DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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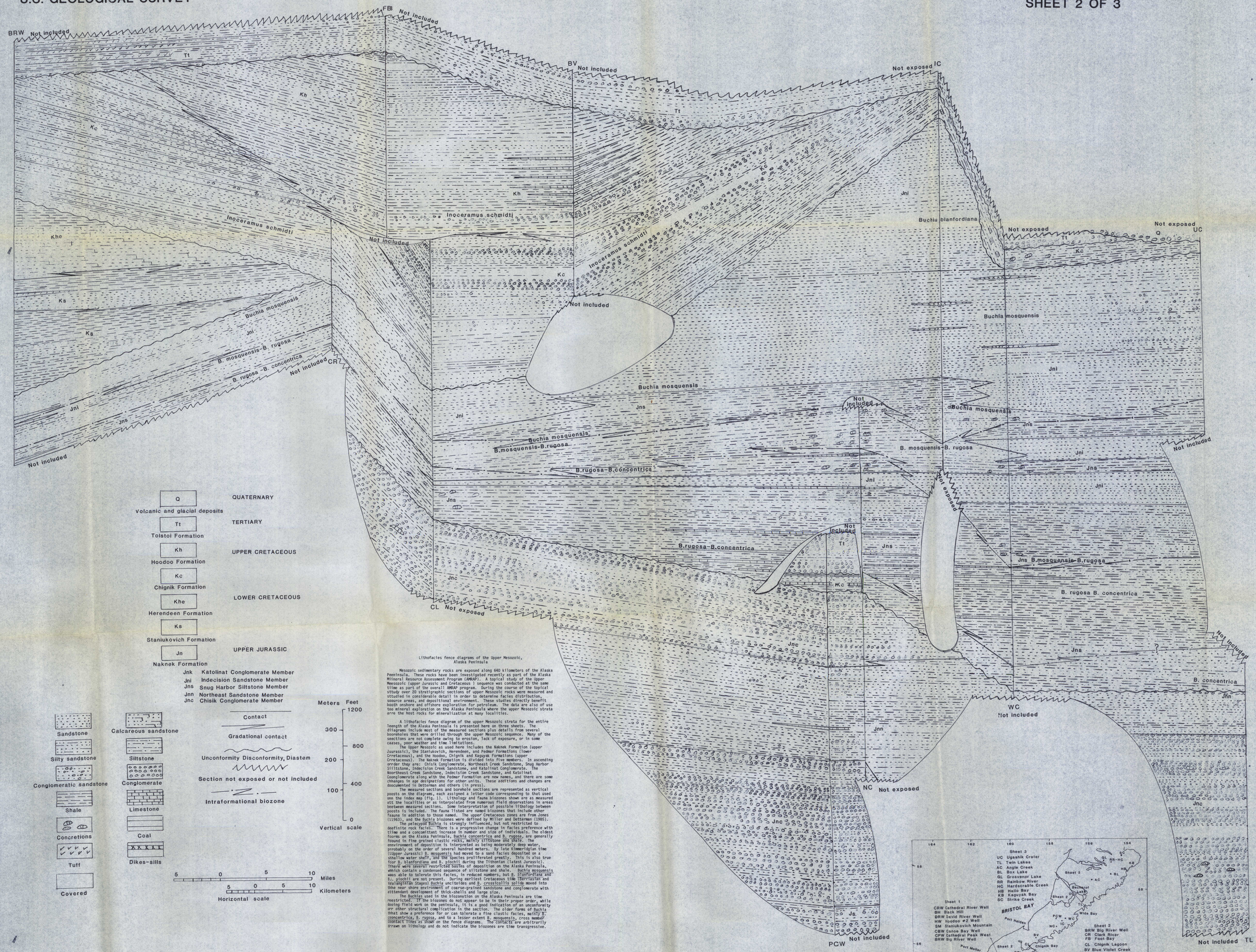
SHEET 2 OF 3



Q Volcanic and glacial deposits — QUATERNARY
Tt Tolstoi Formation — TERTIARY
Kh Hoodoo Formation — UPPER CRETACEOUS
Kc Chignik Formation
Khe Herendeen Formation — LOWER CRETACEOUS
Ks Staniukovich Formation
Jn Naknek Formation — UPPER JURASSIC

Jnk Katolinat Conglomerate Member
Jni Indecision Sandstone Member
Jns Snug Harbor Siltstone Member
Jnn Northeast Sandstone Member
Jnc Chisik Conglomerate Member

Sandstone
Silty sandstone
Conglomeratic sandstone
Shale
Concretions
Tuff
Covered
Calcareous sandstone
Siltstone
Conglomerate
Limestone
Coal
Dikes-sills

Contact
Gradational contact
Unconformity Disconformity, Diastem
Section not exposed or not included
Intraformational biozone

Meters Feet
1200
300
800
200
400
100
0
Vertical scale

5 0 5 10 Miles
5 0 5 10 Kilometers
Horizontal scale

Lithofacies fence diagrams of the Upper Mesozoic, Alaska Peninsula

Mesozoic sedimentary rocks are exposed along 640 kilometers of the Alaska Peninsula. These rocks have been investigated recently as part of the Alaska Mineral Resource Assessment Program (AMRAP). A topical study of the Upper Mesozoic (upper Jurassic and Cretaceous) sequence was conducted at the same ttime as part of the overall AMRAP program. During the course of the topical study over 20 stratigraphic sections of upper Mesozoic rocks were measured and sttudied in considerable detail in order to determine facies distribution, soource areas, and depositional environment. These studies directly benefit booth onshore and offshore exploration for petroleum. The data are also of use too mineral exploration on the Alaska Peninsula where the upper Mesozoic strata arre the host rocks for mineralization at many localities.

A lithofacies fence diagram of the upper Mesozoic strata for the entire leength of the Alaska Peninsula is presented here on three sheets. The diiagrams include most of the measured sections plus details from several boorenholes that were drilled through the upper Mesozoic sequence. Many of the seections are not complete owing to erosion, lack of exposure, or in some ceases, poor weather and ttime limitations.

The Upper Mesozoic as used here includes the Naknek Formation (upper Jurrassic), the Staniukovich, Herendeen, and Pedmar Formations (lower Cretaceous), and the Hoodoo, Chignik and Kagvyak Formations (upper Cretaceous). The Naknek Formation is divided into five members. In ascending order they are: Chisik Conglomerate, Northeast Creek Sandstone, Snug Harbor Siltstone, Indecision Creek Sandstone, and Katolinat Conglomerate. The Noortheast Creek Sandstone, Indecision Creek Sandstone, and Katolinat Coonglomerate along with the Pedmar Formation are new names, and there are some chhanges in age designations for other units. These additions and changes are doocumented in Detterman and others (in press).

The measured sections and borehole sections are represented as vertical poosts on the diagrams, each assigned a letter code corresponding to that used oon the index map (fig. 1). Lithology and fauna biozones shown are as measured att the localities or as interpolated from numerous field observations in areas beetween measured sections. Some interpretation of possible lithology between poosts is included. The fauna listed are named biozones that include other faauna in addition to those named. The upper Cretaceous zones are from Jones (11963), and the Buchia biozones were defined by Miller and Detterman (1985).

The paleogeni Buchia is strongly influenced, but not restricted to deefinite rock facies. There is a progressive change in facies preference with ttime and a concomitant increase in number and size of individuals. The oldest fforms on the Alaska Peninsula, Buchia concentrica and B. rugosa, are generally foound in fine grained clastic rocks, mainly siltstone and shale. The eenvironment of deposition is interpreted as being moderately deep water, prrobably on the order of several hundred meters. By late Kimmeridgian time (Upper Jurassic) B. mosquensis had moved to a sand facies deposited on a shallow water shelf, and the species proliferated greatly. This is also true foor B. blanfordiana and B. plochti during the Tithonian (latest Jurassic). There were several restricted basins of deposition on the Alaska Peninsula, whhich contain a condensed sequence of siltstone and shale. Buchia mosquensis waas able to tolerate this facies, in reduced numbers, but B. blanfordiana and B., plochti are not present. During earliest Cretaceous ttim (Berriasian and Valanginian Stages) Buchia uncitoides and B. crassicollis solids moved into tthe near shore environment of coarse-grained sandstone and conglomerate with atttendant development of thick-shells and large size.

The Buchias used in the biozonation on the Alaska Peninsula are ttime reestricted. If the biozones do not appear to be in their proper order, while dooing field work on the peninsula, it is a good indication of an unconformity orr other structural complication in the sectiion. The older forms of Buchia tthat show a preference for or can tolerate a fine clastic facies, mainly B. cooncentrica, B. rugosa, and to a lesser extent B. mosquensis, cross member ccontact lines as shown on the fence diagrams. The contacts are arbitrarily drrawn on lithology and do not indicate the biozones are time transgressive.

Reference cited

Detterman, R.L., Miller, J.W., Case, J.E, Wilson, F.H., and Yount, M.E., Stratigraphic framework of the Alaska Peninsula: U.S. Geological Survey Bulletin -- (in press).

Jones, D.L., 1963, Upper Cretaceous (Campanian and Maestrichtian) ammonites from southern Alaska: U.S. Geological Survey Professional Paper 432, 53 p.

Miller, J.W. and Detterman, R.L., 1985, The Buchia zones in upper Jurassic rocks on the Alaska Peninsula in Bartsch-Winkler, Susan, and Reed, K.M., eds., The United States Geological Survey in Alaska: Accomplishments during 1983: U.S. Geological Survey Circular 945, p. 51-53.

Index map of the Alaska Peninsula showing location of sections

CENTRAL PART

LITHOFACIES FENCE DIAGRAM OF THE UPPER MESOZOIC, ALASKA PENINSULA

By

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