C-CORE 1.1 Historic records for winds

Historic records for winds

Challenge

Challenge ID	C-CORE_OFF1.1
Title	**Historic records for winds**
Challenge originator:	
General Description	
What data/products do you use?	Historical wind speeds are available in the form of surface-based observations, as reported from ships and buoys, via UCAR (ICOADS), and NOAA (NDBC and NCDC). Historical remotely-sensed satellite observations of 10m wind speeds are available via DEOS-RADS, as well as other agencies such as IFREMER (NAIAD). Historical hindcasts of reanalyzed 10m wind speeds are available via ECMWF (ERA-Interim) and NOAA (WAVEWATCH III). Historical 0-hour global and/or regional model analyses of 10m wind speeds are available via many global agencies such as NOAA, ECMWF, CMC, JMA, UKMET, and others.
When do you use this kind of dataset?	Historical wind data are used to great extent in all phases of the O&G cycle, except strictly operational tasks. The data set is used to assist in qualifying and quantifying the means and extremes of winds in the area of interest, but also to identify frequency of occurrence of wind speeds and weather window (where operational thresholds apply). During the early stages, field assessment/seismics etc. the data are mostly used to assess the operability of the area during different seasons and to assess financial risk and first draft of development costs. During planning of new fields and operations data are used to assess the climatic limitations local/regional weather would have on safety in order to reduce risk for operations, personnel and environment. Finally wind data are important to design of structures that can withstand the local conditions and take into account the risk of the extreme situations of the area.

What are your actual limitations and do you have a work around?	For more superficial analysis, first looks etc. an estimate is often sufficient and the quality of the data set is not as critical as for design studies. The latter requires long time series (for instance preferably more than 1/4 of the extreme calculated – i.e. 25 yrs for 100 year extreme) and high resolution in time and space in order to catch vigorous short-lived and small scale local phenomena. Data of sufficient quality can be hard to come by in coastal and remote/less developed areas and rougher modeled data, estimates and approximations will be used. Sometimes calibration of modeled data to shorter observed time series has to be made. The heights of many historical wind speed observations that are available via ICOADS are unknown, although a portion of the observations include the height of the observation. Similarly, the averaging period of wind observations is a variable that must be reconciled across all record sets prior to effective analyses. There are also important spatial and temporal limitations of historical surface-based and remotely-sensed 10m wind observations that make the analyses of extreme values very challenging (e.g., most extremes at sea were probably not observed or otherwise sampled). **Update frequency:** Too slow in some cases, some data sources do not extend to real time (1 month or more lag), and "patching" with any available observations is necessary. **Temporal resolution:** 3 and 6 hours is too infrequent and does not catch short-lived extremes, and approximations have to be made. **Spatial resolution:** Too large outside well known areas (and large even there). Does not catch small scale and local (topography induced) phenomena. Should be 4 km minimum. **NOTE. High resolution and high update resolution does not equal quality, hence documentation of verification is equally important!!**
Needs and expectations on EO data	EO is used for this today, but resolution, update frequency, length of data series and quality is not sufficient for instance design studies. It is used as input in regional reanalysis and hindcast. Need: Long (10 years +) **observed** time series of high quality (ground-truthed) and with high spatial resolution, especially for coastal areas and emerging O&G areas where demand for such data has been small or non-existent. Or - EO data that can improve modeled reanalyses. Example: Long time series of 10m wind speeds with 1-min, 10-min, 1-hour, and 3-second averaging periods).
Challenge classification	
Pre license	3
Exp.	3
Dev.	4
Prod.	4
Decom.	4
Geographic context/ restrictions	Applies to all six areas of interest, except for the cautionary notes about tropical cyclones, which only applies to South China Sea, West of Ireland, and Myanmar. Seasonality: Applies to all seasons.

Topographic classification / Offshore classification	Ocean
Activity impacted /concerned	
Technology Urgency	Short term (2-5 years)
Information requirements	
Update frequency	Daily or weekly, since historical data is often used to assess recent events. For some parameters and data sets, monthly is still sufficient. Available today: For the historical re-analyses and archived observations, monthly; however, recent observations are available generally without delay.
Temporal resolution	Data should be at least 1-3 hourly resolution depending on area and phenomena needed to be resolved. Available today: ERA-Interim: 6-hourly WaveWatch III: 3 hourly Surface-bases observation: sub-hourly to less frequently Remotely-sensed satellite observation: sub-daily to less frequently
Spatial resolution	Around 4 km Available: ERA-Interim: 0.75° WaveWatch III: 4 arc-mins, 10 arc-mins, and/or 30 arc-mins, depending on area Surface-bases observation: varies based on the locations of the ship/buoy observations Remotely-sensed satellite observation: varies based on platform scanning swath size and other parameters
Data quality	The sources in this document are selected because they are known to have sufficient quality (after some work-around/adaptation). In general separate in-depth verification studies has to be made for each source planned to be used for analysis, and the analysis has to be repeated for each geographical area (since sources might be of sufficient quality in one area but not another). In general, ground observations and modelled sourced are perceived to be of better quality than EO for historical wind data.
Data Coverage and extent	Regional.
Example format	ERA-Interim: grib and netCDF WaveWatch III: grib and/or grib2 Surface-bases observation: text, CSV and/or netCDF Remotely-sensed satellite observation: text
Timeliness	Normally needed urgently, possibly before assessing, planning, or exploring a new field. Hence the data source used for analysis needs to be frequently updated to avoid unnecessary waiting. Daily, weekly or monthly updates of data sets are sufficient, depending on the analysis required.

Existing standards	Multiple paragraphs in DNV-RP-C205, OTO 2001/010, ISO-19001-1, NORSOK-N-003e2, NORSOK-N-006u1, and DNV-OS-J001 contain extensive references to the standard measures of the means and extremes of winds, including the recommended approximations and calculations of return periods and probabilities of exceedance. The DNV series acknowledges that the procedures may not be applicable beyond the area of interest that it was tailored for. In addition, DNV-RP-C205, ISO-19001-1, and DNV-OS-J001 contain cautionary notes regarding the treatment of winds in areas that experience tropical cyclones, such as South China Sea, West of Ireland, and Myanmar.

Relevant products

Content by label

There is no content with the specified labels