

Chapter 7

Buffering in ArcGIS Desktop (ArcMap)



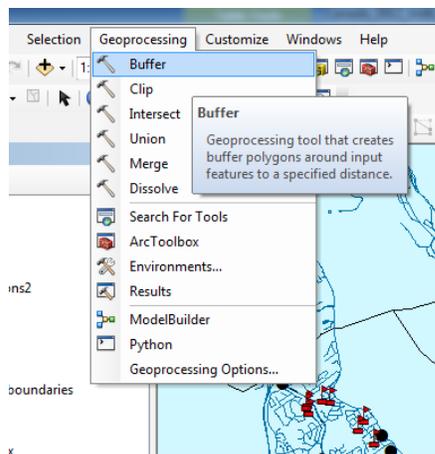
Summary: How far away is that? How many are too close? These are some of the most compelling mapping questions journalists can ask, and one of the most useful tools to answer them is the buffer. With ArcMap, journalists can draw buffers around points such as polluting factories, and see how many other points, such as daycares, are within close proximity. Or they can draw buffers along railways, to see how many homes are within a danger zone, as Jacques Marcoux of CBC Winnipeg did.

Skills you will learn: This tutorial will show you how to create buffers in ArcMap.

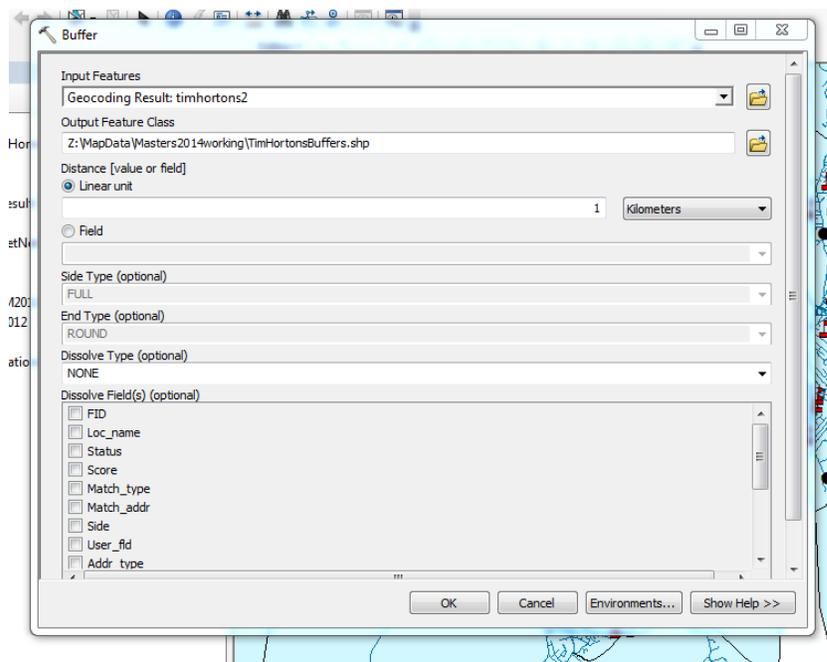
Getting started

The buffering tool allows you to draw circular buffers around points, or rectangular buffers on either side of lines or around the outside of polygons. The buffers are created as new shapefiles or feature classes in a file geodatabase. This makes it easier to identify, count or otherwise analyze other features that fall within the specified distance of the point, line or polygon features. For this tutorial, we'll draw circular buffers around Tim Horton's restaurant locations in Halifax, Nova Scotia.

Begin by choosing Buffer in the Geoprocessing menu:



That brings up the buffering dialogue.



In the Input Features text box, choose the shapefile or feature class that you wish to draw a buffer around. In the Output Feature Class text box, choose the file path and name for the shapefile that will be created.

The linear unit is the radius or width of the buffer, depending on whether the buffer is being drawn around a point feature, or along a line or polygon feature. As an alternative to specifying one, set distance, you can choose the Field radio button, and select an attribute field in the input layer that contains a number that represents the distance. This allows you to have buffers of different sizes around different features.

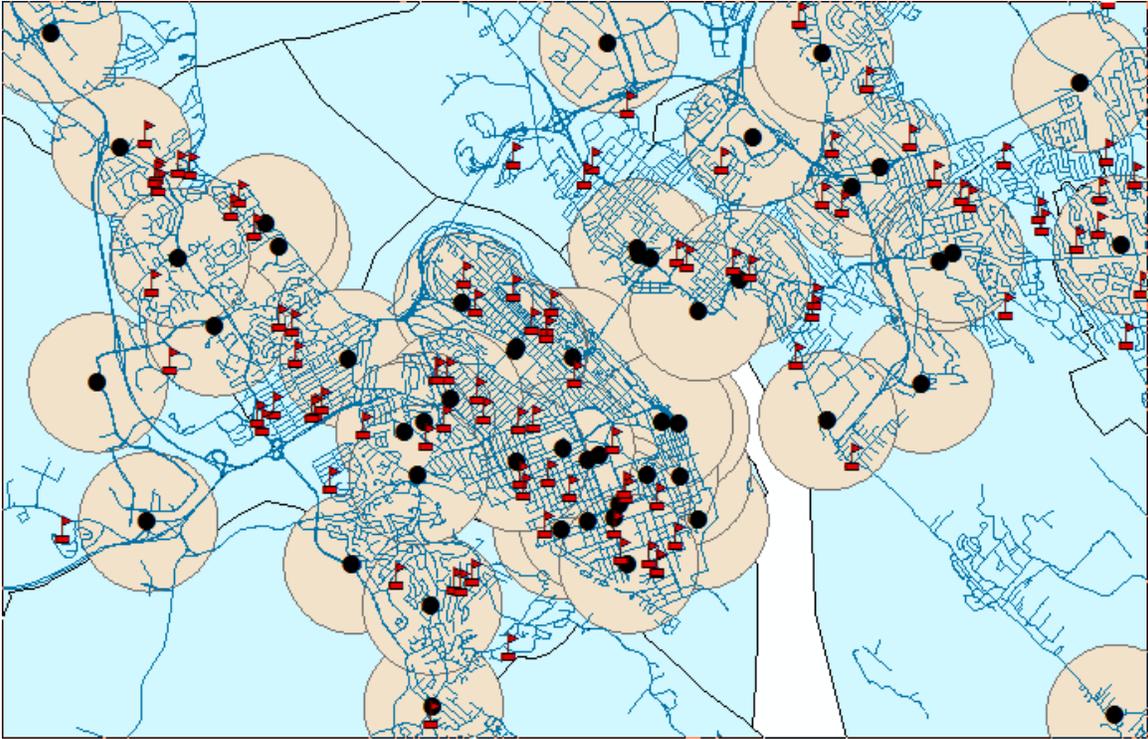
The 'method' parameter determines whether the buffers will be drawn as if on a flat plane, or taking into account the curvature of the earth ('geodesic' buffers). The geodesic buffer method can produce more accurate buffers when large buffers of tens or kilometres or more are being drawn. For a discussion of this issue, see this article from ArcMap maker Esri:

<http://www.esri.com/news/arcuser/0111/geodesic.html>

The 'dissolve type' parameter determines how the buffers will be drawn when they overlap. If the default value of "none" is retained, the buffers will not be dissolved and each one will be a separate polygon. If "all" is selected, buffers will be merged into a single polygon when they overlap.

Another parameter, the dissolve field(s), allows you to specify that the output polygons will be merged if one or more attributes from the input layer are shared by features around which buffers are being drawn. For example, if a city field were chosen here, and two points were in the same city, the buffers would be merged, but if they were in different cities, they would not be merged. The fields to be used for this are chosen in the lower area.

When you have finished choosing the options for your buffers, click OK and ArcGIS will create the buffers. In this example, 1 kilometre buffers have been drawn around Tim Hortons locations. The flagged icons are schools.



The buffers are polygons like any others, and can be used in further analysis, such as in spatial joins. A spatial join could be done to count how many schools are within a kilometre of each Tim Hortons, and the buffer polygons coloured accordingly. See the separate tutorial **Spatial Joins in ArcGIS Desktop**.