

**Utah Lake Water Quality Study
Science Panel Call #8
Summary
June 13, 2019**

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 Steering Committee in general. A list of attendees can be found at the end of the document.

Upcoming Meeting/Call	When	Suggested Agenda Items
ULWQS Science Panel (Meeting #5)	<i>Wednesday, July 10, 9:00 a.m. - 5:00 p.m. MST; Thursday, July 11, 9:00 a.m. - 5:00 p.m. MST</i>	○ Final framework discussion, near-term research studies, strategic research plan
ULWQS Science Panel (Call #9)	<i>August/September, TBD</i>	○ Final framework discussion, near-term research studies, strategic research plan
ULWQS Science Panel (Meeting #6)	<i>October 2019</i>	○ TBD

I. Action Items

Meeting Summaries	Who	Due Date	Completed
1. Post meeting materials and presentations to Dropbox [link]	Facilitation Team	June 14	
2. Share initial version of action items	Facilitation Team	June 17	
3. Share draft meeting summary	Facilitation Team	June 20	
4. Review and share comments on summary	Science Panel	June 27	
5. Finalize meeting summary/post to Dropbox	Facilitation Team	July 3	
WFWQC Research	Who	Due Date	Completed
6. Provide input/feedback on WFWQC <i>Proposal to Measure Atmospheric Deposition of Utah Lake</i>	Science Panel	June 28	

7. Share WFWQC 2019 Utah Lake monitoring plan	Theron Miller	July 3	
8. SP to provide input/feedback on WFWQC Utah Lake Monitoring plan	Science Panel	TBD	
University of Utah Model Development	Who	Due Date	Completed
9. Communicate project milestones including model calibration and delivery dates to the Science Panel	U of U Model Team	TBD	
10. Plan model workshop to discuss model calibration and handoff	DWQ/Facilitation Team/U of U	TBD	
Science Panel Technical Support	Who	Due Date	Completed
11. Provide input (additions, omissions, etc.) on the draft Tetra Tech Analysis Plan	Science Panel	June 21	
12. Share a working draft of the Numeric Nutrient Criteria Development Framework	Tetra Tech	July	
13. Share 1-2-page write-up on the various work plan analyses	Tetra Tech	July 3	
14. Critical shear stress estimates; check with Nick Von Stackelberg to see what he is using, investigate critical shear stress for macrophyte species present in Utah Lake	Tetra Tech	TBD	
15. Follow up with Soren Brothers on analyses of sonde data	Tetra Tech	TBD	
Near-Term Research RFP/Work Plans	Who	Due Date	Completed
16. Conference call to discuss the sediments RFP	Independent Science Panel	June 13	June 13
17. Provide update on sediments RFP	DWQ	ASAP	June 19
18. Provide comments on Bioassay and Paleo Work Plans	Science Panel	June 17	
DWQ Data Collection	Who	Due Date	Completed
19. Share comments on DWQ sampling plan	Science Panel	ongoing	

Science Panel July Meeting	Who	Due Date	Completed
20. Develop draft agenda for July 10-11 Science Panel Meeting	Facilitation Team, Tetra Tech, DWQ	June 28	

II. Meeting Recording

A recording of the meeting (also available on the DWQ website in the near future) can be found at the following link: <http://resolv.adobeconnect.com/pbg8x0i2vr2/>. Please use the video scroll bar along the bottom of the recording window to find the appropriate time in the webinar recording for the session you would like to watch. There are bookmarks in the 'Events Index' on the left side of the screen identifying each session.

III. Key Points of Discussion

Welcome and Agenda Review

Dave Epstein, SWCA, welcomed everyone to the meeting and asked the group to introduce themselves (see participant list below). Mr. Epstein went over the list of individuals participating via teleconference, and reviewed the agenda items, materials, and meeting ground rules.

Follow-up on Action Items from Call #7

- Atmospheric deposition white paper

Mitch Hogsett provided an overview of the outline of the atmospheric deposition whitepaper which is due June 30th. Mr. Hogsett explained that DWQ is developing a contract with Dr. Janice Brahney to provide financial support to complete the white paper.

- Science Panel input/feedback on WFWQC atmospheric deposition study

Mr. Hogsett provided update on the comments to Dr. Theron Miller's work plan for which the Science Panel review is ongoing. Mr. Hogsett will compile member comments into a formal Science Panel response and share with Dr. Miller.

- U of U model calibration timeline

Mr. Hogsett gave update on the final product for the model. He explained that the U of U expects to complete the model calibration by mid-summer., although progress is dependent upon the EPA's ability to fix the EFDC code to address excessive model run time that results from how the model processes wetting and drying shallow lake areas.

- Science Panel input on DWQ 2019 Sampling Plan

Dave Epstein reminded the group that the Division of Water Quality has already shared their Utah Lake Sampling Plan with the Science Panel and requested comments. Mr. Epstein explained that

sampling activities have commenced for the season and UDWQ will take comments on the plan at any time.

Utah Lake Near-term Research RFPs

- Review RFP proposals and evaluation process and results

Co-chair Erica Gaddis provided a summary of the three near-term research RFPs. Ms. Gaddis explained that the Paleo and Bioassay proposals were approved by the evaluation committee, which consisted of independent members of the Science Panel (ISP) and Scott Daly. She continued to explain that the evaluation committee still had questions for the principal investigators on the Sediment Studies and that the ISP will discuss the path forward after this meeting. DWQ will go to the Water Quality Board (WQB) on June 26th to authorize grant funds directly to researchers. Draft work plans for the three studies need to be complete by June 19th to go to WQB for approval on June 26.

- Review project work plans and any remaining Science Panel comments

Mitch Hogsett provided an overview of the near-term research project work plans (bioassay and paleo studies) for SP comment. Specific to the paleo study, Greg Carling recommended freezing cores for better preservation. Janice Brahney replied that some of the cores were collected by freeze cores but not as deep. Mike Paul, Tetra Tech, wanted to clarify whether the site selection was comprehensive and asked whether additional cores were warranted in other areas (west side). Mr. Hogsett suggested that we maybe collect additional core depending on initial results. Mike Brett concurred, especially given most of the water quality problems occur in other parts of the lake. Theron Miller suggested that prevailing winds may have a strong effect on moving blooms to other areas of the lake and should add a site there. Mr. Epstein asked for a poll of the Science Panel on whether to add additional sites for core collection for later analysis. Janice Brahney discussed time constraints of collecting additional cores which would interfere with their timeline and deliverables of analysis. SP members decided to add it to the scope for funding and to wait to determine whether the additional core will be collected later.

Specific to the bioassay work plan, Theron Miller commented that temperature may be a factor in the common garden experiment design since the marina will be warmer. Despite this, the marina was arrived at for practical and safety reasons. SP members urged to submit written comments by June 17.

- Timeline and next steps

Co-chair Erica Gaddis explained that DWQ would be submitting a packet to the Water Quality Board on June 19 for their consideration at their June 26 meeting. An action item was identified for members of the Science Panel to submit comments on the work plans by June 17.

Progress Report on Tetra Tech Work Elements

Mike Paul provided an update on the work plan elements that Tetra Tech is working on, and specifically the progress that has been made since the last Science Panel meeting.

- Criteria framework

Mr. Paul gave an overview of the framework for developing water quality criteria and how it relates to the conceptual model, identification of data gaps, and strategic research plan. Tetra Tech will plan on sharing a draft version of the framework in July.

- Conceptual models:

The various conceptual models developed by Tetra Tech were sent to the SP for review and comment. Mr. Paul suggested that Tetra Tech hopes to finalize them as soon as SP comments are received. He gave overview of the simplified model (unchanged). Mike Brett suggested adding calcite to the model. Causal model was presented unchanged from last version. Phosphorus and Nitrogen models were shown with additions made since last version. Mike Brett reiterated that calcite has to be explicitly included in the P model. Mike presented the new Ecosystem Model and gave brief overview of the pathways. Still collecting SP comments and will write corresponding narrative that describes them.

- Data characterization and analysis plan:

Mike Paul presented a summary of the existing datasets for Utah Lake. Tetra Tech staff is working on a draft analysis plan and request SP feedback. Mr. Paul reviewed 8 areas of data analysis related to charge questions.

Mr. Paul explained that carp excretion estimates based on carp density and excretion rates from different sources nationally. He presented initial carp excretion rate ranges and changes with target removal. He will integrate changes depending on SP review and adjust estimates once assumptions are reviewed. Mr. Paul will provide a summary of the analytical procedures for SP to review.

Mr. Paul gave overview of algae cell count to pigment relationship and presented regression plots. He will also provide summary of analysis procedures. Mike Brett commented that one would not expect to see a good correlation between cell count and pigment (perhaps cell volume and pigment since volume can vary considerably).

Mr. Paul discussed the sonde data analysis but would like more guidance on what the interest is in looking at these data. He suggested that Soren Brothers may have more input on this topic as he has expressed interested in the dataset in the past. Mitch Hogsett weighed in that it is likely included to look and high frequency statistics and metabolism estimates.

Mr. Paul explained that Tetra Tech is not intending to replicate what is in the Utah Lake Data Explorer tool related to temporal and spatial plankton patterns but will develop non-metric multidimensional scaling models and environmental overlays. He presented initial spatial and temporal analysis of assemblages and some paired chemistry data.

Mr. Paul explained that no progress has been made on the topic of diatom and macrophyte autoecology.

Wind and Turbidity: Mr. Paul explained that using wind speed and sediment characteristics, Tetra Tech will estimate sheer stress and re-suspension. They still need information on the median particle size and sediment density for the lake and better equations for estimating critical sheer in lake sediments. James

Martin recommended seeing what Nick Von Stackelberg (DWQ) used in the model for sheer stress as well as sheer stress for macrophytes. Eric Ellis recommended examining sheer stress of macrophytes along shoreline. Mr. Paul responded that wasn't part of the original charge but could integrate it if needed.

Turbidity and Macrophytes: Soren, Eric, and Janice provided some literature on the effects of macrophytes on reducing turbidity and will be reviewing in determining an approach and Tetra Tech will review them in evaluating this subject. Mr. Paul explained that more work will be done on this subject once a better understanding of wind and turbidity has been generated.

Light Extinction: No progress on this task but Mr. Paul stated that Tetra Tech has reviewed some of the approaches. He provided some detail on the types of analyses Tetra Tech would like to explore related to the availability of light in and throughout the water column in Utah Lake. Mike Paul reiterated that he will document procedures for SP review (1-2 pages on each subject) and will provide more detail in July.

- Uncertainty analysis:

Mike Paul gave overview on the draft uncertainty analysis document which is under review. Mr. Paul stated that they are mostly guiding principles at this point and that Tetra Tech will make references available in Drop Box.

Planning for the July 10 and 11, 2019 Science Panel Meeting

- Overview of potential agenda items and request Science Panel input

Dave Epstein discussed planning of July 10-11, 2019 Science Panel and potential presentations from Dr. Ramesh Goel, Dr. LaVere Merritt, and Dr. Jereme Gaeta. Mike Brett discussed getting an update on POTW upgrade costs from DWQ cost study. Erica Gaddis offered to give an overview of DWQs cost estimates for various treatment levels and could have some of the POTW managers present to discuss. Dave polled the group on this presentation and SP approved. Erica discussed whether the Panel would like to have a discussion on the timeline and high-level charge of best attainable state in response to some Steering Committee comments. Dave discussed the potential of having a Steering Committee Q&A, a discussion on the future research plan elements, update from WFWQC, update on DWQ progress on developing model SOW, and an update on U of U model progress. SP members agreed that the proposed items look good and that the Facilitation Team should develop a draft agenda for Science Panel review.

Public Involvement

David Richards – Had a question regarding why the cyano HAB on the west side of the lake 2 weeks ago and not the east side where most nutrient inputs occur. He also questioned the wind dominant wind direction presented by Tetra Tech asserting that most of the wind comes from the SW or NW in winter.

Zach Anderuud – Offered to take any questions on their work (bioassay study) since he was on the call.

Wrap Up

Dave Epstein reviewed the action items discussed during the call, which are included in Section I: Action Items (above). He stated that DWQ and the Facilitation Team will be working on a draft agenda and other preparations for the July 10-11 Science Panel meeting in Salt Lake City.

IV. Meeting Participants (Name, Organization)

Members of the Science Panel:

- Janice Brahney, Utah State University
- Mike Brett, University of Washington
- Mitch Hogsett, Forsgren Associates, Science Panel Chair
- James Martin, Mississippi State University
- Theron Miller, Wasatch Front Water Quality Council
- Greg Carling, BYU

Technical Consultant Staff:

- Michael Paul, Tetra Tech
- Andrea Plevan, Tetra Tech
- Jen Stamp, Tetra Tech

Members of the Public:

- Zach Aanderud, BYU
- Michelle Baker, USU
- Eric Ellis, Co-Chair, Utah Lake Water Quality Study
- Renn Lambert, Limnotech
- G. Lawson
- LaVere Merritt
- David Richards, Oreo Helix

Utah Division of Water Quality Staff Present:

- Erica Gaddis, Co-Chair, Utah Lake Water Quality Study
- James Harris, Assistant Director

Facilitation Team:

- Dave Epstein, SWCA