

Structural and geological study of the zone of influence of the central part of the West Sakhalin fault

Yurii V. Kostrov, kos-geo@yandex.ru

Pavel A. Kamenev, <https://orcid.org/0000-0002-9934-5855>, p.kamenev@imgg.ru

Vladislav A. Degtyarev*, <https://orcid.org/0000-0001-8922-3654>, degtyarevvladislav96@yandex.ru

Institute of Marine Geology and Geophysics of the Far Eastern Branch of RAS, Yuzhno-Sakhalinsk, Russia

[Abstract PDF ENG](#) [_Резюме PDF RUS](#)

[Full text PDF RUS](#)

Abstract. Structural and geological studies were carried out as part of a comprehensive field research for studying the geological and structural characteristics in the area of the village of Boshnyakovo – the town of Shakhtyorsk (the Uglegorsky district, Sakhalin Island). It is shown that the change of the structural-facies zones of the Cenozoic section (from the Middle Eocene to the Lower Miocene) occurs in the Onnai – Goncharovka interfluvium. Large slickensides have been documented in the supposed zone of the Lesogorsk-Uglegorsk earthquake of 1924 with $MLH = 7.0$. Detailed measurements of the spatial orientation of slickensides were carried out in order to reconstruct tectonic stresses by tectonophysical methods. There is a predominance of horizontal extension in the structure of the studied slickensides, less often horizontal extension in combination with shear.

Keywords:

siliceous deposits, stresses, geological structure, tectonic disturbances, slickensides, fracturing

For citation: Kostrov Yu.V., Kamenev P.A., Degtyarev V.A. Structural and geological study of the zone of influence of the central part of the West Sakhalin fault. *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 2022, vol. 6, no. 1, pp. 5–12. (In Russ., abstr. in Engl.). <https://doi.org/10.30730/gtr.2022.6.1.005-012>

Для цитирования: Костров Ю.В., Каменев П.А., Дегтярев В.А. Структурно-геологическое изучение зоны влияния центральной части Западно-Сахалинского разлома. *Геосистемы переходных зон*, 2022, т. 6, № 1, с. 5–12. <https://doi.org/10.30730/gtr.2022.6.1.005-012>

References

1. Sim L.A., Bogomolov L.M., Bryantseva G.V., Savvichev P.A. **2017**. Neotectonics and tectonic stresses of Sakhalin Island. *Geodynamics & Tectonophysics*, 8(1): 181–202. (In Russ.). <https://doi.org/10.5800/GT-2017-8-1-0237>
2. Sim L.A., Kamenev P.A., Bogomolov L.M. **2020**. New data on the latest stress state of the earth's crust on Sakhalin Island (based on structural and geomorphological indicators of tectonic stress). *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 4(4): 372–383. (In Russ.). <https://doi.org/10.30730/gtr.2020.4.4.372-383>
3. Bogomolov L., Sim L., Kamenev P. **2020**. Neotectonics and stressed state patterns of the Sakhalin Island. (Chapter). *Intech Open. Engineering Geology*. (In Russ.). <https://doi.org/10.5772/intechopen.93522>
4. Golozubov V.V., Kasatkin S.A., Grannik V.M., Nechayuk A.E., **2012**. Deformation of the Upper Cretaceous and Cenozoic complexes of the West Sakhalin terrane. *Geotectonics*, 46(5): 333–351. <http://dx.doi.org/10.1134/S0016852112050020>
5. Golozubov V.V., Kasatkin S.A., Malinovskii A.I., Nechayuk A.E., Grannik V.M. **2016**. Dislocations of the cretaceous and cenozoic complexes of the northern part of the West Sakhalin terrane. *Geotectonics*, 50(4): 439–452. <https://doi.org/10.1134/s0016852116040038>
6. Marinin A.V., Sim L.A., Bondar I.V. **2021**. Variation of the stress-and-strain state of the Vuoksi Fault Zone area (Vyborg district). *Vestnik of Saint Petersburg University. Earth Sciences*, 66(2): 396–412. (In Russ.). <https://doi.org/10.21638/spbu07.2021.211>
7. Rebetsky Yu.L., Marinin A.V., Kuzikov S.I., Sycheva N.A., Sychev V.N. **2020**. Tectonophysical study of the Verkhovoi fault activity on the northern slope of the Kyrgyz ridge. *Geodynamics & Tectonophysics*, 11(4): 770–784. (In Russ.). <https://doi.org/10.5800/GT-2020-11-4-0506>
8. Obzhairov A.I. **2021**. Study of natural gases and their use as criteria for solving geological problems. [*The results of science in theory and practice 2021*]. Eurasian Scientific Association, 82(12–5). (In Russ.). <https://doi.org/10.5281/zenodo.5833172>
9. Voeikova O.A., Nesmeyanov S.A., Serebryakova L.I. **2007**. *Neotectonics and active faults of Sakhalin*. Moscow: Nauka Publ., 187 p.
10. Dymovich V.A., Evseev S.V., Evseev V.F. et al. (comp.) **2017**. *State geological map of the Russian Federation on a scale of 1:1,000,000. Third generation. The Far Eastern series. Sheet M-54 (Alexandrovsk-Sakhalinsky)*: Explanatory note. Saint Petersburg: Kartogr. fabrika VSEGEI, 609 p. (In Russ.). URL: https://webftp.vsegei.ru/GGK1000/M-54/M-54_ObZap.pdf
11. Gladenkov Yu.B. (ed.) **1998**. *Decisions of working Interdepartmental regional stratigraphic meetings on the Paleogene and Neogene of the eastern regions of Russia – Kamchatka, the Koryak Highlands, Sakhalin and the Kuril Islands*: Explanatory

note to stratigraphic schemes: Reviewed and approved by the Moscow Time on January 28, 1994. Moscow: GEOS, 147 p. (In Russ.).

12. Gladenkov Yu.B., Bazhenova O.K., Grechin V.I., Margulis L.S., Salnikov B.A. **2002**. *The Cenozoic geology and the oil and gas presence in Sakhalin*. Moscow: GEOS, 225 p. (In Russ.).
13. Heidbach O., Rajabi M., Cui X., Fuchs K., Müller K., Reinecker B., Reiter J., Tingay K., Wenzel F., Xie F., Ziegler M., Zoback M.L., Zoback M.D. **2018**. The World Stress Map database release 2016: Crustal stress pattern across scales. *Tectonophysics*, 744: 484–498. <https://doi.org/10.1016/j.tecto.2018.07.007>