



December 2023 Water Tests Report

For

Windstar

Monthly Post-Hurricane Ian EC and DO Monitoring



www.AdvancedAquatic.com

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292 S. Military Trail – Deerfield Beach, FL 33442

Locations in: Deerfield Beach, Fort Myers, Port St. Lucie, and Clearwater/Tampa

1-800-491-9621



Vertical dissolved oxygen (D/O) readings analysis

Water column Dissolved oxygen / Temperature readings (measured at 1' increments)

Dissolved oxygen (D/O) is a measure of the amount of dissolved oxygen dissolved in water. The amount can tell us a lot about the water quality and whether the pond can sustain life, as in microorganisms and larger organisms like fish. By combining temperature and D/O levels from the surface to the bottom, we can also determine if stratification is occurring. Stratification can cause dead zones at the bottom of a pond. The dead zones are hypoxic (low oxygen) and sustain very little life. The hypoxic water also triggers a chemical reaction that releases phosphates from the sediments that ultimately feeds algae growth.

This test is important in determining water quality and if stratification is present. If low D/O oxygen levels or stratification are determined, aeration may be a good choice for improving water quality.

Guidelines for Interpretation of Dissolved Oxygen Readings

- 0-2 mg/L: not enough oxygen to support fish
- 3-4 mg/L: only a few kinds of fish and insects can survive
- 5-7 mg/L: acceptable for warm water fish
- 8-11 mg/L: very good for most stream fish including cold water fish

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What is Electrical Conductivity and why do we measure it?

Electrical Conductivity (EC)

Electrical conductivity is the total dissolved salts, measured as ions, in the water. These salts separate into positively and negatively charged ions (kind of like electrolytes in your sports drink). Some negative ions you may have heard of include bicarbonate, carbonate, chloride, sulfate, phosphates, and nitrates; four positive ions you may have heard of include calcium, magnesium, sodium, potassium, and ammonium. Ions in the water affect the quality of water for drinking or irrigation. The concentration of ions also influences what microorganisms will prosper in the water based on their desired salinity range. Conductivity will vary based on where the water source comes from and can be a good indicator of groundwater seepage or a sewage leak. Waters that have been heavily impacted by industry can fall into the high conductivity range which is bordering on saline conditions, and is not suitable for some fish or plants.

For reference:

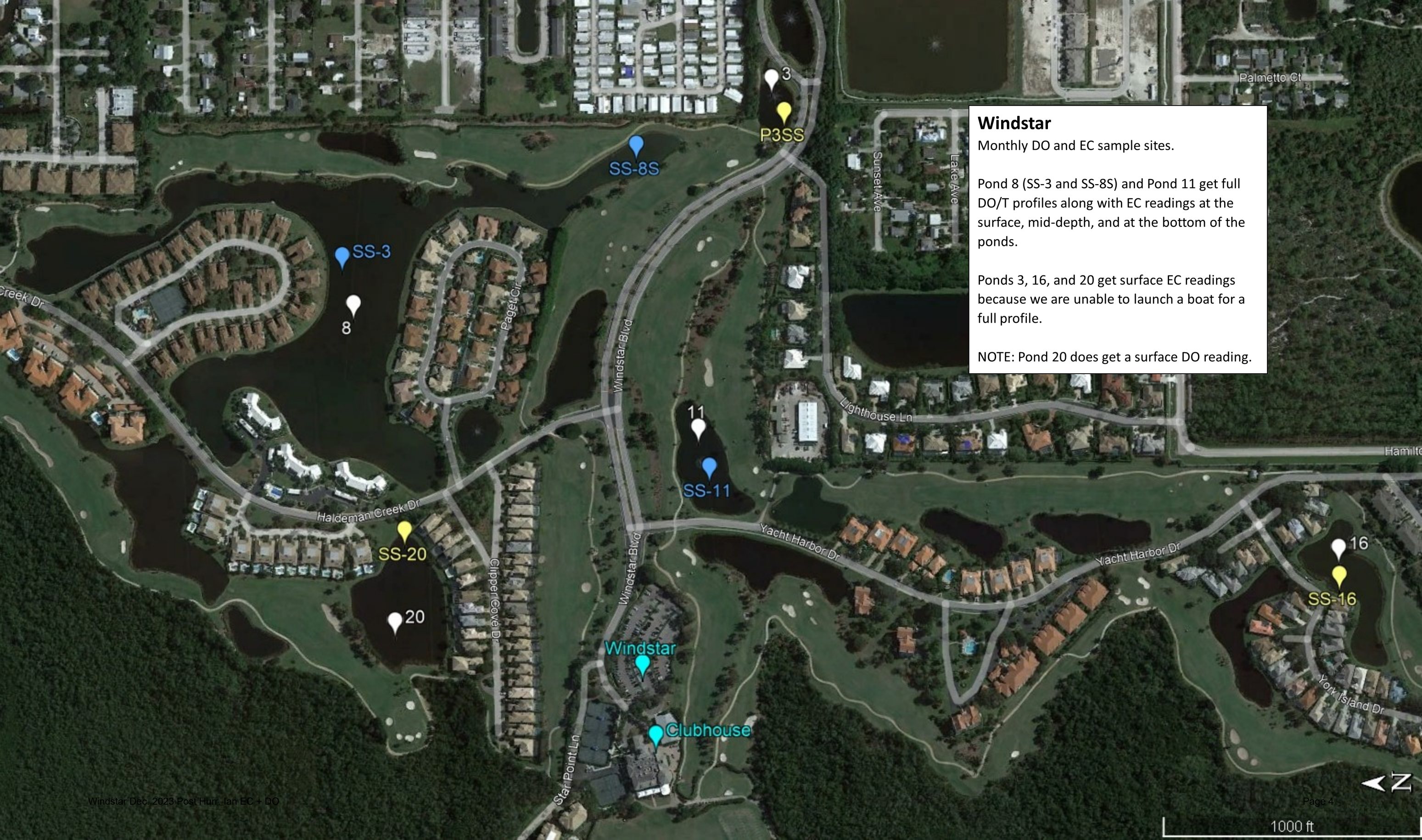
- *0-300 μS = Excellent water quality. Can be consumed by humans. Can be used for irrigation.*
- *300-800 μS = Good drinking water for humans as long as organic material has been filtered out. Generally good for irrigation, although above 300 μS may start to cause leaves to scorch on sensitive plants.*
- *800-2500 μS = Can be consumed by humans, although it would be preferred to have an EC value on the lower end of this scale (800-1650 μS). Requires special management when used for irrigation – consider suitability of soil, good drainage, and salt tolerance of plants.*
- *2500-10,000 μS = Not recommended for human consumption. Not normally suitable for irrigation although 6000 μS can be used for extremely salt tolerant crops with special management.*
- *10,000+ μS = not suitable for human consumption or irrigation.*
- *55,000 μS = seawater*

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Windstar
Monthly DO and EC sample sites.

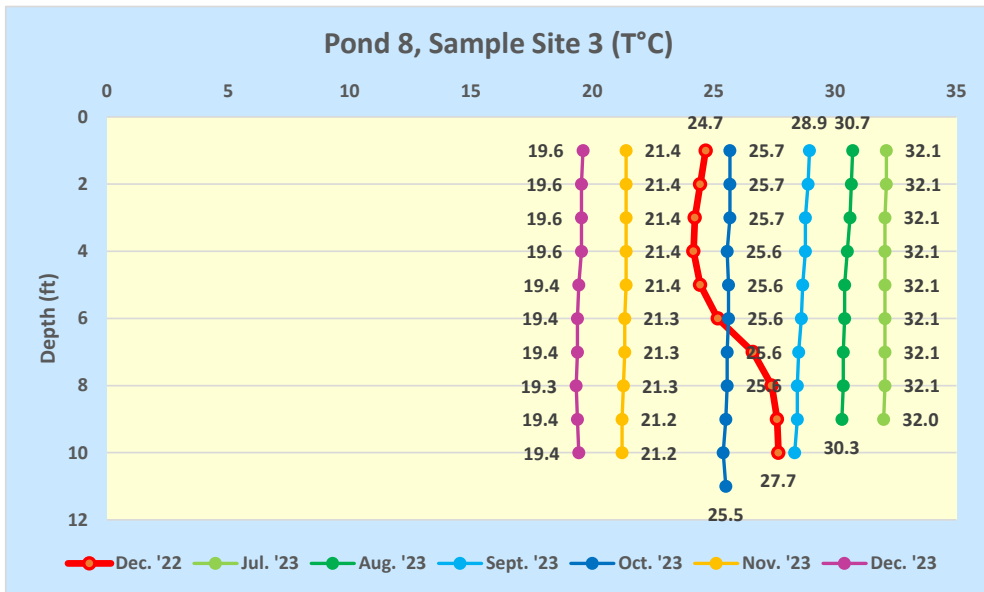
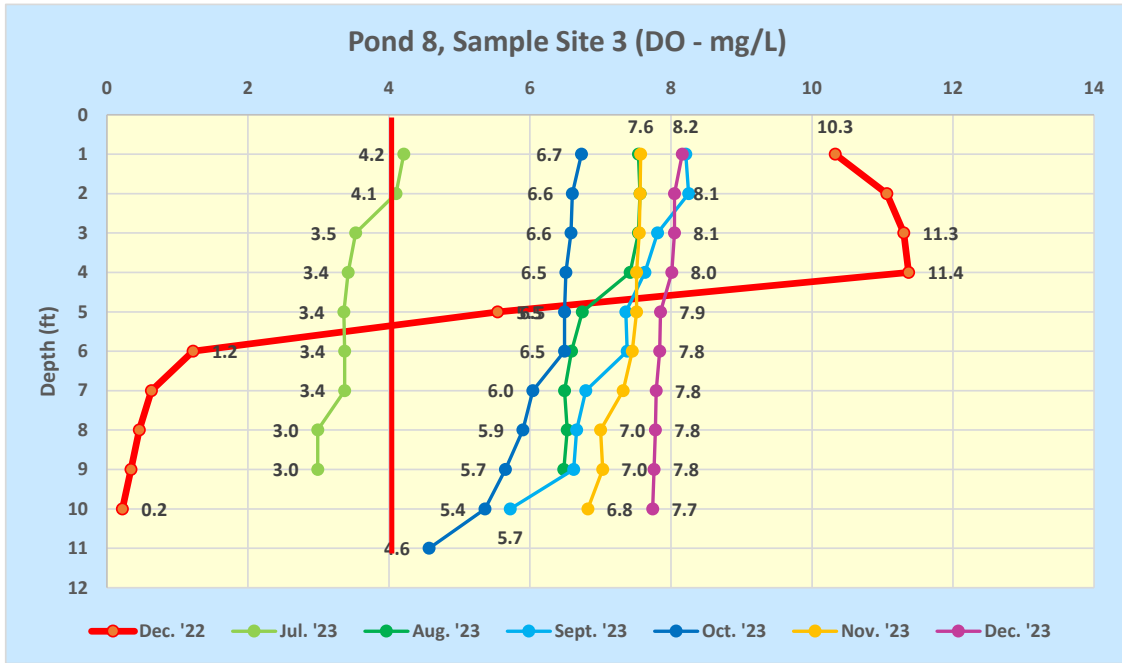
Pond 8 (SS-3 and SS-8S) and Pond 11 get full DO/T profiles along with EC readings at the surface, mid-depth, and at the bottom of the ponds.

Ponds 3, 16, and 20 get surface EC readings because we are unable to launch a boat for a full profile.

NOTE: Pond 20 does get a surface DO reading.



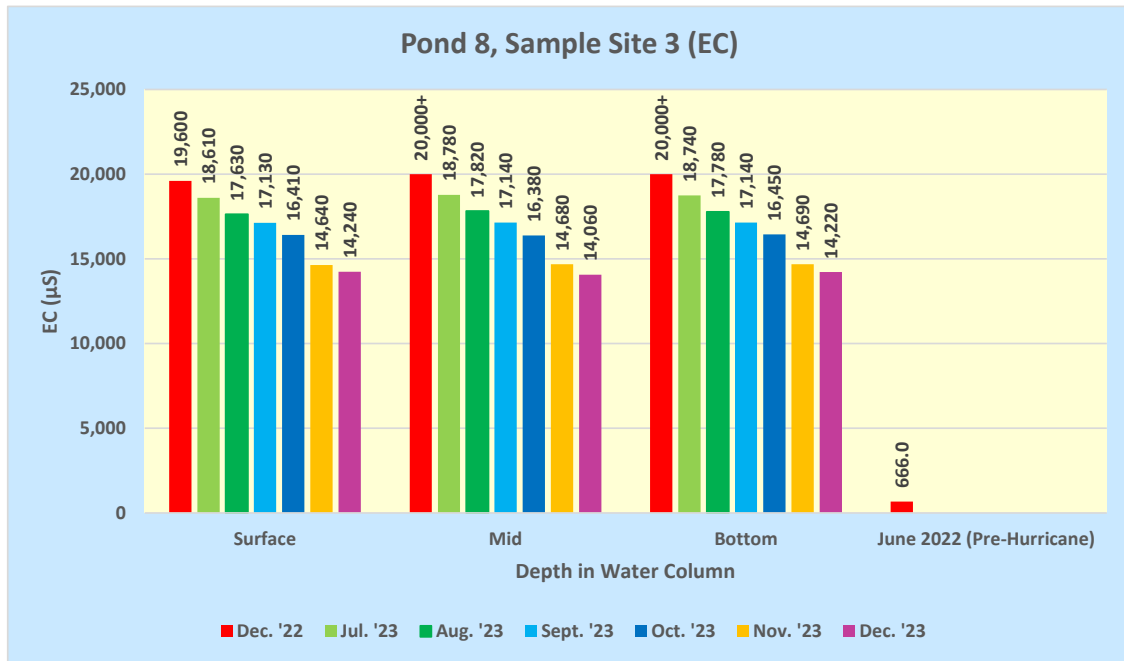
Windstar - Monthly Post-Hurricane Ian EC and DO Profiling Pond 8, Sample Site 3



Temp. (°F)	Temp. (°C)
67.0	19.4
67.3	19.6
70.2	21.2
89.8	32.1

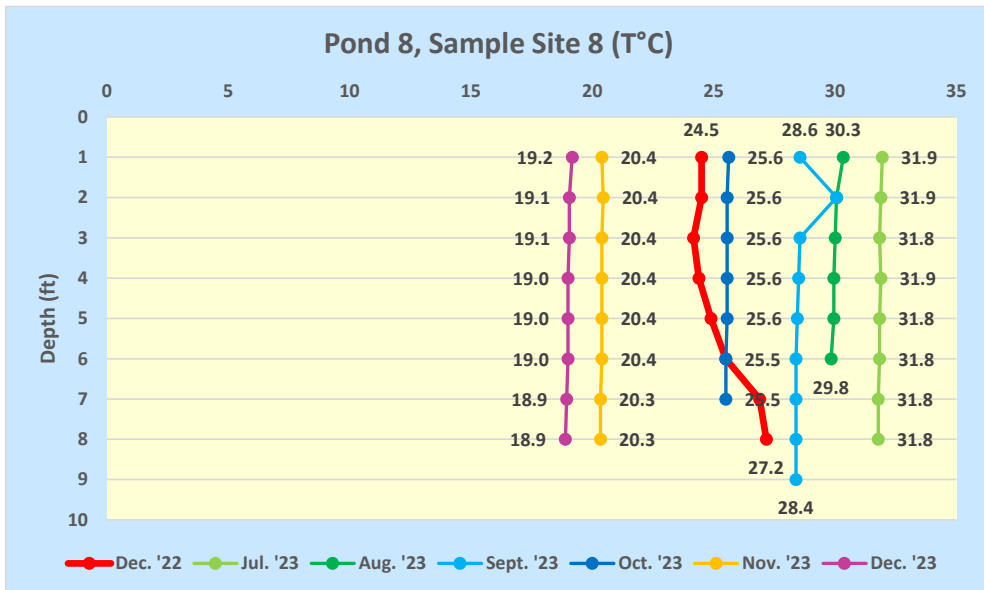
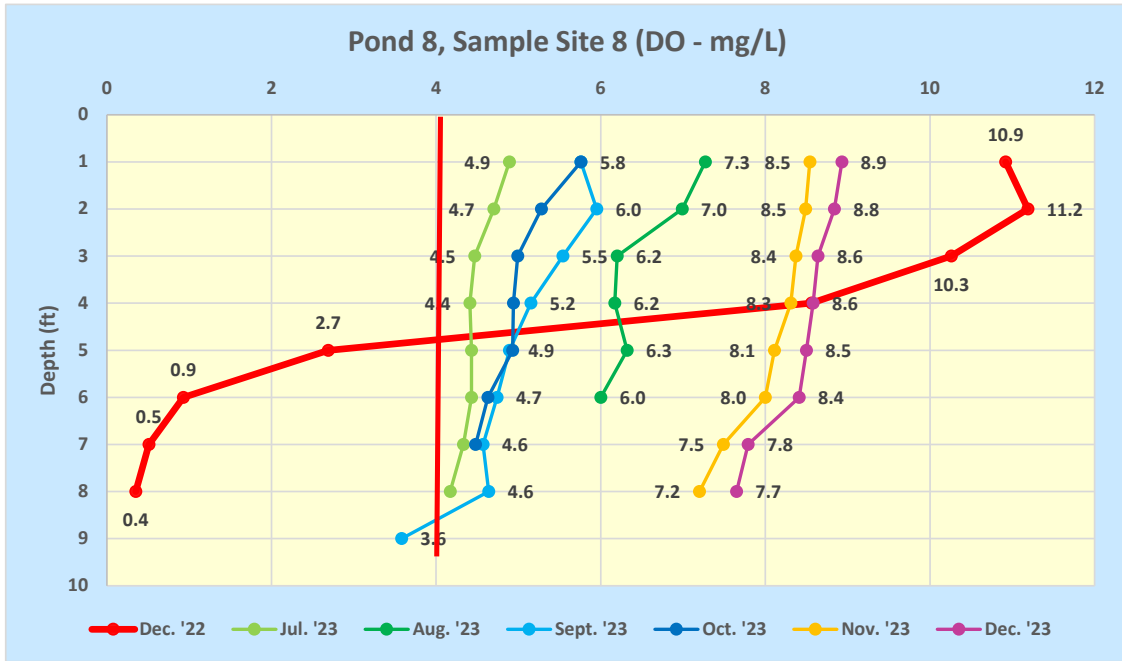


Windstar - Monthly Post-Hurricane Ian EC and DO Profiling Pond 8, Sample Site 3





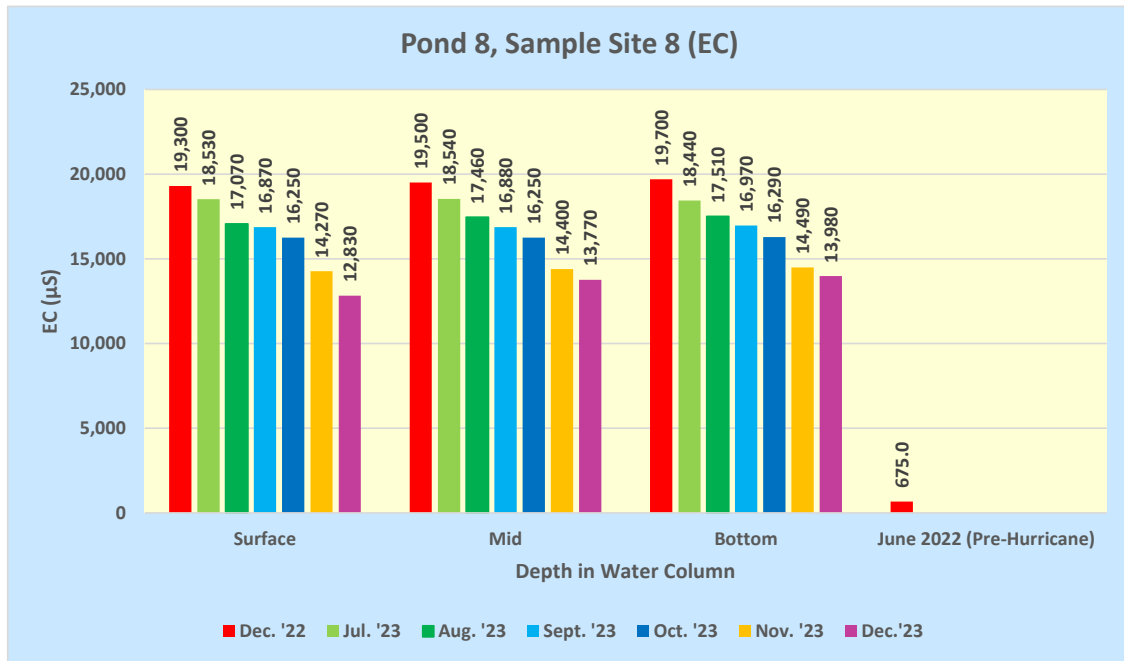
Windstar - Monthly Post-Hurricane Ian EC and DO Profiling Pond 8, Sample Site 8



Temp. (°F)	Temp. (°C)
66.0	18.9
66.5	19.2
78.0	25.6
89.4	31.9

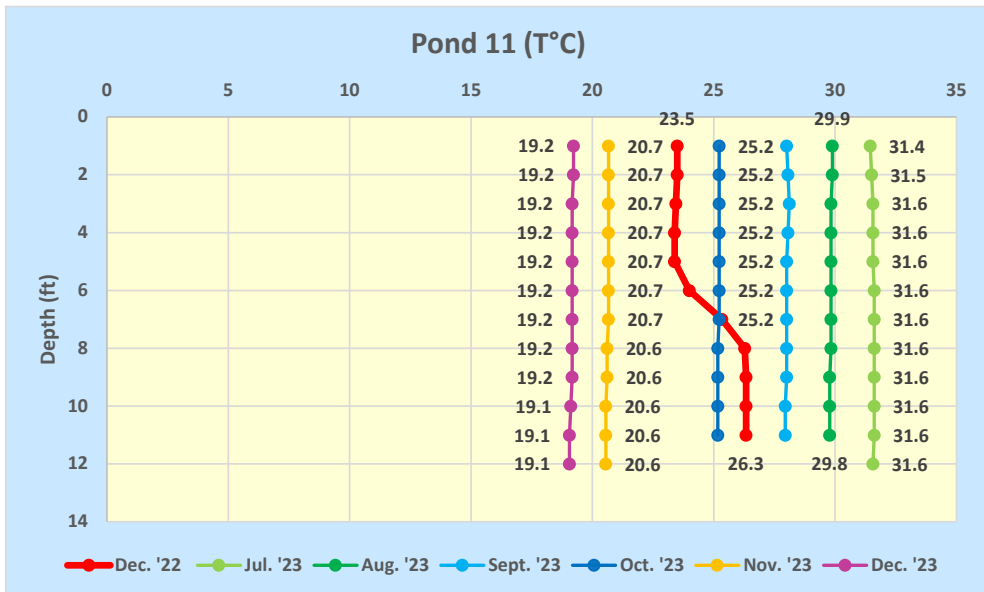
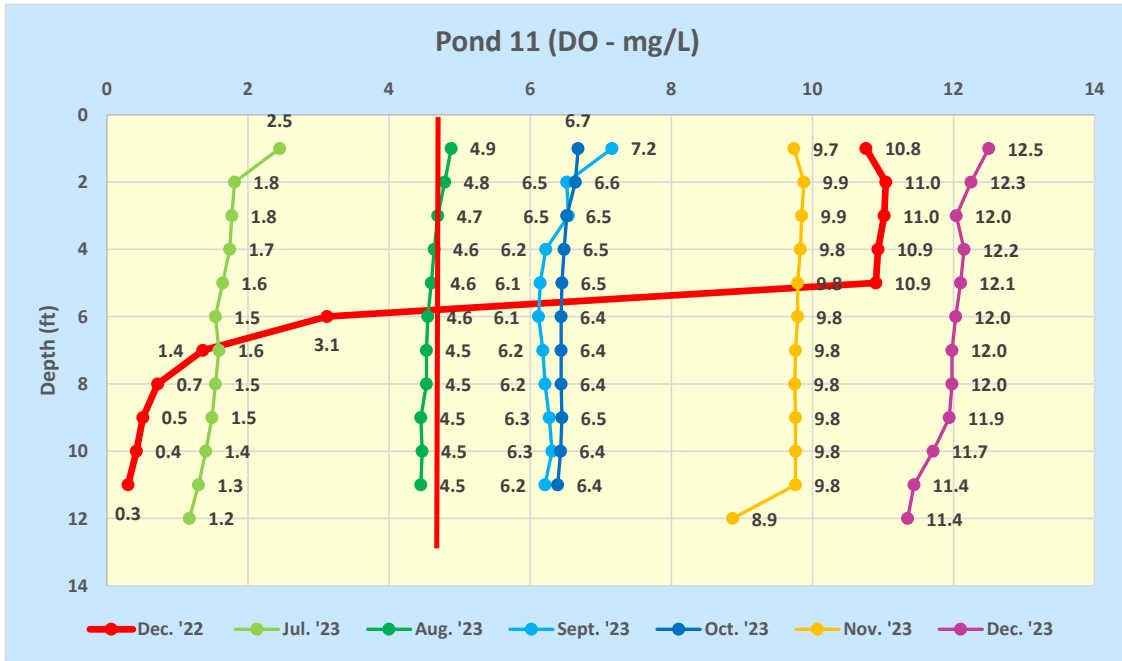


Windstar - Monthly Post-Hurricane Ian EC and DO Profiling Pond 8, Sample Site 8





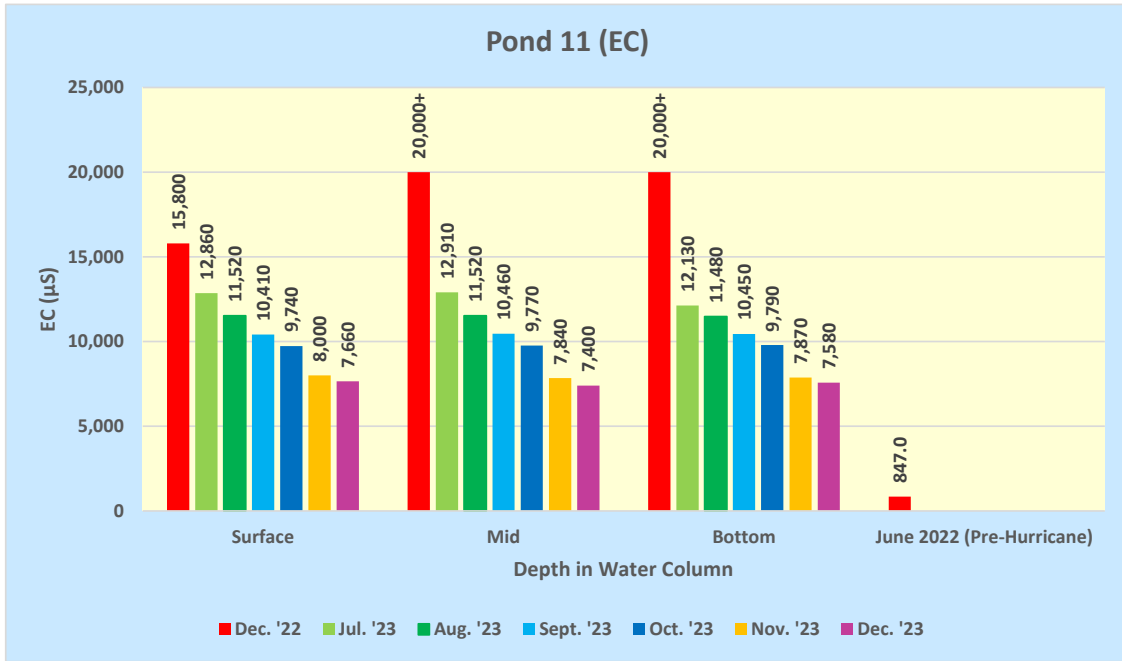
Windstar - Monthly Post-Hurricane Ian EC and DO Profiling Pond 11



Temp. (°F)	Temp. (°C)
66.3	19.1
66.6	19.2
69.1	20.6
88.9	31.6



Windstar - Monthly Post-Hurricane Ian EC and DO Profiling Pond 11

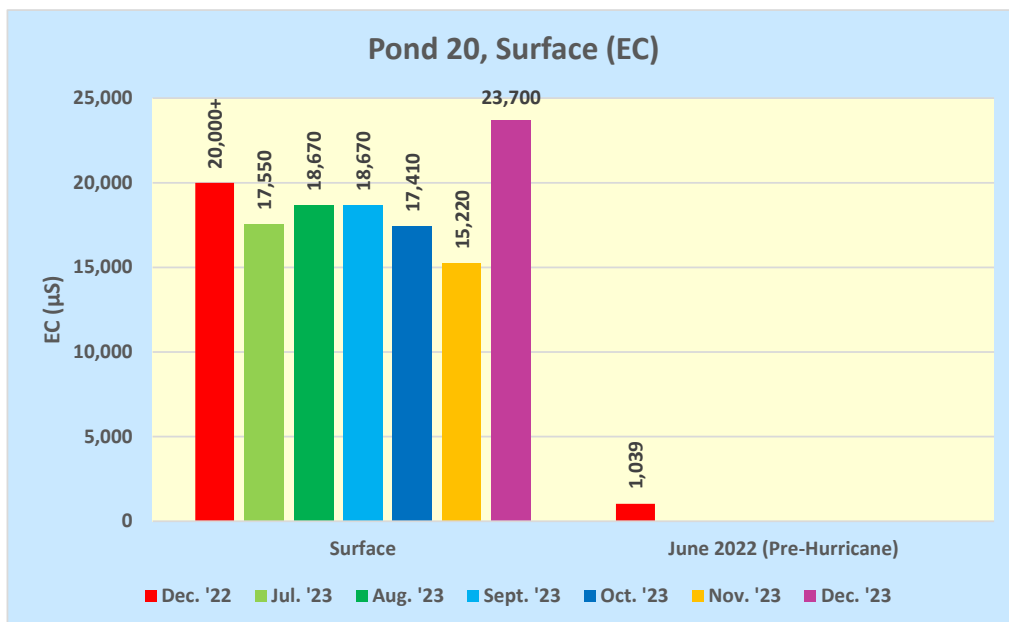




Windstar - Monthly Post-Hurricane Ian EC and DO Profiling Pond 20

The following parameters were measured approximately 3 inches below the surface of the water at Pond 20. We had originally proposed to do a full DO/T° profile of this lake, but because the escarpment is so steep, we are unable to launch a boat in this pond to perform the full profile. Instead, we added a second full profile site to Pond 8 and are just taking a surface DO/T profile for Pond 20.

	DO (mg/L)	Temp. (°C)	Temp. (°F)
Dec. '23	10.9	19.1	66.3
Nov. '23	5.8	21.4	70.5
Oct. '23	6.6	25.7	78.3
Sept. '23	6.9	29.7	85.5
Aug. '23	6.3	30.4	86.7
Jul. '23	4.4	32.1	89.7
Jun. '23	7.2	32.1	89.7
May '23	6.2	29.7	85.5
Apr. '23	9.8	31.0	87.8
Mar. '23	10.3	23.3	74.0
Feb. '23	9.8	24.6	76.2
Jan. '23	7.1	26.0	78.8
Dec. '22	9.2	25.2	77.4





Windstar - Monthly Post-Hurricane Ian EC and DO Profiling Ponds 3 & 16

