

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 distances normally available during the month represented. Abnormal or severe ice or weather conditions may require vessels to alter course farther south to the tracks represented on the late winter or spring Pilot charts. Ice and weather reports should be monitored constantly when proceeding south of Cape 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 encountered more than 10 percent of the time over most of the open ocean north of 32° and east of the Davis Strait. Frequencies of 10 percent are also found in the Mediterranean Sea between the Balearic Islands and Sardinia. The region south of Iceland between Greenland and Ireland observes wave heights of at least 12 feet 40 percent of the time, and of at least 20 feet 10 percent of the time. Within this region, a small area centered near 57°N, 20°W, experiences wave heights of 12 feet or more 50 percent of the time, and 20 feet or more 15 percent of the time.

GALES: Winds of force 8 or greater have increased from the previous month with nearly all unprotected areas north of 38°N reaching a frequency of 5 percent. Most of the central Atlantic north of 40°N reaches 10 percent with the highest frequency being off the southeast tip of Greenland, where it approaches 20 percent.

EXTRATROPICAL CYCLONES: Major areas of cyclogenesis include an area that extends along the coast from the southeastern United States to Nova Scotia, an elliptical area (approximately 14 degrees by 9 degrees) centered near 50°N, 40°W, and an area extending from southeast Greenland to near 50°W. Leading from the Great Lakes, the majority of extratropical lows cross the Gulf of St. Lawrence and head for southwest Greenland. Other primary tracks lead from near 38°N, 60°W across Iceland into the Norwegian Sea, and across Hudson Bay. Secondary tracks lead from Lake Winnipeg across Ontario, across the British Isles and southern Scandinavia into eastern Europe, and across the northwestern Mediterranean from northern Spain to Yugoslavia.

AIR TEMPERATURE: A marked difference in mean air temperatures is noted from the previous month as temperatures continue to drop. November means range from -4°C in Baffin Bay to 25°C in a small region of the Caribbean Sea. The mean temperatures along the 40°N parallel range from a low of 11°C off the New Jersey coast to a high of 18°C at 40°W to 15°C off the Portuguese coast. Along the northeast coast of South America 98 percent of the observations fall between 24°C and 32°C, while over Baffin Bay 98 percent fall between -12°C and 4°C.

TROPICAL CYCLONES: Tropical disturbances have decreased substantially since the warmer months. On the average, only 7 storms in 10 years will reach force 8 or greater, with only 3 of these reaching hurricane strength (force 12). Most of these storms develop over the Caribbean Sea with the preferred tracks either crossing the Yucatan Peninsula bound for the eastern Gulf States or crossing Cuba and heading northeast into open water.

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 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 vane 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: Prevailing westerly winds of force 4 to 6 span most of the Atlantic between 40°N and 60°N. Winds north of 60°N are quite variable, averaging force 4 to 6, and in establishing a prevailing direction they tend to be southwesterly over the eastern Norwegian Sea and northerly between 5°W and the Hudson Bay. South of 40°N, the prevailing winds are generally east and northeasterly averaging force 2 to 4.

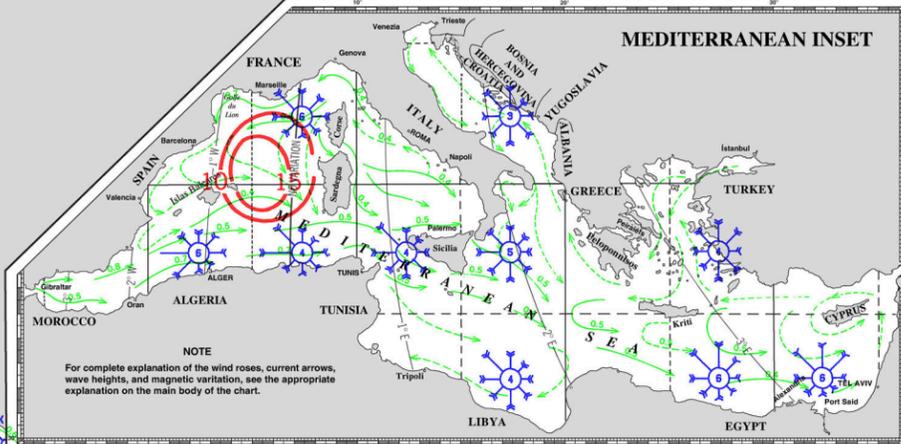
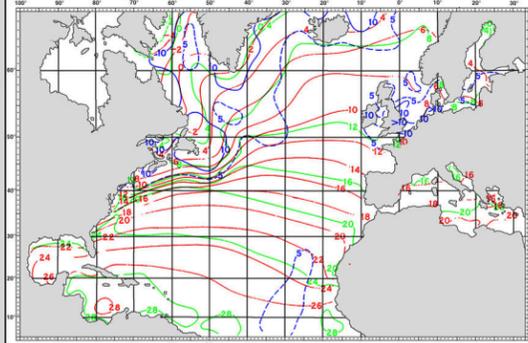
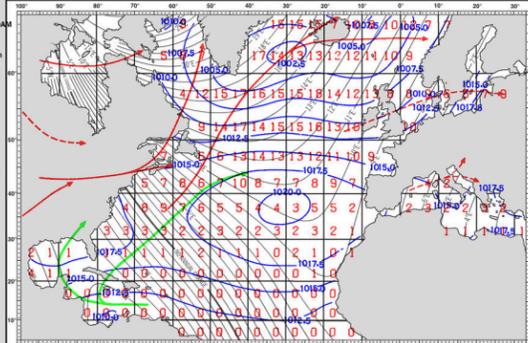
PRESSURE: The Icelandic Low is still centered between Iceland and southern Greenland with a mean central pressure of 1002 millibars, which is higher than either October or December. The Azores High has shifted slightly northeast and is centered near 38°N, 30°W, with a central pressure of 1021 millibars.

VISIBILITY: The percent frequency of visibility less than 2 miles has only slightly increased since October. Areas reporting frequencies of 10 percent or more include: the Bay of Fundy; the Gulf of St. Lawrence; coastal areas of Newfoundland and Baffin Island; southern coastal regions of Greenland; the area north of a line from Angmagssalik, Greenland to the Barents Sea; and portions of the Irish Sea and the southern part of the North Sea.

OCEAN CURRENTS: The green arrows on the chart indicate the prevailing direction, and the numerals show the mean current 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.

EXCEPTIONAL ICE SIGHTINGS
△ Berg (year sighted)
○ Growler (year sighted)

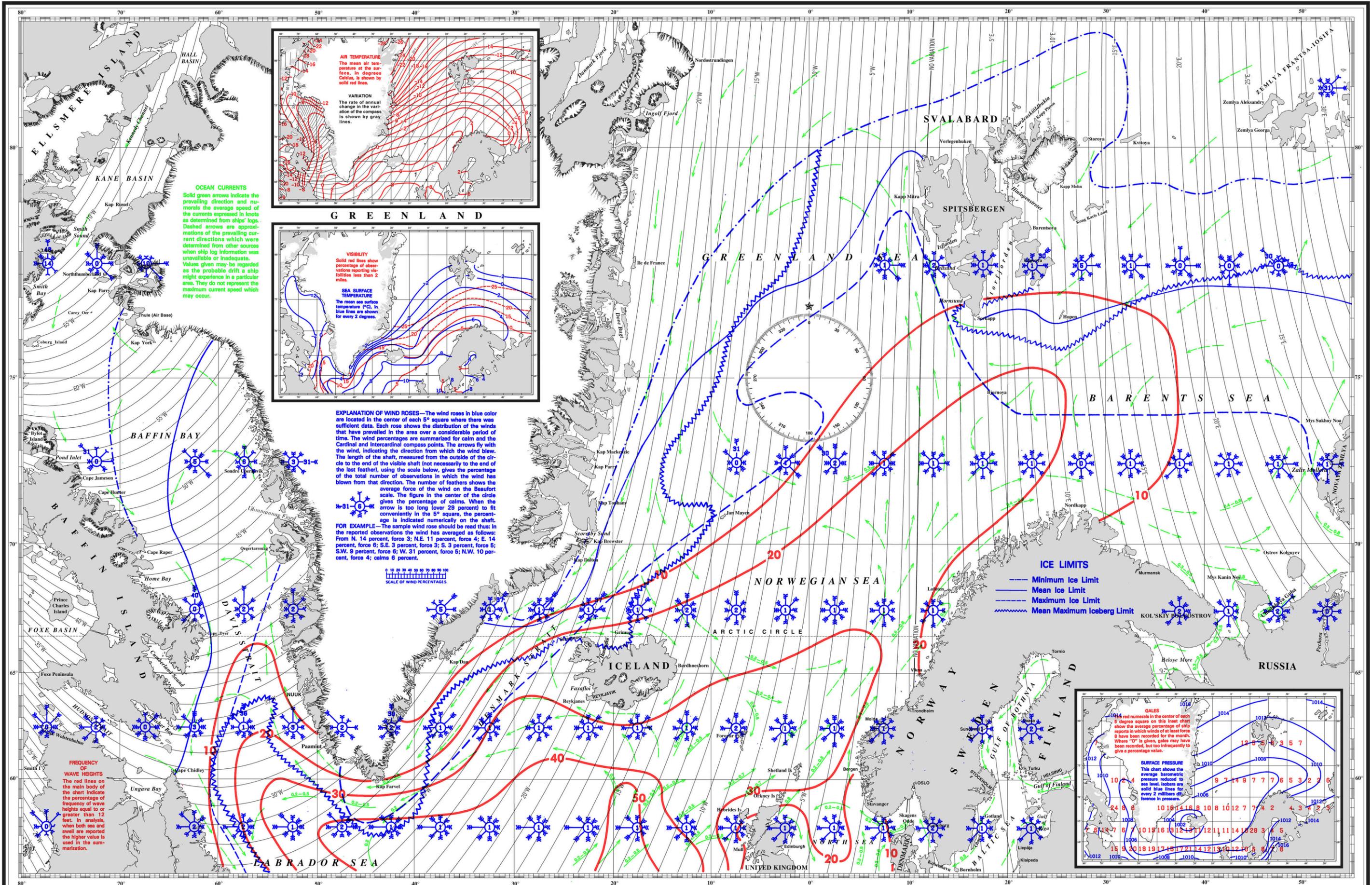
GALES
The red numerals in the center of each 5-degree square on this inset chart show the average percentage of ship reports in which winds of at least force 8 have been recorded for the month. Where "0" is given, gales may have been recorded, but too infrequently to give a percentage value.



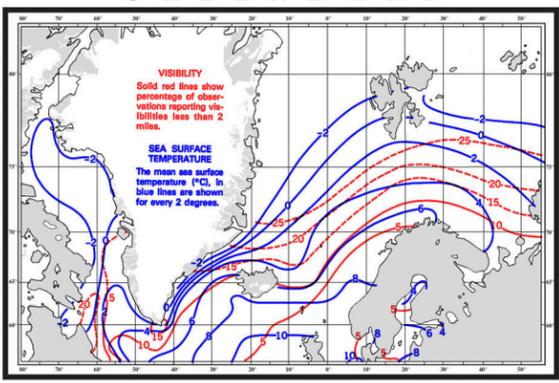
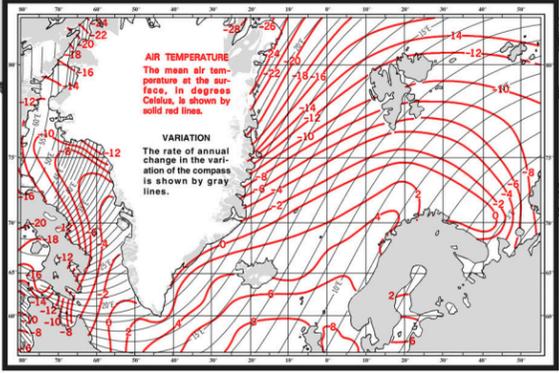
PILOT CHART OF THE NORTHERN NORTH ATLANTIC OCEAN

(THIS CHART SHOULD NOT BE USED FOR NAVIGATIONAL PURPOSES)

SEC. II - NOVEMBER



OCEAN CURRENTS
 Solid green arrows indicate the prevailing direction and numericals 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.

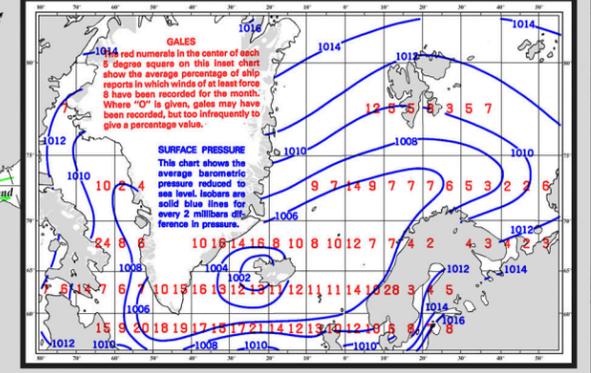


EXPLANATION OF WIND ROSES—The wind roses in blue color are located in the center of each 5° square where there was sufficient data. Each rose shows the distribution of the winds that have prevailed in the area over a considerable period of time. The wind percentages are summarized for calm and the Cardinal and Inter-cardinal compass points. The arrows with the wind, indicating the direction from which the wind blow. 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 25 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 5; S.E. 3 percent; force 5; 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.

0 10 20 30 40 50 60 70 80 90 100
 SCALE OF WIND PERCENTAGES

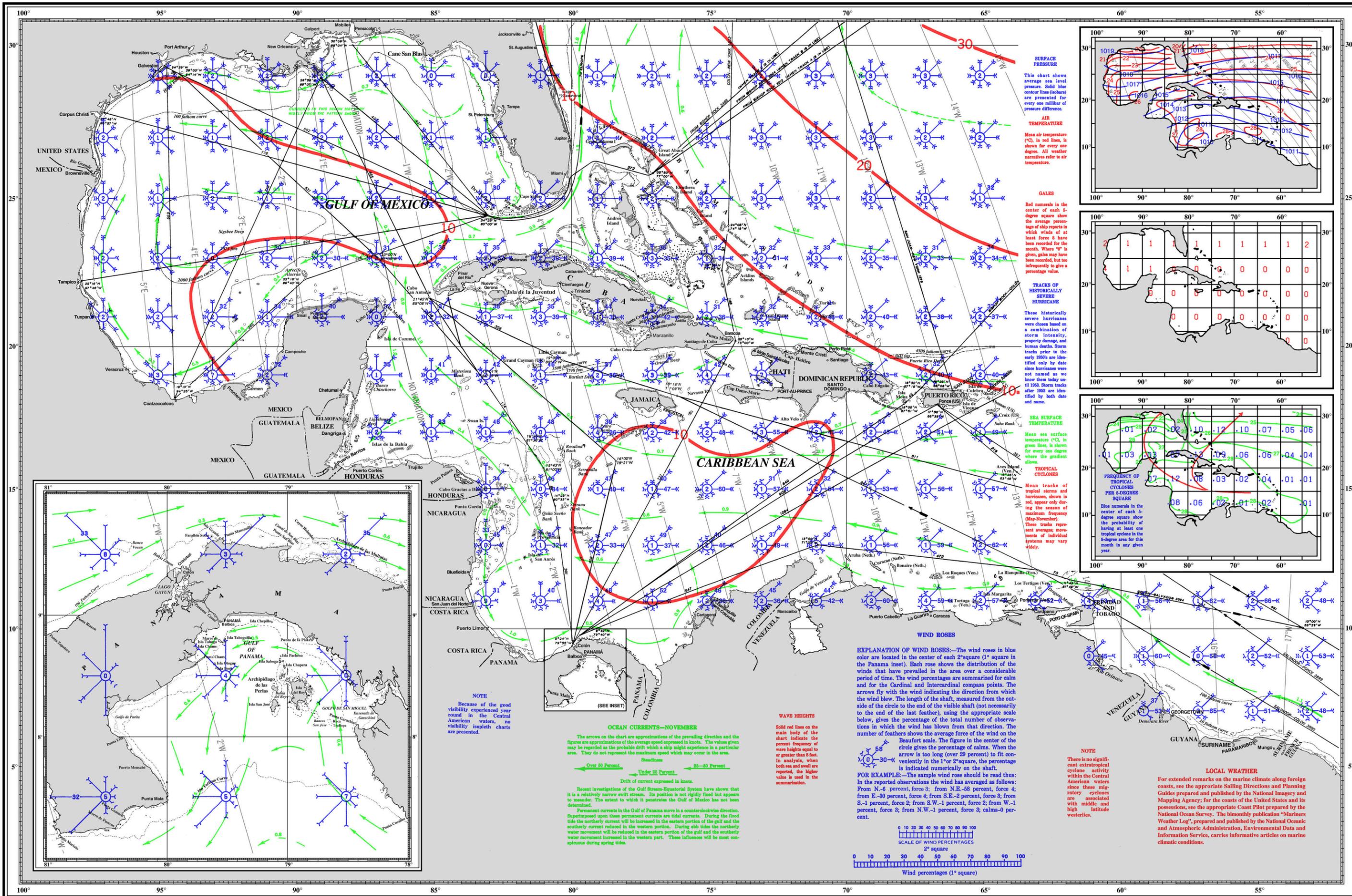
ICE LIMITS
 — Minimum Ice Limit
 — Mean Ice Limit
 - - - Maximum Ice Limit
 ~~~~~ Mean Maximum Iceberg Limit



**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

SEC. III - NOVEMBER



**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, 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 1950's are identified only by date since hurricanes were not named as we know them today until 1953. Storm tracks after 1953 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). Blue numerals in the center of each 5-degree square show the probability of having at least one tropical cyclone in the 5-degree area for this month in any given year.

