Johan Hjort Bridge Data Quality Control Report (1992, 1994)

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8 December 1997

Report WOCEMET 97-23

Version 1.0

Introduction:

This report summarizes the quality of surface meteorological data collected by the Johan Hjort (identifier: LDGJ) crew during two WOCE cruises in 1992 and 1994. The data were provided to the Florida State University Data Assembly Center (DAC) in an electronic format by J. Blindheim of the Institute of Marine Research (IMR), Norway. First, the data were converted to standard DAC netCDF format. Second, the data were processed by using an automated screening program that adds quality control flags to the data, highlighting potential problems. Next, 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). The data quality control report summarizes all flags for the Johan Hjort bridge data and explains reasons why these flags were assigned.

Statistical Information:

The Johan Hjort data are a combined time series created using the underway and on station data. No atmospheric pressure data were collected while on station; thus, the combined series has areas of missing atmospheric pressure data. This combination also resulted in an irregular timing of the observations; however, observations occur roughly every four hours on each of the WOCE cruises. Values for the following variables were collected:

Time	(TIME)
Latitude	(LAT)
Longitude	(LON)
Earth Relative Wind Direction	(DIR)
Earth Relative Wind Speed	(SPD)
Atmospheric Pressure	(P)#
Air Temperature	(T)

collected in underway data only

A statistical summary of the data for each cruise is given in Table 1. A total of 2,128 values is evaluated with 144 flags added by the preprocessor and Data Quality Evaluator for a total of 6.77 percent of the values being flagged.

Table 1: Statistical Cruise Information

CTC	Dates	Number of Records	Number of Values	Number of Flags	Percentage Flagged
AR_18_01	14 Jul 92 - 27 Jul 92	104	728	77	10.58 (0.27*)
AR_18_06	24 Jul 94 - 15 Aug 94	200	1400	67	4.79 (0.79*)

* percentage when “O” flags are not included

Summary:

The bridge data from the Johan Hjort are in excellent condition with only 0.61 percent of the data being flagged for errors. Table 2 provides the numbers and percentage of flags for each variable. A significant number of “O” flags were added during the conversion process. The O-flagged data are considered good but with a lesser degree of precision. These O-flags are not considered in the error flag percentages, marked with an * in Tables 1 and 2. A thorough discussion of the flags follows.

Table 2: Number of Flags and Percentage Flagged by Variable

Variable	F	O	S	T	Total Number of Flags	Percentage of Variable Flagged
TIME				2	2	0.66
LAT	5				5	1.64
LON	5				5	1.64
SPD		131			131	43.09
P			1		1	0.33
Total number of Flags	10	131	1	2	144	6.77(0.61 *)
Percent-age of All Values Flagged	0.47	6.16	0.05	0.09	6.77 (0.61*)	

* percentage when "O" flags are not included

Conversion Flag (O) for the Earth Relative Wind Speed:

Commonly, the DAC receives earth relative wind speed data in units of knots for both underway and on station data. These data are then converted to the standard meter per second by DAC personnel. For the Johan Hjort cruises all of the "on station" earth relative wind speed data were received in units of knots while the "underway" data were received in Beaufort wind force units and knots (Table 3). Since the netCDF files are designed to record only one original unit for earth relative wind speed data, it was necessary to use a flag to identify when a second original unit was received. "O" flags were assigned to earth relative wind speed data that were received originally in Beaufort wind force units. All earth relative wind speed data are good; however, data flagged with an "O" (Beaufort Wind Force) are of a lesser precision than those originally recorded in knots ('Z' flagged).

Table 3: Distribution of Units for Received Wind Speed Data

Year	"On Station" Data (Units)	"Underway Data" (Units)
1992	Knots	Beaufort Wind Force
1994	Knots	Knots / Beaufort Wind Force

Unrealistic Platform Speed:

For both cruises, a few latitude and longitude variables were marked with an "F" flag. These flags show that the platform speed computed by the preprocessor exceeds a realistic speed for a research vessel (15 meters per second). These latitude and longitude positions should be used with caution.

Time Duplicate:

During the 1994 cruise a pair of time duplicate flags were assigned by the preprocessor to indicate where two data records shared identical times. Even though the times for these two records are identical, the original data come from different sources namely, "on station" and "underway." As a result, the duplicate record from the "underway" data includes pressure values while the "on station" data do not. Since it is desirable to include all data in one file for a given time period, both the "on station" and "underway" data have been retained in one file and the time flags reflect the coincident observations from 2 sources.

Final Comments:

The Johan Hjort bridge data are of excellent quality and should be deemed reliable by the user.

Note that “O” flagged wind speeds have lower precision then other wind speed values.

References:

Smith, S. R., C. Harvey, and D. M. Legler, 1996: Handbook of Quality Control Procedures and Methods for Surface Meteorology Dat a. WOCE Report No. 141/96, Report WOCEMET 96-1, Center for Ocean Atmospheric Prediction Studies, Florida State University, Tallahassee, FL 32301