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# On the role of dense water cascades in modification of water masses in the Arctic Ocean

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Ventilation of intermediate and deep Arctic waters by dense, brine-enriched, shelf-origin plumes is permanently addressed, but still poorly quantified shelf-basin interaction process. Major function of cascades is transport of water, dissolved and suspended constituents from shelves to the basin (horizontally) and from the upper layers to the deep layers (vertically). As a means of cross-slope exchange dense water cascades are of topical interest to climate studies, nutrient and carbon fluxes. Eurasian continental margin in the Arctic Ocean is the region where substantial transformation of Arctic water masses occurs. Well documented examples of this transformation include salinization of subsurface layer leading to formation of the so-called 'cold halocline' and rapid cooling/freshening of intermediate Atlantic origin water. According to recent experimental studies these processes could not be explained by vertical mixing alone, but require some lateral input of heat and salt. This input is very likely to originate on shallow shelves of in the Atlantic sector of the Arctic Ocean, which are also well-known for its potential in dense water formation. In this presentation, recent observations of cascading at the Eurasian continental margin of the Arctic Ocean are discussed on the basis of previous knowledge on this subject and model results. According to model results, the largest negative heat input associated with cascading occurs in the intermediate Atlantic origin water layer, while the largest salt input occurs in the overlaying 'cold halocline' layer. The magnitude of cross-slope heat and salt fluxes, associated with cascading is large enough to modify properties of intermediate waters in this part of the Arctic Ocean.