Content datafiles

Long term wind and wave data.

Data are given for key wind and wave data for a period covering 10 years, starting 1st of January 1992. The data are given at a time step of one hour. The site considered is in the North Sea at about 56^{0}5" North , 5^{0}0" East.

The wind and wave data are obtained from the NORA3 hindcast data as described by Haakenstad et al. (2021). The NORA3 data are available at thredds.met.no in NetCDF. The actual data have been extracted and further processed by Cheynet et al. (2023). The temperature data are extracted from the ERA5 database (Hersbach et al., 2020). The ERA5 data are available at Copernicus Climate Change Service (C3S) Climate Data Store (CDS), 10.24381/cds.adbb2d47.

The long term wind data are given at eight vertical levels: z = 10, 20, 50, 100, 150, 250, 500 and 750 m above sea level.

Wind_vel.txt

The file contains eight columns, one for each of the vertical levels above. The wind velocity is given in m/s. The time step is one hour and the time instants are the same as in the file Wave_data.txt.

Wind_dir.txt

The file contains eight columns, one for each of the vertical levels above. The wind direction (coming from) given in degrees. The time step is one hour and the time instants are the same as in the file Wave_data.txt.

Wave_data.txt

The file contains five columns:

1. Time in numerical format. Starts 1. January 1992 at 01:00. The time step is 1 hour. Ends at 31. December 2001 at 23:00.
2. Significant wave height (m).
3. Peak period in wave spectrum (s).
4. Wave direction (deg)
5. Surface friction velocity (m/s)

The numerical time format can be converted to a conventional date format by using the MATLAB "datetime" routine: time = datetime(Data(:,1),'ConvertFrom','datenum');. Here Data(:,1) is the first column in the Wave_data.txt file.

The first five lines of the time column will then look like:
01-Jan-1992 01:00:00
01-Jan-1992 02:00:00
01-Jan-1992 03:00:00
01-Jan-1992 04:00:00
01-Jan-1992 05:00:00

Temp_data.txt

The file contains four columns:

1. Time in numerical format. Starts 1. January 1992 at 00:57. The time step is approximately one hour. Ends at 31. December 2001 at 23:02. (To obtain values at the same time instants as in the wind and wave data files, interpolation may be needed).
2. Sea Surface temperature (degrees K).
3. Air temperature 2 m above sea level (degrees K).
4. Surface friction velocity (m/s).

Short term wind data.

WindTimeSeries.txt

The file contains 40 minutes of recorded wind speeds from a meteorological mast at a costal site (Slettringen at the Norwegian Coast (Heggem et al., 1998). Data from five elevations is given. The elevations are z = 46, 42, 20, 10 and 5 m above ground level. The file contains 6 columns:

1. Column 1, time (s) (time step is 1.1719 s)
2. Column 2 – 6: Measured wind speeds for the five elevations in descending order.

The first line is a heading line naming the columns.

References

Cheynet, E. Li, L., Jiang Z. 2023. Metocean Conditions at Two Norwegian Sites for Development of Offshore Wind Farms. 2023; *(forthcoming)*.

Haakenstad, Hilde, Øyvind Breivik, Birgitte R. Furevik, Magnar Reistad, Patrik Bohlinger, and Ole Johan Aarnes. 2021. "Nora3: A Nonhydrostatic High-Resolution Hindcast of the North Sea, the Norwegian Sea, and the Barents Sea." *Journal of Applied Meteorology and Climatology* 60 (10): 1443–64. https://doi.org/10.1175/JAMC-D-21-0029.1.

Heggem, Tore, Rune Lende, and Jørgen Løvseth. 1998. "Analysis of Long Time Series of Coastal Wind." *Journal of the Atmospheric Sciences* 55 (18): 2907–17. https://doi.org/10.1175/1520-0469(1998)055<2907:AOLTSO>2.0.CO;2.

Hersbach, Hans, Bill Bell, Paul Berrisford, Shoji Hirahara, András Horányi, Joaquín Muñoz-Sabater, Julien Nicolas, et al. 2020. "The ERA5 Global Reanalysis." *Quarterly Journal of the Royal Meteorological Society* 146 (730): 1999–2049. https://doi.org/10.1002/qj.3803.