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National Hydrography Dataset Plus High Resolution (NHDPlus HR) v1.0

April 13, 2018
Poster last updated

Distribution Data Model

The Catalog View

(Distribution Schema)
NHDPlusHR.gdb

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  - NHDPlusBurnWaterbody
  - NHDPlusCatchment
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elev_source.gdb.zip
(Raster bundle)

- elev_clip
- elev_meta
- cat.tif
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- fdroverland.tif
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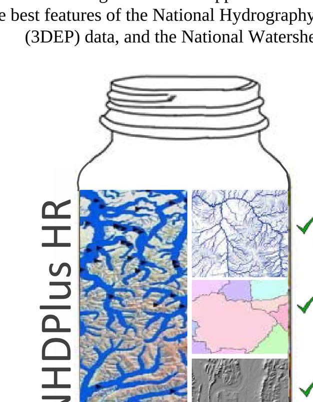
3DEP DEM

NHDPlus HR Dataset

NHDPlus HR is an integrated suite of application-ready geospatial data products, incorporating many of the best features of the National Hydrography Dataset (NHD), the 3D Elevation Program (3DEP) data, and the National Watershed Boundary Dataset (WBD).



INGREDIENTS:

- ✓ National Hydrography Dataset (NHD)
- ✓ Watershed Boundary Dataset (WBD)
- ✓ 3DEP Elevation Data

Burn Components

NHDPlusBurnLineEvent (Simple feature class; Geometry Polyline; Contains M values No; Contains Z values No)
Events describing the parts of NHDFlowline features used for hydro-enforcement

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
SHAPE	Geometry	Yes						
NHDPlusID	Double	Yes			0	0		Unique identifier of a NHDFlowline feature
GridCode	Long integer	Yes			0			Unique, compact identifier for a NHDFlowline feature
ReachCode	String	Yes					14	Unique identifier within a Cataloging Unit; first 8 digits=subbasin code, next 6 digits randomly assigned
FromMeas	Double	Yes	FromMeasure		0	0		Downstream BurnLineEvent Measure (m-value)
ToMeas	Double	Yes	ToMeasure		0	0		Upstream BurnLineEvent Measure (m-value)
BurnLenKm	Double	Yes	BurnLengthKm		0	0		Length of BurnLineEvent feature
RPUID	String	Yes					8	RPU Identifier for the Catchment
StatusFlag	String	Yes		StatusFlag Domain			1	Reserved for use during Build/Refresh Tools Processing
Catchment	Short integer	Yes		NoYes Domain	0			Identifies if line will receive a catchment: 0=No, 1=Yes
Burn	Short integer	Yes		NoYes Domain	0			Identifies if line will be used for hydro-enforcement: 0=No, 1=Yes
VPUID	String	Yes					8	Vector Processing Unit Identifier
SHAPE_Length	Double	Yes			0	0		

NHDPlusBurnWaterbody (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)
NHDWaterbody and NHDArea features used for hydro-enforcement

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
SHAPE	Geometry	Yes						
NHDPlusID	Double	Yes			0	0		Unique identifier of NHDWaterbody or NHDArea feature
SourceFC	String	Yes	SourceFeatureClass				20	NHD Feature Class – "NHDWaterbody", "NHDArea"
OnOffNet	Short integer	Yes	OnNetwork	NoYes Domain	0			On/Off network flag (1 = On network, 0 = Off network)
PurpCode	String	Yes	PurposeCode	PurposeCodeDomain			2	Code describing purpose of feature
Burn	Short integer	Yes		NoYes Domain	0			Identifies if line to be used for hydro-enforcement: 0=No, 1=Yes
VPUID	String	Yes					8	Vector Processing Unit Identifier
SHAPE_Length	Double	Yes			0	0		
SHAPE_Area	Double	Yes			0	0		

NHDPlusLandSea (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)
Polygons used for hydro-enforcement along the NHD coastline

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
SHAPE	Geometry	Yes						
NHDPlusID	Double	Yes			0	0		Unique identifier of Land/Sea polygon
Land	Short integer	Yes		LandSea Domain	0			A numeric code to identify land/sea/estuary area
VPUID	String	Yes					8	Vector Processing Unit Identifier
SHAPE_Length	Double	Yes			0	0		
SHAPE_Area	Double	Yes			0	0		

NHDPlusSink (Simple feature class; Geometry Point; Contains M values No; Contains Z values No)
Point locations of sinks used for hydro-enforcement

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
SHAPE	Geometry	Yes						
NHDPlusID	Double	Yes			0	0		Unique identifier of Sink point
GridCode	Long integer	Yes			0			Unique, compact identification number assigned to a Sink point
PurpCode	String	Yes	PurposeCode	PurposeCodeDomain			2	Code describing purpose of Sink
FeatureID	Double	Yes			0	0		ID of feature in another feature class (ComID, Gaz_ID, PolyID)
SourceFC	String	Yes	SourceFeatureClass				20	Feature class of the feature referenced in FeatureID
RPUID	String	Yes					8	RPUID that holds the Sink
StatusFlag	String	Yes		StatusFlag Domain			1	Flag reserved for use during NHDPlus Build/Refresh Process
Catchment	Short integer	Yes		NoYes Domain	0			0 (no) or 1 (yes) if line will receive catchment
Burn	Short integer	Yes		NoYes Domain	0			0 (no) or 1 (yes) if line will be used for hydro-enforcement
VPUID	String	Yes					8	Vector Processing Unit Identifier

NHDPlusWall (Simple feature class; Geometry Polyline; Contains M values No; Contains Z values No)
Lines used as walls in hydro-enforcement

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
SHAPE	Geometry	Yes						
NHDPlusID	Double	Yes			0	0		Unique identifier of Wall line
WallSource	String	Yes					30	
VPUID	String	Yes					8	Vector Processing Unit Identifier
Burn	Short integer	Yes		NoYes Domain	0			0 (no) or 1 (yes) if line will be used for hydro-enforcement
SHAPE_Length	Double	Yes			0	0		

NHDPlusCatchment (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)
Contains a catchment polygon for a NHDFlowline feature or a Sink feature

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
SHAPE	Geometry	Yes						
NHDPlusID	Double	Yes			0	0		Unique identifier of catchment
SourceFC	String	Yes	SourceFeatureClass				20	Source Feature Class ("NHDFlowline" or "NHDPlusSink")
GridCode	Long integer	Yes			0			Unique, compact identification number for a Catchment
AreaSqKm	Double	Yes			0	0		Catchment area in square kilometers
VPUID	String	Yes					8	Vector Processing Unit Identifier
SHAPE_Length	Double	Yes			0	0		
SHAPE_Area	Double	Yes			0	0		

NHDPlusNHDPlusIDGridCode (Table)
A table that crosswalks the Catchment feature IDs and Grid Codes

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		NHDPlus identifier of a catchment (NHDFlowline or Sink)
SourceFC	String	Yes	SourceFeatureClass				20	Source feature class: NHDFlowline or NHDPlusSink
GridCode	Long integer	Yes			0			Unique, compact identifier for a catchment
VPUID	String	Yes					8	Vector Processing Unit Identifier

NHDPlusEROMMA (Table)
Extended Unit Runoff Method (EROM) Mean Annual (MA) Flow estimates for NHDFlowline features in the NHDPlus network

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		NHDPlus identifier of a NHDFlowline feature
QAMA	Double	Yes	FlowEstARunoffMA		0	0		Flow from runoff (cfs)
VAMA	Double	Yes	VelocityARunoffMA		0	0		Velocity for QAMA (fps)
QIncrAMA	Double	Yes	IncrFlowEstARunoffMA		0	0		Incremental flow from runoff (cfs)
QBMA	Double	Yes	FlowEstBExcessETMA		0	0		Flow with Excess ET (cfs)
VBMA	Double	Yes	VelocityBExcessETMA		0	0		Velocity for QBMA (fps)
QIncrBMA	Double	Yes	IncrFlowEstBExcessETMA		0	0		Incremental flow with Excess ET (cfs)
QCMA	Double	Yes	FlowEstCRefGageRegressMA		0	0		Flow with Reference Gage Regression applied to QBMA (cfs)
VCMA	Double	Yes	VelocityCRefGageRegressMA		0	0		Velocity for QCMA (fps)
QIncrCMA	Double	Yes	IncrFlowEstCRefGageRegressMA		0	0		Incremental Flow by subtracting the sum of upstream QCMA
QDMA	Double	Yes	FlowEstDAdditionRemovalMA		0	0		Flow with PlusFlowAR (cfs)
VDMA	Double	Yes	VelocityDAdditionRemovalMA		0	0		Velocity for QCMA (fps)
QIncrDMA	Double	Yes	IncrFlowEstDAdditionRemovalMA		0	0		Incremental flow with PlusFlowAR (cfs)
QEMA	Double	Yes	FlowEstEGageAdjustedMA		0	0		Flow from gage adjustment (cfs)
VEMA	Double	Yes	VelocityEGageAdjustedMA		0	0		Velocity from gage adjustment (cfs)
QIncrEMA	Double	Yes	IncrFlowEstEGageAdjustedMA		0	0		Incremental flow from gage adjustment (cfs)
QFMA	Double	Yes	FlowEstFGageSequesterMA		0	0		Flow from gage sequestration step (cfs)
QIncrFMA	Double	Yes	IncrFlowEstFGageSequesterMA		0	0		Incremental flow from gage sequestration step (cfs)
ArQNavMA	Double	Yes	AddRemoveFlowNotAvailableMA		0	0		PlusFlowAR flow not available on flowline (cfs)
PETMA	Double	Yes	CatchmentPotentialETMA		0	0		Catchment potential ETMA
QLossMA	Double	Yes	FlowLossFromPotentialETMA		0	0		Catchment flow loss from Excess ET (cfs)
QGAdjMA	Double	Yes	GageFlowAdjustmentMA		0	0		Gage adjustment flow (cfs)
QGNavMA	Double	Yes	GageAdjustmentNotAvailableMA		0	0		Gage adjustment flow not available
GageAdjMA	Short integer	Yes	IsGageAdjustedMA	NoYes Domain	0			Flag indicating if QEMA and QIncrEMA were adj by gage flow
AvgQAdjMA	Double	Yes	GageFlowFlowlineBottomMA		0	0		Gage Q adjusted for bottom of a NHDFlowline feature (cfs)
GageIDMA	String	Yes	NWISGageIDMA				16	Identifier of the gage located on the NHDFlowline feature
GageQMA	Double	Yes	GageFlowMA		0	0		Gaged flow measured by gage on NHDFlowline feature (cfs)
VPUID	String	Yes					8	Vector Processing Unit Identifier

NHDPlusEROMQAMA (Table)
A table that holds QA statistics for the EROM mean annual flow estimates

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		NHDPlus identifier of a NHDFlowline feature
GageID	String	Yes	NWISGageID				16	NWIS GageID value
GageRef	Short integer	Yes	IsReferenceGage	NoYes Domain	0			Identifies if gage is Falcone Reference: 0=No, 1=Yes
QE	Double	Yes	FlowEstEGageAdjusted		0	0		Gage flow (cfs)
QA	Double	Yes	FlowEstARunoff		0	0		Cumulative runoff (cfs)
QB	Double	Yes	FlowEstBExcessET		0	0		QA – Excess ET (EET) (cfs)
QC	Double	Yes	FlowEstCRefGageRegression		0	0		QA - EET +/- Refgage Regression Adjustment (cfs)
QD	Double	Yes	FlowEstDAdditionRemoval		0	0		QA – EET +/ Refgage Regression Adjustment +/- PlusFlowAR (cfs)
QEUnitRo	Double	Yes	UnitFlowEPerSqKm		0	0		QE / DivDASqKm (cfs/sqkm)
QAUnitRo	Double	Yes	UnitFlowAPerSqKm		0	0		QA / DivDASqKm (cfs/sqkm)
QBUnitRo	Double	Yes	UnitFlowBPerSqKm		0	0		QB / DivDASqKm (cfs/sqkm)
QCUnitRo	Double	Yes	UnitFlowCPerSqKm		0	0		QC / DivDASqKm (cfs/sqkm)
QDUnitRo	Double	Yes	UnitFlowDPerSqKm		0	0		QD / DivDASqKm (cfs/sqkm)
QADelta	Double	Yes	FlowEstEMinusFlowEstA		0	0		QE – QA (cfs)
QBDelta	Double	Yes	FlowEstEMinusFlowEstB		0	0		QE – QB (cfs)
QCDelta	Double	Yes	FlowEstEMinusFlowEstC		0	0		QE – QC (cfs)
QDDelta	Double	Yes	FlowEstEMinusFlowEstD		0	0		QE – QD (cfs)
QAURoDelt	Double	Yes	UnitFlowEMinusUnitFlowA		0	0		Q_Eunitro – Q_Aunitro (cfs/sqkm)
QBURoDelt	Double	Yes	UnitFlowEMinusUnitFlowB		0	0		Q_Eunitro – Q_Bunitro (cfs/sqkm)
QCURoDelt	Double	Yes	UnitFlowEMinusUnitFlowC		0	0		Q_Eunitro – Q_Cunitro (cfs/sqkm)
QDURoDelt	Double	Yes	UnitFlowEMinusUnitFlowD		0	0		Q_Eunitro – Q_Dunitro (cfs/sqkm)
VPUID	String	Yes					8	Vector Processing Unit Identifier

NHDPlusEROMQARPT (Table)
QA Report for each Vector Processing Unit (VPU) in run

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length
OBJECTID	Object ID						
RptLine	String	Yes					120

NHDPlusIncrLat (Table)
Mean latitude of each NHDPlusV2 catchment

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		NHDPlus identifier of a catchment (NHDFlowline or Sink)
MissLat	Double	Yes	CatchmentAreaNoDataLatitude		0	0		Area of catchment with no data
MeanLat	Double	Yes	CatchmentMeanLatitude		0	0		Mean latitude in degrees
HydroSeq	Double	Yes	HydrologicSequence		0	0		Hydrologic sequence number
VPUID	String	Yes					8	Vector Processing Unit Identifier

NHDPlusDivFracMP (Table)
Contains specifications about the fraction of a cumulative attribute to be routed through each path in a divergence

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		NHDPlus identifier of a NHDFlowline feature
NodeNumber	Double	Yes			0	0		Unique identifier for the point at the top of the NHDFlowline feature
DivFrac	Double	Yes	DivergenceFraction		0	0		Fraction for routing cumulative attributes down flowlines paths in a divergence
StatusFlag	String	Yes		StatusFlag Domain			1	Used during NHDPlus Build/Refresh Tools Processing
VPUID	String	Yes					8	Vector Processing Unit Identifier

NHDPlusMegaDiv (Table)
A table that holds PlusFlow records for divergences that have two or more outflow paths

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
FromNHDPID	Double	Yes	FromNHDPlusID		0	0		Common identifier of the upstream NHDFlowline feature
ToNHDPID	Double	Yes	ToNHDPlusID		0	0		Common identifier of the downstream NHDFlowline feature
VPUID	String	Yes					8	Vector Processing Unit Identifier

NHDPlusFlow (Table)
A table that describes flowing and non-flowing connections between NHDFlowline features

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
FromNHDPID	Double	Yes	FromNHDPlusID		0	0		
ToNHDPID	Double	Yes	ToNHDPlusID		0	0		
NodeNumber	Double	Yes			0	0		
DeltaLevel	Short integer	Yes	FromStreamLevMinusToStreamLev		0			Common identifier for the upstream NHDFlowline feature
Direction	Short integer	Yes	FlowRelationshipType		0			Common identifier for the downstream NHDFlowline feature
GapDistKm	Double	Yes	GapDistanceKm		0	0		Node number at the bottom of FromComID and the top of ToComID
HasGeo	Short integer	Yes	IsGeometricConnection	NoYes Domain	0			Numerical diff between StreamLevels for FromNHDPID and for ToNHDPID
FromVPUID	String	Yes					8	Flow relationship type
ToVPUID	String	Yes					8	Distance between the downstream and upstream ends
FromPermID	String	Yes	FromPermanentIdentifier				40	Is geometric connection: 0=No (geometric gap); 1=Yes (connected)
ToPermID	String	Yes	ToPermanentIdentifier				40	

NHDPlusFlowlineVAA (Table)
A table that holds Value Added Attributes (VAAs) for each NHDFlowline feature in the NHDPlusFlow table and is updated by NHDPlus Build/Refresh process. Differs from the NHDFlowlineVAA table

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		NHDPlus identifier of a NHDFlowline feature
StreamLeve	Short integer	Yes	StreamLevel		0			Stream level
StreamOrde	Short integer	Yes	StreamOrder		0			Modified Strahler Stream Order
StreamCalc	Short integer	Yes	StreamCalculator		0			Stream Calculator
FromNode	Double	Yes			0	0		Unique identifier for the point at the top of the NHDFlowline feature
ToNode	Double	Yes			0	0		Unique identifier for the point at the end of the NHDFlowline feature
HydroSeq	Double	Yes	HydrologicSequence		0	0		Hydrologic sequence number; places flowlines in ascending hydrologic order.
LevelPathI	Double	Yes	LevelPathIdentifier		0	0		Level Path Identifier – Hydrologic sequence no. of most downstream feature
PathLength	Double	Yes	PathLength		0	0		Distance to terminal NHDFlowline feature downstream along main path
TerminalPa	Double	Yes	TerminalPathIdentifier		0	0		Terminal Path Identifier - Hydrologic sequence number of terminal
ArbolateSu	Double	Yes	UpstreamCumulativeStreamKm		0	0		Arbolate Sum - Kms of stream upstream of bottom of NHD Flowline feature
Divergence	Short integer	Yes	DivergenceCode	Divergence Domain	0			See Divergence Domain for coded values
StartFlag	Short integer	Yes	IsHeadwater	NoYes Domain	0			See StartFlag Domain for coded values
TerminalFl	Short integer	Yes	IsNetworkEnd	NoYes Domain	0			0=not a terminal NHDFlowline feature; 1=a terminal NHDFlowline feature
UpLevelPat	Double	Yes	UpstreamMainPathLevelPathID		0	0		Upstream mainstem level path identifier
UpHydroSeq	Double	Yes	UpstreamMainPathHydroSeq		0	0		Upstream mainstem hydrologic sequence number
DnLevel	Short integer	Yes	DownstreamMainPathStreamLevel		0			Streamlevel of main stem downstream NHDflowline feature
DnLevelPat	Double	Yes	DownstreamMainPathLevelPathID		0	0		Downstream mainstem level path identifier
DnHydroSeq	Double	Yes	DownstreamMainPathHydroSeq		0	0		Downstream mainstem hydrologic sequence number
DnMinorHyd	Double	Yes	DownstreamMinorHydroSequence		0	0		Downstream minor hydrologic sequence number
DnDrainCou	Short integer	Yes	DownstreamDrainageCount		0			Count of NHDFlowline features immediately downstream
FromMeas	Double	Yes	FromMeasure		0	0		ReachCode route measure (m-value) at bottom of NHDFlowline feature
ToMeas	Double	Yes	ToMeasure		0	0		ReachCode route measure (m-value) at top of NHDFlowline feature
ReachCode	String	Yes					14	Unique identifier within a Cataloging Unit; first 8 digits=subbasin code, next 6 digits randomly assigned
RtnDiv	Short integer	Yes	HasReturningDivergence	NoYes Domain	0			Returning Divergence Flag
Thinner	Short integer	Yes	ThinnerCode		0			Not valued; Reserved for future use
VPUIn	Short integer	Yes		NoYes Domain	0			Are there VPU inflows? 0(no) or 1(yes)
VPUOut	Short integer	Yes		NoYes Domain	0			Are there VPU outflows? 0(no) or 1(yes)
AreaSqKm	Double	Yes			0	0		Catchment area in square kilometers
TotDASqKm	Double	Yes	TotalDrainageAreaSqKm		0	0		Total upstream cumulative drainage area at downstream end of NHDFlowline feature
DivDASqKm	Double	Yes	DivergenceRoutedDrainAreaSqKm		0	0		Divergence-routed cumulative drainage area at downstream end of NHDFlowline feature
MaxElevRaw	Double	Yes	MaximumElevationRaw		0	0		Maximum elevation unsmoothed, in centimeters
MinElevRaw	Double	Yes	MinimumElevationRaw		0	0		Minimum elevation unsmoothed, in centimeters
MaxElevSmo	Double	Yes	MaximumElevationSmoothed		0	0		Maximum elevation smoothed, in centimeters
MinElevSmo	Double	Yes	MinimumElevationSmoothed		0	0		Minimum elevation smoothed, in centimeters
Slope	Double	Yes			0	0		Slope of flowline (meters/meters) based on smoothed elevations
SlopeLenKm	Double	Yes	SlopeLengthKm		0	0		Flag indicating that the downstream elevation is fixed, i.e.; not smoothed
ElevFixed	Short integer	Yes	IsElevationFixed	NoYes Domain	0			NHDFlowline feature length (kilometers) used to compute slope
HWType	Short integer	Yes	HeadwaterType	HeadwaterType Domain	0			Headwater Type; 0=Real headwater, 1=Artificial headwater
HWNodeSqKm	Double	Yes	HeadwaterNodeDrainageAreaSqKm		0	0		Catchment area that drains to headwater node of the NHDFlowline feature
StatusFlag	String	Yes		StatusFlag Domain			1	Flag reserved for use during NHDPlus Build/Refresh Process
VPUID	String	Yes					8	Vector Processing Unit Identifier

Annual and Monthly Precipitation

NHDPlusIncrPrecipMA (Table)
Mean annual precipitation averaged over the area of each catchment

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		NHDPlus identifier of a catchment (NHDFlowline or Sink)
MissPMA	Double	Yes	MissingDataAreaPrecipitationMA		0	0		Area of catchment with no data
PrecipMA	Double	Yes	CatchmentMeanPrecipitationMA		0	0		Mean annual precipitation in millimeters x 100
HydroSeq	Double	Yes	HydrologicSequence		0	0		Hydrologic sequence
VPUID	String	Yes					8	Vector Processing Unit Identifier

MM (Mean Monthly) is 01 through 12 for January through December.

NHDPlusIncrPrecipMM12 … **NHDPlusIncrPrecipMM01** (Table)
Mean monthly precipitation averaged over the area of each catchment

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		Unique identifier of a NHDPlus catchment
MissPMM01	Double	Yes	MissingDataAreaPrecipMM01		0	0		Area of catchment with no data
PrecipMM01	Double	Yes	CatchmentMeanPrecipitationMM01		0	0		Mean monthly precipitation in millimeters x 100
HydroSeq	Double	Yes	HydrologicSequence		0	0		Hydrologic sequence
VPUID	String	Yes					8	Vector Processing Unit Identifier

NHDPlusIncrROMA (Table)
Mean annual runoff values

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		Unique identifier of a NHDPlus catchment
MissRMA	Double	Yes	MissingDataAreaRunoffMA		0	0		Area of catchment with no data
RunOffMA	Double	Yes	CatchmentMeanRunoffMA		0	0		Mean runoff (mm)
HydroSeq	Double	Yes	HydrologicSequence		0	0		Hydrologic sequence
VPUID	String	Yes					8	Vector Processing Unit Identifier

Annual and Monthly Temperature

NHDPlusIncrTempMA (Table)
Mean annual precipitation averaged over the area of each catchment

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		Unique identifier of a NHDPlus catchment
MissTMA	Double	Yes	MissingDataAreaTemperatureMA		0	0		Area of catchment with no data
TempMA	Double	Yes	CatchmentMeanTemperatureMA		0	0		Mean annual temperature in degrees centigrade x 100
HydroSeq	Double	Yes	HydrologicSequence		0	0		Hydrologic sequence
VPUID	String	Yes					8	Vector Processing Unit Identifier

MM (Mean Monthly) is 01 through 12 for January through December.

NHDPlusIncrTempMM12 … **NHDPlusIncrTempMM01** (Table)
Mean monthly temperature averaged over the area of each catchment

Field name	Data type	Allow nulls	Alias name	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
NHDPlusID	Double	Yes			0	0		Unique identifier of a NHDPlus catchment
MissTMM01	Double	Yes	MissingDataAreaTemperatureMM01		0	0		Area of catchment with no data
TempMM01	Double	Yes	CatchmentMeanTemperatureMM01		0	0		Mean monthly temperature in degrees centigrade x 100
HydroSeq	Double	Yes	HydrologicSequence		0	0		Hydrologic sequence
VPUID	String	Yes					8	Vector Processing Unit Identifier

Coded-value Domains

HeadwaterType Domain (Coded value domain; Description HeadwaterType Domain; Field type Short integer; Split policy Duplicate; Merge policy Default value)

Code	Description
1	Artificial Heawater
0	Real Headwater

LandSea Domain (Coded value domain; Description LandSea Domain; Field type Short integer; Split policy Duplicate; Merge policy Default value)

Code	Description
0	Estuary
1	Land
2	Sea

Divergence Domain (Coded value domain; Description Main Path Domain; Field type Long integer; Split policy Duplicate; Merge policy Default value)

Code	Description
0	Feature is not part of a divergence
1	Feature is the main path of a divergence
2	Feature is a minor path of a divergence

NoYes Domain (Coded value domain; Description NoYes Domain; Field type Short integer; Split policy Duplicate; Merge policy Default value)

Code	Description
0	No
1	Yes

StartFlag Domain (Coded value domain; Description Start Flag Domain; Field type String; Split policy Duplicate; Merge policy Default value)

Code	Description
A	Automatically generated sink
M	Manual SInk

PurposeCodeDomain (Coded value domain; Description Purpose Code Domain; Field type String; Split policy Duplicate; Merge policy Default value)

Code	Description
SE	Network End
SN	BurnLineEvent non-spatial connection
SP	NHDWaterbody playa
SC	NHDWaterbody closed lake
SH	HUC12 polygon min point or centroid
SK	Karst sinkhole
SD	Togographic depression
SO	Other sink
AC	Coastline from adj VPU
AF	Added feature from adj VPU (non-upstream)
AU	Added feature from adj VPU (upstream)
AI	Inflow connecting feature from upstream VPU
AO	Outflow flowlines to elevation clip boundary
UF	Unused feature (FCode or by feature)
DO	Digitized outlow path
DC	Digitized connector flowline
OC	NHDWaterbody sea, bay, estuary
WB	NHDWaterbody (other)

Flattened Data Model

ArcGIS REST Services Directory

Layers:

- NHDPoint (0)
- NetworkNHDFlowline (1)
- NonNetworkNHDFlowline (2)
- FlowDirection (3)
- NHDLine (4)
- NHDPlusBurnWaterbody (5)
- NHDArea (6)
- NHDWaterbody (7)
- NHDPLUS.NHDPlusCatchment (8)
- NHDPLUS.WBDHU12 (9)

The Catalog View

- FlowDirection
- NetworkNHDFlowline
- NHDArea
- NHDLine
- NHDPlusCatchment
- NHDPoint
- NHDWaterbody
- NonNetworkNHDFlowline
- WBDHU12

FlowDirection and NetworkNHDFlowline feature classes have identical schemas, but are visualized differently.

FlowDirection / NetworkNHDFlowline (Simple feature classes; Geometry Polyline; Contains M values Yes; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No	2	Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					120
LengthKm	Double	Yes			0	0	
ReachCode	String	Yes					14
FlowDir	Long integer	No	0	HydroFlowDirections	0		
WBArea_Permanent_Identifier	String	Yes					40
FType	Long integer	No	460		0		
FCode	Long integer	Yes	46003		0		
InNetwork	Short integer	Yes		NoYes Domain	0		
MainPath	Long integer	Yes		MainPath Domain	0		
VisibilityFilter	Long integer	Yes	0	VisibilityFilter Domain	0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
StreamLeve	Short integer	Yes			0		
StreamOrde	Short integer	Yes			0		
StreamCalc	Short integer	Yes			0		
FromNode	Double	Yes			0	0	
ToNode	Double	Yes			0	0	
HydroSeq	Double	Yes			0	0	
LevelPathI	Double	Yes			0	0	
PathLength	Double	Yes			0	0	
TerminalPa	Double	Yes			0	0	
ArbolateSu	Double	Yes			0	0	
Divergence	Short integer	Yes		DivergenceDomain	0		
StartFlag	Short integer	Yes		NoYes Domain	0		
TerminalFl	Short integer	Yes		NoYes Domain	0		
UpLevelPat	Double	Yes			0	0	
UpHydroSeq	Double	Yes			0	0	
DnLevel	Short integer	Yes			0		
DnLevelPat	Double	Yes			0	0	
DnHydroSeq	Double	Yes			0	0	
DnMinorHyd	Double	Yes			0	0	
DnDrainCou	Short integer	Yes			0		
FromMeas	Double	Yes			0	0	
ToMeas	Double	Yes			0	0	
RtnDiv	Short integer	Yes		NoYes Domain	0		
Thinner	Short integer	Yes			0		
VPUIn	Short integer	Yes		NoYes Domain	0		
VPUOut	Short integer	Yes		NoYes Domain	0		
AreaSqKm	Double	Yes			0	0	
TotDASqKm	Double	Yes			0	0	
DivDASqKm	Double	Yes			0	0	
MaxElevRaw	Double	Yes			0	0	
MinElevRaw	Double	Yes			0	0	
MaxElevSmo	Double	Yes			0	0	
MinElevSmo	Double	Yes			0	0	
Slope	Double	Yes			0	0	
SlopeLenKm	Double	Yes			0	0	
ElevFixed	Short integer	Yes		NoYes Domain	0		
HWType	Short integer	Yes		HeadwaterTypeDomain	0		
HWNodeSqKm	Double	Yes			0	0	
StatusFlag	String	Yes		StatusFlag Domain			1
QAMA	Double	Yes			0	0	
VAMA	Double	Yes			0	0	
QIncrAMA	Double	Yes			0	0	
QBMA	Double	Yes			0	0	
VBMA	Double	Yes			0	0	
QIncrBMA	Double	Yes			0	0	
QCMA	Double	Yes			0	0	
VCMA	Double	Yes			0	0	
QIncrCMA	Double	Yes			0	0	
QDMA	Double	Yes			0	0	
VDMA	Double	Yes			0	0	
QIncrDMA	Double	Yes			0	0	
QEMA	Double	Yes			0	0	
VEMA	Double	Yes			0	0	
QIncrEMA	Double	Yes			0	0	
QFMA	Double	Yes			0	0	
QIncrFMA	Double	Yes			0	0	
ArQNavMA	Double	Yes			0	0	
PETMA	Double	Yes			0	0	
QLossMA	Double	Yes			0	0	
QGAdjMA	Double	Yes			0	0	
QGNavMA	Double	Yes			0	0	
GageAdjMA	Short integer	Yes		NoYes Domain	0		
AvgQAdjMA	Double	Yes			0	0	
GageIDMA	String	Yes					16
GageQMA	Double	Yes			0	0	
Shape_Length	Double	Yes			0	0	

Source: NHDPlusFlowlineVAA table (StreamLeve through StatusFlag)
Source: NHDPlusEROMMA table (QAMA through GageQMA)

NHDArea (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	No					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	Yes	2	Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					120
AreaSqKm	Double	Yes			0	0	
Elevation	Double	Yes		ElevationRange	0	0	
FCode	Long integer	Yes	46006		0		
FType	Long integer	No	460		0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
OnOffNet	Short integer	Yes		NoYes Domain	0		
PurpCode	String	Yes		PurposeCodeDomain			50
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

Source: NHDPlusBurnWaterbody table (OnOffNet, PurpCode)

NHDLine (Simple feature class; Geometry Polyline; Contains M values No; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No	2	Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					120
LengthKm	Double	Yes			0	0	
FType	Long integer	No	411		0		
FCode	Long integer	Yes	41100		0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
Shape_Length	Double	Yes			0	0	

NHDPlusCatchment (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
SHAPE	Geometry	Yes					
NHDPlusID	Double	Yes			0	0	
SourceFC	String	Yes					20
GridCode	Long integer	Yes			0		
AreaSqKm	Double	Yes			0	0	
VPUID	String	Yes					8
SHAPE_Length	Double	Yes			0	0	
SHAPE_Area	Double	Yes			0	0	

NHDPoint (Simple feature class; Geometry Point; Contains M values No; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No	2	Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					120
ReachCode	String	Yes					14
FCode	Long integer	Yes	45800		0		
FType	Long integer	No	458		0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8

NHDWaterbody (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No	2	Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					120
AreaSqKm	Double	Yes			0	0	
Elevation	Double	Yes		ElevationRange	0	0	
ReachCode	String	Yes					14
FType	Long integer	No	390		0		
FCode	Long integer	Yes	39004		0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
OnOffNet	Short integer	Yes		NoYes Domain	0		
PurpCode	String	Yes		PurposeCodeDomain			2
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

Source: NHDPlusBurnWaterbody table (OnOffNet, PurpCode)

NonNetworkNHDFlowline (Simple feature class; Geometry Polyline; Contains M values Yes; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No	2	Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					120
LengthKm	Double	Yes	0		0	0	
ReachCode	String	Yes					14
FlowDir	Long integer	No	0	HydroFlowDirections	0		
WBArea_Permanent_Identifier	String	Yes					40
FType	Long integer	No	460		0		
FCode	Long integer	Yes	46003		0		
InNetwork	Short integer	Yes	1	NoYes Domain	0		
MainPath	Long integer	Yes	0	MainPath Domain	0		
VisibilityFilter	Long integer	Yes	0	VisibilityFilter Domain	0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
Shape_Length	Double	Yes			0	0	

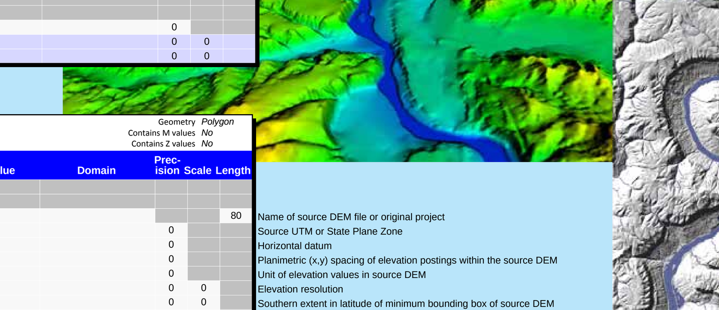
WBDHU12 (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
AreaAcres	Double	Yes			0	0	
GNIS_ID	Long integer	Yes			0		
Name	String	Yes					120
States	String	Yes					50
NonContributingAreaAcres	Double	Yes			0	0	
NonContributingAreaSqKm	Double	Yes			0	0	
TNMID	String	Yes					40
MetaSourceID	String	Yes					40
SourceDataDesc	String	Yes					100
SourceOriginator	String	Yes					130
SourceFeatureID	String	Yes					40
LoadDate	Date	Yes			0	0	8
HUC12	String	Yes					12
HUType	String	Yes		HUType Domain			255
HUMod	String	Yes					30
ToHUC	String	Yes					16
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

3DEP Elevation Data

Raster file definitions

- **cat.tif** An integer raster dataset that associates each cell with a catchment. NHDPlus catchments are created for NHDFlowline features and for Sink features.
- **catseed.tif** An integer raster dataset that contains the codes showing the locations of the seed cells used to produce the NHDPlus catchments.
- **elev_cm.tif** **3DEP DEM** data that was extracted, merged, and projected to the Albers Equal-Area Conic projection and converted to integer centimeters.
- **fac.tif** An integer **f**low **ac**cumulation raster that contains the number of cells within the RPU draining to each cell within the RPU based on the HydroDEM
- **fdr.tif** An ESRI integer **f**low **dir**ection raster that contains the codes that show the direction water would flow from each grid cell within the RPU based on the HydroDEM.
- **fdroverland.tif** An integer raster depicting the Overland Flow Length operation, which is the calculated overland distance for each pixel toward the 'nearest' drainage as per **fdr** flow paths**.**
- **filldepth.tif** An integer raster that contains filled sink depths (pre-fill hydroDEM).
- **hydrodem.tif** An integer raster of the hydro-conditioned digital elevation model with all aspects of the NHDPlus burn components integrated and filled. Elevations in centimeters.
- **shdrelief.jp2** An integer raster that contains the shaded relief generated from elev_cm.
- **swnet.tif** A raster depiction of the surface water network.



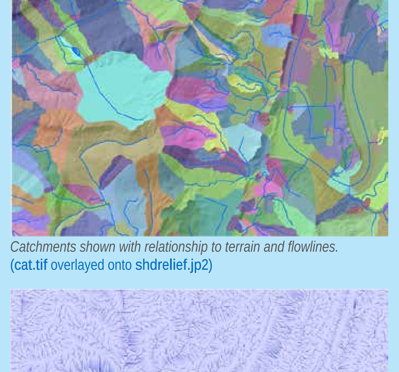
elev_clip (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Id	Long integer	Yes			0		
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

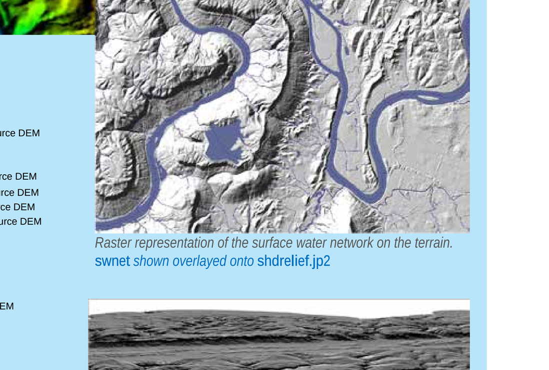
elev_meta (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length	
OBJECTID	Object ID							
Shape	Geometry	Yes						
DEMNAME	String	Yes					80	Name of source DEM file or original project
UTMZONE	Long integer	Yes			0			Source UTM or State Plane Zone
HDATUM	Long integer	Yes			0			Horizontal datum
RESOLUTION	Long integer	Yes			0			Planimetric (x,y) spacing of elevation postings within the source DEM
ZUNIT	Long integer	Yes			0			Unit of elevation values in source DEM
ZSTEP	Float	Yes			0	0		Elevation resolution
LRLAT	Float	Yes			0	0		Southern extent in latitude of minimum bounding box of source DEM
LRLON	Float	Yes			0	0		Eastern extent in longitude of minimum bounding box of source DEM
ULLAT	Float	Yes			0	0		Northern extent in latitude of minimum bounding box of source DEM
ULLON	Float	Yes			0	0		Western extent in longitude of minimum bounding box of source DEM
ZMIN	Float	Yes			0	0		Minimum elvation of source DEM
ZMAX	Float	Yes			0	0		Maximum elevation of source DEM
MEAN	Float	Yes			0	0		Mean elevation of elevations in source DEM
SIGMA	Float	Yes			0	0		Standard deviation of elevations in source DEM
PDEVICE	String	Yes					40	Production device used to compile the source DEM
PMETHOD	Long integer	Yes			0			Production method used to compile or capture the source DEM
PSITE	String	Yes					8	Production site or party who created the source DEM
S_DATE	String	Yes					4	Data source date
I_DATE	String	Yes					4	Data inspection date
ABSX	Long integer	Yes			0			Absolute accuracy in X
ABSY	Long integer	Yes			0			Absolute accuracy in Y
ABSZ	Long integer	Yes			0			Absolute accuracy in Z
ABSPTS	Long integer	Yes			0			Sample size
RMSE	Long integer	Yes			0			Availability of relative accuracy statistics (0=Not Avail; 1=Available)
RMSEX	Long integer	Yes			0			Relative accuracy in X
RMSEY	Long integer	Yes			0			Relative accuracy in Y
RMSEZ	Long integer	Yes			0			Relative accuracy in Z
RMSEPTS	Long integer	Yes			0			Sample size
FREETEXT	String	Yes					140	Free text description
XSHIFT	Float	Yes			0	0		Positional shift in longitude to convert from NAD27 to NAD83
YSHIFT	Float	Yes			0	0		Positional shift in latitude to convert from NAD27 to NAD83
VDATUM	Long integer	Yes			0			Vertical datum of source DEM
ZSHIFT	Float	Yes			0	0		Elevation shift, in meters to convert to NAVD88 values
QUADDATE	Long integer	Yes			0			Date the data were used to produce the 3DEP
QUADNAME	String	Yes					80	Quadrangle name
horizres_m	Float	Yes			0	0		Horizontal resolution of source DEM (floating point)
zmean	Float	Yes			0	0		Mean elevation of elevations before any filtering or reprojection
zsigma	Float	Yes			0	0		Standard deviation of elevations before any filtering or reprojection
meta_p_are	Double	Yes			0	0		
meta_p_per	Double	Yes			0	0		
va_unit	Short integer	Yes			0			The units in which the vertical accuracy is reported
Shape_Length	Double	Yes			0	0		
Shape_Area	Double	Yes			0	0		

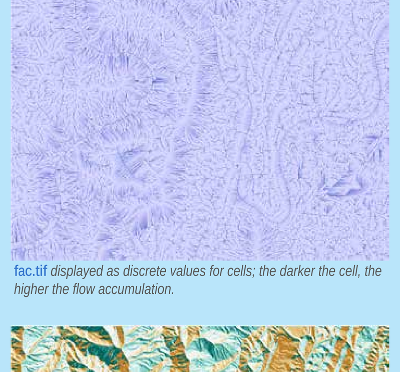
Field definitions taken from the USGS National Map 3DEP Data Dictionary (http://nationalmap.gov/3DEP)



Catchments shown with relationship to terrain and flowlines. (cat.tif overlayed onto shdrelief.jp2)

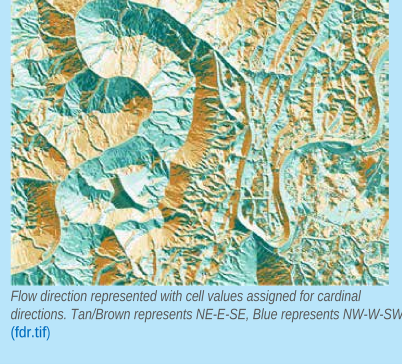


Raster representation of the surface water network on the terrain. swnet *shown overlayed onto* shdrelief.jp2

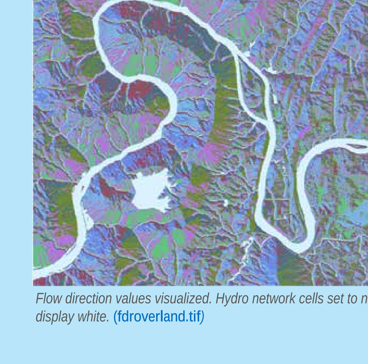


fac.tif displayed as discrete values for cells; the darker the cell, the higher the flow accumulation.

shdrelief.jp2 *visualized in 3D*



Flow direction represented with cell values assigned for cardinal directions. Tan/Brown represents NE-E-SE, Blue represents NW-W-SW (fdr.tif)



Flow direction values visualized. Hydro network cells set to null to display white. (fdroverland.tif)

filldepth.tif *with stretch applied to display fill areas in blue overlayed onto* shdrelief.jp2

shdrelief.jp2 *with stretch applied to highlight terrain.*

National Hydrography Dataset (NHD)

The National Hydrography Dataset is the surface-water component of *The National Map*. The NHD is a comprehensive set of digital spatial data that represents the surface water of the United States using common features such as lakes, ponds, streams, rivers, stream gages, and dams.

For more information on the NHD, including the complete depiction of the NHDv2.2.1 geodata model, please visit **nhd.usgs.gov**.

Feature Classes

NOTE:
The highlighted fields - NHDPlusID and VPUID are a component of NHDPlus and do not exist in the NHD Data Model outside of NHDPlus.

NHDArea (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No		Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					65
AreaSqKm	Double	Yes			0	0	
Elevation	Double	Yes		ElevationRange	0	0	
FType	Long integer	No	460		0		
FCode	Long integer	Yes	46006		0		
VisibilityFilter	Long integer	No	0	VisibilityFilter Domain	0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

NHDFlowline (Simple feature class; Geometry Polyline; Contains M values Yes; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No		Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					65
LengthKM	Double	Yes			0	0	
ReachCode	String	Yes					14
FlowDir	Long integer	No	0	HydroFlowDirections	0		
WBArea_Permanent_Identi	String	Yes					40
FType	Long integer	No	460		0		
FCode	Long integer	Yes	46003		0		
MainPath	Long integer	No	0	MainPath Domain	0		
InNetwork	Short integer	Yes	1	NoYes Domain	0		
VisibilityFilter	Long integer	No	0	VisibilityFilter Domain	0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
Shape_Length	Double	Yes			0	0	

NHDLine (Simple feature class; Geometry Polyline; Contains M values No; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No		Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					65
LengthKM	Double	Yes			0	0	
FType	Long integer	No	411		0		
FCode	Long integer	Yes	41100		0		
VisibilityFilter	Long integer	No	0	VisibilityFilter Domain	0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
Shape_Length	Double	Yes			0	0	

NHDPoint (Simple feature class; Geometry Point; Contains M values No; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No		Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					65
ReachCode	String	Yes					14
FType	Long integer	No	458		0		
FCode	Long integer	Yes	45800		0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8

NHDWaterbody (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values Yes)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
Permanent_Identifier	String	No					40
FDate	Date	No			0	0	8
Resolution	Long integer	No		Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					65
AreaSqKm	Double	Yes			0	0	
Elevation	Double	Yes		ElevationRange	0	0	
ReachCode	String	Yes					14
FType	Long integer	No	390		0		
FCode	Long integer	Yes	39004		0		
VisibilityFilter	Long integer	No	0	VisibilityFilter Domain	0		
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

NHD FCode Descriptions

FType	FCode	Description	NHDArea	NHDFlowline	NHDLine	NHDPoint	NHDWaterbody
537	53700	Area of Complex Channels	X				
307	30700	Area to be Submerged	X				
558	55800	Artificial Path		X			
312	31200	BayInlet	X				
318	31800	Bridge	X		X		
336	33600	Canal/Ditch	X	X			
336	33601	Canal/Ditch: CanalDitch Type = Aqueduct	X	X			
336	33603	Canal/Ditch: CanalDitch Type = Stormwater	X	X			
566	56600	Coastline		X			
334	33400	Connector		X			
343	34300	Dam/Weir	X	X	X	X	
343	34305	Dam/Weir: Construction Material = Earthen	X		X	X	
343	34306	Dam/Weir: Construction Material = Nonearthen	X		X	X	
493	49300	Estuary					X
362	36200	Flume	X		X		
364	36400	Foreshore	X				
367	36700	Gaging Station				X	
367	36701	Gaging Station: Gaging Station Status=Active; Record=Continuous				X	
369	36900	Gate			X	X	
378	37800	Ice Mass					X
403	40300	Inundation Area	X				
403	40308	Inundation Area: Innundation Control Status = Controlled	X				
403	40309	Inundation Area: Innundation Control Status = Controlled, Stage = Flood Elevation	X				
403	40307	Inundation Area: Innundation Control Status = Not Controlled	X				
390	39000	Lake/Pond					X
390	39001	Lake/Pond: Hydrographic Category = Intermittent					X
390	39006	Lake/Pond: Hydrographic Category = Intermittent, Stage = Date of Photography					X
390	39005	Lake/Pond: Hydrographic Category = Intermittent, Stage = High Water Elevation					X
390	39004	Lake/Pond: Hydrographic Category = Perennial					X
390	39009	Lake/Pond: Hydrographic Category = Perennial, Stage = Average Water Elevation					X
390	39011	Lake/Pond: Hydrographic Category = Perennial, Stage = Date of Photography					X
390	39010	Lake/Pond: Hydrographic Category = Perennial, Stage = Normal Pool					X
390	39012	Lake/Pond: Hydrographic Category = Perennial, Stage = Spillway Elevation					X
568	56800	Levee	X		X	X	
398	39800	Lock Chamber	X		X		
411	41100	Nonearthen Shore			X		
428	42800	Pipeline		X			
428	42816	Pipeline: Pipeline Type = Aqueduct		X			
428	42801	Pipeline: Pipeline Type = Aqueduct, Relationship to Surface = At or near		X			
428	42802	Pipeline: Pipeline Type = Aqueduct, Relationship to Surface = Elevated		X			
428	42816	Pipeline: Pipeline Type = Aqueduct		X			
428	42803	Pipeline: Pipeline Type = Aqueduct, Relationship to Surface = Underground		X			
428	42804	Pipeline: Pipeline Type = Aqueduct, Relationship to Surface = Underwater		X			
428	42814	Pipeline: Pipeline Type = General Case		X			
428	42805	Pipeline: Pipeline Type = General Case, Relationship to Surface = At or near		X			
428	42806	Pipeline: Pipeline Type = General Case, Relationship to Surface = Elevated		X			
428	42807	Pipeline: Pipeline Type = General Case, Relationship to Surface = Underground		X			
428	42808	Pipeline: Pipeline Type = General Case, Relationship to Surface = Underwater		X			
428	42815	Pipeline: Pipeline Type = Penstock		X			
428	42809	Pipeline: Pipeline Type = Penstock, Relationship to Surface = At or near		X			
428	42810	Pipeline: Pipeline Type = Penstock, Relationship to Surface = Elevated		X			
428	42811	Pipeline: Pipeline Type = Penstock, Relationship to Surface = Underground		X			
428	42812	Pipeline: Pipeline Type = Penstock, Relationship to Surface = Underwater		X			
428	42813	Pipeline: Pipeline Type = Siphon		X			
428	42820	Pipeline: Pipeline Type = Stormwater		X			
428	42821	Pipeline: Pipeline Type = Stormwater, Relationship to Surface = At or near		X			
428	42822	Pipeline: Pipeline Type = Stormwater, Relationship to Surface = Elevated		X			
428	42823	Pipeline: Pipeline Type = Stormwater, Relationship to Surface = Underground		X			
428	42824	Pipeline: Pipeline Type = Stormwater, Relationship to Surface = Underwater		X			
361	36100	Playa					X
431	43100	Rapids	X		X	X	
434	43400	Reef			X		
436	43600	Reservoir				X	X
436	43618	Reservoir: Construction Material = Earthen				X	X
436	43619	Reservoir: Construction Material = Nonearthen				X	X
436	43601	Reservoir: Reservoir Type = Aquaculture				X	X
436	43609	Reservoir: Reservoir Type = Treatment - Cooling Pond				X	X
436	43603	Reservoir: Reservoir Type = Decorative Pool				X	X
436	43606	Reservoir: Reservoir Type = Disposal - unspecified				X	X
436	43625	Reservoir: Reservoir Type = Disposal, Construction Material = earthen				X	X
436	43626	Reservoir: Reservoir Type = Disposal, Construction Material = nonearthen				X	X
436	43607	Reservoir: Reservoir Type = Evaporator				X	X
436	43623	Reservoir: Reservoir Type = Evaporator, Construction Material = Earthen				X	X
436	43610	Reservoir: Reservoir Type = Treatment - Filtration Pond				X	X
436	43611	Reservoir: Reservoir Type = Treatment - Settling Pond				X	X
436	43612	Reservoir: Reservoir Type = Treatment - Sewage Treatment Pond				X	X
436	43608	Reservoir: Reservoir Type = Swimming Pool				X	X
436	43605	Reservoir: Reservoir Type = Disposal - Tailings Pond				X	X
436	43604	Reservoir: Reservoir Type = Disposal - Tailing Pond				X	X
436	43617	Reservoir: Reservoir Type = Water Storage				X	X
436	43614	Reservoir: Reservoir Type = Water Storage, Construction Material = Earthen, Hydrographic Category = Intermittent				X	X
436	43615	Reservoir: Reservoir Type = Water Storage, Construction Material = Earthen, Hydrographic Category = Perennial				X	X
436	43613	Reservoir: Reservoir Type = Water Storage, Construction Material = Nonearthen				X	X
436	43621	Reservoir: Reservoir Type = Water Storage, Hydrographic Category = Perennial				X	X
436	43624	Reservoir: Reservoir Type = Treatment,				X	X
441	44100	Rock				X	
441	44101	Rock: Relationship to Surface = Abovewater				X	
441	44102	Rock: Relationship to Surface = Underwater				X	
445	44500	SeaOcean	X				
450	45000	SinkRise			X	X	
503	50300	Sounding Datum Line			X		
503	50301	Sounding Datum Line: Positional Accuracy = Approximate			X		
503	50302	Sounding Datum Line: Positional Accuracy = Definite			X		
455	45500	Spillway	X				
458	45800	Spring/Seep				X	
460	46000	Stream/River	X	X			
460	46007	Stream/River: Hydrographic Category = Ephemeral	X	X			
460	46003	Stream/River: Hydrographic Category = Intermittent	X	X			
460	46006	Stream/River: Hydrographic Category = Perennial	X	X			
461	46100	Submerged Stream	X				
466	46600	Swamp/Marsh					X
466	46601	Swamp/Marsh: Hydrographic Category = Intermittent					X
466	46602	Swamp/Marsh: Hydrographic Category = Perennial					X
478	47800	Tunnel			X		
420	42000	Underground Conduit		X			
420	42003	Underground Conduit: Positional Accuracy = Approximate		X			
420	42001	Underground Conduit: Positional Accuracy = Definite		X			
420	42002	Underground Conduit: Positional Accuracy = Indefinite		X			
483	48300	Wall			X		
484	48400	Wash	X				
485	48500	Water Intake/Outflow	X				
487	48700	Waterfall			X	X	
488	48800	Well				X	

Object Tables

NHDReachCodeMaintenance (Table)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Permanent_Identifier	String	No					40
ReachCode	String	No					14
ReachSMDate	Date	Yes			0	0	8
Resolution	Long integer	No		Resolution	0		
GNIS_ID	String	Yes					10
GNIS_Name	String	Yes					100

NHDReachCrossReference (Table)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
OldReachCode	String	Yes					17
OldReachDate	Date	Yes			0	0	8
NewReachCode	String	Yes					17
NewReachDate	Date	Yes			0	0	8
OldUPMI	String	Yes					5
NewUPMI	String	Yes					5
ChangeCode	String	Yes		ChangeCode Domain			4
Process	String	Yes		Process Domain			6
ReachFileVersion	String	Yes		ReachFileVersion Domain			10
OldHUCode	String	Yes					8
NewHUCode	String	Yes					8

NHDVerticalRelationship (Table)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Permanent_Identifier	String	No					40
Above_Permanent_Identifier	String	No					40
Below_Permanent_Identifier	String	No					40

NHD Feature-level Metadata Tables

NHDFeatureToMetadata (Table)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Permanent_Identifier	String	Yes					40
Meta_ProcessID	String	Yes					40
GLOBALID	Global ID						

NHDMetadata (Table)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Meta_ProcessID	String	Yes					40
ProcessDescription	String	No					4000
ProcessDate	Date	No			0	0	8
AttributeAccuracyreport	String	Yes					1800
LogicalConsistencyReport	String	Yes					1000
CompletenessReport	String	Yes					2400
HorizPositionalAccuracyReport	String	Yes					3100
VertPositionalAccuracyReport	String	Yes					3100
MetadataStandardName	String	Yes					100
MetadataStandardVersion	String	Yes					40
MetadataDate	Date	Yes			0	0	8
DataSetCredit	String	Yes					4000
ContactOrganization	String	Yes					100
AddressType	String	Yes					40
Address	String	Yes					100
City	String	Yes					40
StateOrProvince	String	Yes					30
PostalCode	String	Yes					20
ContactVoiceTelephone	String	Yes					40
ContactInstructions	String	Yes					120
ContactEmailAddress	String	Yes					40
GLOBALID	Global ID						

NHDSourceCitation (Table)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Source_DatasetID	String	Yes					40
Title	String	Yes					255
SourceCitationAbbreviation	String	Yes					255
Originator	String	Yes					400
PublicationDate	Date	Yes			0	0	8
BeginningDate	Date	Yes			0	0	8
EndingDate	Date	Yes			0	0	8
SourceContribution	String	Yes					255
SourceScaleDenominator	Long integer	Yes			0		
TypeOfSourceMedia	String	Yes					255
CalendarDate	Date	Yes			0	0	8
SourceCurrentnessReference	String	Yes					255
Meta_ProcessID	String	Yes					40
GLOBALID	Global ID						

Watershed Boundary Dataset (WBD)

The Watershed Boundary Dataset (WBD) defines the areal extent of surface water drainage to a point, accounting for all land and surface areas. A Hydrologic Unit (HU) is a drainage area delineated to nest in a multi-level, hierarchical drainage system. It's boundaries are defined by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream or similar surface water. Hydrologic units are only synonymous with classic watersheds when their boundaries include all the source area contributing surface water to a single defined outlet point.

Hydrologic Units (HU) Feature Classes

Note:
The highlighted fields - NHDPlusID and VPUID are a component of NHDPlus and do not exist in the WBD Data Model outside of NHDPlus HR.

WBDHU2, **WBDHU4**, **WBDHU6**, **WBDHU8** (Simple feature classes; Geometry Polygon; Contains M values No; Contains Z values No)

WBDHU10 (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
TNMID	String	Yes					40
MetaSourceID	String	Yes					40
SourceDataDesc	String	Yes					100
SourceOriginator	String	Yes					130
SourceFeatureID	String	Yes					40
LoadDate	Date	Yes			0	0	8
GNIS_ID	Long integer	Yes			0		
Name	String	Yes					120
AreaAcres	Double	Yes			0	0	
AreaSqKm	Double	Yes			0	0	
States	String	Yes					50
HUC10	String	Yes					10
HUType	String	Yes		HUType Domain			255
HUMod	String	Yes					30
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

WBDHU14 (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)

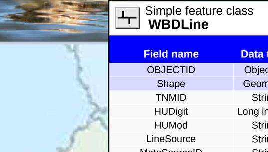
Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
TNMID	String	Yes					40
MetaSourceID	String	Yes					40
SourceDataDesc	String	Yes					100
SourceOriginator	String	Yes					130
SourceFeatureID	String	Yes					40
LoadDate	Date	Yes			0	0	8
GNIS_ID	Long integer	Yes			0		
Name	String	Yes					120
AreaAcres	Double	Yes			0	0	
AreaSqKm	Double	Yes			0	0	
States	String	Yes					50
HUC14	String	Yes					16
HUType	String	Yes		HUType Domain			255
HUMod	String	Yes					30
NonContributingAreaAcres	Double	Yes			0	0	
NonContributingAreaSqKm	Double	Yes			0	0	
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

WBDHU16 (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
TNMID	String	Yes					40
MetaSourceID	String	Yes					40
SourceDataDesc	String	Yes					100
SourceOriginator	String	Yes					130
SourceFeatureID	String	Yes					40
LoadDate	Date	Yes			0	0	8
GNIS_ID	Long integer	Yes			0		
Name	String	Yes					120
AreaAcres	Double	Yes			0	0	
AreaSqKm	Double	Yes			0	0	
States	String	Yes					50
HUC16	String	Yes					16
HUType	String	Yes		HUType Domain			255
HUMod	String	Yes					30
NonContributingAreaAcres	Double	Yes			0	0	
NonContributingAreaSqKm	Double	Yes			0	0	
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	

WBDHU12 (Simple feature class; Geometry Polygon; Contains M values No; Contains Z values No)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
TNMID	String	Yes					40
MetaSourceID	String	Yes					40
SourceDataDesc	String	Yes					100
SourceOriginator	String	Yes					130
SourceFeatureID	String	Yes					40
LoadDate	Date	Yes			0	0	8
GNIS_ID	Long integer	Yes			0		
Name	String	Yes					120
AreaAcres	Double	Yes			0	0	
AreaSqKm	Double	Yes			0	0	
States	String	Yes					50
HUC12	String	Yes					12
HUType	String	Yes		HUType Domain			255
HUMod	String	Yes					30
ToHUC	String	Yes					16
NonContributingAreaAcres	Double	Yes			0	0	
NonContributingAreaSqKm	Double	Yes			0	0	
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
Shape_Length	Double	Yes			0	0	
Shape_Area	Double	Yes			0	0	



WBDLine (Simple feature class; Geometry Polyline; Contains M values No; Contains Z values No)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
TNMID	String	Yes					40
HUDigit	Long integer	Yes		HUDigit Domain	0		
HUMod	String	Yes					30
LineSource	String	Yes					30
MetaSourceID	String	Yes					40
LoadDate	Date	Yes			0	0	8
NHDPlusID	Double	Yes			0	0	
VPUID	String	Yes					8
Shape_Length	Double	Yes			0	0	

HUMod (Table)

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Abbreviation	String	Yes					2
Description	String	Yes					40
HUModFeatureType	Long integer	Yes	2	HUModFeatureType Domain	0		
LoadDate	Date	Yes			0	0	8

Coded-value Domains

HUDigit Domain (Coded value domain; Description HUClass Domain; Field type Long integer; Split policy Duplicate; Merge policy Default value)

Code	Description
0	No data
2	2-digit Hydrologic Unit
4	4-digit Hydrologic Unit
6	6-digit Hydrologic Unit
8	8-digit Hydrologic Unit
10	10-digit Hydrologic Unit
12	12-digit Hydrologic Unit
14	14-digit Hydrologic Unit
16	16-digit Hydrologic Unit

HUModFeatureType Domain (Coded value domain; Description HUModFeatureType Domain; Field type Long integer; Split policy Duplicate; Merge policy Default value)

Code	Description
0	Polygon
1	Line
2	Both

HUType Domain (Coded value domain; Description HUType Domain; Field type String; Split policy Duplicate; Merge policy Default value)

Code	Description
S	Standard
C	Closed Basin
F	Frontal
M	Multiple Outlet
W	Water
I	Island