

Impact of global warming on the agriculture of arid zones of middle asia in the mid xxi century based on the ensemble of regional climate model projections. Shkolnik I. M., Pigoltsina G. B., Efimov. S. V. Proceedings of MGO. 2018. V. 588. P. 5–49.

The assessment of global warming impacts on agroclimatic conditions of the growth of the leading agricultural crops of Central Asia (cotton, spring wheat and spring barley) is carried out. Future climate has been projected by the ensemble of regional climate model with high spatial resolution under the IPCC RCP8.5 scenario. Calculations of the changes in agroclimatic indicators are performed using the ensemble mean climate changes as well as extremely strong and weak changes in the ensemble. By and large, based on ensemble mean projection for the mid XXI century, the boundaries of cotton cultivation can shift northwards up to 500 km and the area of cotton cultivation will increase significantly. Global warming in general will positively affect the agro-climatic conditions of cultivation of spring crops, grown on the rainfed lands of Central Asia. The expected growth of the hydrothermal coefficient (SCC), as a result of a shift in the vegetation period with an increase in temperature can amount to 25–30 % for the ensemble mean changes, and 45–50 % for the largest predicted warming in the ensemble.

Keywords: global and regional climate change, regional climate model, arid region, agroclimatic indicators, cotton, spring wheat, barley.

Tab. 2. Fig. 37. Ref. 19.

Background Stratospheric Aerosol and It's Radiative Characteristics According to Data of Lidar Observations in 2014- 2017. Korshunov V. A. Proceeding of MGO. 2018. V. 589. P. 50–73.

Results of lidar sensing of stratospheric aerosol over Obninsk city are presented for background volcanic period 2014–2017. Sources of elevated aerosol content at lower stratosphere are revealed by means of methods of trajectory analysis. Results of measurements of integral backscattering coefficients and estimates of optical thickness of stratospheric aerosol are presented. Radiative parameters of stratospheric aerosol for background period under considerations are estimated.

Keywords: lidar, stratospheric aerosol, radiative characteristics, climate.

Tab. 3. Fig. 7. Ref. 26.

Studying the efficiency of modifying a convective cloud with hygroscopic and ice-forming agents. Belova L. K., Drofa A. S. Proceeding of MGO. 2018. V. 589. P. 74–97.

The effects of hygroscopic and ice-forming agents on the convective cloud were studied with the use of a numerical 3D-model. Concrete characteristics of agents (the polydisperse salt powder and ice-forming pyrotechnic compound) were taken into consideration. Based on the results of numerical simulation optimal regimes of agent introduction into a cloud for obtaining maximum possible amounts of additional precipitation amounts were determined. It has been shown that the effect of precipitation enhancement under modification is attained due to transformation of cloud drops into precipitation particles (liquid or solid). The most efficient modification impact on a convective cloud is observed at the use of a complex method. From the results of numerical simulation a set of laws determining the efficiency of modification has been set up.

Keywords: convective clouds, hygroscopic and ice-forming agents, complex method, cloud liquid water content, precipitation formation efficiency.

Tab. 1. Fig. 6. Ref. 14.

Global electric circuit in the atmosphere: theoretical models and experimental data. Morozov V. N., Sokolenko L. G., Zainetdinov B. G. Proceedings of MGO. 2018. V. 589. P. 98–113.

The theoretical models of the global electrical circuit describing the global unitary variation of the ionosphere potential are considered in the article. In these models, the thunderstorm activity in high latitudes is the main current generator. Experimental data from the network of stations monitoring the electrical characteristics of the atmosphere in the surface layer are also presented. It is shown that, at coastal high-latitude stations, in contrast to continental ones, theoretical models comply with the data of the experimental observations.

Keywords: the global electrical circuit, theoretical models, the potential of the ionosphere, storm activity, atmospheric electrical field strength, global unitary variation, total electrical conductivity of air.

Fig. 6. Ref. 24.

Estimation of duration and intensivity of shelves on radar location characteristics of the cloudy. Kapustin A. V., Kolbin V. A., Kuznetsov A. D., Seroukhova O. S., Simakina T. E. Proceeding of MGO. 2018. V. 589. P. 114–124.

This study was carried out to assess the possibilities of determining the duration and intensity of precipitation based on the use of radar characteristics of the clouds measured at the time of the beginning of the precipitation. The initial data in the work used the results of radar sounding, performed with the help of Doppler MRL, installed at the airport Pulkovo. Based on the analysis of 61 cases with rainfall over the 4 months of the summer period 2012–2013, regression equations were obtained for the analysis and prediction of the duration and intensity of rainfall.

Keywords: radar sounding of the atmosphere, duration of rainfall, intensity of rainfall, regression equations

Tab. 2. Fig. 5. Ref. 8.

Actinometric network of Roshydromet: current status. Lutsko L. V., Erokhina A. E., Bychkova A. P. Makhotkina E. L., Makhotkin A. N., Bekeneva O. B. Proceedings of MGO. 2018. V. 589. C. 125–152.

The review summarizes data on the present state of actinometrical network of Rosgidromet. Principal results of upgrade carried out over the last 8 year, are presented. Performance of automated meteorological complexes is esteemed. The structure and technical condition of actinometrical networks are analyzed. The issues concerning collection, analysis and storage of actinometrical data are discussed.

Keywords: actinometric observations, modernization, automated actinometric complex, automated measuring complex, data processing, information storage.

Fig. 6. Tab. 3. Ref. 11.

Results of Upgrading and Expansion of Atmospheric Electricity Monitoring Network. Sokolenko L. G., Zainetdinov B. G. Proceedings of MGO. 2018. V. 589. P. 153–166.

The article presents the results of upgrading/ modernization and expansion of the monitoring network of atmospheric boundary layer (ABL) electrical characteristics/parameters. The description of the new developed measuring devices, such as "Pole-2M" and "Electroproductivnost-2M", is given. According to the presented results of simultaneous measurements it can be seen that the observational series continuity is not broken.

Keywords: the atmospheric-electricity network, the electric field strength of the atmosphere, and the electrical conductivity of the air, comparative observations.

Fig. 8. Tab. 4. Ref. 4.

Towards 60-MGO Cloud Physics Laboratory Jubilee: the results for the period 2008–2018. Dovgaluk Ju. A., Sinkevich A. A., Veremei N. E., Kurov A. B., Volkov N. N., Baranova N. I. Proceedings of MGO. 2018. V. 589. P. 153–166.

2018 marks 60-th anniversary from the date of the MGO Cloud Physics Laboratory foundation. Cloud Physics and Cloud Seeding Department which included this laboratory was founded in 1958 as a separate Department due to initiative of N. S. Shishkin under support by vice Director V. Ya. Nikandrov.

Main areas of the laboratory activities for the period 2008–2018 are briefly presented in the article. Main scientific results, obtained for the mentioned period, are presented.

Keywords: cloud physics, scientific results, convective cloud, model, electrification, weather modification.

Fig. 13. Ref. 53.