

# Wind Turbine Data Visualisation

❖ user friendly application

Kim Janovski

# Introduction

- Lots of large raw data sets
- Data often different



Quick & automated way of graphically analysing data

- Lightweight user friendly app was developed
- Tools integrated for quick analysis and export
- No knowledge of coding required

# Application Overview

- Python 3.7 and Tkinter (Anconda)
- Functionalities:
  - Upload different file types
  - Plot **Time Series, Scatter Plot, Histogram, Wind Rose, Weibull Distribution**
  - Edit plots



- Resample & export data in accessible format
- Compiled as a stand-alone program
  - does **not** require Anaconda or Python to run

## Uploading a file

- User inputs Timestamp format and name of the Index Column
- File variables loaded in automatically

Wind Turbine Data Visualisation - File Import

Open File  
Browse A File

Load File

Enter the timestamp format  
Example: 2009-12-31 20:53:45 would be %Y-%m-%d %H:%M:%S

%Y-%m-%d %H:%M:%S

Enter the name of the first (Index) column  
Example: TimeStamp, TTimeStampLocal ...

TimeStamp

# Modifying a dataset

Select plot type

Time range and  
default sampling  
frequency

Time range can  
be modified

Data can be  
resampled or reset

Export modified  
data

## Time Frame Settings

Start Menu

Time Series

Scatter Plot

Histogram

Imported data ranges from 2016-01-02 00:00:00 to 2017-12-31 23:50:00

Default data sampling frequency is 0 days 00:10:00 (hh:mm:ss)

Start date: YYYY-MM-DD(space)hh:mm:ss

default

End date: YYYY-MM-DD(space)hh:mm:ss

default

Sampling frequency: default, 10 min, 30 min, 1 h, w, m ...

1h

Apply

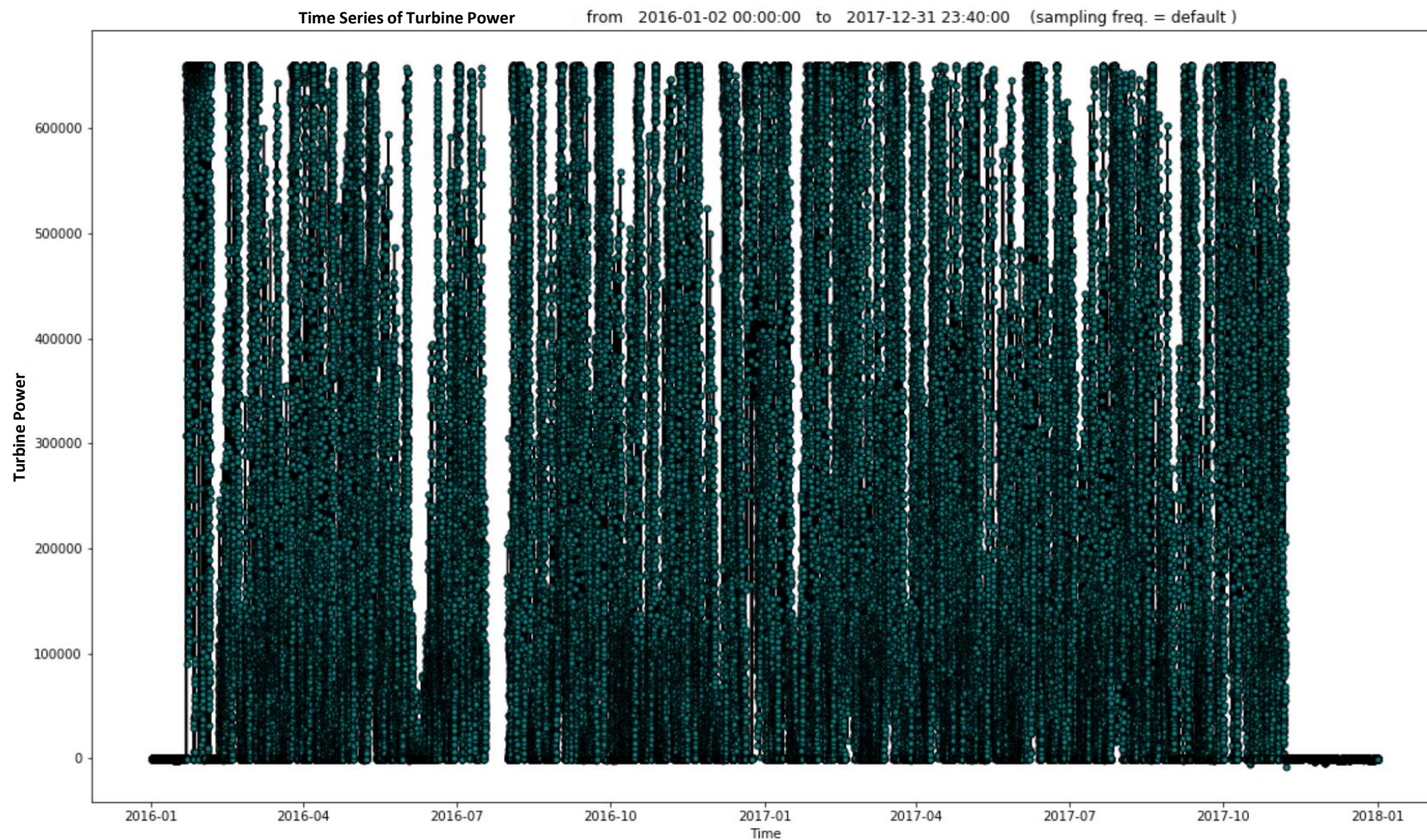
Export .csv

Export .xlsx



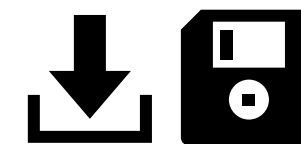
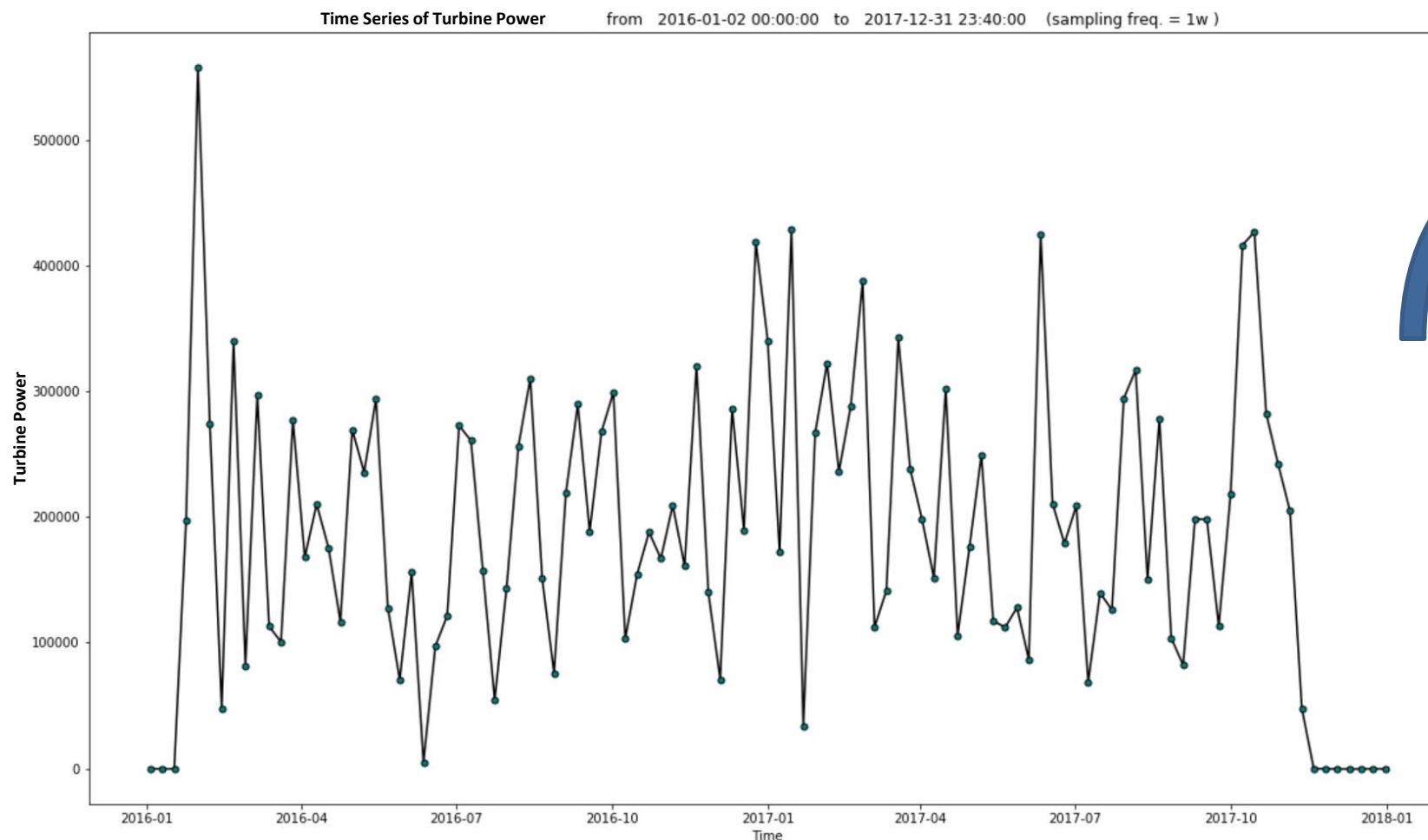
# Time Series

Turbine power, default freq. (10 min)



# Time Series

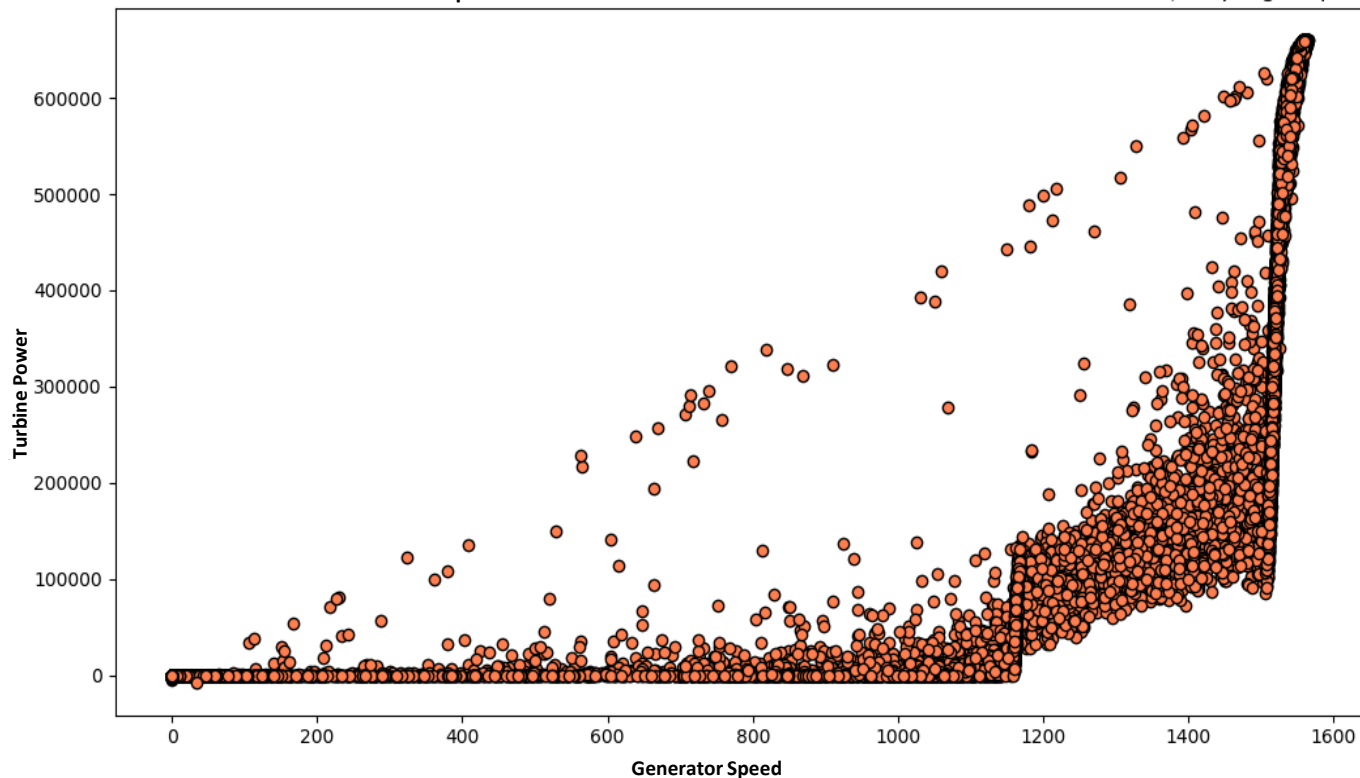
Turbine power, resampled (1 week)



Export graph &  
data file

# Scatter Plot

Turbine Power vs Generator Speed from 2016-01-02 00:00:00 to 2017-12-31 23:40:00 (sampling freq. = 45 min )



Select one variable from each row

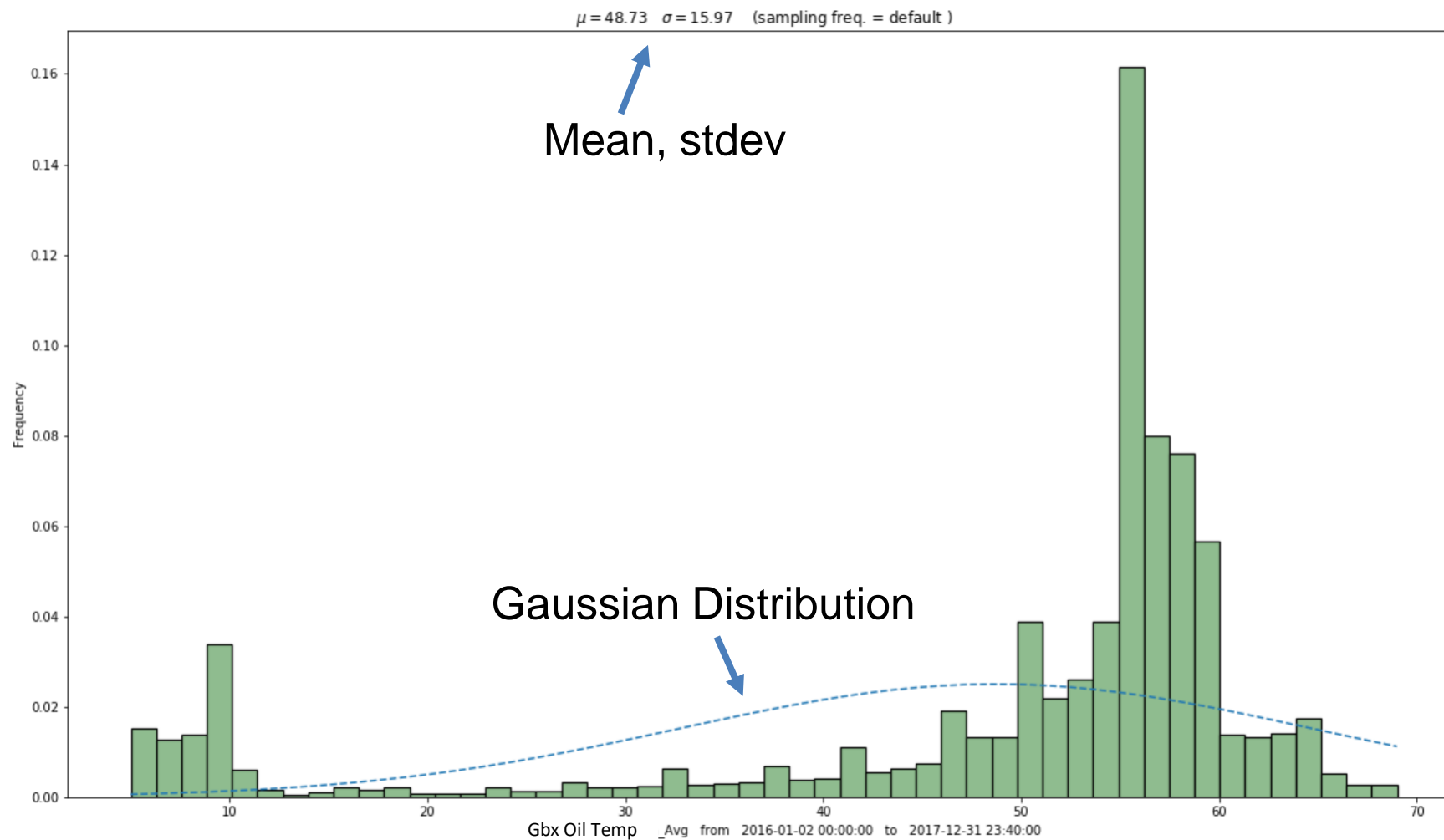
PLOT

x-axis y-axis

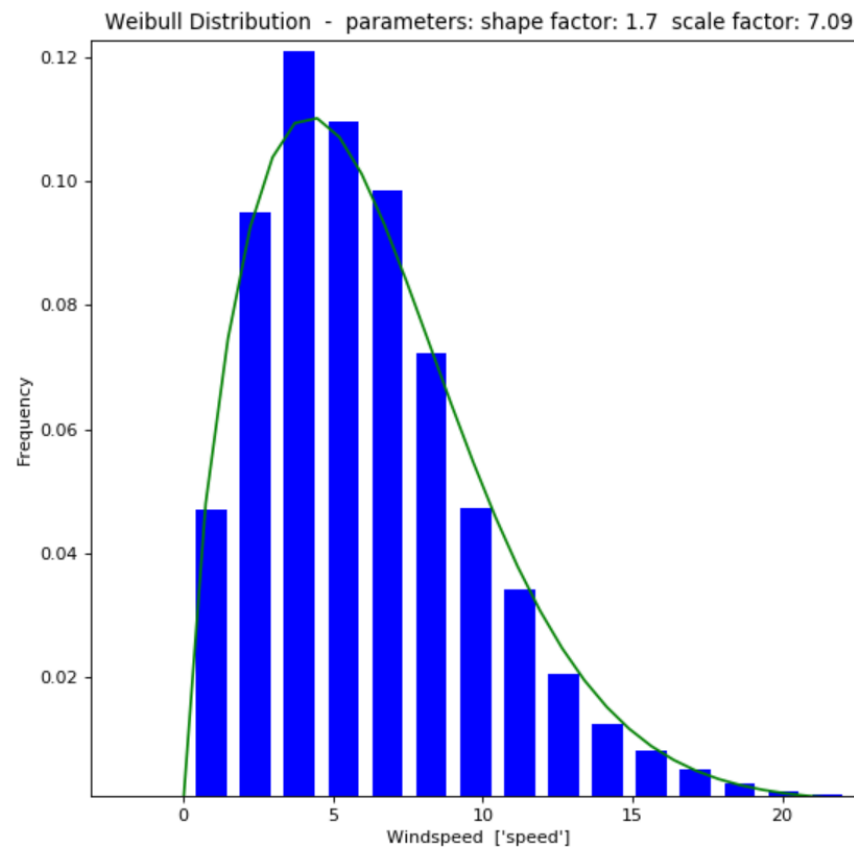
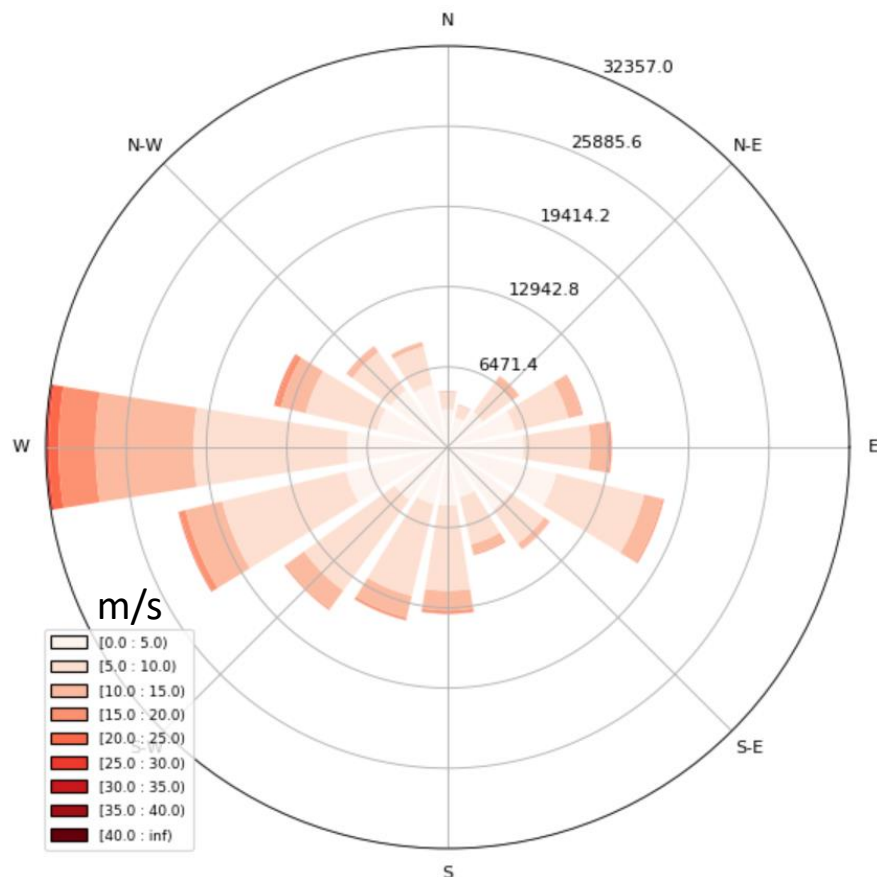
WTUR.W2_10m_Avg	WTUR.W2_10m_Avg
WTUR.W_10m_Std	WTUR.W_10m_Std
WTUR.W_10m_Min	WTUR.W_10m_Min
WTUR.W_10m_Max	WTUR.W_10m_Max
WTUR.W_10m_Avg	WTUR.W_10m_Avg
WGEN.GnTmpSta_10m_Avg	WGEN.GnTmpSta_10m_Avg
WGEN.OpTmRs1_10m_Sum	WGEN.OpTmRs1_10m_Sum
WGEN.OpTmRs2_10m_Sum	WGEN.OpTmRs2_10m_Sum
WGEN.SlpRngTmp_10m_Avg	WGEN.SlpRngTmp_10m_Avg
WGEN.Spd_10m_Avg	WGEN.Spd_10m_Avg
WGEN.Snd_10m_Max	WGEN.Snd_10m_Max



# Histogram



# Wind Rose & Weibull Distribution



Thank you for the attention, any questions?

