



## Working with ArcVoyager: A Jump Start Lesson

### What's Hot: Mapping GLOBE Temperature Observations

This activity is designed to introduce you to ArcVoyager Special Edition, a Geographic Information System (GIS) designed especially for use in schools. A GIS is a system designed for displaying, analyzing and managing **spatial data** – information about places. A GIS combines maps with databases to provide you with tools to visualize information. Using ArcVoyager, you will visualize GLOBE student observations and examine the spatial patterns in the data. To complete this activity, you either can download data (atmospheric temperature protocol) from the GLOBE Data Archive or use the sample data provided in the GLOBE folder inside ArcVoyager (at\_march.txt).

1. Launch ArcVoyager. Go to the section *Designing Global Adventures: Point Me* section and follow the link to the United States projects. Open the United States - Reference Map project. This will provide a geographic context for the GLOBE observations. Turn off the State Capitals and the Major Rivers layers.



2. Add your data table containing Atmospheric Temperature observations to the project.

3. To visualize the data as a map, click on the **View** menu and select **Add Event Theme...** This converts the table into a point theme where each point represents an observation.



4. Use the **Theme Properties** to select one day's observations. Using the Query Builder, set the theme definition (e.g., [Yyyyymmdd] = 19990310).



5. Open the **Legend Editor** (double-click the theme name). Create a Graduated Color map of the observed maximum temperature (select Mxtmp as the Classification Field). Set the Null Data value to -99. This tells ArcVoyager to ignore the records when classifying the data. You may want to use the Equal Interval classification rather than the Natural Breaks classification. Select Temperature as the Color Ramp.



6. Describe the pattern you see.  
Where are the highest temperatures? \_\_\_\_\_  
Where are the lowest temperatures? \_\_\_\_\_  
Are there areas with a sharp contrast in temperature? \_\_\_\_\_



7. Zoom into the California and select only the observation points that fall within the state of California. To select several points, click on the **Select Features** tool and choose the Select by Box tool. Click and drag a box around California. The selected features will become highlighted in yellow.

-  8. Open the theme attribute table and sort the table in descending order on Mxtmp (maximum temperature). Use the **Promote** button to move the selected records to the top of the table.
-  Is there a large range of values? \_\_\_\_\_
-  Do you see any extreme values? \_\_\_\_\_
9. If you see extreme values, find them on the map.  
Are they similar or dissimilar to their neighbors? \_\_\_\_\_  
What do you think might explain these extreme values? \_\_\_\_\_
-  10. Zoom into the San Francisco Bay area of California. Use the **Theme Properties** to set the Label Field as Mxtmp. Label a few observation points. Describe the pattern you see.
-  Where are the higher temperatures? \_\_\_\_\_  
Where are the lower temperatures? \_\_\_\_\_
-  11. Select a few observation points (8-12) and create a column chart of maximum and minimum temperatures. Click the **Series from records/fields** button to see the maximum and minimum temperatures for a single day side-by-side.
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-  12. Find a site with a large difference between maximum and minimum temperatures and find it on the map. (**Hint:** click on a record in the chart with the **Identify** tool and the matching record on the map will flash.)  
Is it close to a body of water (the ocean or San Francisco Bay)? \_\_\_\_\_  
What is its elevation? \_\_\_\_\_
13. Find a site with a small difference between maximum and minimum temperatures and find it on the map.  
Is it close to a body of water (the ocean or San Francisco Bay)? \_\_\_\_\_  
What is its elevation? \_\_\_\_\_
14. Does there seem to be a constant relationship between temperature and proximity to a large water body? \_\_\_\_\_
15. Does there appear to be a constant relationship between temperature and elevation?  
\_\_\_\_\_
16. Zoom into to another area of the United States and repeat steps 10-15. Are your conclusions the same? \_\_\_\_\_
17. This activity has introduced you to some ways to visualize data using ArcVoyager. There are many more ways that ArcVoyager can be used to visualize and analyze data. Experiment with other GLOBE data protocols (e.g., land cover, precipitation, surface water) and with other types of maps. You can explore other areas of the world by opening any of the other projects in the *Designing Global Adventures: Point Me* section. To learn more about GIS and ArcVoyager, explore the ArcVoyager Guide.