

MEMORANDUM OF UNDERSTANDING BETWEEN

**THE DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY (USGS)**

AND

THE VIRGINIA GEOGRAPHIC INFORMATION NETWORK (VGIN)

FOR

THE STEWARDSHIP OF THE NATIONAL HYDROGRAPHY DATASET (NHD)

I. PURPOSE

The purpose of this Memorandum of Understanding (MOU), hereinafter referred to as the Agreement, is to identify the activities that the Virginia Information Technologies Agency's (VITA) Virginia Geographic Information Network (VGIN), and the U.S. Geological Survey (USGS), referred to as partners, will undertake to revise, improve and maintain the high resolution (1:24,000 scale) National Hydrography Dataset (NHD) in a program of statewide data stewardship in Virginia. The partners to this Agreement represent Federal and State government with an interest in providing current, accurate, and consistent surface water geospatial data to meet the requirements of the National Spatial Data Infrastructure (NSDI) for hydrography and of interested state and local agencies.

This agreement applies to high-resolution (1:24,000) scale NHD data only. Stewardship for the medium resolution (1:100,000 scale) data is held by the United States Environmental Protection Agency (EPA) and will not be maintained or revised by State stewardship under this agreement; however, the State steward may provide approved information to the EPA under separate agreement. Local-resolution (> 1:4,800) NHD data will be governed by stakeholder requirements. The development of local resolution NHD may be given backing by the EPA and USGS at a future date under separate agreement.

II. BACKGROUND

The NHD is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells. The NHD interconnects and uniquely identifies the stream segments or reaches that make up the Nation's surface water drainage system. The NHD is a national framework for spatial position for surface water features, their attribution, their connectivity in a flow network, and an addressing system of linking additional related data known as events. A permanent feature identifier known as a reach code references each reach in the framework. Each linear reach is also segmented into linear addresses measures along the reach. The USGS is the authority for reach codes and measures. Because the NHD provides a consistent framework for addressing and analysis, water-related information linked to reach addresses by one organization (national, state, local) can be shared

with other organizations and easily integrated into many different types of applications to the benefit of all.

The success of the NHD will depend on the partnerships established with a wide variety of organizations that work with geospatial hydrographic data. It is recognized that the most current, highest resolution and continuously maintained geospatial information reside with state and local governments, private entities, educational institutions, resource oversight organizations, and other Federal agencies. These organizations will work cooperatively to implement a program to exchange updates and improvements to the NHD.

Virginia has identified the NHD as a significant GIS component to support regional cooperative initiatives, effective and cooperative land management, cooperative ecosystem management, and a myriad of other applications. Thus it is included as an essential geospatial dataset in the Virginia Spatial Data Infrastructure.

The Virginia Geographic Information Network (VGIN) will act as the principal steward for the State, and will serve as the coordinator of stewardship activities for the State, as well as a focal point for edits made by a variety of state organizations. As the principle steward, VGIN will accept and review edits made by partnering agencies and forward those edits to the USGS for incorporation into the national NHD database. To manage the stewardship process, VGIN will work in cooperation with partner agencies as outlined in Appendix D.

III. SCOPE

The intent of this MOU is to outline a partnership strategy and programmatic application for the long-term stewardship of high-resolution NHD sub-basins encompassing the State of Virginia. This agreement covers sub-basins in Virginia as identified in Appendix E. Stewardship of sub-basins shared with adjacent states will be coordinated between the USGS National Geospatial Technical Operations Center (NGTOC), VGIN and with those adjacent states and their corresponding stewardship representatives

Both parties of this MOU recognize that maintaining NHD consistency, currency, and accuracy will benefit both parties and all users of the NHD. The most direct benefit of shared maintenance is the ability to be informed about changes on the landscape and to receive spatial data that faithfully represents those changes. The best resources for information about changes are those closest to the change.

IV. AUTHORITIES

All activities conducted under this Agreement will be in accordance with the applicable laws, executive orders, regulations, and policies of the United States and the Commonwealth of Virginia.

This Agreement is entered into by the USGS under Public Law 99-591 that bestows permanent authority to the USGS to “prosecute projects in cooperation with other agencies, Federal, State, and private” (43 U.S.C. 36c).

This Agreement is entered into by VGIN under Code of Virginia § 2.2-2027 that bestows authority upon the VGIN Coordinator to “oversee the development of and recommend to VITA the promulgation of those policies and guidelines required to support state and local government exchange, acquisition, storage, use, sharing and distribution of geographic or base map data and related technologies.”

V. DEFINITIONS

For definition purposes in this Agreement, ‘stewardship’ is defined as the overall programmatic coordination to maintain an up-to-date statewide NHD dataset while ‘maintenance’ is defined as the necessary revisions, corrections, updates, etc. to a particular sub-basin or set of sub-basins.

VI. COOPERATIVE ACTIVITIES

The U.S. Geological Survey *will*:

1. Be responsive to Virginia by providing the necessary information and assistance to allow the State to implement a stewardship program.
2. Provide contact information for management and technical issues.
3. Provide the tools, documentation, and training to edit and update the NHD (Appendix C).
4. Provide support for the NHDGeoEditTool.
5. Provide clear guidance on expectations for acceptable updates.
6. Provide documentation on formats for update transactions (Appendix A).
7. Provide documentation on validation criteria and quality assurance checks that apply to updates (Appendix B).
8. Provide an Internet accessible reach code allocator and validate reach codes in update submissions.
9. Be responsive to Virginia by processing transactions to the point of distribution in a timely manner of 30 days.
10. Make updates submitted by the steward available in the geodatabase within 60 days.
11. Provide notification, documentation, and assistance in response to submitted updates that do not meet the requirements established and agreed upon by the partners. Return updates that need to be reworked to meet requirements.
12. Notify Virginia of any changes to the NHD structure, format, or content that may affect the State
13. Work with Virginia to develop solutions to incorporate hydrographic data needed by Virginia, but not normally included in the NHD framework.

The Virginia Geographic Information Network *will*:

1. Act as the principal point of contact for the USGS on stewardship issues related to the NHD within the State.
2. Represent the interests of the user community concerned with hydrography in the State by providing the USGS with the most widely accepted representation of the surface water in the NHD.
3. Take stewardship responsibility of 50 Hydrologic Units as documented in Appendix E.
4. Accept input from other agencies and organizations; consider any change submitted and decide authoritatively if it will be accepted or not, and report the decision publicly.
5. Work with partner agencies acting as NHD maintainers or content providers to obtain and incorporate new linework and updates as appropriate. Virginia Partner agencies include but are not limited to those agencies identified in Appendix D.
6. Be responsive to the input received by responding to proposed updates within an agreed-upon, reasonable time. For purposes of this MOU, the time shall be 60 days. Updates to the USGS shall be provided in a timely manner at intervals to be determined.
7. Maintain an awareness of the activities of other agencies and organizations involved in stewardship of the State NHD information in order to include all applicable input for a given area.
8. Provide contact information for management and technical issues.
9. Provide publicly available information on the status of data stewardship activities.
10. Provide updates in the agreed-upon format (Appendix A).
11. Provide metadata that clearly describe the sources used in the update and the process used to make the changes.
12. Provide the USGS with updates that meet agreed-upon quality standards, maintaining quality assurance as follows:
 - a) Strive to ensure that the data is error free so that it will work in (1) the transaction process, (2) input to the working NHD geodatabase, (3) routine validation checks, (4) distribution, and (5) normal applications.
 - b) Perform a quality assurance check on the data before it is delivered to the USGS and ensure that the core content (features, attributes and relationships) identified in the Standards and Quality (QA/QC) Assurance Specifications are included. QA/ QC guidelines are found in the USGS QA / QC Standards (Appendix B). The method used to perform this check will be at the discretion of the partner
11. Rework updates returned for correction and resubmit to the USGS.
12. Utilize nationally consistent reach codes.
13. Provide the USGS with test transactions to demonstrate the ability to meet the standards.

VII. DATA OWNERSHIP AND RIGHTS

All data produced, updated and maintained in the NHD is public domain and thus is available to any interested party.

VIII. FINANCIAL COMMITMENTS

This MOU does not constitute a financial commitment on the part of the USGS or VGIN. The MOU is designed to serve as a mechanism under which each will work cooperatively to exchange updates and continually make improvements to the NHD. All roles and responsibilities are agreed upon in principle and are subject to budgetary and organizational constraints.

IX. PERIOD OF MOU

This MOU becomes effective on the date of signature by all partners and continues until modified by mutual consent or unless terminated with 60 days' written notice by either partner. The MOU will be reviewed periodically and amended or revised when required.

X. POINTS OF CONTACT

The USGS and VGIN designate the following persons as contacts for the resolution of technical, production and policy related questions:

NHD Stewardship (Policy)

United States Geological Survey (USGS)

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USGS Geospatial Liaison Virginia

U.S. Geological Survey

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NHD Stewardship (Policy)

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VITA/VGIN

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XI. NOTE

This Memorandum is not intended to and does not create any contractual rights or obligations with respect to the signatory agencies or any other parties.

XII. APPROVALS

United States Geological Survey



Kari J. Craun
Director, National Geospatial Technical Operations Center
US Geological Survey
1400 Independence Road
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10-24-08

Date

Virginia Geographic Information Network



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Date

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APPENDIX A

DATA DELIVERY FORMAT

All data transactions shall be in Extensible Language (XML) format, as defined in ISO Standard 15022. For more information on this standard, go to:

<http://www.iso15022.org/ISO15022XML/defaultXML.htm>

APPENDIX B

QUALITY ASSURANCE SPECIFICATIONS

For standards on data content, use:

Standards for National Hydrography Dataset – High Resolution; DRAFT
Defines features, feature attributes, attribute values, delineation, representation rules, and data extraction for the National Hydrography Dataset-High Resolution (NHD-HR) at scales larger than 1:100,000. (145p., 271KB, PDF). <http://rmmcweb.cr.usgs.gov/public/nmpstds/nhdstds.html>

For reference documents on features, attributes and relationships in the NHD please go to:
<http://nhd.usgs.gov/techref.html>

Here you will find:

- **NHDinARC QuickStart** [HTML 17k](#)|[PDF 145k](#)
The “NHDinARC QuickStart” is a condensed and highly informative reference document for the NHDinARC data model. The document defines important components of the data model, while addressing basic questions about the dataset.
- **Concepts and Contents** [HTML 597k](#)|[PDF 739k](#)
“Concepts and Contents” is the primary reference document for the National Hydrography Dataset. In this document, one will find information ranging from a high level overview of the NHD to detailed descriptions of the NHD data content. The “Concepts and Contents” document describes the elements of the dataset that will make the USGS Digital Line Graph and the EPA Reach File. The main points of this document are summarized in the “NHDinARC QuickStart” document.
- **NHDinARC Schema** – Diagram of the tables, the table items, the item definitions, and the relationship between the tables in the NHDinARC data model (74k)
 - Microsoft PowerPoint format (61k)
 - Adobe PDF format (76k)
- **NHDinGEO Schema** – Diagram of the tables, the table items, the item definitions, and the relationship between the tables in the NHDinGEO data model.
 - Hydrography (66k)
 - Metadata and Misc. Objects (107k)
- **NHD Data Standards** – Defines valid feature types and their characteristics, the delineation or extent of a feature, how a feature is stored in the data, and detailed capture conditions for each of the feature types in the National Hydrography Dataset (NHD).
- **NHD Fact Sheet** – A brief summary of the history and characteristics of the NHD, with additional information concerning obtaining and maintaining the NHD.

- **Geographic Names Information System (GNIS)** – Access GNIS to check, submit new or make changes to names in GNIS.

APPENDIX C - EDIT TOOLS TO BE USED

A tool is needed to specifically edit NHD data since the NHD structure is somewhat complex. This complexity is a part of the design that makes the NHD so suitable for a stewardship environment. Many components are tracked in special tables that trace the legacy of the data. This tool, known as NHDGeoEditTool, has been developed by the U.S. Forest Service and will be made available to the partner for use. The NHDGeoEditTool is supported and maintained by NGTOC.

For user-developed applications, go to: <http://nhd.usgs.gov/applications.html>

APPENDIX D- VIRGINIA PARTNERS

At the current time VGIN expects the following State agencies to participate in the NHD Update effort:

Virginia Geographic Information Network (VGIN)

Virginia Department of Forestry (VDOF)

Virginia Department of Environmental Quality (DEQ)

Virginia Department of Conservation and Recreation (DCR)

Virginia Department of Game and Inland Fisheries (DGIF)

Virginia Institute of Marine Science (VIMS)

This identification as a state partner (as a maintainer of NHD) does not imply any financial commitment on the part of these agencies.

APPENDIX E - VIRGINIA HYDROLOGIC UNIT CODE LIST (50 Units)

[03010205](#) Albemarle; state(s): NC, VA
[02080207](#) Appomattox; state(s): VA
[03010105](#) Banister; state(s): VA
[03010202](#) Blackwater; state(s): NC, VA
[02070003](#) Cacapon-Town; state(s): MD, PA, VA, WV
02040304 Chincoteague; state(s): DE, MD, VA
[03010203](#) Chowan; state(s): NC, VA
[02070004](#) Conococheague-Opequon; state(s): MD, PA, VA, WV
[02080110](#) Eastern Lower Delmarva; state(s): VA
[02080102](#) Great Wicomico-Piankatank; state(s): VA
[02080208](#) Hampton Roads; state(s): VA
[06010104](#) Holston; state(s): TN, VA
[02080101](#) Lower Chesapeake Bay; state(s): MD, VA
[03010104](#) Lower Dan; state(s): NC, VA
[02080206](#) Lower James; state(s): VA
[02070011](#) Lower Potomac; state(s): MD, VA
[02080104](#) Lower Rappahannock; state(s): VA
[02080108](#) Lynnhaven-Poquoson; state(s): VA
[02080105](#) Mattaponi; state(s): VA
[02080202](#) Maury; state(s): VA
[03010204](#) Meherrin; state(s): NC, VA
[02080203](#) Middle James-Buffalo; state(s): VA
[02080205](#) Middle James-Willis; state(s): VA
[05050002](#) Middle New; state(s): VA, WV
[02070010](#) Middle Potomac-Anacostia-Occoquan; state(s): DC, MD, VA
[02070008](#) Middle Potomac-Catoctin; state(s): DC, MD, VA, WV
[03010102](#) Middle Roanoke; state(s): NC, VA
[06010101](#) North Fork Holston; state(s): TN, VA
[02070006](#) North Fork Shenandoah; state(s): VA, WV
[03010201](#) Nottoway; state(s): NC, VA
[02080106](#) Pamunkey; state(s): VA
[02040303](#) Pocomoke; state(s): DE, MD, VA
[06010206](#) Powell; state(s): KY, TN, VA
[02080103](#) Rapidan-Upper Rappahannock; state(s): VA
[02080204](#) Rivanna; state(s): VA
[03010106](#) Roanoke Rapids; state(s): NC, VA
[02070007](#) Shenandoah; state(s): MD, VA, WV
[02070001](#) South Branch Potomac; state(s): MD, VA, WV
[06010102](#) South Fork Holston; state(s): NC, TN, VA
[02070005](#) South Fork Shenandoah; state(s): VA, WV
[05070201](#) Tug; state(s): KY, VA, WV
[06010205](#) Upper Clinch; state(s): TN, VA
[03010103](#) Upper Dan; state(s): NC, VA
[02080201](#) Upper James; state(s): VA, WV
[05070202](#) Upper Levisa; state(s): KY, VA, WV
[05050001](#) Upper New; state(s): NC, TN, VA
[03010101](#) Upper Roanoke; state(s): VA
[03040101](#) Upper Yadkin; state(s): NC, VA
[02080109](#) Western Lower Delmarva; state(s): VA
[02080107](#) York; state(s): VA