintain an ongoing consultation with the Delta Stewardship Council, which runs the Delta Science Program, and with the Delta Protection Commission. The Delta Watermaster shall

coordinate with OIMA to identify and obtain downscaled projections of climate and hydrology changes expected in the Delta.

10. DWQ shall coordinate with the Regional Water Boards to identify actions, including those recommended by the [West Coast Ocean Acidification and Hypoxia Science Panel](#), the Water Boards could take to minimize impacts associated with ocean acidification, hypoxia, increasing temperature and nutrients. By December 15, 2017 DWQ shall recommend areas of research needed to improve the Water Boards' ability to support resilient ocean and coastal ecosystems, and, where applicable and feasible, to maximize use of natural infrastructure for shoreline protection.

### **III. Respond to Climate Change Impacts**

11. By July 1, 2018, Division of Drinking Water (DDW) shall, in consultation with Office of Information Management and Analysis (OIMA) begin including climate change vulnerability assessments into community water system sanitary surveys, and shall encourage drinking water systems to use the U.S. EPA's Climate Resilience Evaluation and Awareness Tool or a comparable approach to identify vulnerabilities to climate change impacts. DDW shall work with Division of Information Technology to develop a publicly accessible reporting system for the results of these climate change vulnerability assessments.
12. DDW shall work with Division of Financial Assistance to provide technical assistance and financial support to protect drinking water systems that are highly vulnerable to climate change impacts, with emphasis on disadvantaged communities and vulnerable populations. In its reports to the State Water Board, DDW shall provide updates on how vulnerable communities are building resilience to climate change.  
  
DDW, in consultation with OIMA, shall by July 1, 2018 evaluate criteria for siting of new drinking water systems using climate change projections, and shall recommend adjustments to siting criteria and standards as needed.
13. State Water Board staff shall coordinate with the Regional Water Boards and relevant agencies to identify and recommend actions the Water Boards could take for effective permitting of projects to develop new and underutilized water resources, expand surface water and groundwater storage where appropriate, and add operational flexibility to build and enhance resilience to impacts of climate change.
14. State Water Board staff shall, and Regional Water Boards are encouraged to, work with California Department of Forestry and Fire Protection, federal land management, and other relevant agencies to restore and maintain healthy watersheds, reduce vulnerability to catastrophic fires, and support resilience in recovery efforts.
15. Division of Water Quality shall work with the Regional Water Boards to evaluate and by July 1, 2018 make recommendations to the State Water Board on the need to modify permits and other regulatory requirements to reduce vulnerability of water and wastewater infrastructure to flooding, storm surge, and sea level rise.

16. When making recommendations on permits and other decisions to protect coastal infrastructure, wetlands, and other near-shore ecosystems, all State Water Board staff shall, and all Regional Water Boards are encouraged to, refer to projections of sea level rise as directed in the most recent Ocean Protection Council Sea-level Rise Guidance Document, the most current data available through [Cal-Adapt](#), and the California Coastal Commission's Sea Level Rise Policy Guidance, and shall consult with the Ocean Protection Council, the Coastal Commission, Bay Conservation and Development Commission, State Lands Commission, and other relevant agencies.

#### **IV. Rely on Sound Modeling and Analyses**

17. Office of Information Management and Analysis (OIMA) shall work with the California Energy Commission, and the Department of Water Resources to obtain access to relevant climate change data, model outputs and data evaluation services, in part to inform subsequent decisions that will need to take account of extreme events. OIMA and Division of Information Technology shall collaborate on providing these climate change data and model outputs on an open data platform by December 15, 2017.
18. OIMA shall assist State Water Board divisions and offices, and Regional Water Boards in the selection and the use of climate change resources described above, as needed to account for and address impacts of climate change in permits, plans, policies, and decisions.
19. Division of Water Rights shall, by July 1, 2018, identify data needs, and evaluate and make recommendations on regulatory and policy changes regarding the use of models to account for projected impacts of climate change when conducting water availability analyses and shortage analyses.

#### THEREFORE BE IT FURTHER RESOLVED THAT

In order to support implementation, provide education, and public engagement the following shall be addressed:

#### **V. Funding**

20. Division of Financial Assistance (DFA) shall, by July 1, 2017, include climate change mitigation and adaptation objectives in the Clean Water State Revolving Fund (SRF) and Drinking Water SRF Intended Use Plans.
21. DFA shall, by July 1, 2017, ensure that applications and environmental reviews for potential projects account for impacts related to climate change, including potential effects of climate change on the viability of funded projects.
22. DFA shall evaluate and make recommendations by July 1, 2017 regarding appropriate use of California Public Utilities Commission's Water Energy Cost Effectiveness Calculator, or comparable tools, to quantify and report on energy savings and greenhouse gas reductions from projects in any relevant funding programs.
23. The Executive Director shall, beginning in Fiscal Year 2017, to the extent feasible, prioritize and coordinate funding of studies that contribute to implementation of the climate change mitigation and adaptation actions.



## **VI. Outreach**

24. Office of Public Affairs shall include how Water Boards' actions support climate change mitigation and adaptation policy goals in media material, including press releases and fact sheets, and through media interviews.
25. Office of Public Participation (OPP) shall work with State Water Board divisions and offices, and with Regional Water Boards on the development of multi-lingual educational material for climate change-related actions and initiatives, and shall assist in providing, and support local agencies to provide, information and public outreach on potential climate change impacts to water quality, and options and funding opportunities for adapting to those impacts, including protecting source watersheds, drinking water and wastewater treatment infrastructure. OPP shall work with the Office of Environmental Health Hazard Assessment to identify communities most vulnerable to climate change impacts to ensure that those communities have access to information and technical assistance.
26. OPP shall work with State Water Board divisions and offices, Regional Water Boards, and the U.S. EPA to offer consultation to Tribes and solicit feedback on Tribal needs for addressing climate change and related impacts pertaining to the Water Boards' core functions. OPP shall report on its progress annually starting with the 2017-18 Performance Report.

## **VII. Administration**

27. Office of Research, Planning, and Performance (ORPP) shall track implementation of this Resolution, and annually report to the State Water Board on the actions taken by divisions, offices, and Regional Water Boards to mitigate greenhouse gas emissions, and prepare for and adapt to impacts of climate change. The annual updates shall include estimated water and energy savings and greenhouse gas emission benefits associated with Water Boards' regulatory actions, and financial assistance provision.
28. Office of Legislative Affairs (OLA) shall monitor and identify pending legislation that is related to climate change, including measures that may improve adaptation and mitigation, and ORPP shall provide technical support as needed. Where possible, OLA shall suggest modifications to address causes or impacts of climate change, and work collaboratively with the State Water Board divisions and offices, and Regional Water Boards to develop and sponsor legislation that supports mitigation of greenhouse gas emissions or advances potential for adaptation to projected climate change impacts.
29. Office of Information Management and Analysis (OIMA) shall work with relevant programs to identify and develop new performance measures for greenhouse gas emission mitigation, and actions that support adaptation to climate change to be included in the 2017-18 Water Boards' annual Performance Report.



30. ORPP shall identify specific training needs for Water Boards staff by December 15, 2017. ORPP shall work with OIMA to develop training on employing climate models and other relevant tools, data, knowledge, and learning from examples of local success to support Water Boards analyses and decision-making processes.

### CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on March 7, 2017.

AYE: Vice Chair Frances Spivy-Weber  
Board Member Steven Moore  
Board Member Dorene D'Adamo

NAY: None

ABSENT: Chair Felicia Marcus  
Board Member Tam M. Doduc

ABSTAIN: None



---

Jeanine Townsend  
Clerk to the Board