



National Hydrography Dataset Data Dictionary

Data Model version 1.06

U.S. Department of the Interior
U.S. Geological Survey

NHD Data Dictionary Quick Start Data Model v.1.06

This document is a companion to the [NHD Data Model Schema](#). It provides definitions for all the feature classes and attribute tables found in the NHD. This format is easy to use for day to day activities. However, the NHD Data Model Schema includes all the links and relationships between the feature classes and tables that are necessary to fully understand the NHD. Related documents include:

- [Feature Catalog](#) with definitions and examples of all the features and attributes found in the NHD
- [Metadata Creation and Use](#)

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Hydrography Feature Classes

NHDPoint, NHDLine, NHDFlowline, NHDWaterbody, NHDArea

Field Name	Definition	Applies to	Comments
ComID	10-digit integer that uniquely identifies the occurrence of each feature.	All feature classes	National Database key. All maintenance activities depend on this ID.
FDate	Date of last feature modification.	All feature classes	
Resolution	Source resolution. Currently NHD is available as separate resolutions. Plans are to develop a single-resolution database holding the highest resolution data with tools to allow for generalization	All feature classes	Domain of values: Local >1:12,000 High 1:24,000/12,000 Medium 1:100,000
GNIS_ID	Unique identifier assigned by GNIS, length 10.	All feature classes	GNIS_ID = "null" if no name associated with the feature
GNIS_Name	Proper name, specific term, or expression by which a particular geographic entity is known, length 65.	All feature classes	GNIS_Name = "null" if no name associated with the feature
LengthKM	Length of linear feature based on Albers Equal Area, length 8.	NHDFlowline NHDLine	Computed
AreaSqKm	Area of areal feature based on Albers Equal Area, length 8.	NHDArea NHDWaterbody	Computed
Elevation	The vertical distance from a given datum.	NHDArea NHDWaterbody	Stage of the water elevation is encoded in the FCode.
ReachCode	Unique identifier composed of two parts. The first eight digits is the subbasin code as defined by FIPS 103. The next six digits are randomly assigned, sequential numbers that are unique within a subbasin, length 14.	NHDFlowline NHDWaterbody NHDPoint	Required for all NHDFlowlines. NHDWaterbody and NHDPoint feature classes allow reach codes, but does not require them.
FlowDir	Direction of flow relative to coordinate order, length 4.	NHDFlowline	Domain of values: With digitized Uninitialized
WBAreaComID	The ComID of the waterbody through which the Flowline flows.	NHDFlowline	Only applies to Artificial Path
FType	Three-digit integer value; unique identifier of a feature type.	All feature classes	Click here for the feature catalog
FCode	Five-digit integer value; composed of the feature type and combinations of characteristics and values.	All feature classes	Click here for the feature catalog

Hydrography Event Feature Classes

NHDPointEvent, NHDLineEvent, NHDAreaEvent

Field Name	Definition	Applies to	Comments
ComID	10-digit integer that uniquely identifies the occurrence of each feature (or event).	All feature classes	
EventDate	Date an event was created.	All feature classes	
ReachCode	Reach Code on which the event is located.	All feature classes	
ReachSMDate	Reach Version Date	All feature classes	The version date tracks the last time that the reach represented by ReachCode experienced a change in geometry. When the ReachSMDate in the event record and the ReachSMDate in the NHDReachCode_ComID table disagree, the position of the event along the network may need to be updated.
ReachResolution	Source resolution. Currently NHD is available as separate resolutions. Plans are to develop a single-resolution database holding the highest resolution data with tools to allow for generalization	All feature classes	Domain of values: Local >1:12,000 High 1:24,000/12,000 Medium 1:100,000
FeatureComID	ComID of NHD feature that may also be referenced as an event on the linear network	All feature classes	Features from NHDPoint and NHDLine may be referenced to the network through an event feature.
FeatureClassRef	NHD feature class that holds FeatureComID	All feature classes	
SourceOriginator	Originator of the event	All feature classes	
SourceDataDesc	Description of the entity	All feature classes	
SourceFeatID	Identifier of the entity used in the source data.	All feature classes	
FeatureDetailURL	URL where detailed event entity data can be found	All feature classes	
Measure	Measure along the reach, in percent from downstream end, where a point event is located.	Point Event feature class	
FMeasure	Measure along the reach, in percent from downstream	Line Event feature class	

	end, where a linear event begins (from).		
TMeasure	Measure along the reach, in percent from downstream end, where a linear event ends (to).	Line Event feature class	
Offset	Distance from the network to be used to display event	Point and Line Event feature classes	Negative offsets display the event to the left of the network and positive offsets display the event to the right of the line. Offsets are useful for displaying overlapping events.
EventType	Type of entity in an event	All feature classes	

Hydrologic Units

Field Name	Definition	Applies to	Comments
Source	Name of entity creating hydrologic unit	All feature classes	Current Domain of Values: NHD – 1:250,000- or 1:100,000-scale boundaries WBD – certified boundaries from WBD Other
HUC_X	Numeric identifier for each level (2,4,6,8,10, and 12) of hydrologic units	All feature classes	
HU_X_Name	Name assigned to each level (2,4,6,8,10, and 12) of hydrologic units	All feature classes	
<p>The Hydrologic Units feature classes will change as the Watershed Boundary Dataset (WBD) is incorporated into the National Hydrography Dataset. All current WBD attributes will then be available.</p>			

Attribute Tables

NHDFCode

Field Name	Definition	Applies to	Comments
FCode	Five-digit integer value; composed of the feature type and combinations of characteristics and values.	All feature types	Only some features have attributes; last two digits are "00" if no additional values are encoded.
Description	Character string that contains all the characteristics and values associated with a feature code.	All feature types	Only some features have attributes; only feature type is used if no additional values are encoded.
<p>In addition to the full description, there is a text field for each characteristic associated with a feature code. The name of each field is the name of the characteristic. By default, the attribute tables for the feature classes display the text string for the FType and Fcode. This was done to make the data more user friendly. Users may toggle between the text string and the code.</p>			
CanalDitchType	Function or purpose	Canal/Ditch	
ConstructionMaterial	Predominant material used	Dam/Weir and Reservoir	
HydrographicCategory	Portion of the year the feature contains water	Stream/River, Lake/Pond, Reservoir and Swamp/Marsh	
InundationControlStatus	Existence of functional control structures	Inundation Area	
OperationalStatus	State or condition	Special Use Zone	
PipelineType	Function or purpose	Pipeline	
PositionalAccuracy	The accuracy within which a feature may be confidently positioned	Sounding Datum Line and Underground Conduit	
RelationshipToSurface	Vertical location relative to the surface	Pipeline and Rock	
ReservoirType	Function or purpose	Reservoir	
Stage	Height of water surface	Inundation Area and Lake/Pond	
SpecialUseZoneType	Function or purpose	Special Use Zone	

NHDVerticalRelationship

Used for features (i.e. streams and canals) which cross but do not exchange flow

Field Name	Definition	Applies to	Comments
ComID	ComID of the relationship	Vertical Relationship	
AboveComID	ComID of feature above the vertical offset	Flowline that is part of vertical relationship	
BelowComID	ComID of feature below the vertical offset	Flowline that is part of vertical relationship	

NHDFlow

Flow table values are derived from the topologic connectivity of the geometric network and values of FlowDir attribute of NHDFlowline features

This table is not populated in pre-processed subregions

Field Name	Definition	Applies to	Comments
FromComID	ComID of the flowline from which water flows		Value = "0" if flowline is a network start
ToComID	ComID of a flowline to which water flows		Value = "0" if flowline is a network end
DeltaLevel	Numerical difference between stream level for FromComID and stream level for ToComID		Only populated if stream level has been calculated
Direction	Text or Code to describe direction of flow		Domain of Values: In – 709 Network start – 712 Network end - 713 Non-flowing -714
ToComIDMeas			Not valued

NHDReachCode_ComID

Field Name	Definition	Applies to	Comments
ComID	10-digit integer that uniquely identifies the occurrence of each feature.		
ReachCode	Unique identifier composed of two parts. The first eight digits is the subbasin code as defined by FIPS 103. The next six digits are randomly assigned, sequential numbers that are unique within a subbasin, length 14.		
ReachSMDate	Reach Version Date		The version date tracks the last time

			that the reach represented by ReachCode experienced a change in geometry.
Resolution	Source resolution. Currently NHD is available as separate resolutions. Plans are to develop a single-resolution database holding the highest resolution data with tools to allow for generalization		
GNIS_ID	Unique identifier assigned by GNIS, length 10.		
GNIS_Name	Proper name, specific term, or expression by which a particular geographic entity is known, length 65.		

NHDReachCrossReference

Information that tracks changes, over time, to reach codes.

Field Name	Definition	Applies to	Comments
OldReachCode	Reach code prior to change		
OldReachDate	Date old reach code was assigned		
NewReachCode	Reach code after the change		
NewReachDate	Date new reach code was assigned		
OldUPMI	Not used		
NewUPMI	Not used		
ChangeCode	Type of change to the reached feature		(A) Add new reach (D) Delete old reach (11) Old reach to new reach (generally used when an existing reach codes was assigned a new reach code in a new subbasin – reach migration) (P1) Part of old reach to new reach (split)

			(1P) Old reach to part of new reach (merge)
Process	Name of the process that created the reach code change		Many processes to create the NHD were done on the National Database and these have standard codes.
ReachFileVersion	Reach File Version in which the change became effective		
OldHUCCode	Subbasin of the flowline prior to migration		Used if the flowline was originally assigned a reach code based on an incorrect subbasin assignment
NewHUCCode	Subbasin of the flowline prior to migration		Used if the flowline was originally assigned a reach code based on an incorrect subbasin assignment

NHDStatus

This table is only populated during editing. It is blank when NHD is downloaded for use.

Field Name	Definition	Applies to	Comments
ID	Temporary ID assigned to track feature edits.	Edited features	When edits are loaded into the national database, the temporary ID is replaced with an official ComID
Status	Type of edit	Edited features	

NHDProcessingParameters

This table lists the schema and the version of the master NHD database that was used to generate extracted NHD data. This table is most useful to USGS to verify the version used by data stewards for updates.

Field Name	Definition	Applies to	Comments
ParameterName			
ParameterValue			

NHDFeatureToMetadata

This table links every feature in the NHD to one or many metadata records.

Field Name	Definition	Applies to	Comments
ComID	10-digit integer that uniquely identifies the occurrence of each feature.		
DuuID	Digital Update Unit, unique ID.		A Duu is a collection of features that were created or updated using a similar process. The DuuID links to the NHDMetadata table.

NHDMetadata

This table contains FGDC compliant Data Quality information

Field Name	Definition	Applies to	Comments
DuuID	Digital Update Unit, unique ID.		
ProcessDescription	Explanation of the event and related parameters or tolerances		
ProcessDate	Date when the event was completed.		
AttributeAccuracyreport	Explanation of entities and assignments of values in dataset		
LogicalConsistencyReport	Explanation of fidelity of relationships in dataset and tests used.		
CompletenessReport	Information about omissions, criteria, definitions used to derive dataset.		
HorizPositionalAccuracyReport	Horizontal coordinate measurements and description of tests used.		
VertPositionalAccuracyReport	Vertical coordinate measurements and description of tests used.		
MetadataStandardName	Name of the metadata standard used to document the dataset.		

MetadataStandardVersion	Identification of the version of the metadata standard used to document the dataset.		
MetadataDate	Date the metadata was last created or updated.		
DataSetCredit	Recognition of those who contributed to the dataset.		
ContactOrganization	Name or organization to which type of contact applies.		
AddressType	Information provided by the address.		
Address	Address line for the address.		
City	City of the address		
StateOrProvince	State or province of the address		
PostalCode	ZIP or other postal code of the address		
ContactVoiceTelephone	Telephone number to reach Organization or individual.		
ContactInstructions	Supplemental instructions to contact Organization or individual		
ContactEmailAddress	E-mail address to reach contact organization or individual.		

NHDSourceCitation

This table links to process description information found in the NHDMetadata table.

Not all process descriptions have a source citation.

Content is based on FGDC Metadata requirements

Field Name	Definition	Applies to	Comments
Title	Name by which the dataset is known.		
SourceCitationAbbreviation	Short form alias for source citation.		
Originator	Name of an organization or individual that developed the dataset.		
PublicationDate	Date the dataset is		

	published or made available for release.		
BeginningDate	First year of the event (if Range_of_Dates applies).		<Null> if CalendarDate is used
EndingDate	Last year for the event (if Range_of_Dates applies).		<Null> if CalendarDate is used
SourceContribution	Brief statement identifying information contributed by source to dataset		
SourceScaleDenominator	Denomination of representative fraction on a map.		
TypeofSourceMedia	The medium of the source dataset.		
CalendarDate	The year (if Single Date applies).		<Null> if BeginningDate and EndingDate are used
SourceCurrentnessReference	Source time period of content information of source dataset is determined.		
DuuID	Digital Update Unit, unique ID.		Link to the NHDMetadata table

Relationship Classes

To help users discover the feature-based metadata records, explicit relationship classes are created.

Feature-level metadata requires three tables:

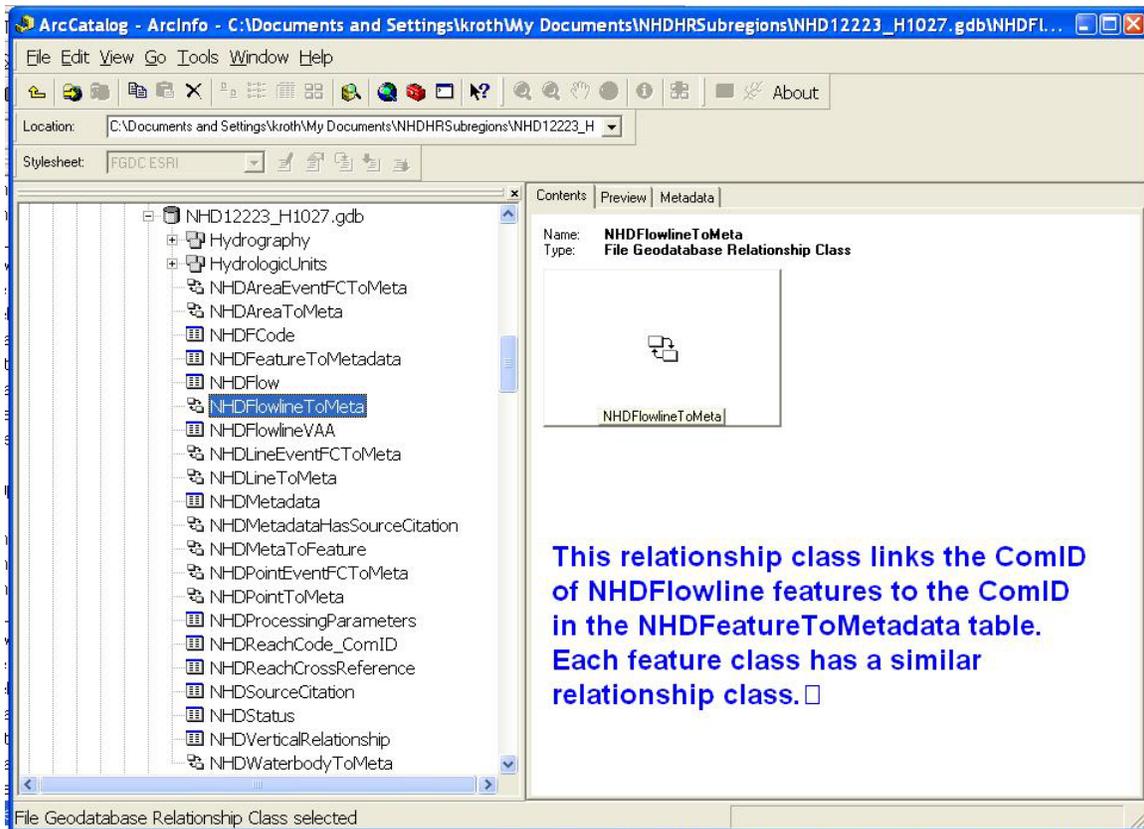
NHDFeatureToMetadata

NHDMetadata

NHDSource Citation

For details on how to use the relationship classes, see [Metadata Creation and Use](#).

The NHD contains the necessary relationships between these tables. For example;



ArcCatalog - ArcInfo - C:\Documents and Settings\kroth\My Documents\NHDHRSubregions\NHD12223_H1027.gdb\NHDMetaToFeature...

File Edit View Go Tools Window Help

Location: C:\Documents and Settings\kroth\My Documents\NHDHRSubregions\NHD12223_H

Stylesheet: FGDC ESRI

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 - NHDAreaEventFCToMeta
 - NHDAreaToMeta
 - NHDFCode
 - NHDFeatureToMetadata
 - NHDFlow
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 - NHDVerticalRelationship
 - NHDWaterbodyToMeta

Name: **NHDMetaToFeature**
Type: **File Geodatabase Relationship Class**



NHDMetaToFeature

This relationship class links the DuuID associated with a feature ComID to the DuuID in the NHDMetadata table. By first relating a feature to the appropriate record in the NHDFeatureToMetadata table and then relating the record in the NHDFeatureToMetadata table to the NHDMetadata table, the data quality information for individual features can be described.

File Geodatabase Relationship Class selected

