1052-86-94 **Tetsu Hara*** (thara@uri.edu), Graduate School of Oceanography, University of Rhode Island, Narragansett, RI 02882, and **Tobias Kukulka**. *Wave spectrum and breaking wave statistics of growing and mature seas.*

Existing numerical wave models are capable of predicting the surface wave spectrum near the spectral peak, but cannot predict the spectrum at higher frequencies nor the statistics of breaking waves. The objective of this study is to develop a theoretical model framework to predict both the spectrum and the breaking statistics over a broad range of frequencies. Since ocean surface waves are forced by wind, and the wind field itself is modified by the presence of surface waves, a coupled model of surface waves and near surface wind is required. By balancing air-side momentum and energy and by conserving wave energy, coupled nonlinear advance delay differential equations are derived, which govern simultaneously the wave and wind field. Under strongly wind forced conditions (young seas) the breaking statistics is the largest at the spectral peak. As the wave field develops, the number of breaking waves at the peak rapidly decreases. However, the breaking wave effect remains important at higher frequencies (smaller waves). (Received August 21, 2009)