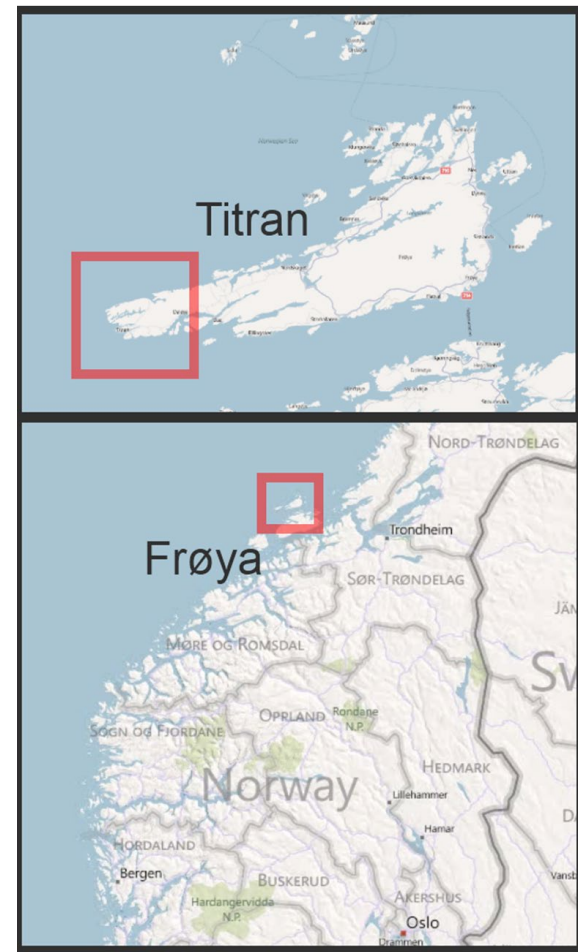
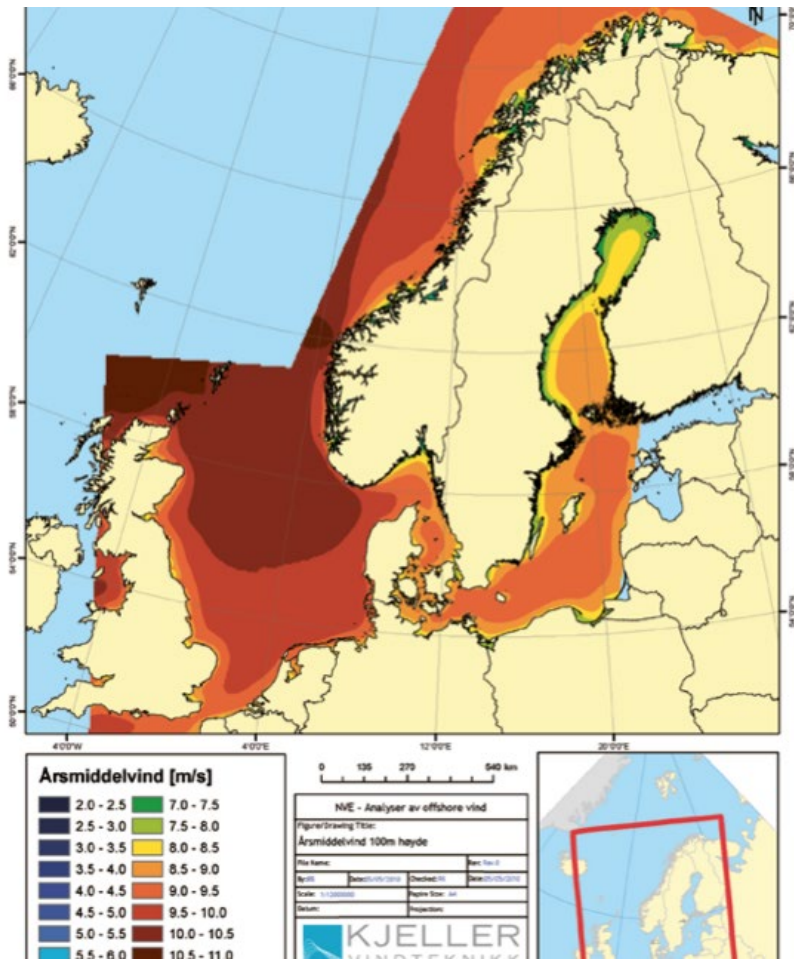


NTNU met-station at the Frøya island

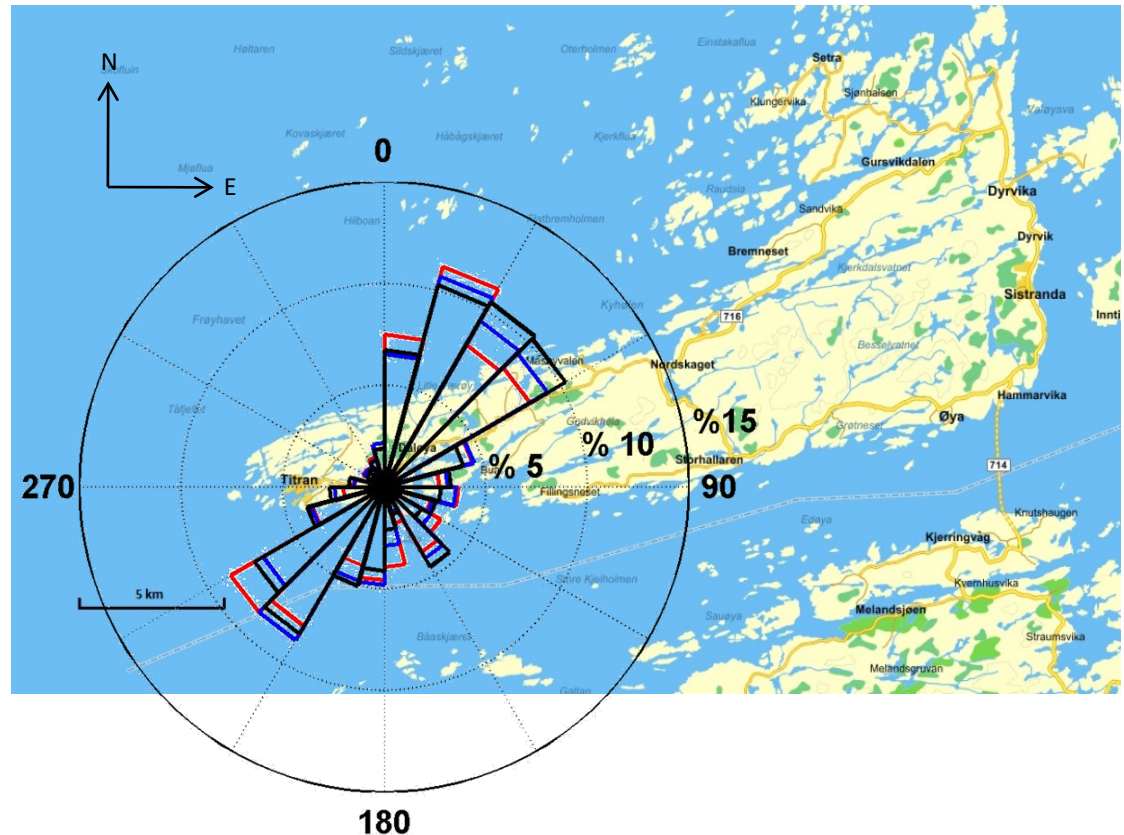


Hardware summary:

- 6 pairs of 2D sonic anemometers at 10, 16, 25, 40, 70, 100 m above the ground
- independent temperature measurements at the same heights and near the ground
- pressure and relative humidity from local met-station nearby (Sula)

Prevailing Wind Directions:

- North-east and south-west directions are dominating
- South-west direction can be estimated as ocean wind



Data resource

- 1 Hz time-series at 6 heights – 2 horizontal velocity components
- Data from time period Nov 2009 to Dec 2015
- 10-min mean data readily available at website [https://zenodo.org/record/2557500 - .XQ0fHi3JJry](https://zenodo.org/record/2557500-.XQ0fHi3JJry)
- 1 Hz data available on request to [mailto:lars.satran@ntnu.no?subject=1 Hz data](mailto:lars.satran@ntnu.no?subject=1%20Hz%20data)

January 10, 2019

Dataset Open Access

Frøya wind data

Piotr Domagalski; Lars Roar Sætran

Herewith we present the dataset of wind measurements from a Skipheia meteorological station on the island of Frøya on the western coast of Norway, Trøndelag.

The site represents an exposed coastal wind climate with open sea, land and mixed fetch from various directions. UTM-coordinates of the Met-mast: 8.34251 E and 63.66638 N.

Presented data were gathered between years 2009-2015;

Hardware summary: 6 pairs of 2D sonic anemometers at 10, 16, 25, 40, 70, 100 m above the ground, independent temperature measurements at the same heights and near the ground; pressure and relative humidity from local meteostation (Sula, 20 km away).

Database summary: approx. 180 000 of 10 min data samples of full data recovery. Wind speed and direction, temperature, pressure & relative humidity (from a nearby meteostation).

Data description: Two data files of different formats are available: a '*.txt' comma-separated values file and a native MATLAB '*.mat' file. Both contain the same data, starting with the first column: timestamp, wind speed (m/s, columns WS1-WS12) for 6 anemometers pairs, wind direction (360 deg, columns WD1-WD12) for 6 anemometers pairs, temperature at 0.2 m (AT0), temperatures at levels of wind measurement (deg C, AT1-AT6), data from nearby meteostation Sula, pressure (hPa, PressureSula), relative humidity (%), RelHumSula), temperature (deg C, TempSula), wind direction (360 deg, WDSula) and wind speed (m/s, WSSula). Columns have headers describing the data (first row).

Detailed site description with wind climate description can be found in attached analysis: Site analysys.pdf.

Additional information and analysis can be found in listed below works, using data from Frøya site, or nearby sites:

IEA Wind TCP Task 27 Compendium of IEA Wind TCP Task 27 Case Studies, Technical Report, Prepared by Ignacio Cruz Cruz, CIEMAT, Spain Trudy Forsyth, WAT, United States, October 2018; Chapter 1.8.

<https://community.ieawind.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=8afc06ec-bb68-0be8-8481-6622e9e95ae7&forceDialog=0>

Domagalski, P., Bardal, L. M., & Satran, L. Vertical Wind Profiles in Non-neutral Conditions-Comparison of Models and Measurements from Froya. *Journal of Offshore Mechanics and Arctic Engineering*, doi: 10.1115/1.4041816, <http://offshoremechanics.asmedigitalcollection.asme.org/article.aspx?articleid=2711333&resultClick=3>

Mathias Møller, Piotr Domagalski and Lars Roar Sætran, Characteristics of abnormal vertical wind profiles at a coastal site, *Journal of Physics: Conference Series*, IOPscience, under review (Feb 2019), DeepWind2019 conference poster available at: https://www.sintef.no/globalassets/project/eera-deepwind-2019/posters/c_moller_a4.pdf

Bardal, L. M., Onstad, A. E., Sætran, L. R., & Lund, J. A. (2018). Evaluation of methods for estimating atmospheric stability at two coastal sites. *Wind Engineering*, 0309524X18780378, <https://doi.org/10.1177/0309524X18780378>

Bardal, L. M., & Sætran, L. R. (2016, September). Spatial correlation of atmospheric wind at scales relevant for large scale wind turbines. In *Journal of Physics: Conference Series* (Vol. 753, No. 3, p. 032033). IOP Publishing, doi:10.1088/1742-6596/753/3/032033, <https://iopscience.iop.org/article/10.1088/1742-6596/753/3/032033/pdf>

Bardal, L. M., & Sætran, L. R. (2016). Wind gust factors in a coastal wind climate. *Energy Procedia*, 94, 417-424, <https://doi.org/10.1016/j.egypro.2016.09.207>

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