

Volcanic activity of the Kuril Islands in 2020–2021

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Abstract. The data on volcanic activity in the Kuril Islands during 2020–2021 are presented. The activity of Ebeko (Paramushir Island), Chirinkotan (Chirinkotan Island) and Sarychev Peak (Matua Island) volcanoes is characterized on the basis of satellite data and results of visual observations. In 2020–2021 a weak (to moderate) explosive eruption (VEI 1-2), which has begun in autumn 2016, continued on Ebeko volcano. During the period under review, at least 1169 emissions were recorded at a height of 1.5–3 (up to 5) km a.s.l. In the interval from May till July, a sharp increase in the explosive activity of the volcano was noted, during this time more than half of the total number of explosions occurred: 2020 – 298 out of 558, 2021 – 344 out of 611. The ashfalls of varying intensity were periodically observed in Severo-Kurilsk. The active phase of the eruption has ended in December 2021, only 2 weak explosions occurred. A moderate (VEI 2) explosive eruption took place on Chirinkotan volcano from August 8 to August 23, 2021. At least 12 volcanic explosions were recorded at a height of 1.5 to 4.5 km a.s.l. An effusive eruption was observed on the Sarychev Peak volcano from December 2020 till February 2021: the crater was filled with lava, after which it erupted along the northeastern slope of the edifice. In 2021, the activity of the volcano was characterized by manifestations of several episodes of an explosive nature: on June 29, July 1, August 6, and November 26, single, relatively weak ejections to a height of about 2.2–3 km a.s.l. were recorded (VEI 2).

Keywords:

Kuril Islands, volcano, eruption, volcanic ash, satellite images, remote sensing data

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References

1. Gorshkov G.S. **1967**. [Volcanism of the Kuril island arc]. Moscow: Nauka, 287 p. (In Russ.).
2. Snou G. **1992**. Zapiski o Kuril'skih ostrovah [Notes on the Kuril Islands]. *Krayevedcheskiy byulleten'*, 1: 89–127. (In Russ.).
3. Polonskiy A.S. **1994**. Kurily [The Kurils]. *Krayevedcheskiy byulleten'*, 3: 3–86.
4. Rybin A.V., Chibisova M.V., Degterev A.V., Guryanov V.B. **2017**. Volcanic eruptions in the Kuril Islands during XXI century. *Vestnik DVO RAN = Vestnik of the FEB RAS*, 1: 51–62. (In Russ.).
5. Loupian E.A., Bourtsev M.A., Balashov I.V., Bartalev S.A., Efremov V.Yu., Kashnitskiy A.V., Mazurov A.A., Matveev A.M., Sudneva O.A., Suchugov I.G., Tolpin V.A., Uvarov I.A. **2015**. IKI Center for collective use of satellite data archiving, processing and analysis systems aimed at solving the problems of environmental study and monitoring. *Sovremennyye problemy distantsionnogo zondirovaniya Zemli iz kosmosa = Current problems in remote sensing of the Earth from space*, 12(5): 263–284. (In Russ.).
6. Efremov V.Yu., Girina O.A., Kramareva L.S., Loupian E.A., Manevich A.G., Matveev A.M., Mel'nikov D.V., Proshin A.A., Sorokin A.A., Flitman E.V. **2012**. Creating an Information Service "Monitoring of active volcanoes of Kamchatka and the Kuril Islands". *Sovremennyye problemy distantsionnogo zondirovaniya Zemli iz kosmosa = Current problems in remote sensing of the Earth from space*, 9(5): 155–170. (In Russ.).
7. Gordeev E.I., Girina O.A., Lupyan E.A., Sorokin A.A., Kramareva L.S., Efremov V.Yu., Kashnitskiy A.V., Uvarov I.A., Burtsev M.A., Romanova I.M., Mel'nikov D.V., Manevich A.G., Korolev S.P., Verkhoturov A.L. **2016**. The VolSatView information system for monitoring the volcanic activity in Kamchatka and on the Kuril Islands. *J. of Volcano-logy and Seismology*, 10(6): 382–394. <https://doi.org/10.1134/s074204631606004x>
8. Valade S., Ley A., Massimetti F., D'Hondt O., Laiolo M., Coppola D., Loibl D., Hellwich O., Walter T.R. **2019**. Towards global volcano monitoring using multisensor sentinel missions and artificial intelligence: The MOUNTS monitoring system. *Remote Sensing*, 11: 1528. <https://doi.org/10.3390/rs11131528>
9. Kotenko T.A., Kotenko L.V., Stanimirova E.I. et al. **2010**. The eruption of the Ebeko volcano in January – June 2009 (Paramushir Island, Kuril Islands). *Vestnik KRAUNTS. Nauki o Zemle*, 1(15): 56–68. (In Russ.).
10. Menyajlov I.A., Nikitina L.P., Budnikov V.A. **1992**. [Activity of Ebeko volcano in 1987–1991: eruption character, their product features, danger for the city of Severo-Kurilsk]. *Volcanology and Seismology*, 5-6: 21–33. (In Russ.).

11. Belousov A., Belousova M., Auer A. et al. **2021**. Mechanism of the historical and the ongoing vulcanian eruptions of Ebeko volcano, Northern Kuriles. *Bull. of Volcanology*, 83(4). <https://doi.org/10.1007/s00445-020-01426-z>
12. Noveyshiyy i sovremennyy vulkanizm na territorii Rossii [*The latest and modern volcanism in Russia*]. **2005**. Moscow: Nauka, 604 p.
13. Degtyarev A.V., Chibisova M.V. **2020**. Volcanic activity on the Kuril Islands in 2019. *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 1(4): 93–102. (In Russ.). <https://doi.org/10.30730/2541-8912.2020.4.1.093-102>
14. Rybin A.V., Chibisova M.V., Degterev A.V. **2018**. Monitoring of volcanic activity in the Kurile Islands: 15 years of work SVERT group. *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 2(3): 259–266. (In Russ.). <https://doi.org/10.30730/2541-8912.2018.2.3.259-266>
15. Kotenko T.A., Sandimirova E.I., Kotenko L.V. **2018**. Eruptions of the Ebeko volcano (Kuril Islands) in 2016–2017. *Vestnik KRAUNTS. Nauki o Zemle = Bull. of KRAESC. Earth Sciences*, 1(37): 32–42 (In Russ.).
16. Firstov P.P., Kotenko T.A., Akbashev R.R. **2020**. Growth of explosive activity of Ebeko volcano in April–June 2020. *Vestnik KRAUNTS. Nauki o Zemle = Bull. of KRAESC. Earth Sciences*, 2(46): 10–15 (In Russ.).
17. Firstov P.P., Akbashev R.R., Makarov E.O., Kotenko T.A., Budilov D.I., Lobacheva M.A. **2020**. Geophysical observations of the Ebeko volcano's eruption (Paramushir Island, Russia) over the period September 2018 – April 2019. *Vestnik KRAUNTS. Nauki o Zemle = Bull. of KRAESC. Earth Sciences*, 1(45): 89–99. (In Russ.). <https://doi.org/10.31431/1816-5524-2019-3-43-89-99>
18. Degterev A.V., Chibisova M.V. **2020**. Activation of the Ebeko volcano in May–July, 2020 (Paramushir Island, Northern Kuril Islands). *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 4(4): 500–505. (In Russ.). <https://doi.org/10.30730/gtr.2020.4.4.500-505>
19. Ivanov B.V., Kirsanov I.T., Khrenov A.P., Chirkov A.M. **1979**. [Active volcanoes of Kamchatka and Kuril Islands in 1978–1979]. *Vulkanologiya i seismologiya*, 6: 94–100. (In Russ.).
20. Rybin A.V., Karagusov Y.V., Izbekov P. E. et al. **2004**. Monitoring of active volcanoes of the Kurile Islands: Present and future. In: *The 2nd International Conference on Volcanic Ash and Aviation Safety, June 21–24, Washington, USA*, p. 55–61.
21. Rybin A.V., Chibisova M.V., Degterev A.V. **2017**. Activity of Chirinkotan volcano (Chirinkotan Isl., the Northern Kuriles) in 2013–2016. *Sovremennyye problemy distantsionnogo zondirovaniya Zemli iz kosmosa = Current problems in remote sensing of the Earth from space*, 14(4): 76–84. (In Russ.). <https://doi.org/10.21046/2070-7401-2017-14-4-76-84>
22. Chibisova M.V., Rybin A.V., Degterev A.V. **2018**. The eruption of Chirinkotan volcano in 2017 according to Himawari-8 satellite data. *Sovremennyye problemy distantsionnogo zondirovaniya Zemli iz kosmosa = Current problems in remote sensing of the Earth from space*, 15(4): 112–118. (In Russ.). <https://doi.org/10.21046/2070-7401-2018-15-4-112-118>
23. Girina O.A., Manevich A.G., Melnikov D.V., Nuzhdaev A.A., Kashnitskiy A.V., Uvarov I.A., Romanova I.M., Sorokin A.A., Malkovsky S.I., Korolev S.P., Kramareva L.S. **2021**. Satellite monitoring of the explosive eruption of Chirinkotan volcano (Northern Kuriles) in 2021. *Sovremennyye problemy distantsionnogo zondirovaniya Zemli iz kosmosa = Current problems in remote sensing of the Earth from space*, 18(5): 321–327. (In Russ.). <https://doi.org/10.21046/2070-7401-2021-18-5-321-327>
24. Degterev A.V., Chibisova M.V., Zharkov R.V. **2021**. Activity of Chirinkotan and Sarychev Peak volcanoes in 2021 (Kuril Islands). *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 5(4): 354–360. (In Russ.). <https://doi.org/10.30730/gtr.2021.5.4.354-360>
25. Andreev V.N., Shancer A.E., Khrenov A.P. et al. **1978**. [Eruption of Sarychev Peak volcano in 1976]. *Bull. of the Volcanological Stations*, 55: 35–40. (In Russ.).
26. Shilov V.N. **1962**. [Eruption of Sarychev Peak volcano in 1960]. *Trudy SakhKNII*, 12: 143–149. (In Russ.).
27. Rybin A., Chibisova M., Webley P. et al. **2011**. Satellite and ground observations of the June 2009 eruption of Sarychev Peak volcano, Matua Island, Central Kuriles. *Bull. of Volcanology*, 73(4): 40–56. <https://doi.org/10.1007/s00445-011-0481-0>
28. Degterev A.V., Chibisova M.V. **2021**. Activation of Sarychev Peak Volcano in 2020–2021 (Matua Isl., the Central Kuril Islands). *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 5(2): 167–171. (In Russ.). <https://doi.org/10.30730/gtr.2021.5.2.167-171>