Stream Team Data Report

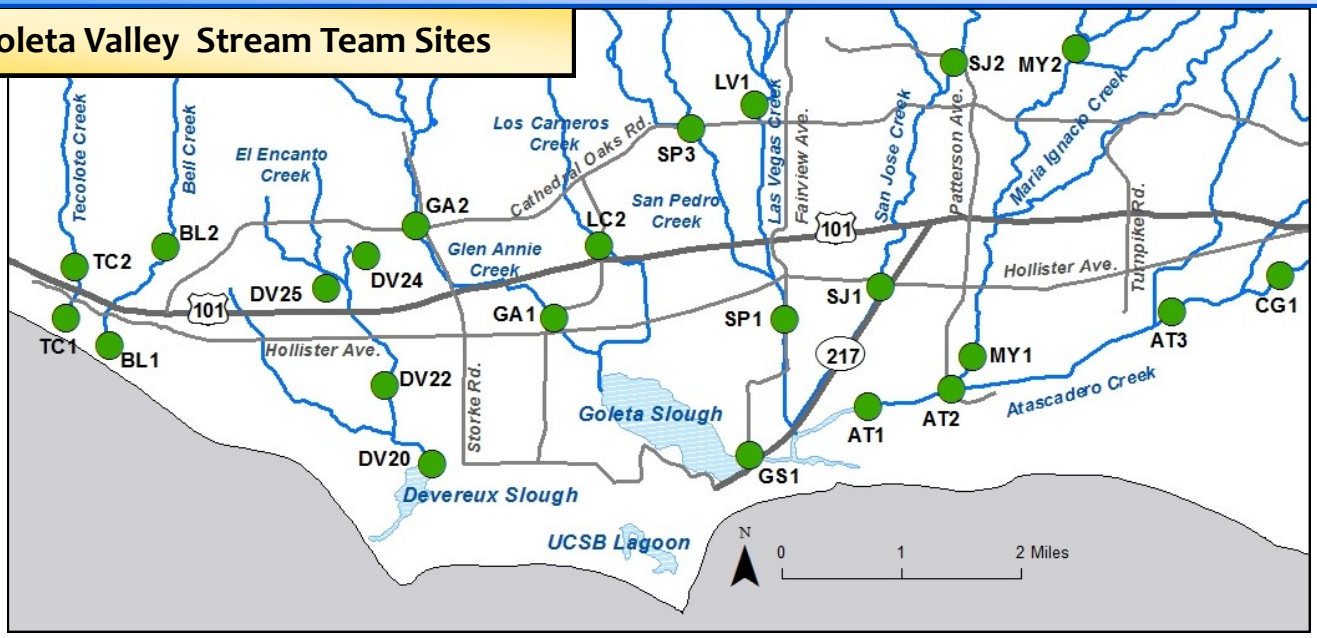
Goleta Valley Watersheds

Water Year 2014 (October 1, 2013-September 30, 2014)

Santa Barbara CHANNELKEEPER®

About Stream Team

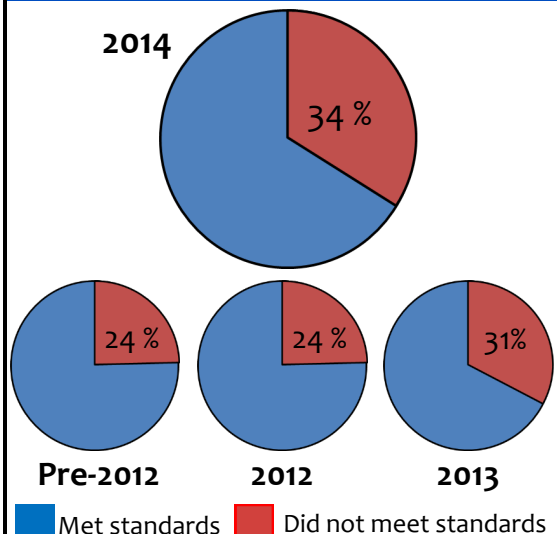
Goleta Valley Stream Team Sites



Santa Barbara Channelkeeper launched the Goleta Valley Stream Team Program in 2002. Stream Team engages volunteers in conducting monthly water quality sampling at 23 sites throughout the Goleta Valley. Our ultimate goal is cleaner, healthier water and a more environmentally responsible citizenry that is actively engaged in addressing the pollution problems plaguing our waterways.

This report is based on a comparison of data collected during the 2014 Water Year (October 1, 2013—September 30, 2014) to applicable water quality standards. These standards were created to ensure that recreation, agriculture, wildlife, and other beneficial uses are not impacted by poor water quality.

Overall Results

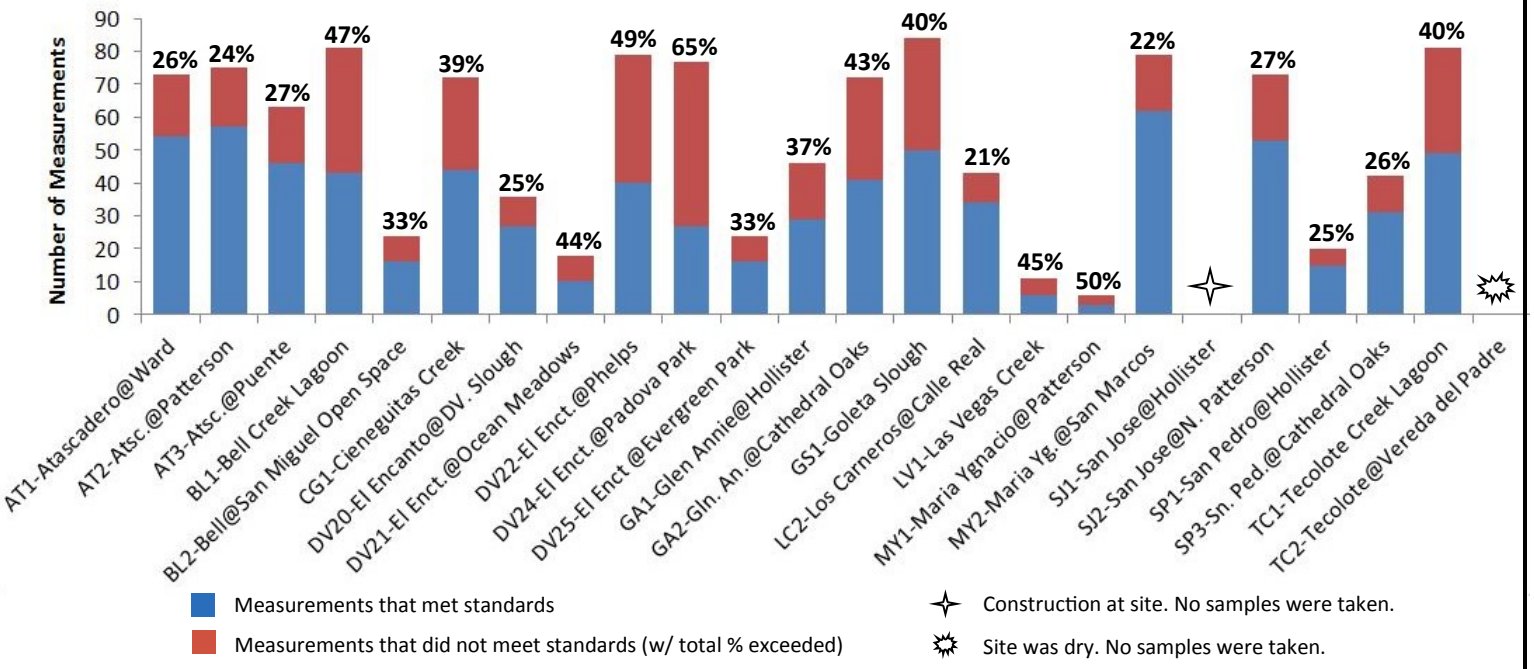


In 2014, a higher percentage of samples failed to meet water quality standards than in the history of our Stream Team Program. Exceedances were higher in 2014 across all parameters tested. The Goleta Valley watersheds had the highest number of exceedances of all the watersheds that we monitor through our Stream Team Program.

THE STANDARDS

Parameter	Standard	Source
Conductivity	< 3,000 µS/cm	Central Coast Basin Plan
Dissolved Oxygen	> 7 mg/L	Central Coast Basin Plan
pH	> 7 and <8.5	Central Coast Basin Plan
Turbidity	<25 NTU	Central Coast Basin Plan
E. Coli	<235 MPN/100 mL	US EPA; 303d criteria
Total Coliform	<10,000 MPN/100 mL	CA Department of Health Services

Exceedances by Site



The graph above shows exceedances of water quality standards by site. In general, sites along El Encanto Creek (DV20, 21, 22, 24, 25) experienced the highest percent of exceedances, primarily due to chronic bacteria and conductivity exceedances. Lagoon sites (GS1, BL11,TC1) also experienced chronic exceedances. Exceedances on Cieneguitas Creek (CG1) were mostly from dissolved oxygen and bacteria, while Glen Annie Creek (GA1 and GA2) had chronic exceedances of all parameters.

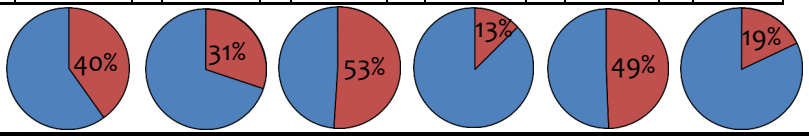
Exceedances by Parameter

Creek	Site	Conductivity	Dissolved Oxygen *	E.coli	pH	Total Coliform	Turbidity
Atascadero	AT1						
	AT2						
	AT3						
Bell	BL1						
	BL2						
Cieneguitas	CG1						
El Encanto (aka Phelps Ditch)	DV20						
	DV22						
	DV24						
	DV25						
Glen Annie	GA1						
	GA2						
Goleta Slough	GS1						
Los Carneros	LC2						
Las Vegas	LV1						
Maria Ygnacio	MY1						
	MY2						
San Jose	SJ1	0	0	0	0	0	0
	SJ2						
San Pedro	SP1						
	SP3						
Tecolote	TC1						
	TC2	0	0	0	0	0	0

Legend

- Lagoon site - standard not applicable
- Did not exceed standard
- Exceeded standard at least once
- Exceeded standard 50% or more
- 0 — No samples taken at site
- Hash marks: <5 samples taken at site

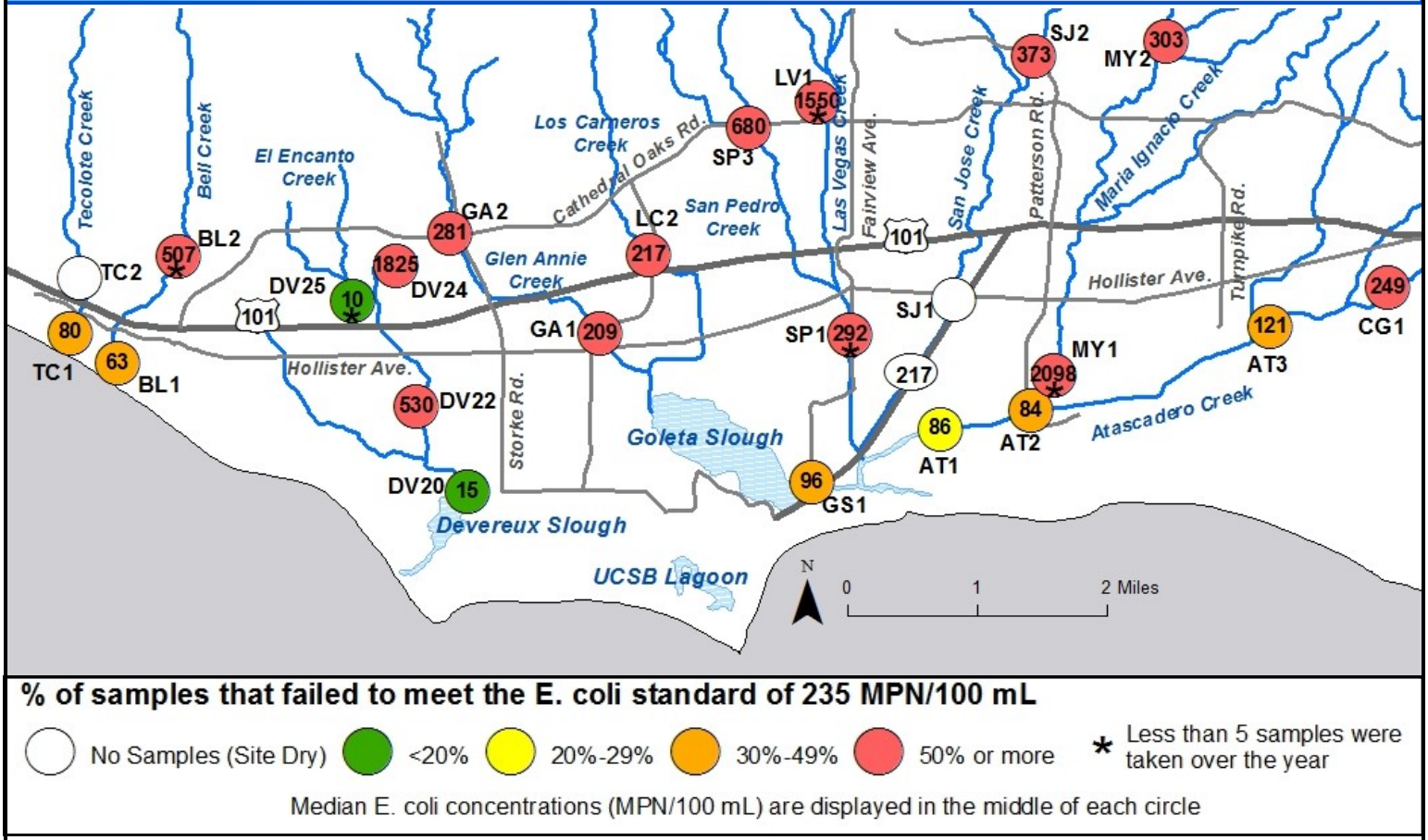
% of total samples that exceeded the standard



As shown in the diagram to the left, bacteria (E.coli and Total Coliform) appear to be the biggest contributor to exceedances in the watershed, with every site exceeding the Total Coliform limit at least once, and over 50% of all samples throughout the year failing to meet the E.coli standard. pH only appears to be a concern for lagoon sites and sites located within creeks that have been channelized (see page 4).

** Because these DO measurements were collected mid-day, they do not reflect minimum DO (which occurs before dawn) and thus should not be used to determine impairment.*

Bacteria



% of samples that failed to meet the E. coli standard of 235 MPN/100 mL

No Samples (Site Dry) | <20% | 20%-29% | 30%-49% | 50% or more | * Less than 5 samples were taken over the year

Median E. coli concentrations (MPN/100 mL) are displayed in the middle of each circle

Bacteria is a significant concern for water quality in the Goleta Valley. The presence of indicator bacteria like E. coli and Total Coliform suggests that other illness-causing pathogens may be present. As shown in the graph above, the E. coli standard of 235 MPN/100 mL was often exceeded throughout the watershed. Of sites where more than 5 samples were taken, SP3 and DV24 had the highest percent of exceedances for E. coli, at 100% and 93%, respectively. Overall, 13 sites experienced chronic E. coli exceedances, with samples failing to meet the standard at least 50% of the time, and 11 sites had median E. coli concentrations that also exceeded the standard. Throughout the watershed, 53% of all samples taken failed to meet the E.coli standard. Additionally, every site failed to meet the Total Coliform standard of less than 10,000 MPN/100 mL at least once, with 13 of 21 sites exceeding the standard more than 50% of the time. Inputs from livestock, urban, and agricultural sources are likely responsible for persistently high bacteria concentrations throughout the Goleta Valley.

Conductivity

Conductivity measures water's ability to conduct electricity. As substances dissolve in water, conductivity increases, along with its salinity. Therefore, measuring conductivity indirectly indicates the amount of total dissolved solids (TDS) in the water. It is not a perfect measure, because some substances, particularly organic compounds like oil, alcohol, or sugar, do not conduct electricity well and have low conductivity. However, in general, a higher conductivity value indicates that there are more chemicals dissolved in the water. While each waterway has a natural level of conductivity, significant changes in conductivity may indicate that a discharge or some other source of pollution, such as agricultural or urban runoff, has entered a stream.

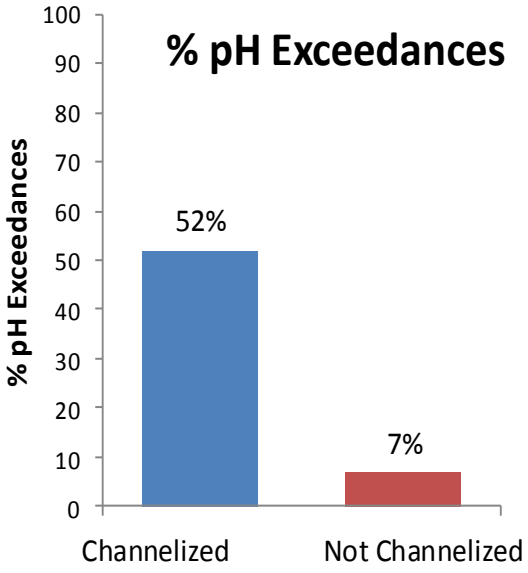
The conductivity of rivers in the U.S. generally ranges from 50 to 1,500 µs/cm. Locally, the Central Coast Basin Plan sets a conductivity objective of less than 3,000 µS/cm to protect agricultural uses. All sites along El Encanto Creek (DV sites) consistently exceeded the conductivity standard. Median conductivity at DV24 was over 5,500 µS/cm throughout the year, with 100% of samples failing to meet the standard. Site GA1, located on Glen Annie Creek, had persistent conductivity issues, with 86% of samples exceeding the standard. Both sites are downstream of several agricultural operations, and DV24 is also downstream of a golf course. Runoff from these land uses may be contributing to consistently high values at these sites.

Issue Spotlight: Impacts of Channelization

Natural section of Atascadero Creek (AT1)

Channelized section of Atascadero Creek (AT3)

Concrete channels significantly affect water quality. They spread out the flow, making the creek very shallow. This condition increases temperature and causes algae to proliferate, which can affect pH and dissolved oxygen levels. The graph below shows how sites located within concrete channels (AT3 and DV22) have a dramatically higher percentage of samples that fail to meet standards for pH. This is due to the fact that the algae has a dominant effect over the shallow water, increasing the pH (making it more basic) as carbonic acid in the water is removed by algae when the carbon is utilized during photosynthesis.



Similar to pH, channelization drives dissolved oxygen concentrations due to the dominant effect of algae. During the day, water in concrete channels becomes saturated with oxygen as plant life produces oxygen through photosynthesis. However, during the night this production essentially stops and dissolved oxygen concentrations drop significantly. In 2014, our sampling at AT3, a channelized site, showed a median dissolved oxygen concentration of 16.8 mg/L, thus we did not detect any exceedances during our regular mid-day Stream Team sampling. However, in 2011 and 2012, Channelkeeper conducted pre-dawn monitoring at several sites to capture these early-morning minimum values. Pre-dawn sampling at AT3 demonstrated that concentrations consistently fell below the standard and were generally less than at any other site, while concentrations during afternoon samplings on the same days were well above 10 mg/L. Fluctuations from morning to afternoon were as much as 15.31 mg/L. This suggests that in 2014, while concentrations from standard samplings were above 10 mg/L, it is extremely likely that concentrations consistently fell below the 7 mg/L standard during the early morning.

Acknowledgements

Special thanks to our Stream Team volunteers who dedicated nearly 300 hours to monitor local waterways in 2014. We also thank the City of Goleta, REI, Deckers, and the Crawford Idema Family Foundation for their support for the Goleta Stream Team Program.

For questions or comments about this report, contact:
Ben Pitterle, Watershed & Marine Program Director
E-Mail: ben@sbck.org Phone: (805) 563-3377 x 3

For historical and more detailed analysis of Stream Team data, visit: www.sbck.org/StreamTeam/Reports

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