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Extremely Cold Subarctic

Location Examples:

- Sakha Republic (Yakutia), Russia

study
By Sarah Fahey

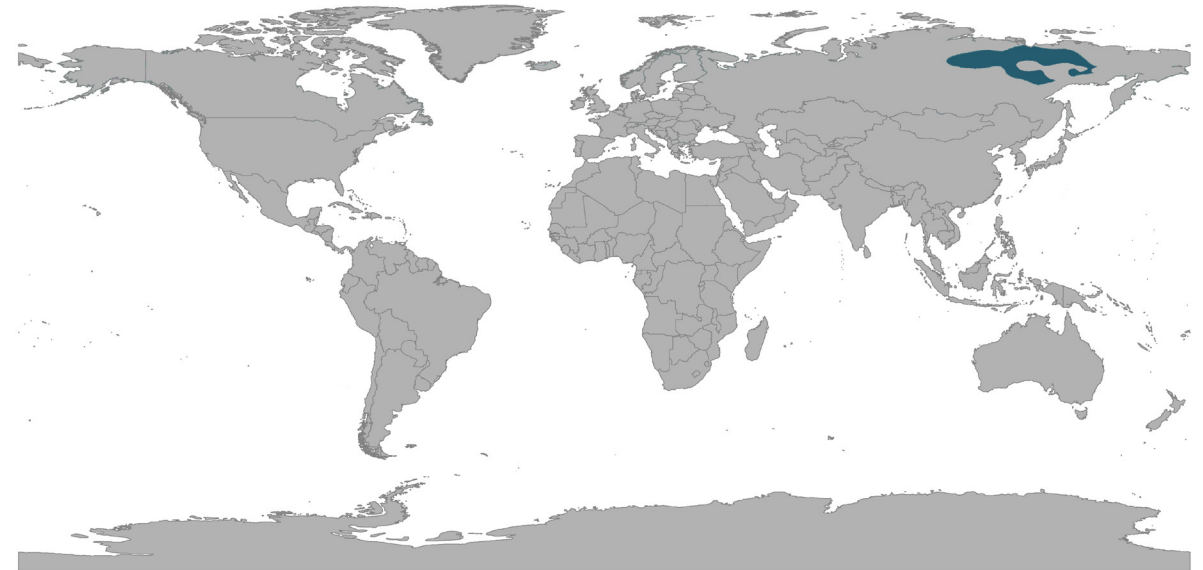
Extremely cold subarctic climates are rare, occurring almost exclusively in the north-eastern part of Russia. Some of the coldest temperatures within civilian populations are recorded in this climate. The coldest months average below 36 °F and the warmest three months average around 50 °F.

These regions are known for their extreme and severe climate. Because of the warm season both building and human civilization is possible. However building is very challenging due to the always frozen soil. Yakutsk is the largest city in this climate. The city itself is built on continuous permafrost, therefore every building is built on underground stilts varying in depth depending on the size of the building.

Sources:

https://en.wikipedia.org/wiki/Sakha_Republic

https://en.wikipedia.org/wiki/Subarctic_climate



World Mammoth and Permafrost Museum

case study
By Sarah Fahey

Location: Yakutsk, Russia



Architect: Leeser Architecture

Owner: N/A

Year of completion: Competition Entry

Climate: Extremely Cold Subarctic Climate

Material of interest: Glazing

Application: Exterior Facade

A double-glazed super-insulating facade system is used. The space between the glass layers is filled with Aerogel, a transparent gelatinous substance that guarantees high standards of insulation.

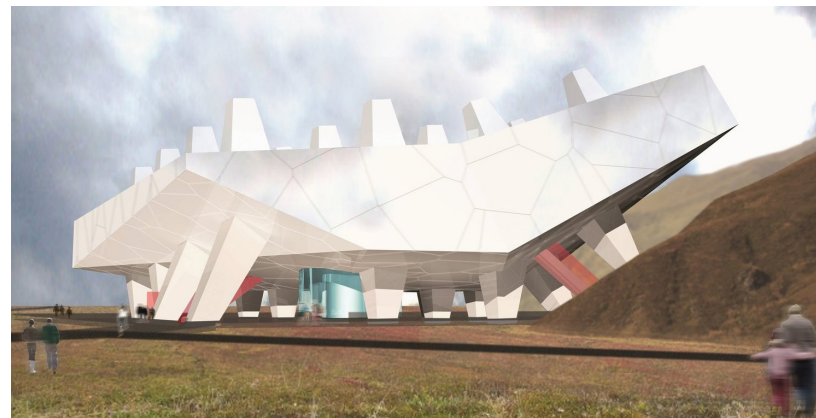
Properties of material: Great thermal insulation properties, reduces heat transfer- allowing for consistent interior climate control, low impact-minimal ground surface area also reduces heat transfer, somewhat flexible allowing unique design which mimics the natural patterns of permafrost cycles, semi-translucent

Sources:

<https://www.archilovers.com/projects/3966/world-mammoth-and-permafrost-museum.html#info>

<https://archinect.com/leeser/project/world-mammoth-and-permafrost-museum-yakutsk-ru>

<https://www.dezeen.com/2007/07/25/mammoth-and-permafrost-museum-by-leeser-arch/>



The National Drama Theatre Yakutsk Rep. of Sakha

case study
By Sarah Fahey

Location: Yakutsk, Russia



Architect: Mabetex Group

Owner: Sakhavneshtroj - Republic of Sakha

Year of completion: 2000

Climate: Extremely Cold Subarctic Climate

Material of interest: Glass & Possibly Prefabricated panels

Application: Exterior

Properties of material: Appears to be made of glass and prefabricated panels which would allow for faster construction and limited exposure to the elements for construction crews.

Sources:

<http://www.mabetex.com/en/63/the-national-drama-theatre-yakutsk-rep-of-sakha-p.html>