

A wide-angle photograph of a wetland area. The foreground is filled with numerous white, fluffy flowers, likely cottongrass, growing on green grass. In the background, there is a dense forest of tall, thin trees, possibly pines or firs, under a slightly overcast sky.

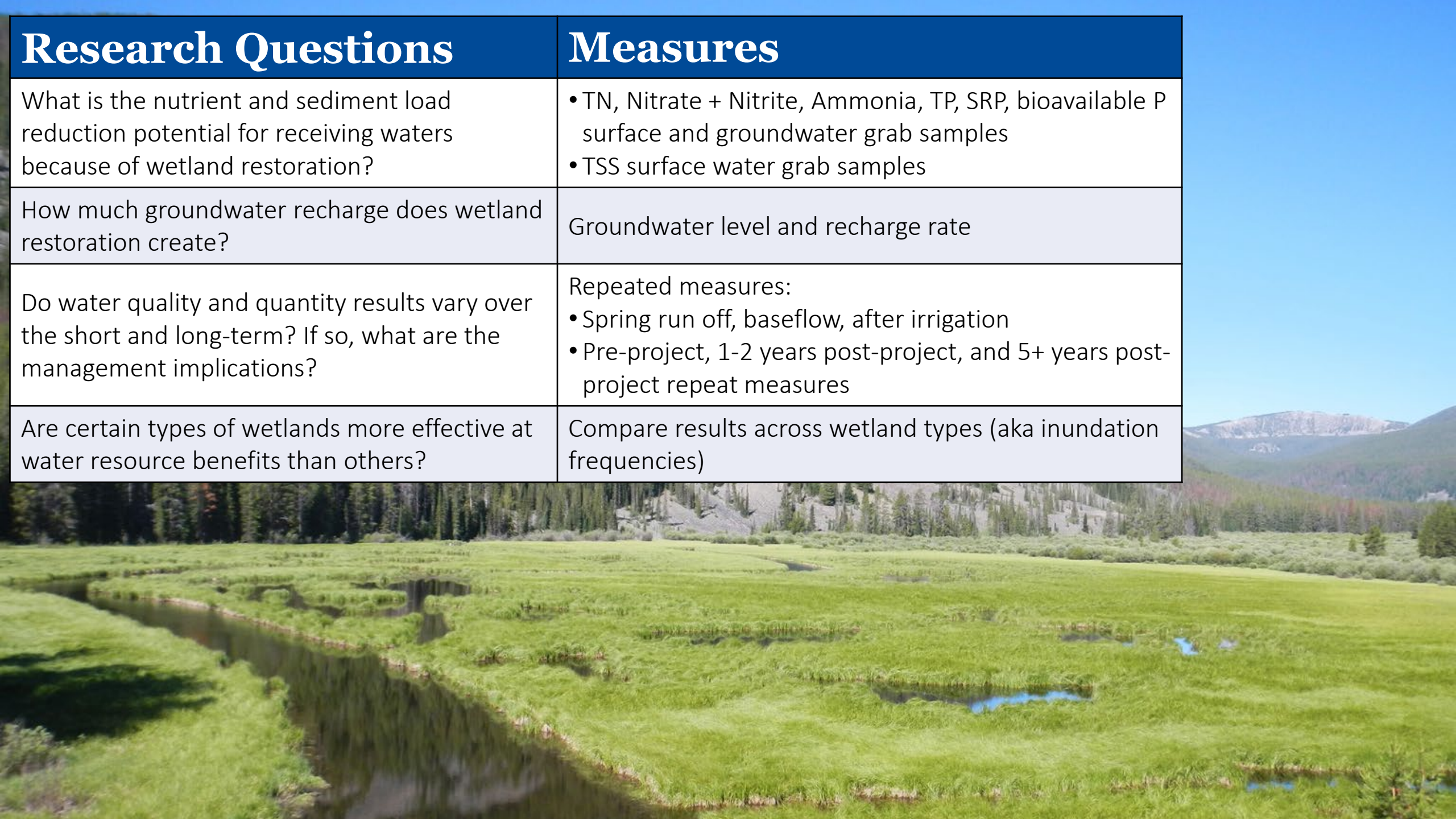
Are wetlands the answer for that?

Monitoring restored wetland water quality and quantity

Hannah Riedl

Montana Department of Environmental Quality





Research Questions	Measures
What is the nutrient and sediment load reduction potential for receiving waters because of wetland restoration?	<ul style="list-style-type: none">• TN, Nitrate + Nitrite, Ammonia, TP, SRP, bioavailable P surface and groundwater grab samples• TSS surface water grab samples
How much groundwater recharge does wetland restoration create?	Groundwater level and recharge rate
Do water quality and quantity results vary over the short and long-term? If so, what are the management implications?	Repeated measures: <ul style="list-style-type: none">• Spring run off, baseflow, after irrigation• Pre-project, 1-2 years post-project, and 5+ years post-project repeat measures
Are certain types of wetlands more effective at water resource benefits than others?	Compare results across wetland types (aka inundation frequencies)

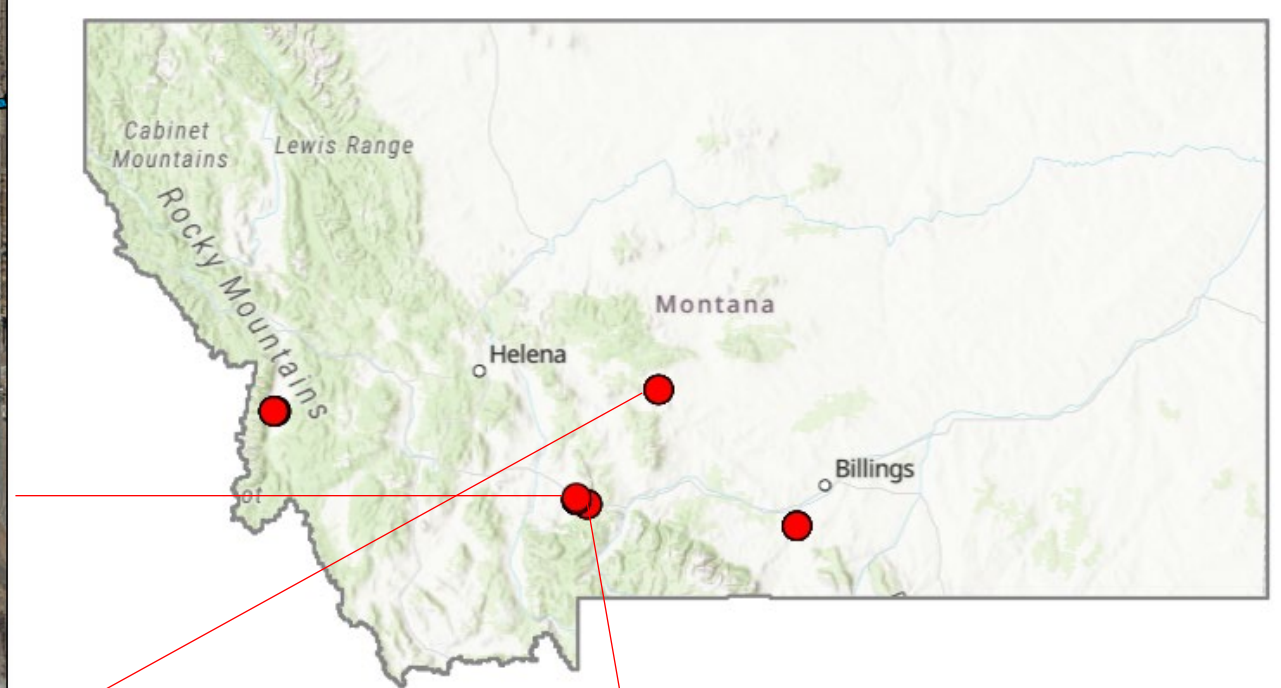
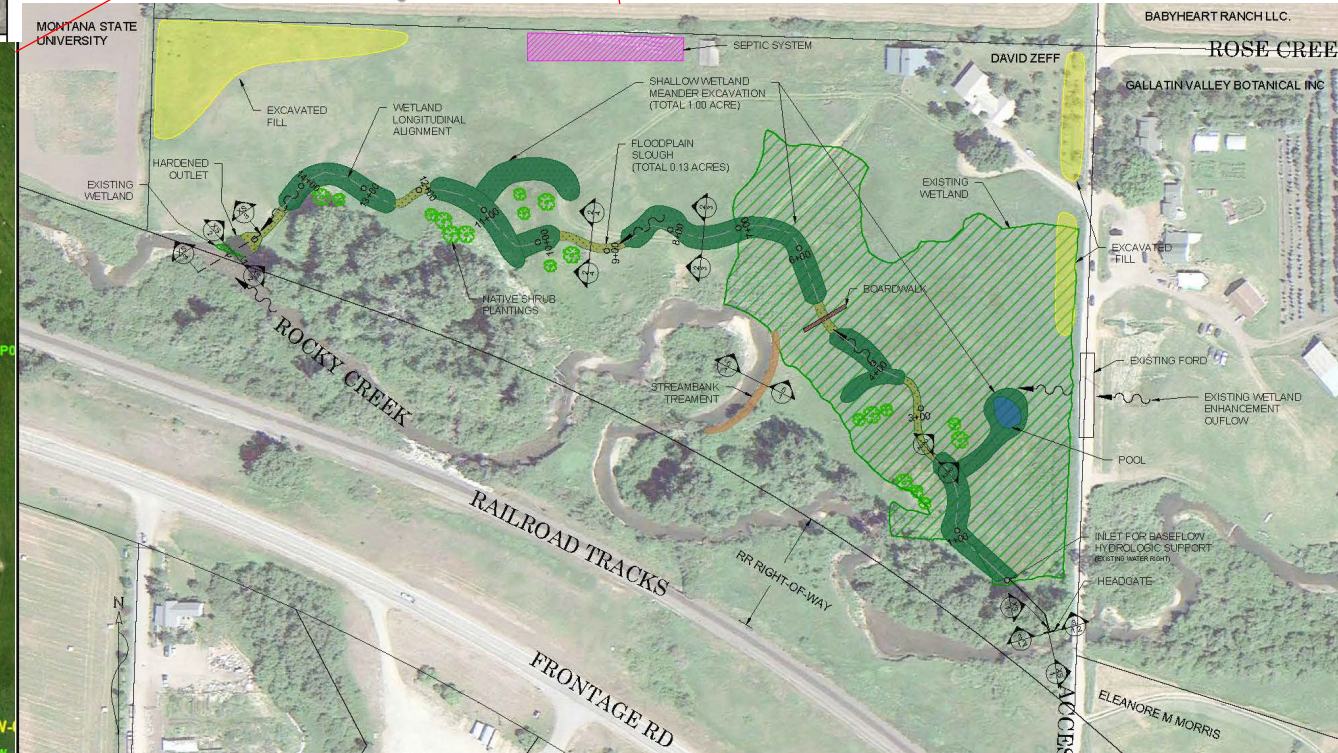
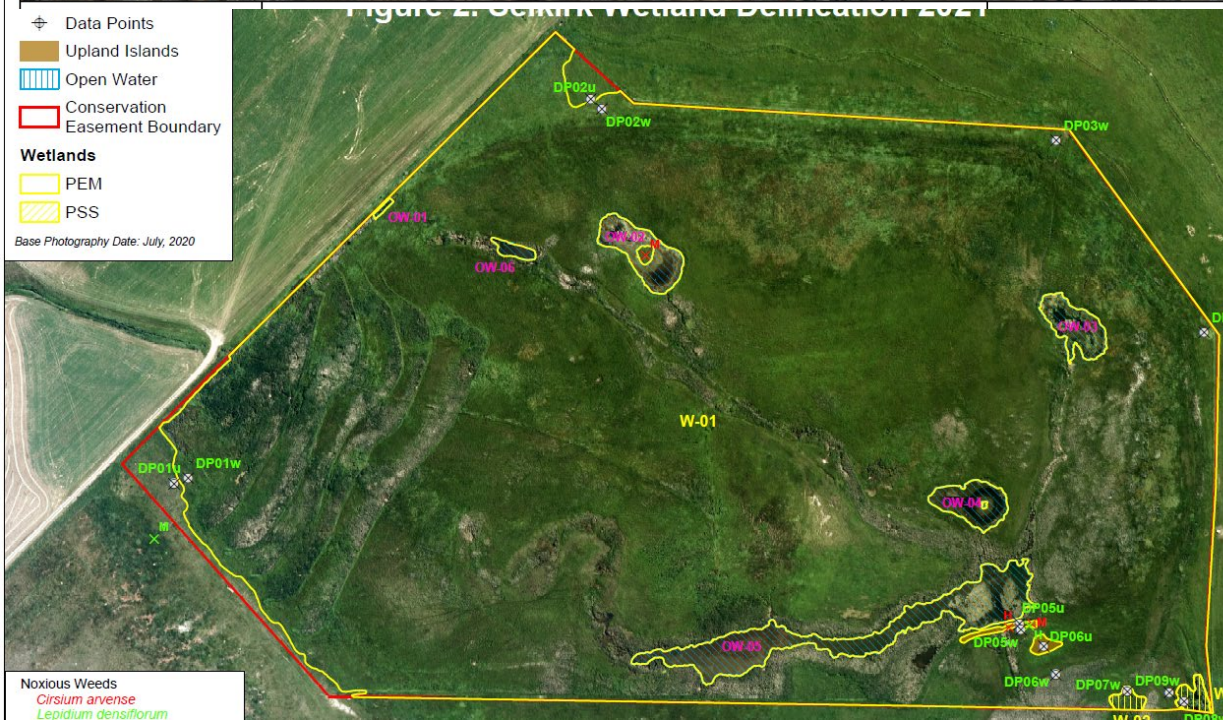


Figure 2. SERIK Wetland Delineation 2021





← August 2022

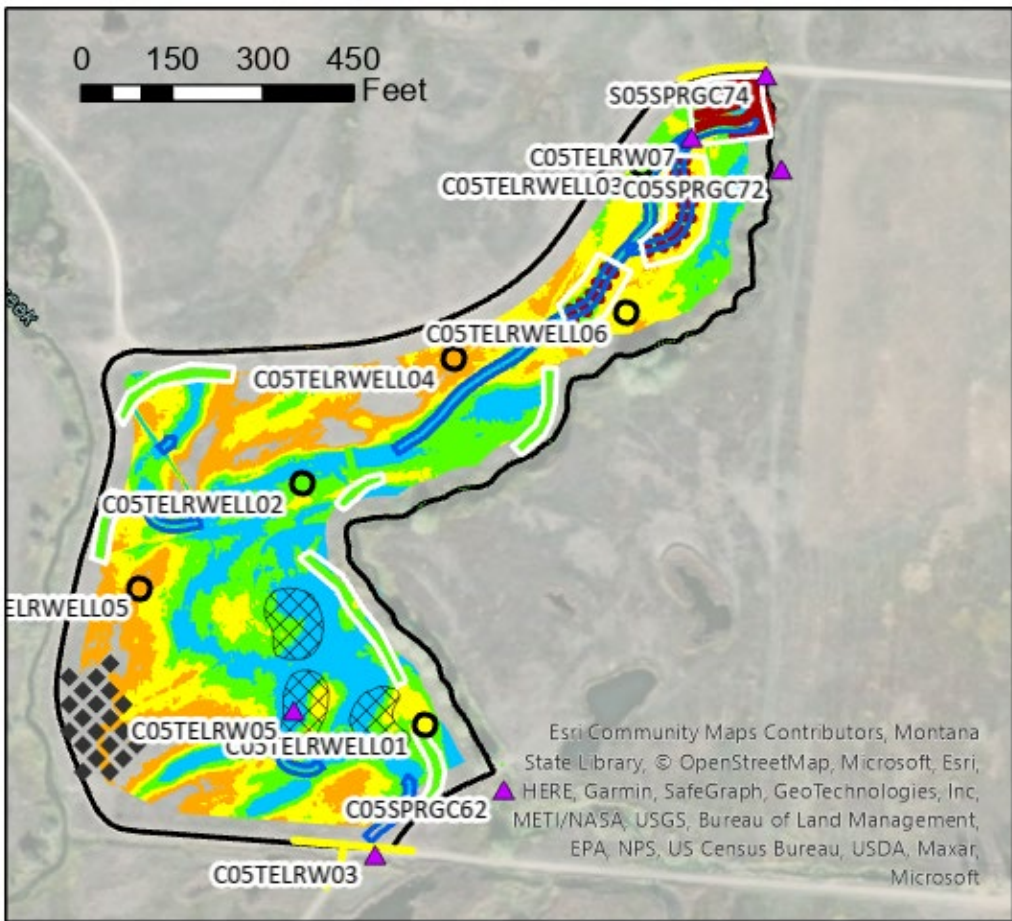
August 2023 →



MONTANA
FRESHWATER
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The general flow of things



Teller_FencesRoads

- Fence
- Raise Road

Design Lines

- Flow Path
- Vegetated Berm
- Willow Brush Trench

Design Areas

- Floodplain Roughness

Staging Area

- Staging Area

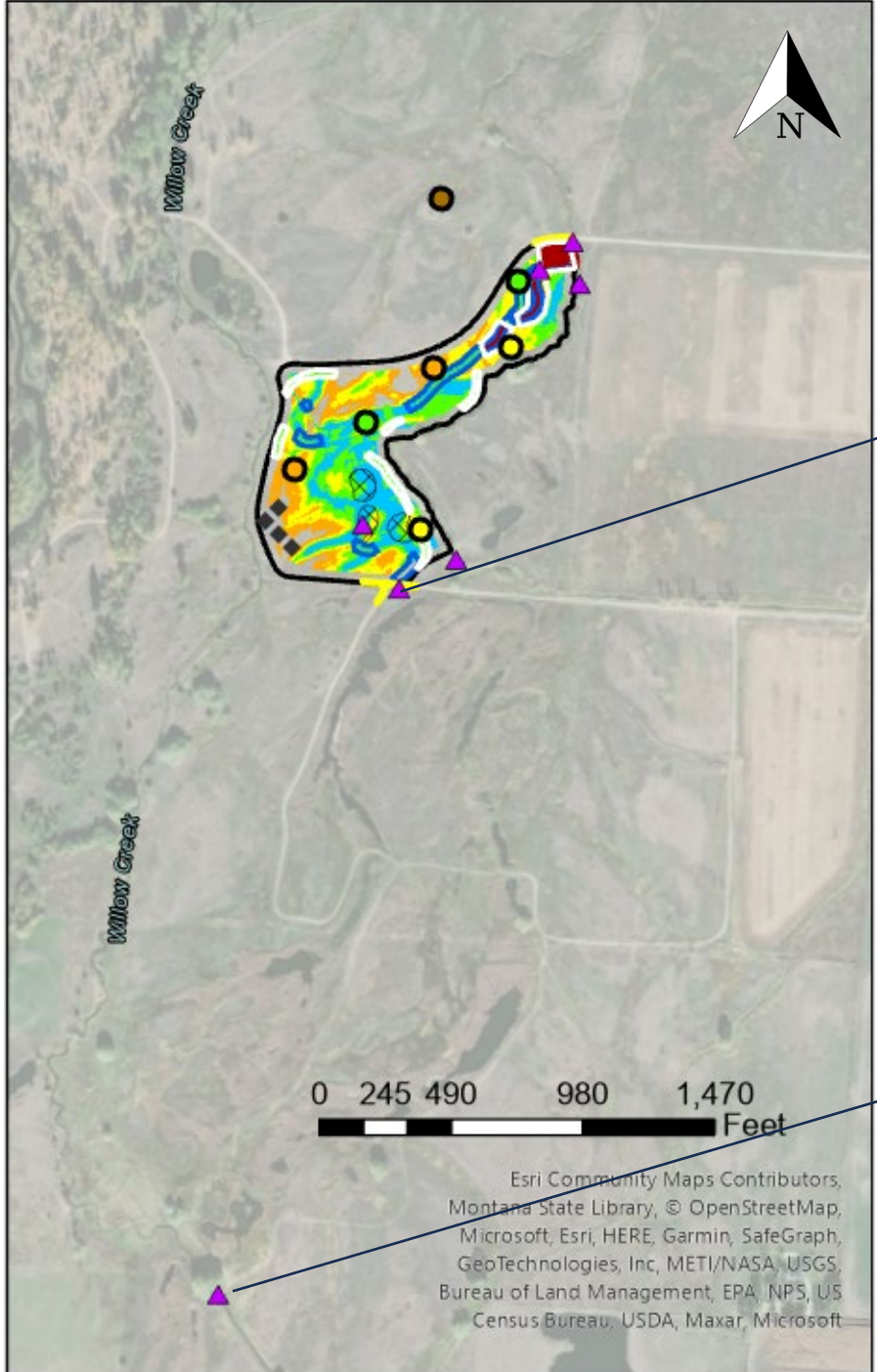
Design Depths

- Inundated
- Frequently Inundated
- Occasionally Inundated
- Rarely Inundated

Project Area

- Project Area

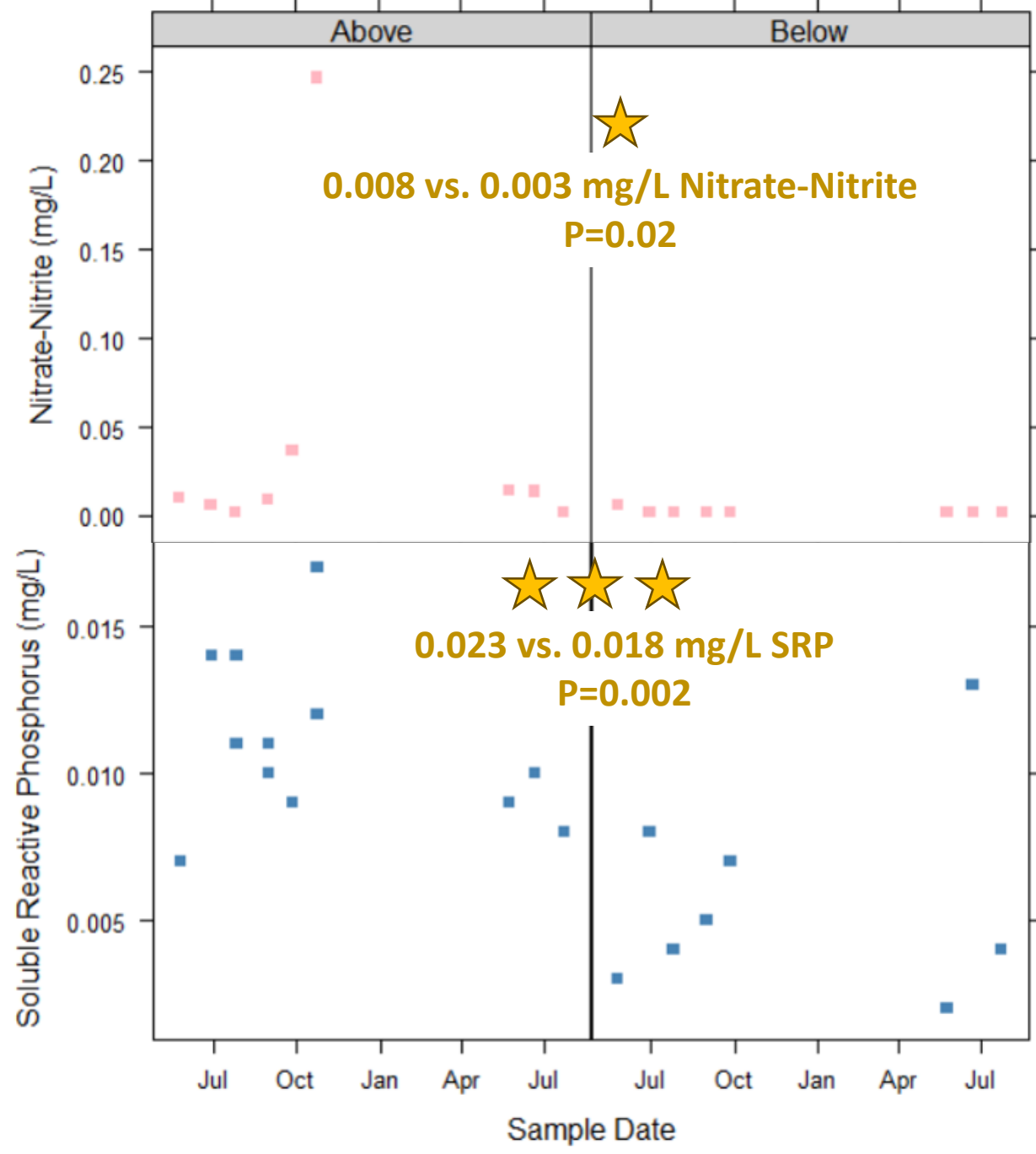
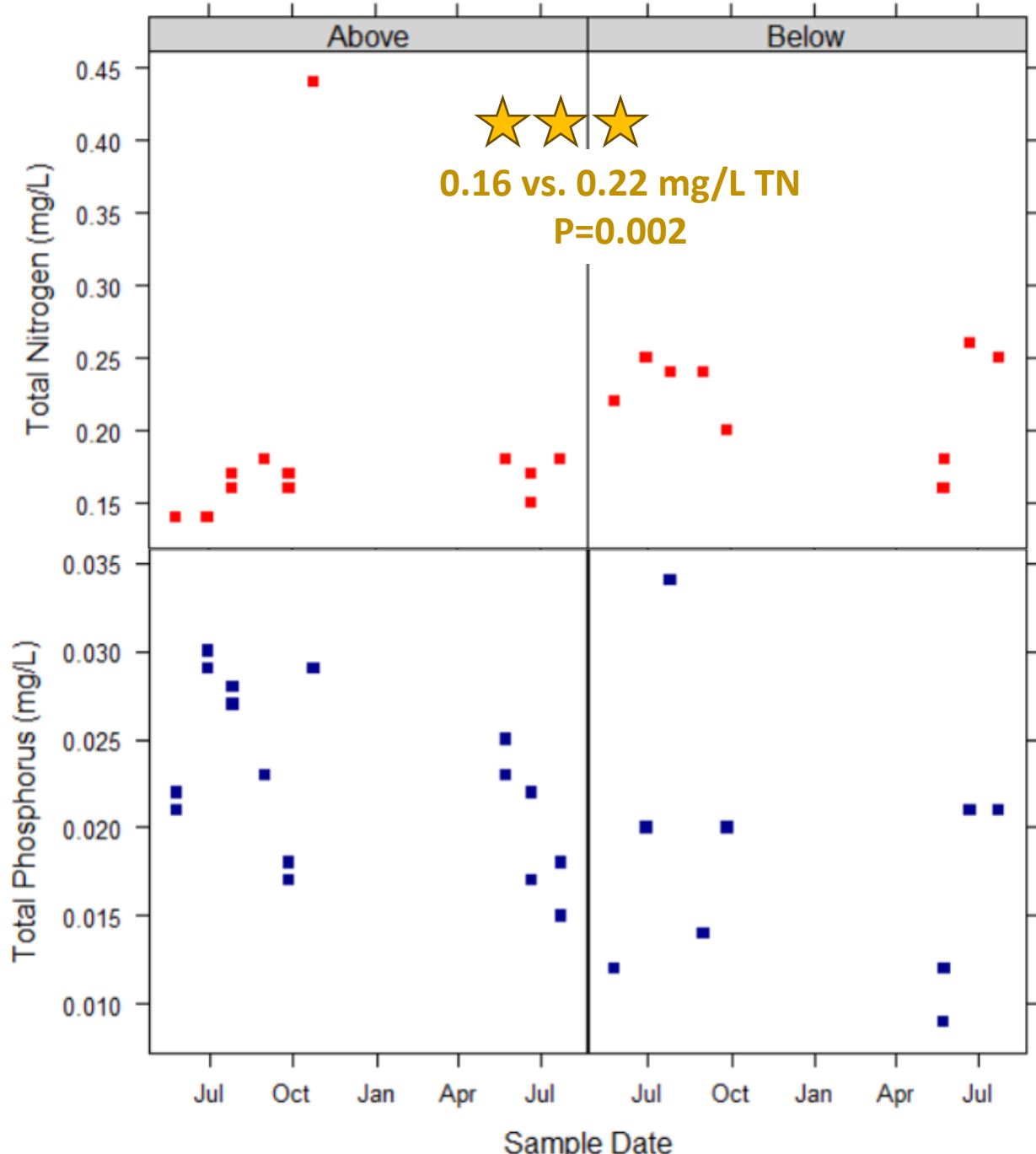
The general flow of things

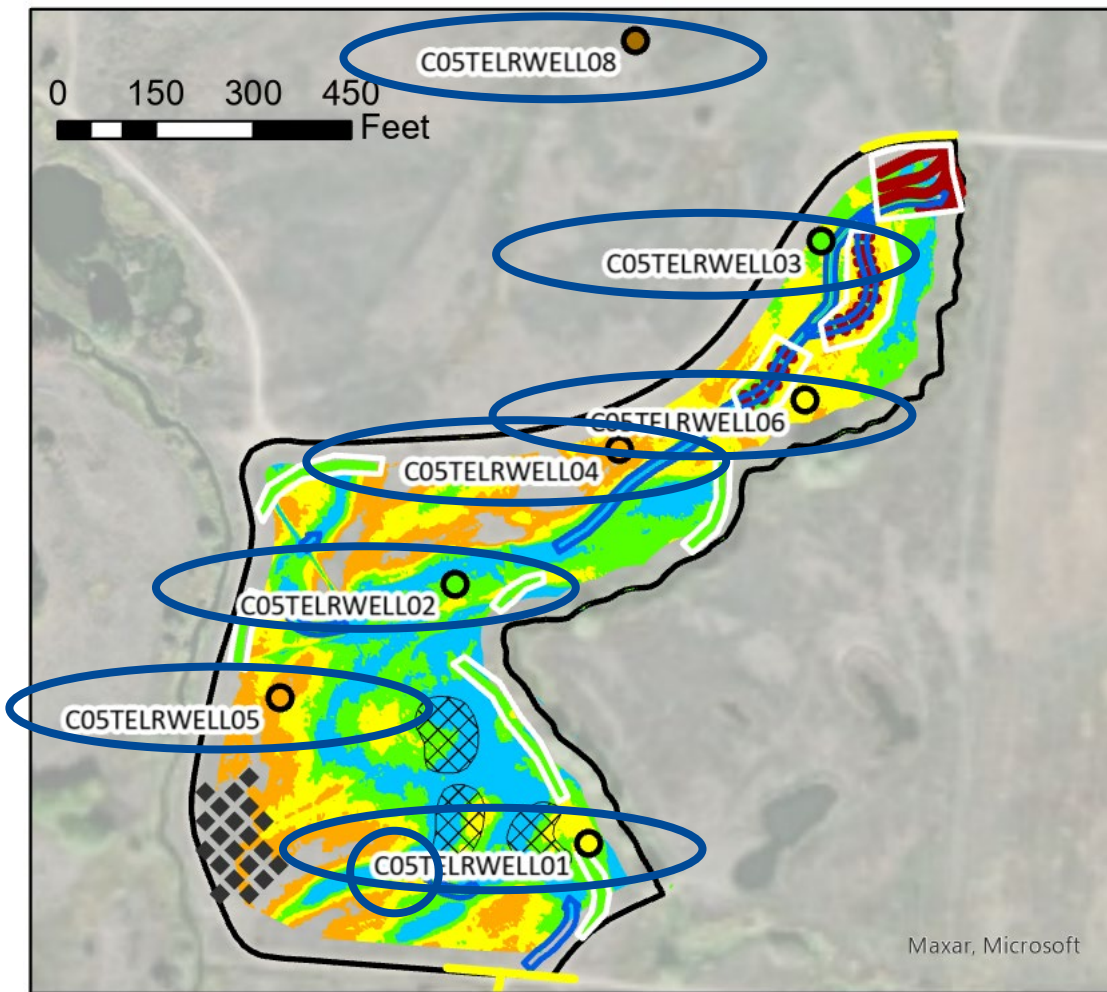


“Teller Wetland Inlet”
(aka NRCS Wetland Outlet)

“Willow Creek abv NRCS
Wetland”

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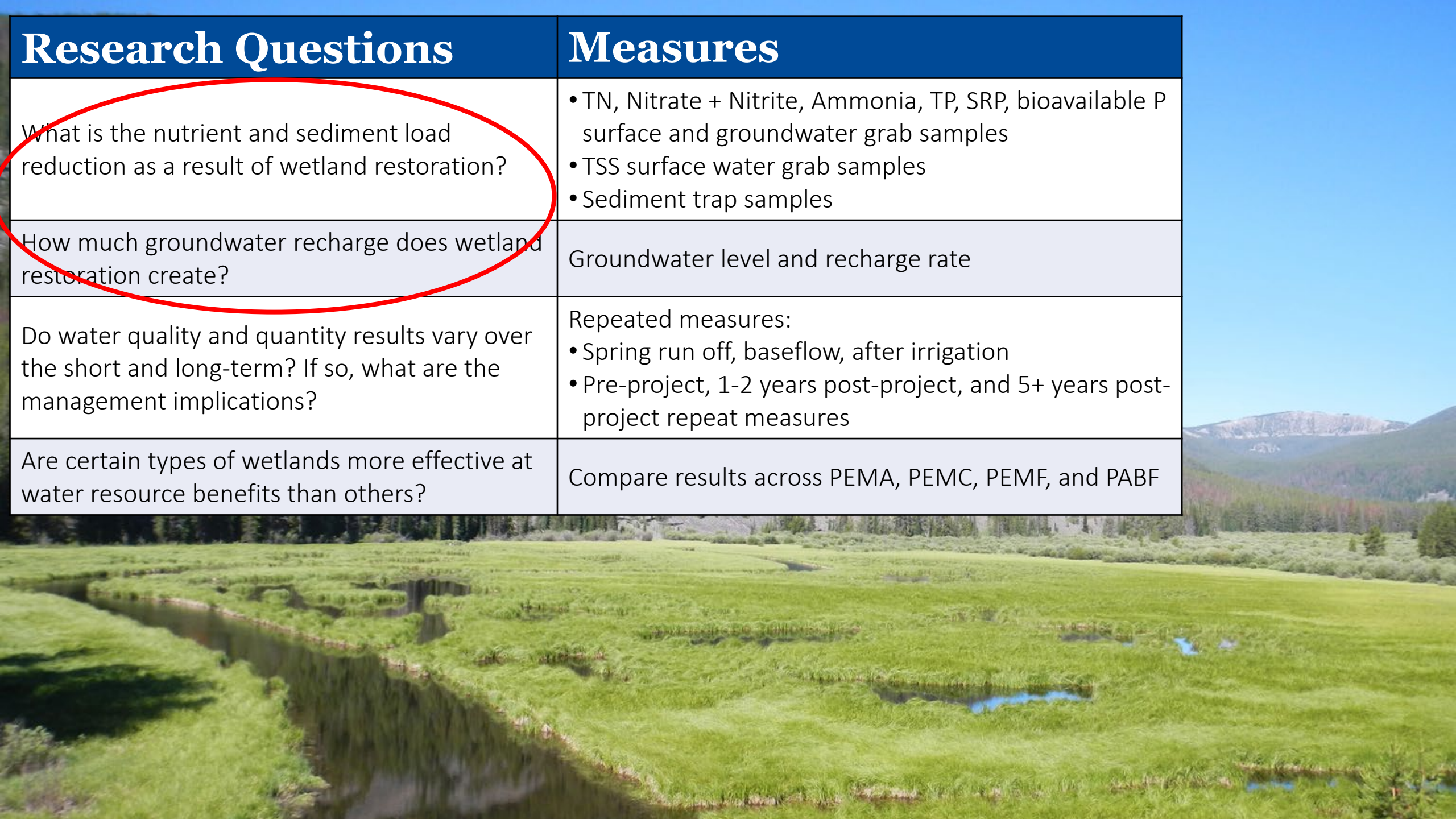




- The control well has always had water
- 3/7 (1, 2, & 3) wells only had water post-restoration (2023)
- 2/7 (4 & 5) wells have never had water
- 1/7 (6) wells had water both years
- 1/7 (“Geum” well) wells became submerged with surface water



What this analysis of Teller
wetland data does not
account for



Research Questions	Measures
What is the nutrient and sediment load reduction as a result of wetland restoration?	<ul style="list-style-type: none">• TN, Nitrate + Nitrite, Ammonia, TP, SRP, bioavailable P surface and groundwater grab samples• TSS surface water grab samples• Sediment trap samples
How much groundwater recharge does wetland restoration create?	Groundwater level and recharge rate
Do water quality and quantity results vary over the short and long-term? If so, what are the management implications?	Repeated measures: <ul style="list-style-type: none">• Spring run off, baseflow, after irrigation• Pre-project, 1-2 years post-project, and 5+ years post-project repeat measures
Are certain types of wetlands more effective at water resource benefits than others?	Compare results across PEMA, PEMC, PEMF, and PABF

Our results can help inform:

- Wetland restoration design
- Maintenance schedules
- Nutrient trading/adaptive management planning

Want to help!?





Questions?

406-444-0549

Hannah.Riedl@mt.gov



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