

USE OF CHART

This chart is not intended to be used alone but in conjunction with other navigational aids. The chart presents, in graphic form, averages obtained from data gathered over many years in meteorology and oceanography to aid the navigator in selecting the quickest and safest routes. Included are explanations of how to use each type of information depicted on this chart.

**LOCAL WEATHER:** For extended remarks on the marine climate along foreign coasts, see the appropriate Sailing Directions (Enroute and Planning Guides) prepared and published by the National Imagery and Mapping Agency. For the coasts of the United States and its possessions, see the appropriate Coast Pilot prepared and published by the National Ocean Survey. The bimonthly publication "Mariners Weather Log", prepared and published by the National Oceanic and Atmospheric Administration, Environmental Data and Information Service, carries information on marine climatic conditions.

**MAGNETIC VARIATION:** The lines of equal magnetic variation for the Epoch 2000 are shown by gray lines on the main body of the chart and the Mediterranean inset chart. The annual rate of change is shown by gray lines on the uppermost inset chart.

**GREAT CIRCLE ROUTES:** The courses shown on this chart are drawn to provide the shortest distance normally available during the month represented. Abnormal or severe ice or weather conditions may require vessels to alter course further south to the tracks represented on the late winter or spring Pilot charts. Ice and weather reports should be monitored consistently when proceeding south of Cap Race, as these waters are subject to irregular hazards.

**WAVE HEIGHTS:** The red lines on the main body of the chart indicate the percentage of frequency of wave heights equal to or greater than 12 feet. In analysis, when both sea and swell are reported, the higher value is used in the summarization. Wave heights of 12 feet or more are less frequent during July except over the Caribbean Sea. Frequencies of 10 percent or more are found in an area that extends from Cape Farvel southeast to near 50°N, 20°W and northward to just east of Iceland. A small area in the southern Caribbean Sea just north of Colombia also reports wave heights equal to or greater than 12 feet 10 percent of the time.

**GALES:** The frequency of gales at a minimum for the year in July. Only off the southern tip of Greenland is the frequency of force 8 or higher winds greater than 5 percent.

**EXTRATROPICAL CYCLONES:** From June to July, a marked northward shift of cyclonic activity occurs over the North Atlantic. A major area of cyclonic activity extends along the North American coast from the Carolinas into the southern Denmark Strait. Another principal area of cyclonic development occurs over the northeastern North Sea. One primary cyclone track leads from the southern Hudson Bay region into the Davis Strait and east across southern Iceland. Another runs from off Cape Hatteras northeastward into the Central Atlantic. Secondary tracks cross the northern Hudson Bay, Norwegian Sea, and also cross Great Britain and southern Scandinavia.

**AIR TEMPERATURE:** The mean air temperature continues to rise with the most significant increases occurring in the higher latitudes. The mean temperature ranges from 4°C in the Davis Strait to 28°C over the Gulf of Mexico and Caribbean Sea. Ninety-eight percent of the temperature observations over the Davis Strait fall between 0°C and 12°C while over the Gulf of Mexico and Caribbean Sea 98 percent fall between 24°C and 32°C. At 40°N, cooler mean temperatures exist along the Iberian peninsula than along the east coast of the United States—a reversal of previous months. The mean temperatures at 40°N run from 19°C off Portugal to over 22°C at 40°W.

**TROPICAL CYCLONES:** The frequency of tropical cyclones increases only slightly from June. On the average for a 10-year period, 8 tropical cyclones with winds of 34 knots or greater can be expected, and 4 of these will reach hurricane strength (64 knots or greater). The primary storm tracks either cross the Caribbean and Gulf of Mexico to the Texas coast or run northward, paralleling the U.S. east coast.

**OCEAN CURRENTS:** The green arrows on the chart indicate the prevailing direction, and the numerals show the mean speed in knots. The broken arrows indicate the probable surface current flow where data are sparse, but more importantly, they indicate directional variability such as in the Sargasso Sea, in regions of entrainment between currents setting in opposing directions, in nearshore tidal regions, and in the northern seas where currents are generally weak and easily influenced by winds.

**NOTE:** It should be kept in mind that most ships tend to avoid areas of inclement weather. The frequency of gales and high waves is generally greater than that which is actually reported due to climatological observations being biased toward favorable weather conditions.

**EXPLANATION OF WIND ROSES:** The wind roses in blue color are located in the center of each 5° square. Each rose shows the distribution of the winds that have prevailed in the area over a considerable period of time. The wind percentages are summarized for calm and the Cardinal and Inter-cardinal compass points. The arrows fly with the wind, indicating the direction from which the wind blew. The length of the shaft, measured from the outside of the circle to the end of the visible shaft (not necessarily to the end of the last feather), using the scale below, gives the percentage of the total number of observations in which the wind has blown from that direction. The number of feathers shows the average force of the wind on the Beaufort scale. The figure in the center of the circle gives the percentage of calms. When the arrow is too long (over 29 percent) to fit conveniently in the 5° square, the percentage is indicated numerically on the shaft.

**FOR EXAMPLE:** The sample wind rose should be read thus: In the reported observations the wind has averaged as follows: From N. 40 percent, force 7; from N.E. 19 percent, force 7; from E. 6 percent, force 5; from S.E. 5 percent, force 5; from S. 5 percent, force 5; from S.W. 9 percent, force 5; from W. 8 percent, force 5; from N.W. 5 percent, force 4; calms 3 percent.

**WINDS:** The largest portion of the July wind pattern across the North Atlantic is due to the clockwise circulation around the Azores High. North of a line from Savannah, Georgia to southern Norway, and south of 63°N, prevailing winds are west to southwest. South of this region to 10°N, the flow is north to northeasterly over the eastern Atlantic and east to southeasterly over the western Atlantic. North of 63°N, the winds are more variable producing a weak northerly component. South of 10°N they are southerly. Prevailing winds over the Mediterranean are northeasterly with an average force 2 to 4 while over most of the North Atlantic the average force is 3 to 5. The strongest winds occur over the Caribbean with an average force 4 to 6.

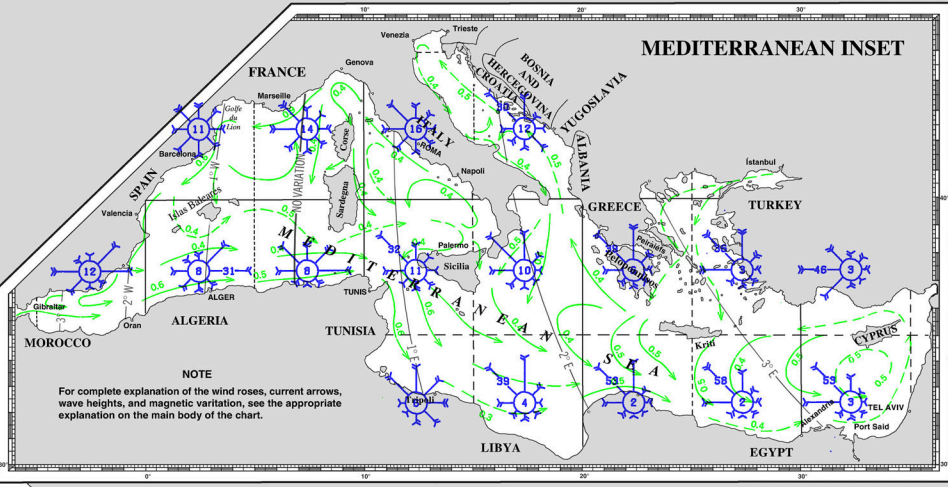
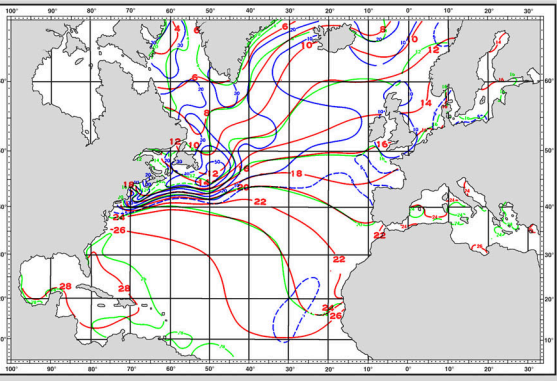
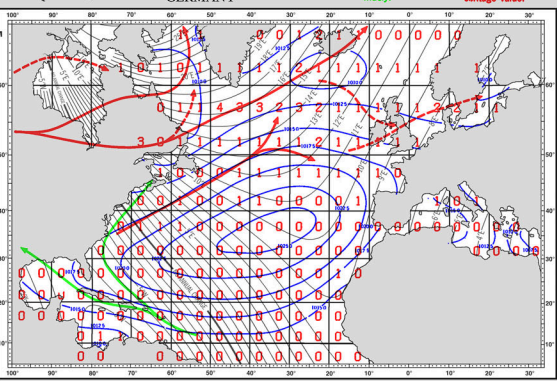
**PRESSURE:** By July the well established Azores High extends from the Gulf of Mexico to the North Sea. It is centered near 35°N, 35°W, with a mean central pressure of 1025 millibars, the highest for the year. The Icelandic low remains an ill-defined east-west trough extending from Hudson Bay to near North Cape, Norway with a mean pressure of 1009 millibars.

**VISIBILITY:** July is the foggiest month of the year over the Grand Banks of Newfoundland where 50 percent of the observations report less than 2 miles visibility. For the rest of the North Atlantic the July analysis resembles that of June, with the 10 percent frequency line running from Long Island northeastward to just west of the Irish Coast where it swings northwest towards the Greenland coast and then east through northern Iceland and the Norwegian Sea. The coastal areas surrounding the British Isles also show poor visibilities (less than 2 miles) 10 percent of the time. The 20 percent line parallels the 10 percent line to the North while frequencies of 30 percent or more are confined to between Cape Cod and Cape Farvel.

EXCEPTIONAL ICE SIGHTINGS

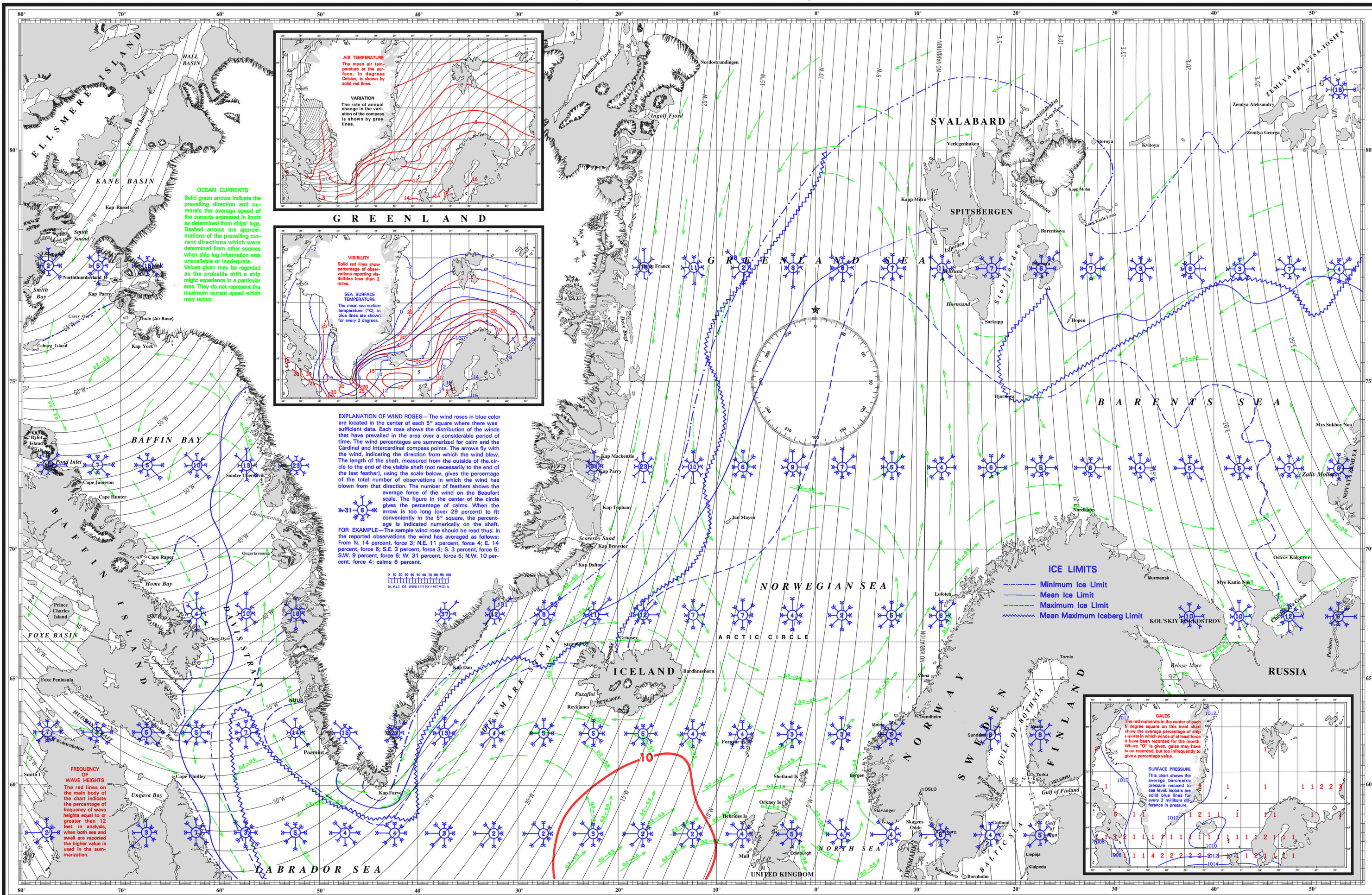
△ Berg (year sighted)  
○ Growler (year sighted)

**GALES**  
The red numerals in the center of each 5-degree square on this inset chart show the average percentage of ship reports in which winds of at least force 8 have been recorded for the month. Where "0" is given, gales may have been recorded, but too infrequently to give a percentage value.

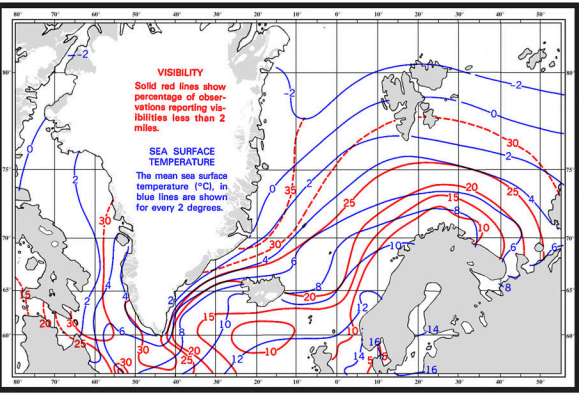
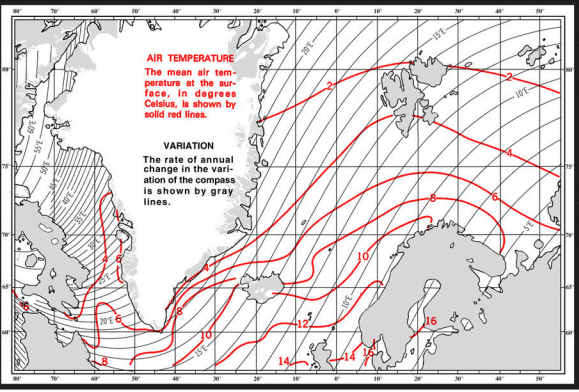


# PILOT CHART OF THE NORTHERN NORTH ATLANTIC OCEAN

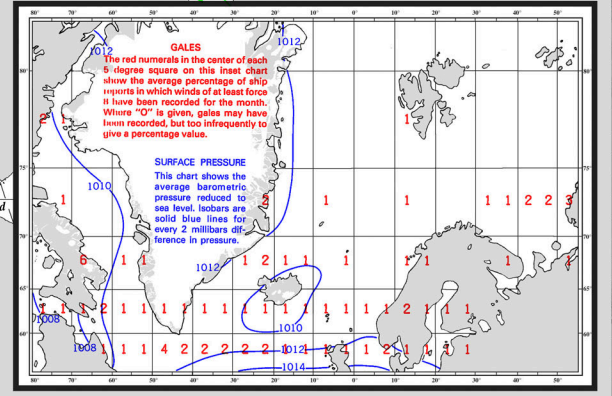
(THIS CHART SHOULD NOT BE USED FOR NAVIGATIONAL PURPOSES)



**OCEAN CURRENTS**  
Solid green arrows indicate the prevailing direction and numerals the average speed of the currents expressed in knots as determined from ships' logs. Dashed arrows are approximations of the prevailing current directions which were determined from other sources when ship log information was unavailable or inadequate. Values given may be regarded as the probable drift a ship might experience in a particular area. They do not represent the maximum current speed which may occur.



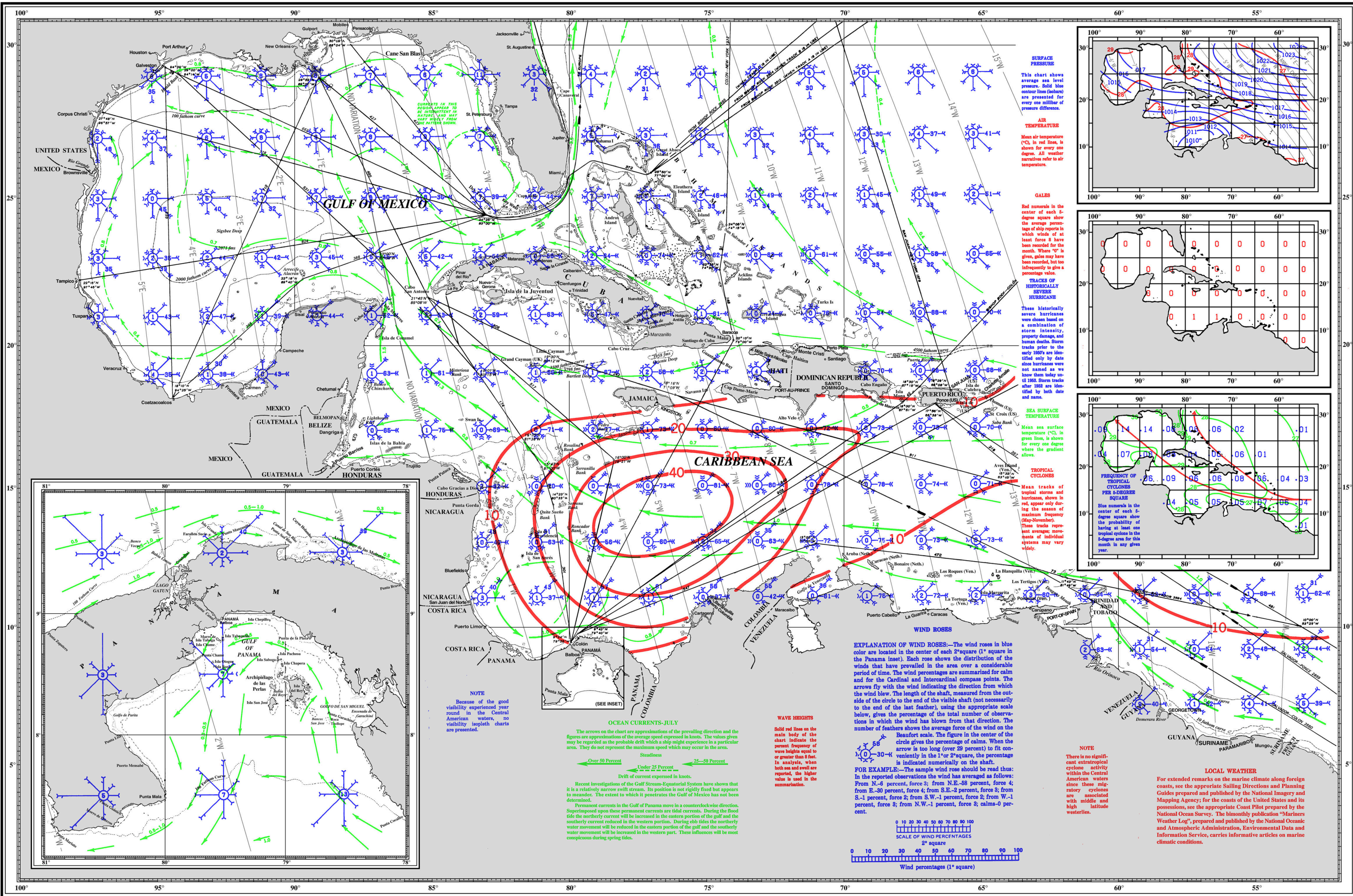
**EXPLANATION OF WIND ROSES**—The wind roses in blue color are located in the center of each 5° square where there was sufficient data. Each rose shows the distribution of the winds that have prevailed in the area over a considerable period of time. The wind percentages are summarized for calm and the Cardinal and Inter-cardinal compass points. The arrows fly with the wind, indicating the direction from which the wind blew. The length of the shaft, measured from the outside of the circle to the end of the visible shaft (not necessarily to the end of the last feather), using the scale below, gives the percentage of the total number of observations in which the wind has blown from that direction. The number of feathers shows the average force of the wind on the Beaufort scale. The figure in the center of the circle gives the percentage of calms. When the arrow is too long (over 29 percent) to fit conveniently in the 5° square, the percentage is indicated numerically on the shaft.  
**FOR EXAMPLE**—The sample wind rose should be read thus: In the reported observations the wind has averaged as follows: From N. 14 percent, force 3; N.E. 11 percent, force 4; E. 14 percent, force 6; S.E. 3 percent, force 3; S. 3 percent, force 5; S.W. 9 percent, force 6; W. 31 percent, force 5; N.W. 10 percent, force 4; calms 6 percent.



**ICE LIMITS**  
--- Minimum Ice Limit  
— Mean Ice Limit  
- - - Maximum Ice Limit  
~ ~ ~ Mean Maximum Iceberg Limit

**FREQUENCY OF WAVE HEIGHTS**  
The red lines on the main body of the chart indicate the percentage of frequency of wave heights equal to or greater than 12 feet. In analysis, when both sea and swell are reported the higher value is used in the summarization.

# PILOT CHART OF CARIBBEAN SEA AND GULF OF MEXICO



**SURFACE PRESSURE**  
This chart shows average sea level pressure. Solid blue contour lines (isobars) are presented for every one millibar of pressure difference.

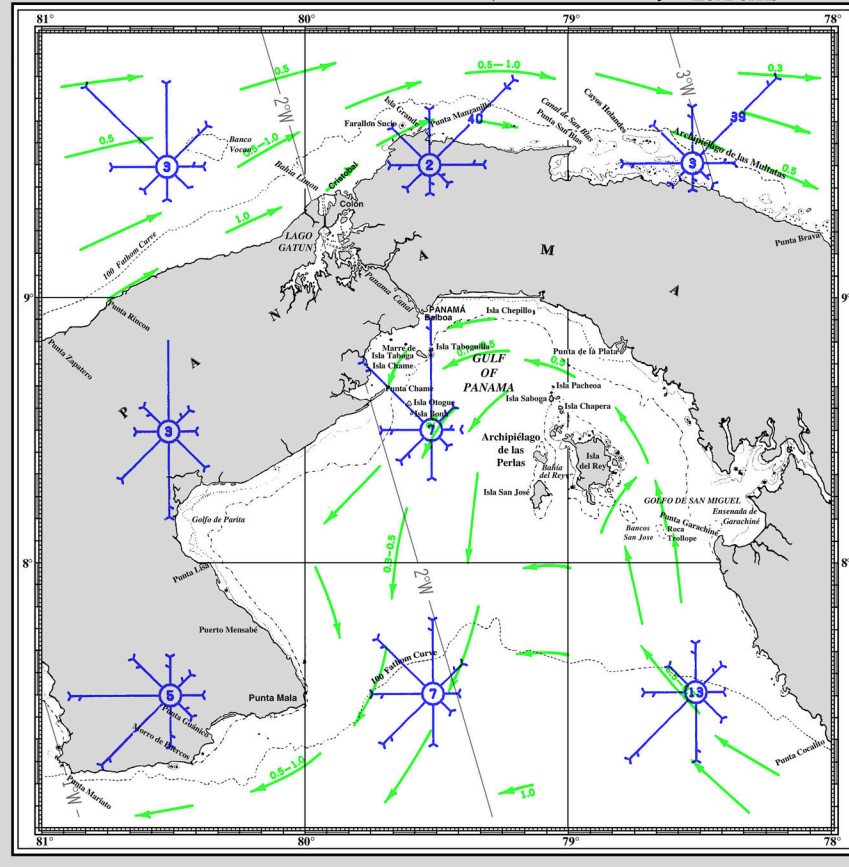
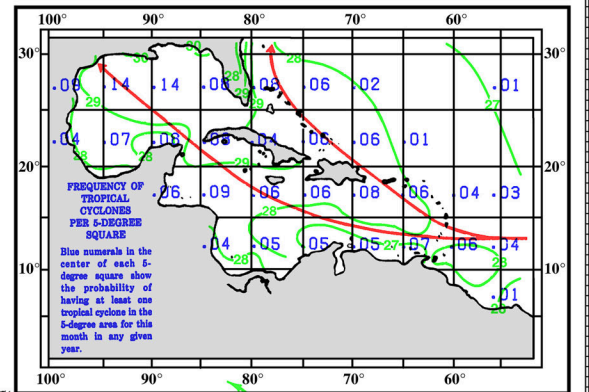
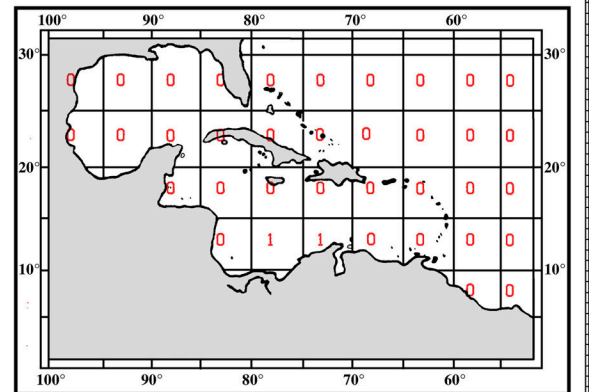
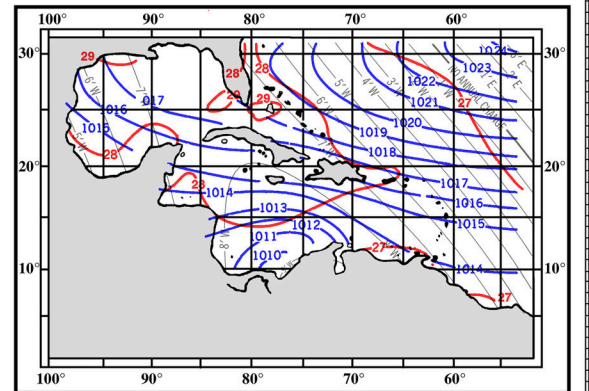
**AIR TEMPERATURE**  
Mean air temperature (°C), in red lines, is shown for every one degree. All weather narratives refer to air temperature.

**GALES**  
Red numerals in the center of each 5-degree square show the average percentage of ship reports in which winds of at least force 8 have been recorded for the month. Where "0" is given, gales may have been recorded, but too infrequently to give a percentage value.

**TRACKS OF HISTORICALLY SEVERE HURRICANE**  
These historically severe hurricanes were chosen based on a combination of storm intensity, property damage, and human deaths. Storm tracks prior to the early 1960s are identified only by date since hurricanes were not named as we know them today until 1968. Storm tracks after 1968 are identified by both date and name.

**SEA SURFACE TEMPERATURE**  
Mean sea surface temperature (°C), in green lines, is shown for every one degree where the gradient allows.

**TROPICAL CYCLONES**  
Mean tracks of tropical storms and hurricanes, shown in red, appear only during the season of maximum frequency (May-November). These tracks represent averages; movements of individual systems may vary widely.



**OCEAN CURRENTS—JULY**  
The arrows on the chart are approximations of the prevailing direction and the figures are approximations of the average speed expressed in knots. The values given may be regarded as the probable drift which a ship might experience in a particular area. They do not represent the maximum speed which may occur in the area.

Steadiness  
 Over 50 Percent  
 Under 25 Percent  
 25-50 Percent

Drift of current expressed in knots.

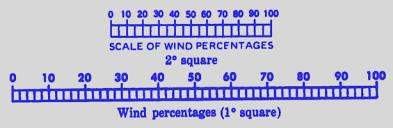
Recent investigations of the Gulf Stream-Equatorial System have shown that it is a relatively narrow swift stream. Its position is not rigidly fixed but appears to meander. The extent to which it penetrates the Gulf of Mexico has not been determined.

Permanent currents in the Gulf of Panama move in a counterclockwise direction. Superimposed upon these permanent currents are tidal currents. During the flood tide the northerly current will be increased in the eastern portion of the gulf and the southerly current reduced in the western portion. During ebb tides the northerly water movement will be reduced in the eastern portion of the gulf and the southerly water movement will be increased in the western part. These influences will be most conspicuous during spring tides.

**WAVE HEIGHTS**  
Solid red lines on the main body of the chart indicate the percent frequency of wave heights equal to or greater than 6 feet. In analysis, when both sea and swell are reported, the higher value is used in the summarization.

**EXPLANATION OF WIND ROSES**—The wind roses in blue color are located in the center of each 2° square in the Panama inset. Each rose shows the distribution of the winds that have prevailed in the area over a considerable period of time. The wind percentages are summarized for calm and for the Cardinal and Intercardinal compass points. The arrows fly with the wind indicating the direction from which the wind blew. The length of the shaft, measured from the outside of the circle to the end of the visible shaft (not necessarily to the end of the last feather), using the appropriate scale below, gives the percentage of the total number of observations in which the wind has blown from that direction. The number of feathers above the average force of the wind on the Beaufort scale. The figure in the center of the circle gives the percentage of calms. When the arrow is too long (over 20 percent) to fit conveniently in the 1° or 2° square, the percentage is indicated numerically on the shaft.

**FOR EXAMPLE**—The sample wind rose should be read thus: In the reported observations the wind has averaged as follows: From N.—5 percent, force 3; from N.E.—58 percent, force 4; from E.—30 percent, force 4; from S.E.—2 percent, force 3; from S.—1 percent, force 2; from S.W.—1 percent, force 2; from W.—1 percent, force 3; from N.W.—1 percent, force 3; calms—0 percent.



**NOTE**  
There is no significant extratropical cyclone activity within the Central American waters since these migratory cyclones are associated with middle and high latitude westerlies.

**LOCAL WEATHER**  
For extended remarks on the marine climate along foreign coasts, see the appropriate Sailing Directions and Planning Guides prepared and published by the National Imagery and Mapping Agency; for the coasts of the United States and its possessions, see the appropriate Coast Pilot prepared by the National Ocean Survey. The bimonthly publication "Mariners Weather Log," prepared and published by the National Oceanic and Atmospheric Administration, Environmental Data and Information Service, carries informative articles on marine climatic conditions.