Questions and Answers for Practical

**IMPORTANT CODE UPDATE** – the map\_transform function in practical notebook was correct but the version in country\_notebook was broken. I’ve created an updated version of country notebook at this link which you can download or else replace the broken version of that function with the working version from the practical notebook.

**What are the variables and how should I analyze them?**

Variables recorded separately at each point:

* TREFHT = Mean surface air temperature (annual or seasonal)
* TREFHTMX = Maximum recorded surface air temperature in any model timestep (30-minute intervals) within that period (Best to focus on annual value)
* PRECT = Mean precipitation rate (annual or seasonal)
* PRECTMX = Maximum recorded precipitation rate in any timestep (Best to focus on annual value)
* P-E = Mean precipitation minus evaporation rate (annual or seasonal)

It is worth taking the time-mean of all variables over the 20-year interval I suggested when producing maps. For example, for TREFHTMX this would give you a map of the average hottest temperature in a year over that period for every gridcell.

If you want to make a timeseries over your region it is worth noting that the mean variables (TREFHT, PRECT, P-E) average a lot of data together so they should be much less variable than the maximum variables which take only one data point per year.

OTHER STUFF

Jupyter notebook - You don't need to hand this in and you can keep working on it past the 26th. I will only be looking at the figures that you put into your report.

We could skype with share-screen during office hours today (13:00 - 15:00) or during the practical hours and office hours on Thursday (11:00 - 13:00, 14:00 - 16:00).

**Editing color bars – Make Part of Course**

The code copied below from Section 4 of the practical notebook has been changed to show different colorbar ranges and to use a different “colormap”. You can find the list of colormaps here with their letter-codes: <https://matplotlib.org/3.1.0/tutorials/colors/colormaps.html>

bounds = np.linspace(-10,10,21) # this just creates a list of 21 numbers from -10, to 10, in steps of 1.

bounds = np.linspace(-8,8,17) # this just creates a list of 17 numbers from -8, to 8, in steps of 1.

bounds = np.linspace(-5,5,21) # this just creates a list of 21 numbers from -5, to 5 in steps of 0.5.  
norm = colors.BoundaryNorm(boundaries=bounds, ncolors=256)  
cs = m.contourf(x, y, map\_data, 11, norm=norm, cmap=plt.cm.BrBG, levels=bounds, extend='both')  
cbar = plt.colorbar(cs, orientation='horizontal', shrink = 0.9, extend='both')

Avoid using assymettric colorbar ranges (e.g. -2 to 10), it is much harder to set these up. Please avoid rainbow colormaps for anomalies, it’s best to have anomaly colorbars centred on a neutral color like gray, white or perhaps yellow.