



The Spring 2019 Physical Oceanography Seminar series presents:

Dr. Leah Johnson,

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Title: Lagrangian evolution of a submesoscale front

Abstract: A wealth of research in the past decade has unveiled the importance of small fronts in the upper ocean buoyancy budget, yet process study type observations are rare due to the challenges of resolving the relevant spatial and temporal scales. Here, a neutrally buoyant, subsurface Lagrangian float was deployed in a small mixed layer front within the California Current System as part of the ONR AESOP program. Its trajectory was acoustically tracked, allowing the region surrounding the drifting float to be intensely surveyed by a ship towing a Triaxus profiler. This Lagrangian approach provides uniquely detailed measurements of the frontal structure and evolution within and below the boundary layer. Initially, downfront winds incite mixing and the float repeatedly traverses the boundary layer. As winds relax and vigorous mixing subsides, the the system enters a different dynamical regime as the front develops an overturning circulation associated with large vertical velocities that ultimately tilt isopycnals over and stratify the upper ocean within a day. A buoyancy flux scaling approach (commonly used with observations to isolate dominant frontal dynamics) fails as most scalings collapse to similar values in this parameter space. Instead, a thorough account and analysis reveal evidence that wind driven inertial motions, boundary layer friction and frontal instabilities work in concert to dictate the evolution of the front.

Seminars are in Corless Auditorium (Watkins Building) at **10:30am**, followed by lunch in Nautilus Galley. Please contact Sarah & Luis if you would like to schedule an individual meeting with the presenter (Sarah_nickford@uri.edu, luispomales@my.uri.edu).