



## Changes in CO<sub>2</sub> trends observed in the lower troposphere over West Siberia

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Long-term airborne observations of greenhouse gases carried out in the troposphere over south-western area of West Siberia since 1997 allowed some specific features in CO<sub>2</sub> trends to be revealed at different heights. At an altitude of 7 km above ground level (AGL), the average annual rate of CO<sub>2</sub> increase was 1.72 ppm yr<sup>-1</sup>. The main distinctive features in the tendencies of CO<sub>2</sub> mixing ratio have been found in the lower troposphere. Thus, for the period from 1997 to 2004, July concentrations of CO<sub>2</sub> at an altitude of 500 m AGL increased slightly with a rate of 0.17 ppm yr<sup>-1</sup>, while since 2005 they began to rise dramatically with a rate of 3.64 ppm yr<sup>-1</sup>.

Analysis of the possible causes of such long-term behavior showed that it was resulted from neither reduction of forest area, nor wildfires, nor forest diseases. Also it is impossible to state that reducing CO<sub>2</sub> sink has been caused by the impact of climate changes on ecosystems.

Possibly, anthropogenic CO<sub>2</sub> accumulation resulted in that Siberian forests cannot assimilate such additional amount of carbon dioxide. A decrease in the sink for atmospheric CO<sub>2</sub> is also observed in the Amazon (Brienen et al. 2015). Brienen et al. (2015) assume that it may be caused by a sustained long-term increase in tree mortality. There is also a supposition that it can be a result of a vegetation replacement by other types of plants or young trees, which absorb less amount of CO<sub>2</sub> (Kunstler et al., 2015; Crowther T. W., 2015). However, it seems highly unlikely to test these hypotheses in the near future due to a huge area of West Siberia, most regions of which are difficult to access.

This work was funded by the Global Environment Research Account for National Institutes of the Ministry of the Environment (Japan) and Russian Foundation for Basic Research (grant No. 14-05-00590).

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