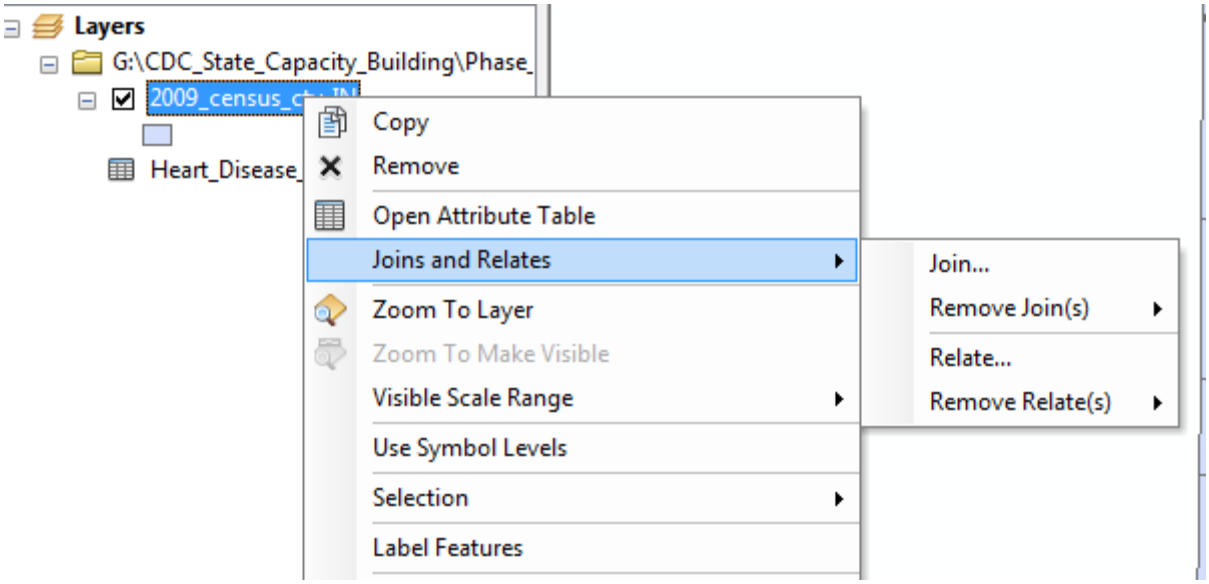
GIS III: **GIS Analysis**
Module 3: Introduction to Hotspot Analysis

*** Files needed for exercise: *2009_census_cty_IN.shp, Heart_Disease_Deaths_2003_2007_all_ages.dbf*

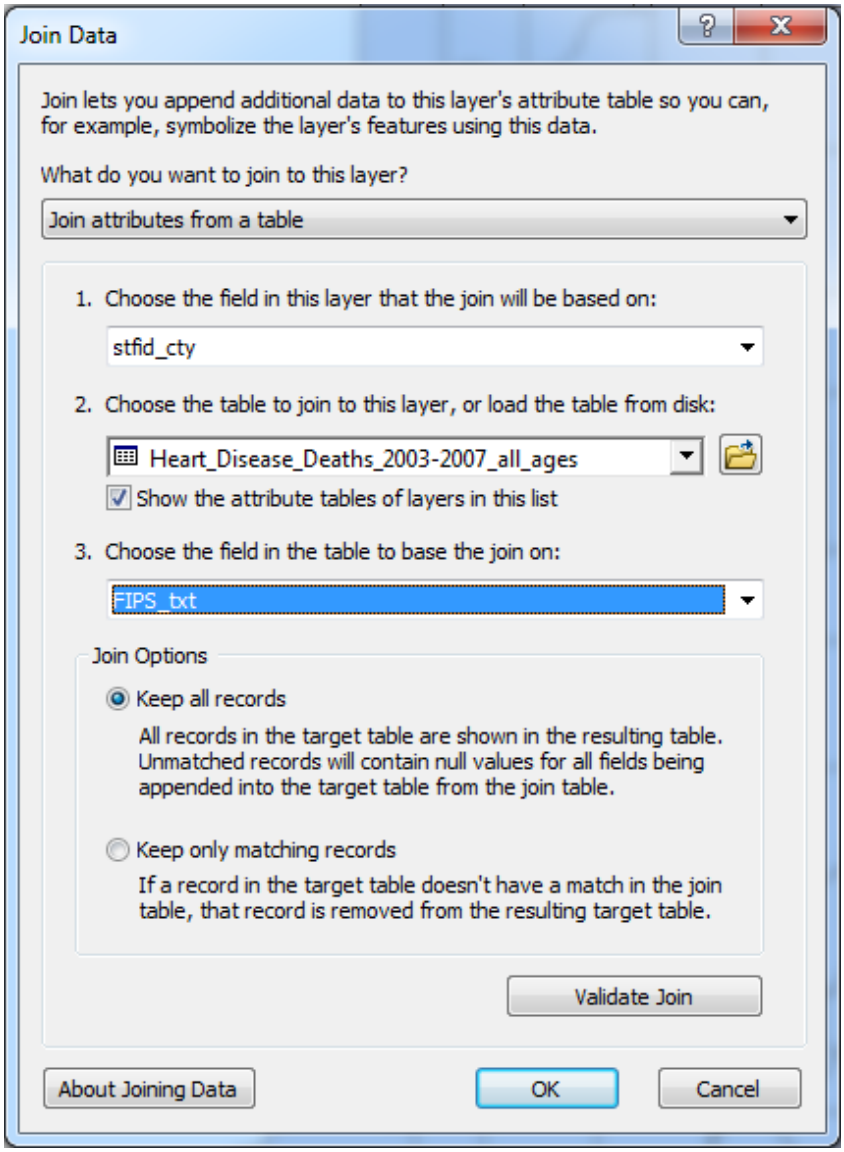
Goals: Perform analysis to check for significance in spatial clustering.

Joining data

1. Open ArcMap.
2. We want to see if the state of Indiana has any statistically significant hotspots of CVD related deaths in order to target those areas. Add both *2009_census_cty_IN.shp* and *Heart_Disease_Deaths_2003_2007_all_ages.dbf*.
3. We will need to join the data. Right click on the IN counties in the table of contents and choose **Joins and Relates** and then **Join**.



4. We want to join the field stfid_cty from our counties shapefile with the field FIPS_txt in our dbf.



5. Export your join to a permanent shapefile by right clicking and choosing **Data > Export Data**.
6. Symbolize your data according to the adjusted mortality rates in the CDC data. Choose to classify your data by quantiles.

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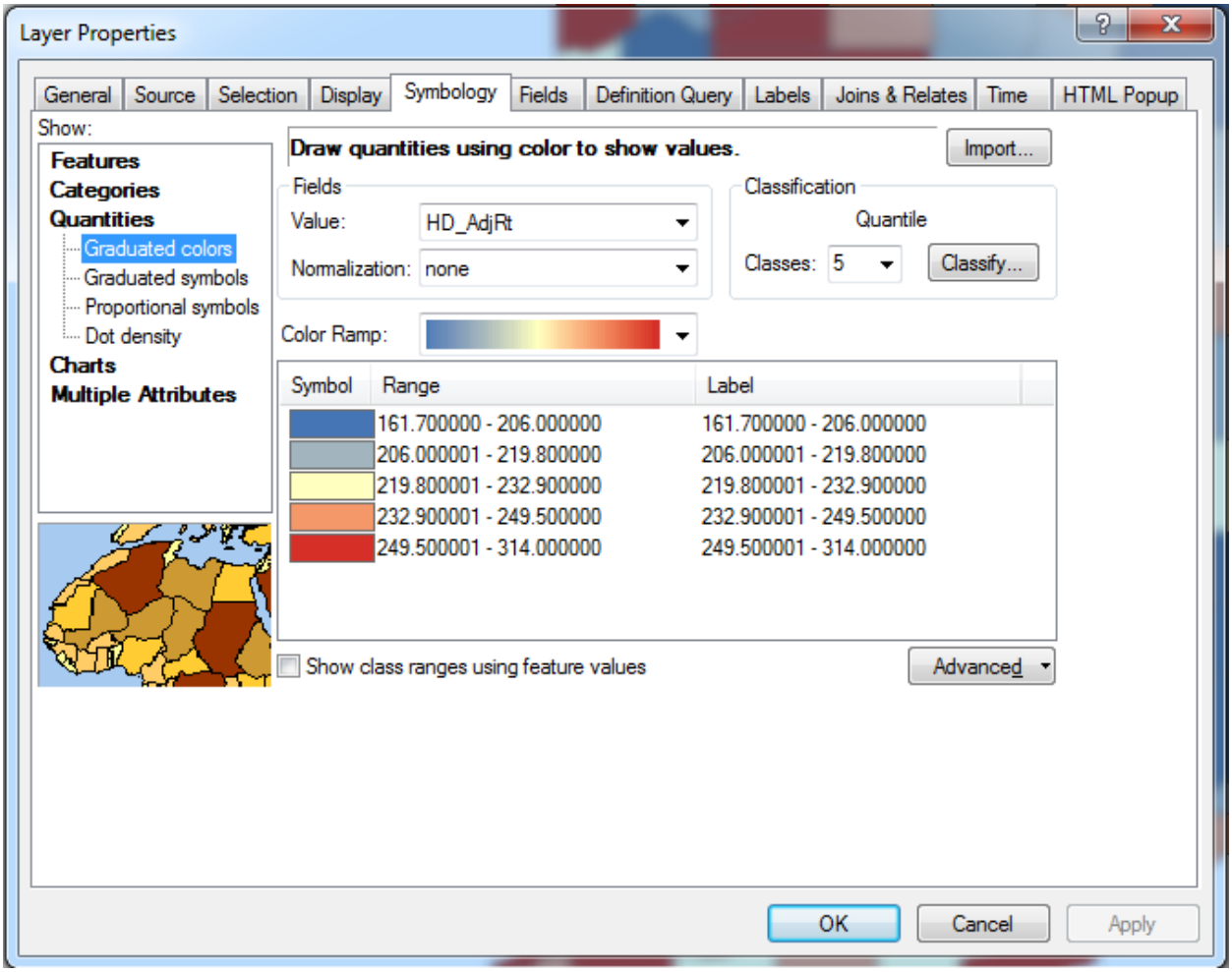
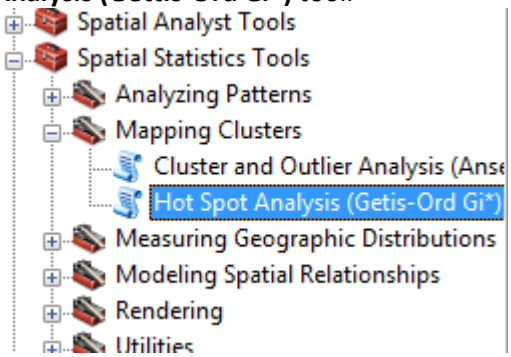


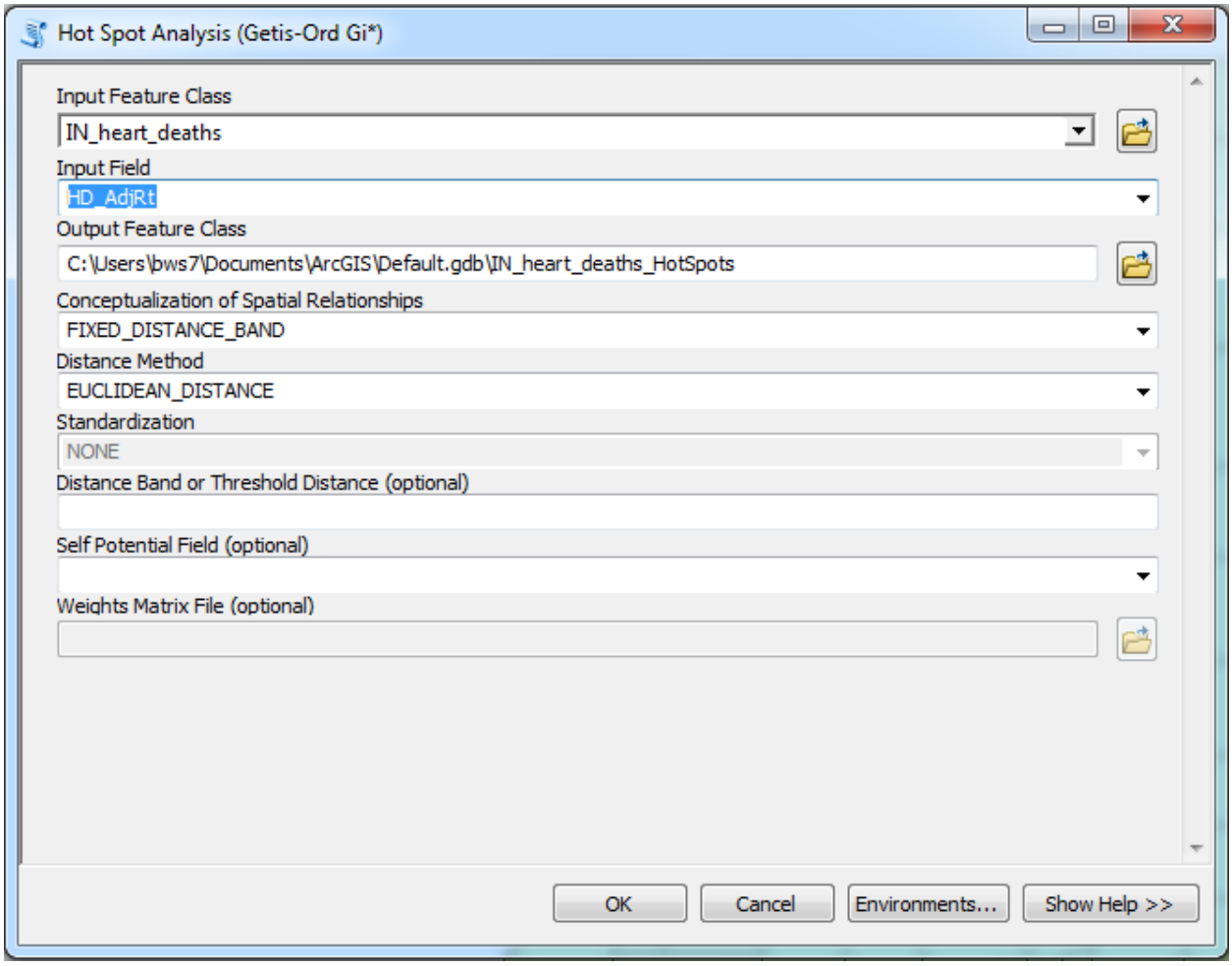
7. It appears as though we can see a hotspot in the southwest part of the state and the north part of the state, as well as cold spots in the northeast and northwest. Are these clusters real or are we being lied to by the way we symbolize and choose to look at the clusters?

Hotspot Analysis

1. In the Spatial Statistics Toolbox, open the Mapping Clusters toolset and find the **Hot Spot Analysis (Gettis-Ord Gi*)** tool.



2. Choose your newly exported joined shapefile as your Input Feature Class. Choose HD_AdjRt as your Input Field. Choose an output that makes sense and save it in a logical place.



3. For the Conceptualization of Spatial Relationships, we are going to choose the default, Fixed Distance Band.
4. Run the tool.
5. Which hotspots and coldspots were statistically significant?
6. Open up the table for your new hotspot analysis and look at the z scores and p values. Remember that a Z score further from zero indicates a higher amount of clustering.

If you have time…
Try other methods of conceptualizations of spatial relationships and see how the results change. Also try this analysis for your own state.