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Availability of Patch Calculator, an ArcGIS v.9 Tool for the Analysis of Landscape Patches

by Jeff P. Lin

PURPOSE: This technical note announces the availability of Patch Calculator, a tool developed by the U.S. Army Engineer Research and Development Center (ERDC) for ESRI's ArcGIS Desktop, version 9 software. Patch Calculator is run through the ArcToolbox application, and can be used to calculate several patch and landscape-related metrics, with the results output as patches and/or a study area (e.g., subwatersheds) shapefile. The results can then be used to support various habitat/ecosystem/watershed modeling and management activities. The tool is available for download at <http://el.erdcl.usace.army.mil/emrrp/gis.html>.

BACKGROUND: The Patch Calculator tool (Figure 1) was created for ArcGIS Desktop version 9, using a script developed in the Python language. The tool requires the ArcGIS Spatial Analyst extension in order to run. Only an ArcView license is required to run the tool, although the higher level ArcInfo license is required to calculate certain metrics.

DESCRIPTION OF THE TOOL: Patch Calculator's help guide is contained within the tool itself. The only required input into the tool is a raster file depicting the patches to be analyzed. The tool will output a single shapefile of the patches with the user-selected metrics for each patch (Figure 2a). A separate shapefile depicting study areas (e.g., subwatersheds) is an optional input. If it is entered, the tool will also output a new study areas shapefile with the patch metrics summarized by study area (Figure 2b). The metrics that can be calculated are:

- Number of patches
- Patch area
- Total patch area
- Mean patch area
- Patch core area (requires ArcInfo license)
- Total patch core area (requires ArcInfo license)
- Mean patch core area (requires ArcInfo license)
- Patch core area ratio (requires ArcInfo license)
- Mean patch core area ratio (requires ArcInfo license)
- Patch edge
- Total patch edge
- Mean patch edge
- Total patch edge density

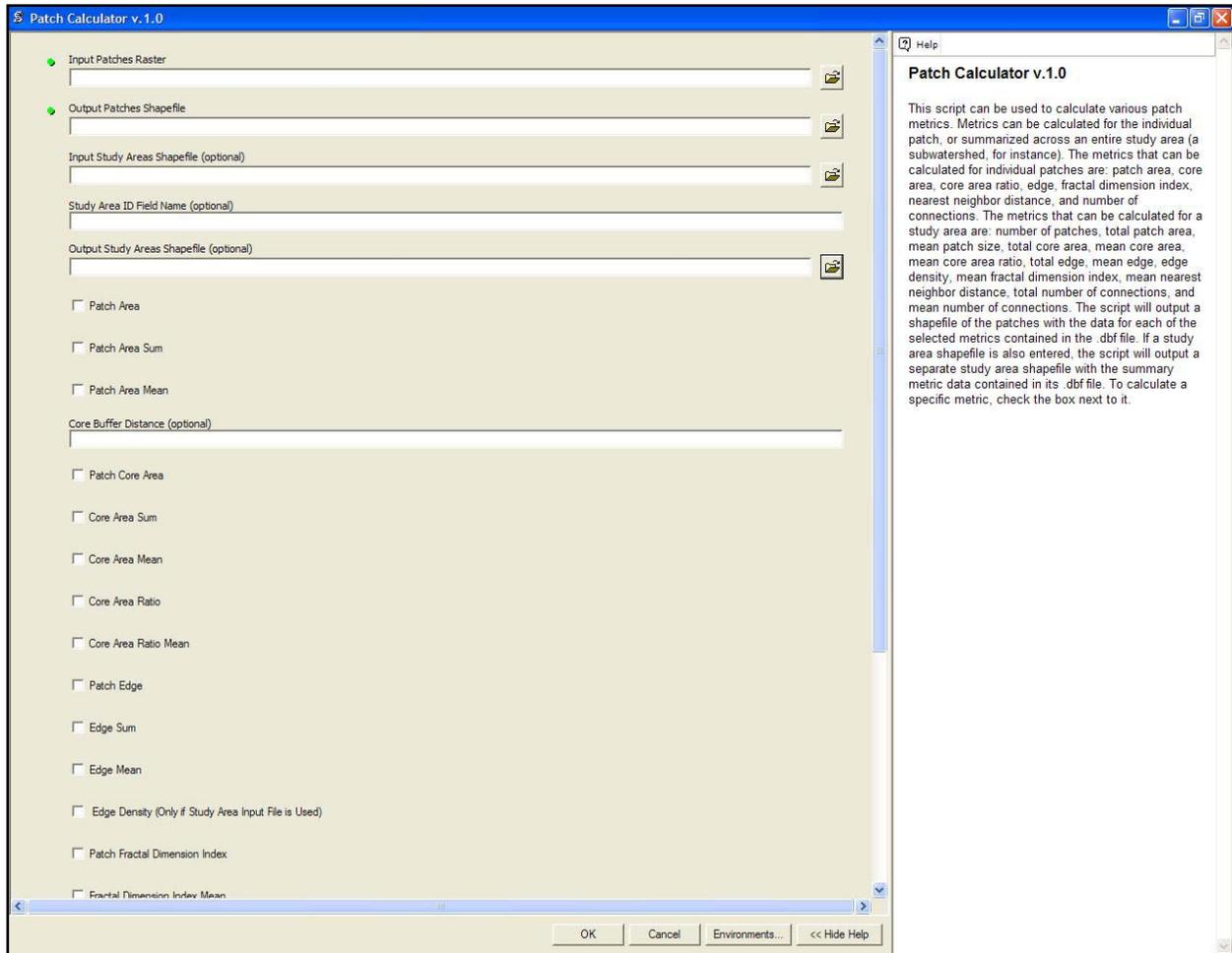


Figure 1. Patch Calculator tool user interface.

- Patch fractal dimension index
- Mean patch fractal dimension index
- Patch nearest neighbor distance (requires ArcInfo license)
- Mean patch nearest neighbor distance (requires ArcInfo license)
- Number of connections for each patch
- Total number of patch connections
- Mean number of patch connections

For the core area metrics, the user can specify the core buffer distance (distance between the patch edge and patch core). For the patch connection metrics, the user can specify the distance between patches for them to be considered “connected.” With the patch connection and nearest neighbor metrics, distances are measured from patch edge to patch edge.

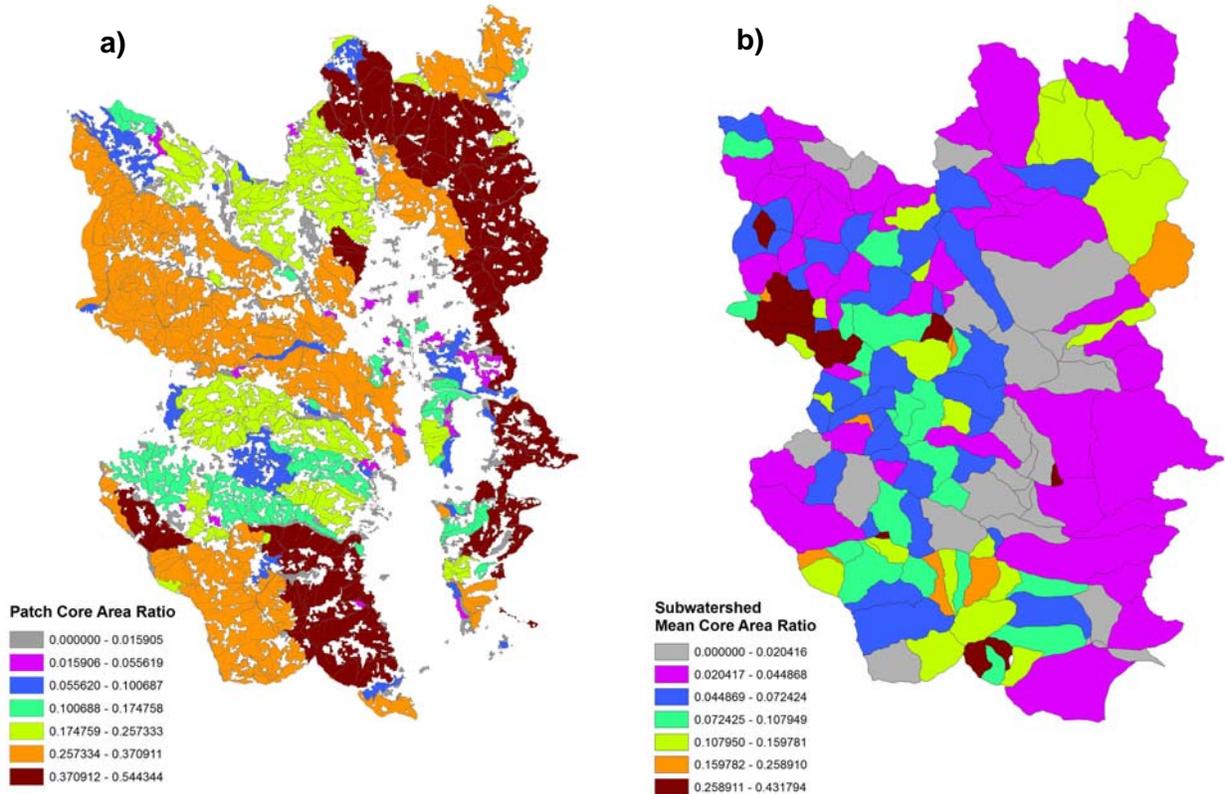


Figure 2. On the left is a map created from the patches output file, showing core area ratios for individual patches. On the right is a map created from the study areas output file, showing the mean core area ratios of each subwatershed.

This is version 1.0 of the tool. Any comments or suggestions on the tool are welcomed and should be sent to the author, Mr. Lin.

POINTS OF CONTACT: This technical note was written by Jeff P. Lin at the U.S. Army Engineer Research and Development Center, Vicksburg, MS. For additional information, contact Lin (601-634-2068, Jeff.P.Lin@erdc.usace.army.mil) or the manager of the Ecosystem Management and Restoration Research Program (EMRRP), Glenn Rhett (601-634-2717, Glenn.G.Rhett@erdc.usace.army.mil). This technical note should be cited as follows:

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