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Introduction

Climate change impacts on California’s coastal and freshwater resources have become more visible in recent years.

California’s iconic coast and ocean contribute \$51.3 billion to California’s GDP, support more than 500,000 jobs, and hold intrinsic value to the cultural identity, heritage, and overall quality of life for all Californians, and yet they remain on the front lines of climate change and biodiversity loss (Harris et al., 2026). Rising sea levels, coastal flooding, ocean acidification, increased ocean temperatures, and reduced oxygen in marine ecosystems are among a myriad of changing ocean conditions that ultimately alter ecosystems and affect people who depend on them. Several new indicators on coastal



impacts, namely coastal flooding and metrics tracking kelp populations, krill length and biomass, and Brandt's cormorant reproductive success, illustrate the extent of climate change impacts on the ocean and marine ecosystems. Changes to California's coastal waters are consistent with global trends (Volkov et al., 2026).

Further inland, freshwater resources are similarly important to the economy, cultural identity, and health of California and the people who depend on them (Mount et al., 2026), and yet a rapidly changing climate has led to rapid glacial retreat, a long-term decline in snowpack, earlier snowmelt, and rising water temperatures in the state's rivers and lakes. Chinook salmon populations have plummeted which impact the traditional lifeways and cultural practices of multiple California tribal nations.

The first ten chapters cover coastal systems: Ocean Acidification of California Waters, Dissolved Oxygen in Coastal Waters, Coastal Ocean Temperature, Sea Level Rise, Coastal Flooding, Marine Harmful Algal Blooms, Kelp Populations, Krill Length and Biomass, Brandt's Cormorant Reproductive Success, and California Sea Lion Pup Demography. The remaining six chapters cover freshwater systems: Glacier Change, Snow-Water Content, Snowmelt Runoff, Salmon River Water Temperature, Lake Water Temperature, and Chinook Salmon Abundance.

References

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