

APPLIED CLASSIFICATIONS OF EARTH'S CLIMATE

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Summary

Applied classifications of climate focused on concrete needs of economics and social life are considered. Special attention is given to such classifications as agroclimatic and bioclimatic classifications, classifications for technical purposes, and classification of wind and solar energy resources. As a rule, for construction of applied classifications the resource approach allowing making economic estimation of different climatic conditions is used.

Zoning of agroclimatic resources is made with the help of criteria as the value of index of biological efficiency including the characteristics of thermal and humidity regime, depth of snow cover, degree of climate continentality. In bioclimatic classifications radiation-effective-equivalent temperature and discomfort index are used as criteria.

For building designing, the climate classifications oriented to various purposes are made: for providing of housing construction, for determination of climatic loads on structures etc. In the first case the characteristics of radiation-temperature-humidity-wind complex are used; in the second one - the high (or low) quantiles of wind speed distribution, ice, snow, and air temperature characteristics.

Macroclimatic zoning of the Globe for technical purposes is based on the values of temperature-humidity complex. Potential wind resources are determined by the values of cube of wind speed, and global radiation is the basis for climatic zoning of solar energy-resources.

1. Introduction

The climate is a natural resource serving as a basis for many kinds of socioeconomic activity. Indirectly the climate influences the ways of development of economics and its stability. The applied classifications of a climate are aimed to the decision of concrete economic and social tasks. Such classifying, which is named often "climatic zoning", allows either to distinguish regions, where the climatic conditions for the given field of application are various, or to find climatic analogues in various parts of the Globe to use rationally the experience accumulated sometimes in rather remote areas. Hence, applied classifications should be numerous according to a large number and variety of problems being solved. They are made not only for each kind of activity of a society, but also for details of this activity. For example, in building designing the maps of zoning by different kinds of loads on constructions (temperature, snow, wind loads, etc.) are used. In addition to them, special zoning maps are made for the purposes of typification of buildings; for designing protecting structures and systems of heating, ventilation and conditioning, for dram systems etc. General agroclimatic classification gives an idea on climatic resources as applied to all kinds of crops. However, there is climatic zoning both for individual crops and for separate sorts of a crop, when for example, the problem of expediency of introducing them in production is solved at given agricultural technology. Thus, the applied climatic classifications can serve both many purposes simultaneously (multi-purpose classifications), and one concrete purpose (one-target classifications).

The specific feature of applied classifications is, as a rule, in combination of climate characteristics and other kinds of information, for example, such as types of soil and surface cover for planning land use, or socioeconomic information (the data on population, etc.). It is necessary to devise such climatic parameters, which could be easily interpreted for practical purposes and at the same time precisely reflect the complex influence of climate on processes being susceptible to it. For this purpose the data on different meteorological variables are jointly considered and complex parameters are constructed on this ground. For example, the data on air temperature, wind speed, relative humidity, and radiation are presented as a function of them, the so-called radiation-effective-equivalent temperature.

The spatial scale of applied classifications has no restrictions provided the density of the observations is sufficient for precise definition of geographical borders of different gradations. The applied climatic classifications made in macro-, meso- and microscale are known. For example, for trade of technical products in various climatic versions the classification of a climate of the whole globe is used. Agroclimatic classifications are made both for the whole globe and for separate countries, areas and administrative districts of these countries. The examples of meso- and microclimate classifications are zoning of city by the number of degree-days with allocation of borders of heat island and review of climatic conditions in a valley to-find favorable and adverse areas for gardening and vegetable growing. As a rule, at work in meso-, and especially, in micro-scale for specification of climatic fields, it is necessary to determine topographical and morphometric interrelations (height above sea level, inclination and situation of area, distance from water reservoirs, presence of vegetation cover, soil types).

Frequently applied classifications of climate affect the interests of administrative units, which are included in a zone of their action. For example, according to climatic zoning the technical products in various climatic versions are delivered to countries. In these cases the borders of climatic areas are sometimes transferred over small distances for coinciding them with the borders of administrative units. It is easy to understand that this is connected with convenience of using the zoning. Thus, the determination of borders in view of administrative division of territory is one of features of applied climatic zoning, which is frequently accepted as a mistake of its composers.

Let's consider the examples of basic kinds of specialized classifications of climate.

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Biographical Sketch

Kobysheva Nina Vladimirovna, Dr. of geogr. Sci., Professor, Honoured Scientist, Head of the technical climatology laboratory of MGO, Professor of Sankt-Petersburg University. Fields of scientific interests are statistical methods in climatology, applied climatology. Author of 7 monographs, 3 text-books, Building Standards and Rules "Building Climatology", more than 200 papers. Supervisor and editor of Scientific-Applied reference book. About 25 Candidate's dissertation were defended under her guidance.

A member of working group of WMO, working group № 13 CIB, working group № 75 of International Electrotechnical Commission. Was conferred a medal of National Exhibition of economy achievements, medal "Honoured expert of gidro-meteo service", Voeikov's prize, International WMO and CCL certificate.

Was born in 1925 in Omsk city. Was graduated from the Odessa Hydrometeorological Institute in 1948. In 1955 has defended the candidate dissertation after finishing the post-graduate course of Main Geophysical Observatory.

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