

Drainage Area: MS, VPU: 07 - Release Notes

12/01/2018 – Updated and New Data

Time of Travel and Related Attributes: The new and updated data is included in new versions of the NHDPlusAttributes and EROMExtension components. Specifically,

EROM mean annual and mean monthly statistics have been re-computed with the following changes:

- Removal of upper and lower limits for reference gage regression adjustment,
- Correction of reference gage regression equation, and
- Reference gage regression included in all flow statistics.

PlusFlowlineLakeMorphology and PlusWaterbodyLakeMorphology tables have been updated based on the new EROM mean annual flows.

PlusFlowlineVAA mean annual time of travel (TOTMA) has been updated based on the new EROM mean annual flows. Path time (PathTime) attribute has been added and populated based on the updated TOTMA values.

12/19/2016 – Updated Components

The NHDSnapshot has been updated to correct a duplicate ComID problem in NHDFlowline.

09/20/2016 – Updated Component

Corrected a handful of incorrect FType/Fcode values and WBAreaCOMID values.

09/06/2016 – EROM Component Updated

The Mississippi River did not have the upstream boundary values from the Missouri River (VPU 10L) properly transferred, which resulted in significant under estimation of flows and drainage areas on the 133 flowlines on the Mississippi River below the confluence with the Missouri River.

05/10/2016 – Updated Components

The improved HUC12 downstream pointers from the February 2016 WBD Version were updated in the NHDPlus WBDSnapshot. When a correspondence between the two versions could be determined for both the HUC12 and the downstream HUC12, the downstream pointer was updated.

02/18/2016 – Updated Components

Several NHDFlowline features in the NHDSnapshot component were edited to eliminate errors when building a geometric network.

01/05/2016 – Updated Components

EROM Mean Annual and Mean Monthly flow estimates have been re-run to correct incremental flows to be the sum of the incremental flows upstream and on the flowline. EROM velocities were updated to

provide velocity estimate only for flowing waters. EROM velocities are now set to -9998 (missing value) in all water bodies except swamp/marsh.

07/08/2015 – Updated Components

The WBDSnapshot was revised to correct the values in the Acres field. The NHDSnapshot and NHDPlusAttributes were revised to correct values in FType/FCode in a handful of features.

1/30/2015 – Revised Component

The VPUAttributeExtension has been updated to include accumulated mean annual and mean monthly runoff files.

2/12/2014 – Replacement components

NHDPlusAttributes component was replaced to correct errors in PlusFlowlineVAA.StreamOrder.

1/21/2014 – New Data Release

The EROMExtension was enhanced to include mean monthly flow estimates. See NHDPlusV2 User Guide for additional information.

12/07/2012 – Replacement components

Three NHDPlusV2 components are replaced with new versions: NHDSnapshot, NHDPlusBurnComponents, and NHDPlusAttributes. These replacements represent some changes in NHDFlowline ReachCode values and the inclusion of an NHDReachCrossReference table that tracks ReachCode changes from NHDPlusV1 to NHDPlusV2.

9/4/2012 – Initial Release Notes

BurnAddLine

There are several lines in the BurnAddLine that represent NHDFlowline features from adjacent VPUs. These flowlines were added to BurnAddLine to constrain the catchment delineations at the inter VPU connection points with VPUs 10L, 05, and 08. These also serve the purpose to ensure proper drainage enforcement of the HydroDEM for the outlet of VPU 07. The GridCode, StreamLeve, and HydroSeq values are temporary values. Official values can be found in the data for the adjacent VPUs.

Catchment/Burn Settings

The following describes unique settings of Burn and Catchment attributes in BurnLineEvent.

- 1) Several flowlines along the VPU border within a grid cell width or outside of the VPU, had their Burn and Catchment properties set to “N” (no). This keeps VPU 07 catchment areas from extending into adjacent VPUs.
- 2) **Limiting effects of “With Digitized” isolated networks:** A number of isolated networks were found that should have connected, but did not connect with the primary drainage system. To reduce the effects of these isolated network errors the Catchment and Burn

- attributes were set to “N”. The areas surrounding these networks are then allocated to down-gradient NHDFlowline features that belong to the primary network. While the drainage area errors are avoided, the flowlines with no catchments do not receive drainage areas or stream flow estimates. The terminal feature of the isolated network errors are: 653844, 653842, 653846, 653824, 655480, 13463797, 5002653, and 5029567.
- 3) One isolated network that should be connected in the NHD was hydro-enforced in the HydroDEM (Burn = “Y” (yes)) but catchments for these flowlines were not generated (Catchment = “N”). This isolated network should be connected to the primary drainage system according to USGS topographic map information and the WBD. A proper connection of this isolated network was added in the NHDPlus BurnAddLine shapefile to complete the connection of the isolated network to the primary drainage network. These actions result in an accurate HydroDEM, flow direction (fdr) and flow accumulation (fac) grids for this area. The drainage areas for the features in the isolated network are assigned to the catchment for the NHDFlowline feature that the BurnAddLine feature connects to (ComID 13891180).
 - 4) An improper connection of the NHD with the Des Moines River was observed. Figure 2 shows the NHDFlowline features colored in black that drain to the Des Moines River in error. The connection does not agree with the WBD and aerial imagery. The flowlines shown in black in Figure 2 were set to “N” for both Catchment and Burn attributes to ensure that the associated drainage areas were allocated to the down gradient features. The drainage areas for these features are allocated to the catchments for the two flowlines highlighted in the figure (ComIDs 5800984, 5802774).
 - 5) A series of flowlines that divert water from a HUC 12 in error and transport flow through two other HUC12s were set to “N” for both Catchment and Burn attributes. Figure 3 shows the location of these NHDFlowline features shown in black. Within the HUC 12 in the center left of the figure, a headwater feature connects to a divergence in the NHD. The main path feature at this divergence is incorrect because it crosses the WBD divide, flowing into the adjacent HUC 12 and exiting incorrectly to another HUC 12 to the south. The correct connection (missing in the NHD data) of the lakes in the center HUC is shown with the yellow dashed line. By setting the features in black to “N” for Catchment and Burn, the drainage areas for these features is allocated to the downstream features within each respective HUC 12. No catchments are generated for the features in black, nor do the features receive cumulative areas or stream flow. The affected ComIDs are: 1100310, 1100818, 1100304, 1100306, 1100816, 2367158, 2367050, 2366786.
 - 6) Another set of NHDFlowline features were set to “N” in the Burn and Catchment attributes. These are shown in Figure 4 where several Stream/River features connect to pipeline features in error. These streams and pipelines connect water systems across WBD divides in error.
 - 7) A series of connected pipeline features in NHD were set to “N” for catchment delineation. These pipelines provide drainage of an urban area of St Paul, Minnesota. Some of these features that provide connectivity of streams to the Minnesota River via the pipeline features, were set to “Y” for Burn. The affected ComIDs are: 937010431, 937010430, 937010429, 937010440, 937010436, 937010432, 937010427, 937010433, 937010437, 937010435, 937010439, 937010434, 937010426, 937010438.

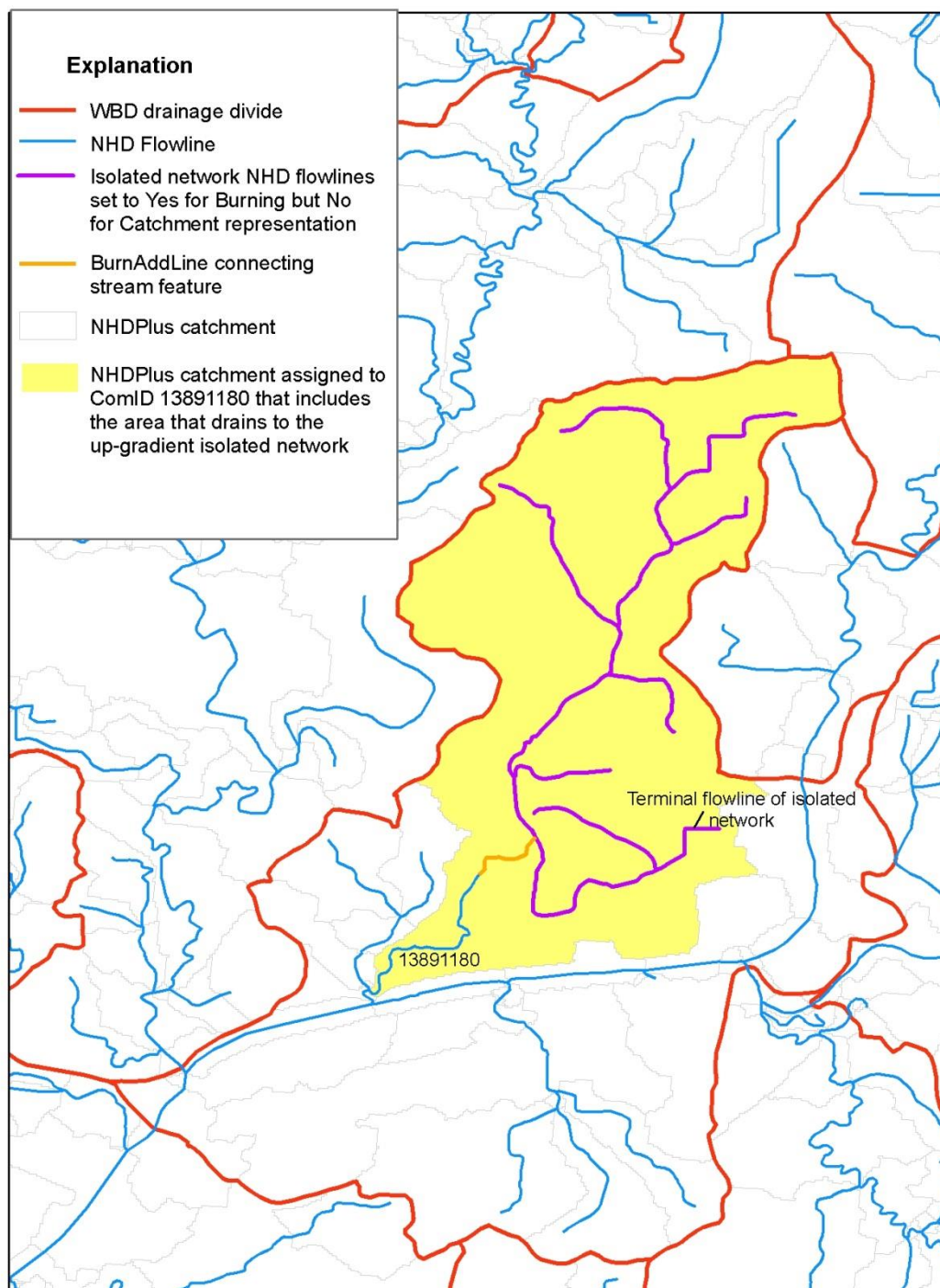


Figure 1.

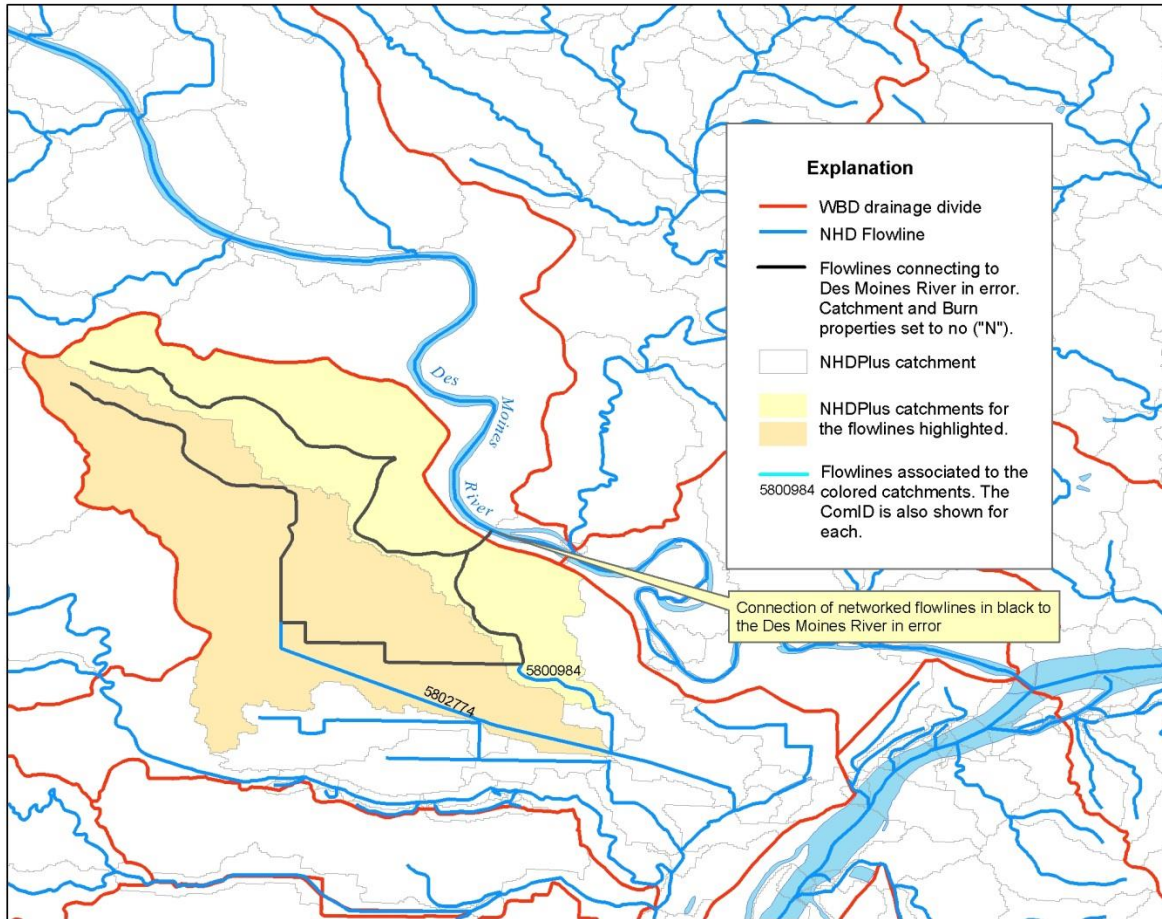


Figure 2

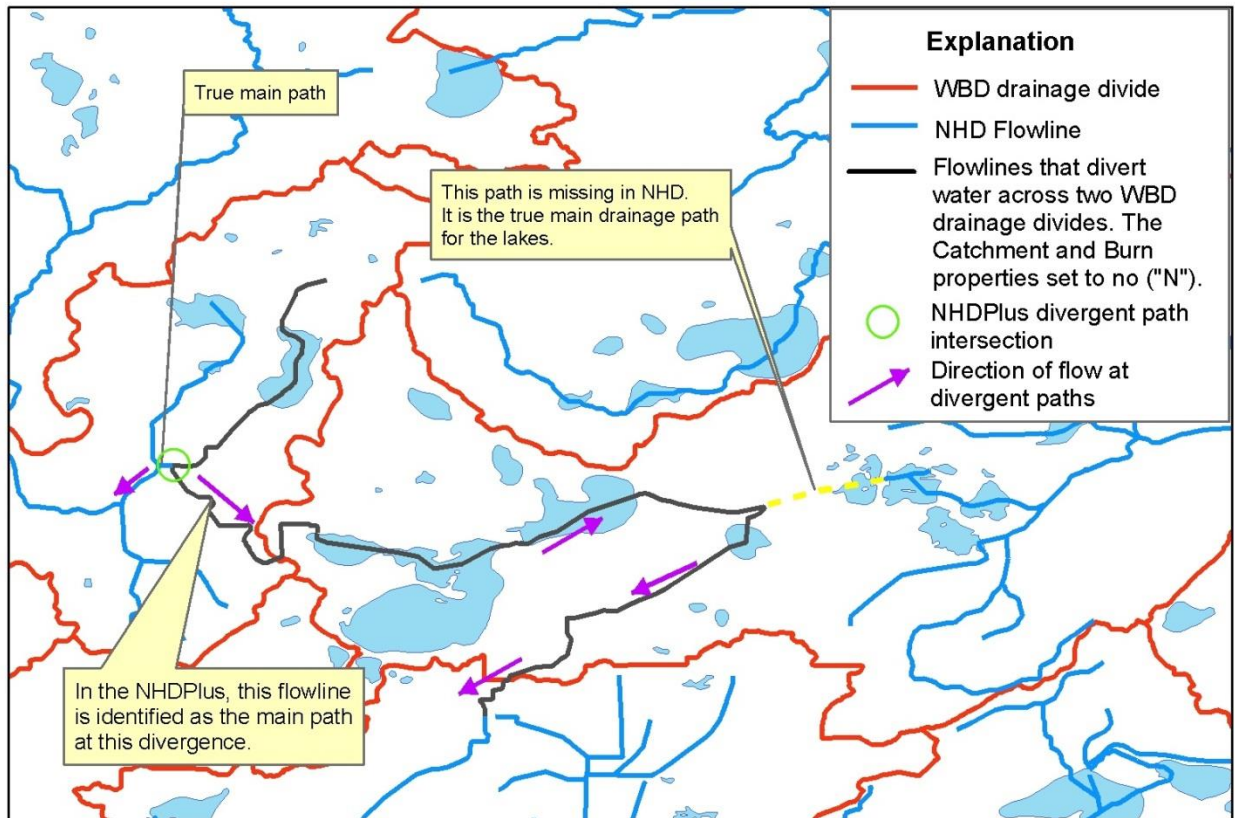


Figure 3.

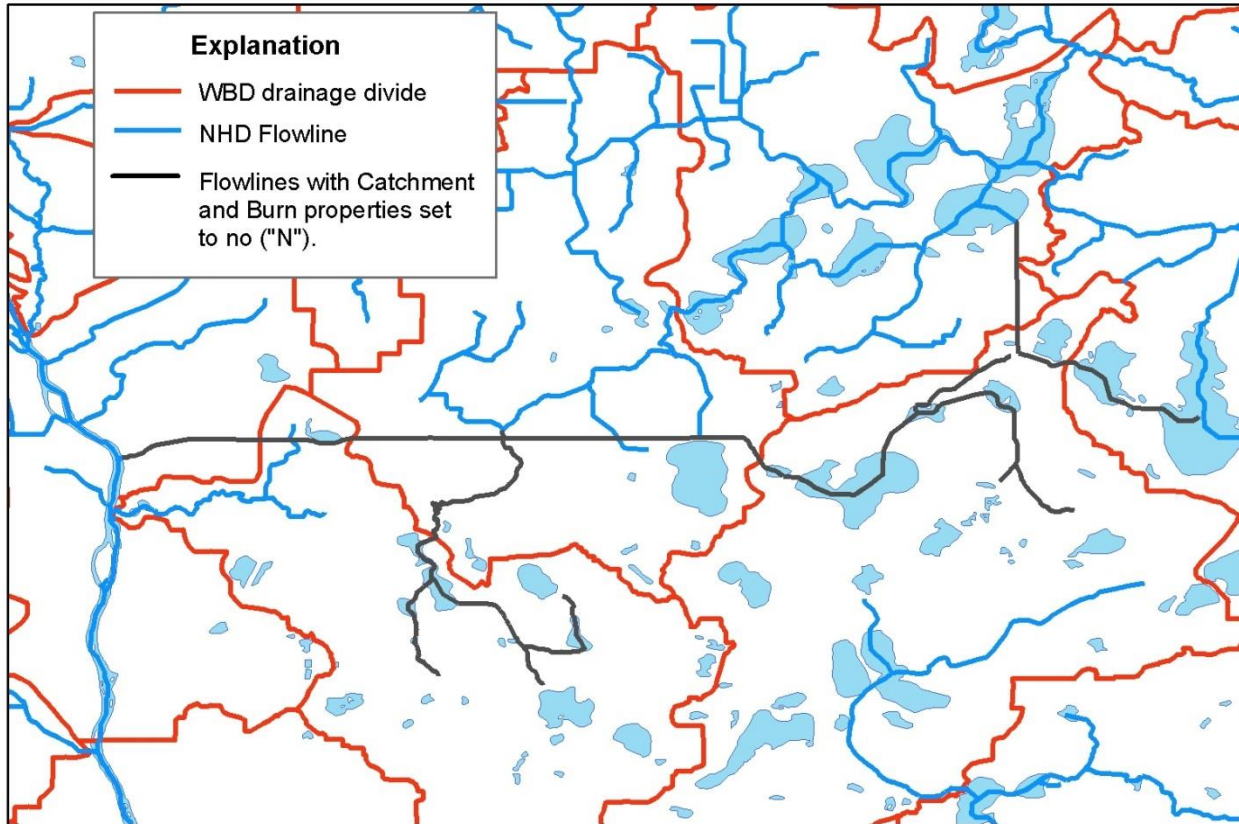


Figure 4

Enhanced Unit Runoff Method (EROM)

See Appendix A of the “NHDPlus V2 User Guide” for a detailed explanation of the EROM parameters.

EROM Flow and Velocity estimates are for Mean Annual values.

The time period for these estimates is 1971 to 2000; the runoff, temperature and precipitation grids are for this time period.

For gage adjustment and Reference Gage Regression, gages must meet the following criteria:

1. A minimum of 20 of the 30 years (1971 to 2000) of complete flow records.
2. NWIS reported drainage area versus NHDPlus drainage area, for the gage, must be within 0.2 (+/- 20%).

Upstream gage drainage area proportion is 0.5 (50%).

Excess Evapotranspiration default coefficients are 0.3 and 0.5.

Gage sequestration proportion is 0.2 (20%).

Reference gages (those gages determined to have minimal impact from human activities) are generally found on smaller streams with lower mean annual flow. Currently, the Reference Gage Regression step adjusts all flows in a VPU regardless of mean annual stream flow. In several VPUs, the Reference Gage Regression step (step 3) will “over-adjust” larger mean annual flows. In these cases, the resulting Reference

Gage Regression flow estimates will be worse than the Runoff/Excesses ET flow estimates (step 2). Note that this issue exists on the larger rivers, which are most likely to have flow gages on them. Consequently, Gage Adjustment step (step 5) will “re-adjust” the flow estimates to better match the expected mean annual flow conditions. Below is a list of the VPUs that appear to be affected by an over adjustment during the Reference Gage Regression and an approximate flow value above which this issue applies:

03N: > 2,000 cfs

03S: > 4,000 cfs

03W: > 15,000 cfs

07: > 3,000 cfs

10L: > 10,000 cfs

11: > 5,000 cfs

12: > 3,000 cfs

16: > 1,000 cfs

17: > 10,000 cfs