SAV in the STAs: Insights into Phosphorus Retention

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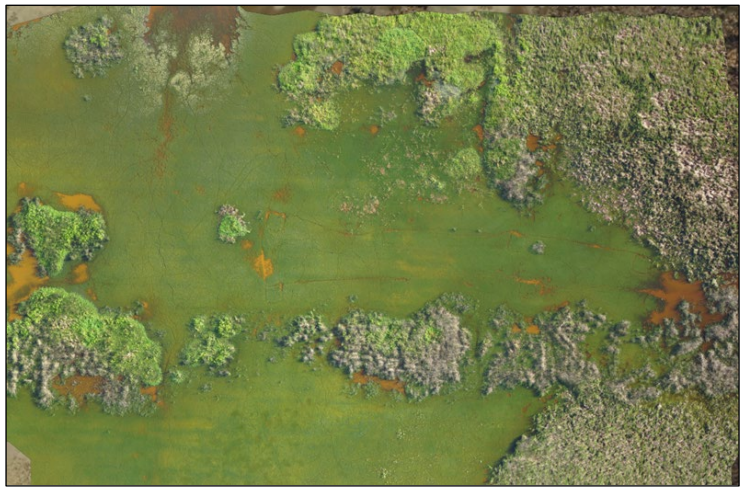
Greater Everglades Ecosystem Restoration Conference

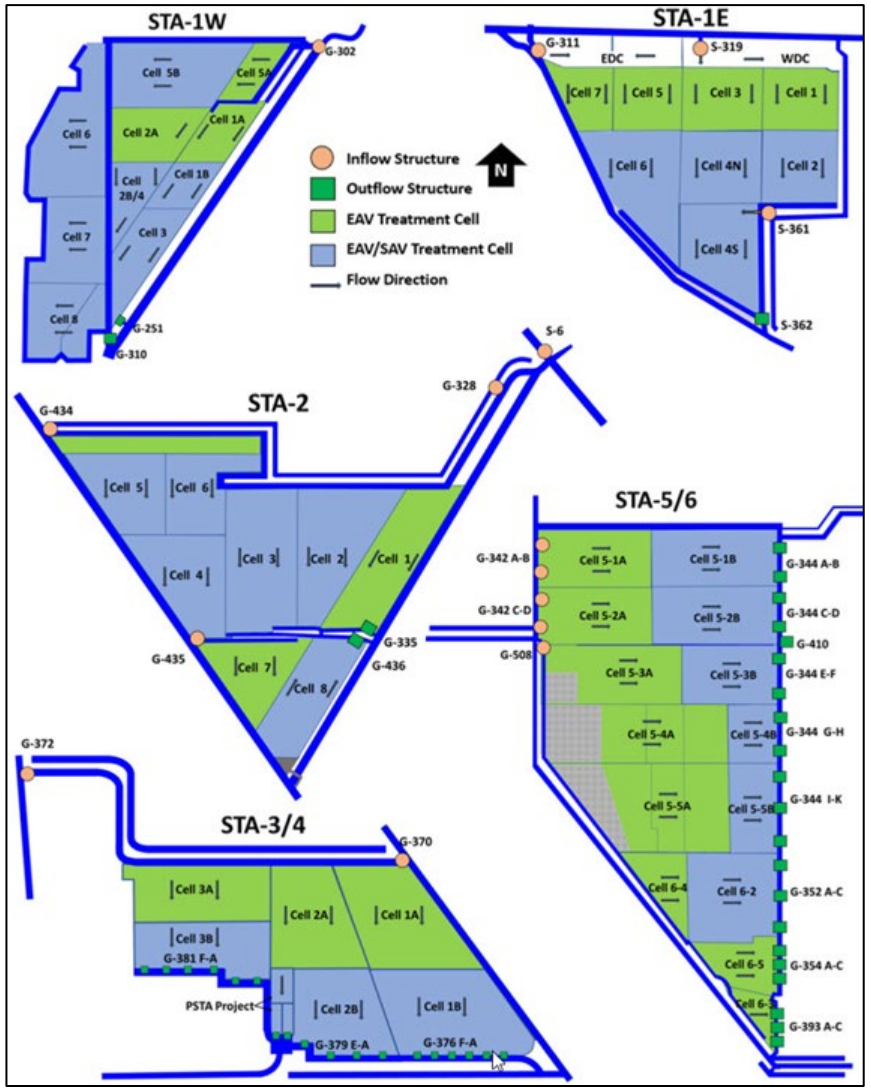
April 22, 2025

Stormwater Treatment Areas

- Reduce TP from surface water entering the Everglades

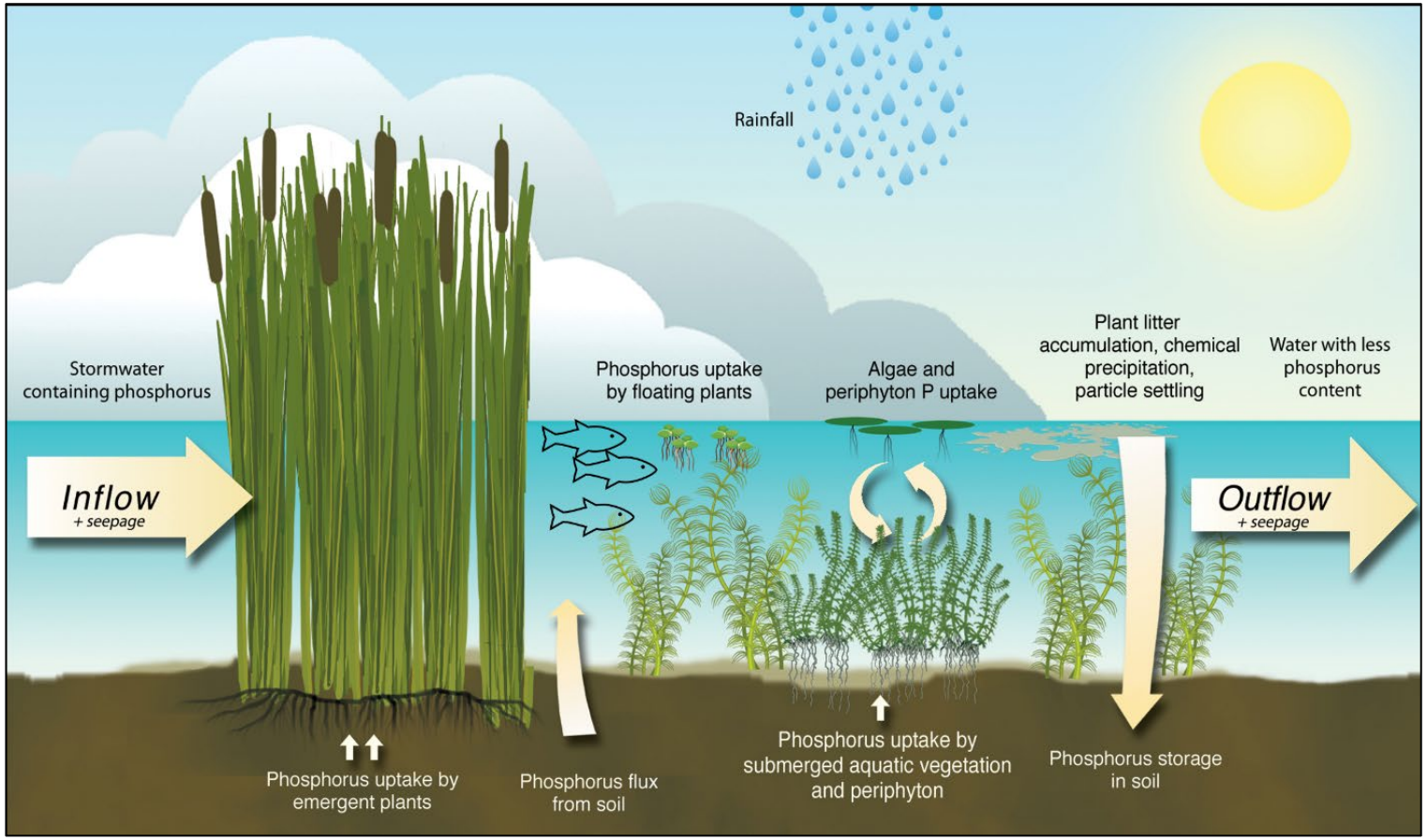
- Emergent (EAV) and Submerged (SAV) Aquatic Vegetation





Submerged Aquatic Vegetation

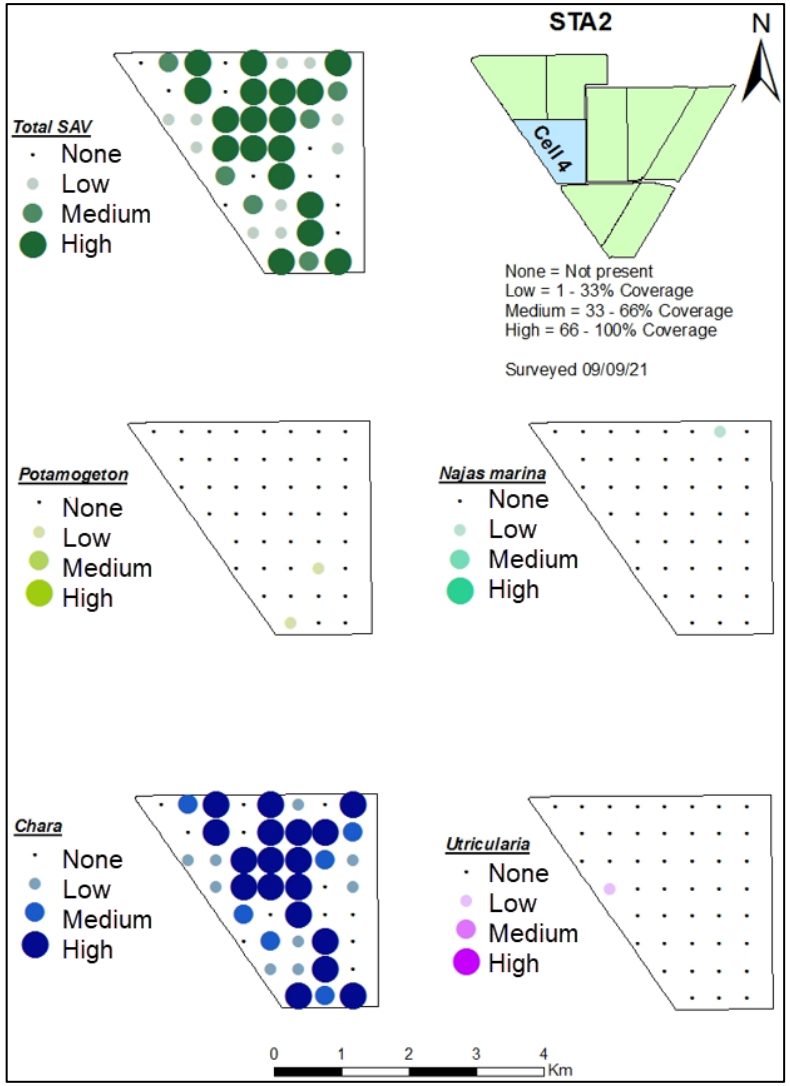
- Direct P uptake from water column
  - Co-precipitation of P
- Supports periphyton
- Prior analysis typically done at mesocosm scale

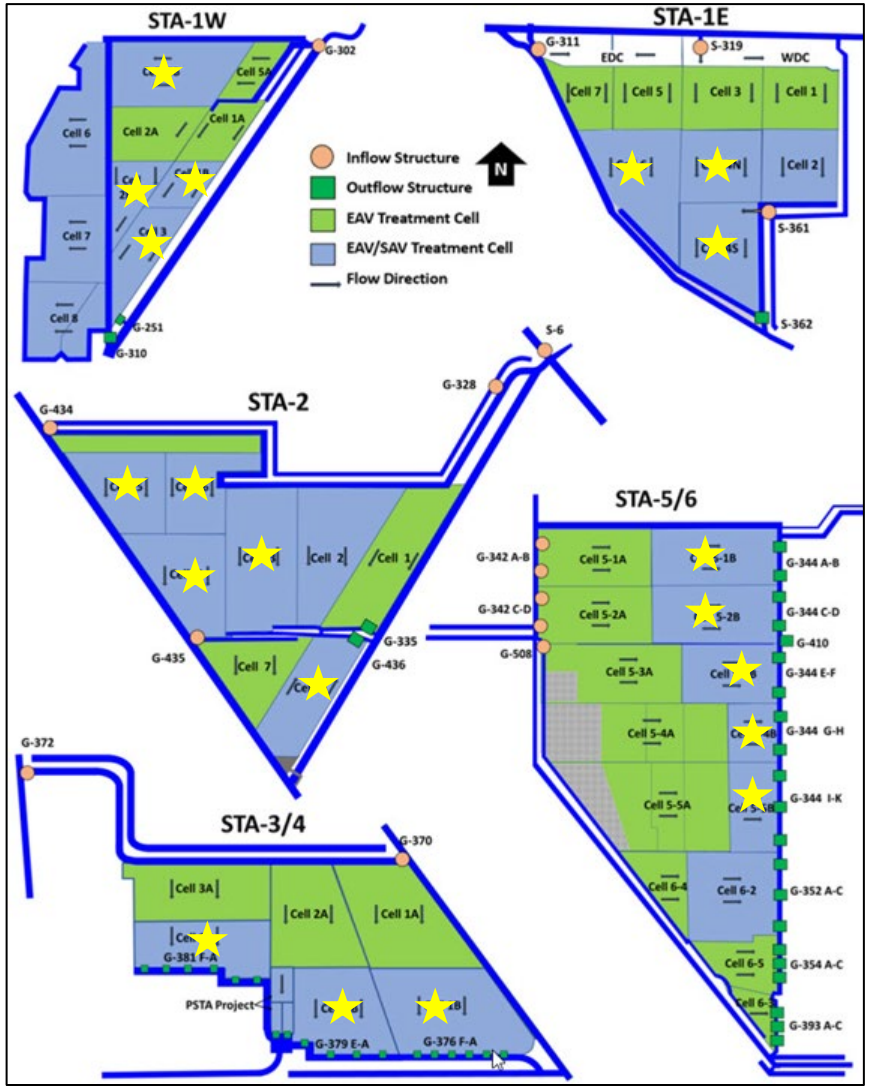


SAV Surveys

- Point-based grid

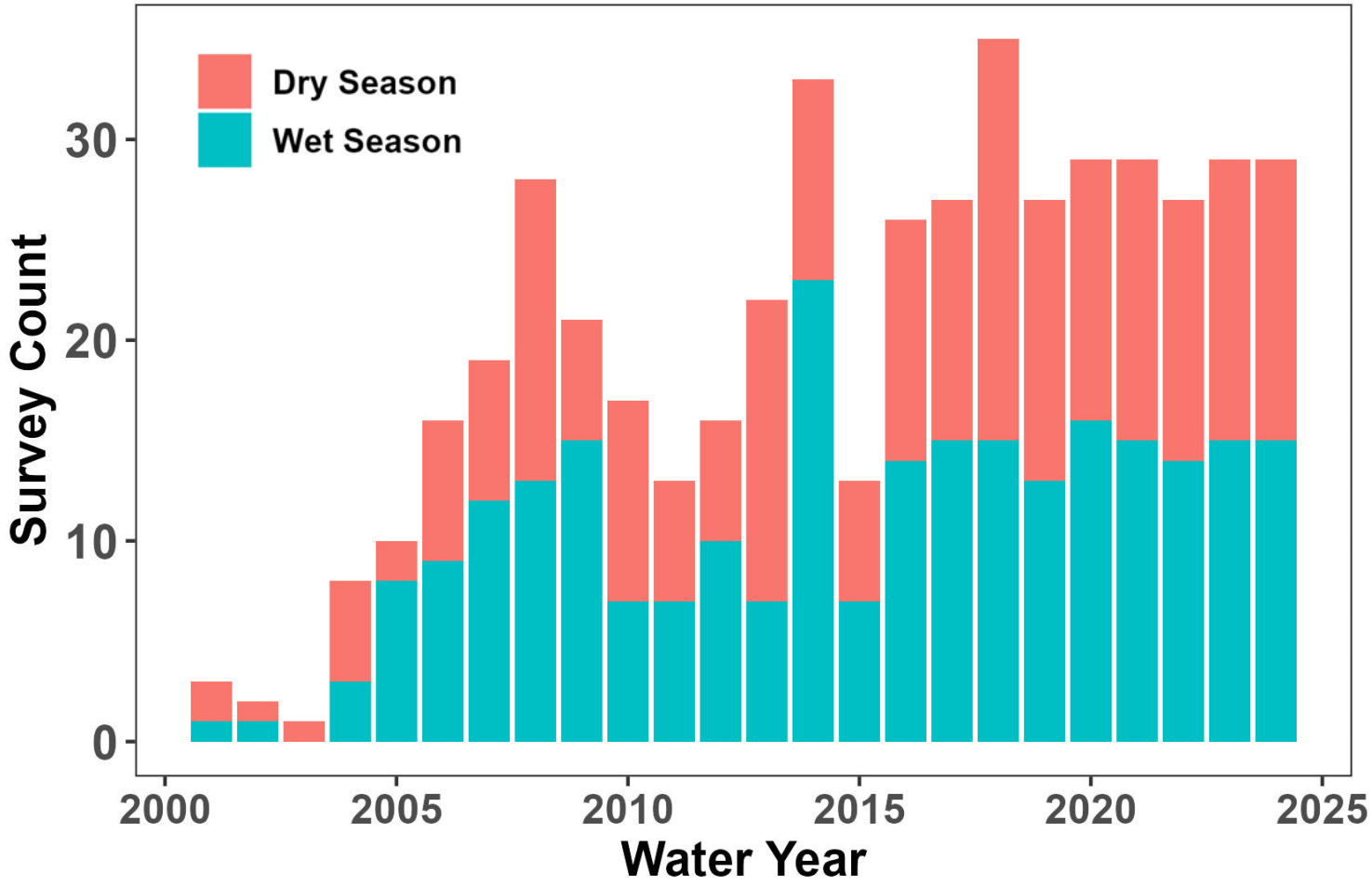
- Low – 1
  - 0 – 33%
- Medium – 2
  - 33 – 66%
- High – 3
  - 66 – 100%





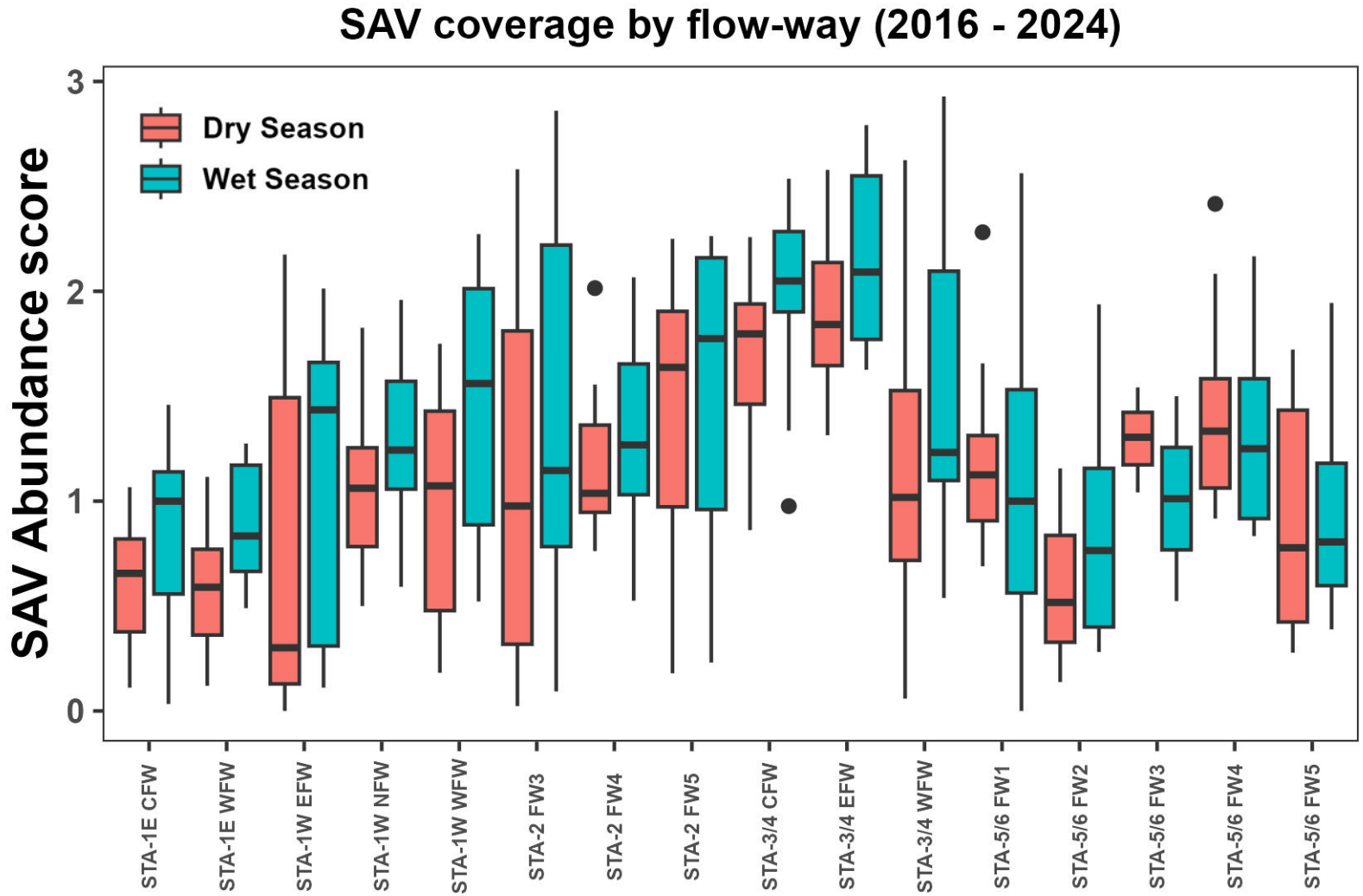
Survey and Flow Datasets

- ~400 surveys since 2000
- Conducted seasonally starting in 2016
- Compared against period of record flow and nutrient dataset
  - Flow
  - 365-day PLR



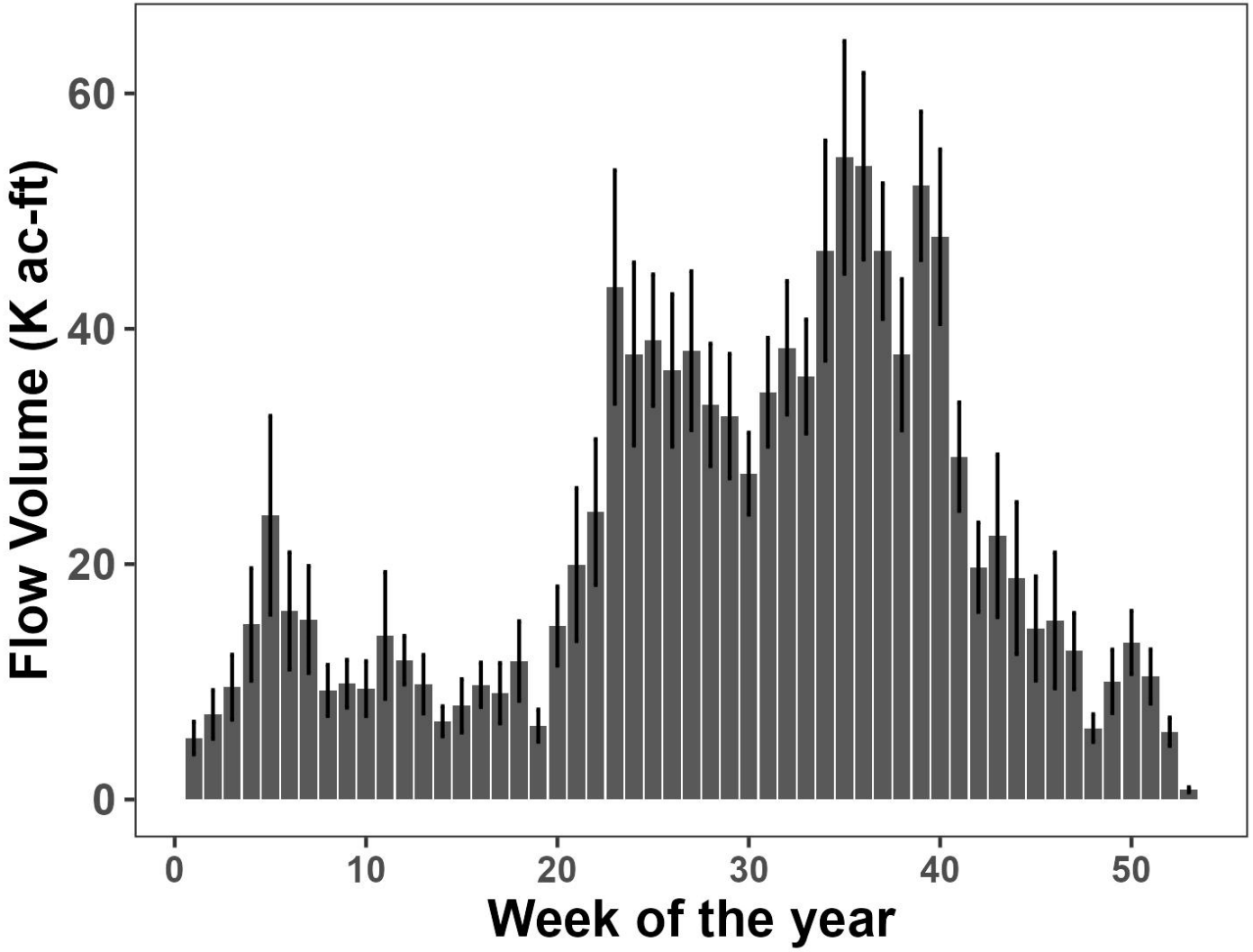
SAV Seasonality

- Important to focus at the flow-way scale
- Median SAV coverage typically higher during the wet season



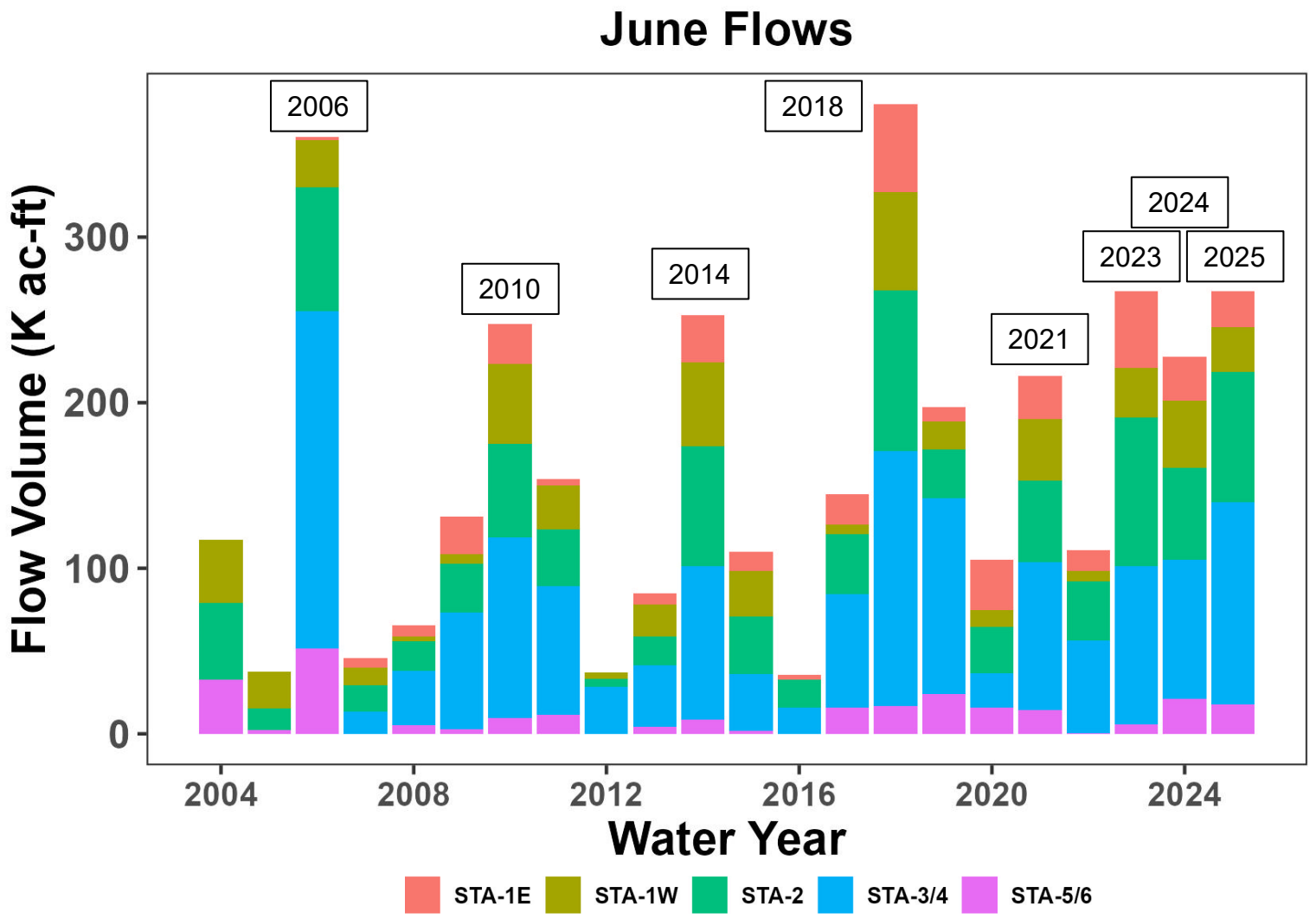
Seasonal Flows

- Flows into the STAs are very seasonal
- First spike in flows coincide with the start of the wet season (~June)
- Other peaks in flows are tied to tropical activity in the fall



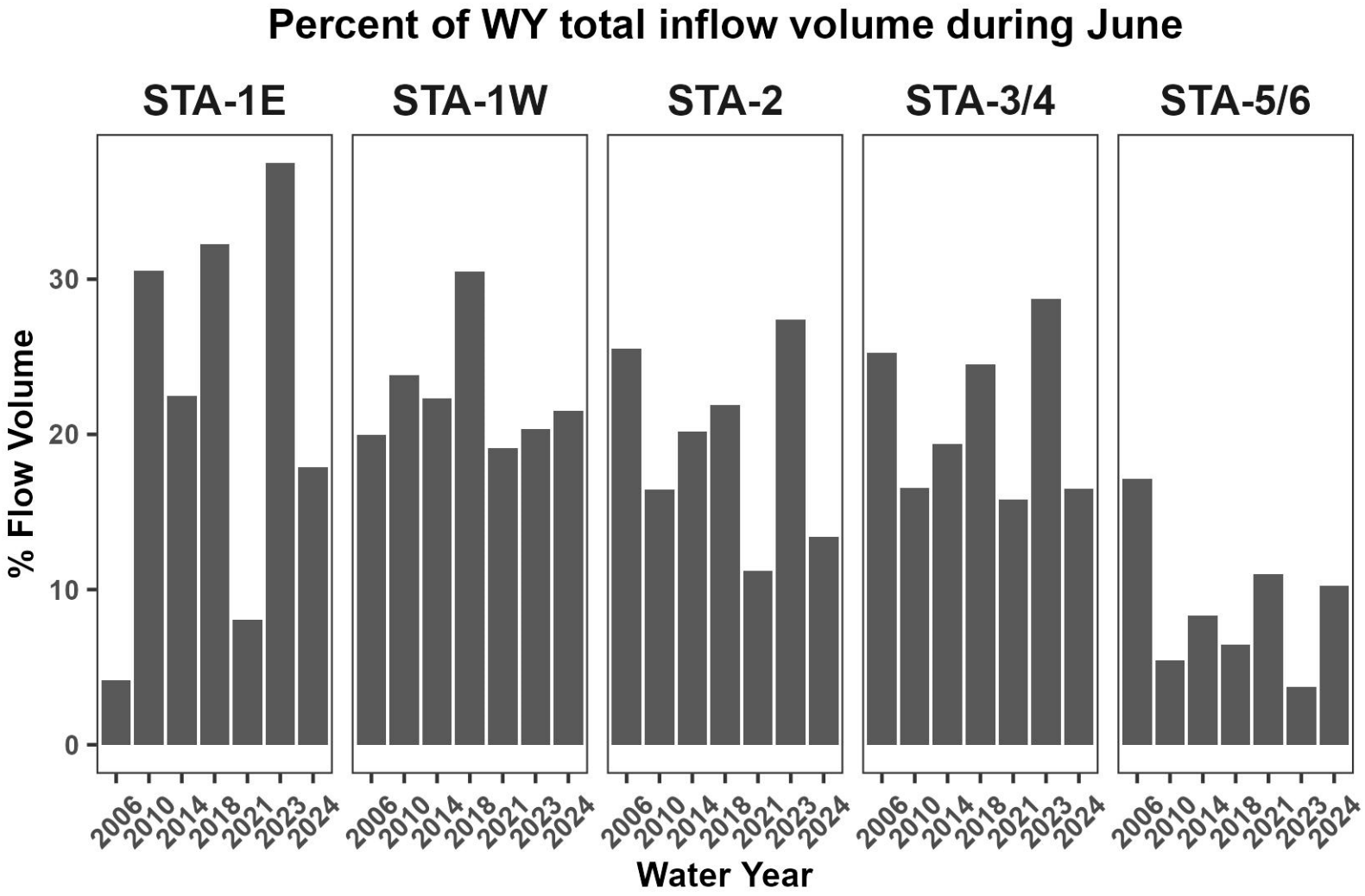
June Flow Events

- ~40% of June's have >200,000 ac-ft of flows
- Large events more frequent in recent years
  - Increase in STA capacity over time



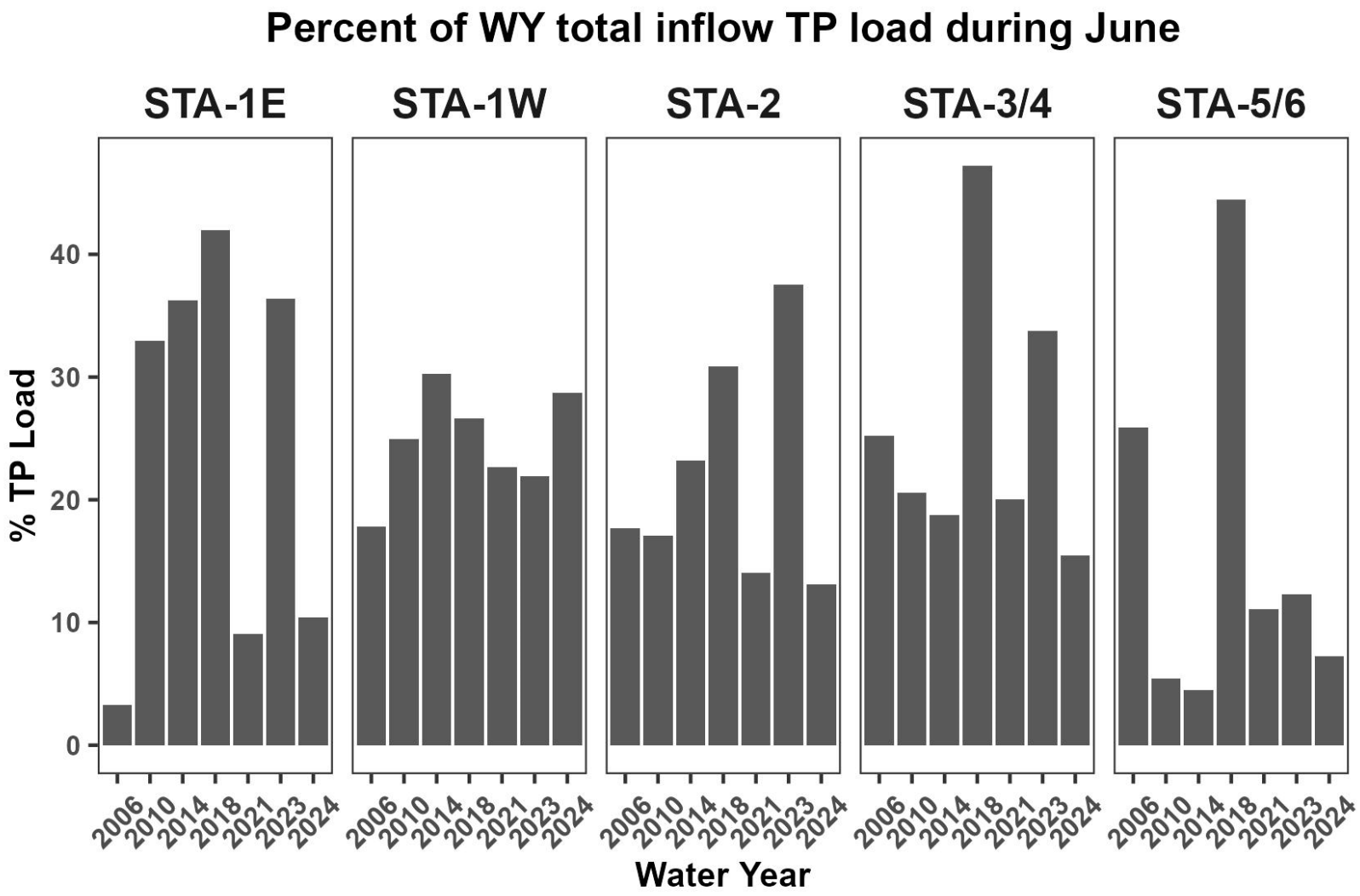
June Flow Events

- Make up around 20% of the year's total inflows
- High flows after stagnant conditions can reduce P retention



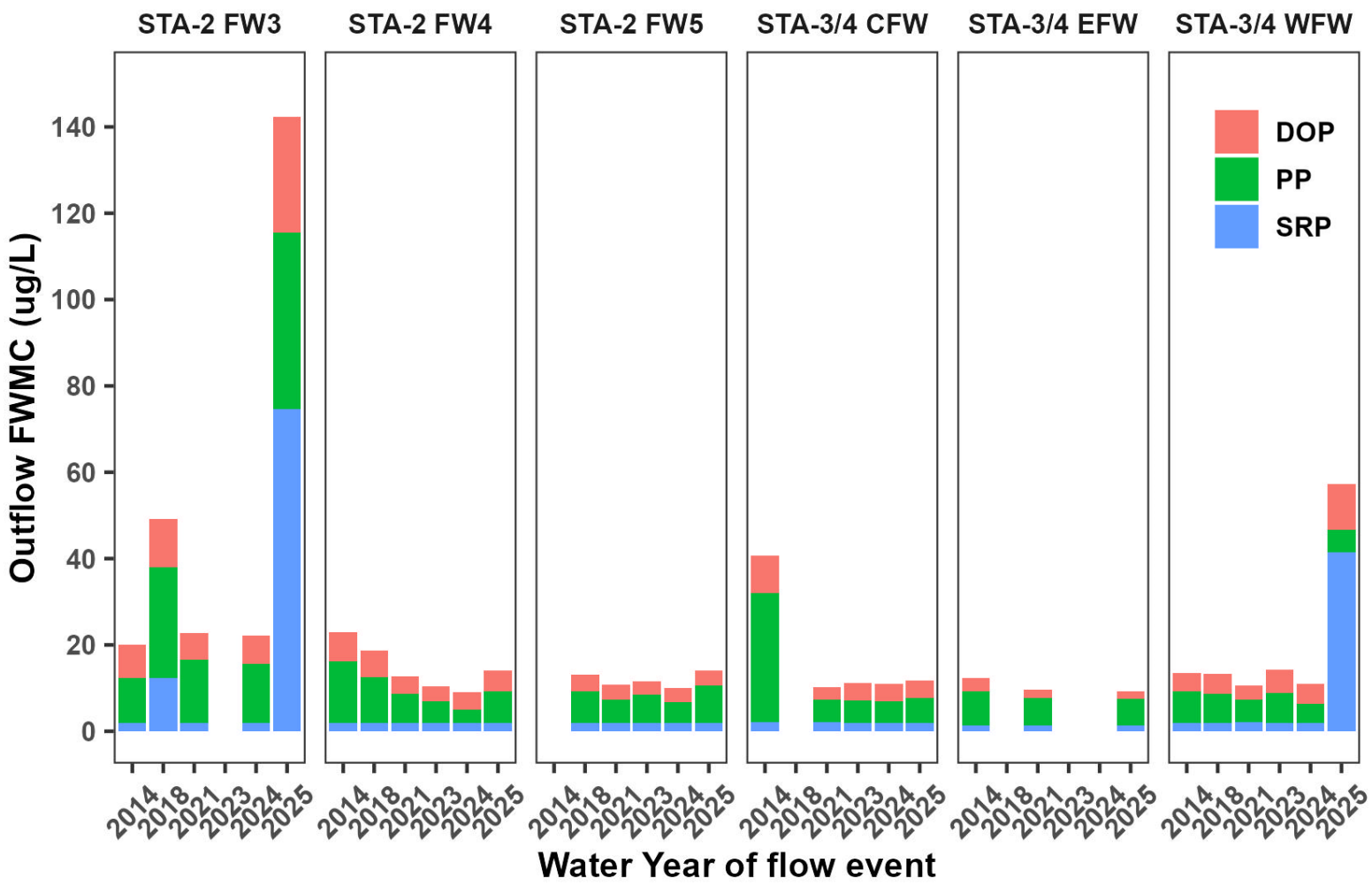
TP Loading

- TP loads associated with flow events are much higher
- Over 40% of the entire years load can be delivered in 1 month



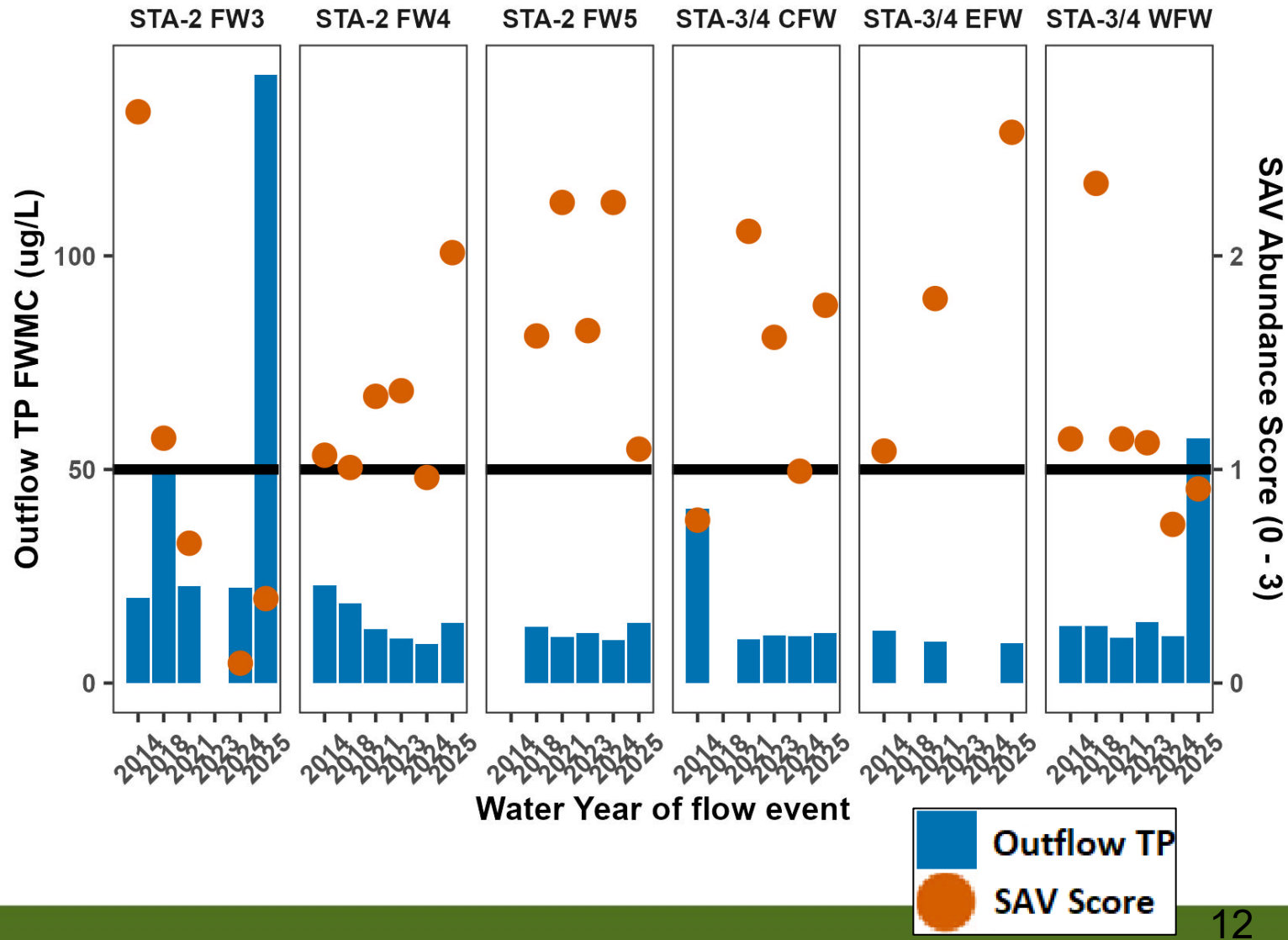
Case Study: STA-2 + STA-3/4

- Minimal ‘disturbance’ compared to other STAs
- Flow-way outflow TP concentration typically ‘resilient’ during June events
- SRP main fraction when flow-way is not ‘resilient’



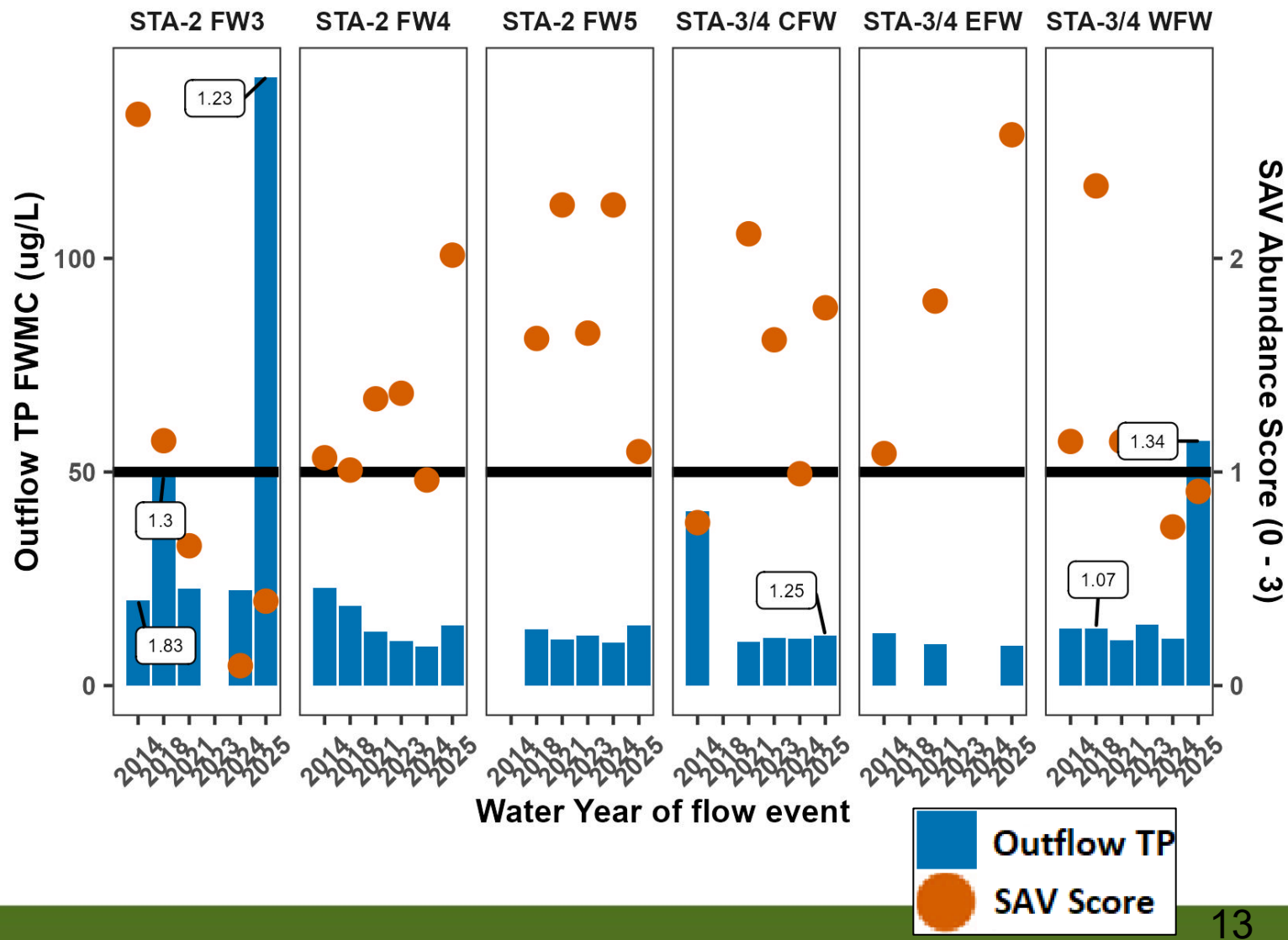
Case Study: STA-2 + STA-3/4

- Compare most recent SAV survey to June outflow TP
- Minimum SAV coverage threshold around ~33% (Abundance Score = 1)



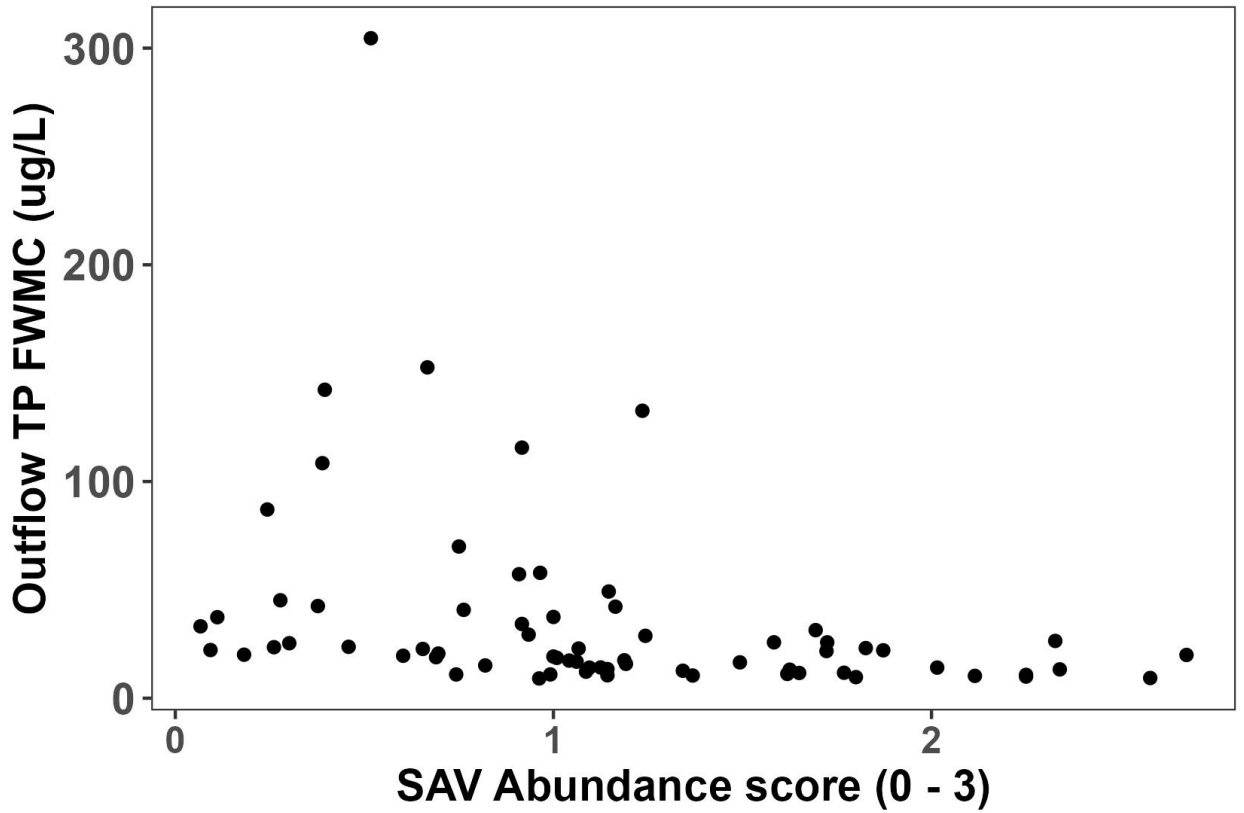
Case Study: STA-2 + STA-3/4

- Compare most recent SAV survey to June outflow TP
- Minimum SAV coverage threshold around ~33% (Abundance Score = 1)
- If 365-day PLR > 1.0, then more SAV coverage needed



SAV Threshold – More P Retention

- STA flows and SAV coverage are seasonal
- Early wet season flow events can be very impactful
- Maintaining SAV coverage threshold and low 365-day PLR linked to lower outflow TP



Contact – Thank You

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