

National Climatic Data Center

DATA DOCUMENTATION

FOR

DATA SET 9973 (DSI-9973)

Pre-MOPS Marine Data (Raw)

August, 13 2003

National Climatic Data Center
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Asheville, NC 28801-5001 USA

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1. **Abstract:** The National Climatic Data Center (NCDC) data base file name is Marine Data. It is also referred to as Surface Marine Data, TD-11 (Tape Deck) and TDF-11 (Tape Deck Family). In the late 1960's marine data stored on punched cards were written to magnetic tape in various TD-11 formats. An edited version of these data were used to produce marine atlases and are generally referred to as Atlas tapes (TD-9760) or pre-70's data. In 1980 and 1982 all available marine data for the 1970's decade were merged in a standard format and known errors were removed. The first merge (1980) was referred to as the 70's rehab or TD-1127. Data were stored in a 140 character common format. The 1982 merge was completed to add additional data for the 70's period, correct other errors in the data and provide a format that would accommodate the 1982 international code changes. These 1970's data are referred to as 70's Decade data or TD-1129. They are in a 148 character format that is also used in current processing.

From 1983-85 a joint project was undertaken to collect all available marine data sets of reasonable quality and combine them into one data base. Members of the joint project included NCDC, Environmental Research Laboratory (ERL), National Center for Atmospheric Research (NCAR) and Cooperative Institute for Research in Environmental Sciences (CIRES). The latter three participants are located in Boulder, Colorado and are referred to collectively as the Boulder Group in this document. The Boulder Group has produced several data files and statistical summaries for the period 1954-1969. The set of products is known as the Comprehensive Ocean-Atmosphere Data Set (COADS).

One of the COADS products is a unique set of marine observations in 1129 format for 1970-79 and in a modified 1129 format for 1854-1969. Known data problems have been corrected and most duplicate observations removed. The set includes most NCDC marine data files, including the 70's Decade data, and data from other sources. The modified format for pre-70's data contains supplemental and additional; data fields determined by source deck number.

The marine reports provided by the Boulder Group in 1129 format are referred to at NCDC as COADS data. All other products available from NCAR such as statistical summaries and long or compressed marine reports are excluded from the meaning of the term COADS as used in this manual.

The period of record of the current data base includes the years 1854 through the present. Data received at NCDC after 1982 are in 1129 format regardless of data year. Users requesting marine data from NCDC will receive 1129 formatted data for 1970 through the present year. The COADS data will be provided for 1970-79 unless the user specifies a different set. Pre-1970's data will be provided from the COADS set in modified 1129 format. The modified 1129 format is the same as 1129 for tape positions 1-78 and 125-140. Tape positions 79-124 and 141-148 contain supplemental data fields which are unique for each deck number. Documentation for the period pre-1970 marine data is available in the Marine Data Users Reference, 1854-1969.

The marine observations are generally taken at synoptic hours, 6-hourly intervals. Research vessel, buoys, and C-MAN station frequently record observations more frequently, usually 3-hourly or hourly.

Marine data are routinely processed on a monthly schedule. In one month data are received for the current data month as well as for previous months and years. Separate tapes of the current month data and delayed data are produced. Each month, current and delayed files are merged into two separate files, one

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containing the current year data and the other containing delayed data. Once each year, an annual file is produced that contains data for the current year. The annual file, delayed data files and duplicate data files are sent to the Environmental Research Lab (ERL), Boulder, Colorado to support the COADS project. The ERL produces 5-year duplicate free merges that contain the delayed data and returns this set to NCDC for entry into the archive.

2. Element Names and Definitions: Originally, marine data were received or stored on computer cards. Each card deck was assigned a number to define the data source. Source deck numbers were retained when storage media changed and have been used to indicate general data quality. The TD-1100 Reference Manual describes data formats according to source deck number.

Decks with beginning dates of 1970 may be valid for years prior to 1970.

Source	Source Deck	Period of Record
Pacific Marine Environmental Lab (PMEL)	143	01/75 - 12/77
USSR Ice Island Observations	186	01/70 - 12/70
Gulf Offshore Weather Observing Network	500	01/82 - 12/82
Monterey-Fleet Numerical oceanography Center	555	01/70 - 6/73
Tuna Boats	666	3/71 - 5/75
First GARP Global Experiment (FGGE)	849-850	12/78 - 11/79
NOAA Data Buoy Center (NDBC)*		
Drifting Buoys	875	11/84 -
Fixed Buoys	876-882	01/70 -
C-MAN	882	03/83 -
Global Telecommunications		
Global Weather Central (AFGWC)	888	01/73 - 12/81
AUTODIN (US Navy Ships)	889	01/73
National Meteorological Center (NMC):		
NMC Ship Data	892	01/80
NMC Fixed Buoy Data	893	01/80
NMC Drifting Buoy Data	894	01/80
NMC Coastal Marine Stations, Other Land Stations and Light Ships	895	01/80
NMC OSV, MARS and Other Sources	896	01/80
National Oceanographic Data Center (NODC)	891	01/70 - 06/77
Japanese	898 (119)	01/70 - 04/74
Australian	900	01/70 - 12/79
WMO Foreign Exchange Data (IMM)	926-927	01/70
Great Lakes Manuscript	927	01/70
US Merchant Manuscript	927	01/70
US Navy Manuscript	927	01/70 - 12/79
Ocean Station Vessel (OSV)	928 (926)	01/70 - 12/79

Beginning in 1980, WMO foreign exchange data were assigned source deck 926, regardless of data year. Some OSV data have also been assigned to deck 926.

* Complete records of NDBC data are stored in TD-1171. Observation from fixed and drifting buoys and C-MAN stations are available at lower time resolution (generally 3 hourly) in the 1129 file from NMC or after COADS updates.

Standard Format Codes 1129

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Table 2 gives the standard 1129 format and element description for marine data archived for 1970 through the present time. Formats for data prior to 1970 are given in the TD-11 Reference Manual for the Atlas data or in the Marine Data Users Reference, 1854-1969.

TABLE 2
STANDARD CODE FORMATS

Record Positions	Element	Tape Configuration	Code Definition and Remarks																																												
01-03	Source deck no.	000-999	Number of the source deck from which the observation came.																																												
04-06	Mardsen Sq.	001-936,999	Mardsen Square system																																												
07-08	Mardsen Sub-Sq.	00-99	Mardsen Square system																																												
09	Quadrant	1-4	1 = n Latitude and W Longitude 2 = n Latitude and E Longitude 3 = S Latitude and W Longitude 4 = S Latitude and E Longitude																																												
10-12	Latitude	000-900	00.0° - 90.0° North or South																																												
13-16	Longitude	0000-1800	000.0° - 180.0° East or West																																												
17-20	Year	19xx	xx = Any number																																												
21-22	Month	01-12	01 = January 07 = July 02 = February 08 = August 03 = March 09 = September 04 = April 10 = October 05 = May 11 = November 06 = June 12 = December																																												
23-24	Day	01-31	Day of the month																																												
25-26	Hour - GMT	00-23	0000 GMT - 2300 GMT																																												
27	Wind Dir indicator	b,0,1,2	b = 36 point scale 0 = 32 point scale 1 = 16 of 36 point scale 2 = 16 of 32 point scale																																												
28-29	Wind direction	00-36,99	Direction from which the wind is blowing <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>36Pt</th> <th>32Pt</th> <th>16 of 36Pt</th> <th>16 of 32Pt</th> </tr> </thead> <tbody> <tr> <td>00=Calm</td> <td>Calm</td> <td>Calm</td> <td>Calm</td> </tr> <tr> <td>01=005-014°</td> <td>006-016°</td> <td></td> <td></td> </tr> <tr> <td>02=015-024°</td> <td>017-028°</td> <td>012-033°</td> <td>012-034</td> </tr> <tr> <td>03=025-034°</td> <td>029-039°</td> <td></td> <td></td> </tr> <tr> <td>04=035-044°</td> <td>040-050°</td> <td></td> <td>035-056°</td> </tr> <tr> <td>05=045-054°</td> <td>051-061°</td> <td>034-056°</td> <td></td> </tr> <tr> <td>06=055-64°</td> <td>062-073°</td> <td></td> <td>057-079°</td> </tr> <tr> <td>07=065-074°</td> <td>074-084°</td> <td>057-078°</td> <td></td> </tr> <tr> <td>08=075-084°</td> <td>085-095°</td> <td></td> <td>080-101°</td> </tr> <tr> <td>09=085-094°</td> <td>096-</td> <td>079-</td> <td></td> </tr> </tbody> </table>	36Pt	32Pt	16 of 36Pt	16 of 32Pt	00=Calm	Calm	Calm	Calm	01=005-014°	006-016°			02=015-024°	017-028°	012-033°	012-034	03=025-034°	029-039°			04=035-044°	040-050°		035-056°	05=045-054°	051-061°	034-056°		06=055-64°	062-073°		057-079°	07=065-074°	074-084°	057-078°		08=075-084°	085-095°		080-101°	09=085-094°	096-	079-	
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				106°	101°	
			10=095-104°	107-118°		102-124°
			11=105-114°	119-129°	102-123°	
			12=115-124°	130-140°		125-136°
			13=125-134°	141-151°		
			14=135-144°	152-163°	124-146°	147-169°
			15=145-154°	164-174°		
			16=155-164°	175-185°	147-168°	170-191°
			17=165-174°	186-196°		
			18=175-184°	197-208°	169-191°	192-214°
			19=185-194°	209-219°		
			20=195-204°	220-230°	192-213°	215-236°
			21=205-214°	231-241		
			22=215-224°	242-253°		237-259°
			23=225-234°	254-254°	214-236°	
			24=235-244°	265-275°	237-258°	
			25=245-254°	276-286°	237-258°	
			26=255-264°	287-298°		282-304°
			27=265-274°	299-309°	259-281°	
			28=275-284°	310-320°		305-326°
			29=285-294°	321-331°	282-303°	
			30=295-304°	332-343°		327-349°
			31=305-314°	344-354°		
			32=315-324°	355-005°	304-326°	350-011°
			33=325-334°			
			34=335-344°		327-348°	
			35=345-354°			
			36=355-004°		349-011°	
			99=Variable			
30	Wind speed	b,0	b = Not measured			

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	indicator		0 = Measured
31-33	Wind speed	000-199	000 = Clam 001-199 = 1 to 199 knots
34	Visibility indicator	90-99	Horizontal visibility at the surface in kilometers 90 = <0.05 91 = 0.05 92 = 0.2 93 = 0.5 Note: When visibility indicator = 1, and visibility = 93, it means that fog was present and visibility was not reported. 94 = 1 95 = 2 96 = 4 97 = 10 98 = 20 99 = 50 or more
37-38	Present weather	00-99	00 = Cloud development not observed 01 = Clouds generally dissolving or becoming less developed 02 = State of the sky unchanged 03 = Clouds generally forming or developing 04 = Visibility reduced haze 05 = Haze 06 = Widespread dust in suspension in the air, not raised by wind, at or near the station at the time of observation. 07 = Dust or sand raised by wind at or near the station at the time of observation, but no well developed dust whirls or sand whirls and no duststorm or sandstorm seen. 08 = Well developed dust swirls or sand whirls seen at or near the station during the preceding hour or at the time of observation, but no duststorm or sandstorm 09 = Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour. 10 = Light fog (visibility 1,100 yards or more). Synonymous with European term "Mist" 11 = Patches of shallow fog or ice fog at the station, not deeper than about 10 meters. 12 = More or less continuous shallow fog or ice fog at the station, not deeper than about 10 meters. 13 = Lightning visible, no thunder heard. 14 = Precipitation within sight, not reaching the surface of the

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			<p>sea.</p> <p>15 = Precipitation within sight, reaching the surface of the sea, but more than 5 km from the ship.</p> <p>16 = Precipitation within sight, reaching the surface of the sea, near to, but not at the ship.</p> <p>17 = Thunderstorm, but no precipitation at the time of observation.</p> <p>18 = Squalls at or within sight of the ship during the preceding hour or at the time of observation.</p> <p>19 = Funnel cloud or Waterspout at or within sight of the ship during the preceding hour or at the time of observation.</p> <p>The following phenomena occurred at the ship during the preceding hour but not at the time of observation.</p> <p>20 = Drizzle (not freezing) or snow grains.</p> <p>21 = Rain (not freezing)</p> <p>22 = Snow</p> <p>23 = Rain and snow or ice pellets, type (a)</p> <p>24 = Freezing drizzle or freezing rain.</p> <p>25 = Shower(s) of rain</p> <p>26 = Showers of snow or of rain and snow.</p> <p>27 = Shower(s) of hail (ice pellets, type (b), snow pellets), or of rain and hail (ice pellets, type (b), snow pellets).</p> <p>28 = Fog or ice fog.</p> <p>29 = Thunderstorms (with or without precipitation)</p> <p>Present weather codes 30-99 refer to phenomena occurring at the ship at time of observation.</p> <p>30 = Slight or moderate duststorm or sandstorm or sandstorm has decreased during the preceding hour.</p> <p>31 = Slight or moderate duststorm or sandstorm, no appreciable change during the preceding hour.</p> <p>32 = Slight or moderate duststorm or sandstorm has begun or has increased during the preceding hour.</p>
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			<p>33 = Severe duststorm or sandstorm has decreased during the preceding hour.</p> <p>34 = Severe duststorm or sandstorm, no appreciable change during the preceding hour.</p> <p>35 = Severe duststorm or sandstorm has begun or has increased during the preceding hour.</p> <p>36 = Slight or moderate drifting snow generally low (below eye level) less than 6 feet.</p> <p>37 = Heavy drifting snow (below eye level) less than 6 feet.</p> <p>38 = Slight or moderate blowing snow generally high (above eye level) 6 feet or more.</p> <p>39 = Heavy blowing snow generally high (above eye level) 6 feet or more.</p> <p>40 = Fog or ice fog at a distance at the time of observation, but not at the ship during the preceding hour, the fog or ice fog extending to a level above that of the observer.</p> <p>41 = Fog or ice fog in patches</p> <p>42 = Fog or ice fog, sky visible has become thinner during the preceding hour.</p> <p>43 = Fog or ice fog, sky invisible has become thinner during the preceding hour.</p> <p>44 = Fog or ice fog, sky visible no appreciable change during the preceding hour.</p> <p>45 = Fog or ice fog, sky invisible no appreciable change during the preceding hour.</p> <p>46 = Fog or ice fog, sky visible has begun or become thicker during the preceding hour.</p> <p>47 = Fog or ice fog, sky invisible has begun or become thicker during the preceding hour.</p> <p>48 = Fog, depositing rime, sky visible.</p> <p>49 = Fog, depositing rime, sky invisible.</p> <p>50 = Drizzle, not freezing, intermittent slight at time of observation.</p> <p>51 = Drizzle, not freezing, continuous slight at time of observation.</p> <p>52 = Drizzle, not freezing, intermittent moderate at time of</p>
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			<p>observation.</p> <p>53 = Drizzle, not freezing, continuous moderate at time of observation.</p> <p>54 = Drizzle, not freezing, intermittent heavy (dense) at time of observation.</p> <p>55 = Drizzle, not freezing, continuous heavy (dense) at time of observation.</p> <p>56 = Drizzle, freezing, slight.</p> <p>57 = Drizzle, freezing, moderate or heavy (dense).</p> <p>58 = Drizzle and rain, slight.</p> <p>59 = Drizzle and rain, moderate or heavy.</p> <p>60 = Rain, not freezing, intermittent, slight at time of observation.</p> <p>61 = Rain, not freezing, continuous, slight at time of observation.</p> <p>62 = Rain, not freezing, intermittent, moderate at time of observation.</p> <p>63 = Rain, not freezing, continuous, moderate at time of observation.</p> <p>64 = Rain, not freezing, intermittent, heavy at time of observation.</p> <p>65 = Rain, not freezing, continuous, heavy at time of observation.</p> <p>66 = Rain, freezing, slight.</p> <p>67 = Rain, freezing, moderate or heavy.</p> <p>68 = Rain or drizzle and snow, slight.</p> <p>69 = Rain or drizzle and snow, moderate or heavy.</p> <p>70 = Intermittent fall of snowflakes.</p> <p>71 = Continuous fall of snowflakes slight at time of observation.</p> <p>72 = Intermittent fall of snowflakes moderate at time of observation.</p> <p>73 = Continuous fall of snowflakes moderate at time of observation.</p> <p>74 = Intermittent fall of snowflakes heavy at time of observation.</p> <p>75 = Continuous fall of snowflakes heavy at time of observation.</p> <p>76 = Ice prisms (with or without fog).</p>
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			<p>77 = Snow grains (with or without fog).</p> <p>78 = Isolated star like snow crystals (with or without fog).</p> <p>79 = Ice pellets, type (a) (sleet, US definition)</p> <p>80 = Rain shower(s), slight.</p> <p>81 = Rain shower(s) moderate or heavy.</p> <p>82 = Rain shower(s), violent.</p> <p>83 = Shower(s) of rain and snow mixed, slight.</p> <p>84 = Shower(s) or rain and snow mixed, moderate or heavy.</p> <p>85 = Snow shower(s), slight.</p> <p>86 = Snow shower(s), moderate or heavy.</p> <p>87 = Slight showers of snow pellets or ice pellets, type (b), with or without rain or rain and snow mixed.</p> <p>88 = Moderate or heavy showers of snow pellets or ice pellets (b), with or without rain or rain and snow mixed.</p> <p>89 = Slight showers of hail with or without rain or rain and snow mixed, not associated with thunder.</p> <p>90 = Moderate or heavy showers of hail, with or without rain or rain and snow, slight mixed, not associated with thunder.</p> <p>91 = Slight rain at time of observation, thunderstorm during preceding hour but not at observation.</p> <p>92 = Moderate or heavy rain at time of observation, thunderstorm during preceding hour but not at observation.</p> <p>93 = Slight snow, or rain and snow mixed or hail, at time of observation with thunderstorm during the preceding hour but not at time of observation.</p> <p>94 = Moderate or heavy snow, or rain and snow mixed, or hail, at time of observation with thunderstorm during the preceding hour but not at time of observation.</p> <p>95 = Thunderstorm, slight or moderate, without hail, but with rain and/or snow at time of observation.</p> <p>96 = Thunderstorm, slight or moderate, with hail at time of</p>
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			<p>observation. 97 = Thunderstorm, heavy, without hail but with rain and/or snow at time of observation. 98 = Thunderstorm combined with duststorm or sandstorm at time of observation. 99 = Thunderstorm, heavy, with hail at time of observation.</p>
39	Past weather	0-9	<p>0 = Cloud covering $\frac{1}{2}$ or less of the sky throughout the appropriate period. 1 = Cloud covering more than $\frac{1}{2}$ of the sky during part of the appropriate period and covering $\frac{1}{2}$ or less during part of the period. 2 = Cloud covering more than $\frac{1}{2}$ of the sky throughout the appropriate period. 3 = Sandstorm, duststorm or blowing snow. 4 = Fog or ice fog or thick haze (US includes thick smoke). 5 = Drizzle 6 = Rain 7 = Snow, or rain and snow mixed. 8 = Shower 9 = thunderstorm with or without precipitation.</p>
40-44	Sea level pressure	08900-10700	890.0-1070.0 millibars
45	Temps indicator	b,1,3,5	<p>Accuracy of original temperature value:</p> <p>b = Unknown 1 = tenths of degrees Celsius 3 = whole degrees Celsius 5 = half degrees Celsius</p> <p>Original temperature values in Fahrenheit are converted to tenths of degrees Celsius and assigned a code value of 1.</p>
46-49	Air temperature	±000-±999	±00.0-±99.9°C (always recorded to tenths). The first position in the field is the sign. Dew-point temperature is generally reported in whole degrees. A zero in recorded in the tenths position when dew-points are reported in whole degrees.
62	Total cloud amt. (N)	0-9	<p>Fraction of celestial dome covered by all clouds.</p> <p>0 = Clear 1 = 1 Okta or less, but not zero.</p>

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			2-8 = 2-8 Oktas 9 = Sky obscured or cloud amount cannot be estimated.
63	Lower cloud amt. (Nh)	0-9	Fraction of celestial dome covered by all the Cl clouds and, if no Cl cloud is present, that fraction covered by all the Cm clouds present. See codes for Total Cloud Amt. (N).
64	Low cloud type (Cl)	0-9, -	0 = No Stratocumulus, Stratus, Cumulus or Cumulonimbus. 1 = Cumulus with little vertical extent and seemingly flattened, or ragged Cumulus other than of bad weather, or both. 2 = Cumulus of moderate or strong vertical extent, generally with protuberances in the form of domes or towers, either accompanied or not by other Cumulus or by Stratocumulus, all having their base at the same level. 3 = Cumulonimbus, the summits of which, at least partially, lack sharp outlines but are neither clearly fibrous (cirriform) nor in the form of an anvil; Cumulus, stratocumulus or Stratus may also be present. 4 = Stratocumulus formed by the spreading out of Cumulus; Cumulus may also be present. 5 = Stratocumulus not resulting from the spreading out of Cumulus. 6 = Stratus in a more or less continuous sheet or layer, or in ragged shreds, or both, but no Stratus fractus of bad weather. 7 = Stratus fractus of bad weather (generally existing during precipitation and a short time before and after) or Cumulus fractus of bad weather, or both (pannus), usually below Altostratus or Nimbostratus. 8 = Cumulus and Stratocumulus other than that formed from the spreading out of Cumulus; the base of the Cumulus is at a different level from that of the Stratocumulus. 9 = Cumulonimbus, the upper part of which is clearly fibrous (cirroform), often in the form of an anvil; either accompanied or not by Cumulonimbus without anvil or fibrous upper part by Cumulus, Stratocumulus, Stratus or pannus.

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			- = Stratocumulus, Stratus, Cumulus and Cumulonimbus invisible owing to darkness, fog, blowing dist or sand, or other similar phenomena.																								
65	Cloud height indicator	b, 0	b = height not measured 0 = height measured																								
66	Cloud height (h)	0-9, -	<p>Height above sea surface of the base of the lowest cloud or fragment thereof.</p> <table border="1"> <thead> <tr> <th>Approximate Height in Feet</th> <th>Height in Meters</th> </tr> </thead> <tbody> <tr> <td>0 = 0-149</td> <td>0-49</td> </tr> <tr> <td>1 = 150-299</td> <td>50-99</td> </tr> <tr> <td>2 = 300-599</td> <td>100-199</td> </tr> <tr> <td>3 = 600-999</td> <td>200-299</td> </tr> <tr> <td>4 = 1000-1999</td> <td>300-599</td> </tr> <tr> <td>5 = 2000-3499</td> <td>600-999</td> </tr> <tr> <td>6 = 3500-4999</td> <td>1000-1499</td> </tr> <tr> <td>7 = 5000-6499</td> <td>1500-1999</td> </tr> <tr> <td>8 = 6500-7999</td> <td>2000-2499</td> </tr> <tr> <td>9 = >8000 or no clouds</td> <td>>2500 or no clouds</td> </tr> <tr> <td>- = missing</td> <td></td> </tr> </tbody> </table>	Approximate Height in Feet	Height in Meters	0 = 0-149	0-49	1 = 150-299	50-99	2 = 300-599	100-199	3 = 600-999	200-299	4 = 1000-1999	300-599	5 = 2000-3499	600-999	6 = 3500-4999	1000-1499	7 = 5000-6499	1500-1999	8 = 6500-7999	2000-2499	9 = >8000 or no clouds	>2500 or no clouds	- = missing	
Approximate Height in Feet	Height in Meters																										
0 = 0-149	0-49																										
1 = 150-299	50-99																										
2 = 300-599	100-199																										
3 = 600-999	200-299																										
4 = 1000-1999	300-599																										
5 = 2000-3499	600-999																										
6 = 3500-4999	1000-1499																										
7 = 5000-6499	1500-1999																										
8 = 6500-7999	2000-2499																										
9 = >8000 or no clouds	>2500 or no clouds																										
- = missing																											
67	Mid cloud type (Cm)	0-9, -	<p>0 = No altostratus, Altostratus or Nimbostratus.</p> <p>1 = Altostratus, the greater part of which is semi-transparent; though this part of the sun or moon may be weakly visible, as through ground glass.</p> <p>2 = Altostratus, the greater part of which is sufficiently dense to hide the sun or moon, or nimbostratus.</p> <p>3 = Altocumulus, the greater part of which is semi-transparent; the various elements of the cloud change only slowly and are all at a single level.</p> <p>4 = Patched (often in the form of almonds or fishes) of Altocumulus, the greater part of which is semi-transparent; the clouds occur at one or more levels and the elements are continually changing in appearance.</p> <p>5 = Semi-transparent Altocumulus in bands, or Altocumulus in one or more fairly continuous layers (semi-transparent or opaque), progressively invading sky, these Altocumulus clouds generally thicken as a whole.</p> <p>6 = Altocumulus resulting from the spreading out of Cumulus (or</p>																								

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			<p>Cumulonimbus).</p> <p>7 = Altocumulus in two or more layers, usually opaque in places, and not progressively invading the sky; or opaque layer of Altocumulus, not progressively invading the sky; or Altocumulus together with Altostratus or Nimbostratus.</p> <p>8 = Altocumulus with sproutings in the form of small towers or battlements; or Altocumulus having the appearance of cumuliform tufts.</p> <p>9 = Altocumulus of a chaotic sky, generally at several levels.</p> <p>- = Altocumulus, Altostratus and Nimbostratus invisible owing to darkness, fog, blowing dust or sand or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds.</p>
68	High cloud type (Ch)	0-9,-	<p>0 = No Cirrus, Cirrocumulus or Cirrostratus.</p> <p>1 = Cirrus in the form of filaments, strands or hooks, not progressively invading the sky.</p> <p>2 = Dense Cirrus, in patches or entangled sheaves, which usually do not increase and sometimes seem to be the remains of the upper part of a Cumulonimbus; or Cirrus with sproutings in the form of small turrets or battlements, or Cirrus having the appearance of cumuliform tufts.</p> <p>3 = Dense Cirrus, often in the form of an anvil, being the remains of the upper parts of Cumulonimbus.</p> <p>4 = Cirrus in the form of hooks or of filaments, or both, progressively invading the sky; they generally become denser as a whole.</p> <p>5 = Cirrus (often in bands converging towards one point or two opposite points of the horizon) and Cirrostratus, or Cirrostratus alone; in either case, they are progressively invading the sky, and generally growing denser as a whole; the continuous veil extends more than 45 degrees above the horizon, without the sky being totally covered.</p> <p>7 = Veil of Cirrostratus covering the celestial dome.</p> <p>8 = Cirrostratus not progressively</p>

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			invading the sky and not completely covering the celestial dome. 9 = Cirrocumulus alone, or Cirrocumulus accompanied by cirrus or both, but Cirrocumulus is predominate. Cirrostratus, invisible owing to darkness, fog, blowing dust or sand or other similar phenomena, or more often because of the presence of a continuous layer of lower clouds. - = Cirrus, Cirrocumulus and Cirrostratus.																																						
69-70	Direction of waves	00-36, 49, 99	<p>Direction from which waves come, in tens of degrees.</p> <table border="1"> <tr> <td>00 = Calm</td> <td>19 = 185-194°</td> </tr> <tr> <td>01 = 005-014°</td> <td>20 = 195-204°</td> </tr> <tr> <td>02 = 015-024°</td> <td>21 = 205-214°</td> </tr> <tr> <td>03 = 025-034°</td> <td>22 = 215-224°</td> </tr> <tr> <td>04 = 035-044°</td> <td>23 = 225-234°</td> </tr> <tr> <td>05 = 045-054°</td> <td>24 = 235-244°</td> </tr> <tr> <td>06 = 055-064°</td> <td>25 = 245-254°</td> </tr> <tr> <td>07 = 065-074°</td> <td>26 = 255-264°</td> </tr> <tr> <td>08 = 075-084°</td> <td>27 = 265-274°</td> </tr> <tr> <td>09 = 085-094°</td> <td>28 = 275-284°</td> </tr> <tr> <td>10 = 095-104°</td> <td>29 = 285-294°</td> </tr> <tr> <td>11 = 105-114°</td> <td>30 = 295-304°</td> </tr> <tr> <td>12 = 115-124°</td> <td>31 = 305-314°</td> </tr> <tr> <td>13 = 125-134°</td> <td>32 = 315-324°</td> </tr> <tr> <td>14 = 135-144°</td> <td>33 = 325-334°</td> </tr> <tr> <td>15 = 145-154°</td> <td>34 = 335-344°</td> </tr> <tr> <td>16 = 155-164°</td> <td>35 = 345-354°</td> </tr> <tr> <td>17 = 165-174°</td> <td>36 = 355-004°</td> </tr> <tr> <td>18 = 175-184°</td> <td></td> </tr> </table>	00 = Calm	19 = 185-194°	01 = 005-014°	20 = 195-204°	02 = 015-024°	21 = 205-214°	03 = 025-034°	22 = 215-224°	04 = 035-044°	23 = 225-234°	05 = 045-054°	24 = 235-244°	06 = 055-064°	25 = 245-254°	07 = 065-074°	26 = 255-264°	08 = 075-084°	27 = 265-274°	09 = 085-094°	28 = 275-284°	10 = 095-104°	29 = 285-294°	11 = 105-114°	30 = 295-304°	12 = 115-124°	31 = 305-314°	13 = 125-134°	32 = 315-324°	14 = 135-144°	33 = 325-334°	15 = 145-154°	34 = 335-344°	16 = 155-164°	35 = 345-354°	17 = 165-174°	36 = 355-004°	18 = 175-184°	
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			<p>49 = Waves confused, direction indeterminate (waves equal to or less than 4 ¾ meters).</p> <p>99 = Waves confused, direction indeterminate (waves greater than 4 ¾ meters).</p> <p>For buoy data this field is average wave direction.</p>								
71	Period of waves	0-9, -	<p>2 = 5 seconds or less 3 = 6-7 seconds 4 = 8-9 seconds 5 = 10-11 seconds 6 = 12-13 seconds 7 = 14-15 seconds 8 = 16-17 seconds 9 = 18-19 seconds 0 = 20-21 seconds 1 = over 21 seconds - = calm or period not determined</p> <p>For buoy data this field is average wave period.</p>								
72-73	Height of waves	00-99	<p>Height in ½ meter increments 00 = < ¼ meter 01-99 = ½ - 49 ½ meters</p> <p>For Buoy data this field is significant wave height.</p>								
74-75	Direction of swell	00-36, 49, 99	Same as Direction of waves								
76	Period of swell	0-9, -	<p>Same as Period of Waves prior to 1969. Beginning January 1, 1968, the code for Period of swell is:</p> <p>0 = 10 seconds 1 = 11 seconds 2 = 12 seconds 3 = 13 seconds 4 = 14 seconds 5 = 5 seconds or less 6 = 6 seconds 7 = 7 seconds 8 = 8 seconds 9 = 9 seconds - = calm or period not determined</p>								
77-78	Height of swell	00-99	Same as Height of waves								
79-80	Country code	Combinations of b, 0-40, and J-R	<table border="1"> <thead> <tr> <th>Recruiting Country</th> <th>Codes</th> </tr> </thead> <tbody> <tr> <td>Netherlands</td> <td>0b }b 00</td> </tr> <tr> <td>Norway</td> <td>0J }J 01</td> </tr> <tr> <td>USA</td> <td>0K }K</td> </tr> </tbody> </table>	Recruiting Country	Codes	Netherlands	0b }b 00	Norway	0J }J 01	USA	0K }K
Recruiting Country	Codes										
Netherlands	0b }b 00										
Norway	0J }J 01										
USA	0K }K										

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				02
			UK	0L }L 04
			France	0M }M 05
			Denmark	0N }N 06
			Italy	0P }P 07
			India	0P }P 08
			Hong Kong	0Q }Q 09
			New Zealand	0R }R 10
			Ireland	1b Jb 11
			Philippines	1J JJ 11
			Egypt	1K JK 12
			Canada	1L JL 13
			Belgium	1M JM 14
			South Africa	1N JN 15
			Australia	1O JO 16
			Japan	1P JP 17
			Pakistan	1Q JQ 18
			Argentina	1R JR 19
			Sweden	2b Kb 20
			Federal Rep. of Germany	2J KJ 21
			Iceland	2K KK 22
			Israel	2L KL 23
			Malaysia	2M KM 24
			USSR	2N KN 25
			Finland	2O KO 26
			Republic of Korea	2P KP 27
			New Caledonia	2Q KQ 28
			Portugal	2R KR 29

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			<table border="1"> <tr><td>Spain</td><td>3b Lb</td></tr> <tr><td></td><td>30</td></tr> <tr><td>Thailand</td><td>3J LJ</td></tr> <tr><td></td><td>31</td></tr> <tr><td>Yugoslavia</td><td>3K LK</td></tr> <tr><td></td><td>32</td></tr> <tr><td>Poland</td><td>3L LL</td></tr> <tr><td></td><td>33</td></tr> <tr><td>Brazil</td><td>3M LM</td></tr> <tr><td></td><td>34</td></tr> <tr><td>Singapore</td><td>3N LN</td></tr> <tr><td></td><td>35</td></tr> <tr><td>Kenya</td><td>3O LO</td></tr> <tr><td></td><td>36</td></tr> <tr><td>Tanzania</td><td>3P LP</td></tr> <tr><td></td><td>37</td></tr> <tr><td>Uganda</td><td>3Q LQ</td></tr> <tr><td></td><td>38</td></tr> <tr><td>Mexico</td><td>3R LR</td></tr> <tr><td></td><td>39</td></tr> <tr><td>German Democratic Republic</td><td>4b Mb</td></tr> <tr><td></td><td>40</td></tr> </table> <p>A right brace (}) may print as a blank on some printers. Country codes prior to 1982 may have an X overpunch (non-numeric character) in one or both record positions. An X overpunch in 79 indicates foreign receipt and in 80 indicates an auxiliary ship.</p>	Spain	3b Lb		30	Thailand	3J LJ		31	Yugoslavia	3K LK		32	Poland	3L LL		33	Brazil	3M LM		34	Singapore	3N LN		35	Kenya	3O LO		36	Tanzania	3P LP		37	Uganda	3Q LQ		38	Mexico	3R LR		39	German Democratic Republic	4b Mb		40
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	38																																														
Mexico	3R LR																																														
	39																																														
German Democratic Republic	4b Mb																																														
	40																																														
81	Ship direction	0-9	<p>Ship's course (true) made good during the 3 hours preceding the time of observation.</p> <p>0 = Ship hove to 5 = SW 1 = NE 6 = W 2 = E 7 = NW 3 = SE 8 = N 4 = S 9 = Unknown</p>																																												
82	Ship speed	0-9	<p>Ship's average speed made good during the 3 hours preceding the time of observation.</p> <p>Prior to 1968:</p> <p>0 = 0 Knots 5 = 21-25 Knots 1 = 1-3 Knots 6 = 16-18 Knots 2 = 4-6 Knots 7 = 31-35 Knots 3 = 7-9 Knots 8 = 22-24 Knots 4 = 16-20 Knots 9 = >24 Knots</p>																																												

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			<p style="text-align: center;">Beginning January 1, 1968:</p> 0 = 0 Knots 5 = 21-25 Knots 1 = 1-5 Knots 6 = 26-30 Knots 2 = 6-10 Knots 7 = 31-35 Knots 3 = 11-15 Knots 8 = 36-40 Knots 4 = 16-20 Knots 9 = >40 Knots
83	Barometric tendency	0-8	0 = Increasing, then decreasing; atmospheric pressure same or higher than 3 hours ago. 1 = Increasing, then steady; or increasing then increasing more slowly; atmospheric pressure now higher than 3 hours ago. 2 = Increasing (steadily or unsteadily) atmospheric pressure now higher than 3 hours ago. 3 = Decreasing or steady, then increasing; or increasing then increasing more rapidly; atmospheric pressure now higher than 3 hours ago. 4 = Steady; atmospheric pressure same as 3 hours ago. 5 = Decreasing, then increasing; atmospheric pressure the same or lower than 3 hours ago. 6 = Decreasing, then steady, or decreasing then decreasing more slowly; atmospheric pressure now lower than 3 hours ago. 7 = Decreasing (steadily or unsteadily) atmospheric pressure now lower than 3 hours ago. 8 = Steady or increasing, then decreasing; or decreasing then decreasing more rapidly; atmospheric pressure now lower than 3 hours ago.
84-86	Amount of pressure change	000-299	Amount of pressure change from 3 hours ago. (Tenths to millibars) 00.0-29.9 millibars
87	Type of ice accretion on ship	1-5	1 = Icing from ocean spray 2 = Icing from fog 3 = Icing from spray and fog 4 = Icing from rain 5 = Icing from spray and rain
88-89	Ice thickness on ship	00-99	Ice thickness in centimeters
90	Rate of ice accretion	0-4	0 = Ice not building up 1 = Ice building up slowly

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			<p>2 = Ice building up rapidly 3 = Ice melting or breaking up slowly 4 = Ice melting or breaking up rapidly</p>
91-97	<p>Ship, OSV, or Buoy call sign or number*</p> <p>*All call signs or numbers begin in tape position 91; i.e., the element is left-justified. In some cases, particularly for buoy numbers, the rightmost positions may be 0 or blank filled.</p>		<p>Identification of individual ship, Ocean Station Vessel, or buoy. Ship numbers can vary from 4 to 7 characters, consisting of mixed alphanumerics. OSV identification prior to July 1975 carried from 4YA to 4YZ. Then it changed from C7A to C7Z. Buoy numbers are 5 digit numerics.</p>
98	Original wind speed units indicator	b, 1, 2	<p>b = not reported 1 = knots 2 = meters per second</p>
99	Original temperature units indicator	b, 1-8	<p>b = not reported 1 = °C (Celsius) to tenths 2 = °F (Fahrenheit) to tenths 3 = Whole °C 4 = Whole °F 5 = Halves of °C 6 = Halves of °F 7 = °F to tenths, and dew point to whole °F 8 = °C to tenths, and dew point to whole °C</p>
100	Sea temperature method indicator	b, B, I 0-7	<p>b = Method unknown (Beginning in 1982) Prior to 1982 indicated intake or unknown I = Intake method B = Bucket method</p> <p>For internationally exchanged data (IMMT) beginning in 1982 and all data after September 1985.</p> <p>0 = Bucket thermometer 1 = Condenser inlet (intake) 2 = Trailing thermistor 3 = hull contact sensor 4 = through hull thermometer 5 = Radiation thermometer</p>

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			6 = Bait tanks thermometer 7 = Others 8 = Method unknown
101-102	Period of waves	00-99	Period of waves in seconds. Field 023 data is the same as Field 040, but in coded form.
103-104	Period of swell	00-99	Period of swell in seconds. Field 026 data is the same as field 041 but in coded form.
105	Description of ice type (Prior to 1982)	0-9	0 = No ice 1 = New ice 2 = Fast ice 3 = Pack or drift ice 4 = Packed slush 5 = Shore lead 6 = Heavy fast ice 7 = Heavy pack or drift ice 8 = Hummocked ice 9 = Icebergs
105	Concentration of ice (New code 1982)	0-9, -	0 = No sea ice in sight 1 = Ship in open lead more than 1.0 nautical mile wide, or ship in fast ice with boundary beyond limit of visibility. 2 = Sea ice present in concentrations less than 3/10 (3/8), open water or very open pack ice. 3 = 4/10 to 6/10 (3/8 to less than 6/8), open pack ice. 4 = 7/10 to 8/10 (6/8 to less than 7/8) close pack ice. 5 = 9/10 or more, but not 10/10 (7/8 to less than 8/8), very close pack ice. 6 = Strips and patches of pack ice with open water between. 7 = Strips and patches of close or very close pack ice with areas of lesser concentration between. 8 = Fast ice with open water, very open pack ice to seaward of the ice boundary. 9 = Fast ice with close or very close pack ice to seaward of the ice boundary. - = unable to report, because of darkness, lack of visibility, or because ship is more than 0.5 nautical mile away from ice edge.
106	Effect of the Ice on navigation (prior to 1982)	0-9	0 = Navigation unobstructed 1 = Navigation unobstructed for steamers, difficult for sail 2 = Navigation difficult for low powered steamers 3 = Navigation possible only for

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			powerful steamers 4 = Navigation possible only for ships reinforced against ice 5 = Navigation possible with assistance of ice breakers. 6 = Channel open in the solid ice. 7 = Navigation temporarily closed. 8 = Navigation closed 9 = Navigation conditions unknown (e.g., owing to bad weather).
106	Stage of ice development (new code 1982)	0-9, -	0 = New ice only (frazil ice, grease ice, slush, shuga) 1 = Nilas or ice rind, less than 10 cm thick. 2 = Young ice (grey ice, grey-white ice), 10-30 cm thick. 3 = Predominantly new and/or young ice with some new and/or young ice. 4 = Predominantly thin first-year ice with some new and/or young ice. 5 = All thin first-year ice (30-70 cm thick). 6 = Predominantly medium first-year ice (70-120 cm thick) and thick first-year ice (> 120 cm thick) with some thinner (younger) first-year ice. 7 = All medium and thick first-year ice. 8 = Predominantly medium and thick first-year ice with some old ice (usually more than 2 meters thick). 9 = Predominantly old ice. - = unable to report, because of darkness, lack of visibility or because only ice of land origin is visible or because ship is more than 0.5 nautical mile away from ice edge.
107	Bearing of principal ice edge from ship (prior to 1982)	0-9	0 = No ice edge can be stated 1 = Edge toward NE 2 = Edge toward E 3 = Edge toward SE 4 = Edge toward S 5 = Edge toward SW 6 = Edge toward W 7 = Edge toward NW 8 = Edge toward N 9 = Edge in several directions
107	Ice of land origin	0-9, -	0 = No ice of land origin 1 = 1-5 icebergs, no growlers or bergy bits 2 = 6-10 icebergs, no growlers or bergy bits 3 = 11-20 icebergs, no growlers or bergy bits 4 = Up to and including 10 growlers

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			<p>with bergy bits - no icebergs. 5 = More than 10 growlers and bergy bits - no icebergs 6 = 1-5 icebergs with growlers and bergy bits 7 = 6-10 icebergs with growlers and bergy bits 8 = 11-20 icebergs with growlers and bergy bits 9 = More than 20 icebergs with growlers and bergy bits - a major hazard to navigation - = Unable to report, because of darkness, lack of visibility or because only sea ice is visible.</p>
108	Distance to ice edge from ship	0-9	0 = up to 1 mile 1 = 1 to 2 mile 2 = 2 to 4 mile 3 = 4 to 6 mile 4 = 6 to 8 mile 5 = 8 to 12 mile 6 = 12 to 16 mile 7 = 16 20 mile 8 = more than 20 mile 9 = unspecified or no observations
108	Bearing of principal ice edge form ship (new code 1982)	0-9, -	0 = Ship in shore or flaw lead 1 = Principal ice edge towards NE 2 = Principal ice edge towards E 3 = Principal ice edge towards SE 4 = Principal ice edge towards S 5 = Principal ice edge towards SW 6 = Principal ice edge towards W 7 = Principal ice edge towards NW 8 = Principal ice edge towards N 9 = Not determined (ship on ice) - = unable to report, because of darkness, lack of visibility or because only ice of land origin is visible.
109	Orientation of ice edge (prior to 1982)	0-9	0 = Unknown-ship outside ice 1 = NE to SW, ice to the NW 2 = E to W, ice to the N 3 = SE to NW, ice to the NE 4 = S to N, ice to the E 5 = SW to NE, ice to the SE 6 = W to E, ice to the S 7 = NW to SE, ice to the SW 8 = N to S, ice to the W 9 = Unknown-ship inside ice
110-111	Amount of precipitation	00-99	Code figures 00-55 = the same precipitation amount in millimeters. For codes 56-90, subtract 50 and multiply answer by 10 to obtain amount in mm. (i.e., code 76 = (76-50) x 10 = 260 mm).

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			91 = 0.1 mm 92 = 0.2 mm 93 = 0.3 mm 94 = 0.4 mm 95 = 0.5 mm 96 = 0.6 mm 97 = A little precipitation, non-measurable 98 = More than 400 mm 99 = Measurement impossible
112-113	Time period for precipitation amount	00-38, 41-46, 49-94, 99	See WMO Manual No. 306, "Manual on Codes", Code Table 4080 for a complete translation of code figures to duration of precipitation amount for different observational periods.
114	Significant cloud amount	0-9	Amount of individual cloud layer or mass. 0 = Clear 1 = 1 Okta or less, but not zero 2-8 = 2-8 Oktas 9 = Sky obscured or cloud amount cannot be estimated
115	Significant cloud type	0-9, -	Cloud genus 0 = Cirrus 1 = Cirrocumulus 2 = Cirrostratus 3 = Alto cumulus 4 = Altostratus 5 = Nimbostratus 6 = Stratocumulus 7 = Stratus 8 = Cumulus 9 = Cumulonimbus - = Cloud not visible owing to darkness, fog, duststorms, sandstorm, or other analogous phenomena.
115-117	Significant cloud height	00-50 56-99	Height of the base of the cloud layer or mass whose genus was reported in Field 045. 00 = <30 meters 01-50 = 30-1,500 meters in increments of 30 meters 56-80 = 1,800-9,000 meters in increments of 300 meters 81-88 = 10,500-21,000 meters in increments of 1,500 meters 89 = > 21,000 meters 90 = < 50 meters 91 = 50-100 meters 92 = 100-200 meters 93 = 200-300 meters 94 = 300-600 meters

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			95 = 600-1,000 meters 96 = 1,000-1,500 meters 97 = 1,500-2,000 meters 98 = 2,000-2,500 meters 99 = >2,500 meters or no clouds										
118	Second most significant past weather	0-9	Same as past weather										
119-120	Second most significant swell direction	00-36, 49, 99	Same as direction of waves										
121-120	Second most significant swell period	00-99	Period of swell in seconds										
123-124	Second most significant swell height	00-99	Same as height of waves										
125-138	Quality control flags	A, B, J, K, L, M, N, Q, R, S	See appendix A.3 for an explanation of flags. 125 = Ship position 126 = Wind 127 = Visibility 128 = Present weather 129 = Past weather 130 = Pressure 131 = Dry bulb 132 = Wet bulb 133 = Dew point 134 = Sea temperature 135 = Clouds 136 = Waves 137 = Swell waves 138 = Amount of pressure tendency (ppp)										
139-140	Quality code (QC)	00-39	The following are the flagged values and their quality codes: <table border="1" data-bbox="857 1306 1403 1457"> <thead> <tr> <th>Flag</th> <th>Quality Code</th> </tr> </thead> <tbody> <tr> <td>R</td> <td>0</td> </tr> <tr> <td>A, B</td> <td>1</td> </tr> <tr> <td>J, K, L</td> <td>2</td> </tr> <tr> <td>M, N, Q, S</td> <td>3</td> </tr> </tbody> </table>	Flag	Quality Code	R	0	A, B	1	J, K, L	2	M, N, Q, S	3
Flag	Quality Code												
R	0												
A, B	1												
J, K, L	2												
M, N, Q, S	3												
141-144	QC date		QC date is the year and month the quality control program was run on the data. It serves to document changes and is for NCDC use only.										
145	IMMT wave measurement	0-9	0 = Wave and swell estimated 1 = Wave and swell measured (Wave Recorder) 2 = Wave measured (Wave Recorder) and swell estimated 3 = Other combination of measured and estimated (Wave Recorder) 4 = Wave and swell measured (Buoy)										

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			<p>5 = Wave measured (Buoy) and swell estimated 6 = Other combinations of measured and estimated (Buoy)</p> <p>Other measurement system:</p> <p>7 = Wave and swell measured 8 = Wave measured and swell estimated 9 = Other combination of measured and estimated</p>
146	IMMT observation platform	0-9	<p>0 = Unknown 1 = Selected ship 2 = Supplementary ship 3 = Auxiliary ship 4 = Automated station/data buoy 5 = Fixed sea station 6 = Coastal station 7 = Aircraft 8 = Satellite 9 = Others</p>
147	Quality code indicator	0-9	<p>0 = No quality control (QC) performed 1 = Manual QC only 2 = Automated QC only (no time-sequence checks) 3 = Automated QC only (including time-sequence checks) 4 = Manual and Automated QC (superficial; no automated time-sequence checks) 5 = Manual and Automated AC (superficial; including time-sequence checks) 6 = Manual and Automated QC (intensive; including time-sequence checks) 7 = Not used 8 = Not used 9 = National system of QC (information to be furnished to WMO)</p> <p>The Ix indicator was initiated with 1982 WMO code change.</p>

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148	Weather operation type and past and present weather indicator (Ix)	1-6	Station Operation	Weather Group
			1 = Manned	Included
			2 = Manned	Omitted (no significant weather to report)
			3 = Manned	Omitted (not observed, data not available)
			4 = Automatic	Included
			5 = Automatic	Omitted (no significant weather to report)
			6 = Automatic	Omitted (not observed, data not available)

Characters in the data record other than those specified in this table may occur. These are retained as original data and should be considered missing (e.g., 9 or blank may occur for telecommunicated observations in record position 148).

3. **Start Date:** 18500101

4. **Stop Date:** Ongoing

5. **Coverage:** Global

- a. Southernmost Latitude: 90° S. Latitude
- b. Northernmost Latitude: 90° N. Latitude
- c. Westernmost Longitude: 180° E. Longitude
- d. Easternmost Longitude: 180° W. Longitude

6. **How to Order Data:**

Ask NCDC's Climate Services about the cost of obtaining this data set.

Phone: 828-271-4800

FAX: 828-271-4876

E-mail: NCDC.Orders@noaa.gov

7. **Archiving Data Center:**

National Climatic Data Center

Federal Building

151 Patton Avenue

Asheville, NC 28801-5001

Phone: (828) 271-4800.

8. **Technical Contact:**

:
:

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

9. Known Uncorrected Problems: Errors and discrepancies in the marine data are present because of the varying quality of the input sources, changes in observing practices, coding practices and data processing procedures throughout the history of data collection. Users of marine data should examine the element flags and be aware on known discrepancies in certain source decks before selecting observations for research projects. Whenever possible or economically practical, known errors or discrepancies have been corrected in the data files. The 1129 data from 1970 to present and the COADS data have been reviewed extensively and most errors have been corrected. COADS data for the 1970 decade replaced the 70's Decade data in the archive. Pre-1970 COADS data are provided to users unless they specify a different tape deck when ordering.

Errors and Discrepancies

Monterey - Fleet Numerical Oceanography Center - Deck 555

From 1966-1973 the only available telecommunication source for marine data was the Monterey data, deck 555. Comparison of data from this deck with manuscript sources shows that temperatures are frequently .5°C to 1.5°C higher than temperatures from other sources. Limited reviews of other weather elements in deck 555 indicate that they may also be questionable. In addition, a significant amount of landlocked data suggests possible location problems. Data from deck 555 should be used with caution.

Sea Temperature Indicator

The sea surface temperature method indicator, bucket or intake, for US ships was not well documented prior to April 1973. The indicator is available only for manuscript reports and is frequently left blank. Beginning in 1982, the indicator in B = bucket, I = Intake and blank = unknown. Prior to 1982, blank meant Intake or unknown. Since intake or injection temperature may be taken several meters below the surface depending on the size and load of the ship, the temperature may vary from the actual sea surface temperature.

Wind Speed and Direction

Wind speed has been estimated by the state of the sail and the state of the sea, and measured by instruments. Scales have changed from Beaufort to knots and meters per second. Similar estimates of direction based on different compass code scales could cause biases or limited precision in these measurements depending on data source and date of observation.

Wave and Swell

WMO code changes were initiated for these fields in July 1963 and January 1968. Prior to July 1963, only the higher of sea or swell was reported and placed in the sea wave field. Some countries made the appropriate changes on the effective date while others continued with old code for indefinite periods. Conversion procedure assumed that code changes were made as specified when they may not have been made. Period of wave and swell should be considered questionable, particularly for foreign exchange data prior to 1968.

NMC Time Blocks

NMC source data (deck 890) are arranged in synoptic time blocks, 00Z, 06Z, 12

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Z and 18Z. Time is reported in hundredths of hours. The 00Z block contains data from 20.50 hours on the previous day to 02.99 hours on the current day. The day is given in a separate header record at the beginning of each block.

When the NMC conversion programs were written, only synoptic time ship data reported in whole hours was provided. Data reported at 2100, 2200 and 2300 hours were assigned to the previous day. Beginning about 1980, off-hourly observation times from buoy, coastal marine automated stations (C-MAN) and occasionally research vessels were entered in the NMC records. Observations for hours 20.50 through 20.99 were located in the 00Z time block and were truncated on conversion to 2000 hours (hour 20 in 1129 format). Since the hour was before 2100, the day in the header was not decremented. The result is that any observation from NMC with a time between 20.50 and 20.99 will have the wrong date, one day later than the correct date.

In October 1985 the conversion program was changed to round the time to the nearest hour before assigning the correct date. Data prior to the August 85 data month will have the 20Z observation misplaced by one day for deck 890 if the original input time was 20.50 to 20.99. Regular ship observations reported at 2000 will have the proper day.

Conversion of Call Sign to SHIP

The NMC call sign field is 6 characters. Other input sources have 7 character call sign fields. This difference was overlooked when conversion programs were written. The NMC conversion program checked the 5th position of the filed and if blank, the filed was accepted as a legitimate 4 character call. If the 5th position was not blank, the 6th and 7th positions were checked. The 7th position was actually the first position of the next NMC filed (time) and was not blank. The conversion program assumed that there was an embedded blank in the call sign (position 6) and converted the call to SHIP.

Any five character call sign in the original NMC data, principally buoy and C-MAN stations, was changed to SHIP on conversion. Since most of these data are replaced with the data from NDBC, only a very small amount of call sign information was lost. This occurred in October 1985 to accept any call sign given in the input data field. When telecommunicated data are garbled or when Navy does not wish the ship call to be known, the identification SHIP is entered in the original call field. Other identification such as NNXX, PLAT and BUOY may be entered in the original call field by various sources. NCDC passes whatever call is provided on input to the 1129 format without alteration beginning with July 1985 data.

10. **Quality Statement:**

11. **Essential Companion Datasets:** None.

12. **References:** No information provided with original documentation.

Appendix

Temperature Indicators

There are 2 temperature indicators in the 1129 format. Position 45 indicates that temperature data in 1129 format are recorded in Celsius degrees. The precision of the original input data is also indicated. For example, a temperature indicator 3 (position 45) means original data were recorded to

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whole degrees in Celsius. If the original value were 25°C, the 1129 value would be 25.0°C.

Position 99 is the original temperature units indicator and identifies the scale and precision of the original data. Indicator codes 1, 3 and 5 (Celsius) are the same for positions 45 and 99. Original units indicator codes 2, 4, 6, 7 and 8 are converted to tenths of degrees Celsius in 1129 and position 45 is set to 1.

A.2 Codes

Most of the codes used in the marine processing system and 1129 format are according to WMO regulations. Exceptions are quadrant, the use of a minus sign (-) in all cases where WMO uses a solidus (/) and quality control flags. Codes used in 1129 format are given in Table 2.

A.3 Flags (NCDC Quality Indicators)

The quality control computer program automatically assigns flags for missing, suspect and erroneous data elements. In 1129 format, flags are located in record positions 125-138. Marine observations are checked for illegal codes, internal consistency, time continuity and extreme values. Original values are not changes. Flags assigned are:

Errors	Systematic or bias error	Suspect	Erroneous
Illegal code	A*		M
Internal Consistency	B	J	N
Time continuity		K	
Extreme value		L	Q

*For cloud fields, flag A indicates cloud types, cloud height, total cloud and/or cloud amount have failed the internal consistency check.

In checking an element for exceeding a reasonable value, climatic data consisting of means and standard deviations were derived using 5° latitude-longitude squares which contained at least 25 observations. Standard deviations were computed for air, wet-bulb, dew-point and sea temperature, and sea level pressure. If a value lies outside $X \pm 4.8$ standard deviations, it is flagged suspect. If the value lies outside $X \pm 5.8$ standard deviations, it is flagged erroneous. A flagged element which is flagged again as a result of a second test retains the flag indicating the highest severity. A flagged element is not used in determining if another element should be flagged. Elements accepted as correct are flagged R and missing elements are flagged S.

The ship position flag is set to M when the latitude exceeds 90.0° or the longitude exceeds 180.0°. All numeric fields are flagged M when non-numeric characters occur. Ship call, year, month, day and hour are compared and when these elements are equal for 2 or more observations but the latitude and longitude differ, the ship positions are flagged K. Positions on land, land-locked data are flagged M.

Time continuity checks (track checks) are performed on temperature (wet bulb, dry bulb, dew point and sea surface), pressure and position. When questionable data are encountered, it is often difficult to determine exactly which data in the series are in error. Because the check is performed sequentially and the K flag is set based on the value of the immediately preceding record, the K flag

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will not precisely identify the questionable element in all cases. The K flag indicated that one or more observations preceding or following the flagged observation in time sequence may be in error. The flagged observation may or may not be in error. An R flag may indicate that no track was possible and the element was accepted as reported"

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