Population Estimator Documentation

The Population Estimator, designed by the Geospatial Research and Spatial Services Program (GRASP) at CDC/ATSDR, is an ArcGIS geoprocessing tool that estimates the population in a user-defined area surrounding a specified feature or features of interest.

Adding the Population Estimator toolbox:

1. Select ArcToolbox from the Geoprocessing tab to open the ArcToolbox window
2. Right click on the ArcToolbox entry and click Add Toolbox
3. Navigate to the location where the Population Estimator is saved and select the Population Estimator toolbox
4. The GRASP Population Estimator toolbox should now be included in your ArcToolbox window
5. Instructions for how to use the tool are included in the tool help (visible when you open the tool)

GRASP’s Population Estimator

Two input layers are required:
- the feature(s) of interest and
- population units, such as census tracts, containing population counts (Figure 1).

Both input layers must be in the same coordinate system. The coordinate system of the output feature layers is the same as the input coordinate system.

The user defines the extent of the area – called a buffer - surrounding the feature(s) of interest. The tool calculates the areal proportion of each population unit that falls within the buffer and then multiplies this proportion by each corresponding unit’s entire population (Figure 2). We assume an equal population distribution for each population unit. The estimated populations for all units may be summed to estimate a total population for the buffer. The tool outputs one of three options:
- **None** – for each population unit, estimates population based on proportion of unit that falls within the buffer(s), with no dissolving or grouping (Figure 3),
- **Individual** – one population estimate for each feature of interest (Figure 4), or
- **Dissolve** - a single population estimate for all areas of interest dissolved together (Figure 5).

Output feature layers will be automatically added to the data frame once processing is complete.

Trouble Shooting

To avoid the error below, be sure to specify a specific folder location to save the output dataset. If the error persists, restart ArcMap. **Error Message:**

Deleting Temporary Data
Completed script AreaProp20...
Failed to execute (AreaProp20).
Failed at Tue Jul 01 10:51:44 2014 (Elapsed Time: 4 minutes 2 seconds)
Figure 1 - Two input layers, the feature of interest and census tracts, along with a user-defined buffer defined using the Population Estimator tool.
Figure 2 - For each tract, the tool calculates the proportion of tract area within the buffer, multiplies this area proportion by the population of the tract. If the user chooses the Individual or Dissolve options, the tool then sums the population counts of tracts within the buffer to estimate the population.
None output feature layer and attribute table. The table includes the estimated population for each tract, or portion of a tract, falling within the user-defined buffer surrounding the feature of interest.
Figure 4 – Individual output feature layer and attribute table. Part A shows three features of interest, each surrounded by a 6-mile buffer. Part B shows the three output features and corresponding attribute table. In this example, the SUM_P_TOTP field is the estimated population for each of the three output features. Overlapping areas are counted multiple times, depending on the configuration of the overlap.
Figure 5 – **Dissolve** output feature layer and attribute table. Part A shows three features of interest, each surrounded by a 6-mile buffer. Part B shows the single output feature, the result of dissolving the buffers, and corresponding attribute table. In this example, the SUM_P_TOTP field is the estimated population for the entire buffered area.