Geophysical Research Abstracts
Vol. 19, EGU2017-19417-1, 2017
EGU General Assembly 2017

Stable carbon and oxygen isotope chronologies from Araucaria angustifolia trees as proxies for investigating the impacts of Andean volcanism on South-Eastern American climate

Olga Churakova (Sidorova) (1,2,3), Matthias Saurer (2,4), Heitor Evangelista da Silva (5), Alan Prestes (6), Christophe Corona (7), Sèbastien Guillet (1), Rolf Siegwolf (2), and Markus Stoffel (1)

(1) University of Geneva, Institute for Environmental Sciences, 1204 Geneva, Switzerland, (2) Paul Scherrer Institute, 5232 Villigen PSI, Switzerland, (3) Siberian Federal University, 660041 Krasnoyarsk, Russia, (4) Swiss Federal Institute for Forest, Snow and Landscape Research WSL, CH-8903 Birmensdorf, Switzerland, (5) Rio de Janeiro State University, Uerj/LARAMG, 20550-013, Brazil, (6) Universidade do Vale do Paraíba (UNIVAP)/Instituto de Pesquisa e desenvolvimento. Av. Shishima Hifumi, 2911 - Urbanova, São José dos Campos - SP, Brazil, (7) CNRS-Université Blaise Pascal, GEOLAB UMR6042, 63057 Clermont-Ferrand, France

Stratospheric volcanic eruptions may lead to global cooling effects due to decreasing incoming solar radiation and perturbation of atmospheric circulation masses. Tree rings as indirect climate proxies, are able to capture information about temperature and precipitation changes from seasonal to annual scale. During past decades, studies of the impact of volcanic eruptions on tree-rings as well as stable isotopes in tree rings were focused mostly on the Northern Hemisphere. However, little attention has been paid to the Southern Hemisphere, particular to South America.
Therefore, our goal is to quantify the impacts of Andean volcanism on Eastern South American climate in terms of temperature and hydrological changes over the past half millennium.
To reconstruct past hydroclimatic and temperature changes after the 12 largest volcanic eruptions of the past 500 years we analyzed carbon and oxygen stable isotopes from cellulose chronologies from Araucaria angustifolia, indigenous climate sensitive conifer species from General Carneiro, State of Paraná, Brazil. The species distribution in southern Brazil is limited between the latitudes of 18° and 30° south, where species occurrence is often associated with Atlantic forest remnants, in mono dominant or mixed forest matrices. To date, a database of 20 tree-ring width chronologies is currently available and spans the last 634 years.
We analyzed that material for precipitation and temperature anomalies, and model allocation of atmospheric circulation patterns after major volcanic eruptions. This will improve our understanding of driving factors of Southern Hemispheric climate over the past centuries.

Acknowledgements: This work was supported by Brazilian-Swiss Joint Research Programme (BSJRP).