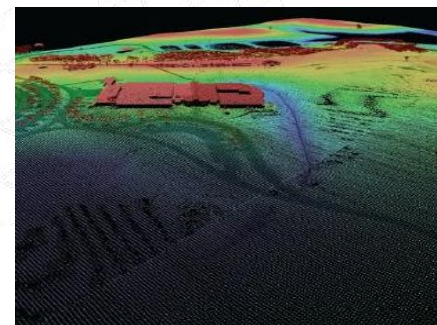
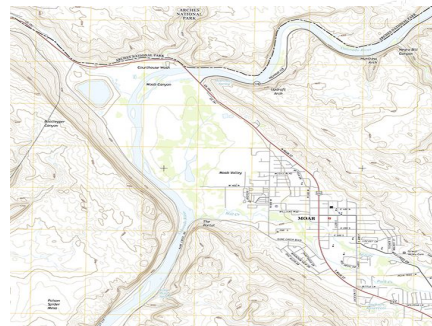




NHDPlus High Resolution VAA Navigator



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Agenda

- Overview of the NHDPlus HR VAA Navigator
- System Requirements
- NHDPlus HR VAA Navigator Toolbar
- Navigation Options
- Using the NHDPlus HR VAA Navigator from a User-written Program
- Demonstration

NHDPlus HR VAA Navigator

- Uses the NHDPlus HR Network Value-Added Attributes to perform network navigation
- Navigation of any NHDPlus HR .gdb
 - Single hydrologic unit (HU)
 - Appended HUs
- ArcMap toolbar
- Call from code
 - Navigate multi-HU drainage areas without appending

System Requirements

- Windows 7 Service Pack 1 64-bit
- ArcGIS 10.5.1
- Microsoft .NET Framework 4.0.3 or higher
- Microsoft SQL Server 2012 Express LocalDB 64-bit
- Microsoft SQL Server 2012 Management Studio

NHDPlus HR VAA Navigator Toolbar



Up Mainstem

Navigate upstream following the main path

Up with Tribs

Navigate upstream following all tributaries

Down Mainstem

Navigate downstream following the main path

Down with Tribs

Navigate downstream following all tributaries

Delete Working Database

Deletes the SQL Server working database

+ Navigation Options

Location where the navigator will place the MS SQL database

Select where to start the navigation

Stop navigation based on stop distance (option)

Filter navigation results based on a specified value of a selected NHDPlus attribute (option)

The screenshot shows the 'NHDPlusHR VAA Navigation Options' dialog box. It contains several sections, each highlighted with a red border and connected to an explanatory text box on the left by a purple arrow:

- Navigation Information:** Includes a text field for 'Navigator Database Path' set to 'E:\NHDPlusHR\Navigatordbms' and a 'Browse' button.
- Navigation Start Options:** Includes two radio buttons. The first is 'Start at top or bottom of "clicked" NHDFlowline'. The second is 'Start at Reachcode measure' with a text field containing '22.7252505437834'.
- Stop Navigation based on Distance Traveled:** Includes a text field for 'Navigation Stop Distance' with a small icon and the unit 'KM'. Below it is a note: 'If a non-zero value is provided, navigation will stop when it reaches that distance from the navigation starting point..'
- Filter Navigation Results:** Includes a paragraph: 'Navigation starts based on the mouse click and start options selected above. Only NHDFlowline features that satisfy the filter condition specified below will be included in the navigation results.' Below this are three fields: 'Attribute Name:' (a dropdown menu), 'Operator:' (a dropdown menu), and 'Attribute Comparison Value:' (a text field).

At the bottom of the dialog are two buttons: 'Navigate' and 'Cancel'.

Filter Navigation Results

Select an Attribute

<u>PathLength</u>	Distance to the terminal <u>NHDFlowline</u> feature downstream along the <u>mainpath</u>	Continuous Numeric(13,4)
<u>ArbolateSum</u>	Kilometers of stream upstream of the bottom of the <u>NHDFlowline</u> feature	Continuous Numeric(13,4)
<u>TotDASqKm</u>	Total Upstream Cumulative Drainage Area at the downstream end of the <u>NHDFlowline</u> feature	Continuous Numeric(14,6)
<u>DivDASqKm</u>	Divergence-routed Cumulative Drainage Area at the downstream end of the <u>NHDFlowline</u> feature	Continuous Numeric(14,6)

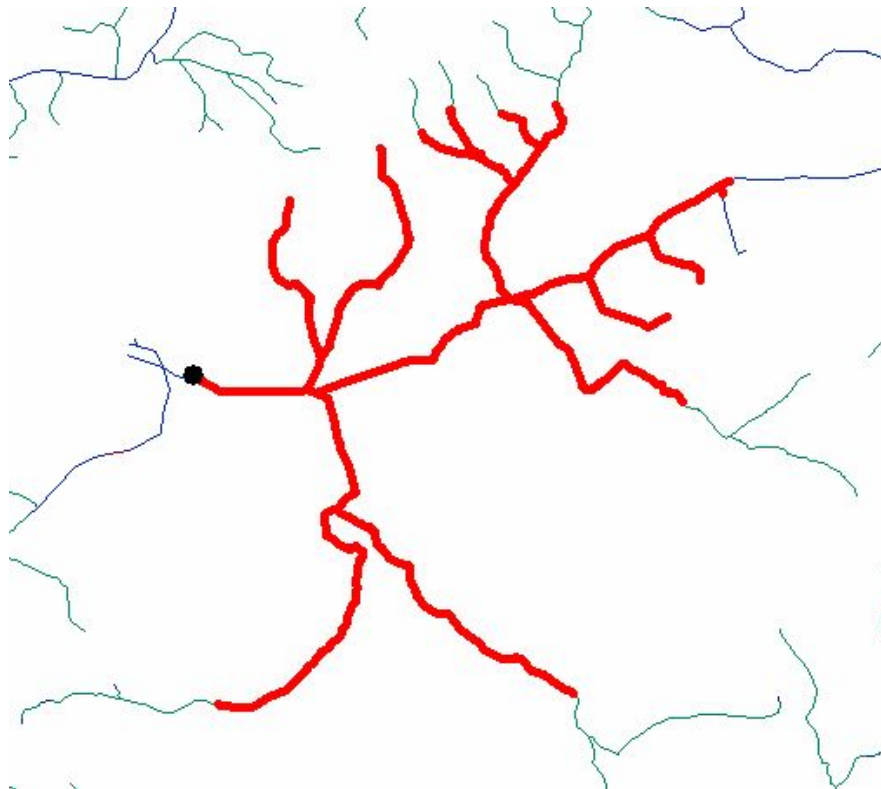
Select an Operator

- < Less than
- <= Less than or equal to
- > Greater than
- >= Greater than or equal to

+

Demonstration

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Using from User-Written Programs

Tool consists of three parts (classes or modules):

- **LoadSqlServerDB**

- Loads NHDPlusFlowlineVAA, NHDPlusFlow, and NHDPlusMegaDiv data for a single NHDPlus HR gdb into the working SQL Server database.

- **MakeWorkingTable**

- Creates a working table to be used for a single navigation from the data previously loaded into the database via LoadSqlServerDB.

- **Vo3Navigator**

- Performs a navigation and places the results in a SQL Server table named t<sessionid>_navresults.

Using from User-Written Programs

InputNHDPlusLocation – input property

Type: String

Applies to calls to: LoadSqlServerDB

Value: Folder location where the NHDPlusHR data is stored. Example:

InputNHDPlusLocation = "D:\NHDPlusHRData"

SessionID – input property

Type: String Applies to calls to: MakeWorkingTable, V03Navigator

Value: SessionID for the navigation, unique value based on the computer system date and time allowing multiple concurrent calls to the Navigator

WorkingTableName – input/output property

Type: String

Applies to calls to: MakeWorkingTable (output), V03Navigator (input)

Value: Table name (of the form t<sessionid>_VAA) for the working table that holds the VPU data. This table is overwritten each time MakeWorkingTable is called with the same <sessionid>.

```
# Initialize the NHDPlusHRVAANavigator objects
o1 = win32com.client.Dispatch("NHDPlusHRVAANavigator.clsLoadSQLServerDB")
o2 = win32com.client.Dispatch("NHDPlusHRVAANavigator.clsMakeWorkingTable")
o3 = win32com.client.Dispatch("NHDPlusHRVAANavigator.clsV2Navigator")

# Create a session_id for this run which is added to the working folder. Each execution
of the script has a unique session id.
now = datetime.datetime.now()
session_id = datetime.datetime.strftime(now, "%Y%m%d%H%M%S%f")[:16]

# Create the temporary working folder
TmpWorkAreaPath = WorkingFolder + "\\" + session_id
if not os.path.exists(TmpWorkAreaPath):
    os.makedirs(TmpWorkAreaPath)

# Load the SQL Server database (DBname) with the NHDPlusHR gdb needed for the
navigations in this run.
# Set the variable for the return value from LoadSQLServerDB
intReturn = 0
# Set common properties for LoadSQLServerDB
o1.DatabaseLocation = DBlocation
o1.DatabaseName = DBname
o1.TempWorkAreaPath = TmpWorkAreaPath
o1.SQLConnectionTimeout = 120
o1.SQLCommandTimeout = 120
o1.AddToExisting = False
```

*See the NHDPlus HR VAA Navigator User Guide at
https://github.com/ACWI-SSWD/nhdplushr_tools
 for complete properties list and Python example*



Questions?

Thank you!

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