



## Western Weddell Sea deep water variability

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The northwestern Weddell Sea works as a catchment basin for all newly formed Weddell water masses before portions escape to the world ocean. This region, therefore, contains all the information on changes which occur to the Weddell Sea environment influencing water mass formation. Intensive hydrographic field work initiated by the international DOVETAIL project revealed that the northwestern Weddell Sea is subject to changes on time scales still to be determined. Recent observations as part of the ISPOL experiment showed that the observed variability is caused (as previously hypothesized) by intermittent formation of water masses which contribute to different types of Weddell Sea Bottom Water located high enough in the water column to cross the South Scotia Ridge. We have evidence that the western Weddell continental shelf produces at various sites a shelf water type beyond Gill's salt threshold (34.515) for the formation of deep and bottom waters which contribute significantly to the renewal of Antarctic Bottom Water. Ice shelf decay along the Antarctic Peninsula exposes larger continental shelf areas which accumulate saltier shelf water enhancing deep water formation. This might cause an increased on-shelf transport of warmer open ocean waters with the feedback of enhanced ice shelf melting and a fresher, more stable shelf water column but, in case of ice shelf decay, additional continental shelf exposure to the atmosphere and increased brine release due to sea ice formation.