

Hydrologic Interpretations of Land and Soil (HILS)

Inaugural Workshop

Date June 2, 2016

Location University of Florida Plant Science Research Education Unit (Citra, FL)

Instructors L. Rex Ellis, PhD, CPSS
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About For many years FAESS and UF scientists have partnered to offer the Hydric Soils Workshop (faess.org/workshops/). That workshop series teaches environmental professionals to interpret the morphology of soils that occur in and around wetlands with the primary objective of identifying and delineating hydric from non-hydric soils. This is an important step in the wetland delineation that occurs prior to land development. The development of the uplands can also benefit from these soil interpretations. Accurate and, where possible, precise knowledge of groundwater saturation is important for the design of applications such as onsite sewage treatment and disposal systems, stormwater retention, and road construction. Environmental applications such as wetland creation, habitat restoration, and animal relocations also benefit from a detailed understanding of shallow groundwater hydrology. The HILS workshop provides methods for generating that knowledge using on-site observation and interpretation of soil morphology.

Topics covered in the HILS workshop are:

- Soil survey concepts and hydrologic information provided in NRCS publications (soil series, map units, drainage class, map scale)
- Principles of Florida geology with specific focus on both regional and local hydrology
- Availability and applicability of off-site landscape tools (e.g. GIS data and soil surveys)
- Long-term formation of soil features (soil horizons, extreme leaching, weathering)
- Short-term formation of soil features (redoximorphic features, erosion, anthropogenic disturbances, contemporary vs. relict)
- Rules for determining depth to Seasonal High Saturation

Agenda

07:30-08:00 Registration

08:00-08:30 Geology, Hydrology, and Landscapes of Florida (Harris)

08:30-09:00 Soil Formation and Morphology (Harris)

09:00-09:30 Off-Site Determination of Landscape Hydrology and Soil Drainage (Ellis)

09:30-10:00 On-Site Determination of Landscape Hydrology and Soil Drainage (Ellis)

10:00-10:30 Soil Indicators of Seasonal High Saturation

10:30-12:00 Field tour of soil pits at PSREU

12:00-13:00 Lunch and travel to Austin Cary Memorial Forest (ACMF)

13:00-16:45 Field exercises at ACMF

16:45-17:00 Review of field work, course summary, Q&A.

end of course

Rex Ellis, PhD, CPSS

Environmental Scientist V
St. Johns River Water Management District
Palatka, FL

Bio:

Rex Ellis is a Certified Professional Soil Scientist (CPSS) and holds a PhD in soil science from the University of Florida. From 2008 to 2013 Ellis served as a research assistant professor in the UF Soil and Water Science Department where he taught a graduate course in Hydric Soils and an undergraduate course in Soil Water Land Use. Ellis also taught numerous individual senior capstone courses with soil undergraduate students.

From 2008 to present Ellis has lead the Florida Land Judging Program, a joint FFA/4-H competitive event where over 50 schools form teams of students who observe and interpret soils in a county and state contest setting. Ellis served as the president for the Florida Association of Environmental Soil Scientists and is currently their webmaster. In 2013 Ellis founded EnREC (Environmental Research and Education Consultants, Inc) to pursue an independent education venture (soilschool.org) where soils information was taught to environmental professionals.

From 2014 to present, Ellis serves as an Environmental Scientist at the St. Johns River Water Management District. His current duties are primarily focused on sediment biogeochemistry and algal bloom modeling in the Indian River Lagoon with on-demand services in hydric soil identification for the consumptive use permitting program.

Ellis also initiated the HILS Technical Committee. Modeled after the National Technical Committee for Hydric Soils, the HILS Technical Committee will consist of industry scientists and soils professionals who will organize and guide the interpretation of soil hydrology in Florida. Ellis currently chairs the HILS Technical Committee.

Willie Harris, PhD

Professor of Soil Genesis and Morphology
Soil and Water Science Department, University of Florida
Gainesville, FL

Bio:

Willie Harris began his soil career at Virginia Tech, where he obtained a degree in agronomy and ultimately a Ph.D. in soil mineralogy in 1984. He worked in the interim between those degrees with the state health department, Virginia Soil Survey Program (Virginia Tech employee), and the Virginia Tech Soil Mineralogy lab. He joined the faculty of the University of Florida Soil and Water Science Department (then, Soil Science Department) in the Fall of 1984, specializing in soil genesis and mineralogy. His appointment has been 70-80% research and 20-30% teaching. He has taught courses in pedology, soil mineralogy, and soil judging, and co-taught a course in Hydric Soils.

Willie has conducted mineralogical and pedological research on weathering processes, mineral distributions as related to weathering and soil genesis, linkage between podzolization and soil hydrology in Spodosols of the SE USA, paragenesis of naturally-phosphatic soils, and irreversible dehydration of hydroxy-interlayered vermiculite. Recent research activities have emphasized applied environmental issues involving phosphorus, including leaching risk for sandy karst soils and the long-term stability of phosphate in dairy-manure-impacted sandy soils. In addition, he has worked collaboratively on research pertaining to (i) phosphorus sorption by drinking water treatment residuals, (ii) lead transformations in contaminated soils, (iii) efficacy and consequence of protocols to stabilize lead using phosphates, (iv) fluidized-bed recovery of phosphate from flushed dairy manure, (v) mineralogical nature of Okeechobee sediment as it relates to turbidity, and (vi) forms of particulate phosphorus in water moving from the Everglades agricultural area.

Willie's initial ideas and insights about coastal plain soil genetic processes stemmed from his access to abundant, well-organized Florida soil characterization, the product of a vibrant soil survey program that was underway when he came to the state. He made use of the data and the archived soil horizon samples to test ideas. Hence, he is indebted to the soil professionals who contributed to the program.