

## **Agriculture and Water Quality in California**

The Environmental Protection Agency's (EPA) [ATTAINS](#) website states that agriculture is the leading probable source of impairments to the nation's assessed rivers and streams and the third probable source of impairments to our assessed rivers and lakes. Impairments from agriculture are generally considered nonpoint source pollution. As irrigation and stormwater runoff moves off of fields and eventually off farms, natural and human-made pollutants are picked up and carried away, finally being deposited into lakes, rivers, wetlands, coastal waters, or contaminating our underground sources of drinking water. The effects of chronic, nonpoint pollution on natural resources are more subtle and gradual than those associated with intentional or accidental spills. In most cases, the loss of fish or wildlife occurs over a long period of time as a result of a decline in water quality. The end result is much more serious since the ability of water to support life may be virtually destroyed.

The most common causes of water quality degradation from agriculture are sediment, nutrients, and pesticides. Salinity, temperature increases, bacteria, and naturally occurring metals are also concerns caused by runoff, water use, animal lots, and other common agricultural practices.

Examples of agricultural activities that can lead to negative water quality impacts are plowing too often or at the wrong time and improper, excessive, or poorly timed application of pesticides, irrigation water, and fertilizer.

### **NRCS Role in Water Quality**

The NRCS provides voluntary conservation planning and technical assistance to individuals, groups, and units of government. These NRCS clients help develop and implement conservation plans to protect, conserve, and enhance natural resources (soil, water, air, plants, and animals) and energy. During the course of developing a conservation plan, an inventory of the resource conditions on the farm is produced, including the soil types and soil characteristics, the slope and slope lengths of each field, crop types and rotations, and other significant items necessary for maintaining soil and water quality and farm productivity.

A [conservation plan](#) by the NRCS provides a professional analysis of a landowner's natural resources and helps owners/managers craft alternatives based on their goals and budget. The alternatives can include engineering, agronomic, soils and biological solutions to address problems such as erosion, impaired water, dust, pesticide and nutrient runoff, and more. Plans can also be developed to further enhance already-healthy land or to augment land for habitat beneficial to fish and wildlife.

Impacts from agricultural activities on surface water and ground water can be minimized by using [conservation practices](#) that are adapted on a site-by-site basis. Conservation practices are specific structural, managerial, or cultural treatments of natural resources commonly used to meet specific needs in planning and maintaining the quality and quantity of water, soil, air, plant,

and animal resources. For example, implementation of irrigation water management, filter strips, and sediment basins can reduce problems from erosion and sedimentation. NRCS conservation practices have decades of history refining and proving their effectiveness for site specific solutions. Many practices designed to reduce pollution also increase productivity or save farmers and ranchers input costs.

## **California's Agricultural Water Quality Regulations**

Water quality in California is under the jurisdiction of the [California State Water Resources Control Board \(SWRCB\)](#). Under the SWRCB are nine [Regional Water Quality Control Boards \(RB\)](#) deciding the standards, objectives, and beneficial uses for the waters in their region. Both the SWRCB and the RBs are regulatory in nature.

The water quality objectives and laws are set by the national [Clean Water Act of 1972](#) and California's [Porter Cologne Water Quality Control Act](#).

While the rules pertaining to water quality and agriculture may vary from region to region, there are many similarities being discussed as the RBs update their [Irrigated Lands Regulatory Program](#) rules that will further regulate agricultural runoff from irrigation and storms. Farmers will be ordered to monitor their runoff, whether individually or regionally through coalitions. Most will be responsible for having evaluations and management plans in place for water quality, sediment management, groundwater management and nitrogen management.

## **Water Quality Assessment**

Water quality assessments are important in determining the condition of the state's waters. Government agencies, water quality coalitions, community and volunteer groups all monitor and maintain records. Much of this data may be found online.

Information gathered from these sources can be used to provide very general, qualitative knowledge to estimate water quality that can be combined with professional judgment, field experience, and common sense. Knowing the past and existing condition of surface waters can help ensure current and planned conservation practices are, and will, contribute towards the correction and prevention of water quality problems. Collecting existing water quality information, analyzing the results and applying this knowledge to conservation planning will allow landowners and planners to achieve the water quality criteria for resource management systems.

## **Further Sources of Information on Water Quality**

### **Federal Sources**

- NRCS:
  1. [Stream Visual Assessment Protocol](#): Provides a simple procedure to evaluate the condition of a stream based on visual characteristics. It is designed for use by landowners and conservationists in the field. The protocol provides an overall

assessment of the condition of the stream and riparian ecosystems, identifies opportunities to enhance biological value, and conveys information on how streams function and the importance of protecting or restoring stream and riparian areas. The assessment can be completed in 15 to 20 minutes and no prior training in biology or hydrology is required.

2. [NRCS Water Quality Handbook](#): This handbook is the principal NRCS water quality reference regarding all agricultural land uses. The handbook is the definitive NRCS resource for water quality technical information, guidance, and procedures.
- U.S. Geologic Survey: National Water Quality Assessment (NAWQA) began its program in 1991, systematically collecting chemical, biological, and physical water quality data from 51 [study units \(basins\)](#) across the nation, including CA.
  - Environmental Protection Agency:
    1. [Surf Your Watershed](#)
    2. [Enviromapper](#)
    3. [STORET](#)
    4. [My Waters Mapper](#)
    5. [How's My Waterway?](#)

### **State of California Sources**

- [California List of Impaired Waters \(303\(d\)\)](#): The 303(d) report provides the type of water body, the Calwater watershed number, the pollutant or stressor causing the impairment (such as temperature or nutrients), the potential sources of the pollutant (such as municipal), the TMDL priority and proposed TMDL completion, and the estimated size of the water body that is impacted.
- SWAMP: The [Surface Water Ambient Monitoring Program \(SWAMP\)](#) is the only statewide program tasked with assessing water quality in all of California's streams, lakes, wetlands, estuaries, and coastal waters. SWAMP coordinates State and Regional Water Board monitoring throughout the State, and is in a unique position to collaborate with partner organizations to produce timely information through reports, fact sheets, Websites, and an extensive water quality data base – all targeted to support water resource management in California.
- CCAMP: The [Central Coast Ambient Monitoring Program \(CCAMP\)](#) is the Central Coast Regional Water Quality Control Board's regionally scaled water quality monitoring and assessment program. The purpose of the program is to provide scientific information to Regional Board staff and the public, to protect, restore, and enhance the quality of the waters of central California.
- Perennial Streams Assessment (PSA): The [PSA](#) is an ongoing, long-term statewide survey of the ecological condition of wadeable perennial streams and rivers throughout California. The PSA collects samples for biological indicators (benthic macroinvertebrates, algae) and chemical constituents (nutrients, major ions, etc.), and conducts habitat assessments (both for in-stream and riparian corridor conditions).

### **Water Quality Training**

- EPA: Learn about the Clean Water Act and other topics at the EPA Watershed Academy: <http://www.epa.gov/owow/watershed/wacademy/acad2000/cwa/index.htm>
- SWAMP Webinars: [http://www.swrcb.ca.gov/water\\_issues/programs/swamp/presentation.shtml](http://www.swrcb.ca.gov/water_issues/programs/swamp/presentation.shtml)

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