

Nearby Source Selection Tool - 2018

This tool was developed to aid in National Ambient Air Quality Standards/Minnesota Ambient Air Quality Standards (NAAQS/MAAQs) modeling analyses in Minnesota, where nearby sources should be considered. The tool allows the identification and selection of sources within a specified distance from the source under review. The tool maps all nearby sources within the selected distance and screens for sources to potentially include in modeling analyses. The screening procedure uses the Square Root Mean D Method (see Minnesota Pollution Control Agency (MPCA) Air Dispersion Modeling Practice Manual).

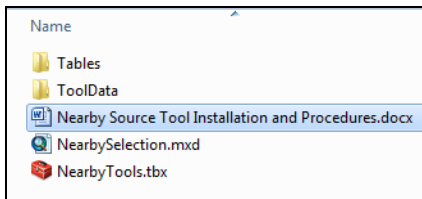
Note: *Regional sources are included for air dispersion modeling in Minnesota within 50 km of the Minnesota border. If conducting modeling for a facility outside of Minnesota, please refer to that states nearby source modeling guidance.*

System requirements

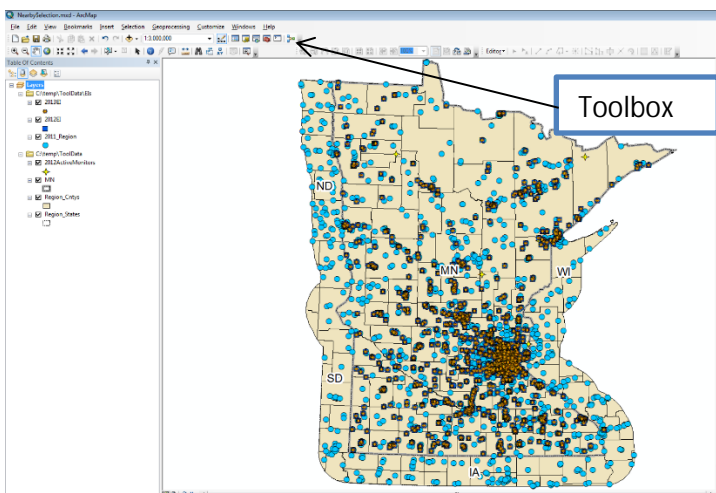
- ArcGIS version: 10.1 or later
- ArcGIS License: Advanced
- Enable Extension: Spatial Analyst
- Geoprocessing Options: "Overwrite the outputs of geoprocessing operations"

Installation

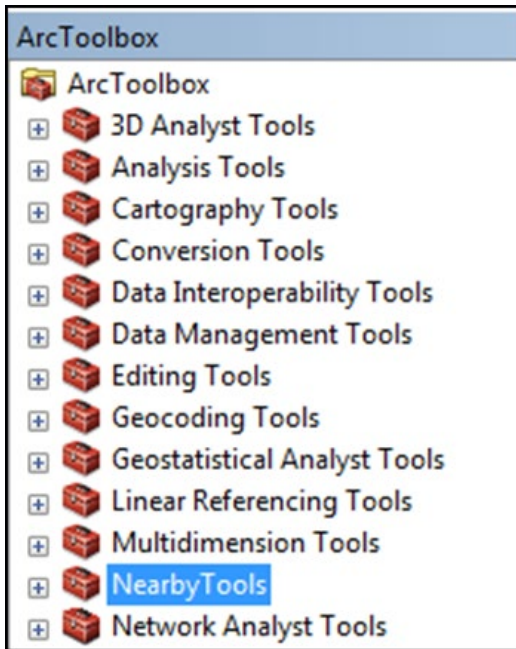
1. Create a 'temp' directory on your C drive (C:\temp).
2. If you already have a C:\temp directory with a previous version of the nearby source tool, remove the previous version, including all associated folders, before moving on to step 3.
3. Extract the contents of the 'NearbyTool' zip file to your C:\temp directory to get the following files and folders: (Paths should be C:\temp\Tables, C:\temp\ToolData, etc..).



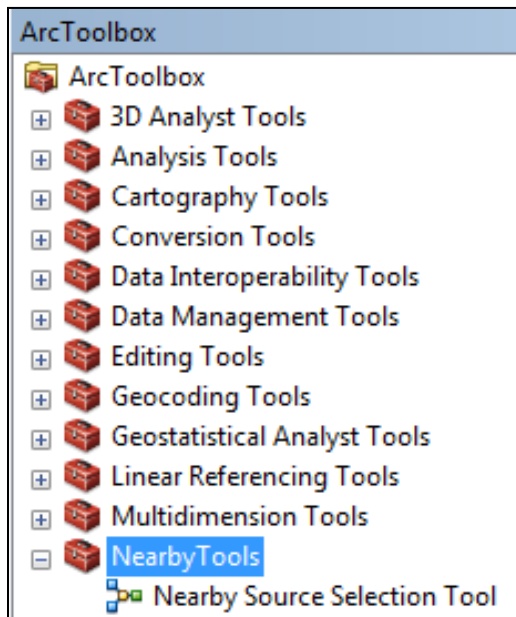
4. Open 'NearbySelection.mxd' in ArcMap.
5. Open 'Toolboxes' by clicking on the Toolbox icon in the Toolbar.



6. Click the '+' next to the 'NearbyTools' toolbox in the ArcToolbox list.



7. Double click the 'Nearby Source Selection Tool' in the 'NearbyTools' tool box.



8. The Nearby Source Selection Tool window appears.

2. Select the pollutant of interest

1. Select a facility.

3. Enter a search radius. (follow MPCA Modeling Practice Manual)

5. Select the emission inventory year to query.

4. Specify the file names and directories for the output layers.

Filling out the nearby source selection window

1. Selecting a facility.
 - a. Click the SQL button for the 'Select Facility Name' field.
 - b. Click on 'Facility'.
 - c. Click 'Get Unique Values'.
 - d. Type the name of the facility in the 'Go To' text box.
 - e. Place the cursor to the right of '=' in the bottom text box.
 - f. Double click the facility name.
 - g. Click 'OK'.
2. Selecting the pollutant of interest.
 - a. Type the pollutant name into 'Pollutant Expression 1' or use the SQL button to select a Pollutant (see #1 procedure).
 - b. Typing a pollutant name: If PM10 is not the pollutant of interest, replace only the PM10 with PM25, NOX, SO2, CO, VOC, or NH3. **Do not** remove the quotes or other portions of the expression.
 - c. Repeat a. or b. for 'Pollutant Expression 2' as well. The pollutant in Pollutant Expressions 1 and 2 **must be the same**.


3. Enter a Search Radius.
 - a. Under 'Linear Unit' type the search radius within which nearby sources will be selected.
 - b. Select the units that apply to the search radius value from the drop-down.
4. Specify the file names and directories for the output layers.
 - a. Layers are overwritten every time the tool is run with default settings.
 - b. Rename the layers if you would like to save the results of each run.
5. Select the emission inventory year from the 'Select Emission Inventory Year' drop-down.
 - a. The 2014 regional emission inventory, and 2015 and 2016 Minnesota emission inventories are available. MPCA's recommendation is to run the tool for each year and make a composite list of the 'Sources to Include' from each year. The composite list represents the list of sources that should be considered for inclusion as nearby sources to be explicitly modeled.

To run the tool, click 'OK'


Map Layers:


When the tool is run and executed successfully, a map with the following layers will be generated.

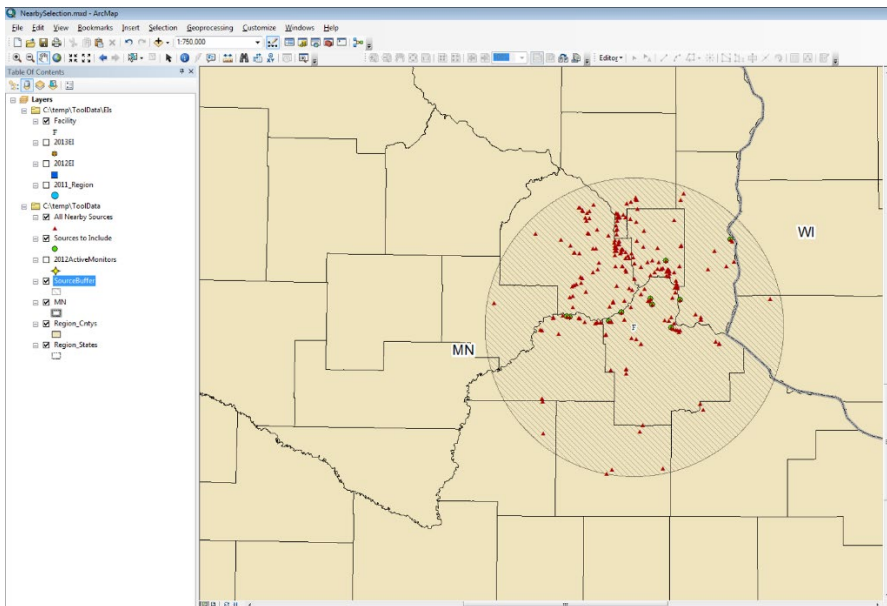
Layers:

Facility: 

All Nearby Sources: 

Sources to Include: 

Source Buffer: 



Tip: To see the sources on the map, click 'Selection' at the top of the ArcMap window, then click 'Clear Selected Features'.

Reviewing the results

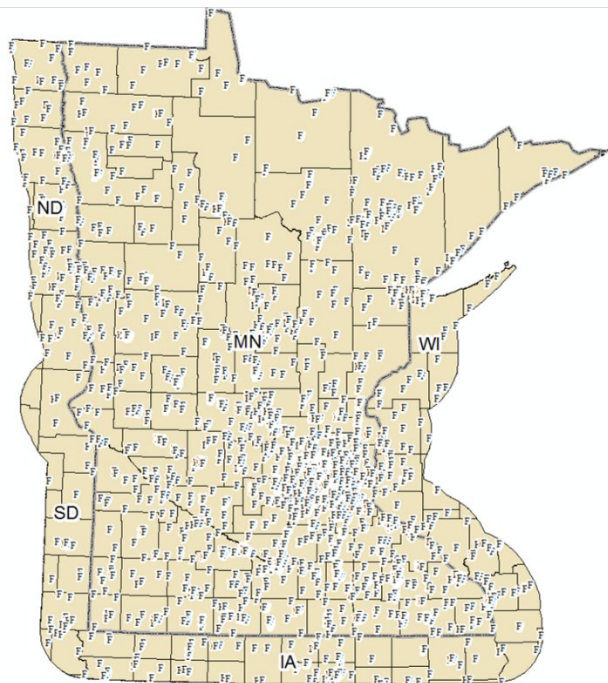
1. Right click the newly created 'Sources to Include' layer.
2. Select 'Open Attribute Table' to view the layer's data table.
3. The 'Sources to Include' layer contains a list of sources that should be considered for inclusion as nearby sources to be explicitly modeled. The sources in this layer meet the Square Root Mean D Method criteria.
4. Verify the location of your facility and nearby sources in the tool before proceeding. If there are any appreciable errors in the location data for the facility or nearby sources to be modeled, notify MPCA and we will adjust the source locations. Tip: Online aerial imagery can be helpful to verify source locations.

Next steps

1. Send an email to AirModeling.PCA@state.mn.us and request modeling parameters on the nearby sources that you plan to model.
2. If MPCA does not have detailed modeling parameters on a particular nearby source, please refer to the nearby source section of MPCA's Air Dispersion Modeling Practice Manual for additional nearby source modeling options.

Trouble-shooting

1. If a facility is manually entered that is not in the emission inventory database, the tool will place an F over all the emission inventory data points as shown below.



2. If your facility is not in the database, please send an email to AirModeling.PCA@state.mn.us so the facility can be added.