



Wetlands Mapping Consortium (WMC) *of the Association of State Wetlands Managers*

Enhancing Wetland Conservation through Improved Mapping and Monitoring

WMC Organizational Webinar May 18, 2011 at 2:00pm ET

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Wetlands Mapping Consortium (WMC)
of the Association of State Wetlands Managers



Enhancing Wetland Conservation through Improved Mapping and Monitoring

WMC National Organizational Webinar
May 18, 2011

Jeanne Christie (ASWM)
Jane Awi (ASWM)
John Galbraith (VTI)
Megan Lang (USDA)

Wetland Mapping Consortium (WMC)

- Formed in partnership with the Association of State Wetlands Managers (ASWM) and Virginia Tech.
- 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.
- Goal is to improve the management of wetland resources through enhanced wetland mapping and monitoring and dissemination of this information.



WMC 2011 Organizational Meetings

- (1) SWS - SAC/MAC Joint Chapter Meeting (March 8, 2011)
- (2) State/Tribal/Federal Coordination Meeting (March 23, 2011)
- (3) WMC National Organizational Webinar (May 18, 2011)**
- (4) Establishing a Formal Framework for WMC (TBA Fall 2011)

AGENDA

- Welcome and Introductions (Jeanne Christie)
- Background (Jane Awl)
- Easily Restored Wetlands Project (John Galbraith)
- Purpose (Megan Lang)
- Next Steps (Jeanne Christie)
- Wrap-up (Jeanne Christie)



Wetland Mapping Consortium (WMC)

Background

Why is the WMC needed?

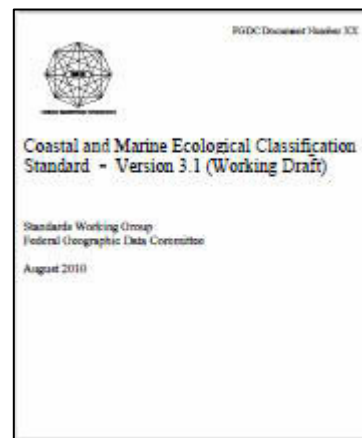
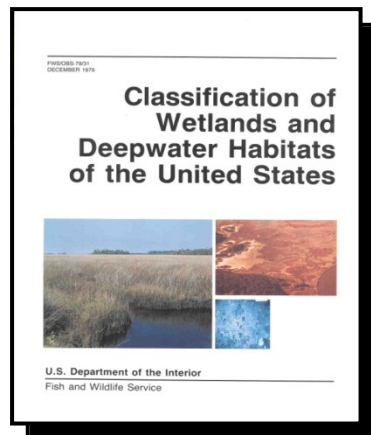
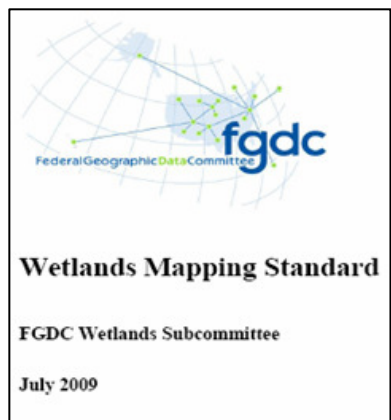
- The ability to map and monitor wetland extent and the fundamental drivers of wetland function is evolving rapidly.
- Enhanced communication amongst and between scientists and managers is necessary to improve the awareness of new remote sensing tools and techniques capable of solving many of our most intractable wetland management challenges.
- Enhanced communication will prevent duplication of funded research efforts and allow the leveraging of resources and expertise.
- Cooperative, synergistic, interdisciplinary research funding proposals and projects may be initiated that overcome limitations at a single institution or agency.

Original Proposed WMC Activities:

- Build collaborative teams to enable rapid and thorough response to calls for proposals.
- Organize a pool of experts who can respond to requests for more information about wetland mapping techniques and technologies.

WMC Membership 2011

- 140+ Individual Members as of May 2011
- Working groups currently using the site include:
 - Wetlands Mapping Standard Workgroup (WMSWG)
 - Wetlands Classification Standard Maintenance Working Group (WCSMWG)
 - Coastal and Marine Ecological Classification Standard Working Group (CMECS)
 - Southeast Wetland Workgroup (SEWWG)



WMC Projects 2009-2011

- ✓ **WMC Scholar Site and Entry Webpage**—Online Collaborative Resources
- ✓ **Hosted wetland mapping sessions at professional meetings (most recently at *SWS SAC/MAC Joint Chapter Meeting (March 2011)*)**
- ✓ ***National Wetlands Newsletter* article series (September-October 2009 and September-October 2010)**
- ✓ **Technical support for FGDC Wetlands Mapping Standard and Wetlands Classification Standard**
 - **Implementation Plan**
 - **Online Training**
 - **Wetlands Classification Image Gallery** —Online image collection
 - ***NEW in 2011: Calling All Wetlands Project* and iPhone app**
 - ***NEW in 2011: Technical Guidance on Unique Identifiers for Wetlands***
- ✓ **Easily Restored Wetlands project** —soil data shared via hard drive

WMC Online Resources

<http://clic.cses.vt.edu/WMC/>



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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)

WMC Online Resources

<http://clic.cses.vt.edu/WMC/>

Utilizes Virginia Tech's *Scholar Site* <https://scholar.vt.edu/portal> based on the Sakai Project (<http://sakaiproject.org/>) open source suite of learning, portfolio, library and project tools.

Collaborative resources include:

- File Sharing
- Discussion Forums
- Email Lists
- Chat Room
- Events Calendar
- Blogs
- Announcements
- Polls

Can the WMC help your project move forward?

- ❖ Utilize WMC communication tools and resources to foster collaboration.
- ❖ Individual project resource areas and member lists, such as for working groups, can be set up within the WMC.

Wetland Mapping Consortium (WMC)



Easily Restored Wetlands Project

Easily Restored Wetlands project

- Hydric soil data (SSURGO) is not readily available nationwide as a single shapefile. Also, the vector format is not always desirable for merging with other data layers.
- Sharon Waltman, USDA-NRCS, Norman Bliss USGS et al. have developed a gridded version of SSURGO spatial data in three pixel sizes for the Conterminous United States. The gridded SSURGO can be used with a database query look up table.
- The current database query identifies "Potential Wetland Soil Landscapes " and includes more than just hydric soils (component "hydricrating = Yes") from the SSURGO data source. This query needs review by WMC to determine usefulness to identify easily restored wetlands.
- The gridded SSURGO spatial data is currently provided on a hard drive to share with users. Bill Wilen of USFWS will direct the fate of the hard drive as it moves between agencies.
- The data is desired to be refreshed at the end of each calendar year, and posted to a site for optional upload. ASWM is making arrangements for serving the data online.
- The Wetlands Mapping Consortium Scholar site hosted at Virginia Tech can be used to build a set of interested users and a request list for tables and fields not provided in the first version (Aug. 1, 2010).

Easily Restored Wetlands project

Requested data:

- SSURGO geodatabase file and the sequel server download, and the selected tables (Spatial, Chorizon, Cohydriccriteria, Comonth, Cosoilmoist, Ksat, Component, Legend, Mapunit).
- 10, 30, and 100 meter gridded SSURGO 12/30/2009 for each state (Albers Equal Area - AEA projection)
- FGDB that includes the full 12/30/2009 SDM snapshot for reference
- 2001 NLDC (in AEA) (optional)
- NASS CDL, if an AEA version
- Results of final query of 12/30/2009 SDM tables
- Results of query from NSSC, USDA-NRCS, Lincoln, NE and Morgantown, WV.

Wetland Mapping Consortium (WMC)



PURPOSE

WMC General Purpose

WMC fosters collaborations and disseminates data and findings for the purpose of enhanced wetland mapping and monitoring.

WMC Long-term Goal

To improve the management of wetland resources through enhanced wetland mapping and monitoring, ultimately resulting in increased conservation of wetlands and the enhanced delivery of wetland ecosystem services via the evaluation of wetland properties and the dissemination of this information to natural resource managers.

What do you view to be the most valuable role of the WMC?

- Posting of solutions (or case studies) for difficult problems.
- Access to expertise involving geospatial datasets.
- Access to an open forum where challenging issues could be addressed by multiple experts.
- Encouraging collaboration between not just scientists but managers, etc.
- Organizing the mapping community – both mappers and data users.
- Sharing information and discussing new technology.
- Informing folks as to what kinds of data are available in their state.
- Cooperative, synergistic, interdisciplinary research proposals that overcome limitations at a single institution or agency.
- Other?

What are the most important things that can be done in the near-term to help achieve our long-term goal?

- Regular newsletters or conference calls?
- Links to journal articles and white papers?
- Training material?
- Links to data?
- Network of topical experts?
- Other?

WMC Organizational Meeting Discussion Questions

SOURCES:

- (1) SWS - SAC/MAC Joint Chapter Meeting (March 8, 2011)
- (2) State/Tribal/Federal Coordination Meeting (March 23, 2011)

WMC Organizational Meeting Discussion Questions

1. What is the greatest current challenge for the wetland mapping community?

- Knowing whether or not the wetland exists and size. Can't always trust NWI and accuracy varies according to landscape and wetland type. Accurate categorization and is it jurisdictional? Big concern on number or area of omitted wetlands. (1)
- How do we reconcile SSURGO hydric soils (overestimation) and NWI (underestimation)? (1)
- Access to data sets. John has data envy. Greg Snyder – lead for LiDAR coordination. (1)
- Consistency and accuracy once mapping is farmed out to states and contractors. (1)
- Resources/Funding (2)
- Training (2)
- Knowledge of new and developing technologies (2)
- Developing contracts to meet the new mapping standards – knowing the right questions to ask and the right limitations/guidelines to set. (2)
- Need guidance as to what should be in an RFP. Sub-standard maps could be a huge issue on multiple fronts. (2)
- What should we expect to pay for a good product? (2)
- Do we need a wetland mapping certification process? (2)
- How much can be automated without losing quality assurance? (2)
- USFWS quality control of data – how can this be done with limited staff? (2)

WMC Organizational Meeting Discussion Questions

2. What do you view to be the most valuable role of the WMC?

- Posting of solutions to difficult problems. Access to expertise involving geospatial datasets. Access to an open forum where challenging issues could be addressed by multiple experts. (1)
- Encouraging collaboration between not just scientists but managers etc. AWRA could be contacted. (1)
- Organizing the mapping community – both mappers and users (2)
- Sharing information and discussing new technology (2)
- Can we inform folks as to what kinds of data are available in their state? (2)

3. What would be the most effective way to organize the consortium, or what should the organization structure look like to best serve the needs of the mapping community?

- Keep it simple; board structure (2)

WMC Organizational Meeting Discussion Questions

4. In addition to what is on the WMC Scholar site now, are there additional technical resources that are needed by the mapping community?

- Links to journal articles and white papers? Training material. Links to data servers. (1)
- Regular newsletters or conference calls. Links to research sites. (1)
- Announcements of updates to wetlands layer would be helpful. (2)
- Thresholds for mapping farmed wetlands? How wet is wet enough? How do you judge this remotely? (2)
- Mapping or data on farmed wetlands (tiled and drained) or difficult to map wetlands? Tips, strategies? (2)

5. Are there other people we should be sure to invite to be part of the Wetland Mapping Consortium?

- Need to invite active wetland mappers. Need a distribution list. (2)
- Policy regarding commercial groups? Can access be limited for commercial folks? (2)

WMC Organizational Meeting Discussion Questions

NO COMMENTS TO DATE:

- 6. What are the most important new opportunities to use wetland maps in decision making?**
- 7. What different kinds of imagery are becoming available and how suitable are they for wetland mapping? Who is trained in using them? What training is needed ?**
- 8. Are you engaging in or know of studies, pilot projects, projects, etc. you would like to share with the larger mapping community?**
- 9. What challenges occur trying to adopt the new FGDC wetlands mapping standard?**
- 10. How much training is needed to map or do qa/qc to ensure maps will meet the new FGDC wetland mapping standard?**
- 11. What should be included in an RFP on wetlands mapping; what should reviewers look for to ensure the mapping project will meet the new standard (can a bid be so low that the project will be poor quality)**
- 12. Should NAPP ever be used to map wetlands? (obviously is it being used, but there are some real concerns). If so, when and what other data should be used to provide ancillary information to ensure mapping project will meet the new standard.**
- 13. Is there publicly available GIS information that would assist in wetland mapping but is still hard to get?**



Wetland Mapping Consortium (WMC)

NEXT STEPS

What should the WMC organizational framework be?

- A consortium without any formal structure?
- A consortium with an informal board?
- A consortium with an elected board?
- A formal 501 (c) (3) Organization?
- Other?

How will WMC Activities and Presentations be identified?

- Ad hoc – individual members organize as needed?
- Formal or informal board?
- Committee or project leaders?
- Quarterly meetings to collectively identify and report on projects?
- Other?

WMC Proposed Webinar Schedule

- June or July – *TRAINING: Using the WMC Scholar Website*
- June - *Unique Identifiers for Wetlands*
- July - *"Calling All Wetlands" Project (& iPhone app for uploading photos from the field*
- August – *Easily Restored Wetlands Project*
- September – *Establishing a Formal Framework for the Wetland Mapping Consortium*
- *Other?*



Wetland Mapping Consortium (WMC)

BRAINSTORMING SESSION



Wetland Mapping Consortium (WMC)

- Next Steps
- Volunteers
- Final Thoughts



Wetland Mapping Consortium (WMC)

Wrap-up

Contact Information

send general email to wetlandmappingconsortium@gmail.com



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Wetland Mapping Consortium (WMC)

Helpful Links:

- ❖ ASWM State Wetland Mapping page:
❖ <http://aswm.org/wetland-science/wetland-mapping>

- ❖ Wetland Mapping Consortium:
❖ <http://clic.cses.vt.edu/WMC/>

- ❖ Using the Wetland Mapping Consortium (WMC) Scholar Site:
❖ http://aswm.org/pdf/lib/using_the_wmc_scholar_site_062310.pdf

Wetland Mapping Consortium (WMC)



Thank you!



Wetland Mapping Consortium (WMC)

Additional Material

Remotely Sensed Data

Four different types of remotely sensed data or data products displayed for a U.S. Department of Agriculture study site located in Caroline County, Maryland. All images illustrate the same forested wetland complex but provide complementary information that can be used to map or characterize wetlands.

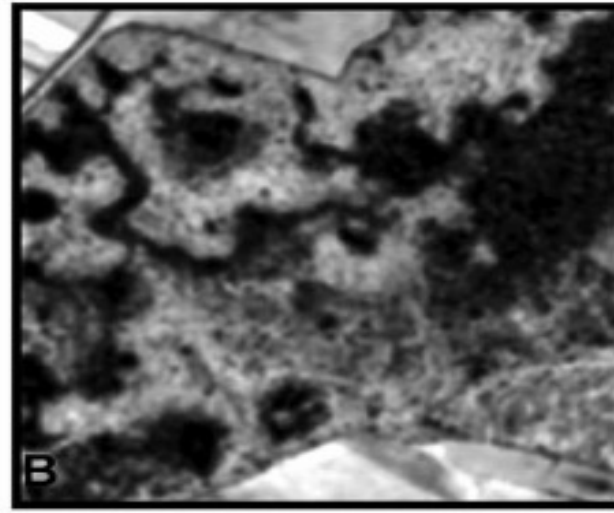
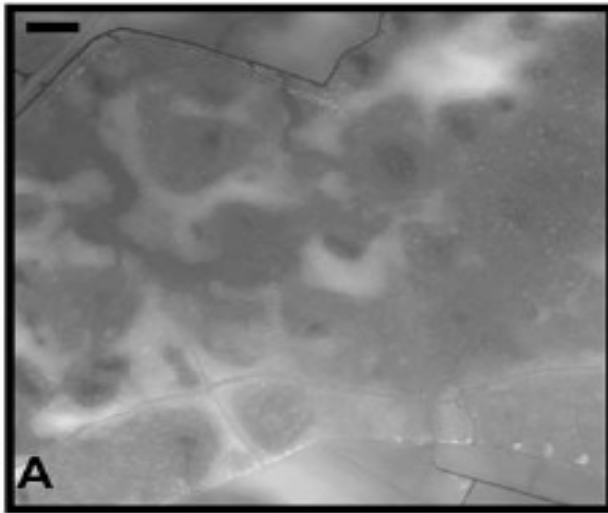


Image A is a one-meter horizontal spatial resolution, 16-centimeter vertical resolution digital elevation model where wetlands are generally exhibited as areas of lower elevation (darker).

Image B illustrates LiDAR intensity derived from ground returns that were collected during a period of average yearly peak wetland inundation (darker areas are inundated).

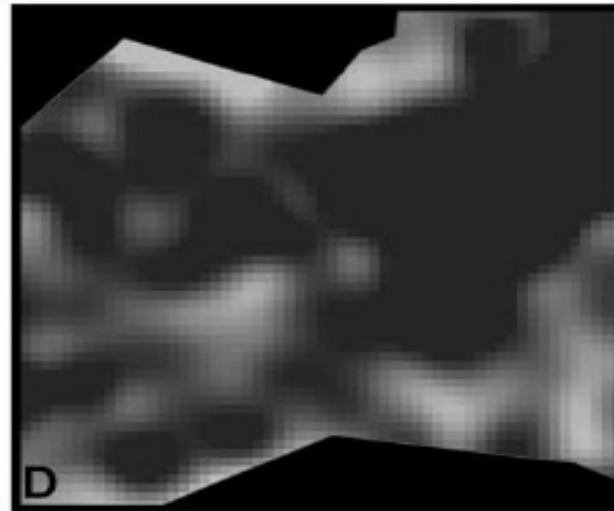
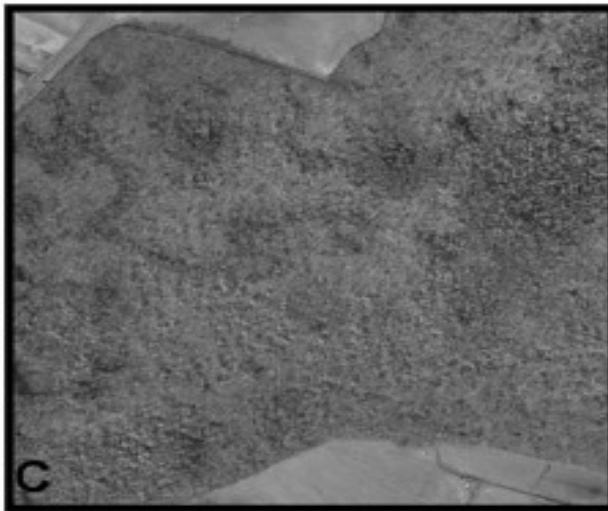


Image C is a one-meter spatial resolution false color near-infrared aerial photograph that was collected at the same time as image B. Note that the darker forested areas correspond with the inundated areas seen on image B but that these areas are much easier to visualize on image B.

Image D is a 30-meter spatial resolution RADAR-derived map of forested wetland hydroperiod where the darker areas are wetter for longer periods of time. This type of product can also be produced using newly available three-meter spatial resolution RADAR data and depicts not only variations in inundation but also differences in soil moisture. Note that there is strong general agreement between all data sources.

0 310 620
Meters

National Wetlands Newsletter

September-October 2009, (31:5) pages 6-11

Improved Wetland Mapping

Through the Use of Advanced Geospatial Technologies

Recently developed remote sensing technologies and techniques have the potential to improve the detail and reliability of wetland maps, update existing National Wetlands Inventory wetlands data, monitor changes in the wetland layer of the National Spatial Data Infrastructure, and improve the ability to monitor key parameters that impact the ability of wetlands to provide ecosystem services at a watershed scale.

BY MEGAN LANG, JANE AWL, BILL WILEN, GREG McCARTY, AND JOHN GALBRAITH

A New Mapping Standard

BY JANE AWL, JEANNE CHRISTIE, MARGARETE HEBER, MEGAN LANG, AND BILL WILEN

Mapping Coalitions

BY JEANNE CHRISTIE AND LEAH STETSON
Association of State Wetland Managers

National Wetlands Newsletter

September-October 2010, (32:5) pages 10-17 and 36-37

National Standards for the Mapping and Classification of Wetlands: Implementation and Maintenance



The Federal Geographic Data Committee adopted national standards for classifying wetlands in 1996, but added national standards for mapping wetlands in 2009. This update addresses the implementation of these standards, the maintenance review of the classification standard, and how wetlands scientists can participate and provide input.

By JANE AWL, BILL WILEN, REBECCA ALLEE, LARRY HANDLEY, MARGARETE HEBER, PAMELA BLASEDELL, JOHN GALBRAITH, AND MEGAN LANG

Light Detection and Ranging:

New Information for Improved Wetland Mapping and Monitoring

To best preserve wetlands and associated ecosystem services, wetlands must be routinely monitored. Wetland mapping is an essential part of this monitoring program. Recently developed remote-sensing technologies and techniques have the potential to improve the detail and reliability of wetland maps and the ability to monitor important drivers of wetland condition and function, such as hydrology. One of these relatively new and rapidly developing technologies is laser altimetry, or light detection and ranging (LiDAR), which provides fine-scale information regarding 3-D topography, vegetation height, and plant structure, as well as hydropattern, across large areas.

By MEGAN LANG, GREG MCCARTY, BILL WILEN, AND JANE AWL

Classification of Wetlands and Deepwater Habitats of the United States



U.S. Department of the Interior
Fish and Wildlife Service

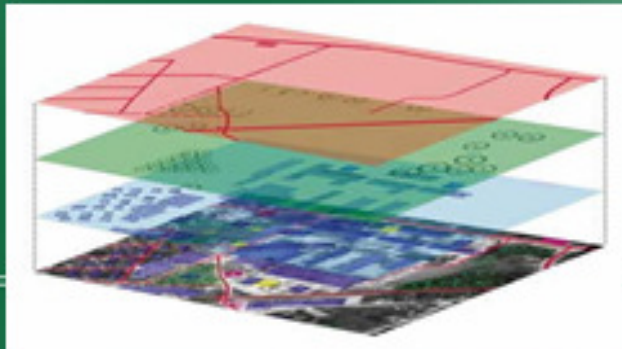
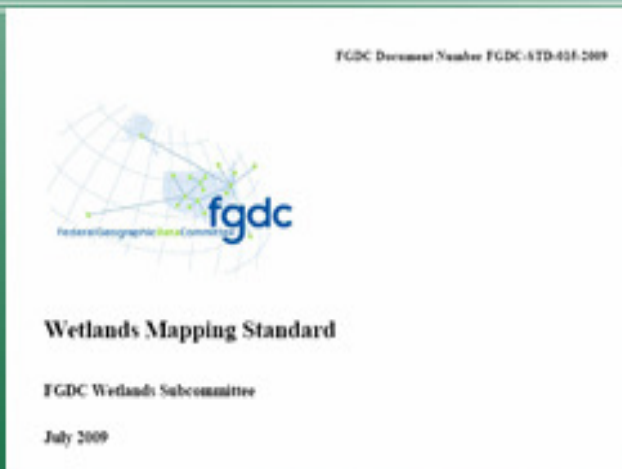
Wetlands Classification Standard *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al, 1979) endorsed by FGDC in 1996, is currently in maintenance (<http://www.fgdc.gov/standards/projects/FGDC-standards-projects/wetlands/index.html>)

Wetlands 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)

National Wetlands Standards

Specify minimum data quality components for inclusion into the National Spatial Data Infrastructure (NSDI)



- ✓ Source Imagery
- ✓ Base Imagery
- ✓ Classification
- ✓ Accuracy
- ✓ TMU (Targeted Mapping Unit)
- ✓ Producer's Accuracy
- ✓ Horizontal Accuracy
- ✓ Data Verification
- ✓ Logical Consistency
- ✓ Edge Matching
- ✓ Attribute Validity
- ✓ Datum and Projection
- ✓ Metadata
- ✓ FWS Coordination and Quality Control

Role of Wetland Mapping Consortium (WMC) Identified in FGDC Wetlands Mapping Standard Implementation Plan

- 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



Wetlands Classification Image Gallery

What is it?

The Wetlands Classification Imagery Gallery is a compilation of wetland images and corresponding information for the FGDC maintenance review of the current National Wetlands Classification Standard (a.k.a. Cowardin et al. 1979). The gallery provides an image framework for the classification of the various and multitude of possible wetland habitats.

Intent/purpose of the gallery

- To support an updated and more robust version of the images critical to the widespread use of the Cowardin Classification System.
- To take advantage of the power of readily available geo-coding applications now incorporated into mobile phone technology, web applications, etc.
- To harness the power of the wetlands stakeholder community to provide current, geo-coded imagery in support of a national classification standard.

CLASS: Forested Wetland
SUBCLASS: Dead
Location: Rolla, MO
Date: May 2010
Photo by L. Handley



SYSTEM Palustrine
CLASS: Forested Wetland
SUBCLASS: Dead
Location: Humphreys County, TN
Date: September 1975
Photo by V. Carter

In addition to images, participants will submit information such as the dominant and scientific plant names, wetland category, National Wetlands Inventory Classification code (if known), and locational information. Easy-to-use templates are available to facilitate field use and submission

Wetlands Classification Image Gallery

The screenshot shows the website's navigation menu at the top with links for Main Page, Gallery Information, NWI Guide, Review Process, and Image Submission. The main content area features a large aerial photograph of a wetland. To the right of the photo is a detailed information panel titled 'Wetland-Image Gallery' which includes 'Wetland Information' (Submerged and Floating Aquatics, E1AB1L), 'Image Date' (Date, Direction, Location, Description), 'Conditions', and 'Dominant Plants' (Turtle Grass, *Thalassia testudinum*). Below the photo are 'Download' and 'Aerial Photo' buttons, and a map showing the location. On the left side, there is a 'Gallery Search' section with dropdown menus for Wetland Category, Country, State, and Key Word.

www.wetlandgallery.cnlworld.org

How easy is it to submit imagery?

The gallery has been designed to facilitate submission and retrieval of documented images to support future wetland classification efforts. Submissions will be reviewed by wetland experts who will confirm the classification codes.

Who are the sponsors of the gallery?

- Environmental Protection Agency
- Fish and Wildlife Service
- United States Geological Service
- Association of State Wetland Managers – Wetland Mapping Consortium

Who can contribute?

The general public, academic researchers and students, government personnel, wetland scientists, geographers, environmentalists, and other interested parties are encouraged to contribute to the Wetlands Classification Image Gallery.

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