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Greenland Sea warming: lateral exchange causes continuous trend at middepth

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The process of lateral heat advection in the Greenland Gyre at intermediate levels gains its importance from the fact that it modifies the intermediate waters incessantly and contributes hereby to the establishment of the vertical hydrographic structure which, in turn, determines the strength of winter convection decisively. In spite of this, the lateral heat input has not been the focus of field campaigns recently. The time record investigated here is a rare opportunity to quantify the lateral heat input into the Greenland Gyre at intermediate levels with a robust signal: convection was relatively weak during three successive winters (between summer 2003 and summer 2006). Below the convection depths modifications can therefore be observed without the interruption by vertical processes and a reliable trend can be determined. Exchange coefficients for the level between 1000 m und 1600 m are determined and heat content changes by lateral input from the rims are quantified.