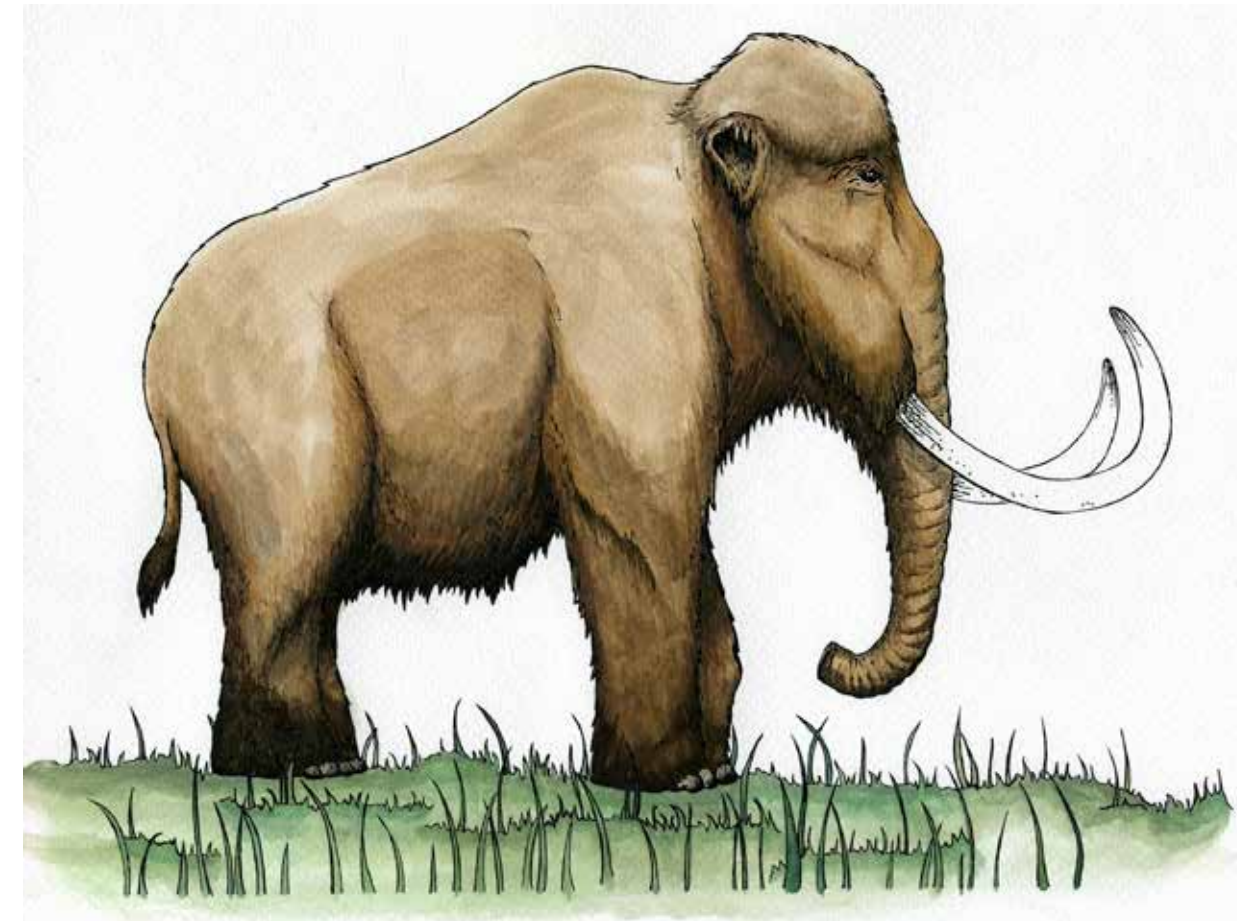


How can exhibit experiences advance climate change communication with visitors?



UNDER the ARCTIC

Digging into Permafrost

The Hidden World of Permafrost is a collaborative research project led by teams at the University of Alaska Fairbanks (UAF) and the Oregon Museum of Science and Industry (OMSI). The project explores the interrelationship between thawing permafrost and climate change, and builds on 50 years of informal education and outreach at the Alaskan Permafrost Tunnel, the Nation's only underground facility for research related to permafrost and climate.

Traveling Exhibition

To bring this story to North American audiences, OMSI and UAF created *Under the Arctic: Digging into Permafrost*, a 2,000 square foot interactive exhibition. Visitors are drawn into the unfamiliar world of permafrost research and thawing landscapes by immersive environments, personal stories from Alaska Natives, and climate change models, metaphors, and solutions.

Learning Research

Our project also has a research component that investigates the broad question "What is the power of a real object?" We are using ethnographic methods to study learning using real, replicated, and virtual objects. Visitors to the permafrost tunnel in Fairbanks and to the exhibition at OMSI are participants in the study.



Arctic Globe: Visitors look down on the Northern Hemisphere to visualize the surprising amount of permanently frozen ground on Earth—over 20% of the land shown.



Replica Permafrost Tunnel: The replica tunnel was carefully modeled on the real tunnel. Visitors enter an immersive environment to explore fossils and ice features frozen in time since the last ice age.



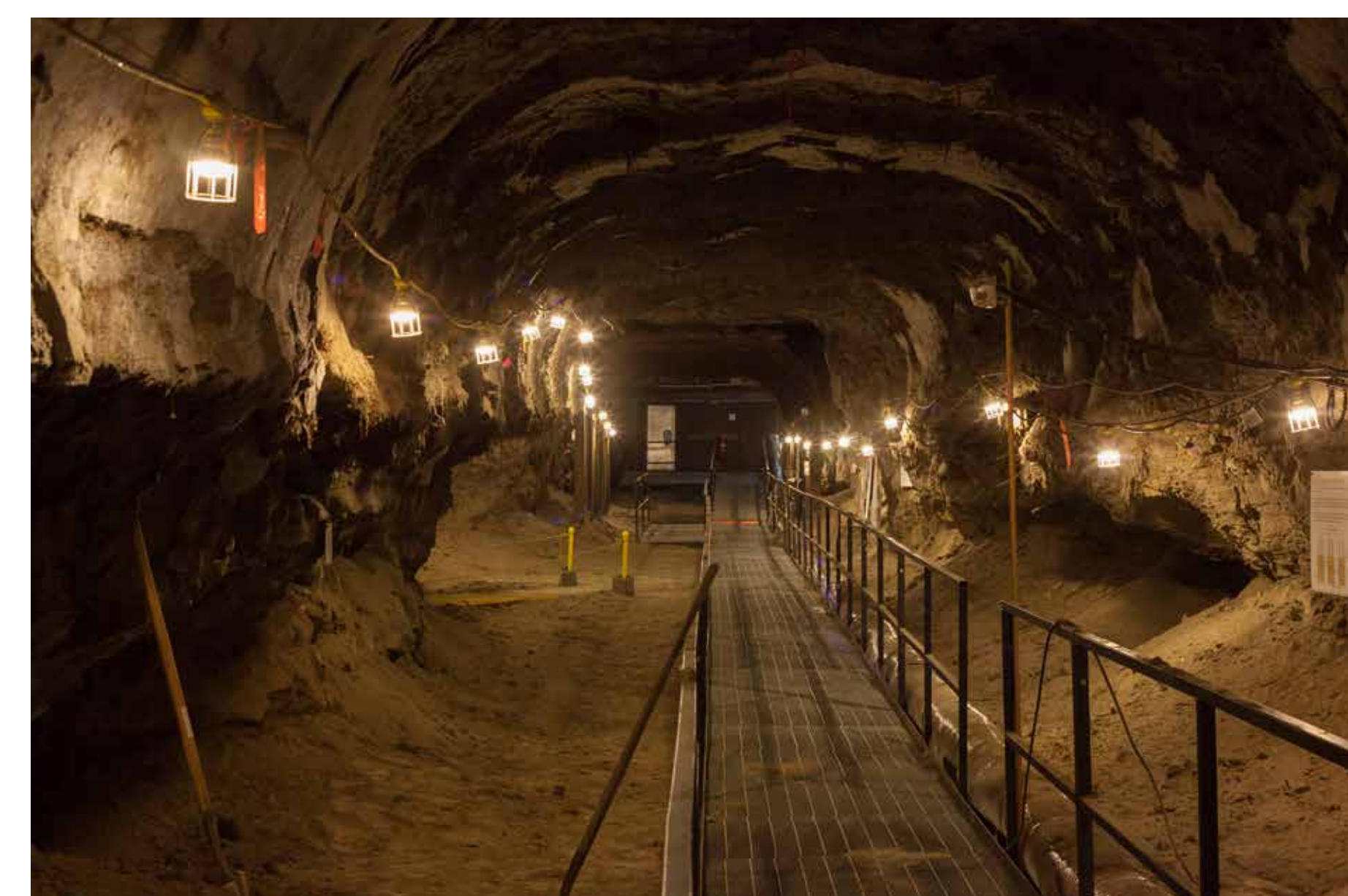
Fossil Microscope Station: Visitors rotate a tray of rocks, silt, and fossil fragments from the real tunnel, use a video microscope to examine them, and look through a field guide to identify the fossils.



Build an Alaskan Village: Visitors of all ages are challenged to build log cabins and roads on a landscape of thawing permafrost. Pushing the "thaw" button triggers sinkholes to open up on the play surface. Unlike a real thaw, these simulated sinkholes can be reset to try again.



World Fossil Fuel Challenge: By working together in this fast-paced game, visitors try to keep fossil fuel reserves (oil, coal, and natural gas) in the ground. If the "fossil fuel reserve" buttons are pressed quickly enough each time they light up, visitors slow climate change and keep global permafrost frozen.



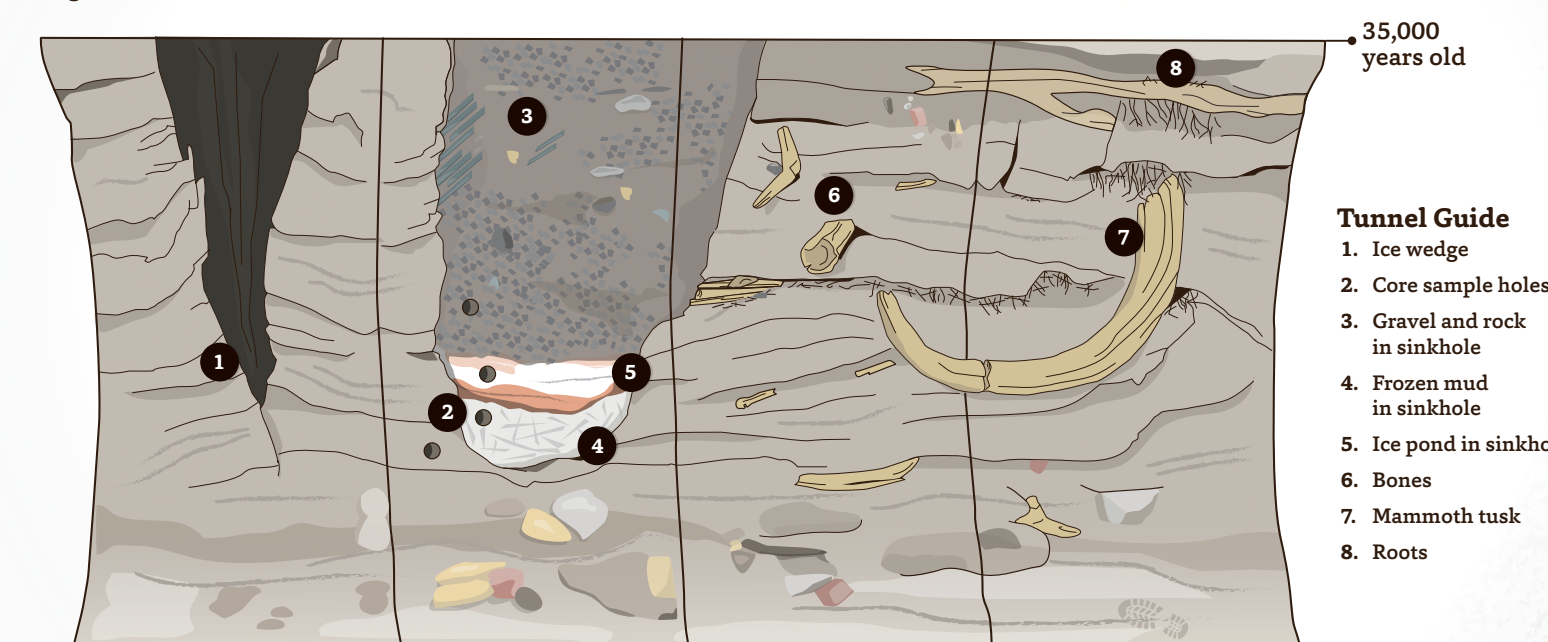
Permafrost Research Tunnel: The Cold Regions Research and Engineering Laboratory (CRREL) built the tunnel during 1963-65. CRREL maintains the tunnel as an active underground laboratory for many different kinds of research.



Permafrost Field Lab: Visitors are invited to join the research team at the Field Lab and further their investigation of permafrost.

Inside Old, Dirty Ice

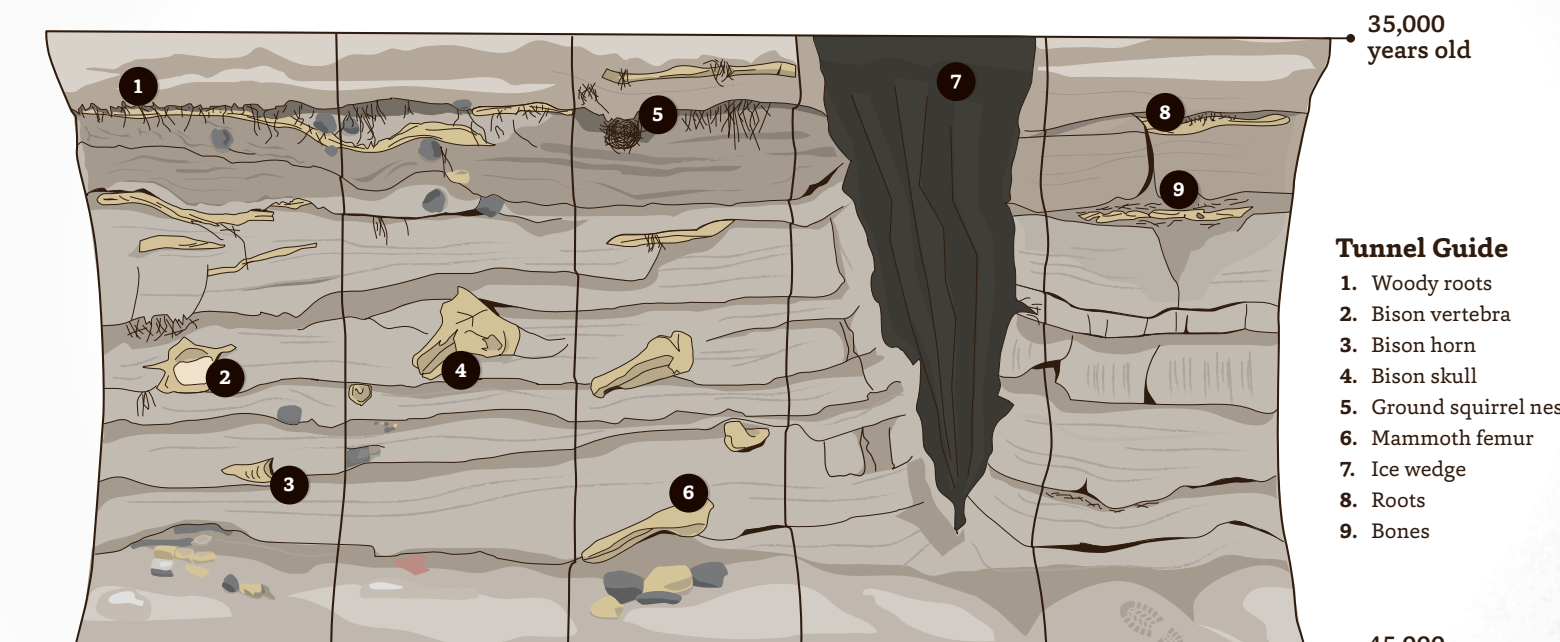
The tunnel around you is mostly made of ice. The silty layers that make up the walls are only 25% soil—the rest is frozen water. Dark ice wedges that cut into the walls are 95% ice. The ice is clear, but appears black because there is no light behind it. How many different kinds of ice can you find?



- Tunnel Guide**
1. Ice wedge
 2. Core sample hole
 3. Gravel and rock in sinkhole
 4. Frozen mud in sinkhole
 5. Ice pond in sinkhole
 6. Bones
 7. Mammoth tusk
 8. Bones

Time Travel Underground

Whatever was in or on the ground here 35,000 to 45,000 years ago was frozen in place. Ancient animals, plants, and microbes became frozen fossils. The tunnel contains many clues to past life and ancient climates. How many different fossils can you find?



- Tunnel Guide**
1. Woody roots
 2. Bison vertebrae
 3. Bison bone
 4. Bison skull
 5. Ground squirrel nest
 6. Mammoth femur
 7. Ice wedge
 8. Bones
 9. Bones

Guide to Replica Permafrost Tunnel



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