



Spatial and Temporal Variability of CO₂ and CH₄ Concentrations in the Atmospheric Surface Layer over West Siberia

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The investigation of greenhouse gas behavior in the atmosphere plays a key role in predicting the global changes of Earth's climate. In this connection, of particular importance is the study of the distribution of sources/sinks of trace gases in the atmospheric surface layer over the different regions of the globe. In order to fill a gap in the data on greenhouse gas concentrations in Russia, National Institute for Environmental Studies (NIES, Japan) and Institute of Atmospheric Optics (IAO SB RAS, Russia) established a network for GHG monitoring (JR-STATION, Japan-Russia Siberian Tall Tower Inland Observation Network). Gas analyzers and meteorological sensors were mounted at radio relay towers located in different regions of West Siberia. The checking equipment was placed in containers at the tower base. In the containers, the climatic parameters optimal for gas analyzer operation were maintained. The work on the network development started in 2001. Since at each of the sites the measurement duration could be different, in this paper we present the data of the greenhouse gas monitoring for eight sites which give the primary idea on the spatial distribution and temporal dynamics of CO₂ and CH₄ in the atmospheric surface layer over West Siberia. The analysis of the data showed that the average increase in concentration of carbon dioxide by results of our measurements in this territory increases within 1.95 – 2.53 ppm/year, depending on the area. The analysis of long-term data testifies about existence of growth of concentration of methane within 3.2 – 7.2 ppb / year. The presence of a distributed network of the sites operating in the monitoring regime makes it possible not only to investigate the temporal dynamics of CO₂ and CH₄ at each site and to determine the spatial differences between the concentrations by comparing the data, but also to plot the distribution charts for different moments of time.

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