Analysis of long-term vegetation dynamics in Northern Eurasia based on NOAA-AVHRR data

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Under existing assumption, the last decades observable climate change affects vegetation growth.

The Space Research Institute of Russian Academy of Sciences within CLIVT (Climate Induced Vegetation Change Analysis Tool) project through Microsoft Research support investigates the relationships between global climate change and vegetation dynamics of Northern Eurasia. The new approach has been elaborated for the analysis of climate-induced long-term vegetation dynamics.

The multi-annual GIMMS NDVI series of NOAA AVHRR instrument, as well as meteorological data base from National Centers for Environmental Prediction and The National Center for Atmospheric Research were used as a main source of information.

NOAA-AVHRR data derived NDVI has been estimated at the level of grid-cells (2.5x2.5 deg) of climatic database for the different vegetation types using GLC 2000 map.

In order to estimate the growing period limits the advanced algorithm has been developed based on using time-series of spectral vegetation indexes and meteorological data. Vegetation and climatic parameters set was obtained using this algorithm.

The vegetation dynamics have been detected in the main part of Northern Eurasia.

The spatial distribution of the relationship between vegetation and meteorological parameters dynamics has been assessed. In general, vegetation dynamics can be explained by climate for the 54% of all detected Northern Eurasian vegetation changes. In many regions the vegetation dynamics is highly correlated with Solar activity.