

# Hints to the Observer

## SEA AND SWELL OBSERVATIONS

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Your wave observations are important to other mariners and to forecasters who rely on them in making analyses and forecasts for ocean and coastal areas. Because waves can travel thousands of miles, the wave energy which you encounter in midocean may later endanger boaters along a distant coastline. The wind, wave, and pressure observations from ships are the only data the forecaster has for estimating when, where, and with what heights those waves will arrive at harbor entrances and beaches.

No one has to tell you about the practical difficulties in making a "good" wave observation--it takes practice, patience, and some determination. While we can't reduce these problems, we can offer some additional guidelines and encourage you to do your best. Wave observations should be made according to the procedures prescribed by the World Meteorological Organization, and transmitted as the last two code groups in the International Ship Code. Basic instructions can be found in Chapter 9 of Weather Service Observing Handbook No. 1.

A recent article by C. L. Bretschneider indicated a very close correlation between the significant wave height\* and the significant wave period in wave-generating areas. Table 5 is adapted from Bretschneider's findings and is applicable to seas (waves that are still under the influence of the winds that generated them). This table does not apply to swells (waves that have moved from their generating area into an area of lighter or calm winds).

From this table it can be seen that high waves typically have long periods. There seems to be a bias on the part of many shipboard observers toward re-

porting the short periods associated with the smaller choppy waves in a complex sea, rather than the longer periods which generally are associated with the higher (significant) waves. It is suggested that shipboard observers should carefully observe and report the wave periods of the "larger well-formed waves." We do not want to imply that the wave periods shown in table 5 are a substitute for carefully made observations.

When swells clearly predominate over locally generated seas, the waves have much greater regularity of height and period as well as longer crests, thus simplifying accurate observations. A comparison of reports between ships that are in proximity reveals that under such conditions many observers have not accurately determined the wave period. Some ships consistently report 5- or 6-sec periods for swells during transoceanic crossings while surrounding ships are reporting much longer periods. It should be mentioned that swells of a given height normally have a longer period than locally generated waves of the same height.

In summary, your observations of waves are important. You should do your best to give a representative report of wave height, wave period, and wave direction.

Last, but not least, we want you to know that FORECASTERS NEED AND APPRECIATE YOUR REPORTS, and your "best effort" on wave observations will help them to provide better wave forecasts for you, other mariners, and coastal residents.

### REFERENCE

Bretschneider, Charles L., "Forecasting Relations for Wave Generation," Look Lab Quarterly, Vol. 1, No. 3, July 1970, pp. 31-34.

\*Average height of the highest one-third of the waves in a fetch or wave set.

Table 5.--Typical sea periods for various sea heights within a sea-generating area (adapted from Bretschneider 1970)

Significant sea height		Significant sea period	
encoded as:		encoded as:	
up to 6 ft	01 - 03	5 sec or less	02 - 05
7 to 10 ft	04 - 06	6 to 7 sec	06 - 07
11 to 15 ft	07 - 09	7 to 9 sec	07 - 09
16 to 20 ft	10 - 12	9 to 10 sec	09 - 10
21 to 30 ft	13 - 18	10 to 12 sec	10 - 12
31 to 40 ft	19 - 24	12 to 14 sec	12 - 14
41 to 50 ft	25 - 30	14 to 16 sec	14 - 16
51 to 60 ft	31 - 36	16 to 17 sec	16 - 17