Readme for FSU_RV_highwind1.txt
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The FSU_RV_highwind1.txt file contains individual marine reports collected during the period 1989 to 2005 from a select set of research vessels (R/Vs). The marine reports were extracted from an extensive collection of both automated and bridge meteorological data held at the Research Vessel Surface Meteorological Data Center (RVSMDC; http://www.coaps.fsu.edu/RVSMDC/). Only reports with unadjusted true (earth-relative) wind speeds greater than or equal to 20 m/s are included. The wind data must also pass a series of quality control processes (see below). The original data are available under the "data" link on the RVSMDC web site.

File Format:

FSU_RV_highwind1.txt is a tab delimited text file with three header lines. The file will easily load into Excel and if the user plans to read the file using Fortran, C, Perl, etc the data can be parsed on the tab by treating the tab as a single character. All values are stored with SI units. Data fields include:

ship_id	Call sign of the vessel
date	Observation year, month, and day
time	Observation hour, minute, and second
coaps_time	Observation time in minutes since 1-Jan-1980 @ 00:00 UTC. Note: time conversion codes available at: http://www.coaps.fsu.edu/woce/html/wcdtools.htm
latitude	Convention: -90 to 90 degrees (+N)
longitude	Convention: 0-359.99 degrees (+E)
PL_WDIR, PLWDIR2	Two possible values for wind direction measured relative to the vessel with 0 degrees representing a bow on wind, 90 degrees representing wind from the starboard side. Convention is direction from which wind blows.
PL_WSPD, PL_WSPD2	Two possible values for wind speed in m/s measured relative to the vessel
DIR, DIR2	Two possible values for true (earth-relative) wind direction. Convention is direction from which wind blows (from north = 0, from east = 90)
SPD, SPD2	Two possible values for true (earth-relative) wind speed in m/s.
T, T2	Two possible values for air temperature (deg. C)
TS, TS2	Two possible values for sea temperature in degrees C at depth noted.
RH, RH2	Two possible values for relative humidity (%)
TW, TW2	Two possible values for wet-bulb temperature (deg. C)
TD, TD2	Two possible values for dewpoint temperature (deg. C)
P, P2	Two possible values for near surface atmospheric pressure (hPa). Note both P and P2 have a type assigned to inform the user whether the value is adjusted to sea level (1), provided at the instrument height (2), or reported pressure type is unknown (0)

Any value in the file that is less than or equal to –99 should be treated as missing. Note that missing values are all assigned a “Z” flag and are considered good observations.

Note that many values have a reported height or depth in meters that follows the data value.

Quality control flags are also provided for all values. The flag to the right of coaps_time applies to all time fields for that record.

Quality Control:

All records have undergone automated and visual quality control. The procedures can be found at: http://www.coaps.fsu.edu/woce/docs/qchbook/qchbook.htm. Each value in the original records was assigned an alphabetic flag:

Flag	Description
A	Original data had unknown units. The units shown were determined using a climatology or some other method.
B	Original data were outside of physically realistic range bounds. For details see the qchbook.htm
C	Time data are not sequential or date/time not valid.
D	Data failed the T>=TW>=TD test. In the free atmosphere, the value of the temperature is always greater than or equal to the wet-bulb temperature, which in turn is always greater than or equal to the dew point temperature.
E	Data failed the resultant wind re-computation check. When the data set includes the platform's heading, course, and speed along with platform relative wind speed and direction, a program re-computes the earth relative wind speed and direction. A failed test occurs when the wind direction difference is >20degrees or the wind speed difference is >2.5 m/s.
F	Platform velocity unrealistic. Determined by analyzing latitude and longitude positions as well as reported platform speed data.
G	Data are greater then 4 standard deviations from the ICOADS climatological means (da Silva et al. 1994). The test is only applied to pressure, temperature, sea temperature, relative humidity, and wind speed data.
H	Discontinuity found in the data.
I	Interesting feature found in the data. More specific information on the feature is contained in the data reports. Examples include: hurricanes passing ship, sharp seawater temperature gradients, strong convective events, etc.
J	Data are of poor quality by visual inspection, DO NOT USE.
K	Data suspect/use with caution - this flag applies when the data look to have obvious errors, but no specific reason for the error can be determined.
L	Oceanographic platform passes over land or fixed platform moves dramatically.
M	Known instrument malfunction.
N	Signifies that the data were collected while the vessel was in port. Typically these data, though realistic, are significantly different from open ocean conditions.
O	Original units differ from those listed in the *original_units* variable attribute within the original data files. For details, please see the quality control report for the original data from which the high wind speed cases were extracted.
P	Position of platform or its movement are uncertain. Data should be used with caution.
Q	Questionable - data arrived at DAC already flagged as questionable/uncertain.

R	Replaced with an interpolated value. Done prior to arrival at the DAC. Flag is used to note condition. Method of interpolation is often poorly documented.
S	Spike in the data. Usually one or two sequential data values (sometimes up to 4 values) that are drastically out of the current data trend. Spikes occur for many reasons including power surges, typos, data logging problems, lightning strikes, etc.
T	Time duplicate.
U	Data failed statistical threshold test in comparison to temporal neighbors. This flag is output by automated Spike and Stair-step Indicator (SASSI) procedure developed by the DAC. Spikes and steps are indicated by V and X flags, respectively. The U flag often indicates noise in the data.
V	Data spike as determined by SASSI.
X	Step/discontinuity in data as determined by SASSI.
Y	Suspect values between X-flagged data (from SASSI).
Z	Data passed evaluation.

These flags can be used to eliminate suspect observations prior to data analysis. In addition to the 20 m/s criteria, the RVSMDC only included records containing SPD and/or SPD2 with A, E, G, I, O, R, or Z flags. Note that the G flag denotes values that exceed 4 standard deviations from the monthly climatological value. The flag is often applied to realistic, yet extreme, values (near storms or in regions where climatology is not well known [Southern Ocean]). The data flagged with E are retained because the true wind recalculation often involves averages that are slightly different from those calculated by the vessel data logger. The lack of metadata makes an exact re-computation difficult. The E test will definitely flag very poor true winds, but may also flag data that is correct where the only difference is the averaging technique. Users of FSU_RV_highwind1.txt may wish to treat the SPD data with E flags separately from the other records.

Most parameters have an associated flag. Only the flags on SPD or SPD2 were used to exclude records, so flags on all other parameters should be examined by the user. For example, if a user needs to use TS, they should check the corresponding data quality flag. The A, E, G, I, O, R, or Z flags would be the RVSMDC's recommendation for data that passes our quality control.

As a final note, no quality control system is perfect. The visual analysis is completed by trained meteorologists, but is subjective. Variations in human analysts and the ongoing evolution of quality control techniques at the RVSMDC imply that the data records in FSU_RV_highwind1.txt will have undergone slightly varying quality evaluation. Our evaluation of the data at the RVSMDC makes us confident that major problems in the data are appropriately flagged. More subtle problems (flow distortion, ship heating) are difficult to identify and may not have been flagged in all cases.

Questions about FSU_RV_highwind1.txt should be addressed to:

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