

# Brain workout #3: investigating SST anomalies in the Nino 3.4 region.

Goal: produce and interpret a SST anomaly time series

1. Access monthly SST data from here:

[https://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.EMC/.CMB/.GLOBAL/.Reyn\\_SmithOlv2/.monthly/.sst/](https://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.EMC/.CMB/.GLOBAL/.Reyn_SmithOlv2/.monthly/.sst/)

2. In the “Data Selection” tab, enter the latitude and longitude boundaries for the Nino 3.4 region. For reference the Nino3.4 region is defined by 5N-5S, 170W-120W. Use the time period between Jan 1995- Dec 2022.

3. In the “Data Filters” tab, select the function that allows you to A) calculate anomalies and B) average over both latitude AND longitude.

4. From the “Views” tab, plot the SST anomaly time series as a bar plot. Be sure to adjust the anomaly range from -2.5 to +2.5

Now, you should have a time series of SST anomalies for the Nino 3.4 region. Given what you know about anomalies, how would you calculate what the Dec 2016 SST was for the area averaged Nino3.4 region? (Hint: you will need to know something about the Dec SST climatology for the area averaged Nino 3.4 region. How could you derive / calculate what that climo would be (think lab 1)? Then, how would you apply the climo to the anomaly to ascertain the actual SST for Dec 2016 for the area average Nino 3.4 region?)

The above requires you to think and apply concepts from lab 1.

Assignment:

1. Submit a monthly SST anomaly time series plot for the area averaged Nino 3.4 region from 1995-2022. The anomaly scale must be between -2.5 and 2.5. 2pts
2. What is the climatological area average SST for Dec in the Nino 3.4 region from 1995-2022? You should have a single value. 2pts.
3. What is the area average SST for the Nino 3.4 region for Dec. 2016? 2pts
4. When was the strongest El Nino between 1995-2022 (approx. month and year)? 1pt
5. When was the strongest La Nina between 1995-2022 (approx. month and year)? 1pt
6. A significant drought occurred across most of the Caribbean between 2015-2016. Why do you think there as a strong drought during that period? In general, what was the large scale atmospheric reason that may have contributed to the drought. 2pts.

Submit your work to [tallen@cimh.edu.bb](mailto:tallen@cimh.edu.bb) BEFORE class on March 4<sup>th</sup>. No late work accepted.