# Near-inertial Energy Pathways

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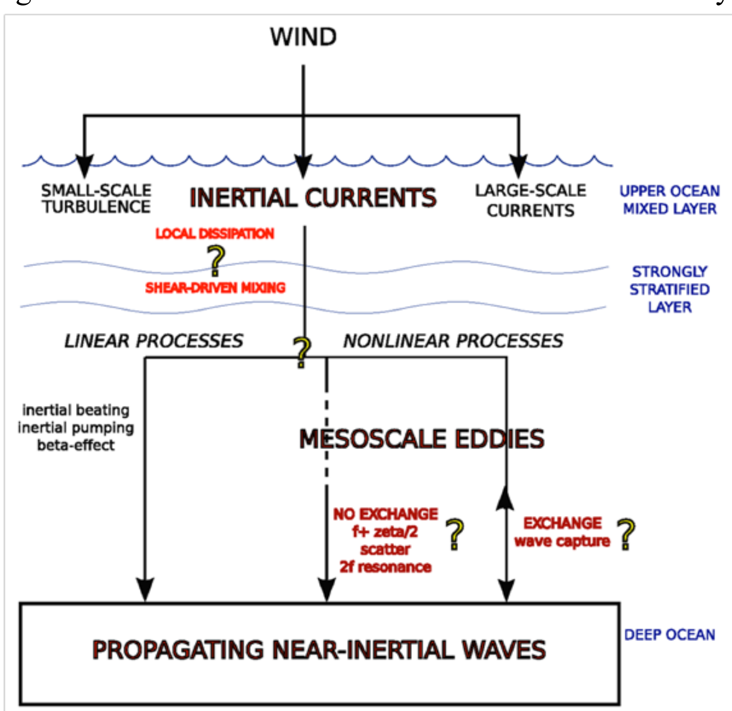
Wind stress fluctuations acting at the surface of the ocean cause the mixed layer to "ring" with strong near-inertial oscillations. Some fraction of this energy is locally dissipated within the mixed layer or in the strongly stratified zone at its base. A large portion, however, makes its way into the ocean interior as propagating near-inertial waves, which eventually break and drive small-scale mixing. The near-inertial energy pathways, far from being controlled by linear processes, appear to be shaped at first order by interactions with the mesoscale eddy field. The nature of these interactions may be more complex than previously thought, involving several distinct mechanisms of energy transfer.

In this study, we investigate fundamental aspects of the near-inertial pathways through a combination of data analysis and numerical modeling in collaboration with principal investigators from the University of Miami (UM), Northwest Research Associates, Inc. (NWRA), Earth and Space Research (ESR) and international scientists. Our strategy is built around accessing and interpreting data from the Global Drifter Program network of surface buoys, available globally at approximately hourly resolution since 2005. Analysis of the surface drifter dataset will quantify previously unobservable details of the near-inertial variability in the surface mixed layer. At the same time, outstanding dynamical questions of wave/eddy interactions will be explored with high-resolution numerical experiments and dynamical models. The net result will be an improved and quantitative understanding of the near-inertial energy flux from the mixed layer to the ocean interior, an important element of the ocean's energy budget. Through this effort, a new hourly-interpolated drifter product with an explicit near-inertial component has been generated and made available to the science community.




*A schematic detailing the processes by which energy input by the wind is converted into propagating internal waves (courtesy of Jonathan Lilly, NWRA).*