



OCEAN CLIMATE RESILIENCY ACTION PLAN

The ocean plays a fundamental role in mitigating climate change by absorbing a significant portion of global carbon emissions. However, carbon dioxide released from increased burning of fossil fuels and changing land uses have exceeded the ocean's capacity to absorb carbon. As a result, the ocean is becoming more acidic, a condition that often co-occurs with depleted oxygen levels, or hypoxia, due to warmer surface waters. Ocean acidification and hypoxia – collectively referred to as “OAH” – have enormous implications on the health and productivity of marine ecosystems and the communities and industries that depend on them. From corroding the shells and skeletons of marine organisms to disrupting normal fish behaviors, changes in ocean chemistry have the potential to alter marine food webs and ecosystems – as well as the benefits that they provide to society, including California's \$45 billion ocean-based economy.

Sea levels are rising as the climate and oceans warm. As the ocean moves inland, California's coastal and estuarine ecosystems will undergo changes of enormous magnitude. On our coast, sea level is projected to rise by more than one foot over the next 40 years and four to five feet by the turn of the century. Scientists warn that sea level rise will be punctuated by episodic flood events as high tides coincide with stronger and more frequent storm surges, putting shoreline properties and ecosystems at risk. Eighty-five percent of Californians live or work along coastal or bay areas; rising seas will also impact water supply canals, wastewater treatment plants, and power plants throughout the state. The release of untreated sewage from just one of California's coastal wastewater treatment plants – which collectively treat 530 million gallons every day – would cause a serious public health and environmental disaster. Moreover, sea level rise will increase saltwater intrusion in coastal aquifers, impacting communities and farmers who rely on groundwater supplies.

Climate change is no longer a far-off projection. It is happening now, and the ocean bears the brunt of its impacts. Responding to climate change will require a sustained, multipronged approach to both mitigate impacts and manage the resulting disruptions. We must act to protect our coastal ecosystems – and our way of life.

Goal 1: Prevent ocean wastewater discharges from causing OAH hot spots.

Nutrient pollution is one of the greatest consequences of human-accelerated global change on coastal ecosystems. Emerging studies suggest that terrestrial, anthropogenic nutrients affect primary productivity, increase nearshore algal blooms, and contribute to OAH. One important source of land-based nutrient pollution comes from wastewater treatment plants. California's urban wastewater has historically been treated solely as waste – used once, treated, and disposed of through offshore dumping. As a result, approximately 12 billion gallons of treated water are wastefully discharged into the ocean or estuaries each day, contributing to nutrient pollution that exacerbates harmful algal blooms and ocean acidification hot spots. California can better manage and treat its wastewater to prevent unnecessary pollution.

- Objective 1-1** The State Water Resources Control Board (State Water Board)'s Ocean Plan sets an OAH Water Quality Objective using the best available science.
- Objective 1-2** California recycles all ocean wastewater discharges by 2040.
- Objective 1-3** Ocean wastewater treatment facilities are required to incorporate denitrification – nitrate removal – into their treatment operations.

Goal 2: Prevent agricultural nutrient inputs from causing harmful algal blooms and exacerbating OAH hot spots.

Water discharges from agricultural operations in California pose significant threats to water quality by transporting pollutants – including toxic pesticides, sediment, nitrate, and salts – pathogens, and heavy metals from cultivated fields into surface and groundwater. These pollutants flow from inland waters to the coast, leading to harmful algal blooms, and, in turn, exacerbating localized OAH. Increased sediment pollution due to the destruction of natural riparian zones by intensive farming

also eventually makes its way to California’s coastline, smothering the marine plants that sequester carbon and provide nursery habitat for valuable fish species. California must develop policies that protect our waterways from pollution while supporting our thriving agricultural economy.

- Objective 2-1 California Coastkeeper Alliance and local advocates oversee and challenge irrigated agricultural orders and dairy orders, as necessary, to ensure that they hold permittees accountable for achieving milestones and timelines that prevent the degradation of our waterways from nitrate pollution.
- Objective 2-2 The Governor’s Office, California Legislature, and relevant state agencies are informed about the negative water quality impacts caused by large-scale agricultural operations.
- Objective 2-3 The State Water Board revises its livestock grazing best practices and includes a prohibition on livestock access to riparian areas.
- Objective 2-4 The State Water Board initiates development of a Biological Policy, which includes nutrient standards that are protective of aquatic health.

Goal 3: Protect critical habitat from stormwater runoff to improve water quality for the enhancement of Marine Protected Areas as climate “hope spots.”

California’s coastal environment is an important ecological and economic resource. It is home to diverse and abundant marine life and includes some of the richest habitats on earth. To protect this diversity, the state has designated 124 Marine Protected Areas (MPAs), which have been shown to serve as ocean ‘hope spots’ or climate reserves in a changing ocean. Additionally, the State Water Board created 34 Areas of Biological Significance (ASBS), a type of State Water Quality Protected Area, in order to preserve and protect especially valuable biological communities.

Although waste discharges are prohibited in ASBS, the State Water Board provided an exemption for outfalls so long as they achieve natural water quality. However, a 2015 analysis by CCKA of ASBS

Compliance Plans revealed widespread non-compliance and dysfunction within the ASBS program. When managed correctly, ASBSs have the potential to serve a critical role to protect coastal water quality in and around MPAs. While only 45 of the 124 MPAs currently have at least some overlap with ASBSs, all MPAs would benefit from the additional water quality protection.

- Objective 3-1 The State Water Board revises its ASBS Exemption Policy to prohibit stormwater permittees from altering natural water quality levels.
- Objective 3-2 The State Water Board develops State Water Quality Protection Areas for all MPAs.

Goal 4: Create living shorelines to improve water quality and sequester GHG emissions.

Living systems like kelp forests, seagrass beds, and salt marshes play multiple roles in mitigating the effects of climate change on marine ecosystems: They have the potential to protect shorelines from sea level rise, sequester carbon, and locally ameliorate ocean acidification by removing carbon dioxide, as well as nutrients and organic carbon introduced by inland runoff, from waters. At the same time, they serve as critical nursery habitat for valuable fishery species and provide numerous other ecosystem services. Unfortunately, these habitats have continued to shrink during a century of net loss. It is critical that we protect kelp, seagrass, and wetlands to preserve their valuable ecosystem functions and to buffer coastal communities against the effects of climate change.

- Objective 4-1 The California Coastal Conservancy develops a permanent, statewide beneficial reuse program to stop the wasteful discharge of high-quality sediment soils and instead uses that soil for wetland restoration.
- Objective 4-2 California remains committed – and fights federal preemption – to use the best available technology for ballast water discharges to better protect seagrass and kelp forests from invasive species.
- Objective 4-3 Provide funding to the Fish and Game Commission to develop a Purple Urchin Bounty Program to incentivize

divers to remove purple urchins from kelp forests and promote kelp forest restoration.

Objective 4-4

Provide funding to the State Coastal Conservancy, State Water Board, California Department of Fish and Wildlife, and/or other applicable state agencies to produce high resolution mapping tools of coastal wetlands.

Objective 4-5

Reduce regulatory barriers to zero-input mariculture, while maintaining environmental protections, particularly for seagrass.

Goal 5: Prevent coastal development in zones at risk from sea level rise.

Many of California's 44 coastal county and municipal governments do not have a framework in place to assess sea level rise vulnerability and implement adaptation strategies in a coordinated and strategic manner. California communities have instead responded reactively to erosion and storm surge events by building seawalls, revetments, and other "hard" armoring approaches along the California coast. Coastal armoring, however, accelerates erosion of existing beaches and coastal habitats and prevents natural shoreline processes from adapting to changes in the coastline. California's coastline and character would be irrevocably changed if coastal armoring intensifies and seawalls become the default approach to address sea level rise.

Objective 5-1

Declare seawalls that intersect with the mean high tide line as a public trust trespass on public lands. Property owners behind applicable seawalls must pay a mitigation fee that supports a Living Shorelines Fund.

Objective 5-2

Require State Treasury incentive programs to consider climate change and sea level rise prior to funding heavy infrastructure projects along the coast.