

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Task:** Precipitation Anomalies in the Sahel 1930 - 2013

**Unit:** Aerosol Data Unit

**Module:** Atmosphere

The Sahel is located in a climate transition zone between the dry Sahara Desert and above Central South Africa that enjoys of tropical weather. This Region is vulnerable to climate changes because of its arid weather due to its' geography.

### Step I

1. Open Excel and go to File Menu and open a **New Workbook**.
2. Go to File and select **Import**
3. The pop up screen will appear: What type of File you want to import? Select **csv**.  
**Note:** the file name at the end has the initials **.csv**, some times it will be a text file, in that case at the end of the file after the period will appear **.txt**) This how you can tell what type of file your importing.
4. Search for the File Name: **Sahel Precipitation Anomaly.csv**
5. The Text Import Wizard window will open.
6. Click on **Delimited** then click **Next**
7. Select:  **Tab**:  **Space**:  **Comma** then click next.
8. On Column Data Format: select **General**
9. Import Data: click **OK** then click **Finish**
10. Save the spreadsheet with the same file name and your initials at the end or follow instructions on how to save the spreadsheet. Save it in a folder in a drive that can easily be accessed.

### Step II

1. Graph the precipitation anomaly of the Sahel. Highlight simultaneously the year Column B and Column C (precipitation). Go to **Chart** and select **Scatter** the select **Straight Marked Scatter**.
2. Change the X Axis Text Box. Click twice on the X-Axis values and the X-Axis Format window will pop up. If that doesn't work can click on the X-Axis when the text box is showing Go to Format and select Axis 1 the format window will show.
3. Change X-Axis Scale. Change the Minimum value to 1930. Change the Maximum value to 2013.
4. Change X-Axis Text Layout. In the pop up X-Axis Format box go to **Text Box** to **Change the Direction** of the text (years) click on the down arrow and **select Rotate to 90° Counterclockwise**. Notice how the years on the X-Axis shift to 90° degree angle, now they can me read. Expand the chart by placing the cursor on the four dots on either side of the blue frame of the graph. Make sure the cursor is a bar not a cross, click holding down and move the cursor in the direction that will stretch the graph.

5. Label the Graph. Go to **Chart Layout** click on **Axis Titles** select X Axis and when the text box pop ups on the graph wright **Year**. Do the same for the Y-Axis; label it Precipitation Anomaly (mm).
6. Add a Title to the graph. Go to Chart Layout and click on **Chart Title**. Select **Title from Above** write **Sahel Precipitation Anomaly 1930 – 2013**.
7. Add Trendline. Click on the graph. Go to Chart Layout and select Trendline, select Linear Trendline. The color of the trendline and the weight (thickness) can be changes. Click on the trendline on the graph so that it is highlighted. Then go to the **Trendline menu** and select **Trendline Options**, select **Line** pick a color from the Color menu. Go to **Weights and Arrows** and click on **Line** and select the width of the line.

### **Analysis Questions:**

1. When did the levels of precipitation in the Sahel begin to decline?
2. According to the graph what year, decades where the worst in terms of levels of precipitation?
3. Compare the graph to the North Atlantic Sea Surface Temperature graph. What do these two graphs have in common?
4. What inference can you make about the trend line of the Sahel Precipitation Anomaly graph and the trend line of the North Atlantic Sea Surface Temperature?  
Hint: The North Atlantic exerts and influence in the weather of the Sahel.
5. How do changes in the surface temperatures of the North Atlantic affect the levels of precipitation of the Sahel?