California Wetlands Monitoring Workgroup

May 22, 2009

Today's Presentation

- Strategy for statewide wetland monitoring and assessment program

- Wetland Portal

Elements of a Statewide Wetland Monitoring Program

Purpose of today's discussion:

- Preview basic outline of monitoring strategy
- Seek Monitoring Council endorsement on approach

Review of Fundamental Questions

Where are the wetlands and
how are they doing?

Review of Fundamental Questions

Are the policies, programs, and projects working?

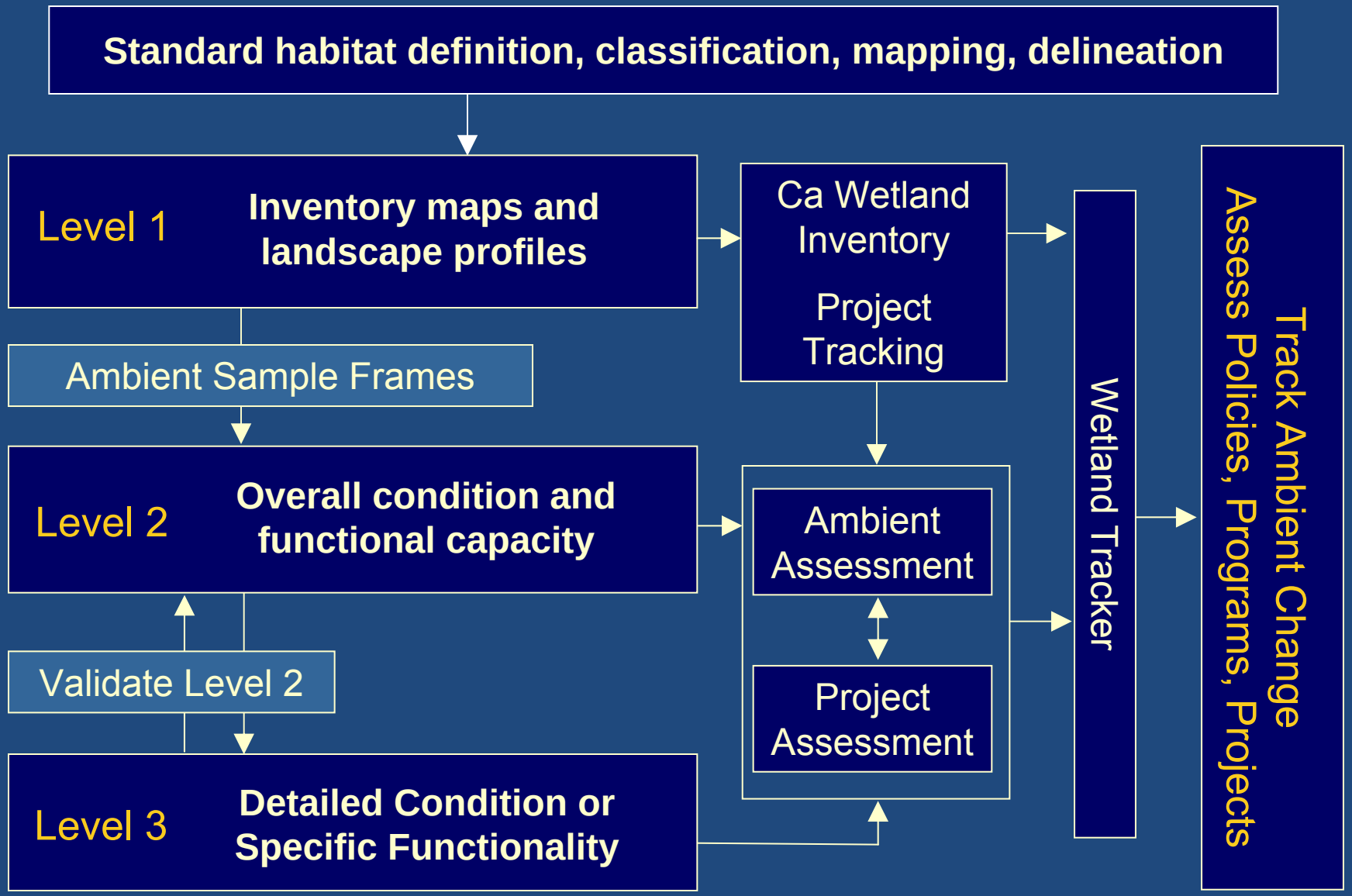
Operational Tenets

- Ongoing coordination of State, Federal & local programs
- Common tools
- Shared data management
- Easy access to resultant information
  - Agencies
  - Public
- Incorporate into existing agency programs
- Provide mechanism for ongoing coordination and refinement

Basic Outline

1. Statement of Need
   - State Wetland Protection Policy
   - State of State's Wetlands Report
2. Key Questions and Goals of Program
3. Technical Framework
   - Description of tools
   - Application of common tools
   - Standard Products
4. Implementation Strategy
5. Funding

Strategy Reflects Technical Framework



Implementation Strategy

- Integrate tools into existing agency programs
  - Regional Monitoring Programs
  - Surface Water Ambient Monitoring Program
  - Vegetation mapping (Natural Resources Agency)
  - Regulatory programs (State and Federal)

- Shared data management
  - Regional data centers
  - Data portals

- Implementation costs
  - Training, QAQC, Tracker Maintenance

Key Program Elements

- Regions
  - Regional Boards, groups of Regional Boards, Data Centers
- Types of Projects
  - Ambient monitoring, impacts, mitigation/restoration
- Standard Tools
  - NWI, CRAM, Wetland Tracker → "required" by agencies
- Ownership of the Program
  - Level 1 (mapping) = Natural Resources Agency
  - Level 2 (CRAM + assessment) = Cal. EPA
- Ongoing Technical Support and Coordination
  - CWMW continues to play this role

Next Steps

- Prepare program documents
- ***Vet program through partner agencies***
- Recommendations for adoption
  - Phase 1
    - Ca Water Quality Monitoring Council
    - incorporate into comprehensive monitoring program strategy
  - Phase 2
    - SWRCB, CDFG, other agencies
    - Agency specific program and policies
- Stipulate steps to support implementation
- Provide on-ramps for agency participation

WETLAND PORTAL

Organization of Portal

Wetlands Data Portal will be organized around Level 1-2-3 framework

- Level 1: Regional and project-scale maps of habitat
- Level 2: Rapid assessment of condition
- Level 3: Intensive measures of wetland condition, function, stress

Two Phases of Implementation

Phase 1 – June 30, 2009

- Questions that State thinks the public wants to know
  - "Where are our wetlands?"
  - Static Content

Phase 2 – Funding Dependent

- Questions that public and agencies can ask of available data
  - Dynamic query capability
  - User defined data output

CALIFORNIA WATER QUALITY MONITORING COUNCIL

GOVERNOR SCHWARZENEGGER

Visit his Website

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

- About SWAMP
- SWAMP Tools

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 >>

→ State & Regional Water Boards

Aquatic Health Links

→Stressors

→Laws, Regulations, Standards, and Guidelines

→Regulatory Activities

→Enforcement Actions

→Research

→Monitoring Programs, Data Sources and Reports

→ National

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 salinity gradient . 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 also found within lakes, rivers, estuaries, and oceans. . More>>

CALIFORNIA WETLAND TRACKER

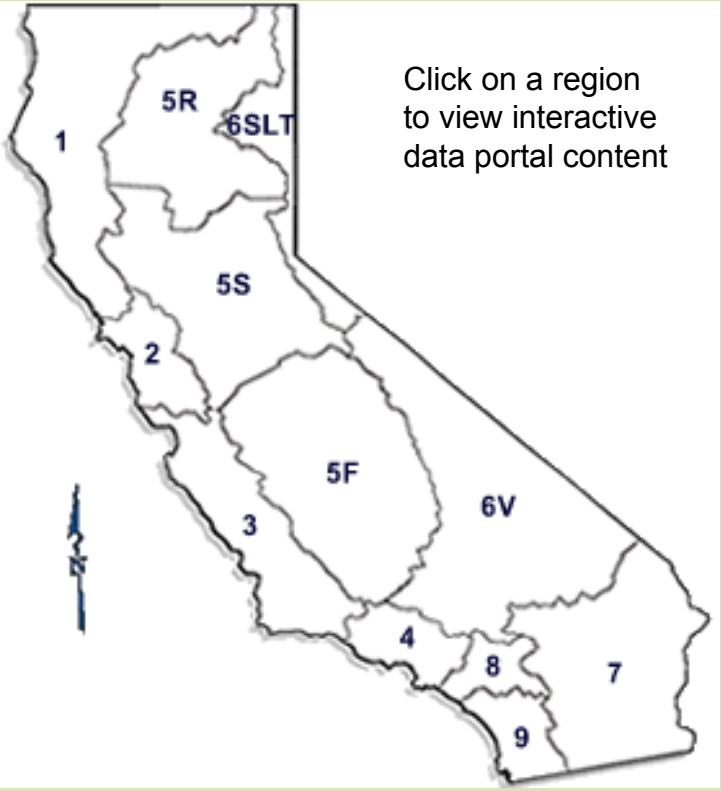
Pick a Region

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

- **About Wetland Tracker**
- **California Rapid Assessment Method (CRAM) for Wetlands**
- **Download Wetland Maps at USFWS National Wetland Inventory Website**

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.



Click on a region to view interactive data portal content

Questions About Wetlands

- What are wetlands and why are they important?
- Where are our wetlands and how much habitat do we have?
- How much habitat have we lost?
- Are we currently gaining or losing wetlands?
- What are the causes of poor wetland health?
- How healthy are our wetlands? [Coming soon…]

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What Are Wetlands and Why Are They Important?

What Are Wetlands?

Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Wetlands can support both aquatic and terrestrial species. The prolonged presence of water creates conditions that favor the growth of 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 and function 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>>

Important Functions and Services

Long 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.

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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 flat, 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>>>

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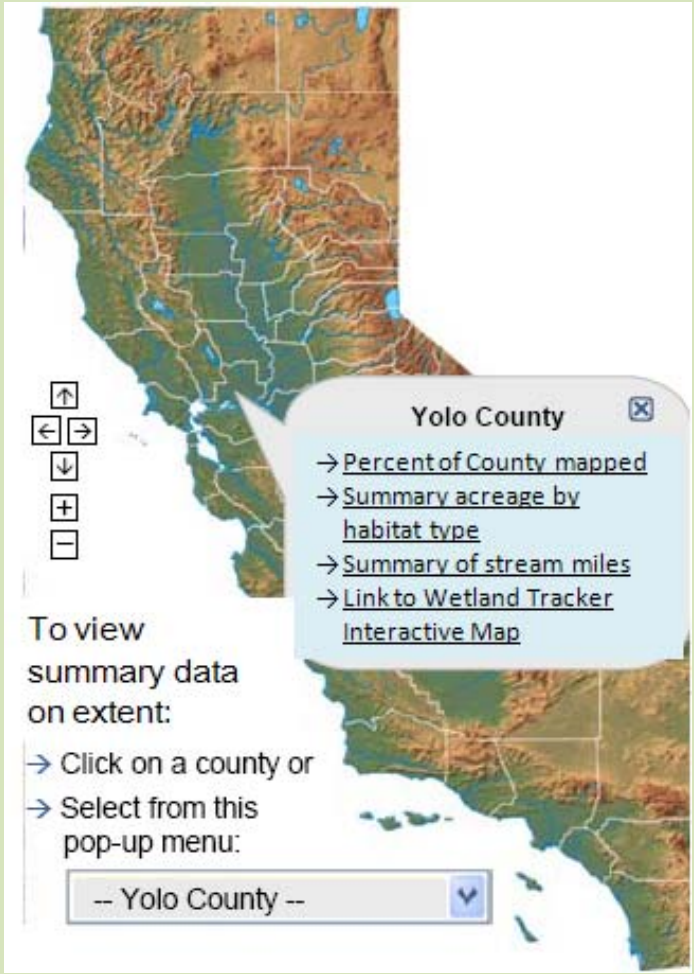
Where Are California's Wetlands? How Much Habitat Is There?

Answers By County



The Statewide Picture

Statewide. As of January 2009 (see Status of Mapping), California has approximately 3.5 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 224,000 acres of riverine wetlands are associated with X miles of rivers and streams (Figure 2).

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Status of Wetland Mapping Efforts

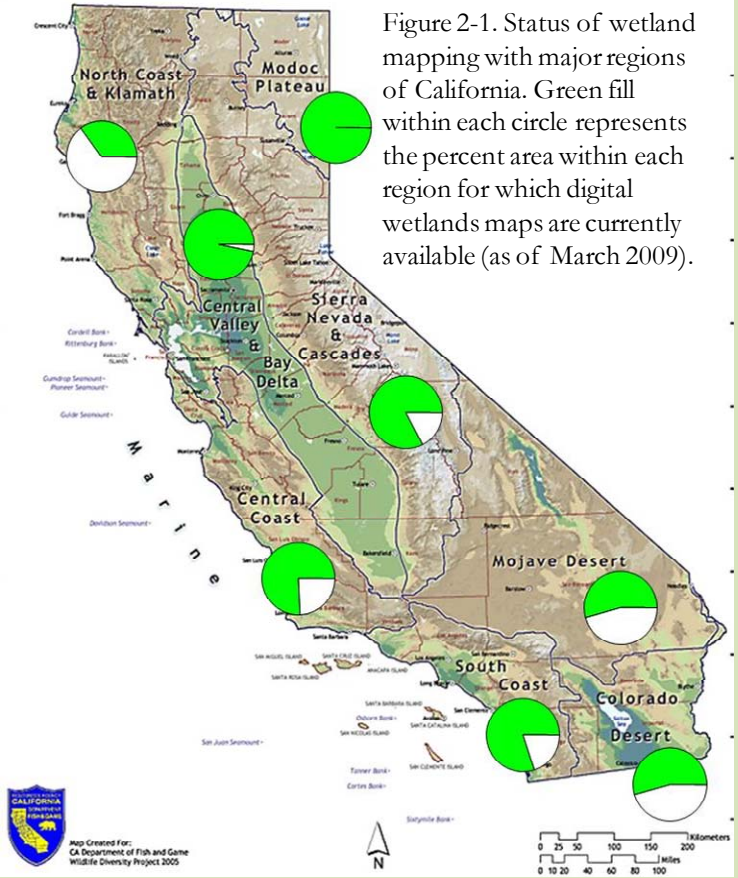

Figure 2-1. Status of wetland mapping with major regions of California. Green fill within each circle represents the percent area within each region for which digital wetlands maps are currently available (as of March 2009).

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

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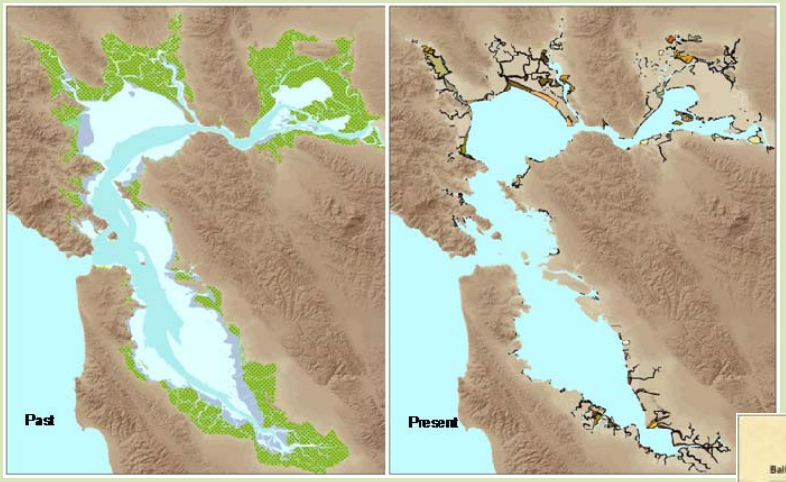
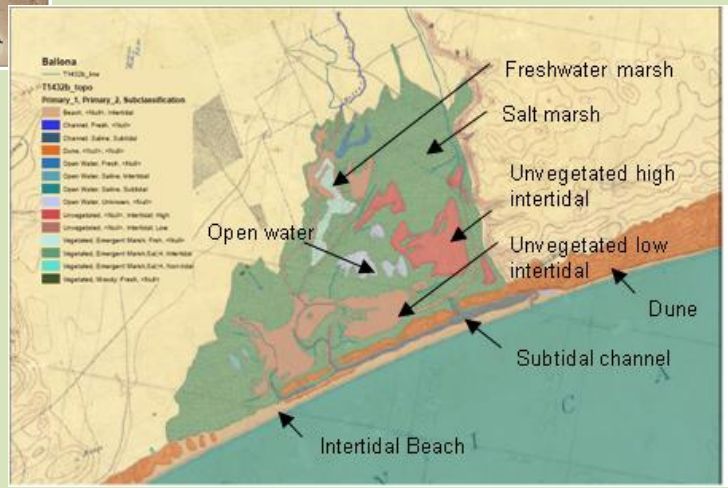
Historical Ecology of Coastal Wetlands

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.

The Ballona Wetlands near Los Angeleles 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.



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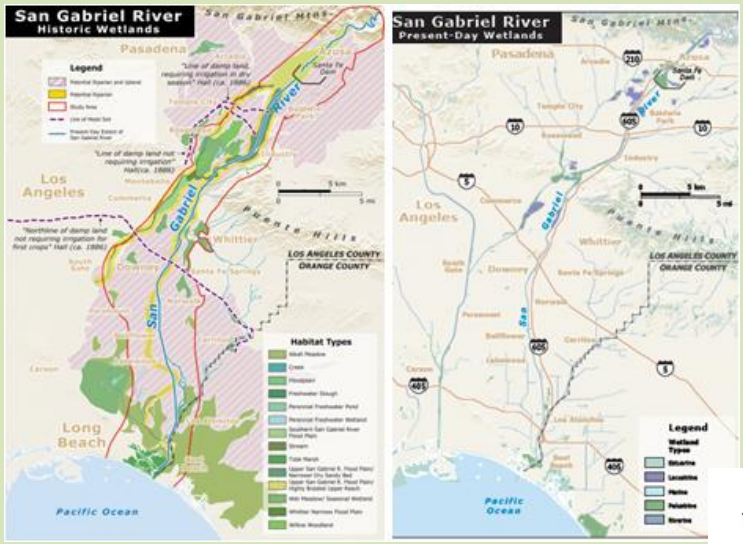
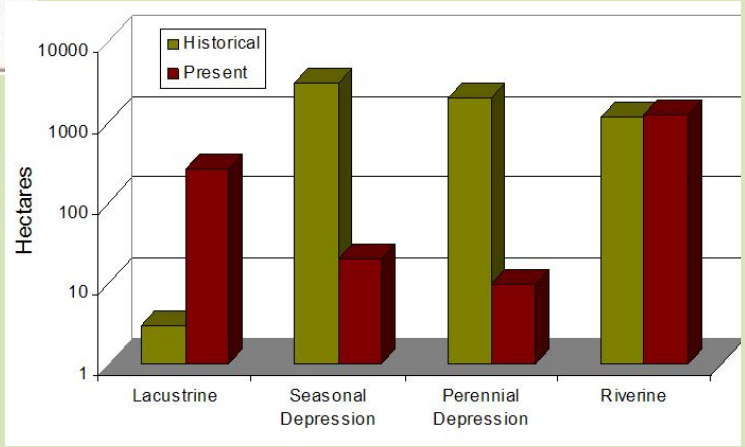
Historical Ecology of Freshwater Wetlands and Watersheds

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.

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.



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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.

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
  - *Links to Corps of Engineers*
  - *Links to State Water Resources Control Board*
  - *Links to California Department of Fish and Game*
  - *Links to California Coastal Commission*

Factors that contribute to wetland gain
- Wetland acquisition and restoration activities
- Programs that encourage wetland compatible agricultural practices
- Compensatory mitigation programs
- Climatic variations
  - *Links to Corps of Engineers*
  - *Links to State Water Resources Control Board*
  - *Links to the USDA Wetland Reserve Program*
  - *Links to California Coastal Conservancy*
  - *Links to the Wildlife Conservation Board*

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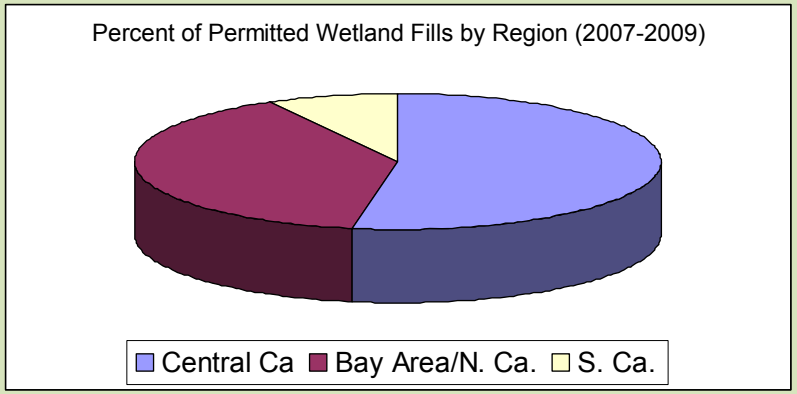
Factors that Contribute to Wetland Loss?

Wetland Loss due to Permitted Activities

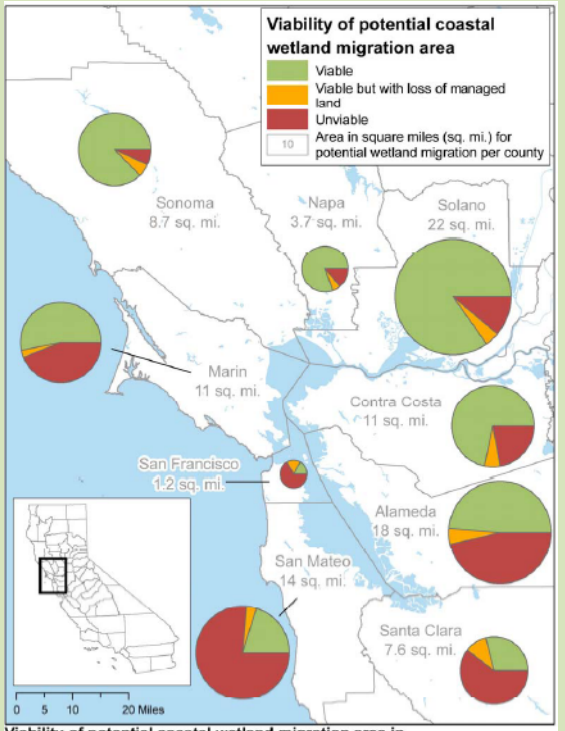
The Corps of Engineers estimates that approximately 2000 acres of wetlands are filled annually in California by permitted activities.



Wetland Loss due to Climate Change

Approximately 700 square miles of coastal wetlands in California are at risk due to sea-level rise.

A sea-level rise of 1.4 m provides approximately 150 square miles of potential wetland migration area. Of this amount, 83 square miles, or 55%, would make viable wetland habitat.



Viability of potential coastal wetland migration area in response to a 1.4 meter sea-level rise in the San Francisco Bay

Data sources: USGS/Scripps Institution of Oceanography, NOAA Coastal Change Assessment Program, CaSIL, ESRI.
http://www.pacinst.org/reports/sea_level_rise

PACIFIC INSTITUTE

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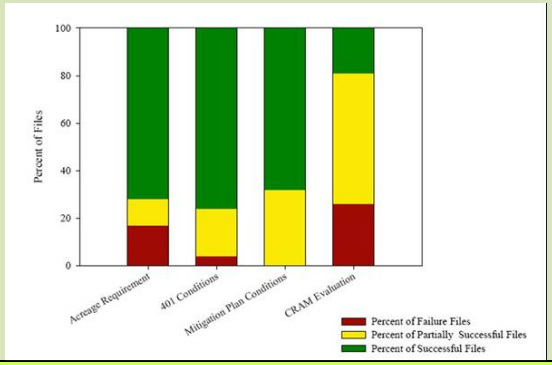
Factors that Contribute to Wetland Gains?

Since 1998, approximately $2.4 billion has been invested in the acquisition and restoration of California wetlands. This investment has resulted in over 775,000 acres of wetlands being protected and restored.

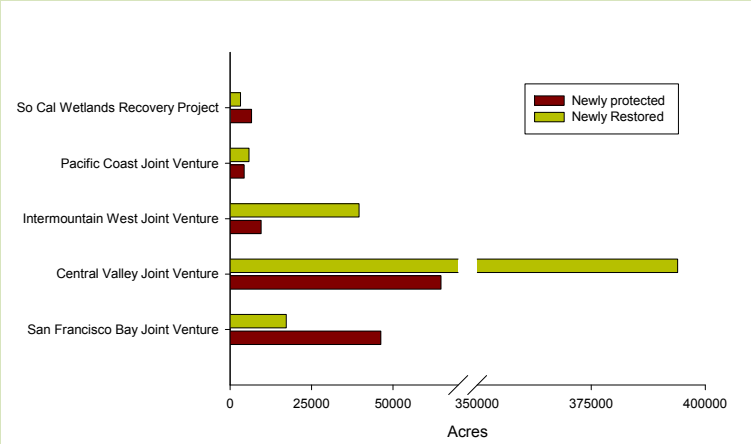
Wetland Gain due to Compensatory Mitigation

Many factors affect the determination of whether compensatory mitigation replaces the wetland functions lost as a result of permitted fills. Compensatory mitigation typically requires equal or greater replacement. However, several studies have indicated that less than 20% of "mitigation" wetlands result in ecologically successful wetlands



Wetland Acquisition and Restoration

As envisioned in the 1993 State Wetland Policy, the State has utilized regional implementation strategies to guide investment of billions of bond dollars in wetland conservation and to move wetland regulation away from permitting isolated mitigation sites to regionally planned mitigation (e.g., banks, SAMPs, NCCPs). Local joint ventures have been particularly successful at acquiring and restoring wetlands in their regions, accounting for over 580,000 acres of wetland acquisition, restoration, and enhancement between 1999 and 2008



Protecting Wetlands on Agricultural Lands

The U.S. Department of Agriculture's Wetlands Reserve Program (USDA-WRP) is a voluntary program that provides technical and financial assistance to private landowners and Tribes to restore, protect, and enhance wetlands in exchange for retiring eligible land from agriculture. Over 1.9 million acres are currently enrolled in WRP nationwide. Since 1998, more than 61,000 acres in California have been enrolled in the USDA-WRP resulting in substantial wetland protection in the agricultural regions of California.

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What Are the Causes of Poor 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>>>

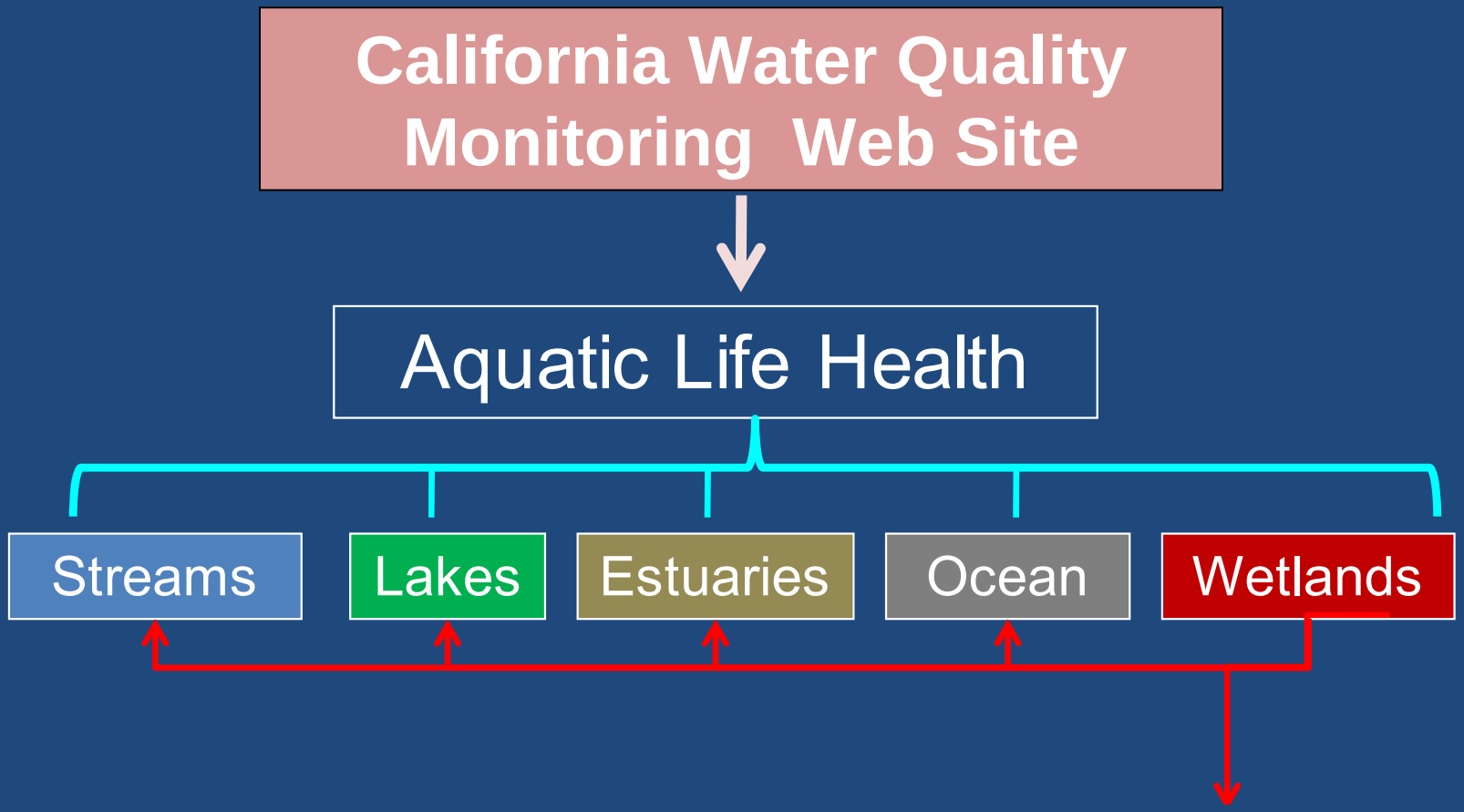
OVERHARVESTING

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

CLIMATE CHANGE

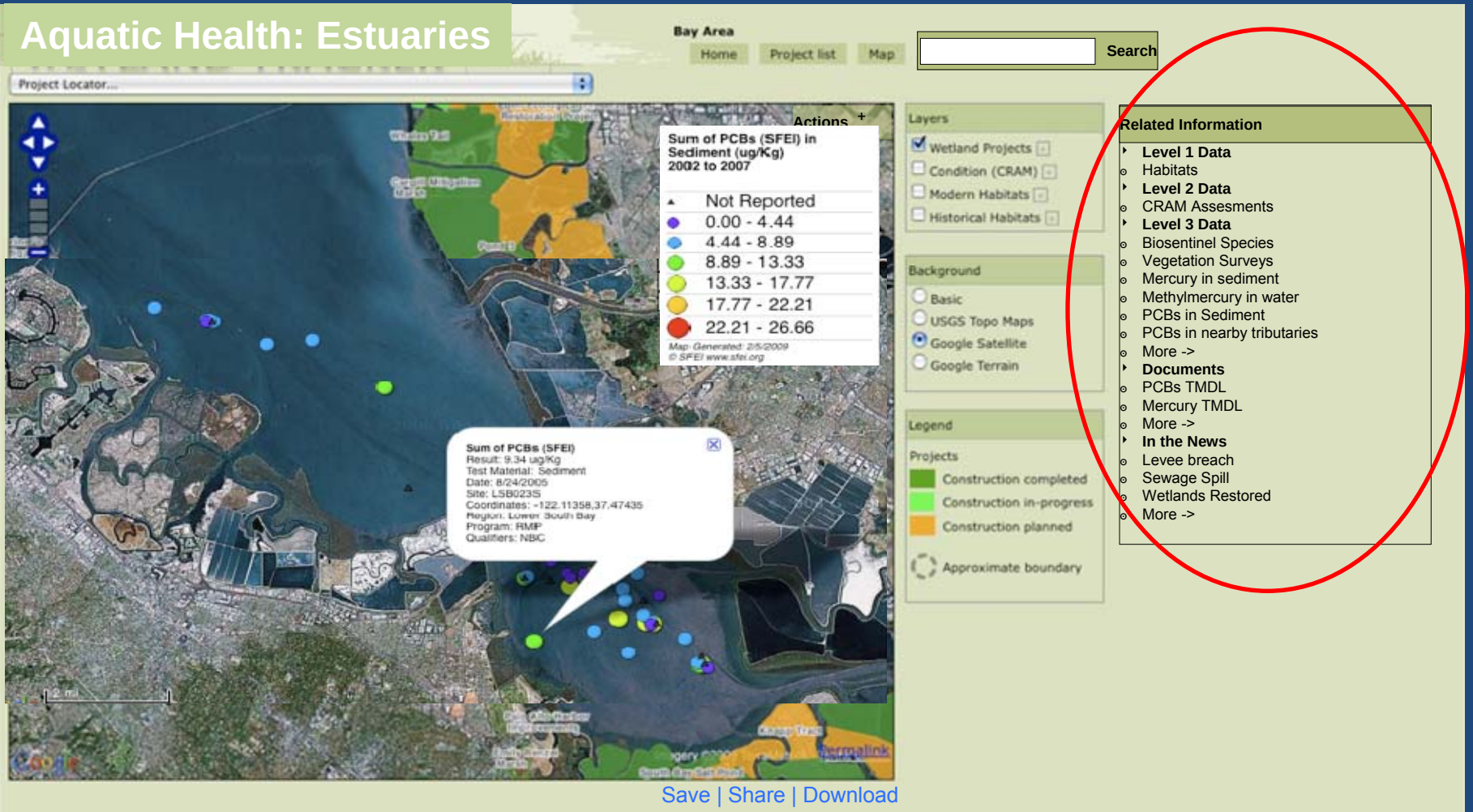
The world is entering a period of rapid climate change. While there is uncertainty about the future rates of change. More>>>

Long-term Vision



User queries may draw data from multiple topic areas

Aquatic Health: Estuaries



Common query and display tools allow data sharing among topic areas

Information Technology Workgroup facilitates common tool development

THANK YOU