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Final Reports of Principal Investigators

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OUTER CONTINENTAL SHELF

ENVIRONMENTAL ASSESSMENT PROGRAM

FINAL REPORTS OF PRINCIPAL INVESTIGATORS

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Anchorage, Alaska

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Outer Continental Shelf Environmental Assessment Program

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VOLUME 47 NOVEMBER 1986

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by

Bruce F. Molnia

U.S. Geological Survey

Final Report
Outer Continental Shelf Environmental Assessment Program
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INTRODUCTION

The U.S. Geological Survey's Eastern Gulf of Alaska Environmental Hazards Project has been investigating the geological history and environmental hazards of the northeastern Gulf of Alaska since 1974. NOAA/BIM funding and ship time has supported this work, in part, since 1975. As 1981 was the last year of NOAA/BIM funding and no future investigations are anticipated, this report is being prepared to summarize the major findings related to environmental hazards in OCS lease area 55 that were determined during the life of the project. Therefore, the first objective of this final report is to delineate, describe, and illustrate the seafloor geology and geologic hazards in the eastern Gulf of Alaska from west of Yakutat Bay to Cross Sound Sea Valley that must be considered before any offshore petroleum-related development activities are undertaken.

The second object of this study is to describe in detail the geology of the Alsek Sediment Instability Study Area, an area offshore of the mouth of the Alsek River that contains gas pockmarks, craters, and other multiple examples of sediment instability. This area, originally designated as a possible pipeline corridor in BIM's EIS for lease sale 55 (1980), was the primary area of field data acquisition during the last field season of this project, May-June 1980. Lastly, a section is presented on depositional environments interpreted from ostracode type and abundance by Elisabeth Brouwers. Ms. Brouwers was funded by NOAA/BLM in the last year of this study to attempt to tie together and interpret previously collected sediment data and micro-paleontological studies.

An explanation of the plates in Appendix XVI follows the Ostracode section.

Reference

U.S. Department of the Interior, Bureau of Land Management, 1980. Final Environmental Impact Statement, Proposed Outer Continental Shelf Oil and Gas Lease Sale, Eastern Gulf of Alaska.

SECTION 1

SEAFLOOR GEOLOGY AND GEOLOGIC HAZARDS IN THE EASTERN GULF OF ALASKA

GEOLOGIC SETTING

The eastern Gulf of Alaska is an area of high seismicity and continuing tectonism because of its proximity to the intersection of the Pacific and North American crustal plates. To the north and west of this area, the Pacific plate is being subducted beneath the North American plate along the Aleutian Trench; to the east, a strike-slip motion persists between the two plates. The area of lease sale 55 lies in the transition zone between the two tectonic regimes (Plafker, 1971). The result is a complex series of faulted and folded structures west of Yakutat Sea Valley and simpler structures to the east (Bruns, 1979). Many of the Tertiary units have been truncated by erosion, perhaps during glacially controlled changes of sea level. Both seismic-reflection and sedimentologic evidence point to glaciation of the shelf during the Pleistocene (Carlson and others, 1977b; Molnia and Carlson, 1978). Glacially derived gravel, sand, and mud presently occur on the middle to outer edge of the shelf, whereas on the inner shelf the till-like materials are covered by a wedge-shaped Holocene-aged unit that grades from sand to clayey silt (Molnia and Carlson, 1980).

Three major sea valleys, incised into the continental shelf approximately perpendicular to shore are, from west to east: Yakutat, Alsek, and Cross Sound Sea Valleys (Fig. 1). Positive-relief features include Pamplona Ridge and Fairweather Ground. Each of these morphologic features has influenced the erosional or depositional processes and the resulting presence or absence of sediment on the continental shelf.

Onshore, the topography consists of a narrow coastal plain backed by the tectonically active glaciated Saint Elias Mountains. The main gaps in these young rugged mountains are valleys carved by seaward-flowing rivers and glaciers. The Alsek River, originating in Canada, annually carries a large load of sediment through the coastal mountains to the Gulf of Alaska. Malaspina Glacier, a massive piedmont glacier, extends to the shoreline and gives rise to numerous meltwater streams that carry significant amounts of suspended matter into the predominantly counterclockwise circulation of the Alaskan Gyre (Reimnitz and Carlson, (1975). Other smaller valley glaciers such as Grand Plateau, Fairweather, and La Perouse Glaciers are the sources of smaller but noteworthy meltwater streams that carry lesser quantities of sediment to the ocean. Two large bays (Icy and Yakutat), which were once the sites of large glaciers (Plafker and Miller, 1958), are incised into the coastline on either side of the Malaspina Glacier. Lituya Bay, 165 km southeast of Yakutat Bay, was also cut by a coalesced glacier that was formed by the glaciers presently discharging melt water and glacial flour at the head of the bay.

Strata, ranging from Paleocene well-indurated argillite and graywacke to Pleistocene semiconsolidated siltstone and conglomeratic mudstone (upper part of the Yakataga Fomation), crop out in the foothills, on the coastal plain, and on some of the islands and banks of the continental shelf (Plafker, 1967, 1971; Plafker and Addicott, 1976; Molnia and Carlson, 1978). Holocene unconsolidated mud, sand and gravel unconformably overlie the wave-, stream- and glacier-planed surface of Paleocene to Pleistocene rocks on the coastal plain as well as on the continental shelf (Plafker and others, 1975; Carlson and others, 1977b; Molnia and Carlson, 1980).

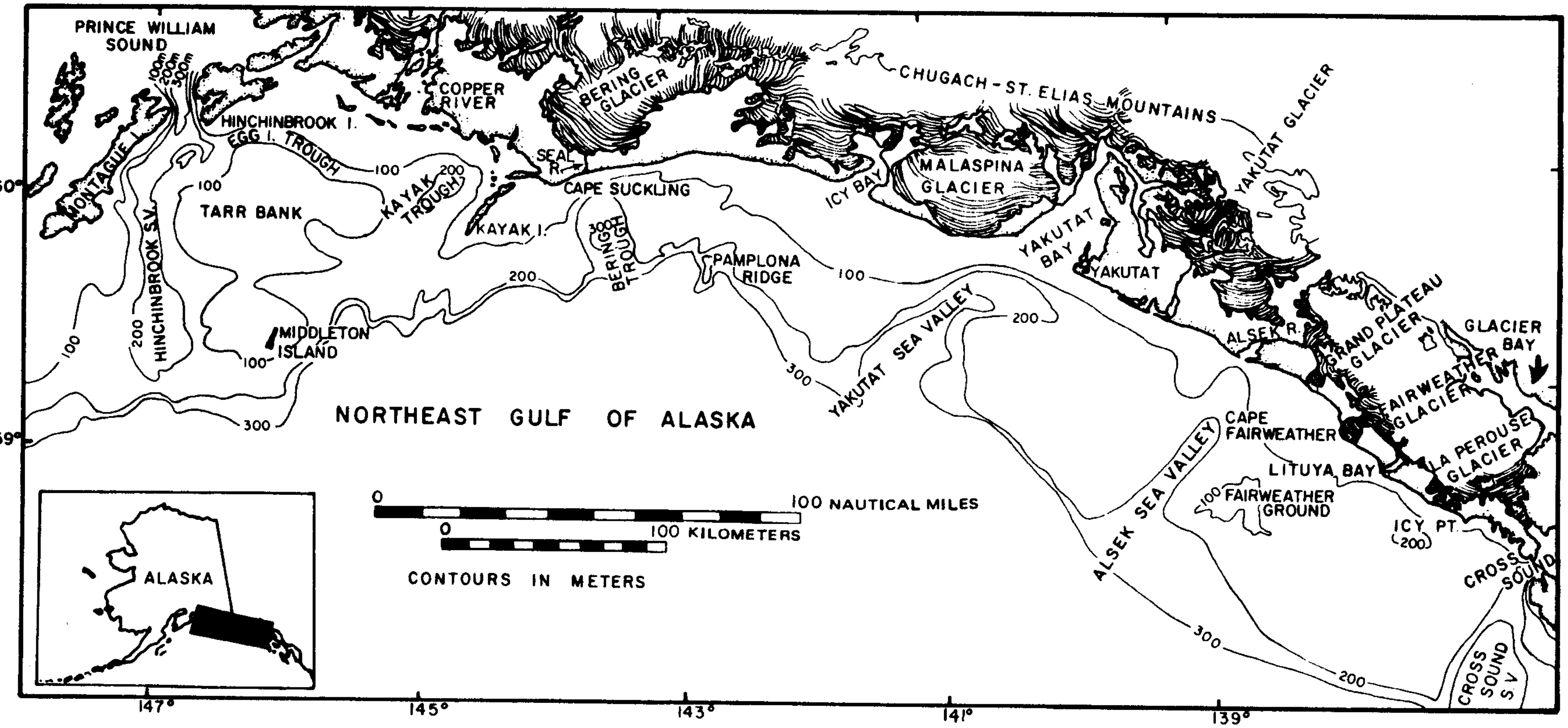

Figure l.–The study area in the northeastern Gulf of Alaska and the location of the major geographical features described in the text.

During the Pleistocene, the continental shelf was repeatedly covered by ice sheets that extended at least to the shelf break (Molnia and Sangrey, 1979). Although no precise date for the last deglaciation of the shelf has been determined, it appears that the outer shelf has been free of a glacial-ice cover for about the past 12,000 years (Molnia, Levy, and Carlson, 1980). Numerous Neoglacial advances of coastal glaciers have covered parts of the inner shelf.

The Alsek River, which drains an area of almost 30,000 km^2, is the largest tributary to the Gulf of Alaska between Yakutat and Cross Sound and appears to be this area's major source of modern sediment. In October 1979, the suspended-sediment load of the Alsek River exceeded 1 g/l.

The coastal area adjacent to the continental shelf is a triangular plain that narrows eastward. North of the plain are glacier-covered mountains that rise to a maximum elevation of about 5,000 m. La Perouse Glacier, approximately 50 km northwest of Cross Sound, is the only glacier in North America whose terminus reaches tidewater in the Pacific Ocean. Other major glaciers in this area are Fairweather Glacier, Grand Plateau Glacier, and Yakutat Glacier. Each of these glacier systems produces large volumes of sediment that is transported by streams, ice rafted, or dumped directly on the continental shelf. Glaciation has been the major sediment-producing process in this region since Miocene time (Molnia and Sangrey, 1979).

Onshore Geology

Onshore, a thick sequence (about 15,000 m) of marine and nonmarine Tertiary and Quaternary sedimentary rocks bound the study area. This sequence crops out in a nearly continuous belt as much as 100 km wide along the south margin of the Chugach and Saint Elias Mountains (Plafker, 1971). The sequence can be divided into a lower, well-indurated, intensely deformed unit made up of Paleocene and Eocene rocks and a varied sequence of middle Tertiary to Quaternary rocks that are less indurated and deformed (Plafker, 1971).

Middle Tertiary rocks are mainly marine mudstone and siltstone with some sandstone. Plafker (1971) described the local occurrence of interbedded tuff, agglomerate, pillow lava, and glauconitic sandstone, as well as alkaline plugs and dikes. Middle Tertiary formations include the Katalla Formation, parts of the Tokun and Poul Creek Formations, Cenotaph Volcanics, and Topsy Formation.

The upper Tertiary and Quaternary section is characterized by a thick sequence (more than 5,000 m) of marine and glacial-marine clastic rocks of Miocene to Holocene age, called the Yakataga Formation. It consists of fossiliferous, thick-bedded mudstone, muddy sandstone, conglomeratic sandy mudstone, and conglomerate (Plafker, 1971).

The Mesozoic Yakutat Group crops out landward of the coastal plain from the Alsek River to Malaspina Glacier and consists of graywacke, argillite, slate, and minor conglomerate (Plafker, 1967). It is mildly to moderately metamorphosed and complexly deformed.

The Chugach-Saint Elias Mountains' crystalline rocks include granitic rocks, schist, gabbro, gneiss, amphibolite, and marble. They are moderately to intensely metamorphosed and complexly deformed.

CLIMATOLOGY AND OCEANOGRAPHY

Weather in the Gulf of Alaska is influenced by two competing pressure systems, the Aleutian Low and the Pacific High (Dodimead and others, 1963; Royer, 1975). Severe westerly storms move through the region during the winter months, when the Aleutian Low predominates. The cyclonic rotation of these storms creates strong easterly winds in the Gulf of Alaska. During the summer the Pacific High becomes dominant, fair weather frequent, and the prevailing winds more southwesterly and more docile. The circulation of shelf waters as a result of wind stress causes strong downwelling during the winter and weak upwelling during the summer (Royer, 1975).

Water circulation in the Gulf of Alaska is forced by the westerly Subarctic Current, that turns north as it nears the North American continent and flows into the Gulf as the Alaskan Gyre. In response, the nearer shore Alaskan Stream flows counterclockwise through the Gulf of Alaska at a speed of 16-20 cm/sec (Dodimead and others, 1963). Large storm waves estimated to be at least 15 m in height (T.C. Royer, University of Alaska, oral commun., 1977), roll across the shelf throughout the winter. These waves undoubtedly disturb the bottom even at the shelf edge (200 m deep).

Strong bottom currents are believed to be active on highs such as Fairweather Ground and Pamplona Ridge. No current velocity data was obtained during the life of this study.

Tsunamis, generated either by regional or remote earthquakes, are frequent visitors to the Alaskan shelf. These long (400-km wavelength) waves devastate coastal structures (Plafker and others, 1969) and most certainly may have some effect on the surface sediment on the shelf.

DATA COLLECTION

The data incorporated in this report were collected on cruises on USGS and NOAA ships, and also include 4000 km of high-resolution seismic data obtained by Nekton, Inc. on contract to USGS' Conservation Division. The cruises, types of data, number of samples, and kilometers of high-resolution seismic-reflection lines are listed in Table 1. The cruises have utilized various means of navigation, including satellite, Loran A, Loran C, Decca Hi-Fix, Faydist, Motorola Mini-Ranger, and radar. The location accuracy ranges from 0.25 to 1.5 km and averages about 0.5 km

Table 1

Cruises in the eastern Gulf of Alaska in study area

Cruise	Date	Type of Data	Amount of Data
NOAA Ship SURVEYOR	4/75 - 5/75	High-resolution seismic	3200 km
NOAA Ship CROMWELL	6/75	Gravity cores and grab samples	125 samples
M/V GREEN (Contract)	6/75 - 8/75	High-resolution seismic	1200 km
NOAA Ship DISCOVERER	10/75	Grab samples	37 samples
R/V SEA SOUNDER	6/76	High-resolution seismic Grab samples	1100 km 59 samples
NOAA Ship DISCOVERER	10/76	Grab samples and cores	25 samples
R/V GROWLER	5/77	High-resolution seismic Cores and grab samples	375 km 12samples
R/V LEE	6/78	High-resolution seismic	350 km
R/V SEA SOUNDER	6/78 - 7/78	High-resolution seismic Cores and grab samples	1400 km 15 samples
NOAA Ship DISCOVERER	5/79	High-resolution seismic Grab samples	1630 km 47 samples
NEKTON Inc. (Contract)	7/79	High-resolution seismic	4000 km
NOAA Ship DISCOVERER	8/79	High-resolution seismic Cores and grab samples	2000 km 378 samples
R/V SEA SOUNDER	10/79	High-resolution seismic Cores and grab samples	1200 km 36 samples
NOAA Ship MILLER FREEMAN	3/80-4/80	Grab samples	113 samples
NOAA Ship DISCOVERER	5/80 - 6/80	High-resolution seismic Cores and grab samples	800 km 204 samples

TOTAL: 17,255 km of seismic data
1,051 samples

DESCRIPTION OF SURFACE SEDIMENTARY UNITS

Four surface sedimentary units were defined by Molnia and Carlson (1975, 1978) for the continental shelf of the northeastern Gulf of Alaska between Yakutat and Montague Island. The units were defined from their characteristics in seismic profile and from examination of seafloor sediment samples. The units originally defined were: Tertiary and Pleistocene stratified rocks; Quaternary glacial-marine sediment; Holocene end moraines; and Holocene sediment. Additional data and a better understanding of the role of glaciation as the dominant sedimentological process shaping this continental shelf region led Molnia and Sangrey (1979) to revise the definition of the Quaternary and Holocene units.

Their revised units, which are used in extending the mapping of the stratigraphy to the shelf east of Yakutat are: (1) Tertiary and Pleistocene stratified rocks; (2) Quaternary till, outwash, and glacial-marine deposits; (3) Holocene end moraines; and (4) Holocene glacial-marine sediment. Seismic and sedimentologic characteristics of the four units are presented in Table 2.

Table 2. Surface sedimentary units on the continental shelf of the northeastern Gulf of Alaska

Unit	Appearance in Seismic Reflection Profiles	Description
Tertiary and Pleistocene sedimentary rocks	Well-developed reflectors comprising folded, faulted and truncated lithified sedimentary strata	Semi- to well-indurated pebbly and sandy mudstone, siltstone, and sandstone
Quaternary till, outwash, and glacial-marine deposits.	Very irregular, discontinuous contorted and angular reflectors. Stratified in places, but rarely extending more than a few hundred meters.	Olive to gray pebbly mud, sandy pebbly mud, and shelly mud
Holocene end moraines	Highly variable reflectors; some stratified but generally discontinuous, high-angle reflectors. Very irregular surface morphology with relief of as much as 100 m	Olive to gray, unsorted, unstratified, heterogeneous mixture of clay, silt, sand and gravel
Holocene glacial-marine sediment	Relatively horizontal and parallel, continuous reflectors except where disrupted by slumping and other types of sediment failure	Olive to gray, underconsolidated clayey silt and silty clay; fine sand in nearshore nearshore zone, interlayered sand mud units in transition zone

DISTRIBUTION OF THE FOUR SURFACE STRATIGRAPHIC UNITS

Figure 2 presents the distribution of the surface stratigraphic units on the entire northeastern Gulf of Alaska continental shelf from Montague Island to Cross Sound. In this section, however, only the newly mapped Yakutat to Cross Sound segment will be described. A detailed description of the distribution of the surface sedimentary units west of Yakutat can be found in Molnia and Carlson (1978).

Tertiary and Pleistocene Stratified Rocks - Stratified rocks crop out on the north wall of the Alsek Sea Valley, as hogback ridges, and in numerous pinnacles on Fairweather Ground, west of Cape Fairweather, southeast of Lituya Bay, and in a continuous nearshore and coastline belt that extends from west of Icy Point to Cross Sound. The Fairweather Ground is composed of highly folded strata with numerous linear trends on the sea floor. Holocene glacial-marine sediment collects in small basins and among the hogback ridges in the Fairweather Ground area. Nearshore strata from west of Icy Point to Cape Spencer are generally flat to slightly folded and show evidence of glacial erosion. The area of outcrop on the north wall of Alsek Sea Valley consists of glacially eroded stratified rock. The valley wall slopes are 30° or more. The steep slopes may be responsible for the sparse cover of Holocene glacial-marine sediment.

Quaternary Till, Outwash, and Glacial-Marine Deposits - This glacially derived unit covers much of the middle and outer continental shelf from Yakutat to Cross Sound. West of the Alsek River, the unit is exposed 25-35 km from shore. East of the Alsek, the distance from shore is less than 20 m. Between Yakutat and Lituya Bay, Quaternary till is molded into a series of moraines having heights of up to 12 m. A detailed, multi-system geophysical survey of the middle shelf in 1980 showed that moraines are present in an area of more than 2,500 km^2, where water depths range from 120 to 180 m. Post-depositional modification and sedimentation, and distance between survey lines make correlation of lobes observed on parallel survey lines impossible. Generally, the entire surface of this unit is a pebbly mud. Sandier glacial-fluvial and glacial-lacustrine deposits and coarse areas of sediment winnowing are also present. Sediment thicknesses range from a thin veneer covering older rocks near the shelf edge to more than 150 m (the limit of mini-sparker penetration), where deposits fill glacially scoured bedrock channels. This unit consists of both Pleistocene sediment deposited when the shelf was completely ice-covered and much younger sediment deposited on the inner shelf by Neoglacial advances during the past few years. Samples of this unit generally are overconsolidated and massive. Inner-shelf deposits of this unit are not exposed at the surface. Rather, they have been observed as subcrop on high-resolution seismic profiles.

Holocene End Moraines - Holocene end moraines deposited by Neoglacial advances during the past 1,000 years are present at the mouths of Lituya and Yakutat Bays and at the shoreline in front of Fairweather Glacier. The Lituya Bay and Fairweather Glacier moraines have not been studied in detail. The Yakutat Bay moraine consists of a series of hard, highly reflective ridges, many having more than 150 m of relief. Well-stratified Holocene glacial-marine sediment has accumulated in small basins between ridges. The width of the moraine

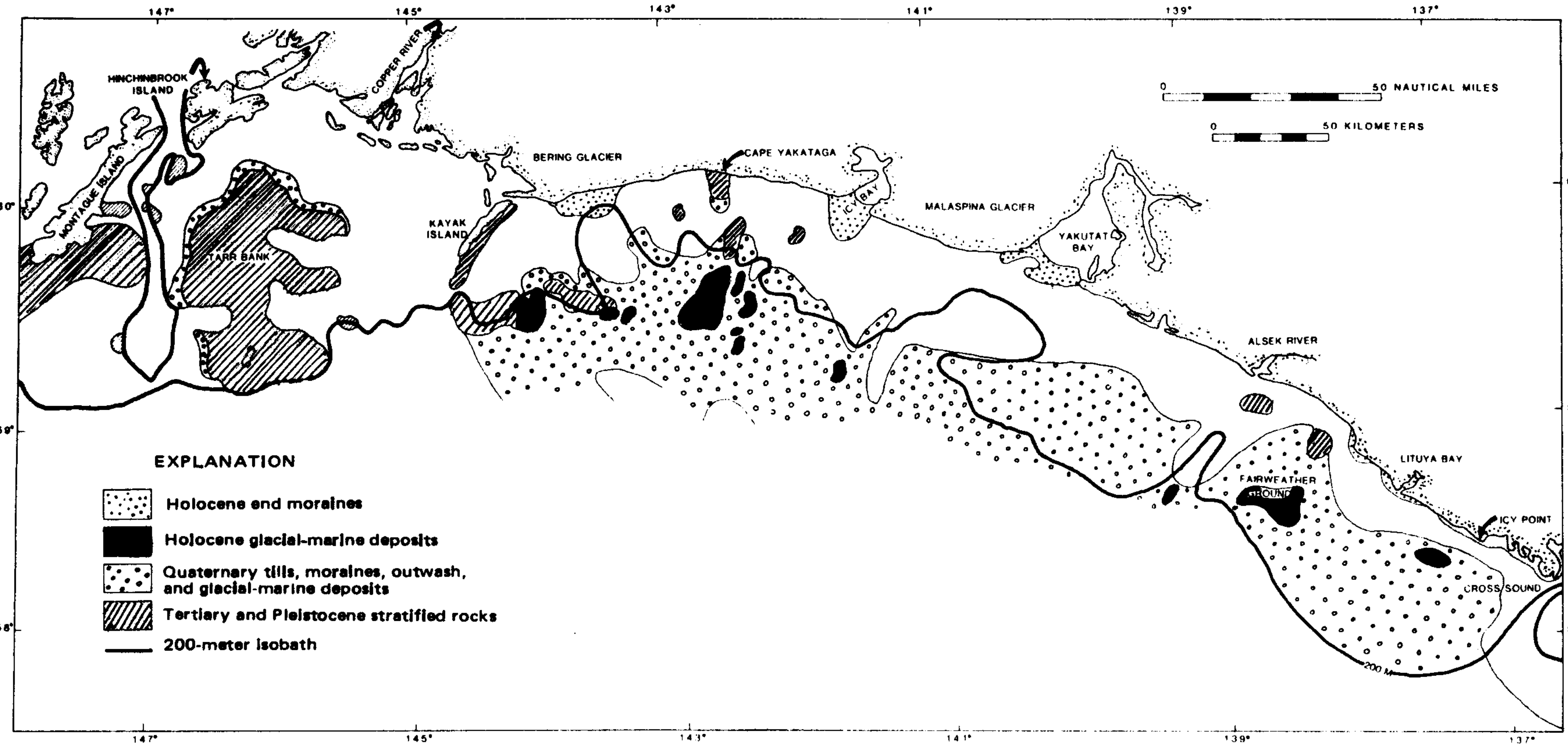

Figure 2.–Distribution of the four continental shelf sedimentary units between Cross Sound and Montague Island.

complex at the mouth of Yakutat Bay is more than 5 km. The Yakutat moraine was deposited between A.D. 900 and 1300 (Plafker and Miller, 1978).

Holocene Glacial-Marine Sediment - Holocene glacial-marine sediment occurs in a band that extends seaward from the shoreline and ranges in width from about 15 to 35 km. Sediment in the band is coarse-grained nearshore, and fine-grained (clayey silt or silty clay) offshore. Two lobes of this unit project down Yakutat and Alsek Sea Valleys. Sampling and seismic investigations show that this unit is well stratified and generally underconsolidated.

Thicknesses of this unit exceed 100 m in numerous areas adjacent to the Fairweather and Grand Plateau Glaciers and in parts of Alsek and Yakutat Sea Valleys. If the last major deglaciation of the shelf was about 12,000 years ago, then maximum Holocene sedimentation rates in this area exceed 10 m per 1,000 years.

SEAFLOOR HAZARDS (Plates I and II)

Four types of seafloor hazard have been mapped in the study area: faults, gas-charged sediment, buried channels, and submarine slides or sediment gravity flows (Fig. 3). These hazards were identified on high-resolution seismic-reflection records made with 3.5-kHz, 400-800-J minisparker or uniboom and supplemented with medium resolution sparker (20-80 J) systems. Seafloor samples in the areas of potential hazards were collected with cores (gravity, dart, vibra) and grab samplers. These data have provided sediment distribution and stratigraphic relations that are reported in detail by Carlson and others (1977) and Molnia and Carlson (1978, 1980). (See Appendix XVI, Plates I and II, for maps of these seafloor hazards.)

SURFACE AND NEAR-SURFACE FAULTS

The faults discussed in this paper are those that offset the sea floor or cut strata in the upper few tens of meters of the substrate. The near-surface faults are probably related to development of deeper structures on the continental margin, as shown by Bruns (1979), and at least several of these faults appear to relate directly to the northwestward convergence between the Pacific and North American Plates (Lahr and Plafker, 1980).

Near-surface faults are located in four parts of this eastern Gulf of Alaska region: the Pamplona zone, the Fairweather Ground shelf-edge structural high, the shelf edge near Alsek Sea Valley, and the seaward extension of the Fairweather fault system that trends southeast from Palma Bay (Fig. 3).

The Pamplona zone marks the boundary between the structurally simple Yakutat segment of the continental margin and the more complexly folded and faulted Yakataga margin to the west (Bruns, 1979). This zone extends across the shelf and the slope from Icy Bay toward the prominent north-trending Pamplona Ridge. Pamplona Ridge, a large horst-like structure bounded by north-northeast-trending reverse faults, forms part of a zone of structural uplift that has been mapped to the base of the continental slope. North of Pamplona Ridge, numerous near-surface faults trend north to northeast,

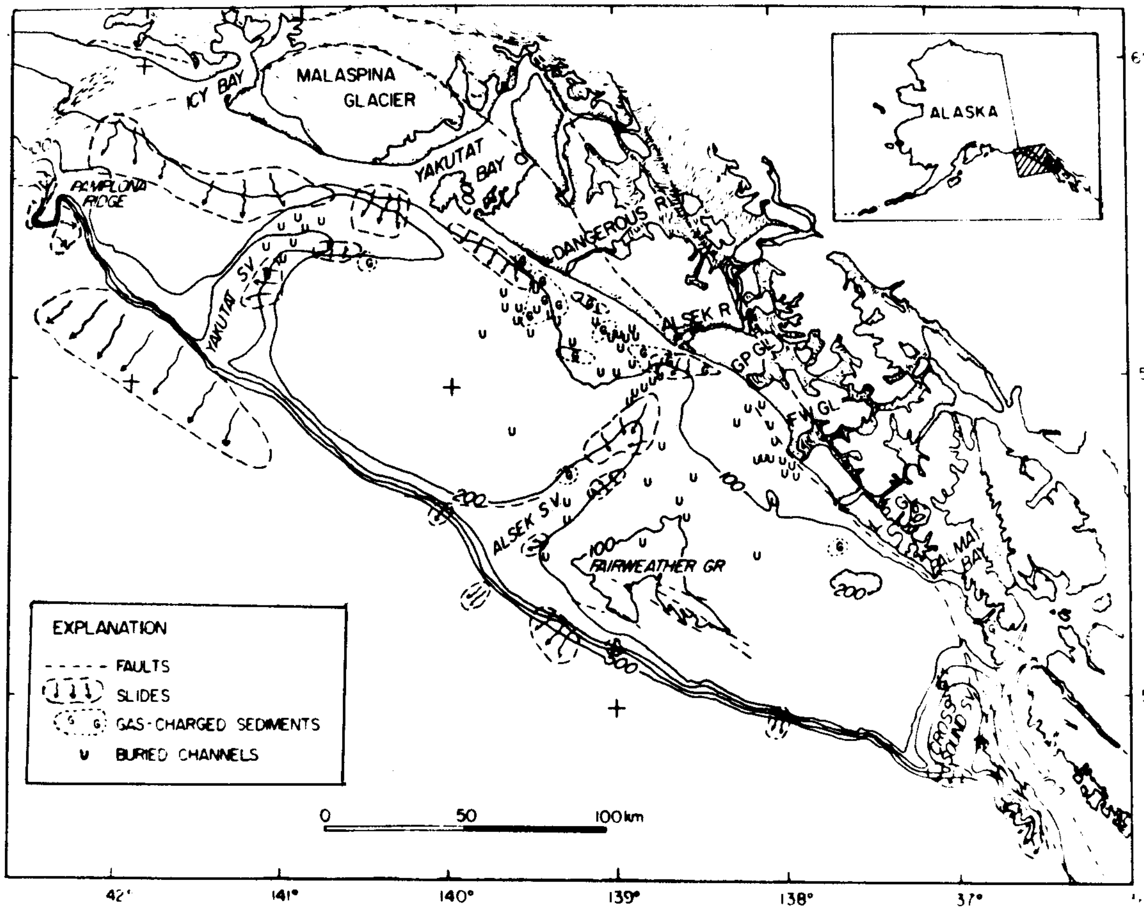

Figure 3. Distribution of the major geohazards of the northeastern Gulf of Alaska between Cross Sound and Pamplona Ridge.

parallel to the major structural trends of the Yakataga shelf that were the targets of recent exploration activities. The longest of these landward dipping reverse faults have been traced for about 30 km (Fig. 3) (Bruns, 1979). Many of these faults are covered by 5 to 10 m of Holocene sediment. However, at least one high-resolution profile shows continuation of a fault upward into the Holocene sediment, but not rupturing the surface. Numerous epicenters of modern earthquakes plot along the Pamplona zone, thus documenting the active nature of these faults (Lahr and others, 1980).

Fairweather Ground is a topographic and structural high about 2100 km^2 in area, located on the outer shelf east of the Alsek Sea Valley (Fig. 1). This high is composed of pre-Tertiary rocks similar to the Yakutat Group on the mainland (Plafker and others, 1978b). Bruns (1979) suggested that steeply dipping seismic reflectors within adjacent rocks of late Yakataga age which flank the high indicate significant uplift during late Cenozoic time of this pre-Tertiary outcrop. Bruns' conclusion is reinforced by the presence of steep scarps with relief of up to 60 m commonly occurring where the rugged pre-Tertiary rocks crop out on the sea floor. These scarps, possibly fault related, trend nearly parallel to the continental slope and have been mapped discontinuously over a total distance of about 60 km (Fig. 3). The alignments of these scarps suggest at least four individual traces along this Fairweather Ground zone. The irregularity of the outcrops and the wide spacing of seismic lines (approximately 10 km) prevent continuous tracing of the possible fault trends.

A solitary fault without surface expression has been mapped at the shelf edge west of Alsek Sea Valley (Fig. 3). No connection is evident between this fault and the multiple traces east of the sea valley. This fault extends in a nearly east-west curvilinear trend for a distance of about 40 km from the upper slope into Alsek Sea Valley. The fault approximately parallels the northwestern wall of the outer one-third of the valley. Motion on this probable reverse fault is north- or landward-side up. Although the recency of this Alsek Sea Valley fault is not known, indications of active seismicity in this area south of Yakutat Bay can readily be seen by the presence of epicenters for 49 small earthquakes of magnitude 1 - 4.4 which occurred between 1974 and 1978.

The seismically active Fairweather fault borders the northeast part of the study area (Fig. 3). This major right-lateral strike-slip fault which has been mapped onshore from Yakutat Bay to the shoreline of Palma Bay (Plafker, 1967; Plafker and others, 1978a) was first mapped in the offshore in 1975 (Molnia and others, 1978). During the summer of 1978, about 1500 km of seismic lines were collected across the shelf southeast of Palma Bay to trace the offshore extension of the Fairweather fault (Carlson and others, 1979). These seismic lines show evidence for two fault traces (Fig. 3). On lines closest to Palma Bay, the eastern fault trace, which is less well defined than the western, appears to trend directly into the Fairweather fault. The trace west of Palma Bay seems to align with a fault that has been inferred but never documented, on the bases of structural features along the shore, to lie just offshore along the coastline at least as far north as Grand Plateau Glacier (Plafker, 1967; Bruns, 1979). This inferred location of the northwestward extension of the western trace has been crossed by only two seismic-reflection lines because of its proximity to the coastline. Poor record quality, largely because of the shallow-water multiples, has prevented identification of this inferred fault. An abrupt 25° change of strike occurs between the two fault traces near Palma Bay. The separation between these two subparallel fault traces ranges from 6 km on the seismic line about 1 km from Palma Bay, to about 12 km off southern Chichagof Island. The two traces extend across the shelf in a south-southeasterly direction for about 225 km, where they appear to merge on the upper slope just southwest of Sitka (Carlson and others, 1979).

The complex fault traces consist of a number of splays or slivers. At several places where a fault bifurcates, the minor trace forms an arc and appears to rejoin the major trace. One exception to this pattern, however, is observed in the Fairweather fault extension about 20 km southeast of Palma Bay, where the Fairweather fault undergoes a major bifurcation in which one branch fault splits off at an angle of about 35°. This branch fault trends toward Lisianski Inlet, where it may connect with the Peril Strait fault (Loney and others, 1975).

The offshore faults vary greatly in appearance on profiles from line to line. Some records show well-defined scarps on the sea floor with reliefs of 25 to 40 m; other crossings of the fault traces exhibit no surface offset, but commonly show broken reflectors or abrupt changes in bedding reflector attitudes that are best explained by faulting. Of the two traces, the western trace is clearly the better defined and is considerably straighter than the eastern. The most unequivocal evidence for Holocene displacement, as manifested by seafloor displacements, is visible in this trace. In most crossings of the fault trace where seafloor offsets are well displayed, the sense of movement is northeast-side down, showing the same sense of vertical displacement as that which occurred along the onshore Fairweather fault during the 1958 Lituya Bay earthquake (Tocher, 1960). The more sinuous eastern trace may be an inactive or relatively less active strand of the fault system; several of the profiles, however, also showed some seafloor offset along this trace.

In addition to the evidence of recent movement along the Fairweather fault system seen on the seismic profiles, the epicenters of two recent large earthquakes coincide very closely with the mapped fault traces. The epicenter of the 1958 Lituya Bay M-7.9 earthquake (Sykes, 1971) plots just south of Palma Bay (Plafker and others, 1978a). The epicenter of the 1972 M-7.3 earthquake (Page, 1973), plots about 2 km west of the outermost fault trace; the focal region of the earthquake virtually coincides with the active trace mapped by Carlson and others (1979), which extends beyond the margin of the study area.

SEAFLOOR INSTABILITY

Three types of potential seafloor hazards involving instability of sediment are present on the continental margin in the eastern Gulf of Alaska: gas-charged sediment, submarine slides and flows, and buried channels. All three hazards are most prevalent in areas seaward of those rivers or streams that carry large quantities of glacially derived sediment to the gulf, or seaward of the glaciers that at one time crossed the shelf.

GAS-CHARGED SEDIMENT

Six areas of gas-charged sediment have been identified in the northeastern Gulf of Alaska between Yakutat Bay and Cross Sound: (1) on the southeast flank of Yakutat Sea Valley, (2) nearshore between Dangerous and Alsek Rivers, (3) on the west flank of Alsek Sea Valley, (4) southeast of Lituya Bay, (5) on the northwest wall of Cross Sound Sea Valley, and (6) southeast of Palma Bay (Fig. 3).

Five of the 6 gas-charged areas are small, covering 10 km^2 or less. The single exception is a nearshore area between the Dangerous area and the area east of the Alsek River, encompassing over 200 km^2. This is the only one of the 6 areas with a surface manifestation of gas. There, thousands of seafloor pockmarks and craters, ranging in diameter from smaller than 2 m to as large as 400 m, are present. These pockmarks and craters are actively forming today (Molnia, 1979) and often are the site of gas seepage to the water column. The eastern part of this region is the site of the Alsek River Sediment Instability Study Area (Section 2).

Seismic profiles of the 6 gas-charged areas show combinations of displaced reflectors (pull-ups and pull-downs), wipeouts and acoustic transparency in the top 50 m of sediment and occasional gas plumes in the water column. Gas analyzed from sediment cores collected in these gas-charged areas, and in gas-charged areas to the west, is predominantly biogenic methane (Molnia and others, 1978). The maximum gas concentration measured in 1979 from a core collected in the nearshore between the Dangerous and Alsek Rivers was 3×10^7 nl of methane per liter of wet sediment, a gas concentration 3 to 4 orders of magnitude greater than background. Similar high concentrations were measured in gas-charged sediment west of the study area (Molnia and others, 1978).

In each of the 6 areas, gas-charged sediment is present in the upper part of a thick Holocene sedimentary section. No evidence of leakage from deeper pre-Holocene sources is visible on the high-resolution profiles. This observation, as well as the biogenic nature of the gas, suggests that bacterial breakdown of organic material deposited in the rapidly accumulating Holocene sediment may be the source of the gas.

Gas-charged sediment has reduced strength and bearing capacity. As the gas concentration increases, sediment stability decreases until failure occurs. Such failure poses a potential hazard to seafloor exploitation because drilling into gas-charged sediment, cyclic loading, seismicity, or spontaneous over-pressurization may cause a sudden and catastrophic release of gas and pore water, and could lead to failure of pipelines and platforms in the immediate area.

Pockmarks and craters on seismic profiles from the nearshore area between the Dangerous and Alsek Rivers closely resemble these in other disturbed areas where sediment sliding is active. Only through site specific side-scan sonar surveys and sediment coring has the relation between the gas-charged sediment and the seafloor pockmarks and craters been established. This relation suggests that in other areas where sediment sliding is active, gas in the sediment may be a major cause for this sediment instability.

SUBMARINE SLIDES

Submarine slides and sediment gravity flows have been found in three general areas in this section of the Gulf of Alaska: in nearshore zones, especially off the mouths of rivers, on the walls of sea valleys, and along the continental slope (Fig.3).

The largest slide (1080 km^2) on the shelf in the study area is located seaward of Icy Bay and the Malaspina Glacier. Here a process of progressive slumping of underconsolidated Holocene clayey silt is taking place in water depths of 70 to 160 m on a slope of less than 0.5°. The slump structures are about 0.5 km long and have relief of 2 to 5 m. The slip surfaces extend to a depth beneath the sea floor of 15 to 40 m, and so the volume of the entire Icy Bay-Malaspina slump is about 32 km^3. This active landward-growing slump may be triggered by prolonged ground shaking resulting from the frequent earthquakes in the nearby Pamplona Ridge zone (Carlson, 1978).

Four other, smaller areas of mass transport have been mapped in the nearshore zone (Fig. 3) all in water shallower than 100 m. The combined area of all four is less than that of the Icy Bay-Malaspina slump. One slide southwest of Yakutat Bay begins on the north wall of Yakutat Sea Valley and extends across most of the valley floor. Ths slide, which covers an area of about 350 km^2 and incorporates the upper few meters of clayey silt, appears to fit into Varnes' (1978) classification as a mudflow that failed due to lateral spreading. A second slide, which begins 4 km seaward of the coastline between Yakutat Bay and Dangerous River, is elongate, about 40 km long, and about 260 km^2 in area. The gradient of the upper part of the slide is about 1° and decreases to about 0.5° at the seaward edge of the slide. High-resolution profiles across the middle of this slide mass are characterized by a series of steplike surfaces with a tread length of about 100 m and a riser height of 3 to 4 m. Apparent backward rotation of these blocks indicates a true rotational slump movement. The effective depth of the rupture surfaces of these slump blocks is about 10 m, so the volume of slumped material is nearly 3 km^3. The third and smallest of the slide masses (60 km^2 in area), located southeast of the Dangerous River, begins about 2 km offshore in water shallower than 20 m. This area of seafloor instability and also the fourth nearshore-slide area seaward of the Alsek River are both associated with gas-charged sediment. It is likely that the gas in the sediment has resulted in high pore pressures, thus contributing to the low strength of the sediment that may fail when agitated by the pounding of storm waves, or from ground shaking during earthquakes. The 150-km^2 area of mass transport just seaward of the mouth of the Alsek River begins in sand and sandy mud less than 2 km offshore in about 25 m of water. This debris flow that has moved down the headwall (approximately 1° slope) to the floor of Alsek Sea Valley has affected the sediment to a depth of 10 to 20 m.

In addition to the slides and flows in the nearshore zone that have entered the upper ends of Alsek and Yakutat Sea Valleys, six other slides have been mapped within the three sea valleys. Numerous areas of sliding and slumping have also been mapped on the continental slope adjacent to the mouths of these sea valleys (Fig. 3). The slides that have been found on the walls of the sea valleys all appear to be mud or debris flow types of mass transport affecting the upper 10 to 20 m of seafloor sediment similar to the debris flow at the head of Alsek Sea Valley.

Although most of the slides observed on the continental slope in the study area are immediately seaward of the sea valleys, sliding appears to be a widespread mechanism for transporting sediment down the continental slope in the entire Gulf of Alaska (Hampton and others, 1978). More than 80 percent of the U.S. Geological Survey's single-channel seismic lines along 1000 km of continental slope in the eastern Gulf of Alaska show evidence of some type of sliding or slumping (Carlson, 1979). Many of these slides are longer than 5 km and occur on slopes with gradients of 3° to 6°. The slides can range from discrete mudflows thinner than 50 m to complex zones of mass transport several hundred meters thick consisting of multiple slides, such as in the area southeast of Cross Sound Sea Valley. The large zone of submarine slides seaward of the mouth of Yakutat Sea Valley encompasses 3000 km^2 (Fig. 3). Profiles across this slide area show evidence of mass transport ranging from hummocky surface morphology and broken or disrupted internal reflectors, to downslope displacement of large blocks. The types of sediment contained in these slides, flows, and slumps are probably of two kinds and two sources. The sediment on the outer shelf is primarily pebbly mud deposited by glaciers that covered the shelf during parts of the Pleistocene. This sediment comprises many of the debris flows, slumps, and glide blocks. The clayey silt comprising the mudflows predominates in the middle shelf and fine sand predominates on the innermost shelf. Cores taken in the sea valleys contain fine sand and silt layers, displaced shallow-water organisms, and some land-derived plant debris indicating the movement of turbidity currents through the sea valleys. These turbidity currents probably carried some of the fine sand and mud onto the slope and contributed to the thick sedimentary sections.

BURIED CHANNELS

A more subtle form of gelogic hazard than gas-charged sediment or submarine slides is the buried channel. The presence of a buried channel often means facies variations between the channel fill and adjacent sediment creating conditions for differential settling and, if self-sorted sand and gravel are present in the fill, pathways for fluid migraton. These features which are considered hazards in the North Sea (Fannin, 1979) should also be considered in the Gulf of Alaska.

Buried channels have been identified in the area between Yakutat Sea Valley and Lituya Bay (Fig. 3). Most of these buried channels are concentrated in three nearshore locations, off the Dangerous and Alsek Rivers and seaward of the Fairweather Glacier. Other buried channels have been identified in Yakutat and Alsek Sea Valleys and on the middle shelf seaward of Fairweather Glacier. No attempt has been made to trace or connect the channels, but the buried channels within Yakutat Sea Valley evidently are connected, as are those in the upper part of Alsek Sea Valley. These buried channels range in size from less than 0.5 km wide and 25 m deep to more than 2 km wide and over 100 m deep and most appear to have been cut into Pleistocene and older glacial sediment. As the glaciers retreated, a large number of meltwater streams flowed across the shelf. Some buried channels show evidence of scour and fill, and several larger channels have small channels nested within them.

In addition to the buried channels marked on Figure 3, the three sea valleys are presently being filled with Holocene sediment (Carlson and others, 1977a; Molnia and Carlson, 1980). This sea valley fill also could create differential settlement problems and must be carefully analyzed before any seafloor structures such as pipelines are built across the fill.

CONCLUSIONS

Seafloor hazards identified within and around OCS lease-sale area 55 include faults, gas-charged sediment, submarine slides and buried channels. These hazards must be carefully delineated and understood before drilling and other seafloor operations related to exploration and production, such as pipeline emplacement, can be carried out safely. Surface and nearsurface faults showing various degrees of activity occur in the Pamplona Ridge-Icy Bay zone, on the shelf-edge structural high on both sides of the Alsek Sea Valley, and along the seaward extension of the Fairweather Fault system southeast from Palma Bay. The nearshore zone between Yakutat Bay and Fairweather Glacier contains three types of hazards that result in seafloor instablity: gas-charged sediment, buried channels, and submarine slides. Slides and slumps also are prevalent along the edges of the sea valleys and appear to be virtually everywhere on the continental slope in the eastern Gulf of Alaska. Because of the highly unstable nature of the slope deposits, especially in the tectonically active eastern Gulf of Alaska, this slope area constitutes the greatest challenge to successful resource development.

REFERENCES

Bruns, T.R., 1979, Late Cenozoic structure of the continental margin, northern Gulf of Alaska, in Sisson, A., ed., The relationship of plate tectonics to Alaskan geology and resources: Alaska Geological Society 1977 Symposium Proceedings, p. I 1-I 30.

Carlson, P.R., 1978, Holocene slump on continental shelf off Malaspina Galcier, Gulf of Alaska: American Association of Petroleum Geologists Bulletin, v. 62, p. 2412-2426.

Carlson, P.R., 1979, Extensive sliding of continental slope sediments, eastern Gulf of Alaska: Geological Society of America Abstracts with Programs, v. 11, p. 398.

Carlson, P.R., Bruns, T.R., Molnia, B. F., and Hampson, J.E., Jr., 1977a, Submarine valleys on the continental shelf, northeastern Gulf of Alaska: Geological Society of America Abstracts with Programs, v. 9, p. 921.

Carlson, P.R., Molnia, B.F., Kittleson, S.C., and Hampson, J.E., Jr., 1977b, Distribution of bottom sediments on the continental shelf, northern Gulf of Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-876, 2 sheets and 13 p.

Carlson, P.R., Plafker, G., Bruns, T.R., and Levy, W.P., 1979, Seaward extension of the Fairweather fault, in Johnson, K.M., and Williams, J.R., eds., The United States Geological Survey in Alaska: Accomplishments during 1978: U.S. Geological Survey Circular 804-B, p. B135-B139.

Dodimead, A.J., Favorite, F., and Hirano, T., 1963, Review of oceanography of the subarctic Pacific region, in Salmon of the North Pacific Ocean: International North Pacific Fisheries Comm. Bull. 13, pt. 2, 195 p.

Fannin, N.G.T., 1979, The use of regional geological surveys in the North Sea and adjacent areas in the recognition of offshore hazards, in Proceedings, Offshore Site Investigation Conference, London, 1979, p. 1-25.

Hampton, M.A., Bouma, A.H., Carlson, P.R., Molnia, B.F., Clukey, E.C., and Sangrey, D.A., 1978, Quantitative study of slope instability in the Gulf of Alaska: 10th Offshore Technology Conference, Houston, Texas, 1978, Proceedings, v. 4, p. 2307-2318.

Lahr, J.C., and Plafker, G., 1980, Holocene Pacific-North American plate interacton in southern Alaska: Implications for the Yakataga seismic gap: Geology, v. 8, p. 483-486.

Lahr, J.C., Stephens, C.D., and Rogers, J., 1980, Earthquake activity and ground shaking in and along the eastern Gulf of Alaska: in Environmental Assessment of the Alaskan Continental Shelf: Environmental Research Laboratory, Boulder, Colorado, Quarterly Reports 9/79 - 12/79.

Loney, R.A., Brew, D.A., Muffler, L.J.P., and Pomeroy, J.S., 1975, Reconnaissance geology of Chichagof, Baranof, and Kruzof Islands, Southeastern Alaska: U.S. Geological Survey Professional Paper 792, 105 p.

Molnia, B.F., 1979, Origin of gas pockmarks and craters: Geological Society of America Abstracts with Programs, v. 11, p. 481-2.

Molnia, B.F., and Carlson, P.R., 1975, Surface sediment distribution, northern Gulf of Alaska: U.S. Geological Survey Open-File Report 75-505, 1 sheet.

Molnia, B.F., and Carlson, P.R., 1978, Surface sedimentary units of northern Gulf of Alaska continental shelf: American Association of Petroleum Geologists Bulletin, v. 62, p. 633-643.

Molnia, B.F., and Carlson, P.R., 1980, Quaternary sedimentary facies on the continental shelf of the northeastern Gulf of Alaska, in Field, M.E., Bouma, A., and Colburn, I., eds., Quaternary depositional environments of the U.S. Pacific continental margin: Society of Economic Paleontologists and Mineralogists Symposium no. 4, Pacific Section, Bakersfield 1980, p. 157-168.

Molnia, B.F., Carlson, P.R., Kvenvolden, K.A., 1978, Gas-charged sediment areas in the northern Gulf of Alaska: Geological Society of America Abstracts with Programs, v. 10, p. 458-459.

Molnia, B.F., Carlson, P.R., and Wright, L.H., 1978, Geophysical data from the 1975 cruise of the NOAA ship SURVEYOR, U.S. Geological Survey Open-File Report 78-209, 40 p., 4 plates.

Molnia, B.F., Levy, W.P., and Carlson, P.R., 1980, Map showing Holocene sedmentation rates in the northeastern Gulf of Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-1170, 1 sheet.

Molnia, B.F., and Sangrey, D.A., 1979, Glacially derived sediments in the northern Gulf of Alaska--Geology and engineering characteristics: Offshore Technology Conference, 11th Annual, Houston, Texas, April 30-May 3, 1979, Proceedings, v. 1, Paper 3433, p. 647-655.

Plafker, George, 1967, Geologic map of the Gulf of Alaska Tertiary Province, Alaska: U.S. Geological Survey Miscellaneous Investigations Map I-484, 1 sheet.

Plafker, G., 1971, Possible future petroleum resources of Pacific margin Tertiary basin, in Future petroleum provinces of North America: American Associaton of Petroleum Geologists Memoir 15, p. 120-135.

Plafker, G., and Addicott, W.O., 1976, Glaciomarine deposits of Miocene through Holocene age in the Yakataga formation along the Gulf of Alaska margin, in Miller, T.P., ed., Recent and ancient sedimentary environments in Alaska: Alaska Geological Society Symposium Proceedings, p. Q1-Q23.

Plafker, G., Bruns, T.R., and Page, R.A., 1975, Interim report on the petroleum resource potential and geologic hazards in the outer continental shelf of the Gulf of Alaska Tertiary province: U.S. Geological Survey Open-File Report 75-592, 74 p.

Plafker, G., Hudson, T., Bruns, T., and Rubin, M., 1978a, Late Quaternary offsets along the Fairweather Fault and crustal plate interactions in southern Alaska: Canadian Journal of Earth Science, v. 15, p. 805-816.

Plafker, G., Kachadoorian, R., Eckel, E.B., and Mayo, L.R., 1969, Effects of the earthquake of March 27, 1964, on various communities: U.S. Geological Survey Professional Paper 542-G, p. G1-G50.

Plafker, G., and Miller, D.J., 1978, Glacial features and surficial deposits of the Malaspina district, Alaska: U.S. Geological Survey Miscellaneous Geological Investigations, Map I-271, scale 1:125,000.

Plafker, G., Winkler, G.R., Hunt, S.J., Bartsch-Winkler, S., Conrad, W.J., and Quintero, P., 1978b, Outcrop samples from the continental slope in the eastern Gulf of Alaska, in Johnson, K.M., ed., The United States Geological Survey in Alaska: Accomplishments during 1977: U.S. Geological SurveyCircular 772-B, p. B97-B101.

Reimnitz, E., and Carlson, P.R., 1975, Circulation of nearshore surface water in the Gulf of Alaska, in Carlson, P.R., Conomos, T.J., Janda, R.J., and Peterson, D.H., Principal sources and dispersal patterns of suspended particulate matter in nearshore surface waters of the northeast Pacific Ocean: National Technical Information Service, ERTS Final Report E75-10266, 145 p.

Royer, T.C., 1975, Seasonal Variations of waters in the northern Gulf of Alaska: Deep-Sea Research, v. 22, p. 403-416.

Sykes, L.R., 1971,. Aftershock zones of great earthquakes, seismicity gaps, and earthquake prediction for Alaska and the Aleutians: Journal of Geophysical Research, v. 75, p. 8021-8041.

Toucher, D., 1960, The Alaska earthquake of July 10, 1958--movement on the Fairweather Fault and field investigation of southern epicentral region: Seismological Society of America Bulletin, v. 50, p. 267-292.

Varnes, D.J., 1978,. Slope movement types and processes, in Schuster, R.L., and Krizek, R.J., eds., Landslides, analysis and control: National Research Council, Transportation Research Board Special Report 176, p. 13-33.

SECTION 2

GEOLOGY OF THE ALSEK SEDIMENT INSTABILITY STUDY AREA

INTRODUCTION

In May and June 1980, a 20-km^2 seafloor area offshore of the mouth of the Alsek River that had been previously identified as containing pockmarks, slumps, and other related sediment-failure features (Molnia and others, 1978; Molnia, 1979) was mosaicked as part of a detailed multisystem investigation of the northeastern Gulf of Alaska continental shelf (Fig. 1 and Plate 4). The multisystem survey of the area was run at a 100-m line spacing utilizing Mini-Ranger for navigation, 3.5- and 12-kHz echo sounders, 400 to 800-J minisparker, and 5- to 25-in^3 airgun acoustic systems. In addition, a digital-recording and processing side-scan sonar system with slant-range correction was used to compile the 100-percent-overlap seafloor mosaic of the area. Sediment samples were collected by Van Veen grab samplers and small corers from within the study area. Uniboom seismic profiles were made between the study area and the coastline.

Description of the area. - A complete picture of the sea floor in the 10 x 2 km mosaicked area was made by assembling 21 speed-corrected, digitally processed side-scan sonar lines (Plate IV, Appendix XVI). Analysis of this mosaic and related bathymetric and seismic data has delineated four seafloor zones: (1) a northwest zone of minimal sediment disturbance characterized by isolated pockmarks and fields of ripple marks or featureless mud; (2) a northcentral zone of medium-density slumping with small slumps and pockmarks; (3) a southcentral zone of intensive and massive sediment disturbance characterized by blocky failures, pockmarks, areas of chaotic multiple scarps, large slumps, accumulation debris, and numerous flow lobes; and (4) an eastern area characterized by north-south sediment funnelling channels. Figure 2 is a schematic drawing of the area.

Zone 1 - The northwestern "undisturbed zone" is characterized by the presence of either broad expanses of sand covered by ripples with wavelengths of 1 - 5 m, or large featureless areas where the surface sediment is a cohesive mud. Isolated slumps and pockmarks are present but cover less than 10 percent of the zone. Ripple orientation suggests onshore/offshore sediment movement.

Sediment instability is characterized by in-situ collapse features without much evidence of translational motion. Isolated pocks and collapse depressions are generally less than 50 m in maximum dimension, with many being 10 m or less in size. Figures 3, 4, and 5 show typical characteristics of the "undisturbed" zone.

Zone 2 - The northcentral zone of small-sized, medium density slumping is characterized by many small slumps, slides, small collapse features, and a variety of types of flows. Most examples of sediment instability have well-defined boundaries and are not layered or superimposed, one slide or slump on top of another. Many areas are covered by an irregular, blocky surface, suggestive of differential in situ sediment volume reduction.

The largest features present are closed collapse depressions up to 300 m in maximum dimension, and elongate flows, also up to 300 m long. Most features, however, are much smaller, with maximum dimensions less than 50 m.

In the northwestern part of Zone 2 the relationship between sediment-failure features and the sand and mud blanket of Zone 1 is not clear. It

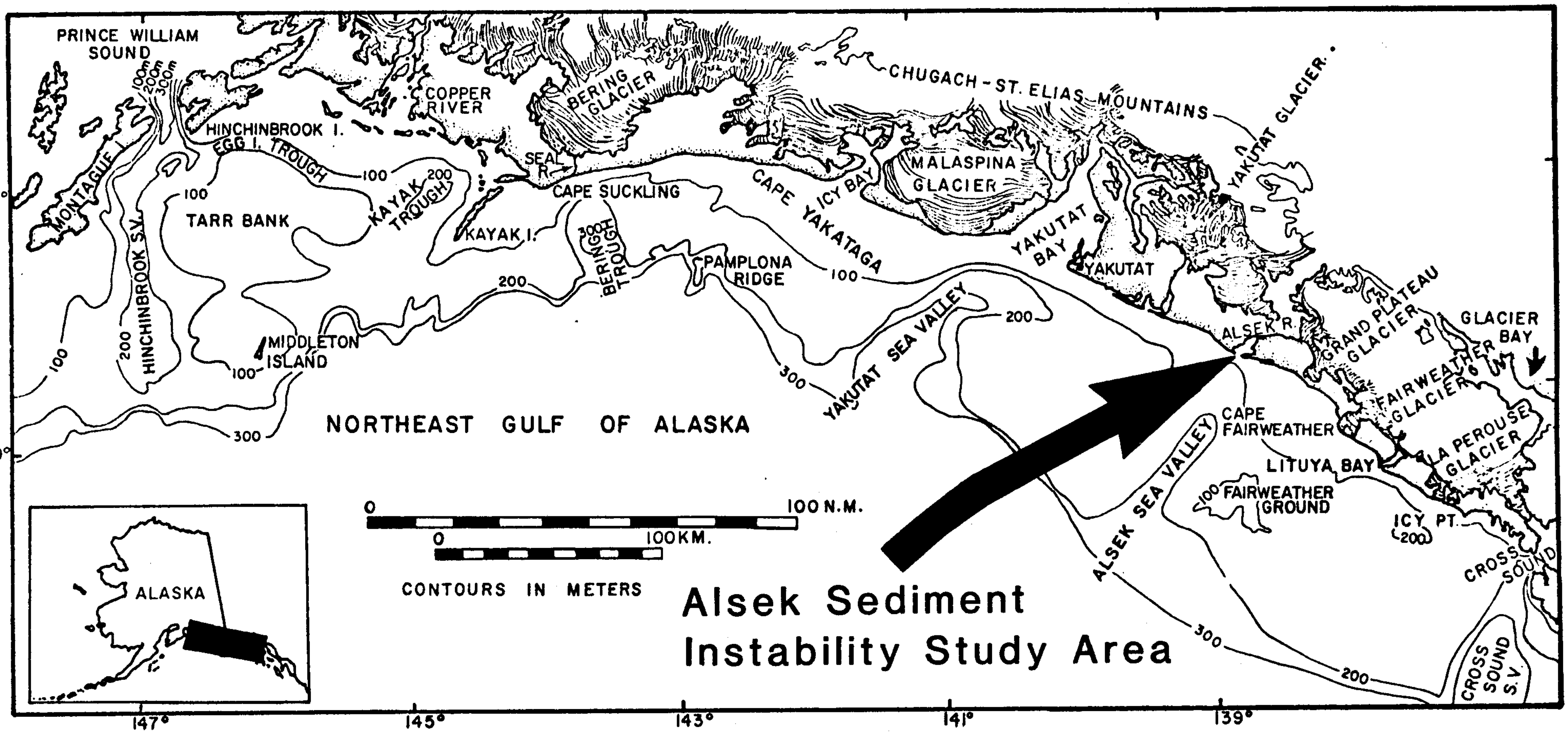

Figure 1. Location of the Alsek Sediment Instability Study Area in the northeastern Gulf of Alaska.

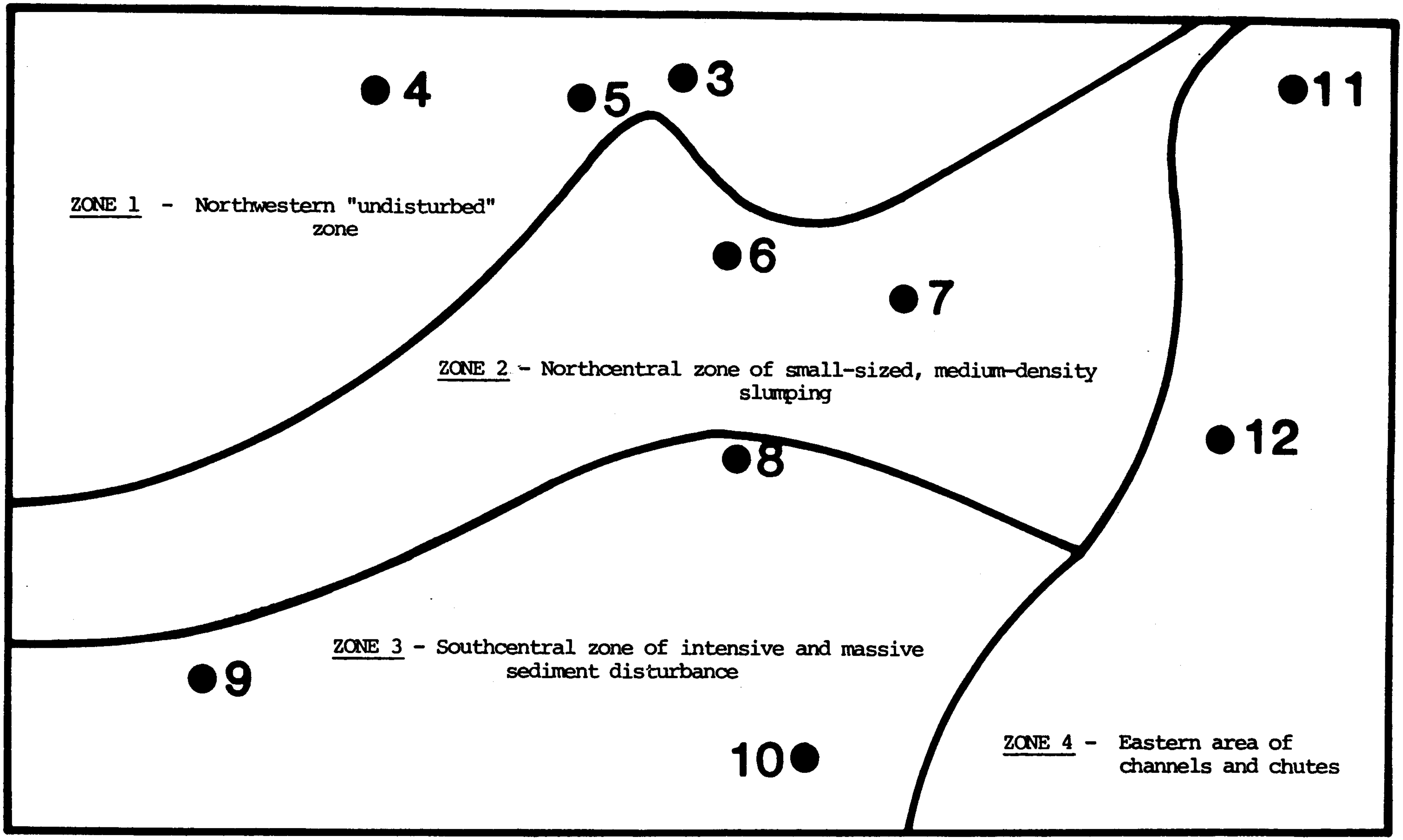

Figure 2. Schematic drawing of the Alsek Sediment Instability Study Area showing the four zones, each characterized by a different style of sediment instability. Numbers correspond to the locations of Figures in this section.

Figure 3. SONARGRAPH example of rippled-sand surface of the northwestern "undisturbed" zone. Note the few isolated collapse features. The upper profile shows mid-line bathymetry.

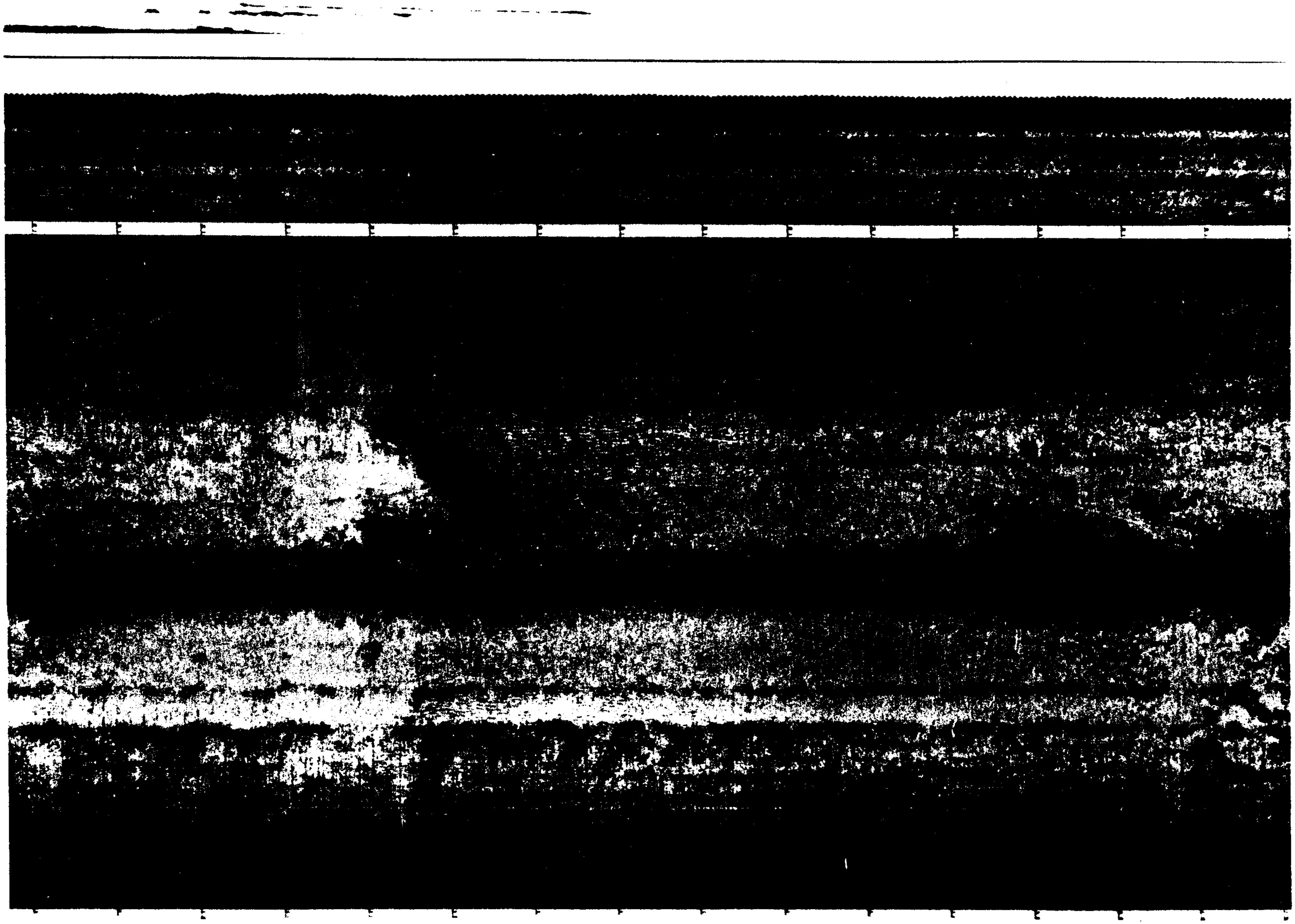

Figure 4. SONARGRAPH example of a flat, undisturbed section of the ripple-sand portion of the "undisturbed" zone.

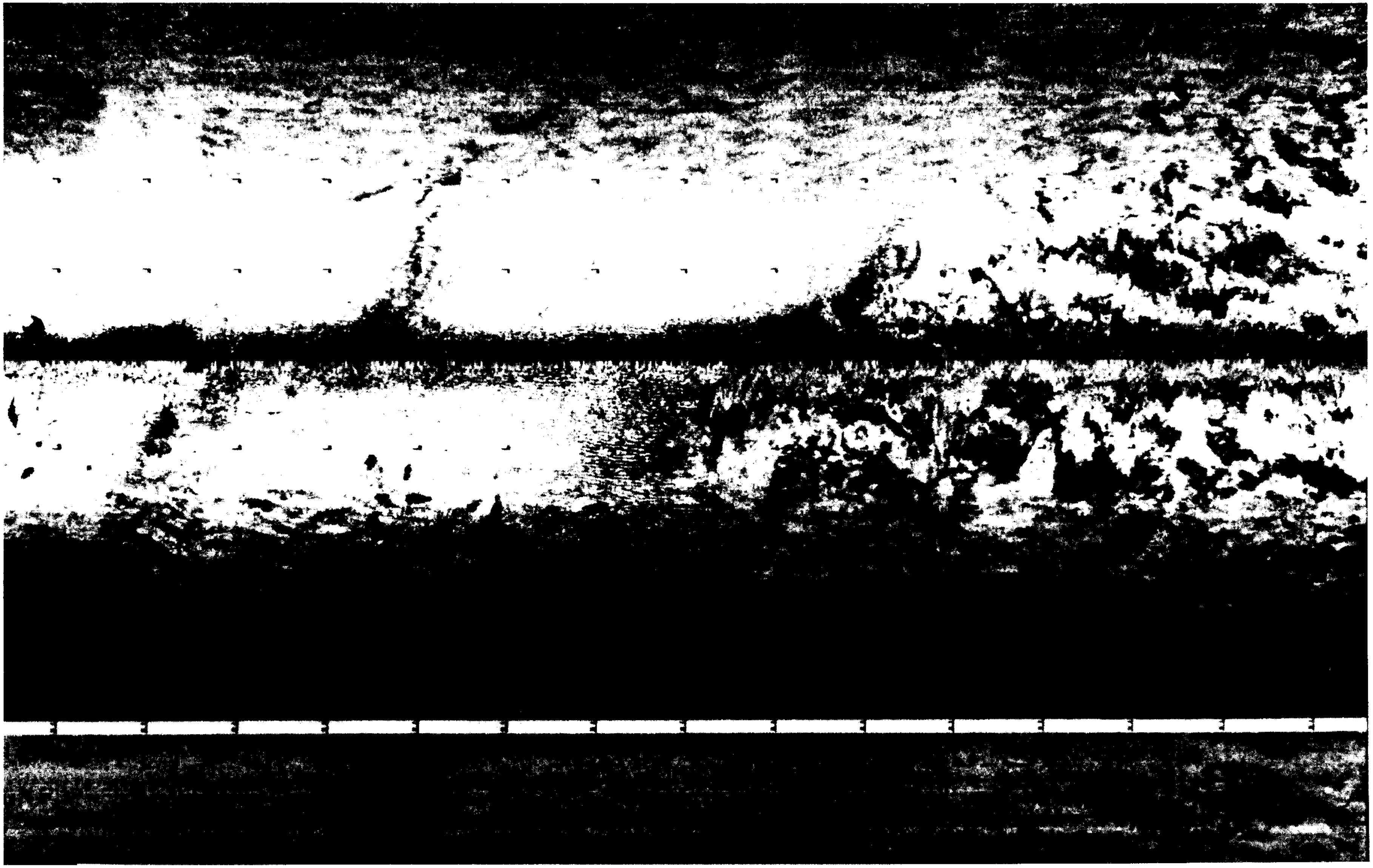

Figure 5. SONARGRAPH of ripples, sand bodies and featureless mud in the northwest "undisturbed" zone.

cannot be clearly determined whether Zone 2 features are expanding northward into Zone 1 or whether the mobile sediment blanket of Zone 1 is burying older craters, pockmarks, and collapse features of northern Zone 2. Examples of Zone 2 features are shown in Figures 6 and 7.

Zone 3 - The largest of the four zones, Zone 3 (the southcentral zone of intensive and massive sediment disturbance) is characterized by multiple generations of slides, slumps, flows, collapse features and other varieties of sediment instability. Features are extremely complex with multiple flow lobes coming from a variety of directions. The size of flows appears to increase at the southern limit of the area. Topography is complex with many areas of flows bounded by channels with well developed sand waves. Examples of Zone 3 features are shown in Figures 8, 9, and 10.

Zone 4 - The eastern area of channels and chutes occupies about 15 percent of the entire mosaic area. Here, generally north-south oriented, well-developed linear troughs, channels and chutes 3-6 m deep, up to 300-400 m wide, and as much as 1.5-1.8 km long, occupy more than half the area. The chutes serve as active channelways for the funnelling of currents and probably sediment. Many sets of trowel marks approach the chutes, disappear within the channel, and then continue on the far side of the chute.

Inter-channel areas are generally devoid of slides, slumps and other types of sediment-failure features. They do, however, have much higher surface reflectivity than channels and chutes. Examples of Zone 4 features are shown in Figures 11 and 12.

GEOTECHNICAL STUDIES IN THE AREA

In-Situ Tests.- In-situ cone penetration and vane shear tests were conducted with the Multi-purpose In-Situ Test System (MITS) leased from Woodward-Clyde Consultants. Two stations were occupied; one in the undisturbed rippled sand (Zone 1) and the other in an area of disturbance (Zone 3). Cone penetration tests in the rippled sand area indicate a layer of dense sand with a friction angle of about 38 degrees and a relative density of near 100 percent, extending from 1-3 m below the sea floor. This material is overlain by a 1-m-thick layer of weak material; generally loose sand or clayey silt. From 3-5 m below the surface a stratified zone exists that is apparently interbedded silts and sands. The sands have a relative density of about 80 percent and a friction angle of about 34 degrees. The silts are relatively dense and have a strength to overburden pressure ratio of around 1.

Vane and cone tests in the area of disturbance (Zone 3)indicate a relatively weak material, probably silt, that is interbedded with sands. The sands comprise 30-40 percent of the 6-m subbottom section that was tested and occur in beds ranging in thickness from 10-70 cm. The sand is apparently in a relatively loose state. The occurrence of sand decreases with depth with the lower 3 m being predominately silt. The silt appears normally- to slightly underconsolidated and has a strength to overburden pressure ratio of 0.5.

Index Property Tests.- Twelve gravity cores from the area of disturbance were tested for vane shearing strength, water content and Atterberg limits. The material tested was almost exclusively silt. Vane shear strengths ranged from 3-19 kPa with a slight tendency toward lower strength in the eastern part of

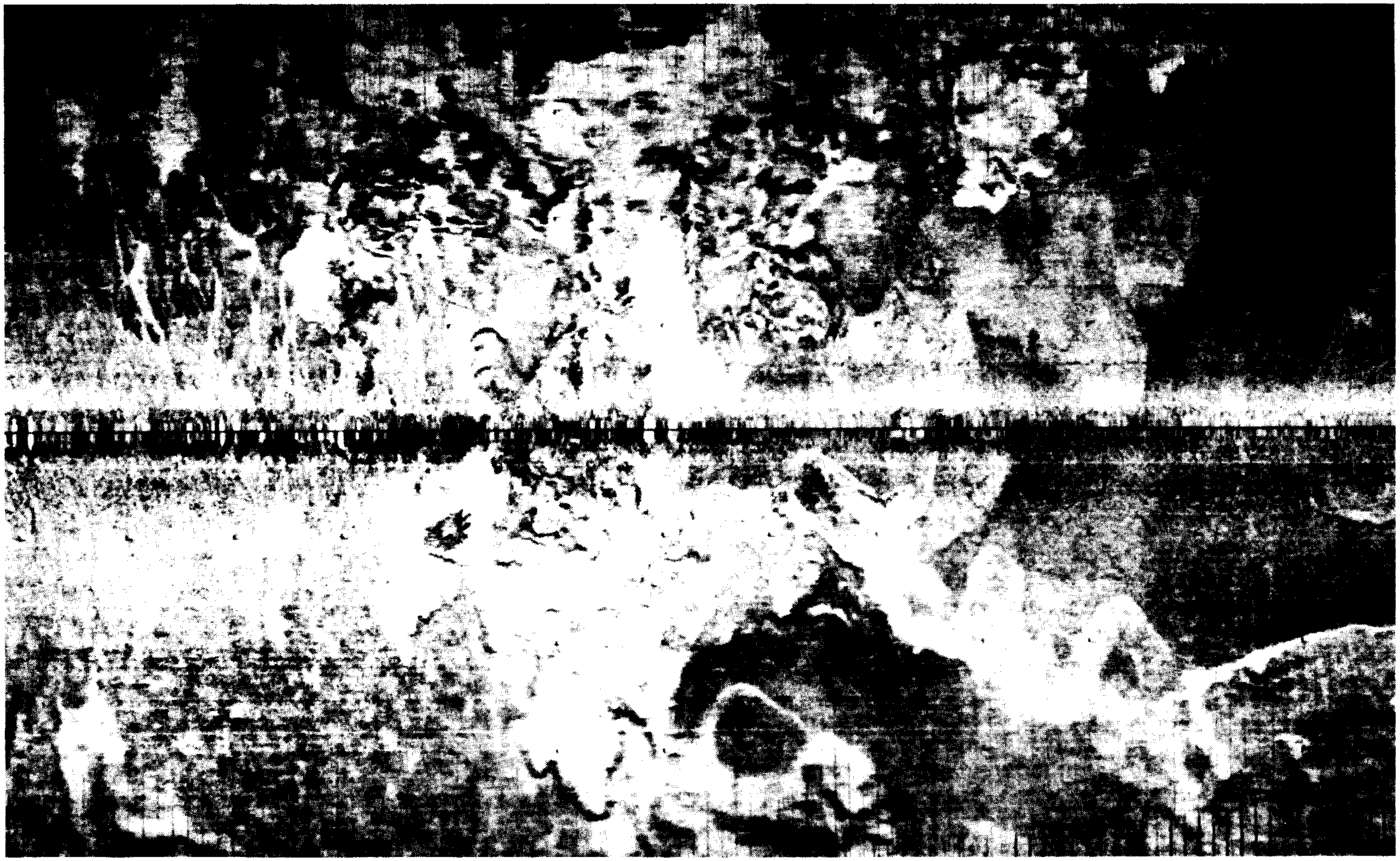

Figure 6. SONARGRAPH example of small collapse features, slides, and linear flows in the northcentral zone of small-sized, medium density slumping.

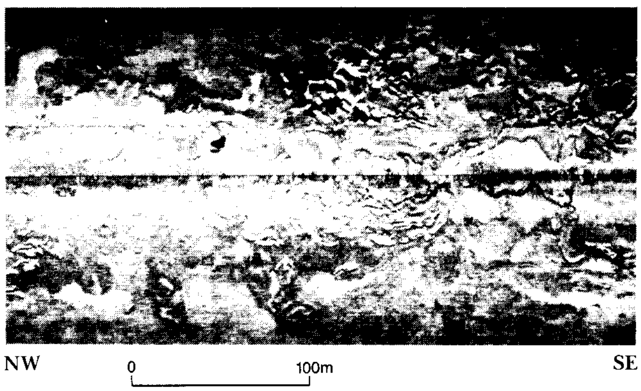

Figure 7. SONARGRAPH example of multiple collapse depressions, small slides, slumps and flows in the north-central zone of small-sized, medium-density slumping.

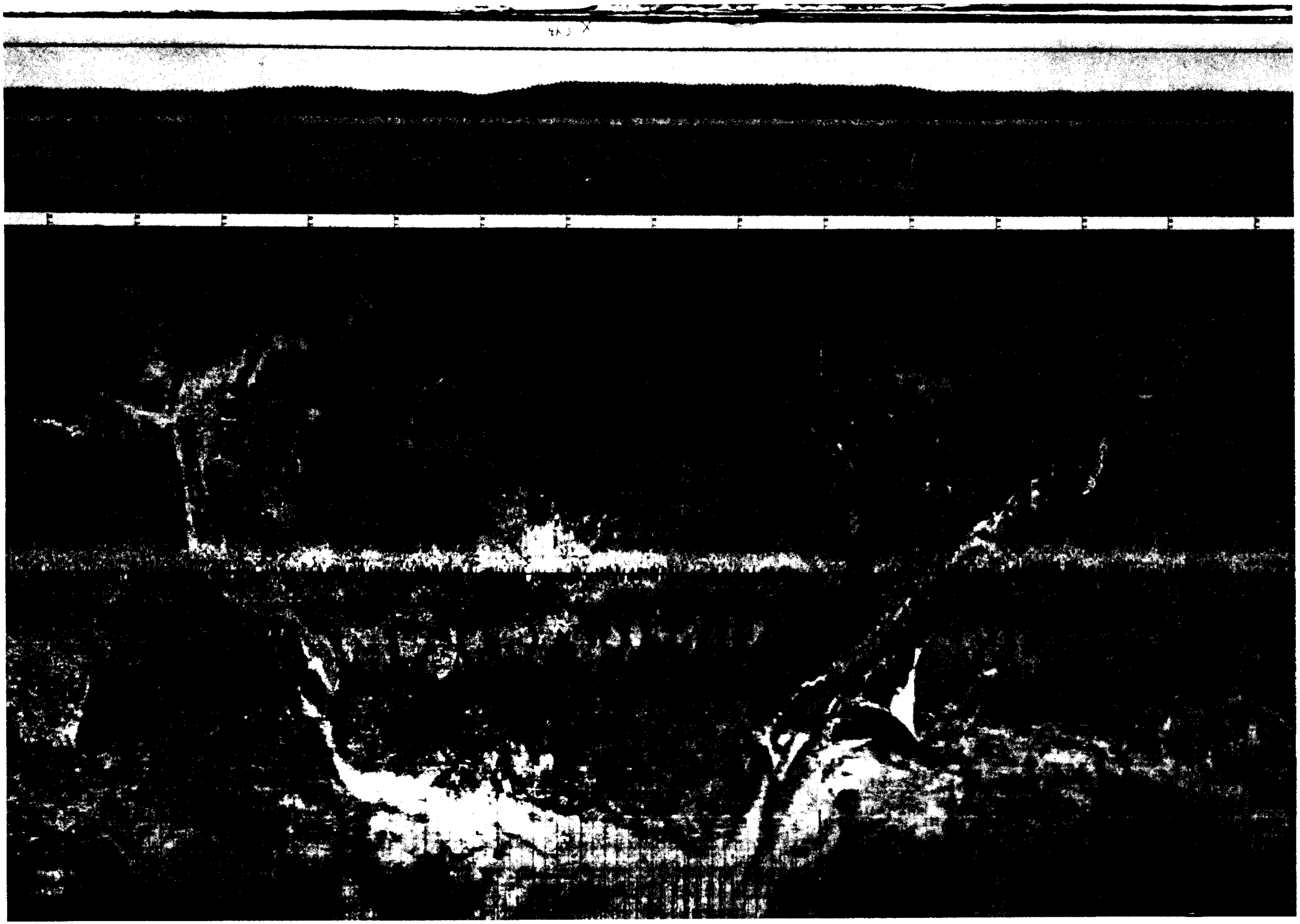

Figure 8. Example of surface features at the north end of the south-central zone of intensive and massive sediment disturbance.

Figure 9. Multiple flows, slumps, and slides in the south-central zone of intensive and massive sediment disturbance.

Figure 10. Example of a massive, lobate slide toe and a series of smaller slide toes in the zone of intensive and massive sediment disturbance.

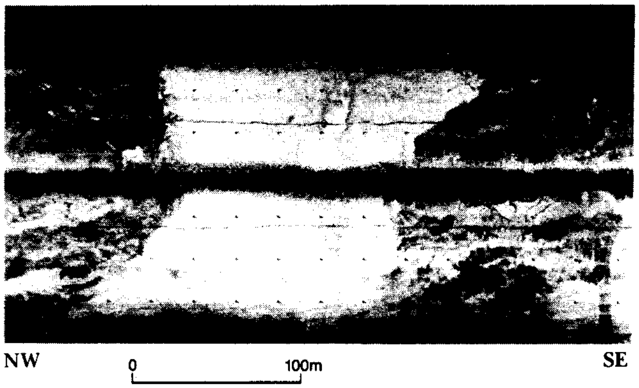

Figure 11. Example of a 150-m-wide channel with wall relief of about 1 m. Features like this are common in the eastern area of channels.

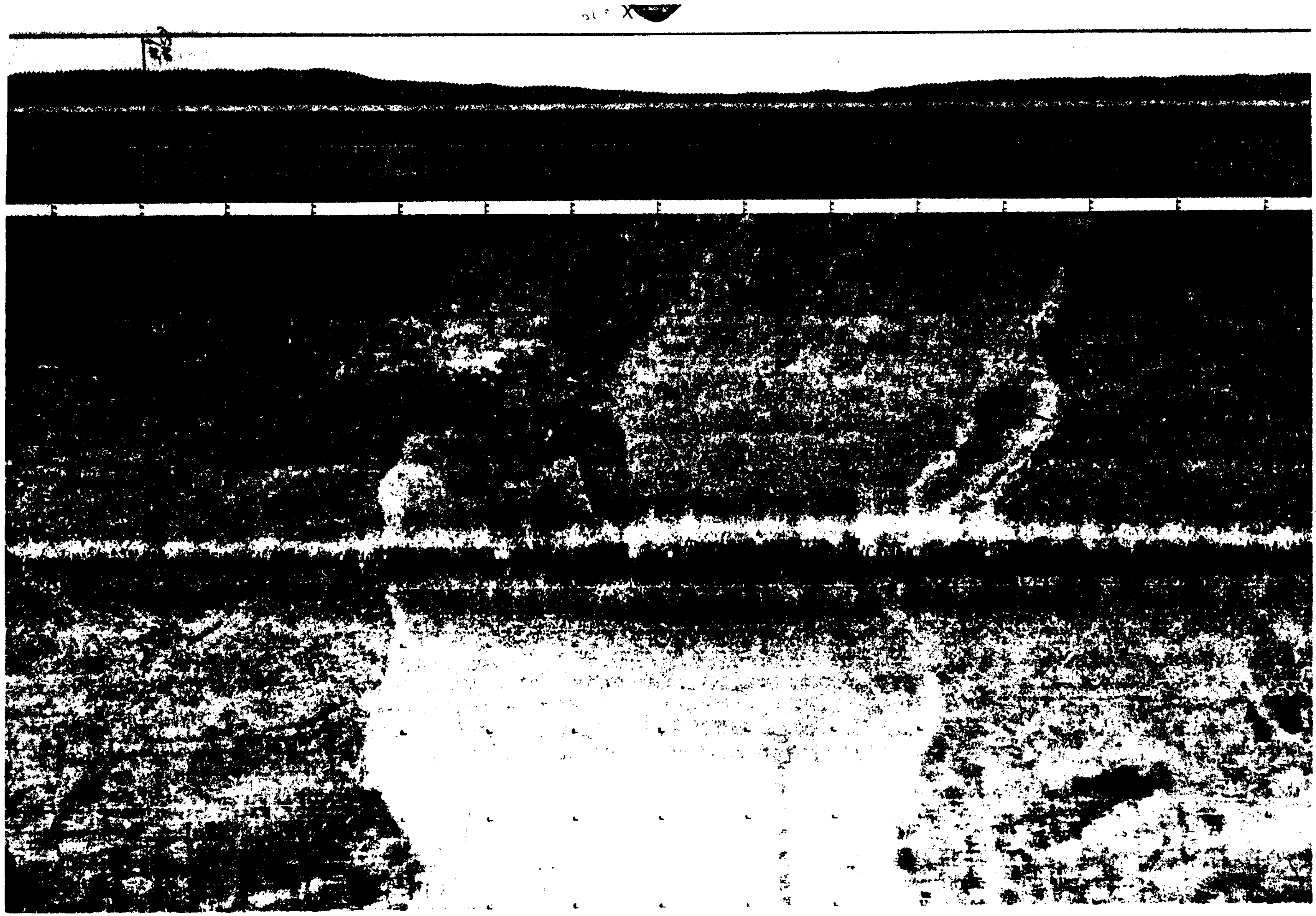

Figure 12. North-south oriented channel in the eastern area of channels and chutes.

the mosaic area. Water contents ranged from 27-50 percent dry weight with the higher values occurring in the eastern section. The liquid limit ranged from 2-41 percent and was typically near the natural water content. Such a condition is generally indicative of a very sensitive material.

Triaxial Testing. - Four gravity cores from the area of disturbance were subjected to static and cyclic triaxial tests. The ratio of strength to overburden pressure for the material in a normally consolidated state was determined to be 0.7. This value can be used to determine the consolidation state of the silts tested in place. The cyclic tests showed a strength degradation of 70 percent during 10 cycles of loading. This is significantly greater than the 30-40 percent strength degradation usually found with nearshore silts and clays and indicates the material could easily lose most of its strength during earthquake or wave loading.

Origin of Sediment Instability.- The upper few meters of sediment are failing as a result of dewatering and degassing induced by the action of one or more of the following processes, all of which are active in this area: cyclic waveloading, earthquake ground shaking, rapid sedimentation, or saturation of the sediment by biogenic methane gas. Additional factors that may contribute to the sediment instability include high pore-water content and the possible presence of a slip surface between the present-day Alsek River sediment and an underlying, dewatered, older silty-sand and clayey-silt layer. The pockmarks, slumps, and other sediment-failure features occur on slopes as gentle as 0.4 degrees and in water 35-80 m deep. Sedimentological evidence from the cores and grab samples suggests that the regional stratigraphy in the mosaic area consists of a veneer of sand less than 1 m thick overlying a 2-4 m thickness of underconsolidated clayey silt with a high water content. The silt, which contains thin sand lenses, overlies a much thicker dewatered clayey silt. Minisparker and airgun seismic data indicate that the total thickness of Holocene sediment in the mosaic area, and in the area adjacent to the mosaic, ranges from 40-120 m and unconformably overlies an older lithified unit. The boundary between the two units is characterized by rounded, glacially-eroded features and by many small U-shaped channels.

REFERENCES CITED

Molnia, B.F., 1979, Origin of gas pockmarks and craters, [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 481-482.

Molnia, B.F., Carlson, P.R., and Kvenvolden, K.A., 1978, Gas-charged sediment areas in the northern Gulf of Alaska, [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 458-459.

SECTION 3

THE TAXONOMY, ECOLOGY, AND ZOOGEOGRAPHY OF THE HOLOCENE AND PLEISTOCENE OSTRACODE FAUNA OF THE GULF OF ALASKA

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I. SUMMARY OF OBJECTIVES, CONCLUSIONS, AND IMPLICATIONS WITH RESPECT TO OCS OIL AND GAS DEVELOPMENT

The northeastern Gulf of Alaska, from Montague Island to Cross Sound (148° to 137° W. longitude), was studied to determine the areas and processes of significant environmental concern to resource development. My specific objective in this project was to provide pertinent information of the age, environment, and sediment transport of continental shelf sediments in the eastern Gulf of Alaska based on the contained ostracode assemblages. An intensive examination was conducted of selected bottom grab samples, assessing the faunal and floral organisms present in each sample. Very detailed studies were made of the ostracode assemblages in the samples.

The Gulf of Alaska forms part of the Aleutian Zoogeographic Province, with a cold temperate (boreal) marine climate. The ostracode species distribution patterns establish the provincial boundaries - south at Dixon Entrance and north at the Aleutian Islands. The provincial boundaries are marked by the termination of some species ranges and by the overlap of species from adjacent faunal provinces. The ostracode assemblages enable a definition and characterization of the Aleutian Province to be made.

Five distinct ostracode assemblages have been defined by means of Principal Coordinate Analysis (PCOORD). Four of these assemblages correspond to physical and chemical parameters that change with depth, primarily water temperature and salinity; to a lesser extent, oxygen content, turbidity, substrate, nutrient supply, and wave and storm activity. These depth assemblages are also reflected in the associated faunal and floral elements. The fifth assemblage is composed of ostracode species that correspond to environments no longer existing in the Gulf of Alaska. Species that presently live either in colder or warmer waters than are present today and/or species that require less turbid waters with lower sediment influx comprise the fossil assemblage. The smaller sediment influx that existed for the fossil ostracode species can also be seen in the associated presence of large numbers of filter feeding organisms.

Ostracode species presently living in the Gulf of Alaska were evaluated to determine and characterize distinct biofacies. Individual species distributions were correlated to the distribution of major controlling environmental variables. Specific regions were recognized containing mixtures of modern and Pleistocene species. The exposed offshore Pleistocene deposits were defined and characterized. Careful examination of modern species enabled the recognition of undescribed fossil species in these sediments. The accurate interpretation of either the modern environments or the Pleistocene deposits hinges on recognizing and deciphering these mixtures.

Detailed counts of adult versus juvenile specimens of a species allows the determination of a life assemblage (biocoenosis) versus a death assemblage (thanatocoenosis, composed of fossil, transported, or reworked specimens). The adult:juvenile ratio provides some measure of sediment transport, both downslope transport and current movement. Recognition of the preferred depth habitat of a species enables an assessment to be made of the origin of the transported sediment, as well as the size range involved.

Establishment of this modern datum of the environmental factors that significantly control or contribute to the distributional patterns of modern ostracode species occurring on the Alaskan continental shelf enables geological applications to be made. This information forms a vital part of the interpretive aspects of Neogene and Quaternary stratigraphic and paleoenvironmental studies in this region. The defined depth assemblages permit reconstruction of paleobathymetry.

Ostracodes have been shown to be sensitive to oil spills in climatically similar environments. Characterization of the present assemblages in terms of species diversity and abundance provides an environmental datum. Any adverse effects caused by an oil spill can be monitored by a re-examination of the assemblage composition and comparison to the established datum.

II. INTRODUCTION

A. GENERAL NATURE AND SCOPE OF STUDY

The primary goal of this study has been to provide pertinent information on the age, environment, and sediment transport of continental shelf sediments of the northeast Gulf of Alaska based on the ostracode assemblages. In addition, these studies provide information tabulating the ostracode species present as well as associated faunal and floral elements. These data on the patterns of distribution and abundance of benthic organisms provide a baseline prior to the development of oil and gas leases on the continental shelf of the Gulf of Alaska.

B. SPECIFIC OBJECTIVES

My specific objective in this study has been to document the distribution and relative abundances of the ostracode species occurring in the Gulf of Alaska and to correlate the distributional patterns to environmental parameters that significantly control or contribute to these patterns. In addition, all associated fauna and flora were identified and documented. The ostracode assemblages examined permit the definition and characterization of a major zoogeographic province in this region. Detailed analyses of the ostracode species enabled recognition of distinct biofacies associations.

This report provides data on the counts of adult versus juvenile specimens, which adds to the documentation of sediment transport patterns on the continental shelf. Finally, the recognition and characterization of offshore, outcropping fossil sediments has been accomplished.

C. TAXONOMIC PLACEMENT AND CHARACTERIZATION OF OSTRACODES

The Ostracoda are a class of the Crustacea, and are characterized by: a) having a bivalved carapace that is hinged along the dorsal margin (with the carapace usually being calcified); b) possessing a bisegmented body with an undifferentiated head; and c) the presence of four pairs of cephalic appendages (antennules, antennae, mandibles, and maxillae). Most species are microscopic (0.4-1.5 mm), although some freshwater forms are larger (up to 8 mm), and macroscopic pelagic forms can be up to 30 mm long (Moore, 1961).

The short, laterally-compressed body is suspended from the dorsal region as an elongate chitinous-pouch. The outer epidermal cells of the chitinous body wall secretes a calcareous layer over all of its surface. The five to seven paired appendages are greatly diversified according to function; these differences are used in part to define the extant orders, suborders, and superfamilies (minor differences in the appendages are also used to define families, genera, and species).

Most ostracodes reproduce sexually, and the differences between the sexes is often reflected in the calcareous valves in the form of dimorphic shell shapes at the posterior end of the valves. Growth of ostracodes is by ecdysis (molting), with chitinous and calcareous layers periodically shed and replaced by larger carapaces (Moore, 1961; Van Morkhoven, 1962, 1979). Each molt involves an approximate doubling in body volume, new appendages are added, and the valves become progressively thicker. Ostracodes molt eight times, with each stage (instar) contributing two valves to the sediment.

Each podocopid ostracode provides 18 valves to the sediment. Ideal preservation of the living population structure in which all ostracodes grew to the adult stage would provide an adult:juvenile ratio of 1:8. In nature, effects of predation and destruction of the very early instars causes the actual adult:juvenile ratio to be about 1:3 to as high as 1:5; the laboratory processing also eliminates the early instars by sieving. The adult to juvenile structure provides an important means of determining a life assemblage. In addition, the population structure has important ramifications in determining whether a fossil assemblage has been transported or is in place. Various juvenile valves and the adult valves are frequently selectively sorted by size according to the water energy, providing a means of determining sediment size fractions moved and water energies involved. The ontogenetic development of an ostracode seems to be restricted to one biotope (Elofson, 1941), so that juveniles and adults occur in the same environment. This means that determinations of a species habitat applies to the adults and juveniles. The adult:juvenile structure provides a key to interpreting ostracode sedimentation patterns and various degrees of valve transportation.

Ostracodes occur in nearly all types and depths of aquatic environments. In the marine world, they occur from abyssal depths to marginal marine inner littoral habitats. Ostracodes are very sensitive to the ambient environment. The species are adapted to particular ranges of the scenopoetic parameters of their environment, so that individual species and communities of species can be used to reconstruct detailed paleoenvironments. The provincial nature of ostracodes further provides that distinctions can be made between northern Japanese and southern Alaskan assemblages from the same climatic zone. The restricted geographic distribution and well-defined biotopes of ostracodes makes them ideal organisms for defining and characterizing particular zoogeographic province.

III. CURRENT STATE OF KNOWLEDGE

The only previous study of ostracodes from the Gulf of Alaska is an unpublished Masters thesis by Painter (1965), done at the University of Kansas. Painter examined 35 samples from the northeast Pacific and Gulf of Alaska, finding 12 species.

Swain and Gilby (1974) described and illustrated 80 species of Holocene ostracodes from the Pacific Ocean along the coastlines of the United States, Mexico, Nicarugua. They found no ostracodes in their samples off of Washington state, nor did they examine any samples further north.

A monographic study of the Holocene ostracodes from the western United States (Baja California to Puget Sound, 21° N to 48° N latitude) by Valentine (1976) treated 341 species in 255 samples from the continental shelf. Valentine recognized four major faunal provinces based on ostracodes; this study suggests that the Gulf of Alaska falls within the cold temperate Aleutian Province.

A series of papers treating ostracode species that live in the warmer temperate waters of Washington, Oregon, and California is useful in identifying species that range to the southeast Pacific as well as warmer water species that are now locally extinct. These papers include Juday (1907), LeRoy (1943a, 1943b, 1945), Skogsberg (1928, 1950), Triebel (1957), Hazel (1962), Crouch (1949), Lucas (1931), Smith (1952), and Watling (1970). Hanai (1957a, 1957b, 1957c, 1959a, 1959b, 1961, 1970) has published on Japanese species that occur in the same climatic province, as has Ishizaki (1966, 1968, 1969, 1971). Ohmert (1968) has studied Chilean ostracodes from the mild temperate climatic zone.

A series of papers that has aided in the identification and determination of the northern geographical limits of the colder water species includes Swain (1963), Schmidt (1963, 1967), Schmidt and Sellman (1966), Neale and Howe (1973, 1975), Neale and Schmidt (1967), Schornikov (1974, 1975), Neale (1959, 1973a, 1973b, 1974), Hazel (1967, 1970a), and Lev (1969).

IV. STUDY AREAS

This report is based on 368 samples collected during three cruises to the Gulf of Alaska, from 1975 to 1980. All of the samples are from the continental shelf, from depths ranging from one meter to 200 meters. Cruise EGAL-75-KC (F.R.S. Townsend Cromwell, 1975) included 228 samples taken between Montague Island and Yakutat Bay (140°-148° W longitude). Thirty-one samples were examined from cruise DC1-79-EG (R/V Discoverer, 1979), with localities between Dry Bay and Cross Sound (136°-138° W longitude). Cruise DC2-80-EG (R/V Discoverer, 1980) included 109 samples taken between Icy Bay and Dry Bay

(138°-142° W longitude).

V. SOURCES, METHODS, AND RATIONALE OF DATA COLLECTION

A. FIELD METHODS

Most of the sediment samples taken in the field were large volume, bottom grabs (Van Veen, Shipek, and Box Core). These samples were analyzed for lithology, grain size, bulk mineralogy, water content, clay mineralogy, and carbon content. These samples proved ideal for a reconnaissance of the benthic organisms present in the Gulf of Alaska. The large volume of sediment enabled large residues to be examined, so that, as much as possible, the total ostracode assemblages present were represented. Samples smaller in size, such as those obtained from core tops, provide information only on the most abundant species; the more rare species living at a site are not represented. Sample locations were selected to reflect the wide range in depth, bathymetric structures, and sediment types occurring in the eastern Gulf.

B. LABORATORY METHODS

The micropaleontological subsamples taken were not standardized, and ranged in size from 200 grams to over one kilogram (wet weight), depending on the initial amount of sample available. The bulk grab samples that were subsampled had not been kept refrigerated, so that many had dried out. In terms of preservation of ostracode soft parts, these storage conditions were better than being kept cold.

All samples were washed on a 200-mesh sieve (75 micrometer opening). The washed sediment was sorted using a set of nested sieves and examined to a sieve size of 180 micrometers. The tabulation of fauna and flora, therefore, does not include any organisms smaller than 180 micrometers in size.

All samples were completely stripped of ostracode valves. All of the ostracode adult and juvenile specimens found in each sample were identified and counted. The percentage each species constitutes of the entire ostracode assemblage was calculated. The counts refer to the total number of valves or recognizable fragments of a species; a carapace is counted as two valves. Any specimens containing preserved chitinous soft parts were noted; these individuals were probably living when collected.

All other organisms present in the washed sediment were identified and tabulated. No attempt was made to assess the relative abundances of these associated fauna and flora.

VI. ZOOGEOGRAPHY

A. INTRODUCTION

A faunal province may be defined as a region in which communities maintain characteristic taxonomic compositions (Valentine, 1973). Temperature is the underlying factor controlling the distribution of organisms, and the distribution of kinds of organisms determines the nature and extent of the different provinces (Hazel, 1970a). The boundaries between provinces form the basis for climatic zone boundaries (from north to south, the northern hemisphere climatic zones are: frigid, subfrigid, cold temperate, mild temperate, warm temperate, subtropical, and tropical). Provincial boundaries are recognized where shelf assemblages, diagnostic over a broad area, alter their composition because of the termination of species ranges and the appearance of forms ranging in from neighboring provinces. These boundaries mark distributional discontinuities which are controlled by environmental factors (Valentine, 1976).

Marine invertebrates cannot control their body temperature, with the rates of their physiological processes being directly influenced by the ambient water temperature. Water temperature is considered the fundamental factor limiting species distribution (Gunter, 1957; Kinne, 1963; Valentine, 1973). This can be seen at many provincial boundaries where a steep temperature gradient occurs over a short geographic distance. Such a steep gradient may act as a survival barrier if a species lethal temperature is present, or it may act as a repopulation barrier for reproduction or larval development temperature requirements (Hutchins, 1947).

A faunal province is unique; climatic changes, faunal migrations, and evolutionary events mitigate against the duplication of successive provinces through time. Even if only the climate is altered, species will be found in new associations and constitute different provinces (Valentine, 1976). Hazel (1970a) showed that modern amphiatlantic ostracode species form different species associations because marine climates differ on opposite sides of the same ocean basin.

The faunal pattern fits the hydrographic pattern closely. Whenever the hydrographic regime changes or is modified, certain species cannot overcome the barrier. Where a hydrographic regime is monotonous, the fauna is similarly so. In all cases, provincial boundaries are marked by marine climatic changes, usually localized by topographic irregularities (Valentine, 1973). Southern boundaries can generally be correlated with summer (August) differences and those in the north correlated with winter differences.

B. FAUNAL PROVINCES OF THE NORTHEAST PACIFIC BASIN

Valentine (1966, 1973) identified six provinces based on molluscan distributions along the west coast of North America. These are: (a) the Bering Province, extending from Point Barrow to the Aleutian Island arc area; (b) the Aleutian Province, extending south to Dixon Entrance; (c) the Oregonian Province, extending south to Point Conception; (d) the Californian Province, extending south to Punta Eugenia-Cedro Island; (e) the Surian Province, extending south to Cabo San Lucas; and (f) the Panamanian Province, extending south to the equator.

The environmental basis for this provincial pattern is clear for most of the boundaries. To the south, the Surian/Panamanian boundary (22° N latitude) marks the subtropical/tropical marine climates. Two large areas of upwelling to the south of Cabo San Lazaro and Punta Eugenia provide a formidable thermal barrier for the northward expanding tropical species. The Californian/Surian boundary (27° N latitude) marks the warm temperate/subtropical marine climates. This break correlates with the change from Pacific equatorial water to the transitional water of the California Current in the summer. The Oregonian/Californian boundary (34° N latitude) marks the mild temperate/warm temperate marine climates. This boundary is at Point Conception, where a sharp thermal gradient is localized by the semipermanent gyre south of Point Conception. The Aleutian/Oregonian boundary (54° N latitude) indicates the cold temperate/mild temperate marine climates. This boundary correlates to the change from the California Current water to the Alaska Current system. The Bering/Aleutian boundary (about 62° N latitude) marks the subfrigid/cold temperate marine climates. This boundary is more subtle, probably corresponding to the change in water masses from the Alaska Current to the Bering Sea water mass.

C. THE ALEUTIAN PROVINCE

Figure 1 shows the proposed boundary positions for the Aleutian Province based on twelve different studies, primarily based on mollusk distributions. Note that the southern extent has varied from 48° to 55° N latitude (Puget Sound to Dixon Entrance) and the northern border from 56° to 62° N latitude (Dixon Entrance to southern Norton Sound) (Valentine, 1966)

Based on the ostracode assemblages examined from the Gulf of Alaska, these waters fall into a cold temperate marine climate. Genera commonly found in the mild temperate Oregonian Province such as Ambostracon, "Aurila", "Hemicythere", Radimella, and Coquimba do not presently live in the Gulf. Species of Ambostracon and Coquimba have been found in Pleistocene lag deposits, suggesting a warming interval during the time of deposition. Some genera from the mild temperate zone do extend to the Gulf of Alaska, including Cytheropteron, Loxoconcha, Pontocythere, Cythere, Munseyella, Pectocythere, and Hemicythere. These are genera that commonly have species existing in the mild temperate through subfrigid marine climates in other regions of the northern hemisphere. Other genera seem to be restricted to this area, including Buntonia, Elofsonia, "Leguminocythereis", Eucytherura, Sclerochilus, and Bythocythere.

Sampling did not extend farther south than Cross Sound, so that an exact

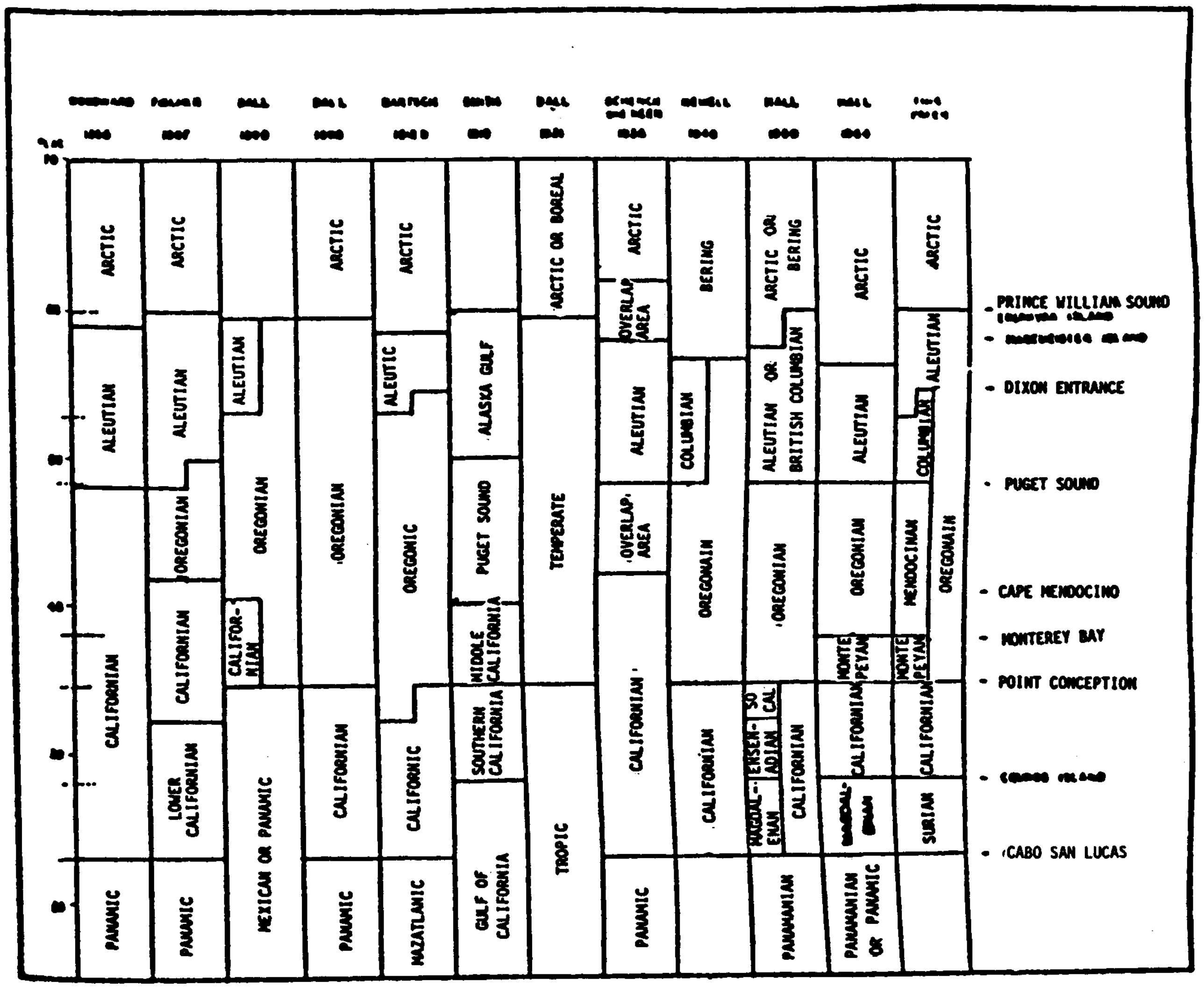


Figure 1. Twelve provincial systems proposed for the northeastern Pacific Shelf, based on mollusks (from Valentine, 1966).

southern boundary for the Aleutian Province could not be determined based on ostracodes. However, based on scattered studies of ostracodes from Vancouver Island (Lucas, 1931; Smith, 1952), combined with the general trend of shallow water ostracode faunas to have similar faunal boundaries as mollusks, the southern boundary at Dixon Entrance proposed by Valentine (1966) is estimated to correspond to the ostracode faunal boundary.

The northern boundary of the Aleutian Province is located to the north of the Aleutian Islands. A series of samples examined from the north Aleutian shelf (between Port Heiden and Port Muller) as well as selected samples from the Pribilof Islands have a markedly arctic influence. The only cold temperate genera present are Cytheropteron, Loxoconcha, Semicytherura, "Leguminocythereis", Sclerochilus, and Pectocythere. The frigid to subfrigid forms present in the south Bering Sea include Finmarchinella, Normanicythere, Elofsonella, Eucytheridea, Paracyprideis, and Schizocythere. The cold temperate species are kept out of the Bering Sea by a combination of two factors: a) the change in water mass from the Alaska Current to the northwest Pacific and Bering Sea waters, and b) by the colder summer temperatures and slightly cooler winter temperatures present on the Aleutian shelf.

VII. PRINCIPAL COORDINATE ANALYSIS

A. INTRODUCTION OF TECHNIQUE

The data analyzed in this study were very large, consisting of 368 samples containing 150 ostracode species. This information is great enough to cause conclusions to be based on only part of the available data base. Multivariate techniques were used to provide a consistent way to search for patterns in the large data matrix.

Principal coordinates analysis (PCOORD) is a method of relating the objects in an analysis to major axes (eigenvectors), to reduce the multidimensional nature of the problem (Hazel, 1977). The eigenvectors and eigenvalues are extracted from a Q-mode matrix of coefficients, in which the various samples are compared to one another on the basis of the species they contain (Hazel, 1970b). The output of the PCOORD is scatter plots of the samples in reduced dimensions. The eigenvalues of the samples for the first three coordinate axes were plotted as the first versus second Principal Coordinate Axes and as the first versus third Coordinate Axes. Principal Coordinates Analysis provides accurate between-group relationships; however, within-group relationships become distorted in reduced space. Hazel (1977) notes that PCOORD is practically unlimited as to the number of species, and that PCOORD is particularly advantageous when there is some structure to the data but when the groups are not compact.

B. PRINCIPAL COORDINATES ANALYSIS A

Appendix X shows the principal coordinates analysis of selected bottom grab samples from cruises EGAL-75-KC, DC1-79-EG, and DC2-80-EG (Table 1). Five different ostracode assemblages were recognized from the PCOORD analysis: Assemblages I,II,III,IV, and V. The assemblages are gradational in nature due to two factors: a) the environments represented by the assemblages are gradational, and b) the samples are not standardized in size, and all species and samples were included in the analysis, resulting in a considerable amount of "noise"

Assemblage I represents the inner neritic depth zone, and is characterized by shallow water species of Cytheromorpha, Bairdia, Argilloecia. Pectocythere, Aurila, Cythere, Elofsonia, Buntonia, Hemicythere, "Leguminocythereis", Eucythere, Pontocythere, and Loxoconcha (Table 4). In addition, occasional non-marine species of Candona, Cyclocypris and Cyprinotus are present.

Assemblage II can be correlated with the middle neritic depth zone. It is characterized by the presence of "Acanthocythereis" dunelmensis, Argilloecia, Buntonia, Cluthia, Cytheromorpha, certain species of Cytheropteron, Eucythere, Eucytherura, "Leguminocythereis", Loxoconcha, Palmanella limicola, Paracypris, Pectocythere, and Robertsonites tuberculata.

Assemblage III corresponds to the outer neritic depth zone. It can be characterized by the presence of "Acanthocythereis" dunelmensis, Cluthia, certain species of Cytheropteron, Cytherura, Eucytherura, Loxoconcha, Macrocypris, Munseyella, Palmanella limicola, Robertsonites tuberculata, Xestoleberis, Hemicytherura, and Bythocythere.

Assemblage IV represents the upper bathyal depth zone. Species that typify this environment include "Acanthocythereis" duenlmensis, Loxoconcha, Cluthia, certain species of Cytheropteron, Eucytherura, Krithe, and Bythocythere.

Assemblage V does not correspond to a depth zone. This group of samples contains large numbers of species that are no longer endemic to the Gulf of Alaska, and are interpreted to represent fossil species. These species include Ambostracon, Baffinicythere emarginata, Bythocytheromorpha, Coquimba, certain Cytheropteron species, selected Cytherura species, Finmarchinella, "Leguminocythereis" sp. D, several Loxoconcha species, Normanicythere, many of the Paradoxostoma species, Patagonacythere, certain Pectocythere species, many of the Sclerochilus species, "Radimella", several of the Semicytherura species, Xestoleberis, and Xiphichilus.

Each sample was assigned to one of the five major ostracode assemblages. Samples that occurred on the boundary of two depth assemblages and which could not clearly be assigned to one were termed a mixture of the two assemblages. Most of the samples containing fossil species also contained modern species living on top of the exposed, unconsolidated fossil deposits. Depending on the water depth at which the fossil deposit occurred, these samples were termed a mixture of Assemblage V and the appropriate modern depth assemblage.

Examination of the plot of Principal Coordinate Axes One and Two shows that Assemblages I and II form distinct groups with very few mixtures. Assemblage III represents most of the samples examined in this analysis, and shows a considerable amount of scatter. Assemblage IV falls within the scatter of Assemblage III, mainly because more species of IV are in common with III than are different. Assemblage V occupies the northwest quadrant, forming a fairly compact grouping, but with no clear differentiation of the different modern mixtures.

Examination of the plot of Principal Coordinate Axes One and Three provides additional information that more clearly separates the five assemblages and the mixtures. Assemblage I again clearly exists as a distinct group of samples. Assemblage II becomes better segregated from Assemblage I. Further, the mixtures of Assemblages II and V cluster together with the samples from pure Assemblage II. Assemblage III remains a large grouping of scattered samples; the mixture of Assemblages III and V do not cluster together with III, but they do form a discrete group isolated from the other fossil mixtures. Assemblage IV shows a more coherent, separated group in this plot.

C. PRINCIPAL COORDINATES ANALYSIS B

Appendix IX shows the Principal Coordinates Analysis of selected bottom grab samples from cruise EGAL-75-KC (Table 2). This analysis was run after PCOORD A had defined the five major ostracode assemblages.

Examination of the plot of Principal Coordinate Axes One and Two corroborates the distinct grouping of samples forming Assemblage I. Assemblage II shows a very large amount of scatter, extending over three quadrants. The mixture of Assemblages II and V forms a more coherent group in the southeast quadrant. Assemblage III consists of far fewer samples which were collected in relatively close geographic proximity; note that these samples form a very discrete cluster.

The plot of Principal Coordinate Axes One and Three again provides a better picture of the sample grouping. Samples from Assemblage I remain a distinct group, although the third axis reveals more vertical scatter than PCOORD A showed. Assemblage II remains a scattered, amorphous plot of samples. Comparison of Assemblage II samples to their geographic locations shows three different environments can be correlated to the PCOORD scatter. Samples of Assemblage II plotting in the southeast quadrant correspond to middle neritic environments off of the Copper River delta. Samples of Assemblage II plotting in the northeast quadrant can be correlated to middle neritic depths of Icy Bay. Samples of Assemblage II plotting in the northwest quadrant correspond to middle neritic depths of Tarr Bank.

Assemblage IV forms a scattered group of samples in the northwest quadrant. Mixtures of Assemblages V and I and of V and III tend to cluster near the groups of Assemblages I and III, respectively. Note that mixtures of

Assemblages V and II form three groups that cluster with the three different environments of pure Assemblage II.

VIII. AREAL DISTRIBUTION OF THE FIVE MAJOR OSTRACODE ASSEMBLAGES

A. YAKUTAT TO CROSS SOUND

Each sample containing ostracodes was assigned to a major ostracode assemblage or mixture of assemblages based on the Principal Coordinates Analyses and based on the species composition of the sample. The areal distribution of the assemblages was then determined by plotting these samples on maps of the Gulf of Alaska.

The map covering the area between Yakutat and Cross Sound (Appendix IX) has the smallest sample coverage. The sample series taken from Palma Bay out to 200 meters depth shows a gradual change in assemblage type as the different depth zones are crossed. Two regions contain exposed fossil deposits: a) Fairweather Ground, and b) eastern Palma Bay. The Palma Bay exposure covers a relatively small area. The Fairweather Ground exposures, in contrast, form a flat bank between 100 and 200 meters water depth, and extend from the Alsek Sea Valley to the Cross Sound Sea Valley.

B. BERING GLACIER TO YAKUTAT BAY

Appendix XII illustrates the five major ostracode assemblages and mixtures of assemblages between the Bering Glacier and Yakutat Bay. Assemblage I is poorly represented in this region, consisting of some small boat collections between Yakutat and Icy Bay and a few samples collected west of Icy Bay.

One of the three Assemblage II environments separated by PCOORD B is represented in the group of samples taken at the mouth of Icy Bay. This environment consists of a steep-sided fiord with cold water and a very high sediment influx from Guyot, Yahtse, and Tyndall Glaciers.

The transitional nature of assemblages proceeding from one depth zone to the next is clearly shown in the transect taken off of the Malaspina Glacier. Three small regions of outcropping fossil sediments are indicated: a) just southeast of Ocean Cape, b) at the mouth of Icy Bay, and c) just seaward of Cape Yakataga.

C. MONTAGUE ISLAND TO KAYAK ISLAND

The most thorough sampling was conducted between Montague Island and Kayak Island (Appendix XIII), during cruise EGAL-75-KC. Assemblage I is well represented as a series of nearshore samples taken between Cape Suckling and Hinchinbrook Island. As documented in PCOORD B, two different environments of Assemblage II occur in this area: a) middle neritic depths east of the Copper River, primarily around Kayak Island, and b) middle neritic depths west of the Copper River, primarily around Tarr Bank. These different environments may reflect the differences in sediment influx of these two regions, with a higher sedimentation rate around Kayak Island and a lower sedimentation rate due to bypassing by currents around Tarr Bank.

Assemblage III is best represented in the samples from this region, showing comparable species composition over the entire depth zone.

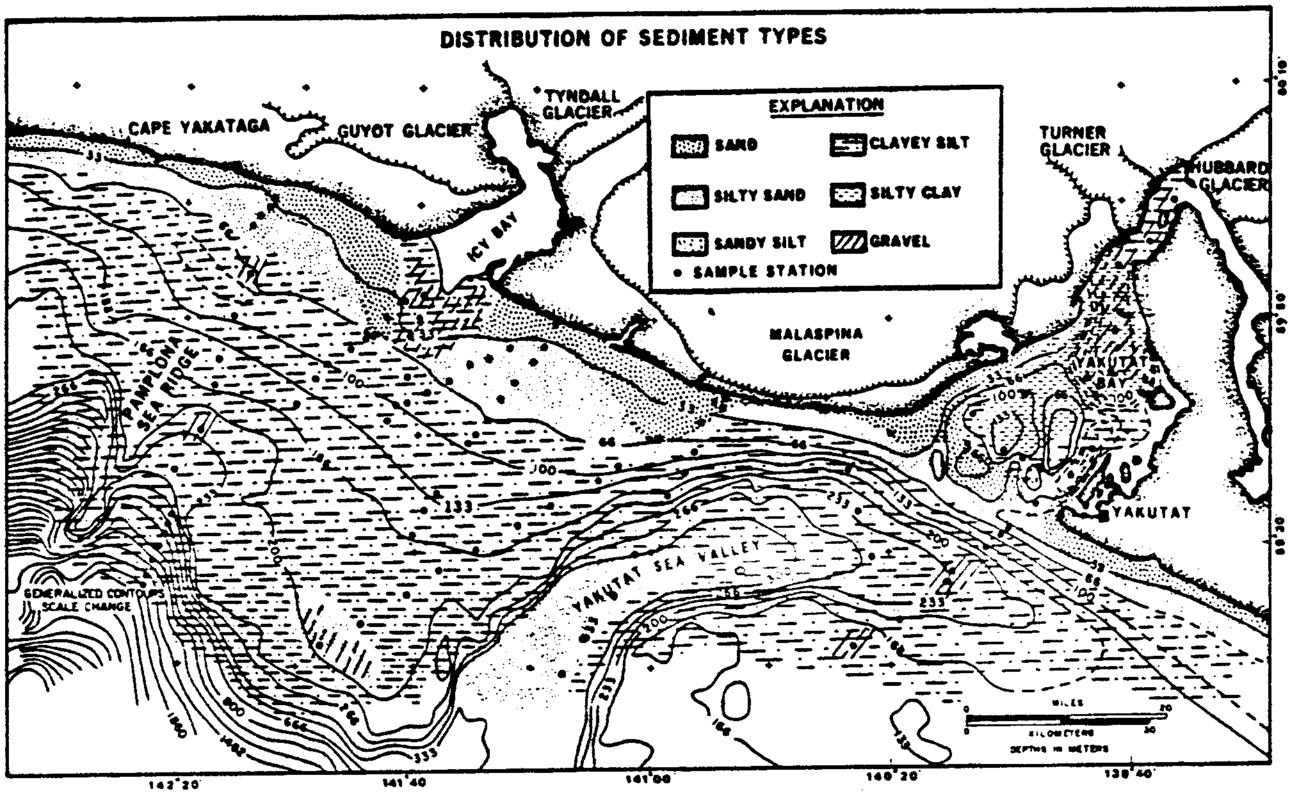
Large regions of outcropping fossil deposits exist in this region, consisting of large banks as well as outcroppings around several of the islands. Both mixtures of fossil and modern species as well as wholly fossil samples are present. The largest exposure of Pleistocene sediments is Tarr Bank, defined by the 100 meter isobath, and cropping out between Montague Island and offshore of the Copper River delta. Exposures of fossil sediments also occur around the southern and western part of Kayak Island, west of Wingham Island, around Middleton Island, and along the southeastern side of Montague Island. Regions containing primarily modern species with transported, eroded fossil species can be seen along the southern end of Tarr Bank, especially to the north and south, and along the southern end of Kayak Island. Samples consisting entirely of fossil species occur in the middle of Tarr Bank, near Seal Rocks, and east of Middleton Island.

IX. CORRELATION OF OSTRACODE ASSEMBLAGES TO ENVIRONMENTAL PARAMETERS

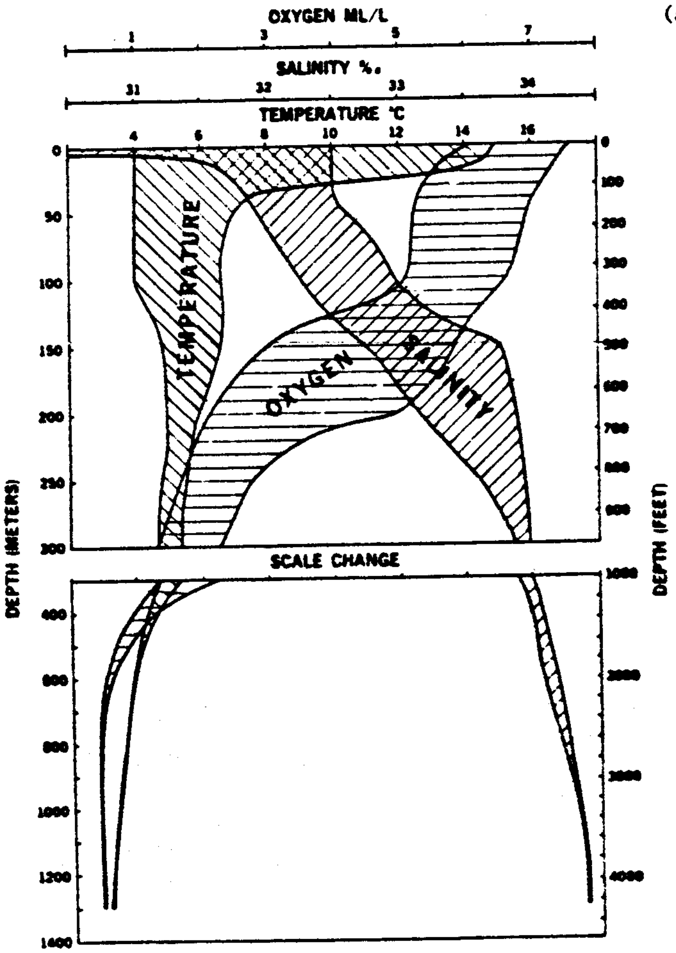
Of the five assemblages defined by means of Principal Coordinate Analysis combined with species composition, four of these can be correlated to depth zones. Assemblage I corresponds to the inner neritic zone, extending from shoreline to about 50-60 meters. Assemblage II comprises the middle neritic zone, extending from 50 to 110 meters. Assemblage III corresponds to the outer neritic zone, from 100 to 200 meters. Assemblage V forms the upper bathyal zone, extending from 200-350 meters.

The break between Assemblages I and II occurs at 50-60 meters. The faunal transition between the inner and middle neritic zones correlates closely with the change in sediment type from sand and silty sand of the inner shelf to the clayey silt of the middle and outer shelf (fig. 2). The deeper limit of inner shelf sand reflects the deeper limit of intermittent turbulence caused by storm waves and storm-induced currents. The 50-60 meter mark is

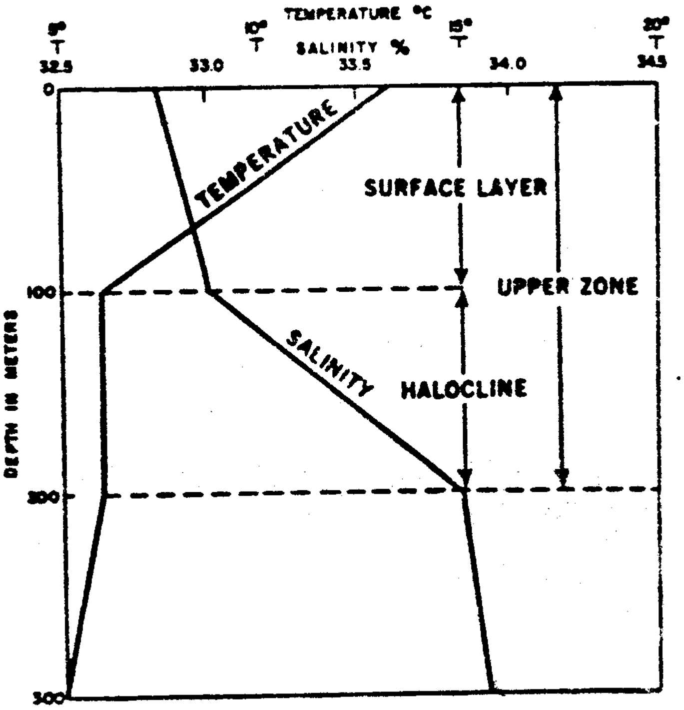
Figure 2. Distribution of sediment types and vertical profiles of the annual range of temperature, salinity, and oxygen from the Continental Shelf, Gulf of Alaska (from Armentrout, 1980).



(a) Distribution of sediment types based on grain-size (after Armentrout, 1980).



(b) Variability of temperature, salinity, and oxygen with depth in coastal waters of study area. Data from Royer (1972).



(c) Schematic temperature and salinity distributions showing structure of the upper zone in the subartic Pacific Ocean (after Fleming, 1958).

consistent with extremely severe winter storm conditions. The inner neritic zone marks the area with the largest salinity and temperature fluctuations, on an annual basis (figs. 2 and 3). Salinity varies from 26-29 o/oo from June to October up to 31 o/oo from January to April. Temperature can vary from 0° to 15° C. The ostracodes that characterize Assemblage I consist of species that can tolerate wide fluctuations in their physical-chemical environment. These species include "Acanthocythereis" dunelmensis, Argilloecia sp. A, Aurila sp. A, Bairdia sp. A, Buntonia sp. A, Cytherois sp. A, Cytheromorpha sp. B, sp. D and sp. E, Cytheropteron aff. C. nodosoalatum, Elofsonia, Eucythere, Hemicythere, "Leguminocythereis", Loxoconcha, and Pectocythere.

The middle neritic zone is characterized by some temperature and salinity variations, although on a markedly reduced scale. Salinity can vary from 32-33 o/oo; temperature varies from 3.5 to 12° C. Bottom sediments are primarily clayey silt. Species characteristic of this zone include "Acanthocythereis" dunelmensis, Argilloecia sp. A, Buntonia, Cluthia, Cytheromorpha, Cytheropteron sp. A and sp. D, Eucythere, Eucytherura, "Leguminocythereis", Loxoconcha sp. A and sp. B, Palmanella limicola, Paracypris, Paradoxostoma sp. I, Pectocythere, and Robertsonites tuberculata.

The boundary between Assemblages II and III marks the middle/outer neritic depth zones, and occurs at 100-110 meters. At this point, bottom temperature begins to stabilize at 5 to 5.5° C and no longer undergoes wide seasonal fluctuations. Oxygen content begins to decrease at 100 meters, changing from 7 ml/1 at 100 meters and decreasing to 3 ml/1 at 200 meters. Empirical observations shipboard document a reduction in turbidity and suspended particulates.

A small break occurs at 150-170 meters, which does not correspond to a major environmental change, but a noticeable faunal change. At this point,

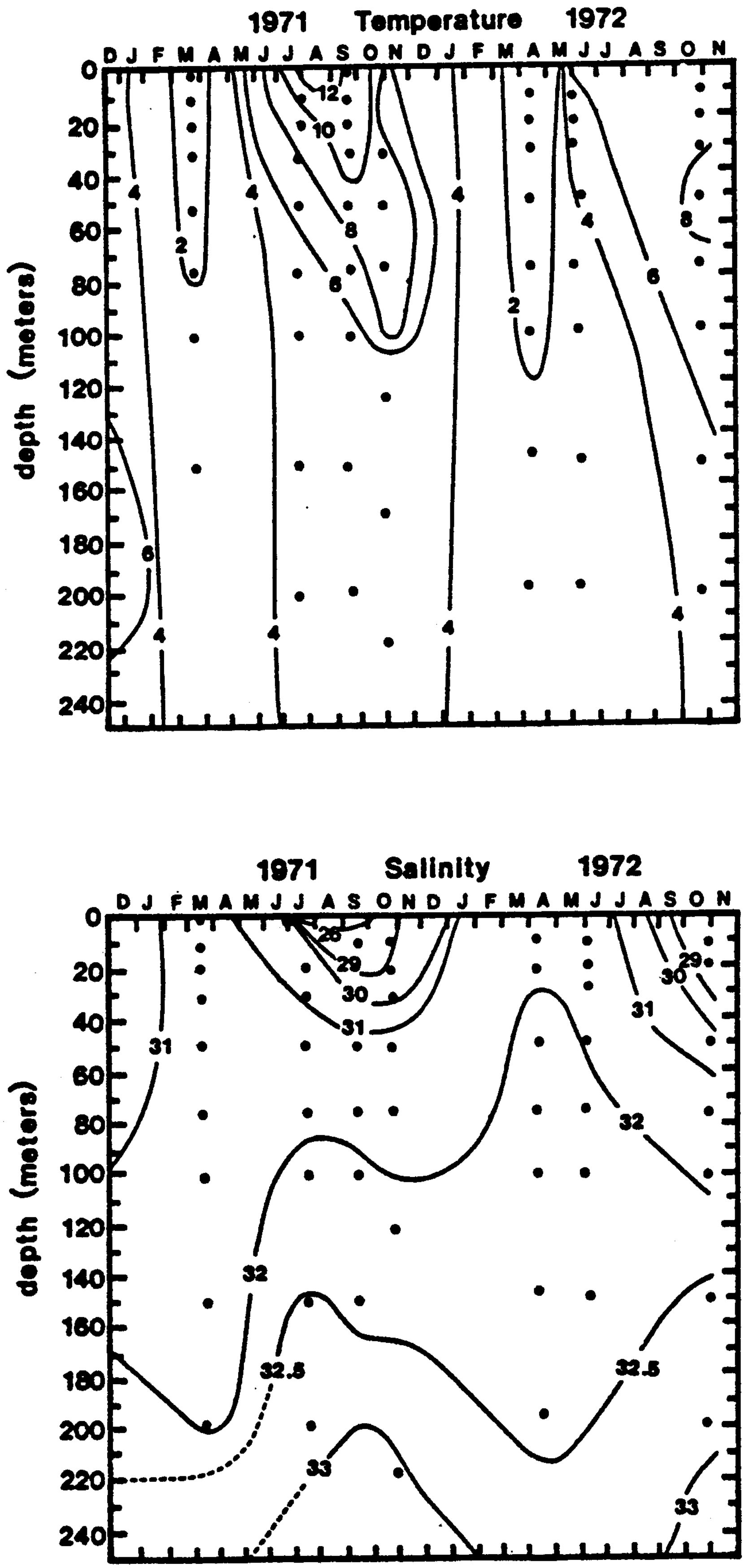


Figure 3. Time series of temperature and salinity taken between December 1970 and October 1972, Gulf of Alaska (from Royer, 1975).

Pectocythere aff. P. parkerae. Cytherois sp. A, Munseyella sp. A, Robertsonites tuberculata, Aurila sp. A, Pectocythere aff. P. quadrangulata, and Cytheropteron aff. C. latissimum drop out. It is around this depth that most of the suspended sediments settle out. No other major environmental parameter can be correlated with this break in fauna.

The boundary between Assemblages III and IV marks the outer neritic/upper bathyal depth zones, occurring at 190-200 meters. Oxygen content is still declining at this point, but at a much slower rate (dropping from 4 ml/l at 200 meters and stabilizing at 1 ml/l at 600 meters). The species diversity drops considerably from Assemblage III to Assemblage IV, as does the relative abundance. The salinity halocline ends at 200 meters, with a salinity value of 33.8 o/oo; salinity slowly increases with greater water depth. Bottom temperatures show no seasonal fluctuations, ranging from 4° to6° C.

Some of the ostracode species are restricted to one depth assemblage, while others range through several depth zones (Table 4). The major ostracode assemblages are defined by the total assemblage species composition and relative abundance of the various species.

The four depth assemblages based on ostracodes correlates well with the distributions of foraminifers and mollusks determined for this area (Armentrout, 1980; Echols and Armentrout, 1980; figs. 4, 5). Similar environmental parameters restrict these organisms distributions.

X. SEDIMENT TRANSPORT PATTERNS

Each ostracode adult has undergone eight molts; adding in the adult, an individual has the potential of leaving 18 valves in the sediment. The adult to juvenile ratio is ideally 1:8. However, the delicate nature of the early

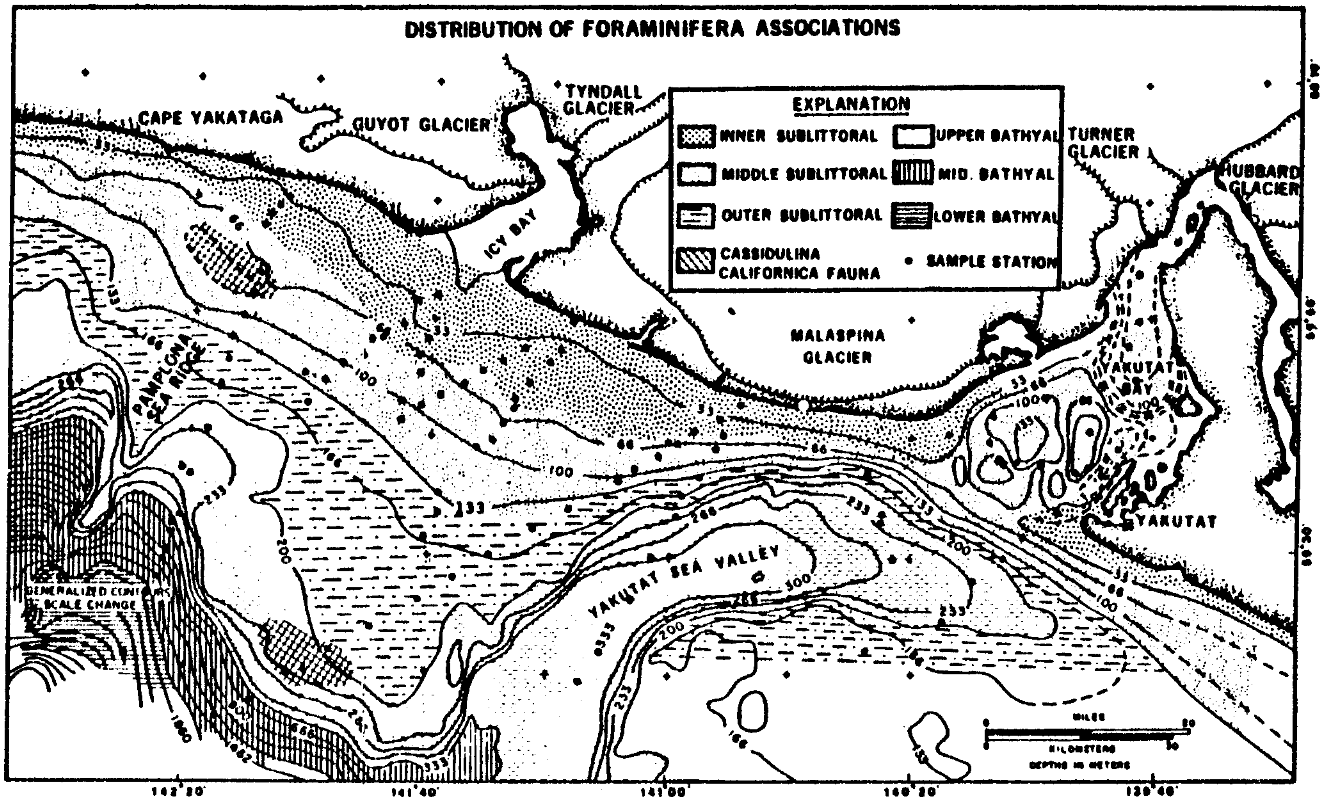


Figure 4. Distribution of depth zones defined by associations of benthic foraminifers (from Armentrout, 1980)

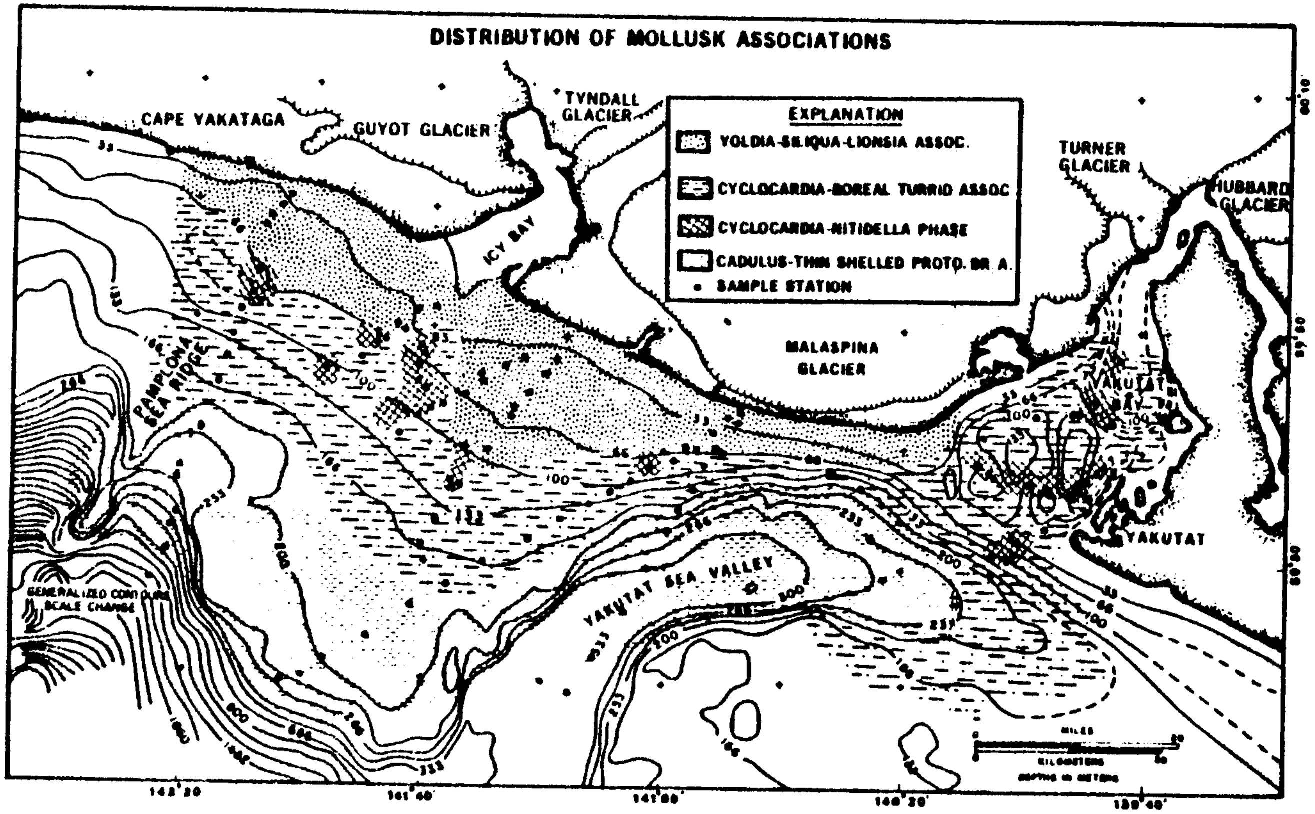


Figure 5. Distribution of mollusk associations in the Gulf of Alaska. (from Armentrout, 1980)

instars, combined with sample preparation techniques reduces this ratio to about 1:3 to 1:4. Examination of the adult to juvenile structure provides a measure of whether the ostracode assemblage is a life assemblage or death assemblage.

Figure 6 illustrates histograms of the adult:juvenile ratio of ostracodes at each locality of cruise DC1-79-EG, between Dry Bay and Cross Sound. The species diversity drops faster where there are steep gradients, as off of Dry Bay. In areas containing broad gentle slopes, such as southwest of Dry Bay, the species diversity and number of individuals progressively decreases seaward in a regular, linear pattern. These latter patterns suggest various degrees of ostracode valve transportation from the onshore areas where ostracodes are diverse and common to deeper water where living ostracodes are less common and apparently less diverse. The deeper water facies are therefore a sum of transported shallow water species and deeper water species. This distribution of ostracodes is readily seen when the ostracode adult:juvenile ratios are examined. The juvenile stages are more easily transported than the adults, and when the adult:juvenile ratios are plotted for the Alsek Sea Valley and Cross Sound Sea Valley, a consistent pattern of decreasing adult:juvenile ratios emerges. These ostracode sedimentation patterns also correspond to an increase in siliceous organisms (sponges and diatoms) in offshore samples. The fact that the distributional patterns of ostracodes have a sedimentological component as well as an ecologic component, is one of the more interesting results of this study.

A series of plots were made of selected species showing abundance versus water depth. Appendix XIV illustrates the 33 most abundant ostracode species found in the Gulf of Alaska. The relative abundance of the species clearly indicates the preferred depth habitats. All of the species illustrated reveal

FIGURE 6

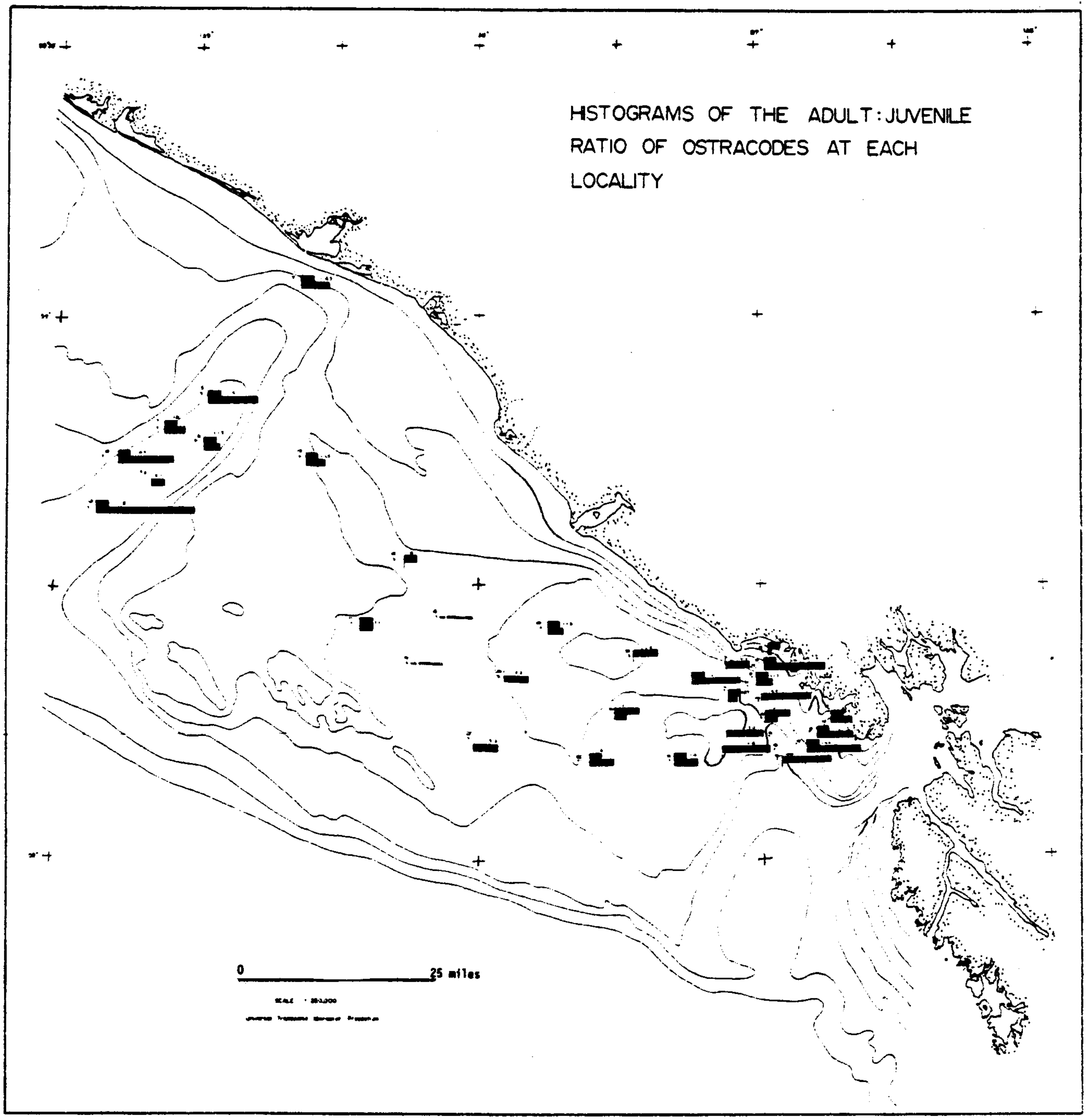


Figure 6. Histogram of the adult: Juvenile ratio of ostracodes from samples of cruise DC1-79-EG, between dry bay and cross sound.

a long "tail" of rare occurrences in deeper waters. These "tails" demonstrate the active downslope transport that is occurring with the shelf sediments, moving fine-grained sediments of the littoral zone into slope deposits.

Figures 7 to 26 illustrate 20 species showing absolute numbers of valves versus water depth. The number of valves is high in the depth zones a species lives in. At both the shallow end and the deep end of a species range, the abundance drops. All of the species illustrated show the effects of downslope transport as a "tail" of rare occurrences in deeper water.

XI. OSTRACODES AS MONITORS OF OIL SPILL EFFECTS AND BENTHIC RECOVERY

A recent detailed study of the macro- and meiofauna from a cold temperate to subfrigid marine climatic zone was conducted by Ankar and Elmgren (1976) at Asko, Sweden, along the northern Baltic coastline. Minimum water temperatures of the Asko study area are somewhat lower than in the Gulf of Alaska (reaching 0° C), but many similarities exist between the two regions. The geographic location of the southern Baltic is at about 54°-60° N latitude, with similar incoming solar radiation as southern Alaska. Many of the macrobenthic and microbenthic species are the same or have closely related counterparts.

Examination of the abundance, wet weight biomass, and species diversity of macro- and meiofauna was conducted at various Asko stations with different bottom lithologies. The deeper muddy substrates were found to contain the richest meiofauna and the lowest biomass. Ostracodes formed 41% of this meiofauna biomass, being more than twice as large as the nematode biomass (17%). Many of the colder water ostracodes were found to have a long life cycle (2 years).

In 1977 the Soviet tanker Tsesis struck a rock in the Asko region and

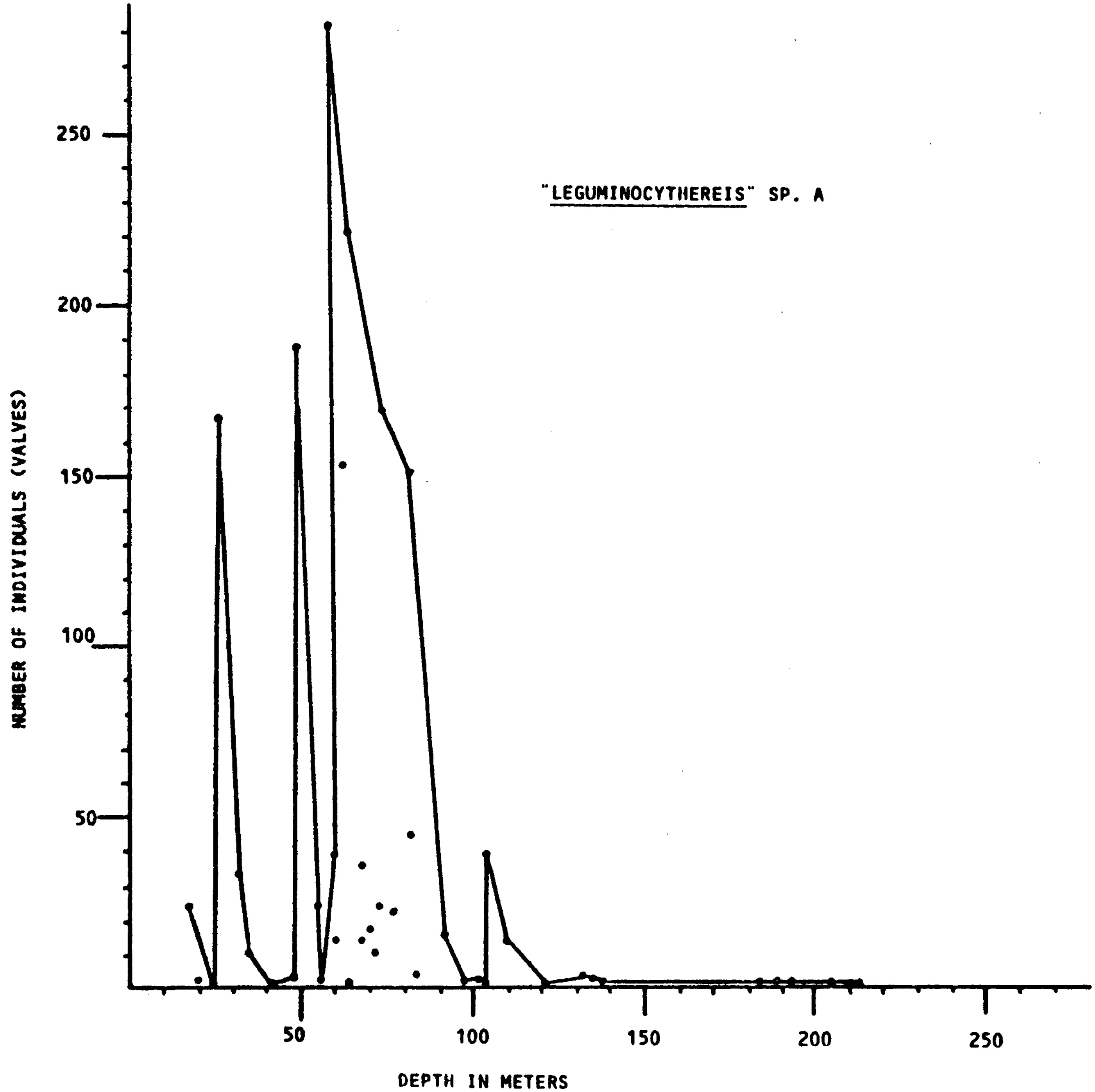


Figure 7. Absolute abundance vs. water depth of the inner-middle neritic species <u>Leguminocythereis</u> sp. A.

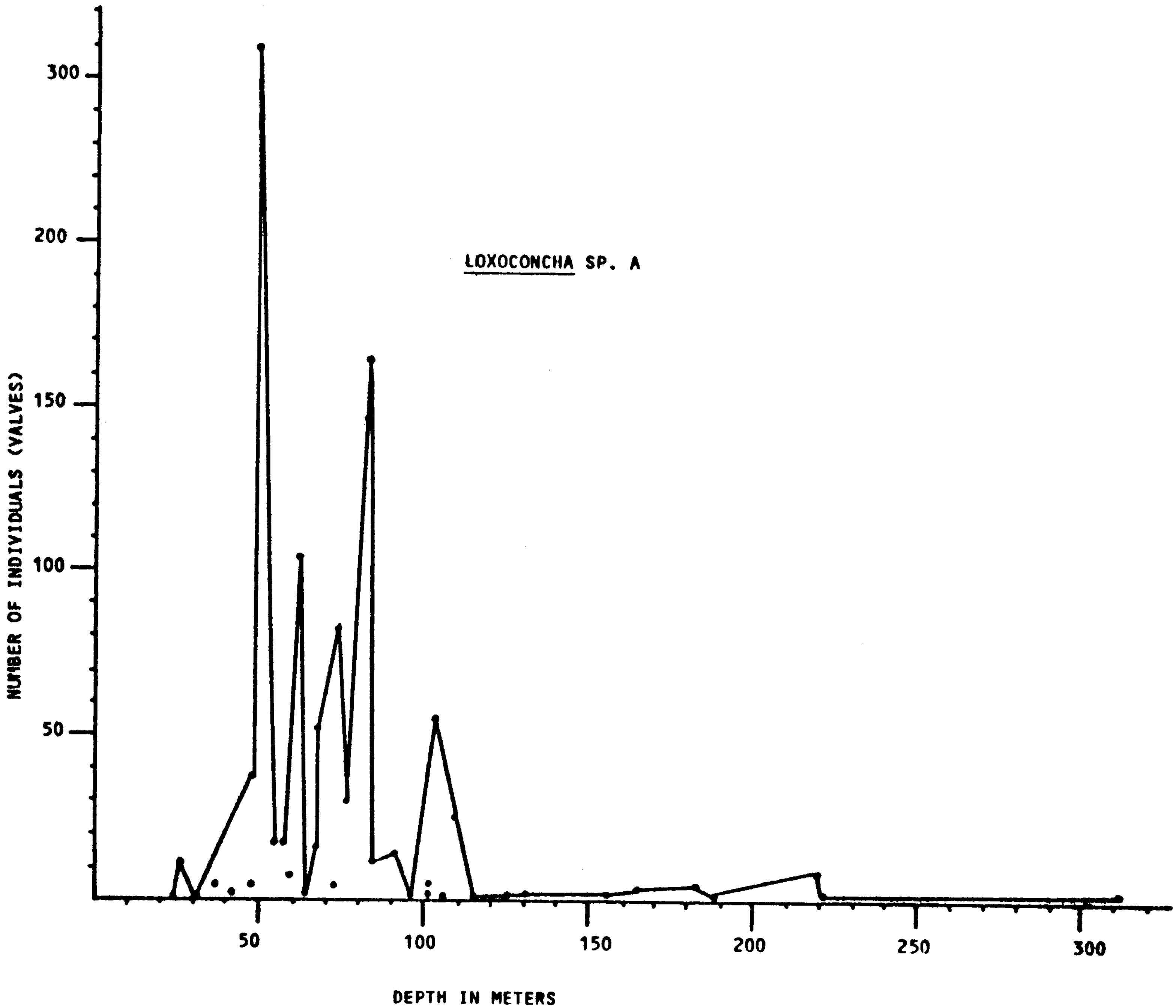


Figure 8. Absolute abundance vs. water depth of the inner-middle neritic species *Loxoconcha* sp. A.

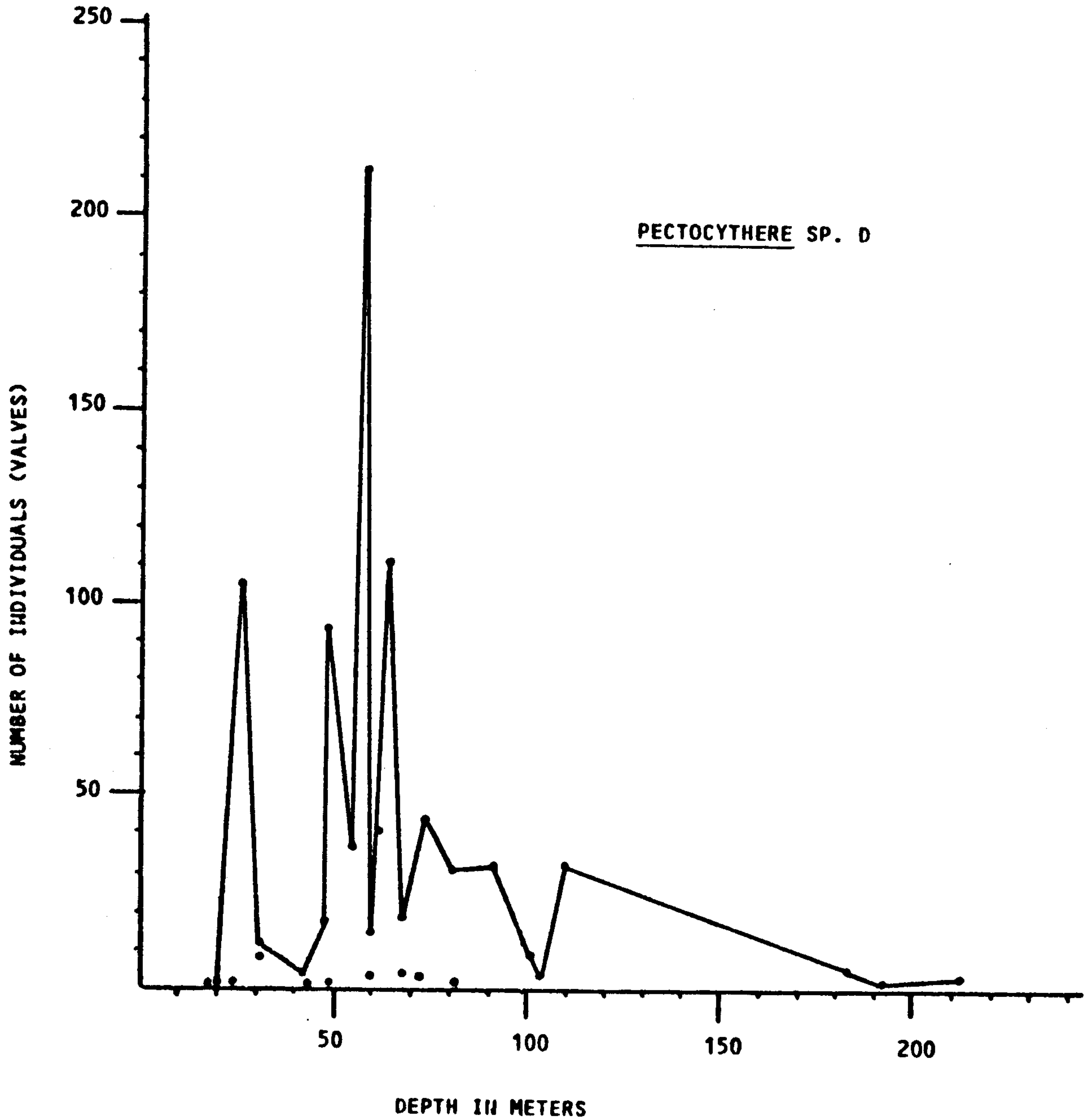


Figure 9. Absolute abundance vs. water depth of the inner-middle neritic species <u>Pectocythere</u> sp. D.

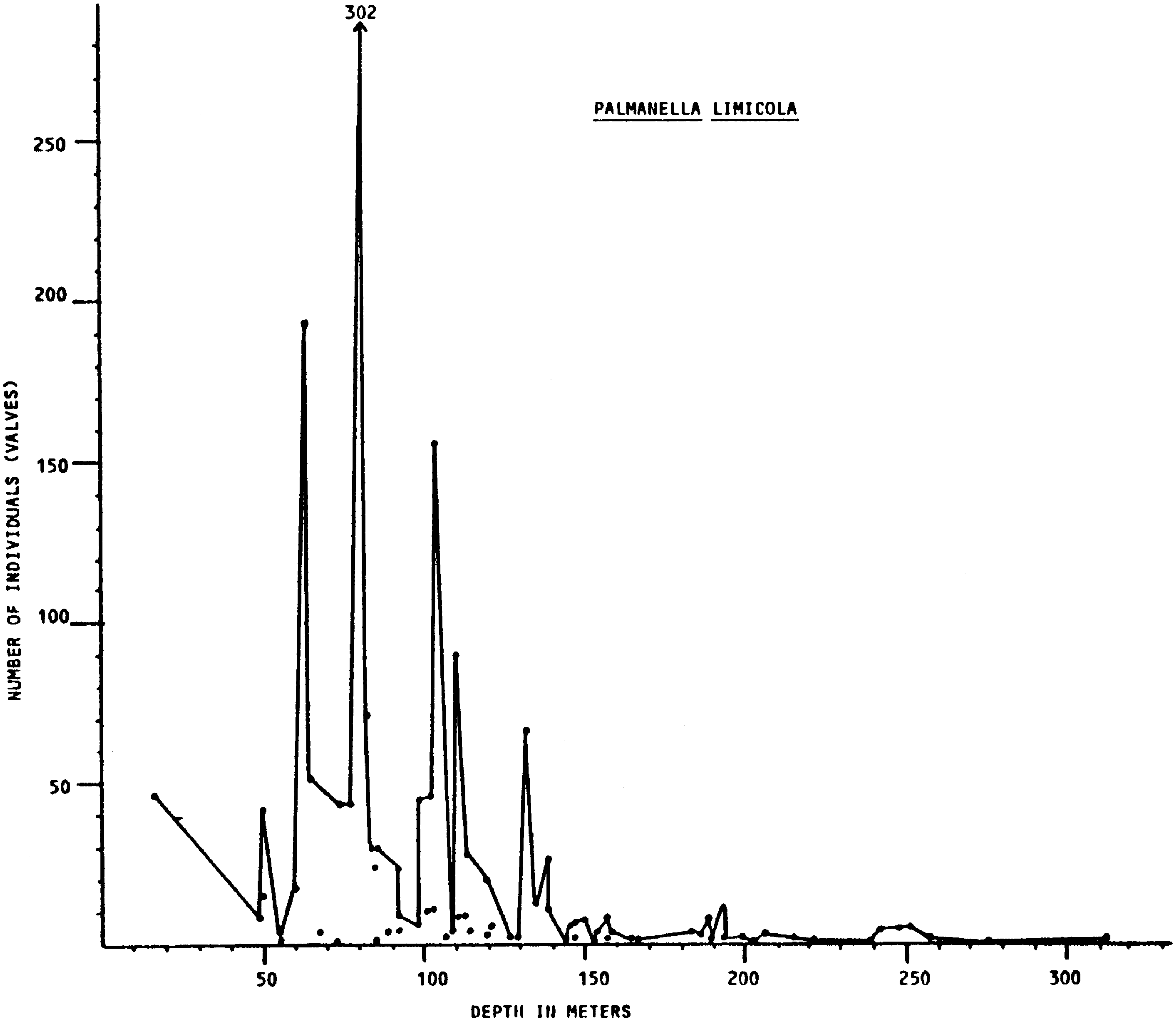


Figure 10. Absolute abundance vs. water depth of the inner-outer neritic species *Palmanella limicola*.

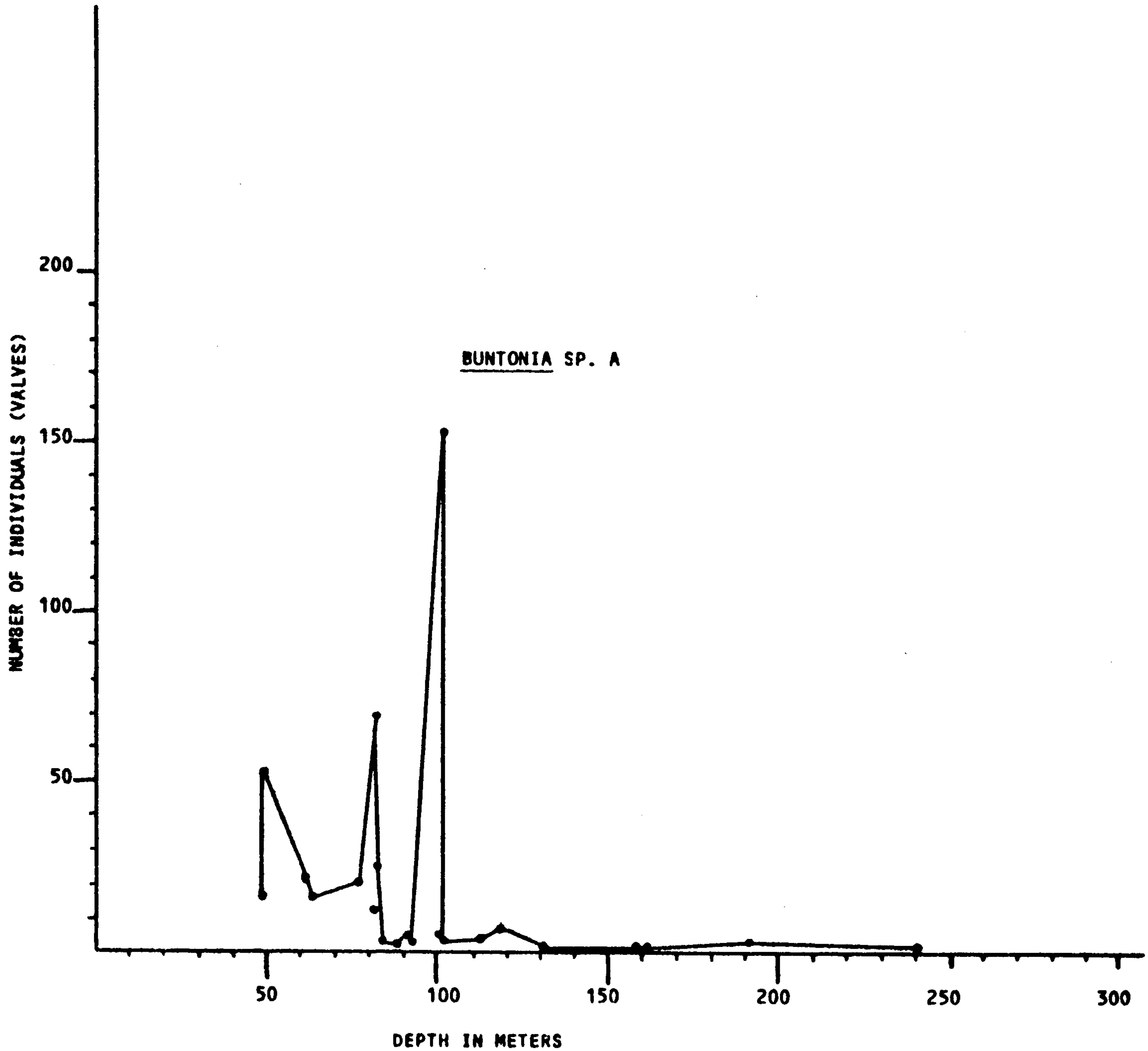


Figure 11. Absolute abundance vs. water depth of the middle neritic species *Buntonia* sp. A.

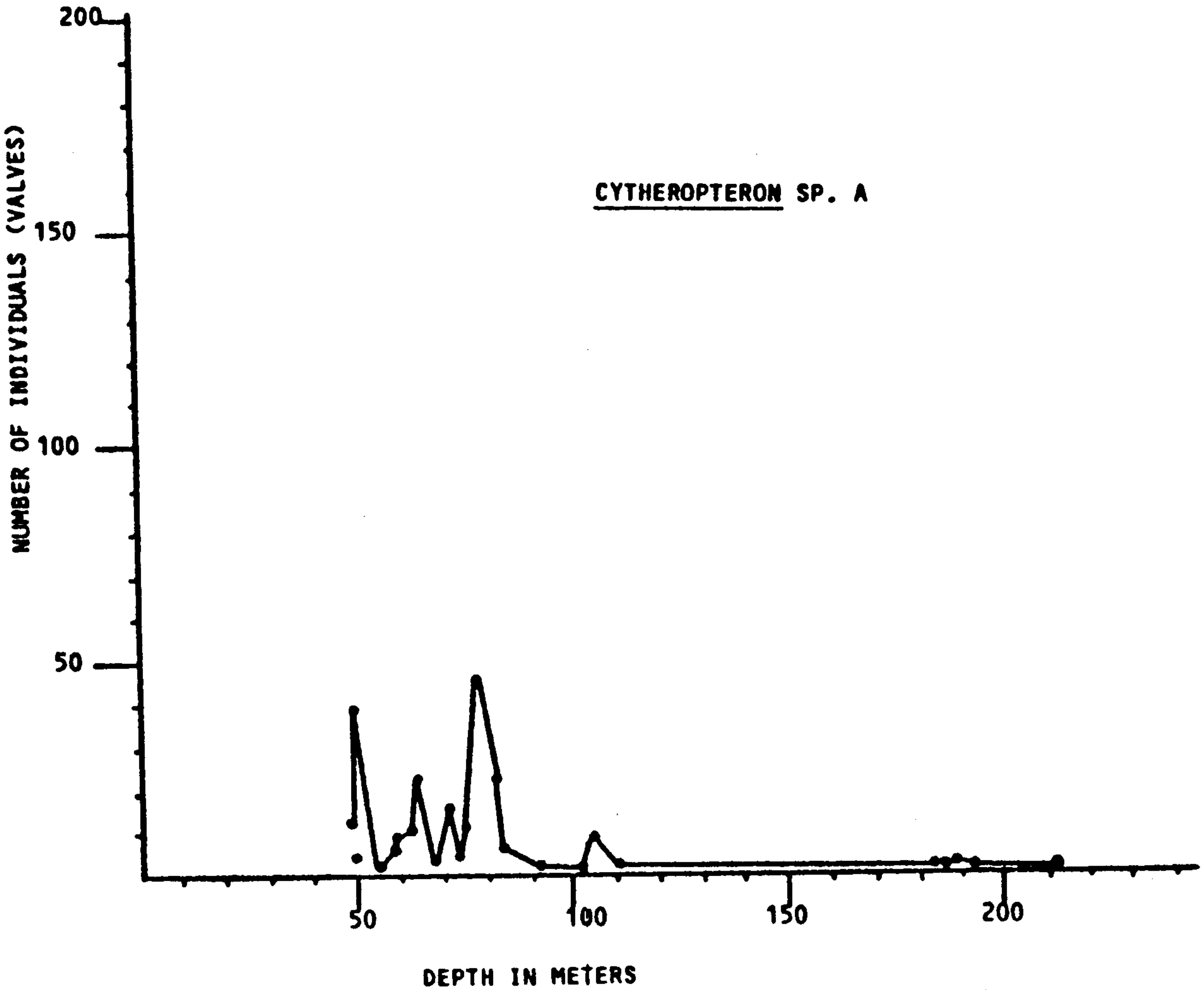


Figure 12. Absolute abundance vs. water depth of the middle neritic species Cytheropteron sp. A.

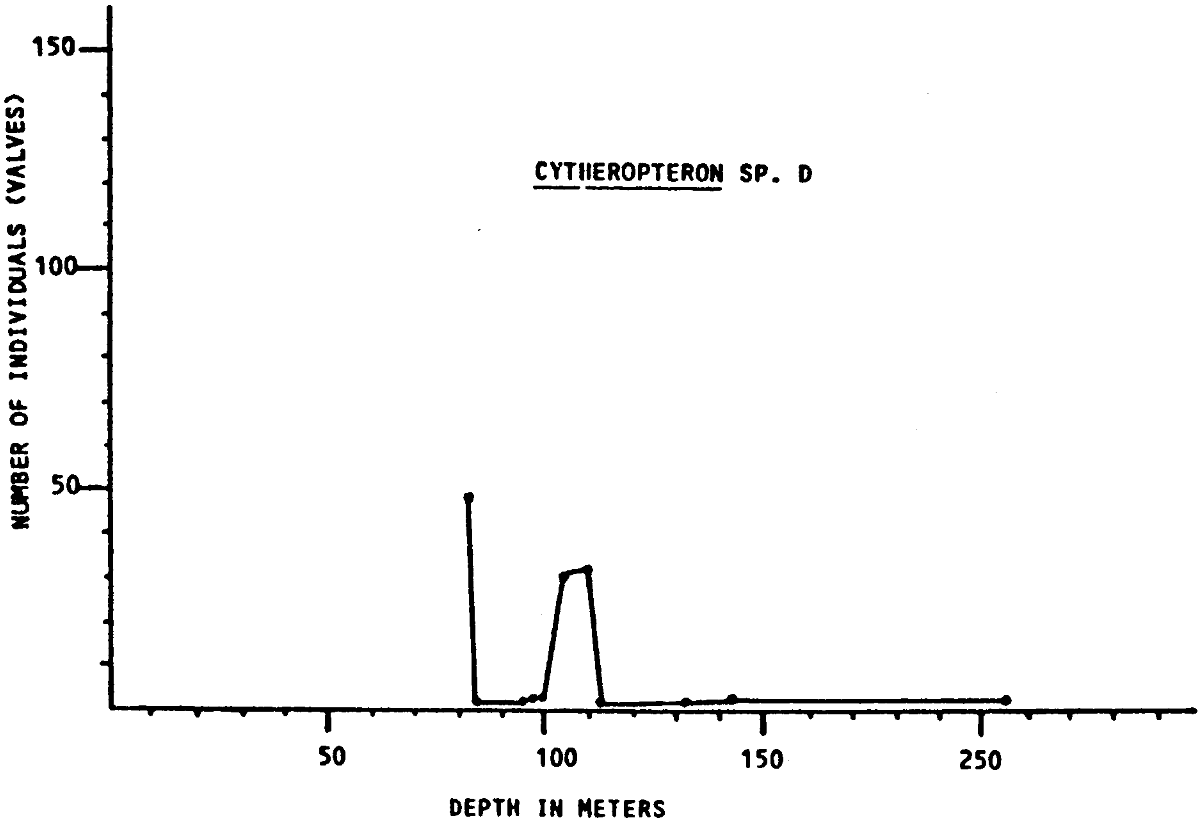


Figure 13. Absolute abundance vs. water depth of the middle neritic species *Cytheropteron* sp. D.

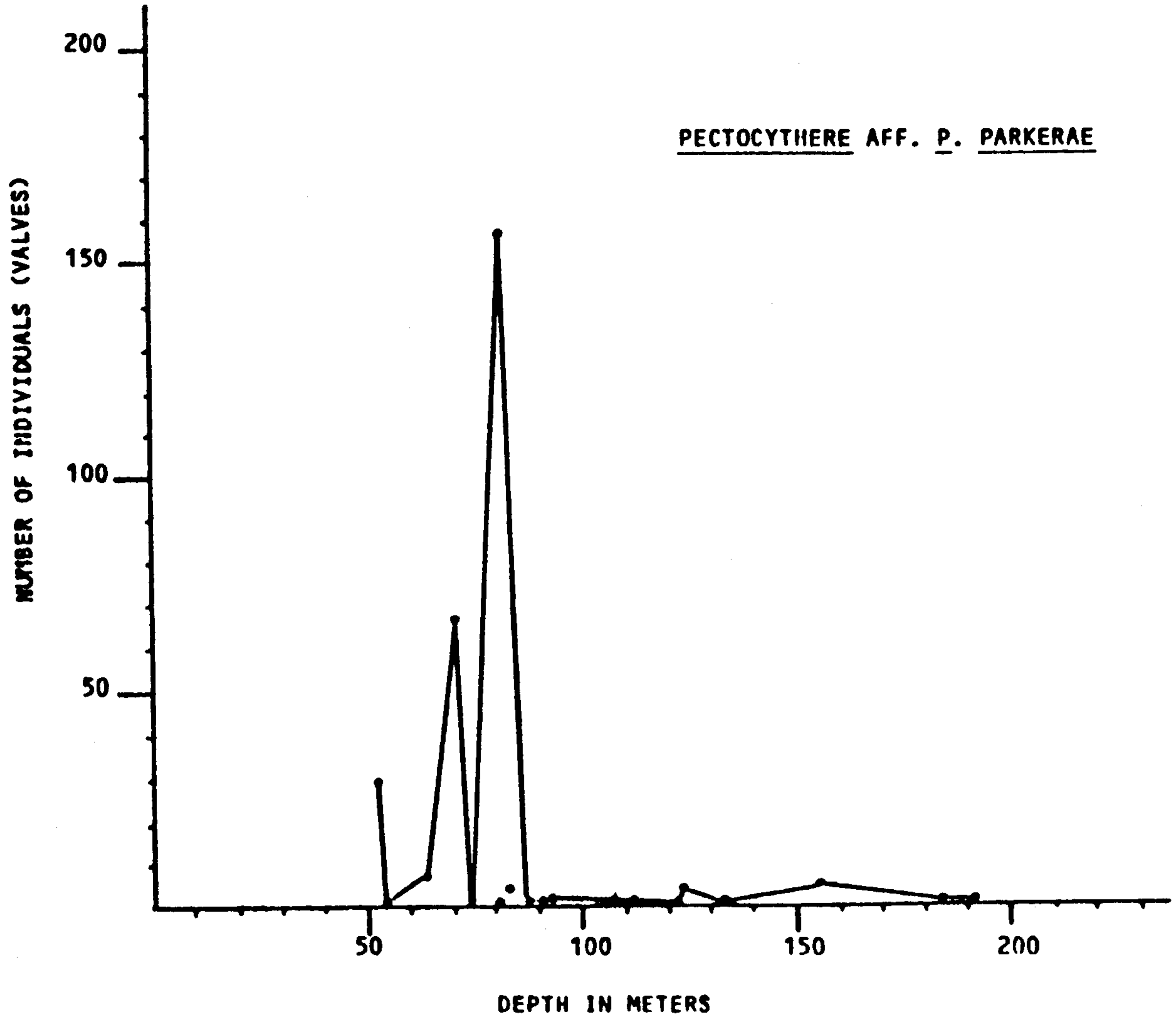


Figure 14. Absolute abundance vs. water depth of the middle neritic species Pectocythere aff. P. parkerae.

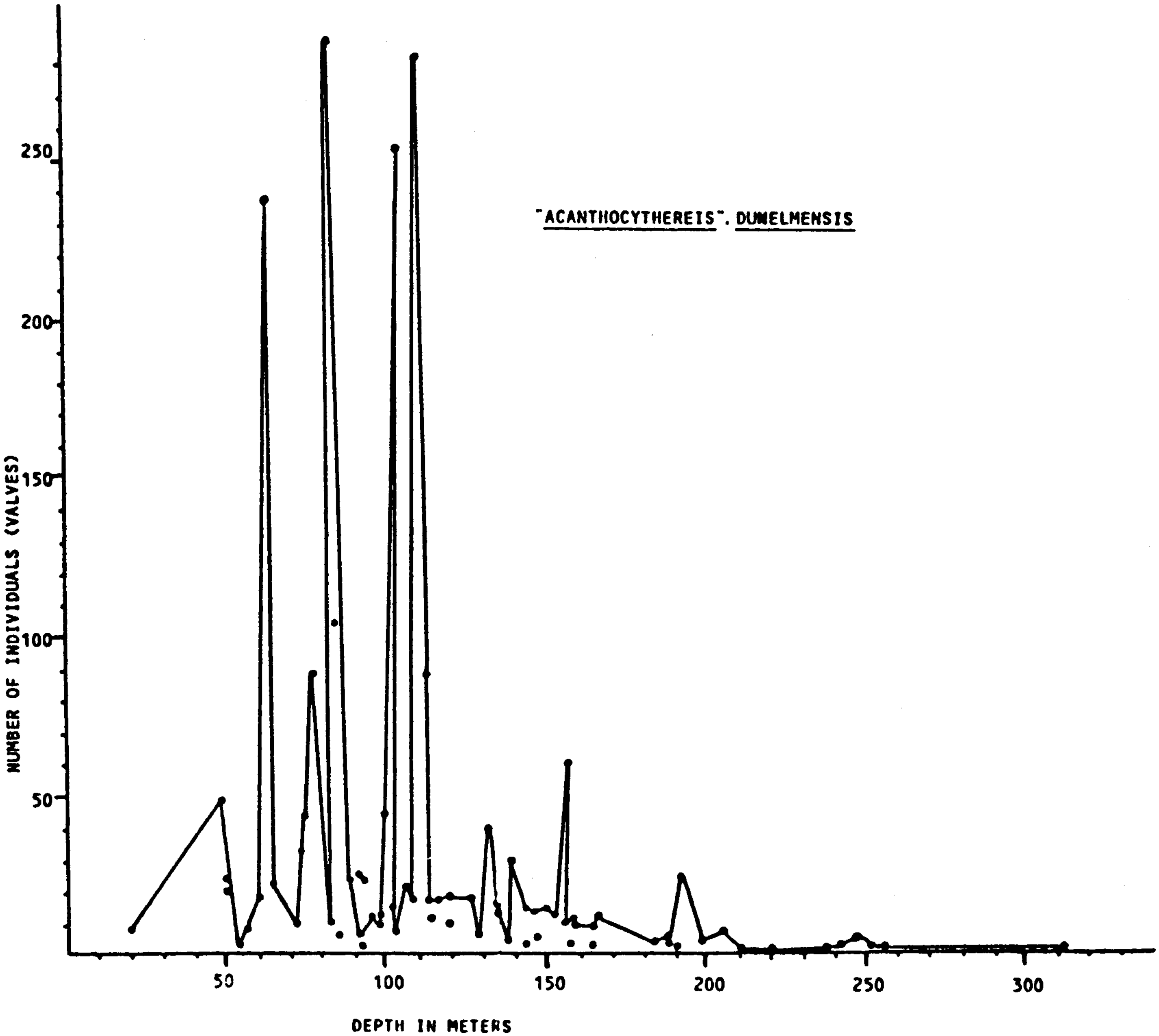


Figure 15. Absolute abundance vs. water depth of the middle-outer neritic species <u>Acanthocythereis</u> <u>dunelmensis</u>.

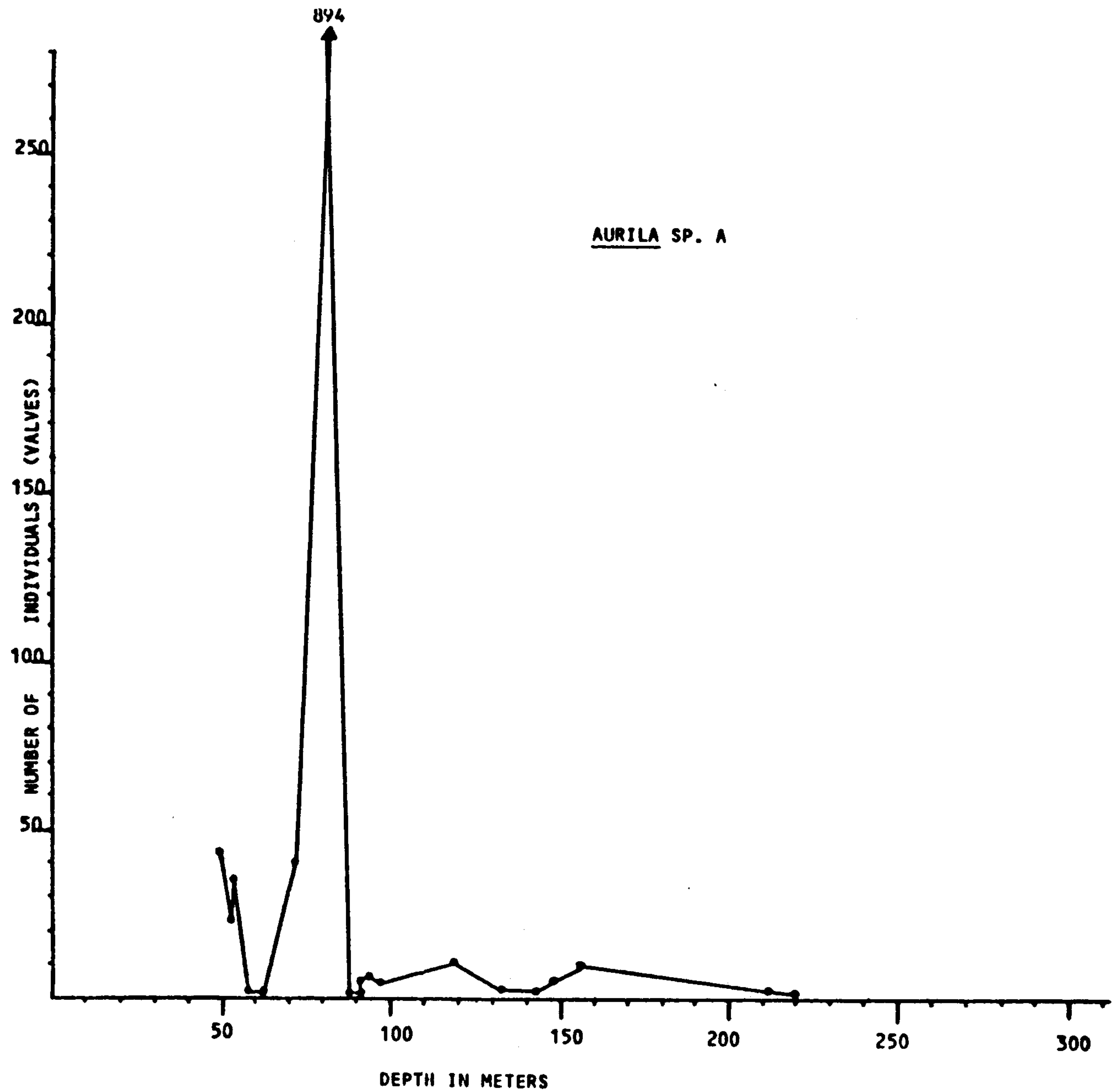


Figure 16. Absolute abundance vs. water depth of the middle-outer neritic species Aurila sp. A.

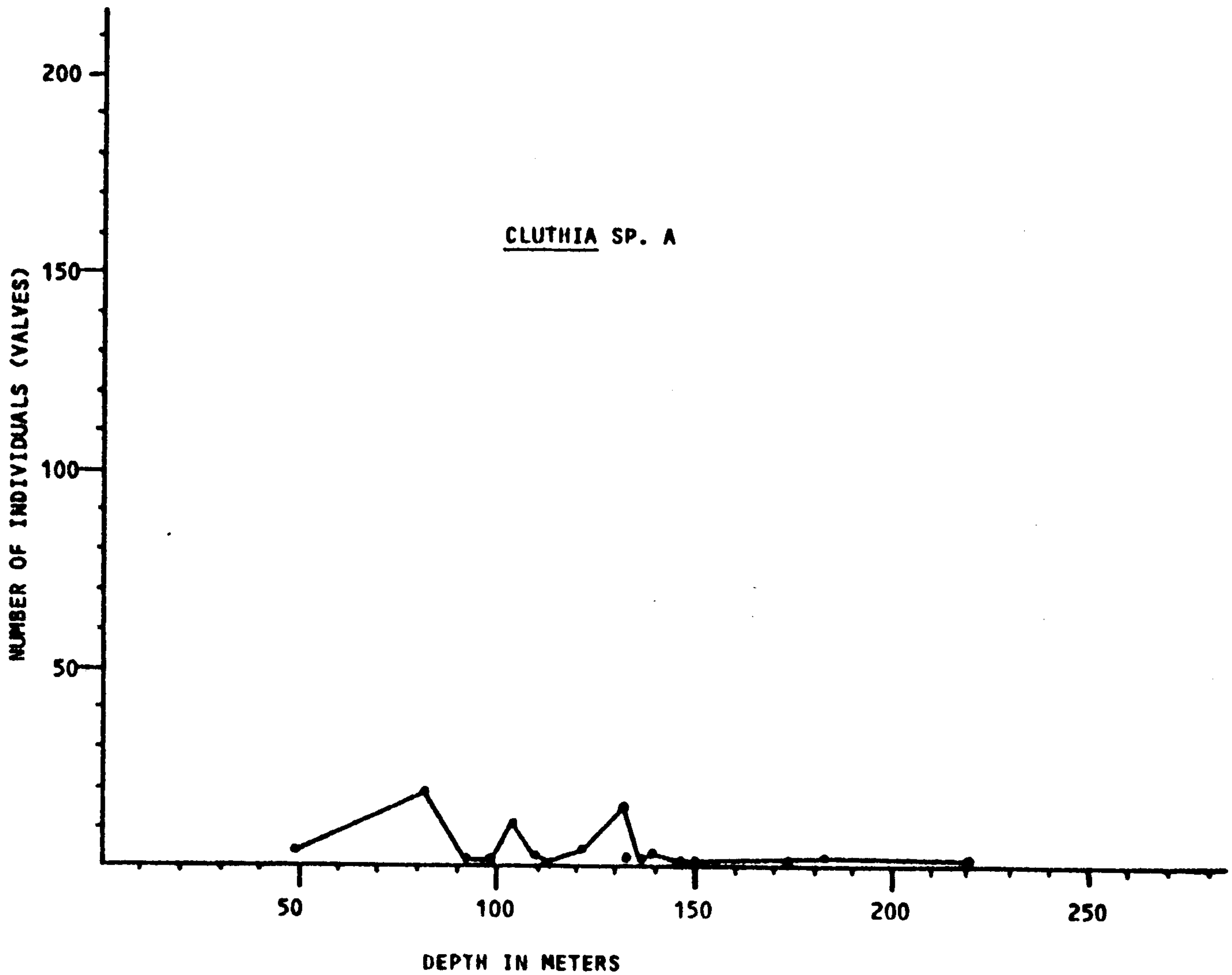


Figure 17. Absolute abundance vs. water depth of the middle-outer neritic species *Cluthia* sp. A.

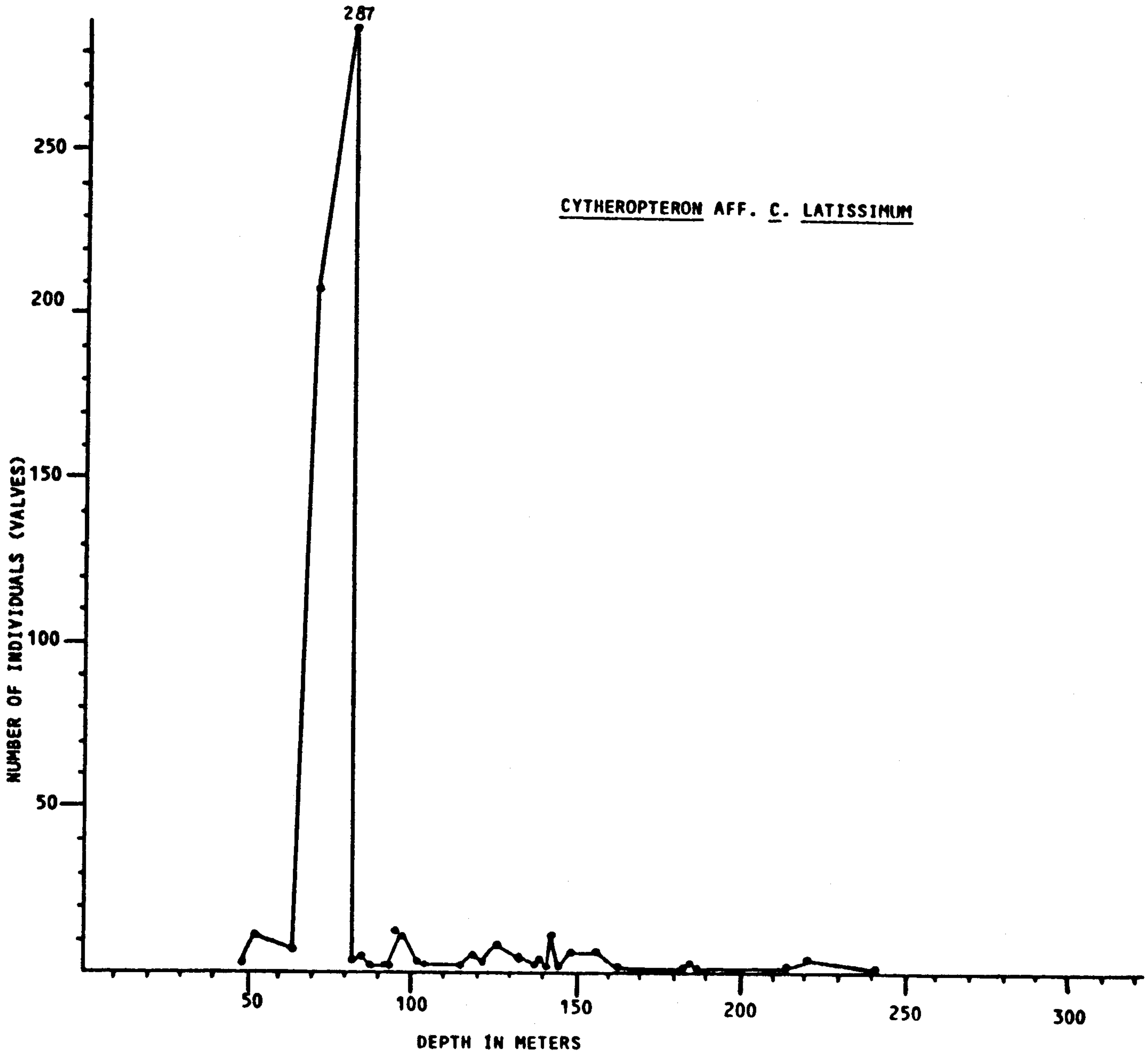


Figure 18. Absolute abundance vs. water depth of the middle-outer neritic species *Cytheropteron* aff. *C. latissimum*.

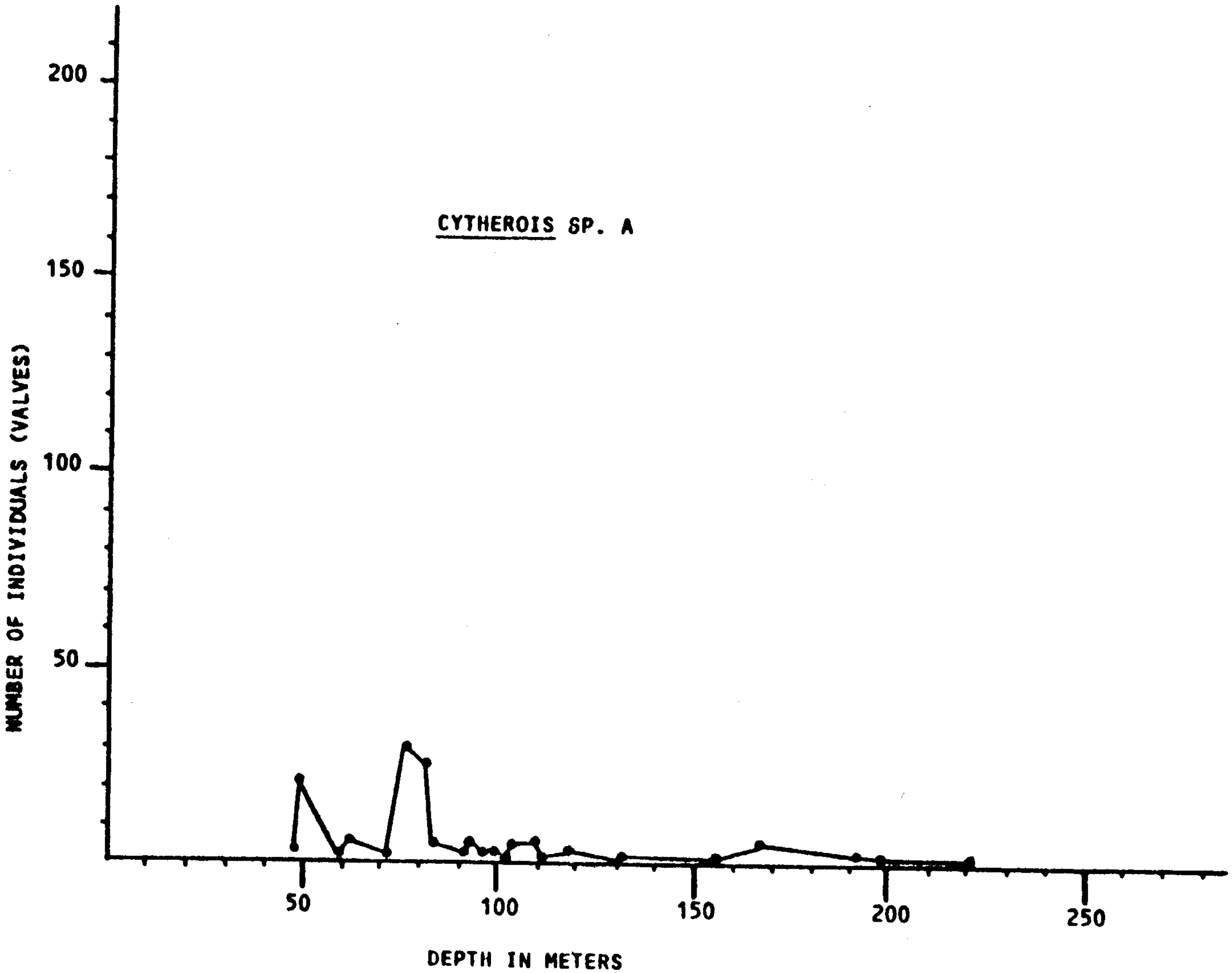


Figure 19. Absolute abundance vs. water depth of the middle-outer neritic species <u>Cytherois</u> sp. A.

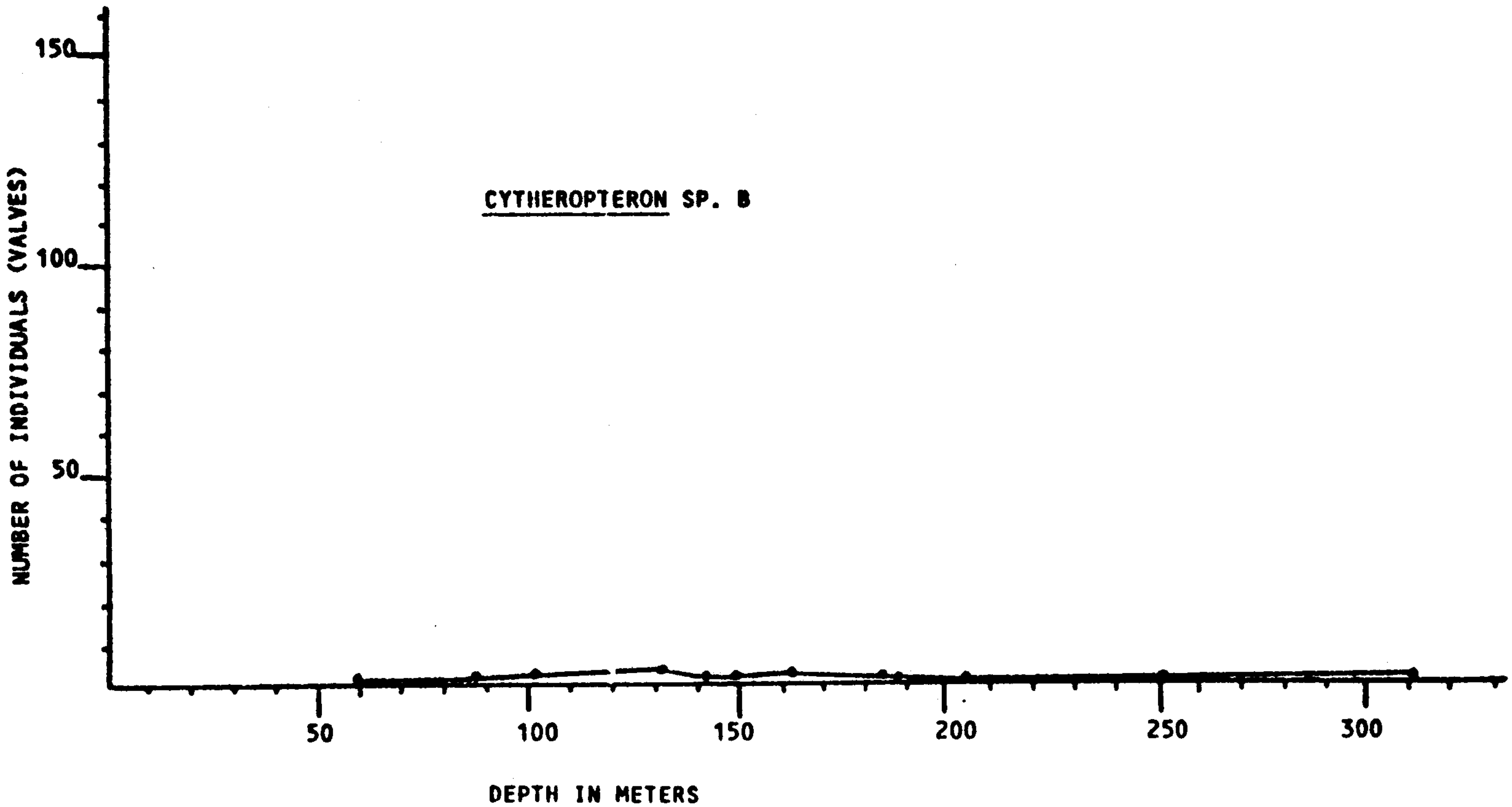


Figure 20. Absolute abundance vs. water depth of the middle-outer neritic species *Cytheropteron* sp. B.

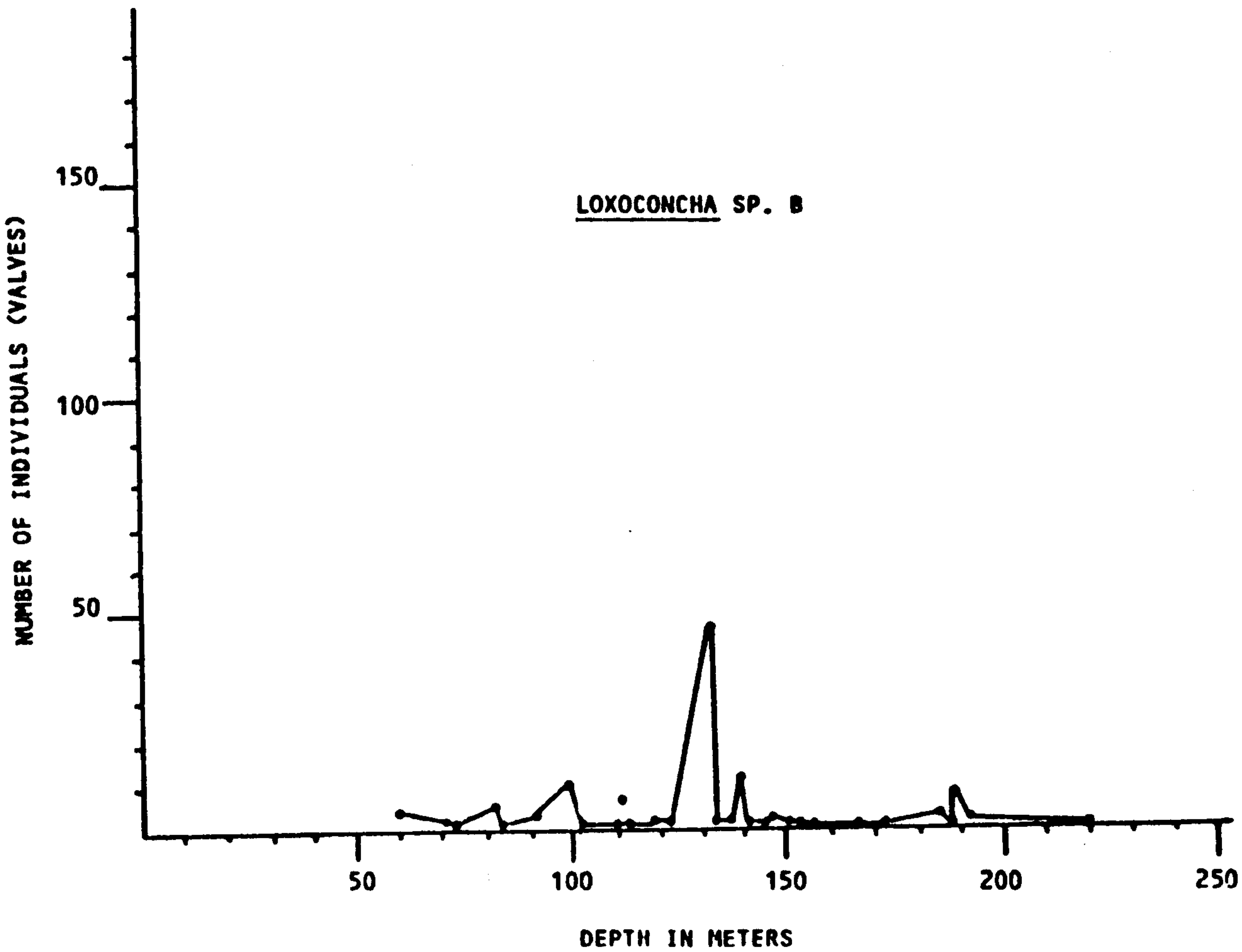


Figure 21. Absolute abundance vs. water depth of the middle-outer neritic species Loxoconcha sp. B.

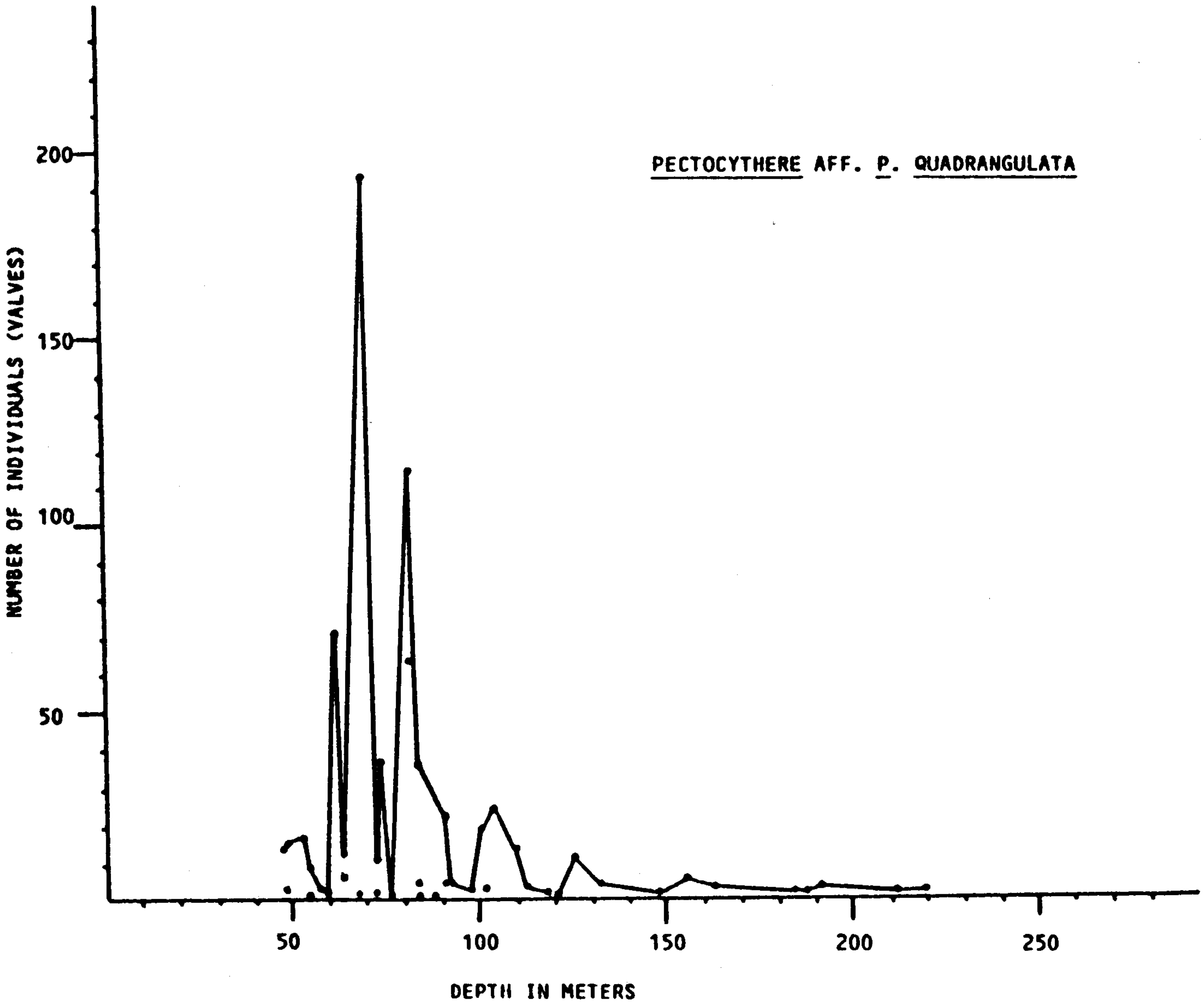


Figure 22. Absolute abundance vs. water depth of the middle-outer neritic species *Pectocythere* aff. *P. quadrangulata*.

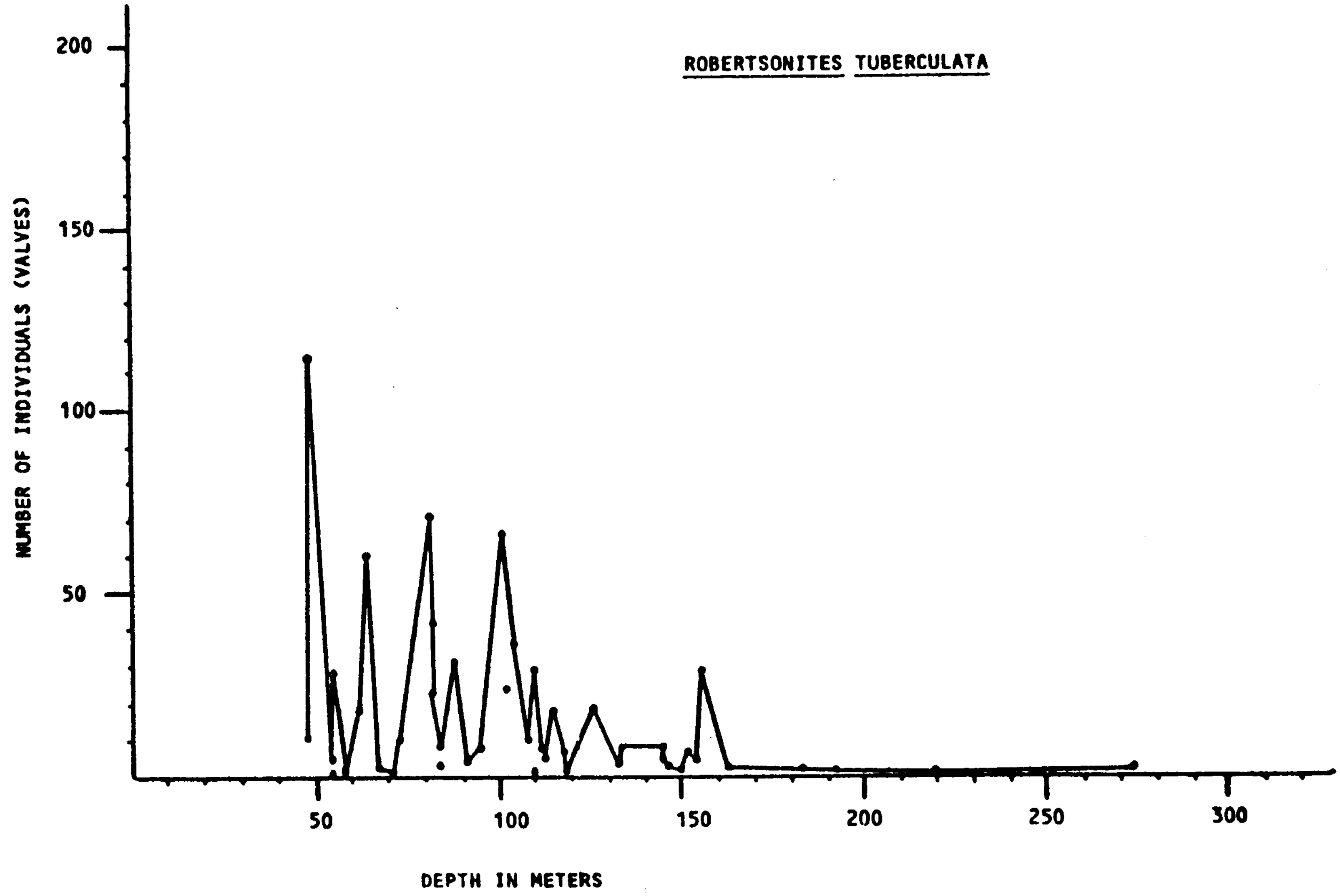


Figure 23. Absolute abundance vs. water depth of the middle-outer neritic species Robertsonites tuberculata.

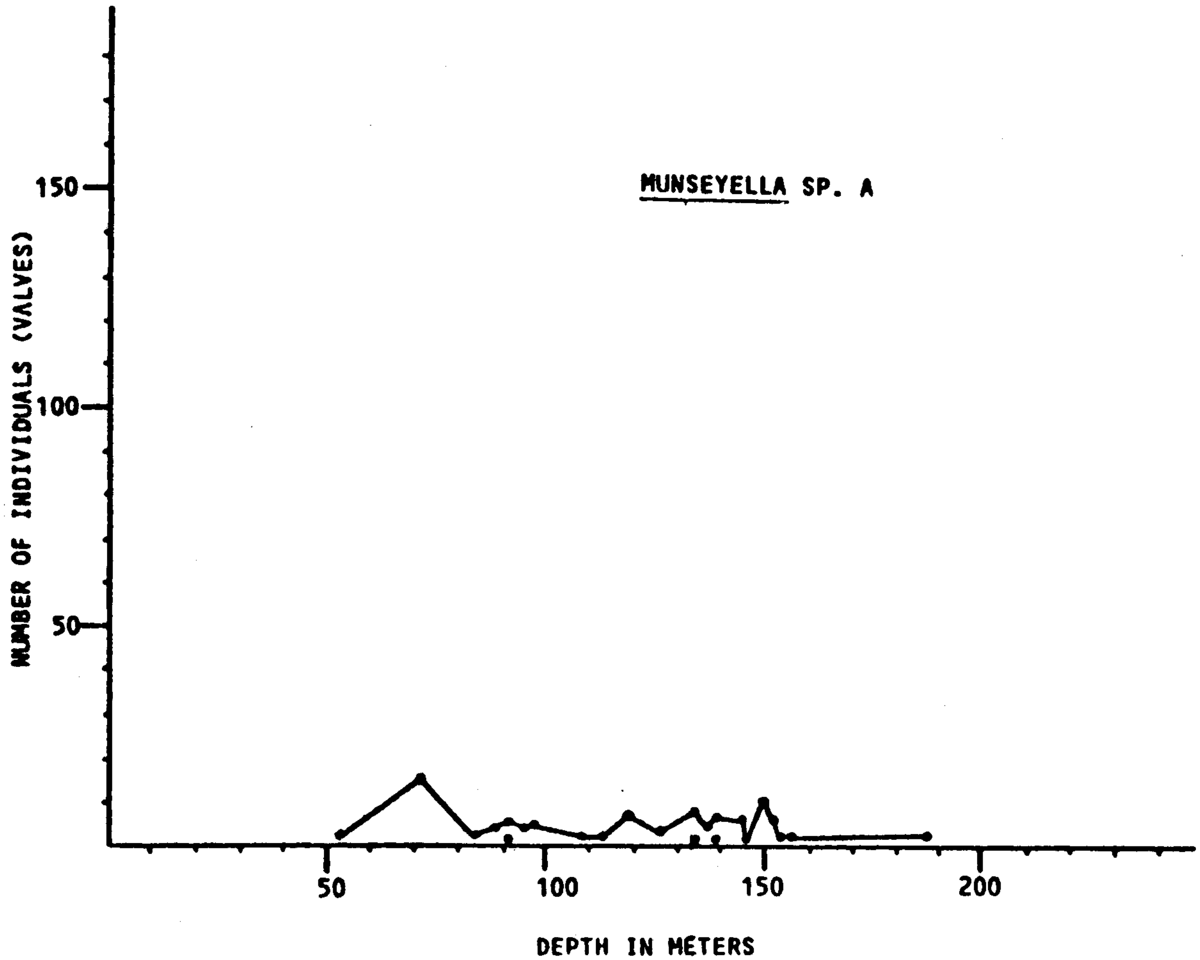


Figure 24. Absolute abundance vs. water depth of the middle-outer neritic species *Munseyella* sp. A.

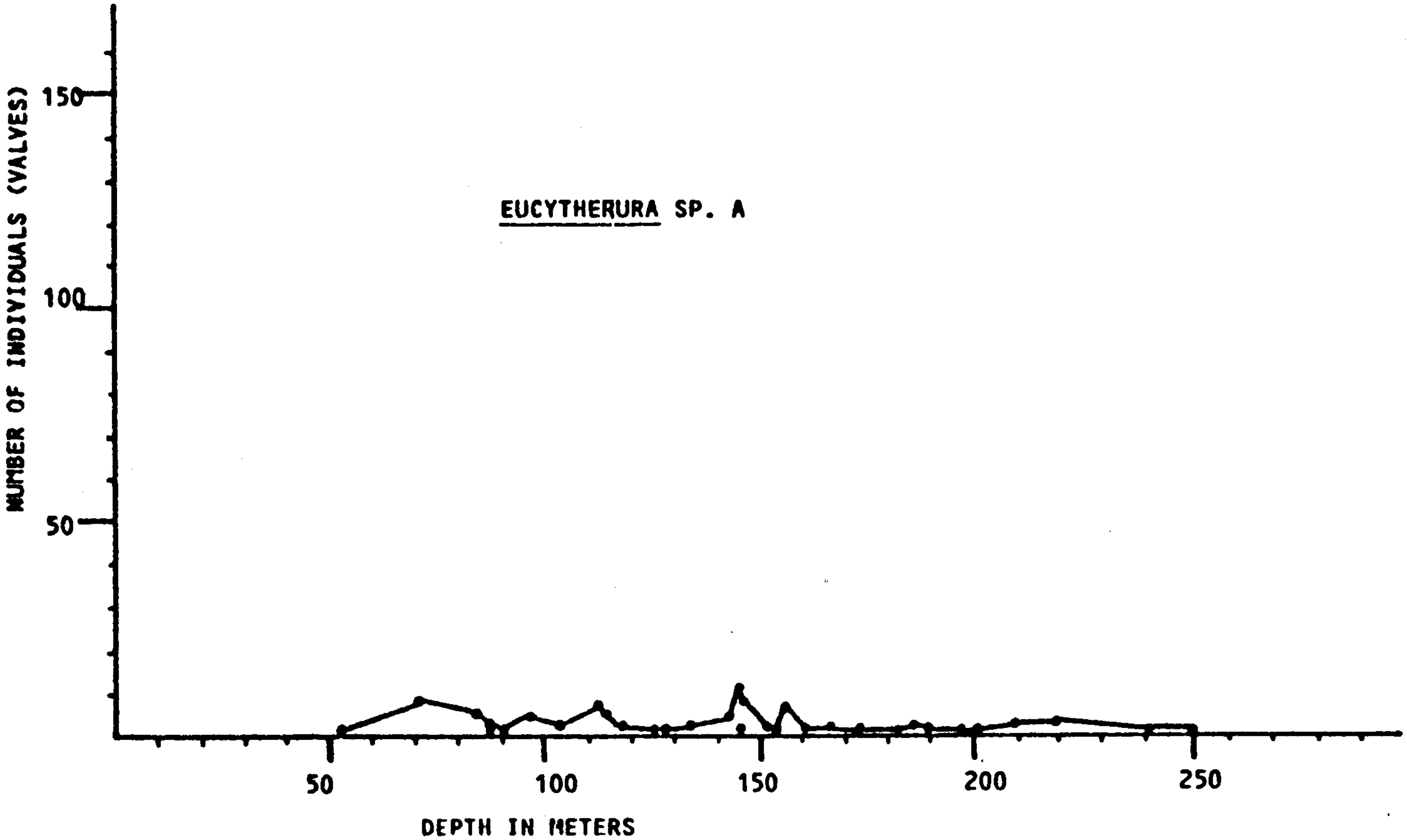


Figure 25. Absolute abundance vs. water depth of the middle-outer neritic, upper bathyal species *Eucytherura* sp. A.

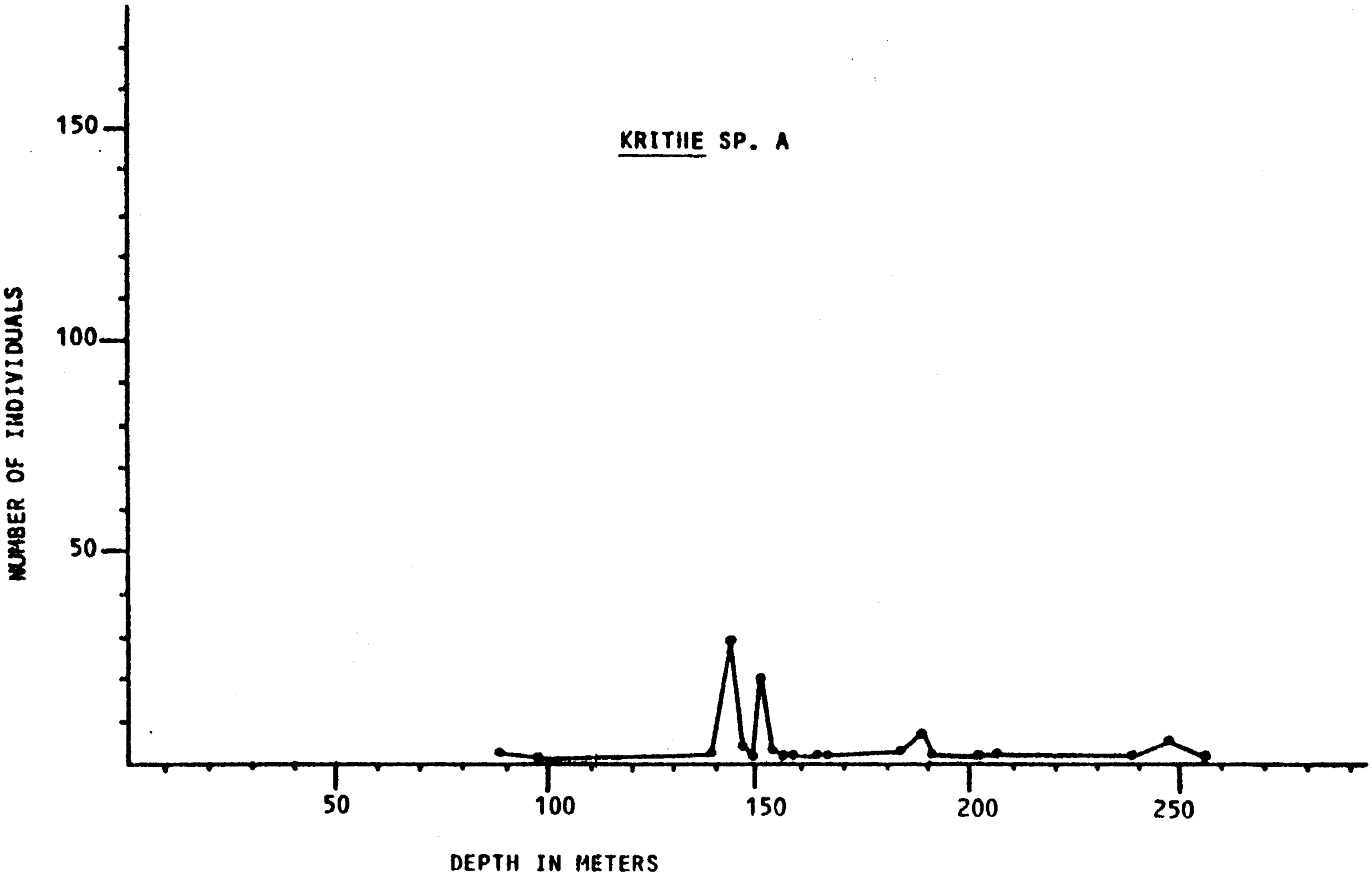


Figure 26. Absolute abundance vs. water depth of the outer neritic, upper bathyal species Krithe sp. A.

spilled a large amount of oil. Comparison of the post-spill meiofauna with the 1976 baseline provided an excellent monitor of the effects on the benthos (Kineman et al., 1980). The ostracodes showed a particular sensitivity to the oil, with a dramatic drop in abundance that can be correlated directly to the oil spill (figs. 27-29). Ostracodes are primarily benthic in nature, capable of clumsy movement in the form of short, non-sustained, "swimming" motions and slow crawling through the sediment. As such, they cannot rapidly escape from an environmental catastrophe such as an oil spill as can more mobile crustaceans (amphipods, for example).

Continued sampling of the Asko bottom sediments up to 10 months following the spill showed selected recovery among the macrofauna and meiofauna. The ostracodes, however, continued showing low abundance throughout this interval, revealing no evidence of recovery. Because of the long life cycle (up to 2 years) and non-migrating behaviour of the cold water ostracodss, the effects of the Tsesis oil spill on the soft bottoms remained for at least two years.

In the Gulf of Alaska, active longshore currents, storm- and wind-driven waves, and tidal activity would cause rapid dispersal of any oil spill in water depths of less than 50 meters. However, in water greater than 50 meters, the substrate is formed of fine-grained silt and clayey silt, with a large meiofauna present. Oil reaching these environments would cause a similar devastating effect on the ostracode populations such as occurred at Asko, especially to the species that are more environmentally restricted (table 3).

The baseline datum that has been established for the Gulf of Alaska ostracodes includes species diversity and relative abundance, as well as detailed geographic distributions of the species. Any oil spill that affects the bottom sediments will profoundly affect the ostracode populations, as

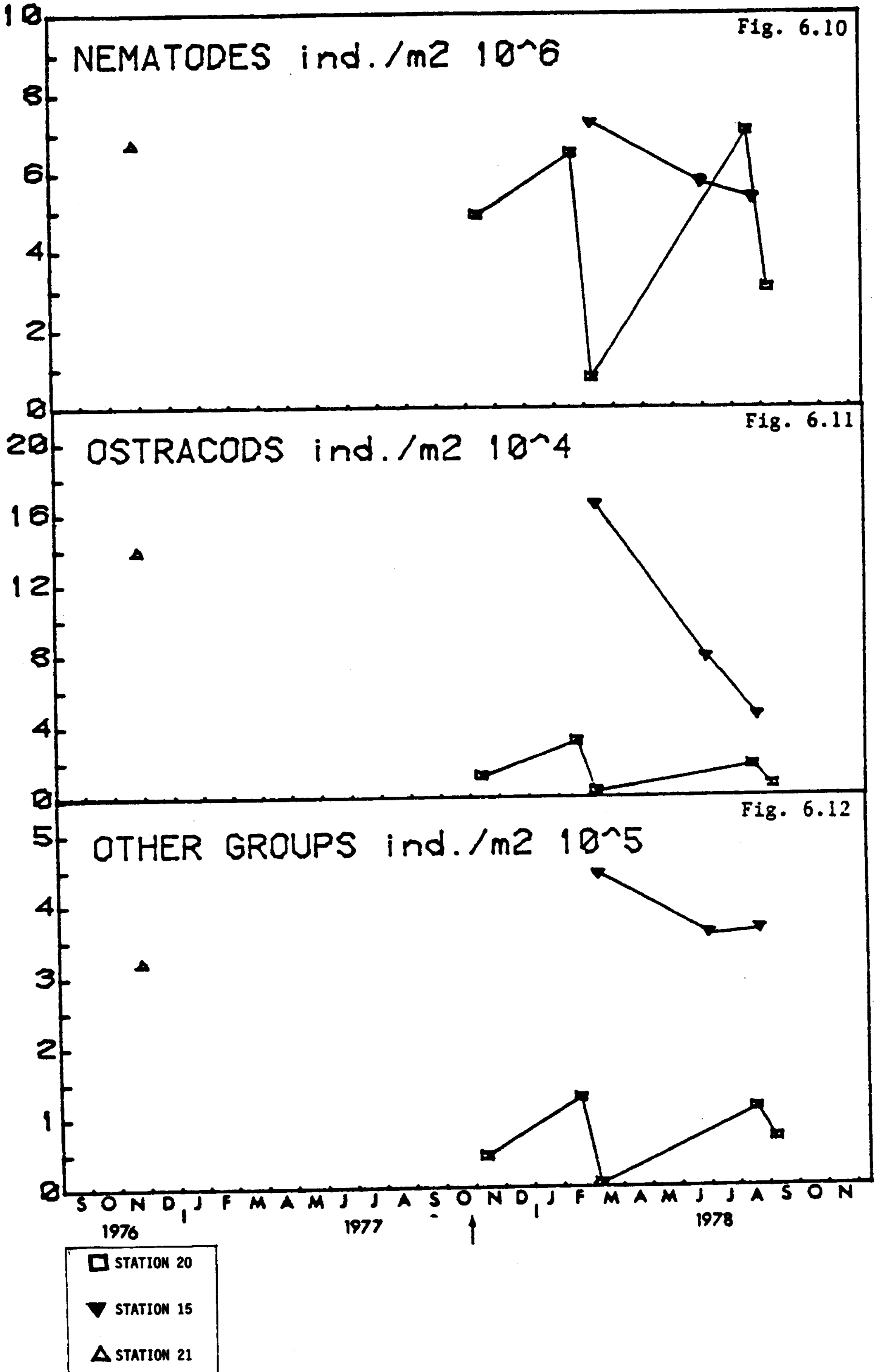


Figure 27. Abundance of nematodes, ostracodes and other groups at Station 15, Asko, showing the drop in abundance with the <u>Tsesis</u> oil spill (from Kineman, et al., 1980)

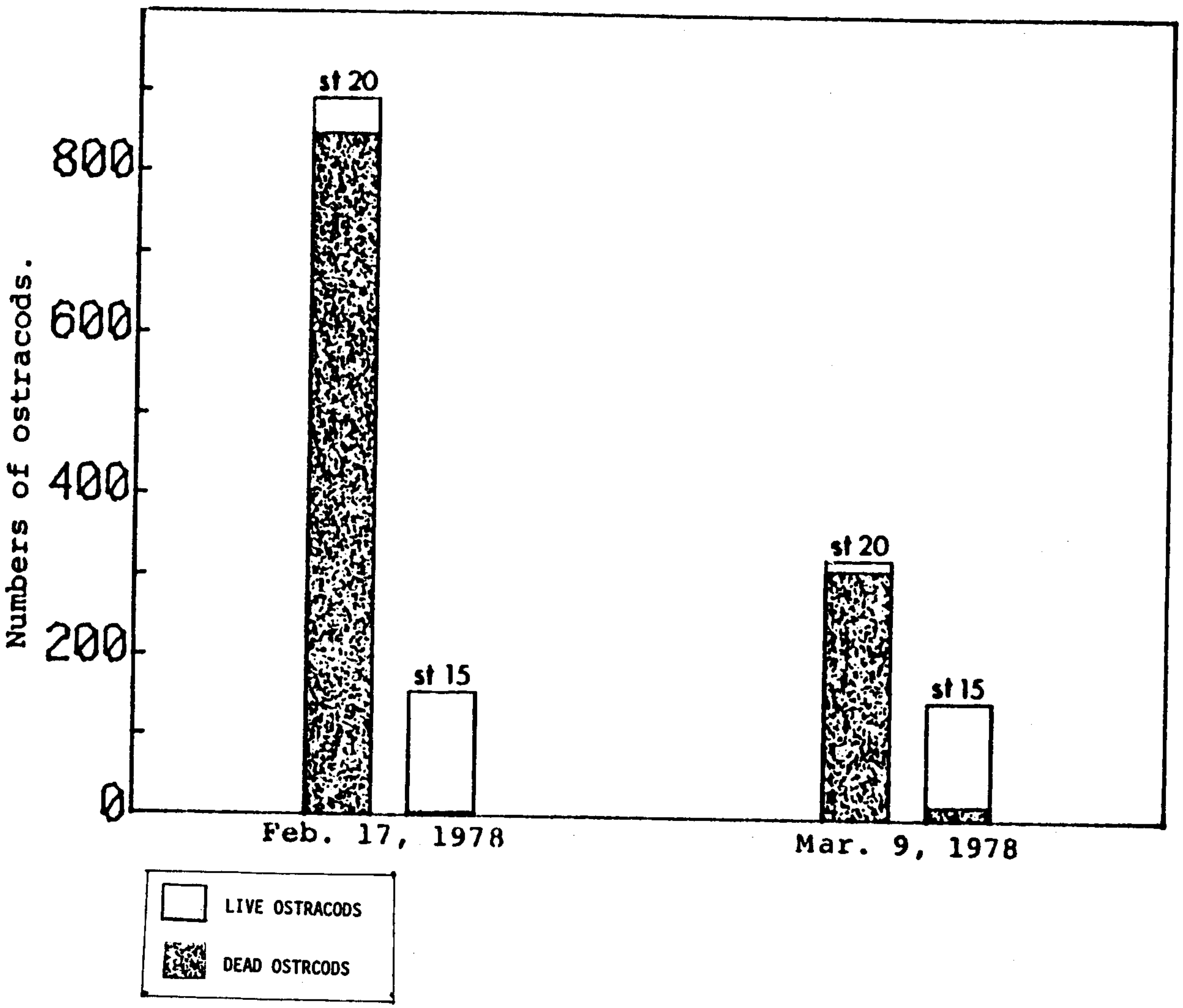


Figure 28. Number of live vs. dead ostracodes before (Feb. 17) and after (March 9) the <u>Tsesis</u> oil spill (from Kineman, et al., 1980)

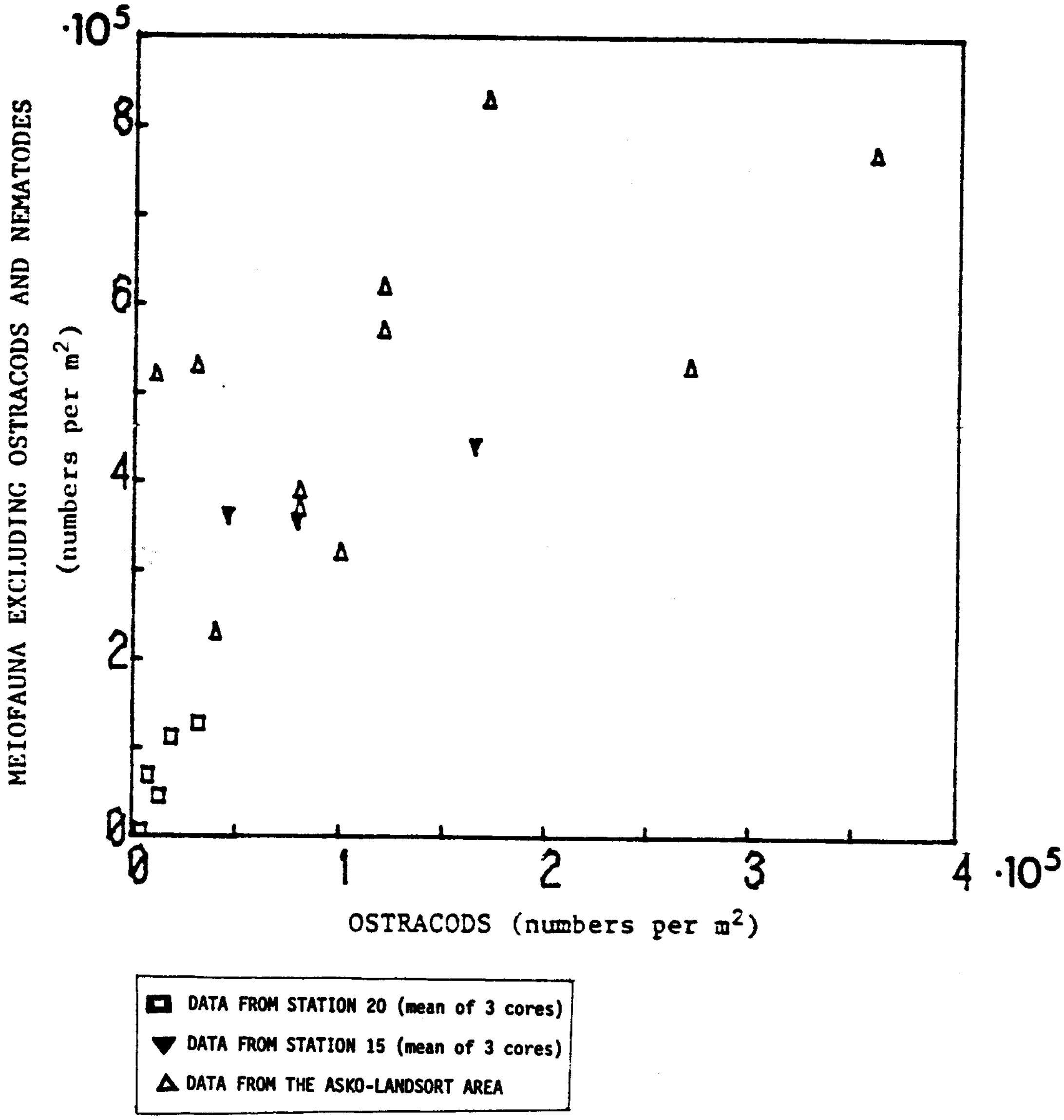


Figure 29. Abundance of ostracodes vs. abundance of other meiofauna groups (from Kineman, et al., 1980)

shown by Kineman et al. (1980). The ostracode species composition and relative abundances of the species will provide a sensitive monitor for adverse oil spill effects on the benthic environment, as well as providing a guide to the total re-establishment of the pre-spill benthic community structure.

REFERENCES

Ankar, S. and Elmgren, R., 1976, The Benthic Macro- and Meiofauna of the Asko-Landsort Area (Northern Baltic Proper), A Stratified Random Sampling Survey: Contrib. Asko Lab., Univ. Stockholm, No. 11, 115 p.

Armentrout, J.M., 1980, Surface Sediments and Associated Faunas of Upper Slope, Shelf and Bay Environments Yakataga-Yakutat area, northern Gulf of Alaska, in Field, M.E., et. al., eds., Quaternary Depositional Environments of the Pacific Coast, Pacific Coast Paleogeography Symposium 4: Pacific Section Soc. Econ. Paleontol. and Mineral., Los Angeles, p. 241-255.

Crouch, R.W., 1949, Pliocene Ostracoda from southern California: Jour. Paleontology, v. 23, p. 594-599.

Echols, R.J. and Armentrout, J.M., 1980, Holocene Foraminiferal Distribution Patterns on the Shelf and Slope, Yakataga-Yakutat area northern Gulf of Alaska, in Field, M.E., et. al., eds., Quaternary Depositional Environments of the Pacific Coast, Pacific Coast Paleogeography Symposium 4: Pacific Section Soc. Econ. Paleontol. and Mineral., Los Angeles, p. 281-303.

Elofson, O., 1941, Marine Ostracoda of Sweden with Special Consideration of the Skagerrak: translation of Zool. Bidrag. Uppsala, 1941, by Israel Program for Scientific Translation, Jerusalem, 1969.

Gunter, G., 1957, Temperature, in Hedgpeth, J.W., ed., Ecology, v. 1, of

Treatise on marine ecology and paleoecology: Geol. Soc. America Mem. 67, p. 159-184.

Hanai, T., 1957a, Studies on the Ostracoda from Japan; I. Subfamily Leptocytherinae n. subfamily: Tokyo Univ. Fac. Sci. Jour., Sec. 2, v. 10, p. 431-468.

Hanai, T., 1957b, Studies on the Ostracoda from Japan; II. Subfamily Pectocytherinae n. subfamily: Tokyo Univ. Fac. Sci. Jour., Sec. 2,v. 10, p. 469-482.

Hanai, T., 1957c, Studies on the Ostracoda from Japan; III. Subfamilies Cytherurinae G.W. Muller (emend. G.O. Sars, 1925) and Cytheropterinae n. subfamily: Tokyo Univ. Fac. Sci. Jour., Sec. 2, v. 11, p. 11-36.

Hanai, T., 1959a, Studies on the Ostracoda from Japan; IV. Family Cytherideidae Sars, 1925: Tokyo Univ. Fac. Sci. Jour., Sec. 2, v. 11, p. 291-308.

Hanai, T., 1959b, Studies on the Ostracoda from Japan; V. Subfamily Cytherinae Dana, 1952 (emend.): Tokyo Univ. Fac. Sci. Jour., Sec. 2, v. 11, p. 409-418.

Hanai, T., 1961, Spinileberis, a new genus of Ostracoda from the Pacific: Palaeontol. Soc. Japan Trans. and Proceed., n. ser., no. 44, p. 167-170.

Hanai, T., 1970, Studies on the Ostracod Subfamily Schizocytherinae Mandelstam: Jour. Paleontology, v. 44, p. 693-729.

Hazel, J.E., 1962, Two new hemicytherid ostracods from the Lower Pleistocene of California: Jour. Paleontology, v. 36, p. 822-826.

Hazel, J.E., 1967, Classification and Distribution of the Recent Hemicytheridae and Trachyleberididae (Ostracoda) Off Northeastern North America: U.S. Geol. Survey Professional Paper 564, 49 p.

Hazel, J.E., 1970a, Atlantic Continental Shelf and Slope of the United States - Ostracode Zoogeography in the Southern Nova Scotian and Northern Virginian Faunal Provinces: U.S. Geological Survey Professional Paper 529-E, p. E1-E21.

Hazel, J.E., 1970b, Binary Coefficients and Clustering in Biostratigraphy: Geol. Soc. America Bulletin, v. 81, p. 3237-3252.

Hazel, J.E., 1977, Use of Certain Multivariate and Other Techniques in Assemblage Zonal Biostratigraphy: Examples Utilizing Cambrian, Cretaceous, and Tertiary Benthic Invertebrates, in Kauffman, E.G. and Hazel, J.E., eds., Concepts and Methods of Biostratigraphy: Dowden, Hutchinson and Ross, Inc., Stroudsburg, Pa., p. 187-212.

Hutchins, L.W., 1947, The bases for temperature zonation in geographical distribution: Ecological Monographs, v. 17, p. 325-335.

Ishizaki, K., 1966, Miocene and Pliocene ostracodes from the Sendai area, Japan: Tohoku Univ., Sci. Rept., 2nd ser. (Geology), v. 37, no. 2, p. 131-163.

Ishizaki, K., 1968, Ostracodes from Uranouchi Bay, Kochi Prefecture, Japan: Tohoku Univ., Sci. Rept., 2nd ser. (Geology), v. 40, no. 1, p. 1-45.

Ishizaki, K., 1969, Ostracodes from Shinjiko and Nakanoumi, Shimane Prefecture, Western Honshu, Japan: Tohoku Univ., Sci. Rept., 2nd ser. (Geology), v. 41, no. 2, p. 197-224.

Ishizaki, K., 1971, Ostracodes from Aomori Bay, Aomori Prefecture, northeast Honshu, Japan: Tohoku Univ., Sci. Rept., 2nd ser. (Geology), v. 43, no. 1, p. 59-97.

Juday, C., 1907, Ostracoda of the San Diego region; II. Littoral Forms: Calif. Univ. Pubs. Zoology, v. 3, p. 135-156.

Kineman, J.J., Elmgren, R. and Hansson, S. (eds.), 1980, The Tsesis Oil Spill: U.S. Dept. Commerce, National Oceanic and Atmospheric

Administration, Outer Continental Shelf Environmental Assessment Program, 296 p.

Kinne, O., 1963, The effects of temperature and salinity on marine and brackish water animals; Part 1, Temperature, in Barnes, H., ed., Oceanography and marine biology - An annual review, v. 1: London, George Allen and Unwin, p. 301-340.

LeRoy, L.W., 1943a, Pleistocene and Pliocene Ostracoda of the coastal region of southern California: Jour. Paleontology, v. 17, p. 354-373.

LeRoy, L.W., 1943b, Name revisions of some Tertiary Ostracodes: Jour. Paleontology, v. 17, p. 629.

LeRoy, L.W., 1945, A Contribution to Ostracodal Ontogeny: Jour. Paleontology, v. 19, p. 81-86.

Lev, O.M., 1969, Analysis and correlation of ostracod fauna from the late Cenozoic sediments in the lower reaches of the Yeniser, Ob, Pechora, Mezen and northern Drina Rivers: Ochenye Zapiski Paleontologia i Biostratigrafia, Pt. 28, Nauch. Issled. Geol. Arktiki Leningrad, p. 25-34.

Lucas, V.Z., 1931, Some Ostracoda of the Vancouver Island region: Fisheries Research Board, Canada, Contr. Canadian Biology and Fisheries, v. 6, p. 399-416.

Moore, R.C., ed., 1961, Treatise on Invertebrate Paleontology, Part Q, Arthropoda 3, Crustacea, Ostracoda: Geol. Soc. America and Univ. of Knasas Press, 442 p., New York and Lawrence, Kansas.

van Morkhoven, F,P.C.M., 1962, Post-Paleozoic Ostracoda - Thier Morphology, Taxonomy, and Economic Use. Volume 1, General: Elsevier Publishing Co., 204 p.

van Morkhoven, F.P.C.M., 1979, Notes on Post-Paleozoic Ostracoda, in Krutak, P., ed., Second Short Course in Micropaleontology: Univ. Nebraska, 38 p.

Neale, J.W., 1959, Normanicythere Gen. Nov. (Pleistocene and Recent) and the Division of the Ostracod Family Trachyleberididae: Palaeontology, v. 2, no. 1, p. 72-93.

Neale, J.W., 1973a, Cluthia (Crustacea, Ostracoda), A New Pleistocene and Recent Leptocytherid Genus: Jour. Paleontology, v. 47, no. 4, p. 683-688.

Neale, J.W., 1973b, Roundstonia globulifera (Brady) 1868 N. Gen. (Crustacea, Ostracoda) Une Espece Caracteristique du Pleistocene et (?) De L'Actuel: Revue de Micropaleontologie, v. 16, no. 2, p. 125-131.

Neale, J.W., 1974, The Genus Finmarchinella Swain 1963 (Crustacea: Ostracoda) and Its Species: Bull. Brit. Mus. (Nat. Hist.), v. 27, no. 2, p. 183-193.

Neale, J.W. and Howe, H.V., 1973, New cold water Recent and Pleistocene species of the genus Cytheropteron (Crustacea, Ostracoda): Crustaceana, v. 25, p. 237-244.

Neale, J.W. and Howe, H.V., 1975, The marine Ostracoda of Russian Harbour, Novaya Zemblya and other high latitude faunas: in Biology and Paleobiology of Ostracoda, F.M. Swain, ed., Bull. Am. Paleontol., v. 65, p. 381-432.

Neale, J.W. and Schmidt, R.A.M., 1967, On Normanicythere leioderma (Norman) and Normanicythere concinella Swain: Micropaleontology, v. 13, no. 3, p. 345-350.

Ohmert, W., 1968, Die Coquimbinae, eine neue Unterfamilie der Hemicytheridae (Ostracoda) aus dem Pliozan von Chile: Bayer. Staatssamml. Palaont. Hist. Geol. Mitt., v. 8, p. 127-165.

Painter, A., 1965, Recent Cytheracean Ostracodes from the Chukchi Sea and the

Northeastern Pacific Including Puget Sound, Haro Strait, and Adjacent Areas, Strait of Juan de Fuca, Silver Bay, and Gulf of Alaska: Unpublished Masters Thesis, Univ. Kansas, Lawrence, Dept. of Geology, 165 p.

Royer, T.C., 1975, Seasonal variations of waters in the northern Gulf of Alaska: Deep-Sea Research, v. 22, p. 403-416.

Schenk, H.G. and Keen, A.M., 1936, Marine Molluscan Provinces of Western North America: Proc. Amer. Philos. Soc., v. 76, no. 6, p. 921-938.

Schmidt, R.A.M., 1963, Pleistocene marine microfauna in the Bootlegger Cove Clay, Anchorage, Alaska: Science, v. 141, p. 350-351.

Schmidt, R.A.M., 1967, New generic assignments for some Pleistocene Ostracoda from Alaska: Jour. Paleontology, v. 141, p. 487-488.

Schmidt, R.A.M. and Sellmann, P.V., 1966, Mummified Pleistocene Ostracods in Alaska: Science, v. 153, p. 167-168.

Schornikov, E.I., 1974, On the Study of Ostracoda (Crustacea) from the intertidal zone of the Kuril Islands: Trans. Acad. Sci., USSR, Far East Sci. Center, Inst. Marine Biol., no. 1, p. 137-214.

Schornikov, E.I., 1975, Ostracod Fauna of the Intertidal Zone in the Vicinity of the Seto Marine Biological Laboratory: Publ. Seto Marine Biol. Lab., v. 22, no. 1/4, p. 1-30.

Skogsberg, T., 1928, Studies on marine Ostracods,—Part II: Calif. Acad. Sci. Occasional Paper 15, 155 p.

Skogsberg, T., 1950, Two new species of marine Ostracoda (Podocopa) from California: California Acad. Sci. Proceed., v. 26, p. 483-505.

Smith, V.Z., 1952, Further Ostracoda of the Vancouver Island Region: Fisheries Research Board Canada, Jour., v. 9, p. 16-41.

Swain, F.M., 1963, Pleistocene Ostracoda from the Gubik Formation, Arctic Coastal Plain, Alaska: Jour. Paleontology, v. 37, p. 798-834.

Swain, F.M. and Gilby, J.M., 1974, Marine Holocene Ostracoda from the Pacific Coast of North and Central America: Micropaleontology, v. 20, no. 3, p. 257-352.

Triebel, E., 1957, Neue Ostracoden aus dem Pleistozan von Kalifornien: Senckenberigana Lethaea, v. 38, p. 291-309.

Valentine, J.W., 1966, Numerical analysis of marine molluscan ranges on the extratropical northeastern Pacific shelf: Limnology and Oceanography, v. 11, p. 198-211.

Valentine, J.W., 1973, Evolutionary Paleoecology of the Marine Biosphere: Prentice-Hall, Inc., New Jersey, 511 p.

Valentine, P.C., 1976, Zoogeography of Holocene Ostracoda Off Western North America and Paleoclimatic Implications: U.S. Geological Survey Professional Paper 916, 47 p.

Watling, L., 1970, Two new species of Cytherinae (Ostracoda) from central California: Crustaceana, v. 19, p. 251-263.

TABLES

TABLE 1
LIST OF THE SAMPLES ANALYZED IN PRINCIPAL COORDINATE ANALYSIS A

CRUISE EGAL-75-KC

BC-4	VV-90	VV-259	S-420
BC-5	VV-92	VV-260	S-421
BC-6	VV-107	S-263	S-426
BC-11	VV-108	VV-282	S-430
BC-16	S-170A	VV-283	S-434
VV-17	S-171	VV-285	
VV-18	S-173	VV-286	
S-19	S-176	VV-288	
VV-20	S-179A	S-289	
S-22	S-180	S-290	
VV-24	S-183	S-296	
VV-26	VV-184	VV-297	
VV-27	S-202	VV-308	
S-32	VV-204	VV-312	
VV-39	VV-205	VV-313	
VV-41	S-208	VV-314	
VV-46	S-209	VV-316	
VV-52A	S-210	VV-317	
VV-53	S-211	VV-319	
VV-54	S-212	VV-320	
VV-55	S-213	VV-324	
VV-58	S-214	VV-325	
VV-59A	S-215	S-328	
VV-59B	S-216	VV-330	
VV-63B	VV-217	VV-332	
S-65B	S-224	VV-333	
S-66	S-226	VV-336	
VV-70	S-246	VV-338	
VV-71	VV-247	VV-339	
VV-83	S-251	VV-341	
VV-84	S-256	S-344	
VV-86	VV-257	S-347	

TABLE 2
LIST OF THE SAMPLES ANALYZED IN PRINCIPAL COORDINATE ANALYSIS B

CRUISE EGAL-75-KC				CRUISE DC1-79-EG	CRUISE DC2-80-EG
S-68	S-120	S-166	S-427	S-1	VV-14
VV-69	S-122A	S-167	S-428	S-5	VV-16
VV-72	S-123	BC-170B	S-429	S-6	VV-18
VV-73	BC-124B	S-174	S-431	S-7	VV-24
VV-74	BC-124A	S-175	S-432	S-9	VV-27
VV-75	VV-125	S-181	S-433	S-10	VV-41
VV-76	BC-127	VV-219		S-12	VV-48
VV-77	BC-128	S-221		S-13	VV-60
VV-78	S-129	BC-223		S-17	VV-62
VV-80	S-130	S-225		S-19	VV-63
VV-87	S-132	S-227		S-23	VV-67
S-88	S-133	VV-229		S-24	VV-70
S-89	S-134	VV-231		S-25	VV-73
VV-91	S-138	VV-232		S-28	VV-82
VV-94	VV-141	VV-233		S-29	VV-86
VV-95	VV-144U	VV-237		S-30B	VV-89
VV-96	S-145	VV-239		S-31B	VV-91
VV-97	S-146	VV-249		S-32B	VV-94
VV-98	S-147	VV-258		S-35	VV-97
VV-99	S-149	S-264		S-36	VV-99
S-103	VV-150	S-265		S-37	VV-155
S-104	VV-153	S-266		S-38	VV-167
BC-105	VV-154	S-268		S-39	VV-168
VV-106	VV-155	VV-284		S-40	VV-169
VV-109	VV-157	S-294		S-41	VV-170
S-110	VV-158	VV-306		S-42	VV-174
S-111	S-159	VV-307		S-43	VV-177
VV-112	VV-161	VV-326		S-44	VV-180
S-113	VV-162	VV-331		S-45	VV-183
S-115	VV-163	S-406		S-46	VV-186
S-117	VV-164B	S-422		S-47	VV-189
S-118	S-165	S-425			VV-192
					VV-195

TABLE 3
LIST OF SELECTED SPECIES FROM THE NORTHEAST GULF OF ALASKA, SHOWING THE DEPTH ASSEMBLAGES THEY OCCUR IN AND THEIR MODERN DEPTH RANGE

[Note that an asterisk (*) indicates that some of the specimens of this species have been found with soft parts in this depth zone]

SPECIES	DEPTH ASSEMBLAGE					MODERN DEPTH RANGE
"*Acanthocythereis*" *dunelmensis*	I*	II*	III	IV		Neritic, bathyal
Acuminocythere sp. A			III		V	Outer neritic
Ambostracon sp. A					V	Fossil
Argilloecia sp. A	I*	II*	III			Neritic
Argilloecia sp. B		II*	III	IV	V	Middle-outer neritic, bathyal
Aurila sp. A	I*	II	III		V	Neritic
"*Australicythere*" sp. A		II*	III		V	Middle-outer neritic
Baffinicythere emarginata					V	Fossil
Bairdia sp. A	I*	II*			V	Inner-middle neritic
Buntonia sp. A	I*	II*	III*			Neritic
Bythocythere sp. A		II			V	Middle neritic
Bythocythere sp. B		II	III	IV	V	Middle-outer neritic, bathyal
Bythocythere sp. C			III			Outer neritic
Bythocytherormopha sp. A					V	Fossil
Bythocytheromorpha sp. B					V	Fossil
Bythocytheromorpha sp. C					V	Fossil
Cluthia cluthae		II			V	Middle neritic
Cluthia sp. A		II*	III*	IV*		Middle-outer neritic, bathyal
Coquimba sp. A					V	Fossil
Cythere aff. *C. alveolivalva*	I	II			V	Inner-middle neritic
Cythere sp. A		II	III		V	Middle-outer neritic
Cytherois sp. A	I*	II	III			Neritic

SPECIES	DEPTH ASSEMBLAGE	MODERN DEPTH RANGE
Cytherois sp. B	II	Middle neritic
Cytheromorpha sp. A	I II III V	Neritic
Cytheromorpha sp. B	II* III*	Middle-outer neritic
Cytheromorpha sp. C	II	Middle neritic
Cytheromorpha sp. D	II* III	Middle-outer neritic
Cytheromorpha sp. E	II* III*	Middle-outer neritic
Cytheropteron aff. *C. latissimum*	II III IV V	Middle-outer neritic, bathyal
Cytheropteron aff. *C. nodosoalatum*	I* II III V	Neritic
Cytheropteron sp. A	II* III* IV V	Middle-outer neritic, bathyal
Cytheropteron sp. B	II III IV	Middle-outer neritic, bathyal
Cytheropteron sp. C	III IV V	Outer neritic, bathyal
Cytheropteron sp. D	II* III IV	Middle-outer neritic, bathyal
Cytheropteron sp. E	II III V	Middle-outer neritic
Cytheropteron sp. F	II III V	Middle-outer neritic
Cytheropteron sp. G	II III IV V	Middle-outer neritic, bathyal
Cytheropteron sp. H	II III IV V	Middle-outer neritic, bathyal
Cytheropteron sp. I	II V	Middle neritic
Cytheropteron sp. J	II	Middle neritic
Cytheropteron sp. K	III	Outer neritic
Cytheropteron sp. L	II III IV	Middle-outer neritic, bathyal

SPECIES	DEPTH ASSEMBLAGE					MODERN DEPTH RANGE
	I	II	III	IV	V	
Cytheropteron sp. M		II	III		V	Middle-outer neritic
Cytheropteron sp. N		II	III		V	Middle-outer neritic
Cytheropteron sp. O		II			V	Middle neritic
Cytheropteron sp. P		II	III		V	Middle-outer neritic
Cytheropteron sp. Q		II	III	IV		Middle-outer neritic
Cytheropteron sp. R	I	II	III		V	Neritic
Cytheropteron sp. S					V	Fossil
Cytheropteron sp. T		II			V	Middle neritic
Cytheropteron sp. U		II			V	Middle neritic
Cytheropteron sp. V					V	Fossil
Cytheropteron sp. W		II	III		V	Middle-outer neritic
Cytheropteron sp. X				IV		Bathyal
Cytheropteron sp. Y					V	Fossil
Cytheropteron sp. Z					V	Fossil
Cytheropteron sp. AA			III			Middle neritic
Cytherura sp. C		II	III		V	Middle-outer neritic
Cytherura sp. D	I	II			V	Inner-middle neritic
Cytherura sp. E					V	Fossil
Cytherura sp. F		II			V	Middle neritic
Cytherura sp. G					V	Fossil
Cytherura sp. H					V	Fossil
Cytherura sp. I			III		V	Outer neritic
Cytherura sp. J					V	Fossil
Elofsonia sp. A	I*	II				Inner-middle neritic
Eucythere sp. A	I*	II*				Inner-middle neritic

SPECIES	DEPTH ASSEMBLAGE					MODERN DEPTH RANGE
Eucytherura sp. A		II	III	IV		Middle-outer neritic, bathyal
Eucytherura sp. B		II				Middle neritic
Eucytherura sp. C			III			Outer neritic
Finmarchinella (Barentsovia) angulata					V	Fossil
Finmarchinella (Barentsovia) barentsovoensis					V	Fossil
Finmarchinella (Barentsovia) sp. A					V	Fossil
Finmarchinella (Barentsovia) finmarchinella					V	Fossil
Hemicythere aff. H. quadrinodosa	I*	II	III			Neritic
Hemicytherura sp. A		II	III		V	Middle-outer neritic
Hemicytherura sp. B		II	III			Middle-outer neritic
Hemicytherura sp. C		II			V	Middle neritic
Krithe sp. A			III*	IV*	V	Outer neritic, bathyal
"Leguminocythereis" sp. A	I*	II*	III			Neritic
"Leguminocythereis" sp. B	I*	II*				Inner-middle neritic
"Leguminocythereis" sp. C			III			Outer neritic
"Leguminocythereis" sp. D					V	Fossil
Loxoconcha sp. A	I*	II*	III*	IV*		Middle-outer neritic, bathyal
Loxoconcha sp. B		II*	III*	IV*		Middle-outer neritic, bathyal
Loxoconcha sp. D					V	Fossil
Loxoconcha sp. E					V	Fossil
Loxoconcha sp. F		II			V	Middle neritic
Macrocypris sp. A			III*			Outer neritic

SPECIES	DEPTH ASSEMBLAGE					MODERN DEPTH RANGE
Munseyella sp. A		II	III*			Middle-outer neritic
Munseyella sp. B		II	III			Middle-outer neritic
Normanicythere sp.					V	Fossil
Palmanella limicola		II*	III*	IV		Middle-outer neritic
Paracypris sp. A		II*				Middle neritic
Paracypris sp. B		II				Middle neritic
Paracytheridea sp. A					V	Fossil
Paradoxostoma aff. *P. brunneatum*					V	Fossil
Paradoxostoma aff. *P. flaccidum*					V	Fossil
Paradoxostoma aff. *P. honssuensis*					V	Fossil
Paradoxostoma aff. *P. japonicum*					V	Fossil
Paradoxostoma sp. A					V	Fossil
Paradoxostoma sp. B			III		V	Outer neritic
Paradoxostoma sp. C			III		V	Outer neritic
Paradoxostoma sp. D					V	Fossil
Paradoxostoma sp. G		II			V	Inner neritic
Paradoxostoma sp. H		II			V	Inner neritic
Paradoxostoma sp. I		II			V	Inner neritic
Paradoxostoma sp. J					V	Fossil
Patagonacythere sp. A					V	Fossil
Pectocythere aff. *P. parkerae*	I*	II*	III		V	Neritic
Pectocythere aff. *P. quadrangulata*	I*	II*	III		V	Neritic
Pectocythere sp. C					V	Fossil
Pectocythere sp. D	I*	II*				Inner-middle neritic
Pectocythere sp. E					V	Fossil
Pectocythere sp. F					V	Fossil
Pectocythere sp. G					V	Fossil
Pontocypris sp. A					V	Fossil

SPECIES	ASSEMBLAGE ZONES					MODERN DEPTH RANGE
Pontocythere sp. A	I*				V	Inner neritic
Pseudocythere sp. A		II	III		V	Middle-outer neritic
Pseudocythere sp. B			III			Outer neritic
"Radimella" jollaensis					V	Fossil
Robertsonites tuberculata	I*	II*	III*	IV	V	Neritic, bathyal
Schizocythere sp. A					V	Fossil
Sclerochilus sp. B			III			Outer neritic
Sclerochilus sp. C		II	III		V	Middle-outer neritic
Sclerochilus sp. D			III		V	Outer neritic
Sclerochilus sp. F					V	Fossil
Sclerochilus sp. G					V	Fossil
Semicytherura aff. S. undata					V	Fossil
Semicytherura sp. D			III		V	Outer neritic
Semicytherura sp. E		II			V	Middle neritic
Semicytherura sp. F					V	Fossil
Xestoleberis sp. A					V	Fossil
Xestoleberis sp. B		II	III		V	Middle-outer neritic
Xiphichilus sp. A					V	Fossil
Xiphichilus sp. B					V	Fossil

TABLE 4

TABULATION OF THE OSTRACODE SPECIES OCCURRING IN EACH MAJOR OSTRACODE ASSEMBLAGE, IN ALPHABETICAL ORDER.

[An asterisk indicates that some of the specimens of that species contained soft parts, which is interpreted to indicate that those specimens were living in situ when collected. Note that in Assemblage V many of the fossil species are presently living in the depth assemblage noted after the species binomen.]

OSTRACODE ASSEMBLAGE I

"*Acanthocythereis*" *dunelmensis*	*
Argilloecia sp. A	*
Aurila sp. A	*
Bairdia sp. A	*
Buntonia sp. A	*
Cytherois sp. A	*
Cythere aff. *C.* *alveolivalva*	
Cytheromorpha sp. A	
Cytheromorpha sp. B	*
Cytheromorpha sp. C	
Cytheromorpha sp. D	*
Cytheromorpha sp. E	*
Cytheropteron aff. *C.* *nodosoalatum*	*
Cytheropteron sp. R	
Cytherura sp. D	
Elofsonia sp. A	*
Eucythere sp. A	*
Hemicythere aff. *H* *quadrinodosa*	*
"*Leguminocythereis*" sp. A	*
"*Leguminocythereis*" sp. B	*
Loxoconcha sp. A	*
Pectocythere aff. *P.* *parkerae*	*
Pectocythere aff. *P.* *quadrangulata*	*
Pectocythere sp. D	*
Pontocythere sp. A	*
Robertsonites *tuberculata*	*
Candona sp.	
Cyclocypris sp.	
Cyprinotus sp.	

OSTRACODE ASSEMBLAGE II

"Acanthocythereis" dunelmensis	*
Argilloecia sp. A	*
Argilloecia sp. B	
Aurila sp. A	
"Australicythere" sp. A	*
Bairdia sp. A	*
Buntonia sp. A	*
Bythocythere sp. B	
Cluthia cluthae	
Cluthia sp. A	*
Cythere aff. C. alveolivalva	
Cythere sp. A	
Cytherois sp. A	
Cytherois sp. B	
Cytheromorpha sp. A	
Cytheromorpha sp. B	*
Cytheromorpha sp. D	
Cytheromorpha sp. E	*
Cytheropteron aff. C. latissimum	
Cytheropteron aff. C. nodosoalatum	
Cytheropteron sp. A	*
Cytheropteron sp. B	
Cytheropteron sp. D	*
Cytheropteron sp. E	
Cytheropteron sp. F	
Cytheropteron sp. G	
Cytheropteron sp. H	
Cytheropteron sp. I	
Cytheropteron sp. J	
Cytheropteron sp. L	
Cytheropteron sp. M	
Cytheropteron sp. N	
Cytheropteron sp. O	
Cytheropteron sp. P	

Cytheropteron sp. Q	
Cytheropteron sp. R	
Cytheropteron sp. T	
Cytheropteron sp. W	
Cytherura sp. C	
Cytherura sp. D	
Cytherura sp. F	
Eucythere sp. A	*
Elofsonia sp. A	
Eucytherura sp. A	
Eucytherura sp. B	
Eucytherura sp. C	*
Hemicythere aff. H. quadrinodosa	
Hemicytherura sp. A	
Hemicytherura sp. B	
"Leguminocythereis" sp. A	*
"Leguminocythereis: sp. B	*
Loxoconcha sp. A	*
Loxoconcha sp. B	*
Loxoconcha sp. F	
Munseyella sp. A	
Munseyella sp. B	
Palmanella limicola	*
Paracypris sp. A	*
Paracypris sp. B	
Paradoxostoma sp. G	
Paradoxostoma sp. H	
Paradoxostoma sp. I	*
Pectocythere aff. P. parkerae	*
Pectocythere aff. P. quadrangulata	*
Pseudocythere sp. A	
Pectocythere sp. D	*
Robertsonites tuberculata	*
Sclerochilus sp. C	

OSTRACODE ASSEMBLAGE III

"Acanthocythereis: dunelmensis
Acuminocythere sp. A
Argilloecia sp. A
Argilloecia sp. B
Aurila sp. A
"Australicythere" sp. A
Buntonia sp. A *
Bythocythere sp. B
Bythocythere sp. C
Cluthia cluthae
Cluthia sp. A *
Cythere sp. A
Cytherois sp. A
Cytheromorpha sp. A
Cytheropteron aff. C. latissimum
Cytheropteron aff. C. nodosoalatum
Cytheropteron sp. A *
Cytheropteron sp. B
Cytheropteron sp. C
Cytheropteron sp. D
Cytheropteron sp. E
Cytheropteron sp. F
Cytheropteron sp. G
Cytheropteron sp. K
Cytheropteron sp. L
Cytheropteron sp. M
Cytheropteron sp. N
Cytheropteron sp. Q
Cytheropteron sp. R
Cytheropteron sp. W
Cytheropteron sp. X
Cytheropteron sp. AA
Cytherura sp. C
Cytherura sp. I

Eucytherura sp. A	
Eucytherura sp. C	
Hemicythere aff. H. quadrinodosa	
Hemicytherura sp. A	
Hemicytherura sp. B	
Krithe sp. A	*
"Leguminocythereis" sp. A	
"Leguminocythereis" sp. C	
Loxoconcha sp. A	*
Loxoconcha sp. B	*
Macrocypris sp. A	*
Munseyella sp. A	*
Munseyella sp. B	
Palmanella limicola	*
Paradoxostoma sp. B	
Paradoxostoma sp. C	
Pectocythere aff. P. parkerae	
Pectocythere aff. P. quadrangulata	
Pseudocythere sp. B	
Robertsonites tuberculata	*
Sclerochilus sp. B	
Sclerochilus sp. C	
Sclerochilus sp. D	
Semicytherura sp. D	
Xestoleberis sp. B	

OSTRACODE ASSEMBLAGE IV

"Acanthocythereis" dunelmensis	*
Argilloecia sp. B	
Bythocythere sp. B	
Cluthia sp. A	*
Cytheropteron aff. C.latissimum	
Cytheropteron sp. A	
Cytheropteron sp. B	

Cytheropteron sp. C

Cytheropteron sp. G

Cytheropteron sp. H

Cytheropteron sp. L

Cytheropteron sp. Q

Cytheropteron sp. X

Eucytherura sp. A

Krithe sp. A *

Loxoconcha sp. B *

Palmanella limicola

Robertsonites tuberculata

OSTRACODE ASSEMBLAGE V

Acuminocythere sp. A

Ambostracon sp. A

Argilloecia sp. B /III

Aurila sp. A /II

"Australicythere" sp. A

Baffinicythere emarginata

Bairdia sp. A

Bythocythere sp. A /II

Bythocythere sp. B

Bythocytheromorpha sp. A

Bythocytheromorpha sp. B

Bythocytheromorpha sp. C

Cluthia cluthae

Coquimba sp. A

Cythere aff. C. alveolivalva /II

Cythere sp. A

Cytheromorpha sp. A

Cytheropteron aff. C. latissimum

Cytheropteron aff. C.nodosoalatum /II

Cytheropteron sp. A

Cytheropteron sp. C /III

Cytheropteron sp. E	/III
Cytheropteron sp. G	?III
Cytheropteron sp. G	/II
Cytheropteron sp. H	/II,III
Cytheropteron sp. I	
Cytheropteron sp. M	/III
Cytheropteron sp. N	/II
Cytheropteron sp. O	/II
Cytheropteron sp. P	/II,III
Cytheropteron sp. R	
Cytheropteron sp. S	
Cytheropteron sp. T	/II
Cytheropteron sp. U	/II
Cytheropteron sp. V	/II
Cytheropteron sp. W	/III
Cytheropteron sp. Y	/III
Cytheropteron sp. Z	/II
Cytherura sp. A	
Cytherura sp. B	
Cytherura sp. C	
Cytherura sp. D	/II
Cytherura sp. E	/II
Cytherura sp. F	/II
Cytherura sp. G	
Cytherura sp. H	/II
Cytherura sp. I	/III
Cytherura sp. J	/II
Finmarchinella (Barentsovia) barentzovoensis	
Finmarchinella (Barentsovia) angulata	
Finmarchinella)Barentsovia) sp. A	
Finmarchinella (Finmarchinella) finmarchica	
Hemicytherura sp. A	
Hemicytherura sp. C	/II
Krithe sp. A	
"Leguminocythereis" sp. D	
Loxoconcha sp. D	

Loxoconcha sp. E

Loxoconcha sp. F

Normanicythere sp.

Paracytheridea sp. A

Paradoxostoma aff. *P. brunneatum*

Paradoxostoma aff. *P. flaccidum*

Paradoxostoma aff. *P. honssuensis*

Paradoxostoma aff. *P. japonicum*

Paradoxostoma sp. A

Paradoxostoma sp. B

Paradoxostoma sp. C

Paradoxostoma sp. D

Paradoxostoma sp. G /II

Paradoxostoma sp. H

Paradoxostoma sp. I /II

Paradoxostoma sp. J

Patagonacythere sp. A

Pectocythere aff. *P. parkerae*

Pectocythere aff. *P. quadrangulata*

Pectocythere sp. C

Pectocythere sp. E

Pectocythere sp. F

Pectocythere sp. G

Pontocypris sp.

Pontocythere sp. A

Pseudocythere sp. A /II,III

"*Radimella*" *jollaensis*

Robertsonites tuberculata /II

Schizocythere sp.

Sclerochilus sp. C /II

Sclerochilus sp. D

Sclerochilus sp. F

Sclerochilus sp. G

Semicytherura aff. *S. undata*

Semicytherura sp. D

Semicytherura sp. E /II

Semicytherura sp. F

Xestoleberis sp. A

Xestoleberis sp. B /II

Xiphichilus sp. A

Xiphichilus sp. B

TABLE 5

LIST OF THE LOCATION, WATER DEPTH, AND OSTRACODE ASSEMBLAGE TYPE OF THE SAMPLES EXAMINED FROM THE GULF OF ALASKA

CRUISE EGAL-75-KC

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
BC-4	59° 39.3' N	147° 40.1' W	Unknown	V/III
BC-5	59° 36.5' N	147° 32.8' W	Unknown	III
BC-6	59° 32.3' N	147° 21.1' W	143 meters	III
BC-11	59° 55.9' N	147° 25.4' W	49 meters	V/II
VV-16	59° 45.9' N	146° 49.4' W	91 meters	III
VV-17	59° 38.1' N	146° 43.5' W	97 meters	V/II
VV-18	59° 33.5' N	146° 42.4' W	113 meters	III
S-19	59° 31.8' N	146° 51.0' W	113 meters	III
VV-20	59° 28.5' N	146° 41.8' W	88 meters	V/II
S-22	59° 27.2' N	146° 41.1' W	106 meters	II
VV-24	60° 01.2' N	147° 15.0' W	143 meters	III
VV-26	59° 56.6' N	147° 06.1' W	205 meters	IV
VV-27	59° 53.8' N	146° 59.2' W	163 meters	III
S-32	59° 28.7' N	146° 29.1' W	53 meters	V/II
VV-39	59° 28.0' N	145° 59.7' W	148 meters	V
VV-41	60° 09.05' N	147° 07.2' W	212 meters	V
VV-46	60° 00.0' N	146° 45.5' W	126 meters	V/III
VV-52A	59° 59.0' N	146° 27.5' W	71 meters	V/II
VV-53	60° 07.7' N	146° 52.8' W	156 meters	V/III
VV-54	60° 06.1' N	146° 49.4' W	112 meters	III
VV-55	60° 14.5' N	146° 50.6' W	220 meters	V
VV-58	60° 13.8' N	146° 44.25' W	221 meters	I
VV-59A	60° 12.1' N	146° 41.2' W	192 meters	V
VV-59B	60° 11.8' N	146° 41.5' W	183 meters	III
VV-63B	60° 01.8' N	146° 14.6' W	64 meters	V/II
S-65B	59° 49.4' N	146° 14.9' W	53 meters	V/I
S-66	59° 46.6' N	146° 15.9' W	75 meters	V
S-68A	59° 42.6' N	146° 15.0' W	81 meters	V/II

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
VV-69	59° 42.6' N	146° 14.6' W	49 meters	V/II
VV-70	60° 12.6' N	146° 15.3' W	108 meters	III
VV-71	60° 10.1' N	146° 15.0' W	84 meters	II
VV-72	60° 15.3' N	146° 00.8' W	90 meters	II
VV-73	60° 10.45' N	146° 01.35' W	95 meters	II
VV-74	60° 09.2' N	146° 01.5' W	90 meters	II
VV-75	60° 07.4' N	146° 02.3' W	84 meters	II
VV-76	60° 02.0' N	146° 00.5' W	77 meters	V/II
VV-77	59° 56' N	146° 1.5' W	86 meters	V/II
VV-78	59° 51.6' N	146° 00.9' W	101 meters	III
VV-80	59° 46.7' N	145° 59.5' W	91 meters	II
VV-83	59° 39.0' N	145° 59.5' W	91 meters	II
VV-84	59° 32.2' N	145° 59.5' W	157 meters	III
VV-86	60° 14.0' N	145° 34.5' W	48 meters	II
VV-87	60° 06.9' N	145° 34.4' W	126 meters	III
S-88	59° 59.2' N	145° 34.0' W	88 meters	II
S-89	59° 58.5' N	145° 34.2' W	84 meters	V
VV-90	59° 52.6' N	145° 34.5' W	88 meters	V/II
VV-91	59° 50.5' N	145° 39.6' W	97 meters	III
VV-92	59° 45.9' N	145° 34.5' W	119 meters	III
VV-94	60° 07.7' N	145° 21.0' W	97 meters	II/III
VV-95	60° 03.3' N	145° 19.8' W	132 meters	III
VV-96	59° 59.2' N	145° 19.3' W	119 meters	III
VV-97	59° 55.7' N	145° 19.5' W	101 meters	III
VV-98	59° 52.5' N	145° 19.8' W	101 meters	III
VV-99	59° 50.4' N	145° 20.6' W	110 meters	III
S-103	60° 09.4' N	144° 58.2' W	35 meters	I
S-104	60° 08.1' N	144° 54.9' W	53 meters	II
BC-105	59° 57.1' N	144° 55.4' W	183 meters	III
VV-106	59° 57.0' N	144° 57.4' W	192 meters	III
VV-107	59° 46.5' N	145° 03.2' W	185 meters	III
VV-108	59° 44.2' N	144° 56.2' W	192 meters	V/III
VV-109	59° 43.4' N	144° 52.7' W	102 meters	II/III

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
S-110	59° 41.5' N	144° 47.2' W	97 meters	II
S-111	59° 38.9' N	144° 41.0' W	148 meters	III
VV-112	59° 37.6' N	144° 37.0' W	145 meters	III
S-113	59° 34.9' N	144° 30.0' W	139 meters	V/III
S-115	59° 46.0' N	144° 47.7' W	64 meters	V/II
S-117	59° 43.0' N	144° 38.1' W	119 meters	II/III
S-118	59° 40.7' N	144° 33.3' W	137 meters	II/III
S-120	59° 48.8' N	144° 41.0' W	66 meters	II
S-122A	59° 55.6' N	144° 31.4' W	55 meters	V/II
S-123	59° 56.7' N	144° 40.2' W	210 meters	IV
BC-124B	59° 57.5' N	144° 43.2' W	234 meters	IV
BC-124A	59° 57.5' N	144° 43.2' W	234 meters	IV
VV-125	59° 59.8' N	144° 44.0' W	232 meters	II/III
BC-127	60° 02.8' N	144° 43.5' W	210 meters	IV
BC-128	60° 00.6' N	144° 40.0' W	227 meters	V/II
S-129	60° 04.9' N	144° 40.4' W	146 meters	I
S-130	60° 07.8' N	144° 39.5' W	31 meters	I/III
S-132	60° 07.1' N	144° 31.2' W	20 meters	I
S-133	60° 03.8' N	144° 26.2' W	17 meters	I
S-134	59° 59.0' N	144° 24.0' W	20 meters	V/I
S-138	59° 38.2' N	145° 50.4' W	168 meters	III
VV-141	60° 06.8' W	146° 14.5' W	71 meters	V/II
VV-144U	59° 57.3' N	146° 19.6' W	64 meters	V/II
S-145	59° 37.4' N	146° 09.0' W	101 meters	III
S-146	59° 35.6' N	145° 54.8' W	143 meters	III
S-147	59° 34.2' N	145° 45.7' W	165 meters	III
S-149	60° 03.2' N	145° 34.5' W	104 meters	III
VV-150	60° 10.4' N	145° 34.5' W	104 meters	II/III
VV-153	60° 12.5' N	146° 27.0' W	137 meters	V/III
VV-154	59° 51.4' N	145° 28.5' W	95 meters	III
VV-155	59° 55.2' N	145° 42.0' W	82 meters	II
VV-157	60° 01.4' N	146° 08.5' W	73 meters	V/II
VV-158	60° 06.0' N	146° 40.5' W	117 meters	III

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
S-159	60° 10.2' N	146° 52.1' W	165 meters	V/III
VV-161	60° 17.4' N	146° 23.7' W	22 meters	I
VV-162	60° 19.2' N	146° 13.2' W	24 meters	I
VV-163	60° 19.5' N	146° 07.0' W	22 meters	I
VV-164B	60° 19.5' N	146° 00.0' W	22 meters	I
S-165	60° 18.3' N	145° 53.5' W	33 meters	I
S-166	60° 17.7' N	145° 45.6' W	20 meters	I
S-167	60° 16.4' N	145° 38.4' W	26 meters	I
S-170A	60° 16.9' N	145° 42.0' W	20 meters	I
BC-170B	60° 16.9' N	145° 42.0' W	20 meters	I
S-171	60° 14.25' N	145° 28.0' W	24 meters	I
S-173	60° 10.4' N	145° 13.6' W	24 meters	I
S-174	60° 09.6' N	145° 06.4' W	35 meters	I
S-175	60° 09.4' N	145° 00.0' W	33 meters	I
S-176	60° 10.0' N	144° 48.0' W	31 meters	I
S-179A	60° 14.75' N	145° 27.1' W	18 meters	I
S-180	60° 09.1' N	144° 44.7' W	26 meters	I
S-181	60° 01.0' N	144° 24.0' W	33 meters	V/I
S-183	59° 55.5' N	144° 34.6' W	91 meters	III
VV-184	59° 54.8' N	144° 54.6' W	188 meters	III
S-202	59° 31.4' N	144° 36.6' W	187 meters	V/III
VV-204	59° 34.8' N	144° 35.8' W	141 meters	V/III
VV-205	59° 37.0' N	144° 35.3' W	145 meters	III
S-208	59° 33.25' N	144° 31.3' W	156 meters	V/III
S-209	59° 35.1' N	144° 31.7' W	139 meters	V/III
S-210	59° 36.9' N	144° 30.5' W	146 meters	III
S-211	59° 40.1' N	144° 28.4' W	146 meters	III
S-212	59° 46.1' N	144° 33.1' W	91 meters	II
S-213	55° 44.7' N	144° 30.2' W	113 meters	III
S-214	59° 43.7' N	144° 28.6' W	55 meters	II
S-215	59° 42.9' N	144° 27.0' W	134 meters	III
S-216	59° 42.1' N	144° 23.0' W	152 meters	III
VV-217	59° 39.8' N	144° 21.2' W	154 meters	III

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
VV-219	59° 36.3' N	144° 17.4' W	475 meters	IV
S-221	59° 50.1' N	144° 27.4' W	29 meters	V/I
BC-223	59° 52.4' N	144° 18.7' W	51 meters	I/II
S-224	59° 50.0' N	144° 16.0' W	64 meters	II
S-225	59° 46.2' N	144° 11.5' W	101 meters	III
S-226	59° 43.0' N	144° 07.25' W	128 meters	III
S-227	59° 39.4' N	144° 04.9' W	161 meters	V/III
VV-229	59° 34.0' N	144° 01.2' W	1189 meters	IV
VV-231	59° 56.9' N	144° 09.7' W	33 meters	I
VV-232	59° 57.25' N	144° 09.9' W	49 meters	I
VV-233	59° 51.6' N	143° 53.25' W	106 meters	II/III
VV-237	59° 51.7' N	143° 42.5' W	225 meters	IV
VV-239	59° 55.6' N	143° 32.4' W	252 meters	IV
S-246	59° 41.9' N	142° 55.8' W	198 meters	III
VV-247	59° 52.2' N	143° 20.5' W	214 meters	IV
VV-249	59° 58.4' N	143° 23.0' W	152 meters	III
S-251	59° 44.5' N	142° 54.0' W	188 meters	III
S-256	59° 48.2' N	142° 46.2' W	190 meters	III
VV-257	59° 57.3' N	142° 46.5' W	119 meters	III
VV-258	59° 57.5' N	142° 41.0' W	108 meters	II/III
VV-259	59° 58.1' N	142° 38.2' W	91 meters	III
VV-260	60° 00.0' N	142° 43.0' W	88 meters	III
S-263	59° 50.8' N	142° 31.0' W	95 meters	V/III
S-264	59° 49.5' N	142° 30.0' W	134 meters	III
S-265	59° 46.2' N	142° 29.9' W	181 meters	III
S-266	59° 42.5' N	142° 34.0' W	262 meters	IV
S-268	59° 40.7' N	142° 21.6' W	174 meters	III
VV-282	59° 54.5' N	142° 20.0' W	82 meters	II
VV-283	59° 51.0' N	142° 14.5' W	84 meters	II
VV-284	59° 50.0' N	142° 14.2' W	86 meters	II
VV-285	59° 47.4' N	142° 14.2' W	115 meters	III
VV-286	59° 43.0' N	142° 13.1' W	157 meters	III
VV-288	59° 36.0' N	142° 13.7' W	238 meters	IV

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
S-289	59° 53.1' N	142° 03.8' W	55 meters	II
S-290	59° 54.6' N	141° 52.3' W	31 meters	I
S-294	59° 48.7' N	141° 25.0' W	29 meters	I
S-296	59° 45.5' N	141° 43.5' W	49 meters	II
VV-297	59° 32.9' N	141° 46.7' W	165 meters	III
VV-306	59° 30.4' N	141° 30.0' W	161 meters	III
VV-307	59° 28.9' N	141° 27.8' W	165 meters	III
VV-308	59° 25.8' N	141° 21.1' W	201 meters	IV
VV-312	59° 31.7' N	141° 14.3' W	156 meters	III
VV-313	59° 29.5' N	141° 11.0' W	256 meters	IV
VV-314	59° 28.5' N	141° 06.3' W	311 meters	IV
VV-316	59° 22.8' N	140° 51.7' W	163 meters	III
VV-317	59° 27.2' N	140° 49.4' W	274 meters	IV
VV-319	59° 33.8' N	140° 50.5' W	247 meters	IV
VV-320	59° 36.4' N	140° 50.5' W	163 meters	III
VV-324	59° 32.3' N	140° 14.0' W	192 meters	III
VV-325	50° 29.0' N	140° 14.1' W	241 meters	IV
VV-326	59° 24.6' N	140° 14.5' W	183 meters	III
S-328	59° 43.2' N	144° 33.6' W	134 meters	III
VV-330	59° 58.2' N	144° 02.8' W	24 meters	I
VV-331	59° 56.1' N	143° 53.4' W	66 meters	V/II
VV-332	59° 54.3' N	143° 53.2' W	73 meters	II
VV-333	59° 47.1' N	143° 51.5' W	128 meters	III
VV-336	59° 48.4' N	144° 38.0' W	274 meters	IV
VV-338	60° 01.0' N	143° 09.3' W	101 meters	II
VV-339	60° 00.8'	142° 56.6' W	102 meters	II
VV-341	59° 57.7' N	143° 04.7' W	137 meters	III
S-344	59° 39.2' N	142° 22.2' W	210 meters	IV
S-347	59° 41.0' N	142° 39.7' W	333 meters	IV
VV-360	59° 39.7' N	140° 31.1' W	48 meters	I
S-406	59° 53.0' N	141° 36.5' W	26 meters	II
S-420	59° 55.1' N	141° 32.9' W	64 meters	II
S-421	59° 55.2' N	141° 34.4 W	59 meters	II

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
S-422	59° 55.8' N	141° 35.6' W	68 meters	V/II
S-425	59° 56.7' N	141° 35.1' W	59 meters	II
S-426	59° 56.1' N	141° 33.5' W	71 meters	II
S-427	59° 55.45' N	141° 32.7' W	71 meters	II
S-428	59° 54.7' N	141° 30.1' W	49 meters	V/II
S-429	59° 55.5' N	141° 30.6' W	60 meters	V
S-430	59° 56.0' N	141° 31.6' W	59 meters	II
S-431	59° 56.5' N	141° 33.3' W	59 meters	II
S-432	59° 57.2' N	141° 31.6' W	68 meters	II
S-433	59° 57.5' N	141° 30.8' W	68 meters	II
S-434	59° 57.1' N	141° 29.6' W	68 meters	II
		CRUISE DC1-79-EG		
S-1	59° 05.0' N	138° 39.9' W	77 meters	I
S-5	58° 52.1' N	138° 58.6' W	205 meters	III
S-6	58° 46.8' N	138° 59.7' W	220 meters	IV
S-7	58° 48.2' N	139° 07.9' W	188 meters	III
S-9	58° 43.1' N	139° 10.3' W	240 meters	IV
S-10	58° 44.9' N	139° 19.1' W	183 meters	III
S-12	58° 39.0' N	139° 22.3; W	251 meters	IV
S-13	58° 45.2' N	138° 38.4' W	108 meters	V/III
S-17	58° 26.4' N	138° 26.4' W	123 meters	V/III
S-19	58° 33.6' N	138° 17.5' W	122 meters	V/III
S-23	58° 26.0' N	137° 48.3' W	167 meters	III
S-24	58° 20.7' N	137° 55.7' W	156 meters	III
S-25	58° 13.9' N	138° 01.9' W	138 meters	V/III
S-28	58° 11.2' N	137° 39.1' W	161 meters	III
S-29	58° 16.4' N	137° 32.5' W	154 meters	III
S-30B	58° 23.0' N	137° 27.9' W	196 meters	III
S-31B	58° 18.6' N	137° 08.2' W	154 meters	III
S-32B	58° 10.9' N	137° 19.8' W	121 meters	V/III
S-35	58° 22.7' N	136° 59.9' W	70 meters	I

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
S-36	58° 21.7' N	137° 00.7' W	111 meters	II
S-37	58° 21.0' N	137° 01.5' W	137 meters	III
S-38	58° 20.2' N	137° 02.3' W	159 meters	III
S-39	58° 19.2' N	137° 03.1' W	173 meters	III
S-40	58° 17.2' N	137° 01.8' W	186 meters	III
S-41	58° 15.7' N	137° 00.4' W	187 meters	III
S-42	58° 13.6' N	136° 58.9' W	174 meters	III
S-43	58° 12.1' N	136° 57.9' W	185 meters	III
S-44	58° 11.0' N	136° 57.3' W	111 meters	III
S-45	58° 14.6' N	136° 47.8' W	119 meters	V/III
S-46	58° 50.1' N	136° 50.1' W	93 meters	V/III
S-47	58° 12.6' N	136° 53.2' W	133 meters	III

CRUISE DC2-80-EG

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
VV-14	59° 19' 10" N	139° 19' 50" W	<20 meters	I
VV-16	59° 18.81' N	139° 18.6' W	35 meters	I
VV-18	59° 06.99' N	138° 48.28' W	44 meters	I
VV-24	59° 06.99' N	138° 44.02' W	42 meters	I
VV-27	59° 06.99' N	138° 43.97' W	43 meters	I
VV-41	59° 06.89' N	138° 42.96' W	40 meters	I
VV-48	59° 06.92' N	138° 42.59' W	37 meters	I
VV-60	59° 28.46' N	139° 47.99' W	58 meters	I
VV-62	59° 28.50' N	139° 48.35' W	64 meters	I
VV-63	59° 28.16' N	139° 48.90' W	62 meters	II
VV-67	59° 28.01' N	139° 49.29' W	82 meters	II
VV-70	59° 28.89' N	139° 49.81' W	98 meters	II
VV-73	59° 27.73' N	139° 50.20' W	104 meters	II
VV-82	59° 28.18' N	139° 48.38' W	74 meters	II
VV-86	59° 27.48' N	139° 50.48' W	110 meters	II
VV-89	59° 28.64' N	139° 48.16' W	55 meters	II
VV-91	59° 00.16' N	139° 54.01' W	128 meters	V/III
VV-94	59° 36.6' N	141° 23.3' W	99 meters	II/III

SAMPLE NUMBER	LATITUDE	LONGITUDE	WATER DEPTH	ASSEMBLAGE TYPE
VV-97	59° 41.8' N	141° 20.1' W	60 meters	II
VV-99	59° 41.0' N	141° 20.7' W	60 meters	II
VV-155	59° 26.05' N	140° 47.35' W	<20 meters	I
VV-167	59° 40.1' N	141° 21.6' W	68 meters	II
VV-168	59° 40.1' N	141° 21.6' W	68 meters	II
VV-169	59° 39.2' N	141° 22.1' W	73 meters	II
VV-170	59° 38.1' N	141° 22.5' W	84 meters	II
VV-174	59° 37.2' N	141° 23.1' W	91 meters	II
VV-177	59° 36.1' N	141° 23.5' W	102 meters	III
VV-180	59° 35.2' N	141° 24.5' W	111 meters	III
VV-183	59° 34.4' N	141° 25.1' W	121 meters	III
VV-186	59° 33.3' N	141° 25.3' W	132 meters	III
VV-189	59° 32.5' N	141° 26.4' W	139 meters	III
VV-192	59° 31.2' N	141° 26.8' W	150 meters	III
VV-195	59° 36.5' N	140° 19.2' W	82 meters	V/II

APPENDIX I

TABULATION OF THE OSTRACODE ASSEMBLAGES AND ASSOCIATED ORGANISMS
FROM SELECTED BOTTOM GRAB SAMPLES TAKEN IN THE NORTHEAST GULF OF ALASKA,
F.R.S. TOWNSEND CROMWELL CRUISE EGAL-75-KC, 1975

ELISABETH M. BROUWERS

U.S.G.S. OPEN-FILE RPORT 81-1314

Introduction

The U.S. Geological Survey is conducting studies of the Alaskan continental shelf, identifying areas and processes of geological hazard that may affect resource development offshore. These hazards include areas of rapid accumulation of unconsolidated sediment, areas of intense erosional activity, and regions of submarine sliding and slumping; shallow faults are also being identified and classified.

The region of concern in this report is the continental shelf of the Northeast Gulf of Alaska, between Montague Island (longitude 148° W.) and Icy Bay (longitude 141° W.), figs. 2 and 3. During 1975, nearly 350 bottom grab samples were collected from this region by the Fisheries Research Ship Townsend Cromwell. These samples formed the basis for the initial characterization of the surface deposits.

Four major sedimentary units were defined on the basis of the bottom grab samples and seismic data (fig. 1) (Carlson and Molnia, 1977; Molnia and Carlson, 1978). These units are (1) Holocene glacial-marine sediments (normal marine deposition), (2) Holocene morainal deposits, (3) Quaternary glacial-marine sediments, and (4) Pleistocene and older lithified sediments. Each of these sedimentary units is in turn composed of various facies defined by lithological, structural, and biological parameters (Molnia and Carlson, 1980).

As part of the Northeast Gulf of Alaska project, I am examining the ostracode assemblages occurring in the Cromwell bottom grab samples. This report provides a tabulation of the fauna and flora contained in 102 selected bottom grab samples (figs. 2 and 3). A baseline datum is being established of the environmental factors that significantly control or contribute to the

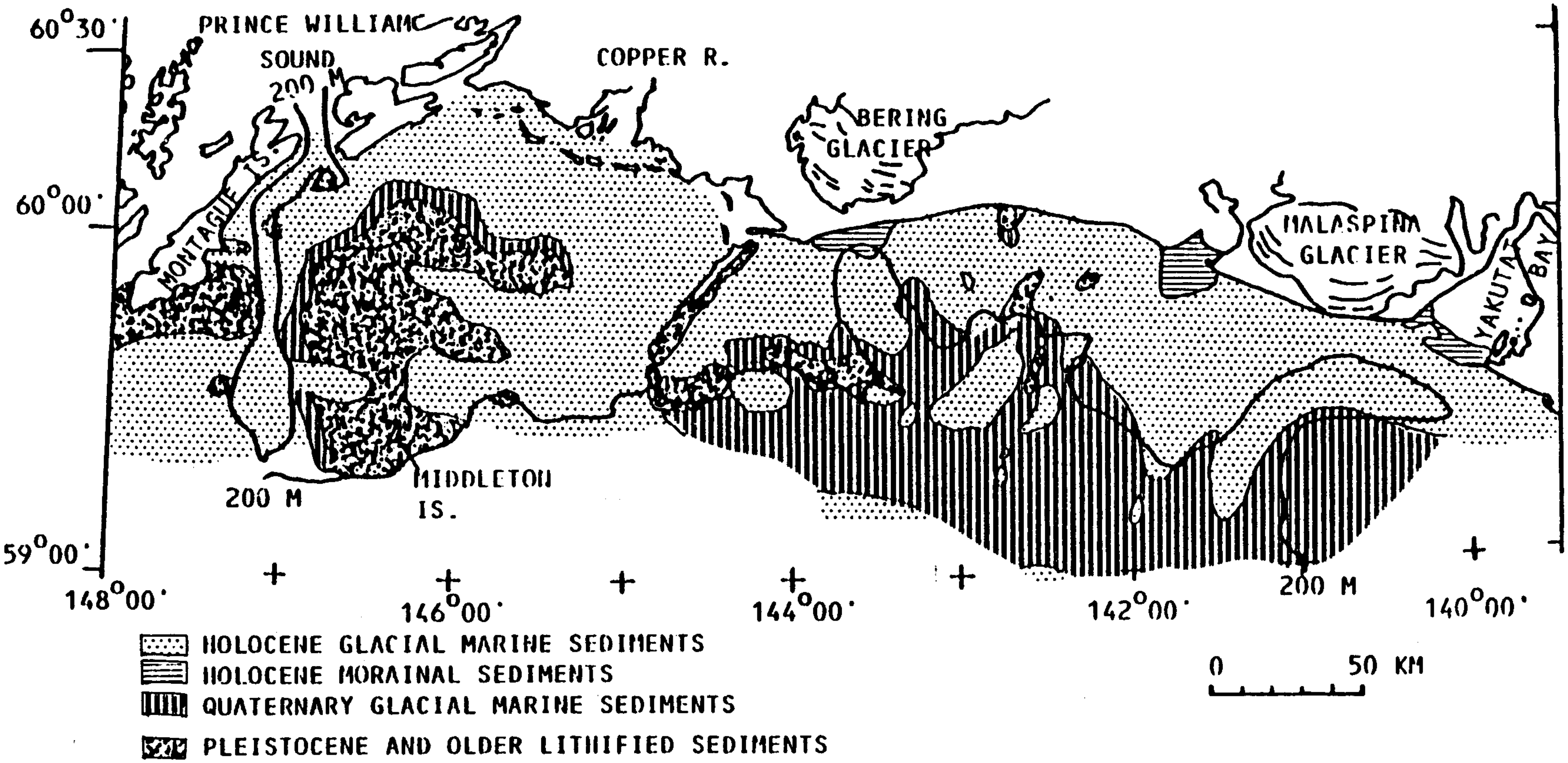


Figure 1.--Geographic distribution of the four major surface sedimentary units on the continental shelf of the northeast Gulf of Alaska between Montague Island and Yakutat Bay (from Molnia and Carlson, 1980).

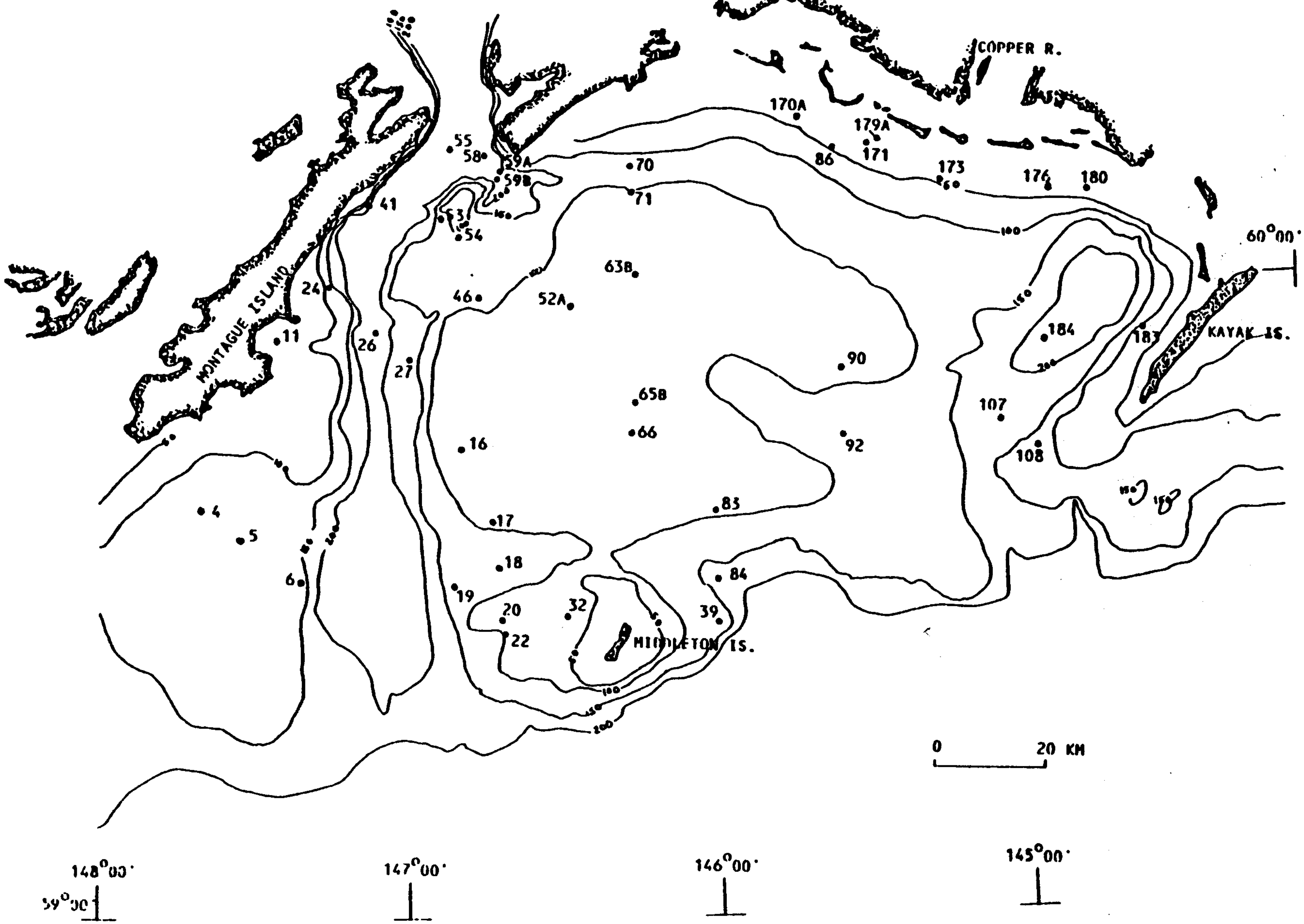


Figure 2.--Map illustrating the location of samples taken between Montague Island and Kayak Island.

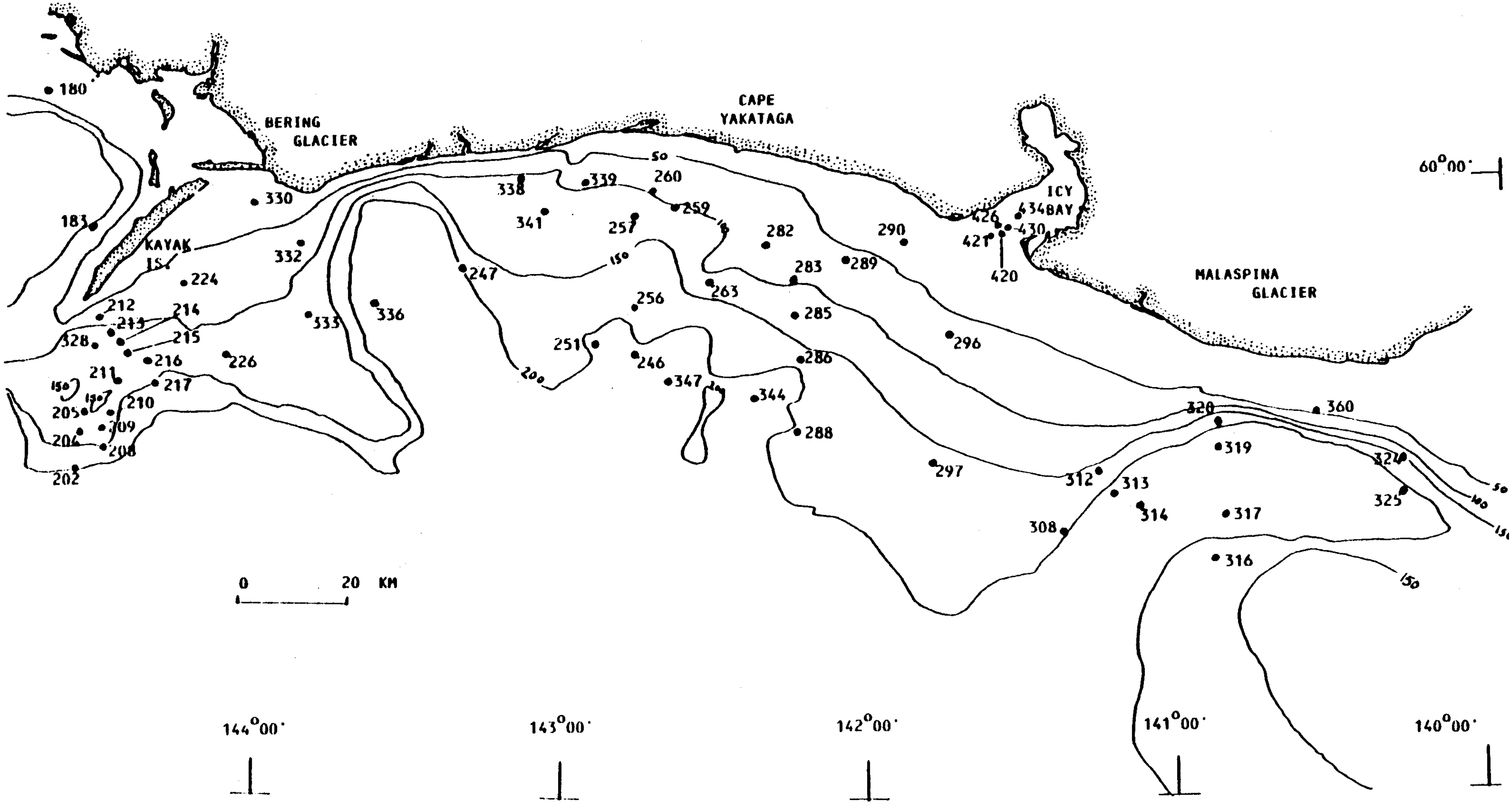


Figure 3.--Map illustrating the location of samples taken between Kayak Island and Icy Bay.

distributional patterns of modern ostracode species occurring in the Gulf of Alaska. The ostracode biofacies defined by characteristic assemblages of species, together with information on the sedimentary facies, provides a model of the environments presently occurring in the Gulf of Alaska, (Brouwers, 1981). This model forms a vital basis for the interpretation of Neogene and Quaternary glaciomarine environments in the Gulf of Alaska Tertiary Province.

Methods

The micropaleontological subsamples taken represent about 1 kg. of raw sediment, depending on the initial amount of sample available. All samples were washed on a 200-mesh sieve (75-micrometer opening). The washed sediment was sorted using a set of nested sieves and examined to a sieve size of 180 micrometers. The tabulation of fauna and flora, therefore, does not include any organism smaller than 180 micrometers in size. All samples were completely stripped of ostracode valves.

The ostracode adult and juvenile specimens found in each sample were identified and counted. The percentage each species constitutes of the entire ostracode assemblage was calculated. The counts refer to the total number of valves or recognizable fragments of a species; a carapace is counted as two valves. An asterisk (*) at the left of a species binomen indicates that specimens of that species contain soft parts. These individuals were probably living when collected.

The ostracode fauna found in the Pleistocene and older lithified sediments consists of modern, living species as well as fossil (Pleistocene) species that are reworked into the recent sediments. Ostracode species that do not presently live in the Gulf of Alaska and occur only as fossils are indicated by the letter (F) adjacent to the binomen. Undoubtedly, other species not indicated are fossil occurrences as well, but more modern distributional data are needed to sort these out.

The lithologic descriptions included are the initial shipboard determinations and, as such, should be considered preliminary, imprecise, and probably not internally consistent. This information is included solely to indicate faunal associations with particular substrate lithologies.

References

Brouwers, E. M., 1981, Distributional patterns of modern ostracode species from the continental shelf, Gulf of Alaska (abs.): University of Colorado, Institute of Arctic and Alpine Research, Arctic Workshop, 10th, Boulder, 1981, p. 3-4.

Carlson, P. R., and Molnia, B. F., 1977, Faulting, instability, erosion, and deposition of shelf sediments, Eastern Gulf of Alaska--Annual Report 1976-77, Research Unit 212/216: N.O.A.A. Environmental Assessment of the Alaskan Continental Shelf, Principal Investigators' Reports, Hazards, v. 17, p. 276-317.

Molnia, B. F. and Carlson, P. R., 1978, Surface sedimentary units of northern Gulf of Alaska continental shelf: American Association Petroleum Geologists Bulletin v. 62, no. 4, p. 633-643.

Molnia, B. F., and Carlson, P. R., 1980, Quaternary sedimentary facies on the continental shelf of the northeast Gulf of Alaska, Field M. E., and others, ed. _in_ Pacific Coast Paleogeography Symposium 4, Quaternary Depositional Environments of the Pacific Coast, Pacific Section, Society of Econ. Paleont. and Miner., p. 157-168.

Neale, J. W., and Howe, H. V., 1975, The marine Ostracoda of Russian Harbour, Novaya Zemlya And Other high latitude Faunas: Bulletins American Paleontology, v. 65, no. 282, p. 381-431.

Table 1.--List of the selected bottom grab samples by type and number.

[Numbers refer to localities shown in figures 1 and 2].

Sample No.	Type	Sample No.	Type	Sample No.	Type
4	Box Core	209	Shipek	347	Shipek
5	Box Core	210	Shipek	360	Van Veen
6	Box Core	211	Shipek	420	Shipek
11	Box Core	212	Shipek	421	Shipek
16	Van Veen	213	Shipek	426	Shipek
17	Van Veen	214	Shipek	430	Shipek
18	Van Veen	215	Shipek	434	Shipek
19	Shipek	216	Shipek	324	Van Veen
20	Van Veen	217	Van Veen	325	Van Veen
22	Van Veen	224	Shipek	328	Van Veen
24	Van Veen	70	Van Veen	330	Van Veen
26	Van Veen	71	Van Veen	332	Van Veen
27	Van Veen	83	Van Veen	333	Van Veen
32	Shipek	84	Van Veen	336	Van Veen
39	Van Veen	251	Shipek	338	Van Veen
41	Van Veen	256	Shipek		
46	Van Veen	257	Van Veen		
52A	Van Veen	259	Van Veen		
53	Van Veen	260	Van Veen		
54	Van Veen	263	Shipek		
55	Van Veen	282	Van Veen		
58	Van Veen	283	Van Veen		
59A	Van Veen	285	Van Veen		
59B	Van Veen	286	Van Veen		
63B	Van Veen	288	Van Veen		
65B	Shipek	289	Shipek		
66	Shipek	290	Shipek		
86	Van Veen	296	Shipek		
90	Van Veen	297	Van Veen		
92	Van Veen	308	Van Veen		
107	Van Veen	312	Van Veen		
108	Van Veen	313	Van Veen		
170A	Shipek	314	Van Veen		
171	Shipek	316	Van Veen		
173	Shipek	317	Van Veen		
176	Shipek	319	Van Veen		
179A	Shipek	320	Van Veen		
180	Shipek	226	Shipek		
183	Shipek	246	Shipek		
184	Van Veen	247	Van Veen		
202	Shipek	251	Shipek		
204	Van Veen	339	Van Veen		
205	Van Veen	341	Van Veen		
208	Shipek	344	Shipek		

Table 2.--Alphabetical list of the ostracode species occuring in the 102 selected bottom grab samples.

"Acanthocythereis" dunelmensis (Norman, 1865)

Acuminocythere sp. A

Ambostracon sp. A

Ambostracon sp. B

Argilloecia sp. A

Argilloecia sp. B

Argilloecia sp. C

Aurila sp. A

"Australicythere" sp. A

Baffinicythere emarginata (Sars, 1865)

Bairdia sp.

Buntonia sp. A

Bythocythere sp. B

Bythocythere sp. C

Bythocytheromorpha sp. A

Bythocytheromorpha sp. B

Bythocytheromorpha sp. C

Candona sp.

Cluthia cluthae (Brady, Crosskey and Robertson, 1874)

Cluthia sp. A

Coquimba sp. A

Cyclocypris sp.

Cythere aff. C. alveolivalva Smith, 1952

Cythere sp. A

Cytherois sp. A

Cytheromorpha sp. A

Cytheromorpha sp. E

Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)

Cytheropteron aff. *C. nodosoalatum* Neale and Howe, 1975

Cytheropteron sp. A

Cytheropteron sp. B

Cytheropteron sp. C

Cytheropteron sp. D

Cytheropteron sp. E

Cytheropteron sp. F

Cytheropteron sp. G

Cytheropteron sp. H

Cytheropteron sp. I

Cytheropteron sp. K

Cytheropteron sp. L

Cytheropteron sp. M

Cytheropteron sp. N

Cytheropteron sp. O

Cytheropteron sp. P

Cytheropteron sp. Q

Cytheropteron sp. R

Cytheropteron sp. S

Cytheropteron sp. T

Cytheropteron sp. U

Cytheropteron sp. V

Cytheropteron sp. W

Cytheropteron sp. X

Cytheropteron sp. Y

Cytherura sp. C

Cytherura sp. D

Cytherura sp. E

Cytherura sp. F

Cytherura sp. G

Elofsonia sp. A

Eucytherura sp. A

Eucytherura sp. B

Eucytherura sp. C

Finmarchinella (_Barentsovia_) _barentzovoensis_ (Mandelstam, 1957)

Finmarchinella (_Barentsovia_) sp. A

Finmarchinella (_Finamarchinella_) _finmarchica_ (Sars, 1866)

Hemicythere aff. _H._ _quadrinodosa_ Schornikov, 1974

Hemicytherura sp. A

Hemicytherura sp. B

Hemicytherura sp C

Krithe sp. A

"_Leguminocythereis_" sp. A

"_Leguminocythereis_" sp. B

"_Leguminocythereis_" sp. C

Limnocythere sp.

Loxoconcha sp. A

Loxoconcha sp. B

Loxoconcha sp. D

Loxoconcha sp. E

Loxoconcha sp. F

Munseyella sp. A

Munseyella sp. B

Palmanella limicola (Norman, 1865)

Paracypris sp. A

Paracypris sp. B

Paradoxostoma aff. P. brunneatum Schornikov, 1975

Paradoxostoma aff. P. flaccidum Schornikov, 1975

Paradoxostoma aff. P. japonicum Schornikov, 1975

Paradoxostoma aff. P. setoensis Schornikov, 1975

Paradoxostoma sp. B

Paradoxostoma sp. C

Paradoxostoma sp. D

Paradoxostoma sp. E

Paradoxostoma sp. G

Paradoxostoma sp. H

Paradoxostoma sp. I

Patagonacythere sp. A

Pectocythere aff. P. parkerae Swain and Gilby, 1974

Pectocythere aff. P. quadrangulata Hanai, 1957

Pectocythere sp. D

Pectocythere sp. E

Pectocythere sp. F

Pectocythere sp. G

Pontocythere sp. A

Pseudocythere sp. A

Robertsonites tuberculata (Sars, 1865)

Roundstonia globulifera (Brady, 1868)

Schizocythere sp. A

Sclerochilus sp. B

Sclerochilus sp. C

Sclerochilus sp. D

Semicytherura aff. *S. undata* (Sars, 1865)

Semicytherura sp. D

Semicytherura sp. E

Semicytherura sp. F

Xestoleberis sp. A

Xestoleberis sp. B

Xiphichilus sp. A

EGAL-75-KC Box Core - 4

Latitude: 59° 39.3' N

Longitude: 147° 40.1' W

Water Depth: Not Known

Lithology: Gray silty clay.

Organisms:
- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Diatoms
- Radiolarians
- Agglutinated Benthic Foraminifers
- Ostracodes

Ostracode Species:	Adult	Juv.	%
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	2	6	36.36
Semicytherura sp. D	3		13.64
Krithe sp. A.	2		9.09
Cytheropteron sp. C	1	1	9.09
Cytherura sp. C	2		9.09
Palmanella limicola (Norman, 1865)	1		4.55
Paradoxostoma sp.		1	4.55
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	4.55

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. E	1		4.55
Cytheropteron sp. M.	1		4.55

Total Ostracodes 22

EGAL-75-KC Box Core - 5

Latitude: 59° 36.5' N

Longitude: 147° 32.8' W

Water Depth: Not Known

Lithology: Gray silty clay; thin water-saturated mud on top.

Organisms: Echinoderm Fragments

Agglutinated Benthic Foraminifers

Calcareous Benthic Foraminifers

Planktic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. G	3	1	57.14
Cytheropteron sp. L	2		28.57
"Acanthocythereis" dunelmensis (Norman, 1865)	1		14.29

Total Ostracodes 7

EGAL-75-KC Box Core - 6

Latitude: 59° 32.3' N

Longitude: 147° 21.1' W

Water Depth: 143 meters

Lithology: Firm, gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Ostracodes
- Diatoms

Ostracode Species:	Adult	Juv.	%
Krithe sp. A	16	13	27.10
Cytheropteron sp. W	18	2	18.69
Cytheropteron sp. N	15	4	17.76
Cytheropteron sp. M	16	1	15.89
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	7	4	10.28
Eucytherura sp. A	4		3.74
Cytheropteron sp. D	2		1.87
Cytherura sp. C	2		1.87
"Acanthocythereis" dunelmensis (Norman, 1865)		1	0.94
Cytheropteron sp. B	1		0.94
Palmanella limicola (Norman, 1865)	1		0.94

Total Ostracodes 107

EGAL-75-KC Box Core - 11

Latitude: 59° 55.9' N

Longitude: 147° 25.4' W

Water Depth: 49 meters

Lithology: Gray silt.

Organisms: Calcareous Benthic Foraminifers

Sponge Spicules

Cheilostome Bryozoans

Pelecypods

Ostracodes

Plant Debris

Diatoms

	Ostracode Species:	Adult	Juv.	%
	*Cytheromorpha sp. E	264	66	21.48
	*Loxoconcha sp. A	119	140	16.86
	"Leguminocythereis" sp. A	13	174	12.18
	*Pectocythere sp. D	43	50	6.05
	Pontocythere sp. A	77	15	5.99
	Hemicythere aff. H. quadrinodosa Schornikov, 1974	1	54	3.58
	*Buntonia sp. A	46	6	3.39
	Cythere sp. A	1	45	3.00
	Xestoleberis sp. A	29	17	3.00
	Aurila sp. A		43	2.80
	*Cytheropteron sp. A	31	7	2.47
(F)	Ambostracon sp. A	5	23	1.82
	Acuminocythere sp. A		27	1.76
	"Acanthocythereis" dunelmensis (Norman, 1865)	5	18	1.50

Ostracode Species:		Adult	Juv.	%
	*Cythere aff. C. alveolivalva Smith, 1952	7	15	1.43
	*Cytherois sp. A	19	2	1.37
	Paradoxostoma aff. P. brunneatum	14	4	1.17
	Schornikov, 1975			
	*Palmanella limicola (Norman, 1865)	6	9	0.98
	Paradoxostoma aff. P. japonicum	3	10	0.85
	Schornikov, 1975			
	Paradoxostoma sp. B	8	5	0.85
(F)	Xestoleberis sp. B	10	3	0.85
	Cytheropteron aff. C. nodosoalatum	1	9	0.65
	Neale and Howe, 1975			
	Pseudocythere sp. A	6	3	0.59
	Loxoconcha sp. D	7	2	0.59
(F)	Cytherura sp. D	6	1	0.46
	Cytheromorpha sp. A	2	4	0.39
(F)	Cytheropteron sp. V	5	1	0.39
(F)	Semicytherura sp. E	5		0.33
	Argilloecia sp. B	4		0.26
(F)	Finmarchnella barentzovoensis		4	0.26
	(Mandelstam, 1957)		4	0.26
	Paradoxostoma sp. G	4		0.26
	Paradoxostoma sp. H	2	2	0.26
	Cluthia sp. A	4		0.26
	Hemicytherura sp. B	3		0.20
	Cytheropteron sp. F	1	2	0.20

Ostracode Species:		Adult	Juv.	%
	<u>Pectocythere</u> aff. <u>P.</u> <u>quadrangulata</u> Hanai, 1957	3		0.20
	<u>Hemicytherura</u> sp. C		2	0.13
(F)	<u>Bythocytheromorpha</u> sp. A	1	1	0.13
	*<u>Bairdia</u> sp.		2	0.13
(F)	<u>Cytherura</u> sp. E		2	0.13
	<u>Cytheropteron</u> aff. <u>C.</u> <u>latissimum</u> of Neale and Howe (1975)		2	0.13
(F)	<u>Coquimba</u> sp. A	1		0.07
	<u>Semicytherura</u> aff. <u>S.</u> <u>undata</u> (Sars, 1965)	1		0.07
	<u>Xiphichilus</u> sp. A	1		0.07
(F)	<u>Ambostracon</u> sp. B		1	0.07
	<u>Cytheropteron</u> sp. I		1	0.07
	<u>Hemicytherura</u> sp. A		1	0.07

Total Ostracodes 1536

EGAL-75-KC Van Veen - 16

Latitude: 59° 45.2' N

Longitude: 146° 49.4' W

Water Depth: 91 meters

Lithology: Gray silt.

Organisms: Calcareous Benthic Foraminifers

Sponge Spicules

Agglutinated and Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adult	Juv.	%
"*Acathocythereis*" *dunelmenis* (Norman, 1865)	1	1	66.67
Munseyella sp. A	1		33.33

Total Ostracodes 3

EGAL-75-KC Van Veen-17

Latitude: 59° 38.1' N

Longitude: 146° 43.5' W

Water Depth: 97 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Foraminifers

Planktic Foraminifers

Sponge Spicules

Ostracodes

Echinoderm Fragments

Ostracode Species:		Adult	Juv.	%
	Cytheropteron aff. C. latissimun of Neale and Howe (1975)	9	2	13.58
	Cythere sp. A	2	8	12.35
	"Acanthocythereis" dunelmensis (Norman, 1865)	2	6	9.88
	Palmanella limicola (Norman, 1865)	3	3	7.41
	Aurila sp. A		5	6.17
	Hemicythere aff. H. quadrinodosa Schornikov, 1974		5	6.17
	Munseyella sp. A	5		6.17
	Eucytherura sp. A	3	1	4.94
	Hemicytherura sp. B	4		4.94
	Cytherois sp. A	2	1	3.70
	Loxoconcha sp. A	2		2.47
	Cytheropteron sp. D	2		2.47
(F)	Finmarchinella (Finmarchinella) finmarchica (Sars, 1866)		1	1.24
	Pseudocythere sp. A	1		1.24

Ostracode Species:		Adult	Juv.	%
	Acuminocythere sp. A		1	1.24
	Krithe sp. A		1	1.24
(F)	"Australicythere" sp. A		1	1.24
	"Leguminocythereis" sp. A		1	1.24
	"Leguminocythereis" sp. B		1	1.24
(F)	Ambostracon sp. A		1	1.24
(F)	Ambostracon sp. B		1	1.24
	Eucytherura sp. B	1		1.24
	Cytherura sp. D		1	1.24
(F)	Cytheropteron sp. U	1		1.24
	Cytheropteron sp. F		1	1.24
	Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	1.24
	Paradoxostoma aff. P. brunneatum Schornikov, 1975	1		1.24
	Cytheropteron sp. T		1	1.24

Total Ostracodes 81

EGAL-75-KC Van Veen - 18

Latitude: 59° 33.5' N

Longitude: 146° 42.4' W

Water Depth: 113 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Pelecypods
- Gastropods
- Ostracodes
- Echinoderm Spine
- Diatoms

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	1	9	35.71
Eucytherura sp. A	5	2	25.00
Palmanella limicola (Norman, 1865)	2	2	14.29
Semicytherura sp. D	2		7.14
Munseyella sp. A	2		7.14
Cytheropteron sp. D	1		3.57
Cythere sp. A		1	3.57
Loxoconcha sp. B	1		3.57

Total Ostracodes 28

EGAL-75-KC Shipek - 19

Latitude: 59° 31.8' N

Longitude: 146° 51.0' W

Water Depth: 113 meters

Lithology: Gray, pebbly mud.

Organisms: Calcareous Benthic Foraminfers

Agglutinated Foraminifers

Agglutinated and Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Echinoderms

Ostracode Species:	Adult	Juv.	%
Sclerochilus sp. D	2		50.0
Cytheropteron sp. G	1		25.0
Cytheropteron sp. K	1		25.0

Total Ostracodes 4

EGAL-75-KC Van Veen - 20

Latitude: 59° 28.5' N

Longitude: 146° 41.8' W

Water Depth: 88 meters

Lithology: Gray mud with some gravel.

Organisms:

Calcareous Benthic Foraminifers

Planktic Foraminifers

Sponge Spicules

Proteinaceous Worm Tubes

Cheilostome Bryozoans

Pelecypods

Scaphopod

Ostracodes

Echinoderm Spines and Fragments

Ostracode Species:		Adult	Juv.	%
(F)	"Australicythere" sp. A	2	9	35.48
	Cytheropteron sp. H	1	2	9.68
	Paradoxostoma sp. D		2	6.45
	Eucytherura sp. A	2		6.45
	*Argilloecia sp. A	2		6.45
	Cytheropteron sp. N	1		3.23
	Aurila sp. A		1	3.23

Ostracode Species:		Adult	Juv.	%
	Semicytherura sp. F		1	3.23
	Cytheropteron aff. C. latissimum of Neale and Howe (1975)		1	3.23
	Cytheropteron sp. F	1		3.23
	Argilloecia sp. B	1		3.23
	Pectocythere aff. P. parkerae Swain and Gilby, 1974		1	3.23
(F)	Ambostracon sp. A		1	3.23
	Hemicytherura sp. B	1		3.23
	Pectocythere aff. P. quadrangulata Hanai, 1957		1	3.23
	Cytheropteron sp. G	1		3.23

Total Ostracodes 31

EGAL-75-KC Shipek - 22

Latitude: 59° 27.2' N

Longitude: 146° 41.1' W

Water Depth: 106 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Pelecypods

Scaphopod

Ostracodes

	Ostracode Species:	Adult	Juv.	%
	"Acanthocythereis" dunelmensis (Norman, 1865)	9	11	76.92
	Palmanella limicola (Norman, 1865)	2		7.69
	Marine Cyprid	1		3.85
	Cytherois sp A	1		3.85
(F)	"Australicythere" sp. A		1	3.85
	Loxoconcha sp. A	1		3.85

Total Ostracodes 26

EGAL-75-KC Van Veen - 24

Latitude: 60° 01.2' N

Longitude: 147° 15.0' W

Water Depth: 143 meters

Lithology: 5 cm of brown, soft, water-saturated mud overlying a firmer, gray, sticky mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Pelecypods
- Pteropod
- Ostracodes
- Diatoms

Ostracode Species:	Adult	Juv.	%
"*Leguminocythereis*" sp. C	1	17	45.0
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	2	11	32.5
Robertsonites tuberculata (Sars, 1865)	5	5	12.5
Aurila sp. A		2	5.0
Palmanella limicola (Norman, 1865)	1		2.5
Cytheropteron sp. Q		1	2.5

Total Ostracodes 40

EGAL-75-KC Van Veen - 26

Latitude: 59° 56.6' N

Longitude: 147° 06.1' W

Water depth: 205 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	3	4	21.88
Bythocythere sp. B	4	2	18.75
Cytheropteron sp. Q	3	2	15.63
Palmanella limicola (Norman, 1865)	1	2	9.38
Cytheropteron sp. X	1	2	9.38
Cytheropteron sp. D	2		6.25
Argilloecia sp. B	2		6.25
Krithe sp. A	2		6.25
Cytheropteron sp. L		1	3.13
Cytheropteron sp. C	1		3.13

Total Ostracodes 32

EGAL-75-KC Van Veen - 27

Latitude: 59° 53.8' N

Longitude: 146° 59.2' W

Water Depth: 163 meters

Lithology: Gray mud.

Organisms:
Calcareous Benthic Foraminifers
Agglutinated Foraminifers
Pelecypods
Pteropod
Ostracodes
Diatoms

Ostracode Species:	Adult	Juv.	%
Marine Cyprid	2		33.33
Robertsonites tuberculata (Sars, 1866)		2	33.33
"Acanthocythereis" dunelmensis (Norman, 1865)		1	16.67
Cytheropteron aff. C. latissimum of Neale and Howe (1975)		1	16.67

Total Ostracodes 6

EGAL-75-KC Shipek - 32

Latitude: 59° 28.7' N

Longitude: 146° 29.1' W

Water Depth: 53 meters

Lithology: Well-rounded cobbles heavily encrusted with bryozoans, with very little sandy silt.

Organisms:

- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Cheilostome Bryozoans
- Cyclostome Bryozoans
- Brachiopods
- Pelecypods
- Gastropods
- Ostracodes
- Echinoderm Fragments and Spines

	Ostracode Species:	Adult	Juv.	%
	*"Australicythere" sp. A	14	37	18.35
	*Pectocythere aff. P. parkerae Swain and Gilby, 1974	29		10.43
	*Ambostracon sp. A	14	11	8.99
	Aurila sp. A	2	21	8.27
(F)	Sclerochilus sp. C	8	11	6.84

Ostracode Species:		Adult	Juv.	%
	Pectocythere aff. P. quadrangulata Hanai, 1957	14	3	6.12
	Cythere sp. A	2	13	5.40
(F)	Finmarchinella (Finmarchinella) finmarchica (Sars, 1866)	10	3	4.68
	Cytheropteron aff. C. latissimum of Neale and Howe (1975)	11		3.96
(F)	Loxoconcha sp. E	8	3	3.96
	*Cytheromorpha sp. A	8		2.88
(F)	Finmarchinella (Barentzovia) sp. A	4	3	2.52
	*Acuminocythere sp. A		7	2.52
	Hemicytherura sp. B	5	1	2.16
	Hemicythere aff. H. quadrinodosa Schornikov, 1974	4		1.44
	Cythere aff. C. alveolivalva Smith, 1952	1	3	1.44
	Cytheropteron sp. F	2	2	1.44
(F)	Bythocytheromorpha sp. B	1	1	0.72
	Sclerochilus sp. B	1	1	0.72
	Cytheropteron sp. I	2		0.72
	"Acanthocythereis" dunelmensis (Norman, 1865)		2	0.72
(F)	Patagonacythere sp. A		2	0.72
	Argilloecia sp. B	2		0.72
	Paradoxostoma sp.		2	0.72

Ostracode Species:		Adult	Juv.	%
	Munseyella sp. A	2		0.72
	Bythocytheromorpha sp. C	1	1	0.72
	Cytheropteron aff. C.	1		0.36
	nodosoalatum Neale and Howe, 1975	1		0.36
	Cytheropteron sp. N	1		0.36
(F)	Ambostracon sp. B		1	0.36
(F)	Pectocythere sp. G	1		0.36
	Elofsonia sp. A	1		0.36
	Eucytherura sp. A	1		0.36

Total Ostracodes 278

EGAL-75-KC Van Veen - 39

Latitude: 59° 28.0' N

Longitude 145° 59.7' W

Water Depth: 148 meters

Lithology: Pebbly mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Sponge Spicules

Cyclostome Bryozoans

Cheilostome Bryozoans

Pelecypod Fragments

Gastropod

Ostracodes

Echinoderm Spines

	Ostracode Species:	Adult	Juv.	%
(F)	"Australicythere" sp. A	65	142	76.95
	Cytheropteron sp. G	13	3	5.95
	Sclerochilus sp. D	4	6	3.72
	Cytheropteron aff. C. latissimum of Neale and Howe (1975)	6		2.23
	Aurila sp. A	5		1.86
(F)	Patagonacythere sp. A	3	1	1.49
(F)	Pectocythere sp. G	3		1.12
	Cytheropteron sp. P	1	2	1.12
(F)	Schizocythere sp. A		2	0.74
(F)	Finmarchinella (Barentsovia) sp. A	1	1	0.74
	Cytheropteron sp. E		2	0.74
	Paradoxostoma aff. P. japonicum Schornikov, 1975	1	1	0.74
	Krithe sp. A	1		0.37
	Hemicytherura sp. A	1		0.37
	"Leguminocythereis" sp. C		1	0.37
	Pectocythere aff. P. quadrangulata Hanai, 1957	1		0.37

Ostracode Species:		Adult	Juv.	%
	Bythocythermomorpha sp. B	1		0.37
	Bairdia sp. A	1		0.37
(F)	Pectocythere sp. F	1		0.37
	Cytherura sp. G	1		0.37
(F)	Finmarchinella (Finmarchinella) finmarchica (Sars, 1866)	1		0.37

Total Ostracodes 269

EGAL-75-KC Van Veen - 41

Latitude: 60° 09.05' N

Longitude: 147° 07.2' W

Water Depth: 212 meters

Lithology: Gray silt

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Plant Debris

Diatoms

Ostracode Species:	Adult	Juv.	%
Aurila sp. A		2	20.0
Bythocythere sp. B	2		20.0
Cytheromorpha sp. A		1	10.0
Pectocythere aff. P. quadrangulata Hanai, 1957		1	10.0
Cytheropteron sp. A		1	10.0
Xestoleberis sp. A		1	10.0
?Cythere sp.		1	10.0
Cythere sp. A		1	10.0

Total Ostracodes 10

EGAL-75-KC Van Veen - 46

Latitude: 60° 00.0'N

Longitude: 146° 45.5' W

Water Depth: 126 meters

Lithology: Sticky gray mud with numerous worms.

Organisms: Calcareous Benthic Foraminifers

Sponge Spicules

Pelecypods

Ostracodes

Ostracode Species:	Adult	Juv.	%
(F) "Australicythere" sp. A		33	20.50
Cytheropteron sp. T	18	9	16.77
Robertsonites tuberculata (Sars, 1865)	3	16	11.80
"Acanthocythereis" dunelmensis (Norman, 1865)	3	13	9.94
(F) Ambostracon sp. A	4	7	6.83
Pectocythere aff. P. quadrangulata Hanai, 1957	2	9	6.83
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	4	4	4.97
Cytheromorpha sp. A	5		3.11
Pectocythere aff. P. parkerae Swain and Gilby, 1974	1	3	2.48
(F) Finmarchinella (Barentsovia) sp. A	1	2	1.86
Palmanella limicola (Norman, 1865)	2	1	1.86
Cytheropteron sp. E	1	2	1.86
Munseyella sp. A	3		1.86
Cytheropteron sp. W	1	1	1.24
(F) Loxoconcha sp. E	1	1	1.24
Cytheropteron sp. H		2	1.24
Hemicytherura sp. B	2		1.24
Cytheropteron sp. F	2		1.24
Paradoxostoma aff. P. japonicum Schornikov, 1975		1	0.62

Ostracode Species:	Adult	Juv.	%
<u>Cytheropteron</u> sp. P	1		0.62
<u>Eucytherura</u> sp. A	1		0.62
<u>Loxoconcha</u> sp. A	1		0.62
<u>Argilloecia</u> sp. B		1	0.62

Total Ostracodes 161

EGAL-75-KC Van Veen - 52A

Latitude: 59° 59.0' N

Longitude: 146° 27.5' W

Water Depth: 71 meters

Lithology: Pebbly, shelly mud.

Organisms:

- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Brachiopods
- Ostracodes
- Echinoderm Fragments

	Ostracode Species:	Adult	Juv.	%
	*"Australicythere" sp. A	110	672	37.70
	Cytheropteron aff. C. latissimum of Neale and Howe (1975)	111	96	9.85
	Pectocythere aff. P. quadrangulata Hanai, 1957	121	72	9.19
	*Ambostracon sp. A	77	77	7.33
(F)	Finmarchinella (Barentsovia) sp. A	116	26	6.76
(F)	Finmarchinella (Finmarchinella) Finmarchica (Sars, 1865)	94	108	5.14
	Pectocythere aff. P. parkerae Swain and Gilby, 1974	65	1	3.14
	Cytheropteron sp. E	37	26	3.00
	Hemicytherura sp. B	37	3	2.86
	Cytheropteron sp. G	39	16	2.62
	Aurila sp. A	3	37	1.90
(F)	Patagonacythere sp. A	21	13	1.62
	Hemicytherura sp. A	18	11	1.38
	Munseyella sp. A	15		0.71
(F)	Loxoconcha sp. E	12	3	0.71
	Cytheropteron sp F	13	2	0.71
	Acuminocythere sp. A		14	0.67
	Cytheropteron sp. N	7	6	0.62
	Cytheromorpha sp. A	5	13	0.62
	"Leguminocythereis" sp. A	8	3	0.52
	Cytheropteron sp. H	6	5	0.52

Ostracode Species:		Adult	Juv.	%
	Cytheropteron sp. I	7	2	0.43
(F)	Pectocythere sp. F	9		0.43
	Eucytherura sp. A	7	1	0.38
	"Acanthocythereis" dunelmensis (Norman, 1865)		7	0.33
(F)	Cytherura sp. F	5	1	0.29
	Cytheropteron sp. K	4		0.19
(F)	Pectocythere sp. E	3		0.14
	Pseudocythere sp. A	3		0.14
(F)	Baffinicythere emarginata (Sars, 1865)	2		0.10
	Bairdia sp.		2	0.10
	Loxoconcha sp. B	2		0.10
	Sclerochilus sp. C	2		0.10
	Cytheromorpha sp. E	2		0.10
	Robertsonites tuberculata (Sars, 1865)		1	0.05
	Cytheropteron sp. L	1		0.05
	Cytheropteron sp. D	1		0.05
(F)	Xestoleberis sp. B	1		0.05
	Eucytherura sp. C	1		0.05
	Cytheropteron sp. O	1		0.05
	Paradoxostoma aff. P. japonicum Schornikov, 1975	1		0.05

Total Ostracodes 2101

EGAL-75-KC Van Veen - 53

Latitude: 60° 07.7' N

Longitude: 146° 52.8' W

Water Depth: 156 meters

Lithology: Gray mud

Organisms:
- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Sponge Spicules
- Proteinaceous Worm Tubes
- Pelecypods
- Gastropods
- Pteropod
- Ostracodes
- Echinoderm Fragments
- Plant Debris
- Diatoms

Ostracode Species:		Adult	Juv.	%
	"Acanthocythereis" dunelmensis (Norman, 1865)	3	56	32.96
	Robertsonites tuberculata (Sars, 1866)		29	16.20
(F)	"Australicythere" sp. A		13	7.26
	Aurila sp. A	1	9	5.59
	Palmanella limicola (Norman, 1865)	3	6	5.03
	Eucytherura sp. A	7		3.91
	Cytheropteron aff. C. latissimum of Neale and Howe (1975)	3	3	3.35
(F)	Ambostracon sp. A	3	3	3.35
	Pectocythere aff. P. parkerae Swain and Gilby, 1974	1	4	2.79
	Pectocythere aff. P. quadrangulata Hanai, 1957	2	3	2.79
	Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	1	2	1.68
	Acuminocythere sp. A		3	1.68
	Loxoconcha sp. A	1	1	1.12
	Paradoxostoma sp. D	2		1.12
	Munseyella sp. A	2		1.12
	Hemicytherura sp. B	2		1.12
	Krithe sp. A	2		1.12
	Paradoxostoma sp. I		2	1.12
	Cytheropteron sp M		1	0.56

Ostracode Species:		Adult	Juv.	%
(F)	*Finmarchinella* (*Barentsovia*) sp. A		1	0.56
	Argilloecia sp. B	1		0.56
	?*Paradoxostoma* sp.		1	0.56
	Cytheropteron sp. H		1	0.56
	Cytherois sp. A		1	0.56
	Paracypris sp.		1	0.56
	"*Leguminocythereis*" sp. C		1	0.56
	Hemicythere aff. *H.* *quadrinodosa* Schornikov, 1974		1	0.56
	Cythere sp. A		1	0.56
	Loxoconcha sp. B	1		0.56
	Cytheropteron sp. Y	1		0.56

Total Ostracodes 179

EGAL-KC Van Veen - 54

Latitude: 60° 06.1' N

Longitude: 146° 49.4' W

Water Depth: 112 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Gastropod

Ostracodes

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	19	68	76.32
Palmanella limicola (Norman, 1865)	6	3	7.90
Robertsonites tuberculata (Sars, 1865)		8	7.02
Eucytherura sp. A	5		4.39
Munseyella sp. A	2		1.75
Limnocythere sp.	1		0.88
Cluthia sp. A		1	0.88
Pectocythere aff. *P. parkerae* Swain and Gilby, 1974		1	0.88

Total Ostracodes 114

EGAL-75-KC   Van Veen - 55

Latitude: 60° 14.5' N

Longitude: 146° 50.6' W

Water Depth: 220 meters

Lithology: Gray mud with some organic material.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Foraminifers
- Planktic Foraminifers
- Pelecypod Fragments
- Ostracodes
- Echinoderm Fragments
- Organic Debris
- Diatoms (numerous)

Ostracode Species:	Adult	Juv.	%
Cytheromorpha sp. A	16	14	38.46
Loxoconcha sp. A	3	5	10.26
Hemicythere aff. *H. quadrinodosa* Schornikov, 1974		7	8.97
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	4		5.13
Cythere aff. *C. alveolivalva* Smith, 1952		4	5.13
Elofsonia sp. A	2	2	5.13
(F) "*Australicythere*" sp. A		2	2.56
Cytheromorpha sp. E	2		2.56
Argilloecia sp. C	2		2.56
Pectocythere aff. *P. quadrangulata* Hanai, 1957		2	2.56

Ostracode Species:		Adult	Juv.	%
	Hemicytherura sp. A	1		1.28
	Cytheropteron sp. Y	1		1.28
	"Acanthocythereis" dunelmensis (Norman, 1865)		1	1.28
(F)	Ambostracon sp. A		1	1.28
	Loxoconcha sp. B	1		1.28
	Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	1		1.28
	Robertsonites tuberculata (Sars, 1865)		1	1.28
	Palmanella limicola (Norman, 1865)		1	1.28
	Cluthia sp. A	1		1.28
	Candona sp.		1	1.28
	Cytheropteron sp. H		1	1.28
	"Leguminocythereis" sp. A		1	1.28
	Aurila sp. A		1	1.28

Total Ostracodes 78

EGAL-75-KC Van Veen - 58

Latitude: 60° 13.8' N

Longitude: 146° 44.25' W

Water Depth: 221 meters

Lithology: Gray sandy mud overlain by a thin layer of soupy, olive-gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Cheilostome Bryozoans
- Pelecypods
- Gastropods
- Ostracodes
- Echinoderm Fragments
- Plant Debris

Ostracode Species:	Adult	Juv.	%
Cytheromorpha sp. A	2	3	27.78
Elofsonia sp. A	2	1	18.75
Pectocythere sp. D	2	1	18.75
"*Leguminocythereis*" sp. A		1	6.25
Hemicythere aff. H. *quadrinodosa* Schornikov, 1974		1	6.25
Cytherois sp. A	1		6.25
Loxoconcha sp. A	1		6.25
Cytheropteron sp. R	1		6.25

Total Ostracodes 16

EGAL-75-KC Van Veen - 59A

Latitude: 60° 12.1' N

Longitude: 146° 41.2' W

Water Depth: 192 meters

Lithology: Olive-gray, pebbly mud.

Organisms:

- Calcareous Benthic Foraminifers
- Proteinaceous Worm Tubes
- Cheilostome Bryozoans
- Pelecypods
- Gastropods
- Ostracodes
- Echinoderm Spine

	Ostracode Species:	Adult	Juv.	%
	Robertsonites tuberculata (Sars, 1866)		1	50.0
(F)	Pectocythere sp. E	1		50.0

Total Ostracodes 2

EGAL-75-KC Van Veen -59B

Latitude: 60° 11.8' N

Longitude: 146° 41.5' W

Water Depth: 183 meters

Lithology: Olive-gray to gray, sandy silt.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

	Ostracode Species:	Adult	Juv.	%
	Cytheromorpha sp. A	6	3	26.47
	Pectocythere sp.		5	14.71
	Loxoconcha sp. A	4		11.77
	"Acanthocythereis" dunelmensis (Norman, 1865)		2	5.88
	Pectocythere aff. P. quadrangulata Hanai, 1957		2	5.88
	*Robertsonites tuberculata (Sars, 1865)	2		5.88
	Paradoxostoma sp. I		1	2.94
	Cytheropteron sp. A		1	2.94
	"Leguminocythereis" sp. A		1	2.94
(F)	"Australicythere" sp. A		1	2.94

Ostracode Species:	Adult	Juv.	%
Cytheropteron aff. *c. latissimum* of Neale and Howe (1975)		1	2.94
Cytheropteron sp. E		1	2.94
Cytheromorpha sp. E	1		2.94
Cythere aff. *C. alveolivalva* Smith, 1952		1	2.94
Cytheropteron sp. S	1		2.94
Hemicythere aff. *H. quadrinodosa* Schornikov, 1974		1	2.94

Total Ostracodes 34

EGAL-75-KC Van Veen - 63B

Latitude: 60° 01.8' N

Longitude: 146° 14.6' W

Water Depth: 64 meters

Lithology: Coarse gravel and cobbles, with sandy mud.

Organisms: Cheilostome Bryozoans

Brachiopods

Pelecypods

Ostracodes

Echinoderm Fragments

	Ostracode Species:	Adult	Juv.	%
(F)	"Australicythere" sp. A	3	19	42.31
	Pectocythere aff. P. quadrangulata Hanai, 1957	11	2	25.00
	Pectocythere aff. P. parkerae Swain and Gilby, 1974	5	2	13.46
	Cytheropteron aff. C. latissimum of Neale and Howe (1975)	3	3	11.54
	Cytheropteron sp. E	1	1	3.85
(F)	Ambostracon sp. A		1	1.92
(F)	Finmarchinella (Barentsovia) sp. A	1		1.92

Total Ostracodes 52

EGAL-75-KC Shipek - 65B

Latitude: 50° 49.4' N

Longitude: 146° 14.9' W

Water Depth: 53 meters

Lithology: Sand and shells, some gravel, trace of mud.

Organisms: Calcareous Benthic Foraminifers

Bryozoans

Pelecypods

Gastropods

Ostracodes

Cirriped Plates

Echinoderm Spines

	Ostracode Species:	Adult	Juv.	%
	*Aurila sp. A	36		85.71
(F)	Sclerochilus sp. C	2		4.76
(F)	"Australicythere" sp. A	1		2.38
(F)	Ambostracon sp. A	1		2.38
(F)	Bythocytheromorpha sp. B	1		2.38
(F)	Finmarchinella (Barentsovia) sp. A	1		2.38

Total Ostracodes 42

EGAL-75-KC Shipek - 66

Latitude: 59° 46.6' N

Longitude: 146° 15.9' W

Water Depth: 75 meters

Lithology: Predominantly gray silt, with shell hash and some gravel.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
Pectocythere aff. P. quadrangulata Hanai, 1957	2	1	75.0
Pectocythere aff. P. parkerae Swain and Gilby, 1974	1		25.0

Total Ostracodes 4

EGAL-75-KC Van Veen - 70

Latitude: 60° 12.6' N

Longitude: 146° 15.3' W

Water Depth: 108 meters

Lithology: 2 cm of brown-gray silt overlying a very firm, gray silt.

Organisms: Pelecypods

Ostracodes

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	3	13	45.71
Robertsonites tuberculata (Sars, 1865)		10	28.57
Cytheropteron sp. F	2	3	14.29
Palmanella limicola (Norman, 1865)	3	1	11.43

Total Ostracodes 35

EGAL-75-KC Van Veen - 71

Latitude: 60° 10.1' N

Longitude: 146° 15.0' W

Water Depth: 84 meters

Lithology: 2 cm of brown-gray silt overlying a firm, gray silt.

Organisms: Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:		Adult	Juv.	%
	"Acanthocythereis" dunelmensis (Norman, 1865)	15	88	61.31
	Palmanella limicola (Norman, 1865)	16	8	14.29
	Loxoconcha sp. A	6	5	6.55
	Robertsonites tuberculata (Sars, 1865)		9	5.36
	Eucytherura sp. A	3	2	2.98
	Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	1	3	2.38
	Cytheropteron aff. *C. nodosoalatum* Neale and Howe, 1975	2	1	1.79
	Paracypris sp. B	2		1.19
	Cytheropteron sp. M	2		1.19
	Munseyella sp. A	2		1.19
	Pectocythere aff. *P. quadrangulata* Hanai, 1957		1	0.60
(F)	*"Australicythere"* sp. A		1	0.60
	Cytheropteron sp. D	1		0.60

Total Ostracodes 168

EGAL-75-KC Van Veen - 83

Latitude: 59° 39.0' N

Longitude: 145° 59.5' W

Water Depth: 91 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	1	1	40.0
Munseyella sp. A	1		20.0
"Acanthocythereis" dunelmensis (Norman, 1865)		1	20.0
Pectocythere aff. P. parkerae Swain and Gilby, 1974	1		20.0

Total Ostracodes 5

EGAL-75-KC Van Veen - 84

Latitude: 59° 32.2' N

Longitude: 145° 59.5' W

Water Depth: 157 meters

Lithology: Gray mud

Organisms: Ostracodes

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		7	63.64
Krithe sp. A		2	18.18
Non-marine Cyprid	1		9.09
Cytheropteron sp. X	1		9.09

Total Ostracodes 11

EGAL-75-KC Van Veen - 86

Latitude: 60° 14.0' N

Longitude: 145° 34.5' W

Water Depth: 48 meters

Lithology: Gray mud.

Organisms: Pelecypods

Insect Head

Plant Debris

Ostracodes

Ostracode Species:	Adult	Juv.	%
*"Acanthocythereis" dunelmensis (Norman, 1865)	2	46	28.92
Loxoconcha sp. A	15	22	22.29
Pectocythere aff. P. quadrangulata Hanai, 1957	1	13	8.43
Cytheropteron sp. A	5	7	7.23
Robertsonites tuberculata (Sars, 1865)	2	9	6.63
Cytheropteron sp. I	7	4	6.63
Palmanella limicola (Norman, 1865)	2	7	5.42
Cytheromorpha sp. A	3	5	4.82
Cytheromorpha sp. E	4	2	3.62
"Leguminocythereis" sp. A		3	1.81
Cytherois sp. A	3		1.81
Loxoconcha sp. F	2		1.21
Cytheropteron aff. C. nodosoalatum Neale and Howe (1975)		1	0.60
Cytheropteron sp. R	1		0.60

Total Ostracodes 166

EGAL-75-KC Van Veen - 90

Latitude: 59° 52.6' N

Longitude: 145° 34.5' W

Water Depth: 88 meters

Lithology: Gray mud with some cobbles.

Organisms: Benthic Foraminifers

Sponge Spicules

Ostracodes

Ostracode Species:	Adult	Juv.	%
Munseyella sp. A	4		44.44
Cytheropteron sp. M	2		22.22
Cytheropteron aff. C. latissimum of Neale and Howe (1975)		2	22.22
Cytheropteron sp. N	1		11.11

Total Ostracodes 9

EGAL-75-KC Van Veen - 92

Latitude: 59° 45.9' N

Longitude: 145° 34.5' W

Water Depth: 119 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Ostracodes

Diatoms

Ostracode Species:		Adult	Juv.	%
	"Acanthocythereis" dunelmensis (Norman, 1865)	3	6	42.86
	Robertsonites tuberculata (Sars, 1865)		7	33.33
	Palmanella limicola (Norman, 1865)	1	3	19.05
(F)	"Australicythere" sp. A		1	4.76

Total Ostracodes 21

EGAL-75-KC Van Veen - 107

Latitude: 59°·46.5' N

Longitude: 145° 03.2' W

Water Depth: 185 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Pelecypods
- Ostracodes
- Echinoderm Fragments
- Diatoms

Ostracode Species:	Adult	Juv.	%
Loxoconcha sp. B	4		28.57
Palmanella limicola (Norman, 1865)		3	21.43
Bythocythere sp, B	2		14.29
Hemicythere aff. H. quadrinodosa Schornikov, 1974		2	14.29
Cytheropteron sp. A		2	14.29
Pectocythere aff. P. parkerae Swain and Gilby, 1974		1	7.14

Total Ostracodes 14

EGAL-75-KC Van Veen - 108

Latitude: 59° 44.2' N

Longitude: 144° 56.2' W

Water Depth: 192 meters

Lithology: Gray mud.

Organisms: Radiolarians

Proteinaceous Worm Tubes

Ostracodes

Diatoms

Ostracode Species:	Adult	Juv.	%
Pectocythere aff. *P. quadrangulata* Hanai, 1957		3	25.00
Cytherois sp. A	2		16.67
Palmanella limicola (Norman, 1865)		2	16.67
Pectocythere aff. *P. parkerae* Swain and Gilby, 1974		1	8.33
Paradoxostoma sp. I	1		8.33
Cytheropteron sp. A	1		8.33
Cyclocypris sp.	1		8.33
(F) ?*Finmarchinella* (*Barentsovia*) *barentzovoensis* (Mandelstam, 1957)		1	8.33

Total Ostracodes 12

EGAL-75-KC Shipek - 170A

Latitude: 60° 16.9' N

Longitude: 145° 42.0' W

Water Depth: 20 meters

Lithology: Gray muddy sand and sandy mud.

Organism:

Plant Debris

Pelecypods

Calcareous Benthic Foraminifers

Echinoderm Fragments

Ostracodes

Ostracode Species:	Adult	Juv.	%
"Leguminocythereis" sp. A		2	50
*Pectocythere sp. D		2	50

Total Ostracodes 4

EGAL-75-KC Shipek - 171

Latitude: 60° 14.25' N

Longitude: 145° 28.0' W

Water Depth: 24 meters

Lithology: Gray mud, with some fine sand near surface.

Organisms: Pelecypods

Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
"*Leguminocythereis*" sp. A		1	50
Loxoconcha sp. A	1		50

Total Ostracodes 2

EGAL-75-KC Shipek - 173

Latitude: 60° 10.4' N

Longitude: 145° 13.6' W

Water Depth: 24 meters

Lithology: Gray mud with very thin layer of fine sand at surface.

Organisms: Pelecypods

Plant Debris

Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. S	1		33.33
Cytheropteron sp. I	1		33.33
Loxoconcha sp. A	1		33.33

Total Ostracodes 3

EGAL-75-KC Shipek - 176

Latitude: 60° 10.0' N

Longitude: 144° 48.0' W

Water Depth: 31 meters

Lithology: Fine sand underlain by gray mud.

Organisms: Pelecypods

Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
*"Leguminocythereis" sp. A	18	15	71.73
Pectocythere sp. D	12		26.09
Loxoconcha sp. A	1		2.17

Total Ostracodes 46

EGAL-75-KC Shipek - 179A

Latitude: 60° 14.75' N

Longitude: 145° 27.1' W

Water Depth: 18 meters

Lithology: Fine sand with clay galls at surface.

Organisms: Benthic Foraminifers

Rare Pelecypods

Ostracodes

Ostracode Species:	Adult	Juv.	%
Pectocythere sp. D	1		100

Total Ostracodes 1

EGAL-75-KC Shipek - 180

Latitude: 60° 09.1' N

Longitude: 144° 44.7' W

Water Depth: 26 meters

Lithology: Very fine dark sand.

Organisms:
- Calcareous Benthic Foraminifers
- Pelecypods
- Proteinaceous Worm Tubes
- Echinoderm Fragments
- Gastropod
- Carbonized Wood Fragments
- Ostracodes

Ostracode Species:	Adult	Juv.	%
*"Leguminocythereis" sp. A	123	43	58.87
* Loxoconcha sp. A	10	1	3.90
* Pectocythere sp. D	98	7	37.23

Total Ostracodes 282

EGAL-75-KC Shipek -183

Latitude: 59° 55.5' N

Longitude: 144° 34.6' W

Water Depth: 91 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	1	4	31.25
Palmanella limicola (Norman, 1865)	1	4	31.25
Loxoconcha sp. B	4		25.00
Cluthia cluthae (Brady, Crosskey and Rovertson, 1874)	1		6.25
Bythocythere sp. C	1		6.25

Total Ostracodes 16

EGAL-75-KC Van Veen - 184

Latitude: 59° 54.8' N

Longitude: 144° 54.6' W

Water Depth: 188 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adult	Juv.	%
Loxoconcha sp. B	9		39.13
"Acanthocythereis" dunelmensis (Norman, 1865)		3	13.04
Bythocythere sp. C	1	1	8.70
Cytheropteron sp. A	2		8.70
"Leguminocythereis" sp. A		2	8.70
Pectocythere aff. P. quadrangulata Hanai, 1957		1	4.35
Acuminocythere sp. A		1	4.35
Loxoconcha sp. A		1	4.35
Hemicythere aff. H. quadrinodosa Schornikov, 1975		1	4.35
Palmanella limicola (Norman, 1865)		1	4.35

Total Ostracodes 23

EGAL-75-KC Shipek - 202

Latitude: 59° 31.4' N

Longitude: 144° 36.6' W

Water Depth: 187 meters

Lithology: Diamicton, cobbles, pebbles, sand, and mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Sponge Spicular Frameworks
- Cyclostome Bryozoans
- Pelecypods
- Gastropods
- Scaphopod
- Ostracodes
- Echinoderm Fragments and Spines

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. M	5		31.25
Eucytherura sp. A	2		12.50
Munseyella sp. A	2		12.50

Ostracode Species:		Adult	Juv.	%
	Cytheropteron sp. H	1	1	12.50
	Cytheropteron sp. F		1	6.25
	Paradoxostoma aff. P. flaccidum Schornikov, 1975		1	6.25
(F)	"Australicythere" sp. A	1		6.25
	Cytherura sp. C	1		6.25
	Cytheropteron aff. C. latissimum of Neale and Howe (1975)		1	6.25

Total Ostracodes 16

EGAL-75-KC Van Veen - 204

Latitude: 59° 34.8' N

Longitude: 144° 35.8' W

Water Depth: 141 meters

Lithology: Thin olive mud with granules and pea-size gravel overlying pebbly, gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians

Sponge Spicules

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
Sclerochilus sp. D	2		20.0
Paradoxostma aff. P. flaccidum Schronikov, 1975		2	20.0
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	2		20.0
Cytheropteron sp. L	1		10.0
Loxoconcha sp. B	1		10.0
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	10.0
Cytheropteron sp. P	1		10.0

Total Ostracodes 10

EGAL-75-KC Van Veen - 205

Latitude: 59° 37.0' N

Longitude: 144° 35.3' W

Water Depth: 145 meters

Lithology: Olive mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Radiolarians

Ostracodes

Diatoms

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	4	8	25.53
Eucytherura sp. A	9	2	23.40
Robertsonites tuberculata (Sars, 1865)		8	17.02
Palmanella limicola (Norman, 1865)	2	4	12.77
Munseyella sp. A	6		12.77
Loxoconcha sp. B	1		2.13
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	1		2.13
Argilloecia sp. B	1		2.13
Cytheropteron sp. L		1	2.13

Total Ostracodes 47

EGAL-75-KC Shipek - 208

Latitude: 59° 33.25' N

Longitude: 144° 31.3' W

Water Depth: 156 meters

Lithology: Gray pebbly mud, with some large cobbles.

Organisms:

- Calcareous Benthic Foraminifers
- Sponge Spicules
- Cheilostome Bryozoans
- Cyclostome Bryozoans
- Pelecypods
- Ostracodes

Ostracode Species:		Adult	Juv.	%
(F)	"Australicythere" sp. A	1		50.0
	Paradoxostoma sp. (not determined)		1	50.0

Total Ostracodes 2

EGAL-75-KC Shipek - 209

Latitude: 59° 35.1' N

Longitude: 144° 31.7' W

Water Depth: 139 meters

Lithology: Gray, pebbly mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Foraminifers
- Sponge Spicules
- Agglutinated and Proteinaceous Worm Tubes
- Pelecypods
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
Sclerochilus sp. D	5	1	33.33
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	2	1	16.67
Krithe sp. A		2	11.11
Cytheropteron sp. C	2		11.11
Cytheropteron sp. L		1	5.56
Paradoxostoma sp. I		1	5.56
Munseyella sp. A	1		5.56

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. O	1		5.56
Cytheropteron sp. G	1		5.56

Total Ostracodes 18

EGAL-75-KC Shipek - 210

Latitude: 59° 36.9' N

Longitude: 144° 30.5' W

Water Depth: 146 meters

Lithology: Soft olive mud overlying gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Proteinaceous Worm Tubes
- Pelecypods
- Scaphopod
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
Eucytherura sp. A	8		22.22
Palmanella limicola (Norman, 1865)	3	4	19.44
Krithe sp. A	1	3	11.11
"Acanthocythereis" dunelmensis (Norman, 1865)		4	11.11
Munseyella sp. A	4		11.11
Robertsonites tuberculata (Sars, 1865)		3	8.33
Loxoconcha sp. B	2		5.56
Munseyella sp. B	1		2.78
Cytheropteron aff. C. latissimum of Neale and Howe, (1975)	1		2.78
Cluthia sp. A	1		2.78
Cytheropteron sp. Q		1	2.78

Total Ostracodes 36

EGAL-75-KC Shipek - 211

Latitude: 59° 40.1' N

Longitude: 144° 28.4' W

Water Depth: 146 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
*Robertsonites tuberculata (Sars, 1865)	2	33.33	
Palmanella limicola (Norman, 1865)		2	33.33
Eucytherura sp. A	1		16.67
"Acanthocythereis" dunelmensis (Norman, 1865)	1		16.67

Total Ostracodes 6

EGAL-75-KC Shipek - 212

Latitude: 59° 46.4' N

Longitude: 144° 33.1' W

Water Depth: 91 meters

Lithology: Gray mud with a sand veneer.

Organisms: Ostracodes

Ostracode Species:	Adult	Juv.	%
*Pectocythere sp. D	32		27.12
*Pectocythere aff. P. quadrangulata Hanai, 1957	20	2	18.64
"Leguminocythereis" sp. A	1	14	12.71
Loxoconcha sp. A	13	1	11.86
Cytheromorpha sp. A	10		8.48
Palmanella limicola (Norman, 1865)	7	1	6.78
Hemicytherura sp. B	3		2.54
Hemicythere aff. H. quadrinodosa Schornikov, 1974	2	1	2.54
Cytheropteron sp. N	3		2.54
"Acanthocythereis" dunelmensis (Norman, 1865)	2	1	2.54
Cytheropteron sp. A	1		0.85
Aurila sp. A		1	0.85
"Leguminocythereis" sp. B		1	0.85
Cythere sp. A		1	0.85
Cythere aff. C. alveolivalva Smith, 1952		1	0.85

Total Ostracodes 118

EGAL-75-KC Shipek -213

Latitude: 55° 44.7' N

Longitude: 144° 30.2' W

Water Depth: 113 meters

Lithology: Gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Proteinaceous and Agglutinated Worm Tubes
- Pelecypods
- Ostracodes
- Echinoderm Fragments
- Diatoms

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	4	24	49.12
"Acanthocythereis" dunelmensis (Norman, 1865)	1	15	28.07
Robertsonites tuberculata (Sars, 1865)		5	8.77
Buntonia sp. A	3	1	7.02
Pectocythere aff. P. quadrangulata Hanai, 1957		3	5.26

Ostracode Species:	Adult	Juv.	%
Pectocythere aff. P. parkerae Swain and Gilby, 1974		1	1.75

Total Ostracodes 57

EGAL-75-KC Shipek - 214

Latitude: 59° 43.7' N

Longitude: 144° 28.6' W

Water Depth: 55 meters

Lithology: Gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Proteinaceous Worm Tubes
- Pelecypods
- Ostracodes
- Echinoderm Fragments
- Plant Debris
- Diatoms

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		7	53.85
Robertsonites tuberculata (Sars, 1865)		3	23.08
Palmanella limicola (Norman, 1865)		3	23.08
Total Ostracodes 13			

EGAL-75-KC Shipek -215

Latitude: 59° 42.9' N

Longitude: 144° 27.0' W

Water Depth: 134 meters

Lithology: Olive-gray mud surface overlying a firm gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Agglutinated Worm Tubes
- Pelecypods
- Gastropods
- Ostracodes

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	3	11	29.17
Palmanella limicola (Norman, 1865)	9	3	25.00
Robertsonites tuberculata (Sars, 1865)		8	16.67
*Munseyella sp. A		8	16.67
Munseyella sp. B	3		6.25
Eucytherura sp. A	1	1	4.17
Loxoconcha sp. B	1		2.08

Total Ostracodes 48

EGAL-75-KC Shipek - 216

Latitude: 59° 42.1' N

Longitude: 144° 23.0' W

Water Depth: 152 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Pelecypods

Ostracodes

Echinoderm Fragments

Plant Debris

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	2	9	35.48
Robertsonites tuberculata (Sars, 1865)	3	4	22.58
Munseyella sp. A	6		19.36
Eucytherura sp. A	2		6.45
Loxoconcha sp. B	1		3.23
Palmanella limicola (Norman, 1865)		1	3.23
Munseyella sp. B	1		3.23
Cytheropteron sp. N	1		3.23
Cytheropteron sp. M	1		3.23

Total Ostracodes 19

EGAL-75-KC Van Veen - 217

Latitude: 59° 39.8' N

Longitude: 144° 21.2 W

Water Depth: 154 meters

Lithology: Gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Agglutinated Benthic Foraminifers
- Pelecypod Fragments
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)		8	42.11
Robertsonites tuberculata (Sars, 1865)	1	4	26.32
Krithe sp. A	1	2	15.79
Sclerochilus sp. D	2		10.53
Loxoconcha sp. B	1		5.26

Total Ostracodes 19

EGAL-75-KC   Shipek - 224

Latitude: 59° 50.0' N

Longitude: 144° 16.0' W

Water Depth: 64 meters

Lithology: Olive mud overlying gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Proteinaceous Worm Tubes
- Pelecypods
- Gastropods
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
Robertsonites tuberculata (Sars, 1865)	3	57	34.68
Palmanella limicola (Norman, 1865)	15	37	30.06
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	3	18	12.14
Buntonia sp. A	12	4	9.25
Pectocythere aff. *P. quadrangulata* Hanai, 1957	7	7	8.09

Ostracode Species:	Adult	Juv.	%
Cytheropteron aff. C. nodosoalatum	1	2	1.73
Neale and Howe, 1975	1	2	1.73
Paracypris sp.	1	2	1.73
Cytheropteron sp. A		2	1.16
"Leguminocythereis" sp. A		1	0.58
Loxoconcha sp. A		1	0.58

Total Ostracodes 173

EGAL-75-KC Shipek - 226

Latitude: 59° 43.0' N

Longitude: 144° 07.25' W

Water Depth: 128 meters

Lithology: Olive mud overlying gray mud containing numerous worm tubes.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. L		2	66.67
Eucytherura sp. A	1		33.33

Total Ostracodes 3

EGA1-75-KC Shipek -246

Latitude: 59° 41.9' N

Longitude: 142° 55.8' W

Water Depth: 198 meters

Lithology: Olive-green mud overlying gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Sponge Spicules
- Pelecypods
- Ostracodes
- Echinoderm Spines
- Diatoms

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	3	1	50.0
Palmanella limicola (Norman, 1865)	2		25.0
?Cytherois sp.		1	12.5
Eucytherura sp. A	1		12.5

Total Ostracodes 8

EGAL-75-KC Van Veen - 247

Latitude: 59° 52.2' N

Longitude: 143° 20.5' W

Water Depth: 214 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Diatoms

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	2		40.0
Robertsonites tuberculata (Sars, 1865)		1	20.0
Cytheropteron sp. H	1		20.0
Cytheropteron aff. C. latissimum of Neale and Howe (1975)		1	20.0

Total Ostracodes 5

EGAL-75-KC Shipek - 251

Latitude: 59° 44.5' N

Longitude: 142° 54.0' W

Water Depth: 188 meters

Lithology: Olive-green mud overlying gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Agglutinated and Proteinaceous Worm Tubes
- Pelecypods
- Ostracodes
- Echinoderm Fragments and Spines

Ostracode Species: Adult	Juv.	%	
*"Acanthocythereis" *dunelmensis* (Norman, 1865)	3	2	62.5
Cytheropteron aff. *C.* *nodosoalatum* Neale and Howe, 1975		2	25.0
Palmanella *limicola* (Norman, 1865)	1		12.5

Total Ostracodes 8

EGAL-75-KC Shipek-256

Latitude: 59° 48.2' N

Longitude: 142° 46.2' W

Water Depth: 190 meters

Lithology: Green mud overlying gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers (numerous)
- Planktic Foraminifers
- Radiolarians
- Sponge Spicules
- Pelecypods
- Ostracodes
- Diatoms

Ostracode Species:	Adult	Juv.	%
Krithe sp. A		2	40.0
"Acanthocythereis" dunelmensis (Norman, 1865)	1		20.0
Cytheropteron sp. Q		1	20.0
Eucytherura sp. A		1	20.0

Total Ostracodes 5

EGAL-75-KC Van Veen - 257

Latitude: 59° 57.3' N

Longitude: 142° 46.5' W

Water Depth: 119 meters

Lithology: Olive mud overlying gray, sticky mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Pelecypods
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	13	7	31.25
"Acanthocythereis" dunelmensis (Norman, 1865)	6	11	26.56
Buntonia sp. A	5	2	10.94
Munseyella sp. A	7		10.94
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	4	1	7.81
Eucytherura sp. A	2		3.13
Cytheromorpha sp. A	2		3.13
Cytheropteron sp. C	1		1.56
Robertsonites tuberculata (Sars, 1865)		1	1.56
Pectocythere aff. P. quadrangulata Hanai, 1957		1	1.56
Cytheropteron sp. E		1	1.56

Total Ostracodes 64

EGAL-75-KC Van Veen - 259

Latitude: 59° 58.1' N

Longitude: 142° 38.2' W

Water Depth: 91 meters

Lithology: Less than 2 cm of olive-green mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Sponge Spicules

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	4	5	32.14
"Acanthocythereis" dunelmensis (Norman, 1865)	1	4	17.86
Munseyella sp. A	5		17.86
Buntonia sp. A	3	1	14.29
Robertsonites tuberculata (Sars, 1865)		4	14.29
Eucytherura sp. A	1		3.57

Total Ostracodes 28

EGAL-75-KC Van Veen - 260

Latitude: 60° 00.0' N

Longitude: 142° 43.0' W

Water Depth: 88 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Proteinaceous Worm Tubes
- Pelecypods
- Scaphopod
- Ostracodes
- Plant Material

Ostracode Species:	Adult	Juv.	%
Robertsonites tuberculata (Sars, 1865)	2	29	45.59
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	5	18	33.82
Palmanella limicola (Norman, 1865)	2	2	5.88
Krithe sp. A	2		2.94
Buntonia sp. A	2		2.94
Paradoxostoma sp. C		1	1.47
Eucytherura sp. A	1		1.47

Ostracode Species:	Adult	Juv.	%
<u>Cytheropteron</u> sp. B	1		1.47
<u>Argilloecia</u> sp. B	1		1.47
<u>Pectocythere</u> sp.		1	1.47
<u>Cytheropteron</u> sp. W	1		1.47

Total Ostracodes 28

EGAL-75-KC Shipek - 263

Latitude: 59° 50.8' N

Longitude: 142° 31.0' W

Water Depth: 95 meters

Lithology: Thin veneer of olive-green mud overlying a gray mud containing several large, rounded cobbles.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Sponge Spicules
- Pelecypods
- Gastropods
- Ostracodes

Ostracode Species:		Adult	Juv.	%
(F)	"Australicythere" sp. A	12	16	34.15
	Cytheropteron aff. C. latissimum of Neale and Howe (1975)	9	3	14.63
	"Acanthocythereis" dunelmensis (Norman, 1865)		11	13.42
	Robertsonites tuberculata (Sars, 1865)	3	5	9.76
	Cytheropteron sp. L	4	1	6.10
	Sclerochilus sp. D		4	4.88
	Munseyella sp. A	4		4.88
	Cytheropteron sp. G	3		3.66
	Marine Cyprid	2		2.44
	Cytheropteron sp. P	2		2.44
	Buntonia sp. A		1	1.22
	Cytheropteron sp. D	1		1.22
	Cytheropteron sp. E		1	1.22

Total Ostracodes 82

EGAL-75-KC Van Veen - 282

Latitude: 59° 54.5' N

Longitude: 142° 20.0' W

Water Depth: 82 meters

Lithology: Gray mud.

Organisms: Ostracodes

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	25	6	35.23
Robertsonites tuberculata (Sars, 1865)	1	22	26.14
Buntonia sp. A	11	1	13.64
"Acanthocythereis" dunelmensis (Norman, 1865)	4	5	10.23
Pectocythere aff. P. quandrangulata Hanai, 1957	1	3	4.55
Cytheropteron aff. C. latissimum of Neale and Howe, 1975	1	2	3.41
Cytheropteron sp. N	1		1.14
Cytheromorpha sp. A	1		1.14
Hemicytherura sp. B	1		1.14
Cytheropteron sp. H		1	1.14
Cytheropteron sp. F	1		1.14
Pectocythere aff. P. parkerae Swain and Gilby, 1974		1	1.14

Total Ostracodes 88

EGAL-75-KC Van Veen - 283

Latitude: 59° 51.0' N

Longitude: 142° 14.5' W

Water Depth: 84 meters

Lithology: Gray silt.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. A	5	1	18.75
"Acanthocythereis" dunelmensis (Norman, 1865)	3	2	15.63
Pectocythere aff. P. parkerae Swain and Gilby, 1974	1	3	12.50
Cytheropteron sp. P	2	1	9.38
Robertsonites tuberculata (Sars, 1865)		3	9.38
Cytheropteron aff. C. latissimum of Neale and Howe (1975)		2	6.25
Buntonia sp. A	1	1	6.25

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)		1	3.13
Pectocythere aff. *P. quadrangulata* Hanai, 1957	1		3.13
Cytheropteron sp. T	1		3.13
Cytheropteron sp. E		1	3.13

Total Ostracodes 29

EGAL-75-KC Van Veen - 285

Latitude: 59° 47.4' N

Longitude: 142° 14.4' W

Water Depth: 115 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
*"*Robertsonites tuberculata* (Sars, 1865)	3	15	45.00
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	3	13	40.00
Cytheromorpha sp. A	2		5.00
Cytheropteron sp. X	1		2.50
Loxoconcha sp. A	1		2.50
Cytheropteron aff. *C.* *latissimum* of Neale and Howe (1975)		1	2.50
Cytheropteron sp. W		1	2.50

Total Ostracodes 40

EGAL-75-KC Van Veen - 286

Latitude: 59° 43.0' N

Longitude: 142° 13.1' W

Water Depth: 157 meters

Lithology: Gray mud.

Organisms: Ostracodes

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmenis (Norman, 1865)	2	6	53.33
Palmanella limicola (Norman, 1865)	2	2	26.67
Cytheropteron sp. Q	1	1	13.33
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	6.67

Total Ostracodes 15

EGAL-75-KC Van Veen - 288

Latitude: 59° 36.0' N

Longitude: 142° 13.7' W

Water Depth: 238 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Radiolarians

Sponge Spicules

Ostracodes

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmenis (Norman, 1865)		1	33.33
Krithe sp. A		1	33.33
Palmanella limicola (Norman, 1865)	1		33.33

Total Ostracodes 3

EGAL-75-KC Shipek - 289

Latitude: 59° 53.1' N

Longitude: 142° 03.8' W

Water Depth: 55 meters

Lithology: Gray mud.

Organisms: Ostracodes

Ostracode Species:	Adult	Juv.	%
Robertsonites tuberculata (Sars, 1865)	3	25	42.42
Loxoconcha sp. A	7	10	25.76

Ostracode Species:	Adult	Juv.	%
**Pectocythere* aff. *P. quadrangulata* Hanai, 1957	7	2	13.64
Pectocythere sp. D		5	7.58
Cytheropteron sp. A	2		3.03
"*Leguminocythereis*" sp. A		2	3.03
Cytheropteron sp. P	1		1.52
Palmanella -*limicola* (Norman, 1865)	1		1.52
Pectocythere aff. *P. parkerae* Swain and Gilby, 1974	1		1.52

Total Ostracodes 66

EGAL-75-KC Shipek - 290

Latitude: 59° 54.6' N

Longitude: 141° 52.3' W

Water Depth: 31 meters

Lithology: Homogeneous fine gray sand.

Organisms: Pelecypods

Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
*"Leguminocythereis" sp. B	26	30	87.50
* Pectocythere sp. D	8		12.50

Total Ostracodes 64

EGAL-75-KC Shipek - 296

Latitude: 59° 45.5' N

Longitude: 141° 43.5' W

Water Depth: 49 meters

Lithology: Olive mud over gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Proteinaceous and Agglutinated Worm Tubes
- Pelecypods
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
Robertsonites tuberculata (Sars, 1865)	8	105	51.60
Palmanella limicola (Norman, 1865)	13	29	19.18
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	1	18	8.68
Buntonia sp. A	13	3	7.31
Pectocythere aff. *P. quadrangulata* Hanai, 1957	6	9	6.85
Loxoconcha sp. A	4	1	2.28
Cytheropteron sp. A		4	1.83
Cluthia sp. A	3		1.37
Cytheromorpha sp. E	1		0.46
Pectocythere sp. D	1		0.46

Total Ostracodes 219

EGAL-75-KC Van Veen - 297

Latitude: 59° 32.9' N

Longitude: 141° 46.7' W

Water Depth: 165 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		10	55.56
Loxoconcha sp. A	1	3	22.22
Palmanella limicola (Norman, 1865)	1	1	11.11
Krithe sp. A		1	5.56
Cytheropteron sp. Q		1	5.56

Total Ostracodes 18

EGAL-75-KC Van Veen - 308

Latitude: 59° 25.8' N

Longitude: 141° 21.1' W

Water Depth: 201 meters

Lithology: Water-saturated, olive-gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Proteinaceous and Agglutinated Worm Tubes

Sponge Spicules

Pelecypods

Gastropods

Ostracodes

Echinoderm Spines

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	1		33.33
Krithe sp. A		1	33.33
Eucytherura sp. A	1		33.33

Total Ostracodes 3

EGAL-75-KC Van Veen -312

Latitude: 59° 31.7' N

Longitude: 141° 14.3' W

Water Depth: 156 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Scaphopod

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		2	66.67
Palmanella limicola (Norman, 1865)		1	33.33

Total Ostracodes 3

EGAL-75-KC Van Veen - 313

Latitude: 59° 29.5' N

Longitude: 141° 11.0' W

Water Depth: 256 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Proteinaceous Worm Tubes

Pteropod

Ostracodes

Echinoderm Fragments

Plant Debris

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	1	1	50.0
"Acanthocythereis" dunelmensis (Norman, 1865)		1	25.0
Krithe sp. A		1	25.0

Total Ostracodes 4

EGAL-75-KC Van Veen - 314

Latitude: 59° 28.5' N

Longitude: 141° 06.3' W

Water Depth: 311 meters

Lithology: Olive-green mud.

Organisms: Calcareous Benthic Foraminifers

Radiolarians

Ostracodes

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	2		40.0
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)		1	20.0
Cytheropteron sp. B		1	20.0
Loxoconcha sp. A		1	20.0

Total Ostracodes 5

EGAL-75-KC Van Veen -316

Latitude: 59° 22.8' N

Longitude: 140° 51.7' W

Water Depth: 163 meters

Lithology: Green sandy mud with many pebbles.

Organisms: Calcareous Benthic Foraminifers

Sponge Spicules

Ostracodes

Ostracode Species:	Adult	Juv.	%
Krithe sp. A		1	100

Total Ostrocodes 1

EGAL-75-KC

Van Veen - 317

Latitude: 59° 27.2' N

Longitude: 140° 49.4' W

Water Depth: 274 meters

Lithology: Olive, sandy mud.

Organisms:

- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Proteinaceous Worm Tubes
- Sponge Spicules
- Pelecypods
- Ostracodes
- Echinoderm Spines

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	1		100

Total Ostracodes 1

EGAL-75-KC Van Veen - 319

Latitude: 59° 33.8' N

Longitude: 140° 50.5' W

Water Depth: 247 meters

Lithology: Green silt.

Organisms: Ostracodes

Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	4	1	33.33
Krithe sp. A	5		33.33
"Acanthocythereis" dunelmensis (Norman, 1865)	2	2	26.67
Robertsonites tuberculata (Sars, 1865)		1	6.67

Total Ostracodes 15

EGAL-75-KC Van Veen -320

Latitude: 59° 36.4' N

Longitude: 140° 50.5' W

Water Depth: 163 meters

Lithology: Olive-gray, sticky, firm mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Agglutinated and Proteinaceous Worm Tubes
- Ostracodes
- Echinoderm Fragments
- Plant Debris

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)		7	38.89
Pectocythere aff. *P*. *quadrangulata* Hanai, 1957	1	2	16.67
Cytheropteron sp. B	1	1	11.11
Palmanella limicola (Norman, 1865)		2	11.11

Ostracode Species:	Adult	Juv.	%
Paradoxostoma aff. -*P. setoensis* Schornikov, 1975	1		5.56
Hemicytherura sp. A	1		5.56
Cytheropteron sp. C	1		5.56
Buntonia sp. A		1	5.56

Total Ostracodes 18

EGAL-75-KC Van Veen - 324

Latitude: 59° 32.3' N

Longitude: 140° 14.0' W

Water Depth: 192 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Proteinaceous Worm Tubes (numerous)
- Pelecypods
- Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adult	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		24	47.06
*Palmanella limicola (Norman, 1865)	5	6	21.57
Loxoconcha sp. B	3		5.88
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	1	1	3.92
"Leguminocythereis" sp. A		2	3.92
Cytheromorpha sp. A	2		3.92
Buntonia sp. A		2	3.92
Paradoxostoma sp. E		1	1.96
Bythocythere sp. B	1		1.96
Cytheropteron sp. G		1	1.96
Cytheropteron sp. Q		1	1.96
Pectocythere sp.		1	1.96

Total Ostracodes 51

EGAL-75-KC   Van Veen - 325

Latitude: 59° 29.0' N

Longitude: 140° 14.1' W

Water Depth: 241 meters

Lithology: Greenish-gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Proteinaceous Worm Tubes
- Pelecypods
- Ostracodes
- Echinoderm Fragments and Spines
- Diatoms

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	3	1	40.0
"Acanthocythereis" dunelmensis (Norman, 1865)		2	20.0
Eucytherura sp. A	1		10.0
Buntonia sp. A		1	10.0
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	1		10.0
Cytheropteron sp. G	1		10.0

Total Ostracodes 10

EGAL-75-KC Shipek - 328

Latitude: 59° 43.2' N

Longitude: 144° 33.6' W

Water Depth: 134 meters

Lithology: Olive mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Agglutinated Worm Tubes
Pelecypods
Ostracodes

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	3	10	37.14
"Acanthocythereis dunelmensis" (Norman, 1865)	2	10	34.29
Robertsonites tuberculata (Sars, 1865)		4	11.43
"Leguminocythereis" sp. A		2	5.71
Cytheropteron sp. K	1		2.86

Ostracode Species:	Adult	Juv.	%
Pectocythere aff. *P. parkerae* Swain and Gilby, 1974		1	2.86
Munseyella sp. A	1		2.86
Buntonia sp. A	1		2.86

Total Ostracodes 35

EGAL-75-KC Van Veen - 330

Latitude: 59° 58.2' N

Longitude: 144° 02.8' W

Water Depth: 24 meters

Lithology: Fine sand.

Organisms:

- Pelecypods
- Ophiuroid Fragments
- Calcareous Benthic Foraminifers
- Ostracodes

Ostracode Species:	Adult	Juv.	%
Pectocythere sp. D	2		100

Total Ostracodes 2

EGAL-75-KC   Van Veen - 332

Latitude: 59° 54.3' N

Longitude: 143° 53.2' W

Water Depth: 73 meters

Lithology: Green mud with very fine sand interspersed, overlying gray mud.

Organisms: Pelecypods

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
*Palmanella limicola (Norman, 1865)	13	31	38.60
*"Acanthocythereis" dunelmensis (Norman, 1865)	11	21	28.07
*Pectocythere aff. P. quadrangulata Hanai, 1957	11		9.65
Robertsonites tuberculata (Sars, 1865)		10	8.77
Cytheropteron sp. A		4	3.51
Loxoconcha sp. A	3	1	3.51

Ostracode Species:	Adult	Juv.	%
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	1	3	3.51
Cytheromorpha sp. A	2		2.63
Loxoconcha sp. B	1		0.88
"Leguminocythereis" sp. B		1	0.88

Total Ostracodes 114

EGAL-75-KC Van Veen - 333

Latitude: 59° 47.1' N

Longitude: 143° 51.5' W

Water Depth: 128 meters

Lithology: Olive-green mud overlying gray mud.

Organisms: Benthic Foraminifers

Ostracodes

Fish Debris

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	1	4	50.0
Palmanella limicola (Norman, 1865)	2		20.0
Cytheropteron sp. L	2		20.0
?*Roundstonia globulifera* (Brady, 1868)		1	10.0

Total Ostracodes 10

EGAL-75-KC Van Veen - 336

Latitude: 59° 48.4' N

Longitude: 144° 38.0' W

Water Depth: 274 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Small Crustacean

Ostracode

Ostracode Species:	Adult	Juv.	%
Robertsonites tuberculata (Sars, 1865)		1	100

Total Ostracodes 1

EGA1-75-KC Van Veen - 338

Latitude: 60° 01.0' N

Longitude: 143° 09.3' W

Water Depth: 101 meters

Lithology: Gray mud with worm tubes.

Organisms: Ostracodes

Woody Material

Ostracode Species:	Adult	Juv.	%
Robertsonites tuberculata (Sars, 1865)	10	56	40.49
Palmanella limicola (Norman, 1865)	32	14	28.22
Pectocythere aff. P. quadrangulata Hanai, 1957	16	2	11.04

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	2	12	8.59
Pectocythere sp. D	9		5.52
Buntonia sp. A	5		3.07
*"*Leguminocythereis*" sp. A	2		1.23
Cytheropteron aff. *C.* *nodosoalatum* Neale and Howe, 1975	1	1	1.23
Loxoconcha sp. A	1		0.61

Total Ostracodes 163

EGAL-75-KC Van Veen - 339

Latitude: 60° 00.8' N

Longitude: 142° 56.6' W

Water Depth: 102 meters

Lithology: Olive mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adult	Juv.	%
Robertsonites tuberculata (Sars, 1865)	1	23	38.10
Palmanella limicola (Norman, 1865)	7	4	17.46
"Acanthocythereis" dunelmensis (Norman, 1865)	3	3	9.52
Loxoconcha sp. A	5		7.94
Buntonia sp. A	3		4.76
Cytheromorpha sp. E	2	1	4.76
Pectocythere aff. P. quadrangulata Hanai, 1957		3	4.76
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	2	1	4.76
Cytherois sp. A		2	3.18
Cytheropteron sp. A	1		1.59
Cytheropteron sp. F		1	1.59
"Leguminocythereis" sp. A		1	1.59

Total Ostracodes 63

EGAL-75-KC Van Veen - 341

Latitude: 59° 57.7' N

Longitude: 143° 04.7' W

Water Depth: 137 meters

Lithology: Gray, water-saturated mud.

Organisms:

- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Proteinaceous Worm Tubes
- Pelecypods
- Ostracodes

Ostracode Species:	Adult	Juv.	%
Palmanella limicola (Norman, 1865)	6	5	40.74
Munseyella sp. A	4		14.82
"Acanthocythereis" dunelmensis (Norman, 1865)		3	11.11
Loxoconcha sp. B	2		7.41
Cytheropteron sp. T		2	7.41
Munseyella sp. B	1		3.70
"Leguminocythereis" sp. A		1	3.70
Cytheropteron sp. X	1		3.70
Cytheropteron sp. L	1		3.70
Cluthia sp. A	1		3.70

Total Ostracodes 27

EGAL-75-KC Shipek - 344

Latitude: 59° 39.2' N

Longitude: 142° 22.2' W

Water Depth: 210 meters

Lithology: Gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Foraminifers
- Planktic Foraminifers
- Sponge Spicules
- Proteinaceous Worm Tubes
- Pelecypods
- Scaphopod
- Cirriped Plates
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
Eucytherura sp. A	2		40.0
Cytheropteron sp. G	1		20.0
Cytheropteron sp. L	1		20.0
"_Acanthocythereis_" _dunelmensis_		1	20.0

Total Ostracodes 5

EGA1-75-KC Shipek - 347

Latitude: 59° 41.0' N

Longitude: 142° 39.7' W

Water Depth: 333 meters

Lithology: Gray mud, very siliceous.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Foraminifers
- Planktic Foraminifers
- Radiolarians
- Sponge Spicules
- Proteinaceous Worm Tubes
- Pelecypods
- Ostracodes
- Echinoderm Spines and Fragments
- Diatoms

Ostracode Species:	Adult	Juv.	%
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	1		100

Total Ostracodes 1

EGAL-75-KC Van Veen - 360

Latitude: 59° 39.7' N

Longitude: 140° 31.1' W

Water Depth: 48 meters

Lithology: Very fine gray-black sand.

Organisms:

Agglutinated and Proteinaceous Worm Tubes

Pelecypods

Calcareous Benthic Foraminifers

Cheilostome Bryozoans

Ostracodes

Ostracode Species:	Adult	Juv.	%
*Pectocythere sp. D	18		94.74
Loxoconcha sp. A	1		5.26

Total Ostracodes 19

EGAL-75-KC Shipek - 420

Latitude: 59° 55.1' N

Longitude: 141° 32.9' W

Water Depth: 64 meters

Lithology: Slightly sandy, gray mud, with many worm tubes on the surface, and heavily bioturbated.

Organisms
- Calcareous Benthic Foraminifers
- Pelecypods
- Gastropods
- Ostracodes
- Diatoms

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. A	12	10	100

Total Ostracodes 22

EGAL-75-KC Shipek - 421

Latitude: 59° 55.2' N

Longitude: 141° 34.4' W

Water Depth: 59 meters

Lithology: Gray mud with worm tubes.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Pelecypods

Ostracodes

Cirriped Plates

Echinoderm Fragments

Diatoms

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. A	3	5	61.54
Eucytherura sp. B	2		15.39
Cytheropteron sp. N		1	7.69
Cytheropteron sp. E		1	7.69
Cytheropteron sp. F		1	7.69

Total Ostracodes 13

EGAL-75-KC Shipek - 426

Latitude: 59° 56.1' N

Longitude: 141° 33.5' W

Water Depth: 71 meters

Lithology: Green mud with fecal pellets overlying gray mud with pelecypods and burrows.

Organisms: Calcareous Benthic Foraminifers

Pelecypod

Ostracodes

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. A	2	13	100

Total Ostracodes 15

EGAL-75-KC Shipek - 430

Latitude: 59° 56.0' N

Longitude: 141° 31.6' W

Water Depth: 59 meters

Lithology: Green mud over gray-green mud.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Diatoms

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. A		6	100

Total Ostracodes 6

EGAL-75-KC Shipek - 434

Latitude: 59° 57.1' N

Longitude: 141° 29.6' W

Water Depth: 68 meters

Lithology: Olive-green mud overlying gray mud, with some sand content.

Organisms: Calcareous Benthic Foraminifer

Elphidium sp.

Ostracodes

Diatoms

Ostracode Species:	Adult	Juv.	%
Cytheropteron sp. A		3	100

Total Ostracodes 3

APPENDIX II

TABULATION OF THE OSTRACODE ASSEMBLAGES AND ASSOCIATED FAUNA AND FLORA FROM VAN VEEN SAMPLES TAKEN IN THE NORTHEAST GULF OF ALASKA, R/V DISCOVERER CRUISE DC2-80-EG, JUNE, 1980

ELISABETH M. BROUWERS

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

INTRODUCTION

The U.S. Geological Survey is presently conducting studies of the Alaskan continental shelf to determine the type and distribution of geologic conditions that could prove hazardous to resource development. Detailed analyses of the sediment distribution, depositional environments, and shallow structure of the northeast Gulf of Alaska began in 1974 (see Molnia and Carlson, 1980, for references). As part of the northeast Gulf of Alaska project, I am establishing a modern datum of the dominant environmental factors that control or contribute to the distributional patterns of modern ostracode species. This information forms a vital part of the interpretive aspects of Neogene and Quaternary stratigraphic and paleoenvironmental studies in this region.

This report tabulates the fauna and flora contained in 109 Van Veen samples collected by the NOAA ship Discoverer (DC2-80-EG) during June, 1980 from the northeast Gulf of Alaska continental shelf (figs. 1-6). Eighty-five species of ostracodes found in the samples were identified and counted, juveniles were differentiated from adults, and the percentage that each species comprises of the entire assemblage was calculated.

All of the samples examined were collected by means of a Van Veen bottom grab sampling device. Forty-one samples were collected by the R/V Discoverer; the remaining 68 samples were collected by a small motorboat or whaleboat that could sample closer to shore (table 1). All of the latter samples are assumed to have been collected from water depths of less than 20 meters, but no actual water depth measurements were made.

At least 500 grams of raw sediment was available from each locality. All samples were washed on a number 200 mesh sieve (75 micrometer opening).

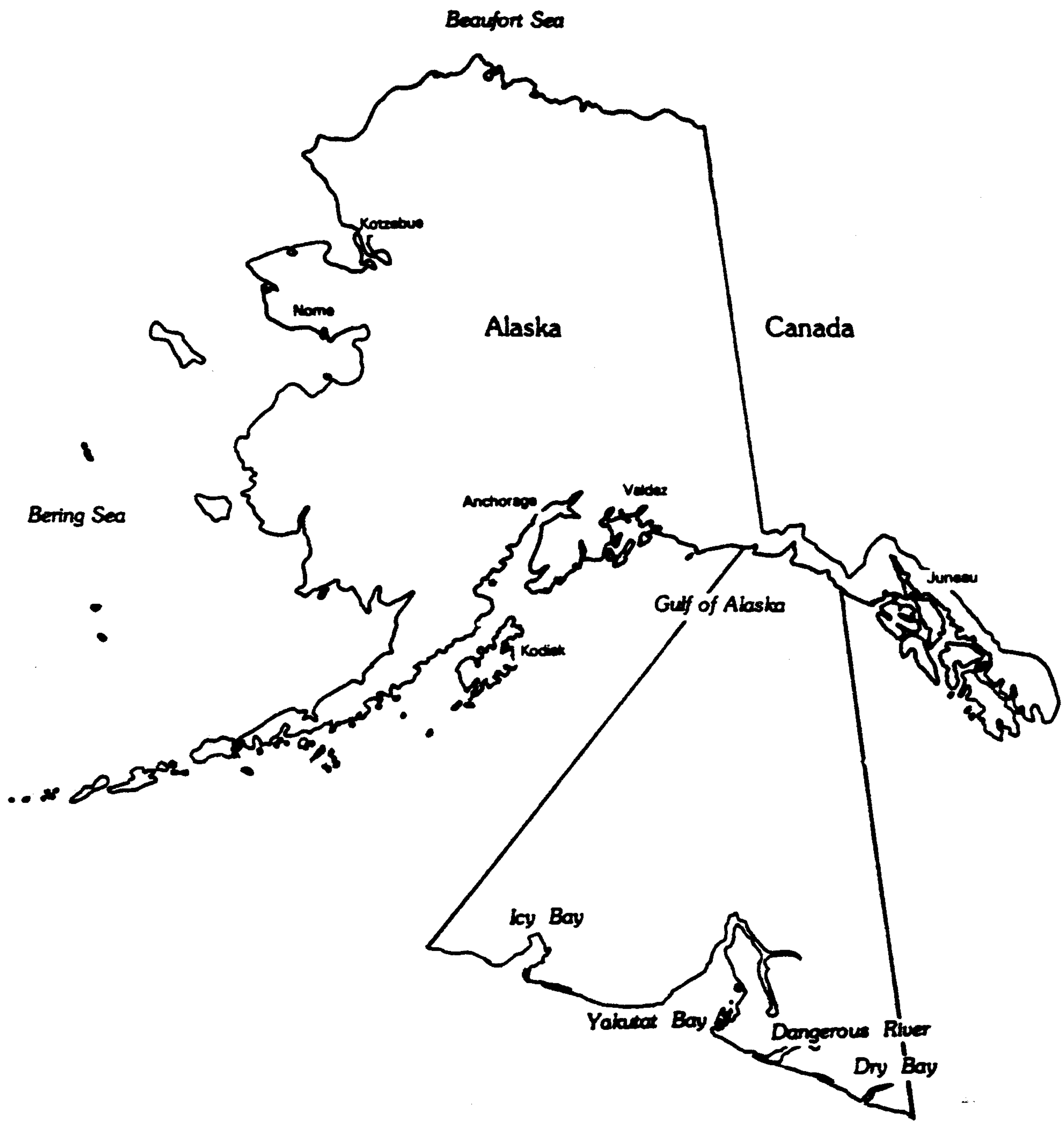
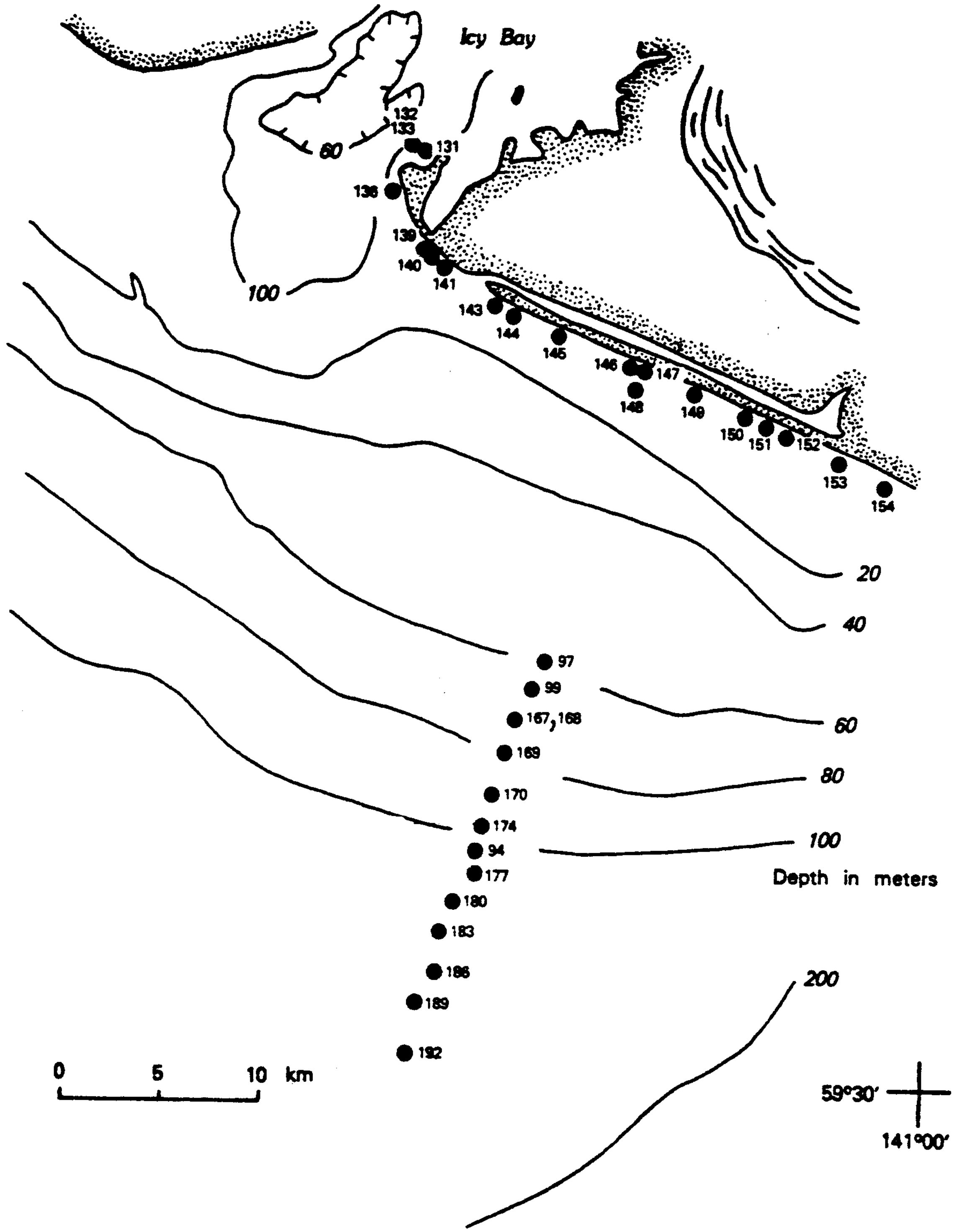


Figure 1.--Map showing the region in Alaska covered in this report.

Figure 2.--Locality map showing samples collected near Icy Bay, from latitude 59° 30' N. to 60° 00' N. and longitude 141° 00' W.



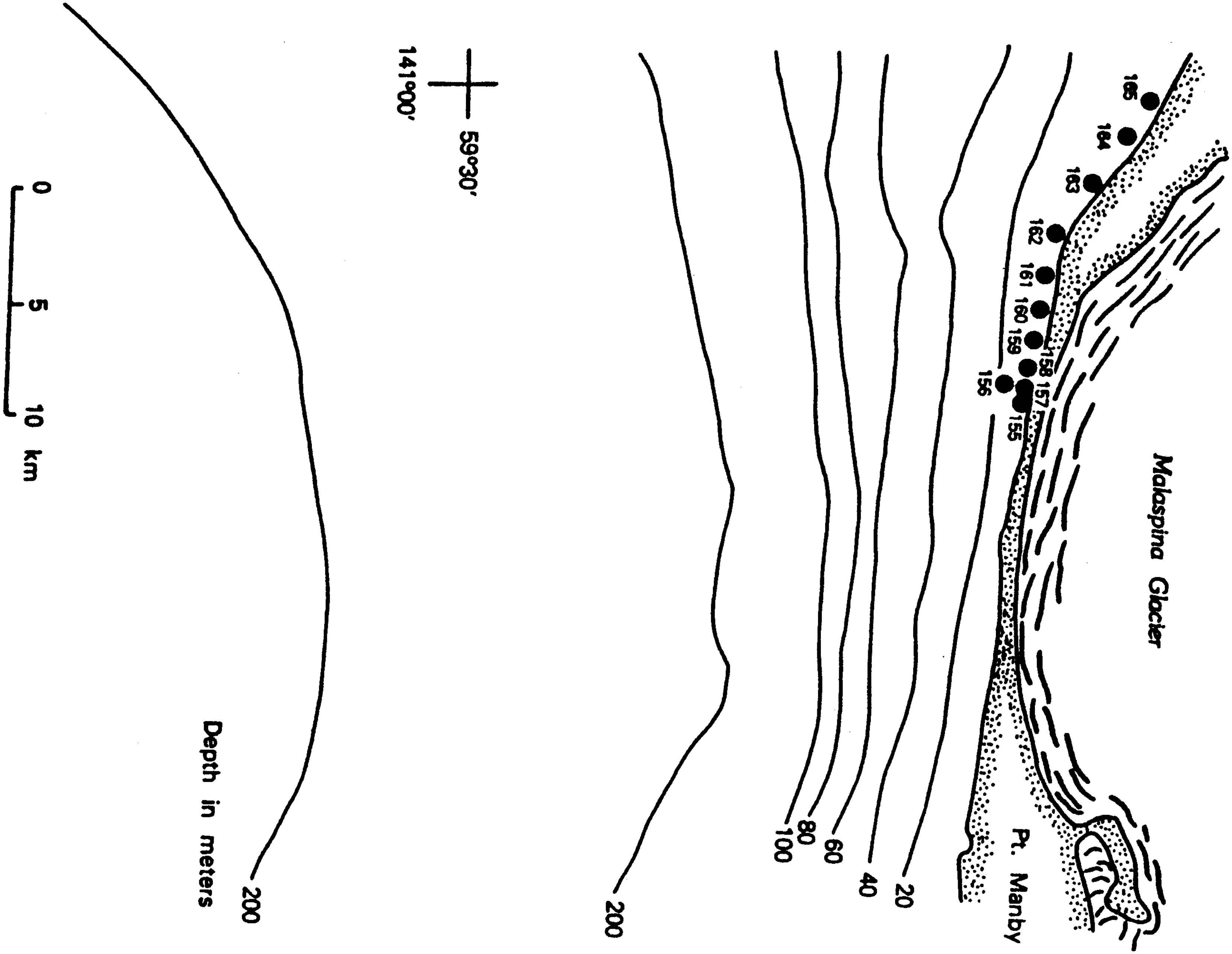


Figure 3.--Locality map showing samples collected between Icy Bay and Point Manby, from latitude 59° 45' N. to 59° 15' N. and longitude 140° 30' W. to 141° 00' W.

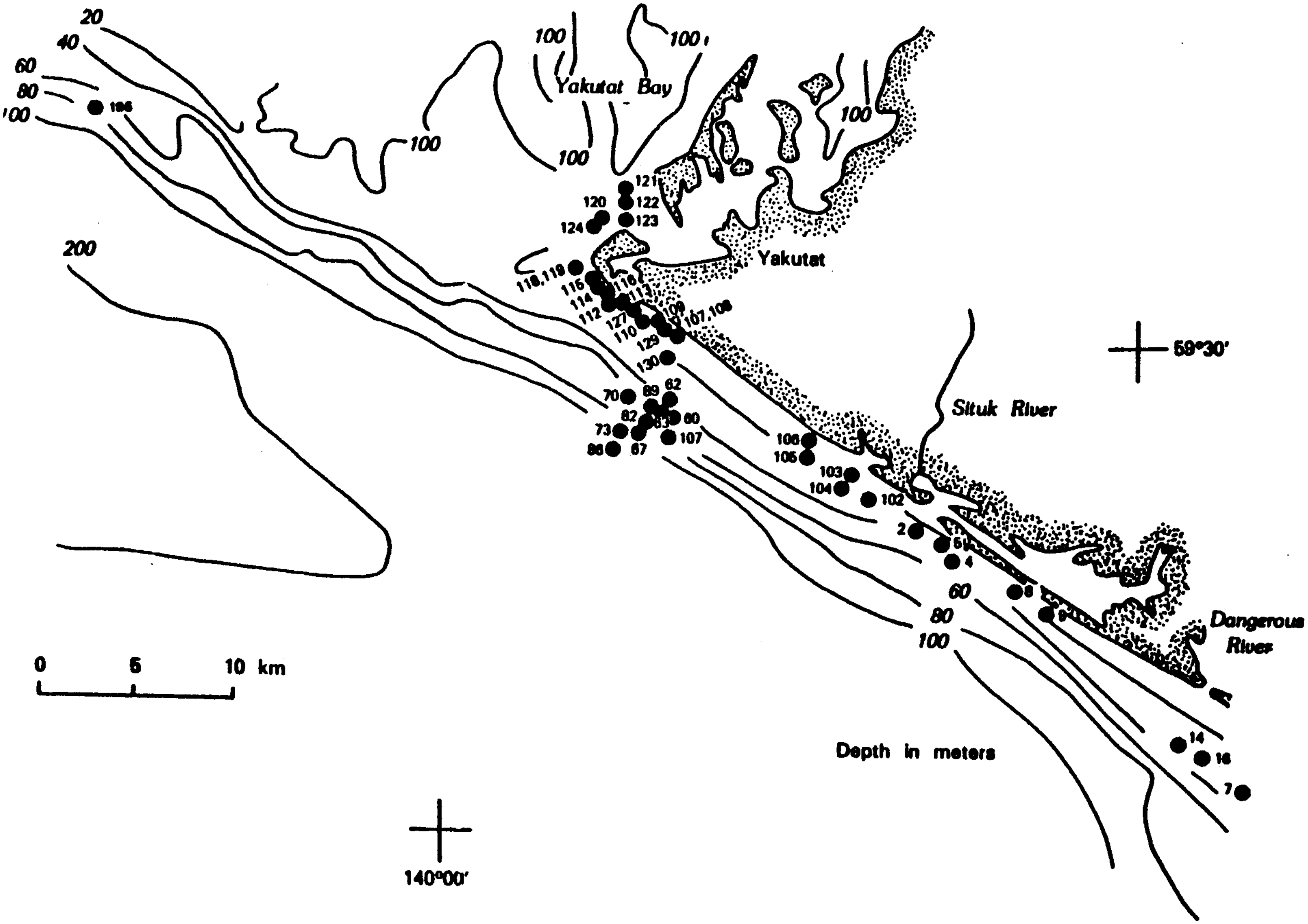


Figure 4.--Locality Map showing samples collected from Yakutat Bay to the Dangerous River, from latitude 59° 15' N. to 59° 45' N. and longitude 139° 30' W. to 140° 30' W.

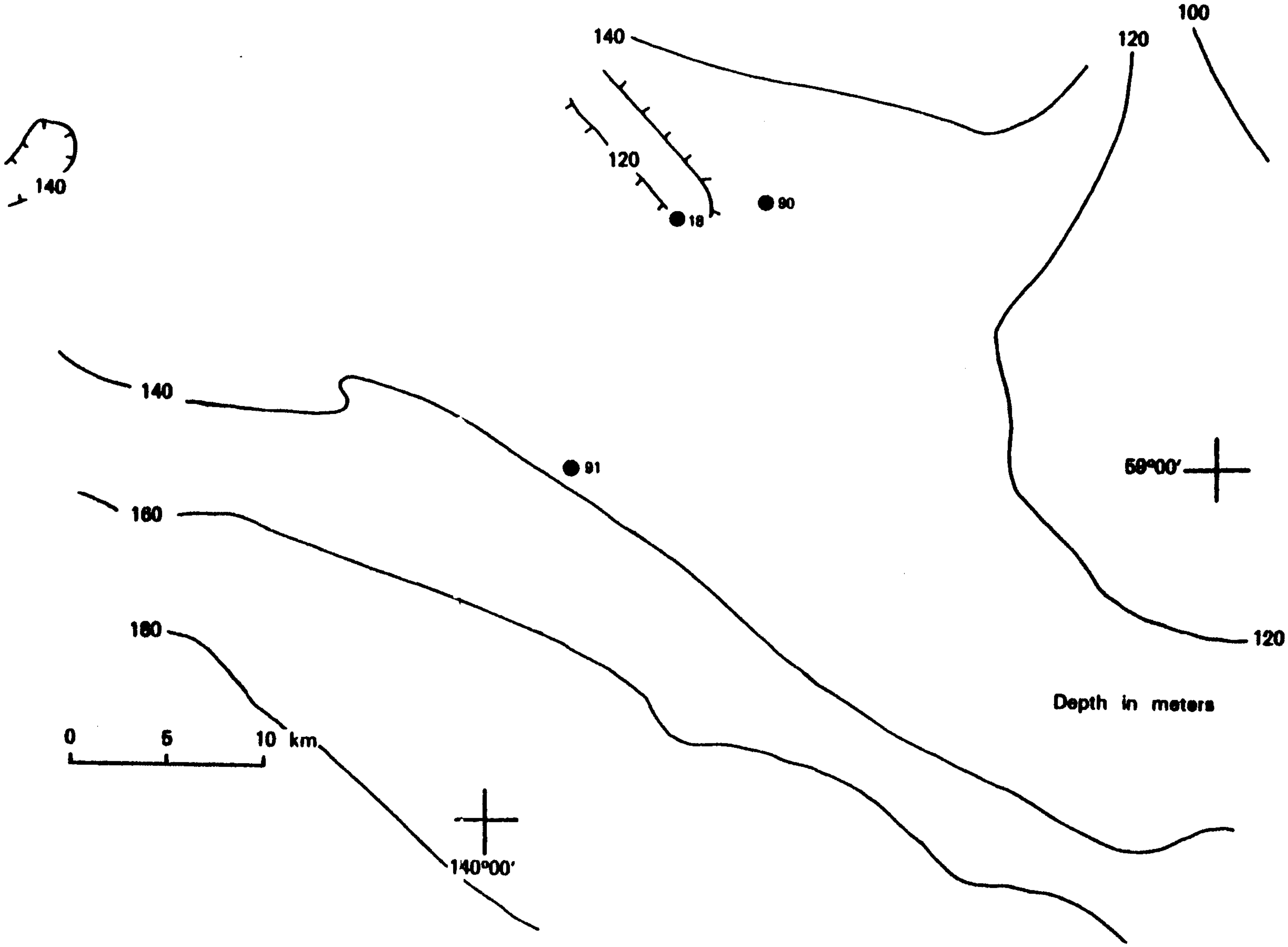


Figure 5.--Locality map showing samples collected south of Yakutat Bay, from latitude 58° 45' N. to 59° 15' N. and longitude 139° 30' W. to 140° 30' W.

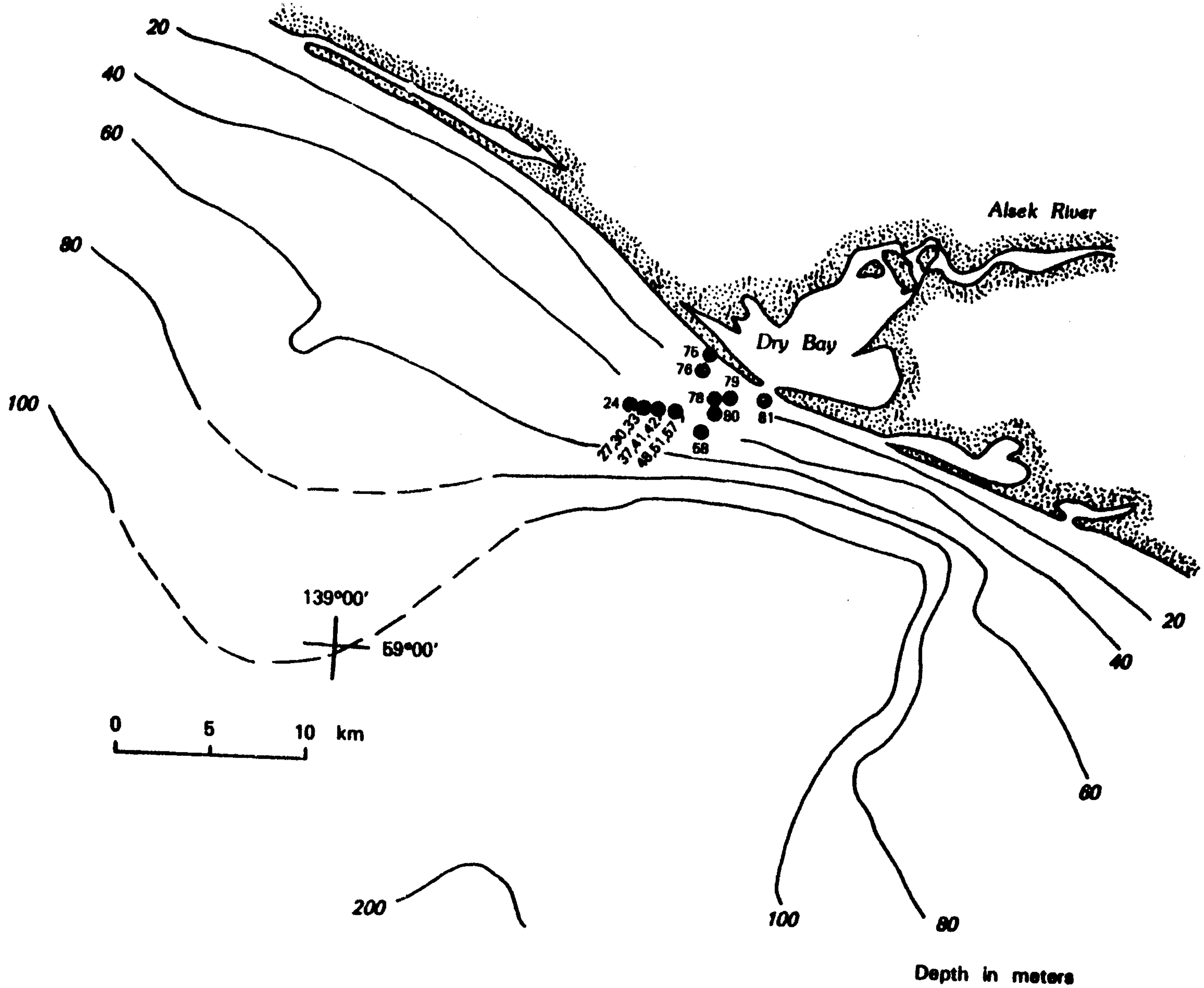


Figure 6.--Locality map showing samples collected near Dry Bay, from latitude 58° 45' N. to 59° 15' N. and longitude 138° 30' W. to 139° 15' W.

Washed sediment was sorted by a set of nested sieves and examined to a sieve size of 180 micrometers.

The term rare is used in a qualitative sense, denoting an abundance of less than 10 organisms or recognizable fragments occurring in 227 grams (8 ounces) of washed material. The counts of ostracode species refers to the total number of valves or recognizable fragments; a carapace is counted as two valves. All samples containing ostracodes were completely stripped of ostracode valves 180 micrometers or larger.

Most of the samples collected are modern, and consist of living and recently dead individuals. An asterisk (*) at the left of a particular species binomen indicates that specimens of that species contained soft parts. I interpret this to indicate that such individuals were living at that site when the sample was collected. Several of the samples contain ostracode species that do not presently live in the Gulf of Alaska, occurring only as fossils. These are indicated by the letter (F) adjacent to the binomen. Undoubtedly, other species not indicated are fossil occurrences as well, but more modern distributional data is needed to sort these out.

The lithologic descriptions presented for each sample represent the initial shipboard examinations, which were described by several individuals. As such, these determinations should be considered as relatively imprecise and not necessarily consistent. Lithology was included in this report to indicate faunal associations with a particular substrate type.

References

Molnia, B. F. and Carlson, P. R., 1980, Quaternary Sedimentary Facies on the Continental Shelf of the Northeast Gulf of Alaska: in Quaternary Depositional Environments of the Pacific Coast, (M. E. Field, et. al., eds). Pacific Coast Paleogeography Symposium 4, Pacific Sect. Soc. Econ. Paleont. Mineral., p. 157-168.

Table 1.--List of Van Veen samples examined, and means of collection, Cruise DC2-80-EG

VAN VEEN NUMBER	COLLECTED FROM	VAN VEEN NUMBER	COLLECTED FROM
1	R/V DISCOVERER	79	Small Boat
2	Small Boat	80	Small Boat
4	Small Boat	81	Small Boat
5	Small Boat	82	R/V DISCOVERER
7	R/V DISCOVERER	86	R/V DISCOVERER
8	Small Boat	89	R/V DISCOVERER
9	Small Boat	90	R/V DISCOVERER
14	Small Boat	91	R/V DISCOVERER
16	R/V DISCOVERER	94	R/V DISCOVERER
18	R/V DISCOVERER	97	R/V DISCOVERER
24	R/V DISCOVERER	99	R/V DISCOVERER
27	R/V DISCOVERER	102	Small Boat
30	R/V DISCOVERER	103	Small Boat
33	R/V DISCOVERER	104	Small Boat
37	R/V DISCOVERER	105	Small Boat
41	R/V DISCOVERER	106	Small Boat
42	R/V DISCOVERER	107	Small Boat
48	R/V DISCOVERER	108	Small Boat
51	R/V DISCOVERER	109	Small Boat
57	R/V DISCOVERER	110	Small Boat
58	R/V DISCOVERER	112	Small Boat
60	R/V DISCOVERER	113	Small Boat

Table 1.--List of Van Veen samples examined, and means of collection, Cruise DC2-80-EG--Continued

VAN VEEN NUMBER	COLLECTED FROM	VAN VEEN NUMBER	COLLECTED FROM
62	R/V DISCOVERER	114	Small Boat
63	R/V DISCOVERER	115	Small Boat
67	R/V DISCOVERER	116	Small Boat
70	R/V DISCOVERER	118	Small Boat
73	R/V DISCOVERER	119	Small Boat
75	Small Boat	120	Small Boat
76	Small Boat	121	Small Boat
78	Small Boat	122	Small Boat
123	Small Boat	160	Small Boat
124	Small Boat	161	Small Boat
127	Small Boat	162	Small Boat
129	Small Boat	163	Small Boat
130	Small Boat	164	Small Boat
131	Small Boat	165	Small Boat
132	Small Boat	167	R/V DISCOVERER
133	Small Boat	168	R/V DISCOVERER
134	Small Boat	169	R/V DISCOVERER
135	Small Boat	170	R/V DISCOVERER
136	Small Boat	174	R/V DISCOVERER
139	Small Boat	177	R/V DISCOVERER
140	Small Boat	180	R/V DISCOVERER
141	Small Boat	183	R/V DISCOVERER

Table 1.--List of Van Veen samples examined, and means of collection, Cruise DC2-80-EG--Continued

VAN VEEN NUMBER	COLLECTED FROM	VAN VEEN NUMBER	COLLECTED FROM
143	Small Boat	186	R/V DISCOVERER
144	Small Boat	189	R/V DISCOVERER
145	Small Boat	192	R/V DISCOVERER
146	Small Boat	195	R/V DISCOVERER
147	Small Boat		
148	Small Boat		
149	Small Boat		
150	Small Boat		
151	Small Boat		
152	Small Boat		
153	Small Boat		
154	Small Boat		
155	Small Boat		
156	Small Boat		
157	Small Boat		
158	Small Boat		
159	Small Boat		

Table 2--Alphabetical list of all of the ostracode species reported from cruise DC2-80-EG

"*Acanthocythereis*" *dunelmensis* (Norman, 1865)

Argilloecia sp. A

Aurila sp. A

"*Australicythere*" sp. A

Buntonia sp. A

Bythocytheromorpha sp. C

Candona rawsoni Tressler, 1957

Candona sp.

Cluthia sp. A

Cyclocypris ampla Furtos, 1933

Cyclocypris sp

Cyprinotus salinus (Brady, 1868)

Cyprinotus sp.

Cythere aff. *C. alveolivala* Smith, 1952

Cythere sp. A

Cytheromorpha sp. A

Cytheromorpha sp. B

Cytheromorpha sp. C

Cytheromorpha sp. D

Cytheromorpha sp. E

Cytherois sp. A

Cytherois sp. B

Cytheropteron aff. *C. nodosoalatum* Neale and Howe, 1975

Cytheropteron aff. *C. latissimum* Neale and Howe, 1975

Table 2.--Alphabetical list of all the ostracode species reported from Cruise DC2-80-EG--Continued

Cytheropteron sp. A

Cytheropteron sp. B

Cytheropteron sp. D

Cytheropteron sp. E

Cytheropteron sp. F

Cytheropteron sp. G

Cytheropteron sp. H

Cytheropteron sp. I

Cytheropteron sp. J

Cytheropteron sp. K

Cytheropteron sp. L

Cytheropteron sp. N

Cytheropteron sp. Q

Cytheropteron sp. R

Cytheropteron sp. S

Cytheropteron sp. W

Cytherura sp. C

Elofsonia sp. A

Eucythere sp. A

Eucytherura sp. A

Eucytherura sp. B

Eucytherura sp C

Finmarchinella (*Barentsovia*) *barentzovoensis* Mandelstam, 1957

Hemicythere aff. *H. quadrinodosa* Schornikov, 1974

Table 2.--Alphabetical list of all of the ostracode species reported from Cruise DC2-80-EG--Continued

Hemicythere sp.

Hemicytherura sp. A

Hemicytherura sp. B

Hemicytherura sp. C

Ilyocypris sp.

"*Leguminocythereis*" sp. A

"*Leguminocythereis*" sp. B

Limnocythere sp.

Loxoconcha sp. A

Loxoconcha sp. B

Loxoconcha sp. D

Loxoconcha sp. F.

Munseyella sp. A

Munseyella sp. B

Palmanella limicola (Norman, 1865)

Paracypris sp. A

Paracytheridea sp. A

Paradoxostoma aff. *P.* *brunneatum* Schornikov, 1975

Paradoxostoma aff. *P.* *japonicum* Schornikov, 1975

Paradoxostoma sp. D

Paradoxostoma sp. I

Paradoxostoma sp. J

Pectocythere aff. *P.* *quadrangulata* Hanai, 1957

Pectocythere aff. P. *parkerae* Swain and Gilby, 1974

Table 2.--*Alphabetical list of all of the ostracode species reported from Cruise DC2-80-EG--Continued*

Pectocythere sp. D

Pontocythere sp. A

Prionocypris *canadensis* Sars, 1926

Prionocypris sp.

Pseudocythere sp. A

Pseudocythere sp. B

Robertsonites *tuberculata* (Sars, 1865)

Sclerochilus sp. B

Semicytherura aff. *S.* *undata* (Sars, 1865)

Semicytherura sp. F

Table 3.--Summary chart showing the presence and absence of the various faunal and floral elements in the Van Veen samples

SAMPLE NUMBER \ ORGANISM	CALCAREOUS BENTHIC FORAMS	AGGLUTINATED BENTHIC FORAMS	PLANKTIC FORAMS	RADIOLARIANS	SPICULES	WORM TUBES	POLYCHAETES	CHEILOSTOME BRYOZOANS	CYCLOSTOME BRYOZOANS	BRACHIOPODS	PELECYPODS	GASTROPODS	SCAPHOPODS	PTEROPODS	OSTRACODES	OTHER CRUSTACEANS	INSECTS	ECHINODERMS	FISH DEBRIS	DIATOMS	SEEDS	PLANT FRAGMENTS	CHAROPHYTES
1						X					X												
2											X												
4																							
5	X										X												
7	X										X												
8							X				X												
9											X												
14	X										X				X								
16	X										X				X			X		X			
18	X		X		X						X	X			X			X		X			
24	X	X									X				X	X							
27	X	X								X	X	X			X	X	X	X		X	X	X	
30	X		X								X							X					
33	X										X												
37	X	X									X			X		X		X					
41	X	X									X	X			X	X		X	X	X			
48	X	X				X					X				X			X		X		X	
51	X										X		X					X		X		X	
57	X																	X		X	X	X	

Table 3.--Summary chart showing the presence and absence of the various faunal and floral elements in the Van Veen samples--Continued

ORGANISM / SAMPLE NUMBER	CALCAREOUS BENTHIC FORAMS	AGGLUTINATED BENTHIC FORAMS	PLANKTIC FORAMS	RADIOLARIANS	SPICULES	WORM TUBES	POLYCHAETES	CHEILOSTOME BRYOZOANS	CYCLOSTOME BRYOZOANS	BRACHIOPODS	PELECYPODS	GASTROPODS	SCAPHOPODS	PTEROPODS	OSTRACODES	OTHER CRUSTACEANS	INSECTS	ECHINODERMS	FISH DEBRIS	DIATOMS	SEEDS	PLANT FRAGMENTS	CHAROPHYTES
58	X		X				X				X							X		X		X	
60	X		X								X				X			X					
62	X	X	X								X				X			X				X	
63	X	X	X			X					X	X			X			X				X	
67	X	X	X	X		X					X	X			X			X	X				X
70	X	X	X	X							X	X			X	X		X					X
73	X	X				X					X	X			X			X					
75																							
76	X										X												
78																							
79											X												
80											X												
81																							
82	X	X	X	X		X					X				X		X	X				X	
86	X	X	X	X		X					X	X			X			X				X	
89	X	X	X								X	X			X			X					
90	X					X					X							X					
91	X	X	X	X	X	X					X				X			X					
94	X	X	X	X		X					X	X	X		X			X		X			

Table 3.--Summary chart showing the presence and absence of the various faunal and floral elements in the Van Veen samples--Continued

ORGANISM / SAMPLE NUMBER	CALCAREOUS BENTHIC FORAMS	AGGLUTINATED BENTHIC FORAMS	PLANKTIC FORAMS	RADIOLARIANS	SPICULES	WORM TUBES	POLYCHAETES	CHEILOSTOME BRYOZOANS	CYCLOSTOME BRYOZOANS	BRACHIOPODS	PELECYPODS	GASTROPODS	SCAPHOPODS	PTEROPODS	OSTRACODES	OTHER CRUSTACEANS	INSECTS	ECHINODERMS	FISH DEBRIS	DIATOMS	SEEDS	PLANT FRAGMENTS	CHAROPHYTES
97	X	X	X	X	X	X					X	X			X			X	X				
99	X	X	X			X					X				X			X		X			
102											X												
103											X												
104											X												
105																							
106											X												
107											X												
108											X												
109											X												
110																							
112											X												
113																							
114											X												
115											X												
116																							
118											X												
119																							
120											X												

Table 3.--Summary chart showing the presence and absence of the various faunal and floral elements in the Van Veen samples--Continued

ORGANISM / SAMPLE NUMBER	CALCAREOUS BENTHIC FORAMS	AGGLUTINATED BENTHIC FORAMS	PLANKTIC FORAMS	RADIOLARIANS	SPICULES	WORM TUBES	POLYCHAETES	CHEILOSTOME BRYOZOANS	CYCLOSTOME BRYOZOANS	BRACHIOPODS	PELECYPODS	GASTROPODS	SCAPHOPODS	PTEROPODS	OSTRACODES	OTHER CRUSTACEANS	INSECTS	ECHINODERMS	FISH DEBRIS	DIATOMS	SEEDS	PLANT FRAGMENTS	CHAROPHYTES
121	X										X												
122											X												
123											X												
124											X												
127											X												
129																							
130																							
131																							
132	X										X	X										X	
133											X												
134	X										X												
135											X												
136																							
139																							
140																		X					
141																							
143											X												
144											X												
145																							
146											X												

Table 3.--Summary chart showing the presence and absence of the various faunal and floral elements in the Van Veen samples--Continued

ORGANISM / SAMPLE NUMBER	CALCAREOUS BENTHIC FORAMS	AGGLUTINATED BENTHIC FORAMS	PLANKTIC FORAMS	RADIOLARIANS	SPICULES	WORM TUBES	POLYCHAETES	CHEILOSTOME BRYOZOANS	CYCLOSTOME BRYOZOANS	BRACHIOPODS	PELECYPODS	GASTROPODS	SCAPHOPODS	PTEROPODS	OSTRACODES	OTHER CRUSTACEANS	INSECTS	ECHINODERMS	FISH DEBRIS	DIATOMS	SEEDS	PLANT FRAGMENTS	CHAROPHYTES
147	X										X												
148											X												
149											X												
150																							
151											X												
152											X												
153											X												
154											X												
155	X										X				X	X		X					
156	X							X			X							X					
157											X							X					
158	X																						
159								X			X												
160											X												
161																							
162											X												
163											X												
164											X												
165											X												
167	X	X	X			X					X				X			X				X	

Table 3.--Summary chart showing the presence and absence of the various faunal and floral elements in the Van Veen samples--Continued

SAMPLE NUMBER \ ORGANISM	CALCAREOUS BENTHIC FORAMS	AGGLUTINATED BENTHIC FORAMS	PLANKTIC FORAMS	RADIOLARIANS	SPICULES	WORM TUBES	POLYCHAETES	CHEILOSTOME BRYOZOANS	CYCLOSTOME BRYOZOANS	BRACHIOPODS	PELECYPODS	GASTROPODS	SCAPHOPODS	PTEROPODS	OSTRACODES	OTHER CRUSTACEANS	INSECTS	ECHINODERMS	FISH DEBRIS	DIATOMS	SEEDS	PLANT FRAGMENTS	CHAROPHYTES
168	X	X	X	X		X					X				X			X		X		X	
169	X	X	X			X					X				X			X		X			
170	X		X	X		X					X	X			X			X		X		X	
174	X	X	X			X					X	X			X			X		X			
177	X	X	X	X		X					X	X			X			X	X	X		X	
180	X	X	X	X		X					X	X		X	X			X	X	X		X	
183	X	X	X	X		X					X	X			X			X		X		X	
186	X	X	X	X		X			X		X	X	X		X	X		X	X	X		X	
189	X	X	X	X	X	X					X	X	X		X			X		X		X	
192	X	X	X	X		X					X	X			X			X					
195	X	X	X			X			X		X	X			X			X		X		X	

DC1-80-EG Van Veen - 1

Latitude: 59° 06.82' N

Longitude: 148° 40.15' W

Water Depth: 30 meters

Lithology: About 15 centimeters of sand overlying mud.

Organisms Present: Worm Tubes

Pelecypod Fragments

DC2-80-EG Van Veen - 2

Latitude: 59° 25' 15" N

Longitude: 139° 33' 15" W

Water Depth: Less than 20 meters

Lithology: Dark gray-green, fine to medium-grain, subangular sand.

Organisms present: Pelecypod Fragments

DC2-80-EG   Van Veen - 4

Latitude: 59° 24' 50" N

Longitude: 139° 31' 20" W

Water Depth: Less than 20 meters

Lithology: Dark gray-green, fine-grain, subangular sand.

Organisms present: Barren of Organic Remains

DC2-80-EG   Van Veen - 5

Latitude: 59° 24' 50" N

Longitude: 139° 31' 50" W

Water Depth: Less than 20 meters

Lithology: Dark gray-green, fine-grain, subangular sand.

Organisms present: Calcareous Benthic Foraminifers

Elphidium spp.

Pelecypod Fragments

DC2-80-EG Van Veen - 7

Latitude: 59° 17.6' N

Longitude: 139° 16.4' W

Water Depth: 37 meters

Lithology: Olive-gray (5Y 3/2), fine-grain, subangular sand.

Organisms present: Calcareous Benthic Foraminifers

Elphidium spp.

Pelecypod Fragments

DC2-80-EG Van Veen - 8

Latitude: 59° 23' 30" N

Longitude: 139° 28' 35" W

Water Depth: Less than 20 meters

Lithology: Dark gray-green, fine-grain, subangular sand.

Organisms present: Polychaetes

Pelecypod Fragments

DC2-80-EG   Van Veen - 9

Latitude: 59° 23' 00" N

Longitude: 139° 26' 50" W

Water Depth: Less than 20 meters

Lithology: Dark gray-green, fine-grain, subangular sand.

Organisms present: Pelecypod Fragments

DC2-80-EG   Van Veen - 14

Latitude: 59° 19' 10" N

Longitude: 139° 19' 50" W

Water Depth: Less than 20 meters

Lithology: Dark-gray-green, fine-grain sand with several large rounded pebbles.

Organisms present: Calcareous Benthic Foraminifers

Pelecypod Fragments

Ostracodes

Ostracode Species:	Adult	Juv.	%
* "*Leguminocythereis*" sp. A	22	2	100

Total ostracode valves - 24

DC2-80-EG   Van Veen - 16

Latitude: 59° 18.81' N

Longitude: 139° 18.6' W

Water Depth: 35 meters

Lithology: Grayish-olive-green (5GY) 3/2), fine-grain, silty sand with some pebbles.

Organisms present: Calareous Benthic Foraminifers

Pelecypods

Ostracodes

Echinoderms

Diatoms

Ostracode Species:	Adult	Juv.	%
* "Leguminocythereis" sp. A	8	2	100

Total Ostracode valves 10

DC2-80-EG Van Veen - 18

Latitude: 59° 06.99' N

Longitude: 138° 48.28' W

Water Depth: 44 meters

Lithology: Dark-greenish-gray (5G 4/1) mud with some organic material and subrounded small pebbles.

Organisms present: Calcareous Benthic Foraminifers
Planktic Foraminifers
Sponge Spicules
Pelecypods
Gastropod
Ostracodes
Echinoderm Fragments
Diatoms

Ostracode Species:	Adult	Juv.	%
Cytheromorpha sp. A		1	50
Pectocythere sp. D	1		50

Total Ostracode valves 2

DC2-80-EG Van Veen - 24

Latitude: 59° 06.99' N

Longitude: 138° 44.02' W

Water Depth: 42 meters

Lithology: Medium-dark-gray (N4), tight, cohesive mud.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Foraminifers

Pelecypods

Small Crustaceans

Ostracodes

Ostracode Species:		Adult	Juv.	%
*	Pectocythere sp. D	4		66.67
	Loxoconcha sp. A	1		16.67
	"Leguminocythereis" sp. A		1	16.67

Total Ostracode valves 6

DC2-80-EG Van Veen - 27

Latitude: 59° 06.99' N

Longitude: 138° 43.97' W

Water Depth: 43 meters

Lithology: Medium-dark-gray, cohesive mud with dark gray-black, coarser-grained sandy material and carbonaceous material.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Brachiopods
Pelecypods
Gastropod
Branchiuran Fragments

Copepod

Daphniid Ephippia

Ostracodes

Insect Mandible

Mites

Chironomid

Stelleroid Ossicles

Scirpus Seeds

Plant Fragments

Diatoms

Ostracode Species:	Adult	Juv.	%
"*Leguminocythereis*" sp. B		6	37.50
Pectocythere sp. D	2		12.50
Loxoconcha sp. A	2		12.50
Candona sp.		2	12.50
Cytheromorpha sp. B	1		6.25
Cytheromorpha sp. C	1		6.25
Cyclocypris sp.		1	6.25
Elofsonia sp. A	1		6.25

Total Ostracode valves 16

DC-80-EG Van Veen - 30

Latitude: 59° 07.02' N

Longitude: 138° 43.72' W

Water Depth: 43 meters

Lithology: Medium-dark-gray (N4), sandy silt with carbonaceous material.

Organisms present: Calcareous Benthic Foraminifers

Planktic Foraminifers

Pelecypods

Ophiuroid Vertebrae

Ophiuroid Vertebrae

Echinoderm Fragments

DC2-80-EG Van Veen - 33

Latitude: 59° 06.95' N

Longitude: 138° 43.54' W

Water Depth: Less than 20 meters

Lithology: Meduim-dark-gray (N4), sandy mud with carbonaceous material.

Organisms present: Calcareous Benthic Foraminifers

Pelecypods

DC2-80-EG Van Veen - 37

Latitude: 59° 07.01' N

Longitude: 138° 43.33' W

Water Depth: 40 meters

Lithology: Medium-dark-gray (N4) mud.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Pelecypods

Pteropod

Small Crustaceans

Echinoderm Fragments

DC2-80-EG Van Veen - 41

Latitude: 59° 06.89' N

Longitude: 138° 42.96" W

Water Depth: 40 meters

Lithology: Medium-dark-gray (N4) mud with some sand-size material and carbonaceous material.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Bethnic Foraminifers
Pelecypods
Gastropod
Large Crustacean Claws
Ostracodes
Echinoderm Fragments
Diatoms (Numerous)

Ostracode Species:	Adult	Juv.	%
"Leguminocythereis" sp. A		1	33.33
"Leguminocythereis" sp. B		1	33.33
Elofsonia sp. A	1		33.33

Total Ostracode valves 3

DC2-80-EG Van Veen - 48

Latitude: 59° 06.92' N

Longitude: 138° 42.59' W

Water Depth: 37 meters

Lithology: Medium dark-gray-green mud.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Agglutinated Worm Tubes

Pelecypods

Ostracodes

Ophiuroid Fragments

Abundant Plant Debris

Diatoms (Few)

Ostracode Species:	Adult	Juv.	%
* Loxoconcha sp. A	4		57.14
* Cytheromorpha sp. D	2		28.57
Cyprinotus salinus Brady, 1868	1		14.29

Total Ostracode valves 7

DC2-80-EG Van Veen - 51

Latitude: 59° 06.93' N

Longitude: 138° 42.45' W

Water Depth: 35 meters

Lithology: Medium dark-greenish-gray (5GY 5/1), tight, featureless mud with a very small sand content.

Organisms present: Calcareous Benthic Foraminifers

Pelecypods

Scaphopod

Echinoderm Fragments

Woody Fragments

Diatoms

DC2-80-EG Van Veen - 57

Latitude: 59° 06.89' N

Longitude: 138° 42.19' W

Water Depth: 33 meters

Lithology: Medium dark-greenish-gray (5GY 5/1) silt with some organic material.

Organisms present: Calcareous Benthic Foraminifers

Echinoderm Fragments

Seed pods

Plant Fragments

Diatoms

DC2-80-EG Van Veen - 58

Latitude: 59° 06.77' N

Longitude: 138° 40.93' W

Water Depth: 33 meters

Lithology: Olive-greenish-gray (5Y 4/1 to 5GY 4/1) mud underlain by a more consolidated sandy, olive-greenish-gray (5Y 4/1 to 5GY 4/1) mud with occasional rounded pebbles.

Organisms present: Calcareous Benthic Foraminifers

Planktic Foraminifers

Polychaete

Pelecypods

Echinoderm Fragments

Plant Debris

Diatoms

DC2-80-EG   Van Veen - 60

Latitude: 59° 28.46' N

Longitude: 139° 47.99' W

Water Depth: 58 meters

Lithology: Medium-gray-green, fine-grain, silty sand.

Organisms present: Calcareous Benthic Foraminifers
Planktic Foraminifers
Pelecypods
Ostracodes
Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
* "Leguminocythereis" sp. A	95	186	37.57
* "Leguminocythereis" sp. B	75	144	29.28
* Pectocythere sp. D	212		28.34
Loxoconcha sp. A	15	2	2.27
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	6		0.80
Pectocythere aff. P. quadrangulata Hanai, 1957	2	1	0.40
Cytheropteron sp. A	2		0.27

Ostracode Species:	Adult	Juv.	%
Aurila sp. A	2		0.27
Robertsonites tuberculata Sars, 1865		2	0.27
Cytheromorpha sp. B		2	0.27
Candona sp.		1	0.13
Cythere sp. A	1		0.13

Total Ostracode valves 748

DC2-80-EG Van Veen - 62

Latitude: 59° 28.50' N

Longitude: 139° 48.35' W

Water Depth: 64 meters

Lithology: Fine-grain, subangular sand.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Pelecypods

Ostracodes

Echinoderm Fragments

Wood and Plant Fragments

Ostracode Species:	Adult	Juv.	%
* "Leguminocythereis" sp. A	26	195	42.26
"Leguminocythereis" sp. B	29	134	31.17
* Pectocythere sp. D	111		21.22
* Loxoconcha sp. A	3	5	1.53
* Pectocythere aff. P. quadrangulata Hanai, 1957	6		1.15
* Eucythere sp. A	5		0.96
Candona sp.		4	0.76
* Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	2		0.57
* Argilloecia sp. A		2	0.38

Total Ostracode valves 523

DC2-80-EG Van Veen - 63

Latitude: 59° 28.16' N

Longitude: 139° 48.90' W

Water Depth: 62 meters

Lithology: Dark-gray-green sandy mud.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Proteinaceous and Agglutinated Worm Tubes

Pelecypods

Gastropods

Ostracodes

Ophiuroid and Echinoderm Fragments

Plant Debris

Ostracode Species:	Adult	Juv.	%
* "Acanthocythereis" dunelmensis Norman, 1865	36	201	21.14
* Palmanella limicola Norman, 1865	86	108	17.31
"Leguminocythereis" sp. B	14	164	15.88
* "Leguminocythereis" sp. A	9	144	13.65

Ostracode Species:	Adult	Juv.	%
* Loxoconcha sp. A	86	18	9.28
* Pectocythere aff. P. quadrangulata Hanai, 1957	54	17	6.33
* Pectocythere sp. D	41		3.66
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	18	12	2.68
* Buntonia sp. A	17	4	1.87
Robertsonites tuberculata Sars, 1865	2	16	1.61
Eucythere sp. A	14	1	1.34
* Cytheromorpha sp. B	11	4	1.34
* Cytheromorpha sp. E	13		1.16
Cytheropteron sp. A	8	2	0.89
Candona sp.		9	0.80
Cytherois sp. A	6		0.54
Cythere sp. A	4		0.36
Cyprinotus sp.	2		0.18
Aurila sp. A		2	0.18
Candona sp.	2		0.18
Argilloecia sp. B		1	0.09
Cythere aff. C. alveolivalva Smith, 1952	1		0.09
Ilyocypris sp.	1		0.09
Elofsonia sp. A	1		0.09

Total Ostracode valves 1121

DC2-80-EG Van Veen - 67

Latitude: 59° 28.01' N

Longitude: 139° 49.29' W

Water Depth: 82 meters

Lithology: Dark-gray-green (5GY 4/1) mud.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Agglutinated and Proteinaceous Worm Tubes

Pelecypods

Gastropods

Ostracodes

Echinoderm Fragments (primarily Ophiuroids)

Fish Debris

Charophyte

Ostracode Species:	Adult	Juv.	%
* "Acanthocythereis" dunelmensis Norman, 1865	63	294	23.66
* Palmanella limicola Norman, 1865	121	181	20.08
"Leguminocythereis" sp. A	8	143	10.01
* Loxoconcha sp. A	54	92	9.68
"Leguminocythereis" sp. B	10	113	8.15
* Pectocythere aff. P. quadrangulata Hanai, 1957	46	17	5.10
Robertsonites tuberculata Sars, 1865	2	69	4.71
* Buntonia sp. A	56	13	4.57
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	30	16	3.05
Cytheromorpha sp. E	31	11	2.78
* Cytheropteron sp. A	20	2	1.46
Pectocythere sp. D	20	11	1.39
* Cytherois sp. A	18		1.19
* Eucythere sp. A	11	4	0.99
Cytheromorpha sp. B	1	14	0.93
* Cytheropteron sp. D	10		0.66
Cluthia sp. A	5		0.33
Candona sp.		3	0.20
Aurila sp. A		2	0.13
Eucytherura sp. C	1	1	0.13

Ostracode Species:	Adult	Juv.	%
Pontocythere sp. A	2		0.13
Cytheropteron aff. *C. latissimum* Neale and Howe, 1975	2		0.13
Argilloecia sp. A		1	0.07
Argilloecia sp. B		1	0.07
Cythere aff. *C. alveolivalva* Smith, 1952	1		0.07
(F) *Finmarchinella* (*Barentsovia*) *barentzovoensis* Mandelstam, 1957		1	0.07
Ilyocypris bradii Sars, 1890	1		0.07
Cyclocypris ampla Furtos, 1933		1	0.07
Cythere sp. A	1		0.07
Hemicythere aff. *H. quadrinodosa* Schornikov, 1974	1		0.07
Prionocypris canadensis Sars, 1926	1		0.07
Pectocythere aff. *P. parkerae* Swain and Gilby, 1974	1		0.07
Cytheropteron sp. G	1		0.07

Total Ostracode valves 1509

DC2-80-EG Van Veen - 70

Latitude: 59° 28.89' N

Longitude: 139° 49.81' W

Water Depth: 98 meters

Lithology: Greenish-gray (5GY 6/1) silt.

Organisms present:
- Calcarious Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Pelecypods
- Gastropods
- Small Crustaceans (Malacostracan)
- Ostracodes
- Ophiuroids
- Echinoderm Fragments
- Charophytes

Ostracode Species:	Adult	Juv.	%
Palmanella limicola Norman, 1865	168	349	22.32
"Acanthocythereis" dunelmensis Norman, 1865	36	477	22.15
Loxoconcha sp. A	107	174	12.13
* Buntonia sp. A	127	90	9.37
Cytheropteron sp. D	121	4	5.40
* Pectocythere aff. P. quadrangulata Hanai, 1957	20	73	4.02
"Leguminocythereis" sp. B	2	85	3.76
"Leguminocythereis" sp. A	2	74	3.28
* Robertsonites tuberculata Sars, 1865	5	59	2.76
Cluthia sp. A	49		2.12
Cytheromorpha sp. B	43		1.86
Cytheropteron sp. A	13	26	1.68
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	7	30	1.60
Cytherois sp. A	27	5	1.38
Cytheromorpha sp. E	23	2	1.08
Pectocythere sp. D	7	11	0.78
* Argilloecia sp. B	8	7	0.65
Eucytherura sp. C	14		0.61
* Loxoconcha sp. B	13		0.56

Ostracode Species:	Adult	Juv.	%
* Argilloecia sp. A	13		0.56
Eucythere sp. A	7	1	0.35
Cytheropteron sp. W	5	2	0.30
Paradoxostoma sp. I	2	4	0.26
Cytheromorpha sp. A	5		0.22
Cytheropteron sp. I	4		0.17
Elofsonia sp. A	3		0.13
Candona rawsoni Tressler, 1957		3	0.13
Cytherois sp. B	2		0.09
Cythere sp. A		2	0.09
Cythere alveolivalva Smith, 1952		1	0.04
Prionocypris sp.		1	0.04
Candona sp.		1	0.04
Cytheropteron sp. L		1	0.04
Cytheropteron sp. Q	1		0.04

Total Ostracode valves 2316

DC2-80-EG   Van Veen - 73

Latitude: 59° 27.73' N

Longitude: 139° 50.20' W

Water Depth: 104 meters

Lithology: Greenish-gray (5GY 6/1) silt.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Numerous Agglutinated Worm Tubes
Pylecypods
Gastropods
Ostracodes
Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
* "Acanthocythereis" dunelmensis Norman, 1865	45	208	28.68
* Palmanella limicola Norman, 1865	45	112	17.69
* Buntonia sp. A	107	46	17.35
* Loxoconcha sp. A	20	38	6.58
"Leguminocythereis" sp. A		39	4.42

Ostracode Species:	Adult	Juv.	%
* Robertsonites tuberculata	2	34	4.08
Sars, 1865			
"Leguminocythereis sp. B	1	33	3.85
* Cytheropteron sp. D	32		3.63
* Cytheromorpha sp. E	28	1	3.29
* Pectocythere aff. P. quadrangulata	5	19	2.72
Hanai, 1957			
Cluthia sp. A	11		1.25
Cytheropteron aff. C. nodosoalatum	5	5	1.13
Neale and Howe, 1975			
Cytheropteron sp. A	7	2	1.02
Argilloceia sp. A	8		0.91
Cytherois sp. A	5		0.57
Argilloecia sp. B	4		0.45
Cytheropteron sp. I	3	1	0.45
Pectocythere sp D	1	3	0.45
Cytheromorpha sp. B	3		0.34
Eucytherura sp. C	2		0.23
Eucytherura sp. A	2		0.34
Cytheropteron aff. C. latissimum	2		0.23
Neale and Howe, 1975			
Paradoxostoma sp. H	1		0.11
Limnocythere sp.	1		0.11

Ostracode Species:	Adult	Juv.	%
Candona sp.		1	0.11
Cytheropteron sp. J	1		0.11

Total Ostracode valves 882

DC2-80-EG Van Veen - 75

Latitude: 59° 08.5' N

Longitude: 138° 40.5' W

Water Depth: Less than 20 meters

Lithology: Medium- to coarse-grain, subangular to subrounded sand.

Organisms present: Barren of Organic Remains.

DC2-80-EG Van Veen - 76

Latitude: 59° 08.05' N

Longitude: 138° 41.0' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5G 4/1), medium-grain, subangular sand.

Organisms present: Calcareous Benthic Foraminifers

Quinqueloculina sp.

Pelecypod Fragment

DC2-80-EG Van Veen - 78

Latitude: 59° 07.7' N

Longitude: 138° 38.7' W

Water Depth: Less than 20 meters

Lithology: Dark-green-gray, medium- to coarse-grain, subangular to subrounded sand.

Organisms present: Barren of Organic Remains.

DC2-80-EG Van Veen - 79

Latitude: 59° 07.35' N

Longitude: 138° 39.6' W

Water Depth: Less than 20 meters

Lithology: Dark-gray-green, medium-grain, subangular sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 80

Latitude: 59° 06.8' N

Longitude: 138° 39.9' W

Water Depth: Less than 20 meters

Lithology: Dark-gray-green, mediumgrain, subangular sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 81

Latitude: 59° 06.95' N

Longitude: 138° 36.6' W

Water Depth: Less than 20 meters

Lithology: Dark-gray-green, medium-grain, subangular sand.

Organisms present: Barren of Organic Remains.

DC2-80-EG Van Veen - 82

Latitude: 59° 28.18' N

Longitude: 139° 48.38' W

Water Depth: 74 meters

Lithology: Dark-gray-green silt with a minor organic content.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Agglutinated Worm Tubes

Pelecypods

Ostracodes

Insect Wing

Echinoderm Fragments

Carbonized Wood Fragments

Woody Plant Fragments

Ostracode Species:	Adult	Juv.	%
* "Leguminocythereis" sp. A	11	158	26.91
* "Leguminocythereis" sp. B	22	112	21.02
Loxoconcha sp. A	50	32	13.06
* "Acanthocythereis" dunelmensis Norman, 1865	8	36	7.01
* Pectocythere sp. D	40	4	7.01
Palmanella limicola Norman, 1865	20	23	6.85
* Pectocythere aff. P. quadrangulata Hanai, 1957	20	17	5.89
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	13	19	5.10
Cytheromorpha sp. D	14		2.23
Cytheropteron sp. A	9	2	1.75
Eucythere sp. A	2	1	0.48
Eucytherura sp. C	2		0.32
Argilloecia sp. B	2		0.32

Ostracode Species:	Adult	Juv.	%
Cytherois sp. A	2		0.32
Cytheromporpha sp. B	2		0.32
Candona sp.		2	0.32
Cythere aff. *C.* *alveolivalva* Smith, 1952	1		0.16
Cyclocypris *ampla* Furtos, 1933	1		0.16
Robertsonites *tuberculata* Sars, 1865		1	0.16
Hemicythere aff. *H.* *quadrinodosa* Schornikov, 1974		1	0.16
Hemicythere sp.	1		0.16

Total Ostracode valves 628

DC2-80-EG Van Veen - 86

Latitude: 59° 27.48' N

Longitude: 139° 50.48' W

Water Depth: 110 meters

Lithology: Olive-gray (5Y 3/2) and dark-greenish-gray (5GY 3/1) silt with organic material throughout.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Agglutinated and Proteinaceous Worm Tubes

Pelecypod

Gastropod

Ostracodes

Echinoderm Fragments

Plant Debris

Ostracode Species:	Adult	Juv.	%
* "Acanthocythereis" dunelmensis Norman, 1865	48	233	46.68
* Palmanella limicola Norman, 1865	43	47	14.95
* Buntonia sp. A	33	10	7.14
* Cytheropteron sp. D	32		5.32
Robertsonites tuberculata Sars, 1865	1	28	4.82
* Loxoconcha sp. A	8	17	4.15

Ostracode Species:	Adult	Juv.	%
"*Leguminocythereis*" sp. B		19	3.16
Cytheropteron aff. *C.* *nodosoalatum* Neale and Howe, 1975	1	13	2.33
Pectocythere aff. *P.* *quadrangulata* Hanai, 1957	2	12	2.32
"*Leguminocythereis*" sp. A	3	11	2.16
Cytheromorpha sp. E	7		1.16
Cytherois sp. A	6		1.0
Cytheropteron aff. *C.* *latissimum* Neale and Howe, 1975	5		0.83
Cytheromorpha sp. B		4	0.66
Cluthia sp. A	1	2	0.50
Cytheropteron sp. I	1	1	0.33
* *Eucytherura* sp. C	2		0.33
* *Pectocythere* sp. D	2		0.33
Cytheropteron sp. A		2	0.33
Argilloecia sp. A	2		0.33
Eucythere sp. A		1	0.17
Candona sp.		1	0.17
Loxoconcha sp. B		1	0.17
Ilocypris sp.	1		0.17
Cytheropteron sp. L	1		0.17

Total Ostracode valves 602

DC2-80-EG Van Veen - 89

Latitude: 59° 28.64' N

Longitude: 139° 48.16' W

Water Depth: 55 meters

Lithology: Dark-greenish-gray (5GY 4/1) to greenish-black (5GY 2/1) silty sand.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Pelecypod Fragments
Gastropods
Ostracodes
Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
* "Leguminocythereis" sp. B	35	33	50.37
* Pectocythere sp. D	27		20.00
"Leguminocythereis" sp. A	7	17	17.78
"Acanthocythereis" dunelmensis Norman, 1865		6	4.44
* Buntonia sp. A	4		2.96

Ostracode Species:	Adult	Juv.	%
Palmanella limicola Norman, 1865	4		2.96
Pectocythere aff. P. quadrangulata Hanai, 1957	1		0.74
Robertsonites tuberculata Sars, 1865		1	0.74

Total Ostracode valves 135

DC2-80-EG Van Veen - 90

Latitude: 59° 07.74' N

Longitude: 138° 43.85' W

Water Depth: 31 meters

Lithology: Dark-greenish-gray (5GY 4/1) fine-grain sand.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Worm Tubes

Pelecypods

Ophiuroid Fragments

DC2-80-EG Van Veen - 91

Latitude: 59° 00.16' N

Longitude: 139° 54.01' W

Water Depth: 128 meters

Lithology: About 3 cm. of medium dusky-yellow-green (5GY 5/2) silt overlying medium dark-greenish-gray (5GY 5/1), more consolidated, sandy mud with some subangular pebbles.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Radiolarians
Numerous Sponge Spicules
Aggulinated Worm Tubes
Pelecypods
Ostracodes
Echinoderm Spines

Ostracode Species:		Adult	Juv.	%
(F)	"Australicythere" sp. A		1	100

Total Ostracode valves 1

DC2-80-EG Van Veen - 94

Latitude: 59° 26.3, N

Longitude: 139° 36.0, W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), fine-grain sand.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Agglutinated Worm Tubes

Pelecypods

Gastropod

Scaphopods

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adult	Juv.	%
* *Palmanella limicola* Norman, 1865	13	32	39.13
* "*Acanthocythereis*" *dunelmensis* Norman, 1865	4	40	38.26
Loxoconcha sp. B	10	1	9.57
Argilloecia sp. A	4	1	4.35
Cytheropteron sp. D	3		2.61
Cytherois sp. A	3		2.61
Pectocythere aff. *P. quadrangulata* Hanai, 1957	1	1	1.74
Candona sp.		1	0.87
Cluthia sp. A		1	0.87

Total Ostracode valves 115

DC2-80-EG   Van Veen - 97

Latitude: 59° 41.8' N

Longitude: 141° 20.1' W

Water Depth: 60 meters

Lithology: Dark-greenish-gray (5GY 4/1), very fine-grain sand with a thin silty layer on the surface.

Organisms present:
- Calcareous Benthic Foraminifers
- Afflutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Occasional Sponge Spicules
- Proteinaceous Worm Tubes
- Pelecypods
- Gastropods
- Ostracodes
- Echinoderm Fragments
- Fish Debris

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* Norman, 1865	2	16	25.00
Palmanella limicola Norman, 1865	3	15	25.00
"*Leguminocythereis*" sp. A	2	12	19.44
Loxoconcha sp. A	5	2	9.72
Loxoconcha sp. B	3	2	6.94
Pectocythere sp. D		3	4.17

Ostracode Species:	Adult	Juv.	%
Pectocythere aff. *P. quadrangulata* Hanai, 1957	2		2.78
Cytherois sp. A	2		2.78
Cytheropteron sp. B	1	1	2.78
Cytheromorpha sp. B		1	1.39

Total Ostracode valves 72

DC2-80-EG Van Veen - 99

Latitude: 59° 41.0' N

Longitude: 141° 20.7' W

Water Depth: 60 meters

Lilthology: Dark-greenish-gray (5GY 4/1), fine-grain sand to silt with a thin layer of mud on top.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Agglutinated Worm Tubes

Pelecypods

Ostracodes

Echinoderm Fragments (primarily Ophiuroids)

Occasional Diatoms

Ostracode Species:	Adult	Juv.	%
* "Leguminocythereis sp. A	5	34	66.10
* Pectocythere sp. D	10	5	25.42
Loxoconcha sp. A	2	1	5.08
* Cytheromorpha sp B		2	3.39

Total Ostracode valves 59

DC2-80-EG Van Veen - 102

Latitude: 59° 26.3' N

Longitude: 139° 36.0' W

Water Depth Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), fine-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 103

Latitude: 59° 26.3' N

Longitude: 139° 37.2' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), fine-grain, subangular sand.

Organisms present: Pelecypod Fragments

DC2-80-EG Van Veen - 104

Latitude: 59° 26.6' N

Longitude: 139° 37.5' W

Water Depth: Less than 20 meters

Lithology: Olive-gray (5Y 4/5), medium-grain sand.

Organisms present: Rare pelecypod Fragments

DC2-80-EG Van Veen - 105

Latitude: 59° 27.3' N

Longitude: 139° 39.77' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), fine-grain, subangular sand.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 106

Latitude: 59° 27.6' N

Longitude: 139° 39.3' W

Water Depth: Less than 20 meters

Lithology: Dark-gray (N3), medium-grain sand.

Organisms present: Pelecypod Fragments

DC2-80-EG Van Veen - 107

Latitude: 59° 30.2' N

Longitude: 139° 47.2' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), fine-grain, subangular sand.

Organisms present: Pelecypod Fragments

DC2-80-EG Van Veen - 108

Latitude: 59° 30.5' N

Longitude: 139° 46.9' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), medium-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 109

Latitude: 59° 31.2' N

Longitude: 139° 48.9' W

Water Depth: Less than 20 meters

Lithology: Olive-black (5YR 2/1), coarse to very coarse-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 110

Latitude: 59° 31.0' N

Longitude: 139° 49.1' W

Water Depth: Less than 20 meters

Lithology: Olive-gray (5Y4/5), medium-grain sand.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 112

Latitude: 59° 31,6' N

Longitude: 139° 50.6' W

Water Depth: Less than 20 meters

Lithology: Grayish-olive-green (5GY 3/2) to olive-black (5Y 2/1), fine-grain, subangular sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 113

Latitude: 59° 31.6' N

Longitude: 139° 50.4' W

Water Depth: Less than 20 meters

Lithology: Dark-green, medium-grain, subangular sand

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 114

Latitude: 59° 31.9' N

Longitude: 139° 51.2' W

Water Depth: Less than 20 meters

Lithology: Greenish-black, (5GY 2/1), fine-grain, subangular sand.

Organisms present: Pelecypod Fragment

DC2-8-EG Van Veen - 115

Latitude: 59° 32.0' N

Longitude: 139° 51.5' W

Water Depth: Less than 20 meters

Lithology: Dark-medium-green, medium-grain, subangular sand.

Organisms present: Abraded Pelecypod Fragments

DC2-80-EG   Van Veen - 116

Latitude: 59° 31.7' N

Longitude: 139° 50.5' W

Water Depth: Less than 20 meters

Lithology: Olive-black (5Y 2/1), fine-grain, subrounded to subangular sand.

Organisms present: Barren of Organic Remains

DC2-80-EG   Van Veen - 118

Latitude: 59° 32.2' N

Longitude: 139° 51.9' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), fine- to medium-grain sand.

Organisms present: Pelecypod Fragments

DC2-80-EG Van Veen - 119

Latitude: 59° 32.2' N

Longitude: 139o 52.0' W

Water Depth: Less than 20 meters

Lithology: Olive-gray, medium-grain sand.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 120

Latitude: 59° 33.7' N

Longitude: 139° 50.9' W

Water Depth: Less than 20 meters

Lithology: Dark gray (N3), fine-grain sand.

Organisms present: Pelecypod Fragments

DC2-80-EG   Van Veen - 121

Latitude: 59° 33.6' N

Longitude: 139° 49.6' W

Water Depth: Less than 20 meters

Lithology: Olive-gray (5Y 4/1), medium- to coarse-grain sand.

Organisms present: Calcareous Benthic Foraminifer

Quinqueloculina sp.

Rare Pelecypod Fragments

DC2-80-EG   Van Veen - 122

Latitude: 59° 33.7' N

Longitude: 139° 49.7' W

Water Depth: Less than 20 meters

Lithology: Dark-gray (N3), fine-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 123

Latitude: 59° 33.7' N

Longitude: 139° 50.0' W

Water Depth: Less than 20 meters

Lithology: Olive-gray (5Y 4/1), coarse-grain sand with some shell fragments.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 124

Latitude: 59° 33.5' N

Longitude: 139° 51.5. W

Water Depth: Less than 20 meters

Lithology: Olive-gray (5Y 4/1), medium-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 127

Latitude: 59° 31.3' N

Longitude: 139° 49.4' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), coarse to very coarse-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 129

Latitude: 59° 30.7' N

Longitude: 139° 47.6' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5G 4/1), fine- to medium-grain sand.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 130

Latitude 59° 29.0' N

Longitude: 139° 41.0' W

Water Depth: Less than 20 meters

Lithology: Olive-gray (5Y 4/1), medium-grain sand.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 131

Latitude: 59° 55.29' N

Longitude: 141° 27.9' W

Water Depth: Less than 20 meters

Lithology: Coarse gravel composed of subrounded lithic fragments.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 132

Latitude: 59° 55.33' N

Longitude: 141° 28.2' W

Water Depth: Less than 20 meters

Lithology: Light-greenish-gray (5GY 5/1), sandy mud.

Organisms present: Calcareous Benthic Foraminifers

Elphidium sp.

Quinqueloculina sp.

Pelecypod Fragment

Gastropod Fragment

Plant Debris

DC2-80-EG Van Veen - 133

Latitude: 59° 55.38' N

Longitude: 141° 28.4' W

Water Depth: Less than 20 meters

Lithology: Light greenish-black (5GY 3/1), medium-grain, subangular sand with some coarse sand to gravel-size lithic fragments.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 134

Latitude: 59° 55.20' N

Longitude: 141° 28.6' W

Water Depth: Less than 20 meters

Lithology: Light-greenish-black (5GY 3/1), fine-grain sand.

Organisms present: Calcareous Benthic Foraminifers

Elphidium spp.

Pelecypod Fragments

DC2-80-EG Van Veen - 135

Latitude: 59° 54.88' N

Longitude: 141° 28.7' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), medium-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 136

Latitude: 59° 54.46' N

Longitude: 141° 28.4' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), medium-grain, subangular sand with some gravel-size lithic fragments.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 139

Latitude: 59° 53.08' N

Longitude: 141° 27.02' W

Water Depth: Less than 20 meters

Lithology: Medium- to coarse-grain, well sorted, subrounded to subangular sand.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 140

Latitude: 59° 52.95' N

Longitude: 141° 26.83' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 3/1), fine-grain, silty sand.

Organisms present: Echinoderm Spine

DC2-80-EG Van Veen 141

Latitude: 59° 52.78' N

Longitude: 141° 26.42' W

Water Depth: Less than 20 meters

Lithology: Dark-gray (N3) silt with some pebbles.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 143

Latitude: 59° 51.77' N

Longitude: 141° 23.17' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), medium-grain sand with some small pebbles.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 144

Latitude: 59° 51.60' N

Longitude: 141° 22.43' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), medium-grain, subangular sand.

Organisms present: Pelecypod Fragments

DC2-80-EG Van Veen - 145

Latitude: 59° 51.08' N

Longitude: 141° 19.82' W

Water Depth: Less than 20 meters

Lithology: Medium-dark-gray (N4) silt.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 146

Latitude: 59° 50.10' N

Longitude: 141° 15.48' W

Water Depth: Less than 20 meters

Lithology: Light-greenish-black (5GY 3/1), medium-grain, subangular, well-sorted sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 147

Latitude: 59° 52.3' N

Longitude: 141° 16.90' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), fine- to medium-grain, subangular sand with some lithic fragments.

Organisms present: Rare Calcareous Benthic Foraminifers

Elphidium sp.

Pelecypod Fragments

DC2-80-EG Van Veen - 148

Latitude: 59° 50.2' N

Longitude: 141° 15.0' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), medium-gray sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG   Van Veen - 149

Latitude: 59° 49.6' N

Longitude: 141° 12.5' W

Water Depth: Less than 20 meters

Lithology: Medium- to coarse-grain, well-sorted sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG   Van Veen - 150

Latitude: 59° 48.4' N

Longitude: 141° 09.4' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), fine-grain sand.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 151

Latitude: 59° 48.3' N

Longitude: 141° 08.2' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), fine-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 152

Latitude: 59° 48.1' N

Longitude: 141° 07.5' W

Water Depth: Less than 20 meters

Lithology: Fine- to medium-grain, subangular sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 153

Latitude: 59° 47.5' N

Longitude: 141° 04.1' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), medium-grain, subangular to subrounded, moderately-well-sorted sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 154

Latitude: 59° 46.9' N

Longitude: 141° 02.0' W

Water Depth: Less than 20 meters

Lithology: Greenish-black (5GY 2/1), medium-grain sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 155

Latitude: 59° 43.5' N

Longitude: 140° 46.5' W

Water Depth: Less than 20 meters

Lithology: Olive gray (5Y 4/1), fine-grain, sandy silt.

Organisms present: Calcareous Benthic Foraminifers

Elphidium spp.

Quinqueloculina sp.

Trichohyalus sp.

Pelecypods

Branchiurans

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
"*Leguminocythereis*" sp. A		1	100

Total Ostracode valves 1

DC2-80-EG Van Veen - 156

Latitude: 59° 43.1' N

Longitude: 140° 47.1' W

Water Depth: Less than 20 meters

Lithology: Olive-gray (5Y 4/1) to medium-dark-gray (N4), fine-grain sandy silt.

Organisms present: Calcareous Benthic Foraminifers

Elphidium spp.

Eponides sp.

Cheilostome Fragments

Pelecypod Fragments

Echinoderm Fragments

DC2-80-EG Van Veen - 157

Latitude: 59° 43.6' N

Longitude: 140° 47.1' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY /41), fine-grain, subangular sand.

Organisms present: Pelecypod Fragments

Echinoderm Fragments

DC2-80-EG Van Veen - 158

Latitude: 59° 43.9' N

Longitude: 140° 47.8' W

Water Depth: Less than 20 meters

Lithology: Very coarse, well-sorted sand.

Organisms present: Calcareous Benthic Foraminifers

Elphidium spp.

DC2-80-EG Van Veen - 159

Latitude: 59° 43.9' N

Longitude: 140° 49.0' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), medium-grain, subrounded to subangular, poorly-sorted sand.

Organisms present: Cheilostome Fragments

Abraded Pelecypod Fragment

DC2-80-EG Van Veen - 160

Latitude: 59° 43.9' N

Longitude: 140° 50.08' W

Water Depth: Less than 20 meters

Lithology: Medium- to coarse-grain, subrounded to angular, poorly-sorted sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 161

Latitude: 59° 43.9' N

Longitude: 140° 51.6' W

Water Depth: Less than 20 meters

Lithology: Dark-gray (N3), subangular to subrounded gravel with coarse sand.

Organisms present: Barren of Organic Remains

DC2-80-EG Van Veen - 162

Latitude: 59° 44.0' N

Longitude: 140° 53.0' W

Water Depth: Less than 20 meters

Lithology: Olive-black (5Y 2/1), water-saturated silt.

Organisms present: Pelecypod Fragments

DC2-80-EG Van Veen - 163

Latitude: 59° 45.1' N

Longitude: 140° 55.8' W

Water Depth: Less than 20 meters

Lithology: Olive-gray to olive-black (5Y 3/1), medium- to coarse-grain, subangular sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 164

Latitude: 59° 46.00' N

Longitude: 140° 57.5' W

Water Depth: Less than 20 meters

Lithology: Dark-greenish-gray (5GY 4/1), coarse-grain sand.

DC2-80-EG Van Veen - 165

Latitude: 59° 46.5' N

Longitude: 140° 59.0' W

Water Depth: Less than 20 meters

Lithology: Olive black (5GY 2/1), coarse-grain, subangular to subrounded sand.

Organisms present: Rare Pelecypod Fragments

DC2-80-EG Van Veen - 167

Latitude: 59° 40.1' N

Longitude: 141° 21.6' W

Water Depth: 68 meters

Lithology: Dark-greenish-gray (5GY 4/1) silt.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Agglutinated Worm Tubes

Pelecypod

Ostracodes

Live Ophiuroid

Echinoderm Fragments and Spines

Plant Debris

Ostracode Species:	Adult	Juv.	%
Loxoconcha sp. A	7	10	42.5
"*Leguminocythereis*" sp. A	2	12	35.0
Pectocythere sp. D	2	2	10.0
Cytheromorpha sp. E		2	5.0
Pectocythere aff. *P. quadrangulata* Hanai, 1957	2		5.0
Cytheromorpha sp. B	1		2.5

Total Ostracode valves 40

DC2-80-EG Van Veen - 168

Latitude: 59° 40.1' N

Longitude: 141° 21.6' W

Water Depth: 68 meters

Lithology: Dark-greenish-gray (5GY 4/1) silt.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Occasional Radiolarians
Agglutinated and Proteinaceous Worm Tubes
Pelecypods
Ostracodes
Echinoderm Fragments
Occasional Diatoms

Ostracode Species:	Adult	Juv.	%
Loxoconcha sp. A	38	14	37.68
"Leguminocythereis" sp. A	1	35	26.09
* Cytheromorpha sp. E	18	5	16.67
Pectocythere sp. D	1	18	13.77
Palmanella limicola Norman, 1865	2	2	2.90
Robertsonites tuberculata Sars, 1865		2	1.45
Pectocythere aff. P. quadrangulata Hanai, 1957		2	1.45
Cythere sp. A	1		0.72
Hemicytherura sp. A		1	0.72

Total Ostracode valves 138

DC2-80-EG   Van Veen - 169

Latitude: 59° 39.2' N

Longitude: 141° 22.1' W

Water Depth: 73 meters

Lithology: Dark-greenish-gray (5GY 4/1), highly compacted silt.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Agglutinated Worm Tubes
Pelecypod
Ostracodes
Echinoderm Fragments
Diatoms

Ostracode Species:	Adult	Juv.	%
"Leguminocythereis" sp. A	1	23	54.55
* Cytheromorpha sp. E	6		13.64

Ostracode Species:	Adult	Juv.	%
Loxoconcha sp. A	2	2	9.09
Pectocythere sp. D	2	2	9.09
Palmanella limicola Norman, 1865	1	1	4.55
Pectocythere aff. P. quadrangulata Hanai, 1957	2		4.55
Robertsonites tuberculata Sars, 1865		1	2.27
Candona sp.		1	2.27

Total Ostracode valves 44

DC2-80-EG Van Veen - 170

Latitude: 59° 38.1' N

Longitude: 141° 22.5' W

Water Depth: 84 meters

Lithology: Dark-greenish-gray (5GY 4/1), under-consolided silt.

Organisms present: Calcareous Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Proteinaceous and Agglutinated Worm Tubes

Pelecypods

Gastropod

Ostracodes

Echinoderm Fragments

Carbonized Wood Fragments

Diatoms

Ostracode Species:	Adult	Juv.	%
"Acanthocythereris" dunelmensis Norman, 1865	10	41	35.17
Pectocythere aff. P. quadrangulata Hanai, 1957	13	23	24.83
Palmanella limicola Norman, 1865	11	19	20.69
* Robertsonites tuberculata Sars, 1865	3	6	6.21
Cytherois sp. A	2	3	3.45
Cytheropteron sp. A	3	2	3.45
"Leguminocythereis" sp. A		4	2.76
Buntonia sp. A	1	2	2.07
Argilloecia sp. B	1		0.69
Loxoconcha sp. B	1		0.69

Total Ostracode valves 145

DC2-80-EG Van Veen - 174

Latitude: 59° 37.2' N

Longitude: 141° 23.1' W

Water Depth: 91 meters

Lithology: Dark-green-gray (5GY 4/1) silt.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Agglutinated Worm Tubes

Pelecypods

Gastropods

Ostracodes

Echinoderm Fragments (primarily Ophiuroids)

Diatoms

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* Norman, 1865	4	21	37.31
* *Palmanella limocola* Norman, 1865	13	11	35.82
* *Pectocythere* aff. *P. quadrangulata* Hanai, 1957	2	2	5.97
Loxoconcha sp. B	4		5.97
Cytherois sp. A	3		4.48
Cluthia sp. A	1		1.49
Cytheromorpha sp. B		1	1.49
Loxoconcha sp. A	1		1.49
Argilloecia sp. A	1		1.49
Argilloecia sp. B		1	1.49
Buntonia sp. A	1		1.49
Cytherura sp. C		1	1.49

Total Ostracode valves 67

DC2-80-EG Van Veen - 177

Latitude: 59° 36.1' N

Longitude: 141° 23.5' W

Water Depth: 102 meters

Lithology: Dark-greenish-gray (5GY 4/1) silt with some streaks of organic material.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Worm Tubes

Pelecypods

Gastracodes

Ostracodes

Echinoderm Fragments

Fish Bones

Woody Plant Fragments

Diatoms

Ostracode Species:	Adult	Juv.	%
* "Acanthocythereis" dunelmensis Norman, 1865	5	8	41.94
Palmanella limicola Norman, 1865	1	10	35.48
Buntonia sp. A	2		6.45
Cytheropteron sp. B	1	1	6.45
"Leguminocythereis" sp. A		1	3.23
Loxoconcha sp. B		1	3.23
Cytherois sp. A	1		3.23

Total Ostracode valves 31

DC2-80-EG Van Veen - 180

Latitude: 59° 35.2' N

Longitude: 141° 24.5' W

Water Depth: 111 meters

Lithology: Dark-gray-green (5GY 4/1) silt with worm tubes and some organic material.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Agglutinated Worm Tubes

Pelecypods

Pteropod

Ostracodes

Echinoderm Fragments

Fish Debris

Fecal Pellets

Plant Debris

Diatoms

Ostracode Species:	Adult	Juv.	%
Palmanella limocola Norman, 1865	4	5	32.14
"Acanthocythereis" dunelmensis Norman, 1865		8	28.57
Loxoconcha sp. B	5	2	25.00
Cytherois sp. A	2		7.14
Sclerochilus sp. B	1		3.57
Cluthia sp. A	1		3.57

Total Ostracode valves 28

DC2-80-EG Van Veen - 183

Latitude: 59° 34.4' N

Longitude: 141° 25.1' W

Water Depth: 121 meters

Lithology: 3-4 cm. of gray-olive-green (5GY 3/2), mottled silt underlain by dark-greenish-gray (5GY 4/1), mottled silt with laminae of organic material.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Radiolarians
Proteinaceous and Agglutinated Worm Tubes
Pelecypods
Gastropods
Ostracodes
Echinoderm Fragments
Plant Debris
Diatoms

Ostracode Species:	Adult	Juv.	%
Palmanella limicola Norman, 1865	1	5	40.00

Ostracode Species:	Adult	Juv.	%
Cluthia sp. A	4		26.67
Loxoconcha sp B	2		13.33
"*Acanthocythereis*" *dunelmensis* Norman, 1865		1	6.67
Cytheropteron sp. K.	1		6.67
"*Leguminocythereis*" sp. A		1	6.67

Total Ostracode valves 15

DC2-80-EG Van Veen - 186

Latitude: 59° 33.3' N

Longitude: 141° 25.3' W

Water Depth: 132 meters

Lithology: Dusky yellow-olive-green (5GY 4/2) silt underlain by dark-greenish-gray (5GY 4/1), more consolidated silt with small amounts of organic material.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers

Radiolarians

Proteinaceous and Agglutinated Worm Tubes

Cyclostome Bryozoans

Pelecypods

Gastropods

Scaphopods

Crustacean Fragments

Ostracodes

Echinoderm Fragments (primarily Ophiuroids)

Fish Scales

Plant Debris

Abundant Diatoms

Ostracode Species:	Adult	Juv.	%
Palmanella limicola Norman, 1865	6	61	32.37
Loxoconcha sp. B	41	6	22.71
"Acanthocythereis" dunelmensis Norman, 1865	4	36	19.32
Cytheropteron sp. K	14	3	8.21
Cluthia sp. A	15		7.25
Cytheropteron sp. Q	3	1	1.93
Argilloecia sp. A	3		1.45
Cytheropteron sp. B	1	2	1.45
"Leguminocythereis" sp. A		3	1.45

Ostracode Species:	Adult	Juv.	%
Loxoconcha sp. A		2	0.97
Cytheromorpha sp .C	1	1	0.48
Eucytherura sp. C	1		0.48
Bythocythere sp. B	1		0.48
Cytheropteron sp. D	1		0.48
Cytherois sp. A		1	0.48
Pseudocythere sp. A		1	0.48

Total Ostracode valves 207

DC2-80-EG Van Veen - 189

Latitude: 59° 32.5' N

Longitude: 141° 26.4' W

Water Depth: 139 meters

Lithology: Dark-greenish-gray (5G 4/1) silt.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Sponge Spicules

Proteinaceous and Agglutinated Worm Tubes

Pelecypods

Gastropods

Scaphopod

Ostracodes

Ophiuroid Vertebrae

Plant Debris

Numerous Diatoms

Ostracode Species:	Adult	Juv.	%
"*Acanthocythereis*" *dunelmensis* Norman, 1865	1	29	32.97
Palmanella limicola Norman, 1865	6	21	29.67
Loxoconcha sp. B	12	1	14.29
Munseyella sp. A	6		6.59
Cytheropteron sp. Q	4	1	5.50
Cytheropteron sp. K	4		4.40
Cluthia sp. A	2	1	3.30
"*Leguminocythereis*" sp. B		2	2.20
Munseyella sp. B	1		1.10

Total Ostracode valves 91

Latitude: 59° 31.2' N

Longitude: 141° 26.8' W

Water Depth: 150 meters

Lithology: 1 cm. of grayish-olive (10Y 4/2), water-saturated silt underlain by dark greenish-gray (5GY 4/1) silt.

Organisms present: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Radiolarians
Proteinaceous Worm Tubes
Pelecypods
Gastropods
Ostracodes
Echinoderm Fragments

Ostracode Species:	Adult	Juv.	%
* Krithe sp. A	16	4	32.79
"Acanthocythereis" dunelmensis Norman, 1865	2	12	22.95
* Munseyella sp. A	10		16.39

Ostracode Species:	Adult	Juv.	%
Palmanella limicola Norman, 1865	5	3	13.11
Munseyella sp. B		3	4.92
Loxoconcha sp. B	2		3.28
Robertsonites tuberculata Sars, 1865		2	3.28
Cytheropteron sp. B	1		1.64
Cluthia sp. A	1		1.64

Total Ostracode valves 61

DC2-80-EG Van Veen - 195

Latitude: 59° 36.5' N

Longitude: 140° 19.2' W

Water Depth: 82 meters

Lithology: Dark-greenish-gray (5GY 4/1) silty mud with concentrations of organic material.

Organisms present: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Cyclostome Bryozoans

Agglutinated and Calcareous Worm Tubes

Pelecypods

Gastropods

Ostracodes

Ophiuroid Vertebrae

Plant Debris

Diatoms

Ostracode Species:	Adult	Juv.	%
Aurila sp. A	44	850	23.98
Cytheropteron sp. E	173	139	8.37
Cytheropteron aff. C. latissimum Neale and Howe, 1975	172	115	7.70
Cytheromorpha sp. B	226	16	6.49
Cytheropteron sp. N	69	103	4.61
Loxoconcha sp. A	94	70	4.40
Pectocythere aff. P. parkerae Swain and Gilby, 1974	65	91	4.19
* Hemicytherura sp. A	127	1	3.43
* Cytheropteron sp. F	89	30	3.19
Pectocythere aff. P. quadrangulata Hanai, 1957	41	73	3.06
Cythere sp. A	18	86	2.79

Ostracode Species:	Adult	Juv.	%
Cytheromorpha sp. E	77	13	2.41
Palmanella limicola Norman, 1865	17	55	1.93
"Acanthocythereis" dunelmensis Norman, 1865	3	67	1.88
Cytheropteron sp. R	33	21	1.45
Paradoxostoma sp. D	33	16	1.31
Cytheropteron sp. D	48		1.29
Cytheropteron sp. I	26	19	1.21
Eucythere sp. A	32	13	1.21
"Leguminocythereis" sp. A		45	1.21
Loxoconcha sp. D	34	9	1.15
Paradoxostoma sp. I	21	21	1.13
* Robertsonites tuberculata Sars, 1865		42	1.13
* Argilloecia sp. A	31	6	0.99
Hemicytherura sp. B	32	1	0.89
Semicytherura sp. F	25	7	0.86
Semicytherura aff. S. undata Sars, 1865	32		0.86
Pseudocythere sp. A	30	1	0.83
Eucytherura sp. C	26		0.70
Cytherois sp. A	26		0.70
* Buntonia sp. A	16	9	0.67
* Cluthia sp. A	19		0.51

Ostracode Species:	Adult	Juv.	%
* Hemicytherura sp. C	18		0.48
Paradoxostoma aff. P. japonicum Schornikov, 1975	10	6	0.43
"Leguminocythereis" sp. B		15	0.40
Cytheropteron aff. C. nodosoalatum	11	3	0.38
Cytheropteron sp. A	6	4	0.27
Bythocytheromorpha sp. C	7		0.19
Cytherois sp. B	7		0.19
Loxoconcha sp. B	6		0.16
Eucytherura sp. B	6		0.16
Paradoxostoma aff. P. brunneatum Schornikov, 1975	4		0.13
Paracytheridea sp. A	4		0.11
Pseudocythere sp. B	4		0.11
Candona sp.		3	0.08
Bairdia sp.	1	2	0.08
Loxoconcha sp. F	2		0.05
Pectocythere sp. D	2		0.05
* Paracypris sp. A		2	0.05
Paradoxostoma sp. H	2		0.05
Paradoxostoma sp. J	2		0.03
Cytheropteron sp. S	1		0.03
Hemicythere aff H. quadrinodosa Schornikov, 1974		1	0.03

Total Ostracode valves 3728

APPENDIX III

TABULATION OF THE OSTRACODE ASSEMBLAGES AND ASSOCIATED ORGANISMS FROM SELECTED BOTTOM GRAB SAMPLES TAKEN IN THE NORTHEAST GULF OF ALASKA, F.R.S. TOWNSEND CROMWELL CRUISE EGAL-75-KC, 1975: PART II

ELISABETH M. BROUWERS

SUBMITTED FOR U.S. GEOLOGICAL SURVEY OPEN FILE REPORT

EGAL-75-KC Shipek-68A

Latitude: 59° 42.6' N

Longitude; 146° 15.0' W

Water Depth: 81 meters

Lithology: Gray mud with gravel and shells.

Organisms: Calcareous Benthic Foraminifers

Sponge Spicules

Cheilostome Bryozoans

Brachiopods

Pelecypods

Ostracodes

Ostracode Species:	Adult	Juv.	%
"Australicythere" sp. A	39	136	51.17
Pectocythere aff. P. quadrangulata Hanai, 1957	30	11	11.99
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	22	11	9.65
Pectocythere aff. P. parkerae Swain and Gilby, 1974	19	4	6.73
"Acanthocythereis" dunelmensis (Norman, 1865)	3	13	4.68
Robertsonites tuberculata (Sars, 1865)		9	2.63

Ostracode Species:	Adults	Juv.	%
Cytheromorpha sp. B	4	1	1.46
Ambostracon sp. A	1	3	1.17
Cytheropteron sp. G	4		1.17
Cytheropteron sp. L	2	2	1.17
Cytheropteron sp. H	3	1	1.17
Cytheropteron sp. E	2	2	1.17
Eucytherura sp. A	3		0.88
Argilloecia sp. A	3		0.88
Hemicytherura sp. B	2		0.59
Cytheropteron sp. N	2		0.59
Finmarchinella (Barentosovia) sp. A	2		0.59
Cytheropteron sp. F	1	1	0.59
Finmarchinella (Finmarchinella) finmarchica (Sars, 1866)	1		0.29
Palmanella limicola (Norman, 1865)	1		0.29
Acuminocythere sp. A	1		0.29
Cytheropteron sp. D	1		0.29
Sclerochilus sp. C		1	0.29
Sclerochilus sp. F	1		0.29

Total Ostracodes 342

EGAL-75-KC   Van Veen-69

Latitude: 60° 16.6' N

Longitude: 146° 14.6' W

Water Depth: 49 meters

Lithology: Olive-gray, sandy, clayey silt.

Organisms: Ostracodes

Ostracode Species:	Adults	Juv.	%
* "Leguminocythereis" sp. A	20	198	20.20
Pectocythere aff. P. quadrangulata Hanai, 1957	150	48	18.35
Pectocythere sp. D	159	38	18.26
Loxoconcha sp. A	59	88	13.62
Robertsonites tuberculata (Sars, 1865)	15	54	6.39
"Acanthocythereis" dunelmensis (Norman, 1865)	7	49	5.19
Palmanella limicola (Norman, 1865)	19	29	4.45
Cytheropteron sp. A	18	23	3.40
* Hemicythere aff. H. quadrinodosa Schornikov, 1974	4	27	2.87
Cytheromorpha sp. B	15	2	1.58

Ostracode Species:	Adults	Juv.	%
Cytheromorpha sp. E	16		1.48
Cytheromorpha sp. A	14		1.30
Cythere aff. C. alveolivalva Smith, 1952	2	7	0.83
Candona sp.	1	5	0.56
Elofsonia sp. A	4		0.37
Cytherois sp. B	2		0.19
Cytheropteron aff. C. nodosoalatum Neale and Howe (1975)	1		0.09
Cythere sp. A		1	0.09
Cyclocypris sp.	1		0.09
Acuminocythere sp. A		1	0.09
Cytherura sp. J	1		0.09
Cytheropteron sp. I		1	0.09

Total Ostracodes 1079

EGAL-75-KC Van Veen-72

Latitude: 60° 15.3' N

Longitude: 146° 00.8' W

Water Depth: 90 meters

Lithology: Gray-brown mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Gastropods

Ostracodes

Ostracode Species:	Adults	Juv.	%
Robertsonites tuberculata (Sars, 1865)	5	61	33.67
"Acanthocythereis" dunelmensis (Norman, 1865)	1	52	27.04
Cytheropteron sp. B	8	14	11.23
Bythocythere sp. B	8	12	10.20
Cytheropteron sp. A	3	11	7.14
Palmanella limicola (Norman, 1865)	1	6	3.57
Pectocythere aff. P. quadrangulata Hanai, 1957	4	3	3.57
Cytheromorpha sp. B		2	1.02
Cytherois sp. A	1	1	1.02
Cyclocypris sp.		1	0.51
Pseudocythere sp. A		1	0.51
Loxoconcha sp. B	1		0.51

Total Ostracodes 196

EGAL-75-KC Van Veen-73

Latitude: 60° 10.45' N

Longitude: 146° 01.35' W

Water Depth: 95 meters

Lithology: Gray-brown, clayey silt.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	24	155	72.47
Palmanella limicola (Norman, 1865)	14	5	7.69
Loxoconcha sp. A	8	6	5.67
Eucytherura sp. A	7	1	3.24
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		7	2.83

Ostracode Species:	Adults	Juv.	%
Munseyella sp. a	5		2.02
Cluthia cluthae (Brady, Crosskey, and Robertson, 1874)	4		1.62
Cytheropteron sp. D	3	1	1.62
Cytheropteron sp. Q		3	1.22
Loxoconcha sp. B	2		0.81
Robertsonites tuberculata (Sars, 1865)		1	0.41
"Australicythere" sp. A		1	0.41

Total Ostracodes 247

EGAL-75-KC Van Veen-74

Latitude" 60° 09.2' N

Longitude: 146° 01.5' W

Water Depth: 90 meters

Lithology: Gray-brown silt.

Organisms: Calcareous Benthic Foraminifers

Proteinaceous Worm Tubes

Gastropods

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	2	23	32.47
Loxoconcha sp. A	5	14	24.68
Palmanella limicola (Norman, 1865)	9	9	23.38
Cytheropteron aff. *C. nodosoalatum* Neale and Howe, 1975	5	3	10.39
Eucytherura sp. A	3		3.90
Cytheropteron sp. L		1	1.30
Robertsonites tuberculata (Sars, 1865)	1		1.30
Cytheropteron sp. D	1		1.30
Munseyella sp. B	1		1.30

Total Ostracodes 77

EGAL-75-KC Van Veen-75

Latitude: 60° 07.4' N

Longitude: 146° 02.3' W

Water Depth: 84 meters

Lithology: Rounded cobbles at the surface, underlain by gray mud with pea-sized gravel.

Organisms:

- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Sponge Spicules
- Pelecypods
- Ostracodes
- Echinoderm Spines
- Diatoms

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	1	2	42.86
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	1	2	42.86
Palmanella limicola (Norman, 1865)		1	14.29

Total Ostracodes 7

EGAL-75-KC Van Veen-76

Latitude: 60° 02.0' N

Longitude: 146° 00.5' W

Water Depth: 77 meters

Lithology: 10 cm of gravel and shell fragments overlying gray silty mud.

Organisms:

Calcareous Benthic Foraminifers

Sponge Spicules

Proteinaceous and Agglutinated Worm Tubes

Brachiopods

Pelecypods

Gastropods

Pteropod

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
"Australicythere" sp. A	25	111	51.52
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	12	20	12.12

Ostracode Species:	Adults	Juv.	%
Pectocythere aff. P. quadrangulata Hanai, 1857	8	15	5.68
Pectocythere aff. P. parkerae Swain and Gilby, 1974	11	4	5.68
Cytheropteron sp. G	11	4	5.68
"Acanthocythereis" dunelmensis (Norman, 1865)	2	3	1.89
Robertsonites tuberculata (Sars, 1865)	2	3	1.89
Cytheromorpha sp. B	4	1	1.89
Cytheropteron sp. H	1	4	1.89
Eucytherura sp. A		3	1.14
Cytheropteron sp. N	1	2	1.14
Hemicytherura sp. B	2		0.76
Munseyella sp. A	2		0.76
Ambostracon sp. A		2	0.76
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	0.38
Hemicytherura sp. A	1		0.38
Cytheropteron sp. F		1	0.38
"Leguminocythereis" sp. D		1	0.38

Total Ostracodes 264

EGAL-75-KC Van Veen-77

Latitude: 59° 56' N

Longitude: 146° 1.5' W

Water Depth: 86 meters

Lithology: Gray, pebbly mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Sponge Spicules

Pelecypods

Gastropods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	5	4	25.71
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	3	6	25.71
Cytheropteron sp. H	1	2	8.57
Cytheropteron sp. E	1	2	8.57
Munseyella sp. A	2		5.71

Ostracode Species:	Adults	Juv.	%
Eucytherura sp. A		2	5.71
Cytheropteron sp. G		2	5.71
Palmanella limicola (Norman, 1865)	1		2.86
"*Australicythere*" sp. A		1	2.86
Cytheropteron sp. O	1		2.86
Cytheromorpha sp. A	1		2.86
Cytheropteron sp. F		1	2.86

Total Ostracodes 35

EGAL-75-KC Van Veen-78

Latitude: 59° 51.6' N

Longitude: 146° 00.9' W

Water Depth: 101 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Proteinaceous Worm Tubes

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		38	67.86
Palmanella limicola (Norman, 1865)	5	5	17.86
Cytherois sp. A	2		3.57
Eucytherura sp. A	1	1	3.57
Cytheropteron sp. Q	1		1.79
Cytheropteron sp. D	1		1.79
Munseyella sp. B	1		1.79
Cytheropteron sp. A		1	1.79

Total Ostracodes 56

EGAL-75-KC Van Veen-80

Latitude: 59° 46.7' N

Longitude: 145° 59.5' W

Water Depth: 91 meters

Lithology: Tan-gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Sponge Spicules
- Proteinaceous Worm Tubes
- Pelecypods
- Gastropods
- Ostracodes
- Diatoms

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	12	2	18.18
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	3	10	16.88
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	1	11	15.58
"*Australicythere*" sp. A		6	7.79

Ostracode Species:	Adults	Juv.	%
Pectocythere aff. P. parkerae Swain and Gilby, 1974	2	3	6.49
Cluthia sp. A	3	1	5.20
Cytheropteron sp. H		3	3.90
Cytheropteron sp. F		2	2.60
Robertsonites tuberculata (Sars, 1865)		2	2.60
Hemicytherura sp. A		2	2.60
Paradoxostoma sp. G	2		2.60
Cytheromorpha sp. A	2		2.60
Eucytherura sp. A		1	1.30
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	1.30
Cytheropteron sp. O		1	1.30
Cytheropteron sp. E		1	1.30
Cytheropteron sp. D	1		1.30
Paradoxostoma sp.		1	1.30
Pectocythere aff. P. quadrangulata Hanai, 1957	1		1.30
Aurila sp. A		1	1.30
Sclerochilus sp. C		1	1.30
Cytheropteron sp. G	1		1.30

Total Ostracodes 77

EGAL-75-KC   Van Veen-87

Latitude: 60° 06.9' N

Longitude: 145° 34.4' W

Water Depth: 126 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Proteinaceous Worm Tubes
- Pelecypod Fragments
- Ostracodes
- Diatoms

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		25	52.08
Robertsonites tuberculata (Sars, 1865)		11	22.92
Krithe sp. A	1	1	4.17
Munseyella sp. A	2		4.17
Cytheropteron sp. Q		2	4.17
Loxoconcha sp. B		2	4.17

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. R	1		2.08
Palmanella limicola (Norman, 1865)		1	2.08
Bythocythere sp. B		1	2.08
Cluthia sp. A	1		2.08

Total Ostracodes 48

EGAL-75-KC Shipek-88

Latitude: 59° 59.2' N

Longitude: 145° 34.0' W

Water Depth: 88 meters

Lithology: Gray mud with pebbles and cobbles.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Sponge Spicules

Proteinaceous Worm Tubes

Pelecypods

Pteropod

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	4	5	50.0
Munseyella sp. A	2		11.11
"Australicythere" sp. A		1	5.56
Robertsonites tuberculata (Sars, 1865)		1	5.56
Cytheropteron sp. E	1		5.56
Eucytherura sp. A	1		5.56
Pectocythere aff. P. parkerae Swain and Gilby, 1974	1		5.56
Cytheropteron sp. N		1	5.56
Cytheropteron sp. F		1	5.56

Total Ostracodes 18

EGAL-75-KC Shipek-89

Latitude: 59° 58.5' N

Longitude: 145° 34.2' W

Water Depth: 84 meters

Lithology: Gray mud with cobbles and gravel.

Organisms: Calcareous Benthic Foraminifers

Sponge Spicules

Proteinaceous Worm Tubes

Cheilostome Bryozoans

Pelecypods

Gastropods

Pteropod

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
Cluthia cluthae (Brady, Crosskey, and Robertson, 1874)	2		100

Total Ostracodes 2

EGAL-75-KC Van Veen-91

Latitude: 59° 50.5' N

Longitude: 145° 39.6' W

Water Depth: 97 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Proteinaceous Worm Tubes
- Ostracodes
- Echinoderm Fragments
- Diatoms

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	5	1	50.00
"Acanthocythereis" dunelmensis (Norman, 1865)		3	25.00
Munseyella sp. A	1		8.33
Eucytherura sp. A		1	8.33
Munseyella sp. B		1	8.33

Total Ostracodes 12

EGAL-75-KC Van Veen-94

Latitude: 60° 07.7' N

Longitude: 145° 21.0' W

Water Depth: 97 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Proteinaceous Worm Tubes
- Pelecypods
- Gastropods
- Ostracodes
- Organic Debris

Ostracode Species:	Adults	Juv.	%
* Robertsonites tuberculata (Sars, 1865)		24	42.11
"Acanthocythereis" dunelmensis (Norman, 1865)	2	18	35.09
Loxoconcha sp. A	1	3	7.02
Cluthia sp. A	3		5.26
Palmanella limicola (Norman, 1865)	1		1.75
Loxoconcha sp. B	1		1.75

Ostracode Species:	Adults	Juv.	%
Bythocythere sp. B	1		1.75
Cytheropteron sp. B	1		1.75
Cytheropteron sp. Q		1	1.75
Pseudocythere sp. A		1	1.75

Total Ostracodes 57

EGAL-75-KC Van Veen-95

Latitude: 60° 03.3' N

Longitude: 145° 19.8' W

Water Depth: 132 meters

Lithology: Greenish-gray mud.

Organisms: Calcareous Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Pteropod

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	3	21	80.00
Palmanella limicola (Norman, 1865)	1	1	6.67
* Krithe sp. A	1		3.33
Cytheropteron sp. B	1		3.33
Robertsonites tuberculata (Sars, 1865)		1	3.33
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	3.33

Total Ostracodes 30

EGAL-75-KC Van Veen-96

Latitude: 59° 59.2' N

Longitude: 145° 19.3' W

Water Depth: 119 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	1	8	56.25
Palmanella limicola (Norman, 1865)	1	1	12.50
Krithe sp. A	2		12.50
Robertsonites tuberculata (Sars, 1865)		1	6.26
Eucytherura sp. A		1	6.25
Loxoconcha sp. B		1	6.25

Total Ostracodes 16

EGAL-75-KC Van Veen-97

Lithology: 59° 55.7' N

Longitude: 145° 19.5' W

Water Depth: 101 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Gastropods

Ostracodes

Ostracode Species:	Adults	Juv.	%
Loxoconcha sp. A	4	2	28.57
"Acanthocythereis" dunelmensis (Norman, 1865)	2	3	23.81
Palmanella limicola (Norman, 1865)	5		23.81
Eucytherura sp. A	1	1	9.52
Cytheropteron sp. L		1	4.76
Munseyella sp. A	1		4.76
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	4.76

Total Ostracodes 21

EGAL-75-KC Van Veen-98

Latitude: 59° 52.5' N

Longitude: 145° 19.8' W

Water Depth: 101 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Proteinacecus Worm Tubes

Pelecypods

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	7	2	30.00
"Acanthocythereis" dunelmensis (Norman, 1865)	1	6	23.33
Eucytherura sp. A	4		13.33
Robertsonites tuberculata (Sars, 1865)	1	2	10.0
Loxoconcha sp. A	1	1	6.67
Cytheropteron sp. D	2	6.67	

Ostracode Species:	Adults	Juv.	%
Munseyella sp. A	2		6.67
Cluthia cluthae (Brady, Crosskey, and Robertson, 1874)	1		3.33

Total Ostracodes 30

EGAL-75-KC Van Veen-99

Latitude: 59° 50.4' N

Longitude: 145° 20.6' W

Water Depth: 110 meters

Lithology: Gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Proteinaceous Worm Tubes
- Pelecypods
- Pteropods
- Ostracodes
- Echinoderm Fragments
- Diatoms

Ostracode Species:	Adults	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	5	18	57.50
Palmanella limicola (Norman, 1865)	5	6	27.50
* *Munseyella* sp. A	4		10.00
* *Cluthia* sp. A	1		2.50
Xestoleberis sp. B		1	2.50

Total Ostracodes 40

EGAL-75-KC Shipek-103

Latitude: 60° 09.4' N

Longitude: 144° 58.2' W

Water Depth: 35 meters

Lithology: Thin layer of gray mud overlying dark, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Gastropods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"*Leguminocythereis*" sp. A	3	2	41.67
* *Loxoconcha* sp. A	4		33.33
Robertsonites tuberculata (Sars, 1865)	2		16.67
Pectocythere sp. D	1		8.33

Total Ostracodes 12

EGAL-75-KC Shipek-104

Latitude: 60° 08.1' N

Longitude: 144° 54.9' W

Water Depth: 53 meters

Lithology: Gray mud with some sand lenses.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Gastropod

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	49	98	34.83
* Robertsonites tuberculata (Sars, 1865)	31	107	32.70
Pectocythere aff. P. quadrangulata Hanai, 1957	81	22	24.41
Palmanella limicola (Norman, 1865)	13	6	4.50
Loxoconcha sp. A	11	3	3.32
Cytheropteron sp. A		1	0.24

Total Ostracodes 422

EGAL-75-KC Box Core-105

Latitude: 59° 57.1' N

Longitude: 144° 55.4' W

Water Depth: 183 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	6	63	38.33
Loxoconcha sp. B	52	2	30.00
* Cytheropteron sp. A	6	12	10.00
* Cluthia sp. A	13		7.22
* Krithe sp. A	8	4	6.67
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	2	1	1.67
Cytheropteron sp. M	3		1.67
Cytheropteron sp. Q	1	1	1.11
Bythocythere sp. B	2		1.11

Ostracode Species:	Adults	Juv.	%
Cytherura sp. I	1		0.56
"*Leguminocythereis*: sp. A		1	0.56
Cluthia cluthae (Brady, Crosskey, and Robertson, 1874)	1		0.56
Robertsonites tuberculata (Sars, 1865)		1	0.56

Total Ostracodes 180

EGAL-75-KC Van Veen-106

Latitude: 59° 57.0' N

Longitude: 144° 57.4' W

Water Depth: 192 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	3	47	31.25
* Loxoconcha sp. B	44	2	28.75
* Cytheropteron sp. A	12	13	15.63
Bythocythere sp. B	4	9	8.13
* Krithe sp. A	11	2	8.13
Cytheropteron sp. Q	2	5	4.38
Cluthia sp. A	5		3.13
Cytheropteron sp. AA	1		0.63

Total Ostracodes 160

EGAL-75-KC Van Veen-109

Latitude: 59° 43.4' N

Longitude: 144° 52.7' W

Water Depth: 102 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Proteinaceous Worm Tubes

Bryozoans

Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	1	20	17.65
Pectocythere aff. P. parkerae Swain and Gilby, 1974	1	13	11.77
Loxoconcha sp. A	3	7	8.40
Cythere aff. C. alveolivalva Smith, 1952		10	8.40
Acuminocythere sp. A		8	6.72
"Leguminocythereis" sp. A		7	5.88
Cytheromorpha sp. B	3	4	5.88
"Acanthocythereis" dunelmensis (Norman, 1865)	1	5	5.04
Robertsonites tuberculata (Sars, 1865)		6	5.04
Cytheromorpha sp. A	4	2	5.04
Hemicythere aff. H. quadrinodosa Schornikov, 1974		4	3.36
Buntonia sp. A	2	1	2.52

Ostracode Species:	Adults	Juv.	%
Pectocythere aff. P. quadrangulata Hanai, 1957	1	2	2.52
Loxoconcha sp. D		2	1.68
Cytheropteron sp. E		2	1.68
Cytheromorpha sp. E	2		1.68
Cytheropteron sp. A		2	1.68
Cythere sp. A		1	0.84
* Sclerochilus sp. F	1		0.84
"Australicythere" sp. A		1	0.84
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	1		0.84
Ambostracon sp. A		1	0.84
Cytherois sp. A		1	0.84

Total Ostracodes 119

EGAL-75-KC Shipek-110

Latitude: 59° 41.5' N

Longitude: 144° 47.2' W

Water Depth: 97 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Robertsonites tuberculata (Sars, 1865)	1	5	22.22
Cytheropteron sp. G	4		14.82
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	3	1	14.82
"Acanthocythereis" dunelmensis (Norman, 1865)	2	1	11.11
Loxoconcha sp. A		2	7.41
Munseyella sp. A	2		7.41
Cytheropteron sp. F	1		3.70
Palmanella limicola (Norman, 1865)		1	3.70
Cytheromorpha sp. A	1		3.70
Cytheropteron sp. N	1		3.70
Sclerochilus sp. C		1	3.70
Paradoxostoma sp.		1	3.70

Total Ostracodes 27

EGAL-75-KC Shipek-111

Latitude: 59° 38.9' N

Longitude: 144° 41.0' W

Water Depth: 148 meters

Lithology: Olive mud overlying gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Proteinaceous Worm Tubes
- Brachiopods
- Pelecypods
- Gastropods
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	5	6	24.44
"Acanthocythereis" dunelmensis (Norman, 1865)	2	7	20.00
Robertsonites tuberculata (Sars, 1865)		8	17.78
Eucytherura sp. A	2	2	8.89

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. L	2	2	8.89
Munseyella sp. A	3		6.67
Cytheropteron sp. D	1		2.22
Cluthia sp. A	1		2.22
Buntonia sp. A		1	2.22
"Leguminocythereis" sp. A		1	2.22
Munseyella sp. B	1		2.22
Loxoconcha sp. B	1		2.22

Total Ostracodes 45

EGAL-75-KC Van Veen-112

Latitude: 59° 37.6' N

Longitude: 144° 37.0' W

Water Depth: 145 meters

Lithology: Olive-green mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
* Munseyella sp. A	3		23.08
* Palmanella limicola (Norman, 1865)	2	1	23.08
* Macrocypris sp.	2		15.39
"Acanthocythereis" dunelmensis		2	15.39
Robertsonites tuberculata (Sars, 1865)		1	7.69
Cytheropteron sp. L	1		7.69
Eucytherura sp. A	1		7.69

Total Ostracodes 13

EGAL-75-KC Shipek-113

Latitude: 59° 34.9' N

Longitude: 144° 30.0' W

Water Depth: 139 meters

Lithology: Olive mud with occasional small pebbles and coarse sand overlying gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Sponge Spicules
- Calcareous and Proteinaceous Worm Tubes
- Pelecypods
- Gastropod
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
Sclerochilus sp. D	5		55.56
Krithe sp. A	3		33.33
Eucytherura sp. A	1		11.11

Total Ostracodes 9

EGAL-75-KC Shipek-115

Latitude: 59° 46.0' N

Longitude: 144° 47.7' W

Water Depth: 64 meters

Lithology: Dark gray, muddy, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Worm Tubes

Bryozoans

Pelecypods

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
Loxoconcha sp. A	40	93	15.13
* "Leguminocythereis" sp. A	9	104	12.86
Pectocythere aff. P. quadrangulata Hanai, 1957	67	39	12.06
Hemicythere aff. H. quadrinodosa Schornikov, 1974	3	89	10.47
Cythere aff. C. alveolivalva Smith, 1952	7	48	6.26
* Cytheromorpha sp. B	39	6	5.12
* Palmanella limicola (Norman, 1865)	15	23	4.32

Ostracode Species:	Adults	Juv.	%
Aurila sp. A	3	34	4.21
Pectocythere sp. D	9	25	3.87
Robertsonites tuberculata (Sars, 1865)	3	28	3.53
Pectocythere aff. *P. parkerae* Swain and Gilby, 1974	3	22	2.84
"*Radimella*" *jollaensis* (LeRoy, 1943)		18	2.05
Acuminocythere sp. A	3	14	1.93
Cytheromorpha sp. E	15		1.71
Cythere sp. A	2	11	1.48
Cytheropteron aff. *C. nodosoalatum* Neale and Howe, 1975	1	11	1.37
Paradoxostoma sp. G	8	4	1.37
Cytheropteron sp. A	7	5	1.37
* *Buntonia* sp. A	7	4	1.25
Hemicytherura sp. A	10	1	1.25
Loxoconcha sp. D	7	2	1.02
Coquimba sp. A	2	6	0.91
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	1	5	0.68
Cytherois sp. A	5		0.57
* *Paradoxostoma* sp. I	4	1	0.57
Hemicytherura sp. B	5		0.57
Ambostracon sp. A		4	0.46
Cytheropteron sp. Z	1	2	0.34
* *Argilloecia* sp. A	2		0.23

Ostracode Species:	Adults	Juv.	%
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)		1	0.11
myodocopid	1		0.11

Total Ostracodes 879

EGAL-75-KC Shipek-117

Latitude: 59° 43.0' N

Longitude: 144° 38.1' W

Water Depth: 119 meters

Lithology: Gray mud.

Organisms:
Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Pelecypods
Ostracodes

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	2	7	33.33
* "Acanthocythereis" dunelmensis (Norman, 1865)	4	4	29.63
Pectocythere sp. D	1	2	11.11
Robertsonites tuberculata (Sars, 1865)		2	7.41
"Leguminocythereis" sp. A		2	7.41
Pectocythere aff. P. quadrangulata Hanai, 1957	1		3.70
Loxoconcha sp. A		1	3.70
Cytheropteron sp. S	1		3.70

Total Ostracodes 27

EGAL-75-KC Shipek-118

Latitude: 59° 40.7' N

Longitude" 144° 33.3' W

Water Depth: 137 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Occasional Diatoms

Ostracode Species:	Adults	Juv.	%
Eucytherura sp. A	5	2	36.84
Palmanella limicola (Norman, 1865)	3	2	26.32
Robertsonites tuberculata (Sars, 1865)		2	10.53
Cytheropteron sp. L		1	5.26
Cytheropteron sp. D	1		5.26
Munseyella sp. B	1		5.26
"Acanthocythereis" dunelmensis (Norman, 1865)		1	5.26
"Leguminocythereis" sp. A		1	5.26

Total Ostracodes 19

EGAL-75-KC Shipek-120

Latitude: 59° 48.8' N

Longitude: 144° 41.0' W

Water Depth: 66 meters

Lithology: Dark, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Agglutinated and Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"*Leguminocythereis*" sp. A	159	109	78.82
Pectocythere sp. D	30		8.82
* *Pectocythere* aff. *P. quadrangulata* Hanai, 1957	14	1	4.41
Robertsonites tuberculata (Sars, 1865)	5	4	2.65
"*Leguminocythereis*" sp. B	2	3	1.87
Loxoconcha sp. A	3		0.88
Eucythere sp. A	2		0.59
Cytheromorpha sp. B	2		0.59
Buntonia sp. A		2	0.59

Ostracode Species:	Adults	Juv.	%
Cythere aff. *C. alveolivalva* Smith, 1952		1	0.29
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	1		0.29
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)		1	0.29
Aurila sp. A		1	0.29

Total Ostracodes 340

EGAL-75-KC Shipek-122A

Latitude: 59° 55.6' N

Longitude: 144° 31.4' W

Water Depth: 55 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Echinoderm Fragments

Plant Material

Diatoms

Ostracode Species:	Adults	Juv.	%
* Palmanella limicola (Norman, 1865)	52	21	51.41
"Acanthocythereis" dunelmensis (Norman, 1865)	2	18	14.09
* Buntonia sp. A	11	6	11.97
Pontocythere sp. A		5	3.52
Cluthia sp. A	4		2.82
Cytheropteron sp. D	4		2.82
Hemicythere aff.. quadrinodosa Schornikov, 1974		4	2.82
Cythere sp. A		4	2.82
Cythere aff. C. alveolivalva Smith, 1952		3	2.11
Cytheromorpha sp. B		2	1.41
Cluthia cluthae (Brady, Crosskey, and Robertson, 1874)	1		0.70
"Leguminocythereis" sp. A		1	0.70

Ostracode Species:	Adults	Juv.	%
Cytherois sp. A		1	0.70
Loxoconcha sp. A	1		0.70
Cytheropteron sp. Y		1	0.70
Loxoconcha sp. D	1		0.70

Total Ostracodes 142

EGAL-75-KC Shipek-123

Latitude: 59° 56.7' N

Longitude: 144° 40.2' W

Water Depth: 210 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Radiolarians

Gastropod

Ostracodes

Ostracode Species:	Adults	Juv.	%
* *Loxoconcha* sp. B	11	2	30.23
"Acanthocythereis" dunelmensis (Norman, 1865)		9	20.93
Cytheropteron sp. A	4	3	16.28
Cluthia sp. A	4		9.30
Cytheropteron sp. Q	2	2	9.30
Bythocythere sp. B	2	1	6.98
Cytheropteron sp. C	2		4.65
"Leguminocythereis" sp. A		1	2.33

Total Ostracodes 43

EGAL-75-KC Box Core-124B

Latitude: 59° 57.5' N

Longitude: 144° 43.2' W

Water Depth: 234 meters

Lithology: Sticky, firm, gray mud with some fragments of more firm mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. Q		1	100

Total Ostracodes 1

EGAL-75-KC Box Core-124A

Latitude: 59° 57.5' N

Longitude: 144° 43.2' W

Water Depth: 234 meters

Lithology: Very soft, soupy, gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Ostracodes

Ostracode Species:	Adults	Juv.	%
Bythocythere sp. B	5		41.67
Cytheropteron sp. Q	2	3	41.67
Palmanella limicola (Norman, 1865)	2		16.67

Total Ostracodes 12

EGAL-75-KC Van Veen-125

Latitude: 59° 59.8' N

Longitude: 144° 44.0' W

Water Depth: 232 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Worm Tubes

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Loxoconcha sp. B	2		33.33
"*Leguminocythereis*" sp. A	1		16.67
Loxoconcha sp. A		1	16.67
Cytheropteron sp. D	1		16.67
Cytheropteron aff. *C. nodosoalatum* Neale and Howe, 1975		1	16.67

Total Ostracodes 6

EGAL-75-KC Box Core-127

Latitude: 60° 02.8' N

Longitude: 144° 43.5' W

Water Depth: 210 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Gastropods

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Bythocythere sp. B	9	4	35.14
* "*Acanthocythereis*" *dunelmensis* (Norman, 1865)	2	6	21.62
Cytheropteron sp. A	7		18.92
Loxoconcha sp. B	3		8.11
Cytheropteron sp. Q		2	5.41
* *Krithe* sp. A	2		5.41
Cytheropteron sp. C	2		5.41

Total Ostracodes 37

EGAL-75-KC Box Core-128

Latitude: 60° 00.6' N

Longitude: 144° 40.0' W

Water Depth: 227 meters

Lithology: Stiff gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Cheilostome Bryozoans

Cyclostome Bryozoans

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adults	Juv.	%
Hemicythere aff. H. quadrinodosa Schornikov, 1974		14	17.72
Cythere sp. A		8	10.13
Cytheropteron sp. B	2	5	8.86
Cytheropteron sp. A	3	3	7.60
Bythocythere sp. B	5	1	7.60
Loxoconcha sp. A	1	5	7.60
Aurila sp. A		4	5.06
Cythere aff. C. alveolivalva Smith, 1952	1	3	5.06
Loxoconcha sp. D	1	2	3.80
Cythweromorpha sp. B	2	1	3.80
Paradoxostoma sp. G		3	3.80
Coquimba sp. A		2	2.53
Hemicytherura sp. B	1	1	2.53
Hemicytherura sp. A	2		2.53

Ostracode Species:	Adults	Juv.	%
Krithe sp. A	1		1.27
Pontocythere sp. A	1		1.27
Cytherura sp. G	1		1.27
Paradoxostoma sp. D		1	1.27
"Australicythere" sp. A		1	1.27
Cluthia sp. A	1		1.27
"Leguminocythereis" sp. A		1	1.27
Cytheropteron sp. X	1		1.27
"Leguminocythereis" sp. D		1	1.27

Total Ostracodes 79

EGAL-75-KC Shipek-129

Latitude: 60° 04.9' N

Longitude: 144° 40.4' W

Water Depth: 146 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Fish Vertebrae

Plant Material

Ostracode Species:	Adults	Juv.	%
"*Leguminocythereis*" sp. A	9	85	47.96
* *Pectocythere* sp. D	73	6	40.31
Loxoconcha sp. A	6	6	7.14
Cytheromorpha sp. A	6		3.06
Pectocythere aff. *P. quadrangulata* Hanai, 1957	2		1.02
Aurila sp. A		1	0.51

Total Ostracodes 196

EGAL-75-KC Shipek-130

Latitude: 60° 07.8' N

Longitude: 144° 39.5' W

Water Depth: 31 meters

Lithology: Fine sand with muddy matrix.

Organisms: Ostracodes

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. Z	1	2	33.33
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		2	22.22
Loxoconcha sp. B	2		22.22
"Acanthocythereis" dunelmensis (Norman, 1865)		1	11.11
Cytherella sp. A		1	11.11

Total Ostracodes 9

EGAL-75-KC Shipek-132

Latitude: 60° 07.1' N

Longitude: 144° 31.2' W

Water Depth: 20 meters

Lithology: Gray sand.

Organisms: Ostracodes

Ostracode Species:	Adults	Juv.	%
"Leguminocythereis: sp. B	2	2	44.44
Pectocythere sp. D	1		11.11
Cythere aff. C. alveolivalva Smith, 1952		1	11.11
Loxoconcha sp. A	1		11.11
Candona sp.		1	11.11
Hemicythere aff. H. quadrinodosa Schornikov, 1974		1	11.11

Total Ostracodes 9

EGAL-75-KC Shipek-133

Latitude: 60° 03.8' N

Longitude: 144° 26.2' W

Water Depth: 17 meters

Lithology: Fine-grained, gray sand.

Organisms: Ostracodes

Ostracode Species:	Adults	Juv.	%
Hemicythere aff. *H. quadrinodosa* Schornikov, 1974	1		100

Total Ostracodes 1

EGAL-75-KC Shipek-134

Latitude: 59° 59.0' N

Longitude: 144° 24.0' W

Water Depth: 20 meters

Lithology: Fine-grained sand with very slight amount of mud.

Organisms: Ostracodes

Ostracode Species:	Adults	Juv.	%
* Pontocythere sp. A	27	1	22.40
* "Leguminocythereis" sp. B	14	13	21.60
* Pectocythere sp. D	26		20.80
Aurila sp. A	2	9	8.80
Hemicythere aff. H. quadrinodosa Schornikov, 1974	2	7	7.20
* Loxoconcha sp. A	5	1	4.80
* "Leguminocythereis" sp. A	6		4.80
"Radimella" jollaensis (LeRoy, 1943)	1	2	2.40
Cytheromorpha sp. A	3		2.40
Cythere aff. C. alveolivalva Smith, 1952	1	1	1.60
Loxoconcha sp. D		1	0.80
Finmarchinella (Barentsovia) angulata (Sars, 1866)	1		0.80
Robertsonite tuberculata (Sars, 1865)		1.	0.80
Cythere sp. A		1	0.80

Total Ostracodes 125

EGAL-75-KC Shipek-138

Latitude: 59° 38.2' N

Longitude: 145° 50.4' W

Water Depth: 168 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Sponge Spicules

Pelecypods

Pteropod

Ostracodes

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)		2	22.22
Munseyella sp. A	2		22.22
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	1	1	22.22
Argilloecia sp. A		1	11.11
Eucytherura sp. A	1		11.11
Cytheropteron sp. L		1	11.11

Total Ostracodes 9

EGAL-75-KC Van Veen-141

Latitude: 60° 06.8' N

Longitude: 146° 14.5' W

Water Depth: 71 meters

Lithology: Gray mud with muddy sand; coarse-grained, poorly-sorted, rounded sand layer of variable thickness; pebbles in mud.

Organisms:
- Calcareous Benthic Foraminifers
- Planktic Foraminifers
- Sponge Spicules
- Bryozoans
- Mollusk Fragments
- Ostracodes
- Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
"Australicythere" sp. A	26	96	38.49
Pectocythere aff. P. parkerae Swain and Gilby, 1974	32	8	12.62
Pectocythere aff. P. quadrangulata Hanai, 1957	22	11	10.41

Ostracode Species:	Adults	Juv.	%
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	15	7	6.94
Cytheropteron sp. G	10	4	4.42
Finmarchinella (*Barentosvia*) sp. A	8	3	3.47
Ambostracon sp. A	5	5	3.16
"*Leguminocythereis*" sp. D	4	4	2.52
Cytheropteron sp. H	4	4	2.52
Hemicytherura sp. B	6		1.89
Cytheropteron sp. E	4	2	1.89
Finmarchinella (*Finmarchinella*) *finmarchica* (Sars, 1866)	1	4	1.58
Acuminocythere sp. A	3	2	1.58
Robertsonites tuberculata (Sars, 1865)		4	1.26
Cytheromorpha sp. B	4		1.26
Eucytherura sp. A	3		0.95
* *Argilloecia* sp. B	2		0.63
Cytheropteron sp. I	1	1	0.63
"*Acanthocythereis*" *dunelmensis* (Norman, 1965)	1	1	0.63
Cytheromorpha sp. A	2		0.63
Coquimba sp. A	1		0.32
Hemicytherura sp. A	1		0.32
Cytheropteron sp. N	1		0.32
Palmanella limicola (Norman, 1865)	1		0.32
Pectocythere sp. F	1		0.32

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. X	1		0.32
Cytheropteron sp. F	1		0.32
Cytheropteron sp.	1		0.32

Total Ostracodes 317

EGAL-75-KC Van Veen-144Upper

Latitude: 59° 57.3' N

Longitude: 146° 19.6' W

Water Depth: 64 meters

Lithology: Sandy mud with shells and gravel.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Sponge Spicules

Agglutinated Worm Tubes

Cheilostome Bryozoans

Brachiopods

Pelecypods

Cirriped Plates

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adults	Juv.	%
* "Australicythere" sp. A	66	284	41.32
* Pectocythere aff. P. parkerae Swain and Gilby, 1974	93	9	12.04
Ambostracon sp. A	50	28	9.21
Pectocythere aff. P. quadrangulata Hanai, 1957	59	16	8.86
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	26	13	4.61
Finmarchinella (Barentsovia) sp. A	32	6	4.49
Patagonacythere sp. A	13	9	2.60
Cytheropteron sp. G	14	8	2.60
"Leguminocythereis" sp. D	8	6	1.65
Finmarchinella (Finmarchinella) finmarchica (Sars, 1866)	6	8	1.65
Aurila sp. A	3	9	1.42
Hemicytherura sp. B	10	1	1.30
Cytheropteron sp. N	7	4	1.30
Cytheropteron sp. E	3	6	1.06
Acuminocythere sp. A	3	4	0.83

Ostracode Species:	Adults	Juv.	%
Cytheromorpha sp. B	6	1	0.83
Cytherura sp. F	5		0.59
Pectocythere sp. E	5		0.59
Cytheropteron sp. H	3	1	0.47
Cytheromorpha sp. A	4		0.47
Pectocythere sp. F	3		0.35
Cytheropteron sp. F	3		0.35
Cytheropteron sp. I	2		0.24
Sclerochilus sp. F	1	1	0.24
Loxoconcha sp. E	2		0.24
Hemicythere aff. *H.* *quadrinodosa* Schornikov, 1974	1		0.12
"*Acanthocythereis*" *dunelnensis* (Norman, 1865)		1	0.12
Cythere aff. *C.* *alveolivalva* Smith, 1952	1		0.12
Argilloecia sp. B	1		0.12
Sclerochilus sp. G	1		0.12
Sclerochilus sp. C		1	0.12

Total Ostracodes 847

EGAL-75-KC Shipek-145

Latitude: 59° 37.4' N

Longitude: 146° 09.0' W

Water Depth: 101 meters

Lithology: Thin layer of soupy, olive-gray mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		4	23.53
Palmanella limicola (Norman, 1865)		4	23.53
Robertsonites tuberculata (Sars, 1865)		3	17.65
Cytheropteron sp. L		3	17.65
Munseyella sp. B	1		5.88

Total Ostracodes 17

EGAL-75-KC Shipek-146

Latitude: 59° 35.6' N

Longitude: 145° 54.8' W

Water Depth: 143 meters

Lithology: Thin layer of soupy, olive-green mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Proteinaceous Worm Tubes

Pteropods

Ostracodes

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	2	7	47.37
"Acanthocythereis" dunelmensis (Norman, 1865)		5	26.32
Loxoconcha sp. B	3		15.79
Cytheropteron sp. Q	1	1	10.53

Total Ostracodes 19

EGAL-75-KC Shipek-147

Latitude: 59° 34.2' N

Longitude: 145° 45.7' W

Water Depth: 165 meters

Lithology: Soupy, olive-gray mud overlying gray mud.

Organisms:
- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Planktic Foraminifers
- Radiolarians
- Proteinaceous Worm Tubes
- Pelecypods
- Pteropod
- Ostracodes
- Diatoms

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. L	2	1	30.00
Loxoconcha sp. B	2	1	30.00
Palmanella limicola (Norman, 1865)		1	10.00
Cytheropteron sp. Q		1	10.00
Munseyella sp. B	1		10.00

Ostracode Species:	Adults	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	1		10.00

Total Ostracodes 10

EGAL-75-KC Shipek-149

Latitude: 60° 03.2' N

Longitude: 145° 34.5' W

Water Depth: 104 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	11	30	53.25
Palmanella limicola (Norman, 1865)	5	4	11.69
Eucytherura sp. A	8		10.40
Loxoconcha sp. A	3	2	6.49
Munseyella sp. A	4		5.20
Cytheropteron sp. L	2	1	3.90
Robertsonites tuberculata (Sars, 1865)		3	3.90
Loxoconcha sp. B	2		2.60
Munseyella sp. B	1		1.30
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)		1	1.30

Total Ostracodes 77

EGAL-75-KC Van Veen-150

Latitude: 60° 10.4' N

Longitude: 145° 34.5' W

Water Depth: 104 meters

Lithology: Gray mud.

Organisms:
Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Radiolarians
Pelecypods
Ostracodes
Plant Material
Diatoms

Ostracode Species:	Adults	Juv.	%
Robertsonites tuberculata (Sars, 1865)	5	32	25.00
Loxoconcha sp. B	22	8	20.27
Cytheropteron sp. A	8	19	18.24
"Acanthocythereis" dunelmensis (Norman, 1865)	2	20	14.87
Cytheropteron sp. Q	5	4	6.08
Bythocythere sp. B	3	1	2.70
Cluthia sp. A	3	1	2.70
Pseudocythere sp. A	2		1.35
Munseyella sp. B	2		1.35
Palmanella limicola (Norman, 1865)	1	1	1.35
Cytheropteron sp. K	2		1.35

Ostracode Species:	Adults	Juv.	%
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	1	1	1.35
Loxoconcha sp. A		1	0.68
Cytherois sp. A	1		0.68
Pectocythere aff. *P. parkerae* Swain and Gilby, 1974		1	0.68
Cytherura sp. I		1	0.68
Cyclocypris sp.	1		0.68

Total Ostracodes 148

EGAL-75-KC Van Veen-153

Latitude: 60° 12.5' N

Longitude: 146° 27.0' W

Water Depth: 137 meters

Lithology: Olive-gray, soupy mud overlying homogeneous gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Pteropod

Ostracodes

Echinoderm Fragments

Plant Material

Diatoms

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	14	135	56.87
Robertsonites tuberculata (Sars, 1865)	8	55	24.05
Palmanella limicola (Norman, 1865)	2	11	4.96
Cytheropteron sp. A	5	5	3.82
Bythocythere sp. B	5		1.91
Loxoconcha sp. B	4	1	1.91
Cytheropteron aff. C. latissimum of Neale and Howe (1975)		4	1.53
"Australicythere" sp. A		3	1.15
Cytherura sp. I		2	0.76
Cluthia sp. A	2		0.76
Pectocythere aff. P. quadrangulata Hanai, 1957		1	0.38
Cytheromorpha sp. B	1		0.38
Hemicytherura sp. A		1	0.38

Ostracode Species:	Adults	Juv.	%
Xestoleberis sp. B		1	0.38
Cluthia cluthae (Brady, Crosskey and Robertson, 1874)	1		0.38
Finmarchinella (*Finmarchinella*) *finmarchica* (Sars, 1866)		1	0.38

Total Ostracodes 262

EGAL-75-KC Van Veen-154

Latitude: 59° 51.4' N

Longitude: 145° 28.5' W

Water Depth: 95 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Pteropod

Ostracodes

Ostracode Species:	Adults	Juv.	%
Loxoconcha sp. A	5	5	25.64
Palmanella limicola (Norman, 1865)	5	2	17.95
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	1	6	17.95
Munseyella sp. A	5		12.82
Eucytherura sp. A		2	5.13
Cytherura sp. I		2	5.13
Cytheropteron sp. L		2	5.13
Cytheropteron sp. D	2		5.13
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)		1	2.56
Munseyella sp. B	1		2.56

Total Ostracodes 39

EGAL-75-KC Van Veen-155

Latitude: 59° 55.2' N

Longitude: 145° 42.0' W

Water Depth: 82 meters

Lithology: Gray mud with pebbles, cobbles, and shells.

Organisms: Calcareous Benthic Foraminifers

Sponge Spicules

Bryozoans

Proteinaceous Worm Tubes

Pelecypods

Gastropods

Pteropod

Ostracodes

Echinoderms

Ostracode Species:	Adults	Juv.	%
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	1	1	33.33
"*Australicythere*" sp. A		2	33.33
Cytheromorpha sp. B	2		33.33

Total Ostracodes 6

EGAL-75-KC Van Veen-157

Latitude: 60° 01.4' N

Longitude: 146° 08.5' W

Water Depth: 73 meters

Lithology: Gray mud with pebbles and cobbles.

Organisms:
Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Cheilostome Bryozoans
Cyclostome Bryozoans
Proteinaceous Worm Tubes
Pelecypods
Gastropods
Scaphopod Fragments
Ostracodes
Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
Aurila sp. A	20	110	20.12
Ambostracon sp. A	5	33	5.88
"Acanthocythereis" dunelmensis		38	5.88
Pectocythere aff. P. parkerae Swain and Gilby, 1974	20	14	5.26

Ostracode Species:	Adults	Juv.	%
Loxoconcha sp. A	13	16	4.49
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	10	17	4.18
Acuminocythere sp. A	3	24	4.18
Robertsonites tuberculata (Sars, 1865)	2	21	3.56
Cytheropteron sp. E	14	8	3.41
Cytheropteron sp. A	11	9	3.10
Cytheromorpha sp. B	10	8	2.79
Cytheropteron sp. N	12	4	2.48
Cytheromorpha sp. A	6	7	2.01
Sclerochilus sp. C	4	9	2.01
Loxoconcha sp. D	6	5	1.70
Pseudocythere sp. A	10	1	1.70
Argilloecia sp. A	6	4	1.55
Pectocythere aff. P. quadrangulata Hanai, 1957	2	8	1.55
Hemicytherura sp. B	5	5	1.55
Palmanella limicola (Norman, 1865)	4	6	1.55
Paradoxostoma sp. H	7	3	1.55
Xestoleberis sp. B	4	5	1.39
"Australicythere: sp. A		9	1.39
Cytheropteron sp. R	8	1	1.39
Paradoxostoma sp. I	5	4	1.39
Paradoxostoma sp. D	8		1.24
"Radimella" jollaensis (LeRoy, 1943)	1	7	1.24

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. F	5	1	0.93
Finmarchinella (Barentsovia) sp. A	1	5	0.93
Cluthia cluthae (Brady, Crosskey, and Robertson, 1874)	5	1	0.93
Coquimba sp. A	4	2	0.93
Bythocytheromorpha sp. A	4	1	0.77
* Bairdia sp. A	2	2	0.62
Munseyella sp. A	4		0.62
Cytheropteron sp. I	3	1	0.62
Cytheropteron sp. G	2	1	0.46
Buntonia sp. A		3	0.46
Cytheromorpha sp. E	3		0.46
Sclerochilus sp. E	3		0.46
Argilloecia sp. B		2	0.31
Bythocytheromorpha sp. B	2		0.31
Semicytherura aff. S. undata (Sars, 1865)	2		0.31
Hemicytherura sp. A	2		0.31
Hemicythere sp.	1	1	0.31
Cytheropteron sp. Y		2	0.31
Paracypris sp.	1		0.16
Pectocythere sp. F	1		0.16
Bythocythere sp. B		1	0.31
Cytheropteron sp. H	1		0.16
Cytherura sp. H	1		0.16
Cythere aff. C. alveolivalva Smith, 1952		1	0.16

Ostracode Species:	Adults	Juv.	%
Elofsonella sp. A	1		0.16
Schizocythere sp. A	1		0.16
Bythocythere sp. A	1		01.6

Total Ostracodes 646

EGAL-75-KC Van Veen-158

Latitude: 60° 06.0' N

Longitude: 146° 40.5' W

Water Depth: 117 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Mollusk Fragments

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	3	8	36.67
Rboertsonites tuberculata (Sars, 1865)		8	26.67
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	1	2	10.00
"Australicythere" sp. A		3	10.00
Cytheropteron sp. N	1		3.33
Loxoconcha sp. A	1		3.33
Cytheropteron sp. A	1		3.33
Munseyella sp. B	1		3.33
Cytheropteron sp. B		1	3.33

Total Ostracodes 30

EGAL-75-KC Shipek-159

Latitude: 60° 10.2' N

Longitude: 146° 52.1' W

Water Depth: 165 meters

Lithology: Thin layer of olive-gray, soupy mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Proteinaceous Worm Tubes

Bryozoans

Pelecypods

Cyprid Barnacles

Ostracodes

Echinoderm Spine

Diatoms

Ostracode Species:	Adults	Juv.	%
Aurila sp. A	18	58	16.27
* "Acanthocythereis" dunelmensis (Norman, 1865)	5	43	10.28
Pectocythere aff. P. quadrangulata Hanai, 1957	2	24	5.57
Cytheropteron sp. A	13	10	4.93
Loxoxoncha sp. A	5	16	4.50
Ambostracon sp. A	1	19	4.28
Cytheropteron sp. N	11	9	4.28
Paradoxostoma sp. G	9	9	3.85
Cytheromorpha sp. B	10	6	3.43
* Robertsonites tuberculata (Sars, 1865)	1	15	3.43
"Australicythere" sp. A		13	2.78
Loxoconcha sp. D	7	5	2.57

Ostracode Species:	Adults	Juv.	%
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	10	1	2.36
Palmanella limicola (Norman, 1865)	4	7	2.36
Cytheropteron sp. E	4	6	2.14
Finmarchinella (*Barentsovia*) sp. A	1	8	1.93
* *Acuminocythere* sp. A	2	7	1.93
Sclerochilus sp. C	4	4	1.71
Xestoleberis sp. B	6	1	1.50
Cytheropteron sp. F	1	6	1.50
Paradoxostoma aff. *P. japonicum* Schornikov, 1975	3	3	1.29
Cytherois sp. A	5	1	1.29
Hemicytherura sp. A	6		1.29
Cytheromorpha sp. E	5		1.07
Pseudocythere sp. A	4	1	1.07
* *Munseyella* sp. A	4		0.86
Coquimba sp. A	4	0.86	
Paradoxostoma aff. *P. brunneatum* Schornikov, 1975	1	2	0.64
* *Bairdia* sp.	2	1	0.64
Argilloecia sp. A	1	2	0.64
Cytheropteron sp. G	2	1	0.64
Hemicytherura sp. B	3		0.64
Loxoconcha sp. E	2	1	0.64
Cytheropteron sp. I		3	0.64

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. H		3	0.64
Semicytherura aff. S. undata (Sars, 1865)	2		0.43
Hemicytherura sp. C	2		0.43
Elofsonia sp. A	2		0.43
Xiphichilus sp.	2		0.43
Pectocythere sp. E	2		0.43
Buntonia sp. A	2		0.43
Bythocytheromorpha sp. B	1		0.21
Xestoleberis sp. A		1	0.21
"Leguminocythereis: sp. D		1	0.21
Cytheropteron sp. Y	1		0.21
Paradoxostoma sp. J	1		0.21
Bythocythere sp. A	1		0.21
Normanicythere sp.		1	0.21
Argilloecia sp. B	1		0.21
Eucytherura sp. A		1	0.21
Semicytherura sp. F		1	0.21
Hemicythere aff. H. quadrinodosa Schornikov, 1974		1	0.21

Total Ostracodes 467

EGAL-75-KC Van Veen-160A

Latitude: 60° 15.0' N

Longitude: 146° 31.8' W

Water Depth: 37 meters

Lithology: Dark, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Echinoderm Spines

EGAL-75-KC Box Core-160C

Latitude: 60° 14.9' N

Longitude: 146° 32.2' W

Water Depth: 37 meters

Lithology: Dark, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Agglutinated and Proteinaceous Worm Tubes

Pelecypods

EGAL-75-KC Van Veen-161

Latitude: 60° 17.4' N

Longitude: 146° 23.7' W

Water Depth: 22 meters

Lithology: Dark, fine-grained, well-sorted sand.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
Hemicythere aff. H. quadrinodosa Schornikov, 1974	1		50.00
Cythere aff. C. alveolivalva Smith, 1952	1		50.00

Total Ostracodes 2

EGAL-75-KC Van Veen-162

Latitude: 60° 19.2' N

Longitude: 146° 13.2' W

Water Depth: 24 meters

Lithology: Dark, fine-grained sand with overlying thin layer of soupy, gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Echinoderm Fragments

Plant Material

Ostracode Species:	Adults	Juv.	%
Cytheromorpha sp. B	3	6	33.33
Hemicythere aff. H. quadrinodosa Schornikov, 1974	3	2	18.52
* Elofsonia sp. A	4		14.82
Pectocythere sp. D	2	1	11.11
Cytherura sp. D	1	2	11.11
Cytheromorpha sp. E	2		7.41
Cythere aff. C. alveolivalva Smith, 1952		1	3.70

Total Ostracodes 27

EGAL-75-KC Van Veen-163

Latitude: 60° 19.5' N

Longitude: 146° 07.0' W

Water Depth: 22 meters

Lithology: Dark, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Plant Material

Ostracode Species:	Adults	Juv.	%
* Hemicythere aff. H. quadrinodosa Schornikov, 1974	2		66.67
Elofsonia sp. A	1		33.33

Total Ostracodes 3

EGAL-75-KC Van Veen-164A

Latitude: 60° 19.5' N

Longitude: 146° 00.0' W

Water Depth: 22 meters

Lithology: Dark, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Plant Debris

EGAL-75-KC Van Veen-164B

Latitude: 60° 19.5' N

Longitude: 146° 00.0' W

Water Depth: 22 meters

Lithology: Dark, fine-grained sand.

Organisms: Occasional Calcareous Benthic Foraminifers

Pelecypod Fragments

Ostracodes

Occasional Echinoderm Fragments

Plant Fragments

Ostracode Species:	Adults	Juv.	%
Cytheromorpha sp. B	5	1	46.15
Hemicythere aff. H. quadrinodosa Schornikov, 1974	2	2	30.77
Elofsonia sp. A	3		23.08

Total Ostracodes 13

EGAL-75-KC Shipek-165

Latitude: 60° 18.3' N

Longitude: 145° 53.5' W

Water Depth: 33 meters

Lithology: Dark, fine-grained sand with some gray mud.

Organisms: Rare Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
* *Cytheromorpha* sp. B	2	3	41.67
Pectocythere sp. D	2		16.67
* *Loxoconcha* sp. A	2		16.67
Pectocythere aff. *P.* *quadrangulata* Hanai, 1957		1	8.33
Eucythere sp. A	1		8.33
"*Leguminocythereis*" sp. A		1	8.33

Total Ostracodes 12

EGAL-75-KC Shipek-166

Latitude: 60° 17.7' N

Longitude: 145° 45.6' W

Water Depth: 20 meters

Lithology: Dark, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adults	Juv.	%
Candona sp.		1	25.00
Elofsonia sp. A	1		25.00
Aurila sp. A		1	25.00
Cytheromorpha sp. B	1		25.00

Total Ostracodes 4

EGAL-75-KC Shipek-167

Latitude: 60° 16.4' N

Longitude: 145° 38.4' W

Water Depth: 26 meters

Lithology: Dark, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers
Mollusk Fragments
Ostracodes

Ostracode Species:	Adults	Juv.	%
"*Leguminocythereis*" sp. A		1	100

Total Ostracodes 1

EGAL-75-KC Shipek-169

Latitude: 60° 17.7' N

Longitude: 145° 50.7' W

Water Depth: 35 meters

Lithology: Dark, fine-grained sand with some clay galls at surface.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Echinoderm Fragments

EGAL-75-KC Box Core-170B

Latitude: 60° 16.9' N

Longitude: 145° 42.0' W

Water Depth: 20 meters

Lithology: Dark, fine-grained, well-sorted sand overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Echinoderm Fragments

Plant Fragments

Ostracode Species:	Adults	Juv.	%
Cytheromorpha sp. B	2		50.00
Pectocythere sp. D	1		25.00
Loxoconcha sp. A		1	25.00

Total Ostracodes 4

EGAL-75-KC Shipek-172

Latitude: 60° 13.5' N

Longitude: 145° 21.2' W

Water Depth: 18 meters

Lithology: Dark, fine-grained sand.

Organisms: Barren of any faunal or floral remains.

EGAL-75-KC   Shipek-174

Latitude: 60° 09.6' N

Longitude: 145° 06.4' W

Water Depth: 35 meters

Lithology: Gray mud with fine-grained sand.

Organisms: Ostracodes

Ostracode Species:	Adults	Juv.	%
"*Leguminocythereis*" sp. A	3	3	37.50
Pectocythere sp. D	5		31.25
Pectocythere aff. *P. quadrangulata* Hanai, 1957	2		12.50
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)		1	6.25
Loxoconcha sp. A		1	6.25
Cytheropteron sp. R	1		6.25

Total Ostracodes 16

EGAL-75-KC Shipek-175

Latitude: 60° 09.4' N

Longitude: 145° 00.0' W

Water Depth: 33 meters

Lithology: Gray mud with very thin, surficial layer of sand.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Plant Material

Ostracode Species:	Adults	Juv.	%
Cytheromorpha sp. A	1		50.00
Cytheromorpha sp. B		1	50.00

Total Ostracodes 2

EGAL-75-KC Box Core-179B

Latitude: 60° 14.8' N

Longitude: 145° 26.9' W

Water Depth: 18 meters

Lithology: Fine-grained sand with thin clay layer at surface.

Organisms: Pelecypod Fragments

EGAL-75-KC Shipek-181

Latitude: 60° 01.0' N

Longitude: 144° 24.0' W

Water Depth: 33 meters

Lithology: Gray mud with slight amount of sand.

Organisms: Calcareous Benthic Foraminifers

Agglutinated and Proteinaceous Worm Tubes

Cheilostome Bryozoans

Pelecypods

Gastropods

Ostracodes

Ostracode Species:	Adults	Juv.	%
Pectocythere aff. P. quadrangulata Hanai, 1957	141	55	24.17
* Robertsonites tuberculata (Sars, 1865)	11	150	19.85
Loxoconcha sp. A	48	36	10.36
* Buntonia sp. A	73	8	9.99
* Cytheromorpha sp. B	48	7	6.78
Palmanella limicola (Norman, 1865)	22	11	4.07
Hemicythere aff. H. quadrinodosa Schornikov, 1975	5	27	3.95
"Leguminocythereis" sp. A		26	3.21
Cytheromorpha sp. A	24		2.96
"Acanthocythereis" dunelmensis (Norman, 1865)	2	21	2.84
Cythere aff. C. alveolivalva Smith, 1952	5	10	1.85
Aurila sp. A	1	13	1.73
Cythere sp. A	2	9	1.36
Ambostracon sp. A		11	1.36
* Pectocythere sp. D	5	3	0.99
Loxoconcha sp. D	5	1	0.74
Loxoconcha sp. E	3	2	0.62
Pontocythere sp. A	5		0.62
Cytheropteron sp. I	4		0.49
* Argilloecia sp. A	3		0.37
Hemicytherura sp. A		2	0.25
Elofsonia sp. A	2		0.25

Ostracode Species:	Adults	Juv.	%
Cytherura sp. F	2		0.25
Argilloecia sp. B	2	0.25	
Cytheropteron sp.		1	0.12
Cytherois sp. A		1	0.12
paracyprid		1	0.12
Paradoxostoma sp. G		1	0.12
Acuminocythere sp. A		1	0.12
Paradoxostoma sp. B		1	0.12

Total Ostracodes 811

EGAL-75-KC Van Veen-203

Latitude: 59° 32.5' N

Longitude: 144° 36.4' W

Water Depth: Not Determined

Lithology: Gray, gravelly mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Sponge Spicules

Cheilostome Bryozoans

Pelecypods

Echinoderm Spines

EGAL-75-KC Van Veen-219

Latitude: 59° 36.3' N

Longitude: 144° 17.4' W

Water Depth: 475 meters

Lithology: Gray mud.

Organisms: Radiolarians

Sponge Spicules

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. Q	1		100

Total Ostracodes 1

EGAL-75-KC Shipek-221

Latitude: 59° 50.1' N

Longitude: 144° 27.4' W

Water Depth: 29 meters

Lithology: Olive- sandy mud overlying gray clay with some shell fragments.

Organisms:
Calcareous Benthic Foraminifers
Planktic Foraminifers
Cheilostome Bryozoans
Pelecypods
Gastropods
Ostracodes
Echinoderm Spines
Fish Parts
Plant Debris

Ostracode Species:	Adults	Juv.	%
* _Pectocythere_ sp. D	224	38	34.79
* _Loxoconcha_ sp. A	95	125	29.22
"_Leguminocythereis_" sp. A	5	63	9.03
* _Cytheromorpha_ sp. B	40	22	8.23

Ostracode Species:	Adults	Juv.	%
* Pectocythere aff. P. parkerae Swain and Gilby, 1974	58	2	7.97
Cytheromorpha sp. A	39	2	5.44
* Cytheromorpha sp. E	17		2.26
* Aurila sp. A	2	3	0.66
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975	4	1	0.66
Pectocythere aff. P. quadrangulata Hanai, 1957		3	0.40
Cytheropteron sp. A	1	2	0.40
Cythere sp. A		2	0.27
"Leguminocythereis" sp. B		2	0.27
Cythere aff. C. alveolivalva Smith, 1952		1	0.13
Palmanella limicola (Norman, 1865)		1	0.13
Finmarchinella (Barentsovia) sp. A		1	0.13
Baffinicythere emarginata (Sars, 1865)		1	0.13
Loxoconcha sp. F	1		0.13

Total Ostracodes 753

EGAL-75-KC Box Core-223

Latitude: 59° 52.4' N

Longitude: 144° 18.7' W

Water Depth: 51 meters

Lithology: Muddy, fine-grained sand.

Organisms: Ostracodes

Ostracode Species:	Adults	Juv.	%
* "Leguminocythereis" sp. A	13	104	43.01
* Pectocythere sp. D	103	4	39.34
Loxoconcha sp. A	14	28	15.44
Cytheropteron sp. A	2	1	1.10
"Leguminocythereis" sp. B		2	0.74
Pectocythere aff. P. quadrangulata Hanai, 1957		1	0.37

Total Ostracodes 272

EGAL-75-KC Shipek-225

Latitude: 59° 46.2' N

Longitude: 144° 11.5' W

Water Depth: 101 meters

Lithology: Gray mud.

Organisms: Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		3	42.86
Palmanella limicola (Norman, 1865)	2		28.57
Robertsonites tuberculata (Sars, 1865)		1	14.29
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	14.29

Total Ostracodes 7

EGAL-75-KC Shipek-227

Latitude: 59° 39.4' N

Longitude: 144° 04.9' W

Water Depth: 161 meters

Lithology: Very stiff, olive-gray mud with subrounded pebbles and shells.

Organisms: Radiolarians

Ostracodes

Ostracode Species:	Adults	Juv.	%
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	3	2	55.56
Cytheropteron sp. G	2	1	33.33
Cytheropteron sp. L		1	11.11

Total Ostracodes 9

EGAL-75-KC Van Veen-229

Latitude: 59° 34.0' N

Longitude: 144° 01.2' W

Water Depth: 1189 meters

Lithology: Stiff, gray-green mud.

Organisms: Radiolarians

Sponge Spicules

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		1	100
unidentifiable fragment			

Total Ostracodes 1

EGAL-75-KC Van Veen-231

Latitude: 59° 56.9' N

Longitude: 144° 09.7' W

Water Depth: 33 meters

Lithology: Gray sand.

Organisms: Calcareous Benthic Foraminifers

Bryozoans

Ostracodes

Echinoderm Fragments

Ophiuroids

Ostracode Species:	Adults	Juv.	%
"*Leguminocythereis*" sp. A		2	100

Total Ostracodes 2

EGA:-75-KC Van Veen-232

Latitude: 59° 57.25' N

Longitude: 144° 09.9' W

Water Depth: 49 meters

Lithology: 2-3 cm of green-gray sand overlying gray mud, with sand layers.

Organisms:
- Pelecypod Fragments
- Ostracodes
- Echinoderm Fragment
- Plant Fragments
- Carbonaceous Plant Fragments

Ostracode Species:	Adults	Juv.	%
Pectocythere sp. D	11		68.75
Loxoconcha sp. A	1	1	12.50
Cytheromorpha sp. A	2		12.50
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	6.25

Total Ostracodes 16

EGAL-75-KC Van Veen-233

Latitude: 59° 51.6' N

Longitude: 143° 53.25' W

Water Depth: 106 meters

Lithology: Olive-green mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Radiolarians

Proteinaceous Worm Tubes

Pelecypods

Gastropods

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
* "Acanthocythereis" dunelmensis (Norman, 1865)	3	6	37.50
Palmanella limicola (Norman, 1865)		9	37.50
* Cytheropteron sp. Q	2		8.33
Cytheropteron sp. A	1	1	8.33
Pectocythere aff. P. quadrangulata Hanai, 1957		1	4.17

Ostracode Species:	Adults	Juv.	%
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		1	4.17

Total Ostracodes 24

EGAL-75-KC Van Veen-237

Latitude: 59° 51.7' N

Longitude: 143° 42.5' W

Water Depth: 225 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Proteinaceous Worm Tubes
Pelecypods
Ostracodes
Echinoderm Spines
Plant Debris
Diatoms

Ostracode Species:	Adults	Juv.	%
* Cluthia cluthae (Brady, Crosskey, and Robertson, 1874)		2	66.67
Palmanella limicola (Norman, 1865)		1	33.33

Total Ostracodes 3

EGAL-75-KC Van Veen-239

Latitude: 59° 55.6' N

Longitude: 143° 32.4' W

Water Depth: 252 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Scaphopod Fragments

Ostracodes

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Normann, 1865)		1	100

Total Ostracodes 1

EGAL-75-KC Van Veen-241

Latitude: 59° 43.2' N

Longitude: 143° 26.6' W

Water Depth: 311 meters

Lithology: Olive-gray mud.

Organisms:

- Calcareous Benthic Foraminifers
- Agglutinated Benthic Foraminifers
- Radiolarians
- Sponge Spicules
- Fish Parts
- Diatoms

EGAL-75-KC Van Veen-242

Latitude: 59° 39.7' N

Longitude: 143° 22.9' W

Water Depth: 289 meters

Lithology: Olive-gray mud.

Organisms: Calcareous Benthic Foraminifers

EGAL-75-KC Van Veen-243

Latitude: 59° 34.9' N

Longitude: 143° 19.9' W

Water Depth: 238 meters

Lithology: Olive-gray mud with sand, gravel and cobbles.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Sponge Spicules

Cheilostome Bryuozoans

Pelecypods

Scaphopods

Organisms: Ophiuroid Parts

Echinoderm Fragments and Spines

EGAL-75-KC Van Veen-249

Latitude: 59° 58.4' N

Longitude: 143° 23.0' W

Water Depth: 152 meters

Lithology: Gray mud.

Organisms: Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)	1	6	41.18
Palmanella limicola (Norman, 1865)	5		29.41
* Buntonia sp. A	2		11.76
Robertsonites tuberculata (Sars, 1865)		2	11.76
Cytheropteron sp. D	1		5.88

Total Ostracodes 17

EGAL-75-KC Shipek-254A

Latitude: 59° 31.3' N

Longitude: 142° 39.5' W

Water Depth: 403 meters

Lithology: Muddy gravel.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Sponge Spicules

EGAL-75-KC Van Veen-258

Latitude: 59° 57.5' N

Longitude: 142° 412.0' W

Water Depth: 108 meters

Lithology: About 1-2 cm of olive-green, soupy mud overlying gray, mottled mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Agglutinated Worm Tubes

Pelecypods

Ostracodes

Echinoderm Fragments

Plant Debris

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	6	16	37.93
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	2	8	17.24
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	2	3	8.62
Munseyella sp. A	5		8.62
Eucytherura sp. A	2	1	5.17
Pectocythere sp. D		2	3.45
Robertsonites tuberculata (Sars, 1865)		2	3.45
Cytheropteron sp. D	1	1	3.45
Cytheromorpha sp. B		1	1.72
Pectocythere aff. *P. quadrangulata* Hanai, 1957		1	1.72
Cytheropteron sp. G	1		1.72
Cytheropteron sp. A		1	1.72
Paradoxostoma sp. I		1	1.72
Loxoconcha sp. B	1		1.72

Ostracode Species:	Adults	Juv.	%
Buntonia sp. A		1	1.72

Total Ostracodes 58

EGAL-75-KC Shipek-264

Latitude: 59° 49.5' N

Longitude: 142° 30.0' W

Water Depth: 134 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)	3	16	45.24
Palmanella limicola (Norman, 1865)	2	3	11.90
Cytheropteron aff. *C. latissimum* of Neale and Howe (1975)	5		11.90
Robertsonites tuberculata (Sars, 1865)	1	3	9.52
Cytheropteron sp. L	1	2	7.14
Munseyella sp. A	2		4.76
Cytheropteron sp. G	2		4.76
Loxoconcha sp. A		1	2.38
Paradoxostoma sp. B		1	2.38

Total Ostracodes 42

EGAL-75-KC Shipek-265

Latitude: 59° 46.2' N

Longitude: 142° 29.9' W

Water Depth: 181 meters

Lithology: Olive-gray mud with pebbles.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Echinoderm Fragments

Ostracode Species:	Adults	Juv.	%
Robertsonites tuberculata (Sars, 1865)		2	66.67
Palmanella limicola (Norman, 1865)	1		33.33

Total Ostracodes 3

EGAL-75-KC Shipek-266

Latitude: 59° 42.5' N

Longitude: 142° 34.0' W

Water Depth: 262 meters

Lithology: Olive mud with cobbles and gravel.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Sponge Spicules

Agglutinated and Proteinaceous Worm Tubes

Ostracodes

Echinoderm Spines and Fragments

Diatoms

Ostracode Species:	Adults	Juv.	%
Eucytherura sp. A		1	100

Total Ostracodes 1

EGAL-75-KC Shipek-268

Latitude: 59° 40.7' N

Longitude: 142° 21.6' W

Water Depth: 174 meters

Lithology: Olive-gray mud layer overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Sponge Spicules

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Echinoderm Debris

Plant Debris

Ostracode Species:	Adults	Juv.	%
Eucytherura sp. A	7	5	38.71
"Acanthocythereis" dunelmensis (Norman, 1865)		8	25.81
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	1	3	12.90
Krithe sp A		2	6.45
Cytheropteron sp. L	1	1	6.45
Palmanella limicola (Norman, 1865)	1		3.23
Sclerochilus sp. C	1		3.23
Munseyella sp. A	1		3.23

Total Ostracodes 31

EGAL-75-KC Van Veen-284

Latitude: 59° 50.0' N

Longitude: 142° 14.2' W

Water Depth: 86 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Plant Debris

Ostracode Species:	Adults	Juv.	%
* "Acanthocythereis" dunelmensis (Norman, 1865)	25	43	30.09
Robertsonites tuberculata (Sars, 1865)		50	22.12
* Palmanella limicola (Norman, 1865)	20	15	15.49
* Pectocythere aff. P. quadrangulata Hanai, 1957	26	4	13.27
Buntonia sp. A	8	2	4.43
Eucytherura sp. A	7		3.10
Cytheropteron sp. E	2	4	2.66
Cytheropteron aff. C. latissimum of Neale and Howe (1975)	5		2.21

Ostracode Species:	Adults	Juv.	%
Munseyella sp. A	4		1.77
Cytheropteron sp. G	2		0.89
Cytheropteron sp. H		2	0.89
Cytheromorpha sp. D	2		0.89
Cytheropteron sp. F	1		0.44
Pectocythere aff. *P. parkerae* Swain and Gilby, 1974	1		0.44
Cytheropteron sp. D	1		0.44
Cytheropteron sp. A	1		0.44

Total Ostracodes 226

EGAL-75-KC Shipek-294

Latitude: 59° 48.7' N

Longitude: 141° 25.0' W

Water Depth: 29 meters

Lithology: Fine-grained, gray sand.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
Pectocythere sp. D	1		100

Total Ostracodes 1

EGAL-75-KC Van Veen-306

Latitude: 59° 30.4' N

Longitude: 141° 30.0' W

Water Depth: 161 meters

Lithology: Gray-green mud.

Organisms:
Calcareous Benthic Foraminifers
Agglutinated Benthic Foraminifers
Planktic Foraminifers
Radiolarians
Proteinaceous Worm Tubes
Pelecypods
Ostracodes

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	6	3	37.50
"*Acanthocythereis*" *dunelmensis* (Norman, 1865)		6	25.00
Krithe sp. A	3	2	20.83
Munseyella sp. A	4		16.67

Total Ostracodes 24

EGAL-75-KC Van Veen-307

Latitude: 59° 28.9' N

Longitude: 141° 27.8' W

Water Depth: 165 meters

Lithology: Thin layer of green mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Ostracodes

Ostracode Species:	Adults	Juv.	%
Palmanella limicola (Norman, 1865)	7	6	38.24
"Acanthocythereis" dunelmensis (Norman, 1865)		9	26.47
Krithe sp. A		5	14.71
Munseyella sp. A	5		14.71
Cytheropteron sp. Q	1	1	5.88

Total Ostracodes 34

EGAL-75-KC Van Veen-310

Latitude: 59° 22.1' N

Longitude: 141° 09.5' W

Water Depth: 298 meters

Lithology: Green, muddy, fine-grained sand.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Sponge Spicules

Worm Tubes

Gastropods

Ophiuroids

Echinoderm Fragments and Spines

Diatoms

EGAL-75-KC Van Veen-326

Latitude: 59° 24.6' N

Longitude: 140° 14.5' W

Water Depth: 183 meters

Lithology: Gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Sponge Spicules

Proteinaceous Worm Tubes

Pelecypods

Ostracodes

Echinoderm Fragments

Diatoms

Ostracode Species:	Adults	Juv.	%
"Acanthocythereis" dunelmensis (Norman, 1865)		6	46.15
Palmanella limicola (Norman, 1865)	3		23.08
Krithe sp. A		2	15.39
Cytheropteron sp. L	1		7.69
Cytherois sp. A	1		7.69

Total Ostracodes 13

EGAL-75-KC Van Veen-331

Latitude: 59° 56.1' N

Longitude: 143° 53.4' W

Water Depth: 66 meters

Lithology: Olive-green mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Pelecypods

Ostracodes

Plant Debris

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. A	10	13	32.86
Loxoconcha sp. A	5	10	21.43
Palmanella limicola (Normann, 1865)	5	5	14.29
"Leguminocythereis" sp. A		6	8.57
Pectocythere sp. D	3	1	5.71
"Acanthocythereis" dunelmensis (Norman, 1865)		2	2.86
Cytheropteron aff. C. nodosoalatum Neale and Howe, 1975		2	2.86
Hemicytherura sp. B	2		2.86

Ostracode Species:	Adults	Juv.	%
Finmarchinella (Barentsovia) sp. A	1		1.43
Hemicythere aff. H. quadrinodosa Schornikov, 1974		1	1.43
Paradoxostoma sp. B	1		1.43
Paradoxostoma sp. G	1		1.43
Cytheromorpha sp. D	1		1.43
Cluthia sp. A		1	1.43
Total Ostracodes 70			

EGAL-75-KC Van Veen-334

Latitude: 59° 37.6' N

Longitude: 143° 34.0' W

Water Depth: 145 meters

Lithology: Pebbly mud.

Organisms: Sponge Spicules

EGAL-75-KC Shipek-348

Latitude: 59° 31.8' N

Longitude: 142° 24.8' W

Water Depth: 631 meters

Lithology: Homogeneous olive-gray mud.

Organisms: Calcareous Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Sponge Spicules

Proteinaceous Worm Tubes

Ophiuroid Plates

Diatoms

EGAL-75-KC Shipek-349

Latitude: 59° 32.6' N

Longitude: 142° 30.5' W

Water Depth: 714 meters

Lithology: Homogeneous olive-green mud.

Organisms:	Calcareous Benthic Foraminifers
	Planktic Foraminifers
	Radiolarians
	Sponge Spicules
	Proteinaceous Worm Tubes
	Pelecypods
	Ophiuroid Plates
	Diatoms

EGAL-75-KC	Van Veen-350
Latitude:	59° 34.3' N
Longitude:	142° 33.0' W
Water Depth:	578 meters
Lithology:	Very soft, olive mud.
Organisms:	Calcareous Benthic Foraminifers
	Planktic Foraminifers
	Sponge Spicules
	Proteinaceous Worm Tubes
	Pelecypods
	Fish Scales
	Diatoms

EGAL-75-KC Van Veen-351

Latitude: 59° 35.0' N

Longitude: 142° 44.3' W

Water Depth: 615 meters

Lithology: Green mud.

Organisms: Calcareous Benthic Foraminifers

Agglutinated Benthic Foraminifers

Planktic Foraminifers

Radiolarians

Sponge Spicules

Proteinaceous Worm Tubes

Echinoderm Fragments

Ophiuroid Spines

Diatoms

EGAL-75-KC Shipek-405

Latitude: 59° 52.4' N

Longitude: 141° 37.5' W

Water Depth: 24 meters

Lithology: Gray mud with numerous pebbles.

Organisms: Rare Benthic Foraminifers

Pelecypod Fragments

EGAL-75-KC Shipek-406

Latitude: 59° 53.0' N

Longitude: 141° 36.5' W

Water Depth: 26 meters

Lithology: Very stiff gray clay with some pebbles.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. A	1		100

Total Ostracodes 1

EGAL-75-KC Shipek-407

Latitude: 59° 52.62' N

Longitude: 141° 35.25' W

Water Depth: 35 meters

Lithology: Mud with encrusting organisms at surface, with cobbles, gravel and sand.

Organisms: Calcareous Benthic Foraminifers

Bryozoans

Pelecypods

Cirriped Plates

EGAL-75-KC Shipek-409

Latitude: 59° 51.7' N

Longitude: 141° 32.2' W

Water Depth: 35 meters

Lithology: Fine-grained, dark sand.

Organisms: Pelecypod Fragments

EGAL-75-KC Shipek-412

Latitude: 59° 53.61' N

Longitude: 141° 35.15' W

Water Depth: 40 meters

Lithology: Dark gray clay with thin veneer of pebbles and shell fragments.

Organisms: Calcareous Benthic Foraminifers

Cheilostome Bryozoans

Pelecypods

Cirriped Plates

EGAL-75-KC Shipek-414

Latitude: 59° 55.99' N

Longitude: 141° 37.6' W

Water Depth: 26 meters

Lithology: Stiff gray clay overlain by veneer of pebbles.

Organisms: Calcareous Benthic Foraminifers

Pelecypod Fragments

Echinoderm Spine

EGAL-75-KC Shipek-415

Latitude: 59° 55.22' N

Longitude: 141° 36.45' W

Water Depth: 31 meters

Lithology: Olive-green mud with pebbles and cobbles overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Bryozoans

Pelecypods

EGAL-75-KC Shipek-422

Latitude: 59° 55.8' N

Longitude: 141° 35.6' W

Water Depth: 68 meters

Lithology: Gray mud with some sand.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. A	23	18	58.57
Cytheropteron sp. N	7		10.00
Hemicytherura sp. A	2	5	10.00
Loxoconcha sp. D	2	2	5.71
Cytheromorpha sp. B	2		2.86
Cytherura sp. F	2		2.86
Paradoxostoma sp. H	2		2.86
Hemicytherura sp. B	1		1.43
Paradoxostoma sp. G	1		1.43
Cytheropteron sp. F	1		1.43
Loxoconcha sp. A		1	1.43
Cytheropteron sp. E		1	1.43
Total Ostracodes 70			

EGAL-75-KC Shipek-423

Latitude: 59° 55.5' N

Longitude: 141° 35.9' W

Water Depth: 27 meters

Lithology: Stiff gray clay with coarse sand and cobbles at surface.

Organisms: Rare Pelecypod Fragments

EGAL-75-KC Shipek-425

Latitude: 59° 56.7' N

Longitude: 141° 35.1' W

Water Depth: 59 meters

Lithology: Green soupy mud overlying gray mud.

Organisms: Rare Calcareous Benthic Foraminifers

Pelecypods

Gastropod

Ostracodes

Plant Debris

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. A	3	5	72.73
Cytheropteron aff. *C.* *nodosoalatum* Neale and Howe, 1975		1	9.09
Candona sp.		1	9.09
Bythocythere sp. B	1		9.09

Total Ostracodes 11

EGAL-75-KC Shipek-427

Latitude: 59° 55.45' N

Longitude: 141° 32.7' W

Water Depth: 71 meters

Lithology: Olive-green mud overlying gray-green mud.

Organisms: Occasional Calcareous Benthic Foraminifers

Pelecypod

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. A		1	100

Total Ostracodes 1

EGAL-75-KC Shipek-428

Latitude: 59° 54.7' N

Longitude: 141° 30.1' W

Water Depth: 49 meters

Lithology: Dark gray, soupy sand with much organic material.

Organisms:
Rare Calcareous Benthic Foraminifers
Pelecypods
Gastropods
Ostracodes
Plant Debris
Diatoms

Ostracode Species:	Adults	Juv.	%
Loxoconcha sp. A		2	28.57
Cytheromorpha sp. B		1	14.29
Cytheropteron sp. I	1		14.29
Cytherura sp. D		1	14.29
Cythere sp. A		1	14.29
Cytheropteron aff. *C. nodosoalatum* Neale and Howe, 1975		1	14.29

Total Ostracodes 7

EGAL-75-KC Shipek-429

Latitude: 59° 55.5' N

Longitude: 141° 30.6' W

Water Depth: 60 meters

Lithology: Green soupy mud overlying gray-green, clayey sand.

Organisms: Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Hemicytherura sp. C	1		100

Total Ostracodes 1

EGAL-75-KC Shipek-431

Latitude: 59° 56.5' N

Longitude: 141° 33.3' W

Water Depth: 59 meters

Lithology: Olive-green mud overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Plant Debris

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. A		4	50.00
Cytheropteron sp. E		2	25.00
Cytheropteron aff. *C.* *nodosoalatum* Neale and Howe, 1975	1		12.50
Pseudocythere sp. A	1		12.50

Total Ostracodes 8

EGAL-75-KC Shipek-432

Latitude: 59° 57.2' N

Longitude: 141° 31.6' W

Water Depth: 68 meters

Lithology: Green mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Diatoms

Ostracode Species:	Adults	Juv.	%
Cytheropteron sp. A	14	18	96.97
Loxoconcha sp. A		1	3.03

Total Ostracodes 33

EGAL-75-KC Shipek-433

Latitude: 59° 57.5' N

Longitude: 141° 30.8' W

Water Depth: 68 meters

Lithology: Olive-green mud with some sand overlying gray mud.

Organisms: Calcareous Benthic Foraminifers

Pelecypods

Ostracodes

Ostracode Species:	Adults	Juv.,	%
Cytheropteron sp. A	11	26	100

Total Ostracodes 37

APPENDIX IV

REPORT ON THE OSTRACODE ASSEMBLAGES AND THE ASSOCIATED ORGANISMS FROM SHIPEK SAMPLES TAKEN IN THE NORTHEAST GULF OF ALASKA, R/V DISCOVERER CRUISE DC1-79-EG, MAY, 1979

ELISABETH M. BROUWERS

INTERNAL U.S. GEOLOGICAL SURVEY EXAMINATION AND REPORT

X

REPORT ON REFERRED FOSSILS

STRATIGRAPHIC RANGE	Holocene	SHIPMENT NUMBER	PAC-79-8M
GENERAL LOCALITY	Alaska	REGION	G. of Alaska
QUADRANGLE OR AREA		DATE RECEIVED	7/11/79
KINDS OF FOSSILS	Ostracodes	STATUS OF WORK	Complete
REFERRED BY	B. F. Molnia	DATE REPORTED	10/23/79
REPORT PREPARED BY	Elisabeth M. Brouwers		

Project 9560-61648

This report concerns 33 samples from the eastern Gulf of Alaska collected on the NOAA ship Discoverer during May, 1979. These are subsamples taken from the large grab samples obtained during the cruise. In addition, I am including the findings from 5 samples taken in Prince William Sound and Glacier Bay.

I have made counts of all of the ostracode valves and have differentiated between juveniles and adults. This was done to try to determine which assemblages are in place (biocoenosis) and which may have undergone partial or total transportation (thanatocoenosis). Adults are indicated by *A* and juveniles by *J*; a carapace is counted as two valves. I hope to be able to establish some patterns of sediment transport in this manner in the regions sampled (see R. C. Whatley and D. R. Wall, 1969, A Preliminary Account of the Ecology and Distribution of Recent Ostracoda in the Southern Irish Sea, IN The Taxonomy, Morphology and Ecology of Recent Ostracoda, ed. J. W. Neale Oliver and Boyd).

Following is a list of the species that occurred in each sample. Most of the species (and several of the genera) are new forms and are left in open nomenclature for the purposes of this report.

Sample DC-1-79 EG 1 (MF 5687) is from lat. 59 degrees 05.0 minutes, long. 138 degrees 39.9 minutes, Station 020, end of line 50. Grey muddy silt, lots of organics. 77 meters depth.

PALMANELLA LIMICOLA (Norman, 1865)	26A, 16J
EUCYTHERE ?ARGUS (Sars, 1865)	1J
CYTHEROPTERON aff. C. RARUM Hanai, 1957	6A, 3J
CYTHERE LUTEA O. F. Muller, 1785	1A
SCLEROCHILUS sp.	2J
ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	18A, 71J
LOXOCONCHA sp. A	103A, 265J
CYTHEROIS? sp. A	22A, 8J
LEPTOCYTHERE sp.	5J
CYTHEROPTERON sp. A	12A, 34J
LEGUMINOCYTHEREIS sp. A	1A, 21J
PECTOCYTHERE sp. A	1J a

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REPORT ON REFERRED FOSSILS

STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8M
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

ARGILLOECIA sp. A	4J
LEPTOCYTHERE sp. of Swain and Gilby, 1974	1J
BUNTONIA sp. A	3A, 17J
CYPRIDEIS BEACONENSIS LeRoy, 1943	1A
LIMNOCYTHERE sp.	1J

A/J equals 193/450, 1/2.33

also - gastropods, pelecypods, pteropod
agglutinated and proteinaceous worm tubes
few benthic and planktic foraminifers
plant material.

Sample DC-1-79 EG 5 (MF 5688) is from lat. 58 degrees 52.1 minutes, long. 138 degrees 58.6 minutes, station 024, end of line 54, 205 m. depth. Greenish brown mud, little silt.

ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	1A
LEGUMINOCYTHEREIS sp. A	1J
CYTHEROPTERON sp. B	1J
PALMANELLA LIMICOLA (Norman, 1865)	1J
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975	1J

A/J equals 1/4

also - pelecypods, gastropods
benthic and planktic foraminifers
spicules
diatoms
echinoderm fragments
plant debris
worm tubes

Sample DC-1-79 EG 6 (MF 5689) is from lat. 58 degrees 46.8 minutes, long. 138 degrees 59.7 minutes, station 025, end of line 55, 220 m. depth. Greenish-brown mud, very little silt. 8

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REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE

GENERAL LOCALITY

QUADRANGLE OR AREA

KINDS OF FOSSILS

REFERRED BY

REPORT PREPARED BY

SHIPMENT NUMBER PAC-79-8M

REGION

DATE RECEIVED

STATUS OF WORK

DATE REPORTED

PALMANELLA LIMICOLA (Norman, 1865)	3A
EUCYTHERURA sp. A	3J
AUSTRALICYTHERE? sp. A	1J

A/J equals 3/4, 1/1.33

also - pelecypods
worm tubes
echinoderm fragments
benthic and planktic foraminifers
lots of spicules and diatoms

Sample DC-1-79 EG 7 (MF 5690) is from lat. 58 degrees 48.2 minutes, long. 139 degrees 07.9 minutes, station 026, end of line 56, 188 m. depth. Greenish brown mud, very little silt.

ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	1A,	4J
PALMANELLA LIMICOLA (Norman, 1865)	8A,	1J
CYTHEROPTERON sp. B		1J
KRITHE aff. K. GLACIALIS Brady, Crosskey & Robertson, 1874		7J
BUNTONIA sp. A		1J
AUSTRALICYTHERE? sp. A		1J

A/J equals 9/15, 1/1.7

also - spicules, diatoms
worm tubes
benthic and planktic foraminifers
pelecypods
echinoderm fragments

Sample DC-1-79 EG 9 (MF 5691) is from lat. 58 degrees 43.1 minutes long. 139 degrees 10.3 minutes, station 028, end of line 58, 240 m. depth. Homogeneous greenish brown mud, no silt.

PALMANELLA LIMICOLA (Norman, 1865)	1J

A/J equals 0/1

also - pelecypods, gastropods, pteropod
planktic and benthic foraminifers
proteinaceous worm tubes a

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REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE

GENERAL LOCALITY

QUADRANGLE OR AREA

KINDS OF FOSSILS

REFERRED BY

REPORT PREPARED BY

SHIPMENT NUMBER PAC-79-8M

REGION

DATE RECEIVED

STATUS OF WORK

DATE REPORTED

echinoderm fragments
diatoms, spicules

Sample DC-1-79 EG 10 (MF 5692) is from lat. 58 degrees 44.9 minutes, long. 139 degrees 19.1 minutes, station 029, end of line 59, 183 m. depth. Homogeneous greenish mud, no silt.

ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	3A,	7J
KRITHE aff. K. GLACIALIS Brady, Crosskey & Robertson, 1874		3J
PALMANELLA LIMICOLA (Norman, 1865)		4J
EUCYTHERURA sp. A		1J
EUCYTHERE? ARGUS (Sars, 1865)	1A	
PONTOCYTHERE sp. A		1J
CLUTHIA CLUTRAE (Brady, Crosskey & Robertson, 1874)		2J

A/J equals 4/18, 1/4.5

also - large quantities of sponge spicules, diatoms
radiolarians
echinoderm spines
planktic and benthic foraminifers

Sample DC-1-79 EG 12 (MF 5693) is from lat. 58 degrees 39.0 minutes, long. 139 degrees 22.3 minutes, station 031, end of line 61, 251 m. depth. Homogeneous greenish mud, little, if any silt.

ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)		2J
PALMANELLA LIMICOLA (Norman, 1865)		5J
EUCYTHERURA sp. A		1J
CYTHEROPTERON sp. B	1A	

A/J equals 1/8

also - very siliceous, lots of spicules, diatoms
pelecypod
benthic and planktic foraminifers
worm tubes
echinoderm fragments
some plant material a

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REPORT ON REFERRED FOSSILS

STRATIGRAPHIC RANGE

GENERAL LOCALITY

QUADRANGLE OR AREA

KINDS OF FOSSILS

REFERRED BY

REPORT PREPARED BY

SHIPMENT NUMBER PAC-79-8M

REGION

DATE RECEIVED

STATUS OF WORK

DATE REPORTED

Sample DC-1-79 EG 13 (MF 5694) is from lat. 58 degrees 45.2 minutes, long. 138 degrees 38.4 minutes, station 043, end of line 73, 108 m. depth. Greenish sandy, silty mud with lots of pebbles (rounded, up to 1.5-2 inch diameter).

PECTOCYTHERE sp. A	1A
AUSTRALICYTHERE? sp. A	2A, 6J
CYTHEROPTERON sp. H	1A, 1J
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975	1J
MUNSEYELLA sp. A	2A
PSEUDOCYTHERE sp. A	1J
	A/J equals 6/9, 1/1.5

also - brachiopod
echinoderm spine
benthic and planktic foraminifers
pelecypod fragments
rare spicules

Sample DC-1-79 EG 16 (MF 5695) is from lat. 58 degrees 22.4 minutes, long. 138 degrees 15.1 minutes, station 058, end of line 88, 127 m. depth. Green, muddy, sandy silt with rounded pebbles (up to 1 inch diameter).

No ostracodes were found in this sample

also - spicules
benthic and planktic foraminifers
echinoderm fragments
worm tubes
brachiopod
pelecypod fragments

Sample DC-1-79 EG 17 (MF 5696) is from lat. 58 degrees 26.4 minutes, long. 138 degrees 26.4 minutes, station 059, end of line 89, 123 m. depth. Green silty mud with pebbles. a

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REPORT ON REFERRED FOSSILS

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STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8Ma
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

PECTOCYTHERE sp. A 1A
CYTHERURA sp. A 1J
A/J equals 1/1

also - benthic and planktic foraminifers
spicules
worm tubes
bryozoans

Sample DC-1-79 EG 18 (MF 5697) is from lat. 58 degrees, long. 138 degrees 08.8 minutes, station 060, end of line 90, 130 m. depth. Green black muddy silt.

No ostracodes were found in the sample.

also - agglutinated worm tubes
benthic foraminifers, rare planktic foraminifers
pelecypods
spicules
echinoderm fragments

Sample DC-1-79 EG 19 (MF 5698) is from lat. 58 degrees 33.6 minutes, long. 138 degrees 17.5 minutes, station 061, end of line 91, 122 m. depth. Green, silty, gravelly mud.

PARADOXOSTOMA sp. A 1A
A/J equals 1/0

also - echinoderm spines
benthic and planktic foraminifers
pelecypod, pteropod
bryozoan
some spicules

CONTINUED ON PAC-79-8Mb a

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REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE	Holocene	SHIPMENT NUMBER	PAC-79-8Mb
GENERAL LOCALITY	Alaska	REGION	G. of Alaska
QUADRANGLE OR AREA		DATE RECEIVED	7/11/79
KINDS OF FOSSILS	Ostracodes	STATUS OF WORK	Complete
REFERRED BY	B. F. Molnia	DATE REPORTED	10/23/79
REPORT PREPARED BY	Elisabeth M. Brouwers		

CONTINUED FROM PAC-79-8Ma

Sample DC-1-79 EG 23 (MF 5699) is from lat. 58 degrees 26.0 minutes, long. 137 degrees 48.3 minutes, station 065, end of line 95, 167 m. depth. Green mud, some silt.

ARGILLOECIA sp. A		3J
ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)		3J
PALMANELLA LIMICOLA (Norman, 1865)	1A,	1J
EUCYTHERURA sp. A	1A,	1J
Cytherideid		1J
CYTHEROIS? sp. A	5A	

A/J equals 7/9, 1/1.3

also - worm tubes
benthic foraminifers, few planktic foraminifers
diatoms, spicules
plant material
pelecypod
echinoderm fragments

Sample DC-1-79 EG 24 (MF 5700) is from lat. 58 degrees 20.7 minutes, long. 137 degrees 55.7 minutes, station 066, end of line 96, 156 m. depth. Green-black, very muddy silt.

PALMANELLA LIMICOLA (Norman, 1865)	1J
CANDONA sp.	1J

A/J equals 0/2

also - diatoms, spicules
proteinaceous and agglutinated worm tubes
benthic and planktic foraminifers
pelecypods, gastropod

Sample DC-1-79 EG 25 (MF 5701) is from lat. 58 degrees 13.9 minutes, long. 138 degrees 01.9 minutes, station 067, end of line 97, 138 m. depth. Green silty mud with pebbles (up to 3 inch diameters). a

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8Mb
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975 1J
CYTHEROPTERON sp. C 1J
A/J equals 0/2

also - spicules, diatoms
worm tubes
benthic and planktic foraminifers
pelecypods
echinoderm fragments

Sample DC-1-79 EG 28 (MF 5702) is from lat. 58 degrees 11.2 minutes, long. 137 degrees 39.1 minutes, station 075, end of line 105, 161 m. depth. Green silty mud.

ACANTHOCYHEREIS DUNELMENSIS (Norman, 1865) 1J
PALMANELLA LIMICOLA (Norman, 1865) 1J
EUCYTHERURA sp. A 1A
A/J equals 1/2

Sample DC-1-79 EG 29 (MF 5703) is from lat. 58 degrees 16.4 minutes, long. 137 degrees 32.5 minutes, station 076, end of line 106, 154 m. depth. Green silty mud.

PALMANELLA LIMICOLA (Norman, 1865) 1A, 1J
ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865) 1A
A/J equals 2/1

also - diatoms, spicules
benthic foraminifers (no planktic foraminifers)
agglutinated and proteinaceous worm tubes
gastropod, pelecypod
enchinoderm fragments
plant material

Sample DC-1-79 EG 30B (MF 5707) is from lat. 58 degrees 23.0 minutes, long. 137 degrees 27.9 minutes, station 077, end of line 107, a

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REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE

GENERAL LOCALITY

QUADRANGLE OR AREA

KINDS OF FOSSILS

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196 m. depth. Green-gray mud, slightly silty; looser, oozy green mud (surface?).

ARGILLOECIA sp. A	1A
PALMANELLA LIMICOLA (Norman, 1865)	1A
	A/J equals 2/0

Sample DC-1-79 EG 31B (MF 5705) is from lat. 58 degrees 18.6 minutes, long. 137 degrees 08.2 minutes, station 078, end of line 108, 154 m. depth. Green-gray silty mud with worm tubes.

PALMANELLA LIMICOLA (Norman, 1865)	4A	
ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	1A,	3J
CYTHEROPTERON sp. D		1J
MUNSEYELLA sp. A	2A	
EUCYTHERURA sp. A		1J
		A/J equals 7/5, 1/0.7

Sample DC-1-79 EG 32B (MF 5706) is from lat. 58 degrees 10.9 minutes, long. 137 degrees 19.8 minutes, station 079, end of line 109, 121 m. depth. Green-gray, silty, foram mud with concentrated layer of pebbles that seemed to be on surface.

CYTHEROPTERON sp. E	1A	
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975		3J
PECTOCYTHERE cf. P. QUADRANGULATA Hanai, 1957	1A	
CYTHEROPTERON sp. F		1J
		A/J equals 2/4, 1/2

also - spicules
echinoderm spines
benthic and planktic foraminifers
worm tubes
gastropods
cyclostome bryozoans a

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8Mb
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

Sample DC-1-79 EG 35 (MF 5707) is from lat. 58 degrees 22.7 minutes, long. 136 degrees 59.9 minutes, station 085, end of line 115, 70 m. depth. Dark, green-black, sandy silt; sand dominated by heavy minerals.

LEGUMINOCYTHEREIS sp. A — 13A, 4J
(all specimens have the chitinous appendages and body still preserved)
A/J equals 13/4, 1/0.3

also - pelecypod fragments
proteinaceous worm tubes

Sample DC-1-79 EG 36 (MF 5708) is from lat. 58 degrees 21.7 minutes, long. 137 degrees 00.7 minutes, station 086, line 116, 111 m. depth. Green mud, slightly silty; looser, green-brown siltier mud at top layer.

ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	2A, 5J
PALMANELLA LIMICOLA (Norman, 1865)	3J
HEMICYTHERURA sp. A (aff. H. sp. A of Valentine, 1976)	1J
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975	1J

A/J equals 2/10, 1/5

also - worm tubes
plant material
benthic foraminifers, some planktic foraminifers
pelecypods, gastropods
diatoms, spicules
fecal pellets

Sample DC-1-79 EG 37 (MF 5709) is from lat. 58 degrees 21.0 minutes, long. 137 degrees 01.5 minutes, station 087, line 116, 137 m. depth. Green mud, very little if any silt; looser green-brown mud at top layer.

ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865) — 2J
A/J equals 0/2 a

X

REPORT ON REFERRED FOSSILS

STRATIGRAPHIC RANGE

GENERAL LOCALITY

QUADRANGLE OR AREA

KINDS OF FOSSILS

REFERRED BY

REPORT PREPARED BY

SHIPMENT NUMBER PAC-79-8Mb

REGION

DATE RECEIVED

STATUS OF WORK

DATE REPORTED

Sample DC-1-79 EG 38 (MF 5710) is from lat. 58 degrees 20.2 minutes, long. 137 degrees 02.3 minutes, station 088, line 116, 159 m. depth. Green mud, very little silt; looser green-brown mud on top.

*ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	2J
BUNTONIA sp. A	1J
CYTHEROPTERON sp. G	1J

A/J equals 0/4

also - agglutinated worm tubes
echinoderm fragments
pelecypods
benthic foraminifers, some planktic foraminifers
some spicules, diatoms
fecal pellets

Sample DC-1-79 EG 39 (MF 5711) is from lat. 58 degrees 19.2 minutes, long. 137 degrees 03.1 minutes, station 089, end of line 116, 173 m. depth. Green mud, little silt, looser, green-brown organic ooze mud on top.

ARGILLOECIA sp. A	4A	
LEGUMINOCYTHEREIS sp. A		1J

A/J equals 4/1

also - pelecypod fragments
arenaceous, benthic foraminifers
proteinaceous worm tubes
echinoderm fragments

Sample DC-1-79 EG 40 (MF 5712) is from lat. 58 degrees 17.2 minutes, long. 137 degrees 01.8 minutes, station 090, line 117, 186 m. depth. Green mud, little silt; looser, green-brown mud on top.

ARGILLOECIA sp. A	1A
PALMANELLA LIMICOLA (Norman, 1865)	3A

A/J equals 4/0 a

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE

GENERAL LOCALITY

QUADRANGLE OR AREA

KINDS OF FOSSILS

REFERRED BY

REPORT PREPARED BY

SHIPMENT NUMBER PAC-79-8Mb

REGION

DATE RECEIVED

STATUS OF WORK

DATE REPORTED

also - benthic and planktic foraminifers
agglutinated and proteinaceous worm tubes
gastropods, pelecypods
diatoms, some spicules
echinoderm fragments
plant material

Sample DC-1-79 EG 41 (MF 5713) is from lat. 58 degrees 15.7 minutes, long. 137 degrees 00.4 minutes, station 091, line 117, 187 m. depth. Green mud; looser green-brown organic ooze mud on surface.

ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	1A
PALMANELLA LIMICOLA (Norman, 1865)	3A, 1J
ARGILLOECIA sp. A	2A, 2J
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1875	1A
HEMICYTHERURA sp. B	1A
CYTHEROPTERON sp. I	1J
unidentified ostracode fragment	

A/J equals 8/4, 2/1

also - diatoms, spicules
pelecypods, gastropod
agglutinated and proteinaceous worm tubes
benthic foraminifers, some planktic foraminifers
some plant material
echinoderm fragments

Sample DC-1-79 EG 42 (MF 5714) is from lat. 58 degrees 13.6 minutes, long. 136 degrees 58.9 minutes, station 092, line 117, 174 m. depth. Green mud with looser green-brown mud on surface.

CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975	1A
EUCYTHERURA sp. A	1A
CLUTHIA CLUTHAE (Brady, Crosskey & Robertson, 1874)	1A

CONTINUED ON PAC-79-8Mc a

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X

STRATIGRAPHIC RANGE	Holocene	SHIPMENT NUMBER	PAC-79-8Mc
GENERAL LOCALITY	Alaska	REGION	G. of Alaska
QUADRANGLE OR AREA		DATE RECEIVED	7/11/79
KINDS OF FOSSILS	Ostracodes	STATUS OF WORK	Complete
REFERRED BY	B. F. Molnia	DATE REPORTED	10/23/79
REPORT PREPARED BY	Elisabeth M. Brouwers		

CONTINUED FROM PAC-79-8Mb

A/J equals 3/0

Sample DC-1-79 EG 43 (MF 5715) is from lat. 58 degrees 12.1 minutes, long. 136 degrees 57.9 minutes, station 093, line 117, 185 m. depth. Green mud; looser green-brown organic ooze mud on top; lots of plant growth, worms.

CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975 — 2A
PECTOCYTHERE cf. P. QUADRANGULARA Hanai, 1957 — 1A
CYTHEROPTERON sp. B — 1A

A/J equals 4/0

Sample DC-1-79 EG 44 (MF 5716) is from lat. 58 degrees 11.0 minutes, long. 136 degrees 57.3 minutes, station 094, end of line 117, 183 m. depth. Green mud, slightly sandy with rock fragments, organics.

CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975 — 4A

A/J equals 4/0

also - echinoderm fragments and spines
benthic foraminifers, some planktic foraminifers
plant material
pelecypod fragments, gastropods
proteinaceous and agglutinated worm tubes
gastropods
some spicules

Sample DC-1-79 EG 45 (MF 5717) is from lat. 58 degrees 14.6 minutes, long. 136 degrees 47.8 minutes, station 095, end of line 118, 119 m. dpeth. Green mud.

ARGILLOECIA sp. A — 2J
FINMARCHINELLA ANGULATA (Sars, 1865) — 4J a

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FORM [illegible]

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8Mc
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

XESTOLEBERIS sp. A (aff. X. DENTATA Schornikov, 1975)	1A	
CYTHERURA sp. B		1J
AURILA sp. A (aff. A. sp. C of Valentine, 1976)	2A,	9J
PONTOCYPRIS sp. A		1J
?AMBOSTRACON sp.		4J
CYTHEROPTERON sp. F		3J
CYTHEROMORPHA sp. A	2A,	1J
CYTHERURA sp. C	4A	
BUNTONIA sp. A		4J
?LOXOCONCHA sp. A		2J
PECTOCYTHERE sp. B	1A	
PSEUDOCYTHERE sp. A	1A	
HEMICYTHERE sp. A		1J
CYTHEROIS sp. A	2A,	1J
HEMICYTHERURA sp. A	5A,	1J
PARADOXOSTOMA sp. B	4A	
PARADOXOSTOMA sp. C	1A,	2J
PALMANELLA LIMICOLA (Norman, 1865)		2J
?LOXOCONCHA sp. B	2A	
PARADOXOSTOMA aff. P. JAPONICUM Schornikov, 1975	1A,	1J
PARADOXOSTOMA aff. P. HONSSUENSIS Schornikov, 1975		4J

A/J equals 26/43, 1/65

also - pelecypods
few echinoderm fragments
diatoms, spicules
lots of plant material
few benthic foraminifers

Sample DC-1-79 EG 46 (MF 5718) is from lat. 58 degrees 13.7 minutes, long. 136 degrees 50.1 minutes, station 096, line 119, 93 m. depth. Green mud, slightly silty.

PECTOCYTHERE sp. C	1A	
?AMBOSTRACON sp.		3J
CLUTHIA CLUTHAE (Brady, Crosskey & Robertson, 1874)	1A	
PALMANELLA LIMICOLA (Norman, 1865)		1J
HEMICYTHERURA sp. A	2A	

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FORM 9-1981 (OCT 1972)

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8Mc
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	5A,	19J
CYTHEROIS sp. A	5A	
FINMARCHINELLA ANGULATA (Sars, 1865)		5J
HEMICYTHERURA sp. B	4A,	1J
BYTHOCYTHERE sp. A		1J
BUNTONIA sp. A		3J
PECTOCYTHERE sp. C		1J
HEMICYTHERE sp. A		1J
CYTHEROPTERON sp. A	1A	
CYTHEROPTERON sp. F	1A,	2J
CYTHEROMORPHA sp. A		17J
AURILA sp. A		6J
EUCYTHERURA sp. B		1J
LOXOCONCHA sp. B		1J
CLUTHIA sp. A	2A	
PARADOXOSTOMA sp. D		1J
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975		2J
PECTOCYTHERE sp. B	1A,	3J
PARADOXOSTOMA aff. P. HONSSUENSIS Schornikov, 1975		1J
PECTOCYTHERE aff. P. QUADRANGULATA Hanai, 1957	1A	
unidentifed Cytherideid		1J
ACUMINOCYTHERE sp.		2J
CYTHEROPTERON sp. B		1J

A/J equals 24/73, 1/3

also - worm tubes
pelecypods, gastropods
echinoderm parts
benthic foraminifers, some plantkic foraminifers
diatoms, some spicules

Sample DC-1-79 EG 47 (MF 5719) is from lat. 58 degrees 12.6 minutes, long. 136 degrees, 53.2 minutes, station 097, line 119, 133 m. depth. Green mud, slightly silty.

PSEUDOCYTHERE sp. A	1A	
EUCYTHERURA sp. A	1A	
PECTOCYTHERE sp. B		2J a

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REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8Mc
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

PECTOCYTHERE aff. P. QUADRANGULATA Hanai, 1957	2A
PARADOXOSTOMA sp. B	2A, 4J
PARADOXOSTOMA aff. P. HONSSUENSIS Schornikov, 1975	1J
ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	1A, 2J
ACUMINOCYTHERE sp.	2J
CYTHEROMORPHA sp. A	1A 11J
CLUTHIA CLUTHAE (Brady, Crosskey & Robertson, 1874)	2J
PECTOCYTHERE cf. P. PARKERAE Swain and Gilby, 1974	1A
?LOXOCONCHA sp. A	2J
ROBERTSONITES TUBERCULATA (Sars, 1865)	1J
?AMBOSTRACON sp.	4J
HEMICYTHERURA sp. A	4J
AURILA sp. A	3J
ARGILLOECIA sp. A	1J
ARGILLOECIA sp. unidentified	3J
LOXOCONCHA sp. B	1J
LOXOCONCHA sp. C	2A
PARADOXOSTOMA sp. E	1J
CYTHEROPTERON aff. C. RARUM Hanai, 1957	1J
CYTHEROPTERON sp. F	2J
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975	4J
PARADOXOSTOMA sp. F	1A
PONTOCYTHERE sp. B	1J
CYTHEROPTERON sp. H	1J

A/J equals 12/53, 1/4.4

Sample BFM-78-1 is from Prince William Sound, lat. 60 degrees, 17 minutes 00 seconds N., long. 148 degrees 21 minutes 00 seconds, Icy Bay, from 20 m. depth. This is an anchor sample taken from the H. M. S. Growler

CYTHEROPTERON sp. F	19A, 23J
PALMANELLA LIMICOLA (Norman, 1865)	3A, 44J
ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)	8J
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975	7A, 34J
LOXOCONCHA sp. C	1J

A/J equals 29/110, 1/38 a

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE

SHIPMENT NUMBER PAC-79-8Mc

GENERAL LOCALITY

REGION

QUADRANGLE OR AREA

DATE RECEIVED

KINDS OF FOSSILS

STATUS OF WORK

REFERRED BY

DATE REPORTED

REPORT PREPARED BY

Sample BFM-2 is from Prince William Sound, lat. 60 degrees 48 minutes 26 seconds, long. 148 degrees 34 minutes 07 seconds, east of Emerald Isle, from 9 m. depth. This is an anchor sample taken from the Growler.

No ostracodes were found in this sample.

also - plant material
pelecypods
benthic foraminifers
echinoderm spine
diatoms

Sample BFM-3 is from Prince William Sound, lat. 60 degrees 58 minutes 20 seconds, long. 147 degrees 04 minutes 58 seconds, station Fye, Heather Island, from 8 m. depth. This is an anchor sample taken from the Growler.

CYTHERE? aff. C. JAPONICA Hanai, 1959 1J
A/J equals 0/1

also - pelecypods
echinoderm spines
barnacle plates
benthic foraminifers

Sample G-4 is from Glacier Bay, north Sandy Cove.

CYTHEROPTERON sp. F		1J	
CYTHERURA sp. B		1J	
ACANTHOCYTHEREIS DUNELMENSIS (Norman, 1865)		2J	
CYTHEROPTERON aff. C. ARCTICUM Neale and Howe, 1975		2J	
SEMICYTHERURA sp. A	1A		
CYTHERURA sp. C	1A		
CYTHERE? aff. C. JAPONICA Hanai, 1959		2J	
CYTHEROPTERON aff. C. RARUM Hanai, 1957		1J	a

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FORM 9-1881 (OCT 1978)

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8Mc
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

LOXOCONCHA sp. A — 1A, 2J

A/J equals 3/11, 1/3.67

The sample from Glacier Bay, 9/11/78, Wachusett Inlet, 25 m. depth, Susil Cove is barren of calcareous microfossils.

Systematics and zoogeography:

As I stated earlier, most of these species are new and undescribed. I will consistently maintain the *species B* or *species A* nomenclature for all of the species in the Gulf of Alaska samples until I formally name and describe them; at that time I will update the reports.

The overwhelming majority of the species and genera occurring in these samples are from Pacific stock. For example, CYTHERE LUTAE has ancestors in the Neogene sediments of Japan and Taiwan. PECTOCYTHERE was described from Japan and has been found promarily in temperate climatic regions of the Pacific Basin; many species occur along the Asian coast and several species along the California coast. *LEGUMINOCYTHEREIS* is also strictly Pacific, with a possible species in California. AUSTRALICYTHERE is a genus that was described from Antarctica, and has been found in mild to cold temperate waters off of Argentina.

Six species also occur in the north Atlantic Pleistocene and Holocene: CYTHERE LUTHEA, PALMANELLA LIMICOLA, *ACANTHOCYTHEREIS* DUNELMENSIS, CLUTHIA CLUTHAE, ROBERTSONITES TUBERCULATA, and FINMARCHINELLA AUGULATA. All of these species occur in the cold temperate through the frigid climatic zones in the Atlantic (see enclosed figure) except CYTHERE LUTAE, which ranges from the mild temperate to subfrigid climatic zones.

The ostracode assemblage represented in these samples is indicative of a cold temperate climatic zone, with summer air temperatures of less than 14 degrees C. and winter temperatures less than 9 degrees C.

CONTINUED ON PAC-79-8Md a

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE	Holocene	SHIPMENT NUMBER	PAC-79-8Md
GENERAL LOCALITY	Alaska	REGION	G. of Alaska
QUADRANGLE OR AREA		DATE RECEIVED	7/11/79
KINDS OF FOSSILS	Ostracodes	STATUS OF WORK	Complete
REFERRED BY	B. F. Molnia	DATE REPORTED	10/23/79
REPORT PREPARED BY	Elisabeth M. Brouwers		

CONTINUED FROM PAC-79-8Mc

PALMANELLA LIMICOLA and AURILA sp. A are similar to forms occurring in the mild to warm temperate climatic zones of California, Washington and Oregon. A temperature change as seen in different climatic zones may separate these related species; if this is the case, a temperature cline may be established.

I cannot indicate yet exactly when or where the western Pacific species migrated to the eastern Pacific basin side. I would guess that they traveled in the temperate climatic zone, possibly along the shallow shelf provided around the Aleutians, following parts of the main North Pacific current across the Pacific. The Pacific forms are all Neogene species and genera, mainly Pliocene and Quaternary. More precise information on this topic is exactly what I am aiming for in the project.

Distribution:

In the samples from DC-1-79 EG, the ostracode species diversity is highest nearshore, in shallow waters. The species diversity and number of individuals drops offshore and in deeper waters, such as the troughs and broad slopes occurring seaward of Dry Bay and Icy Point. The diversity drops faster where there are steep gradients, as off of Icy Point, and more slowly along gentle gradients, as off of Dry Bay.

In the broad gentle slope south-southwest of Dry Bay, the diversity and number of individuals progressively decreases offshore in a regular pattern. In sample 1, the species diversity is 17, with 7 species represented by juveniles only (depth 77 meters). By sample 12 in 251 m. depth, only 4 species are present, with 3 represented by juvenile valves only. This probably reflects selective transport of the smaller, lighter juvenile valves offshore, and they are beginning to accumulate as sample 12. The samples also become more siliceous offshore, with high components of sponge spicules and diatoms, indicating open water, offshore conditions.

The scattered samples around Lituya Bay and La Perouse Glacier have no distinct trend as shown above. The adult/juvenile ratios range from 2/1 to 0/2. Most of the samples have a moderate proportion of siliceous

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REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE

SHIPMENT NUMBER PAC-79-8Md

GENERAL LOCALITY

REGION

QUADRANGLE OR AREA

DATE RECEIVED

KINDS OF FOSSILS

STATUS OF WORK

REFERRED BY

DATE REPORTED

REPORT PREPARED BY

material, indicating open marine conditions.

The region to the southeast of Icy Point has steeper gradients than near Dry Bay. The sample sequence from 35-44 shows progressively fewer juveniles offshore. Samples 42-44 contain no juveniles at all. I believe that this reflects selective transport of the juveniles. Because of the steeper gradient, I would expect to find them further offshore in the trough opposite Cross Sound. Sample 35 contains only one species, *LEGUMINOCYTHEREIS* sp. A. Every single specimen contains the chitinous appendages and body, suggesting that these are in place and were alive when collected. Samples 45-47 have the greatest diversity of any of the samples. Further, all of these samples (35-47) contain little siliceous material and moderate amounts of plant material.

Two samples contain non-marine to marginal marine species. Sample 1 has one valve each of CYPRIDEIS BEACONENSIS and LIMNOCYTHERE sp. Both specimens are yellow and slightly corroded form transport. LIMNOCYTHERE is a non-marine genus - the valve may have come from a nearby river, such as the Alsek River. The CYPRIDEIS valve indicates a brackish water environment-possibly Dry Bay. These two valves are much the worse for wear and may have been transported from a river further away; they also might be from fossil non-marine sediments.

Sample 24 contains a fragment of a non-marine ostracode species, CANDONA sp. This fragment is in very good shape, showing little effect of transportation. The specimen has been transported down a river into the Gulf, presumably from nearby.

Comments:

As for samples BFM-78-1, BFM-3 and G-4, I have given you species lists. These are cold temperate faunas as well. I am not struck by anything out of place. The assemblage may be a little different because of having a different environment within the bays.

I will become more specific as I better define the environmental parameters of these species. I can see indications of sediment dispersal over the shelf in these samples already. a

REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE

GENERAL LOCALITY

QUADRANGLE OR AREA

KINDS OF FOSSILS

REFERRED BY

REPORT PREPARED BY

SHIPMENT NUMBER PAC-78-8Md

REGION

DATE RECEIVED

STATUS OF WORK

DATE REPORTED

Kris McDougall will supplement this report with the foraminifers from the samples.

Samples	Species represented By Adults Only	Juveniles Only	Adult & Juveniles	Total No. of species
DRY BAY				
1	2	7	8	17
5	1	4	0	5
6	1	2	0	3
7	0	4	2	6
9	0	1	0	1
10	1	5	1	7
12	1	3	0	4
ICY POINT				
35	0	0	1	1
36	0	3	1	4
37	0	1	0	1
38	0	3	0	3
39	1	1	0	2
40	2	0	0	2
41	3	1	2	6
42	3	0	0	3
43	3	0	0	3
44	1	0	0	1
45	6	11	6	23
46	7	17	4	28
47	6	18	3	27

a

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REPORT ON REFERRED FOSSILS

X

STRATIGRAPHIC RANGE		SHIPMENT NUMBER	PAC-79-8Md
GENERAL LOCALITY		REGION	
QUADRANGLE OR AREA		DATE RECEIVED	
KINDS OF FOSSILS		STATUS OF WORK	
REFERRED BY		DATE REPORTED	
REPORT PREPARED BY			

EUROPE

CLIMATIC ZONE	BIOGEOGRAPHIC PROVINCE	BOUNDARY
Frigid	Arctic	W. Spitsbergen Novaya Zemlya
Subfrigid	*Transitional*	N. Norway Iceland
Cold Temperate	Norwegian	Shetland Is. Skaggerak
	Caledonian	S. W. Ireland N. England
Mild Temperate	Celtic	Channel Islands
Warm Temperate	Lusitanian @	

Elisabeth M. Brouwers

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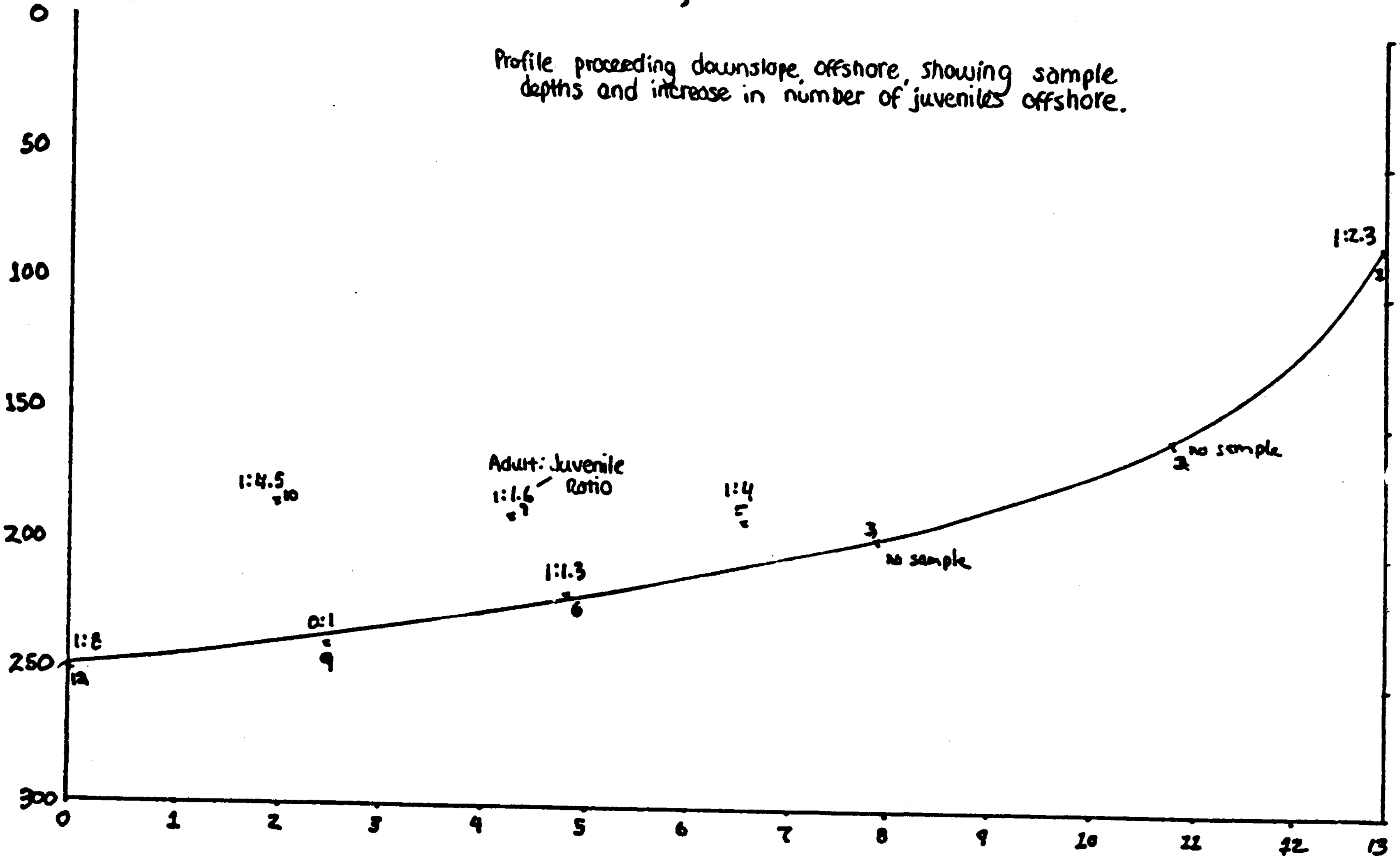
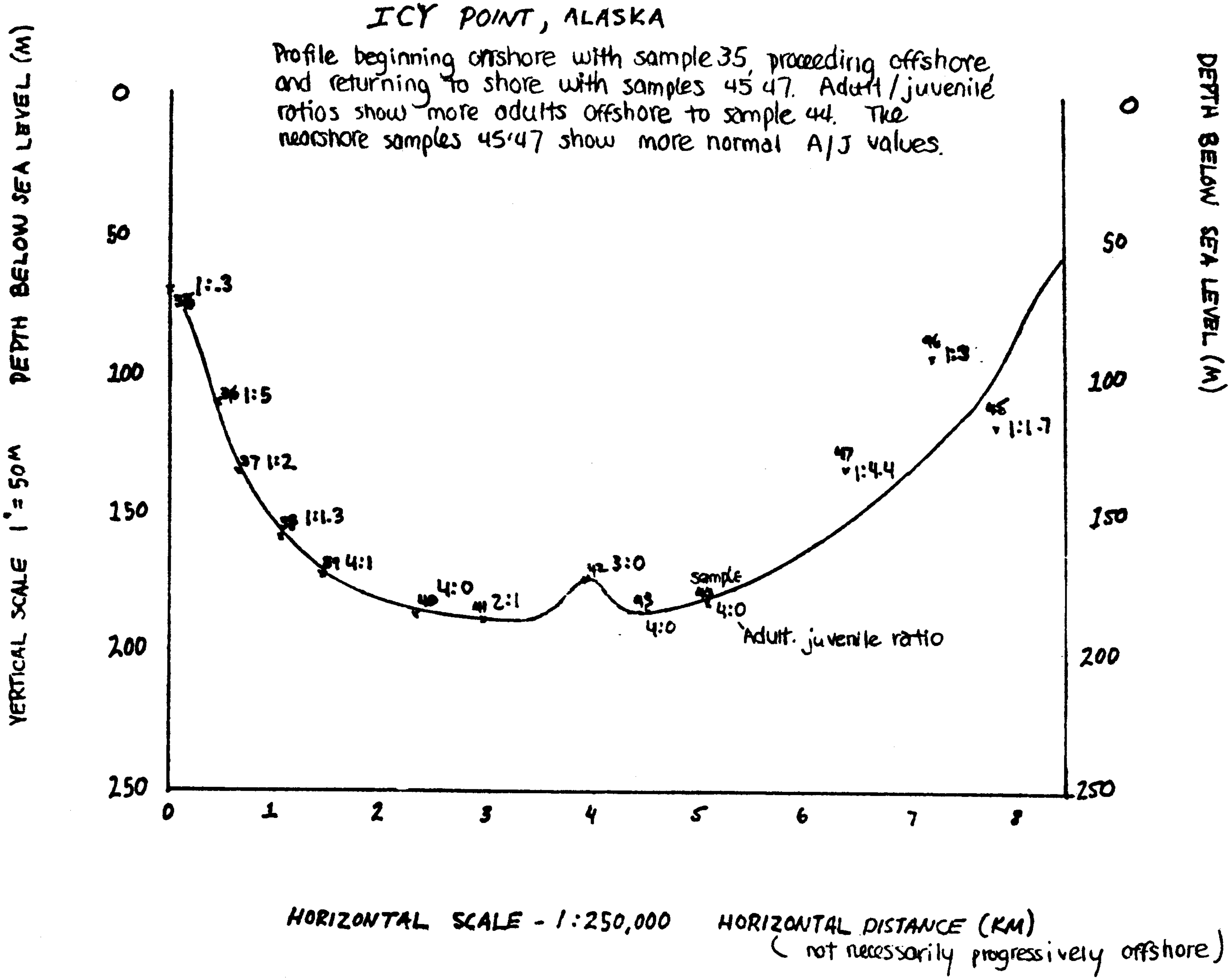
DRY BAY, ALASKA



HORIZONTAL SCALE 1:250,000 HORIZONTAL DISTANCE (KM)


ICY POINT, ALASKA
Profile beginning onshore with sample 35, proceeding offshore and returning to shore with samples 45-47. Adult / juvenile ratios show more adults offshore to sample 44. The nearshore samples 45-47 show more normal A/J values.
DEPTH BELOW SEA LEVEL (M)
VERTICAL SCALE 1" = 50M
0
50
100
150
200
250
1:.3
1:5
1:2
1:1.3
4:1
4:0
2:1
3:0
4:0
sample
4:0
Adult: juvenile ratio
1:4.4
1:3
1:1.7
0
1
2
3
4
5
6
7
8
HORIZONTAL SCALE - 1:250,000
HORIZONTAL DISTANCE (KM)
(not necessarily progressively offshore)

APPENDIX V

DISTRIBUTION OF HOLOCENE OSTRACODES IN THE EASTERN GULF OF ALASKA: A ZOOGEOGRAPHIC, ECOLOGIC, AND BIOSEDIMENTOLOGIC ANALYSIS

ELISABETH M. BROUWERS

U.S. Geological Survey

ABSTRACT

Ninth Arctic Workshop
Institute of Arctic and Alpine Research
University of Colorado
Boulder
1980

DISTRIBUTION OF HOLOCENE OSTRACODES IN THE EASTERN GULF OF ALASKA: A ZOOGEOGRAPHIC, ECOLOGIC, AND BIOSEDIMENTOLOGIC ANALYSIS

Elisabeth M. Brouwers, U.S. Geological Survey, Denver, Colorado

This study is part of a larger project that seeks to establish a modern data base of environmental factors that significantly control or contribute to the distributional patterns of modern ostracodes and foraminifers on the Alaska continental shelf. Existing knowledge of living ostracodes and foraminifers from this region is essentially non-existent, but studies in other areas suggest that such information would form a vital part of the interpretive aspects of Neogene and Quaternary stratigraphic and paleoenvironmental studies in this region. The samples used in this study were collected on a cruise in the eastern Gulf of Alaska during May, 1979, on the NOAA vessel Discoverer, as part of the Outer Continental Shelf project. This project deals with areas of environmental concern to resource development (e.g., accumulation rates of sediments, erosional regions, submarine slides, faults, etc.)

The eastern Gulf of Alaska falls within the cold temperate climatic zone (Aleutian molluscan province of Valentine), and is characterized by mean summer air temperature of less than 14°C. and mean winter air temperatures of less than 8°C. So far, sixty-seven ostracode species have been differentiated, most of them being new species. The vast majority of these species clearly have their origins in the Pacific, but a few (six species) are also known from the North Atlantic Pleistocene and Holocene. This geographic distribution closely parallels the mollusks and emphasizes the paleoclimatic potential of ostracodes.

Within the study area of the eastern Gulf of Alaska, the ostracode species diversity is highest nearshore in shallow water and progressively becomes lower offshore in deeper water or in onshore regions of deeper water (troughs). The species diversity drops faster where there are steep gradients, as off of Dry Bay. In areas containing broad gentle slopes, such as southwest of Dry Bay, the species diversity and number of individuals progressively decreases seaward in a regular, linear pattern. These latter patterns suggest various degrees of ostracode valve transportation from the onshore areas where ostracodes are diverse and common to deeper water where living ostracodes are less common and apparently less diverse. The deeper water facies are therefore a sum of transported shallow water species and deeper water species. This bioclastic distribution of ostracodes is readily seen when the ostracode adult:juvenile ratios are examined. Ostracodes are bivalved crustaceans having incremental growth, with several distinct juvenile stages and one adult stage, with each stage contributing either one carapace or two valves to the sediment. The juvenile stages are more easily transported than the adults, and when the adult:juvenile ratios are plotted for selected troughs or other areas, a consistent pattern of decreasing adult:juvenile ratios emerges. These ostracode sedimentation patterns also correspond to an increase in siliceous organisms (sponges and diatoms) in offshore samples. The fact that the distributional patterns of ostracodes have a sedimentological component as well as an ecologic component, is one of the more interesting results of this study.

APPENDIX VI

DISTRIBUTIONAL PATTERNS OF MODERN OSTRACODE SPECIES FROM THE CONTINENTAL SHELF, GULF OF ALASKA

ELISABETH M. BROUWERS

U.S. Geological Survey

ABSTRACT

Tenth Arctic Workshop
Institute of Arctic and Alpine Research
University of Colorado
Boulder
1981

DISTRIBUTIONAL PATTERNS OF MODERN OSTRACODE SPECIES FROM THE CONTINENTAL SHELF, GULF OF ALASKA

Elisabeth M. Brouwers, U.S. Geological Survey, Denver, Colorado 80225

Several hundred Van Veen, Shipek, and box-core samples of surface sediments from the continental shelf of the Gulf of Alaska were examined for ostracodes. The study area ranges from Montague Island (148° W. latitude) to Lituya Bay (138° W. latitude), encompassing 59°-60° N. longitude. To date, at lease 100 species of ostracodes have been recognized in these samples.

The Gulf of Alaska at present is subdivided into a variety of environments, each defined by particular physical-chemical variables such as water temperature, depth and depth-related factors, salinity, sediment influx, substrate, bathymetric features, currents, and wave action. Each environment contains a characteristic ostracode assemblage or biofacies that has a distinct geographic distribution corresponding to the distribution of major physical-chemical parameters. Five biofacies are recognized on the basis of preliminary results: a) shallow nearshore sand, b) middle neritic, c) outer neritic, d) Icy Bay, and e) Pleistocene lag.

Ambient water temperature is the fundamental physical-chemical parameter that controls ostracode distribution. Temperature affects species distribution in two ways- by limiting survival and by controlling reproduction and larval development. Species extend north and south to regions where survival or repopulation minimum or maximum temperatures are reached. These maximum and minimum temperatures form the end limits that define the latitudinal range of a species. Within the latitudinal range of an ostracode species, a second zonation can be defined based on depth-related changes. Ostracodes do not respond to depth directly, but rather to environmental factors that change with depth (ie., salinity, bottom temperature, turbulence, turbidity, substrate, light intensity, dissolved gases, and nutrient supply).

Recognition of these biofacies and their primary limiting physical-chemical parameters forms a vital part of the interpretive aspects of Neogene and Quaternary stratigraphic and paleoenvironmental studies of the Gulf of Alaska Province.

APPENDIX VII

PRELIMINARY REPORT ON OSTRACODE ASSEMBLAGES FROM THE NORTHEAST GULF OF ALASKA CONTINENTAL SHELF

ELISABETH M. BROUWERS

IN PRESS, 1980 ALASKA ACCOMPLISHMENTS CIRCULAR,
U.S. GEOLOGICAL SURVEY CIRCULAR 844

Preliminary report on ostracode assemblages from the northeast Gulf of Alaska continental shelf

By Elisabeth M. Brouwers

This study is part of a U.S. Geological Survey program to determine regions and processes of possible environmental concern to resource development in the Gulf of Alaska. A baseline datum is being established of the environmental factors that significantly control or contribute to the distributional patterns of modern ostracode species occurring on the continental shelf of the eastern gulf, from Montague Island (148° W.) to Yakutat Bay (140° W.).

The Gulf of Alaska today consists of a variety of habitats, defined by chemical and physical parameters such as water temperatures, depth and depth-related factors, salinity, sediment influxes, bathymetric features, and current and wave patterns. Biofacies are characterized by distinct assemblages of ostracode species which respond to a particular set of physical-chemical conditions. Preliminary results delineate four biofacies in the eastern Gulf of Alaska: a) middle to outer neritic, b) Icy Bay, c) Pleistocene lag, and d) shallow nearshore sand (see Figure 1).

Typical of the middle to outer neritic biofacies are the assemblages found east of Pamplona Ridge, where water depths are 86-300 m. The lithology typifying this biofacies consists of olive-green mud overlying gray mud, corresponding to the glacial marine clayey silt and silty clay facies of Molnia and Carlson (1980). The ostracodes that define this biofacies include: "Acanthocythereis," Cytheropteron spp., Palmanella, Krithe, "Buntonia", Eucytherura, Munseyella, Cytheromorpha, and Robertsonites. Associated organisms include benthic and planktic foraminifers (dominated by Cassidulina and planktic forms), pelecypods, agglutinated and proteinaceous

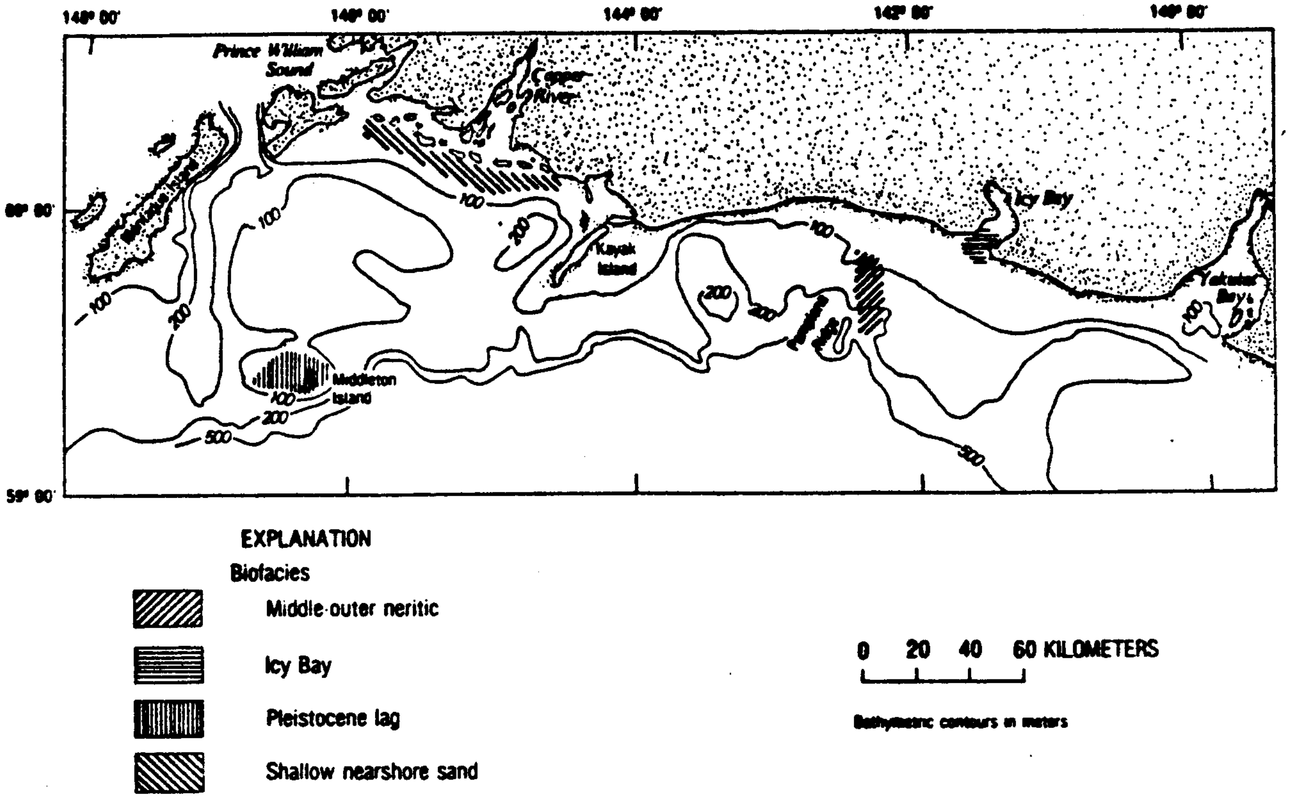


Figure 1. Map of northeast Gulf of Alaska illustrating ostracode biofacies (modified from Carlson et al., 1977).

worm tubes, echinoderm fragments, and some siliceous material (sponge spicules, diatoms, and radiolarians). At progressively greater depths, the amount of siliceous material increases and the amount of material larger than 75 um decreases.

Three lithologies characterize Icy Bay: a) Holocene morainal material with coarse gravel, sand, and stiff clay, b) fine sand, and c) Holocene glacial marine greenish-gray mud. The morainal material is found in water depths of 23-34 m at the mouth of and outside of Icy Bay. Fine sand occurs in water depths of 31-34 m, just west of Point Riou. The greenish-gray mud occurs inside of the bay mouth in water depths of 41-67 m, and includes abundant diatoms and worm tubes; this mud represents the sediment type that is presently being deposited in Icy Bay. A distinct assemblage of species occurs in Icy Bay. The ostracode biofacies, defined by the following forms, is nearly the same in all three lithologies: Cytheropteron spp., Loxoconcha, Semicytherura, and Hemicytherura. Associated organisms include rare benthic foraminifers (Elphidium, Quinqueloculina, Florilus, and Epistominella), pelecypods, cheilostome bryozoans, and diatoms. Cirriped plates, and echinoderm spines, are also present.

Pleistocene lag deposits occur on bathymetric highs, where currents and wave action winnow out the fine-grained glacial sediments leaving rounded cobbles, gravel, and shell debris, with some sandy silt. The ostracode assemblage occurring in these lag deposits, reflecting a mixture of mild temperate to subfrigid climates and faunas, includes: Sclerochilus, "Australicythere," Finmarchinella spp., Pectocythere spp., Bythoceratina, Cytheropteron spp., Hemicytherura, Aurila, Acuminocythere, Hemicythere, Munseyella, Cythere spp., Loxoconcha spp., Semicytherura, Xestoleberis, Krithe, Argilloecia, Bairdia, Eucythere, Robertsonites, "Acanthocythereis", Palmanella, Baffinicythere, Pseudocythere, Eucytherura, and Cytheromorpha. Associated organisms include abundant encrusting and erect cheilostome bryozoans, brachiopods, pelecypods, gastropods, cyclostome bryozoans, benthic foraminifers, some planktic foraminifers. Sponge spicules, and echinoderm fragments are also present. The area around Middleton Island, which lies in shallow water (43-63 m depth) is typical of the lag deposit facies.

Samples of shallow nearshore sand occurring offshore of the Copper River barrier islands yield a characteristic ostracode fauna. This is a region of active longshore drift where the sediments consist of well-sorted, dark, fine sand (the littoral and nearshore sand facies of Molnia and Carlson, 1980). Water depths above these sediments range from 18-34 m. Ostracodes characteristic of this biofacies include: Hemicythere, Cythere, Pectocythere, Cytheromorpha, Eucythere, Loxoconcha, Aurila, Cytheropteron, and "Cytheretta." Associated organisms include pelecypods, and occasional benthic foraminifers. Agglutinated worm tubes, plant debris, and echinoderm fragments are also present. The benthic foraminifer fauna, which is typical of shallow-water regions, includes Elphidium, Quinqueloculina, Florilus, Cassidulina, and Biloculina.

Recognition of biofacies and their primary limiting physical-chemical conditions is important because the appearances and local extinctions that record changes in environment (at the biofacies level) in Neogene and Quaternary sediments in the gulf of Alaska must be distinguished from phylogenetic changes (that is, first appearance, evolution, and final extinction).

REFERENCES CITED

Carlson, P. R., Molnia, B. F., Kittelson, S. C., and Hampson, J. C., Jr., 1977, Map of distribution of bottom sediments on the continental shelf, northern Gulf of Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-876, various scales, 2 sheets.

Molnia, B. F., and Carlson, P. R., 1980, Quaternary sedimentary facies on the continental shelf of the northeast Gulf of Alaska, in Field, M. E., and others, Quaternary depositional environments of the Pacific Coast: Society of Economic Paleontologists and Mineralogists, Pacific Coast Paleogeography Symposium 4, v. 4, p. 157-168.

APPENDIX VIII

PALEOENVIRONMENTAL ANALYSIS OF THE OSTRACODES OCCURRING IN QUATERNARY SEDIMENTS FROM CORES TAKEN NEAR ICY BAY

ELISABETH M. BROUWERS

IN PRESS, 1981 ALASKA ACCOMPLISHMENTS CIRCULAR
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PALEOENVIRONMENTAL ANALYSIS OF THE OSTRACODES OCCURRING IN QUATERNARY SEDIMENTS FROM CORES TAKEN NEAR ICY BAY

by Elisabeth M. Brouwers

The continental shelf south of Icy Bay is a region of contrasting offshore sedimentation rates, ranging from areas of non-deposition near Cape Yakataga to areas with sedimentation rates of up to 18 mm per year (Molnia et. al., 1980). This study examined the ostracode faunas occurring in four cores from this region (fig. 1) with several goals in mind: (a) to establish whether the cores in the area of high sedimentation rates could be correlated; (b) to determine if any climatic cycles are present that are comparable to the high resolution onshore dendrochronology records; (c) to determine the Holocene/Pleistocene boundary in the core taken off Cape Yakataga; and (d) to establish whether any major geotechnical trends are paralleled by faunal trends.

Initial sample sizes and vertical spacing of samples were limited by availability of material from the cores; consequently, all of the ostracode assemblages contain small numbers of individuals. The ostracode fauna from each sample was tabulated and compared to the distinct depth assemblages I have determined for the modern ostracode faunas in this region.

The cores were taken in water depths of 82-156 meters, which incorporates the middle neritic (50-100 m) and outer neritic

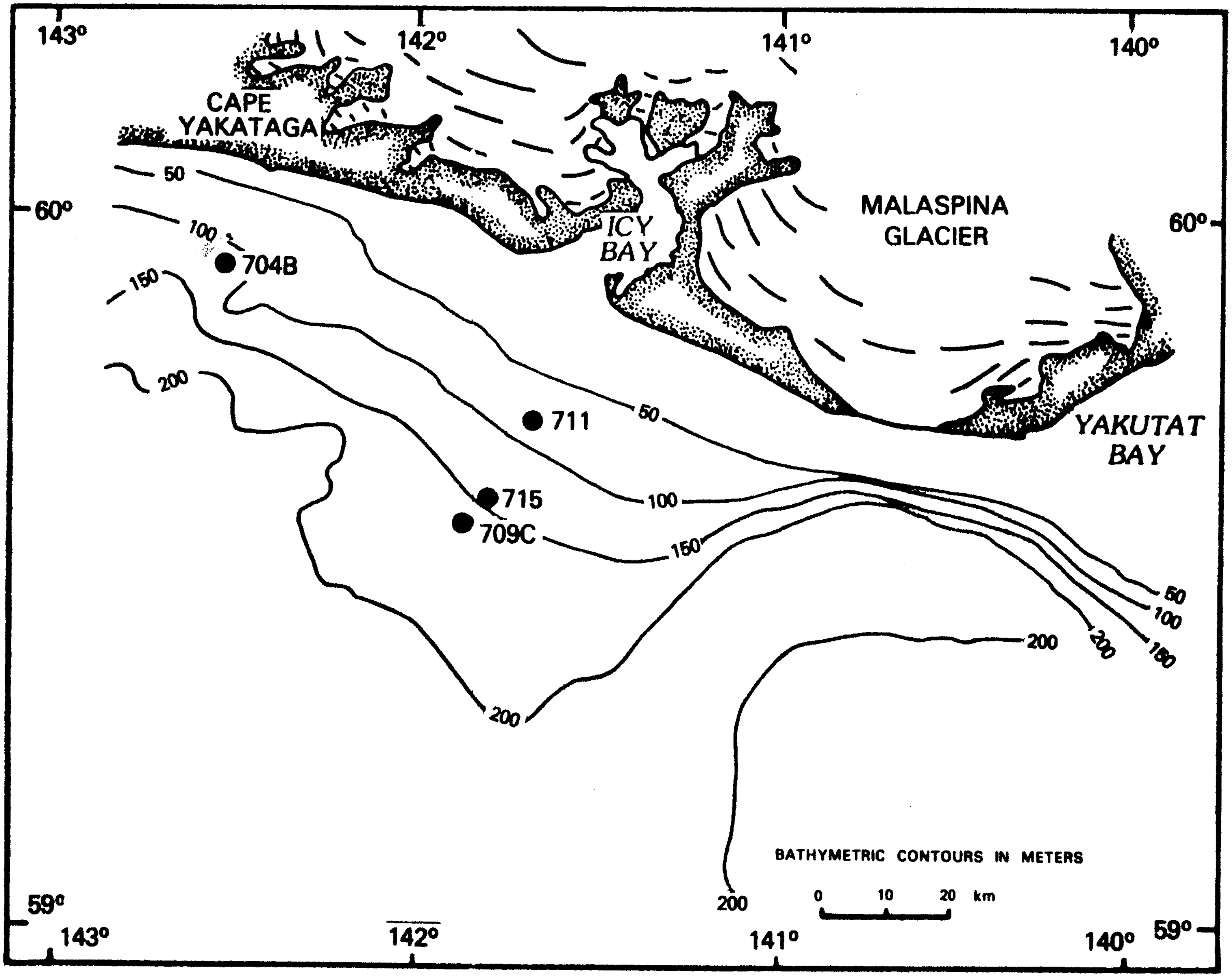


Figure 1. Location of gravity cores examined (modified from Carlson et. al., 1978).

(100-200 m) depth zones. The present environmental conditions for the middle neritic depths is one of moderate annual bottom temperature variation (2°-8° C.) and slight bottom salinity variation (31-32 0/00) (Royer, 1975). In contrast, the outer neritic zone is slightly more stable, with maximum annual temperature variations of 2°-6° C., though primarily from 2°-4° C., and salinity maintaining about 32 0/00. Winter downwelling and storms further cause an overturn of low temperature surface waters to the bottom.

The ostracode faunas from cores 709C, 711, and 715 have been interpreted to represent two components. The first component (termed Component A) consists of a fauna that presently lives in this region in an environment of deeper middle neritic to shallow outer neritic conditions. In addition, a large number of inner neritic ostracode species occur in this component. Some of these species are probably living at the edge of their habitat, while other specimens are being transported in by downslope sediment movement. The transportation aspects are well illustrated by the selective movement of the lighter, smaller juvenile specimens (Brouwers, 1980). Component A comprises the upper part of cores 709C, 715 and 704, and all of core 711 (fig. 2).

The second aspect (Component B) consists of an ostracode fauna that lives today primarily in outer neritic depths, where the annual temperature range is reduced and summer maximum temperatures are lower. Aspects of the shallower neritic depths are greatly reduced and may be largely accounted for by offshore transport and by species living at the edge of their habitats.

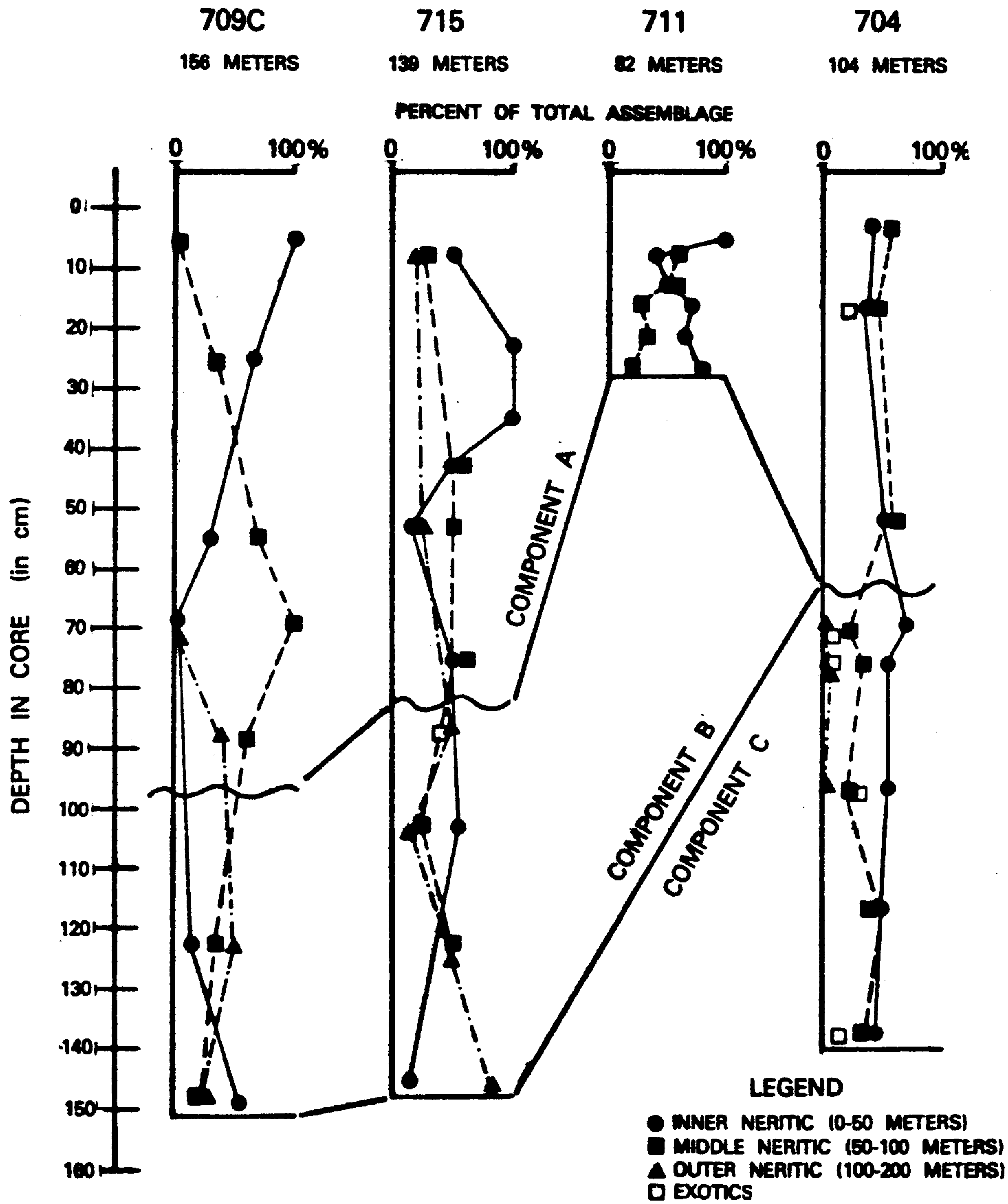


Figure 2. Stratigraphic distribution of the ostracode faunas plotted as a percentage of the total sample. The wavy lines indicate the approximate boundary between the different assemblages. The solid lines connecting the cores mark correlation of similar faunas. Water depths of the cores is given below the core number.

Component B ocurs at the bottom of cores 709C and 715. This subtle change in fauna can be interpreted to represent a different thermal regime than that which exists today. The difference could be due to either colder temperatures or less variable annual temperature ranges.

High resolution climatic cycles (on the order of the 50 year cycles determined by dendrochronology) were not observed in the cores. This is interpreted to be due to two factors; first, the sample sizes were too small to make the desired larger, and more representative, counts of the ostracode populations. Secondly, and more important, the offshore environment is more ameliorated compared to the onshore cycles. The mixing by current systems and winds and the large water masses involved do not respond as quickly to smaller scale changes in seasonal climates, especially in depths of greater than 100 meters. A better area to look for these changes in the marine record is in shallow bays. Unfortunately, nearly all of the bays in the Gulf of Alaska have short (less than 100 years) records because of the presence of more advanced glaciers and consequent bottom scouring in the past century.

Core 704 was subsampled because it was taken in an area of non-deposition, and the liklihood of the Holocene/Pleistocene boundary occurring in the core was very good. The upper part of the core can be correlated in terms of similar environment with Component A of the other three cores. Below this are a number of ostracode species that have not been documented to date as living today in the Gulf of Alaska, and are interpreted as being fossil (i.e., extinct in this region) (Component C). These fossil species have been found in colder environments such as the south Bering Sea. In addition, a lower sedimentation rate is indicated by the greater number of adult versus juvenile specimens, especially when compared to the other three cores. Based primarily on the presence of the fossil species, and to a lesser extent the appearance of a change of preservation of the specimens, this lower interval of the core suggests that older, probably Pleistocene, sediments are present, dating from an environment with colder water conditions.

REFERENCES

Brouwers, E.M., 1980, Distribution of Holocene Ostracodes in the Eastern Gulf of Alaska: A Zoogeographic, Ecologic, and Biosedimentologic Analysis (abs.): University of Colorado, Institute of Arctic and Alpine Research, Arctic Workshop, 9th Boulder, CO, 1980, p. 5-6.

Carlson, P.R., Levy, W.P., Molnia, B.F., and Hampson, J.C., 1978, Geotechnical Properties of Sediments from the Continental Shelf South of Icy Bay, Northeastern Gulf of Alaska: U.S. Geological Survey Open-File Report 78-1071, 29 p.

Molnia, B.F., Levy, W.P., and Carlson, P.R., 1980, Map Showing Holocene Sedimentation Rates in the Northeastern Gulf of Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-1170, Scale 1:500,000.

Royer, T.C., 1975, Seasonal Variations of Waters in the Northern Gulf of Alaska: Deep-Sea Research, v. 22, p. 403-416.

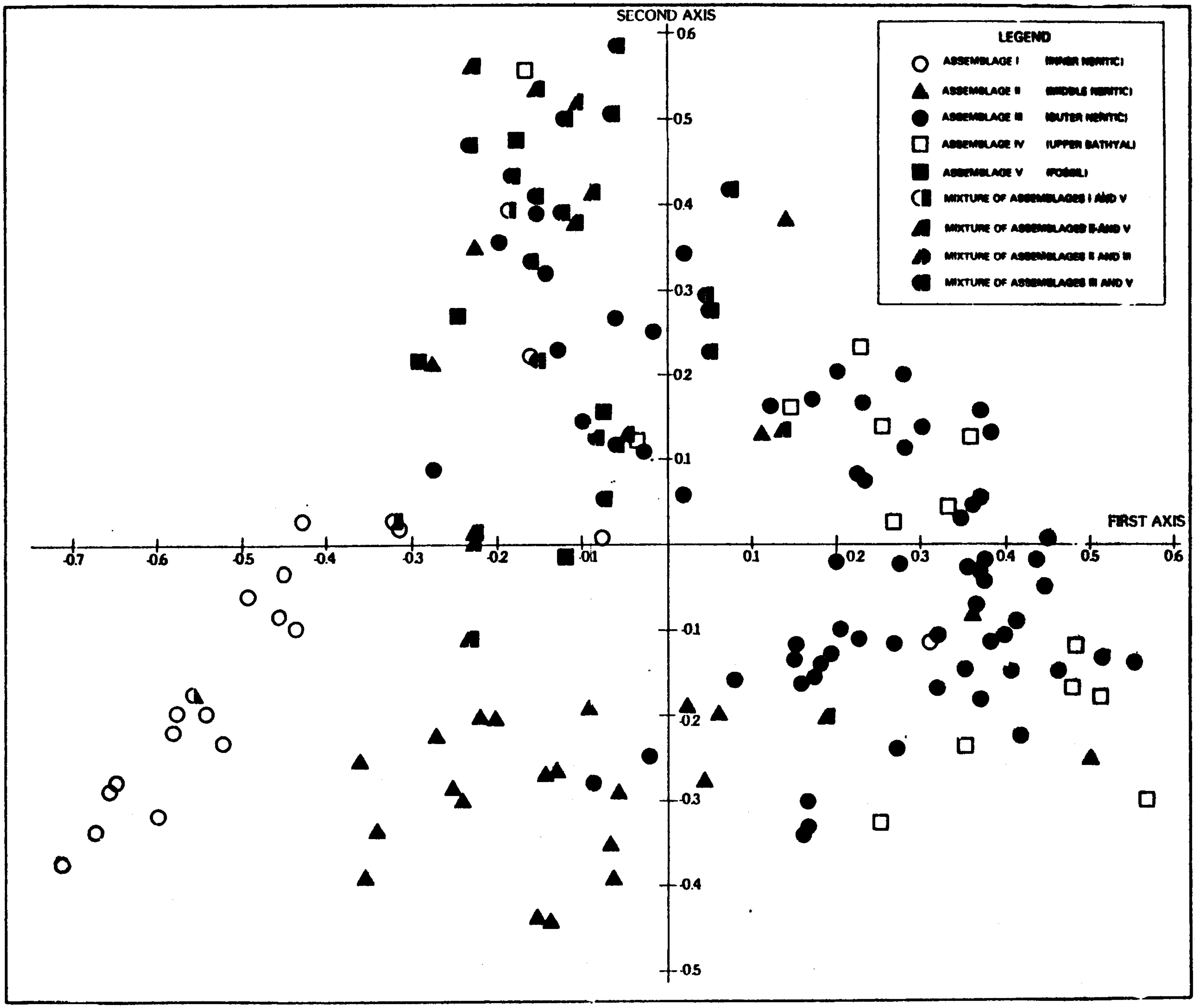
APPENDIX IX

PRINCIPAL COORDINATE ANALYSIS OF SELECTED BOTTOM GRAB SAMPLES FROM CRUISE EGAL-75-KC

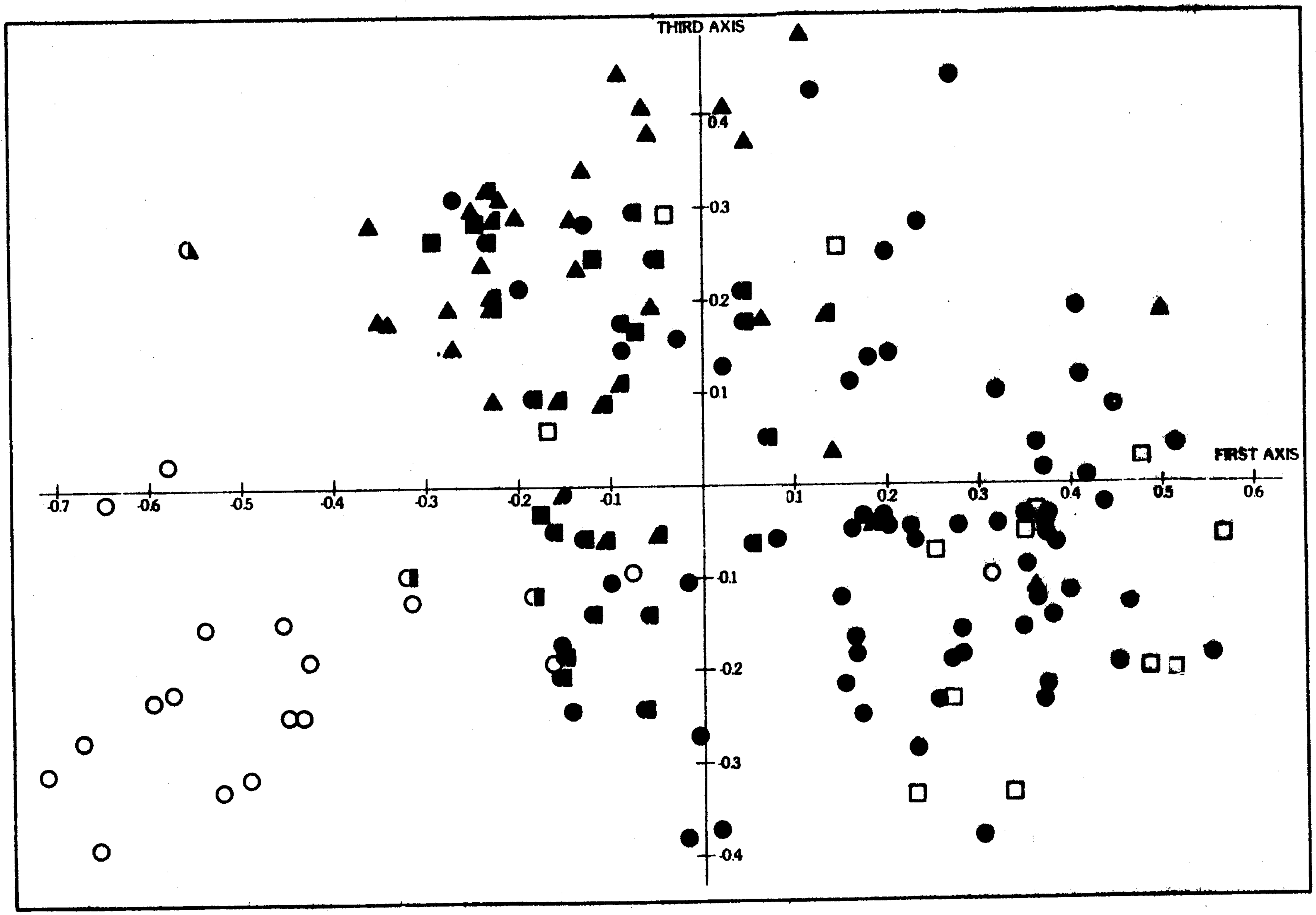
PLOTS OF FIRST AND SECOND AXES AND OF FIRST AND THIRD AXES

ELISABETH M. BROUWERS

SUBMITTED FOR PUBLICATION AS U.S. GEOLOGICAL SURVEY
MISCELLANEOUS FIELD STUDIES MAP



SECOND AXIS
FIRST AXIS
LEGEND
ASSEMBLAGE I (INNER NERITIC)
ASSEMBLAGE II (MIDDLE NERITIC)
ASSEMBLAGE III (OUTER NERITIC)
ASSEMBLAGE IV (UPPER BATHYAL)
ASSEMBLAGE V (FOSSIL)
MIXTURE OF ASSEMBLAGES I AND V
MIXTURE OF ASSEMBLAGES II AND V
MIXTURE OF ASSEMBLAGES II AND III
MIXTURE OF ASSEMBLAGES III AND V

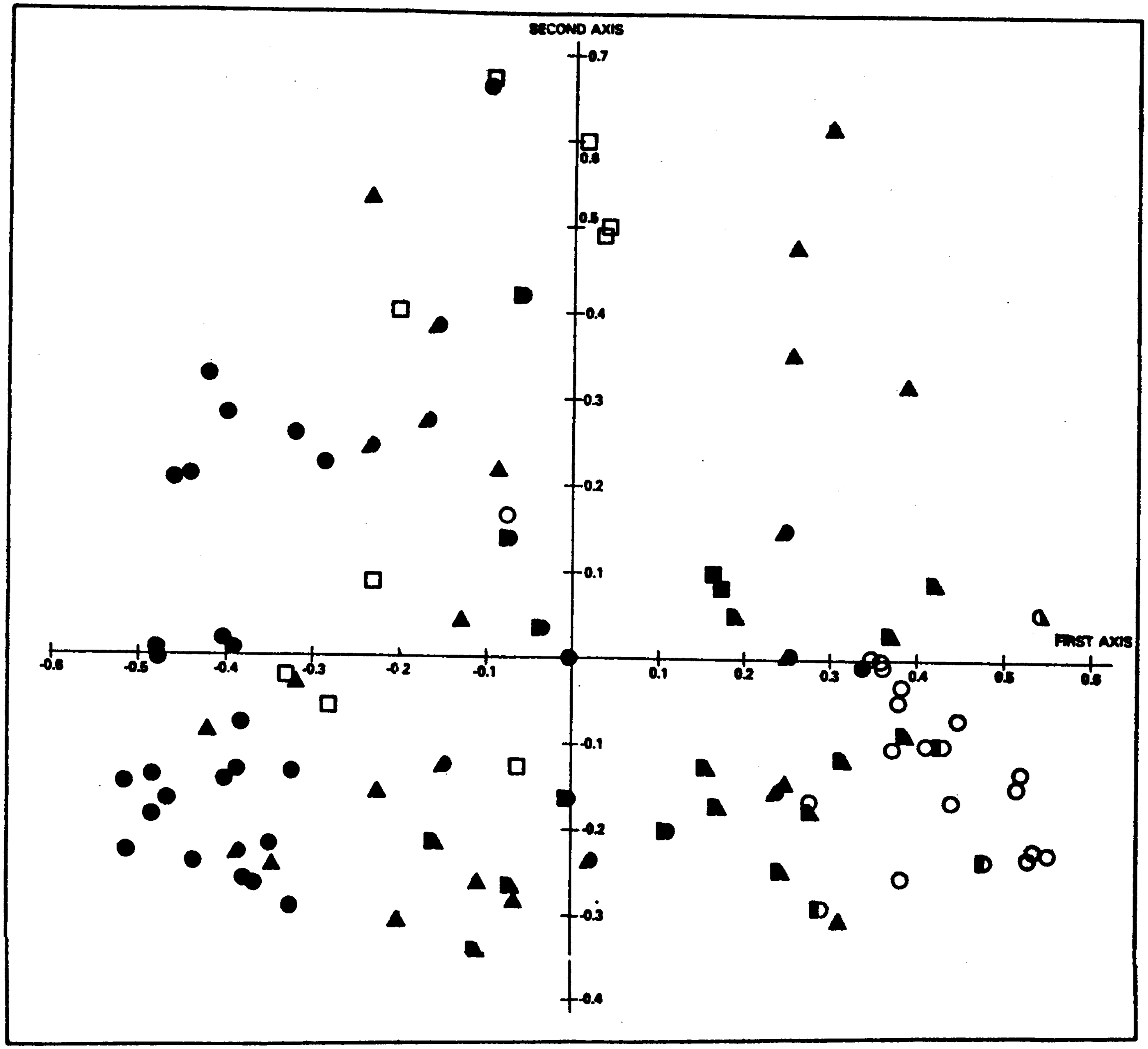

THIRD AXIS
FIRST AXIS
-0.7 -0.6 -0.5 -0.4 -0.3 -0.2 -0.1 0.1 0.2 0.3 0.4 0.5 0.6
0.4 0.3 0.2 0.1 -0.1 -0.2 -0.3 -0.4

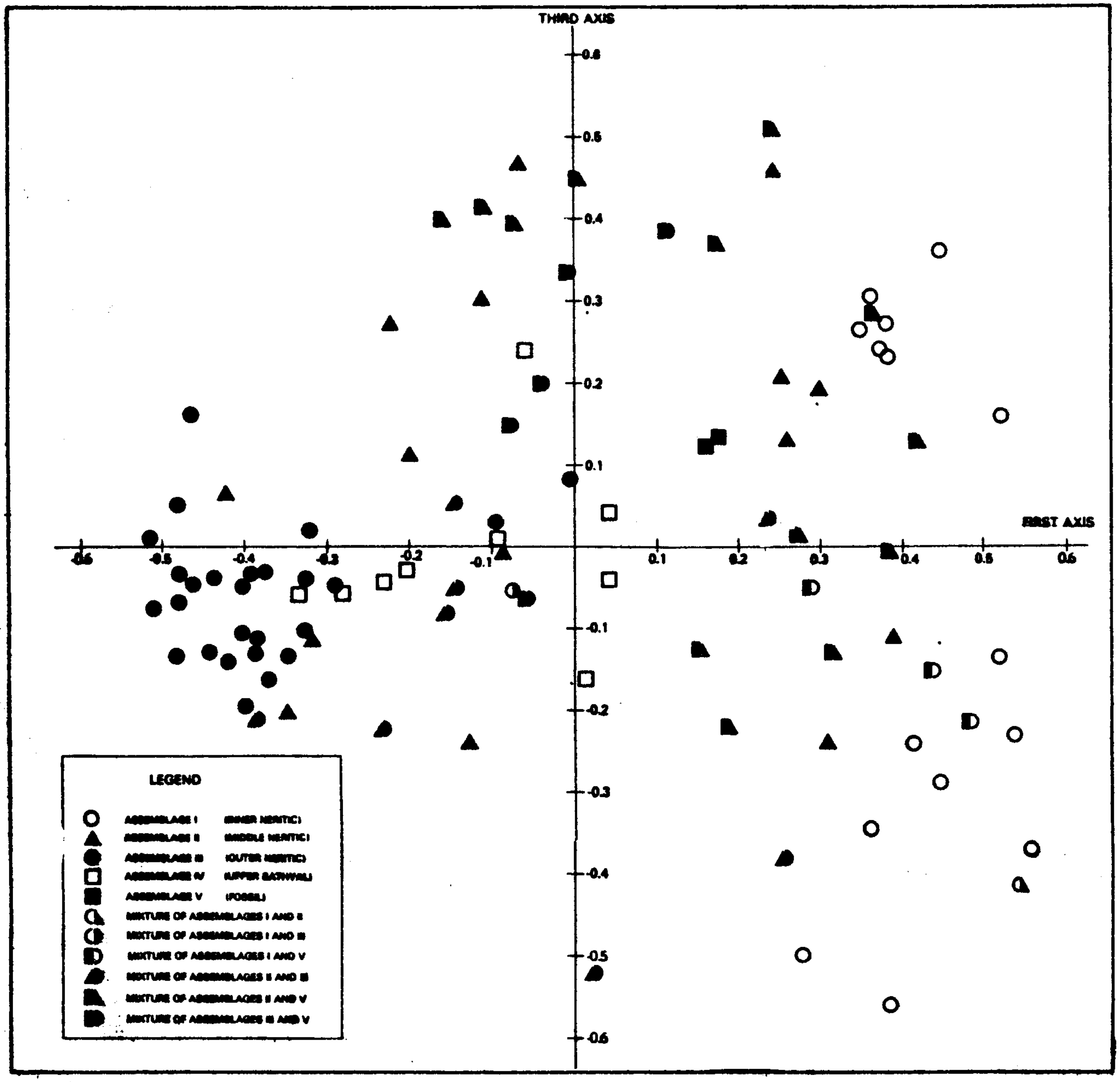
APPENDIX X

PRINCIPAL COORDINATE ANALYSIS OF SELECTED BOTTOM GRAB SAMPLES
FROM CRUISES EGAL-75-KC, DC1-79-EG AND DC2-80-EG

ELISABETH M. BROUWERS

SUBMITTED FOR PUBLICATION AS U.S. GEOLOGICAL SURVEY
MISCELLANEOUS FIELD STUDIES MAP


SECOND AXIS
FIRST AXIS
0.7
0.6
0.5
0.4
0.3
0.2
0.1
-0.1
-0.2
-0.3
-0.4
-0.6
-0.5
-0.4
-0.3
-0.2
-0.1
0.1
0.2
0.3
0.4
0.5
0.6

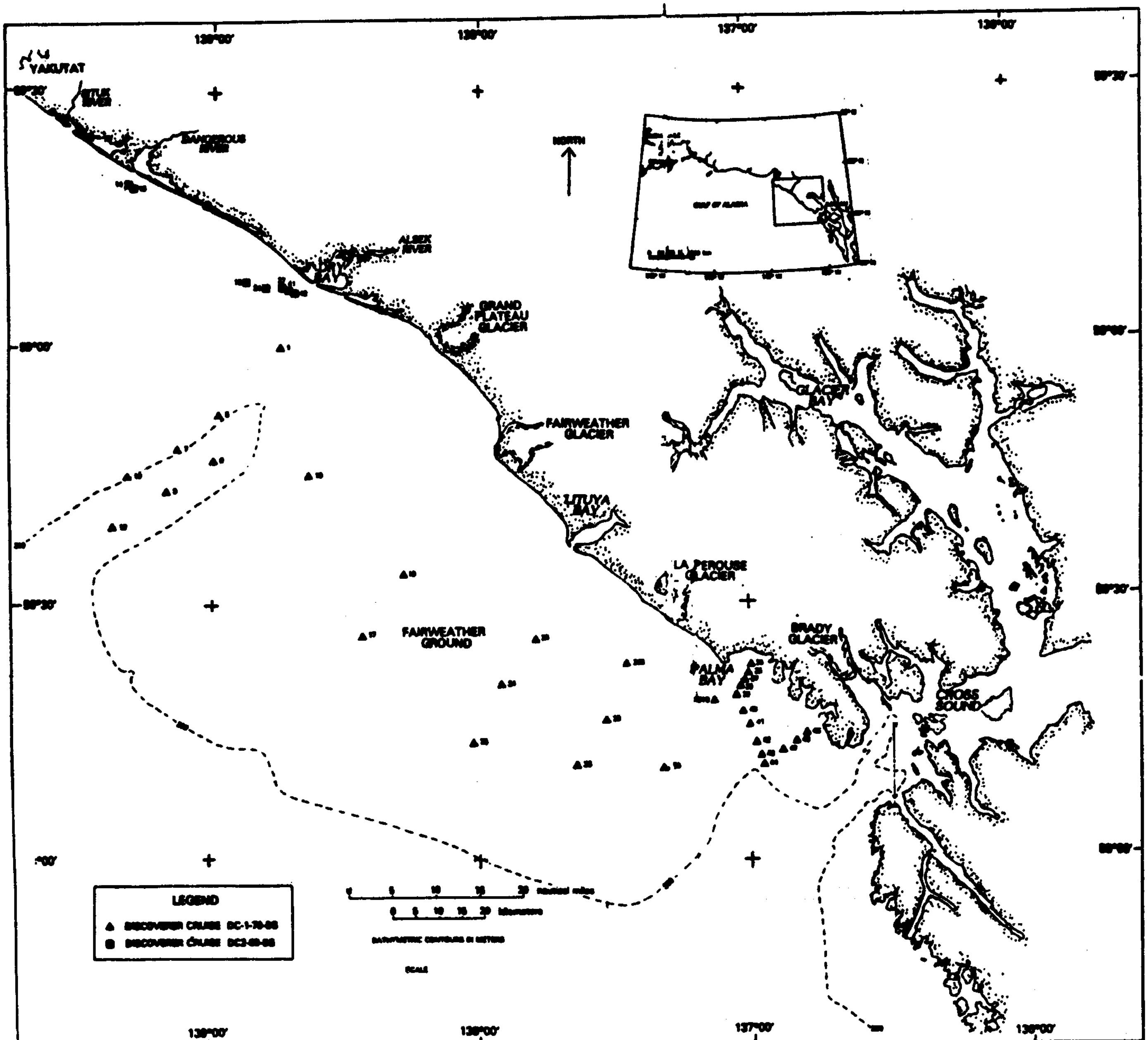

THIRD AXIS
FIRST AXIS
0.6
0.5
0.4
0.3
0.2
0.1
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
LEGEND
ASSEMBLAGE I (INNER NERITIC)
ASSEMBLAGE II (MIDDLE NERITIC)
ASSEMBLAGE III (OUTER NERITIC)
ASSEMBLAGE IV (UPPER BATHYAL)
ASSEMBLAGE V (FOSSIL)
MIXTURE OF ASSEMBLAGES I AND II
MIXTURE OF ASSEMBLAGES I AND III
MIXTURE OF ASSEMBLAGES I AND V
MIXTURE OF ASSEMBLAGES II AND III
MIXTURE OF ASSEMBLAGES II AND V
MIXTURE OF ASSEMBLAGES III AND V

APPENDIX XI

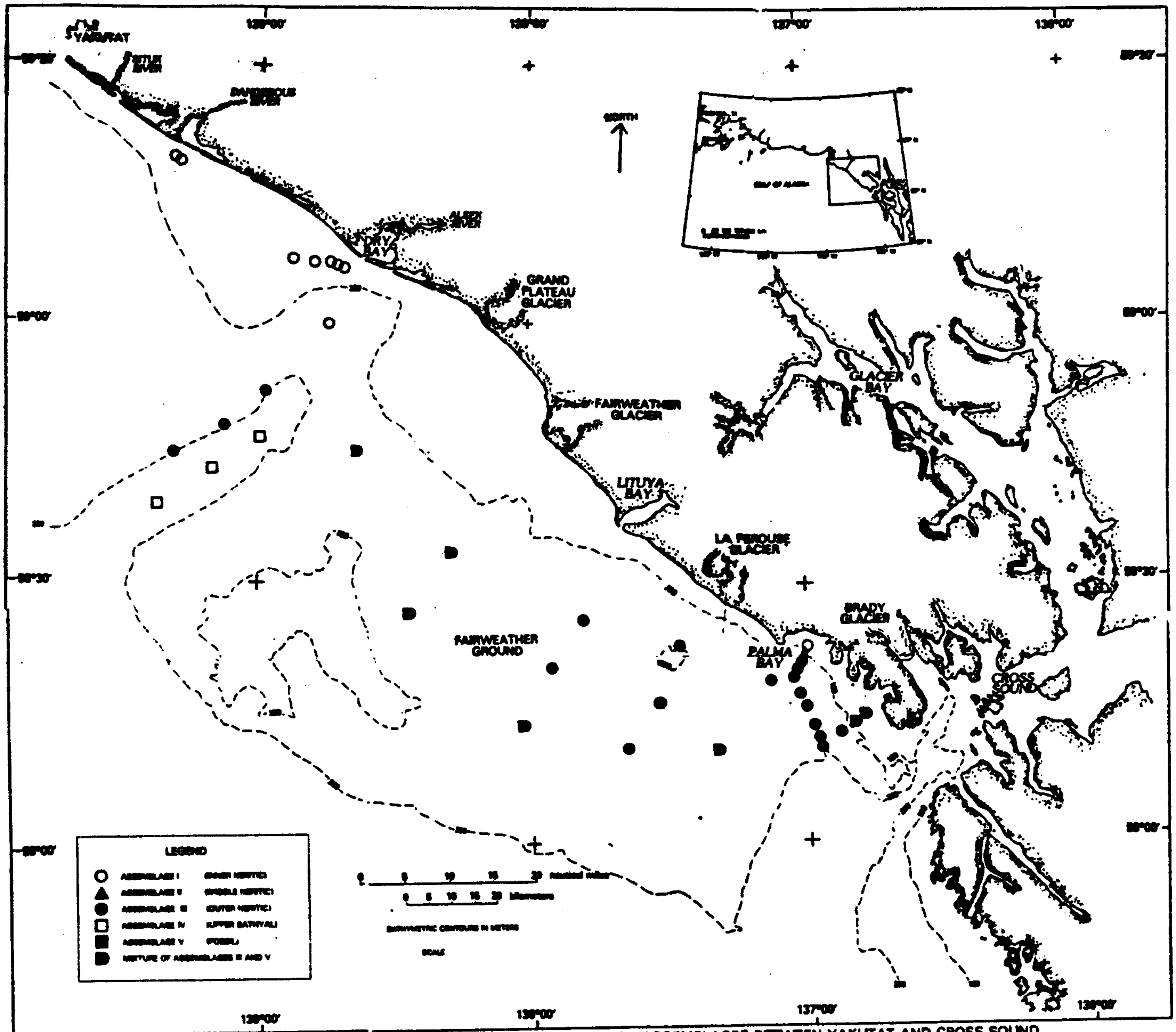
MAPS SHOWING DISTRIBUTION OF BOTTOM GRAB SAMPLES EXAMINED AND THE CORRESPONDING AREAL DISTRIBUTION OF THE FIVE MAJOR OSTRACODE ASSEMBLAGES BETWEEN YAKUTAT AND CROSS SOUND

ELISABETH M. BROUWERS

SUBMITTED FOR PUBLICATION AS U.S. GEOLOGICAL SURVEY MISCELLANEOUS FIELD STUDIES MAP



MAP SHOWING DISTRIBUTION OF BOTTOM GRAB SAMPLES EXAMINED BETWEEN YAKUTAT AND CROSS SOUND



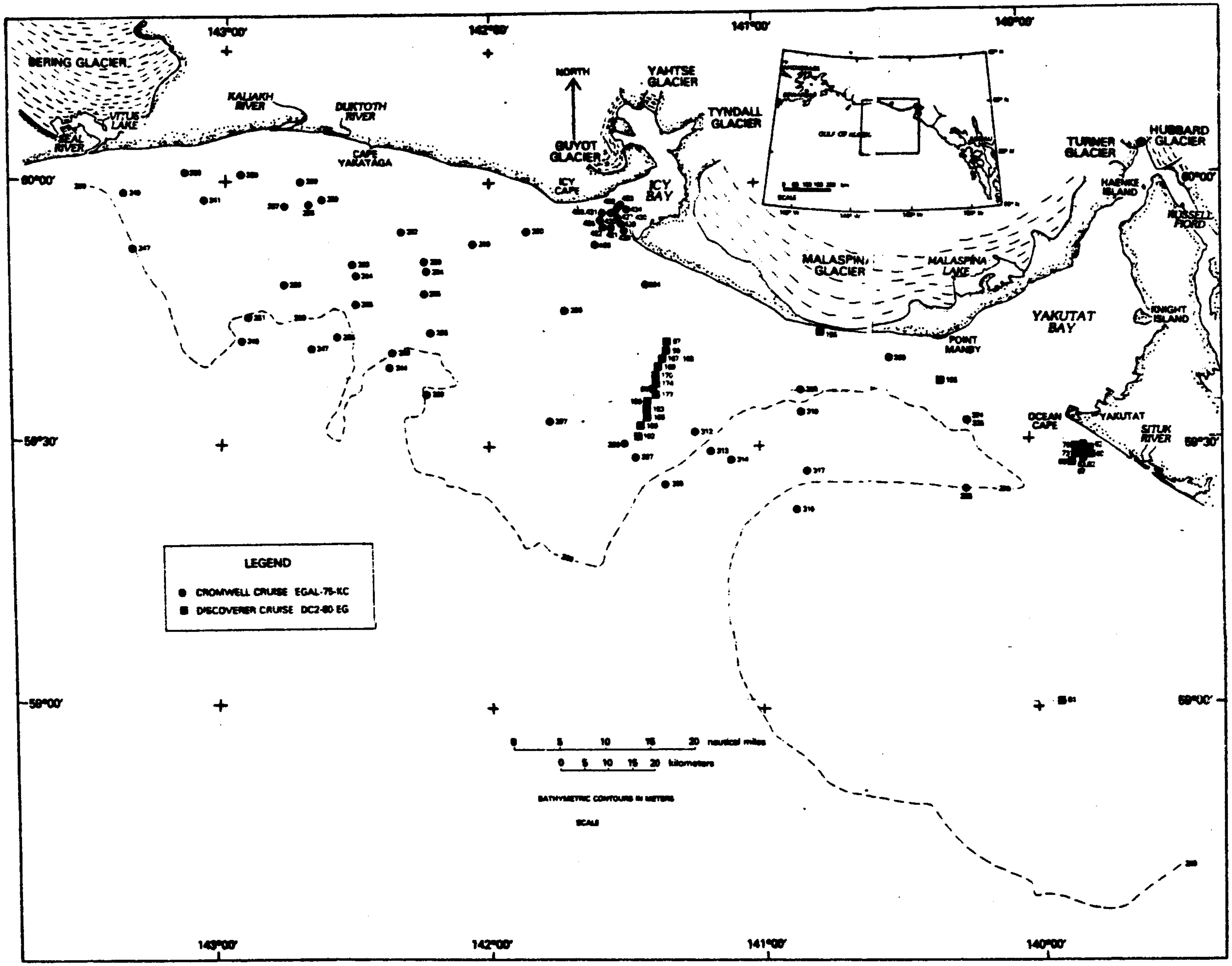
MAP SHOWING AREAL DISTRIBUTION OF THE FIVE MAJOR OSTRACODE ASSEMBLAGES BETWEEN YAKUTAT AND CROSS SOUND

APPENDIX XII

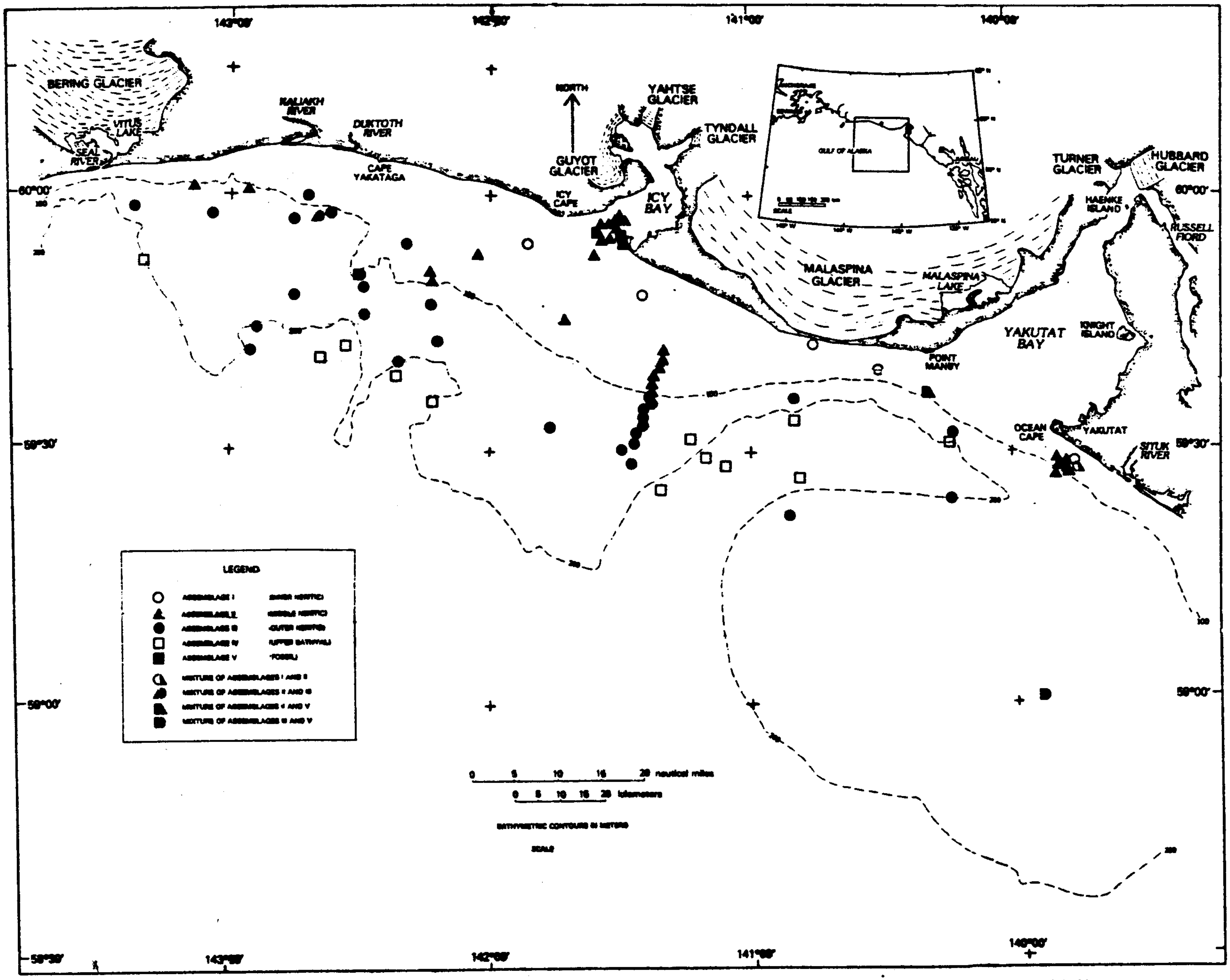
MAPS SHOWING DISTRIBUTION OF BOTTOM GRAB SAMPLES EXAMINED AND THE CORRESPONDING AREAL DISTRIBUTION OF THE FIVE MAJOR OSTRACODE ASSEMBLAGES BETWEEN BERING GLACIER AND YAKUTAT BAY

ELISABETH M. BROUWERS

SUBMITTED FOR PUBLICATION AS U.S. GEOLOGICAL SURVEY
MISCELLANEOUS FIELD STUDIES MAP



MAP SHOWING DISTRIBUTION OF BOTTOM GRAB SAMPLES EXAMINED BETWEEN BERING GLACIER AND YAKUTAT BAY



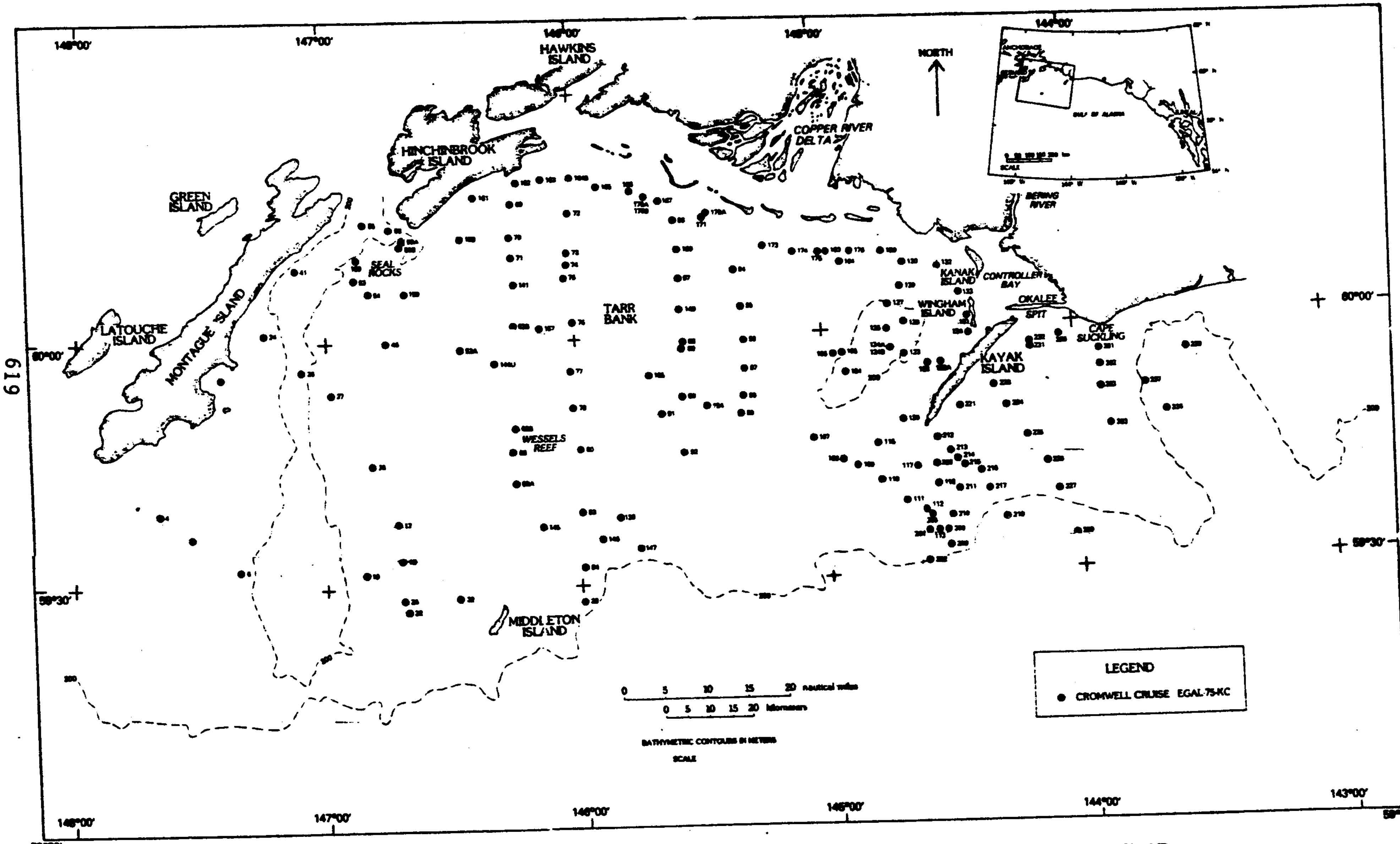
MAP SHOWING AREAL DISTRIBUTION OF THE FIVE MAJOR OSTRACODE ASSEMBLAGES BETWEEN BERING GLACIER AND YAKUTAT BAY

APPENDIX XIII

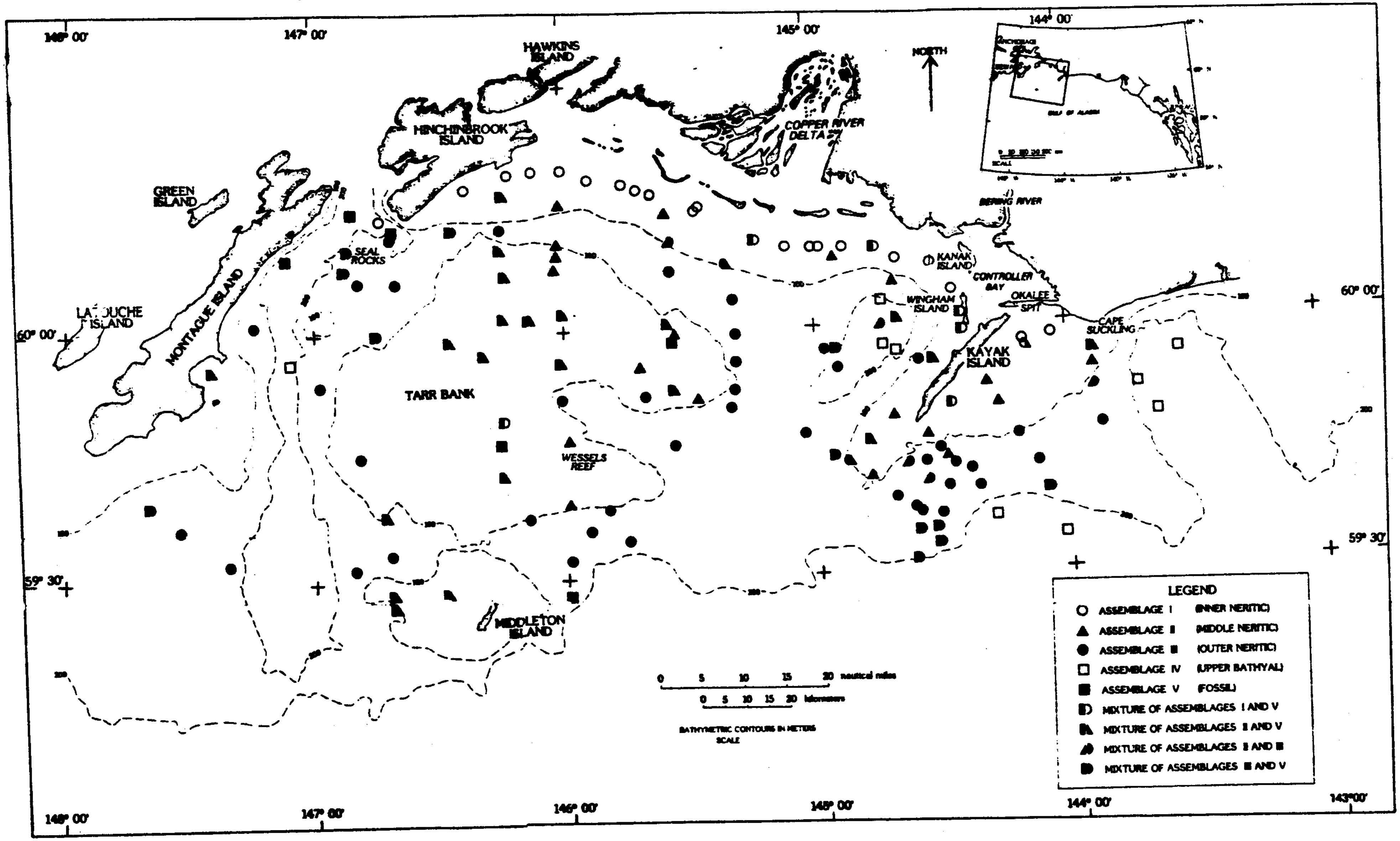
MAPS SHOWING DISTRIBUTION OF BOTTOM GRAB SAMPLES EXAMINED AND THE CORRESPONDING AREAL DISTRIBUTION OF THE FIVE MAJOR OSTRACODE ASSEMBLAGES BETWEEN MONTAGUE ISLAND AND KAYAK ISLAND

ELISABETH M. BROUWERS

SUBMITTED FOR PUBLICATION AS U.S. GEOLOGICAL SURVEY
MISCELLANEOUS FIELD STUDIES MAP



MAP SHOWING DISTRIBUTION OF BOTTOM GRAB SAMPLES EXAMINED BETWEEN MONTAGUE ISLAND AND KAYAK ISLAND



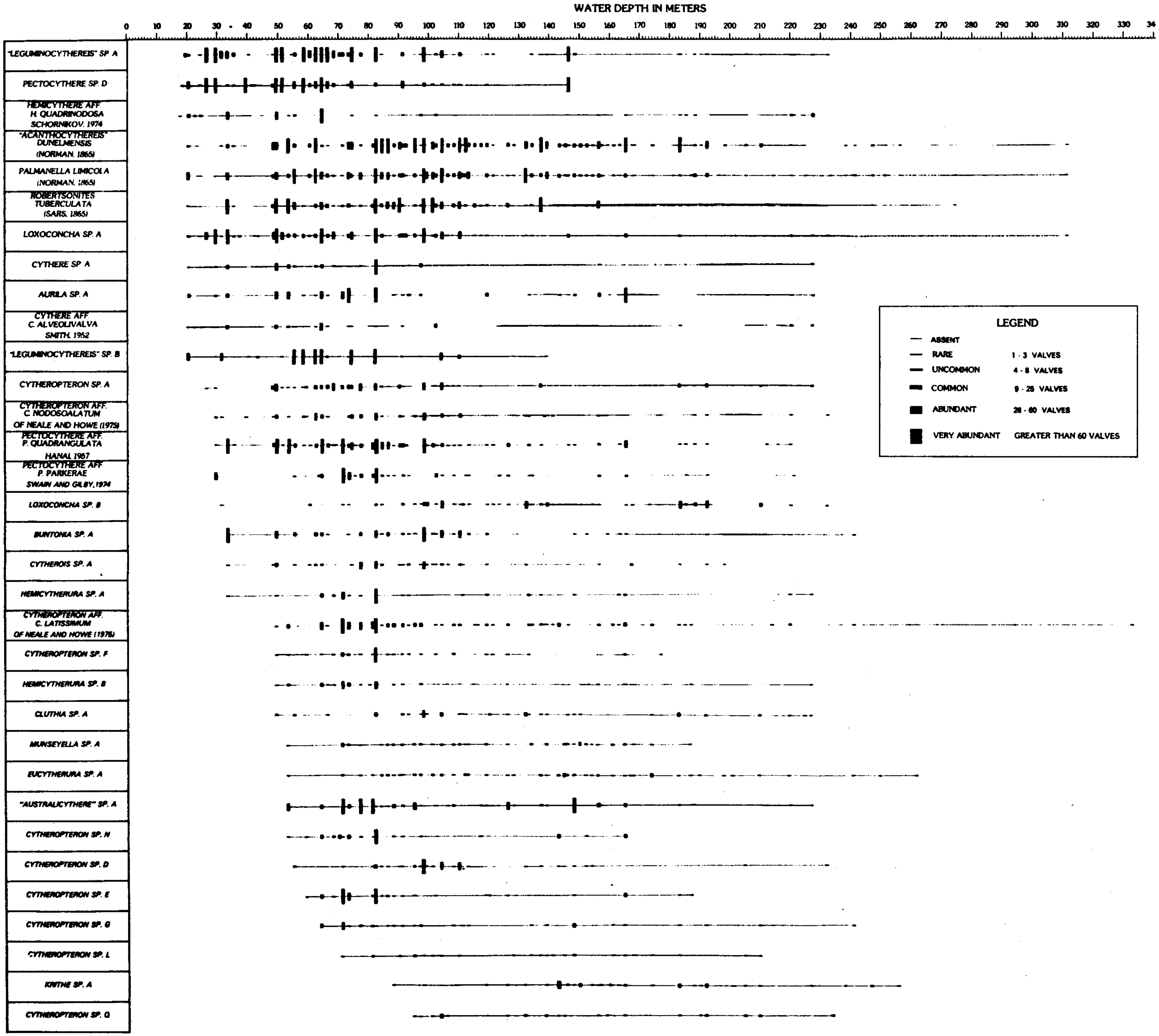
MAP SHOWING AREAL DISTRIBUTION OF THE FIVE MAJOR OSTRACODE ASSEMBLAGES BETWEEN MONTAGUE ISLAND AND KAYAK ISLAND

APPENDIX XIV

PLOT OF THE 33 MOST COMMON OSTRACODE SPECIES -
ABUNDANCE VERSUS WATER DEPTH

ELISABETH M. BROUWERS

PLOT OF THE 33 MOST COMMON OSTRACODE SPECIES - ABUNDANCE VERSUS WATER DEPTH



APPENDIX XV

PRELIMINARY ANALYSIS OF THE MICROFAUNA FROM SELECTED BOTTOM GRAB SAMPLES, SOUTHERN BERING SEA

ELISABETH M. BROUWERS AND KRISTIN MCDOUGALL

IN PRESS, 1981 ALASKA ACCOMPLISHMENTS CIRCULAR,
U.S. GEOLOGICAL SURVEY CIRCULAR

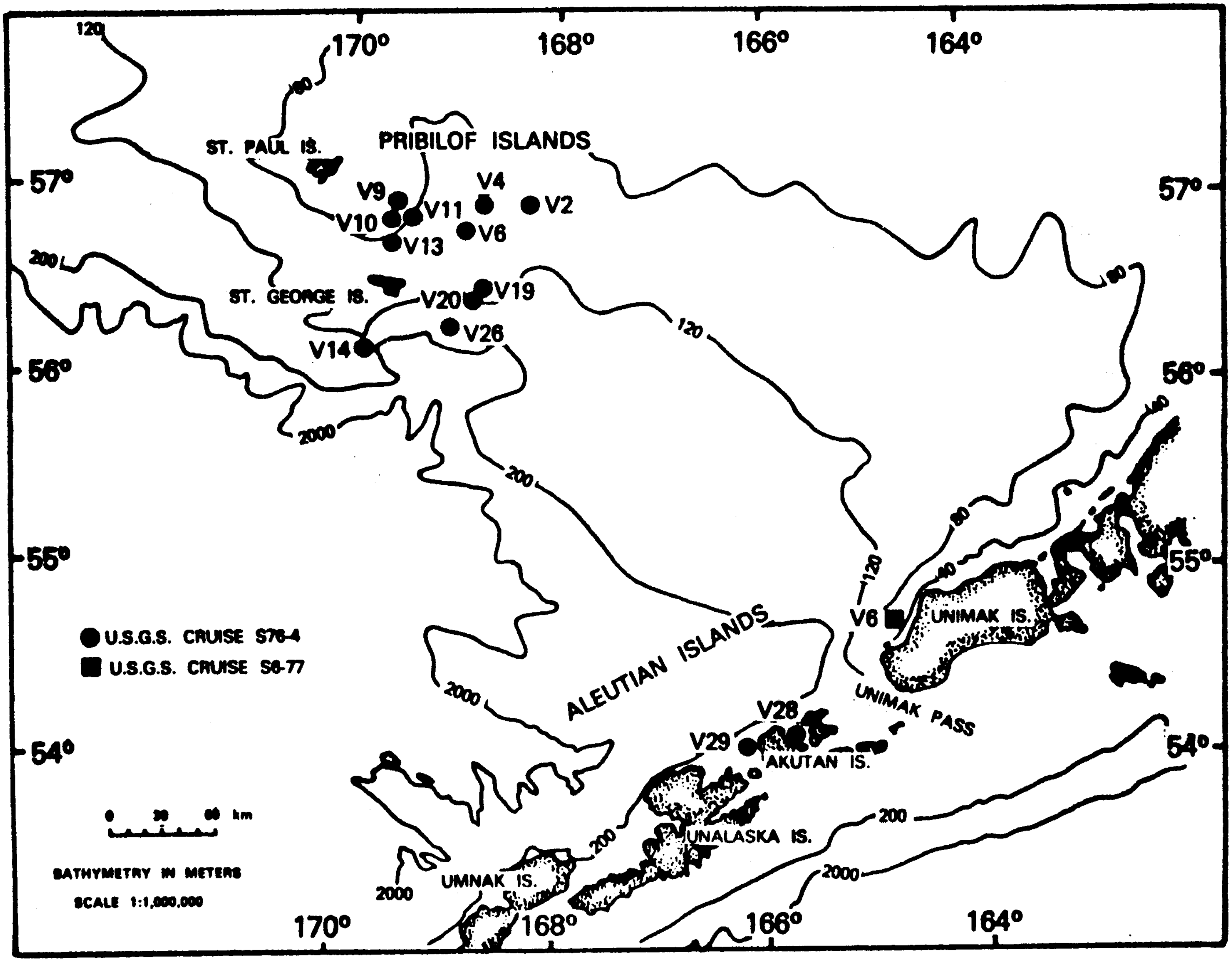
PRELIMINARY ANALYSIS OF THE MICROFAUNA FROM SELECTED BOTTOM GRAB SAMPLES, SOUTHERN BERING SEA

by Elisabeth Brouwers and Kristin McDougall

The ostracode and foraminifer faunas were examined from fourteen Van Veen samples taken from the continental shelf adjacent to the Pribilof Islands and the Aleutian Islands (fig. 1). These faunas represent two distinct assemblages, one from the Pribilof Islands and the second from the Aleutians Islands.

The Pribilof Island assemblage contains a mixture of species presently living in the region and fossil species representing a cooler environment. Endemic ostracode species are "*Acanthocythereis*" *dunelmensis*, "*Leguminocythereis*" sp. D, *Pectocythere* aff. *P. quadrangulata*, and *Krithe* sp. Based on their modern geographic ranges, these species indicate a cold temperate to subfrigid marine climate; the Pribilof Islands today has a mean sea surface temperature range of +1° C to +9° C. Since no organic stains were used, living and fossil benthic foraminifers are difficult to determine in the Pribilof Island samples. *Buliminella elegantissima*, *Elphidiella hannai*, *Nonionella puchella Trichohylinus columbiensis*, and *T. ornatissima* probably represent the living fauna. These benthic foraminiferal species indicate shallow, cold temperate waters and agree with the ostracode data. These occurrences near the Pribilof Islands represent the northern limits of the cold temperate ostracode and foraminifer ranges.

The fossil species lived in colder water conditions than different, colder thermal regime for the Pribilofs during the time of deposition. *Elphidium clavatum* is the principal indicator of fossil species and the cold

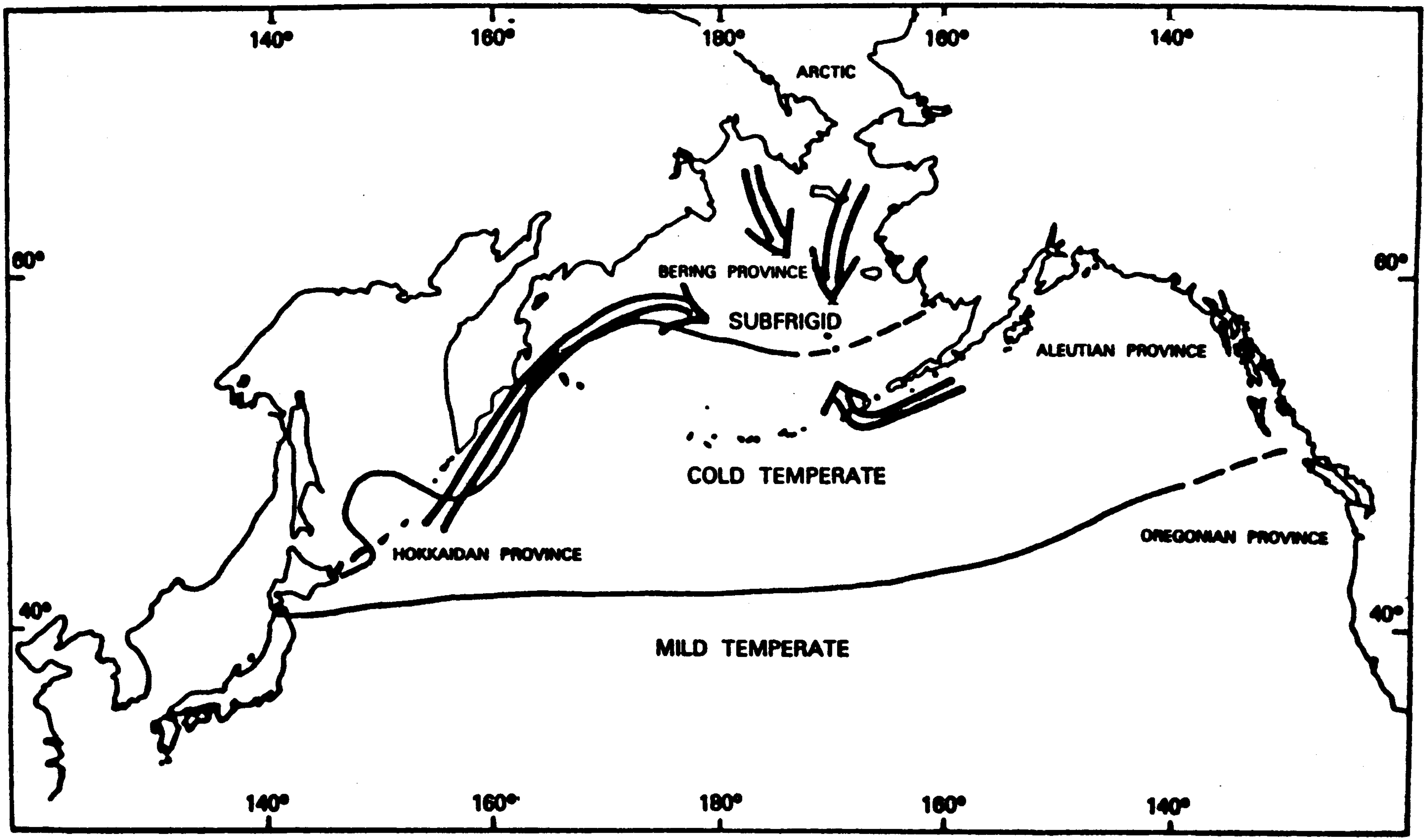

170°
168°
166°
164°
57°
56°
55°
54°
120
80
200
2000
40
PRIBILOF ISLANDS
ST. PAUL IS.
ST. GEORGE IS.
V2
V4
V6
V9
V10
V11
V13
V14
V19
V20
V26
V28
V29
ALEUTIAN ISLANDS
UNIMAK IS.
UNIMAK PASS
AKUTAN IS.
UNALASKA IS.
UMNAK IS.
U.S.G.S. CRUISE S76-4
U.S.G.S. CRUISE S6-77
0 30 60 km
BATHYMETRY IN METERS
SCALE 1:1,000,000

Arctic waters. The mixture of modern temperate species with Arctic species supports previous interpretations that the shelf sediments near the Pribilof Islands are relict in nature, mixed modern elements.

The Aleutian Island ostracode assemblages consist entirely of fossil species. The ostracode fauna in these samples is interpreted to consist of a mixture of three components, representing three distinct zoogeographic provinces (fig. 2). The first component is thought to be a shallow water assemblage of cold temperate species from the Aleutian Province, which extends today from near Vancouver Island to Bristol Bay. A large number of phytal forms (Pontocypris, Sclerochilus, Paracytherois, Paradoxostoma, and Xestoleberis) indicates deposition within the photic zone. Several of the cold temperate indicators are known to be living in the Gulf of Alaska and the Pribilof Islands.

A second component is represented by species that are very similar to western Pacific faunas from the cold temperate Hokkaido Province. The ostracodes are congeneric with ostracode assemblages occurring along Japan and the Kuril Islands (for example, Finmarchinella [Barentsovia], Bythocytheromorpha, and Pectocythere). Because so few Quaternary microfaunas have been documented from the western Pacific, it is difficult to determine whether the forms are conspecific.

A third group of species has a modern distribution in colder waters (subfrigid to frigid marine climates) than is currently present in the Aleutians. The presence of these species is interpreted to indicate that the thermal regime at the time of deposition of these species was much colder. This colder water fauna has migrated from the Bering and Arctic Provinces of Asia and North America and includes the ostracode species Elofsonella concinna neoconcinna, Finmarchinella (Barentsovia) barentzovoensis, and Eucytheridea



140°
160°
180°
160°
140°
ARCTIC
BERING PROVINCE
SUBFRIGID
ALEUTIAN PROVINCE
60°
60°
COLD TEMPERATE
HOKKAIDAN PROVINCE
OREGONIAN PROVINCE
40°
40°
MILD TEMPERATE
140°
160°
180°
160°
140°

punctillata.

Benthic foraminiferal assemblages from the Aleutian Island samples contain numerous fossil species as well as cold temperate species indegenous to the North Pacific. Elphidium clavatum is a common member of these assemblages and in conjunction with E. bartletti, E. orbiculare, E. subarcticum and Buccella frigida represent the cold arctic fauna, which existed in this area during the glacial episodes. The occurrence of Cassidulina californica, Elphidiella groenlandica and numerous other neritic species indicate the presence of cold temperate Pacific faunas. These benthic foraminiferal species like the cold temperate ostracode species are living in the Gulf of Alaska. Again since no organic stain was used, it is unknown whether these species were living at the time of collection.

This analysis suggests that 1) during the Pleistocene cold arctic waters extended as far south as the Aleutian Islands and 2) during the Holocene cold temperate water masses feom the North Pacific extend as far north as the Pribilof Islands.

REFERENCES

Gardner, J. V., Vallier, T. L., Dean, W. E., Kvenvolden, K. A. and Redden, G. D., 1979, Sedimentology and Geochemistry of Surface Sediments and the Distribution of Faults and Potentially Unstable Sediments, St. George Basin Region of the Outer Continental Shelf, Southern Bering Sea: U.S. Geological Survey Open-File Report 79-1562, 89 p.

U.S. Navy, Chief of Naval Operations, 1977, Marine Climatic Atlas of the World, Volume II, North Pacific Ocean: NAVAIR 50-1C-529, Naval Weather Service Detachment, Washington, D.C., 388 p.

APPENDIX XVI

LARGE PLATES (REDUCED*)

Plate I - Geohazards I

Plate II - Geohazards II

Plate III - Sediment Grain Size

Plate IV - Seafloor Mosaic of the Alsek Sediment Instability Study Area

*Note: These plates, oversized in the original report, have been reduced in size for this Appendix.

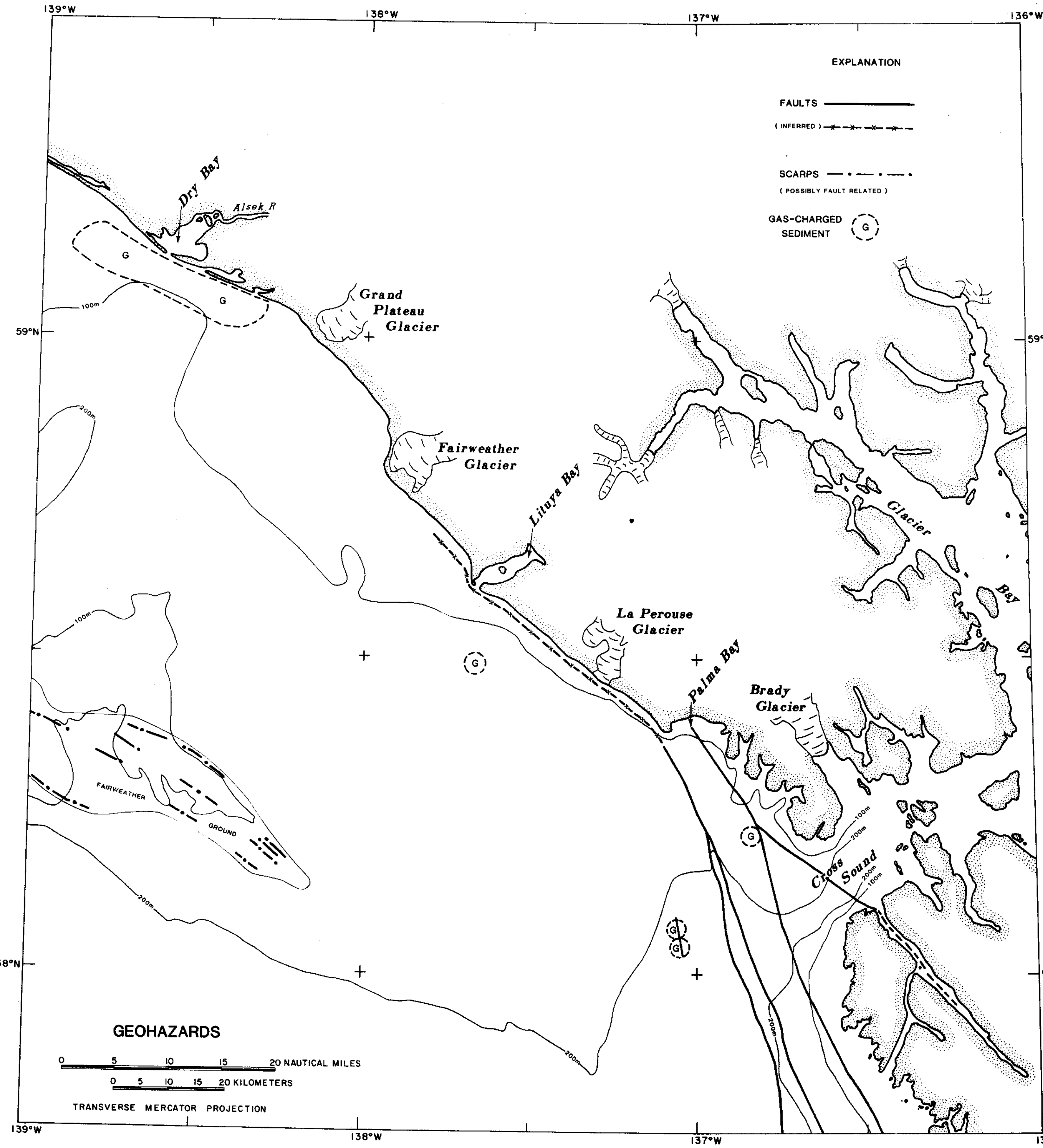


Plate I-A. (Geohazards I) This plate and Plate I-B present faults, scarps, gas-charged sediment, and bedform information for the area between 136°W and 142°W. Also included are the 100-m and 200-m isobaths and the outline of Fairweather Ground. (Details are presented in the text of Section 1.)

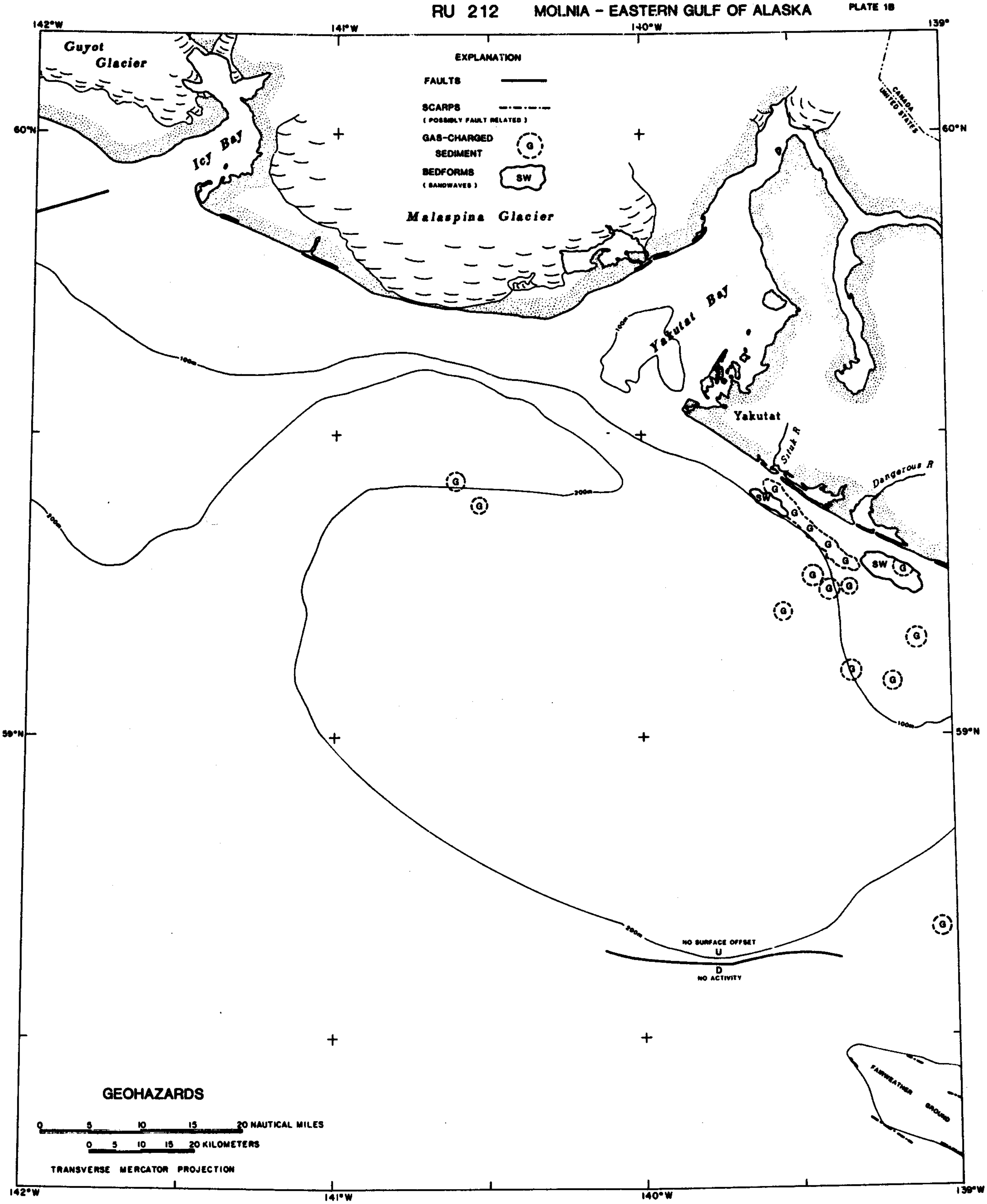


Plate I-B. (Geohazards I, cont'd.) See caption for Plate I-A.

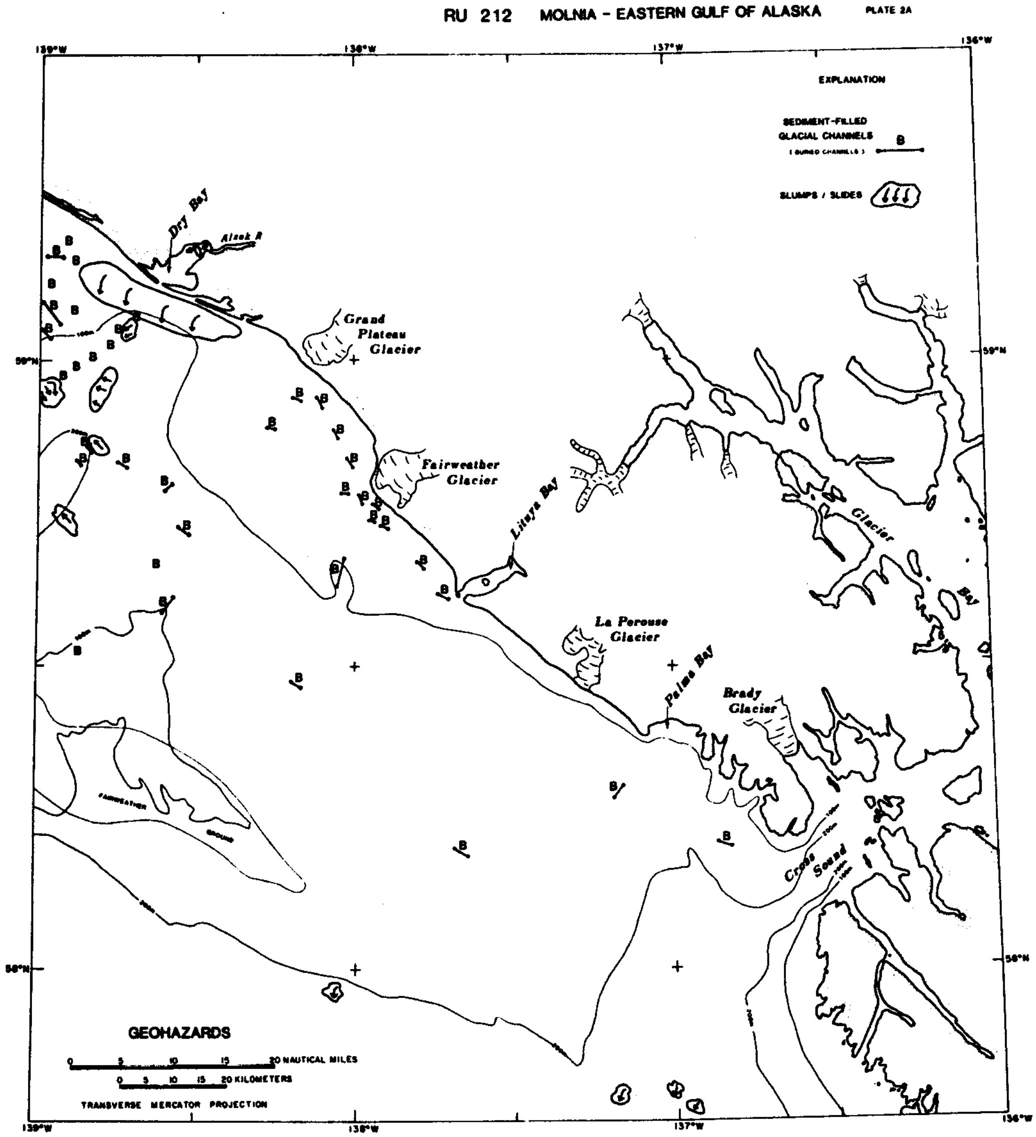


Plate II-A. (Geohazards II) This plate and Plate II-B present slump and slide locations and also the locations of sediment-filled, glacially eroded channels (buried channels) for the area between 136°W and 142°W. (Details for each type of geohazard shown are presented in the text of Section 1.)

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PLATE 2B

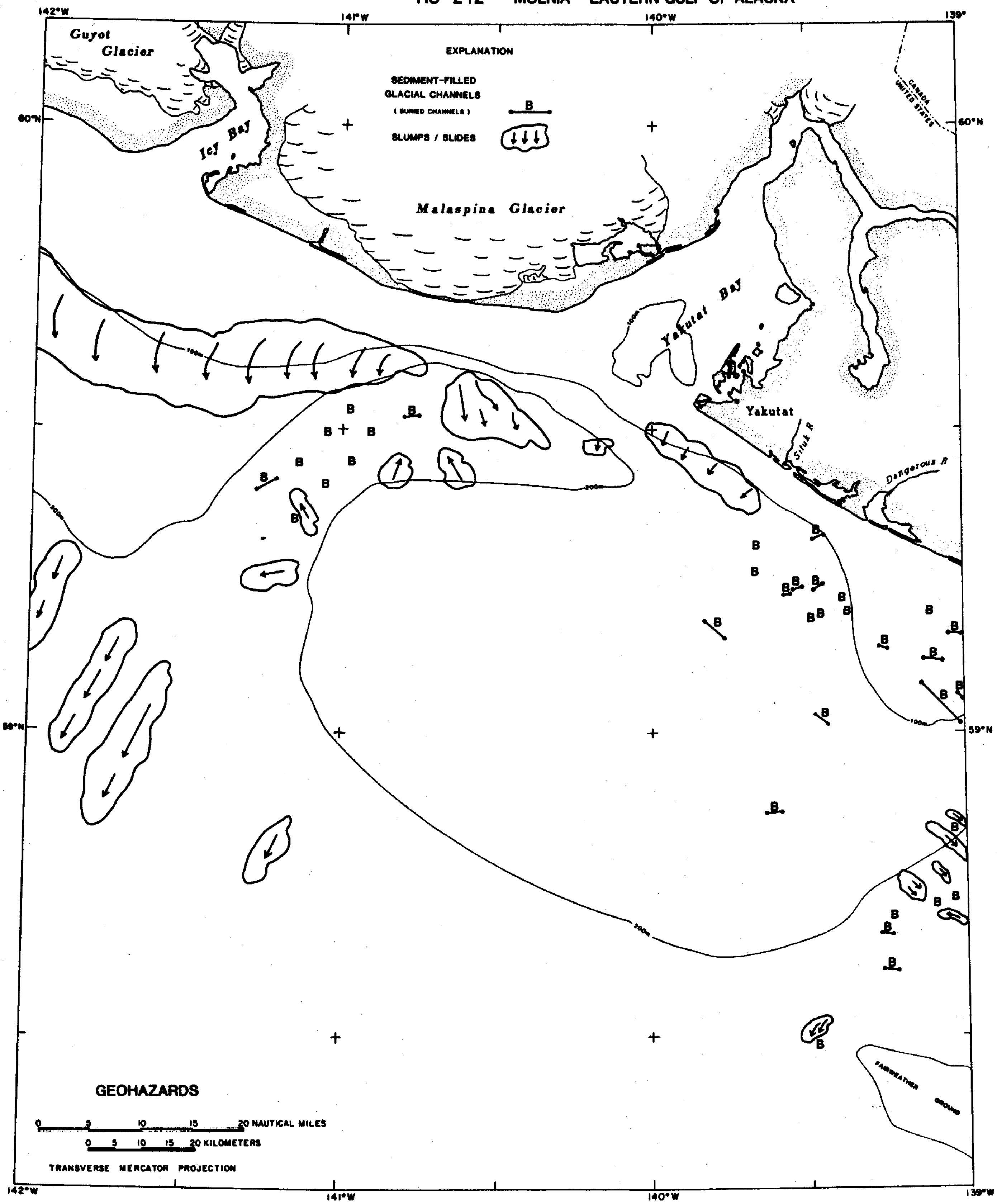

Plate II-B. (Geohazards II, cont'd.) See caption for Plate II-A.

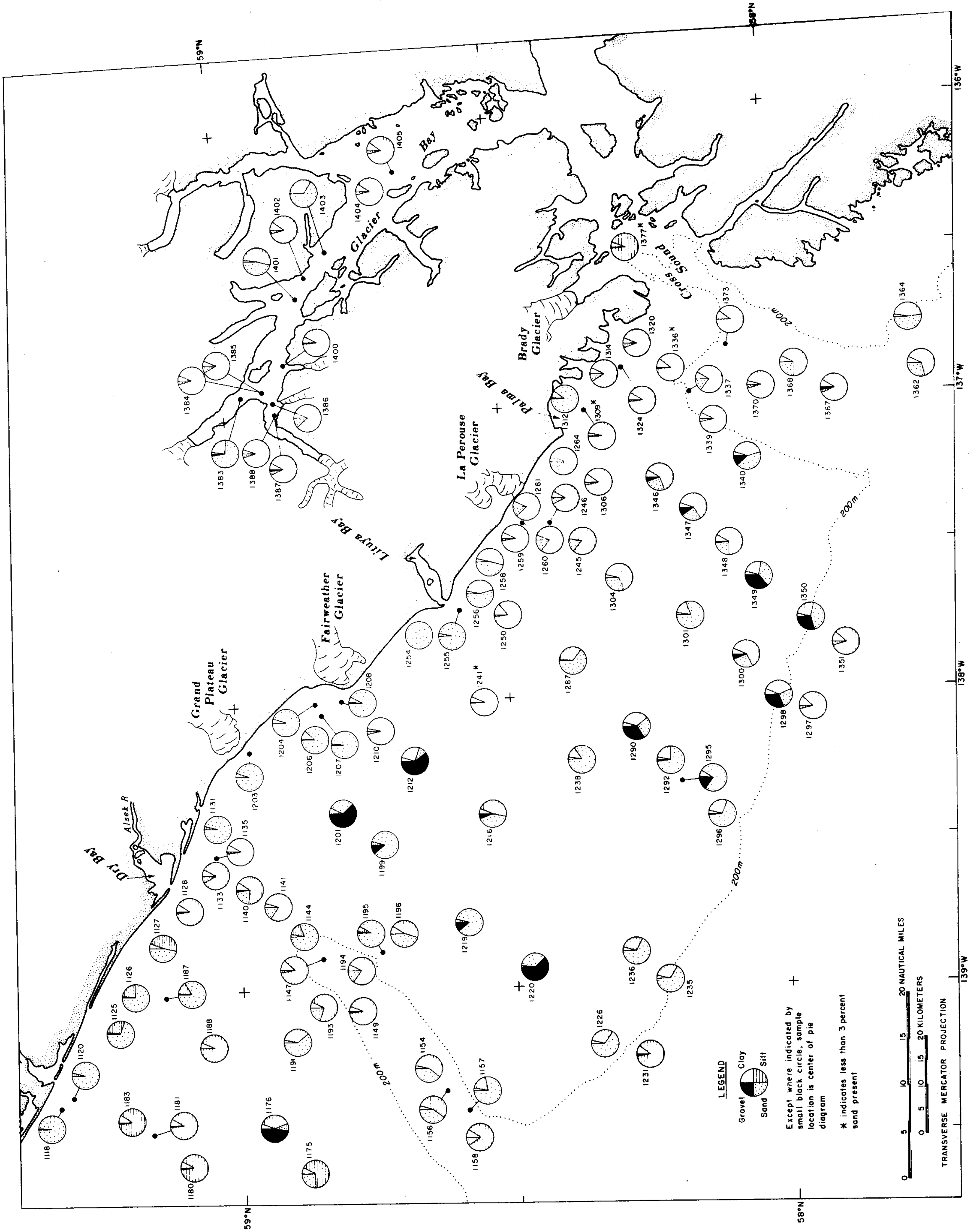

Plate III-A. (Sediment Grain Size) This plate and Plate III-B show the grain-size distribution in over 100 surficial sediment samples collected between Cross Sound and Glacier Bay (to the east) and Bering Glacier (to the west). Data is presented by the use of pie diagrams.

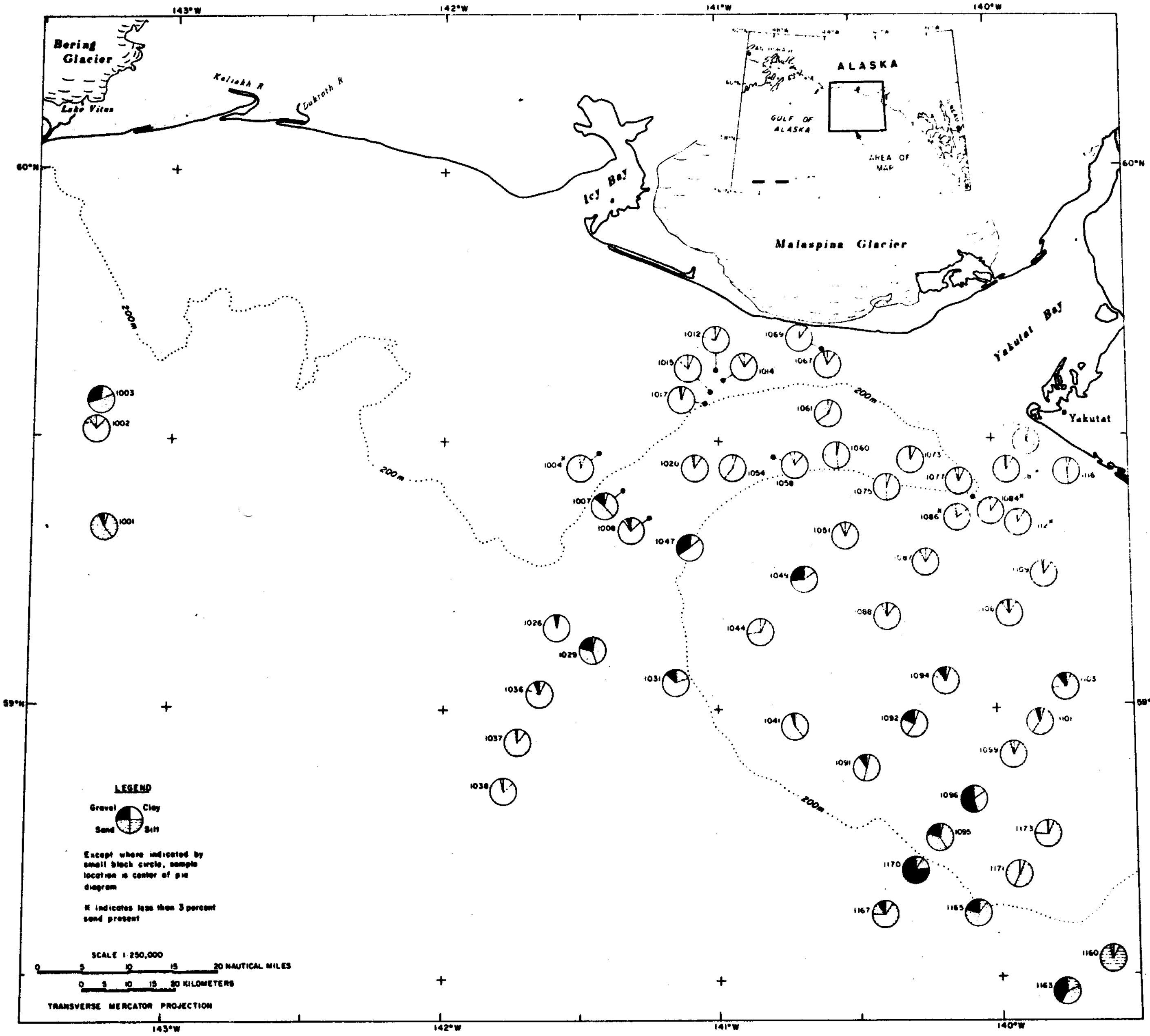

Plate III-B. (Sediment Grain Size, cont'd.) See caption for Plate III-A.

(PLATE IV NOT AVAILABLE)

*Plate IV. (Seafloor Mosaic of the Alsek Sediment Instability Study Area) This plate presents a graphic representation of the sea floor offshore of the mouth of the Alsek River. This area contains a large variety of different types of seafloor sediment failure features, including collapse depressions, slides, slumps, flows, craters, pockmarks, channels, and chutes. (The area is described in detail in the text of Section 2.)

* This photomosaic was not available in a form which could be reduced in size for publication in this volume, but it is available in:

Molnia, B. F., and Rappeport, M. L. 1984. Seafloor mosaic of the Alsek sediment instability area, northeastern Gulf of Alaska USGS Open-File Report 84-397.

The following references would also be helpful in the photomosaic analysis:

Molnia, B. F., and Rappeport, M. L. 1985. Bathymetric map of the Alsek River sediment instability area, northeastern Gulf of Alaska, USGS Miscellaneous Field Investigation I-T364.

Molnia, B. F., and Rappeport, M. L. Mosaic of pockmarked seafloor area near the Alsek River, northeastern Gulf of Alaska, USGS in Alaska: accomplishments during 1980. In: USGS Circular 844 pp. 146-148.