

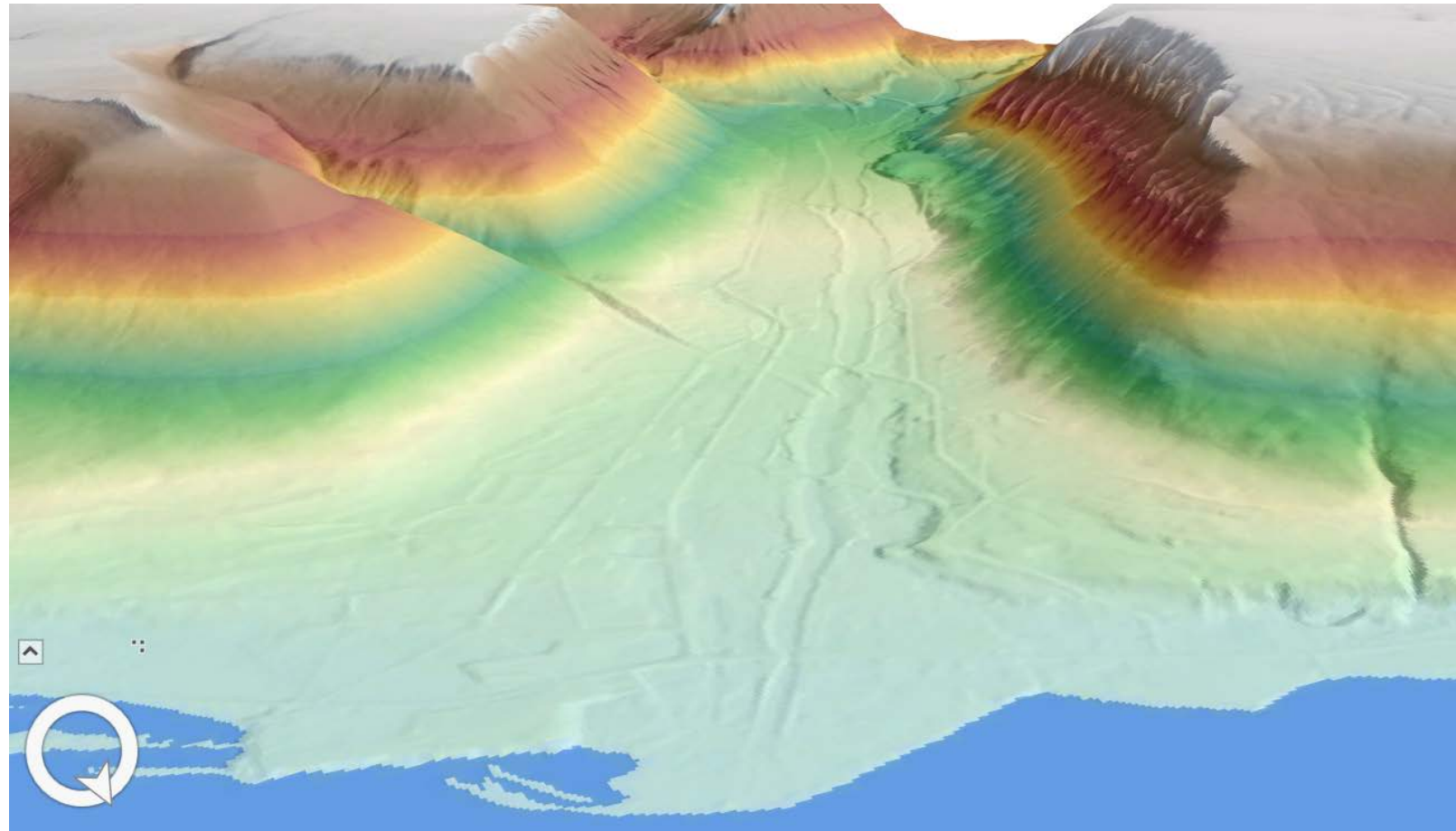
# Landslide hazard map of Longyearbyen

Use ArcGIS Pro in landslide hazard mapping.



# Aim

- Create snow avalanche/landslide hazard map of Longyearbyen using ArcGIS Pro.

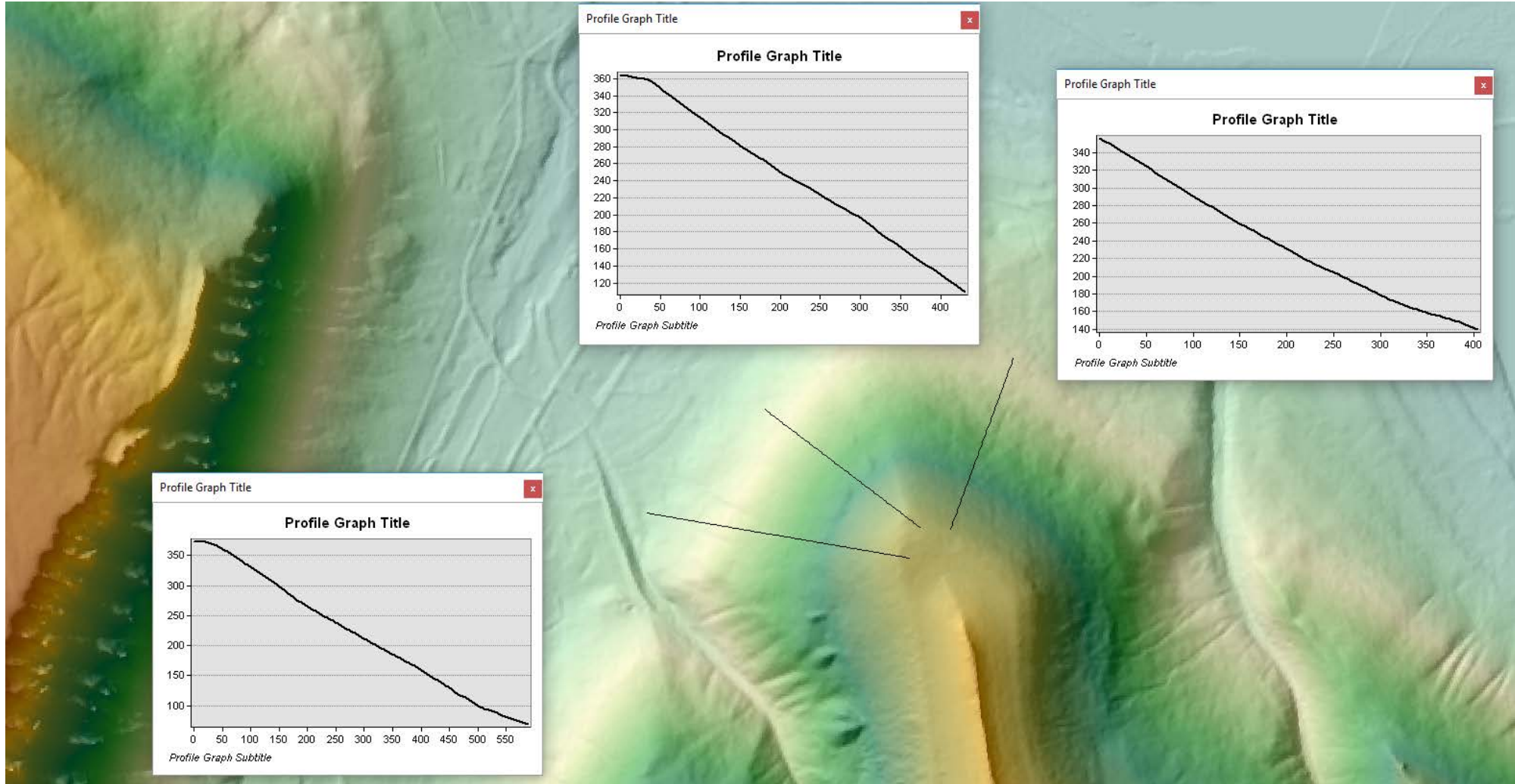


3D model of Longyearbyen DEM (5 m resolution). Vegetation, buildings and cars can be removed with LiDAR data.

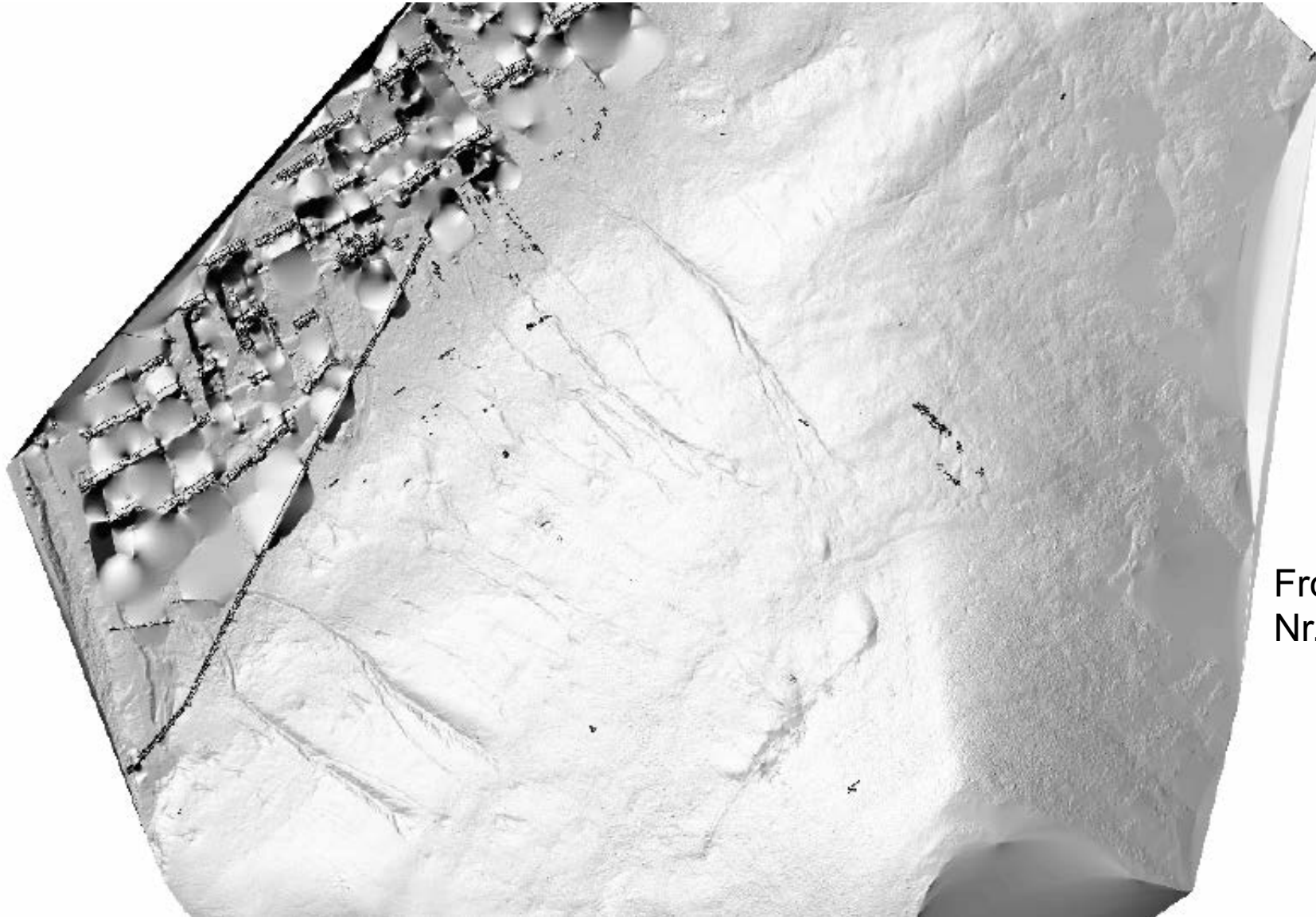
# Data

- Digital elevation models (5 meter resolution of Longyearbyen)
  - Create slope maps
  - Recognize avalanche paths and entrainments
- Ortophotos (10 cm resolution)
  - Remotely map avalanche types and combine with historic events
- NVE database – Overview of historic events
- Litterature
  - High arctic avalanche monitoring in maritime Svalbard (Eckerstorfer et al., 2008)
  - Skredrapport Sukkertoppen
- Quaternary geological maps

# Calculate runout distances for hazardous areas



# High resolution (25 cm) hillshade of Sukkertoppen



From: NVE report:  
Nr. 80/2018

Orthophoto of  
Longyearbyen

10 cm resolution

From:

<https://geodata.npolar.no>



# Landslide hazard map

- Create maps for landslide hazards in Longyearbyen.
- Can be combined with local knowledge and historic events.
- Investigations into bed dip, sediment types and slope angles can give a better understanding of what avalanches occur in certain configurations

# References

- **Eckerstorfer, M., Neumann, U., and Christiansen, H. H.**, High arctic avalanche monitoring in maritime Svalbard, *in* Proceedings Proceedings of the International Snow Science Workshop 2008, p. 784-790.
- **Sukkertoppen** – skredfarevurderinger og faglige anbefalinger om mulige sikringstiltak. <https://www.nve.no/nytt-fra-nve/nyheter-skred-og-vassdrag/nye-skredvurderinger-i-longyearbyen/>
- <https://geodata.npolar.no>