Assessment of Water and Constituent Transport to the L31N Canal Following Two Hydraulic Alterations to Flow

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Goals

- Quantify groundwater seepage into the L31N canal to test the effectiveness of two restoration attempts (seepage barrier and one mile bridge)
- Determine an effective geochemical tracer to distinguish sources of groundwater seepage

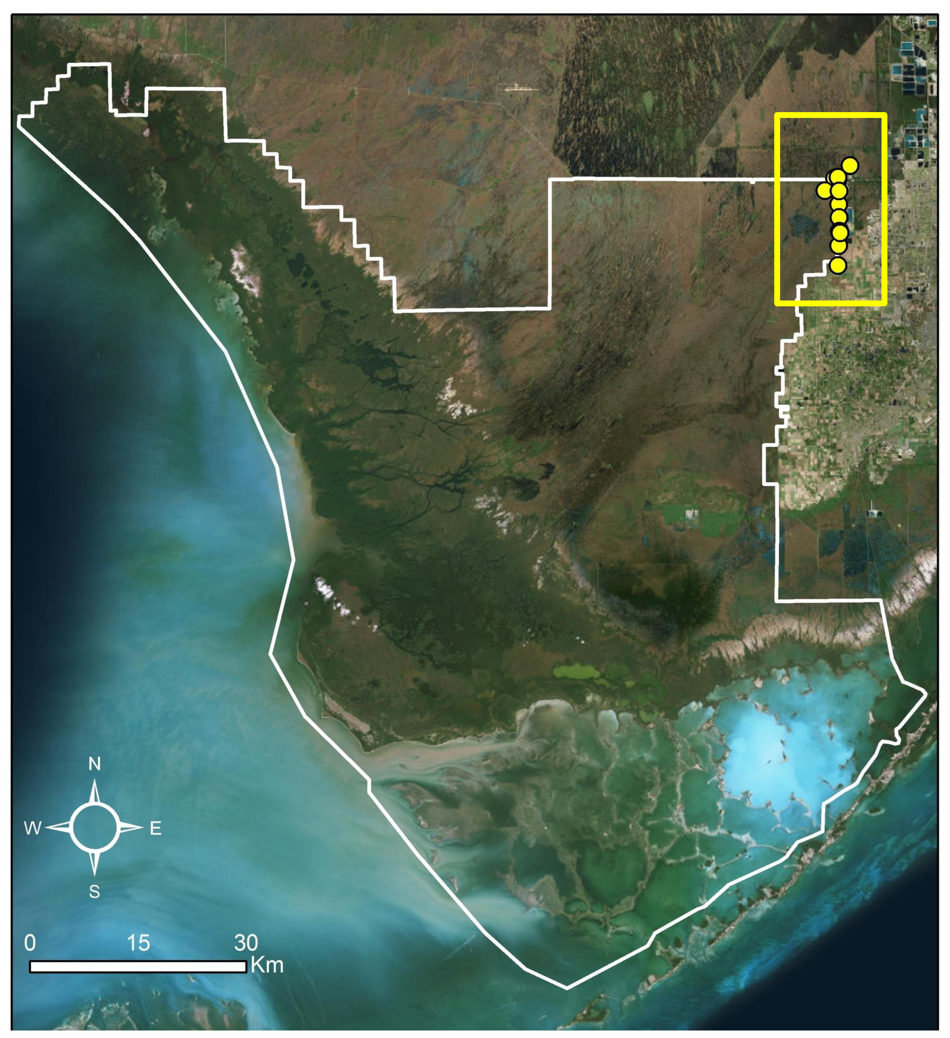

Figure 1. Study area (yellow) in relation to ENP boundary (white)

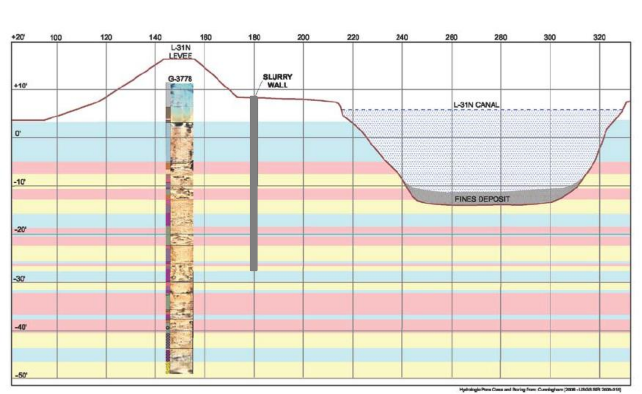

Figure 2. Seepage barrier adjacent to L31N canal

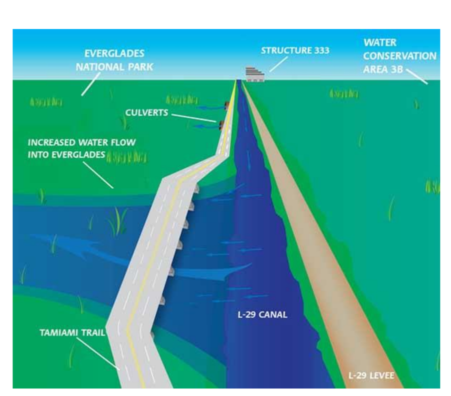

Figure 3. One mile bridge allowing water to enter ENP at northeast Shark Slough

Research Methodology

- Collect surface water and groundwater samples and analyze for geochemical constituents, including major ions and isotopes of hydrogen and oxygen

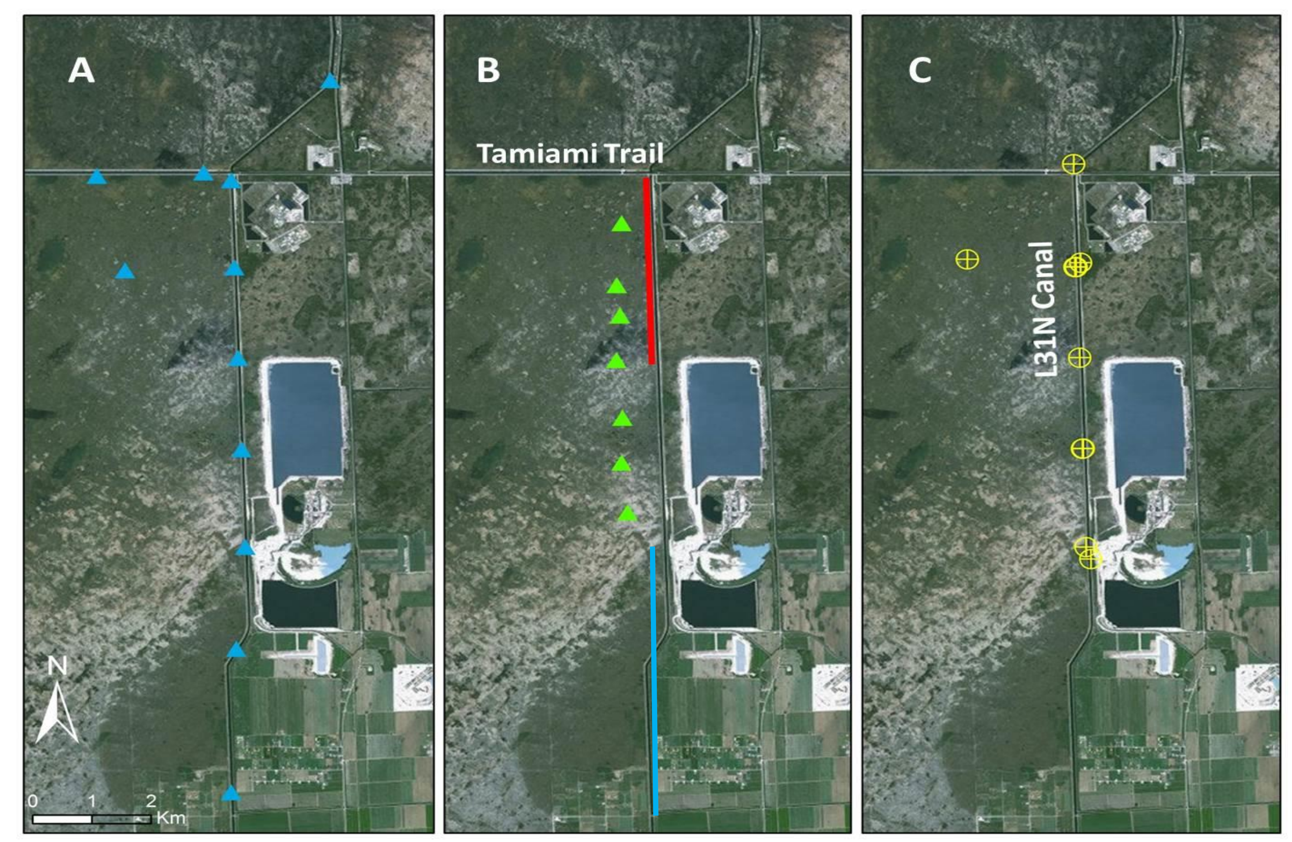

Figure 4. Study area. A) Surface water sites, B) Marsh transect sites and C) Groundwater sites. The red line in panel B represents the approximate location and extent of the seepage barrier in 2015 (red) and 2017 extension (blue)

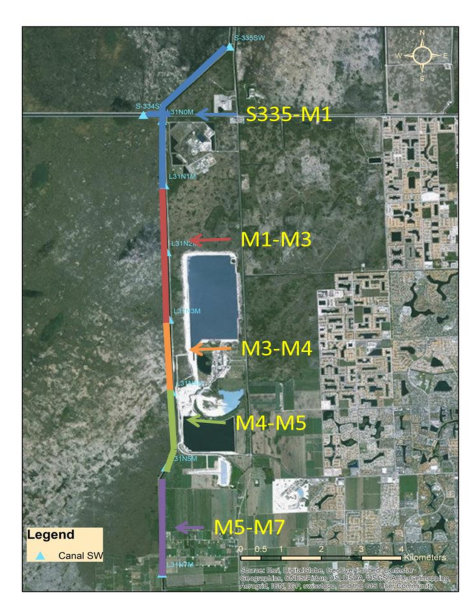

Figure 5. Canal segments where water budgets are conducted

- Use flow meter and weather tower data to conduct water budgets for canal segments.
- $P + Q_{in} - PET - Q_{out} - \Delta S = GW_{seep}$

Results

- The L31N canal contributed to groundwater recharge during the first two miles in 2015, suggesting the seepage barrier held water within the park
- South of the barrier, the canal was recharged by groundwater from ENP – barrier only partially effective

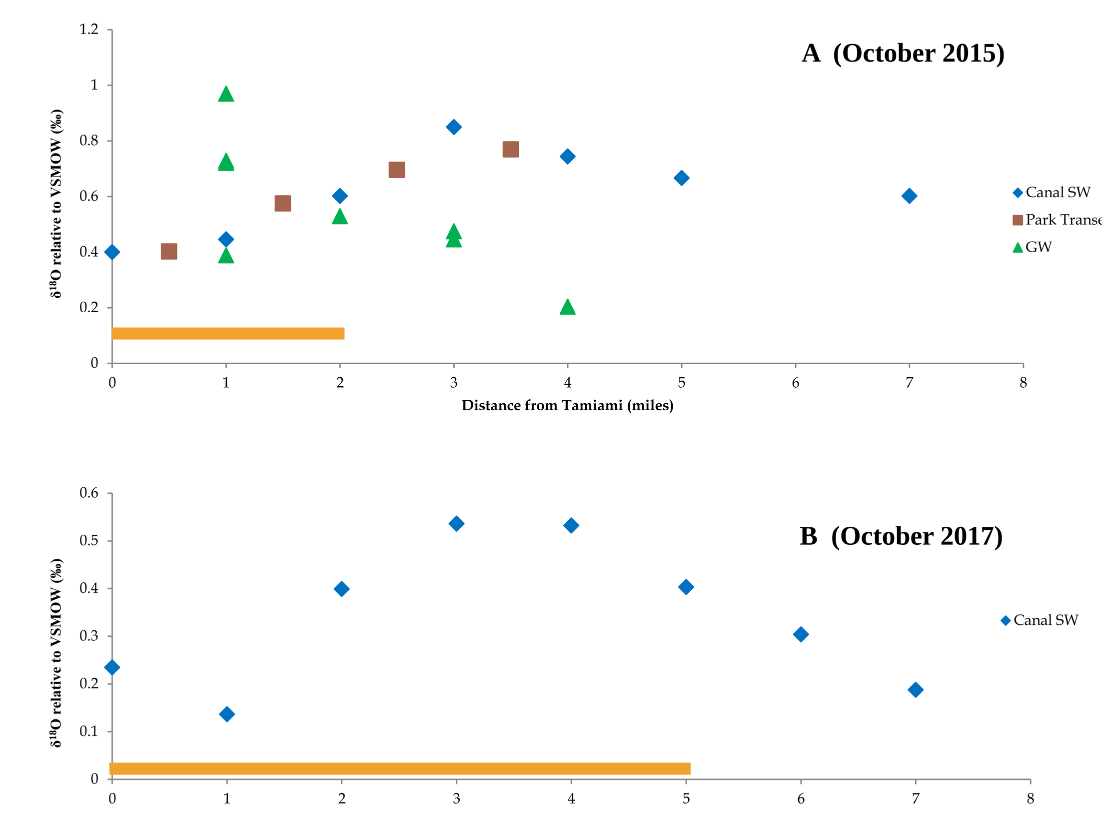

Figure 6. $\delta^{18}O$ values for sampes from A) October 2015 and B) October 2017. Orange lines represent seepage barrier length during sampling

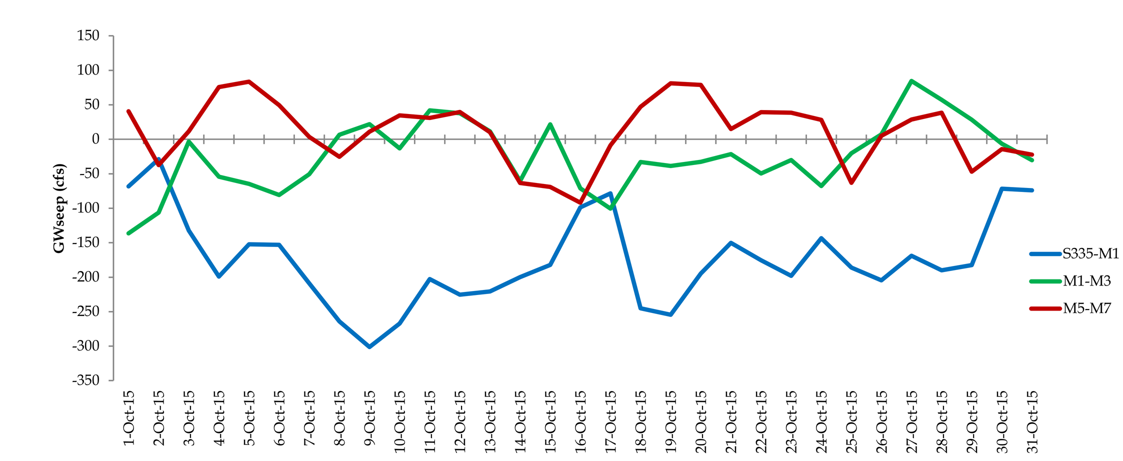

Figure 7. Calculated groundwater seepage values from three canal segments in cubic feet per second. October 2015. S335 to Mile 1, Mile 1 to Mile 3 and Mile 5 to Mile 7. (Figure 5)

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