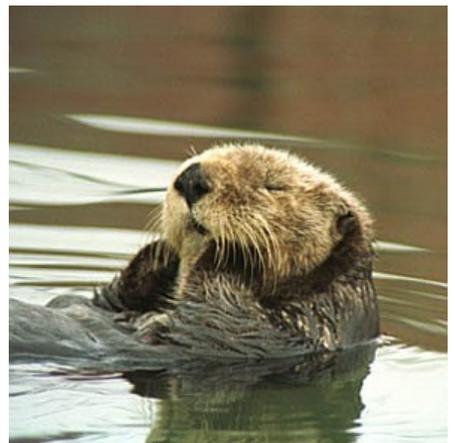
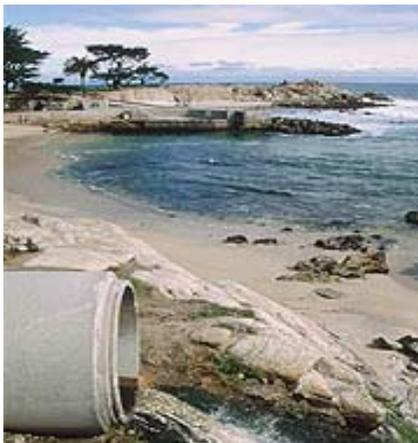


California's AquaGems: Areas of Special Biological Significance



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California has 34 **“Areas of Special Biological Significance”** (ASBSs) along its world-renowned coastline. Under the California Ocean Plan, these “AquaGems” were given special status over 30 years ago to protect the unique and sensitive biological species and communities they harbor.

These sensitive marine ecosystems strung along California's coast are home to rich kelp forests and ocean canyons filled with corals, sea otters, seals, dolphins, yellowfin tuna, rockfish, and numerous species of whales and sharks.



Trinidad Head, SWRCB.

Each AquaGem possesses unique biological characteristics, which support complex yet fragile ecosystems. Some areas are rocky reef habitats while others are nutrient-rich deep waters containing rare marine life.

Californians and tourists alike are drawn to these 34 magnificent AquaGems. They comprise some of the most beautiful tourist destinations in the State. The areas are used for scenic viewing, swimming, scuba diving, photography, and scientific research. In addition to their resource value, the AquaGems are vital to California's economy.

California has the largest ocean economy in the United States. Coastal tourism and recreation far outperform all other ocean-related activities, such as oil and gas production, shipping, and fishing. Total travel spending in California coastal counties was \$82.5 billion and supported 892,600 jobs in 2004. Protecting our AquaGems is an investment in our ocean economy.

The State banned pollution into the AquaGems more than 30 years ago. Unfortunately, the clear prohibition on pollution into these biologically important areas has been largely ignored over the years. In fact, these precious and unique coastal resources are threatened by the largest source of coastal pollution—urban stormwater runoff. As a result, some of the AquaGems have become so

polluted that they cannot even be safely used for wading, let alone as habitats for sensitive species. Three national reports, including one conducted by the United States Commission on Ocean Policy, have concluded that our coastal waters and oceans are in crisis and in critical need of more protection.

The State Water Board is at a crossroads in its approach to protecting these AquaGems. In 2003, the State Water Board discovered more than 1,600 illegal discharges into these areas. Some of those who are illegally discharging pollution are unwilling to commit the resources to

cleanup. Instead, they are hiring lobbyists to weaken the law protecting these valuable marine resources.



James V. Fitzgerald Reserve and Tidepool, Linda Sheehan.

Conservation, community, and recreational groups favor preserving the waste discharge prohibition instead of weakening the law. What's needed is a practical framework that enforces the law and allows, where appropriate, cities and other polluters a reasonable timeframe to design and implement cleanup plans to protect our AquaGems. Under this practical framework, water pollution dischargers would use off-the-shelf technologies and cost-effective options tailored to their circumstances to come into compliance on a time schedule set by the State Water Board based on the circumstances applicable to the situation. The State Water Board must show strong leadership to implement this framework and ensure protection of our most valuable coastal resources.

North Coast AquaGems

Marked by lush Redwood Forests along its coastal mountains, the magnificent North Coast has 14 Areas of Special Biological Significance:

- Redwood National Park
- Trinidad Head
- King Range
- Jughandle Cove
- Saunders Reef
- Del Mar Landing
- Gerstle Cove
- Bodega
- Bird Rock
- Point Reyes Headlands
- Double Point
- Duxbury Reef
- Farallon Islands
- James V. Fitzgerald

The North Coast region extends from Del Norte County to San Mateo County. The coastal areas support a wide variety of species from arrowgrass to humpback whales. The ocean economy represents nearly 10 percent of the jobs in the northern rural regions of Humboldt, Del Norte, Mendocino, and San Francisco counties, and about 7 percent of total employment in the entire North Coast region. The Northern California ocean economy is worth nearly \$13 billion annually and employs more than 194,000 people.

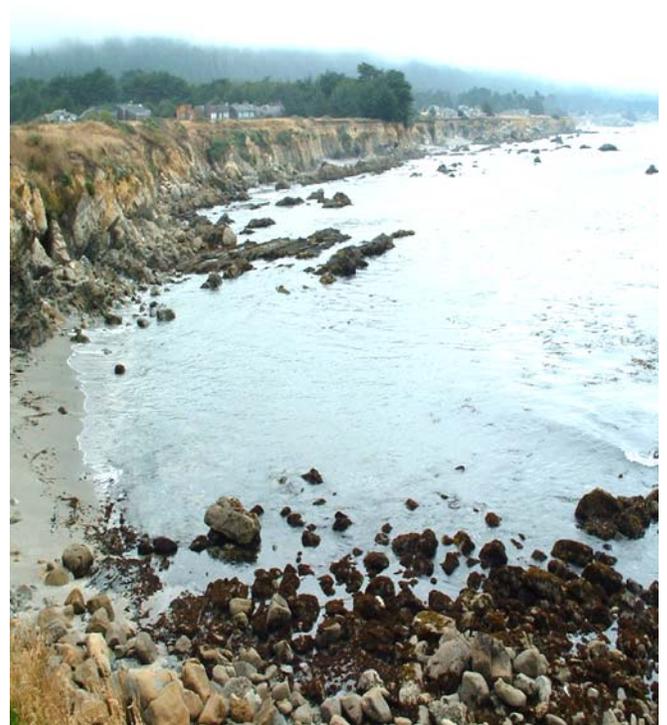


King Range, SWRCB.

Most Threatened AquaGems

The AquaGems with the greatest number of pollutant discharges along the North Coast are:

- Redwood National Park (41 discharges)
- James V. Fitzgerald (28 discharges)
- Trinidad Head (17 discharges)
- King Range (17 discharges)



Del Mar Landing, SWRCB.

According to the State Water Board's 2003 report, there are 159 illegal discharges of pollutants into 12 of the 14 North Coast AquaGems. The only AquaGems with no pollution discharges were Bird Rock and Double Point. Much of the waste discharge contains harmful pollutants such as heavy metals and petroleum products from Highway 1, where the road parallels the cliffs along the coastline.

Featured AquaGem: James V. Fitzgerald

Location

The James V. Fitzgerald Reserve in San Mateo County has 5.5 miles of coastline and occupies 518 acres of marine habitat. San Mateo County manages this Reserve, which lies entirely within the boundaries of the Monterey Bay National Marine Sanctuary.



Outstanding tide pools are one of the reasons James V. Fitzgerald receives more than 135,000 visitors annually, SWRCB.

Resources

James V. Fitzgerald is one of the richest intertidal areas on the California coast. Extensive shale reefs are home to a wide variety of marine life, such as giant green anemones, limpets, purple sea urchins, crabs, and snails. In fact, over 25 new species have been discovered at this Reserve. It's best to see the tide pools during low tides, which expose the rocky shoreline to view. The intertidal zone, which contains rocky reefs at sea level and pocket beaches, is renowned for its richness and diversity of species. Accessible at low tide, the reefs receive high levels of use because of their proximity to the San Francisco Bay Area.

Stormwater Runoff

There are 28 direct discharges of polluted urban runoff into the Fitzgerald Reserve. San Vicente Creek, which drains an urban watershed and is chronically contaminated with coliform bacteria, also flows directly into this Reserve.



James V. Fitzgerald is home to extensive shale reefs, teeming with life, which become exposed at low tide, SWRCB.

Impacts

The discharges flowing into the Fitzgerald Reserve are causing significant contamination, threatening both aquatic life and human health. After heavy rains, the plume of contamination from San Vicente Creek may flow into the intertidal area of the Reserve, extending several meters north and south of the creek mouth. The beach at the Reserve is regularly closed or posted with contamination warnings, and has received an “F” grade in Heal the Bay’s Beach Report in 27 percent of the dry weather samples taken in 2004. Despite this contamination, the Fitzgerald Reserve receives more than 135,000 visitors annually.



James V. Fitzgerald is regularly closed or posted with warnings of bacterial contamination, Linda Sheehan.

Central Coast AquaGems

From the unparalleled beauty of Big Sur to the picturesque beaches of Santa Barbara, the Central Coast is home to eight Areas of Special Biological Significance:

- Año Nuevo
- Pacific Grove
- Carmel Bay
- Point Lobos
- Julia Pfeiffer Burns
- Salmon Creek Coast
- San Miguel, Santa Rosa & Santa Cruz Islands
- Santa Barbara and Anacapa Islands

The natural splendor of the Central Coast supports a wide variety of migratory birds, plants, and marine mammals. Chief among the marine mammals is the California sea otter, a threatened species. In fact, the region from Monterey to Santa Barbara is home to a well-documented subpopulation of sea otters, which lives within the local waters year round.



Sea otter naps off Monterey, Marc Shargel. Reprinted with Permission.

Sea otters play an important role in maintaining healthy kelp beds by controlling the population of herbivores, such as sea urchins. However, the sea otter remains a threatened species, with an estimated population of only 2,700. A major threat to sea otters is diseases caused by land-based pollution from human activity.

Visitors from around the state and the world visit the Central Coast to admire its stunning marine ecosystems. In fact, the ocean economy in Central California (Santa Cruz, Monterey, San Luis Obispo,

Santa Barbara, Ventura) is worth nearly \$6 billion. Central California has the fastest growing ocean economy of any region in the state. It grew by more than \$1 billion between 1990 and 2000.



Polluted runoff flows into Bay at Lover's Point in Pacific Grove, Monterey Bay National Marine Sanctuary.

Most Threatened AquaGems

The AquaGems with the greatest number of pollutant discharges along the Central Coast are:

- Carmel Bay (348 discharges)
- Pacific Grove (246 discharges)
- Salmon Creek Coast (35 discharges)
- Julia Pfeiffer Burns (25 discharges)

According to the State Water Board's 2003 report, the Central Coast has 687 illegal discharges of pollutants into its AquaGems. Many of the discharges are from pipes that dump contaminated urban runoff directly into ocean waters. These discharges include city drains, road runoff, golf courses, and seawalls with drainage pipes from private homes.



Brown Sea Nettle floats off Pacific Grove, Marc Shargel. Reprinted with Permission.

Featured AquaGem: Carmel Bay

Location

Carmel Bay is located in Monterey County, immediately adjacent to the town of Carmel, and includes 6.2 miles of coastline, extending from Pescadero Point to Granite Point. Carmel Bay lies entirely within the Monterey Bay National Marine Sanctuary, and contains the Carmel Bay State Marine Conservation Area. Point Lobos is adjacent to the mouth of Carmel Bay.

Resources

Investigations to support designating Carmel Bay as an Area of Special Biological Significance highlighted the significance for scientific study of the Bay's resources. These resources include various species of special interest such as the rare purple hydrocoral (*Allopora californi*); several deep-water marine invertebrates; previously unstudied sponges; and the California (southern) sea otter (*Enhydra lutris*). According to the State Parks Department: "The presence of the Carmel Submarine Canyon causes seasonal upwellings of nutrient-rich deep seawater. This phenomenon makes Carmel Bay an extremely rich, diversified, and highly productive marine ecosystem of statewide, if not national, significance."



Carmel Bay is directly adjacent to the City of Carmel, and receives many visitors to its beaches, SWRCB.

Stormwater Runoff

Carmel Bay has the second largest number of pollutant discharges of any Area of Special Biological Significance in the State – a total of 348 direct discharges including polluted runoff from streets, highways, golf courses, and private homes. Approximately 60 percent of the runoff from the City of Carmel flows through storm drains directly into Carmel Bay, and 40 percent drains directly into the Carmel River, which also flows into Carmel Bay.

Impacts

The Central Coast Ambient Monitoring Program has observed high levels of coliform at the coastal confluence of the Carmel River, as well as chloride, dissolved solids, and sodium and sulfate levels that exceed water quality standards. High levels of silt, together with nutrient pollution, increase turbidity and threaten the corals that reside in Carmel Bay. Bacterial contamination may contribute to recent high levels of sea otter mortality. Scientists found that 34 percent of sea otters tested in the region were infected with a parasite associated with cat feces. Stillwater Cove Beach in Carmel Bay received Heal the Bay's "Beach Bummer" award for 2003-2004, indicating that it was one of the ten most polluted beaches in California.



Carmel Bay is home to extensive kelp forests and a diverse community of unusual invertebrates, Marc Shargel. Reprinted with Permission.

Southern California AquaGems

Renowned for its world-famous sandy beaches, Southern California is home to 12 Areas of Special Biological Significance:

- Laguna Point to Latigo Point
- San Nicolas Island and Begg Rock
- Northwest Santa Catalina Island
- Western Santa Catalina Island
- Farnsworth Bank
- Southeast Santa Catalina Island
- Robert E. Badham
- Irvine Coast
- Heisler Park
- San Clemente Island
- San Diego-Scripps
- La Jolla



Laguna Point to Latigo Point, SWRCB.

Most Threatened AquaGems

The AquaGems with the greatest number of pollutant discharges in Southern California are:

- Laguna Point to Latigo Point (410 discharges)
- La Jolla (184 discharges)
- San Diego-Scripps (92 discharges)
- Northwest Santa Catalina Island (38 discharges)

According to the State Water Board's 2003 report, Southern California's AquaGems have 812 illegal discharges. The majority of discharges are pipes and holes through seawalls, bluffs, and landscape areas. These pipes carry bacteria and pollutants from urban streets and surfaces directly into these sensitive ecosystems.



Pollution harms marine life. NRDC/Heal the Bay.



Irvine Coast, SWRCB.

Stretching from Ventura County to San Diego County, Californians and tourists use these waters for swimming, fishing, and snorkeling. The waters also are habitat for seals, leopard sharks, birds, gray whales, and a diverse population of fish and plant life. The ocean economy employs nearly 375,000 people in this region, and is worth more than \$24 billion in the Southern California counties of Los Angeles, Orange and San Diego alone. Tourism is the Los Angeles region's second largest industry, with nearly four million tourists annually, and over 45 million beach visits per year.

The greatest threat to these waters is polluted stormwater runoff. Increasing urban development and paved sprawl result in increased pollutant load, volume and velocity into these waters, harming public health, marine life, and local economies.

Featured AquaGems: San Diego-Scripps & La Jolla

Location

The San Diego-Scripps and La Jolla Areas of Special Biological Significance are contiguous ocean areas adjoining the La Jolla district of the City of San Diego. These areas have other state-protected area designations – Marine Life Refuge and Ecological Reserve – that recognize their value as outstanding marine wildlife habitat areas.



The La Jolla AquaGem is adjacent to the City of San Diego, and receives runoff from holes in seawalls, SWRCB.

Resources

Both AquaGems are characterized by rocky intertidal reef habitats, and the La Jolla Reserve also features extensive kelp forests. Both areas are habitat for spiny lobsters and squid, as well as multitudes of fish species. Endangered brown pelicans are known to roost in the cliffs near La Jolla Caves at the southern end of the La Jolla Reserve, and gray whales are known to pass through the vicinity of both areas on their annual migration.

Stormwater

A recent report documented 92 pollutant discharges into San Diego-Scripps, and 184 pollutant discharges entering the neighboring La Jolla Reserve. Many of these pollutant discharges are from pipes and/or holes coming through seawalls, draining storm runoff from the University of California at San Diego

campus, private residences, bluffs, and landscaped areas. The City of San Diego itself has several larger storm drains that discharge to the areas, including a drain at the foot of Avenida de la Playa.

Impacts

San Diego's stormwater runoff is commonly contaminated with pathogens (fecal coliform and streptococcus) and heavy metals (such as cadmium, copper, lead, and zinc) that exceed state and federal water quality criteria. Stormwater within the region also has been found to contain the pesticides diazinon and chlorpyrifos at levels that can cause chronic or acute toxicity. The shorelines of both the San Diego-Scripps and La Jolla Areas of Special Biological Significance regularly exceed water quality standards for bacterial indicators.



La Jolla is home to rich kelp forests, SWRCB.

Practical Solutions For Protecting California's AquaGems

One of the best ways to protect California's 34 AquaGems is to stop pollution at the source. Along with pollution prevention methods, information and knowledge about pollution control practices have increased dramatically over the past decade. Today, there are many cost-effective, practical solutions used throughout California to protect water quality. In fact, dozens of construction, industry, and government handbooks detail off-the-shelf tools for preventing pollution. These tools have 80-90 percent pollutant removal rates. In other words, these proven technologies used in combination with other pollution control measures can stop pollution before it reaches our AquaGems.



Small wetland removes pollutants, LA RWQCB.

Sources of Funding

Protecting California's AquaGems is an investment in our coastal economy. Californians support water pollution cleanup with grants and ballot measures because they recognize the value of our coasts. Since 2001, Californians have dedicated nearly \$2 billion for protecting our water quality. For example:

- Coastal Nonpoint Source Control \$43.1 million
- Clean Beaches Initiative \$76 million
- Nonpoint Source Pollution Control \$19 million
- Nonpoint Source Implementation \$4.5 million
- Agricultural Water Quality Grants \$14 million
- Urban Stormwater Projects \$14.25 million
- Integrated Watershed Management \$47.5 million
- CALFED Programs \$9.4 million

Innovative funding solutions, such as Los Angeles' Prop O, are also possible. Over 76 percent of voters in the City of Los Angeles voted for a \$500 million bond measure that will be used to finance capital improvements to prevent pollution. Partnership grants with government agencies, such as the Coastal Conservancy, are also available.



Virginia Avenue Park Retrofit produces zero net runoff. Santa Monica.



Porous surface allows for water infiltration, LA RWQCB.

Common-Sense Practices Include

- Preserving natural areas so that stormwater can infiltrate the ground
- Installing storm drain filters
- Employing detention and filtration basins
- Using sand traps and filters
- Raising public awareness
- Preventing illicit discharges
- Retrofitting parks with dry wells and catch basins
- Using porous surfaces that allow drainage into the ground

References

- C. Kreuder, et al., "Patterns of Mortality in Southern Sea Otters (*Enhydra lutris nereis*) from 1998-2001," 39(3) *Journal of Wildlife Diseases* 495, 2003.
- California Coastal Commission, Draft Findings of the Monterey County Local Coastal Program Periodic Review, December 2003, available at <http://www.coastal.ca.gov/recap/mco-lcp-review.html>.
- California Coastal Resources, available at <http://ceres.ca.gov/ceres/calweb/coastal.html>.
- California Regional Water Quality Control Board San Diego Region, Order No. R9-2004-0378, NPDES Permit No. CA0107239, Waste Discharge Requirements for the University of California Scripps Institution of Oceanography, San Diego, October 2004.
- California State Water Resources Control Board, James V. Fitzgerald Marine Reserve, San Mateo County. California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report No. 79-12, 1979.
- California State Water Resources Control Board, Carmel Bay, Monterey County. California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report No. 79-10, 1979.
- Central Coast Ambient Monitoring Program and First Flush Monitoring Results, available at <http://www.mbnms.nos.noaa.gov/monitoringnetwork/events.html#reports>.
- Dean Runyan Associates 2005, California Coastal Spending, available at www.deanrunyan.com/pdf/pdfca/implgance.pdf.
- Eric Woolson, "Passing Proposition O," *Stormwater Journal*, Vol 6. No. 2, March/April 2005, available at http://www.stormh2o.com/sw_0503_proposition.html.
- Heal the Bay, "Beach Report Card," 2004.
- Horner, Richard R., *Fundamentals of Urban Runoff Management: Technical and Institutional Issues*, August 1994.
- James A. Estes, et al., "Causes of Mortality in California Sea Otters During Periods of Population Growth and Decline" 19 *Marine Mammal Science* 198, January 2003.
- Judith Kildow and Charles S. Colgan, "California's Ocean Economy: A Report to the Resources Agency" July 2005.
- Miller, et al., "Coastal freshwater runoff is a risk factor for *Toxoplasma gondii* infection of southern sea otters (*Enhydra lutris nereis*)," 17 *International Journal for Parasitology* 997, 2002.
- Monterey County Planning Department, Del Monte Forest Land Use Plan Local Coastal Program, March 1985.
- National Ocean Economics Program, 1990-2000 State Summary of Coastal and Ocean Social and Economic Trends.
- Natural Resources Defense Council, "Testing the Waters," August 2003.
- NOAA, Year of the Ocean Discussion Paper: Coastal Tourism and Recreation, 1999.
- Pew Oceans Commission, *America's Living Oceans: Charting a Course for Sea Change*, May 2003.
- Point Lobos State Reserve and Carmel River State Beach General Plan, October 1979.
- San Mateo County Environmental Service Agency Parks and Recreation Division, Fitzgerald Marine Reserve Master Plan: Final Environmental Impact Report, June 2004.
- Southern California Coastal Water Research Project, Final Report: Discharges Into State Water Quality Protection Areas, July 2003.
- State Water Resources Control Board, Exception to the California Ocean Plan for the University of California Scripps Institution of Oceanography Discharge into the San Diego Marine Life Refuge ASBS: Initial Study, April 2004.
- State Water Resources Control Board, Powerpoint Presentation on Funding for ASBS Workshop, August 31, 2005 available at <http://www.waterboards.ca.gov/plnspols/oplans/asbs.html>; <http://www.swrcb.ca.gov/funding/docs/bondmoney.pdf>.
- The Sea Otter (*Enhydra lutris*): Behavior, Ecology, and Natural History, Biological Report 90(14), 1990.
- State Water Resources Control Board, Final Functional Equivalent Document: Amendment of the Water Quality Control Plan, Ocean Waters of California, March 2005, amended April 2005.
- U.S. Environmental Protection Agency, National Menu of BMPs for Storm Water Phase II, available at <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>.
- U.S. Fish and Wildlife Service, Final Revised Recovery Plan for the Southern Sea Otter (*Enhydra lutris nereis*), viii, 2003.
- University of California at Davis, "What's Killing California Sea Otters?" available at <http://www.seaotterresearch.org/>.
- Water Quality Control Plan (Basin Plan) for the Central Coast Region.
- Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin.

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