



Created By: Lane Carter

Advisors: Paul Evangelista, Jim Graham

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Software: Hawth's Analysis Tools, Windows Explorer, Internet Explorer, ArcGIS 9.3.1

Lesson 5: How to Create 200 Random Points Using Hawth's Tools

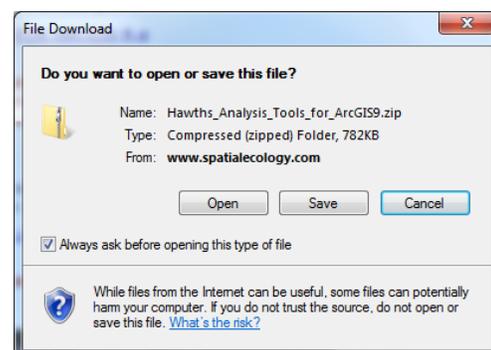
Background

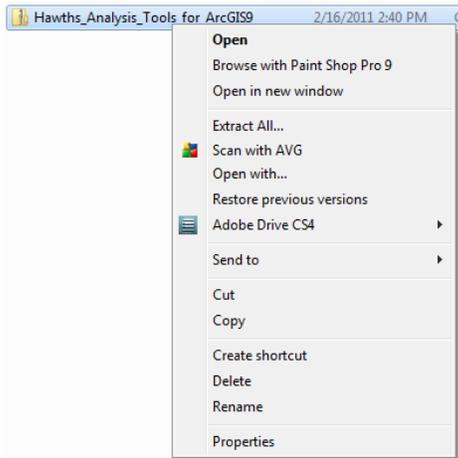
Within this tutorial, you will learn how to download *Hawth's Analysis Tools* (an ArcGIS toolbox extension) and use it to generate 200 random points within an invasive Tamarisk polygon layer bound by a Landsat satellite scene. Throughout the process, you will be using *Windows Explorer*, *ArcGIS version 9.3.1*, and *Hawth's Analysis Tools*. Information on how to download free Landsat satellite scenes and place them into *ArcMap* can be found within the tutorial "How to Download USGS Glovis Landsat Data." The tamarisk layer I will be using for demonstration was retrieved from the archive at the Natural Resource Ecology Lab at Colorado State University (NREL). The process in generating random points should be applicable to any polygon shapefile.

Downloading Hawth's Analysis Tools

This portion of the tutorial will explain how to download *Hawth's Analysis Tools* as well as how to install the program so it will properly show up when running the extension within *ArcMap*.

1. Navigate to <http://www.spatial ecology.com/htools/download.php> or click on the first link after doing a Google search of "Hawth's Analysis Tools." Then click on the **Download** tab at the top of the page.
2. Once on the download page, the website provides some helpful information on how to download and install the tool pack along with some warnings and a link to the most recent version of Hawth's Tools.
3. Approximately two-thirds down the page there is a link that looks like this:
[DOWNLOAD HAWTH'S TOOLS \(v3.27\) FOR ARCGIS 9.x](#)
4. Follow this link by clicking on it and it will bring up a download window. Click **Save** and navigate to the workspace you would like to store the .zip folder.
5. After the download is complete, click **Open Folder** or close out of the download window and navigate to the .zip file using Windows Explorer.





6. Right click on the .zip folder labeled **Hawth's_Analysis_Tools_for_ArcGIS9**. Select **Extract All**.

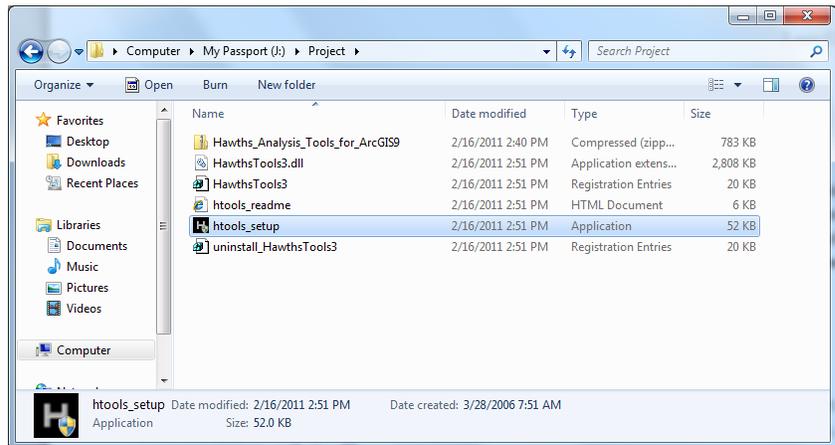
7. Choose a location to store the files contained within the .zip folder by using the **Browse** button.

8. Once a location has been selected, the path name will appear in the window next to the **Browse** button. Click **Extract**.

9. Navigate to the folder where you saved the files. There should be 5 new files present: an

application extension file, a registration entries file, a setup file, an .html readme file, and an uninstallation file.

10. Installing: Click on the file named **htools_setup**.



11. When the window to the left is shown, make sure that the installation option is selected and click **Next**.

12. For the next window, browse to the location where Hawth's tools will be saved using the browse icon **IMPORTANT:** According to the makers of the software extension, the default location is most likely to save the extension so it runs properly.

13. Click **Install**.



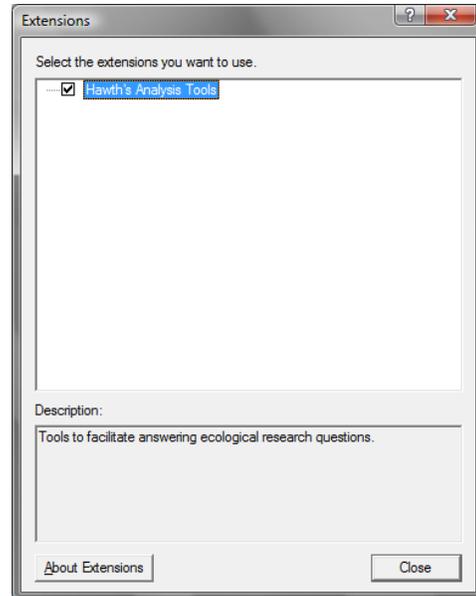
13. A notice will inform you that the tool has successfully been installed. Click **Ok**.

14. Open *ArcMap version 9.3.1* and select **A new empty map** then click **Ok**.

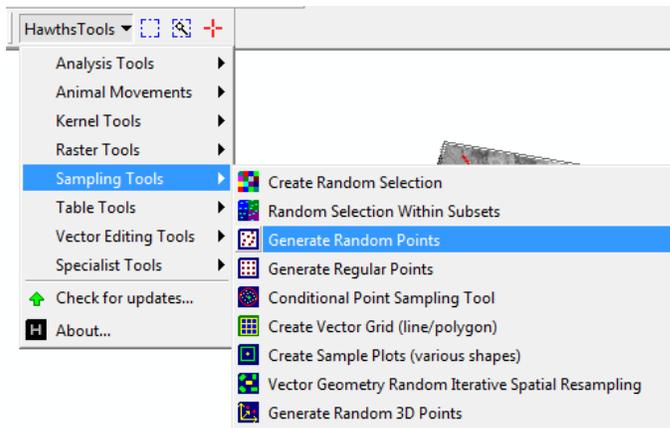
15. Hawth's Analysis Tools will be showing up as a toolbar within ArcMap. In order to activate the toolbar first click on the **Tools** at the top of the screen and click on **Extensions**.

16. **Hawth's Analysis Tools** will show up in the window, check the white box and click **Close**.

17. Next click the **View** tab at the top of the screen and scroll down to **Toolbars**. A long list will appear like the one to the left. Click **Hawth's Tools** to make the toolbar visible on your workspace.



Creating 200 Random Points



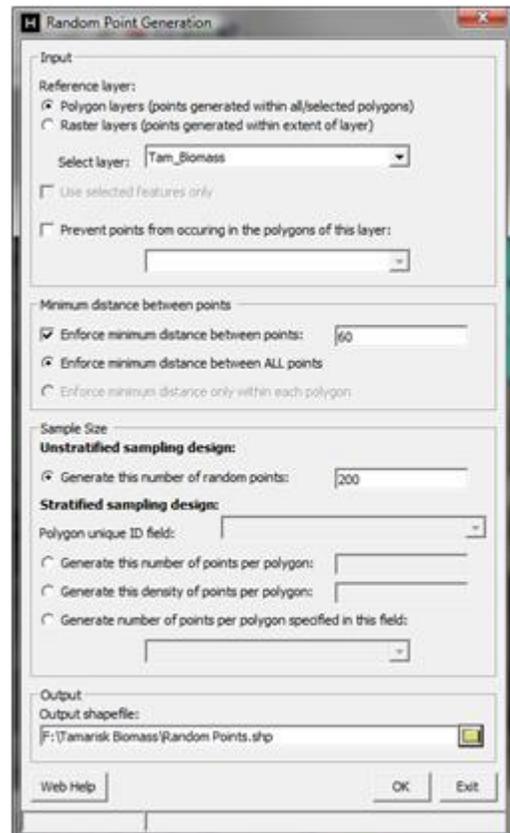
1. Click on the **Hawths Tools** drop down menu within the Hawth's Tools toolbar. Scroll to **Sampling Tools** and select **Generate Random Points**.

2. A window will appear like the image to the right.

3. Under **Reference layer** select *Polygon layers...* and use the drop down to select the layer you have already loaded into ArcMap. In this case the layer is **Tam_Biomass**.

4. One can also prevent any random points from occurring in unwanted polygon layers, in which you would check the appropriate box and select another vector layer. In this case it is not needed.

5. Check the box for *Enforce minimum distance between points* and enter in a numerical value of



choice. In the case of biomass for Tamarisk I am choosing **60** meters.

Note: Do not enter any measurement into this window such as meters or kilometers (an error message will appear when trying to generate the points). Because this coordinate system is based in meters, the single numerical value will do.

6. Select *Generate the number of random points* and enter the number **200**.

7. Lastly, select the *Output Shapefile* by browsing to your work space using the **browse**  icon. Name it **Random_Points**.

8. When the window looks like the above picture, click **Ok**.

9. The points will begin to generate and a progress bar will appear at the bottom of the window. **Note:** This process may take awhile so be patient.

10. When the process finishes click **Ok** in the prompted window, Hawth's Tools will close and the random points will be added as a new layer to your table of contents.

11. You can now manipulate the points just like its own shapefile.

Congratulations! You have now successfully created 200 random points using Hawth's Tools!