



Student-led research

**The Nature Conservancy's
Shorelands Preserve**

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What is a Professional Science Masters?



Professional Science Masters programs

combine advanced STEM coursework with essential business and transferrable skills, creating tomorrow's workforce in science, technology, and innovation.



Creating Tomorrow's STEM Innovators & Leaders



University of Utah PSM Programs

**COMPUTATIONAL
& DATA SCIENCE**



BIOTECHNOLOGY



**ENVIRONMENTAL
SCIENCE**



**EARTH RESOURCE
MANAGEMENT**





Alternative Pathway to a Masters

- Flexible
- Non-thesis
- Part-time or Full-time
- Completed in 2 – 4yrs
- Academic Ownership
- Professional Development & Career Alignment
- Industry Partnerships & Opportunities
- Experiential learning



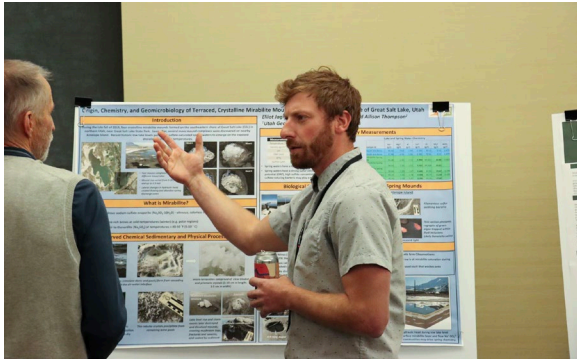
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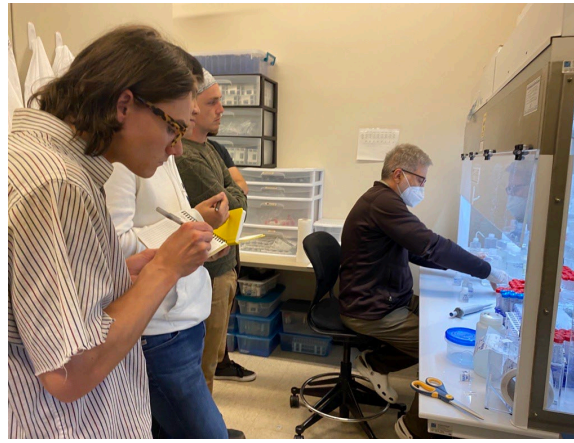
A group of students in a field. Two students in the foreground are looking at a blue clipboard. In the background, two other students are working with plants. The field is filled with green and yellow vegetation under a clear blue sky.

MST 6963 Environmental Field Methods & Analysis

- Collect and measure a range of environmental variables;
- Analyze and interpret data results from field results;
- Consider the implications of our data results to Great Salt Lake
- Produce a final report for community partner use and ongoing data collection.



GSL Issues Forum



Classroom Knowledge



Community Professionals

PRIMER / CONTEXT

COMPETENCIES

PRACTICAL APPLICATION



Study Site:
TNC Shorelands Preserve



$\frac{1}{4}$ mile SE





Water enters
Shorelands Preserve through
Freeport Storm Drain

West Davis Corridor

West Davis Corridor

West Davis Corridor

Freeport Drain WRI Site

Existing
water
channel

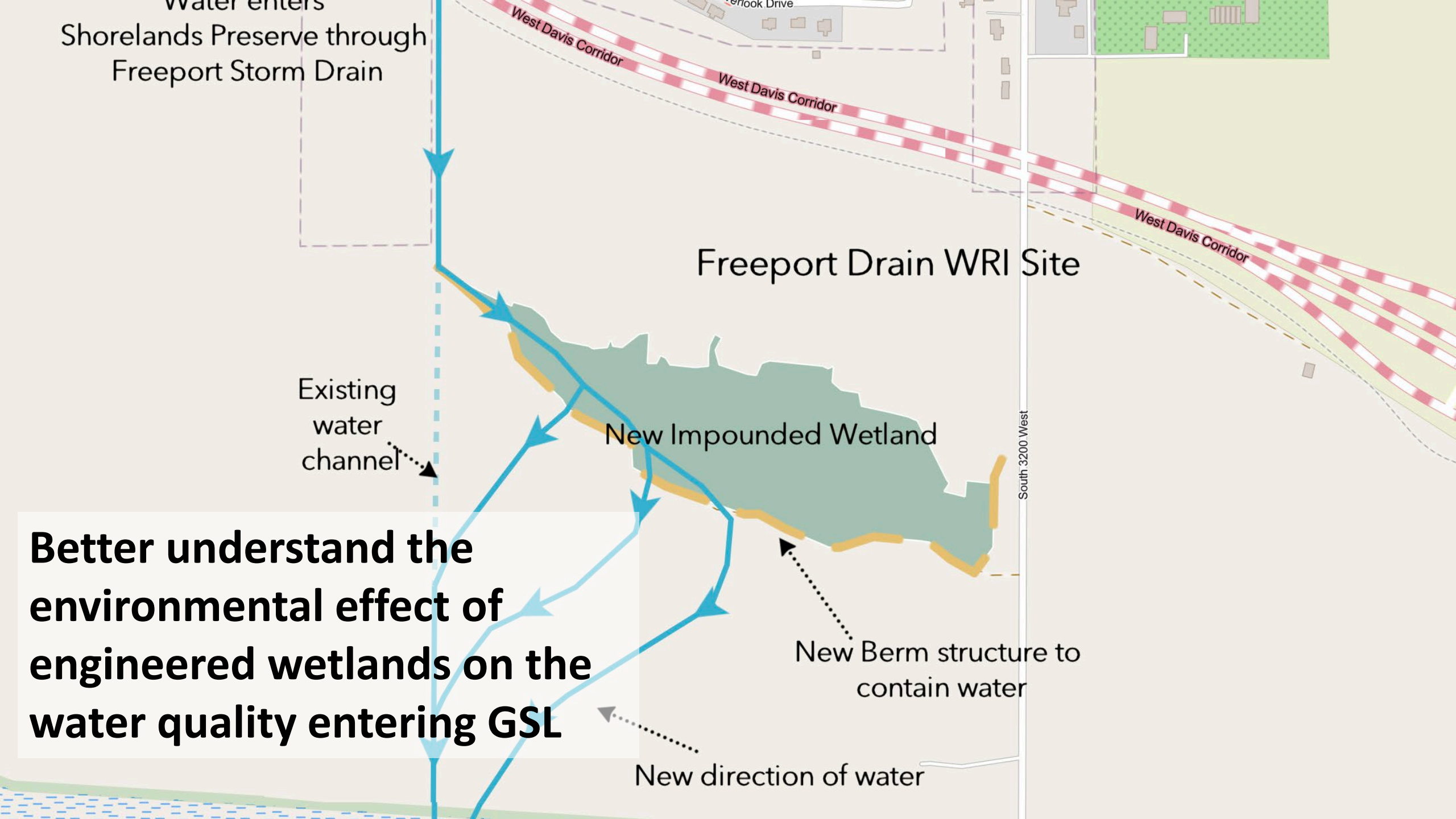
New Impounded Wetland

South 3200 West

New Berm structure to
contain water

New direction of water

**Better understand the
environmental effect of
engineered wetlands on the
water quality entering GSL**





Summer 2022 objective:
document site
characteristics prior to
wetland construction

- Vegetation community identification and mapping
- Water chemical and quality sampling
- Sediment chemical sampling

Vegetation Results

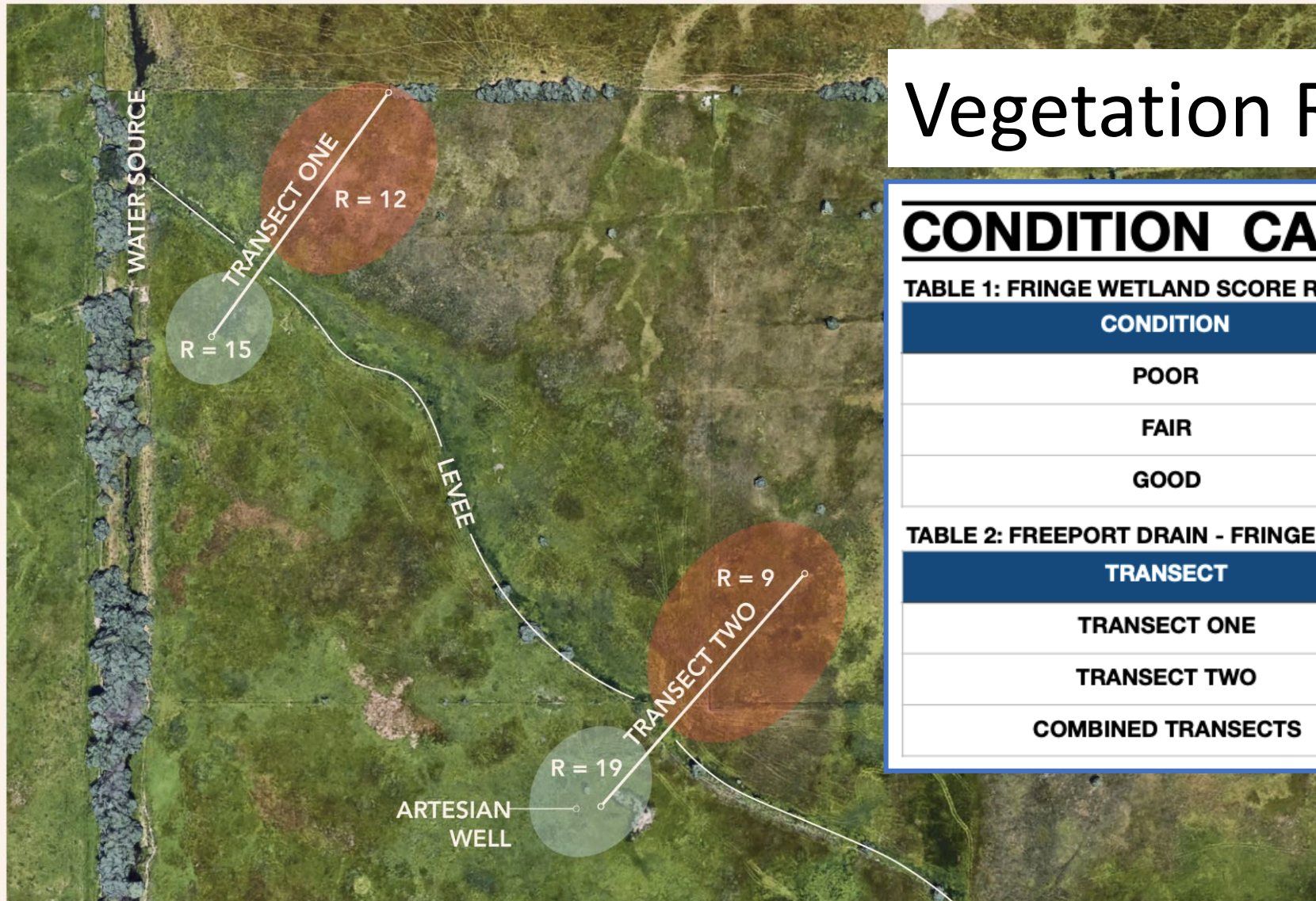
CONDITION CALCULATION

TABLE 1: FRINGE WETLAND SCORE RANGES AND CONDITIONS

CONDITION	FRINGE WETLAND SCORE RANGES
POOR	0 — 16.2
FAIR	16.3 — 20.7
GOOD	20.8 — 30

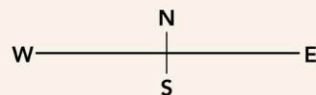
TABLE 2: FREEPORT DRAIN - FRINGE WETLAND SCORES & CONDITIONS

TRANSECT	FRINGE WETLAND SCORE & CONDITION
TRANSECT ONE	11.421 — POOR
TRANSECT TWO	13.596 — POOR
COMBINED TRANSECTS	14.188 — POOR



FREEPORT DRAIN SITE TRANSECT LOCATIONS & SPECIES RICHNESS

SCALE
100 M



KEY

SPECIES RICHNESS = R

R = 15 to 19

R = 9 to 12

REFERENCE: Downard, Becka (November 12, 2021)
Improving Great Salt Lake Wetland Quality Through
Monitoring of Wetland Uses, Water Quality, and
Condition: Final Report for USEPA Region 8 FY 2018-2019
Wetland Program Development Grant CD-96878701 UTAH
DIVISION OF WATER QUALITY

Site 1A, 1B



Site 2



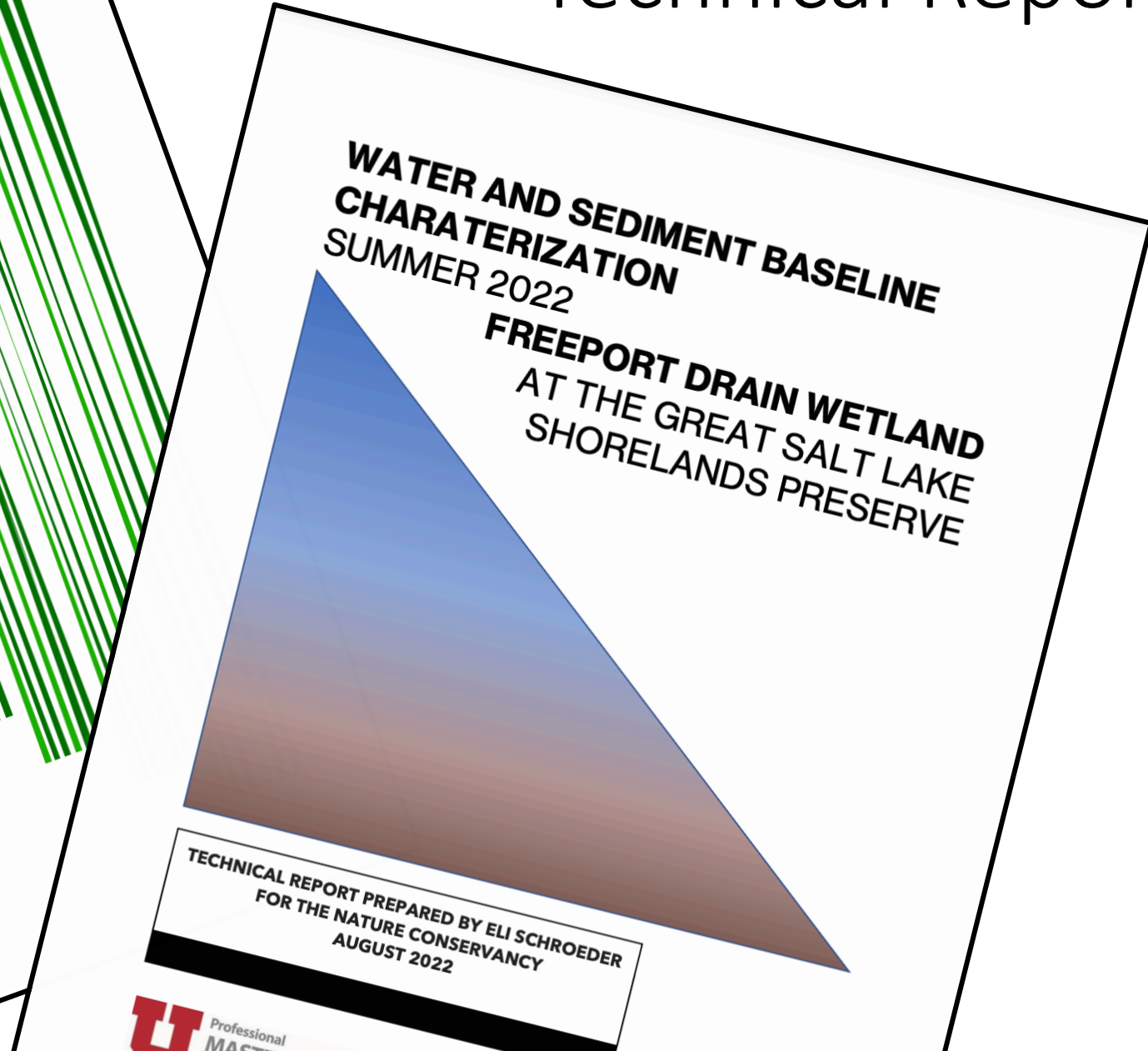
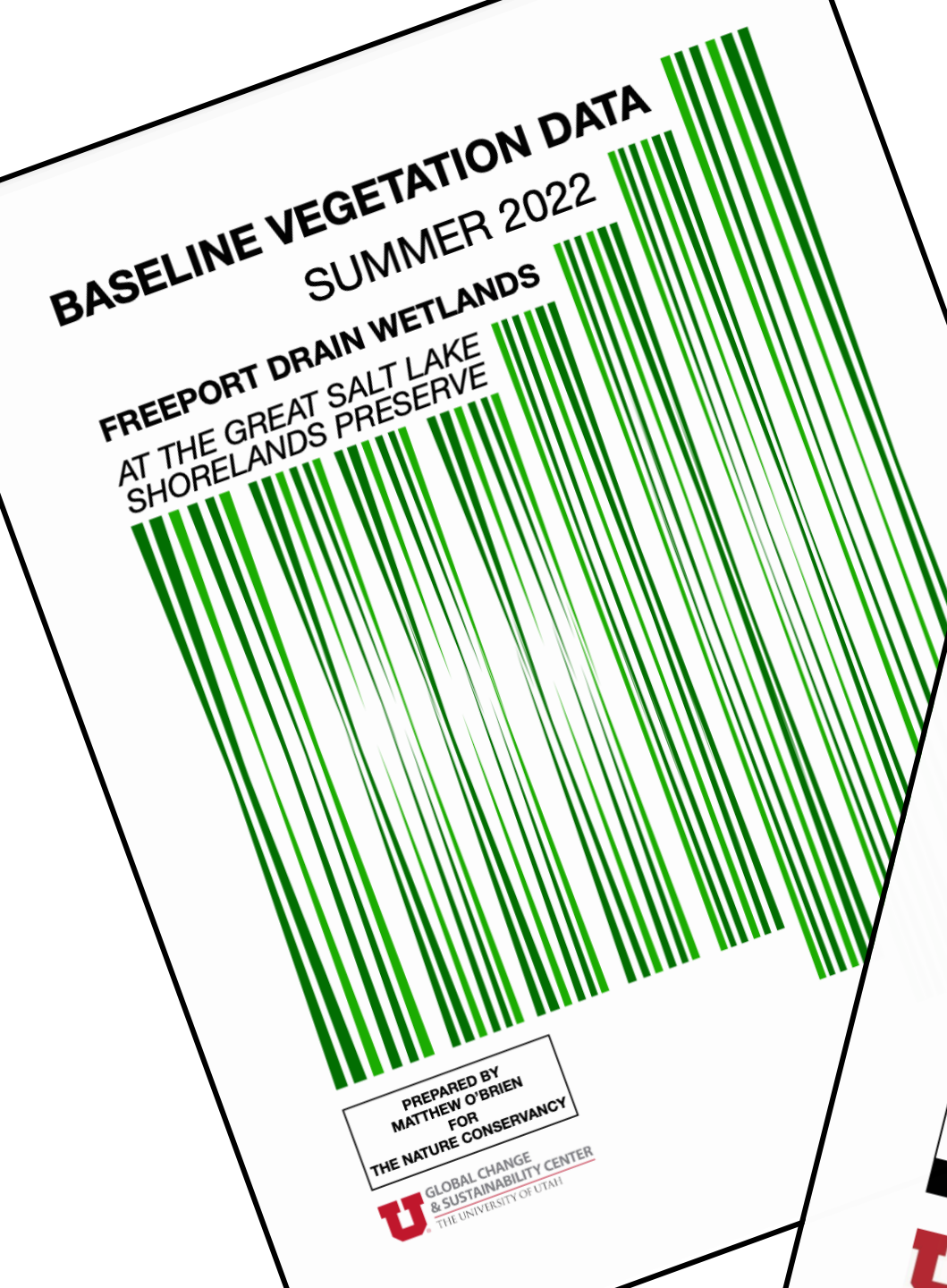
Site 3



Water and Sediment Analysis *Snapshot* June 2022

- Analytes: Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Ni, K, Sc, Se, Na, Sr, Tl, U, V Zn [method: ICP-MS, IC]
- Water Results: within acceptable drinking water standards (WHO)
- Sediment Results: Arsenic (As) Elevated (USGS, US soils concentrations). Minor concern: Sb, Cd, Co, Pb, Li, Mn, Tl

Technical Reports



Mike Kolendrianos, the Shorelands Preserve Manager grew up farming just minutes from the project site



▶ 00:00

Mike K
Sho



iving Lab



A Living Lab

nts get their hands dirty contributing to a Wetland Restoration Project at Great Salt Lake
Shorelands Preserve



Ongoing work

- Amy Collins: professional experience project; 2022-2023 (*research grant*)
 - *Understanding the effectiveness and environmental economic considerations of engineered wetlands at the Great Salt Lake Shorelands Nature Preserve*
- Summer 2023: field trips and data collection
- Sabrina Santos: professional experience project; 2023-2024 (research grant) *video
 - *Analysis and Cost Considerations of Seasonal Water Quality and Ecosystem Users; Freeport Engineered Wetland Monitoring at The Great Salt Lake Shoreland Nature Preserve*
- Summer 2024: MST 6963 Environmental Field Methods & Analysis





Final Thoughts

- Testbed for research and experiential learning
- Service to our community and collaborators
- Aim to create a long-term monitoring dataset
- New ideas?



Thank you



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