

Developing Ecologically Significant, Economically Practical, and Regulatorily Compliant Performance Criteria



Panel Introduction



Karen Lawrence – District Mitigation Coordinator, U.S. Army Corps of Engineers (Omaha, NE)



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Rich McEldowney – Principal Riparian Ecologist, Confluence Consulting Inc. (Bozeman, MT)



Lucy Harrington – Sr. Regulatory Specialist, GEI Consultants, Inc. (Denver, CO)



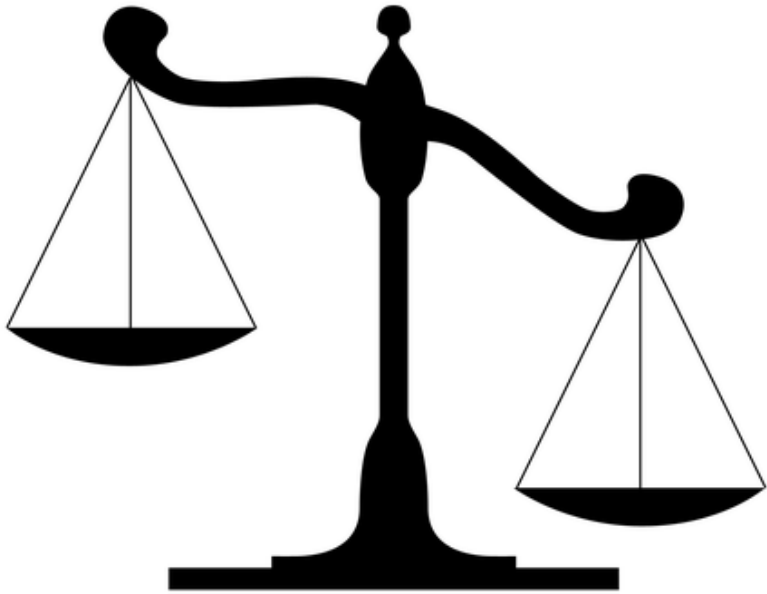
Panel Overview

- Background presentations
 - Regulatory
 - Academia
 - Consulting
- Moderator questions
- Audience questions

**Purpose: Spark conversation and
thought**



Let's Get the Balance Right



- Wetland mitigation offsets losses of functions and values
- Mitigation = regulatory-required restoration
- What tools can non-agency staff provide?



Framing the Issue...

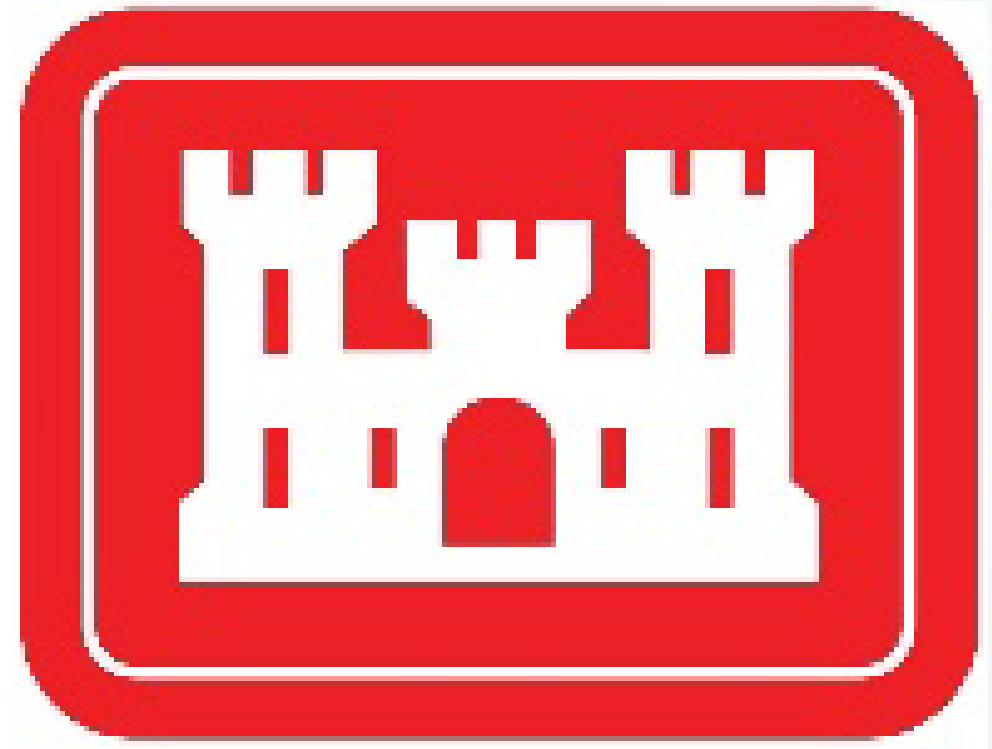
- What should we be monitoring to demonstrate “significant” restoration?
- What functions have been lost that should be restored?
- How can natural variability be incorporated into a project (time, space, climate, natural processes, etc.).
- How can regulatory restoration be a driver?

Many, many, many, more....

Regulatory

Karen Lawrence

*US Army Corps of
Engineers, Omaha District*



Who wants to gamble with credit releases???



"I'm going to
make the
wetland better"

Will some credits be released this year?

I can just tell
it's working
like it should



How do I think
it looks?

Wonder who
will evaluate
the site next
year?

Reduce the Guess - Reduce the Unknown

- ❑ One of the Sponsor's goal is to show the site has established lift (equates to credits available to sell).
- ❑ The Sponsor and the Corps agree to an appropriate method to assess the site. Each method should have data collection protocols that everyone can understand and follow.
- ❑ Each site will have specific performance measures. There is no guess work in determining if a performance measure is met because the Sponsor provides the details.
- ❑ The Sponsor then knows when to approach the Corps.
- ❑ The Corps can approve an appropriate number of credits to be released with a high level of confidence the site is trending towards success.

Reminder: The USACE regulates aquatic resources

(Note: releases are usually tied to annual monitoring reports)

§ 332.2 “Performance standards are observable or measurable physical (including hydrological), chemical and/or biological attributes that are used to determine if a compensatory mitigation project meets its objectives.”

§ 332.5 Ecological performance standards.

(a) The approved mitigation plan must contain **performance standards that will be used to assess whether the project is achieving its objectives...**

(b) **Performance standards must be based on attributes that are objective and verifiable...**

Academic

Jeremy Sueltenfuss

Colorado State University

Applied EcoHydro



Ecosystem Forms, Functions, and Processes



Process



Form

Overhanging
Branches



Function

Lower Temps
Habitat

But are the necessary processes occurring to maintain these forms, to promote these functions?!?

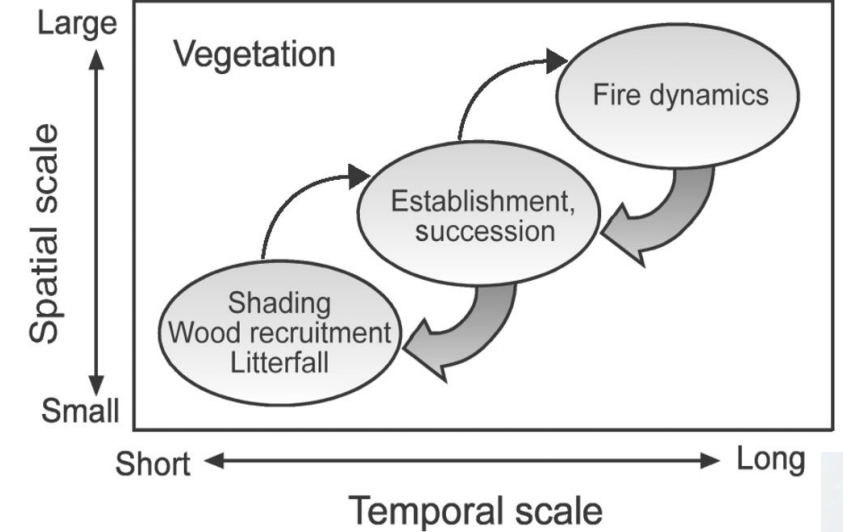
Ecosystem Forms, Functions, and Processes



Process Establishment
Succession

Form Overhanging
Branches

Function Lower Temps
Habitat



Ecosystem Forms, Functions, and Processes



Process

Establishment
Succession



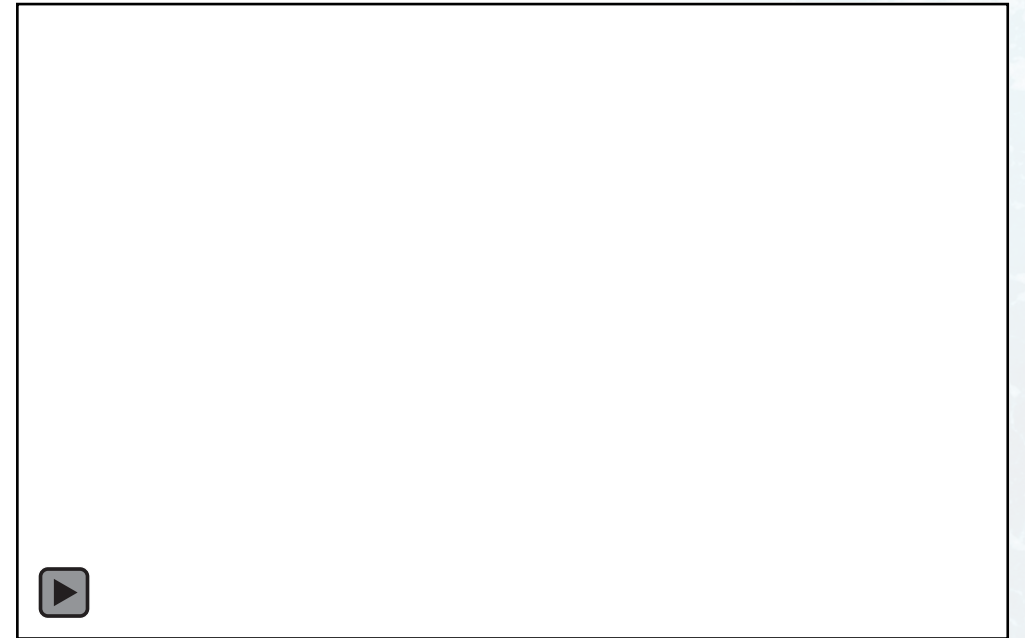
Form

Overhanging
Branches



Function

Lower Temps
Habitat



Wetlands are highly variable



Wetlands have been altered in many different ways



What do we measure to know if a wetland has been restored appropriately?

What makes an indicator useful?

Good indicators are ideally

Specific to a certain wetland type

Doesn't occur in other situations



VS

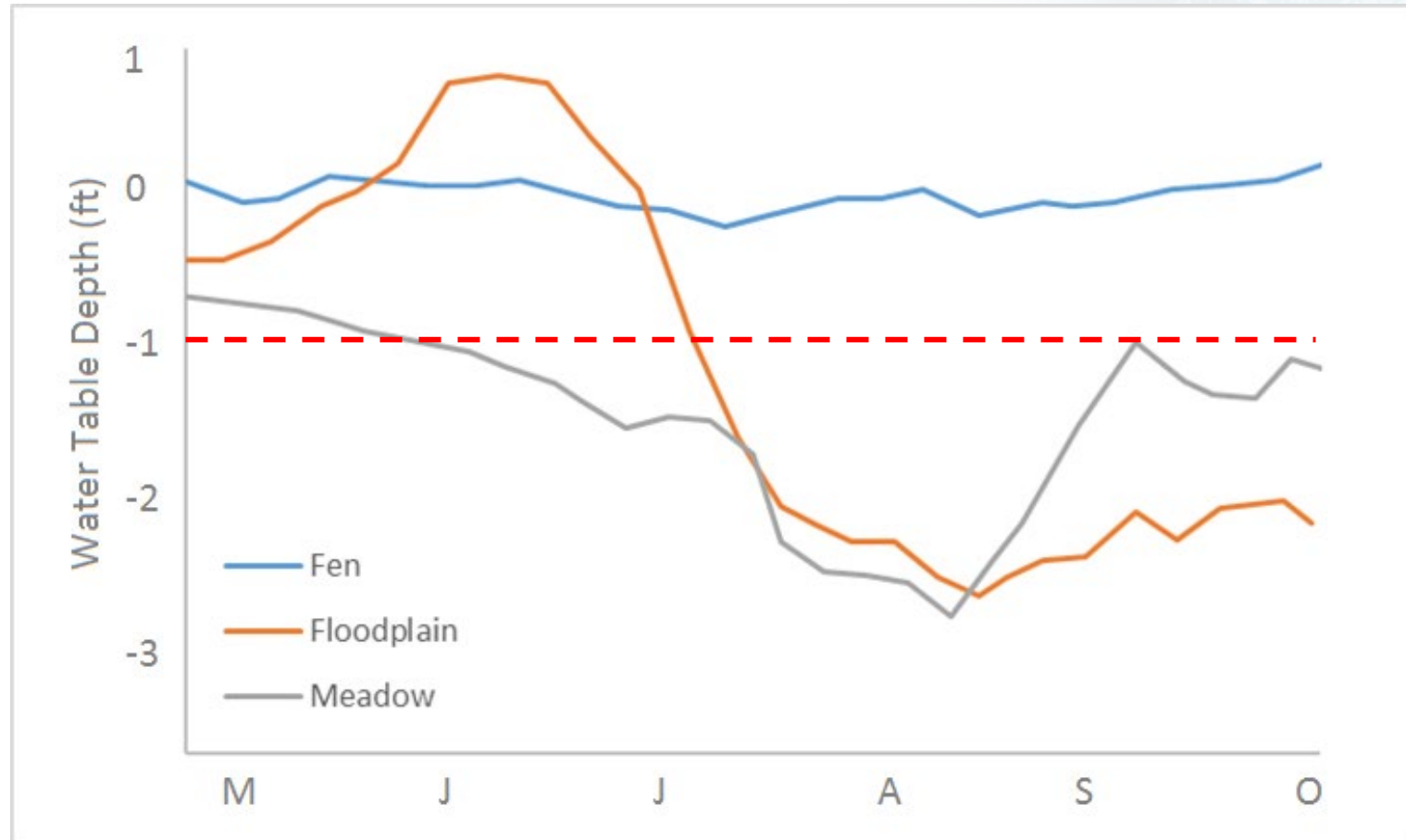
Faithful to a certain wetland type

Always present

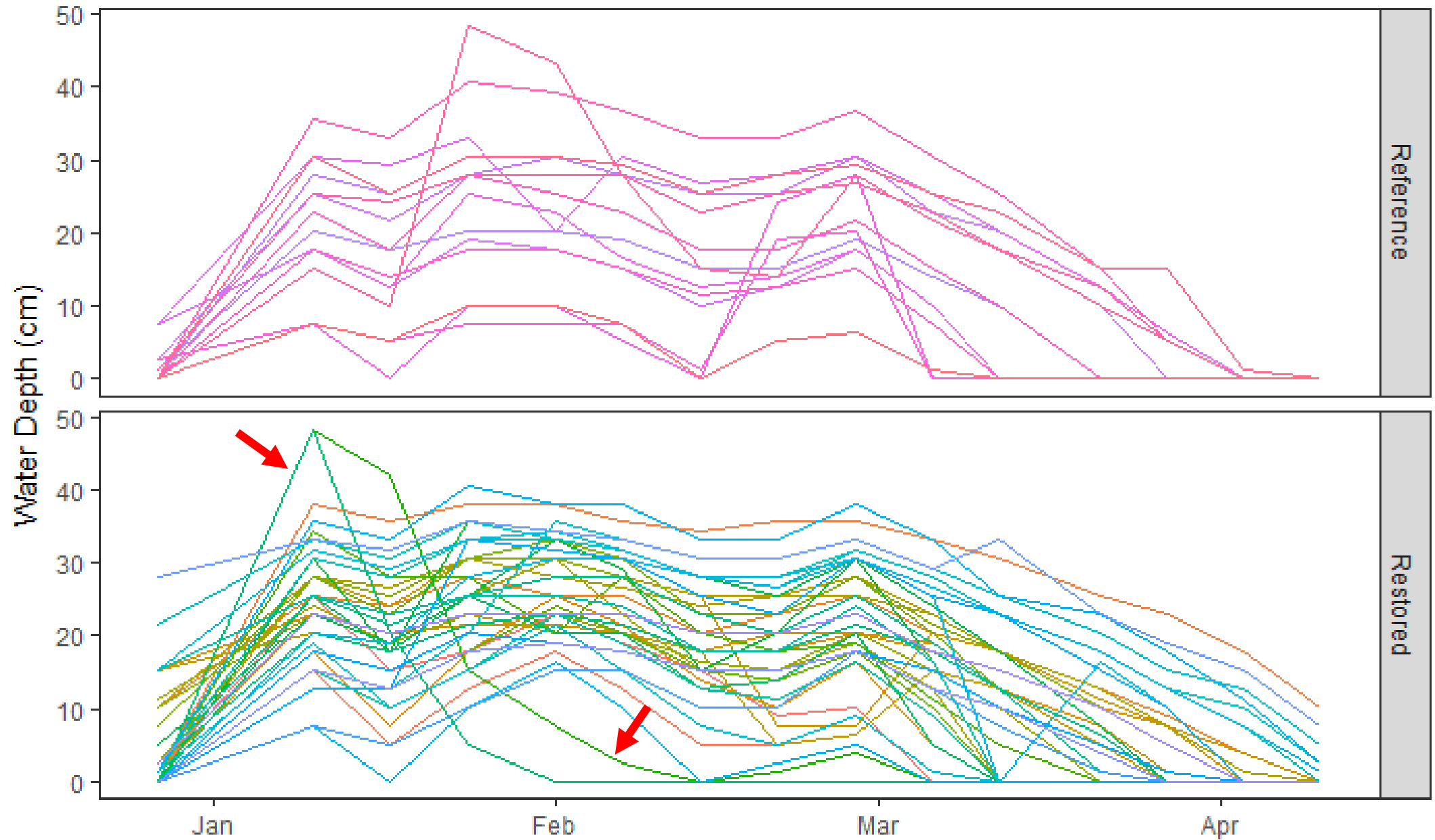


Hydrology Drives Wetland Form and Function

Wetland types differ in their hydrologic regime



Vernal Pool Water Levels

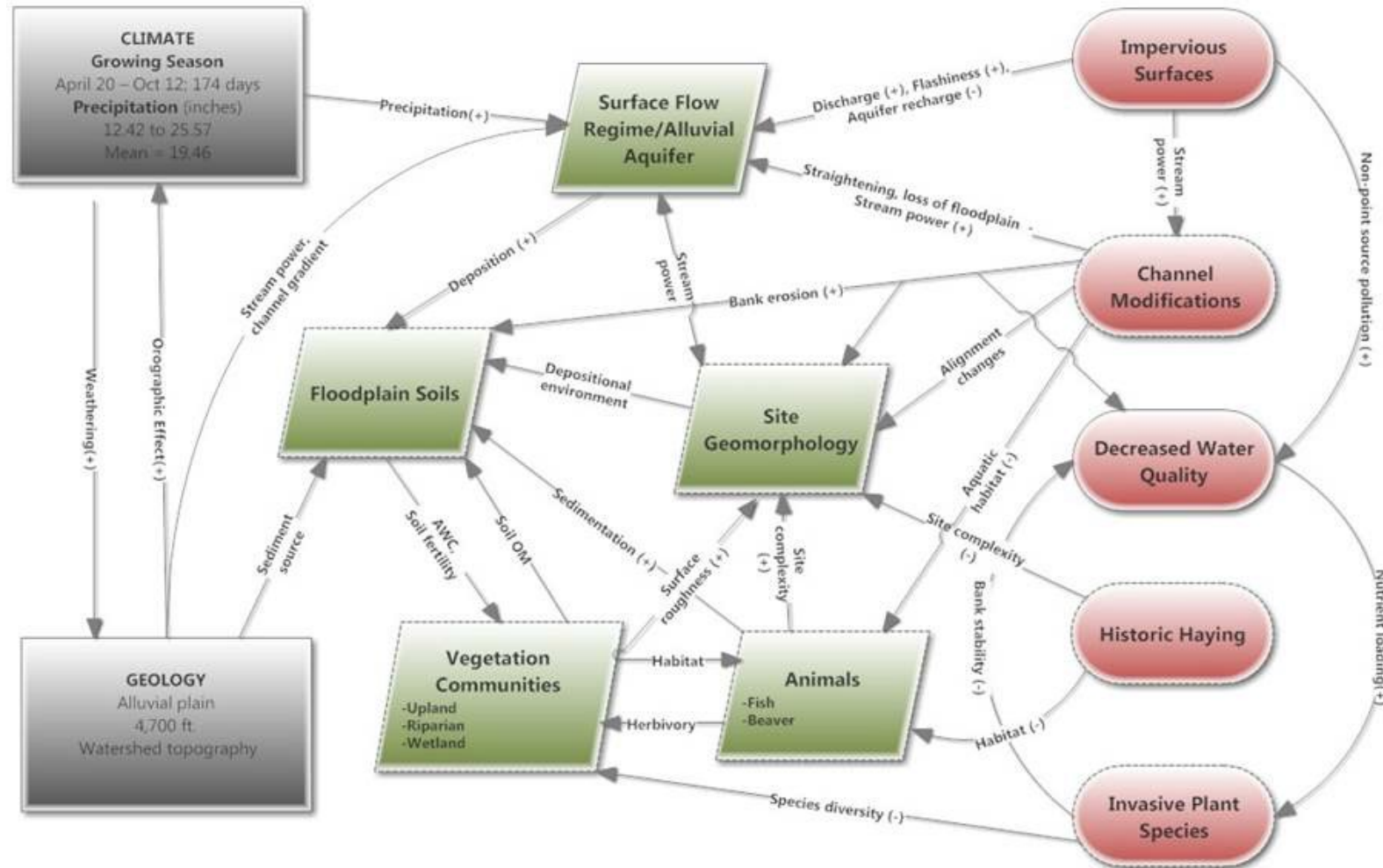


We should measure lots of things!

INDEPENDENT VARIABLES

DEPENDENT VARIABLES

ANTHROPOGENIC STRESSORS



NOTES: Polygons with solid lines indicate watershed scale conditions.
Dashed lines indicate onsite conditions.

Focus on Process over Form

- Process-based indicators might be more helpful than form-based indicators
 - Adaptive management opportunities
- Indicators should be specific to that exact wetland or wetland type
 - Hydrologic indicators can be used across many (all?) different wetland types
- We should strive for indicators that are meaningful

Consulting

Rich McEldowney

Confluence Consulting Inc



Ecological Significance

Convention of Biological Diversity – a site is considered to be ecologically significant if it possesses one or more of the following:

- Uniqueness or Rarity
 - Connectivity between/among habitats
 - Special importance for life history stages of species
 - Importance for threatened, endangered, or declining species and/or habitats
 - Vulnerability, fragility, sensitivity, or slow recovery
 - Biological productivity
 - Biological diversity
 - Naturalness
-
- Provides important functions

Ecological Significance – for mitigation sites

- Special importance for life history stages of species
- Biological productivity
- Biological diversity
- Provides important functions

Ecological Significance - Example

- Biological productivity
- Special importance for life history stages of species

WINTER 2017



WINTER 2017



WINTER 2017



Fall Migration time - OCTOBER 2018



Breeding time - JUNE 2017

What we need to know

- How does a mitigation site get credit for ecologically significant features?
 - Functional units work for functions, but what about biological productivity or diversity, or providing important habitat for specific life stages?
- How should each of the different ecologically significant features be measured?
- **Practitioners need more context** to be able to develop meaningful success criteria for ecologically significant parameters –
 - the use of reference standards (HGM approach), reference sites, and/or literature.

How do we “juice” our performance standards? Get more bang for the buck?

- Use volunteers and/or local residents to conduct additional monitoring events of different events (e.g., seasonal migrations, high water, etc.).
- Adjust level of monitoring effort to better reflect project objectives but keep the effort practicable:
 - Delineate site at end of 5 years rather than every year
 - Measure % cover during 3rd growing season rather than every year.
 - Alternate years for monitoring tasks to reduce level of effort per year.

Questions?



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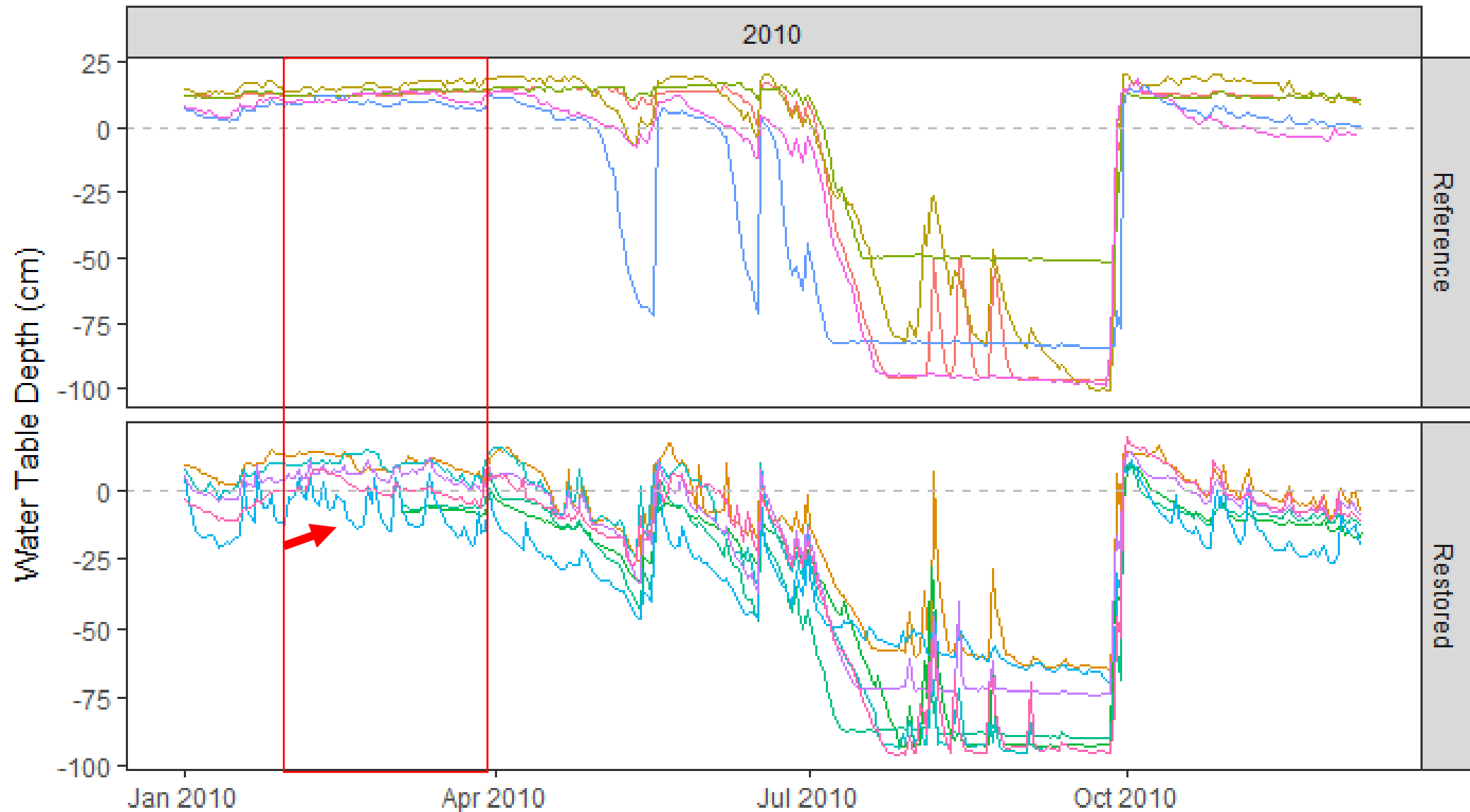
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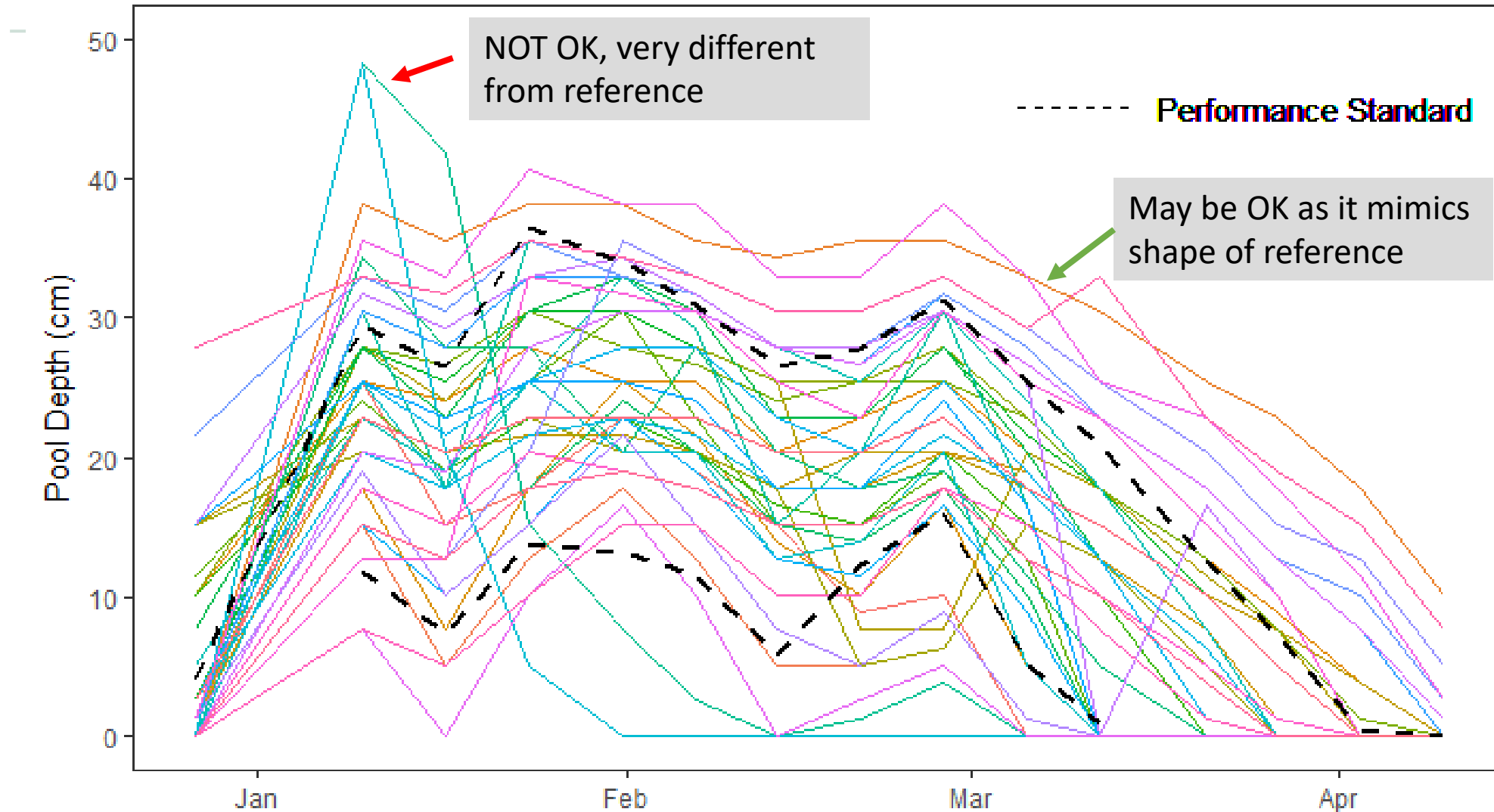
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Extra Slides

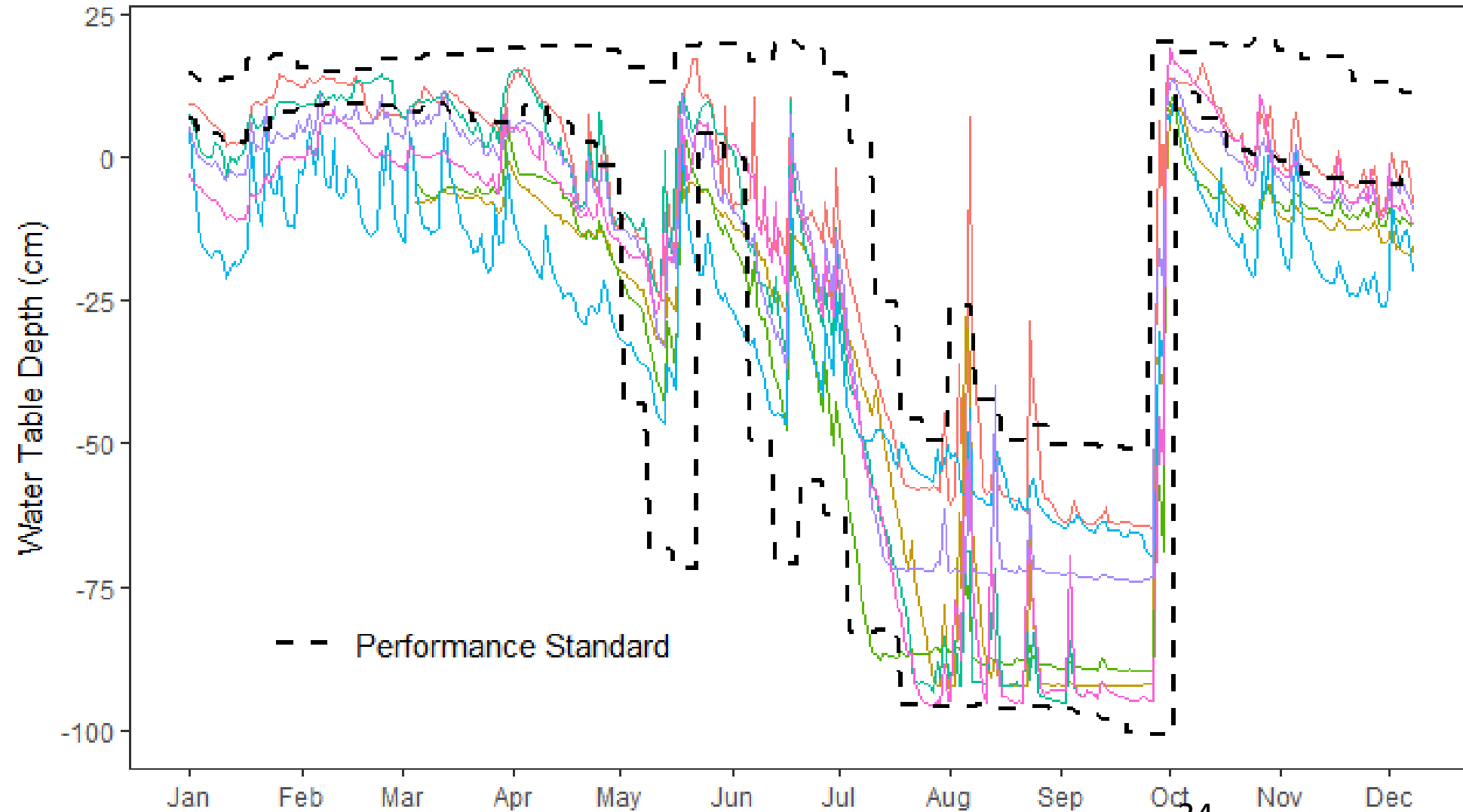
Temperate Forested Wetland Water Levels



Vernal Pool Hydrologic Performance Standards



Forested Hydrologic Performance Standards



§ 230.95 Ecological Performance Standards

(a) The approved mitigation plan must contain performance standards that will be used to assess whether the project is achieving its objectives. Performance standards should relate to the objectives of the compensatory mitigation project, so that the project can be objectively evaluated to determine if it is developing into the desired resource type, providing the expected functions, and attaining any other applicable metrics (e.g., acres).

(b) Performance standards must be based on attributes that are objective and verifiable. Ecological performance standards must be based on the best available science that can be measured or assessed in a practicable manner. Performance standards may be based on variables or measures of functional capacity described in functional assessment methodologies, measurements of hydrology or other aquatic resource characteristics, and/or comparisons to reference aquatic resources of similar type and landscape position. The use of reference aquatic resources to establish performance standards will help ensure that those performance standards are reasonably achievable, by reflecting the range of variability exhibited by the regional class of aquatic resources as a result of natural processes and anthropogenic disturbances. Performance standards based on measurements of hydrology should take into consideration the hydrologic variability exhibited by reference aquatic resources, especially wetlands. Where practicable, performance standards should take into account the expected stages of the aquatic resource development process, in order to allow early identification of potential problems and appropriate adaptive management.

The problem with most wetland mitigation performance criteria from an ecological perspective

- Over emphasis on primary productivity and vegetation parameters - % cover, % noxious weeds, % native hydrophytes, floristic quality index.

“the stormwater BMP approach to wetland monitoring”

- Failure to capture ecologically significant parameters
 - e.g., sinks/sources? trophic pyramid? food webs? habitat interspersions?
- Complicated, difficult to replicate and/or measure, costly
- Lack sensitivity to change, this is especially problematic over short timeframes (e.g., 1 or 2 growing seasons)

Reality Check -

Ecological Performance Standards

- **Site context?** Need to be aligned with the site's potential, including its landscape position. Does its potential match the potential of the reference site?
- **Appropriate scale?** Need to understand the site enough to account for temporal and spatial variability at scales that are ecologically and contextually significant – migration, seasonality, interspersions.
- **Data Limitations?** Need to acknowledge the limitations of the data being collected – who is collecting it? How is it being collected? What methods are being used? Is a reference site even available?
- **Practicable?** Monitoring a reference site doubles the level of effort/cost. At what point does this extra effort make the monitoring program 'non-practicable'?