Model Lands and Saltwater Intrusion

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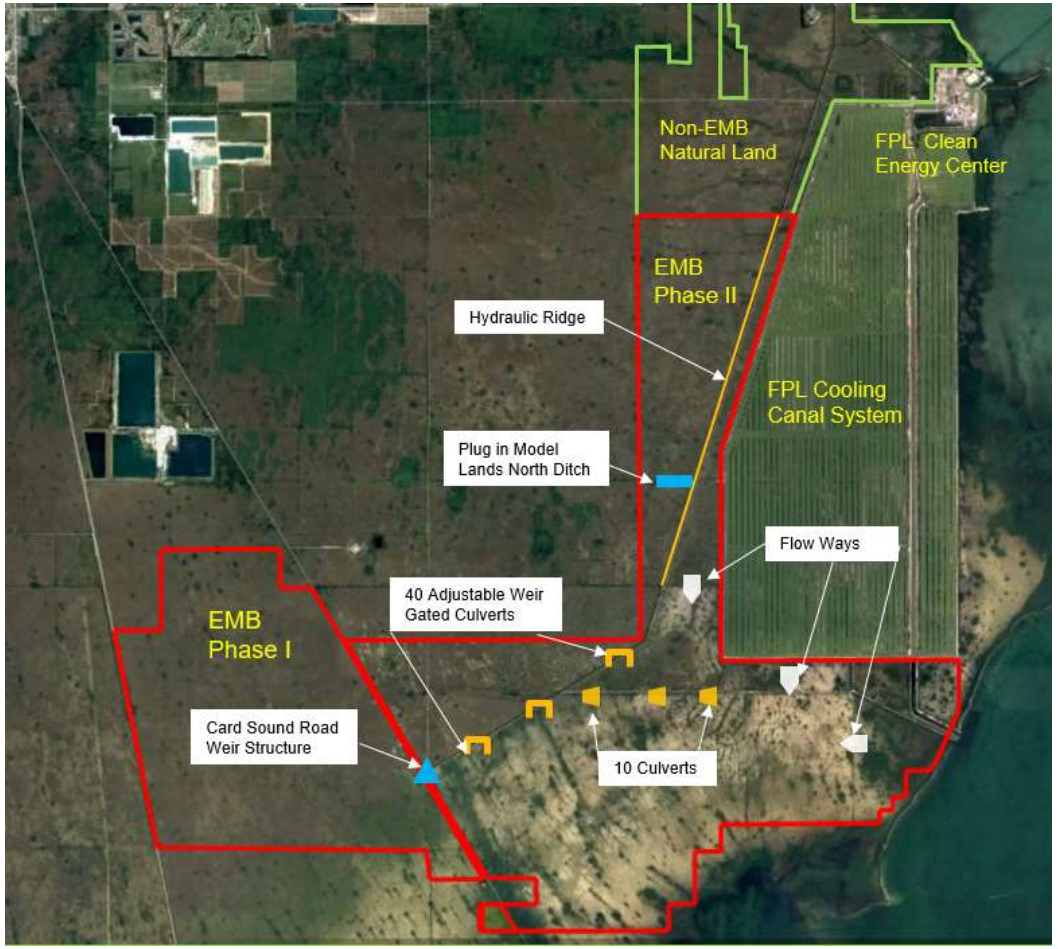
FPL's Role in the Model Lands Basin

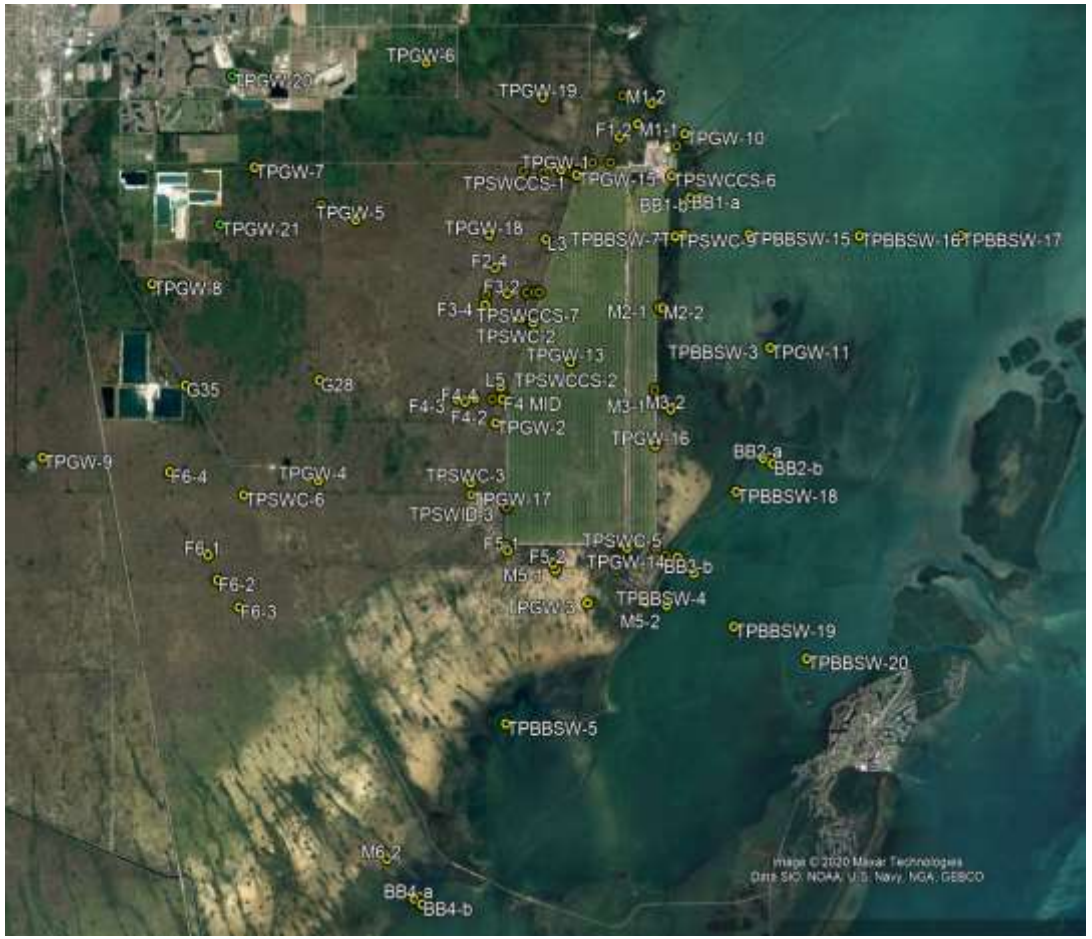
- **Largest land owner in the basin**
- **Turkey Point Clean Energy Center**
  - Over 2800 MW generating capacity serving 900,000 homes in MD and south Broward counties
- **Environmentally Sensitive Lands**
  - Restoring and preserving over 15,000 acres of fresh and marine wetlands including the Everglades Mitigation Bank
- **Largest source of hydrologic, water quality & ecologic data in the Model Lands region**



FPL maintains the most extensive groundwater, surface water and ecological monitoring network in the region

FPL Turkey Point Monitoring Network

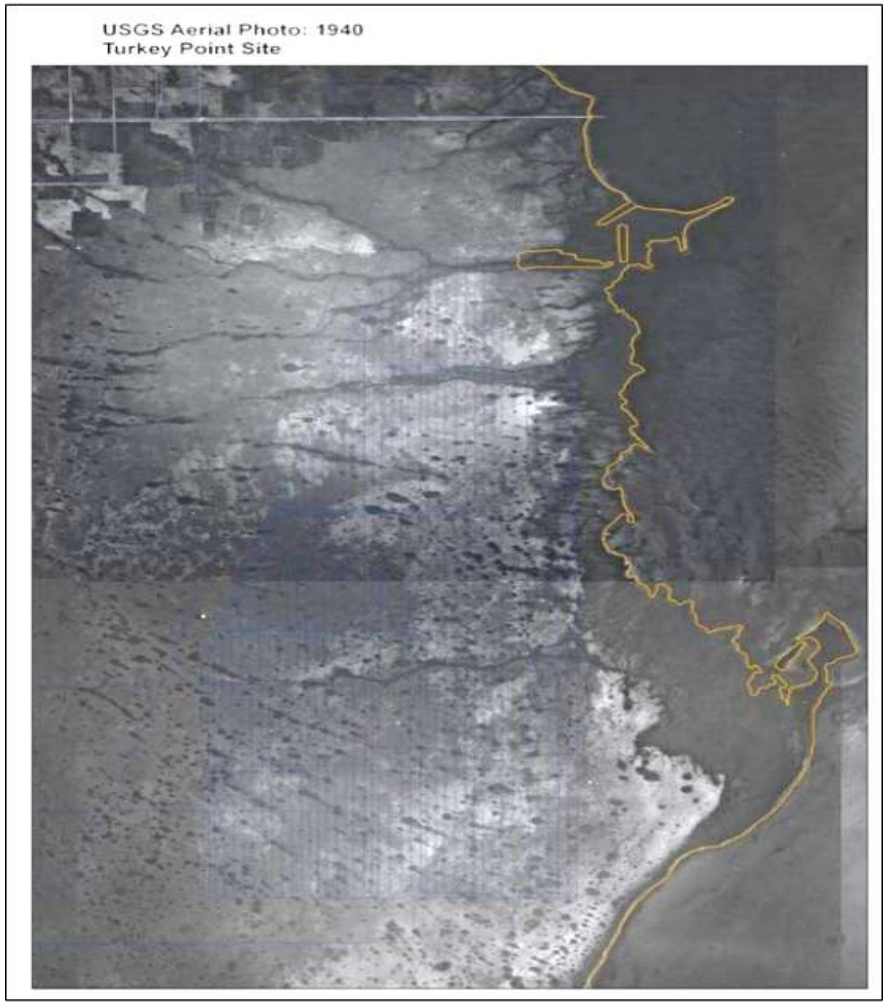
- 66 GW monitoring wells located at 26 sites in Basin, CCS and Bay
- 33 SW sites (44 stations) located in the Bay, canals, CCS and ID
- 46 ecological sites located in Bay, marsh and mangrove
- Automated hourly, quarterly analytic
- QAPP based QA/QC program
- Over 4.5 million data values per year



Low lying, tidal impacted for miles inland, the Model Lands has been extensively underlain by saltwater continuously

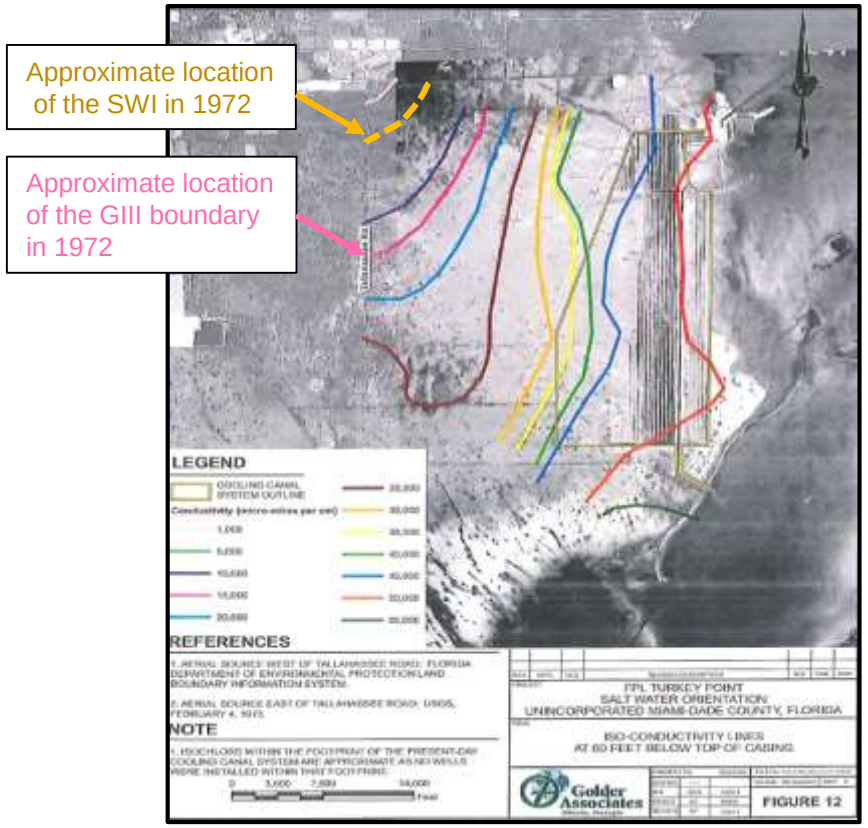
Model Lands Physiography: Prone to SWI from the start

- **Basin located south of the Coastal Ridge**
  - Low flat land with elevations less than 4 feet NGVD
- **Tidal creeks provided drainage and path for saltwater incursion**
- **‘White zone’ coastal characteristics 2.5 miles inland**
- **Marl soils supported sparse stunted sawgrass and tree island communities**

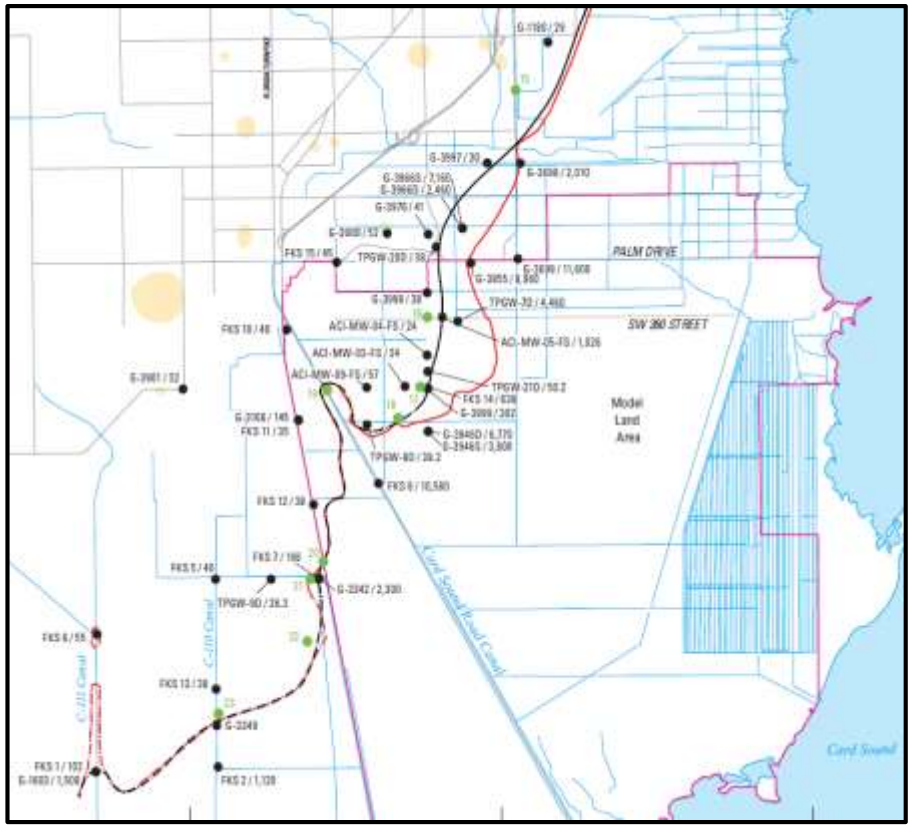


Saltwater interface has moved inland about 1.5 miles along Palm Drive since 1972

1972 Pre-CCS 60 ft. Conductivity



2018 Aquifer Base 1,000 mg/L Cl

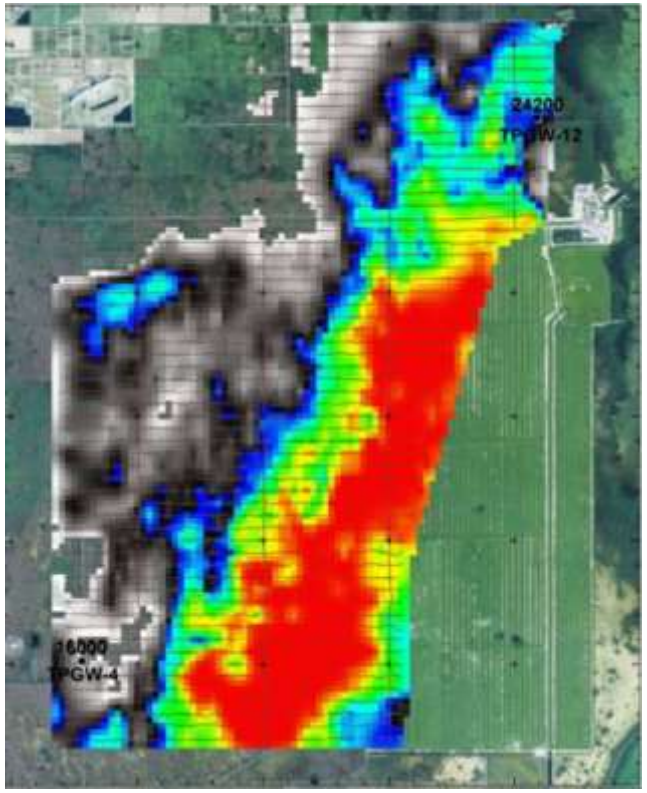


Rate of inland SWI movement is currently declining but this could change as sea level continues to rise at a rapid rate

FPL conducted apportionment solute transport modeling in 2018 to assess contributing factors to saline GW migration

Factors Effecting Landward Movement of the SWI

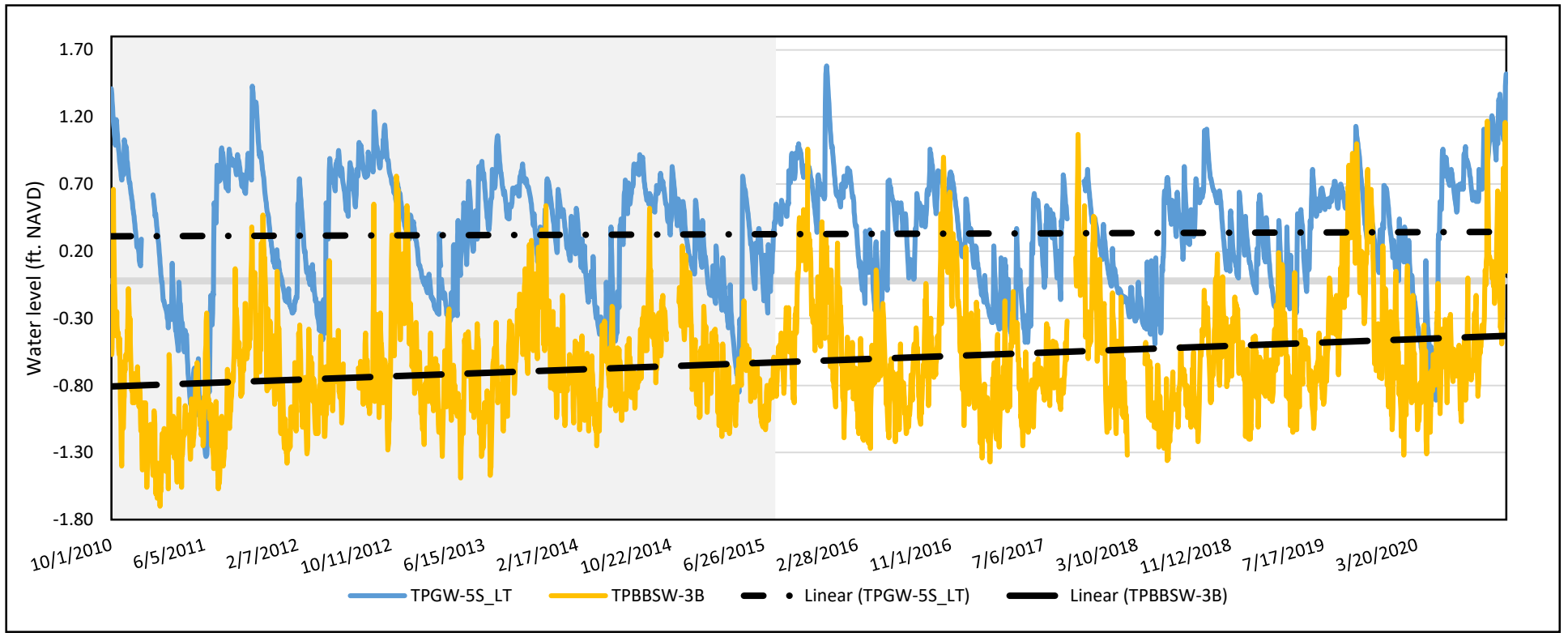
- **FPL CCS hypersaline groundwater**
  - 15 mgd remediation began in 2018
  - 22% reduction in plume Year 1
- **Sea level rise**
- **Drainage/ flood control**
- **Land use changes**
- **Climate/droughts**



FPL is remediating the CCS hypersaline plume, however other causes of saltwater intrusion continue unabated

Bay elevations increased 4 inches in 10 years while groundwater levels remain relatively stable

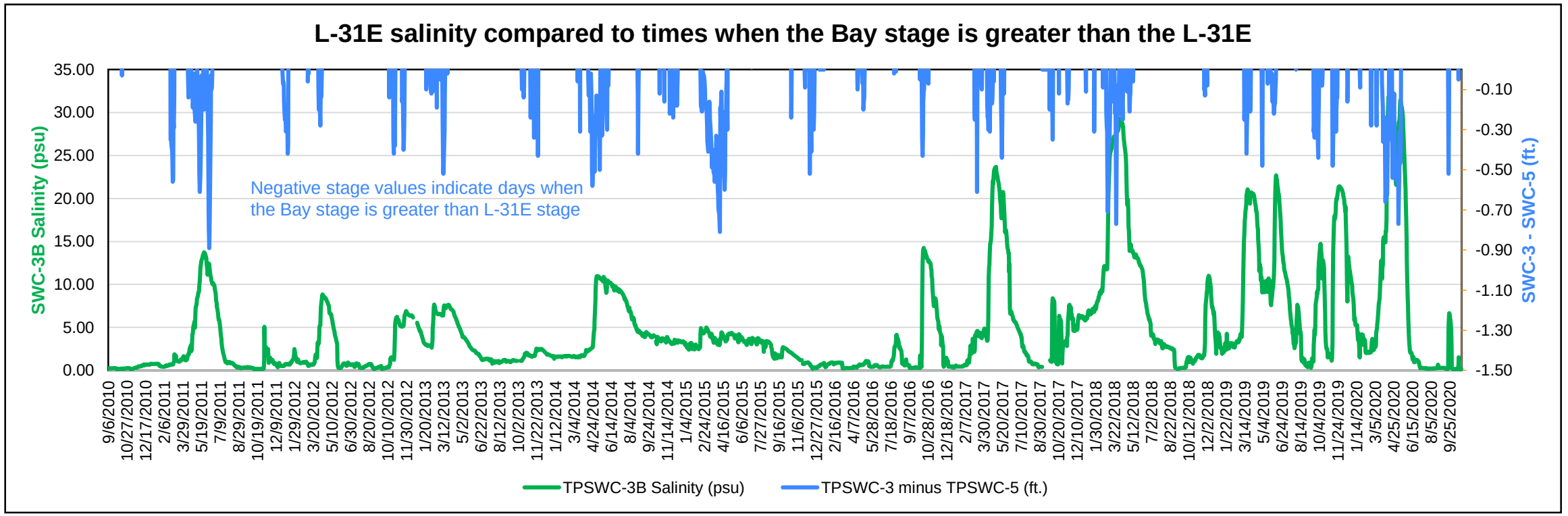
Vulnerability to Coastal Saltwater Intrusion Increasing



Bay stages > GW elevations over 8% this past year (2019-2020) vs 1.3% in in 2010-2011: GW < 0.5 ft. above Bay stage 24% of the time

L-31E canal salinity levels increases when Bay stages are higher than L-31E canal stage

Relationship Between L-31E Salinity and Bay Stage



Frequency and duration of sea water encroachment into L-31E canal is increasing as Bay stage increases

Managing hydrology in the Model Lands needs to consider unintended impacts to saltwater migration, ecology and land use

Summary

- **Model Lands Basin is uniquely susceptible to saltwater intrusion**
- **FPL is retracting the hypersaline plume and its impact on SWI**
  - over 12.5 billion gallons of hypersaline GW removed; plume size is reducing
- **Sea level rise is impacting the L-31E and basin groundwater resource**
  - Four inches in last 10 years; Bay water incursions are increasing in frequency and duration
- **Increasing water elevations eastward of the SWI has the potential to increase inland migration of saline groundwater**
  - Solute transport modeling is necessary to prevent unintended consequences