



Soil and Plant Science Division

National Technical Committee for Hydric Soils Annual Meeting Minutes May 29-30, 2024

Charlotte, NC

Wednesday – May 29th, 2024

9:00 am **Field Trip**

Sites are seasonally saturated soils that exhibit seasonal shifts in color

Meet at Home2 Suites by Hilton, Charlotte Piper Glen

5110 Piper Station Dr, Charlotte, NC 28277

Travel to field sites about 20 minutes away at

<https://www.indiantrail.org/facilities/facility/details/Crooked-Creek-Park-4>.

Attendance:

NTCHS members:

Lenore Vasilas, Natural Resources Conservation Service (NRCS); Jacob Berkowitz, United States Army Corps of Engineers (USACE); Aaron Miller, NRCS; Richard Griffin, Prairie View A & M University; Rusty Griffin, United States Fish and Wildlife Service (USFWS); Chris Parker, Environmental Protection Agency (EPA); Colby Moorberg, Kansas State University; Chelsea Duball, Grand Valley State University; Jennifer Smith, NRCS.

Army Corps of Engineers (ACOE) Guests:

Sydney Bufkin, Yadav Sapkota, Sam Dailey, Doug Perez, Amber Lipsky

Discussion of the Field Site:

The study region is characteristic of the exurbs of Charlotte, NC. It has been experiencing unbridled rates of development whereby municipalities have been struggling to provide infrastructure resources such as clean drinking water and sewer networks.

Soils are forming in alluvium and slope alluvium of low order drainageways, stream channels, and floodplains along the Carolina Slate Belt (often argillite). Soil series investigated for this topic is the Cid Series: Fine, mixed, semiactive, thermic Aquic Hapludults with a very high silt content.

Hydrology consists of both flashy overland flow events that coat surface litter and debris in silty residue and a shallow water table with localized recharge, flowthrough, and discharge zones in these low order catenas. Evidence of flooding and ponding events that occur from January to March are visible as water marks along the bases of woody stems and trunks.





Hydrophytic vegetation is present especially in micro-low positions, but broad stream divides with low K-sat are also commonly recognized to have slow drainage classes associated with traditionally upland positions.

Assumptions are that much of the initial field mapping for this region would have occurred outside of the wet months such that the Cid series is mostly characterized in literature as an upland soil with few to no gray layers. It is also clear that the Cid series is occurring in locations that clearly meet the hydric soil definition, if not periodically hydric indicators.

Six sites were selected for paired plots: one in the interior of a low, concave position; one in boundary position. When these soils are wet, they often meet F3 or F19, but when they dry out, the chromas increase to 5 or 6. There are plenty of redox concentrations present within the upper 25 cm but some of them become faint when the chromas are elevated during the dry season. Soils were repeatedly described in December, March, April, and July of 2023 to capture the seasonal evolution of matrix features. The wettest season is during leaf-off periods from Winter to Spring. However, the period prior to full leaf-out in early spring, when temperatures rebound to encourage biological activity but before the draw-down of water tables, is the critical time to capture peak reducing conditions, observe reactions to alpha-alpha dipyridyl, and produce the most effective results on IRIS tubes.

In summary, we observed sites where the interior position has moister soil materials that, upon excavation, a short period of exposure to air allowed the matrix to develop higher chromas - often a full color chip change or more - such that the soils no longer met a hydric indicator. On the boundary position, where the hydrophytic indicator was less pronounced (more questionable), we were able to observe some hydric indicators such as F3 or F19. But only during March and April months were the hydrology indicators through Indicator of Reduction in Soils (IRIS) and alpha-alpha dipyridyl consistently present to meet the Hydric Soil Technical Standard (HSTS), and during these time windows hydric soil indicators can be reliably observed such that a proper wetland determination could be achieved.

Thursday – May 30th, 2024

Attendance:

NTCHS members in person:

Lenore Vasilas, NRCS; Jacob Berkowitz, USACE; Aaron Miller, NRCS; Richard Griffin, Prairie View A & M University; Rusty Griffin, USFWS; Chris Parker, EPA; Colby Moorberg, Kansas State University; Chelsea Duball, Grand Valley State University; Jennifer Smith, NRCS, Mike Vepraskas, North Carolina State University.

NTCHS members on Teams:

Tony Jenkins, NRCS; Karen Vaughn, University of Wyoming; Ronald McCormick, Bureau of Land Management (BLM); Steve Monteith, NRCS.

Guest:

Sydney Bufkin, USACE



9:00 Field Trip discussion – recap and comments

- Sydney Bufkin – presented the recap of the field trip and a digest of the data including results of their 1-year study across six sites and a drafted journal paper for submission to publication.
- Mike Vepraskas – suggested that the Iron (Fe) in this system is not immigrating / emigrating, rather, its recycling around due to the lack of slope gradient to flush it. Classic hydrology of broad divides whereby localized flow between the micro-highs and lows can concentrate water and iron.
- Richard Griffin – commented that the behavior of the iron seems to reflect flowthrough and discharge hydrology.
- Jacob Berkowitz – this study has provided the opportunity to expand upon our guidance for conducting a hydric soil investigation; rather than expand the hydric soil indicators, suggests that we focus on our procedural components. Much the same way the wetland delineation requires that hydrology and vegetation indicators be observed under a strategic seasonality strategy, hydric soils should place an emphasis on seasonality for those soils with dynamic hydric soil properties (such as the presence of reduced Fe, traces or thin mucky layers, organic coatings, iron sulfide (FeS), etc.).

10:00 Old Business

- Lenore Vasilas – Motions to approve the minutes from 2023. Seconded by Jacob Berkowitz. No comments. All in favor.

10:10 Field Indicators of Hydric Soils in the United States revisions to version 9.0

- Lenore Vasilas - Latest round of edits are back. There are multiple editing tasks such as the reversed decision about Boolean symbols. Need to have more eyes on this round to make sure we don't fumble the logic symbol signs. Might divvy up the workload to willing participants.
- Mike Vepraskas – make sure we adjust language for A11 to account for all textures. Users have complained about its clarity.
- Aaron Miller – comments that the definition of depleted matrix doesn't discriminate textures. Don't need to explicitly list textures in the indicator text.
 - Jacob Berkowitz – motions that we strike mention of all textures in the indicator language for A11 and, instead, adopt the language “depleted or gleyed” to cover the technical needs. Mention of “any texture” can be in the first line of user notes.
- Aaron Miller – Glossary includes a table for the upper limit of “faint”, but users in the field would prefer the bottom limit of “distinct” as a more intuitive tool.
 - Jacob Berkowitz – not sure if that will be a more complicated table, asks Aaron Miller to draft it for review and could be swapped out if no different.
- Jennifer Smith – would like S7 to comment on dynamics of sand masking.
 - Lenore Vasilas – included that language into every indicator that deals with coated grains.

- Colby Moorberg – wish list would include an HTML version of the indicators whereby links would take user to photo archives for illustrated examples.

FeS indicator permanence and matrix chroma requirement.

- Lenore Vasilas – topic of whether FeS indicator A18 needs to address temporal nature vs. permanence of FeS concentrations as user notes to help with understanding its dynamic nature.
- Jacob Berkowitz – this indicator is another proof-positive, there is no proof-negative indicator so either apply another indicator or come back at the right season.
- Aaron Miller – another dynamic hydric soil property that requires the local professional to comprehend the seasonality of local hydrology. This topic would fit well into the problematic guidance document under the discussion of dynamic hydric soil properties.

11:00 **Changes needed to the Hydric Soil Criteria to accommodate subaqueous soil taxonomy and continuous inundation**

- Lenore Vasilas – problem: subaqueous soils don't currently come out hydric according to the criteria. Flooding defined as temporal. Ponding has no time limit but would have met criteria if included continuous. Proposal is to add continuous inundation concept and to change criteria, following options:
 - Add 5th criterion for continuous inundation
 - Add Wassents to criterion 1.
 - Add all the taxa to criterion 2 for subaqueous.
- Do we wait to see if taxonomy changes to add new soil order for wet soils? Or do we change criteria now and not worry about the unknown?
- Jacob Berkowitz mentions he prefers change to criterion 2.
- Aaron Miller motions to add Wassents to criterion 1.
- Mike Vepraskas points out that criterion 2 has problems with meeting an indicator.
- Colby Moorberg motions to amend criterion 1 to add a comma after Folistels, strike “and”, and add “and all Wassents”. Mike Vepraskas seconds. Call for discussion.... all in favor.

11:30 **Lunch**

1:30 **Problematic Soil Situations Document**

- Aaron Miller – need for an update to the problematic soil's topics and issues. ACOE Regional Supplements are decades from last publication. Most, if not all, of the problematic topics are out of date. NTCHS tech notes touch on a few of the problematic topics but are also out of date. Vepraskas, et al. text on Problematic Hydric Soils was published in 1996. The benefits of a comprehensive compendium on problematic soils are manifold:
 - Clearinghouse of the topics for the public to have easy access to the current state of the science.
 - Provide citable resource.
 - Framework to emphasize the highest priority topics where fewest workable solutions have been developed and the highest demand for solutions exists.

- Would allow this committee, and other organized groups to reference the topics for recommendations to prioritize research opportunities, funding, etc.
- Jacob Berkowitz – comments that the ACOE regional supplements directly reference the indicators for any updates to the science but do not reference any tech notes or additional guidance.
- Aaron Miller – we may need to insert the link to our supplemental guidance (i.e. “Problematic Hydric Soils”) as we do other tech notes in the indicators. That is what we currently do.
 - Mike Vepraskas – acknowledges the merits of having a living document resource like a Wikipedia of problematic topics.
 - Karen Vaughn - We should get a grad student to do the literature search for references to support each chapter of this “problematic” document.
- Aaron Miller – will share the working document that has the outline for all problematic topics which includes a draft of each section started. (Note: the blue text is that which was copied and pasted from sources, white text is new content.) We need contributors to adopt topics for development. Will send out Box Link next week with this and other resources that can be shared with NTCHS.
- Colby Moorberg – if we publish this as a text, we can do versioning every time the content reaches a threshold. Would get an ISPN (Integrated Services Packet Network) for it.
 - Lenore Vasilas – can get ISPN on an internal reviewed tech note too.
- Jacob Berkowitz – will reach out to Soil Science Society of America (SSSA) editors for advice on a publication like this.
- Karen Vaughn – supports the idea of a reference to the problematic hydric scenarios as a great service to the wetland and soils community to benefit from. Highly endorses.
- Tony Jenkins – motions to move forward with this effort formally so that we can provide more support. Colby Moorberg – seconds motion. No additional comments. All in favor!

1:45 Website revisions – Tech Notes

- Aaron Miller – have drafted a document that summarizes all the tech notes. Shared by email with all committee members.
 - Currently, the tech notes cannot be posted on NRCS website because they have not been through internal review. Also don’t meet 508 compliance.
 - There are only a few legitimate, unique, tech-note-worthy topics. Other tech notes should be archived.
 - Problematic Hydric Soils topic is one of the tech notes and condenses several of the older versions.
 - HSTS is a tech note (currently TN 11).
 - Alpha-alpha dipyridyl topic is another tech note (currently TN 8).
 - Mike Vepraskas will review the hydrology system tech note for relevance into the hydric soils topical nature (currently TN 6).
 - Aaron Miller will review tech note 1 to see if there is content that is unique enough to need a home or become a formal tech note.



2:15 Redox Study

Updates by Colby Moorberg and Chelsea Duball

- Colby Moorberg – color changes to soil descriptions with sample exposure
 - Mike Vepraskas - suggestion to choose good sites that react to alpha-alpha dipyridyl. Also be aware of sandy sites that don't have enough Fe in the soil to change color.
 - Jacob Berkowitz – reconsider using the 1-hour time lapse observation. Could be critical.
- Colby Moorberg – discussion of redox of interdunal areas

2:45 Updates

NRCS

- Aaron Miller – The Ecosystem Dynamics Interpretive Tool (EDIT) database is finally funded for major updates due to persistence of National Easement Staging Tool (NEST) Leader Jamin Johanson. I have been working with Jamin Johanson on the critical needs of EDIT to leverage correlations with National Soil Information System (NASIS) to improve its primary functions. Hydric soil features are a high priority. Formal request for NTCHS to submit recommendations to NEST for how to incorporate hydric information. The following are the recommendations:
 - List of Component – “Hydric Status” and the “Drainage Class”
 - Link to Component-Month for flooding and ponding RIC
 - Link to Component – “Hydric Criteria” and list any of the 4 criteria that are relevant
 - Link the MLRA/LRR/LRU for each site such that an investigator would be directed to choose only those indicators that are applicable to that LRA from that list. All others would be for testing. This would be a quick indicator-usability reference for any map unit component for area of interest. No more relying on the 1:5M scale LRR map to determine where one is standing to decide which indicators to use.
 - Potential to list the actual indicators that have been applied to a component-pedon, where pedons have been linked to component-pedon table. Probably mostly those data map units from post-2010 will have them.
- Jennifer Smith – hosted Advanced Hydric Soils for soil scientists in Madison, WI two weeks ago. Went really well, great crop of students.
- Tony Jenkins – Supports recommendations for EDIT and Ecological Site Descriptions (ESD) updates with regard to hydric data fields.
- Lenore Vasilas - Will need a new NTCHS Chairperson starting next year (2025) when I retire. Needs to be a National Level person. Likely candidates are Joey Shaw and maybe Debbie Surabian. Also need to replace 3 academic members (pedology, hydrology, microbiology). And one NRCS position for Steve Montieth.
- Steve Montieth – Retiring at end of July 2024. Not available to serve as chairperson. Maybe reach out to Deb Harms for nomination requests to replace his seat. Kellogg Soil Survey Lab (KSSL) move is still ongoing and overriding all sample processing activities, though the first lab analyses will be coming soon. KSSL is continuing to make IRIS devices via annual requests for assistance.





BLM

- Ron McCormick – Public Lands rule regarding permitting for restoration activities is coming soon. Soil training also coming up, will have a focus on hydric topics.

USFS

- Dave D'Amore – not present, submitted typed updates into notes.

USFWS

- Rusty Griffin – Released Status and Trends Report. “Wetlands Mapper Tool”.
 - 6th study since 1950's-1970s
 - Sharp decrease in wetland loss then a gain from 2000 to 2004 where wetland acres increased
 - Losing freshwater wetlands where open ponds increased in developments that cleared formerly vegetated wetlands.
 - Looking for folks to help review

USACE

- Jacob Berkowitz – Cid series soil study presented data today. Data collection completed, paper publication with guidance that states: “such sites need to be visited at appropriate time of year/season.”
 - NEPA process to include an estimation of carbon impact of projects on military installations. On wetlands restoration projects, potential to add carbon sequestration. Only in CONUS (Contiguous United States) for now.
 - Assessment methodology –
 - Wet pine flats along Gulf Coast
 - Non tidal zones in NY state
 - New England states RAM
 - Build elevation capitol into mangrove to stop the loss of mangrove forests utilizing dredged materials added to these ecosystems
 - Converting wetland-hydric soil spreadsheet from XL app to mobile app.

EPA

- No report

University/Technical Membership

- Mike Vepraskas – Hydrologic performance criteria using model to determine whether restored wetlands have succeeded in meeting drainage class. At this time, there is no standard method for evaluating a successful restoration of hydrology. No verification of estimates made following project completion.
 - Determine saturation durations during the growing season for restored and natural soils
 - Use the saturation durations to assess restoration success at two restored wetlands
 - Make recommendations for assessing the hydrology of restoration sites
 - The saturation durations defined for “drainage classes” of natural soils can be used for restoration assessments.
 - Initial estimates of growing season saturation were too low.





- Drainage classes (SWPD) can have broad saturation ranges and will have to be subdivided into groups with narrow saturation ranges.
- Assessments can be made separately for each well at a site to identify problem areas.

4:30 New membership discussion

- Colby Moorberg – membership drive announcements went out for hydrologist and microbiologist. We have one application from a soil microbiologist (Dr. Michael Weintraub, University of Toledo). Also need to add in pedologist to replace Karen Vaughn. Need to send the notices to State Soil Scientist (SSS) and Regional Directors (RDs) of NRCS to get them to reach out to partners.

Wrap up and location of next meeting

- Jacob Berkowitz – Baton Rouge, LA could be a host. Or Tennessee to see the shallow gleyed soils there. Also, could look at the Sharkey and other Vertic soils.
- Folks should bring up the topic of needs for locations at respective Regional National Cooperative Soil Survey (NCSS) conferences. Attendees should bring the problematic soils outline from Aaron Miller's document to the meetings to put up on screen as a prompt for folks to think about potential topics we need.
- Would be useful to have the Problematic Soils document in hand here to prioritize future field site locations. We could start checking them off as a list.

