



The Zotino Tall Tower Observatory (ZOTTO): A 300m tall tower for long-term atmospheric monitoring of biogeochemical changes in central Siberia

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The boreal and arctic zone of Eurasia with its large amounts of carbon stored in the forests and soils, as well as in wetlands and the underlying permafrost, clearly represents a hot spot in the Earth system. What happens to this carbon pools in a warming climate constitutes a pressing question in Earth system science. While climate warming may lead to an expansion of the growing season and thus to more carbon uptake by photosynthesis, concurrent increases in soil respiration and CO₂ releases might counterbalance this effect. Furthermore, warming may liberate a fraction of the carbon stored in wetlands and permafrost either as CO₂ or as methane, both important greenhouse gases. Changes in the hydrological regime might similarly affect fire frequency and wetland extent with associated consequences in greenhouse gas emissions. In order to monitor on a regional scale these changes, the Zotino Tall Tower Observatory (ZOTTO) in central Siberia near 60N, 90E has been established in a cooperation project between the German Max-Planck-Society and the V.I. Sukachev Institute of Forest, Krasnojarsk as a partner project of the International Science and Technology Center, Moscow. This station includes a 300m tall measurement mast for the continuous high-precision monitoring of biogeochemically important greenhouse gases (carbon dioxide, methane, nitrous oxide, carbon monoxide, oxygen/nitrogen ratio) in the surface and planetary boundary layer. Additional measurement systems monitor aerosols and reactive chemistry (Currently aerosol number/size distribution, aerosol scattering and absorption, ozone and NO_x). Measurements on the completed tower began in October 2005 and first results demonstrate the potential of this long-term

monitoring strategy.