Analysis for Mediterranean Area

Our team is responsible for Mediterranean sea area. However, since we don’t have any buoy data for this area, we use ship data instead. We collect our dataset from Voluntary Observing Ships program. We use data of April from 2001 to 2016, trying to find air temperature change and sea temperature change during these years. There are multiple challenges we've met when we clean the data. The most hardest part of data manipulation is to convert our date variable into Posix's type. However, we used lubridate package and solved this issue.

For further analysis, we read all the data via links and clean out the data we need in the right form. We generate some basic plots for EDA part which are showed as follow.

Exploratory Data Analysis

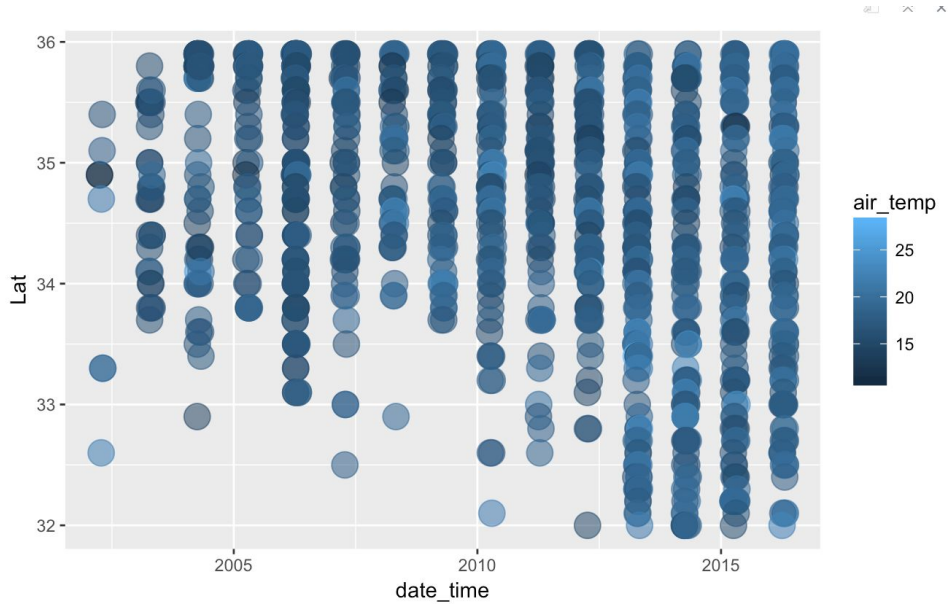


Figure1 shows air temperature of latitude of 32-36.

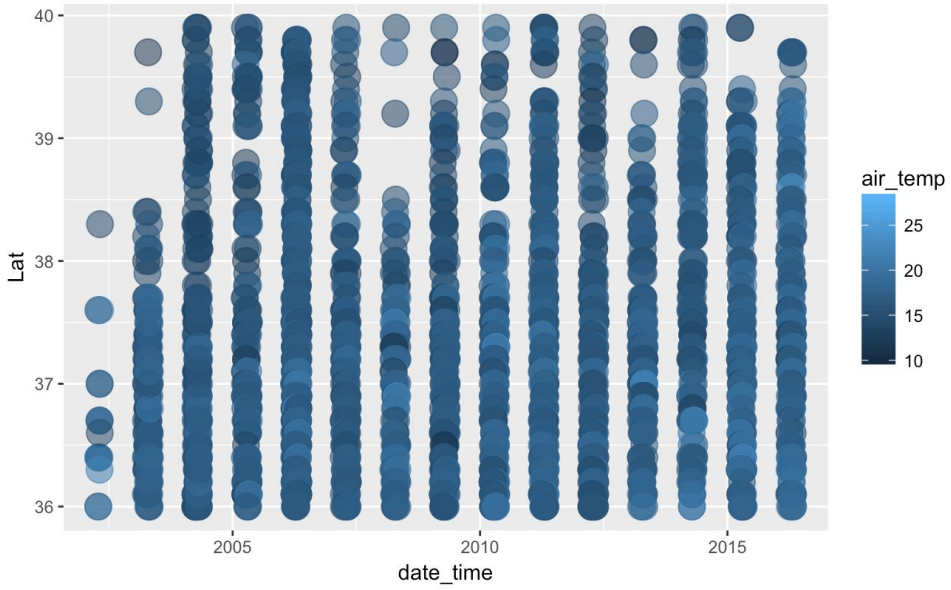


Figure2 shows air temperature of latitude of 36-40.

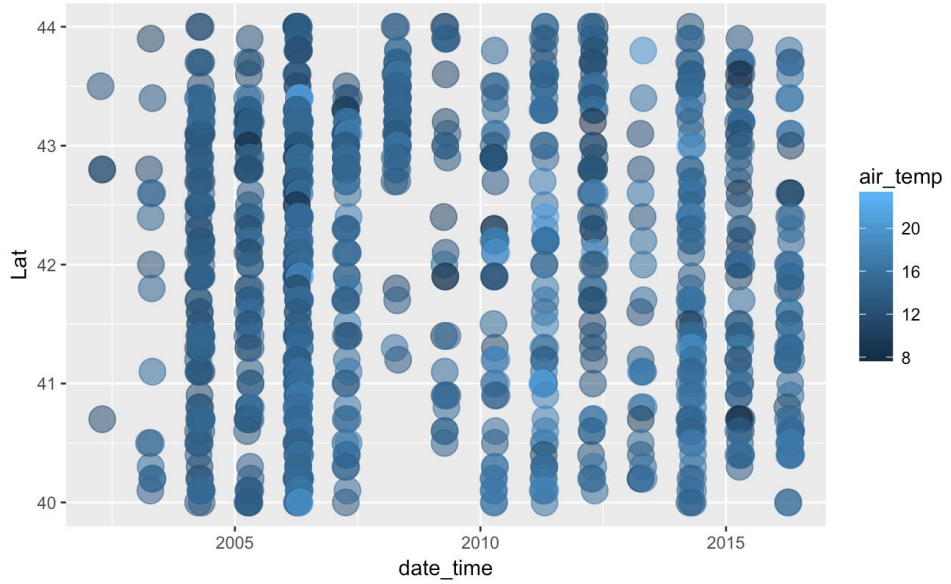


Figure3 shows air temperature of latitude of 40-44.

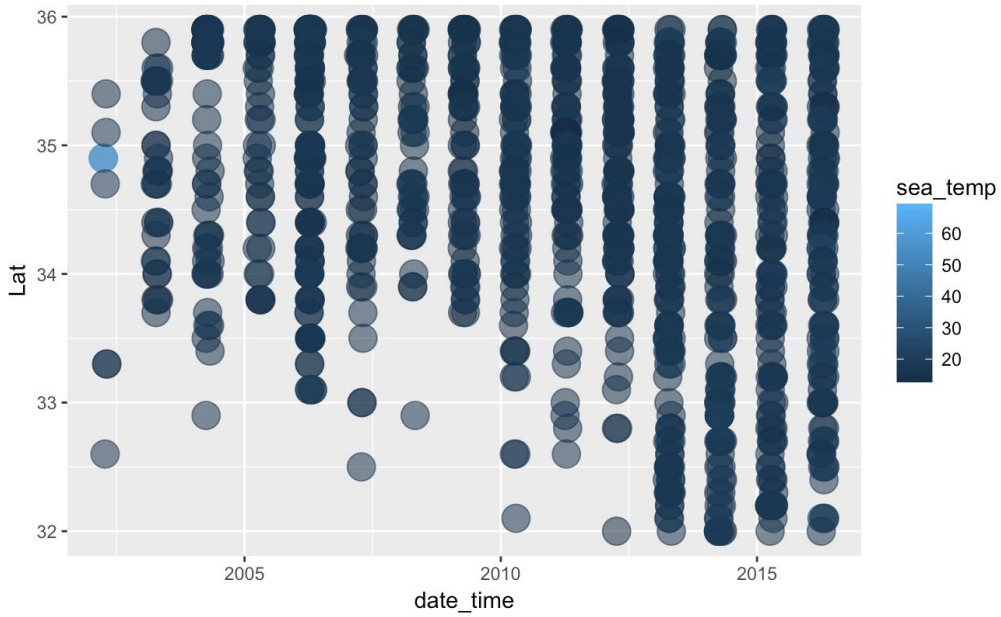


Figure4 shows sea temperature of latitude of 32-36.

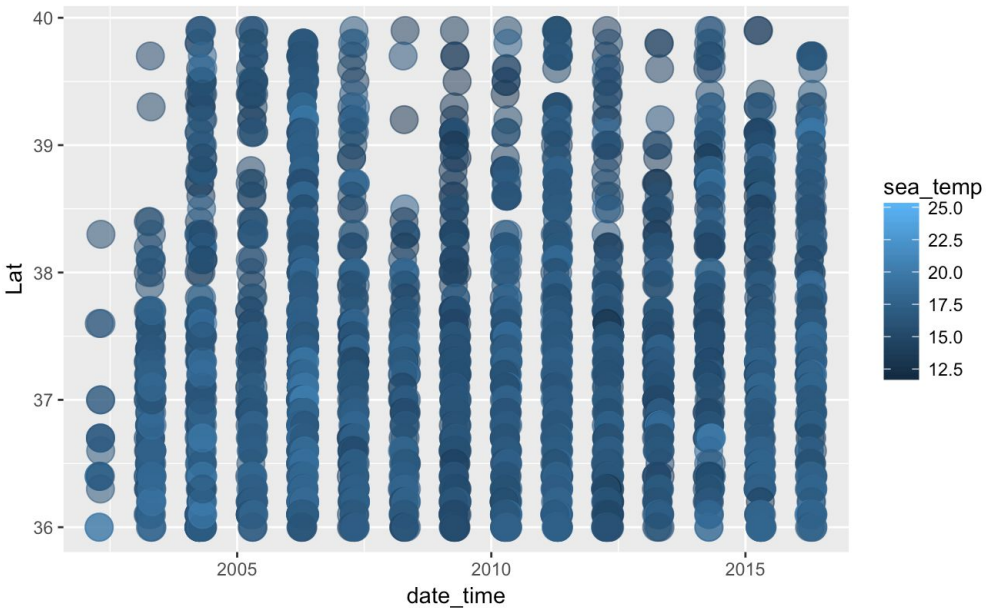


Figure5 shows sea temperature of latitude of 36-40.

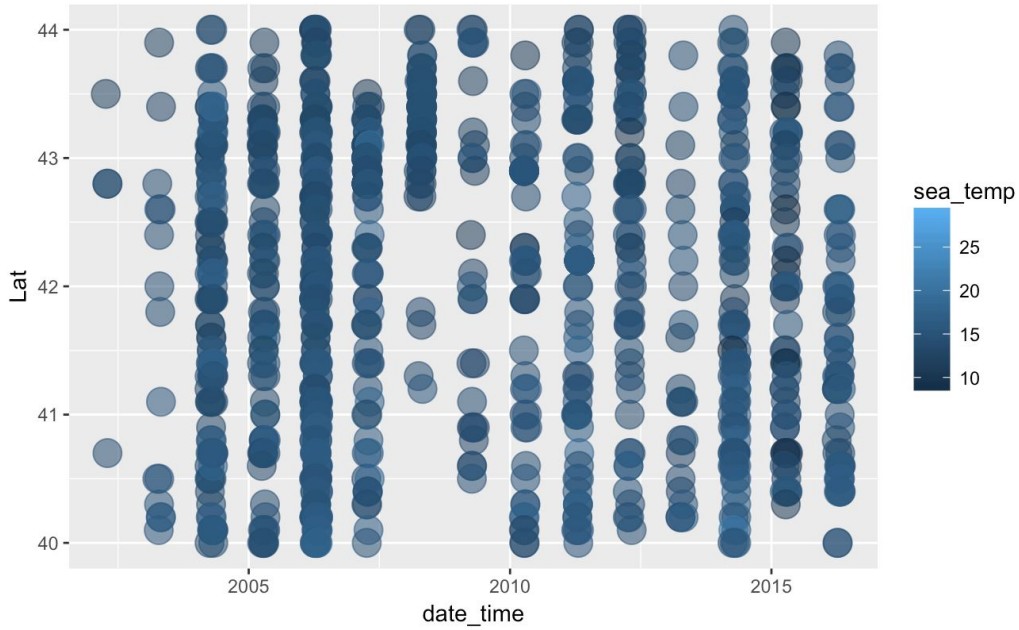
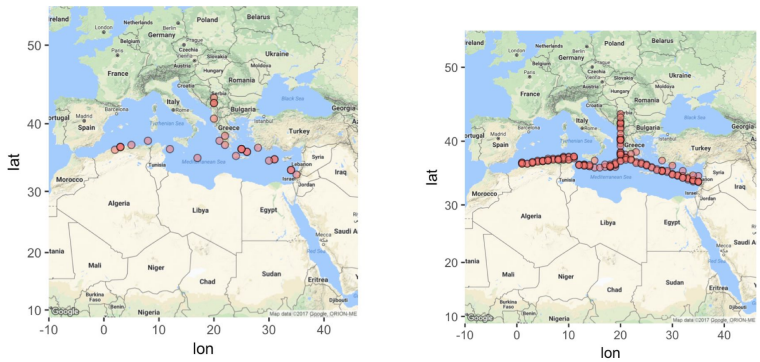


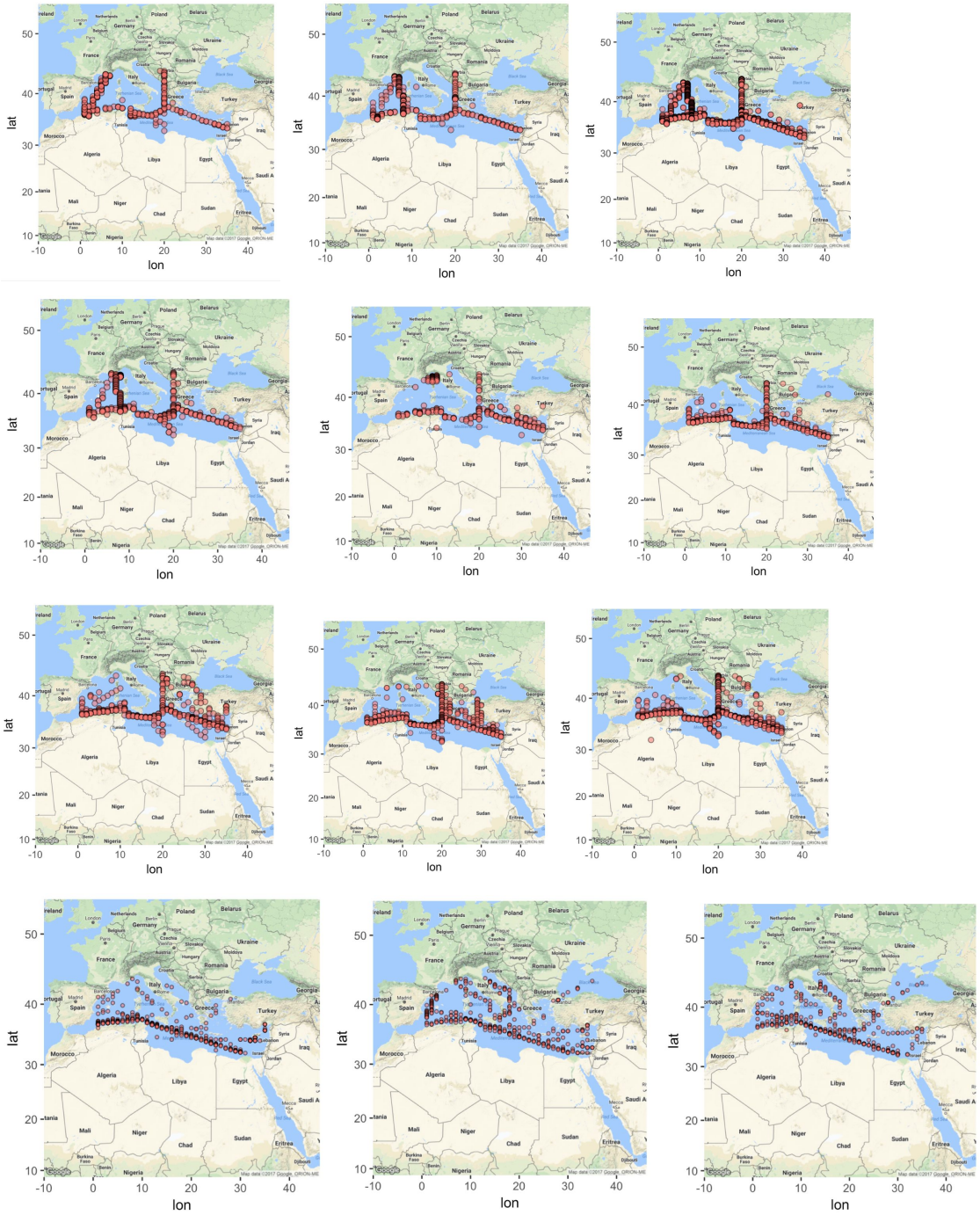
Figure6 shows sea temperature of latitude of 40-44.

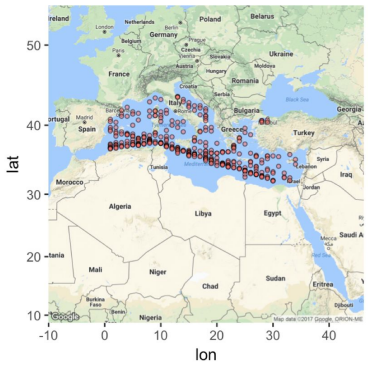
Summary:

From figure 1 to 3, we can see that from latitude 40 - 44, which is in figure 3, color is lighter than figure 1 and 2. Furthermore, it is consistent with the sea temperature.

Figure 4 to 6 show different sea temperature degree in different latitude. The dark color in the graph means sea temperature degree is low and the light color means sea temperature degree is high. We can see that with the increase of latitude, sea temperature increases.




lat
lon
50
40
30
20
10
-10
0
10
20
30
40
Poland
Belarus
Germany
Ukraine
France
Romania
Italy
Spain
Greece
Turkey
Morocco
Algeria
Libya
Egypt
Mali
Niger
Chad
Sudan
Nigeria



We have plots from 2002 to 2016 since there is no ship data in 2001.

Reference:

Data source urls:
https://www1.ncdc.noaa.gov/pub/data/vosclim/2001/VOSClim_GTS_apr_2001.txt
https://www1.ncdc.noaa.gov/pub/data/vosclim/2002/VOSClim_GTS_apr_2002.txt
https://www1.ncdc.noaa.gov/pub/data/vosclim/2003/VOSClim_GTS_apr_2003.txt
https://www1.ncdc.noaa.gov/pub/data/vosclim/2004/VOSClim_GTS_apr_2004.txt
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https://www1.ncdc.noaa.gov/pub/data/vosclim/2016/VOSClim_GTS_apr_2016.txt