The impact of observed climate changes on the energy industry (the case of Pskov, Smolensk and Bryansk regions). Akentyeva E. M., Klueva M. V., Fasolko D. V. Proceedings of MGO. 2019. V. 595. P. 7—21.

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: hazardous weather, climatic loads, climate change, electricity, power lines.

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

Comparison of the characteristics of multipoint thunderstorm systems. Snegurov A. V., Snegurov V. S. Proceedings of MGO. 2019. V. 595. P. 22—62.

The results of comparing the effectiveness of multipoint thunderstorm systems are presented.

Keywords: probability of detection, accuracy of measurements, thunderstorm system.

Fig. 18. Tab. 11. Ref. 41.

Numerical Simulation of Impact of Electrical Processes on the Formation of Dangerous Phenomena Associated with Convective Clouds. Dovgalyuk Yu. A., Veremey N. E., Toropova M. L., Sinkevich A. A., Mikhailovsky Yu. P. Proceedings of MGO. 2019. V. 595. P. 62—82.

A modified numerical non-stationary three-dimensional model was used to simulate the evolution of a convective storm cloud in three cases with different temperature and humidity structure of the atmosphere.

It is found that corona discharges in some atmospheric situations play a significant role in the evolution of the cloud and associated dangerous weather phenomena. These discharges contribute to the freezing of water droplets at lower temperatures and therefore lead to faster crystallization of the convective cloud.

The nature and degree of impact of corona discharges on the formation and development of dangerous phenomena associated with convective clouds (showers, hail, thunderstorms) significantly depend on the proportion of supercooled liquid part of the cloud from its total volume. If this proportion is large enough, the intensity of hail and thunderstorm activity increases by tens of percent. Otherwise, the contribution of corona discharges to the crystallization of the cloud is insignificant, there is only a shift of the maxima of these values in time: thunderstorm and hail both begin and stop earlier.

Keywords: numerical simulation, electrical processes, three-dimensional model, dangerous phenomena, convective clouds.

Fig. 5. Tab. 2. Ref. 18.

Materials to the Atlas of satellite synthetic aperture radar signatures of the ice cover of the Arctic seas. Part 2. SAR signatures of the ice cover in the Central Oceanic Ice Massif and recommendation for the ship routing in high altitudes. Melentyev V. V., Melentyev A. V., Chernook V. I., Paschenko B. Ye., Smirnova A. S., Pettersson L. H. Proceedings MGO. 2019. V. 595. P. 106—131.

The results of thematic interpretation of satellite SAR surveys of the ice cover of the Central Arctic basin (including the foreign Arctic), which are part of the Atlas of SAR signatures of the Arctic seas, recommended as a guide for skippers working on the Northern Sea Route, are presented.

The possibility of ice drifting at high latitudes is confirmed by SAR data for mapping the spatiotemporal variability of perennial ices of the Central Ocean massif and its spurs (Spitsbergen, North Kara, Taimyr, Ayonsky, Chukotsky), including the process of formation of the Novaya Zemlya local massif of drifting ice and other key water area.

Keywords: Northern Sea Route, the Central Oceanic Ice Massif, the Spitsbergenskiy, Severokarskiy and Aionskiy spurs of COM, the local Novozemelskiy ice massif , multi-year ice, ice breccia, polynyas, fractures, remote sensing, SAR signatures.

Fig. 15. Ref. 31.

Physical and statistical empirical model of development of lightning activity of convective clouds. Mikhailovsky Yu. P., Popov V. B., Sinkevich A. A., Abshaev A. M., Abshaev M. T., Adzhiev A. H., Gekkieva J. M., Senyukov V. V. Proceedings of MGO. 2019. V. 595. P. 83—105.

On the basis of MRL-5 and LS8000 data on the development of 100 clouds, a physical and statistical empirical model of the development of lightning activity of convective clouds was developed. The analysis of the model showed significant differences in the 40 monitored cloud characteristics during the two scans (at the time of the first discharges and before them). The greatest differences were manifested in the volume and water content of the supercooled part of the cloud. The model can be used to verify numerical models and develop new methods for forecasting and diagnosing weather hazards associated with convective clouds.

Keywords: thunderstorm, lightning, radar, lightning direction finding, empirical model statistical methods, North Caucasus.

Fig. 4. Tab. 2. Ref. 35.

Materials to the Atlas of satellite synthetic aperture radar signatures of the ice cover of the Arctic seas. Part 2. SAR signatures of the ice cover in the Central Oceanic Ice Massif and recommendation for the ship routing in high altitudes. Melentyev V. V., Melentyev A. V., Chernook V. I., Paschenko B. Ye., Smirnova A. S., Pettersson L. H. Proceedings MGO. 2019. V. 595. P. 106—131.

The results of thematic interpretation of satellite SAR surveys of the ice cover of the Central Arctic basin (including the foreign Arctic), which are part of the Atlas of SAR signatures of the Arctic seas, recommended as a guide for skippers working on the Northern Sea Route, are presented.

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Fig. 15. Ref. 31.

Modeling size of hydrometeors at artificial cloud modification. Kuznetsov A. D., Kryukova S. V., Simakina T. E. Proceedings of MGO. 2019. V. 595. P. 132—144.

The water content and radius of hydrometeors over the cross section of a cumulonimbus cloud with a change of the intense crystallization level height caused by the artificial cloud modification were simulated.

Keywords: water content simulation, hydrometeors size, intensive crystallization level, artificial cloud modification.

Fig. 5. Tab. 1. Ref. 17.

Statistical analysis of the lightning discharges frequency (cloud—cloud type) in the North Caucasus republics and the Stavropol Territory. Proceedings of MGO. 2019. V. 595. P 145—152.

The paper presents a statistical analysis of lightning activity on the territory of the North Caucasian republics and Stavropol Territory depending on terrain stats. Statistical characteristics of the cloud—cloud lightning were analyzed for the period 2009—2018.

Studies have shown that, on average, most thunderstorms occur at altitudes from 500 to 1000 m, with the peak of lightning activity formed over any terrain in addition to the highlands, fall on June. For the highlands, there was an increase in the number of thunderstorms per square kilometer from may to September.

Keywords: lightning, terrain stats, weather radar, groepelingen.

Fig. 3. Ref. 9.

Corrosion rate change of metals in the coastal zone of the mediterranean sea. Pershina N. A., Polischuk A. I., Semenets E. S., Ionin V. A., Pavlova M. T. Proceedings of MGO. 2019. V. 595. P. 153—168.

Observation results of corrosion rate of the metal samples exposing on the coast of the Mediterranean Sea are generalized. The corrosion rate change from the sea edge, the relief of the coastal strip and the concentration of corrosive agents in the atmosphere is shown.

Keywords: corrosion rate, corrosive agents of the atmosphere, sea water, relief of the coastal strip, intensity of chlorides and sulfates deposition.

Fig. 7. Ref. 12.

Local and global factors determining changes in the aerosol optical thickness of the atmosphere Moscow. Gorbarenko E. V. Proceedings of MGO. 2019. V. 595. P. 169—189._

The results of monitoring the aerosol turbidity of the atmosphere, conducted at the Meteorological Observatory of Moscow State University since 1955, are analyzed. The features of the variability of the aerosol turbidity of the atmosphere in Moscow in recent decades in comparison with the entire observation period are considered. The peculiarities of the variability of the aerosol turbidity of the atmosphere are considered in relation to the interannual variability of the indices characterizing the variability of the atmosphere in the Northern Hemisphere. It has been shown that in the 21st century the tendency towards a decrease in aerosol turbidity continued, and now it has intensified. An assessment of the possible causes contributing to its significant reduction in this period is made.

Keywords: series of observations, aerosol optical thickness of the atmosphere, aerosol turbidity, anthropogenic pollution.

Fig. 8. Tab. 3. Ref. 23.

Winter slippery conditions on the roads for khanty-mansi autonomous okrug – Uugra. Kuzhevskaya I. V., Volkova M. A., Nechepurenko O. E., Kiryakov E. I., Chursin V. V. Proceedings of MGO. 2019. V. 595. P. 190—203.

The results of evaluating the winter slippery period on a road network in the Khanty-Mansi Autonomous Region-Yugra are presented based on calculated specialized indicators. It is shown that the winter slippery period begins in the first decade of October and lasts until the third decade of April, amounting to 155–190 days over the cold period. The data on the number of days per year with different intervals of negative temperatures allow the calculation of the ratio of requisite anti-icing materials for the cold period. The number of days with possible events of winter slipperiness formation in areas with the highest density of the road network has increased since 2011, while the duration of the period with slick roads remains almost unchanged. This leads to an increase in the number of treatment required to retain the quality and efficiency of work when maintaining public roads to ensure road safety.

Keywords: winter road maintenance (WRM), roadway safety and mobility, adverse winter weather conditions

Fig. 3. Tab. 2. Ref. 16.