Permafrost Coastal Systems Network (PerCS-Net)

The Permafrost Coastal Systems Network will accelerate the process of scientific discovery, facilitate public access to scientific data, and promote convergence through an international, transdisciplinary network focused on science, engineering, and societal issues associated with permafrost-affected coasts and communities in the Arctic.

January 2021

Permafrost Coasts Featured in NOAA's 2020 Arctic Report Card

Observations on permafrost coasts were included in NOAA's 2020 Arctic Report Card for the first time in the 15 year history of the annual publication. The Coastal Permafrost Erosion essay involved contributions from 24 authors located in 8 different countries, with half of the authors being an early career researcher. Key highlights of the essay include observations documenitng an increase in erosion of permafrost coasts in the Arctic since the early 2000s, coinciding with warming temperatures, sea ice reduction, and permafrost thaw. Coasts along the US and Canadian Beaufort Sea experienced the largest increase in erosion rates in the Arctic, ranging from +80 to +160%, when comparing average rates from the last two decades of the 20th century with the first two decades of the 21st century. The initiation of several national and international research networks in recent years has enabled closer coordination and collaboration of measurements and a better understanding of pan-Arctic permafrost coastal dynamics. The formation of interdisciplinary research teams and increasing collaboration across knowledge systems, such as Western science and Indigenous knowledge, has increased the scope and breadth of studies being conducted along permafrost coasts as well as their societal relevance. Combined, these developments show great promise for understanding future changes in coastal permafrost dynamics and the potential impact on both the natural and built environments.

Arctic Report Card 2020

THE SUSTAINED TRANSFORMATION TO A WARMER, LESS FROZEN AND BIOLOGICALLY CHANGED ARCTIC REMAINS CLEAR

Coastal Permafrost Erosion

Benjamin M. Jones[1], Anna M. Irrgang[2], Louise M. Farquharson[3], Hugues Lantuit[2], Dustin Whalen[4], Stanislav Ogorodov[5], Mikhail Grigoriev[6], Craig Tweedie[7], Ann E. Gibbs[8], Matt C. Strzelecki[9], Alisa Baranskaya[5], Nataliya Belova[6], Anatoly Sinitsyn[10], Aart Kroon[11], Alexey Maslakov[5], Gonçalo Vieira[12], Guido Grosse[2,13], Paul Overduin[2], Ingmar Nitze[2], Chris Maio[14], Jacquelyn Overbeck[15], Mette Bendixen[16], Piotr Zagórski[17], and Vladimir E. Romanovsky[3]

Frontiers Special Issue Update

We now have eight papers published in our Frontiers Special Issue (Observations, Interactions, and Implications of Increasingly Dynamic Permafrost Coastal Systems) and three more are currently in review. PerCS-Net is offering publication cost support to graduate students and early career researchers. Please contact bmjones3@alaska.edu if you have any questions. The final submission deadline has also been extended to 13 March 2021. We look forward to receiving your submissions for peer-review.

New Special Issue!

"Permafrost Regions in Transition" call for papers in Geography, Environment, Sustainability of the Russian Geographical Society! Permafrost is an important component of the cryosphere. It plays a critical role in the functioning of Arctic environmental ecosystems and global climate change and affects human activities in the polar and alpine regions. This multidisciplinary Special Issue of GES journal is focused on research and education activities that address changes facing permafrost regions. The Issue welcomes papers on history and methods of permafrost research, development of new information and data resources, observations and modeling studies, environmental and socioeconomic dimensions of the permafrost regions.

Guest Editors:
1) Prof. Dr. Frederick Nelson, Department of Geography, Environment, and Spatial Sciences, Michigan State University, East Lansing, USA.
2) Prof. Dr. Dmitriy Streletskiy, The George Washington University, USA.
3) Dr. Alexey Maslakov, Lomonosov Moscow State University, Russia.
4) Dr. Irina Streletskaya, Lomonosov Moscow State University, Russia.
Submission deadline: March 31st, 2021

Currently, PerCS-Net includes 158 members from 21 countries, with nearly half of the network consisting of early career researchers! Please help us continue to bring together the international coastal permafrost community by providing material for future quarterly newsletters and by spreading the word through your own networks.

Vision Statement

PerCS-Net envisions building:

A sustainable, pan-Arctic permafrost coastal observatory network providing coordinated and timely information to researchers, managers, indigenous stakeholders, and the general public

A transdisciplinary research network that fosters linkages in order to amplify the broader impacts of each individual network and maintain a circumpolar alliance for Arctic coastal community information exchange

An international community that fosters and empowers the next generation of students, early-career researchers, and indigenous communities faced with the known and unknown challenges of the future Arctic System.

PhD Position Announcement at UAF!

The Permafrost Laboratory at the Geophysical Institute, University of Alaska Fairbanks seeks a PhD student to work on the National Science Foundation-funded research project: Resilience and adaptation to the effects of permafrost degradation induced coastal erosion. To goal of this project is to understand the complex interrelationships and mutual impacts of continued climate change in the Arctic among the following components: permafrost degradation and coastal erosion, civil infrastructure and development, and community well-being and socio-demographic and cultural resilience. Results from this study will be used to formulate a holistic and predictive model that will aid future adaptation of social systems and the built environment to the unprecedented natural environmental changes in the Arctic. The successful applicant will primarily focus on (1) modeling and predicting the rate, magnitude, and mechanisms of permafrost degradation and associated land loss within communities on the north coast of Alaska; (2) help with the development of several infrastructure hazard maps for the northern Alaskan coastal region under the effects of permafrost degradation and coastal erosion. Please contact Dr. Louise Farquharson (lmfarquharson@alaska.edu) for more information about this exciting opportunity.

New Network Member Publications

Baranskaya, A., Novikova, A., Shabanova, N., Belova, N., Maznev, S., Ogorodov, S. and Jones, B.M., 2021. The Role of Thermal Denudation in Erosion of Ice-Rich Permafrost Coasts in an Enclosed Bay (Gulf of Kruzenstern, Western Yamal, Russia). Frontiers in Earth Science, 8.

Berry, M.H.B., Whalen, M.D. and Lim, M., 2021. Long-term ice-rich permafrost coast sensitivity to air temperatures and storm influence: lessons from Pullen Island, NWT. Arctic.

Bogardus, R., Maio, C., Mason, O., Buzard, R., Mahoney, A. and de Wit, C., 2020. Mid-Winter Breakout of Landfast Sea Ice and Major Storm Leads to Significant Ice Push Event Along Chukchi Sea Coastline. Frontiers in Earth Science, 8, p.344.

Brady, M.B. and Leichenko, R., 2020. The impacts of coastal erosion on Alaska's North Slope communities: A co-production assessment of land use damages and risks. Polar Geography, 43(4), pp.259-279.

Bristol, E.M., Connolly, C.T., Lorenson, T.D., Richmond, B.M., Ilgen, A.G., Choens, R.C., Bull, D.L., Kanevskiy, M., Iwahana, G., Jones, B.M. and McClelland, J.W., 2021. Geochemistry of coastal permafrost and erosion-driven organic matter fluxes to the Beaufort Sea near Drew Point, Alaska. Frontiers in Earth Science, 8.

Jones, B. M., A. M. Irrgang, L. M. Farquharson, H. Lantuit, D. Whalen, S. Ogorodov, M. Grigoriev, C. Tweedie, A. E. Gibbs, M. C. Strzelecki, A. Baranskaya, N. Belova, A. Sinitsyn, A. Kroon, A. Maslakov, G. Vieira, G. Grosse, P. Overduin, I. Nitze, C. Maio, J. Overbeck, M. Bendixen, P. Zagórski, and V. E. Romanovsky. 2020. Coastal Permafrost Erosion. Arctic Report Card 2020, R. L Thoman, J. Richter-Menge, and M.L. Druckenmiller, Eds.,

Lapham, L.L., Dallimore, S.R., Magen, C., Henderson, L.C., Powers, L.C., Gonsior, M., Clark, B., Côté, M., Fraser, P. and Orcutt, B.N., 2020. Microbial Greenhouse Gas Dynamics Associated With Warming Coastal Permafrost, Western Canadian Arctic. Frontiers in Earth Science, 8, p.576.

Jong, D., Bröder, L., Tanski, G., Fritz, M., Lantuit, H., Tesi, T., Haghipour, N., Eglinton, T.I. and Vonk, J.E., 2020. Nearshore zone dynamics determine pathway phf organic carbon from eroding permafrost coasts. Geophysical research letters, 47(15), p.e2020GL088561.

Overbeck, J.R., Buzard, R.M., Turner, M.M., Miller, K.Y., and Glenn, R.J., 2020, Shoreline change at Alaska coastal communities: Alaska Division of Geological & Geophysical Surveys Report of Investigation 2020-10, 29 p., 45 sheets.

Ramage, J., Jungsberg, L., Wang, S., Westermann, S., Lantuit, H. and Heleniak, T., 2021. Population living on permafrost in the Arctic. Population and Environment, pp.1-17.

For more information, please consider joining PerCS-Net to keep informed about upcoming activities and new products – https://permafrostcoasts.org. We are very excited to build this International Network of Networks with the community!