

BEST MANAGEMENT PRACTICES IN THE MS DELTA: WHAT ARE WE LEARNING?

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FARMERS ADVOCATING RESOURCE MANAGEMENT
DELTA F.A.R.M.



Spatial Scale of Involvement

Farmers

State agencies
collaboration



Consensus Driven
Outputs

Collaboration
(Within State)



Mississippi's Approach: Collaborative Foundation



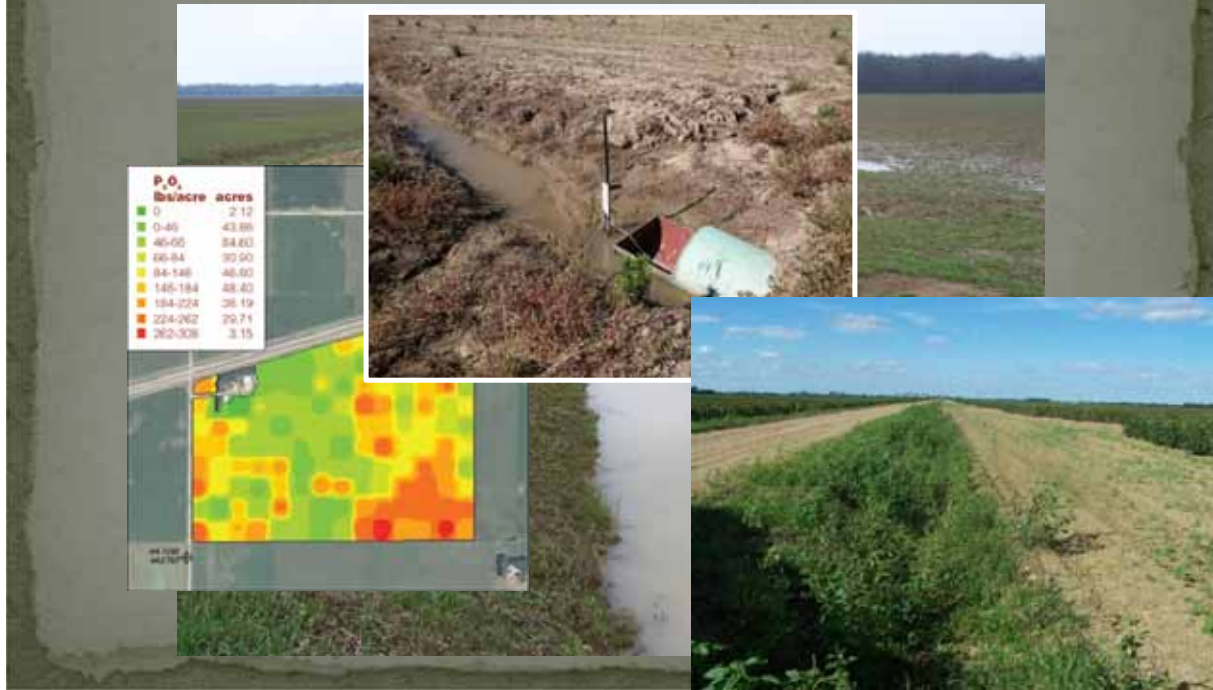
Keys to Nutrient Reductions

- Water Management
 - Water Conservation
 - Alternative Water Supplies
- BMPs
 - Effectiveness for nutrient concentration/load reductions
 - Creating scaled management of BMPs
- Leverage resources and outputs to address both water quality & quantity and highlight/showcase our successes!



Mississippi: Solution (s)

Three strategies for reducing nutrient/fertilizer pollution:



What do we know from the literature about BMP effectiveness??

- Use specific criteria: 1) row-crop agriculture, 2) clay/silt loam soils, 3) slopes 0-5%, 4) occurring within the LMAV
- 18 Articles: 1980 – 2010
- 9 BMP's = Illustrating between 15-100% reduction TN/TP
 - Conservation Tillage (4)
 - Filter Strips (2)
 - CRP (1)
 - Wetlands (natural + constructed) (4)
 - Drainage Ditches (3)
 - Cover Crops (1)
 - Slotted Board Riser (1)
 - Subsurface drainage (1)
 - Winter Ricefield Management (1)

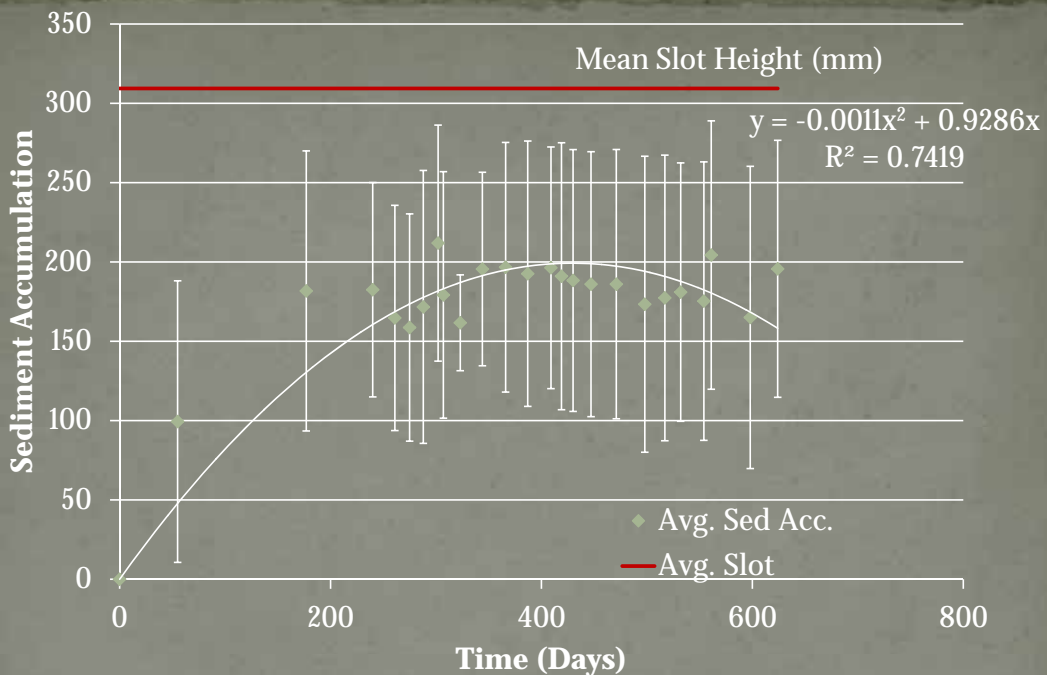
WATER CONTROL STRUCTURES: OFF CHANNEL NUTRIENT ASSIMILATION



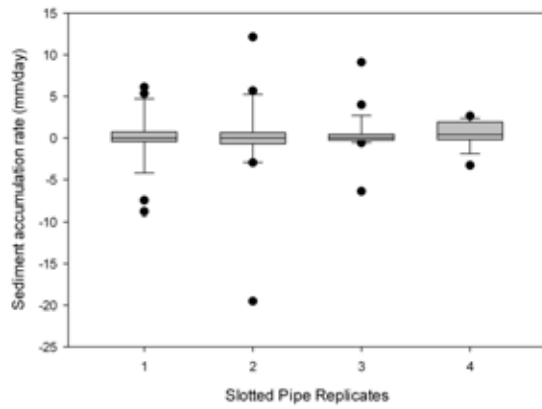
Hard to quantify

- Reduce Flow Velocity
- Sediment Retention
- First contact -Edge-of-field

Unknown Inputs



- Sediment accumulation amounts between replicates significantly different
- Significant difference in slope between
 - 0-235 (0.81-0.99) and 235-634 (0.01-0.3)



Sediment Volumes
3.88 and 11.5 m³

Total P loads
3.32 to 18.86 kg TP

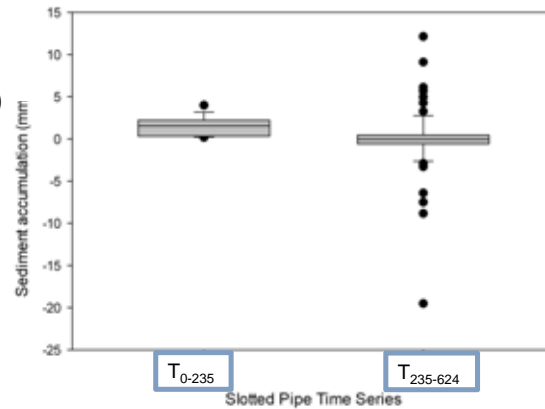
Sediment accumulation rates (0-634 days)

-0.05±0.62 mm/day

0.035±1.01 mm/day

0.34±0.50 mm/day

0.48±0.36 mm/day



Median T0-235 = 1.550 mm/day (.328 – 2.2 ~25-75%)

Median T235-634 = -0.0357 mm/day (-0.59-0.455)

Vegetated Drainage Ditches

Mini Wetlands

- Reduced Flow
- Nutrient Cycling

VADD ~ 30-45% for N and P reduction



Use of vegetated drainage ditches as tools to reduce nutrients



Modify water residence w/ the use of low weirs in the drainage ditch



LOW-GRADE WEIRS



Increase water residence time =

More contact time for contaminants
(e.g. nutrients, pesticides, etc.)

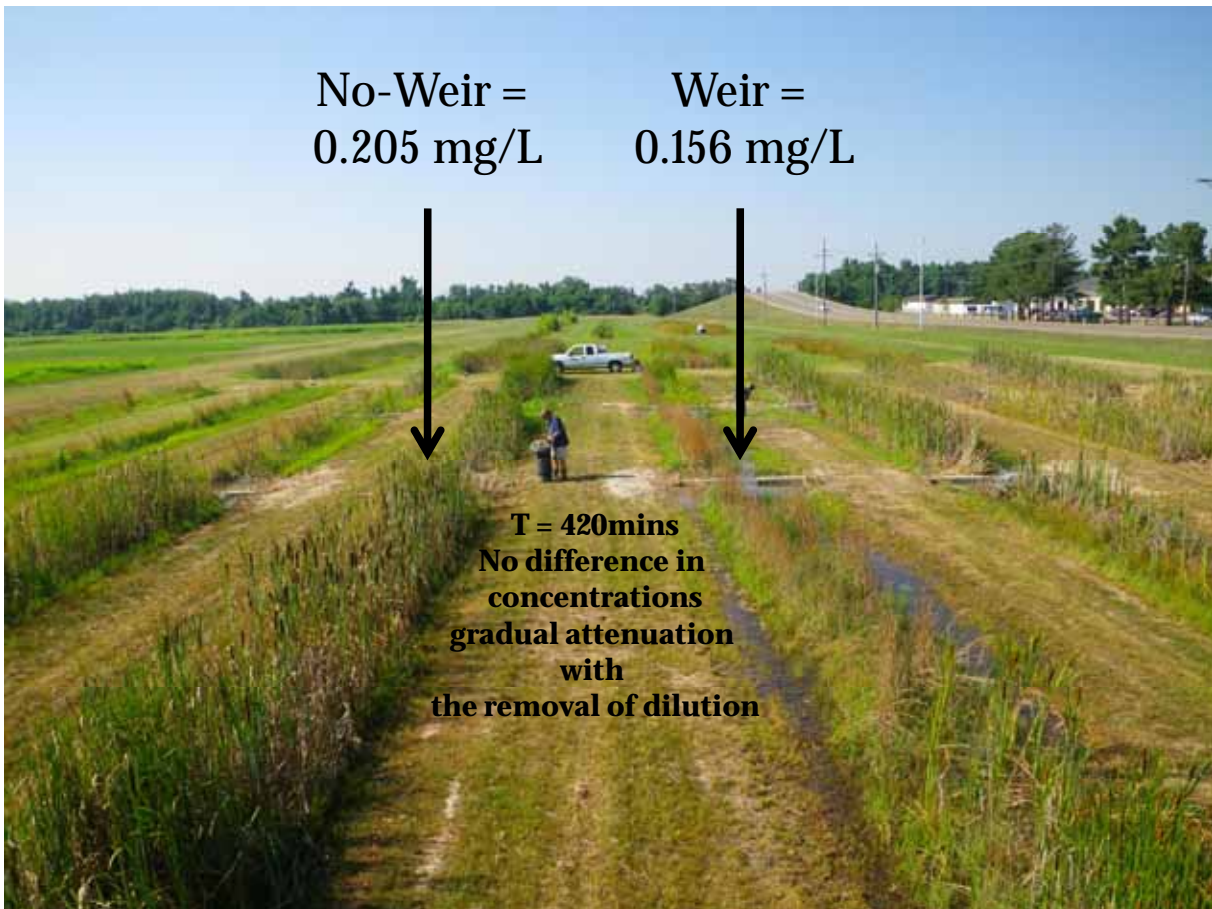
Delicate balance between water movement in ditch
and contaminant processing time...after all, it's still a ditch!

No-Weir =
0.205 mg/L

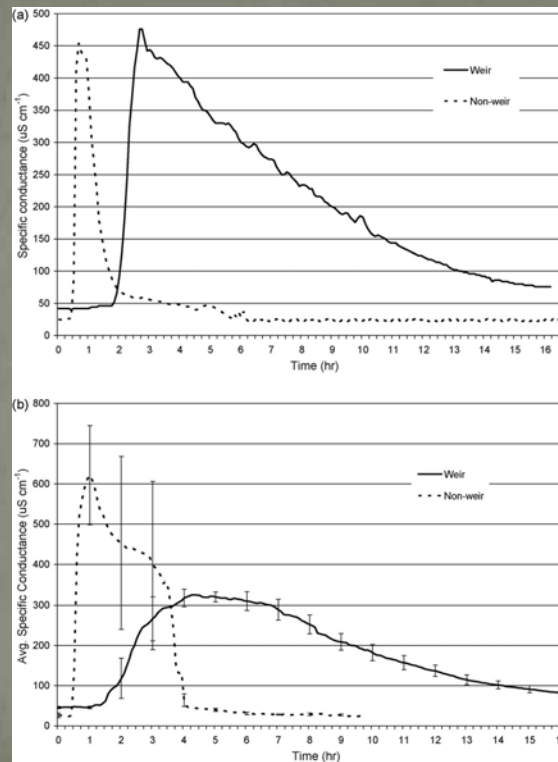
Weir =
0.156 mg/L



T = 420mins
No difference in
concentrations
gradual attenuation
with
the removal of dilution



LOW-GRADE WEIRS: AFFECT RESIDENCE



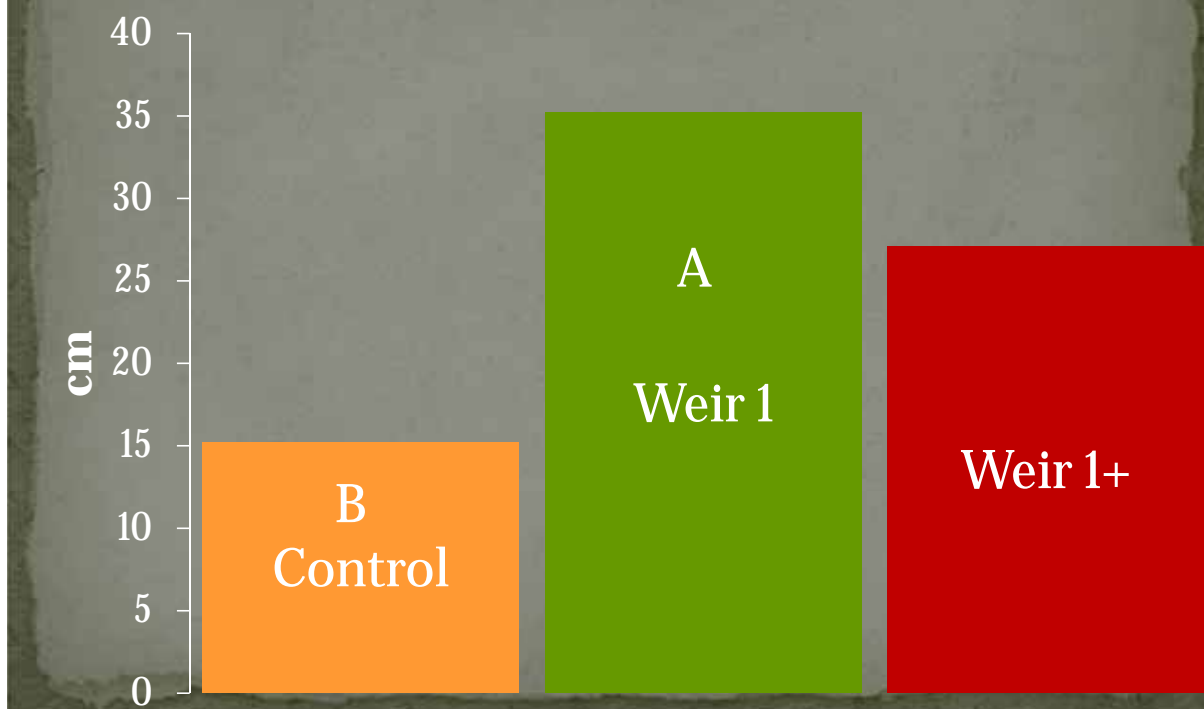
How is hydrology impacted in the field????

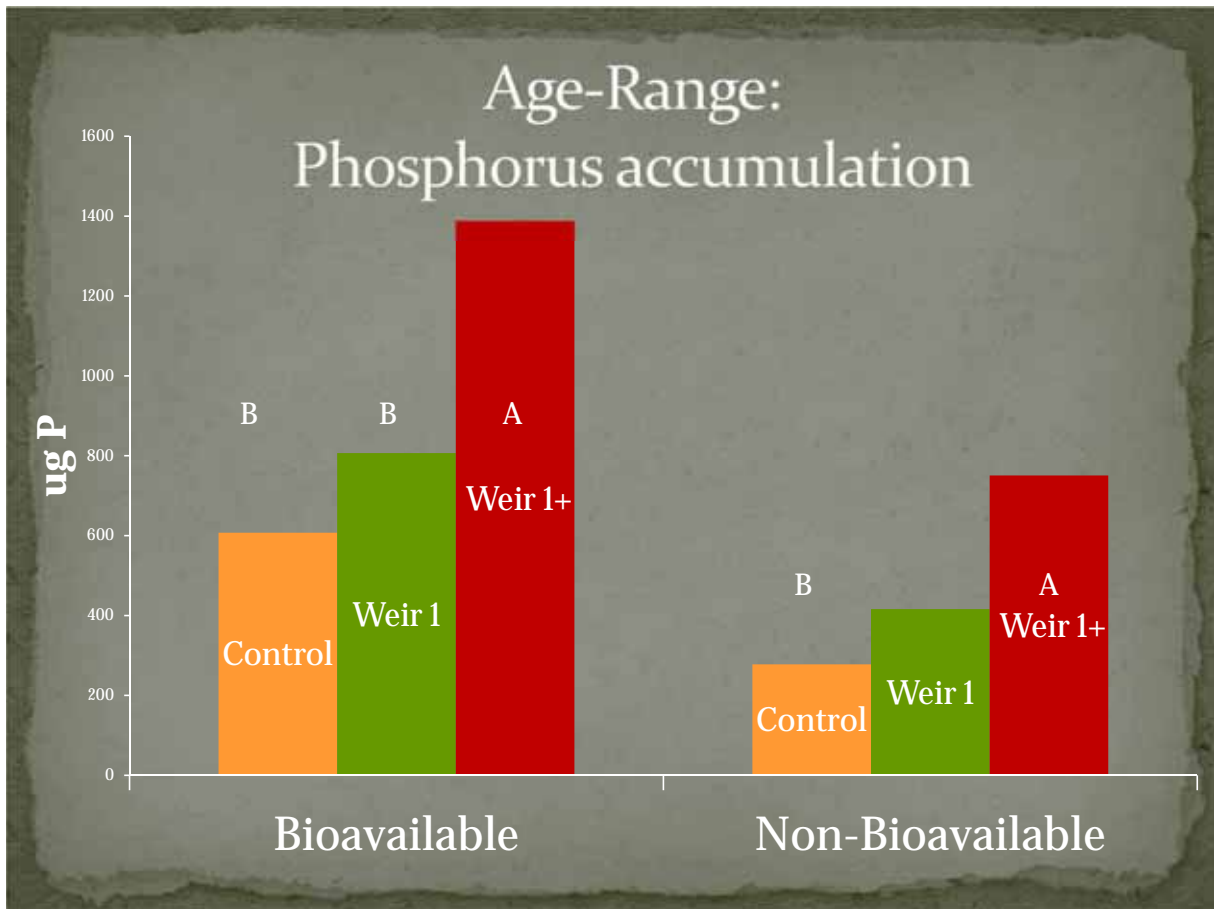
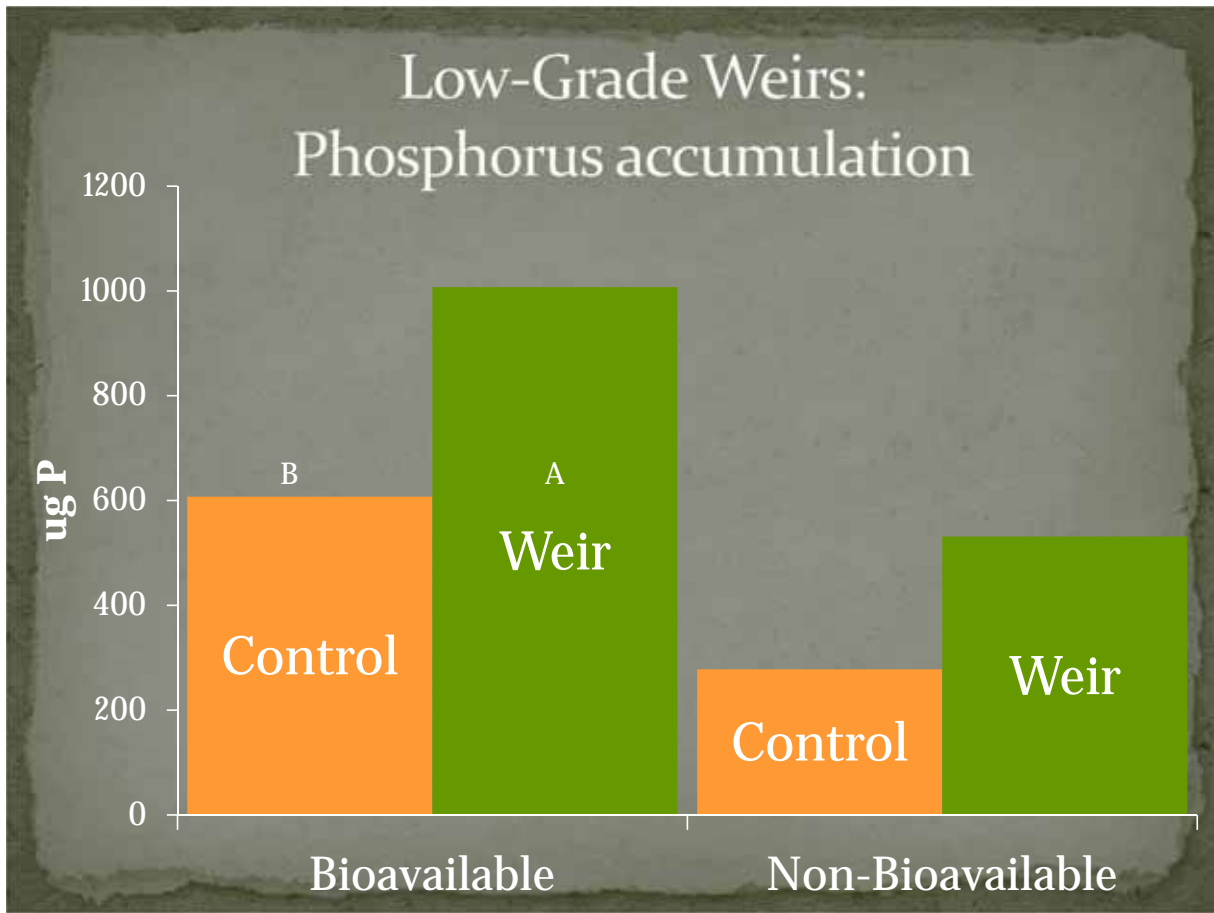


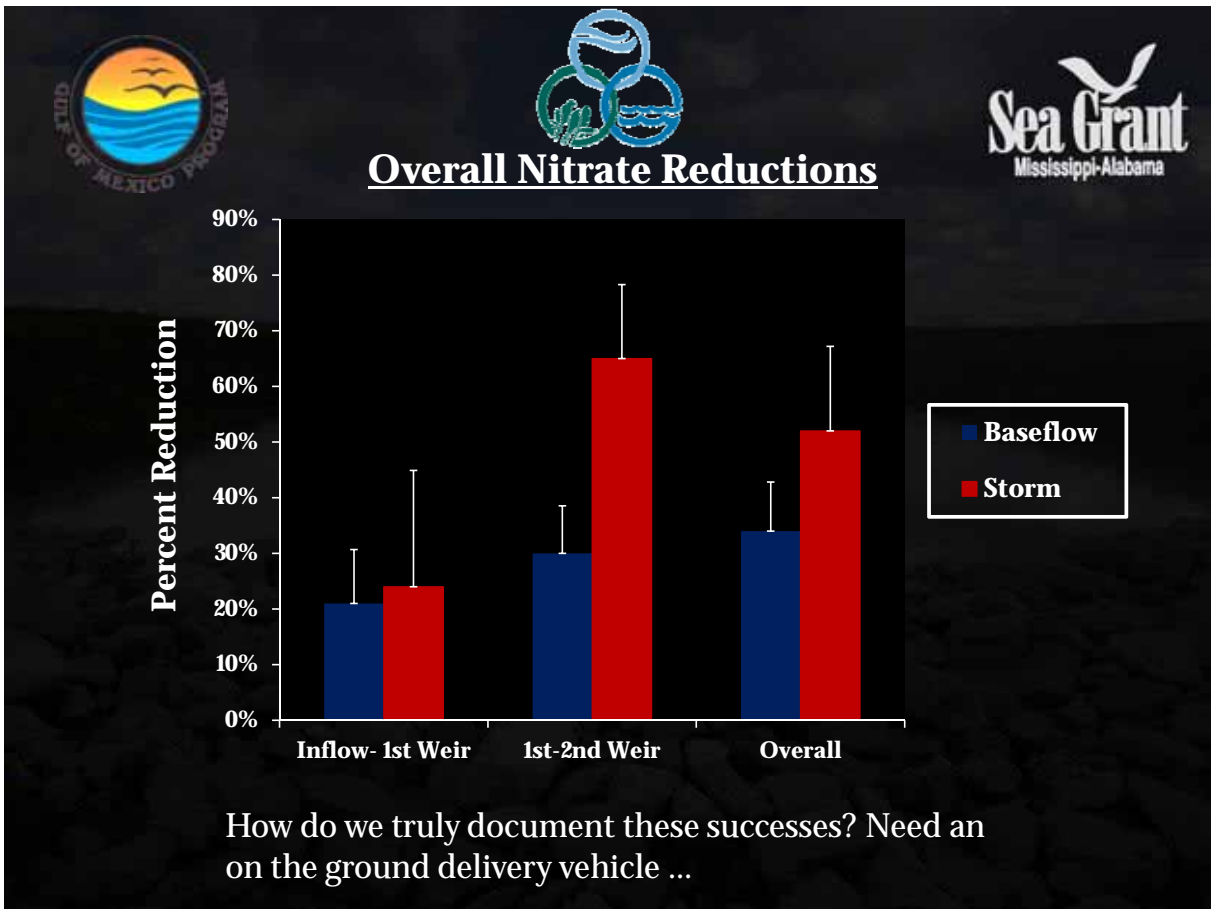
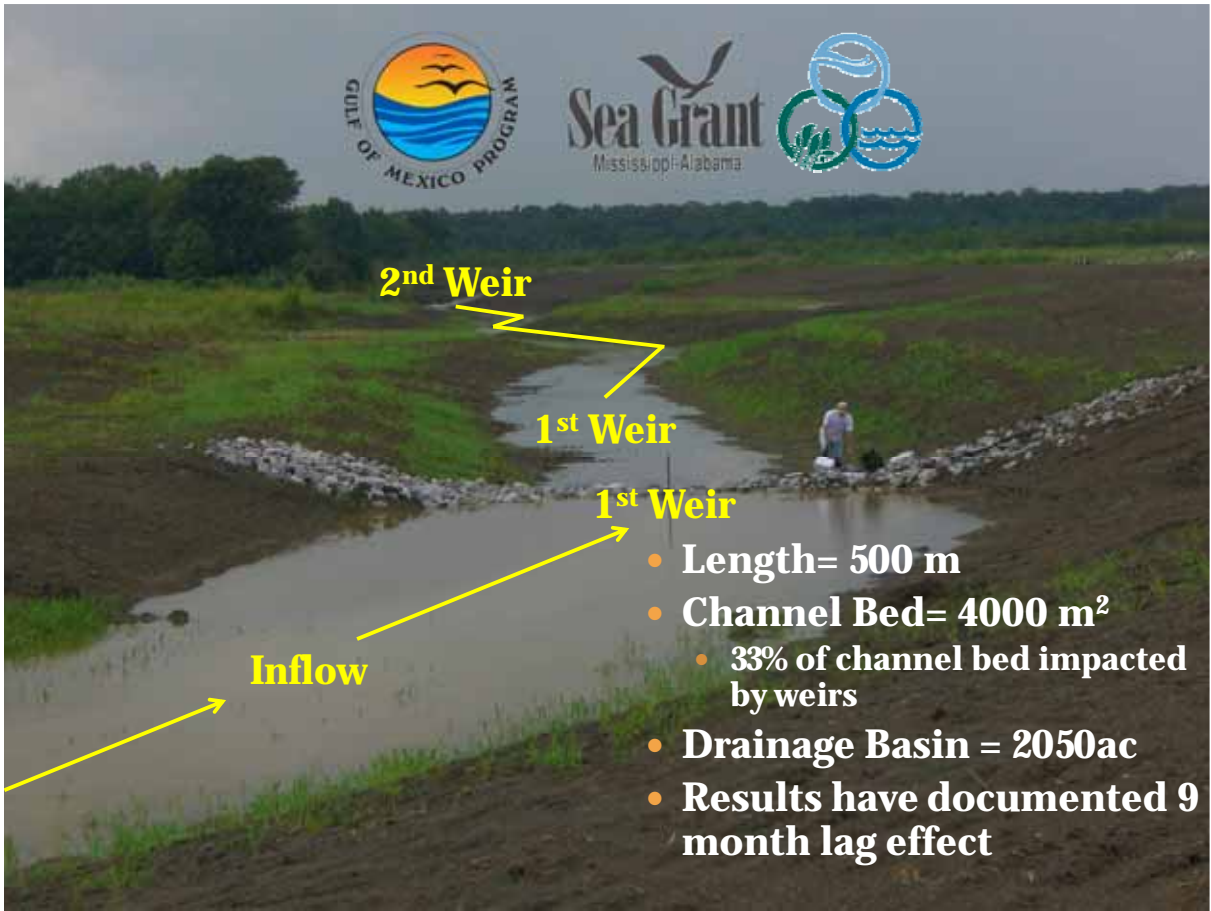
Low-Grade Weirs: Sediment accumulation

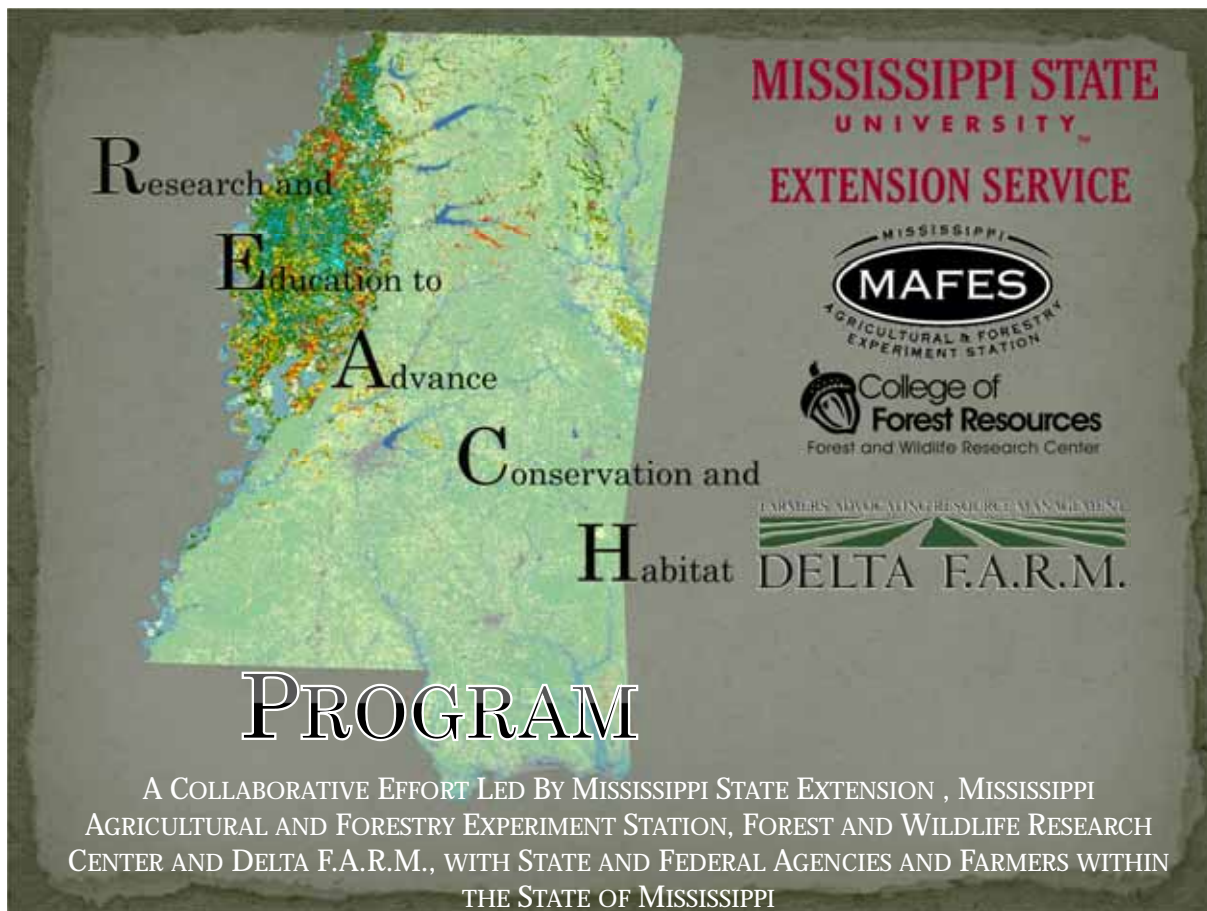


Age-Range: Sediment Accumulation









Research and
Education to
Advance
Conservation and
Habitat

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Forest Resources
Forest and Wildlife Research Center

FARMERS ADVANCING RESOURCE MANAGEMENT
DELTA F.A.R.M.

PROGRAM

A COLLABORATIVE EFFORT LED BY MISSISSIPPI STATE EXTENSION , MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION, FOREST AND WILDLIFE RESEARCH CENTER AND DELTA F.A.R.M., WITH STATE AND FEDERAL AGENCIES AND FARMERS WITHIN THE STATE OF MISSISSIPPI

Thank-you

