LITTORAL SEDIMENT RFP

Utah Lake Water Quality Study
Science Panel Meeting
May 21, 2020

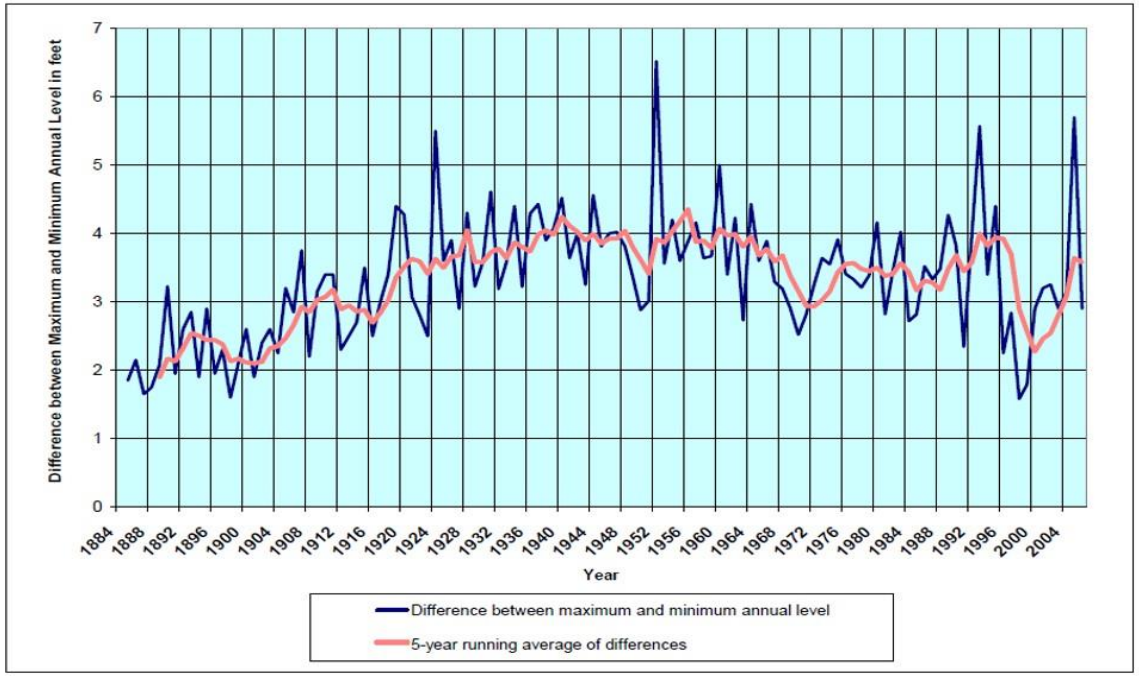
UTAH DEPARTMENT of ENVIRONMENTAL QUALITY

GOALS

- Review and Discuss Littoral RFP
- Seek approval to move to SC and release

LITTORAL SEDIMENT RFP

- Lake level fluctuates
- Drying = Aeration
- Aeration = Transformation
- Lake level effect on nutrient cycling?



LITTORAL SEDIMENT RFP

- Objectives:
  - Spatial and temporal extent of drying – GIS exercise
  - Rate and magnitude of C, N and P fluxes by sediment characteristics and drying treatment (duration)
  - Compare the fluxes to other loads

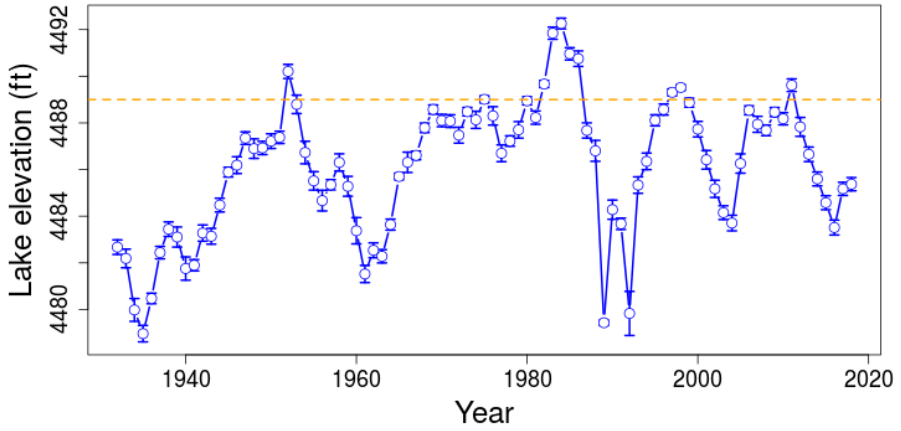
- Outcomes:
  - Role of drying as a source/sink for C, N and P
  - Comparison of littoral sediment loads to others
  - Estimate of duration and extent effect on C, N, and P flux

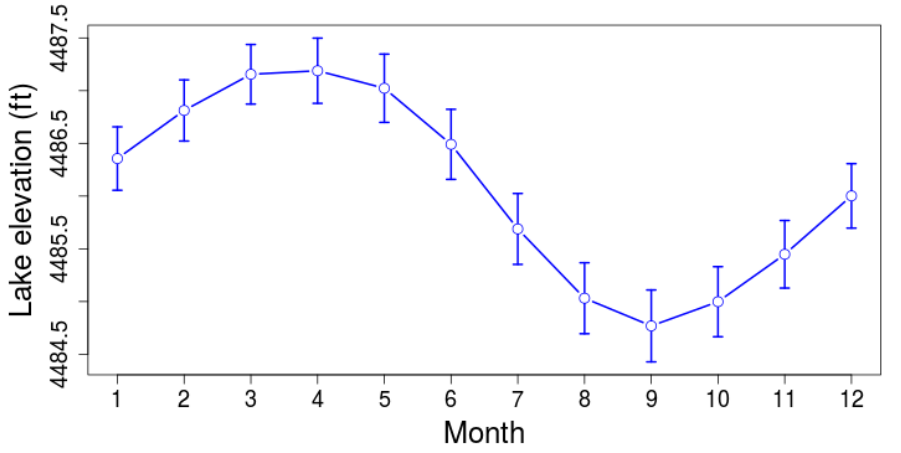
LITTORAL SEDIMENT RFP

- Tasks

1. Lit review (context) and lake level evaluation (quantify extent)

2. Sampling and analysis plan (QC on methods/approach)





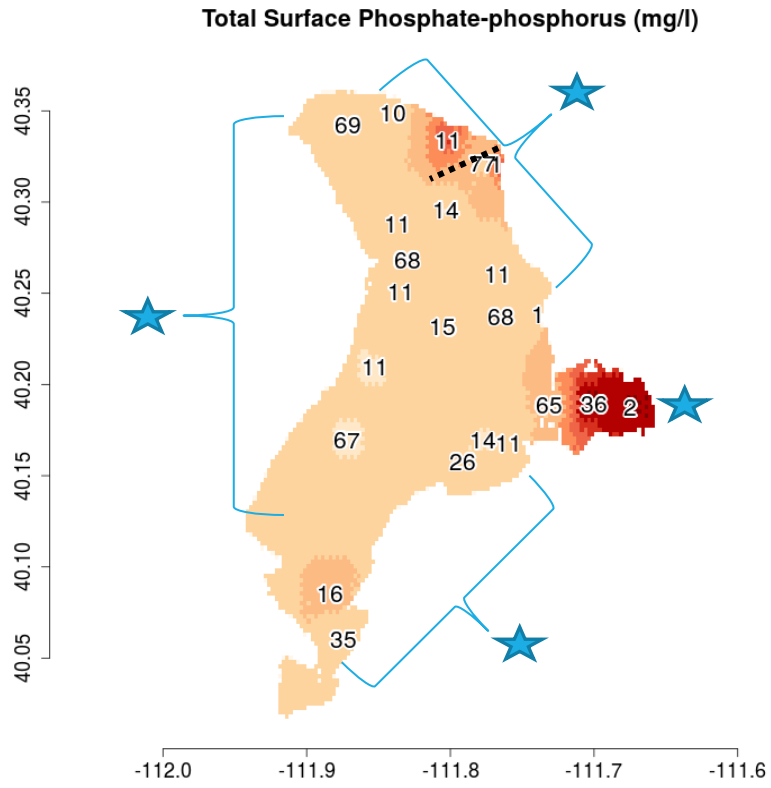
https://markfernandez.shinyapps.io/TEST_UtahLakeDataExplorer2/

LITTORAL SEDIMENT RFP

- Tasks

3. Field collection of cores

  - Provo, Northeast, West, South
  - One site – get a spatial gradient
  - Collect during inundation
  - Initial sediment characterization: sediment and C, N, and P



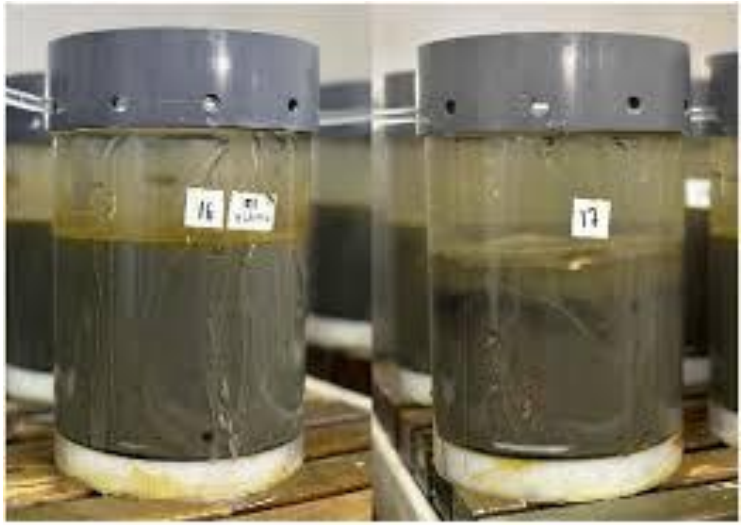
LITTORAL SEDIMENT RFP

- Tasks

4. Laboratory Component

  - Drying of different durations - to be informed by Task 1 (how long are typical drying durations?)
  - Re-wet soils

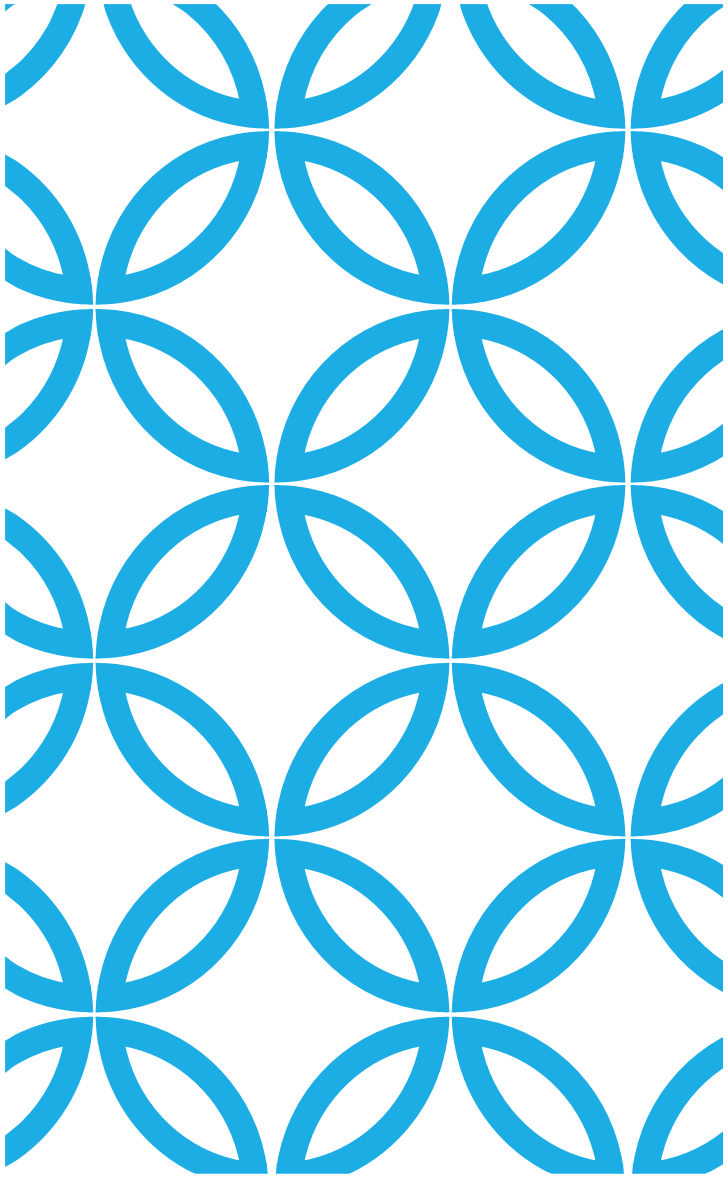
  - Do we need wet/dry scenarios?
  - Lake not really wetting/drying over short time scales.
  - Duration is main difference and will differ by lake elevation.



LITTORAL SEDIMENT RFP

- Tasks

5. C, N, and P analysis
   - Measure C, N and P to water column upon re-wetting.
   - Should we measure C, N and P bulk loss as well?
6. Technical Report



COMMENTS, QUESTIONS?

CNP WORKPLAN

Utah Lake Water Quality Study
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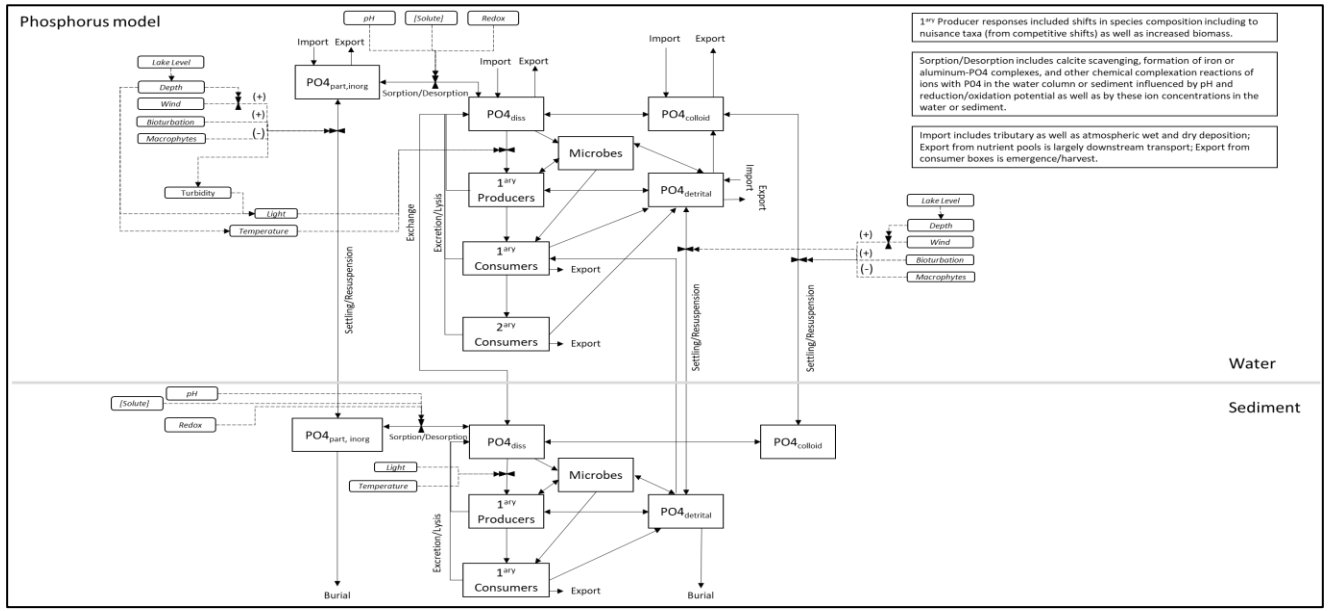
UTAH DEPARTMENT of ENVIRONMENTAL QUALITY

GOALS

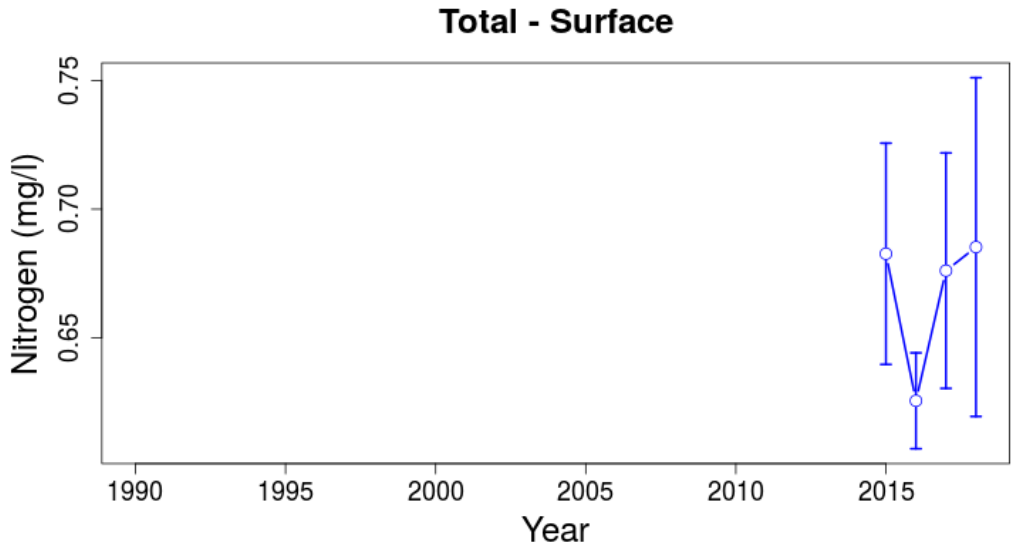
- Review and Discuss CNP Workplan
- Seek approval to move to SC and proceed

C,N,P WORKPLAN

- We have a lot of pieces of these stocks and flows
- But no synthesis
- Before we identify gaps for research, need to synthesize
- In addition, a SP based lake mass balance calculation is desired
  - Complement PSOMAS, Merritt, and Mike Brett's review



C,N,P WORKPLAN



- Objectives:
  - Compile mass balance of C, N and P for Utah Lake (external inputs and outputs)
  - Compile all known data on stocks and internal fluxes for C, N and P
    - Specifically for water column and sediment processes
    - Put values on conceptual models
  - Identify major gaps and propose future studies

- Outcomes:
  - C, N and P input and output estimates to Utah Lake
  - Relative roles of water column and sediment in cycling
  - Actively cycling pools
  - Nutrient budget to inform future research

C,N,P WORKPLAN

- Tasks

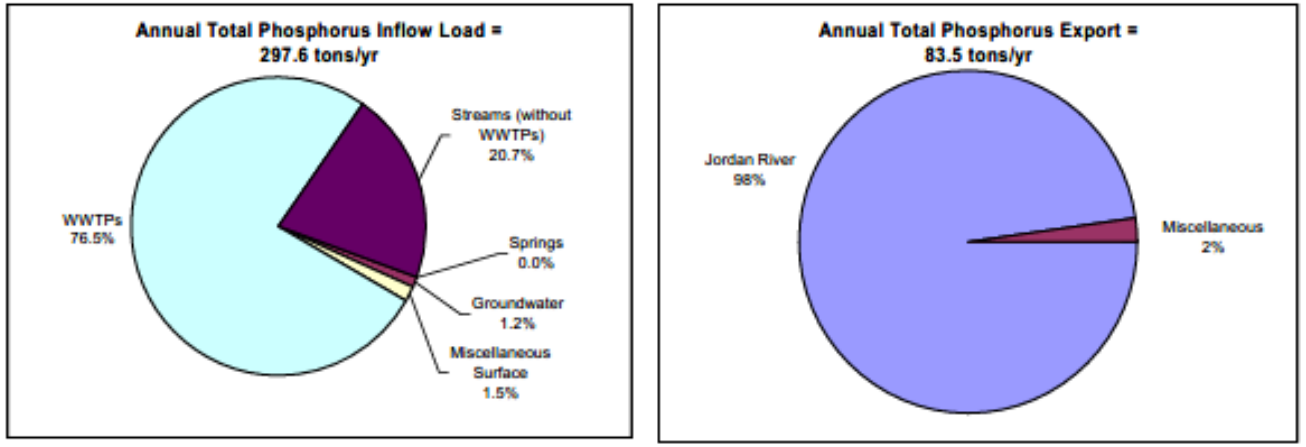


Figure 6: Total Phosphorus Load Summary

Psomas & SWCA 2007

1. Lit review and data compilation
   - Inputs/outputs
   - Water column/sediment stocks and flux data
   - Any data on modifying factors (redox, temperature, binding, etc.)
   - Track metadata: uncertainty (time and space), method, source

2. Generate mass balance models
   - External – from updated input/output data
   - Internal – populate conceptual models
   - SedFlux model – attempt to population and run

C,N,P WORKPLAN

- Tasks

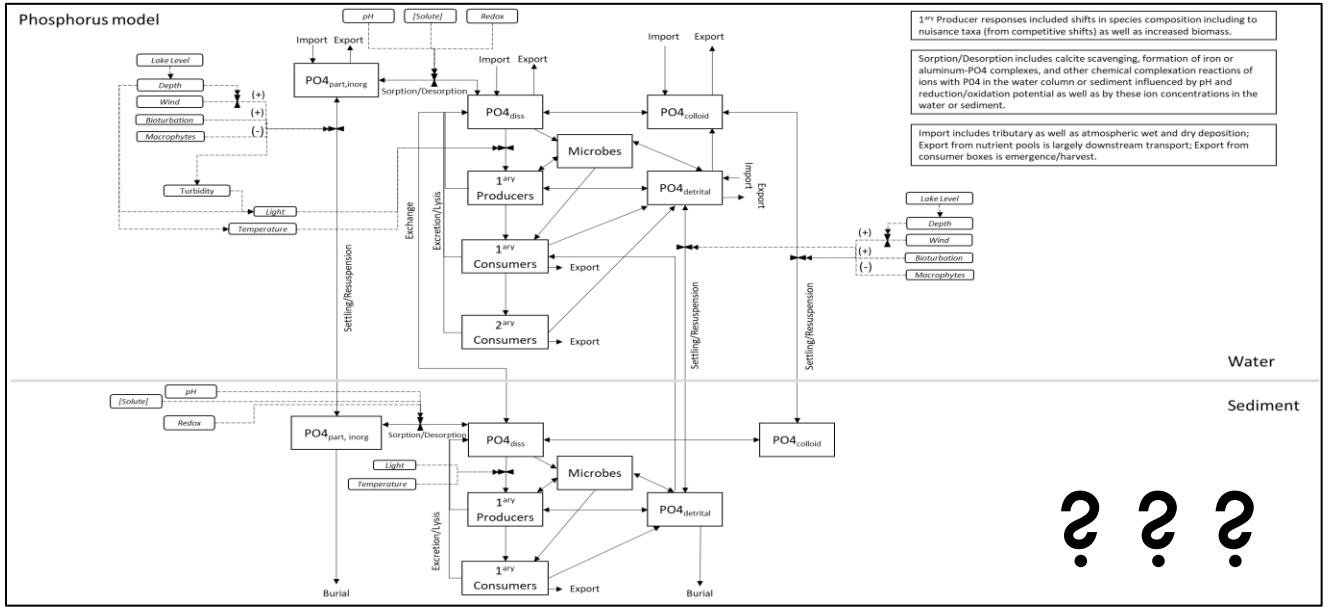
3. Evaluate bioavailability
   - Estimate percent of pools that are actively cycled based on literature

4. Identify Data Gaps
   - Based on synthesis and models

   - Existing, but poorly constrained
   - Reasonably filled with literature
   - Gaps to address through research

5. Recommended future studies

6. Report



Future RFPs

COMMENTS, QUESTIONS?

TECHNICAL FRAMEWORK SUMMARY

Utah Lake Water Quality Study
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UTAH DEPARTMENT of ENVIRONMENTAL QUALITY

GOALS

- Review SC comments on Technical Framework
- Get SP feedback to inform SC discussion

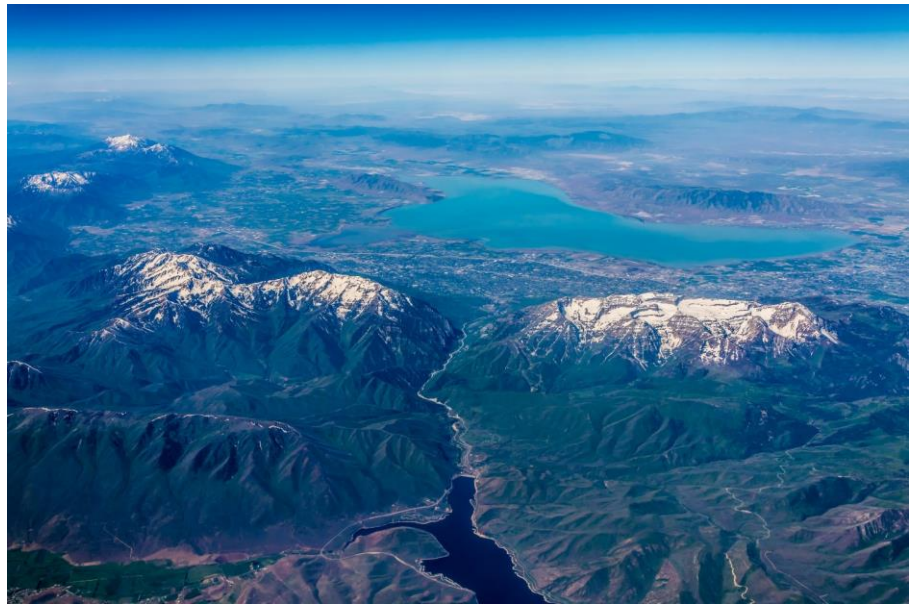
FRAMEWORK

- Process for deriving NNC
  - Multiple Lines
  - Combining Evidence
  - Incorporating Uncertainty
- SP approved, went to SC for review

Utah Lake Water Quality Study—Numeric Nutrient Criteria Technical Framework

DRAFT

February 24, 2020
Version 6.0



PRESENTED TO

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SC COMMENTS

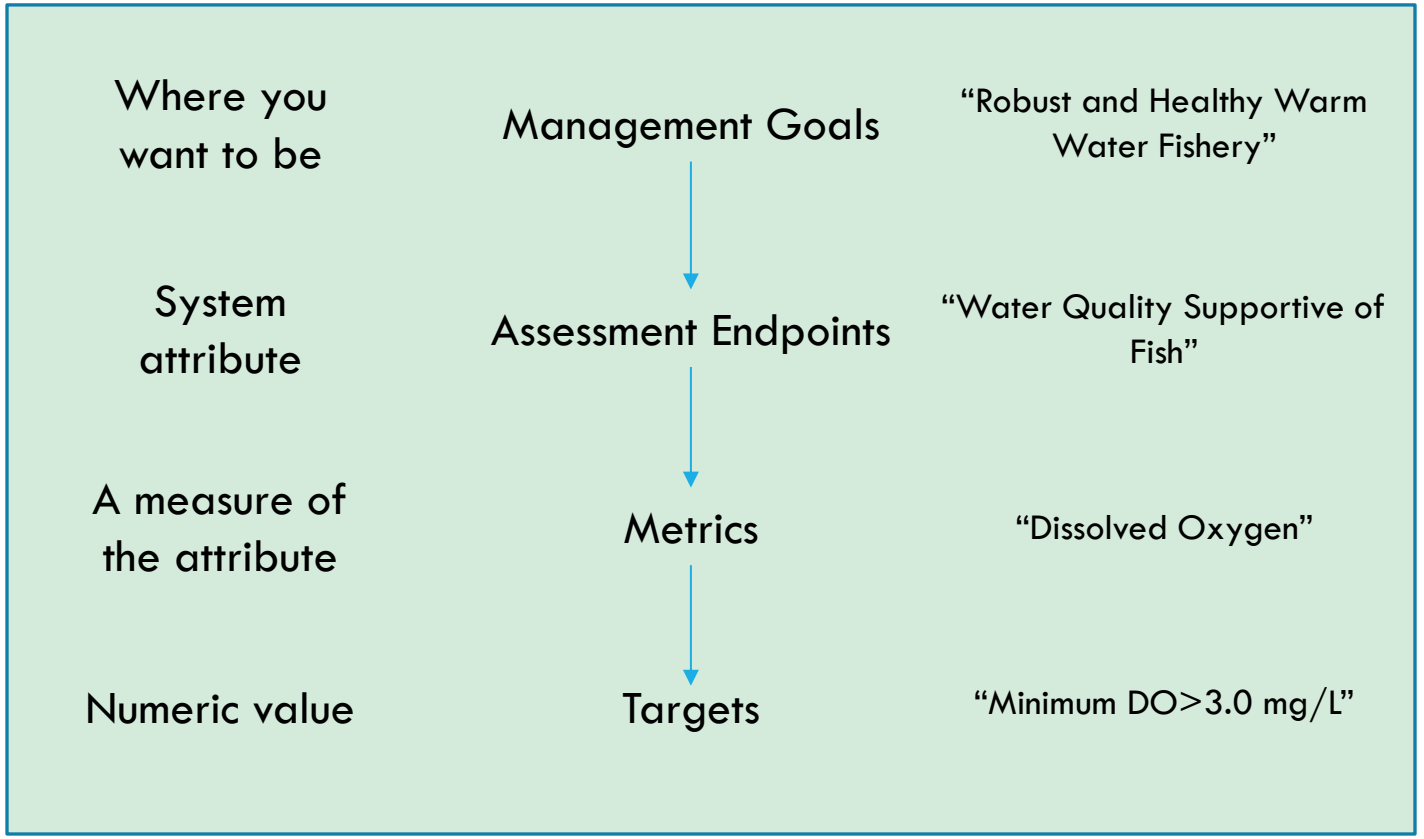
- Editorial comments
  - Grammar, word choice, etc.

- Nothing really on Part 1 – overview and background including uncertainty

- Most on Part 2 – but not on process (lines) or combing (multiple lines); mostly on goals and measures
  - Questions about specific target examples (that distracted from the overall approach)
  - General tone: general vs. specific (some wanted more specifics)
  - Clarification: especially agricultural use
  - Lots and lots on management goals – confusion and clarification

SC COMMENTS: MANAGEMENT GOALS

- Management Goals
  - Ecological Risk Construct
  - Desired condition
  - Value based
  - Certainly include designated uses – but not only
  - Need to decide these FIRST, the rest derives from this



NEXT

Erica will discuss management goal topic in more detail and recap the conversations