Discovery Multimet Data Quality Control Report

Cruises:
SR_01_/02
S__04I/03
ISS01_/04
P__19_/02
PR_30_/02
I__08A/00
ISS01_/03

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August 28, 1996

Report WOCEMET 96-11

Version 2.0

Introduction:

The data referenced in this report were collected from the research vessel Discovery (call sign: GLNE; data source: British Oceanographic Data Center/D. Turner) Multimet automated data collection system from 3 different cruises. The data were received in electronic format and converted to a standard format. 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). This data quality control report summarizes the flags for the Discovery data, including those added by both the preprocessor and the analyst.

Statistical Information:

The data from the Discovery were expected to include observations every minute from 3 cruises covering 7 WOCE lines. The start and end dates, the number of observations, and the number and percentage of non-Z flags for each cruise is given in table 1. Time (TIME), latitude (LAT), longitude (LON), earth relative wind direction (DIR), earth relative wind speed (SPD), sea temperature (TS), atmospheric pressure (P), air temperature (T), wet-bulb temperature (TW), longwave atmospheric radiation (RAD), photosynthetically available radiation (RAD2), and shortwave atmospheric radiation (RAD3) were quality controlled. A total of 2,053,824

Table 1: List of dates and number of records and flags for each of the cruises

CTC	Dates	Number of Records	Number of Values	Number of Flags	Percentage Flagged
SR_01_ /02 P__19_ /02 PR_30_ /02	11/11/92-12/14/92	48,240	578,880	200,692	34.67
S__04I/03 I__08A /00 ISS01_/03	02/06/93-03/18/93	57,183	686,196	65,950	9.61
ISS01_/04	03/23/03-05/02/93	57,689	692,268	14,380	2.08

values were checked and 281,022 flags were added resulting in 13.68 percent of the data being flagged. The distribution, including percentages flagged for each variable sorted by type is detailed in table 2.

Summary:

a: Significant problems:

With the exception of 2 problems, these data are in very good condition. The 45,940 "K" flags added to T are a result of T being very 'noisy' data. There was too much noise to flag the data effectively as spikes. Rather, the analyst added the "K" flags to caution the user to filter the T data before use.

The second problem was that many of the T, T2, TW, and TW2 data points were flagged by the pre-screener as "D"; most of the T and TW values were almost equal. According to information received from the data provider, this problem is most likely the result of not filling the TW sensor water bottles during the cruise.

Table 2: Percentage of Flags Assigned by Flag Type and Variable

Variable	B	D	G	I	J	K	L	Q	S	Total Number of Flags	Percentage of Records Flagged
TIME										0	0.00
LAT					84	3804	14			3902	2.39
LON					84	3787	14			3885	2.38
DIR					42	253		145	72	512	0.31
SPD			677	1	42	148		986	1	1855	1.14
TS	17588		2046					36		19670	12.06
P				1	42			114		157	0.10
T		35030	465		1	45940		106	73	81615	50.04
T2		39731	290					245	7	40273	83.48
TW		79358			1	77		4		79473	27.65
TW2		39738								39738	62.38
RAD					1			107	3	111	0.06
RAD 2	9755				37					9792	6.00
RAD 3					38					38	0.02
Totals:	27343	193857	3478	2	372	54009	28	1743	189	281021	

Percentage of flags used	1.33	9.44	0.17	0.00	0.02	2.67	0.00	0.08	0.00	13.68	

B: Data point out of bounds
D: Failed T≥Tw≥Td test
G: Data point lies beyond 4 standard deviations from climatological mean
I: Data point of special interest
J: Erroneous data point
K: Caution/Suspect data
L: Land error
Q: Added before data was received by the Data Assembly Center
S: Spike in data

b: Other cautionary flags:

- The 17,588 "B" flags added to TS are a result of the sea temperature around the Antarctic coast being less than 0.0 °C. This is not an uncommon occurrence, but the flags were left to indicate that this situation exists.
- The 9755 "B" flags were added to RAD2 due to observations that were less than 0.0 W/m2. These values are probably the result of a calibration problem with the sensor.
- All of the "J" flags added to LAT, LON, SPD, DIR, P, RAD2, RAD3 were due to readings of 0.0 for all observations for 03/23/93.
- All of the "Q" flags added were added before the Data Assembly Center received the data. The significance of the "Q" flag was not readily apparent to the DQE.

Final Note:
These data are in very good condition. The analyst cautions the user against using the wet-bulb data for cruises SR_01/02 and S__04I/03. The wet-bulb data for ISS01_/04 seems fine. The analyst foresees no other problems using this 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.