Supporting Arctic Operations

Overview

As the Arctic region becomes increasingly strategic to U.S. national security, military leaders have begun to consider solutions to the challenges brought on by operations in such extreme conditions. This includes efforts to understand health concerns and warfighter performance in severe cold, new methods of risk assessment for extended missions, and impacts of climate change, such as potential exposure to historic biological pathogens.

As experts with over 90 years of experience in biology, chemistry, data science, and advanced materials, Battelle is uniquely positioned to conduct research around novel solutions for operating in harsh conditions.

Solutions

Battelle scientists have begun to leverage Arctic research and decades of innovation to support operations in the Arctic Circle.

HeatCoat™

HeatCoat™ is a revolutionary coating made with carbon nanotube (CNT) technology. Originally designed for use in aviation as a plane deicer, HeatCoat™ can be custom engineered for other applications. It's flexibility and durability make it excellent solution for treating textiles and clothing to keep operators warm in Arctic temperatures.

Environmental Research

Battelle National Ecological Observatory Network (NEON) staff have collected environmental samples in the Arctic region, including intact permafrost soil cores, active layer soil, and surface water to study their chemical, physical, and biological properties. Teams use advanced omics to identify and characterize pathogens in thawing permafrost to determine if they are viable and pose a risk to troops.

Health Effects

Battelle is investigating the impact of Arctic conditions on the health and mission performance of military personnel. Using this information, researchers are assessing and developing new surveillance strategies to monitor and protect those stationed in extreme environments.

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Leveraging Arctic research for military utility

Potential Health Effects of Thawing Permafrost

Research viability and effects of pathogens released from permafrost thaw

Identify areas at increased risk of permafrost thaw and wildfires utilizing satellite imagery

Develop communication strategies for poor air quality alerts

Prevention Programs to Protect Military Personnel in the Arctic Environment

Research physiological mechanisms that underlie susceptibility to extreme cold (e.g., biomarkers)

Develop prevention strategies to increase effectiveness of military personnel's ability to execute the mission

Assess existing surveillance programs (e.g., vectors, OEHSA, water vulnerability assessment)

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It can be done

ID 829 08/22