



HETEROGENEITIES OF S WAVE ATTENUATION FIELD IN THE REGIONS OF KURIL AND KAMCHATKA AND THEIR RELATION TO SEISMICITY

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By analogy with the vast region of South America, where seismicity level increased sharply after the deep-focus Bolivian earthquake of 09/06/1994 (Mw 8.2, h=635 km), we suppose, that similar effect can be observed in the regions of Kuril and Kamchatka after the great Sea of Okhotsk earthquake of 24/05/2013 (Mw 8.3, h=609 km). We have been studying characteristics of short-period shear wave attenuation field in the lithosphere of Kuril and Kamchatka to pick up zones of possible preparation for large and great earthquakes. We used a method, based on an analysis of maximum amplitudes ratio in Sn and Pn wave groups. We were studying recordings of earthquakes with hypocenter depths of 0-33 km, obtained by stations PET and KGB at distances of ~250-1050 km. A total number of ~350 earthquake seismograms from three areas, limited by coordinates of 45.0-50.5° N, 150-160° E, 52-54° N, 159-162° E and 54.0-56.5° N, 161-165° E correspondingly were processed.

As a whole, the lowest attenuation is observed in the southern area, and the highest – in the central one. Low attenuation corresponds to rupture zones of great earthquakes of 1952 (Mw 9.0) and 1963 (Mw 8.6), and high attenuation – to the zones of events of 1997 (Mw 7.8), 2006 (Mw 8.3) and 2007 (Mw 8.1). This data agrees well with earlier results, which show, that large and great subduction earthquakes occur in the areas of higher fluid content in the uppermost mantle. After large earthquake fluids are ascending into the earth's crust during a few decades, which leads to a “drainage” of the uppermost mantle.

The areas of higher attenuation, where no large earthquakes occurred during enough long time are of a special interest. Such areas are first of all rupture zones of large and great earthquakes of 1915 (Mw 7.9, northern Kuril), 1841 (M~8.4), 03.02.1923 (Mw 8.5) and 24.02.1923 (Mw 7.2), all in Kamchatka region. We believe that processes of preparation for large earthquakes occur in these areas.

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