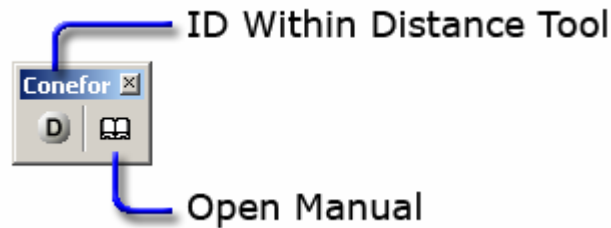


# Conefor Inputs



"Conefor Inputs" is a custom-made GIS extension for ArcView 3.x, ArcGIS 9.x and ArcGIS 10 developed by Jeff Jenness Enterprises ([www.jennessent.com](http://www.jennessent.com)) specifically for the Conefor Sensinode 2.2 software (CS22).

The instructions for installation and use of the extension provided below have also been included as part of the CS22 user's manual. CS22 software and manual can be freely downloaded from <http://www.udl.es/usuaris/saura/cs22.htm> or from <http://www.conefor.udl.es/cs22.htm>.

"Conefor Inputs" allows easily obtaining from a theme in ArcGIS (e.g. shapefile) both the node file and the connection file (as a distance file) directly in the format required by CS22. The distances in the connection file calculated by this extension are edge-to-edge Euclidean (straight-line) between all the features (e.g. patches) of a theme, with the option to analyse either all features or only those within a specified distance (see below). The text node and distance files provided by this extension are directly usable (with no change) in CS22.

## Installation

### For ArcView 3.x

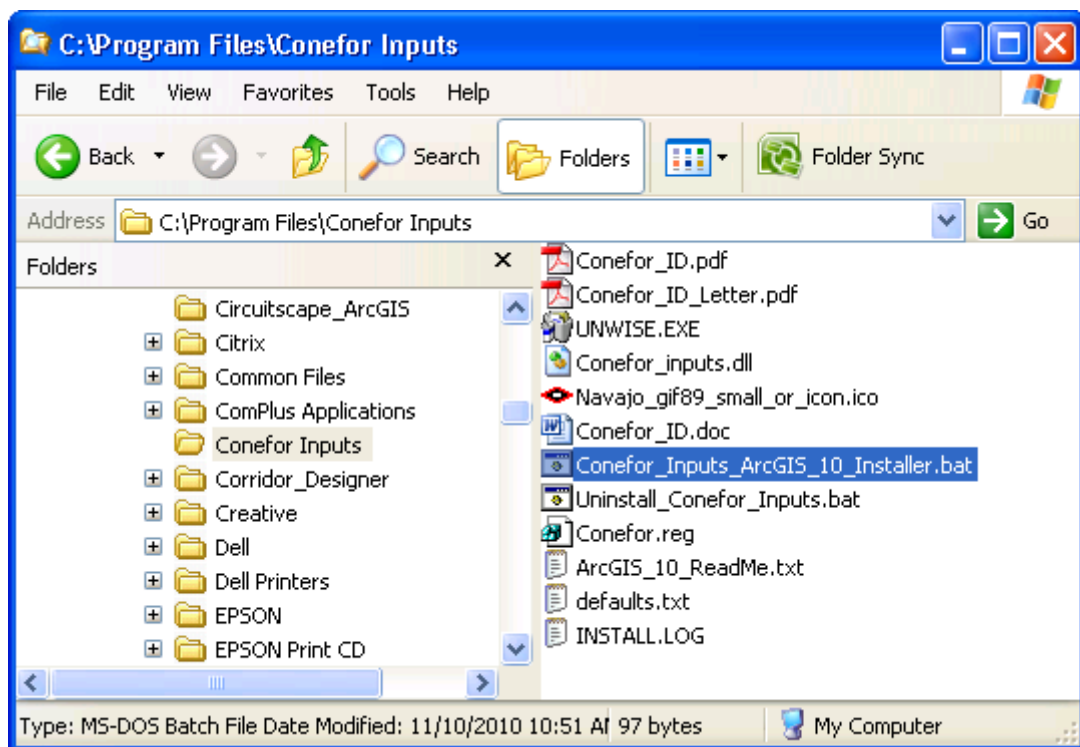
- 1) Begin by placing the "conefor\_inputs.avx" file into the ArcView extensions directory (../Av\_gis30/Arcview/ext32/). This file is available for download at [http://www.jennessent.com/arcgis/conefor\\_inputs.htm](http://www.jennessent.com/arcgis/conefor_inputs.htm).
- 2) After starting ArcView, load the extension by clicking on File --> Extensions... , scrolling down through the list of available extensions, and then clicking on the checkbox next to the extension called "Conefor Inputs."
- 3) The Conefor Inputs tool will appear in your View button bar as a button with a "D" on it:

### For ArcGIS 9.x

- 1) Make sure ArcGIS is closed.
- 2) Install the Conefor Inputs extension by double-clicking on the file "Conefor\_inputs.exe", which will be located in the "Extensions GIS\ArcGIS 9.x" folder (within the folder where you installed CS22, typically C:\Program files\Conefor Sensinode 22, or some other similar path), and follow the instructions. This installation file is also available at [http://www.jennessent.com/arcgis/conefor\\_inputs.htm](http://www.jennessent.com/arcgis/conefor_inputs.htm). The installation routine will register the Conefor\_inputs.dll with all the required ArcMap components.
- 3) Start ArcMap.

## For ArcGIS 10

- 1) Make sure ArcGIS is closed.
- 2) Install the tool on your hard drive by running the file "Conefor\_inputs\_10.EXE", which will be located in the "Extensions GIS\ArcGIS 9.x" folder (within the folder where you installed CS22, typically C:\Program files\Conefor Sensinode 22, or some other similar path), and follow the instructions. This installation file is also available at [http://www.jennessent.com/arcgis/conefor\\_inputs.htm](http://www.jennessent.com/arcgis/conefor_inputs.htm). This installation routine will install the DLL and several ancillary files on your hard drive, but will **not** register the tool with ArcGIS.
- 3) Use Windows Explorer to open your installation folder. If you used the default installation values, then this folder will be located at "Program Files\Conefor Inputs\". This folder will also include some additional files and this manual.



- 4) Double-click the file "Conefor\_Inputs\_ArcGIS\_10\_Installer.bat" to register the tool with ArcGIS 10.0. If the registration is successful, then you should see a "Registration Succeeded" notice.



**Note:** For the concerned or curious, the batch file *Conefor\_Inputs\_ArcGIS\_10\_Installer.bat* contains the following single line of text:

```
"%CommonProgramFiles%\ArcGIS\bin\ESRIRegAsm.exe" /p:Desktop "Conefor_inputs.dll"  
/f:"Conefor.reg"
```

It directs the ESRI installer *ESRIRegAsm* to register the extension DLL *Conefor\_inputs.dll* within ArcGIS, using GUID and Class ID values from the registry file *Conefor.reg* (also located in your installation directory). Both *Conefor\_inputs\_ArcGIS\_10\_Installer.bat* and *Conefor.reg* may be opened and viewed using standard text editors such as Notepad or WordPad.

## 5) Start ArcMap

The default install location for the extension is a folder named "Conefor Inputs" inside the folder "Program Files", which will also include some additional files required by the extension and this manual. This folder should better be editable to the user (i.e. not restricted to administrators), since this extension occasionally writes to a file located in this folder. The extension should not crash if it is unable to write to this folder, but it will run better if it can.

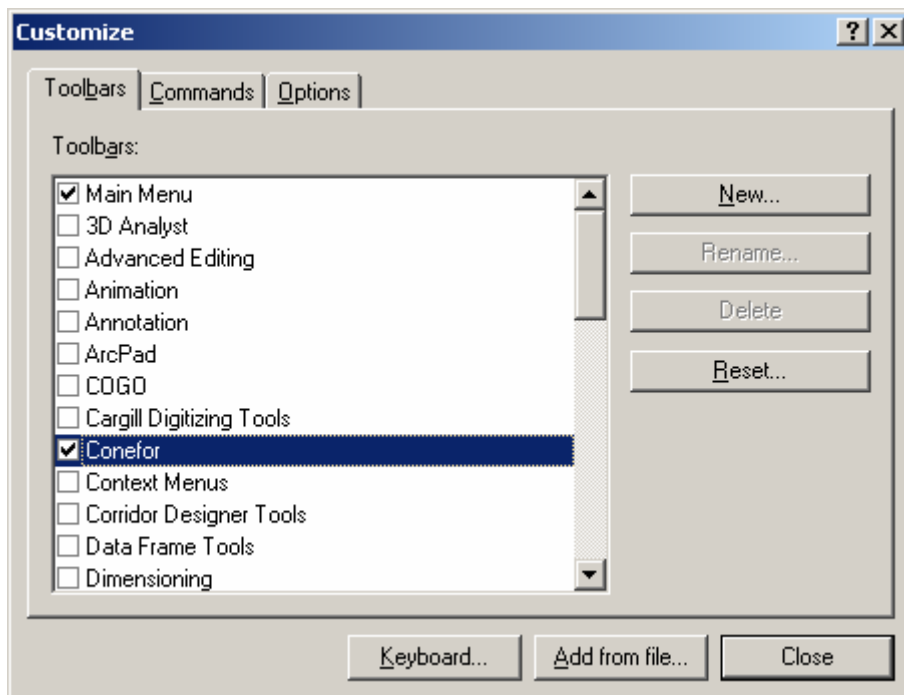
This tool is installed as an Extension in ArcMap, although it is a type of extension that does not show up in the list of extensions available in the "Tools" menu.

## Viewing the Tool

After installing the extension, you should see the following new toolbar in your map (it may also be embedded in your standard ArcMap toolbars, rather than as a standalone object):



If you do not see this toolbar, then open your "Customize" tool (by either double-clicking on a blank part of the ArcMap toolbar, or by clicking the "Tools" menu, then "Customize"), click the "Toolbars" tab and check the box next to "Conefor".

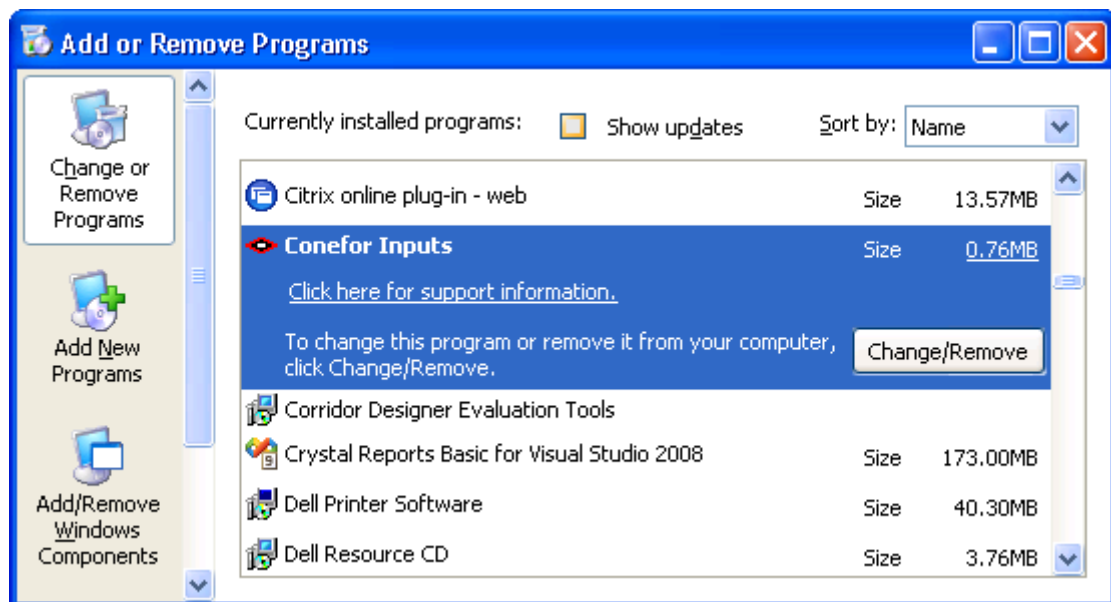


You should now see your Conefor toolbox in ArcMap.

## Uninstalling the Tool

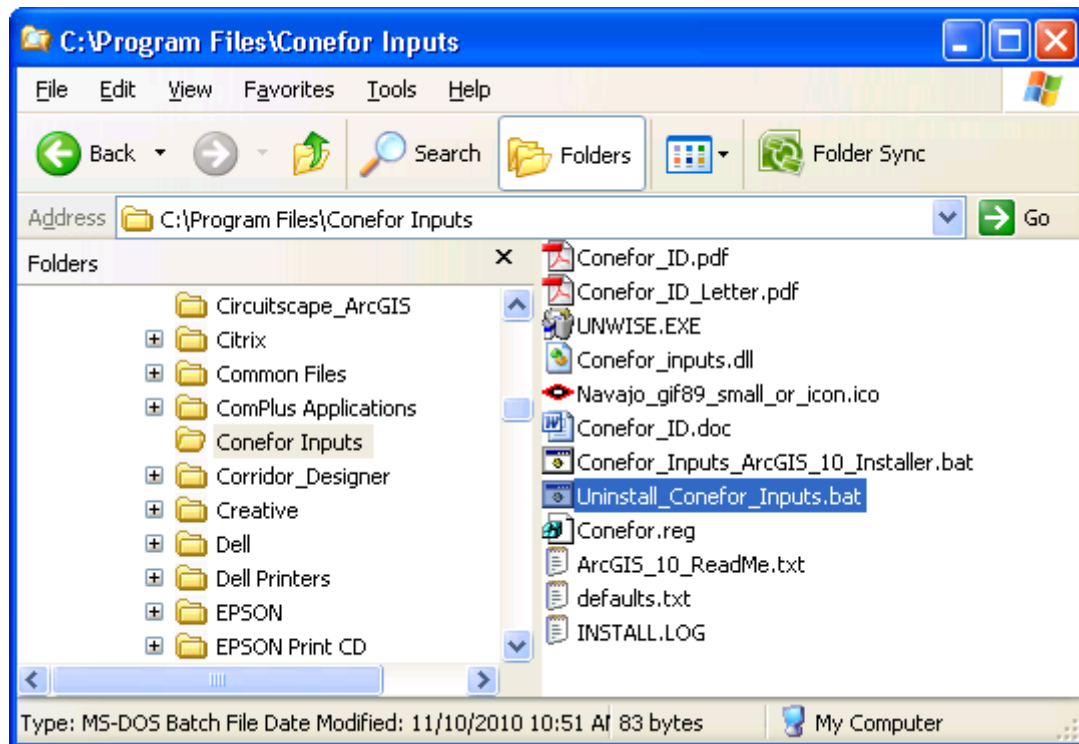
Uninstalling the tool ArcGIS 9.x:

- 1) Close ArcMap
- 2) Click the Windows "Start" button, then "Control Panel", then "Add or Remove Programs". Find "Conefor Inputs", click the "Remove" button and follow the instructions to remove it.

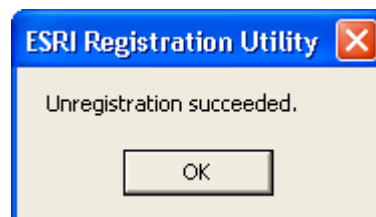


Uninstalling the tool in ArcGIS 10.0:

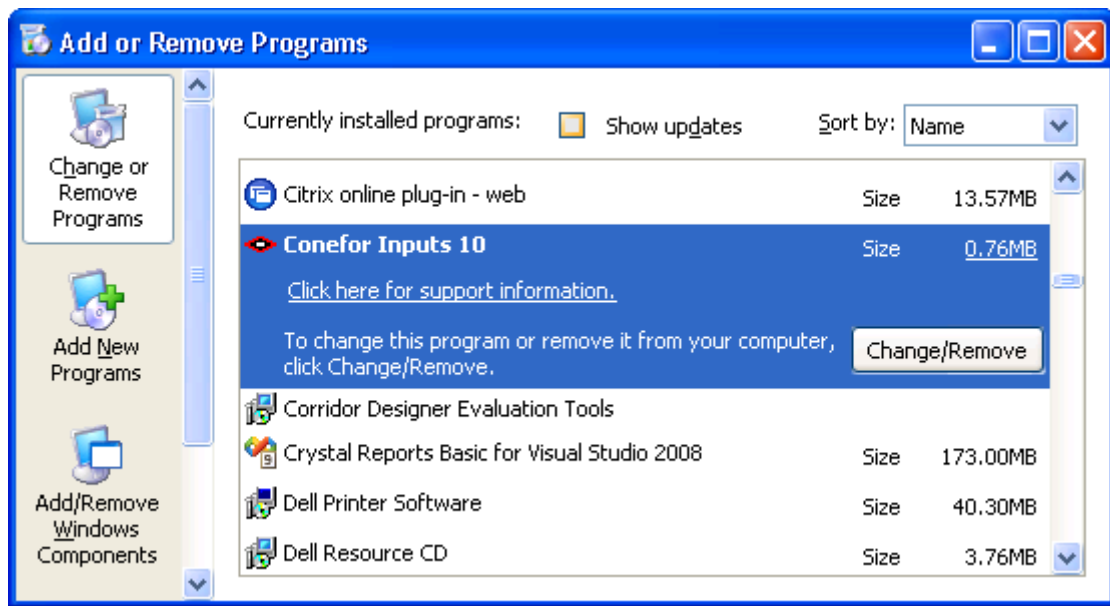
- 1) Close ArcMap
- 2) Use Windows Explorer to open your installation folder. If you used the default installation values, then this folder will be located at "Program Files\Conefor Inputs\". This folder will also include some additional files and this manual.



- 3) Double-click the file "Uninstall\_Conefor\_Inputs.bat" to unregister the tool with ArcGIS 10.0. If the unregistration is successful, then you should see a "Unregistration Succeeded" notice.



- 4) Click the Windows "Start" button, then "Control Panel", then "Add or Remove Programs". Find "Conefor Inputs 10", click the "Remove" button and follow the instructions to remove it.



**Note:** For the concerned or curious, the batch file *Uninstall\_Conefor\_Inputs.bat* contains the following single line of text:

```
"%CommonProgramFiles%\ArcGIS\bin\ESRIRegAsm.exe" /p:Desktop /u "Conefor_inputs.dll"
```

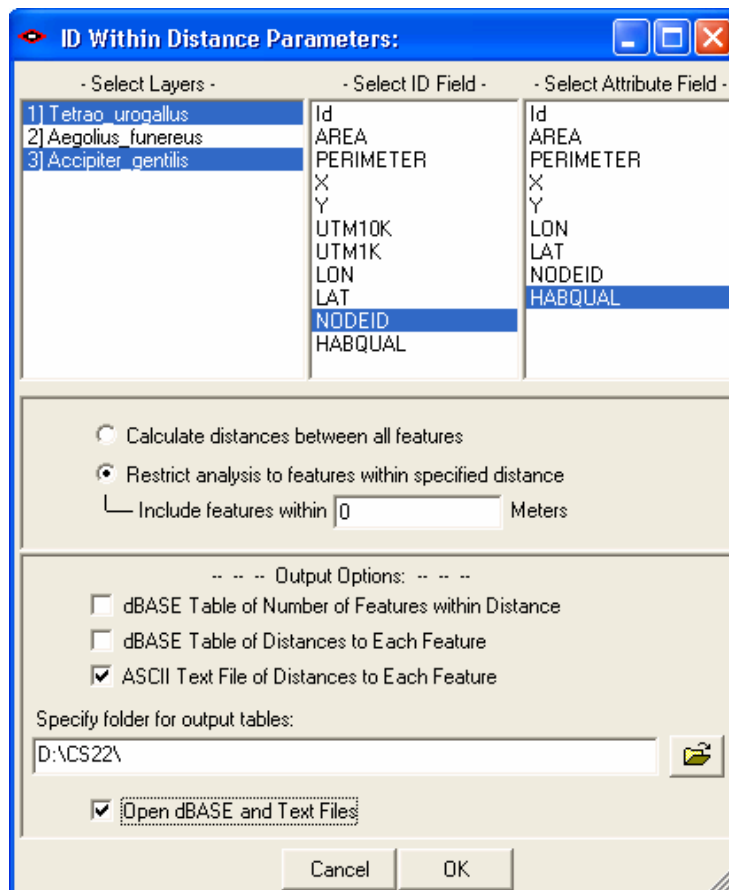
It directs the ESRI installer *ESRIRegAsm* to unregister the DLL within ArcGIS. *Uninstall\_Conefor\_Inputs.bat* may be opened and viewed using standard text editors such as Notepad or WordPad.

## Use of the extension (within ArcGIS 9.x)



The extension tool consists of only two buttons: the one in the left ("D") opens the dialog for obtaining the node and distance files, while the one in the right just opens this help file.

After clicking the "D" button the "ID Within Distance Parameters" dialog will be shown:



In the "ID Within Distance Parameters" dialog proceed as follows:

1) Select the layer or layers with the habitat data (where each feature will be considered as a different node in the resultant files).

The layers should be already open (added) in ArcMap/ArcGIS. Note that this tool will always analyze all the features in each selected layer. It will not restrict analysis to only the selected features.

2) Select the field in the layer containing a unique ID for each node (feature in the layer).

This ID field should be already prepared in your layer before opening the dialog. In case your layer does not contain this ID field, you can easily obtain it in ArcGIS 9.x by creating a new field (Add field... in the layer Attributes table), typically of Short Integer type, and by calculating the ID values in that field for each feature as  $1 + \text{the FID field in your layer}$ . The FID field contains a unique ID for each feature in your layer, starting from 0 up to the number of features-1, and should typically be the first and leftmost field in your attribute table. FID is an 'internal' field that will not show up in the list of fields to be selected in the dialog, but the field you create from that FID as described above will appear in the dialog.

3) Select the field in the layer containing the attribute of the nodes (e.g. habitat area, habitat quality, quality-weighted area, etc.). This attribute field should be as well calculated and available in the layer before starting the dialog.

4) Select if you intend to calculate distances to either all other features in the layer (this will correspond to a full connection file, as described in section 5.3), or only those features that are within a specified distance (this will correspond to a partial

connection file, as described in section 5.3). In this latter case the distance threshold must be entered in the same units of the actual feature class projection ("Include features within xxxxx Map units").

The distance threshold option is particularly useful for reducing the processing time in the distance calculations through the GIS, when a significant proportion of the pairs of patches are too distant from each other to be directly connected. This may be the case for themes covering large geographical regions. If for example the maximum dispersal distance of the analysed species is 5 km, it makes no sense spending time in calculating distances between patches that are separated by dozens of kilometres. In this case, restrict the analysis to features within 5 km, and only the pairs of features within that distance will be included in the output. All the nodes (features) not present in the distance/connection file will be considered completely directly unconnected in CS22 (e.g. by being further apart than 5 km in the previous example), as described in section 5.3.

Note that if you select multiple layers to analyze, then the ID and Attribute Field listboxes will only show those fields from the first selected layer. This extension will assume that all selected layers will have the ID and Attribute fields that you select.

5) Select the output option "ASCII text file of distances to each feature", which is the output file that can be directly used in CS22.

The distance file will be named "Distances\_[Layer Name]\_X.txt", where [Layer Name] is the name of the input layer being analyzed, and "X" is a number that guarantees that this is a unique filename. The first such file created in this folder will be named "Distances\_[Layer Name].txt"; the second will be named "Distances\_[Layer Name]\_2.txt", etc. The file contains three columns of data, representing the ID of node  $i$ , the ID of node  $j$ , and the Euclidean distance between nodes  $i$  and  $j$ , as described for the connection file format in section 5.3. Note that the extension will only calculate the distance between any pair of features one time. If the tool has already calculated the distance from  $i$  to  $j$ , it will not recalculate the distance from  $j$  to  $i$ . Furthermore, the distance will only be entered into the distance file once, as required by CS22. If the file has an entry for the distance from  $i$  to  $j$ , the file will not also have an entry for the distance from  $j$  to  $i$  (as required by CS22).

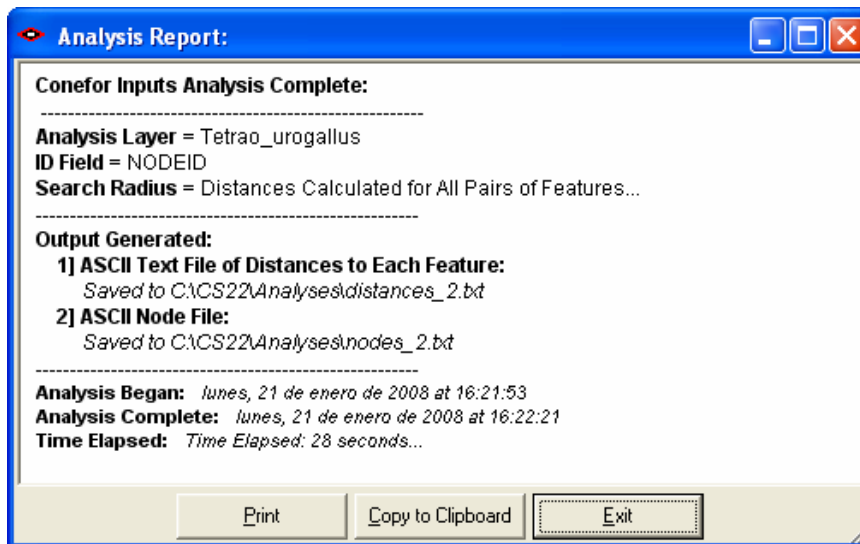
The extension will also automatically generate the node file in the format required by CS22, containing two columns of data, the first representing the node ID and the second containing the attribute value for that node (see section 4.2). The file will be named "Nodes\_X.txt", where "X" is a number that guarantees that this is a unique filename. The first such file created in this folder will be named "Nodes.txt"; the second will be named "Nodes\_2.txt", etc.

6) Select the folder where the node and distance files will be saved. Note that you just have to select the folder (one click) and not to open the folder (the output file names are fixed as described above).

7) Decide whether you would like to automatically open all new files for viewing.

Upon completion, the tool will optionally open all the tables and text files it produced (for you to view them), and it will also summarize the processing in a simple "Analysis report".





Note that the processing slows down with large shapefiles (that is, with increasing number of polygon features). Also, highly complex features can slow down the computation time when calculating distances between them. Polygons with lots of vertices will take longer to analyse than polygons with few vertices. Some previous processing to reduce the total number of vertices describing the polygon boundaries (especially removing redundant vertices if there are some) may benefit the speed of the distance computation through this extension.

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Tool updated July 24, 2008 (Ver. 1.0.118) to allow for batch processing of multiple feature layers.