State of California
ENVIRONMENTAL PROTECTION AGENCY
RESOURCES AGENCY

CALIFORNIA WATER QUALITY MONITORING COUNCIL

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My Water Quality – hosted by the Surface Water Ambient Monitoring Program (SWAMP)

GOVERNOR SCHWARZENEGGER
Visit his Website

- Cal/EPA
- The Resources Agency
- About the California Water Quality Monitoring Council (links to page 12)
- State & Regional Water Boards
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- Monitoring Programs, Data Sources & Reports
- Water Quality Standards, Plans and Policies
- Regulatory Activities
- Enforcement Actions
- Research

- About SWAMP
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SWAMP Surface Water Ambient Monitoring Program

Welcome to My Water Quality

This web portal, supported by a wide variety of public and private organizations, presents California water quality monitoring data and assessment information from a variety of perspectives that may be viewed across space and time.

IS OUR WATER SAFE TO DRINK?

Safe drinking water depends on a variety of chemical and biological factors regulated by a number of local, state, and federal agencies. More >>

IS IT SAFE TO SWIM IN OUR WATERS?

Swimming safety of our waters is linked to the levels of pathogens that have the potential to cause disease. More >>

IS IT SAFE TO EAT FISH AND SHELLFISH FROM OUR WATERS?

Aquatic organisms accumulate certain pollutants from the water in which they live, sometimes reaching levels that could harm consumers. More >> (links to page 2)

ARE OUR AQUATIC ECOSYSTEMS HEALTHY?

The health of fish and other aquatic organisms and communities depends on the chemical, physical, and biological quality of the waters in which they live. More >>

WHAT STRESSORS AND PROCESSES AFFECT OUR WATER QUALITY?

Beneficial uses of our waters are affected by emerging contaminants, invasive species, trash, global warming, acidification, pollutant loads, and flow. More >>

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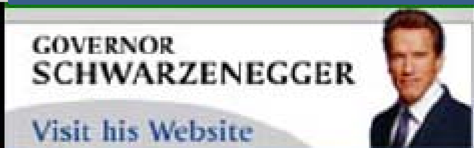


→ State & Regional Water Boards

Aquatic Health Links

→Stressors

→Laws, Regulations, Standards, and Guidelines

→Regulatory Activities

→Enforcement Actions

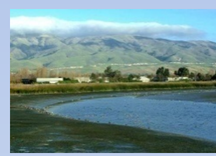
→Research

→Monitoring Programs, Data Sources and Reports

Home > Aquatic Ecosystem Health

Are Our Aquatic Ecosystems Healthy?

California has many types of aquatic habitats. Follow the links below to learn more….

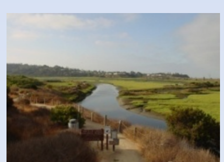


ESTUARIES
Estuaries are unique habitats found where rivers and the ocean mix. They feature a diverse array of plants and animals that are adapted to life along this mixing zone. More >>

LAKES
California lakes, supporting deep water, wetlands, riparian woodlands, offer a quiet refuge for plants, animals and humans alike. More >>

STREAMS
California's streams and rivers flow through diverse habitats, from mountain canyons, valleys, deserts, estuaries and urban areas. Riparian woodlands develop along stream banks and floodplains, linking forest, chaparral, scrubland, grassland, and wetlands. More>>

OCEAN
California has 1,100 miles of shoreline and 220,000 square miles of state and federal oceanic habitat, featuring one of the world's most diverse marine ecosystems. More>>



WETLANDS
Wetlands are found in the transition between dry land and water . Ponds, marshes, playas, bogs, fens, wet meadows, and vernal pools are common names for wetlands. Wetlands are a component of lakes, rivers, estuaries, and oceans. . More>>

CALIFORNIA WETLAND TRACKER

Pick a Region {drop down]

- North Coast
- San Francisco Bay
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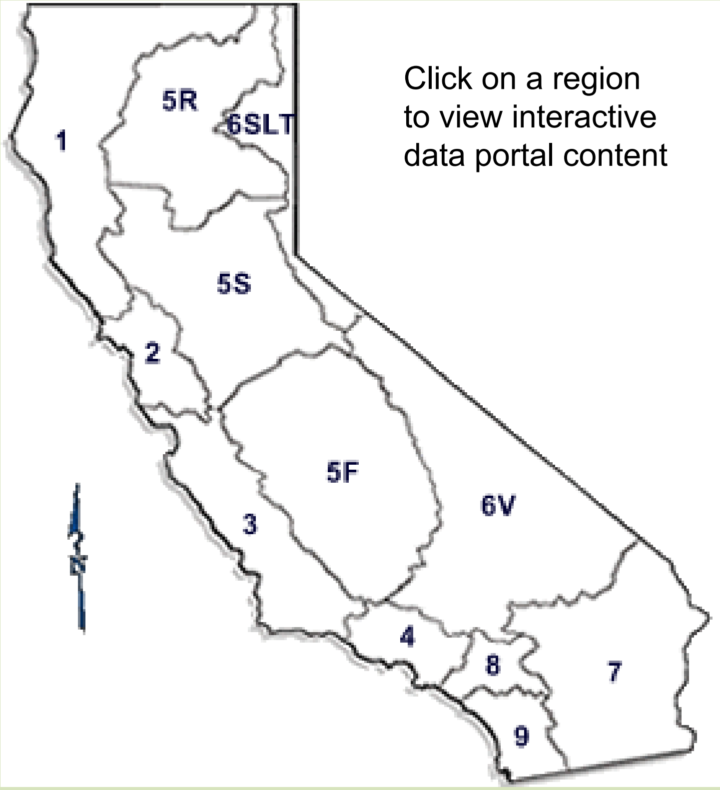
- **What are wetlands ?**
- **Wetland functions and services**
- **Diversity of California Wetlands**
- **Wetland stressors**
- **About Wetland Tracker**
- **California Rapid Assessment Method (CRAM) for Wetlands**

Information about California Wetlands

The Wetland Tracker provides the pubic information on California wetlands through summary pages and an interactive web-based data portal. Click on a question to view answers to basic questions on California's wetlands. The interactive portal shows information on wetland distribution, condition, and projects (where available) in California.



Questions About Wetlands

- Where are our wetlands and how much habitat do we have?
- How much habitat have we lost?
- Is wetland extent currently changing?
- How healthy are our wetlands?

What Are Wetlands?

Wetlands are areas where water covers or is near the surface of the soil for a period of time during the year. Wetlands can support both aquatic and terrestrial species. The presence of water favors the specially adapted plants (hydrophytes) and promote the development of characteristic wetland (hydric) soils.

Wetlands are found in every region of California. They vary widely in form, function and human services (more>>) because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors, including human disturbance. More on the diversity of California wetlands>>

Why Are Wetlands Important? Wetland Functions and Services

Although once regarded as wastelands, wetlands are now recognized as important features in the landscape. They provide numerous beneficial services for people and for fish and wildlife. Some of these services, or functions, include protecting and improving water quality, providing fish and wildlife habitats, storing floodwaters, groundwater storage, and maintaining surface water flow during dry periods. These beneficial services, considered valuable to societies worldwide, are the result of the inherent and unique natural characteristics of wetlands. Wetland functions and services vary by wetland type.

PICS OF WETLANDS FUNCTIONS

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Diversity of California's Wetlands

California's wetlands are a product of the tremendous variability in climate, elevation, landscape setting, and hydrology found in the state. As a result, these wetlands feature a diversity of plants and animals that sharply distinguish the state from any other in North America. Within California's wetlands, eight major types are present.

MARINE WETLANDS

Marine wetlands consist of the intertidal beaches, rocky shorelines exposed to the influence of waves and current of the open ocean. **More>>>**

ESTUARINE WETLANDS

Estuarine wetlands exist along the margins of tidal sloughs, enclosed bays, and estuaries. They are subject to daily fluctuations in water height. **More>>>**

RIVERINE WETLANDS

Riverine wetlands form within the channel of a river or stream at bank full stage. These wetlands include flats, emergent marsh, or the riparian woodlands that fringe the channel. **More>>>**

LAKE WETLANDS

Wetlands fringing lakes differ from playas in being at least 6 feet deep during the dry season. Lakes are at least 20 acres in size. **More>>>**

SLOPE WETLANDS

Slope wetlands form due to seasonal or perennial emergence of groundwater into the root zone or onto the ground surface. Wet meadows are a special type of slope wetland. **More>>>**

DEPRESSIONAL WETLANDS

Depressional wetlands exist in topographic lows that may or may not have outgoing surface drainage. **More>>>**

PLAYA WETLANDS

Playas are nearly level, shallow, ephemeral or perennial, strongly alkaline or saline water bodies with very fine-grain sediments of clays and silts. **More>>>**

VERNAL POOLS

Vernal pools and swales are a special kind of seasonal depressional wetlands having bedrock or an impervious soil horizon close to the surface and supporting a unique "vernal pool flora." **More>>>**

Text for each wetland type

ESTUARINE WETLANDS

Estuarine wetlands exist along the margins of river mouths, coastal lagoons, tidal sloughs, enclosed bays, and estuaries. They are subject to daily or twice-daily tidal fluctuations in water height. These fluctuations might be fully natural or muted due to tide gates, culverts, weirs, etc. The water is a mixture of marine or ocean water and freshwater. Water salinity can range from fresh to hyper-saline (i.e., more saline than the ocean). Estuarine wetlands include marsh, mudflats , tidal channels, shallow water subtidal habitat, and fringing riparian woodland habitat.

RIVERINE WETLANDS

Riverine wetlands form within the channel of a river or stream at bank full stage. These wetlands include flowing water, flats, emergent marsh, and the riparian woodlands that fringe the channel.

Text for each wetland type

DEPRESSIONAL WETLANDS

Depressional wetlands exist in topographic lows that may or may not have outgoing surface drainage. Precipitation and overland flow is their main source of water. They differ from springs and seeps that depend mainly on groundwater. They differ from lakes by not having a perennial body of water at least 6 ft deep and at least 20 acres in area during the dry season. Depressional wetlands can have prominent areas of shallow open water and can be densely vegetated. They differ from playas by not being strongly alkaline or saline. Depressional wetlands include shallow open water, flats, emergent marsh, and riparian woodland that may fringe the wetland. Depressional wetlands are a part of the Palustrine (freshwater) class of wetlands mapped by NWI.

NEED PICS– PLEASE DONATE

MARINE WETLANDS

Marine wetlands consist of the intertidal beaches, rocky shorelines exposed to the influence of waves and current of the open ocean.

Text for each wetland type

SLOPE WETLANDS

Slope wetlands include seeps and springs that form due to seasonal or perennial emergence of groundwater into the root zone or onto the ground surface. They can form on hillsides (e.g., hill slope seeps) or nearly level terrain (e.g., wet meadows). They differ from riparian wetlands by lacking well-defined channels that extend throughout the wetland. Seeps and springs are almost entirely dependent on groundwater. Wet meadows are a special type of slope wetland. Slope wetlands are part of the Palustrine class of wetlands mapped by NWI.

PLAYA WETLANDS

Playas are nearly level, shallow, ephemeral (seasonal) or perennial, sodic (i.e., strongly alkaline) or saline water bodies with very fine-grain sediments of clays and silts. Unlike vernal pools, playas have little or no vascular vegetation within the water body itself, and they support sparse peripheral vegetation. Unlike lakes, playas are less than 6 ft deep during the dry season, although they can be hundreds of acres in size. Playa wetlands are part of the Palustrine class of wetlands mapped by NWI.

NEED PICS– PLEASE DONATE

Text for each wetland type

LAKE WETLANDS

Lakes differ from playas in being at least 6 feet deep during the dry season. Lakes are at least 20 acres in size. Lake wetlands include the shallow open water habitat, flats, fringing marsh and woodland riparian habitat that can fringe the lake.

VERNAL POOLS WETLANDS

Vernal pools and swales are a special kind of ephemeral (seasonal) depressional wetlands having bedrock or an impervious soil horizon close to the surface and supporting a unique "vernal pool flora." These depressions fill with rainwater and runoff from small catchment areas during the winter and may remain inundated until spring or early summer, sometimes filling and emptying repeatedly during the wet season. Estimated vernal pool areas should only include the pools themselves at maximum water volume, not the surrounding uplands. Vernal pools are mapped as Palustrine wetlands by NWI

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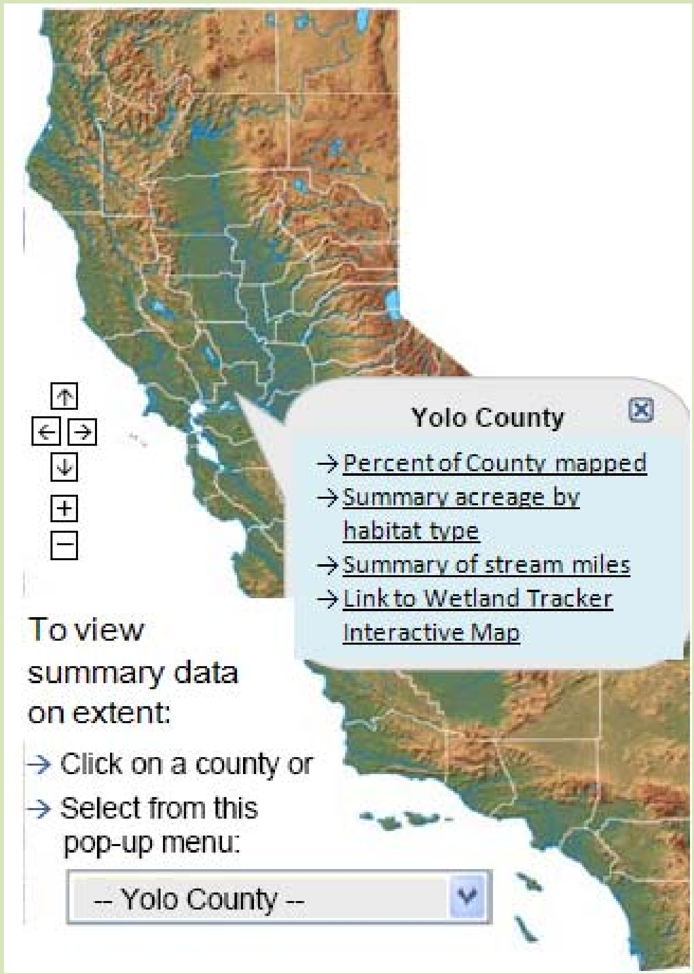
Where Are California's Wetlands? How Much Habitat Is There?

Answers By County



The Statewide Picture

Statewide. As of January 2009 (see Status of Mapping), California has approximately 2.9 million acres of wetlands.

A third of the State's wetlands are found in the San Francisco Bay Delta and Central Valley Regions (Figure 1). Another third is in the Sierra and Modoc Regions of the State, with the remainder found in the North, Central, and South Coasts and the Colorado and Mojave Desert.

Freshwater wetlands are the most abundant in California (Table 1), with 47% of the total wetland area found in the palustrine class. Palustrine wetlands are a class within the NWI classification system which includes depression, vernal pools, playas, and slope wetlands. Another 42% are associated with lakes, while 11% are associated with rivers and streams, marine intertidal shorelines, and estuaries.

California's 251,000 acres of riverine wetlands are associated with 410,000 miles of rivers and streams (Figure 2).

Status of Wetland Mapping Efforts

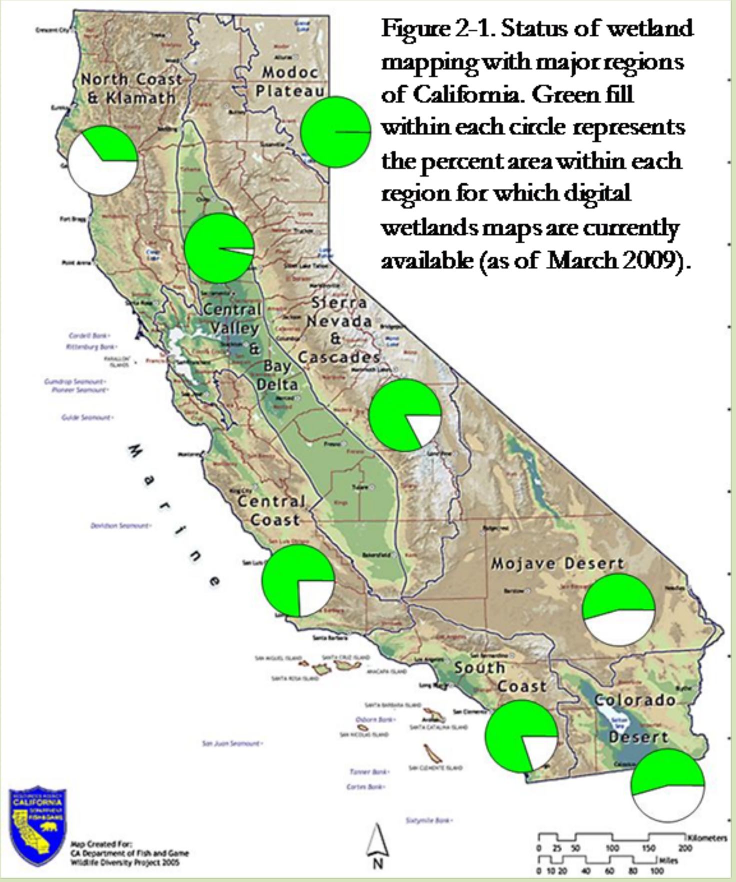


Figure 2-1. Status of wetland mapping with major regions of California. Green fill within each circle represents the percent area within each region for which digital wetlands maps are currently available (as of March 2009).

In 2002, the State of California began developing a complete map of wetlands in our state through a partnership with the California Resources Agency, U.S. Fish and Wildlife Service National Wetland Inventory (NWI), and regional partners in South Coast and San Francisco Bay.

Currently, 82% of the state has digital maps of wetlands that the public can access through NWI (Figure 3). Regions of the State in which more progress is needed (mapped less than 75%) are the North Coast/Klamath, Mojave and Colorado Desert Regions.

Many of these maps date from the 1980s and are not sufficiently detailed to assess trends. The State of California is working to continuously update these maps (Figure 3) and use additional mapping methods that will allow us to more quickly evaluate the trends in wetland acreage. Maps are currently being updated in several areas of the State, including large projects in South Coast and San Francisco Bay.

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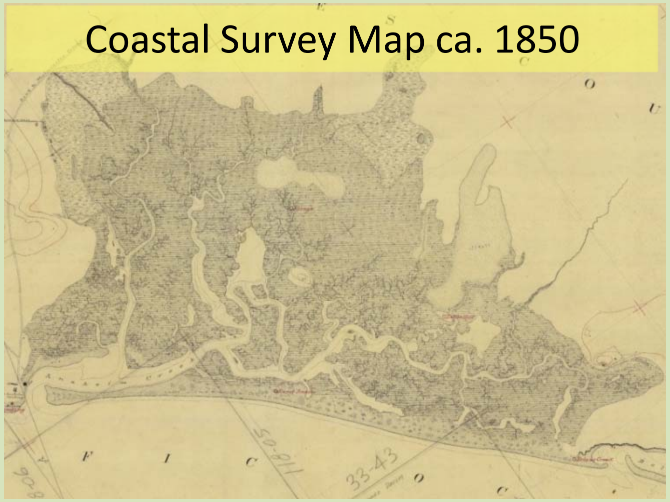
How Much Wetland Habitat Has California Lost?

It is estimated that California has lost somewhere between 75-90% of the wetlands present prior to European settlement (Dahl 1990). This wetland loss has occurred as land was converted from open space to urban and agricultural land uses.

Regional investigations of the historical extent of wetlands provides more detailed insight to wetland losses since California's statehood in 1850. Studies are being conducted on coastal wetlands and freshwater wetlands.



Coastal Survey Map ca. 1850

Spanish Land Grant Map ca. 1850

Click on the links below for more information on regional historical ecology studies underway in selected areas of the State:

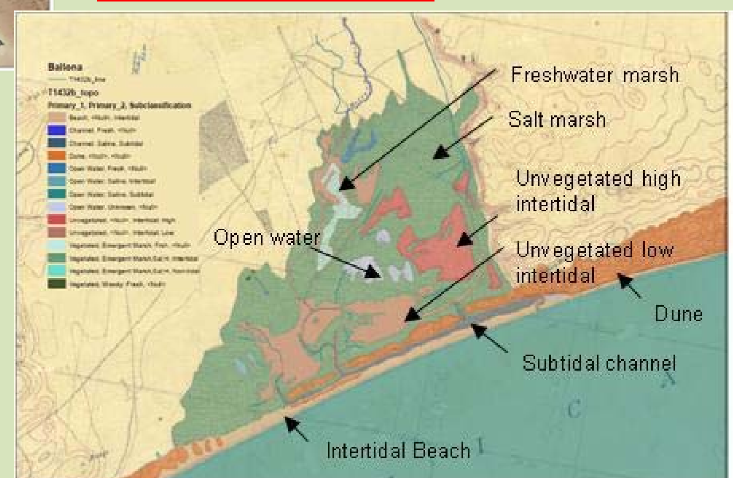
San Francisco Bay and its watersheds
Southern California coastal watersheds
Central Coast watersheds

Historical Ecology of Coastal Wetlands

Land use changes that have occurred over the last two centuries have decreased the amount and average size of coastal wetland. In the more urbanized estuaries of the South Coast and the San Francisco Estuary, many wetlands are embedded in intensive land uses and bounded by levees. These conditions diminish the hydrological and ecological connectivity among the wetlands, increase their susceptibility to invasion, and reduce their overall capacity to serve society.

Since European contact, wetlands in the San Francisco Estuary have decreased by 99%. Most of its historical wetlands were freshwater, of which less than 1% remains. Only about 15% of its historical salt marshes remain. This wetland loss is a direct consequence of conversion of filling, diking, and draining wetlands for human uses and changes to watershed land use that result in wetland loss. More on this project >>>>

The Ballona Wetlands near Los Angleles have been reduced to 28% of its historical size between 1876 and 2007. Moreover, the habitats at Ballona have shifted from primarily mudflat and saltmarsh to grassland and freshwater marsh. For example, in 1876, 60% of Ballona was saltmarsh, compared to only 13% today. More on this project >>>>



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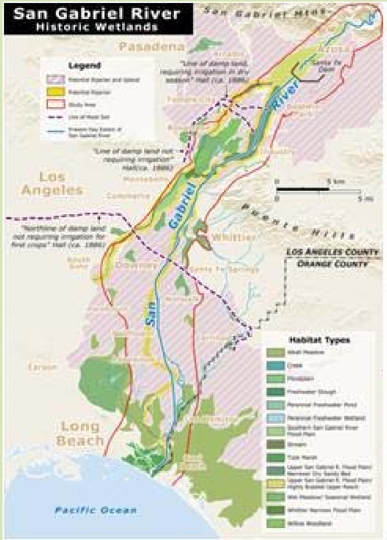
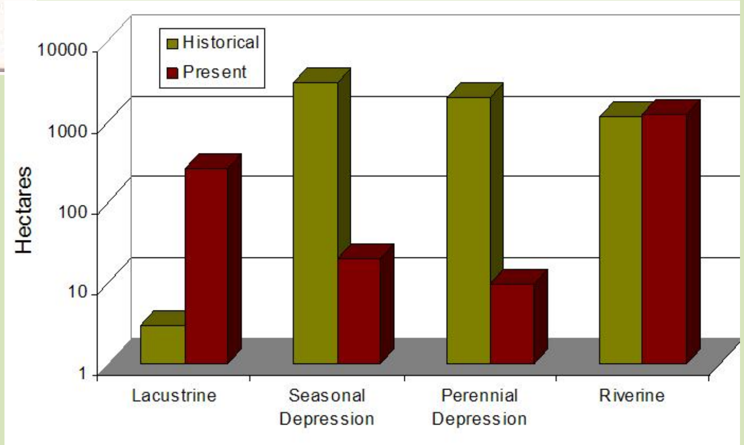
Historical Ecology of Freshwater Wetlands and Watersheds

Freshwater wetlands have been profoundly impacted by land use changes over the past two centuries. A large diversity of seasonal depressional wetlands have been drained or modified to support agriculture and urbanization. The amount of perennial ponds and lakes have greatly increased in order to provide opportunities for flood control, recreation, irrigation, and other consumptive uses .



The San Gabriel River watershed has experienced approximately 86% wetland loss since 1850. The seasonal floodplain wetland complexes have been converted to urban land uses and the river has been channelized. Historically the floodplain supported approximately 47,000 acres of semi-permanent wetlands, primarily alkaline marsh. An additional 800 to 4,000 acres of seasonal wetlands were present in some years and absent in others. More on this project >>>>

In the Napa River watershed, almost all of the seasonal and perennial depressional wetlands have been filled to make room for urban development, pasture, and vineyards. Lake wetlands has been greatly increased by the construction of reservoirs for flood control, recreation, irrigation, and other consumptive uses. More on this project >>>>



CALIFORNIA WETLAND TRACKER

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Is California Currently Gaining or Losing Wetlands?

Many activities contribute to wetland gains and losses; most of these activities are not well documented. Consequently, accurate assessment of ongoing wetland gains and losses is challenging. Individual State agencies typically track changes in wetland area associated with their programs. Unfortunately, the lack of a coordinated tracking or data management systems makes it difficult to assess overall gains and losses among these programs. Coordinated data collection and sharing through the use of the Wetland Tracker will ultimately provide a means to assess net gains and losses.

Factors that contribute to wetland loss
- Wetland fills permitted by State and Federal regulation
- Activities exempt from regulations (e.g. agricultural activities)
- Unauthorized activities
- Climatic variations

Factors that contribute to wetland gain
- Wetland acquisition and restoration activities
- Programs that encourage wetland compatible agricultural practices
- Compensatory mitigation programs
- Climatic variations

The following agencies are involved in regulating or conserving California wetlands: [DROP DOWN LIST OF AGENCY LINKS]

•Corps of Engineers
•State Water Resources Control Board
•USDA Wetland Reserve Program
•California Coastal Conservancy
•Wildlife Conservation Board
•California Department of Fish and Game
•California Coastal Commission

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What Factors Affect Wetland Health?

Human activities that result in a reduction in wetland quantity or quality are called wetland stressors. Most wetlands are subject to multiple stressors that exacerbate their negative effects. All stressors are ultimately due to land use practices and can be sorted into five basic groups.

HABITAT CONVERSION

People can change wetlands from one type to another, or change them into non-wetland areas. **More>>>**

HYDROLOGICAL MODIFICATION

Unnatural changes in the timing and duration of flooding in a wetland of a wetland can affect its functions and services. **More>>>**

BIOLOGICAL INVASION

Non-native species that are introduced into a wetland can multiply, displacing native species and altering wetland functions and services. **More>>>**

POLLUTION

The accumulation of anything in a wetland that causes an unacceptable decline in its services can be called pollution. **More>>>**

OVERHARVESTING

Fish, game, plants, timber, and water are wetland resources that can be renewed by natural process. Unregulated harvesting can outpace renewal. **More>>>**

CLIMATE CHANGE

The world is entering a period of rapid climate change. While there is uncertainty about the future rates of change. **More>>>**

Text for Stressor Descriptions

HABITAT CONVERSION

People can change wetlands from one type to another, or change them into non-wetland areas. Wetlands tend to form on flat landscapes, such as floodplains and valley floors, favored for many land uses, such as housing and farming that can easily displace or destroy wetlands. Except for laws protecting them, most wetlands can be easily drained or filled. Such habitat conversion has been the leading cause for declines in the distribution and abundance of every kind of wetland in California. There has been a 90% reduction in wetland acreage in California since the gold rush of 1849.

HYDROLOGICAL MODIFICATION

Unnatural changes in the timing and duration of flooding in a wetland (a.k.a. hydroperiod) of a wetland can affect its functions and services. The hydroperiod of a wetland is easily modified by upstream impoundments, diversions, or additions of surface water. Levees, riverbank revetments, spring boxes, dams, and every other unnatural structure directly affect wetlands. Seasonal wetlands are the most vulnerable to changes in water supplies. They tend to be shallow and subject to high rates of evaporation. Slight changes in hydrology can affect large changes in seasonal wetlands.

NEED PICS AND LINKS– PLEASE DONATE

Text for each wetland type

BIOLOGICAL INVASION

Non-native species that are inadvertently or intentionally introduced by people into a wetland can proliferate, displacing native species and altering wetland functions and services. Bullfrogs, the Louisiana red crayfish, Brazilian milfoil, bluegill sunfish, and many other alien plants and animals are changing the essential functions of California wetlands.

POLLUTION

The accumulation of anything in a wetland that causes an unacceptable decline in its services can be called pollution. It isn't always a manufactured chemical that is dumped, spilled, leaked, or otherwise released by people into the environment. An overabundance of nutrients, sediment, native vegetation, or even water can pollute a wetland. Management of wetlands for purposes of vector control can result in pollution. Many wetlands function as natural filters and tend to have higher concentrations of pollutants than other habitat types.

NEED PICS AND LINKS– PLEASE DONATE

Text for each wetland type

OVERHARVESTING

Fish, game, plants, timber, and water are wetland resources that can be renewed by natural process. Unregulated harvesting can outpace renewal. In some cases, moratoria on harvesting have allowed wetlands to replenish the resources and harvesting has been restored in sustainable ways. In other case, adequate resources have yet to be renewed. Wetland resources that are created very slowly, such as oil, natural gas, minerals, sand, and peat, are regarded as non-renewable. In California, overharvest is less of a threat that other stressors. Forested wetlands that were severely impacted by past logging practices are now better protected by forest practice rules.

CLIMATE CHANGE

The world is entering a period of rapid climate change. While there is uncertainty about the future rates of change and how long they will last, California is already experiencing greater year-to-year variability in rainfall and air temperature, higher average temperatures, and less snow pack. To the extent that climate change is caused by people, it could be considered a stressor. Regardless of its causes, climate change will likely impact all wetlands in California.

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How Healthy Are California Wetlands?

What is wetland "health?" To evaluate the ecological integrity or "health" of wetlands, a scientist visits a wetland and collects information about the number and types of different kinds of organisms are living there. The scientist also collects information about the habitat quality, water level, and chemistry to support the biological information. The scientist then compares the information on the ecological integrity of the wetland to reference conditions. This is similar to the way a human doctor would collect information about a patient, such as blood pressure and temperature, and compare it to a known range of condition. If the values are too high or too low, then the doctor knows that the patient is sick. Similarly, the wetland scientist can compare the biological information to a known range of conditions and determine the health of the wetland.

What do we know about the health of California wetlands? A tremendous quantity of data have been collected on the ecological integrity of California's wetlands. Unfortunately, these data have been collected with a variety of methods, making reporting on a regional or state level very difficult. To address this issue, an interdisciplinary team of scientists and agency staff have been working on developing a toolkit of standardized assessment methods.

Assessments of the health of wetlands utilizing these standardized methods are just becoming available. The State of California recently completed a study of the health of salt marshes (more>>) and is conducting an ongoing study of the health of wadeable streams (more>>) using, among other methods, the California Rapid Assessment Method (CRAM) for wetlands (www.cramwetlands.org).

CRAM measures the overall health of a wetland based on the integrity of its marsh plant community (Biotic Structure), Hydrology, Physical Structure and quality and quantity of the buffer that surrounds the wetland (Landscape Context). CRAM also identifies possible causes of poor wetland health by identifying so called "stressors". Disturbance from natural forces such as floods, fires, sea level rise, and climate change can also result in poor health and must be taken into consideration when identifying management measures to improve health.

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Health of California's Salt Marshes

The 2007 study of the health of the State's approximately 44,456 acres of salt marshes showed that 85% of the wetland area was in good to very good health (Figure 1). Thirty-five percent of the acreage of salt marsh had scores reflecting very good hydrology and health of the marsh plant community; an even higher percentage (65%) was found to have large, intact buffers. Salt marshes within the State were found to be most adversely affected by impacts to their physical structure, with 50% of the acreage scoring in the fair to poor category.

[INSERT PIC OF SALT MARSHES]

Salt marsh health generally declined from Northern to southern California, consistent with a trend in increasing urbanization from north to south (Table 1; Figure 1). The most severe human stressors identified were different in each region. Overall, dikes and levees were among the most frequent and most severe stressors identified statewide. These features restrict tidal exchange and reduce the flushing of wetland, directly impacting the physical structure of a salt marsh. Altered rates of sediment deposition can also produce low CRAM physical structure scores.

At the landscape scale, improving the overall condition of estuaries and their wetlands will ultimately require changes in watershed management. The goals are to assure adequate supplies of clean water and sediment, to improve tidal circulation between the wetlands and their estuaries, and to provide adequate lands to accommodate estuarine upland relocation due to sealevel rise. Specific management actions include (more>>)...

Pick a Region

- North Coast
- San Francisco Bay
- Central Coast
- South Coast
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  - San Diego
- Central Valley
  - Redding
  - Sacramento
  - Fresno
- Lahontan
  - Lake Tahoe
  - Victorville
- Colorado River Basin

- **What are wetlands ?**
- **Wetland functions and services**
- **Diversity of California Wetlands**
- **Wetland stressors**
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Recommendations for Improving the Health of Salt Marshes

At the landscape scale, improving the overall condition of estuaries and their wetlands will ultimately require changes in watershed management. The goals are to assure adequate supplies of clean water and sediment, to improve tidal circulation between the wetlands and their estuaries, and to provide adequate lands to accommodate estuarine upland relocation due to sea level rise. Specific management actions include:

- The conversion of estuaries to human land use has greatly decreased the extent of salt marshes and associated habitat. Undertake protection of remaining habitat and restoration to increase the size of estuarine wetlands to reduce the effects of terrestrial predators and other stressors.

- In all regions, converting floodplains to developed land use has reduced their ability to filter runoff. Necessary steps to protect these systems include: 1) Managing sediment loads, and reducing contaminants concurrently delivered with that sediment, 2) Balancing reduced pollutant inputs to these systems while providing enough sediment to sustain estuarine wetlands from expected sea level rise, 3) Restoring inflowing creeks and upland areas to increase filtration before discharging to estuaries. Actions should be taken to remediate problems in areas already impacted by sediment and contaminants.

- Invasive plants and animals compete with natives for food and refuge. Remove invasive plant and animal species from salt marshes and surrounding lands and reestablish or reintroduce native species.

- Levees, dikes, and structures related to railroads and roads have changed hydrology and created poor physical structure. Careful removal, realignment, or re-engineering of transportation infrastructure is required to improve tidal flushing. A statewide forecast of sea level rise across the coast would help preview estuarine wetland restoration opportunities, and help predict whether levee realignment to reduce this stressor is possible.

- Mosquito ditches in salt marshes reduce the amount of standing water available to mosquitoes for breeding. Although this is one effective way to reduce potential for disease, this practice alters natural patterns of hydrology and sedimentation on the marsh. Wetland managers and vector control agencies need to work together to develop mosquito management approaches that mitigate hydrological impacts to wetlands.

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Health of Wadeable Streams

The State of California has launched a program assessing the chemical and biological integrity of the State's wadeable streams through the Perennial Stream Assessment (PSA) State Water Resources Control Boards (SWRCB) Surface Water Ambient Monitoring Program (SWAMP), administered by the California Department of Fish and Game (CDFG). Recently CRAM was piloted along side of water chemistry, toxicity, and benthic macroinvertebrates to assess the overall health of the riverine riparian forest associated with streams. These data can be used to compare with surveys of riverine riparian habitat in the Napa River Watershed, the Morro Bay Watershed, and the San Gabriel River watershed through an USEPA-funded Wetland Demonstration Program Pilot Project.

[insert pics]

Preliminary data from the SWAMP PSA show that approximately 30% of the State's of miles riverine riparian habitat is in good to very good health. The PSA data provides the opportunity to put the results from individual watershed assessments in context (Figure 1). The health of the Napa River riparian habitat is near that of the Statewide PSA data, with roughly 60% of the stream miles assessed having scores in ranges representing good to very good health). In contrast, Morro Bay watershed riparian habitat was in better health (85% of stream miles in good to very good health), while San Gabriel River watershed riparian habitat is faring much worse (35% in good to very good health).

Information from the Napa River watershed provides some insight as to some of the reasons for declining health of streams in agricultural and urban land uses (Figure 2). Monitoring data from this watershed reveals that the amount of riparian area wide enough to support the full complement of riparian functions, including wildlife support, has decreased by almost 90%. Most of the increase in the total amount of riparian area is due to narrow areas along ditches and around stock ponds that have very limited function.