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EFFECT OF GREEN GAS CONCENTRATION IN THE EARTH'S ATMOSPHERE ON THE AVERAGE GLOBAL TEMPERATURE

V.V. Bepoludin

Southern Federal University

Climate change is one of the most important environmental problems of our time, which has arisen in the last couple of decades.

Currently, as a result of intensive human activity, the average global temperature increases, which is associated with an increase in the concentration of greenhouse gases in the atmosphere, such as carbon dioxide CO_2 , methane CH_4 , etc. From the moment of the industrial revolution when the process of burning fossil fuels (coal, oil and natural gas) began, for certain needs, there was a violation of the natural balance of concentrations of gases such as CO_2 , CH_4 , etc. For example, when burning fossil fuels, carbon is released, which is mixed with oxygen and forms carbon dioxide CO_2 , which enters the atmosphere of the earth as a result of which the planet is heated due to the greenhouse effect, which is formed as a result of greenhouse gas retention of a certain amount of solar radiation reflected from the earth. So carbon dioxide CO_2 can absorb infrared radiation (heat) [1].

Figure 1 (a) shows the dependence of the average global temperature on CO_2 concentration from 1880 to 2012 [2], as well as the dependence of the change in the volume of Arctic sea ice from 1979 to 2012, Figure 1 (b).

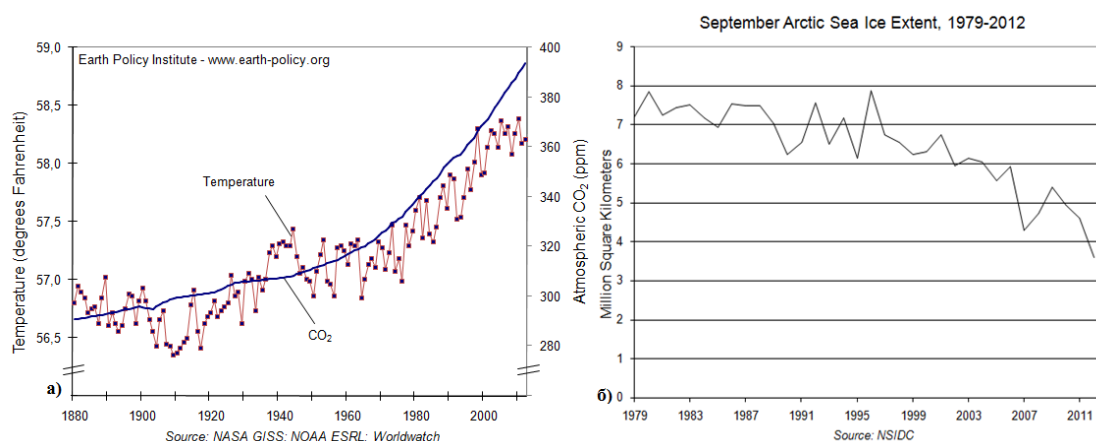


Figure 1. The dependence of the change in the average global temperature on CO_2 concentration (a), and changes in sea ice volume from 1979 to 2012 (b)

From the graph it is clear that with an increase in CO_2 concentration in the earth's atmosphere, the average global temperature increases. At the moment, the average temperature is still rising reaching all the new average highs. So for the last 800,000 years before the industrial revolution, the concentration of CO_2 in the atmosphere was about 280 parts per million (ppm). Today, the concentration of CO_2 in the atmosphere is about 400 ppm [2-4].

During the ice age (about 50,000-100,000 years ago), the global average annual temperature of the Earth was 5-10 degrees Celsius colder than today.

One of the most noticeable manifestations of an increase in global temperature is a reduction in the volume of sea ice, also increases the area of the desert [2]. The reduction in ice volumes began from the end of the ice age and continues to this day, however, with increasing temperature, this process has accelerated. At the moment, the concentration of CO₂ in the atmosphere is quite high, this level of CO₂ concentration was not observed from the moment when the Pliocene era ended, which began about 5 million years ago and ended about 3 million years ago, then there was much less ice on the planet, and the seas were much higher [5,6].

In the process of photosynthesis, trees not only provide oxygen, but also absorb carbon dioxide, which is the main source of global warming. For example, decaying or burning trees emit carbon, which they have accumulated during photosynthesis [5, 6].

So when large amounts of moisture evaporate from the ocean, the likelihood of storms will increase because extra moisture will fuel the storm.

To eliminate the deterioration and normalization of the climate, as well as other environmental problems described above, it is necessary to limit CO₂ emissions to a certain safe value, as well as to use renewable energy sources, that is, wind, solar energy and hydropower. It is necessary to use energy sources in which carbon is used in limited quantities or is not used at all. Trees are the largest source of oxygen, and ironically, their area is decreasing. Planting trees and increasing forest area is one of the possible solutions to global warming, as the greenhouse effect will be significantly reduced.

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