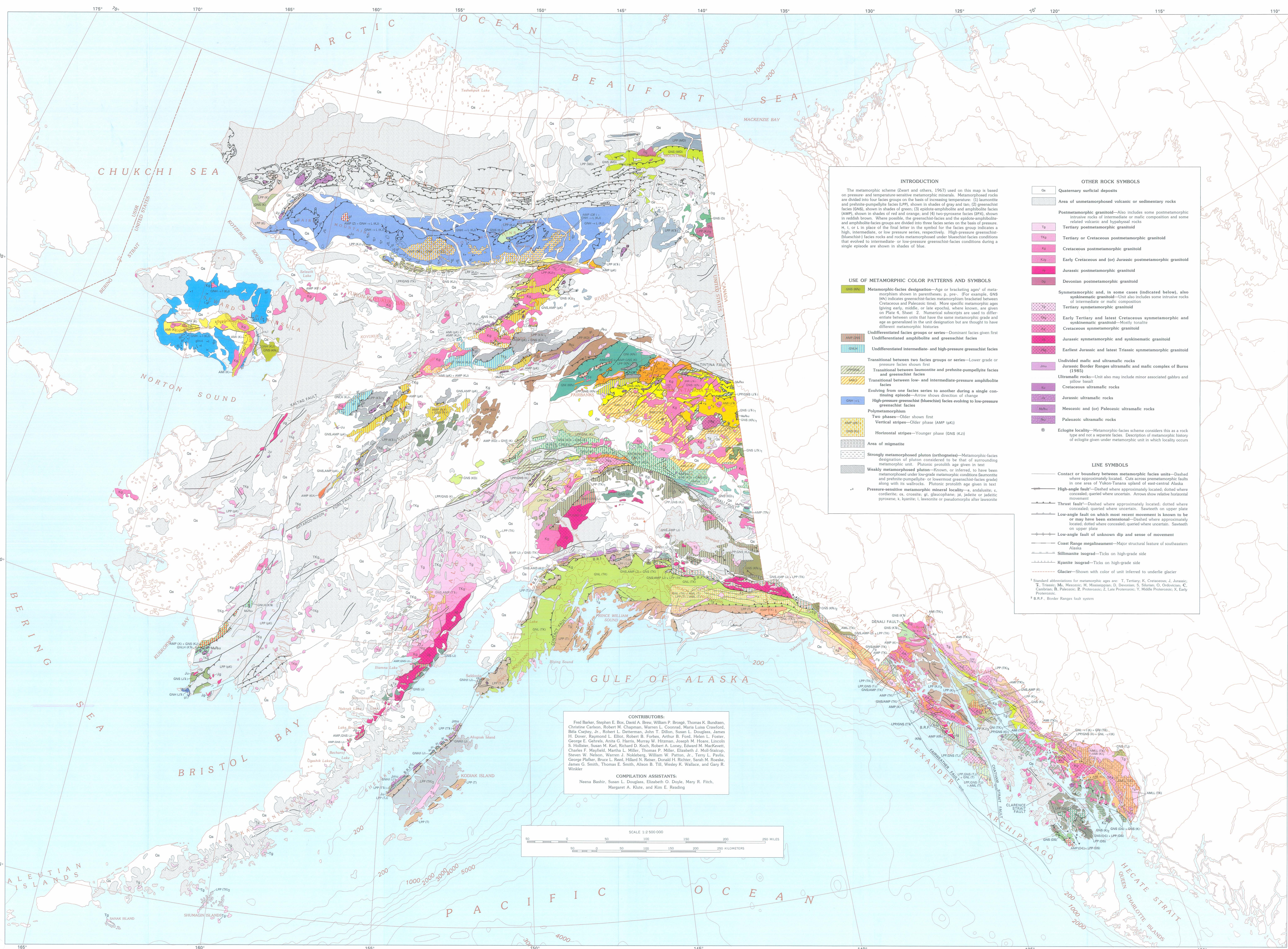




INTRODUCTION

The metamorphic scheme (Zwart and others, 1967) used on this map is based on pressure- and temperature-sensitive metamorphic minerals. Metamorphosed rocks are divided into four facies groups on the basis of increasing temperature: (1) laumontite and prehnite-pumpellyite facies (LPP), shown in shades of gray and tan; (2) greenschist facies (GNS), shown in shades of green; (3) epidote-amphibolite and amphibolite facies (AMP), shown in shades of red and orange; and (4) two-pyroxene facies (2PX), shown in reddish brown. Where possible, the greenschist-facies and the epidote-amphibolite- and amphibolite-facies groups are divided into three facies series on the basis of pressure: H₁, I, or L in place of the final letter in the symbol for the facies group indicates a high, intermediate, or low pressure series, respectively. High-pressure greenschist- (blueschist-) facies rocks and rocks metamorphosed under blueschist-facies conditions that evolved to intermediate- or low-pressure greenschist-facies conditions during a single episode are shown in shades of blue.

USE OF METAMORPHIC COLOR PATTERNS AND SYMBOLS

Metamorphic-facies designation—Age or bracketing ages¹ of metamorphism shown in parentheses; p, pre-. (For example, GNS (Ks) indicates greenschist-facies metamorphism bracketed between Cretaceous and Paleocene time). More specific metamorphic ages (giving early, middle, or late epochs), where known, are given on Plate 4, Sheet 2. Numerical subscripts are used to differentiate between units that have the same metamorphic grade and age as generalized in the unit designation but are thought to have different metamorphic histories.

Undifferentiated facies groups or series—Dominant facies given first

Undifferentiated amphibolite and greenschist facies

Undifferentiated intermediate- and high-pressure greenschist facies

Transitional between two facies groups or series—Lower grade or pressure facies shown first

Transitional between laumontite and prehnite-pumpellyite facies and greenschist facies

Transitional between low- and intermediate-pressure amphibolite facies

Evolving from one facies series to another during a single continuing episode—Arrow shows direction of change

High-pressure greenschist (blueschist) facies evolving to low-pressure greenschist facies

Polymetamorphism

Two phases—Older shown first

Vertical stripes—Older phase (AMP (Ks))

Horizontal stripes—Younger phase (GNS (Ks))

Area of migmatite

Strongly metamorphosed pluton (orthogneiss)—Metamorphic-facies designation of pluton considered to be that of surrounding metamorphic unit. Plutonic protolith age given in text

Weakly metamorphosed pluton—Known, or inferred, to have been metamorphosed under low-grade metamorphic conditions (laumontite and prehnite-pumpellyite- or lowermost greenschist-facies grade) along with its wallrocks. Plutonic protolith age given in text

Pressure-sensitive metamorphic mineral locality—a, andalusite; c, cordierite; cs, crossite; gl, glaucophane; jd, jadeite or jadeitic pyroxene; k, kyanite; l, laumontite or pseudomorphs after laumontite

OTHER ROCK SYMBOLS

Quaternary surficial deposits

Area of unmetamorphosed volcanic or sedimentary rocks

Postmetamorphic granitoid—Also includes some postmetamorphic intrusive rocks of intermediate or mafic composition and some related volcanic and hypabyssal rocks

Tertiary postmetamorphic granitoid

Tertiary or Cretaceous postmetamorphic granitoid

Cretaceous postmetamorphic granitoid

Early Cretaceous and (or) Jurassic postmetamorphic granitoid

Jurassic postmetamorphic granitoid

Devonian postmetamorphic granitoid

Synmetamorphic and, in some cases (indicated below), also synkinematic granitoid—Unit also includes some intrusive rocks of intermediate or mafic composition

Tertiary synmetamorphic granitoid

Early Tertiary and latest Cretaceous synmetamorphic and synkinematic granitoid—Mostly tonalite

Cretaceous synmetamorphic granitoid

Jurassic synmetamorphic and synkinematic granitoid

Earliest Jurassic and latest Triassic synmetamorphic granitoid

Undivided mafic and ultramafic rocks

Jurassic Border Ranges ultramafic and mafic complex of Burns (1955)

Ultramafic rocks—Unit also may include minor associated gabbro and pillow basalt

Cretaceous ultramafic rocks

Jurassic ultramafic rocks

Mesozoic and (or) Paleozoic ultramafic rocks

Paleozoic ultramafic rocks

Eclogite locality—Metamorphic-facies scheme considers this as a rock type and not a separate facies. Description of metamorphic history of eclogite given under metamorphic unit in which locality occurs

LINE SYMBOLS

Contact or boundary between metamorphic facies units—Dashed where approximately located. Cuts across premetamorphic faults in one area of Yukon-Tanana upland of east-central Alaska

High-angle fault—Dashed where approximately located; dotted where concealed; queried where uncertain. Arrows show relative horizontal movement

Thrust fault—Dashed where approximately located; dotted where concealed; queried where uncertain. Sawtooth on upper plate

Low-angle fault on which most recent movement is known to be or may have been extensional—Dashed where approximately located; dotted where concealed; queried where uncertain. Sawtooth on upper plate

Low-angle fault of unknown dip and sense of movement

Coast Range megafault—Major structural feature of southeastern Alaska

Sillimanite isograd—Ticks on high-grade side

Kyanite isograd—Ticks on high-grade side

Glacier—Shown with color of unit inferred to underlie glacier

¹ Standard abbreviations for metamorphic ages are: T, Tertiary; K, Cretaceous; J, Jurassic; Tr, Triassic; Mz, Mesozoic; M, Mississippian; D, Devonian; S, Silurian; O, Ordovician; C, Cambrian; P, Paleozoic; E, Proterozoic; Z, Late Proterozoic; Y, Middle Proterozoic; X, Early Proterozoic.

² B.R.F., Border Ranges fault system

CONTRIBUTORS:
Fred Barber, Stephen E. Box, David A. Brew, William P. Brosop, Thomas K. Bundren, Christine Carlson, Robert M. Chapman, Warren L. Conrad, Maria Luisa Crawford, Bela Csapley, Jr., Robert L. Datterman, John T. Dillon, Susan L. Douglass, James H. Dover, Raymond L. Elliot, Robert B. Forbes, Arthur B. Ford, Helen L. Foster, George E. Gehrels, Anita G. Harris, Murray W. Hitzman, Joseph M. Hoare, Lincoln S. Hollister, Susan M. Karl, Richard D. Koch, Robert A. Loney, Edward M. MacFowett, Charles F. Mayfield, Martha L. Miller, Thomas P. Miller, Elizabeth J. Moll-Stalup, Steven W. Nelson, Warren J. Nokleberg, William W. Patton, Jr., Terry L. Pavlis, George Puffer, Bruce L. Reed, Hilard N. Reiser, Donald H. Richter, Sarah M. Roese, James G. Smith, Thomas E. Smith, Alison B. Till, Wesley K. Wallace, and Gary R. Winkler

COMPILATION ASSISTANTS:
Neema Bashir, Susan L. Douglass, Elizabeth G. Doyle, Mary R. Fitch, Margaret A. Klute, and Kim E. Reading

