John P. Tully Sequential ASCII Interface Loop (SAIL)
Data Quality Control Report

Cruise:
P__15N/01
P__15N/02
PR_06_/12
PRS01_/06

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Introduction:

The data referenced in this report were collected from the research vessel John P. Tully (Call sign: CG2958; Data Provider: Institute of Ocean Science, Canada; P.I.: H. Freeland) SAIL System for 2 WOCE cruises covering 4 hydrographic lines. These data were received in electronic format and converted to the standard FSU 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). The data quality control report summarizes the flags for the John P. Tully SAIL data, including those added by both the preprocessor and the analyst.

Statistical Information:

The data referenced in this report were expected to include observations taken every 2 minutes by the John P. Tully SAIL System. The details of the cruise, including start and end date, number of values, records, and flags, and percentage flagged are outlined in Table 1.

Time (TIME), latitude (LAT), longitude (LON), platform heading (PL_HD), platform speed (PL_SPD), earth relative wind direction (DIR), earth relative wind speed (SPD), sea temperature (TS), and atmospheric pressure (P) were analyzed.

Table 1: Statistical Cruise Information

CTC	Dates	Number of Records	Number of Values	Number of Flags	Percentage Flagged
P__15N/01 PR_06_/12 PRS01_/06	09/06/94 - 10/08/94	22738	204642	44780	21.88
P__15N/02	10/13/94 - 11/11/94	20136	181224	42773	23.60

A total of 385866 values were checked, with 87553 flags added by the prescreener and analyst, resulting in 22.69 percent of the data being flagged. The distribution of flags for each variable sorted by flag type is detailed in table 2.

Summary:

A:<u>Major Problems:</u>

There is only 1 major problem in this data set: the wind data, both DIR and SPD are completly erroneous. Throughout all the files, both of these variables have a signature of the ship's movement in them. This problem was encountered in other data sets such as the Thompson(WTEA) and the Knorr(KCEJ). It was determined that this problem was a result of a mis-calculation of the data where all the available information was not being used. This resulted in a signature of the ship's movement in the DIR and SPD data, with the problem being worse at high ship speeds. The problem with the WTEA and KCEJ was resolved by recalculating the winds with all of the available parameters: PL_WSPD, PL_WDIR, PL_HD, PL_SPD, and PL_CRS. However, the CG2958 does not include all of these parameters, so there is no way to recalculate the earth relative winds. Thus, all the data was flagged with "J" or "K" flags; the "K" flags being applied when ship speeds were lower, thus the observed wind speeds are closer to the true wind speed.

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

Variable	G	H	I	J	K	S	Total Number of Flags	Percentage of Variable Flagged
TIME							0	0.00
LAT						2	2	0.00
LON						2	2	0.00
PL_HD							0	0.00
PL_SPD							0	0.00
DIR				42872			42872	100.00
SPD				31648	11224		42872	100.00
TS					103	150	253	0.59
P	1547	2	3				1552	3.62
Total Number of Flags Used	1547	2	3	74520	11327	154	87553	22.69
Percentage of Flags Used	0.33	0.00*	0.00*	15.80	2.40	0.03	22.69	

G: Data point greater than 4 standard deviations from climatology
H: Data shows a discontinuity
I: Data has an interesting feature
J: Data is erroneous
K: Data is suspect, use caution
S: Data shows a spike

B: <u>Minor Problems:</u>

- The 1547 "G" flags added to P are from the extremely low pressures encountered by the John P. Tully during it's voyage.
- P also had 3 "I" flags added by the analyst to highlight these extremely low pressures. The lowest pressure recorded in this data set is 967.5mb at 3:16 on 9/20/94.
- A discontinuity also existed in the P data. This occurred on 9/15/94 and resulted in the analyst applying 2 "H" flags to the data.
- The TS data had 150 Spikes. These are pointed out by the "S" flags applied by the analyst. In a data set of this size it is not unusual to have a number of spikes. No inherent problem exists.
- There was one specific problem with the TS data, though. On 9/18/94, an unusual pattern appeared in the TS

data. The data twice showed a several degree drop in the period of 2 minutes. The data between these drops were flagged with 103 "K" flags.

- 2 Spikes were also found in each LAT and LON. These also were flagged with the "S" flag.

Final Note:

Depending on which variables the user is considering using, these data are either in good shape or poor shape. The wind data, DIR and SPD, are unusable in their current condition. The TS and P data on the other hand are in outstanding condition. The user should have no problem with these variables.

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.