World Climate Change Conference

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по изменению климата

ABSTRACTS

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Abstracts of presentations on the World Climate Change Conference

Part 1. Plenary session
Part 2. Section oral presentations
Part 3. Poster presentation

Information on the Round Tables

1. Round Table of social and non-governmental organizations (Social Forum)
2. Carbon Business-Forum
3. Energy and Climate Change

Chairmen of the International Organizing Committee - **Yury Izrael**

Scientific Secretary – **Elena Kvasnikova**

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CLIMATE OF THE NORTHERN EURASIA IN THE LATE HOLOCENE: INFORMATION FROM THE SPATIAL NETWORK OF THE LONG-TERM TREE-RING CHRONOLOGIES

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A spatial network of dendroclimatic monitoring stations has been established and permanently expanded and improved in Russia. Data base covers currently over 350 long-term tree-ring chronologies located in the European part of Russia, the Urals, Siberia and Far East. The length of most chronologies exceeds 300 years. In subaArctic of Eurasia the supra-long tree-ring chronologies were designed, time duration of which was beginning from 2500 (Taimyr, north- east of Yakutia) to 7300 (Yamal peninsula) years. The main aims of using dendroclimatic network are: 1) revealing and analyzing tree growth response to regional and global climate changes in Northern Eurasia; 2) reconstruction of dynamics of the main climatic variables (temperature, precipitation, water run off, etc.) as well as extreme events in forest ecosystems like forest fires, insect outbreaks, floods, droughts, etc. on the studied territory during the last centuries; 3) revealing spatial regularities in temperature and moistening dynamics in northern Eurasia; 4) a comparative analysis of climate change in northern Eurasia and the Northern Hemisphere. There are the following basic results:

1. Spatial-temporal reconstructions of summer temperature (with annual resolution) in the Ural-Siberian SubArctic region were made for the last 400 years (Vaganov, Shiyatov, Mazepa, 1996). A very good coincidence in the long-term temperature variations during the last 600 years was revealed for the Northern Eurasia and for the Arctic sector of North America and Greenland. It was shown that among other climate forcing mechanisms the variability in solar radiation, volcanic activity and carbon dioxide concentration significantly effects the long-term temperature variations in the Arctic region of the Northern Hemisphere.

2. Temperature variations in high latitudes of Eurasia reconstructed from the four supra-long (millennial) tree- ring chronologies (Scandinavia, Yamal, Taimyr, Yakutia) clearly showed the Medieval Warm Epoch (AD 900-1300) and Little Ice Age (AD 1400-1850). The current warming in the Northern Eurasia is characterized by substantial spatial heterogeneity (different amplitude of temperature variability in different sectors of the SubArctic region). The amplitude and rate of the current warming do not exceed those ones of the 10-th century (the warming in Medieval Warm Epoch).

3. Based on the 2500-year absolute and some "floating" tree-ring chronologies obtained for Eastern Taimyr and the 7300-year absolute chronology for Yamal the long-term ground air temperature variations were quantitatively evaluated. The long-term temperature rise in the Medieval Warm Epoch was assessed as about $1,5^0$C, and in "the Climatic Optimum of the Holocene" (4500-6000 BP) the temperature rise reached $3\text{-}3,5^0$C. These evaluations are in a good agreement with the subfossil wood found 200- 300 km northwards from the modern tree line in northern Eurasia. It means that in "the Climatic Optimum of the Holocene" the tree line was located far to the north from modern timberline.

4. Some cycles repeated and important from statistical point of view were revealed in the millennial tree-ring chronologies. The main cycles make 70-80 and 160-170 years, which are in a good agreement with those cycles observed at analyzing oxygen isotope concentration in Greenland ice cores. A significant coincidence in the long-term tree-ring records has been shown for northern Eurasia and the Greenland ice core data on decadal to centennial scales.

Reference:

Vaganov E.A., Shiyatov S.G., Mazepa V.S. Dendroclimatic Study in Ural-Siberian Subarctic. Novosibirsk, *Nauka*, 1996, - 246 p.