Franklin Data Quality Control Report

Cruises:PR_13N/01
PR_11_/01
PR_11_/02
PR_11_/03
PR_13N/02
P__21_/00
PR_11_/04
PR_13N/04
PR_11_/06
PR_11_/07

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Introduction:

The data referenced in this report were collected from the research vessel Franklin (call sign: VJJF) CSIRO meteorological station scanner from each of 10 different cruises for WOCE. The original data converted to a standard format and then preprocessed using an automated data checking program. Next, a visual inspection was completed by a data quality evaluator (DQE) 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 report summarizes the flags for the Franklin data, including flags added by both the pre-processor and the analyst.

Statistical Information:

The data from the Franklin were expected to include observations every 5 minutes from 10 cruises. The cruise track code (CTC), the begin and end date, the number of records, values, and flags and the percentage of non-Z flags for each cruise is 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

Table 1: List of dates and numbers of records and flags for each cruise

CTC	Dates	Number of Records	Number of Values	Number of Flags	Percent Flagged
PR_13N/01 PR_11_/01	08/15/89 - 09/09/89	6725	26900	2	0.01
PR_11_/02	09/09/89 - 09/26/89	4949	19796	8	0.02
PR_13N/02	02/26/90 - 03/23/90	7061	28244	2	0.01
PR_11_/05	03/23/90 - 04/06/90	4274	17096	0	0.00
P__21_/00	11/15/91 - 12/14/91	8210	98520	911	0.92
PR_11_/04	09/18/92 - 10/04/92	4496	53952	0	0.00
PR_13N/04	06/24/93 - 07/18/93	5836	75868	6005	7.92
PR_11_/06	09/11/93 - 10/04/93	5712	54051	6	0.01
PR_11_/07	03/10/94 - 04/03/94	6759	87867	0	0.00

temperature (TS), atmospheric pressure (P), air temperature (T), and relative humidity (RH) were quality controlled. A total of 462294 values were checked and a total of 6934 flags were added to the 7 cruises resulting in 1.5% of the data being flagged. Table 2 details the flag distribution, including percentages flagged for each variable sorted by type.

Summary:

All the files for this data set do not contain the same parameters. The differences in content were not necessarily divided by cruise. No explanation was given for the discrepancy. Table 3 outlines which parameters are available for which files.

Table 2: Frequency of Flags Assigned for Each Variable

Variable	Unreal Move-ment	>4 s.d. from Climatologi-cal Mean	Interesting Feature	Erroneous Data	Caution /Suspect Data	Spike	Totals	Percent-age of Records Flagged
LAT	5						5	0.0
LON	5						5	0.0
DIR			4				4	0.0
SPD		25					25	0.0
TS			3			1	4	0.0
P				5365			5365	33.1
T						8	8	0.0
RH					1518		1518	5.2
Totals:	10	25	7	5365	1518	9	6934	1.5
Percentage of flags used	0.00	0.01	0.00	1.16	0.33	0.00	1.50	

Two notable problems occurred in this data set. The first was that the atmospheric pressure observations for the entire PR_13N/04 cruise were reported as 0.0mb. These values were flagged as "J", erroneous data. One must assume an instrument malfunction; however, no confirmation of a malfunction was available. The second problem was that many of the relative humidity observations were at exactly 100% for the periods 11/30/91 - 12/14/91 and 07/09/93 - 07/18/93. This is a highly improbable situation. However, due to the absence of disputing data all these values were flagged with "K", caution/suspect data.

Table 3: Parameters Available for Each File

Filename	Cruise	Available Parameters
VJJF.890815005v100.nc	PR_13N/01	TIME, LAT, LON, TS
VJJF.890820005v100.nc		TIME, LAT, LON, TS
VJJF.890825005v100.nc		TIME, LAT, LON, TS
VJJF.890830005v100.nc		TIME, LAT, LON, TS
VJJF.890904005v100.nc		TIME, LAT, LON, TS
VJJF.890909005v100.nc	PR_11_/02	TIME, LAT, LON, TS
VJJF.890914005v100.nc		TIME, LAT, LON, TS
VJJF.890919005v100.nc		TIME, LAT, LON, TS
VJJF.890924003v100.nc		TIME, LAT, LON, TS
VJJF.900226005v100.nc	PR_13N/02	TIME, LAT, LON, TS
VJJF.900303005v100.nc		TIME, LAT, LON, TS
VJJF.900308005v100.nc		TIME, LAT, LON, TS
VJJF.900313005v100.nc		TIME, LAT, LON, TS
VJJF.900318005v100.nc	PR_11_/05	TIME, LAT, LON, TS
VJJF.900323005v100.nc		TIME, LAT, LON, TS
VJJF.900328005v100.nc		TIME, LAT, LON, TS
VJJF.900402005v100.nc		TIME, LAT, LON, TS
VJJF.911115005v100.nc	P__21_/00	TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH
VJJF.911120005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH
VJJF.911125005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH
VJJF.911130004v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH
VJJF.911205005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH
VJJF.911210005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH
VJJF.920918005v100.nc	PR_11_/04	TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH
VJJF.920923005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH
VJJF.920927005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, T, RH

Filename	Cruise	Available Parameters
VJJF.930624005v100.nc	PR_13N/04	TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.930629005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.930704005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.930709005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.930714005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.930911005v100.nc	PR_11_/06	TIME, LAT, LON, TS
VJJF.930915005v100.nc		TIME, LAT, LON, TS
VJJF.930920005v100.nc		TIME, LAT, LON, PS_CRS, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.930925055v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.930930005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.940310005v100.nc	PR_11_/07	TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.940315005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.940320005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.940325005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH
VJJF.940330005v100.nc		TIME, LAT, LON, PS_CRS, PL_SPD, PS_WDIR, PS_WSPD, DIR, SPD, TS, P, T, RH

In addition, there were some minor problems with the data set. Five observations each of lat and lon were flagged with “F”, unreal movement, by the pre-screener. No explanation was given for the readings, so they were not changed by the analyst. The meteorological observations for these records should be taken to be correct unless otherwise flagged. There were also 25 “G”, observation >4 standard deviations from climatological mean, descriptive flags added to earth relative wind speed observations during the period 12/10/91 - 12/14/91. The flagged observations, which are near 20m/s, appear to be correct. Therefore, the flags were not changed by the analyst.

Three sea temperature observations were flagged with “I”, interesting feature. In each case, the sea temperature fell more than 4 degrees, and then rose to near the previous temperature within a 4 hour period. Only the lowest temperature during each of these episodes was flagged. One possible explanation for this is that strong winds that mixed the ocean waters resulting in colder water near the ocean surface. A lack of corresponding data hinders further investigation into the cause of these events.

Four wind direction observations were also flagged with "I". The Intertropical Convergence Zone boundary shows up clearly as the ship passes through it twice. The observations at the start and finish of the change in wind direction at the beginning and end of the event were each flagged.

Final Note:

With the exception of the atmospheric pressure observations for the PR_13N/04 cruise and the relative humidity observations mentioned above, these data appear to be in excellent condition. The analyst foresees no problems in 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.