

The contribution of hydroisostasy to modern changes in sea level and vertical displacements of the solid surface of the Earth in the Far Eastern seas

Bulgakov, Rustam F. (<https://orcid.org/0000-0001-9095-3785>), r.bulgakov@imgg.ru

Institute of Marine Geology and Geophysics of the FEB RAS, Yuzhno-Sakhalinsk, Russia

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Abstract. Global warming causes further degradation of glaciers and the release of water into the World Ocean. The influx of additional water leads to a rise in sea level. The rate of modern water level rise is still influenced by the residual processes from the last global glaciation, with its maximum about 20 thousand years ago. The melting of large ice sheets in areas far from the centers of glaciation, such as the Far Eastern seas, caused the loading of the seabed with a 120 m layer of water – hydroisostasy – which caused vertical displacements of the seafloor and coastal areas. Although the influx of the glacier meltwater ceased 4–6 thousand years ago, due to the viscous properties of mantle layers, vertical displacements of the solid surface continue to this day, which contributes to the modern rise in water level in the seas of the World Ocean. The contribution of residual processes should be taken into account when assessing modern fluctuations in sea level and vertical displacements of the solid surface of the Earth. This study provides the estimated contribution of residual displacements associated with the consequences of the last global glaciation to the modern rise in sea level and vertical displacements of the solid surface of the Earth in the Far Eastern seas, which was obtained by numerical modeling. As a result of the conducted modeling, it was shown that the climatic rise in sea level is restrained by the negative contribution of hydroisostasy in geodynamically active zones.

Keywords:

hydroisostasy, relative changes in sea level, displacements of the solid surface of the Earth, rise in sea level

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