1086-76-1143 **Nicholas E Pizzo*** (npizzo@ucsd.edu) and **W. Kendall Melville**. *Vortex generation by deep water breaking waves.*

The connection between wave dissipation by breaking deep-water surface gravity waves and the resulting turbulence and mixing is crucial for an improved understanding of air-sea interaction processes. In this study, we consider the relationship between a breaking wave and an impulsively forced fluid, allowing us to build upon the classical work on vortex ring phenomena to quantify the circulation generated by a breaking wave. From this we find that the circulation $\Gamma = \chi c^3/g$, where χ is a proportionality factor, c is the phase speed of the wave and g is the acceleration due to gravity. Using a scaling argument, we show that $\chi = \alpha(hk)^{\frac{3}{2}}$, where hk is a breaking slope parameter and α is a constant. This formula then allows us to find a direct relationship between the circulation and the wave energy dissipation rate due to breaking, ϵ. We find agreement between our model and the limited available experimental data. Finally, potential application of this theory to ocean processes will be discussed. (Received September 19, 2012)