



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

Snow Community of Practice (CoP)

Description

The Snow CoP is a group of professionals from ERDC's Cold Regions Research and Engineering Laboratory (CRREL) and Topographic Engineering Center (TEC) and from the National Oceanic and Atmospheric Administration's (NOAA) Operational Hydrologic Remote Sensing Center in Minnesota, bound together by a common sense of purpose: to provide one-stop solutions for its customers' snow science and engineering problems. The Snow CoP pursues a common set of solutions, maintains a common store of knowledge, and relies on combined expertise to collaboratively solve snow problems presented to it. The Snow CoP comprises nearly 50 members whose expertise includes hydrology; geophysics; chemistry; biology; acoustics; physics; geology; glaciology; atmospheric sciences; and mechanical, geological, civil, and electrical engineering. The group has been developing a strategic plan to ensure that its collective snow research capabilities are being fully applied to solve problems for the Corps of Engineers, the Army, and the Nation.



Snowdrift over a road in North Dakota.

Capabilities

The skills and knowledge within the ERDC Snow CoP and problems that members have successfully treated include the following:

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|--------------------------------|-----------------------------------|
| Acoustic propagation over snow | Hydrologic modeling |
| Avalanches | Laboratory analyses of snow |
| Blowing and drifting snow | Oxygen isotopes in snow |
| Chemistry of snow | Radiation (solar and terrestrial) |
| Climate change | Remote sensing |
| Climate modeling | Snow characterization |
| Clouds | Snow hydrology |
| Distributed snow modeling | Snow loads on structures |
| Electromagnetic propagation | Snow permeability |
| Fluid flow in snow | Surface-air transfer |
| Forest/snow interaction | Surface energy budget |
| Heat transfer in snow | Vehicle mobility on snow |

Supporting Technology

The community possesses state-of-the-art hard and soft tools that it can rapidly bring to bear on snow problems. The hard tools include facilities and equipment that range from coldrooms and laboratory equipment to an instrumented vehicle and a wide variety of field instruments. The soft tools are computer programs for the following:

Advection and diffusion in snow	Forest thermal signatures
AVHRR snow mapping	GIS manipulations
Blowing snow	Global climate modeling
Bulk surface flux estimates	Hydrological modeling
3-D cloud scenes	Manipulating RadarSat data
Detailed 1-D snow modeling	Mesoscale modeling
Discrete element snow modeling	Radiative background modeling
Distributed snow modeling	Snow sliding on roofs
Forest albedos	Vehicle performance on snow

Benefits

The Snow CoP works to ensure that a spirit of cooperation and collegiality exists across the ERDC laboratories in the research area of snow. The collaborative synergy of the Snow CoP benefits both its members and customers through the sharing of information and the collective expertise that can be applied to solving problems.

ERDC POCs

Dr. Matthew Sturm
907-353-5183
E-mail: Matthew.Sturm@erdc.usace.army.mil

Janet P. Hardy
603-646-4306
E-mail: Janet.P.Hardy@erdc.usace.army.mil