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A modelling assessment from glacial North Pacific deep water to modern intermediate water formation process

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North Pacific Intermediate water (NPIW) is a dominant water mass controlling ∼400-1200m depth North Pacific Ocean, meanwhile there is a cessation of North Pacific deep water (NPDW) formation in in modern observations. In contrast, paleoceanographic evidences have recorded NPDW formations during last glacial periods. This suggests either a rapid or gradual shutting down process of NPDW formation during the last deglaciation. Here, we use an Earth System Model to diagnose the physical and corresponding biogeochemical evolutions in the North Pacific Ocean before and after the last deglaciation, as well as potential changes during rapid climate shifts of the last deglaciation. Linked to different background climate conditions and varying Atlantic Meridional Overturning Circulation states, we characterize the modelled NPIW and NPDW changes and builds up linkages to marine records. Our results further develop our understanding about the deglacial switch from NPDW to modern NPIW-only formation process.