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## Multiple-scale Variations of Wind-generated Waves in the Southern California Bight

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### Abstract

A numerical wave model is applied to study the wind-generated wave in the Southern California Bight (SCB). Observational data available in this area are used to validate the numerical model results. The model is integrated for 10 years (2004-2013). The comparison of the model results with observations shows that the model well reproduces the wave variations in the SCB. The multiple-scale variations in the wave field are examined: inter-annual, seasonal, intra-seasonal, diurnal. The significant wave height and swell wave height distributions display distinct patterns during different seasons. On the inter-annual scale, the wave variation in the SCB is influenced by El Niño Southern Oscillation (ENSO) activities. Intra-seasonal scale events occur frequently. Land/sea breezes cause the diurnal variation. The effects of topography (especially islands) and currents on waves are analyzed. The islands in the SCB provide significant sheltering effects to the coast from deep-ocean waves. The effect of background currents on waves is discussed.