

Informing the Clean Water Act:

Elkhorn Slough Coastal Training

**Elkhorn Slough National Estuarine
Research Reserve**

Final Management Plan 2007-2011

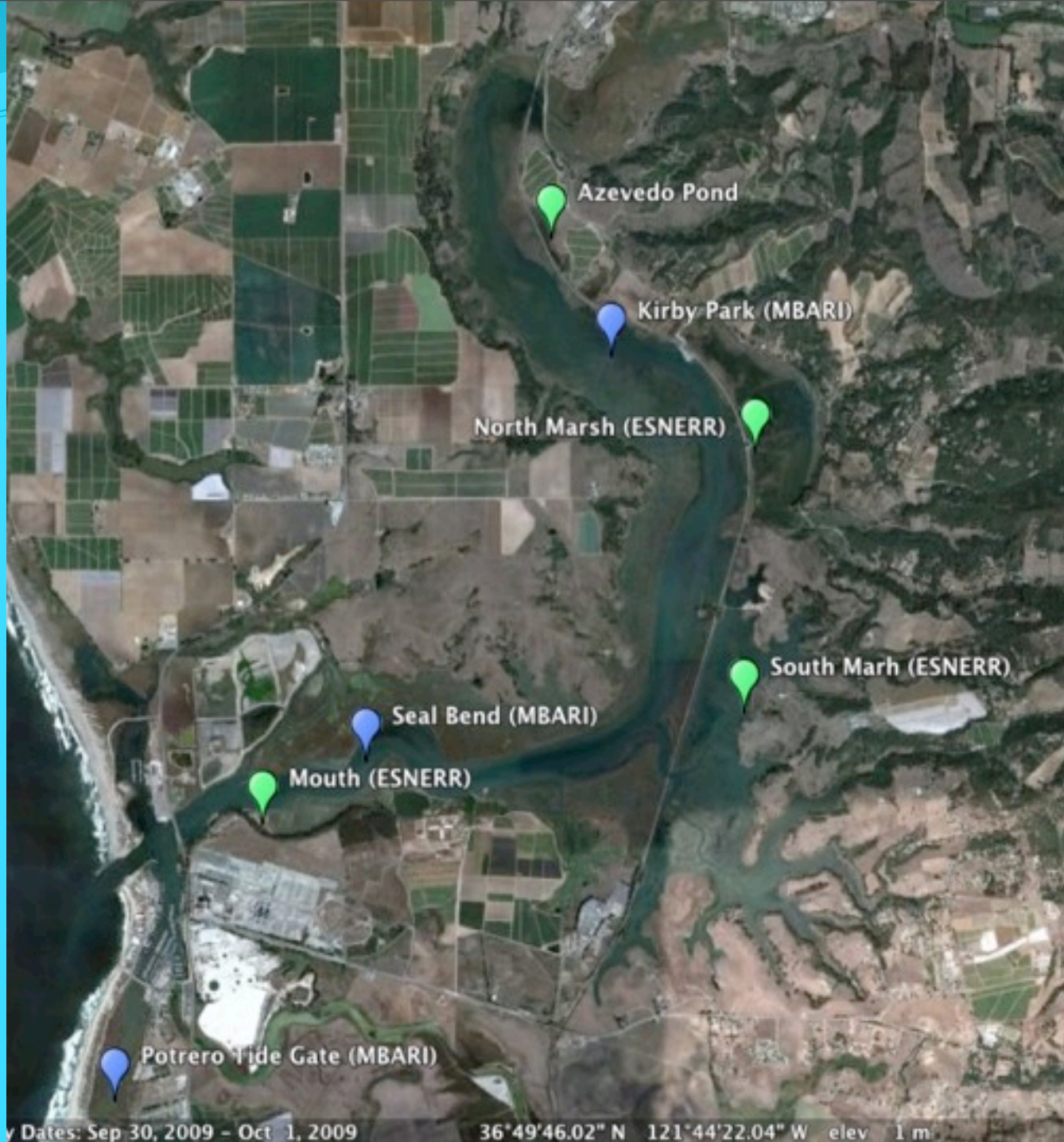
September 29, 2006



Wednesday, May 8, 2013



Wednesday, May 8, 2013





Wednesday, May 8, 2013



Wednesday, May 8, 2013



Wednesday, May 8, 2013



Wednesday, May 8, 2013







ENTRIX

*Environmental and
Natural Resource Management
Consultants*





LAND TRUST
OF SANTA CRUZ COUNTY



BIG SUR LAND TRUST



NATIONAL MARINE SANCTUARIES



Elkhorn Slough National Estuarine
Research Reserve
Coastal Training Program
Coastal Planners and Regulators
Audience Needs Assessment

roduction
isions made on behalf of coastal communities can have prof
estuarine and coastal environments. Elected officials, land u
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hen do not have adequate access to relevant science based info
chnology to make informed decisions affecting the coast.

The National Estuarine Research Reserve System (NERRS) has
address these information and technology needs through target
programs at the local and regional levels.

The Elkhorn Slough National Estuarine Research Reserve (ES
(CTP) has been established to build on the experience and res
and enhance reserve capabilities to deliver training. The goal
whole have been described as follows:

The goal of the Coastal Training Program is to improve deci
resources management at local and regional levels.

The objectives of the Coastal Training Program are to:

- 1) Provide the best available science-based information to
individuals and groups that are making important deci
coastal watershed, estuarine, and nearshore waters;
- 2) Increase networking and collaboration across sectors
management issues in local and bio-geographic areas;
- 3) Increase understanding of the environmental, social an
activity within the coastal landscape.



Elkhorn Slough National Estuarine COASTAL TRAINING PROGRAM WEB SURVEY

Spring 2005



Elkhorn Slough National Estuarine Research Reserve
San Francisco Bay National Estuarine Research
Reserve

Land Manager Needs Assessment Web Survey

March 2012

Written By
Grant Lyon
ESNERR Coastal Training Program

Grey Hayes
ESNERR Coastal Training Program

Marina Psaros
SF Bay Coastal Training Program



Elkhorn Slough National Estuarine Research Reserve
Coastal Training Program
Coastal Planners and Regulators
Audience Needs Assessment

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Elkhorn Slough National Estuarine Research Reserve
COASTAL TRAINING PROGRAM
WEB SURVEY

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Elkhorn Slough National Estuarine Research Reserve
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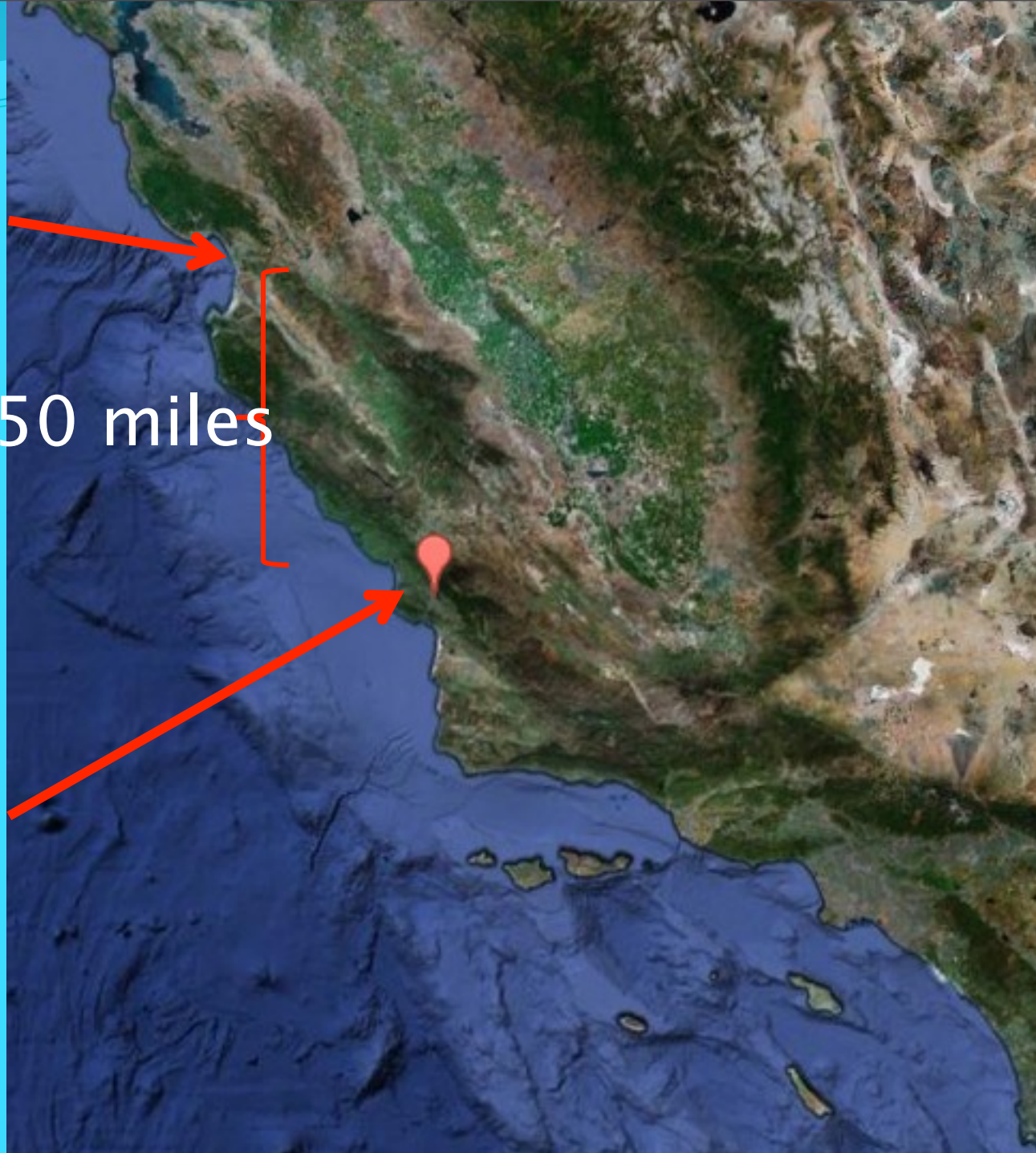
March 2012

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Grant Lyon
ESNERR Coastal Training Program
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Marina Psaros
SF Bay Coastal Training Program

Elkhorn

150 miles

Water
Quality
Control
Board





Appointed Officials



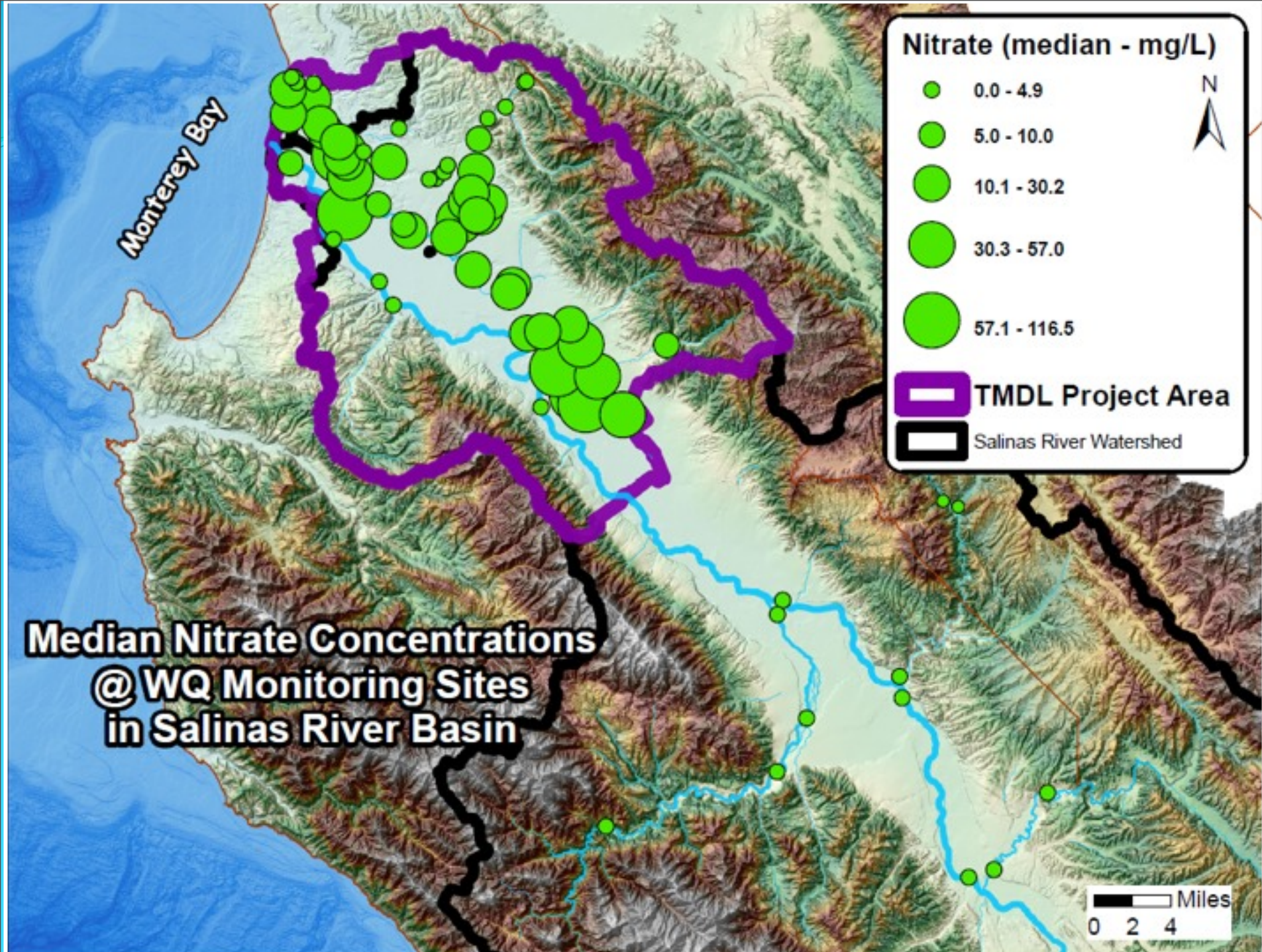
Technical staff



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY



**Central Coast Regional Water
Quality Control Board**



Why Do a TMDL?...

CWA Objective: “to restore and maintain the chemical, physical and biological integrity of the Nation’s waters”

Federal Clean Water Act:

**States Must “List” Impaired Waterbodies
Not Meeting WQ Standards**



“Listed” Waterbodies:

**States (Water Board) must address =
TMDL**



State TMDL Policy



**Implementation Plan
Basin Plan Amendment**



Wednesday, May 8, 2013



Data Export System

The DES was developed to provide the majority of users with quick and easy access to SWMP data. The DES utilizes a map-based interface and offers single station exports, yearly authenticated file downloads (these may include non-standard nutrient parameters), charting, and a current conditions display for real-time stations.

[To launch the Data Export System, click here.](#)



Advanced Query System

The AQS was developed to specifically address the data delivery needs of those end-users looking for large amounts of data exported in a format that can be easily imported and manipulated for data analysis. The AQS offers three different query options allowing for mass downloads of annual files, customized queries for specific parameters and multiple stations in the same file, and an option to merge water quality, meteorological and nutrient datasets.

[To launch the Advanced Query System, click here.](#)

Station	Code	DateTimestamp	Temp	SpCond	Sal	DO_pct	DO_mgl	Depth	pH	Turb
e1kvmwq	01/01/2005	00:00	13.2	047.83	31.1	104.1	09.0	2.63		0017
e1kvmwq	01/01/2005	00:30	13.2	047.75	31.1	104.7	09.1	2.71		0016
e1kvmwq	01/01/2005	01:00	13.1	047.87	31.2	105.0	09.1	2.84		0018
e1kvmwq	01/01/2005	01:30	13.1	048.00	31.3	105.0	09.1	2.91		0013
e1kvmwq	01/01/2005	02:00	13.1	048.17	31.4	105.0	09.1	2.98		0010
e1kvmwq	01/01/2005	02:30	13.1	048.34	31.5	104.7	09.1	3.04		0009
e1kvmwq	01/01/2005	03:00	13.1	048.42	31.6	103.9	09.0	3.08		0008
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e1kvmwq	01/02/2005	04:00	13.2	048.91	31.9	098.6	08.5	3.15		0006
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e1kvmwq	01/02/2005	05:00	13.2	048.65	31.7	096.8	08.3	3.07		0010
e1kvmwq	01/02/2005	05:30	13.2	048.61	31.7	098.2	08.5	3.04		0010



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CENTRAL COAST REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL COAST AMBIENT MONITORING PROGRAM



[About CCAMP](#)

[CCAMP Data Navigator](#)

[Reports and Publications](#)

[Data Delivery](#)

[CCAMP Technical Support](#)

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.



The Bay Foundation provides web server space, design services, and technical support for this website.
Data provided on this site should not be used without consultation with the data providers

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e1kvmwq	01/02/2005	05:30	13.2	048.61	31.7	098.2	08.5	3.04		0010

Strategize
with Reserve
and Partners

Plan
Assessment
with
Researchers

Audience
Assessment

Communicate
Needs to
Researchers

Translate with
Researchers

Communicate
to Audience

Evaluate

Research

Scientific
Publications

Meeting
Notes

Collaborative
Meeting
Planning

Web
Archive

September 2010
Researchers—
Who can use
our data to
help improve
water quality?

October 2010
Coastal
Training
Contact
Regional Board

Nov 2010
Coastal
Training
&
Researchers
Meet with
Regional Board

December 2010
Coastal Training
Regional Board
Needs Assessment
Interviews/Surveys

January 2011
Coastal Training
Facilitate ESNERR Strategic Planning – Response to Needs

February 2011
Coastal Training
&
Researchers
Present to
Regional Board

March 2011
Coastal Training
Facilitate ESNERR
Strategic Planning
– Next Steps

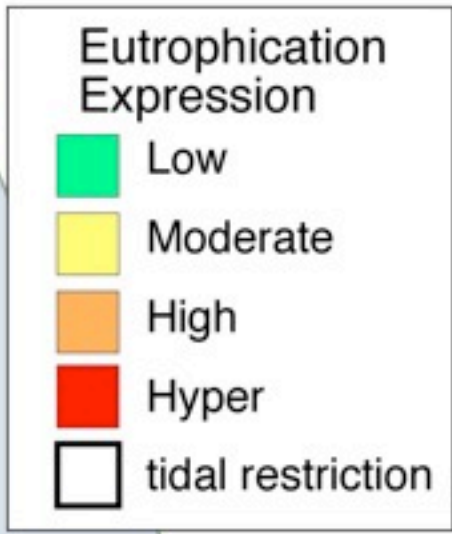
March – November
2011
Coastal Training
&
Researchers
Peer Review Regional
Board Draft Rules

March –
December
2012
Researchers
–
Fish kill
experiments

March 2012
Coastal Training
&
Researchers
Presentation to Regional
Board and Partners

March – Sept 2012
Coastal Training
Facilitate ESNERR
Strategic Planning
Next Steps

October 2012
Coastal Training
&
Researchers
Meet with Congressman,
Farm Representatives, etc



36° 50' N

Monterey Bay

Carneros Creek

Elkhorn Slough

Old Salinas R.

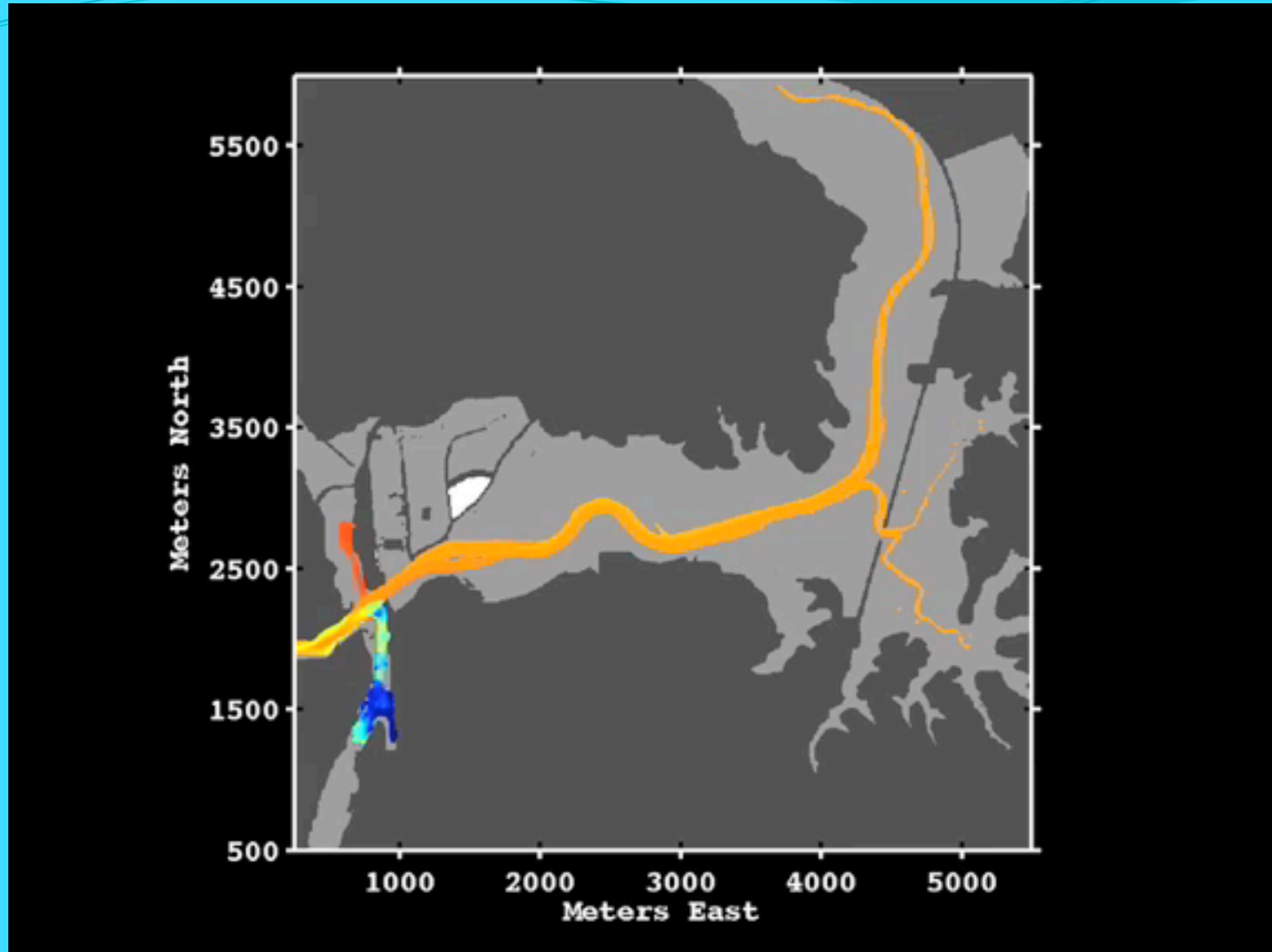
Moro Cojo Slough



121° 47' W



Nutrients: Tidally pumped up the estuary



Source: Nick Nidzieko



Wednesday, May 8, 2013

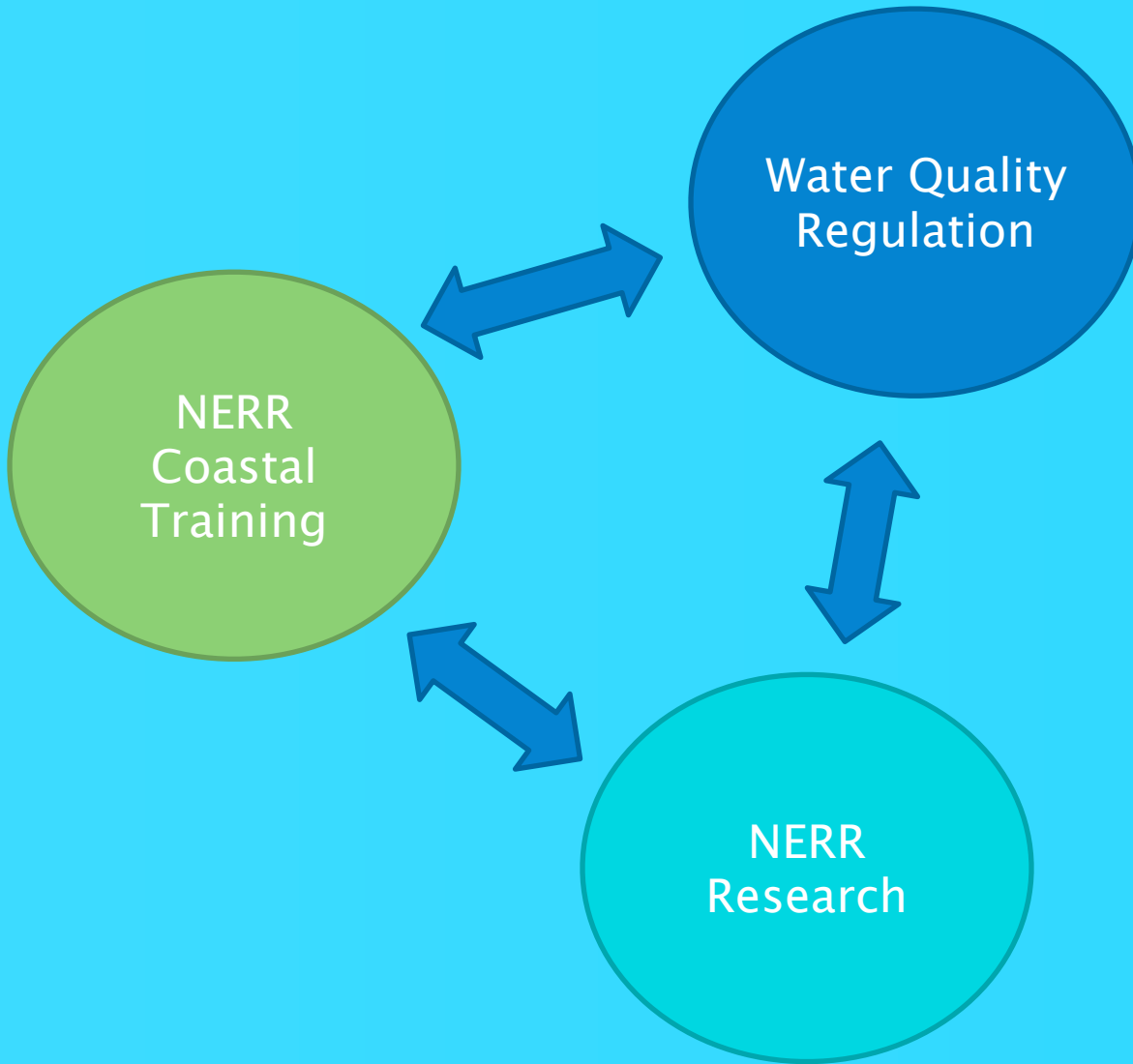
**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place, Suite 101
San Luis Obispo, California**

**RESOLUTION NO. R3-2009-0053
JULY 10, 2009**

**RECOMENDING CHANGES TO THE CLEAN WATER ACT SECTION 303(D) LIST
OF IMPAIRED WATERBODIES AND SECTION 305(B) WATER QUALITY
CONDITION REPORT (THE 2008 INTREGRATED REPORT)**

WHEREAS, the California Regional Water Quality Control Board, Central Coast Region (Central Coast Water Board), finds that:

1. Section 305(b) of the federal Clean Water Act requires the State to prepare a biennial update of an assessment of the waters within the State;
2. Section 303(d) of the federal Clean Water Act requires the State to identify waters within the State for which water quality standards are not attained;
3. A thorough and comprehensive water quality assessment is critical to measuring progress towards the Vision of Healthy Watersheds;
4. Central Coast Water Board staff actively solicited water quality information from the public on December 4, 2006, and received data and information from 19 different monitoring programs; and
5. Central Coast Water Board staff assembled and considered all readily available data to assess water quality conditions and prepared fact sheets supporting recommendations for additions, deletions and changes to the existing list of impaired water bodies consistent with the State Water Resources Control Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy);



Outcome

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

STAFF REPORT FOR REGULAR MEETING OF MARCH 14-15, 2013
Prepared February 15, 2013

ITEM NUMBER: 6

SUBJECT: Amending the Water Quality Control Plan for the Central Coastal Basin to Adopt Total Maximum Daily Loads for Nitrogen Compounds and Orthophosphate in Lower Salinas River and Reclamation Canal Basin and the Moro Cojo Slough Subwatershed

STAFF CONTACT: Pete Osmolovsky 805/549-3699 or paosmolovsky@waterboards.ca.gov

THIS ACTION: Adopt Resolution No. R3-2013-0008

More informed TMDL Regulation for Nitrogen in main source tributary to the Elkhorn Slough

(Staff had never set standards in salt water)

Outcome

Also noteworthy is that the U.S. Environmental Protection Agency (USEPA) recently reported that nitrogen and phosphorus pollution, and the associated degradation of drinking and environmental water quality, has the potential to become one of the costliest and most challenging environmental problems the nation faces⁶. More than half of the nation's streams, including most streams in the lower Salinas Valley, have medium to high levels of nitrogen and phosphorus. According to USEPA, nitrate drinking water standard violations have doubled nationwide in eight years. Additionally, it has been widely demonstrated that drinking water supplies in the Salinas Valley have been substantially impacted by nitrate⁷. Algal blooms, resulting from the biostimulatory effects of nutrients, are steadily on the rise nationwide; related toxins have potentially serious health and ecological effects. These types of water quality impairments in the lower Salinas valley are also having significant adverse downstream impacts to the receiving waters of the ecologically sensitive Elkhorn Slough estuary as demonstrated by estuarine researchers and the peer-reviewed scientific literature.

Water Board staff also evaluated the potential for violations of the Basin Plan's biostimulatory substances water quality objective. Biostimulatory impairments can occur due to the presence of elevated nitrogen and phosphorus in waterbodies. It is well established and well documented¹ that nutrients (such as nitrate and phosphate), in combination with other physical and chemical factors, can potentially contribute to excessive growth of algae and aquatic plants in rivers, streams, and coastal waterbodies. This excess algal biomass can then potentially result in biostimulatory impairments by detrimentally affecting dissolved water column oxygen, pH, and aquatic habitat. Staff's assessment² indicates that seasonal biostimulatory impairments are widespread in the TMDL Project Area, and are generally associated with the dry season (May through October). These impairments are also having significant adverse downstream impacts to the ecologically sensitive Elkhorn Slough estuary as demonstrated by estuarine researchers and the peer-reviewed scientific literature (see TMDL Project Report – Attachment 2 to the Staff Report).

Outcome

PUBLIC INVOLVEMENT

Staff conducted stakeholder outreach efforts during TMDL development. Staff conducted public workshops in the city of Salinas in June 2010, April 2011, October 2011, and November 2012, and staff engaged with stakeholders during the development of the TMDL through informal meetings, correspondence, and telephone contact. In particular, extremely helpful information, feedback, and assistance were provided by individuals and researchers affiliated with the Elkhorn Slough National Estuarine Research Reserve, the Monterey County Water Resources Agency, the California State University Monterey Bay Watershed Institute, the Central Coast Wetlands Group at Moss Landing Marine Labs, the Monterey Bay Aquarium Research Institute, and the Monterey County Water Quality and Operations Committee. Other individuals and entities staff engaged with during public workshops or during TMDL development included representatives of the following:

- Monterey County Water Resources Agency
- City of Salinas
- Costa Farms, Inc.
- Monterey Bay Aquarium Research Institute
- University of California Cooperative Extension
- Resource Conservation District of Monterey County
- Representatives of commercial farms and ranches
- Agricultural consultants
- Representative of State Senator Sam Blakeslee
- Monterey County of Public Works
- Researchers and resource professionals from the Elkhorn Slough National Estuarine Research Reserve

Public acknowledgement of NERR involvement

Outcome

Also noteworthy is that regional studies, and estuarine researchers suggest that currently, control of nitrogen in this system may be considerably more important than control of phosphorus. TetraTech scientists found that streams in nutrient subcoregion 6 are more often limited by nitrogen than by phosphorus, which may explain by there is a strong water quality correlation between water quality impairment and nitrate levels in subcoregion 6¹⁶. Further, an estuarine researcher with the Elkhorn Slough National Estuary Research Reserve reported that phosphorus control is not as important as nitrogen control with respect to downstream impacts on Elkhorn Slough. The types of ephemeral macroalgae found in Elkhorn Slough thrive readily in high nitrogen conditions but are relatively insensitive to phosphorus inputs¹⁷ (personal communication, Brent Hughes, ESNERR, August 10, 2011). Accordingly, as a practical matter staff maintains that the focus of resources and technical analyses, should be directed with respect to nitrogen.

Personal communication is important

D.10 Seasonal Biostimulatory Numeric Targets

D.10.1 Basis for Dry-Season and Wet-Season Numeric Targets

Photo documentation, field observations, and input provided by researchers⁸ with expertise in eutrophication issues in Elkhorn Slough and the lower Salinas Valley indicate clear evidence of algae problems and biostimulation in the summer months, and that eutrophication is primarily a summer-time water quality problem in coastal confluence waterbodies and streams of northern Monterey County (for example, see following figure).



There is also some evidence of periodic and episodic excessive chlorophyll levels in winter months, based on available water quality data. Staff concludes that it would be unwarranted at this time to apply the nutrient numeric targets developed in this appendix to implement the Basin Plan's biostimulatory objective on a year-round basis. Additionally, winter nutrient loads are often associated with higher velocity stream flows which are likely to scour filamentous algae and transport it out of the watershed. These higher flows also flush nutrient compounds through the watershed and

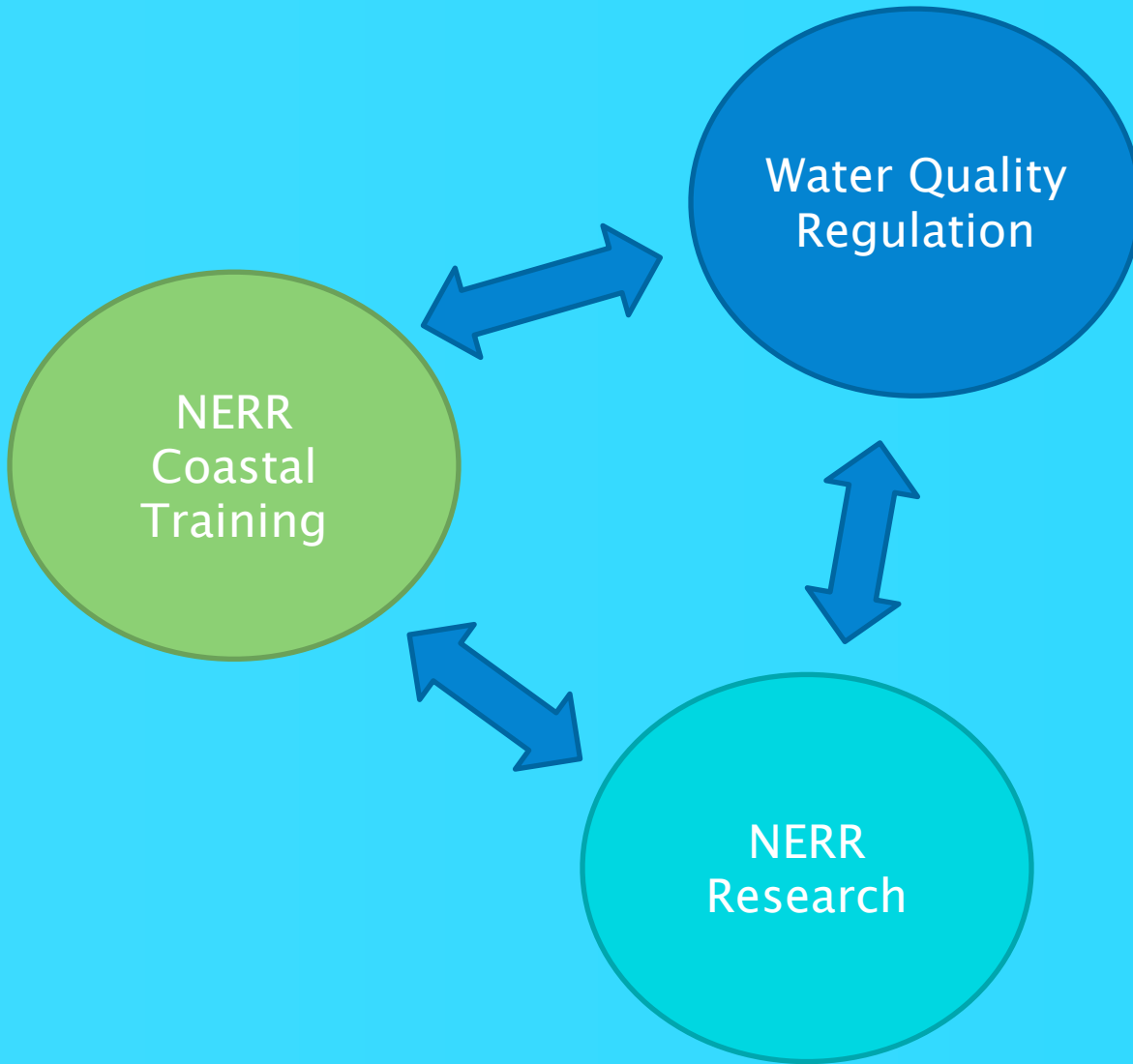
⁸ Personal communications: Ken Johnson, Ph.D. (Senior Scientist, Monterey Bay Aquarium Research Institute); Brent Hughes (estuarine ecologist, Elkhorn Slough National Estuarine Research Reserve); Mary Hamilton (environmental scientist, Central Coast Ambient Monitoring Program)

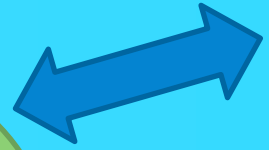
Outcome

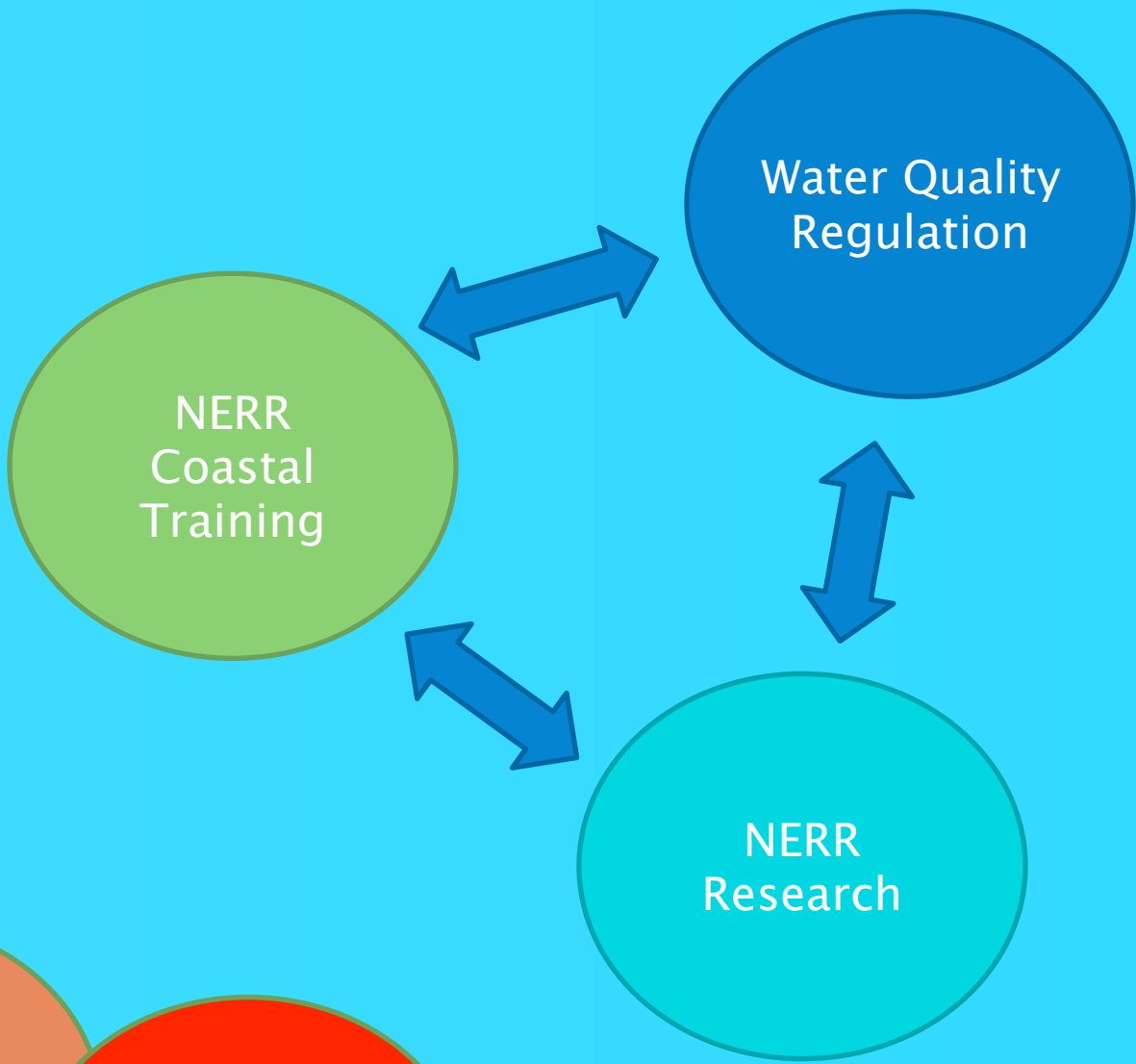
4. While this may be outside the scope or responsibility of the TMDL report, I found there to be a lack of clarity regarding who will pay for and conduct the long-term watershed water quality monitoring proposed on p. 182, as well as the beginning of Section 7.7. Are owners/operators of irrigated lands responsible for water quality monitoring of their water quality impacts in the Project Area?

Staff response: Water quality monitoring is currently being conducted on behalf of growers by the Cooperative Monitoring Program (CMP). This monitoring program works on behalf of growers and has been collecting a large body of data for at least seven years. At this time, the TMDL is not proposing nor anticipates additional monitoring above and beyond what growers are already paying for, or are required to do pursuant to the adopted Agricultural Order. To limit the burden of monitoring, we are proposing at this time a limited number to TMDL compliance monitoring sites, and that current monitoring programs, including CMP, ESNERR, and CCAMP are already collecting sufficient data at these sites.

**Demonstration that NERRS can save others' \$
by helping with mandatory monitoring**







Farmers

Lawyers

The End