FGDC Wetlands Mapping Standard – A Progress Update

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Who Has Helped Develop the Standard?

- Colleen Charles, USGS
- Bob Pierce, USGS
- Paul Wiese, USGS
- Larry Handley, USGS *
- Tom Dahl, FWS
- John Cooper, FWS
- Bill Pearson, FWS
- Ralph Tiner, FWS *
- Bill Wilen, FWS, NWI *
- Jo Ann Mills, FWS
- Margarete Heber, EPA *
- Palmer Hough, EPA
- Chanda Littles, EPA
- Christine Mazzarella, EPA
- Myra Price, EPA
- Kathy Mulder, EPA
- Jim Dick, NWI
- Norman Melvin, USDA
- Romell Nandi, EPA
- Barbara White, FWS
- Edmund Miller, OSD *

- Pedro Flores, NACo *
- Norman Melvin, NRCS
- James Robb, IDEM *
- Mark Sudol, COE
- Jon Soderberg, COE
- Andy Damasis DHS
- Jeanne Christie, ASWM *
- Dawn Browne, Ducks Unlimited *
- Marti McGuire, NOAA *
- Mark Gernes, MPCA
- Ky Ostergaard, INDUS Corp
- Dave LaBranche, DOD
- Mark Zundel, US Bureau of Indian Affairs
- Stephen Getlein, Army Environmental Center
- Jane Awl, TVA **
- Randall Gray, USDA
- Chris Berginnis, Ohio DPS
- John Christy, Oregon State University
- Vince Allen, EPA

**Bold** = Workgroup member
* with **Bold** = very active workgroup member
** with **Bold** = superhuman
Why Have a 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
- Inform 404 decisions following the Rapanos decision
Why Have a Standard?

Wetlands change over time…
Why Have a Standard?

A Wetland Mapping Standard will:

- Streamline mapping efforts for greater consistency and efficiency

- Enable any entity to map using the standard and construct or update the National Wetlands Inventory (NWI) Geodatabase and the National Map

- Facilitate consistent mapping layers that can be used across geopolitical and watershed boundaries
What Exists Now?

• A Federal Geographic Data Committee (FGDC) Wetland Classification Standard exists, but there is 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
What Was Proposed to and Approved by the FGDC in February 2006?

• Base proposal of FGDC standard on existing FWS standards
• Alignment/coordination with other pertinent standards: NHD, NOAA classifications, FGDC classification standards, etc.
• Significant stakeholder engagement
• Propose draft for comment in August 2007
Current Contents of the 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
Groups that have Reviewed or Discussed the Standard

- ESRI National Conference
- INDUS Corp.
- Individual States in Regions 2, 4, & 5
- ASWM (2007, 2008 panel)
- ASWM State Outreach calls
- USGS
- FWS/NWI
- NACo
- Southeastern Wetlands Data Users

- TVA
- IDEM
- Ducks Unlimited
- NOAA
- EPA
- DOD, COE
- NRCS
- NEIWPCC
- TNGIC
Timeline: Already completed

- Feb 2006: Approval by FGDC to develop a proposal
- Spring 2006: Present proposal to stakeholder groups (i.e. ASWM, NACo, NSGIC, etc.)
- Summer 2006: Begin drafting standard- 1 year to proposal
- Fall 2006 - Winter 2007: Outreach to wetland community
- Fall 2006 - Winter 2007: Ensure that state/federal agencies/tribes are comfortable with proposal
- March 2007: Presented draft standard to FGDC Standards workgroup for review
- June 2007: FGDC Standards workgroup approved and sent to formal FGDC for approval
- August 2007: FGDC Committee to Propose
- August - November 2007: Public Comment Period
- December 2007: Response to comments
- December 2007 - May 2008: Revise standard based on comments and complete Response to comments document
• May 15, 2008 - Present standard to Wetlands Subcommittee for approval and Agency/Dept Concurrence (by June 3 meeting) (OEI concurs for EPA)

• June 2008 - Present standard to FGDC Standards workgroup for approval

• Prepare a draft FR Notice for concurrence to coordinate with FGDC approval of standard

• August 2008 - Present Standard to the FGDC Committee for final approval—FR Notice

• May – September 2008 - work on Implementation Plan with Stakeholders and Workgroup and OEI
Why does developing an FGDC Standard take so long?

• 12 Step FGDC Process - Now at step 10

• Very intensive Stakeholder process and inter-agency process

• In addition: Because the FGDC standards already undergo an extensive public/private sector review process, NIST has decided to declare the FGDC standards as already validated by the FGDC process without having them go through an additional NIST evaluation panel process.

• FGDC-endorsed standards are "validated" for use in the E-Gov initiatives and Lines of Business by NIST.

• The FGDC-endorsed standards will be listed on the NIST E-Gov Standards Resource Center Web pages at http://ts.nist.gov/standards/e-gov/
Who We Heard from during the Public Comment Period?

21 Organizations submitted comments
- 7 Federal Agencies
- 5 State Agencies
- 6 Special Interest groups
- 1 University
- 2 Independent Research Organization

~180 comments received (110 of those dealt with Appendices/implementation issues)
Responses developed for all comments
What We Learned from the Public Comments

• Majority of commentors supported standard
• American Farm Bureau misinterpreted the intent of the standard
• Many comments were technical and helped inform revisions to Standard requirements:
  – Major change addressed was scale flexibility and addition of FWS Waiver process
  – Many comments surrounding implementation related processes
Key Revisions based on Public Comments

Clarifications to **Objectives and Scope**, including:

- Reference to OMB Circular A-16 (revised)

- Use of ancillary data is supported, just not a requirement

- Clearer language and organization for Exemptions section

- Addition of Exemption for Marine and Estuarine benthic habitat mapping - currently necessitates the use of different definitions & classifications

- Addition of Exemption by Waiver: *In order to ensure the best available data can always be included*…
Waiver Process

• A waiver is an authorized exemption from a specific minimum requirement in the standard

• An exemption may be granted based on data quality, but not on cost

• The waiver allows for comprehensive coverage of “best available” data more quickly, meeting the needs of many end users

• The U.S. Fish and Wildlife Service data steward for water resources and wetlands is the final authority for the waiver process
Revisions to Technical Requirements:

- “In-shore Deepwater” language was changed throughout the document to specify “Estuarine and Lacustrine Deepwater”

- Clarified what is meant by Source versus Base Imagery, and their respective requirements

- Clarified Classification Level requirements - Special Modifiers only required “where applicable”, other details in footnotes updated
Key Revisions based on Public Comments (cont.)

Revisions to Technical Requirements (cont.):

- Clarified that the **Target Mapping Unit** measure *allows for mapping below a specified threshold, but does not subject that finer detailed mapping to the accuracy requirements of the standard*

- Clarified that **Producer's Accuracy** is measured by both Feature and Attribute accuracy
  
  - **Feature accuracy** is the correctness of the identification of wetland vs. non-wetland
  
  - **Attribute accuracy** is the correctness of the classification of the wetlands using the FGDC Wetlands Classification Standard

- Additional requirement added for **Attribute accuracy**: *must be at least 85%*
Key Revisions based on Public Comments (cont.)

Revisions to Technical Requirements:

• Datum and Projection clarified
  ➢ Wetlands data may be created or used in any standard datum and projection
  ➢ However, data must be re-projected to Albers Equal-Area projection and NAD83 prior to submission

• FWS Coordination and Quality Control:
  ➢ Mapping entities are advised to consult with FWS to coordinate (to assure a logical, technically sound, and comprehensive approach)
  ➢ FWS will be responsible for final quality control of all products
Revisions to Appendices:

- Appendices were classified as Normative or Informative.
- Most Informative appendices have been removed from the final standard since they were included mainly for consideration during public comment.
- The removed Informative appendices will be used to shape the Implementation guidelines (to be developed).
Key Revisions based on Public Comments (cont.)

Revisions to Appendices (cont.):

- The final version contains 3 appendices:
  - A: Attributes for Wetland Classification (Normative)
  - B: Attributes for LLWW (for Landscape, Landform, Water Flow path, and Waterbody Type) (Informative)
  - C: Definitions (Informative)

- Better quality graphics are provided for Attributes for Wetland Classification (Normative)

- Definition section has been updated to reflect the other revisions to the standard
The Standard:

• Applies to **ANY** entity/organization using federal funds to map wetlands

• Technical requirements (lower 48):
  – Source imagery: 1 m resolution
  – Base imagery: 1 m resolution, 1:12K scale
  – Classification based on Cowardin
  – TMU: .5 acres, Feature Accuracy: 98%
  – Horizontal Accuracy: 5 m

• Flexibility to address wetland mapping in rural areas
Implementation

- Encourage states/tribes to establish wetlands mapping funding coalition
- Any entity receiving federal money must use FGDC standard
- Encourage others to adopt/use the standard
- Grant money as seed money are possibilities for funding
- Provide training workshops and materials for technical implementation – for example, online help
• Implementation is separate from FGDC approval

• No “Implementation” section of the standard - Detailed guidelines for practical implementation of the standard will be developed after FGDC approval;
  – Technical process specifications (attributes, polygon lineage, software compatibilities, data formats, etc.)
  – How wetlands data are collected and added to wetlands layer of NSDI
  – Ongoing dialog with wetland stakeholders to address implementation issues
  – Discussions with Workgroup and OEI as well
Ongoing Technical Challenges:

• Data History (Lineage and Tracking)

• Stable Unique Identifiers

• Parsing (NWI Code)
Polygon Lineage and Unique Stable Identifiers -- Ideal

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Polygon Lineage – Scale Deviation

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Multi-Agency Digital Mapping Initiative

- Currently FWS only has funding to complete 1% of the map per year. Consequently, the national wetlands map is out of date and much of the country has never been mapped.

- A multi-agency funding proposal is being developed to complete the national wetlands digital map, implementing the standard.

- The goal is to increase wetland mapping by at least 10% per year.

- Part of the funding would be allocated for upgrading the NWI database and facilitating data exchange, while the larger portion would be used as grant money to the states, tribes and local communities to map wetlands.
More Information

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