

SCIENTIFIC RESEARCH LICENSE

LICENSE # 04 026 26N-M

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AFFILIATION: Vermont State University

TITLE: Interpretations of Polar Environments at the Nanoscale

OBJECTIVES OF RESEARCH:

X-ray computed tomography (CT) provides non-destructive 3D imaging and analysis of internal structure for any porous media. Our team utilizes CT imaging to probe permafrost and sea ice for microbes in samples collected from Alaska, Canada, and Greenland. Recent advances in this technology now allow for imaging at the nanoscale, where we ultimately seek to visualize microorganisms inhabiting the pore spaces. By characterizing this structure, we will further our understanding of how microbial communities relate to their environment, and how changes such as increased freeze/thaw cycles in a changing climate may impact their health and microbial function. In addition to imaging the permafrost and sea ice, we extract DNA from samples to examine microbe diversity to connect the physical and biological characteristics of cores from different sites and by depth. This work will provide the first images of permafrost and sea ice at the nanoscale.

TERMS & CONDITIONS:

The holder of the licence will be bound by the terms and conditions of the Nunavut Impact Review Board Screening Decision Report (NIRB File # 26YN021) and the Department of Culture & Heritage archaeological sites terms and conditions. These terms and conditions will form part of this licence. These terms and conditions will form part of this license.


DATA COLLECTION IN NU:

DATES: June 15, 2026-July 03, 2026

LOCATION: Cambridge Bay, Eureka, Resolute Bay

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James Shirley
Science Advisor

