NHDPlusV1 Network to NHDPlusV21 Network Crosswalk

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Purpose of the Crosswalk

The purpose of the Crosswalk table is to assist NHDPlusV1 users with moving information that is tied to the NHDPlusV1 Flowline network to the NHDPlusV21 Flowline network. NHDPlusV1 Flowlines not in the network (i.e. NHDPlusV1.NHDFlowline.FlowDir = "Uninitialized") were not cross walked. NHDPlusV1 network Flowlines were cross walked only to NHDPlusV21 network Flowlines (i.e. NHDPlusV21. NHDFlowline.FlowDir = "With Digitized'). The Crosswalk links NHDPlusV1 Flowline ComIDs to NHDPlusV21 Flowline ComIDs.

Table 1 provides statistics related to the Crosswalk.

NHDPlusV1 Total Flowlines:	3,001,031
NHDPlusV1 Network Flowlines (FlowDir="With Digitized")	2,651,812
NHDPlusV1 Flowlines Not in Network (FlowDir="Uninitialized")	349,219
Number of Crosswalk Records	2,643,247
NHDPlusV1 Network Flowlines cross walked to NHDPlusV21 Network:	2,636,493
Number NHDPlusV1 Network Flowlines cross walked 1-to-1	2,630,264
Number NHDPlusV1 Network Flowlines cross walked Many-to-1, 1-to-Many or Many-to-Many	6,229

Table 1: Crosswalk Statistics

Process Description

A conflation technique was used. A full linear conflation was considered, but rejected for two reasons (1) the excessive level of effort involved and (2) the vast majority of Flowlines crosswalk 1-to1 and therefore did not require a linear conflation. Instead, a 3-point conflation technique was used, as described in steps 1 and 2 below.

A strict conflation rule that all three points needed to conflate within +/- 0.00001 decimal degrees was applied before a crosswalk was accepted. The reasoning for this restriction was that when a Flowline was edited, it generally meant that the network connectivity was altered and a crosswalk would provide misleading information.

Step 1: Three points were defined on each NHDPlusV1 Network Flowline: 2% from the top of the Flowline, 2% from the bottom of the Flowline and the middle of the Flowline.

Step 2: The three points were located on the NHDPlusV21 network Flowlines using the ArcGIS Linear Referencing Tool->Locate Features Along Routes with a snap threshold of 0.00001 decimal degrees (generally less than 2 feet) and a route identifier of ComID. The snap threshold was tested. Larger thresholds tended to create many incorrect crosswalk entries in areas where extensive NHDPlusV21 Flowline editing had occurred. These highly edited areas were also areas where no logical crosswalk could be made.

Step 3: After the point conflation, duplicate Crosswalk records (i.e. same NHDPlusV1 and V21 ComIDs) were removed.

Step 4: All NHDPlusV1 Network Flowlines which did not receive a Crosswalk entries were visually examined and one or more manual Crosswalk entries were created, as needed. Some these NHDPlusV1 Network Flowlines still did not receive any Crosswalk entries because (1) they were removed from the NHDPlusV21 Network (i.e. became Flowdir = "Uninitialized" in NHDPlusV21) or (2) NHDPlusV21 edits prevented a logical crosswalk.

Step5: The NHDPlusV21 Network Flowlines (see Table 1) which did not receive any Crosswalk entries were analyzed as a group. Some were not in the NHDPlusV1 network (i.e. Flowdir = "Uninitialized" in NHDPlusV1). Some were new and/or significantly reshaped Flowlines in NHDPlusV21. The group analysis was, by definition, a random check and no additional Crosswalk entries were identified.

Step 5: QAQC - Where the NHDPlusV1 ComID equaled the NHDPlusV21 ComID, the Crosswalk entries were accepted without further Visual QAQC. Visual QAQC was performed on a random set of NHDPlusV1 Flowlines that linked to multiple NHDPlusV21 Flowlines. While most Crosswalk entries were found to be correct, a small number (no more than 1500) were found to exhibit a singular characteristic. The NHDPlusV1 Flowline linked to the correct NHDPlusV21 Flowlines and incorrectly to the adjacent touching NHDPlusV21 Flowlines. Generally, this occurred in NHDPlusV21 Flowlines that were very short or ones that had very few coordinates. In these cases, the "Locate Features Along Routes" tool snapped the "2%" points to the endpoint of the NHDPlusV21 Flowline rather than to the "2%" points. Approximately 1500 Crosswalk entries have the potential of exhibiting this problem.

Crosswalk Table Format

Field Name	Description	Format
V1_ComID	NHDPlusV1 Flowline ComID	Long Integer
V1Rchcode	NHDPlusV1 Flowline Reachcode	Text
V1Ftype	NHDPlusV1 Flowline Feature Type	Text
V2_ComID	NHDPlusV21 Flowline ComID	Long Integer
V2Rchcode	NHDPlusV21 Flowline Reachcode	Text
V2FType	NHDPlusV21 Flowline Feature Type	Text
V1_Len	NHDPlusV1 Flowline LengthKM	Double
V2_Len	NHDPlusV2 Flowline LengthKM	Double
XwalkType	Type of Crosswalk: "1-1" or "Not 1-1"	Text

Using the Crosswalk

Users, who have information tied to NHDPlusV1 Network Flowline ComIDs, can join the Crosswalk table to their information using the Crosswalk V1_ComID field. The XwalkType field will indicate which user data cross walked cleanly and which user data needs examination. When XwalkType = "1-1", the Crosswalk to NHDPlusV21 is clean. When XWalkType = "Not 1-1", the user should examine the results and adjust as needed. When there is no Crosswalk entry joined to the user data, this data will need to be linked to NHDPlusV21 without use of the Crosswalk.

It should be noted that in HUC2 20 (Hawaii), the NHDPlusV1 was built from NHD Medium Resolution and the NHDPlusV21 was built from the NHD High Resolution. Users should carefully examine the results of using the Crosswalk in this HUC2.

With regard to coordinate ordering, flipping the direction of flow (i.e. changing coordinate ordering) was a common edit made during NHDPlusV21 production. Flipping the direction of flow also changes the measures (i.e. M values) along the Flowline. Depending on the type of user data, changes in flow direction may have significance when using the Crosswalk and should be examined carefully by the user. If user data is linked solely to the Flowline ComID and assumed to be at some predetermined point along the Flowline (such as at the top or at the bottom), then the Crosswalk will provide sufficient information. If user data is linked to a measure (i.e. M value) along the Flowline, then new NHDPlusV21 measures can be developed using the ArcGIS Linear Referencing Tools.