

Detecting and Identifying Water Contaminants Unique to Specific Sources in the Environment: assessing provenance

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Goals

- Generate a combination of physical and chemical database of water from various locations in South Florida.
- Find a unique parameter(s) so specific to a water source that the water can be traced in a conservative manner.
- Provide a comprehensive characterization of the two end members in each system.
- Understand the difference between baseline and event conditions using statistical variability
- Provide a mixing model that will explain the contribution of each source to the observed localized conditions in order to evaluate the contribution of the urban or managed environment to the freshwater and saltwater endmembers.

Research Methodology

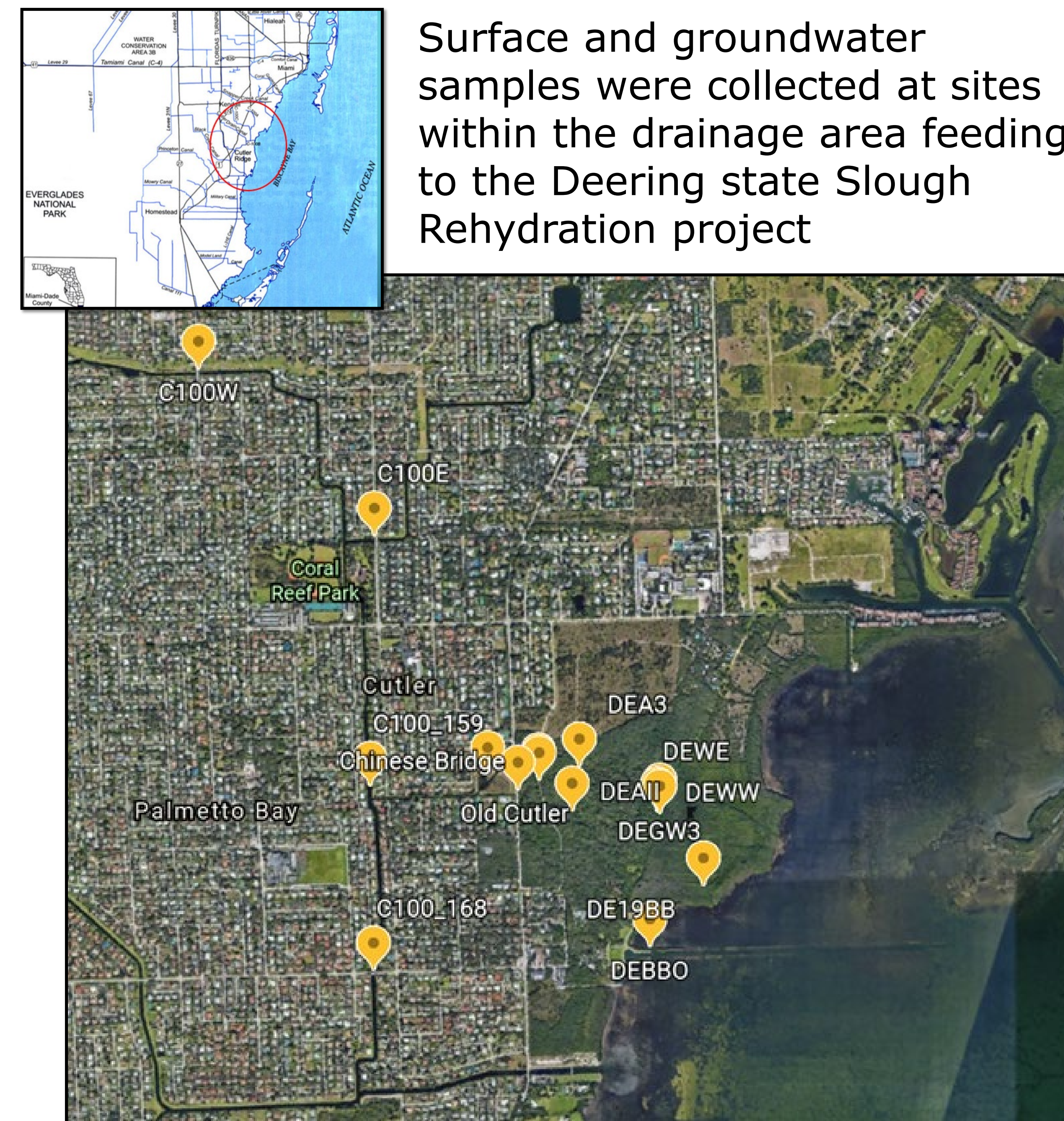
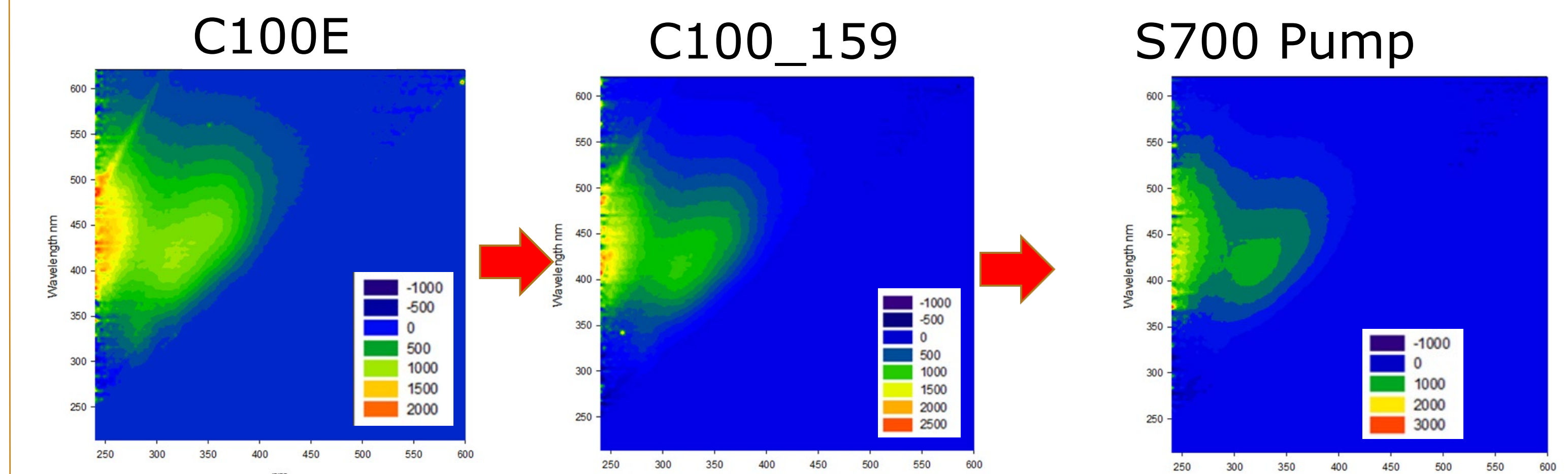


Figure 2: Sampling sites of Deering Estate Project

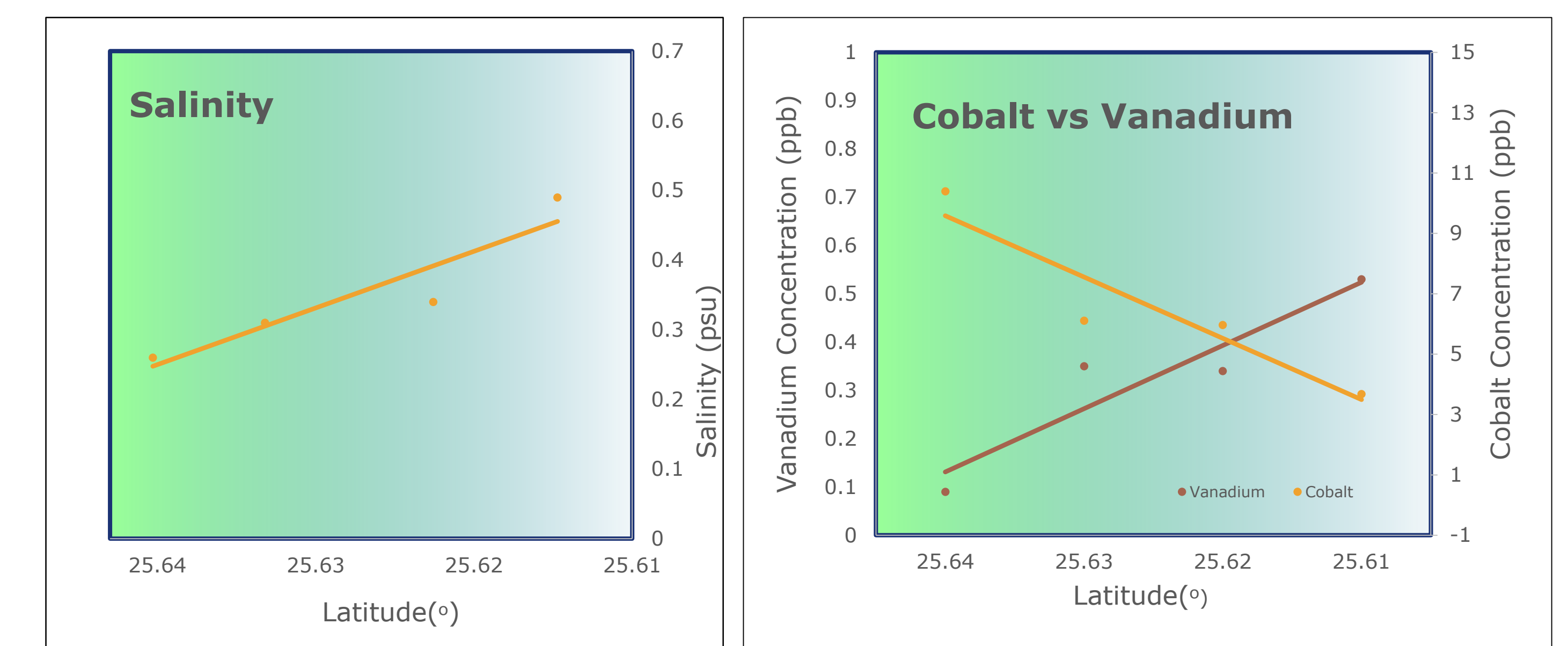
Samples were characterized for common water quality parameters (field collected) and analyzed for a suite of indicators that could be used to assess provenance and environmental changes.

- Nutrients – Major, minor and trace elements – Sucralose – Human derived tracers – Optical properties (absorption and fluorescence)

Results



Site Name	Sucralose Concentration (ng/L)	Site Name	Sucralose Concentration (ng/L)
C100W	625	DEAII	312
C100E	758	DEA3	427
C100_159	657	DEGW3	266
C100_168	367	DEWW	212
Old Cutler	478	DEWE	212
S700 Pump	508	DE19BB	207
GWW2	219	DEBBO	64.8
Chinese Bridge	265		



- The initial findings show a transition between the canal watershed and the receiving estuarine lagoon
- Salinity seems to be a good conservative indicator of mixing
- The concentration of Splenda indicate a canal system impacted by human-derived sources
- Some elements could be further explored as indicators of provenance (Cobalt and Vanadium)



Figure 1. Thermo Q-Exactive Orbitrap.



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