

RAIN GENERATED TURBULENCE:

The effects of rainfall on the ocean surface at low wind speed

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The effects of rainfall entering the ocean have traditionally been ignored during investigations of air-sea interface exchanges. Rainfall, however, has been observed to impact many aspects of the problem including enhancing air-sea gas exchanges and generating a rain-induced wave damping effect. Previous rainfall dynamics experimental studies led to a proposed mechanism for the observed wave damping, that rain-induced turbulence generates an extremely large eddy viscosity that damps short waves, but direct turbulence measurements have not been completed. Rain-induced turbulence measurements, I believe, can be shown to directly relate to both the gas transfer velocity and the rain-induced wave damping. Using a Nortek Vectrino, we will complete three-dimensional turbulence measurements beneath a rain simulator, above the wind-wave-current tank at the University of Delaware's Air-Sea Interaction Laboratory. The experiments, to be completed with several different rain and wind conditions, will measure turbulent quantities, air-sea gas transfer velocity, and wave parameters simultaneously to determine their corresponding relationships.