



## A picture is worth a thousand observations: Exploring GLOBE data with GIS

With thousands of students, teachers and scientists collecting data worldwide, the GLOBE Program provides a wealth of data about the environment to be explored by everyone. All of this data is available to download from the GLOBE Program, and a variety of tools are available for examining it. Often, the easiest way to make sense of a large database is to see it in a picture such as a map or a chart. A Geographic Information System (GIS) makes it easy to map GLOBE data and see patterns that aren't obvious in a list of numbers. This tutorial guides you through the process of downloading GLOBE data and mapping it with ArcVoyager, a GIS designed especially for use in schools.

### 1. Downloading data from the GLOBE website:

Open your web browser and go to the GLOBE Program's homepage ([www.globe.gov](http://www.globe.gov)). Under the heading GLOBE Data, follow the link to the **Data Archive**.

Data can be retrieved in multiple ways:

- observations from all reporting sites for one or more measurement groups can be retrieved for a single day or multiple days
- observations from all reporting sites for a single measurement group for the duration of the GLOBE program can be retrieved.
- observations for a single site can be retrieved

To examine GLOBE data using ArcVoyager, you will want to retrieve observations from all reporting sites for the most recent day or some other time period (i.e., several consecutive days). For this example, you will retrieve data for one week so follow the link to **select any time period**.

You are presented with several options for formatting and retrieving data. For this tutorial, you want a small data set that will be easy to work with so select about a week's worth of observations. Select the measurement group(s) and dates of interest to you. Several data formatting options are available, but you must press the **More Options** button to see them. You can choose whichever Description options you wish. However, to use the data in ArcVoyager you need to choose specific Location, Date Format and Data Delimiter options.

**Location Options:** The data file must include Latitude/Longitude coordinates. You also can include school names, if you wish. To include school names, select **Both** (i.e., both Lat/Lon/Ele and School Name). If you do not want the names, simply select **Lat/Lon/Ele**.

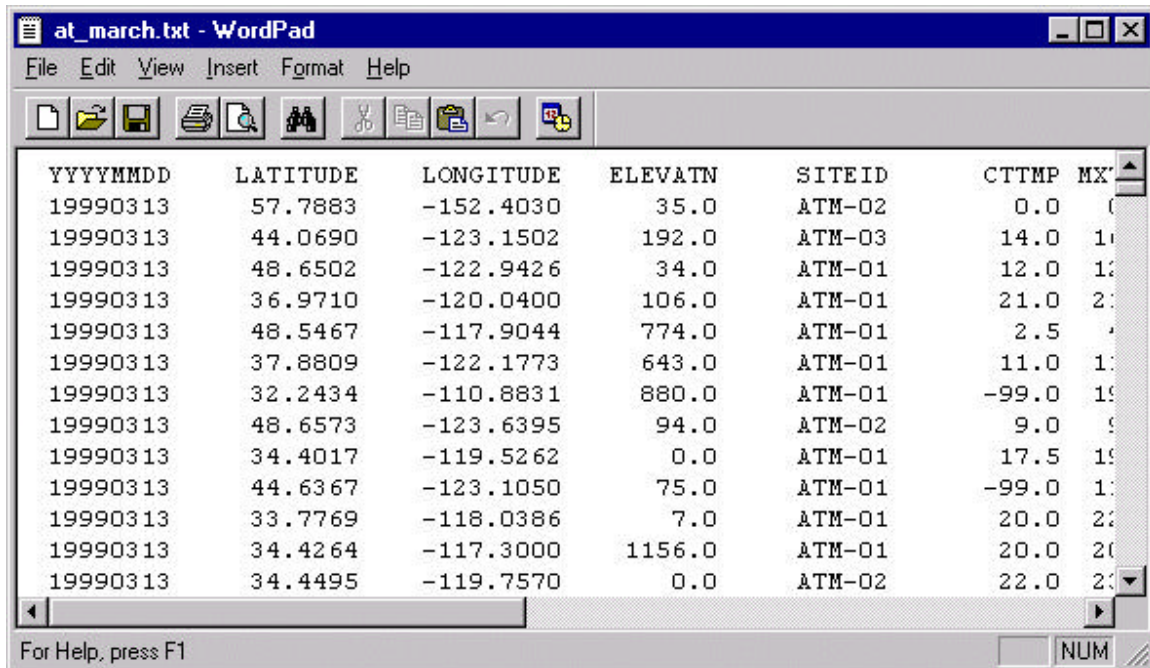
**Date Format Options:** Select **YYYYMMDD**.

**Data Delimiter Options:** Select **Tab**.

When you are satisfied with your choices, press the **Get Data** button. The selected data will be displayed in your browser. To use these data in ArcVoyager, you need to download them to your computer. Use the **Save As...** option to save this information to a text file. Be sure to select **Plain Text (.txt)** (Netscape) or **Text file (.txt)** (Internet Explorer) from the box labeled Save as type..

## 2. Editing the observation data:

You need to edit the data to remove any extraneous information. To edit the data, you can use either a text editor such as Wordpad, a spreadsheet program such as Excel, a database program such as Microsoft Works, or a word-processing program such as Word. Remove the extraneous information at the beginning and the end of the file, leaving only the column headers and the observations. Your file should look similar to the one below. Save the file as a Text document.



YYYYMMDD	LATITUDE	LONGITUDE	ELEVATN	SITEID	CTTMP	MX
19990313	57.7883	-152.4030	35.0	ATM-02	0.0	0
19990313	44.0690	-123.1502	192.0	ATM-03	14.0	10
19990313	48.6502	-122.9426	34.0	ATM-01	12.0	12
19990313	36.9710	-120.0400	106.0	ATM-01	21.0	20
19990313	48.5467	-117.9044	774.0	ATM-01	2.5	4
19990313	37.8809	-122.1773	643.0	ATM-01	11.0	10
19990313	32.2434	-110.8831	880.0	ATM-01	-99.0	19
19990313	48.6573	-123.6395	94.0	ATM-02	9.0	9
19990313	34.4017	-119.5262	0.0	ATM-01	17.5	19
19990313	44.6367	-123.1050	75.0	ATM-01	-99.0	10
19990313	33.7769	-118.0386	7.0	ATM-01	20.0	20
19990313	34.4264	-117.3000	1156.0	ATM-01	20.0	20
19990313	34.4495	-119.7570	0.0	ATM-02	22.0	20

## 3. Mapping the observations with ArcVoyager:

Launch ArcVoyager. Open one of the projects in either the *Designing Global Adventures: Point Me* section or the *Creating New Worlds: Turn Me Loose* section.



Click the Add Table button. Select **Delimited Text (.txt)** as the file type and select your file. A new table will be created. Review the table to make sure there are no empty cells. (If the table contains empty cells or the columns don't appear to match up there probably are formatting problems in the text file. You will need to exit ArcVoyager and edit the text file again.) Close the table.

From the **View** menu, select **Add Event Theme...** In the Add Event Theme dialog box, make sure your table is selected in the box labeled **Table:**. ArcVoyager automatically will select the field named Long as the **X field** and the field named Lat as the **Y field**. Click OK to create a new theme from the table. This theme will be added to the view.

You now can map or analyze this data using ArcVoyager. Remember that there may be multiple observations for a single reporting location. If so, there will be multiple points on the map at that location although you will see only the top point. When mapping or analyzing the data, it may be necessary to select a single day's observations. Below is a map showing the reported maximum temperature (degrees Celsius) for September 18, 1998 in the coterminous United States.

