Ecosystem Rarity Toolbox: User Guide

Developed by,

Samantha Sifleet
Contractor to the U.S. Environmental Protection Agency
www.samanthasifleet.com

The "Ecosystem Rarity Toolbox" was developed for the U.S. EPA EnviroAtlas. This toolbox is set of python scripts aggregated into a GIS toolbox using ArcDesktop 10.1. This toolbox contains four tools that each calculates a given metric of relative ecosystem rarity. This toolbox can be downloaded from www.samanthasifleet.com.

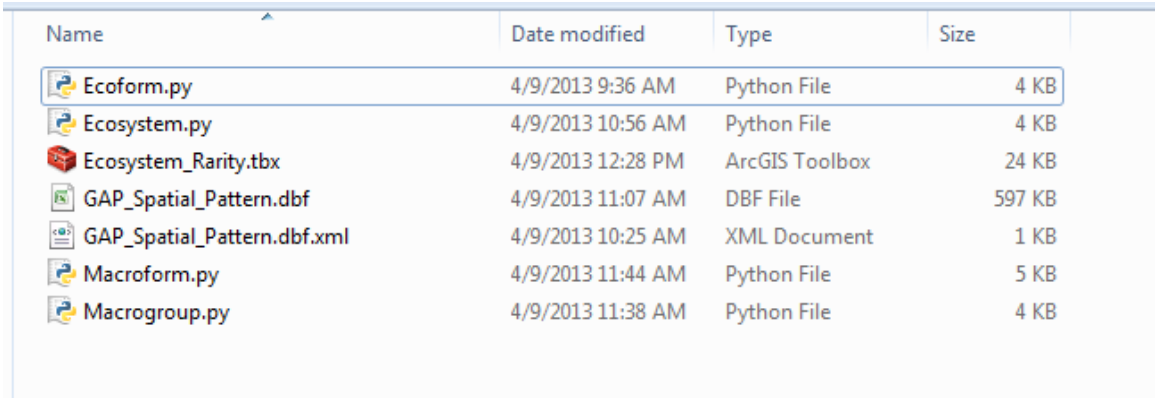
Step 1: Download the Necessary files

1.1 Download the Ecosystem Rarity Toolbox

This toolbox can be downloaded from:

http://enviroatlas.epa.gov/enviroatlas/tools/rarity

The contents of the downloaded zip file are shown in the figure below. The toolbox and python scripts must be saved to the same folder.



Name	Date modified	Type	Size
Ecoform.py	4/9/2013 9:36 AM	Python File	4 KB
Ecosystem.py	4/9/2013 10:56 AM	Python File	4 KB
Ecosystem_Rarity.tbx	4/9/2013 12:28 PM	ArcGIS Toolbox	24 KB
GAP_Spatial_Pattern.dbf	4/9/2013 11:07 AM	DBF File	597 KB
GAP_Spatial_Pattern.dbf.xml	4/9/2013 10:25 AM	XML Document	1 KB
Macroform.py	4/9/2013 11:44 AM	Python File	5 KB
Macrogroup.py	4/9/2013 11:38 AM	Python File	4 KB

1.2 Download the GAP Landcover Raster Data

The tools in this toolbox require the ecosystem specific USGS GAP raster data as an input parameter. This data can be downloaded here:

http://gapanalysis.usgs.gov/gaplandcover/data/download/

The national data or just a subset of the data can be used.

Step 2: Add the Toolbox to Arc map

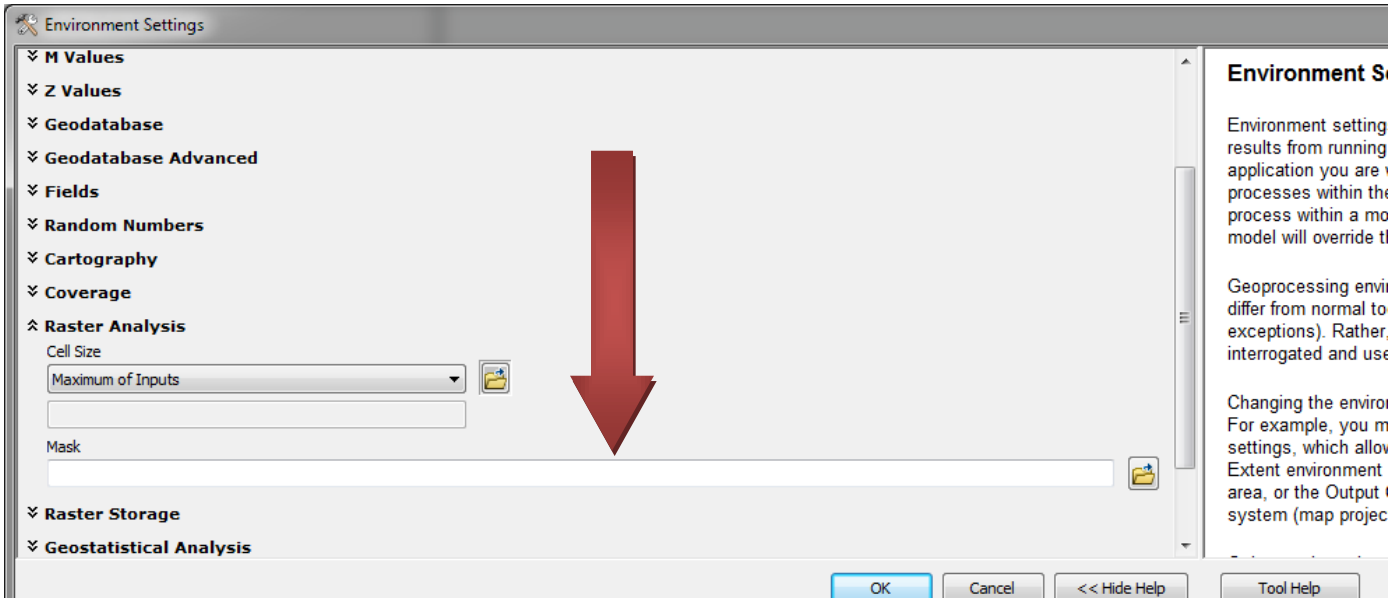
1. Right click on ArcToolbox in the Toolbox window of ArcMap
2. Select Add Toolbox
3. Navigate to where you stored the downloaded Ecosystem Rarity Toolbox and python scripts and select it

http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html#/Using_the_ArcToolbox_window/003q0000001m000000/

Step 3: Prep the data

All of the tools can be run over any area of interest. So, if the user wants to calculate the relative rarity in a given state or ecoregion (etc...), the input data needs to be limited to the area of interest. There are multiple tools in ArcGIS that can be used to prep the data and they are listed below. The clipped raster must have an attribute table – so, if it doesn't have one, run the build raster attribute table tool (Data Management).

1. Clip (Data Management)
   http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html#/Clip/00170000009n000000/
2. Raster Calculator (Spatial Analyst)
   http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html#/Raster_Calculator/009z000000z7000000/
   a. Insert only the original raster (to be clipped) into the expression window
   b. Select the "Environments" button
   c. Open raster analysis in Environment Settings
   d. Under Mask navigate to the file you want to clip the raster to.



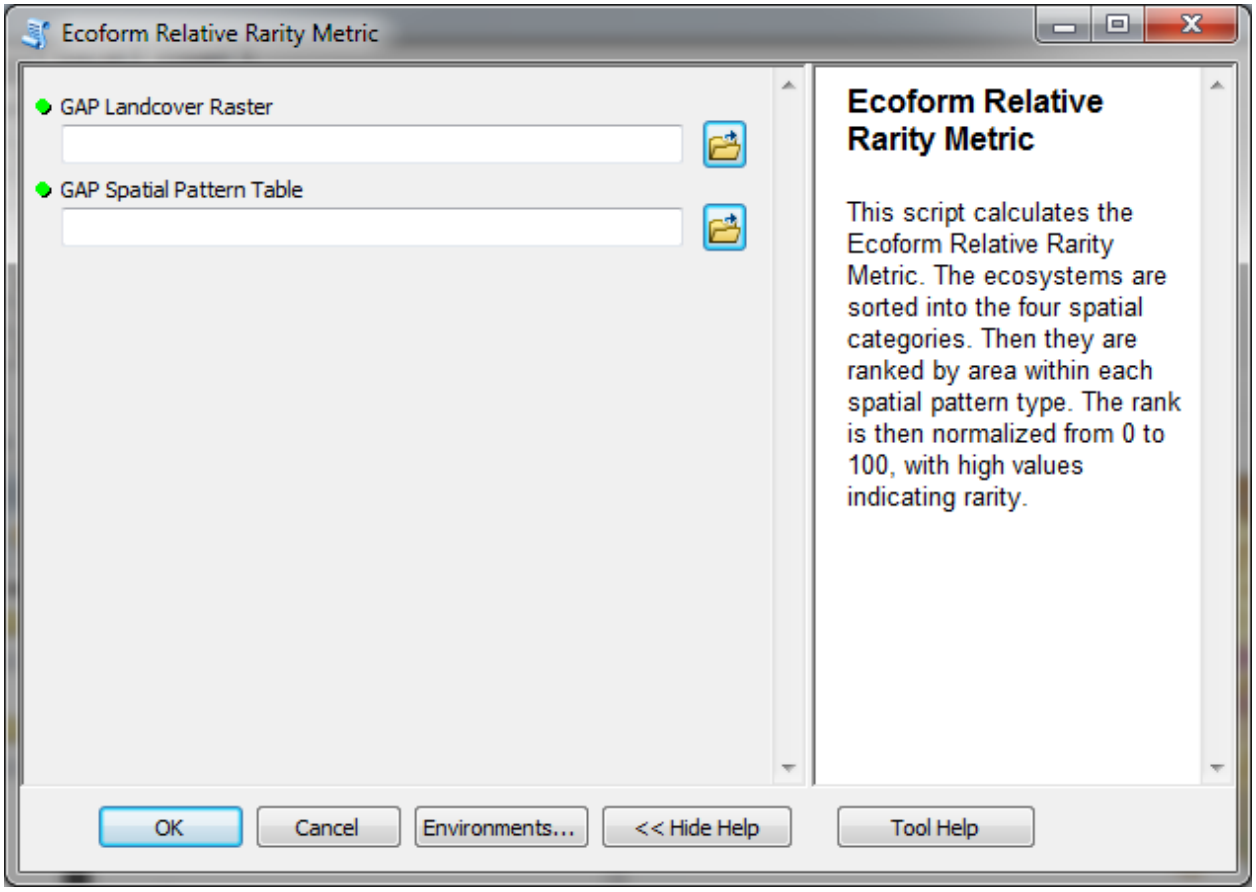
3. Extract by Mask (Spatial Analyst)
   http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html#/Extract_by_Mask/009z000000 2n000000/

Step 4: Run the Tools

All four of the tools require two input parameters: (1) the GAP Landcover Raster (clipped to area of interest) and (2) the GAP Spatial Pattern Table. The GAP Spatial Pattern Table is included in the Toolbox download.

4.1 Tool: Ecoform Relative Rarity

1. Open the tool

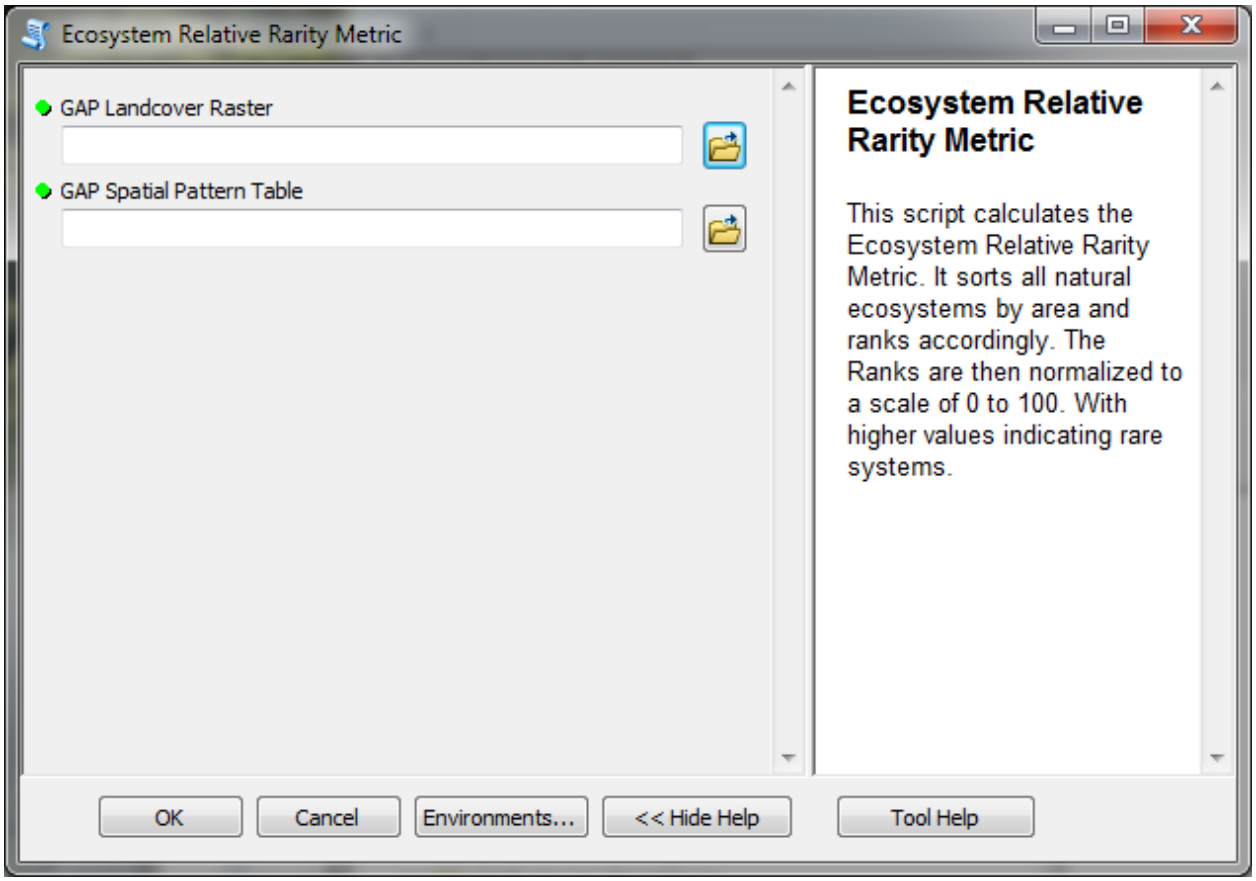


2. Navigate to the appropriate parameters
    a. The GAP Landcover Raster can be for the entire US or for a limited area as discussed above in steps 1 and 3. The data must be downloaded from : http://gapanalysis.usgs.gov/gaplandcover/data/download/
    b. The GAP Spatial Pattern Table is included in the toolbox download package.
3. The GAP Spatial Pattern Table (.dbf) is included in the toolbox download package
4. Run the tool

5. Examine the output – This tool creates a new column in the raster attribute table containing the Ecoform Relative Rarity Metric

4.2 Tool: Ecosystem Relative Rarity

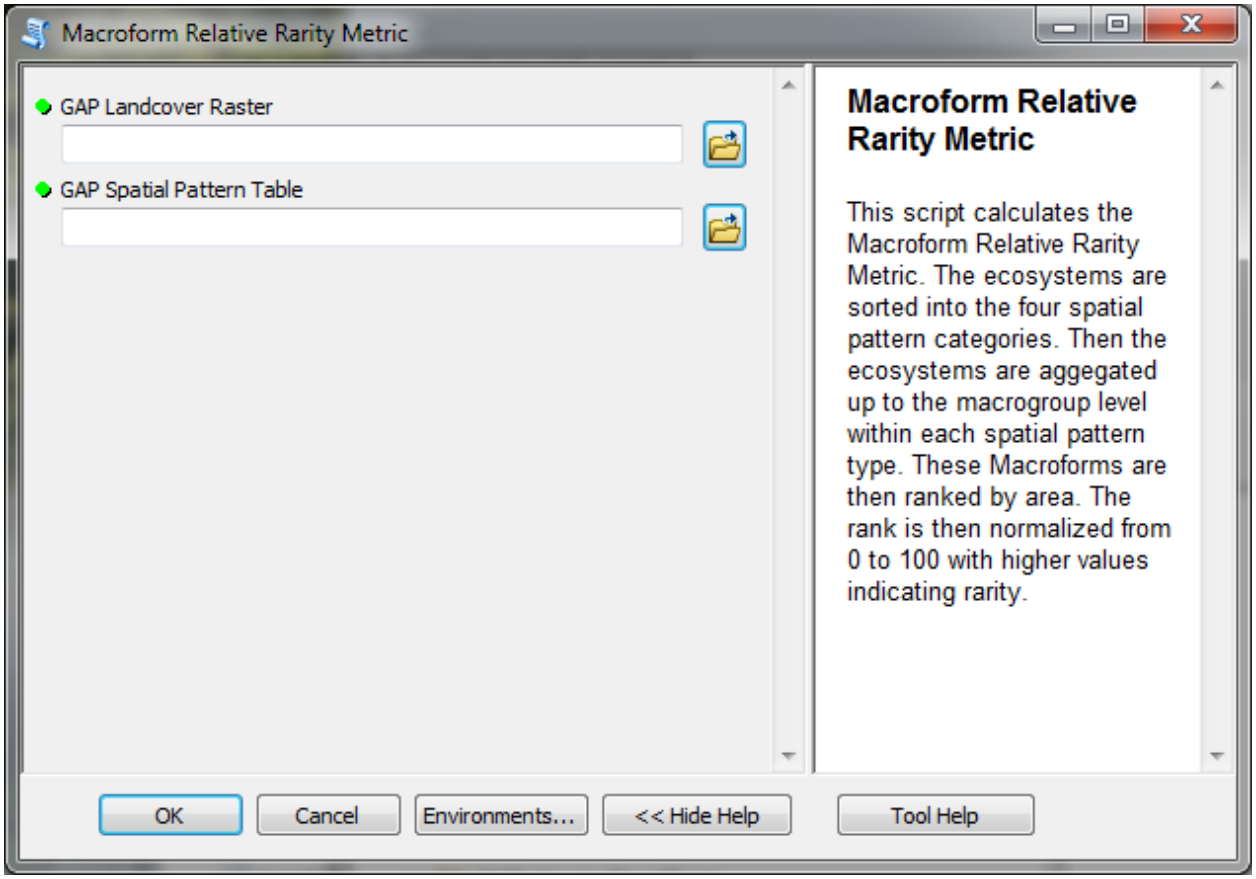
1. Open the tool



2. Navigate to the appropriate parameters
    a. The GAP Landcover Raster can be for the entire US or for a limited area as discussed above in steps 1 and 3. The data must be downloaded from : http://gapanalysis.usgs.gov/gaplandcover/data/download/
    b. The GAP Spatial Pattern Table (.dbf) is included in the toolbox download package.
3. Run the Tool
4. Examine the output – This tool creates a new column in the raster attribute table containing the Ecosystem Relative Rarity Metric

4.3 Tool: Macroform Relative Rarity

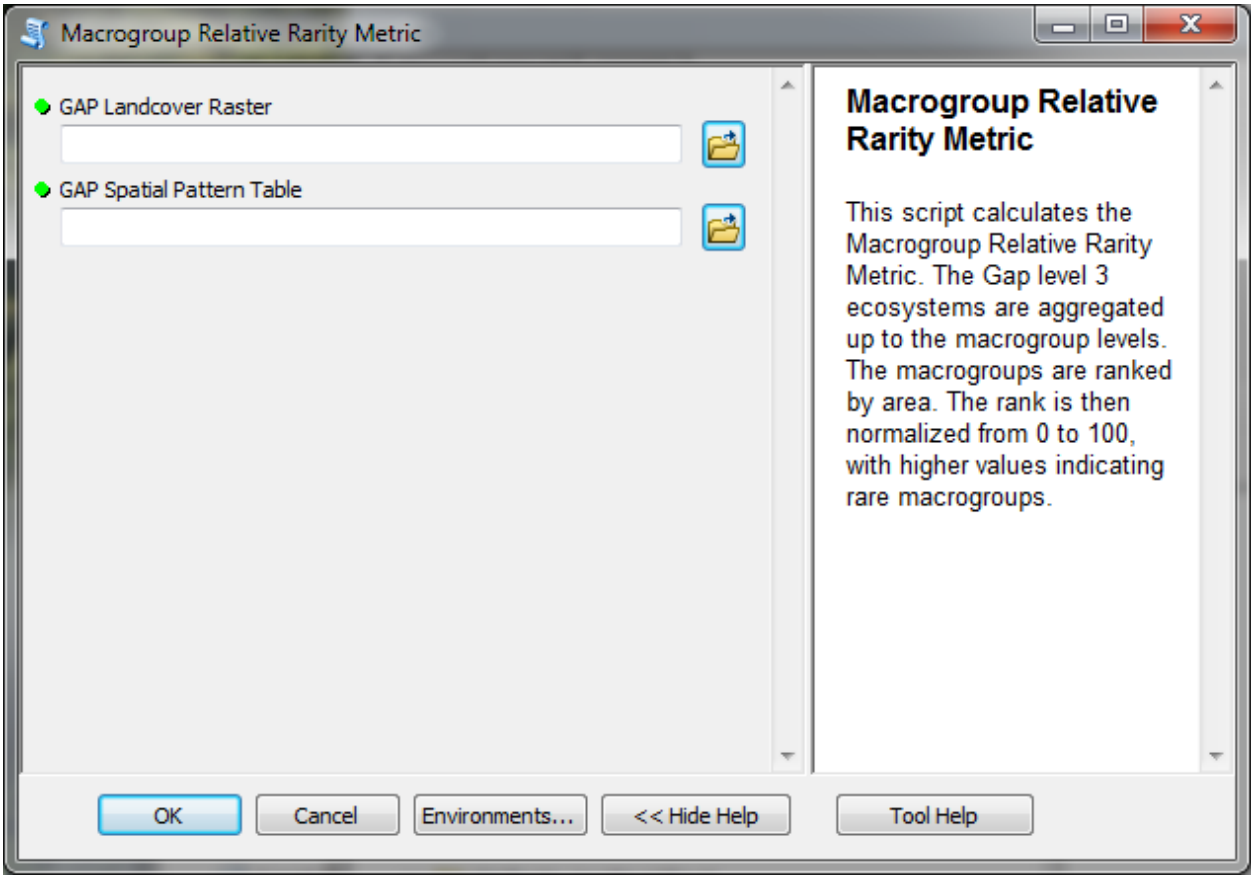
1. Open the tool



2. Navigate to the appropriate parameters
    a. The GAP Landcover Raster can be for the entire US or for a limited area as discussed above in steps 1 and 3. The data must be downloaded from : http://gapanalysis.usgs.gov/gaplandcover/data/download/
    b. The GAP Spatial Pattern Table (.dbf) is included in the toolbox download package.
3. Run the Tool
4. Examine the output – This tool creates a new column in the raster attribute table containing the Macroform Relative Rarity Metric

4.4 Tool: Macrogroup Relative Rarity

1. Open the tool



2. Navigate to the appropriate parameters
    a. The GAP Landcover Raster can be for the entire US or for a limited area as discussed above in steps 1 and 3. The data must be downloaded from : http://gapanalysis.usgs.gov/gaplandcover/data/download/
    b. The GAP Spatial Pattern Table is included in the toolbox download package.
3. Run the Tool
4. Examine the output – This tool creates a new column in the raster attribute table containing the Ecosystem Relative Rarity Metric