

The Yedoma Region: A Synthesis of Circum-Arctic Distribution and Thickness

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Vast regions of Arctic Siberia, Alaska, and the Yukon Territory are covered by ice-rich silts penetrated by large ice wedges, resulting from syngenetic sedimentation and freezing. Because of fast incorporation of organic material into permafrost during sedimentation, Yedoma deposits include low-degraded organic matter. Moreover, ice-rich permafrost deposits like Yedoma are especially prone to degradation triggered by climate changes or human activity. When Yedoma deposits degrade, large amounts of sequestered carbon as well as other nutrients are released, which is of global significance for the climate system.

The main objective of this IPA Action Group is to provide a map showing the circum-arctic distribution and thickness of Yedoma deposits. This product is of importance for assessing infrastructure vulnerability, calculating permafrost carbon stocks, and to improve the modelling of future landscape change trajectories within these remote regions. Yedoma coverage quantification is based on the digitization of surface geological and quaternary geological maps and the analysis of remote sensing data. This information is merged with data on Yedoma thickness extracted from drilling records and outcrop observations reported in the scientific literature.

The Yedoma Action Group started its activities in early 2015 with a presentation of the Action Group's goals at the Melnikov Permafrost Institute in Yakutsk, Russia. After this we had side meetings in Flagstaff, USA (May 2015); Potsdam, Germany (November 2015); a workshop and session during the ICOP in Potsdam, Germany; and



sessions at the AGU Fall Meetings in 2015 and 2016 in San Francisco, USA.

A key milestone was reached by organising and conducting the successful session at the 11th International Conference on Permafrost. Here nine oral and fourteen poster presentations with a focus on Yedoma were given. Moreover, a hands-on workshop was organised prior to ICOP 2016 in Potsdam, where 24 scientists from 5 countries participated. At this workshop, experts evaluated, discussed, and added information to the first drafts of the regional and circum-arctic Yedoma maps. Further products like a Yedoma photo database and a first version of the Yedoma thickness database are now already published online on the Arctic Permafrost Geospatial Centre (APGC, <http://apgc.awi.de/>). In addition, a multi-author review manu-

script on the Yedoma carbon stock characteristics has been submitted. Another paper on the Yedoma coverage and thickness is in preparation. During ICOP plans have emerged to develop a special journal issue on Yedoma in the journal *Permafrost and Periglacial Processes*. These plans are currently still being further developed by a team of potential guest editors from the IPA Action Group and we hope to announce a call for manuscripts by early 2017.

GET INVOLVED

If you are interested in becoming involved in the Yedoma Action Group activities and in contributing data or sharing your ideas, please contact jens.strauss@awi.de and have a look at the Arctic Permafrost Geospatial Centre (<http://apgc.awi.de/>) to download the first products of the Yedoma Action Group.