## Comparison of SAMW and AAIW formation rates in the South Pacific between NCAR-CCSM4 and hydrographic observations

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The formation of Subantarctic Mode Water (SAMW) and Antarctic Intermediate Water (AAIW) significantly contributes to the total uptake and storage of anthropogenic gases, i.e. CO2 and CFCs within the Southern Hemisphere. These water masses play an important role in the earth's heat, freshwater, carbon budgets and resupply of oxygen and nutrients to the subtropical oceans to sustain the marine ecosystem. The South Pacific is a principle formation site of SAMW and AAIW in the Southern Hemisphere. Within this study, we conducted a comparison of the large-scale distribution of CFCs in the South Pacific between the World Ocean Circulation Experiment (WOCE) and Climate Variability and Prediction (CLIVAR) hydrographic observations, and the simulations diagnosed from a five member ensemble average of the National Center for Atmospheric Research (NCAR) Community Climate System Model version 4 (CCSM4). In the model simulations, the CFC uptake within the South Pacific is underestimated compared to observations particularly in the density surfaces that define SAMW and AAIW. To quantify this bias, we compare observed and model formation rates of SAMW and AAIW based on CFC-12 inventories within SAMW and AAIW across the South Pacific. This research shows the importance of model and observational comparisons to better understand the physical mechanisms responsible for SAMW and AAIW formation and help to identify important biases in the simulation of these processes in climate models.