

Identification_Information:

Citation:

Citation_Information:

Originator: USGS Minnesota Water Science Center, and the Minnesota Department of Natural Resources

Publication_Date: 2008

Publication_Time: Unknown

Title: The 8, 10, and 12 hydrologic unit boundaries for Minnesota

Edition: 1

Geospatial_Data_Presentation_Form: vector digital data

Publication_Information:

Publication_Place: Mounds View, Minnesota

Publisher: USGS

Online_Linkage: Unknown

Description:

Abstract: This data set is a complete digital hydrologic unit boundary layer to the Subwatershed (12-digit) 6th level for the State of Minnesota. This data set consists of geo-referenced digital data and associated attributes created in accordance with the "FGDC Proposal, Version 2.0 - Federal Standards For Delineation of Hydrologic Unit Boundaries 10/01/04" (http://www.ftw.nrcs.usda.gov/huc_data.html). Polygons are attributed with hydrologic unit codes for 4th level sub-basins, 5th level watersheds, 6th level subwatersheds, name, size, downstream hydrologic unit, type of watershed, non-contributing areas and flow modification. Arcs are attributed with the highest hydrologic unit code for each watershed, linesource and a metadata reference file.

Purpose: The Watershed and Subwatershed hydrologic unit boundaries provide a uniquely identified and uniform method of subdividing large drainage areas. The smaller sized 6th level sub-watersheds (up to 40,000 acres) are useful for numerous application programs supported by a variety of local, State, and Federal Agencies. This data set is intended to be used as a tool for water-resource management and planning activities, particularly for site-specific and localized studies requiring a level of detail provided by large-scale map information. The dataset will be appended to a larger seamless nationally consistent geospatial database as other states complete their portion of the watershed boundary dataset.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 20080304

Currentness_Reference: Publication date of sources

Status:

Progress: Complete

Maintenance_and_Update_Frequency: Unknown

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -97.364735

East_Bounding_Coordinate: -89.483215

North_Bounding_Coordinate: 49.384479

South_Bounding_Coordinate: 43.334879

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: HUC

Theme_Keyword: Hydrologic Units

Theme_Keyword: Hydrologic Unit Code

Theme_Keyword: Region

Theme_Keyword: Sub-region

Theme_Keyword: Basin

Theme_Keyword: Sub-basin

Theme_Keyword: Watershed
Theme_Keyword: Watershed Boundaries
Theme_Keyword: boundaries
Theme_Keyword: Subwatershed
Theme_Keyword: WBD
Theme_Keyword: Watershed Boundary Dataset

Place:

Place_Keyword_Thesaurus: None
Place_Keyword: Minnesota
Place_Keyword: Wisconsin
Place_Keyword: South Dakota
Place_Keyword: North Dakota
Place_Keyword: Iowa
Place_Keyword: Canada
Place_Keyword: Minnesota River
Place_Keyword: Red River
Place_Keyword: St Louis River
Place_Keyword: St Croix River

Access_Constraints: None

Use_Constraints: The distributor shall not be held liable for improper or incorrect use of this data, based on the description of appropriate/inappropriate uses described in this metadata document. It is strongly recommended that this data is directly acquired from the distributor and not indirectly through other sources which may have changed the data in some way. These data should not be used at scales greater than 1:24,000 for the purpose of identifying hydrographic watershed boundary feature locations in Minnesota. The USGS should be acknowledged as the data source in products derived from these data. The Minnesota Watershed Boundary Dataset is public information and may be interpreted by all organizations, agencies, units of government, or others based on needs; however, they are responsible for the appropriate application of the data. Federal, State, or local regulatory bodies are not to reassign to the Natural Resources Conservation Service any authority for the decisions they make. The Natural Resources Conservation Service will not perform any evaluations of these maps or purposes related solely to State or local regulatory programs. Photographic or digital enlargement of these maps to scales greater than that at which they were originally delineated can result in misrepresentation of the data. If enlarged, the maps will not include the fine detail that would be appropriate for mapping at the small scale. Digital data files are periodically updated. Files are dated, and users are responsible for obtaining the latest version of the data from the source distributor.

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: USGS, Water Science Center, Minnesota
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Contact_Instructions: Please email questions and requests.

Data_Set_Credit: Funding for the Minnesota Watershed Boundary Dataset (WBD) was provided by the USGS, the Minnesota Department of Transportation and the Minnesota Department of Natural Resources.

Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.2.4.1420

Data_Quality_Information:

Logical_Consistency_Report: There are no unclosed polygons, intersections without nodes, or polygons without labels or with more than one label. ArcGIS 'topology' rules for polygons were used to identify and correct intersections without nodes, unclosed polygons and remove duplicate lines with the same beginning and ending nodes. All sliver polygons were removed using topology rules or manually in ArcMap.

Completeness_Report:

There are fields with incomplete attributes in the .pat for some or all polygons. At the time of completion of this dataset, there were required fields but attributes for some were optional. These fields are Ncontrb_a, Hu_10_ds, Hu_12_ds, Hu_10_GNIS, and Hu_12_GNIS. Due to the long period of development of this dataset with the involvement of multiple partners, the lineage of some fields is not definitively known. The Ncontrb_a field is completely attributed with either a positive value or zero, but it is not known if a zero value in some cases signified a null (undetermined) value. The Hu_10_ds and Hu_12_ds fields are not universally filled in every subbasin. There are a few Hu_10_name and Hu_12_name fields where a name for the hydrologic unit could not be determined. These fields contain the 10 or 12-digit HUC as a placeholder, as specified by standards. The Hu_10_mod and Hu_12_mod fields are completely attributed with either the value "NM" meaning no modification, or some other single modification code or combination of modification codes. It is not known if the value "NM" was used as a default value, or if these fields consistently include a complete list of all modifications present in the hydrologic unit.

There are no fields with incomplete attributes in the .aat for lines. The lines adjacent to the universal polygon are attributed with a 0 for the Hu_level. These cannot be attributed until the adjacent states complete their linework at which point the highest level of hydrologic unit can be determined. The Linesource field may not include a complete list of all sources used to delineate the hydrologic unit line.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The Minnesota WBD was produced using Digital Raster Graphics (DRG's), Digital Ortho Quads, Digital Elevation Models (DEM's), field verification, and lidar data as the source data. Data completeness for DRG files reflects content of the source graphic and may therefore be reflected in the completeness and accuracy of the WBD. The map was digitized using USGS 1:24,000-scale digital raster graphic base maps, with an inherited error of +/- 40 feet according to the USGS National Map Accuracy Standards.

It is estimated that any errors detected were less than 10%. It should also be noted that while general rules of hydrology were used (i.e. natural water flow is downhill), the locations of boundaries is still somewhat subjective as the 1:24,000-scale DRG's do not always provide enough information for identifying the location of the boundaries.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: USGS

Publication_Date: Unknown

Title: 1:24k Digital Raster Graphic

Geospatial_Data_Presentation_Form: map

Online_Linkage: <http://deli.dnr.state.mn.us/>

Online_Linkage: <http://terraserver-usa.com/>

Source_Scale_Denominator: 1:24,000

Type_of_Source_Media: online

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 1960

Ending_Date: 2005

Source_Currentness_Reference: DRG and air photo publication dates

Source_Citation_Abbreviation: USGSDRG

Source_Contribution: map delineation

Process_Step:

Process_Description:

Level 6 (12-digit) watersheds were delineated within a nested hierarchical structure using the existing Minnesota watershed dataset Watershed95 (approximately Level 7 delineations) as a starting framework. The 14 digit watershed areas were grouped into 10 and 12 digit hydrologic units that fit Federal Standards for the Delineation of Hydrologic Units Boundaries.

The typical size of a level 6 (12 digit) watershed is 10,000 to 40,000 acres. Not all watersheds exceeding 10,000 acres are delineated. Only those watersheds that show some unique cultural, physical, or logical significance were included in the data.

The order of precedence for establishing the pour point of a sub-watershed is: (1) at the outlet of a lake or pond; (2) at a confluence; (3) at some topographic feature, such as a natural gap in topography; (4) at a dam; (5) at a stream gaging station. The procedure followed is fully documented and explained at the Minnesota DNR (MNDNR) website http://www.dnr.state.mn.us/watersheds/lakeshed_project.html and in the Lake Watershed Delineation Project procedural manual.

The MNDNR has integrated the digitized watershed boundaries, stream arcs and pour points with the 30m DEM, in part to create hydrologically corrected DEMs. The MNDNR use the hydrologically corrected DEMs to create a synthetic stream network to build upstream-downstream connectivity with digitized hydrologic units. To get this raster: vector integration to work, the MNDNR often had to move the pour points and watershed lines the equivalent of one or two 30 meter grids cells upstream from the actual confluence. It was found that delineating hydrologic unit boundaries to the cartographic confluence will create all kinds of issues with the integration of streams (NHD) and hydrologically enhanced DEMs.

There are instances where the pour point was backed off from the confluence more than what was necessary; these instances will be corrected over time as they are identified as part of the ongoing MNDNR update/maintenance effort.

Source_Used_Citation_Abbreviation: USGSDRG

Process_Date: 1995-2008

Process_Step:

Meta_ID: MN02

Process_Description: USGS, Water Science Center, Salt Lake City; Edits to Downstream coding and switch huc12 codes for 090201030302 & 090201030303.

Source_Used_Citation_Abbreviation:

Process_Date: 20090916

Process_Step:

Meta_ID: MN03

Process_Description: NCGC corrected original HUC12 polygon 090201030103 that had a couple of slivers. MN DNR office said to look up and correct per their website: <http://deli.dnr.state.mn.us/>

Source_Used_Citation_Abbreviation:

Process_Date: 20091118

Process_Step:

Meta_ID: MN04

Process_Description: USGS, Water Science Center, Salt Lake City
Name edits:

Populate blank fields

Correct spelling, ex. Srping to Spring, St. to Saint or visa versa depending on how GNIS has it, Cemetary to Cemetery

Standardize use of "Frontal"

Standardize use of "Headwaters, Outlet"

Standardize use of "Upper, Middle, Lower"

Cursory check that name is contained within the hydrologic unit

Remove extraneous non-domain or non-GNIS names at, near, below, above, from, to, directional-northernmost, southern, easterly, etc.

Incorrect spacings, ex. Oakcreek should be Oak Creek

Source_Used_Citation_Abbreviation:

Process_Date: 20100708

Process_Step:

META_ID: MN05

Process_Description: In-State Data Steward made edits to boundaries.

Process_Date: 201007
Process_Step:
META_ID: MN06
Process_Description: Edits made by USGS Water Science Center, Salt Lake City

Process_Date: 201008
Process_Step:
META_ID: MN07
Process_Description: Updates by USGS Water Science Center, Salt Lake City, Utah.
Edits to any of the following:
Polygon attributes, Line Mods, HU_Level, Linesource, DS codes and states.

Source_Used_Citation_Abbreviation:
Process_Date: 201010

Process_Step:
META_ID: MN08
Process_Description: Updates by MN DNR - In-state WBD Stewards
Edits to polygon attributes and Linework.
Source_Used_Citation_Abbreviation:
Process_Date: 201107

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: G-polygon
Point_and_Vector_Object_Count: 2476

SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: String
Point_and_Vector_Object_Count: 7605

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Geographic:
Latitude_Resolution: 0.000000
Longitude_Resolution: 0.000000
Geographic_Coordinate_Units: Decimal degrees

Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222

Vertical_Coordinate_System_Definition:

Altitude_System_Definition:
Altitude_Resolution: 0.000100
Altitude_Encoding_Method: Explicit elevation coordinate included with horizontal coordinates

Entity_and_Attribute_Information:

Detailed_Description:

Entity_Type:
Entity_Type_Label: MN_WBD_ply080225
Entity_Type_Definition: polygons identify watershed boundaries
Entity_Type_Definition_Source: n/a

Attribute:

Attribute_Label: Shape
Attribute_Definition: Feature geometry.

Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
 Unrepresentable_Domain: Coordinates defining the features.

Attribute:
 Attribute_Label: OBJECTID
 Attribute_Definition: Internal feature number.
 Attribute_Definition_Source: ESRI
 Attribute_Domain_Values:
 Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.

Attribute:
 Attribute_Label: HUC_8
 Attribute_Definition: A unique 8-digit code from the USGS map series "Hydrologic Unit Maps". The same number was used in every record that pertains to a subwatershed that resides within the same 8-digit sub-basin.
 Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
 Attribute_Domain_Values:
 Codeset_Domain:
 Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
 Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
 Attribute_Label: HUC_10
 Attribute_Definition: This field provides a unique 10-digit code for each watershed derived from the 8-digit code. This same number was used in every record that pertains to a subwatershed that resides within the same 10-digit watershed.
 Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
 Attribute_Domain_Values:
 Codeset_Domain:
 Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
 Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
 Attribute_Label: HUC_12
 Attribute_Definition: This field provides a unique 12-digit code for each subwatershed derived from the 10-digit code.
 Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
 Attribute_Domain_Values:
 Codeset_Domain:
 Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
 Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
 Attribute_Label: ACRES
 Attribute_Definition: Area of subwatershed including non-contributing areas calculated to acres as a whole number, no decimals.
 Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
 Attribute_Domain_Values:
 Codeset_Domain:
 Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
 Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
 Attribute_Label: STATES
 Attribute_Definition: The "States" field includes the names of all state(s) that the subwatershed falls within.
 Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
 Attribute_Domain_Values:
 Codeset_Domain:
 Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
 Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:

Attribute_Label: NCONTRB_A

Attribute_Definition: Drainage areas that do not flow toward the outlet of any hydrologic unit are considered non-contributing.

Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries

Attribute_Domain_Values:

Codeset_Domain:

Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries

Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:

Attribute_Label: HU_10_DS

Attribute_Definition: The 10-digit code of the 5th level hydrologic unit that is receiving the majority of the flow from the watershed that the 6th level HU falls within. Outlets created by ditching or other artificial drainage were not considered for this field.

Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries

Attribute_Domain_Values:

Codeset_Domain:

Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries

Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:

Attribute_Label: HU_10_NAME

Attribute_Definition: A unique name for each 5th level hydrologic unit that relates to the major water feature within the polygon or the major water body it contributes to.

Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries

Attribute_Domain_Values:

Codeset_Domain:

Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries

Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:

Attribute_Label: HU_10_MOD

Attribute_Definition: This field identifies interbasin transfers (IT), dams at outlet (DM), etc. that modify natural overland flow as modifications are identified from most significant to least significant modification(s).

Hydrologic units with no modification are marked with NM.

Attribute_Definition_Source: Modification by Minnesota Department of Natural Resources to the Federal Standards for Delineation of Hydrologic Unit Boundaries

Attribute_Domain_Values:

Codeset_Domain:

Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries

Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:

Attribute_Label: HU_10_TYPE

Attribute_Definition: This field identifies the type of watershed.

Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries

Attribute_Domain_Values:

Codeset_Domain:

Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries

Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:

Attribute_Label: HU_12_DS

Attribute_Definition: The 12-digit code of the 5th level hydrologic unit that is receiving the majority of the flow from the watershed that the 6th level HU falls within. Outlets created by ditching or other artificial drainage were not considered for this field.

Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries

Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
Attribute_Label: HU_12_NAME
Attribute_Definition: A unique name for each 6th level hydrologic unit that relates to the major water feature within the polygon or the major water body it contributes to.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
Attribute_Label: HU_12_MOD
Attribute_Definition: This field identifies interbasin transfers (IT), dams at outlet (DM), etc. that modify natural overland flow as Modifications are identified from most significant to least significant modification(s). Hydrologic units with no modification are marked with NM.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
Attribute_Label: HU_12_TYPE
Attribute_Definition: This field identifies the type of watershed.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
Attribute_Label: HU_10_GNIS
Attribute_Definition: GNIS Feature Identification Numbers for each feature in the 5th level hydrologic unit name separated by a space.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
Attribute_Label: HU_12_GNIS
Attribute_Definition: GNIS Feature Identification Numbers for each feature in the 6th level hydrologic unit name separated by a space.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for the Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
Attribute_Label: Shape_Length
Attribute_Definition: Length of feature in internal units.
Attribute_Definition_Source: ESRI

Attribute_Domain_Values:
Unrepresentable_Domain: Positive real numbers that are automatically generated.

Attribute:
Attribute_Label: Shape_Area
Attribute_Definition: Area of feature in internal units squared.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Positive real numbers that are automatically generated.

Detailed_Description:
Entity_Type:
Entity_Type_Label: MN_WBD_arc080225
Entity_Type_Definition: identifies watershed boundaries
Entity_Type_Definition_Source: n/a

Attribute:
Attribute_Label: Shape
Attribute_Definition: Feature geometry.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Coordinates defining the features.

Attribute:
Attribute_Label: OBJECTID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.

Attribute:
Attribute_Label: Shape_Length
Attribute_Definition: Length of feature in internal units.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Positive real numbers that are automatically generated.

Attribute:
Attribute_Label: HU_LEVEL
Attribute_Definition: The highest hydrologic unit level (smallest number) for the line (arc) represented by the record.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
Attribute_Label: LINESOURCE
Attribute_Definition: The base map source(s) used to delineate at 1:24,000 scale.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: Federal Standards for Delineation of Hydrologic Unit Boundaries
Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Attribute:
Attribute_Label: META_ID
Attribute_Definition: Metadata ID is a code that identifies which metadata file applies to the arc.
Attribute_Definition_Source: Federal Standards for Delineation of Hydrologic Unit Boundaries
Attribute_Domain_Values:
Codeset_Domain:

Codeset_Name: Federal Standards for Delineation of Hydrologic Unit Boundaries

Codeset_Source: Please refer to the Entity and Attribute Overview for valid values

Overview_Description:

Entity_and_Attribute_Overview:

This is a description of attributes by field from the Federal Standards for Delineation of Hydrologic Unit Boundaries

1) Polygon attributes

Huc_8 : Eight Digit Hydrologic Unit Code - (REQUIRED)

A unique 8-digit code from the USGS map series "Hydrologic Unit Maps". The same number was used in every record that pertains to a subwatershed that resides within the same 8-digit sub-basin. Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined numbers were assigned in a clockwise fashion.

Huc_10: Ten Digit Hydrologic Unit Code - (REQUIRED)

This field provides a unique 10-digit code for each watershed. This same number was used in every record that pertains to a subwatershed that resides within the same 10-digit watershed. Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined numbers were assigned in a clockwise fashion.

Huc_12: Twelve Digit Hydrologic Unit Code - (REQUIRED)

This field provides a unique 12-digit code for each subwatershed. Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined numbers were assigned in a clockwise fashion.

Acres: Acres - (REQUIRED)

Area of subwatershed including non-contributing areas calculated to acres as a whole number, no decimals.

The "Acres" field was calculated from the "Area" field.

States: States - (REQUIRED)

The "States" field includes the names of all state(s) that the subwatershed falls within. The 2-digit postal abbreviation in upper case and in alphabetical order was used, separated with a comma.

Ncontrb_a: Non-Contributing Area - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)

Drainage areas that do not flow toward the outlet of any hydrologic unit are considered non-contributing.

If a non-contributing area is on the boundary between two or more hydrologic units, the non-contributing area is associated with the hydrologic unit adjacent to the low point on the boundary. This attribute should be the total of the non-contributing areas within a hydrologic unit calculated in acres.

Hu_10_ds: Fifth Level Downstream Hydrologic Unit Code - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)

This field has the 10-digit code of the 5th level hydrologic unit that is receiving the majority of the flow from the watershed that the 6th level HU falls within. Outlets created by ditching or other artificial drainage were not considered for this field. If an HU flows into an ocean or the Gulf of Mexico, this field was populated with "OCEAN" and if a HU flows into one of the Great Lakes the term "LAKE" was used. If a HU flows across international borders, "CANADA" or "MEXICO" was used depending on which country the HU drains into. If an HU is a closed basin, then the term "CLOSED BASIN" was used.

Hu_10_name: Fifth Level Hydrologic Unit Name - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)

This field used officially recognized names only. This field was populated by following the directions in subsection 6.3 "Watershed and Subwatershed Naming Protocol". The name used to attribute the watershed was used only once within a 4th level unit.

Hu_10_mod: Fifth Level Hydrologic Unit Modifications - (REQUIRED)

This field identifies any type of modifications to natural overland flow that alters the location of the hydrologic

unit boundary for a 10-digit watershed. This field shows the most significant to least significant modification(s) to the watershed boundary. One or more of the following abbreviations was used.

SC - Stormwater Canal or Drainage Canal
ID - Irrigation Ditch
IT - Interbasin Transfer
BC - Barge Canal or Navigation Canal
SD - Stormwater Ditch
PD - Pipe Diversion
CD - Channel Diversion
NC - Noncontributing Area
KA - Karst
LE - Levee
NM - No Modifications
OC - Overflow Channel or Flume
DM - Dam at outlet or HU boundary
GC - General Canal/Ditch
PS - Pumping Station
DD - Drainage Ditch
SI - Siphon
AD - Aqueduct
RS - Reservoir
TF - Transportation Feature (road, railroad, docks etc.)
GF - Ground-Water Flow
MA - Mining Activity
UA - Urban Area
GL - Glacier
IF - Ice Field
OF - Overbank Flow
OT - Other

Hu_10_type: Fifth Level Hydrologic Unit Type - (REQUIRED)

This field was populated with the hydrologic unit type from the list provided that most closely identifies the watershed.

S - "Standard" hydrologic unit - Any land HU with drainage flowing to a single outlet point, excluding non-contributing areas. This includes areas or small triangular wedges between adjacent HU's that remain after classic hydrologic units are delineated. Some examples include "true", "classic", "composite", and "remnant" hydrologic units.
C - "Closed Basin" hydrologic unit - A drainage area that is 100% non-contributing. This means all surface flow is internal, no overland flow leaves the hydrologic unit through the outlet point.
F - "Frontal" hydrologic unit - Areas along the coastline of lakes, oceans, bays, etc. that have more than one outlet. These HU's are predominantly land with some water areas at or near the outlet(s).
M - "Multiple Outlet" hydrologic unit - An area that has more than one natural outlet; for example, an outlet located on a stream with multiple channels. This does not include frontal or water hydrologic units, hydrologic units with artificial interbasin transfers, drainage outlets through karst or ground-water flow, or outlets that cross a stream with an island. This code should be used only in rare instances.
W - "Water" hydrologic unit - Hydrologic units that are predominantly water with adjacent land areas, ex. lake, estuaries, harbors.
I - "Island" hydrologic unit - A hydrologic unit that is one or more islands and adjacent water out to the toe of the shore face.
U - "Unclassified" hydrologic unit - A hydrologic unit that can't be defined or doesn't fit into one of the types that have been listed.

Hu_12_ds: Sixth Level Downstream Hydrologic Unit Code - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)

This field was populated with the 12-digit code of the 6th level hydrologic unit that is receiving the majority of the flow from the subwatershed. Outlets created by ditching or other artificial drainage were not considered for this field. If a HU flows into an ocean or the Gulf of Mexico it was populated with "OCEAN" and if a HU flows into one of the Great Lakes the term "LAKE" was used. If a HU flows across international borders, "CANADA" or "MEXICO" was used depending on which country the HU drains into. If an HU is a closed basin, this field was populated with the term "CLOSED BASIN".

Hu_12_name: Sixth Level Hydrologic Unit Name - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)
Officially recognized names were used in this field. This field was populated by following the directions in subsection 6.3 "Watershed and Subwatershed Naming Protocol". The name used to attribute the subwatershed was used only once within a 4th level unit.

Hu_12_mod: Sixth Level Hydrologic Unit Modifications - (REQUIRED)
This field identifies any type of man-made modification(s) to natural overland flow that alters the location of the hydrologic unit boundary for a 12-digit subwatershed. One or more of the following abbreviations was chosen for this field.

SC - Stormwater Canal or Drainage Canal
ID - Irrigation Ditch
IT - Interbasin Transfer
BC - Barge Canal or Navigation Canal
SD - Stormwater Ditch
PD - Pipe Diversion
CD - Channel Diversion
NC - Noncontributing Area
KA - Karst
LE - Levee
NM - No Modifications
OC - Overflow Channel or Flume
DM - Dam at outlet or HU boundary
GC - General Canal/Ditch
PS - Pumping Station
DD - Drainage Ditch
SI - Siphon
AD - Aqueduct
RS - Reservoir
TF - Transportation Feature (road, railroad, docks etc.)
GF - Ground-Water Flow
MA - Mining Activity
UA - Urban Area
GL - Glacier
IF - Ice Field
OF - Overbank Flow
OT - Other

Hu_12_type: Sixth Level Hydrologic Unit Type - (REQUIRED)
This field was populated with the hydrologic unit type from the list provided that most closely identifies the subwatershed.

S - "Standard" hydrologic unit - Any land HU with drainage flowing to a single outlet point, excluding non-contributing areas. This includes areas or small triangular wedges between adjacent HU's that remain after classic hydrologic units are delineated. Some examples include "true", "classic", "composite", and "remnant" hydrologic units.

C - "Closed Basin" hydrologic unit - A drainage area that is 100% non-contributing. This means all surface flow is internal, no overland flow leaves the hydrologic unit through the outlet point.

- F - "Frontal" hydrologic unit - Areas along the coastline of lakes, oceans, bays, etc. that have more than one outlet. These HU's are predominantly land with some water at or near the outlet(s).
- M - "Multiple Outlet" hydrologic unit An area that has more than one natural outlet; for example, an outlet located on a stream with multiple channels. This does not include frontal or water hydrologic units, hydrologic units with artificial interbasin transfers, drainage outlets through karst or ground-water flow, or outlets that cross a stream with an island. This code should be used only in rare instances.
- W - "Water" hydrologic unit - Hydrologic units that are predominantly water with adjacent land areas, ex. lake, estuaries.
- I - "Island" hydrologic unit - A hydrologic unit that is one or more islands and adjacent water out to the toe of the shore face.
- U - "Unclassified" hydrologic unit - A hydrologic unit that can't be defined or doesn't fit into one of the types that have been listed.

Hu_10_GNIS: Fifth Level GNIS Feature Identification Number - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)
 The Geographic Names Information System (GNIS) has a unique Feature Identification Number for each officially recognized name in the country. This number is 6-7 characters long. If a hydrologic unit name uses two or more features, then this field would have two GNIS feature numbers with a space separating each number.

Hu_12_GNIS: Sixth Level GNIS Feature Identification Number - (FIELD REQUIRED, ATTRIBUTES OPTIONAL)
 The Geographic Names Information System (GNIS) has a unique Feature Identification Number for each officially recognized name in the country. This number is 6-7 characters long. If a hydrologic unit name uses two or more features, then this field would have two GNIS feature numbers with a space separating each number.

2) Line attributes

Hu_level: Hydrologic Unit Level - (REQUIRED)
 This field provides the means to create cartographically pleasing maps. This field is populated with the highest hydrologic unit level (smallest number) for the line (arc) represented by the record. The attribute was recorded using numbers 1 through 6 representing each level with 1 being the highest and 6 the lowest level. An example would be if a line represents a region, subregion, basin, subbasin, watershed, and subwatershed boundary, then this cell was populated with a 1 (Region). Below is a list of numbers used for each level.

Level	Digit#	Name
1	2	Region
2	4	Subregion
3	6	Basin
4	8	Subbasin
5	10	Watershed
6	12	Subwatershed

Linesource: Line Spatial Data Source - (REQUIRED)
 The Linesource indicates the base map source(s) used to delineate at 1:24,000 scale. The field was populated using one of the standardized code(s) listed below. If more than one code was used, then a comma was used to separate the codes.

- TOPO24 - Delineation from hardcopy 1:24,000 scale topographic maps
- TOPO25 - Delineation from hardcopy 1:25,000 topographic maps, only Alaska and Caribbean
- TOPO63 - Delineation from hardcopy 1:63,360 topographic maps, only Alaska and Caribbean
- DRG24 - Delineation from 1:24,000 scale Digital Raster Graphics
- DRG25 - Delineation from 1:25,000 Digital Raster Graphics, only Alaska and Caribbean
- DRG63 - Delineation from 1:63,360 Digital Raster Graphics, only Alaska and Caribbean
- DEM10 - Derived from 10 meter Digital Elevation Model
- DEM30 - Derived from 30 meter Digital Elevation Model

NED30 - Derived from 30 meter National Elevation Dataset Model
EDNA30 - (formally NED-H), derived from 30 meter Elevation Derivatives for National Applications
BATH"scale" (ex. BATH24) - Interpreted from NOAA 1:24,000 scale bathymetric data
HYPSO"scale" (ex. HYPSO24)- Delineated from 1:24,000 scale contour data
ORTHO"scale" (ex. ORTHO12) - Interpreted from 1:12,000 scale Ortho-imagery
DEDEM10 - Drainage enforced 10 meter Digital Elevation Model
DEDEM30 - Drainage enforced 30 meter Digital Elevation Model
GPS - Derived from Global Positioning System
LIDAR - Derived from LIDAR
IFSAR - Derived from IFSAR data
OTH - Other
UNK - Unknown
All other reference and source maps not listed should be noted in the metadata.

Meta_id: Metadata ID Number - (REQUIRED)

The Metadata ID is a code that identifies which metadata file applies to the arc. In most cases there is only one metadata file. However, in some cases more than one metadata file was used to identify different groups and/or procedures used to produce the lines. The metadata ID is a 4-character code starting with the 2-letter state postal code, followed by a 2-digit sequence number. For example "OK01", "ID02", etc.

Entity_and_Attribute_Detail_Citation: Federal Standard for Delineation of Hydrologic Unit Boundaries

Distribution_Information:

Distributor:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Chris Sanocki

Contact_Organization: United States Geological Survey, Water Science Center, Minnesota

Contact_Address:

Address_Type: mailing address

Address: 2280 Woodale Drive

City: Mounds View

State_or_Province: Minnesota

Postal_Code: 55112

Country: USA

Contact_Voice_Telephone: (763) 783-3100

Contact_Electronic_Mail_Address: sanocki@usgs.gov

Contact_Instructions: please e-mail with data requests.

Distribution_Liability: The distributor shall not be held liable for improper or incorrect use of this data, based on the description of appropriate/inappropriate uses described in this metadata document. It is strongly recommended that this data is directly acquired from the distributor and not indirectly through other sources which may have changed the data in some way. These data should not be used at scales greater than 1:24,000 for the purpose of identifying hydrographic watershed boundary feature locations in Minnesota. United States Geological Survey, Water Science Center, Minnesota makes no claims for the data's suitability for other purposes. United States Geological Survey, Water Science Center, Minnesota should be acknowledged as the data source in products derived from these data. The Minnesota Watershed Boundary Dataset is public information and may be interpreted by all organizations, agencies, units of government, or others based on needs; however, they are responsible for the appropriate application of the data. Federal, State, or local regulatory bodies are not to reassign to the United States Geological Survey, Water Science Center, Minnesota or the Natural Resources Conservation Service any authority for the decisions they make. The Natural Resources Conservation Service will not perform any evaluations of these maps or purposes related solely to State or local regulatory programs. Photographic or digital enlargement of these maps to scales greater than that at which they were originally delineated can result in misrepresentation of the data. If enlarged, the maps will not include the fine detail that would be appropriate for mapping at the small scale. Digital data files are periodically updated. Files are dated, and users are responsible for obtaining the latest version of the data from the source

distributor.
Standard_Order_Process:
 Digital_Form:
 Digital_Transfer_Information:
 Format_Name: SHP
 Transfer_Size: 30
 Digital_Transfer_Option:
 Online_Option:
 Computer_Contact_Information:
 Network_Address:
 Network_Resource_Name: <http://datagateway.nrcs.usda.gov>
 Fees: none
Metadata_Reference_Information:
 Metadata_Date: 20080421
 Metadata_Contact:
 Contact_Information:
 Contact_Person_Primary:
 Contact_Person: Chris Sanocki
 Contact_Organization: United States Geological Survey, Water Science Center, Minnesota
 Contact_Address:
 Address_Type: mailing address
 Address: 2280 Woodale Drive
 City: Mounds View
 State_or_Province: Minnesota
 Postal_Code: 55112
 Country: USA
 Contact_Voice_Telephone: (763) 783-3100
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
 Online_Linkage: <http://www.esri.com/metadata/esriprof80.html>
 Profile_Name: ESRI Metadata Profile