Annual Water Quality Report for
City of Capitola
First Flush Monitoring Event
September 25, 2014

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Preserving and protecting our coastal watersheds

Introduction

As part of a regional effort throughout the Monterey Bay, the Coastal Watershed Council (CWC) conducted the 2014 First Flush Program in the City of Capitola in the fall of 2014. As CWC's program partner, the Monterey Bay National Marine Sanctuary conducted similar activities in Monterey County. CWC's work was funded by a contract with the City of Capitola.

The goal of the First Flush Event is twofold: First, to serve as a tool for education and outreach to the community regarding the impacts citizens have on local water quality through urban runoff; and secondly, to collect scientifically valid water quality data to support environmental management decision-making at the local and state levels.

First Flush is an annual volunteer monitoring event that involves monitoring of storm drain runoff during the first significant rainfall of the wet season. During the first seasonal rainfall, runoff washes significant levels of pollutants off street surfaces, driveways, vehicles, and buildings into storm drains. This mix of constituents then flows from the storm drains directly into creeks, rivers, and the Monterey Bay.

The 2014 First Flush Event covered eight monitoring sites in the City of Capitola. During the event, trained teams of volunteers recorded observations and measurements in the field. In addition, samples were collected for laboratory analysis of nutrients, bacteria, metals, and total suspended solids.

CWC teams follow scientific protocols to ensure that our data are reliable and can be compared to regulatory water quality objectives. Water quality objectives ("WQOs") are set by regulators to help ensure that ambient water quality is sufficient to support the "beneficial uses" of each ambient water body, as designated in the regional Water Quality Control Plan (usually referred to as the "Basin Plan"). With respect to human activities, common beneficial uses include swimming, fishing, drinking water, or irrigation. When a WQO is exceeded, it indicates that the water quality may not be protective of one or more beneficial uses and the water body may be designated as "impaired". The designated beneficial uses of Soquel Creek, per Chapter II of the Basin Plan, are:

MUN – Municipal and Domestic Supply
AGR – Agricultural Supply
IND – Industrial Service Supply
GWR – Ground Water Recharge
REC1 – Water Contact Recreation
REC2 – Non-Contact Water Recreation
WILD – Wildlife Habitat
COLD – Cold Fresh Water Habitat
MIGR – Migration of Aquatic Organisms
SPWN – Spawning, Reproduction, and/or Early Development
BIOL – Preservation of Biological Habitats of Special Significance
FRESH – Freshwater Replenishment
COMM – Commercial and Sport Fishing

More information and data about water quality are available on the CWC website at http://coastal-watershed.org/.

In addition to this report card, CWC's First Flush program partner, the Monterey Bay National Marine Sanctuary, prepares an Annual First Flush Report that includes the Counties of Santa Cruz and Monterey. Those reports can be downloaded from: http://montereybay.noaa.gov/resourcepro/reports.html

Methods

Training

All CWC trainings for water quality monitoring focus on imparting knowledge and skills required to follow quality assurance protocols consistent with USEPA and State Water Resources Control Board procedures. CWC's trainings always stress the importance of volunteer safety above all other considerations.

Prior to the 2014 First Flush Event, volunteers received a hands-on classroom training for basic field water quality tests, including measurements of water temperature, electrical conductivity, pH, and transparency. They were also taught how to properly collect and preserve water samples for laboratory analysis of nutrients (nitrate and orthophosphate), bacteria (*Escherichia coli*, enterococcus, and total coliform), metals (copper, lead, and zinc), total suspended solids, and hardness.

During a follow-up field training called the "Dry Run", volunteers went to their sites, performed field measurements, recorded observations, and collected water samples for laboratory analysis. The Dry Run served to familiarize volunteers with their team members and provided an opportunity to visit their monitoring site(s) in daylight and during good weather. This is an important safety measure because the First Flush storm often comes during the night and the familiarity that volunteer teams gain during the Dry Run prepares them to visit their site(s) during the First Flush Event, when conditions are wet and possibly dark. In addition, Dry Run results offer a comparison between pollutant concentrations in dry weather flows and flows during the First Flush storm.

Volunteers received the classroom training on September 8, 2014 and Dry Run field training on September 13, 2014. CWC trained 20 volunteers; 13 participated in the actual storm event monitoring on Thursday, September 25, 2014.

Sites

This report card shows the results of water quality monitoring conducted at four storm drain sites (Auto Plaza, Capitola Center, Creekside, and Capitola Pier), three Soquel Creek sites, and one Noble Gulch Creek site in the City of Capitola. CWC and staff from the Public Works Department at the City of Capitola chose the stream and outflow/storm drain sites based on drainage basin characteristics and safe access for volunteer monitoring teams. Sites were also chosen to represent the upper, middle, and

lower reaches of Soquel Creek and its tributaries within the boundaries of the City of Capitola. Details on site characteristics are shown in Appendix A.

Data Collection

Field equipment included a digital thermometer to measure water temperature, an Oakton EC Testr to measure electrical conductivity, Macherey-Nagel non-bleeding pH strips to measure pH, and 120 cm transparency tubes to measure transparency. pH and transparency were collected during the Dry Run and only during the rain event if there was daylight. Field measurements and physical observations such as presence of trash, scum, bubbles, odor, oil sheen, flow, and weather conditions were recorded on field data sheets.

Sample containers were filled with storm drain runoff or creek water for laboratory analysis of nitrate, orthophosphate, *E.coli*, enterococcus, total coliform, copper, lead, zinc, total suspended solids, and hardness. All collected water samples were analyzed as individual grab samples rather than as a composite of samples.

The First Flush event includes water sample collection for laboratory analysis and field measurements during the first hour of significant runoff. This is intended to cover the initial portion of the rising limb of the rainfall/runoff hydrograph, to capture the heaviest pollutant load and highest concentrations of measured constituents. In the City of Capitola two time series water samples for laboratory analysis were collected from storm drain sites, at "time zero" and 60 minutes. Note: the "time zero" Capitola Center Storm Drain bacteria sample bottle leaked during transport and bacteria analyses were unable to be performed. A single sample was collected from the Soquel Creek sites at "time zero". Field measurements and visual observations were conducted three times (at "time zero", 30 minutes, and 60 minutes) at all storm drain sites, and once (concurrent with the single lab sample collection) at the creek sites.

Data Analysis

Monitoring results for nitrate, copper, lead, zinc, and pH were compared to the WQOs in Chapter III of the Central Coast Regional Water Quality Control Board's Basin Plan. *E.coli* and enterococcus results were compared to the USEPA 2012 Recreational Water Quality Criteria. Orthophosphate results were compared to the former Central Coast Ambient Monitoring Program (CCAMP) Attention Level. There is no applicable WQO in the Central Coast Basin Plan for total coliform; for reporting purposes the WQO for total coliform in the neighboring San Francisco Basin Plan is referenced. There are no applicable WQO's or attention levels for water temperature, electrical conductivity, transparency, urea, total suspended solids, or hardness (measured as the sum of calcium and magnesium). Details regarding the applicable WQOs and other criteria are shown in Appendix B.

Exceedances of WQOs and other criteria are noted in the presentations of Dry Run field and lab results in Appendix C and First Flush Event field and lab results in Appendix D.

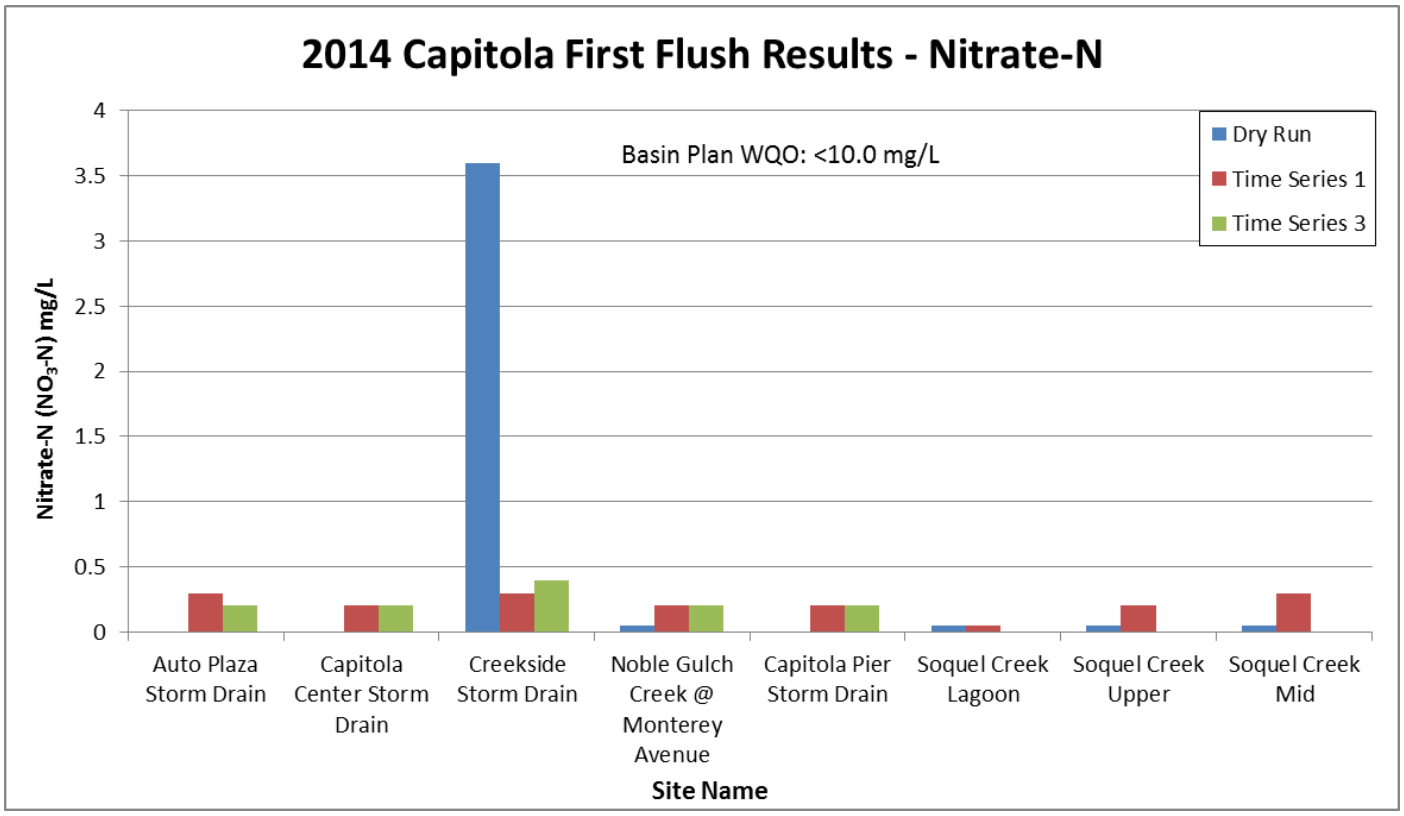
While it is essential to note that WQOs apply only to receiving waters (such as named creeks, rivers, and the Bay), and not to urban runoff discharges, comparisons of urban runoff monitoring results to WQOs provide a frame of reference by which results can be evaluated. Absent other objective standards to use as a comparison, these WQOs are the most appropriate values to compare to environmental results for both receiving waters and discharges.

While most Basin Plan WQOs are constant across watersheds, some WQOs are dependent on the background levels within the watershed. For instance, the copper Basin Plan WQO is dependent on the hardness of the receiving water. When the hardness level is >100 mg/L, the Basin Plan WQO is <30 µg/L; when hardness levels are <100 mg/L, the Basin Plan WQO is <10 µg/L (Basin Plan, Table 3-5). Measured hardness levels at all three Soquel Creek sites were greater than 100 mg/L during the Dry Run and at Soquel Creek Lagoon and Soquel Creek Upper during the First Flush event; therefore the applicable copper WQO is <30 µg/L for those sites. During the First Flush event the measured hardness level at Soquel Creek Mid was less than 100 mg/L; therefore the applicable copper WQO is <10 µg/L for that site.

Results

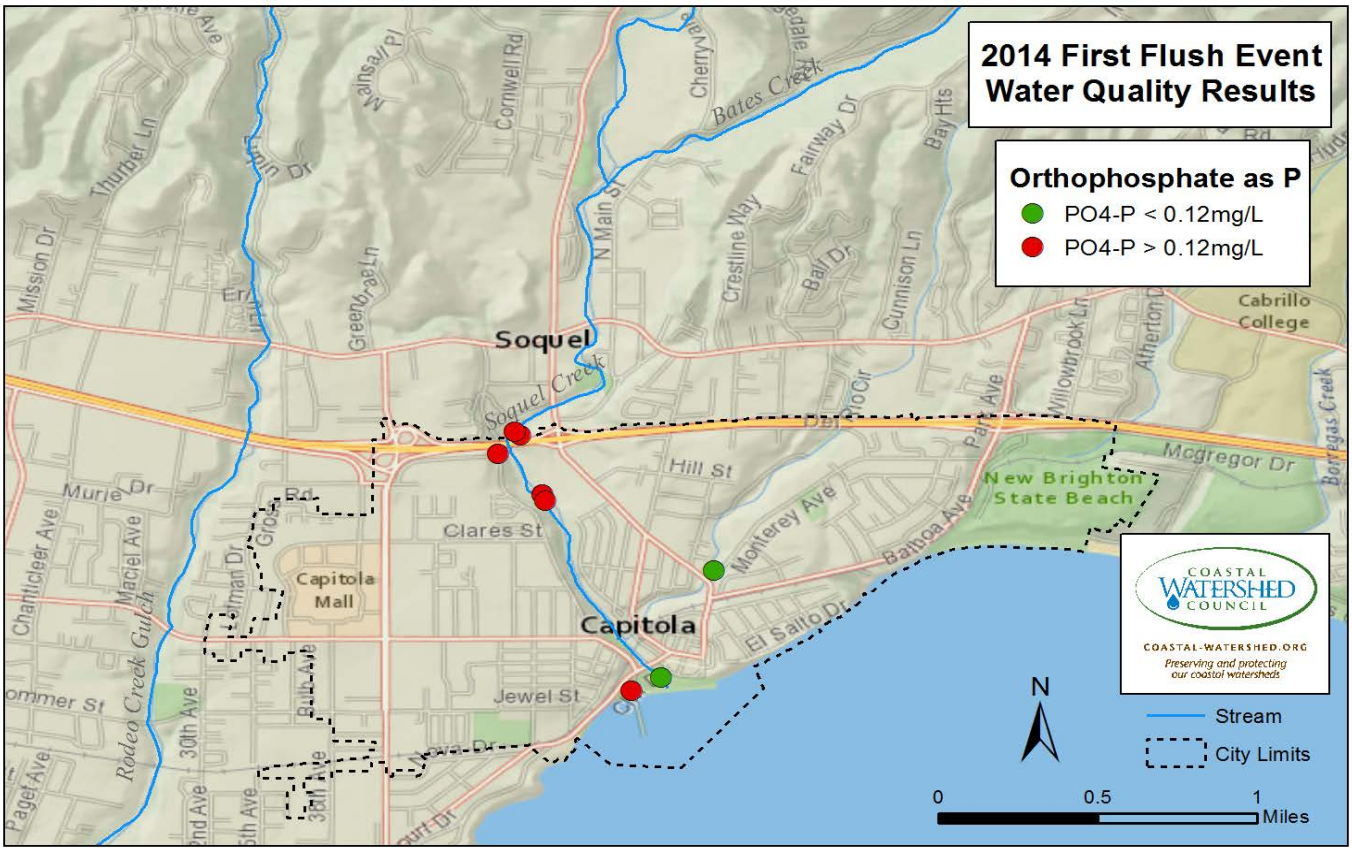
The 2014 First Flush annual report is designed to facilitate public education and awareness and to engage residents in best management practices in our local watersheds. The First Flush Annual Report can also be viewed online at: http://coastal-watershed.org/cwc-reports/

The analytical results from the 2014 Dry Run and First Flush Event are provided in Appendix C and Appendix D, respectively. The data were evaluated and results are reflected in the following graphs, map, and discussion.



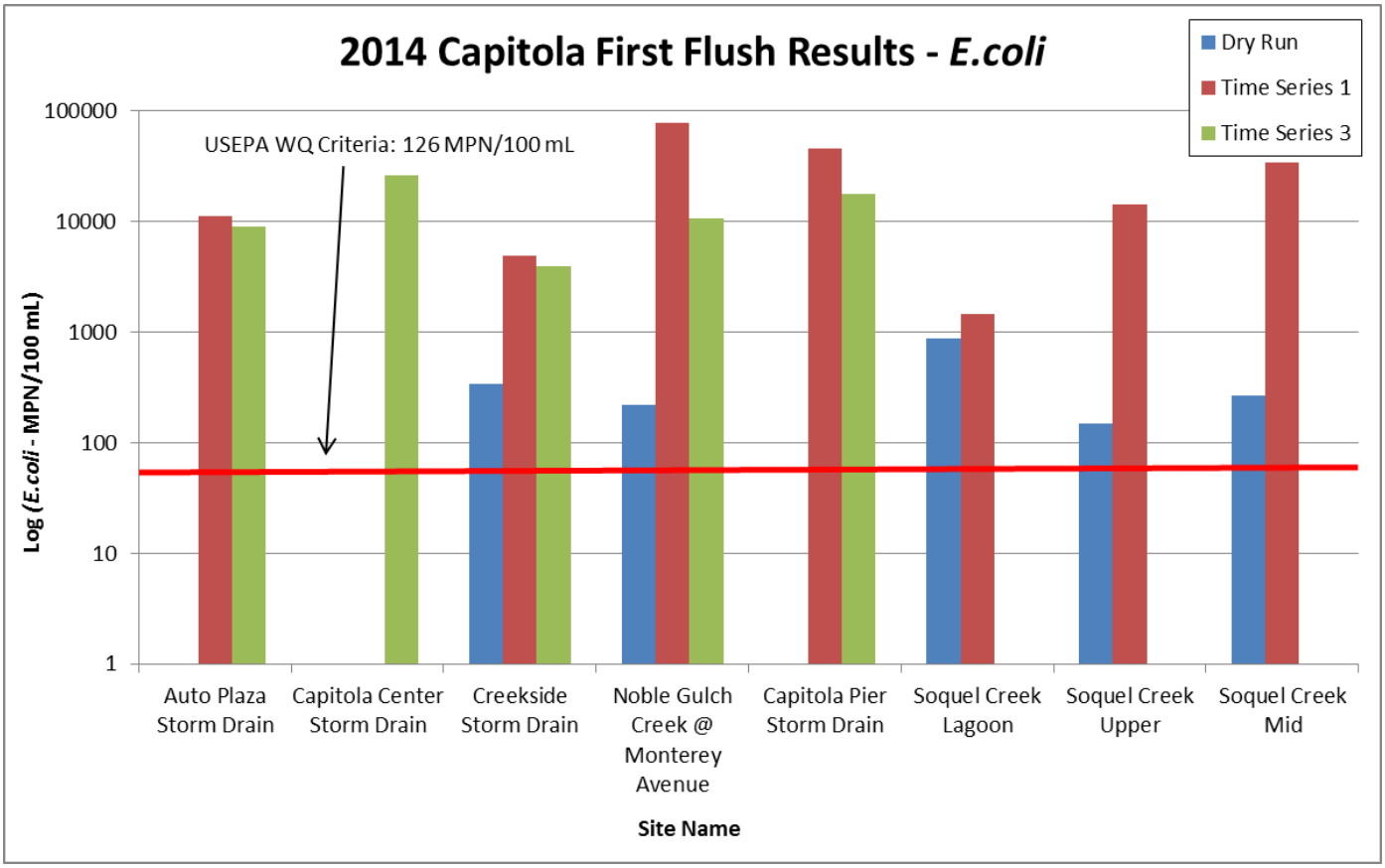
Nitrate Results:

- **None of the sites exceeded the Basin Plan WQO of <10 mg/L during the Dry Run or First Flush Event**
- **Nitrate is necessary for healthy plant growth, but too much can lead to algal blooms that deplete oxygen in water**
- **Sources: runoff from lawns or fields containing fertilizers, animal waste, wash water, leaking sewer lines or failing septic systems, excess dumping of vegetative material**
- **What you can do: limit the use of chemical fertilizers, wash cars where water won't run into a storm drain (use the lawn), place cut/dead vegetation in yard waste can or compost it**
- **Learn more at: http://coastal-watershed.org/stewardship/**



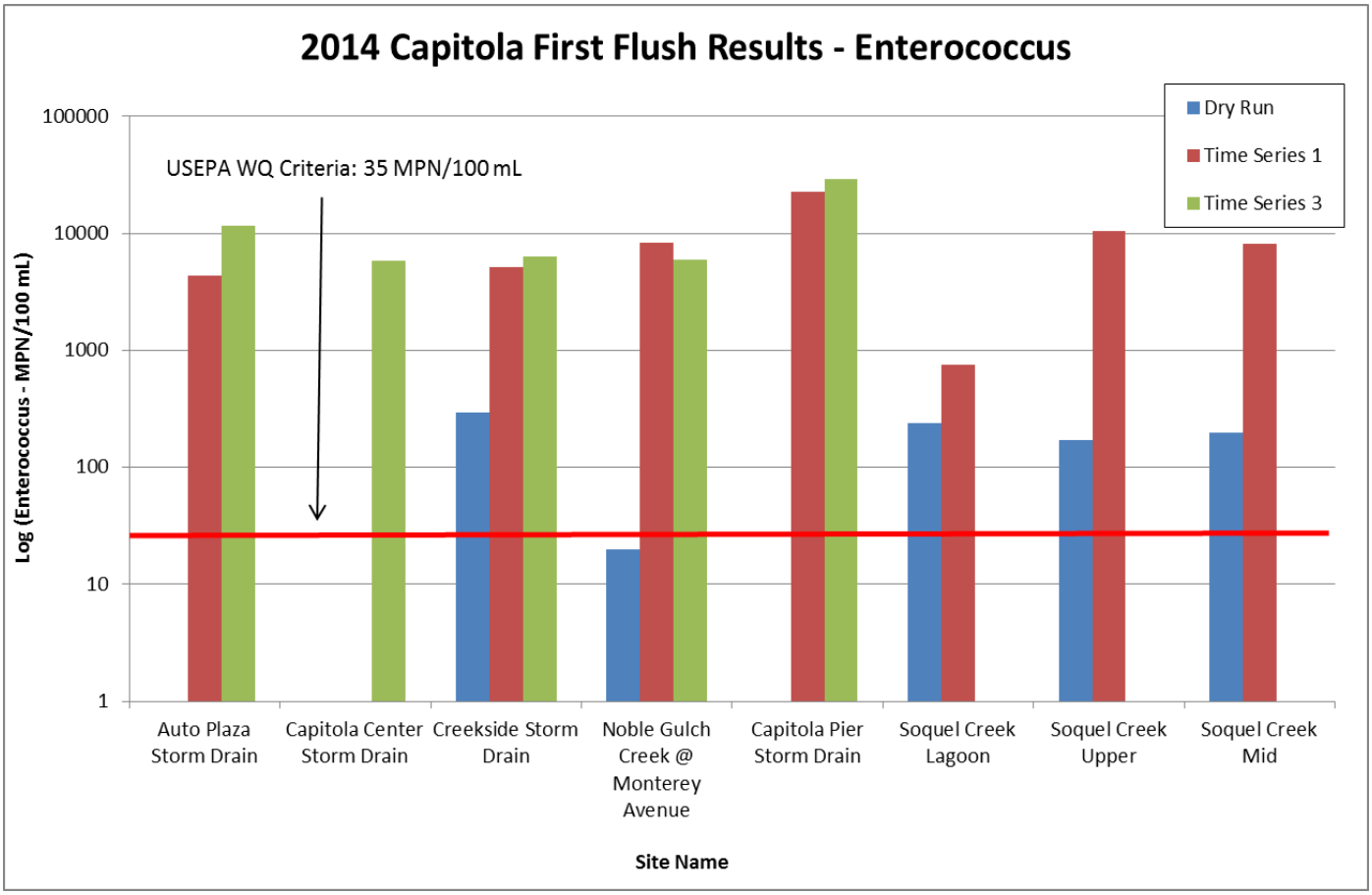
Orthophosphate Results:

- **100% of sites met the former CCAMP attention level of <0.12 mg/L PO_4-P during the Dry Run; 6 of 8 sites exceeded the former CCAMP attention level during the First Flush Event**
  - **Exceedances during the First Flush Event included the following: Auto Plaza, Capitola Center, and Capitola Pier Storm drains during both time series; Creekside Storm Drain during the first time series; and samples at Soquel Creek Upper and Mid creek sites**
- **Orthophosphate is a necessary nutrient for aquatic plants, but excess amounts can cause algal blooms, oxygen depletion, and death of fish, invertebrates & other aquatic species**
- **Sources: runoff from fertilized lawns, fields, or animal manure storage areas; leaking sewer lines; failing septic systems; commercial cleaning products**
- **What you can do: maintain septic systems, limit the use of chemical fertilizers (especially before a rain)**
- **Learn more at: http://coastal-watershed.org/stewardship/**



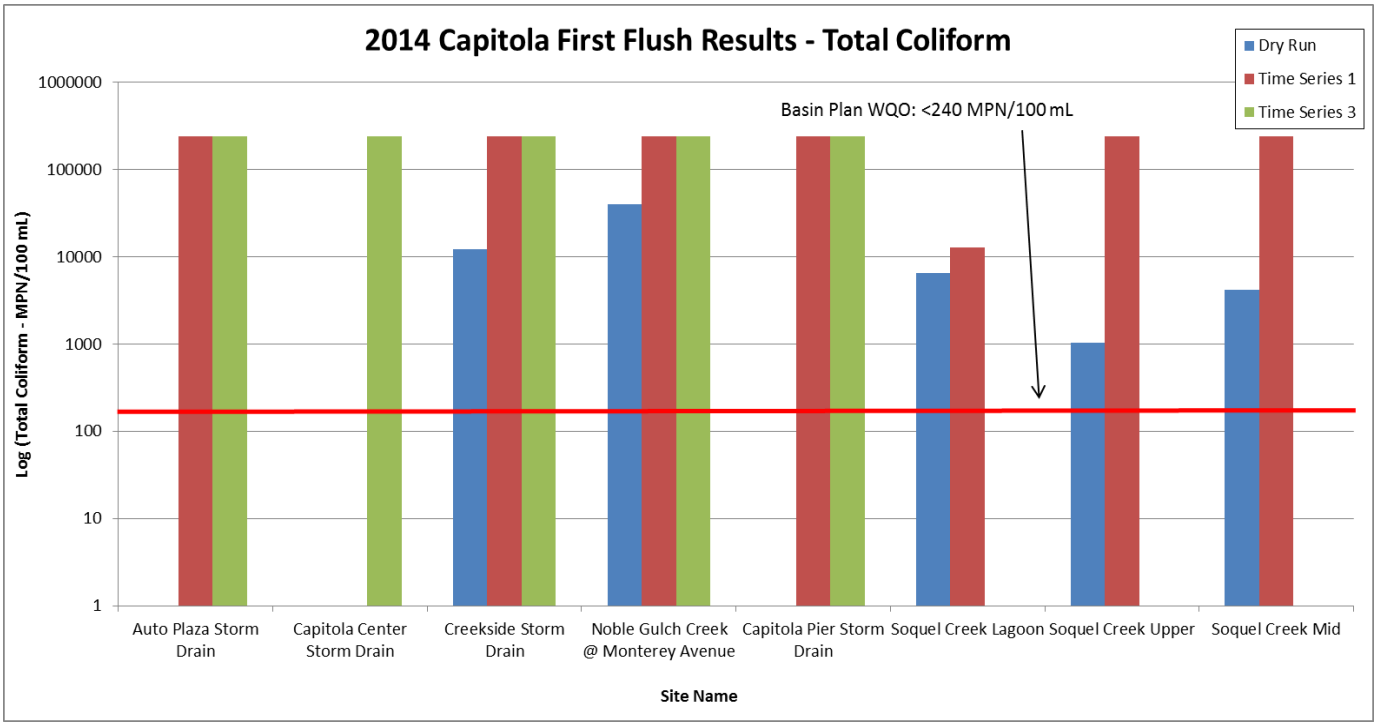
E.coli Results:

- **All five sites with flow exceeded the USEPA Water Quality (WQ) Criterion of 126 MPN/100 mL during the Dry Run; 100% of sites exceeded the USEPA WQ Criterion during the First Flush Event**
  - **Note: the First Flush Event Time Series 1 Capitola Center Storm Drain bacteria sample bottle leaked during transport and analysis was unable to be performed**
- ***E.coli* is an indicator of fecal pollution in water that may originate from animals or humans**
- **Sources: leaky sewer pipes, failing septic systems, pets, and wildlife (esp. birds)**
- **What you can do: maintain septic systems, clean up after pets, report leaking sewer lines**
- **Learn more at: http://coastal-watershed.org/stewardship/**



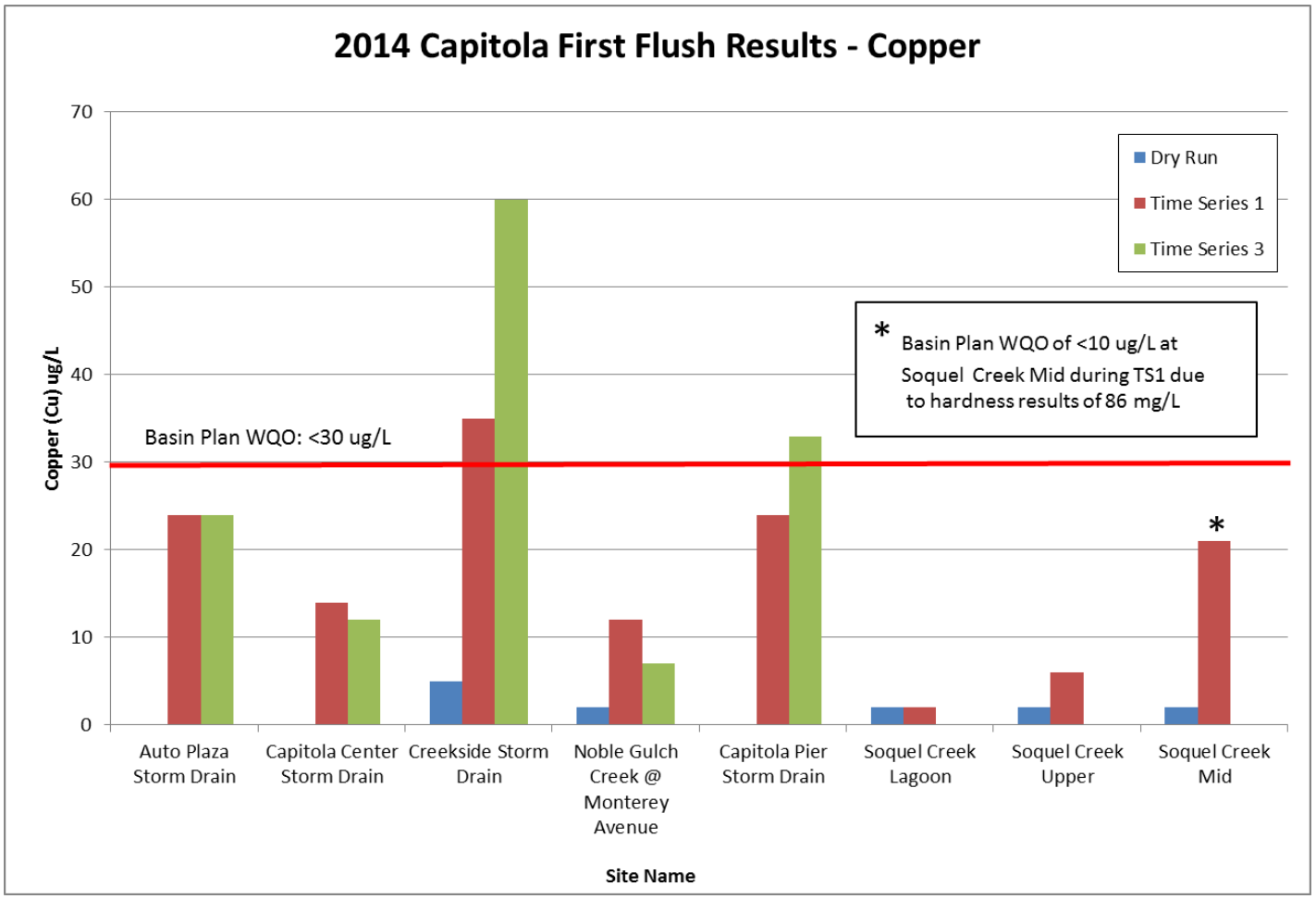
Enterococcus Results:

- **Four of 5 sites with flow exceeded the USEPA Water Quality (WQ) Criterion of 35 MPN/100 mL during the Dry Run; 100% of sites exceeded the USEPA WQ Criterion during the First Flush Event**
  - **Exceedances during the Dry Run included the following: Creekside Storm Drain, Soquel Creek Lagoon, Soquel Creek Upper, and Soquel Creek Mid**
  - **Note: the First Flush Event Time Series 1 Capitola Center Storm Drain bacteria sample bottle leaked during transport and analysis was unable to be performed**
- **Enterococcus is an indicator of fecal pollution in water that may originate from animals or humans**
- **Sources: leaky sewer pipes, failing septic systems, pets, and wildlife (esp. birds)**
- **What you can do: maintain septic systems, clean up after pets, report leaking sewer lines**
- **Learn more at: http://coastal-watershed.org/stewardship/**



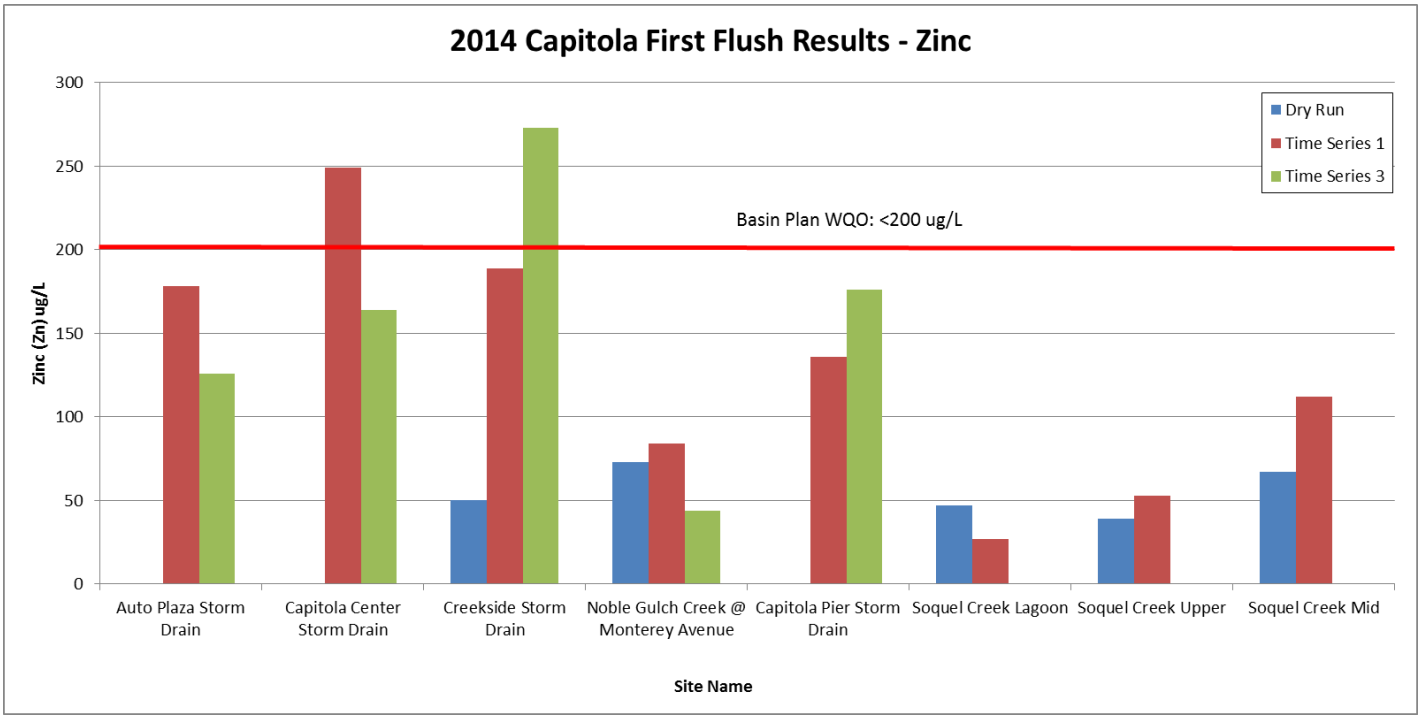
Total Coliform Results:

- **100% of sites exceeded the Basin Plan Water Quality Objective (WQO) of <240 MPN/100 mL at all sites with flow during the Dry Run and in all samples during the First Flush Event**
  - **Note: the First Flush Event Time Series 1 Capitola Center Storm Drain bacteria sample bottle leaked during transport and analysis was unable to be performed**
  - **Note: there is no applicable WQO in the Central Coast Basin Plan; for reporting purposes total coliform in the neighboring San Francisco Basin Plan is referenced**
- **Total Coliform is an indicator of fecal pollution in water that may originate from animals or humans**
- **Sources: leaky sewer pipes, failing septic systems, pets, and wildlife (esp. birds)**
- **What you can do: maintain septic systems, clean up after pets, and report leaking sewer lines**
- **Learn more at: http://coastal-watershed.org/stewardship/**



Copper Results:

- **All 5 sites with flow met the Basin Plan Water Quality Objective (WQO) of <30 µg/L during the Dry Run; 3 of 8 sites exceeded the Basin Plan WQO during the First Flush Event**
  - **Exceedances during the First Flush Event included the following: Capitola Pier Storm Drain during the second time series, Creekside Storm Drain during both time series and in the Soquel Creek Mid sample (see note in discussion regarding Basin Plan WQO levels for copper)**
- **Copper occurs naturally at low levels, but too much can be harmful to fish and other aquatic organisms**
- **Sources: vehicle brake and tire wear, vehicle wash-water, building materials, fungicides**
- **What you can do: consider alternative brake pads (such as ceramic) & wash cars where water won't run into a storm drain (use the lawn)**
- **Learn more at: http://coastal-watershed.org/stewardship/**



Zinc Results:

- **All 5 sites with flow met the Basin Plan Water Quality Objective (WQO) of <200 µg/L during the Dry Run; 2 of 8 sites exceeded the Basin Plan WQO during the First Flush Event**
  - **Exceedances during the First Flush Event included the following: Capitola Center Storm Drain during the first time series and Creekside Storm Drain during the second time series**
- **Zinc occurs naturally at low levels, but too much can be harmful to fish and other aquatic organisms**
- **Sources: vehicle brake and tire wear, vehicle wash-water, building materials**
- **What you can do: consider alternative brake pads (such as ceramic) & wash cars where water won't run into a storm drain (use the lawn)**
- **Learn more at: http://coastal-watershed.org/stewardship/**

Discussion/Conclusions

This report summarizes results for the 2014 First Flush Dry Run and Event conducted in the City of Capitola. Exceedances of WQOs or attention levels were documented for orthophosphate, bacteria (*Escherichia coli*, enterococcus, and total coliform), metals (copper and zinc), and pH.

Additional Laboratory Constituents

- Note: the copper Basin Plan WQO is dependent on the hardness of the receiving water. Measured hardness levels at all three Soquel Creek sites were >100 mg/L during the Dry Run and at the Soquel Creek Lagoon and Soquel Creek Upper sites during the First Flush event; therefore the applicable copper WQO is <30 µg/L for those sites. During the First Flush event the measured hardness level at the Soquel Creek Mid site was <100 mg/L; therefore the applicable copper WQO is <10 µg/L for the Soquel Creek Mid site.)

- There were no exceedances of the lead Basin Plan WQO of <30 µg/L Pb at any sites during the Dry Run or First Flush Event.

Field-measured Parameters

There was one exceedance of the Basin Plan WQO of >7.0 and <8.5 pH during the Dry Run for pH (the Soquel Creek Mid site with a result of 6.5 pH) and seven exceedances of the Basin Plan WQO during the First Flush Event (the Auto Plaza and Creekside Storm Drain sites during the second and third time series and the Capitola Center Storm Drain site during all three time series); all exceedance results were low at either 6.0 or 6.5 pH.

Trash was observed during the Dry Run at the Soquel Creek Upper, Soquel Creek Mid, and Soquel Creek Lagoon sites. During the First Flush event trash was observed at the Auto Plaza Storm Drain site during the first and third time series, the Capitola Pier Storm Drain site during the first time series and the Soquel Creek Lagoon site.

Sewage was neither sited nor smelled at any sites during the Dry Run or First Flush event.

Oil sheen was reported at the Soquel Creek Lagoon site only during the First Flush Event.

Scum was reported at the Noble Gulch Creek @ Monterey Avenue site during the Dry Run. During the First Flush Event, 4 of 8 sites in Capitola reported scum (the Auto Plaza Storm Drain, Noble Gulch Creek @ Monterey Avenue, and Capitola Pier Storm Drain sites during all three time series, and the Soquel Creek Lagoon site).

Summary/Follow-up

Volunteers collecting this valuable information play a key role in our community as stewards of our watersheds. The information they provide is used by resource agencies, local governments, and community groups to protect and improve the health of our local streams.

The results in this report and from other monitoring programs can be used to facilitate pollution prevention efforts by identifying which constituents are of greatest concern, and

evaluating trends in water quality for key constituents over time. Environmental data, by their very nature, are extremely variable, and conclusions are often difficult to make based on limited data points. Nonetheless, these results are of use in shaping regional programs to inform the public about environmental stewardship.

CWC's mission is to preserve and protect coastal watersheds through community stewardship, education, and monitoring. The First Flush program and the partnership between CWC and the City of Capitola represent a collaboration that supports the goals of each organization and benefits the overall community.

More information about local water quality data is available at http://coastal-watershed.org or by contacting Debie Chico-Macdonald at (831) 464-9200 or djchirco@coastal-watershed.org.

Appendix A – Monitoring Site Locations

Appendix A: 2014 City of Capitola First Flush Sites

Site ID	Site Name	Drainage Type	Site Description	Latitude	Longitude
304-CSD-03	Auto Plaza Storm Drain	Storm Drain Outfall	Under freeway overpass at Creekside Plaza	36.982519	-121.959825
304-CSD-05	Capitola Center Storm Drain	Storm Drain Outfall	Behind Nob Hill on Bay Avenue	36.980600	-121.957800
304-CSD-06	Creekside Storm Drain	Storm Drain Outfall	Storm Drain at Creekside Plaza	36.983419	-121.958828
304-CSD-08	Noble Gulch Creek @ Monterey Avenue	Noble Gulch Creek	At Noble Gulch Park on Monterey Ave	36.976970	-121.950040
304-CSD-09	Capitola Pier Storm Drain	Storm Drain Outfall	Storm Draina under the Capitola Pier	36.971280	-121.953780
304-SOQUE-22	Soquel Creek Lagoon Outlet	Soquel Creek	At mouth of Soquel Creek	36.971897	-121.952406
304-SOQUE-26	Soquel Creek Upper	Soquel Creek	At Creekside Plaza, just upstream of Creekside storm drain	36.983500	-121.959000
304-SOQUE-28	Soquel Creek Mid	Soquel Creek	Behind Nob Hill on Bay Avenue	36.980400	-121.957800

Appendix B – Water Quality Objectives and Other Criteria

Applicable WQOs and attention levels are as follows:

Field & Laboratory WQOs & AL's				
Analyte	**WQO or Attention Level**	**Averaging Period**	**Units**	**Source of WQO/AL**
Field:				
Water Temperature	Not Evaluated	Inst. Value	℃	CCRWQCB Basin Plan Objective for Cold Water Habitat
Electrical Conductivity	NA			NA
pH	>7.0 and <8.5	Inst. Value	pH units	CCRWQCB Basin Plan Objective for Cold Water Habitat
Transparency	NA			NA
Laboratory:				
E.coli	126	Geo Mean/30 day	MPN/100 mL	USEPA 2012 Recreational WQ Criteria
Total Coliform*	<240	Median/30 day	MPN/100 mL	SF Bay Region Basin Plan for Water Contact Recreation
Enterococcus	35	Geo Mean/30 day	MPN/100 mL	USEPA 2012 Recreational WQ Criteria
Nitrate (NO_3-N)	<10.0	Inst. Value	mg/L	CCRWQCB Basin Plan
Orthophosphate (PO_4-P)**	<0.12	Inst. Value	mg/L	Former CCAMP Attention Level
Copper (Cu) ***	<30	Inst. Value	µg/L	CCRWQCB Basin Plan
Lead (Pb)	<30	Inst. Value	µg/L	CCRWQCB Basin Plan
Zinc (Zn)	<200	Inst. Value	µg/L	CCRWQCB Basin Plan
Total suspended solids (TSS)	NA			NA

* Total coliform: there is no applicable WQO in the CCRWQCB Basin Plan; for report purposes the neighboring SF Basin Plan is referenced.

** Orthophosphate: there is no applicable WQO in the Basin Plan; for report purposes the former CCAMP Attention Level is referenced.

*** Copper receiving water WQO is Hardness dependent.

+ (Urea, Conductivity, Magnesium, Calcium, and Calcium Carbonate ($CaCO_3$) do not have a specific receiving water WQO or Attention Level).

Appendix C – Dry Run Analytical Results

Appendix C provides the field and laboratory results for the City of Capitola Dry Run. Results that exceed the applicable WQO or attention level are shaded in order to highlight these results. Not all tests were performed during every monitoring event (no flow at the Auto Plaza, Capitola Center, and Capitola Pier Storm Drain sites during the Dry Run); these instances are listed as "NA" when the test was not performed or "NR" if the datum was not recorded.

	CSD-03	CSD-05	CSD-06	CSD-08	CSD-09	SOQUE-22	SOQUE-26	SOQUE-28
Station ID	**Auto Plaza Storm Drain**	**Capitola Center Storm Drain**	**Creekside Storm Drain**	**Noble Gulch Creek @ Monterey Ave.**	**Capitola Pier Storm Drain**	**Soquel Creek Lagoon**	**Soquel Creek Upper**	**Soquel Creek Mid**
Nitrate-N (NO_3-N)	NA	NA	3.6	ND	NA	ND	ND	ND
Orthophosphate-P (PO_4-P)	NA	NA	ND	ND	NA	ND	ND	ND
Urea-N	NA	NA	NA	NA	NA	NA	NA	NA
E.coli	NA	NA	342	218	NA	882	149	267
Total Coliform	NA	NA	12,263	39,726	NA	6,511	1,024	4,196
Enterococci	NA	NA	296	<20	NA	240	170	196
Copper (Cu)	NA	NA	5	ND	NA	ND	ND	ND
Lead (Pb)	NA	NA	ND	ND	NA	ND	ND	ND
Zinc (Zn)	NA	NA	50	73	NA	47	39	67
Total Suspended Solids (TSS)	NA	NA	5	2	NA	3	ND	8
Hardness (as CaCO3)	NA	NA	NA	NA	NA	281	291	294
Calcium	NA	NA	NA	NA	NA	53	77	78
Magnesium	NA	NA	NA	NA	NA	36	24	24
Water Temperature	NA	NA	15.3	15.7	NA	20.8	15.6	16.8
pH	NA	NA	7.0	7.0	NA	7.5	7.0	6.5
Electrical Conductivity	NA	NA	710	680	NA	1,230	740	780
Transparency	NA	NA	NR	>120	NA	>120	>120	>120
Visual Field Observations:								
Flow	NA	NA	L	L	NA	NR	NR	NR
Trash	NR	F	F	F	F	T	T	T
Sewage (sited or smelled)	NA	NA	F	F	NA	F	F	F
Oil Sheen	NA	NA	F	F	NA	F	F	F
Scum	NA	NA	F	T	NA	F	F	F

Shaded values indicate dishcarge value exceeds receiving water WQO or Attention Level

ND = Non-detect result
NA = No data available/test not performed
NR = Not recorded
T/F = True/False
H/M/L = High/Medium/Low

Appendix D – First Flush Analytical Results

Appendix D provides the field and laboratory results for the City of Capitola First Flush Event. Results that exceed the applicable WQO or attention level are shaded in order to highlight these results. Not all tests were performed during every monitoring event (no Time Series 2 lab analyses, Capitola Center Storm Drain Time Series 1 bacteria sample lost due to bottle leakage during transport, pH and transparency not collected during Time Series 1 at the Auto Plaza Storm Drain and Creekside Storm Drain sites due to darkness, Capitola Pier Storm Drain site did not have transparency tube for event); these instances are listed as "NA" when the test was not performed or "NR" if the datum was not recorded.

	Auto Plaza Storm Drain	Auto Plaza Storm Drain	Auto Plaza Storm Drain	Capitola Center Storm Drain	Capitola Center Storm Drain	Capitola Center Storm Drain	Creekside Storm Drain	Creekside Storm Drain	Creekside Storm Drain	Noble Gulch Creek @ Monterey Ave.	Noble Gulch Creek @ Monterey Ave.	Noble Gulch Creek @ Monterey Ave.	Capitola Pier Storm Drain	Capitola Pier Storm Drain	Capitola Pier Storm Drain	Soquel Creek Lagoon	Soquel Creek Upper	Soquel Creek Mid
	CSD-03	CSD-03	CSD-03	CSD-05	CSD-05	CSD-05	CSD-06	CSD-06	CSD-06	CSD-08	CSD-08	CSD-08	CSD-09	CSD-09	CSD-09	SOQUE-22	SOQUE-26	SOQUE-28
Parameter	Time Series 1	Time Series 2	Time Series 3	Time Series 1	Time Series 2	Time Series 3	Time Series 1	Time Series 2	Time Series 3	Time Series 1	Time Series 2	Time Series 3	Time Series 1	Time Series 2	Time Series 3	Time Series 1	Time Series 1	Time Series 1
Nitrate-N (NO_3-N)	0.30	NA	0.20	0.20	NA	0.20	0.30	NA	0.40	0.20	NA	0.20	0.20	NA	0.20	ND	0.20	0.30
Orthophosphate-P (PO_4-P)	0.40	NA	0.40	0.70	NA	0.60	0.20	NA	0.10	ND	NA	0.10	0.20	NA	0.20	ND	0.30	0.20
Urea-N	431	NA	NA	75	NA	NA	60	NA	NA	39	NA	NA	186	NA	NA	28	89	105
E.coli	11,190	NA	9,060	NA*	NA	26,130	4,950	NA	3,950	77,010	NA	10,580	46,110	NA	17,890	1,460	14,390	34,480
Total Coliform	>241,960	NA	>241,960	NA*	NA	>241,960	>241,960	NA	>241,960	>241,960	NA	>241,960	>241,960	NA	>241,960	12,910	>241,960	>241,960
Enterococci	4,320	NA	11,620	NA*	NA	5,810	5,120	NA	6,370	8,330	NA	5,910	22,470	NA	29,090	750	10,430	8,130
Copper (Cu)	24	NA	24	14	NA	12	35	NA	60	12	NA	7	24	NA	33	ND	6	21
Lead (Pb)	ND	NA	ND	ND	NA	ND	ND	NA	10	ND	NA	ND	6	NA	8	ND	ND	ND
Zinc (Zn)	178	NA	126	249	NA	164	189	NA	273	84	NA	44	136	NA	176	27	53	112
Total Suspended Solids (TSS)	17	NA	26	14	NA	12	20	NA	75	120	NA	38	32	NA	72	2	9	26
Hardness (as CaCO3)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	267	184	86
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	56	49	23
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31	15	7
Water Temperature	NA	19.0	18.9	19.2	18.4	18.9	19.2	19.2	18.8	18.0	18.0	18.0	19.5	19.5	19.2	21.2	18.2	18.6
pH	NA	6.0	6.5	6.5	6.5	6.5	NA	6.5	6.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.5	7.0
Electrical Conductivity	NA	80	70	60	60	50	90	110	90	600	550	530	110	130	90	1150	610	170
Transparency	NA	17.2	22.3	29	28	33	NA	9	10.1	30	35	33	NA	NA	NA	109.5	35.2	25.0
Visual Field Observations:																		
Flow	H	H	H	M	M	M	H	H	NA	H	NA	NA	M	M	L	NA	M	M
Trash	T	T	F	F	F	F	F	F	F	F	F	F	T	F	F	T	NA	NA
Sewage (sited or smelled)	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	NA	NA
Oil Sheen	F	F	F	F	F	F	NA	F	F	F	F	F	F	F	F	T	NA	NA
Scum	T	T	T	F	F	F	NA	F	F	T	T	T	T	T	T	T	NA	NA

Shaded values indicate dishcarge value exceeds receiving water WQO or Attention Level

ND = Non-detect result

NA = No data available/test not performed

NA* = Capitola Center Time Series 1: sample cap loose, sample leaked out

NR = Not recorded

T/F = True/False

H/M/L = High/Medium/Low