Modern pollen-vegetation-climate relationships and pollen productivity estimates for common East Siberian taxa

Rongwei Geng\textsuperscript{1,2,3}, Andrei Andreev\textsuperscript{1}, Stefan Kruse\textsuperscript{1}, Yan Zhao\textsuperscript{2,3}, Ulrike Herzschuh\textsuperscript{1}, Luidmila Pestraykova\textsuperscript{4}, and Evgenii Zakharov\textsuperscript{4,5}

\textsuperscript{1}Alfred Wegener Institute for Polar and Marine Research, Potsdam, Germany
\textsuperscript{2}Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China
\textsuperscript{3}University of Chinese Academy of Sciences, Beijing, China
\textsuperscript{4}North-Eastern Federal University of Yakutsk, Yakutsk, Russia
\textsuperscript{5}Institute for Biological Problems of the Cryolithozone, Russian Academy of Sciences, Siberian branch, Yakutsk, Russia

East Siberia is an ideal area for investigating the relationships between modern pollen assemblages and vegetation under the extremely cold and dry climate conditions. These relationships are the basis of paleovegetation and paleoclimate reconstructions from fossil pollen records. Pollen productivity estimates (PPE) are required for reliable pollen-based quantitative vegetation reconstructions. Here, we present a new pollen dataset of 48 moss/soil and 24 lake surface sediment samples collected from Chukotka and Yakutia. Generally, tundra and taiga vegetation sites can be well distinguished in the surface pollen assemblages from East Siberia. Moss/soil and lake samples have mostly similar pollen assemblages but contents of some pollen taxa may vary significantly in different sample types. We classified drone images based on field survey to obtain high-resolute vegetation data. Pollen counts in moss/soil samples and vegetation data can be used in the Extended R-Value (ERV) model to estimate the relevant source area of pollen (RSAP) and the PPEs of major plant taxa. The result of PPE calculation for most common taxa (Alnus, Betula, Cyperaceae, Ericaceae, Larix, Pinus and Salix) can be used to improve vegetation reconstructions.