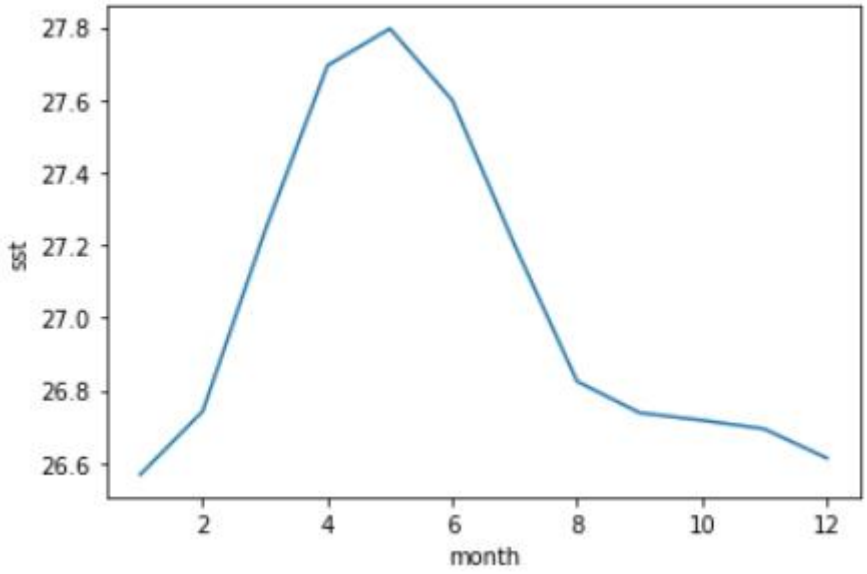
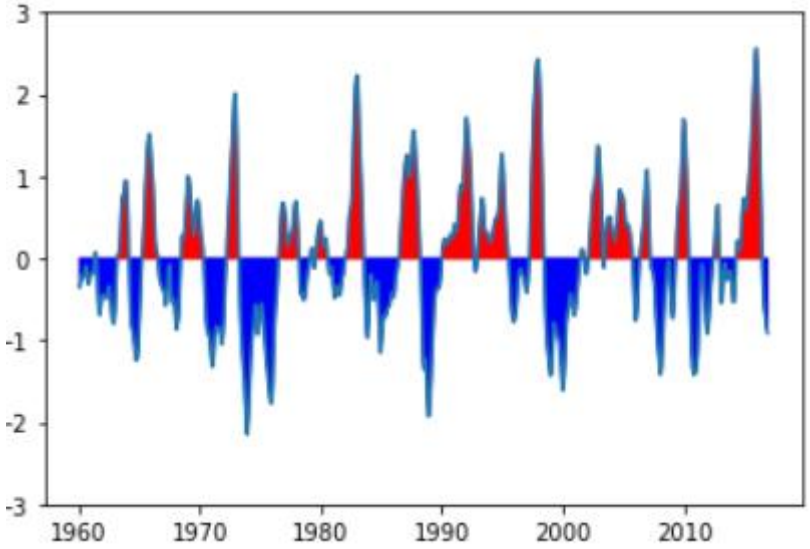
PS3_1

1.1 Monthly climatology for SST from Niño 3.4 region**.**



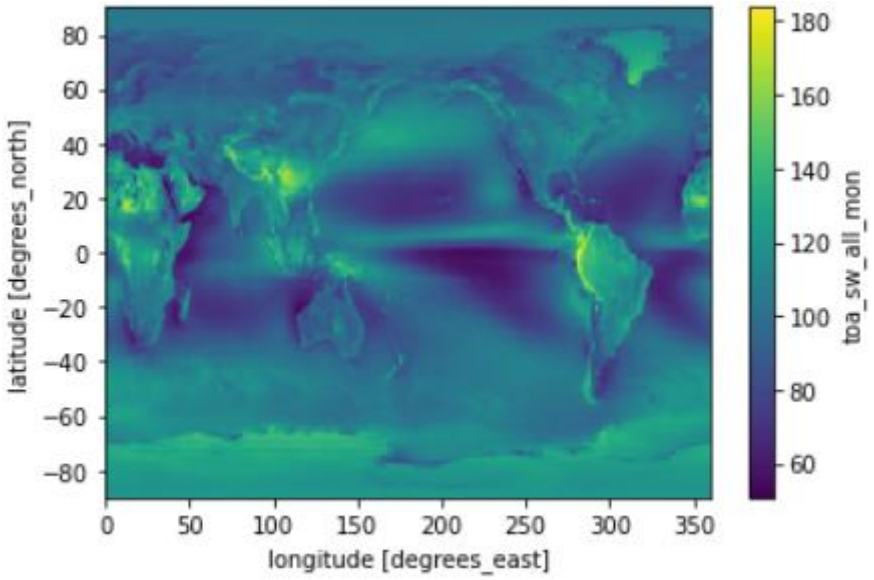
1.2 Anomalies and the plot.



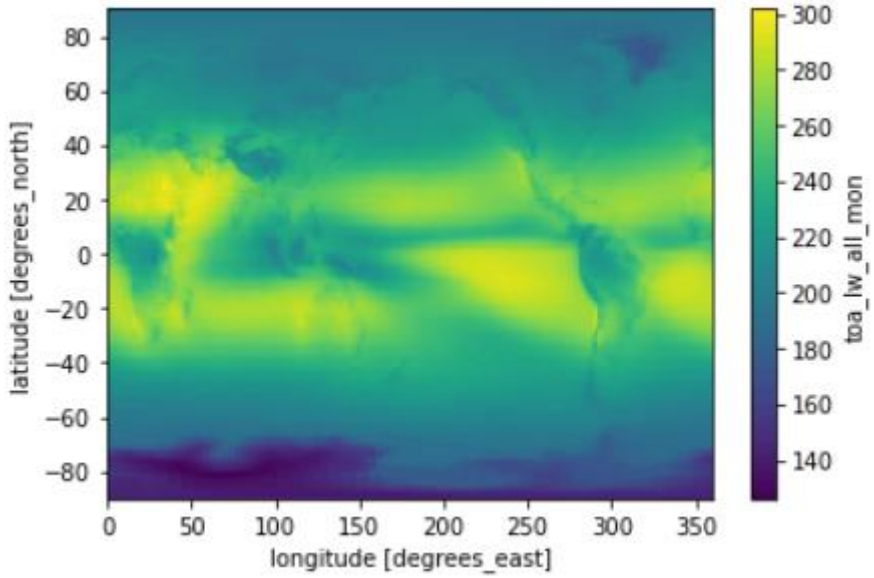
PS3_2

2.1 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.

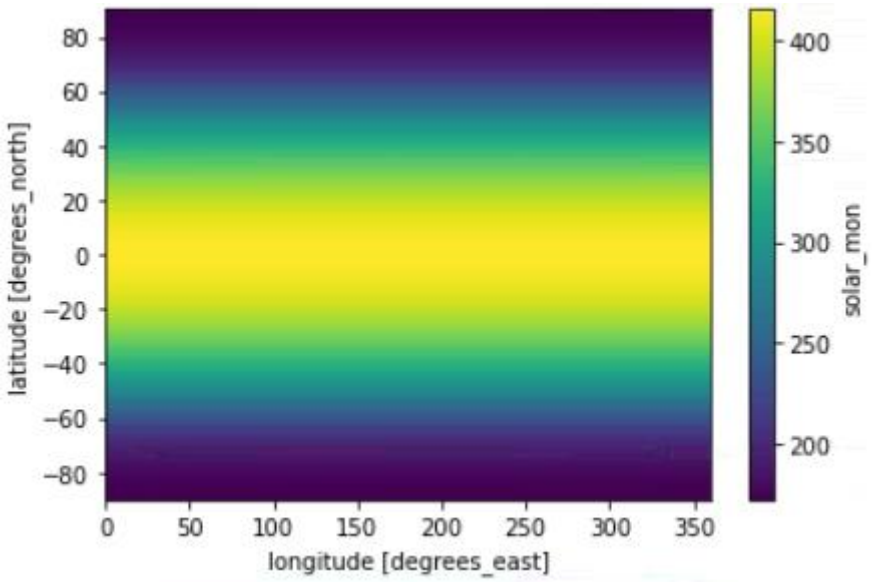
Shortwave:



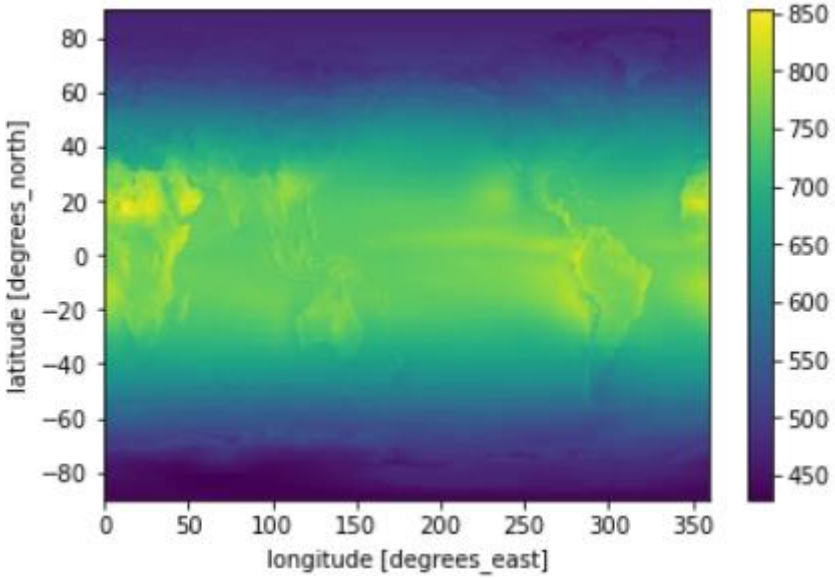
Longwave:



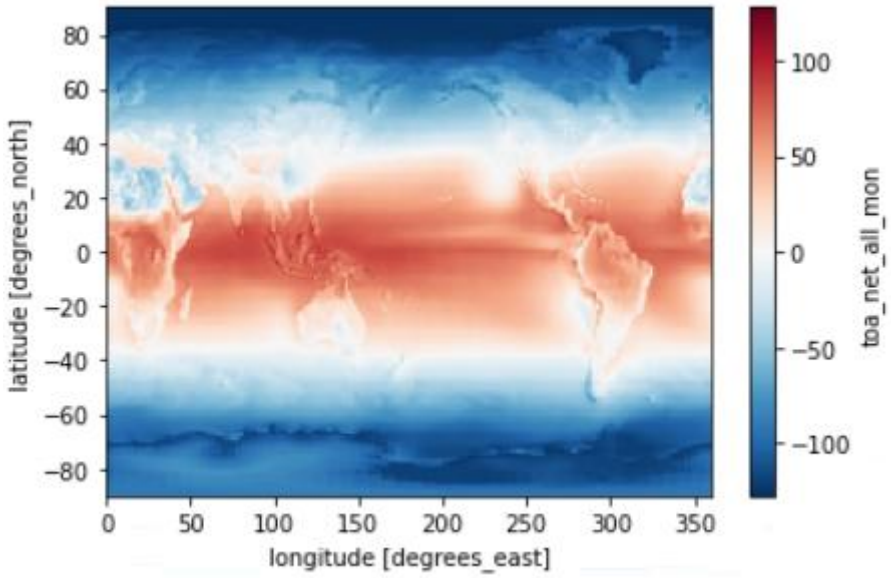
Solar radiation:



Add up the three variables:



TOA net flux:



Findings:

After adding up the three variables above, visually seeing, they are not equivalent to the TOA net flux.

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

Incoming solar after calculating the area of each grid:

```
array(14037950., dtype=float32)
```

Outgoing shortwave after calculating the area of each grid:

```
array(4089832.2, dtype=float32)
```

Outgoing longwave after calculating the area of each grid:

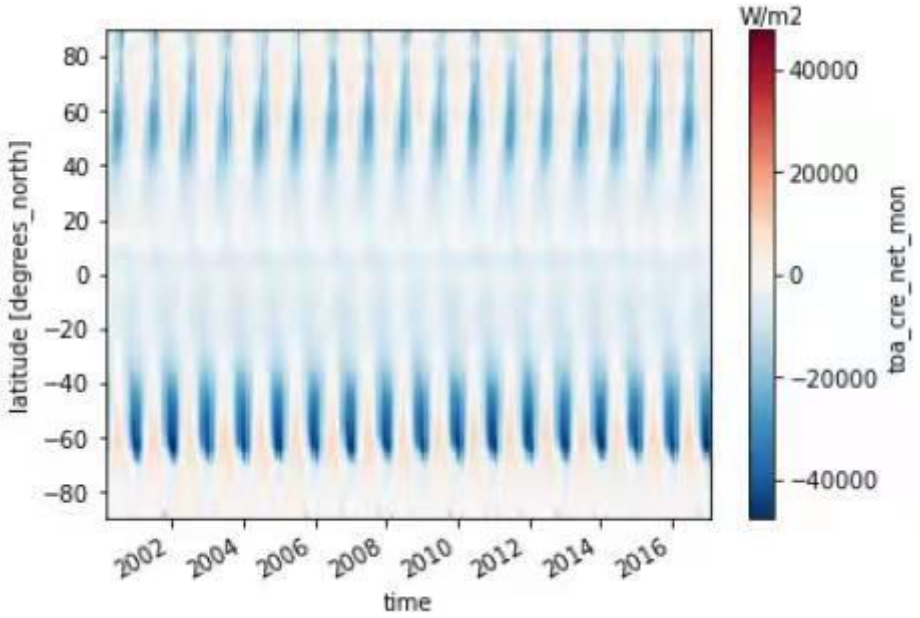
```
array(9911886., dtype=float32)
```

Findings:

14037950-(4089832.2+9911886)=36231.8

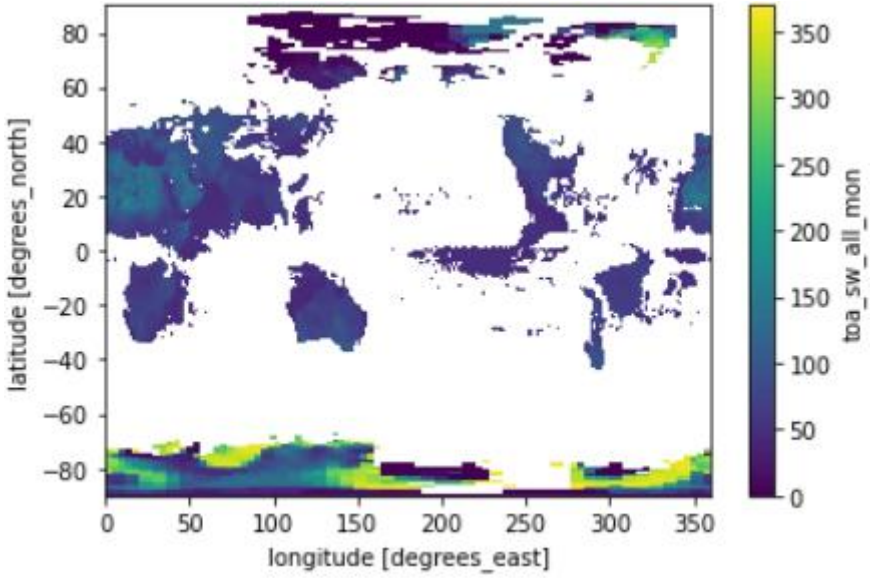
TOA incoming solar basically equivalent to outgoing longwave and outgoing shortwave which match up with the cartoon.

2.3 Calculate and plot the total amount of net radiation in each 1-degree latitude band.

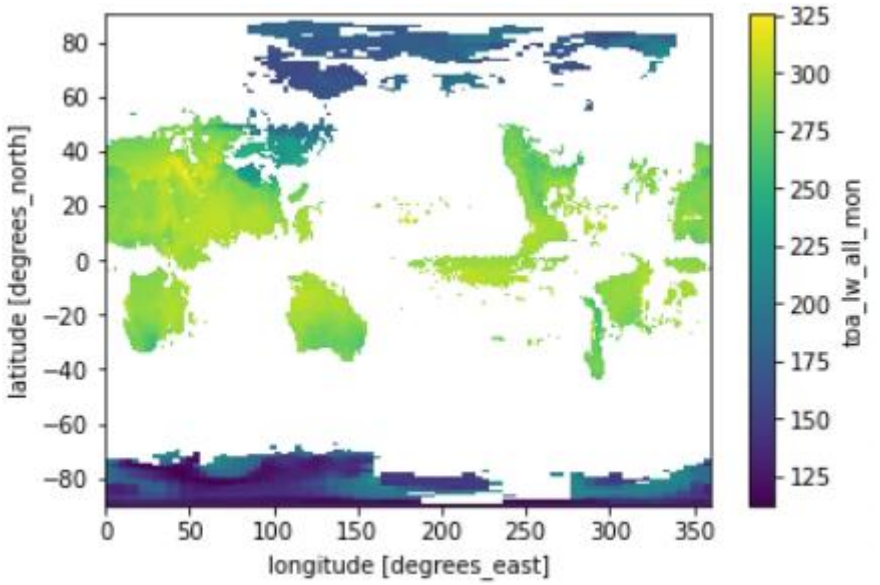


2.4 Time-mean outgoing shortwave and longwave radiation for low and high cloud area regions.

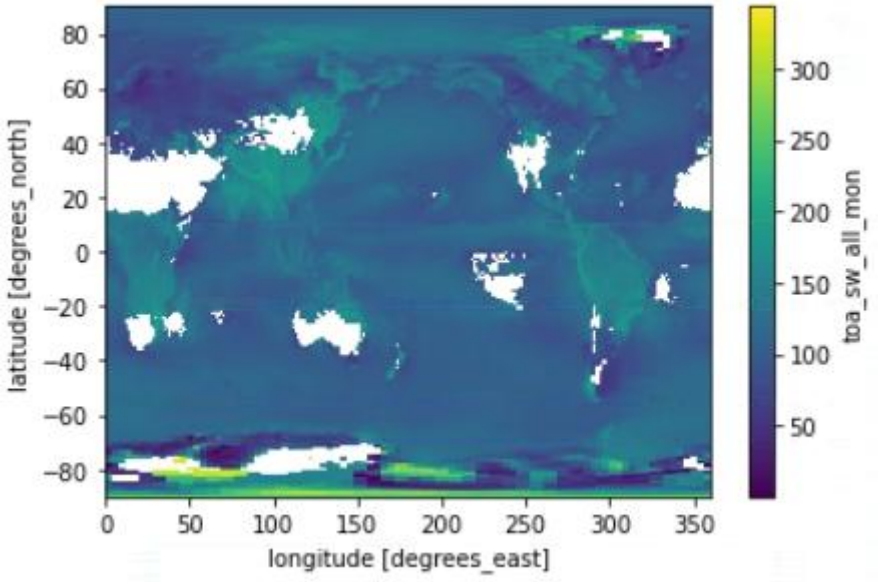
Outgoing shortwave for low cloud area:



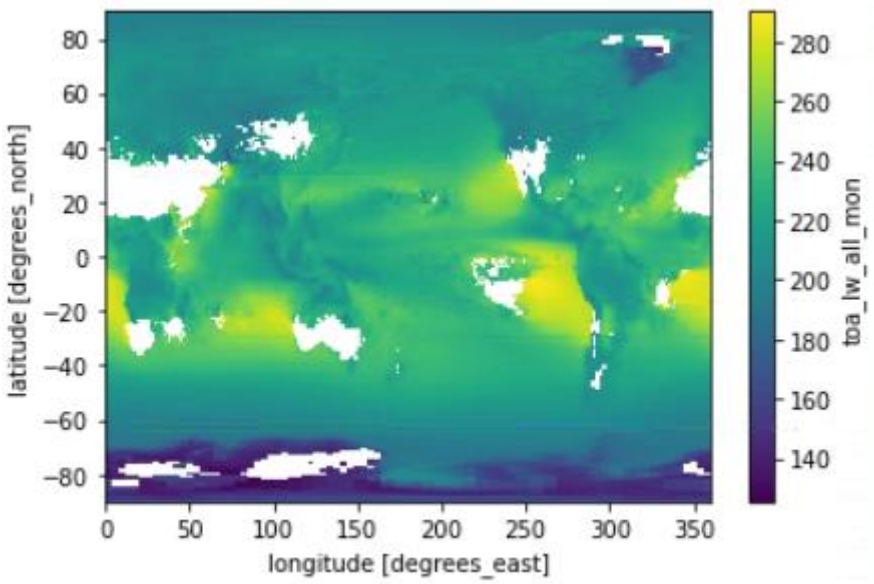
Outgoing longwave for low cloud area:



Outgoing shortwave for high cloud area:



Outgoing longwave for high cloud area:



2.5 Global mean values of shortwave and longwave radiation.
For low cloud area:

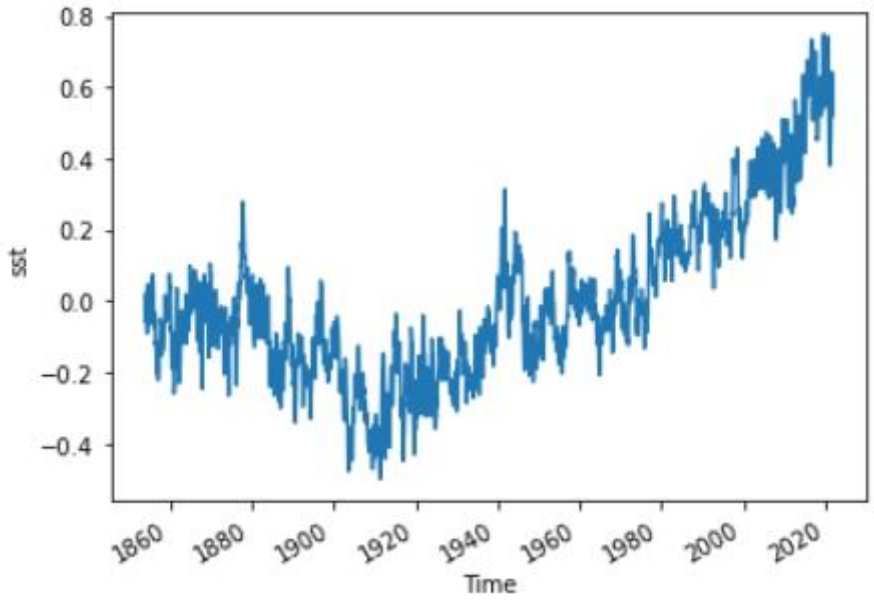
```
array(160.94173, dtype=float32)
```

For high cloud area:

```
array(165.05835, dtype=float32)
```

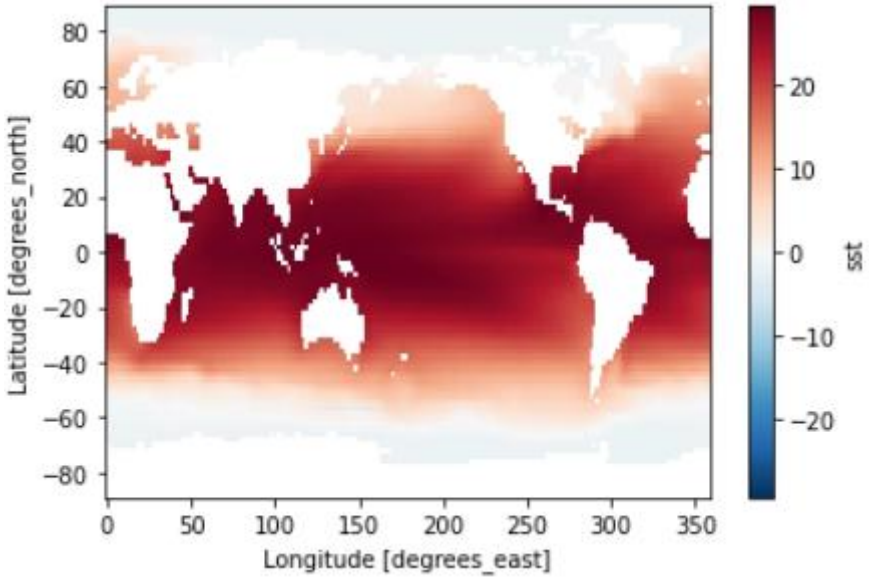
Findings:
Clouds would increase the sum of shortwave and longwave radiation.

PS3_3 data:sst.mnmean.nc
3.1 Plot a time series of a certain variable with monthly seasonal cycle removed.

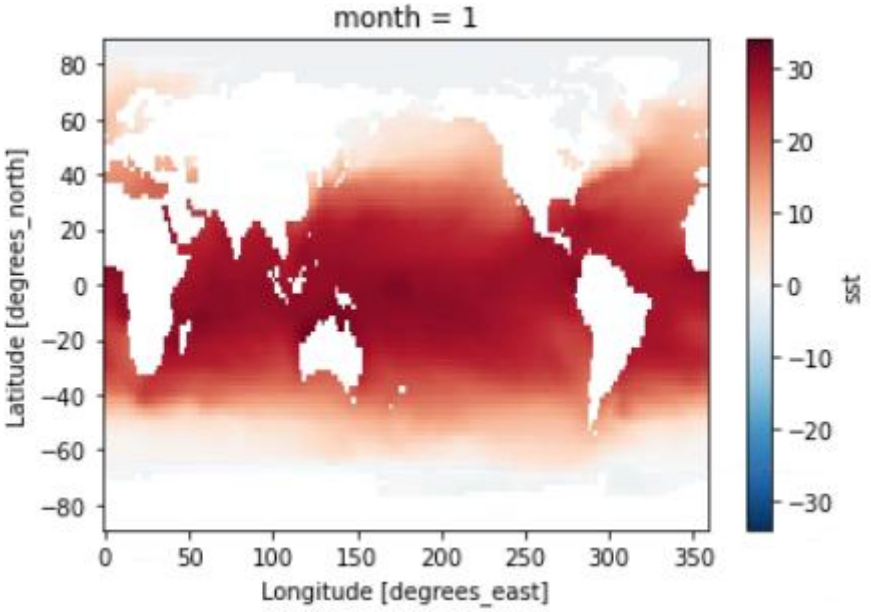


3.2 Different plots.

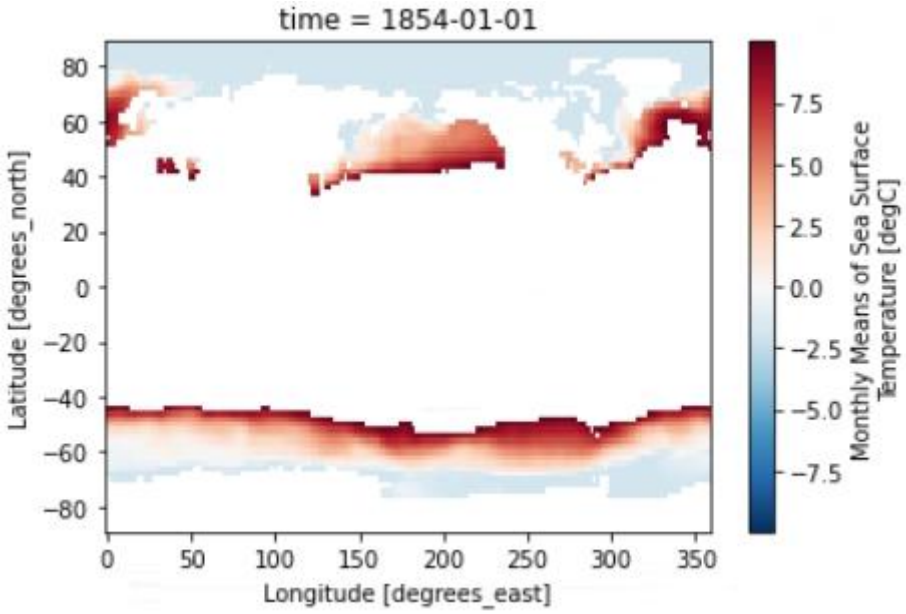
Mean sst:



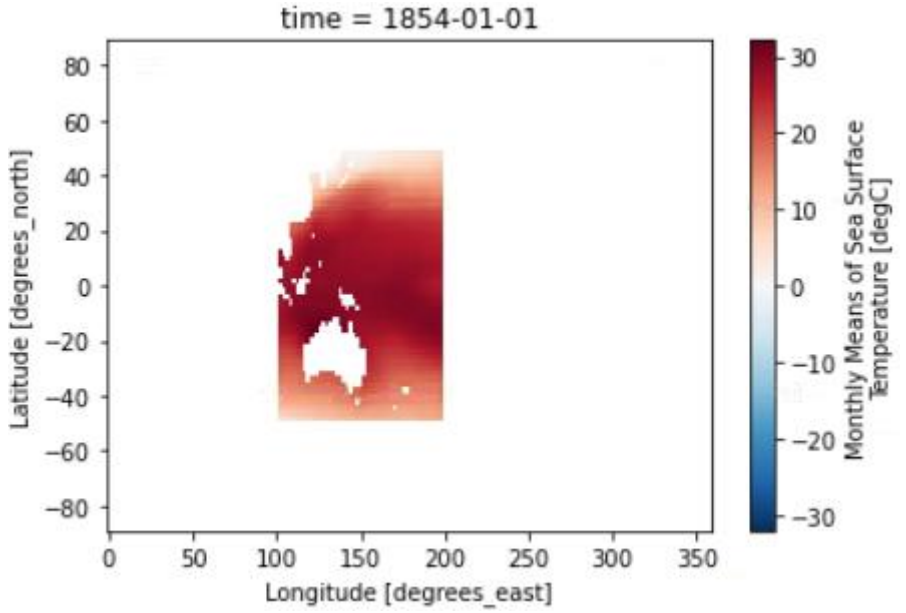
Maximum figure in January:



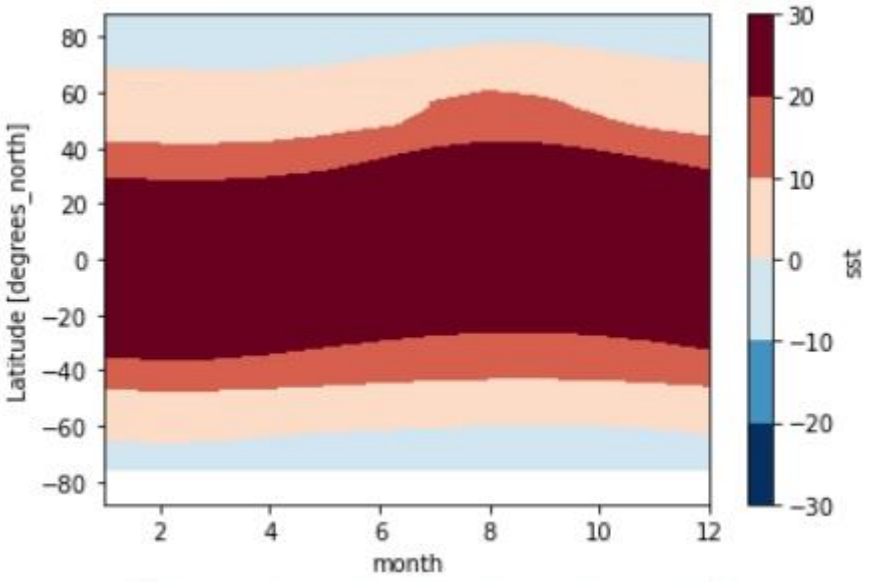
The area where the temperature is less than 10 degrees Celsius at the first piece of data:



The area where the longitude is between -50 and 50, and the latitude is between 100 and 200 at the first piece of data:



Monthly average contour map for the average of each latitude:


Latitude [degrees_north]
80
60
40
20
0
−20
−40
−60
−80
2
4
6
8
10
12
month
30
20
10
0
−10
−20
−30
sst