Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02809, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02809
EGU General Assembly 2008

The 4th technogenic timberline in dendroclimatology: Climatic sensitivity of tree-ring samples collected in polluted areas

O.I. Shumilov (1), E.A. Kasatkina (1), V.A. Masloboev (1), I.Yu. Kirtsideli (2) and A.G. Kanatjev (1)

(1) Institute of North Industrial Ecology Problems, Kola Science Centre RAS, 184209 Apatity, Russia (e-mail: oleg@aprec.ru), (2) Botanical Insitute RAS, St. Petersburg, Russia

It is known that paleoclimatic information can be obtained from tree-ring records. These samples are usually collected around three regions: at the northern (high-latitude or arctic) timberline, at the southern (arid) timberline, and in the mountain regions along the altitude timberline. The general feature of these three regions is their enhanced sensitivity to the external forcing. Obviously there are some difficulties in data accessing from wood samples collected at middle latitudes. Therefore to obtain reliable climatic information from middle latitude dendrochronological data it is necessary to find trees with the greatest sensitivity. The more proper ones are trees growing at the limit of surviving around big polluted centres like Monchegorsk copper-nickel enterprise (Severonikel; 67.9 N, 32.9 E) at Kola Peninsula. By now we've analyzed more than 30 tree-ring records (about 15 wood samples in each series) collected at different parts of Kola Peninsula. All samples were cross-dated and ring widths were measured using standard dendrochronological technicues and COFECHA and ARSTAN programs. It was obtained that the more clear response on external impacts (solar activity, volcanic eruptions, climatic changes) was observed in the last century only on tree-ring data collected in the vicinity of Severonikel plant. This heightened sensitivity of wood samples permitted us to suggest the 4th or "technogenic" timberline located around polluted areas, where climatic variations may be effectively studied. It is very important that global and regional climatic changes may be studied rather far from the usual timberline areas at middle latitudes where the industry

concentration and pollution are maximal.

The work was supported by the Program "Biodiversity and dynamics of gene pool" and by the Regional Scientific Program of the Murmansk region.