



## **Cloud estimation as an important factor in the formation and prediction of weather and climate conditions**

V.G. Margaryan

Yerevan State University, Department of Physical Geography and Hydrometeorology., Yerevan, Armenia  
(vmargaryan@ysu.am)

Clouds – one of the most interesting phenomena of nature. They, changing the thermal and radiation regime of the atmosphere, affect many aspect of human activity, the flora and fauna. The dependence of different types of transport is great, especially aviation, on clouds fogs, the lower boundary of clouds and horizontal visibility are important factors that make it possible to take off and land the aircraft. Cloudiness also acts on the field of atmospheric motion, primarily on the field of ascending velocities. And their inclusion in digital forecasting models increases the accuracy. The role of cloudiness is also important in the formation and change of climate. Features of daily and annual distribution of low and total cloudiness (expressed in points) and number of cloudy days are discussed and analyzed in the work, are clarified cloud repeatability status and the main types if cloud repeatability status and the main types of cloud in Lori region of the Republic of Armenia. For solving of these problems as a theoretical and informational basis are relevant studies. As a starting material used actual data of cloudiness observations of meteorological stations of the Ministry of Emergency Situations of the Republic of Armenia “Service for Hydrometeorology and active influence on atmospheric phenomena”. As a methodological basis used general scientific, geographical, characteristic, statistical analysis, confrontation, comparison, analysis methods. For short-term weather forecasts, in particular, for hazardous meteorological phenomena, satellite images are of great importance, which give an idea of the formation, development of clouds and their movement. Until 2010, the system “Tecnavia”, operated by the hydromet service, provided twice a day satellite imagery, when the satellite was at the zenith of our region. In October 2010, in hydromet service, within the framework of the “DAWBEE (Data Access for Western Balkan and Eastern European Countries)” project, the system for receiving information from satellites, operated by the EUMETSAT. The system makes it possible to make more detailed analyzes of the origin, development and movement of clouds. The information obtained is used not only for weather forecasting, but also for forecasts of spring floods runoff and agrometeorological forecasts. The use of the system made it possible to significantly improve the accuracy of forecasts of hazardous phenomena. Now work is underway to obtain an analysis of the images of the NDVI on the same system that ensure the course of vegetation on the surface of the earth and the use of these images in the methodology of yield forecasting, which is being implemented now. Cloudiness, like other meteorological elements, are characterized by a certain daily and annual course and uneven spatial distribution. In most of the republic the cloudy state of the sky lasts up to 6-7 months. The high frequency of the cloudy sky is distinguished by a highland zone and regions with a humid climate (Lori plain, north-east, south-east), where within a year exceeds the cloudy state of the sky. Here during the year there are on the average 75-160 cloudy days in total cloud cover, and 25-85 cloudy days along the lower cloud cover. In the arid regions of the republic (Ararat valley and foothill zone) during the year there are on average 70-100 cloudy days in total cloud cover, and from 5-10 to 40 cloudy days in the lower cloud cover. Studies show that in the warm and cold periods of the year the difference in the daily course of cloud cover is significant. From October to March-April, cloudiness (mainly layered) reaches a maximum in the early morning, and from May to September (mostly convective) – in the afternoon. It was found out that during the year the minimum frequency of the cloudy sky condition (8-10 points) is observed in December-January, since February there has been an increase that reaches the main maximum in March-April. From May there is a slight decrease in cloudiness. The secondary minimum of the repeatability of the cloud state is observed in August-September, after which there is again an increase. The secondary maximum is observed in October-November. Since November, the amount of cloudiness deceases. It should be noted that such an annual course is characterized by a general cloudiness. And in the annual course of the lower cloud cover (point), one maximum (April-May) and one minimal (December-January) values are observed predominantly. There is little where the maximum of cloud cover is in summer and the minimum in winter (for example, Lori, Chambarak, Vanadzor). In some areas (for example, Shnogh, Tashir, Semyonovka, Goris, etc.) during ther year the clouds are evenly distributed, there are no sharp fluctuations in cloud cover (no more than 20 We discussed repeatability conditions of clear (0-2 points), semi-cloudy (3-7 points) and cloudy (8-10 points) of sky (Studies show, that maximum value of total cloudiness in all periods of observations

observes in March-April, minimum - in August-September. In study area mainly are prevailed cirrus, altocumulus, stratocumulus, cumulonimbus clouds. And altocumulus and stratocumulus clouds more often are in July, cirrus in April-May, cumulonimbus - in May-June. Generally, during the cold period are prevailed stratus and in spring and summer months - cumulus.

Thus, [U+F0FC] Use of such a system of satellite information in the hydromet service makes it possible to improve the degree of accuracy of meteorological forecasts; [U+F0FC] Cloudiness stands out both of daily and annual cause; [U+F0FC] Maximum repeatability cloudy sky condition mainly observes in March-April and the minimum - in December-January; [U+F0FC] In the cold season the maximum cloudiness observes early in the morning and during the warm period - in the afternoon, when the intensity of convective flows is increased; [U+F0FC] The link between clouds repeatability and absolute height of area is almost absent.