Geospatial Analysis

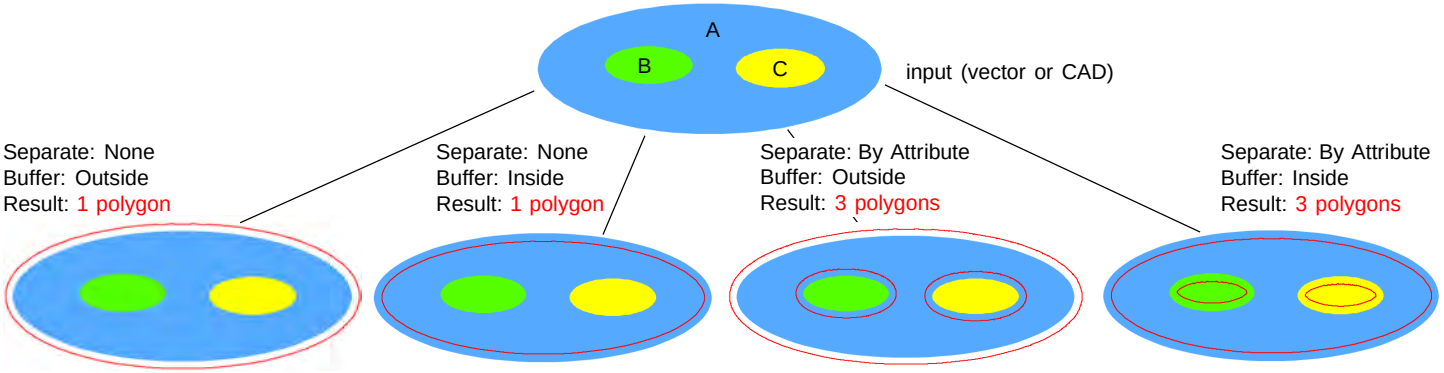
Buffer Zone Options for “Islands”

The Buffer Zones process lets you create buffer zones around all elements or only around interactively and/or query selected elements for maximum flexibility in determining which elements to buffer. The Buffer Zones process has many different option settings (see the Technical Guide entitled *Vector Analysis: Buffer Zone Generation*). Some of these settings have results that vary depending on other option settings. This TechGuide illustrates how the Separate By Attribute and By Element features are affected by the Use Polygons as Region option.

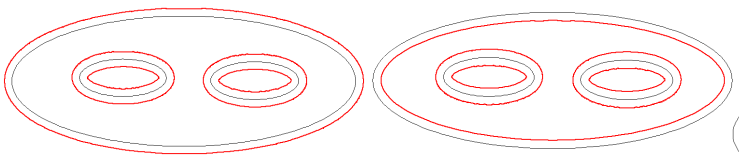
Make sure you change the Process option to Selected if you want to buffer only those elements that have been selected (marked). Elements can be selected for buffering using a variety of methods: you can mix and match use of the Mark by Query (from the Layer Manager) with selection using the mouse and the Select tool or using the checkbox for each record shown in the tabular view of a database table. The By Query processing option evaluates your entered query and buffers only those elements that satisfy the query without regard for any elements selected in the View window.

The Use Polygons as region option only produces different results when buffering vector polygons. Other object types do not have the polygonal topology required to generate polygon “holes” for islands and, thus, do not define polygon “holes” to preserve islands. The By Attribute and By Element choices for separation produce the same result when all elements have a unique attribute attached.

Each of the three ovals illustrated below has a unique attribute (A, B, or C). With the Separate option set to None, buffering produces a single oval either inside or outside the largest oval. The input illustrated could be vector or CAD but not a region because regions have no attributes.



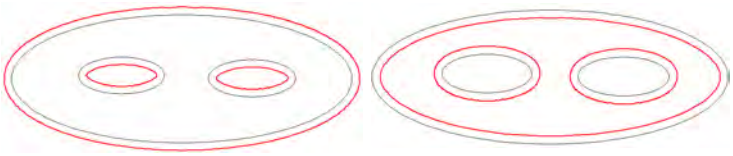
In a region object, nested polygons are treated as alternately outside and inside the region. When the Use Polygons as Region option is on for vector objects, islands in the polygons are treated as outside the polygons. In the example shown, polygons B and C are outside the region defined by polygon A. In the illustration below left, the buffer polygons inside polygons B and C are part of the outside buffer for polygon A while the next larger buffer polygons are outside polygons B and C. In the illustration below right, the buffer polygons inside polygons B and C are the inside buffer for polygons B and C while the next larger buffer polygons are inside buffers for polygon A. The results below apply to vector input only.



Separate: By Element (or unique Attribute)
Buffer: Outside
Use Polygons as Region: On
Result: 5 polygons

Separate: By Element (or unique Attribute)
Buffer: Inside
Use Polygons as Region: On
Result: 5 polygons

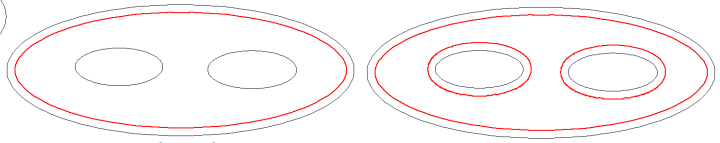
The results below apply to region object input only. Note the difference between these results and the vecor/CAD buffering results above.



Buffer: Outside
Result: 3 polygons

Buffer: Inside
Result: 3 polygons

The illustrations below show buffering results for a single selected vector polygon (polygon A). The other illustrations on this page use all polygons and no lines for buffer generation.



Process: Selected
Buffer: Polygons Inside
Separate: None
Use Polygons As Region: Off
Result: 1 polygon

Process: Selected
Buffer: Polygons Inside
Separate: None
Use Polygons As Region: On
Result: 3 polygons