A numerical 2-D zonally averaged interactive dynamical radiative-photochemical model of the ozonosphere including aerosol physics is used to predicting the future long-term changes of the Earth’s ozone layer caused by anthropogenic pollution of the atmosphere by the greenhouse gases CO$_2$, CH$_4$, N$_2$O, by ozone-depleting chlorine and bromine compounds, and by H$_2$O emitted from supersonic aircrafts. The model takes into account also an increasing of the ocean surface temperature caused by greenhouse effect and accompanying increase of water vapour influx into the atmosphere from the ocean.

The model calculations showed that by the middle of 21$^{st}$ century the total ozone changes caused by the greenhouse gases are predicted to be comparable in absolute value with those due to chlorine and bromine species. Abundance of the greenhouse gases in the atmosphere will be the main anthropogenic factor controlling the state of the ozone layer in the second half of the century. Anthropogenic increasing of water vapour abundance in the atmosphere due to emission from supersonic aircrafts as well as due to heating of the ocean surface caused by greenhouse effect is shown to give a sensible contribution to the calculated ozone changes. This occurs due to additional cooling of the stratosphere, which leads to a weakness in efficiencies of all gas phase catalytic cycles of the ozone destruction. The processes, which determine the influence of the greenhouse gases on the Earth’s ozone layer evolution, have been studied in details. The contributions of different pollutions to the predicted ozone changes have been estimated.