**Using Arctic driftwood at the interface of marine and terrestrial (paleo-)environmental research**

Lena Hellmann1,2, Ólafur Eggertsson3, and Ulf Büntgen1,2,4 (on behalf of all workshop participants)

*1Swiss Federal Research Institute, WSL, Birmensdorf, Switzerland*

*2Oeschger Centre for Climate Change Research, Bern, Switzerland*

*3Iceland Forest Service Mógilsá, Reykjavik, Iceland*

*4Global Change Research Centre AS CR, Brno, Czech Republic*

The three-days workshop on the use of Arctic driftwood as a proxy at the interface of marine and terrestrial environments was held at the Icelandic Forest Research Institute Mógilsá, which is located around 20km northwest of Reykjavik. Expertise in dendro-sciences, (paleo-)climatology and -ecology, as well as archaeology, history, oceanography and radiocarbon dating, all fields related to the Arctic region, was represented by a group of 21 participants from ten different European and North American countries. The aims of this meeting were (1) to organize and coordinate future fieldwork activities, (2) to join forces towards a cross-disciplinary driftwood review paper, (3) to collect ideas for fundraising and proposal writing to improve international driftwood research.

Presentations by most participants were structured according to different research fields: A first session on dendro-sciences and climatology provided an overview on achievements and potential regarding driftwood provenancing, dating and the potential of reconstructing current dynamics and sea ice variations in the Arctic Ocean. A second session started with insight into proxy-based climate reconstructions for the Arctic and was followed by a broad spectrum of archaeological driftwood research ranging from wood decaying fungi to ancient wood use and tree-ring dating of archaeological driftwood remains. A third session addressed the reconstruction of relative sea-level changes in the Arctic, the effects of shrinking Arctic sea ice, the use of paleo-climate to constrain future climate predictions, as well as the current progress in radiocarbon dating.

Discussion did not only include the specific topics of the presentations, but also the need for sample exchange as well as free data access and resulted in ideas for grant proposals. All participants agreed on writing an interdisciplinary review article about the current status and future perspectives within Arctic driftwood research. Figure 1 illustrates the complexity of the Arctic driftwood system and proves the need for interdisciplinary research efforts. Participants will take responsibility for different chapters. The review paper is mainly motivated by the high sensitivity of the Arctic to slight climatic variations, in turn characterized by short instrumental measurements and rare proxy data that constrain model predictions. Knowledge on past variations in sea ice extent, ocean current dynamics, relative sea level change, biotic dispersal, transport times within the Arctic Ocean and the importance of driftwood for human settlements is scarce. Arctic driftwood is an integral that combines various fields of research within the Arctic region by representing an easily accessible and relatively cheap environmental archive with a huge unused potential that needs to be explored. An interdisciplinary approach will allow more reliable reconstructions that extend further into the past than instrumental data. To reach a broad audience, an overview of existing methods and material from different disciplines for Arctic driftwood research will be provided in the paper. Fieldwork, logistics and sampling strategies are an important issue in Arctic driftwood research. Possible analyses include the application of wood anatomy, dendrochronology, mycology, as well as 14C and e.g. strontium analyses. The paper will further propose the need of Arctic driftwood as a cross-disciplinary proxy archive that can be used to overcome missing long term observations and detailed modeling approaches. The outlook will set priorities for future driftwood fieldwork and research activities and promote Arctic driftwood as part of multi-proxy approaches to better understand past and present characteristics of the Arctic system. A follow-up meeting on Arctic driftwood research is planned for May 2017.

figure_DWoverview2.tif

***Figure 1:*** *Scheme of the complex Arctic driftwood system: The amount and kind of driftwood material that starts its way to the Arctic Ocean is determined by species composition, erosion processes and logging activities in the boreal forest zone. How much wood is transported further and in which direction is influenced by boreal river discharge, sea ice extent, ocean currents and the duration of transport, limited by the floating capacity. Deposition sites are in general shallow and ice-free coastlines.*