FS Sonne Automated Weather System Data Quality Control Report

Kennard B. Kasper and Shawn R. Smith

World Ocean Circulation Experiment (WOCE)

Surface Meteorological Data Assembly Center

Center for Ocean Atmospheric Prediction Studies

Florida State University

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Addendum:

Members of the WOCE Hydrographic Project Office (WHPO) and WOCEMET met at the 13th Data Products Committee (DPC) meeting in College Station, TX to discuss reconciliation of the WOCE cruise line designators. This was done in anticipation of the future release of version 3 of the WOCE global data set, and resulted in changes to several WOCE cruise line designations.

On August 20, 2001 WOCEMET removed the WOCE designation for the cruise IR_05_/01. The quality control information for this data set has been left in this report for the user, but please note that the line previously known as IR_05_/01 is NOT a WOCE cruise line.

WOCEMET removed the WOCE designation for the cruise IR_05_/02. The quality control information for this data set has been left in this report for the user, but please note that the line previously known as IR_05_/02 is NOT a WOCE cruise line.

WOCEMET removed the WOCE designation for the cruise I__01E/01. The quality control information for this data set has been left in this report for the user, but please note that the line previously known as I__01E/01 is NOT a WOCE cruise line.

Introduction:

This report summarizes the quality of automated weather system (AWS) data recorded on the FS Sonne (identifier: DFCG) between 21 November 1997 and 4 January 1998.This cruise contains 3 WOCE lines. The dates for the WOCE lines are in Table 1. The data were provided to the Florida State University Data Assembly Center (DAC) in electronic format by M. Dengler of the Institute fuer Meereskunde, Germany. They were converted to a standard DAC netCDF format. The data were then processed using an automated screening program which adds quality control flags to the data, highlighting potential problems. Finally, the Data Quality Evaluator reviewed the data and current flags. Flags were then added, modified, and deleted according to the judgement of the Data Quality Evaluator and other DAC personnel. An in depth description of the WOCE quality control procedures can be found in Smith et al. (1996). This data quality control report summarizes all flags for the FS Sonne AWS data and explains reasons why these flags were assigned.

Table 1: Dates for WOCE lines

WOCE Line	Dates Traversed
IR_05/_01	3 Dec 97 - 11 Dec 97
IR_05_/02	23 Dec 97 - 24 Dec 97
I__01E/01	24 Dec 97 - 4 Jan 98

Statistical Information:

The FS Sonne AWS data are expected to include observations taken every minute on the WOCE cruise. Values for the following variables were collected:

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)
Relative Humidity	(RH)

Details for the entire cruise including dates, number of records, number of values, number of flags, and percentage flagged are listed in Table 2. A total of 532,962 values are evaluated with 895 flags added by the preprocessor and Data Quality Evaluator for a total of 0.17 percent of the values being flagged.

Table 2: Statistical Cruise Information

Dates	Number of Records	Number of Values	Number of Flags	Percentage Flagged
22 Nov 97 - 4 Jan 98	59,218	532,962	895	0.17

Summary:

The AWS data from the FS Sonne are in excellent condition with only 0.17 percent of the data being flagged for errors. Table 3 provides the numbers and percentage of flags for each variable. A thorough discussion of the flags follows.

Table 3: Number of Flags and Percentage Flagged by Variable

Variable	G	K	S	Total Number of Flags	Percentage of Variable Flagged
DIR			39	39	0.07
SPD	5		36	41	0.07
T		387		387	0.65
RH		428		428	0.72
Total number of Flags	5	815	75	895	0.17
Percent-age of All Values Flagged	0.00*	0.15	0.01	0.17	

* percentage less than 0.01

Value Greater Than 4 Standard Deviations from Climatology ("G" flags):
The preprocessor assigned "G" flags to earth relative wind speed data. The flags identify values that are greater than 4 standard deviations from the Da Silva (1994) climatology for earth relative

speed. This test does not necessarily indicate erroneous values, just extreme data.

Data Suspect ("K" flags)
The Data Quality Evaluator assigned "K" flags to temperature and relative humidity data for 30 November 1997 between 1800 UTC and 0000 UTC. Temperature and relative humidity values fluctuated up and down rapidly within this time period. Upon evaluating other physical parameters in the same data set, no apparent physical cause for the fluctuations was surmised by the Data Quality Evaluator. These flags indicate that the flagged data are suspect and should be used with caution.

Spike in the Data ("S" flags)
The Data Quality Evaluator applied "S" flags to earth relative wind direction and earth relative wind speed data. The flags indicate areas in the data that are drastically out of the current data trend. Spikes are common to electronic data and may be associated with power surges that briefly disrupt the electronic integrity of the AWS systems.

Final Comments:

The FS Sonne AWS data is of excellent quality and should be very reliable for the user.

References:

da Silva, A. M., C. C. Young and S. Levitus, 1994: Atlas of Surface Marine Data 1994, Volume 1: Algorithms and Procedures. NOAA Atlas Series. In preparation.

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 32301