

Angel Island State Park



A SCENIC LEGACY of CLIMATES PAST

Climate change is really nothing new. Throughout our planet's long history, conditions have repeatedly fluctuated between warm and cool, wet and dry.

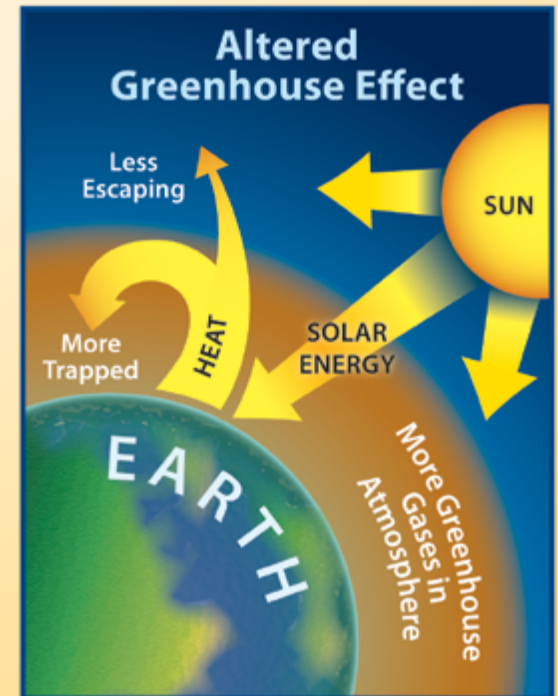
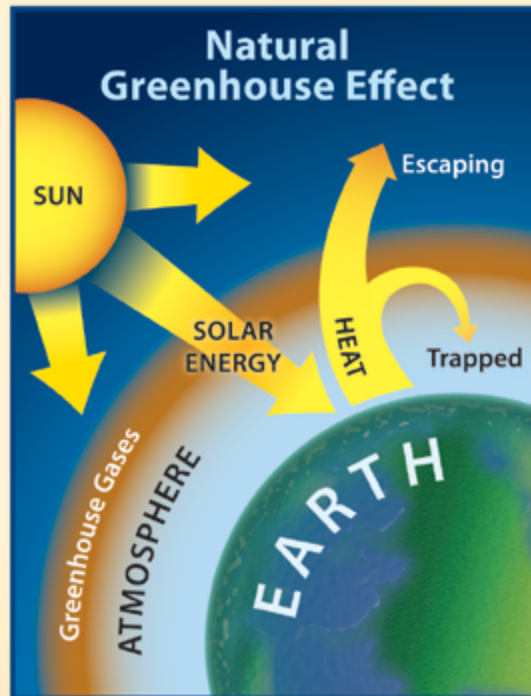
Some of these past climatic changes have left their mark on our present-day state parks. For instance, Ice Age glaciers gave Lake Tahoe's Emerald Bay its distinctive form—and the warming afterward created Angel Island when meltwater flooded San Francisco Bay.



Emerald Bay
State Park

CHANGE IS IN THE AIR

Scientific evidence overwhelmingly indicates that California's climate is changing—along with the planet's climate as a whole. Globally, the 2000-2009 decade was the warmest on record.



REMODELING NATURE'S GREENHOUSE

Atmospheric gases such as water vapor and carbon dioxide (CO₂) trap heat that the earth radiates after it's been warmed by the sun. This conversion of sunlight into trapped warmth is similar in principle to what happens in a closed car or in a greenhouse—hence the term “greenhouse effect.”

What makes today's changing climate different from past episodes of change is its *human* dimension. Climate scientists now agree that human-caused emissions of CO₂ are a key factor in the current rapid warming trend. In recognition of this fact, the State of California is now actively working to reduce these emissions.

OUR CRUCIAL ROLE

California State Parks is in a key position to respond to climate change impacts. The State Park System's



1.6 million acres are a rich storehouse of biodiversity, and the preservation, protection and expansion of park wildlands are making it possible for many climate-threatened species to survive.

Because much state parkland is relatively undisturbed, it may reveal impacts of climate change that are masked elsewhere by human activities. To rephrase an environmental adage, our parks may hold answers to questions we have not yet learned to ask.

California State Parks is responding to climate change through "COOL PARKS," a three-pronged strategic initiative. The strategies employed are **adaptation**, **mitigation**, and **education**.



ADAPTATION

Preparing Our Parks for Climate Change

Our field staff has assessed potential climate-related threats to park facilities statewide. Plans are being developed to adapt park infrastructure accordingly.

Natural resources specialists are identifying the State Park System's environmental resources that are most vulnerable to climate change. This information will help managers as they monitor and address impacts on habitats and species.

California State Parks is cooperating with other organizations to examine how creating large landscape reserves could help sustain our biodiversity. Acquiring protected open spaces is another strategy to help climate-sensitive plants and animals readjust their ranges.



MITIGATION

Becoming Part of the Solution

California State Parks is doing its part to reduce greenhouse gases by making its facilities more energy efficient, by relying more on solar power, and by switching to lower-emission vehicles.

At the same time, our parks provide a range of climate-friendly services that Californians are just beginning to appreciate. For example, park ecosystems such as old-growth forests store (or "sequester") great quantities of carbon that might otherwise find its way into the atmosphere. And the greenery and shade of urban state parks (as in the Los Angeles area) can help offset the "heat island" effect that makes cities disproportionately warm.

Solar panels are installed on the roof of a building at Anza-Borrego Desert State Park.



EDUCATION

Fostering Awareness, Understanding and Commitment

Through its educational and interpretive services, California State Parks is helping the public to become better informed about climate change and its ramifications. By focusing on climate through the lens of parks, we hope that many park users and supporters will be inspired to take constructive action.

Youth programs such as Junior Rangers are introducing this issue to the future stewards of our planet.



YOU CAN HELP!

Don't let the scale and scope of climate change discourage you. You can meaningfully contribute to a solution by reducing your "carbon footprint."

For Californians this is especially true, because our state's prominence on the world stage and its reputation for innovation and trend-setting serve to magnify the effects of what we do. As former Governor Arnold Schwarzenegger remarked at a United Nations climate conference, "The power of influence we have is equivalent to a continent."

Over the past two decades, California has taken a leading role in addressing climate change. Assembly Bill 32 became landmark law in 2006 by mandating the reduction of greenhouse gases in the state.

WHAT CAN YOU DO?

Energy conservation is extremely important because so much of the production and use of energy releases large amounts of greenhouse gas.

Making wise consumer choices (buying energy-efficient products) and modifying your behavior (using public transit and recycling, for example) can save you considerable money while reducing carbon dioxide emissions by thousands of pounds each year.

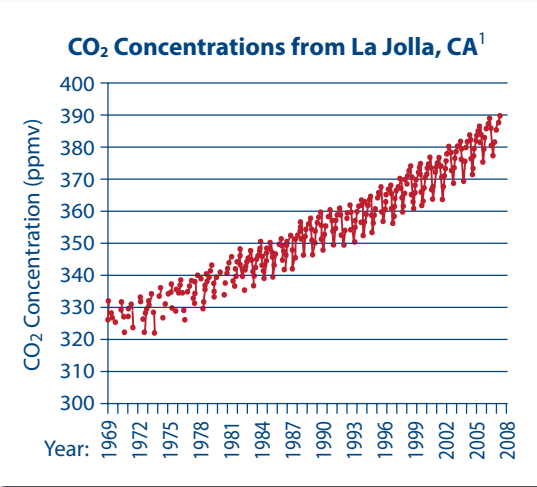
As a climate-conscious citizen, you can also make a difference by becoming involved in public decision-making—and by actively supporting our state parks!



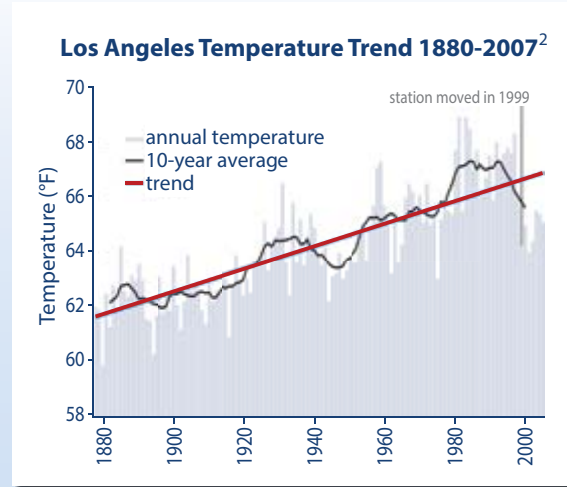
MOUNTING EVIDENCE

Concerns about California's changing climate are based on solid science. The evidence includes:

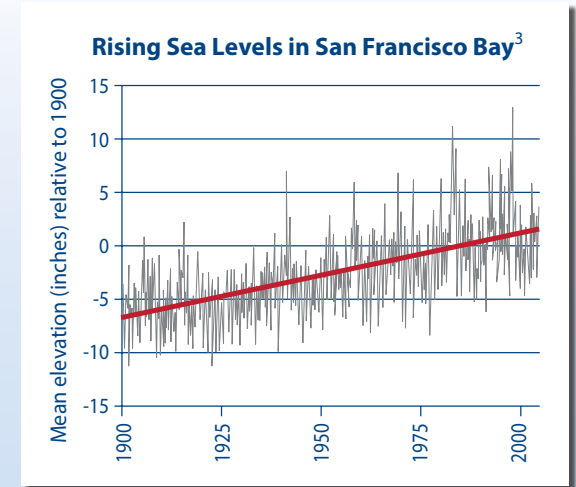
—A steady increase in atmospheric carbon dioxide, a greenhouse gas:



—Average air temperatures trending upward:



—A rising sea level as oceans warm and glacial ice melts worldwide:



FORECAST: WARMER—But By How Much?

Our ability to predict climate change impacts, while rapidly advancing, is still imprecise. The range of projected impacts depends not only upon scientific uncertainty, but also on what people choose to do about climate change. This chart presents three possible scenarios based on how we collectively respond to reduce emissions.

Projected Global Warming Impact in California Before the End of This Century³

WARMING RANGE	LOW	MEDIUM	HIGH
Temperature increases by	3 - 5½°F	5½ - 8°F	8 - 10½°F
Urban heat wave days increase by	2 - 2½ times	2½ - 4 times	3 - 4 times
Critically dry years increase by	up to 1½ times	2 - 2½ times	2½ times
Risk of large wildfires increases by	10 - 35%	55%	not determined
Sierra snowpack is reduced by	30 - 60%	70 - 80%	90%
Sea level rises ⁴ by	31 - 50 inches	37 - 60 inches	43 - 69 inches

Reducing greenhouse gas emissions is ESSENTIAL if we are to avoid the higher warming ranges.

¹ Source: R.F. Keeling, et al., Carbon Dioxide Research Group, Scripps Institution of Oceanography, University of California, La Jolla, California

² Source: NASA Earth Observatory, California Temperatures on the Rise, <http://earthobservatory.nasa.gov/IOTD/view.php?id=7596>

³ Source: Our Changing Climate 2006 Report, California Climate Change Center, <http://www.climatechange.ca.gov>

⁴ Source: Resolution of the California Ocean Protection Council on Sea-Level Rise, November 9, 2010 Report, State of California Ocean Protection Council, <http://www.opc.ca.gov/2010/12/climate-adaptation-and-sea-level-rise>

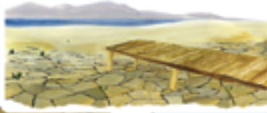
PROSPECTS FOR OUR PARKS

In order to survive the warming temperatures, many plants and animals will have to **shift** their **ranges** northward or to higher elevations.

Familiar **natural communities** may unravel as species respond in different ways.



Drought and draw-down will decrease water in **reservoirs**, reducing summer recreation opportunities.



Reduced mountain snowpacks will curtail traditional **winter sports**.



More of the winter precipitation will fall as rain instead of snow, increasing seasonal flooding and making **rivers** more destructive and dangerous.

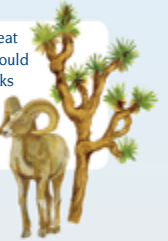


Due to climate change, some **spring wildflowers** are already blooming one to two weeks earlier than before.

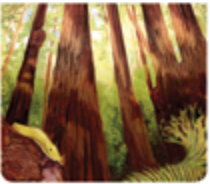
Vital relationships with pollinators may be disrupted if this trend continues.



Intensifying heat and dryness could cost some parks their most **cherished life-forms**.



There have been fewer foggy days along the north coast in recent decades—a troubling sign for the region's iconic, fog-dependent **redwoods**.



Sea level rise and more erratic runoff will seriously threaten levees and impact water quality in the Delta region.



Tide pool animals typical of Southern California are replacing colder-water species along the central coast.



On **tidal flats** and in coastal wetlands, even a few inches of sea level rise could mean the loss of thousands of acres of valuable wildlife habitat.



A **rising sea level**, along with an expected increase in shoreline erosion, will shrink popular **beaches** and threaten **facilities** at many coastal parks.



Increasingly, wildfires put irreplaceable **cultural resources** at risk—not only by destroying historic structures, but also by damaging or exposing archaeological sites.

