

INTERIM REPORT ON DATA AND OBSERVATIONS OBTAINED DURING THE STUDY OF THE DETENTION POND AT SHELTER BAY DRIVE

30 SEPTEMBER, 2024

With legend and notational changes to Figs. 1-12

Ref. 1: Detention Pond Field Trial – A Joint Effort: Utility and Beautification

This is the first interim report of observations and measurements taken as part of a joint project by the Utility Board and the Beautification Committee to better understand the hydrology of the pond and to identify plants that would be suitable to a possible future littoral zone around the pond. The project background is provided in Ref, 1 issued as a community information note and approved for release during the Commission Meeting of 19 September 2024.

The study period commenced with the drilling of five boreholes on 23 July, 2024 and the installation of 50 test plants on 2 August, 2024 at the Northeast corner of the pond. Although it is premature to draw conclusions the information obtained to date is provided to show the type of data being collected. During late July and into mid August the pond was largely dry with only 0.14 inches of precipitation recorded in the period 24-31 July and 3.45 inches from 1-16 August. In late August and during September the precipitation increased.

Part A: Field Trial of Candidate Plants for Future Pond Littoral Zone

At the time of installation the pond was dry and supplemental watering was required to help establish the plants. This was done by members of the Beautification Committee during August. Observations by Committee members indicated that the plants dried out faster than expected and required watering very day. The Dahoon Holly on the berm dried really quickly but was manually irrigated. Mary Kohl noted that the birds love this area as a food source. By 2 September the rainfall increased and further watering became unnecessary. Since 2 September the pond has retained water such that low lower plants have been inundated. The upper grassy plants have done well but it is not known if the lower plants will survive the extended inundation although they are inundation resistant. The condition of these plants will not be fully known until water levels recede. Photographs below taken on Sep. 2 and Sep 14 are representative of September conditions.



Sep 2 Jane Byland



Sep. 2 Sandy Glassman



Sep. 14 Sandy Bachman



Sep 14 Sandy Bachman



Sep 29 Janie Byland (Dahoon Holly on berm)

Part B Borehole Monitoring

Public works installed five boreholes (diameter 9", depth 60") on July 23 and began monitoring the salinity levels on 24 July. Each of the boreholes are profiled by salinometer by Public Works staff on a regular basis. The data consist of salinity of the water at depth intervals of 5 inches down to 30 inches and at full depth of 60"

The data obtained to date include measurements taken on:

7/24/2024 at 10:30 am with tide at 2.1 ft rising

7/26/2024 at 2:00 pm with tide at 1.9 ft falling

8/16/2024 at 2:30 pm with tide at 0.18 ft rising

8/28/2024 at 2:07 pm with tide at 0.24 ft rising

9/6/2024 at 1:15 pm with tide at 1.78 falling

9/13/2024 at 2:15 pm with tide at 0.82 rising

9/25/2024 at 9:15 am with tide at 0.64 falling (period of king tides of 3.3 ft)

The salinity profiles are presented graphically in two formats: all boreholes at each measurement date and individual boreholes for all 7 measurement dates. Depths indicated are relative to the top of the drain grate Shelter Bay Drive. To provide supporting information on the status of the pond, the depth to first water relative to the drain grate is shown by a red circle above each profile. All data are presented in the following 12 plots. Figs. 1 to 7 show all five borehole profiles for each measurement date. Figs. 8-12 show a specific borehole at each of the 7 measurement dates. It is noted that when the pond is fully inundated the first water levels relative to the drain grate should be the same for all boreholes. There is some deviation to this since the correction factor to the raw data is approximate since only the nearest measured elevation of the pond bottom relative to the grate is used. This results in a variation of the first water level of 1 to 2 inches between boreholes when the pond is fully inundated.

FIG. 1

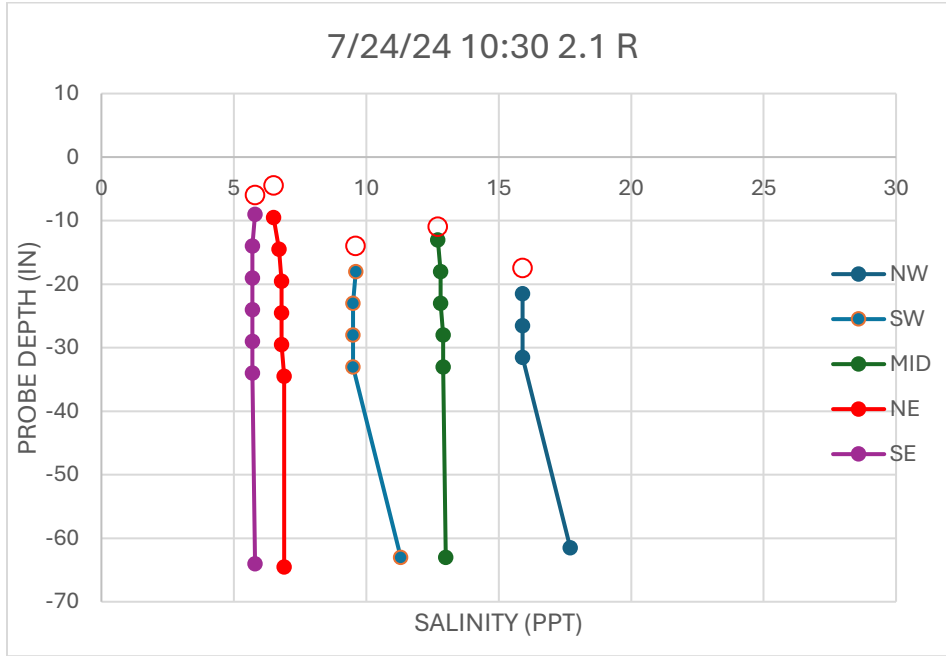


FIG. 2

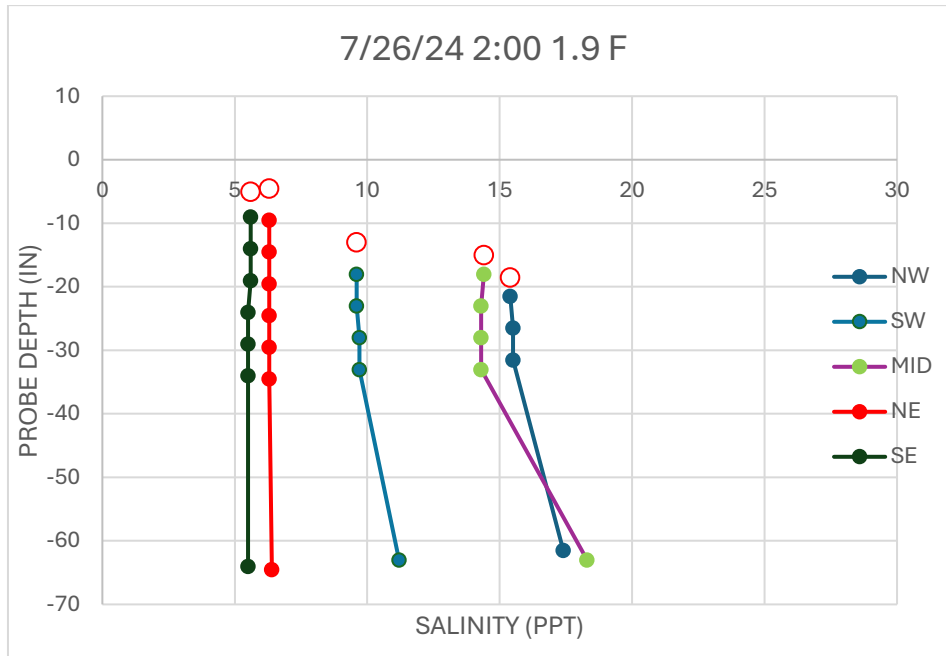


FIG. 3

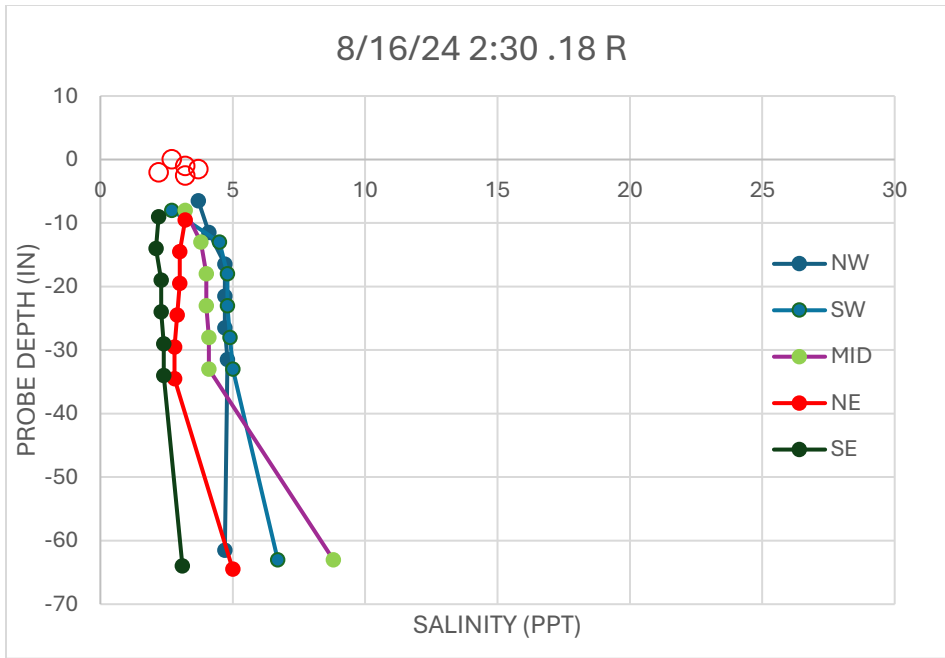


FIG. 4

FIG. 4

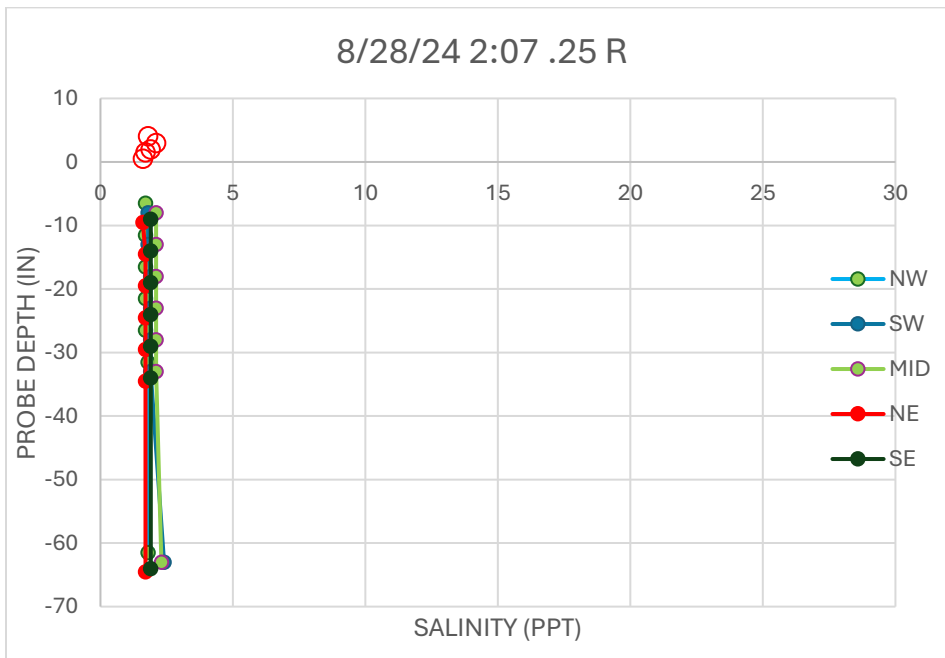


FIG. 5

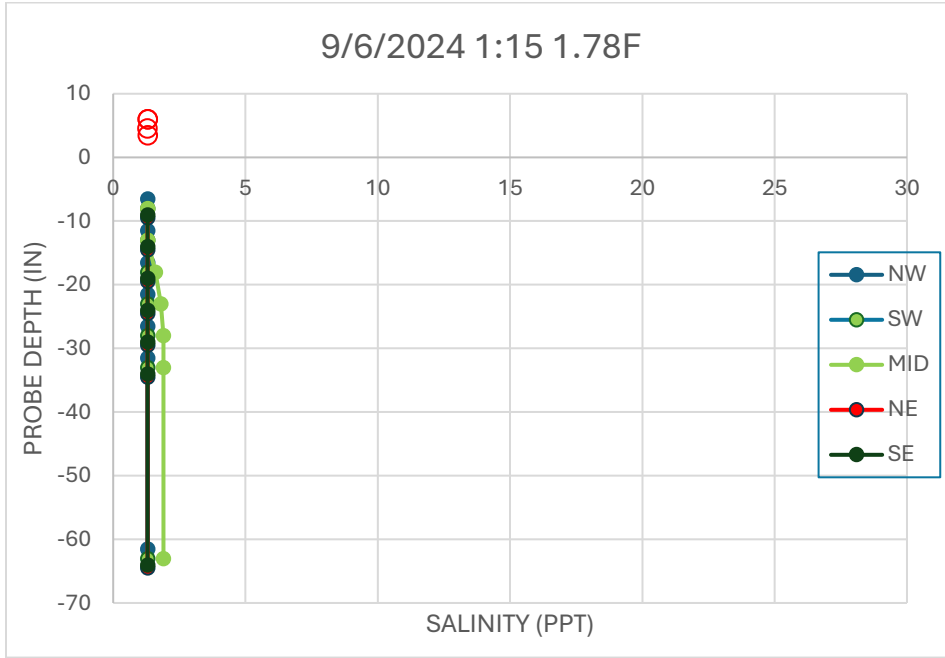


FIG. 6

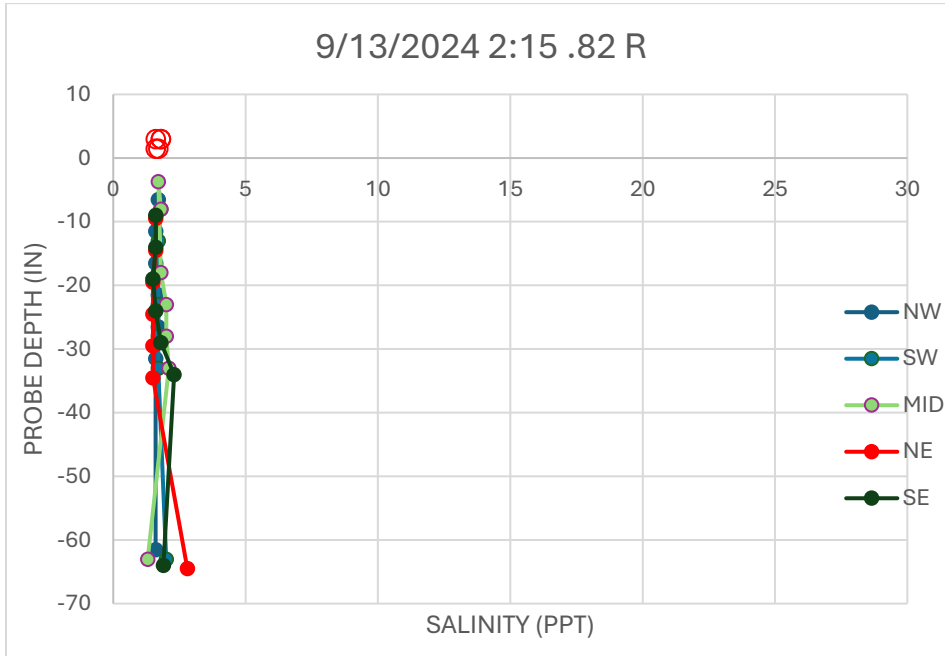


FIG. 7

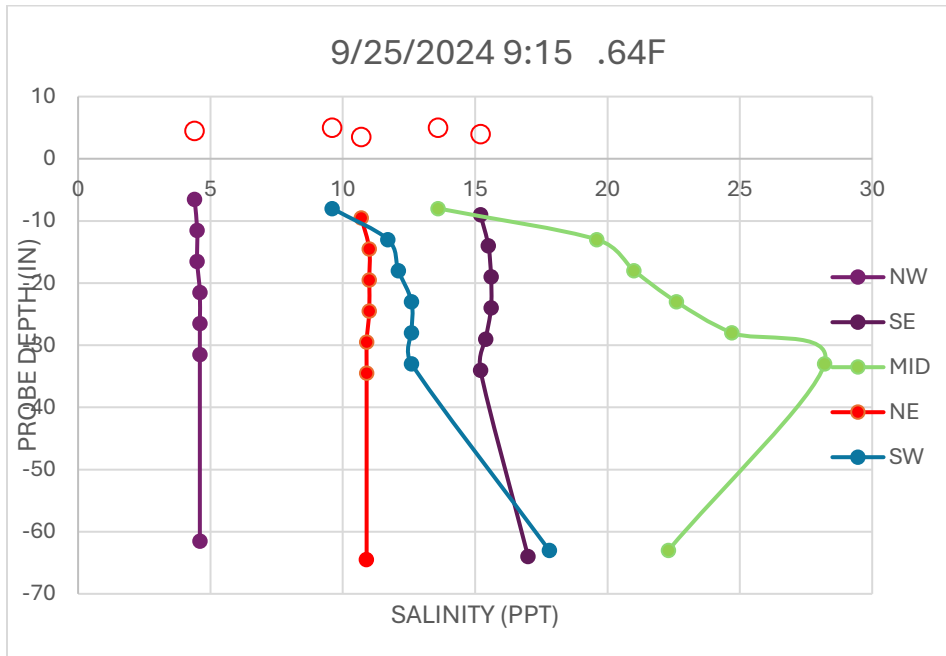


FIG. 8

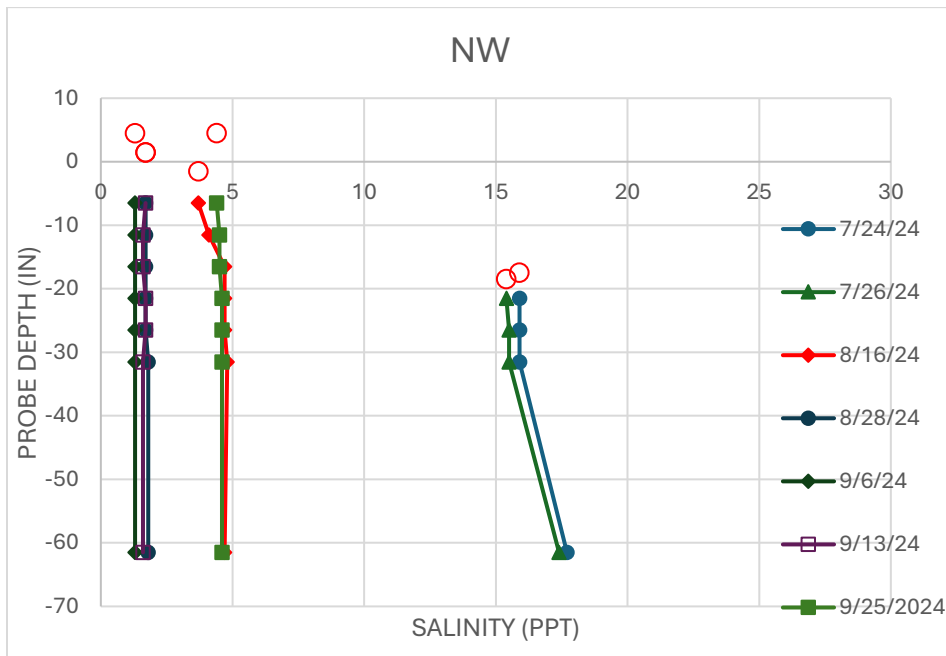


FIG. 9

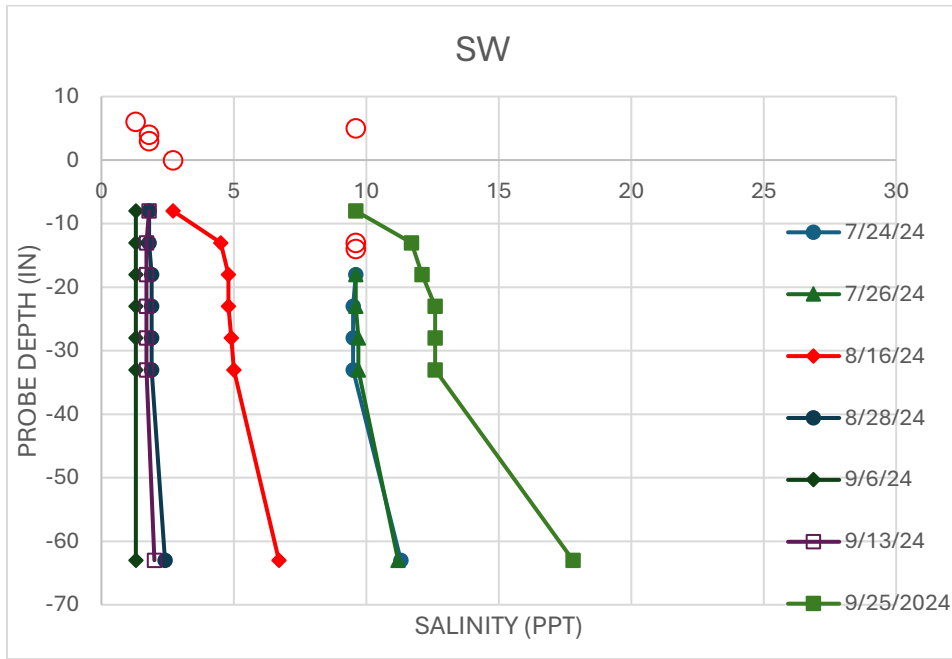


FIG. 10

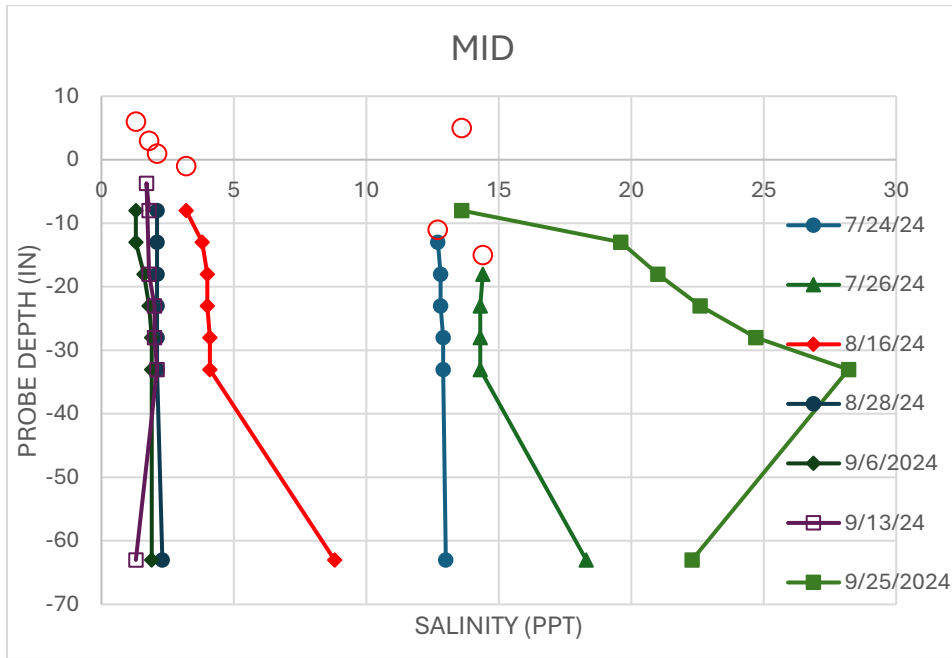


FIG. 11

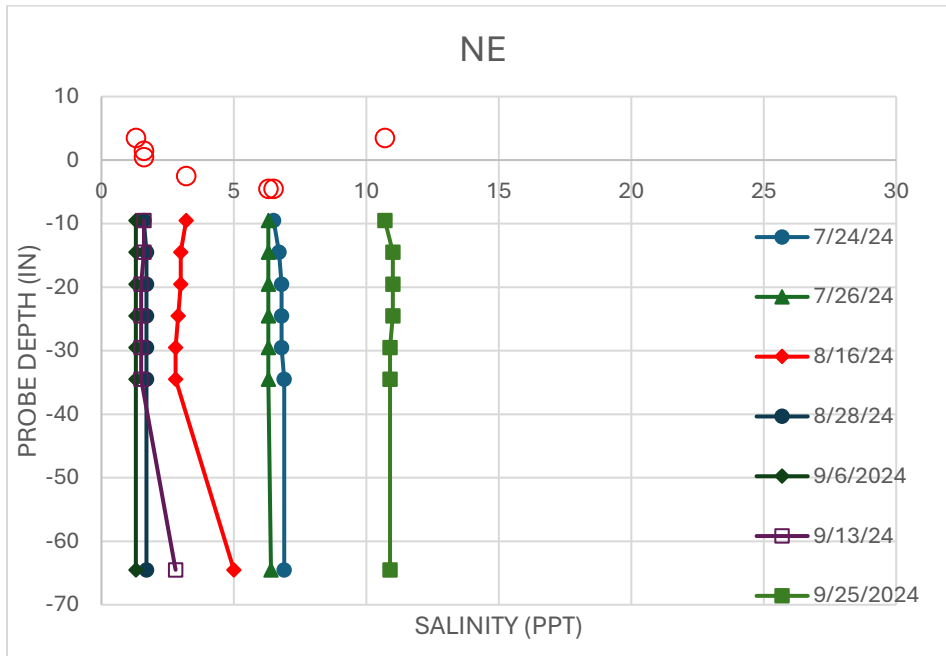
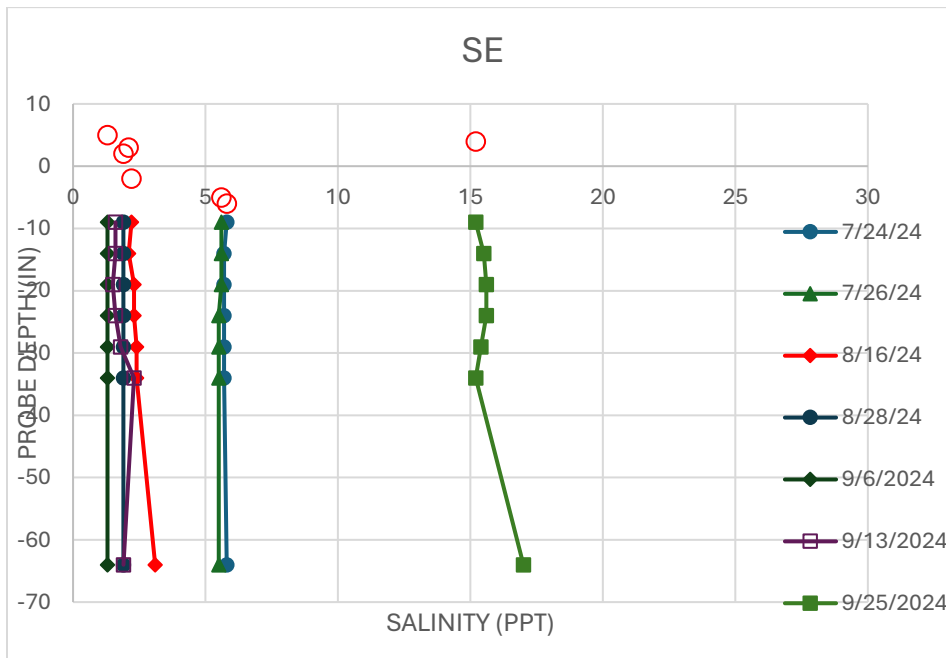


FIG. 12



OBSERVATION SUMMARY TO DATE

While no conclusions are drawn at this early stage, several observations can be made.

- 1) During dry conditions (7/24, 7/26) profiles show a well-mixed water column with little or no salinity increase at the bottom of the borehole. Average salinities vary from 6 to 16 ppt between boreholes.
- 2) During dry conditions first water varies from 18" below the drain grate at the NW borehole to 5 inches at the NE borehole.
- 3) When the pond is inundated (8/28, 9/6, 9/13) the water column is essential fresh completely to the bottom of the borehole with no stratification
- 4) When the pond is inundated during a period of king tides (9/25) there is significant salinity and associated stratification particularly in the MID borehole.
- 5) During periods of inundation first water varied from 4 to 5 inches above the grate

RESPECTFULLY SUBMITTED

Dave Mckeehan (Beautification Committee)

3 October 2024