


AGU Fall Meeting 2009

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Recent and Future Changes in Eurasian Permafrost: Observations, Modeling, Possible Consequences (Invited)

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Permafrost has received much attention recently because surface temperatures are rising in most permafrost areas of the earth, bringing permafrost to the edge of widespread thawing and degradation. The thawing of permafrost that already occurs at the southern limits of the permafrost zone can generate dramatic changes in ecosystems, in water and carbon cycles, and in infrastructure performance. If current trends will continue into the future, there are no doubts that warming of permafrost will eventually trigger widespread permafrost thawing. There is much uncertainty at what exact locations and areas permafrost will start to thaw first, what will be the rate of this degradation, and what exactly will be the consequences for other components of the Arctic, sub-Arctic and Global Natural Systems. To monitor the present thermal state of permafrost, the International Permafrost Association launched its International Polar Year project # 50, Thermal State of Permafrost (TSP). Our recent observations from Northern Eurasia as a part of TSP project and obtained historical permafrost temperature data show a general increase in permafrost temperatures during the last few decades. Most of the sites show a substantial warming. This warming was different at different locations, but was typically from 0.5 to 2°C at the depth of zero seasonal temperature variations in permafrost. Substantial increase in permafrost temperatures up to 0.5°C was recorded during the last three years at several locations along the Siberian Arctic shoreline. This abrupt increase may be related to the dramatic sea ice loss during the same period.

Thawing of the Little Ice Age permafrost is going on at many locations and there are some indications that the late-Holocene permafrost started to thaw at some specific undisturbed locations in the European North-East, in the northwest of West Siberia, and in western Yakutia. Some projections of possible changes in permafrost during the current century based on application of calibrated permafrost models will be provided in our presentation. Possible consequences of these changes will be also discussed.

Contact Information

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