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EARTH AND ATMOSPHERIC SCIENCES

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To whom it may concern,

Letter of Interest with respect to THAW: *"Trends and Hazards in Arctic Warming: Climate change and greenhouse gas emissions from Arctic permafrost regions"*

I am writing to state my strong support for the proposed THAW project to be submitted under the EU 7 Framework Programme. The goal of the proposal is to improve the understanding of the vulnerability of Arctic permafrost to climate change, and estimate the implications of this on the global greenhouse gas concentrations and the future climate. We consider the proposed project as very valuable to our activities in the field of quantifying greenhouse gas emissions and their feedbacks to the global climate system from northern high latitudes.

Currently, we are investigating the magnitudes and probabilities of abrupt climate transitions due to potential positive feedbacks between biosphere and atmosphere in the Arctic. We hypothesize that there exists a climate warming threshold beyond which permafrost degradation becomes widespread and thus instigates strong and/or sharp increases in methane emissions (via thermokarst lakes and wetland expansion). These would outweigh any increased uptake of carbon (e.g. from peatlands) and would result in a strong, positive feedback to global climate warming.

In addition, we are examining how future changes in land use and land cover influence the exchange of CO2 and CH4 between terrestrial ecosystems and the atmosphere, terrestrial carbon storage and primary productivity, water supply and radiative forcing of the atmosphere through changes in surface albedo in Northern Eurasia. We are further assessing how human adaptation and quality of life may be impacted by these changes.

The Proposed project THAW aligns well with our pursuit. Thus I look forward to a fruitful collaboration with the team.

Best regards,

Qianlai Zhuang
Purdue University