



2023 DIY & CAT Monitoring Programs

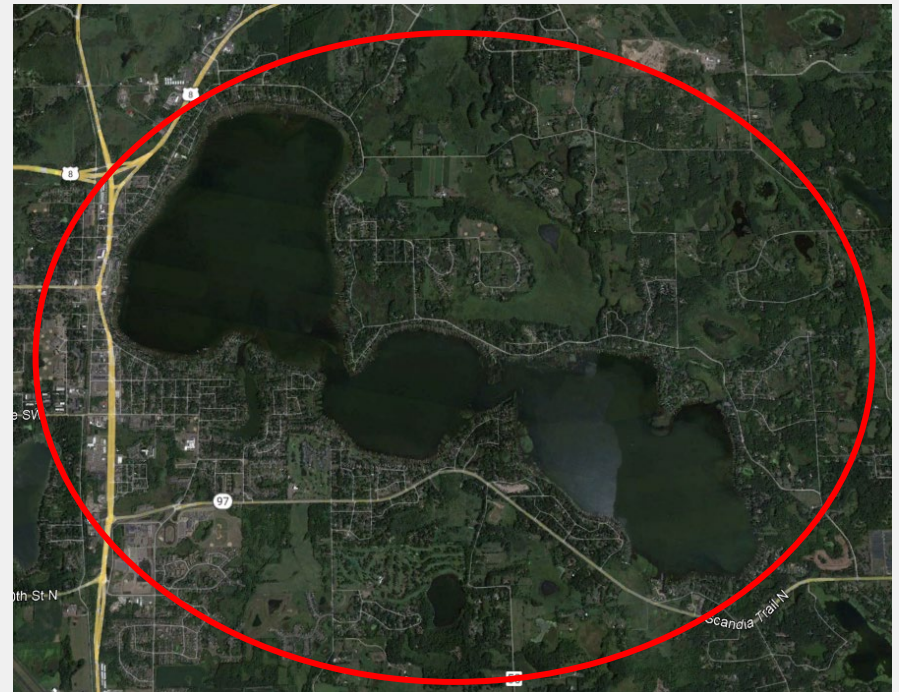
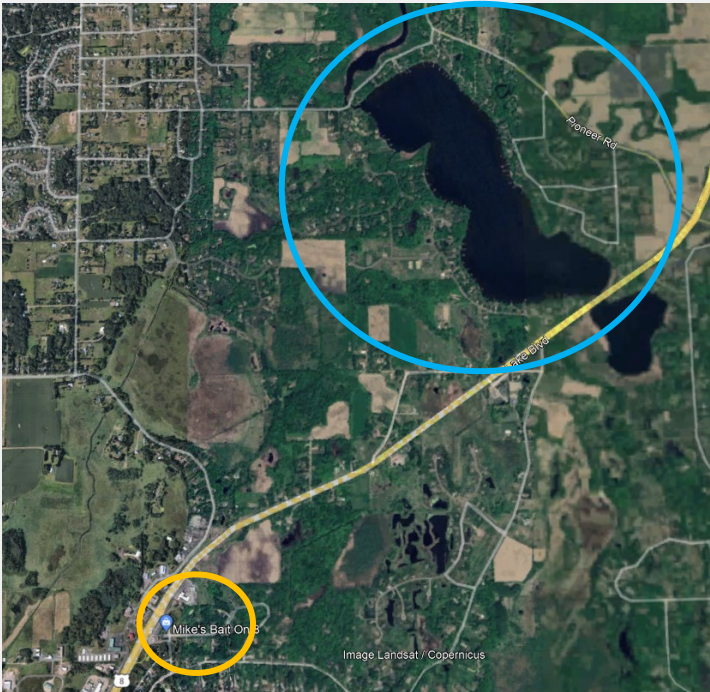
Blayne Eineichner – Project Coordinator

Victoria D'Amico – Water Resource Technician





DIY Diagnostic and CAT Programs – Monitoring Locations



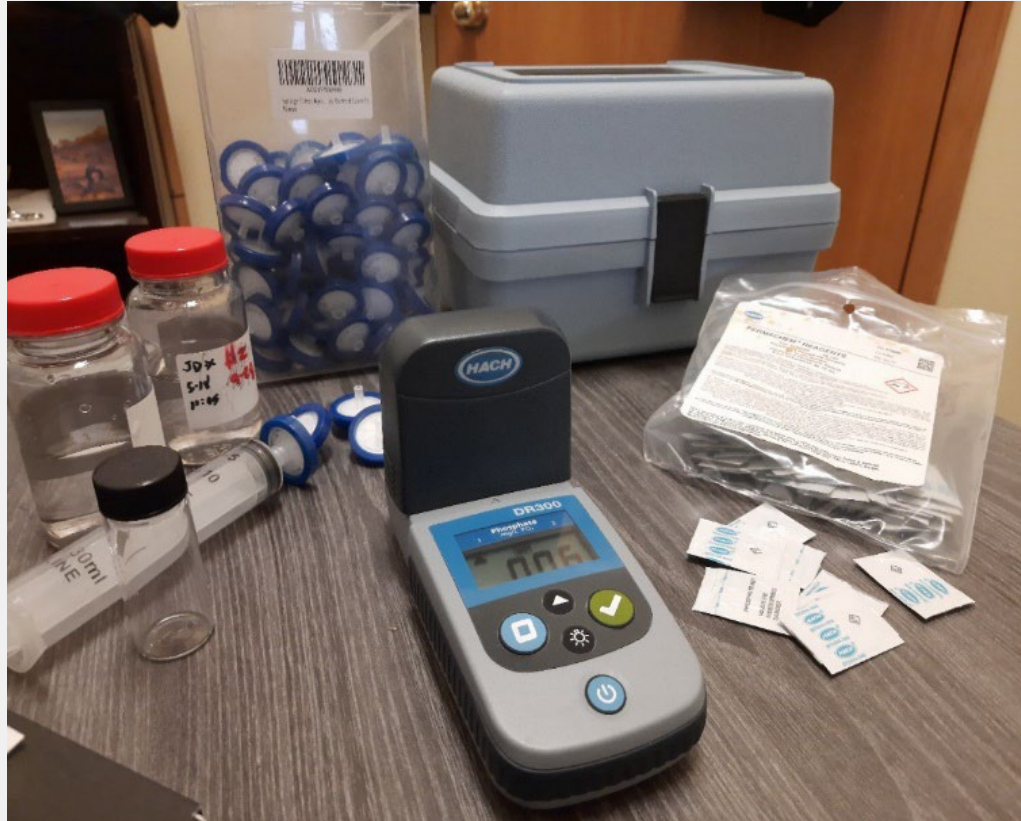
Do-It-Yourself Diagnostic Monitoring
Direct Drainages to **Comfort Lake** &
County Line Subwatershed

Comfort Lake-Forest Lake Watershed District

Citizen Assisted Tributary Monitoring
Expanded to **all basins of Forest Lake**

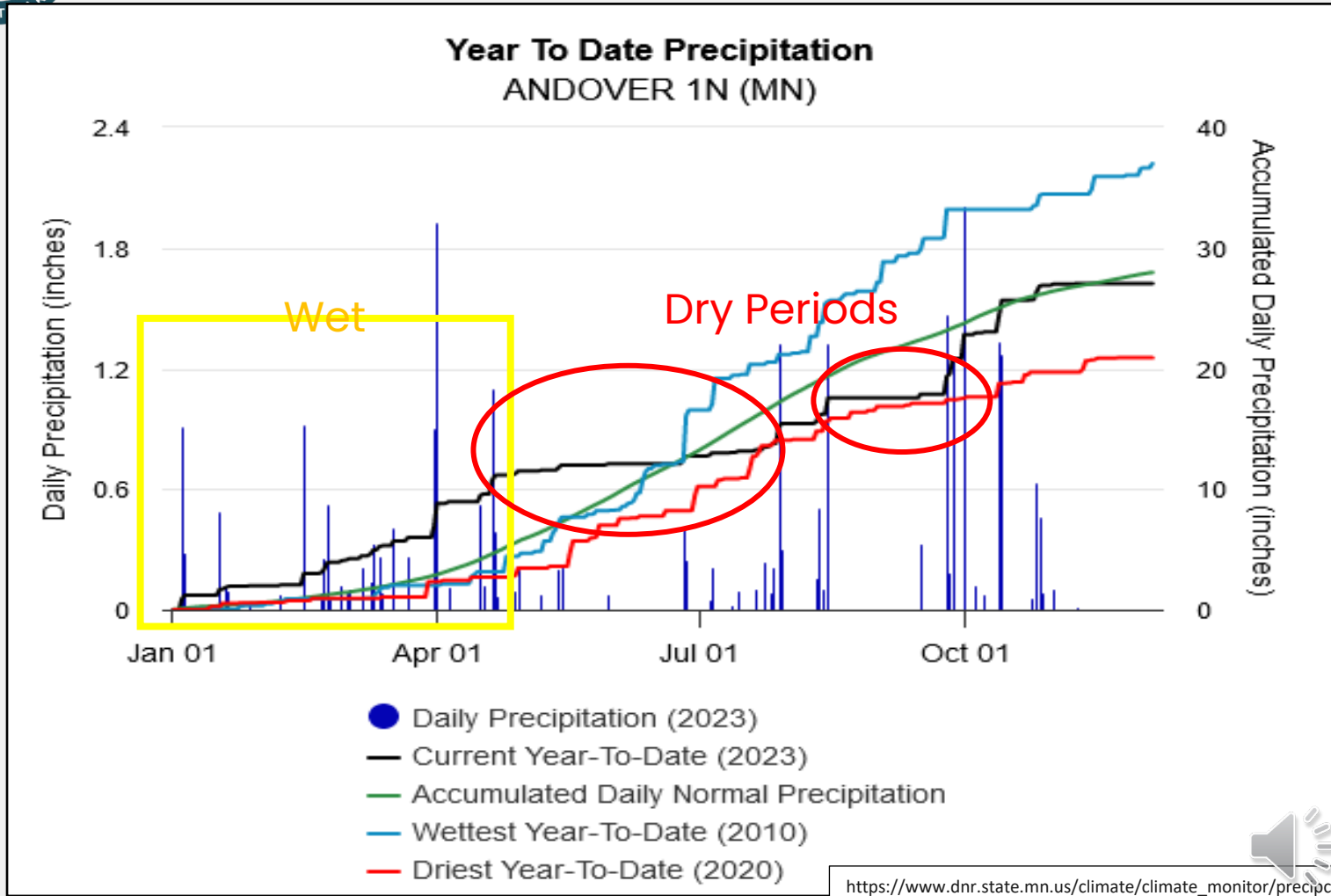


DIY Diagnostic and CAT Programs





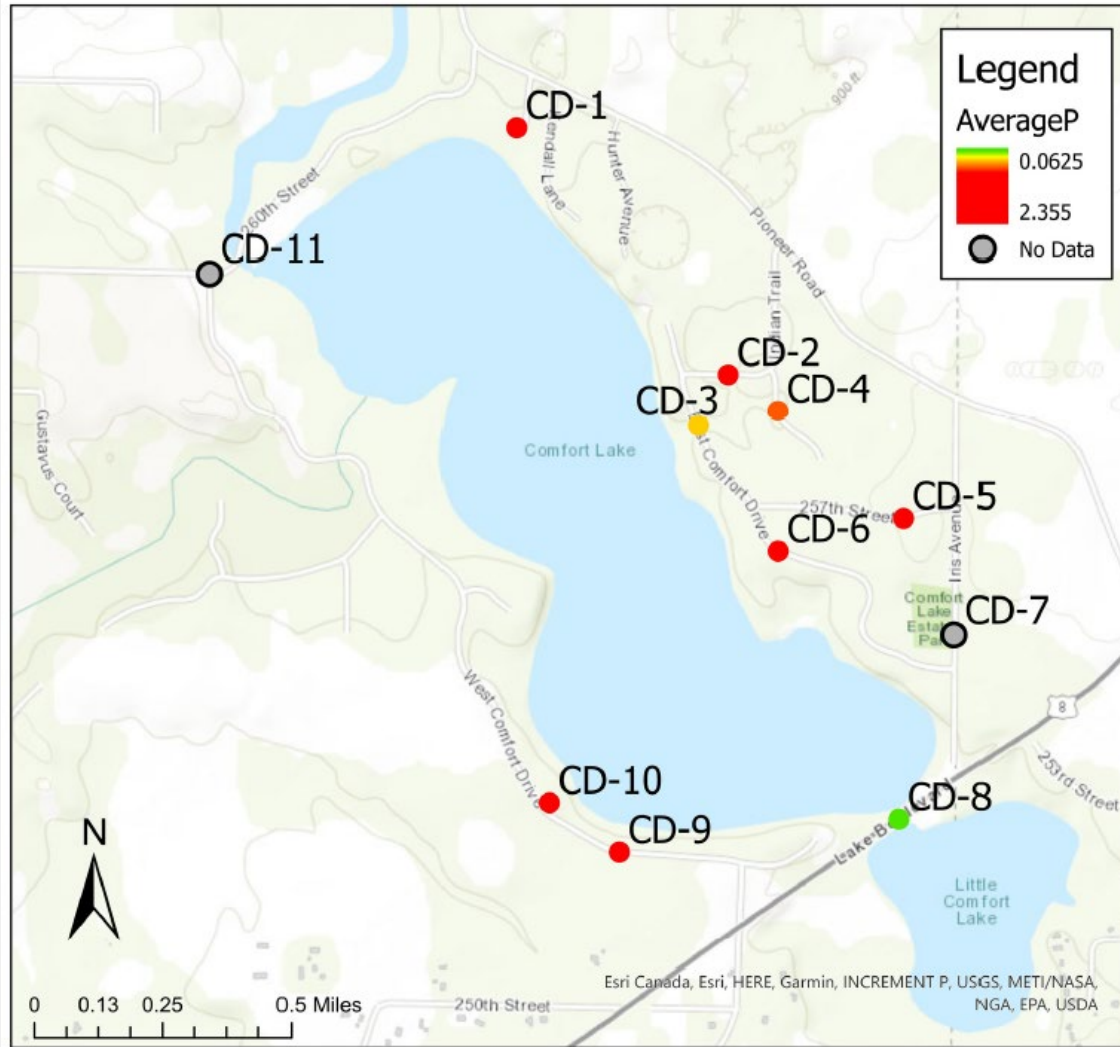
2023 Climate Conditions



2023 precipitation summary for the closest MNDNR monitoring station to the CLFLWD

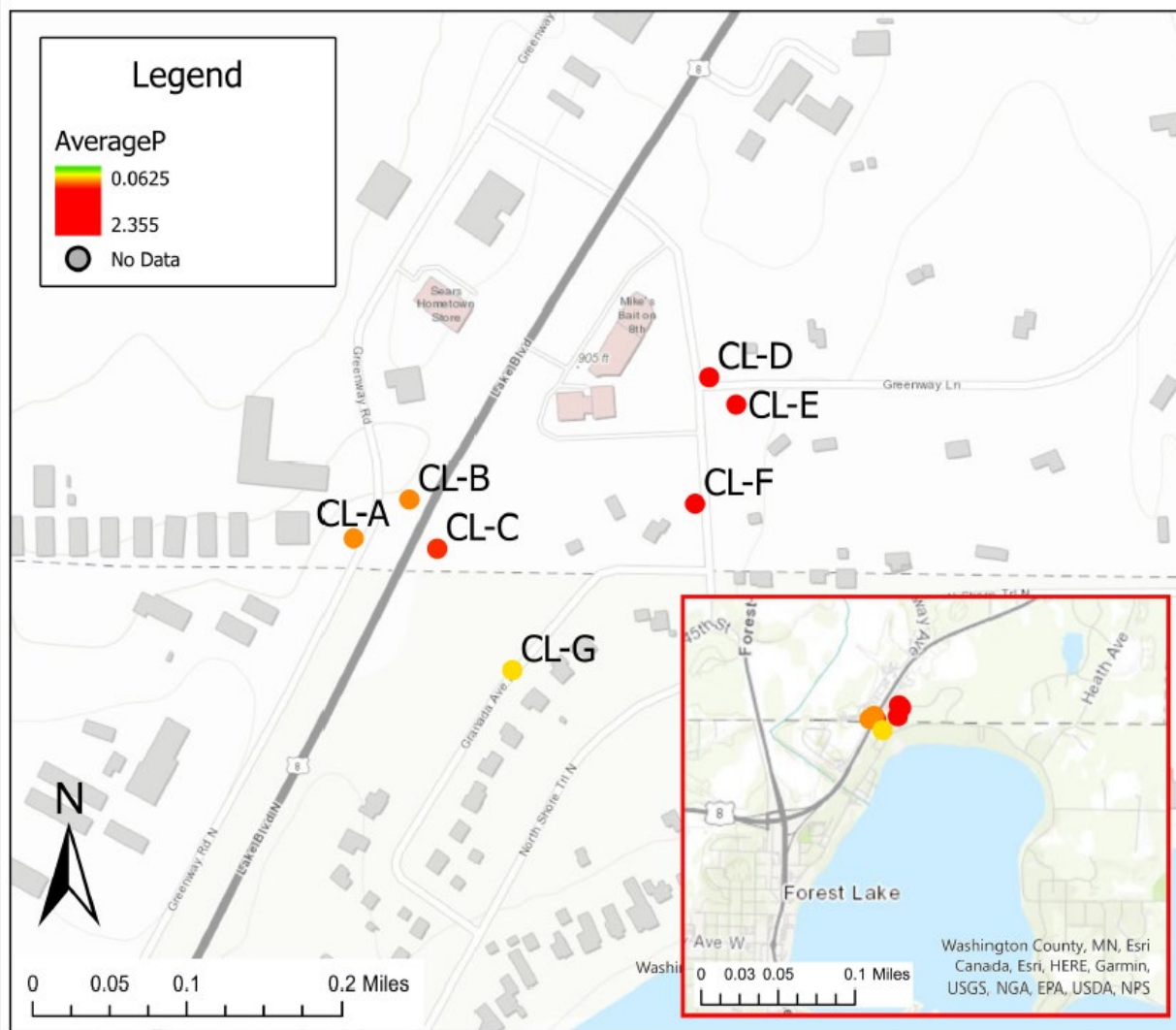


DIY Diagnostic – Comfort Lake Direct Drainages



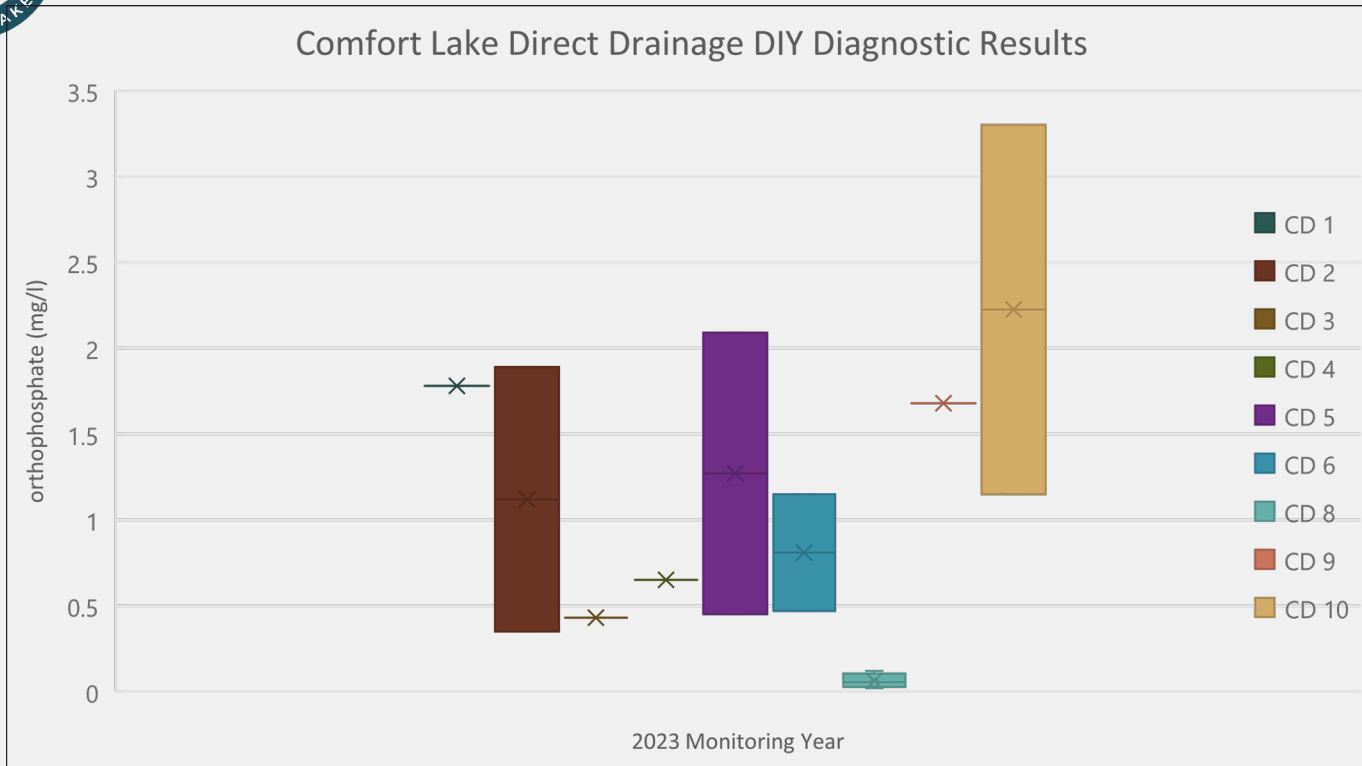


DIY Diagnostic – County Line Subwatershed





DIY Diagnostic – Comfort Lake Direct Drainages



Runoff/wetland

Ditch/runoff

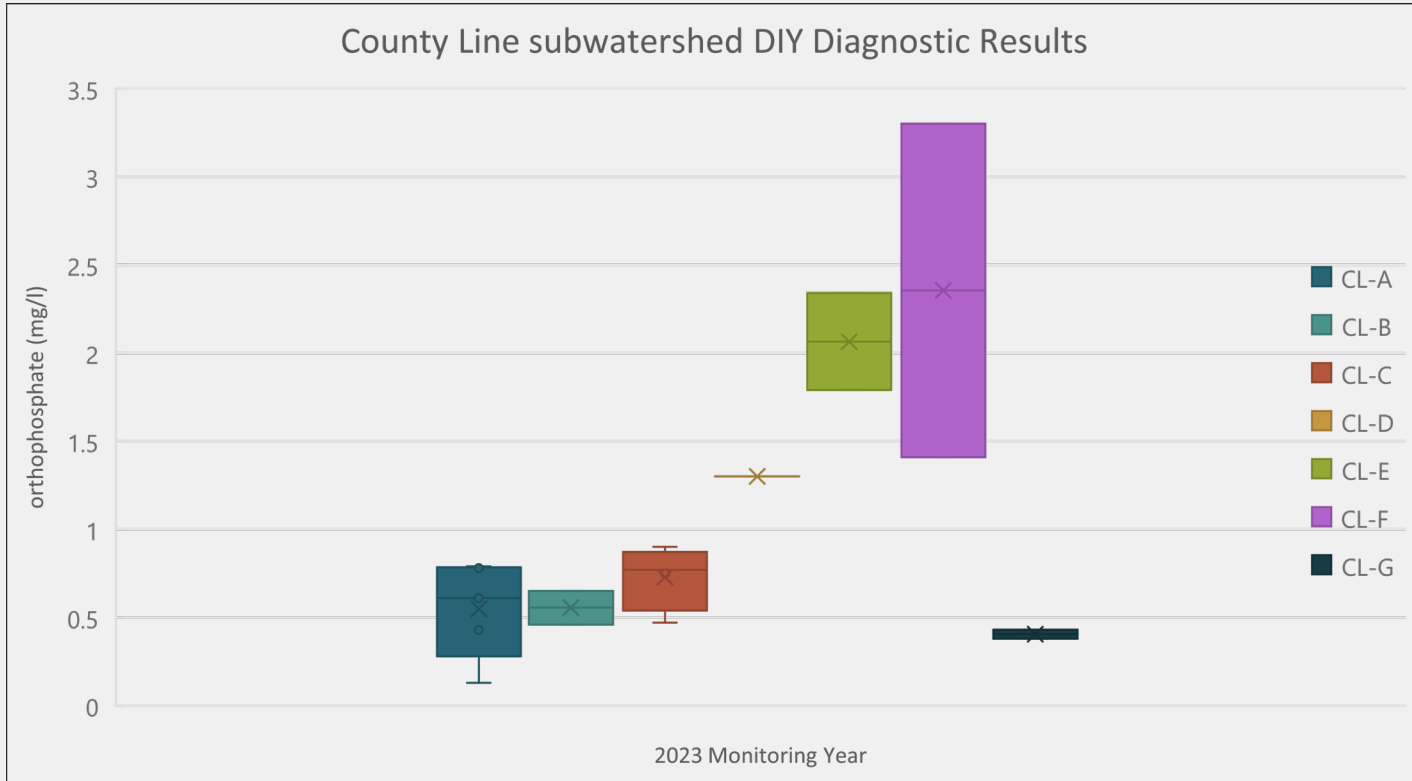
manholes

Date	CD 1	CD 2	CD 3	CD 4	CD 5	CD 6	CD 7	CD 8	CD 9	CD 10	CD 11
4/12	1.78	0.35	0.43	0.65	0.45	1.15	.	0.12	1.68	1.15	.
5/19	0.05	.	.	.
8/14
9/26	.	1.89	.	.	.	.	.	0.02	.	.	.
10/1	2.09	0.47	.	0.06	.	3.3	.





DIY Diagnostic – County Line Subwatershed



Greenway Ave Ditches

Date	CL-A	CL-B	CL-C	CL-D	CL-E	CL-F	CL-G
4/12	0.79	.	0.9	1.3	1.79	.	.
5/19	0.13	.	.	.	.	1.41	.
8/14	0.61	0.46	0.79	.	.	.	.
9/26	0.43	.	0.47	.	.	.	0.38
10/1	0.78	0.65	0.75	.	2.34	3.3	0.43





DIY Diagnostic – County Line Highway Wetland



The yellow Polygon indicates the study area and the stars indicate where the wetland soil cores were collected. The darker red the star appears, the higher the phosphorus concentration. The red arrows indicate inlet flow paths and the blue arrow indicates outflow.





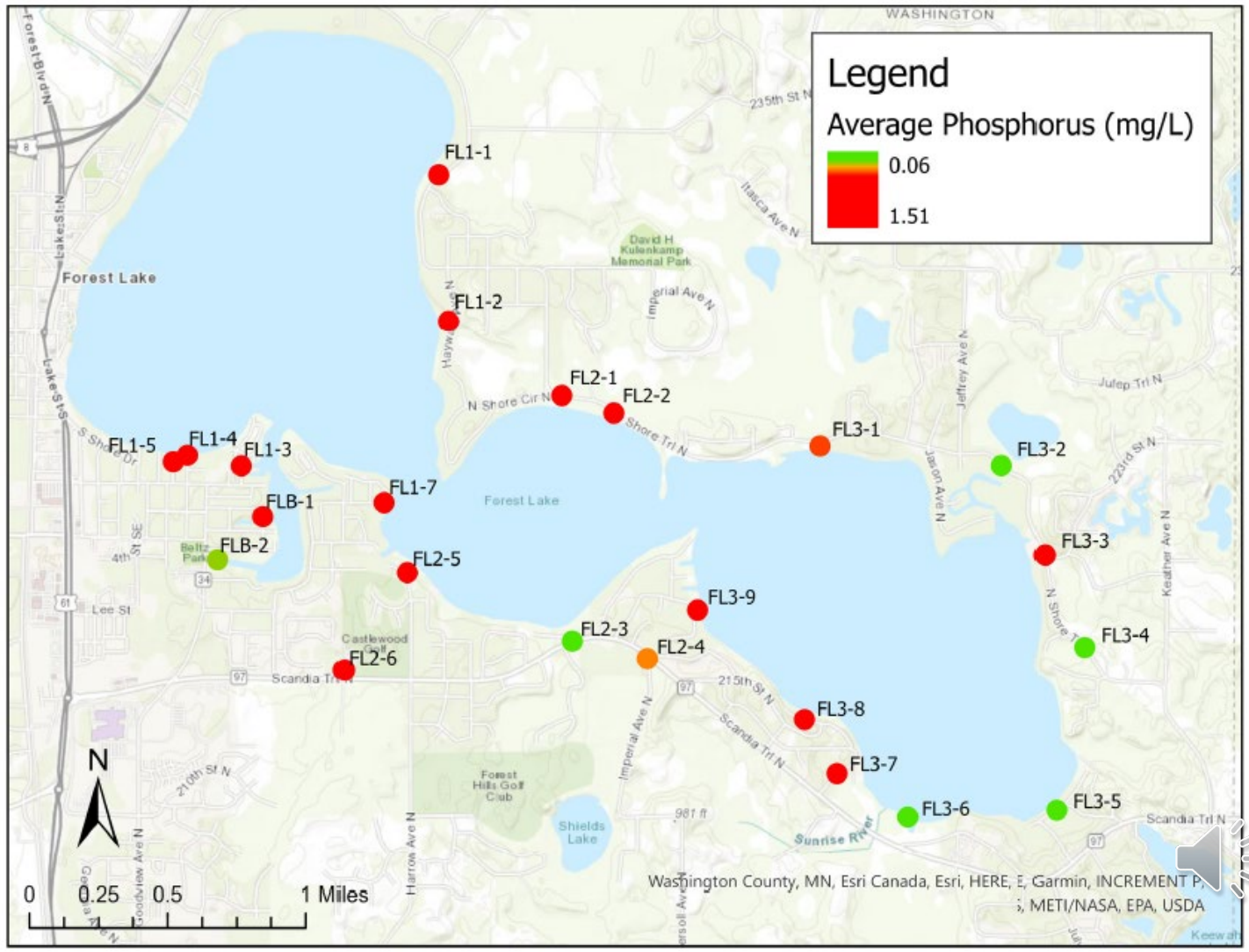
DIY Diagnostic – County Line Highway Wetland

Lab Sample Number	Sample ID (location and depth of soil)	Bray P (mg/kg soil)
1	CLW-B 0-24	14 / 13
2	CLW-B 24-28	15
3	CLW-B 28-48	7
4	CLW-A 0-24	17
5	CLW-A 24-44	12
6	CLW-C 0-26	22
7	CLW-C 26-30	1
8	CLW-C 30-40	1
9	CLW-D 0-24	9
10	CLW-D 24-30	7
11	CLW-D 30-48	6
12	CLW-E 0-48	8
13	CLW-F 0-24	10
14	CLW-F 24-42	6
15	CLW-G 0-18	12
16	CLW-G 18-22	13
17	CLW-G 22-36	1



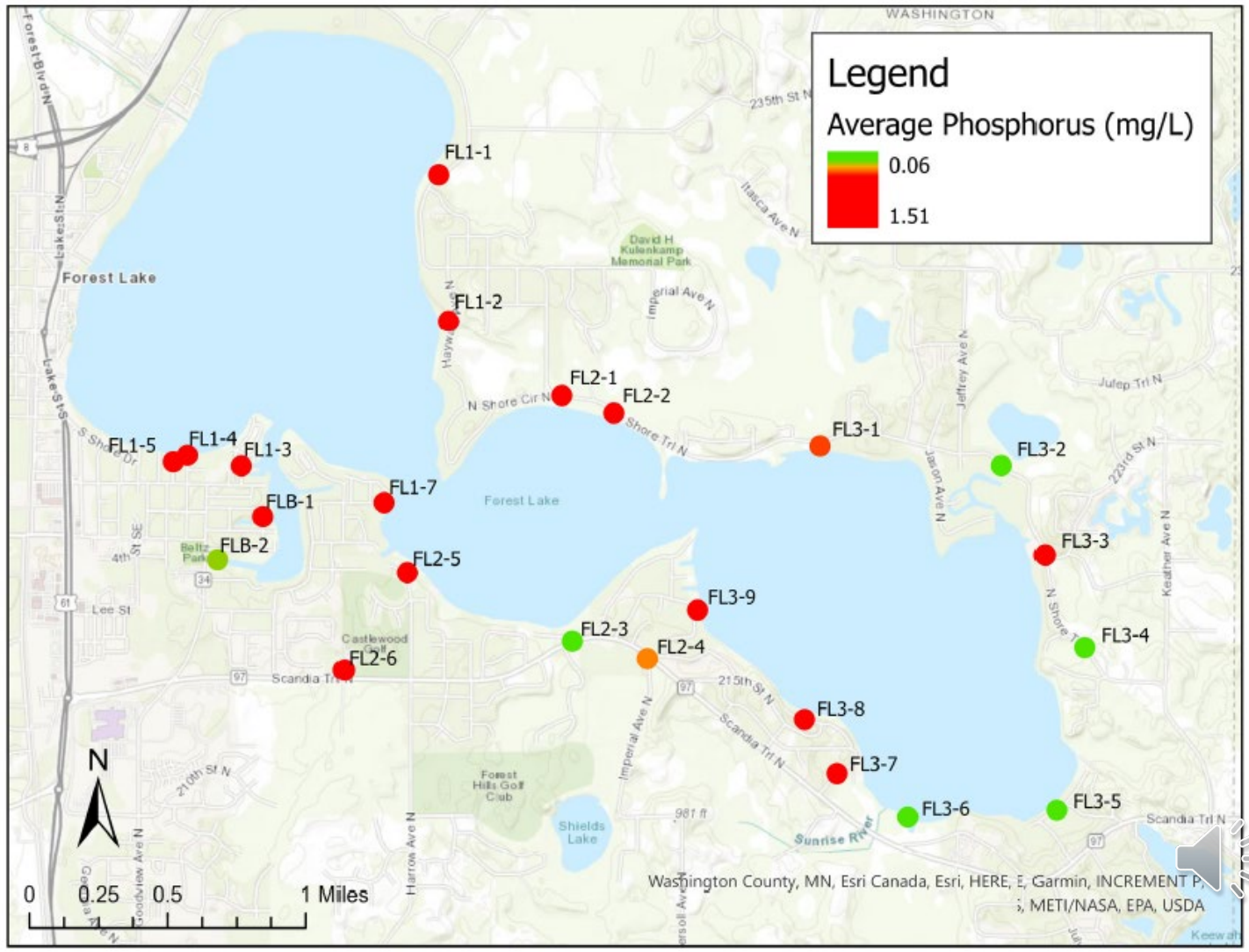


CAT Program – Forest Lake





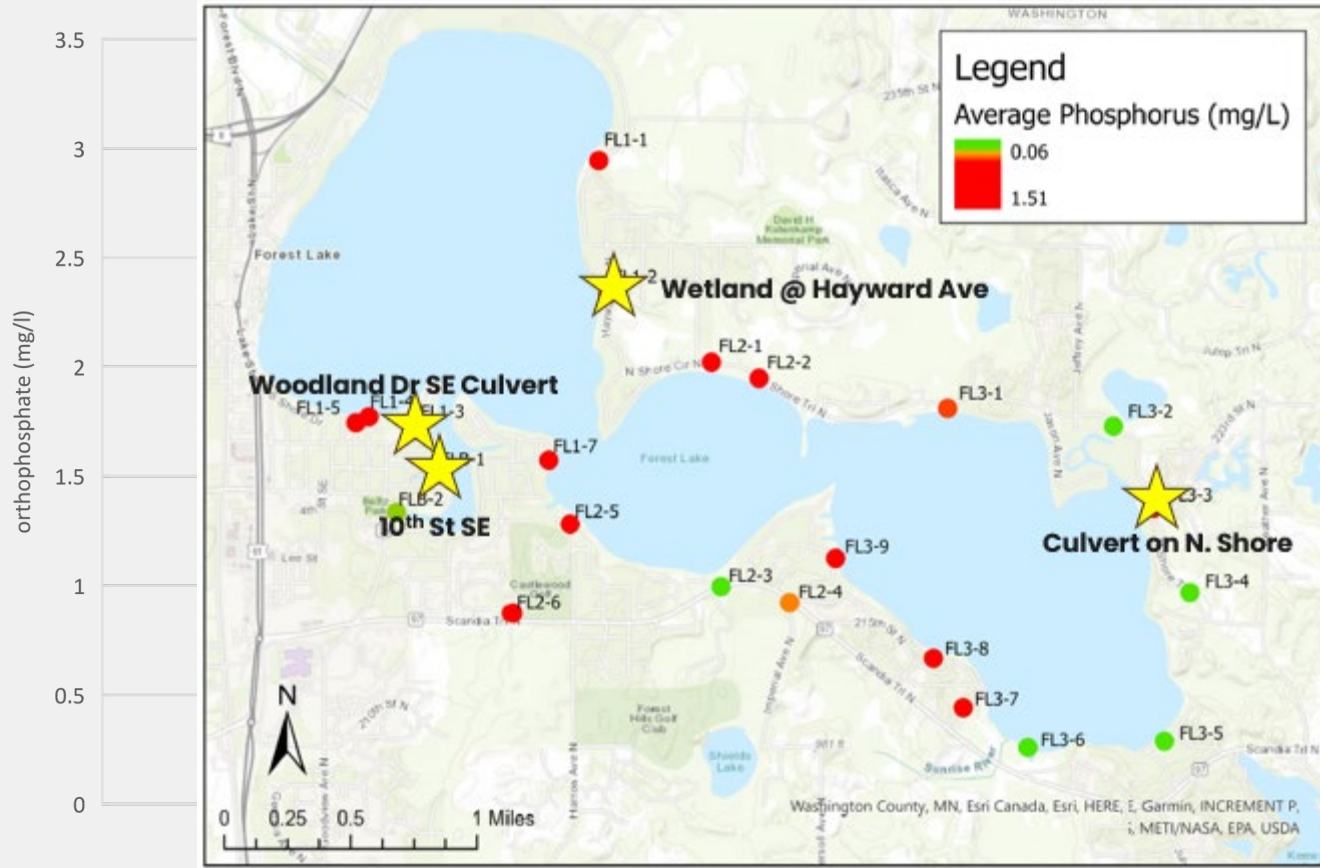
CAT Program – Forest Lake





CAT Program – Forest Lake

2023 Forest Lake CAT Diagnostic Results



- FL1-1
- FL1-2
- FL1-3
- FL1-4
- FL1-5
- FL1-7
- FL2-1
- FL2-2
- FL2-3
- FL2-4
- FL2-5
- FL2-6
- FL3-1
- FL3-2
- FL3-3
- FL3-4
- FL3-5
- FL3-6
- FL3-7
- FL3-8
- FL3-9
- FLB-1
- FLB-2





CAT Program – Forest Lake

Date	FL1-1	FL1-2	FL1-3	FL1-4	FL1-5	FL1-7	FL2-1	FL2-2	FL2-3	FL2-4	FL2-5	FL2-6	FL3-1	FL3-2	FL3-3	FL3-4	FL3-5	FL3-6	FL3-7	FL3-8	FL3-9	FLB-1	FLB-2
4/11/2023	0.44	0.78	1.75	0.5	0.53	0.99	0.71	0.67	0.16	0.49	0.63	0.51	0.08	0.1	0.73	0.24	0.11	0.26	0.82	1.06	0.58		
4/19/2023	0.41	1.15					0.6	0.5					0.19	0.03		0.16							
5/6/2023							1.05	0.34	0.21	0.18													
5/7/2023					0.21										1.7	0.18		0.06					
5/13/2023		1.27																					
6/25/2023	1.34																	0					
7/19/2023				0.95	0.33																		0.22
7/26/2023					0														0.05				
7/27/2023																							
8/11/2023																							0.27
9/12/2023				1.33	1.58																		3.3
9/24/2023				0.18	0.22													0.24					0.26
9/29/2023			0.89	0.38	0.34								0.9	0.09									1.86
10/13/2023			1.24	0.26	0.44								0.78	0.05									0.61
10/25/2023													0.45	0.05									



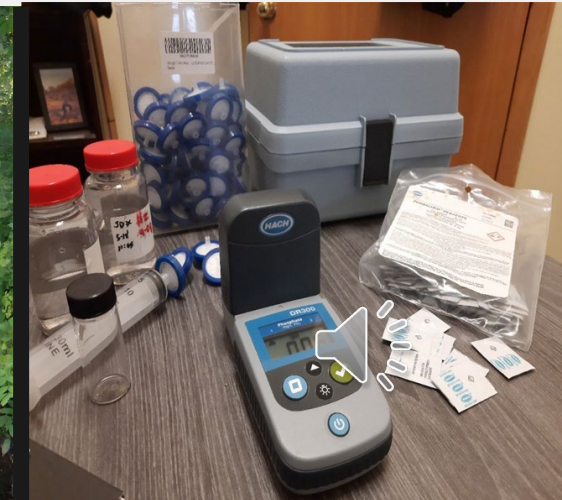


Duplicate Water Quality Sample Comparison

The Comparison study will be picked back up in 2024 using samples from our lake hypolimnion monitoring effort.

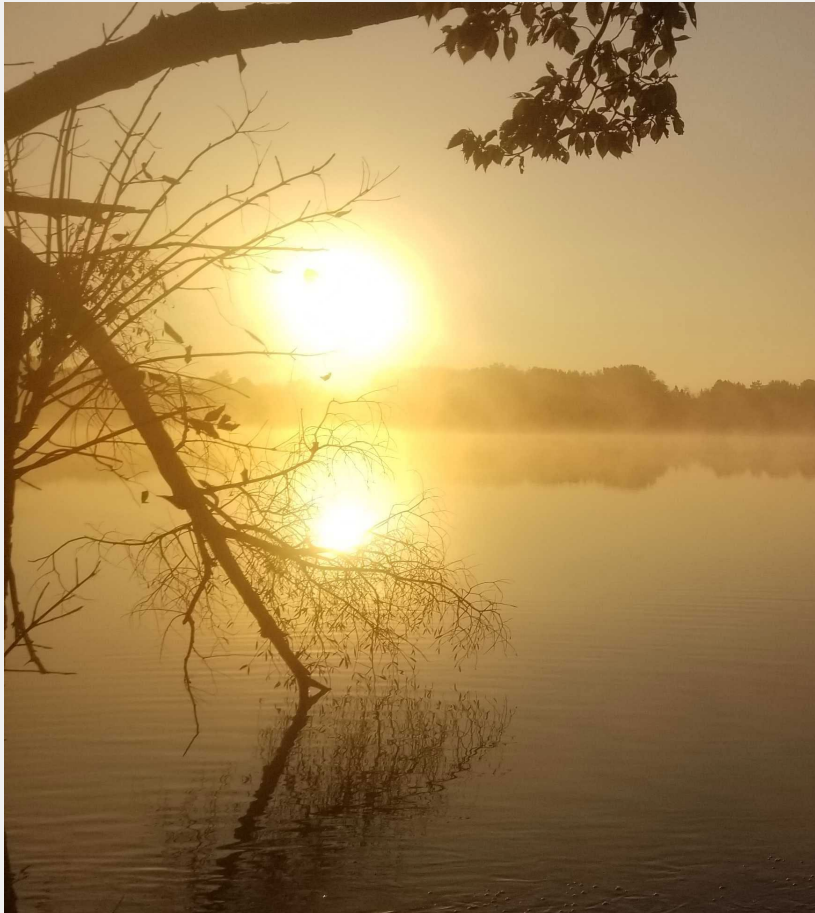
Samples will be analyzed by both Instrumental Labs, as well as with our DIY pocket colorimeter technology.

Several improvements in the DIY analysis protocol initiated in 2023 that should further improve the accuracy of findings in the DIY and CAT programs





DIY Diagnostic and CAT Programs - Conclusion



- 2023 was another challenging monitoring years due to drought
- Few conclusions can be drawn from the sparse dataset

Recommendations

- Repeat the DIY and CAT efforts in 2024
 - Comfort Lake Direct Drainages DIY
 - County Line Subwatershed DIY
 - Forest Lake CAT
- Revive the Duplicate Sample Comparison Study



Acknowledgments

The Comfort Lake-Forest Lake Watershed District would like to thank the volunteers who participated in the 2023 Citizen Assisted Tributary Monitoring program.

Volunteers included:

Doug Joens, Jeyanthi Kernik, Sue Koenitzer, Tom Koenitzer, Tony Kuehn, Keith Kuhnly, Cindy Lehman, Brad Oosterhuis, Randy Schumacher, Kristyn Stephens, Michelle Trudeau-Spanjers, and John Spanjers.

Thank You!

