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| Projektleitung: Andrea Fischer | Projektnummer: P34399 |

*(project leader) (project number)*

Projekttitel**: (C)old.ice – insights into Late Holocene Alpine climate**

*(Project title)*

**III. KURZBERICHT ÜBER DEN PROJEKTFORTSCHRITT im vorangegangenen Kalenderjahr** (Deutsch oder Englisch)

>*Short report on the project’s progress for the last calendar year (German or English)<*

Kurzbericht zum Kalenderjahr\_\_\_\_2023\_\_\_\_\_\_\_\_\_\_\_

*(Short report for the calendar year)*

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| The project tasks are generally on course and on schedule. Minor deviations result from natural hazards and the extreme glacier melt of the year 2023, along with very long ablation seasons and warm winter temperatures. The warm conditions with meltwater production until November even at highest elevations caused a delay in core drilling. The project has now been extended by one year so we can use another winter for drilling if it will be cold (and dry) enough.  We added Futschöl rock glacier to the areas of interest defined in the proposal, where ice has become exposed, plus an ice field close to the site where Ötzi, the ice-man was found, and Gurgler Eisjoch, where a number of artefacts were discovered. The data of Weißsseespitze mass balance and ice cores were used for a publication on the Ötzi spot and its glaciological characterization. As it turned out that the distribution of snow cover at WSS is changing fro year to year, and mass balance shows a complicate pattern, GOPRO systems had been bought for an aerial monitoring. First images have been acquired in 2023, the system will be operational in 2024 to calculate volume change. Major progress was made regarding the analysis of the WSS ice core and the analysis of the WSS station data. The WSS ice core data was already published by Azzurra Spagnese. One significant layer was identified in the chemistry of the core, but the related processes and the age of the layer remain unclear. Complementary datings of the ground pointed to potential periods of plant growth at the summit (with ice present at the same time). The analysis of the energy balance data will be published in 2024. A wooden artefact was found close to our core drilling site in Jamtal on Jamtalferner. We are waiting for the macro-radiocarbon dating and have taken surface ice samples, because those findings might help to constrain the age of the glacier surface.  The samples for the micro-radiocarbon dating were sent to our project partner Margit Schwikowski. No firm dates are available for the processing, however, due to technical issues with their instruments. The macro-radiocarbon samples have been sent to VERA, University of Vienna, with results promised by 06/2024.  Of the WPs, WP 2.1. is completed, but additional drillings are envisaged. WP2.3. is partly completed: no macrofossils could be found for Großvenediger; at Marmolada a number of other groups were active because of the glacier collapse hazard. In summer 2024 it might be feasible to catch up with the plan at Marmolada. In WP 3.1. the effort was focused on WSS cores, because no dating is available yet for the other cores (3.6. posponed for technical issues at our partner lab). WP 4 is ongoing, with a publication envisaged for 2024. The results of WP 5 are published together with the core chemistry (see below). Work on WP 6 and 7 is ongoing.  Conference presentations were made at the IUGG in Berlin and the INQUA in Roma.  Spagnesi A., Bohleber P., Barbaro E., Feltracco M., De Blasi F., Dreossi G., Stocker-Waldhuber M., Festi D., Gabrieli J., Gambaro A., Fischer A. and Barbante C. (2023) Preservation of chemical and isotopic signatures within the Weißseespitze millennial old ice cap (Eastern Alps), despite the ongoing ice loss. Front. Earth Sci. 11:1322411. doi: 10.3389/feart.2023.1322411  Pilø, L., Reitmaier, T., Fischer, A., Barrett, J. H., & Nesje, A. (2023). Ötzi, 30 years on: A reappraisal of the depositional and post-depositional history of the find. The Holocene, 33(1), 112–125. <https://doi.org/10.1177/09596836221126133> |