

DECADAL TO MULTI-CENTURY GLOBAL OCEAN VENTILATION IN A HIGH RESOLUTION OFF-LINE TRACER TRANSPORT MODEL

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We investigate global ocean water-mass ventilation pathways and rates using a high resolution tracer transport model. The model resolution is at 1/4-degree over a Mercator grid with 21 vertical levels. The principle behind the model is to take a state-of-the-art eddy-permitting simulation of the oceanic circulation, and using the predicted fields of velocity, construct a separate model of tracer transport. The challenge in this work is to further incorporate a realistic representation of oceanic mixing and surface convective overturn. In initial research, numerical model simulations have been conducted of the outflow of North Atlantic Deep Water into the Southern Ocean, the recirculation of deep water into the Pacific Ocean, and the ventilation pathways and rates of Antarctic Bottom Water. A separate experiment is undertaken to examine CFC ventilation in the off-line tracer model for the purposes of comparing with existing observations. The model captures water-mass ventilation pathways very well, with the exception of downslope flow processes, which are poorly resolved in z -level models.