**NHDPlusHR VAA Navigator**

**User Documentation**

**Horizon Systems Corporation**

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# Description

The NHDPlusHR VAA Navigator performs navigation on the NHDPlus HR (High Resolution) surface water network using NHDPlusHR Value Added Attributes (NHDPlusFlowlineVAA). The Navigator may be used through ArcMap via a special ArcMap toolbar or it may be called from user-written program code. The Navigator will work on any NHDPlusHR GDB workspace.

The Navigator performs four types of navigation: upstream mainstem, upstream with tributaries, downstream mainstem, and downstream with divergences. Navigations can begin and end on full NHDFlowline features or may begin and end at points along features.

Any of the four types of navigation may be stopped based on a user-supplied distance from the starting point. Navigation results may also be filtered based on certain user specified criteria.

# NHDPlusHR Navigator Toolbar

From the ArcMap toolbar, the first time the VAA Navigator is executed for a given NHDPlusHR VPU, it builds a Microsoft SQL database for that VPU which speeds up future navigations. The database is called V03NavDB\_<vvvvvvvv>.mdf, where <vvvvvvvv> is the VPUid for the NHDFlowline feature class being navigated. The database is created in a local folder specified by the user. The second and subsequent times that the Navigator is executed, it looks for the database and, if found, uses it.

Recommendation: In the navigation options dialog displayed when the VAA Navigator Toolbar is used, specify that the Navigator databases are to be stored with the installed NHDPlusHR data in a sub-folder that is created for that purpose. The user must have read/write privileges to the folder.

Note: When called from a user-written program, the NHDPlusHR VAA Navigator is capable of navigating drainage areas that contain multiple VPUs. When used through the ArcMap toolbar, only a single VPU will be navigated during each use of the tool.

# Microsoft SQL Server 2012 LocalDB and the NHDPlusHR VAA Navigator

The Navigator uses Microsoft SQL Server 2012 Express LocalDB to build the navigation databases described above and to perform each navigation. SQL Server 2012 Express LocalDB must be installed on the computer that is going to run the Navigator. The SQL Server instance must be accessible to the login of the user who will be executing the Navigator. If SQL Server is installed with default parameters, then the default server instance name is *(localdb)\V11.0*.

Once a navigation database is created by the VAA Navigator, it MUST only be deleted or moved through the SQL Server functions found in SQL Server 2012 Management Studio. The databases should never be renamed.

# Installation

Install or upgrade Microsoft .NET (see NHDPlusV2 VAA Navigator Toolbar “System Requirements” on the NHDPlusV2 Tools webpage). Links to the Microsoft web page for .NET are also on the tools webpage.

Install SQL Server 2012 Management Studio. The Install package is available on the NHDPlusV2Tools webpage.

The NHDPlusHR VAA Navigator Toolbar is installed as part of the installation of the NHDPlusHR VAA Navigator. If you have a previous version of the NHDPlusHR VAA Navigator installed, remove the toolbar from the ArcMap toolbar ribbons and uninstall the NHDPlusHR VAA Navigator using Windows Control Panel.

Create a directory on your hard drive to use for the installation. Place a copy of NHDPlusHRVAANavigatorInstall\_<version number>.7z file into that directory. Use 7-Zip to unzip NHDPlusHRVAANavigatorInstall\_<version number>.7z using the “Extract Here” option. Once the installation is complete, this directory and its contents may be deleted.

Double-click on NHDPlusHRVAANavigatorSetup.exe to start the installation program. The installation program will place all the necessary files on your local hard drive and add the necessary entries to your computer’s registry. During the installation, you will need to select a location on your hard drive to be used for NHDPlusHR Tools. This will default to C:\NHDPlusHRTools in the install process. You may change the default to a <drive>:\<foldername> of your choice. The folder may already exist, but that is not required. It is recommended that all NHDPlusHR tools be installed in the same folder. The NHDPlusHR VAA Navigator (and the NHDPlusHR VAA Navigator Toolbar) will be placed in a sub-folder called NHDPlusHRVAANavigator under the folder specified during the install.

In the installation folder there is a file called NavigatorCaller.ini. It has two parameters that contain the paths to the folders the NHDPlusHRVAANavToolbar uses for processing. The two parameters are **TempWorkAreaPath** and **NavDBPath**. These default to:

TempWorkAreaPath=C:\Working

NavDBPath= C:\NHDPlusHR\NavigatorDBs

Anyone using the NHDPlusHRVAANavToolbar needs to have read/write permissions for the folders specified in these two parameters. These paths should exist and can be changed in the NavigatorCaller.ini to any folders where the user has read/write permissions.

The other two parameters: **DataSource** and **SessionID** in NavigatorCaller.ini should not be modified.

To register the NHDPlusHR VAA Navigator Toolbar with ArcMap:

1. Start ArcMap. If using Windows 7 or a later version of Windows, you may need to right click on ArcMap and choose “Run as Administrator”.
2. Right click on an empty area of the ArcMap toolbar ribbons. Select “Customize” (at the bottom of the list). Choose the “Commands” tab in the Customize dialog.
3. Click “Add from File”. Navigate to the folder where you installed the VAA Navigator. Select \NHDPlusHRVAANavToolbar\NHDPlusHRVAANavToolbar.tlb. Click OK. If you receive a “No Objects Added” message, then you must return to step 1 and use the “Run as Administrator” option.
4. Click “Close”
5. Right click on an empty area on the ArcMap toolbar ribbons. Select the NHDPlusHR VAA Nav Toolbar from the list.

# Known Problems & Issues

None.

Please contact nhdplus@hscnet.com if you experience problems with the VAA Navigator.