



Wind wave variability in the South China Sea

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Wind wave characteristics in South China Sea (SCS) are studied for the period 1953-2007 using gridded Voluntary Observing Ships (VOS) data within a rectangular domain 90° E - 130° E and 10° S - 30° N. Monthly VOS data are analyzed simultaneously and correlated with NCEP wind data of the same resolution. The trends and variability during the 55-year period are analyzed for wind and wave parameters. Empirical relationships between wind speed and wave parameters are derived for typical regions, including southern SCS, Gulf of Thailand, central SCS and northern SCS.

Increasing trend is observed in wave heights during 1953-2007. It has been found that swells are sufficiently contributed to the significant wave heights in the SCS. The wind sea heights and wave periods are highly correlated with wind in the SCS, except for a few regions where the reports in VOS are considerably low. The correlation coefficient of wind sea heights amounts up to 0.86, whereas for the wind sea period reaches 0.82. The correlation coefficient between the wind speed and dominant wave period reaches 0.70, and between wind speed and wind sea period is up to 0.75. The 55-year mean wind speed shows that the wind speeds are higher (up to 6.4 m/s) at the central and northern part of the SCS, whereas those at the southern SCS and Gulf of Thailand are below 5 m/s. The 55-year mean SWH ranges up to 2.75m and the SWH is considerably higher at the northern SCS. A gradual increase in wave height is observed between the decades 1950s to 2000s. Interestingly, a northward shift in the intensity of SWH is observed. The southwest (SW) monsoon waves shows increasing trend in SWH, swell height and wind sea heights which are significantly higher at the northern SCS, however, similar pattern is not evident in the northeast (NE) monsoon waves, showing that the intensity of SW monsoon generated waves becomes increased in the recent decades. Variations associated with ENSO (El Nino Southern Oscillations) are observed in the annual mean wind speed and wave height in the SCS, which is also evident in the seasonal wave heights.