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The National Map National Hydrography Dataset (NHD) Model

February, 2006

This model is part of the Homeland Security Best Practices Model.

The Catalog View

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Attribute Tables

Feature Detail

Table **NHDFCode**

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
FCode	Long integer	No			0			Five-digit integer value comprised of the feature type and combinations of characteristics and values
Description	String	No					255	
CanalDitchType	String	Yes					32	Function or purpose (Aqueduct or Unspecified)
ConstructionMaterial	String	Yes					32	Predominant material used (Earthen, Nonearthen, or Unspecified)
HydrographicCategory	String	Yes					32	Portion of the year the feature contains water (Intermittent or Perennial)
InundationControlStatus	String	Yes					32	Existence of functional control structures (Controlled or Not Controlled)
OperationalStatus	String	Yes					32	State or condition (Abandoned or Operational)
PipelineType	String	Yes					32	Function or Purpose (Aqueduct, General, Penstock, or Siphon)
PositionalAccuracy	String	Yes					32	The accuracy with which a feature can be confidently positioned (Approximate or Definite)
RelationshipToSurface	String	Yes					32	Vertical location relative to the surface (Abovewater or Underwater)
ReservoirType	String	Yes					32	Function or purpose (Aquaculture, Decorative Pool, Disposal, Evaporator, Swim Pool, Treatment, Unspecified, or Water Storage)
Stage	String	Yes					32	Height of water surface is the basis for the elevation
SpecialUseZoneType	String	Yes					32	Function or purpose (Dump site or Spoil area)

Table **NHDFlow**

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

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
FromComID	Long integer	No			0			
ToComID	Long integer	No			0			
DeltaLevel	Long integer	Yes			0			Difference in level from first reach to second reach
Direction	Long integer	Yes		FlowDirection	0			Integer code for the direction of flow
ToComIDMeas	Double	Yes			0	0		

Table **NHDFlowlineVAA**

NHDFlowline Value Added Attributes are entirely derived from the NHDFlowline features and the Flow table values

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
ComID	Long integer	No			0			10-digit integer value that uniquely identifies each feature or reach (not the feature or reach)
FDate	Date	Yes			0	0	8	Date of last feature modification
StreamLevel	Long integer	Yes			0			Drain_level of the downstream mainstem drain
StreamOrder	Long integer	Yes			0			Strahler stream order number for the drain
FromNode	Double	Yes			0	0		Nationally unique ID for the "from" node endpoint of the drain
ToNode	Double	Yes			0	0		Nationally unique ID for the "to" node endpoint of the drain
HydroSeq	Double	Yes			0	0		Nationally unique sequence number that places the reach in hydrologic sequence
LevelPathID	Double	Yes			0	0		Hydro Sequence No of downstream drain that is on the same level path as this drain according to the DFlow Table
PathLengthKM	Double	Yes			0	0		Distance from this drain's pourpoint to its terminal drain's pourpoint according to the DFlow Table
TerminalPathID	Double	Yes			0	0		
ArbolateSumKM	Double	Yes			0	0		Sum of the lengths of all the drains that drain to the downstream end of the current drain
DivergenceFlag	Long integer	Yes			0			If this drain is 1 branch of a flow split 1=drain is main branch 2=otherwise 0=drain not a branch of flow split
StartFlag	Long integer	Yes			0			Set to 1 if the drain is a headwater drain according to the DFlow Table otherwise 0
TerminalFlag	Long integer	Yes			0			Set to 1 if drain is a terminal drain (flows into ocean, Great Lakes, Canada, Mexico, or the ground) otherwise set to 0
DnLevel	Long integer	Yes			0			Stream level of drain
ThinnerCode	Long integer	Yes			0			Ordinal value designed to allow selection of progressively more dense networks Least dense network=1
UpLevelPathId	Double	Yes			0	0		LevelPathID of upstream mainstream drain
UpHydroSeq	Double	Yes			0	0		Hydro Sequence No of upstream mainstem drain
UpMinHydroSeq	Double	Yes			0	0		Minimum Hydro Sequence No of all upstream drains
DnLevelPathID	Double	Yes			0	0		Level path ID of downstream drain
DnMinHydroSeq	Double	Yes			0	0		At a divergence, the Hydro sequence number of the minor downstream drain
DnDrainCount	Long integer	Yes			0			Number of drains immediately downstream

Table **NHDVerticalRelationship**

Only NHDFlowline features can participate in vertical relationships

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
ComID	Long integer	No			0			10-digit integer value that uniquely identifies the occurrence of each feature
AboveComID	Long integer	No			0			Common identifier of feature above vertical offset
BelowComID	Long integer	No			0			Common identifier of feature below vertical offset

Processing

Table **NHDProcessingParameters**

Parameters used for processing data

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
ParameterName	String	No					24
ParameterValue	String	No					100

Table **NHDStatus**

NHDStatus is used to track data changes for transaction uploads to the central repository

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
ID	Long integer	No			0		
Status	Long integer	No		Status	0		

Table **NHDReachCode_ComID**

ReachCode_ComID data is applied in the central database to maintain links for backward compatibility with FOC-based systems. This table is not part of the personal geodatabase distribution

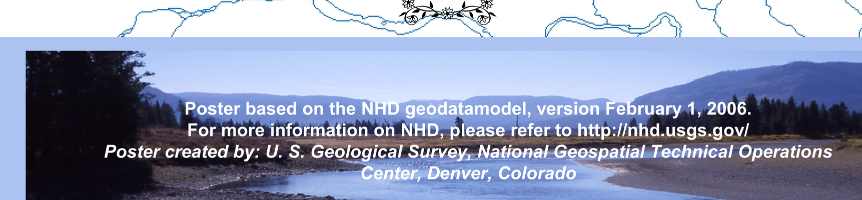
Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
ComID	Long integer	No			0			10-digit integer value that uniquely identifies the occurrence of each feature
ReachCode	String	No					14	Unique identifier composed of two parts The first eight digits is the subbasin code as defined by FIPS 103 The next six digits are randomly assigned sequential numbers that are unique within a Cataloging Unit Length 14
ReachSMDate	Date	Yes			0	0	8	Reach Spatial Modification Date
Resolution	Long integer	No		Resolution	0			Code for source resolution 1=Local resolution 2=High resolution 3=Medium resolution
GNIS_ID	String	Yes					10	The unique national identifier assigned by GNIS Length 10
GNIS_Name	String	Yes					100	Proper name, specific term, or expression by which a particular geographic entity is known Length 65

Table **NHDReachCrossReference**

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
OldReachCode	String	Yes					17	Reach Code prior to the change
OldReachDate	Date	Yes			0	0	8	Date OldReachCode was originally assigned (yyyymmdd)
NewReachCode	String	Yes					17	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 Cataloging Unit Length 14
NewReachDate	Date	Yes			0	0	8	Date NewReachDate was assigned (yyyymmdd)
OldUPM	String	Yes					5	Upstream Marker Index of Old Reach (RF3-Alpha Only)
NewUPM	String	Yes					5	Upstream Marker Index of New Reach (RF3-Alpha Only)
ChangeCode	String	Yes					4	Type of change to the reach feature
Process	String	Yes					6	Process where the change occurred
ReachFileVersion	String	Yes					10	Reach File Version in which change became effective
OldHUCode	String	Yes					8	Hydrologic unit is a member of the hierarchical system for identifying and subdividing river basin units of the United States
NewHUCode	String	Yes					8	Hydrologic unit is a member of the hierarchical system for identifying and subdividing river basin units of the United States

Implicit Associations Between NHD Feature/Object Classes

Table 1	Attribute 1	Relationship	Table 2	Attribute 2
NHDArea	FCode	1-1	NHDFCode	FCode
NHDFlowline	ComID	1-0/m	NHDFlow	FromComID
NHDFlowline	ComID	1-0/m	NHDFlow	ToComID
NHDFlowline	ComID	1-1	NHDFlowlineVAA	ComID
NHDFlowline	ComID	1-0/m	NHDVerticalRelationship	AboveComID
NHDFlowline	ComID	1-0/m	NHDVerticalRelationship	BelowComID
NHDFlowline	FCode	1-1	NHDFCode	FCode
NHDFlowline	ReachCode	0/m-0/1	NHDReachCode_ComID	ReachCode
NHDFlowline	WBAreaComID	0/m-0/1	NHDArea	ComID
NHDFlowline	WBAreaComID	0/m-0/1	NHDWaterbody	ComID
NHDLine	FCode	1-1	NHDFCode	FCode
NHDLineEventFC	ReachCode	0/m-1	NHDReachCode_ComID	ReachCode
NHDPoint	FCode	1-1	NHDFCode	FCode
NHDPoint	ReachCode	0/1-0/1	NHDReachCode_ComID	ReachCode
NHDPointEventFC	FeatureComID	0/1-0/1	NHDArea	ComID
NHDPointEventFC	FeatureComID	0/1-0/1	NHDLine	ComID
NHDPointEventFC	FeatureComID	0/1-0/1	NHDPoint	ComID
NHDPointEventFC	ReachCode	0/m-1	NHDReachCode_ComID	ReachCode
NHDWaterbody	FCode	1-1	NHDFCode	FCode
NHDWaterbody	ReachCode	0/m-0/1	NHDReachCode_ComID	ReachCode
NHDReachCode_ComID	ReachCode	0/1-0/m	NHDReachCrossReference	NewReachCode



FEATURE CLASSES

Simple feature class **NHDPoint** — Geometry Point; Contains M values No; Contains Z values Yes

Contains points representing NHD hydrographic landmark features

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
Shape	Geometry	Yes						
ComID	Long integer	No	0		0			Uniquely identifies the occurrence of each feature length 10
FDate	Date	No			0	0	8	Date of last feature modification
Resolution	Long integer	No		Resolution	0			Code for source resolution 1=Local resolution 2=High resolution 3=Medium resolution
GNIS_ID	String	Yes					10	Unique identifier assigned by GNIS length 10
GNIS_Name	String	Yes					65	Proper name, specific term, or expression by which a particular geographic entity is known length 65
ReachCode	String	Yes					14	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 Cataloging Unit length 14
FType	Long integer	No	458		0			Three digit integer value unique identifier of a feature type
FCode	Long integer	Yes	45800		0			Five-digit integer value comprised of the feature type and combinations of characteristics and values

Subtypes of NHDPoint — Subtype field FType; Default subtype 458. List of defined default values and domains for subtypes in this class

Subtype Code	Subtype Description	Field name	Default value	Domain	
343	DamWeir	Resolution / FCode	34305	Resolution / DamWeir FCode	Barrier constructed to control the flow or raise the level of water
367	Gaging Station	Resolution / FCode	36700	Resolution / Gaging Station FCode	Structure used to measure the characteristics of a hydrographic feature
369	Gate	Resolution / FCode	36900	Resolution / Gate FCode	Structure that may be swung, drawn, or lowered to block an entrance or passageway
398	Lock Chamber	Resolution / FCode	39800	Resolution / Lock Chamber FCode	Enclosure on a waterway used to raise or lower the vessels as they pass from one level to another
431	Rapids	Resolution / FCode	43100	Resolution / Rapids FCode	Area of swift current in a stream or river characterized by standing waves, boulders, or rocks
436	Reservoir	Resolution / FCode	43600	Resolution / Reservoir FCode	Constructed basin formed to contain water or other liquids
441	Rock	Resolution / FCode	44101	Resolution / Rock FCode	Concreted mass of stony material
450	SinkRise	Resolution / FCode	45000	Resolution / SinkRise FCode	Place at which a stream disappears underground or reappears at the surface in a karst area
458	SpringSeep	Resolution / FCode	45800	Resolution / SpringSeep FCode	Place where water issues from the ground naturally
485	Water IntakeOutflow	Resolution / FCode	48500	Resolution / Water IntakeOutflow FCode	Structure through which water enters or exits a conduit
487	Waterfall	Resolution / FCode	48700	Resolution / Waterfall FCode	Vertical or near vertical descent of water over a step or ledge in the bed of a river
488	Well	Resolution / FCode	48800	Resolution / Well FCode	Pit or hole dug or bored into the earth for the extraction of water or other fluids or gases

Simple feature class **NHDLine** — Geometry Polyline; Contains M values No; Contains Z values Yes

Contains routes representing linear NHD hydrographic landmark features

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
Shape	Geometry	Yes						
ComID	Long integer	No	0		0			Uniquely identifies the occurrence of each feature length 10
FDate	Date	No			0	0	8	Date of last feature modification
Resolution	Long integer	No		Resolution	0			Code for source resolution 1=Local resolution 2=High resolution 3=Medium resolution
GNIS_ID	String	Yes					10	Unique identifier assigned by GNIS length 10
GNIS_Name	String	Yes					65	Proper name, specific term, or expression by which a particular geographic entity is known length 65
LengthKM	Double	Yes			0	0		Length of linear feature Albers Equal Area length 8
FType	Long integer	No	411		0			Three digit integer value unique identifier of a feature type
FCode	Long integer	Yes	41100		0			Five-digit integer value comprised of the feature type and combinations of characteristics and values
Shape_Length	Double	Yes			0	0		

Subtypes of NHDLine — Subtype field FType; Default subtype 411. List of defined default values and domains for subtypes in this class

Subtype Code	Subtype Description	Field name	Default value	Domain	
318	Bridge	Resolution / FCode	31800	Resolution / Bridge FCode	Structure spanning and providing passage over a waterway, railway, or other obstacle
343	DamWeir	Resolution / FCode	34305	Resolution / DamWeir FCode	Barrier constructed to control the flow or raise the level of water
362	Flume	Resolution / FCode	36200	Resolution / Flume FCode	Open inclined artificial channel constructed of wood, metal, or concrete generally elevated
369	Gate	Resolution / FCode	36900	Resolution / Gate FCode	Structure that may be swung, drawn, or lowered to block an entrance or passageway
568	Levee	Resolution / FCode	56800	Resolution / Levee FCode	A natural or manmade embankment along the edge of a stream, river, canal/ditch, or waterbody that protects the surrounding land from flooding
398	Lock Chamber	Resolution / FCode	39800	Resolution / Lock Chamber FCode	Enclosure on a waterway used to raise or lower vessels as they pass from one level to another
411	Nonearthen Shore	Resolution / FCode	41100	Resolution / Nonearthen Shore FCode	Structure built of stone, concrete, or other building material that borders a body of water
431	Rapids	Resolution / FCode	43100	Resolution / Rapid FCode	Area of swift current in a stream or river characterized by standing waves or by boulders and rocks
434	Reef	Resolution / FCode	43400	Resolution / Reef FCode	Chain of rocks or coral at or near the surface of the water
450	SinkRise	Resolution / FCode	45000	Resolution / SinkRise FCode	Place at which a stream disappears underground or reappears at the surface in a karst area
503	Sounding Datum Line	Resolution / FCode	50302	Resolution / Sounding Datum Line FCode	Line representing the tidal datum to which bathymetric contours are referenced
533	Special Use Zone Limit	Resolution / FCode	53302	Resolution / Special Use Zone Limit	Limit of an area used for distinctive types of maritime activities
478	Tunnel	Resolution / FCode	47800	Resolution / Tunnel FCode	Underground or underwater passage
483	Wall	Resolution / FCode	48300	Resolution / Wall FCode	Upright structure of masonry, wood, plaster, or other building material serving to enclose, divide, or protect an area
487	Waterfall	Resolution / FCode	48700	Resolution / Waterfall FCode	Vertical or near vertical descent of water over a step or ledge in the bed of a river

Simple feature class **NHDFlowline** — Geometry Polyline; Contains M values Yes; Contains Z values Yes

Consists of routes that make up a linear surface water drainage network

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
Shape	Geometry	Yes						
ComID	Long integer	No	0		0			Uniquely identifies the occurrence of each feature length 10
FDate	Date	No			0	0	8	Date of last feature modification
Resolution	Long integer	No		Resolution	0			Code for source resolution 1=Local resolution 2=High resolution 3=Medium resolution
GNIS_ID	String	Yes					10	Unique identifier assigned by GNIS length 10
GNIS_Name	String	Yes					65	Proper name, specific term, or expression by which a particular geographic entity is known length 65
LengthKM	Double	Yes			0	0		Length of linear feature Albers Equal Area length 8
ReachCode	String	Yes					14	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 Cataloging Unit length 14
FlowDir	Long integer	No	0	HydroFlowDirections	0			Direction of flow relative to coordinate order Length 4
WBAreaComID	Long integer	Yes			0			ComID of the waterbody through which the Flowline (Artificial Path) flows
FType	Long integer	No	460		0			Three digit integer value unique identifier of a feature type
FCode	Long integer	Yes	46003		0			Five-digit integer value comprised of the feature type and combinations of characteristics and values
Shape_Length	Double	Yes			0	0		

Subtypes of NHDFlowline — Subtype field FType; Default subtype 460. List of defined default values and domains for subtypes in this class

Subtype Code	Subtype Description	Field name	Default value	Domain	
558	Artificial Path	Resolution / FlowDir / FCode	0 / 55800	Resolution / HydroFlowDirections / ArtificialPath FCode	Abstraction to facilitate hydrologic modeling through open water bodies and along coastal and Great Lakes shorelines and to act as a surrogate for lakes and other water bodies
336	CanalDitch	Resolution / FlowDir / FCode	0 / 33600	Resolution / HydroFlowDirections / CanalDitch FCode	Artificial open waterway constructed to transport water, to irrigate or drain land, to connect two or more bodies of water, or to serve as a waterway for watercraft
566	Coastline	Resolution / FlowDir / FCode	0 / 56600	Resolution / HydroFlowDirections / Coastline FCode	Line that follows the main outline of the land, including bays, but crosses rivers at their mouth. In the NHD, the outline of selected coastal islands are included as part of the coastline
334	Connector	Resolution / FlowDir / FCode	0 / 33400	Resolution / HydroFlowDirections / Connector FCode	Known, but unspecific, connection between two nonadjacent network segments
428	Pipeline	Resolution / FlowDir / FCode	0 / 42805	Resolution / HydroFlowDirections / Pipeline FCode	Closed conduit with pumps, valves, and control devices for conveying fluids, gases, or finely divided solids
460	StreamRiver	Resolution / FlowDir / FCode	0 / 46006	Resolution / HydroFlowDirections / StreamRiver FCode	Body of flowing water

Simple feature class **NHDArea** — Geometry Polygon; Contains M values No; Contains Z values Yes

Contains regions representing areal NHD hydrographic landmark features

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
Shape	Geometry	Yes						
ComID	Long integer	No	0		0			Uniquely identifies the occurrence of each feature length 10
FDate	Date	No			0	0	8	Date of last feature modification
Resolution	Long integer	No		Resolution	0			Code for source resolution 1=Local resolution 2=High resolution 3=Medium resolution
GNIS_ID	String	Yes					10	Unique identifier assigned by GNIS length 10
GNIS_Name	String	Yes					65	Proper name, specific term, or expression by which a particular geographic entity is known length 65
AreaSqKm	Double	Yes			0	0		Area of areal features Albers Equal Area length 8
Elevation	Double	Yes		ElevationRange	0	0		Elevation of water surfaces where water pools is encoded for a few features length 8
FType	Long integer	No	460		0			Three digit integer value unique identifier of a feature type
FCode	Long integer	Yes	46006		0			Five-digit integer value comprised of the feature type and combinations of characteristics and values
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		

Subtypes of NHDArea — Subtype field FType; Default subtype 460. List of defined default values and domains for subtypes in this class

Subtype Code	Subtype Description	Field name	Default value	Domain	
307	Area to be Submerged	Resolution / Elevation / FCode	30700	Resolution / ElevationRange / Area to be Submerged FCode	Known extent of the intended lake that will be created behind a dam under construction
312	BayInlet	Resolution / Elevation / FCode	31200	Resolution / ElevationRange / BayInlet FCode	Water area that is an opening of the sea or ocean into the land, or an estuary, lake, or river into its shore
318	Bridge	Resolution / Elevation / FCode	31800	Resolution / ElevationRange / Bridge FCode	Structure spanning and providing passage over a waterway, railway, or other obstacle
336	CanalDitch	Resolution / Elevation / FCode	33600	Resolution / ElevationRange / CanalDitch FCode	Artificial open waterway constructed to transport water, to irrigate or drain land, to connect two or more bodies of water, or to serve as a waterway for watercraft
343	DamWeir	Resolution / Elevation / FCode	34305	Resolution / ElevationRange / DamWeir FCode	Barrier constructed to control the flow or raise the level of water
362	Flume	Resolution / Elevation / FCode	36200	Resolution / ElevationRange / Flume FCode	Open inclined artificial channel constructed of wood, metal, or concrete generally elevated
364	Foreshore	Resolution / Elevation / FCode	36400	Resolution / ElevationRange / Foreshore FCode	Part of a seashore between the high-water and low-water marks
373	Hazard Zone	Resolution / Elevation / FCode	37300	Resolution / ElevationRange / Hazard Zone FCode	Area identified as a danger to maritime navigation
398	Lock Chamber	Resolution / Elevation / FCode	39800	Resolution / ElevationRange / Lock Chamber FCode	Enclosure on a waterway used to raise or lower vessels as they pass from one level to another
403	Inundation Area	Resolution / Elevation / FCode	40308	Resolution / ElevationRange / Inundation Area FCode	Area of land subject to flooding
431	Rapids	Resolution / Elevation / FCode	43100	Resolution / ElevationRange / Rapids FCode	Area of swift current in a stream or river characterized by standing waves, boulders, or rocks
445	SeaOcean	Resolution / Elevation / FCode	44500	Resolution / ElevationRange / SeaOcean FCode	Great body of salt water that covers much of the Earth
454	SpecialUse Zone	Resolution / Elevation / FCode	45401	Resolution / ElevationRange / Special Use Zone FCode	Area where distinctive types of maritime activities occur
455	Spillway	Resolution / Elevation / FCode	45500	Resolution / ElevationRange / Spillway FCode	Constructed passage for surplus water to run over or around a dam
460	StreamRiver	Resolution / Elevation / FCode	46006	Resolution / ElevationRange / StreamRiver FCode	Body of flowing water
461	Submerged Stream	Resolution / Elevation / FCode	46100	Resolution / ElevationRange / Submerged FCode	Usually dry portion of a stream bed that contains water only during or after a local rainstorm or heavy snowmelt
484	Wash	Resolution / Elevation / FCode	48400	Resolution / ElevationRange / Wash FCode	Great body of salt water that covers much of the earth
485	Water IntakeOutflow	Resolution / Elevation / FCode	48500	Resolution / ElevationRange / Water IntakeOutflow FCode	Body of flowing water
537	Area of Complex Channels	Resolution / Elevation / FCode	33600	Resolution / ElevationRange / Area of Complex Channels FCode	Artificial open waterway constructed to transport water, to irrigate or drain land, to connect two or more bodies of water, or to serve as a waterway for watercraft

Simple feature class **NHDWaterbody** — Geometry Polygon; Contains M values No; Contains Z values Yes

Contains regions representing areal NHD hydrographic waterbody features

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
Shape	Geometry	Yes						
ComID	Long integer	No	0		0			Uniquely identifies the occurrence of each feature length 10
FDate	Date	No			0	0	8	Date of last feature modification
Resolution	Long integer	No		Resolution	0			Code for source resolution 1=Local resolution 2=High resolution 3=Medium resolution
GNIS_ID	String	Yes					10	Unique identifier assigned by GNIS length 10
GNIS_Name	String	Yes					65	Proper name, specific term, or expression by which a particular geographic entity is known length 65
AreaSqKm	Double	Yes			0	0		Area of areal features Albers Equal Area length 8
Elevation	Double	Yes		ElevationRange	0	0		Elevation of water surfaces where water pools is encoded for a few features length 8
ReachCode	String	Yes					14	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 Cataloging Unit Length 14
FType	Long integer	No	390		0			Three digit integer value unique identifier of a feature type
FCode	Long integer	Yes	39004		0			Five-digit integer value comprised of the feature type and combinations of characteristics and values
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		

Subtypes of NHDWaterbody — Subtype field FType; Default subtype 390. List of defined default values and domains for subtypes in this class

Subtype Code	Subtype Description	Field name	Default value	Domain	
378	Ice Mass	Resolution / Elevation / FCode	37800	Resolution / ElevationRange / Ice Mass FCode	Field of ice, formed in regions of perennial frost
493	Estuary	Resolution / Elevation / FCode	49300	Resolution / ElevationRange / Estuary FCode	Lower end of a river or a semi-enclosed coastal body of water with access to the open ocean which is affected by the tides and where fresh and salt water mix
390	LakePond	Resolution / Elevation / FCode	39004	Resolution / ElevationRange / LakePond FCode	Standing body of water with a predominantly natural shoreline surrounded by land
436	Reservoir	Resolution / Elevation / FCode	43600	Resolution / ElevationRange / Reservoir FCode	Constructed basin formed to contain water or other liquids
466	SwampMarsh	Resolution / Elevation / FCode	46600	Resolution / ElevationRange / SwampMarsh FCode	Noncultivated, vegetated area that is inundated or saturated for a significant part of the year. The vegetation is adapted for life in saturated soil conditions
361	Playa	Resolution / Elevation / FCode	36100	Resolution / ElevationRange / Playa FCode	Flat area at the lowest part of an undrained desert basin, generally devoid of vegetation

Event Feature Classes

Simple feature class **NHDLineEventFC** — Geometry Polyline; Contains M values No; Contains Z values No

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
Shape	Geometry	Yes					
OBJECTID	Object ID						
ComID	Long integer	No			0		
EventDate	Date	Yes			0	0	8
EventType	String	No			0		100
ReachCode	String	No					60
ReachSMDate	Date	Yes			0	0	8
ReachResolution	Long integer	No		Resolution	0		
FeatureComID	Long integer	Yes			0		
FeatureClassRef	Long integer	Yes		Event Feature Class Reference	0		
Source_Originator	String	Yes					130
Source_DataDesc	String	Yes					100
Source_FeatureID	String	Yes					40
FeatureDetailURL	String	Yes					255
Offset	Double	Yes			0	0	
FMeasure	Double	No			0	0	
TMeasure	Double	No			0	0	
Shape_Length	Double	Yes			0	0	

Simple feature class **NHDPointEventFC** — Geometry Point; Contains M values No; Contains Z values No

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
Shape	Geometry	Yes					
OBJECTID	Object ID						
ComID	Long integer	No			0		
EventDate	Date	Yes			0	0	8
EventType	Long integer	No		Point Event Type	0		
ReachCode	String	No					60
ReachSMDate	Date	Yes			0	0	8
ReachResolution	Long integer	No		Resolution	0		
FeatureComID	Long integer	Yes			0		
FeatureClassRef	Long integer	Yes		Event Feature Class Reference	0		
Source_Originator	String	Yes					130
Source_DataDesc	String	Yes					100
Source_FeatureID	String	Yes					40
FeatureDetailURL	String	Yes					255
Offset	Double	Yes			0	0	
Measure	Double	No			0	0	

Relationship class **NHDPointToMeta** — One to many
Relationship class **NHDLineToMeta** — One to many
Relationship class **NHDAreaToMeta** — One to many
Relationship class **NHDFlowlineToMeta** — One to many
Relationship class **NHDPointEventFCToMeta** — One to many
Relationship class **NHDWaterbodyToMeta** — One to many
Relationship class **NHDLineEventFCToMeta** — One to many

To Meta

Feature Metadata

In the NHD geodatamodel, feature-level metadata information is included in three tables: NHDFeatureToMetadata, NHDMetadata, and NHDSourceCitation. The NHDFeatureToMetadata table is a link between the features and their metadata. The NHDMetadata table contains the general metadata characteristics for each collection of features. The NHDSourceCitation table lists the sources associated with each metadata instance.

Table **NHDFeatureToMetadata**

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
ComID	Long integer	Yes			0		
DuuID	Long integer	Yes			0		

Relationship class **NHDMetaToFeature**

Type Simple; Cardinality One to many; Notification None; Forward label MToFeatureToMetadata; Backward label ToMetadata

Destination table: Name NHDFeatureToMetadata

Origin table: Name NHDMetadata; Primary key DuuID; Foreign key DuuID

No relationship rules defined

Table **NHDMetadata**

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
DuuID	Long integer	No			0			Digital Update Unit, unique ID
ProcessDescription	String	No					4000	Explanation of the process, including parameters or tolerances
ProcessDate	Date	No			0	0	8	Date when the process was completed
AttributeAccuracyReport	String	Yes					1800	Explanation of entities and assignments of values in dataset
LogicalConsistencyReport	String	Yes					1000	Explanation of fidelity of relationships in dataset, and tests used
CompletenessReport	String	Yes					2400	Information about omissions, criteria, definitions used to derive dataset
HorizPositionalAccuracyReport	String	Yes					3100	Horizontal coordinate measurements and description of tests used
VertPositionalAccuracyReport	String	Yes					3100	Vertical coordinate measurements and description of tests used
MetadataStandardName	String	Yes					100	Name of the metadata standard used to document the dataset
MetadataStandardVersion	String	Yes					40	Identification of the version of the metadata standard used to document the dataset
MetadataDate	Date	Yes			0	0	8	Date the metadata was last created or updated
DataSetCredit	String	Yes					4000	Recognition of those who contributed to the dataset
ContactOrganization	String	Yes					100	Name or organization to which type of contact applies
AddressType	String	Yes					40	Information provided about the address, i.e., mailing, physical, etc
Address	String	Yes					100	Address line for the address
City	String	Yes					40	City of the address
StateOrProvince	String	Yes					30	State or province of the address
PostalCode	String	Yes					20	ZIP or other postal code of the address
ContactVoiceTelephone	String	Yes					40	Telephone number to reach organization or individual
ContactInstructions	String	Yes					120	Supplemental instructions to contact organization or individual
ContactEmailAddress	String	Yes					40	E-mail address to reach contact organization or individual

Relationship class **NHDMetadataHasSourceCitation**

Type Simple; Cardinality One to many; Notification None; Forward label SourceCitation; Backward label Metadata

Origin table: Name NHDMetadata; Primary key DuuID; Foreign key DuuID

Destination table: Name NHDSourceCitation

No relationship rules defined

Table **NHDSourceCitation**

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
Title	String	Yes					255	Name by which the dataset is known
SourceCitationAbbreviation	String	Yes					255	Short form alias for source citation
Originator	String	Yes					400	Name of an organization or individual that developed the dataset
PublicationDate	Date	Yes			0	0	8	Date the dataset is published or made available for release
BeginningDate	Date	Yes			0	0	8	First year of the event (if Range_of_Dates applies)
EndingDate	Date	Yes			0	0	8	Last year of the event (if Range_of_Dates applies)
SourceContribution	String	Yes					255	Brief statement identifying information contributed by source to dataset
SourceScaleDenominator	Long integer	Yes			0			Denomination of representative fraction on a map
TypeofSourceMedia	String	Yes					255	The medium of the source dataset, i.e., paper, CD-ROM, online, etc
CalendarDate	Date	Yes			0	0	8	The year (if Single_Date applies)
SourceCurrentnessReference	String	Yes					255	The basis on which the source time period of content information of the source data set is determined
DuuID	Long integer	No			0			Digital Update Unit, unique ID

Feature Domains (FCodes)

All FCode domains: Coded value domain; Field type Long integer; Split policy Duplicate; Merge policy Default value.

Domain	Code	Description
Area of Complex Channels FCode	53700	Area of Complex Channels
Area to be Submerged FCode	30700	Area to be Submerged
ArtificialPath FCode	55800	Artificial Path
BayInlet FCode	31200	Bay/Inlet
Bridge FCode	31800	Bridge
CanalDitch FCode	33600	Canal Ditch
	33601	Canal Ditch: Canal Ditch Type = Aqueduct
Coastline FCode	56600	Coastline
Connector FCode	33400	Connector
DamWeir FCode	34300	Dam/Weir
	34305	Dam/Weir: Construction Material = Earthen
	34306	Dam/Weir: Construction Material = Nonearthen
Estuary FCode	49300	Estuary
Flume FCode	36200	Flume
Foreshore FCode	36400	Foreshore
Gaging Station FCode	36700	Gaging Station
Gate FCode	36900	Gate
Hazard Zone FCode	37300	Hazard Zone
Ice Mass FCode	37800	Ice Mass
HydroFlowDirections	0	Uninitialized
	1	WithDigitized
Inundation Area FCode	40300	Inundation Area
	40308	Inundation Area: Inundation Control Status = Controlled
	40309	Inundation Area: Inundation Control Status = Controlled; Stage = Flood Elevation
	40307	Inundation Area: Inundation Control Status = Not Controlled
LakePond FCode	39000	Lake/Pond
	39001	Lake/Pond: Hydrographic Category = Intermittent
	39006	Lake/Pond: Hydrographic Category = Intermittent; Stage = Date of Photography
	39005	Lake/Pond: Hydrographic Category = Intermittent; Stage = High Water Elevation
	39004	Lake/Pond: Hydrographic Category = Perennial
	39009	Lake/Pond: Hydrographic Category = Perennial; Stage = Average Water Elevation
	39011	Lake/Pond: Hydrographic Category = Perennial; Stage = Date of Photography
	39010	Lake/Pond: Hydrographic Category = Perennial; Stage = Normal Pool
	39012	Lake/Pond: Hydrographic Category = Perennial; Stage = Spillway
Levee FCode	56800	Levee
Lock Chamber FCode	39800	Lock Chamber
Nonearthen Shore	41100	Nonearthen Shore
Pipeline FCode	42800	Pipeline
	42816	Pipeline: Pipeline Type = Aqueduct
	42801	Pipeline: Pipeline Type = Aqueduct; Relationship to Surface = At or Near
	42802	Pipeline: Pipeline Type = Aqueduct; Relationship to Surface = Elevated
	42803	Pipeline: Pipeline Type = Aqueduct; Relationship to Surface = Underground
	42804	Pipeline: Pipeline Type = Aqueduct; Relationship to Surface = Underwater
	42814	Pipeline: Pipeline Type = General Case
	42805	Pipeline: Pipeline Type = General Case; Relationship to Surface = At or Near
	42806	Pipeline: Pipeline Type = General Case; Relationship to Surface = Elevated
	42807	Pipeline: Pipeline Type = General Case; Relationship to Surface = Underground
	42808	Pipeline: Pipeline Type = General Case; Relationship to Surface = Underwater
	42815	Pipeline: Pipeline Type = Penstock
	42809	Pipeline: Pipeline Type = Penstock; Relationship to Surface = At or Near
	42810	Pipeline: Pipeline Type = Penstock; Relationship to Surface = Elevated
	42811	Pipeline: Pipeline Type = Penstock; Relationship to Surface = Underground
	42812	Pipeline: Pipeline Type = Penstock; Relationship to Surface = Underwater
	42813	Pipeline: Pipeline Type = Siphon
Playa FCode	36100	Playa
Rapids FCode	43100	Rapids
Reef FCode	43400	Reef
Reservoir FCode	43600	Reservoir
	43618	Reservoir: Construction Material = Earthen
	43619	Reservoir: Construction Material = Nonearthen
	43601	Reservoir: Reservoir Type = Aquaculture
	43609	Reservoir: Reservoir Type = Cooling Pond
	43603	Reservoir: Reservoir Type = Decorative Pool
	43606	Reservoir: Reservoir Type = Disposal
	43625	Reservoir: Reservoir Type = Disposal; Construction Material = Earthen
	43626	Reservoir: Reservoir Type = Disposal; Construction Material = Nonearthen
	43607	Reservoir: Reservoir Type = Evaporator
	43623	Reservoir: Reservoir Type = Evaporator; Construction Material = Earthen
	43610	Reservoir: Reservoir Type = Filtration Pond
	43611	Reservoir: Reservoir Type = Settling Pond
	43612	Reservoir: Reservoir Type = Sewage Treatment Pond
	43608	Reservoir: Reservoir Type = Swimming Pool
	43605	Reservoir: Reservoir Type = Tailings Pond
	43604	Reservoir: Reservoir Type = Tailings Pond; Construction Material = Earthen
	43624	Reservoir: Reservoir Type = Treatment
	43617	Reservoir: Reservoir Type = Water Storage
	43614	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydro Cat = Intermittent
	43615	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydro Cat = Perennial
	43613	Reservoir: Reservoir Type = Water Storage; Construction Material = Nonearthen
	43621	Reservoir: Reservoir Type = Water Storage; Hydrographic Category = Perennial
Rock FCode	44100	Rock
	44101	Rock: Relationship to Surface = Abovewater
	44102	Rock: Relationship to Surface = Underwater
SeaOcean FCode	44500	Sea/Ocean
SinkRise FCode	45000	Sink/Rise
Sounding Datum Line FCode	50300	Sounding Datum Line
	50301	Sounding Datum Line: Positional Accuracy = Approximate
	50302	Sounding Datum Line: Positional Accuracy = Definite
Special Use Zone FCode	45400	Special Use Zone
	45402	Special Use Zone: Special Use Zone Type = Dump Site; Operational Status = Abandoned
	45401	Special Use Zone: Special Use Zone Type = Dump Site; Operational Status = Operational
	45404	Special Use Zone: Special Use Zone Type = Spoil Area; Operational Status = Abandoned
	45403	Special Use Zone: Special Use Zone Type = Spoil Area; Operational Status = Operational
Special Use Zone Limit FCode	53300	Special Use Zone Limit
	53301	Special Use Zone Limit: Positional Accuracy = Definite
	53302	Special Use Zone Limit: Positional Accuracy = Indefinite
Spillway FCode	45500	Spillway
SpringSeep FCode	45800	Spring/Seep
StreamRiver FCode	46000	Stream/River
	46003	Stream/River: Hydrographic Category = Intermittent
	46006	Stream/River: Hydrographic Category = Perennial
	46007	Stream/River: Hydrographic Category = Ephemeral
Submerged Stream FCode	46100	Submerged Stream
SwampMarsh FCode	46600	Swamp/Marsh
Tunnel FCode	47800	Tunnel
Wall FCode	48300	Wall
Wash FCode	48400	Wash
Water IntakeOutflow FCode	48500	Water Intake/Outflow
Waterfall FCode	48700	Waterfall
Well FCode	48800	Well

General Domains

Range domain **ElevationRange** — Field type Double; Split policy Default value; Merge policy Default value

Minimum value	Maximum value
-400	9000

Domain	Field type / Split policy / Merge policy	Code	Description
Event Feature Class Reference	Long integer / Duplicate / Default value	1	NHDArea
		2	NHDFlowline
		3	NHDLine
		4	NHDPoint
		5	NHDWaterbody
FlowDirection	Long integer / Default value / Default value	709	In
		712	NetworkStart
		713	NetworkEnd
		714	Non-Flowing
HydroFlowDirections	Long integer / Duplicate / Default value	0	Uninitialized
		1	WithDigitized
HydrologicUnitSource	Long integer / Default value / Default value	0	Watershed Boundaries Dataset
		1	NHD
		2	Other
Point Event Type	Long integer / Duplicate / Default value	2	Dam
		3	Divergence Structure
		1	Gaging Station
Resolution	Long integer / Duplicate / Default value	1	Local
		2	High
		3	Medium
Status	Long integer / Default value / Default value	1	Add Feature
		2	Modify Feature Attribute
		3	Modify Feature Geometry
		5	Delete Feature
		6	Delete Relationship
		7	Add Metadata
		8	Modify VAA
		9	Add Event
		10	Modify Event
		11	Delete Event
		12	Modify VAA_All
		13	Add Relationship

Hydrologic Units Feature Classes

Simple feature class **Region** — Geometry Polygon; Contains M values No; Contains Z values No

Regions are the largest drainage basins containing either the drainage area of a major river or the combined drainage areas of several rivers. Regions are the first level (2-digit) in the hydrologic unit hierarchy

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
Shape	Geometry	Yes						
OBJECTID	Object ID							
Source	Long integer	No		HydrologicUnitSource	0			Name of entity creating extended element
HUC_2	String	No					2	2-digit identifier
HU_2_Name	String	Yes					80	Name of the Region
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		

Simple feature class **Subregion** — Geometry Polygon; Contains M values No; Contains Z values No

Subdivisions of regions. Subregions are the second level (4-digit) of the hydrologic unit hierarchy

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
Shape	Geometry	Yes						
OBJECTID	Object ID							
Source	Long integer	No		HydrologicUnitSource	0			Name of entity creating extended element
HUC_4	String	No					4	4-digit identifier
HU_4_Name	String	Yes					80	Name of the Subregion
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		

Simple feature class **Basin** — Geometry Polygon; Contains M values No; Contains Z values No

Basins are the third level (6-digit) of the hydrographic unit hierarchy. Formerly called "accounting units."

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
Shape	Geometry	Yes						
OBJECTID	Object ID							
Source	Long integer	No		HydrologicUnitSource	0			Name of entity creating extended element
HUC_6	String	No					6	6-digit identifier
HU_6_Name	String	Yes					80	Name of the Basin
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		

Simple feature class **Subbasin** — Geometry Polygon; Contains M values No; Contains Z values No

Subdivisions of basins. Subbasins are the fourth level (8-digit) of the hydrologic unit hierarchy. Formerly called "cataloging units."

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
Shape	Geometry	Yes						
OBJECTID	Object ID							
Source	Long integer	No		HydrologicUnitSource	0			Name of entity creating extended element
HUC_8	String	No					8	8-digit identifier
HU_8_Name	String	Yes					80	Name of the Subbasin
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		

Simple feature class **Watershed** — Geometry Polygon; Contains M values No; Contains Z values No

Subdivisions within a subbasin. Watersheds are the fifth level (10-digit) of the hydrologic unit hierarchy

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
Shape	Geometry	Yes						
OBJECTID	Object ID							
Source	Long integer	No		HydrologicUnitSource	0			Name of entity creating extended element
HUC_10	String	No					10	10-digit identifier
HU_10_Name	String	Yes					80	Name of the Watershed
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		

Simple feature class **Subwatershed** — Geometry Polygon; Contains M values No; Contains Z values No

Subdivisions of watersheds. Subwatersheds are the sixth level (12-digit) of the hydrologic unit hierarchy

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
Shape	Geometry	Yes						
OBJECTID	Object ID							
Source	Long integer	No		HydrologicUnitSource	0			Name of entity creating extended element
HUC_12	String	No					12	12-digit identifier
HU_12_Name	String	Yes					80	Name of the Subwatershed
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		