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Department of Marine Sciences
Presents a Seminar by

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UConn CIRCA

**Exploring the role of wave-driven turbulence at the air-sea interface
through measurements of TKE dissipation rates**

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This work serves as an observation-based exploration into the role of wave-driven turbulence at the air-sea interface by resolving Turbulent Kinetic Energy (TKE) dissipation rates above and below the surface. A series of subsurface ocean measurements confirm a TKE dissipation rate enhancement relative to the law-of-the-wall ($\epsilon_{obs} > \epsilon_{wall}$) down to approximately 6 m. Simultaneous measurements of TKE dissipation rates on the atmospheric side capture a deficit relative to the law-of-the-wall ($\epsilon_{obs} < \epsilon_{wall}$). This deficit was explained in terms of wave-induced perturbations and integrated to provide a novel estimate of the amount of energy going into the wave field. These estimates correlate well with a classic spectral input parameterization. Observations suggest that approximately 3-10% of the available kinetic energy on the atmospheric side is going into dissipation under different wind forcing conditions. From a spectral perspective the input-dissipation balance holds for wind speeds in the 8-12 ms⁻¹ range with wave ages (U_{10}/c_p) denoting developed seas (0.87 – 1.05). Above 12 ms⁻¹ winds, waves are actively growing and only a fraction of the spectral input goes into dissipation, here under young seas ($U_{10}/c_p > 1.1$) the spectral input-dissipation balance does not hold.

Host: Jim O'Donnell

Time & Date: 11:00 am, Friday, January 20, 2023

Place: Lowell Weicker Building, Seminar Room 103 (or WebEx)

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