PS3_report

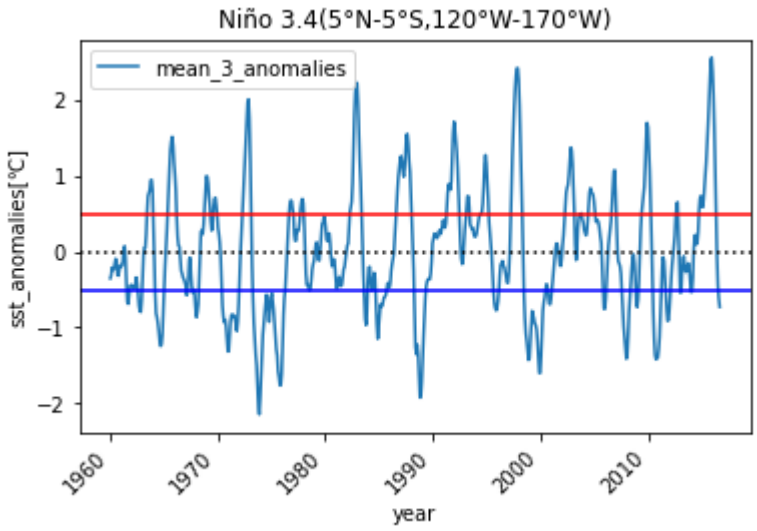
1.1 [5 points] Compute monthly climatology for SST from Niño 3.4 region, and subtract climatology from SST time series to obtain anomalies.

Out[36]:

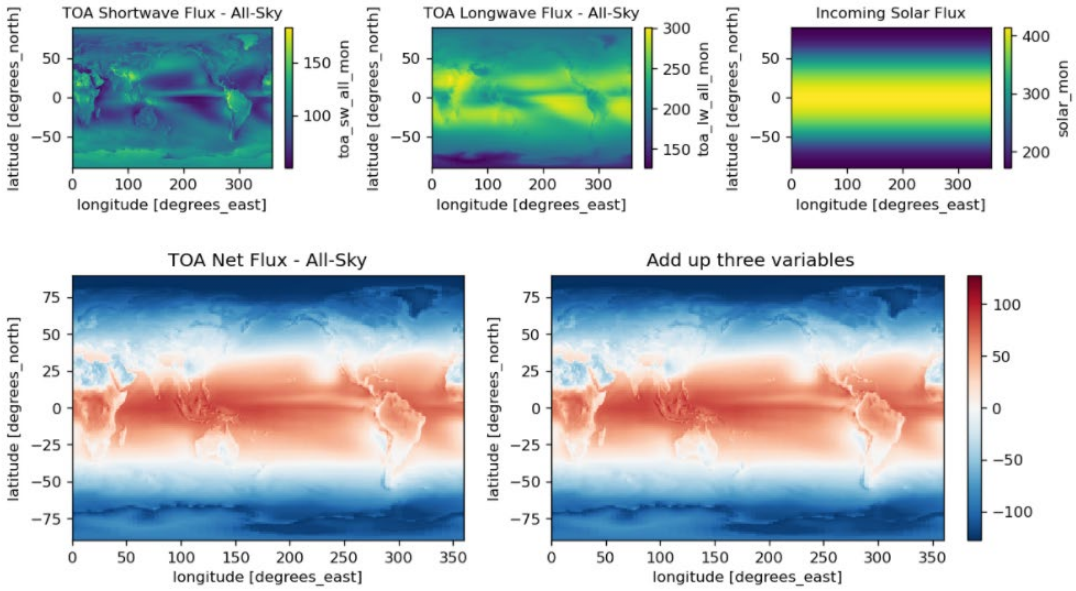
	mean_3_anoma	mo	date
0	-0.352137	JFM	1960-01-15
1	-0.307922	FMA	1960-02-15
2	-0.210943	MAM	1960-03-15
3	-0.240803	AMJ	1960-04-15
4	-0.225803	MJJ	1960-05-15
...	...	...	...
675	0.500900	JJA	2016-04-15
676	-0.072014	JAS	2016-05-15
677	-0.442696	OND	2016-06-15
678	-0.618626	NDJ	2016-07-15
679	-0.728378	DJF	2016-08-15

680 rows × 3 columns

1.2 [5 points] Visualize the computed Niño 3.4.



2.1 [5 points] Make a 2D plot of the time-mean TOA longwave, shortwave, and solar radiation for all-sky conditions. Add up the three variables above and verify (visually) that they are equivalent to the TOA net flux.



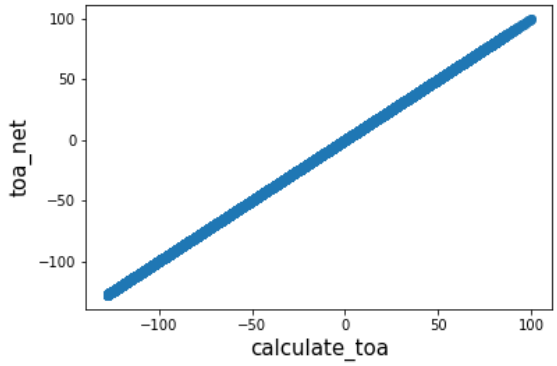
2.2 [10 points] Calculate and verify that the TOA incoming solar, outgoing longwave, and outgoing shortwave approximately match up with the cartoon above.

xarray.DataArray

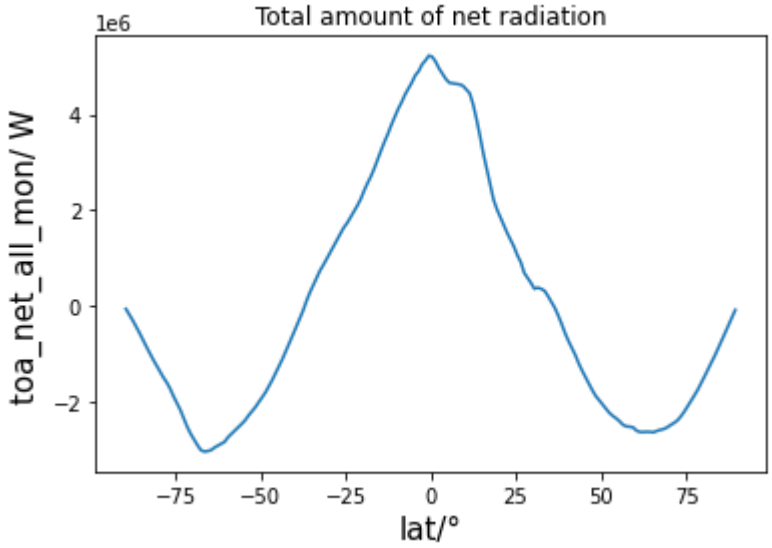
array(1.6990367, dtype=float32)

▸ Coordinates: (0)

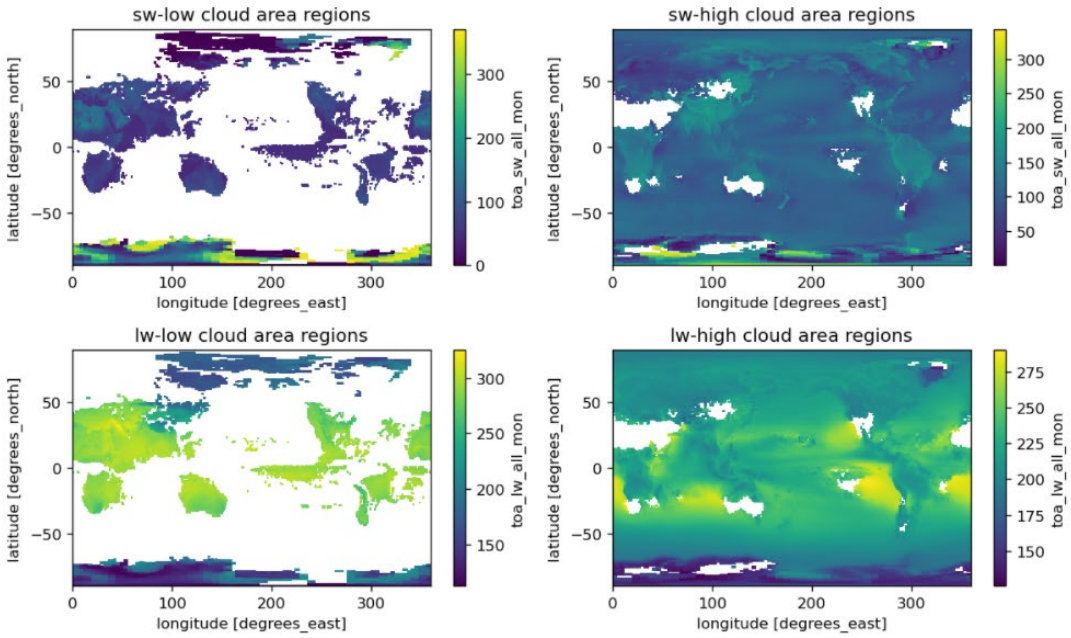
▸ Attributes: (0)



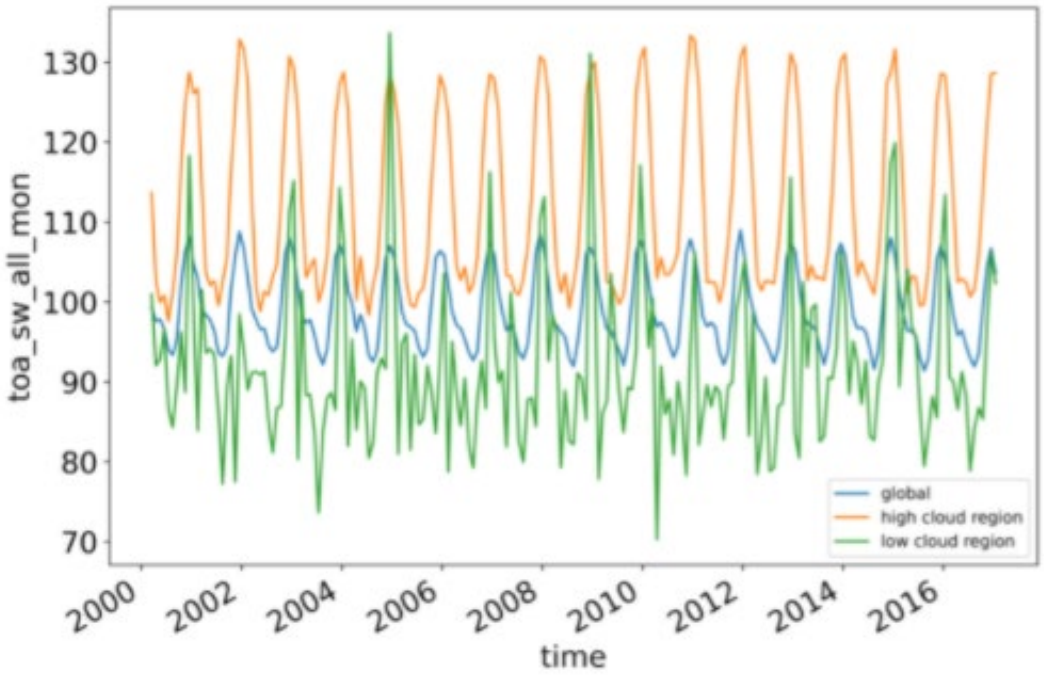
2.3 [5 points] Calculate and plot the total amount of net radiation in each 1-degree latitude band. Label with correct units.

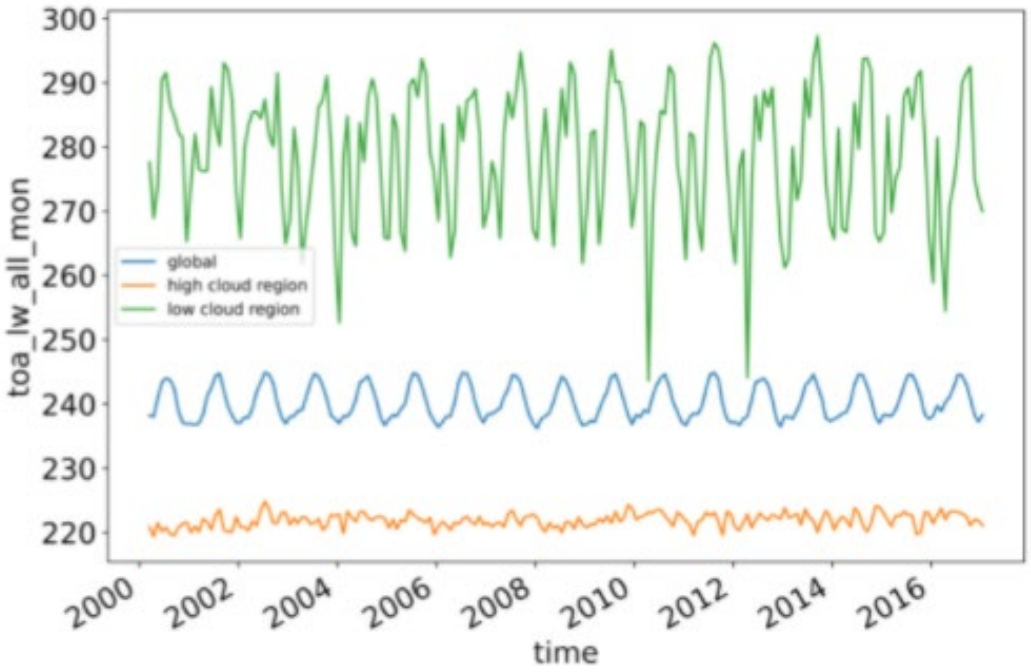


2.4 [5 points] Calculate and plot composites of time-mean outgoing shortwave and longwave radiation for low and high cloud area regions. Here we define low cloud area as ≤25% and high cloud area as ≥75%. Your results should be 2D maps.



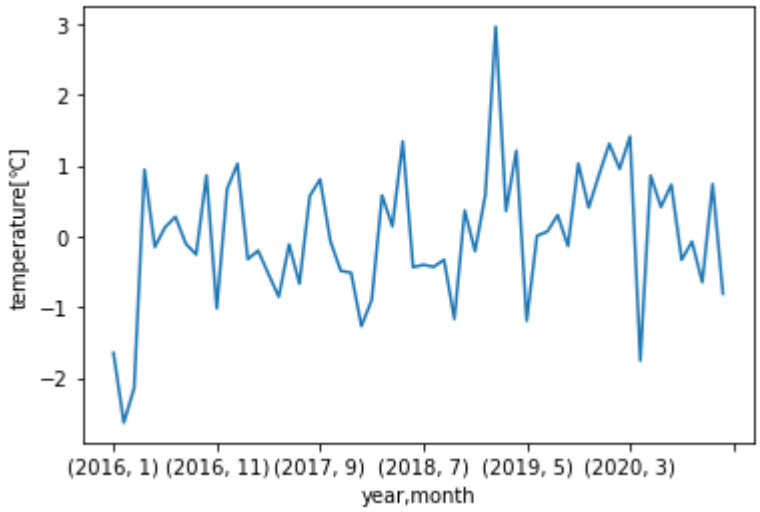
2.5 [5 points] Calculate the global mean values of shortwave and longwave radiation, composited in high and low cloud regions. What is the overall effect of clouds on shortwave and longwave radiation?





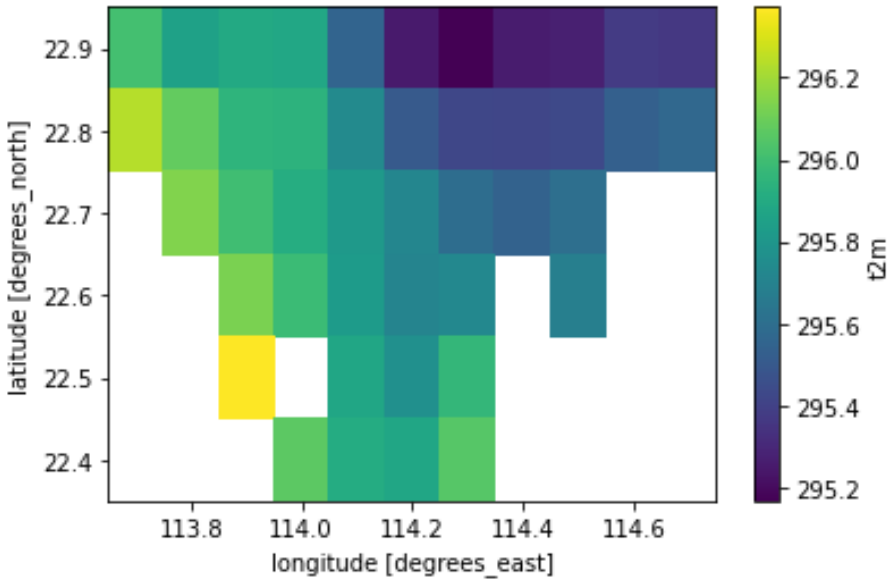
The absorption of radiation is selective, the absorption of short-wave radiation is small, and the absorption of long-wave radiation is large.

3.1 [5 points] Plot a time series of a certain variable with monthly seasonal cycle removed.

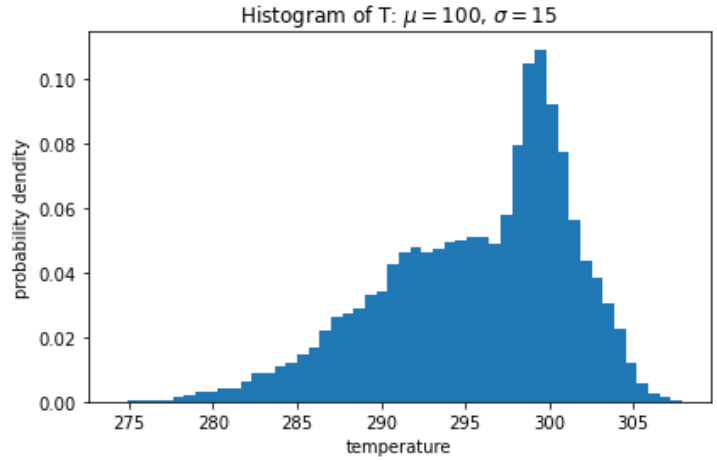


3.2 [5 points] Make at least 5 different plots using the dataset.

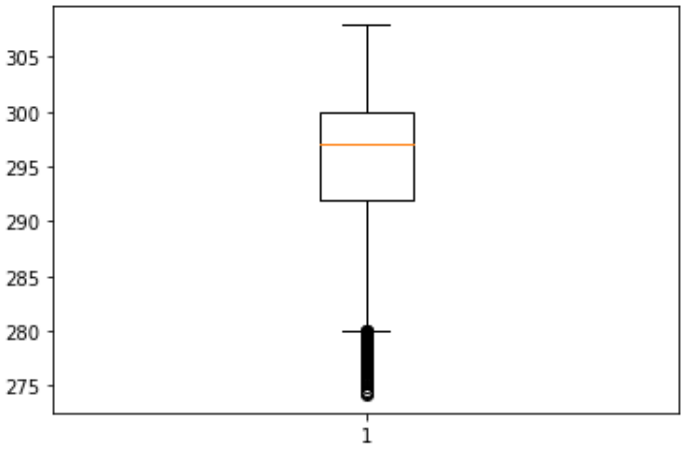
2D maps



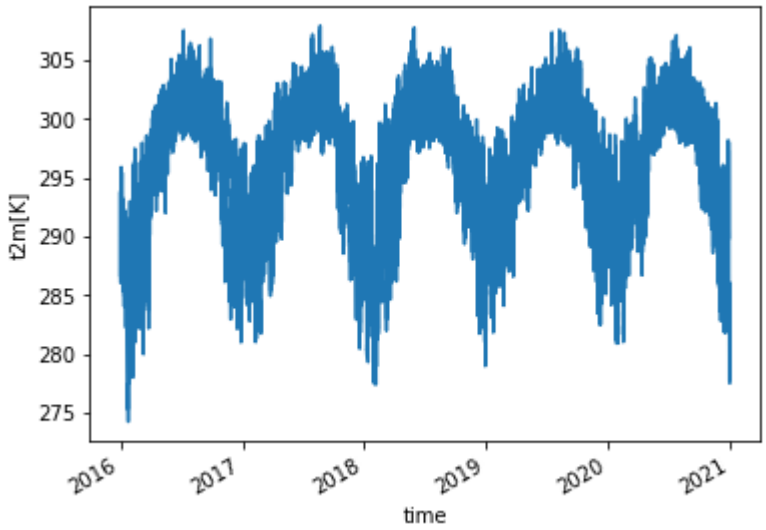
Histogram



Box



Time series



Monthly_temperature