



Ray-tracing modeling of the propagation velocity of P-waves in the sedimentary cover and basement of the main structures in the Central Arctic.

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To determine the main features of the sedimentary cover and basement of the main structures in the Central Arctic, regional seismic 2D MCS survey and wide-angle reflection/refraction seismic sonobuoy soundings were carried out in 2011, 2012 and 2014 years. Depending on the severity of the ice conditions, seismic streamers of various lengths were used during 2D MCS survey: 4500 m streamer while surveying in open water and in slight accumulation of drifting ice; 600 m streamer in ice fields. For correct time/depth conversion of seismic sections obtained with a short streamer (600 m) wide-angle reflection/refraction seismic sonobuoy soundings were used.

To obtain the velocity parameters of the sedimentary cover and the basement, a 2D ray-tracing modeling of reflected and refracted waves from wide-angle sonobuoy data was carried out in SeisWide software. Ray-tracing modeling has been matched with 2D MCS data in order to take into account the effect of the main seismic boundaries relief on the velocity values. As a result, 2D velocity models of the sedimentary cover and basement were computed. On the basis of velocity models, the thickness map of the sedimentary cover was created and the velocity parameters of the intermediate seismic complex (base of stratified sediments) and the crystalline basement of the main structures of the Central Arctic were determined.

Finally, on the basis of the obtained seismic characteristics of the basement and potential fields data interpretation, the zoning by seismic types of the basement was carried out.