



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Cold Regions Research and Engineering Laboratory

Description

During the winter, low temperatures and harsh weather prevail over nearly 50 percent of the world's land mass. Snow, ice, frozen ground, and extended darkness make life difficult for both the military and civilians.

Since 1961 CRREL's mission has been to gain knowledge of cold regions through scientific and engineering research and to put that knowledge to work for the Corps of Engineers, the Army, the Department of Defense, and the Nation. CRREL is the DOD's only laboratory that addresses the problems and opportunities unique to the world's cold regions.

In 1993, the ERDC received the Army's Research and Development Excellence Award (Large Laboratory Category) and the major technical accomplishment cited in the award was CRREL's development of "...state-of-the-art physics models for vehicle/ground interaction and three-dimensional seismic propagation that enables ground sensors to identify and target vehicles," a program that evolved from CRREL's battlespace environment research.

Capabilities

Battlespace environments research at CRREL focuses on minimizing or eliminating the dramatic effects of winter weather and the environment on operations conducted by the Army. To do this, effective decision-making tools such as models, simulation, and mission planning/rehearsal factors are required that accurately predict state of the ground, atmospheric conditions, and system performance in complex cold-region environments.

A critical component of CRREL's capabilities is its unrivaled facilities. The principal experimental and laboratory facilities operated by CRREL are located at the headquarters complex at Hanover, N.H. CRREL has an aggregation of facilities not found anywhere else in the world, which have national and international recognition for their unique capabilities. The main laboratory consists of 24 low-temperature research cold rooms with a temperature range down to -35°C. Separate facilities include -- the 73,000 square foot Ice Engineering Facility (IEF) houses three special-purpose research areas; a large low-temperature towing tank, a 100-foot-long refrigerated flume for modeling rivers, and a large hydraulic-model room for studying ice impacts on civil works facilities, primarily locks and dams. The 27,000 square foot Frost Effects Research Facility (FERF) supports full-scale research on the impact of freeze-thaw cycles on pavements, foundations, and utility systems.

The Civil Works Remote Sensing/Geographic Information Systems Center is involved in oil spill and flood mapping, and large area environmental assessments

critical to emergency response efforts. The Cold Regions Science and Technology Information Analysis Center serves as the nation's corporate repository for data generated within the cold regions area of science and engineering. CRREL also has special purpose ice test facilities, clean rooms, low temperature materials laboratories, a research permafrost tunnel in Fox, Alaska, and has access to a 133-acre permafrost research site on Ft. Wainwright, Alaska.

Point of Contact

James Wuebben, Acting Director, Cold Regions Research and Engineering Laboratory, US Army Engineer Research and Development Center, 603-646-4418, James.L.Wuebben@erdc.usace.army.mil.