Geosistemy perehodnykh zon = Geosystems of Transition Zones / Геосистемы переходных зон

2023, vol. 7, no. 2, pp. 132–148

URL: http://journal.imgg.ru/archive.html ; https://elibrary.ru/title_about.asp?id=64191

https://doi.org/10.30730/gtrz.2023.7.2.132-148 ; https://www.elibrary.ru/crpost

Seismicity of the South Far East of Russia in 2022

[1*] Dmitry A. Safonov, https://orcid.org/0000-0002-2201-2016, d.safonov@imgg.ru

[2] Elena P. Semenova, https://orcid.org/0000-0002-7435-961X, semenova@seismo.sakhalin.ru

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

[2] *Sakhalin Branch of the Federal Research Center "United Geophysical Survey of RAS", Yuzhno-Sakhalinsk, Russia*

Abstract PDF ENG Резюме PDF RUS Full text PDF RUS

Abstract. The paper presents a review of the seismicity of the southern part of the Russian Far East in 2022 based on the data from the catalog of the "Yuzhno-Sakhalinsk" Regional Information Processing Center of the Sakhalin Branch of the Federal Research Center "United Geophysical Survey of the Russian Academy of Sciences". The main parameters of the seismicity, such as the statistical estimation of seismicity level SESL'09, Benioff diagrams, density maps of conditional elastic deformation in 2022 compared to the previous longer time interval, are estimated. A brief analysis of the most significant and interesting earthquakes for detailed study is given. The seismicity of the Kuril-Okhotsk, Sakhalin and the Amur and Primorye regions in 2022 remained within the background values. At the same time, seismic activation was noted in the Sakhalin region, manifested in a number of moderately strong events on the northeastern shelf, in the Uglegorsky district, north of the Schmidt Peninsula, as well as a strong mantle event in the La Perouse Strait with Mw = 5.9. The strongest earthquake of the Kuril-Okhotsk region with Mw = 6.0 occurred in the southern part of the Kuril Island arc. A long series of moderately strong events in the Middle Kurils with Mw up to 5.6 attracts attention. The problem of operational processing of earthquakes in the Amur region and Primorye due to the decreasing number of seismic stations in this region is noted, as well as the systematic underestimation of the energy characteristics of deep-focus earthquakes.

Keywords:

earthquakes, seismicity, seismic activity, Amur region, Primorye, Sakhalin, Kuril-Okhotsk region

For citation: Safonov D.A., Semenova E.P. Seismicity of the South Far East of Russia in 2022. *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 2023, vol. 7, no. 2, p. 132–148. (In Russ., abstr. in Engl.). https://doi.org/10.30730/gtrz.2023.7.2.132-148 ; https://www.elibrary.ru/crpost

References

1. Safonov D.A., Semenova E.P. **2022.** Seismicity of the South Far East of Russia in 2021. *Geosistemy perehodnykh zon = Geosystems of Transition Zones,* 6(2): 85–99. (In Russ., abstr. in Engl.). https:// doi.org/10.30730/gtrz.2022.6.2.085-099
2. Sokos E., Zahradník J. **2013.** Evaluating centroid-moment-tensor uncertainty in the new version of ISOLA software. *Seismological Research Letters*, 84: 656–665. https://doi.org/10.1785/0220130002
3. Safonov D.A., Konovalov A.V. **2017**. Moment tensor inversion in the Kuril-Okhotsk and Sakhalin regions using ISOLA software. *Tikhookeanskaya geologiya*, 36(3): 102–112. (In Russ.). URL: http://itig.as.khb.ru/POG/2017/n_3/PDF_3_17/102-112.pdf
4. Kostylev D.V. **2021**. Formation of a unified system for collecting seismological information in the Sakhalin Division GS RAS. *Rossiiskii seismologicheskii zhurnal = Russian J. of Seismology*, 3(2): 41–53. (In Russ.). https://doi.org/10.35540/2686-7907.2021.1.03
5. Richter C.F. **1958.** *Elementary seismology*. New York: Freeman and Co., 768 p.
6. Gusev A.A., Mel'nikova V.N. **1990.** Relations between magnitudes: global and Kamchatka data. *Volcanology and Seismology*, 6: 55–63. (In Russ., abstr. in Engl.).
7. Saltykov V.A. **2011.** A statistical estimate of seismicity level: The method and results of application to Kamchatka. *J. of Volcanology and Seismology*, 5: 123–128. https://doi.org/10.1134/S0742046311020060
8. Poplavskaya L.N. (ed.) **2006.** [*Regional catalog of Sakhalin Island earthquakes, 1905–2005*]. Yuzhno-Sakhalinsk: IMGiG DVO RAN, 103 p. (In Russ.).
9. Kim Ch.U., Andreeva M.Yu. **2009.** [*Earthquake catalog of the Kuril-Kamchatka region (1737–2005)*]. Preprint. Yuzhno-Sakhalinsk: IMGiG DVO RAN, 126 p.
10. Safonov D.A., Nagornyh T.V., Kovalenko N.S. **2019**. *Seismicity of the Amur and Primorye regions*. Yuzhno-Sakhalinsk: IMGG FEB RAS, 104 p. (In Russ., abstr. in Engl.).

11. Solov'eva O.N., Solov'ev S.L. **1967.** Relationship connecting energy class and magnitude for the Kuril Is. earthquakes. *Izv. AN SSSR. Fizika Zemli*, 2: 13–23. (In Russ.).
12. Solov'eva O.N. **1978**. Determining the magnitudes of deep-focus earthquakes. *Izv. AN SSSR. Fizika Zemli*, 1: 25–35. (In Russ.).
13. Safonov D.A., Semenova E.P. **2022**. Regional magnitude M_{wa} in the Russian Far East. *Seismic Instruments*, 58(Suppl 1): S42–S57. https://doi.org/10.3103/S074792392207009X
14. Benioff H. **1951**. Earthquakes and rock creep: (Part I: Creep characteristics of rocks and the origin of aftershocks). *Bull. of the Seismological Society of America*, 41(1): 31–62. https://doi.org/10.1785/bssa0410010031
15. Chebrova A.Yu., Chemarev A.S., Matveenko E.A., Chebrov D.V. **2020**. Seismological data information system in Kamchatka branch of GS RAS: organization principles, main elements and key functions. *Geophysical Research*, 21(3): 66–91. https://doi.org/10.21455/gr2020.3-5
16. Konovalov A.V., Stepnova Yu.A., Stepnov A.A. **2023**. A strong earthquake on February 5, 2022 (ML 5.5) near a petroleum deposit on the northeastern shelf of Sakhalin Island. *Russian J. of Pacific Geology*, 17(1): 54–67. https://doi.org/10.1134/s1819714023010049
17. Safonov D.A. **2020**. Reconstruction of the tectonic stress field in the deep parts of the Southern Kuril-Kamchatka and Northern Japan subduction zones. *Geodynamics & Tectonophysics*, 11(4): 743–755. (In Russ.). https://doi.org/10.5800/GT-2020-11-4-0504