



Introduction to Geospatial Technology

Lesson 7: Geospatial Technology Applications – Public Health and Safety

Can you believe that as little as six inches of water can wash a car off of a road? Water is a natural resource that we cannot survive without but too much water at one time however, can be a problem. Drainage ditches in most cities can withstand a normal downpour but what happens when those are full? If the water eventually ends up in area lakes, what will happen will the lakes overflow? What about the quality of water that is involved in these runoff situations?

Your students will use ArcMap to display the state map, basins, major lakes, cities and interstates in Texas to answer various scenarios presented throughout this lesson. After opening a new empty map, they will add their first two data layers; one of state of Texas and of the basins of Texas. Editing the basin layer will enable the students to better visualize where each of the basins is located. In order to answer the first scenario they are challenged with, the students will need to label the basins and zoom in to a specific area on their map. The next scenario they are presented with will be that of a flooding situation. They will first need to add and edit an additional layer, Texas major lakes. They will query this layer by using Select by Attributes to find Lake Buchanan. After setting their selectable layer to major lakes, the students will use the select features tool to discover which water systems are below Lake Buchanan. They will export this data and add it to the map. To investigate which cities and interstates downstream might be affected by the flooding, the students will add these files also. They will use Select by Location to determine which cities are in danger of flooding. In the end, they will discover that only one interstate in the specified area is in jeopardy of flooding by one lake and will be able to name these two using the Identify tool.

In addition to the scenarios that are presented, there are also questions supplied throughout the lesson that can be answered by the students upon completing the lesson tasks.

Lesson Related Links:

<http://www.tceq.state.tx.us/>
http://en.wikipedia.org/wiki/Drainage_basin
<http://www.fema.gov/hazard/flood/index.shtm>

What Will You Teach?

- Editing Layer Properties
 - Renaming layers, changing the color and line width, editing symbology to unique values, selecting different color ramps, labeling features, exporting data
- Explore ArcMap navigational tools
 - Using Zoom In/Out tools, Full extent tool, Identify tool, Select Feature tool
- Querying data layers
 - Using Select by Attributes
 - Using Select by Location
- Sorting tabular data
- Creating a Map Layout
 - Determining page orientation, repositioning the data frame, establishing font size and position, creating an appropriate legend, selecting north arrow, inserting a scale bar, adding text to the layout
- Exporting and Printing a Map Layout

How Will You Teach It?

- Present this lesson's PowerPoint Presentation file: IGTL7 Presentation.ppt
- Have the students go through the lesson teaching them to create an ArcMap document, use their navigational and query tools to find answers and how to print and export a map.