Brighton Tailwater
Water Quality Monitoring Results 2025

(Patuxent River Catch and Release Area)

Potomac-Patuxent Trout Unlimited (PPTU)

11/6/2025

Presenter: Bob Bokulic

Background

- **PPTU is monitoring the Patuxent River tailwater (below Brighton Dam) to assess water quality for trout**
  - **Class IV water, catch & release, artificial flies only**
- **Goal is to have a fishery capable of supporting stocked trout year-round**
  - **Tailwater is stocked regularly by DNR in fall and/or early spring**
- **Dam is operated by WSSC for regional water supply**
  - **Hydroelectric function no longer used**
- **MDE limits are: Dissolved Oxygen (DO) $\geq$5 mg/L and water temp $\leq$ 75^{o} F**
- **Discharge is the only parameter monitored by USGS (must be $\geq$ 7.5 cfs)**

Monitoring Equipment

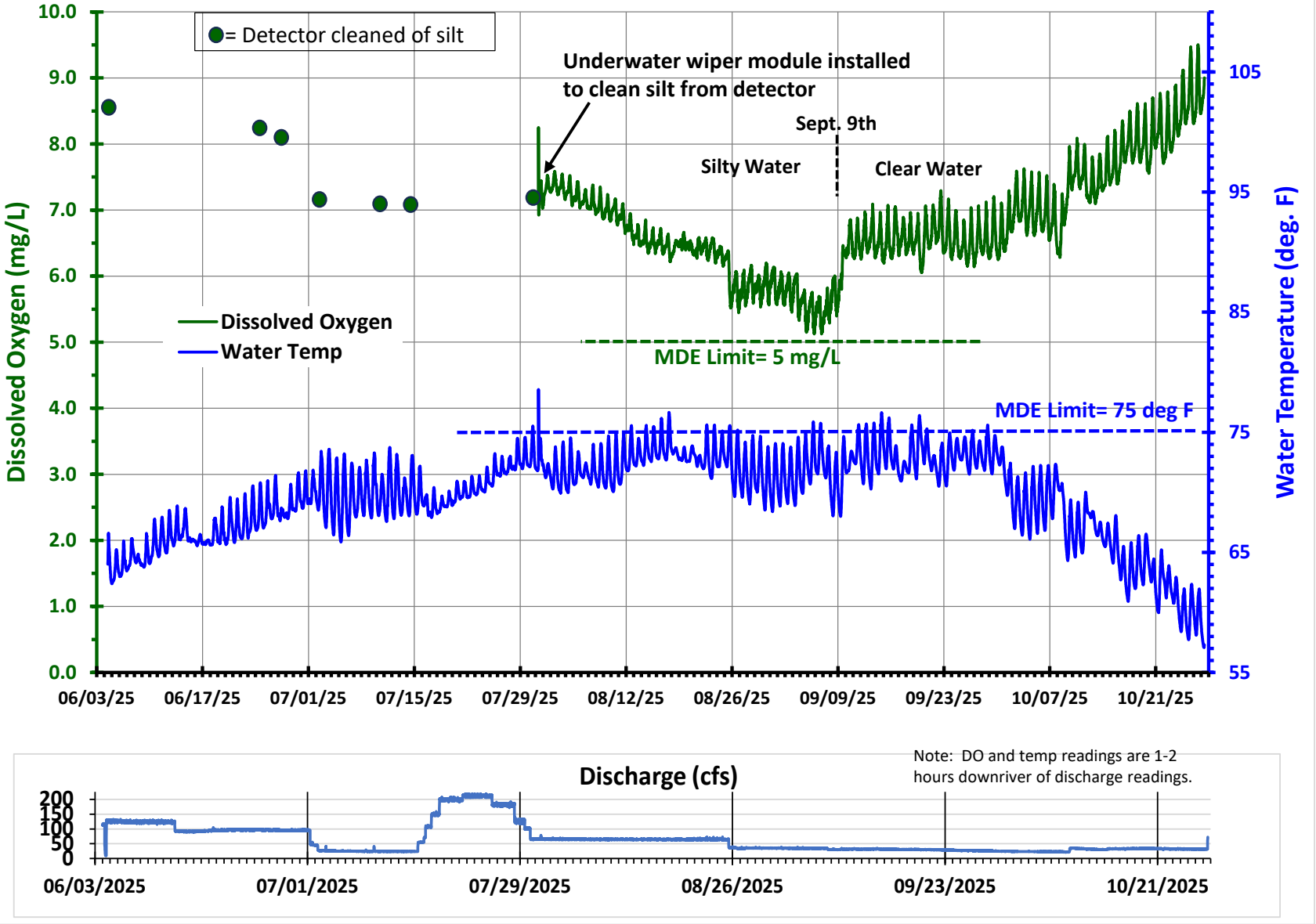
- **Sensor was immersed downstream of Haviland Mill Bridge**
- **Data was downloaded weekly via Bluetooth connection from logger on river bank**
- **Acknowledgements:**
  - **PPTU water monitoring group included Jay Sheppard, Bob Bokulic, Ron Briggs, Jim Irons, Ron Kerrick, and Alan Williams**
  - **DNR Adam and Neal Eschleman assisted with sensor deployment and measurement verification**
  - **USGS Todd Lester suggested the PME wiper module to address silt buildup on the sensor**

Onset/HOBO DO Sensor and Logger
(sampling interval= 20 sec)

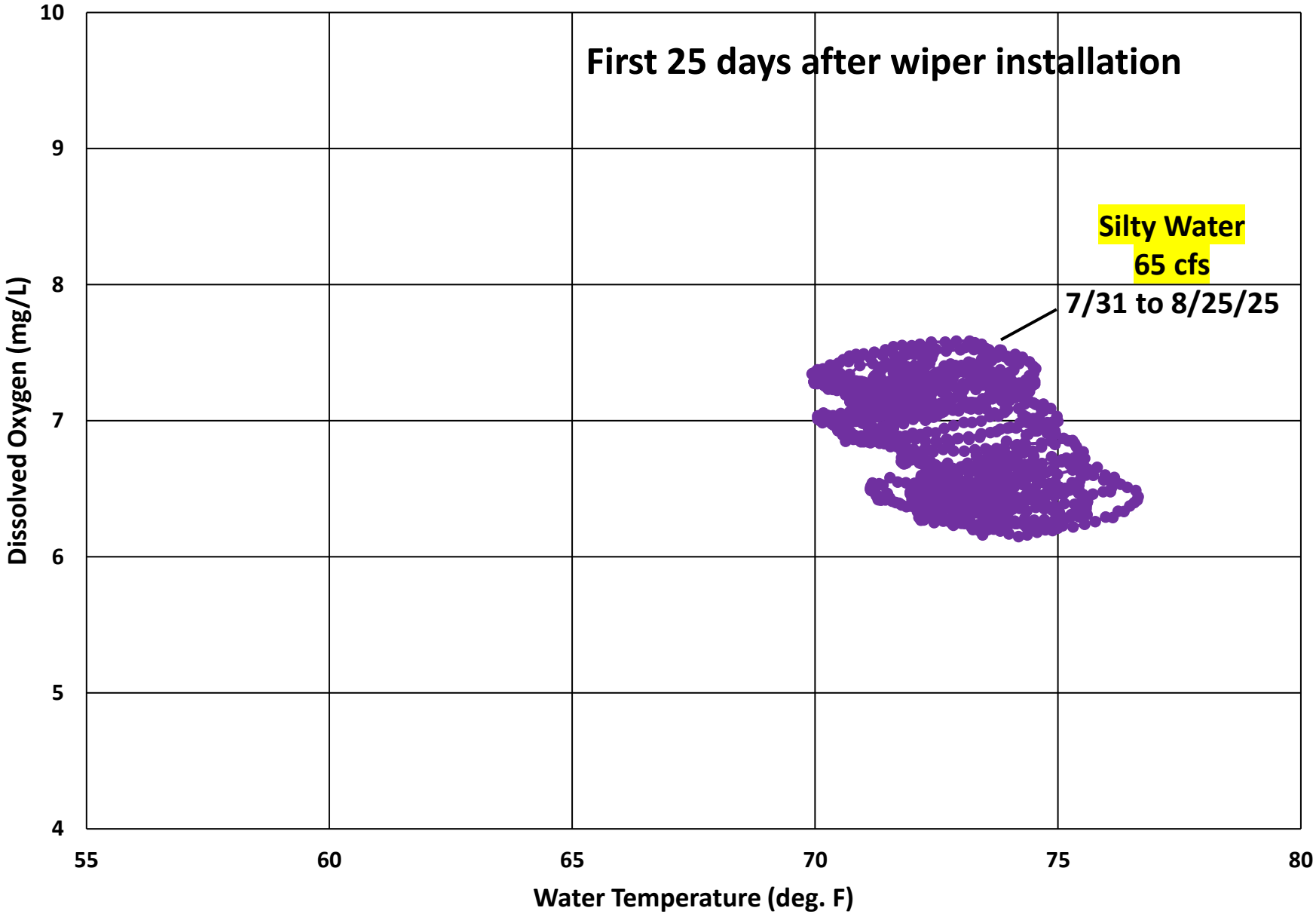
DO Sensor Integrated wi/ PME Wiper Module
(cleaned off detector 4x/day)

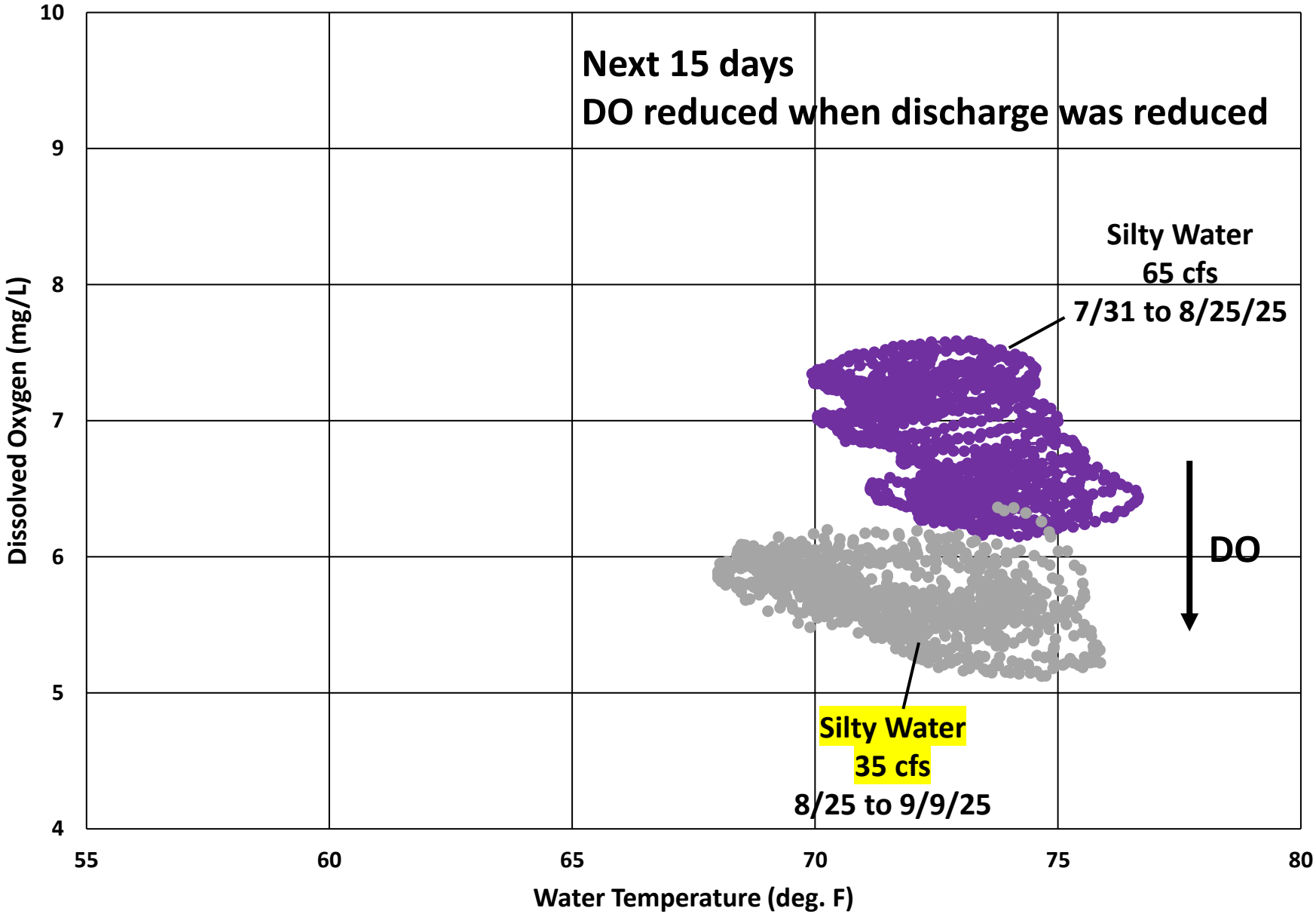
Monitoring Results- Jun to Oct 2025

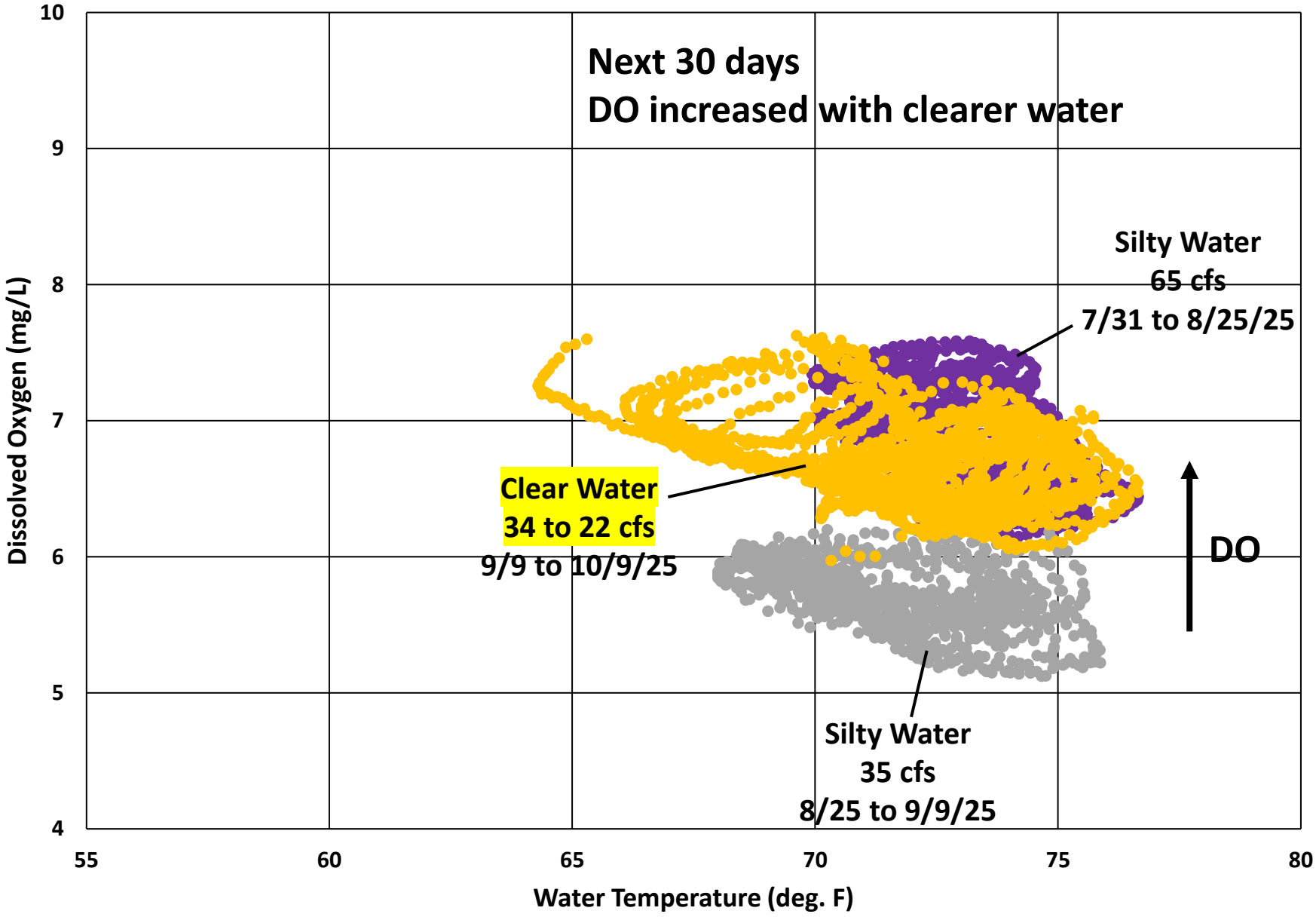
- **Silt impeded DO measurements from mid-June until an underwater wiper was installed. Silt suddenly cleared in the water during the week of Sept. 9th.**

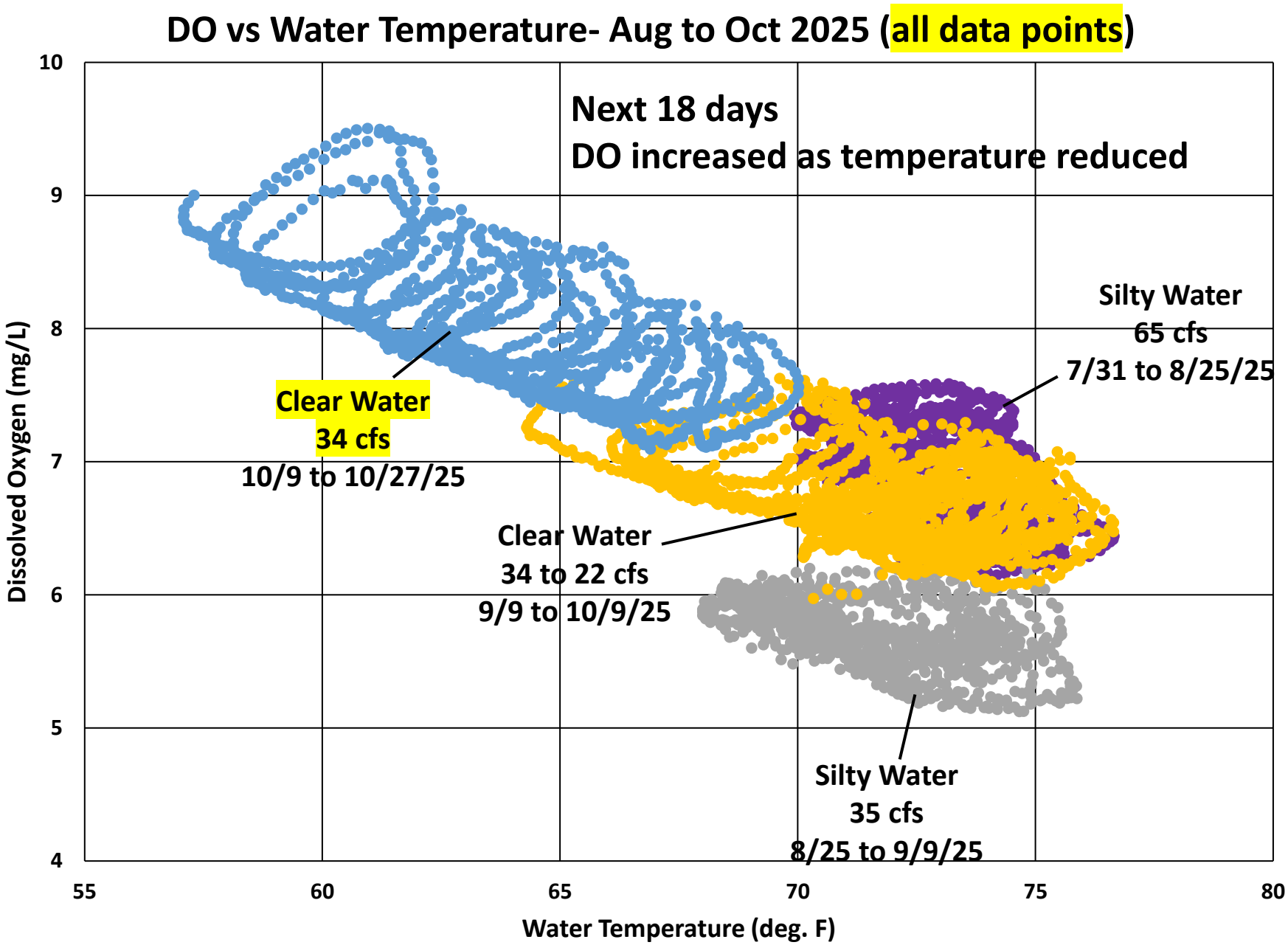


Insights

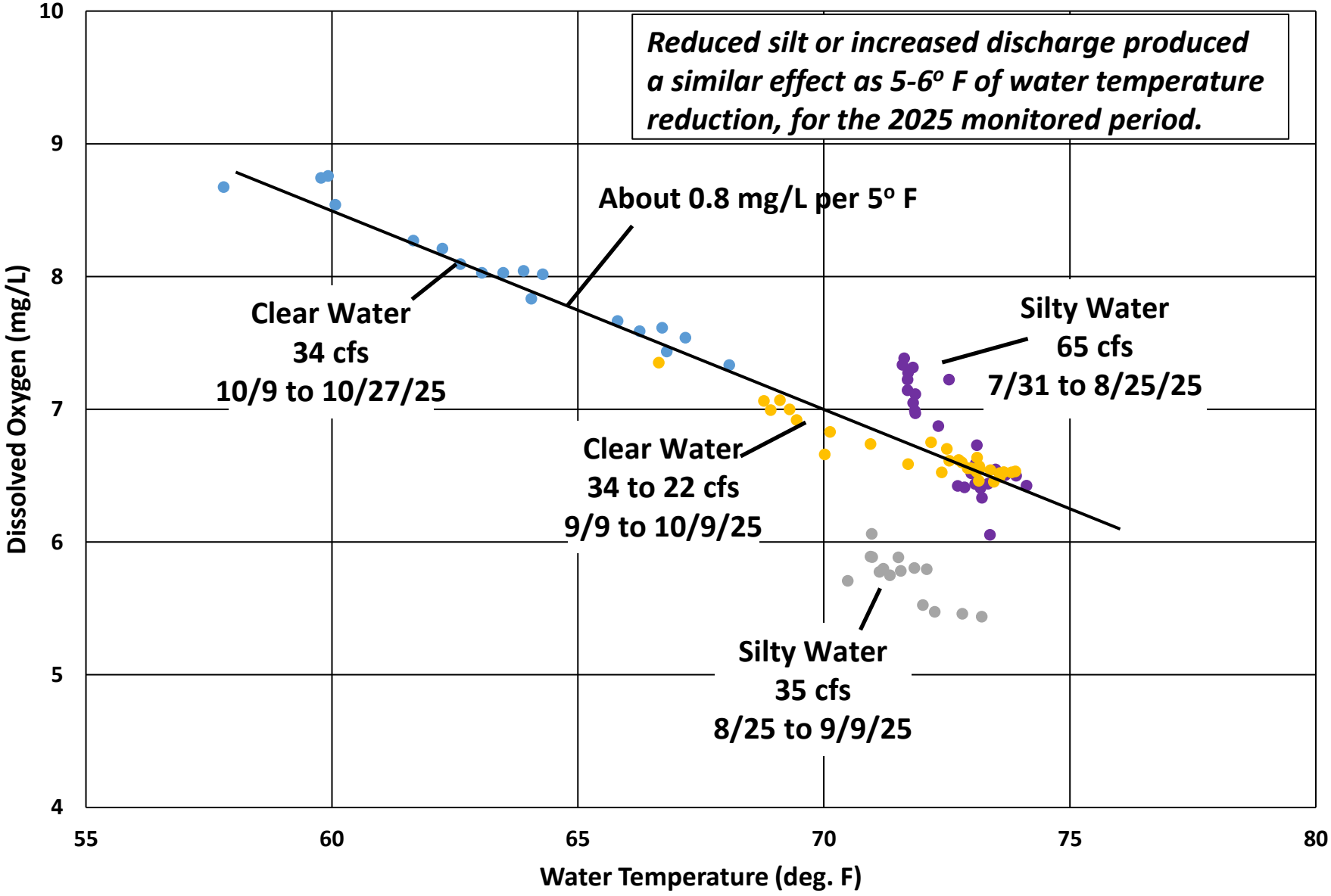

First 25 days after wiper installation
Silty Water
65 cfs
7/31 to 8/25/25
Dissolved Oxygen (mg/L)
10
9
8
7
6
5
4
55
60
65
70
75
80
Water Temperature (deg. F)


Next 15 days
DO reduced when discharge was reduced
Silty Water
65 cfs
7/31 to 8/25/25
DO
Silty Water
35 cfs
8/25 to 9/9/25
Dissolved Oxygen (mg/L)
10
9
8
7
6
5
4
55
60
65
70
75
80
Water Temperature (deg. F)

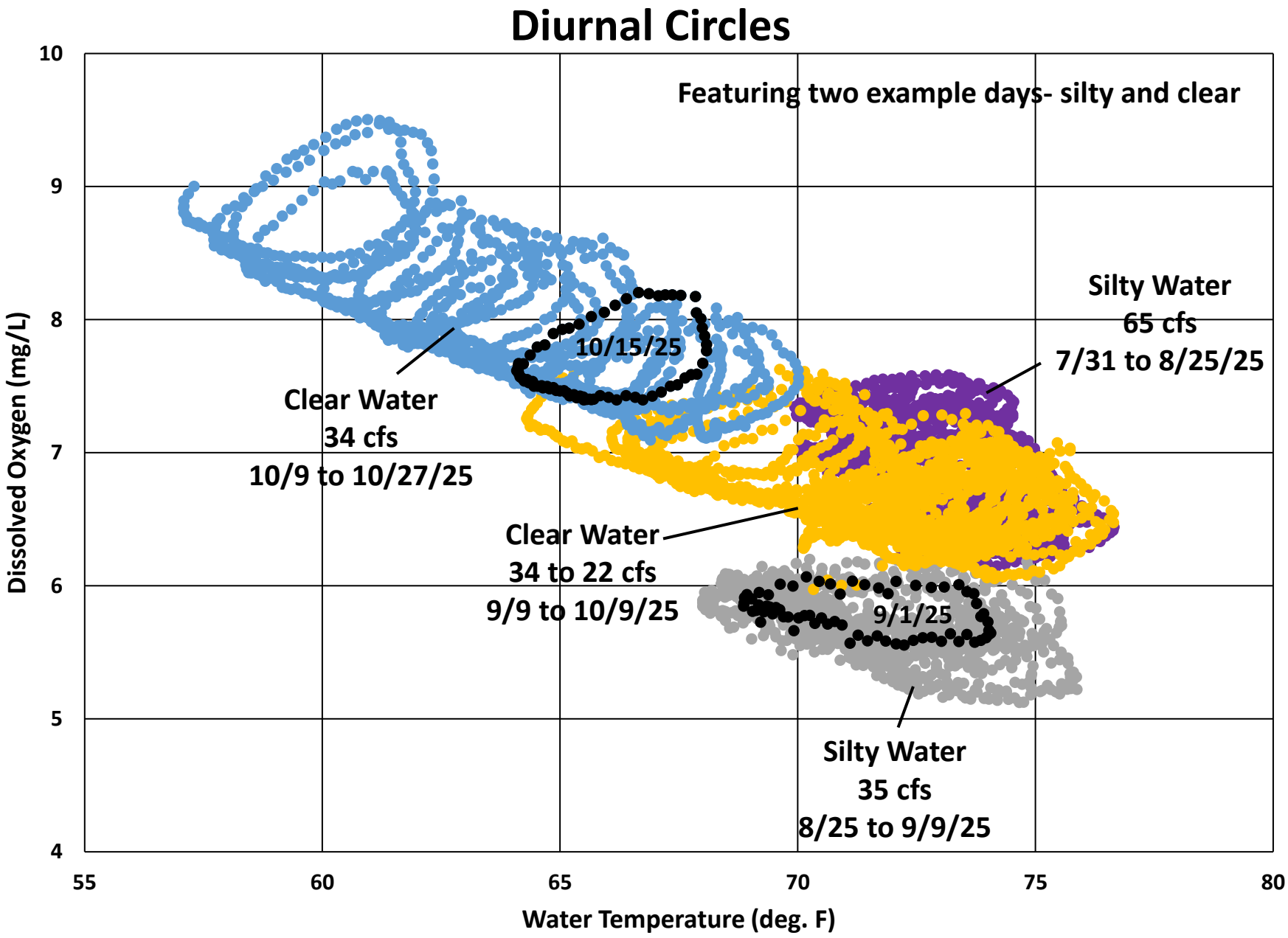

Next 30 days
DO increased with clearer water
Silty Water
65 cfs
7/31 to 8/25/25
Clear Water
34 to 22 cfs
9/9 to 10/9/25
DO
Silty Water
35 cfs
8/25 to 9/9/25
Dissolved Oxygen (mg/L)
Water Temperature (deg. F)
10
9
8
7
6
5
4
55
60
65
70
75
80

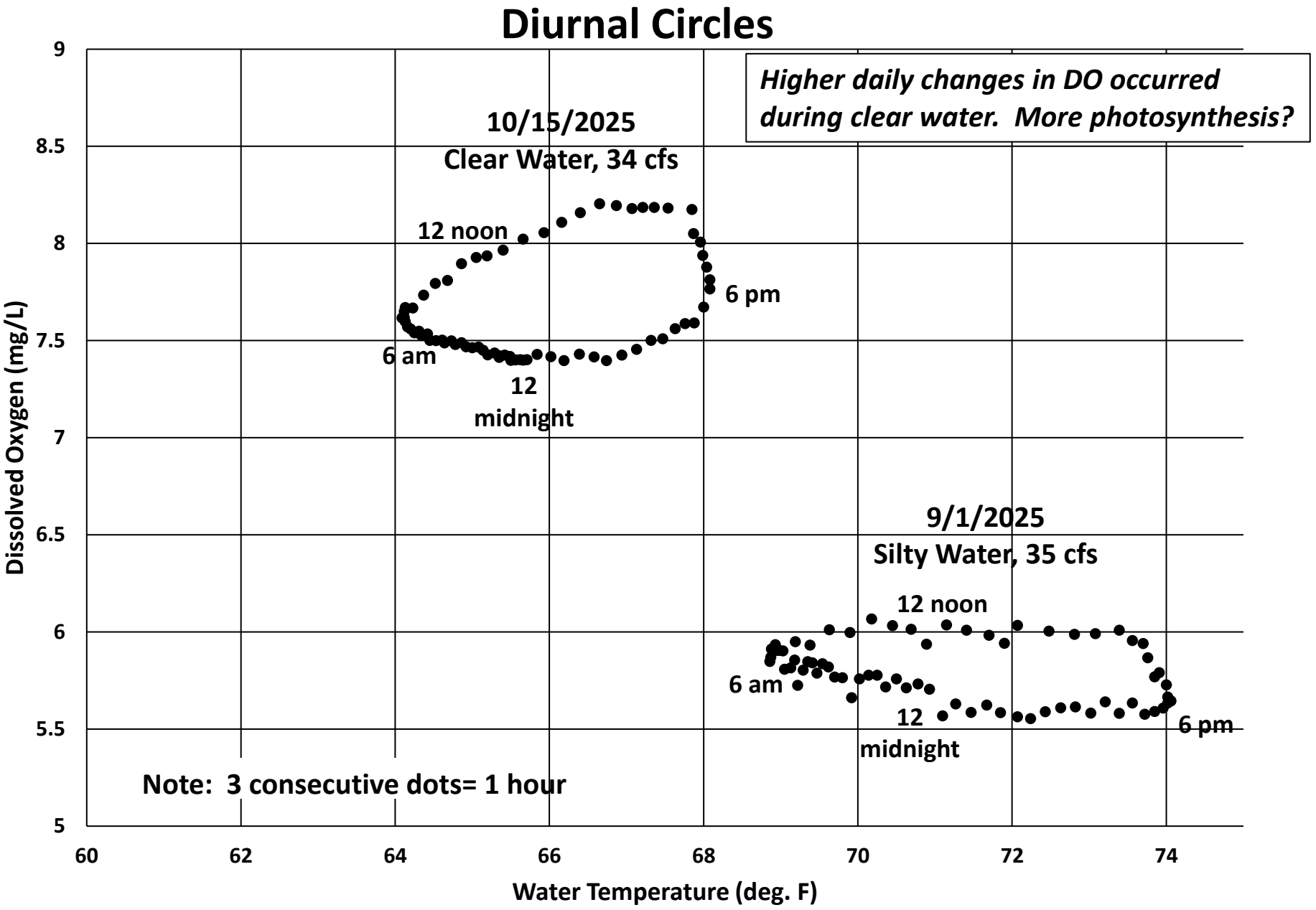

DO vs Water Temperature- Aug to Oct 2025 (all data points)
Next 18 days
DO increased as temperature reduced
Clear Water
34 cfs
10/9 to 10/27/25
Clear Water
34 to 22 cfs
9/9 to 10/9/25
Silty Water
65 cfs
7/31 to 8/25/25
Silty Water
35 cfs
8/25 to 9/9/25
Dissolved Oxygen (mg/L)
Water Temperature (deg. F)
10
9
8
7
6
5
4
55
60
65
70
75
80

DO vs Water Temperature- Aug to Oct 2025 (Daily Averages)



Clear water model: DO= (-0.15337)T + 17.73


Diurnal Circles
Featuring two example days- silty and clear
Dissolved Oxygen (mg/L)
Water Temperature (deg. F)
10
9
8
7
6
5
4
55
60
65
70
75
80
Clear Water
34 cfs
10/9 to 10/27/25
10/15/25
Silty Water
65 cfs
7/31 to 8/25/25
Clear Water
34 to 22 cfs
9/9 to 10/9/25
9/1/25
Silty Water
35 cfs
8/25 to 9/9/25


Diurnal Circles
Higher daily changes in DO occurred during clear water. More photosynthesis?
10/15/2025
Clear Water, 34 cfs
12 noon
6 pm
6 am
12 midnight
9/1/2025
Silty Water, 35 cfs
12 noon
6 am
12 midnight
6 pm
Note: 3 consecutive dots= 1 hour
Dissolved Oxygen (mg/L)
9
8.5
8
7.5
7
6.5
6
5.5
5
Water Temperature (deg. F)
60
62
64
66
68
70
72
74

2025 Findings…and a Question

- **Tailwater was in compliance with MDE requirements except short periods of >75º F water temperature**

- **Silt levels were high from mid-June to mid-Sept. Muddy looking water.**
  - **Visual observations indicated that silt came through the dam from the reservoir side**
  - **Excessive silt suppresses bug life, which the trout depend on**

- **Question:** ***Can WSSC operate their intake gates and/or needle valves differently to reduce silt and extend colder water into early September?*****
  - **Reduced silt in tailwater**
  - **Operate intake gates to minimize water temperature in early Sept timeframe**

****Within existing WSSC water supply requirements**

Sensor Measurement Verification

	PPTU HOBO/Onset Sonde			DNR YSI Meter		
Date	DO (mg/L)	Water Temp. (deg F)	Time	DO (mg/L)	Water Temp. (deg F)	Time
6/4/2025	8.6	63.7	11 am	8.8	63.5	11 am
7/31/2025	7.2	72.9	11 am	7.2	73.1	10 am
10/23/2025	8.7	61.8	1 pm	8.9*	61.5*	1 pm
				* Made at Haviland Bridge		