

National Technical Committee for Hydric Soils Annual Business Meeting Minutes Virtual July 29, 2025

National Technical Committee for Hydric Soils (NTCHS) Members in Attendance

Cory Owens, NRCS; Jennifer Smith, NRCS; Richard Griffin, Prairie View A&M University; Jacob Berkowitz, U.S. Army Corps of Engineers; David D'Amore, U.S. Forest Service; Chelsea Duball, Utah State University; Ron McCormick, Bureau of Land Management; Julie McMichael, NRCS; Aaron Miller, NRCS; Colby Moorberg, Kansas State University; Chris Parker, Environmental Protection Agency; Ron Reuter, Oregon State University; Lenore Vasilas, NRCS Earth Team Volunteer; Michael Vepraskas, North Carolina State University; Barret Wessel, Michigan State University; and Michael Weintraub, University of Toledo

10:00 a.m.

Welcome and Introductions

- Cory Owens led the committee through introductions, previewed the agenda, and discussed logistics for the virtual meeting.

10:15 a.m.

Old Business

- Aaron Miller reviewed highlights from the 2024 annual meeting minutes.
- The committee did not have any comments.
- Colby Moorberg moved to accept the minutes.
- Richard Griffin seconded the motion.
- All were in favor.

10:30 a.m.

Introduction of New Technical Members

- Cory Owens reviewed the names of the new technical members who had been invited to the NTCHS. She introduced and welcomed Barret Wessel, who provided a more in-depth introduction. She mentioned that Ron Reuter might attend the meeting later in the day, but Michael Weintraub and Thorston Knappenberger had conflicts and could not attend. There will be a follow-up meeting where all the members can meet not only the new technical members, but also the new NRCS members to be discussed later in the meeting. Note: Michael Weintraub did join the meeting later in the proceedings.



- Barret Wesel provided a more in-depth introduction highlights include:
 - Extensive experience with hydrology, stream restoration, and subaqueous soils.
 - Ph.D. in Soil and Watershed Science from University of Maryland, where he worked on subaqueous soils of Chesapeake Bay with Marty Rabenhorst.
 - Postdoc with the Agricultural Research Service looking at runoff in Western Lake Erie Basin tile-drained soils.
 - He is currently working on:
 - Wetland soil projects in Michigan.
 - Carbon accounting, both organic and inorganic, to establish baseline carbon data for the State of Michigan. This is particularly interesting in locations with extensive marl.
 - He is involved in the currently paused National Cooperative Soil Survey Old Woman Creek Subaqueous project.
 - He is contributing to rethinking the Aquasols proposal to include a cleaner break for a subaqueous soil order under a different name, leaving problematic “wet” soils for another day.
 - He hopes to work more at the Corey Marsh Ecological Research Center associated with the university as there are many research opportunities in rice and cranberries and the redox potential levels, with the level of control of the water table.

10:45 a.m.

Review of NRCS Members and Recommendations

- Cory Owens introduced the three NRCS applicants for the two open NRCS slots on the committee.
- Colby Moorberg, Barret Wessel, and Chelsea Duball all encouraged the selection of Ann Rossi-Gill based on previous and current work experiences and interactions with her.
- Cory Owens noted that all three candidates were technically proficient and would be good members of the team but recommended Julie McMichael and Ann Rossi-Gill for inclusion since the committee is limited to two selections.
 - This was supported by Aaron Miller and Jennifer Smith.
 - Julie McMichael was recognized for her expertise regarding hydric soils as they relate to NRCS’ conservation compliance, and Ann Rossi-Gill for her technical expertise in New England hydric soils. Owens, Aaron Miller, and Jennifer Smith all commented on candidate William Tripp’s technical strengths and acknowledged he would make meaningful contributions to the committee, making it a difficult choice.
- Cory Owens concluded the topic by letting the committee know she would inform the NRCS candidates of the outcome.



11:00 a.m.

Review of the Status of NRCS Technical Notes

- Julie McMichael joined the meeting.
 - Cory Owens offered Julie McMichael congratulations on becoming a member of the NTCHS.
 - Julie McMichael provided the following updates on the status of the pending technical notes.
1. Items completed
 - a. “Hydric Soil Technical Standard”—This is finished and posted to the NTCHS web page.
 - b. NTCHS Meeting Minutes for Fiscal Year 2023 and Fiscal Year 2024—These are finished and posted to the NTCHS web page.
 2. Items remaining
 - a. Alpha-alpha guide—This had made it through the internal review process. However, with the release of the paper by Jacob Berkowitz, it was decided to table it because there was a fear of being redundant and with lack of staff working on the edits it seemed like a better fit. At the National Cooperative Soil Survey (NCSS) Conference it was noted that the journal paper would not be able to be released outside of the journal for a period of time. So, this one may need to be looked at again and posted to the web page for a period until Berkowitz’s paper is released and can be added to the NTCHS web page.
 - b. Discussion on the alpha-alpha guide
 - 1) Jacob Berkowitz mentioned there is a more technical long-form version of the alpha-alpha guide coming. It might be redundant. Different audiences may use different versions. Many tools for many users.
 - 2) Aaron Miller mentioned that the committee can choose to post documents or cite references depending on what everyone thinks is best.
 - 3) Julie McMichael clarified that NRCS was leaning towards posting Jacob Berkowitz’s work as it filled a gap in making the information immediately available.
 - 4) Jacob Berkowitz mentioned there have been persistent questions on the use of the test strips. There was a recognized need from the U.S. Army Corps of Engineers for official clarification to not apply the weak acid when the test strips are being utilized for soil applications.
 - 5) Aaron Miller mentioned the opportunity to update the technical standard as a place to make sure the language is clear. Also, the committee can add appendices to the technical standard.
 - 6) Cory Owens noted an action to review the publication options and decide what to put on the NTCHS web page.
 3. Indicator of Reduction in Soils (IRIS)—This was finished and made it through the initial stage of the internal review process. It had some issues with diagrams and making sure the diagrams were

Section 508 conformant (i.e., color contrast). Heather Emmons was helping to try to fix and working with Kelly Harris. At the NCSS Conference, Marty Rabenhorst offered to do a peer review and assist with the diagrams to ensure their integrity with the process itself, if that would be helpful. To Julie McMichael's knowledge, no one has yet reached out to Marty Rabenhorst, but it would be great to have his insight.

4. Water Table Monitoring—Submitted for internal review, but it did not make it through the initial stage of the internal review process before the end of the detail so was on hold.
- Cory Owens noted an action to look at the status of the technical notes and develop a plan to get them finished.

11:25 a.m.

Problematic Soils Compendium and 1997 Soil Science Society of America (SSSA) Problematic Soils Publication

- Aaron Miller played his lightning talk about the Problematic Soils Compendium from the NCSS Conference for the committee.
- Aaron Miller has been invited by the Bureau of Waterways Engineering and Wetlands for the State of Pennsylvania to speak on the topic. He is working on a “tech note” version of the compendium and mentioned he is not actively working on an update to the 1997 SSSA Problematic Soils publication, and that perhaps a small group could consider taking that on.
- Colby Moorberg mentioned the NCSS National Research Committee talked about meeting more regularly (i.e., every 2 months) and focusing their discussions on different themes. He and Chelsea Duball have the January webinar session and have proposed to Skye Wills to have problematic hydric soils and research opportunities as the theme. Cory Owens let everyone know she is working with the group on hosting these sessions under the NCSS Partners Seminars that she has produced in the past.
- Jacob Berkowitz started a more in-depth discussion on the opportunities to update the 1997 SSSA Problematic Soils publication and shared the table of contents on screen with the committee. He elaborated on how there are many advances in the tools and opportunities to bring new science into the publication. After the last NTCHS business meeting, he reached out to SSSA, and they are interested in an update. The next step would be for the committee to put together a prospectus for the update and connect with the original authors who are still working. SSSA mentioned it could publish a hard copy of a new version and update the online version at a more regular cadence. He reminded everyone that these endeavors typically take 18–24 months.
- Chelsea Duball mentioned that timing works well if the committee would like to have the work completed by the publication's 30th anniversary.
- Dave D'Amore really supports these studies and reminded everyone that there is a lot to learn from the Wet Soils Monitoring Program sites that are still likely around the country.
- Jacob Berkowitz reminded everyone that there needs to be maintained differentiation between naturally problematic soils and soils that have been altered or distributed as may affect Clean

Water Act enforcement purposes. He pointed out that these two instances were collapsed into “Difficult” Hydric Soil Situations in the U.S. Army Corps of Engineers Regional Supplements to the 1987 “Wetland Delineation Manual.”

- Cory Owens noted an action to convene a small group to talk about what an update to the 1997 Problematic Hydric Soils publication may look like. Potential members include Mike Vepraskas, Richard Griffin, and Jacob Berkowitz.

12:00 p.m.

Referrals from the NCSS Hydric Soils Committee

- Cory Owens initiated a conversation about the only referral from the NCSS Hydric Soils Committee this year, which was to consider iron sulfide (FeS) on IRIS tubes being included in the “Hydric Soil Technical Standard.”
- Chelsea Duball noted that Marty Rabenhorst mentioned this. She has done a lot of work on this, but the topic might be limited to those who are using IRIS devices that are not turning white, rather they are turning black with FeS. She mentioned that Marty Rabenhorst and she both have data on this.
- Barret Wessel has worked with one of Marty Rabenhorst’s students on this data collection. He elaborated that it could get complicated with the timing of when someone checks the IRIS tube. Depending on texture, they have seen FeS develop in as little as 15 minutes, so they have a range between minutes to months for FeS to be apparent.
- Lenore Vasilas mentioned the evidence of FeS is proving anaerobic conditions, so the timing, which is critical for the biogeochemical reactions of Fe transformation, is not as big of a deal for seeing FeS.
- Chelsea Duball noted if the devices are out too long and it was black; it can turn white. This is not in the “Hydric Soil Technical Standard” now. If there is FeS on the film, it must be captured immediately or else the Fe can change color again to orange. If included in the standard, there would need to be user guidance on this, and it would be system dependent.
- Barret Wessel mentioned if the reaction is happening so fast you are getting a snapshot is 15 minutes enough to be considered monitoring data.
- Colby Moorberg mentioned that a field tour to look at FeS has been discussed. It does not take long for the FeS to precipitate, and since the S is below Fe on the redox ladder there is the assumption that the soil has been reduced long enough to get to S.
- Jacob Berkowitz initiated a conversation on what is going on when the black is going back to orange. He elaborated that Marty Rabenhorst spoke to this the last time and that it is a thin, metastable form of FeS on the device and that the longer those films are in place they see the black precipitate on them move to a more stable form.
- Richard Griffin noted that in sandy systems there is a sequential process with the sulfide and iron in the system. It will recoat and get Fe over the top of the sulfide; we will get Fe on top close to water’s edge. When you get away from that the Fe dominates.



- Chelsea Duball shared the paper “[Rapid Formation of Iron Monosulfide on Indicator of Reduction in Soils Devices in S-Rich Hydric Soils](#)” by Duball, Megan L. Andersen, Dylan Beaudette, and Karen L. Vaughn and published in the SSSA Journal, volume 87, pages 707–717.
- Aaron Miller noted organic matter is often a thin layer at the top of the playa. In these instances, in the top 30 cm you might only get a portion that is truly reduced. Being able to add the black colors to the white is critical.
- Jacob Berkowitz flagged up the standard and mentioned that although there is no standard duration of IRIS device deployment the period of deployment is typically designed to capture the wet portion of the growing season and that the maximum deployment should not exceed one annual wet-dry cycle.
- Jacob Berkowitz and Chelsea Duball noted that time of deployment and numeric threshold for FeS would need to be finalized as well as the depth requirements. Consensus has not been reached on this.
- Cory Owens noted an action to check NRCS’ IRIS tube technical note and decide if FeS should be considered for inclusion.
- Cory Owens noted an action to see who is interested in further work to update the standard to include FeS.

1:00 p.m.

Committee Updates—General Members

NRCS—Cory Owens, Aaron Miller, and Jennifer Smith

- The addition of Wassents to criteria 1 of the hydric soils list is on its way to the notice of changes to the Federal Register
- Delivery of the Advanced Hydric Soils Training is slated for the week of May 18, 2026, in New Mexico. Basic Hydric Soils Training is pending.
- Ecological site description work that incorporates consideration of hydric soils is ongoing.
- The NTCHS was reported in a late spring data call of committees and working groups that NRCS participates in.
- NRCS is planning on the 2026 NTCHS meeting to take place in Montana as the location was deferred this year. Montana is facing development pressures, and there are soils that are likely hydric but not meeting a current indicator.
- The use of Topologically Integrated Geographic Encoding and Referencing (TIGER) acres in lieu of Natural Resources Inventory (NRI) acres, which have been historically used to calculate the area and boundary of a major land resource area (MLRA), is being proposed. This would add consistency geospatially on the boundary of MLRAs.



Bureau of Land Management—Ron McCormick

- He expressed his and his coworkers' appreciation of the tools and references developed by the committee and uses these in their everyday work.

U.S. Forest Service—Dave D'Amore

- He elaborated more on the opportunities presented by looking at the Wet Soils Monitoring program.
- He continues to work with Nic Jelinski in Alaska on soil projects.
- The outcome of the USDA reorganization on his position is uncertain, and he is preparing for continued U.S. Forest Service coverage on the committee if he transitions.

U.S. Army Corps of Engineers—Jacob Berkowitz

- He has continued work on Cid soils and seasonally shifting chromas. This phenomenon is found throughout the slate belt.
- Aaron Miller mentioned that often soil survey crews are going to describe soils in the dry season, so NRCS descriptions will be biased to the dry state of the profile, when it is customary to collect the data.
- He is initiating work in Alaska, which continues to find instances of areas that meet the hydrophytic plant criteria but not a hydric soil indicator. They will be re-looking at F3 and other indicator options that are not currently available in Alaska.
 - This could be a parent material phenomenon.
 - Lenore Vasilas mentioned that depleted matrices formed above permafrost, and so A3 and A11 were issued as test indicators for Alaska, but nobody tested them, so they were removed.

Environmental Protection Agency—Chris Parker

- Streamflow Duration Assessment Methods are being finalized through a joint effort by U.S. Army Engineer Research and Development Center and Environmental Protection Agency. These will help classify streamflow duration, which could have impact on waters of the United States determinations.

2:00 p.m.

Committee Updates—Subject Matter Expert Members

Chelsea Duball, Utah State University

- She is working with Colby Moorberg on measuring color changes in redox features and matrices.
- She is implementing IRIS devices.
- She is working on an NRCS funded project assessing wetland soil health and dynamic soil properties in Michigan. This will help tailor dynamic soil property data collection to wet soil systems.



Richard Griffin, Prairie View A&M University

- He is participating in Collaborative Earth! He works on rewilding coastal forest wetland providing plant materials to landowners to expand riparian buffers and ecological services with the potential for carbon crediting.
- He is researching in-season wetlands on the east side of Texas.

Colby Moorberg, Kansas State University

- He discussed two posters showcasing current work:
 - Field Indicators of Hydric Soils Function as Intended in Interdunal Wetland in the Great Bend Sand Plains
 - A6—Organic bodies observed along with S5. IRIS tubes will be installed this spring.
 - Quantifying Changes in Soil Redox Feature Expression in Bison Wallows.
- He is looking at Kisiwa series, which is problematic. IRIS tubes will be installed this spring.

Michael Vepraskas, North Carolina State University

- He presented recent work on Using Hydrology and Soil Drainage Class to Evaluate Wetland Restoration Sites.

Barret Wessel, Michigan State University

- He is involved in the following Master of Science (MS) and PhD projects:
 - Colin Assenmacher's MS project on rusty crayfish invasion and soil properties may lead to a crayfish invasion interpretation.
 - Chris Baish's PhD on iron dynamics as a driver of glossic horizon formation and lessivage.
 - Bernie Frantz's MS project on carbon and bulk density in organic and limnic soils in Michigan.
 - Mason Rutgers' MS project on Michigan Sparta soil (Mollisol), plant communities as drivers of pedogenesis.
- He is working on other smaller projects on wild rice and micronutrients in sugar beet soils.
- He is involved with Midwest Climate Adaptation Science Center postdoc Abu Kibria's work on wetland restoration in the Midwest, currently working on reviewing case studies and restoration practices that practitioners are using in the field.

Ron Reuter, Oregon State University

- His proposed work in hydric in the Pacific Northwest includes:
 - Revitalize a Wet Soils Monitoring Program site here in Oregon 25 years on.
 - Adapting to effects of Emerald Ash Borer and alterations in climatic patterns.
 - Retrospective of the Wet Soil Monitoring Program.
 - Investigation of modern or relic iron and manganese.



- Application of IRIS tubes in the Pacific Northwest.
- Investigate burned watersheds with reworked riparian zones.
- Work to be done on tidal wetland soils.
- He is open to other ideas and has reached out to state and federal agencies.

2:30 p.m.

2026 Meeting

- Cory Owens noted the 2026 meeting will pick up where we left off planning in Montana. Colby Moorberg has proposed that the 2027 meeting location be in Kansas.