

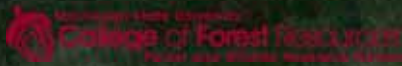
Preliminary Sediment Accumulation and Phosphorus Retention Behind Low Grade Weirs in the Mississippi Delta

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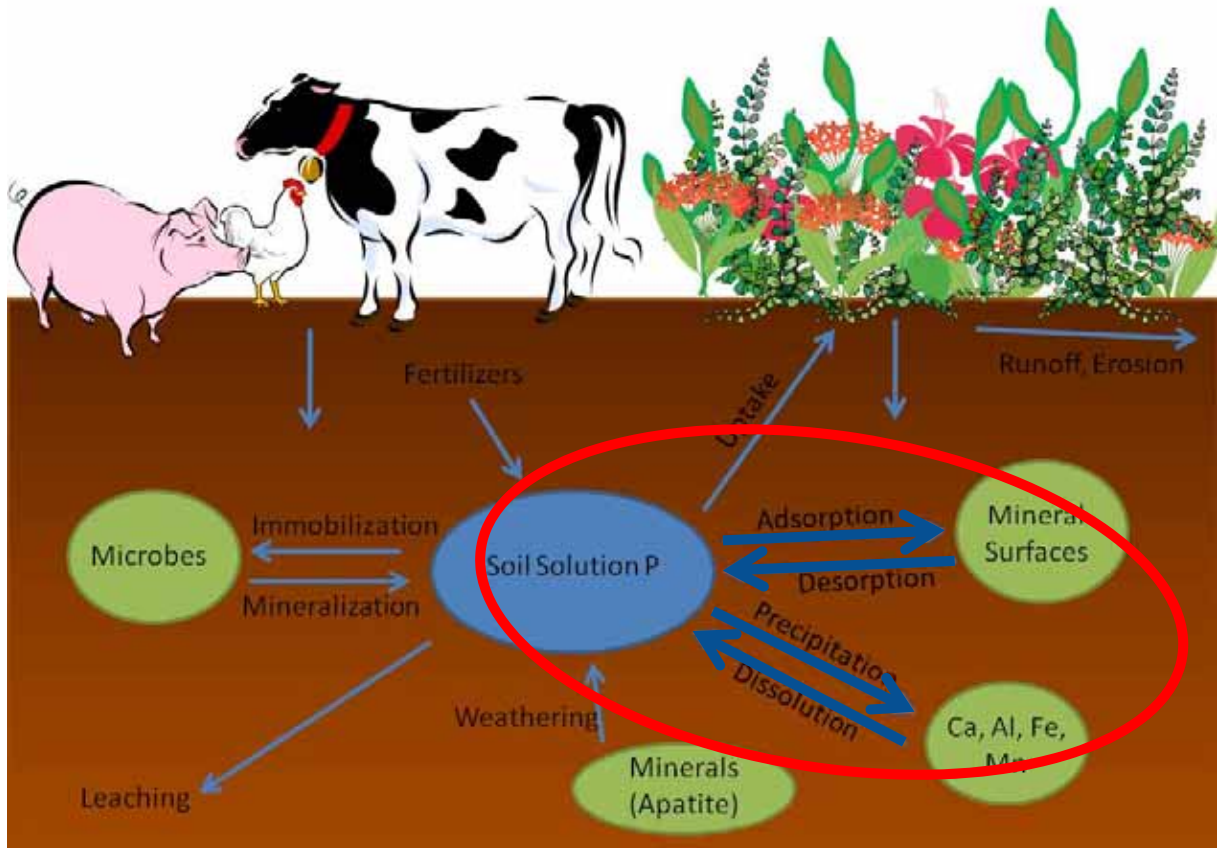
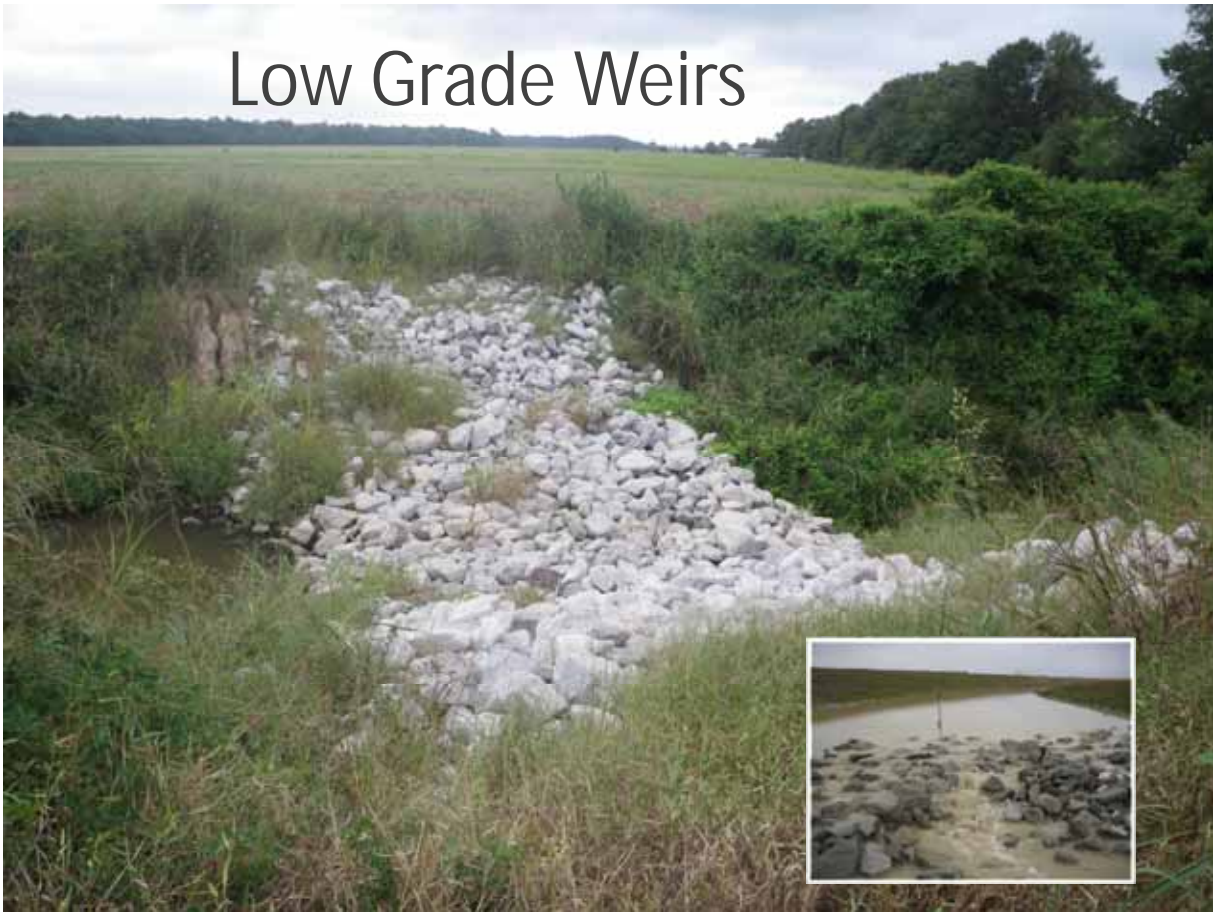


Agriculture

Non-Point
Source
Pollution



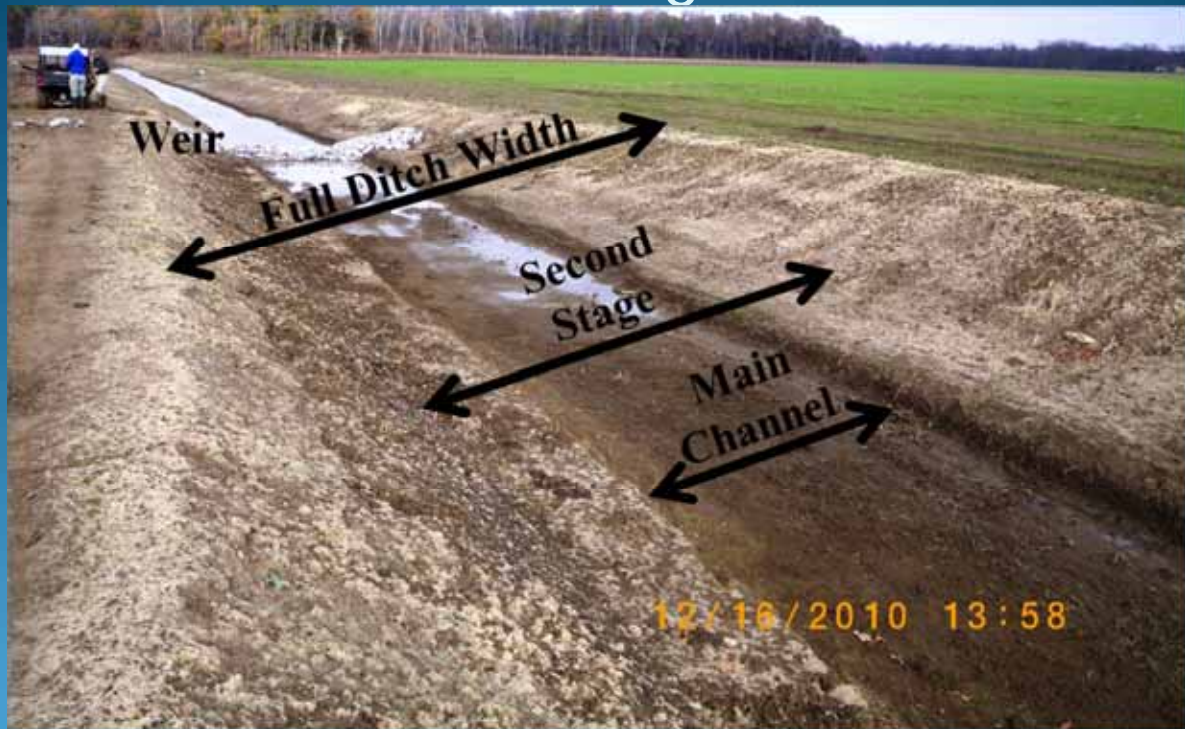
Low Grade Weirs



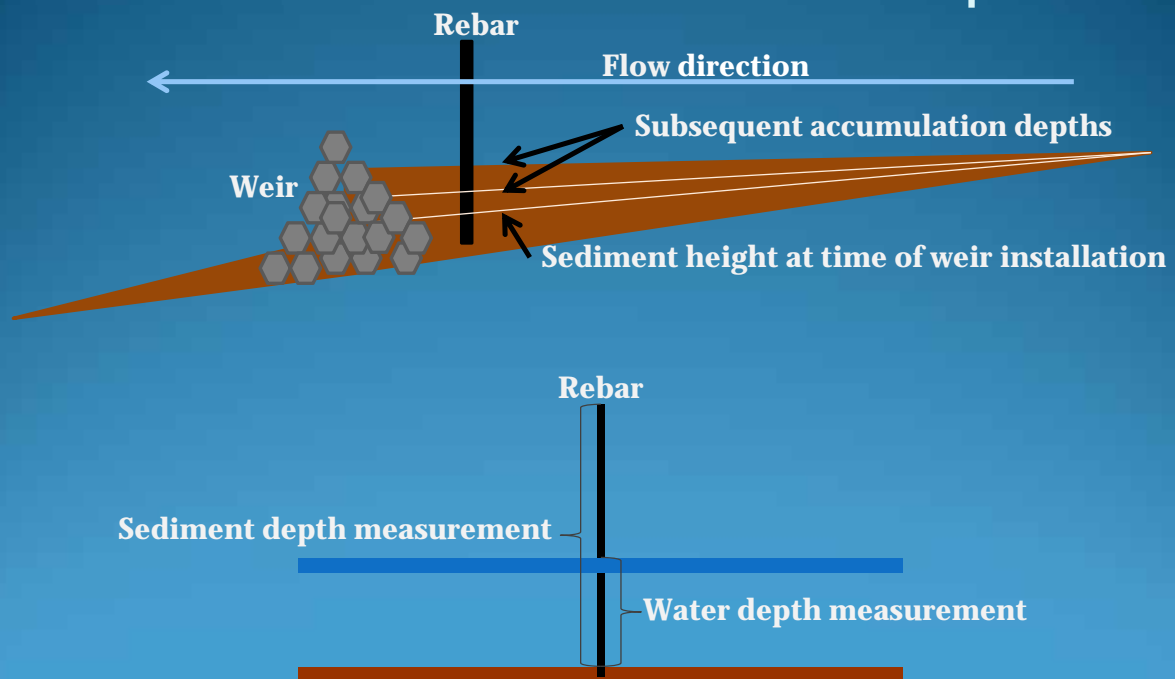
How does a weir change the ditch system over time?



Methods: Two Stage Ditch

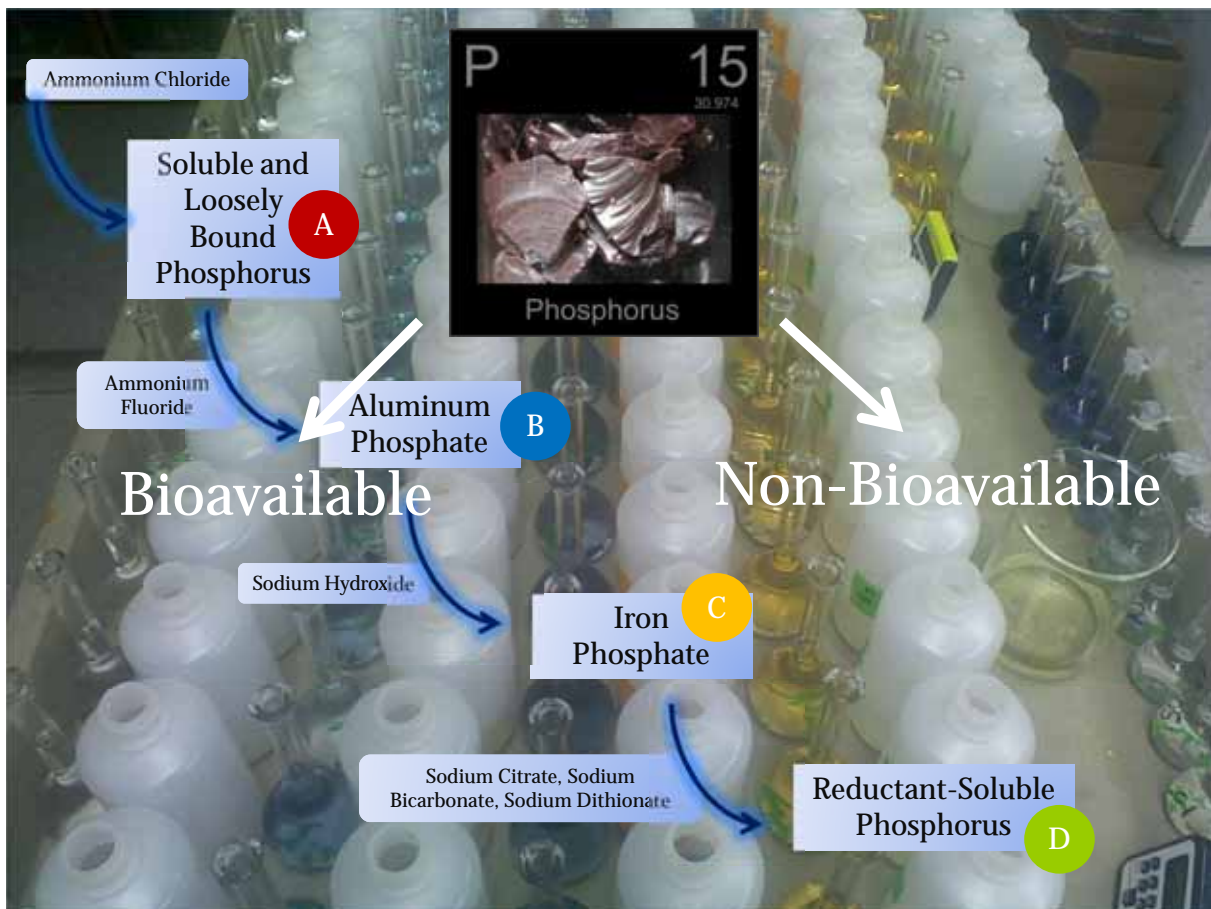
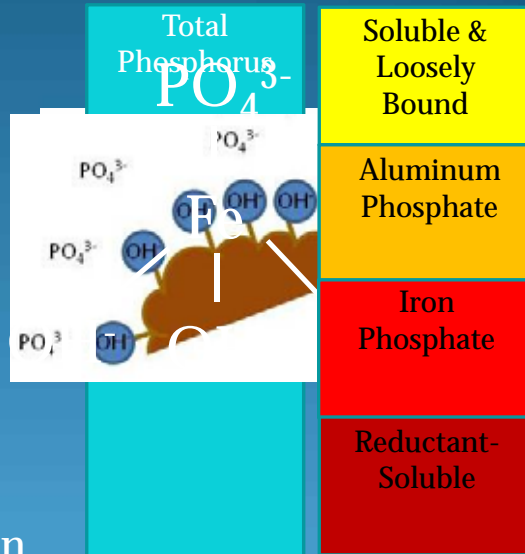


Methods: Sediment Accumulation & Water Depth



Methods: Sediment Analysis

- Soil type
 - Particle Size Analysis
- % Organic Matter
 - DeBolt Procedure
- pH
- Total Phosphorus
 - HF digestion
- Phosphorus fractionation
 - Soluble & loosely bound, AlPO_4 , FePO_4 , and reductant-Soluble



Bioavailable : Non-Bioavailable

Bioavailable

Non-Bioavailable

↑ Ratio

Bioavailable

Non-Bioavailable

↓ Ratio

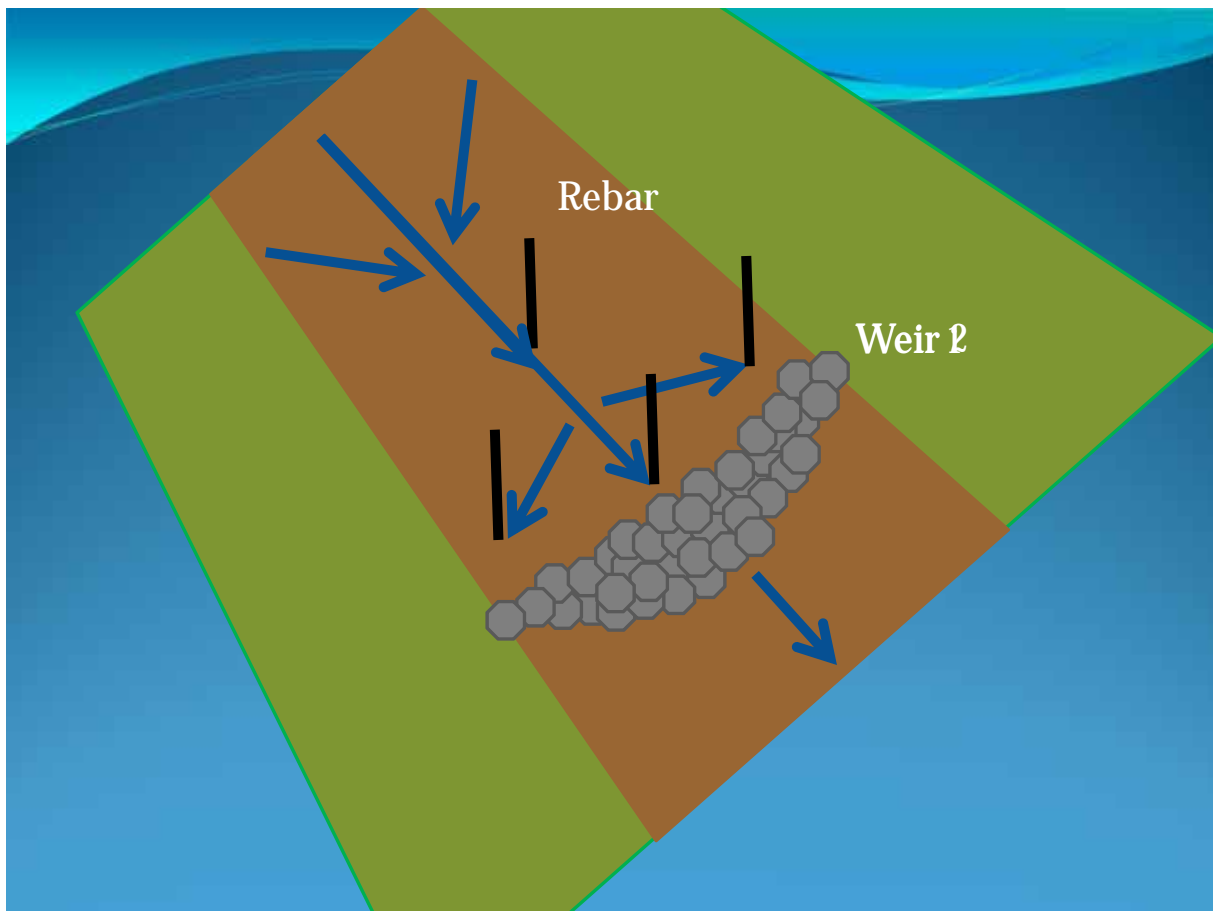
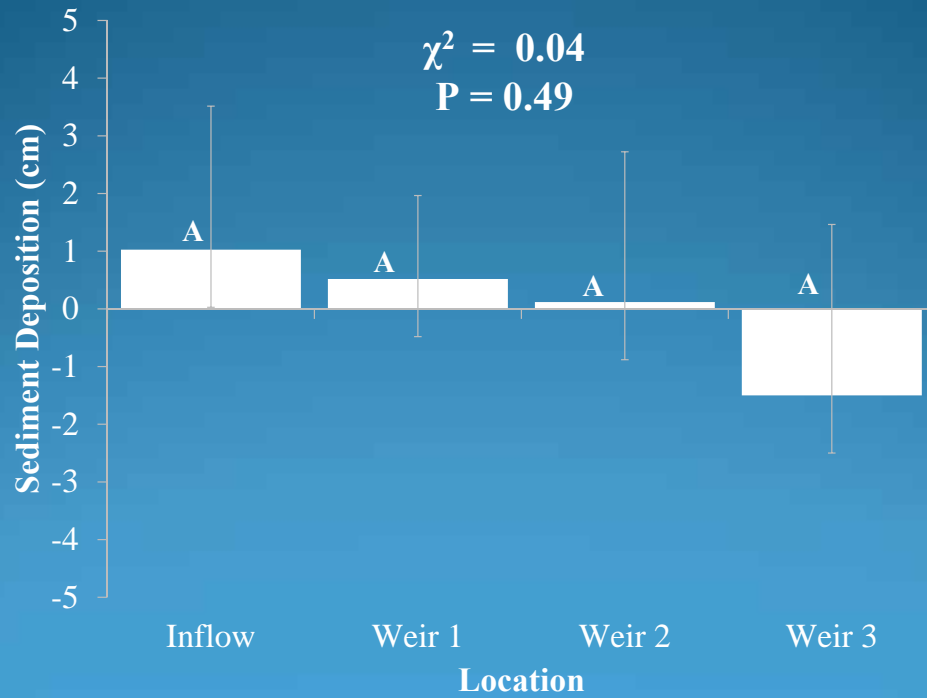
Weir 1

January

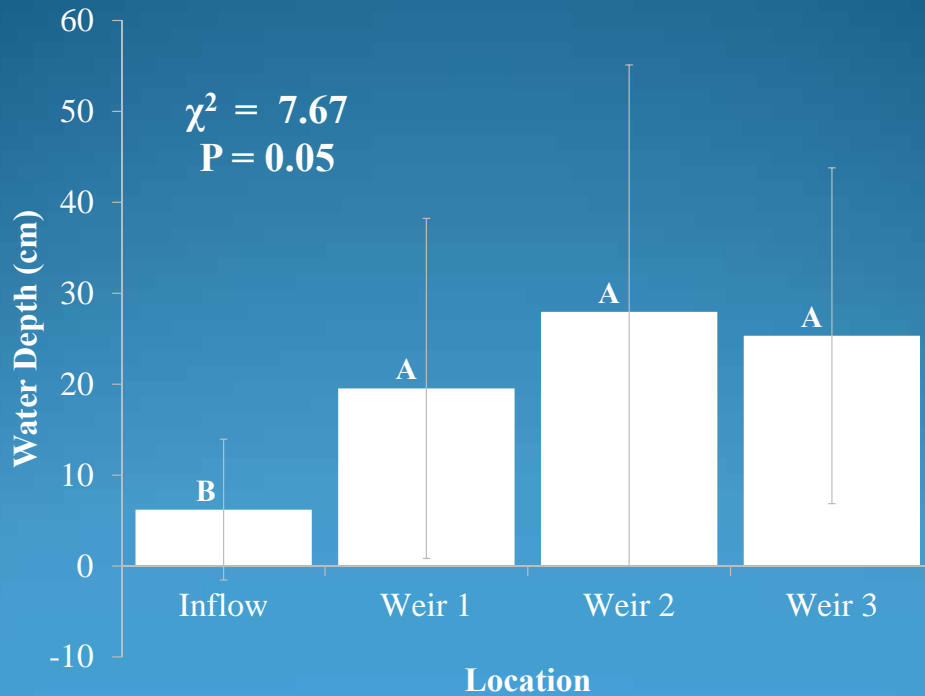
August



Results: Sediment Deposition

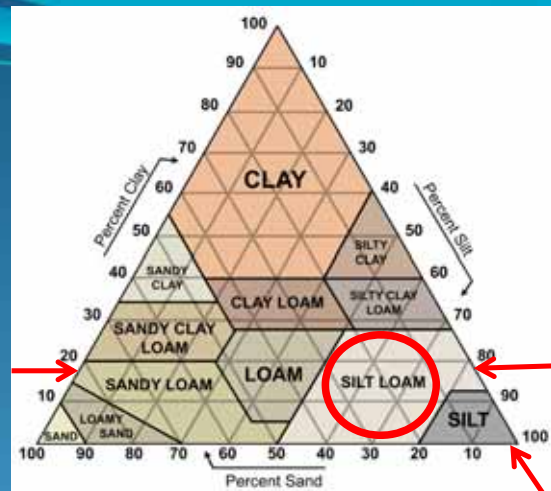


Results: Water Depth



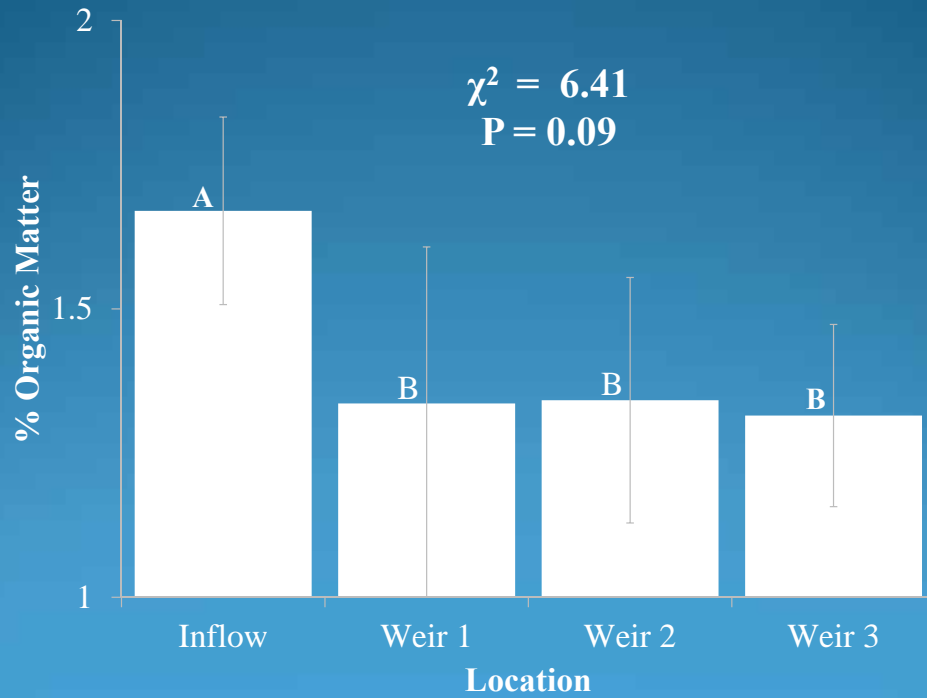
Results: Soil Type

Silt Loam

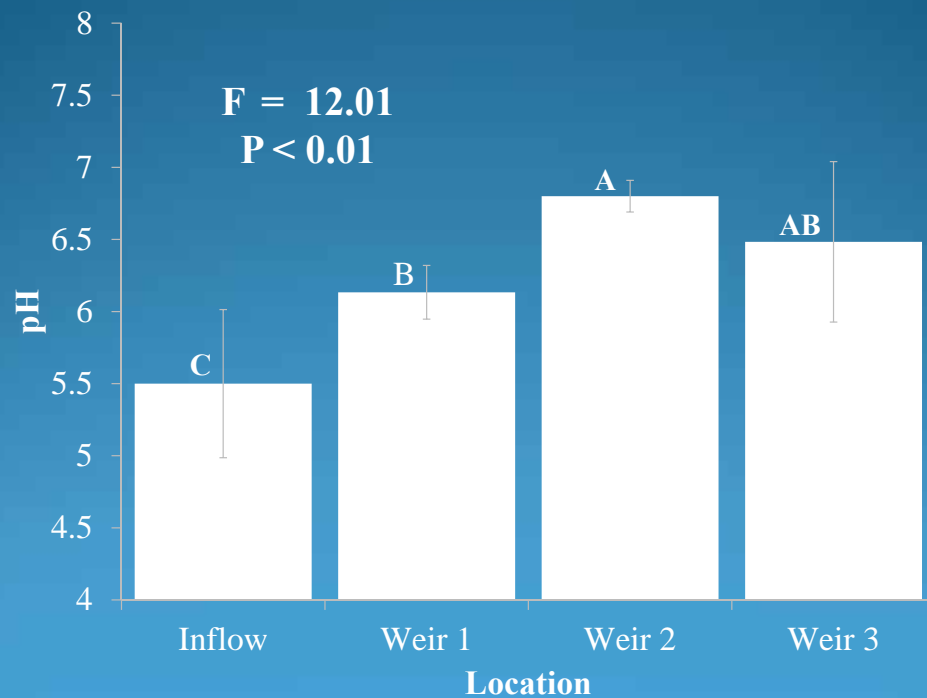


SAND% (>50 to < 1020 μm)	SILT% (>2 to < 50 μm)	CLAY% (<2 μm)
0.483	81.986	17.531

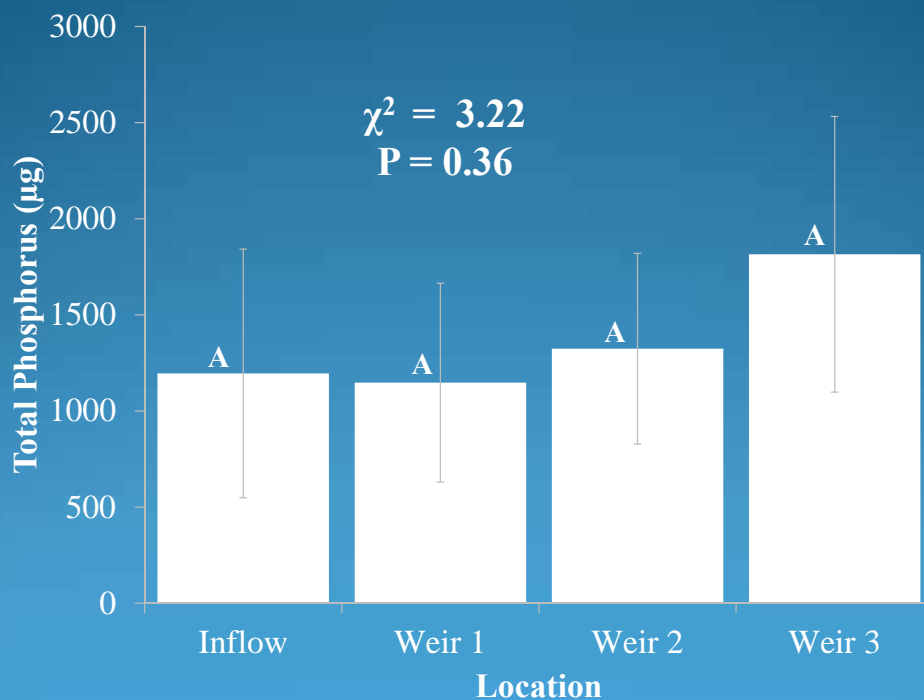
Results: Organic Matter %



Results: pH

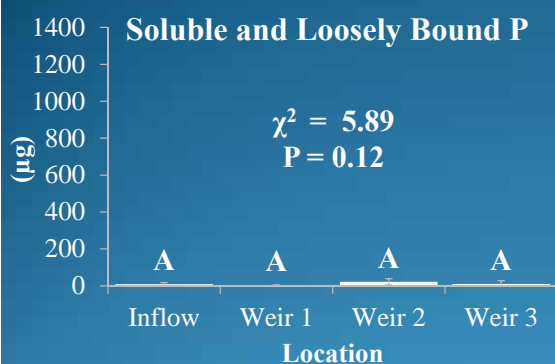


Results: Total Phosphorus

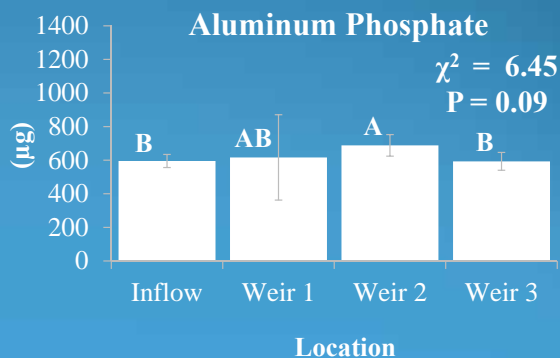
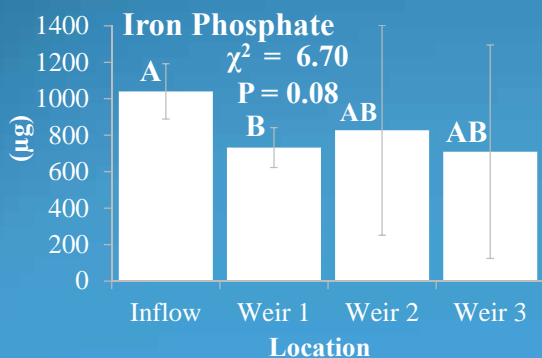
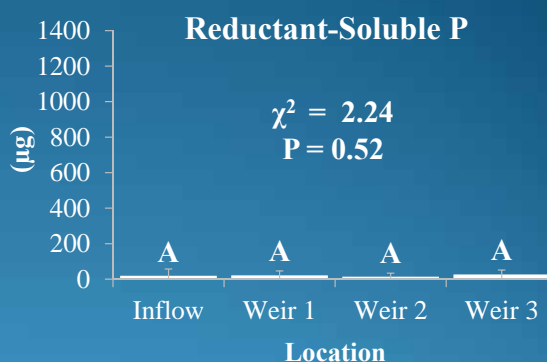


Results: Phosphorus Fractionations

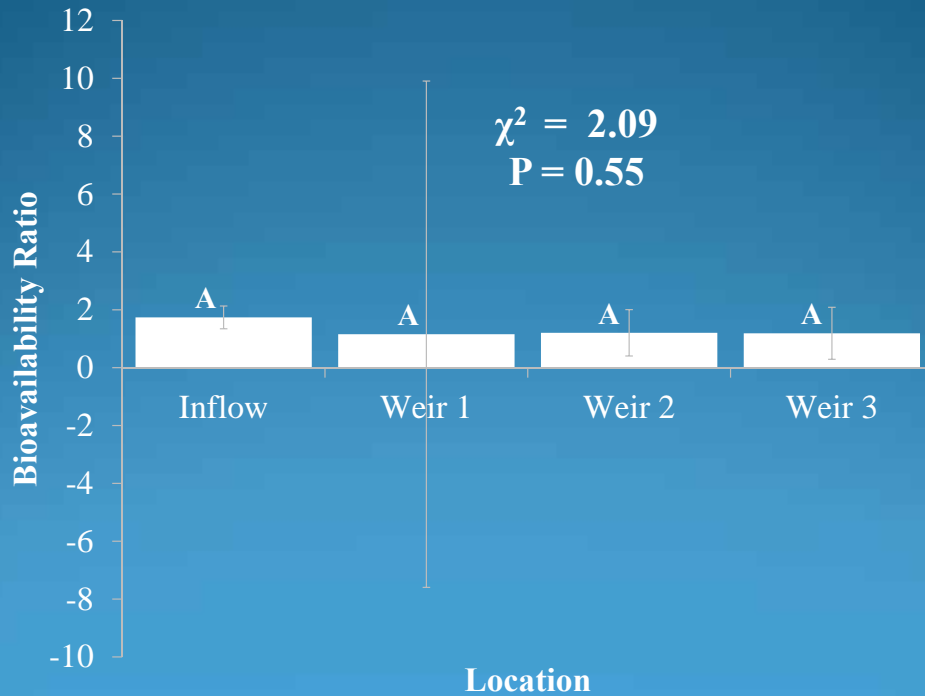
Bioavailable



Non-Bioavailable



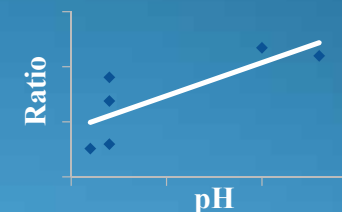
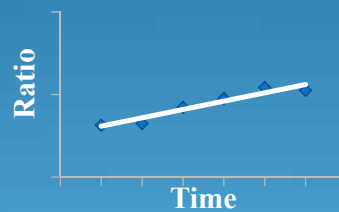
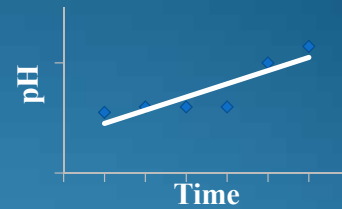
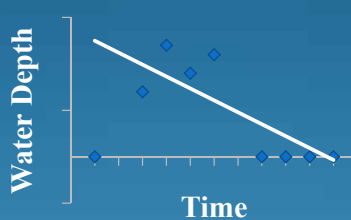
Results: Bioavailability Ratio



Results: Inflow

Variables correlated with time

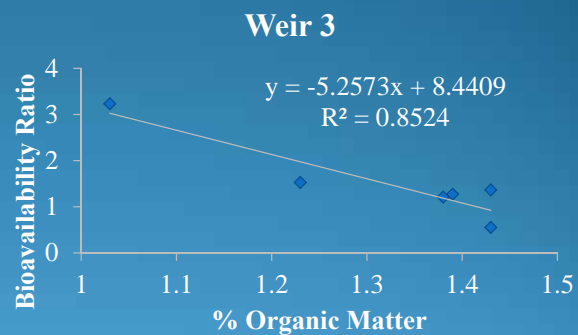
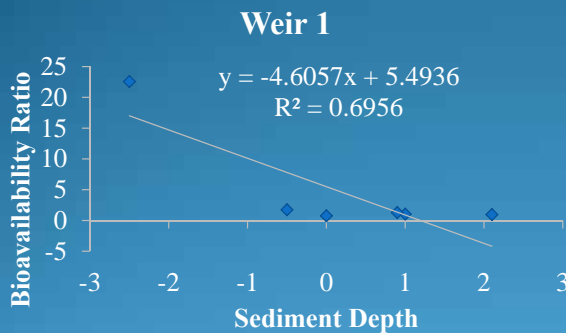
- Water Depth
 - Negative correlation
 - $F = 3.99$
 - $P = 0.08$
 - $R^2 = 0.33$
- pH
 - Positive correlation
 - $F = 12.92$
 - $P = 0.02$
 - $R^2 = 0.76$
- Bioavailability Ratio
 - Positive correlation
 - $F = 44.14$
 - $P < 0.01$
 - $R^2 = 0.92$
 - Ratio positively correlated with pH
 - $F = 6.50$
 - $P = 0.06$
 - $R^2 = 0.62$



Results: Weirs

Variables correlated with time

- None



Conclusion:

- Bioavailability ratios of sediments behind weirs are not correlated with pH despite having higher average pH
- Bioavailability ratios of sediments at inflow increase through time

Acknowledgements

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