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Temperature waves influence on a top layer of sediments in the Arctic shelf seas

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Calculations of temperature waves in the Laptev Sea bottom sediments indicate that the optimum time for the most effective geochemical researches, which are related to sediments of the Arctic shelf seas, is a period between October and December or even later. Though this result is not absolutely general, it concerns the most interesting regions: in the first place – the regions where the bottom permafrost takes place, and secondly – the regions under the influence of fresh water fluxes space deviation which is determined by seasonal variability of the Great Siberian rivers overflows.

The main reason for taking interest in the above mentioned regions is associated with involving new layers of sediments into active reactions. Being initially frozen they became unfrozen because of heat penetration in a most deep layers exactly at that time. Temperature waves can play an important role in a process of unfreezing of ice layers in sediments, having been filled with fresh river water in summer time and this water would be frozen later, in winter, when cold high salinity ocean waters swell. These ice layers could be melted some months later after the maximum summer temperature of sea water takes place and so bottom gas exits could be opened at this time and then they should be frozen again.

Calculations were made on a basis of a simple one-dimensional heat diffusion equation with a boundary condition, obtained as an average annual dependence of a near bottom water temperature.

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