Forestal and Environmental modelling and data science

Working with meteorological data - Windrose, dew point and wind chill

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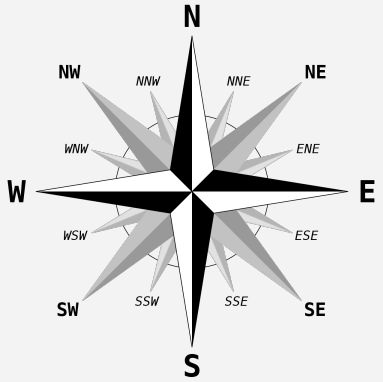
Outline

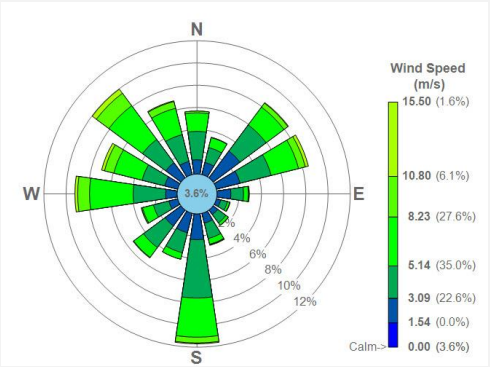
- Understand what is a windrose, dew point and wind chill
- Work with wind data data from Brazil
  - Meteorological station
- Pandas data handling, filtering and resampling
- Plots with Windrose library
- Explore the Google Colab facility

Wind rose

- graphic tool used by **meteorologists** to give a succinct view of how wind speed and direction are typically distributed at a particular location.
- Polar coordinate system of gridding, the frequency of winds over a time period is plotted by wind direction, with colour bands showing wind speed ranges.
- The direction of the longest spoke shows the wind direction with the greatest frequency.



Cardinal directions



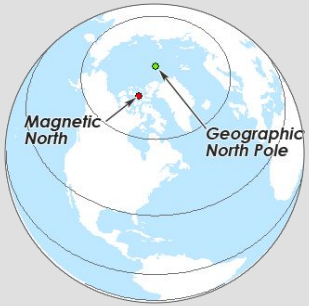
Wind rose

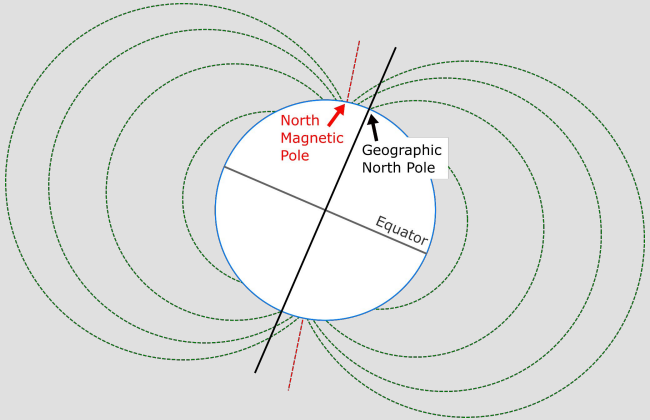
Compass

- **magnetized needle** which can pivot to align itself with **magnetic north.**

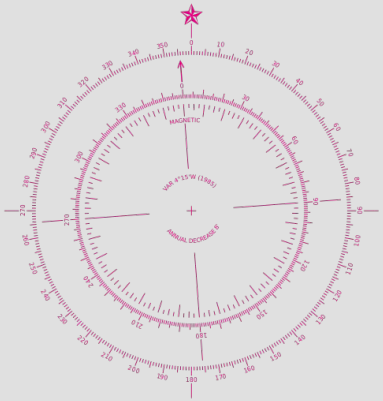
Compass rose:

- You probably have this on your phone!
- Where is north now?





Compass



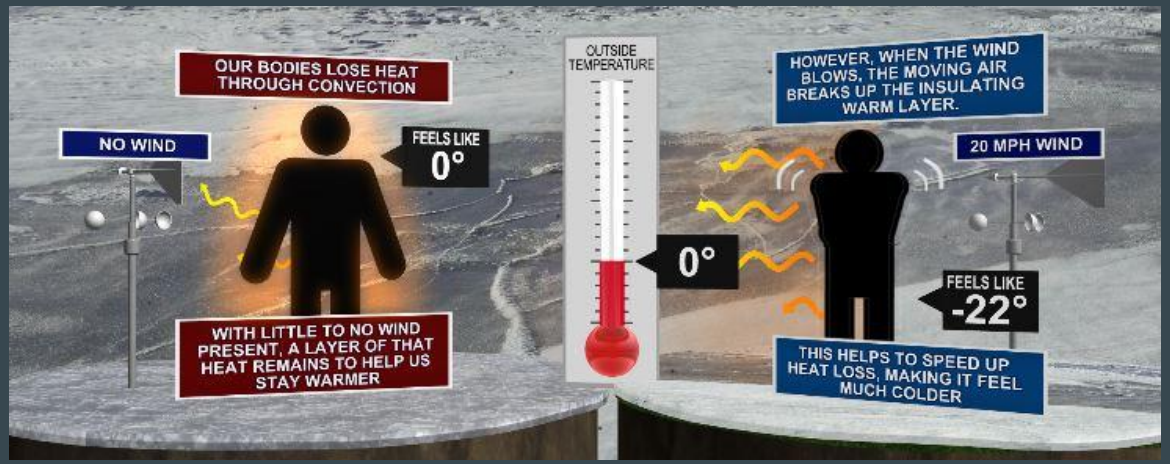
Compass rose

Dew Point

- Dew point is the temperature to which air must be cooled for water vapor in it to condense into dew or frost.
- At any temperature there is a maximum amount of water vapor that the air can hold.
- This maximum amount is called water vapor saturation pressure.
- Addition of more water vapor results in condensation.

Wind Chill

- Wind chill is the lowering of body temperature due to the passing flow of lower-temperature air.
- **Wind chill index** is always lower than the air temperature.



Let's code :)

- Open your Google Drive
- Create / find your folder, organize it
- Start a new Google Colab session

A copy of the notebook will be on https://github.com/stenoe/FEDS