

Surface Mixing and Its Implementation in Regional Ocean Models

*Robin Robertson¹

1.University of New South Wales, Canberra

Many vertical mixing parameterizations exist for the Regional Ocean Modeling System (ROMS) and they give widely different results. How well these parameterizations reproduce surface mixing is critical for both climate and military applications. Using meteorological and oceanographic data from the Southern Ocean Time Series mooring south of Australia, different mixing parameterizations in ROMS were evaluated for their ability to replicate the surface mixed layer environment. Three different vertical mixing parameterizations were investigated: Nakanishi-Niino, Mellor-Yamada 2.5 and the Large-McWilliams-Doney Kpp profile. Nakanishi-Niino performed the best for this application using the criteria of the surface mixed layer depth and the structure of the upper ocean temperatures. Additionally, a sensitivity study was performed to determine the best set of parameters to use.

Keywords: vertical mixing, surface mixed layer