The impact of observed climate changes on the transport sector (the case of Pskov, Smolensk and Bryansk regions). Stadnik V. V., Klueva M. V., Zadvornykh V. A., Samoylova E. P. Proceedings of MGO. 2020. V. 599. P. 7—25.

Ground transportation is one of the most weather-dependent economy sectors. The article considers the impact of climatic changes on two types of transportation facilities - highway and railway sectors that prevail in the transport structure of the Russian regions bordering the Republic of Belarus.

Keywords: tailored climate parameters, hazardous weather, impact, adaptation.

Fig. 2. Tab. 7. Ref. 10.

Microclimatic approach to the estimation of snow cover spatial variability in mountainous relief with insufficient meteorological information. Pigoltcina G. B., Fasolko D. V. Proceedings of MGO. 2020. V. 599. P. 26—44.

A methodology for detailed quantitative assessment of the spatial variability of the snow cover characteristics in the conditions of difficult terrain and insufficient meteorological information is described. Microclimatic corrections are determined and calculation data of specialized snow cover indices for the mountainous relief of the Anyui ridge are presented.

Keywords: snow cover, mountainous relief, altitude variability.

Fig. 4 Tab. 6. Ref. 12.

Measurements of dissolved in water GHG concentrations and calculations of gas exchange between reservoirs and atmosphere. Zinchenko A. V., Privalov V. I., Ivakhov V. M. Proceedings of MGO. 2020. V. 599. P. 45—58.

A theoretical description and an example of practical implementation of measurements of the concentration of greenhouse gases dissolved in the water by a chromatographic head-space method were given. In contrast to the standard theory of the head-space method, the dynamics of the tendency of the gas concentration in the head space to a stationary value was considered and estimates of relaxation times for various gases were given. The method was implemented for measuring CO_2 and CH_4 in a natural reservoir. The obtained concentrations of dissolved gases were compared with the literature data, and the consistency of the results was shown. Using the measured concentrations of dissolved gases, the calculated estimates of the CO_2 and CH_4 flux densities from the surface of the reservoir were obtained. Estimates of the accuracy of flux calculations were carried out. A conclusion was made about the reliability of the method for measuring the concentration of dissolved gases and the satisfactory accuracy of the flux calculations.

Key words: climate, greenhouse gases, water bodies, measurements

Tabl. 3. Ref. 17.

Comparison of results of evaporation from water surface long-term observations using heat-insulated evaporator SHI-3000TM with data of SHI Valdai branch water-evaporation complex. Kalyuzhny I. L., Reshetnikov F.Yu. Proceedings of MGO. 2020. V. 599. P. 59—73.

The article presents the results of the temporal and spatial variability of observed evaporation values obtained for the water evaporation basins and the evaporators of the Valdai branch of the State Hydrological Institute (SHI). It is shown that the absence of heat exchange between a heat-insulated evaporator and the surrounding soil causes a decrease in its reduction coefficients, in comparison with the SHI-3000 network evaporator, and ensures their stable values, on average, close to $0,81 – 0,82$. The values of the heat-insulated evaporator installed on dry land coincide with the analogous evaporation values for a 20 m² basin located on a raft, which corresponds to evaporation from the surface of the reservoir.

Key words: evaporation from water surface, heat-insulated evaporator, transition coefficients, average long-term characteristics, Valdai

Fig. 4 Tab. 6. Ref. 21.

Discretization and Infographics in Regulatory Calculations of Air Pollution. Ziv A. D. Proceedings of MGO. 2020. V. 599. P. 74—92.

The article deals with the organization of calculations and display of results when assessing air pollution in large areas. The main goal was to obtain the more accurate results with a reasonable increase in the amount of computation compared to the current practice. Among two proposed approaches the first one is irregular nested grids are dependent on sources location and ignored sanitary protection zones of enterprises. In the second one a piecewise constant function is obtained which is the concentrations upper bound at the each grid cell. Evaluations of the effectiveness of both methods are given based on the proposed methodology of such evaluations. The issue of results infographics is also considered.

Fig. 4. Tab. 3. Ref. 13.

Testing the accuracy of temperature profile calculations using the NRLMSISE-00 model for St. Petersburg. Volobueva O. V., Drobzheva Ya. V., Ivanova I. A., Toptunova O. N. Proceedings of MGO. 2020. V. 599. P. 93—103.

The results of a joint analysis of quantitative estimates of errors in calculating altitudinal and seasonal variations in air temperature obtained using the atmospheric model (NRLMSISE-00), based on their comparison with experimental data for the St. Petersburg region, are presented.

Fig. 5. Ref. 9.

Validation the predictive fields of meteorological elements of the global atmospheric model on the average periods based on aerological sounding data for the Central part of the North Caucasus. Kagermazov A. Kh., Sozaeva L. T. Proceedings of MGO. 2020. V. 599. P. 104—114.

On the basis of correlation analysis it was assessed the degree of agreement (validation) of predictive values of the atmospheric stratification (132 hours in advance), obtained from the global atmospheric model (GFS NCEP) with the actual data of upper-air sounding of meteorological station in the Central part of the North Caucasus («Mineralnje Vodi», «Divnoje»). It shows a good agreement between the predictive and actual data, despite on the rather long advance time.

Keywords: validation, the output of the global model, the upper-air sounding, advance time, correlation.

Fig. 4. Tab. 1. Ref. 11.

Calculation of the zone of infrasound monitoring of small-scale earthquakes on single-jump routes for the Tien-Shan seismic region. Drobzheva Ya. V. Proceedings of MGO. 2020. V. 599. P. 115—127.

The zones of infrasonic monitoring of low-magnitude earthquakes in the Tien Shan region with an infrasound unit on single-hop paths for various geophysical conditions are calculated. The calculation results are confirmed experimentally by analyzing infrasound records during an earthquake.

Keywords: infrasound, waves, earthquake, model, experiment

Fig. 7. Ref. 5.

Equipment, technique and preliminary results of measuring the specific charge on the particles of the reagent formed by exposure of the pyrotechnical compositions. B. M. Khuchunaev, S. O. Gekkieva, A. Kh. Budaev. Proceedings of MGO. 2020. V. 599. P. 128—139.

This article presents the results of laboratory experiments on testing equipment and methods for determining the specific charge on reagent particles formed during the sublimation of the AgI reagent and AD-1 pyrocomposition. The method for measuring charged particles is based on the use of the deflection of reagent particles in the electric field of a flat capacitor. Preliminary results obtained in the course of research made it possible to establish that when pyrotechnic compositions are sublimated, particles are charged, and the ratio between negative and positively charged particles is 7: 3.

Keywords: active influences, pyrotechnic composition, reagent, ice-forming particles, electricity, cloud, sublimation, specific charge.

Fig. 5. Tab. 1. Ref. 13.

Backscatter of radar radiation by cloud and rain drops. Sozaeva L. T., Zhaboeva M. M. Proceedings of MGO. 2020. V. 599. P. 140—150.

The results of calculations of the characteristics of backscattering of electromagnetic radiation from drops using the Separation of Variables Method (SVM) algorithm for non-spherical particles are presented, assuming that drops falling in clouds and precipitation are deformed, taking the shape of an oblate spheroid. For comparison, the backscattering factors calculated by the Mie algorithm and in the Rayleigh approximation for spherical drops are given. Analysis has shown that when inverted the microstructural characteristics of hail clouds and precipitation from radar measurements (DMRL-C), it is necessary to use the method of separating SVM variables for spheroidal particles.

Keywords: backscatter cross sections, variable separation method, hydrometeors, radar methods, hail clouds, dual polarization.

Fig. 2. Tab. 1. Ref. 10.

The development of the concept of using mobile stations of impact on hail processes. Alita S. L., Borisova N. A. Proceedings of MGO. 2020. V. 599. P. 151—161.

The article is devoted to the development of the concept of using mobile stations on hail processes. The article analyses the existing system of anti-hail protection with the purpose of identifying weak points caused by the immobility of impact stations. The analysis was made on the basis of the material presented in the annual reports of the Stavropol paramilitary service for the period from 2010 to 2019. As a result, a variant of the methodology for using mobile stations of impact on hail processes has been obtained.

Key words: impact station, anti-hail works, hailstorm, protected area, anti-hail missile.

Tab. 3. Fig. 2. Ref. 11.

On the impact of aircrafts traffic on the development of cumulonimbus clouds. Kuznetsov A. D., Lyalushkin A. S., Mikhaylushkin S. Y., Solonin A. S., Teterin E. A. Proceedings of MGO. 2020. V. 599. P. 162—175.

Value of information about the appearance of a significant number of aircraft engine products at the maneuvering level (600 meters) in the airport area for quality of operational weather forecast for aviation was illustrated on the example of the conditions for the development of a powerful cumulonimbus clouds on June 07, 2019 in the South-West of St. Petersburg (near Pulkovo airport). Review of climate and current weather conditions was performed. The trajectories of aircraft movement constructed using the location data of the air traffic management system (automated dependent surveillance-ADS) are superimposed on the radio echo contours of dangerous weather phenomena obtained from an automated meteorological radar system «Meteor-Meteocell».

Keywords: automated weather radar system, AWRS, automated dependent surveillance, ADS, air traffic management, ATM, cumulonimbus clouds, short term weather forecast, thunderstorm.

Fig. 3. Ref. 16.