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# Identifying priority areas of paleolimnological research

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## Abstract

Globally, we conducted an exhaustive analysis to map where sediment cores have been collected and noted a strong bias towards the temperate-subarctic zones of North America and Europe. We are now quantifying global heterogeneity in environmental, climatic and human dynamics (e.g. land use, temperature and human population) and historical perturbations to identify hotspots of global change and pin-point regions where high resolution analyses of well dated cores are needed to properly characterize historical trajectories. These results will inform a regional study of soil erosion dynamics.

To calculate spatial heterogeneity and temporal dynamics, we extracted modern and past data from 550,000 watersheds. Our study relies on four global databases: 1) Sediment core data set at global scale (Jenny et al. 2016, and this study); 2) HydroBASIN watershed boundaries at a global scale (Lehner et al. 2013); 3) HYDE historical land-use change data set (Goldewijk et al. 2011); 4) UDEL historical climate data set at global scale (Willmott et al. 1995). Coefficients of variance (CV) were used to identify regions in the worlds of high local heterogeneities. Additive mixed-effect model (AMM) were used to calculate regional trends of land cover/ uses during the Anthropocene and to delineate regional boundaries. New time series data are under collection - collaboration with National Lacustrine Core Facility (LacCore, US) and INRS (Qc)

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