



Insights from Water Quality Community Based Monitoring Program – Storm Drain Detectives, City of Lodi

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5) Vista Oaks Charter School 6) Reese Elementary 7) Tokay High School 8) (now at) City of Manteca 9) Lodi Unified School District





What is Storm Drain Detectives?



- Community-based water quality monitoring program in Lodi, California started in 2001
- Bi-weekly monitoring of five sites at Lodi Lake and in the Lower Mokelumne River
- Elementary, Middle, and High-school students volunteers from five schools (6th, 7th, 8th, and High School)





Monitoring Photos





Monitoring Photos



Student-Involvement



The program is based on student-based monitoring, with over 3,000 students involved since the start of the program





History of Storm Drain Detectives



- In 1998, the State Water Resources Control Board (SWRCB) fined the City of Lodi's Wastewater Treatment Plant, to avoid paying the whole fine City of Lodi asked the SWRCB to be able to put half of the fine towards a community water-quality education program
- In collaboration with City of Lodi, Clean Water Team (SWRCB), environmental consultants... Storm Drain Detectives was created in 2001





Goal #1 of Storm Drain Detectives

Engage and Make Accessible, a Water Quality

Education - Provide meaningful opportunities for Lodi students to engage in the collection of water quality data from the Mokelumne River and work towards answering the question: "How does the City of Lodi's stormwater runoff impact the Mokelumne River's water quality?"





Goal #2 of Storm Drain Detectives

Promote Watershed Stewardship - Through participation in the Storm Drain Detective Monitoring Program, and learning more about water quality, and the impact that stormwater has on the Mokelumne River, the students will learn the importance of watershed considerate behavior. “We are the solution to water pollution.”





Goal #3 of Storm Drain Detectives

Career Water Quality Professionals - Time spent by students working alongside City of Lodi water quality professionals allows for questions to be asked, discussion to follow and more learning to take place by students. These professionals also offer students a chance to learn about the many jobs involved in the water treatment industry.





Goal #4 of Storm Drain Detectives

Classroom Extended Learning - Opportunities for teachers to extend lessons to include SDD experience, examples and data to science standards being taught in the classroom





Goal #5 of Storm Drain Detectives

Builds Teamwork - Students learn to work as a team as they monitor each month, as well as learn to take personal initiative as they each do their part.





Goal #6 of Storm Drain Detectives

Honing Leadership Skills - Returning SDD students over the years have been able to learn valuable leadership skills as they work with new students, master equipment calibration, and solve unexpected problems. Letters of recommendation are written to colleges, scholarship committees and prospective employers to support these returning participants who have gone beyond the meeting of a class requirement, to rejoin for the good of the group.



Data Collected

- As part of the monitoring program, we collect water quality parameters: pH, Dissolved Oxygen, Electrical Conductivity, temperature, nitrates, turbidity, bacteria, and visual observations bi-weekly
- Once a year, we conduct Secchi Disk monitoring at Lodi Lake as another test for turbidity/clarity



LODI CITIZEN'S MONITORING - Sampling & Analysis Field Data Sheet



DATE of Sampling	TIME of Sampling	Air Temp. °C. Digital	Water Temp. °C. Digital	Water Temp. °C. D.O. Meter	D.O. - mg/L D.O. - Meter, mg/L	pH Meter	pH Paper	EC / Conductivity	Nitrate, mg/L as N	Turbidity, NTUs	
SITE Sampling Locations: <input type="checkbox"/> Site #1 <input type="checkbox"/> Site #3 <input type="checkbox"/> Site #7 <input type="checkbox"/> Site #8 <input type="checkbox"/> Site #9C											
Date	Time	°C Air Digital	°C Water DO Meter	D.O. - Meter	D.O. - Chemet	pH Meter	pH Paper	EC / Conductivity	Nitrate	Turbidity	
Grade:											
Use Observation Codes below	Weather:	Odor:	Algae:	Foam:	Turbid.:		Oil:	Litter:	Color:	Invasive Species:	BOX # _____

OBSERVATIONS- Describe Site and Conditions.
**pH and *EC- Please take three samples and record each, then average.*

BACTERIA

Incubation at 35 +/- 0.5 for 48 +/- 3 hours

Date Collected: _____ Time Collected: _____ Date Set Up: _____ Time Set Up: _____

Location: _____ Set Up By: _____

Sampled By: _____ 45 minute wait before dish sealed

E. coli Count: _____ E. coli Count: _____

After 24hrs: _____ After 48hrs: _____

Sample A Sample B Sample A Sample B

Method of incubation: _____ Incubator 35°C Room Temp: _____

WATER QUALITY GRADE:

Grade	pH	Temp	D.O.	Turbidity	EC	Nitrates
A	7.0 - 8.0	Weather and condition dependent	> 85% Saturation	< 5	< 150	< 1
B	6.5-6.9, 8.1-8.5		75-84% Sat.	5-20	151-300	2-3
C	6.0-6.4, 8.6-9.0		65-74% Sat.	21-50	301-500	4-5
D	5.5-5.9, 9.1-9.5		55-64% Sat.	50-150	501-1000	6-10
F	<5.5, >9.5		< 55% Sat., <5.0 ppm	> 150	> 1000	> 10

SCHOOL: CIRCLE ONE: Reese School Lodi High School Tokay High School Joe Serna Charter School **TEACHERS/STUDENTS:**

Weather:	Odor:	Algae:	Foam:	Turbidity:	Flow:	Oil:	Litter:	Color:	Invasive Species:
0. Clear/sunny	7. Foggy	0. None	7. Sulfide	0. None	0. Clear	0. None	0. None	0. None	7. Zebra mussel
1. Calm	8. Drizzle	1. Feces	8. Chlorine	1. Light (< 5%)	1. Separated Bubbles	1. Cloudy	1. Low	1. Blue	1. Water Hyacinth
2. Light Breeze	9. Rain	2. Fishy	9. Other	2. Mod. (5-25%)	2. Mod. (< 1/2" high)	2. Murky	2. Med.	2. Brown	2. Egeria densa
3. Windy	10. Snow	3. Musty		3. High (25-50%)	3. High (> 1/2" high)	3. Tar on banks	3. High	3. Olive Brown	3. Parrot feather
4. Very windy	11. Hail	4. Decay		4. Dense (> 50%)		4. Dense (> 30 pcs)	4. Dense	4. Green	4. Curly Leaf Pondweed
5. Overcast/cloudy	12. Other	5. Ammonia		6. Petroleum			5. Red	5. Eurasian water-milfoil	
6. Partly cloudy							6. Yellow	6. Parrot feather	

SDD Data Sheet



COVID and Monitoring

At the onset of the COVID pandemic, we had to make the decision to stop monitoring. We were not monitoring for two months at the onset of the pandemic (March to April '21). We returned to monitoring without students, with only the SDD leaders (teachers, City of Lodi employees, and program leaders). We broke into smaller teams, ensured we were sanitizing between use of monitoring equipment, and masked. We were able to persevere as a program. Following a nearly 1.5 years of leader-only monitoring, we were able to once again welcome students to the program.





Equity, Diversity, and Inclusion

As a program, we have more work to be done. We have made a conscious step forward in increasing EDI within our community program. We have incorporated two lower-income (primarily students of color) schools to participate. Although that we have made this step to increase inclusion, we still need to encourage more students and schools that are of more diversity to be included within the program. As a program, we will and have made a conscious step forward to ensure that we are abiding by EDI principles.





Storm Drain Detectives Resources

Storm Drain Detectives Website: <https://www.lodi.gov/492/Storm-Drain-Detectives>

SDD Data: <https://www.lodi.gov/505/Monthly-Data>

Mokelumne Current: <https://lodiwatershed.com/index.php/the-mokelumne-current/>

Educational Videos: <https://lodiwatershed.com/index.php/edu-resources/watershed-education-videos/>

