

CALIFORNIA COASTKEEPER ALLIANCE AGRICULTURAL PRINCIPLES



California leads the nation as a top agricultural producer and contributor to global food supply. Unfortunately, intensive agricultural activities threaten the very resources upon which they depend, including clean water and healthy soil. California Coastkeeper Alliance has identified eleven critical principles to reduce the environmental impact of the agricultural industry and ensure swimmable, fishable, drinkable water for all.

California's agricultural industry accounts for over \$20 billion of the state's economy annually. The success of California agriculture, however, is dependent on the state's climate, soil health, and water resources. On average, California agriculture irrigates more than 9 million acres using roughly 34 million acre-feet of water typically diverted from surface waters or pumped from groundwater. While a majority of irrigated water is used efficiently to reduce the demand of water by individual farms, and even used to recharge groundwater supplies, water diversions for irrigated agriculture pose significant environmental challenges by diminishing instream flows and depleting groundwater aquifers throughout the state.

Water discharges from agricultural operations in California pose significant threat to water quality by transporting pollutants – ranging from toxic pesticides, sediment, nitrate, and salts pathogens, and heavy metals from cultivated fields into surface and groundwater. Encroachment of streams and rivers throughout the state by intensive farming and grazing have also led to the destruction of natural riparian zones through increased erosion, nutrient and sediment pollution, higher water temperatures, and degraded aquatic habitats. Nutrient pollution and eutrophication are pressing challenges to water quality in California and agriculture is the largest source of nitrogen input into the environment in the state. The over- or improper application of fertilizers onto agricultural fields can cause excess nutrients to be lost to the environment through runoff, erosion, leaching, or volatilization, and impair beneficial uses of water throughout the state, including drinking water and recreation.

To address the impairment of California waterways from agricultural operations, the California Coastkeeper Alliance has identified eleven principles California must pursue to maintain healthy and clean water for all Californians to swim, fish, and drink.

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- Principle 1 Individual growers are held accountable with enforceable standards, milestones, and timelines in irrigated Agricultural Orders. Most existing Agricultural Orders regulating agricultural activities within California contain no enforceable standards to ensure growers are complying with state-wide water quality objectives.
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- Principle 2 Robust surface water monitoring and reporting is required in irrigated Agricultural Orders to demonstrate compliance with enforceable standards. Without monitoring to determine whether individual growers' management measures are achieving water quality standards, it is impossible to hold growers accountable for their polluted runoff.
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- Principle 3 Irrigated Agricultural Orders include transparent reporting and do not delegate regulatory authority to Third-Party Coalitions. By delegating data collection responsibilities and not providing some oversight over Third-Party Coalitions, Regional Boards statewide risk the submission of inaccurate, incomplete, and misinterpreted water quality and water use data.
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- Principle 4 Pesticide monitoring protocols are updated using best available science to allow for detection of toxicity violations. Pesticide monitoring protocols have failed to keep pace with new pesticide technology and product use by focusing on pesticides that are no longer widely used in California, rather than those currently used.
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- Principle 5 Riparian setbacks are required to enhance natural ecological and hydrological function. Encroachment of riparian zones from intensive farming and grazing has led to higher nutrient and sediment pollution, higher water temperatures, lower water tables, poor water storage, and degraded aquatic environments.
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- Principle 6 Livestock grazing is prohibited in California waterways and within riparian setbacks. Improper livestock grazing poses a serious threat to water quality, through the direct discharge of contaminants and increases in erosion from poor soil health.

Principle **7** | Irrigated water is not wasted and is allocated reasonably to ensure public trust resources are protected. California needs to better implement existing laws to protect against overallocation of the state's water supplies and preserve public trust resources.

Principle **8** | Cover crop is required, and no-till management practices are incentivized, to reduce erosion and improve soil health. Compaction of soils from overgrazing, the destruction of stream bank vegetation and riparian zones, and traditional tillage practices have all led to increased rates of bank instability and erosion, in turn increasing sediment runoff.

Principle **9** | Every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. Studies indicate that fertilizer from irrigated agriculture is the largest source of nitrate pollution in drinking water in California, with irrigated agriculture causing 78 percent of the nitrate loading to groundwater.

Principle **10** | Concentrated animal feeding operations are sited away from surface waters and areas with high potential for groundwater infiltration. The proliferation of Concentrated Animal Feeding Operations (CAFOs) and associated concentrated waste has the potential to contribute nutrients, suspended solids, pathogens, and heavy metals to surface and groundwater supplies.

Principle **11** | All applicable beneficial uses must be considered and protected when adopting Agricultural Orders. The objectives required by the State Water Resources Control Board to protect beneficial uses may be numeric or narrative, or some mix of both, often leading to confusion and the exclusive consideration of human-beneficial uses.

Principle 1 | Individual Growers are Held Accountable with Enforceable Standards, Milestones, and Timelines in Irrigated Agricultural Orders.

PROBLEM

Agricultural operations pose some of the most serious threats to California’s water resources; however, current regulation of the industry is not on par with the severity or magnitude of those threats. Most existing Agricultural Orders regulating agricultural activities within California contain no effective mechanisms to ensure that growers covered by a specific order are complying with state-wide water quality objectives. Even when exceedances are detected, there is typically no requirement that water quality benchmarks become formal effluent limitations and thereby enforceable by the State and Regional Water Boards. This lack of enforceable standards has led to widespread water quality impairments due to agricultural activities throughout the state.

The State Water Board’s current reliance on management practices in lieu of enforceable standards is illegal under the Porter-Cologne Act and the state’s Nonpoint Source Policy. Without performance standards linked to actual objectives, existing requirements, like nutrient management ratios, do not enable us to understand how water quality will be impacted by those practices or whether those practices are effective for meeting standards. Further still, relying on best management practices has proven insufficient for ensuring that water quality standards are being met.

ANSWER

The Nonpoint Source Policy states that “management practice implementation never may be a substitute for meeting water quality requirements.” California should make a finding to that effect to ensure that growers are held accountable by implementing legally enforceable standards tied to water quality objectives. Nutrient ratios should be enforceable and linked to water quality objectives and agricultural operations that result in discharges to high-quality waters must be required to meet antidegradation standards.

Principle 1 | ACTIONS CALIFORNIA SHOULD TAKE

- Violation of nutrient application and removal (A/R) ratios should be an enforceable standard. Any violation of the nutrient A/R ratios should result in additional controls to prevent further receiving water exceedances. State and Regional Water Boards should – independent of third parties – develop nutrient A/R ratios based on the best available science for high nitrogen risk crops.
- Growers should comply with water quality standards in the shortest time possible – not once an exceedance is detected. Further, the Regional Water Boards should determine the shortest time possible and set enforceable interim milestones to achieve water quality standards – not Third-Party Coalitions. Regional Water Boards should require submission of field-level data to begin during the first year of order adoption.

- State and Regional Water Boards should conduct legally sufficient antidegradation analyses. A Water Board must make findings when a permitting activity may produce waste that will discharge into existing high-quality waters, identify degradation of waters through appropriate monitoring, and provide adequate means of ensuring Best Practicable Treatment of Control standards would be implemented when high quality water is degraded by existing agricultural activities.
- The State and Regional Boards should translate narrative standards for nutrients to numeric standards. All regions should either accept the default baseline nutrient standards consistent with the EPA criteria based on Aggregate Ecoregion III [Phosphorus, Total 0.020 mg/L. Total Nitrogen 0.38 mg/L] or determine site-specific standards using EPA developed protocols to replace the baseline.

Principle 2 | Robust Surface Water Monitoring and Reporting is Required in Irrigated Agricultural Orders to Demonstrate Compliance with Enforceable Standards.

PROBLEM

California's agricultural program has a systematic management failure throughout the state due to a lack of verification monitoring to ensure compliance with water quality standards at the farm or operation level. Existing water quality monitoring requirements focus on stream sample collection at resolutions that are far too inadequate to determine compliance on a farm-by-farm or site-by-site level. This inadequacy significantly hampers enforcement efforts and also fails to assist farmers themselves in determining whether or not their management practices are effective. The Nonpoint Source Policy requires that management practices are "tailored to a specific site and circumstance;" however, that criteria is impossible to verify solely with representative monitoring. As a result, the Regional Water Boards continue to have no evidence demonstrating that current management measures will effectively achieve water quality standards.

Without monitoring to determine whether individual growers' management measures are achieving water quality standards, it is impossible to hold growers accountable for their polluted runoff; and ultimately, impossible to protect our waterways from agriculture pollution.

ANSWER

The State must recognize and acknowledge that representative monitoring, without any individual monitoring requirements, is insufficient to verify that beneficial uses are being protected. Instead, agricultural operations should be required to impose a monitoring scheme that verify individual compliance with water quality standards and maximize individual accountability, while ensuring buy-in and cooperation from growers. Growers implementing responsible and truly effective practices and indicate their achievement of meeting water quality standards will not be required to do individual

monitoring. If a water quality exceedance is identified, however, the State should require individual monitoring that moves upstream from the polluted site to identify the specific sources of degradation.

Principle 2 | ACTIONS CALIFORNIA SHOULD TAKE

- Monitoring programs should be developed such that when receiving water violations are detected, iterative follow-up monitoring activities are carried out until individual contributors (e.g., farms) are identified. Once a second receiving water violation has been detected in the subwatershed, require all growers upstream of that exceedance to begin conducting edge-of-field monitoring until the responsible parties are identified and the exceedance is corrected.
- Require all growers that are discharging into impaired waterways where benchmark exceedances have been detected to conduct edge-of-field monitoring until growers demonstrate achievement of discharge effluent limitations.

Principle 3 | Irrigated Agricultural Orders include Transparent Reporting and Do Not Delegate Regulatory Authority to Third-Party Coalitions.

PROBLEM

Under both State and Federal law, disclosure of water quality data to the public is vitally important. Anything less than individual grower data violates the Clean Water Act, the Porter-Cologne Act, and the Nonpoint Source Policy. However, most growers currently police and regulate themselves through Third-Party Coalitions managed and directed by the growers themselves. These Coalitions control the submission of compliance data and aggregate it with the intent of preventing enforcement against specific growers. Coalitions are also solely responsible for the quality assessment of the information.

Coalitions have not adequately demonstrated measurable progress toward achieving water quality objectives. For example, when the Ventura County Agricultural Irrigated Lands Group analyzed seven years of its cooperative monitoring program data, it concluded that the available data collected on water quality and best management practice implementation was insufficient to “associate any potential reduction in total pollutant loading with grower action.” Anonymous data without an explicit grower name attached to it does not achieve individual accountability. It limits the ability of the public and the Regional Water Boards to comprehensively analyze the implementation and effectiveness of management practices. It also violates the California Constitution, Proposition 59, which includes a public right of access to government information.

ANSWER

Third-Party Coalitions oversight should be minimized, while their function to help growers be encouraged and rewarded. Third-Party Coalitions have the potential to increase consistency, reduce costs and

increase efficiencies for growers, and provide coordination and information sharing, all of which should be encouraged. However, the Nonpoint Source Policy is clear that the responsibility to regulate and enforce water quality standards ultimately rests with the State and Regional Water Boards. As such, these responsibilities should not be delegated to Coalitions, which should instead best serve as a peer-to-peer educational and coordination role. By delegating responsibilities, and not providing some oversight over Coalitions, the Regional Boards risk the submission of inaccurate, incomplete, and misinterpreted data by the Coalitions through an inherent bias in favor of growers, in turn compromising efforts to protect water quality.

The Regional Boards should disallow the anonymous reporting of data, ensuring that all data submitted includes the explicit names of property owners and growers, as well as the best management practices they are implementing. This would increase transparency and accountability, in turn ensuring that growers are indeed implementing best management practices and meeting water quality standards. Increasing transparency may also assist with local implementation of the State Groundwater Management Act (SGMA) and enforcement of drinking water standards of the Safe Drinking Water Act.

Principle 3 | ACTIONS CALIFORNIA SHOULD TAKE

- Revoke the authority of Third-Party Coalitions to anonymize and aggregate data. Third-Party Coalitions should serve an educational and coordination role, and be encouraged to help increase consistency among growers, reduce costs, and provide peer-to-peer information sharing among growers.
- Make data publicly accessible and include the name of the property owner and grower and link the best management practices implemented and nitrogen management data to specific locations.
- Require independent auditing or some other means of verification, which will allow the Water Boards, along with the public, to ensure accuracy.
- Conduct independent research of the benefits (ex: reduce costs, increase efficiencies for growers, coordination and information sharing) and the negatives of Coalitions (ex: aggregating data, anonymous reporting, manipulating data to suggest improvements in the watershed that are not actually occurring).

Principle 4 | Pesticide Monitoring Protocols are Updated using Best Available Science to Allow for Detection of Toxicity Violations.

PROBLEM

Over 1.2 billion pounds of pesticides are used annually in the United States, much of it for agriculture. Nearly 200 million pounds of pesticides are applied to California farms annually. While these pesticides

can be valuable for agricultural operations, they often leave the field in soil and water and negatively impact non-target plant, animals, and humans. For example, the majority of active pesticides applied to California vineyards, totaling almost two million pounds, are applied during the winter and spring months, when rain is mostly likely to carry excess pesticides into local waterways.

While most monitoring still focuses on the toxicity posed by diazinon and chlorpyrifos, the use of those pesticides has been declining for many years, and current testing protocols have not kept pace with new pesticide technology. Most agricultural operations have shifted to using more toxic and persistent alternatives, such as pyrethroids and neonicotinoids. As a result, the toxicity of California's waterways may be significantly underestimated due to the lack of monitoring for these pesticides.

ANSWER

The State should rely on federally backed toxicity testing that currently exists for many of the pesticides currently popular in California, rather than rely on existing sampling methods which are based on the science of pesticides no longer commonly used in California. For example, the EPA-approved test species, the crustacean *Hyalella azteca*, is native to California and an important food source for native fishes. It is also sensitive to pyrethroid pesticides. In combination with the small fly, *Chironomus*, which is sensitive to neonicotinoid pesticides, sampling can provide a far more accurate picture of the toxicity caused by pesticides commonly used today. At the same time, the State must monitor more regularly for contaminants like 123-TCP and DBCP that are legacy pollutants from agricultural operations that are still impacting water quality, but not currently monitored.

Farmers also have a range of possible best management practices they can implement to limit the contamination of waterways from pesticides. Possible best management practices include:

- Strive for maximum use of naturally occurring control forces in the pest's environment, including weather, pest diseases, predators, and parasites.
- Focus first on non-chemical measures that help prevent problems from developing, rather than relying on chemicals to kill infestations after an infestation has occurred.
- Use chemical pesticides only if close inspection shows the chemical pesticides are required to prevent severe damage.
- Use cultural methods, biological controls, and other alternatives to conventional chemical pesticides.
- Use field scouting, pest forecasting, and economic thresholds to ensure that pesticides are used for real, rather than perceived, pest problems.
- Match pesticides with field site features to minimize the risk of contaminating waterways.

Principle 4 | ACTIONS CALIFORNIA SHOULD TAKE

- Incorporate toxicity testing into statewide monitoring and reporting requirements using a panel of test organisms including the 3-species test, as well as *Hyalella*, which is sensitive to pyrethroid pesticides, and *Chironomus*, which is sensitive to neonicotinoid pesticides.

- Implement into State law the US EPA standards for pesticide residues in drinking water that address approximately 200 organic chemicals.
- Require an annual evaluation of pesticides in use statewide, in consultation with academics, to determine if the panel of test organisms should be modified.

Principle 5 | Riparian Setbacks are Required to Enhance Natural Ecological and Hydrological Function.

PROBLEM

Intensive farming and grazing has led to a destruction of natural riparian zones along streams, rivers, wetlands, and bays throughout the state. Encroachment of riparian zones has led to higher nutrient and sediment pollution and higher water temperatures. Any value provided by thin vegetated setbacks that are left is often mitigated by the increased erosion from adjacent plowing, grazing, and road building. Degraded riparian areas often have a lower water table, poor water storage, poor fish habitat with water warm and little shade, and low wildlife diversity. Along most of the Russian River, for example, setbacks do not exist beyond the top of the bank and the river has been put into an unnatural straitjacket as wineries are increasingly built up to river's edge. As a result, at least 75 percent of the riparian forests in the Russian River watershed, which are critical for filtering pollution from the adjacent vineyards, have been lost.

California's current agricultural program is not mandating, prioritizing, or even incentivizing the use of healthy riparian setbacks to protect beneficial uses. Third-party sustainability programs for growers to self-certify their operations have proven insufficient. Unfortunately, the threats of riparian encroachment are expected to only become more serious as climate change results in longer and hotter drier periods and increasingly intense flood events that further erode the riparian zone.

ANSWER

Riparian setback zones provide various ecological benefits, including the creation of stable and productive soils, cleaner water, enhanced wildlife habitat, protection of crops and livestock, enhancement of aesthetics and recreation opportunities, increased control of stream temperature, and offer filtration of pollution from adjacent agricultural lands. Wood roots increase the resistance of streambanks and shorelines to erosion and riparian vegetation provides litter and woody debris, which helps create the critical habitat and conditions for aquatic organisms. As a result, areas with healthy riparian setbacks typically have a higher water table, increased underground water storage, higher vegetation productivity, higher wildlife diversity, better fish habitat, and cleaner water.

Riparian setbacks would serve to protect streams running through agricultural operations by achieving the conditions beneficial to both the environment and landowners. Setbacks are permanent areas and shrubs located adjacent to streams, lakes, ponds, and wetlands meant to enhance ecological functions. For example, plants stabilize soils and reduce erosion while foliage can provide shade and reduce water

temperature. Setbacks of sufficient width also intercept sediments, nutrients, pesticides, and other contaminants to reduce surface water pollution. Most scientists suggest that a setback of 25-50 meters is appropriate to measurably improve water quality. Other best management practices growers can implement to reduce runoff at the edges of waterways include avoiding underdrains that erode stream channels, planting permanent cover crops to maintain erosion control, and avoiding cultivation before or during rainy conditions.

Principle 5 | ACTIONS CALIFORNIA SHOULD TAKE

- Set mandatory riparian setback zones with a width based on best available science for that region. Require a minimum 25-foot setback for roads.
- Provide formal guidance to growers on drainage patterns and sediment and erosion control measures.
- Develop technical assistance programs for growers that will include guidelines for designing projects that increase stormwater capture and infiltration, reduce runoff, and protect wetlands and riparian areas.
- Incentivize growers to establish flow breaks and floodplains to control flows and to build detention ponds and swales to filter pollutants and increase groundwater recharge.
- Complete a Stream Protection Policy focused on riparian habitat, as a follow up to the Wetlands Policy.
- Adopt a statewide policy of annual net gain of ecologically functioning riparian and wetland habitat to mitigate for a century of net loss of these critical habitats.

Principle 6 | Livestock Grazing is Prohibited in California Waterways and Within Riparian Setbacks.

PROBLEM

Improper livestock grazing poses a serious threat to water quality, through the direct discharge of contaminants and increases in erosion from poor soil health. In the American West, livestock grazing is often cited as the most widespread cause of species endangerment. Poor grazing practices can wreak ecological havoc on sensitive ecosystems by destroying vegetation, damaging wildlife habit, and disrupting natural processes. 120 California waterways are impaired specifically due to grazing activities impacting riparian zones. Lush streams and riparian forests throughout California have been reduced to flat, dry wastelands, and once-rich topsoil has been severely degraded. Further, some landscapes have become prone to unnaturally severe fires due to the overgrazing of native grasses.

The primary impacts of grazing come from the unmanaged concentration of livestock in waterways and riparian areas. When livestock are allowed unfettered, direct access to a stream or river, their waste can increase the concentration of nutrients and bacteria, as well as other pathogens like viruses and fungi.

When concentrated in riparian areas, grazing livestock can remove the vegetation needed to retain stream bank stability and degrade soils. In turn, this increases stream temperature due to the lack of shade and increases erosion, leading to wider and shallower streams. Overgrazing and the compaction of soils by livestock also decreases infiltration rates, deteriorates soil structure, and decreases organic cover material. These impacts can modify the entire hydrologic regime of the waterways with cascading effects on aquatic organisms. Infiltration of water in the riparian and flood plain areas plays a key role in watershed function, including the capture, storage, and safe release of water with implications on flood risk and water supply.

ANSWER

Effective grazing management can not only maximize production for ranchers, it can also help protect riparian ecosystems and other sensitive areas. Effective grazing management practices will limit physical disturbance to soft soils, reduce erosion, and reduce the discharge of sediment, animal waste, nutrients, pathogens, and chemicals to surface water. Other benefits include reduced fire risk and less surface runoff due to greater infiltration into healthy soils.

Ranchers and growers can implement various best management practices that will protect waterways on their properties from the negative impacts of grazing. Sufficient riparian setback zones should be required to limit direct animal access to waterways and to the riparian zone, and to mitigate the acute water quality degradation resulting from livestock entering waterways or degrading the riparian zone. Artificial shade areas can be constructed far from riparian zones to encourage use of upland sites by livestock, particularly in hot locations. Ranchers should also adjust intensity and duration of grazing based on the actual availability of forage to protect soils from erosion (by avoiding overgrazing) and to control animal movement near riparian zones and waterways.

Principle 6 | ACTIONS CALIFORNIA SHOULD TAKE

- Explicitly prohibit livestock access to riparian zones, ponds or lake shores, wetlands, and streambanks using exclusionary fencing.
- Require riparian grazing management practices that include: exclusion fencing, animal trails and walkways through or around sensitive areas, and stabilized stream crossings.
- Incentivize streambank restoration efforts and the development of exclusion fencing and stream setbacks

Principle 7 | Irrigated Water is Not Wasted and is Allocated Reasonably to Ensure Public Trust Resources are Protected.

PROBLEM

California's rivers are regularly dewatered by excessive, and increasing, agricultural surface and groundwater withdrawals. Our waterways have been over-allocated by water rights adjudications

that provided virtually no water for instream uses for fish, wildlife, and recreation. At the same time, unregulated groundwater extraction has increased rapidly in recent decades, particularly during drought periods, causing rivers to literally sink underground to fill a depleted aquifer.

Currently over 80 percent of California's water goes to agricultural uses. These diversions, coupled with widespread over pumping of groundwater, have significantly diminished instream flows in rivers and streams throughout the state. On the North Coast, most major rivers and tributaries in the Klamath Basin suffer from significantly reduced flows for a good portion of the year due to diversions for irrigated agriculture. In the Humboldt Region, the proliferation of the marijuana cultivation industry has resulted in significant diversions of instream flows and reduced soil quality, which has increased the runoff of sediment and agricultural chemicals in sensitive aquatic ecosystems.

ANSWER

California needs to better implement existing laws to protect against overallocation of the state's water resources. Federal and State wild and scenic rivers acts protect some streamflows. The Federal Act prohibits the construction of any dam or water conduit that would directly affect a designated river. Similarly, California law prohibits most dams on or diversions from designated rivers. In addition to the wild and scenic rivers acts, a number of statutory and common law doctrines might be used to protect streamflows. The public trust doctrine creates public rights in the use of the state's navigable waters for fishing and recreation. Because public rights are paramount, agricultural rights may not interfere with public trust resources. In theory, the State Water Resources Control Board, as trustee of the public's rights, could be enjoined from permitting diversions for agriculture use that interfere with the public's instream rights. California's constitutional restrictions on unreasonable use could also protect instream uses. A determination under the California Constitution stating that diversions depleting environmentally necessary streamflows are presumptively unreasonable would require the State Water Resources Control Board to deny proposed appropriations and forbid riparian diversions threatening streamflows. Another legal protection for streamflows is a statutory provision requiring the State Water Resources Control Board to weigh instream uses when ruling on appropriation applications. The Water Code requires the Board to consider recreational uses and the preservation and enhancement of fish and wildlife in determining whether water is available for appropriation. In acting on an application, the Board must consider the relative benefit of all beneficial uses concerned, including instream uses. The Board must notify the California Department of Fish and Wildlife of all appropriation applications to allow the Department to recommend amounts of water required to protect the stream's wildlife. The Department may also propose modifications to public and private water projects that substantially and adversely affect fish and wildlife.

Principle 7

ACTIONS CALIFORNIA SHOULD TAKE

- Apply vastly under-utilized legal tools, such as the waste, unreasonable use, and public trust doctrines.
- Attain legal recognition of the connectivity between groundwater pumping and instream flows.
- Develop and prioritize instream water rights to ensure that waterways' needs are addressed.

- Gather data and require transparent reporting on surface flows, groundwater levels, and water withdrawals and uses.
- Enforce water use rights violations.
- Increase agricultural water efficiency while reducing demand so that efficiency savings are left instream. Incentivize growers to implement dry farming practices where possible.

Principle 8

Cover Crop is Required, and No-Till Management Practices are Incentivized, to Reduce Erosion and Improve Soil Health.

PROBLEM

Sediment is the number one non-point source pollutant throughout the United States. Compaction of soils from overgrazing, the destruction of stream bank vegetation and riparian zones, and traditional tillage practices that completely expose the soil surface have all led to increased rates of bank instability and erosion, in turn increasing sediment runoff. The excess buildup of sediment in wetlands and rivers can modify the hydrological regime of the waterway, resulting in degraded stream habitat, suffocation of eggs and young in spawning beds, loss of pool depth, and reduced water filtration. These physical problems, in turn, can severely impact the health of fish species and other aquatic organisms. In addition, the eroded soil particles and sediment mobilized via runoff can also carry a host of other direct contaminants like nutrients, pesticides, and herbicides.

ANSWER

Growers have a host of best management practices and proper tillage practices they can implement to reduce the threats of erosion. Leaving cover crops and crop residue after harvest on the soil surface reduces runoff and soil erosion. It can also conserve soil moisture and hold onto the excess nutrients and pesticides on the field to avoid them running off into nearby waterways. Growers should implement no-till systems when possible. The Natural Resources Conservation Services (NRCS) under the U.S. Department of Agriculture defines no-till systems as leaving all residue on the soil surface and disturbing no more than 10 percent of the soil surface while planting.

The benefits of best management practices like cover crops and no-till systems include improved soil stability, improved water holding capacity, and reduced surface ponding of rainfall. This, in turn, increases infiltration and reduces erosion. The increase in infiltration is primarily a result of improved soil structure, slowed runoff, and the presence of old, undisturbed root structures. Infiltration and improved water holding capacity can increase the amount of water available for plants, improving the overall health of crops and any riparian vegetation, which is particularly valuable in water-stressed regions such as California. By increasing the amount of surface residue cover by 80 to 90 percent, no-till systems can also limit wind erosion and dust production and reduce sheet erosion by 94 percent or more. These practices reduce water and air quality problems and the negative impacts of erosion on fish and aquatic organisms, while also increasing the capacity of soils to sequester greenhouse gases like carbon.

These practices also have distinct benefits for the growers themselves by increasing operational efficiency. No-till practices result in reduced labor and inputs costs, allowing farmers to increase their production area or reduce their overall effort. When done well, no-till practices will have no negative impact on crop yields and can improve yield by increasing moisture retention and water availability.

Principle 8 | ACTIONS CALIFORNIA SHOULD TAKE

- Maximize crop residue by requiring cover cropping from at least October to May. Any field fallowed for any length of time between October and May must be cover cropped.
- Educate growers on on-farm management best practices, such as no-till, and fund incentive and demonstration programs to promote carbon sequestration, increase water-holding capacity, and improve crop yields.
- Provide research, education, and technical support for growers, including funding academic research on healthy soil practices and developing a user-friendly soil management database.
- Under the Healthy Soils Initiative, permit at least 100 new composting and anaerobic digestion facilities by 2020 to increase the generation and use of compost in soil.
- Improve education and awareness of government cost-sharing programs for implementing best management practices to reduce the financial barriers of implementation and limit up-front costs for growers.
- Reward best management practices adoption through buyer contract preferences or tax incentives.
- Provide regular funding to expand programs, such as the UC SAREP Cover Crops Database.

Principle 9 | Every Human Being has the Right to Safe, Clean, Affordable, and Accessible Water Adequate for Human Consumption, Cooking, and Sanitary Purposes.

PROBLEM

Nutrient pollution and eutrophication are pressing challenges to water quality in California and agriculture is the largest source of nitrogen input into the environment in the state. The over- or improper application of fertilizers onto agricultural fields can cause excess nutrients to be lost to the environment through runoff, erosion, leaching, or volatilization. In fact, approximately half of the nitrogen applied to fruit and vegetable crops is used, while only a quarter of the nitrogen in animal feed for livestock becomes meat or dairy products. Once in the waterway, nutrients can lead to an excess growth of aquatic plants, including toxic algae and submerged weeds, which can impair beneficial uses, including drinking water and recreation.

Nitrogen contamination poses a severe threat to human and animal health. Ammonia produced in animal manure and other organic nutrient sources can become toxic and create the conditions for toxic algae blooms. These toxic blooms make swimming unsafe, can poison marine life, and have shut down entire

fisheries. Meanwhile, nitrates leaching from fields into aquifers have left over 100,000 square miles of groundwater contaminated with nitrates. Studies indicate that fertilizer from irrigated agriculture is the largest source of nitrate pollution in drinking water in California, with irrigated agriculture causing 78 percent of the nitrate loading to groundwater. Researchers estimate that tens of millions of pounds of nitrate leach into groundwater in the Salinas Valley alone each year. As a result, thousands of domestic and small system wells serving hundreds of thousands of people have nitrate levels exceeding the drinking water standard.

ANSWER

Assembly Bill 685 was signed into law in September 2012 and became effective January 1, 2013 (Water Code Section 106.3). The law declares that “every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.” The law calls on all relevant state agencies to consider the human right to water “when revising, adopting, or establishing policies, regulations, and grant criteria” relevant to domestic water uses. To ensure every human has the right to clean water, the State must require proper nutrient management.

Proper nutrient management encourages the natural process of nutrient cycling, which in turn optimizes crop growth, limits costs for growers, and minimizes the environmental impacts of nutrient pollution. Effective soil and irrigation water testing and monitoring of nutrient loading will also allow farmers to ensure that nutrients are available to meet crop needs while eliminating extraneous nutrient movement off their fields. Growers must effectively work to control nutrients on their lands. Source control, via the application of fertilizer, irrigation water, and organic materials, is often the easiest and most cost-effective pathway for growers to address nutrient pollution. Growers must also engage in regular monitoring of nutrients and the movement of nutrients in soil, water, air, plants, and livestock to maintain crop production while avoiding excess application or accumulation of nutrients.

Principle 9 | ACTIONS CALIFORNIA SHOULD TAKE

- Set enforceable groundwater nutrient loading performance standards based on accurate, up-to-date models for different ecosystems and basins.
- Require the provision of near-term emergency replacement water, and permanent drinking water solutions, for communities whose drinking water source is contaminated by agricultural discharges.
- Set a fertilizer fee.

Principle 10 Concentrated Animal Feeding Operations are Sited Away from Surface Waters and Areas with High Potential for Groundwater Infiltration

PROBLEM

In the second half of the 20th century, rapid expansion and vertical integration of the meat production industry almost destroyed independent family farms and led to a shift from traditional meat production and grazing methods to the proliferation of Concentrated Animal Feeding Operations (CAFOs). CAFOs confine tens of thousands of animals and have the potential to contribute large pollutant loads into waterways. In fact, CAFOs can produce as much waste as a small city, but typically lack the basic waste treatment system to process it. A 2017 EPA report shows that only 30 percent of the largest industrialized livestock facilities in the country have permits as required by the Clean Water Act to control their pollution.

Growers typically apply the large amounts of untreated animal sewage produced by their operations onto adjacent croplands. However, growers often apply waste in far excess of the amounts needed to fertilize these lands and as a result, much of that waste is mobilized via runoff into nearby waterways. The large amounts of animal waste produced by concentrated livestock has the potential to contribute nutrients, suspended solids, pathogens, and heavy metals to surface and groundwater supplies. In addition, the growth of contract farming that has resulted from this shift in production has also shifted liability for pollution from the multinational corporations that own the livestock and dictate meat production to the on-the-ground grower. As a result, the companies benefiting from the profit of industrial meat production can hide behind farmers and avoid liability. Beyond farming, CAFOs housing animals for recreational purposes present similar waste discharge concerns in suburban and urban areas and are often ignored by regulators.

ANSWER

Because CAFOs are often located near streams and waterways, they must be particularly well managed to minimize human health and aquatic ecosystem impacts. There are multiple best management practices that must be implemented to minimize the impacts of CAFOs and the resulting waste discharges. This includes various mechanisms for runoff control, solid and liquid waste storage and reuse, and nutrient management. The specific practices individual operations should implement are dependent on the type of facility, the animal in the CAFO, any potential receiving water, and the specific area of the facility that is the problem.

CAFOs must also be required to provide specific information regarding their location and specific management practices to allow facilities to be more easily inspected, and the effectiveness of their practices more easily assessed. As part of that effort, agencies and nonprofit organizations must work together to better study and understand the actual impacts of individual CAFOs with extensive water quality monitoring. While rancher-initiated waste-to-energy projects (e.g., converting methane produced by livestock into usable gas) should be encouraged, these projects should include a denitrification component to simultaneously address both climate change/emissions and water quality impacts.

Principle 10 | ACTIONS CALIFORNIA SHOULD TAKE

- The State Water Board should adopt a Non-Dairy CAFO General Order to regulate animal operations that are not currently addressed, such as equestrian facilities.
- Establish clear guidelines for facility siting in the permitting process for new facilities or expansions that require CAFOs to be located away from surface waters, areas with high potential for infiltration of contaminants into groundwater supplies, and generally away from critical or sensitive ecosystems.
- Impose a moratorium on construction for the expansion of CAFOs absent implementation of the best management practices.
- Identify all Confined Animal Feeding Operations and update the list annually.
- In areas with high potential for groundwater infiltration, Salt and Nutrient Management Plans associated with agricultural activities should include a monitoring program that is transparently reported to the Water Boards and the general public.

Principle 11 | All Applicable Beneficial Uses Must Be Considered and Protected When Adopting Agricultural Orders

PROBLEM

Each region's "Basin Plan" lists the specific waters to be protected and the specific beneficial uses assigned to each water. Water Code section 13263(a) requires that when issuing waste discharge requirements, Regional Boards "shall take into consideration the beneficial uses to be protected [and] the water quality objectives reasonably required for that purpose."

California Water Code section 13050(f) describes the beneficial uses of surface and ground waters that may be designated by the State or Regional Board for protection, and includes: beneficial uses of the waters of the state that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Additionally, beneficial uses for surface waters are designated under the federal Clean Water Act section 303 in accordance with regulations contained in 40 CFR 131. In 1972 and 1994, the State Water Resources Control Board adopted a uniform list and description of beneficial uses to be applied throughout all basins of the State; twenty-three beneficial uses are now defined statewide and these beneficial uses include everything from "municipal and domestic supply" and "water contact recreation" through warm and cold "fresh water habitat." The "objectives" required to protect a beneficial use can be numeric or narrative or some mix of both, often leading to confusion.

In the Central Coast Region, beneficial uses of the lower Salinas River include the following: municipal water supply, agricultural water supply, cold freshwater habitat, warm freshwater habitat, fresh water replenishment, water contact recreation, non-contact water recreation, commercial and sport fishing,

wildlife habitat, and migration of aquatic organisms. Yet, with all these beneficial uses, the Regional Board allows removal of water that would otherwise enter the river to be treated for agricultural use and groundwater recharge, instead of requiring agricultural pollutant source control, treatment of water, and return of that water to the Salinas River. In summary, only human-beneficial-uses are considered.

In the Eastern San Joaquin, the Central Valley Board is even more cavalier, entirely disregarding any discharge of nitrogen unless it is in excess of the drinking water standard, even though the “aquatic life” standard (cold and warm habitats, commercial and sport fishing, wildlife habitat, migration of aquatic organisms and more, such as rare, threatened or endangered species) is generally a small fraction of the municipal supply limit for nitrogen.

Discharge limits for agriculture must be specific and must be protective of all beneficial uses.

ANSWER

All beneficial uses must be considered and protected. Agricultural Orders must protect all the beneficial uses of waters of the state that receive agricultural discharges. If beneficial uses of a stream are municipal water supply (10mg/L nitrate as N), cold water habitat (2mg/L nitrate as N), and freshwater replenishment (meaning surface flow), the State and Regional Boards must create limits for nitrate discharge at 2mg/L nitrate as N, and ensure flow for downstream freshwater replenishment.

Principle **11** | ACTIONS CALIFORNIA SHOULD TAKE

- Monitoring programs must be provided to determine the effects of discharges on all beneficial water uses, including effects on aquatic life, species diversity, and seasonal fluctuations.
- Agricultural permits must enumerate beneficial uses of all receiving waters and the corresponding standards to protect those beneficial uses.
- Agricultural permits must require growers to demonstrate, through monitoring and practices, they are achieving the standards protective of all beneficial uses.
- Narrative standards must be translated into measurable metrics.
- Agricultural Orders must contain effluent limitations that achieve the Waste Load Allocation of relevant TMDLs.