



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

Blowing and Drifting Snow

Problem In windy locations in winter, blowing snow reduces visibility, hampers construction and transportation, and creates unsafe conditions. It is necessary to be able to predict the impact of blowing snow so that solutions can be devised to mitigate its adverse effects.



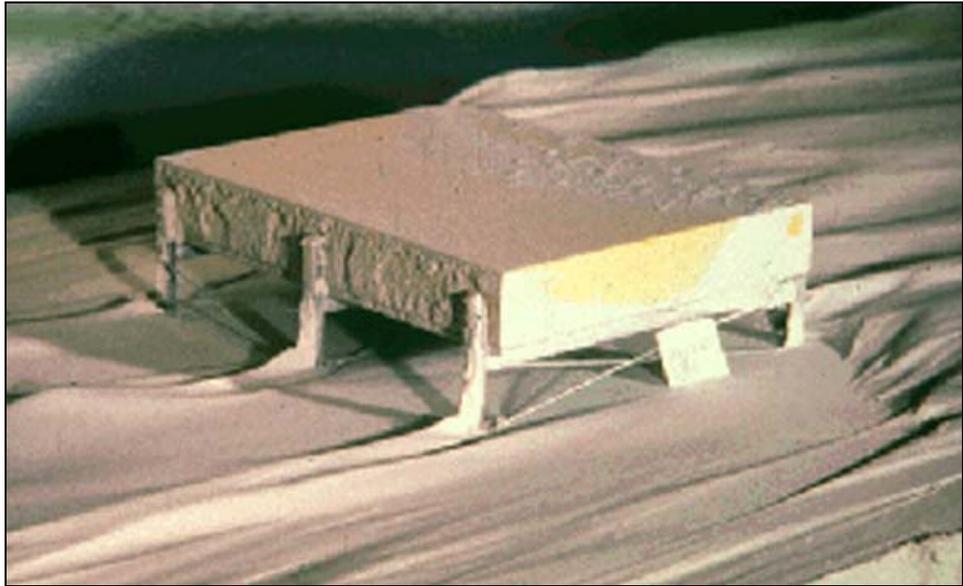
This anvil-head drift, also known as “sastrugi,” testifies to the power of wind to erode and drift snow.

Description Researchers at the Engineer Research and Development Center’s Cold Regions Research and Engineering Laboratory (ERDC-CRREL) conduct studies of blowing and drifting snow from the ice caps of Greenland and Antarctica to the ephemeral snow covers of the Alaskan Arctic and continental United States. This work meshes with studies on military training ranges, soil biogeochemistry, ice sheets and sea ice, atmospheric chemistry, and remote sensing of snow-covered terrain.

Blowing snow studies at ERDC-CRREL take two forms: modeling using numerical computer codes, and modeling using wind tunnels and physical models. In both cases, experimental work on snow processes is used to constrain and guide the modeling.

In addition to field studies, ERDC-CRREL scientists and engineers conduct blowing and drifting snow research in on-site facilities:

- [Snow Drift Wind Tunnel](#)
- [Environmental Wind Tunnel](#)
- [Flume](#)



Building model in Snow Drift Wind Tunnel.

Expected Products

The results of this research are improved numerical codes that can be used to predict drift profiles, the redistribution of snow in basins, and water losses due to sublimation during drifting. Specific case studies, typically done in the wind tunnels, allow researchers to identify areas of concern related to infrastructure and building designs for snowy, windy areas.

Snow distributions generated as part of blowing and drifting snow research can be used in hydrologic and ecologic studies in the areas of thermal regime of underlying soils, depletion of snow cover during snowmelt, and snowmelt runoff. Sublimation distributions can be used to guide development of sublimation parameterizations within regional and global atmospheric models. Computer precipitation fields can be used to validate solid precipitation outputs from regional atmospheric models in arctic, prairie, and alpine regions where blowing snow is common.

Potential Users

The snow and ice research community worldwide will benefit from this research.

Projected Benefits

Most problems associated with blowing snow and snow drifts arise because no consideration was given to the issue during design. Mitigation in the design phase can save thousands of dollars in snow removal and facility maintenance costs.

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