

**ASWM Outreach and Training for FGDC
Wetland Mapping Standard
Kick-off Meeting
April 29, 2010**

Jeanne Christie
Association of State Wetland
Managers

FGDC Wetland Mapping Standard

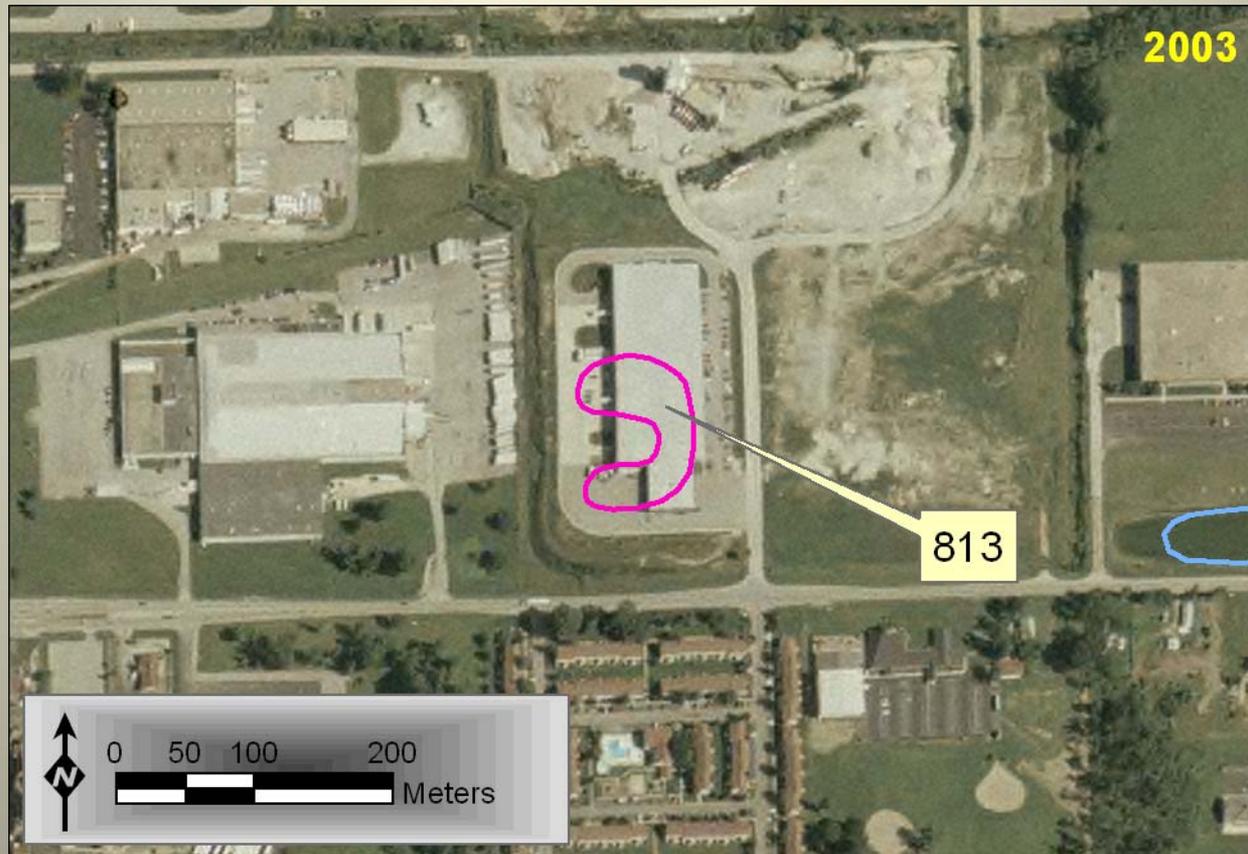
Wetland Maps are Essential to...

- Get a complete and accurate picture of wetland resources in the US
- Calculate (not estimate) wetland loss and gain
- See wetland geospatial distribution
- Complete the watershed picture on the National Map – wetlands currently missing
- Rapanos decision



FGDC Wetland Mapping Standard

Wetlands change over time...



FGDC Wetland Mapping Standard

A Wetland Mapping Standard:

- Streamlines mapping efforts for greater consistency and efficiency
- Enables any entity to map using the standard and construct or update the National Wetlands Inventory (NWI) Geodatabase and the National Map
- Facilitates consistent mapping layers that can be used across geopolitical and watershed boundaries

FGDC Wetland Mapping Standard

- Previously a Federal Geographic Data Committee (FGDC) Wetland Classification Standard existed, but there was no standard addressing its use in mapping...hence this "new" standard
- U.S. Fish & Wildlife Service (FWS) will never have the resources to undertake wetland mapping and updating alone, especially on a continual basis – a partnership (Fed, State, Tribal, Local and others) can accomplish this

FGDC Wetland Mapping Standard

- New FGDC Standard is based on existing FWS standards
- Provides alignment/coordination with other pertinent standards: NHD, NOAA classifications, FGDC classification standards, etc.
- Enables Development and Revision of Wetland Maps by many partners
- Adopted July of 2009



Contents of the Wetland Mapping Standard

- Background
- Objective
- Scope/Exemptions
- Applicability
- FGDC Standards and Other Related Practices
- Standard Development Procedures and Representation
- Maintenance Authority
- FGDC Requirements and Quality Components:
 - Source Imagery
 - Base Imagery
 - Classification
 - Accuracy
 - TMU (Targeted Mapping Unit) and Producer's Accuracy
 - Horizontal Accuracy
 - Data Verification
 - Logical Consistency
 - Edge Matching
 - Attribute Validity
 - Datum and Projection
 - Metadata
 - FWS Coordination and Quality Control
- References
- Appendix A. Classification Keys - Normative
- Appendix B. LLWW Attributes - Informative
- Appendix C. Definitions – Informative
- Tables
 - Spatial Resolution Requirements of Source Imagery
 - Spatial Resolution Requirements of Base Imagery
 - Classification Levels Required Based on Habitat Type
 - TMU and Producer Accuracy Requirements
 - Horizontal RMSE Accuracy Requirements

ASWM Outreach and Training for FGDC Wetland Mapping Standard

The purpose of this project is to carry out key recommendations included in the Implementation Plan for the FGDC Wetland Mapping Standard adopted in July of 2009.

There are two tasks:

First, ASWM will develop online and instructor-lead training materials on the proposed standard that will be incorporated into U.S. Fish and Wildlife Service training and available to local, tribal, and state government and other individuals and groups.

The training materials will enable these parties to adopt the standard and prepare data for submission to the U.S. Fish and Wildlife Service National Wetlands Inventory program so that it can be added to the Wetlands Layer of the National Spatial Data Infrastructure and the national map.

ASWM Outreach and Training for FGDC Wetland Mapping Standard

Second, the Implementation Plan describes the need for accurate and up-to-date information as well as innovation and improvements in wetland mapping techniques.

To facilitate ongoing dialogue among experts a Wetland Mapping Consortium has been created and is jointly hosted by Virginia Tech University in Blacksburg, Virginia and ASWM.

FGDC Wetland Mapping Standard

Important Documents

- New National Wetland Mapping Standard was endorsed by FGDC in 2009 ([http://www.fgdc.gov/standards/projects/FGDC-standards-projects/wetlands-mapping/2009-08%20FGDC%20Wetlands%20Mapping%20Standard final.pdf](http://www.fgdc.gov/standards/projects/FGDC-standards-projects/wetlands-mapping/2009-08%20FGDC%20Wetlands%20Mapping%20Standard%20Standard%20final.pdf))
- New *“Data Collection Requirements and Procedures for Mapping Wetland, Deepwater and Related Habitats of the United States”* published in 2009 ([http://www.fws.gov/wetlands/ documents/gNSDI/DataCollectionRequirementsProcedures.pdf](http://www.fws.gov/wetlands/documents/gNSDI/DataCollectionRequirementsProcedures.pdf))
- Implementation Plan for the FGDC Wetlands Mapping Standard Version ([http://www.fws.gov/wetlands/ documents/gNSDI/DRAFTImplementationPlanFGDCWetlandsMappingStandard.pdf](http://www.fws.gov/wetlands/documents/gNSDI/DRAFTImplementationPlanFGDCWetlandsMappingStandard.pdf))

ASWM Outreach and Training for FGDC Wetland Mapping Standard

As recommended in the Implementation Plan, training materials will be developed to target three primary audiences: executive and supervisory personnel, GIS technicians, and wetland scientists.

Some of the materials will be developed for online delivery to be incorporated into the overall package of wetland mapping training materials currently under development within the U.S. Fish and Wildlife Service.

Additional materials will be developed for instructor-led training programs which could be delivered in regional training sessions that may be hosted by federal agencies, states, and local government or as part of conferences and workshops dealing with wetlands, mapping and related topics.

Interactive web-based online information modules will be developed using appropriate software and industry standards.

ASWM will develop wetland mapping standard training materials ready for pilot testing including the following subtasks:

- Draft training modules
- Organize the mapping standard draft training modules into smaller, cohesive sub-modules.
- Develop an index for the course and indexes for each separate module and sub-module and incorporate into PPT.
- Develop and incorporate learning objectives into the beginning of each module and sub-module.
- Develop the tests for the end of each module and sub-module.
- Identify gaps in the technical instruction provided that need to be developed by ASWM or by FWS; develop needed additional instruction within the technical capability of ASWM; coordinate and incorporate additional input by FWS.
- Identify screen-captures, images, or interactive clips that ASWM can provide or that need to be provided by FWS to demonstrate a concept.
- Edit the draft text for spelling, grammar, continuity, clarity, redundancy, and appropriate knowledge level; add additional explanation as needed; delete extraneous information; and identify any cross-links needed among the modules (for example, where a concept is explained on another slide or another module).
- Develop list of definitions for technical terms and list of abbreviations that will serve as pop-ups.
- Provide the revised modules, indices, and lists for review; and incorporate changes.



Training Example: What is a Wetland?



Klamath NWR, Oregon



Humboldt NWR, California



Learning Objectives

- Know what a wetland is
- Understand the functions of wetlands
- Know the three parameters of a wetland
- Know the definition of a wetland
- Be able to use the National List of Plant Species that Occur in Wetlands
- Be able to identify hydric soil indicators
- Be able to identify hydrology indicators



What is a wetland?



There are wetlands associated with desert playas, washes, and oases.

Every landscape has wetlands. They form where rainfall or runoff accumulates, or where groundwater saturates the topsoil.



Mountains and valleys have wet meadows, bogs, fens, sag ponds, vernal pools, and other kinds of wetlands along the shores of lakes, reservoirs, and ponds and on floodplains.



Coastal landscapes have tidal flats and tidal marshes.



Many parks, nature preserves, agricultural lands, and private lands have wetlands that are carefully managed for waterfowl and other wildlife.

****FIND PHOTO**

Wetlands have been constructed to treat wastewater and prevent shorelines from eroding.

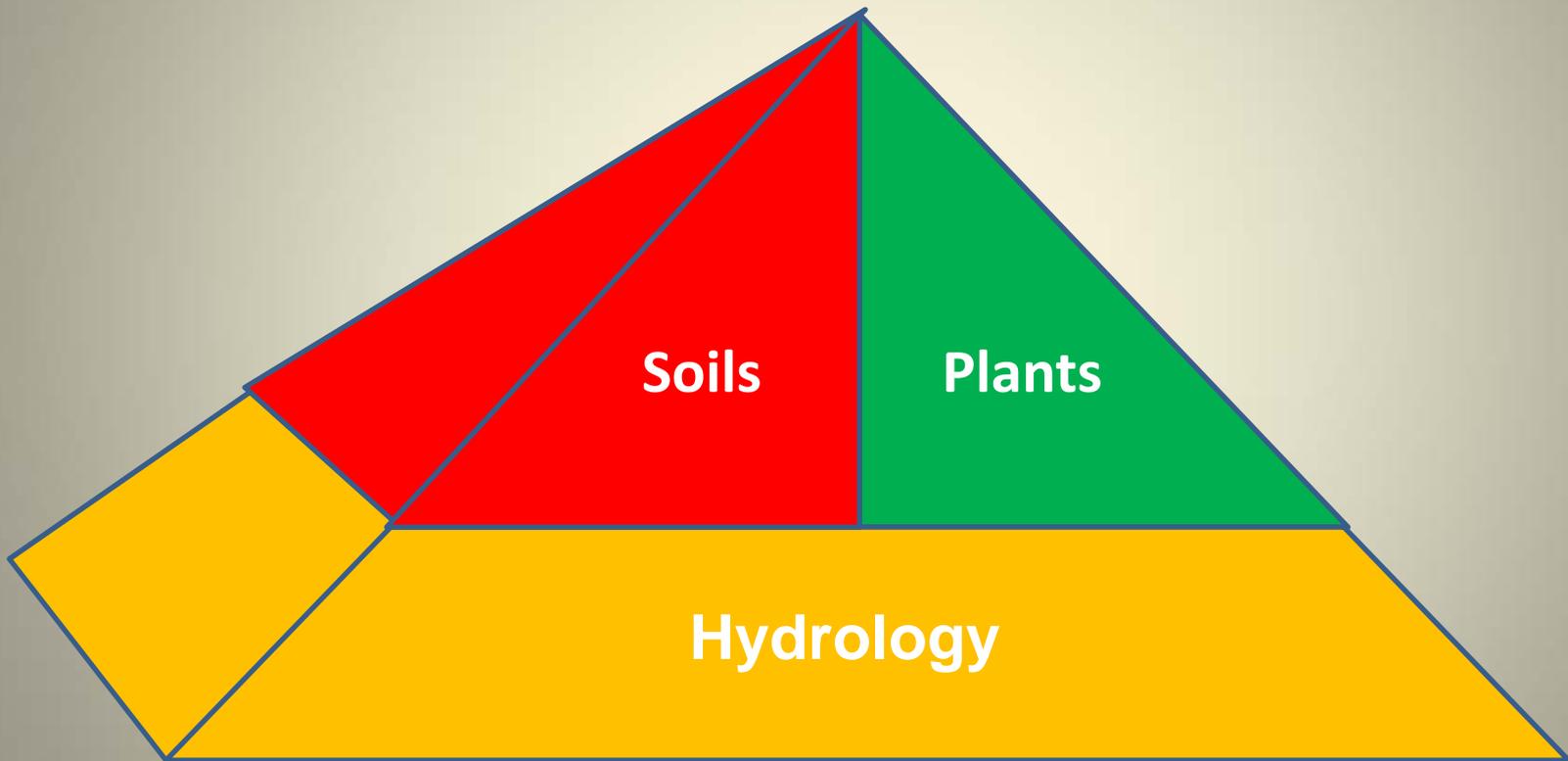


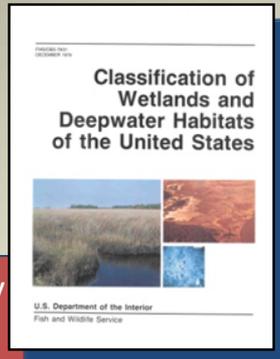
Why are Wetlands Important?

- store surface water
- control pollution and flooding
- replenish aquifers
- promote nutrient cycling
- protect shorelines
- maintain natural communities of plants and animals
- provide opportunities for education and recreation.
- To help regulate climate



Ecological Characteristics





The definition of wetlands used by the National Wetlands Inventory for mapping wetlands is taken from the National Classification Standard approved by the Federal Geographic Data Committee, entitled “Classification of Wetlands and Deepwater Habitats of the United States,” by Lewis M. Cowardin,... (Cowardin et al.).

Wetland Definition for Mapping

“Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes:

National List of Plant Species that Occur in Wetlands

NRCS Hydric Soil Lists & Hydric Soil Criteria

- 1) at least periodically, the land supports predominantly **hydrophytes**;
- 2) the substrate is predominantly undrained **hydric soil**; and
- 3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.”



Three Wetland Parameters

HYDROLOGY

Area is inundated or saturated to the surface for at least 5% of the growing season in most years.

HYDRIC SOILS

NRCS County Hydric Soil Lists and Hydric Soil Indicators.

HYDROPHYTIC VEGETATION

More than 50 percent of the dominant species are obligate (OBL), facultative wet (FACW), or facultative (FAC) on list of plant species that occur in wetlands.

What is the Wetland Mapping Consortium (WMC)?

- The WMC is an interdisciplinary group of wetland scientists and wetland professionals interested in mapping and monitoring wetlands.
- Group members use digital data with remotely sensed products to improve the science, inventory and manage wetland resources.

Goal of Wetland Mapping Consortium

- *Improve the management of wetland resources through enhanced wetland mapping and monitoring and dissemination of this information to natural resource managers.*

Implementation Role of Wetland Mapping Consortium

- Fostering collaborations

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- Providing on-going support for implementing new technologies

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- Adding discussion group capabilities to address technical challenges

Implementation Role of Wetland Mapping Consortium

- Fostering collaborations
- Providing on-going support for implementing new technologies
- Adding discussion group capabilities to address technical challenges
- Developing new applications to meet the needs of decision makers



Association of State Wetland Managers, Inc.



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If you are unable to find the information you are looking for, please search the ASWM website using Google below.

Search www.aswm.org
 Search WWW

NEWS OF INTEREST

Updated 3/16/09

EPA Wetlands Division launches State and Tribal Wetland Program Development webpage with Core Elements Framework

EPA's Wetlands Division launched the Enhancing State and Tribal Wetlands Program (ESTP) initiative in 2008. The ESTP is a sustained effort to provide enhanced EPA support to state and tribal wetland programs, with a focus on programs that are actively working to build their capabilities. The Wetlands Core Elements Framework is the foundation of this effort and is now available at <http://www.epa.gov/owow/wetlands/initiative/estp.html> ASWM and a group of states and tribes worked with EPA to develop the Core Elements Framework (CEF) which focuses on four fundamental aspects of state/tribal wetland programs: Monitoring and Assessment, Regulation, Voluntary Restoration and Protection and Water Quality Standards for Wetlands. The CEF provides detailed information on each of the core elements including a comprehensive menu of program objectives, actions and milestones that states/tribes can choose from to chart their own course for program development. The webpage includes a brief description of the ESTP initiative, the final Core Elements Framework, and links to related information. The CEF is designed primarily as a resource for states and tribes and can serve as a foundation for working with EPA on wetland program development. In the future, Wetland Program Development Grants will be linked to program building actions in the CEF. Updates will on potential changes to the grants will be provided on the website starting in Spring 2009.

ASWM launches new webpage on the Stimulus Bill 2009, green infrastructure



Stimulus Bill 2009

The stimulus bill was signed on February 17 th, but the federal agencies in many cases have been working for months to get ready to spend a great deal of money in a very short period of time. Some agencies such as the Federal Highways Administration posted information about spending stimulus monies even before the bill was signed. Agencies are rapidly finalizing and posting additional details on the criteria that will be used to fund "shovel ready" projects. ASWM has assembled information that identifies opportunities and challenges with respect to funding projects that will have an impact on wetlands and other water resources. This includes funding that can be used for

NEWS

Water Subcommittee Approves Major Bill to Invest in Water Infrastructure [\[Press Release\]](#)

Calling All Wetland Specialists and Other Interested Parties - Seeking Observations on Growing Season [E-mail: [Ralph_Tiner](mailto:Ralph_Tiner@fws.gov) Ralph_Tiner@fws.gov]

NEW ASWM WEBPAGES

[Local Land Trusts with Wetland Programs](#)

[Wetland Mapping](#)

[Floodplains](#)

[Programmatic General Permits](#)

[Wetland Assessment](#)

[Wetlands and Farm Programs](#)

[State Wetland Delineator Certification Programs](#)

[How to Hire the Right Wetlands Consultant](#)

[How to Design a Wetlands](#)

ASWM
Web Site

- Wetland
Mapping

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ASWM: Wetland Mapping - Mozilla Firefox

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http://www.aswm.org/swp/mapping/index.htm



State Wetland Programs

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Wetland Mapping

ASWM News — Media Coverage — State Programs — Publications/Reports/ Research
Links of Interest — Job and Research Opportunities — Mapping Resources
(This page last updated on 2/2/09.)

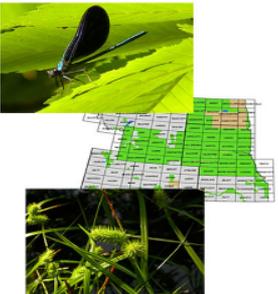
ASWM Partners to Create Wetland Mapping Consortium (WMC)



Fall 2008: The WMC is an interdisciplinary group of wetland scientists and managers interested in mapping and monitoring wetlands with remotely sensed images and/or using the resultant products to best manage wetland resources. For more information on this developing group, see http://aswm.org/swp/mapping/wetland_mapping_consortium_010509.pdf

ASWM Feature Article

Wetland Mapping – From Mylar to Mosaics and Beyond, by Leah Stetson, ASWM



Mapping has indeed come a long way from the introduction of paper maps that have been used for centuries. Geographic information systems (GIS) maps have been around since the 1960s, but primarily available to the federal government and to a limited number of groups who had the technical expertise to apply it. Since the 1990s, however, a wider range of organizations, including state wetland programs, have been equipped with the technology, funding and the basic data to begin mapping natural resources. [\[Read more\]](#)

[Back to Top](#)

Media Coverage

Scientists updating state wetland maps

Wetland Mapping page

WMC Mission statement



WMC Web Site

Wetland Mapping Consortium - Mozilla Firefox

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http://clc.cses.vt.edu/WMC/

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(17 unread) Yahoo! Mail, jmg5355 AirSet - CSES-GIS Week Planner https://webmail.v...0361266883024054 Wetland Mapping Consortium

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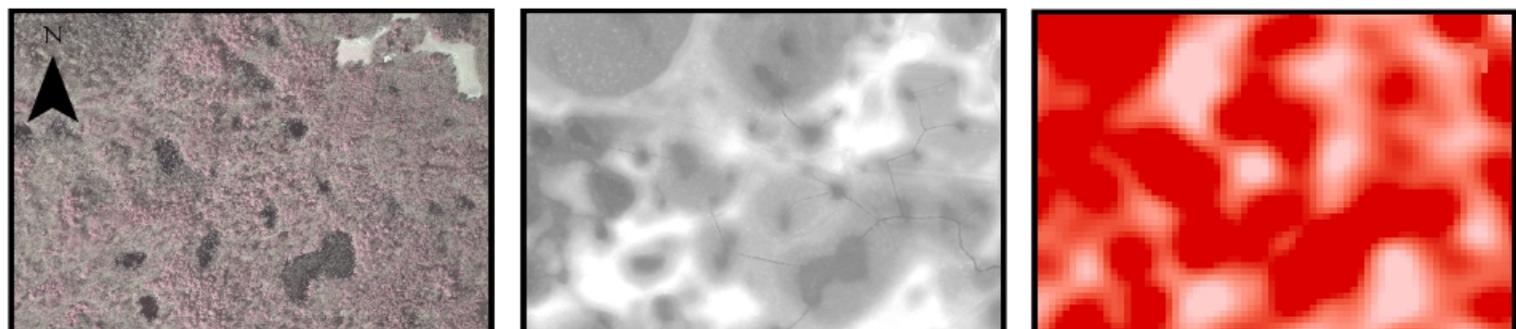
Wetland Mapping Consortium

[Scholar Web Site](#) for Communication Among Registered Users*

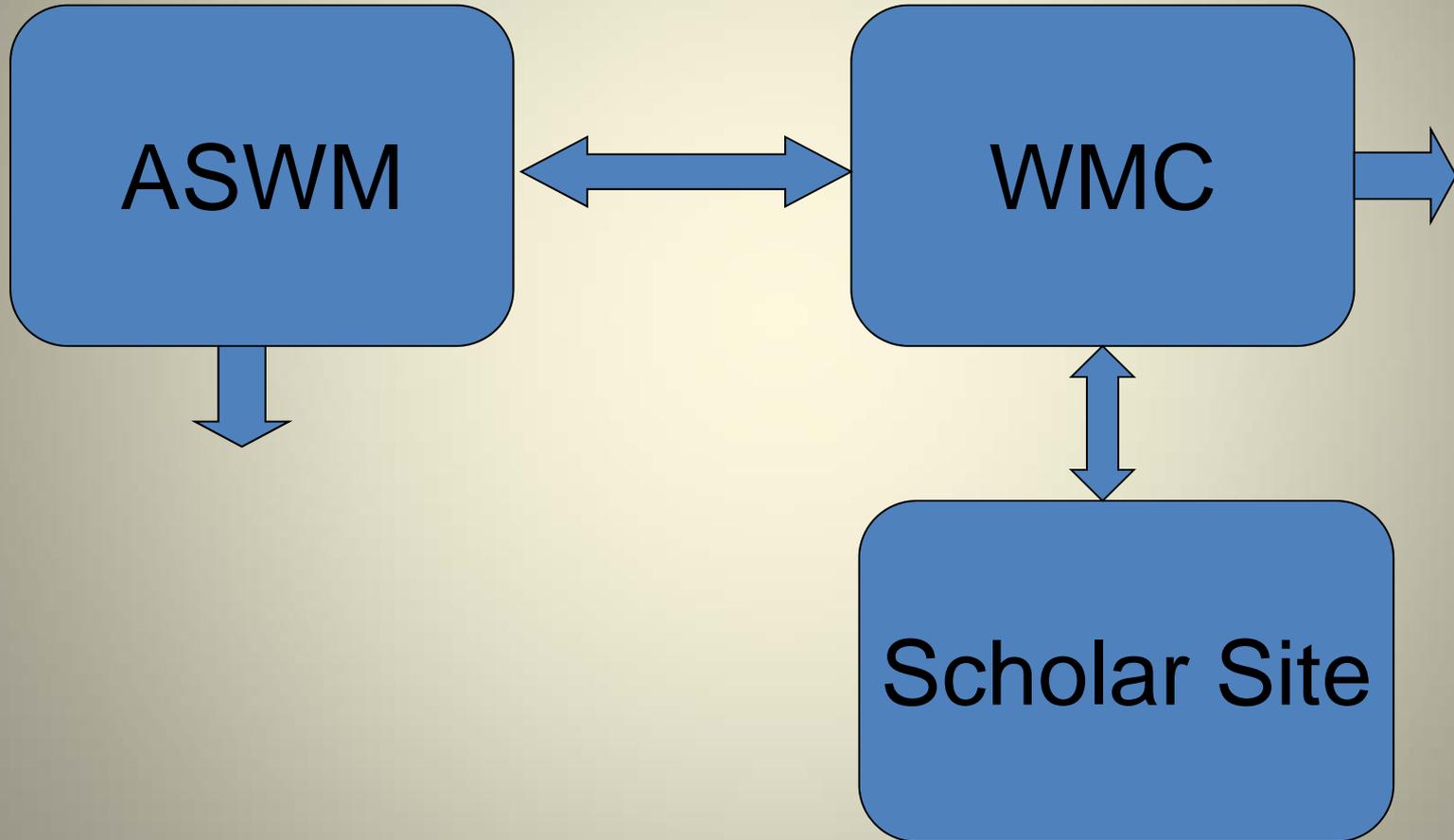
* [How do I Register?](#)

Wetland Mapping Information For Visiting Users

- [Links to Wetland Mapping Data](#)
- [Information about Wetland Mapping From ASWM](#)
- [Links to Wetland Mapping Standards](#)
- [Objectives of the Wetland Mapping Consortium](#)
- [Contact Us](#) (Subject: Wetland Mapping Consortium)



Linked Web Sites



Scholar Site

Scholar : Wetland Mapping Consortium : Home - Mozilla Firefox

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vt.edu https://scholar.vt.edu/portal/site/9c21338c-48e4-4055-8a2d-6464887a859b

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- Announcements
- Calendar
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- Mailtool
- Email Archive
- Chat Room
- Blogger
- Polls
- Sign-up
- Lessons
- Resources
- Drop Box
- Podcasts
- Wiki
- 4help
- Site Editor

Site Information Display

Options

Links on the left that have content or expected content.

Wiki (for co-authored documents such as articles or papers),

Drop Box (repository for documents) -
Wetland_Mapping_Standard_Implementation_Plan

Discussion Board (Interaction - ask an expert, post timely information),

Forum (Static - Facts and FAQ),

Active Chat Room (Like a Messenger or on-line chat),

Roster (a list of individual registered users).

Click on the links they are interested in and use the Help section - lower left.

Recent Announcements

Options

There are currently no announcements at this location.

Recent Chat Messages

Options

Calendar

Options

February, 2010

<	Today	>				
Sun	Mon	Tue	Wed	Thu	Fri	Sat
31	1	2	3	4	5	6

Scholar Site – For Communication

- A Scholar site was set up for the purpose of compiling a listserv and co-authoring and editing of the Wetland Mapping Standard Implementation Plan.
- Others may access the site by joining. Send a message of request to one of the following Contacts:

Contacts

ASWM

Sharon Weaver

webmaster@aswm.org

Megan Lang, USDA-USFS

Megan.Lang@gmail.com

Jane Awl

janeawl@earthlink.net

John Galbraith

john.galbraith@vt.edu

CMI

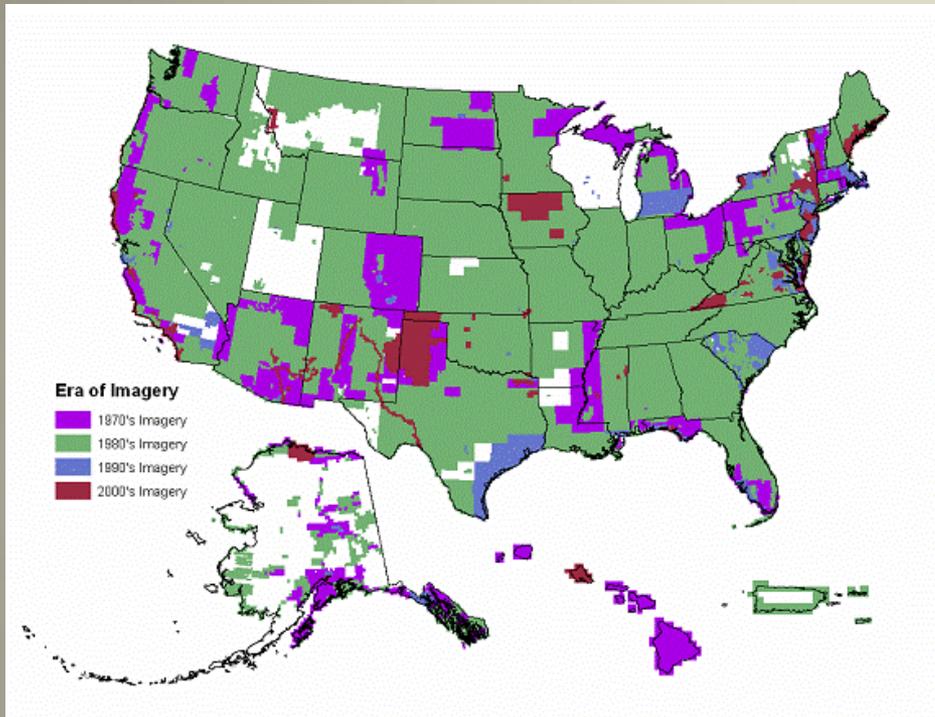
Kevin McGuckin

kmcguckn@vt.edu

Need For Advancement

- States need to know who to contact for expertise and services. We should allow a listing to be compiled.
- WMC needs to know what opportunities for applied and basic research are possible. We are linked in to the ASWM page for that.
- The WMC wants and needs to know what products and services are needed by the federal and state agencies. We need feedback to guide group functions. The Scholar site allows discussion and contact.

Projects - NWI Mapping



Long term Mapping Objectives

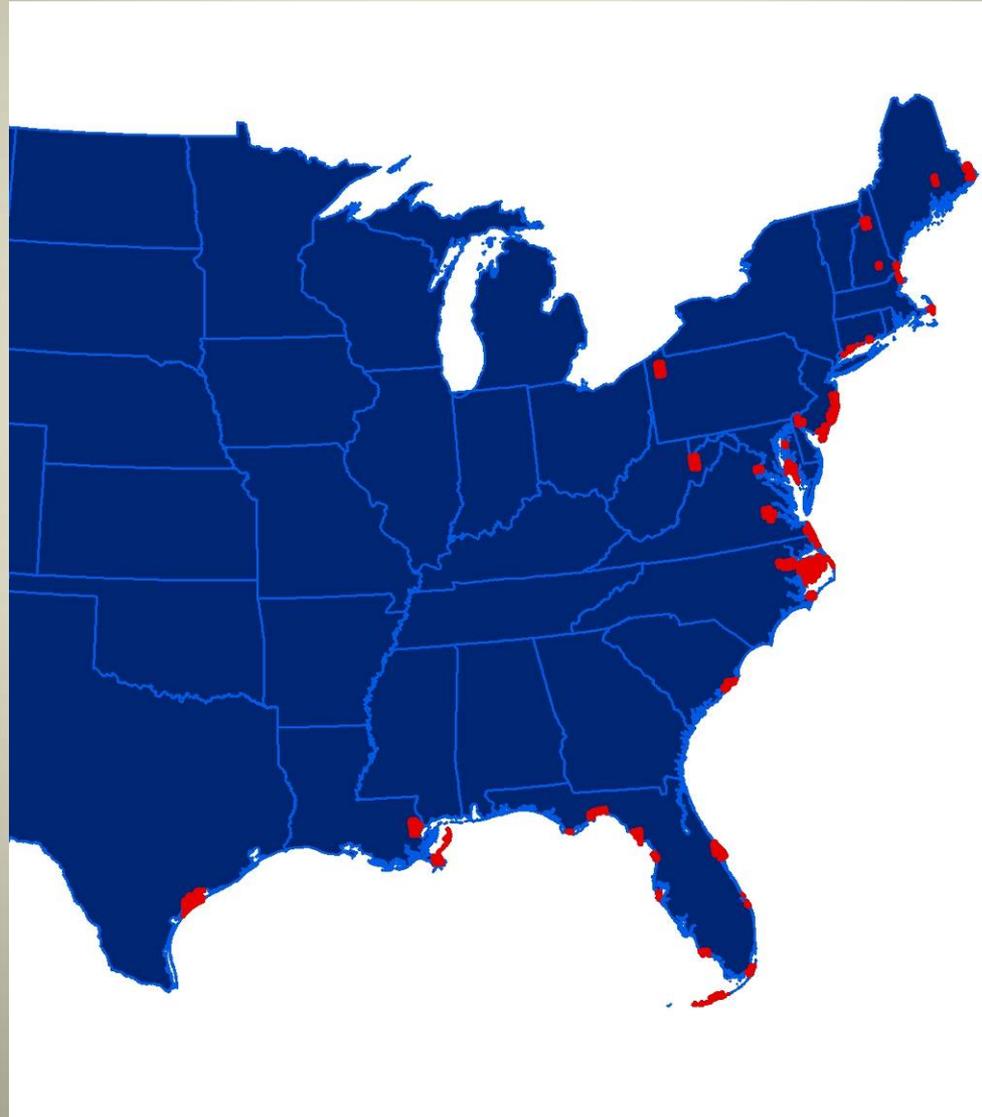
1. Complete an updated contiguous U.S mapping with a $\frac{1}{2}$ acre target mapping unit (TMU) using source imagery of 1 meter resolution.
2. Increase electronic access to users.
3. Update wetland mapping every 5 years for areas of wetland change.

Wetlands increase?

With the higher resolution mapping required by the standard, the total wetland acreages *mapped* are expected to increase as more wetland acreage will be identified at the $\frac{1}{2}$ acre TMU. The 1 meter source data resolutions will also allow mappers to identify smaller wetland areas that were previously missed.

Projects – Wildlife Refuge Mapping at CMI

<http://www.cmiweb.org/>



Wetland Change Detection

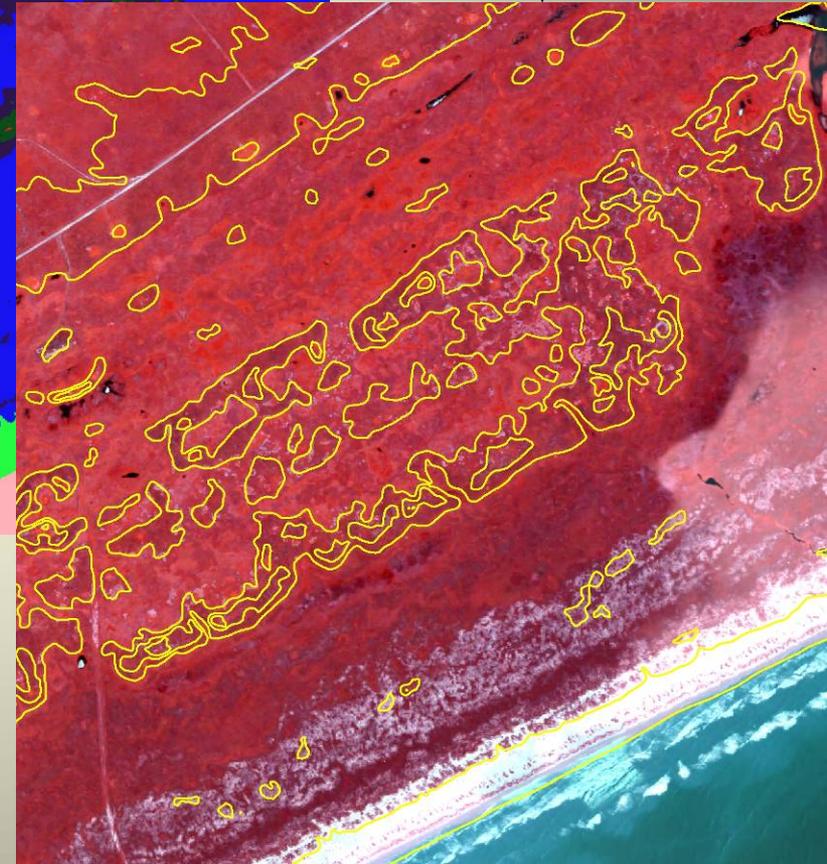
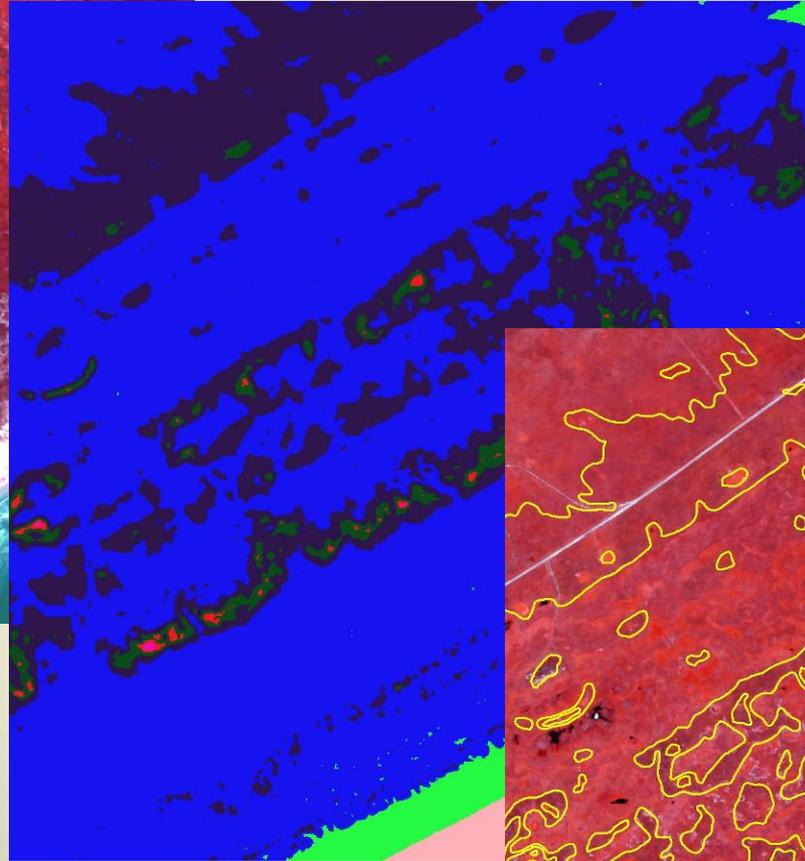
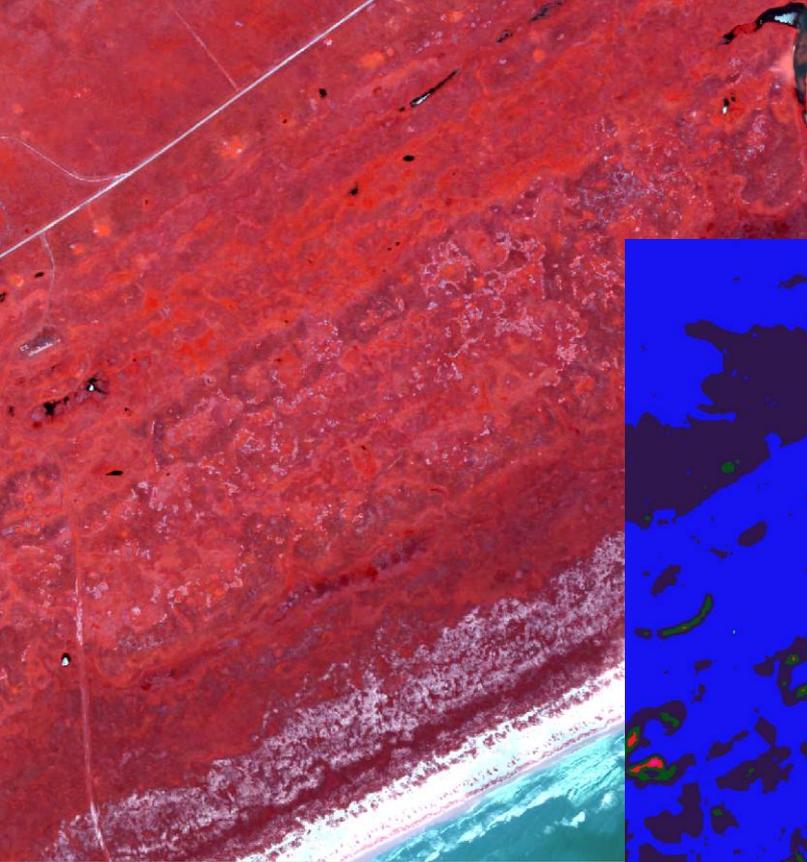


BEFORE



AFTER
New road built, stream modified

← Texas – Image, LiDAR,
Wetland Map



ASWM Outreach and Training for FGDC Wetland Mapping Standard

The Wetlands Mapping Consortium webpage is being hosted on a scholar website by Virginia Tech at: <https://scholar.vt.edu/portal> . The membership portion of the site (all content that exists at this point in time) is password protected: <https://scholar.vt.edu/portal/site/9c21338c-48e4-4055-8a2d-6464887a859b> . A description is available at: http://aswm.org/swp/mapping/wetland_mapping_consortium_010509.pdf .

Guest access to the site can be provided to individual reviewers upon request. Please ask them to each email janeawl@earthlink.net and provide a valid email address. Their email address serves as the username for their account set-up and the website will generate a unique password and send it to them at their email address.

Role of ASWM in Implementation

- provide on-going support for implementing new technologies used in wetland mapping, such as data collection procedures;

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- add discussion group capabilities to address technical mapping challenges;

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- foster coalitions that may purchase imagery;
- post maps of imagery status;

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- foster coalitions that may purchase imagery;
- post maps of imagery status;
- publish case studies of applications that use the wetlands data; and
- help develop and provide a gateway to training opportunities.

Project Milestones

- ASWM will develop and review objectives as needed for each wetland standard training module section. It will facilitate review and incorporate recommended changes for an online mapping training course. It will complete review by the end of Month 2.
- ASWM will invite wetland mapping professionals from around the country to participate in the Wetland Mapping Consortium, provide content (new applications, developing mapping applications, grant opportunities etc.) by the end of Month 4.
- ASWM will develop wetland mapping standard training materials ready for pilot testing by the end of Month 6 including the following subtasks:
 - Draft training modules
 - Organize the mapping standard draft training modules into smaller, cohesive sub-modules.
 - Develop an index for the course and indexes for each separate module and sub-module and incorporate into PPT.
 - Develop and incorporate learning objectives into the beginning of each module and sub-module.
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 - Identify gaps in the technical instruction provided that need to be developed by ASWM or by FWS; develop needed additional instruction within the technical capability of ASWM; coordinate and incorporate additional input by FWS.
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 - Develop list of definitions for technical terms and list of abbreviations that will serve as pop-ups.
 - Provide the revised modules, indices, and lists for review; and incorporate changes.

Project Milestones (cont.)

- ASWM will support completion of Wetland Mapping Standard Modules and review of other training materials by the end of Month 8 including the following subtasks:
 - Review modules once completed by FWS (which includes creating the design, incorporating the text, and making the links for a final draft product).
 - Coordinate review of the training course by 3-6 outside representative users.
 - Incorporate identified changes needed.
 - Coordinate beta testing of the training course as it is being reviewed by willing participants in the Wetlands Subcommittee, ASWM, and Wetland Mapping Consortium.
 - Incorporate identified changes needed.
- ASWM will continue providing content (new applications, developing mapping applications, grant opportunities etc.) to the Wetland Mapping Consortium through Month 10.
- ASWM will distribute information about the new standard by identifying information needs and developing new webpages linked to its existing wetland mapping webpage on the mapping standard, <http://www.aswm.org/swp/mapping/index.htm>, and update and maintain those webpages through Month 11.
- Wetland Mapping Consortium will be self-sustaining with members providing new content (new applications, developing mapping applications, grant opportunities etc.) by the end of Month 12.
- ASWM will deliver a final report on all activities under this grant, Month 12.

NSDI Website Description

ASWM Outreach and Training for FGDC Wetland Mapping Standard

Award Number G10AC00204, Category 6: FGDC Standards Development and Implementation Assistance and Outreach

This project will carry out key recommendations included in the Implementation Plan for the FGDC Wetland Mapping Standard adopted in July of 2009. The Association of State Wetland Managers (ASWM) will work with members of the Wetlands Mapping Standard Workgroup and the Federal Geographic Data Committee Wetlands Subcommittee to provide training materials and enhance expert communication and resolution of technical issues described in the Implementation Plan. ASWM will develop online and instructor-lead training materials on the proposed standard that will be incorporated into U.S. Fish and Wildlife Service training and available to local, tribal, and state government and other individuals and groups. The training materials will enable these parties to adopt the standard and prepare data for submission to the U.S. Fish and Wildlife Service National Wetlands Inventory program so that it can be added to the Wetlands Layer of the National Spatial Data Infrastructure and *The National Map*. In addition, the Implementation Plan identifies a number of technical and strategic recommendations that need to be addressed over time. ASWM in partnership with Virginia Tech, the U.S. Fish and Wildlife Service and subject experts will provide a forum to broaden discussion and resolution of these topics.

[Association of State Wetland Managers](#)
[Implementation Plan for the FGDC Wetlands Mapping Standard](#)

Contacts:

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ASWM Outreach and Training for FGDC Wetland Mapping Standard

Questions

Discussion

Recommendations

Next Steps

ASWM Outreach and Training for FGDC Wetland Mapping Standard

For more information please contact:

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