



# PILOT CHART OF THE NORTH PACIFIC OCEAN

MARCH

## AVERAGE CONDITIONS OF WIND AND WEATHER OVER THE NORTH PACIFIC OCEAN DURING CURRENT MONTH

**WINDS:** From Japan to northern California and southern Alaska, the prevailing winds are from the west to southwest averaging force 4 to 6. The remaining regions of the Pacific maintain average force winds of 3 to 5. Northwesterly winds prevail south of 25°N and north of 60°N with north to northwesterly winds occurring over the Sea of Okhotsk, the Sea of Japan, the Yellow Sea, and off the coast of California.

**PRESSURE:** The transition month shows the Aleutian low filling to 1004 millibars, compared to 997 millibars in February. It is still centrally positioned at 53°N, 170°E. A secondary low of 1007 millibars has formed in the Gulf of Alaska. A noticeable lessening of the pressure gradient across the North Pacific has also occurred since the previous month. The Siberian High has retreated significantly, affecting little of the Pacific Ocean except in the vicinity of the Yellow Sea. The Pacific Subtropical High has greatly increased its influence by extending from the western United States to 165°E. Its central pressure has increased to over 1023 millibars and is now centered near 30°N, 138°W.

**VISIBILITIES:** During March, increased frequencies of visibilities less than 2 miles occur over the East China Sea with frequencies reaching 20 percent off the China coast near Shanghai. Most regions north of 40°N show frequencies of at least 5 to 10 percent with frequencies exceeding 20 percent along most of the coastal areas of the Sea of Okhotsk and across most of the Bering Sea. The highest occurrences appear in the Bering Sea where frequencies of 30 percent are observed in several areas.

**AIR TEMPERATURE:** With the approach of spring the mean air temperature slightly north of the Pacific. Ninety percent of the temperature observations in the Sea of Okhotsk and Bering Sea are still below 0°C. The mean temperatures range from below -20°C to below 20°C near the equator. The remaining 10 percent of the temperatures in the Chukchi Sea fall between -40°C and 0°C and between 24°C and 32°C below 10°N. Eastward along the 40th parallel, 98 percent of the temperatures fall between -6°C and 17°C with the means ranging from 3°C to 11°C.

**WAVE HEIGHTS:** The red lines on the main body of the chart indicate the percentage of frequency of wave heights greater than or equal to 12 feet. In analysis, when both sea and swell are reported, the higher value is used in summarization. Wave heights of at least 12 feet are observed more than 10 percent of the time in most areas between Japan and North America and between the Bering Sea and Hawaii. Frequencies increase to 30 percent over the western Pacific between the Kuril Islands and the Pribilof Islands and between 155°E and 178°W near the 40th parallel. Wave heights of this magnitude are also observed 10 percent of the time between the Marshall and Hawaiian Islands and in the waters surrounding Taiwan.

**GALES:** Most gale force winds over the North Pacific Ocean occur (5 percent or greater) from east-central Japan to as far north as the Bering Sea and the Gulf of Alaska and as far east as Canada and the northwestern United States. Frequencies of 10 percent or more are mainly confined to the western North Pacific from 17°N to 57°N and lie north of the Aleutians in the north and between Japan and the international date line in the south.

**EXTRATROPICAL CYCLONES:** During March, the major area of cyclogenesis spans some 600 miles in width and extends in length from Japan to near 45°N, 170°E. The primary storm track crosses southern Japan passing through the center of the major area of cyclogenesis. On the northeast edge of this area of cyclogenesis, the primary track branches with the lows either heading north towards the Aleutians or east towards Canada. A second primary track branches from the northwestern edge of the area of cyclogenesis into the southern region of the Bering Sea. Secondary tracks move southeast out of Asia across northern Japan, north across the central region of the Gulf of Alaska, and southeast into the northwestern United States.

**TROPICAL CYCLONES:** For the period of record only one tropical storm has been observed during March in the eastern North Pacific. However, on the average in the western North Pacific, a tropical storm (2-34 kts) will be observed once every 2 years and a typhoon (2-64 kts) once every 5 years.

**AVERAGE ICE LIMITS:** Types and limits of ice are shown in red as follows:  
Minimum extent of sea ice of 1/4 or greater concentration.  
Mean extent of sea ice of 1/4 or greater concentration.  
Maximum extent of sea ice of 1/4 or greater concentration.  
Glaciers.

**FREQUENCY OF WAVE HEIGHTS:** The red lines on the main body of the chart indicate the percentage of frequency of wave height equal to or greater than 12 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 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 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 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. 32 percent, force 5; from N.E. 11 percent, force 4; from E. 8 percent, force 4; from S.E. 4 percent, force 4; from S. 3 percent, force 4; from S.W. 5 percent, force 4; from W. 10 percent, force 4; from N.W. 25 percent, force 4; calms 2 percent.

The monthly stream and drift currents shown on this chart by green arrows indicate in general the currents that may be expected. Generally, sufficient data are available to delineate the prevailing current pattern and to determine the mean speed. However, the user is cautioned that changes in wind direction, speed, and duration can change local currents both in direction and speed.

## SURFACE CURRENTS

The monthly stream and drift currents shown on this chart by green arrows indicate in general the currents that may be expected. Generally, sufficient data are available to delineate the prevailing current pattern and to determine the mean speed. However, the user is cautioned that changes in wind direction, speed, and duration can change local currents both in direction and speed.

- Prevailing direction
- - - Probable direction
- 1.2 Mean current speed in knots.
- Approximate limits of Equatorial Countercurrent.

## 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.

Small icebergs and bergy bits calved from glaciers are usually confined to coastal waters.

## 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 Defense Mapping Agency Hydrographic/Topographic Center. For the coasts of the United States and its possessions, see the appropriate Coast Pilot prepared and published by the National Ocean Service. The quarterly 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.

**MAGNETIC VARIATION:** The lines of equal magnetic variation for the epoch 1990 are shown by gray lines on the main body of the 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. Weather reports should be monitored constantly when proceeding across the North Pacific, immediately South or East of the Aleutians, as these waters are subject to severe conditions.

## VISIBILITY

Solid blue lines show percentage of observations reporting visibilities less than 2 miles. 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.

## SURFACE PRESSURE

This chart shows the average barometric pressure reduced to sea level. Isobars are solid blue lines for every 2.5 millibars difference in pressure.

## STORM TRACKS

These are mean tracks of both tropical and extratropical cyclones. The prevailing direction of motion of storm systems is indicated by the arrows. Heavy solid red lines denote primary tracks; thin dashed lines denote secondary tracks. Arrow heads end in areas of maximum frequency.

## SEA SURFACE TEMPERATURE

The mean sea surface temperature (°C), in blue lines are shown for every 4 degrees.

## AIR TEMPERATURE

The mean air temperature (°C), in red lines, is shown for every 2 degrees.

**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 based toward favorable weather conditions.

**NOTE:** Maritime boundary provisionally applied pending formal exchange of instruments of ratification.

**NOTE:** Depiction of maritime boundary has been changed since the last edition.

