The Permafrost Coastal Systems Network (PerCS-Net)
An emerging international network focused on permafrost coastal systems in transition

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Permafrost Coasts - A Wicked Problem

There is no place more representative of the challenges faced at the intersection of natural, social, and built systems than the rapidly changing Arctic. In particular, permafrost coastal systems are sensitive to Arctic Ocean–land linkages and permafrost degradation, owing to permafrost thaw and land subsidence, rising sea levels, reductions in sea ice cover and the resulting increase in open water, and increasingly frequent and impactful storms. These changes in the Arctic system have increased the vulnerability of permafrost coasts to erosion and altered coastal morphologies, ecosystems, and carbon export to oceans. Aside from environmental impacts, this presents a wicked problem for the many human interests operating along the arctic coasts, including those involved in traditional lifestyles, as well as industrial and commercial activities. To improve our understanding and management of permafrost coastal change, a coordinated approach is required that facilitates knowledge exchange across borders, the involvement of a wide array of stakeholders, and the incorporation of research from a diverse range of fields.

Coastal Erosion and Thaw Subsidence

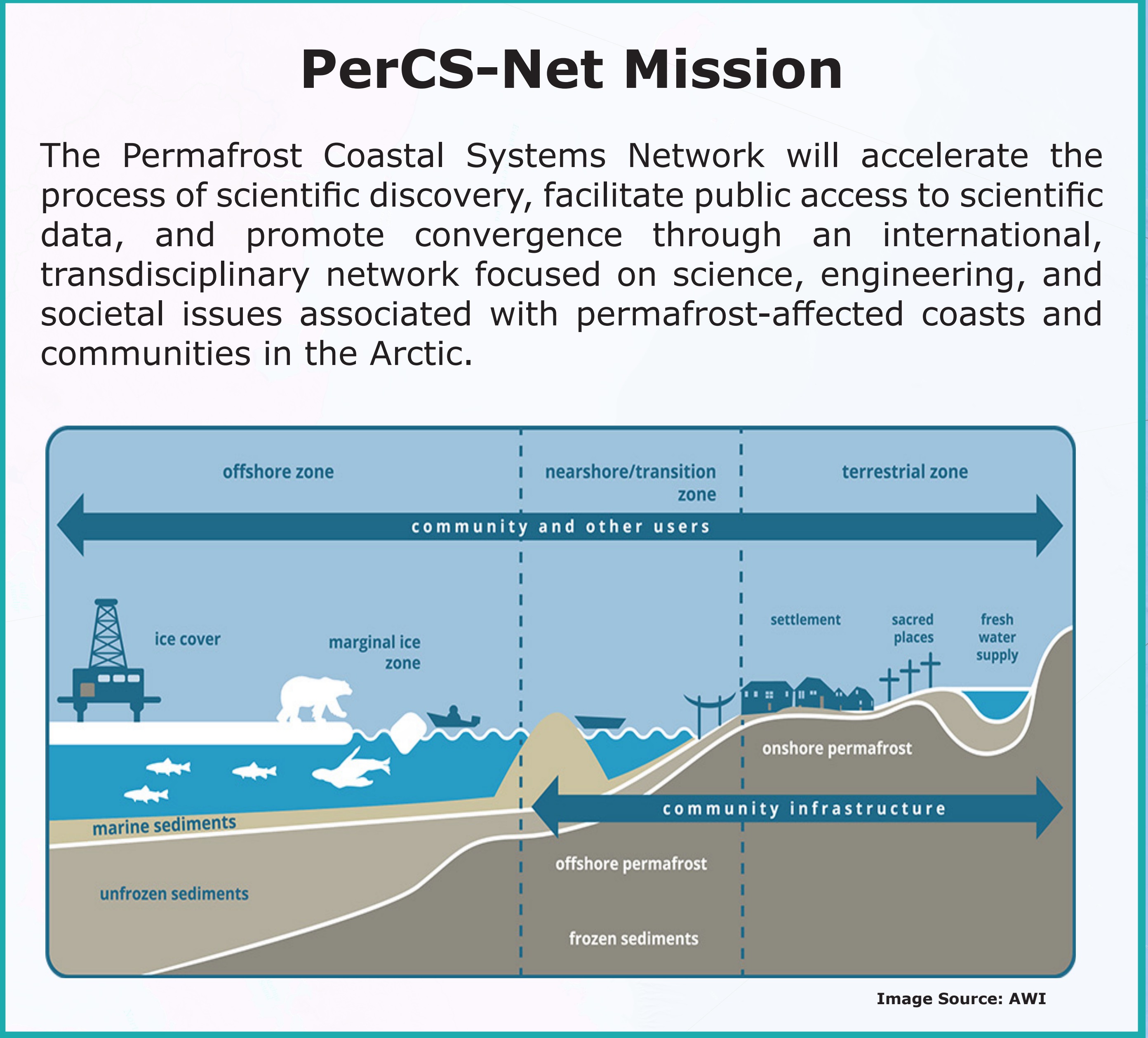Permafrost Bluff Erosion | Riverine Flooding | Delta Flooding | Coastal Plain Flooding

Socioeconomic and Cultural Impacts

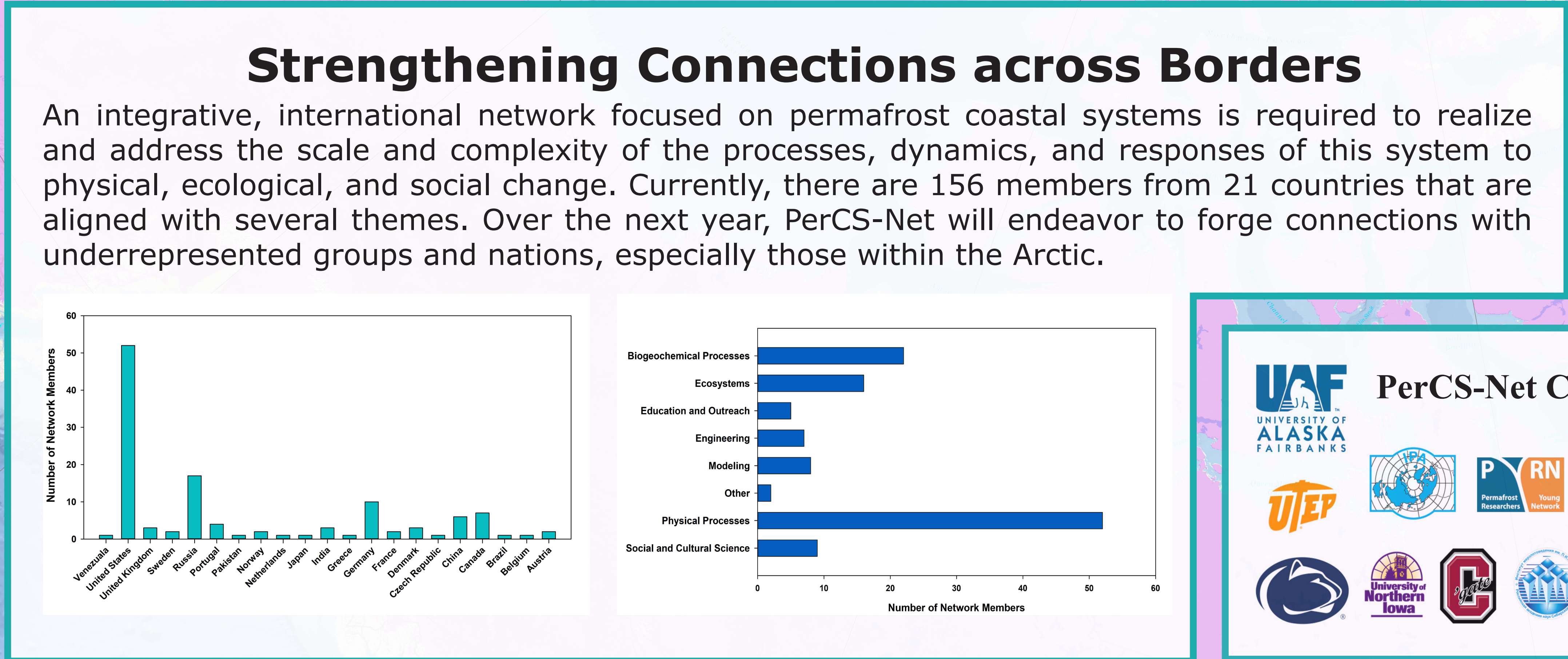Loss of Subsistence Cabins | Loss of Cultural Heritage Sites | Infrastructure Impacts | Infrastructure Impacts

A better understanding of permafrost coastal systems and how they are responding to changes in the Arctic is important since a high proportion of Arctic residents live on or near coastlines, and many derive their livelihood from terrestrial and nearshore marine resources.

PerCS-Net Mission

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.

Image Source: AWI

Join the Network!

PerCS-Net Goals and Objectives

(1) develop internationally recognized protocols for quantifying the multitude of changes and impacts occurring in Arctic coastal permafrost systems,

(2) sustain observations from representative coastal key sites,

(3) unify annual and decadal-scale observations of circum-arctic permafrost-influenced coasts,

(4) refine a circum-arctic coastal mapping classification system and web-based delivery of geospatial information for management planning purposes and readily accessible information exchange for vulnerability assessments,

(5) engage local communities and observers to capture impacts on subsistence and traditional livelihoods, and

(6) promote synergy across networks to foster the next generation of students, postdoctoral scholars, and early-career researchers faced with the known and unknown challenges of the future Arctic System.

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Strengthening Connections across Borders

An integrative, international network focused on permafrost coastal systems is required to realize and address the scale and complexity of the processes, dynamics, and responses of this system to physical, ecological, and social change. Currently, there are 156 members from 21 countries that are aligned with several themes. Over the next year, PerCS-Net will endeavor to forge connections with underrepresented groups and nations, especially those within the Arctic.

PerCS-Net Collaborator Universities, Institutes, Agencies, and Associations