

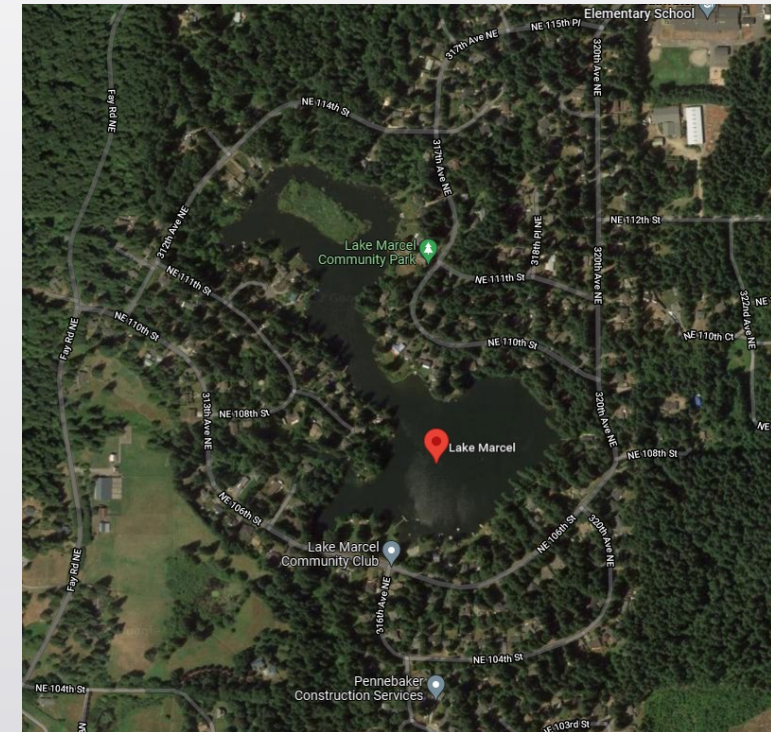
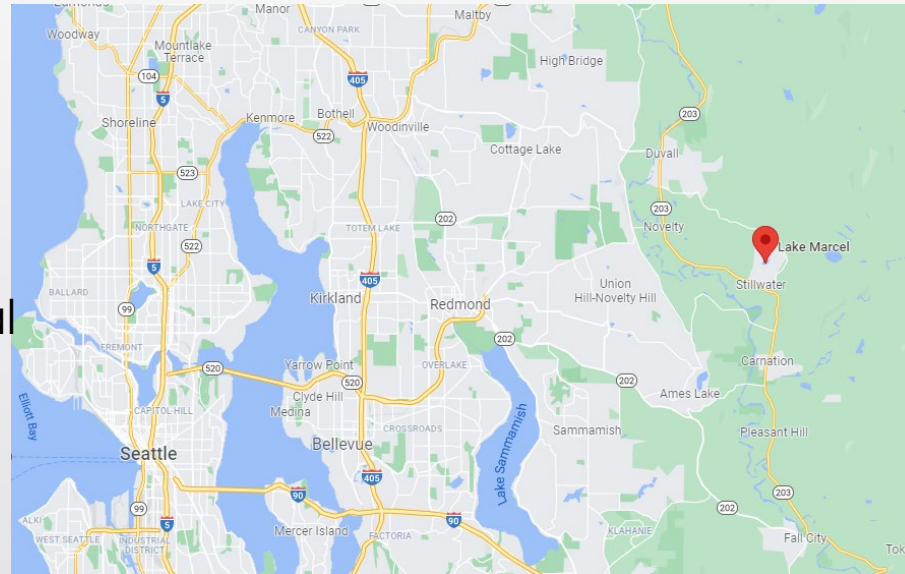


Lake Marcel Cyanobacteria Management Plan

Chris Knutson and Wafa Tafesh

Background at Lake Marcel

- 20 miles east of Seattle
- 33 acres, shallow
- Watershed 1200 acres
- Primarily rural residential and RA-5
- Lake Stewardship Program



Ecology Grant

- Freshwater Algae control grant (applied in 2020)
- Partners- Herrera Consulting, Lake Marcel Community Club
- Received in 2021
- 50K (+ match)
- Grant period 2021-2023
- Deliverable-Lake Cyanobacteria Management Plan

LAKE MARCEL CYANOBACTERIA MANAGEMENT PLAN



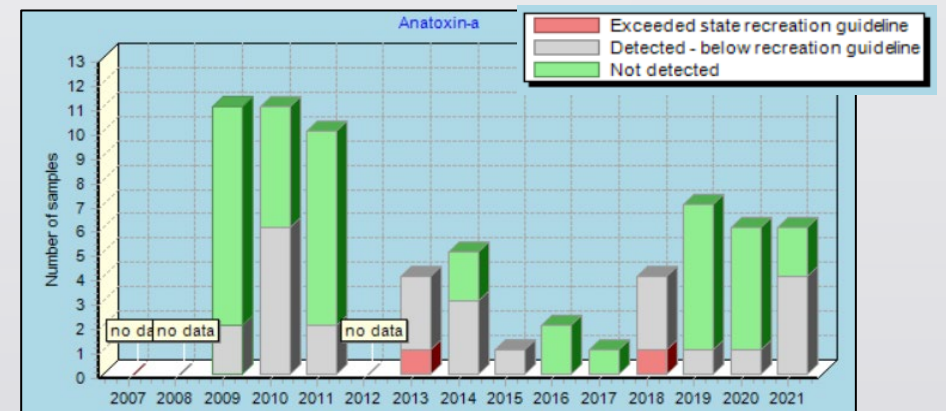
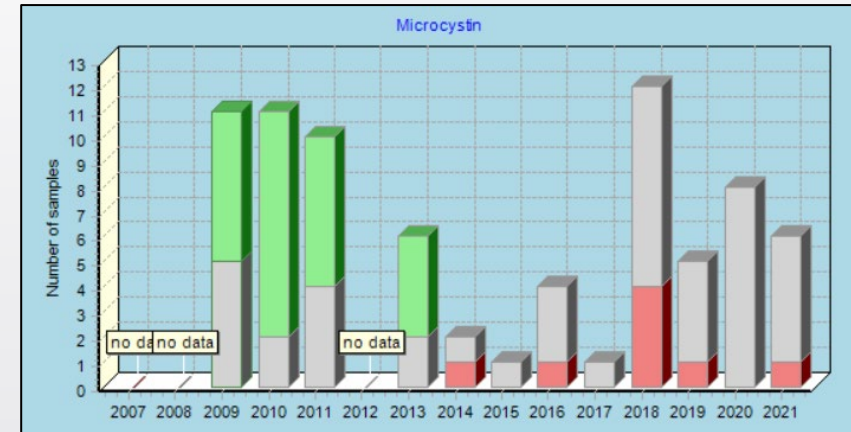
Prepared by
Herrera Environmental Consultants
and

King County Water and Land Resources Division



Cyanobacteria History

- History of (toxic) algae blooms
- Consistent moderate/high toxicity events (10 -100µg/L microcystin)
- Both anatoxin and microcystin
- Only test when bloom is present



Sampling program

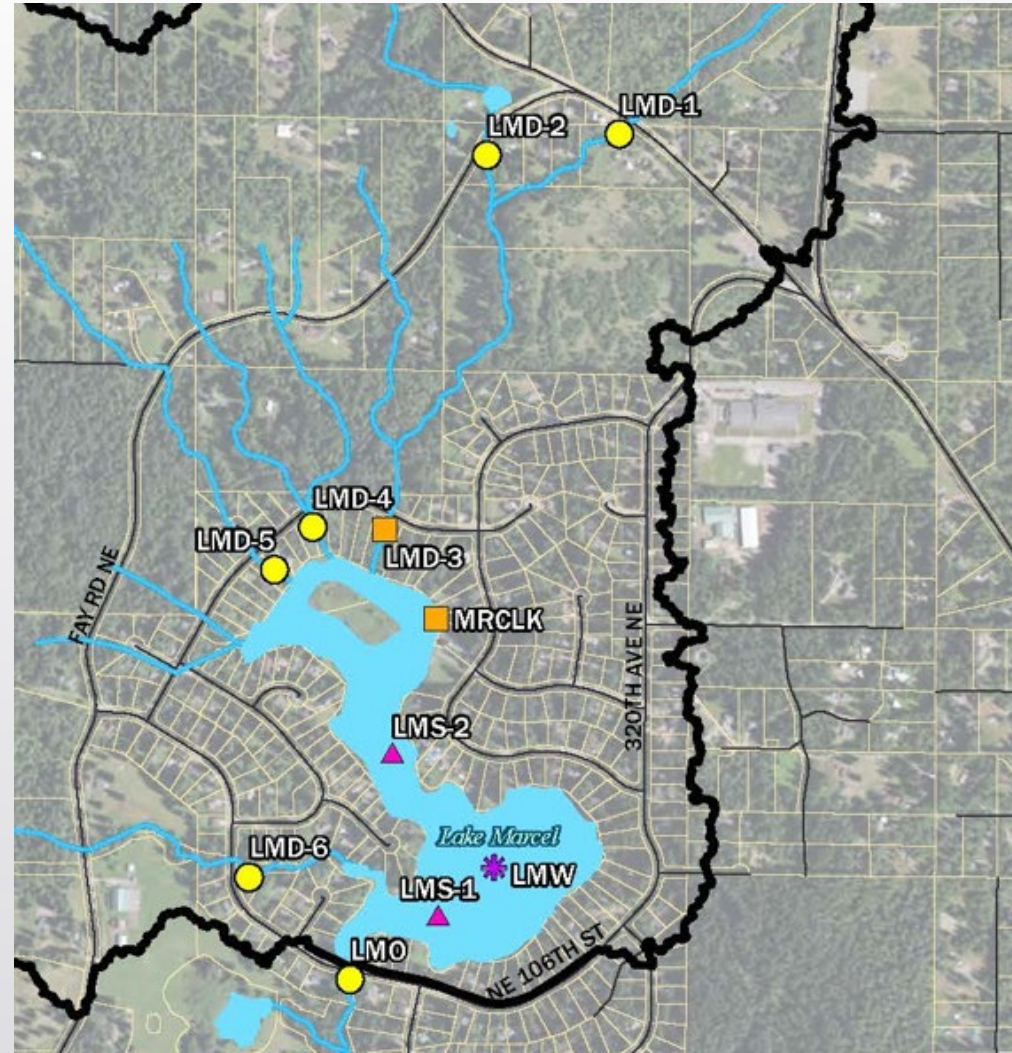
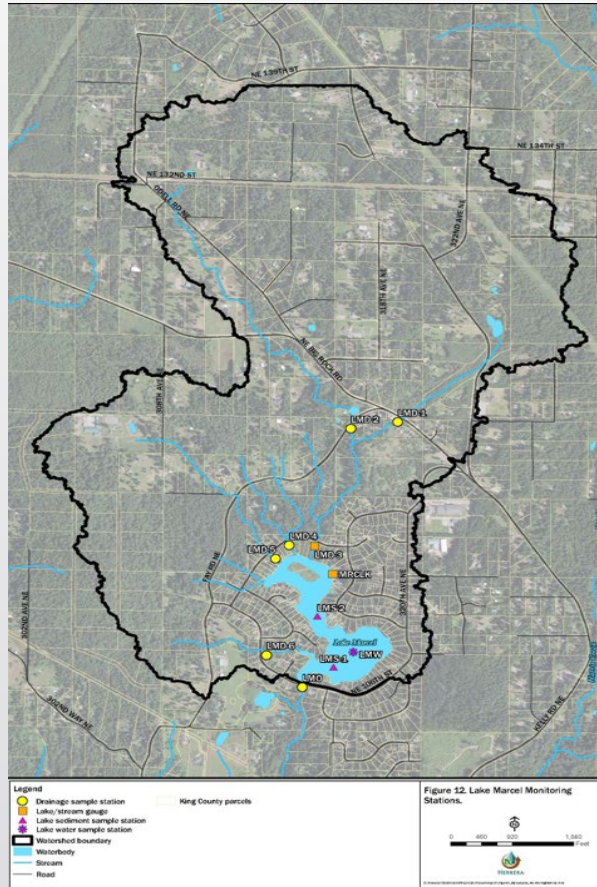
- Inlet and in-lake sampling
- Jan-Dec 2022

Table 2. Monitoring Plan for the Lake Marcel Cyanobacteria Management Plan.

Parameter	Location: Station ID	Depth	Sampling Event Frequency	Sampler
Hydrology and Drainage Water Quality				
Rain gauge	1 rain gauge: 05un	NA	Continuous in 2022	LMCC
Lake level gauge	1 lake gauge: MRCLK	NA	Continuous in 2022	KC
Flow gauge	1 stream: LMD-3	NA	Continuous in 2022	KC
Outlet discharge	1 outlet: LMO	Cross section	10 events: 4 base events (months 2,5,8,11) and 6 storm events (months 2,4,6,9,10,11) in 2022	KC
Inlet discharge	5 drainages: LMD-1, LMD-2, LMD-4, LMD-5, LMD-6	Cross section		
Total phosphorus		Mid-depth		
Orthophosphate P		Mid-depth		
Lake Water Quality				
Secchi depth ^a	Deep: LMW (A765)	NA	12 events: twice monthly May-October 2022	LMCC (+HEC and KC in May)
Temperature ^a	Deep: LMW (A765)	Profile at 0.5 m intervals		
Dissolved oxygen	Deep: LMW (A765)			
pH	Deep: LMW (A765)			
Conductivity	Deep: LMW (A765)			
Total phosphorus	Deep: LMW	S and B		
Chlorophyll a	Deep: LMW	S only	6 events: monthly Jan-April, Nov-Dec 2022	
Total phosphorus ^{a,b}	Deep: LMW (A765)	S only		
Chlorophyll-a ^{ab}	Deep: LMW (A765)	S only	4 events: May, July, Aug, Oct 2022	
Alkalinity ^b	Deep: LMW (A765)	S and B		
Orthophosphate P ^b	Deep: LMW (A765)	S and B		
Total nitrogen ^{a,b}	Deep: LMW (A765)	S and B		
Nitrate+nitrite N ^b	Deep: LMW (A765)	S and B	3 events semimonthly: May, July, Sept 2022	
Ammonia N ^b	Deep: LMW (A765)	S and B		
Chlorophyll-a ^{ab}	Deep: LMW (A765)	B only		
Phytoplankton	Deep: LMW (A765)	S and B		
Zooplankton	Deep: LMW (A765)	Vertical tow		
Lake Sediment				
Dry weight, bulk density, P fractions, total iron	Deep: LMS-1, Shallow: LMS-2	5 core intervals: 0-2, 4-6, 8-10, 16-18, and 24-26 cm	1 event in August 2022	HEC (+LMCC)
Waterfowl and Fish Surveys				
Waterfowl count	Lake	NA	Monthly reporting in 2022	LMCC
Angler Survey	Lake	NA		

KC = King County, LMCC = Lake Marcel Community Club, HEC = Herrera, S = 1 meter from Surface, B = 1 meter from Bottom

Sampling locations





Questions? Contact us!

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Thanks to all our partners!

