Taking into account the non-stationarity of meteorological series during averaging Kobysheva N. V., Nitsis V. E. Proceedings of MGO. 2019. V. 594. P. 7—14.

One of the tasks of applied climatology is to determine the accuracy of the climate information used, which largely depends on the size of the data sample. Presents a methodology for estimating the duration of a calculation period for regulatory climatic parameters. The rationale for its application in applied climatology is considered.

Keywords: processing period, stationarity, applied tasks

Fig. 1. Ref. 11.

Creation of electronic climate directories for the regions of the Russian Federation adjoining the Republic of Belarus. Razuvaev V. N., Korshunova N. N., Davletshin S. G., Trofimenko L. T. Proceedings of MGO. 2019. V. 594. P. 15—23.

The article considers the progress of work in creating the regional electronic climate directories for the Smolensk, Pskov and Bryansk Regions. Geographic, climatic and economic peculiarities of these regions were studied at the first stage. The content and structure of the regional directories were developed. At the second stage, software for creating specialized data sets to calculate characteristics of the regional directories was developed and the data sets of different time resolution for meteorological stations of the Smolensk Region were created. The studies conducted by RIHMI-WDC are part of the research work Developing the System of Climatic Service Provided to the Public and Economic Sectors of the Russian Federation and the Republic of Belarusthat is carried out under the Union State Programme Developing the System of Hydrometeorological Safety of the Union State.

Keywords: words:specialized climatological service, electronic climate directory, climate information, specialized data sets.

Tab. 1. Ref. 10.

Materials to the atlas of satellite Synthetic Aperture Radar (SAR) signatures of the ice cover of the Arctic seas. Part 1. Retrieval of hazardous ice phenomena by use of SAR satellite remote sensing data and their applications for the optimization of ice navigation in the Arctic seas and the estuaries of great Siberian rivers. Melentyev V. V., Melentyev A. V., Smirnova A. S., Chernook V. I., Paschenko B. Ye., Pettersson L. H. Proceedings of MGO. 2019. V. 594. P. 24—62.

The paper deals with the retrieving physical parameters of different sea ice types and dangerous ice phenomena in the Arctic Ocean. It includes an Atlas of satellite SAR microwave signatures, image examples as well the application of SAR based sea ice information for planning of ship routing and prevention of accidents in ice covered waters. In absence of the in situ instrumental measurements or visual observations, the SAR signatures of the frazil ice are investigated and recommendations on how to avoid the risk of icing on the ships. Validation of the classified and interpreted satellite SAR images are provided using airborne (An-24 *Arctic* and L-410 *Nord* aircrafts) and in situ shipborne validation observations (nuclear icebreakers *Sovetsy Souz*, *Arctica*, *Yamal*, *Rossia*, *Vaigash* and *Taimyr*). The SAR signatures of the frazil ice, grease ice, slush, shuga, nilas (dark and light) and ice edge were investigated. Some examples of the SAR based retrieval of the zones of quasi-stationary cracks and fractures are presented and used for planning of ice routing and tactical navigation in the Russian Arctic seas and inside the Central Ice Massif.

Keywords: Northern Sea Route, remote sensing, SAR signatures, dangerous ice phenomena, ice river, Novaya Zemlya, The Central Ice massif, ice cracks and deformation.

Fig. 18. Ref. 25.

Methodology of assessment and prediction of climate parameters in the conditions of non-stationary climate. Kalyuzhny I. L., Lavrov S. A. Proceedings of MGO. 2019. V. 594. P. 63—81.

Basing on the complex of field and laboratory investigations the main thermo physical characteristics of the active layer are analyzed for dominant types of drained marshes over the Kola peninsula. It is shown that degree of the active layer moistening is the main factor affecting changes in volumetric heat capacity, coefficients of temperature conductivity and heat diffusivity. Density of peat dry residue effects in a less degree. Coefficient of heat diffusivity increases into the thawed and frozen active layer increases under volumetric water content rising. Fixed is general dependency of thermo physical characteristics changes on volumetric water content for drained marshes of the Kola peninsula.

Keywords: thermo physical characteristics, natural and drained marshes, the Kola peninsula.

Tabl. 5, Fig 5, Ref. 8.

Comments on the paper «Calculation of air pollution using boundary integral equations» by A. D. Ziv. Genikhovich E. L. Proceedings of MGO. 2019. V. 594. P. 82—90.

The presented paper is devoted to critical comments on the article by A. D. Ziv, published in Proceedings of the MGO, vol. 590. It is proposed in the last article to generalize the current regulatory document «Methods for calculating the dispersion of emissions of harmful (polluting) substances in atmospheric air» in terms of taking into account the effects of the velocity of the dry deposition of pollutants, Vd, when calculating the long-term mean concentrations. On the contrary to the statement in the paper, that the formal apparatus used there allows for taking into account the arbitrary dependence of Vd on the spatial coordinate, it is shown now that these calculations are justified only for constant Vd. It is noted, however, that for such Vd it is computationally more efficient to use a tabulated numerical solution of the diffusion equation. The practical feasibility of such calculations with constant Vd, however, seems doubtful due to the inability to correctly establish the value of these constants for real cities.

Keywords: weather and climate risks, climate change, adaptation actions.

Ref. 10.

Calculations of air pollution taking into account dry deposition. Responses to the comments of E. L. Genikhovich. Ziv A. D. Proceedings of MGO. 2019., V. 594. P. 91—94.

In response to the publication of E. L. Genikhovich «Comments on the paper... » some explanations are given. The author agrees that it is worth to use the constant averaged dry deposition velocity Vd in the urban environment calculating concentration taking with account for dry deposition. This seems to be mentioned in fact in the criticized article. Furthermore some arguments in a favor of using variable Vd for the significant distances from the city are given. In this case the average values are obtained for the consecutive clusters (disk segments). The author admits that the use of the one-dimensional diffusion equation to describe the effect of dry deposition, as well as a number of others, is, of course, simpler from the point of the description itself. However, the result is another model, it differs from standard one in case of Vd = 0. Note that the use of standard model is a crucial point of paper «Calculation of air pollution using boundary integral equations». As to more computational efficiency, it looks not obvious without some justification.

Keywords: weather and climate risks, climate change, adaptation actions.

Ref. 5.

To calculate the responses of the atmosphere on local thermal and dynamic impacts. Kh. Ingel. Proceedings of MGO. 2019. V. 594. P. 95—106.

The nonlinear integral model of turbulent thermals is developed in a number of ways. In particular, the three-dimensional motion of thermals from local sources of heat and/or momentum in the shear flow is considered. Additionally, the possibility of the presence in the thermal volume sources of heat and impulse. The general analytical solution, expressed in quadratures, depends on the stratification conditions, the shear of the background flow and the sources mentioned. Solutions describe different modes of thermal dynamics. Intensification of involvement due to the interaction of the thermal with the cross-flow can lead to a more rapid expansion of the thermal and a decrease in its mobility. Analyzed specific examples with downward movements generated by sources of impulse.

Keywords: thermal, convection, turbulence, integral models, shear flows, nonlinearity, analytical solutions.

Fig. 1. Ref. 9.

Estimation of the contribution of different hydrometeors to the total radar reflectivity in hail clouds. Kagermazov A. H. Sozaeva L. T. Proceedings of MGO. 2019. V. 594. P. 107—119.

The results of numerical simulation of the evolution of the hail cloud, the time course of radar reflectivity and its change with height are presented. Estimation of the contribution of different sorts of hydrometeors to the total radar reflectivity was carried out. It is shown, that by the contribution of raindrops to the reflectivity at a wavelength of 10 cm can be neglected, and on a wavelength of 3,2 cm the contribution of raindrops must be taken into account on solving the inverse problems of the scattering theory. By contribution of cloud droplets and crystals at both wavelengths can be neglected.

Keywords: hail clouds, radar reflectivity, distribution function of droplets and hailstones, wavelength.

Fig. 1. Tab. 2. Ref. 9.

Extreme temperature regime of the cold period in the south of Western Siberia. Volcova M. A., Cheredko N. N., Titovskaya A. A., Zhuravlev G. G., Proceedings of MGO. 2019. V. 594. P. 120—136.

The paper presents the results of the spatio-temporal assessment of extreme temperature phenomena of the cold season in the south of Western Siberia for 1961–2016. The extremity indicators are analyzed at different temporal intervals in order to identify the dependence of abovementioned phenomena on the directionality of global climate trends. During the period of the highest global warming (1976–1997) a decrease in extremeness in the temperature regime of the cold season was revealed. The frequency of extreme temperature conditions under "slowing down of warming" period (1998–2016) has shown an increase compared with the phase of the highest global warming rates at most stations, and on parts of the stations it exceeded the indicators of the period of the climatic norm.

Keywords: extreme temperature phenomena, cold season, Western Siberia.

Fig. 3. Tab. 2. Ref. 23.

The results of the study of the recurrence of snowstorms in the territory of the Tomsk region are presented. The features of their long-term regime and spatial distribution are discussed. The decrease of the number of days with a snowstorm and the average duration of blizzards has been observed in the last three decades. The highest values of repeatability and duration of snowstorms are observed at meteorological stations located along the riverbed of the Ob River. Reduction in the frequency of snowstorms occurs amid decreasing wind speeds. This is largely due to changes in the general circulation of the atmosphere. Namely - a period of low frequency of the eastern form of circulation. The previously established long-term tendency to an increase in air temperature over Western Siberia during the winter months led to a weakening of the gradients of surface pressure. The consequence of this was a decrease in wind speed values.

Fig. 5. Ref. 22.