

Water Quality

A significant portion of the California's water supplies are impaired, and rising salinity threatens to lower agricultural yields (see the salinity white paper). In addition, lower water quality increases costs for urban water treatment and has the potential to cause substantial harm to human health and ecosystems.

The Federal government regulates water quality through the Clean Water Act (CWA), the Safe Drinking Water Act (SDA), and the Coastal Zone Reauthorization Act (CZARA) which are administered by the Environmental Protection Agency. Generally, states implement the federal framework, but have the choice to implement stricter regulations. In California, the State Water Resources Control Board has authority to establish water quality guidelines for long range resource planning. This includes management programs for groundwater and surface water and control of recycled water. Water quality standards are determined and enforced by nine Regional Water Quality Control Boards. These regional boards issue waste discharge permits and can mandate the abatement of discharges within their jurisdiction. The standards for water quality apply to both surface and groundwater, and under the Porter-Cologne Act of 1969 the boards have the authority to regulate waste discharges from point and non-point sources.

Over the past four decades, much of the regulatory focus has been on regulating and managing point source pollution. Non-point source pollution is now of regulatory interest. Land use practices can be a potential source of non-point source pollution. Farming and ranching are significant contributors to non-point source water pollution through irrigation return flows, runoff and deep percolation from farmland where fertilizer, pesticides and agricultural waste are applied. Non-point source agricultural discharges and runoff have polluted surface water and aquifers with zoonotic disease pathogens, pesticides, salts, nutrients, sediments, elevated water temperature and, in some cases, heavy metals. Global climate change may worsen these effects as higher water temperatures reduce water oxygen levels and more intense rainfall may require more investment in systems to control runoff (DWR 2009).

Pesticides and fertilizers can be toxic to wildlife and humans, and pathogens from various sources, including animal farming, may threaten water quality, human and ecosystem health, and food safety (Cowan 2005). Exclusion zones that prohibit the application of certain chemicals around water supplies can prevent surface water contamination. However, it is much more difficult to mitigate the contamination of groundwater supplies because of the complexity of flows of underground water.

California has approximately 2,400 dairies and 1.3 million cows that generate more than 30 million tons of solid and liquid waste every year (EPA 2009). The majority of these dairies are designated as concentrated animal farming operations (CAFOs), meaning a large number of animals are raised in a confined area and feed is brought to the animals rather than them grazing (EPA 2008). Most California CAFOS are located in the Central Valley, where more than 80 percent of California dairies are located (SWRCB 2009).

Most of the animal waste from CAFOs is applied to croplands, and could potentially contaminate surface water and groundwater with discharges including nitrogen and phosphorous, sediments, pathogens, hormones and ammonia, pesticides and possibly heavy metals (EPA 2008a; CDC 2004). In 2003, the EPA required that all CAFOs obtain a point-source permit and develop plans for waste-disposal. The California State Water Resources Control Board and the nine regional boards regulate waste discharges from CAFOs. In California, it is unlawful for CAFOs to discharge waste into water bodies, so dairies of the Central Valley did not require permits under the National Pollutant Discharge Elimination System (NPDES). Instead, Total Maximum Daily Loads (TMDL) waste discharge requirements implemented by the Central Valley Water Board require that dairies pay a scaled fee, employ nutrient management plans, and monitor groundwater quality at some locations (SWRCB 2009).

TMDL waste discharge requirements will impose additional costs on California producers that will likely lead to shifts in adopted technologies, changes in the crop mix, and a shift in some farming activities to other regions. Since the dairy industry is mobile in relation to cropland, it is the major farm industry most likely to respond by shifting to regions without stringent waste discharge regulations. The direct cost of implementing a TMDL discharge plan depends on the complexity of the plan. The SWRCB estimated complex plans to cost around \$1 million each in 2001 (SWRCB 2001). Ongoing TMDL compliance across the state is therefore likely to involve substantial costs. Waste discharge requirements will reduce emissions by changing farming practices and by discouraging economic activity.

– University of California Agricultural Issues Center, July 2009

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