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SHEET 1 OF 2

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| SERIES | SUBSERIES | STAGE |
|---|---|---|
| PLEISTOCENE | | |
| PLIOCENE | | MOCLIPSIAN |
| MIOCENE | UPPER MIOCENE | GRAYSIAN |
| | | WISHKAHAN |
| | MIDDLE MIOCENE | NEWPORTIAN |
| | LOWER MIOCENE | PILLARIAN |
| | | JUANIAN |
| OLIGOCENE | | MATLOCKIAN or ("BLAKELEY") |
| EOCENE | UPPER EOCENE | GALVINIAN "LINCOLN" |
| | | "KEASEY" |
| | MIDDLE EOCENE | "TEJON" |
| | | "TRANSITION" |
| CRETACEOUS | | |

## ① MIDDLETON ISLAND

| PELECYPODS | Localities |
|---|---|
| *Astarte fabula* Reeve | M1743 aff., M1746 |
| *Astarte elliptica* Brown (*alaskana* Dall) | M1743, M1752 |
| *Astarte* cf. *A. leffingwelli* Dall | M1746 |
| *Astarte* aff. *A. rollandi* Bernard | M1754 |
| *Chlamys islandica kanaga* MacNeil | M1742 |
| *Chlamys pseudislandica platkori* MacNeil | M1742, M1743 |
| *Chlamys coatsi middletonensis* MacNeil | M1741 |
| *Chlamys* (*Leochlamys*) *tugidakensis* MacNeil | M1746, M1751, M1754 |
| *Clinocardium ciliatum* (Fabricius) | M1740, M1747, M1751 |
| *Cyclocardia crebricostata* (Krause) | M1754 |
| *Hiatella arctica* (Linné) | M1743, M1744 |
| *Serripes groenlandicus lapercuuii* (Deshayes) | M1744, M1754 |
| **GASTROPODS** | |
| *Fusitriton oregonensis* (Redfield) | M1745, M1754 |
| *Natica* (*Cryptonatica*) *clausa* Broderip & Sowerby | M1744, M1745, M1746, M1747 |
| *Neptunea* aff. *N. decemcostata* (Say) | M1743, M1744, M1745 |
| *Neptunea* aff. *N. lamellosa* Golikov | M1741, M1743, M1744, M1745 |
| *Neptunea* aff. *N. lyrata* (Gmelin) | M1741, M1744, M1753, M1754 |
| *Neptunea* aff. *N. ventursensis* (Waterfall) | M1744 |
| *Neptunea* sp. (some resemblance to *N. insularis* (Dall) | M1742 |
| *Volutopsius* aff. *V. stefanssoni* (Dall) | M1745 |
| **BARNACLE** | |
| *Balanus* cf. *B. hameri* (Ascanius) | M1750 |

## ③ MILLER HILLS

| PELECYPODS | Localities |
|---|---|
| *Clinocardium* sp. | M1892? |
| *Macoma* sp. | M1893 |
| *Yoldia* aff. *Y. akanensis* Uozumi and *Y. chehalisensis* Arnold | M1893, M1894 |
| **GASTROPOD** | |
| *Antiplanes* cf. *A. thurstonensis* (Weaver) | M1892 |

## ④ WINGHAM ISLAND

| PELECYPODS | Localities |
|---|---|
| *Crassatella* sp. | M5774 |
| *Glycymeris* cf. *G. eocenica* (Weaver) | M5741 |
| *Nuculana* sp. | M5774 |
| *Pitar arnoldi* (Weaver) | M5743, M5745? |
| *?Portlandella* sp. | M5744? |
| *Thyasira disjuncta* Gabb | M5741 |
| *?Yoldia* sp. | M5745 |
| **GASTROPODS** | |
| *Cymatium* aff. *C. cowlitzense* (Weaver) | M5741 |
| *Epitonium* (*Boreoscala*) sp. | M5774 |
| *Ficopsis* cf. *F. meganoensis packardi* Marriam & Turner | M5191 |
| *Polinices* sp. | M5191, M5774 |
| *?Turrid* | M5741 |
| *?Turritella* sp. | M5191 |
| **CRUSTACEANS** | |
| *Branchioplax washingtoniana* Rathbun n. subsp.? | M5740 |
| Undetermined fragments | M5742 |
| **STARFISHES** | |
| Asteropectinid | M5779 |
| Ophiuroid | M5779 |
| **SCAPHOPOD** | |
| *Dentalium* sp. | M5191 |
| **CEPHALOPOD** | |
| *Aturia grandior* Schenck | M5740 |

## ⑤ CAPE ST. PETER

| PELECYPODS | Localities |
|---|---|
| *Crenomytilus* cf. *C. mathewsoni* (Gabb) | M5780 |
| *?Lima oakvillensis* Clark | M5778 |
| *?Portlandella* sp. | M1778 |
| **GASTROPODS** | |
| Naticid | M1778 |
| Turrid | M1778 |
| Undetermined fragments (2 or more taxa) | M1778 |
| **SCAPHOPOD** | |
| *Dentalium* (*Cocodentalium*) *nunomae* Takeda | M1778 |
| ?ECHINOID FRAGMENTS | M1778 |

## ⑥ KAYAK ISLAND-WEST

| PELECYPODS | Localities |
|---|---|
| *Acila gettysburgensis* (Reagan) | M1771, M5781, 15862? |
| *Acila taliaferroi* Schenck | M5781, 15862 cf. |
| *Acila* cf. *A. yakatagensis* (Clark) | M1767 |
| *Calyptogena chitanii* (Kanehara) | M5747 |
| *Lucinoma acutilineata* (Conrad) | M5781 |
| *Macoma* aff. *M. calcarea* (Gmelin) | 15862 |
| *Megayoldia* cf. *M. thraciaeformis* (Storer) | M5775, 15861, 15862 |
| *Megayoldia* cf. *M. yotsukuraensis* (Ozaumi) | M1767, M1770, M5747, 15861, 15862 |
| *Portlandella* cf. *P. karaginskiensis* (Gladenkov) | M5781, 15861 |
| *Portlandella orientalis* (Kristofovich) | M1767 cf., 15861, 15862 |
| *Portlandella scapha* (Tokuyama) | M1767 |
| *Portlandella* n. subgenus and n. sp. | M1769 |
| *Portlandella* n. sp.? | M1767, M1768? |
| *Solemya* sp. | M5781 |
| *Thyasira* cf. *T. disjuncta* Gabb | 15861 |
| **GASTROPODS** | |
| Cancellarid | 15861 |
| *Colus* sp. | M5775 |
| *Colus* n. sp. | M1767, M5775, M5781 |
| *Cryptonatica* sp. | M1768, M5775 |
| *Fusitriton* sp. | M5746 |
| *Neptunea* aff. *N. modesta* Kuroda | M1768 |
| *?Polinices* sp. | M5775 |
| **SCAPHOPOD** | |
| *Dentalium* sp. | 15862 |

## ⑦ KAYAK ISLAND-NORTH

| PELECYPODS | Localities |
|---|---|
| *Acila* sp. | M5728 |
| *Delectopecten* n. sp.? aff. *D. lillisi* (Herlein) | M5727 |
| *Thyasira disjuncta* Gabb | M5723, M5739? |
| **GASTROPODS** | |
| *Bathybembix* n. sp.? aff. *B. columbiana* (Dall) and *B. arnoldi* (Durham) | M5729, M5731 |
| *Conus* cf. *C. cowlitzensis* Weaver | M5723 |
| *?Galeodea* sp. | M5723 |
| **CRUSTACEANS** | |
| *Eumorphocorystes naselensis* Rathbun | M5726, M5731 |
| Undetermined fragments | M5723, M5729 |
| **CEPHALOPOD** | |
| *Aturia* cf. *A. grandior* Schenck | M5726 |

## ⑧ KAYAK ISLAND-EAST

| PELECYPODS | Localities |
|---|---|
| *Acila gettysburgensis* (Reagan) | M5942 |
| *Calyptogena chitanii* (Kanehara) | M5721, M5770, M5777 |
| *Calyptogena* n. sp.? | M5721 |
| *Nuculana* (*Borissia*) *alferovi* Slodkewitsch | M5770 |
| *Portlandella scapha* (Tokuyama) | M5762 cf., M5763 |
| *Portlandella* cf. *P. karaginskiensis* Gladenkov | M5771 |
| *Portlandella* n. sp.? | M5770 |
| *Solemya* sp. | M5942 |

## ⑨ CREEK "E" AND REEF

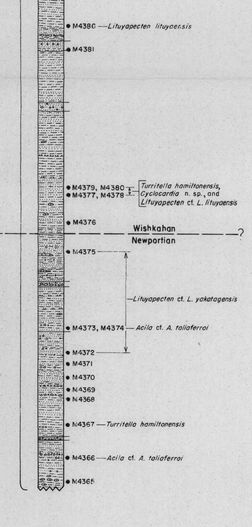
| PELECYPODS | Localities |
|---|---|
| *Acila gettysburgensis* (Reagan) | M5720 |
| *Acila shumardi* (Dall) | M1775 |
| *Calyptogena* n. sp.? | M5759 |
| *Delectopecten* cf. *D. peckhami* (Gabb) | M5767 |
| *Eonolen* sp. | M5768 |
| *?Hubertschenckia* sp. | M5768, M5941 |
| *Macoma* (*Rexithaerus?*) n. sp.? | M1775 |
| *Nuculana* sp. | M1775 |
| *Pitar arnoldi* (Weaver) | M1775, M5750, M5752, M5768 |
| *Pitar* cf. *P. dalli* (Weaver) | M5773 |
| *?Portlandella* sp. | M1775 |
| *Solemya dalli* Clark | M5772 |
| *Spisula* cf. *S. pittsburghensis* Clark | M1775 |
| *Thyasira bisecta* (Conrad) | M5725, M5773 |
| *Thyasira disjuncta* Gabb | M5768, M5941 |
| **GASTROPODS** | |
| *Bathybembix* n. sp.? aff. *B. columbiana* (Dall) and *B. arnoldi* (Durham) | M5774 |
| *Epitonium* (*Boreoscala*) *condoni* (Dall) | M5768 |
| *Perse pittsburghensis* Durham | M1775 |
| *Polinices* sp. | M5768 |
| Turbinid | M5941 |
| **CRUSTACEANS** | |
| *Eumorphocorystes naselensis* Rathbun | M5769, M5774 |
| *Portunites alaskensis* Rathbun | M5752, M5753 |
| Undetermined fragments | M5766 |
| **SCAPHOPOD** | |
| *Dentalium* sp. | M1775 |
| **BRACHIOPODS** | |
| Undetermined fragments | M5769 |

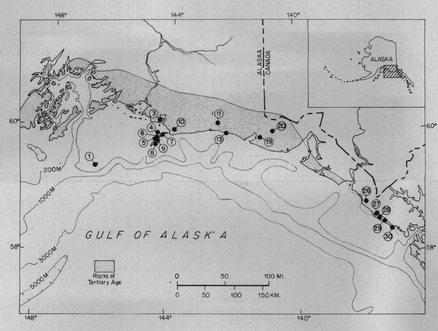
## ⑩ SUCKLING HILLS

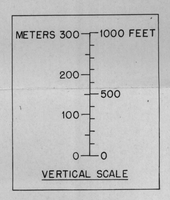
| PELECYPODS | Localities |
|---|---|
| *Clinocardium* cf. *C. yakatagensis* (Clark) | M1782, M1783, M1789 |
| *Lucinoma* cf. *L. acutilineata* (Conrad) | M1781, M1785 |
| *Megayoldia* cf. *M. thraciaeformis* (Storer) | M1780 |
| *Nuculana* n. sp. | M1788 |
| *Panomya* cf. *P. turgida* Dall | M1782, M1783 |
| *Thyasira* cf. *T. bisecta* (Conrad) | M1781, M1785 |
| **GASTROPOD** | |
| *Antiplanes* cf. *A. perversa* (Gabb) | M1779 |
| **CRUSTACEANS** | |
| Crabs and crab fragments | M1792, M1779 |
| **BARNACLE** | |
| *Balanus* sp. | M1784, M1792 |
| **ECHINOID** | |
| Spatangoid fragments | M1787 |

## ⑪ KULTHIETH MOUNTAIN

| PELECYPODS | Localities |
|---|---|
| *Acila* cf. *A. taliaferroi* Schenck | M4366, M4374 |
| *?Astarte* sp. | M4390 |
| Cardiid | M4377, M4388 |
| *Chlamys* aff. *C. tugidakensis* MacNeil | M4390 |
| *Clinocardium* cf. *C. ciliatum* (Fabricius) | M4388 |
| *Clinocardium yakatagensis* (Clark) | M4366?, M4368, M4369, M4371 cf., M4374 |
| *Cyclocardia* n. sp. MacNeil | M4377, M4380 |
| *Cyclocardia* sp. | M4366?, M4371, M4387, M4388, M4389, M4390 |
| *Macoma* cf. *M. calcarea* Gmelin | M4374 |
| *Macoma* cf. *M. inconspicua* von Martens | M4388 |
| *?Macoma* cf. *M. arctata* (Conrad) | M4388 |
| *Megayoldia* cf. *M. thraciaeformis* (Storer) | M4368, M4374 |
| *Mya truncata* Linné | M4368, M4370?, M4377, M4386 |
| *Mya* cf. *M. cuneiformis* (Bohn) | M4366 |
| *Mya* sp. | M4375, M4388? |
| *?Mytilus* sp. | M4390 |
| *Nuculana alferovi sakalinensis* Kristofovich (= "*Lenda*" *fossa* Baird) | M4365, M4366 cf., M4368?, M4369, M4377 |
| *Panomya* sp. | M4389 |
| *Pegyridea hamiltonensis* (Clark) | M4368 |
| *Patinopecten* (*Litupapecten*) *litupaensis* MacNeil | M4377, M4378, M4386 |
| *Patinopecten* (*Litupapecten*) cf. *P.* (*L.*) *yakatagensis* (Clark) | M4372, M4373, M4375 |
| *Petitoma* sp. | M4371 (same as M1791) |
| *Pododesmus* (*Monia*) *macrochisma* (Deshayes) | M1897 |
| *?Secundella* sp. | M4381 |
| *Spisula* cf. *S. albaria* (Conrad) | M4386 |
| *Spisula* cf. *S. albaria yoodaspeedi* Etherington | M4386 |
| *Swiftopecten* cf. *S. dommilleri* MacNeil | M4387 |
| **GASTROPODS** | |
| *Antiplanes* sp. | M4377 |
| *?Calliostoma* sp. | M4378 |
| *Crepidula* sp. | M4377 |
| *?Fusitriton* sp. | M4377 |
| *Natica* (*Cryptonatica*) cf. *N.* (*C.*) *clausa* Broderip & Sowerby | M4379, M4380 |
| *Neptunea* n. sp. aff. *N. eurekaensis* (Martin) | M4379 |
| *Neptunea* aff. *N. tabulata* (Baird) | M4376, M4377, M4379, M4380, M4386 |
| *Neptunea* aff. *N. lyrata* (Gmelin) | M4390 |
| *Neptunea* or *Volutopsius* sp. | M4388 |
| *Trichotropis* aff. *T. cancellatus* Hinds | M4387 |
| *Turritella hamiltonensis* Clark | M4367, M4380 |
| Vermetid | M4387, M4390 |
| **BARNACLE** | |
| *Balanus* sp. | M1899, M4377?, M4381? |
| **STARFISH** | |
| *Scutellaster oregonensis* (Clark) | M1898 |



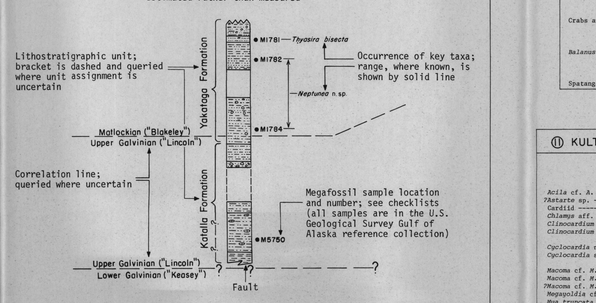




## EXPLANATION

STRATIGRAPHIC SECTIONS

Lithologic symbols are standardized; column is blank where no rocks are exposed; column is dashed and symbols are not shown where thickness is estimated rather than measured




CHECKLISTS

Queried taxa are tentatively identified

**M4244?**
Taxa questionably present in collection from this locality

**M4224 cf.**
Species present is cf. species cited in collection from this locality

**M1887 aff.**
Species present is aff. species cited in collection from this locality

Measured stratigraphic sections are numbered sequentially from west to east to correspond with their designations in Rau, Plafker, and Winkler (1977). Numbers 2, 12, 14-18, and 21-25 are not included, inasmuch as they were used to designate wells for which no megafossil information is available. (The wells are not included on these charts.)

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

# PRELIMINARY MEGAFOSSIL BIOSTRATIGRAPHY AND CORRELATION OF STRATIGRAPHIC SECTIONS IN THE GULF OF ALASKA TERTIARY PROVINCE

BY W. O. ADDICOTT, G. R. WINKLER, AND GEORGE PLAFKER

1978

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UNITED STATES GEOLOGICAL SURVEY

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OPEN FILE REPORT 78-491
SHEET 2 OF 2

Preliminary megafossil biostratigraphy and correlation of stratigraphic sections in the Gulf of Alaska Tertiary Province
by
W. O. Addicott, G. R. Winkler, and George Plafker

Introduction

This report summarizes the stratigraphic occurrence, age, and correlation of Cenozoic marine mollusk and other larger invertebrate assemblages that have been collected from 18 measured surface sections in the Gulf of Alaska Tertiary Province. It complements reports on the benthic foraminiferal biostratigraphy and lithology of these and 12 well sections from the this province (Rau, Plafker, and Winkler, 1977; Plafker, Winkler, and Hunt, unpub. data).

The Gulf of Alaska Tertiary Province is an arcuate band of coastal and insular outcrops of dominantly marine strata extending from Icy Point (long 137° W.) west-northwest to Kayak Island (long 144° W.) and thence southwest to Middleton Island (long 146° W.) (Plafker, 1967). A complete sequence of Paleocene to Pleistocene megafaunas is represented; the pre-upper Eocene part of the sequence, however, is incompletely represented (Addicott and Plafker, 1971). The stratigraphic occurrence, age, and correlation of the megafaunas are summarized on the basis of collections from 18 measured surface sections. The benthic foraminiferal biostratigraphy of these sections and of 12 well sections have been presented similarly by Rau, Plafker, and Winkler (1977), and the geologic setting and lithostratigraphy of the measured sections and wells are in preparation by Plafker, Winkler, and Hunt (unpub. data). Larger marine invertebrates, notably mollusks, have provided the primary biostratigraphic basis for correlation among these surface sections and for age determination by faunal correlation with the rather well-known Tertiary sequence of the coastal ranges of the conterminous United States (Weaver and others, 1944). Only limited documentation of the stratigraphic occurrence of Alaskan Tertiary molluscan faunas has been published (Kanno, 1971; Miller, 1957, 1961, 1971, 1975; Plafker, 1974). This progress report adds to the rather scanty base of biostratigraphic data on marine larger invertebrate faunas of this region and is presented solely for the purpose of making available the existent biostratigraphic data on U.S. Geological Survey collections secured during the past 15 years from measured surface sections. These collections represent a small percentage of the available but largely unstudied biostratigraphic data on marine megafossils from the Gulf of Alaska Tertiary that will become available in the future as the result of current projects in the area.

Sources of data

Identifications of marine megafossils are mostly by Addicott excepting that most of those collections with numbers under M2000 and those with "D" prefixes were identified by F. S. MacNeil during the early 1960's, and those collections from the southeasternmost part of the region (Fairweather Glacier, Cenotaph Island, and La Perouse Glacier sections) with numbers in the M6500 and M6600 series were identified by Louie Marincovich. No attempt has been made to revise older identifications. Thus the generic assignment of a few species may require subsequent revision when current investigations are completed. Locality numbers with "M" prefixes pertain to data and megafossil collections in Menlo Park, Calif.; those with "D" prefixes pertain to a Denver, Colo., locality register but the collections are housed in Menlo Park.

Current investigations

We emphasize here that this is a progress report and note that several paleontologists are currently making detailed biostratigraphic and faunal studies of the molluscan sequence of the Gulf of Alaska Tertiary Province, and these studies will surely modify some of the data presented in this progress report. Marincovich is now restudying these and other U.S. Geological Survey collections as well as recently collected material from several sections in this region as a part of his long-range faunal studies of the marine Tertiary of the Gulf of Alaska. Richard C. Allison of the University of Alaska is also working on the molluscan biostratigraphy of this region with special emphasis on the Neogene (Allison, 1976, 1979). Additional studies have been carried out, or are in progress, by industrial and consulting paleontologists in connection with petroleum exploration. The results of this work, however, are not available and it is highly unlikely that these data will be published at an early date.

Previous work on megafossils

The molluscan paleontology of the Gulf of Alaska Tertiary Province has been the subject of two monographs of the late Oligocene and Miocene faunas from the Yakataga District (Clark, 1932; Kanno, 1971). Pectinid bivalves of this region have been described and monographed by MacNeil (1961, 1967). Reports on Tertiary marine mollusks of this region published prior to 1971 are listed by Addicott (1971) together with brief annotations. Other reports that deal significantly with Tertiary mollusks from the Gulf of Alaska include Addicott and others (1971), Addicott and Plafker (1971), Allison (1976, 1979), MacNeil (1965), MacNeil and others (1961), Marincovich (1976), Masuda (1972, 1973, 1976), Miller (1953, 1961, 1971), Nelson (1979), Plafker and Addicott (1976), Plafker and MacNeil (1966), and Plafker and Miller (1957). The sand dollar echinoids of the Pacific coast of Alaska were recently monographed by Wagner (1974).


Age determination and correlation

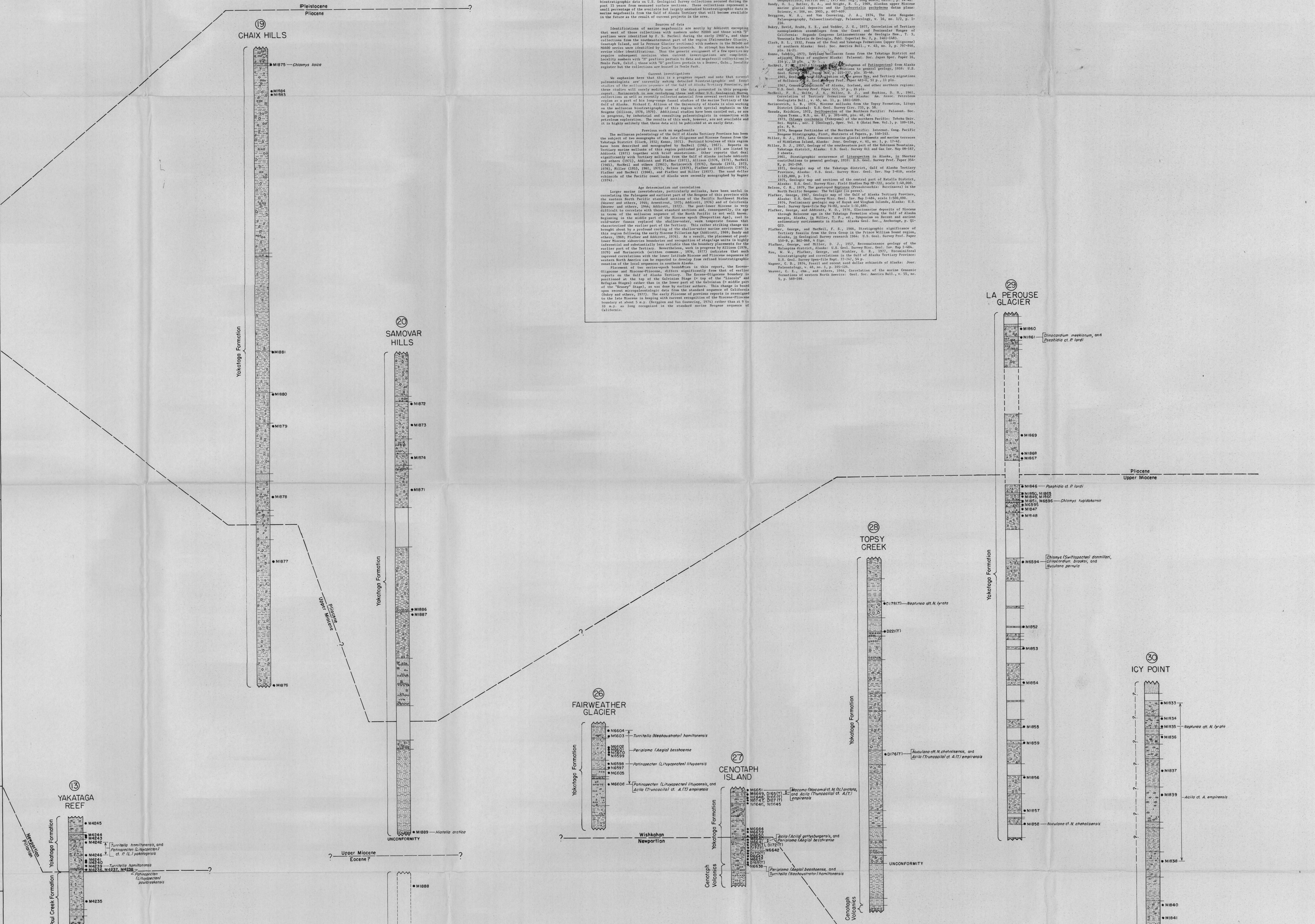
Larger marine invertebrates, particularly mollusks, have been useful in correlating the Paleogene and earliest part of the Neogene of this province with the eastern North Pacific standard sections of the Pacific Northwest States (Weaver and others, 1944; Armentrout, 1975; Addicott, 1976) and of California (Weaver and others, 1944; Addicott, 1972). The post-lower Miocene is very difficult to correlate with these standard sections and, consequently, its age in terms of the molluscan sequence of the North Pacific is not well known. Beginning in the middle part of the Miocene epoch (Newportian Age), cool to cold-water faunas replaced the shallow-water, warm temperate faunas that characterized the earlier part of the Tertiary. This rather striking change was brought about by a profound cooling of the shallow-water marine environment in this region following the early Miocene Pillarian Age (Addicott, 1969; Bandy and others, 1969; Plafker and Addicott, 1976). As a result, the placement of post-lower Miocene subseries boundaries and recognition of stage/age units is highly inferential and substantially less reliable than the boundary placements for the earlier part of the Tertiary. Nevertheless, work in progress by Allison (1976, 1979) and Marincovich (written communs., 1976, 1977) indicates that much improved correlations with the lower latitude Miocene and Pliocene sequences of western North America can be expected to develop from refined biostratigraphic zonation of the local sequences in southern Alaska.

Placement of two series-epoch boundaries in this report, the Eocene-Oligocene and Miocene-Pliocene, differs significantly from that of earlier reports on the Gulf of Alaska Tertiary. The Eocene-Oligocene boundary is positioned at the top of the Galvinian Stage (= top of the "Lincoln" and Refugian Stages) rather than in the lower part of the Galvinian (= middle part of the "Keasey" Stage), as was done by earlier authors. This change is based upon recent micropaleontologic data from the standard sequence of California (Bukry and others, 1977). The early Pliocene of previous reports is reassigned to the late Miocene in keeping with current recognition of the Miocene-Pliocene boundary at about 5 m.y. (Berggren and Van Couvering, 1974) rather than at 9 to 10 m.y. as long recognized in the standard marine Neogene sequence of California.

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## 13 YAKATAGA REEF

| PELECYPODS | Localities |
|---|---|
| *Acila* sp. | M4237, M4238 |
| *Clinocardium* cf. *C. alaskensis* (Clark) | M4238 |
| *Clinocardium* cf. *C. ciliatum* (Fabricius) | M4239 |
| *Clinocardium* cf. *C. hamiltonensis* (Clark) | M4238 |
| *Clinocardium* cf. *C. yakatagensis* (Clark) | M4235 |
| *Crenella* sp. | M4239, M4244? |
| *Cyclocardia* n. sp. | M4237 |
| *Katherinella* sp. | M4235 |
| *Macoma* cf. *M. incongrua* von Martens | M4235, M4245 |
| *Macoma* cf. *M. sookensis* Clark & Arnold | M4235 |
| *Mya truncata* Linné | M4245 |
| *Nemocardium* sp. | M4235 |
| ?*Neptuneid* sp. | M4242 |
| *Nuculana* cf. *N. alferovi sakalinensis* Kristofovich | M4238 |
| *Nuculana* (*Leionuculana*) aff. *N.* (*L.*) *postangulata* Clark | M4244 |
| *Panopea* fragment | M4235 |
| *Patinopecten* (*Lituyapecten*) *poulcreekensis* MacNeil | M4237 |
| *Patinopecten* (*Lituyapecten*) *yakatagensis* (Clark) | M4242 cf., M4246 |
| *Patinopecten* (*Lituyapecten?*) sp. | M4237 |
| *Patinopecten* sp. | M4245 |
| *Periploma* cf. *P. besshoense* (Yokoyama) | M4246 |
| ?*Pododesmus* sp. | M4239 |
| ?Tellinid | M4237 |
| *Thracia* cf. *T. schencki* Tegland | M4235 |
| **GASTROPODS** | |
| *Antiplanes* sp. | M4245 |
| ?*Bittium* sp. | M4239 |
| ?*Buccinum* sp. | M4244 |
| *Cancellaria alaskensis* Clark | M4235 |
| *Natica* cf. *N. clarki* Etherington | M4235 |
| *Natica* (*Cryptonatica*) sp. | M4246 |
| *Neptunea plafkeri* Kanno | M4241 |
| *Neptunea* aff. *N. tabulata* (Baird) | M4236 |
| *Priscofusus* cf. *P. stewarti* (Tegland) | M4235 |
| *Turritella hamiltonensis* Clark | M4239, M4242, M4246 |
| **BRACHIOPODS** | |
| *Hemithiris psittacea* Gmelin | M4239 |
| ?*Terebratalia occidentalis obsoleta* Dall | M4239 |
| Undetermined fragments | M4242, M4243 |

## 19 CHAIX HILLS

| PELECYPODS | Localities |
|---|---|
| *Chlamys chaixensis* MacNeil | M1875 |
| *Chlamys lioica* (Dall) | M1875 |
| *Chlamys* (*Leochlamys*) *tugidakensis* MacNeil | M1878 |
| *Clinocardium* cf. *C. yakatagensis* (Clark) | M1876 |
| *Cyclocardia* cf. *C. redondoensis* Burch | M1881 |
| *Cyclocardia* cf. *C. ventricosa* (Gould) | M1880, M1881 |
| *Macoma calcarea* Gmelin | M1879 |
| *Megayoldia* aff. *M. thraciaeformis* (Storer) | M1876 |
| *Mya truncata* Linné | M1875 |
| *Nuculana* aff. *N. fossa* (Baird) | M1876 |
| *Propeamussium alaskense* (Dall) | M1875 |
| **GASTROPODS** | |
| *Admete* cf. *A. couthouyi* (Jay) | M1881 |
| ?*Aforia* cf. *A. circinata* (Dall) (resembles *Megasurcula wynoocheensis* (Weaver)) | M1876 |
| *Bittium* aff. *B. nigatum* Carpenter | M1881 |
| *Colus* aff. *C. jordani* Dall | M1876 |
| *Neptunea* aff. *N. decemcostata* (Say) | M1875 |
| **BARNACLE** | |
| *Balanus* sp. | M1878, M1880 |
| **SCAPHOPOD** | |
| *Dentalium* sp. | M1881 |

## 20 SAMOVAR HILLS

| PELECYPODS | Localities |
|---|---|
| *Clinocardium ciliatum* (Fabricius) | M1871 |
| *Hiatella* cf. *H. arctica* Linné | M1872 |
| *Macoma astori* Dall | M1872, M1887 cf. |
| *Macoma* aff. *M. calcarea* Gmelin | M1874 |
| *Nuculana fossa* (Baird) | M1874 cf., M1887 aff. |
| *Nuculana* cf. *N. chehalisensis* (Weaver) | M1890 |
| *Yoldia hyperborea* (Lovan) | M1887 |
| **GASTROPODS** | |
| *Admete* cf. *A. couthouyi* (Jay) | M1872 |
| *Natica* (*Cryptonatica*) *clausa* Broderip & Sowerby | M1886 aff., M1887 cf. |
| *Neptunea* cf. *N. decemcostata* (Say) | M1871, M1874 |
| *Neptunea* aff. *N. eurekaensis* (Martin) | M1874 |
| *Tachyrhynchus* aff. *T. erosus* (Couthouy) | M1872, M1873 |
| *Turritella* cf. *T. gretschishkini* Ilyina | M1889 |

## 26 FAIRWEATHER GLACIER

| PELECYPODS | Localities |
|---|---|
| *Acila* (*Truncacila*) cf. *A.* (*T.*) *empirensis* Howe | M6606 |
| *Clinocardium* sp. | M6598, M6599, M6600, M6602, M6603 |
| *Cyclocardia* aff. *C. yakatagensis* (Clark) | M6599 |
| *Macoma incongrua* (von Martens) | M6604 |
| *Mya* (*Mya*) *truncata* Linné | M6598 cf., M6599 |
| *Nuculana* sp. | M6602 |
| *Panomya arctica* (Lamarck) | M6599, M6600, M6606 cf. |
| *Patinopecten* (*Lituyapecten*) *lituyaensis* MacNeil | M6598, M6606 |
| *Patinopecten* (*Lituyapecten*) sp. | M6606 |
| *Periploma* (*Aelga*) *besshoense* (Yokoyama) | M6597, M6599, M6600, M6602, M6603, M6604, M6606 |
| *Yoldia* (*Yoldia*) aff. *Y.* (*Y.*) *takaradaensis* (Kristofovich) | M6601, M6602 |
| **GASTROPODS** | |
| *Beringius* cf. *B. crebricostatus* (Dall) | M6602 |
| ?*Buccinum* sp. | M6604 |
| *Colus* sp. | M6599?, M6600, M6602 |
| *Musashia* (*Neopsephaea*) cf. *M.* (*N.*) *corrugata* (Clark) | M6606 |
| *Natica* (*Cryptonatica*) *clausa* Broderip & Sowerby | M6599, M6600, M6602, M6603, M6606 |
| *Neptunea* (*Neptunea*) *plafkeri* Kanno | M6604 |
| *Turritella* (*Neohaustator*) *hamiltonensis* Clark | M6604 |

## 27 CENOTAPH ISLAND

| PELECYPODS | Localities |
|---|---|
| *Acila* (*Acila*) *gettysburghensis* (Reagan) | M6640, M6641 |
| *Acila* cf. *A. empirensis* Howe and *A. nakazimai* Otuka | D165(T) |
| *Clinocardium* cf. *C. ciliatum* (Fabricius) | D166(T), D169(T) |
| *Clinocardium* cf. *C. coosense* (Dall) | D165(T), D166(T), D167(T) |
| *Clinocardium* cf. *C. corbis* (Martyn) | M6637, M6638 |
| *Clinocardium* cf. *C. nuttalli* (Conrad), *C. corbis* (Martyn) | D172(T) |
| *Cyclocardia hamiltonensis* (Clark) | M6641, M6645 |
| *Diplodonta* cf. *D. parilis* Conrad | D172(T) |
| *Macoma* (*Macoma*) cf. *M.* (*M.*) *arctata* (Conrad) | M6649, M6651 |
| *Macoma* aff. *M. brota* Dall | D165(T), D166(T) |
| *Macoma* aff. *M. calcarea* Gmelin | D165(T), D166(T), D167(T), D168(T) |
| *Macoma incongrua* (von Martens) | M6638, M6641, M6643, M6646, M6648, M6649, D165(T) aff., D166(T) aff., D167(T) aff. |
| *Macoma* cf. *M. inconspicua* Broderip & Sowerby | D165(T) |
| *Macoma* cf. *M lipara* Dall | D168(T) |
| *Macoma* (*Macoma*) aff. *M.* (*M.*) *lorenzoensis arnoldi* Tegland | M6651 |
| *Megayoldia thraciaeformis* (Storer) | D169(T) |
| *Mya cuneiformis* (Boehm) | M6639, M6640, M6641, M6650 |
| *Mya truncata* Linné | M6637, M6638, D171(T) |
| *Nuculana* (*Borissia*) *alferovi sakalinensis* Kristofovich | M6638, M6641 |
| *Patinopecten* cf. *P. jonesi* Kanno | M6641 |
| *Patinopecten* (*Lituyapecten*) sp. | M6644, M6647 |
| *Periploma* (*Aelga*) *besshoense* (Yokoyama) | M6638, M6640, M6641 |
| *Pseudocardium* cf. *P. densatum* Conrad | D172(T) |
| *Securella alaskensis* (Clark) | M6647 |
| *Securella* cf. *S. securis* (Shumard) | D166(T), D172(T) |
| *Siliqua* sp. | M6649, D165(T) |
| *Spisula* (*Mactromeris*) cf. *S.* (*M.*) *albaria* (Conrad) | M6649 |
| *Spisula equilateralis* (Clark) | M6638 |
| *Terebratulina* cf. *T. transversa caurina* Gould | D168(T) |
| *Thracia* sp. | M6638, M6643?, D165(T)? |
| *Yoldia* (*Yoldia*) cf. *Y.* (*Y.*) *biremis* Uozumi | M6638 |
| *Yoldia* (*Cnesterium*) *ensifera* Dall | M6638, M6640 cf., M6646, M6649 cf. |
| *Yoldia* cf. *Y. limatula strigata* Dall | D168(T) |
| *Yoldia* cf. *Y. scissurata strigata* Dall | D168(T) |
| *Yoldia* sp. A | M6648 |
| *Yoldia* sp. B | M6648 |
| **GASTROPODS** | |
| *Beringius* cf. *B. crebricostatus* (Dall) | M6638 |
| *Buccinum* n. sp. | D165(T) |
| *Clinopegma* aff. *C. magna* (Dall) | D166(T) |
| *Littorina* cf. *L. petricola* Dall | D167(T) |
| *Littorina* sp. | M6637 |
| *Natica* (*Cryptonatica*) *clausa* Broderip & Sowerby | M6638, M6639, M6640, M6644 |
| *Natica* (*Cryptonatica*) sp. | D165(T), D166(T) |
| *Neptunea* (*Neptunea*) cf. *N.* (*N.*) *plafkeri* Kanno | M6637, M6638, M6641 |
| *Neptunea* sp. A | M6644 |
| *Neptunea* sp. B | M6644 |
| *Oenopota chiachiana* (Dall) | D169(T) |
| *Priscofusus* aff. *P. clarki* Kanno | M6638 |
| *Priscofusus* sp. | M6639 |
| *Thais lamellosa* (Gmelin) | D171(T) |
| *Turritella* cf. *T. gretschiskini* Ilyina | D168(T) |
| **CRUSTACEAN** | |
| Spiny lobster fragments | D167(T) |
| **ECHINOIDS** | |
| Sand dollars | M6641, M6643 |

## 28 TOPSY CREEK

| PELECYPODS | Localities |
|---|---|
| *Acila* cf. *A. empirensis* (Howe), *A. nakazimai* Otuka, *A. conradi* Meek | D176(T) |
| *Clinocardium* cf. *C. coosense* (Dall) | D176(T) |
| *Macoma* cf. *M. calcarea* Gmelin | D176(T) |
| *Nuculana chehalisensis* (Weaver) | D176(T) |
| *Pandora* cf. *P. grandis* Dall | D176(T) |
| *Periploma* aff. *P. stearnsii* Dall | D176(T) |
| *Spisula voyi* Gabb | D178(T) |
| *Thyasira* cf. *T. disjuncta* Gabb | D176(T) |
| **GASTROPODS** | |
| *Clinopegma magna* (Dall) | D221(T) |
| *Natica* (*Cryptonatica*) cf. *N.* (*C.*) *clausa* Broderip & Sowerby | D176(T) |
| *Neptunea* aff. *N. lyrata* (Gmelin) | D178(T) |
| **BARNACLE** | |
| *Balanus* sp. | D176(T) |

## 29 LA PEROUSE GLACIER

| PELECYPODS | Localities |
|---|---|
| *Chlamys* (*Leochlamys*) *tugidakensis* MacNeil | M1851 |
| *Chlamys* (*Swiftopecten*) *donmilleri* MacNeil | M6594 |
| *Clinocardium brooksi* (Clark) | M6594 |
| *Clinocardium meekianum* (Gabb) | M1861 |
| *Cyclocardia* sp. | M6594 |
| *Hiatella arctica* (Linné) | M1860 |
| *Macoma calcarea* Gmelin | M1847 cf., M1849, M1850 cf., M1862, M1865 cf., M1866 |
| *Macoma* aff. *M. lipara* Dall | M1850 |
| *Macoma incongrua* (von Martens) | M6594 |
| *Macoma brota* Dall | M6594 |
| *Macoma* sp. (intermediate between *M. lipara* Dall and *M. middendorffi* Dall) | M1867, M6594 |
| *Nucula* aff. *N. bellotii* A. Adams | M1853 |
| *Nucula tenuis expansa* Reeve | M1862 |
| *Nuculana fossa* Baird | M1846 cf., M1855 cf., M1867 cf. |
| *Nuculana* cf. *N. chehalisensis* (Weaver) | M1858 |
| *Nuculana* cf. *N. pernula* (Muller) | M6594 |
| *Pododesmus* (*Monia*) *macrochisma* (Deshayes) | M1850, M1866, M1869 |
| *Psephidia* cf. *P. lordi* (Baird) | M1846, M1861 |
| *Serripes groenlandicus* (Bruguiere) | M1849, M1861 |
| *Spisula* (*Mactromeris*) *albaria* (Conrad) | M6594 |
| *Spisula* cf. *S. voyi* (Gabb) | M1866 |
| *Yoldia* cf. *Y. limatula* (Say) | M1862 |
| ?Venerid | M6496 |
| **GASTROPODS** | |
| *Colus* sp. | M6495 |
| *Fusitriton oregonensis* (Redfield) | M1862 |
| *Natica* (*Cryptonatica*) *clausa* Broderip & Sowerby | M1846, M1848 |
| *Neptunea* aff. *N. decemcostata* (Say) | M1849 |
| *Oenopota* aff. *O. chiachiana* (Dall) | M1861 |
| *Oenopota* aff. *O. tenuissima* (Dall) | M1861 |
| *Thais lamellosa* (Gmelin) | M1869 |
| **BARNACLE** | |
| *Balanus* sp. | M1848, M1856 |
| **SCAPHOPOD** | |
| *Dentalium* sp. | M1853 |
| **BRACHIOPOD** | |
| *Hemithiris psittacea* (Gmelin) | M1866 |

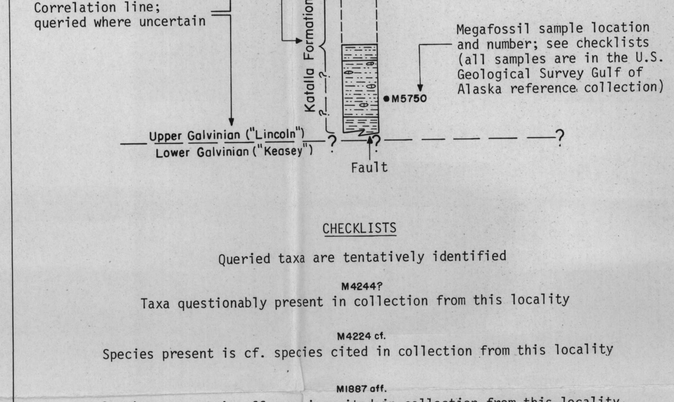
## 30 ICY POINT

| PELECYPODS | Localities |
|---|---|
| *Acila* cf. *A. empirensis* (Howe), *A. nakazimai* Otuka, *A. conradi* (Meek) | M1833, M1834, M1836, M1837, M1838, M1839 aff. |
| *Megayoldia* aff. *M. thraciaeformis* (Storer) | M1834 |
| *Patinopecten* (*Lituyapecten*) n. sp. | M1842, D187(T) |
| *Spisula* aff. *S. albaria* (Conrad), *S. coosense* Howe | M1833 |
| *Thyasira* aff. *T. bisecta* (Conrad) | M1836 |
| **GASTROPODS** | |
| *Bittium* aff. *B. bramkrampi* Durham | M1836 |
| *Fusinus* n. sp.? (may be *Liomesus sulculatus* Dall) | M1845 |
| *Natica* (*Cryptonatica*) aff. *N.* (*C.*) *clausa* Broderip & Sowerby | M1836 |
| *Neptunea* aff. *N. eurekaensis* (Martin) | M1835, M1836, M1838 |
| *Neptunea* aff. *N. lyrata* (Gmelin) | M1835 |
| **STARFISHES** | |
| *Scutellaster* n. sp.? | M1835 |
| Spatangoid fragments | M1833, M1835, M1839, M1840, M1841, M1843, M1845 |

## EXPLANATION

STRATIGRAPHIC SECTIONS

Lithologic symbols are standardized; column is blank where no rocks are exposed; column is dashed and symbols are not shown where thickness is estimated rather than measured




CHECKLISTS

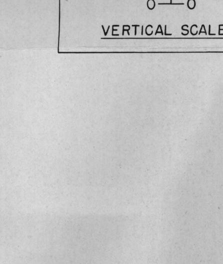
Queried taxa are tentatively identified

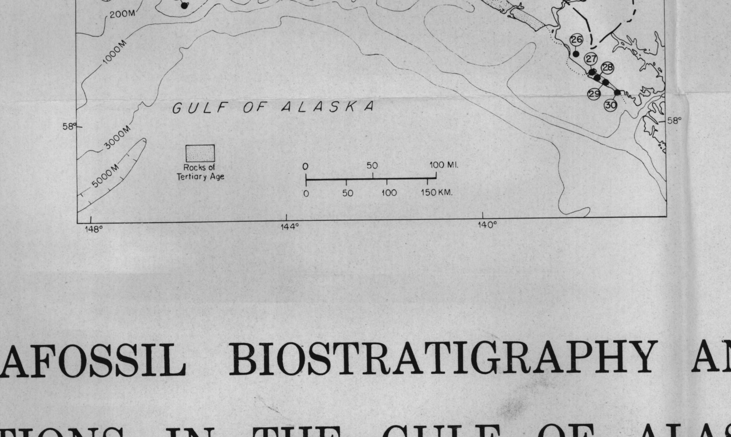
M4244?
Taxa questionably present in collection from this locality

M4224 cf.
Species present is cf. species cited in collection from this locality

M1887 aff.
Species present is aff. species cited in collection from this locality

Measured stratigraphic sections are numbered sequentially from west to east to correspond with their designations in Rau, Plafker, and Winkler (1977). Numbers 2, 12, 14-18, and 21-25 are not included, inasmuch as they were used to designate wells for which no megafossil information is available. (The wells are not included on these charts.)




# PRELIMINARY MEGAFOSSIL BIOSTRATIGRAPHY AND CORRELATION OF STRATIGRAPHIC SECTIONS IN THE GULF OF ALASKA TERTIARY PROVINCE

BY W. O. ADDICOTT, G. R. WINKLER, AND GEORGE PLAFKER

1978

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.