DOI: https://doi.org/10.37162/2618-9631-2022-2-168-180

Monitoring of surface ozone in the Karadag Nature Reserve in 2017–2021 / Lapchenko V.A., Kuznetsova I.N. // Hydrometeorological Research and Forecasting, 2022, no. 2 (384), pp. 168-180.

The background environmental monitoring station in the Karadag Nature Reserve is the only point for routine measurements (since 2010) of surface ozone on the Black Sea coast of the Russian Federation. Surface ozone observations at the station over the past five years are discussed. An insignificant interannual variability of surface ozone is shown as compared to the previous years. Seasonal and diurnal variations in surface ozone averaged over the period of 2017–2021 generally coincide with the previous period and are comparable with the typical variations at foreign Mediterranean stations. The surface ozone regime at the analyzed station is characterized by an insignificant diurnal amplitude: it is about 5 μg/m^3 in winter and increases by almost 3–4 times in the warm season. However, due to increased nighttime ozone, it remains significantly smaller than at lowland stations. In the dark time of the day, surface ozone is 50–55 μg/m^3 in winter and autumn and about 70 μg/m^3 in spring and summer. The surface ozone regime is significantly affected by the breeze circulation and, at night, by slope winds providing the influx of ozone from the free troposphere. At the background monitoring station, surface ozone values approaching the maximum single permissible concentration of ozone (MPCm.s.) are occasionally recorded. In spring, such events are associated with the movement of the upper-level frontal zone over the region. The registered cases of exceeding MPCm.s. were observed in the plumes of air polluted in remote areas and spreading to Crimea.

Keywords: surface ozone, Karadag Nature Reserve, seasonal and diurnal variation, maximum permissible concentration of ozone

Tab. 1. Fig. 5. Ref. 21.