

California Coast and Ocean Report

Status, Progress, and What's Ahead

2026 HIGHLIGHTS



California's iconic coast and ocean are core to the state's identity and economy, but these special places are on the front lines of climate change and biodiversity loss. In the face of unprecedented challenges, the state has taken bold action to combat threats and build resilience to help people and nature thrive. **Below are highlights from select indicators that tell the story of California's coast and ocean.**

SEA LEVEL RISE

Sea level rise is already impacting habitats and coastal communities in California. In response, **historic investments in planning, restoration, and nature-based projects** are helping people and nature adapt to a changing coastline.



MARINE MAMMALS

While California's marine mammal populations are generally thriving, entanglement in fishing gear, harmful algal blooms, and whale ship strikes are major concerns. California is addressing these threats through **improved monitoring, faster response, and new collaborations with fishermen** to develop and test safer gear.



COMMERCIAL FISHERIES

While many fisheries in California are healthy and thriving, several – such as salmon and Dungeness crab – are in crisis due to the accelerating impacts of climate change. Through actions like the Klamath River dam removal and improved data collection, California is **restoring habitat and modernizing fisheries management** to build resilience for the ocean and coastal communities.



KELP

California's kelp forests are increasingly vulnerable in a changing ocean, with more than 95% of Northern California's kelp forests vanishing over the last decade. California's **bold, no-regrets investments in kelp research, monitoring, and restoration** have shown promising results, with more work ahead to ensure the long-term health of these iconic ecosystems.



COASTAL ACCESS

As climate change reshapes California's coast, public access – a fundamental right of all Californians – may be at risk. By **supporting inclusive, science-based sea level rise planning efforts and adaptation projects**, California is ensuring that our treasured coastline will remain accessible for future generations.

Learn more about the full report...

California Coast and Ocean Report

Status, Progress, and What's Ahead

2026 OVERVIEW



ABOUT THE REPORT

The 2026 California Coast and Ocean Report uses science to explore **14 key indicators** of California's coast and ocean. Developed through a public process and guided by more than 120 scientists, these indicators reveal both the threats facing our coast and ocean and the actions needed to protect people and ecosystems. This Report tells **a story of both pressure and progress**: while climate impacts are threatening wildlife, livelihoods, and coastal access, investments in sustainable solutions are improving the health and resilience of coastal and marine ecosystems and the people who rely on them.

PEOPLE



Community Benefits



Beach Water Quality



Coastal Access



Commercial Fisheries

WILDLIFE & HABITATS



Seabirds & Shorebirds



Fish



Marine Mammals



Kelp



Rocky Intertidal



Sandy Beaches

STRESSORS



Sea Level Rise



Ocean Acidification



Harmful Algal Blooms



Ocean Temperature



Dive into the indicators at opc.ca.gov/report

— **PEOPLE** —



COMMUNITY BENEFITS

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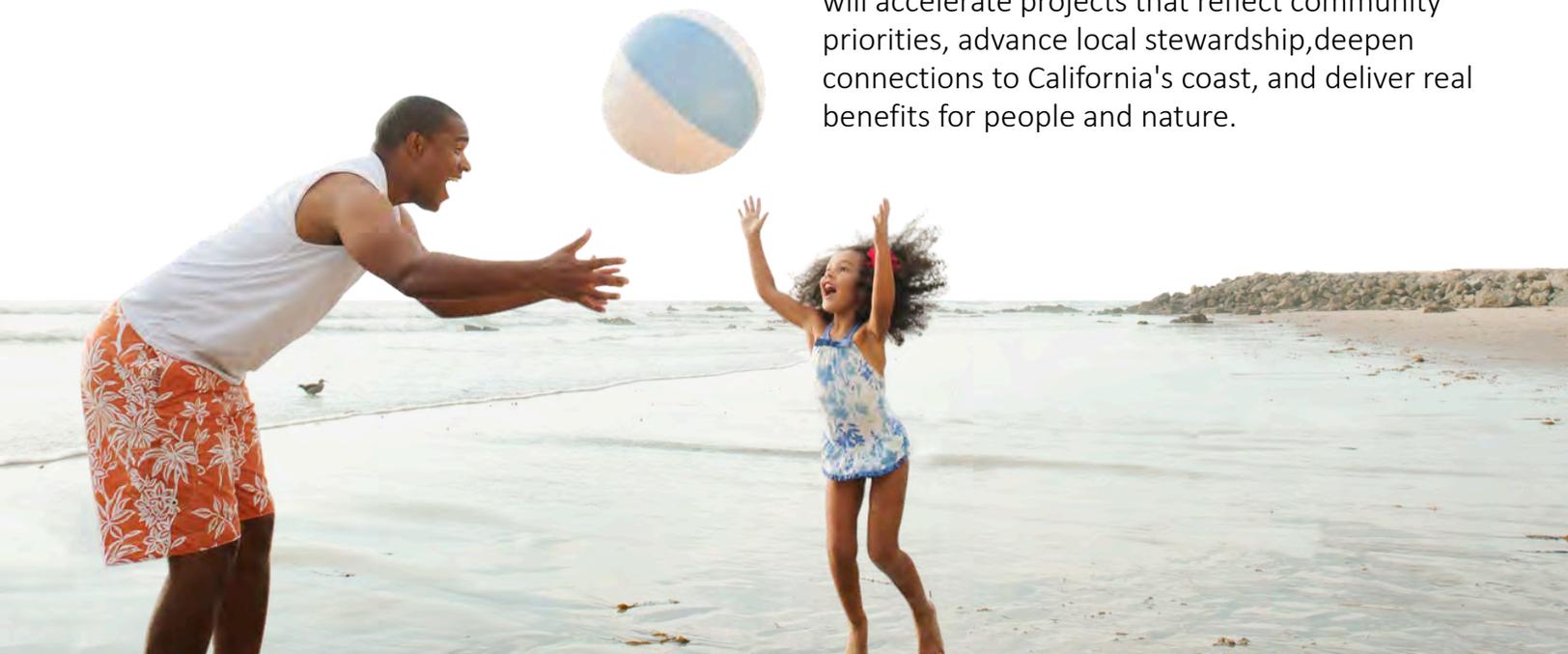
California is renowned for its extraordinary biodiversity and the incredible diversity of its communities. People from across the state visit our world-class coastline to recreate, connect with nature, and seek relief from the inland summer heat. However, historical and ongoing injustices, including the displacement of California Native American tribes, redlining, exclusion from land use decisions, and concentrated pollution, has impacted how many experience and access the coast. While the state has made progress to remedy these harms, much work remains – because access to a healthy coast and ocean is a shared right of all Californians.

PROGRESS

California is actively breaking down barriers to coastal access and funding, and including communities in the decisions that impact them. Guided by OPC's first-ever **Equity Plan** and **Tribal Engagement Strategy** to center tribal and community needs, nearly **50% of OPC-funded projects** since 2022 have **directly benefited environmental justice communities** and California Native American tribes.

LOOKING AHEAD

Intentional, community-led action is central to a healthy coast and ocean for all. Proposition 4, the **2024 Climate Bond**, directs a historic **\$10 billion to help the state prepare for a changing climate**, with at least 40% of all funds required to provide meaningful and direct benefits to California Native American tribes and other vulnerable communities. This historic investment, coupled with new state programs, will accelerate projects that reflect community priorities, advance local stewardship, deepen connections to California's coast, and deliver real benefits for people and nature.



DEEPER DIVE: ENVIRONMENTAL JUSTICE ADVISORY BOARD

First convened in 2024, the **Environmental Justice Advisory Board for California's Coast and Ocean** advises OPC on the ocean and coastal needs of California communities. The inaugural seven-member Board elevates tribal and environmental justice community priorities, evaluates the state's progress on **maximizing community benefits**, advises on **equitable grantmaking**, and strengthens **regional networks and partnerships**.

REDUCING BARRIERS TO FUNDING FOR COMMUNITY PROJECTS

- **Technical Assistance:** SB 1 Sea Level Rise Adaptation Program. OPC's first technical assistance program removed barriers for applicants and has resulted in over \$19 million awarded to tribes and local communities.
- **Environmental Justice Small Grants Program:** OPC funded two rounds of grants for community- and tribally-led projects increasing coastal stewardship and access, including a partnership with the Coastal Commission's WHALE TAIL® Grants Program.
- **Tribal Nature-Based Solutions Program:** Through a first-of-its-kind funding program, CNRA awarded \$101 million to support tribal multi-benefit nature-based solutions projects, including ancestral land return and habitat restoration.

DEEPER DIVE: TRIBAL MARINE STEWARDS NETWORK

The **Tribal Marine Stewards Network** (TMSN) is an alliance of six California Native American tribes (the Tolowa Dee-ni' Nation, Pulikla Tribe of Yurok People, Kashia Band of Pomo Indians, Amah Mutsun Tribal Band, Santa Ynez Band of Chumash Indians, and Cher-Ae Heights Indian Community of the Trinidad Rancheria) stewarding, protecting, and restoring ocean and coastal resources across their ancestral territories. Launched as an OPC-funded pilot in 2020, the Network conducts tribally-led research, monitoring, and education to support **environmental stewardship, economic security, community well-being, and cultural vitality**.



In 2022, members of the Wiyot Tribe celebrated the purchase, with support from OPC, of one of the last pieces of undeveloped coastal wetland and upland near Humbolt Bay.



To learn more, visit
opc.ca.gov/report



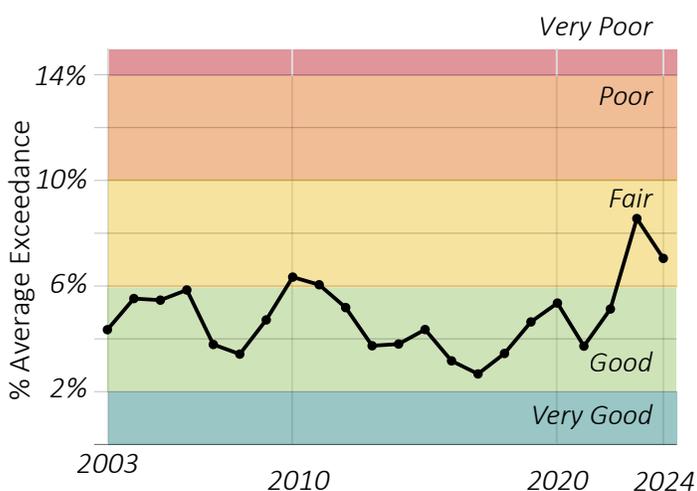
BEACH WATER QUALITY

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Every year, tens of millions of Californians swim, surf, and play in the ocean. Whether the water is safe depends on beach water quality, meaning how free coastal waters are from harmful bacteria and viruses that can cause illness. Poor water quality is closely linked to rainfall and runoff, which carry pollution from streets and farms into the sea. Routine monitoring and public reporting help people make informed choices about when and where it is safe to get in the water.

STATUS

Most California beaches are safe to swim with good water quality, aside from the last two years, when water quality was slightly worse due to heavy rainfall. However, California struggles with **known problem sites** (e.g., beaches close to storm drain outlets) where poor water quality can persist.



Based on the statewide average of *Enterococcus* bacterial counts exceeding the health safety standards, beach water quality has been relatively stable since 2003 with more recent years being slightly worse due to heavy rainfall.

PROGRESS

California now has one of the most sophisticated beach safety systems in the country. A first-of-its-kind forecasting model can predict contamination risks before water testing results are even available, giving swimmers advance warning on high-risk days. **Faster bacterial testing methods**, developed with state support, have also cut the time it takes to issue a beach advisory from days to hours. These tools are working: **public awareness and safety at problem beaches have measurably improved.**

LOOKING AHEAD

Climate change presents serious threats to coastal water quality, including from **increased extreme storms and wildfires.** Continuing to improve water quality will require **investments in improved stormwater management, sewage treatment infrastructure, and nature-based solutions** to filter contaminants.



SOURCES OF POLLUTANTS

Urban and agricultural runoff, sewage discharge, and animal waste are the main sources of the bacteria and associated pathogens that contribute to poor beach water quality. In most of California, rain washes these pollutants into storm drains that flow into the ocean. This leads to years with more rainfall having worse water quality than dry years

PROBLEM SITES WITH POOR BEACH WATER QUALITY

- Linda Mar Beach, Pacifica
- Santa Monica Pier
- Southern San Diego near the Tijuana River



HOW TO STAY SAFE WHEN THE WATER QUALITY IS POOR

- Check your local beach water quality before visiting the beach
- Avoid entering the water for 72 hours after rain
- Avoid swimming near flowing storm drains



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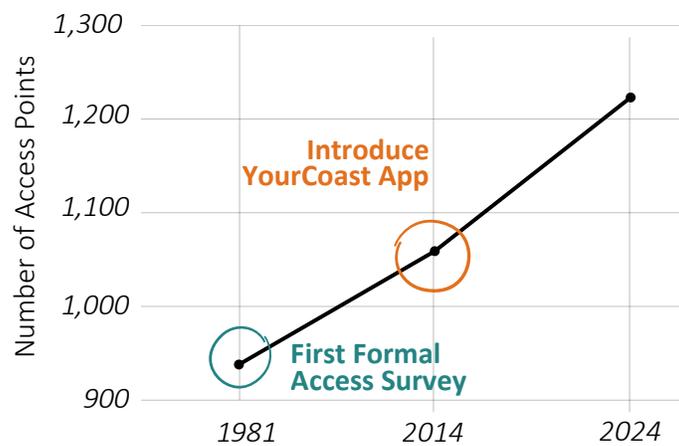
COASTAL ACCESS

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California's coast belongs to everyone, but getting there is not always easy. Since 1976, the California Coastal Act has protected the public's right to reach the state's beaches and rocky shores, recognizing that access to the ocean is essential to recreation, well-being, and California's identity. Even so, access remains limited in some areas where privately owned land or rugged terrain blocks the way.

STATUS

Coastal access has increased since the formation of the California Coastal Commission fifty years ago. Now, **more than half of California's coastline (55%) is within walking distance of a coastal access point.**



The number of coastal access points and parks managed by the California Coastal Commission have significantly increased since 1981.



PROGRESS

California has **added hundreds of new public access points** since the Coastal Commission was established 50 years ago, growing from under 900 to more than 1,200 today. The **YourCoast app, launched to help people find coastal access sites** near them, has been used by millions of Californians. The state has also **invested in making coastal access more equitable**, including **accessible facilities** for people with disabilities and adding new segments of the **California Coastal Trail** that open up stretches of coastline that were previously hard to reach.

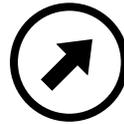
LOOKING AHEAD

As sea levels rise, **some beaches may disappear** where the shoreline cannot move inland, threatening the public's ability to enjoy California's coast. But California is taking action. Through forward-thinking planning and targeted investments, the state is working to protect and expand coastal access for generations to come. The forthcoming statewide **Beach Resiliency Plan will identify beaches most at risk** from sea level rise and chart a clear path forward—guiding bold strategies to preserve public access as the shoreline changes.



GREATER COASTAL ACCESS IN MORE POPULATED AREAS

2024 Status Trend Region



NORTHERN CALIFORNIA

Northern California, well known for its rugged coastline and inaccessible steep cliffs, has the least direct coastal access.



CENTRAL CALIFORNIA

In Central California, coastal access is limited by cliffs, the Amtrak rail line, military land use, and privately owned large ranching areas along the Gaviota Coast in Santa Barbara County. Less than 3% of the Gaviota Coast, a 76-mile stretch of coast along the Santa Barbara Channel, has any public access, making it one of the least accessible regions in California.



SOUTHERN CALIFORNIA

Southern California has the most accessible coastline in the state.

Percentage of coastal miles in each region that are within walking distance of a public access point, excluding areas closed for military use or inaccessible steep cliffs. Arrows represent trends in the number of coastal access points over time.



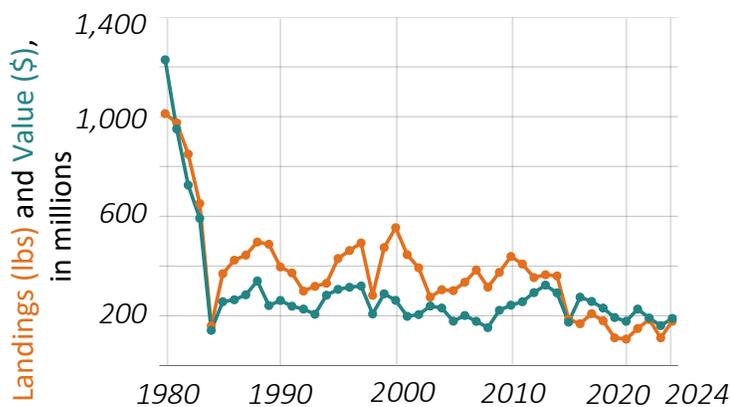
COMMERCIAL FISHERIES

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Commercial fishing is woven into the fabric of California's coastal communities, supporting thousands of fishing families and delivering local, wild-caught seafood to millions of Californians each year. State and federal agencies work to manage these fisheries sustainably, balancing the health of the ocean with the livelihoods that depend on it. But a changing ocean is putting both fish populations and the people who depend on them under growing pressure.

STATUS

Most commercial fisheries in California are in good condition, with healthy stocks, stable catch, and consistent dockside value. However, **climate change is causing major disruptions to some of the most important fisheries in California**. These disruptions include continued impacts to the commercial Dungeness crab fishery and an unprecedented three-year closure of the commercial salmon fishery.



Over the last decade, two major metrics of fishery health – “catch,” or total pounds of fish landed, and “ex-vessel value,” or total amount paid for fishermen’s catch – have remained generally stable, despite an overall trend of decline in both of these metrics over the last fifty years.

PROGRESS

In the last several years, the state has **taken major action to support healthy commercial fisheries**. California made history with the removal of four dams on the Klamath River, completed in 2024, as the largest dam removal and river restoration project ever undertaken in the United States. For the first time in over a century, salmon can reach hundreds of miles of spawning habitat once blocked by dams. State agencies are also working to improve the “climate readiness” and adaptability of fisheries management through innovative methods like **modernized fisheries data collection**.

LOOKING AHEAD

The **accelerating impacts of climate change** – from drought and wildfire to warming waters and kelp loss – **pose significant risks to California’s commercial fisheries**. Through proactive, climate-ready fisheries management, technological innovation, and investments in coastal community resilience, the state will continue to **work with fishing communities to combat these threats and support healthy and profitable fisheries into the future**.

FISHERY SPOTLIGHTS

DUNGENESS CRAB

One of California's oldest and most valuable fisheries, the commercial Dungeness crab fishery generates tens of millions of dollars in revenue each year. However, the long-term health of this fishery is under threat due to multiple climate-driven issues, including increases in whale entanglements from crab fishing gear.



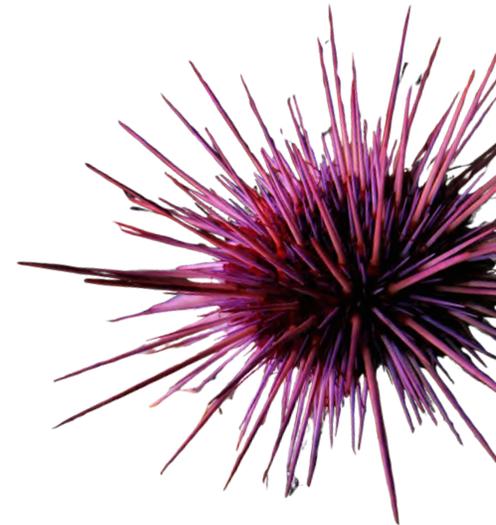
CHINOOK SALMON

California's commercial chinook salmon fishery has been closed since 2023, largely because of impacts to salmon populations caused by drought, wildfires, and the loss of river habitat that salmon need to spawn. Chinook salmon was declared a federal fishery disaster in 2023 and 2024.



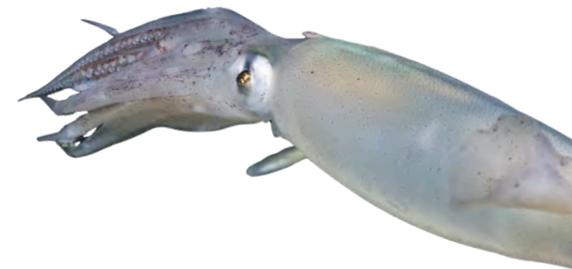
RED SEA URCHIN

The health of the commercial red sea urchin fishery varies across the state. In Southern California, red sea urchins are generally abundant and the fishery is profitable. However, in Northern California, widespread kelp forest losses have led to fishery collapse. The federal government has allocated millions of dollars since 2016 to support the recovery of the Northern California red sea urchin fishery.



MARKET SQUID

Generally considered the most valuable fishery in California, commercial market squid landings were worth \$78 million in 2024, with most landings occurring in Monterey Bay and the Channel Islands. However, the health of the market squid fishery is highly dependent on ocean conditions; landings decrease in warm-water years.



WILDLIFE & HABITATS



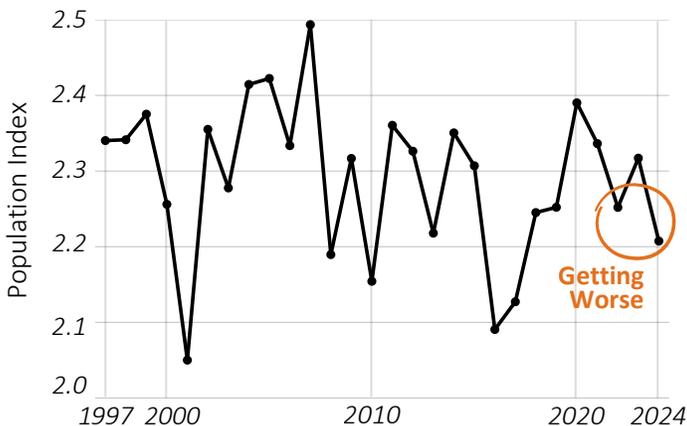
SEABIRDS & SHOREBIRDS

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California's coastline and ocean support hundreds of species of seabirds and shorebirds, from brown pelicans soaring over the surf to tiny snowy plovers nesting on open beaches. These birds are part of what makes California's coast feel alive, and for many Californians, spotting them is one of the quiet pleasures of a day at the shore. They are also sensitive indicators of ocean health: when food is scarce, waters are toxic, or habitat disappears, birds are often the first to show it.

STATUS

Trends in seabird and shorebird population status are mixed. Offshore species, like Black-footed albatross, are highly vulnerable to climate variability and changing prey availability, and are generally declining across the state. Nearshore species, like Brandt's cormorants, are generally doing well. **Coastal and estuarine species, like sandpipers, are showing concerning declines**, likely due to threats such as habitat loss and pollution.



The seabird community has been generally stable over the last 30 years. Since 2019, more bird populations are decreasing than are increasing.

PROGRESS

California passed the Migratory Bird Protection Act to close a gap in federal law that left millions of birds vulnerable to incidental killing, making California a national leader in bird protection. **Restoration projects** along the coast are **rebuilding nesting habitat** for species like the western snowy plover that have been displaced by development and human disturbance. And at the Farallon Islands, the largest seabird breeding colony in the continental United States, **long-term monitoring supported by state funding** continues to track how species are faring as ocean conditions change.

LOOKING AHEAD

California's seabirds and shorebirds face an uncertain future. As ocean conditions continue to change, these species will be threatened by **warming waters**, increased **harmful algal blooms** (which can be toxic to birds), **habitat loss**, and **changing food resources**. To help combat these threats, California is committed to **monitoring** marine birds, **protecting and restoring habitat**, and **mitigating land-based impacts** to the coast and ocean.

SPECIES HIGHLIGHTS



Brandt's cormorants (upper photo) and **common murre**s (lower photo) have more than tripled in population size since the 1990s, largely as a result of increases in their main food source, Northern anchovies, and the successful protection of nearshore islands.



Brown pelicans were heavily impacted in the 1970s by DDT, a now-banned pesticide that was catastrophic for many birds. Since 2019, however, the abundance of this iconic species has increased by 89%.



Ashy storm-petrels had been increasing since the 1990s, but then began decreasing in 2019. Nest failure due to predation is a notable threat to these species.



FARALLON ISLANDS: BIODIVERSITY HOTSPOT

Islands provide safe havens for seabirds to nest, and the waters around islands are often rich sources of food. The wind-swept Farallon Islands off of San Francisco, protected as a National Wildlife Refuge within the Greater Farallones National Marine Sanctuary, are home to the single largest seabird breeding colony in the continental United States. These islands are a critical site for long-term seabird monitoring and research.





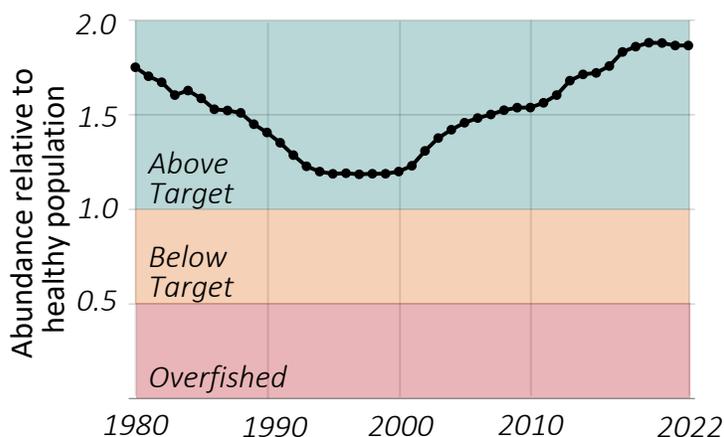
FISH

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California’s ocean waters are home to almost 600 species of fish. From the salmon that California Native American tribes have harvested for thousands of years to the iconic great white shark. In addition to playing a key role in coastal and marine ecosystems, fish support coastal economies through commercial, recreational, and subsistence fishing and are a critical food source for millions of Californians. Strict environmental protections and sustainable fisheries management help keep California’s fish populations some of the healthiest in the world. This indicator focuses on the ecological status of California’s fish based on abundance; a separate indicator explores the health of commercial fisheries across the state.

STATUS

Most fish species in California have healthy, abundant populations. This includes species that are commonly commercially harvested in California. **Fluctuations in fish populations are generally caused by natural changes in ocean conditions,** though increased fishing pressure and climate-related impacts, such as kelp loss, can cause declines in fish abundance.



Change in average abundance of 45 fish species compared to healthy population targets over time.

PROGRESS

Decades of science-based catch limits, California’s statewide network of marine protected areas, and habitat restoration have brought **dozens of species back from the brink of collapse**, including several rockfish populations that were severely overfished in the 1980s and 1990s. Today, many of **California's fish populations are among the healthiest and most carefully managed in the world.**

LOOKING AHEAD

Many fish species, including more than half of commercially harvested species, are **vulnerable to climate change impacts such as ocean warming, ocean acidification, and hypoxia.** Continued support for **scientific research and monitoring,** and ongoing investments to **conserve and restore coastal and marine ecosystems,** will be critical to minimize negative impacts to fish and fisheries.

FISH SPOTLIGHTS

SARDINES AND ANCHOVIES

Sardines and anchovies are important fisheries in California and serve as a major food source for tunas, salmon, seabirds, and marine mammals. Sardines and anchovies experience alternating boom-and-bust cycles driven by natural changes in ocean conditions.



VERMILION ROCKFISH

The vermilion rockfish is one of the most desirable targets for recreational fishermen. Though overfishing led to major declines in populations of rockfishes during the 1980s and 1990s, sustainable fisheries management – including catch limits, closures, and ongoing scientific monitoring – has helped rockfish recover in California.

GARIBALDI

The bright orange Garibaldi, California's State Marine Fish, is a distinctive species often spotted by divers in Southern California's kelp forests and rocky reefs. Male Garibaldi cultivate and guard small "gardens" of red seaweed for their nests, creating unique patchy mosaics across the rocky seafloor. Take of Garibaldi is prohibited throughout California.



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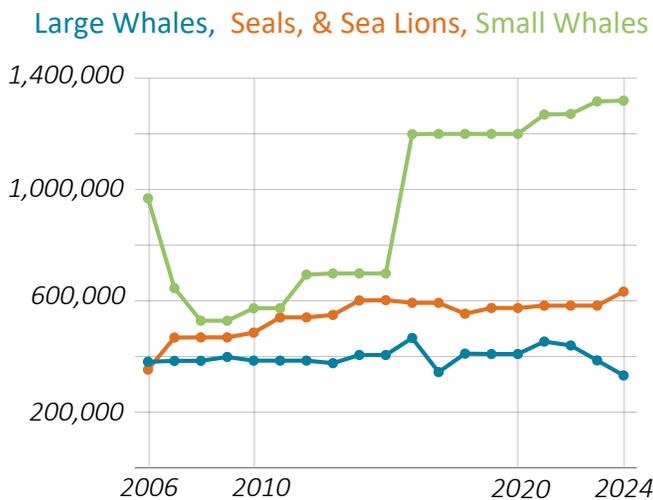
MARINE MAMMALS

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Few things stop a Californian in their tracks like a whale surfacing offshore or a sea otter floating in the kelp. California is home to nearly 40 species of marine mammals, including the blue whale, the largest animal on Earth. California's marine life are a source of wonder, ecological importance, and economic value through wildlife-based tourism. Most populations are rebounding from a century of hunting and whaling, but some, like the southern sea otter, remain threatened, and all face new risks from a changing ocean.

STATUS

Overall, marine mammal populations in California are healthy. Stock assessments by the National Oceanic and Atmospheric Administration (NOAA) in 2024 showed that, out of 26 marine mammal species assessed, **most species are increasing or stable, and two species are in decline: killer whales and gray whales.** Gray whale populations have decreased by nearly 40% in recent years, likely due to environmental change.



Population of marine mammals over time (2006 to 2024), showing overall numbers to be stable or increasing.

PROGRESS

California leads the country in marine mammal protection. Working with fishing communities, the state developed and tested new **'whale-safe' fishing gear to prevent entanglement-related deaths**, which had been rising since 2014. When whales do become entangled, a **faster emergency response system**, built in partnership with federal agencies, the fishing industry, academics, and conservation groups, is now saving animals that would previously have died. California scientists are also developing tools to **predict where harmful algal blooms (HABs) will strike**, giving marine mammal responders a head start in responding to HAB-related illnesses and marine mammal strandings along the coast.

LOOKING AHEAD

Despite **encouraging signs of recovery and stability**, California's marine mammals are **still vulnerable**, especially in a changing ocean. The state is **doubling down on cutting-edge research and monitoring, technological innovation, and partnerships with fishing communities**, which will help protect these awe-inspiring species for generations to come.

DEEPER DIVE: PROTECTING BLUE WHALES BLUE SKIES PROGRAM

Fatal collisions with large ships threaten whales off California's coast in high traffic areas that overlap with habitat critical for whale feeding, migration and reproduction. **Protecting Blue Whales and Blue Skies** (BWBS) is a partnership between government agencies, research partners and conservation organizations working to make our air cleaner, and the ocean quieter and safer for whales. The program achieves these goals through a Vessel Speed Reduction (VSR) zone in which ocean-going vessels of 300 GT (gross tons) and larger voluntarily slow down to 10 knots or less within sensitive whale habitats off California's coast.

Since 2014, the program has avoided over 200,000 metric tons of greenhouse gas emissions, 5,900 tons of NOx emissions, and resulted in an estimated 50% reduction in whale strikes. The California Legislature recently enacted Assembly Bill 14 (Hart, 2025) to expand the success of this program statewide.



SPECIES HIGHLIGHTS



HUMPBACK WHALE populations have **increased** since monitoring began in 1990, but entanglement in fishing gear increased dramatically beginning in 2014, impacting humpback whales. Ship strikes are another ongoing threat to humpback whales.



GRAY WHALES Gray whales migrate along the entire West Coast, from the Arctic to Baja California. Gray whale populations have **decreased** by nearly 40% between 2019 and 2023 — a loss of tens of thousands of animals. This event was driven largely by ecosystem changes in Arctic feeding grounds that reduced birth rates and caused malnutrition, leaving gray whales more vulnerable in California waters.



CALIFORNIA SEA LION populations have fully **rebounded** to healthy levels under the protection of the Marine Mammal Protection Act. However, strandings of sea lions have recently increased, due to domoic acid poisoning caused by harmful algal blooms.



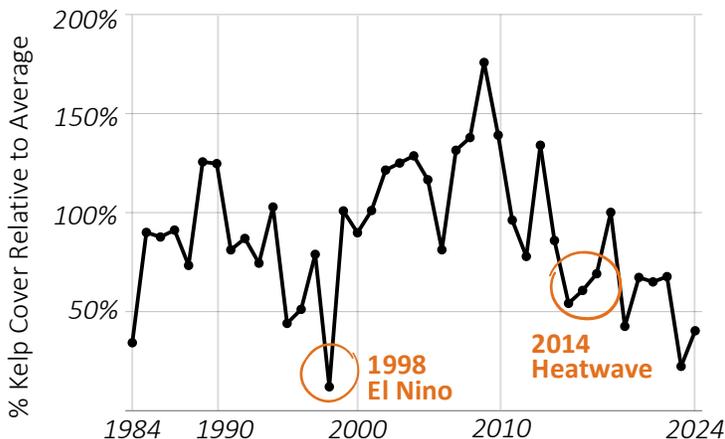
KELP

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Dive into the water off California's coast and you may find yourself in a kelp forest, towering columns of seaweed rising from the seafloor to the surface and sheltering hundreds of species of fish and wildlife. These ecosystems are among the most productive on Earth, and they are deeply woven into California's identity, economy, and cultural heritage. But California's kelp forests are in serious trouble, having shrunk dramatically over the past decade as the ocean warms.

STATUS

In recent years, California has experienced severe **climate-driven declines** in kelp canopy. Overall, kelp canopy has been lower than normal since 2014, when a marine heat wave resulted in dramatic die-offs of kelp across the state. **In 2024, more than 75% of kelp forests were smaller than their long-term average.** However, preliminary data from 2025 indicate that kelp forests are **beginning to recover in much of Central and Southern California.**



Percent of kelp cover in 2024 relative to the long-term average (1984-2013).

PROGRESS

California has taken bold action in the face of kelp loss, adopting a “learn by doing” approach that meets the urgency of the moment and **investing close to \$11 million in kelp research and restoration** over the last four years. These efforts are filling knowledge gaps to successfully restore kelp ecosystems and build resilience in the face of a changing ocean.

LOOKING AHEAD

Early successes, driven by state investments, will directly inform the development of a statewide **Kelp Restoration and Management Plan – the first plan of its kind in California history.** Additionally, Proposition 4, the 2024 Climate Bond, earmarked **\$19 million specifically for kelp protection and restoration** – a landmark investment that will drive progress on the **state’s goal to restore 2,000 acres of kelp by 2030.**





STATUS VARIES ALONG THE COAST

2024 Status	5-Year Trend	Region
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-96%



NORTHERN CALIFORNIA

Kelp cover in **2024 was the second lowest in four decades** and lower than any other region. Substantial declines started in 2014 when a marine heatwave coincided with the **loss of sea stars and an explosion in kelp-eating purple sea urchin** populations. Generally, kelp forests in this area have yet to recover.

-53%



CENTRAL CALIFORNIA

2024 was the third-worst year on record, with kelp cover at **half of the long-term average** size. Kelp cover has been **declining since 2019**, although the cause is still unclear.

-77%



SOUTHERN CALIFORNIA

Kelp cover **improved compared to 2023, which was one of the worst years on record**, likely due to early-season storms.

+7%



CHANNEL ISLANDS

Kelp cover in this region has increased over recent years. The southern Channel Islands, such as **San Clemente and Catalina, remain most abundant**. However, the northern islands, such as **San Miguel and Santa Rosa, are experiencing declines** in kelp cover.

Percentages are 2024 kelp cover compared to the long-term average (1984-2013). Arrows are the direction of change over the last five years (2020-2024).



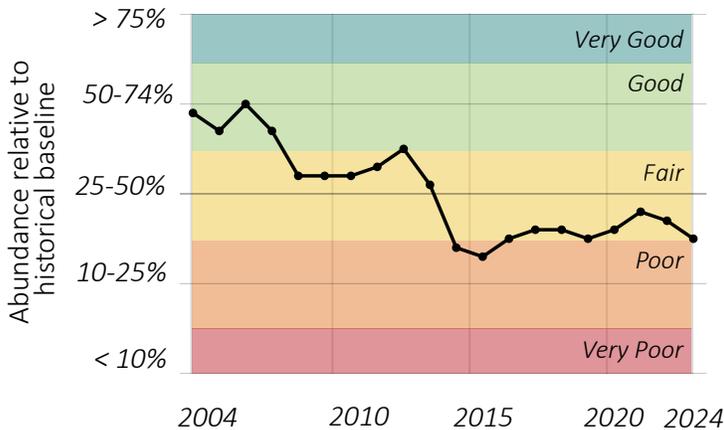
ROCKY INTERTIDAL

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Tidepools are one of California's most visited natural wonders, places where someone can crouch down and come face to face with sea stars, anemones, and hermit crabs without a boat or scuba gear. These rocky intertidal habitats, where the shoreline meets the sea, support remarkable biodiversity and offer Californians an unmatched window into ocean life. They are also surprisingly rare and fragile, already showing the effects of heat waves and pollution in ways that scientists are tracking closely.

STATUS

From 2013-2015, a **major marine heat wave and disease outbreak caused populations of ochre sea stars, rockweeds, and other intertidal species to decline.** In some places, rocky intertidal ecosystems are starting to recover from heat wave impacts, but recovery has been highly variable across the state.



The combined status of four key species abundance from 2004- 2023, compared to the historical baseline: rockweeds, surfgrass, mussels, and ochre sea stars.

PROGRESS

California has built **one of the world's most comprehensive tidepool monitoring programs.** The Multi-Agency Rocky Intertidal Network and the citizen science program Snapshot Cal Coast together track hundreds of species at sites across the entire state coastline, generating data that scientists use **to track change over time, detect early warning signs of ecosystem stress, and measure whether marine protected areas are working.**

LOOKING AHEAD

As climate change accelerates, bringing with it impacts like heat waves, increasing ocean temperatures, and rising sea levels, **rocky intertidal ecosystems will be increasingly at risk.** Protecting these rare and sensitive habitats from **overharvest, trampling, pollution, and other human impacts,** as well as **making room for intertidal zones to move inland as sea levels rise,** will help to ensure the long-term health of these ecosystems into the future.

PATTERNS OF CHANGE

California’s tidepools are home to algae, invertebrates, fishes, mammals, and shorebirds that feed in these areas. Many of these species are essential for healthy ecosystems. Rockweeds and surfgrasses, for example, provide food and habitat for other species, while ochre sea stars – voracious predators – help maintain biodiversity by keeping other species in check.



As ocean conditions have changed in the last decade, these keystone species have been impacted, resulting in changes to rocky intertidal ecosystems across the state.

NORTHERN CALIFORNIA

Overall, rocky intertidal habitats have changed the least in this region over the last decade. This is the only region in California where ochre sea stars have shown recovery following a major disease outbreak in 2013.

CENTRAL CALIFORNIA

This region has seen major declines in foundational algae and plant species, such as rockweeds and surfgrasses, which began declining in 2019 and have yet to recover.

SOUTHERN CALIFORNIA

Rocky intertidal habitats have changed substantially in this region over the last decade, with marked declines in rockweeds, mussels, and sea stars. Human impact, such as trampling and overharvest, is particularly high in this region.

CHANNEL ISLANDS

In this region, both rockweeds and ochre sea stars declined following a major marine heat wave that lasted from 2014-2016, and these species have not recovered. However, populations of other rocky intertidal species, including the endangered black abalone, have increased in this region.



To learn more, visit
opc.ca.gov/report



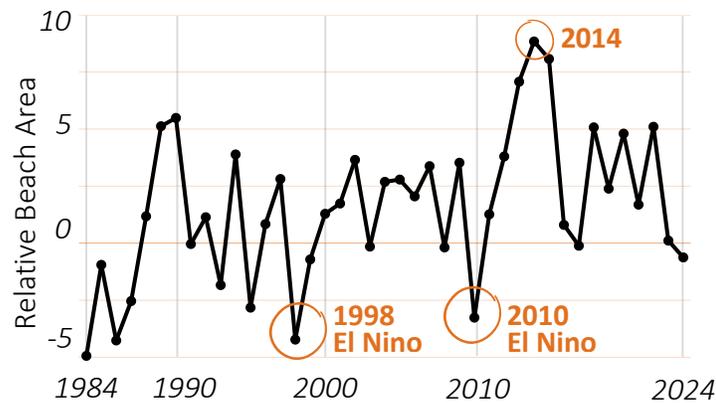
SANDY BEACHES

California Coast and Ocean Report *Status, Progress, and What's Ahead* 2026

For millions of Californians, the beach is one of the most visited and beloved places in the state, a place to swim, surf, fish, and gather. Beyond recreation, beaches protect coastal communities from erosion and flooding and provide essential habitat for wildlife. These defining features of California's coastline face a long-term challenge: they are slowly shrinking due to sea level rise and other stressors.

STATUS

Most California beaches have been shrinking, or narrowing, since the record-high widths in 2014. Due to the strong winter storms of 2023, beaches in Central California have been shrinking more than beaches in Northern and Southern California.



Changes in beach area as tracked by satellite measurements. Beaches were smallest during the El Niño storm years of 1998 and 2010, and largest in 2014 due to calm conditions that allowed sand to accumulate.

PROGRESS

Keeping California's beaches intact requires addressing the sources of sand that feed them. **Reconnecting inland sediment through healthy rivers, such as the historic Klamath Dam removal, can restore the natural flow of sand and sediment to the coast, replenishing beaches starved of naturally occurring sediment.** The state has also made **historic investments in dune and wetland restoration**, which not only protect beaches from erosion today but also create pathways for beaches to migrate inland as sea levels rise.

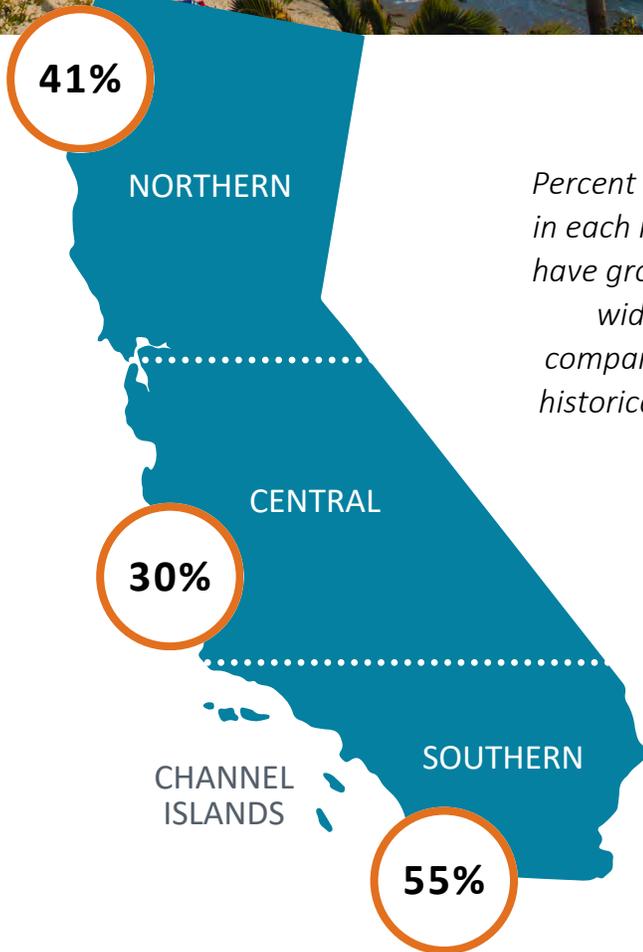
LOOKING AHEAD

Beaches are dynamic environments that vary naturally from year to year, however **rising seas, beach erosion, and development** are putting California's beaches under long-term pressure — a problem scientists call 'coastal squeeze.' Through the development of a **Beach Resiliency Plan** and **planning for sea level rise**, the state is taking a proactive, coordinated, and consistent approach to support coastal planning that prioritizes beaches and the public's right to enjoy them.



BEACH SIZE FLUCTUATES ALONG THE CALIFORNIA COAST

Following a considerable loss of sand in 2010 due to storms, California beaches recovered to near-record widths in 2014. Since then, those wide beaches have been shrinking, but these patterns vary considerably from beach to beach. More beaches are losing sand in Central California, and beaches are consistently shrinking in places like Surfside and San Clemente. The state and local planners must consider beach-specific differences when planning for sea level rise.



Percent of beaches in each region that have grown, or are wider, in 2024 compared to their historical average.

NORTHERN CALIFORNIA

59% of beach segments are narrowing and **41% are widening**. There was a moderate narrowing trend over the past four years.

CENTRAL CALIFORNIA

70% of beach segments are narrowing and **30% are widening**. There was a strong narrowing trend over the past four years.

SOUTHERN CALIFORNIA

45% of beach segments are narrowing and **55% are widening**. There was a weak narrowing trend over the past four years.

STRESSORS



SEA LEVEL RISE

California Coast and Ocean Report *Status, Progress, and What's Ahead* 2026

California has nearly 1,100 miles of coastline, and rising seas are affecting almost every stretch of it. Sea level rise, driven by warming oceans and melting ice sheets, is steadily pushing water higher onto shores, increasing flooding, erosion, and the risk of saltwater reaching freshwater supplies. For the millions of Californians who live, work, and play along the coast, it is one of the most consequential long-term threats they face.

STATUS

Over the past century, **California's coast has seen about 6–8 inches of sea level rise** and is experiencing accelerated sea level rise, with a projected statewide average increase of **0.8 feet by 2050 and between 1.6 and 3.1 feet by 2100**. Sea level rise poses significant threats to coastal infrastructure, habitats and wildlife, and communities, with **some scenarios estimating over 5 feet of rise and over \$250 billion in property exposed to sea level rise-related threats** by the end of this century.



PROGRESS

California is one of the few places in the world requiring every coastal city and county to have a sea level rise plan — a law passed in 2023 that sets a 2034 deadline and mandates use of the best available science. The state has backed that requirement with real money: the Ocean Protection Council's **Senate Bill 1 Sea Level Rise Adaptation Grant Program has invested more than \$36 million** across the state to help coastal and Bay Area communities plan and prepare for a changing coastline. The **2024 Climate Bond (Proposition 4) includes substantial new funding** to accelerate this program and support coastal resilience statewide.

LOOKING AHEAD

Sea level rise planning and implementation of adaptation projects are expected to progress significantly in the coming years with **continued funding** from the Ocean Protection Council's **Senate Bill 1 Sea Level Rise Adaptation Grant Program and Climate Bond investments**. The Ocean Protection Council is also committed to **updating the best available science** on sea level rise approximately every 5 years.

SEA LEVEL RISE PLANNING VARIES ACROSS THE CALIFORNIA COAST

Proactive, consistent, and long-term planning for sea level rise is essential for coastal communities to prepare and build resilience by minimizing threats to public health, infrastructure, and safety, while ensuring investments are smart and long-lasting. Statewide, planning for sea level rise is currently underway across 68% of coastal and Bay jurisdictions. This requires early and consistent community engagement to ensure local support and consensus, making adaptation efforts reflective of community values, and therefore more effective and sustainable for long term planning and local investments.

NORTHERN CALIFORNIA

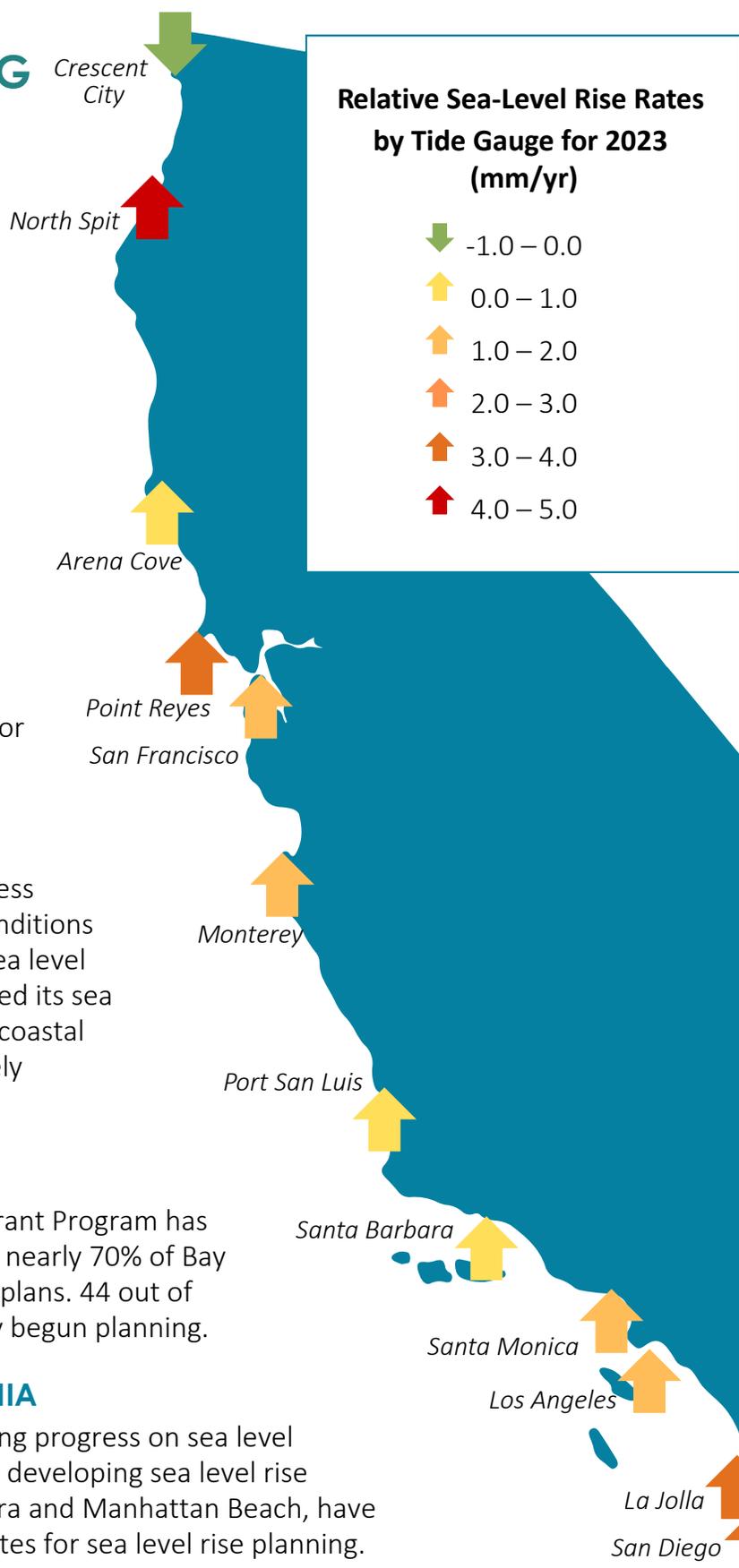
The North Coast is unique in its relatively less developed coastal areas and geological conditions that make some areas less vulnerable to sea level rise. While only Sonoma County has certified its sea level rise plan, 75% of Northern California coastal and Bay Area cities and counties are actively underway in planning.

SAN FRANCISCO BAY AREA

Ocean Protection Council's Senate Bill 1 Grant Program has invested more than \$20 million to support nearly 70% of Bay Area jurisdictions to develop sea level rise plans. 44 out of 51 jurisdictions have formally or informally begun planning.

CENTRAL AND SOUTHERN CALIFORNIA

The Central and South Coast are also making progress on sea level planning, with 64% of jurisdictions actively developing sea level rise plans. Two South Coast cities, Santa Barbara and Manhattan Beach, have certified Local Coastal Program (LCP) updates for sea level rise planning.





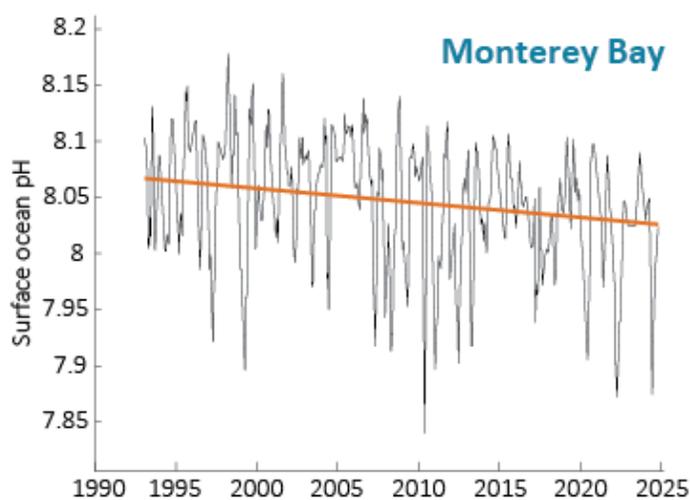
OCEAN ACIDIFICATION

California Coast and Ocean Report
Status, Progress, and What's Ahead
2026

The ocean absorbs excess carbon dioxide that humans release into the atmosphere, and that is changing the chemistry of California's coastal waters. Ocean acidification makes seawater more corrosive, weakening the shells and skeletons of crabs, oysters, clams, and other animals that Californians harvest and depend on. For fishing communities, shellfish farmers, and tribes with deep cultural ties to the sea, this is not a distant threat. It is already affecting livelihoods and cultural connection, in addition to impacting ecosystem health.

STATUS

The amount of **seawater that is corrosive to marine life's shells is six times larger** off California's coast than before the widespread use of fossil fuels. Acidification can be further **intensified by land-based sources of nutrients**, such as wastewater, especially near densely populated urban areas.



Ocean acidification time series observed in Monterey Bay showing long-term acidification.

PROGRESS

California is taking action on ocean acidification. The state is committed to **ambitious carbon emission reduction goals**, including 100% carbon-free electricity and economy-wide carbon neutrality by 2045 to directly address the carbon emissions driving acidification. California has also built **one of the most comprehensive ocean monitoring networks** on the West Coast, tracking acidity levels in real time and funding research to understand how acidification is already affecting fisheries and marine food webs.

LOOKING AHEAD

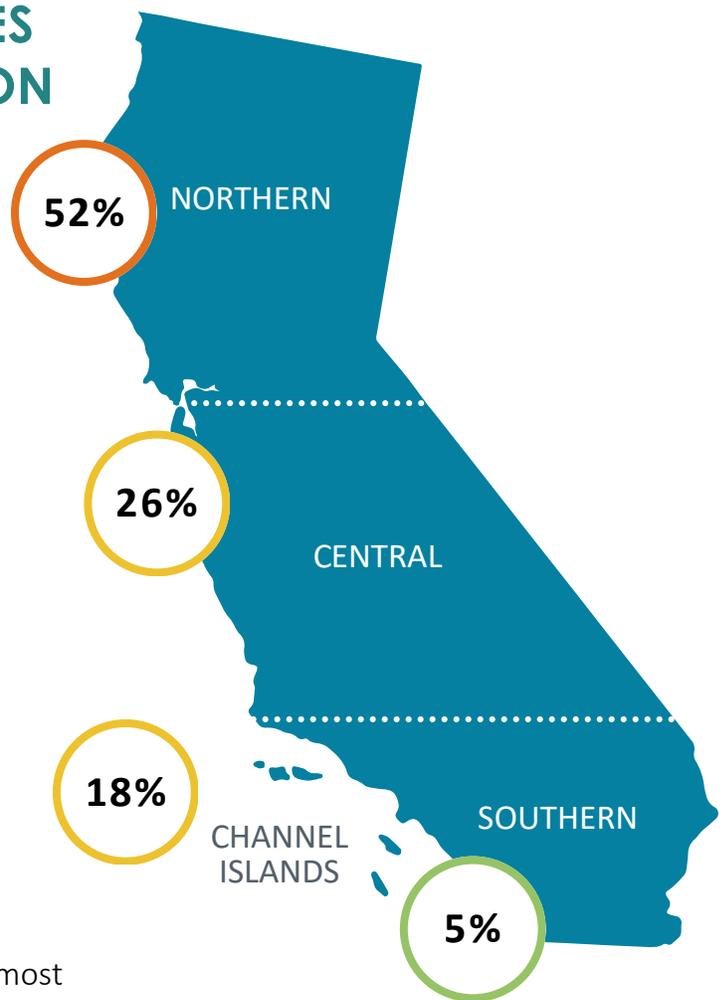
As carbon dioxide emissions increase, **ocean acidification will continue to worsen and shrink the area of the ocean that is favorable to shell-building marine life**. In addition to California's ambitious carbon neutrality goals, the State Water Resources Control Board is also considering **taking action to address the impacts of land-based nutrients** on coastal acidification.

OCEAN ACIDIFICATION VARIES SEASONALLY AND BY LOCATION

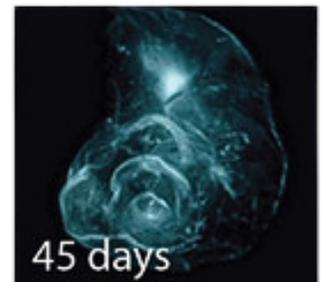
Ocean acidification is influenced by both natural (e.g., upwelling) and human-caused processes (e.g., atmospheric carbon dioxide and land-based nutrients). Its severity fluctuates seasonally and regionally across California. In the summer, strong winds push acidic, nutrient-rich water from the deep ocean to the surface, a process called upwelling. Upwelling is strongest in Northern California, where 50% or more of waters are corrosive during the summer months. Conditions in Northern California are more acidic compared to Southern California. California is particularly vulnerable to ocean acidification because of these natural upwelling processes.

IMPACTS ON MARINE LIFE AND FISHERIES

Ocean acidification is already impacting California's most valuable fisheries and marine food webs. As seawater becomes more acidic, animals such as **crabs, oysters, clams, mussels,** and **pteropods** have a harder time building their shells and skeletons. To reduce these impacts, some California oyster farmers are testing strategies to make seawater more favorable to shellfish, like growing oysters alongside kelp.



Typical values of the percent of corrosive waters in the summer. In some years, corrosive waters can exceed 80% off Northern and Central California and up to 30% off Southern California.



Pteropod shells dissolving under severe ocean acidification conditions.



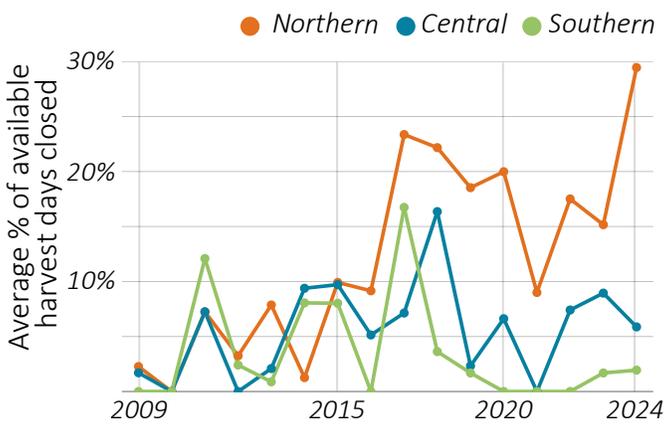
HARMFUL ALGAL BLOOMS

California Coast and Ocean Report *Status, Progress, and What's Ahead* 2026

Harmful algal blooms, or HABs, happen when certain algae grow out of control and produce toxins. For Californians who fish, gather shellfish, or spend time near the coast, HABs are a direct health concern: the toxins accumulate in seafood and can make people and marine wildlife seriously ill. Climate change is making these events more frequent and severe. When toxins are detected, managers often close shellfish harvesting to protect public safety.

STATUS

In 2024, HAB-related shellfish harvesting **advisories or closures impacted 8 of the 15 coastal counties** in California, including four of the five Northern California counties. **Recreational shellfish harvesting closures due to HABs have been increasing in Northern California** since 2009 due to high levels of toxins in razor clams, however there was no change in the long-term trend for most coastal counties. In recent years, atypically high numbers of marine mammals have stranded in Central and Southern California due to suspected HAB toxins.



Percentage of areas with HABs-related recreational shellfish (oysters, clams, scallops, and mussels) advisories and closures.

PROGRESS

California runs one of the most proactive HAB monitoring programs in the United States. Every year before the Dungeness crab season opens, the state tests for toxins along the entire coast, protecting both consumers and fishermen from the health consequences of a contaminated harvest. When **marine mammals strand** due to toxic algal blooms, **state-funded rescue and rehabilitation teams respond.** And a new forecasting effort is working to **predict where blooms will occur before they happen,** buying critical time for public health officials and fishery managers to respond.

LOOKING AHEAD

Warming and marine heatwaves are contributing to the northward expansion of HAB species, so **more HAB events in Northern California are anticipated.** In Central and Southern California **increases in marine mammal impacts** have been observed.



DEEPER DIVE: MARINE MAMMAL STRANDINGS

HAB toxins can make marine mammals, such as sea lions, dolphins, and whales, physically sick, disoriented, and stranded on beaches. Strandings have increased in recent years, suspected to be due to HAB toxins.

- Strandings are often caused by domoic acid poisoning, which can happen when marine mammals are exposed to toxic algae – often a byproduct of warming oceans. Domoic acid poisoning can result in abnormal or aggressive behavior in sea lions, putting people at risk if they interact with sick animals.
- In Southern and Central California, strandings were already higher in the first half of 2025 (numbers through June) than in the previous six years and included more strandings of whales and dolphins than previously observed.
- The public can report strandings to 415-289-SEAL.



NORTHERN CALIFORNIA

This region has experienced an uptick in marine mammal strandings three of the past four years (2022, 2023, and 2025), many of which were suspected to be associated with HAB toxin exposure.

CENTRAL CALIFORNIA

This region has experienced an uptick in marine mammal strandings three of the past four years (2022, 2023, and 2025), many of which were suspected to be associated with harmful algal bloom (HAB) toxin exposure.

SOUTHERN CALIFORNIA

As of 2025, this region experienced its 4th consecutive year of significant marine mammal strandings.



Number of HABs-related sea lion strandings in 2024.

DEEPER DIVE: DUNGENESS CRAB

In Northern California, Dungeness crab is a culturally and economically important fishery also impacted by HAB toxins. In 2024, health advisories against harvesting and eating Dungeness crab were issued all five Northern California counties. In addition to the routine in-season testing, the state conducts annual pre-season HAB toxin testing to help protect public health before the crab season begins.



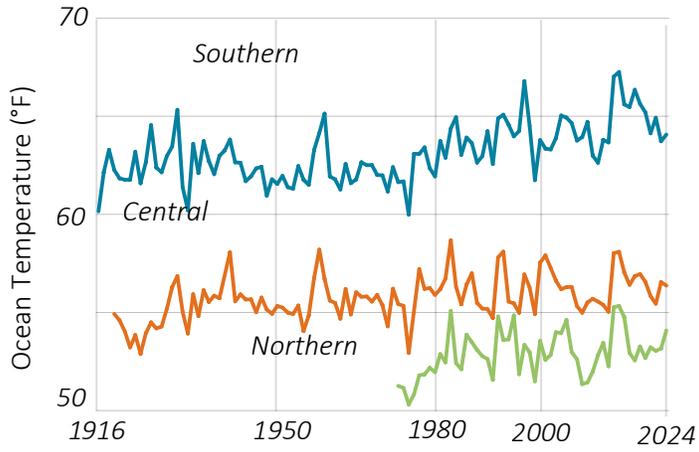
OCEAN TEMPERATURE

California Coast and Ocean Report *Status, Progress, and What's Ahead* 2026

Ocean temperature shapes nearly everything Californians experience along the coast: the health of kelp forests, the location of fish and other marine life, the timing of harmful algal blooms, and the severity of coastal storms. California's ocean is naturally cooled by upwelling, which draws cold, nutrient-rich water from the depths and supports some of the world's most productive marine food webs. But the ocean is warming due to human-induced greenhouse gas emissions. Extended stretches of unusually warm water, known as marine heat waves, are becoming more frequent, with cascading effects on ecosystems and people.

STATUS

Ocean waters off California's coast are warming by approximately 2°F per century. In the past 50 years, ocean temperature in Southern California has warmed more than in other parts of the coast. Despite the long-term warming trend, 2024 temperatures were relatively close to average along most of California's coast. While the year started warmer due to El Niño, stronger upwelling brought cooler waters to the ocean surface in late 2024.



Since the 1970's, ocean temperature has increased 1.8F in Southern California. The temperatures in Central and Northern California show slower warming trends.

PROGRESS

California's network of 124 marine protected areas (MPAs), one of the largest ecologically connected MPA networks in the world, may help strengthen resilience to ocean warming. Scientific monitoring suggests some ecosystems, such as kelp forests and tide pools, may recover from marine heat waves faster within MPAs than in unprotected areas. **California is committed to research and monitoring** to better understand the impacts of ocean warming, how to employ tools like MPAs to bolster resilience, and where to focus conservation and restoration efforts.

LOOKING AHEAD

Climate change will continue to warm the ocean, leading to **more frequent and severe marine heatwaves**. Continued leadership and progress in reducing greenhouse gas emissions will help reduce the underlying driver of increasing ocean temperature and marine heat waves. **Investments in monitoring ocean conditions and ecological changes** will ensure managers can understand, predict, and respond to temperature-driven changes along California's coast.

SPECIES MOVING WITH A WARMING OCEAN



As ocean temperatures rise, species move to water that is more suitable, reshaping ecosystems and food webs. Sensitive to temperature stress, animals and plants in the rocky intertidal zone are good indicators of ocean warming patterns. One in five species living in this zone is found further north than they were just two decades ago. Today, species such as the orange sea cucumber and wakame (winged kelp) can be found more than 200 miles further north than in the early 2000s.



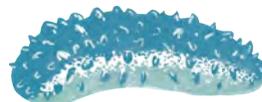
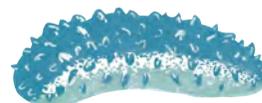
Orange sea cucumber



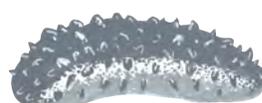
Wakame (winged kelp)

© John D Reynolds

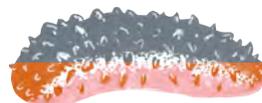
Moving North
51 species



Not Moving
182 species



Moving South
10 species



Of the 243 monitored rocky intertidal species, 51 species (21%) are now seen further north in cooler waters, and 10 species (4%) are found in southern locations.