

NE-1438 Multistate Project Meeting Minutes and 2015 Annual Report

The meeting was held on Monday, July 20, 2015 at the Monongahela National Forest Headquarters, Elkins, WV. The meeting began at 10:00 a.m.

Minutes

Members present:

Stephanie Connelly (USFS)

Mark Stolt (URI)

Bianca Peixoto (URI Graduate student on project)

Jim Thompson (WVU)

Martin Rabenhorst (UMD)

Bruce Vasilas (UD)

Mickey Spokas (UMass)

John Galbraith (Virginia Tech)

Patrick Drohan (PSU)

Stephanie Connelly reviewed USFS housekeeping items.

Patrick Drohan, Jim Thompson and Mickey Spokas took the minutes.

The meeting opened with a discussion of the difficulties in participating in multistate projects due to funds meant to support projects being redirected by Experiment Station Deans. This may be due to flat funding of Hatch and past Expansion of University administrative staff.

Project Objectives

1. Improve our understanding at a regional scale of how vernal pool ecosystems differ in distribution, hydrology, hydroperiod, redox chemistry, and carbon storage and flux. Along with this we will develop a better understanding of the effects of hydrology and temperature on carbon pools and sequestration in wetlands along a temperature gradient.
2. Identify the need for additional hydric soil indicators for northeast vernal pools. As such, if needed we will monitor the saturation and reducing conditions in the identified soils and develop new hydric soil indicators for inclusion as part of the National Indicators of Hydric Soils for the Northeast Supplement.
3. Develop morphometric indices of the hydroperiod within vernal pools.
4. Estimate the current density of vernal pools within each of our subregions and develop predictions of the numbers that have been lost because of disturbance.

A record of the group's discussions toward implementing the multistate research activities follows:

Site Selection

Descriptions of each site chosen in regard to location (landscape attributes too), size, area ponded, depth, vegetation (in general), etc.

Site Discussion:

- Bruce has 1 site in a Delmarva Bay. Wells and piezometers were put in last Fall (2014).
- Patrick has three in a ridge saddle in the Ridge and Valley Physio province.
- Marty has one in a Delmarva Bay.
- Mark has 8 sites and will likely work with 4 for the project.
- John has had trouble getting permission on USFS lands. Stephanie Connelly will help with finding sites on the Jefferson N.F.
- Jim is working with a PhD student in Wildlife and Fisheries looking for sites on the Monongahela N.F. Jim and Stephanie also spoke about interest in created wetland/vernal pool habitat using plastic liners.
- Mickey has 6 pools not instrumented yet.

Spatial Distribution and Analysis

“Using GIS technology and available imagery, estimates will be made of the size, shape, and density of vernal pools across landscapes of the region. Where possible, these data will also be used to evaluate the extent to which vernal pools may have been altered (drained or filled). These analyses may permit estimation of the number of vernal pool wetlands that have been lost or those that may potentially be restored.” Several folks are working on this from different aspects: LiDAR, field survey, literature search.

Plot Layout and Experimental Design

“Three hydrological zones will be identified: Zone 1 is seasonally ponded, and typically contains emergent, shrub or woody vegetation; Zone 2 is a wetland transitional zone marked by saturation, but not significant ponding; Zone 3 is the upland area beyond the wetland boundary.”

Do all sites have three distinct zones? What is the width of each? How long are the transects? Answers to these questions are still being determined since all participants have not identified their sites yet.

Hydrological Measurements

“The depth of ponded water or the depth to the water table (below the surface) will be recorded at each site. Depth of ponded water will be measured using a staff gauge. Monitoring ports consisting of a well screen installed to a depth of 100 cm will be placed at each plot and water tables will be measured periodically (Figure 3). Along a single transect at each site, water table recording devices will be installed and programmed to record water table levels twice each day. The detailed (daily) data set from the recording devices will be extended to the other transects based on the periodic observations in the monitoring ports. Also along a single transect, nests of piezometers will be installed to help with interpretation of hydrological flow patterns.”

Did everyone put their wells to 100 cm or deeper? Yes, some deeper (Bruce and Mark).

One transect has data loggers, correct? Yes, the other transects have manual wells.

How many is a nest of piezometers? What depth do you place the piezometers? Piezometers installed at a depth of interest and slotted 15 cm from the depth of interest upward.

How is that depth determined? To depth that can be augered.

Any further questions about calibration of loggers? Bruce is having issues. We will go over this in the field this week and then send emails around.

Soil Morphological Descriptions

Comments or Discussion? We will record what is there and then note how it differs. Patrick has noted some issues with field data not matching the Soil Survey well.

Vegetation Analysis

Comments or discussion? Bruce volunteered to do Marty's. Bruce will find a standard vegetation method.

Climate Data

How close are the weather stations to your plots?

What approach are we going to use to determine if it is a "normal" year in regard to climate (precipitation)?

Use the EFOTG WETS table....

Are there metrics of ET that we are going to worry about?

Use Class A airports and look across the region.

What depth, and where, are we measuring soil temperature?

Hobo pendants (put in ziplock bag)

Ibuttons

For the sensor above ground, hang on north side of the tree (out of direct solar radiation) and a meter above ground. Perhaps build homemade solar shelter:

<https://www.youtube.com/watch?v=LkVmJRsw5vs>

Quantifying Carbon and Nitrogen Stocks

Marty suggests using 50 cm cores.

You'll need to know the inside diameter

Bevel the edge before putting into the ground.

Stick the aluminum core (3 inch or 2 inch) into the ground

Excavate around the pipe to remove from site.

Cut the core in half using electric shears.

Use geometry to get the volume, describe horizons and sample by horizon

Measure mass

We should all use the same zero and standard. The zero is a muffle-furnace fired sample. The standard should be something with ~3-4% carbon...loamy or silty.

Soil Redox Assessment

IRIS (indication of reduction in soil) tubes will be used to assess the reducing soil conditions within each plot (Rabenhorst, 2008; Rabenhorst and Burch, 2006; Rabenhorst et al., 2008; Vasilas et al., 2013). Five replicate IRIS tubes will be inserted at each plot to a depth of 50 cm. IRIS Tubes will be installed for a one month period in the Spring when water tables are expected to be high. The installation date at each site will be within one week of the beginning of the growing season as determined by US Army Corps of Engineers guidance (USACE, 2010; USACE, 2012; USACE, 2012).

Is this just for plots along the primary transect? Yes

Are each of us making our own IRIS tubes? No.

Installation at start of growing season for a 4 week period

Start Spring 2016.

One transect with 5 tubes per plot means 15 per plot/month; total of 30 for the 2 month install.

Use the push-probe 7/8 inch size....NOT one inch.

Environmental grade PVC does not have the black lettering that affects the paint. Otherwise the black color has to be removed with acetone.

Remind Marty to put his template Powerpoint presentation for the laser printer: tracking the IRIS tube paint loss.

Organic Matter Decomposition

Marty has a recommendation for diameter (3/8")?

Marty presented his dowel/stick study to justify 3/8 inch size stick. We have gone from stakes to dowel rods.

Pilot hole made with a stainless steel rod 3/8 inch size that they bent over and sharpened the bottom on.

Marty proposes one set (5 rep sticks for each plot along all transects (9 plots)) left in the whole year. 5 sets of 5 sticks at each plot. 2nd minimum....Marty's data put sticks in so that there were enough to pull at 3, 6, 9, and 12 month intervals.

EVERYONE SHOULD PUT IN ENOUGH DOWEL RODS FOR ONE YEAR STARTING

~Oct. 15-Nov. 15, 2015.

30 cm lengths

String them together with poly bailing twine (orange).

Aluminum tags can be bought from Ben Meadows or Granger.

Use a pair of pliers to remove the stick (and not pulling the tag to).

Marty suggest putting in not only an extra set, but also an extra stick per set.

What do the sticks represent?

Relative comparison across study sites. Less difficult than litter bags. Greater than 70% cellulose.

Questions on what kinds of carbon are being decomposed.

Do you measure the amount of decomposition with depth (i.e.) every 5 cm of the 30 cm stick?

Marty demonstrated his chopper mechanism for the paint sticks.
Uses special \$150 software to link his balance to laptop.
Should we chop just zones 2 and 1?

Other measures of decomposition?
Bruce suggests Kohlhart screen method...see Bruce's chapter....Some (Mark) are also placing sticks laying on the surface and leave bags

Data Collection via Proximal Sensing

GPR and EMI: Patrick will survey DE and MD...maybe VA.

Other methods not covered in the proposal that we should consider?

Root cores...measure the number of roots in the core. Gas measurements with closed chamber.

Other comments: Everyone should do a rapid assessment of disturbance.

The meeting was adjourned at 5:10 pm.

NE-1048 Accomplishments

This represents the first year of the project. Sites are getting established, protocols worked out, and experiments and monitoring initiated.

Publications: One paper was presented at the Society of Wetland Scientists annual meeting in June of 2015.

Peixoto, B., and M.H. Stolt. 2015. Landscape Attributes, Hydrology, and Edaphic Conditions of Southern New England Vernal Pool Wetlands. Abstract- Annual Meetings of the Society of Wetland Scientists.

Outreach: The project was discussed and major issues raised among the graduate students and US Forest Service personnel attending the Northeast Graduate Student Pedology Field Tour that followed the multistate meeting.