Minutes of the MRP NE-1938 Participants Meeting

ASA-CSSA-SSSA Annual Meetings

10 November 2019

San Antonio, TX

1. In attendance

Mark Stolt (chair), Patrick Drohan, John Galbraith, David Lindbo, Colby Moorberg, Marty Rabenhorst, Mickey Spokas, Jim Thompson, Judy Turk, Bruce Vasilas, Karen Vaughan, Jon Wraith.
2. Background
	1. NE-1938 is the fourth iteration of this hydropedology-oriented multistate research project. The focus of this project is to determine C stocks across depressional wetlands having a range of temperatures. In concert with accounting the C stored in these systems, we will measure inputs of C through litter and dead fall, rates of decomposition of these C sources, and the fluxes of C via carbon dioxide (CO2) and methane (CH4) that occur in these soils. We will make these measures in, or adjacent to, each of the two zones of these wetlands (seasonally inundated, seasonally saturated), and the adjacent uplands. Our working hypothesis is that since the multistate sites will have similar hydrologic conditions, relationships between soil temperature and soil C additions, decomposition, and losses can be identified. These relationships can be used to understand the effect of increasing temperatures on C stocks and fluxes in wetlands over the next century.
3. General discussion
	1. Temperature sensors
		1. There are some concerns regarding the temperature data loggers, particularly regarding accessibility of the loggers a depth of 50 cm. Alternatives to buried sensors were discussed. A new device from Campbell Scientific was suggested, as well as products from Edaphic Scientific.
		2. Of importance is appropriate housing for temperature data loggers that are not waterproof.
		3. The data from the soil temperature sensors should be compared to temperature measurements from the water level data loggers in the wells.
	2. IRIS films
		1. Is it necessary to always begin with a new pilot hole for the IRIS films, or can a new film be inserted into the hole from a previously deployed IRIS film? Anna Schwyter, a graduate student working with Karen Vaughan at the University of Wyoming, is testing this at a study site in Wyoming.
4. Study sites
	1. Mark Stolt is considering selecting a new study site for this project; all other participants in the previous multistate project will maintain existing sites.
	2. New participant sites
		1. Judy Turk (University of Nebraska) has identified a study site in a playa in a relict channel fo the Platte River. The parent materials at the site are loess over alluvium.
		2. Colby Moorberg (Kansas State University) is working with the NRCS to identify possible study sites, with a goal of finding a playa with previous monitoring data.
	3. The expectation for study sites is that they include three distinct zones: (i) ponded, (ii) saturated but not ponded, and (iii) upland/dry.
5. Data collection
	1. Each participant should compile basic information on their site, including:
		1. Geographic coordinates
		2. Watershed size
		3. Topography
		4. General climate description
		5. Ecological site information
	2. For existing sites, there is a need to review the data compiled during the previous project. Some of these data are on the Google Drive folder for the project. However, the water table and temperature data are not continuous.
		1. Many people are collecting multiple observations per day. Should a single daily measurement be selected to represent each day, or should all measurement be averaged?
	3. Climate data needs to be compiled for each site, including daily precipitation (total) and daily temperature (minimum and maximum). Everyone needs to identify weather stations where data can be acquired.
	4. Those who have collected vegetation data for each of the three zones at their sites should enter that information into the appropriate Google Drive spreadsheet.
		1. Bruce has established that we will follow USACE vegetation survey protocols.
		2. Post your data here: <https://docs.google.com/spreadsheets/d/1DBz-ALgiwml0nir02Uzqh_CrEbuqSDydlba1rk4QXnc/edit?usp=sharing>
		3. Add detailed vegetation data here: <https://drive.google.com/open?id=1m-oyxadPn29SUc-Dwy-fjQqpfu5Tpld->
	5. Bruce has the nitrate data for the soil samples that were collected and submitted to him.
		1. Should we consider N deposition, e.g., from NADP data?
	6. Opportunities for additional data collection were discussed
		1. A new faculty at the University of Massachussetts, Justin Richardson, is interested in metal biogeochemistry, such as mercury or cadmium. It was noted that cadmium is now highly regulated in the European Union. If this were to be pursued, David Lindbo noted that the Conservation Innovation Grants (CIG) program may be a source for funding support.
		2. Colby described work he is conducting using mini-rhizotron cameras to examine rooting depth and fine root turnover. A methods paper is in progress for publication.
		3. Patrick suggested that we consider measuring phosphorus (extractable vs. total vs. dissolved reactive P) and/or emerging contaminants (estrogen, caffeine). He also suggested consideration of charcoal and pollen analyses.
6. Analysis and publishing
	1. Marty indicated that an IRIS manuscript is in preparation.
	2. Is the decomposition stick data from the previous project publishable? If so, is anyone interested in leading the development of that manuscript?
	3. Karen is interested in examining our morphological data as well as profile descriptons from other projects to investigate relationships between chroma 3 or 4 depletions and measured water table data.
		1. Jim suggested data from the NRCS Wet Soil Monitoring Project might be worth considering. Jim has data for multiple sites in Minnesota. Dave Hopkins at North Dakota State University might have data for sites in North Dakota. The National Soil Survey Center should have data from all WSMP sites archived (profile descriptions, pedon characterization data, well data, piezometer data, temperature data, redox potential data).
	4. Assessment of decomposition in the new project will include both litter bags and sticks.
		1. We discussed a revised methodology for the decomposition sticks. Sticks will be deployed for 1 year across all three transects (3 transects x 3 plots/transect x 5 replicates/plot). Sticks will be laid on the soil surface, tethered with nylon string trimmer line (through a hole in each stick) to secure the sticks. Both 1 cm and 2 cm diameter dowels will be used.
		2. We discussed using both hand-made litter bags (filled with maple leaves) and commercially-available tea bags to assess decomposition. It was proposed that we deploy the litter bags and/or tea bags during the three warmest and driest months. Others suggested leaving them out for a full year. We will test the methods in spring/summer of 2020, with full deployment in 2021. A complete procedure will need to be drafted.
			1. See <http://www.teatime4science.org/> for more information on the tea bag methodology.
	5. Greenhouse gas fluxes will also be measured at each site as part of the new project. Mark has conducted this type of sampling for previous research projects. He will conduct a demonstration of these methods at the 2020 Northeast Regional Cooperative Soil Survey Workshop in Blacksburg, VA (June 22-25). A video will be created for those not in attendance.
		1. Analysis of the gas samples will most likely need to be at a local lab (e.g., at each cooperator’s university). Everyone should attempt to identify a lab on their campus with a gas chromatograph where their samples can be analyzed. It may be possible to have all samples analyzed at the Kellogg Soil Survey Laboratory in Lincoln, NE.
7. Milestones
	1. Site selection for new participants
		1. Colby is seeking an establish a site, maybe 2; Judy has a site identified
	2. Wrap up of NE-1438
		1. Karen will develop and distribute a data survey, and will eventually work on aggregation of the data.
	3. A gas sampling demonstration will occur at the 2020 NERCSS Workshop in Virginia
		1. Mark and Colby will discuss protocols
		2. All should identify a lab that could analyze their samples
		3. Karen will follow up with KSSL
	4. Tea bags will be deployed on a trial/exploratory basis in 2020
		1. Should this also be demonstrated at the NERCSS Workshop…or at a Mid-Atlantic Hydric Soil Committee meeting?
	5. The next Northeast Regional Pedology Field Tour is scheduled for the summer of 2021 and will be hosted by John Galbraith, who will plan to include a visit to his vernal pool site during the trip.

Prepared by Karen Vaughan and Jim Thompson