Heincke AWS Quality Control Report

Cruises: AR_16_/01
AR_16_/02
AR_16_/03
AR_16_/06
AR_16_/08

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Introduction:

The data referenced in this report were collected from the research vessel Heincke(call sign: DBCK; data provider: Inst. For Baltic Sea Research; PI: H.C. John) DATADIS Automatic Weather System(AWS) for 5 different WOCE cruises. The data were recieved in electronic format and converted to a standard FSU format. During the conversion, several changes were made to the data. These changes are outlined in Appendix A. Then they were preprocessed using an automated data checking program. Next a visual inspection was completed by a Data Quality Evaluator who reviewed, modified and added appropriate quality control (QC) flags to the data. Details of the WOCE QC can be found in Smith et al (1996). The data quality control report summarizes the flags for the Heincke AWS data, including those added by both the preprocessor and the analyst.

Statistical Information:

The first 4 cruises in the data set from the Heincke was expected to include minute resolution data taken in 4-1 hour intervals each day. The other 2 cruises include one minute resolution data taken for the entire day each day. The start and end dates, the number of records and values and the number and percentage of flags added are given in table 1.

Time (TIME), latitude (LAT), longitude (LON), platform course (PL_CRS), platform speed (PL_SPD), earth relative wind direction (DIR), earth relative wind speed (SPD), sea temperature (TS), atmospheric pressure (P), air temperature (T), and wet-bulb temperature (TW) were analyzed for all the cruises. In addition, platform speed measured by an electromagnetic log (PL_SPD2), and platform speed measured by a doppler log (PL_SPD3), were

Table 1: List of dates and number of records for each cruise.

Cruise:	Dates:	Number of Records	Number of Values	Number of Flags	Percentage Flagged
AR_16_/01	03/13/91 - 03/20/91	1261	16393	209	1.27
AR_16_/02	03/23/91 - 03/26/91	918	11934	67	0.56
AR_16_/03	04/02/91 - 04/10/91	2013	26169	936	3.58
AR_16_/06	10/16/91 - 10/19/91	270	3510	0	0.00
AR_16_/08	01/05/92 - 01/19/92	646	8398	50	1.90

analyzed for the first 3 cruises. Dew-point temperature (TD), and relative humidity (RH) were analyzed for the final 2 cruises. A total of 66404 values were analyzed with 1262 flags being added resulting in 1.90 percent of the data being flagged. The distribution of flags for each variable sorted by flag type is detailed in table 2.

Summary:

These data are in very good condition.

A: Significant problems

Only two problems that could be considered major exist in these data. The first is that the doppler log calibration is off, resulting in 578 observations for PL_SPD3 outside the bounds of normal platform movement. PL_SPD2 had 47 observations out of bounds as well. The second is that

308 of the observations for T, TW, and TD failed the T≥Tw≥Td test. There is no cause for this that is obvious to the evaluator.

Table 2: Number of Flags and Percentage Flagged for Each Variable

Variable	B	D	G	K	S	T	Number of Flags	Percentage of Data Flagged
TIME						44	44	0.86
LAT					1		1	0.02
LON					1		1	0.02
PL_CRS	1						1	0.02
PL_SPD					3		3	0.06
PL_SPD2	47						47	1.12
PL_SPD3	528						528	12.60
DIR				4			4	0.08
SPD			1	2			3	0.06
TS			1				1	0.02
P					2		2	0.04
T		289	2		1		292	5.72
TD		22					22	2.40
TW		308					308	6.03
RH							0	0.00
Totals:	576	619	4	6	8	44	1257	1.89
Percentage of Flags Added:	0.87	0.93	0.01	0.01	0.01	0.07	1.89	

B: Value out of accepted bounds
D: Values fail T≥Tw≥Td test
G: Value greater than 4 standard deviations from climatology
K: Value questionable/suspect
S: Spike in data
T: Time duplicate

B: minor problems:

- 44 "T" flags added to TIME for duplicate time stamps
- 4 "K" flags added to DIR, and 2 "K" flags added to SPD for suspect observations
- 8 "S" flags added for spikes in different variables

Final Note:

These data are in very good condition. The analyst foresees no problems using these data.

References:

Smith, S.R., C. Harvey, and D.M. Legler, 1996: Handbook of Quality Control Procedures and Methods for Surface Meteorology Data. WOCE Report No. 141/96, Report WOCEMET 96-1, Center for Ocean Atmospheric Prediction Studies, Florida State University, Tallahassee, FL 32310.

Appendix A

- At time 6324786 the wind direction of 0 has been converted to 360 degrees due to a wind speed of 90
- At time 6331877 the wind direction of 0 has been converted to 360 degrees due to a wind speed of 42
- At time 6335565 the wind speed of 0 has initiated a calm wind conversion.
- At time 6204254 the wind direction of 0 has been converted to 360 degrees due to a wind speed of 65