

**Utah Lake Water Quality Study
Science Panel Call (Web-meeting) #13
Summary
Thursday, May 28, 2020**

This document includes a list of future meetings, action items, and a brief summary of the discussions. Please review the action item list for tasks assigned to you and/or the Science Panel in general (those are highlighted in yellow). A list of attendees can be found at the end of the document.

Upcoming Meeting/Call	When	Suggested Agenda Items
SC Call #5	June 4	<ul style="list-style-type: none"> ○ Endorse 2 RFPs and hear/discuss SP work updates
SP Call #14 (TBC)	June 16	<ul style="list-style-type: none"> ○ Data Characterization Analysis Plan Report results and discussion, continued discussion of Calcite RFP
ISP Call	TBD (June/July)	<ul style="list-style-type: none"> ○ Rank proposals
SC Call #6	June 30	<ul style="list-style-type: none"> ○ Management goals; approve proposals (if ranking completed)
SP Call #13	TBD (July)	<ul style="list-style-type: none"> ○ TBD

I. Action Items

Meeting Summaries	Who	Due Date	Completed
1. Post background materials and presentations to Dropbox [link]	Facilitation Team	May 29	May 29
2. Share draft call summary	Facilitation Team	June 3	June 3
3. Review and share comments on summary	Science Panel	June 10	
4. Finalize call summary/post to Dropbox	Facilitation Team	June 11	
Draft Calcite RFP	Who	Due Date	Completed
5. Share mineralogy data to inform Calcite Interactions RFP development	Ramesh G., Zach A., Janice B., and Greg C.	June 12	
6. Work with James and Mike to develop pilot-scale mineralogy study	Mike P. and Kateri S.	June 12	

7. Revise Calcite RFP (including the pilot-scale mineralogy study) and share with SP for review/comment	Mike P. and Kateri S.	TBD	
8. Review and share comments on new RFP	Science Panel	TBD	
Strategic Research Plan	Who	Due Date	Completed
9. Review and share comments on draft SRP	Science Panel	June 19	
10. Revise draft SRP and share with SP for review and comment	Mike P. and Kateri S.	TBD	
Management Goals and Charge	Who	Due Date	Completed
11. Share the draft Management Goals Table with the SP	Facilitation Team	May 29	May 29
12. Review draft Management Goals Table and share comments (if possible)	Science Panel	June 10	
13. Provide update on SC discussions/decisions on draft Management Goals Table	SC Co-chairs	TBD	
Atmospheric Deposition			
14. Share approved AD recommendation with SP for reference	Facilitation Team	May 29	May 29
15. Share comment and response document from the Sediments study with Theron	Facilitation Team	May 29	May 29
16. Develop products in response to SP's AD recommendation letter including: 1) a comment/response document; 2) an overarching research plan including revised SAP; and 3) address recommendations provided by Dr. David Gay	Theron Miller	June 19	
Miscellaneous	Who	Due Date	Completed
17. Share SP approved document describing approach to engaging with research with SC (and SP for reference)	Facilitation Team	May 29	May 29

II. Meeting Recording

Recordings of the meeting (also available on the DWQ website in the near future) can be found at the following [link](#) (password: 9M#01dFN).

III. Key Points of Discussion

Welcome and Agenda Review

Dave Epstein, SWCA, welcomed everyone to the web meeting and provided an overview of the meeting agenda and went over the ground rules and best practices for participation in the Zoom call/web-meeting. He then confirmed the Science Panel members, project team members, and other participants listening in to the meeting.

Near-Term Research Projects

Update on Paleolimnology study of Utah Lake. Dr. Janice Brahney, USU and Science Panel member, provided a brief overview discussion of the Paleo study. She explained that the research team recently received some results for the Bird Island sediment core and are waiting for core dating results. Other results including diatoms and pigments are forthcoming. Results for some of the analyses are delayed, up to six months, due to complications related to COVID-19.

Update on Bioassay Study of Utah Lake. Dr. Zach Aanderud, BYU, presented a summary of some results from the May, July, August, and October (all in 2019) bioassay harvests. He summarized results of nutrient limitation in the various portions of the lake and presented cell counts (done by Dr. Sam Rushforth) for various cyanobacteria species in the lake. His team completed the spring harvest in early May and results will be available soon. Dr. Aanderud also discussed the experimental design of a newly implemented nutrient dilution study to examine effects of reducing nutrient concentrations. Dr. Mike Brett, Science Panel member, asked for clarification on the ion concentrations presented for reconstruction of Utah Lake water. Dr. Aanderud clarified the calcium concentrations presented on the slide was misrepresented and the actual concentration is actually 0.07 g/L.

RFP Development

Draft Calcite Interactions RFP. Dr. Kateri Salk-Gundersen, Tetra Tech, provided an overview of the draft Calcite Interactions RFP and discussed important mechanisms for phosphorus/calcium interactions, as well as other important phosphorus removal mechanisms. Dr. Salk also reviewed the seven tasks of the draft RFP, discussed potential overlap of each with an ongoing study by Mark Devey in Dr. Brahney's lab, and proposed that the RFP content and timeline be modified to avoid duplication of effort.

Dr. James Martin, Science Panel member, provided a reference relevant to the discussion: *Reddy, K.R., Kadlec, R.H., Flaig, E., Gale, P.M., 1999. Phosphorus retention in streams and wetlands: a review. Crit. Rev.*

Dr. Salk posed the following question to the Science Panel: recognizing that the Brahney study may inform the Calcite RFP, how should the timeline of the RFP be adjusted?

Dr. Hans Paerl, Science Panel member, asked if the ongoing bioassay study can help inform this study. For the unialgal growth assay, he suggested the RFP should reference the standard methods for this type of work but should also evaluate both N fixing and non-fixing cyanobacteria.

Dr. Martin suggested that the outcomes should support the modeling studies by developing a quantitative predictive relationship between dissolved inorganic P and calcium to be used in developing a lake-specific algorithm. He went on to explain that the results need to also determine the partitioning relationship and whether it is reversible.

Dr. Brett mentioned the potential for a pilot study to determine mineralogy to inform a future, comprehensive calcite Interactions. He explained that a focused study on the mineralogy completed by a geochemist could be extremely helpful.

Dr. Paerl stated that there are a lot of complex questions in this and putting out a broad RFP could be problematic, therefore putting out an RFP that focuses in on what needs to be known first is probably a good idea. During additional discussion several other members supported the idea of a narrowly focused study on mineralogy. There was also agreement that broadening the scope to include a holistic evaluation of all potential P binding mechanisms; however, the RFP should be broken up into pieces with an initial RFP focused on mineralogy.

Dr. Greg Carling, Science Panel member, mentioned that his lab has mineralogy data from SEM for several years and that XRD does not allow for analysis of trace minerals like calcium-P.

The Panel ultimately agreed that Tetra Tech should work with Dr. Brett and Dr. Martin to develop a more focused pilot proposal to help with defining the overall needs. They agreed an additional RFP would likely be developed later, after the pilot was implemented.

Update on SRP development, next steps, and timeline. Dr. Michael Paul, Tetra Tech, provided a brief presentation on recent modifications made to the strategic research plan (SRP) following the Science Panel research prioritization effort that occurred between December and March. He explained that the new version provides additional detail for each priority to include content for the Littoral Sediment, Calcite Interactions, and C, N, and P Budget RFPs as well as the nitrogen fixation and denitrification components included in the BYU Bioassay study. The Panel agreed to review the current draft (Section 4.2 especially) to verify that all priorities have been captured correctly so the SRP can be finalized.

Public Discussion. Dr. David Richards, Oreo Helix Consulting, shared the following (via the chat box): Calcite binding RFP: I do not see any link to mollusks in it. Mollusks are/were instrumental in Ca cycling in Utah Lake, and I would argue THE most important component of Ca cycle. Chironomid larvae also play a critical role in P availability via O₂ (anoxic vs. oxic) levels at sediment interface. Ignore mollusks and midges at our peril. Also, looks like we jumped from supra-awesome chemistry studies to semi-adequate carp effects/study thoughts but completely avoided the critical link in between the two; e.g. Mollusks and Midge. Could someone on the SP explain rationale?

Dr. Brett responded that including mollusk sequestration and sink of P /Calcium into a form that is less available could be very interesting. Dr. Salk noted that the RFP could be expanded to include this. Dr.

Brahney added that she plans to run P chemistry on paleo shells to analyze how much P in shells. Dr. Richards estimated that mollusk shells may be 1 to 2% P.

Science Panel Engagement Regarding Research to Address Initial Charge

Brief overview of document describing Science Panel approach for engaging on research

opportunities. Paul De Morgan, RESOLVE, introduced the recently developed document that summarizes how the Science Panel engages with researchers – including scientists formally engaged through contracts to implement studies and other outside partners undertaking relevant studies in the area – to obtain the information necessary to complete the tasks given to them by the ULWQS Steering Committee. The document also provides a historical accounting of the various AD initiatives and documents exchanges that have occurred since March 2019. Mr. De Morgan asked the SP if they had any reactions to the document and whether they would be comfortable sharing it with the Steering Committee – in particular given that the last section includes a request of the Steering Committee. The Science Panel voted unanimously to share the document with the Steering Committee.

Discuss and seek approval of Science Panel recommendation. Dr. Mitch Hogsett, Science Panel chair, summarized the process for developing comments on the recent WFWQC AD sampling plan and explained that Dr. Theron Miller, WFWQC, provided a response to them on May 27. He then summarized the broader recommendation document, highlighting the three major components.

Dr. Miller generally indicated he understood and agree with the recommendation, but stated there are some limitations to the scope of their work and that they would not be able to incorporate everything requested in the SP recommendation. Dr. Brett stated that the data generated by this project needs to be readily available to the SP. Dr. Miller responded by saying that a spreadsheet will be made available, but not until after the findings were published.

In response to the SP recommendation to predetermine all methods and calculations that will be used for analyzing results and drawing final conclusions, Dr. Miller indicated that he will let the data collected through this study determine which methods are utilized and that he will not develop the methods and calculations in advance of the data.

Mr. De Morgan noted that Dr. Miller was able to review the recommendations prior to the call and asked whether the SP would be comfortable approving the recommendation at this time. After some discussion among the members, and confirmation by Dr. Miller, the SP decided to seek approval of the recommendation. The recommendation was approved with unanimous support from all SP members.

IV. Public Involvement

Dr. Richards provided the following comment (via chat box): Last Friday, May 22, 2020 we had constant winds of >> 50 mph on Utah Lake and visibility was < ½ mile for over 2 hours. Dust and sand were everywhere. The lake was covered in dust. In all likelihood, more AD fell over the entirety of Utah Lake in 2 hours than on Lake Tahoe in a year. Hence, reliance on a regional model is nonsense. These wind/dust events (i.e. ‘haboobs’) are not atypical for Utah Lake. I have talked with a few scientists working on UL and Great Salt lake and the emphasize the regional models don’t work. Please do not start the big U of U model using regional AD data. Thanks.

Dr. Brahney responded saying that there may be confusion on regional deposition and what the estimates are used for. Difference between local (point sources, sources nearby) and regional (includes kaboobs/large scale dust storm) events that use remote locations not to be confused with local sources.

Meeting Participants (Name, Organization)

Members of the Science Panel:

- Janice Brahney, Utah State University
- Mike Brett, University of Washington
- Soren Brothers, Utah State University
- Greg Carling, Brigham Young University
- Mitch Hogsett, Forsgren Associates, Science Panel Chair
- Ryan King, Baylor University
- James Martin, Mississippi State University
- Theron Miller, Wasatch Front Water Quality Council
- Michael Mills, June Sucker Recovery Program
- Hans Paerl, University of North Carolina

Technical Consultant Staff:

- Michael Paul, Tetra Tech
- Kateri Salk-Gundersen, Tetra Tech

Members of the Steering Committee:

- Eric Ellis, Co-Chair, Utah Lake Commission
- Erica Gaddis, Co-Chair, Utah Division of Water Quality

Members of the Public:

- Zach Aanderud, BYU
- Jeff DenBleyker, Jacobs
- Ramesh Goel, U of U
- Renn Lambert, LimnoTech
- David Richards, Oreo Helix Consulting

Utah Division of Water Quality Staff:

- Scott Daly, Utah Lake Project Coordinator
- Jodi Gardberg, Watershed Protection Section Manager

Facilitation Team:

- Paul De Morgan, RESOLVE
- Dave Epstein, SWCA