



The Otter Project

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Humboldt BAYKEEPER
Klamath RIVERKEEPER
Yuba River WATERKEEPER
Russian RIVERKEEPER
Monterey COASTKEEPER
Santa Barbara CHANNELKEEPER
Los Angeles WATERKEEPER
Orange County COASTKEEPER
Inland Empire WATERKEEPER
San Diego COASTKEEPER



AGRICULTURAL ORDER 4.0 ENVIRONMENTAL PANEL

September 21, 2018 Central Coast Regional Water Board Workshop

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2010 Water Quality Status Report

- “Staff has examined a large amount of data from both CCAMP and the CMP. We have found that many of the same areas that showed serious contamination from agricultural pollutants five years ago, particularly nitrate and toxic pesticides, are still seriously contaminated.”
- “In general, staff finds poor water quality, biological and physical conditions in many waterbodies located in, or affected by, agricultural areas in the Central Coast Region.”



09.15.2009

2018 Surface Water Quality Conditions Report

- “Data show degradation of surface water quality in the lower reaches of waterbodies located in the major agricultural areas of the central coast region, particularly in the lower Pajaro River, Salinas River (including Gabilan Creek and Tembladero Slough) and Santa Maria River watersheds. This pollution severely impacts aquatic life and other beneficial uses.”
- “Overall water quality data in these areas do not indicate that conditions are improving in terms of achieving water quality objectives and protecting beneficial uses.”

2018 Groundwater Quality Conditions Report

- “Nitrate contamination continues to threaten or impair significant drinking water sources in the central coast. The most recent nitrate concentration data indicate ongoing and increasing degradation in many groundwater basins, predominantly in agricultural areas.”
- “The current average discharge of waste nitrogen from irrigated agriculture today, based on Total Nitrogen Applied reporting, is approximately ten times the discharge level identified by the 2012 UC Davis Nitrate Report as being protective of water quality and beneficial uses.”

Today
(09/09/2018)



Today
(09/09/2018)



Today
(09/09/2018)



Today
(09/09/2018)



Waiver or General WDR?

While not mandated, we believe a waiver is the preferred type of order.

- Given the lack of improvement over the last 15 years, we believe the mandatory 5 year time limit before review of a waiver is appropriate.
- The Nonpoint Source Policy is a requirement of the federal Clean Water Act, which uses NPDES permits. NPDES permits are more akin to waivers than WDRs.

POLICY FOR IMPLEMENTATION AND ENFORCEMENT OF THE NONPOINT SOURCE POLLUTION CONTROL PROGRAM

SWRCB May 2004

“[T]he most successful control of nonpoint sources is achieved by prevention or by minimizing the generation of NPS discharges.” emphasis added

Source limitations are the best control of NPS pollution.

The staff and Board have multiple tools available to them including source limitations (numeric standards and limits) and requiring best management practices (MPs or BMPs).

NPS Policy specifically calls out: “MP implementation, however, may not be substituted for actual compliance with water quality requirements.”

If management practices then you “shall”...

KEY ELEMENT 1: An NPS control implementation program's ultimate purpose shall be explicitly stated. Implementation programs must, at a minimum, address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements.

KEY ELEMENT 2: An NPS control implementation program shall include a description of the MPs and other program elements that are expected to be implemented to ensure attainment of the implementation program's stated purpose(s), the process to be used to select or develop MPs, and the process to be used to ensure and verify proper MP implementation.

KEY ELEMENT 3: Where a RWQCB determines it is necessary to allow time to achieve water quality requirements, the NPS control implementation program shall include a specific time schedule, and corresponding quantifiable milestones designed to measure progress toward reaching the specified requirements.

KEY ELEMENT 4: An NPS control implementation program shall include sufficient feedback mechanisms so that the RWQCB, dischargers, and the public can determine whether the program is achieving its stated purpose(s), or whether additional or different MPs or other actions are required.

KEY ELEMENT 5: Each RWQCB shall make clear, in advance, the potential consequences for failure to achieve an NPS control implementation program's stated purposes.

Agricultural Principles



Hold Individual Growers Accountable

PRINCIPLE ONE – Individual growers are held accountable with enforceable standards, milestones, and timelines in irrigated Agricultural Orders.

- The Nonpoint Source Policy states that “management practice implementation never may be a substitute for meeting water quality requirements.”
- 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.

Hold Individual Growers Accountable

Recommendations

- Violation of nutrient application and removal (A/R) ratios should be an enforceable standard. Any violation of the nutrient AR ratios should result in additional controls to prevent further receiving water exceedances.
- Growers should comply with water quality standards in the shortest time possible – not once an exceedance is detected. 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.
- State and Regional Boards should translate narrative standards for nutrients to numeric standards: 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.

Require Robust Surface Water Monitoring and Reporting

PRINCIPLE TWO – Robust surface water monitoring and reporting is required in irrigated Agricultural Orders to demonstrate compliance with enforceable standards.

- Representative monitoring, without any individual monitoring requirements, is insufficient to verify that beneficial uses are being protected.
- 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.

Require Robust Surface Water Monitoring and Reporting

Recommendations

- Develop monitoring programs so 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.

Transparent Reporting and Non-Delegation to Third Party Coalitions

PRINCIPLE THREE – Irrigated Agricultural Orders include transparent reporting and do not delegate regulatory authority to Third-Party Coalitions.

- Third Party Coalitions oversight should be minimized, while their function to help growers be encouraged and rewarded.
- 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.

Minimize Toxicity from Pesticide Discharges by Improving Monitoring

PRINCIPLE FOUR – Pesticide monitoring protocols are updated using best available science to allow for detection of toxicity violations.

- While most monitoring still focuses on the toxicity posed by diazinon and chlorpyrifos, the use of those pesticides has declined 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.
- State and Regional Boards 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.

Minimize Toxicity from Pesticide Discharges

Recommendations – Best Management Practices

- 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 FIVE – Riparian setbacks are required to enhance natural ecological and hydrological function.

Require Riparian
Setbacks



Require Riparian Setbacks

Recommendations

- Set mandatory riparian setback zones with a width based on best available science for that region. Require a minimum 25-foot setback for roads.
- Reduce runoff by avoiding underdrains, planting permanent cover crops for erosion control, and avoiding cultivation before or during rainy conditions.
- 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.

PRINCIPLE SIX – Livestock grazing is prohibited in California waterways and within riparian setbacks.



Prohibit Livestock
Grazing in
Waterways

Allocate Irrigated Water Reasonably to Prevent Waste

PRINCIPLE SEVEN – Irrigated water is not wasted and is allocated reasonably to ensure public trust resources are protected.

- California waterways have been over-allocated by water rights adjudications that provided virtually no water for instream uses for fish, wildlife, and recreation.
- Simultaneously,, unregulated groundwater extraction has increased rapidly in recent decades, particularly during drought periods, causing rivers to literally sink underground to fill a depleted aquifer.
- To protect against waste, the Regional Board should:
 - ✓ 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 by incentivizing growers to implement dry farming practices where possible.

Require Cover Crop and Incentivize No-Till Management Practices

PRINCIPLE EIGHT – Cover crop is required, and no-till management practices are incentivized, to reduce erosion and improve soil health.

- Sediment is the number one non-point source pollutant throughout the United States.
- Leaving cover crops and crop residue after harvest on the soil surface reduces runoff and soil erosion.
- 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.
- 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.

Require Cover Crop and Incentivize No-Till Management Practices

Recommendations

- 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.

Ensure Affordable, Safe and Clean Drinking Water

PRINCIPLE NINE – Every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.

- Nutrient pollution and eutrophication are pressing challenges to water quality and agriculture is the largest source of nitrogen input into the environment in California.
- Nitrogen contamination poses a severe threat to human and animal health.
- “Every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.” (Assembly Bill 685, 2012)
- 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.
- Growers must 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.

Ensure Affordable, Safe and Clean Drinking Water

Recommendations

- 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 TEN – Concentrated animal feeding operations are sited away from surface waters and areas with high potential for groundwater infiltration.

Cite CAFOs Away
from Surface
Waters and Areas of
High Groundwater
Infiltration



Consider and
Protect All
Applicable
Beneficial Uses in
Ag Orders

PRINCIPLE ELEVEN – All applicable beneficial uses must be considered and protected when adopting Agricultural Orders.

- Cal. Wat. 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.”
- Beneficial uses under Cal. Wat. Code include (but not 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.**
- 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.

Consider and Protect All Applicable Beneficial Uses in Ag Orders

Recommendations

- 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.
- Ag Orders must contain effluent limitations that achieve the Waste Load Allocation of relevant TMDLs.

Questions:

- What can growers and the regional board do to demonstrate quantifiable progress to minimize nitrate discharge to groundwater to achieve water quality objectives?
- What can growers and the regional board do to demonstrate quantifiable progress to minimize nutrient discharge to surface waters to achieve water quality objectives?
- What can growers and the regional board do to demonstrate quantifiable progress to minimize toxicity in surface waters from pesticide discharges to achieve water quality objectives?
- What can growers and the regional board do to demonstrate quantifiable progress to minimize sediment discharge to achieve water quality objectives?

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER NO. R4-2016-0143

CONDITIONAL WAIVER OF WASTE DISCHARGE REQUIREMENTS
FOR DISCHARGES FROM IRRIGATED AGRICULTURAL LANDS
WITHIN THE LOS ANGELES REGION

The California Regional Water Quality Control Board, Los Angeles Region (Regional Water Board) finds:

PURPOSE OF ORDER

1. For the reasons set forth below, the Regional Water Board concludes that it is in the public interest to establish a Conditional Waiver for Discharges from Irrigated Agricultural Lands (Conditional Waiver or Order). The conditions established in this Order are intended to ensure that discharges from irrigated agricultural lands are managed such that they do not degrade water quality or impair beneficial uses of waters of the state within the Los Angeles Region.
2. The Los Angeles Region has approximately 97,000 acres of agriculture under irrigation and approximately 2,100 operations that are or may be discharging waste from irrigated agricultural lands to waters of the state. The Region's agriculture is concentrated in Ventura County, in the Calleguas Creek, Santa Clara River, and Ventura River watersheds. It is estimated that approximately 3,500 acres of Los Angeles County irrigated agricultural lands lie within the Los Angeles Region. These areas are dispersed, non-contiguous, and interspersed with other land uses, such as urban and industrial land uses.
3. Agricultural activities can generate wastes such as sediment, pesticides, nutrients, and oxygen-demanding organic matter that, upon discharge to waters of the state, can degrade water quality and impair beneficial uses.
4. The 2008-10 Clean Water Act Section 303(d) list of impaired water bodies in the Los Angeles Region identifies agriculture as a potential source of pollutants that impair water quality and beneficial uses of numerous waters of the state within the Region.
5. The Regional Water Board and the United States Environmental Protection Agency (USEPA) have established 16 Total Maximum Daily Loads (TMDLs) in the Los Angeles Region to address water bodies that are impaired due to sediment, pesticides, nutrients, bacteria, trash, and salts, and which identify irrigated agricultural lands as a source of pollutants and assign load allocations to discharges from irrigated agricultural lands.
6. The Regional Water Board has established this Conditional Waiver, including the specific requirements herein, based on data and information submitted through the Dischargers' past annual monitoring reports, water quality management plans, and other available information. A Staff Report has been prepared to explain the principal

1

Los Angeles Region Ag Waiver

- 97,000 acres of irrigated farmland
- 2,100 individual growers

Essential Waiver Elements:

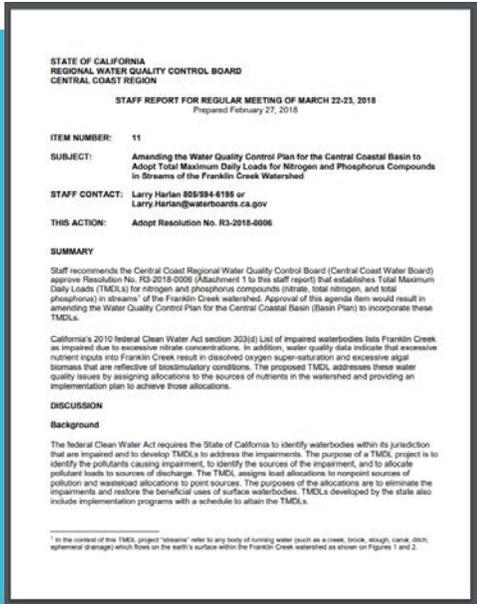
- Specific time schedule to achieve water quality requirements
- Time schedule triggers individual discharge monitoring for all growers upstream of contaminated site if water quality objectives not met.
- Timeline triggers conversion of benchmarks to enforceable effluent limitations at point of discharge

Table 3. Water Quality Benchmark Compliance Deadlines

TMDL Constituents	Compliance Date
Malibu Creek Watershed Nutrients TMDL	October 14, 2022
Santa Clara River Nitrogen Compounds TMDL	October 14, 2022
Ventura River Estuary Trash TMDL	October 14, 2020
Calleguas Creek Nitrogen Compounds and Related Effects TMDL	October 14, 2025
Revolon Slough and Beardsley Wash Trash TMDL	October 14, 2020
Upper Santa Clara River Chloride TMDL	October 14, 2020
Calleguas Creek Watershed and Mugu Lagoon Siltation TMDL*	March 24, 2015
Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL	March 24, 2022
Ventura River Algae TMDL	June 28, 2019
McGrath Lake OC Pesticides and PCBs TMDL	June 30, 2021
Malibu Creek Watershed Sedimentation and Nutrients TMDL	July 2, 2021
Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL	March 26, 2022
Calleguas Creek Watershed Boron, Chloride, Sulfate and TDS (Salts) TMDL	Dec. 23, 2023
Santa Clara River Estuary Toxaphene TMDL	October 7, 2025
Calleguas Creek Watershed and Mugu Lagoon OC Pesticides & PCBs TMDL	March 24, 2026
Oxnard Drain #3 Pesticides, PCBs, and Sediment Toxicity TMDL	April 14, 2026

➤ Deadlines align with TMDL schedules

➤ TMDL deadlines are forthcoming and motivating



Franklin Creek Nitrogen TMDL

- Irrigated agriculture is the primary source of contamination
- Timeline established in the TMDL
- Ag Waiver identified as sole implementation mechanism
- Ag Waiver fails to adequately address actual issue – **shallow groundwater loading**





Shallow groundwater loading and seepage to Franklin Creek is primary source of nitrogen

Not runoff



Solutions:

- Enforceable nitrogen application limits.
- Enforceable vegetated riparian buffer requirements.

Controlling Nitrogen

Nitrogen in Agricultural Systems: Implications for Conservation Policy. USDA 2011

Three basic practices:

- “Rate. Apply no more nitrogen than 40 percent more than that removed with the crop at harvest, based on the stated yield goal, including any carryover from the previous crop.”
- “Timing. Not applying nitrogen in the fall for a crop planted in the spring.”
- “Method. Injecting or incorporating (applying to the surface and then discing the fertilizer into the soil) nitrogen rather than broadcasting onto the surface without incorporation.”

Where drinking water contamination is a primary concern:

- “[A] recommendation could be that in areas where leaching to drinking water sources is a concern, improvements in nitrogen use efficiency could focus on application rate reductions or improvements in timing.”

Controlling Nitrogen

Nitrogen in Agricultural Systems: Implications for Conservation Policy. USDA 2011

And when nitrogen (inevitably) gets away

“Off-Site Practices That Capture Nitrogen”

- “Off-field conservation measures can be used in conjunction with on-field nitrogen management to either capture reactive nitrogen in biomass or convert it to inert N₂ through denitrification. Examples of off-site practices include vegetative buffers or filters and restored and constructed wetlands”
- “Based on a wide range of studies, Mayer et al. (2005) estimate that buffers can remove about 74 percent of the nitrogen passing through the buffer root zone.” emphasis added
- “However, in many areas of the country where tile drains are used to control the water table, especially in the Corn Belt, subsurface flows pass below the root zone and are not filtered by vegetative buffers.”

Ideas to consider:

Numeric standard / application limitations

- USDA. Apply no more nitrogen than 40 percent more than that removed with the crop at harvest, based on the stated yield goal, including any carryover from the previous crop;

or

- Easiest and perhaps most liberal. Apply no more than 150 percent of nitrogen requirement as fertilizer amendment.

and

- In addition, determine and enforce sub-watershed loading.

Ideas to consider:

Management Practices

No Channelized Flow From Field:

- A minimum 50-foot vegetated buffer shall be maintained between planted crops and any waters of the state.
- Crops planted on any slope greater than 2-percent (?) must install management practices to slow and infiltrate any excess irrigation water or stormwater.
- Crops planted on any slope and utilizing impermeable materials (plastic) must install detention ponds designed to capture and infiltrate any excess irrigation water or stormwater (sizing info).
- Additional recommended management practices (partial list): Wetlands (engineered or natural), cover cropping, two-stage ditch, bioreactors, saturated buffer.

Ideas to consider:

Management Practices

Channelized Flow (tile drains, ditches, and culverts):

Management practices must be installed to capture or remove nitrogen. No drain should discharge water into a water of the state in excess 10mg/L N after 5 years or 2 mg/L N after 10 years.

- Channelized flows shall be routinely monitored using a field test kit.
- Where channelized flows show exceedance, exceedance shall be reduced by 50 percent within three years and eliminated by five years.
- Where channelized flows show persistent exceedance due to high-N source water (and growers should be encouraged to “pump and treat” high-N waters), grower must demonstrate a consistent reduction of N from source to discharge.
 - ✓ Source, as well as discharge, must be routinely monitored using a field test kit

Recommended management practices (partial list): Wetlands (engineered or natural), cover cropping, no fall fertilizer applications, two-stage ditch, bioreactors, saturated buffer.

Controlling Toxicity

Ideas to consider:

Application limitation: none. Staff should work closely with DPR to develop application restrictions protective of environmental health.

Management Practices:

- **No Channelized Flow From Field:** Same as N
- **Channelized Flow From Field:** Same general framework as N
No drain should discharge water into a water of the state in excess one toxic unit after 3 years.
 - ✓ A sampling of channelized flows shall be routinely monitored quarterly for two years and every other year thereafter.
 - ✓ Where channelized flows show exceedance, exceedance shall be reduced by 50 percent within two years and eliminated by three years.

Surface Water Quality Monitoring – A NEW Paradigm

Current (old) Paradigm:

~50 Receiving Water Monitoring Stations

- Far removed from any one source
- Generally a blend of different types of sources (municipal, stormwater, agricultural)
- Generally a blend of many management practices
- Non responsive to pollution events
- Incredibly expensive for the limited results

Surface Water Quality Monitoring – A NEW Paradigm

New Paradigm

- Designed by Dr. Revital Katznelson
 - Technical liaison to SWRCB
 - Has worked with and mentored several Regional Boards
 - Co-creator of SWAMP (Surface Water Ambient Monitoring Program)
 - Water Quality Data Elements Workgroup Member, National Water Quality Monitoring Council
 - Aquatic Sensors Workgroup Member, National Water Quality Monitoring Council
 - Teaches Water Quality Monitoring and related lab and field courses at UC Berkeley Extension
 - Peer-reviewed articles in scientific journals including the Journal of Biological Chemistry, the Archives of Microbiology, the European Journal of Biochemistry, and the Journal of the Society of Environmental Toxicology and Chemistry.
- Full disclosure – Dr. Katznelson worked as a paid consultant for The Otter Project

Surface Water Quality Monitoring – A NEW Paradigm

What is the purpose?

- The monitoring program must serve and comply with Porter-Cologne and the Nonpoint Source Pollution Control Program.
- Growers know their numbers and are paying attention.

What are the goals?

- Goal One: Compliance. Assure compliance of agricultural discharges with water quality objectives (WQOs).
- Goal Two: Source identification. Determine individual discharge sources.
- Goal Three: Management practice effectiveness evaluation. Validates effectiveness of management practices as implemented in the real world
- Goal Four: Long term trends. Are we getting anywhere?

Surface Water Quality Monitoring – A NEW Paradigm

Component 1: Long term monitoring at three or four fixed stations at integrative sites.

Component 2: Commodity-based Stations. Eight to twelve stations. Data loggers, field and lab analysis.

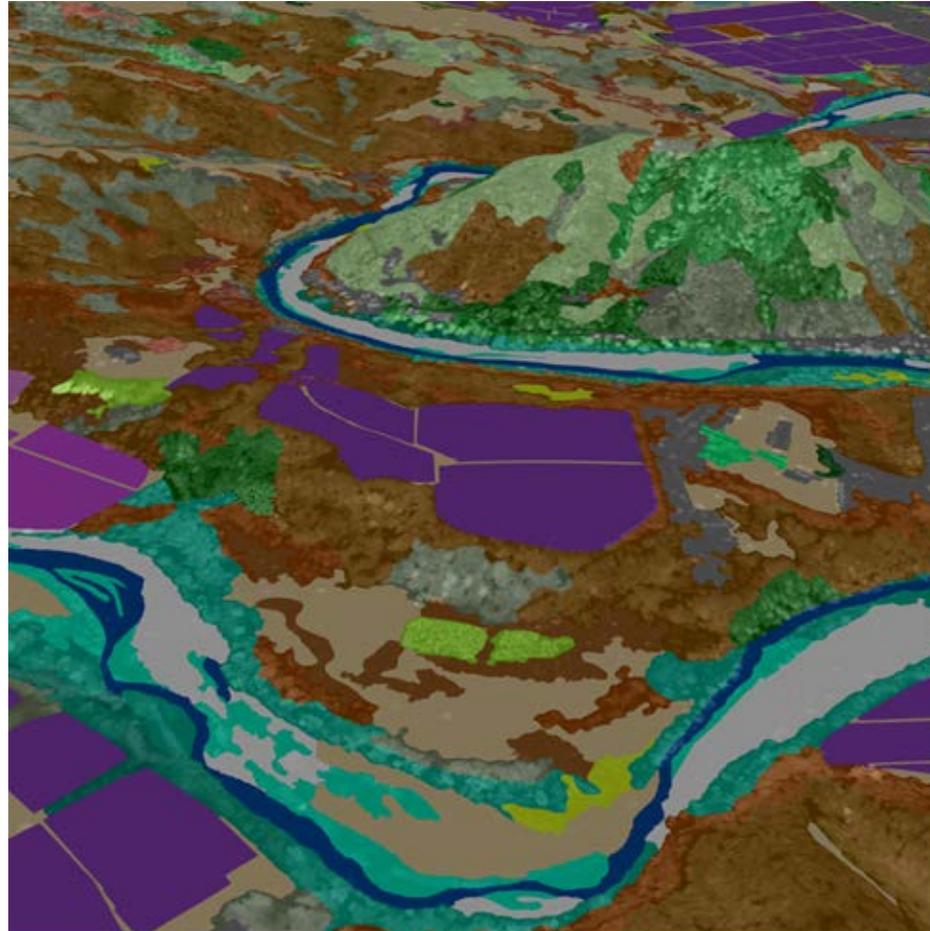
Component 3: Routine observations and reporting. Growers routinely (twice weekly (?)) making field observations using field test kits. Cost is approximately \$1 per test. Reporting via smart phone.

Component 4: Quick response track-back monitoring when alerted by observations

Component 5: Special studies (if necessary)

Important Note: RWQCB staff (no coalition) conducts components 1, 2, 4

Protecting Riparian and Wetland Areas



A recently completed fine scale vegetation map for Sonoma County showcases many of the most recent advances in landscape and habitat assessment. Based on high-resolution imagery and LiDAR data.

CONCLUSION

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