

**MEMORANDUM OF UNDERSTANDING**

**BETWEEN**

**THE STATE OF NORTH DAKOTA**

**NORTH DAKOTA STATE WATER COMMISSION**

**AND**

**NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY**

**AND**

**THE DEPARTMENT OF THE INTERIOR**

**U.S. GEOLOGICAL SURVEY**

**FOR**

**JOINT STEWARDSHIP**

**OF THE**

**NATIONAL HYDROGRAPHY DATASET**

**AND THE**

**WATERSHED BOUNDARY DATASET**

**IN THE**

**STATE OF NORTH DAKOTA**

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## **I. Purpose**

The purpose of establishing this Memorandum of Understanding (MOU) is to identify the activities the North Dakota State Water Commission (NDSWC), the North Dakota Department of Environmental Quality (NDDEQ), and the United States Geological Survey (USGS) will undertake to revise, improve, and maintain the National Hydrography Dataset (NHD) and the Watershed Boundary Dataset (WBD) in a program of statewide data stewardship for North Dakota. NDSWC, NDDEQ, and the USGS have an interest in providing current, accurate, and consistent surface water geospatial data to meet the requirements of the National Spatial Data Infrastructure (NSDI), to support The National Map (TNM), and to support North Dakota end user needs for hydrography data.

## **II. Background**

The USGS, National Geospatial Program, is the Federal civilian mapping agency and provides a foundation of digital geospatial data representing the topography, natural landscape, and built environment of the United States. It engages partners and communities of use to collaboratively produce consistent and accurate topographic map data.

NDSWC and NDDEQ are executive agencies with the State of North Dakota. The NDSWC's and NDDEQ's mission is to protect and restore the environment, and to foster a healthy and prosperous North Dakota for present and future generations. In that pursuit, the NDSWC and NDDEQ has identified both the NHD and WBD as significant geospatial components to support regional cooperative initiatives, effective and cooperative land management, cooperative ecosystem management, and a myriad of other applications. The GIS Section of their Offices is tasked with obtaining, preparing, editing, and publishing geospatial data needed by its geoscientists, as well as assisting them with preparing geospatial data submitted in reports to the United States Environmental Protection Agency (EPA). The EPA's preference is for states to reference applicable geospatial data to NHD and WBD features.

The success of the NHD and WBD depend on partnerships which are established with a variety of local, state, federal and tribal organizations. These partners serve an important stewardship role, as described in the Roles and Responsibilities section, and work cooperatively among themselves and with the USGS to share updates and promote improvements to the NHD and WBD.

The NHD is a comprehensive set of digital geospatial 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 of surface water features, their attribution, their connectivity in a flow

network, and an addressing system for linking additional related data or information to the network. Each reach in this framework is referenced by a permanent feature identifier known as a reach code and is segmented into linear addresses or “measures”. The USGS is the authority for reach codes, measures, and other permanent identifiers on the NHD. Because the NHD provides a nationally consistent framework for addressing and analysis, water-related information linked to reach addresses by one organization (national, state, or local) can be shared with other organizations and easily integrated into many different types of applications to the benefit of all.

The Watershed Boundary Dataset (WBD) is a companion dataset to the NHD and is included in the NHD data delivery. The WBD is a nationally consistent and seamless dataset consisting of nested, multilevel, hierarchical drainage areas from the 2-digit to the 12-digit level. Each drainage area is defined by topographic and hydrologic criteria that delineate an area of land upstream from a specific point on a stream. NHD surface water features are contained within hydrologic unit boundaries. A ReachCode is assigned to an NHDFlowline based on the 8-digit hydrologic unit that contains it. As such, the first 8 digits of any ReachCode match the corresponding 8-digit hydrologic unit code. The WBD provides a consistent framework for programmatic planning, implementation, and reporting at the national, regional, state, and local levels.

The combination of the NHD and WBD form a powerful analytical and reporting system that, when combined with Geographic Information Systems (GIS) software, allows users to assess vital information about the hydrography in their area of interest. The NHD and WBD are both useful for mapping and visualization purposes and the NHD is used as the hydrography layer on the United States Topographic maps. The NHD and WBD also are used in watershed management and assessment, water quality initiatives and calculating total maximum daily loads.

The USGS created the high-resolution NHD and WBD at a scale of 1:24,000. Over the last decade the introduction of higher resolution data, defined at a scale greater than 1:24,000 has led to the NHD and WBD becoming a multiresolution geodatabase of hydrographic features. With ongoing technological improvements, the resolution of the NHD and WBD will continue to increase.

### **III. Authority**

All activities conducted under this MOU will be in accordance with the applicable laws, executive orders, regulations, and policies of the United States and the State of North Dakota.

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

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Specific joint agency authorities: Executive Order 12906, published April 13, 1994, that established the development of the NSDI and called for partnerships for data acquisition.

The State of North Dakota is required to submit an integrated report to the EPA on April 1<sup>st</sup> of every even numbered year as described in the Clean Water Act (CWA) section 303(d) and section 305(b).

## **IV. Scope**

The parties to this MOU recognize that maintaining NHD and WBD consistency, currency, and accuracy will benefit both agencies and all users of the NHD and WBD. The USGS understands the best sources for information about changes come from those closest to the change, such as State and local governments, and other local organizations. NDSWC and NDDEQ recognize the benefits of having a Federal partner to store, maintain, and distribute the data, as well as create tools to assist with editing and using the NHD and WBD. NDSWC and NDDEQ and any approved substewards intend to use the Markup Tool to submit potential edits for Hydrography data and products. NDSWC and NDDEQ will use the Markup Reviewer to assist in validating Markups and assist the USGS in making those edits.

This agreement covers 8-digit hydrologic units (HU8, formerly "sub-basins") in North Dakota as identified in Appendix A. Stewardship of HU8 shared with adjacent states will be coordinated between NDSWC and NDDEQ, the USGS and with those adjacent states and their corresponding stewardship representatives.

## **V. Roles and Responsibilities**

This MOU outlines a partnership to implement comprehensive stewardship of the NHD and the WBD in North Dakota. This section describes the responsibilities for each agency.

A) NDSWC will:

- 1) Act as the primary steward and principle point of contact for the USGS on all NHD stewardship issues in the State of North Dakota and coordinate with NDDEQ, the WBD principal steward, on all WBD edits.
- 2) Act as editors for the USGS on NHD stewardship issues in the State of North Dakota.
- 3) Accept and consider all input from other agencies and organizations in North Dakota, decide if the proposed changes are acceptable and if so, incorporate the changes into the national NHD. If needed, USGS can aid in this responsibility to meet specific timelines.

- 4) Receive guidance from the North Dakota WBD Principal Steward to decide if the proposed changes are acceptable and if so, incorporate the changes into the national NHD. If needed, USGS can aid in this responsibility to meet specific timelines.
- 5) Represent the interests of the hydrography user community in North Dakota by providing the USGS with the most widely accepted representation of surface waters and drainage area boundaries in North Dakota.
- 6) Edit NHD data only in the State of North Dakota, and respect adjoining state's requests for notification prior to checking out data from the stewardship website.
- 7) Coordinate with the North Dakota WBD Principal Steward and adjoining state stewards when NHD edits may affect drainage area boundaries in those states
- 8) Actively seek out other agencies and organizations interested in acting as substewards that provide contributions to the NHD. Notify the WBD Principal Steward of any additional agencies or organizations interested in acting as NHD editors.
- 9) Provide contact information for the NHD Principal Steward and the NHD and WBD Technical Points of Contact who will represent the state
- 10) Whether editing NHD data directly or through a substeward, use the tools and processes provided by the USGS as defined in the section, "NHD Standards and Technical References". NDSWC and NDDEQ will use the suite of Markup Tools to submit potential edits and assist in validating and editing.
- 11) Utilize nationally consistent Reachcode identifiers obtained from USGS.
- 12) Provide updates to the USGS in a timely manner, dependent on monetary and human resources available at any specific point in time.
- 13) Provide publicly available information on the status of NHD stewardship activities.

B) NDDEQ will:

1. Act as the primary steward and principle point of contact for the USGS on all WBD stewardship issues in the State of North Dakota and coordinate with NDSWC, the NHD principal steward, on all WBD edits.
2. Act as editors for the USGS on WBD stewardship issues in the State of North Dakota.
3. Accept and consider all input from other agencies and organizations in North Dakota, decide if the proposed changes are acceptable and if so, incorporate the changes into the national WBD. If needed, USGS can aid in this responsibility to meet specific timelines.
4. Receive guidance from the North Dakota NHD Principal Steward to decide if the proposed changes are acceptable and if so, incorporate the changes into the national WBD. If needed, USGS can aid in this responsibility to meet specific timelines.

5. Represent the interests of the hydrography user community in North Dakota by providing the USGS with the most widely accepted representation of surface waters and drainage area boundaries in North Dakota.
6. Edit WBD data only in the State of North Dakota, and respect adjoining state's requests for notification prior to checking out data from the stewardship website.
7. Coordinate with the North Dakota NHD Principal Steward and adjoining state stewards when WBD edits may affect drainage area boundaries in those states
8. Actively seek out other agencies and organizations interested in acting as substewards that provide contributions to the WBD. Notify the NHD Principal Steward of any additional agencies or organizations interested in acting as WBD editors.
9. Provide contact information for the WBD Principal Steward and the NHD and WBD Technical Points of Contact who will represent the state
10. When editing WBD data directly, use tools and processes provided by the USGS as defined in the section "WBD Standards and Technical References".
11. Provide updates to the USGS in a timely manner, dependent on monetary and human resources available at any specific point in time.
12. Provide publicly available information on the status of WBD stewardship activities.

C) The U.S. Geological Survey will:

- 1) Be responsive to NDSWC and NDDEQ by providing necessary information, guidance, and technical expertise to support NDSWC and NDDEQ in the creation and maintenance of a stewardship program.
- 2) Notify NDSWC and NDDEQ of any changes to the NHD or WBD data model, national database, editing tools, or distribution system that may affect NDSWC and NDDEQ.
- 3) Provide contact information for the NHD and WBD Technical Points of Contact and The National Map Liaison.
- 4) Create, maintain, and supply documented editing tools necessary to edit the NHD and WBD according to data model requirements.
- 5) Create and maintain the Internet resources necessary to support the editing tools.
- 6) Provide teleconference and online based NHD Basics, NHD Update Tool, and NHD GeoConflation Tool training on a regular basis.
- 7) USGS will assist NDSWC and NDDEQ in validating and editing Markups using the Markup Reviewer.
- 8) Provide teleconference and online based WBD technical exchange meetings, and tool trainings on a regular basis
- 9) Store, maintain, and distribute the national NHD-WBD database as necessary.

- 10) As necessary, work with North Dakota to develop solutions and incorporate hydrographic data that isn't currently represented in the NHD or WBD.
- 11) Respect North Dakota's request for notification prior to checking out data from the stewardship website.

## VI. NHD Standards and Technical References

All edits to the NHD are completed through either the NHD Update tool or the NHD GeoConflation tool, neither of which are available to the general public. All editors must go through NHD training prior to editing the NHD. The NHD Update tool requires NHD data to be edited at the 8-digit hydrologic unit level, while the NHD GeoConflation tool can accommodate either 8-digit or 10-digit hydrologic units. All data used with these editing tools is checked out from the NHD/WBD Hydrography Maintenance Portal (HMP) website, which is located here:

<https://hydromaintenance.nationalmap.gov/HMP>

Prior to editing the NHD, all editors must go through a series of training courses that are provided by teleconference and online meetings. NHD Basics provides an overview of the NHD model and stewardship program. NHD Update Tool Training Part 1 delivers information about this editing tool and teaches editors how to use the tool. NHD Update Tool Training Part 2 covers the in-depth quality control checks associated with this tool that ensure the NHD model is enforced during editing. To accommodate monthly training sessions and to allow editors to practice their editing skills, the training stewardship site is located at:

[https://hydromaintenance.nationalmap.gov/HMP\\_Training](https://hydromaintenance.nationalmap.gov/HMP_Training)

The Hydrographic Data Community (HDC) is the primary communications site for NHD and WBD partners and is login/password protected. Access to this site will be granted prior to any scheduled training for which the editor has signed up. This site is located here:

<https://my.usgs.gov/confluence/pages/viewpage.action?spaceKey=hdc&title=Hydrographic+Data+Community>

The schema underlying the NHD geospatial database model is very complex. A document describing it in detail is found here:

[https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/s3fs-public/atoms/files/NHDv2.2.1\\_poster\\_081216.pdf](https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/s3fs-public/atoms/files/NHDv2.2.1_poster_081216.pdf)

Hydrographic features must meet stringent requirements to be included in the NHD. To learn more about the NHDPlus HD, the Next Generation of National Hydrography go to:

<https://www.usgs.gov/core-science-systems/ngp/national-hydrography/nhdplus-high-resolution>

Once included in the NHD, features must meet specific requirements to be classified as lakes, streams, swamps, canals, oceans, etc. These requirements are detailed in the NHD Feature Catalog, which is found here:

[https://nhd.usgs.gov/userguide.html?url=NHD\\_User\\_Guide/Feature\\_Catalog/Hydrography\\_Dataset/Hydrography.htm](https://nhd.usgs.gov/userguide.html?url=NHD_User_Guide/Feature_Catalog/Hydrography_Dataset/Hydrography.htm)

NHD features are only allowed to interact with specific types of other features in the database. These are known as the NHD Feature to Feature Rules and they can be found here:

[https://usgs-mrs.cr.usgs.gov/NHDHelp/FeatureRules/feature\\_rules.htm](https://usgs-mrs.cr.usgs.gov/NHDHelp/FeatureRules/feature_rules.htm)

If the NHD steward is a separate entity, the NHD steward will be contacted when a major WBD revision results in the need to modify the NHD.

## **VII. WBD Standards and Technical References**

The WBD and NHD are managed under individual data models but are coordinated as a single source of reliable hydrography for the nation. If the WBD steward is a separate entity, the WBD steward will be contacted when a major NHD revision results in the need to modify the WBD.

Standards and procedures for the WBD are published as a USGS Techniques and Methods report, hereafter called “the standard”. It is located here:

<https://pubs.usgs.gov/tm/11/a3/>

The standard is designed to enable local, regional, and national partners to consistently and accurately delineate watersheds. WBD stewardship and coordination, criteria for delineating hydrologic units, appropriate data sources, coding and naming, and required geospatial data structure are outlined in detail in the standard. Stewardship workflow and WBD relation with NHD is illustrated in figure 1 of the 4th edition of the standard.

The WBD state steward listed in the “Points of Contact” section of this document coordinates and assumes responsibility for changes to the data at the state level. As such, approved editors are encouraged to coordinate closely with the state steward on proposed revisions to the WBD. Other organizations with specific local or topical interests may assume additional stewardship under the guidance of the WBD state



steward. WBD is a “certified” national dataset. As such, all edits undergo quality control and assurance by the WBD National Technical Coordination (NTC) Team before acceptance to the national dataset. The WBD NTC is a team of individuals who review, facilitate, and approve updates, and work closely with the WBD state steward and approved editors to ensure that all revisions to the WBD follow the guidelines set forth in the standard.

A suite of editing tools developed by the USGS at the National Geospatial Technical Operations Center (NGTOC) is available for the WBD. The toolset facilitates editing of WBD data, management of feature level metadata, and adherence to the standard within the data. Tools are available for download at the Hydrographic Data Community (HDC) located at the following link (if you do not see the WBD Software Downloads page, contact your WBD POC for access):

<https://my.usgs.gov/confluence/display/hdc/Watershed+Boundary+Dataset+%28WBD%29+Community>

This login/password protected site is also a primary source of information and communication from NGTOC to the steward community. NGTOC is responsible for maintaining and improving the WBD tools and for conducting tool training. Stewards check out data for their area of interest from the NHD/WBD Hydrography Maintenance Portal (HMP) website at:

<https://hydromaintenance.nationalmap.gov/HMP>

Prior to editing the WBD, editors must undergo training. Contact USGS NGTOC WBD Partner Support for assistance with the stewardship website, tools, and for tool training here:

<https://my.usgs.gov/confluence/display/hdc/Watershed+Boundary+Dataset+%28WBD%29+Community>

A list of fellow WBD stewards, editors, and points of contact can be found here:

[https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/watersheds/?cid=nrcs143\\_021620](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/watersheds/?cid=nrcs143_021620)

## **VIII. Data Ownership and Rights**

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

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## IX. Financial Commitments

This MOU does not constitute a financial commitment on the part of either party. 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.

## X. Period of Agreement

This MOU is effective upon the date of the last signature and shall remain in effect for five (5) years. USGS and NDSWC and NDDEQ will meet annually to review this MOU, discuss desired changes, and document any modifications in an amendment. Either party to the MOU may modify by mutual consent or terminate their participation in the MOU by providing 60 days advance written notice.

## XI. Points of Contact

The USGS and NDSWC and NDDEQ designate the following persons as authorized representatives responsible for engaging in this stewardship agreement.

<b>NHD/WBD Integrated Stewardship</b>	<b>NHD Stewardship</b>	<b>WBD Stewardship</b>
U.S. Geological Survey	North Dakota State Water Commission	North Dakota Department of Environmental Quality
Name: James Langtry	Rod Bassler	Ann Fritz
Title: National Map Liaison	GIS Coordinator	Environmental Scientist
Address: 5231 S. 19 <sup>th</sup> Street	900 E. Boulevard Avenue	918 E. Divide Avenue
Phone: 402-328-4128	701-328-4998	701-328-5162
Fax: 402-328-4101	701-328-3696	701-328-5200
Email: <a href="mailto:jlangtry@usgs.gov">jlangtry@usgs.gov</a>	<a href="mailto:rbassler@nd.gov">rbassler@nd.gov</a>	<a href="mailto:afritz@nd.gov">afritz@nd.gov</a>

**NHD Technical**

U.S. Geological Survey  
Name: Joel Skalet  
Title: NHD Partner Support  
Address: U.S. Geological Survey  
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Phone: 608-238-9333 ext. 152  
FAX:  
Email: [jjskalet@usgs.gov](mailto:jjskalet@usgs.gov)

**NHD Technical**

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North Dakota State Water Commission  
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701-328-3696  
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**WBD Technical**

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FAX: 303-202-4504  
Email: [lniknami@usgs.gov](mailto:lniknami@usgs.gov)

**WBD Technical**

North Dakota Department of  
Environmental Quality  
Ann Fritz  
Environmental Scientist  
918 E. Divide Avenue  
Bismarck, ND 58501  
  
701-328-5162  
701-328-5200  
[afritz@nd.gov](mailto:afritz@nd.gov)

**U.S. Geological Survey**

Name: Kimberly Jones  
Title: WBD National Technical  
Coordination Lead  
Address: 2329 West Orton Circle  
West Valley City, UT 84119  
Phone: 801-908-5032  
Email: [kjones@usgs.gov](mailto:kjones@usgs.gov)

## XII. Approvals


The individuals below are authorized to sign and execute this MOU between their respective institutions on the data appearing below their respective signatures.

**DAVID  
BROSTUEN**

Digitally signed by DAVID  
BROSTUEN  
Date: 2020.02.11 10:44:26  
-07'00'

David Brostuen, Director  
Director NGTOC  
U.S. Geological Survey

Date



2.12.2020

Garland Erbele, P.E.  
State Engineer

Date

North Dakota State Water Commission



David Glatt  
Director

North Dakota Department of Environmental Quality

2-13-2020

Date