The National Watershed Boundary Dataset or *Watersheds 101*

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North Dakota Department of Health
Division of Water Quality

OUTLINE

- What is the WBD?
- Why did we develop the Watershed Boundary Dataset (WBD)?
- Who completed this data?
- How was the dataset created?
- How is it maintained?
- How can I get a copy of the WBD?

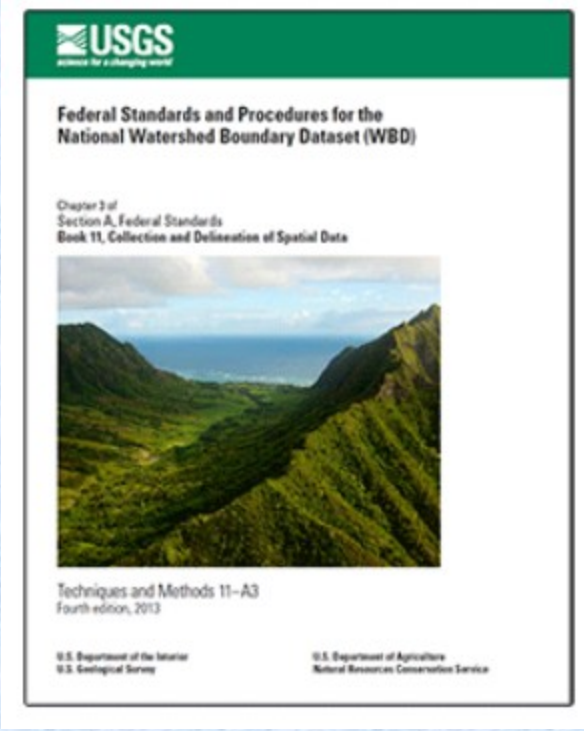
What is it?

WBD = Watershed Boundary Dataset

- A series of nested hierarchical drainage units encompassing all surface area drainage in the nation (containers).
- Each drainage unit is subdivided into uniform areas based on topography and hydrologic principles using Federal Standards.
- Baseline drainage area framework at 1:24,000 scale for the nation *in digital form (ie. GIS)*.
- Part of the U.S. Geological Survey *National Map*
- Distributed with the National Hydrologic Dataset - or NHD (streams and rivers, lakes and ponds)

Standards & Certification process

Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD), By the U.S. Geological Survey and U.S. Department of Agriculture, Natural Resource Conservation Service; Fourth Edition - 2013



http://pubs.usgs.gov/tm/11/a3/

Hydrologic Unit Hierarchy

REGION 1
21 Nationally
HU Code: 2 digit

SUBREGION 2
221 Nationally
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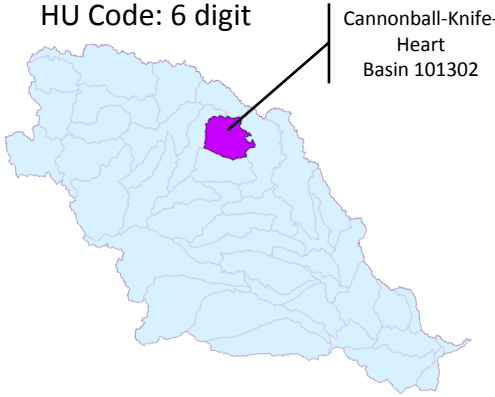
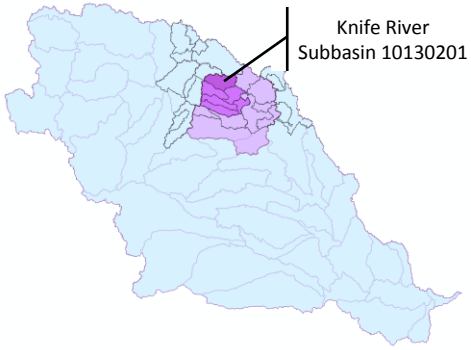
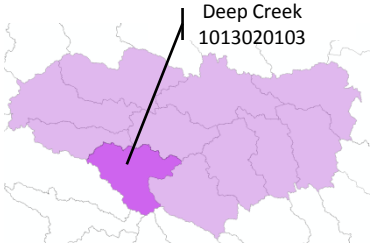
BASIN 3
378 Nationally
HU Code: 6 digit



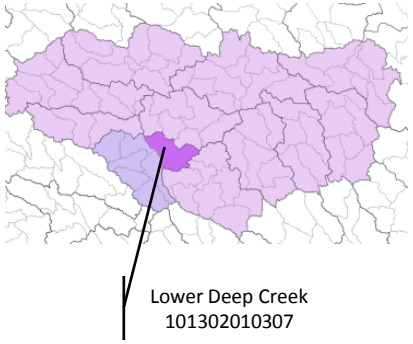
SUBBASIN 4
2236 Nationally
HU Code: 8 digit
average size: 700 mi^2



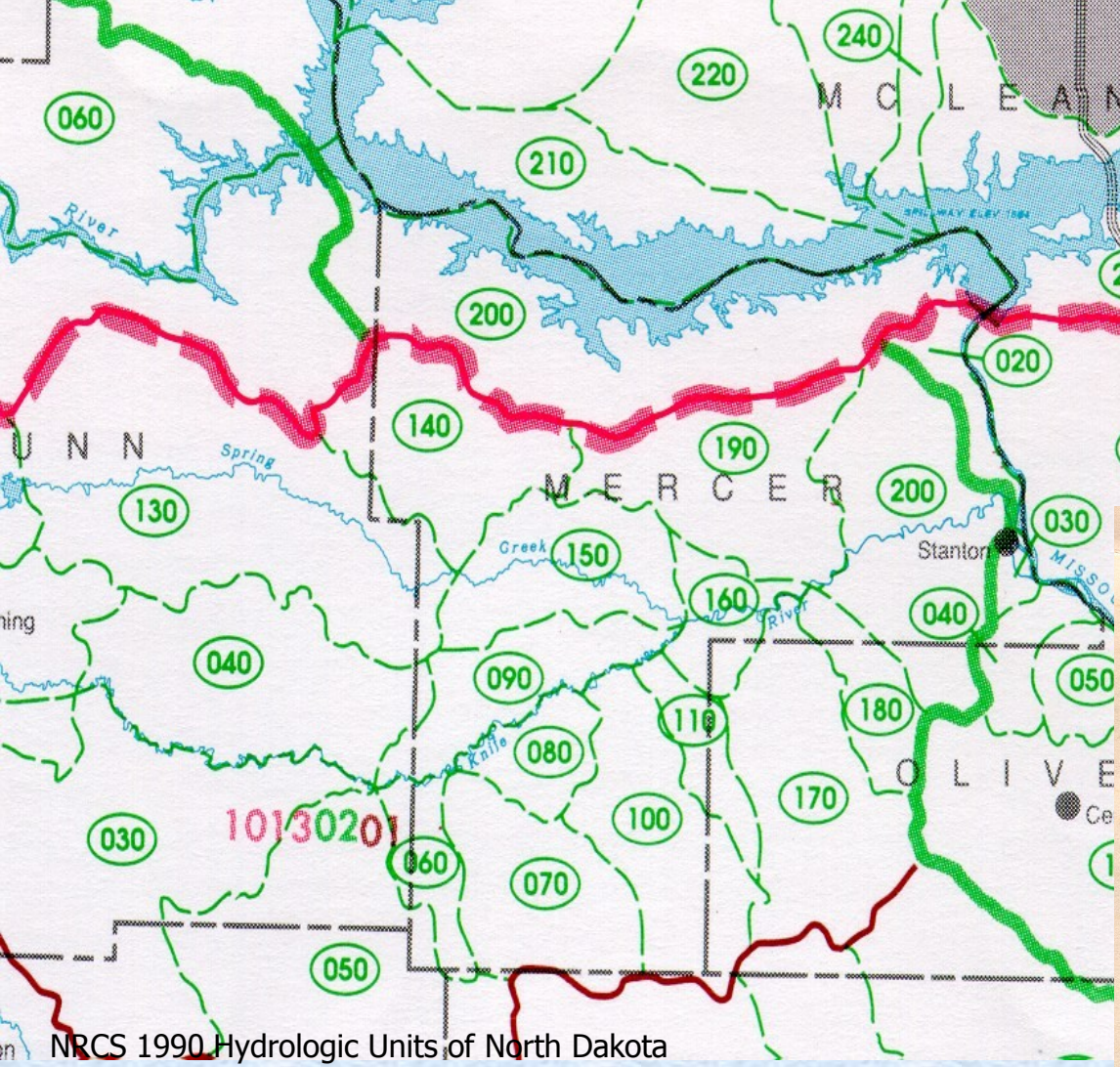
WATERSHED 5
5-15 per Subbasin
HU Code: 10 digit
size: 40,000-250,000 acres



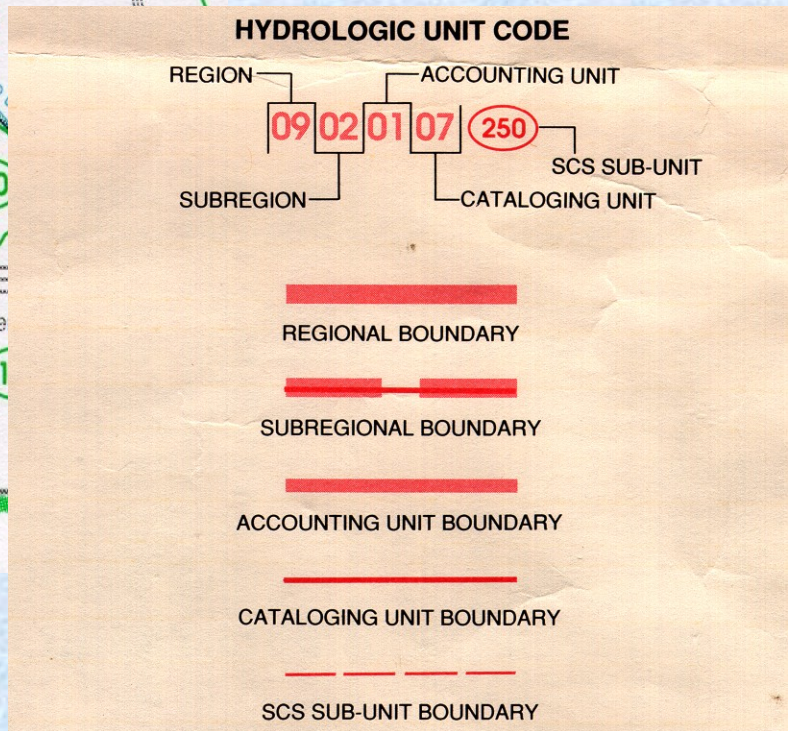
SUBWATERSHED 6
5-15 per Watershed
HU Code: 12 digit
size: 10,000-40,000 acres
(not less than 3,000)



WHY?



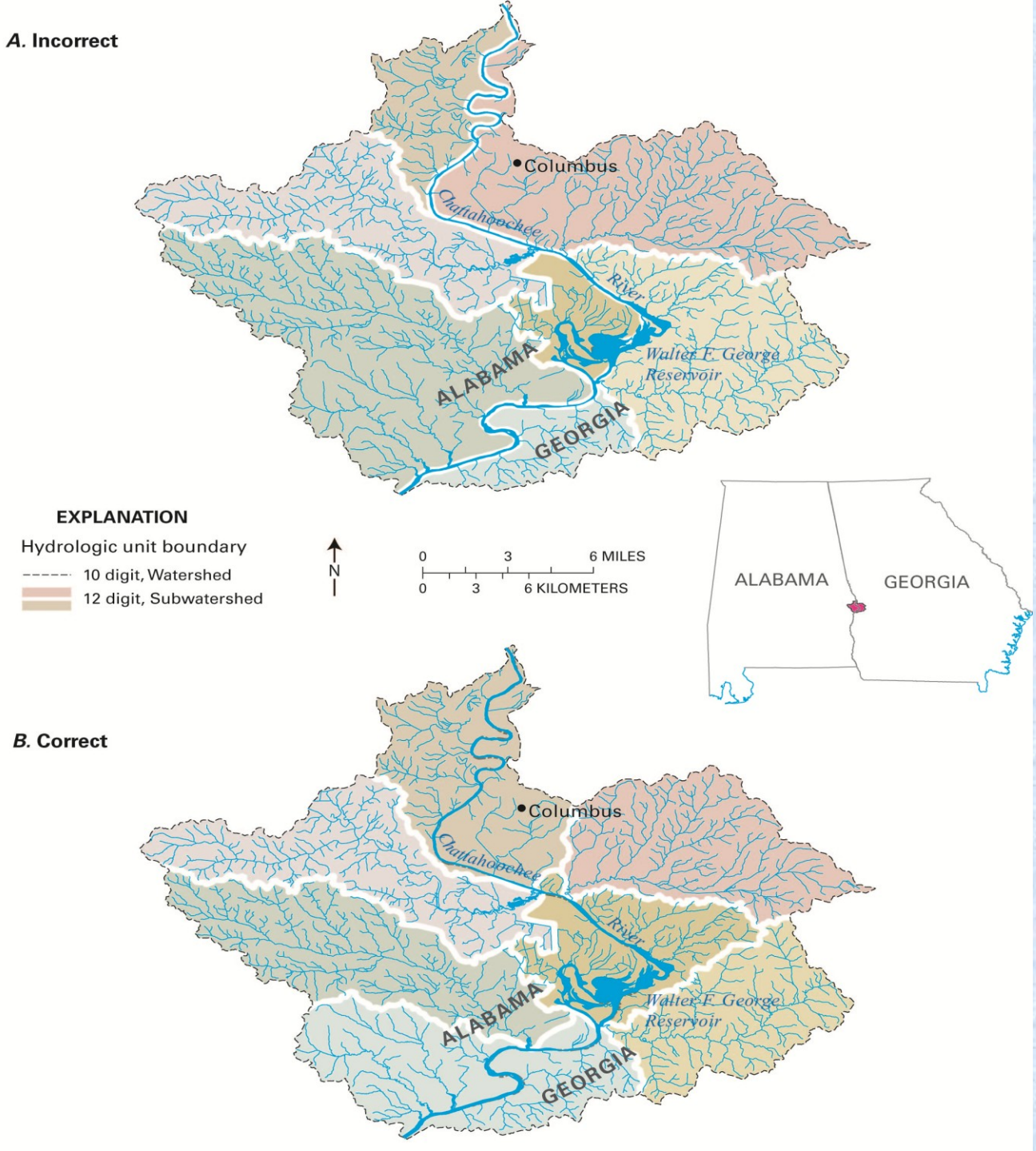
NRCS 1990 Hydrologic Units of North Dakota



-The "Old" Hydrologic Unit Codes and polygons followed political or administrative borders; did not accurately reflect hydrologic drainage (divides down stream centerlines)

-Different terminology between different agencies

-Stopped at international borders of Canada and Mexico.



"New" Delineations of hydrologic features based on land surface, surface water flow and hydrogeographic features. NOT administrative or political features.

The WBD ….

- Is surface area drainage for the nation.
- Provides baseline data for the all federal and state agencies that deal with natural resources.
- Was consistently created across the nation using Federal Standards.

- *We're all on the same page*

WHO created the WBD?

- North Dakota Cooperators (signed MOU in 2000)
  - ND Dept. of Health
  - ND State Water Commission
  - ND Geological Survey
  - U.S. Forest Service - Dakota Prairie Grasslands
  - U.S. Geological Survey
  - U.S. Dept. of Agriculture - Natural Resource Conservation Service

Additional technical or financial support provided by U.S. Bureau of Reclamation, ND GISTC Data Acquisition Funds, EPA Consolidated Funding Grant, and EPA National Environmental Information Exchange Network grants.

Also included with original delineation efforts: NWS, International Joint Commission, USACE, ND DEM, ND WUA, Federal Highway Administration, USF&W

WHO created the WBD?

- Regional Cooperators

Scientists and hydrologists who consulted each other when delineating across state boundaries.

  - Minnesota Department of Natural Resources
  - U.S. Geological Survey – MN Water Resource District office
  - U.S. Geological Survey – SD Water Resource District Office
  - U.S. Forest Service - Dakota Prairie Grasslands
  - U.S. Dept. of Agriculture - Natural Resource Conservation Service (MT, ND, SD state offices)

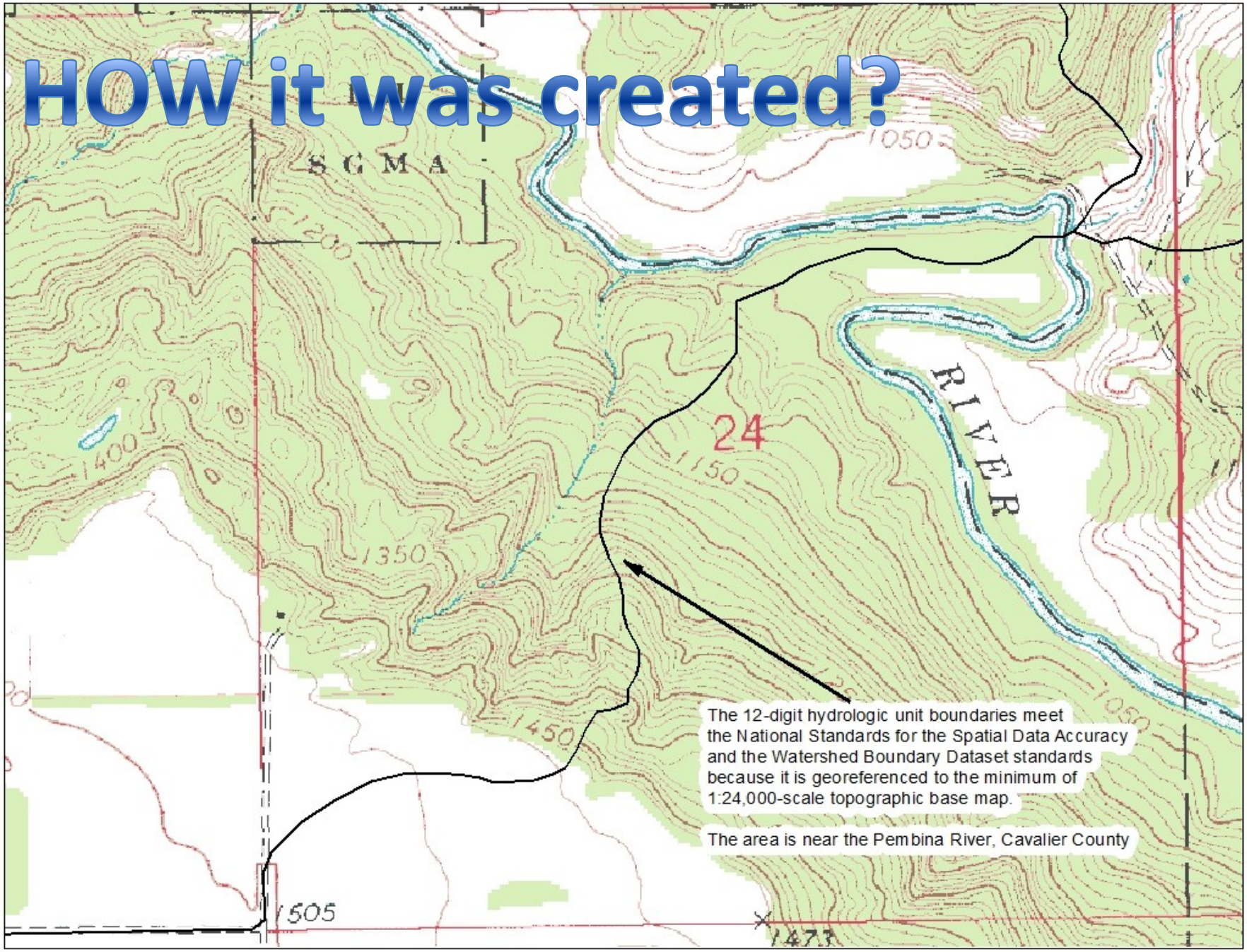
WHO created the WBD?

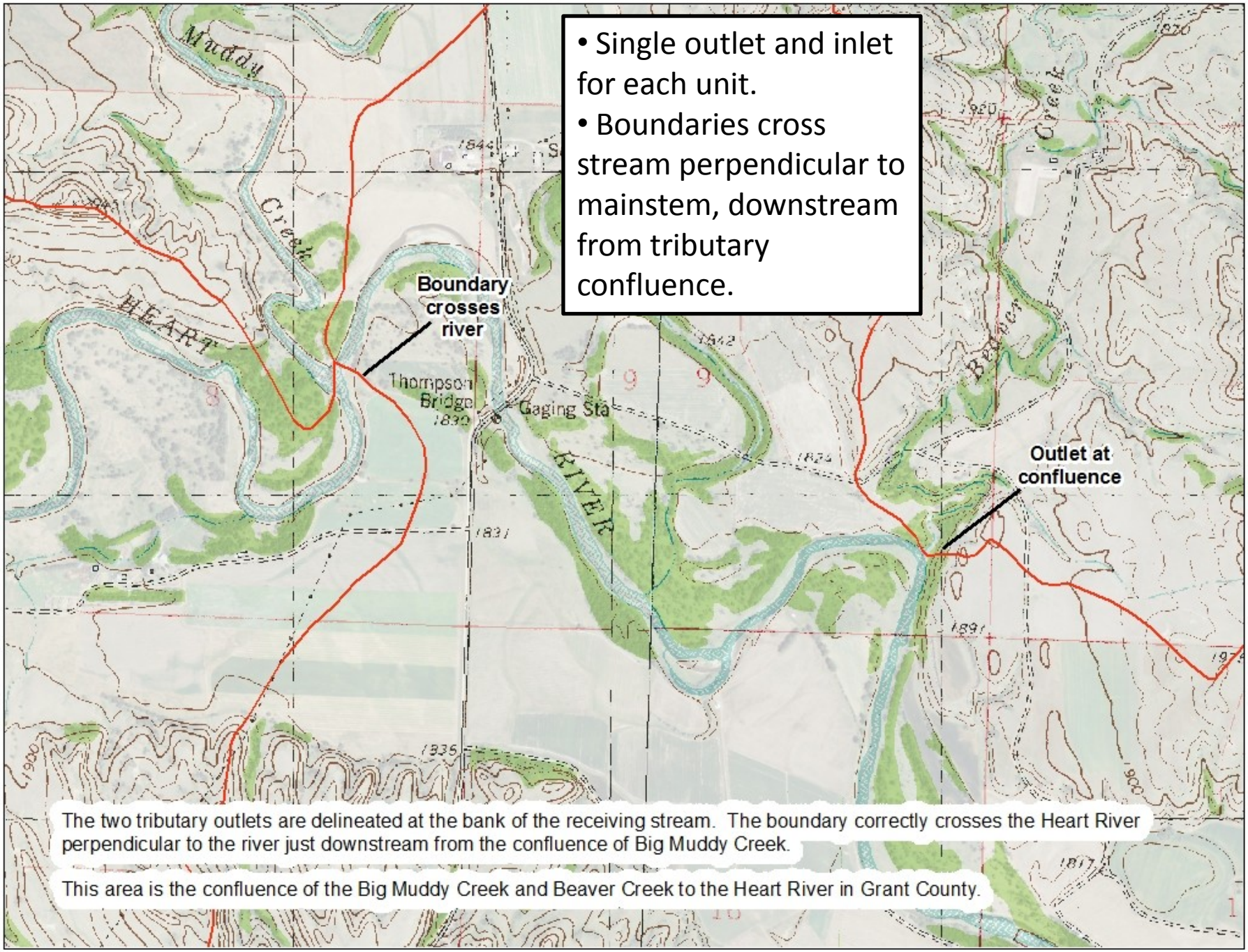
- International Cooperators

Scientists and hydrologists who consulted each other when delineating across ND- Canada boundaries.

- Manitoba Water Stewardship
- Saskatchewan Water Stewardship
- Environment Canada
- Canadian Agri-Environment Services Branch - PFRA

HOW it was created?

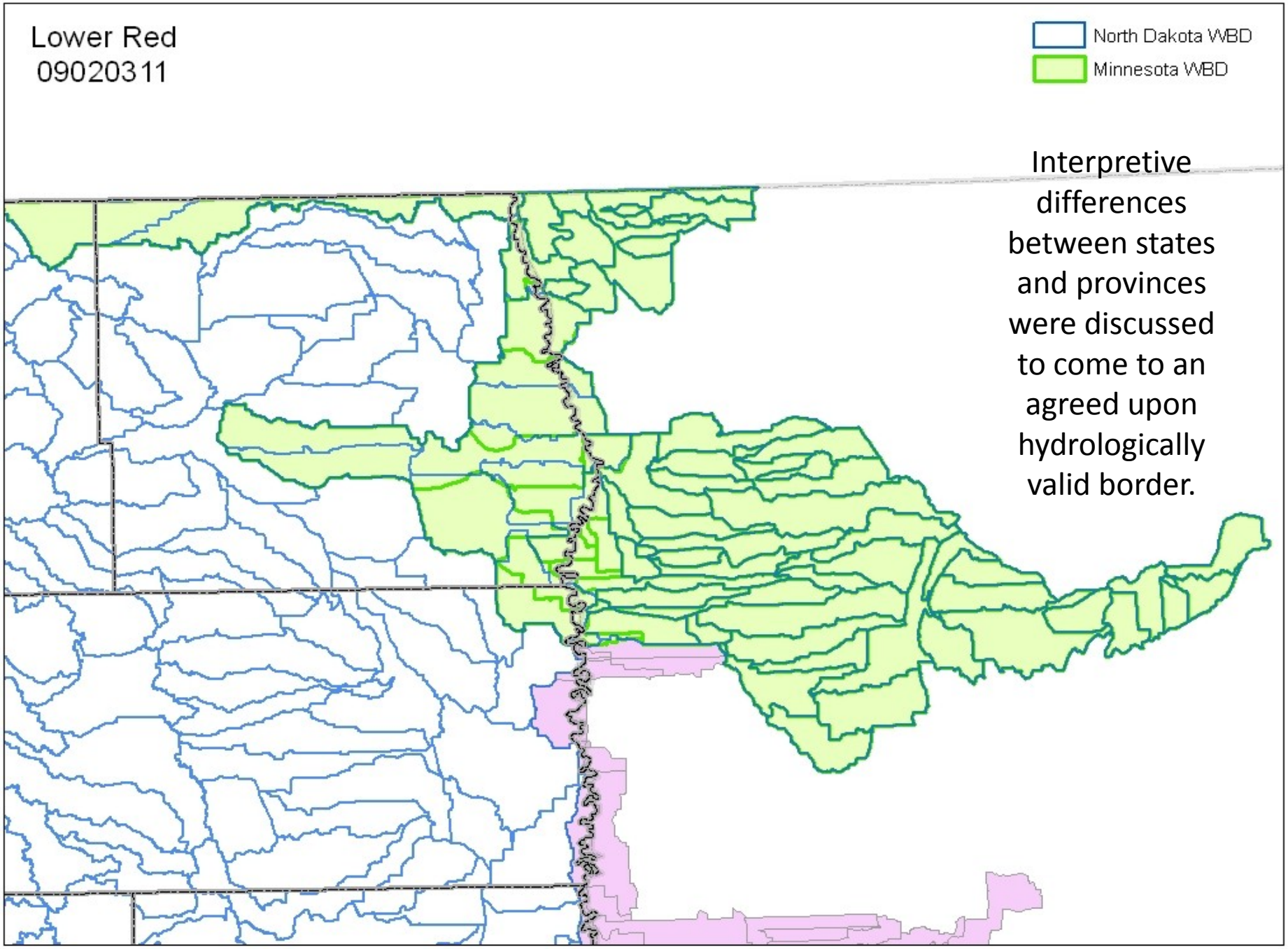


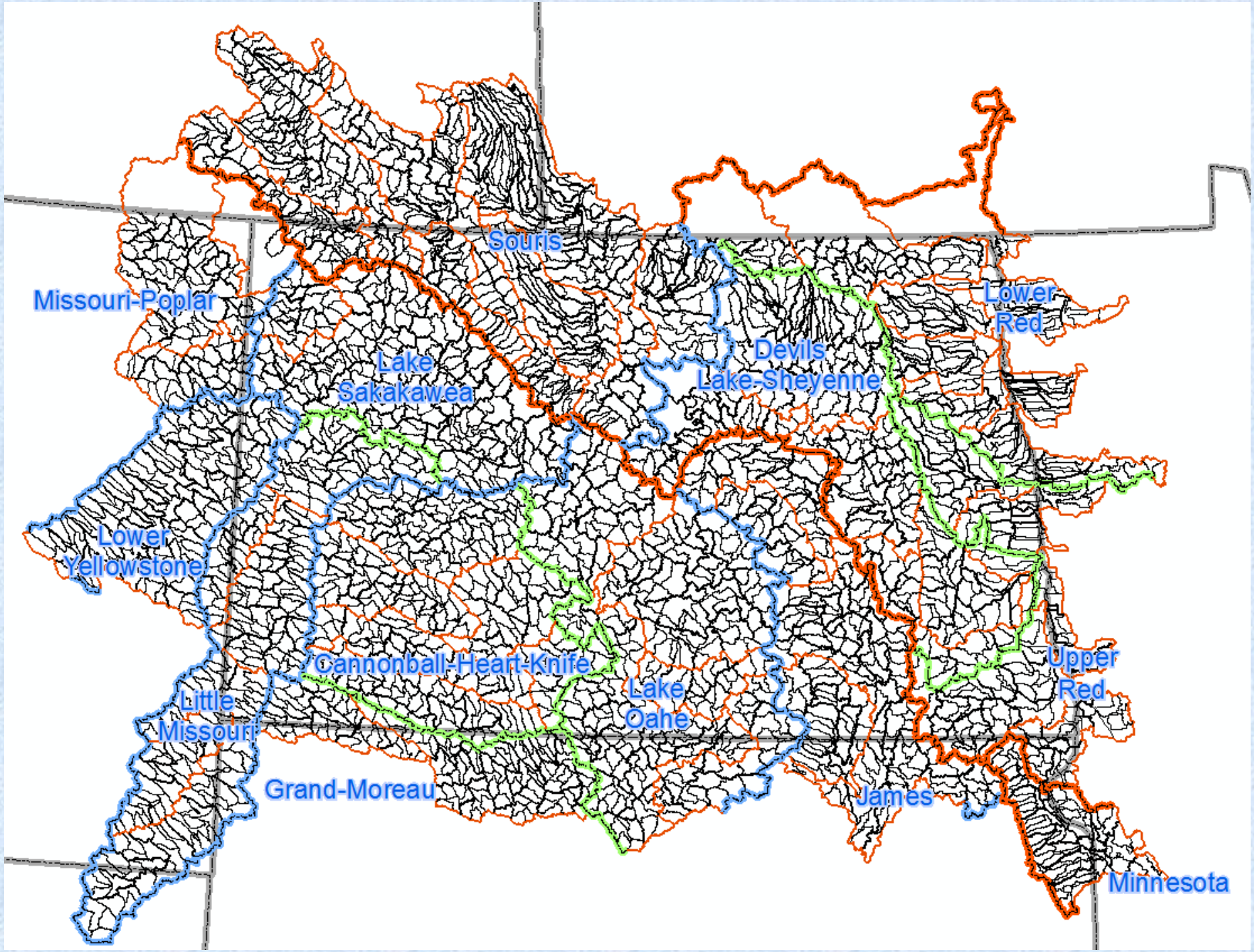


- Single outlet and inlet for each unit.
- Boundaries cross stream perpendicular to mainstem, downstream from tributary confluence.

The two tributary outlets are delineated at the bank of the receiving stream. The boundary correctly crosses the Heart River perpendicular to the river just downstream from the confluence of Big Muddy Creek.

This area is the confluence of the Big Muddy Creek and Beaver Creek to the Heart River in Grant County.


Lower Red
09020311
North Dakota WBD
Minnesota WBD
Interpretive differences between states and provinces were discussed to come to an agreed upon hydrologically valid border.


Souris
Missouri-Poplar
Lower
Red
Devils
Lake-Sheyenne
Lake
Sakakawea
Lower
Yellowstone
Cannonball-Heart-Knife
Upper
Red
Lake
Oahe
Little
Missouri
Grand-Moreau
James
Minnesota

How do I get it?

nhd.usgs.gov

Pre-staged Subregions

U.S. Geological Survey - National Hydro...

nhd.usgs.gov

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The National Map

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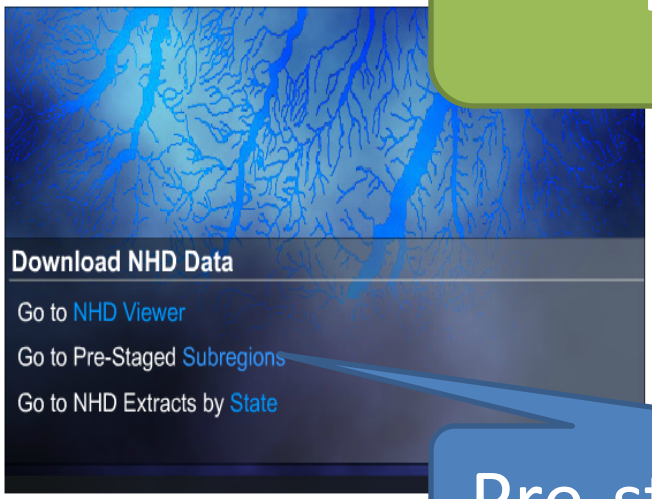
Hydrography

National Hydrography Dataset
Watershed Boundary Dataset



Sea

re used to portray
atures such as rivers,
nits drainage basins as
enclosed areas in eight different size categories. Both datasets represent the real world at a nominal scale of 1:24,000-scale, which means that one inch of The National Map data equals 2,000 feet on the ground. To maintain mapping clarity not all water features are represented and those that are use a moderate level of detail.

The NHD and WBD are digital vector datasets used by geographic information systems (GIS). These data are designed to be used in general mapping and in the analysis of surface water systems. In order to make a map these data must be used by a GIS to render the data and then print a map or make an image. The NHD is portrayed on the US Topo map product produced by the USGS and the NHD and WBD can be viewed on the Hydrography Viewer or the general mapping oriented The National Map Viewer.

In mapping, the NHD and WBD are used with other data themes such as elevation, boundaries, transportation, and structures to produce general reference maps. The NHD and WBD are often used by
ibutes imbedded in the data to
NHD contains a flow network that
an addressing system based on
ter such as water discharge rates,
water quality, and fish population.

The WBD exists in six levels of a nested hierarchy permitting the analysis to determine which drainage basin a particular location is enclosed in. This makes it possible to determine which rivers and lakes could be affected by an event such as a toxic spill. Using basic NHD features like flow network, linked information, and other characteristics, along with one of the six levels of WBD areas, it is possible to study cause and effect relationships, such as how a source of poor water quality upstream might affect a fish population downstream.

Some of the files on this page are presented in Portable Document Format (PDF); the latest version of Adobe Acrobat Reader or similar software is required to view it. Download the latest version of Acrobat Reader, free of charge.

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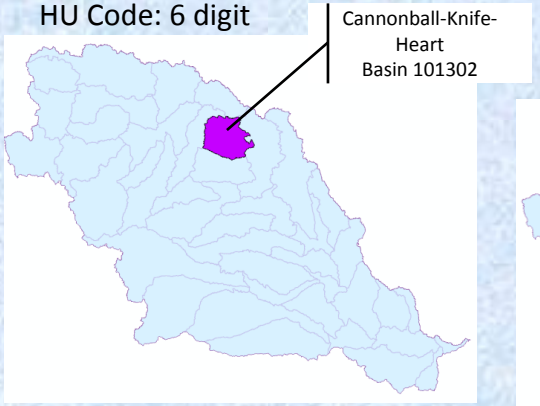

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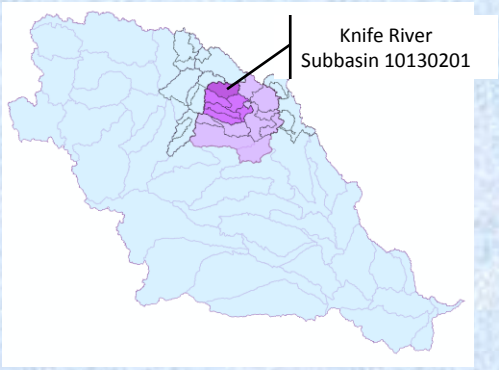

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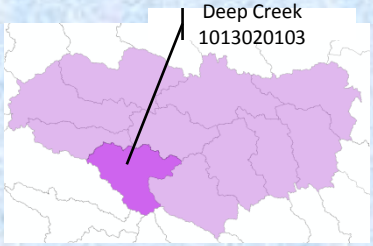

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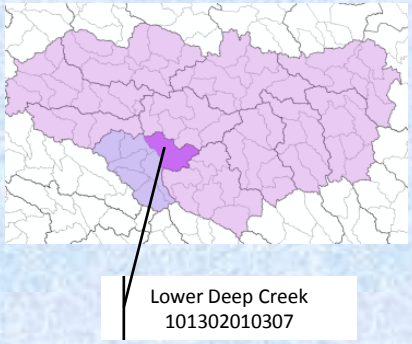

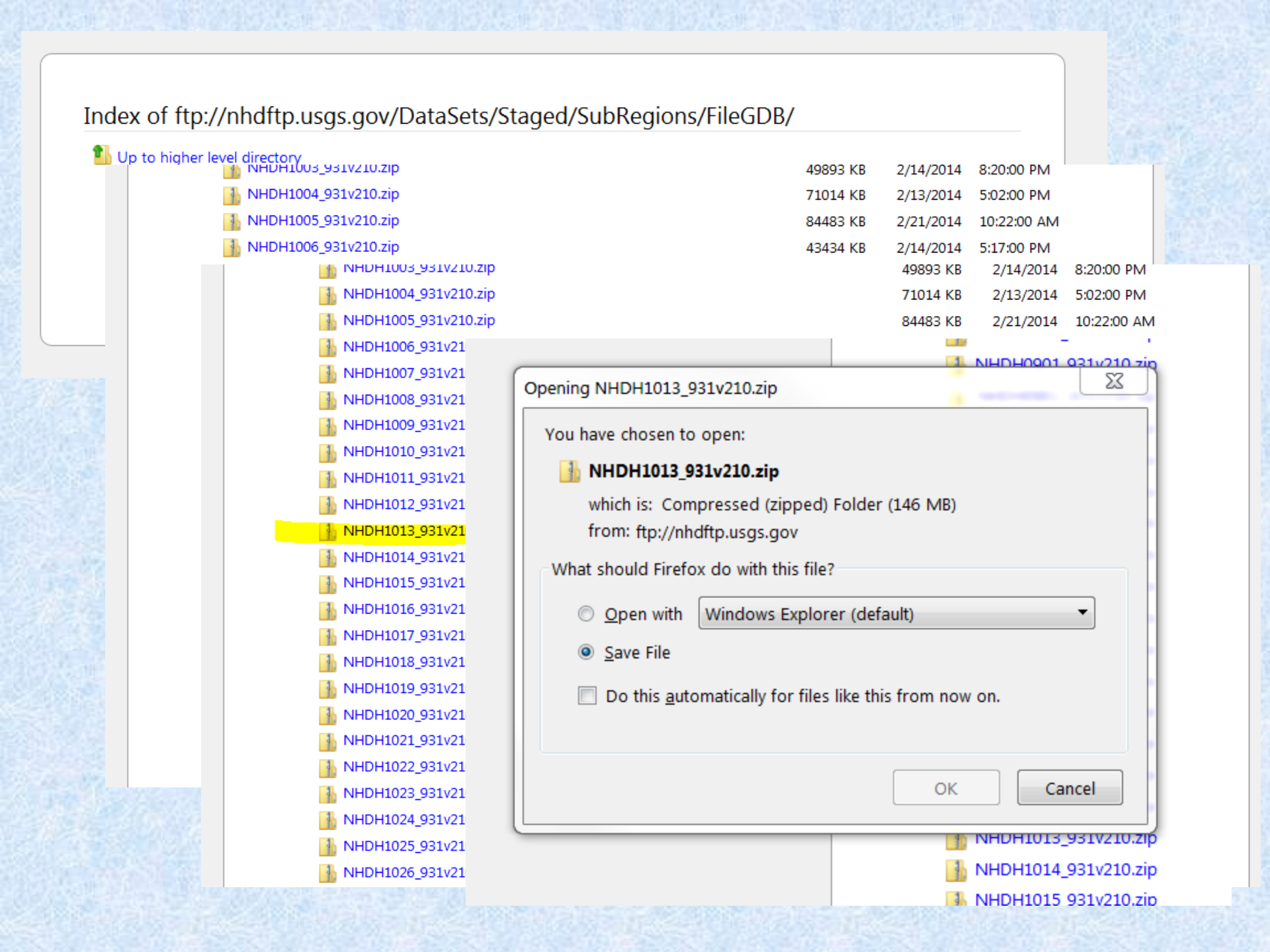
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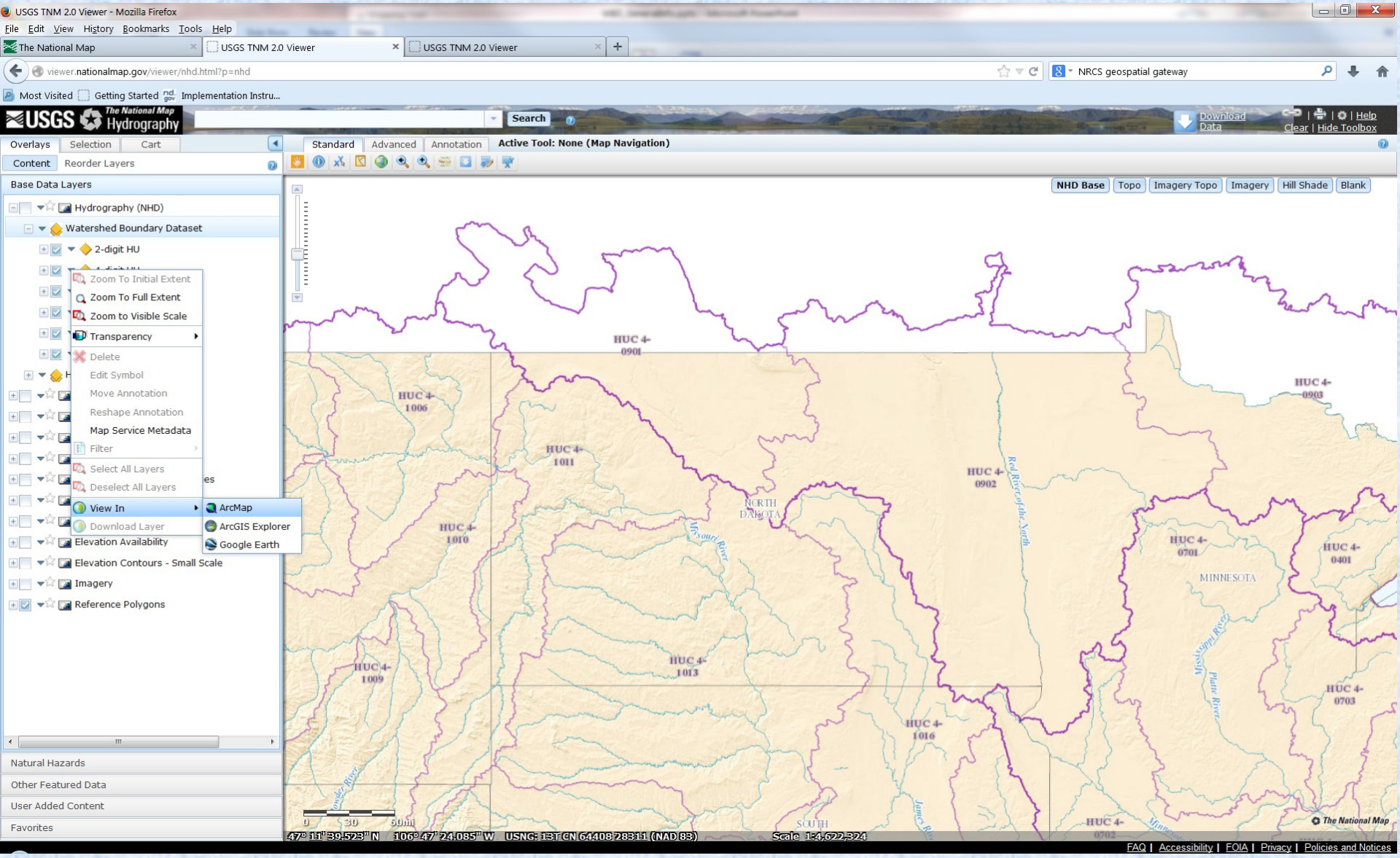
NHDH1023_931v21
NHDH1024_931v21
NHDH1025_931v21
NHDH1026_931v21
Opening NHDH1013_931v210.zip
You have chosen to open:
NHDH1013_931v210.zip
which is: Compressed (zipped) Folder (146 MB)
from: ftp://nhdftp.usgs.gov
What should Firefox do with this file?
Open with Windows Explorer (default)
Save File
Do this automatically for files like this from now on.
OK
Cancel
NHDH1013_931v210.zip
NHDH1014_931v210.zip
NHDH1015_931v210.zip

http://viewer.nationalmap.gov/viewer/nhd.html?p=nhd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USGS TNM 2.0 Viewer
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Content
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Annotation
Active Tool: None (Map Navigation)
Base Data Layers
Hydrography (NHD)
Watershed Boundary Dataset
2-digit HU
Zoom To Initial Extent
Zoom To Full Extent
Zoom to Visible Scale
Transparency
Delete
Edit Symbol
Move Annotation
Reshape Annotation
Map Service Metadata
Filter
Select All Layers
Deselect All Layers
View In
ArcMap
ArcGIS Explorer
Google Earth
Download Layer
Elevation Availability
Elevation Contours - Small Scale
Imagery
Reference Polygons
Natural Hazards
Other Featured Data
User Added Content
Favorites
NHD Base
Topo
Imagery Topo
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Hill Shade
Blank
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HUC 4-0903
HUC 4-1011
HUC 4-0902
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HUC 4-0701
HUC 4-0401
HUC 4-1009
HUC 4-1013
HUC 4-0703
HUC 4-1016
HUC 4-0702
NORTH DAKOTA
SOUTH DAKOTA
MINNESOTA
Missouri River
Red River of the North
Mississippi River
Platte River
0 30 60mi
47° 11' 39.523" N 106° 47' 24.085" W USNG: 13T CN 64408 28311 (NAD 83)
Scale 1:4,622,324
The National Map
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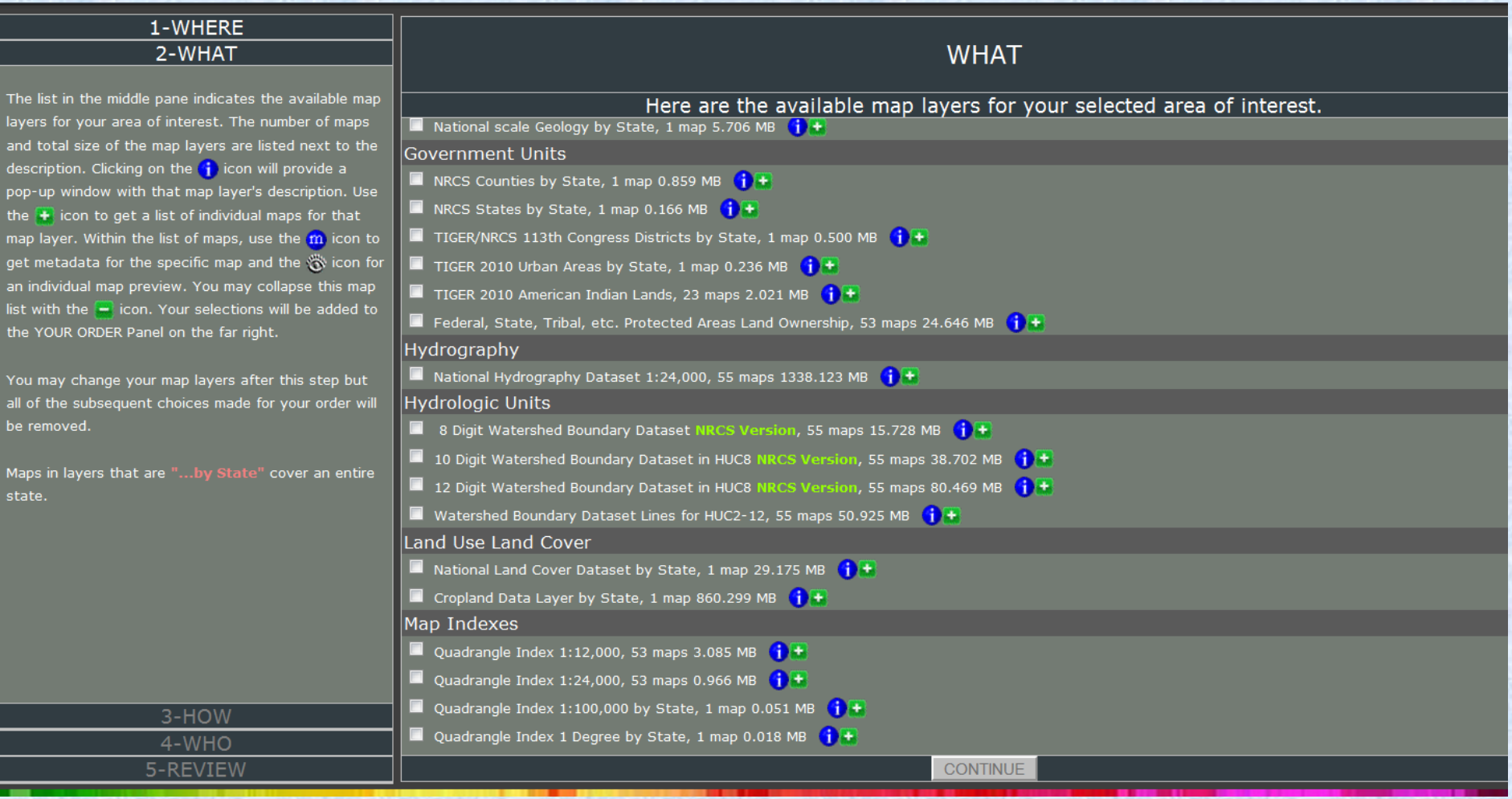
http://datagateway.nrcs.usda.gov/

- Click “GET DATA”
- Order by interactive map, bounding box, or place (state(s) or county(ies), or custom Area Of Interest
- Click “CONTINUE”

http://datagateway.nrcs.usda.gov/



WBD on NRCS Data Gateway is a snapshot in time; usually updated twice per year.

Download *RECENT* WBD from
ftp://nhdftp.usgs.gov/DataSets/Staged/SubRegions/

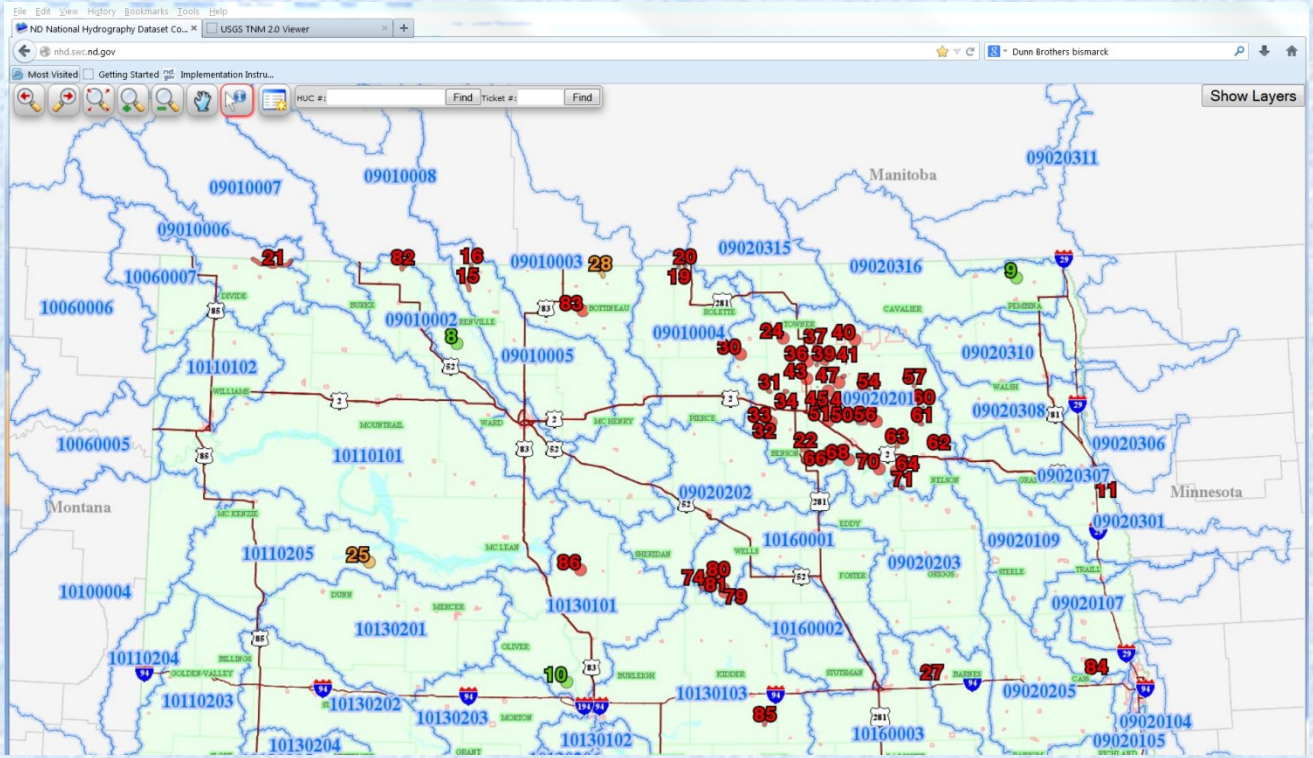
or

SNAPSHOT in TIME
NRCS Geospatial Data Gateway:
http://datagateway.nrcs.usda.gov/

ND NHD Comment Website

If you notice an area that needs to be corrected by the Data Stewards

http://nhd.swc.nd.gov/



For more information contact:

- Ann Fritz, ND WBD Data Steward

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  Division of Water Quality
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  Bismarck, ND 58501-1947

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  Email: afritz@nd.gov