CA Urban Streams Alliance-The Stream Team (The Stream Team)

Memo

To: Friends of the Gualala River (FoGR), Board of Directors
From: Timmarie Hamill, Director, The Stream Team, 530 519-2826
Date: 5-14-25
Re: Stormwater Monitoring, 6PPD-q

Introduction:
In 2022, The Stream Team launched the Gualala River Stream Team to assess water quality in the Gualala River and estuary. This effort builds on over two decades of watershed monitoring across Northern California, grounded in strong local partnerships with community members and organizations. These collaborations are essential to establishing baseline conditions and tracking the long-term impact of restoration and resource management on water quality.
Guided by an established monitoring plan (MP) and quality assurance project plan (QAPP), The Stream Team ensures data integrity while expanding efforts to monitor emerging pollutants like 6PPD-quinone (6PPD-q) during storm events that are being carried to the Gualala River and estuary when it rains. 6PPD-q predominantly enters aquatic environments through surface runoff from roads from automobile tires. Tire wear particles (TWP) are generated and released as tires roll across road surfaces, particularly as vehicles brake, accelerate, and turn (Baensch-Baltruschat et al. 2020; Seiwert et al. 2022).

The Rose Foundation and Friends of Gualala River (FoGR) funded laboratory costs, while the Stream Team covered updates to the MP and QAPP (to include 6PPD-q), as well as sampling supplies and equipment. Both FoGR and the Stream Team contributed volunteer labor for field monitoring.

Purpose and Scope
The goal of this monitoring effort is to assess the presence of 6PPD-q in the Gualala River estuary, which is highly toxic to Coho Salmon and Steelhead Trout. The project aims to identify road runoff hot spots and establish baseline conditions prior to upcoming estuary restoration and the Caltrans Gualala Downtown Streetscape Enhancement project. Data collected will inform recommendations for runoff mitigation measures, such as green infrastructure and infiltration systems, to reduce pollutant loads to the estuary.

Sampling and Analysis Methods
Sampling and analysis followed protocols based on:

- Washington State Department of Ecology SOPs for 6PPD-q
- EPA guidance for laboratory procedures
- Stream Team SOPs aligned with California's SWAMP protocols

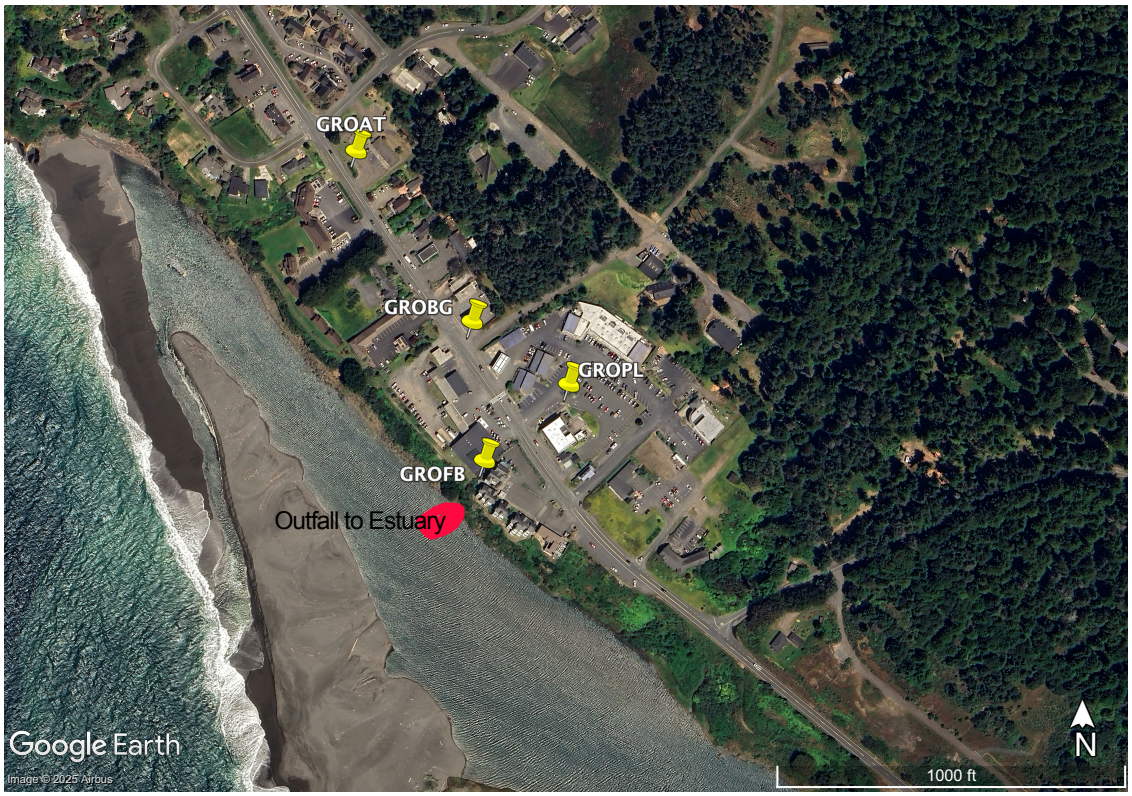
Field and Laboratory Analysis

Field measurements (temperature, pH, dissolved oxygen, conductivity, and turbidity) were taken concurrently with sample collection. Samples were transported on ice and analyzed by:

1. **Eurofins Laboratory** – 6PPD-q (EPA Draft Method 1634)
2. **Fruit Growers Lab** – Zinc (EPA Method 200.8) and oil & grease (EPA Method 1664A)

Sampling Site Locations:

Site ID	Site Name	Site GPS
GROAT	Above Trink's	38.46838N, -123.315126W
GROBG	Below Chevron Gas Station	38.46358N, -123.314705W
GROPL	Parking Lot (Sundstrom Mall)	38.46182N, -123.314355W
GROFB	Foot Bridge	38.45967N, -123.314659W



Data Results:

Sampling Date	Analyte Details				Location								
	Type	Units	MDL	RL	Above Trinks	Below Gas Station	Parking Lot	Foot Bridge	Kayak Launch	Camp Ground	North Fork	South Fork	Below Confluence NF/SF
1/24/24	Dissolved Oxygen	mg/l	1.5	1.5	9.00		9.00	9.00	10.00	9.00	9.00	9.00	10.94
5/4/24			0.5	1.5	10.82	11.14		10.92	10.50		11.14		11.02
9/21/24			0.5	1.5	9.54	9.00							
10/12/24			0.5	1.5									
11/1/24			0.5	1.5									
1/31/25			0.5	1.5	10.88			10.90	10.16	10.71			
1/24/24	Total Dissolved Solids	mg/l	3.0	8.0	120.00		40.00	160.00	120.00	110.00	90.00	110.00	110.00
5/4/24			3.0	8.0	70.00	40.00		40.00	110.00		90.00		90.00
9/21/24					310.00	340.00							
10/12/24								140.00					
11/1/24					180.00			80.00					
1/31/25					360.00			225.00	110.00	140.00			
1/24/01	Conductivity	mS/l	1.0	1.0	160.00		60.00	200.00	140.00	140.00	120.00	130.00	130.00
5/4/24			1.0	1.0	110.00	60.00		60.00	170.00		140.00		140.00
9/21/24					470.00	540.00							
10/12/24								220.00					
11/1/24					280.00			120.00					
1/31/25					550.00			350.00	180.00	220.00			
1/24/24	Turbidity	NTU	0.2	0.5	35.10		157.00	36.90	28.40	20.60	17.80	21.20	30.60
5/4/24			0.2	0.5	24.90	50.80		24.30	1.22		0.52		0.41
9/21/24					37.40	40.10							
10/12/24								48.40					
11/1/24					95.60			49.30					
1/31/25					10.80			51.20	15.70	10.71			
1/24/24	Water Temperature	°C	0.5	0.5	10.00		11.00	11.00	10.00	10.00	10.00	10.00	10.00
5/4/24			0.5	0.5	12.77	11.80		12.20	13.20		13.00		13.20
9/21/24			0.5	0.5	15.00	14.00							
10/12/24			0.5	0.5									
11/1/24			0.5	0.5									
1/31/25			0.5	0.5	9.50			9.10	8.40	8.10			
1/24/24	pH	pH Units	1.0	0.5	8.90		9.10	9.00	8.60	8.40	8.80	8.60	8.70
5/4/24			1.0	0.5	10.10	9.50		9.10	8.70		8.60		8.70
9/21/24			1.0	0.5	8.20	8.10							
10/12/24			1.0	0.5									
11/1/24			1.0	0.5	6.70			7.40					
1/31/25			1.0	0.5	7.90			6.90	6.90	6.90			
1/24/24	Zinc	mg/l	0.00084	0.02	0.0394		0.1460	0.0797					
5/4/24			0.00084	0.02	0.0431	0.1030		0.0812					
9/21/24			0.00084	0.02									
10/12/24			0.00084	0.02				0.1690					
11/1/24			0.00084	0.02	0.0319			0.0669					
1/31/25			0.00084	0.02	0.0369			0.0510					
1/24/24	Oil and Grease	mg/l	1.7	3.0	ND		12.60	2.66					
5/4/24			1.7	3.0	ND	1.81		ND					
9/21/24			1.7	3.0									
10/12/24			1.7	3.0				ND					
11/1/24			1.7	3.0	ND			2.66					
1/31/25			1.7	3.0	ND			1.91					
1/24/24	6PPD-q	ng/l	5.0	20.0									
5/4/24			5.0	20.0		71.00							
9/21/24			5.0	20.0									
10/12/24			5.0	20.0				110.00					
11/1/24			5.0	20.0	28.00			130.00					
1/31/25			5.0	20.0	14.00			170.00					

Action Limits:

		Basin Plan	Ocean Plan
Indicator Parameter	Units	Action Level Concentrations (< means must be under the action level)	Action Level Concentrations
e.coli (fecal coliform)	#/100 mL	< 400 (single sample max) < 200 (geometric mean - 6 samples weekly)	< 400 (single sample max) < 200 (geometric mean - 6 samples weekly)
Conductivity	mS/L	285 (Navarro, no criteria for Garcia or Gualala)	?
pH	pH units	6.5 to 8.5	6.0 to 9.0 or no change > 0.2 units from what occurs naturally
Oil and Grease	mg/L	< 25 (monthly avg) < 75 (one time max)	< 25 (monthly avg) < 40 (7 day avg) <75 (Instantaneous max)
Turbidity	NTU	<20% increase above naturally occurring levels	<75 (monthly avg) <100 (7 day avg) < 225 (Instantaneous max)
Zinc	mg/L	< .08 mg/L daily max	<75 (6-month median) <80 (Daily max) < 200 (Instantaneous max)
6PPD-q	ng/L	<95	< 95 adult Coho. < 40 juvenile Coho

Note: This is my understanding of the action limits – What are the Caltrans limits for stormwater?

Brief Conclusions:
The following parameters exceeded action levels:

- Conductivity: 60 to 550 µS/L
- Turbidity: 0.41 to 95.6 NTU
- Zinc: 0.0319 to 0.1690 mg/L
- 6PPD-q: 14 to 170 ng/L (4 of 6 sample dates above action level)

The results suggest runoff pollution primarily originates from gas stations, parking lots, and Highway 1. For instance, 6PPD-q levels ranged from 71 to 179 ng/L at the Gas Station, Parking Lot, and Footbridge sites, compared to 14 to 28 ng/L at the Above Trinks site. Zinc levels followed a similar pattern, ranging from 0.05 to 0.17 mg/L at the Gas Station, Parking Lot, and Footbridge sites, versus 0.03 to 0.04 mg/L at Above Trinks.

These findings highlight the need for enhanced mitigation efforts to reduce stormwater runoff and protect water quality in the estuary, which is critical for endangered coho, threatened steelhead, and other important species.

We plan to submit a proposal to the Environmental Enhancement and Mitigation (EEM) Program to secure funding for additional stormwater mitigation measures associated with the Caltrans Gualala Downtown Streetscape Enhancement project. We seek Caltrans' support to ensure these measures complement and enhance existing project elements, providing added protection for the estuary and benefiting Coho salmon habitat impacted by roadway runoff.

Data has been submitted to CEDEN and should be posted on the Open Data Portal in the CEDEN Augmentation Dataset: https://data.ca.gov/dataset/surface-water-chemistry-results-ceden-augmentation

I filtered the data query on our two parent programs for The Stream Team (The Stream Team, Gualala River and The Stream Team, Big Chico Creek) and these data sets have been uploaded: https://data.ca.gov/dataset/surface-water-chemistry-results-ceden-augmentation/resource/e07c5e0b-cace-4b70-9f13-b3e696cd5a99?filters=Program%3AThe%20Stream%20Team%2C%20Big%20Chico%20Creek%7CProgram%3AThe%20Stream%20Team%2C%20Gualala%20River

The data portal for CEDEN sometimes inconsistent or hard to find data. If you would like help locating our CEDEN data, please contact Timmarie Hamill.

This memo is intended to lay the groundwork for discussing targeted mitigation measures, drawing on the Stream Team's past stormwater projects and ongoing work in Gualala to address water quality issues.