Environmental Measures Team

Potential Next Step Options

Water Resource Assessment Team Meeting
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Introduction and Background

- The EMT provides expertise concerning wetlands and surface waters within the CFWI area
- From 2008-2012, District wetland scientists, along with stakeholder representatives, evaluated hydrologic stress conditions, existing hydrologic data, and ecological conditions of hundreds of isolated wetlands and lakes within or adjacent to the CFWI area

Introduction and Background

- Wetlands/lakes classified based on amount of available information:
  - Class 1: Hydrologic stress condition known, ecologic field evaluations conducted, available long-term water level data
  - Class 2: Hydrologic stress condition known, inconsistent or no water level data
  - Class 3: Location known, hydrologic stress condition not known, no available data

Introduction and Background

- Developed methodology for determining wetland stress to correlate to hypothetical groundwater withdrawals to predict future wetland stress
- EMT's final report completed in 2013 and contribution to 2015 CFWI RWSP completed in 2014
- Since then, EMT was to convene as needed to provide assistance as requested by the various technical teams

Introduction and Background

- Asked by WRAT in late 2016 to develop scope of work to address concerns regarding the EMT dataset in support of 2020 CFWI RWSP
- First task: conduct power analysis to determine statistically valid/representative subset of 200 Class 2 wetlands to re-evaluate regarding stress status
- Results of the power analysis were presented to the WRAT in May 2017
- EMT was then tasked to develop a list of potential options for wetland evaluation for the 2020 RWSP

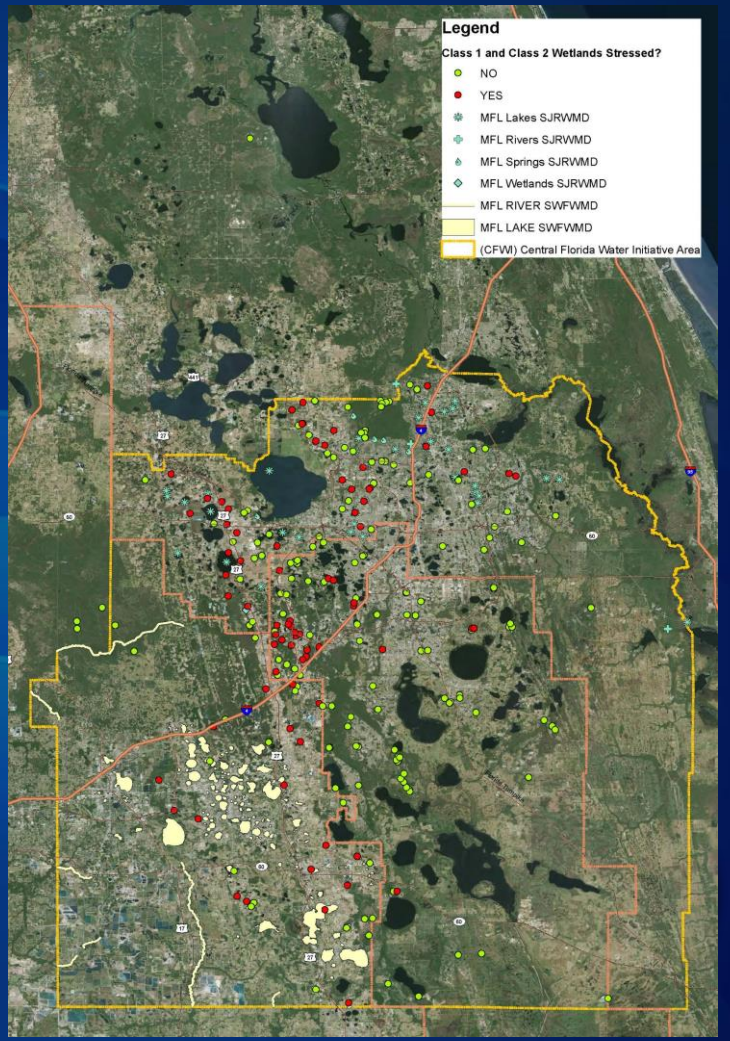
Potential Next-Step Options

- Option 1: Statistical analysis using existing EMT dataset along with the updated ECFTX model
- Option 2: Statistical analysis using expanded EMT dataset along with the updated ECFTX model
- Option 3: GIS-based analysis using Kinser-Minno type method along with updated ECFTX model
- Option 4: Some combination of the above options

Proposed Next-Step Option 1

Statistical Analysis (Used for 2015 CFWI RWSP) With Existing EMT Dataset:

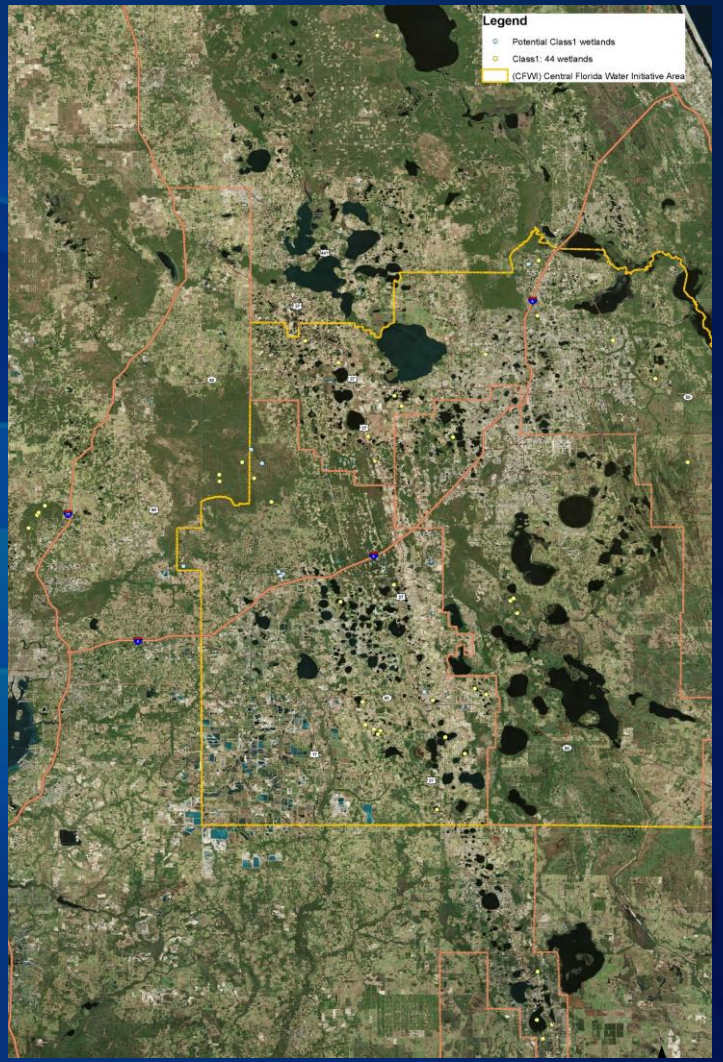
- No changes to EMT dataset
  - 44 Class 1 wetlands
  - 200 Class 2 wetlands
- Conduct analysis using original EMT dataset and updated ECFTX model runs provided by the HAT



Proposed Next-Step Option 2

Statistical Analysis (Used for 2015 CFWI RWSP) With Expanded EMT Dataset:

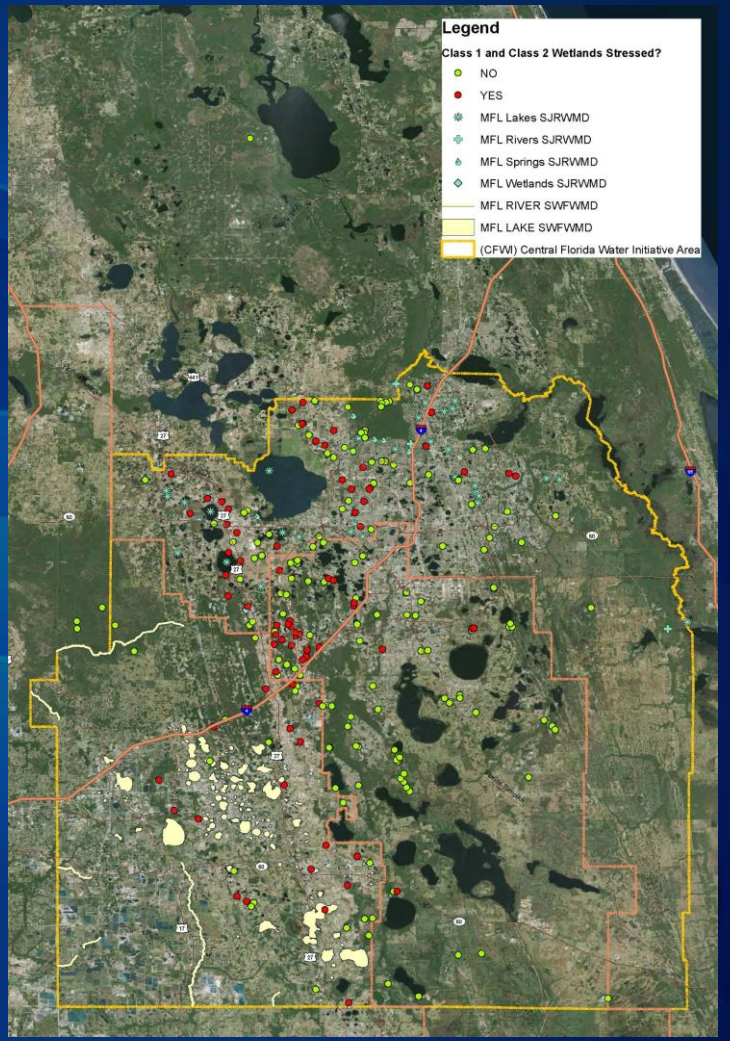
- Expanded Class 1 Wetland Dataset
  - Isolated wetlands established by DMIT wetlands group as long-term monitoring sites
  - 8 potential wetlands (1 SJR, 7 SWF)
  - Hydrological data period of record consistent with existing wetlands
  - Conduct stress status evaluation
  - Additional level of effort: 4 field days, 4 office days



Proposed Next-Step Option 2

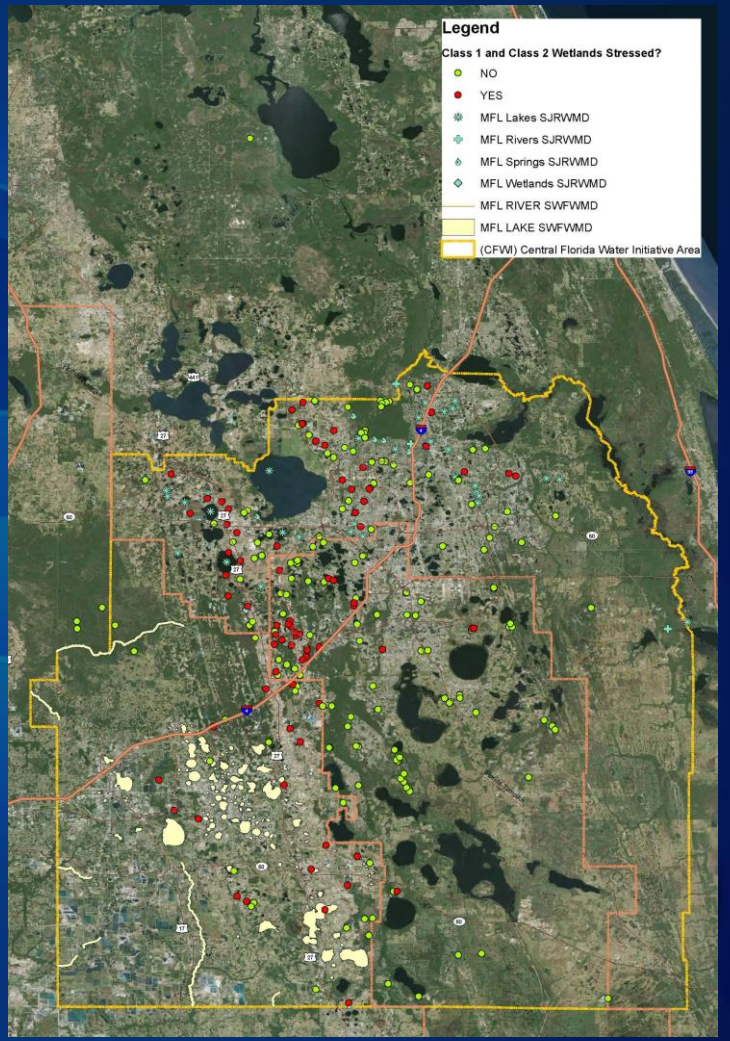
Statistical Analysis Methodology (Used for 2015 CFWI RWSP) With Expanded EMT Dataset:

- Expanded Class 2 Wetland Dataset
  - Isolated wetlands identified by DMIT wetlands group during long-term monitoring program development
  - Conduct stress status evaluations
  - Evaluations conducted by experienced District wetland scientists using same methodology and stream-lined data form



Proposed Next-Step Option 2

- Expanded Class 2 Wetland Dataset
  - Spatially distributed, in areas of known data gaps, random sample
  - ~60 wetlands identified
  - Additional level of effort (per District): 2 weeks field work, 3 weeks office work



Proposed Next-Step Option 1 or 2

Class 1 Wetlands (Either Existing 44 or Expanded 52):

- Working collaboratively with the HAT:
  - Summarize, analyze data from decided period of record
  - Perform risk-based analysis of wetlands to develop relationship for likelihood of stress as a function of water levels
  - Using ECFTX model output predicting future change in groundwater levels under various model scenarios and developed statistical relationship, estimate the probability of change in wetland stress status resulting from future projected changes in groundwater levels
  - Staff to do this work would have to be identified

Proposed Next-Step Option 1 or 2:

Class 2 Wetlands (Either Existing 200 or Expanded 250+):

- Using stress status data, calculate a population-weighted average risk of stress status change by assuming that the statistical distribution of historical water levels can be estimated from those observed in Class 1 wetlands
- Staff to do this work would have to be identified

Proposed Next-Step Option 3

GIS-Based Analysis Using a Kinser-Minno Type Method:

- GIS-based method used to identify areas with vegetative communities that are susceptible to adverse impacts due to reduced water levels in the surficial aquifer and the relative likelihood of harm to those communities in response to projected water level declines
- Susceptibility determined based on community type, soil drainage class, degree of water level drawdown in the surficial aquifer, and landscape position

Proposed Next-Step Option 3

GIS-Based Analysis Using a Kinser-Minno Type Method:

- Additional GIS layers utilized to provide additional screening tools to further identify discreet wetland vegetative communities that may be susceptible to adverse impacts due to reduced water levels
- Yields a spatial identification of areas with low, moderate, or high potential for adverse change to wetland function due to surficial aquifer water level declines

Proposed Next-Step Option 3

GIS-Based Analysis Using a Kinser-Minno Type Method:

- Appropriate list of filters (e.g., ridge wetlands, plains wetlands, isolated, connected) specific to CFWI area wetlands, as well a set of appropriate values of wetland stress, would need to be developed
- Majority of analysis can be conducted by utilizing GIS layers
- Additional level of effort: 1 week of field work to verify existing wetland characteristics; several weeks of office work for GIS layers analysis, once the filters and layers are established
- Staff to do the GIS work would have to be identified

Proposed Next-Step Option 4

Some Combination of Options 1-3:

- Option 1: Statistical analysis using existing EMT dataset along with updated ECFTX model
  - No additional effort (need statistician)
- Option 2: Statistical analysis using expanded EMT dataset along with updated ECFTX model
  - Expanded Class 1 dataset: Additional effort of 4 field days, 4 office days
  - Expanded Class 2 dataset: Additional effort of 2 weeks field, 3 weeks office
  - Need statistician
- Option 3: GIS-based analysis using Kinser-Minno type method along with updated ECFTX model
  - Additional effort of 1 week field, several weeks office, need GIS staff

Tentative Schedule

- Late Jan./Early Feb.: Finalize EMT's options and recommendations for wetlands/surface waters assessment in support of 2020 CFWI RWSP and seek necessary approval from WRAT, MOC, and SC
- Feb.: Develop and finalize tasks, obtain help from necessary staff
- Mar./Apr.: Conduct fieldwork, office work, necessary analyses
- May 30, 2018: Complete draft report
- June 30, 2018: Complete final report

Discussion/Recommendation:

- Option 1: Statistical analysis using existing EMT dataset along with updated ECFTX model
- Option 2: Statistical analysis using expanded EMT dataset along with updated ECFTX model
- Option 3: GIS-based analysis using Kinser-Minno type method along with updated ECFTX model
- Option 4: Some combination of the above options