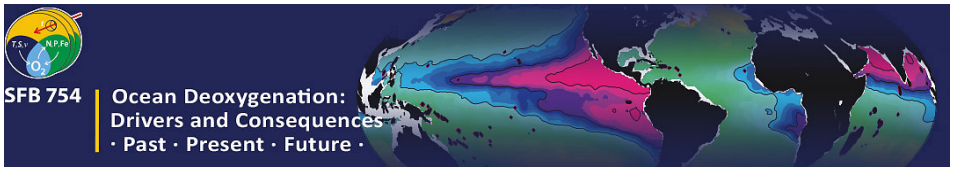

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Quantifying thermocline oxygen and nitrate supply by Subantarctic Mode and Antarctic Intermediate Waters

Subantarctic Mode Water (SAMW) and Antarctic Intermediate Waters (AAIW) are major sources for the ventilation of the subtropical thermocline and of the shadow zones, as well as for the nutrient supply of the lower latitudes. Hence, variability of the formation rate and properties of these water masses, and the oxygen (O2) and nitrate (NO3) they transport, may significantly affect subtropical productivity and oxygen minimum zones.

We analyze the results of an ocean-sea ice data-assimilating Southern Ocean State Estimate (SOSE) and biogeochemistry model for the years 2008-2012. This time period is characterized by large interannual variability. We use a water mass framework applied to five day averaged SOSE output in order to understand and quantify the processes controlling O2 and NO3 inventories, transport and variability in the SAMW and AAIW density range. In particular, we want to understand the relative importance of physical processes (such as buoyancy fluxes and diapycnal mixing) and biogeochemical processes (such as productivity, gas exchange and tracer mixing) to drive inventories, northward export and variability. We discuss potential downstream effects on low latitude productivity and thermocline ventilation.

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