EFFECT OF HYDROLOGIC RESTORATION ON COASTAL WETLAND SOIL PROPERTIES

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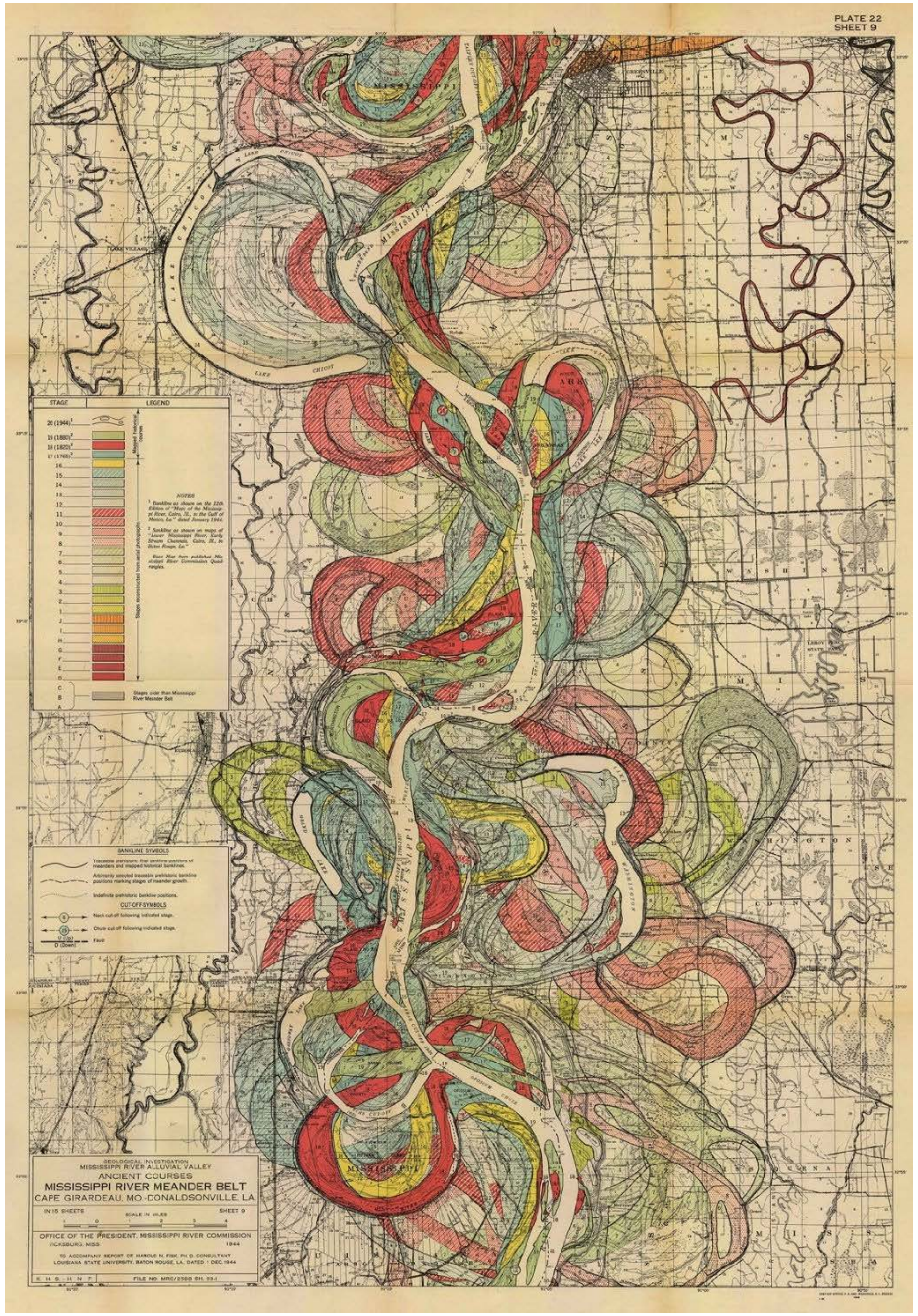
LSU | College of the Coast & Environment

Wetland Loss in Louisiana

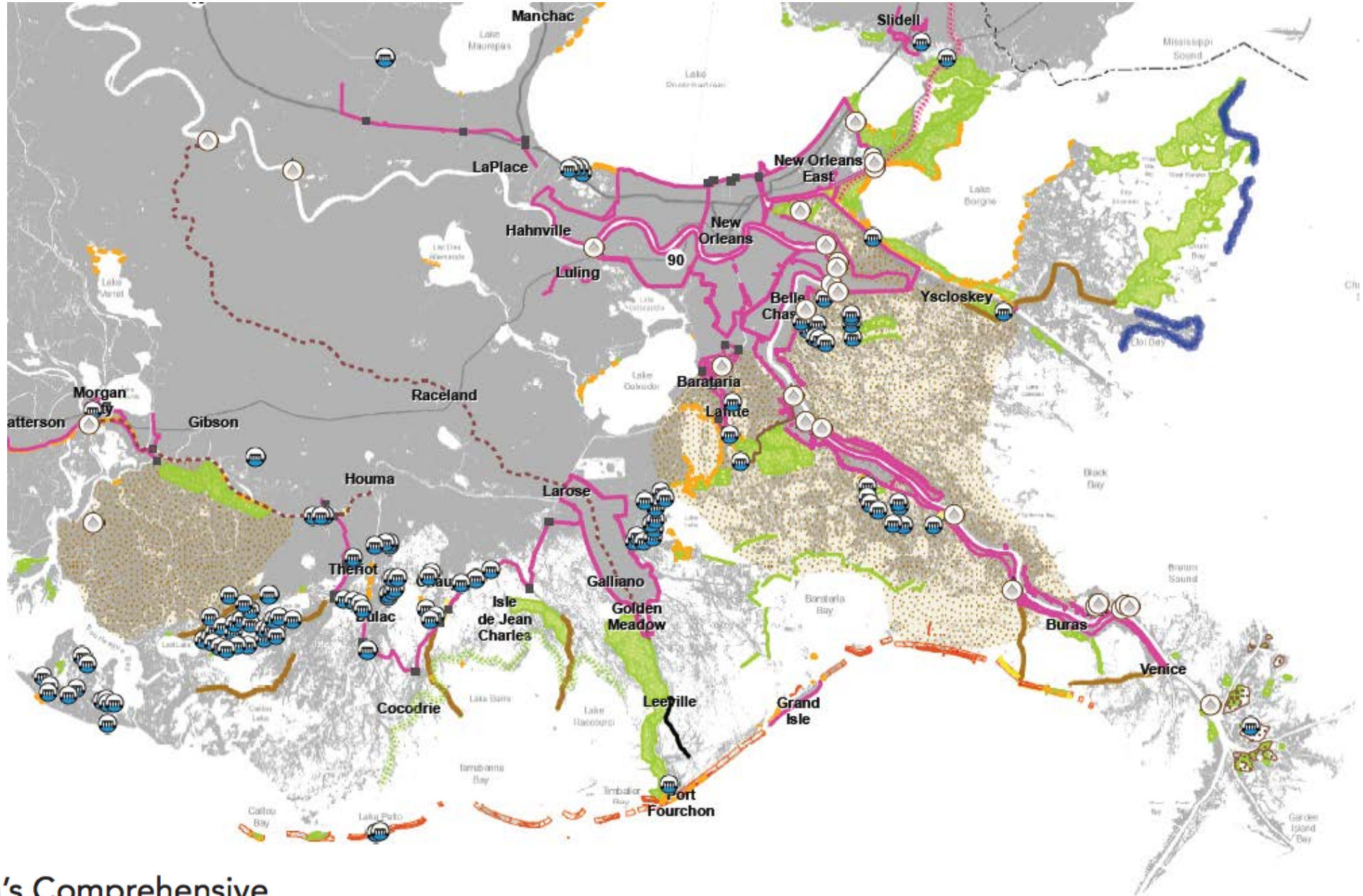
Land 1932

Wetland Loss in Louisiana

Land 2010



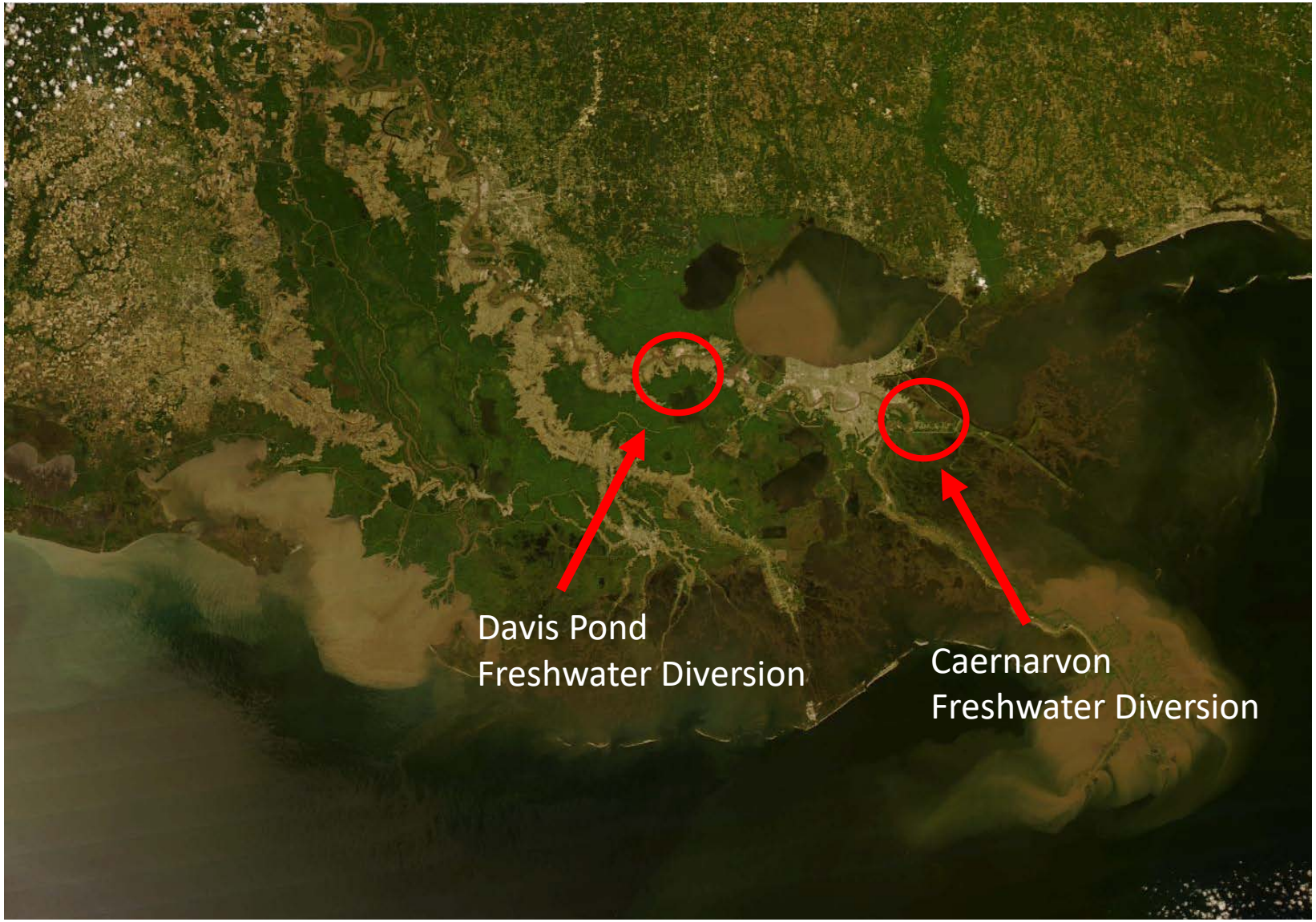
Harold N. Fisk



Louisiana's Comprehensive
Master Plan for a Sustainable Coast

Source: CPRA 2012 Coastal Master Plan

Legacy Diversions

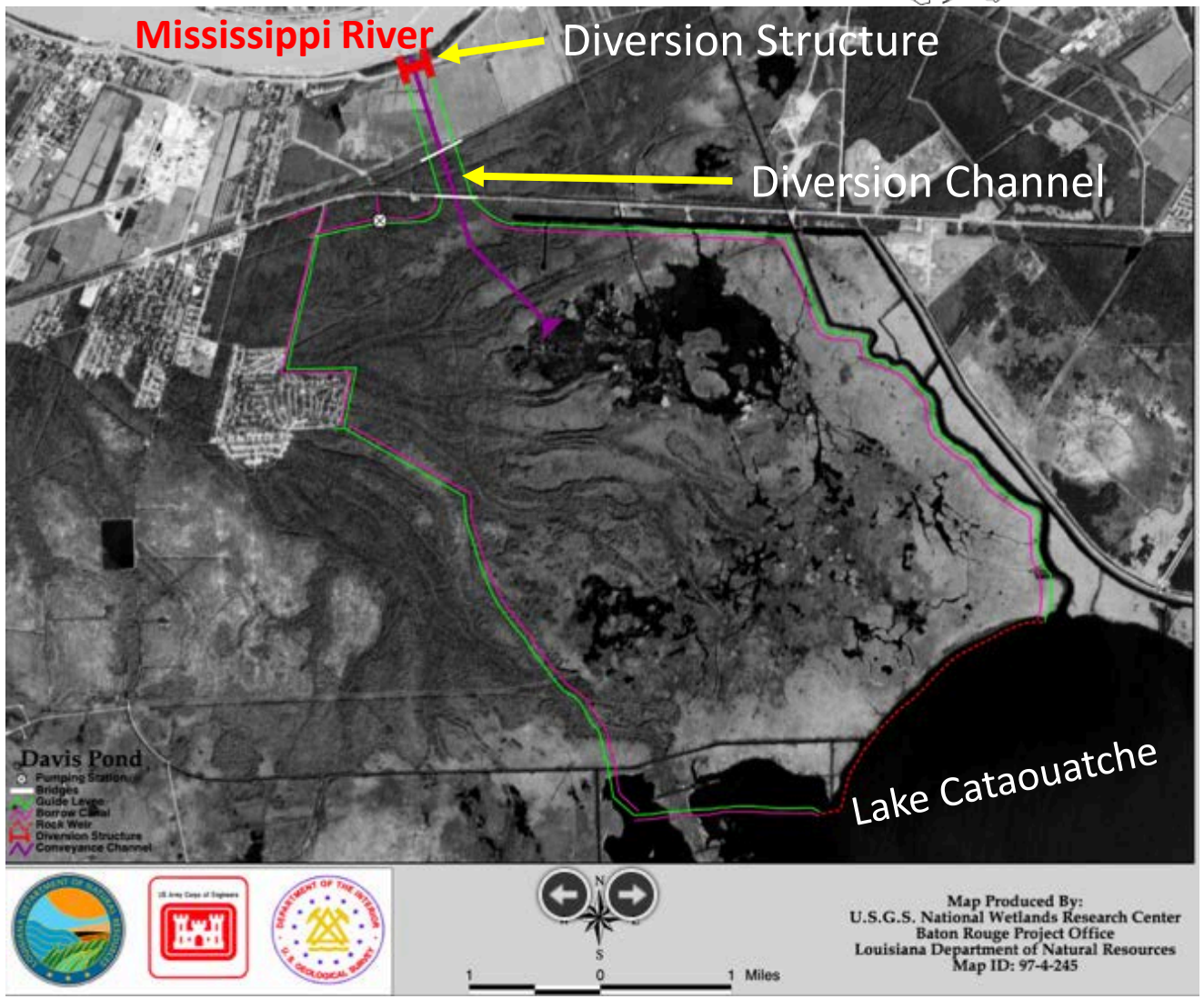


Source: NASA/Modis - LSU Earth Lab. Image Date May 17, 2011

Freshwater Diversion – Davis Pond

- Finished in 2002, full capacity in 2006
- 10,650 cfs (1.8% of average river discharge)
- 10,000 acre ponding area
- Salinity management tool

Source: US Army Core of Engineers



Source: Chuck Villirubia and CPRA

Davis Pond Wetland

Nov 29, 2011

Photos: Alina Spera and Eddie Weeks (2018)

Davis Pond Wetland

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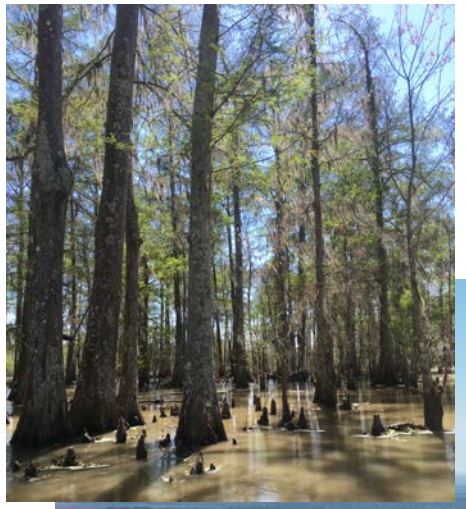
Davis Pond Wetland



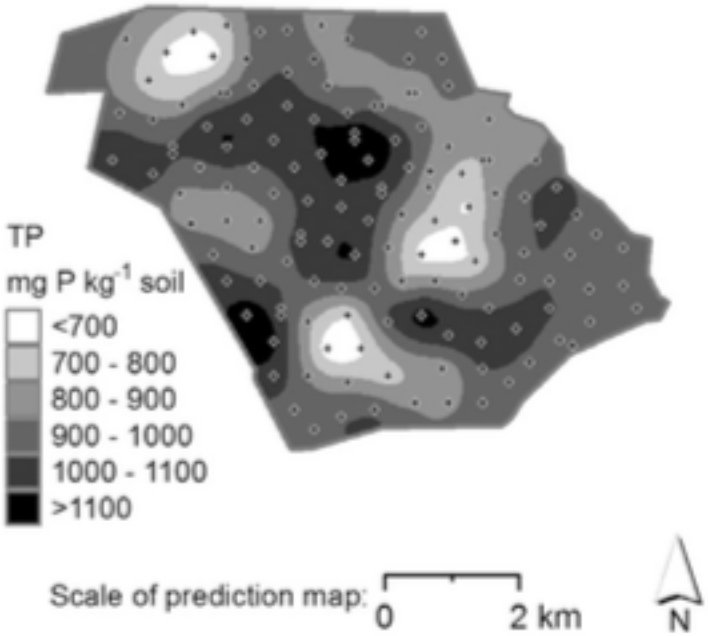
Nov 29, 2011

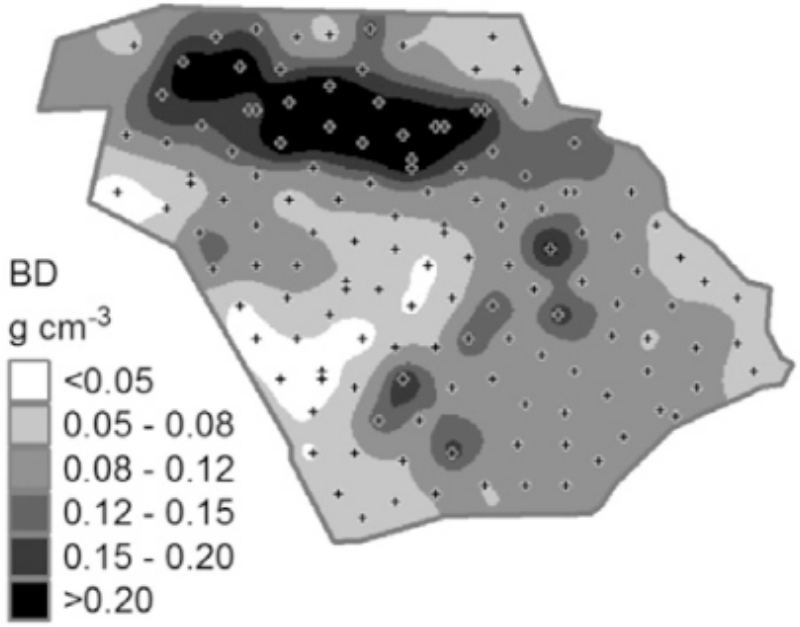
Photos: Alina Spera and Eddie Weeks (2018)

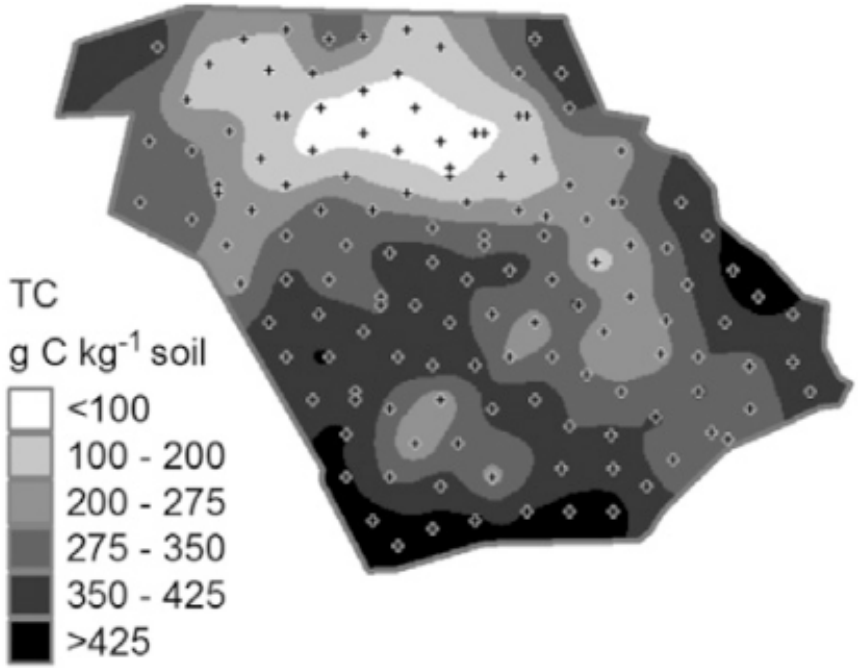
Past work: soil properties baseline

- Dr. Ron Corstanje's sampling design
- 142 stations, 0-10 cm
- LOI, BD, TC, TN, TP
- Baseline of nutrient status
- Accretion mechanism

WABL Photo Library (2007)



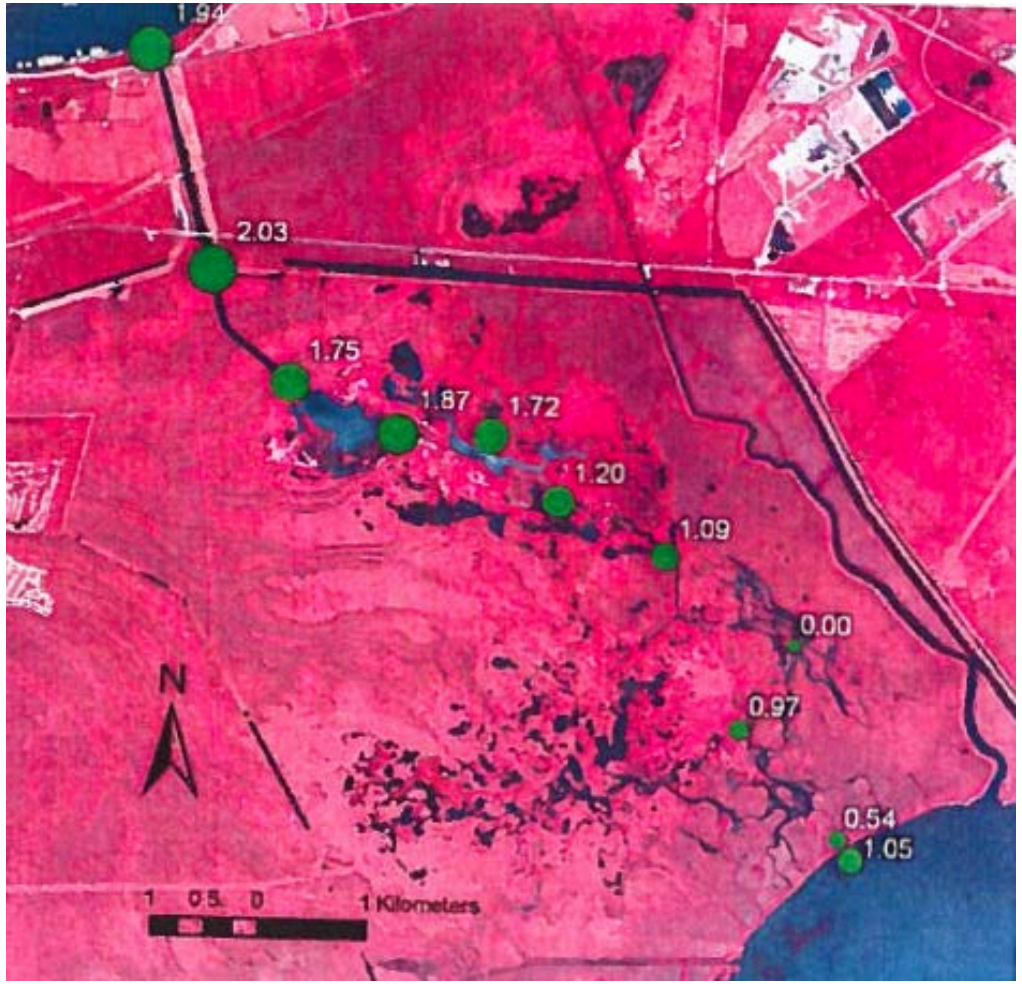


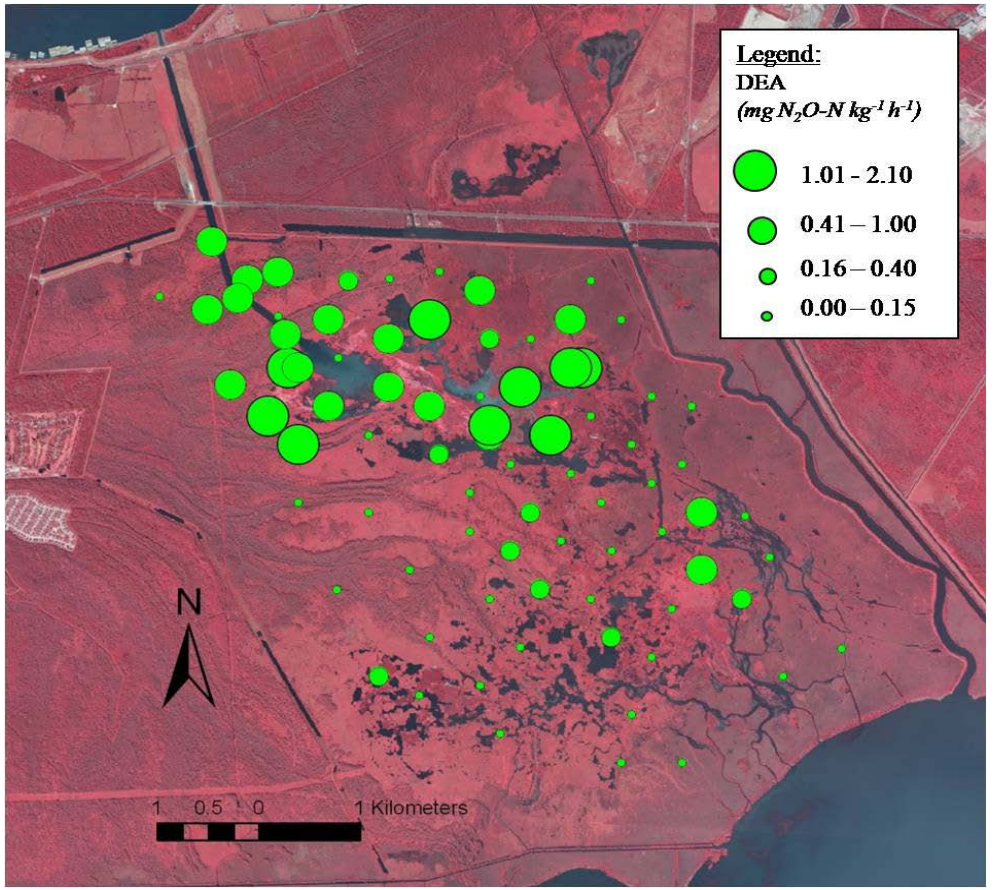


Kral et al. 2012

Past work: ecosystem functions

- Nutrient removal
- Lisa Gardner (2008)





20 years later, what has changed?

Oct 25, 1998

Jan 24, 2018

open water → emergent vegetation

Nov 29, 2011

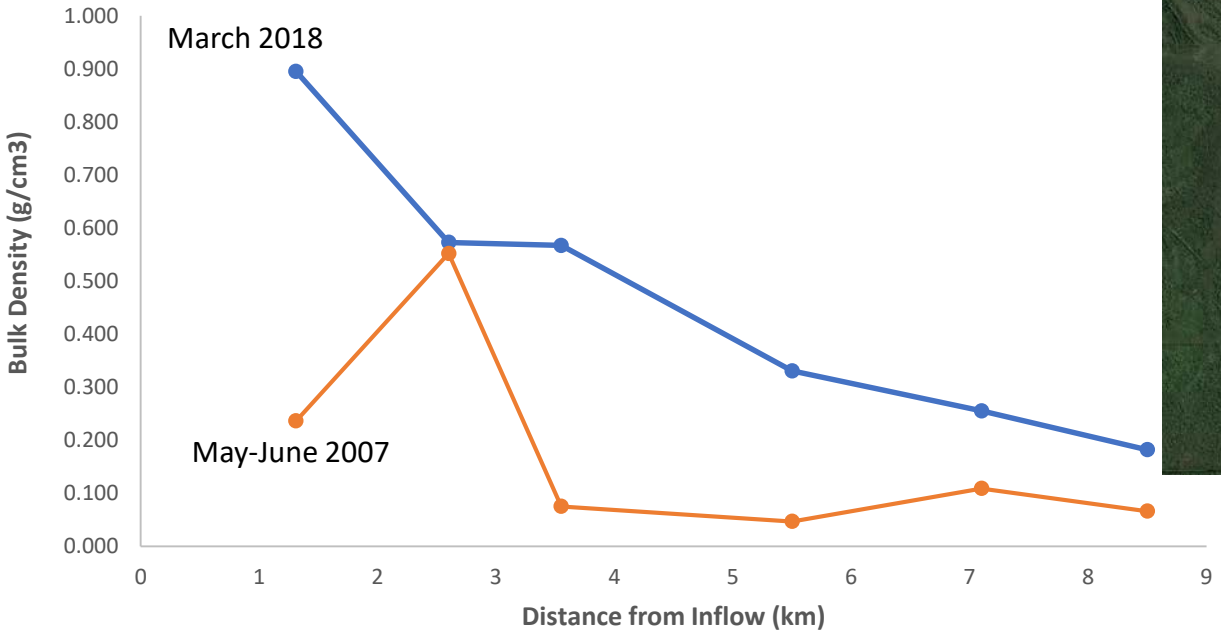
March 9, 2018

Eddie Weeks (2018)

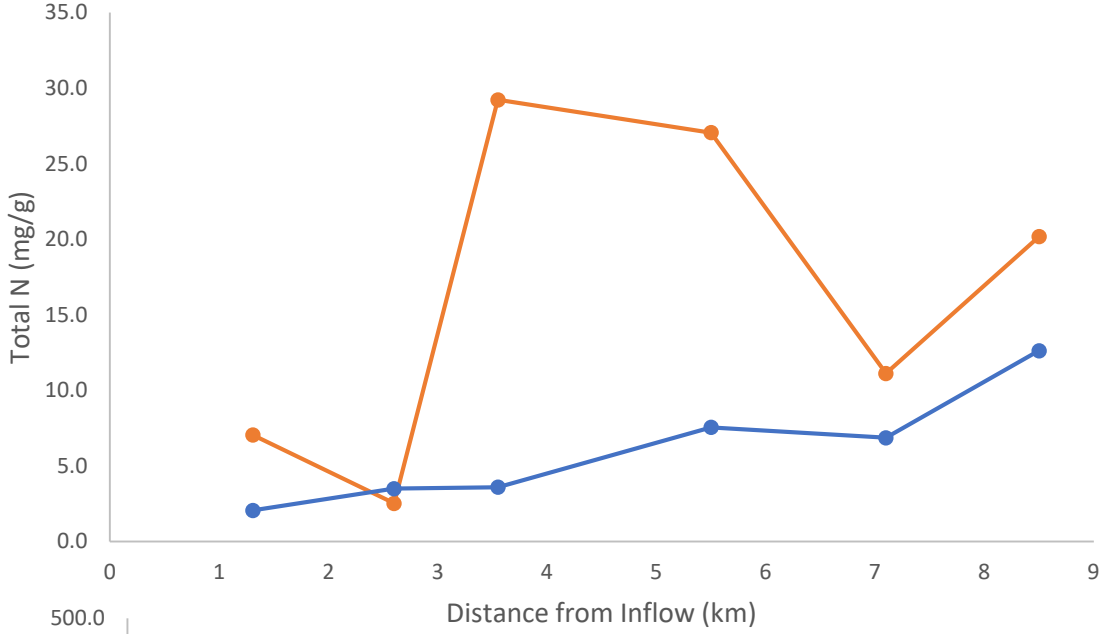
Continuing Work

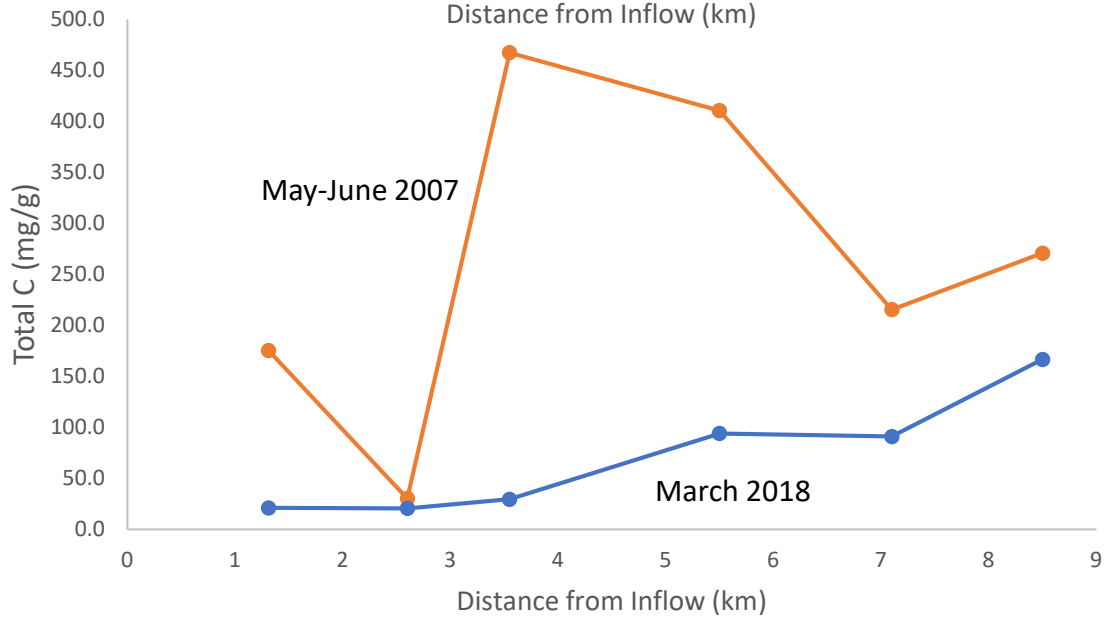
- 150 stations, 0-10 and 10-20 cm
- LOI, BD, TC, TN, TP
- Long cores
- Accretion, vegetation changes, nutrient loading
- ^{15}N study

Preliminary Results: Bulk Density

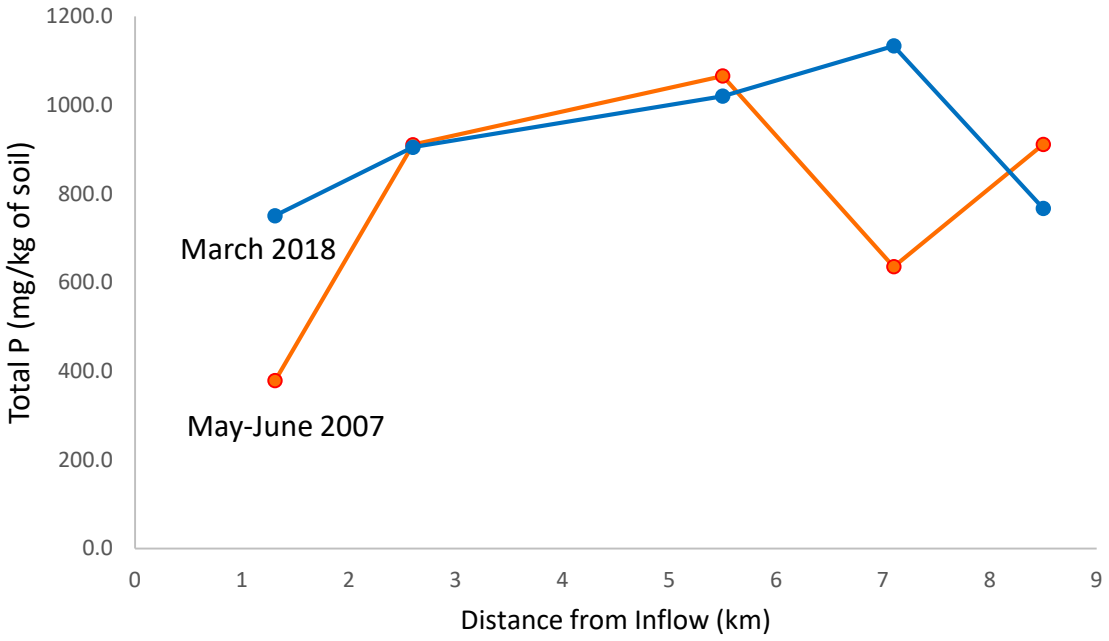


Nitrogen and Carbon



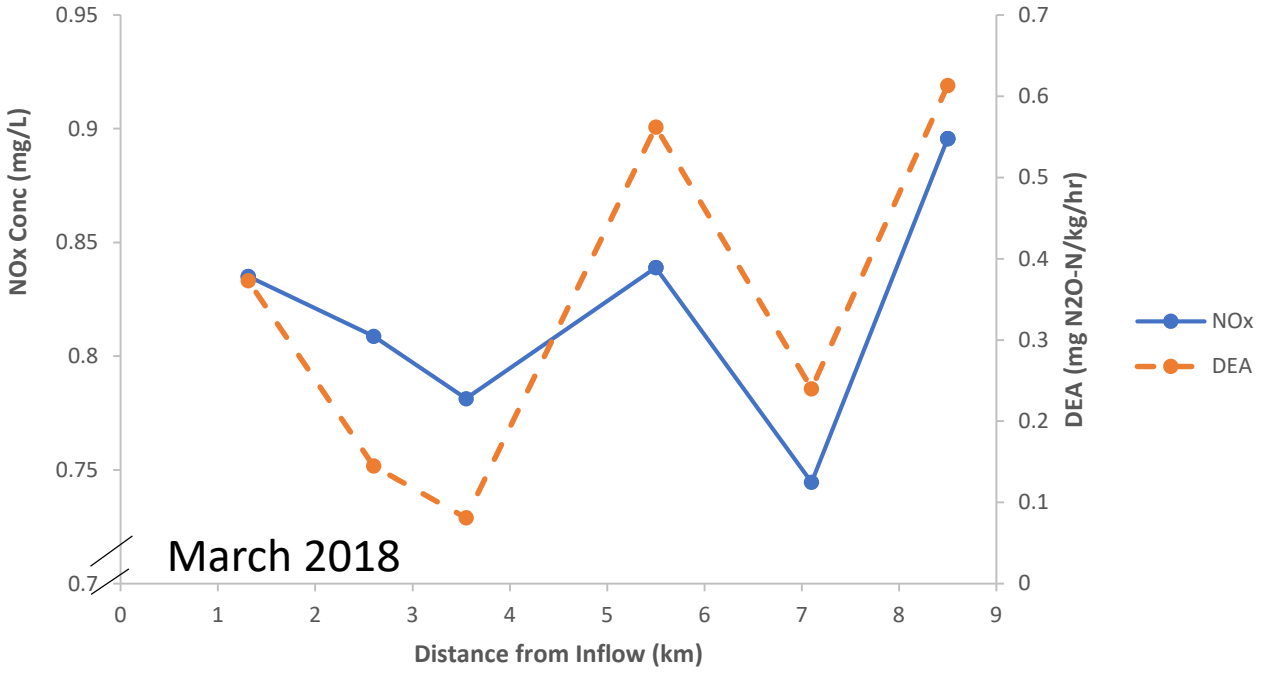


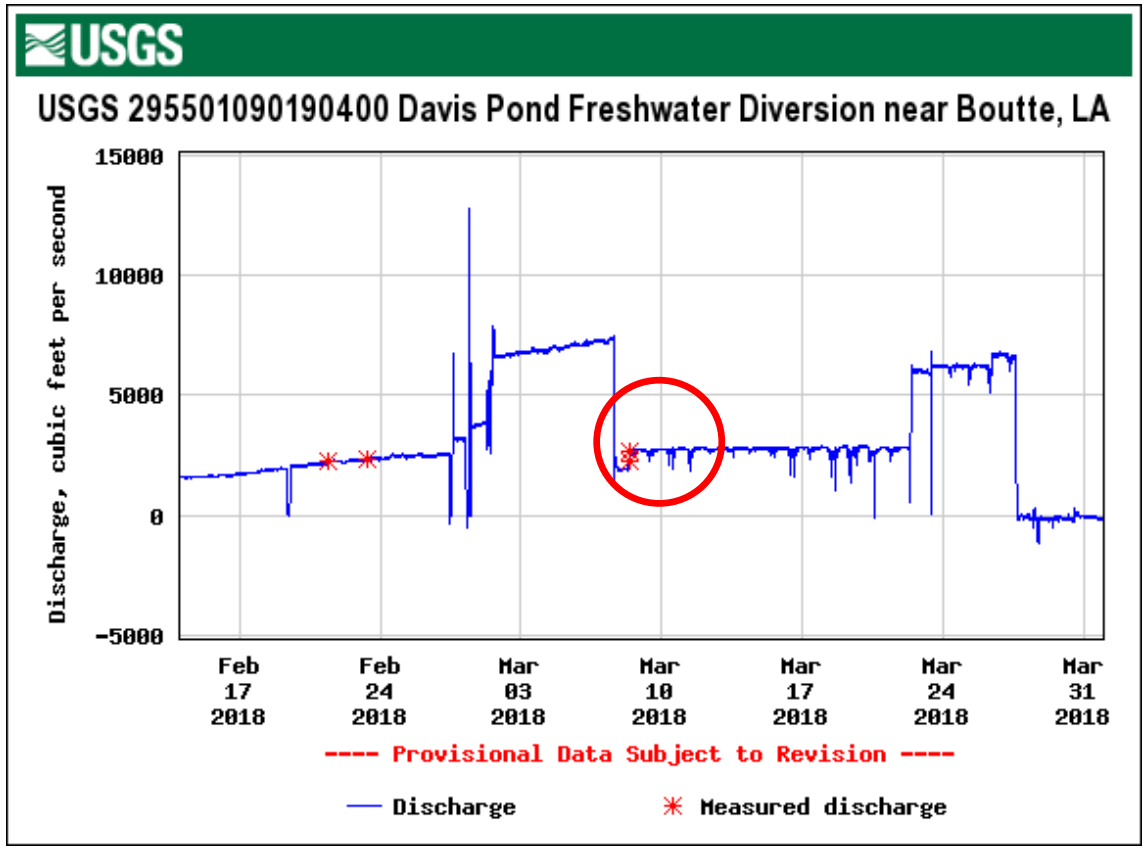
Phosphorous



Nitrate concentrations and DEA along flow path

- March 2018 = No treatment
- General DEA trends were high





Eddie Weeks (2018)

What I hope to achieve

- How have nutrients and sediments impacted plant health and wetland resilience, accretion mechanism and ecosystem functions?
- More clear cut answers on impact of diversions

Questions?

Acknowledgments

- Advisor: John White
- Eddie Weeks
- WABL Family
- SWS

Eddie Weeks (2018)

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