

INTRODUCTION

Permafrost, or perennially-frozen ground, is rock or soil that remains continuously colder than 0°C for 2 years or longer (Muller, 1947; Ferrians and others, 1969; Péwé 1966, 1982). On the basis of the interpretation of ~1:65,000-scale false-color infrared aerial photographs, this map illustrates the inferred extent and estimated ice content of permafrost between the ground surface and a depth of 6 m in the proposed corridor straddling the Alaska Highway between Delta Junction and the Canada border from July 1978 to July 1983, the dates of the aerial photographs. The presence or former presence of permafrost and the ground-ice content are inferred from several indicators including vegetation, slope and aspect, landform, soil type, local drainage, and terrain features, such as open-system pingos, polygonal ground and thermokarst pits, gullies, and ponds (Kreig and Reger, 1982). After initial permafrost maps were completed, airborne-resistivity data became available and we were able to compare our initial interpretations with those data, producing map changes that better represent local conditions. The lack of confirming subsurface data causes our interpretation to be considered tentative until validated by multi-year ground-temperature measurements that verify the persistence of frozen ground. Permafrost classifications in areas that were burned just prior to August 1980 are less reliable than in unburned areas because the vegetation was destroyed or significantly altered and, in these areas, interpretation of permafrost is based primarily on landform and setting, which are less diagnostic than vegetation. The user is cautioned that this map has not been verified by field observations, except very locally, although we have considerable field experience in the Tanana River valley and during our interpretation referred to available published and unpublished reports. Physical properties of map units are extrapolated from similar deposits in the region and from previously published reports and data. Detailed subsurface investigations should be completed prior to development.

PERMAFROST MAP UNITS

Symbols indicate the inferred continuity of permafrost in uppercase letters and the estimated ice content in lowercase letters. For example, 'Dm' indicates that discontinuous permafrost with low to moderate ice content is inferred between the ground surface and a depth of ~6 m. Classes of permafrost continuity are consistent with classes used in previous mapping in Alaska (Ferrians, 1965; Kreig and Reger, 1982; Brown and others, 1997; Jorgenson and others, 2008).

Symbol	Description
F	CONTINUOUSLY FROZEN—More than 90 percent of the area is inferred to be underlain by permafrost
D	DISCONTINUOUSLY FROZEN—Between 50 and 90 percent of the area is inferred to be underlain by permafrost
S	SPORADICALLY FROZEN—Between 10 and 50 percent of the area is inferred to be underlain by permafrost
G	GENERALLY UNFROZEN (ISOLATED MASSES)—Between 0 and 10 percent of the area is inferred to be underlain by permafrost
U	NO PERMAFROST—Seasonally frozen but the ground is inferred to be warmed to a temperature above 0°C at least once during any 2-year period
r	MODERATE TO HIGH ICE CONTENT—Estimated to typically contain 50 to >1,000 percent gravimetric soil moisture relative to dry weight
m	LOW TO MODERATE ICE CONTENT—Estimated to typically contain 25 to 50 percent gravimetric soil moisture relative to dry weight
l	LOW ICE CONTENT—Estimated to typically contain 6 to 25 percent gravimetric soil moisture relative to dry weight

REFERENCES CITED

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Péwé, T.L., 1966, Permafrost and its effect on life in the North: Corvallis, Oregon State University Press, 40 p.

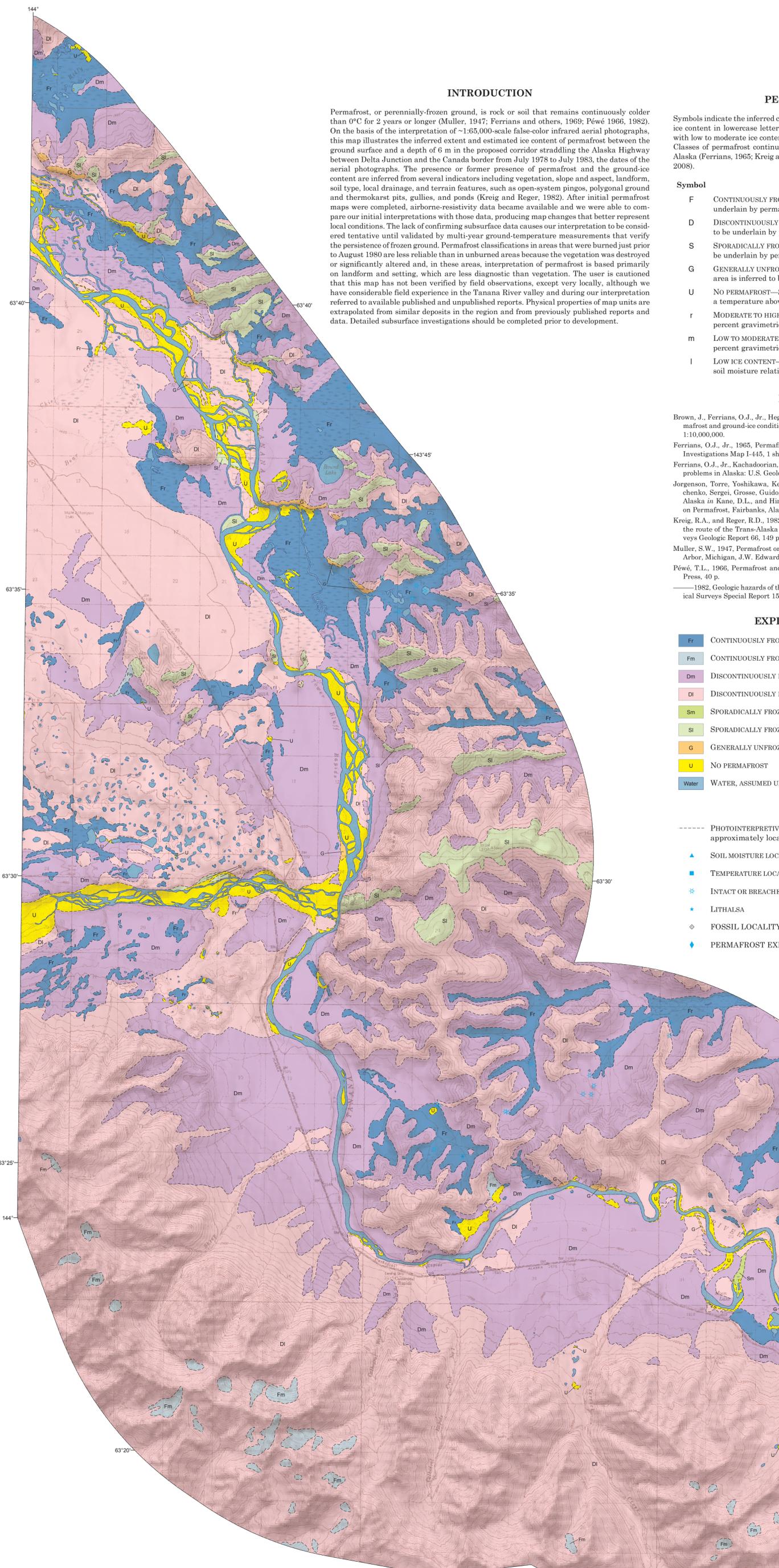
—1982, Geologic hazards of the Fairbanks area, Alaska: Alaska Division of Geological & Geophysical Surveys Special Report 15, 109 p. doi:10.14509/2614

EXPLANATION OF MAP UNITS

Fr	CONTINUOUSLY FROZEN, MODERATE TO HIGH ICE CONTENT
Fm	CONTINUOUSLY FROZEN, LOW TO MODERATE ICE CONTENT
Dm	DISCONTINUOUSLY FROZEN, LOW TO MODERATE ICE CONTENT
Di	DISCONTINUOUSLY FROZEN, LOW ICE CONTENT
Sm	SPORADICALLY FROZEN, LOW TO MODERATE ICE CONTENT
Si	SPORADICALLY FROZEN, LOW ICE CONTENT
G	GENERALLY UNFROZEN (ISOLATED PERMAFROST MASSES)
U	NO PERMAFROST
Water	WATER, ASSUMED UNDERLAIN BY TALIKS

MAP SYMBOLS

- PHOTOINTERPRETIVE BOUNDARY—All boundaries are inferred or approximately located
- ▲ SOIL MOISTURE LOCALITIES
- TEMPERATURE LOCALITY
- ✱ INTACT OR BREACHED OPEN-SYSTEM PINGO
- ★ LITHALSA
- ◇ FOSSIL LOCALITY
- ◆ PERMAFROST EXPERIMENTAL SITE



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3354 College Road • Fairbanks, Alaska 99709-3707
Phone 907-451-5010 • Fax 907-451-5050
email: dggs@alaska.gov
website: www.dggs.alaska.gov

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3354 College Road • Fairbanks, Alaska 99709-3707
Phone 907-451-5010 • Fax 907-451-5050
email: dggs@alaska.gov
website: www.dggs.alaska.gov

Topographic base map from:
U.S. Geological Survey topographic maps
Tanacross B-6 (1949)
Tanacross C-6 (1955 - minor revisions 1982)

Projection:
Universal Transverse Mercator Zone 7 North

Datum:
North American Datum of 1927

Geologic field investigations by:
R.D. Reger¹ (2006-2012), D.S.P. Stevens² (2006-2008),
D.N. Solie³ (2006-2008), T.D. Hubbard² (2008-2012)

Permafrost interpretation by:
R.D. Reger¹ (2006-2014), T.D. Hubbard² (2008-2014)

Airphoto interpretation by:
R.D. Reger¹ (2006-2014), T.D. Hubbard² (2008-2014)

Lidar interpretation by:
R.D. Reger¹, T.D. Hubbard² (2010-2014)

Geologic GIS data layers created by:
D.S.P. Stevens² (2007, 2008), G. Davidson² (2009),
T.D. Hubbard² (2009-2014), R.E. Westbrook² (2010, 2011),
P.E. Gallagher² (2010-2012), S.K. Panda⁴ (2009)

Cartography by:
P.E. Gallagher² (2015-2016), T.J. Naibert² (2016)

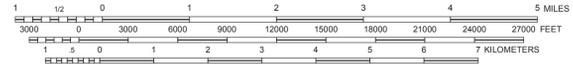
Editorial review by:
P.K. Davis⁵ (2014, 2015)

Peer review by:
D.N. Solie³ (2016)
R.A. Combellick² (2016)

INTERPRETIVE PERMAFROST MAP, ALASKA HIGHWAY CORRIDOR,
DELTA JUNCTION TO THE CANADA BORDER, ALASKA

by
R.D. Reger¹ and T.D. Hubbard²
2016

SCALE 1:63360



TANACROSS B-6 AND C-6 - CONTOUR INTERVAL 100 FEET
TANACROSS B-6 AND C-6 - SUPPLEMENTAL CONTOUR INTERVAL 50 FEET
TANACROSS B-6 - DATUM IS MEAN SEA LEVEL
TANACROSS C-6 - NATIONAL GEODETIC VERTICAL DATUM OF 1929



Location of Map Area

Affiliation:

¹ Reger's Geologic Consulting, P.O. Box 3326, Soldotna, Alaska 99669

² Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, Alaska 99709-3707

³ Baseline Geoconsulting, LLC, P.O. Box 82293, Fairbanks, Alaska 99708-2293

⁴ University of Alaska Fairbanks, Geophysical Institute, 903 Koyukuk Drive, Fairbanks, Alaska, 99775

⁵ Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, Alaska 99709-3707, Retired