

NHDPlus VAA COM Object Navigator Tool
User Documentation
Horizon Systems Corporation
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Description:

The VAA COM Object 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 NHDGEOinSHP dataset that contains a fully populated NHDFlowlineVAA.dbf table (generally this means an NHDPlus dataset). The navigator performs four types of navigations: upstream main stem, upstream with tributaries, downstream main stem, and downstream with divergences. Any of the four types of navigation may be stopped at a user-supplied distance from the starting point. When used via the ArcMap toolbar, results are returned to ArcMap as a new layer in the map called Navigation Results. When used outside of ArcMap, results are returned in a table called tblNavResults in the TNavWork.mdb database which resides in the highest level directory of the NHDPlus dataset.

Processing Information:

VAANavigatorCOM.dll relies on TNavWork.mdb. If TNavWork.mdb does not exist in the NHDPlus dataset, it is created. If TNavWork.mdb does exist in the NHDPlus dataset and is of an older schema version, it is recreated. Depending on the speed of your computer and the size of the NHDPlus dataset, this process can be lengthy. For optimum performance of the navigator, once this .mdb is created, it should be left in the NHDPlus dataset.

The navigation results are returned in TNavWork.mdb, Table tblNavResults.

Known Problems & Issues:

None.

Please contact nhdplus@hscnet.com if you have problems.

Installation:

Note: If you have a previous version of the NHDPlus Navigation Tools on your computer, it would be best to manually remove it. If you have previously run this

installation program, you will need to remove it through Control Panel \ Add or Remove Programs to make certain that all registry entries are cleared.

1. Create a directory on your hard drive to use for the installation. Place a copy of VAACOMObjectNavigator.zip into that directory. Then unzip VAACOMObjectNavigator.zip into that directory. Once the installation is complete, this directory and its contents can be removed, if desired.
2. Double-click on VAACOMObjectNavigator.exe to start the installation program. The installation program will place all the necessary files on your 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 NHDPlus Tools. This will default to C:\NHDPlusTools. You can change this to a <drive>:\<foldername> of your choice. The folder can exist previously, but that is not required. It is recommended that all NHDPlus tools be installed in the same directory. The VAA COM Object Navigator tool will be placed in a sub-directory called VAACOMObjectNavigator under the specified install directory.

Registering the NHDPlus VAA COM Object Navigator tool with ArcMap

- Start ArcMap.
- Right click on an empty area on the toolbar. Select "Customize" (at the bottom of the list), "Commands" tab.
- Click "Add from File". Navigate to your NHDPlus tools directory. Select \VAACOMObjectNavigator\VAANavToolbarCOM.dll. Click OK.
- Click "Close"
- Right click on an empty area on the ArcMap toolbar. Add the NHD VAA Nav (COM) toolbar.

An example of using the tool in Arcmap is given in NHDPlus Exercise # 4.

<ftp://ftp.horizon-systems.com/NHDPlus/Exercises/NHDPlus-Exercise4-NavigatingWithVAAsandFlowTable.pdf>

Using the NHDPlus VAA COM Object Navigator Tool from User-written program code.

Properties:

The properties in **RED** are required to navigate.

Navtype – Type of navigation. (STRING) Valid values are
UPMAIN – Upstream Mainstem
UPTRIB – Upstream with tributaries

DNMAIN – Downstream mainstem
DNDIV – Downstream with divergences

Startcomid – Starting NHDFlowline comid for the navigation. (NUMERIC) Must be greater than 0.

Startmeas – Starting measure for the navigation. (NUMERIC) Must be between 0 and 100, inclusive. Additionally, a startmeas of –1 is valid. It indicates that the navigator should perform “whole NHDFlowline” navigation and begin at the from measure of the NHDFlowline for upstream navigations and the to measure of the NHDFlowline for downstream navigations.

Maxdistance – Maximum travel distance in kilometers. (NUMERIC) A value of 0 indicates there is no maximum travel distance and to navigate each path until the path ends. 0 is the default value.

Datapath – Path to the NHDPlus workspace, openme.txt should be in this location (STRING)

Appath – Path to the directory containing VAANavigationCom.dll. (STRING)
There are several external files packaged along with the VAANavigation COM object that are needed to perform navigation. The com object must be able to find them. (TNavWorkskel.mdb, TFromToSkel.mdb, ComputeFromTo.dll)

Method:

VAANavigate – Performs a navigation. Returns an integer. 0 if there is a known problem, 1 otherwise. Results of the navigation are in tblNavResults in TNavWork.mdb, located in the uppermost directory of the workspace being navigated.

Usage Examples

VB

1. Choose VAANavigatorCOM as a project reference
2. VB Code to use the VAANavigator COM object

```
‘Declarations  
Dim objNav As clsVAANavigate  
Dim numReturn As Integer
```

```
‘Initialize the navigate object  
Set objNav = New clsVAANavigate
```

```

'Set the properties
objNav.Navtype = "UPMAIN"
objNav.Startcomid = 6961145
objNav.Startmeas = 0
objNav.Maxdistance = 100
objNav.Datapath = "d:\nhdplus\nhdplus07\"
objNav.Apppath =
"d:\nhdplus\Navigation_Tools\VAACOMObjectnavigator\"

'Use the VAANavigate method to do a navigation
numReturn = objNav.VAANavigate

'MsgBox Str(numReturn)

'Terminate the object
Set objNav = Nothing

```

Python

The following Python script will perform a navigation using the VAANavigatorCOM object. Lines beginning with # are comments. The print statements are for debugging purposes only.

```

import win32com.client

#Initialize object
o = win32com.client.Dispatch("VAANavigatorCOM.clsVAANavigate")

#Set properties
o.Navtype = "UPMAIN"
o.Startcomid = 6961145
o.Startmeas = 0
o.Maxdistance = 100
o.Datapath = "d:\\hsc\\nhdplus\\nhdplus07\\"
o.Apppath = "d:\\hsc\\nhdplustoold\\vaacomobjectnavigator\\"

#print o.Navtype
#print o.Startcomid
#print o.Maxdistance
#print o.Datapath
#print o.Apppath

#Do the navigation
numReturn = o.VAANavigate()
#print numReturn

```

#Terminate the object
o = None