

Increasing Access to High Quality, Affordable Wetland Training for On-the-Ground Wetland Professionals in the United States:

Putting together the Puzzle and Hitting an Accidental Home Run

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On-the-ground wetland professionals, whether working for state and tribal wetland programs or in other capacities, are faced with a diverse and complicated set of tasks in their day-to-day work. Not only do they need to understand wetland science, monitoring and assessment, restoration, regulatory and legal information, and policy, they need to acquire leadership, management, research and evaluation skills.

Whether or not they receive a rigorous training on these topics as part of their formal education, they all remain challenged to stay abreast of the latest science and technologies to allow them to do their jobs to the best of their ability. This reality means that ongoing training should be a cornerstone of wetland programs, providing staff with access to continuing education opportunities and qualified trainers. Additionally, with wetland professionals turning over in many states due to retirements, budget cuts and reorganization, the need for training is pressing.



Massachusetts Audubon Vernal Pool Creation Training
Photo Credit: Jeanne Christie

In 2015, ASWM embarked on a new project to improve access to high quality wetland training for states, tribes and other wetland professionals across the United States. This project was designed to explore and articulate training priorities that will increase the capacity of on-the-ground state and tribal wetland professionals to carry out their day-to-day work implementing wetland programs. The project was designed to identify tools and techniques to improve decision making and ultimately enhance the protection and management of wetlands. This article shares how ASWM's wetland training project has developed, current findings, some of the new tools and opportunities the project has created, and the story of an unexpected major success that has arisen from the project. The article will conclude with a look to the future and what it holds for ASWM in terms of supporting ongoing efforts to improve access to high quality, low cost wetland training.

Let Us Begin at the Beginning: A Growing Need for Access to Wetland-focused Continuing Education

Over the years, ASWM has been gathering information about training needs. This has informed the development of ASWM workshops, webinars, and presentations. ASWM consistently heard from states that finding the resources to address the many existing training needs was always a challenge. In order to get at the root of training quality and delivery needs, ASWM decided to undertake a more comprehensive examination of wetland training. This decision was based on several observations:

- Access to high quality, affordable, accessible training opportunities is limited.
- Given rapid advancements in wetland science and limited training budgets and workloads, it can be a challenge for states and tribes and also for all wetland professionals to attain and maintain knowledge of cutting edge science, law and policy and to obtain continuing education in the use of current tools and technology.
- Due to budget constraints and internal travel policies, state and tribal field staff members are even less likely than managers to be afforded the opportunity to participate in off-site training and conferences, even though this knowledge is essential to making decisions on the front line and improving the management and protection of wetlands.
- State and tribal wetland staff members often lack access to scientific journals and other resources required to study independently.
- The characteristics of high quality training are well-established in the research literature and could offer insights to improve wetland training.
- Evaluating different types of wetland training could offer insights into which offerings are best suited to meet the various needs of wetland professionals.
- Piloting innovative training options would provide an opportunity to determine how new technologies could be harnessed to fill training gaps.



Budgets for conference travel are limited for many states and tribes
Photo Credit: Jeanne Christie

Over the last two years, ASWM has actively worked with funding partners to secure the support needed to explore training needs and improve access to high quality training for wetland professionals. ASWM was awarded a US EPA Wetland Program Development Grant for the majority of ASWM's work on this topic, but has also received training support from the US Fish and Wildlife Service, the McKnight Foundation, and the Switzer Foundation.

To ensure representation of many different perspectives, program types and regions across the U.S., ASWM formed a national project workgroup to guide this new effort. The workgroup is comprised of state wetland program managers, national and regional EPA staff, and nonprofit representatives including the Society of Wetland Scientists.

Identifying Training Needs

For this project, ASWM conducted a significant needs assessment connecting the dots between findings from a range of major ASWM studies and discussions with wetland program managers and partners on training needs. The need for improved training on a range of topics was derived from ASWM's State Wetland Program Status and Trends Report, Wetland Restoration Project, study on stream identification, delineation and jurisdiction, and through ASWM's ongoing workshop and training activities. Partners have shared similar findings as well. According to the Society of Wetland Scientists Professional Certification Program Board of Directors, the absence of affordable training opportunities is a source of concern for many wetland professionals. A list of training needs ([Table 1](#)) was developed, circulated and revised to become a guide for ASWM's priority setting. This list is not all-inclusive, but provides a roadmap of needs that have emerged from investigation and discussion with our key stakeholders over the last several years.



Field trip to view mitigation sites in Montana
Photo Credit: Jeanne Christie



Basic Training is needed on Hydrology, Soils and Vegetation;
Photo Courtesy: [The Watershed Company](#)

Table 1. Summary of Priority Training Needs for Wetland Professionals

A. Regulatory Training
1. Training on strategies to strengthen §401 Water Quality Certification Programs
2. Orientation to the Clean Water Act and the Section §404 Program
3. Wetland basics – hydrology, soils, plants, biology, hydro-bio connections, etc.
4. Training on wetland-specific regulatory topics (especially for new staff), such as what is a wetland regulatory program, how to review a permit, how to integrate requirements into permits; how to develop, implement and evaluate mitigation requirements; and how to evaluate outcomes.
Additional regulatory training priorities include: How to review a restoration permit application; Training on in lieu fee programs and mitigation bank development/financial and legal planning; Training on energy project wetland impacts and permitting considerations; and How to use functional uplift measures in mitigation assessment
B. Monitoring and Assessment Training
1. Training on targeted monitoring and assessment tools
2. Guidance on how to adapt targeted monitoring and assessment tools to individual states (RAMs, IBIs)
3. How to effectively use monitoring and assessment tools to measure success (performance)
Additional monitoring and assessment training priorities include: Mapping and other technology; QA/QC for wetland mapping; Training on how and when to use hydrogeomorphic assessments (HGM); Measuring functional uplift; How to target data collection to support program goals; and Field-based training to see and test on real-world examples
C. Wetland Water Quality Standards Training
1. Training for states that rely on 401 certifications on how wetland water quality standards can strengthen their protection of wetlands
2. What makes water quality standards for wetlands unique from other standards
3. Sharing of models, templates and lessons learned
D. Wetland Restoration Training for Voluntary and/or Regulatory (Mitigation) Restoration
1. Training on components of restoration success and how to measure success (performance)
2. How to incorporate wetland restoration into larger watershed planning
3. How to connect wetland restoration with floodplain and hazard management
Additional monitoring and assessment training priorities include: How to develop performance standards for restoration projects; Training on restoration techniques; How to prioritize restoration site selection; How to access and use comprehensive GIS data layers for restoration planning and design; and Training on how to incorporate applicable recommendations to other (non-state) voluntary wetland restoration planning and implementation efforts
E. Other Training Topics
1. Training on how to successfully use and develop tools to assist with communications
2. Training on specific technical tools and topics (e.g. scenario based planning, adaptation planning processes; ecosystem services valuation)
3. Training on EPA's four core elements and how to strengthen them (planning and implementation)
4. Trainings that further explore the impacts to wetlands from climate change and/or the value of wetlands to ameliorate some of the impacts of climate change
5. Training on leadership, strategic planning, supervision, facilitation and project management

Making Sure ASWM Does Not Recreate the Wheel

While ASWM is interested in helping create or facilitate the creation of high quality training to fill in the gaps, it would be inefficient to recreate the wheel where there are existing high quality trainings that are accessible and affordable to state wetland professionals. One of the first tasks undertaken by ASWM was to identify existing training offerings and to compile a matrix of these offerings. ASWM has identified over 350 wetland training offerings and more than 100 entities that regularly deliver wetland training in various locations across the United States.

ASWM's new matrix provides available information on training offerings listed by:

- Name of training entity;
- Type of training;
- Delivery mechanism (classroom, online, fieldwork, etc.);
- Level of education (undergraduate, graduate, professional/continuing);
- Geographic location;
- Cost; and
- Whether or not it contributes towards certification requirements.

This matrix will be posted on the ASWM website by the end of the project and will be updated on a periodic basis. The focus of the matrix is on connecting those seeking trainings with information about who is offering what. Training opportunities continue to also be posted on ASWM's website calendar.

What is "High Quality" Training and How Do We Know It When We See It?

Part of ASWM's effort to connect wetland professionals with training opportunities was to determine the characteristics of "high quality" training. To explore this and identify the characteristics, ASWM staff (in collaboration with the national project workgroup) conducted a review of peer-reviewed and training industry literature on training quality. Working with states and the national workgroup, ASWM gathered additional information. The project has produced a list of key characteristics to guide practitioners developing training activities as well as wetland professionals seeking to participate in high quality learning opportunities ([Table 2](#)).

Key characteristics address elements, ranging from quality of teaching staff and a foundation based on sound science to training approaches and evaluation. ASWM encourages wetland professionals to evaluate training alternatives, including those offered in the future by ASWM, based on these characteristics, by examining whether specific elements are in place and encouraging those who develop training to adopt them. A complete listing of characteristics of high quality wetland training and individual measures will be published in ASWM's final project report.



Massachusetts Audubon Vernal Pool Training
Photo Credit: Jeanne Christie

Table 2. Characteristics of High Quality Wetland Training

Is based on thorough assessment of target audience's training needs	Limits participant numbers to allow for interaction appropriate to the training type	Provides opportunities for participants to ask questions
Is taught by high quality trainer(s)	Includes a diversity of participants and embraces different learning styles	Provides opportunities for participants to express personal perspectives
Identifies minimum skill-level required	Emphasizes how content could impact the work of participants	Provides opportunities for participants to interact with each other
Is based on sound science	Provides examples of the content/practices in use	Allows participants opportunities throughout to provide feedback to the trainer
Provides learning objectives	Includes experiential component, as appropriate for the training type	Provides opportunities to reflect on what was learned
Circulates a description of the training, speakers and agenda prior to the training activity	Provides opportunities for participants to share their own experiences	Includes evaluation and is accompanied by support resources
Is focused and well-paced; Has clear direction	Employs humor/fun in teaching	Has before-during-after strategies to ensure training is transferable directly to job
Is scheduled at convenient times and locations; regular schedule is provided for multi-session trainings	Utilizes engaging visuals	Provides a supportive post-training environment

Evaluating Different Training Types: Are All Training Types Created Equal?

Another question is which types of training are preferred by wetland professionals? To conduct this analysis, ASWM and the national workgroup is utilizing research evaluation measures for a variety of training venues. By the end of the project, ASWM will have assessed a dedicated conference, a workshop at a conference, webinar delivery, online training delivery, and a symposium (as part of an existing wetland professional conference) to examine measures of quality, similarities, differences, priorities and preferences.

While initial findings indicate that the majority of wetland professionals prefer participating in onsite training workshops, their ability to participate in this kind of training is very limited. Training



Training may be enhanced by inclusion of an experiential learning field component; Photo Credit: USACE

participants have indicated that while they PREFER face-to-face onsite training, they are far more LIKELY to participate in online training opportunities. Primary factors identified to date appear to be lack of training opportunities, timing (trainings are not offered when they need it), and lack of funding. Measures of quality also vary depending on the capacity of different types of trainings to provide characteristics of high quality training. Findings from this comparative evaluation will be published in ASWM's final project report.

What are the Basic Knowledge and Skills a Wetland Professional Needs to Be Competitive for Wetland Positions Today?

Training should be designed to fill a need (i.e. answer the question “to what end?”). To answer this question, ASWM is working with state wetland managers, academics and private consulting firm representatives to develop a scope of key training and skills that wetland professionals often need to meet the responsibilities of their positions.

- What knowledge is essential, preferred, and the gold standard for different positions?
- What skills are needed? Applicable to what areas?
- What experience is needed to be effective in different positions?
- What skills are currently lacking in the background of many job applicants?
- What training do managers most wish applicants had?
- How can agencies, nonprofits, academic institutions and others support training wetland professionals to be effective in positions they seek to fill?



Wetland Professionals need a wide range of knowledge and experience to perform their work effectively; Photo credit: DNREC

Over time, ASWM seeks to develop and build a list of key skills to help trainers determine necessary elements for trainings at every level. This information will be relevant to students, wetland professionals and public and private organizations hiring wetland professionals.

Informing Higher Education about Opportunities to Strengthen Offerings

Through the fall and winter, ASWM will be working with wetland academics to review and refine a white paper that will be shared with targeted higher education institutions by the end of the project period.

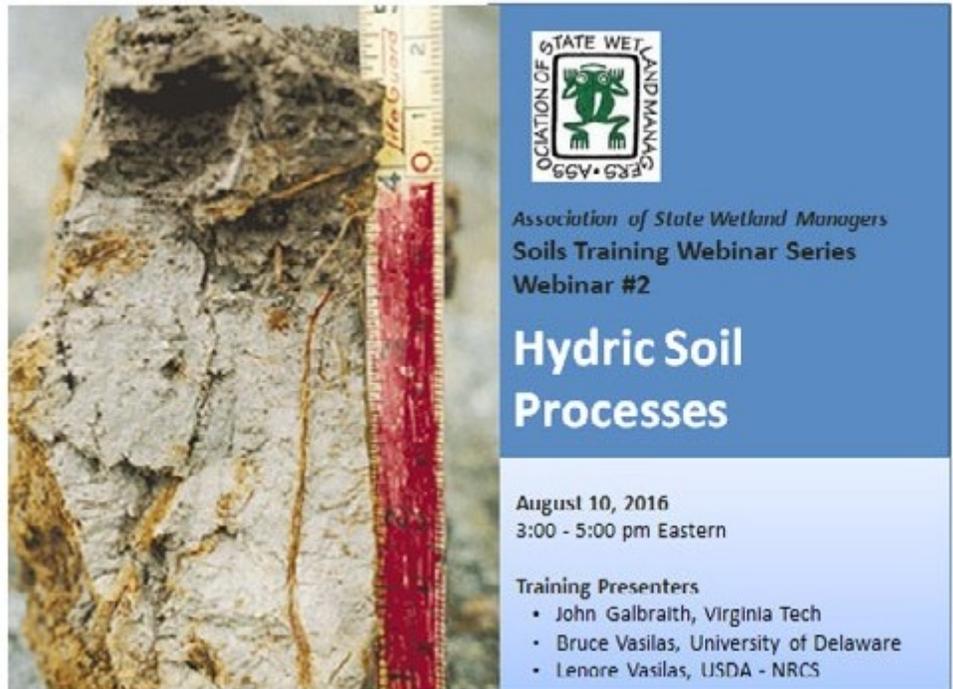


Some higher education institutions offer well-developed training programs for students and professionals; Photo credit: Rutgers University

The paper will share findings to date about the types of academic credentials that are desired to help prepare wetland professionals to enter the workforce and expand their skills over time. This white paper will describe how to improve offerings at the undergraduate, graduate and continuing education levels in ways that will both encourage students to enter degree/certificate or continuing education programs, and also provide them with the breadth of knowledge and training so they can enter the workforce ready to take on positions in state/tribal wetland programs or other wetland-related professions.

Filling in the Gaps and Hitting it Out of the Park: ASWM's Hydric Soils Training Series

ASWM has found through its needs assessment efforts that access, time and resources are huge barriers that keep wetland professionals from getting the training they need. With the maturing of technology and best practices for the use of online training, ASWM included the development of pilot online training modules as part of the project. ASWM was fortunate to be able to recruit five nationally-respected hydric soils trainers who were willing to contribute their time, knowledge and skills to develop and deliver four webinars on hydric soils. They covered the basics of hydric soils, soil texture and colors, landscapes and landforms and using hydric soils information in the field to inform decision-making. These webinars were an unexpected success. Each webinar garnered around a thousand registrations because according to participants, there were no other training opportunities on this topic.



ASWM's Hydric Soils Webinar Training Series has exceeded ASWM's expectations; Image credit: ASWM

Meeting the Need for Anytime/Anywhere Access: ASWM's Pilot Online Training Modules

The hydric soils webinar training series was designed to serve as a tool to record live presentations for post-processing into online training modules. While ASWM hoped it could secure a significant live audience to provide feedback about the content and presentations, more so the live webinars would also serve as a virtual recording studio and a way to beta test a new approach to measuring knowledge acquisition using a quiz tool. Each webinar had three presentations, which will be processed into three individual modules. Bookend information is being added before and after each presentation to complete each module "package." Upon completion of a quiz, participants receive a certificate of completion that can be used to apply to various accrediting institutions for continuing education credits. This project has required ASWM to identify delivery tools and systems, determine how to support and coordinate online offerings and evaluate knowledge acquisition in an entirely remote interaction. Additionally, ASWM has been working to pilot different automated certificate generating options in order to improve the efficiency with which these services can be delivered to participants.



Incorporating Measures of Knowledge Acquisition

Previously, ASWM has provided Certificates of Participation for participants in the live webinar only. ASWM is able to track participation during webinars using the GoToWebinar software. However, ASWM has not been able to track use of archived webinars by individuals and thus has not awarded certificates for after-the-event viewing. The hydric soils training project is beta testing the development of online modules that incorporate an assessment of knowledge acquisition as a way to evaluate whether or not a participant qualifies for a certificate of completion for participation in non-live training. The hydric

soils training team has worked to develop and test a series of questions. Pre-testing the quiz questions has proved valuable, providing insights into question structure and the capacity of participants to utilize information learned in the online setting. ASWM's online module quizzes will be structured to incorporate this learning and will allow ASWM to provide documentation of completion to individual participants in an entirely remote training environment.

Understanding What Online Trainings Can and Cannot Offer: Providing Guidance to Secure On-the-Ground Training to Supplement Online Learning

While these online options have been applauded for providing high quality basic training in a highly accessible format at no cost to participants, ASWM acknowledges that webinars and online modules cannot replace some key elements provided through on-the-ground training. ASWM has been working with the soils trainers and its national Wetland Training Workgroup to develop supplemental guidance for individuals seeking additional field training on how to apply the concepts presented in the webinars in the real world.

A list of recommended classroom and field-based exercises to supplement ASWM's distance learning offerings is being developed. These include how to prepare reference information about a wetland site before going into the field, how to assess soil plots in various soil types and circumstances, and how to apply this information to management decisions. This guidance document will be available to agencies, organizations and businesses seeking to expand employee skills in hydric soils, with proposed options for recruiting trainers to run half-day, whole day and multi-day training options. A half-day field exercise is being piloted and evaluated this November as part of a state monitoring workshop in New Jersey. Findings from this training effort will be included in ASWM's final project report. It is expected that this guidance information will be refined over time as additional lessons are learned about how to improve training for wetland professionals working on hydric soils.



On-the-Ground Training Offers Unique Learning Opportunities
Photo Credit: Jeanne Christie

Finding Sustainable Solutions to Offering Online Modules

As part of this exploratory process, it has become clear that significant time and other resources are required to sustain online training efforts. ASWM's recorded hydric soils webinars will remain available to all at no charge. However, to offset the cost to maintain the training components, ASWM will be charging a small fee to process certificates of completion for those who are not ASWM members. As a benefit of membership, ASWM members will receive certificates at NO CHARGE for any completed module or webinar.

What the Future Holds

As ASWM has explored each element of this project, internal practices have changed to ensure lessons learned are incorporated --- about needs, preferences, characteristics of high quality training, and technical options for delivering and evaluating wetland training. ASWM is now better situated to select training topics that are needed, format training to incorporate best practices and use tools that work for a wide range of people with varying skill levels. While the need remains for major investments in training resources, ASWM's project has made a contribution to this effort by exploring the fundamental underpinnings this work should build upon and testing new tools and guidance that can serve as a springboard from which future efforts can launch. Plans are in the works to develop an online training series on strengthening §401 certification in 2017. ASWM's commitment to creating and strengthening training opportunities for wetland professionals will continue as part of the organization's mission.



Bombay Hook National Wildlife Refuge;
Photo Credit: Tim Williams, USFWS

We welcome ideas and suggestions on all elements of this project and our efforts going into the future. Please send comments and questions to project lead Brenda Zollitsch, ASWM Policy Analyst via email to brenda@aswm.org.