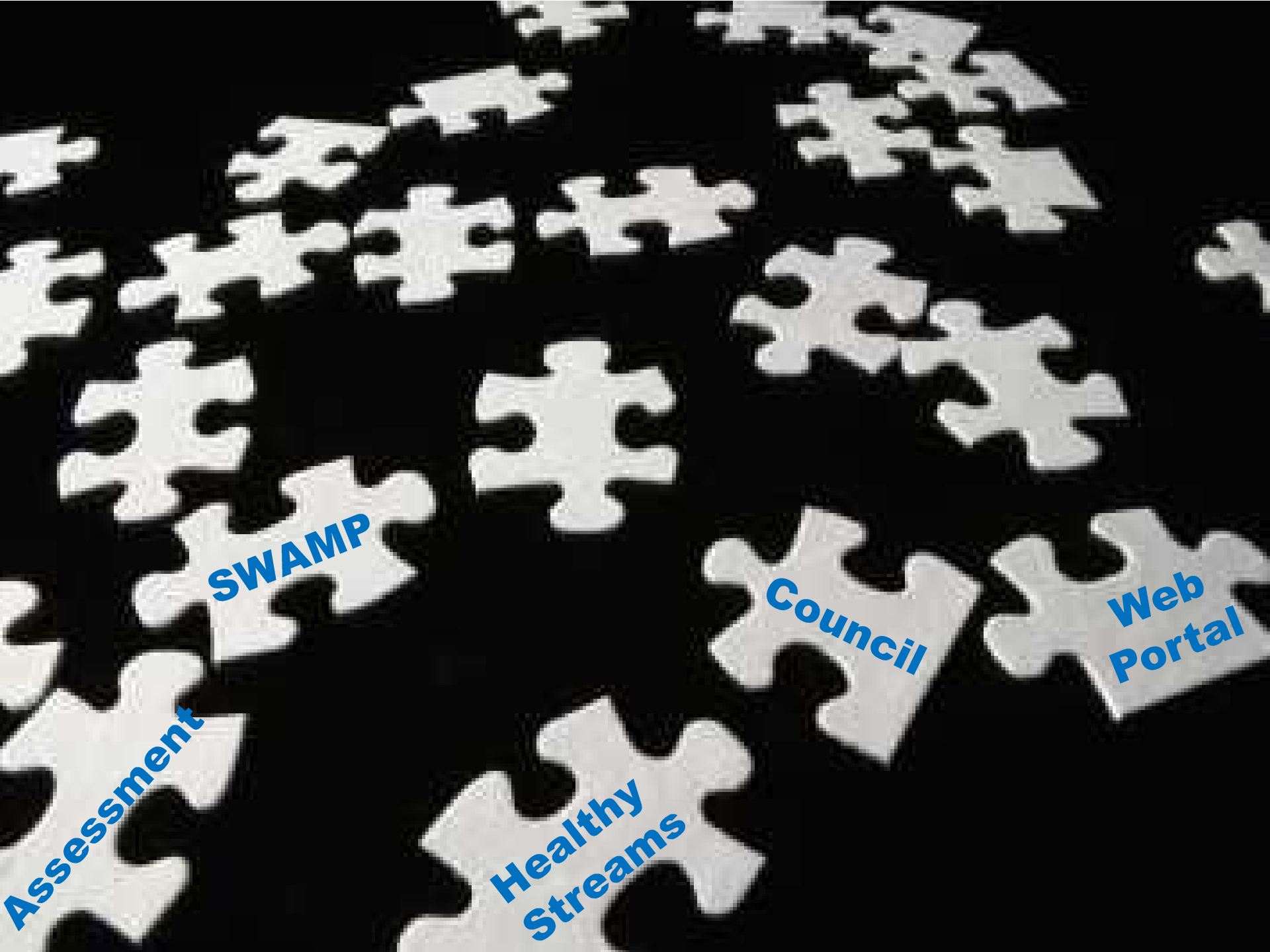
Developing California's Healthy Stream Partnership

Integrated Assessments & Information Delivery through the CA Water Quality Monitoring Council Healthy Ecosystem Web Portal

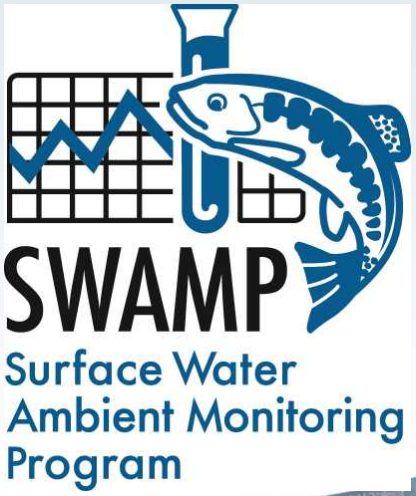
Karen Larsen

CA State Water Board

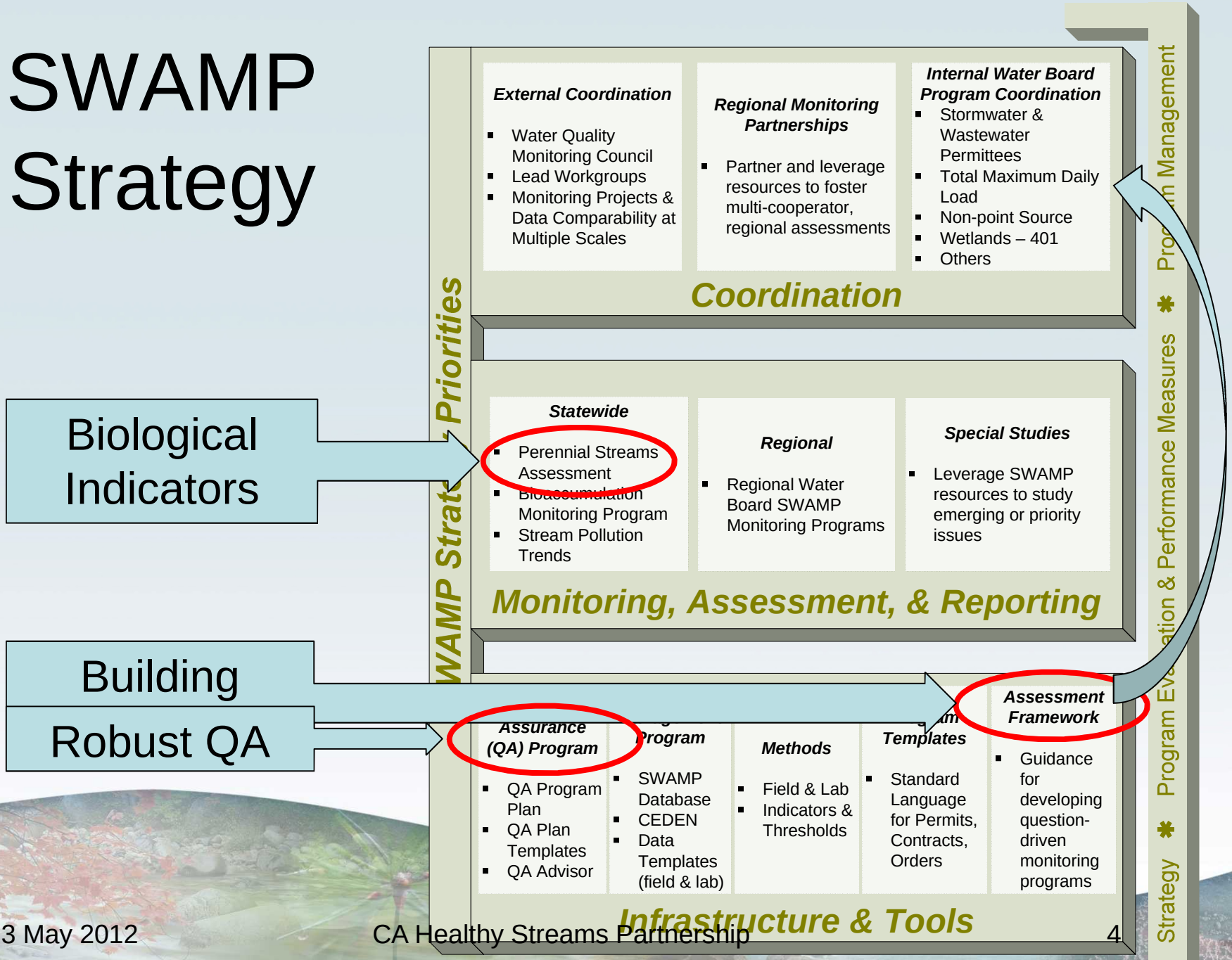

SWAMP
Council
Web Portal
Assessment
Healthy Streams

SWAMP

- Required by AB 982 (1999)
- Comprehensive statewide program (surface water)
- Coordinate all ambient monitoring
- Robust Quality Assurance
- Comparable Data
- Accessible



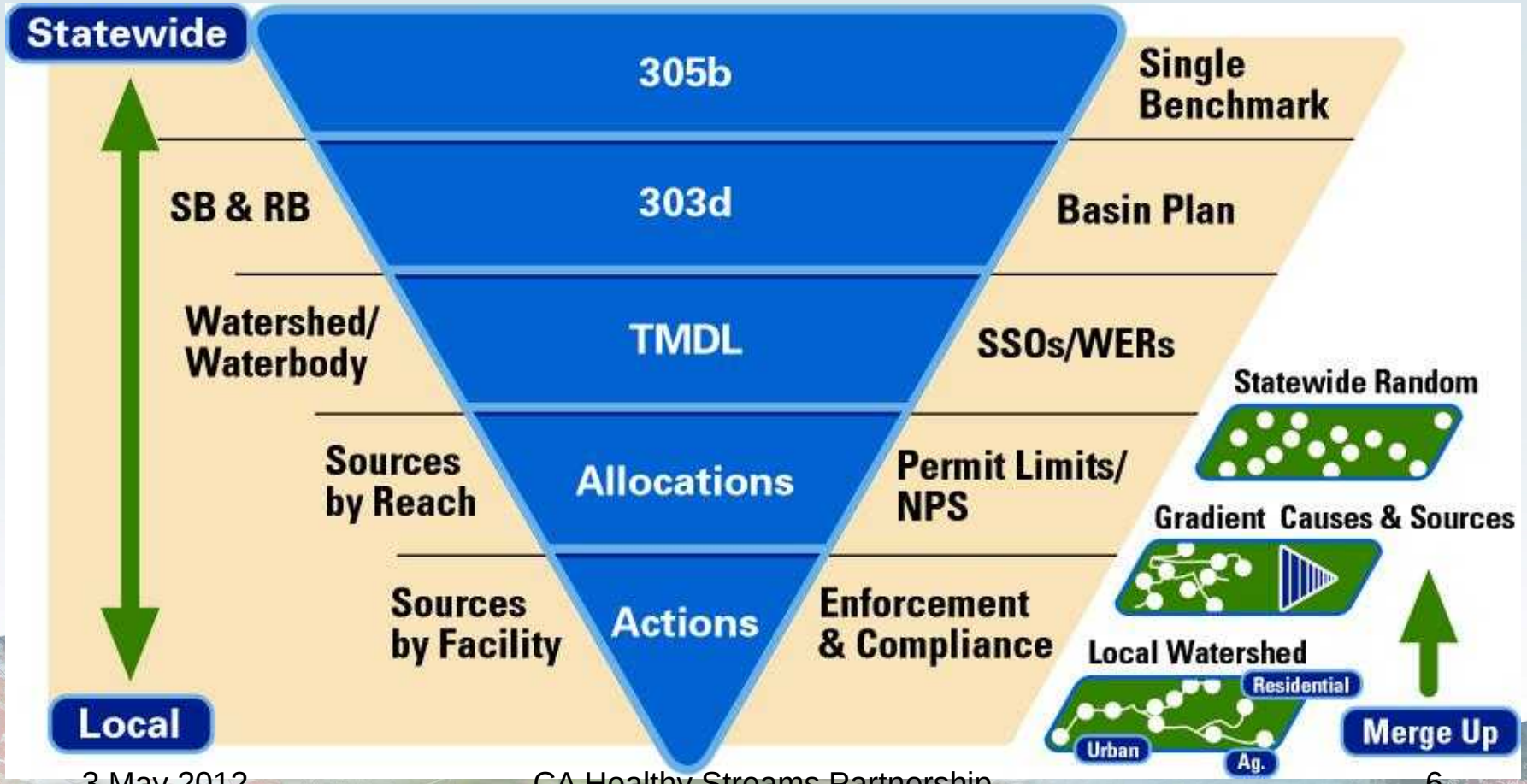
SWAMP Strategy



Building Comparability – Assessment Framework

- Common Indicators
- Common Assessment Thresholds
- Application-Appropriate Methods
- Quality Assurance Program
- Data Management & Exchange
- Tool Box, Training, & Help Desk

Integrating Across Scales & Regulatory Programs



CALIFORNIA WATER QUALITY MONITORING COUNCIL

Objectives

- Maximize use of existing water monitoring
- Make data available to decision makers and public

Implementation

- Streamlined data access – Theme-specific Web Portals
- Expert workgroups to manage portal content
- Overarching Council guidance

- Cal/EPA
- Natural Resources Agency
- About the California Water Quality Monitoring Council

- Web Portal Partners
- Monitoring & Assessment Programs, Data Sources & Reports
- Water Quality Standards, Plans and Policies
- Regulatory Activities
- Enforcement Actions
- Research

- State & Regional Water Boards
  - Performance Report
  - About SWAMP
  - SWAMP Tools

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 that may be viewed across space and time. Initial web portal development concentrates on four theme areas, with web portals to be released one at a time. Click the Contact Us tab for more information.

The Monitoring Council seeks to provide multiple perspectives on water quality information and to highlight existing data gaps and inconsistencies in data collection and interpretation, thereby identifying areas for needed improvement in order to better address the public's questions. Questions and comments should be addressed through the Contact Us tab.

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. *[Future Portal]*

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?

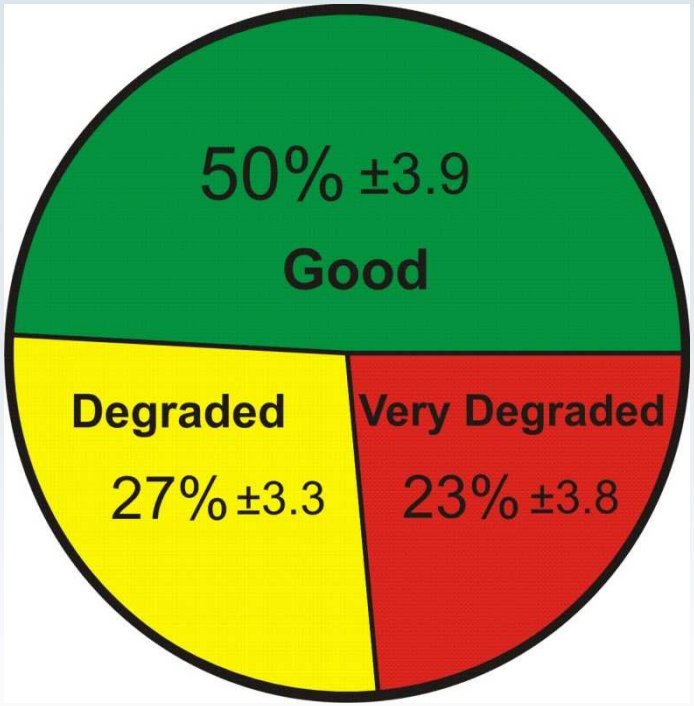
Aquatic organisms are able to accumulate certain pollutants from the water in which they live, sometimes reaching levels that could harm consumers. More>>

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>>

Healthy Streams Partnership

- Utilize physical, chemical, and biological objectives to:
  - Protect high quality streams
  - Protect “at risk” streams from degradation
  - Set restoration goals for impaired streams



Healthy Streams Partnership

Objectives

- Chemical (CTR, Basin Plans)
- Toxicity
- Biological (BMI, algae)
- Habitat (Hydromod, Riparian Policy)

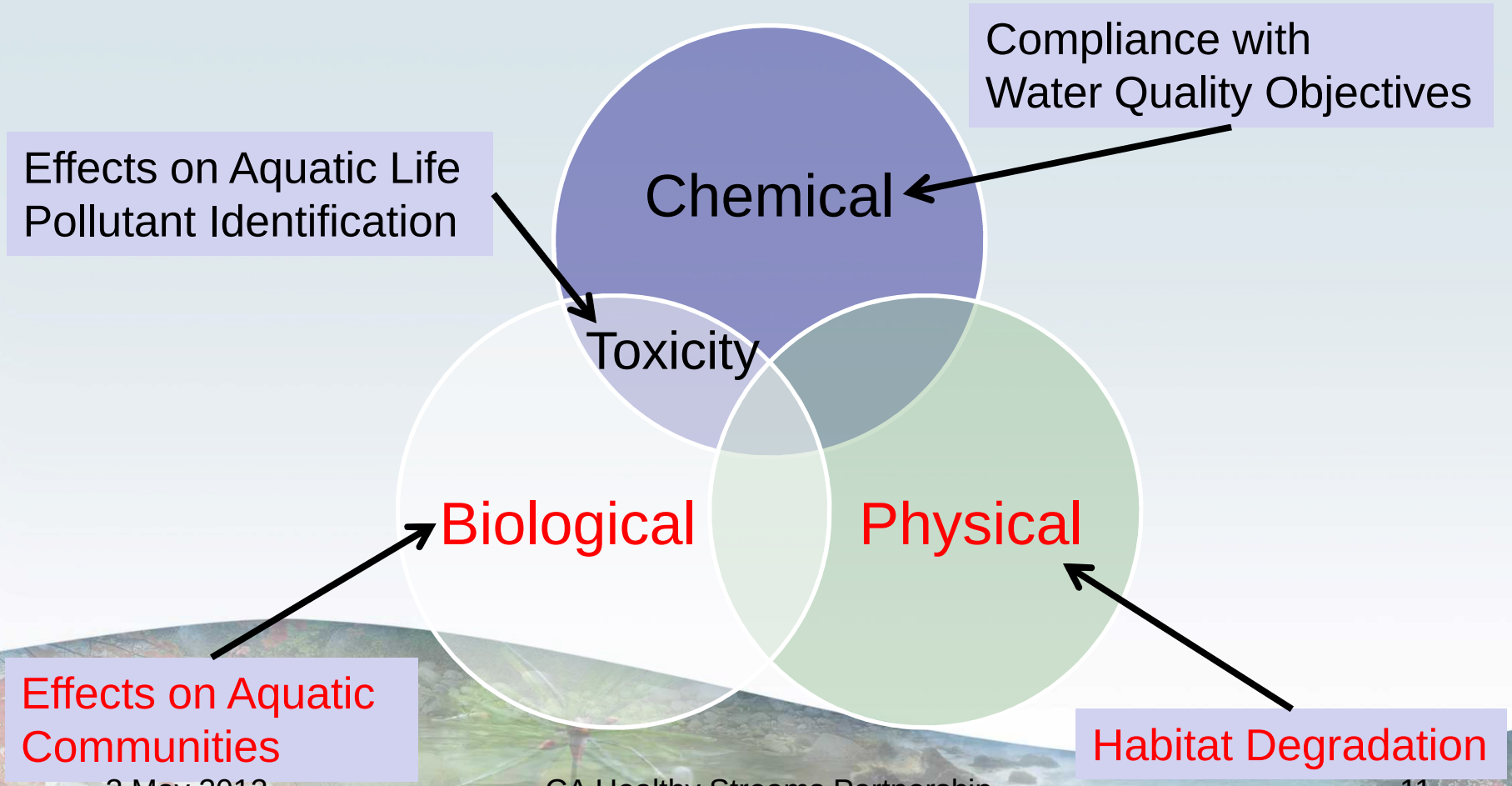
Programmatic Tools

- 305(b)/303(d) Assessments
- Non-point Source
- NPDES
- 401 Certification, Wetlands
- TMDLs
- Compliance/Enforcement
- Anti-degradation

SWAMP Assessment Framework

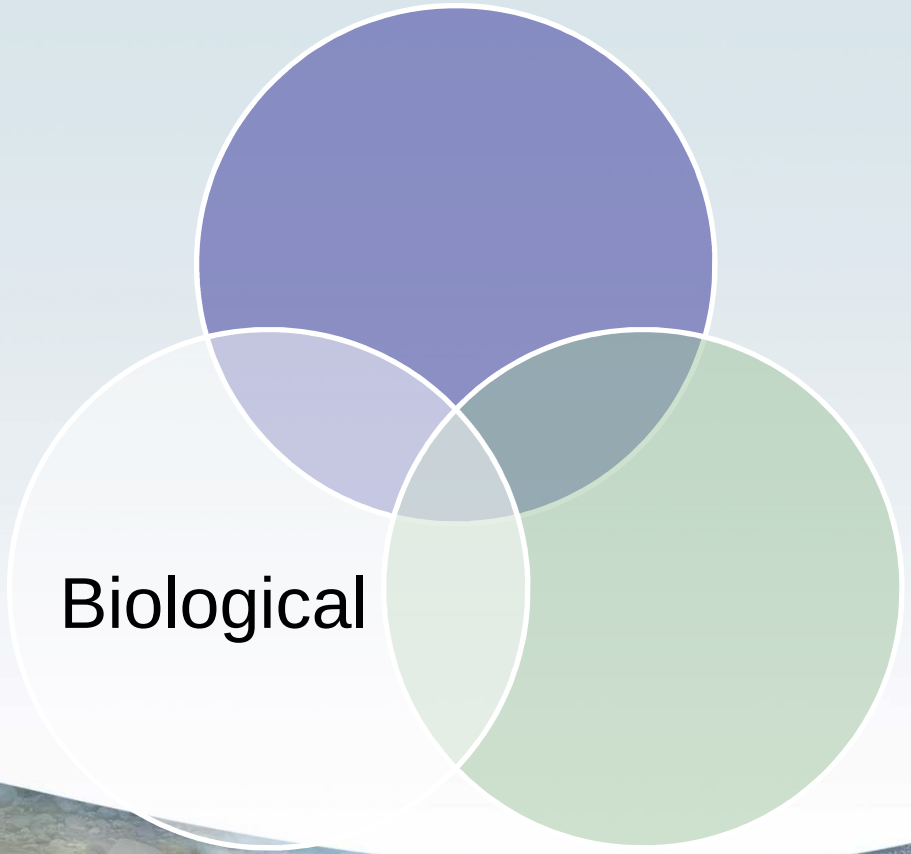
- Indicator Development (assessment tools)
- Perennial Streams Survey (background condition)
- Reference Condition (expectations)
- Statewide Pollution Trends (chemistry, toxicity)

Healthy Streams Partnership



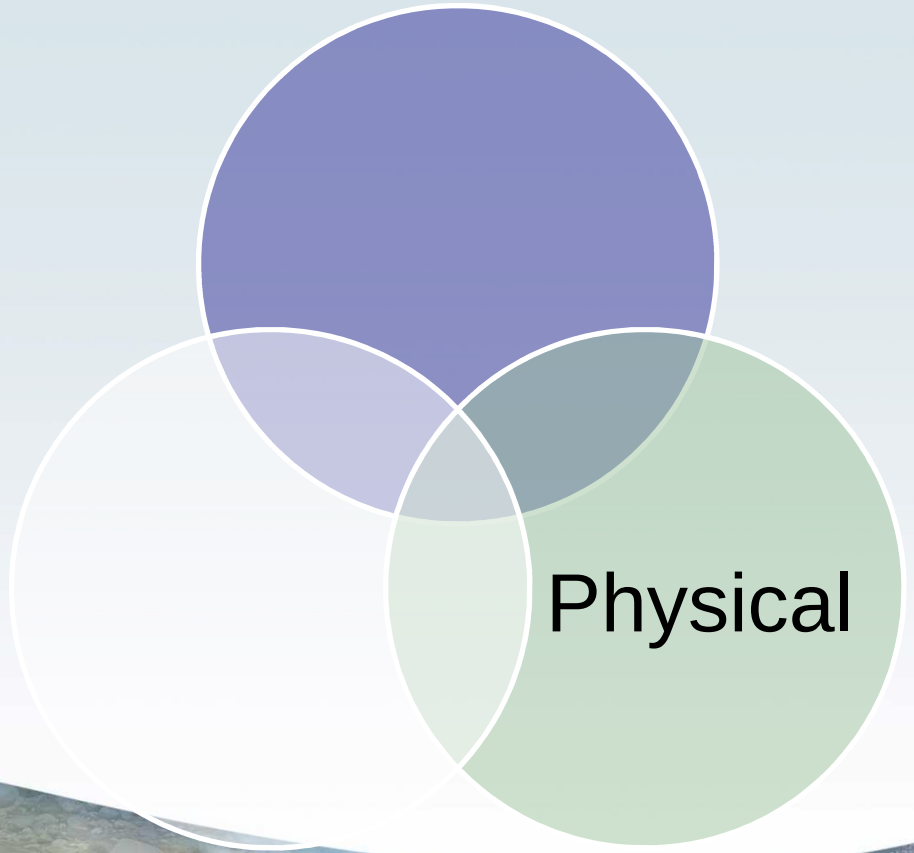
Healthy Streams Partnership Biology

- Perennial Streams Assessment
- Reference Condition
- Indicator Development
- Nutrient Numeric Endpoints
- Biological Objectives



Healthy Streams Partnership Physical

- Hydromodification
- Riparian Area and Wetland Protection Policy



CA Healthy Watersheds Assessment

- Six Healthy Watersheds Attributes
  1. Landscape condition
  2. Habitat condition
  3. Hydrologic condition
  4. Geomorphic condition
  5. Water quality
  6. Biological condition

Watershed Attribute Indicators

Landscape Condition	Habitat Condition	Hydrologic Condition	Geomorphic Condition	Water Quality	Biological Condition
% Natural Land Cover	Riparian Vegetation	Hydrologic Alteration	% Sands & Fines	Predicted TN	O/E BMI Scores
Landscape Connectivity	Habitat Complexity	Groundwater Stress		Predicted TP	Wetland Biotic Structure
Landscape Disturbance Regime	Habitat Fragmentation				

Index of Watershed Health

- Normalize & scale indicators
- Indicator weighting by Healthy Streams Partnership
- Calculate sub-indices for each attribute

- Cal/EPA
- Natural Resources Agency
- About the California Water Quality Monitoring Council

AQUATIC HEALTH LINKS

- Stressors
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California Streams, Rivers and Lakes

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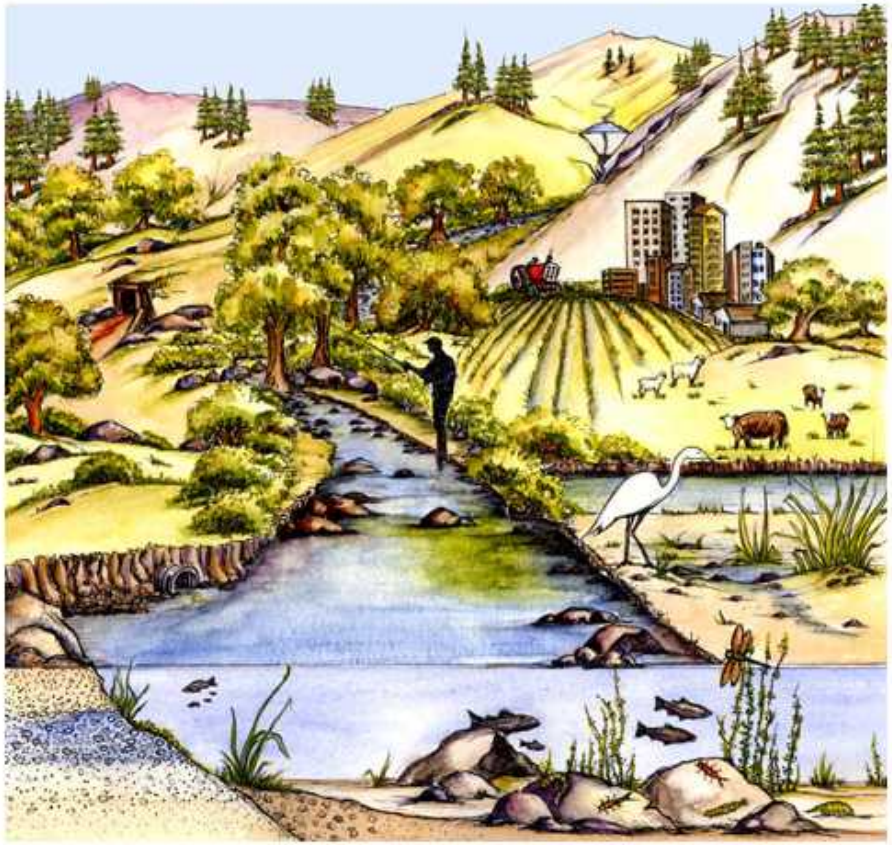

Healthy streams, rivers, and lakes provide safe drinking water, recreational opportunities, and important habitat for species ranging from the red-shouldered hawk to steelhead to crayfish and dragonflies. Maintaining healthy streams, rivers, and lakes can reduce the need for water treatment and water supply costs and make landscapes more resilient to climate change. To determine the health of a waterway and the flora and fauna that live there, investigators can use a combination of chemical, biological, and physical assessments. Among the characteristics that may be considered are habitat quality, aquatic life diversity, water chemistry, stream hydrology, the physical channel form, and sediment transport processes of the stream. Show | Hide Navigation Instructions.

QUESTIONS ANSWERED

- What is the extent of our stream and river resources?
- What is the condition of our streams and rivers?
- What is being done to make our waters healthier?

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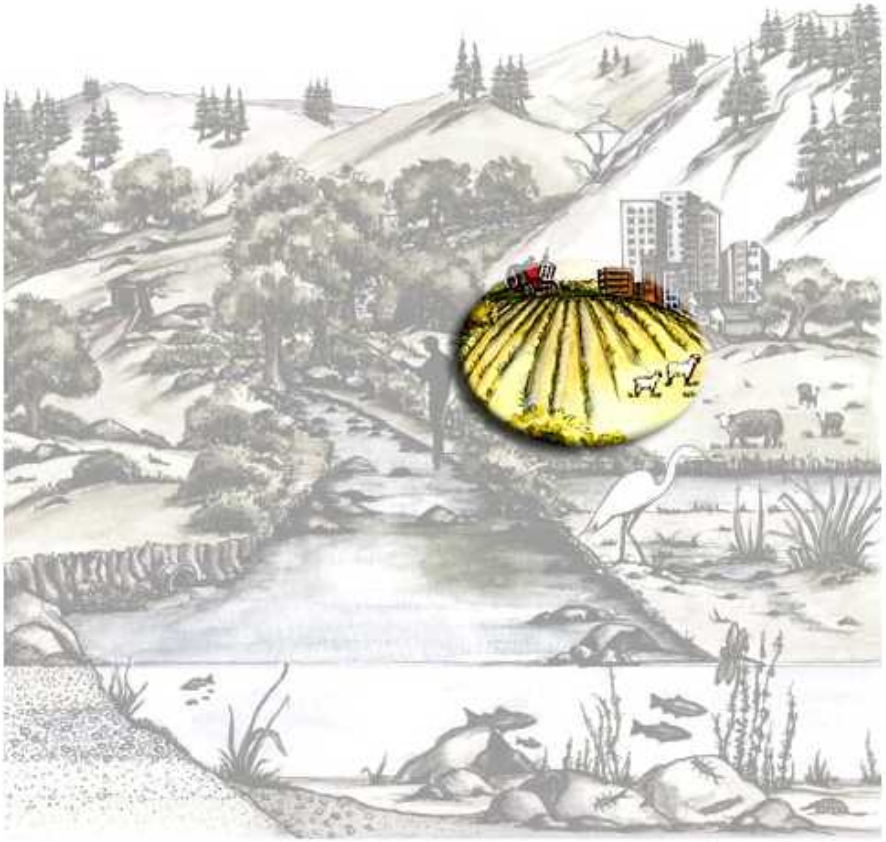

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California Streams, Rivers and Lakes

Why is Land Use Important?

Nearby Urban

The built environment found in an urban area is characterized by the trappings of civilization. Roads, sewer systems, parks, and flood channels mark the landscape. These cause significant changes in how water flows across the landscape and on the quality of that water. Stormwater runoff in urban areas can pick up oils and chemical residue from our cars and streets; bacteria and nutrients from pet waste; and pesticides and nutrients from lawns and gardens. These pollutants can harm fish and wildlife populations, compromise native vegetation, and degrade water quality

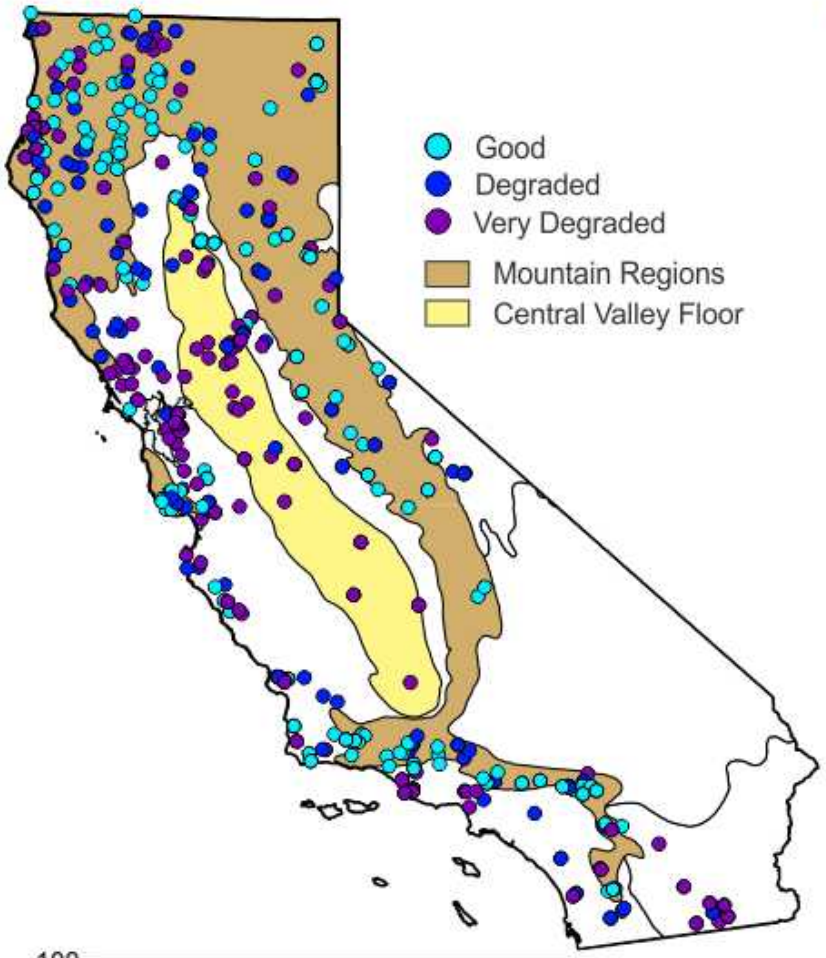
Buildings, paved parking lots and roads are hard, impervious surfaces which control how water is transported to urban streams. In an urban setting rain and snowmelt cannot penetrate the hard surfaces and soak into the ground. Instead, stormwater drains directly to storm drains, streams, or other surface water bodies. Typically the volume and velocity of surface water flow are higher in urban areas than in undeveloped areas. This altered hydrology can be very different from the natural drainage patterns and may disrupt the balance between its water and sediment within the system.

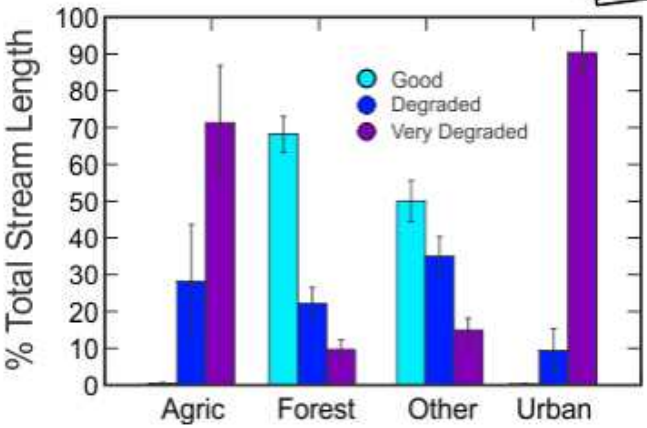
Often streams that flow through our cities and towns have lost many of the adjacent trees and shrubs that provide shade and streamside (riparian) habitat. The loss of riparian vegetation may increase water temperature above that which is healthy for fish and other native species that live in the streams

Nearby Agriculture

Agricultural practices greatly impact stream health. Plowing, pesticide application, irrigation, fertilizing, planting, and harvesting can introduce pollutants into nearby streams. Confined animal facilities (e.g., feedlots, dairies), and grazing can also be a source of pollution. Excess sediment, nutrients, pathogens, pesticides, and salts are commonly found pollutants in waters adjacent to and downstream of agricultural areas.

While grazing cattle compact the soil, making it harder for rainfall to infiltrate soils and move into groundwater basins. Instead, more water flows directly into streams. Some natural drainages are channelized to provide water for irrigation or to move agricultural runoff away from fields. Increased flow volume and velocity create an altered hydrology that is different from the natural drainage patterns for a stream and may disrupt the balance between its water and sediment in the system.





How does land use affect the health of our streams?

The health of our rivers and streams is influenced by their surroundings. Streams that run through industrial corridors may be subject to increased stress relative to pristine streams in the Sierra. Streams in agricultural areas could be subject to contaminants from pesticide applications. Streams in cities may be littered with trash.

- Why is land use important?

This map shows the distribution of sites sampled under the Perennial Streams Assessment (PSA) Program between 2000 and 2007 coded by biological condition.

The Perennial Streams Assessment (PSA) looked at the relationship between the condition of our streams and nearby land uses. The PSA study sites were classified based on the dominant land use in the upstream watershed. Stream condition was then compared across these land use classes. Land use appears to be a strong determinant of stream condition. A higher proportion of stream miles are impaired in agricultural and urban landscapes. In fact, 100% of streams draining agricultural and urban landscapes sampled in the PSA survey had degraded or very degraded biological condition, whereas about 30% of streams draining forested landscapes had degraded biological condition.

Streams draining agricultural areas tended to have high levels of agriculture related contaminants (phosphorous, nitrogen, chloride). In addition, almost all of these streams exhibited some form of habitat disturbance, both instream and riparian. Urban streams had high levels of nutrients and very high levels of chloride. Habitat degradation was common in most urban streams where instream habitat was especially degraded. Poor water quality and habitat degradation observed in forested areas was less pervasive than for either agricultural or urban areas.

- View reports of the State Water Board's Perennial Streams Assessment (PSA)

(Updated 3/21/12)

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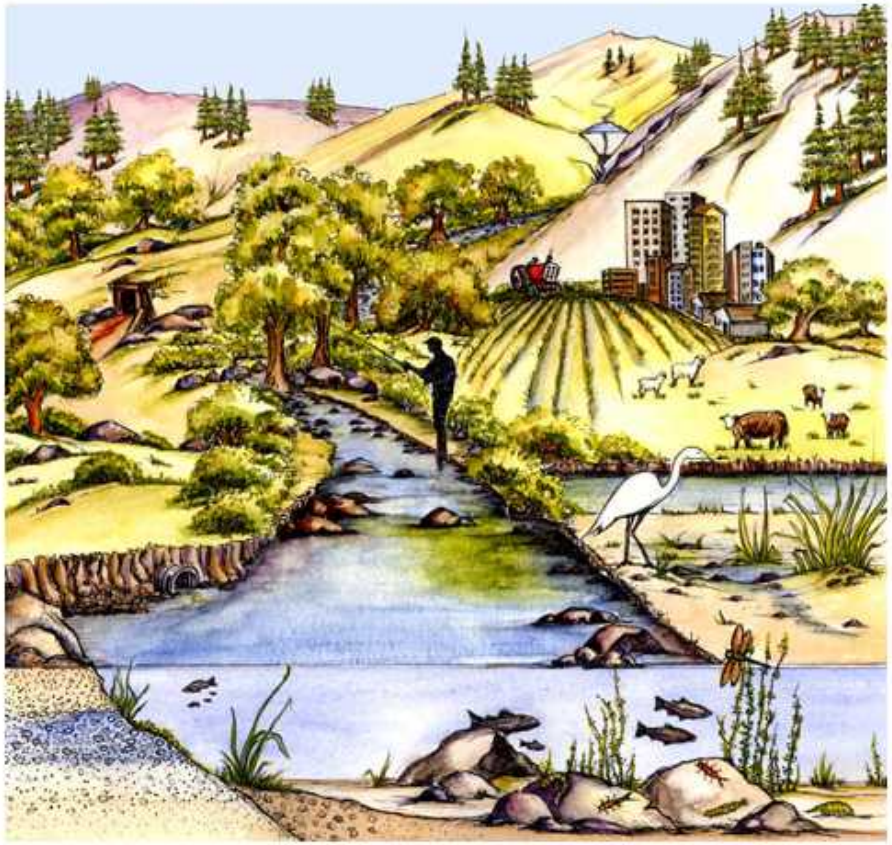

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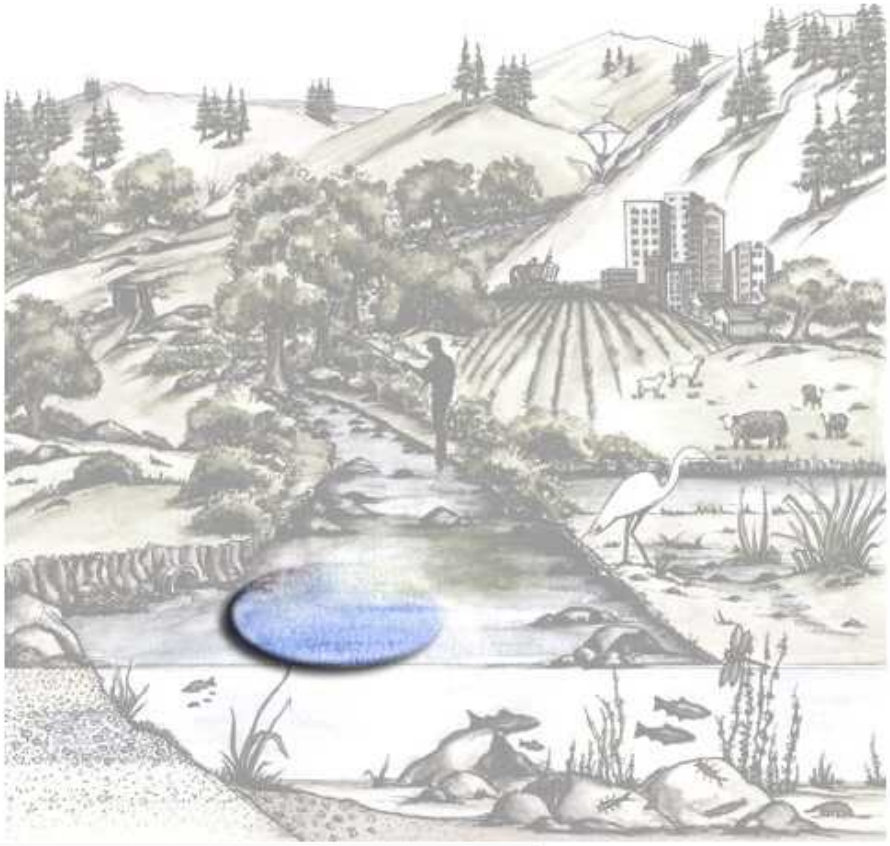

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California Streams, Rivers and Lakes

How is the quality of water important in our streams, rivers and lakes?

The quality of the water in a stream affects the health of fish and other organisms that live there as well as our ability to use the water for swimming, drinking, and other purposes. Many of our streams have high levels of pesticides, bacteria, and other contaminants. These contaminants are discharged or wash into streams from land uses such as agriculture, industry, urban and residential development, and mining operations. The pollutants can contaminate drinking water and harm plants and wildlife. Monitoring water quality can help managers identify sources of pollution and work to promote healthy streams. In monitoring of fresh water sites conducted between 2001 and 2010, greater than 50% of collection sites showed some degree of toxicity or pollution harmful to fish or other aquatic life.

How do we measure water quality?

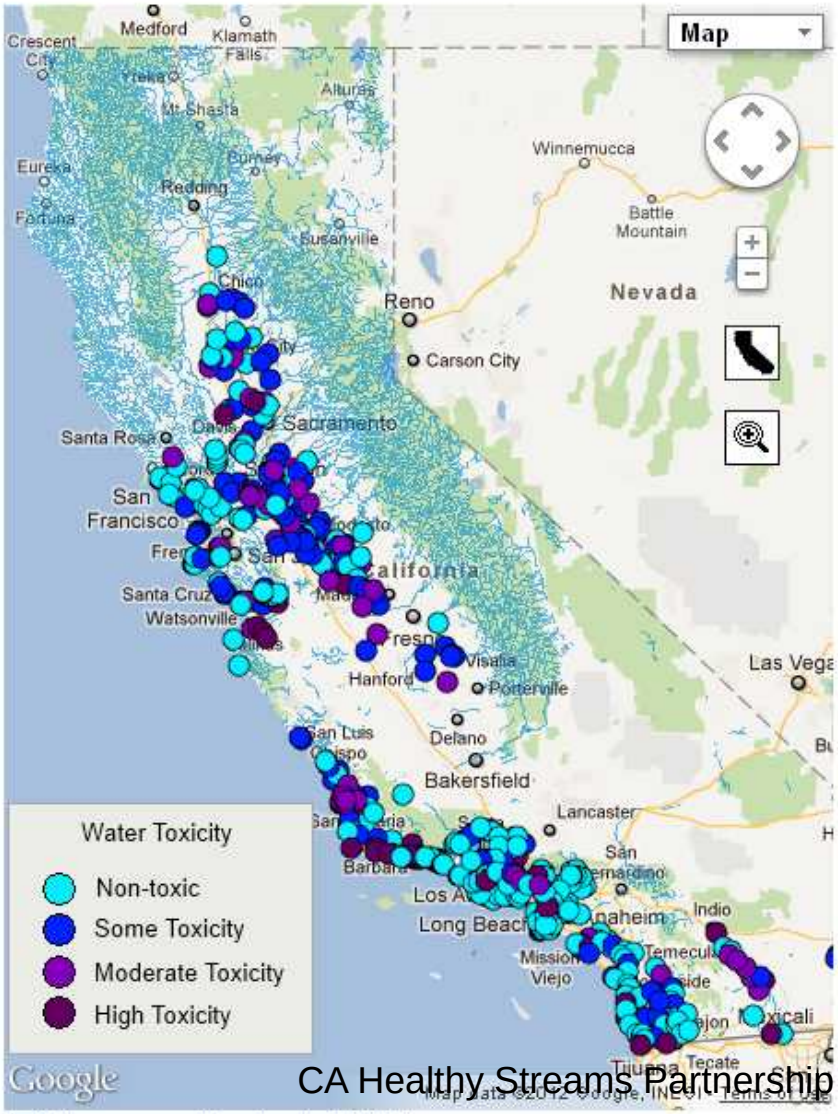
To measure water quality, managers can perform water toxicity tests, which measure whether a sample of water is toxic to test organisms. These can be combined with chemical analyses of pollutant concentrations in water and measurements of temperature, dissolved oxygen, and water clarity to get a more complete picture of water quality. This portal contains information on water toxicity levels throughout the state. Water chemistry information will be added to this portal in the future. The effects of bacteria on swimming safety statewide are presented in the Safe to Swim portal.

- Water Toxicity data - this page explains how well California streams can support aquatic life
- Water Pollution - future pages will contain data from chemical analysis of pollutants in our waters

(Updated 2/28/12)

California Streams, Rivers and Lakes


– Select a Region Type –

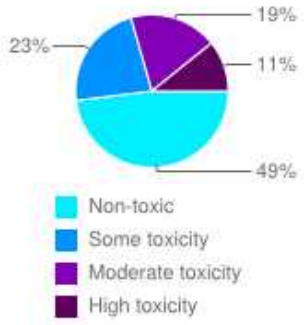


View water toxicity data in CEDEN.

How toxic is the water in our streams, rivers and lakes?

To measure how well a water body supports aquatic life, we can perform a toxicity test. Water samples from a given water body are taken to the laboratory and groups of organisms are exposed to that water to see if they exhibit any adverse effects, such as the inability to reproduce or death. Toxicity tests are especially useful in water quality monitoring because they show the overall effect on aquatic life of all of the chemicals found in the water sample.

In 2011 the State Water Board issued its report of nine years of toxicity testing data collected by the Surface Water Ambient Monitoring Program and partner programs. Toxicity was assessed based study of sites around the state. The process used to characterize the magnitude of toxicity at each site was designed to take into consideration the widely varying number of samples and types of test among sites. Toxicity tests can assess mortality, behavioral changes, reproductive status or physiological and biochemical changes.



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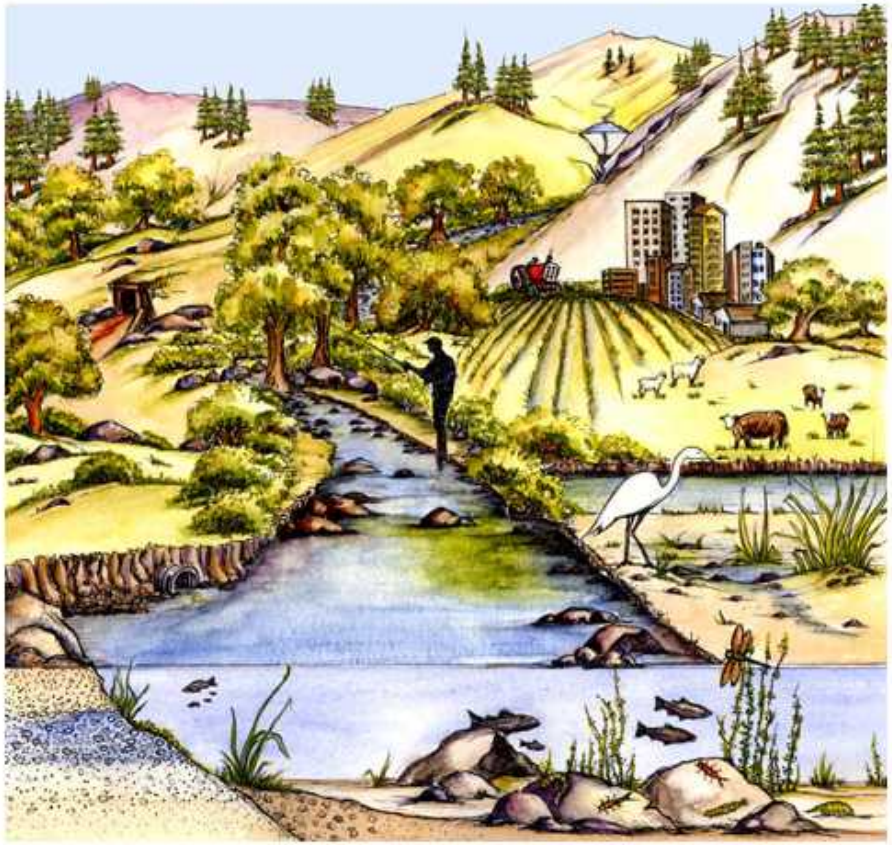

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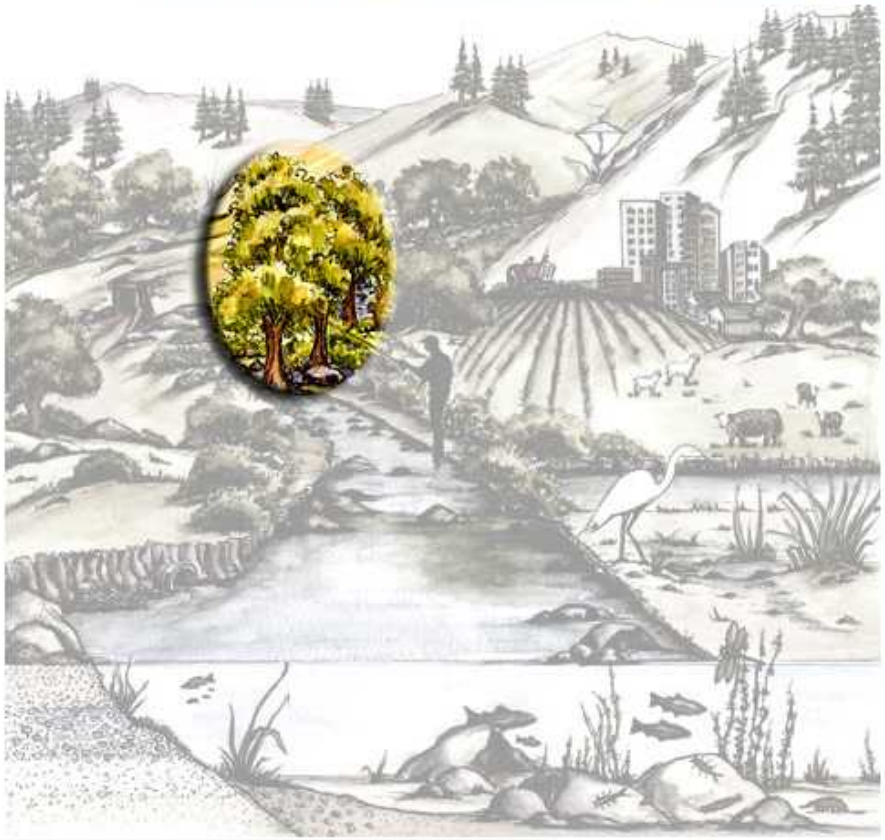

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California Streams, Rivers and Lakes

Why is riparian cover and buffer important?

The characteristics of the area immediately surrounding a stream can affect channel form, sediment input, pollution, water temperatures, and the type of life a stream can support. These areas bordering a stream are known as "riparian areas." Streams that flow through highly developed or urban areas often lack a functional streamside corridor to protect the stream from human influences like trash, contaminants, and even foot traffic, causing the stream to become unhealthy.

Naturally, California streams support a broad range of riparian habitat types. Some healthy streams are surrounded by bare ground or steep canyons, while others support grasses, shrubs, trees, or even wetlands. Healthy riparian areas can help absorb flood flows and provide a protective buffer between the stream and the surrounding land uses, as well as providing important habitat for wide range of species. Streamside vegetation also provides shade that can help keep water temperature low enough for species such as salmon to survive, and filters contaminants entering streams.

riparian cover

How do we measure the condition of riparian areas?

To assess streamside characteristics and riparian health, investigators can record the type of vegetation found along a stream, the width of the riparian zone, and other factors.

buffer

(Updated 2/28/12)


California
Healthy
Streams
Questions?