

WILLARD SPUR SCIENCE PANEL MEETING

This Science Panel meeting was held over a period of two days on January 28-29, 2013 at the UDEQ building at 195 North 1950 West, Salt Lake City, Utah. The following represents a summary of discussion on the second day, January 29. It is not intended to represent meeting minutes. An audio recording of the meetings may be found at <http://www.willardspur.utah.gov/panel/meetings.htm>.

JANUARY 29, 2013

NAME/AFFILIATION

Jim Hagy*	U.S. EPA, Office of Research & Development
John Luft*	Utah Division of Wildlife Resources
Theron Miller*	Farmington Bay/Jordan River Water Quality Council
Jeff Ostermiller*	Utah Division of Water Quality
Suzan Tahir	Utah Division of Water Quality
Toby Hooker	Utah Division of Water Quality
Bill Johnson	University of Utah
Ramesh Goel	University of Utah
Mitch Hogsett	University of Utah
Joel Pierson	University of Utah
Heidi Hoven	Institute for Watershed Sciences
Sarah Jane Rushforth	Rushforth Phycology
David Richards**	EcoAnalysts ,Inc.
Jeff DenBleyker	CH2M HILL

* Indicates Science Panel member

** Attended by telephone

INTRODUCTION

Meeting attendees were introduced and Jeff DenBleyker reviewed the meeting's agenda for the day. The objective for the day was to review and discuss recommendations for further work from the investigators and make final recommendations for work to be completed in 2013. Discussion moved immediately into a review of the previous day's discussion.

REVIEW OF FIRST DAY'S DISCUSSION

See presentation slides at: <http://www.willardspur.utah.gov/documents/SP01-2829-13/PresentationsSummary.pdf>

Jeff DenBleyker provided an overview of key points and observations made by the investigators during the previous day. The review focused primarily upon the last slide of the presentation found at the link above (the link is to a presentation that summarized the work for the Steering Committee but included the points discussed by the Science Panel). The last slide illustrates how the observations made by all of the different investigators integrate together and tell a good story of how nutrients were cycled and the responses observed in Willard Spur during 2012.

Key comments from the Science Panel included:

1. Add organic nutrient curves to the figure; source of increase could be decomposition of vegetation and birds
2. Add chlorophyll-a curves to the figure, perhaps also water depth and DO
3. The Science Panel agreed that everything seems to fit together very well, key will be understanding what caused the early senescence of SAV in 2012. The SAV appear to crash, release nutrients, see a response in nutrient concentrations in the water and increase in phytoplankton.
4. Should look at leaf pack experiments to look at decomposition factors, will need lots of replication, look at macroinvertebrates vs microbes, compare leaf packs in contact and not in contact with sediment
5. How are nutrients being recycled from decomposing vegetation? There is very little nutrient stored in sediments.

6. Should measure $\delta^{15}\text{N}$ isotopes in test plots and also outside the test plots in a separate control

RECOMMENDATIONS FOR NUTRIENT CYCLING STUDY – 2013

There was an open discussion of the recommendations the investigating team made the previous day. Following are key questions and comments that were made:

1. If we appear to generally see the water column/phytoplankton respond to nutrients released by senescing SAV, how does that intersect with results that SAV appear to get most of their nutrients from sediment?
2. Heidi Hoven stated that their goal will be to identify the trigger mechanisms and responses for early SAV senescence, thus they could possibly complete two sampling events in April, weekly in May and June, and continuing until they see SAV decline
3. We saw a response to nutrients in sediment, thus we can monitor long term changes in sediment nutrients. A pooling condition is ideal for a sediment sources as the plants do not have incoming nutrients in the water column. The controlling condition could be a water column change, thus perhaps we should focus upon water column amendments. Using bulk chemistry and isotopic chemistry we can see what changes in sediment due to water amendments. It was decided that the experiments in 2013 would focus upon only water amendments. No amendments will be made to the sediment.
4. Need to more comprehensively compare data from the 2012 test plots with DWQ's 2012 monitoring data
5. All agreed that the nutrient cycle study would complete two sampling events in April, four in May, and two in June with the assumption that SAV will decline in June.
6. DWQ will look at limnocorrals to look at chemical processes in water column, these do not address macrophyte response times
7. Study design: focus upon water, will have three water treatments plus a control (high and medium concentrations will be the same used in 2012 with the addition of a new lower concentration), use bag of fertilizer on a stick vs ropes (place 4" off bottom), minimize surface ropes, use bird barriers, didn't previously see much response in tuber/drupelets thus do it only monthly, add CNP and isotope (epiphytes, plants and seston) analyses, look at branch density, drop macroinvertebrates, no chlorophyll-a and periphyton work
8. Look at 3-4 2012 DWQ diatom sites and a high treatment and control site, compare with 2011 results, Sarah Rushforth to provide DWQ with cost to do this
9. Discussed chamber experiment at length. Discussed precision of analyses; need to define precision of results. The experiments in 2013 will be completed over 24 hour period, will add DO and pH probes to chambers, will look at background/ambient and two spikes (0.1 and 1.0), will not include SAV in chambers (and will confirm as part of SOP). It was agreed that the experiments would not be done on the test plots but in other locations. Will measure net daily metabolism in the field vs lab, measure DIC. Discussed three options, UofU will provide costs but assume that Option 1 will be completed; the remaining options can be added at a later time.
 - a. Option 1: complete in June in one location
 - b. Option 2: complete in June and August in one location
 - c. Option 3: complete in June and August along a transect to investigate spatial variability

RECOMMENDATIONS FOR FOOD WEB EXPERIMENTS

There was an open discussion of the recommendations the investigating team made the previous day. Following are key questions and comments that were made:

1. Larry Gray had noted that the typical overwintering population of macroinvertebrates may have been lost in fall 2012. It was agreed that DWQ should continue macroinvertebrate sampling in 2013 to track recover of macroinvertebrates. Perhaps this is why we saw such smaller numbers of macroinvertebrates in 2011. Larry should add documentation of his isotope and life cycle work to his report.
2. Does filamentous algae replace SAV as habitat structure for macroinvertebrates? Perhaps DWQ can better document type of algae when monitoring sites.
3. It was agreed that no further work was needed to investigate fish use in Willard Spur. It was agreed that it is a warm water fishery and beneficial use classification should be changed. Perhaps look at DO and pH requirements?
4. Willard Spur and Farmington Bay are not dissimilar, should look at nutrients in the sediments of phragmites stands in different locations, also look at CNP in leaves

5. It was agreed that DWQ would reduce the total number of monitoring sites in the open water of Willard Spur, capture nearshore sites at inputs and a few open water sites
6. Should develop the nutrient budget. Look at evaporation rates, denitrification rates, sample organic matter flowing out of Willard Spur, close the nutrient budget with burial of nutrients.
7. There were concerns about the pelagic nutrient limitation experiment in that it does not include the sediment microbial component. The bags used only capture phytoplankton. DWQ will look at similar experiments to look at the microbial component.
8. Where are the nitrogen fixers? We would expect them in freshwater wetlands. Is something else limiting growth of algae?
9. Hydrology for 2013 would be nice but not high priority, we have a pretty good understanding of how nutrient loads can vary

NEXT STEPS

Action items include:

1. The Science Panel will provide written comments on draft reports submitted in preparation for this meeting within two weeks.
2. The nutrient cycling study team will develop their workplan for 2013 reflecting discussion at this meeting. The goal is to get it to the Science Panel, allow a minimum of two weeks for their review, and obtain approvals from the Science Panel to proceed no later than the end of March. This work is already under contract.
3. Additional workplans for monitoring and experiments will be developed and submitted to the Science Panel for review by mid- March. This will allow for review, approval and development of contracts if needed.

Schedule:

- Next Science Panel meeting will be a conference call the last week of March to discuss any workplan review comments.
- DWQ and CH2M HILL will develop workplans for submittal to the Science Panel by mid-March. This will include a budget request for the Science Panel and Steering Committee to consider.