Assessment of CO_2 flux variation for Russian forest ecosystems under climate change with JSBACH model

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GOAL

to assess the response

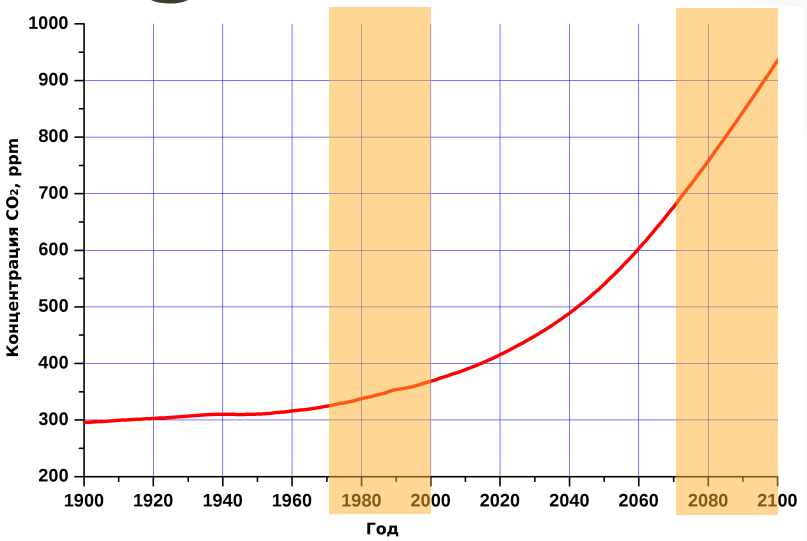
of the geographical distribution of woody vegetation in Russian and their ability to absorb carbon dioxide from the atmosphere

to the climate forcing set by the RCP 8.5 scenario

Experimental Design

Atmospheric data:
1. INMCM4 (Global climate model)
[Volodin E. et al., 2010]

2. PLASIM (Global large scale model of intermediate complexity)
[Fraedrich K. et al., 2005]



Atmospheric CO_2 concentration, RCP 8.5, 1901-2100.

For each model day:

- Minimum and maximum day temperature at 2 m [^{0}C]
- Wind speed at 10 m [m/s]
- Precipitation [kg/m^{2}s]
- Specific humidity at surface [kg/kg]
- Shortwave and longwave downward radiation [W/m^2]
- Clear sky downward shortwave radiation [W/m^2]

Land surface model: JSBACH
(Raddatz T. J. et al., 2007; Reick, C. et al., 2013)
Land part of MPI-ESM model

- soil hydrology
- soil heat transfer
- energy balance on the surface
- absorption, storage and emission of carbon from plants and soils
- photosynthesis
- predictive phenological scheme
- vegetation dynamics (natural, as well as damage by wind and fires)

Considered parameters

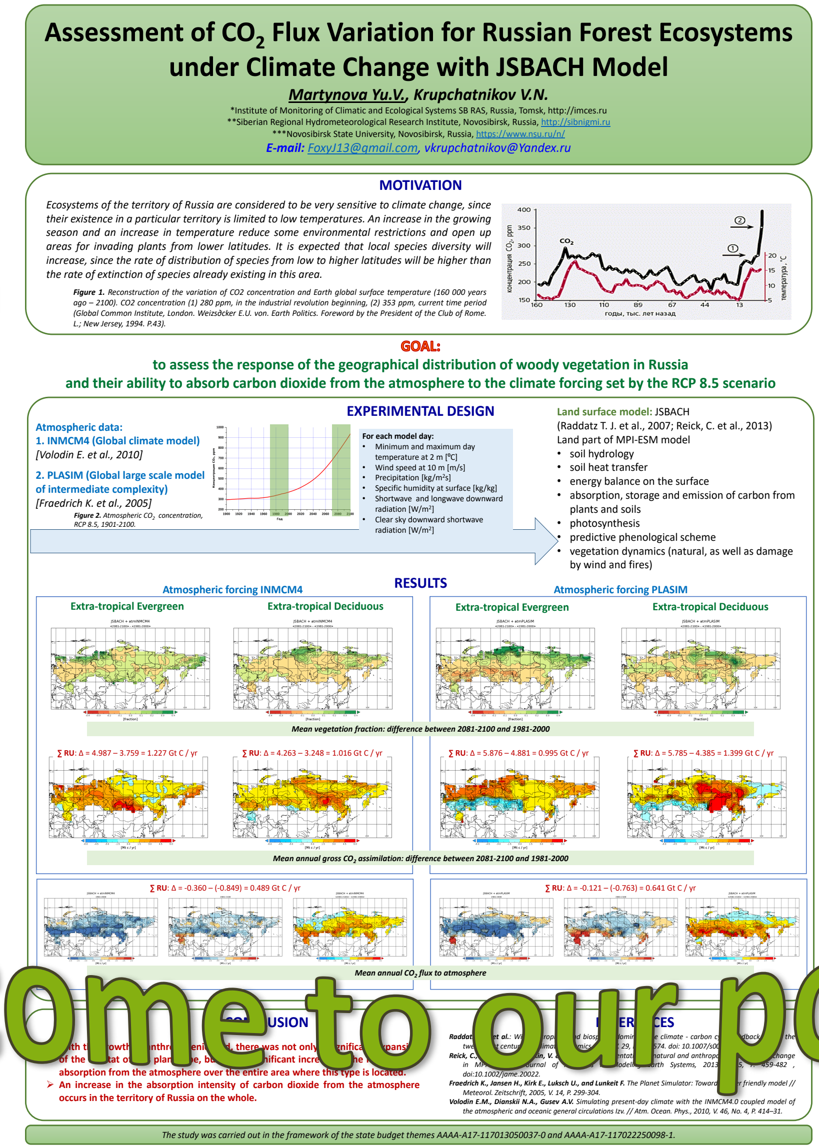
- Extra-tropical evergreen
- Extra-tropical deciduous

- Vegetation fraction
- Mean annual gross CO_2 assimilation
- Mean annual CO_2 flux to atmosphere

- 1981-2000
- 2081-2100

Results and Conclusion

5 June (Wed.)



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