

Minutes from the NE-1938 Multistate Meeting. 9 am to 4:30 pm eastern time via video conference

Agenda

- 1) Review of the proposed methods. Review and comment on anything that needs to be changed or included.
- 2) Discussion of timing of each method including time of year, length of deployment, how many deployments, etc.
- 3) Update from each participant. Do you have a site picked out? Is it instrumented to measure hydrology at each transect point? What sampling and analysis have you completed or need to do?
- 4) Methodology to share? Marty will talk about making litter bags. Anyone else have videos or slides to share?
- 5) Discussion of potential publications.
- 6) Additional discussion.

Summary of Experimental Plan (see discussion points for changes or new additions to the methods)

1. Plot layout
 - a. nine research plots along three transects
 - b. Elevations along each transect will be measured
2. Hydrology
 - a. depth of ponded water or the depth to the water table will continue to be recorded
 - b. Along a single transect at each site, water table recording devices have been installed recording daily.
3. Soil Morphology
 - a. At each plot, a soil profile description to a depth of 1 to 2 m
 - b. descriptions will be compared with approved field indicators of hydric soils
4. Vegetation Analysis
 - a. Plant communities in each of the three zones will be assessed
 - b. Discussion:
 - COE method (5 m circular plot)
 - Bruce will send out method to be used
5. Weather and Climate Data
 - a. from the nearest weather station

b. Daily records of precipitation and of minimum and maximum temperatures

c. Discussion:

- Using closest versus average of three closest
- Ideally stations would have 30-year record to generate WETS data
- Phenology website:
- <http://uspest.org/cgi-bin/ddmodel.us?sta=E6248&mdt=all&spp=aaa&cal=A&tlow=41&thi=130&stm=1&std=1&styr=17&enm=5&end=31&cel=0&fcast=1&spyr=0&shd=1&mkt=0&mkg=1&ipc=1&evnts=3>

<http://climatesmartfarming.org/tools/>

6. Soil Temperature (in concert with IRIS)

Discussion

- Nothing was in the proposal about soil temperature, but it was measured previously at existing sites.
- we did have info about soil temperatures at 25 cm or 30 cm
- Should have at least daily monitoring - I think most have done more frequent monitoring).
- Judy & Colby - talk to Karen about temp sensors that don't need to be buried
 - https://www.onsetcomp.com/products/data-loggers/u23-003?creative=178262173812&keyword=&matchtype=&network=g&device=c&gclid=Cj0KCQiA3NX_BRDQARIsALA3fILw66tf3_qlf9i4hqN_p38LGVB9X8MiCmqSy3pwaDX0HfhwXmabUs0aAijBEALw_wcB

7. Quantification of Carbon and Nitrogen Stocks

a. Carbon and nitrogen stocks will be determined at all 9 plots from the upper 50 cm

b. Total carbon will be determined in duplicate by dry combustion

c. Discussion

- Mark said he'd set up a spreadsheet
- Sample by master horizon to 50 cm depth
- Karen couldn't use a core method; we need flexibility for sites that aren't conducive to core method

8. Soil Inorganic Nitrogen

a. Soil nitrate and ammonium from each plot

b. in the middle to end of the aerobic phase (August -September).

c. Four to six replicate cores will be collected using a 30 cm push probe,

<https://docs.google.com/spreadsheets/d/1MHPn-BYYDNBjXkMOPOFk4kCCLPJKAQM6P199wYHa60/edit#gid=0>

d. Discussion. Bruce will look for dilution factor (and meaning/significance)

9. Soil Redox Assessment - IRIS films

- a. Along 1 transect (with daily WT data and temperature data)
- b. Both Fe and Mn films
- c. Discussion
 - No more IRIS film work is needed for existing sites
 - It would be good to get data from Judy's and Colby's sites

10. Carbon Inputs

- a. Along the central (one) transect
- b. Replicate measurements of leaf litterfall during 2 periods
 - i. Dec – Aug
 - ii. Sept - NovVegetable plant “flats”
1 transect - 3 reps at each of three plots
https://www.bedbathandbeyond.com/store/product/sweater-drying-rack/1010214963?skuId=10214963&enginename=google&mcid=PS_googlepla_nonbrand_storage_online&product_id=10214963&adtype=pla&product_channel=online&adpos=&creative=356217081052&device=c&matchtype=&network=g&rkg_id=0&utm_campaign=71700000054078528&utm_adgroupid=58700005141630539&targetid=92700045203765756&gclid=Cj0KCQiA3NX_BRDQARIsALA3fILdVJLP5blC8b7lqsZzEoHGOgg_y_D3MqtasgZ1sxW4OE7Ee32IfTZYaAuUDEALw_wcB&gclsrc=aw.ds
- c. Triplicate C inputs as deadfall will be determined in each plot.
 - 1x1 m² plots, clear it out initially, then go back at least once per year to determine mass of dead fall
- d. Discussion
 - There were questions about how much carbon is contributed from roots
 - Methods discussed
 - Root cores
 - In-growth cores
 - Minirhizotrons
 - Root exclusions paired with the gas flux sampling

11. Organic Matter Decomposition

- a. previous study
 - i. northern white birch (*Betula papyrifera*) sticks (9.5 mm dowels, 30 cm long)
 - ii. were inserted into the soil for one year
- b. Current Study
 - i. leaf-litter bags in each of 9 plots
 1. (Northern Red Oak)

2. How long to be deployed?
3. When to be deployed
4. Discussion:
 - Should we remove existing leaves, place litter bags/sticks, then put existing leaves back on top?
 - Consensus: no, leave them bare
 - May need to staple them down to ensure good contact with the soil and avoid blowing away.
 - We will make our own bags
 - Mark will send us leaves
 - We need to send Mark our shipping address
 - When will bags and sticks be deployed? (see discussion below)

Litter Bags

Deployment date and duration: Install at 200 GGD - for 150 days

Number and location: Install 5 (8" x 9") bags at each plot along the transect = 45 bags/yr. Also deploy 5 random bags.

Site preparation/installation: Litter/duff moved to the side. Secure to the soil surface (weight, line, or staple).

Sealer: <https://www.amazon.com/CooPee-Impulse-Handheld-Packaging-Resturant/dp/B08C51KRZD/ref>

Screen: <https://www.homedepot.com/p/Phifer-36-in-x-25-ft-BetterVue-Insect-Screen-3030802/203193957>

Wooden Sticks

Deployment date and duration: Install when litter bags are removed (150 days after 200 GGD).

Number and location: 5 sticks deployed for 365 days x 9 plots = 45 sticks/yr - use unused sticks from previous deployment. Repeat for two years.

Site preparation/installation: Litter/duff moved to the side. Sticks loosely secured to the soil surface with a landscape staple or other device.

Tea Bags

Deployment date and duration: Install June 1 for 90 days (June, July, August).

Number and location: Two types of tea - 5 bags buried at each site along the transect (2 x 5 x 9 = 90 of each type of tea).

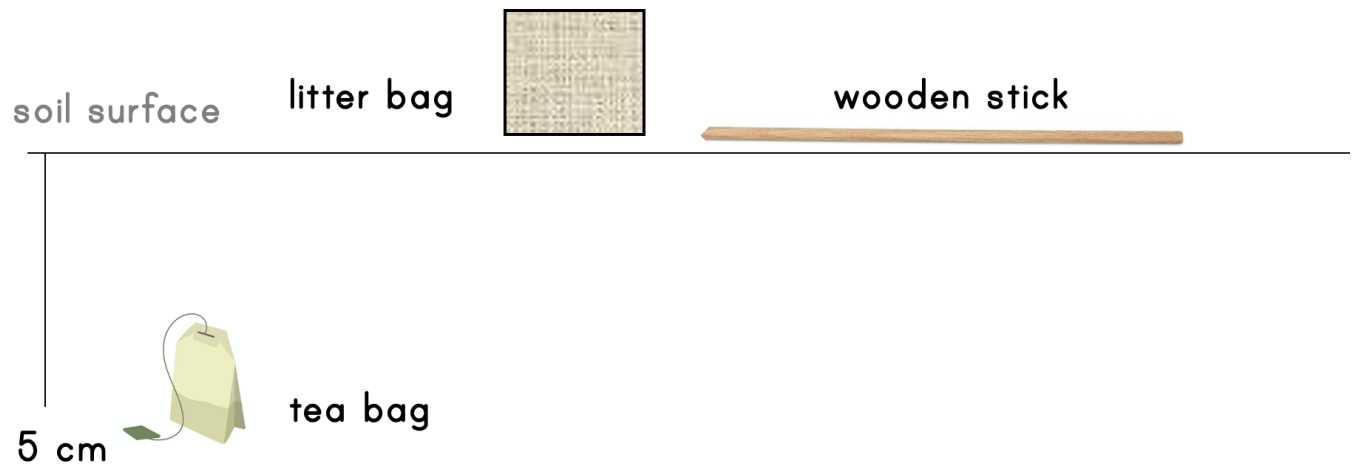
Site preparation/installation: Use trowel or soil knife to open soil at 5 cm. Insert and mark using a metal stake - consider using metal detector suggested by Patrick -

<https://www.amazon.com/JACIKA-Unearthing-Sensitivity-Waterproof-Pinpointing/dp/B07TT682W6/ref>

5 boxes of each tea = $5 \times 2 \times 9 = 90$ boxes for all

<http://www.teatime4science.org/method/availability-of-tea/>

Karen will order for all and distribute. Patrick contacting Lipton.



12. Greenhouse Gas Flux

- a. To be measured at each research plot on each of the three transects
- b. closed chamber approach
- c. When to be done
 - i. Which year
 - ii. Which seasons/times? How often?

Discussion of potential publications

- Karen suggested we need to find a graduate student to lead the data synthesis and analysis. This would need to be a student who has funding but needs a project. John suggested online masters students as a potential pool of students. Nobody was against the idea of having a grad student lead these efforts, but it was mentioned we needed a student that had some authority to “herd everyone”
- What can we learn from Mn IRIS - publication spearheaded by Marty; will get draft into shared document in next 2 weeks
- Morphology Pub - Karen
- Initial decomposition study - find a grad student to take lead on this?
- Possible discussion of organic enriched surface horizons in wet soils

Additional discussion

- Karen is doing a modeling study to do things like predict how long a soil must be saturated to create 2% redox concentrations
 - Grad student has a spreadsheet already made
 - She wants us to add our data to the sheet
 - Will send an email
 - We need to add data from our transects from each site