

Intermediate-depth earthquakes and the connection of the seismicity with metamorphism and deep fluid regime in subduction zone for the North Island of New Zealand

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Abstract Резюме [Rus PDF](#)

We applied descriptive statistics to the distributions of intermediate-depth earthquakes for a well-studied area of the North Island of New Zealand. Data on the density of the number of earthquakes are studied in the coordinates: depth - distance from the upper boundary of the submerged plate. This approach shows that some clusters of hypocenters are confined to the upper boundary of the subduction plate, while others are significantly distant from this boundary. At the same time, structures of sharply increased earthquakes density are distinguished. It can be interpreted through certain quasi-linear relations between pressure and temperature in subduction slab. Future studies can check the correlations between these structures and particular fronts of metamorphic transformations in immersed plates. Also note that the seismogenic structure can be quite confidently distinguished by spatial distribution of the density of earthquakes. This peak is located at the region near the upper boundary of the subduction slab under the zone of arc volcanism. In the southern part of the studied subduction zone, where such volcanism is not developed, such seismically active structure is not observed. The obtained data in comparison with the data for other subduction zones may be useful for choosing from alternative models of deep and intermediate-depth seismicity that is most consistent with modern seismological data.

Keywords

intermediate-depth earthquakes, subduction zone, New Zealand, metamorphism, dehydrations reactions

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