

**Utah Lake Water Quality Study
Science Panel Meeting #11
Summary
March 3, 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 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 #7)	March 19-20, 2020	<ul style="list-style-type: none"> ○ Develop draft summer 2020 RFPs from prioritized research ideas; discuss model development; update on near-term research projects; initiate SP Charge progress report
ULWQS Science Panel (Call #12)	2-hr. call between March 30 and April 3 (Tentative – dependent on when meeting scheduled)	<ul style="list-style-type: none"> ○ Seek SP approval of RFPs

I. Action Items

Progress on action items for this call (and prior events) can be reviewed using the following Smartsheet tool: <https://app.smartsheet.com/sheets/6pcjmP76Vfp8vwpmWV9P9r5JWrwXJ66648v5CF51>

Meeting Summaries	Who	Due Date	Completed
1. Post background materials and presentations to Dropbox [link]	Facilitation Team	March 6	
2. Share draft meeting summary	Facilitation Team	March 6	March 6
3. Review and share comments on summary	Science Panel	March 13	
4. Finalize meeting summary/post to Dropbox	Facilitation Team	March 16	
Science Panel Technical Support	Who	Due Date	Completed
5. Provide opportunity for Mike Brett, Soren Brothers, and Theron Miller to share thoughts on/approval of Uncertainty and Framework documents [NOTE: products already approved based on call results]	Facilitation Team	March 6	March 6

6. Develop synthesis memo summarizing SRP one-on-one conversations and distribute to Science Panel	Michael Paul	March 6	
7. Review memo summarizing SRP one-on-one conversations	Science Panel	March 13	
Atmospheric Deposition	Who	Due Date	Completed
8. Share updated atmospheric deposition sampling proposal	WFWQC/Theron Miller	TBD	
9. Review and provide comments on WFWQC atmospheric deposition sampling proposal to Mitch Hogsett	Science Panel	TBD	
10. Compile comments and share with SP in advance of SP meeting (if proposal shared in time)	Mitch Hogsett	TBD	
Near-term Research Projects	Who	Due Date	Completed
11. Distribute Sediment Equilibrium draft final report and Bioassay interim report for Science Panel review	Facilitation Team	March 3	March 3
12. Review and provide comments on Sediment Equilibrium and Bioassay reports to Mitch Hogsett	Science Panel	March 13	
13. Compile comments and share with SP in advance of SP meeting	Mitch Hogsett	March 18	

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: <https://utdeg.adobeconnect.com/pm6r474a14ya/>. 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 call and listed the Science Panel members, project team members, and other participants listening in on the call. Mr. Epstein also provided an overview of the meeting agenda.

Uncertainty Guidance

Mike Paul, Tetra Tech, reviewed the purpose of the Uncertainty document for characterizing certainty for products developed by the Science Panel throughout the ULWQS. Dr. Paul also reviewed the edits made to the document following the last round of Science Panel review. These edits included adding a discussion to capture the approach for characterizing mechanistic modeling uncertainty, model team commitments, and how the Facilitation team will manage conversations related to uncertainty throughout the process.

Science Panel member Dr. James Martin asked how and when the Uncertainty document will be implemented. Dr. Paul stated that the approach described in the document will be implemented right away and that the Science Panel will make a determination of uncertainty for all Science Panel products including answers provided for the charge questions, results from the mechanistic models, and the lines of evidence described in the NNC Framework Document. Dr. Paul stated that he will work on drafting a 1-page document providing a guide for how to apply the approach to implementing the approach to answer the charge questions.

Mr. Epstein then asked if members support approval of the document and all members in attendance expressed their approval. He stated that the Facilitation Team will follow up with absent Science Panel members to seek their approval of the document after the call.

Numeric Nutrient Criteria Framework

Dr. Paul provided an overview of the general purpose of the ULWQS Numeric Nutrient Criteria (NNC) Framework Technical Approach document and described edits made in response to recent Science Panel and DWQ comments. Several edits were made to the document including the addition of language to describe the DWQ regulatory processes, how management goals are discussed in the document, additional description of the on stressor-response modeling, language to describe how multiple lines of evidence approach is protective of designated beneficial uses, and a clarification of to apply the stringency rule. Dr. Paul explained that criteria must have a magnitude, frequency, and duration to be implementable.

Mr. Epstein asked Dr. Paul to review the timeline of previous drafts, Science Panel review, and substantive edits made to previous versions. He then asked for reactions, questions, or comments from the Science Panel. Hearing none, he asked Science Panel members if they support approval of the current draft document. All members in attendance approved finalizing the document. Mr. Epstein stated that the Facilitation Team will follow up with absent members to seek their approval of the document.

Strategic Research Plan

Michael Paul introduced the discussion by indicating the goal of the conversation today is to set the stage for the March 19th and 20th Science Panel meeting where members will spend considerable time discussing research approaches and developing associated requests for proposals (RFPs). Dr. Paul reviewed the process from the last several months to develop a prioritized list of research questions to answer the Initial Charge and inform the NNC Framework approach document.

Dr. Paul summarized the conversations from the calls he and Scott Daly had individually with each of the Science Panelists during the last half of February 2020. Several major themes were discussed by members, including:

1. Questions 1 through 4 are related to one another and should be considered together;
2. There is a need to comprehensive accounting and interpretation of all existing data and information before doing additional research;
3. The application of intermediate models like PHREEQ and SEDFLUX to predict water column conditions are a good initial step before conducting additional field research;
4. What are nutrient standing stocks, fluxes, and can we predict recovery time?
5. What are the mechanisms of nutrients entering the water column from the sediments?
6. What is the bioavailability calcite bound phosphorus?
7. What nutrients are coming out of the sediments as they wet and dry and do the sediments act as a sink or source of nutrients?
8. What is the role of carbon in nutrient cycling, specifically the nitrogen cycle?

Science Panel member Dr. Hans Paerl asked if N and P fluxes can be measured together in mesocosms and suggested that simultaneous measurements of both nutrient fluxes would be important. He also suggested that the role of fish in the carbon cycle should be evaluated. Science Panel Chair Dr. Mitch Hogsett agreed that simultaneous N and P measurement is important.

Mesocosms were suggested as a method to further investigate lake nutrient cycling, macrophytes, carp, and lake level and see how they compare to laboratory experimental results.

Considering the results of the one-on-one phone discussions, Dr. Paul offered some thoughts on how to transition from general research questions to specific project ideas:

1. The Science Panel could propose a project to compile all data and information and develop supplemental models (e.g. SEDFLUX) , and to identify specific data gaps;
2. Develop a nitrogen budget study to investigate standing stocks, rates, and fluxes;
3. Develop a calcite binding study to investigate rates and forms; and
4. Identify potential for mesocosm to look at N and P budgets, pH manipulations, and others.

Mr. Epstein asked for questions and additional discussion. Seeing none, he asked to revisit the prioritization list and seek formal approval for presentation to the Steering Committee. All members present approved the priority research questions ranking and Mr. Epstein indicated the Facilitation Team would follow up with absent members to seek their approval of the document.

Atmospheric Deposition of Nutrients to Utah Lake

Dr. Hogsett reviewed the ongoing effort to incorporate external review comments into the Wasatch Front Water Quality Council (WFWQC) atmospheric deposition sampling and analysis plan. Dr. Hogsett mentioned that Theron Miller had indicated he intends to finalize the draft monitoring plan by the end of this week (March 6, 2020).

Additionally, Dr. Hogsett explained that the WFWQC is planning on installing 2 additional NADP samplers; one in Farmington Bay (not near Utah Lake) and another adjacent to the Utah Lake shoreline. Mr. Epstein reviewed the timeline of events related to the development of the WFWQC sampling plan and reminded the group that sharing an updated version of the draft plan with the Science Panel was an action item coming out of the January 23 Science Panel call (SP Call #10). He indicated Dr. Miller had anticipated completing the updates in mid-February so the panelists could review it prior to the upcoming meeting but that was not possible; he indicated the hope was still that if the document was shared in time that some discussion would occur during the meeting, and if not, the schedule would have to be revised further.

Near-term Research Project Updates

Mitch Hogsett reviewed the current status of the Sediment Equilibrium report. He explained that Dr. Goel and Dr. Carling completed the draft final report and the report will be distributed to the Science Panel for review following this call. Dr. Hogsett also provided an overview of the status for the interim Bioassay report, which would also be distributed to the Science Panel following the call. The panelists were asked to review these documents prior to the meeting (by March 13) so their comments could be discussed with the researchers at the upcoming meeting.

IV. Public Comment

Juhn-Yuan Su, University of Utah: What are the primary goals for conducting separate atmospheric deposition studies among the ones conducted by Dr. Brahney vs. those by Dr. Miller?

Jeff DenBleyker, Jacobs: TSSD is working to secure additional funding partners, study plan is forthcoming within the next couple of weeks.

Dan Potts, Salt Lake County Fish and Game Association: Mr. Potts provided support for the uncertainty guidance document and thinks the process is huge. Carp cycling of nutrients is a very important topic to consider. For the research priorities it makes sense to combine lake level, macrophytes, and biogeochemistry items. Need to make sure that we are considering the effect on wind and turbidity and the role it has on nutrient cycling. Wind is a far greater driver on turbidity and nutrients than carp.

Juhn-Yuan Su, University of Utah: Thanks. Please let me know once an agenda for the next Science Panel meeting is up, particularly with the model calibration efforts discussion. I will only be available on the 3/20 (Friday) for that.

V. Participation

Meeting Participants (Name, Organization)

Members of the Science Panel:

- Janice Brahney, Utah State University
- Greg Carling, Brigham Young University
- Mitch Hogsett, Forsgren Associates, Science Panel Chair
- Ryan King, Baylor University
- James Martin, Mississippi State University
- Michael Mills, June Sucker Recovery Program
- Hans Paerl, University of North Carolina

Technical Consultant Staff:

- Michael Paul, Tetra Tech

Members of the Steering Committee:

- Eric Ellis, Co-Chair, Utah Lake Commission

Members of the Public:

- Jeff DenBleyker, Jacobs
- Renn Lambert, LimnoTech
- LaVere Merritt, Brigham Young University
- Dan Potts, member of the public
- Juhn-Yuan Su, University of Utah

Utah Division of Water Quality Staff:

- Scott Daly, Utah Lake Project Coordinator
- Jodi Gardberg, Watershed Protection Section Manager
- David O'Bryant, Watershed Protection Section Intern

Facilitation Team:

- Dave Epstein, SWCA