

# Report on the Quality of Marine Surface Observations

Report Number 34

ORGS UKMO R Duplicate

10 FEB 2006

**National Meteorological Library**

FitzRoy Road, Exeter, Devon. EX1 3PB

July to December 2005





# REPORT ON THE QUALITY OF MARINE SURFACE OBSERVATIONS:

JULY TO DECEMBER 2005

## Distribution list :

### i) External

Director World Weather Watch, WMO, Mr D. Schiessl  
President CBS, Mr A. Gusev  
Ex-President CBS, Dr A. A. Vasiliev  
President CMM, Mr J. Guddal  
Technical Co-ordinator DBCP, Mr E. Charpentier  
European Centre for Medium-range Weather Forecasts (attn. Mr D. Richardson)  
National Centers for Environmental Prediction (attn. Mr B. Ballish)  
Japanese Meteorological Agency (attn. Dr N. Sato)  
Japanese Meteorological Agency (attn. Mr Yukinari Ohta)  
Royal Netherlands Meteorological Institute [KNMI] (attn. Mr R. Rozeboom)  
Deutscher Wetterdienst (attn. Mr V. Gärtner)  
Deutscher Wetterdienst (attn. Mr B. Richter)  
Bibliothek des Deutschen Wetterdienstes  
Canadian Meteorological Centre (attn. Mr G. Verner)  
Meteo-France (attn. Mr B. Lacroix)  
Japan Meteorological Agency, Mr T. Iriguchi,

### ii) Internal

National Meteorological Library  
Manager of Observation Monitoring, Mr M. Harrison  
Observation Monitoring Team Member, Mr G. Dow

**For further information on or copies of this report, please contact:**

Manager of Observation Monitoring,  
Discovery 2,  
The Met Office,  
Fitzroy Road,  
Exeter,  
Devon,  
EX1 3PB  
United Kingdom.

E-mail: [mike.harrison@metoffice.gov.uk](mailto:mike.harrison@metoffice.gov.uk)







# REPORT ON THE QUALITY OF MARINE SURFACE OBSERVATIONS:

JULY TO DECEMBER 2005

## CONTENTS

1. Introduction
2. Monitoring methods
3. Monitoring results:
  - 3.1 *Pressure*
  - 3.2 *Wind*
  - 3.3 *Sea-surface temperature*
4. Summary







# REPORT ON THE QUALITY OF MARINE SURFACE OBSERVATIONS:

JULY TO DECEMBER 2005

## LIST OF TABLES

1. Frequency distribution of the number of observations of pressure, wind and SST.
2. Number of observations of pressure for past six-month periods.
3. Platforms reporting suspect pressure observations:
  - 3a *Stations reporting in DRIFTR code.*
  - 3b *Stations reporting in SHIP code.*
4. Platforms reporting in SHIP code, not listed in table 3 but listed as suspect in the previous six-month period.
5. Platforms reporting suspect wind speed observations:
  - 5a *Stations reporting in DRIFTR code.*
  - 5b *Stations reporting in SHIP code.*
6. Platforms reporting in SHIP code, not listed in table 5 but listed as suspect in the previous six-month period.
7. Platforms reporting suspect wind direction observations:
  - 7a *Stations reporting in DRIFTR code.*
  - 7b *Stations reporting in SHIP code.*
8. Platforms reporting in SHIP code, not listed in table 7 but listed as suspect in the previous six-month period.
9. Platforms reporting suspect sea surface temperature:
  - 9a *Stations reporting in DRIFTR code.*
  - 9b *Stations reporting in SHIP code.*
10. Platforms reporting in SHIP code, not listed in table 9 but listed as suspect in the previous six-month period.
11. Number of platforms reporting suspect pressure, wind and sst observations for each of the six-month periods covered by the WMO reports on the quality of marine observations.







# REPORT ON THE QUALITY OF MARINE SURFACE OBSERVATIONS:

JULY TO DECEMBER 2005

## LIST OF FIGURES

1. Number of observations of pressure for past six-month periods.
- 2a Distribution of O-B SHIP pressure differences, all observations.
- 2b Distribution of O-B SHIP pressure differences, flagged observations only.
- 2c Distribution of O-B SHIP pressure differences, unflagged observations only.
- 2d-f As 2a-c but for wind speed.
- 2g-l As 2a-c but for wind direction.
- 2j-l As 2a-c but for SST.
3. Geographical distribution of bias of SHIP pressure.
4. Geographical distribution of standard deviation of SHIP pressure.
5. Geographical distribution of the number of SHIP pressure observations.
- 6-8 As figures 3-5 but for wind speed.
- 9-11 As figures 3-5 but for wind direction.
- 12-14 As figures 3-5 but for SST.







# REPORT ON THE QUALITY OF MARINE SURFACE OBSERVATIONS:

JULY TO DECEMBER 2005

## 1. INTRODUCTION

In 1985, the Commission for Basic Systems (CBS) agreed that there was a need for GDPS / Global NWP centres to monitor the quality of observations available on the GTS and to exchange monthly lists of stations providing seemingly erroneous data. In 1988 three lead centres were nominated which would have a co-ordinating role of producing, at six-monthly intervals, consolidated lists of suspect stations for given data types together with information on the nature of the error. The Met Office was allocated the role as lead centre for marine surface observations which encompass observations from ships, drifting buoys, moored buoys and other fixed marine platforms. This is the thirty-fourth of its reports and covers the period July to December 2005. For each observing platform identified as suspect, values are supplied for the number of observations received at the Met Office, the number of these observations with gross errors, the observations' mean differences from the background values used by the numerical data assimilation system and the standard deviations of these differences.

Following the CBS recommendations, by the end of the 1980s there were four centres active in the monthly exchange of monitoring information; The Met Office, ECMWF, RSMC Tokyo and NCEP. Since then, a number of other centres have also begun to exchange this information and these reports have included data provided by Météo-France as of report number 23. Initially, the only monitoring information exchanged on marine surface observations related to pressure, and the first two WMO reports addressed that parameter alone. Since then, these reports have contained monitoring statistics for wind observations, now being exchanged between centres on a consistent monthly basis. In addition, the report contains monitoring results for sea-surface temperature (SST). Due to changes in the observation processing system and database structure, there was no monitoring of SST data at the Met Office from May 1998 to September 2000. The SST information presented in reports 20 to 23 was therefore compiled, with permission, from the monthly NCEP monitoring data and so is not directly comparable with that presented in other reports. SST monitoring was reinstated at the Met Office from October 2000.



## 2. MONITORING METHODS

Errors in observations may arise from a number of sources: the instrument may be malfunctioning, figures may be mistaken while being transferred manually, or there may be corruption of data during transmission. Errors can also arise in the pressure report if the adjustment to sea level is made incorrectly or not at all, and a poorly sighted anemometer can result in errors in the observations of wind. For SST observations, the depth at which the observation is made can be crucial. 'Surface' observations from buoys are usually made at a depth of around 0.5m, whereas ships may take a measurement between a depth of 10m and the surface, depending on the method used. At present, there is no indication given within the report of the observation's depth, so it is not possible to determine the significance of this factor. (By contrast, satellites measure the temperature of the ocean's 'skin' which is generally slightly cooler than the temperature immediately beneath, by several tenths of a °C, as a result of evaporative cooling and other surface processes.)

Some errors can be detected by applying checks on the code format and the internal consistency of the report (for example: are the position and pressure consistent with a report 6 hours earlier?). Checks on spatial consistency are possible if there are other nearby observations. However, such quality checks are unable to identify errors on all occasions and it is recognised that the numerical data assimilation systems in use today can provide global reference values applicable in observation monitoring. The short-term forecast from the previous numerical analysis, commonly known as the first-guess or background field, provides perhaps the most useful information on observation quality, as it represents an accurate and spatially consistent estimate of the observed value which is independent of the observation itself. Observation-minus-background (hereafter referred to as O-B) differences are at the core of all monitoring work by GDPS centres. Unlike wind and pressure, SST monitoring at the Met Office used to be performed against the analysis field, this being judged a sufficiently good approximation due to the slowly varying nature of SST, relative to parameters measured above the surface. As of October 2000, background values have been used but with the slowly varying nature of SST used to assume persistence, such that the background is in fact the previous analysis. (These analyses are performed daily at the Met Office from an assimilation of both surface and satellite observations.) Thus the SST monitoring at the Met Office is no longer limited by a dependence upon the observations themselves.

Taking all marine surface observations together, the values of O-B have distinct characteristics. The vast majority of the observations show quite small departures from background and the distribution of O-B is nearly Gaussian, with little or no bias. The errors in the background field probably contribute most to the values of O-B for these observations. There is often, however, a smaller group of observations departing much more from the background, for which observation error is the only reasonable explanation for the large values of O-B. Studies of the distribution and variation of O-B at different points around the globe enable reasonably accurate estimation of background error, and this provides the basis for the monitoring methods described here. Those marine observing platforms for which, in a sufficiently large sample, the observed values differ from the background by an amount significantly in excess of the estimate of background error, may be labelled as suspect with a high degree of confidence. The limits used here to identify suspect observing platforms have been set sufficiently stringent to preclude much likelihood of the background, rather than the observations, being in error.

Each monitoring centre produces a monthly list of the identifiers of marine observing platforms considered suspect according to the departure from the model background values. All observations, both synoptic and asynoptic, are assimilated. At the Met Office (as of May 2000) and ECMWF, the background fields are interpolated to the observation time whereas Météo-France, Tokyo and Washington, use the background value valid at the nearest main synoptic hour.



Given that the number of observations made during the month is at least 20, then the condition used by all centres for obtaining platforms for the suspect lists is that at least one of the following criteria are satisfied:

#### Pressure

1. the | mean of O-B |  $\geq 4.0$  hPa
2. the standard deviation of O-B  $\geq 6.0$  hPa
3. the percentage of gross errors  $\geq 25$

#### Wind

1. the | mean of O-B |  $\geq 5.0\text{ms}^{-1}$  (Speed)  
 $\geq 30^\circ$  (Direction)
2. the standard deviation of O-B  $\geq 80^\circ$  (Direction)
3. the percentage of gross errors  $\geq 25$

Gross errors are defined as observations that depart from the background by more than 15hPa (Pressure) or  $25\text{ms}^{-1}$  (Vector Wind). The mean and standard deviation of the samples are evaluated excluding gross errors and in this way occasional 'wild' values resulting from, for example, corruption during transmission, do not influence the sample characteristics. Direction statistics are also calculated excluding values in light winds, where either the observed or background speeds are less than  $5\text{ms}^{-1}$ .

Relatively little information is exchanged between centres on a regular monthly basis for SST.

The monthly results for pressure from all five monitoring centres show considerable agreement, both on the observing platforms listed as suspect and the values of the mean and rms difference from each centre's background. Differences between the monthly suspect lists are usually due to the different numbers of observations available at each centre. The cut-off varies between 6 and 24 hours. There are also some unexplained variations in the data receipt between the centres, which may be due to problems in the GTS or in the local procedures for handling the data. Monitoring results for wind speed also show reasonable agreement on the mean and standard deviation from each centre's background; there is less agreement as to which platforms are listed, reflecting the greater uncertainty when monitoring wind speed.



This report draws together all the monthly monitoring results exchanged on marine surface data and identifies a list of observing platforms that have provided observations of poor quality over the 6-month period. In drawing up this list, there have been a number of guiding principles:

1. As with the monthly lists, accuracy is assessed relative to background values.
2. Observing platforms are listed only where there is a very high degree of confidence that the observations rather than the background values are in error.
3. At least 40 reports are required over the period in which the observations are considered suspect.
4. The perceived accuracy over the last part of the six-month period is of greatest importance; observing platforms are not listed if there has been recent improvement and their reports are at present without major error.
5. Given that the number of observations made during the period is greater than or equal to 40, then the condition for listing a platform as suspect in this report is that at least one of the following criteria are satisfied:

#### Pressure

1. the | mean of O-B |  $\geq 3.5$  hPa
2. the standard deviation of O-B  $\geq 5.0$  hPa
3. the percentage of gross errors  $\geq 25$

#### Wind

1. the | mean of O-B |  $\geq 5.0 \text{ ms}^{-1}$  (Speed)  
 $\geq 30^\circ$  (Direction)
2. the standard deviation of O-B  $\geq 6.0 \text{ ms}^{-1}$  (Speed)  
 $\geq 60^\circ$  (Direction)
3. the percentage of gross errors  $\geq 25$

#### SST

1. the | mean of O-B |  $\geq 3.0^\circ \text{C}$
2. the standard deviation of O-B  $\geq 5.0^\circ \text{C}$
3. the percentage of gross errors  $\geq 25$

All observations having gross errors are excluded from the calculation of the mean and standard deviation of O-B. The same gross error limits apply in these reports as in the monthly lists. The Met Office now sets a limit of  $10^\circ \text{C}$  for SST but this was previously  $5^\circ \text{C}$  and NCEP use  $15^\circ \text{C}$ . Also, criteria previously used in these reports were based on O-A statistics. Data presented here is, then, not directly comparable with that in earlier reports.

The limits on the bias and standard deviation O-B are more stringent than those for the monthly lists because the sample sizes are larger. If there has been a recent change in quality, they are only applied at the end of the period. Identifiers can be listed in this report without appearing on any of the monthly lists. This is can be due to a representative sample only being obtained over several months or deterioration occurring at the end of the period for platforms reporting very frequently. The 6-month list is longer than most of the monthly lists because many ships cease reporting for variable periods of time, in many cases while they are in port or out of service. Only over a relatively long period, probably more than 6 months, is a representative sample obtained from all those ships providing observations.



### 3. MONITORING RESULTS

The monitoring results presented in this report relate only to data exchanged over the GTS. Observations from marine platforms are transmitted in one of two formats: the SHIP code, used for most observations from ships, moored buoys and other fixed platforms, and the BUOY code, used mostly for observations from drifting buoys. In this report, the term "ship observations" refers to those received in the SHIP code and the "drifting buoy observations" to those received in BUOY code. The SHIP code indicates whether the observation was made manually or by an automatic system and accordingly the sub-divisions "manual ship" and "automatic ship" will be defined.

#### 3.1 Pressure

In the six-month period, July to December 2005, 2833900 observations of pressure were monitored at Exeter from 2814 manual ships, 572 drifting buoys, and 411 automatic ships. The number of reports received from individual ships varies greatly as Table 1 demonstrates; apparently, a large percentage only report once. The reason for this is unclear but it may be a result of errors in the part of the message giving the ship identifier. A comparison with the corresponding table in report number 33 shows further slight drops in the number in the number of manual and automatic ships, but a fairly significant increase (15%) in the number of drifters. Since most marine observations are located in the northern hemisphere, there is inevitably some seasonal variation in the number of vessels reporting, especially in the case of buoys, since new or replacement buoys are generally deployed in better weather conditions. Considering the general trends over previous reports, however, shows a continuing downwards trend in the number of manual ships reporting pressure observations, whilst an opposite trend is evident for drifting buoys.

Table 2 shows the number of observations of pressure that have been received over the GTS at the Met Office and processed, over past 6-month periods. Due to changes in data storage methods in May 1991, report number 5 covered the period January to May 1991 only, thence figures for January to June 1991 have been scaled-up in order to make a fair comparison with other 6-month periods; this may not be entirely accurate. Further changes in November 1993 for drifting buoys and automatic ships for pressure and winds, may have allowed duplication of a few identifiers in totals for the period June to December 1993, as reclassification from one observation type to another occurred. The observation distribution shown in Table 2 will also have been affected in the long term with a slight shift towards drifting buoys; no duplication of observations occurred however. (SST observations were not affected by the November 1993 change.) The period January to June 1998 is also based on only 5 months data (February-June), but the numbers of observations received have been scaled up, as in the 1991 case.

Figure 1 shows the information presented in Table 2 more clearly. It can be seen that the total number of observations remained fairly steady with only minor fluctuations until report number 11 (January-June 1994). Since that time however, there has been a steady increase in the total, with the number of observations of pressure nearly doubling between reports 11 and 16 (July-December 1996), a period of just 2.5 years. This increase was due to the larger number of reports from each drifting buoy, as reliability has improved; many drifting buoys now make several thousand observations of pressure during a 6-month period. The number of reports from drifting buoys now exceeds those for manual ships by around 222 %, with a little under 54 % of all marine pressure observations now being made by drifting buoys. The sudden increase seen in the number of automatic ships in report number 19 (January-June 1998) was due to observation processing changes at the Met Office, whereby all reports from 'automatic ships' are processed, rather than only one report per 6-hour assimilation period, as previously. Since then there has been a steady increasing trend in the total number of pressure reports.



A histogram of O-B differences for all ship pressure reports in the period July to December 2005 is shown in Figure 2a, together with the Gaussian distribution with the same mean and standard deviation. Although almost all values fall within the range +5 to -5 hPa, a small number of much larger values, presumably resulting from erroneous observations, contribute to the large standard deviation of the population. The distribution for all those observations which fail the automatic quality-control checks is broad (Figure 2b). The remaining 93.8 % of the observations, that pass the quality checks, show a distribution of O-B which is very close to Gaussian (Figure 2c) with mean -0.1 hPa and standard deviation 1.3 hPa. The principal contribution to the standard deviation is assumed to be from background errors.

A global estimate of the background error, such as that provided above, can conceal large spatial variations. Background values will be more accurate in data-rich areas (e.g.: in the North Sea or Mediterranean) or where the meteorological variability is low (e.g.: the tropics). The geographical distributions of the mean and standard deviation of the values of O-B from all ship observations which pass the quality-control checks, have been calculated for 10-degree latitude-longitude boxes and are plotted in Figures 3 and 4. In most areas, the magnitude of the mean is less than 1.0 hPa, the exceptions being generally where the sample size is small. The standard deviation is generally around 1.5 hPa. The number of ship pressure reports accepted by the model quality control in each 10-degree box is shown in Figure 5.

Table 3 contains a list of those ships and drifting buoys considered to have produced suspect observations of pressure in the period July to December 2005. Values over the six-month period are given for the number of observations of pressure available for Met Office global model runs, the number of observations differing from the model background value by more than 15 hPa (gross errors), and the mean and standard deviation of the model O-B. The number of times the identifier has appeared on the monthly suspect lists from the five monitoring centres is also given. In order to give a detailed picture of the frequency of reporting and any changes in the observation accuracy, 6-month time-series of O-B differences are given at the end of the report for each of the identifiers listed.

An interesting characteristic of the errors identified here, which soon becomes obvious on inspection of the time-series charts at the end of this report, is that most can be attributed to a bias in the observed pressure. In many cases, the bias is constant over the whole monitoring period; although some values depart greatly from the sample mean, presumably due to some gross error in the observation, these are generally isolated instances. In only a few cases are there regular large random departures from background. Those observing platforms listed in Table 3 which appeared in report number 33 (January to June 2005) have been indicated with an asterisk. A comparison of the statistics given here with those in the report number 32 (July to December 2004), clearly indicates that the bias in the pressure observations from a few ships has hardly changed for more than a year.

Statistics for those marine observing platforms listed in report number 33 and which do not appear in Table 3b, are given in Table 4 along with comments on the quality of their pressure observations. Time-series charts of the pressure observations from these platforms are not given. Less than 40 reports were received in the 6-month period for many of the ships on this list. Approximately 36 % of them, however, do show some improvement in the quality of their observations.



### 3.2 Wind

Monitoring observations of wind is more problematical than pressure. On most observing platforms, wind is measured using anemometers; the reported speed depends upon the averaging period and instrument height above sea level, which varies a great deal between platforms. Since large structures distort wind flow, the anemometer position relative to the wind bearing and platform structure does affect the measurement. (These factors do not apply to those ship observations where wind speed is based on visual estimates of the sea state e.g. the UK VOF fleet.)

In these monitoring results, the background winds are valid at a height of 10 metres above mean sea level; slightly lower than the average height of ship anemometers. Where anemometer height is much different from 10 metres, a significant O-B speed bias may be evident. Examples of this are, observations from oil rigs or tankers with anemometer heights of 50m or more (although the speeds reported by some rigs are now adjusted on board to be nominal 10m values) and buoys, where the anemometer can be as low as 2m.

In the period July to December 2005, 1430141 wind observations were available for monitoring at Exeter, from 2853 manual ships, 94 drifting buoys, and 467 automatic ships. (More detail is given in Table 1.) The number of reported manual ship identifiers has continued to decline, whereas there has been an 18% increase in the number of drifting buoys reporting wind observations. As stated for pressure observations, the large increase in the number of monitored wind observations, seen in report number nineteen, was largely due to the inclusion of all 'automatic ship' data, not just one report in each six hour period.

Histograms of O-B differences for ship observations of wind speed are presented in Figures 2d, 2e and 2f and of wind direction in Figures 2g, 2h and 2i. As with observations of pressure, those wind observations that fail the quality-control checks differ most from background, some by as much as  $50 \text{ ms}^{-1}$ , and they make a large contribution to the variance of O-B. The distributions of O-B wind speed and direction for the remaining 93 % of the observations are nearly Gaussian. There is a speed bias of  $1.1 \text{ ms}^{-1}$  relative to background, with a direction bias of just  $-2.4^\circ$ .

Figures 6 and 7 show the geographical distributions over the six-month period of the mean and standard deviation of O-B for ship observations of wind speed that pass the quality-control checks. The numbers of wind reports used to generate these statistics are presented in Figure 8. The standard deviation of O-B wind speed is typically  $2.5$  to  $4 \text{ ms}^{-1}$  in middle latitudes and  $2$  to  $3 \text{ ms}^{-1}$  in the tropics. The bias is generally around  $+1 \text{ ms}^{-1}$ , but exceeds  $+2 \text{ ms}^{-1}$  in a few places. Similar distributions of the mean and standard deviation of O-B wind direction are shown in Figures 9 and 10. Only reports where both the observed and background wind speeds are greater than  $5 \text{ ms}^{-1}$  were used to obtain these values. The magnitude of the bias is less than 10 degrees in most places. The standard deviation is generally between 20 and 30 degrees globally but in some data-sparse areas, it is as large as 40 or 50 degrees. The numbers of reports of wind direction used to generate these statistics are presented in Figure 11.

Figures 6-11 provide reference values against which to compare the O-B characteristics for different marine observing platforms. Table 5 contains a list of those ships and drifting buoys considered to have produced suspect observations of wind speed in the period July to December 2005, and in Table 7 a similar list is provided for wind direction. Values are given for the number of observations of wind received at the Met Office, the number of observations having a vector difference from background of more than  $25 \text{ ms}^{-1}$  (gross errors), and the mean and standard deviation of O-B. Time-series of O-B are given at the end of the report for each listed identifier. In the majority of the cases of suspect speed observations, a constant bias is clearly evident. Errors in observations of direction are more random in nature. Tables 6 and 8 contain statistics for platforms reporting in ship code which are not included in Tables 5 and 7 but that



were listed in the previous report, for wind speed and direction respectively. Time-series plots for these identifiers are not included in this report.



### 3.3 *Sea-surface temperature*

In the six-month period July to December 2005, a total of 3679017 observations of SST were monitored at the Met Office, from 2523 manual ships, 1727 drifting buoys and 333 automatic ships. Of the total, 356579 were from manual ships, 2713395 from drifting buoys and 609043 from automatic ships. (More detail is given in Table 1.) For the same reasons as stated for pressure observations, it appears that many identifiers report only once during the six-month period. As is also apparent for pressure and wind observations, the number of manual ships reporting SSTs appears to be slowly on the wane, whereas there was a 22% increase in the number of drifting buoys and a smaller increase in automatic ships. Despite there still being a relatively small number of drifting buoys, they contribute a substantial percentage of the total number of SST observations received. This is due to the frequency of buoy observations; hourly in many cases, with ships tending to report only at the main synoptic hours.

Histograms of O-B differences for all ship SST reports are shown in Figures 2j, 2k and 2l. As with observations of pressure and wind, those SST observations that fail the quality-control checks differ most from background and make a large contribution to the variance of O-B. The distribution of O-B SST for the remaining 87 % of the observations is nearly Gaussian. There is a bias of 0.1 °C relative to background.

Figures 12 and 13 show the geographical distributions over the three-month period of the mean and standard deviation of O-B for ship observations that pass the quality control checks. The numbers of reports used to generate these statistics are presented in Figure 14. The bias is generally around 0.5°C and the standard deviation 1 to 2°C. Particular exceptions to this tend to show up where the number of observations is relatively low.

Table 9 contains a list of the ships and drifting buoys considered to have produced suspect observations over the 6-month period. The comments given in each case provide an indication of the main reason for the station to be listed as suspect; time-series charts have also been plotted for SST and are included at the end of the report. The majority of the identifiers appearing on the list do so because of bias. Table 10 gives details of the performance over the latest 6-month period of ships which were considered suspect in the previous period but which do not appear in Table 9.



#### 4. SUMMARY

157 marine observing platforms are listed as producing suspect observations of pressure over the period July to December 2005, 142 as producing suspect wind observations and 225 as producing suspect SST observations. The first report issued by RSMC Bracknell, for the period January to June 1989, listed 150 marine platforms producing suspect observations of pressure. With the selection criteria remaining unchanged, an initial reduction in the number of platforms listed as suspect was followed by a series of reports listing similar numbers of suspects but as can be seen from Table 11, there was an increase during the current period in platforms reporting suspect observations of pressure, wind and, most notably, SST. The increase in platforms reporting suspect SST observations is most likely related to the large increase in operational drifters during this reporting period – there were 108 suspect drifter platforms this period compared to 61 in the previous period. Taking the increase in operational platforms into account, this trend does not, it seems, actually represent decreasing observation quality.

The most common characteristic in the case of identifiers listed as producing suspect pressure observations is bias in the reported pressure, sometimes remaining constant for many months. In the case of wind suspects, the most common reason for listing a platform is a bias in the reported wind speed, while a few show large standard deviations or biases in wind direction. For sea-surface temperature observations, bias is again the most common cause of error.

The selection criteria have been set sufficiently stringent to ensure that the platforms listed are only those for which there is a high degree of confidence in their reports having errors. There are many others, not listed here, for which there must be considerable doubt over the quality of the observations. A wider range of monitoring results is available from the Met Office on request.



TABLE 1: FREQUENCY DISTRIBUTION OF THE NUMBER OF REPORTS OF PRESSURE, WIND AND SEA SURFACE TEMPERATURE FROM INDIVIDUAL IDENTIFIERS AVAILABLE FOR MONITORING AT EXETER, JULY TO DECEMBER 2005.

Number of reports	Number of manual ships reporting			Number of drifting buoys reporting			Number of automatic ships reporting		
	Press.	Wind	SST	Press.	Wind	SST	Press.	Wind	SST*
1	330	344	302	8	8	5	16	21	5
2-10	302	308	305	5	2	12	14	14	0
11-20	178	181	168	6	4	5	7	7	2
21-40	235	239	246	3	3	4	8	9	2
41-100	555	568	508	15	16	22	20	22	5
101-200	640	650	530	16	4	49	27	27	4
201-500	452	448	354	56	6	150	27	27	11
501-1000	52	55	52	57	18	207	54	66	34
1001-1500	28	30	23	44	9	142	45	69	61
1500+	42	30	35	362	24	1131	193	205	209
<b>Total</b>	2814	2853	2523	572	94	1727	411	467	333
(Report 33)	(3025)	(3050)	(2652)	(497)	(79)	(1420)	(433)	(482)	(312)

\* numbers are for automatic (fixed) buoys only



TABLE 2: NUMBER OF OBSERVATIONS OF PRESSURE RECEIVED AT EXETER ON THE GTS FOR EACH OF THE SIX-MONTH PERIODS COVERED BY THE WMO REPORTS ON THE QUALITY OF MARINE OBSERVATIONS.

Period	WMO report number	Number of Observations			
		Manual ships	Drifting buoys	Automatic ships	Total
Jan - Jun 1989	1	424087	174971	40082	639140
Jul - Dec 1989	2	421315	151972	58016	631303
Jan - Jun 1990	3	424335	177927	63847	666109
Jul - Dec 1990	4	412430	205488	71146	689064
Jan - Jun 1991	5	364760	177069	64401	606230
Jul - Dec 1991	6	348710	148604	68456	565770
Jan - Jun 1992	7	332443	216872	73893	623208
Jul - Dec 1992	8	336958	247873	80862	665693
Jan - Jun 1993	9	340293	288208	77317	705818
Jul - Dec 1993	10	348082	316261	88650	752993
Jan - Jun 1994	11	334134	279963	111928	726025
Jul - Dec 1994	12	383760	305618	142468	831846
Jan - Jun 1995	13	369781	407111	124537	901429
Jul - Dec 1995	14	394016	528938	138653	1061607
Jan - Jun 1996	15	430162	566035	122909	1119106
Jul - Dec 1996	16	477928	621869	133221	1233018
Jan - Jun 1997	17	446530	623835	122178	1192543
Jul - Dec 1997	18	453399	684292	140227	1277918
Jan - Jun 1998	19	426622	700743	423217	1550582
Jul - Dec 1998	20	443548	700239	497313	1641100
Jan - Jun 1999	21	432506	697983	466311	1596800
Jul - Dec 1999	22	448996	771624	500070	1720690
Jan - Jun 2000	23	443023	772510	455799	1671332
Jul - Dec 2000	24	477828	829588	512338	1819754
Jan - Jun 2001	25	458345	784686	465887	1708918
Jul - Dec 2001	26	473887	914744	554002	1942633
Jan - Jun 2002	27	443876	1111699	517200	2072775
Jul - Dec 2002	28	544433	952313	595959	2092705
Jan - Jun 2003	29	432672	994877	506185	1933734
Jul - Dec 2003	30	473591	1128039	605241	2206871
Jan - Jun 2004	31	435824	1092461	596495	2124780
Jul - Dec 2004	32	434160	1113527	724014	2271701
Jan - Jun 2005	33	471113	1221528	717207	2409848
Jan - Jun 2005	34	472565	1523938	837397	2833900



TABLE 3: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT PRESSURE OBSERVATIONS OVER THE PERIOD JULY TO DECEMBER 2005.

Column 1	Call sign or identifier.
Column 2	Number of pressure observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3	Number of pressure observations differing by more than 15 hPa from background (gross error).
Column 4	Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5	Mean of observation-minus-background differences (bias) excluding cases of gross error.
Columns 6-10	Number of times observing platform has appeared on suspect lists. B=Exeter, E=ECMWF, F=MétéoFrance, T=Tokyo, W=Washington.
Column 11	Comments on quality of pressure observations.

- Notes:
1. Units are hPa.
  2. Observing platforms marked with an asterisk were listed in the previous report (January to June 2005)

Table 3a: Platforms reporting in BUOY code

*i): Platforms non-operational at the end of the reporting period*

14930	1466	665	6.1	-4.3	2	3	2	2	2	Bias, SD and GE
15904	327	0	0.8	-5.1	2	0	0	0	2	Bias
16521	1613	71	3.0	0.9	0	0	0	0	0	Bias and GE at end of report
16555	1010	0	1.8	-0.1	0	0	0	0	0	Bias and SD at end of report
17506	339	141	6.8	-2.2	1	1	1	1	1	Bias, SD and GE
17905	1721	415	6.9	-0.8	3	3	2	3	3	Bias, SD and GE
17908	1491	105	3.1	0.8	0	0	0	0	0	Bias and SD
17910	2108	12	5.0	1.0	0	0	0	0	0	Bias and SD
21903	2647	3	2.5	1.0	1	0	1	1	1	Bias
21905	2126	85	2.8	1.2	1	1	1	0	1	Bias and GE
21907	1620	0	3.0	0.1	0	0	0	0	0	Bias and SD from Nov
21913	1345	87	2.5	-0.6	0	0	0	0	0	Bias and SD at end of report
21918	3013	20	3.2	2.9	1	0	1	1	1	Bias and SD from November
21929	2391	210	3.9	-1.3	2	1	2	2	2	Bias, SD and GE at end of report
21940	3375	27	1.5	0.5	0	0	0	0	0	Bias and SD at end of period
21941	1473	1	2.5	1.5	0	0	0	1	1	Bias and SD from November
21942	2120	127	4.2	3.3	2	1	2	3	3	Bias and SD from October
21945	2815	6	2.6	1.7	1	0	0	1	1	Bias and SD from November
21946	112	36	5.3	-4.9	1	1	1	1	1	Bias, SD and GE at end of report
21947	2648	106	4.7	1.6	1	1	1	1	1	SD from September

Continued →



21948	110	110	---	---	1	1	1	0	1	Gross Errors
21952	2271	100	4.6	-1.1	1	2	1	1	1	Bias and SD from September
21953	2111	26	3.6	0.4	1	0	1	1	1	Bias and SD from November
21954	99	62	6.0	3.8	1	1	1	1	1	Bias, SD and GE
21956	2455	1	2.1	1.1	0	0	0	0	0	Bias and SD from November
21958	2758	4	2.2	1.1	0	0	0	0	0	Bias and SD from September
21960	2236	9	2.0	0.9	0	0	0	0	0	Bias and SD from November
21962	2047	3	2.6	1.2	0	0	0	0	1	Bias and SD from November
21964	1542	3	3.8	2.6	1	0	1	1	1	Bias from October
21967	984	56	4.4	-1.5	0	0	0	0	0	Bias and SD
21968	847	1	3.1	2.0	1	0	1	1	1	Bias from December
23948	1649	581	5.9	3.7	3	2	3	3	3	Bias, SD and GE
23949	1194	1170	5.1	7.8	3	3	3	2	3	Bias, SD and GE
23950	1001	984	6.7	-7.4	3	3	3	1	3	Bias, SD and GE
25522	1194	1080	7.4	5.0	2	2	2	1	2	Bias, SD and GE
25571	58	58	---	---	2	2	1	0	2	Gross Errors
25573	50	5	7.8	-1.4	1	2	1	0	0	Bias and SD
26501	372	39	0.7	0.2	1	1	1	0	1	GE from August
41505	1429	288	2.7	1.1	1	1	1	1	1	Bias, SD and GE at end of report
41528	3210	315	1.6	0.5	1	1	1	1	1	Bias, SD and GE at end of report
41532	147	45	0.5	1.1	1	1	1	1	1	Gross Errors
41542	2177	20	1.6	0.7	0	0	0	0	0	Bias and GE at end of report
41927	3660	31	2.2	0.6	1	0	1	1	1	Bias and SD from December
41929	2620	96	2.7	1.4	1	1	1	1	1	Bias at end of report
41931	3109	32	2.0	0.6	1	0	1	1	1	Bias and SD at end of report
41934	3459	14	1.5	0.0	0	0	0	0	0	Bias and SD at end of report
41935	1993	21	2.2	0.6	1	0	1	1	1	Bias at end of report
41939	1677	12	1.5	-2.4	1	0	0	0	0	Bias at end of report
42573	395	26	2.4	0.3	0	0	0	0	0	Bias and GE at end of report
44726	1926	48	0.6	-0.4	0	0	0	0	0	GE at end of report
44840	711	118	4.5	0.7	1	1	1	1	1	Bias and GE at end of report
46531	1304	44	2.6	1.0	1	0	0	1	1	GE at end of report
46566	329	80	2.8	2.4	1	0	0	1	1	Bias and GE at end of report
46583	1689	2	2.7	1.5	0	0	0	0	0	Bias and SD
46707	3100	49	1.5	1.2	0	0	0	0	0	GE at end of report
48536	86	72	9.3	-2.5	2	2	2	0	2	SD and GE
48586	14194	155	0.8	0.2	0	0	0	0	0	GE at end of report
52522	1509	102	1.0	0.8	1	1	1	1	1	GE at end of report
52528	691	149	1.1	2.2	1	0	1	0	1	GE at end of report
52689	1707	126	1.8	0.4	1	0	1	1	0	Bias, SD and GE at end of report

Continued →



55920	108	4	3.6	3.1	0	0	0	0	0	Bias
55934	1020	602	7.6	3.3	2	2	2	1	2	Bias, SD and GE
56521	1420	1	2.2	1.7	0	0	0	0	0	Bias
61557	439	146	7.3	-3.0	4	3	0	3	4	Bias, SD and GE
62908	511	0	2.5	-0.8	1	1	0	0	1	Bias and SD at end of report
64609	3939	39	0.9	-0.4	0	0	0	0	0	SD and GE at end of report
71628	450	114	6.7	1.4	1	1	1	1	1	Bias, SD and GE

ii): Platforms operational at the end of the reporting period

Identifier	N Obs.	NGE	SD	Bias	B	E	F	T	W	Comments
21906	3696	11	2.0	0.0	0	0	0	0	0	SD from Nov
21916	2135	36	2.6	1.6	0	0	0	1	0	Bias and SD from November
21935	2999	0	2.6	-0.5	0	0	0	0	0	Bias and SD from October
21951	1600	4	3.1	1.6	1	0	1	1	1	Bias and SD from November
21955	2504	7	2.5	1.3	0	0	0	1	0	Bias and SD from September
21966	883	8	2.9	1.7	0	0	0	1	0	Bias and SD
25574	477	38	3.2	-0.3	4	3	4	0	0	Bias and SD from August
31551	21586	898	5.2	-1.4	1	0	1	1	1	Bias and SD
41615	6614	1	1.0	0.2	0	0	0	0	0	Bias and SD at end of period
46560	3210	69	2.7	1.3	0	0	0	0	0	Bias and SD from October
46568	2634	7	2.7	2.1	0	0	0	0	0	Bias and SD from September
71543	1317	0	1.3	-2.9	0	0	0	0	2	Bias

Table 3b: Platforms reporting in SHIP code

Identifier	N Obs.	NGE	SD	Bias	B	E	F	T	W	Comments
AUBC	53	0	1.3	5.9	1	0	1	0	1	Bias
AUFI *	107	0	1.6	4.0	2	1	1	0	4	Bias
A8EU2	192	0	2.1	1.2	0	1	0	1	1	Bias from November
A8FA6	113	0	1.5	4.2	2	0	2	1	2	Bias
A8FJ8	194	0	3.5	-2.7	1	0	1	0	1	Bias and SD
A8FN8	102	0	2.0	2.3	0	0	0	0	0	Bias from August
A8FR5	122	0	1.3	5.3	3	1	3	1	2	Bias
A8GQ8	55	0	1.9	3.6	0	0	0	0	0	Bias
CSGN *	245	0	0.6	-11.6	2	0	0	0	2	Bias
CYBJ	48	1	2.5	5.5	0	0	0	0	0	Bias
CYLX *	96	1	2.4	10.9	1	0	1	0	1	Bias
C6FE5	216	0	1.4	3.4	0	0	0	0	3	Bias
C6FZ6	162	0	3.0	4.4	3	2	3	3	3	Bias from September
C6NL6	87	0	2.5	6.0	2	1	2	0	2	Bias
C6PZ3 *	159	0	1.4	6.2	4	3	4	4	4	Bias

Continued →



C6QF6	166	0	2.5	2.2	0 0 0 1 1	Bias from October
C6SE6 *	66	0	0.8	7.1	0 0 0 0 0	Bias
DADD	138	1	2.3	2.2	0 0 1 0 2	Bias from September
DCFG2	138	0	1.2	4.4	4 2 3 2 4	Bias
DDQI	1988	20	1.4	-0.5	0 0 0 0 0	SD and GE at end of report
DEHY	155	0	1.9	1.4	1 1 1 1 1	Bias from December
DPJC *	82	0	2.5	6.2	1 3 2 2 3	Bias
DQVO	188	0	1.9	-2.5	2 1 2 1 0	Bias from October
D5XH	55	0	2.2	-4.4	0 0 0 0 0	Bias
ELTY4	96	0	1.7	-4.0	1 0 1 0 1	Bias
ELVX9	385	1	1.0	3.6	2 0 2 2 3	Bias
ELYY5 *	46	0	1.8	8.4	1 1 0 0 2	Bias
FNFD	847	0	1.8	-1.5	0 0 0 0 0	Bias from October
HQTEST *	701	1	0.6	-12.0	3 0 0 0 0	Bias
KF003	89	3	2.2	-6.2	2 0 1 0 2	Bias
KS028	616	34	0.9	-0.8	1 0 1 0 1	SD and GE at end of report
KS049 *	1392	0	0.8	-4.3	6 0 6 6 0	Bias
LAOX5	88	1	1.3	3.5	1 1 1 1 2	Bias
OUHC2	113	1	2.8	3.9	2 0 2 2 2	Bias
OVJB2	118	0	1.9	-1.8	0 0 0 0 0	Bias from December
PCBU	95	0	1.7	3.6	1 0 0 0 1	Bias
PCFT	159	0	3.1	2.5	2 1 2 0 2	Bias
PINX	56	0	4.0	6.8	1 1 1 0 1	Bias
SYAQ	113	0	2.1	5.5	3 0 3 1 3	Bias
UANF	87	0	1.3	4.8	2 1 2 2 2	Bias
UBAW *	106	0	2.6	-3.4	0 0 0 0 0	Bias
UBDU *	121	0	1.4	-4.2	1 1 0 0 0	Bias
UCJB *	49	3	1.4	-5.4	1 1 1 0 1	Bias
UCJL *	106	6	4.6	-4.0	2 1 2 2 2	Bias
UCUF	321	20	2.6	0.0	1 1 1 1 1	Bias, SD and GE from December
UCUP *	97	1	2.1	3.4	0 0 0 0 0	Bias
UDYN	202	0	2.6	-0.3	0 0 0 0 0	Bias at end of report
UGNQ	290	0	2.8	-1.4	1 0 1 1 1	Bias from November
UGTP	80	3	1.8	3.6	0 0 0 0 0	Bias
UIAG	42	0	2.8	3.4	0 0 0 0 0	Bias
VC6750	1920	48	2.4	-0.6	1 0 1 1 1	Bias and GE at end of report
VTXL *	107	1	3.0	5.5	2 2 2 2 2	Bias
VVGG *	70	0	3.4	3.6	1 1 1 0 1	Bias
VVJN	61	0	2.3	-5.9	1 0 1 0 1	Bias
VVKS	52	0	3.6	5.4	1 1 1 0 1	Bias

Continued →



V2AC9	193	0	1.8	-4.6	5	1	5	0	3	Bias
V2AJ8	50	0	1.6	4.2	1	0	1	0	1	Bias
V2AW5	294	2	2.1	4.0	4	0	4	4	4	Bias
V7EA2	58	0	2.4	-4.0	0	0	0	0	0	Bias
V7EB7	83	0	0.6	4.3	2	0	2	0	2	Bias
V7FW8	178	0	2.7	2.3	1	1	1	1	1	Bias
WAM7635	72	0	3.5	4.1	1	0	1	0	1	Bias
WAQ3521	133	4	3.1	-4.4	2	0	2	0	2	Bias
WBN7617	296	2	4.7	1.2	1	0	1	1	1	Bias and SD
WCX5321	106	7	4.3	-6.0	3	0	2	0	3	Bias
WCY2853	142	2	1.6	4.2	2	0	2	0	2	Bias
WCZ7337	79	1	4.2	-4.1	1	0	1	0	1	Bias
WDB3834 *	268	6	3.7	1.0	1	0	1	1	1	Bias
WDB7815	92	0	2.2	-3.2	0	0	0	0	0	Bias
WDB9918	138	1	2.5	-5.0	4	0	4	2	3	Bias
WDB9986	182	3	2.8	1.8	0	0	0	1	0	Bias at end of period
ZCBN9	401	3	1.0	4.2	4	0	6	6	6	Bias
3FHJ6	128	3	1.8	-2.2	0	1	1	0	1	Bias at end of report
3FMV4	49	1	1.8	4.0	1	1	1	0	1	Bias
41030	280	0	1.8	-2.4	0	0	0	0	0	Bias
44022	6058	53	1.1	0.7	0	0	0	0	0	Bias and GE at end of report
62402 *	352	0	2.9	1.5	1	0	1	0	0	Bias
9VIC4	95	0	1.8	4.1	1	0	0	1	1	Bias



**TABLE 4: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 3 BUT LISTED AS SUSPECT OVER THE PERIOD JANUARY TO JUNE 2005.**

Column 1	Call sign or identifier.
Column 2	Number of pressure observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3	Number of pressure observations differing by more than 15 hPa from background (gross error).
Column 4	Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5	Mean of observation-minus-background differences (bias) excluding cases of gross error.
Column 6	Comments on quality of pressure observations.

Notes: 1. Units are hPa

Identifier	N Obs.	NGE	SD	Bias	Comments
ATIU	26	0	1.0	-0.7	Less than 40 reports
AUCT	27	0	2.0	2.6	Less than 40 reports
A8AM3	0	---	---	---	No reports
A8CB7	240	0	1.6	-3.5	Bias reduced
A8DE3	142	0	1.2	-1.6	Bias reduced
A8DZ2	164	0	1.7	-1.9	Bias reduced
A8EG9	45	0	0.9	3.2	Bias reduced
A8FA5	0	---	---	---	No reports
A8GX4	56	0	1.0	-1.5	Bias reduced
A8XG4	0	---	---	---	No reports
CGDS	1459	13	3.5	-1.8	Bias
DEAZ	58	0	2.3	2.4	Bias reduced
DGHX	225	0	2.6	1.1	Bias reduced
DGZK	20	0	1.6	-1.4	Less than 40 reports
DNFA	78	0	1.2	-0.2	Bias reduced
FQ411	0	---	---	---	No reports
H9JT	136	0	2.0	-1.5	Bias reduced
H9LA	38	1	2.2	-3.2	Less than 40 reports
JPFT	128	0	1.2	3.0	Bias reduced
JPPO	83	0	1.3	3.2	Bias reduced
KHJB	236	0	2.2	1.3	Bias reduced
KMJL	19	0	3.3	-3.2	Less than 40 reports
KS012	0	---	---	---	No reports
MGJS8	169	0	2.4	0.6	Bias reduced
ONAS	171	0	1.5	0.3	Bias reduced

Continued →



OUFA	57	0	2.1	2.5	Bias reduced
OXFU2	0	---	---	---	No reports
PCFM	213	0	1.3	0.5	Bias reduced
PJVL	6	0	0.4	4.2	Less than 40 reports
TCCJ7	55	0	2.3	-3.3	Bias reduced
TEST	34	34	---	---	Less than 40 reports
TESTDL	0	---	---	---	No reports
UASU	274	0	1.3	-1.5	Bias reduced
UCSS	26	0	1.9	-5.5	Less than 40 reports
UDYG	171	0	1.8	0.6	Bias reduced
UFJJ	278	1	2.1	-1.2	Bias and SD reduced
UHCE	12	0	3.8	-3.6	Less than 40 reports
UICP	0	---	---	---	No reports
VTKZ	12	2	1.3	-7.7	Less than 40 reports
VTSQ	13	0	1.6	-4.1	Less than 40 reports
VTXK	28	0	1.9	5.5	Less than 40 reports
VVCZ	14	0	2.3	4.0	Less than 40 reports
V2FY	220	0	1.8	3.0	Bias reduced
V2GR	139	0	2.3	3.9	Bias reduced
WADZ	257	109	6.9	9.3	Bias, SD and GE reduced
WCY7054	132	2	2.1	0.0	Bias reduced
WDB9984	22	0	1.3	-2.4	Less than 40 reports
XXXX	0	---	---	---	No reports
ZCBP5	28	0	2.5	0.6	Less than 40 reports
ZCBU4	12	0	2.2	3.3	Less than 40 reports
ZCDF8	161	1	1.6	-0.2	Bias reduced
12505	0	---	---	---	No reports
25572	0	---	---	---	No reports
26505	0	---	---	---	No reports
26506	0	---	---	---	No reports
3FKM8	42	0	2.2	2.3	Bias reduced
31554	0	---	---	---	No reports
33580	0	---	---	---	No reports
41033	502	0	1.1	-0.3	Bias reduced
44625	0	---	---	---	No reports
44721	0	---	---	---	No reports
48535	0	---	---	---	No reports
48539	0	---	---	---	No reports
48543	0	---	---	---	No reports
48612	0	---	---	---	No reports

Continued →



52683	0	---	---	---	No reports
52685	0	---	---	---	No reports
52686	0	---	---	---	No reports
52691	0	---	---	---	No reports
52694	0	---	---	---	No reports
53524	0	---	---	---	No reports
56504	0	---	---	---	No reports
56520	0	---	---	---	No reports
61556	0	---	---	---	No reports
62801	0	---	---	---	No reports
64524	0	---	---	---	No reports
73654	0	---	---	---	No reports



TABLE 5: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT WIND SPEED OBSERVATIONS OVER THE PERIOD JULY TO DECEMBER 2005.

Column 1	Call sign or identifier.
Column 2	Number of wind speed observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3	Number of wind observations with vector difference from background of more than $25\text{ms}^{-1}$ (gross error).
Column 4	Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5	Mean of observation-minus-background differences (bias) excluding cases of gross error.
Column 6-10	Number of times observing platform has appeared on suspect lists. B=Exeter, E=ECMWF, F=MétéoFrance, T=Tokyo, W=Washington.
Column 11	Comments on quality of wind speed observations.
Notes:	1. Units are $\text{ms}^{-1}$
	2. Observing platforms marked with an asterisk were listed in the previous report (January to June 2005)

Table 5a: Platforms reporting in BUOY code

*i): Platforms non-operational at the end of the reporting period*

Identifier	N Obs.	NGE	SD	Bias	B	E	F	T	W	Comments
21576	2934	53	4.5	-0.7	1	1	1	0	1	Bias and GE at end of report
41544	941	0	1.8	-2.1	0	0	0	0	0	Bias at end of report
41625	2207	4	2.9	3.3	1	1	0	0	1	Bias at end of report
41670	676	3	4.4	8.5	3	3	3	1	3	Bias
41919	1230	1	6.8	6.4	2	2	2	0	2	Bias and SD
41923	172	2	5.0	2.6	1	1	0	0	1	Bias and SD
41929	238	13	7.1	6.6	1	1	1	0	1	Bias and SD
41930	833	94	6.3	3.7	1	1	1	0	1	Bias, SD and GE
41934	62	34	7.7	6.9	1	1	1	0	5	Bias, SD and GE
41936	607	7	4.8	2.9	1	0	0	0	0	Bias and SD
41937	497	12	5.6	4.2	1	1	1	0	1	Bias and SD
41938	175	98	7.8	11.4	2	2	2	0	2	Bias, SD and GE
41940	624	30	5.4	9.8	2	2	2	0	2	Bias and GE
41942	870	49	6.9	6.0	2	2	2	0	2	Bias and SD
41943	607	61	6.9	3.9	2	2	2	0	2	Bias and SD
41945	700	36	6.5	4.2	2	1	2	0	1	Bias and SD
52530	3419	25	3.0	0.0	0	0	0	0	0	Bias and SD
62566	1839	4	3.8	1.0	0	1	0	0	0	Bias and SD



ii): Platforms operational at the end of the reporting period

Identifier	N Obs.	NGE	SD	Bias	B E F T W	Comments
41927	57	21	7.6	2.1	0 0 0 0 0	Bias and SD
41931	64	31	8.0	11.3	0 0 0 0 6	Bias, SD and GE
41939	78	44	9.0	4.2	1 1 1 0 4	Bias, SD and GE
46643	195	0	3.0	6.2	1 1 0 0 1	Bias

Table 5b: Platforms reporting in SHIP code

Identifier	N Obs.	NGE	SD	Bias	B E F T W	Comments
ATVX	63	0	3.6	6.2	0 0 1 0 1	Bias
A8FI3	178	1	3.9	4.3	2 0 1 1 0	Bias
A8GS3	190	1	4.7	10.1	4 4 4 3 4	Bias
CYLY *	187	0	3.9	4.9	0 0 2 0 2	Bias
ELRJ6	67	0	3.3	4.5	0 0 0 0 0	Bias at end of report
ELXT8	144	12	4.8	5.9	2 2 3 2 3	Bias
GYYP	1082	0	3.4	2.7	0 0 0 0 0	Bias at end of report
HP6038 *	1322	0	2.9	3.8	0 0 0 0 0	Bias
H3PK	84	0	2.9	-5.6	2 2 2 1 2	Bias
JPBN	1320	0	2.2	1.1	0 0 0 0 0	Bias at end of report
JPPO *	83	3	4.9	6.5	3 0 2 0 2	Bias
KGTY	344	2	3.5	2.0	0 0 0 0 0	Bias at end of period
LF3J	1405	0	3.1	-0.5	0 0 0 0 0	Bias and SD at end of period
MDGV9	80	0	3.3	4.4	1 1 1 0 1	Bias
MHNL6	80	0	5.3	5.0	0 0 0 0 0	Bias
OWFU2	514	0	3.2	3.7	0 0 0 0 0	Bias at end of period
PJTA	2569	0	2.2	0.9	0 0 0 0 0	Bias at end of period
SBNX	296	0	3.6	0.9	0 0 0 0 0	SD at end of report
SDBQ	82	0	3.5	3.7	0 0 0 0 0	Bias
SGBA	98	0	3.6	3.8	0 0 0 0 0	Bias at end of report
UCFT	180	0	4.0	2.6	1 0 0 0 0	Bias
UCJO	89	17	3.1	1.6	0 0 0 0 0	GE at end of report
UCUF	321	7	3.5	2.1	0 1 0 0 0	Bias and SD at end of report
UDDE *	98	0	5.8	-0.4	0 0 0 0 0	SD
UIHY	59	1	4.5	4.6	0 1 0 1 1	Bias
VCLX	226	0	3.2	4.1	0 0 0 1 2	Bias
VEP717 *	1287	0	4.1	5.2	3 0 2 3 3	Bias
VLTT *	503	0	3.9	4.8	0 1 1 0 1	Bias
VRVP2	361	18	4.6	3.1	1 0 1 0 0	GE at end of period
VWSZ	74	0	5.0	6.2	1 0 0 1 1	Bias

Continued →



V2JN	318	0	3.2	1.8	0 0 0 1 0	Bias at end of period
V7IS7	270	1	3.7	3.2	0 0 0 0 0	Bias at end of period
WAZ9548	51	0	5.1	4.6	0 0 0 0 0	Bias and SD
WBN2074	65	0	3.3	5.1	0 0 1 0 0	Bias
WCQ8110	578	0	3.6	2.4	0 0 0 0 0	SD at end of report
WDA5598	46	1	3.4	5.8	0 0 0 0 0	Bias
YJUF7	1296	0	2.9	3.2	0 0 0 0 0	Bias
3FZM6	82	7	5.3	5.0	1 1 1 1 0	Bias and SD
42047	2134	9	2.0	0.0	0 0 0 0 0	SD at end of report
44255	3048	0	1.8	0.0	0 0 0 0 0	Bias at end of report
45142	3378	0	2.1	2.7	0 0 0 0 0	Bias at end of report
46088	* 2612	0	2.8	3.2	0 0 0 0 0	Bias at end of period
46131	* 4201	0	2.9	3.2	0 0 0 0 0	Bias
46146	* 4195	0	2.5	3.6	0 0 0 0 0	Bias
46181	4201	0	2.9	2.4	0 1 0 0 0	Bias
62147	69	0	3.7	5.0	1 1 1 1 1	Bias
62168	571	0	2.6	1.5	0 0 0 0 0	Bias at end of period
62407	289	0	3.0	3.3	1 0 1 0 0	Bias at end of period
8PNZ	90	0	3.8	4.7	0 0 0 0 0	Bias
9MBW7	140	0	4.8	2.8	1 1 1 0 1	Bias and SD at end of period
9MBX5	78	6	6.6	4.1	1 1 1 0 1	Bias and SD
9MCD3	78	2	5.4	7.7	2 1 1 0 2	Bias and SD
9MSM	104	3	5.9	5.4	1 1 1 1 0	Bias and SD
9MTE	* 48	0	4.6	8.3	1 1 1 0 1	Bias



TABLE 6: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 5 BUT LISTED AS SUSPECT OVER THE PERIOD JANUARY TO JUNE 2005.

Column	1	Call sign or identifier.
Column	2	Number of wind speed observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column	3	Number of wind observations with vector difference from background of more than $25\text{ms}^{-1}$ (gross error).
Column	4	Standard deviation of observation-minus-background differences excluding cases of gross error.
Column	5	Mean of observation-minus-background differences (bias) excluding cases of gross error.
Column	6	Comments on quality of wind speed observations.
Notes:	1.	Units are $\text{ms}^{-1}$



Identifier	N Obs.	NGE	SD	Bias	Comments
C6FU6	2	0	3.4	2.9	Less than 40 reports
C6QF6	166	0	3.4	0.2	Bias reduced
DBUY	110	1	2.8	2.0	Bias reduced
DHOJ	73	0	4.1	3.3	Bias reduced
ELBU6	0	---	---	---	No reports
ELSP9	0	---	---	---	No reports
ELVP2	255	0	6.8	4.8	Bias reduced
ELWX5	1313	1	3.8	0.9	Bias reduced
ELZT3	0	---	---	---	No reports
H9YY	0	---	---	---	No reports
KS050	0	---	---	---	No reports
LAHV	321	1	3.0	2.6	Bias reduced
MZHC8	241	0	2.8	1.2	Bias reduced
PBFC	325	0	4.4	3.2	Bias reduced
PBVO	10	2	1.4	-4.3	Less than 40 reports
P3BP9	54	2	2.0	1.2	Bias and SD reduced
P3KT8	171	1	2.8	0.9	Bias and SD reduced
SGAK	73	0	2.7	3.0	Bias reduced
TEST	34	0	1.2	-1.3	Less than 40 reports
UCUQ	70	0	2.5	3.5	Bias reduced
V2AH1	111	0	3.4	2.4	Bias reduced
WDA3588	854	0	4.7	4.4	Bias reduced
WDB7583	823	0	3.8	2.9	Bias and SD reduced
ZCDG8	360	0	3.5	3.7	Bias reduced
4XGU	143	0	3.5	2.7	Bias reduced
46082	2343	0	2.4	0.1	Bias reduced
9MBQ6	155	1	5.1	1.7	Bias reduced
9MCM4	212	4	5.1	3.3	Bias and SD reduced



TABLE 7: LIST OF MARINE OBSERVING PLATFORMS PRODUCING SUSPECT WIND DIRECTION OBSERVATIONS OVER THE PERIOD JULY TO DECEMBER 2005 .

Column	1	Call sign or identifier.
Column	2	Number of wind direction observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column	3	Number of wind observations with vector difference from background of more than $25\text{ms}^{-1}$ (gross error).
Column	4	Standard deviation of observation-minus-background differences excluding cases of gross error.
Column	5	Mean of observation-minus-background differences (bias) excluding cases of gross error.
Column	6-10	Number of times observing platform has appeared on suspect lists. B=Exeter, E=ECMWF, F=MétéoFrance, T=Tokyo, W=Washington.
Column	11	Comments on quality of wind direction observations.

- Notes:
1. Units are degrees ( $^{\circ}$ ).
  2. Observing platforms marked § had a significant speed bias at some time within the period and the statistics and their plots refer to direction reports associated with background wind speeds greater than  $5\text{ms}^{-1}$ . If no significant speed bias was present, the statistics and plots refer to direction reports with an observed speed greater than  $5\text{ms}^{-1}$ .
  3. Observing platforms marked with an asterisk were listed in the previous report (January to June 2005)

Table 7a: Platforms reporting in BUOY code

*i): Platforms non-operational at the end of the reporting period*

Identifier	N Obs.	NGE	SD	Bias	B	E	F	T	W	Comments
41542	3140	15	73.9	58.8	3	3	4	3	3	Bias and SD from September
41938 §	175	94	25.8	-9.4	0	0	0	0	0	GE
46707	97	0	91.6	22.2	0	0	0	0	4	SD

*ii): Platforms operational at the end of the reporting period*

Identifier	N Obs.	NGE	SD	Bias	B	E	F	T	W	Comments
41931 §	64	27	92.5	-0.3	0	0	0	0	0	SD and GE
41939 §	78	30	79.7	34.1	0	0	1	0	1	Bias, SD and GE



Table 7b: Platforms reporting in SHIP code

Identifier	N Obs.	NGE	SD	Bias	B E F T W	Comments
A8AX3	124	0	68.6	15.5	0 0 0 0 2	SD
A8CG2	175	0	65.6	-14.5	1 0 1 1 1	Bias and SD
A8FU7	215	1	62.5	1.9	0 0 0 0 3	SD
CFN3031	960	2	59.9	-40.4	3 0 3 3 2	Bias and SD from November
CGTF	339	1	60.3	-43.0	0 2 2 1 4	Bias and SD
C6SI3	* 252	4	64.0	-2.3	1 1 1 1 2	Bias and SD
C6SS3	187	0	68.6	-20.3	0 1 1 0 1	SD
DCCO2	63	0	64.6	-5.8	0 0 0 0 0	SD
DEFL	61	0	64.9	-17.5	0 0 0 0 1	SD
ELWX5	* 131 § 3	1	49.4	-29.0	0 1 0 0 2	Bias and SD
ELXT8	§ 144	12	92.4	5.9	3 3 3 2 3	Bias and SD
FPOW	* 162	0	57.4	-3.6	0 0 0 0 1	SD
JPPO	§ 83	3	73.0	6.7	1 0 2 0 3	SD
KCB53	* 116	0	50.5	-42.5	0 0 0 0 0	Bias
KF002	110	1	61.1	-10.0	0 0 0 0 0	SD
KS044	* 892	0	42.0	-68.2	4 4 5 3 5	Bias and SD
KUU619	97	0	74.5	-21.8	0 0 0 0 2	SD
LAJV4	§ 930	59	83.6	36.2	5 7 8 6 6	Bias, SD and GE
MDGV9	§ 80	0	55.1	-33.6	0 0 0 0 0	Bias
MZHC8	* 228	0	54.5	-8.6	0 0 0 0 2	SD
OVZV2	* 192	0	59.9	-19.3	0 1 0 0 1	Bias and SD
PCPR	153	0	65.0	13.2	1 0 0 0 0	SD
PJOY	80	0	74.4	-2.6	0 1 1 0 2	SD
PJRH	* 252	0	60.7	-0.3	0 0 0 0 1	SD
SYAQ	112	0	80.0	1.3	0 0 0 0 2	SD
SYMK	* 123	1	57.1	12.6	0 0 0 0 1	SD
S6CD2	* 53	0	68.7	12.2	0 0 0 0 1	SD
S6MJ	225	0	60.2	4.4	0 0 1 0 2	SD
UAJS	131	0	60.9	11.9	0 0 0 0 1	SD
UANF	83	0	60.1	-14.1	0 0 0 0 0	SD
UBDU	114	1	61.5	-9.8	0 0 0 0 0	SD
VHA2333	68	0	60.6	-15.1	0 0 0 0 0	SD
VRVP2	§ 357	18	78.7	-7.0	3 2 3 2 3	Bias, SD and GE
V2AZ5	140	1	69.9	4.7	0 0 0 0 1	SD
V2FM	111	0	62.8	3.8	0 0 0 0 3	SD

Continued →



V2OL	275	0	50.6	33.9	0	0	0	0	1	Bias
V2PJ6	1407	0	69.2	1.0	0	1	0	0	2	SD
V3ZK2	95	1	61.2	-8.1	0	0	0	0	0	SD
WBM8733	70	0	71.4	-2.1	0	0	0	0	0	SD
WBN2074	§ 65	0	67.1	2.8	0	0	0	0	1	SD
WBO3345	81	0	62.8	21.3	0	0	0	0	1	SD
WCX5321	107	0	71.6	25.3	0	0	0	0	1	Bias and SD
WCY2853	133	1	67.7	5.3	0	0	0	0	0	SD
WCZ7335	79	0	56.9	-49.3	0	0	0	0	2	Bias
WCZ7337	101	0	53.8	-33.5	0	0	0	0	3	Bias
WYL5445	* 46	0	67.4	-5.1	0	0	0	0	0	SD
WYT8569	388	0	60.3	0.1	0	0	0	0	1	SD
ZCDM2	83	0	49.8	-34.2	0	0	0	0	1	Bias
ZCDP2	70	0	87.1	-1.4	0	0	0	0	2	SD
ZCGL2	111	0	60.7	19.8	0	0	0	0	0	Bias
ZIYE7	78	0	75.1	-7.1	0	0	0	0	1	SD
23098	140	0	41.2	-33.0	0	1	0	0	0	Bias
23100	676	0	85.0	-2.7	3	4	5	4	5	Bias and SD
3EXQ9	135	0	61.5	-14.1	0	0	0	0	0	SD
3FMH7	304	1	62.0	-3.0	1	1	0	1	3	SD
3FPS9	103	1	58.9	-44.0	0	0	0	0	0	Bias and SD
3FZM6	*§ 81	6	75.0	-22.8	0	0	0	0	2	SD
41030	§ 567	0	73.9	6.4	1	0	2	1	3	SD
41037	366	0	68.9	-3.6	0	1	1	1	1	SD
42023	1276	6	89.6	-18.3	1	2	1	1	1	Bias and SD from October
44040	* 2118	0	38.0	34.3	0	0	5	1	5	Bias
44258	* 3301	0	36.1	25.3	0	0	0	0	0	Bias
46081	*§ 4081	0	50.2	-51.6	0	0	6	5	6	Bias and SD
46091	* 926	0	62.0	-72.4	0	0	0	1	5	Bias and SD
46092	* 624	0	38.3	-49.1	0	0	0	0	1	Bias
5WDC	* 69	0	55.1	12.3	0	0	0	0	1	Bias and SD
53057	1359	0	95.3	-44.9	3	2	3	3	4	Bias and SD
6ZXG	* 235	0	59.2	-23.0	0	0	0	0	1	Bias and SD
7850	59	0	67.3	0.8	0	0	0	0	0	SD
9VHB9	80	0	64.1	13.8	1	1	1	0	0	SD



TABLE 8: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 7 BUT LISTED AS SUSPECT OVER THE PERIOD JANUARY TO JUNE 2005.

Column 1	Call sign or identifier.
Column 2	Number of wind direction observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3	Number of wind observations with vector difference from background of more than $25\text{ms}^{-1}$ (gross error).
Column 4	Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5	Mean of observation-minus-background differences (bias) excluding cases of gross error.
Column 6	Comments on quality of wind direction observations.

Notes: 1. Units are degrees (°)

Identifier	N Obs.	NGE	SD	Bias	Comments
A3CK5	41	1	79.0	-22.2	Bias reduced
A8BI5	0	---	---	---	No reports
A8BT5	0	---	---	---	No reports
A8CC9	264	0	67.5	-0.3	SD reduced
A8DO8	349	1	47.9	-2.2	Bias and SD reduced
A8EX5	55	0	51.8	-12.5	SD reduced
CGDS	1443	0	42.3	-7.3	Bias and SD reduced
C6LU4	307	0	52.1	-10.6	SD reduced
DGZO	161	0	48.9	4.5	SD reduced
DIOB	165	0	43.4	0.4	Bias reduced
ELXU5	2	0	0.0	26.8	Less than 40 reports
FPOD	565	0	33.2	-13.4	SD reduced
HZZC	97	0	54.9	-1.2	SD reduced
H8FE	34	0	80.4	64.1	Less than 40 reports
H900	0	---	---	---	No reports
KS045	0	---	---	---	No reports
KS050	0	---	---	---	No reports
KVMU	0	---	---	---	No reports
LMEL	2650	0	31.3	-4.2	Bias and SD reduced
OWFD2	42	0	37.6	-1.7	SD reduced
PEAJ	214	0	44.3	-10.1	Bias and SD reduced
P3CE9	6	0	53.7	14.2	Less than 40 reports
P3KM9	10	0	51.9	-41.0	Less than 40 reports
P3NL5	185	0	42.6	-5.8	SD reduced
TEST	0	---	---	---	No reports

Continued →



UCTI	0	---	---	---	No reports
UCUE	163	0	15.0	-8.8	Bias reduced
UDYG	151	0	25.7	-6.9	Bias reduced
UIAG	33	0	30.1	-22.1	Less than 40 reports
UICP	0	---	---	---	No reports
VHA2365	0	---	---	---	No reports
VSUA5	38	0	47.9	-8.6	Less than 40 reports
VVMA	97	0	30.4	4.7	SD
V2AH1	109	0	60.4	-13.2	SD reduced
V7FW7	181	0	55.9	2.4	SD reduced
WAZ9548	51	0	64.1	-6.5	SD reduced
WCX9106	56	0	42.0	-9.6	Bias and SD reduced
WSNB	194	1	48.4	11.9	Bias reduced
WYL4978	13	0	43.9	46.1	Less than 40 reports
30501	0	---	---	---	No reports
3FPW6	19	0	41.5	10.7	Less than 40 reports
46053	1361	0	40.1	-23.2	Bias reduced
52077	0	---	---	---	No reports
52083	0	---	---	---	No reports
9MCR4	121	0	48.7	1.0	** Add a comment here **
9VDN3	38	0	77.0	-22.5	Less than 40 reports



TABLE 9: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT SEA SURFACE TEMPERATURE OBSERVATIONS OVER THE PERIOD JULY TO DECEMBER 2005.

Column 1	Call sign or identifier.
Column 2	Number of sea-surface temperature observations available for monitoring over the six-month period, excluding duplicates, but including any observations with gross errors.
Column 3	Number of sea surface temperature observations differing by more than 10 °C from background (gross error).
Column 4	Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5	Mean of observation-minus-background differences excluding cases of gross error.
Columns 6-10	Number of times observing platform has appeared on suspect lists. B=Exeter, E=ECMWF, F=MétéoFrance, T=Tokyo, W=Washington.
Column 11	Comments on quality of sea surface temperature observations.

- Notes:
1. Units are °C
  2. Observing platforms marked with an asterisk were listed in the previous report (January to June 2005)

Table 9a: Platforms reporting in BUOY code

*i): Platforms non-operational at the end of the reporting period*

Identifier	N Obs.	NGE	SD	Bias	B E F T W	Comments
13595	458	15	2.3	1.7	0 - 0 - 0	Bias at end of report
14558	1948	0	2.5	2.2	1 - 1 - 1	Bias at end of report
15504	3396	0	0.2	-3.6	6 - 0 - 0	Bias
15510	3482	0	0.3	-3.8	6 - 5 - 1	Bias
15649	3312	0	0.4	-3.3	4 - 0 - 0	Bias
15904	426	28	4.0	-0.9	1 - 0 - 0	Bias and SD at end of report
16515	239	0	2.3	2.4	0 - 0 - 0	Bias
17559	1270	1270	---	---	2 - 2 - 2	GE
21515	118	118	---	---	1 - 1 - 1	GE
21537	531	7	1.3	-1.3	0 - 1 - 0	Bias and GE at end of report
21914	815	7	2.1	-0.4	0 - 0 - 0	Bias
21915	3494	4	1.5	-0.4	0 - 0 - 0	Bias at end of report
21937	2449	28	2.1	0.2	1 - 0 - 0	Bias and GE at end of report
22534	798	0	0.5	-3.3	2 - 1 - 0	Bias
22535	232	7	1.6	-4.0	2 - 1 - 0	Bias
22536	213	76	0.3	-4.8	2 - 2 - 2	Bias and GE
22571	2914	0	1.2	-0.5	0 - 0 - 0	Bias at end of report
22592	1896	0	1.8	-0.2	1 - 1 - 0	Bias at end of report
22630	141	141	---	---	1 - 1 - 1	GE
22905	1150	0	0.8	-0.3	0 - 0 - 0	Bias at end of report

Continued →



22909	563	120	1.7	-1.1	1 - 1 - 1	Bias from November
22913	657	0	2.0	-0.3	0 - 0 - 0	Bias at end of report
22938	1244	0	1.7	-0.6	0 - 0 - 0	Bias at end of report
22940	877	23	1.9	-1.0	0 - 0 - 0	Bias at end of report
31535	1981	0	0.8	0.1	0 - 0 - 0	Bias at end of report
31914	207	0	0.7	4.9	1 - 0 - 1	Bias
32620	3702	0	0.3	-4.2	6 - 3 - 6	Bias
32622	2152	47	0.7	-0.1	0 - 0 - 0	GE at end of report
32705	2126	39	1.1	-0.3	0 - 0 - 0	Bias and SD at end of report
32805	874	0	0.5	-3.6	2 - 0 - 0	Bias
32815	830	0	0.4	-3.5	2 - 0 - 0	Bias
32816	785	0	0.2	-3.5	2 - 1 - 0	Bias
32819	730	0	1.1	-3.6	2 - 0 - 0	Bias
32821	789	0	0.3	-3.4	2 - 0 - 0	Bias
32823	703	0	0.3	-4.1	2 - 2 - 1	Bias
32827	612	0	0.6	-3.1	1 - 0 - 0	Bias
32829	633	0	0.2	-3.5	2 - 1 - 0	Bias
32870	2380	0	0.8	0.0	0 - 0 - 0	Bias at end of report
33582	4516	0	1.5	0.4	0 - 0 - 0	Bias from November
33589	3805	22	1.5	-0.3	0 - 0 - 0	Bias and SD from November
41505	1812	23	0.3	0.1	0 - 0 - 0	GE at end of report
41552	2955	0	0.8	0.2	1 - 0 - 0	Bias at end of report
41557	2901	192	2.2	1.0	1 - 1 - 1	Bias at end of report
41855	2651	0	1.0	0.3	0 - 0 - 0	Bias at end of report
41914	4026	0	1.2	0.2	0 - 0 - 0	Bias at end of report
41920	1648	0	1.2	1.3	0 - 0 - 0	Bias at end of report
41934	3607	28	0.8	-0.7	0 - 0 - 0	GE at end of report
41939	3252	47	1.1	-0.6	0 - 0 - 0	GE at end of report
42540	1213	0	1.5	0.4	0 - 0 - 0	Bias at end of report
43538	252	0	0.8	-3.1	1 - 1 - 0	Bias
43540	1314	0	1.2	-0.4	0 - 0 - 0	Bias at end of report
43555	804	0	0.6	6.1	2 - 0 - 0	Bias
43558	1675	0	2.2	3.5	2 - 0 - 0	Bias
43565	1634	47	2.0	2.4	1 - 0 - 0	Bias at end of report
43567	1587	0	1.5	0.2	1 - 0 - 0	Bias at end of report
43568	834	0	1.7	3.6	1 - 0 - 0	Bias
43575	244	0	1.0	-6.3	1 - 1 - 1	Bias
43581	365	0	0.5	3.5	1 - 0 - 0	Bias
43584	504	10	3.5	2.3	0 - 0 - 0	Bias and SD
44505	3961	2	1.8	-1.2	1 - 0 - 1	Bias from October

Continued →



44509	905	96	1.6	2.2	2 - 1 - 1	Bias
44608	2772	41	0.7	0.1	0 - 0 - 0	GE at end of report
44845	2862	1	2.5	-0.8	1 - 0 - 0	Bias
44902	2804	0	2.4	-1.0	1 - 0 - 1	Bias
44908	382	0	1.2	2.6	0 - 0 - 0	Bias
46539	2719	11	0.5	0.1	0 - 0 - 0	GE at end of report
46632	1701	10	1.1	0.3	0 - 0 - 0	SD and GE at end of report
46637	734	63	3.1	0.0	0 - 1 - 0	GE
46707	3043	24	1.0	0.2	0 - 0 - 0	Bias and GE at end of report
46972	1311	4	0.8	4.6	5 - 4 - 4	Bias
51525	1366	4	2.6	1.6	1 - 1 - 1	Bias at end of report
51747	3599	0	0.3	-4.0	6 - 6 - 6	Bias
51748	3857	0	0.3	-4.3	6 - 6 - 6	Bias
51750	2459	11	0.4	0.3	0 - 0 - 0	GE at end of report
51752	3642	0	0.3	-4.3	6 - 6 - 6	Bias
51905	1432	0	0.9	-0.3	0 - 0 - 0	Bias at end of report
51961	1642	45	2.5	0.1	0 - 0 - 0	Bias and SD from August
51980	2764	0	1.2	-0.3	1 - 1 - 0	Bias from November
52528	681	0	1.6	0.4	1 - 0 - 1	Bias at end of report
52607	2997	0	1.0	-0.1	0 - 0 - 0	Bias at end of report
53522	895	0	0.3	-4.2	2 - 1 - 2	Bias
53566	973	0	0.4	-4.1	2 - 1 - 2	Bias
53567	783	0	0.4	-4.1	2 - 1 - 2	Bias
53568	804	0	0.3	-4.1	2 - 1 - 2	Bias
53571	157	0	1.5	-4.7	1 - 1 - 1	Bias
53580	892	0	0.4	-4.3	2 - 1 - 2	Bias
53582	976	0	0.4	-4.1	2 - 1 - 2	Bias
53591	981	0	0.4	-4.2	2 - 1 - 2	Bias
53592	921	0	0.4	-4.2	2 - 1 - 2	Bias
53593	974	0	0.4	-4.2	2 - 1 - 2	Bias
53594	996	0	0.4	-4.3	2 - 1 - 2	Bias
53595	926	0	0.4	-4.2	2 - 1 - 2	Bias
53596	904	0	0.4	-4.1	2 - 1 - 2	Bias
53599	914	0	0.4	-4.3	2 - 1 - 2	Bias
53600	886	0	0.4	-4.2	2 - 1 - 2	Bias
53601	891	0	0.4	-4.2	2 - 1 - 2	Bias
53602	811	0	0.4	-4.0	2 - 2 - 1	Bias
53603	158	0	1.2	-5.0	2 - 2 - 2	Bias
53605	921	0	0.3	-4.0	2 - 1 - 1	Bias
53606	770	0	0.4	-4.2	2 - 1 - 2	Bias

Continued →



53607	788	0	0.4	-4.2	2 - 1 - 1	Bias
53608	348	0	3.1	-4.0	2 - 1 - 2	Bias
53901	230	0	1.6	-4.7	2 - 2 - 2	Bias
53902	913	0	0.3	-4.2	2 - 1 - 2	Bias
53903	801	0	0.3	-3.9	2 - 1 - 1	Bias
53904	558	1	0.2	-3.9	2 - 1 - 1	Bias
55629	1286	0	1.7	-0.4	0 - 0 - 0	Bias at end of report
55916	161	119	0.2	0.0	1 - 1 - 1	GE
56544	889	2	2.4	-0.9	1 - 0 - 0	Bias at end of report
61769	2350	5	1.4	0.2	1 - 0 - 0	SD at end of report
61816	168	168	---	---	1 - 0 - 0	GE
61817	144	144	---	---	1 - 0 - 0	GE
61818	162	162	---	---	1 - 0 - 0	GE
61819	195	195	---	---	1 - 0 - 0	GE
61820	141	141	---	---	1 - 0 - 0	GE
62512	2075	74	1.4	-0.1	1 - 1 - 1	Bias and GE at end of report
62514	218	0	2.8	4.2	1 - 0 - 0	Bias
62557	3847	148	0.7	0.1	1 - 0 - 1	Bias and GE at end of report

ii): Platforms operational at the end of the reporting period

Identifier	N Obs.	NGE	SD	Bias	B	E	F	T	W	Comments
13518	5062	2	0.8	-0.1	0	-	0	-	0	Bias at end of period
15502	3183	0	0.2	-3.4	6	-	0	-	0	Bias
22530	529	0	2.3	-1.2	0	-	0	-	0	Bias at end of period
22538	513	49	2.9	-4.1	2	-	1	-	1	Bias and SD
22625	842	4	3.3	-3.2	4	-	4	-	1	Bias
32538	3660	0	0.3	-4.2	6	-	6	-	5	Bias
32675	3829	32	0.6	0.2	0	-	0	-	0	GE at end of period
32803	859	0	1.0	-4.0	2	-	0	-	1	Bias
33632	2105	251	2.7	-0.4	2	-	2	-	2	Bias and GE from August
41912	4603	0	0.6	-3.8	6	-	1	-	0	Bias
41928	1771	8	1.4	-0.1	0	-	0	-	0	SD from September
41969	2105	0	0.3	-4.0	4	-	4	-	3	Bias
43578	915	0	0.4	-4.6	2	-	2	-	2	Bias
51743	3699	0	0.4	-4.3	6	-	6	-	6	Bias
51751	3612	0	0.3	-3.9	6	-	6	-	5	Bias
51959	1528	0	1.3	-1.2	1	-	0	-	0	Bias from August
53521	869	0	0.4	-4.1	2	-	1	-	2	Bias
53578	860	0	0.3	-4.3	2	-	1	-	2	Bias
53604	975	0	0.4	-4.3	2	-	1	-	2	Bias
53609	828	0	0.4	-4.3	2	-	1	-	2	Bias
61815	146	146	---	---	1	-	0	-	0	GE



Table9b: Platforms reporting in SHIP code

Identifier	N Obs.	NGE	SD	Bias	B E F T W	Comments
A8DZ4	70	0	2.1	2.6	1 - 1 - 0	Bias
CG252	121	69	0.9	8.9	3 - 0 - 1	Bias and GE
CG2992	47	0	2.8	5.4	1 - 0 - 2	Bias
CTFB	53	1	1.7	-3.1	1 - 1 - 1	Bias
C6IO9	176	13	2.6	0.7	0 - 0 - 0	GE at end of report
C6QE3	152	3	1.9	2.4	1 - 1 - 0	Bias from December
C6RJ6	198	1	0.7	-3.2	6 - 2 - 0	Bias
C6SI6	174	1	2.6	-1.6	1 - 0 - 0	Bias
DCCN2	151	0	1.4	-3.0	3 - 2 - 1	Bias
DGRF	179	0	2.6	1.6	2 - 2 - 2	Bias from November
DHDH	51	0	1.0	-3.3	0 - 0 - 0	Bias
DIBZ	165	0	0.8	-2.6	1 - 0 - 0	Bias
DIDY	112	4	4.0	-2.1	3 - 2 - 2	Bias
DPCU	49	0	1.0	3.0	0 - 0 - 0	Bias
DPKZ	42	2	2.4	-4.5	0 - 0 - 0	Bias
ELSM9	394	15	2.0	-6.1	6 - 6 - 6	Bias
FNFD	562	0	2.1	1.9	2 - 2 - 1	Bias from October
FNIA	220	0	3.8	-1.3	1 - 0 - 0	Bias
GYYP	71	25	2.1	0.3	0 - 1 - 1	GE
KHRC	191	0	0.8	-5.4	5 - 5 - 5	Bias
KS011	250	0	1.5	-3.2	1 - 0 - 1	Bias
KS049	1238	5	2.5	-4.0	6 - 6 - 0	Bias
LAVV4	84	0	1.7	-3.2	1 - 1 - 0	Bias
PJWQ	209	0	1.1	2.6	0 - 0 - 0	Bias
SWLC	64	0	2.8	-3.6	1 - 0 - 0	Bias
S6IW	262	0	1.3	-5.2	6 - 6 - 6	Bias
UCDM	103	2	2.7	-3.1	1 - 0 - 1	Bias
UCJX	107	0	1.5	-3.2	0 - 1 - 1	Bias
UCUF	330	0	2.1	0.7	1 - 1 - 1	Bias from December
UFJC	142	19	2.0	-3.7	4 - 2 - 2	Bias and GE
UFLC	83	1	2.9	-2.8	0 - 0 - 0	Bias
UGGA	171	62	2.0	-3.9	5 - 3 - 3	Bias and GE
UIAH	258	0	1.6	1.3	0 - 0 - 0	Bias from December
VCTV	50	3	2.4	-4.3	1 - 0 - 0	Bias
VJDL	86	21	0.3	0.7	0 - 0 - 0	GE at end of report

Continued →



VQFS4	86	1	2.7	-2.5	0 - 0 - 0	Bias from November
VRBH5	178	0	2.0	-2.2	1 - 1 - 1	Bias from December
VVKV *	137	0	0.9	3.0	2 - 2 - 0	Bias
V2AC6 *	160	1	1.5	3.4	6 - 6 - 0	Bias
WAAH *	476	0	1.1	2.5	2 - 1 - 0	Bias
WCZ5528	333	3	2.4	-3.0	3 - 3 - 3	Bias
WDB2122	52	0	2.3	4.1	0 - 0 - 0	Bias from October
WMLH	161	0	1.7	2.0	2 - 1 - 0	Bias from October
WSLH	79	1	1.6	-2.7	0 - 0 - 0	Bias
WSRH	99	0	1.2	-3.6	3 - 2 - 1	Bias
WZJD	213	3	0.8	-3.8	5 - 4 - 2	Bias
Y3CH *	2449	2	1.5	0.8	0 - 2 - 1	Bias
ZCBE7 *	89	19	1.3	7.5	1 - 0 - 0	Bias and GE
ZCDH9	150	1	2.8	-1.5	1 - 1 - 1	Bias from November
ZMFR	892	546	3.6	-1.5	4 - 4 - 4	GE from September
3FKM8 *	129	1	1.9	-4.8	3 - 0 - 3	Bias
3FOW2 *	53	0	3.2	3.3	0 - 0 - 0	Bias
4XIS	100	1	2.3	-3.1	1 - 1 - 1	Bias
41008	4113	0	1.7	-0.6	1 - 0 - 0	Bias from November
41025 *	4161	0	2.0	0.0	0 - 0 - 0	Bias from October
41035	5383	0	2.6	-1.9	2 - 1 - 0	Bias from October
42007	2854	0	2.3	-1.4	1 - 0 - 1	Bias from November
42035	4148	0	1.9	-0.7	1 - 0 - 0	Bias from November
44014 *	3518	0	1.3	-1.5	1 - 0 - 0	Bias
44141	4138	0	2.2	0.9	0 - 0 - 0	Bias
44150	3869	0	1.9	0.2	1 - 0 - 0	Bias from November
45139 *	2288	0	2.4	-1.2	1 - 1 - 0	Bias at end of report
45141	2240	1628	1.4	8.5	4 - 1 - 4	Bias and GE
45142 *	3325	0	1.1	0.5	0 - 0 - 3	Bias at end of report
45143 *	3181	0	1.0	-0.1	0 - 0 - 0	Bias at end of report
45145 *	2242	1625	1.3	7.9	4 - 0 - 3	Bias and GE
45150 *	2070	1023	1.6	8.4	4 - 2 - 2	Bias and GE
46212 *	2585	0	1.8	-1.0	1 - 1 - 0	Bias
61298	1663	1663	---	---	4 - 0 - 0	GE
61299	1665	1665	---	---	4 - 0 - 0	GE
61300	127	127	---	---	1 - 0 - 0	GE
61301	751	751	---	---	2 - 0 - 0	GE
61302	703	703	---	---	2 - 0 - 0	GE
61303	766	766	---	---	2 - 0 - 0	GE
61304	747	747	---	---	2 - 0 - 0	GE

Continued →



61305	586	586	---	---	2 - 0 - 0	GE
61306	626	626	---	---	2 - 0 - 0	GE
61307	634	634	---	---	2 - 0 - 0	GE
61308	571	571	---	---	2 - 0 - 0	GE
61309	622	622	---	---	2 - 0 - 0	GE
61310	797	797	---	---	2 - 0 - 0	GE
61311	747	747	---	---	2 - 0 - 0	GE
61312	688	688	---	---	2 - 0 - 0	GE
61313	716	716	---	---	2 - 0 - 0	GE
61314	788	788	---	---	2 - 0 - 0	GE
9HQB6	190	4	3.1	-2.9	2 - 2 - 1	Bias



TABLE 10: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 9  
BUT LISTED AS SUSPECT OVER THE PERIOD JANUARY TO JUNE 2005.

Column 1	Call sign or identifier
Column 2	Number of sea-surface temperature observations available for monitoring over the 6-month period, including any observations with gross errors.
Column 3	Number of sea surface temperature observations differing by more than 10 °C from the background (gross error).
Column 4	Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5	Mean of observation-minus-background differences excluding cases of gross error.
Column 6	Comments on quality of sea surface temperature observations.

Notes: 1. Units are °C

Identifier	N Obs.	NGE	SD	Bias	Comments
A8BZ6	188	0	2.5	-2.8	Bias reduced
A8CK2	39	0	1.1	-3.1	Less than 40 reports
CGDR	842	0	1.4	2.1	Bias reduced
CG2350	818	0	1.4	0.7	Bias reduced
C6IZ7	107	0	1.3	2.2	Bias reduced
C6QF4	0	---	---	---	No reports
DBAI	376	1	1.3	-0.7	Bias reduced
DBBX	2285	1	1.1	0.7	Bias reduced
DBBXX	235	0	1.2	0.6	Bias reduced
DBFC	3856	3	1.9	-0.8	Bias reduced
DBFR	3582	0	1.4	0.0	Bias reduced
DBKV	3968	0	0.9	0.0	Bias reduced
DEFL	59	0	0.9	2.3	Bias reduced
DGGV	23	0	0.9	3.1	Less than 40 reports
ELMA6	286	0	0.9	1.9	GE reduced
ELOT3	0	---	---	---	No reports
ELPQ9	7	0	0.6	3.5	Less than 40 reports
ELVZ6	55	1	2.8	0.7	Bias reduced
ELXL3	78	0	1.2	-0.4	Bias reduced
HZZD	64	1	2.2	-1.5	Bias reduced
H3AP	32	28	1.4	-7.8	Less than 40 reports
JADY	181	0	1.3	2.7	Bias reduced
JDWX	1079	0	1.7	-0.8	Bias and SD reduced
JGBF	66	0	1.4	-0.6	Bias reduced
KGJD	0	---	---	---	No reports

Continued →



KHRP	358	0	0.8	0.4	Bias reduced
KS035	806	0	1.2	0.8	Bias reduced
LAIP5	359	0	1.1	-2.7	Bias reduced
LF3F	1050	58	0.3	0.1	GE reduced
MASH6	208	0	1.9	1.1	Bias reduced
NL9H	277	0	0.8	-1.3	Bias reduced
OYZC	313	0	1.9	0.8	Bias reduced
PDKU	10	0	2.9	-2.6	Less than 40 reports
PDTM	54	0	1.4	0.7	Bias reduced
PFRO	121	0	2.0	1.6	Bias reduced
PHSG	35	0	1.8	-0.6	Less than 40 reports
TEST	34	34	---	---	Less than 40 reports
TSMU	60	2	4.4	-2.0	Bias reduced
UCCW	191	0	3.0	0.8	Bias reduced
UCNK	15	0	1.5	-4.1	Less than 40 reports
UCPD	153	0	2.2	1.2	GE reduced
UGMC	270	1	2.2	-0.1	Bias reduced
UHFV	181	0	2.3	-1.0	GE reduced
UIDO	112	1	1.8	0.2	Bias reduced
VLTT	204	13	1.0	0.6	GE reduced
VOPM	171	0	1.6	1.2	Bias reduced
VRUR7	111	0	1.4	0.9	Bias reduced
V7CZ6	243	0	1.9	0.4	Bias reduced
V7HS2	220	0	1.2	2.4	Bias reduced
WGJF	27	1	2.9	-5.7	Less than 40 reports
WSDX	0	---	---	---	No reports
12505	0	---	---	---	No reports
12508	0	---	---	---	No reports
15621	0	---	---	---	No reports
15632	0	---	---	---	No reports
15902	0	---	---	---	No reports
17687	0	---	---	---	No reports
21577	0	---	---	---	No reports
22584	0	---	---	---	No reports
23094	540	0	1.7	-1.2	Bias reduced
23689	0	---	---	---	No reports
3FJV4	0	---	---	---	No reports
3FMV4	52	0	0.7	-0.5	Bias reduced
3FPA6	262	2	2.8	2.7	Bias reduced
3FVG8	0	---	---	---	No reports

Continued →



32693	0	---	---	---	No reports
32702	0	---	---	---	No reports
32741	0	---	---	---	No reports
33543	0	---	---	---	No reports
33634	0	---	---	---	No reports
41013	3309	0	1.0	0.0	Bias reduced
41520	0	---	---	---	No reports
43522	0	---	---	---	No reports
43528	0	---	---	---	No reports
44004	4154	0	1.3	1.1	Bias reduced
44007	4140	0	1.1	-0.5	Bias reduced
44008	4154	0	2.0	-1.0	Bias reduced
44011	0	---	---	---	No reports
44013	4136	0	1.5	-0.3	Bias reduced
44029	3796	0	1.5	-0.2	Bias reduced
44030	3670	0	1.3	-0.1	Bias reduced
44039	1582	0	1.0	1.4	Bias reduced
44547	0	---	---	---	No reports
44548	0	---	---	---	No reports
45007	1100	0	1.3	0.5	Bias reduced
45012	1153	0	1.2	0.5	Bias reduced
45135	2976	0	1.3	1.1	Bias reduced
45149	3509	0	0.7	0.3	Bias reduced
45151	2381	0	1.3	1.8	Bias reduced
45154	3300	2	1.5	0.9	Bias reduced
46060	4168	0	0.7	0.4	Bias reduced
46061	8321	0	0.7	0.2	Bias reduced
46081	4137	0	1.1	-0.9	Bias reduced
51674	0	---	---	---	No reports
51890	0	---	---	---	No reports
51934	0	---	---	---	No reports
51968	0	---	---	---	No reports
51985	0	---	---	---	No reports
52645	0	---	---	---	No reports
52683	0	---	---	---	No reports
52685	0	---	---	---	No reports
52686	0	---	---	---	No reports
52696	0	---	---	---	No reports
53576	0	---	---	---	No reports
55627	0	---	---	---	No reports

Continued →



56619	0	---	---	---	No reports
62164	2817	0	0.4	-0.2	Bias, SD and GE reduced
64608	0	---	---	---	No reports
64611	0	---	---	---	No reports
65602	0	---	---	---	No reports
9HCH7	199	5	2.5	2.0	Bias reduced

TABLE 11: NUMBER OF PLATFORMS REPORTING SUSPECT PRESSURE, WIND AND SST OBSERVATIONS FOR EACH OF THE SIX-MONTH PERIODS COVERED BY THE WMO REPORTS ON THE QUALITY OF MARINE OBSERVATIONS.

Report	Period Covered	Pressure	Wind	SST	Comments
1	January to June 1989	150			
2	July to December 1989				
3	January to June 1990				
4	July to December 1990				
5	January to June 1991				
6	July to December 1991	81	27	98	
7	January to June 1992	74	23	126	
8	July to December 1992	64	19	102	
9	January to June 1993	64	24	164	
10	July to December 1993	71	21	124	
11	January to June 1994	72	27	130	
12	July to December 1994	71	29	127	
13	January to June 1995	82	33	132	
14	July to December 1995	104	39	121	
15	January to June 1996	99	35	124	
16	July to December 1996	112	23	102	
17	January to June 1997	88	19	94	
18	July to December 1997	85	22	100	
19	January to June 1998	74	28	89	Feb-Jun for P & Wind, Jan-Apr for SST
20	July to December 1998	75	45	58	NCEP SST data
21	January to June 1999	95	45	35	NCEP SST data
22	July to December 1999	111	43	35	NCEP SST data
23	January to June 2000	129	64	38	NCEP SST data
24	July to December 2000	124	80	79	
25	January to June 2001	123	101	123	
26	July to December 2001	125	114	145	
27	January to June 2002	152	129	165	
28	July to December 2002	158	148	171	
29	January to June 2003	119	136	143	
30	July to December 2003	133	130	152	
31	January to June 2004	106	110	139	
32	July to December 2004	141	150	152	
33	January to June 2005	125	113	174	
34	July to December 2005	157	142	225	







Figure 1: Number of observations of pressure received at Exeter on the GTS for each of the six-month periods covered by the WMO reports on the quality of marine surface observations

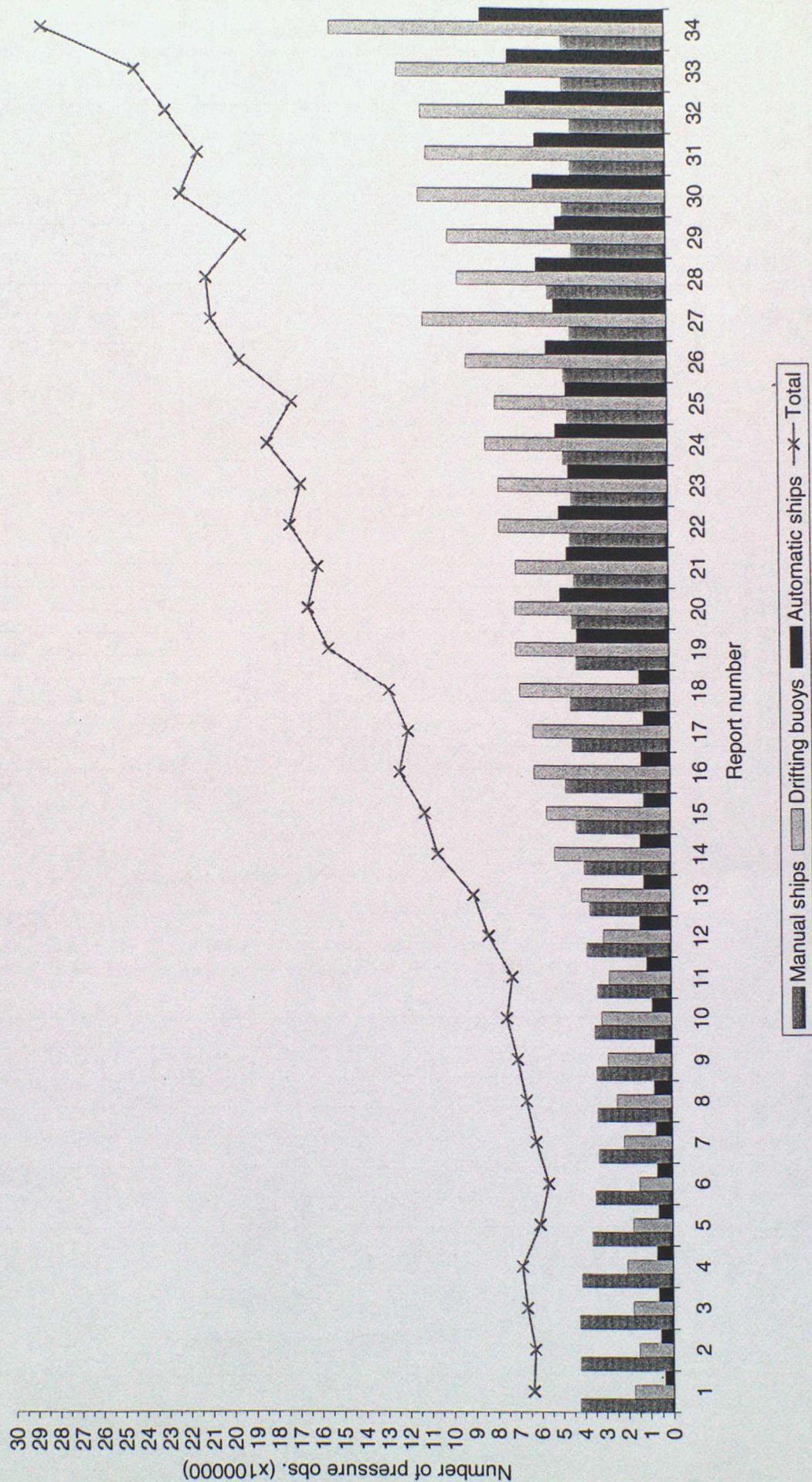




Figure 2a: Distribution of ship O-B pressure (hPa)  
 Period of data: July-Dec 2005 Data used: All observations

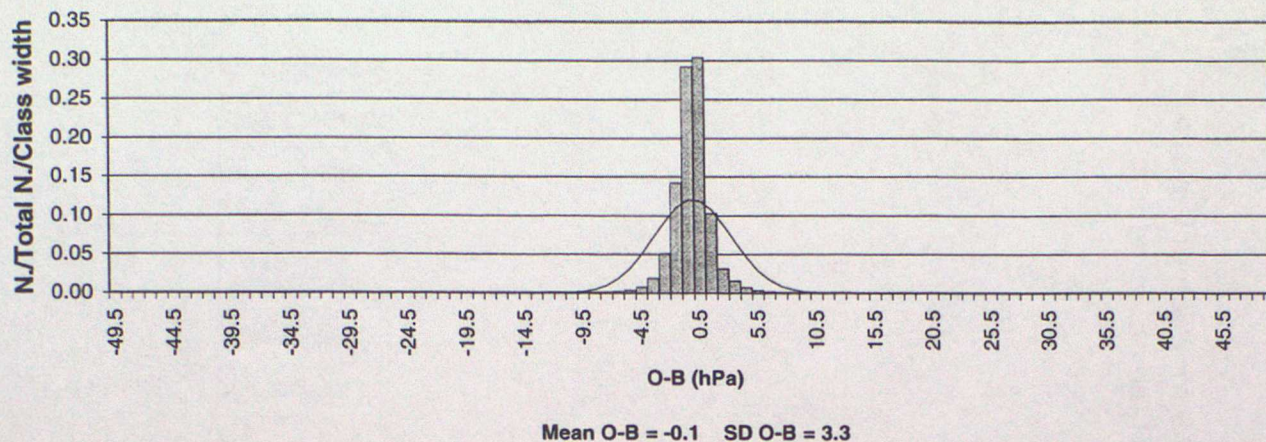


Figure 2b: Distribution of ship O-B pressure (hPa)  
 Period of data: July-Dec 2005 Data used: Flagged observations

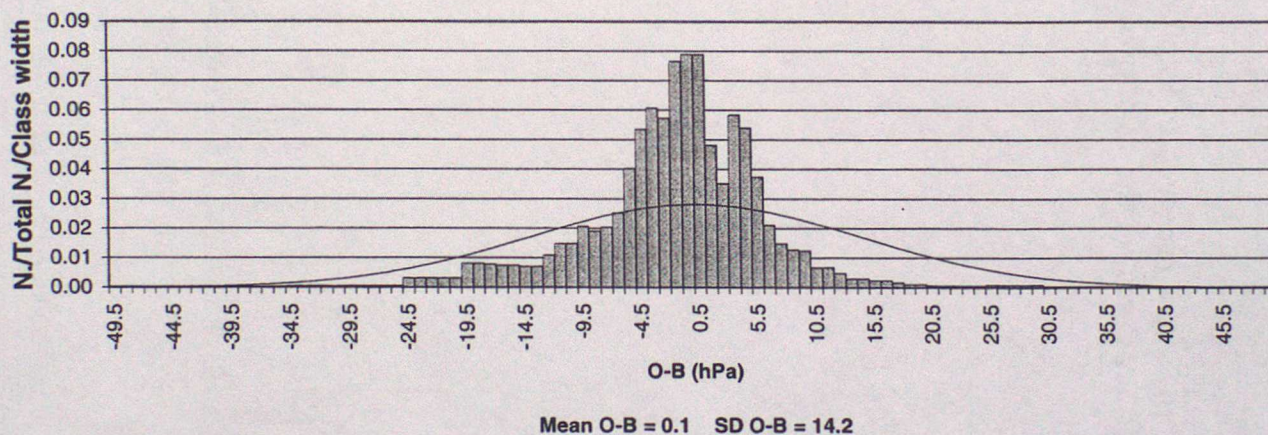


Figure 2c: Distribution of ship O-B pressure (hPa)  
 Period of data: July-Dec 2005 Data used: Unflagged observations

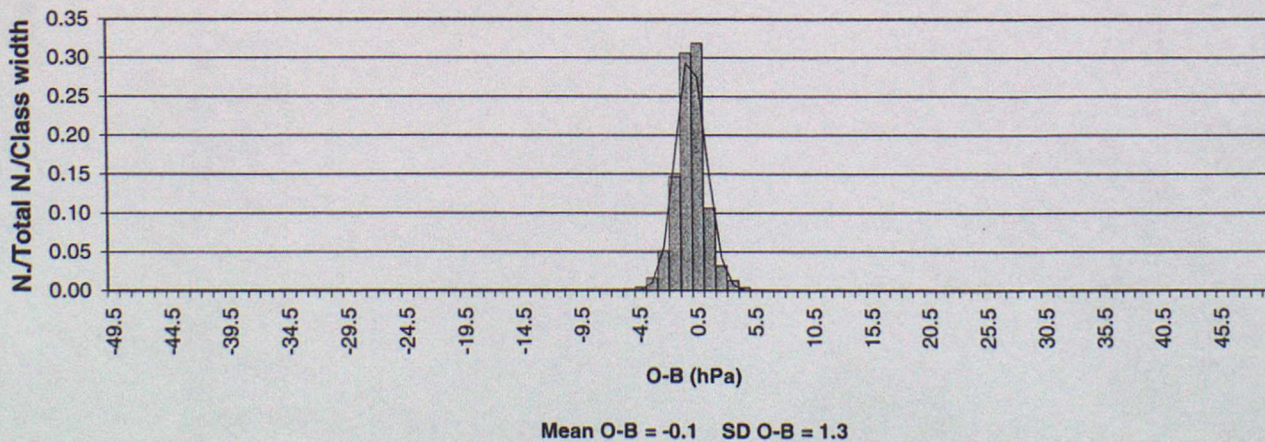




Figure 2d: Distribution of ship O-B wind speed ( $\text{ms}^{-1}$ )  
 Period of data: July-Dec 2005 Data used: All observations

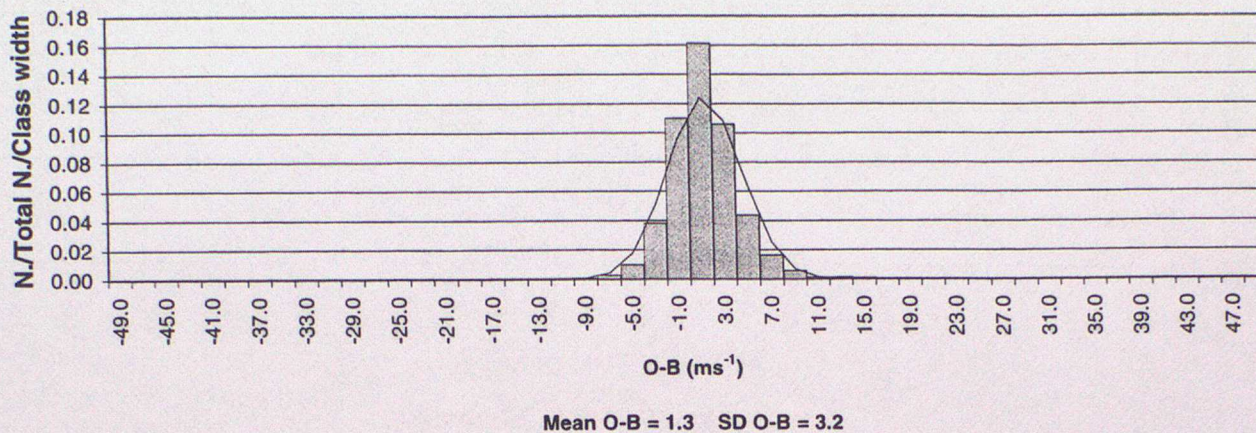


Figure 2e: Distribution of ship O-B wind speed ( $\text{ms}^{-1}$ )  
 Period of data: July-Dec 2005 Data used: Flagged observations

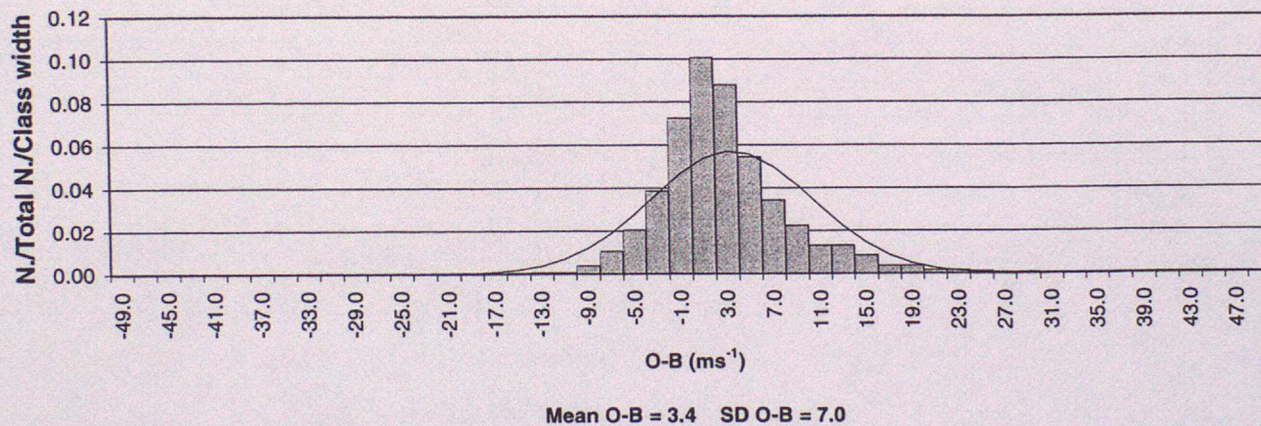


Figure 2f: Distribution of ship O-B wind speed ( $\text{ms}^{-1}$ )  
 Period of data: July-Dec 2005 Data used: Unflagged observations

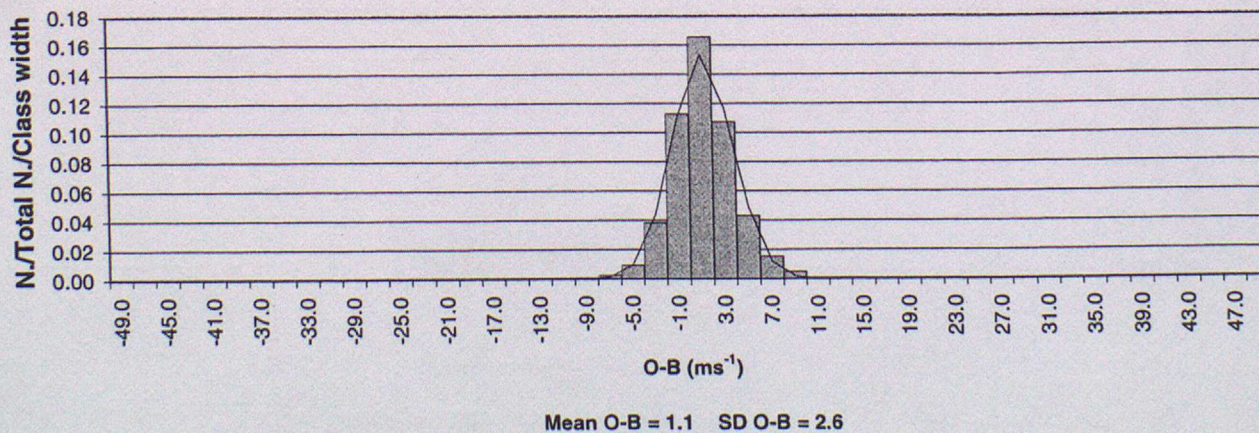




Figure 2g: Distribution of ship O-B wind direction (degrees)  
Period of data: July-Dec 2005 Data used: All observations

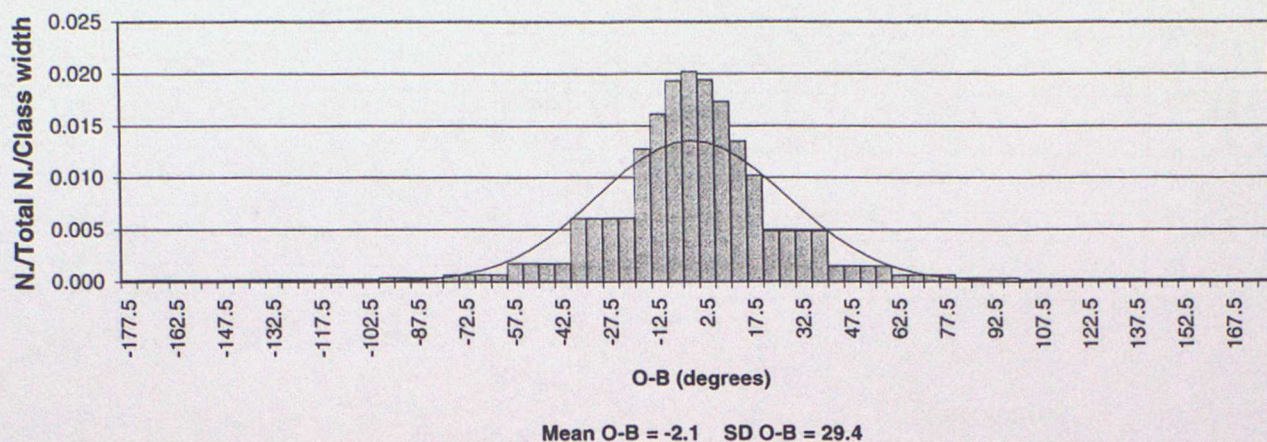


Figure 2h: Distribution of ship O-B wind direction (degrees)  
Period of data: July-Dec 2005 Data used: Flagged observations

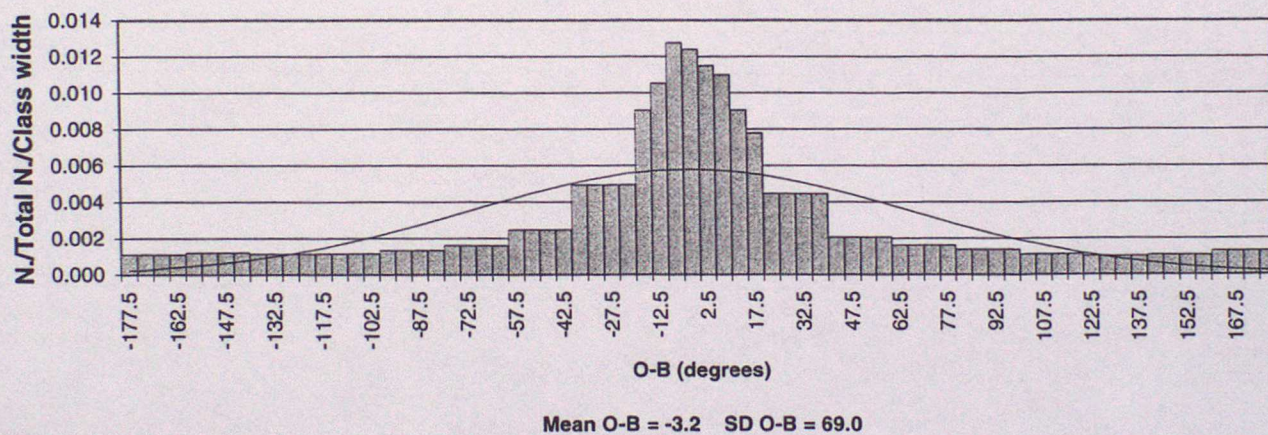


Figure 2i: Distribution of ship O-B wind direction (degrees)  
Period of data: July-Dec 2005 Data used: Unflagged observations

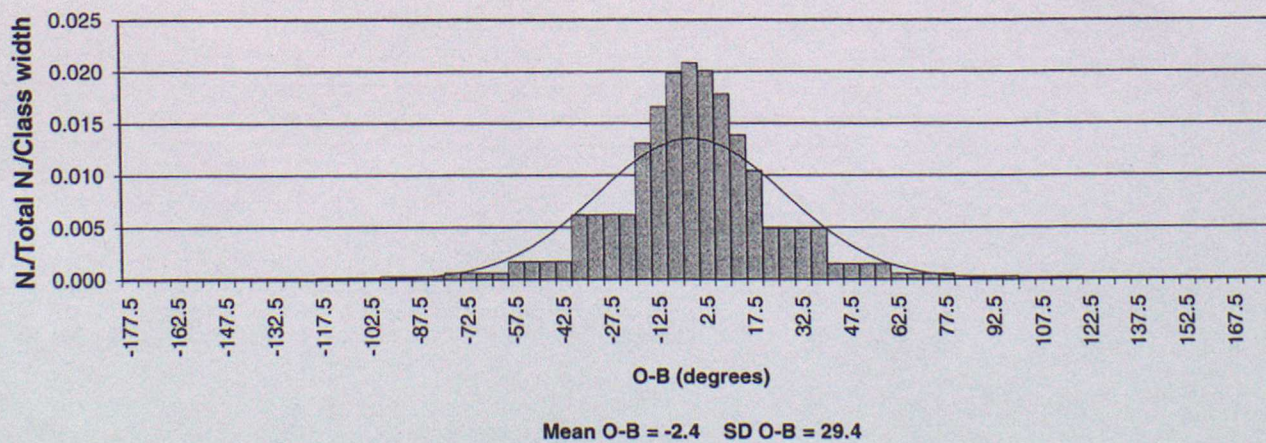




Figure 2j: Distribution of ship O-B SST ( $^{\circ}\text{C}$ )  
 Period of data: July-Dec 2005 Data used: All observations

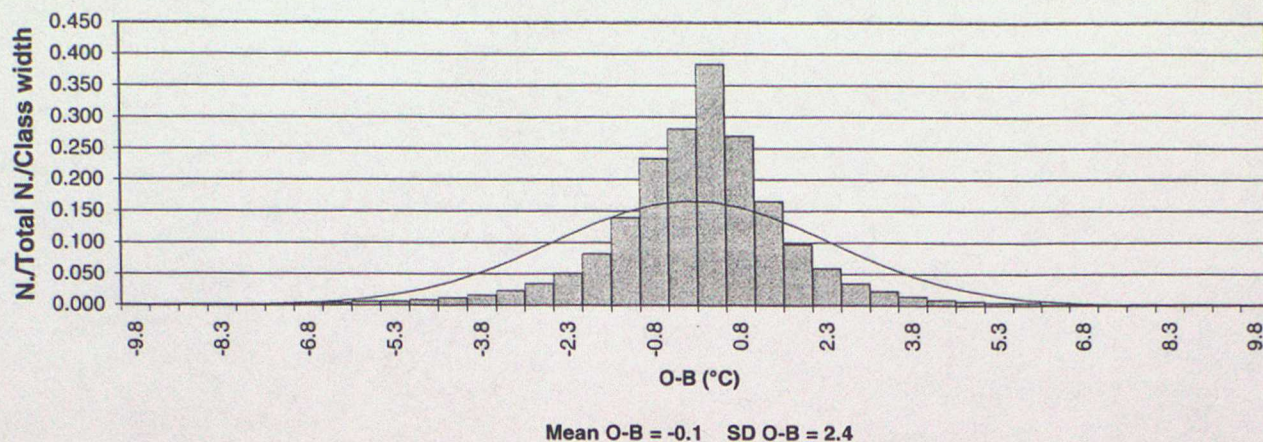


Figure 2k: Distribution of ship O-B SST ( $^{\circ}\text{C}$ )  
 Period of data: July-Dec 2005 Data used: Flagged observations

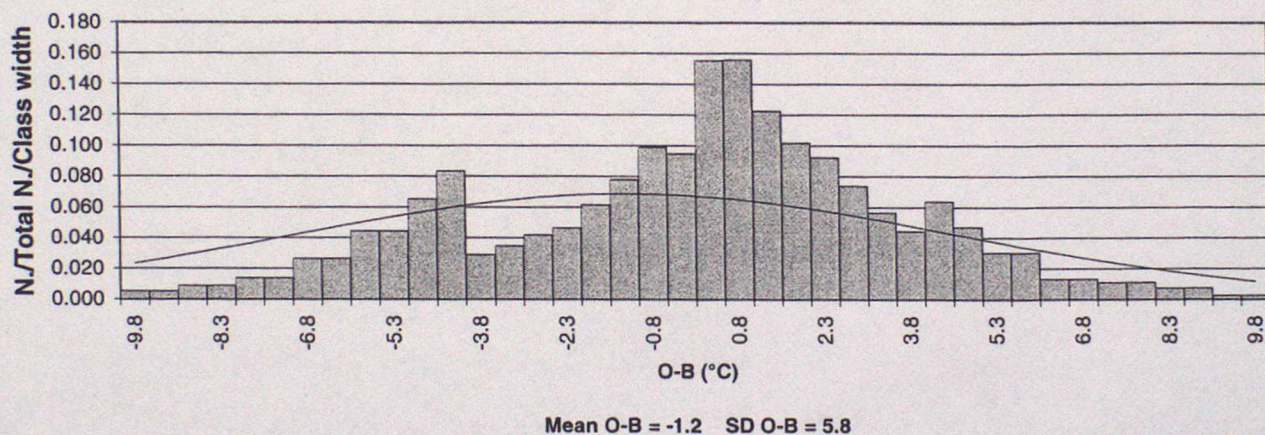


Figure 2l: Distribution of ship O-B SST ( $^{\circ}\text{C}$ )  
 Period of data: July-Dec 2005 Data used: Unflagged observations

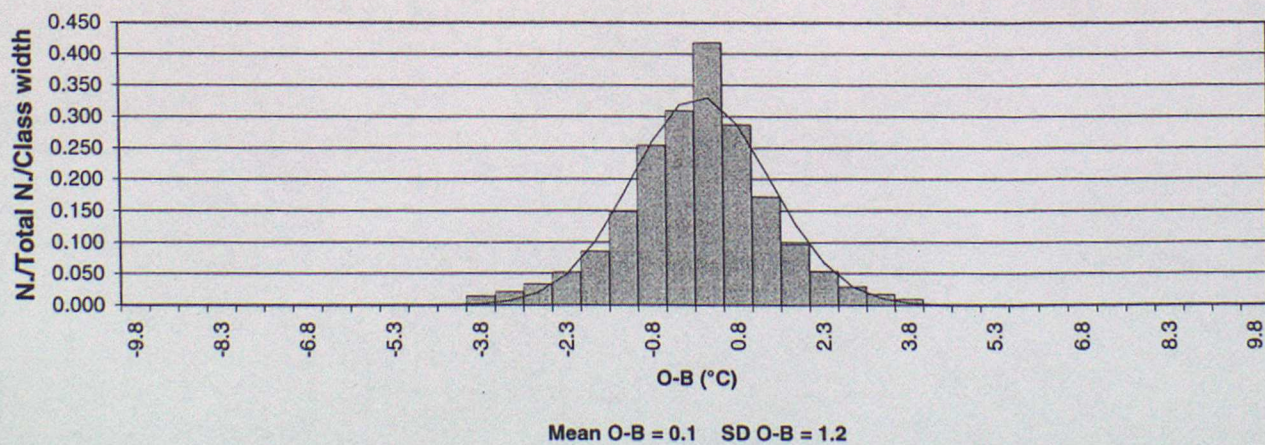








Figure 3: Bias of Ship O-B Pressure (hPa). Date:- July - December 2005  
 Only observations passing quality control used in statistics  
 Contours drawn to 10 degree boxes, if the number of observations is greater than 10  
 Shaded areas have a bias of magnitude greater than 0.5 hPa





Figure 4: Standard Deviation of Ship O-B Pressure (hPa). Date:- July - December 2005  
Only Observations passing quality control used in statistics  
Contours drawn to 10 degree boxes, if the number of observations is greater than 10  
Shaded areas have a standard deviation of greater than 2.0 hPa





Figure 5:  
 Plot of the Number of Ship Pressure Observations. Date:- July - December 2005  
 Only observations passing quality control included

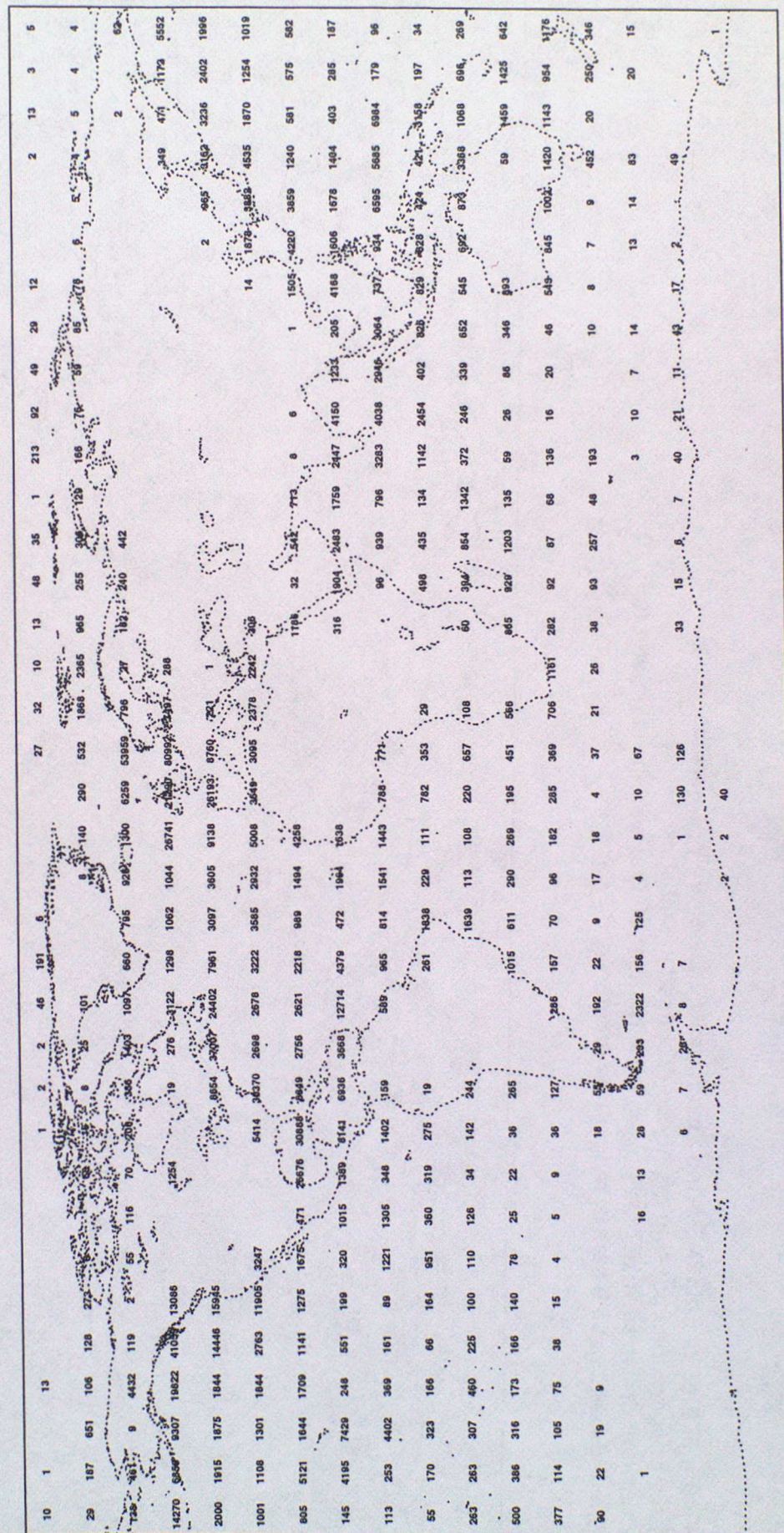




Figure 6: Bias of Ship O-B Wind Speed (ms<sup>-1</sup>). Date:- July - December 2005  
Only observations passing quality control used in statistics  
Contours drawn to 10 degree boxes, if the number of observations is greater than 10  
Shaded areas have a bias of magnitude greater than 2.0 ms<sup>-1</sup>

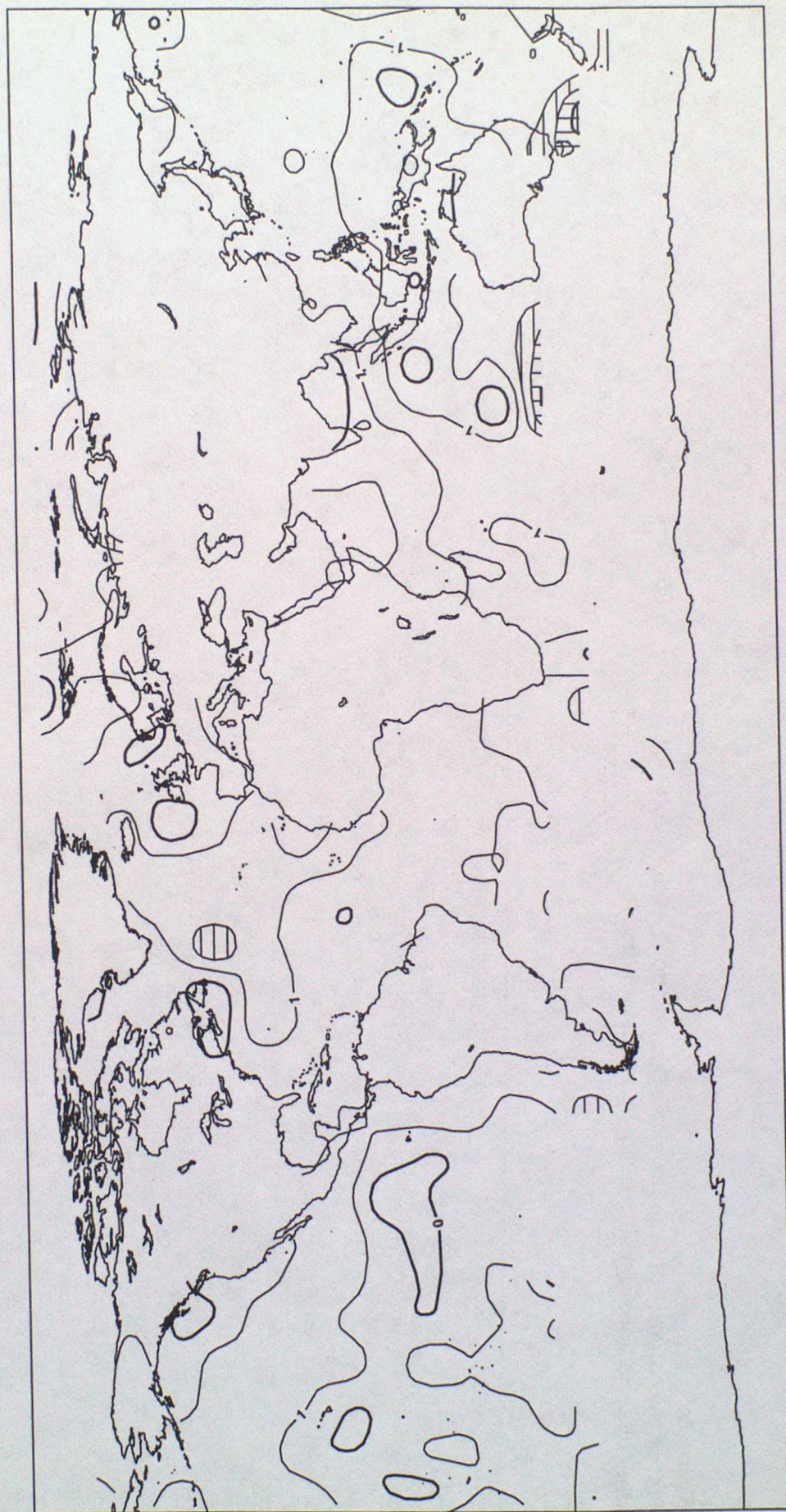




Figure 7: Standard Deviation of Ship O-B Wind Speed (ms<sup>-1</sup>). Date:- July - December 2005  
Only Observations passing quality control used in statistics  
Contours drawn to 10 degree boxes, if the number of observations is greater than 10  
Shaded areas have a standard deviation of greater than 4.0 ms<sup>-1</sup>

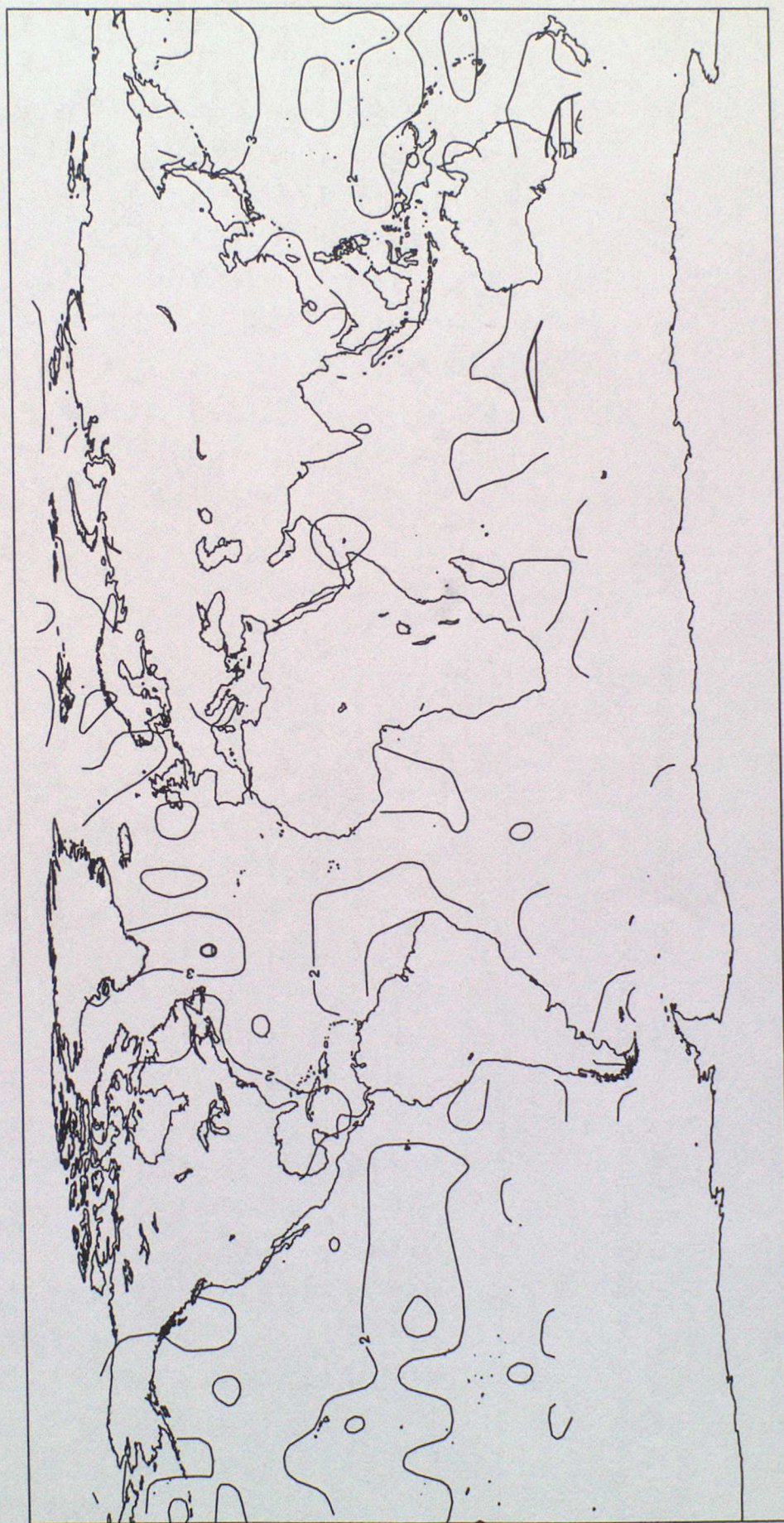




Figure 8:  
 Plot of the Number of Ship Wind Speed Observations. Date:- July - December 2005  
 Only observations passing quality control included

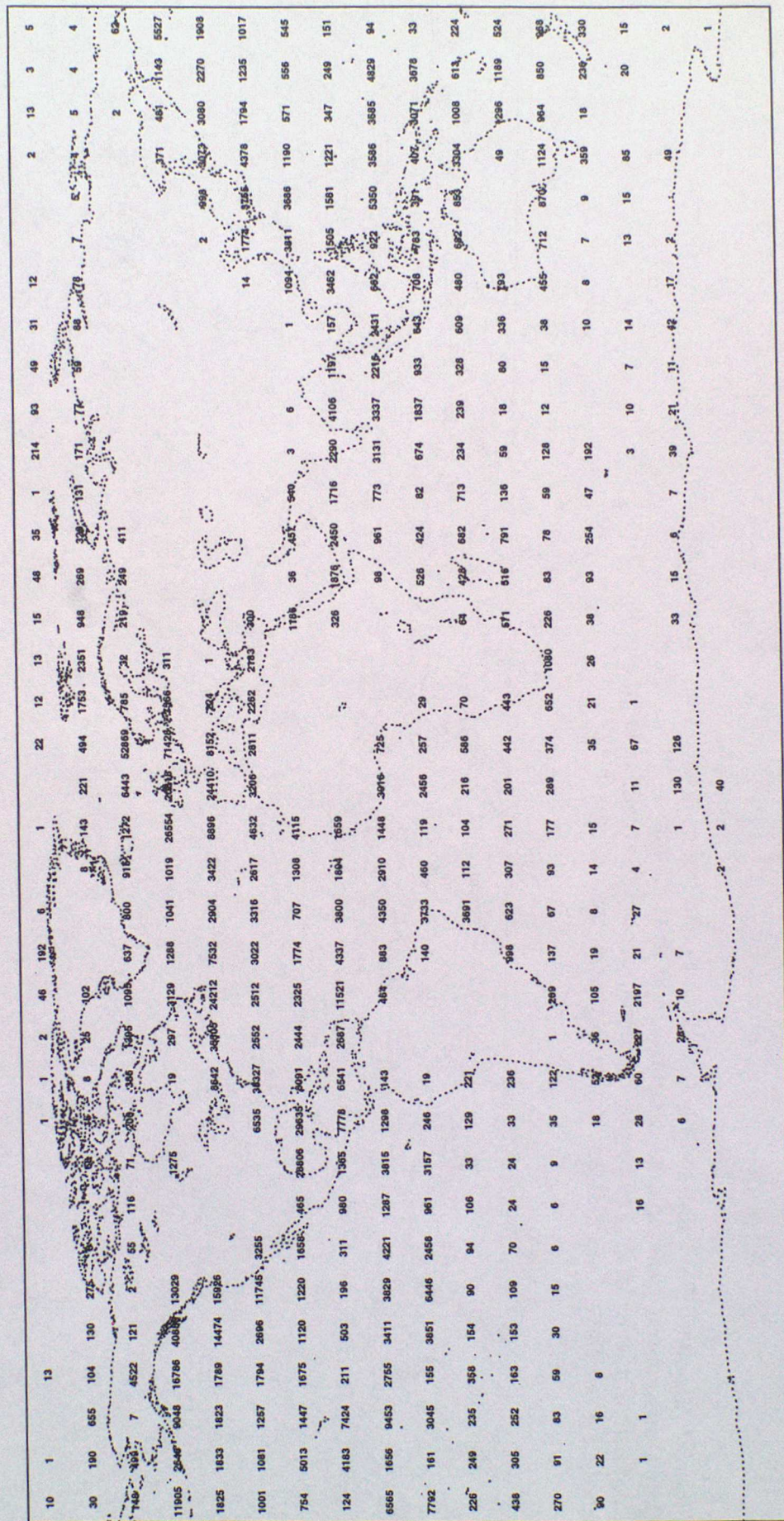




Figure 9: Bias of Ship O-B Wind Direction (degrees). Date:- July - December 2005  
Only observations passing quality control used in statistics  
Contours drawn to 10 degree boxes, if the number of observations is greater than 10  
Shaded areas have a bias of magnitude greater than 10 degrees

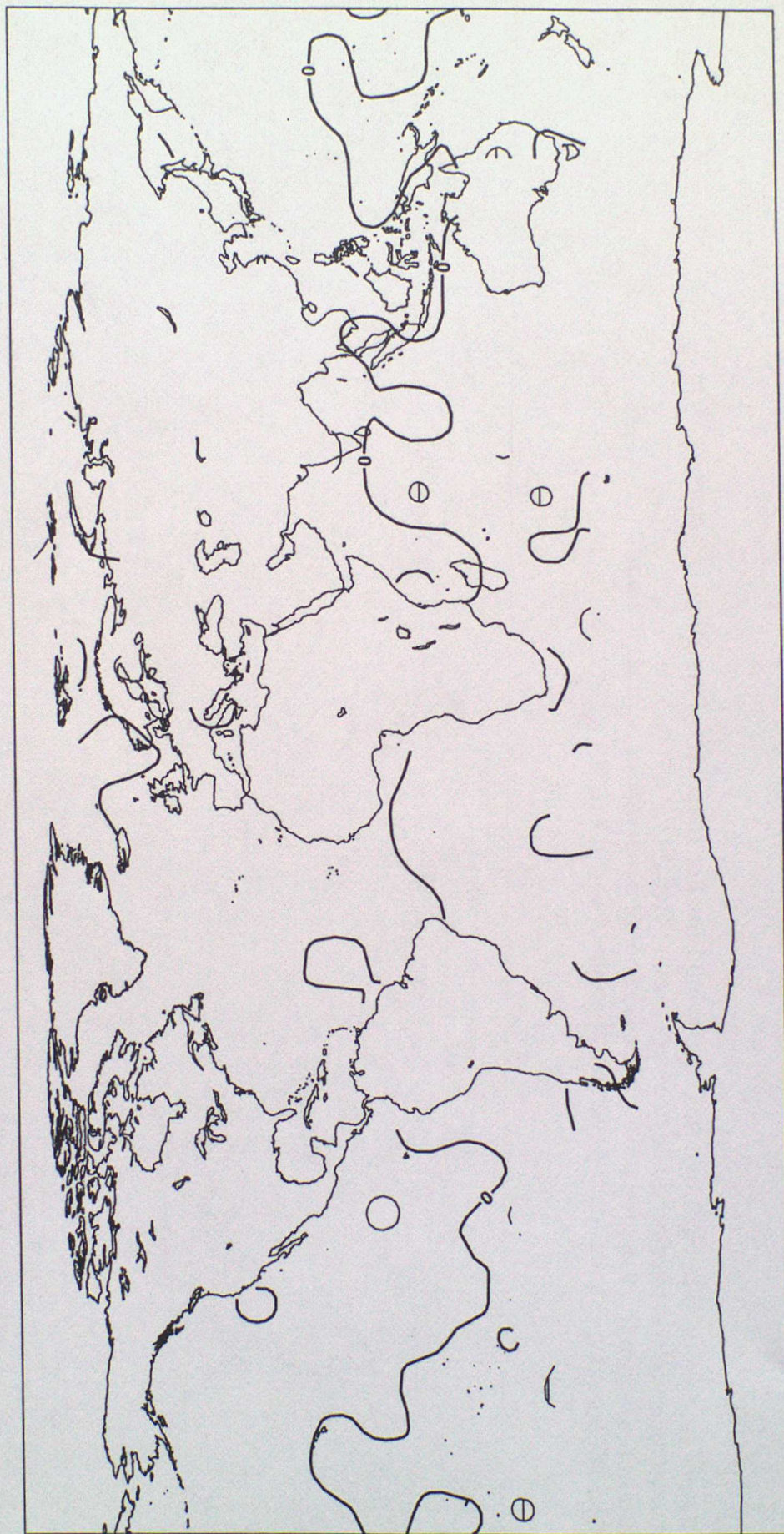




Figure 10: Standard Deviation of Ship O-B Wind Direction (degrees). Date:- July - December 2005  
Only Observations passing quality control used in statistics  
Contours drawn to 10 degree boxes, if the number of observations is greater than 10  
Shaded areas have a standard deviation of greater than 40 degrees

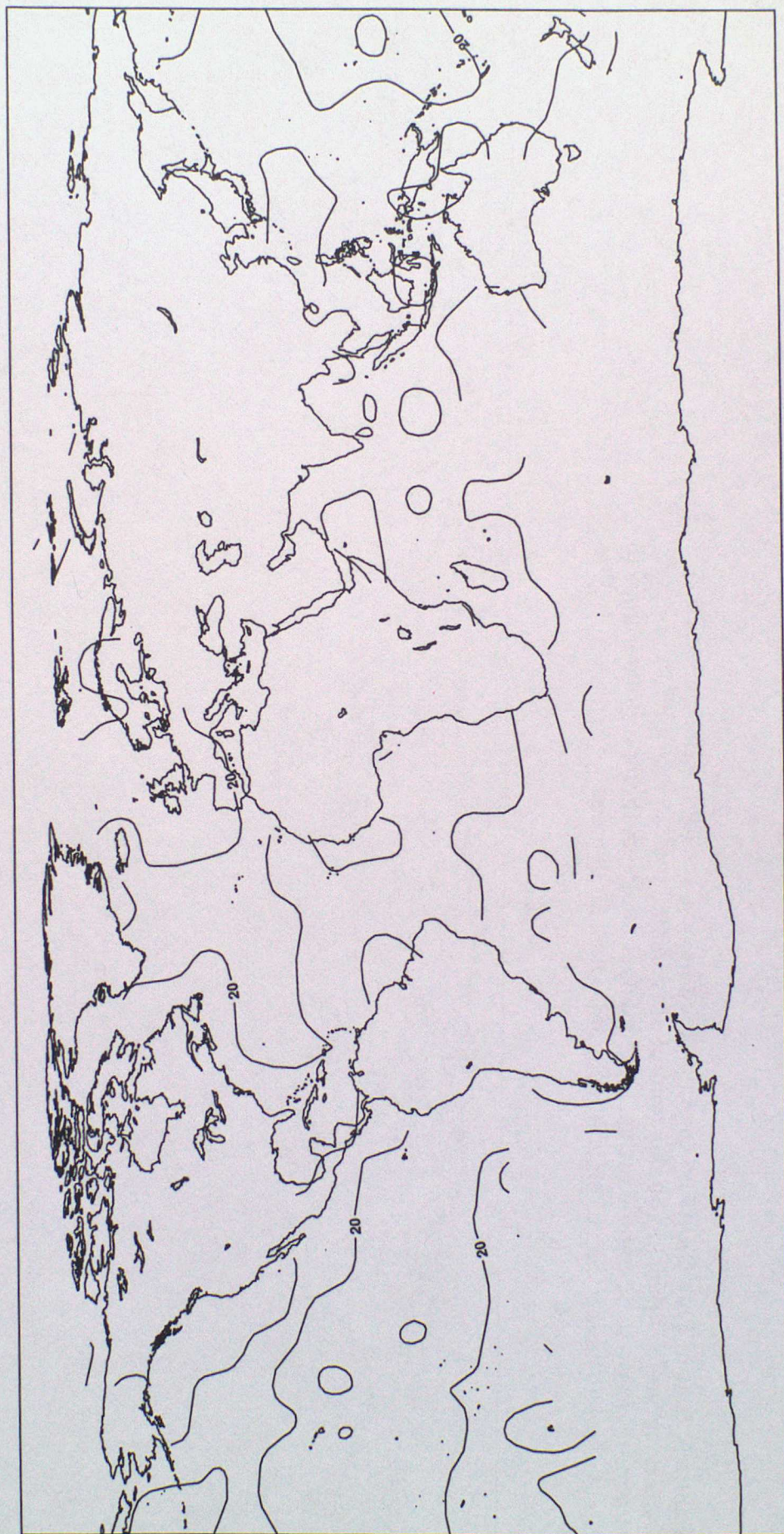




Figure 11:  
 Plot of the Number of Ship Wind Direction Observations. Date:- July - December 2005  
 Only observations passing quality control included

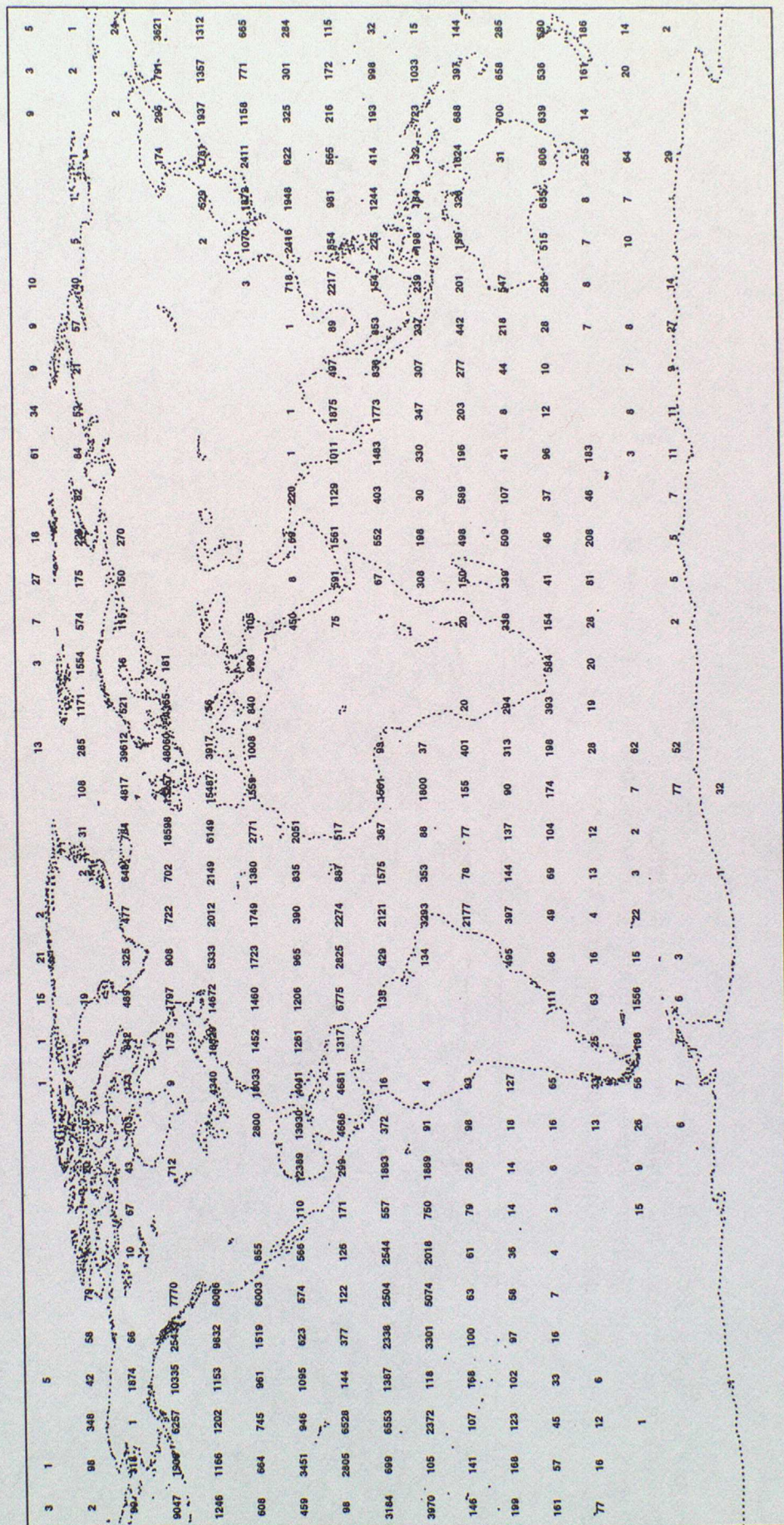




Figure 12: Bias of Ship O-B SST (degrees C). Date:- July - December 2005  
Only observations passing quality control used in statistics  
Contours drawn to 10 degree boxes, if the number of observations is greater than 10  
Shaded areas have a bias of magnitude greater than 1.0 degree C





Figure 13: Standard Deviation of Ship O-B SST (degrees C). Date:- July - December 2005  
Only Observations passing quality control used in statistics  
Contours drawn to 10 degree boxes, if the number of observations is greater than 10  
Shaded areas have a standard deviation of greater than 3.0 degrees C

