

Climate Is Regulated By Water

1 August 2005

About one hundred years ago, S. Arrhenius brought forward a hypothesis that the atmospheric temperature of at the surface of the Earth was increasing under the influence of the glasshouse effect created by carbonic acid gas. Since that time, the researchers, when simulating the planet climate, have mainly focused on O₂ and it is water vapour that comprises the largest mass of all greenhouse gases. Thanks to water vapour and clouds, the average temperature at the surface of the planet is about 15 degrees C, instead of minus 58 degrees C (absolutely dry air would have this particular temperature).

Measuring air temperature at night in windless weather, in absence of low clouds, fogs or precipitations, the researchers have come to the conclusion that cooling down of the earth surface depends on water vapour concentration: the high the concentration is, the more warmth the Earth would preserve. In this case, water vapour plays the role of greenhouse gas in the atmosphere.

Other greenhouse admixtures - carbon oxide and dioxide, often called carbon monoxide and carbonic acid gas, sulfur dioxide and nitrogen dioxide, hydrogen chloride, ammonia and many others – also impact the air temperature, but their role in this process is much weaker. This is explained by the fact that water vapour density (absolute humidity) is by two to three times higher than that of other admixtures. And the quantity of radiation, including thermal radiation, absorbed by some admixture and the rise of temperature caused by it is proportionate to the concentration (density) of this admixture.

Cloud sheets play an important role in the thermal conditions of the Earth. According to space exploration data, in all continents of the Northern hemisphere, there is a connection between average monthly values of cloud quantity and surface air temperature. In the warm half of a year, this connection is tight enough, in the cold one – it is slightly weaker. The only exception to the rule is Europe in summer.

The amount of cloud, according to the same data, is increasing with each decade: since 1971 through 1990 it increased by 2 percent in the Northern hemisphere, by 4 percent – in the southern hemisphere, and by 3 percent - above the Earth on the whole. Based on this data, the researchers claim that carbonic acid gas and other admixtures, to which main attention was paid in the 20th century when simulating the climate, do not play a significant role in changing thermal conditions of the Earth.

The Moscow geographers believe that climatologists have no grounds at all to talk about such change, as the main part of the planet, including oceans and deserts, is not embraced by meteorological watch. It should also be taken into account that all evaluations of global temperature changes are obtained through observations in inhabited localities, where it is always more damply and cloudy, and consequently, hotter than in the uninhabited locations. Terrestrial climate specialists should particularly focus their effort on the problem of interaction between fluxes of radiation and humidity and cloudiness fields.

Source: Informnauka (Informscience) Agency

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