

Met-ocean in Thailand

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1. Introduction

Tropical cyclones are affecting Thailand as events like the tropical depression, tropical storm and typhoon. The tropical cyclones are directly coming onto Thailand or moving pass neighborhood country to Thailand and they can cause damage in Thailand by strong winds, strong wave and storm surge. The typhoons in Thailand have 14 events in past 59 years and 8% of tropical depression and tropical storm such as Typhoon Gay (1989) and Typhoon Linda (1997). Typhoon Gay was heavy damage in Chumphon province which 446 people lost and 16 vessel missing by 6–11m swells. After that, Thailand was developing the typhoon disasters mitigation system in 1993 for typhoon warning and monitoring also maritime development with oceanographic buoys in Gulf of Thailand and Andaman Sea. Oceanographic buoys are a mooring buoys installed with the multi-sensor for measuring the meteorological data such as wind, wave, current speed and directions, sea surface temperature etc. The oceanographic buoys are operated by Geo-Informatics and Space Technology Development Agency (Public Organization: GISTDA) from 1991 - 2006 which 11 stations by 9 stations in Gulf of Thailand and 2 stations in Andaman Sea. The buoys are located in the deep sea area which 20-50m depth from sea water level to the seabed.

This paper are present the met-ocean data in Thailand which recorded by 4 stations oceanographic buoys in Gulf of Thailand at Hua Hin, Rayong, Song Khla and Andaman sea at Phuket station. The buoy locations are important for maritime development, tourism locations and economic areas in Thailand.

2. Wind Data

The wind data was recorded by oceanographic buoys stations as shown in Fig. 1 by wind rose diagrams for each station in 1993, 1994, 1997 and 2006 with wind data grouping 16 directions and 6

wind speed classes, the meaning that the wind originates from outer and propagates toward center circumference of the polar plot as the percentage of directions frequency distributions. The maximum hourly wind speeds and maximum significant wave height are show in the Table 1.

Table 1. Maximum hourly wind speeds and maximum significant wave height

Station	Max. Wind Speeds (m/s)	Wind Direction (Deg.)	Max. Significant Wave Height (m)	Direction Significant Wave Height (Deg.)
Hua Hin	16.98*	123*	4.06*	125*
Phuket	16.46	257	3.76	225
Rayong	13.89*	50*	2.99*	87*
Song Khla	21.61	207	2.81	84

Note: The met-ocean data caused by typhoon Linda *

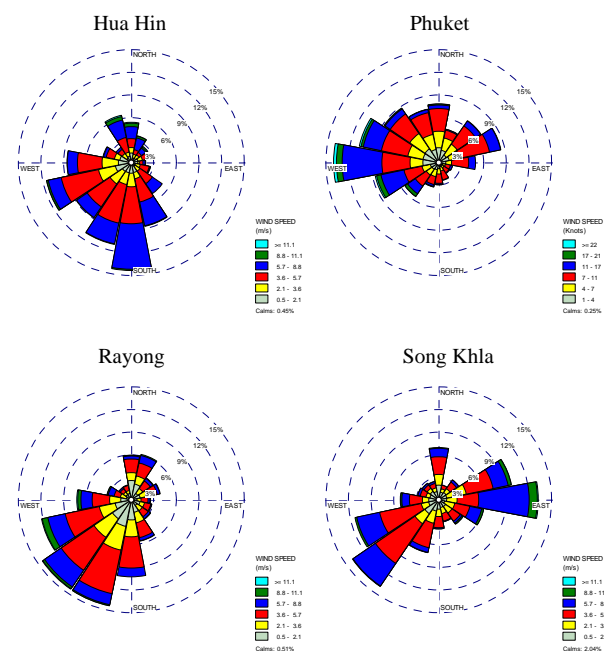


Fig. 1 Wind rose diagrams

Hua Hin station has hourly wind speed 3.6-5.7 m/s with the maximum occurrences 35.5% and 5.8-8.8 m/s with occurrences 25.9%, the predominant direction are 168.5-191.25 degree with 14.31% of occurrences. Therefore, Hua Hin station has most hourly wind speed 3.6-8.8 m/s and wind direction coming on SW in monsoon as shown in Fig. 1.

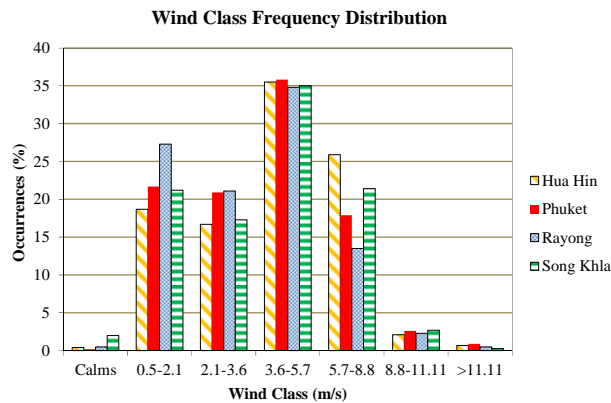


Fig. 2 Wind class frequency distribution

The hourly wind speeds are most occurrences within a range 3.6-5.7 m/s of all stations in Thailand as shown in Fig. 2.

3. Wave Data

The Significant wave height was shown in Fig. 3 by wave rose diagrams for each station same as the definition of wind diagram but the wave rose diagrams represent the significant wave height.

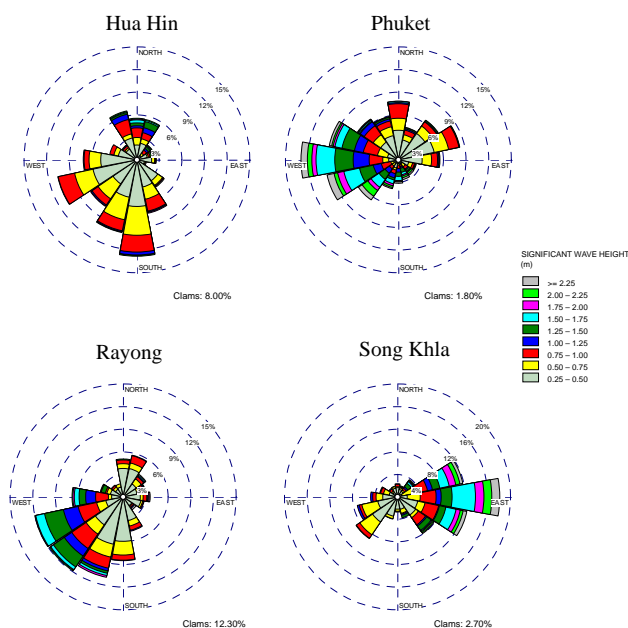


Fig. 3 Significant wave height rose diagrams

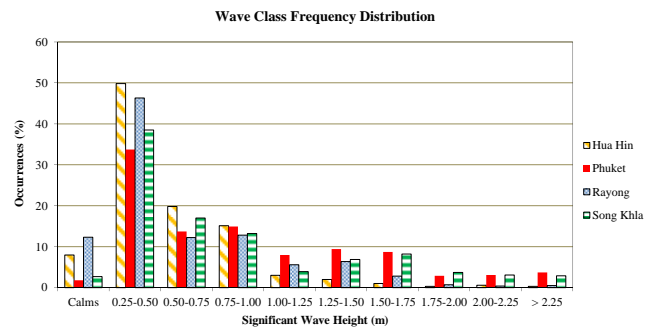


Fig. 4 Significant wave height class frequency distribution

The Significant wave heights are most occurrences within a range 0.25-0.50 m of all data, Phuket and Song Khla station has a tendency of wave height more than other station.

4. Conclusions

Tropical cyclones are not severe in Thailand. Nevertheless, the typhoon can cause damage in Thailand by strong winds, strong wave and storm surge. Therefore, the typhoon disaster prevention and mitigation system are necessary for human safety protection. The met-ocean data has been recorded uncontinuously since 24 years ago so difficult to data collection because some data file lost in the system. The met-ocean data are discontinuous in a yearly mainly the measurement sensor and buoys necessarily to maintenance procedure.

The hourly wind speed are within a range 3.6-5.7 m/s at Hua Hin, Phuket Rayong and Song Khla. Song Khla and Phuket station has a significant wave height more than other stations which more than 2.20 m in East direction.

References

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