ALASKA DIVISION OF GEOLOGICAL &
GEOPHYSICAL SURVEYS

REPORT OF INVESTIGATION 2024-8
Nicolazzo and Larsen, 2025
SHEET 1 OF 3
Explanatory report accompanies map
http://doi.org/10.14509/31309

Landslide Inventory Map for Haines, Alaska

by

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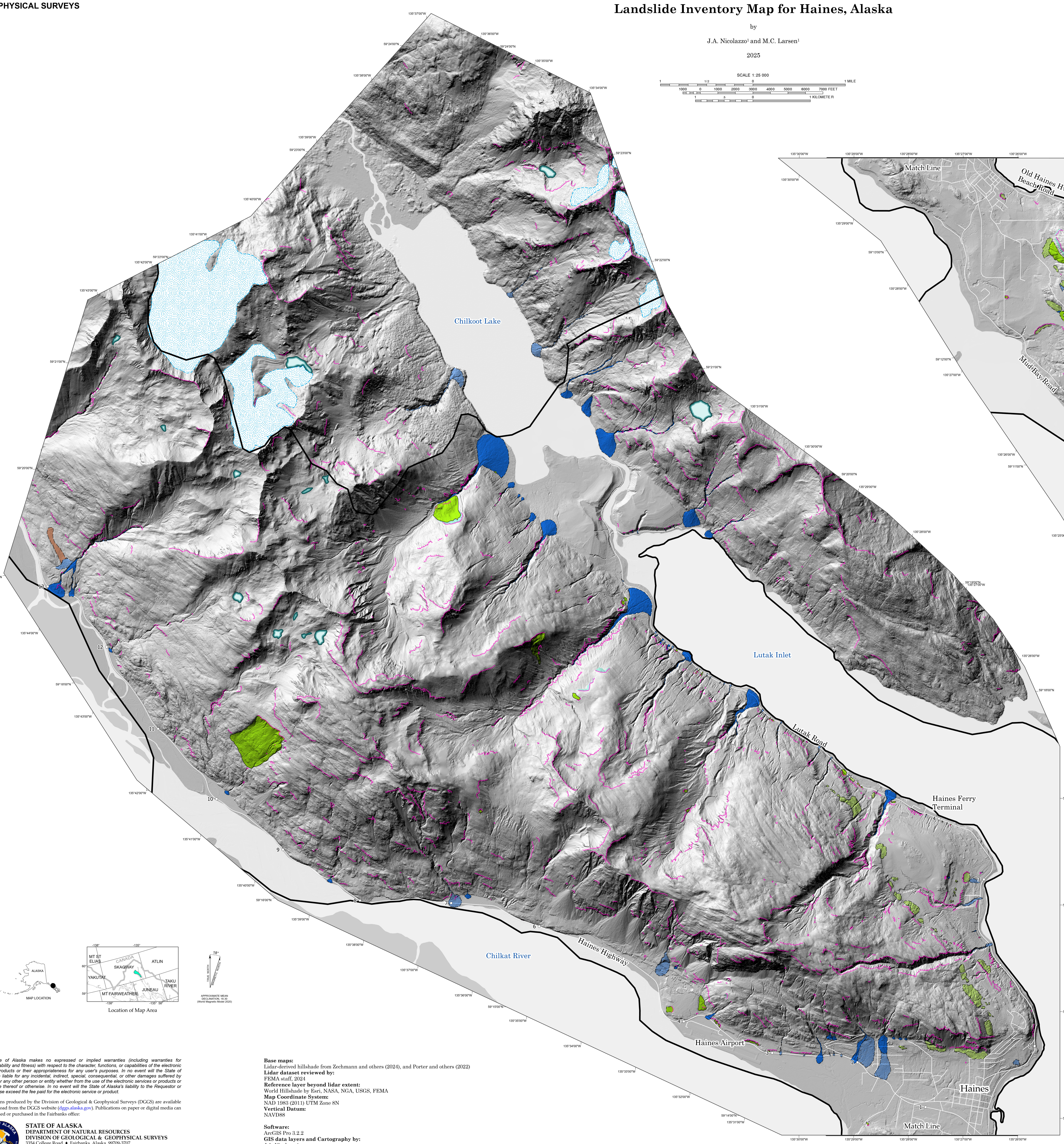
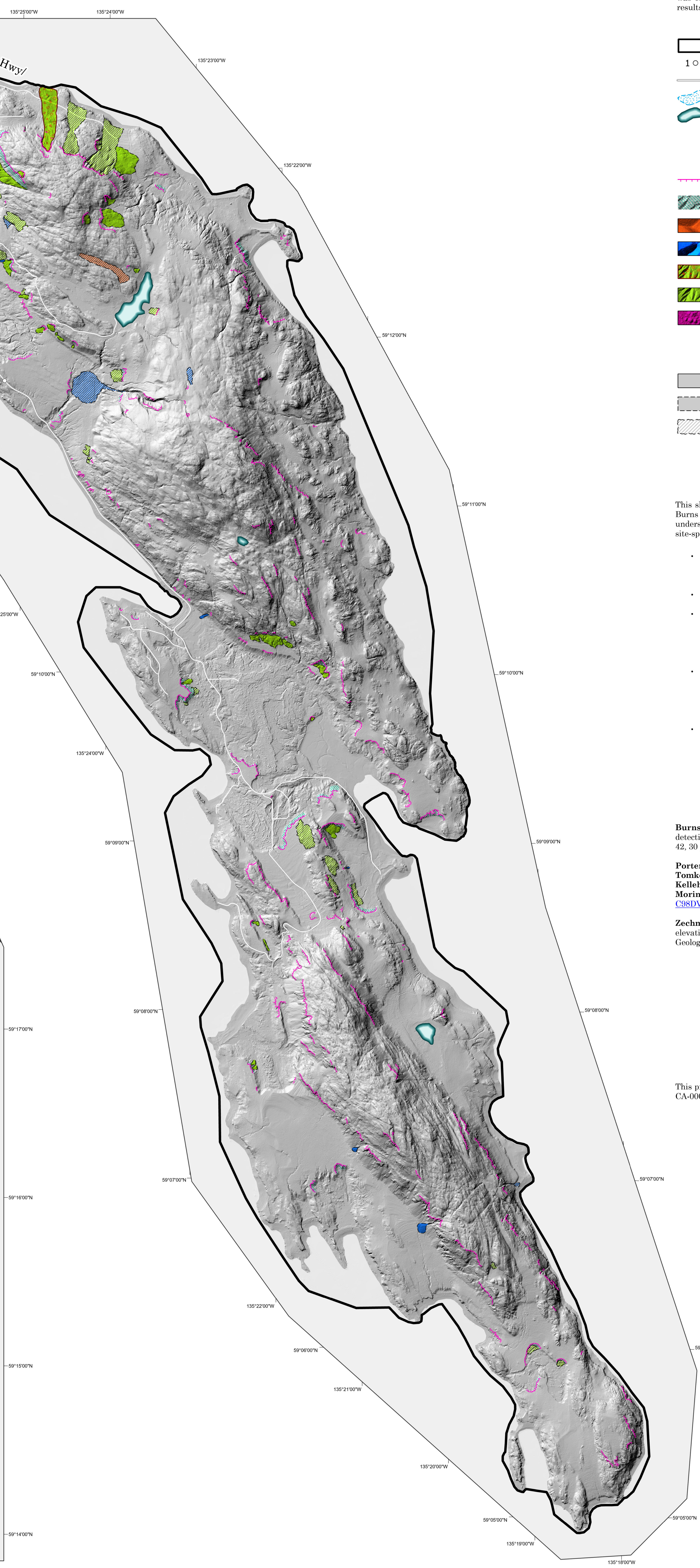
2025

SCALE 1:25 000





Location of Map Area

APPROXIMATE MEAN DECLINATION, 18.30 (World Magnetic Model 2020)

EXPLANATION

This map is an inventory of existing slope failures within a portion of the Haines Borough. This inventory is an essential data layer used to model landslide and debris flow susceptibility (map sheets 2 and 3). It is based primarily on lidar datasets and it is possible that landslides and debris flows were not identified during the inventory's creation, or that new events occurred after this map was prepared.

This map was prepared following protocols similar to that of the Oregon Department of Geology and Mineral Industries (DOGAMI) (Burns and Madin, 2009). The inventory is displayed over a hillshade raster image derived from a 2022 lidar dataset (Zechmann and others, 2024). Outside the limit of this high-resolution dataset, the displayed hillshade is derived from the ArcticDEM (Porter and others, 2022). The ArcticDEM was compiled from several different sources, collected at different times, and at different resolutions, so results from this dataset have a lower confidence.

EXTENT OF LIDAR COVERAGE (ZECHMANN AND OTHERS 2024)

1 ○ MILEPOST

ROAD CENTERLINES

GLACIER

POND

MOVEMENT SYMBOLOGY

SCARP Approximate location, hachures point downslope

FLANK Approximate location

CREEP, UNDIFFERENTIATED Slow moving soil.

DEBRIS FLOW, UNDIFFERENTIATED Includes debris flow, earthflow, mudflow, etc.

LANDSLIDE, COMPLEX Beach Road landslide initiated as a deep seated bedrock landslide and became a debris flow.

LANDSLIDE, UNDIFFERENTIATED Generic term includes all types of mass movement.

ROCKFALL, UNDIFFERENTIATED Includes rockfall and rock topple.

CONFIDENCE SYMBOLOGY

SOLID OUTLINE, SOLID COLOR High confidence, accurate

DASHED OUTLINE, SOLID COLOR Uncertain identity or approximate location

DASHED OUTLINE, HATCHED COLOR Questionable identity or inferred location

LIMITATIONS

This slope failure inventory was developed with the best available data, using protocols similar to that of Burns and Madin (2009); however, there are inherent limitations as discussed below. These limitations underscore that this map was designed for regional application and should not be used as an alternative to site-specific studies.

- Lidar provides a "snapshot" view of the landscape at the time of data collection; therefore, maps based on lidar data interpretation may become less accurate as new landslides or other changes to the landscape occur or new technology that would improve the data products becomes available.
- Lidar data interpretation may also change as new terrain feature interpretation techniques develop.
- While every reasonable effort was made to map all slope failures, given the limitations in lidar datasets, available imagery, field validation, and vegetation density, it is likely that some slope failures were missed, overlooked, or misinterpreted by the authors. As new information and improved technology become available, we expect that future mapping will identify additional events that our analysis missed with greater accuracy and confidence.
- This map is intended for regional-scale purposes and to assist state and local agencies in land-use planning. The map does not replace site-specific investigations and is not suitable for land-use regulation, building-code development, or to answer legal questions. It should not be used to assess the hazard to any one property. However, the map can serve as a useful tool for estimating the regional slope failure hazard and as a starting place for future site-specific maps.
- This map is non-regulatory.

REFERENCES CITED

Burns W.J., and Madin I.P., 2009, Protocol for inventory mapping of landslide deposits from light detection and ranging (lidar) imagery: Oregon Department of Geology and Mineral Industries Special Paper 42, 30 p.https://www.oregongeology.org/pubs/sp/p-SP-42.htm

Porter, Claire; Howat, Ian; Noh, Myoung-Jon; Husby, Erik; Khuvis, Samuel; Danish, Evan; Tomko, Karen; Gardiner, Judith; Negrete, Adelaide; Yadav, Bidhyananda; Klassen, James; Kelleher, Cole; Cloutier, Michael; Bakker, Jesse; Enos, Jeremy; Arnold, Galen; Bauer, Greg; Morin, Paul, 2022, ArcticDEM – Strips, Version 4.1; Harvard Dataverse, V1.https://doi.org/10.7910/DVN/C98DVS

Zechmann, J.M., Daanen, R.P., Wikstrom Jones, K.M., and Wolken, G.J., 2024, Lidar-derived elevation data for Haines, Southeast Alaska, collected October 2021 and October 2022: Alaska Division of Geological & Geophysical Surveys Raw Data File 2023-18, 16 p. https://doi.org/10.14509/31034

ACKNOWLEDGMENTS

This project was funded by the FEMA Cooperative Technical Partners Programs (grant number EMS-2021-CA-00013-S0001).

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Base maps:
Lidar-derived hillshade from Zechmann and others (2024), and Porter and others (2022)
Lidar dataset reviewed by:
FEMA staff, 2024
Reference layer beyond lidar extent:
World Hillshade by Esri, NASA, NGA, USGS, FEMA
Map Coordinate System:
NAD 1983 (2011) UTM Zone 8N
Vertical Datum:
NAVD88

Software:
ArcGIS Pro 3.2.2
GIS data layers and Cartography by:
J.A. Nicolazzo[1]
Cartographic review by:
A.E. Macpherson[1]

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