CT5102 Class Exercise

Visualising Storm Ophelia

The aim of this task is to use ggplot2 perform an exploratory analysis of Storm Doris (October 16th 2017), based on the data in aimsir17.

See https://www.met.ie/cms/assets/uploads/2018/10/Ophelia-1.pdf

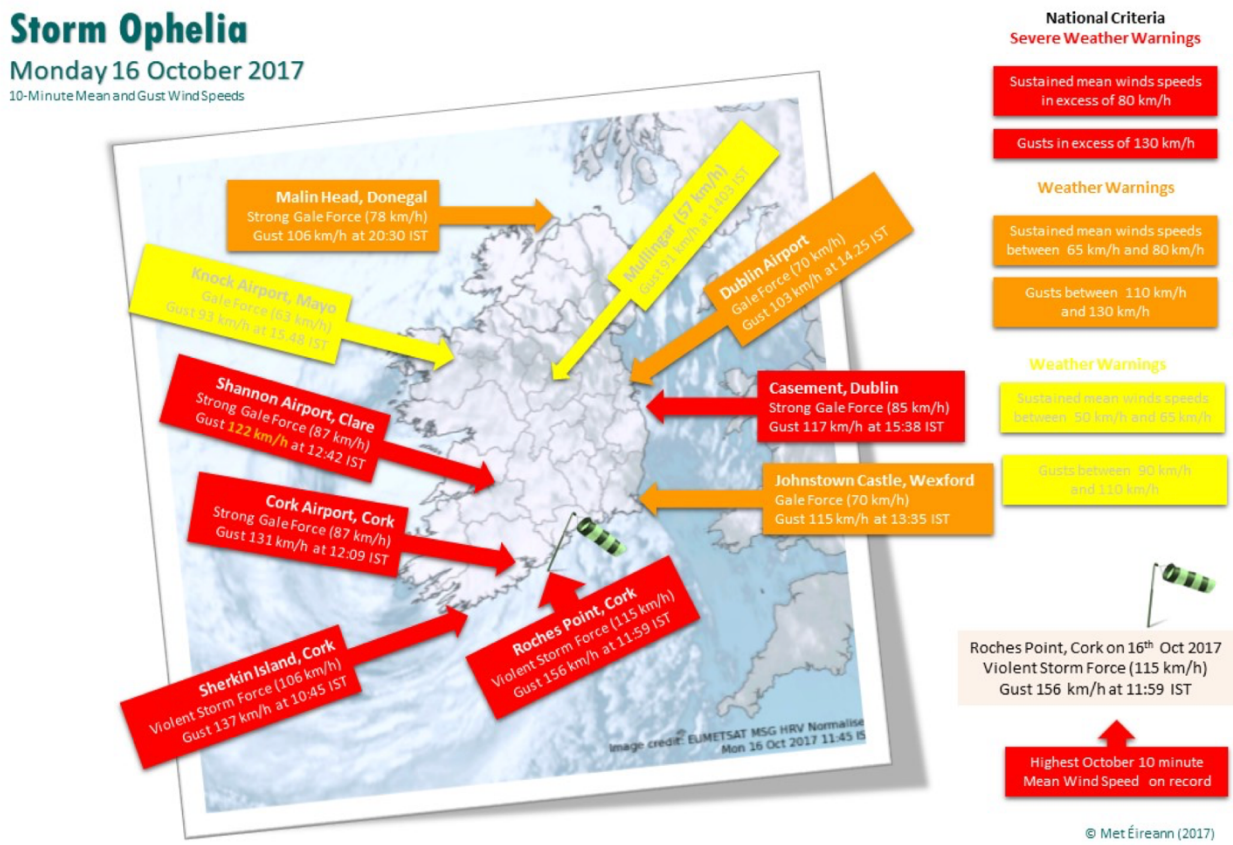


Figure 15 Some of the recorded winds during Storm Ophelia on the 16th of October 2017, including what they would correspond to on Met Éireann's colour-coded warning system.

Here are your tasks.

(1) Load the following libraries

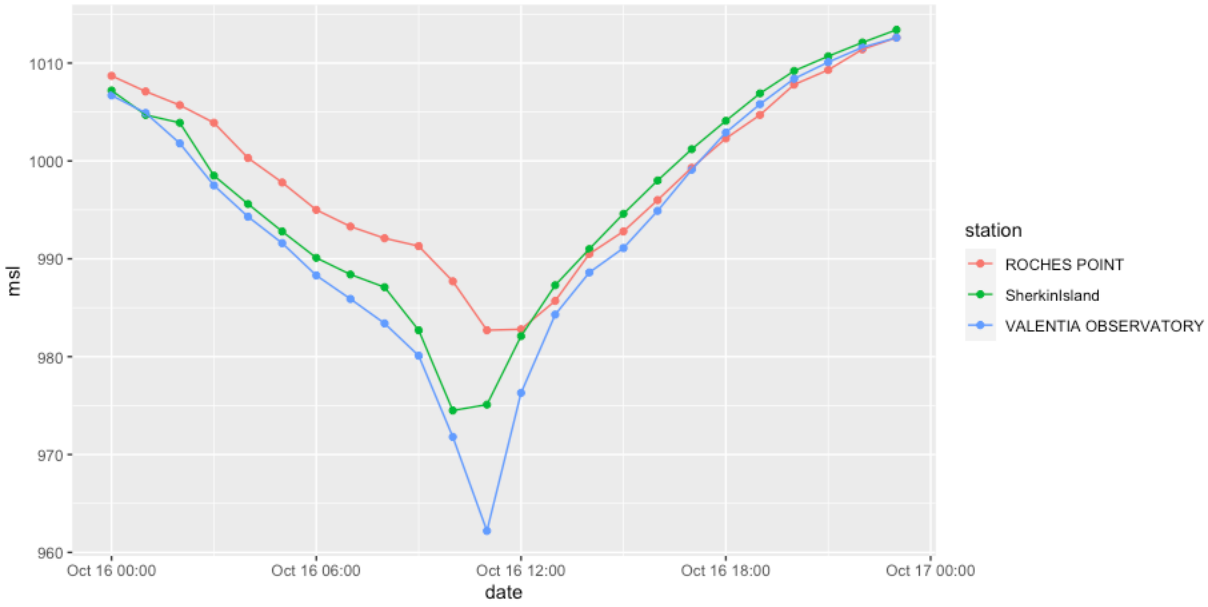
```
library(ggplot2)
library(aimsir17)
```

(2) Replicate the following code so that you can create a tibble that contains observations for three weather stations, on October 16th 2017. The station are ROCHES POINGT, SherkinIsland and VALENTIA OBSERVATORY

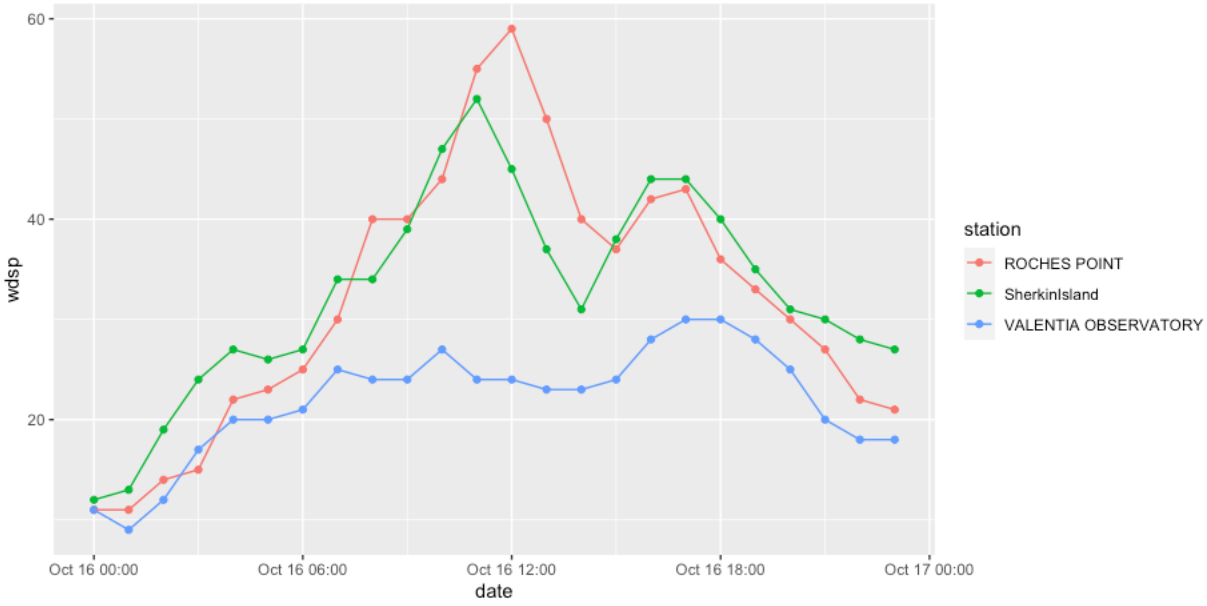
```
> ophelia
# A tibble: 72 x 12
   station  year month   day  hour date                rain  temp  rhum   msl  wdsp
   <chr>   <dbl> <dbl> <int> <int> <dttm>              <dbl> <dbl> <dbl> <dbl> <dbl>
 1 ROCHES…  2017    10    16     0 2017-10-16 00:00:00   0    13.8    98 1009.    11
 2 ROCHES…  2017    10    16     1 2017-10-16 01:00:00   0.1  13.9    98 1007.    11
 3 ROCHES…  2017    10    16     2 2017-10-16 02:00:00   0.1  13.9    98 1006.    14
 4 ROCHES…  2017    10    16     3 2017-10-16 03:00:00   1.1  14      97 1004.    15
 5 ROCHES…  2017    10    16     4 2017-10-16 04:00:00   0.2  14      97 1000.    22
 6 ROCHES…  2017    10    16     5 2017-10-16 05:00:00   0    15.4    88  998.    23
 7 ROCHES…  2017    10    16     6 2017-10-16 06:00:00   0    16      80  995     25
 8 ROCHES…  2017    10    16     7 2017-10-16 07:00:00   0    16.3    75  993.    30
 9 ROCHES…  2017    10    16     8 2017-10-16 08:00:00   0    14.5    78  992.    40
10 ROCHES…  2017    10    16     9 2017-10-16 09:00:00   0.4  13.3    77  991.    40
# … with 62 more rows, and 1 more variable: wddir <dbl>
```

The tibble ophelia contains all the data need for the task. As a check, there should be 72 observations in total (24 per day, for each of three weather stations).

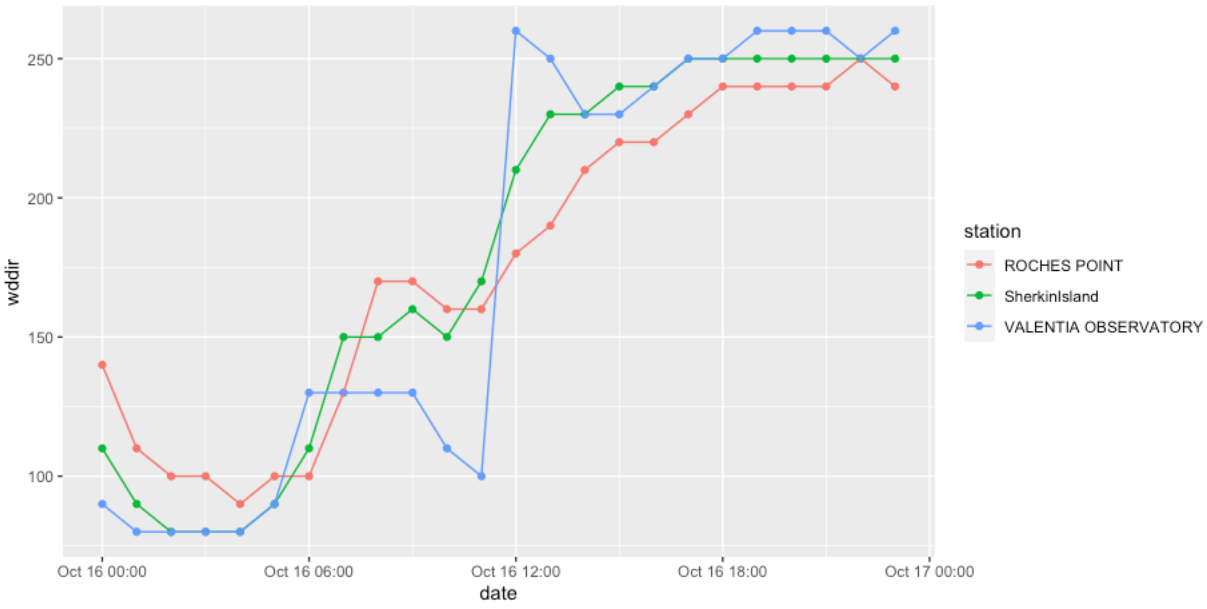
(3) Generate the following plot that shows mean sea level atmospheric pressure for October 16th.



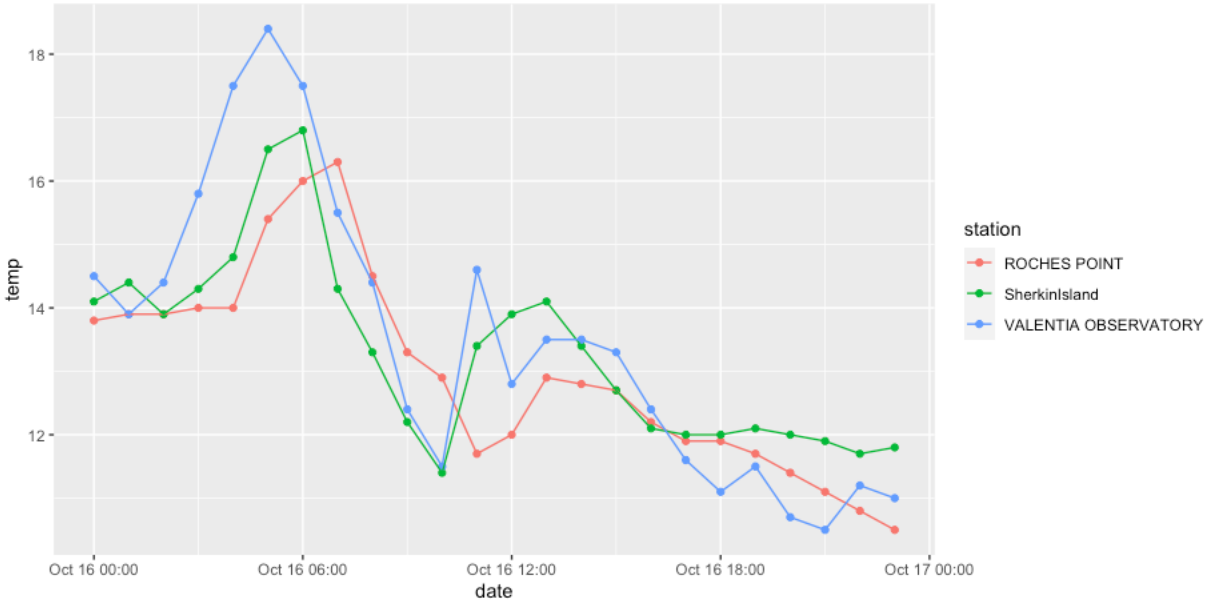
(4) Generate the following plot that shows wind speed.



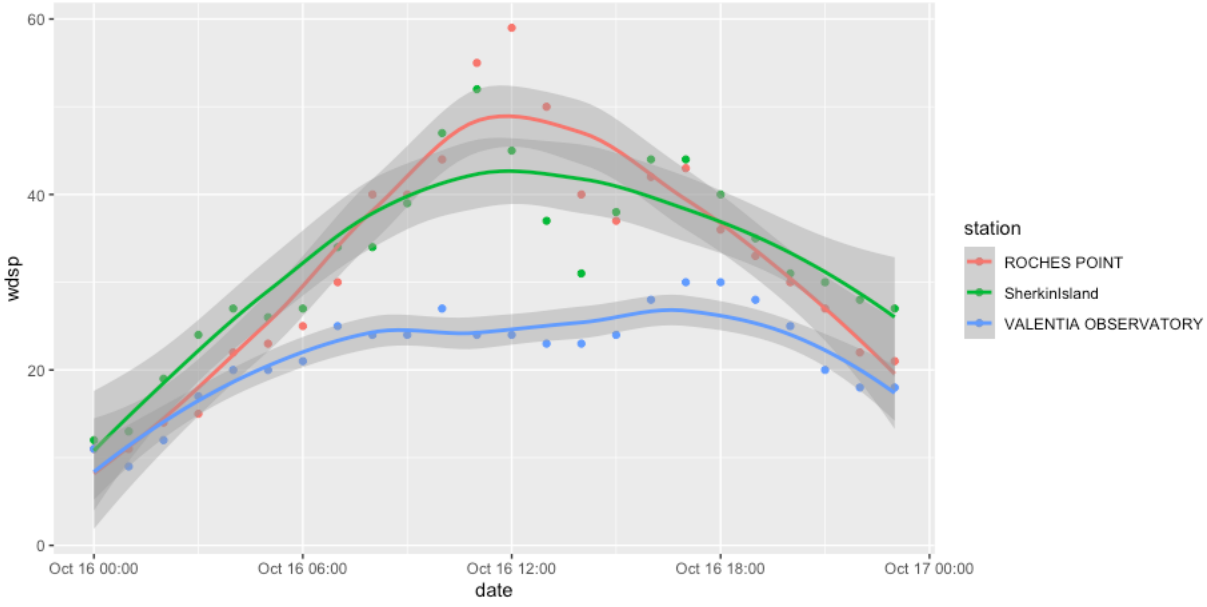
(5) Generate the following plot that shows wind direction.



(6) Generate the following plot that shows temperature.



(7) Generate the following plot that shows the trends for windspeed, making use of the function geom_smooth()



(8) Generate the following plot that plots wind direction against wind speed.