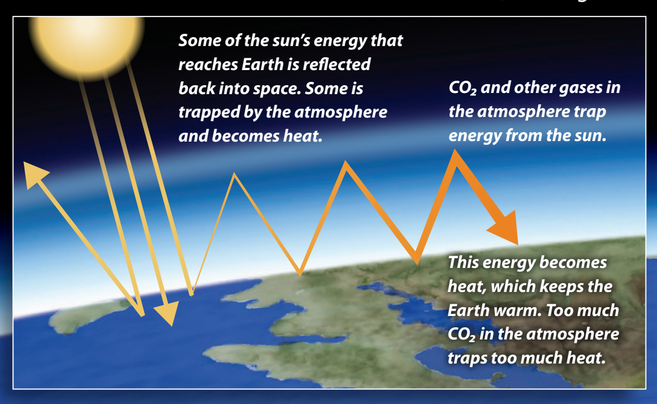
Climate Change and the Future of California's Water

California's Mediterranean climate – with its hot, dry summers and cool, wet winters – makes managing water a challenge. A complex system of dams and aqueducts stores and distributes water to help protect communities from floods and provides a reliable supply of water throughout the year. However, this system is at risk from climate change. Increased temperatures, reduction of the Sierra snowpack, and sea level rise are already impacting water supply and demand, and the impacts are expected to become more pronounced in the coming decades. Understanding why climate change is happening, how it will impact our water resources, and what we can do to minimize its effects is essential for managing our water resources and protecting our future.

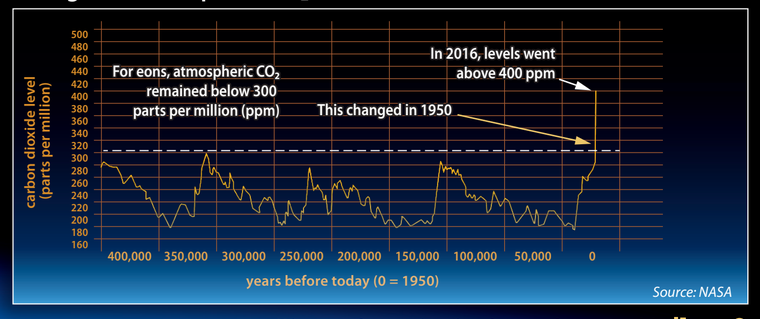
What Causes Climate Change?

When we burn fossil fuels such as coal, oil, and gas to power our homes, factories, and cars, we release carbon dioxide (CO_2) into the atmosphere. CO_2 is a heat-trapping gas. Regular CO_2 released through the carbon cycle helps the atmosphere act like a blanket, keeping the Earth warm enough to live on. However, burning fossil fuels releases additional CO_2 into the atmosphere. This rampant CO_2 causes the atmosphere to act like a thicker blanket, which traps too much heat and disrupts the climate.

Learn about the Carbon Cycle



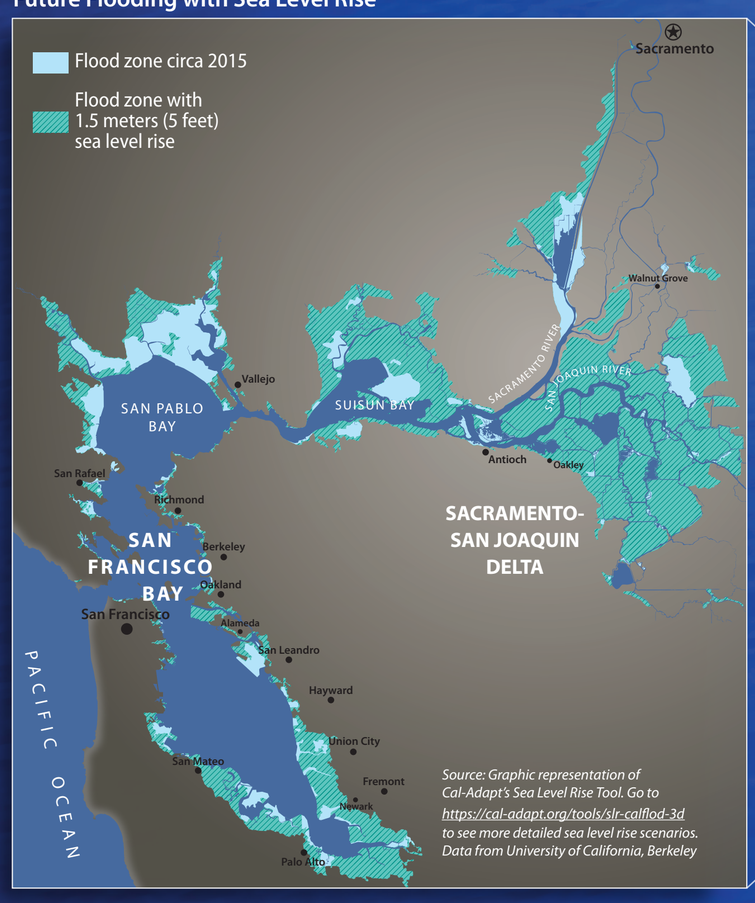
Changes to Atmospheric CO_2



Discover how scientists know about Earth's past climate, and predict future change

What Climate Change Means for California

Future Flooding with Sea Level Rise



Heavy rains and king tides—the highest tides of the year—are traditional causes of flooding in the Delta. Sea level rise and larger storms resulting from climate change are projected to lead to more extensive flooding by the end of the century.

Sea Level Rise

As the climate warms, land ice melts and oceans undergo thermal expansion. These both contribute to rising sea levels. In California, sea level rise threatens coastal communities with flooding and poses risks to groundwater reservoirs and the health and quality of the Sacramento-San Joaquin Delta – the primary source of fresh water for 27 million Californians from the San Francisco Bay Area to San Diego.

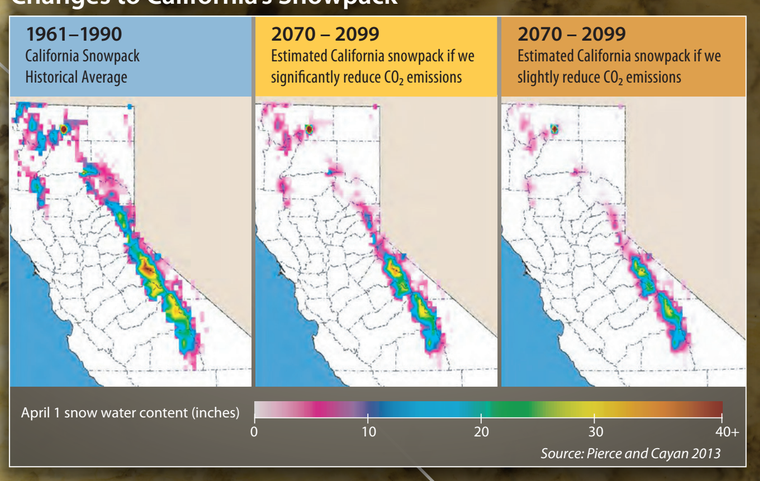
Find out more about sea level rise

Reduction in Snowpack

The Sierra snowpack acts as a frozen reservoir that, as it melts, provides water during the hot, dry summers. Warming temperatures, leading to rain instead of snow, have already reduced the snowpack by 25 percent in the last 100 years. Climate models indicate snowpack will continue to decline in the 21st century. This loss, combined with earlier and faster melting, decreases how much water we have during our hot, dry summer months.

More facts about the Sierra snowpack

Changes to California's Snowpack

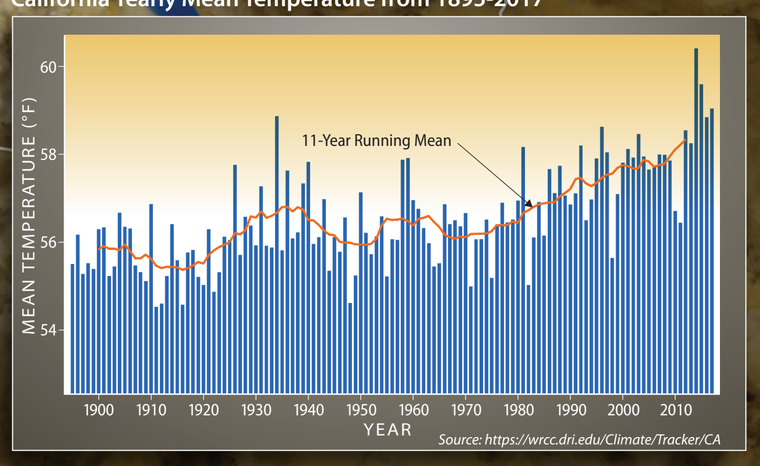


Warmer Temperatures

Warmer temperatures impact our water supply, demand, and the crops we can grow. As rain replaces snow, water is harder to store. Higher temperatures also lead to greater evapotranspiration, increasing the demand for water. In California's agriculturally rich Central Valley, higher temperatures also mean a reduction in the winter chill days required by certain crops such as apples, pears, walnuts, and pistachios.

Find out more about heat impacts

California Yearly Mean Temperature from 1895-2017



What You Can Do About Climate Change

Our climate future is not fixed. Some amount of climate change is already happening but reducing CO_2 now can reduce the speed and severity of climate change and help protect our water resources. We need to prepare to adjust (or adapt) to the impacts of climate change and take steps to reduce (or mitigate) the levels of CO_2 in the atmosphere.

People in California and throughout the world are working together to take action and protect our future. Students and other young people are essential parts of the solution. What will you and your friends do?

Conserve Water

Conserving water helps us adapt to and mitigate climate change. By conserving water, even in wet years, we are better prepared for the dry years. Conserve water by replacing lawns with drought-tolerant native plants.

Conserving water also saves energy. While water can generate clean energy (i.e. hydroelectricity), heating, treating and pumping water consume a lot of energy. By using less water, we use less energy, which reduces the amount of CO_2 we put into the atmosphere.

Talk to Others

Talk to your parents, siblings, neighbors, and friends about climate change. Make a short public service announcement or video and post it online or have a school-wide screening. Reach out to your city council and school board and encourage them to take steps to address climate change. Share your actions on social media.

Work with Your School

Planting native plant gardens and trees, launching lunch compost programs, installing water bottle refill stations, biking, walking, or taking other clean energy transportation to school, and creating no-idle zones for cars are just a few ways students across the country are already taking action to reduce the carbon footprint of their schools. Join the effort!

Your key to unlock more facts about California and climate change can be found at

water.ca.gov/climatechangeposter

California Department of Water Resources

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