COMET Climate Variability and Change Virtual Course October 2011

Statistics Lab Directions

This lab is a self-paced exercise consisting of written answers for questions organized in three sections plus one optional topic. Please respond to these questions on the Statistics Lab Forum. You may work together with your learning partners at your office location, *except where specified otherwise (in Italics)*. You should work 1 hour and stop regardless of whether you complete all three/four assignments or not (this is needed to assess an average virtual learning pace).

Section 1: How normal is the climate normal?

by [Marina Timofeyeva](#) - Thursday, September 29, 2011, 04:21 PM

This is an interesting question to examine. There are several different meanings in using this statistical term.

Conversational Approach. Very often people refer to climate normal to assess the "usual or typical" climate state at an area or a location. "Usual" or "Typical" in the language of statistics means the most frequently occurring.

Technical Approach. To complicate the story, the term "normal" implies usage of a Normal distribution properties. In case of Climate Variable Normal, it means a Normal Distribution was fit to the climate data.

NWS Directive Approach. Use the NWS Directives 10-1004 on Climate Records http://www.weather.gov/directives/sym/pd01010004curr.pdf to get the definition.

Question for you to think about: *How would you explain what the climate normal is to a curious and statistically-savvy customer at your local office?*

Exercise for you to do:

1. Obtain your local office area climate normal using xmACIS, located at http://xmacis.nrcc.cornell.edu/*, using the drop down menus to select the *Daily/Monthly Normals* or *Temperature/Precipitation Graphs*.

***NOTE*:** To access this site you have to use your NOAA computer. If you are tele-working today use http://www.cdc.noaa.gov/data/usstations/

2. Share with the group what your climate normal is?

3. Be prepared to discuss your case.

Section 2: How does the correlation work?

by [Marina Timofeyeva](#) - Thursday, September 29, 2011, 04:20 PM

You are responsible for identifying possible local climate signals for conducting local studies at your office. The Climate Diagnostic Center website is one possible resource for this investigation.

Go to: http://www.cdc.noaa.gov/USclimate/Correlation/.

This is the Monthly/Seasonal Correlation Page, which allows one to plot correlations of US climate division data with atmospheric/oceanic time series. Please see an example here.

Another possibility is to go to: http://www.cdc.noaa.gov/Correlation/

This is the Linear Correlations in Atmospheric Seasonal/Monthly Averages Page, which allows one to plot correlations and regressions of atmospheric variables, using NCEP Reanalysis Data, with atmospheric/oceanic time series. Please see an example here.

After you see the example, please do the following exercise on your own:

1. Select a variable, month/season, time series and other parameters of interest to you.
2. Generate a plot and save the image on your computer.
3. Please reply to this message to share the rationale for your selections, provide your interpretation of the results and upload your image.
4. Discuss inputs with other participants on this forum or at your location.
5. Be prepared to discuss your correlation output.

Section 3: How are the statistics applied?

by Marina Timofeyeva - Thursday, September 29, 2011, 04:20 PM

Examine different CPC websites and explain how statistics are used and what they mean in the specific content of CPC discussions, products and statements.

Use reply to answer the following questions:
1. Describe the anomaly used in CPC ENSO Alert System
http://www.cpc.noaa.gov/products/analysis_monitoring/enso_advisory/enso-alert-readme.shtml

2. In reference to trends at CPC seasonal outlook discussion,
(http://www.cpc.noaa.gov/products/predictions/90day/fxus05.html) what statistical method did CPC use in their computations of the trend?

3. CPC produces climate forecasts (http://www.cpc.noaa.gov/products/forecasts/) for 3 categories Below-, Near- and Above- Normal. What statistics are used in the definition of these categories?

Section 4: (Optional) What can be known from histograms?
by Marina Timofeyeva - Thursday, September 29, 2011, 04:19 PM

Histograms and distribution statistics describe a climate variable character. Each story is unique and informative for understanding local climate and communicating this to the NWS users. Here is one example...

The NOAA tool we can apply for such exercise is located at http://www.cdc.noaa.gov/data/usstations/

1. Select a state of your WFO location,

2. Select option for Data Distribution Plots and hit Submit button

3. Specify a site of your interest, Climate Variable, Time range, and hit Submit button. **Hint**: you may choose to examine composite histograms and statistics for selected period of observations. Use years for El NIno / La Nina, provided at http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml

4. Save your plot and use reply to this message to share your story with the group.

5. Be prepared to discuss

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