Investigation of Groundwater Interaction in Shark River Slough

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Goals

To better understand the hydrology of Shark River Slough through water quality data, and look for evidence of water exchange between sources.

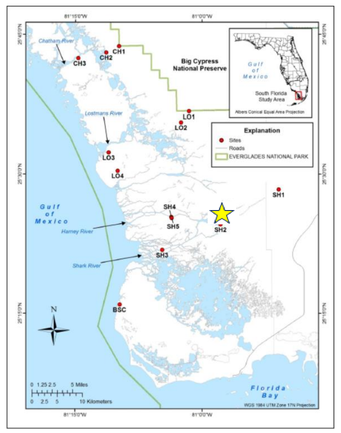

Figure 1. Site map for SH2 (SRS4) Shark River Slough provides drainage for a significant amount of the everglades, as well as Miami's Water Conservation Areas. Saltwater intrusion into the groundwater has been steadily increasing in this area the last 50 years.

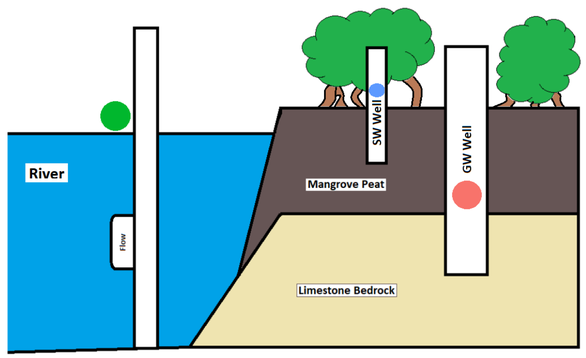

Figure 2. Rough cross section of the layout of SH2. Colored dots correspond to graph colors.

Acknowledgements: Mark Kershaw: YSI technical support; Peter Regier: CREST grad; REU Cohort

Importance

Stressors including saltwater intrusion into groundwater risk altering the key biological processes that keep The Everglades and mangroves healthy.

Research Methodology

Data recorded from USGS EDEN and L-TER pressure transducers was compiled to establish long term trends in depth and salinity.

Two YSI Exo2 water quality sondes were deployed in the groundwater and river at SH2 for a two week period (June 5-June 19).

Results

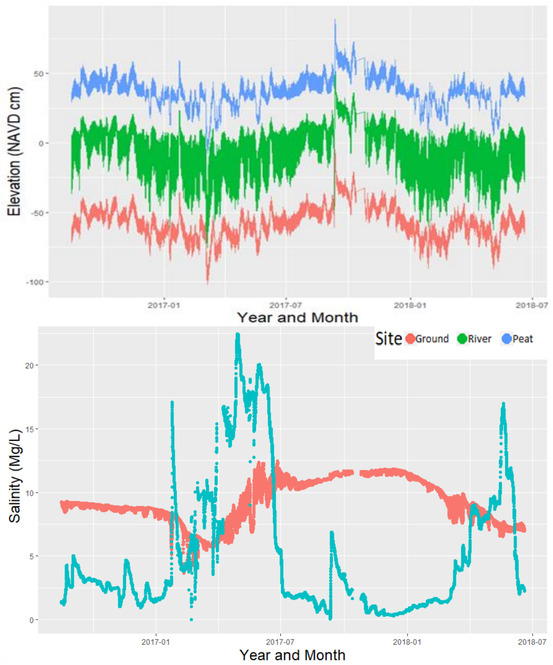

Figure 3. Long Term Water Levels. The lowest levels occur during the driest months of the year, however the water sources always remain relatively synchronized.

Figure 4. Long Term Changes in Salinity. Greater peat salinity values are seen during the winter, likely due to lower levels of precipitation, yet the groundwater shows an inverse response. Changes in temperature (not shown) were positively correlated in the winter.

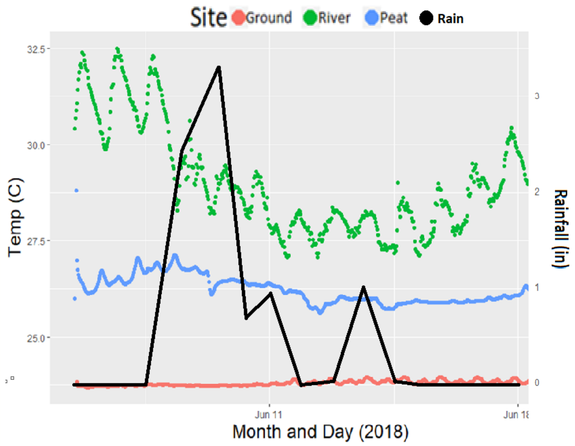

Figure 5. Short Term Temp and Rainfall. Highlighted here is temperature and rainfall (cloud cover)

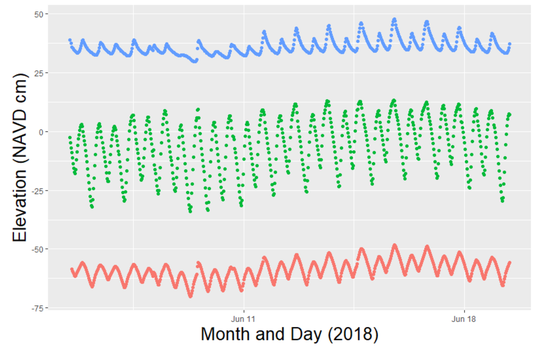

Figure 6. Short Term Water Levels. This shows the tidal signal in all three water sources.

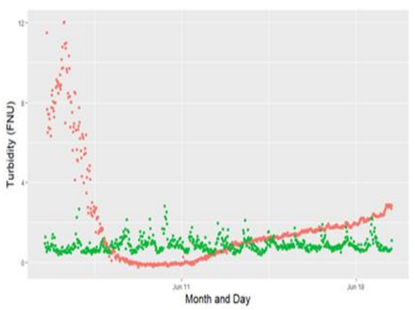

Figure 7. Turbidity. Many of the water quality measurements were impacted by the pumping of the well prior to deployment, Seen as the instability in the first days of this graph.

Conclusions

Tidal response and meteorological events are main sources of short term change, while long term variation can be linked to seasonal differences.

Interaction is more likely occurring when river and peat water are colder and more saline, however a more complete set of data is needed to prove this.

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This material is based upon work supported by the National Science Foundation under Grant No. HRD-1547798. This NSF Grant was awarded to Florida International University as part of the Centers of Research Excellence in Science and Technology (CREST) Program. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.