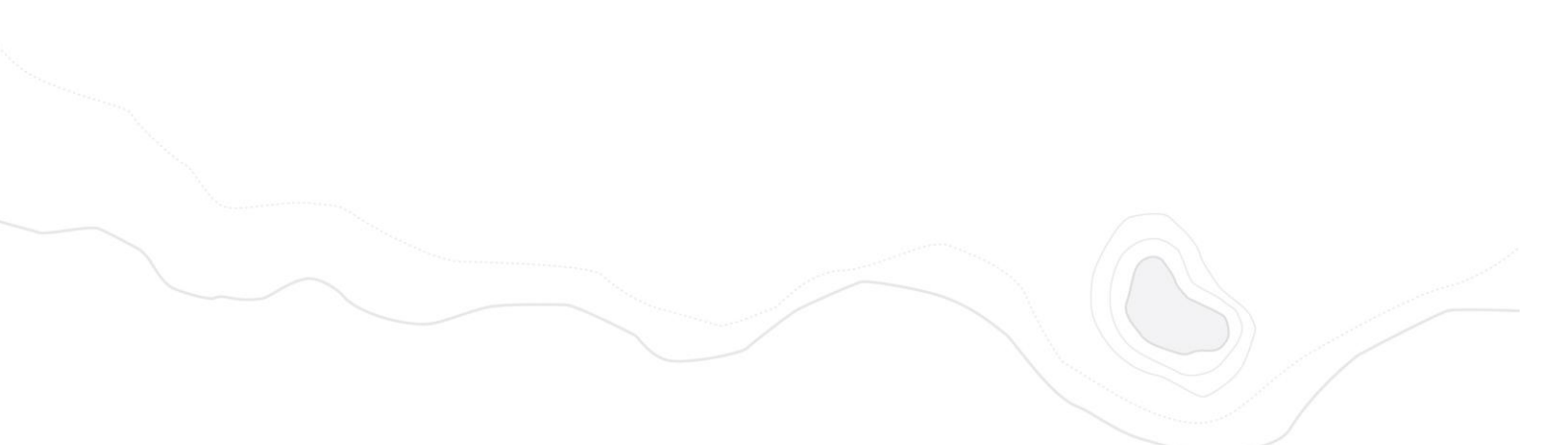





A horizontal banner at the top of the page showing a topographic map with contour lines and elevation markers (2, 4, 6, 7, 8) on a dark blue background.

Conducting spatial analysis with ArcMap

A decorative graphic at the bottom of the page consisting of light gray contour lines and a shaded area, mirroring the topographic map style.

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Conducting spatial analysis with ArcMap

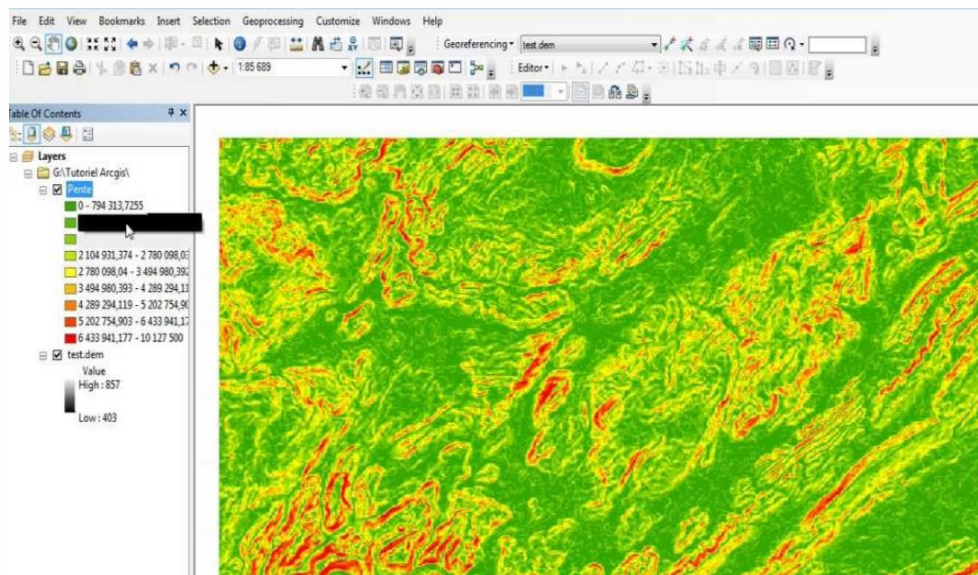
The ArcGIS Spatial Analyst extension offers a rich suite of tools and capabilities for performing comprehensive, raster-based spatial analysis. You can employ a wide range of data formats to combine datasets, interpret new data, and perform complex raster operations.

Examples of the analysis you can carry out with the extension include terrain analysis, surface modelling, surface interpolation, suitability modelling, hydrological analysis, statistical analysis and image classification.

The following are brief descriptions of the main components of ArcGIS Spatial Analyst. The most common way to access ArcGIS Spatial Analyst functionality is with the geoprocessing tools. This rich environment allows you to quickly and easily organise and execute the tools necessary to complete your analytic tasks, as well as providing a mechanism to automate, document and share your workflows.

In the geoprocessing framework, you can perform Spatial Analyst operations in these ways:

- Running individual [tool dialogs](#)
- Combine tools with [ModelBuilder](#) to automate workflows and create spatial models
- Automate workflows and create new tools with [Python](#)

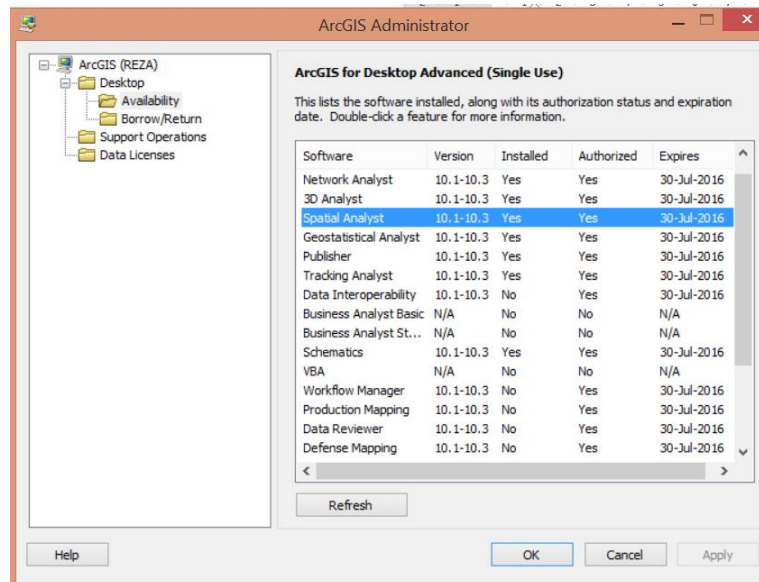


Using Spatial Analyst toolbox

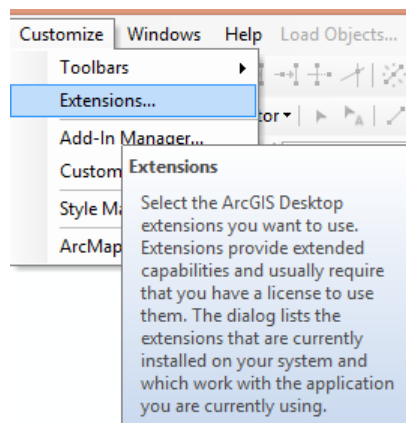
In this tutorial session, we will use the tools in Spatial Analyst toolbox.

Activate Spatial Analyst Toolbox

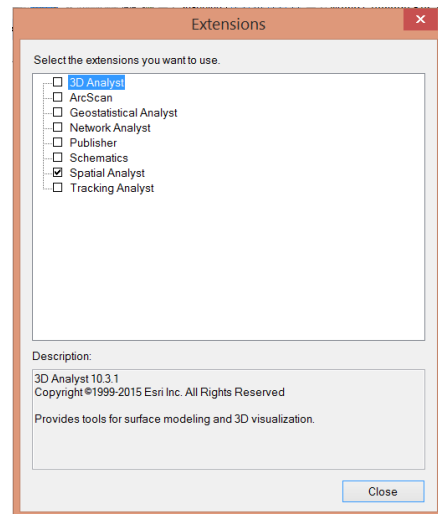
1. Make sure the Spatial Analyst extension has been provided by opening ArcGIS Administrator.



2. Open ArcMap, and in the main menu click 'customise' and choose 'extensions' in the sub menu.



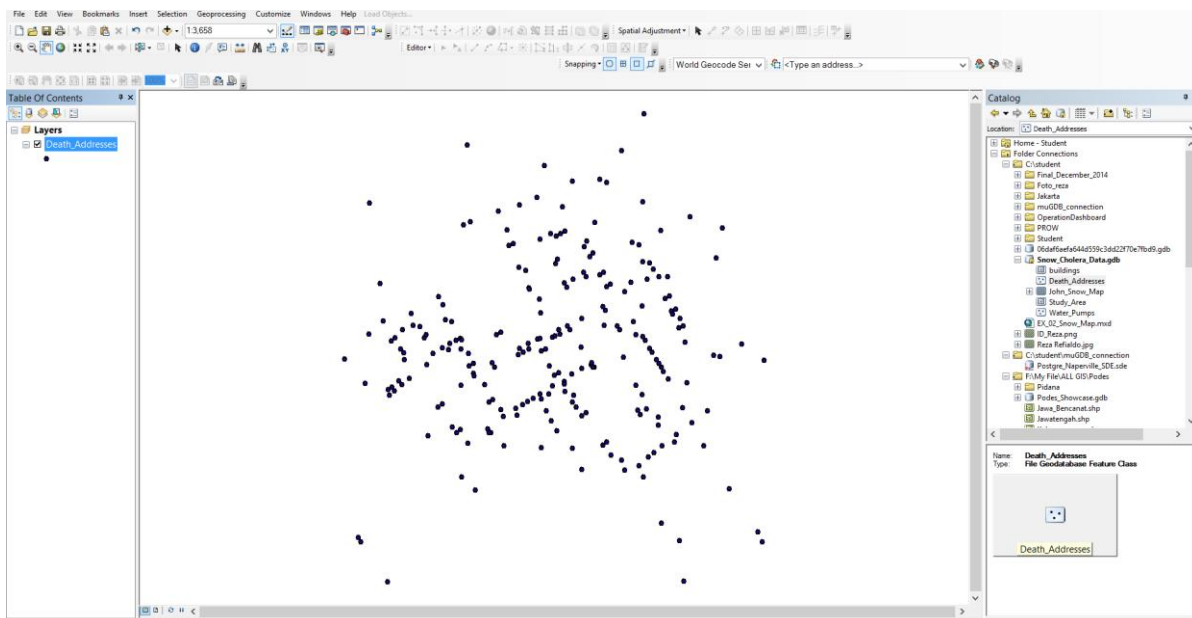
- In the extensions window, mark the Spatial Analyst box. This will activate the Spatial Analyst toolbox in ArcMap.



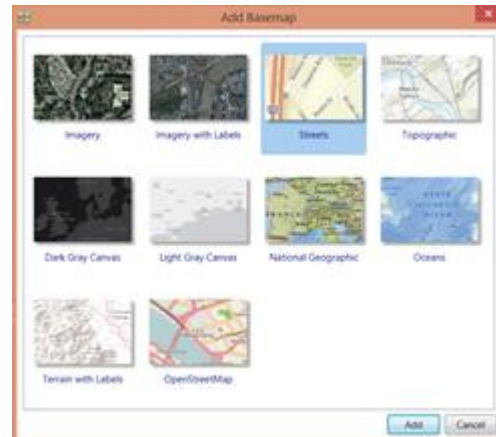
Using the Kernel Density tool in the Spatial Analyst toolbox

In this step, we will learn how to calculate the density of features in a neighbourhood around those features. For this case, we will use the case of death density caused by cholera disease in London, England.

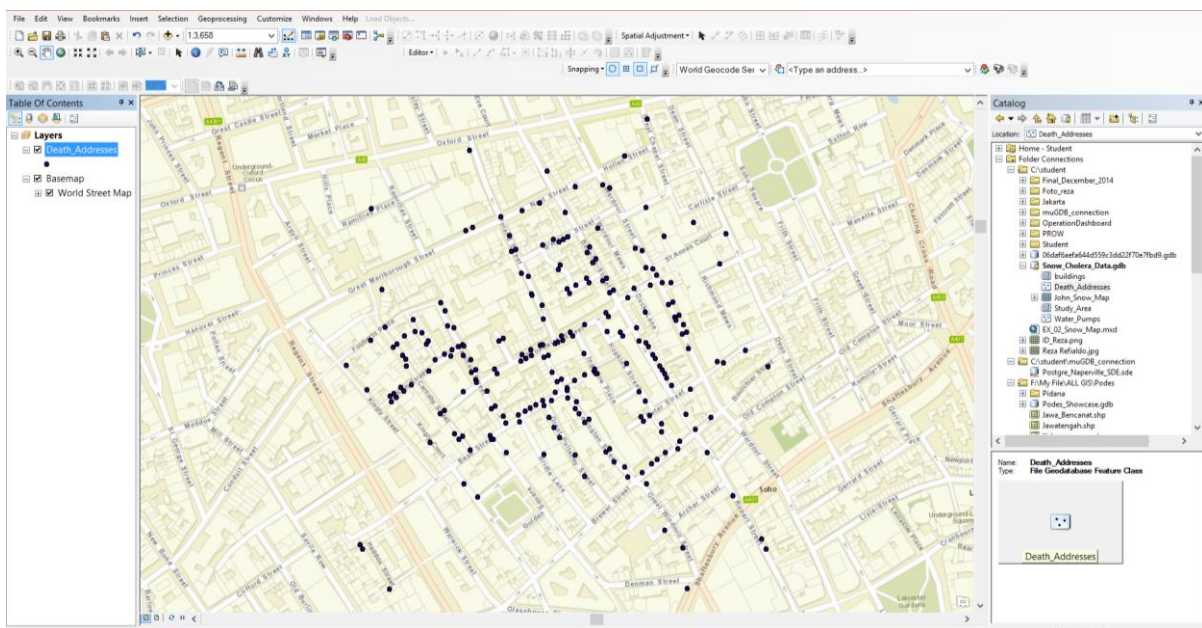
- Load the death distribution point data.



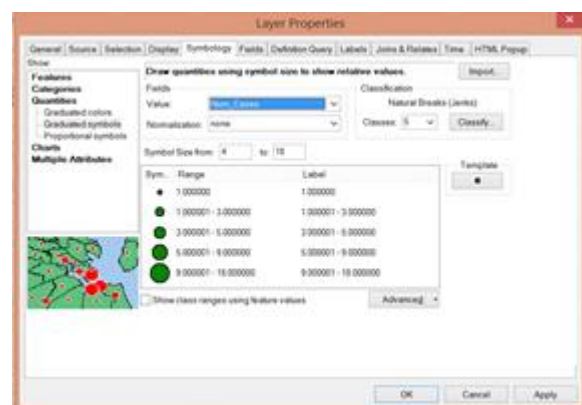
- To better determine the location of the incidents, add the streets base map.



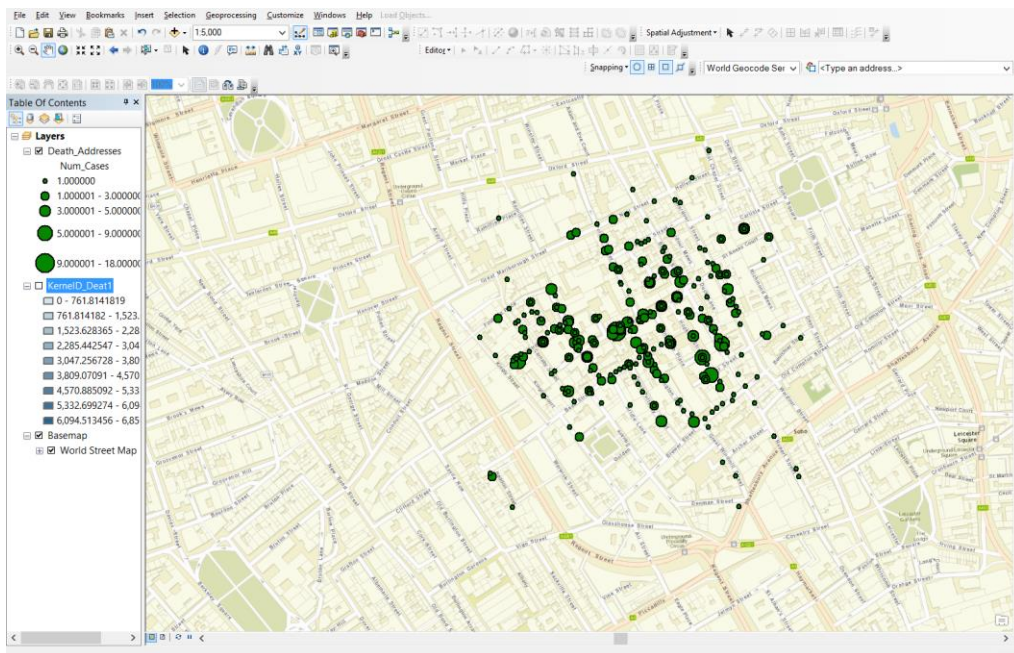
- Click 'add'. The base map will now be added to the map.



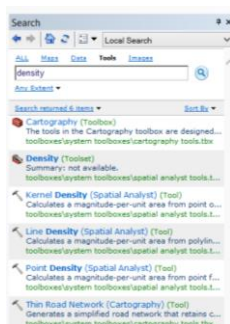
- Replace the point symbol with the proportional symbol to better reflect the number of occurrences at each point. Right click on the point and select 'properties', then click the symbol tab.



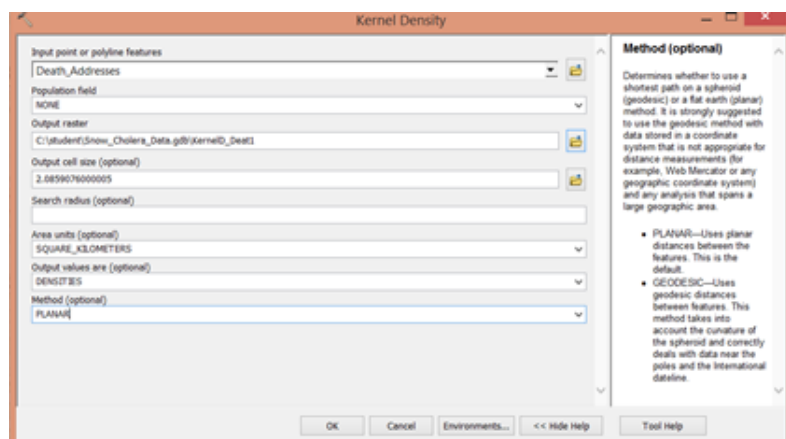
5. Click 'OK'.



6. Next, using search tools menu (Ctrl+F), select the Kernel Density tool.



7. Select the input point to be analysed and select square_kilometres as the area units.



8. Click 'OK'. A new raster layer will appear which describes density levels relating to the incidence of death due to cholera. The more blue colour shown, the higher the density.