Geophysical Research Abstracts
Vol. 17, EGU2015-11610, 2015
EGU General Assembly 2015

Tree-ring based reconstruction of spring hydroclimate variability in the Caucasus

Dario Martin-Benito (1), Nesibe Köse (2), Tuncay Güner (2), and Neil Pederson (3)

(1) Institute of Terrestrial Ecosystems, ETH Zürich, Switzerland (dario.martin@usys.ethz.ch), (2) Forest Botany Department, Faculty of Forestry, Istanbul University, Turkey (nesibe@istanbul.edu.tr), (3) Harvard Forest, Harvard University, Petersham, MA, USA (neilpederson@fas.harvard.edu)

The Caucasus region has been identified as one of the most prominent biodiversity hotspots in the world. The region experiences recurrent droughts that not only affect natural vegetation but also the agriculturally-based economies in the Caucasus. Across northeastern Turkey and the Caucasus region, instrumental records providing information on climate variability are generally scarce. Thus the magnitude and frequency of past droughts in this biologically important region are less known. Additionally, despite the increase of climate reconstructions in the past decades for many parts of Europe and Asia, relatively little work has been done to understand hydroclimate variability in the Caucasus region. Nearly all efforts in the region have focused on the Mediterranean part of Turkey and the Middle East region.

We developed new tree-ring width chronologies from different elevation sites in northeastern Turkey with the goal to reconstruct annually-resolved estimates of temperature and hydroclimate across the region. We developed the first reconstruction of spring hydroclimate variability for the Caucasus and the southeastern Black Sea Region since 1750 CE using a nested procedure.

Despite the high mean annual precipitation in the region, our reconstruction accounted for over 45% of May-June precipitation variability from 1925 to 2006. We observed no evidence of a decrease in spring precipitation during the recent decades. However, we do see a decrease in precipitation variability over the last 75 years with respect to previous periods that, at this time, does not appear to be related to sample replication. Although our reconstructed precipitation shows important similarities with previous work from Mediterranean and northern Turkey, we find distinct drought periods are also evident suggesting a wider range of climate dynamics in the broader Black Sea region than what has been previously identified. Distinct episodes of drought at the larger scales could have important implications for the dynamics of ecosystems prior to and after the 20th century.