



Lake Shirley Lake Management Annual Report 2023-2024

Lake Shirley – Lunenburg/Shirley, Massachusetts

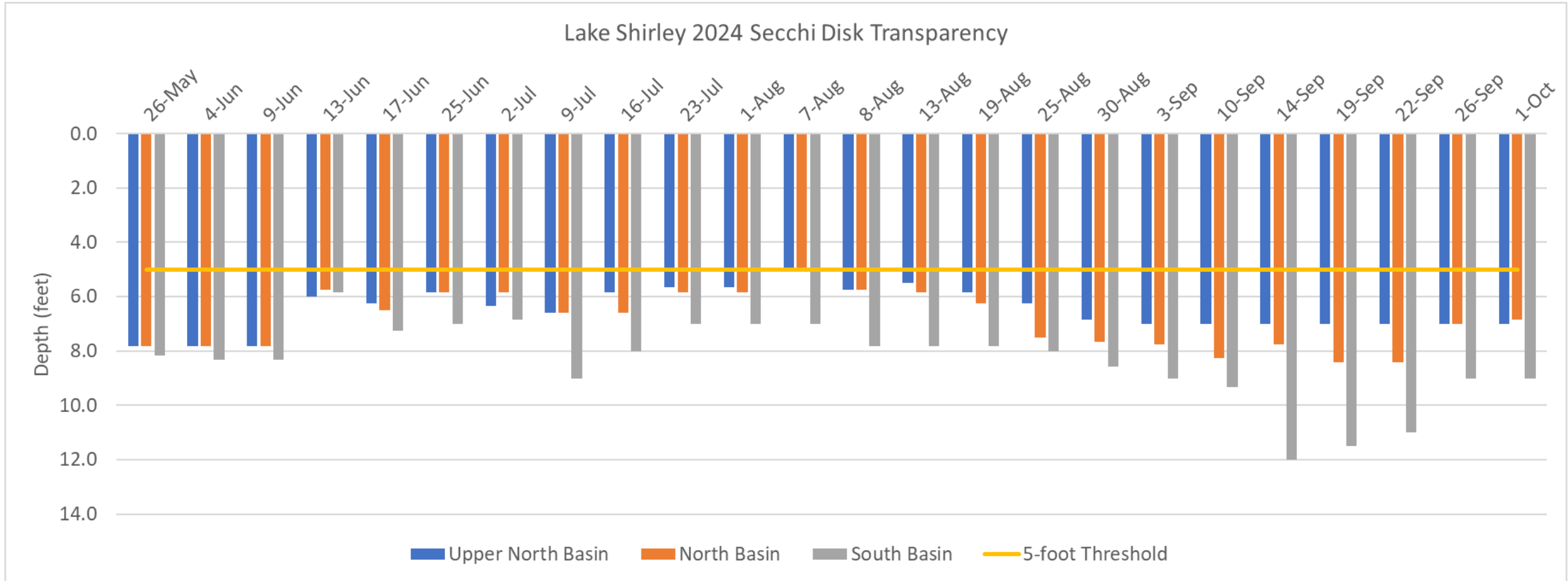


Drawdown – Not a desirable year

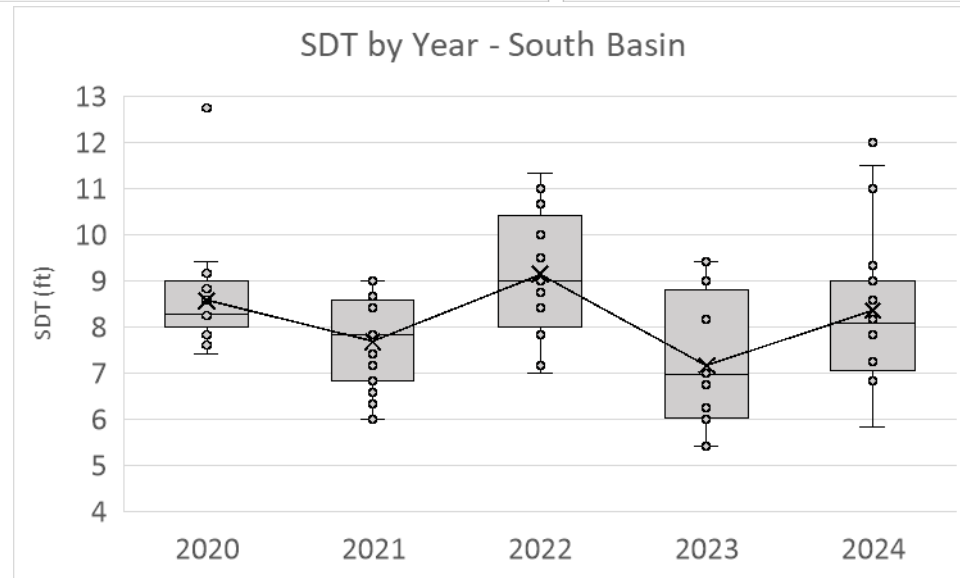
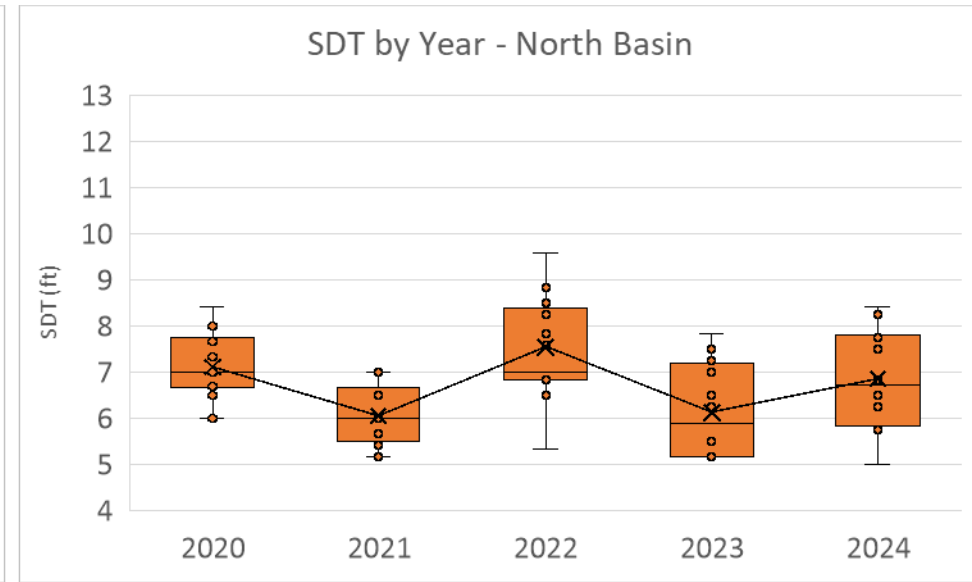
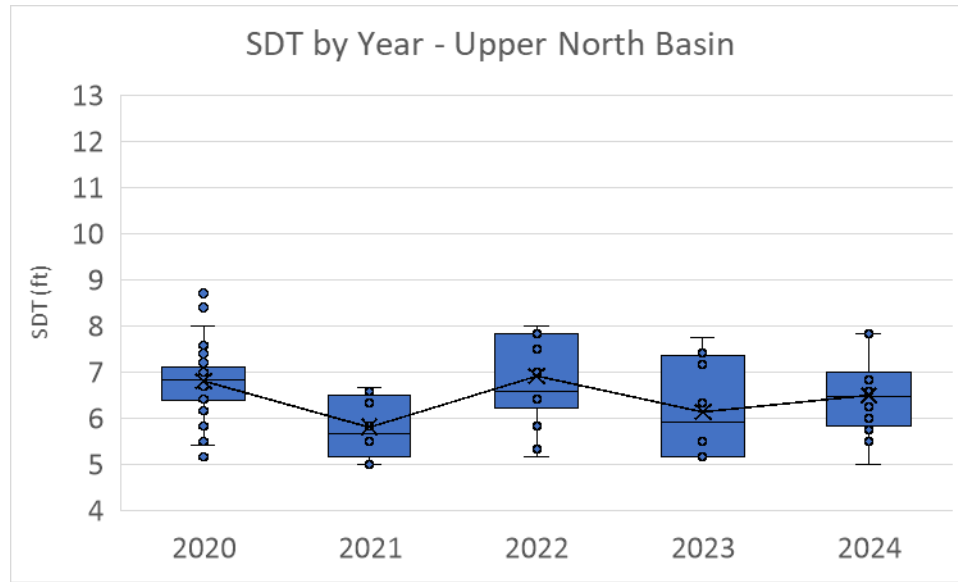
- Target drawdown of 6 feet was not achieved during winter 2023-24.
 - Achieved max 5.0-foot drawdown in early Jan – significant rainfall – over 14 inches between Oct & Jan
- No complaints regarding wells.
- Temp were above freezing for most of this period.
- No fish kills were reported during the drawdown period
- Water flowing over spillway due to rain by Jan 13; only receded 15 inches before refill was complete by March 7

Monitoring - SDT

Remained above 5'; threshold to collect algal samples
South Basin continues to have the highest clarity



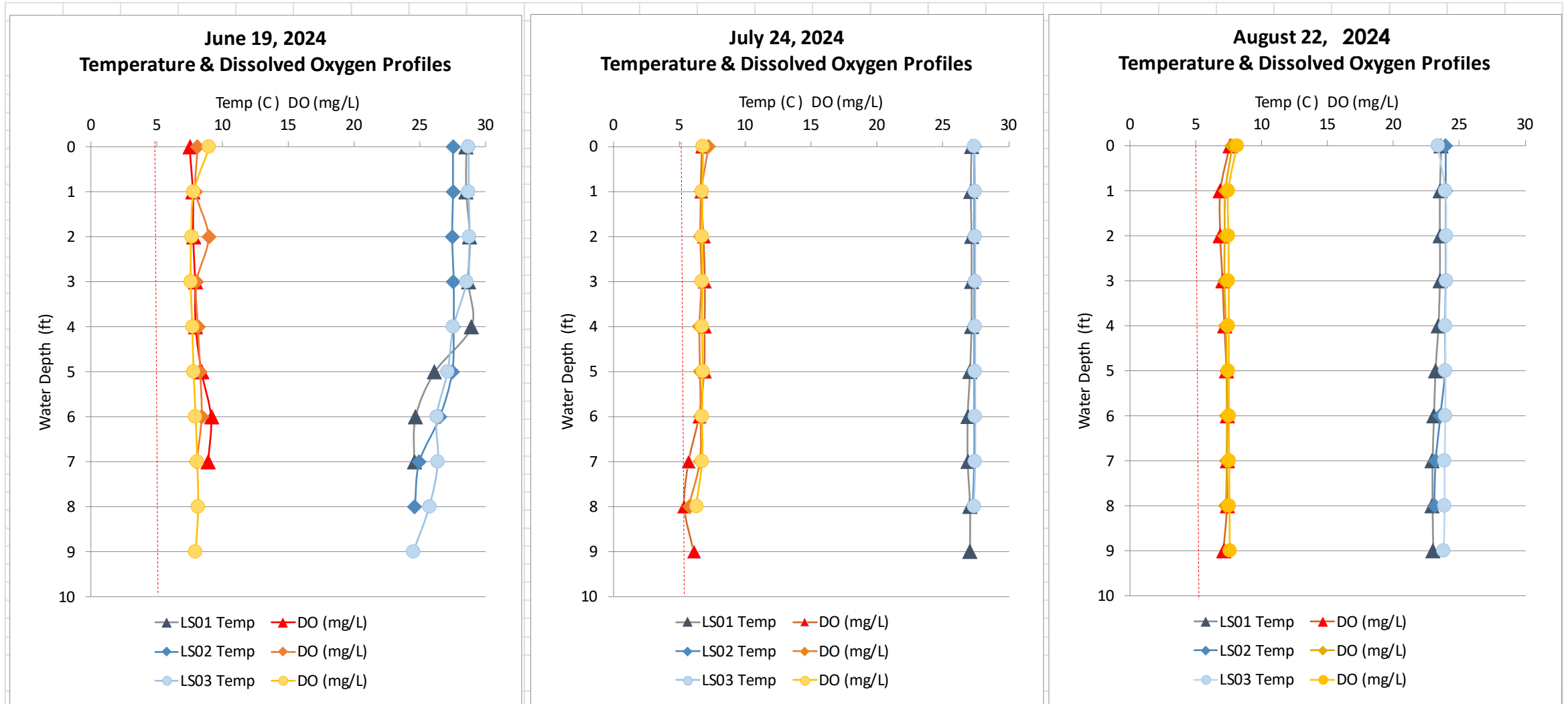
Monitoring – SDT last five years



Line represents average value over time

Monitoring – Temperature & Dissolved Oxygen

- All DO concentrations were above the 5.0 mg/L threshold



Nutrients

Nitrogen

Lab quality control data suggest there were poor recoveries – results are not likely representative of conditions

Phosphorus

- Overall low - One values exceeded 0.020 mg/L threshold which is enough to support algal blooms in July at the surface
- North Basin is typically higher than other basins

	SURFACE TP mg/L			BOTTOM TP mg/L		
	LS-1	LS-2	LS-3	LS-1	LS-2	LS-3
6/19/2024	0.012	<0.010	<0.010	0.016	<0.010	<0.010
7/24/2024	0.022	0.011	<0.010	0.017	0.013	0.013
8/22/2024	0.015	0.015	0.015	0.025	0.016	0.014
	SURFACE TN mg/L			BOTTOM TN mg/L		
	LS-1	LS-2	LS-3	LS-1	LS-2	LS-3
6/19/2024	0.72	0.74	0.50	0.63	0.55	0.75
7/24/2024	0.36	2.18	1.62	2.23	2.67	0.15
8/22/2024	0.65	0.58	0.62	0.61	0.54	0.46
Exceed TP desirable threshold concentration						
Laboratory QC exceeded acceptance thresholds						
Discussed with lab. They will research but do not have samples to re-test						

End Season Plant Survey

- Net decrease in species richness in 2023 and similar results in 2024
- Conservation species observations were low. Only one location for Robbin's pondweed and coontail was not encounter during the survey
- Community dominated by fanwort – presence of increased in 2024

**80% of the 66 observation locations contained fanwort
20% increase from 2023 and 66% increase since 2022**

	Common Name	Aug-13	Oct-15	Oct-16	Oct-17	Sep-18	Sep-19	Sep-20	Sep-21	Aug-22	Sep-23	Sep-24
Target Non-native Invasives	Eurasian milfoil											
	Variable milfoil	1	1									1
	European Naiad	36	13	40		39	60	35	29	23	37	21
	Fanwort	25	19	18	7	19	50	33	37	32	44	53
	Curlyleaf pondweed	1		2						1		
Target Native	Wild celery	38	38	52	32	30	50	42	40	41	38	37

Treatment - Herbicide

Pre-treatment data showed higher density and lower biovolume than 2023

Treated areas >50% density or areas suspected of reaching that density later in the seasons.



Areas excluded:

- Limited use for contact recreation
- Promote growth of desirable species (*P. Robbinsii* & *C. demersum*)

Treatment Date	July 17 th
Product	Tribune (diquat) & Nautique (copper)
Treatment Area	58.7 acres
Quantity	75 gallons – Tribune 26.75 gallons - Nautique 7.75 gallons - Flumigard SC
GPS Tracks	See Figure 1
Applicator name	Rocco Notaro, MA Certification #AL-0053966
Site Conditions	Weather: Fair/Mostly Cloudy, winds 7-10 MPH SW, High 80's°F Water Temp: 25.8°C at surface, 23.8°C near bottom Dissolved Oxygen: 8.1 mg/l at surface; 3.75 mg/l near bottom (9-feet) Water clarity: 5'9"

2024-2025 Plan

- Implement drawdown – target 6 feet
- Continue WQ monitoring program
- Whole-lake fluridone treatment

	Schedule	Notes/Criteria
Initial Fluidone Application	mid/late April	Application of liquid & pellet formulations of Sonar (fluridone) herbicide to all littoral areas
Interim inspection/sampling	early May	Inspect plant condition & collect sample for herbicide testing
Follow-Up Application	early/mid May	Application of liquid & pellet formulations of Sonar (fluridone) herbicide to all littoral areas
Interim inspection/sampling	late May	Inspect plant condition & collect sample for herbicide testing
Follow-Up Application	early/mid June	Application of liquid & pellet formulations of Sonar (fluridone) herbicide to all littoral areas
Interim inspection/sampling	late June	Inspect plant condition & collect sample for herbicide testing
Late Season Survey (conducted by ARC)	Late September/early October	Full data point survey



Questions...???