



Universität
Basel

Research Project

Chironomid-based summer temperatures from the Eemian to the Holocene: Towards a European temperature reconstruction covering the past 130,000 years

Third-party funded project

Project title Chironomid-based summer temperatures from the Eemian to the Holocene: Towards a European temperature reconstruction covering the past 130,000 years

Principal Investigator(s) [Heiri, Oliver](#) ;

Project Members [Bolland, Alexander](#) ;

Organisation / Research unit

Departement Umweltwissenschaften / Geoökologie (Heiri)

Department

Project start 01.01.2017

Probable end 31.12.2020

Status Completed

Proxy-based reconstructions of late Quaternary climate change are essential for assessing the relevance of climatic conditions for the development of landscapes, ecosystems and cultures as well as for understanding the influence of changing climate forcing factors on global and regional climates. However, for Central Europe, and notably for northern Switzerland and adjacent regions, only limited quantitative information is available on the amplitude of temperature changes during large sections of the past 130,000 years. Based on fossil chironomid records from sites in the northern Alpine region of Switzerland and adjacent regions, this project will develop a new palaeotemperature dataset that describes long-term (millennial-scale) summer temperature changes during this time interval. The presently available chironomid-temperature transfer function for the Alpine region will be expanded by analysing an additional 40 lakes to make it suitable for July air temperature reconstruction based on fossil chironomids in late Quaternary sediments from northern Alpine lowland and mid-elevation lakes. New Lateglacial chironomid records from two sites in Switzerland will be developed. Together with reconstructed temperatures obtained from previously analysed chironomid records in the study region, these data will be used to calculate a multi-site reconstruction of summer temperature change during the past 18,000 years. In collaboration with partner projects, new chironomid-based July air temperature reconstructions will also be developed from two lakes in southern Germany close to the Swiss border, covering the time interval of ca. 130,000–40,000 and ca. 40,000–14,000 years ago, respectively. Combined these records will describe July air temperature variations in the study region at multimillennial- to millennial-scale for the interval 130,000–18,000 years ago and at millennial- to multicentennial-scale for the past 18,000 years. The project will produce the first reconstruction of July air temperature change from central Europe covering a full interglacial-glacial-interglacial cycle based on a standardized and consistent methodology, and the longest chironomid-based temperature reconstruction available to date. It will therefore provide the user community (e.g., archaeologists, palaeoecologists, glaciologists, vegetation and climate modellers) with a new, high-quality palaeotemperature dataset for the northern Alpine region. This dataset can be used to study the effects of past temperature change on the development of cultures, biomes and ecosystems in central Europe, and to assess the effect of variations in climate forcing factors on regional climate.

Financed by

Swiss National Science Foundation (SNSF)

Add publication

Published results

4600884, Bolland, Alexander; Rey, Fabian; Gobet, Erika; Tinner, Willy; Heiri, Oliver, Summer temperature development 18,000-14,000 cal. BP recorded by a new chironomid record from Burgäschisee, Swiss Plateau, 0277-3791, Quaternary Science Reviews, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

4624451, Bolland, Alexander; Kern, Oliver A.; Allstädt, Frederik J.; Peteet, Dorothy; Koutsodendris, Andreas; Pross, Jörg; Heiri, Oliver, Summer temperatures during the last glaciation (MIS 5c to MIS 3) inferred from a 50,000-year chironomid record from Föramoos, southern Germany, 0277-3791, Quaternary Science Reviews, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

4634934, Bolland, Alexander; Kern, Oliver A.; Koutsodendris, Andreas; Pross, Jörg; Heiri, Oliver, Chironomid-inferred summer temperature development during the late Rissian glacial, Eemian interglacial and earliest Würmian glacial at Föramoos, southern Germany, 0300-9483 ; 1502-3885, Boreas, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

4640348, Bolland, Alexander, Chironomid-inferred summer temperature and lake development during the last interglacial-glacial cycle in central Europe, Publication: Thesis (Dissertationen, Habilitationen)

4604068, Ilyashuk, Elena A.; Ilyashuk, Boris P.; Heiri, Oliver; Spötl, Christoph, Summer temperatures and lake development during MIS 5a interstadial: New data from the Unterangerberg palaeolake in the Eastern Alps, Austria, 0031-0182, Palaeogeography, Palaeoclimatology, Palaeoecology, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

4596914, Kaufmann, Darrell; McKay, Nicholas; Routson, Cody; Erb, Michael; Davis, Basil; Heiri, Oliver; Jaccard, Samuel; Tierney, Jessica; Dätwyler, Christophe; Axford, Yarrow; Brussel, Thomas; Cartapanis, Olivier; Chase, Brian; Dawson, Andria; de Vernal, Anne; Engels, Stefan; Jonkers, Lukas; Marsicek, Jeremiah; Moffa-Sánchez, Paola; Morrill, Carrie; Orsi, Anais; Rehfeld, Kira; Saunders, Krystyna; Sommer, Philipp S.; Thomas, Elizabeth; Tonello, Marcela; Tóth, Monika; Vachula, Richard; Andreev, Andrei; Bertrand, Sebastien; Biskaborn, Boris; Bringué, Manuel; Brooks, Stephen; Caniupán, Magaly; Chevalier, Manuel; Cwynar, Les; Emile-Geay, Julien; Fegyveresi, John; Feurdean, Angelica; Finsinger, Walter; Fortin, Marie-Claude; Foster, Louise; Fox, Mathew; Gajewski, Konrad; Grosjean, Martin; Hausmann, Sonja; Heinrichs, Markus; Holmes, Naomi; Ilyashuk, Boris; Ilyashuk, Elena; Juggins, Steve; Khider, Deborah; Koinig, Karin; Langdon, Peter; Larocque-Tobler, Isabelle; Jianyong, Li; Lotter, André; Luoto, Tomi; Mackay, Anson; Magyari, Eniko; Malevich, Steven; Mark, Bryan; Massafiero, Julieta; Montade, Vincent; Nazarova, Larisa; Novenko, Elena; Paril, Petr; Pearson, Emma; Peros, Matthew; Pienitz, Reinhard; Plóciennik, Mateusz; Porinchu, David; Potito, Aaron; Rees, Andrew; Reinemann, Scott; Roberts, Stephen; Rolland, Nicolas; Salonen, Sakari; Self, Angela; Seppä, Heikki; Shala, Shyhyrete; St-Jacques, Jeannine-Marie; Stenni, Barbara; Syrykh, Liudmila; Tarrats, Pol; Taylor, Karen; van den Bos, Valerie; Velle, Gaute; Wahl, Eugene; Walker, Ian; Wilmshurst, Janet; Zhang, Enlou; Zhilich, Snezhana, A global database of Holocene paleotemperature records, 2052-4463, Scientific Data, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

Add documents

Specify cooperation partners

| ID | Kreditinhaber | Kooperationspartner | Institution | Laufzeit - von | Laufzeit - bis |
|-----------|----------------------|----------------------------|----------------------------|---------------------------|---------------------------|
| 4495877 | Heiri, Oliver | Pross, Jörg | University of Heidelberg | 01.08.2018 | 31.12.2020 |
| 4495888 | Heiri, Oliver | Koutsodendris, Andreas | University of Heidelberg | 01.01.2018 | 31.12.2020 |
| 4495889 | Heiri, Oliver | Tinner, Willy | University of Bern | 01.01.2018 | 31.12.2019 |
| 4495890 | Heiri, Oliver | Millet, Laurent | University de France-Comté | 01.01.2018 | 31.12.2020 |