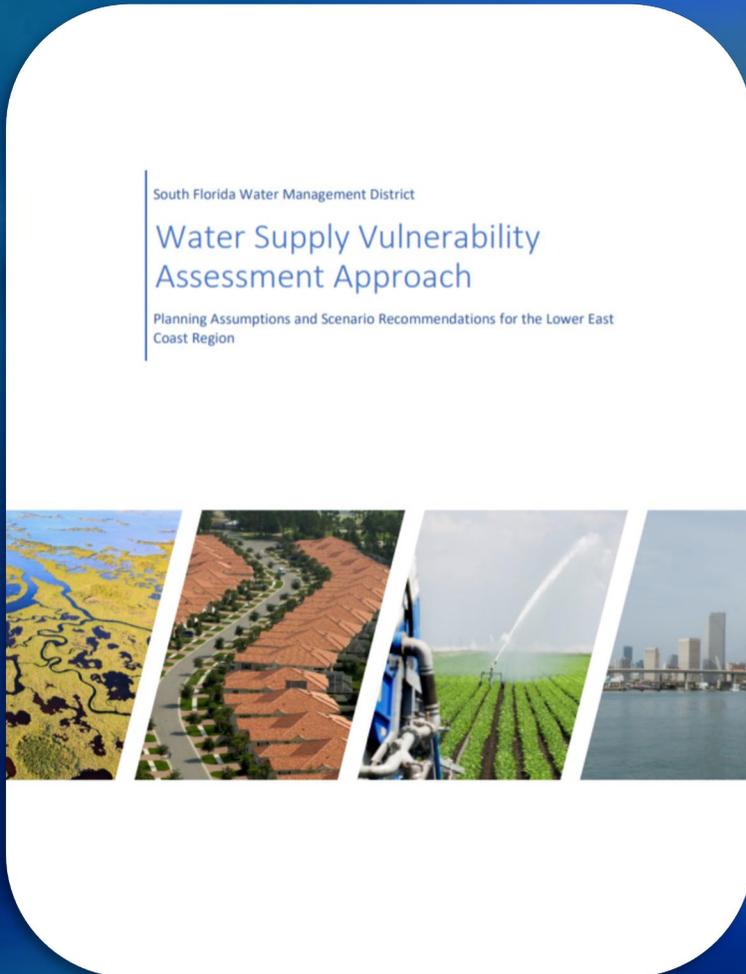




Water Supply Vulnerability Assessment for Florida's Lower East Coast Planning Region

Anushi Obeysekera
9th University of Florida Water Institute Symposium
February 20, 2024

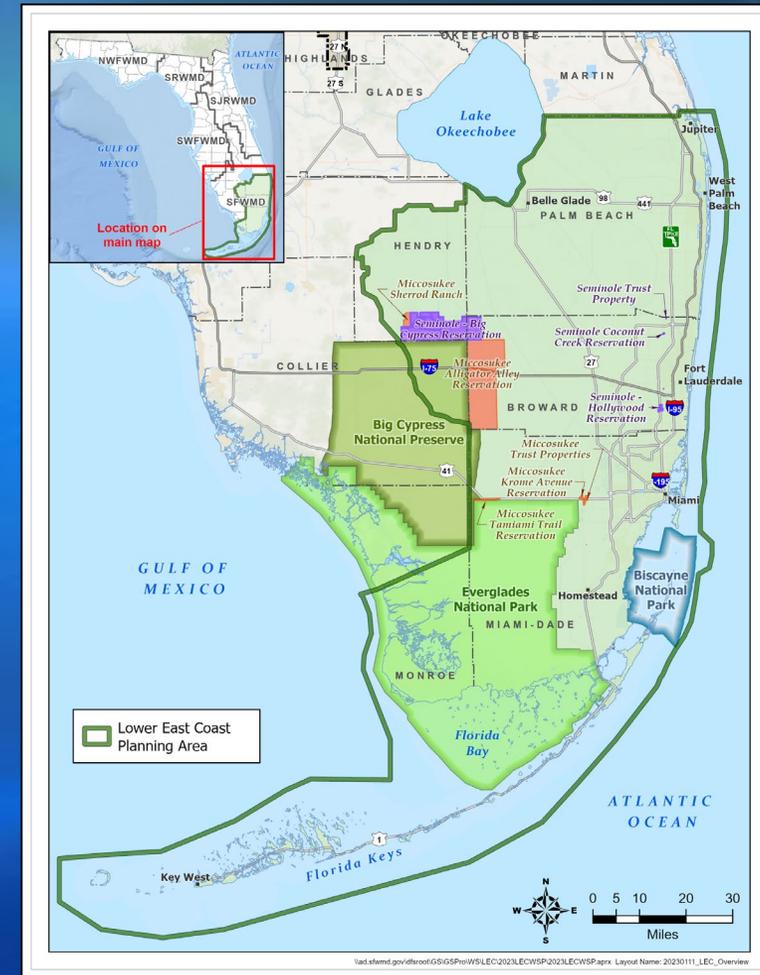
Executive Summary



- Lower East Coast has a population of 6.2 million people
- 50-year planning horizon
- Looking at increase in water supply, climate change and sea level rise
- Scenarios will use East Coast Surficial Model, a density dependent SEAWAT groundwater model

Lower East Coast Planning Region

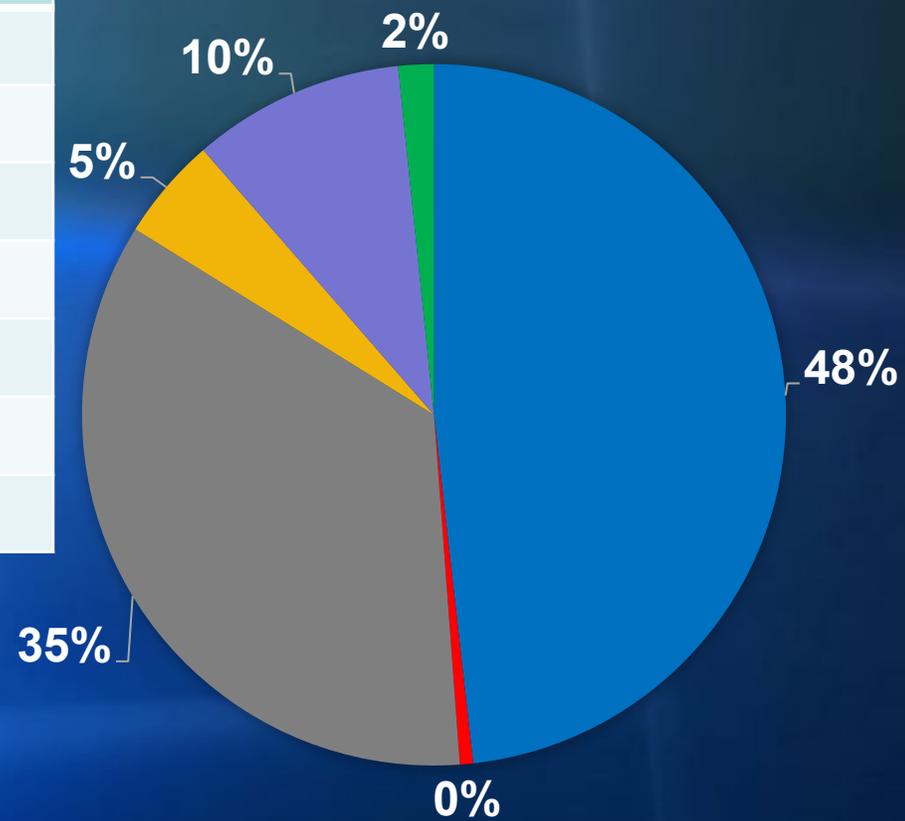
- Includes:
 - Palm Beach, Broward, Miami-Dade, part of Monroe County, and part of the eastern portions of Collier and Hendry counties
 - Seminole Tribe of Florida reservations and Miccosukee Tribe of Indians of Florida reservations
- Population:
 - 2021 6,222,707
- Major agricultural industry
- Significant environmental features



Water Supply in the Lower East Coast

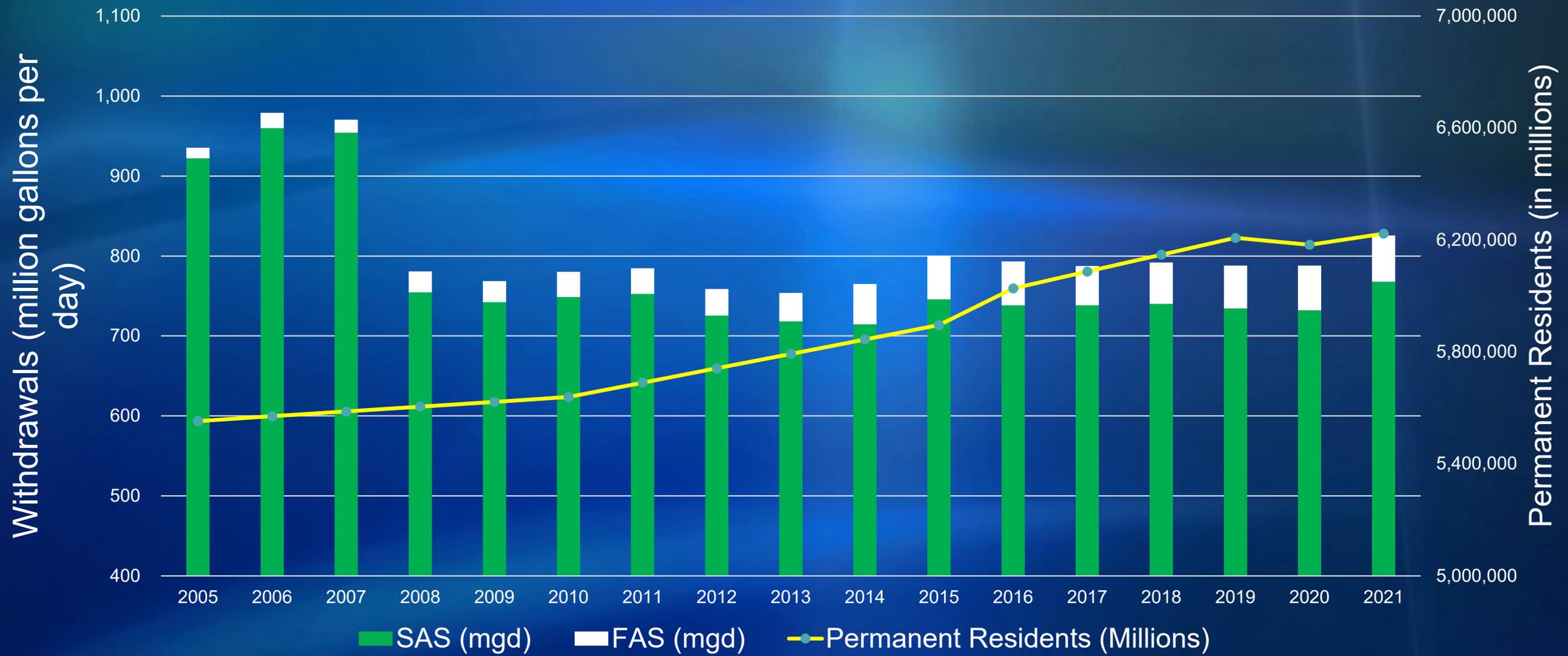


Water Use Category	2021
Public Supply	887.67
Domestic Self-Supply	11.15
Agriculture (i.e., crops, livestock, and aquaculture)	645.20
Commercial/Industrial/Institutional	87.35
Landscape/Recreational	179.45
Power Generation	29.98
LEC Planning Area Total	1,840.80

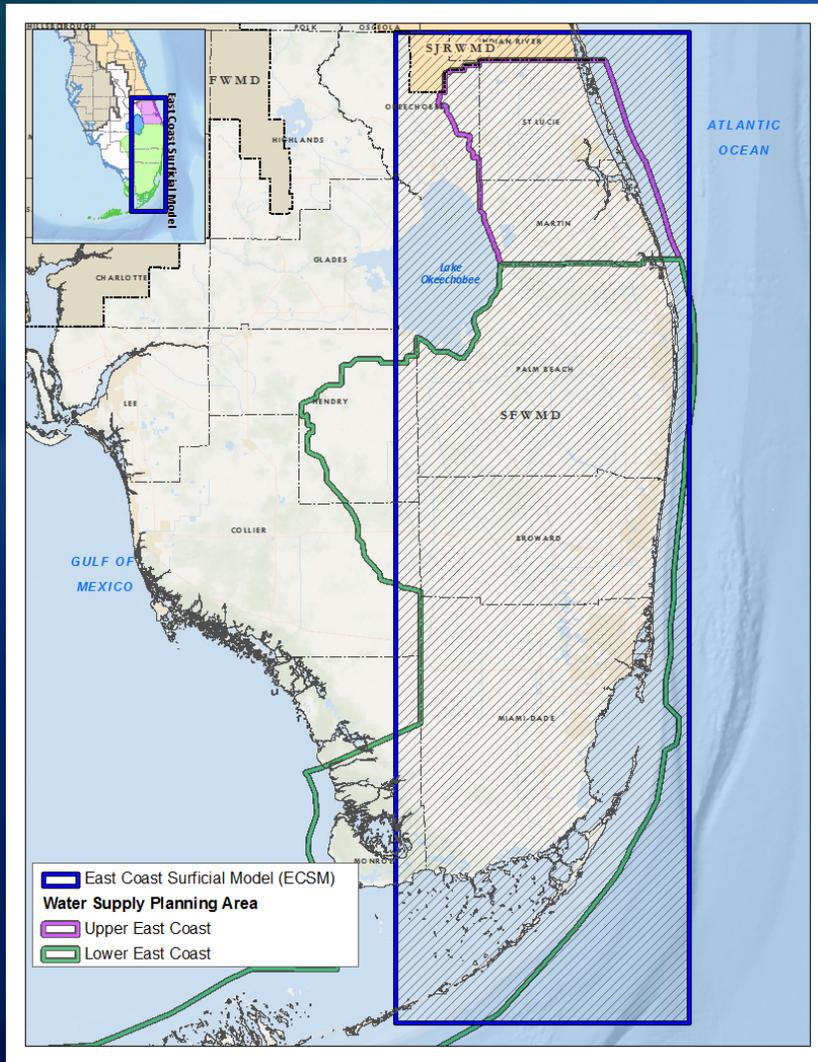


Demands in million gallons per day.

Public Supply Groundwater Use



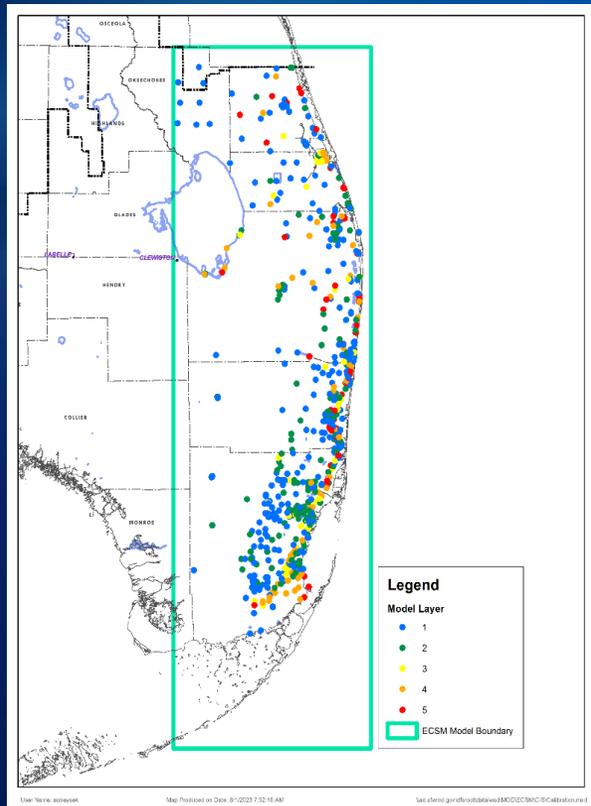
East Coast Surficial Model



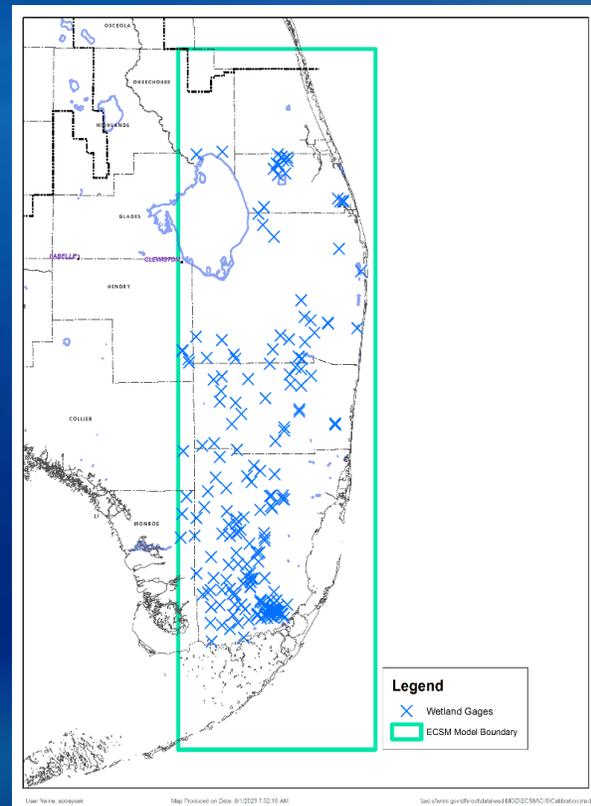
- SEAWAT (USGS Computer Code modified by SFWMD)
- Calibration Period of Record: 1985 – 2012, Verification Period of Record: 2013 – 2016
- Cell size: 1,000 ft x 1,000 ft
- 5 model layers that represent the Surficial Aquifer System, including the Biscayne Aquifer
- Calibrated to water levels (daily), water quality (Total Dissolved Solids [TDS]) mg/L (monthly), and structure flows (30-day rolling average)

ECSM Calibration Locations

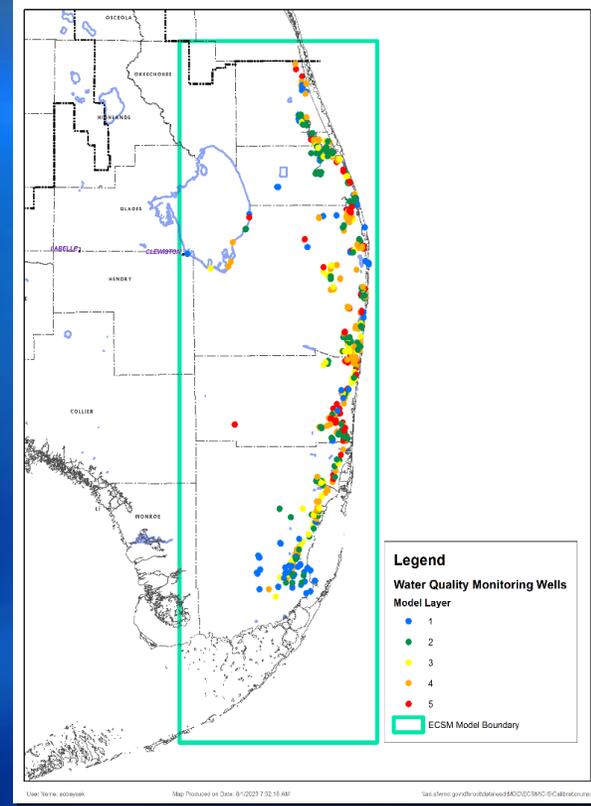
1037 Groundwater Monitoring Wells



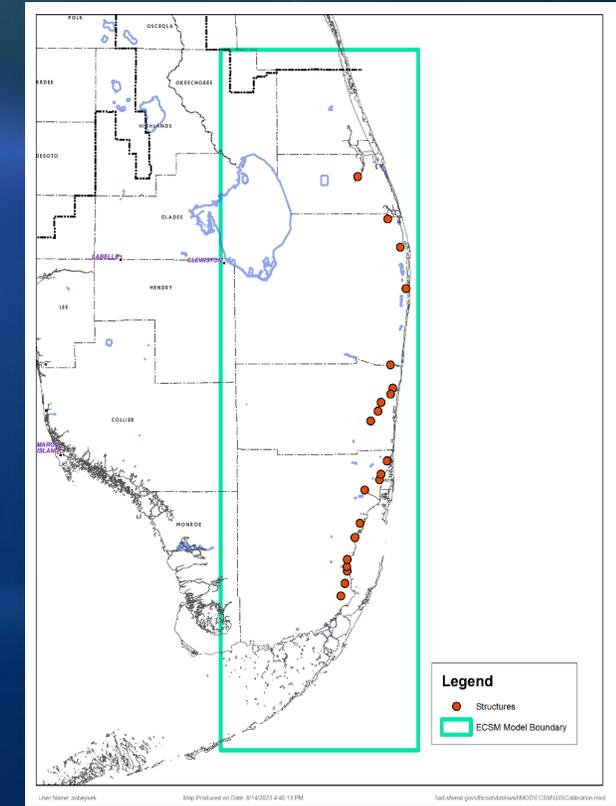
198 Wetland Gages



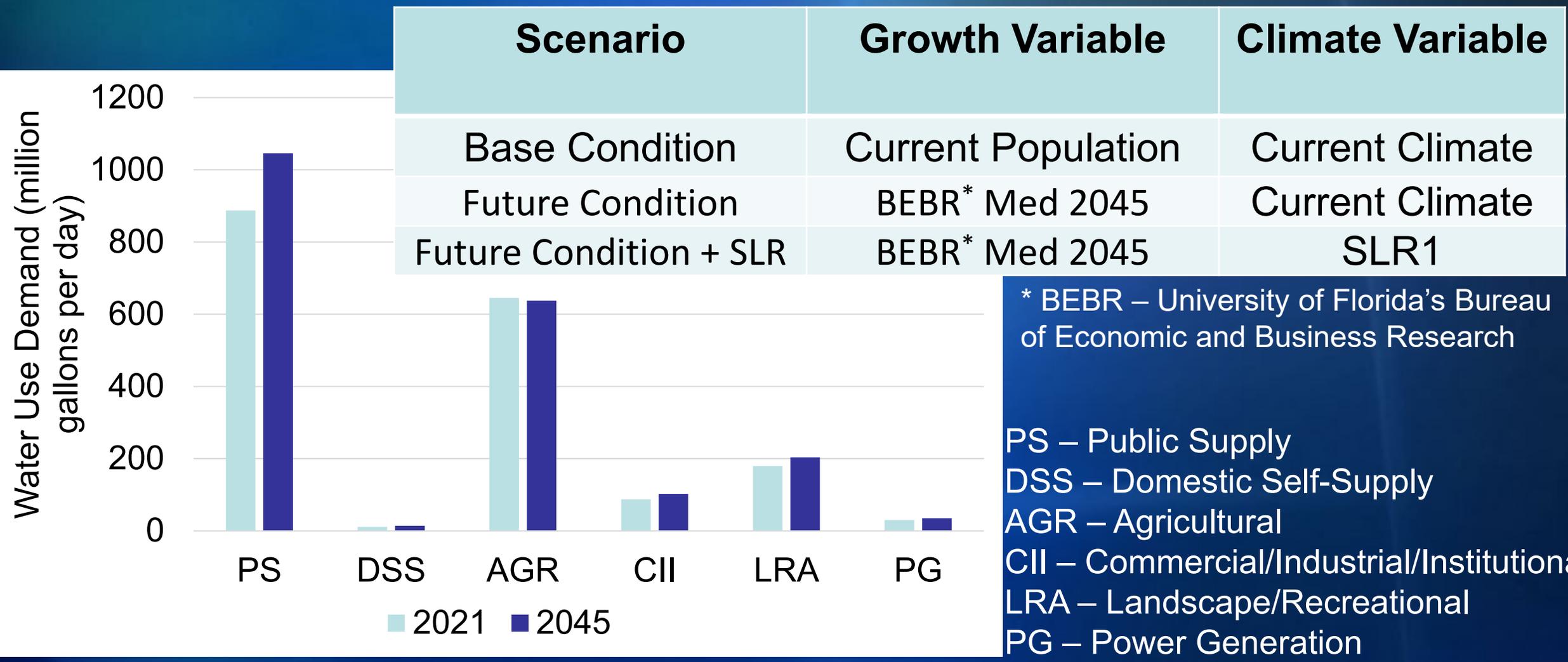
919 Water Quality Monitoring Wells



20 Surface Water Structures



Lower East Coast Water Supply Plan



Water Supply Vulnerability Assessment Scenarios

Scenario Runs	Growth Variable	Climate Variable
	Current Population	Current Climate
	BEBR Med 2075	Current Climate
	BEBR Med 2075	SLR1
	BEBR Med 2075	Warmer and Drier
	BEBR Med 2075	Warmer, Drier, & SLR1
	BEBR Med 2075	Hot, Driest, & SLR2

BEBR – University of Florida’s Bureau of Economic and Business Research

50-year Water Supply Demand Projections

Public Supply

- Population = BEBR Med 2075
- Demand = Per Capita Use Rate for 50 years

Domestic Self-Supply

- Population = BEBR Med 2075
- Demand = Per Capita Use Rate for 50 years

Agricultural

- Projected agricultural acreages will remain consistent with the 2045 projections. AFSIRS will be utilized to determine irrigation demands.

Landscape/Recreational

- Water use demands will increase proportional to population

Commercial/Industrial/Institutional

- Scenario runs will utilize 2045 Water Supply Plan demands

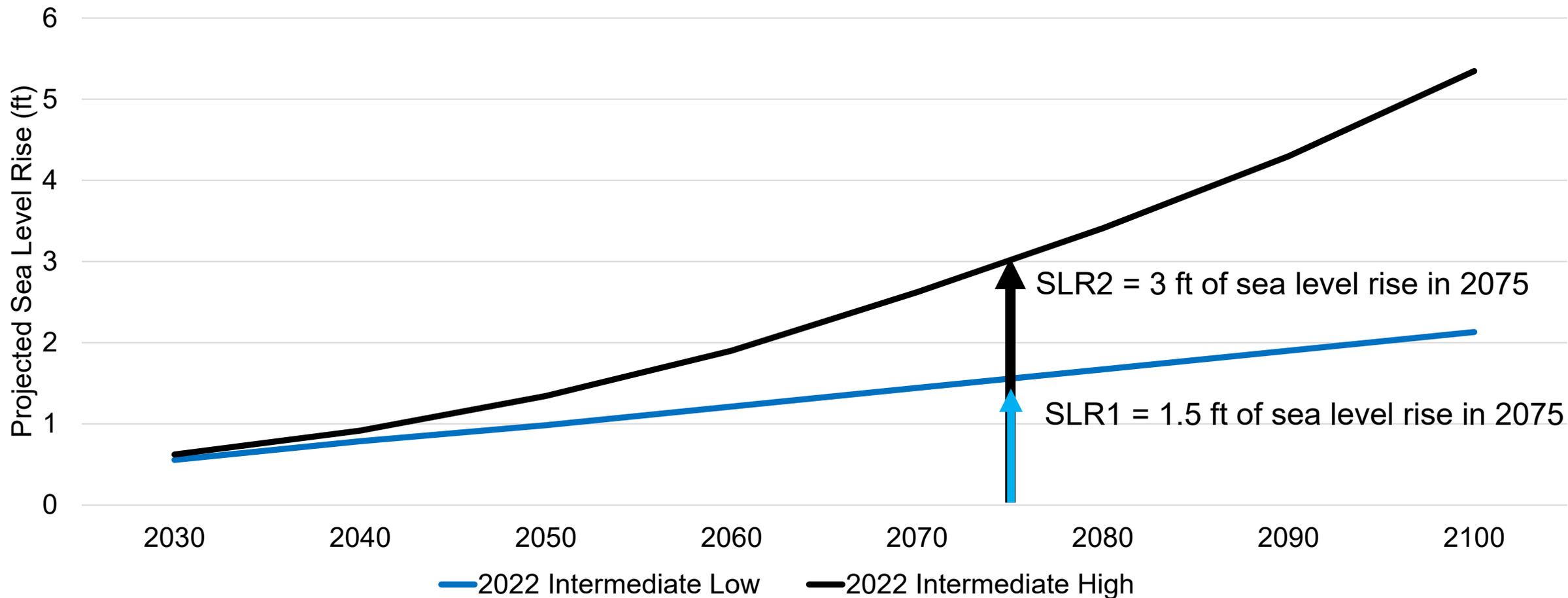
Power Generation

- Scenario runs will utilize 2045 Water Supply Plan demands

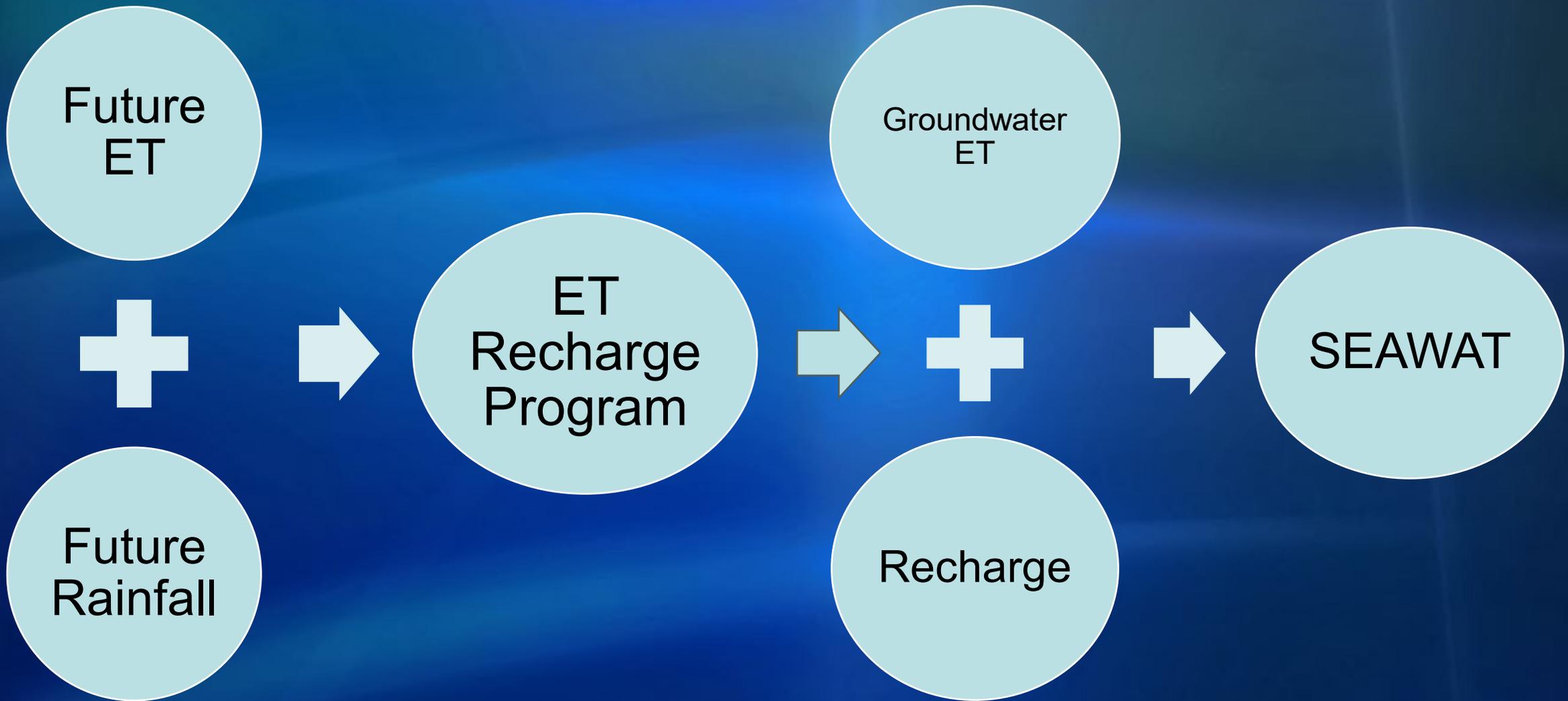
AFSIRS – Agricultural Field-Scale Irrigation Requirement Simulation

Sea Levels in 2075

2022 NOAA Sea Level Rise Projections – Key West



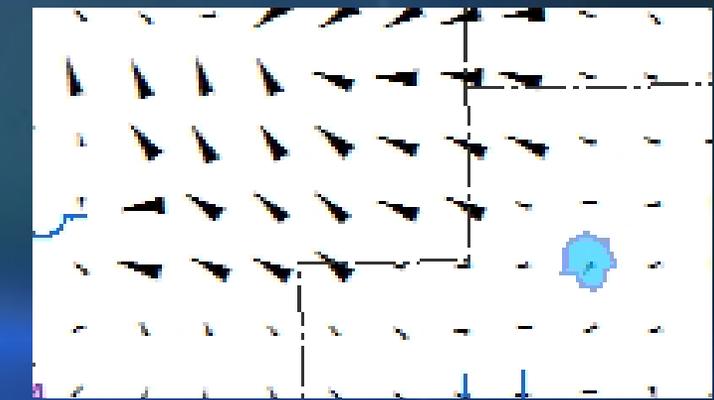
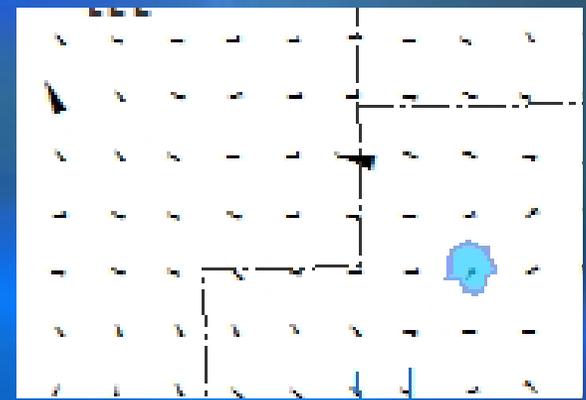
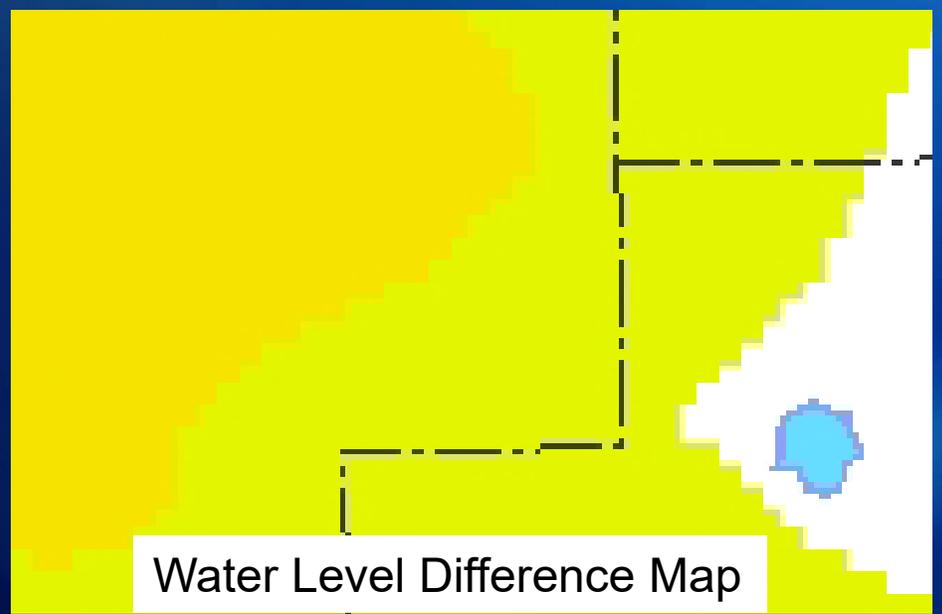
Climate Conditions



Sample Model Analysis

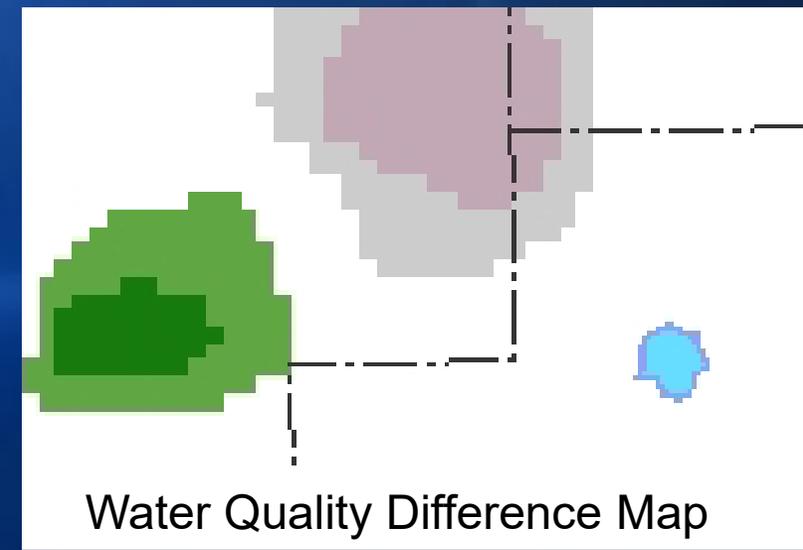
Differences between model scenarios are compared to each other to look for impacts

Future water levels – Current water levels = Water Level Difference Map



Flow vectors from different scenarios are compared to each other

Future water quality – Current water quality = Water Quality Difference Map





Discussion