Greenhouse gases, aerosol and climate. Karol I. L., Reshetnikov A. I. Proceedings of MGO. 2014. V.573. P. 5—38.

The review of recent studies devoted to both main greenhouse gases concentration and their emissions and also to model estimations of greenhouse gases release into the atmosphere. The influence of both permafrost thawing and forestry methods on climate change is discussed. The monitoring data from Tiksi hydrometeorological observatory, from tower in the region of Zotino village and others are shown. The response of Earth's climate on black carbon aerosol is considered too.

Keywords: carbon dioxide, methane, nitrous oxide, halocarbons, black carbon.

Tabl. 5. Fig. 8. Ref. 46.

Precipitation. Bogdanova E. G., Gavrilova S. J., Ilyin B. M. Proceedings of MGO. 2014. V.573. P. 65—91.

The article presents the estimations of the observed changes in the amount of precipitation fallen in Russia, obtained on the basis of MGO data archive.

The trend in annual precipitation for the period 1976—2012 on the biggest part of Russia is positive. On average in Russia it is 0,3 mm / month / 10 years. The maximum seasonal increase in precipitation also occurs in the spring and is +1,6 mm / month / 10 years.

Climatologically homogeneous series of MGO allowed to estimate the spatial and temporal changes of various characteristics of precipitation for the entire period of instrumental measurements. During the period 1936—2010 was observed increase in annual precipitation almost throughout the EChR, as well as in central Siberia. In Western and Eastern Siberia, as well as in the Baikal region, Transbaikalia, the Amur and Primorye dominated area with negative trends. The increase in annual precipitation is observed only in some places in the narrow coastal strip of the Sea of Okhotsk and Sakhalin.

The amount of solid precipitation is reduced by the dominant part of the territory of Russia. Liquid and mixed precipitation increasing almost everywhere, especially in the EChR.

Duration of precipitation of strong and very strong intensity in the whole of Russia for the period 1976—2010 increases.

Keywords: amount of precipitation, intensity of precipitation, duration of precipitation, solid. liquid and mixed precipitation/

Tabl. 6. Fig. 10. Ref. 18.

Cloud cover and solar radiation regime over Russia: observed climatic changes. Khlebnikova E.I., Makhotkina E.L., Sall I.A., Proceedings of MGO. 2014. V.573. P. 39—64.

Regional changes in climatic characteristics of cloudiness and solar radiation regime in the late XX — early XXI centuries are in discussion. The main focus is on the specific features of the changes for the last 10—15 years. Trends in the atmospheric column transparency and aerosol optical thickness of the atmosphere, as well as in the basic components of the surface radiation balance, using the data of actinometric observations, are analyzed. Particular attention to the modern features of changes in the frequency of occurrence for different cloud types is given.

The results are discussed in the context of global climate changes for the characteristics in consideration.

Key words: climate change, clouds, actinometric observations, atmospheric transparency, aerosol turbidity, solar radiation, direct radiation, global radiation, surface radiation budget

Fig. 10. Ref. 42.

Impact of climate change on energy production and consumption in Russia. Shkolnik I. M., Meleshko V. P., Khlebnikova E. I., Akentieva E. M., Genikhovich E. L., Kiselev A. A. Proceedings of MGO. 2014. V.573. P. 92—222.

Growing concern about expected multi-valued impacts of climate change in Russian Federation was recently expressed by scientific community and governmental bodies. Numerous studies show that most significant warming and precipitation increase are projected for the eastern part of Russia. The south-western part of the country is vulnerable to dry condition and water stress that may further be amplified as climate warming continues. Heating period as well as fuel consumption will change significantly during cold season. Climate change will also impact potential of renewable (solar and wind) energy. All these factors are expected to affect national plan of energy system development for the period until 2030. However, the plan does not account for possible implication of climate change. This paper objectives are to evaluate climate impact on energy system in different parts of the country and to formulate action plan for adaptation based on climate change scenario derived from model projections.

Key words: climate change, model projections, energy system, energy consumption.

Tab. 20. Fig. 48. Ref. 66.