

Modeling of climates of the past

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The empirical data on change of a climate in the past. Climate variations during the Cenozoic era, Late Pleistocene and Holocene.

A problem of the modeling climates of the past. A set of parameters and initial data. An opportunity of validation of modeled results. The international projects directed on modeling of climates of the past (PMIP, PAGES, GLOCOPH etc.).

Variations of the CO₂ contents in an atmosphere: very slow sources and sinks of the carbon and fast changes in system ocean – atmosphere - land accompanying changes of a climate.

Solar constant changes and their role in climate change. An example of transition from the Little Ice Age climate (XV-XIX of century) to warm condition of the beginning of XX century.

Changes of insolation on the top of an atmosphere caused by variations of elements of an orbit of the Earth (mechanism of Milankovitch). Examples of the response of climatic system on the given effect: a) modeling of a climate transition from an isotope stage "5e" to "5d" (125 - 115 ka before present), б) simulation of a climate during the Holocene.

Combined effects of Milankovitch and fluctuations of CO₂ on a climate during the Late Pleistocene and Holocene. Modeling of a climate of the last cryochron (Last Glacial Maximum) (21 ka before present).

Sharp and rapid breaks of the warming and deglaciation during transition from the Late Pleistocene to Holocene and the Younger Dryas cold event as their example. Simulation of abrupt climate change induced by freshwater input to the North Atlantic ocean.