sediments is that kaolinite is a "low latitude" clay mineral and chlorite a "high latitude" one.

Concentrations of uranium in the sediments range from 0.75 to 5.0 ppm and their variations seem to have no relation to the texture, organic carbon content, or clay mineralogy of the sediments.

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LATE CENOZOIC HISTORY OF DEPOSITION OF NORTHERN BERING SHELF

The diverse topography and sediment types of the northern Bering shelf owe their origin to a combination of tectonic activity, subaerial processes during lowered sea level, and present marine processes. Late Cenozoic to recent tectonic expression is evident in nearshore regions, particularly (1) along southwestern Seward Peninsula, where faulting and folding affect sea-floor bedrock and relict gravel distribution and the major northward sea valley and subaerial drainage pathways and (2) off central St. Lawrence Island, where lava flows and plugs disrupt morphology of a structural seafloor depression.

During lowered sea levels of the Quaternary, Siberian glaciers pushing up to 150 km beyond the present shoreline deposited a series of morainal ridges now exposed as linear gravel bars that extend southward from Bering Strait and northward from St. Lawrence Island. Other early to middle Pleistocene local valley glaciers pushed debris a few kilometers off the coast of Seward Peninsula; subsequent reworking by shoreline transgressions and regressions has left these as nearshore patches of partly auriferous relict gravels. Shorelines of lower sea levels also formed beach ridges that are evident as linear topographic scarps, ridges, and constructional lenses of sorted, rounded, shelly, and oxidized coarse sands and gravels.

During the Holocene and other Quaternary periods of high sea levels strong currents affected the sea-floor shape and sediment distribution, particularly in the Bering and Anadyr Straits, where relict gravels and hummocky topography of apparent glacial origin remain exposed. On the lee side of such current-swept channels, slackening currents have deposited sediments forming shoals such as those north of Cape Prince of Wales and Northeast Cape. Except for the Siberian morainal ridges, nearshore areas, and straits regions, where current scour preserves surface relict gravels, most of the northern Bering sea floor has a thin cover of Holocene transgressive fine marine sands.

Holocene Yukon sediments are deposited as interlaminated fine sand and clayey silt, up to 60 km off the delta, and around Norton Sound where sediment has been ponded by the modern current regime. Ancient, buried depositional wedges of Yukon sediment apparently extended farther west and account for the smoother topography that is found within 200 km of the modern delta. Limited Holocene deposits, extensive subaerial topography, and common relict sediments suggest that during periods of high sea level, Yukon and other contemporaneous sediment are swept from most of northern Bering Sea by the strong northward currents. The great canyons of the Bering continental margin suggest a southward transport of Yukon sediment during low sea levels. This apparent past and present movement of Yukon sediment may explain the general lack of modern sediments in northern Bering Sea and presence of Holocene deposits on the epicontinental shelves in the north and south.

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APPLICATION OF ACOUSTICS TO DETERMINATION OF PERMAFROST DISTRIBUTION

During the past several years, interest in the Arctic region as a source of petroleum has developed, spurred by the discovery of the North Slope petroleum deposits. A major problem involves the engineering properties and stability of frozen ground subjected to load-bearing stresses and the addition of heat from structures and heated pipelines.

Acoustic data-acquisition systems, coupled with sophisticated processing, reduction, and analysis techniques, are used to determine the permafrost and/or seasonal ice distribution in the subsurface. Oceans International has evolved techniques for the acquisition of valid data.

Sophisticated data-analysis techniques, which have been proved in other disciplines, such as aerospace telemetry and communications theory, are being applied to both the more general geophysical problem, and the specific permafrost-ground-ice problem.

The reduced, analyzed data which have been developed, can be used to determine, measure, and evaluate those parameters which are most important in delineating permafrost. It is important that the analyzed data be displayed in both gross and detailed formats for proper understanding.

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DEVONIAN (OLD RED SANDSTONE) SEDIMENTATION AND TECTONICS OF NORWAY

Lower and Middle Devonian continental redbeds in Norway record the deposition of coarse clastic fluvial sediments in a series of separate intramontane basins. Contemporaneous uplifting of surrounding provenance areas resulted in the deposition of breccias, conglomerates, and sandstones as thick coalescing alluvial fans and stream deposits in E-W-trending grabens and half-grabens. The largest of the structurally formed basins covers an area of approximately 2,000 sq km and has a maximum preserved continuous Devonian section of approximately 5,000 m.

Devonian rocks crop out in four parts of Norway: (1) 6 basins along the west coast north of Bergen thought to contain Middle Devonian sediments; (2) several isolated areas west of Trondheim thought to be primarily Early Devonian; (3) a small outlier of very coarse Lower Devonian sediments in eastern Norway near Røragen; and (4) redbeds of probable Early Devonian age near Oslo. Fossils are scarce and include plants, crustaceans, and Crossopterygian vertebrates.

The Devonian basins in western Norway developed in the former eugeosynclinal part of the Caledonian geosyncline, which underwent major orogeny and uplift during the Late Silurian and Early Devonian. This uplift resulted in the formation of a major NE-SE-SW-trending mountain system, which supplied abundant and varied detritus to the Devonian intramontane basins, including eugeosynclinal metasediments and metavolcanics, high-grade metamorphic schists, gneisses and amphibolites, and diverse mafic and felsic intrusive igneous rocks.

Postdepositional folding and faulting have obscured the original basin margins; the Devonian sediments presently form a series of E-W-trending anticlines and synclines that have locally been thrust over surround-