

Geological Survey of Canada Open File 3428

INTRODUCTION

The summary tectonostratigraphic terrane map depicts and outlines geologic units in the circum-North Pacific region. The map is a summary of a more detailed geologic map of the circum-North Pacific region compiled by the Geological Survey of Canada (Geological Survey of Canada, 1992). This more detailed map also contains descriptions of tectonic events, magmatic arcs, and other major geologic units. The map is based on data from a variety of sources, including field observations, aeromagnetic maps, and geology of the circum-North Pacific. Additional detailed information on tectonic events and magmatic arcs is contained in the following references: Goff, 1987; Turner, 1987; and Goff, 1987.

The summary map and the more detailed map are the result of extensive geologic mapping projects in the Russian Far East, Hokkaido Island, and Alaska, the Canadian Cordillera, and the U.S.A. Pacific Northwest in the last few decades. Extensive geologic mapping projects have been completed in a number of tectonostratigraphic terranes that were accreted onto continental margins around the circum-North Pacific margin during the Mesozoic and Cenozoic (Parker, 1984; Howell and others, 1985; Watson and Fyfe, 1985; Parko and Hazlett, 1986, 1988; Jones and others, 1987; Monger and Berg, 1987; Fyfe and Cook, 1987; Zverevich and others, 1990; Naumov, 1991, 1992; Monger and others, 1994; Silbrigg and others, 1992; Nelso and others, 1992; and others, 1994, 1995).

A definition for the map is **tectonostratigraphic terrane** which is defined below as a fault-bounded geologic entity or fragment that is characterized by a distinctive geologic history that differs markedly from that of adjacent terranes and occurs in a discrete zone. Most tectonostratigraphic terranes therefore consist of two or more units, and are fault-bounded, stratigraphically coherent assemblages that formed below accretion, i.e., below oceanic crust, and are commonly associated with ophiolite and island arc sequences, many subduction zone or accretionary wedge complexes. The terranes are generally bounded by suture zones or major faults or fault systems. Suture zones are commonly defined as zones of contraction and extension, and may be either tectonic or magmatic in origin, or both. They commonly occur along an arc or orogenic belt, or as a result of collision of two continental masses. On this map, the terranes are interpreted according to their inferred tectonic environments. Most suture zones are interpreted as zones of contraction, but some may be interpreted as zones of extension. On this map, the terranes are interpreted according to their inferred tectonic environments. Most suture zones are interpreted as zones of contraction, but some may be interpreted as zones of extension.

ACKNOWLEDGMENTS

We thank the many geologists who provided us with their valuable expertise and contributions to the Geological Survey of Canada. In particular, we thank the members of the Russian Committee on Geology and Mineral Resources (Russian Committee on Geology and Mineral Resources) for their help and support. We also thank the Exton Foundation Research Company, University of Alaska.

REFERENCES CITED

1989. Plate tectonic history of the southwest Pacific and western North America, in: Wilson, R.L., Ausubel, D.M., and Decker, R.W., eds., *The western Pacific Ocean and the Pacific Basin*, Geological Society of America, Geology of North America, v. 1, p. 21-55.

1989. *Map of the north-central Pacific Ocean*, in: Wilson, R.L., Ausubel, D.M., and Decker, R.W., eds., *The western Pacific Ocean and the Pacific Basin*, Geological Society of America, Geology of North America, v. 1, p. 1-24.

1994. *Map showing major occurrences of accreted volcanic rocks and the pre-Cenozoic rocks of the circum-North Pacific*, in: Fyfe, G.W., and Cook, R.F., eds., *The Geology of Alaska, Boulder, Colorado*, Geological Society of America, Geology of North America, v. 1, p. 401-468.

1989. *Map of Alaska, U.S. Geological Survey*, scale 1:2,500,000.

1989. *Map of Alaska, U.S. Geological Survey*, scale 1:2,500,000.

1984. *Latest Mesozoic and Cenozoic magmatism in southeastern Alaska*, in: Parkin, George, and Berg, J.C., eds., *The Geology of Alaska*, Boulder, Colorado, Geological Society of America, v. 1, p. 801-814.

1987. *Continental rifting and magmatism in western Alaska*, in: Fyfe, G.W., and Cook, R.F., eds., *The Geology of Alaska*, Boulder, Colorado, Geological Society of America, v. 1, p. 55-119.

1989. *Geologic map of southeastern Alaska*, U.S. Geological Survey Miscellaneous Investigations Series Map 1-187, 1 sheet, scale 1:500,000. 24 p.

1994. *Geology of southeastern Alaska*, in: Parkin, George, and Berg, J.C., eds., *The Geology of Alaska*, Boulder, Colorado, Geological Society of America, v. 1, p. 41-149.

1989. *Geology of Alaska, U.S. Geological Survey*, scale 1:2,500,000.

1991. *Geology of Alaska, U.S. Geological Survey*, scale 1:2,500,000.

1991. *Geologic map of the Khibinye Territory and Amur Region*, Far East Production and Geologic Association, Leningrad, 2 sheets, scale 1:2,500,000.

1989. *Geologic map of the Khibinye Territory and Amur Region*, Far East Production and Geologic Association, Leningrad, 2 sheets, scale 1:2,500,000.

1989. *Geologic map of the Khibinye Territory and Amur Region*, Far East Production and Geologic Association, Leningrad, 2 sheets, scale 1:2,500,000.

1989. *Geologic map of the Khibinye Territory and Amur Region*, Far East Production and Geologic Association, Leningrad, 2 sheets, scale 1:2,500,000.

1989. *Geologic map of the Khibinye Territory and Amur Region*, Far East Production and Geologic Association, Leningrad, 2 sheets, scale 1:2,500,000.

UNDIFFERENTIATED CENOZOIC AND MESOZOIC OVERLAY

SEDIMENTARY ASSEMBLAGES AND BASINAL DEPOSITS

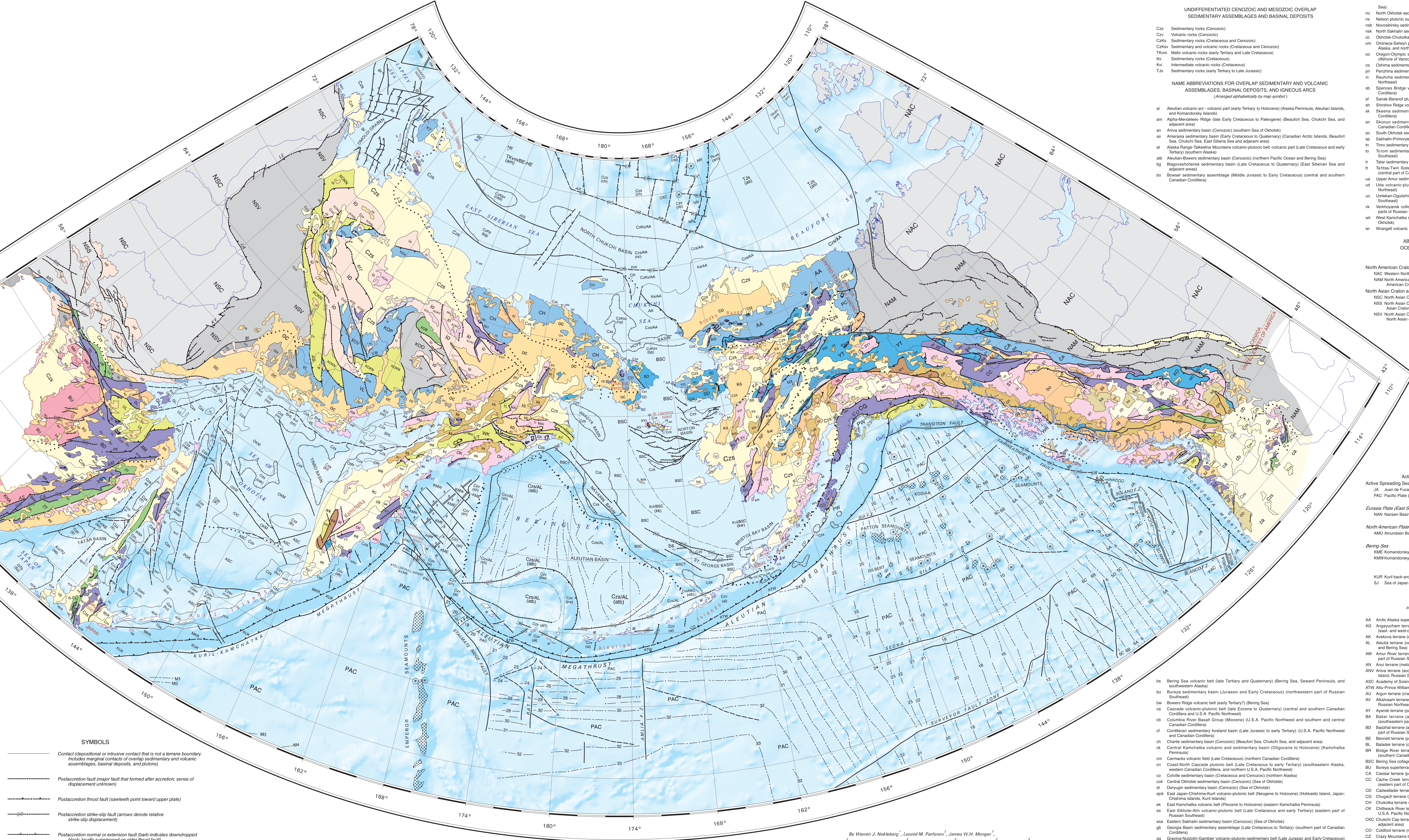
aa Sedimentary rocks (Cenozoic)
 cb Volcanic rocks (Cenozoic)
 ca Sedimentary rocks (Cenozoic and Cenozoic)
 caa Sedimentary rocks (Cenozoic and Cenozoic)
 caaa Sedimentary rocks (Cenozoic and Cenozoic)
 caaaa Sedimentary rocks (Cenozoic and Cenozoic)
 caaaaa Sedimentary rocks (Cenozoic and Cenozoic)
 caaaaaa Sedimentary rocks (Cenozoic and Cenozoic)

NAME ABBREVIATIONS FOR OVERLAY, SEDIMENTARY AND VOLCANIC ASSEMBLAGES, BASINS, DEPOSITS AND OROGENIC AREAS

aa Andalusite zone (Spain)
 ab Annapolis terrane (U.S.A. Pacific Northwest)
 ac Annapolis terrane (U.S.A. Pacific Northwest)
 ad Annapolis terrane (U.S.A. Pacific Northwest)
 ae Annapolis terrane (U.S.A. Pacific Northwest)
 af Annapolis terrane (U.S.A. Pacific Northwest)
 ag Annapolis terrane (U.S.A. Pacific Northwest)
 ah Annapolis terrane (U.S.A. Pacific Northwest)
 ai Annapolis terrane (U.S.A. Pacific Northwest)
 aj Annapolis terrane (U.S.A. Pacific Northwest)
 ak Annapolis terrane (U.S.A. Pacific Northwest)
 al Annapolis terrane (U.S.A. Pacific Northwest)
 am Annapolis terrane (U.S.A. Pacific Northwest)
 an Annapolis terrane (U.S.A. Pacific Northwest)
 ao Annapolis terrane (U.S.A. Pacific Northwest)
 ap Annapolis terrane (U.S.A. Pacific Northwest)
 aq Annapolis terrane (U.S.A. Pacific Northwest)
 ar Annapolis terrane (U.S.A. Pacific Northwest)
 as Annapolis terrane (U.S.A. Pacific Northwest)
 at Annapolis terrane (U.S.A. Pacific Northwest)
 au Annapolis terrane (U.S.A. Pacific Northwest)
 av Annapolis terrane (U.S.A. Pacific Northwest)
 aw Annapolis terrane (U.S.A. Pacific Northwest)
 ax Annapolis terrane (U.S.A. Pacific Northwest)
 ay Annapolis terrane (U.S.A. Pacific Northwest)
 az Annapolis terrane (U.S.A. Pacific Northwest)

PRE-ACCRETIONARY ON-LAND TECTONIC ENVIRONMENTS

aa Active spreading Seafloor and Cenozoic Oceanic Plates
 ab Active Spreading Seafloor (Pacific Ocean)
 ac Active Spreading Seafloor (Pacific Ocean)
 ad Active Spreading Seafloor (Pacific Ocean)
 ae Active Spreading Seafloor (Pacific Ocean)
 af Active Spreading Seafloor (Pacific Ocean)
 ag Active Spreading Seafloor (Pacific Ocean)
 ah Active Spreading Seafloor (Pacific Ocean)
 ai Active Spreading Seafloor (Pacific Ocean)
 aj Active Spreading Seafloor (Pacific Ocean)
 ak Active Spreading Seafloor (Pacific Ocean)
 al Active Spreading Seafloor (Pacific Ocean)
 am Active Spreading Seafloor (Pacific Ocean)
 an Active Spreading Seafloor (Pacific Ocean)
 ao Active Spreading Seafloor (Pacific Ocean)
 ap Active Spreading Seafloor (Pacific Ocean)
 aq Active Spreading Seafloor (Pacific Ocean)
 ar Active Spreading Seafloor (Pacific Ocean)
 as Active Spreading Seafloor (Pacific Ocean)
 at Active Spreading Seafloor (Pacific Ocean)
 au Active Spreading Seafloor (Pacific Ocean)
 av Active Spreading Seafloor (Pacific Ocean)
 aw Active Spreading Seafloor (Pacific Ocean)
 ax Active Spreading Seafloor (Pacific Ocean)
 ay Active Spreading Seafloor (Pacific Ocean)
 az Active Spreading Seafloor (Pacific Ocean)



ABBREVIATIONS FOR MAJOR FAULTS

AD Adyash-Taryn thrust fault (Russian Northwest)
 AF Annuh fault (East Siberian Sea)
 AM Annuh fault (East Siberian Sea)
 AN Annuh fault (East Siberian Sea)
 AO Annuh fault (East Siberian Sea)
 AP Annuh fault (East Siberian Sea)
 AQ Annuh fault (East Siberian Sea)
 AR Annuh fault (East Siberian Sea)
 AS Annuh fault (East Siberian Sea)
 AT Annuh fault (East Siberian Sea)
 AU Annuh fault (East Siberian Sea)
 AV Annuh fault (East Siberian Sea)
 AW Annuh fault (East Siberian Sea)
 AX Annuh fault (East Siberian Sea)
 AY Annuh fault (East Siberian Sea)
 AZ Annuh fault (East Siberian Sea)

POST-ACCRETIONARY ON-LAND AND MESOZOIC GONDWANA ANTI-CLOCKWISE OVERLAY OF ASSEMBLAGES

aa Active or extinct spreading ridge (dotted where approximately located)
 ab Active or extinct spreading ridge (dotted where approximately located)
 ac Active or extinct spreading ridge (dotted where approximately located)
 ad Active or extinct spreading ridge (dotted where approximately located)
 ae Active or extinct spreading ridge (dotted where approximately located)
 af Active or extinct spreading ridge (dotted where approximately located)
 ag Active or extinct spreading ridge (dotted where approximately located)
 ah Active or extinct spreading ridge (dotted where approximately located)
 ai Active or extinct spreading ridge (dotted where approximately located)
 aj Active or extinct spreading ridge (dotted where approximately located)
 ak Active or extinct spreading ridge (dotted where approximately located)
 al Active or extinct spreading ridge (dotted where approximately located)
 am Active or extinct spreading ridge (dotted where approximately located)
 an Active or extinct spreading ridge (dotted where approximately located)
 ao Active or extinct spreading ridge (dotted where approximately located)
 ap Active or extinct spreading ridge (dotted where approximately located)
 aq Active or extinct spreading ridge (dotted where approximately located)
 ar Active or extinct spreading ridge (dotted where approximately located)
 as Active or extinct spreading ridge (dotted where approximately located)
 at Active or extinct spreading ridge (dotted where approximately located)
 au Active or extinct spreading ridge (dotted where approximately located)
 av Active or extinct spreading ridge (dotted where approximately located)
 aw Active or extinct spreading ridge (dotted where approximately located)
 ax Active or extinct spreading ridge (dotted where approximately located)
 ay Active or extinct spreading ridge (dotted where approximately located)
 az Active or extinct spreading ridge (dotted where approximately located)

SYMBOLS

Postaccretionary fault (major fault that formed after accretion; section of displacement unknown)
 Postaccretionary fault (east-west part beneath upper plate)
 Postaccretionary non-extension fault (Bathurst fault)
 Fault bounding terrane or oceanic plate (where conventional tectonostratigraphic assumptions or basal deposits, same and age of displacement unknown)
 Turbidity basin terranes
 Mesamorphic terranes
 Post-ACCRETIONARY ON-LAND AND MESOZOIC GONDWANA ANTI-CLOCKWISE OVERLAY OF ASSEMBLAGES
 Active or extinct spreading ridge (dotted where approximately located)
 Selected ocean floor magnetic/formation number shows correlation with geomagnetic polarity time scale
 Minor offshore oceanic or Cenozoic basin (thickness greater than about 2 km (km); thickness smaller than about 2 km)
 Large amount of oceanic plateau
 Small amount

USGS OPEN FILE 3428

USGS OPEN FILE REPORT 96-727

SUMMARY CIRCUM-NORTH PACIFIC TECTONOSTRATIGRAPHIC TERRANE MAP

Scale 1:10,000,000

Digital cartography by T. J. Wood and J.D. Norcross, Geoscience Information Division, U.S. Geological Survey

Natural Resources Canada and W.L. Nelso, U.S. Geological Survey

Electronic map produced by the Geoscience Information Division, Natural Resources Canada

Any revisions or additional geological information known to the world should be welcomed by the Geological Survey of Canada and the U.S. Geological Survey

COASTLINES, CHANGES, AND COUNTRY BOUNDARIES were obtained from ANS/VOLCANO, 1:500,000 scale, and are copyright © data contained in the *Intellectual Property of Environmental Systems Research Institute, ESRI*. The use of particular designations of countries or territories does not imply any judgement by the publishers, the Geological Survey of Canada and the U.S. Geological Survey as to the legal status of such countries or territories, or of their authorities and institutions or of the delineation of their boundaries.

BATHYMETRIC DATA from U.S. Department of Commerce, *National Oceanic and Atmospheric Administration*, *National Oceanographic Data Center*, 1988. *Geospatial Referenced Data*. CD-ROM. Washington, D.C.

USGS GEOLOGICAL SURVEY

Washington, D.C., and Denver, Colorado, U.S.A.
 Denver, Colorado, U.S.A.
 Reston, Virginia, U.S.A.
 Menlo Park, California, U.S.A.
 Golden, Colorado, U.S.A.
 Denver, Colorado, U.S.A.

USGS GEOLOGICAL SURVEY

Washington, D.C., and Denver, Colorado, U.S.A.
 Denver, Colorado, U.S.A.
 Reston, Virginia, U.S.A.
 Menlo Park, California, U.S.A.
 Golden, Colorado, U.S.A.
 Denver, Colorado, U.S.A.