

Changes in Stratigraphic Nomenclature by the U.S. Geological Survey, 1977

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CONTRIBUTIONS TO STRATIGRAPHY

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CONTENTS

	Page
Introduction	A1
Listing of nomenclatural changes	3
Revision of the age of the Pancho Rico Formation, central Coast Ranges, California, by Warren O. Addicott	88
The Bugle and Witch Members of the Keating Formation, Escabrosa Group, and the Mississippian nomenclature in the Big Hatchet Mountains, Hidalgo County, New Mexico, by Augustus K. Armstrong and Bernard L. Mamet	90
Revised ages of Cambrian and Ordovician formations of the Conestoga Valley near York and Lancaster, southeastern Pennsylvania, by Gregory S. Gohn	94
The Sandy Springs Group and related rocks in the Georgia Piedmont; nomenclature and stratigraphy, by Michael W. Higgins and Keith I. McConnell	98
Restriction and renaming of the Neruokpuk Formation, north- eastern Alaska, by Hillard N. Reiser, Donald K. Norris, J. Thomas Dutro, Jr., and William P. Brosge	106
Age of the Metaline Limestone or Formation in northeastern Washington, by John E. Repetski	107
Ages of the Lee, Breathitt, Caseyville, Tradewater, and Sturgis Formations in Kentucky, by Charles L. Rice	108
Coral zones and problems of Mississippian stratigraphy in the Williston basin, Montana and North Dakota, by William J. Sando	110
Twin River Group (upper Eocene to lower Miocene)--defined to include the Hoko River, Makah, and Pysht Formations, Clallam County, Washington, by Parke D. Snavely, Jr., Alan R. Niem, and James E. Pearl	111
Age and continuity of the Valdez Group, southern Alaska, by Russell G. Tysdal and George Plafker	120
References cited	124
Author index	133

RESTRICTION AND RENAMING OF THE NERUOKPUK FORMATION,
NORTHEASTERN ALASKA

By Hillard N. Reiser,¹ Donald K. Norris,²
J. Thomas Dutro, Jr.,³ and William P. Brosgé¹

E. de K. Leffingwell (1919, p. 103-105, pl.11) mapped a distinctive quartzite schist from the Canning River eastward to the Jago River. He described the schist, which he considered pre-Carboniferous, as being typically developed at Lake Peters and named it the Neruokpuk Schist, stating that the name is taken from the Eskimo name for Lakes Peters and Schrader. And indeed, Lake Peters, the southern of these two joined lakes, is surrounded by mountains that are underlain by this quartzite schist.

Subsequent mapping by geologists of the U.S. Geological Survey in and east of its type area expanded the Neruokpuk to include additional rock types (Brosgé and others, 1962; Reed, 1968; Reiser, 1970; Sable, 1977), and its name was revised to Neruokpuk Formation. In 1972, its age was revised to Precambrian, Cambrian, and post-Cambrian pre-Mississippian on the basis of marine fauna from some parts (Dutro and others, 1972). The quartzite schist was designated a Precambrian member of the Neruokpuk, and 11 other lithologically distinct members were described.

Geologists working in northeastern Alaska and in the adjoining northwestern part of Canada have found the name Neruokpuk Formation confusing as now applied because of the great variety of rock types and the extensive age range of the unit.

To remedy the present confusion, we propose that (1) the name Neruokpuk be again restricted to the rocks lithologically correlative and homotaxial with the type Neruokpuk as originally described by Leffingwell, and (2) that the name Neruokpuk Quartzite be used to reflect this restricted usage.

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According to this new usage, basement rocks in the wells drilled in northeastern Alaska should no longer be referred to the Neruokpuk unless they sufficiently resemble the quartzite schist at its type locality. A lithologic unit found in the wells that cannot be correlated with rock units recognized in surface exposures perhaps should have its own nomenclature.

AGE AND CONTINUITY OF THE VALDEZ GROUP, SOUTHERN ALASKA

By Russell G. Tysdal¹ and George Plafker²

The name Valdez Group (originally named Valdes series) was given to rocks near Port Valdez (fig. 11) by Schrader (1899, 1900), and subsequently was used by Moffit (1954) for rocks exposed in the northwestern part of Prince William Sound that previously were called the Sunrise series by Mendenhall (1899, 1900). Similar strata north and south of Turnagain Arm were mapped as Valdez(?) Group by Clark (1972), however, because continuity with Valdez of the type area was not established. This paper summarizes evidence establishing the continuity of the strata, permitting removal of the query from the Valdez(?) Group. Fauna collected from the Valdez Group (as used here) were, until the studies of Jones (Jones and Clark, 1973), assigned a Jurassic to Cretaceous age. Jones' work showed that all age-diagnostic fossils of the Valdez identified to species level are Maestrichtian and Campanian(?) (latest Cretaceous). Thus, we consider the Valdez to be of Late-Cretaceous age and abandon the Jurassic to Cretaceous age assignment.

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Valdes) is the type area, but no type section was designated. In the same publications, the name Sunrise series was introduced by Mendenhall (1899, 1900) for rocks exposed along Passage Canal (then called Portage Bay) "all about the western waters of Prince William Sound," along the overland route from Resurrection Bay (west of Resurrection Peninsula, fig. 11) to Turnagain Arm, and along the shore of the Arm. Grant and Higgins (1910) changed the name of the Valdez to Valdez Group and, like Mendenhall, assigned most of the strata along the eastern side of the Kenai Peninsula, south from Resurrection Bay, to the Sunrise series. Moffit (1954) believed that part of the Sunrise strata in the northwestern part of the Prince William Sound was westward continuation of the Valdez Group, and he abandoned usage of the name Sunrise series.

Strata north of Turnagain Arm were designated as Valdez(?) Group by Clark (1972) because correlation with rocks of the type area was not certain. The query is herein removed from the Valdez(?) Group because continuity has been established between rocks of the type area and those of the Turnagain Arm area. Plafker, Hudson, and Winkler (unpub. data, 1975) have traced Valdez strata from the type area at Port Valdez across the southeastern corner of the Anchorage quadrangle and into the Seward quadrangle. Tysdal and Case (in press; unpub. data, 1976) have shown continuity of Valdez rocks in the Seward quadrangle with those of the Anchorage quadrangle, including the Turnagain Arm area.

From its type area, the Valdez Group was traced eastward across the Valdez, Cordova, and Bering Glacier quadrangles to the Canadian border (Plafker, Hudson, and Winkler, unpub. data, 1975) and southward through the Seward, Blying Sound, Kenai, and Seldovia quadrangles to the southern part of the Kenai Peninsula (Tysdal and Case, unpub. data, 1976; Plafker, unpub. data, 1975). The southern limit of the Valdez Group is defined by the Contact fault system, a major structure that extends westward from near the Canadian border in the Chugach Mountains to Prince William Sound (Winkler and Plafker, 1975); thence, southward through the Seward quadrangle and into the Blying Sound quadrangle (Tysdal and Case, in press). Plafker and others (1977) project it southwestward to Kodiak Island, where it juxtaposes correlative Cretaceous rocks on the northwest against Tertiary rocks. The northern margin of the Valdez Group is delimited by the Border Ranges fault system, a major system of faults that extends from the Kodiak Islands into Canada and probably into southeastern Alaska (MacKevett and Plafker, 1974; Plafker and others, 1977), or by the Eagle River thrust fault and related faults (Clark, 1972; Plafker and others, 1977; Tysdal and Case, 1977, in press).

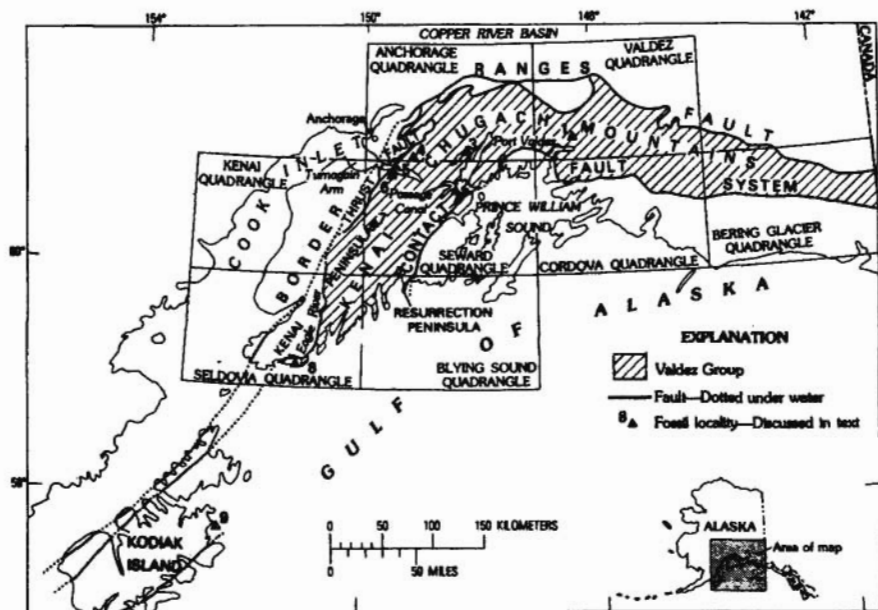


Figure 11.—Map showing area of Valdez Group.

VALDEZ GROUP

The Valdez Group is a thick sequence of rhythmically interbedded, indurated graywacke, siltstone, and minor mudstone and pebble conglomerate. Graded beds, cross beds, convolute laminations, and flame structures are present but are not readily observed owing to deformation and metamorphism. Valdez strata locally contain interbedded tuff and pillow basalt and on the Resurrection Peninsula are intruded by basalt sills and sheeted dikes, gabbro, and rarely serpentinized dunite (Tysdal and others, 1977; Tysdal and Case, *in press*). The entire sequence is intensely folded and regionally metamorphosed to grades ranging from the zeolite facies and the lowermost greenschist facies to the upper zones of the amphibolite facies. Granitic plutons and dikes intrude the Valdez in some areas.

Rocks exposed in the Port Valdez area and northward across the Chugach Mountains to the Copper River Basin originally were named "Valdes series" by Schrader (1899, 1900). Port Valdez (formerly spelled

Age

We consider the Valdez Group to be Late Cretaceous in age because all of the age-diagnostic fossils identified to species level are of Maestrichtian and possibly Campanian (latest Cretaceous) Age. The unit previously was assigned a Jurassic to Cretaceous age because of uncertainty regarding (1) the age range of the few fossils then known and (2) boundaries of the Valdez Group in its eastern extensions and its possible correlation with units containing Late Jurassic fossils (Plafker and MacNeil, 1966). New mapping precludes the possibility that Jurassic strata are included within the group (Plafker and Hudson, unpub. data, 1977).

Prior to the studies of Jones (Jones and Clark, 1973), all the age-diagnostic fossils obtained from the Valdez Group (as defined here) were assigned to the range of Jurassic to Cretaceous. Ulrich (1910) considered Inoceramya concentrica, collected from strata on Woody Island (loc. 9, fig. 11) that are correlative with the Valdez Group, as Early Jurassic (Jones and Clark, 1973). Inoceramus fossils collected north of Turnagain Arm (loc. 4, fig. 11) by B. L. Johnson in 1911 were believed by T. W. Stanton to be similar to Inoceramya concentrica, but he stated that there was no essential difference in general type between the Jurassic species of Inoceramus and some of those in the Cretaceous (Martin and others, 1915). Johnson also collected Inoceramus from float on a moraine on the east side of Valdez Glacier (loc. 1, fig. 11) and Inoceramya concentrica from the north side of Barry Arm (loc. 3, fig. 11) and from float at Point Cochrane (loc. 2, fig. 11) (Johnson, 1914). Park (1933) collected imprints of Inoceramus from six closely spaced localities (loc. 4, fig. 11) north of Turnagain Arm that J. B. Reeside, Jr., believed were Cretaceous, largely because he thought it unlikely that so many Inoceramus would be present in a rock older than Cretaceous. D. L. Jones (in Plafker and MacNeil, 1966) restudied these collections and concluded that the fossils, which are mostly poorly preserved, could not be assigned a more definite age than Jurassic to Cretaceous. But subsequent collections of fossils from the Valdez Group of the Kenai-Chugach Mountains and from correlative rocks on Woody Island (loc. 9, fig. 11) have yielded Inoceramus kusiroensis, a widespread fossil of Maestrichtian Age; it occurs with Inoceramya concentrica at some localities (Jones and Clark, 1973). In addition, poorly preserved Inoceramus collected by Plafker and John Kelley from the Valdez Group near Point Dick (loc. 8, fig. 11) are, according to Jones (oral commun., 1977), of Campanian or Maestrichtian Age. No other age-diagnostic species have been collected from the Valdez Group.

The fossil localities north and south of Turnagain Arm (loc. 4, 5, 6, 7, fig. 11), at Barry Arm and Point Cochrane, and at Valdez Glacier show that these Maestrichtian fossils span almost 3/4 of the width of outcrops of the Valdez Group. Tysdal and Case (1977) suggested that those localities north and south of Turnagain Arm may be in the central part of a complex synclinorium, and we suspect that the Barry Arm-Point Cochrane trend also may be synclinal. The intervening areas could represent somewhat older rocks, but no data exist to suggest that the rocks are older than Late Cretaceous. Certainly no evidence exists to indicate a Jurassic age.

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