

Snapshot Day Report

May 7th 2005



Results of a Sanctuary-Wide Water Quality Monitoring Event

Author:

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This report is available for download at www.montereybay.noaa.gov/monitoringnetwork/events.html



Executive Summary

Snapshot Day (SSD) is a one-day event that utilizes citizen volunteers to collect and analyze water samples from streams that enter the Monterey Bay National Marine Sanctuary (MBNMS). SSD began on Earth Day 2000 and has become a widely recognized volunteer event in which important water quality information is gathered.

SSD is a partnership between The Monterey Bay Sanctuary Citizen Watershed Monitoring Network (Network) and the Coastal Watershed Council. The Coastal Watershed Council coordinates San Mateo and Santa Cruz counties while the Network coordinates Monterey County, south to Morro Bay.

On the morning of May 7th, 2005, volunteers gathered at four centralized hubs strategically placed in each of the four counties bordering the Sanctuary (San Mateo, Santa Cruz, Monterey, and San Luis Obispo). The Hubs facilitated the tracking of equipment, lab sample chain of custody, verification of complete and accurate data sheets, post calibration measurements, and provides a place for volunteers to gather and feel part of a larger event.

On Snapshot Day, 161 volunteers monitored 163 sites. As in the past events, results show that the majority of sites met the water quality objectives (WQO) intended to support cold water fish habitat. Eighty-six sites (53%) had no exceedances of the WQOs for any of the parameters measured. However, transparency and dissolved oxygen were the most common field measurement to not meet the WQOs at 16% and 15% of the sites respectively. In contrast to 2004, the number of dissolved oxygen exceedances was down from 23%.

Similar to last year, *E. coli* (bacteria from warm-blooded animals) and orthophosphate were the parameters analyzed in the lab that most commonly exceeded their water quality objectives. The *E. coli* WQO was exceeded at 16% of the sites, and orthophosphate WQO was exceeded at 18% of the sites.

In 2004, the percentage of exceedances for *E. coli* and orthophosphate was 24% so there was a significant decrease in 2005. Sites with orthophosphate exceedances were found throughout the sanctuary except on the Big Sur coast. *E. coli* exceedances were found primarily around the Monterey Bay and in San Luis Obispo County. Just one site in San Mateo County exceeded the *E. coli* WQO.

This year, as in 2004, 18 Areas of Concern (sites that exceeded 3 or WQOs) were identified. Twelve of the 18 sites were Areas of Concern last year. Of the 34 sites identified as Areas of Concern over the past five years, 5 have been Areas of Concern four times, and 1 (Alisal Creek, Salinas) has been an Area of Concern every year.

As we have reported for the past few years, a pattern is emerging from year to year with the data collected by volunteers in this program. The same sites continue to be Areas of Concern and the same pollutants continue to be problematic. However, this year, the percentage of sites that exceeded water quality objectives for each parameter went down from previous years.

There is tremendous opportunity to take this information and target available resources towards implementing management programs and best management practices, educating the local population and revising public policy, with the goal of improving water quality.

The volunteers collecting the data were well trained, and the rigorous quality assurance gives confidence that the results presented in this report are accurate. For the majority of sites, Snapshot Day is the only time these waterbodies are ever monitored. We are grateful to the volunteers and all of our partners listed on the following page for making this event possible.

Central Coast Snapshot Day 2005 was organized by:

The **Monterey Bay Sanctuary Citizen Watershed Monitoring Network** (Network) supports citizen monitoring programs throughout the Monterey Bay National Marine Sanctuary. (831) 883-9303.

www.montereybay.noaa.gov/monitoringnetwork/welcome.html

The **Coastal Watershed Council** is a public education non-profit advocating the preservation and protection of coastal watersheds through establishment of community-based watershed stewardship programs. (831) 426-9012. <http://www.coastal-watershed.org/>

The **California Coastal Commission** is proud to help support the Central Coast Snapshot Day as an important educational program linking land & water quality stewardship with coastal resource protection. (831) 427-4863. <http://www.coastal.ca.gov/>

The **Monterey Bay National Marine Sanctuary (MBNMS) Water Quality Protection Program** works to protect the watersheds along nearly 300 miles of the Sanctuary's coastline. (831) 420-1670
<http://www.mbnms.nos.noaa.gov/>

The **Ocean Conservancy** (Center for Marine Conservation) is the largest national nonprofit organization committed solely to protecting ocean environments and conserving the global abundance and diversity of marine life through science-based advocacy, research, and public education, as well as informed citizen participation. (831) 425-1363
<http://www.cmc-ocean.org/>



Volunteers at the San Mateo Hub in San Gregorio

Participating Agencies and Organizations

Arana Gulch Watershed Alliance
Big Creek Reserve
California Coastal Commission
Carmel River Watershed Conservancy
Central Coast Regional Water Quality Control Board
City of Capitola
City of Monterey
City of Pacifica
City of Pacific Grove
City of Santa Cruz
City of Watsonville
Coastal Watershed Council
Creek Environmental Laboratory
Crystal Springs Drinking Water
DeAnza College
Earth Systems Science and Policy Program (CSUMB)
Elkhorn Slough National Estuarine Research Reserve
Garrapata Watershed Council
Gulf of the Farallones National Marine Sanctuary
Harmony Foods Inc.
Kelly's French Bakery
Monterey Bay Analytical Services
Monterey Bay National Marine Sanctuary
Monterey Bay Sanctuary Foundation
Monterey County Community Links
Monterey Regional Water Pollution Control Agency
Morro Bay Volunteer Monitoring Program
Natural Resource Conservation Service, Monterey Cty
New Leaf Market
Odwalla
San Gregorio Environmental Resource Center
San Gregorio General Store
San Lorenzo Urban Restoration Project
San Lorenzo Valley High School
San Luis Obispo County Environmental Health
San Mateo County Environmental Health
Santa Cruz Coffee Roasting Company
Santa Cruz County Environmental Health
Santa Cruz Safeway - Mission Street
Scott Creek Watershed Council
Sewer Authority Mid-Coastside (SAM)
Starbuck's Coffee
Surfrider Foundation
The Ocean Conservancy
Trader Joe's
United States Environmental Protection Agency
University of California at Santa Cruz Environmental Studies Dept.
Upper Salinas Las Tablas RCD
Upper Salinas Watershed Coalition
Watershed Institute, CSUMB
Whole Foods

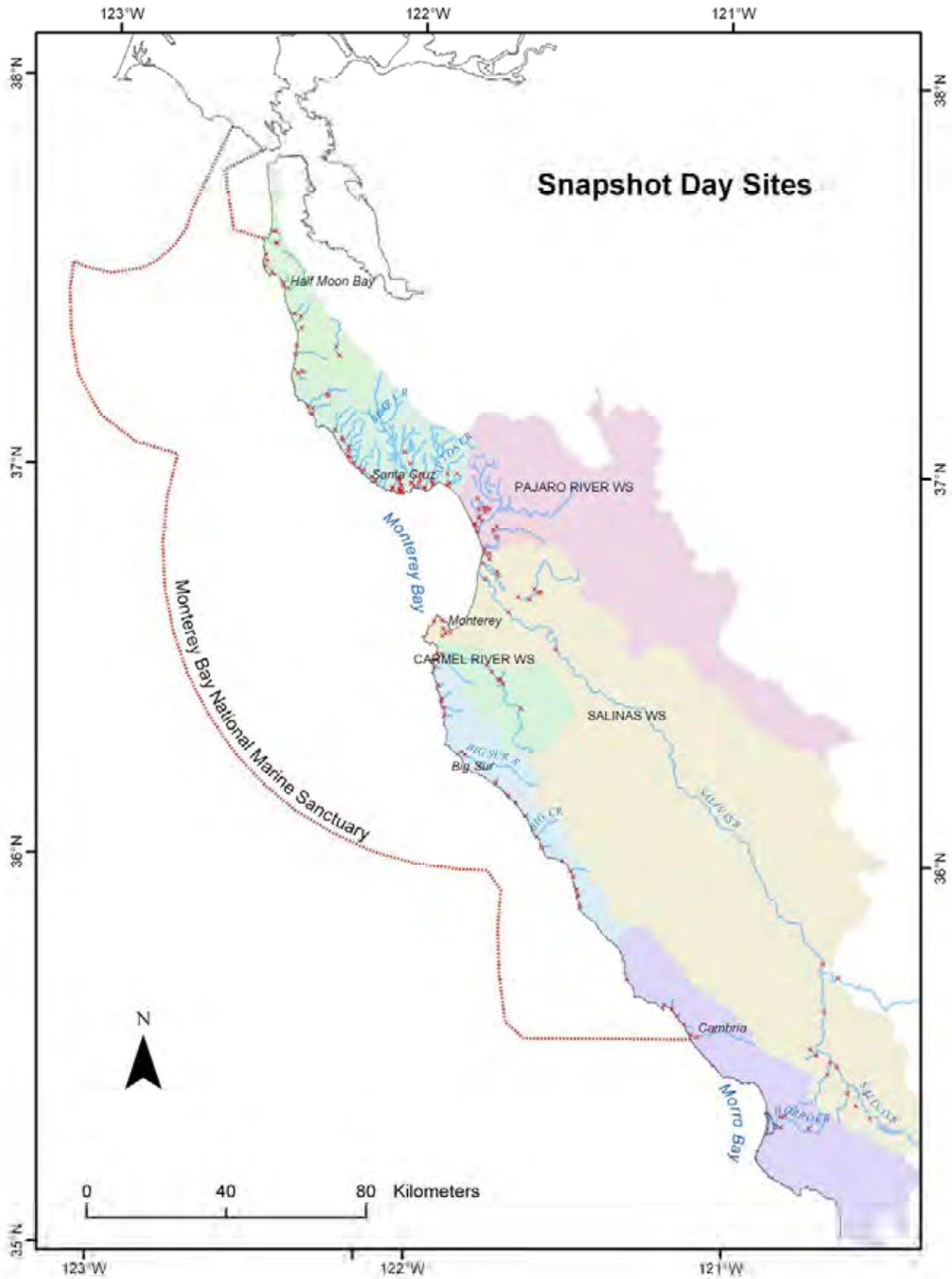


Figure 1. Map of Central Coast monitoring sites

Methods

Teams of trained volunteers measured dissolved oxygen, water and air temperature, conductivity, pH, and transparency or turbidity. They also collected water samples for lab analysis of nitrate, orthophosphate, total coliform and *E. coli*. Monitoring teams were provided with a bucket “kit” that included either a Winkler or CHEMets Dissolved Oxygen kit, two bulb thermometers (for air and water) or one digital thermometer, Oakton conductivity meter, Machery-Nagel non-bleeding pH strips and a transparency tube or dual cylinder turbidity kit. The bucket also included distilled water, gloves, paper towels, trash bag, pens/pencils, sample bottles and clipboard with data sheets, instruction, maps, and photo documentation forms.



Denyse Frischmuth records observations while Robert Frischmuth, Vicky Pearse, and Louise Pearse prepare to monitor at the mouth of the Carmel River. Photo by Warren Yogi

The sample collection and field measurements were taken using the protocols developed by the State Water Resources Control Board’s Clean Water Team and detailed in the 2003 California Coast Wide Snapshot Day Monitoring Plan. The results were compared with general Water Quality Objectives (WQOs) designated by the Central Coast Ambient Monitoring Program (CCAMP), the General Basin Plan or the US Environmental Protection Agency (see Table 1).

In order to ensure valuable data, a state approved Quality Assurance Project Plan and Monitoring Plan was developed specifically for this event. The volunteers collecting the data were well trained, and the rigorous quality assurance gives confidence that the results presented in this report are accurate.

Table 1. Water Quality Objectives

<u>Parameter (reporting units)</u>	<u>Water Quality Objectives</u>	<u>Source of Objective</u>
Dissolved Oxygen (ppm)	Not lower than 7 or greater than 12	Basin Plan Objective for Cold Water Fish
pH	Not less than 6.5 or more than 8.5	General Basin Plan objective
Water Temperature (°C)	Not more than 22	Basin Plan Objective for Cold Water Fish
Transparency (cm)	Not less than 25	Central Coast Ambient Monitoring Program (CCAMP)
Nitrate as N (ppm)	Not to exceed 2.25	Central Coast Ambient Monitoring Program (CCAMP)
Orthophosphate as P (ppm)	Not to exceed 0.12	Central Coast Ambient Monitoring Program (CCAMP)
<i>E. coli</i> (MPN/100ml)	Not to exceed 400	EPA Ambient Water Quality Criteria



Jenny Snook measures pH at Natividad Creek in Salinas

Results

On the Central Coast, 161 volunteers monitored 163 sites on 107 water bodies. This year, there were 50 fewer volunteers than in 2004, but they were still able to monitor more waterbodies than previous years. It was a mostly sunny day on the coast with air temperatures ranging between 10.8 °C (51.4 °F) and 17.0°C (62.6 °F).

Most stations met the water quality objectives as detailed in Table 1. Eighty-six sites, compared to 87 sites in 2004, had no exceedance for any of the water quality objectives. Once again, orthophosphate and *E. coli* were the two parameters that most often exceeded their water quality objectives at 18% and 16% of the sites. This was down significantly from 2004 in which 24% of the sites exceeded each of those parameters.

All of the data from Snapshot Day 2005 can be found in tabular form in Attachment 3, which lists the results of every parameter by site. The data is also reported visually on the maps found on pages 10-12. Map #1 shows nitrate-N results. Map #2 shows orthophosphate-P results. Map # 3 shows *E. coli* results.

The following describes the parameters evaluated during this event and their importance in the aquatic ecosystem. Please refer to Table 2 for statistical summaries.

Water Temperature

Water temperature is an important environmental factor for fish and other aquatic life, as many species need specific temperatures to survive and reproduce.

Table 2. Snapshot Day Statistics

Parameter	WQO	Stations Sampled	Number of Exceedences	Percent of Sites with Exceedences	Minimum Result	Maximum Result	Average Result	Median Result
AirTemp (°C)	none	150	N/A	N/A	10.8	27	17.3	17.0
WaterTemp (°C)	≤ 22	156	4	3%	10.5	30	15.2	14.2
Dissolved Oxygen (mg/L)	≥ 7, ≤12	143	21	15%	1.8	19	8.9	9.0
pH	≥ 6.5, ≤ 8.5	160	17	11%	5	9.5	7.2	7.3
Conductivity (µS)	none	159	N/A	N/A	30	16200	N/A	N/A
Transparency (cm)	≥ 25	106	17	16%	6	>120	87	117
Turbidity (JTU)	≤ 20	40	1	3%	0	30	6.0	5.0
<i>E. coli</i> (MPN/100 ml)	≤ 400	160	26	16%	1	24192	N/A	N/A
Total coliform (MPN/100 ml)	≤ 10000	160	17	11%	61	>24196	N/A	N/A
Nitrate-N (mg-N/L)	≤ 2.25	160	18	11%	<0.01	39.80	2.86	0.24
Orthophosphate-P (mg-P/L)	≤ 0.12	160	28	18%	<0.01	2.38	0.26	0.10

Temperature also affects the concentration of dissolved oxygen in the water column and the rate of photosynthesis for aquatic plants. Human activities such as water diversions that decrease flows or removal of streamside vegetation that shades the water, can lead to elevated water temperatures.

It is important to keep in mind that much of the data was collected in the morning hours; therefore water temperature results likely do not reflect the maximum daily or annual temperature for the water body.

The Basin Plan Objective for Cold Water Fish is water temperature less than 22 degrees Celsius (22°C). Temperatures above 22°C can be stressful for coho and steelhead and other aquatic organisms. The average temperature for Central Coast sites was 15.2°C and the median 14.2°C. This year, just four sites exceeded the temperature WQO with values between 22.6 and 30.0 °C. This is down from twelve sites in 2004. Stations with elevated temperatures from lowest to highest were Santa Rita Creek, Harkin Slough and two sites on Moro Cojo Slough.

Dissolved Oxygen

All aquatic animals require dissolved oxygen to breath. The concentration of dissolved oxygen in the water column affects a wide range of behaviors such as feeding, spawning, and incubation. Lowered dissolved oxygen is mainly a result of excessive nutrients which promote plant growth. In the process of breaking down plant matter, organisms deplete available oxygen through respiration.

The General Basin Plan Objective for dissolved oxygen is not less than 5 milligrams per liter (mg/l), however, on the Central Coast we use the Water Quality Objective for Cold Water Fish, which is not less than 7 mg/l or greater than 12 mg/l, based on the amount of dissolved oxygen needed by migrating steelhead trout. The average dissolved oxygen level for Central Coast sites was 8.9 mg/l, very similar to 8.5 mg/l last year and 8.9 in 2003. Fifteen sites ranged from 6.6 mg/l to as low as 1.8 mg/l. Six sites had saturated dissolved oxygen concentrations between 12.2 and 19.0 mg/l. They were Tembladero Slough, Pomponio Creek, San Lorenzo River, and three sites in the Moro Cojo. The total number of exceedances was down from 37 in 2004.

Conductivity

Conductivity is a measure of the ability of water to conduct electrical current. Measuring conductivity gives an indication of the amount of total solids (such as salts, mineral, acids, and metals) dissolved in the water. Conductivity varies with water source and geographic region.

There is no water quality objective for conductivity. However, once a baseline of conductivity values is established, variations may signal a change in the waterbody's composition. For example, a decline in conductivity may be caused by rainwater and an increase in conductivity may signal sources of pollution such as agricultural runoff or municipal wastewater. Snapshot Day volunteers measured conductivity to establish a baseline for future comparisons.

Alkalinity/Acidity (pH)

pH is a measure of the percent of hydrogen ions in a water column. Water with a pH value of 7 is neutral, above 9 is alkaline and below 5 is acidic. Many chemical reactions in aquatic organisms that are critical for survival and growth, occur only within a very narrow pH range. Also, fish gills and fins can be damaged in extreme pH conditions.

The General Basin Plan Objective for pH fall between 8.5 and 6.5. The average pH level for all Central Coast sites was 7.2 and median 7.3. The average remained

the same as last year and down from 7.6 in 2003. Fourteen sites in San Mateo, Santa Cruz and San Luis Obispo counties had pH values between 6.3 and 5.0. Rinconada Creek in the upper Salinas River watershed had the lowest pH value of 5.0. The three Moro Cojo Slough sites had a pH of 9.0 or greater. The Moro Cojo sites also exceeded this water quality objective in 2003 and 2004.



Carissa Carter at San Vicente Creek in Davenport filling the transparency tube

Turbidity/Transparency

Turbidity is a measure of the amount of suspended particles in water. Natural turbidity levels vary from stream to stream. Excessive turbidity may indicate erosion, nutrient loading, or artificial algae growth. Approximately 2/3 of the Snapshot Day teams assessed area water bodies using a transparency tube. The other teams used the dual cylinder method or turbidimeters.

Seventeen (16%) sites where transparency tubes were used (up from thirteen (14%) sites in 2004) did not meet the CCAMP Action Level for transparency of 25 cm (see Table 2). That means that the water was so turbid that a miniature secchi disc could not be viewed through 25 centimeters of water. As was the case in 2003 and 2004, thirteen of the seventeen sites were located in the lower Salinas Valley watershed.

There is not an established water quality objective for turbidity measured by the dual cylinder method, however, a typical turbidity value for muddy water after a storm is between 20-50 Jackson Turbidity Units (JTU). One site (3%) (down from ten sites in 2004) reported turbidity above this range. Waddell Creek in Santa Cruz County was the only site to exceed the WQO with a value of 30 JTU.

Volunteers also recorded turbidity by a visual analysis, classifying water clarity at a given site as: clear, cloudy, or turbid. Based on the completed data sheets, 75% of the sites were described to have clear water, which is exactly the same as in 2003 and 2004.

Nutrients

Nitrate and orthophosphate are nutrients that occur naturally in water bodies and promote aquatic plant growth. Excessive nutrient levels can lead to excessive algal and aquatic weed growth that in turn depletes the available oxygen in the water column. Runoff containing detergents, fertilizers, animal waste, industrial waste, or sewage, contributes to elevated nutrient levels as does excess vegetative material from dumping “green waste” into waterways.

Nitrate - Eighteen (11%) sites exceeded the CCAMP action level for nitrate as N of 2.25 mg/l (see Table 2). Nitrate results ranged from non-detect at many of the sites to 39.8 mg-N/l. The average nitrate concentration was 2.86 mg-N/l and the median was 0.24 mg-N/l. All nitrate exceedances were found between the Watsonville Slough and the Lower Salinas Valley except for one site in Morro Bay on Los Osos Creek. The highest concentrations were at the Reclamation Ditch (39.8 mg-N/l), Elkhorn Slough (32.3 mg-N/l), Gabilan Creek (28.6 mg-N/l) and three Tembladero Slough sites (28.4, 27.3, 20.6 mg-N/l). The number of nitrate exceedances was down from twenty-three sites in 2004 and eighteen in 2003.

Orthophosphate - Twenty-eight (18%) sites reported concentrations above the General Basin Plan Objective for orthophosphate set at 0.12 mg-P/l (see Table 2). Orthophosphate results ranged from non-detect at many

sites to 2.38 mg-P/l in Elkhorn Slough. The average orthophosphate concentration was 0.26 mg-P/l and the median was 0.10 mg-P/l. Many of the exceedances were in the lower Salinas Valley and Watsonville Slough watersheds. Other locations with exceedances included; two sites in San Mateo County, one site in Santa Cruz County, and five sites in San Luis Obispo County. The total number of exceedances was down from thirty-nine (24%) sites in 2004.

Coliform

Most coliform bacteria originate from the feces of warm-blooded animals and indicate the presence of human sewage or wildlife contamination, as well as feces-born organisms that can cause diseases such as hepatitis A, bacterial meningitis, and encephalitis. Excessive coliform counts pose potential problems for both aquatic and human health.

E. coli is a member of the fecal coliform group. The EPA Water Quality Criteria of 400 MPN/100 ml was used as the water quality objective. *E. coli* concentrations exceeded the water quality objective at 26 sites (16%), down from 40 sites in 2004 and 41 sites in 2003 (see Table 2). The highest concentrations were found in Corcoran Lagoon (>24,192 MPN/100 ml), Watsonville Slough (4,611 MPN/100 ml) and Graves Creek in San Luis Obispo (4,352 MPN/100 ml).



Becky Stamski and Ty Kennedy-Bowdoin streamside in Lidell Creek near Davenport

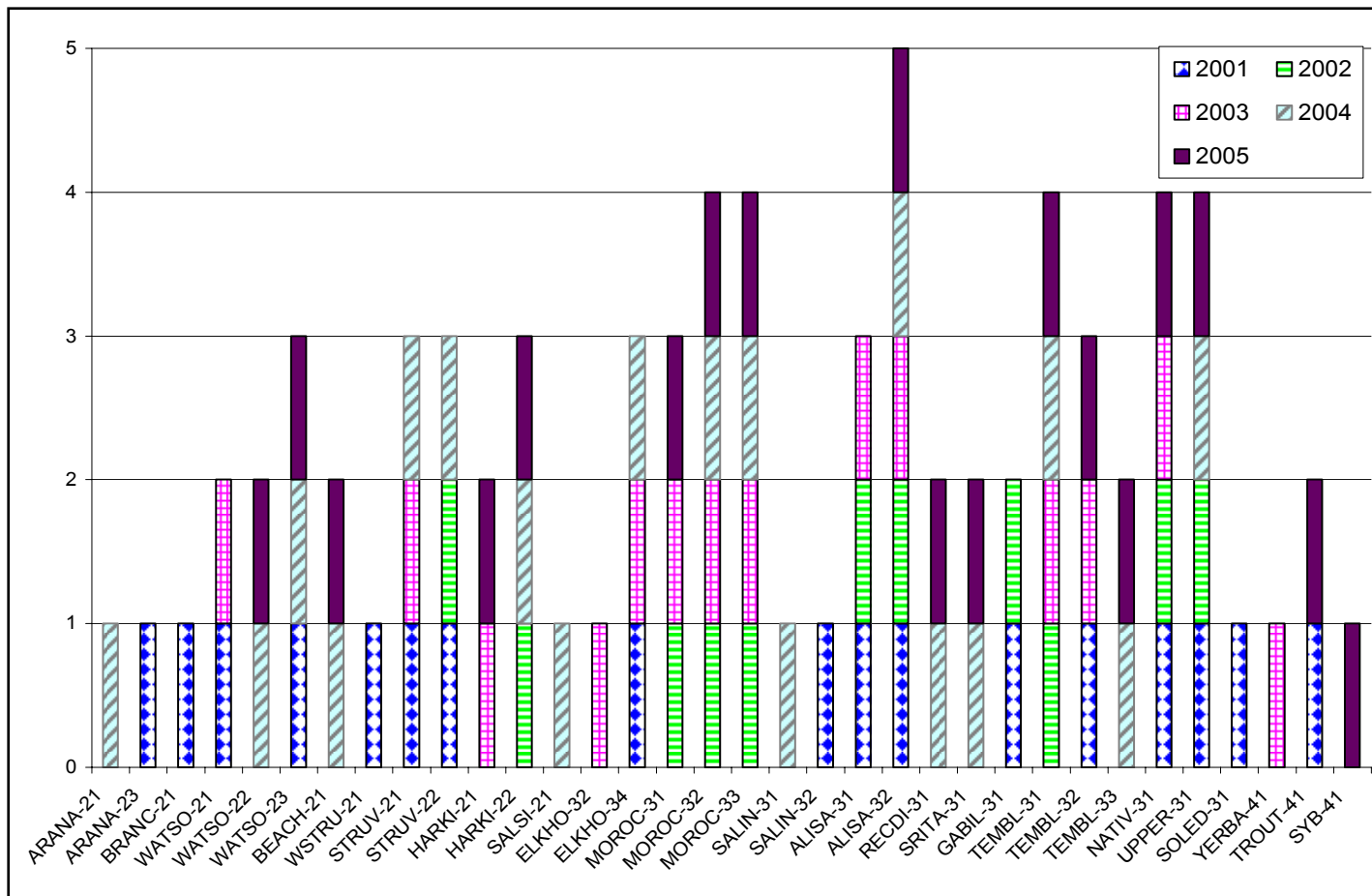


Figure 3. Depicts the number of times a site has been designated an Area of Concern on Snapshot Day for the years 2001-2005 (ALISA-31 and SOLED-31 have not been monitored since 2003).

Areas of Concern

Stations that exceed three or more of the seven parameters are identified as “Areas of Concern”. This directs attention to a subset of water bodies that may require additional monitoring or follow up. This water monitoring model has been implemented over the last six years and provides trend information as well as highlights persistent problem areas.

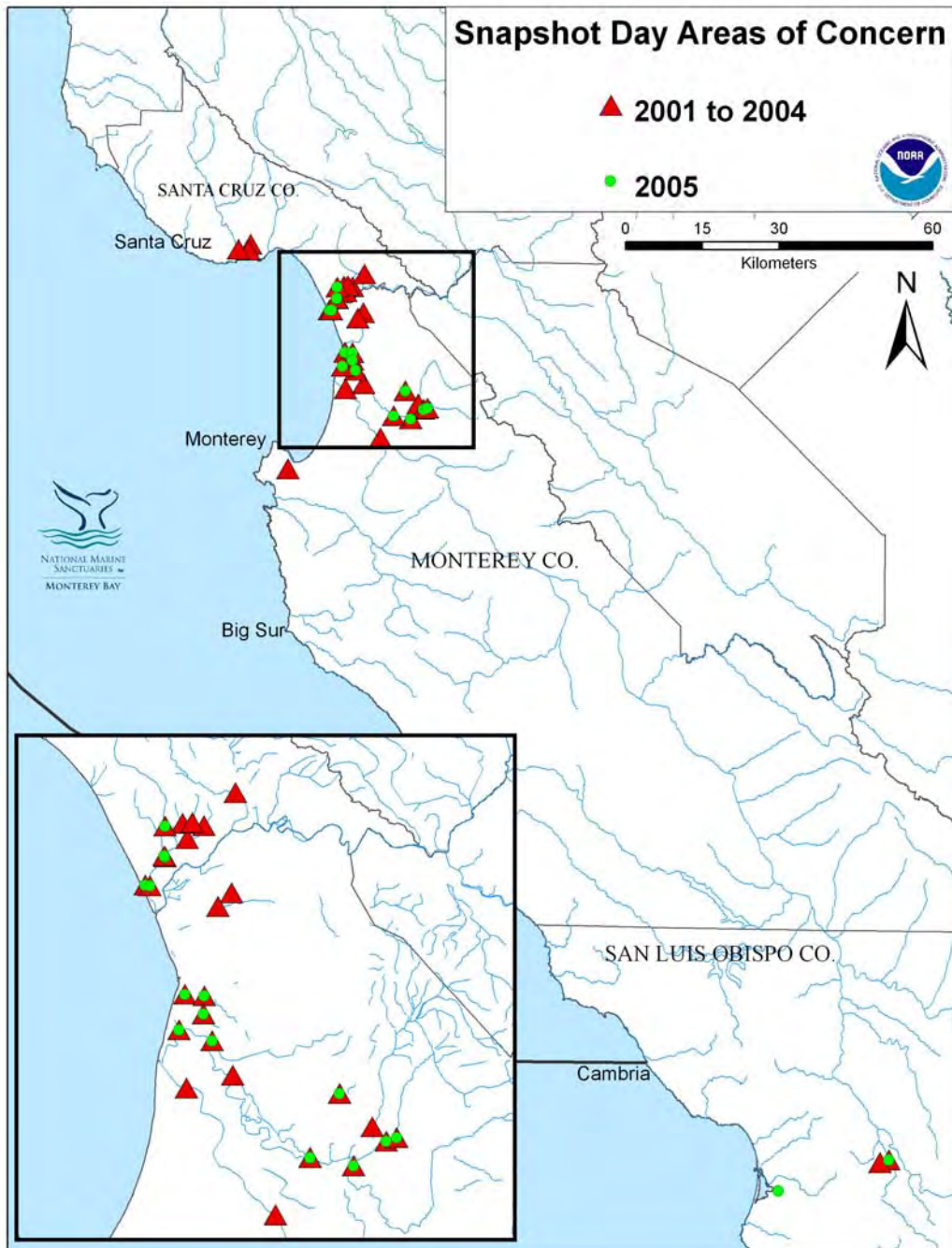
This year, eighteen Areas of Concern were identified on the Central Coast. In 2004, there were also 18 Areas of Concern, up from 14 identified in 2003, 11 identified in 2002, and 17 identified in 2001. Twelve of the 18 Areas of Concern in 2005 were also Areas of Concern in 2004. Of the 34 stations identified as Areas of

Concern during the previous five Snapshot events – Los Osos Creek is new this year, nine were Areas of Concern twice, eight were Areas of Concern three times, five were Areas of Concern four times and Alisal Creek was an Area of Concern every year (see Figure 3).

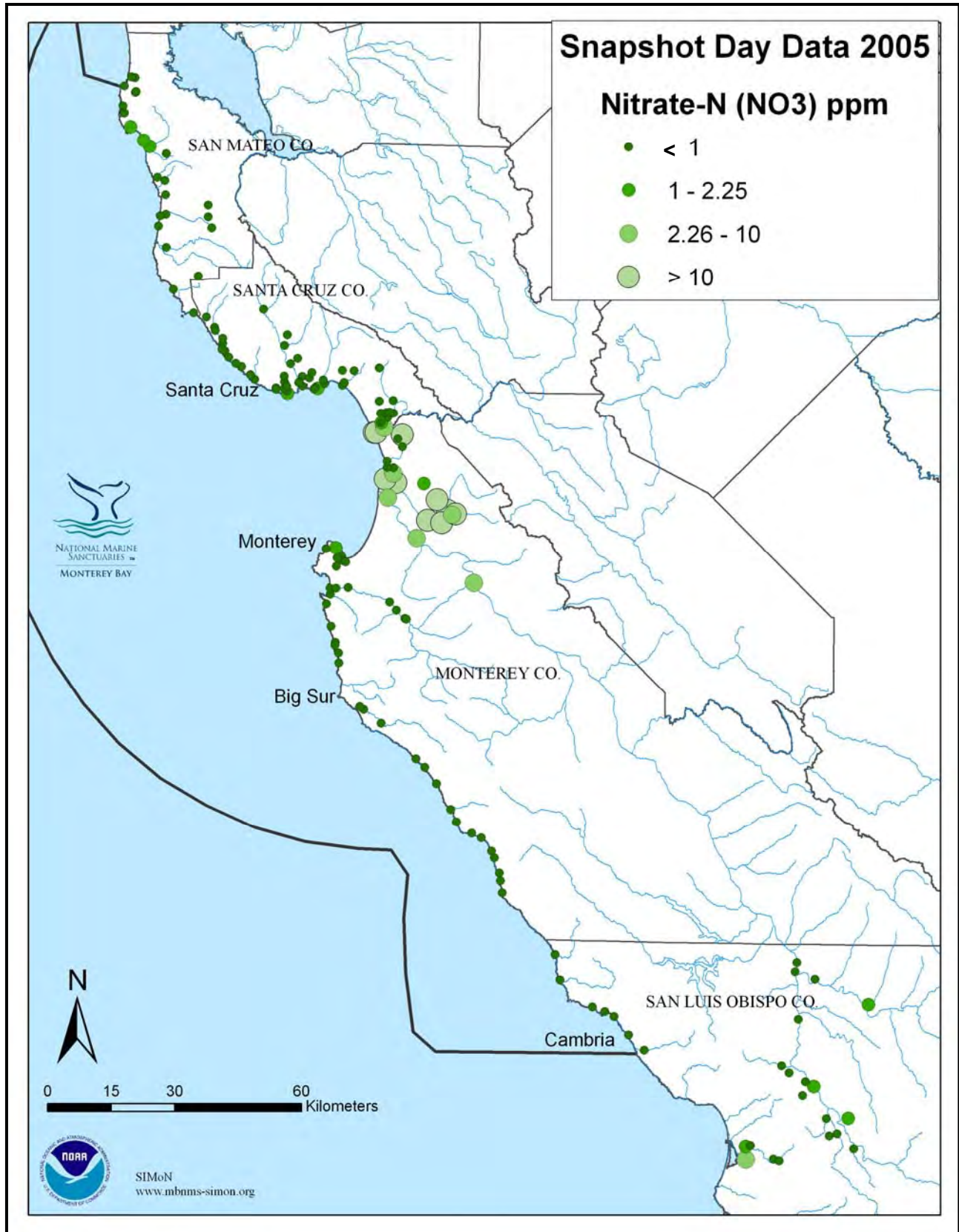
The 2005 Central Coast Areas of Concern were compared with California’s list of impaired water bodies (2002 “303(d) list”) and the 2005 proposed revisions. The 303(d) list was generated by the Regional and State Water Quality Control Board and identifies impaired waterways in the state of California. The methodology for this listing is available on the State Board web site (www.swrcb.ca.gov).

This comparison between the Snapshot Day sampling events and the 303(d) list is intended to compare Snapshot Day results with other studies to determine whether the results are similar and also to identify areas where further investigation is warranted. Of the 18 Areas of Concern identified in 2005 on the Central Coast, all but four (77%) were on the 2002 303(d) list. Two of the waterbodies, Natividad Creek and Santa Rita Creek in Salinas, are proposed to be

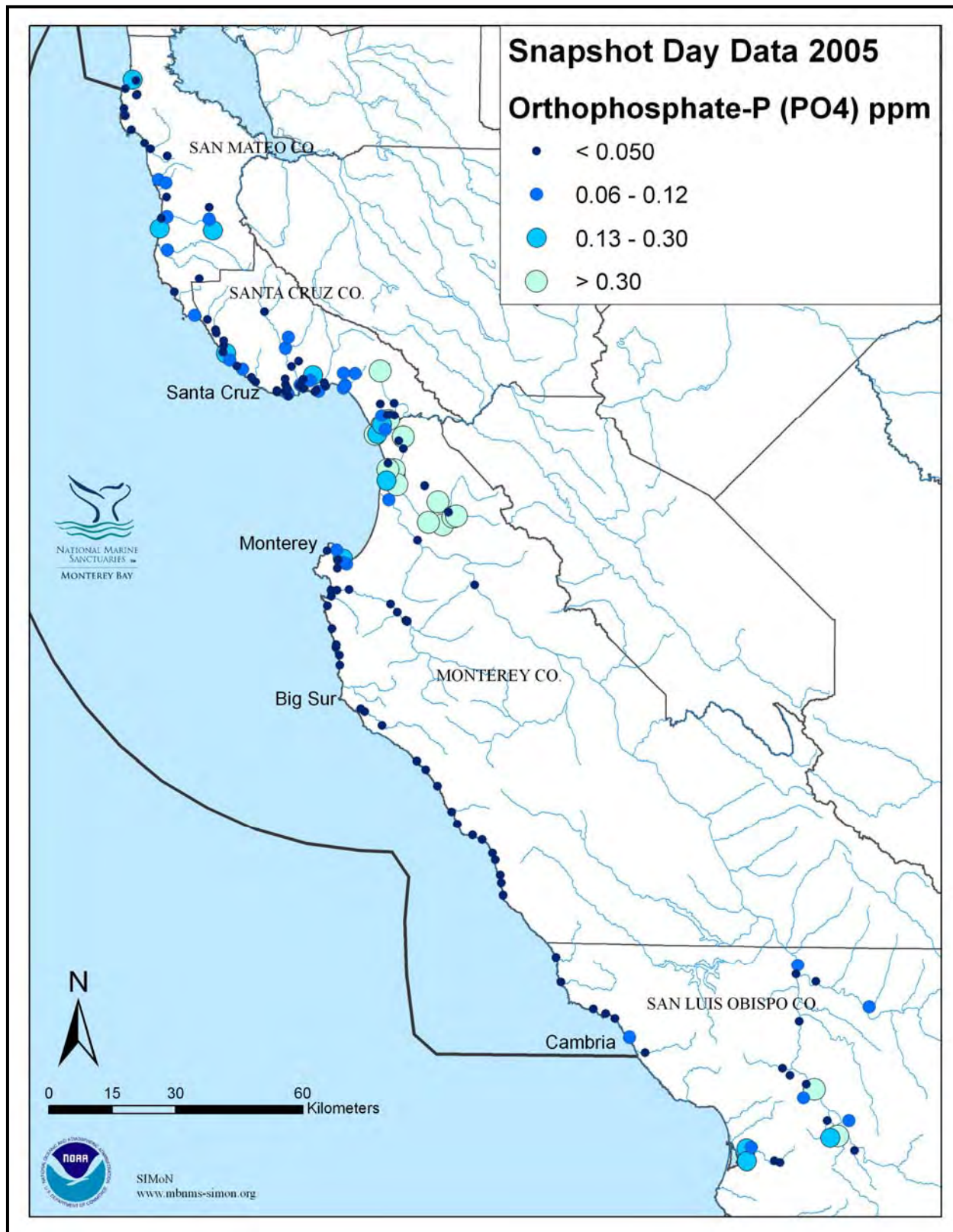
added to the revised 303(d) list for excessive nitrate concentrations. Trout Creek in San Luis Obispo and Harkin Slough, which have been areas of concern for at least two years, are not listed. For those waterbodies that are listed on the 303(d) list, the Snapshot Day results do correlate well with the impairments for which they are listed.



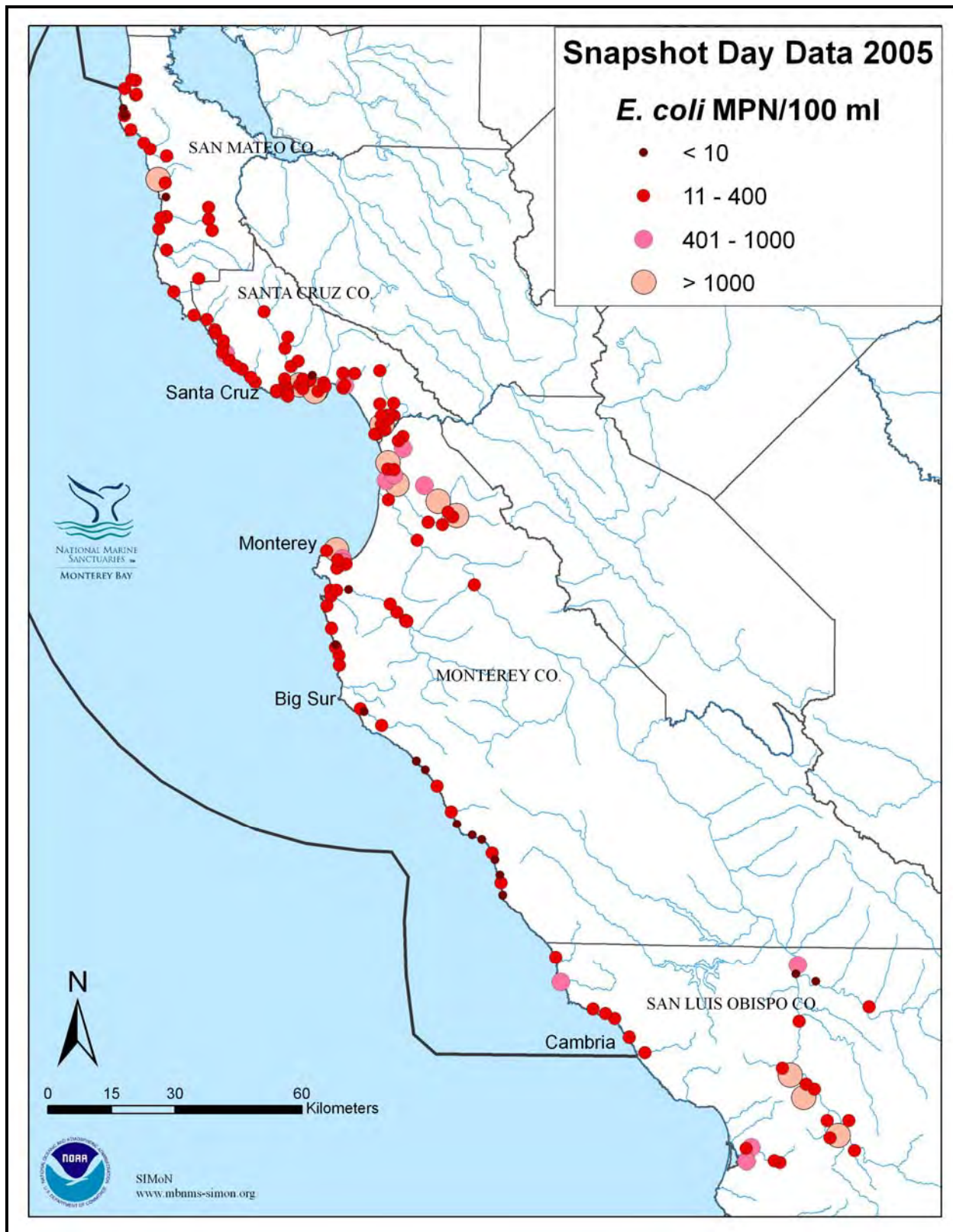
#1 Snapshot Day Nitrate-N Results



#2 Snapshot Day Orthophosphate-P Results



#3 Snapshot Day *E. coli* Results



Conclusion

Based on the results from this year's event, the number of exceedances for water temperature, dissolved oxygen, turbidity, *E.coli*, nitrate and orthophosphate were down this year compared to 2004. Eighty-six of the sites (53%) did not have a single exceedance for any of the water quality objectives, which is almost exactly the same as in 2004. Many of the water bodies along the San Mateo Coast and Big Sur Coast were, overall, in very good condition. In contrast, the water bodies in more urban and agricultural areas seem to be more impacted by the surrounding land use.



Dave Parrara collecting water from the Reclamation Ditch in Salinas. Photo by Lisa Emanuelson

There were 18 Areas of Concern in both 2004 and 2005. Of the 18, twelve were identified as Areas of Concern both years and are located between the Watsonville Slough and Lower Salinas River. It is important to acknowledge that there is an inherent bias toward the identification of Areas of Concern that are impacted by agriculture. This is partly because of an experimental design that is biased towards water quality parameters that represent the major issues on the central coast (ie. nutrients and turbidity), and partly based on the greater ability of citizen groups to monitor certain parameters (ie. water temperature, turbidity and dissolved oxygen) over other contaminants (ie. metals, oil and grease). The number of sites defined as Areas of Concern within agricultural areas is also influenced by the strong

agriculture presence on the central coast. Fortunately, many efforts are currently underway to address agriculture impacts to local rivers and streams. It is possible that the fewer number of exceedances that were detected during this event may be a result of the best management practices (BMPs) being implemented by the agriculture community and local resource agencies. However, in general, the AOCs indicated that additional work and efforts are required to improve water quality.

There are other monitoring sites that were not Areas of Concern but somehow stood out from the other sites. These locations include:

- Rinconada Creek in the upper Salinas River watershed had the lowest pH value of 5.0
- Waddell Creek in Santa Cruz County had the highest turbidity value of 30 JTU.
- Graves Creek in San Luis Obispo reported an *E. coli* concentration of 4,352 MPN/100 ml
- *E. coli* concentrations in three urban drainages in Monterey and Pacific Grove ranged from 816 to >2,420 MPN/100 ml
- Purisma Creek was the only site in San Mateo County to exceed the water quality objective for *E. coli* with a value of 3,076 MPN/100 ml
- The nutrient values for Calera Creek in San Mateo were much lower this year than in the previous two Snapshot Day events. The orthophosphate results went from 2.72 mg-P/l in 2004 and 1.6 mg-P/l in 2003 to 0.15 in 2005.

Overall, water quality conditions seemed better for the 2005 Snapshot Day event than previous years. The number of exceedances for orthophosphate, *E. coli* and dissolved oxygen all dropped by about 8%. For sites primarily in San Mateo and Santa Cruz counties, the turbidity exceedances dropped by 12%.

This one day event continues to demonstrate the value of citizens collecting important water quality information. They are able to document water quality impairments and consistent results over the time span of six years. We are grateful to all of the people that volunteered their time for this event!

Attachment 1 Snapshot Day Participants

Hub Participants	
Anne Jensen	
Bridget Hoover	
Debie Chirco-Macdonald	
Donna Meyer	
Erica Burton	
Gerry Doan	
Holly Price	
John Laird, 27th Dist. Assemblyman	
Kirsten Liske	
Kelley Higgason	
Mike Rotkin, Mayor, City of Santa Cruz	
Rachel Saunders	
Tamara Doan	
Team Leader	Team Members
Ann Kitajima	Annie Gillespie
Annie Schmidt	John Fischer, Lauren Clayton, Susan Lynch, Frank Hicks
Becky Stamski	Carissa Carter, Ty Kennedy-Bowdoin
Ben Bouldin	Greg Sanders, Pat Bouldin
Bobby Jo Close	Philip La Follette
Brenda Donald	Deborah Hirst, Susan Danielson, Alfield Donald
Breta Holgers	Gregg Kerlin, Laura Kahn
Carey Cooper	Julia Davenport, Kyrria Sevco
Chantile Royer	CeCe Bayer, Magali Blanco
Cheryl Lambert	Sonya Morrison
Chris Berry	Matt Baldzikowski, George McMenamin
Chris Coburn	Rosalie Hackett
Chuck Kozak	
Claude Albanese	Art Chapman, Ken Eberle
David Norris	Jeff Johnson, Kim Ha
DJ Funk	Marti Johnson, Adriana Morales
Don Hoover	Tera Hoover
Ed Niland	Julia Niland

Attachment 1 Snapshot Day Participants cont.

Team Leader	Team Members
Gabriela Carvalho	Timba Harris
Gary Smith	Alejandro Valencia, Susan Ferrel
Gregg Kerlin	Chantell Royer
Huff McGonigal	Shane Coker, Summer Rogers
Jackie McCloud	Dave Fichtner, Rachel Niederer
Jaime Lien	Jim Patterson
Jason Nachamkin	Clive Sanders, Hal Titus, Karen Finlen
Jeff Hayes	Talia Reyes, Jan Reyes
Jonathan Toal	Jim Spaulding
Julia Villaire	Tracy Maxwell
Justin Dennis	Jenine Beecher, Lilian Dennis
Justin Morgan	Anne Jurek
Kelly Chapin	Art Evjen, Fran Horvath
Ken Ekelund	Steve Mack, Dennis Long
Kurt Merg	
Lisa Emanuelson	Dave Parara
Loro Paterson	Andrea Zurr
Maris Sidenstecker	Enid Irwin, Karen Harris
Mark Meibeyer	Stacey Couture, Sam Couture, Jeff Kwasny
Mary Scannell	Shane Anderson
Melanie Lindberg	Julianne Rhodes, Duncan Lindberg
Michelle Parker	Kristy Pannke
Michelle Roest	Lucille Bosco, Carole Adams, Phil Adams
Mike Lacey	Bob Croyle
Natalie Zayas	Heather Cott, Edward Murray, Jonathan Lepe, Ana Martinez
Neil Panton	Mary Panton, Julien Gulmert, Suzana Gulmert
Rachael Peavler	Jason Parke
Rachel Garrett	Robin Kimmy
Robert Frischmuth	Denyse Frischmuth, Louise Pearse, Vicky Pearse, Warren Yogi
Robin Lee	Claudia Pineda, Brad Snook, Jenny Snook
Sarah Bally	Kelly Young
Tom LaHue	Devi Tong, Brian Tong

Attachment 2

<h1 style="margin: 0;">Monterey Bay National Marine Sanctuary</h1> <h2 style="margin: 0;">Field Data Sheet</h2>				DOC_ID# : _____	
				Datum: _____	
Please Use one sheet for each Station. Use back for comments.				GPS Coordinates:	
				W: _____ N: _____	
Watershed: _____				GPS_ID: _____	
				Hydrologic Unit ID: _____	
Watershed Group Name: _____				Station (Site) ID: _____	
				Waterbody: _____	
Site map is attached to this data sheet, please update if necessary.				Waterbody Type: _____	
Flow discharge (circle one): Stagnant (NOT Flowing), Trickle (< 1 quart/sec), Moderate (< 5 gal/sec), High (> 5 gal/sec)			Volunteer Monitors		
Weather Conditions (circle): Has it rained within the last 24 hours? Y / N			TEAM LEADER (list full name & phone #): _____		
--SKY-- --PRECIPITATION-- --WIND-- no clouds none none partly cloudy foggy breezy heavy clouds misty windy overcast rain blustery			Phone: () _____		
			4) _____ 5) _____		
			(list additional names on back)		
Time of Field Measurements: _____					
INSTRUMENT ID	PARAMETER	RESULT	Replicate	UNITS	(circle appropriate unit)
	Air Temperature			F or C	Water Clarity (circle one): clear cloudy murky (water itself, not scum)
	H2O Temperature			F or C	
	pH			pH units	
	Dissolved Oxygen			mg/l (ppm)	
	Conductivity			µS mS	Sampling device used? Y N If so, what kind? Kemmerer bottle
	Turbidity			JTU NTU	
	Transparency			cm	other: _____
				UNIT _____	
				UNIT _____	
				UNIT _____	
Notes and Observations : (include any equipment comments/problems or observations such as water color, trash composition, etc...)				Fish or Wildlife Observed: (describe number seen, length of fish, and behavior)	
Sample Collection:					
Sample ID:	Time Collected:	Collected by:	Type:	Container type :	
			Bacteria		
			Nutrient		
Sample Custody:					
Relinquished By: _____			Received By: _____		
Date /Time: _____			Date /Time: _____		
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Do not jeopardize your personal safety to complete this datasheet.					

