ROLE OF VEGETATION ON LOCAL WATER COLUMN PHOSPHORUS DYNAMICS IN THE EVERGLADES STAS

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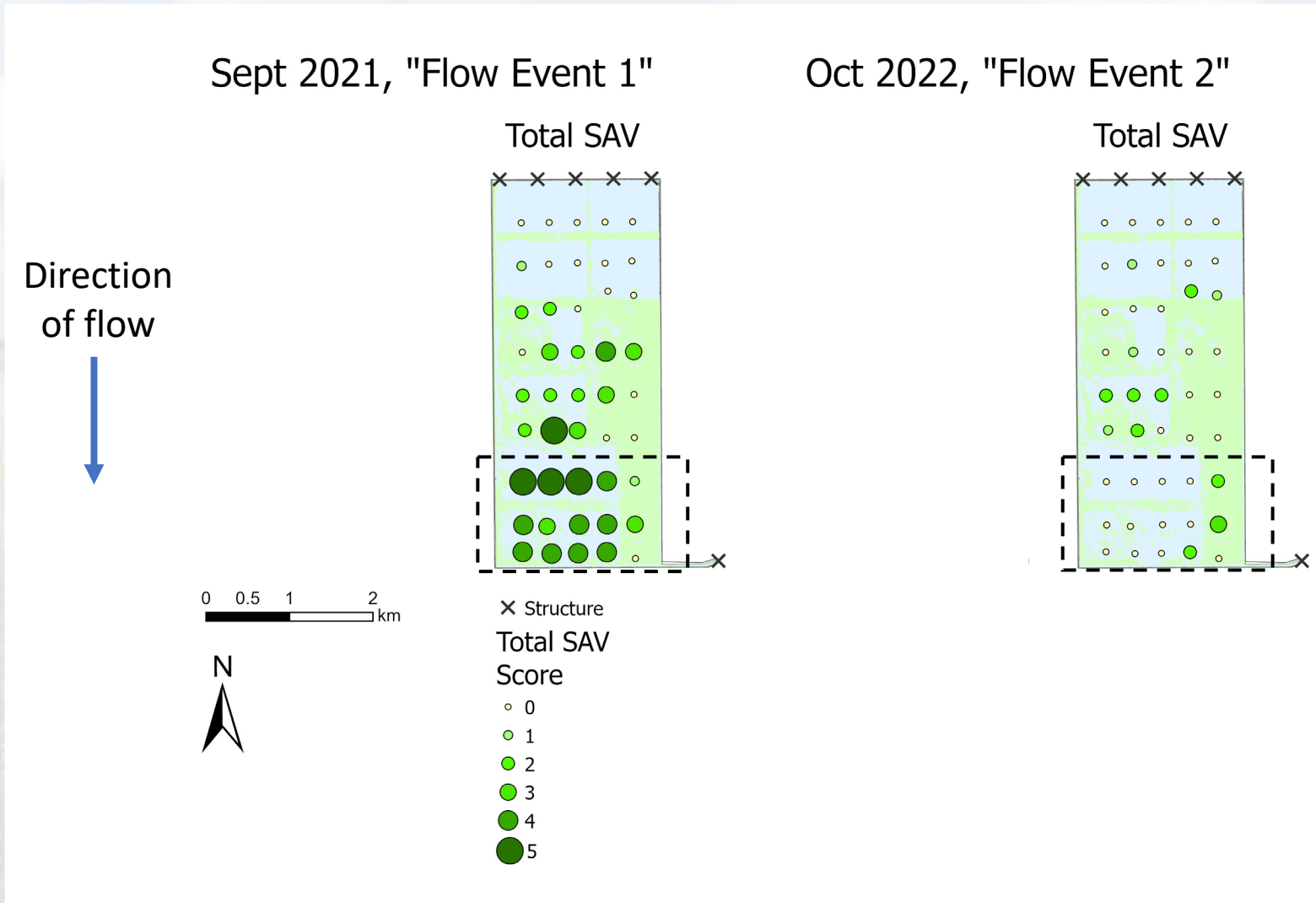**GEER 2025**

Coral Springs, FL

DB Environmental

Everglades Stormwater Treatment Areas (STAs)

- STAs remove TP from runoff prior to discharge to Everglades Protection Area

- A variety of factors influence TP removal

- Internal monitoring of water quality coupled with vegetation surveys can provide details to understand STA performance
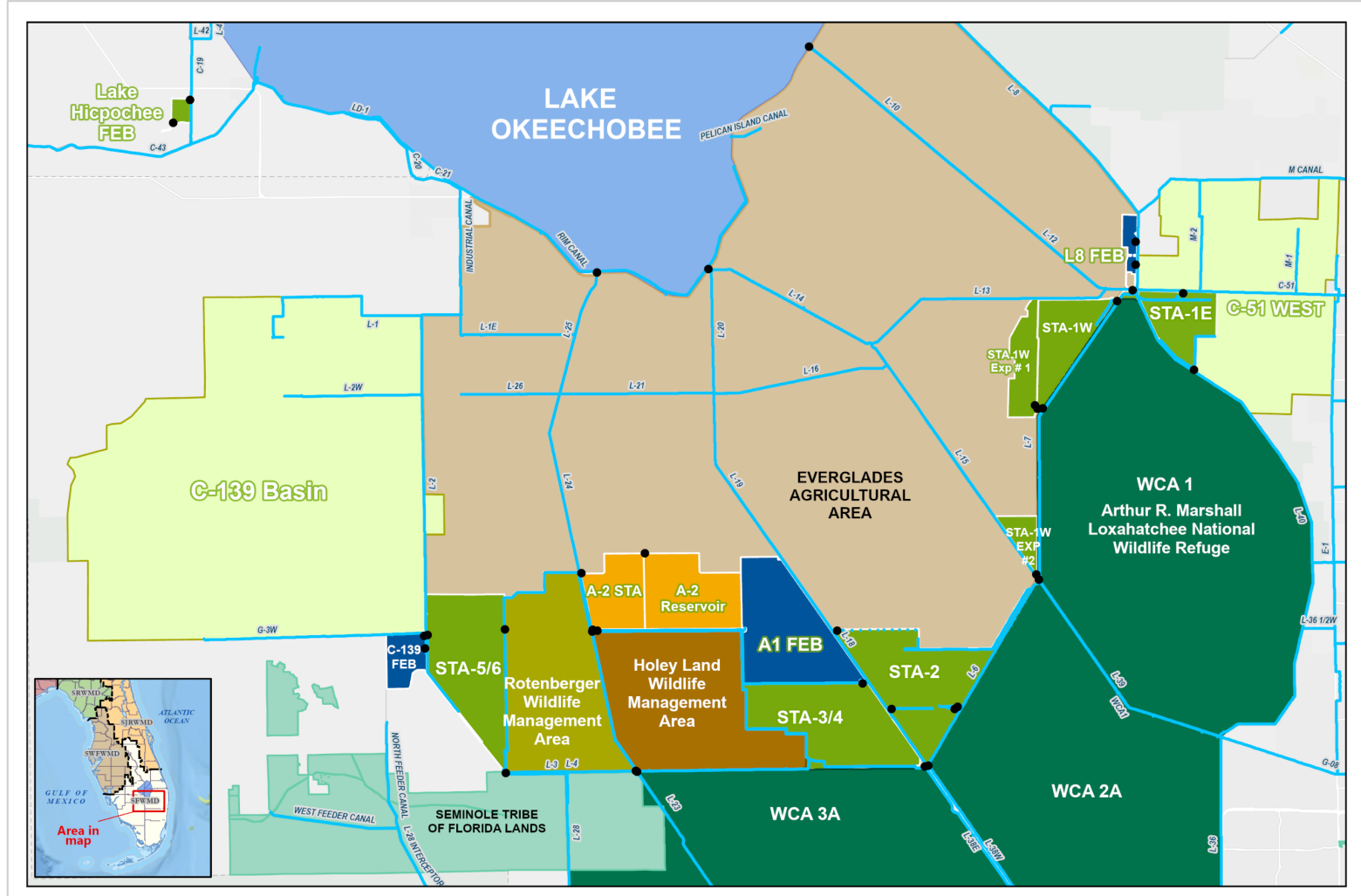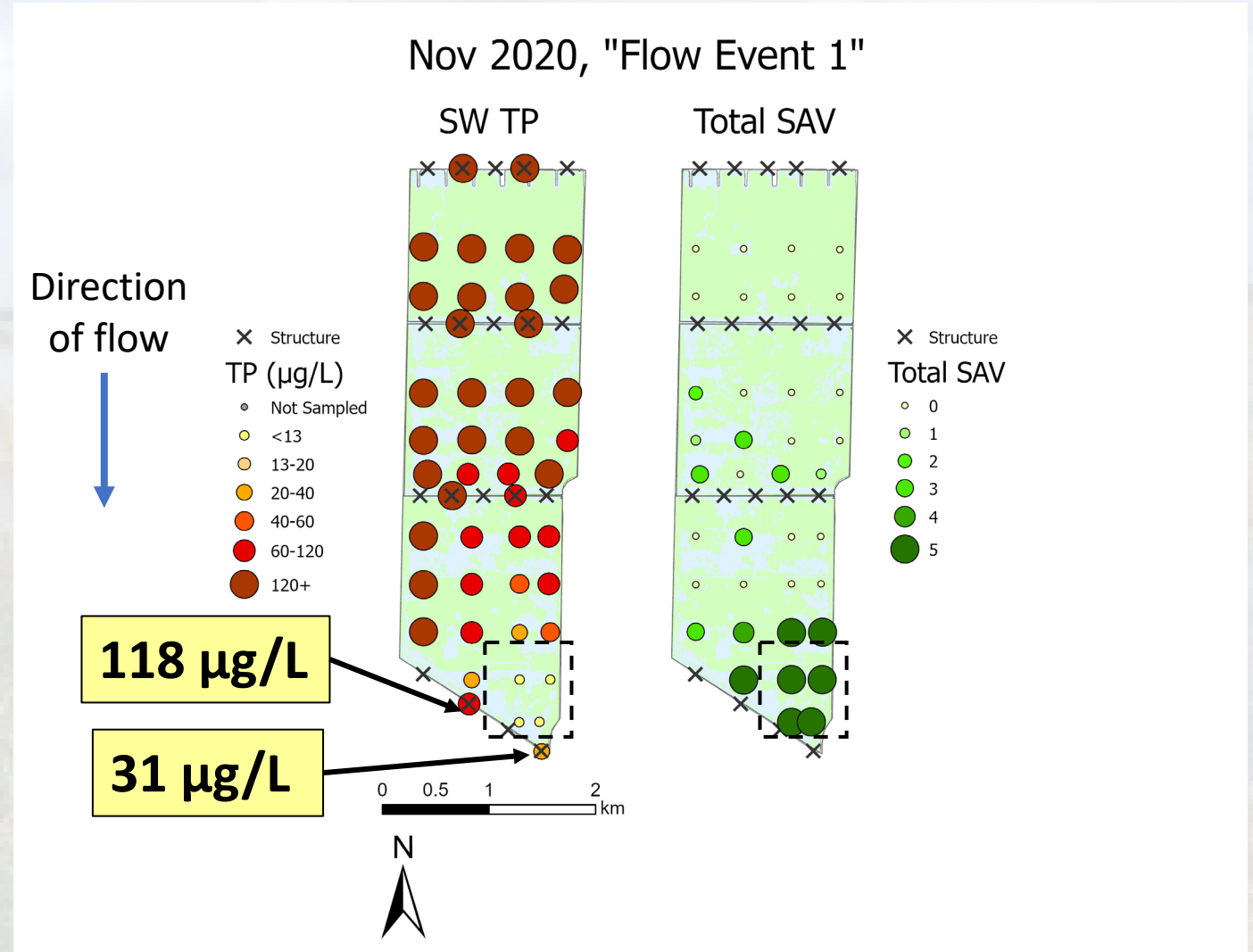
STA-2 Flow-way 3

- Sampling was conducted before and after SAV loss

- Sharp contrast in P removal between events

- Importance of water depth management and maintaining dense SAV

Sept 2021, "Flow Event 1"

Total SAV

Oct 2022, "Flow Event 2"

Total SAV

Direction of flow

0 0.5 1   2
km

N

✕ Structure

Total SAV Score

○ 0
○ 1
● 2
● 3
● 4
● 5

STA-1E Central Flow-way

- Heterogeneous vegetation coverage resulted in east-to-west variation in outflow P concentrations

Nov 2020, "Flow Event 1"

SW TP   Total SAV

Direction of flow

× Structure

TP (µg/L)
- Not Sampled
- <13
- 13-20
- 20-40
- 40-60
- 60-120
- 120+

× Structure

Total SAV
- 0
- 1
- 2
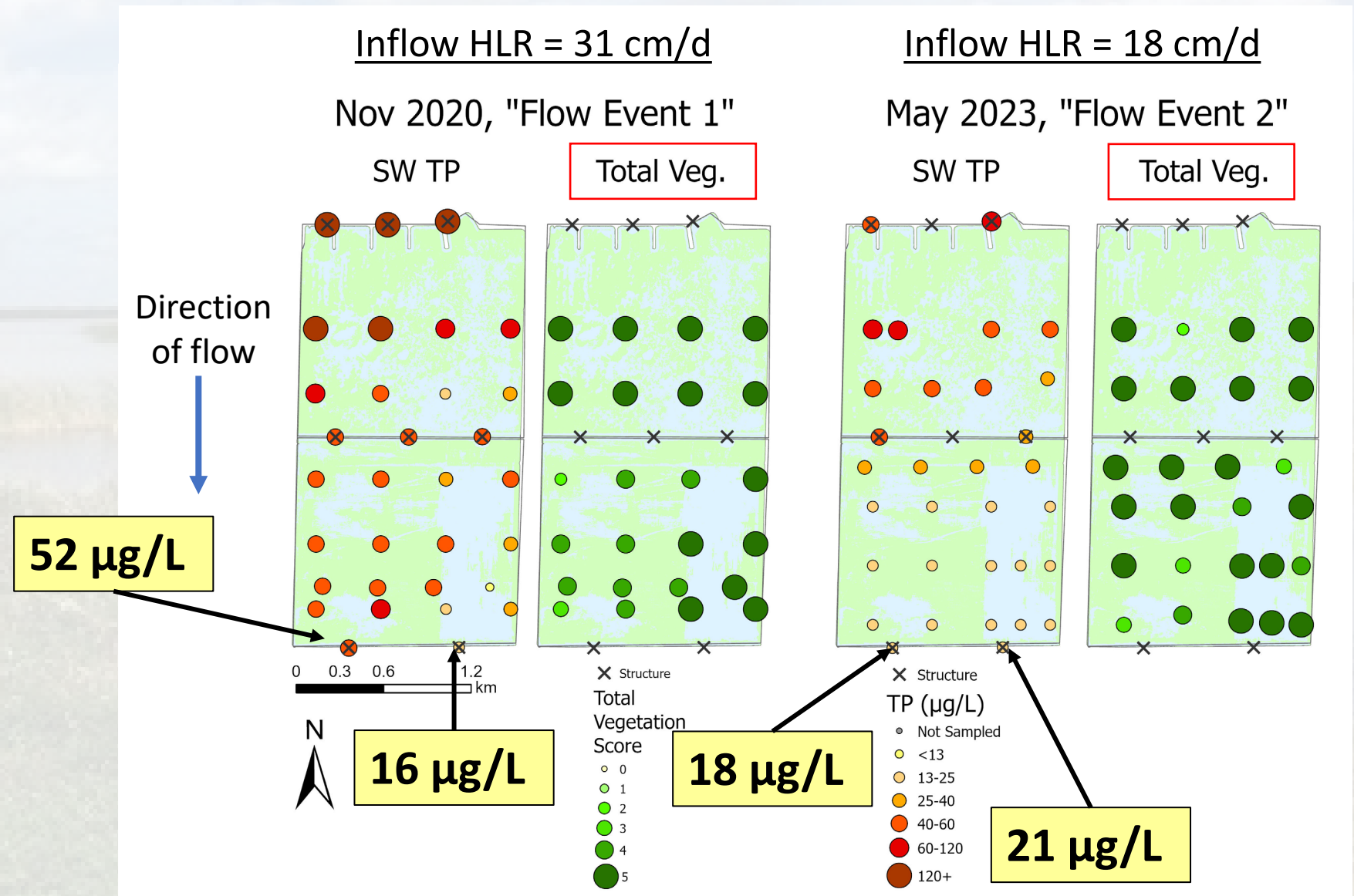- 3
- 4
- 5

118 µg/L
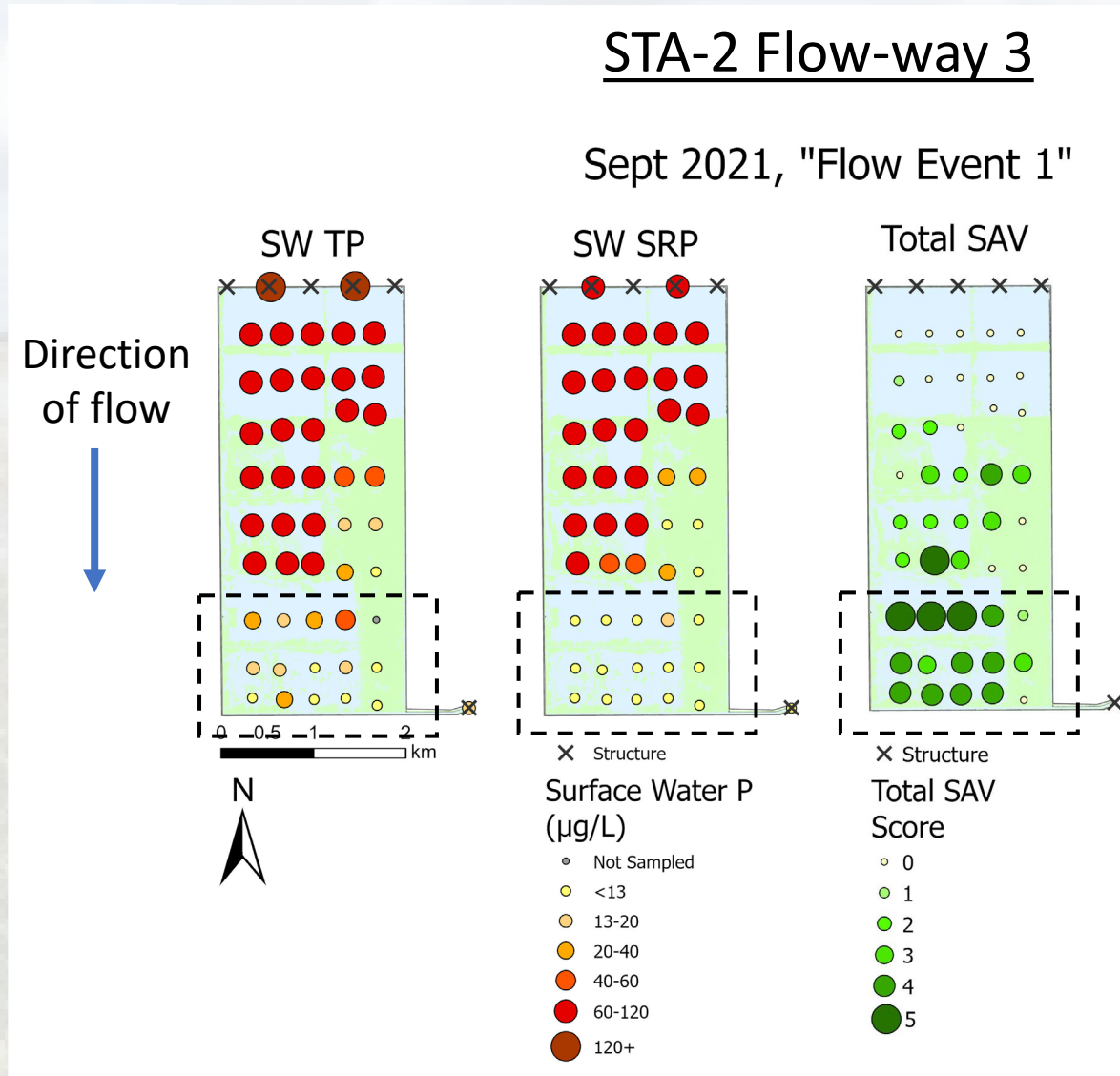
31 µg/L

0 0.5 1 2 km

N

STA-1E Eastern Flow-way

- Heterogeneous vegetation coverage resulted in east-to-west variation in outflow P concentrations during high loading conditions
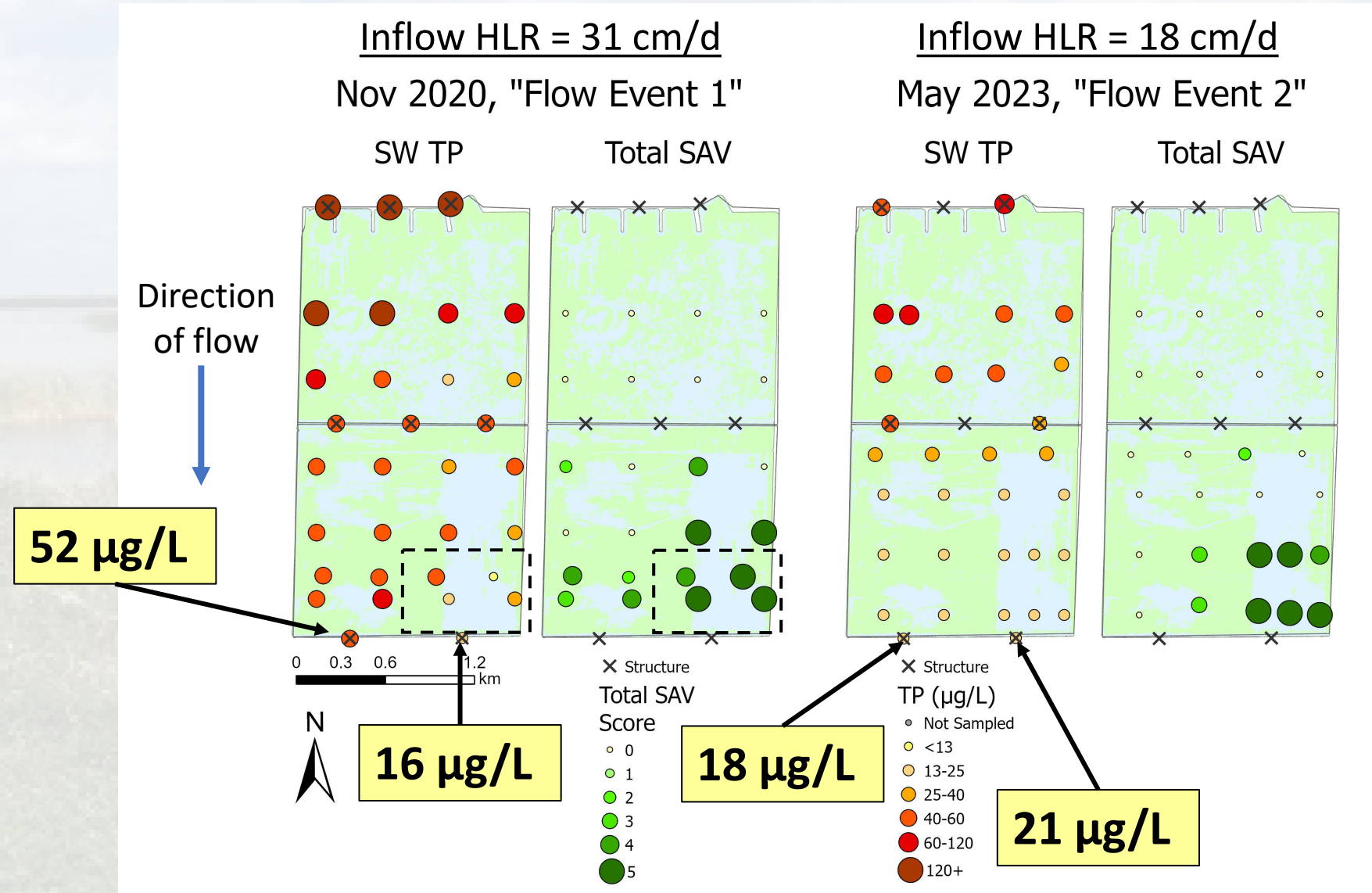
STA-1E Eastern Flow-way

- Heterogeneous vegetation coverage resulted in east-to-west variation in outflow P concentrations during high loading conditions
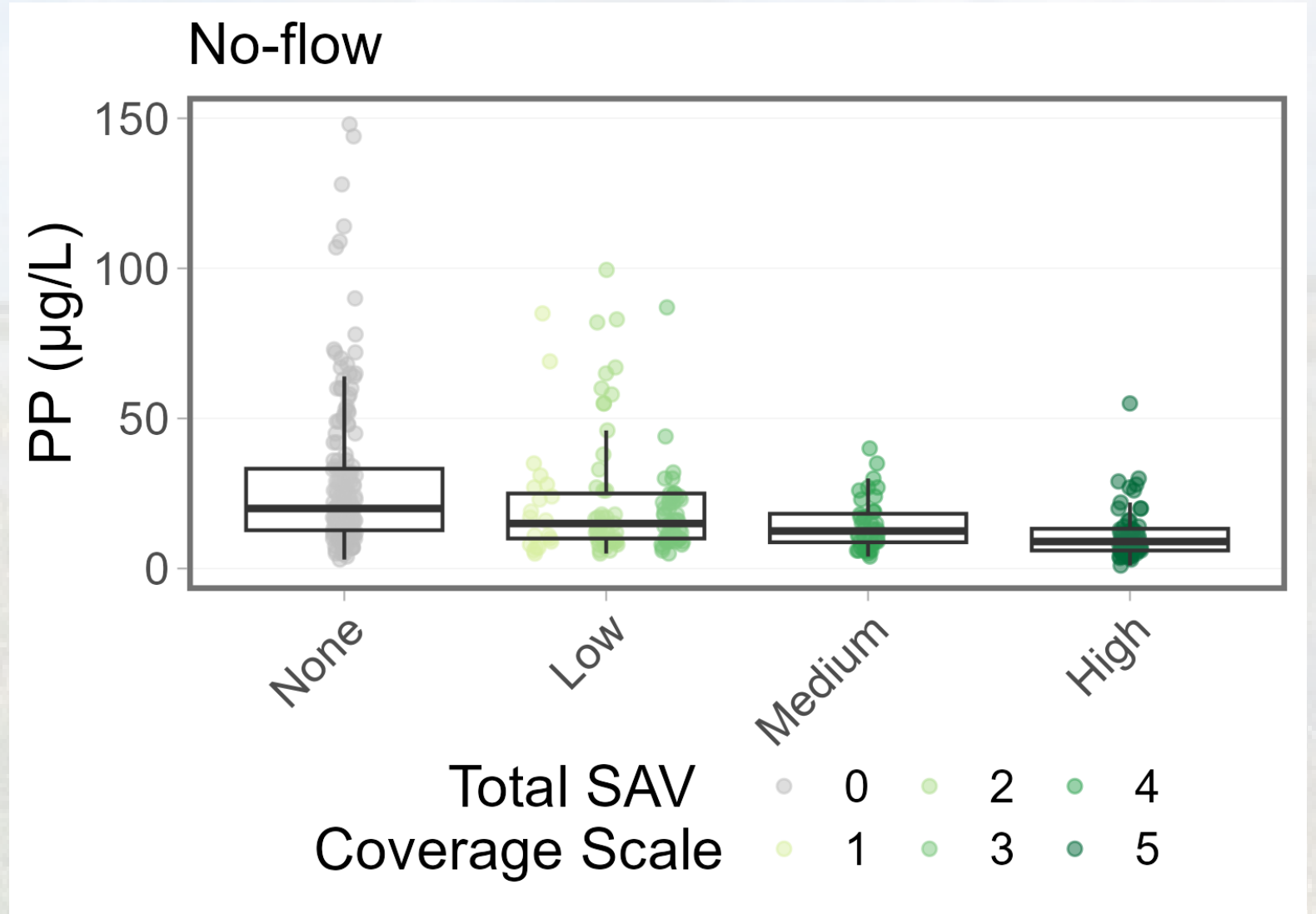
Additional insights – Flowing conditions

- 24 coupled internal water quality and vegetation surveys

- TP removal patterns during flowing conditions related to patterns of vegetation-driven removal of soluble reactive phosphorus (SRP)


STA-2 Flow-way 3

Sept 2021, "Flow Event 1"

SW TP

SW SRP

Total SAV

Direction of flow

N

✕ Structure

Surface Water P (μg/L)

- Not Sampled
- <13
- 13-20
- 20-40
- 40-60
- 60-120
- 120+

✕ Structure

Total SAV Score

- 0
- 1
- 2
- 3
- 4
- 5

Additional insights – No-flow conditions

- Particulate phosphorus (PP) accumulation was lower in vegetated regions during no-flow conditions
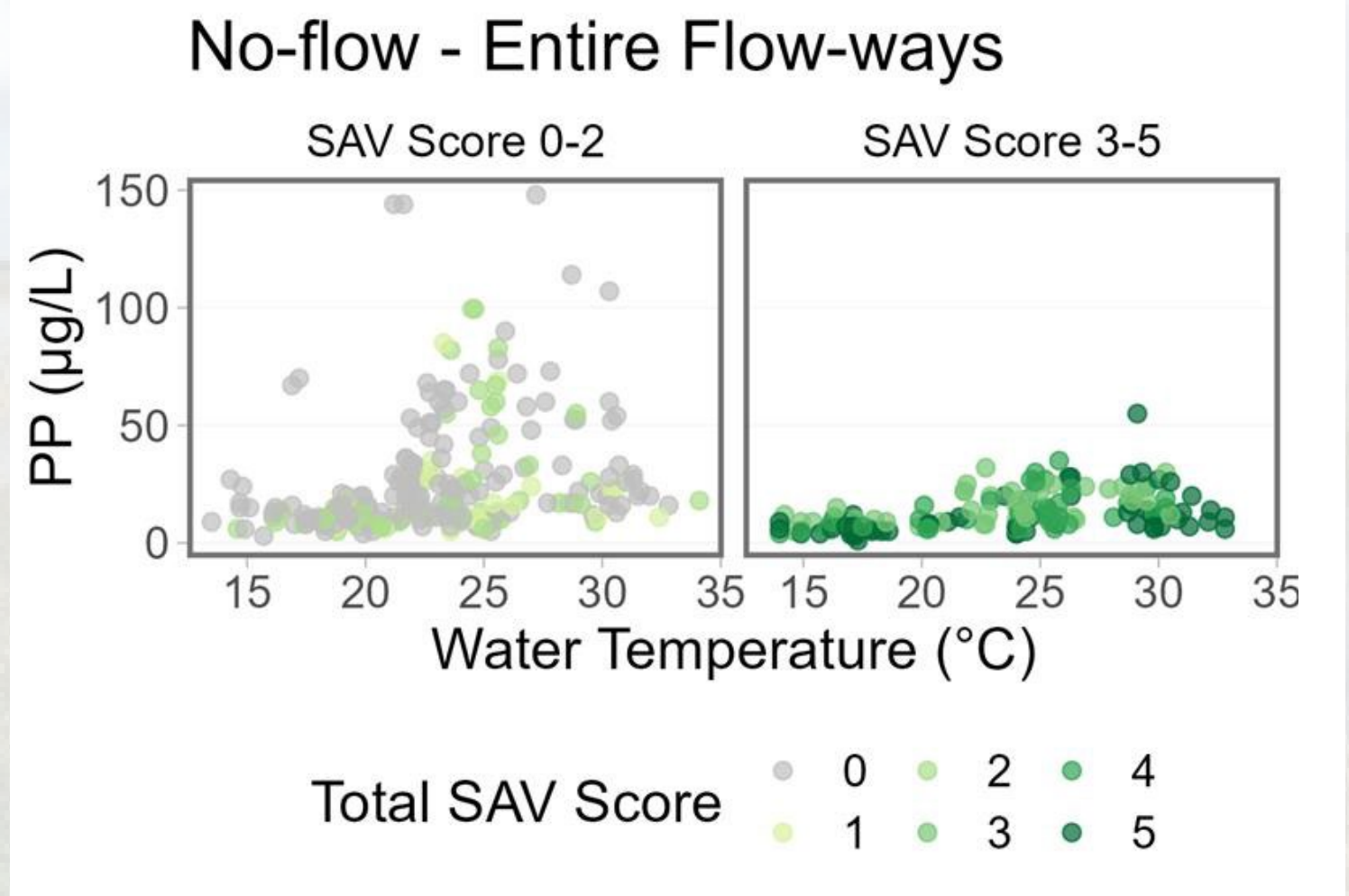
Additional insights – No-flow conditions cont.

- Lower water depth conditions resulted in higher surface water PP when there was low SAV density
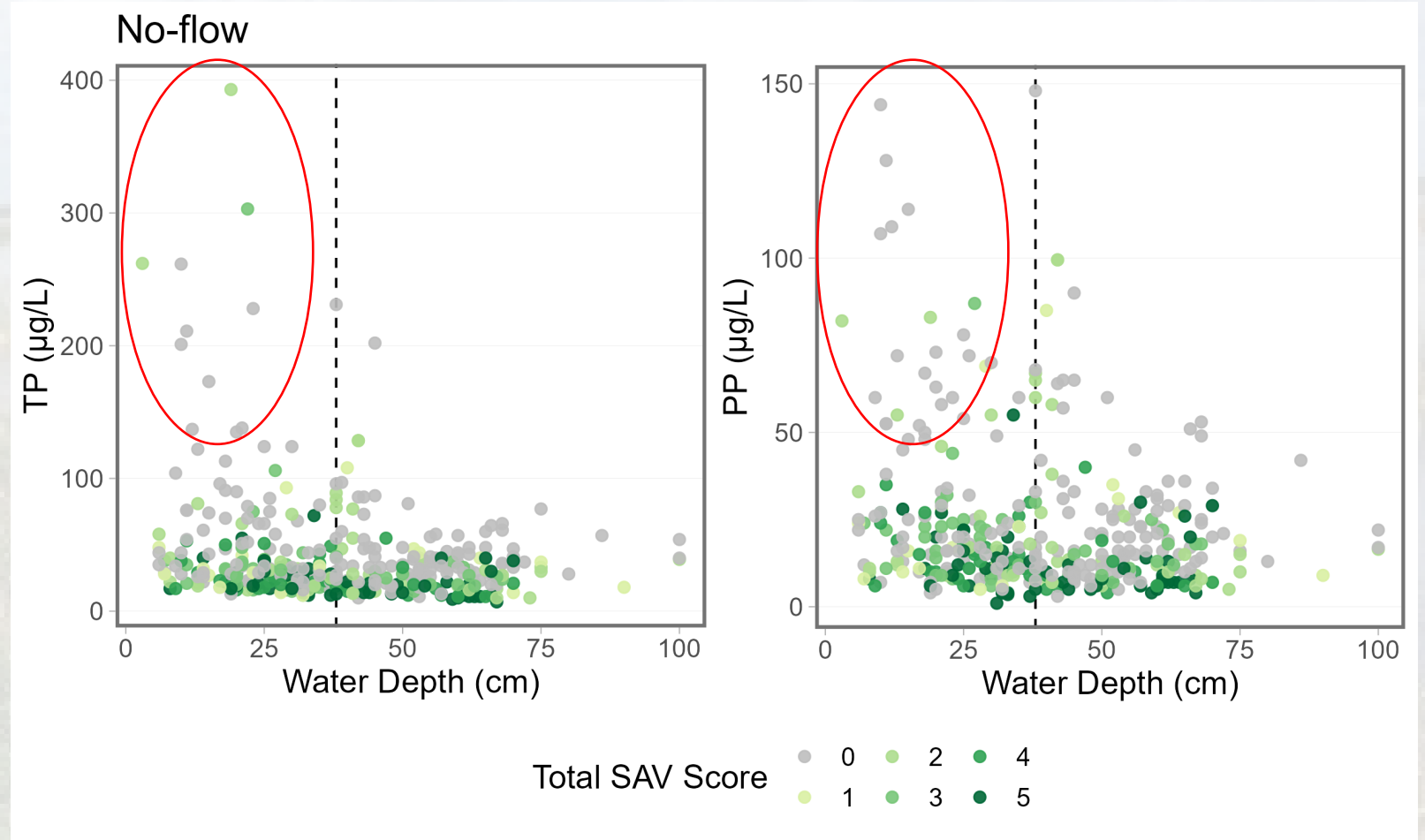
Additional insights – No-flow conditions cont.

- Low SAV coverage resulted in higher surface water PP concentrations at higher water temperatures

No-flow - Entire Flow-ways

SAV Score 0-2   SAV Score 3-5

PP (µg/L) vs Water Temperature (°C)

Total SAV Score: 0, 1, 2, 3, 4, 5

Conclusions

- Clear relationships between local vegetation abundance in the outflow region and outflow P

- Crucial to try to avoid vegetation loss in the STAs
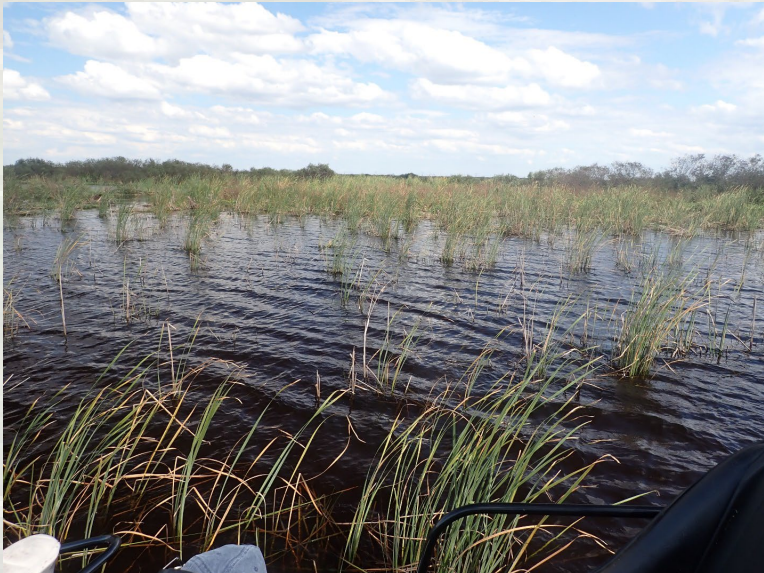
Acknowledgements

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References

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Questions?

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