SNOW DRIFTS

Scan this QR code for access to more information!

Introduction

The Delta Junction High school was requested to join the snow view globe photos of snow in clouds, trees, and on land intensive observation. (IOP) globe training to learn globes protocols for land cover about observing snow on the ground which can be compared to NASA remote sensing technology records to see if they get the same reading.

Snow is part of the local and global water cycle that impacts agriculture and natural resources within the interior region of Alaska. The purpose was to see how much water equivalent is in the snow for agricultural and natural resources. Sharing of data with citizen scientists around the world about snow drift accumulation due to wind occurrences helps with the purpose of knowing potential water availability for resource management.

Hypothesis

What wind speeds are required to create snow compaction in a windward snow drift?

Methodology

- Globe and landcover snow measurements (snow collection sampling were utilized.)
- From November to February 2025, the windward snow drift at the Delta Junction High school was surveyed for snow ed monitoring.
- Protocol sites selected from toe of the drift to the peak of the drift
- High school students collected and measured snow and melt water samples at each incriminated site.
- Used measuring devices:
  -Meter stick for snow or the lack of snow
  -Rain gauge to measure liquid of total snow (Also known as snow water melt equipment in mm)
  -Snowboard during snow event to measure depth, amount of water, and ph of new snow
  -Weather station to collect wind data

Data

- Later on in our research, a Chinook (warm tropical wind) occurred feb 2-9th, losing over a foot of snowpack .
- Reported from Ft. Greely Garrison weather station high 39 degrees and average 19 degree with wind clocked at 60mph.
- Height of snow drift was 2438.4 mm tall before Chinook, after it went down to 1524 mm.
- From monitoring before and after the Chinook, estimated a total of 680 mm of snow melt occured.
- Was reported from Ft. Greely Garrison source.

Images Of Ground Findings

Delta High school Windward Drift

Showing of snow drift/loss of snow pack

Ice layers on Drift

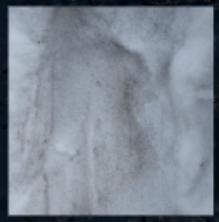
Showing of Icicle creation/Ice layers

Images Of Ground Findings

Weathered down ice layer

Showing of Melt Clusters

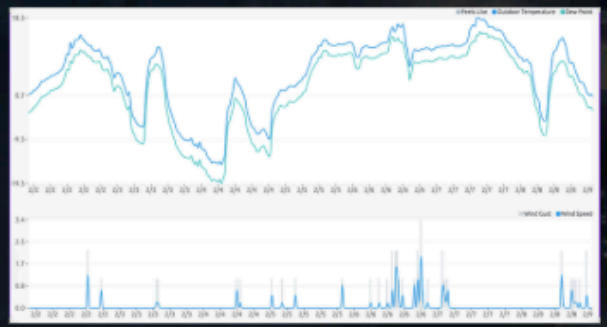
First site on Drift



Discovered it was completely ice at the bottom!

Data Images

Temperature and Windspeed Data



Results

After a few weeks of measuring, we had discovered it was completely ice at the bottom and we were no longer able to measure physically along the snow drift entirely because of the ice. During this, we had found melt clusters as well when looking around the Chinook (snow layer that when heated due to rain, warm weather, etc. melts down.) and a full display of ice layers.

When heat rose, and our melt water started to spread through the snow ribs/boundary layers (percolate), it would then further compact once the atmosphere's heat lowered, made a new layer, as well as fortified the snow ribs.

Wind Contribution

Conclusion; We had discovered that the wind, specifically harsher wind speeds (such as 60 mph) can help with snow compaction when it came to our windward snow drift.
The wind typically blows it in a leapfrog manner called saltation, helping create a new outer layer. However, it doesn't just do this to the drift. Since wind helps with temper control, the harsher the wind, the more it contributes to creating further pressure and compaction when it freezes over.

Continuing research will continue through 2025 until snow has dissipated and water findings can be fully calculated

1Fianna Rooney, 1T. Kovalenko, 2Christi Buffington, 2 Julia White

1Delta Greely School District, Delta Junction, AK; 2Globe Alaska and NASA SnowEx. Mentoring and Collaberation