Environmental Measures Team

Class 1 Wetland Assessment Results

WRAT Meeting
August 9, 2018

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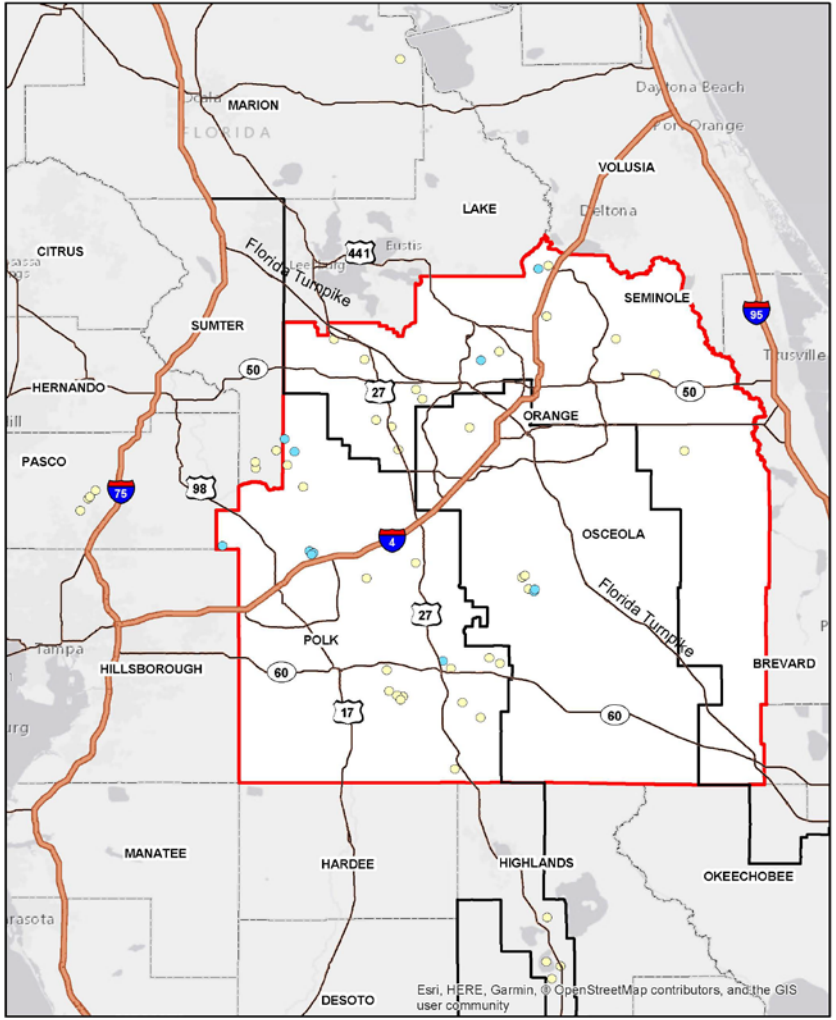
Introduction

- EMT tasked to develop a list of potential options for wetlands/lakes analyses for the 2020 CFWI RWSP
- Approved Option: Statistical analysis using expanded EMT dataset along with the updated ECFTX model
- Expanded EMT dataset includes 44 Class 1 wetlands and 11 new Class 1 wetlands
- First task: Assess current stress status of 44 Class 1 wetlands used in previous analysis, as well as 11 new Class 1 wetlands

Revised Methodology

- Revised form
- Joint field day
- Small number of expert wetland scientists



Results of Assessments

- 55 wetlands/lakes assessed in Spring 2018
- Stress status of 11 of 44 Class 1 wetlands (25%) changed since original evaluation

Results of Assessments

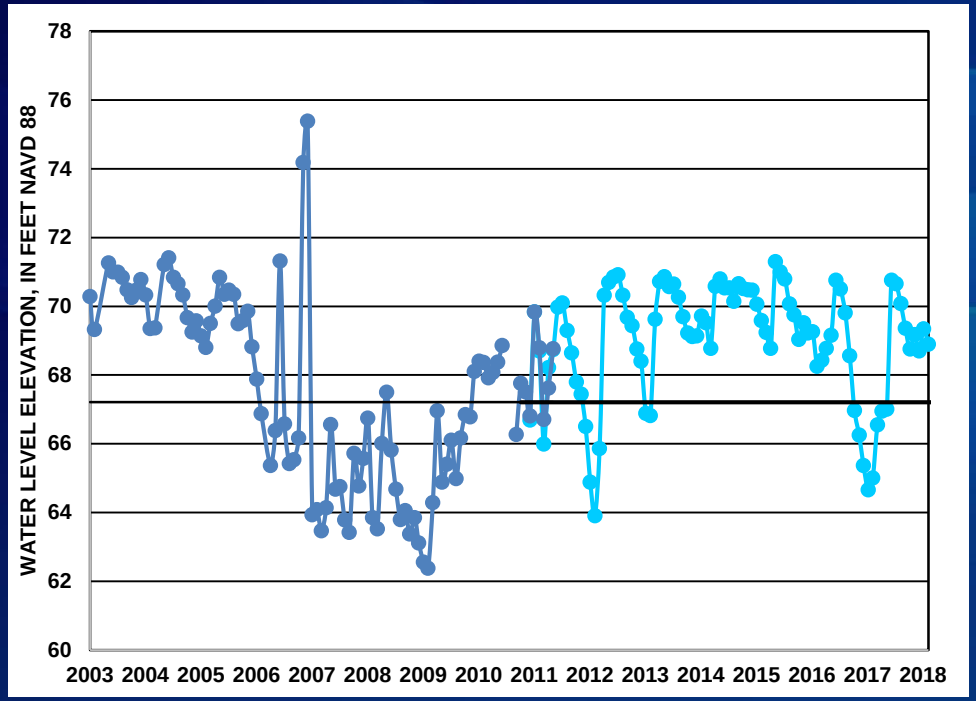
- Five Plain wetlands changed from Stressed to Not Stressed
  - Tibet Butler, Lake Gem, Island Lake, Cypress Creek E Marsh, Cypress Creek W33
- One Plain lake changed from Not Stressed to Stressed
  - Lake Sylvan
- Four Ridge wetlands changed from Stressed to Not Stressed
  - Lake Wales, Big Gum Lake, Polecat Lake, Crooked Lake
- One Ridge lake changed from Not Stressed to Stressed
  - Gator Lake

Reasons for Change in Stress Status

- Five Plain wetlands and Four Ridge wetlands changed from Stressed to Not Stressed
  - Change in definition of stress (e.g., historical impacts considered in original evaluation)
  - Recovery due to reduced wellfield pumping
  - Field inspection indicated no hydrologic stress and increased water levels in recent years
- One Plain lake and one Ridge lake changed from Not Stressed to Stressed
  - Field inspection indicated hydrologic stress

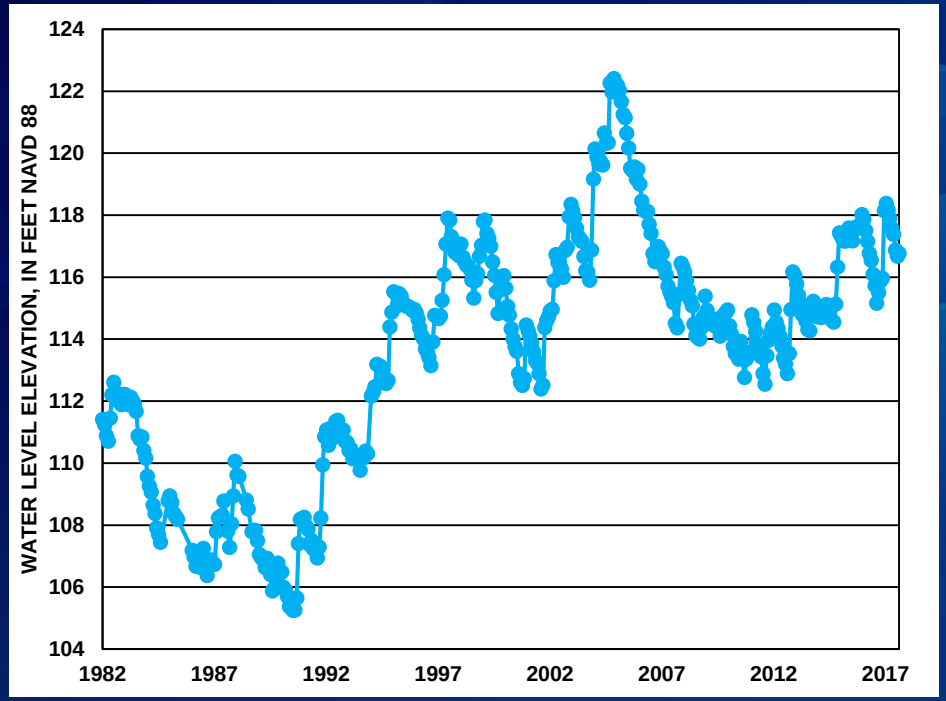
Example of Plain Wetland That Changed From Stressed to Not Stressed

Cypress Creek E Marsh



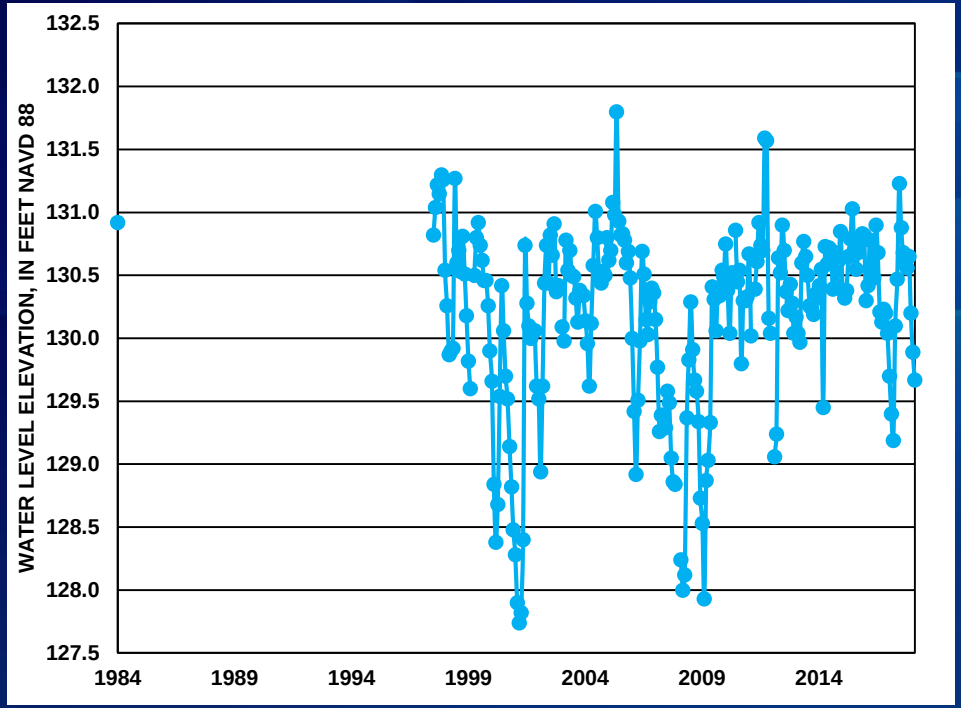
Example of Ridge Wetland That Changed From Stressed to Not Stressed

Crooked Lake



Example of Ridge Lake That Changed From Not Stressed to Stressed

Gator Lake



Results of Assessments

- 11 new Class 1 wetlands:
  - 9 Plain (8 Not Stressed, 1 Stressed)
  - 2 Ridge (Stressed)

Results of Assessments

- Original Assessment/Dataset Used:
  - 44 Class 1 Wetlands
  - 18 Plain Wetlands (10 Not Stressed, 8 Stressed)
  - 26 Ridge Wetlands (15 Not Stressed, 11 Stressed)
- Updated Assessment/Expanded Dataset:
  - 55 Class 1 Wetlands
  - 27 Plain Wetlands (23 Not Stressed, 4 Stressed)
  - 28 Ridge Wetlands (18 Not Stressed, 10 Stressed)

Summary

- Stress status of 11 of 44 Class 1 wetlands (25%) changed since original evaluation
- Change in size and distribution of dataset
  - 44 to 55 Class 1 wetlands
  - 18 Plain (10 NS, 8 S) to 27 Plain (23 NS, 4 S)
  - 26 Ridge (15 NS, 11 S) to 28 Ridge 18 NS, 10 S)

Discussion/Questions

Environmental Measures Team

Proposed Future Tasks

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August 9, 2018

Kym Rouse Holzwart
Senior Environmental Scientist
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Introduction

- EMT met in June to develop a list of tasks in support of the 2020 update of the CFWI RWSP
- EMT tasked to develop a description of two tasks for which assistance is needed
- Will develop a full Scope of Work for EMT's path forward once task descriptions are finalized and approved

Proposed Task 1: Determination of Period of Record of Water Level Data for Class 1 Wetland Analysis

- Period of record used for 2015 CFWI RWSP analysis: 2006-2011 (6 Years)
- **E**xpand the period of record for 2020 CFWI RWSP analysis
- Perform analysis to determine how many new years of data can be added to the period of record without causing the dataset to become non-representative

Proposed Task 1: Determination of Period of Record of Water Level Data for Class 1 Wetland Analysis

- Obtain, organize, review, and QA/QC the water level data from 2006 through 2011 for each Class 1 wetland
- For each site, add new years of data (2012, 2013, 2014, 2015, 2016, and 2017)
- Calculate the P50 and P80 after each year is added to determine how much change has occurred as a result of adding in the additional year

Proposed Task 2: Wetland Stress Analysis

- For the 2020 CFWI RWSP, the EMT's analysis of the potential impacts of future groundwater withdrawals on wetlands will include two steps based on the Class 1 wetlands dataset:
  - Analyses of Class 1 wetland water level data to compute a statistical relationship between observed stress and observed P80 water level variations. This relationship is used to estimate the probability (or risk) of future changes in stress occurring in isolated plain and ridge wetlands, based on modeled water level changes, between the reference condition and a future groundwater withdrawal scenario.

Proposed Task 2: Wetland Stress Analysis

- Perform assessment of modeled future water level changes at known wetlands in the CFWI area, and calculate the risk for wetland stress occurrence at each location. The probability of change in wetland stress status (from unstressed to stressed, or the reverse) will be calculated for each wetland, based on the risk function calculated in Step 1. The expected total area of stressed wetlands will be calculated and mapped for the CFWI area by summing the effects of water level changes and recorded wetlands throughout the CFWI area. The Groundwater Availability Team will use these tool to predict likely effects of groundwater withdrawals, as predicted by modeled water levels, on wetland resources.

Proposed Task 2: Wetland Stress Analysis

The processes to perform the analysis are as follows:

- Calculate a P80 water level (for the selected period of record) for each of the Class 1 wetlands
- Update the Class 1 wetland statistics (mean, standard deviation of P80 water levels) for each wetland group (stressed and unstressed) and each physiographic province (Plain and Ridge)
- Determine if the data are normally distributed
- Revise risk analysis equations for Plain and Ridge wetlands in order to conduct the wetland stress analysis

Proposed Task 2: Wetland Stress Analysis

- Modify the stress risk algorithm that was developed for post-processing of the ECFT model results to incorporate the updated risk statistical risk equations and for compatibility with the ECFTX model
- Post-process ECFTX model runs:
  - Calculate probable stressed and unstressed wetland acreage for each ECFTX model cell in the reference condition and calculate the probable change in stressed and unstressed wetland acreage for each ECFTX model cell under the simulated future conditions
  - Calculate probable change in total stressed wetland acreage for each model scenario, and prepare tables and maps showing the geographic distribution of projected stressed wetland acreage

Discussion/Questions