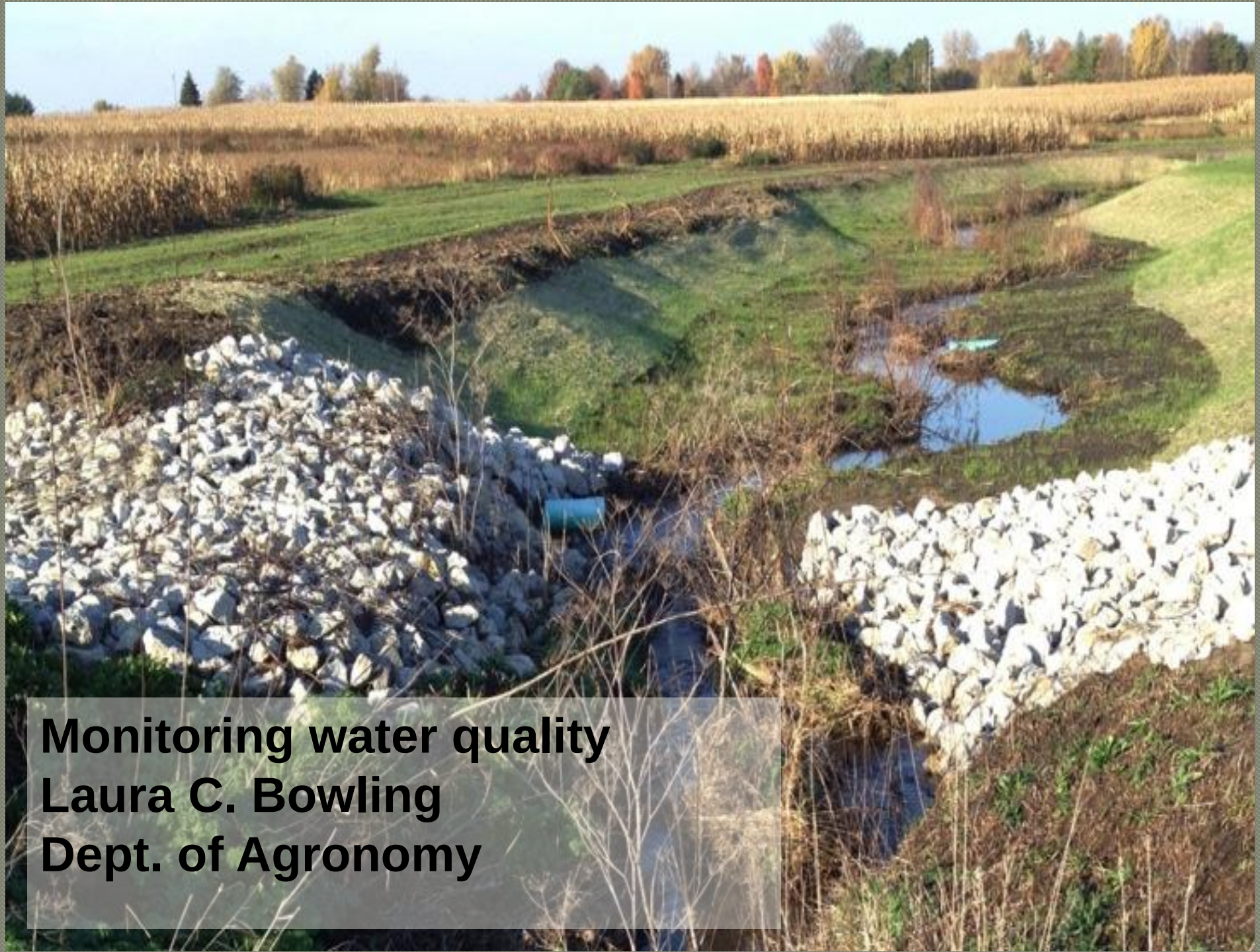
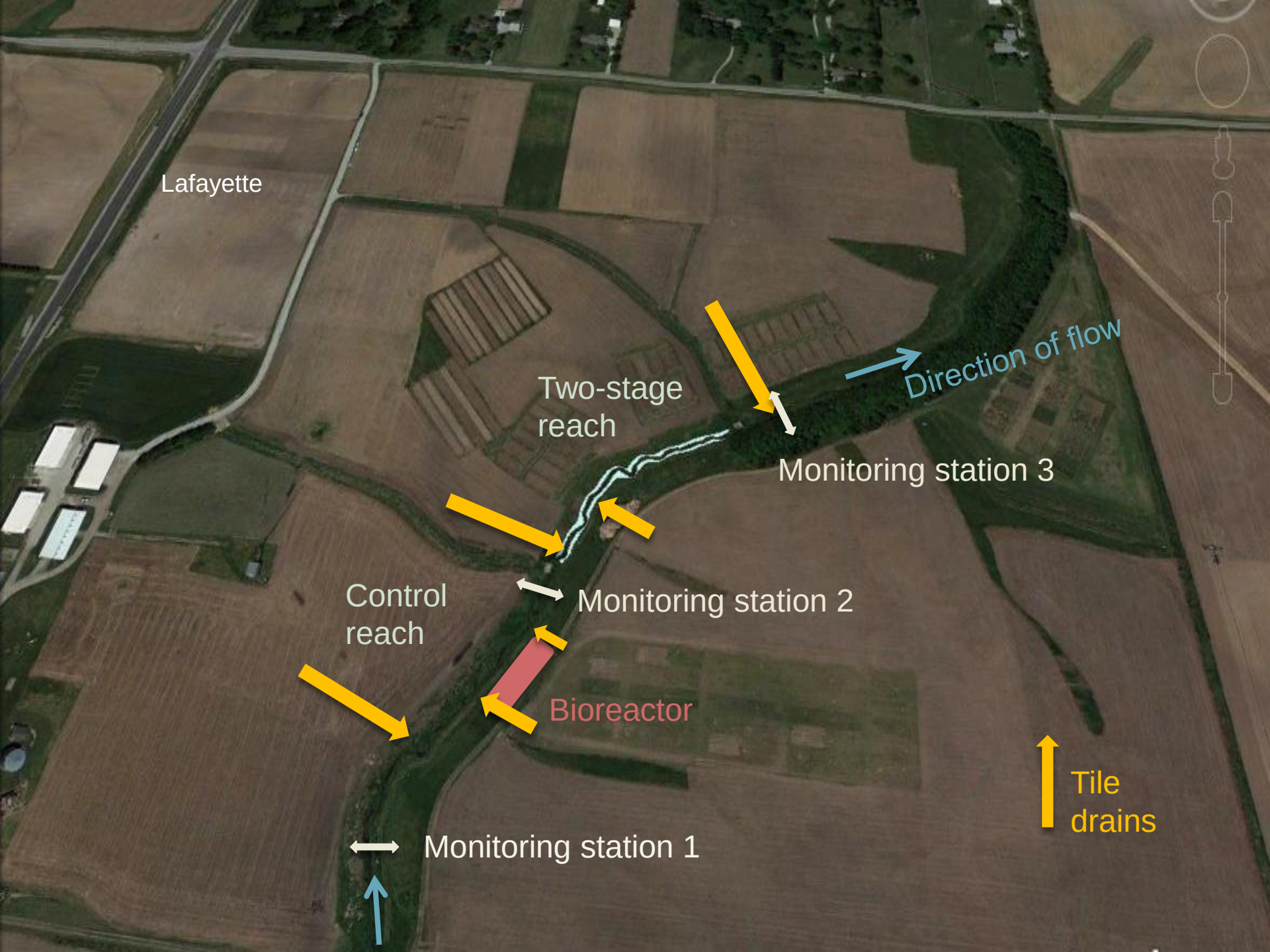


Monitoring water quality

Laura C. Bowling
Dept. of Agronomy


Lafayette
Two-stage reach
Direction of flow
Monitoring station 3
Control reach
Monitoring station 2
Bioreactor
Tile drains
Monitoring station 1

What is being monitored at each cross-section?

- Every 15 minutes:
  - Water level
  - Turbidity
  - Temperature
  - Dissolved oxygen
  - Tile Discharge

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What is being monitored at each cross-section?

- Weekly:
  - Discharge
  - Baseflow concentrations of nitrate, total phosphorus, orthophosphate and total suspended solids (TSS)

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What is being monitored at each cross-section?

- Storm events:
  - Flow proportional samples for nitrate, total phosphorus, orthophosphate and total suspended solids (TSS) concentrations.

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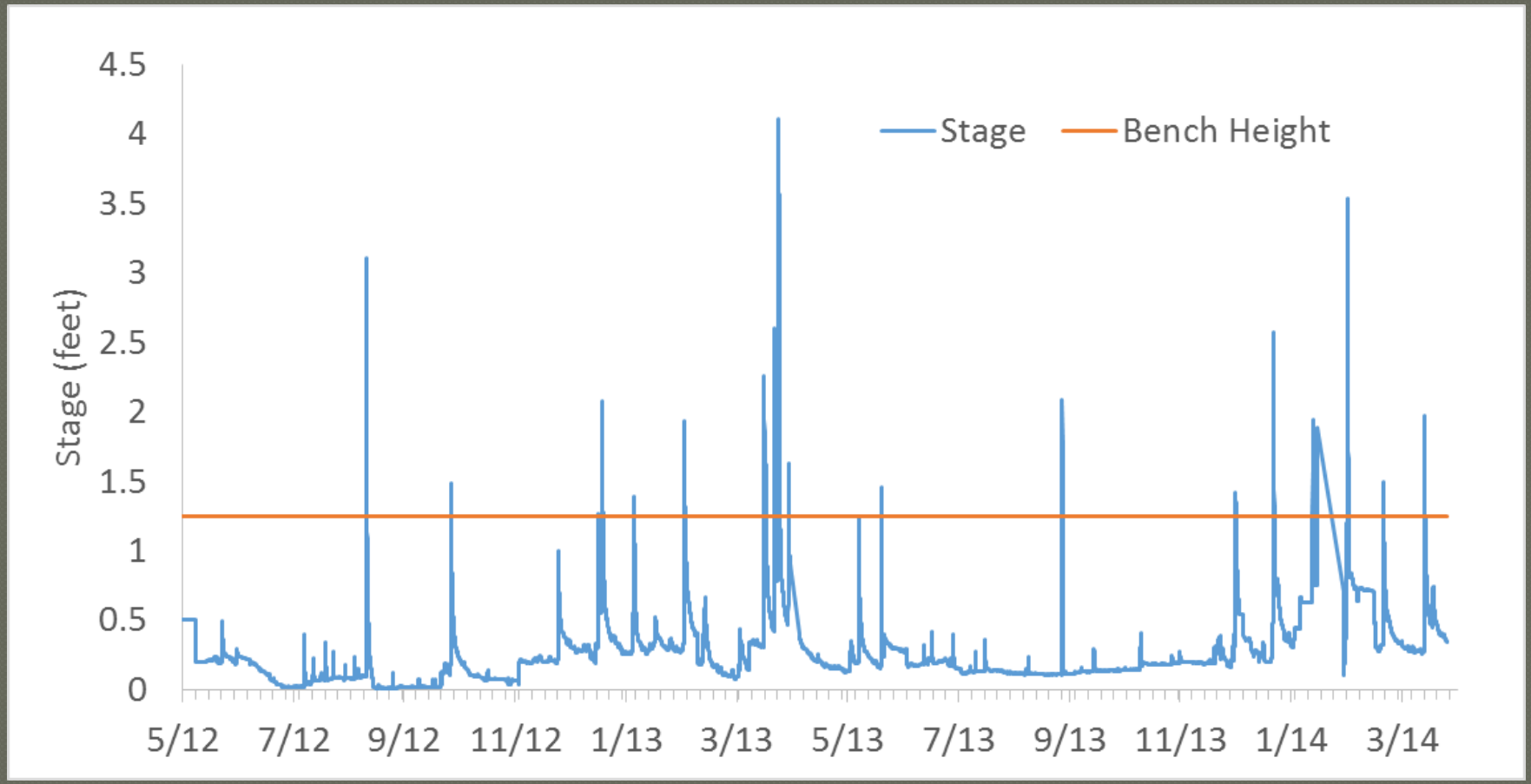
Water Level in the Ditch



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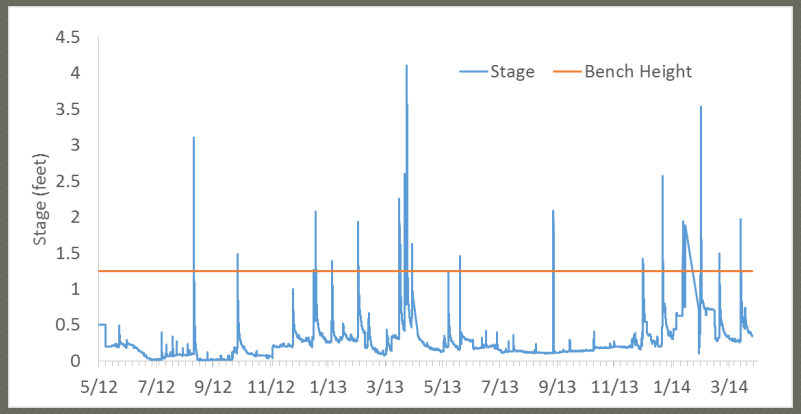
Water Level in the Channel



- Between 5/22/12 – 4/15/14
  - Stream was above the benches for about 150 hours (1% of the time).
  - 23 events
  - 6.5 hours / event

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Percent reduction in concentration in the treatment and control sections

TPAC ditch	TSS	Total phosphorus	Nitrate-N
Control section	31	-135%	-10%
Two-stage section	-27%	35%	6.5%

Upstream – Downstream, so negative value indicates concentration increases downstream.

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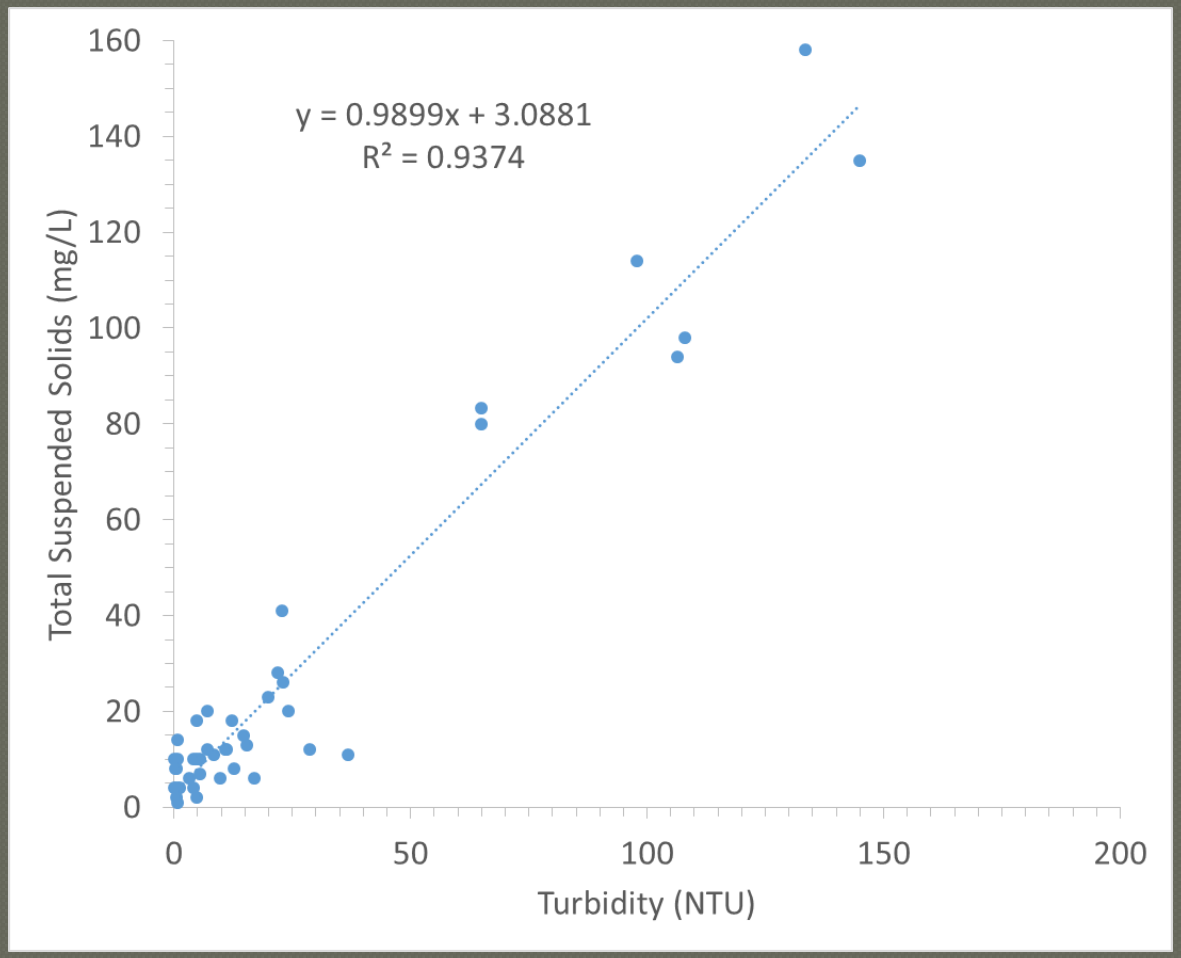
Using turbidity to evaluate TSS



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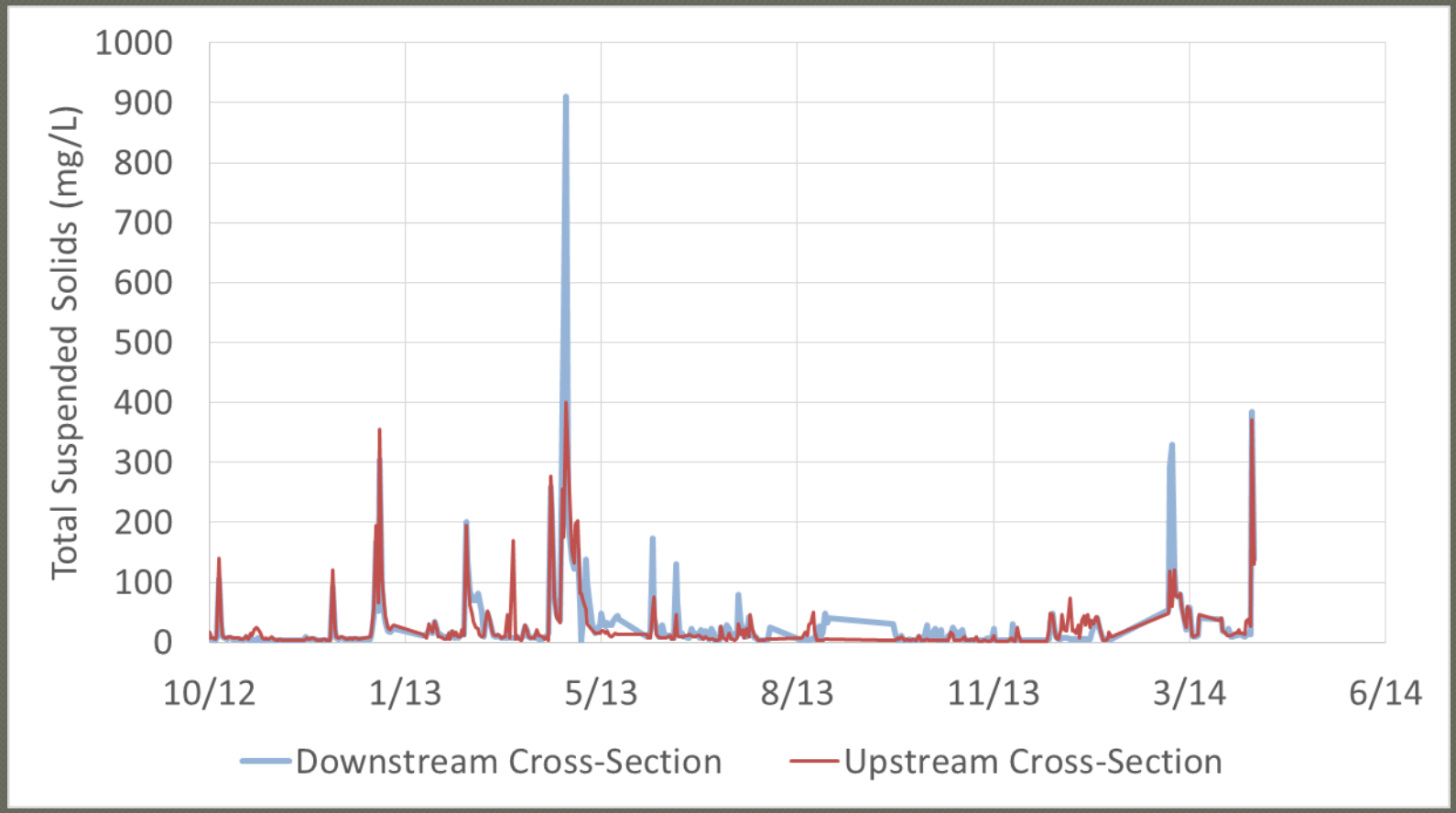
TSS Time Series



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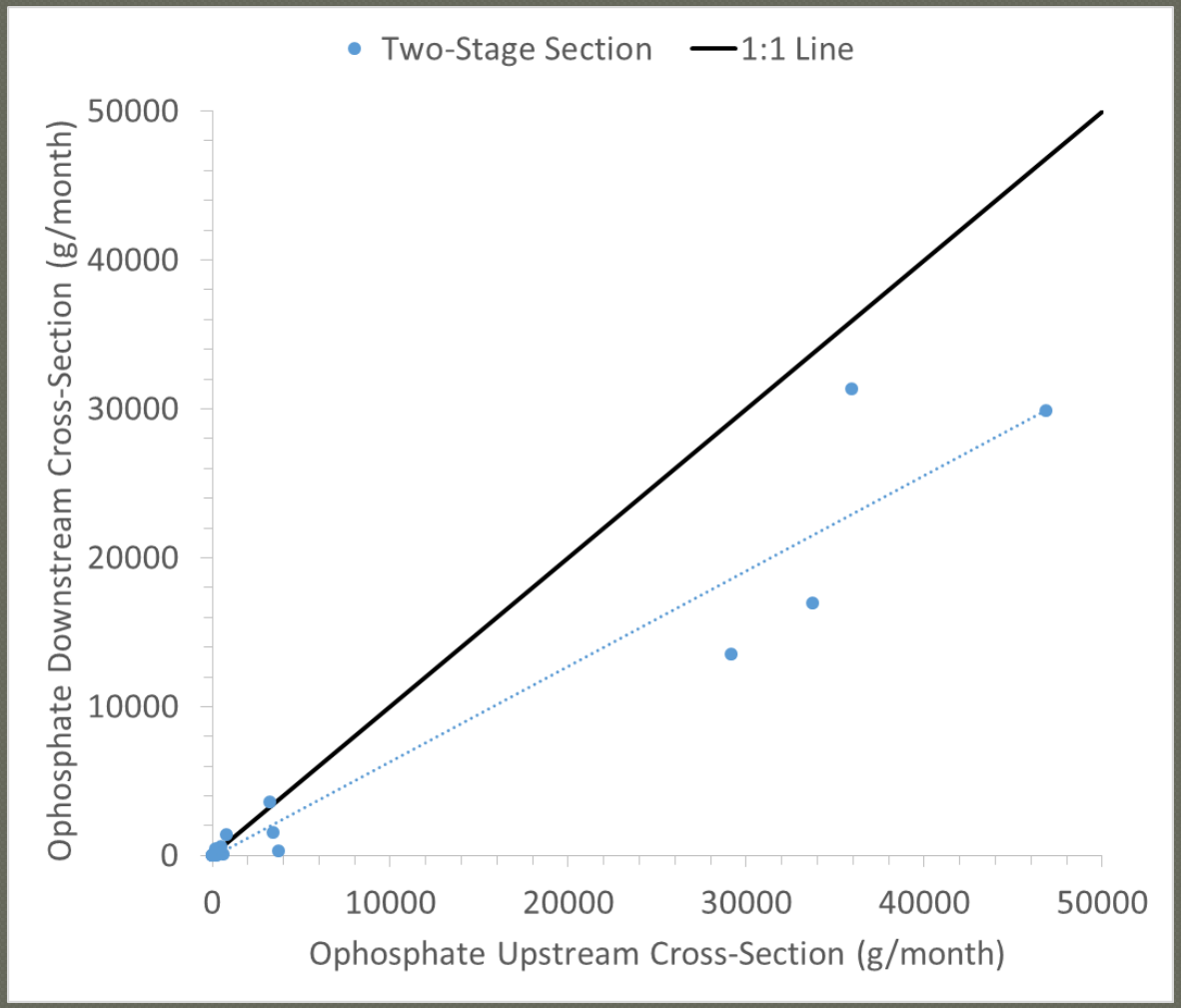
Accumulation of fine sediment

Monthly Load of Ortho-Phosphate



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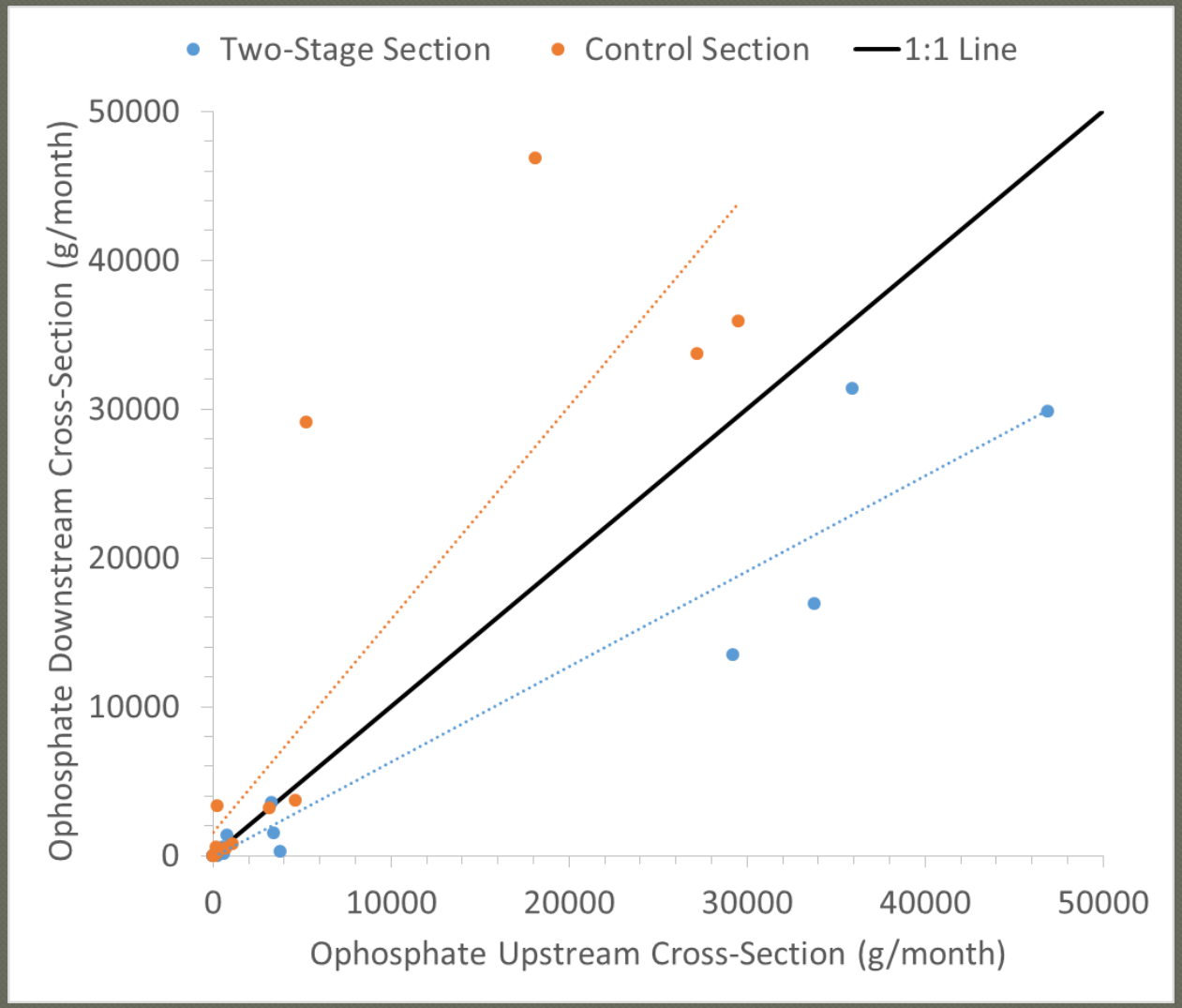
Monthly Load of Ortho-Phosphate



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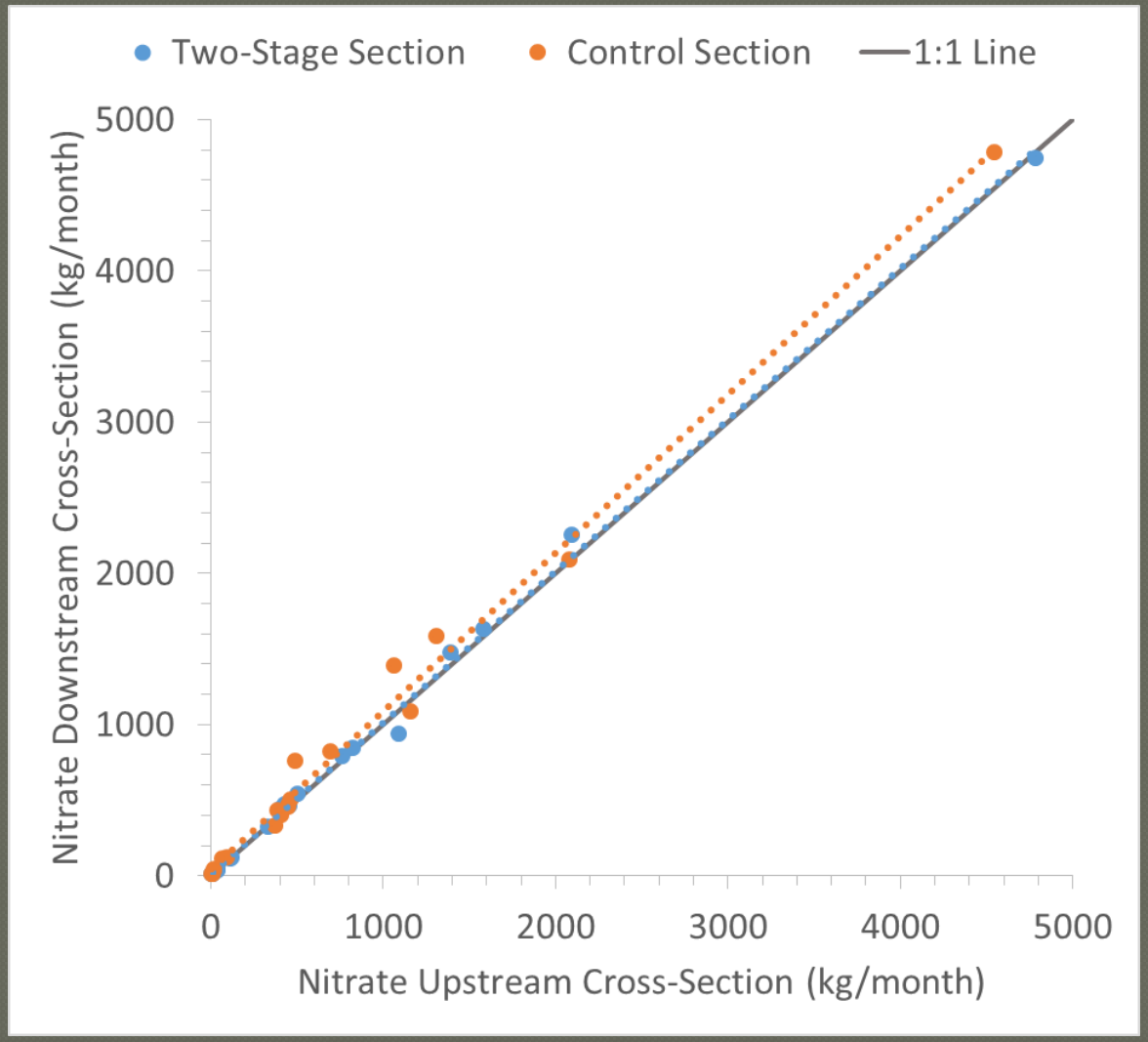
Monthly Load of Nitrate-N



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Water Quality Summary

- It is still early days in terms of water quality results.
- Strong seasonal cycle means that looking at partial years of data can result in bias.
- Future work will look more closely at the role of the benches.

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