

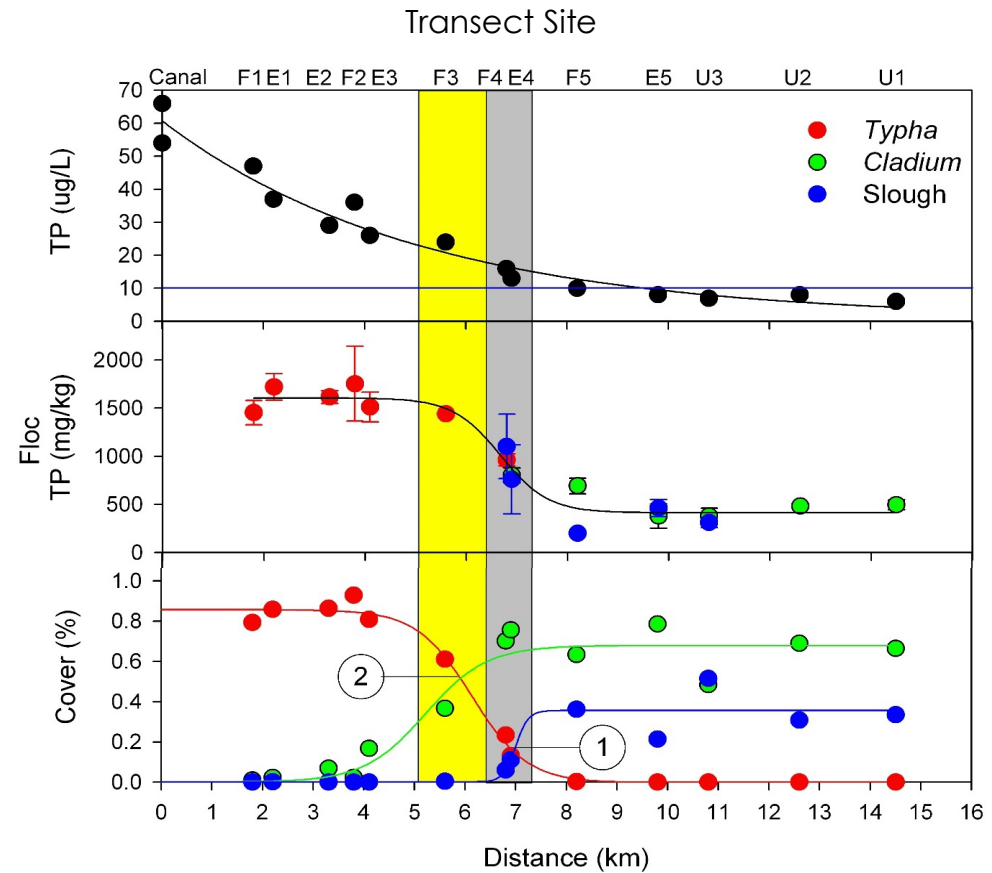
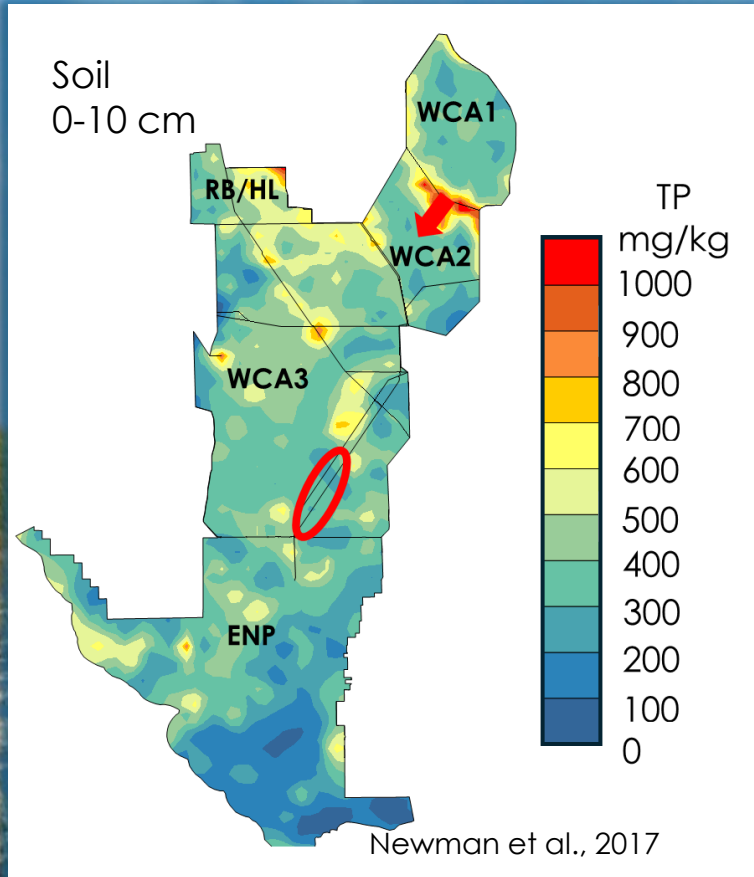
Understanding the Water Quality- Quantity Tradeoffs: Can we Find a Balance?

Sue Newman



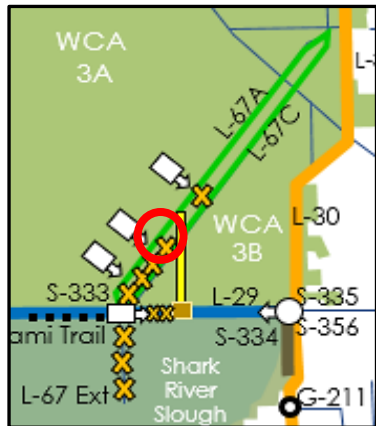
GEER Conference 2025

Water Quality & Quantity Effects

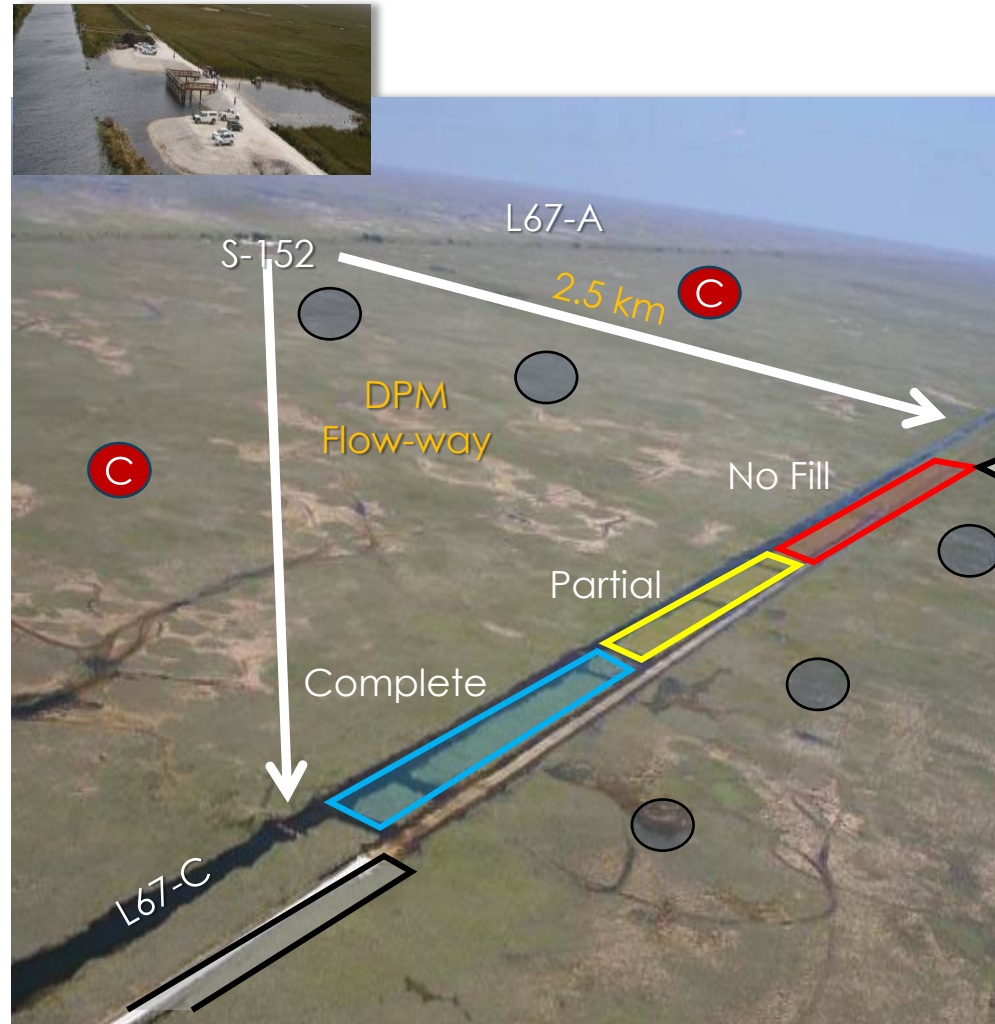


Hagerthey et al., 2008

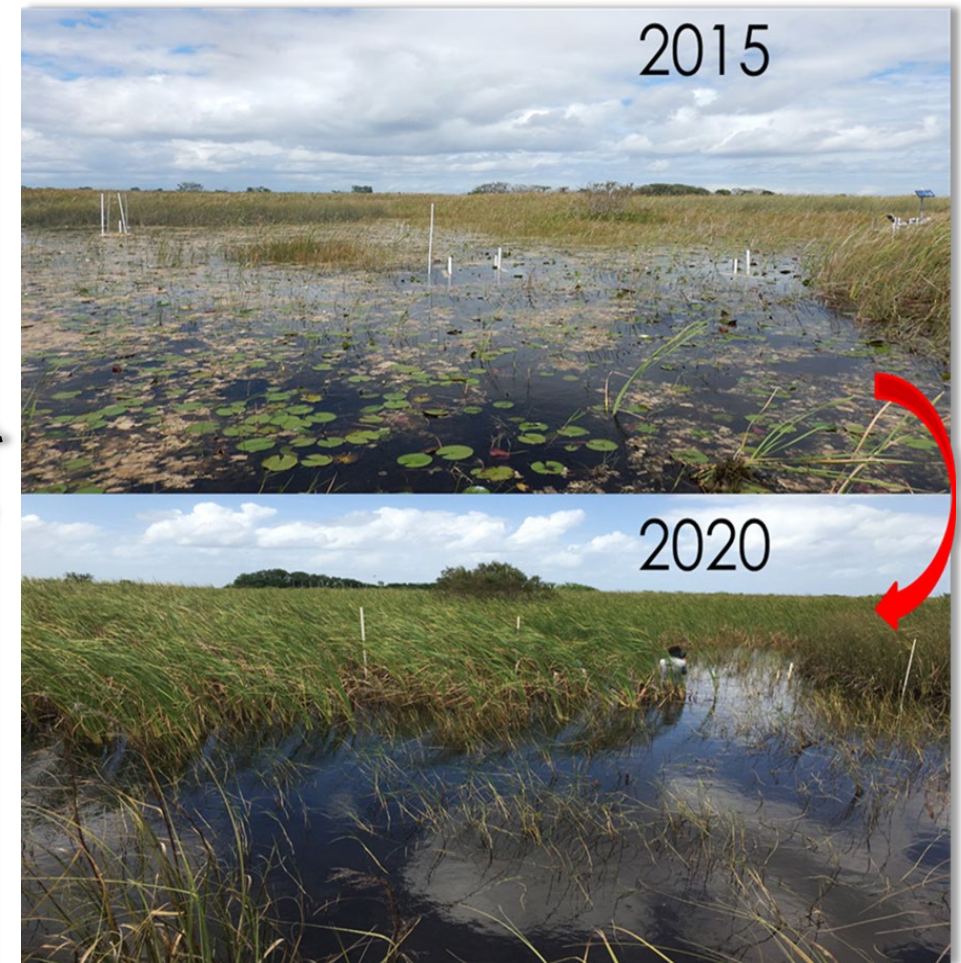
Restoring Flow : Decomp Physical Model (DPM)



- S-152 Discharge Structure includes 10 – 60" gated culverts
- Inflow geometric $TP \leq 10\text{ppb}$
- L67-C canal – 3000-ft levee gap & 3 backfill treatments
- Before-After-Control-Impact (BACI) design

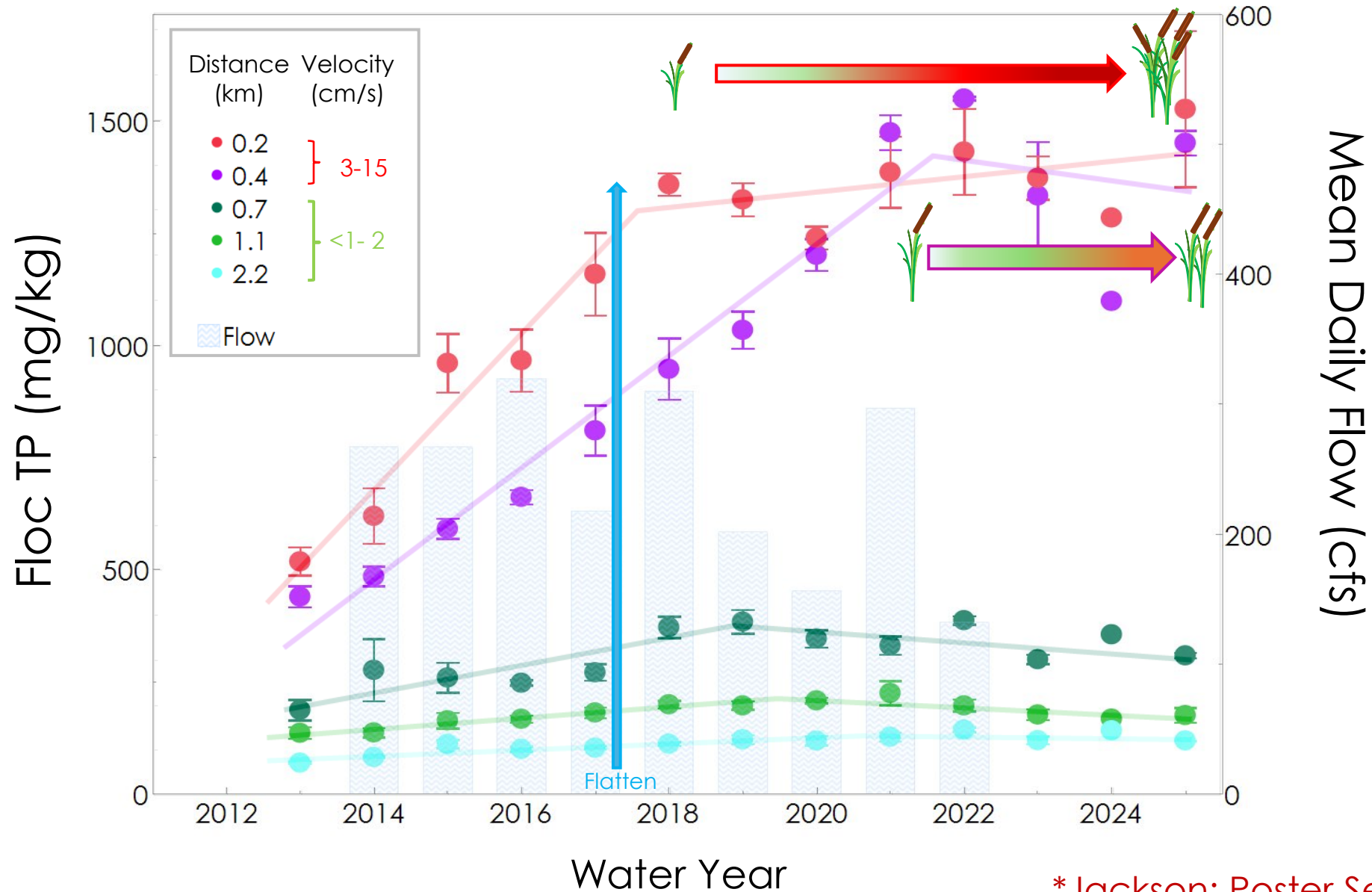


0.2 km from S152

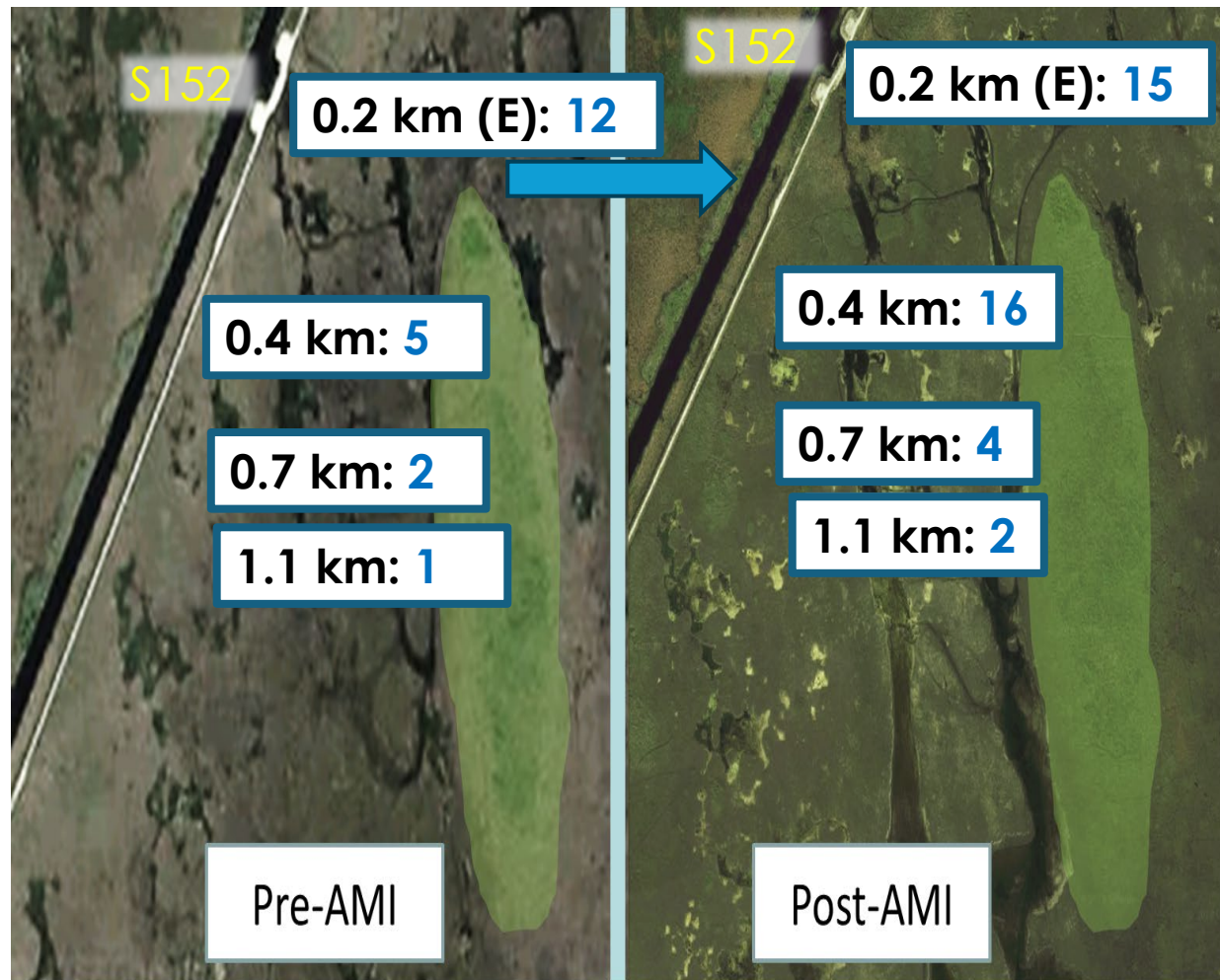


Invasion of cattail into slough

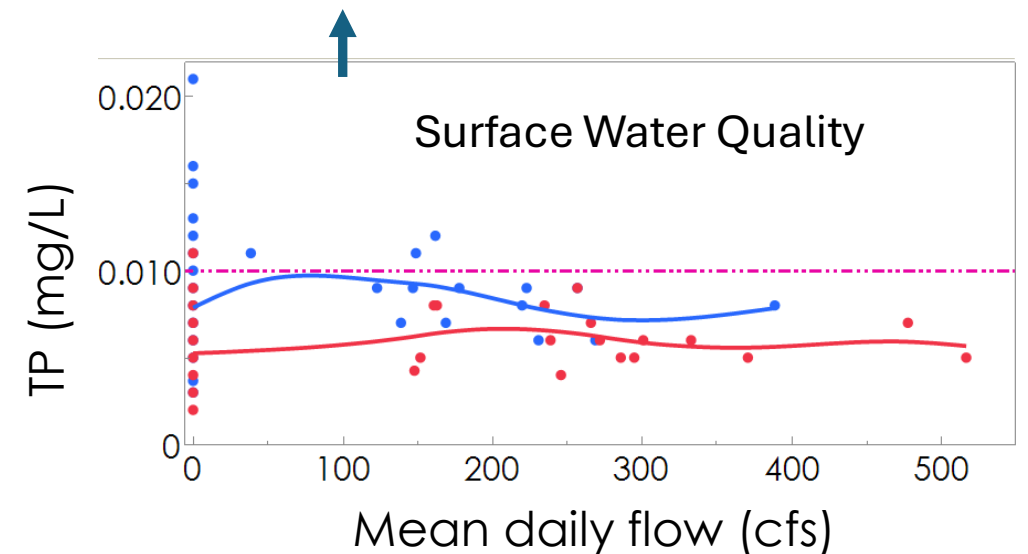
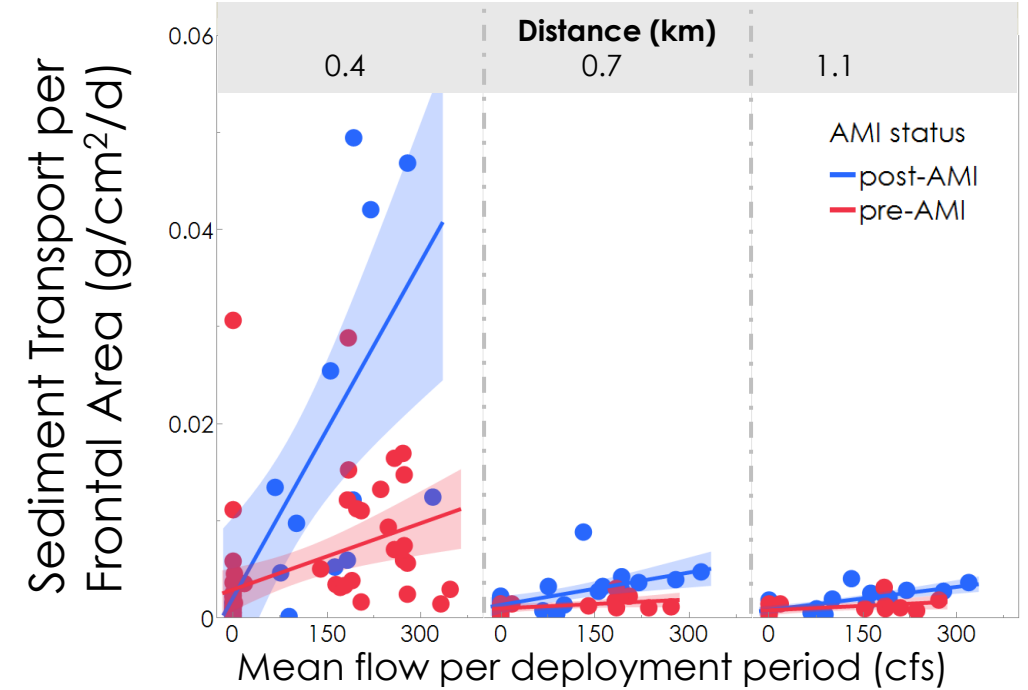
Floc TP increase in Response to Velocity



Vegetation Management (AMI) to Redirect & Increase Spatial Extent of Flow



Surface water velocity- cm/s

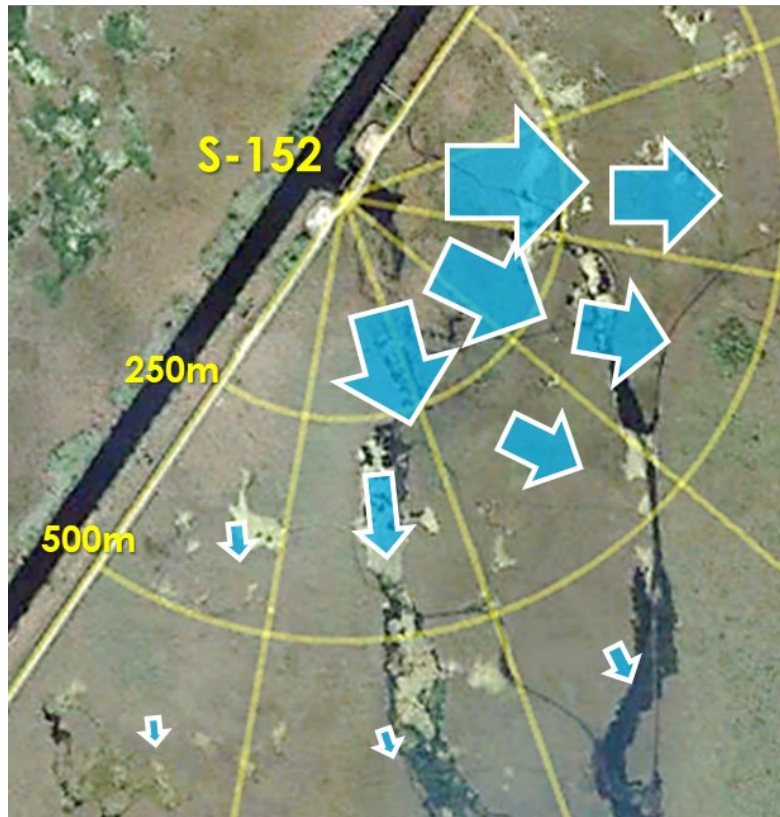


Distribute Flow by Combining AMI and Spreader Swale

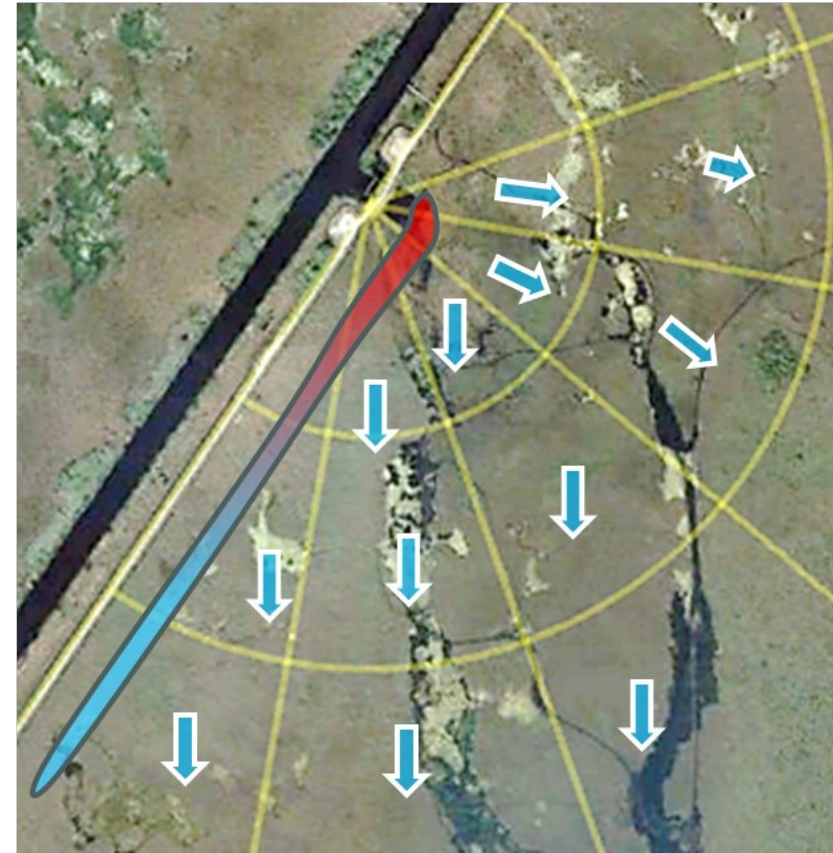
AMI helps realign and distribute flow- but can we reduce damaging velocities adjacent to structure inflows?

Without
Spreader

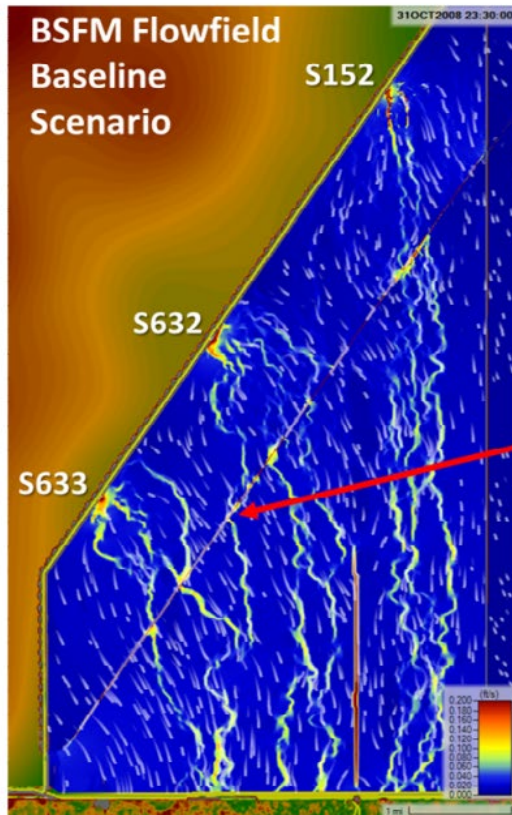
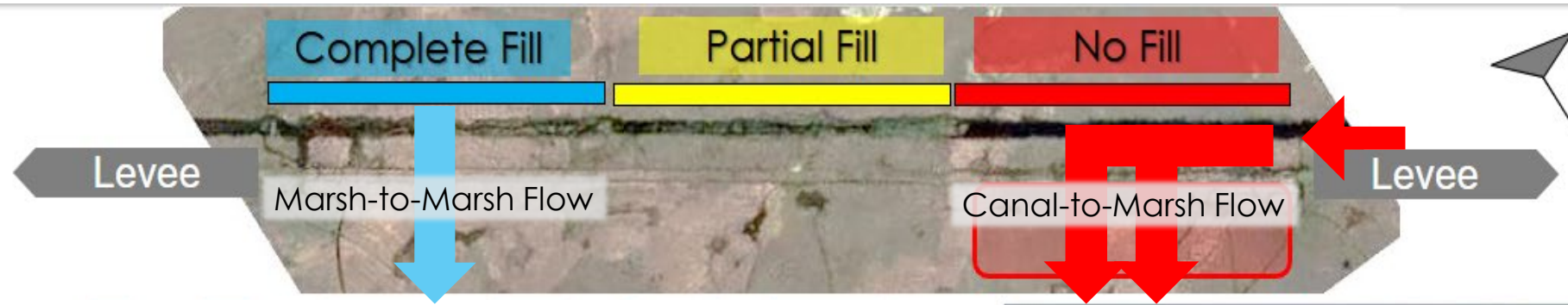
Flow direction
& velocity



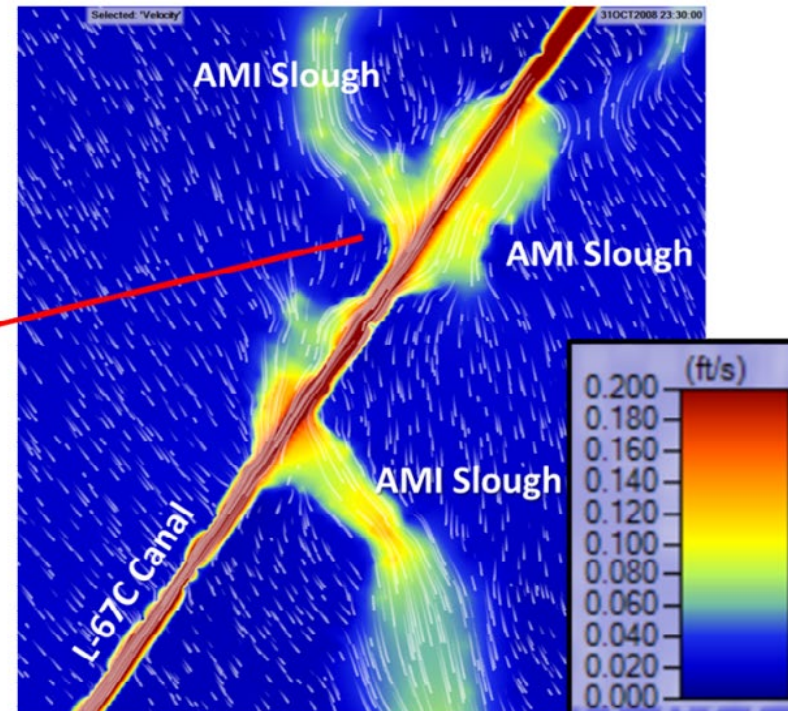
With
Spreader



Canal to Marsh Sediment Load- Enhance Marsh to Marsh Distribution



*

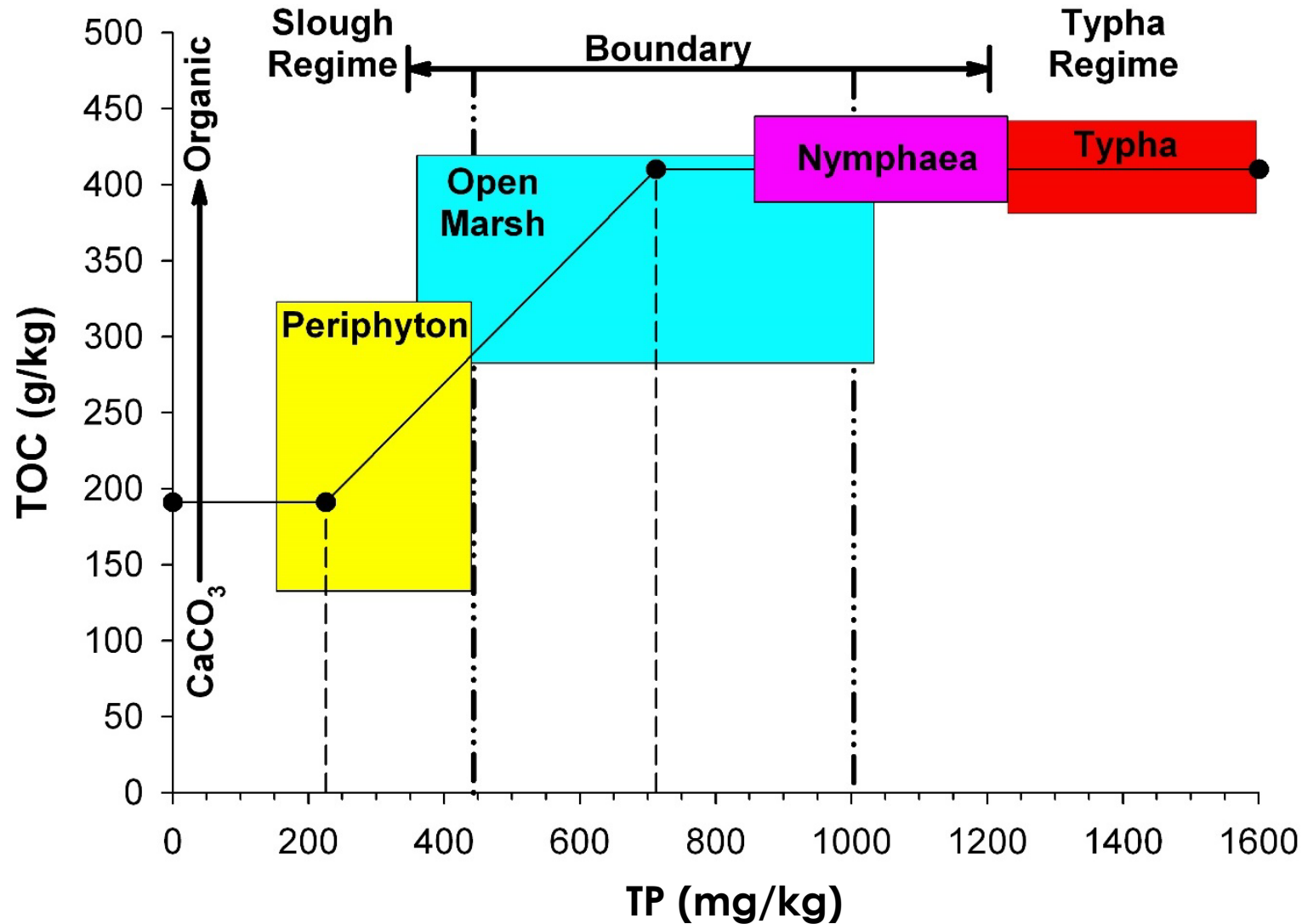


Invasion of slough by cattails

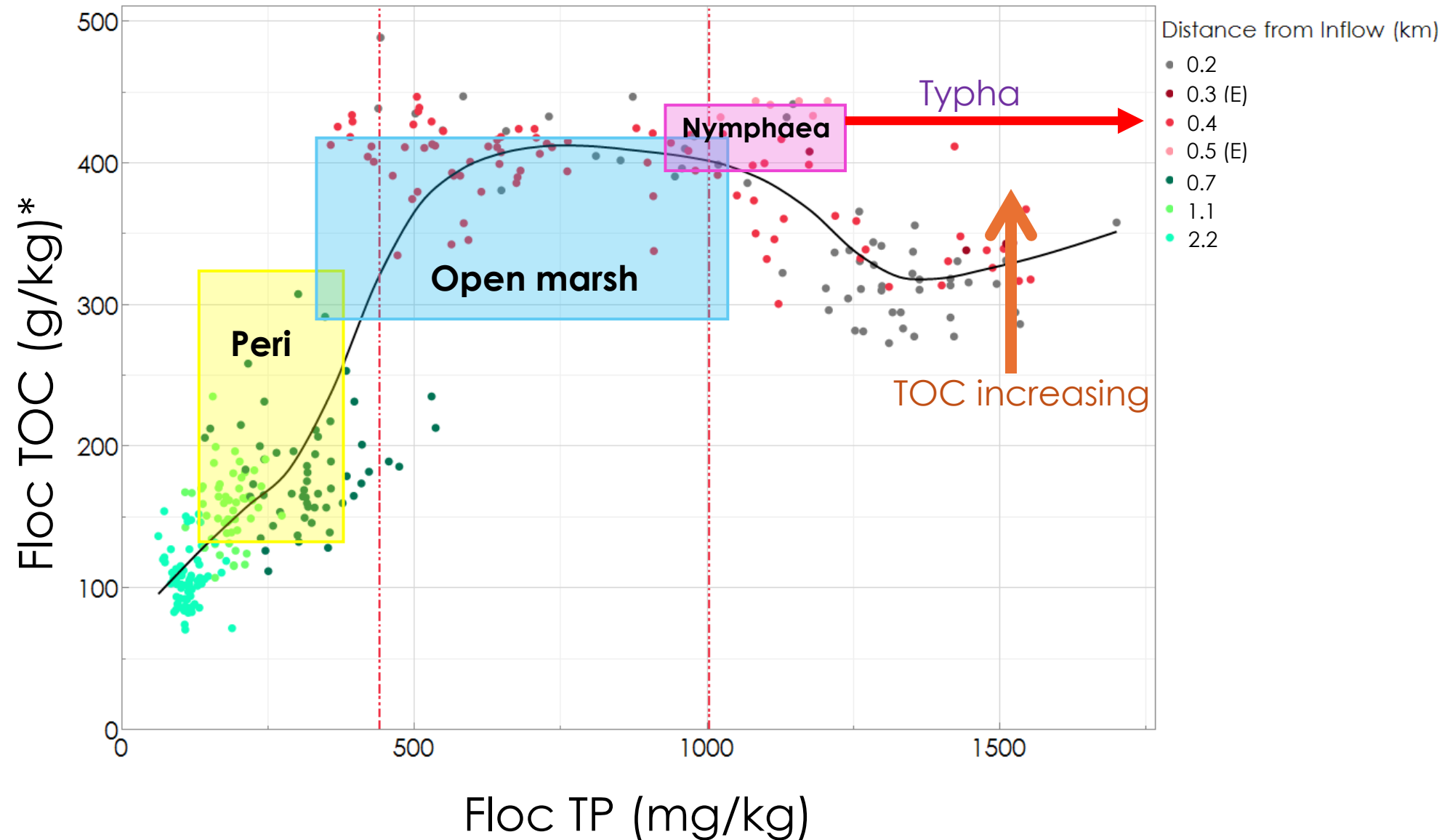
Floc TP ~ 1500 mg/kg

*Saunders - Session 1, 11:05 am

Conceptual Model of Slough to Typha Regime Change



Application of the Conceptual Model with DPM

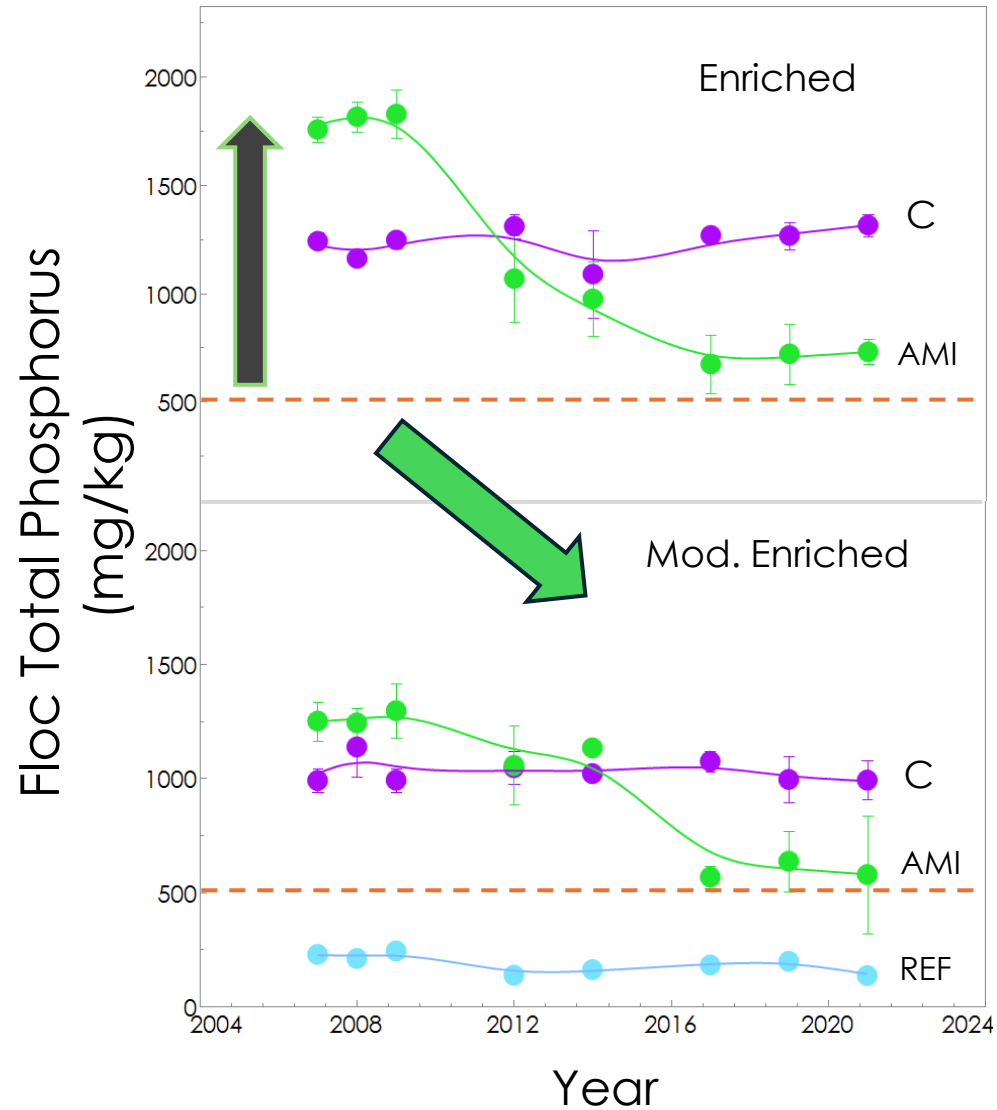




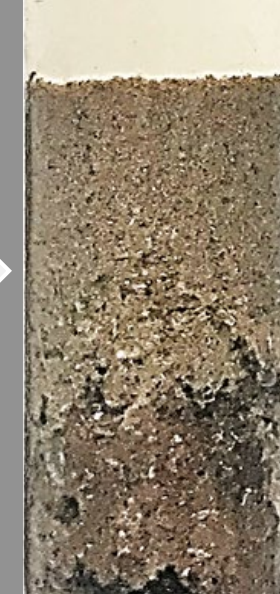
Pre AMI

9 yrs Post AMI

Overcoming nutrient feedback.....



Cattail



Created
Open



Unenriched

Summary

“Think Different” to create a balance

Closer Resemblance to Nature

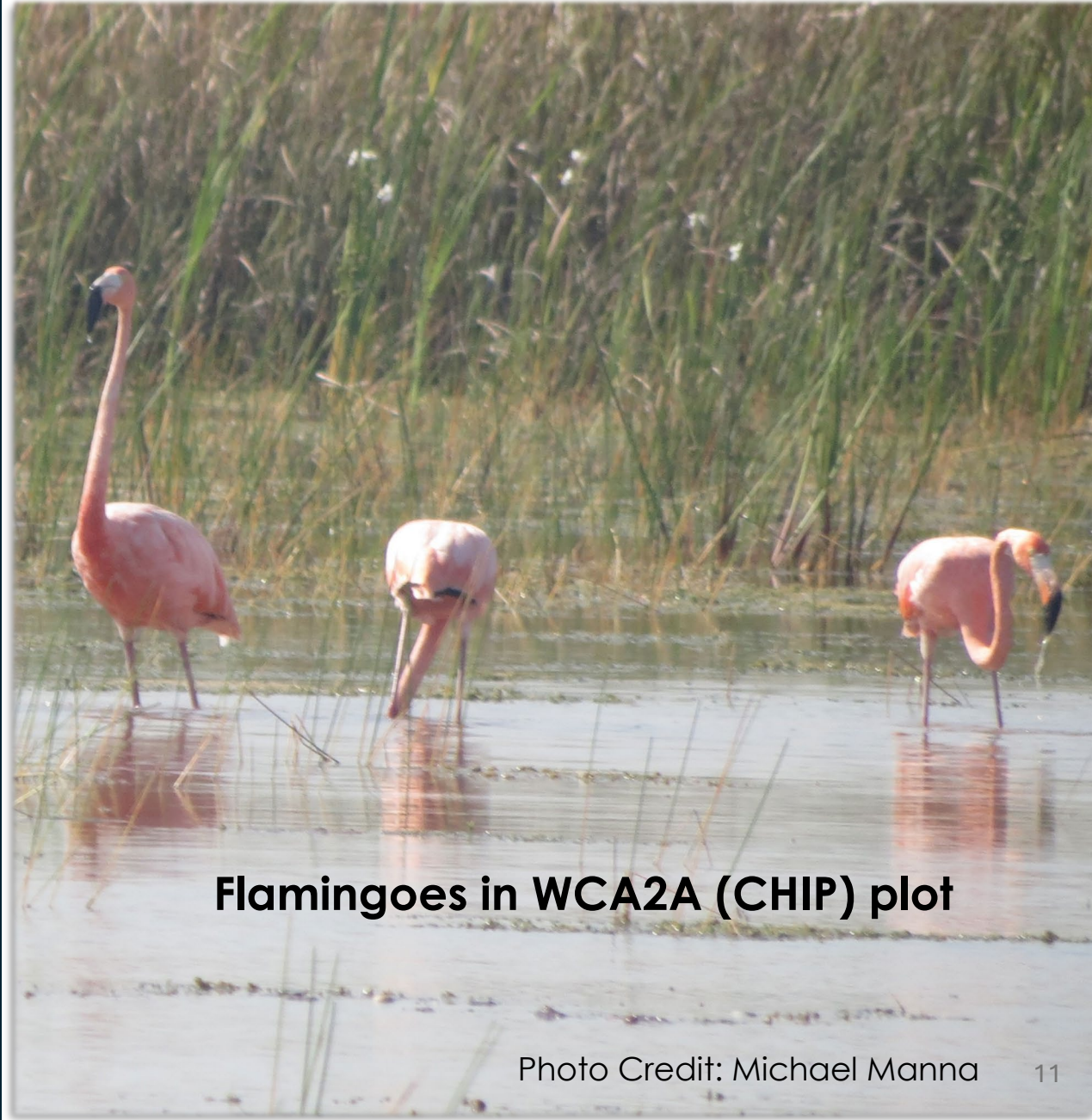
Distribution- greater emphasis on internal dispersal mechanisms

- Disperse flows by:
 - Modify structural inputs
 - Marsh velocities < 3 cm/s
 - Within marsh connections
 - AML, marsh-to-marsh

Timing- not just seasonal

- Operational modifications to avoid locally damaging loads beyond assimilation capacity
- Recovery periods

*Zweig- Session 2, 11:05 am



Flamingoes in WCA2A (CHIP) plot

Photo Credit: Michael Manna

Acknowledgements

Co-authors

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Mark Cook, Fred Sklar &
Dong Yoon Lee



Photo Credit: Michael Manna