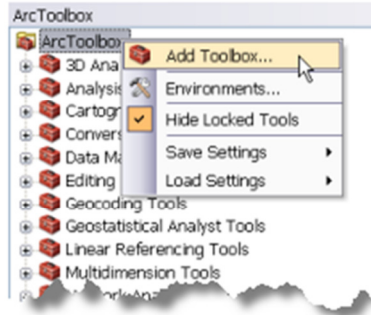


Population Estimator Documentation

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)



To add a toolbox to the ArcToolbox window, right-click the ArcToolbox entry and click **Add Toolbox**

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)
```

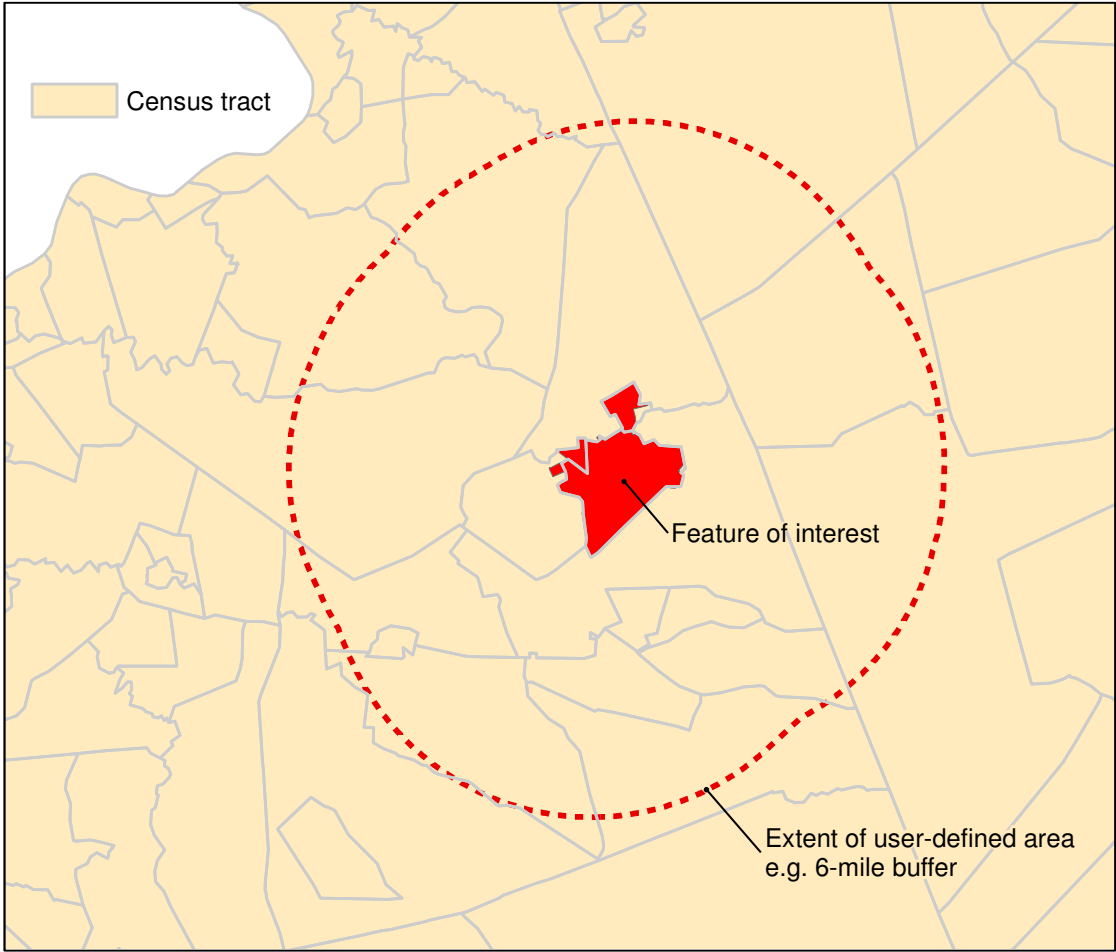


Figure 1 - Two input layers, the feature of interest and census tracts, along with a user-defined buffer defined using the Population Estimator tool.

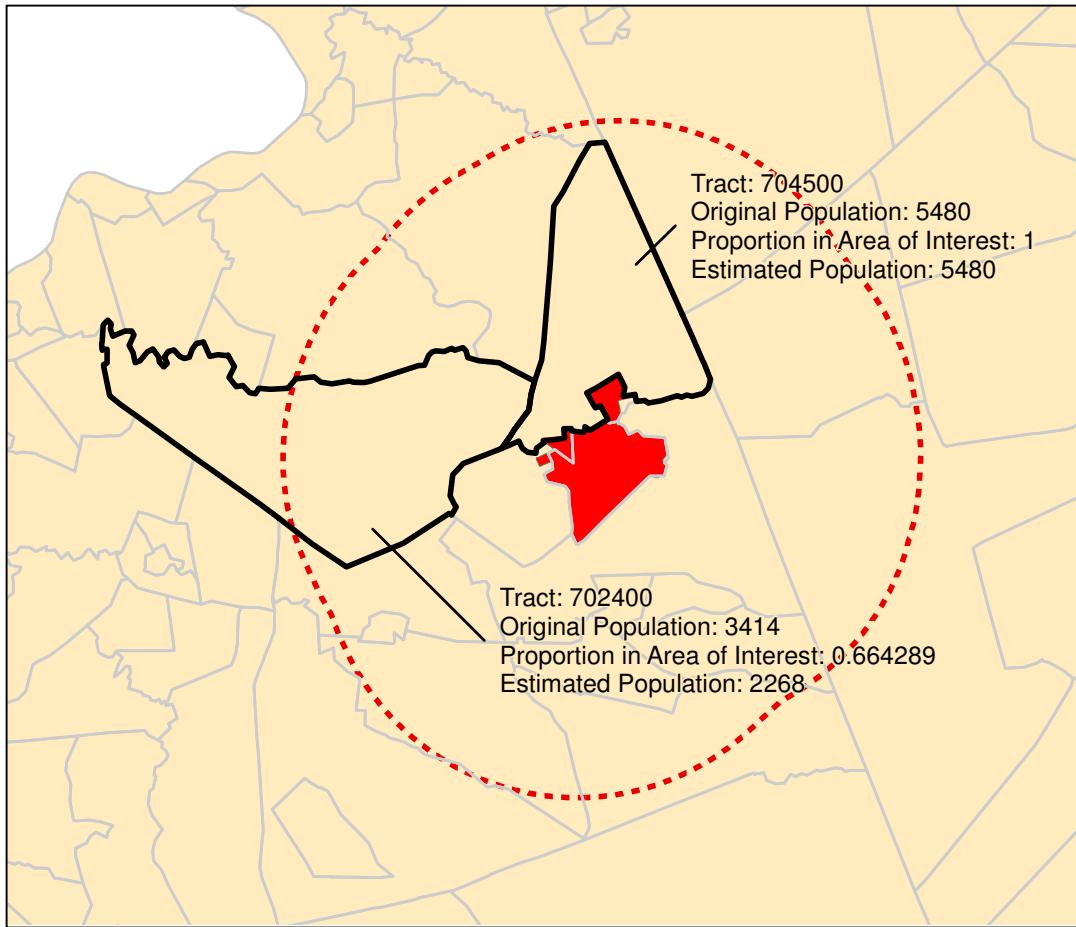
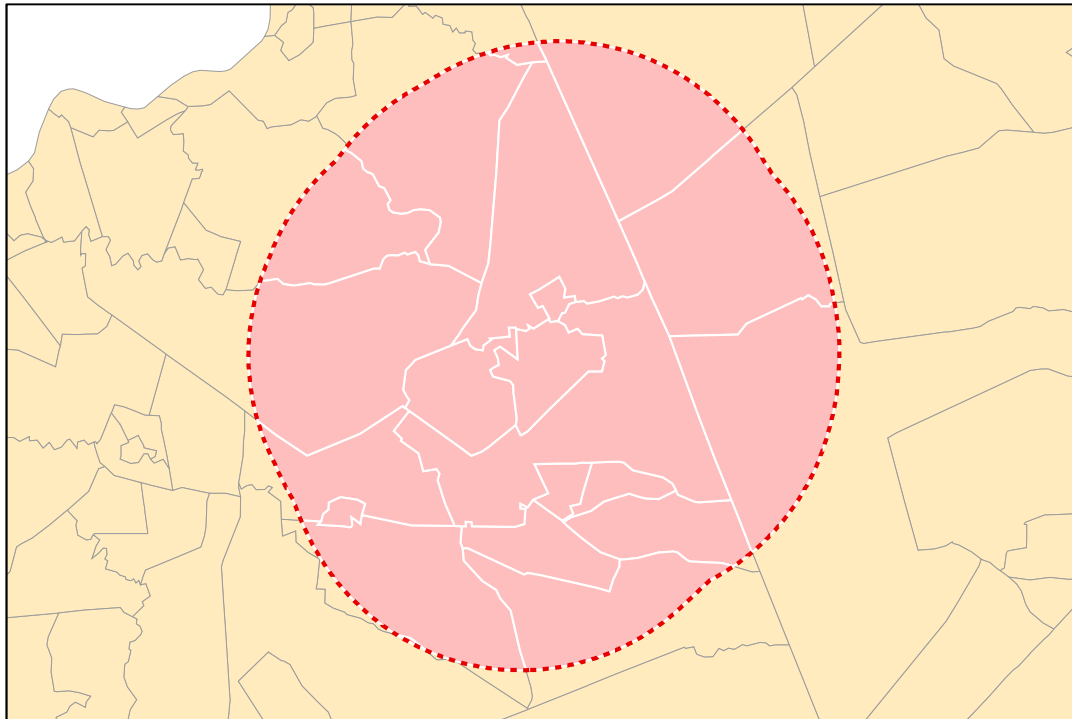


Figure 2 - For each tract, the tool calculates the proportion of tract area within the buffer, multiplies this area proportion by the population of the tract. If the user chooses the Individual or Dissolve options, the tool then sums the population counts of tracts within the buffer to estimate the population.



TRACT	TOTPOP	Shape_STAr	Shape_STLe	Orig_Area	Prop_Area	Prop_Perce	P_TOTPOP	BUFF_DIST
702207	3682	0.001256	0.193522	11920583.9745	11920583.8404	1	3682	6
704802	5318	0.001647	0.204482	15615603.6928	15615603.6295	1	5318	6
701401	6495	0.00545	0.387787	51606991.673	22284545.4572	0.431813	2805	6
702101	2887	0.000184	0.064367	1747286.75251	1747286.75479	1	2887	6
702203	3309	0.003983	0.335931	37800393.77	32297077.4869	0.854411	2827	6
702204	2289	0.002596	0.307252	24616396.7492	20418434.9019	0.829465	1899	6
702206	1875	0.001722	0.214571	16336727.4336	15891759.0039	0.972763	1824	6
702208	7064	0.004762	0.393277	45199191.1202	26674966.3528	0.590165	4169	6
702209	3065	0.000506	0.131215	4795038.14141	4795038.00884	1	3065	6
702210	4863	0.000385	0.095766	3654206.8232	3654206.97219	1	4863	6
702300	1409	0.000168	0.060899	1595587.45851	1595587.48256	1	1409	6
702400	3414	0.008056	0.51481	76345884.8468	50715699.521	0.664289	2268	6
704801	3122	0.005608	0.526682	53166007.6604	53166007.4122	1	3122	6
703201	3687	0.006972	0.586989	66184946.6718	122970.368399	0.001858	7	6
704302	4616	0.005608	0.374468	53083674.3294	36036850.6312	0.678869	3134	6
704500	5480	0.004695	0.360707	44465113.6195	44465113.3699	1	5480	6
982111	823	0.001225	0.177074	11609492.9027	11609493.0018	1	823	6
811900	6902	0.012913	0.513337	122154366.957	33144771.807	0.271335	1873	6
003001	6081	0.002784	0.276096	26328553.7334	1278339.66648	0.048553	295	6
718000	8421	0.005771	0.319516	54658510.4645	44566365.9783	0.81536	6866	6
739100	1563	0.015141	0.736313	143583347.453	43099401.0174	0.30017	469	6

Figure 3 – 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.

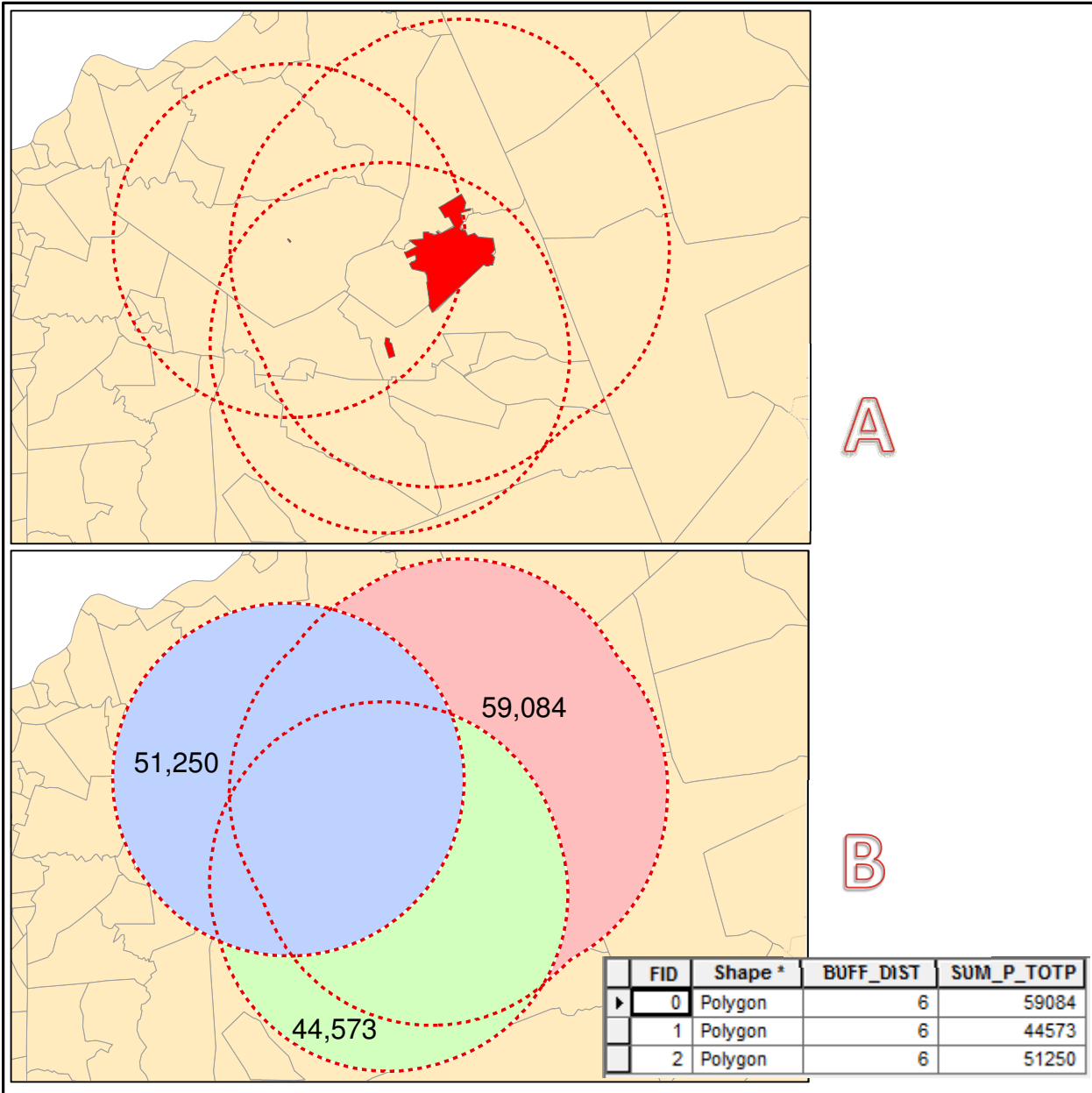


Figure 4 – **Individual** output feature layer and attribute table. Part A shows three features of interest, each surrounded by a 6-mile buffer. Part B shows the three output features and corresponding attribute table. In this example, the SUM_P_TOTP field is the estimated population for each of the three output features. Overlapping areas are counted multiple times, depending on the configuration of the overlap.

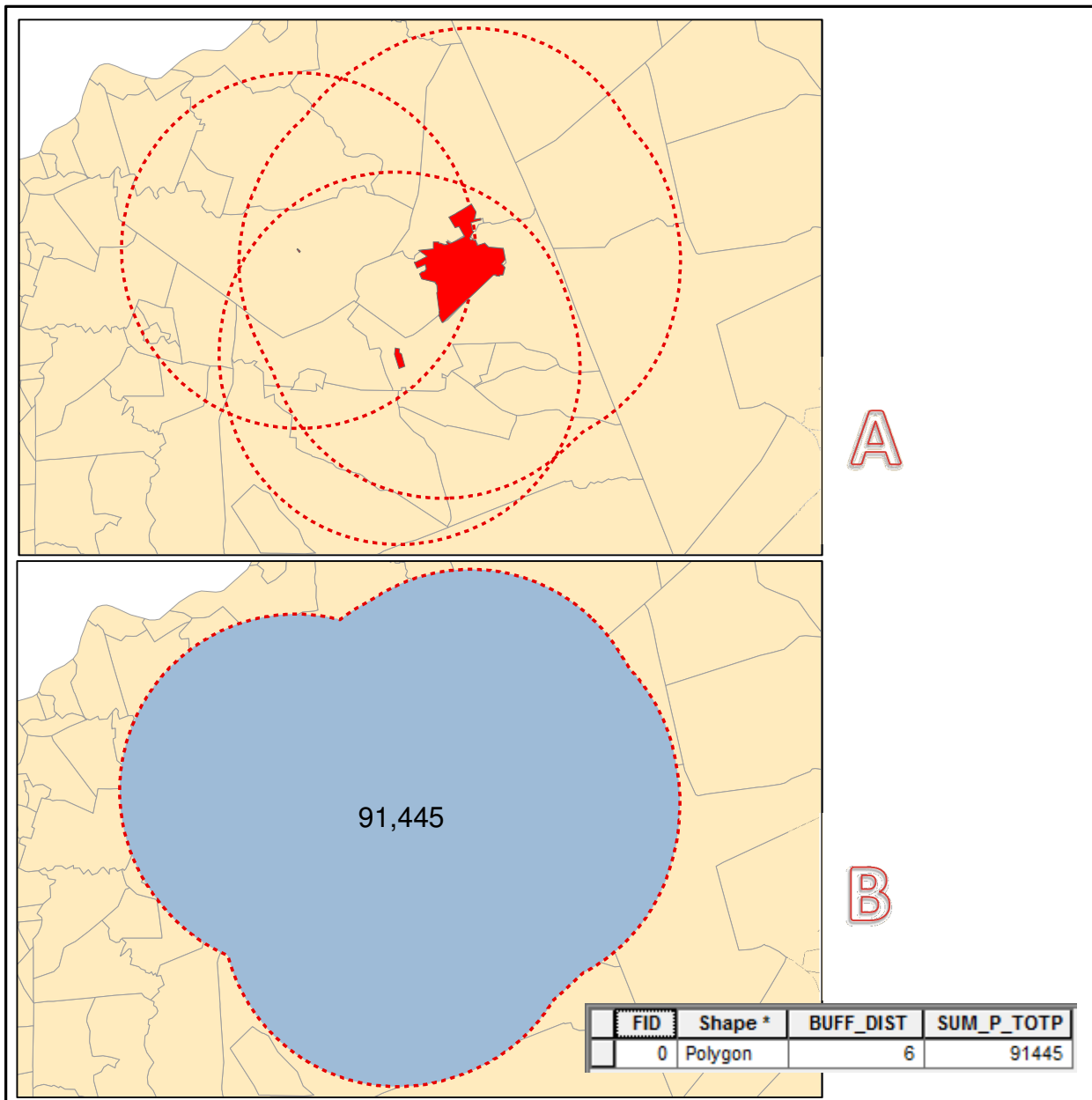


Figure 5 – **Dissolve** output feature layer and attribute table. Part A shows three features of interest, each surrounded by a 6-mile buffer. Part B shows the single output feature, the result of dissolving the buffers, and corresponding attribute table. In this example, the SUM_P_TOTP field is the estimated population for the entire buffered area.