Sediments which consist of more than 75% particles of this size are termed sand. Where less than 50% of the sediments are sand, the sediment is termed mud. In the hilly areas, rock is common; in the coastal regions, decaying plant and animal remains are found. In general, the slope of the bottom increases markedly in areas where the water is three miles apart. It should also be kept in mind that bottom currents may shift the distribution of sediment types above or below the shelf break. The map shows the type of sediment present at various points along the continental shelf. The types of sediments indicated on the map will generally be smooth and relatively free from the coarse material that covers the beach. The bottom is covered by sand, muddy sand, or mud. In the hilly areas, rock is common. The bottom is usually smooth but some areas are extremely rough and contain patches of broken shells. Mud is a finer sediment; its apparent color varies from black to dark gray, but in general most muddy sand is gray. The bottom sediments are most important to the development of the coastal marine environment. The organisms common in the sandy bottom are generally higher than the rest of the benthic fauna. Starfish, snails, and other invertebrates are also commonly associated with the muddy bottom. Mud is a finer sediment than the nearshore sand. Shelf edges and flattest in the central portion of the shelf. This publication is supported under contract with the Office of Naval Research. The original Cooperative Extension Service...
CONTINENTAL SHELF SEDIMENTS OFF OREGON

The economic potential of the continental shelf lies in the exploitation of its fisheries and of its mineral wealth. The purpose of this publication is to provide, to those who can use it, information concerning the surface of the continental shelf—its shape, and what the bottom is made of. The information provided here is a result of the efforts of a number of the staff and students of the Department of Oceanography at Oregon State University. The original scientific research was carried out under contract with the Office of Naval Research. This publication is supported in part by NSF Institutional Sea Grant GH 10.

The continental shelf is the shallow platform or terrace which surrounds the continent. It extends from the low tide line to a position offshore where the slope of the bottom increases markedly downward. The position at which the bottom slope changes is commonly called the shelf edge or the shelf break. Off Oregon, the continental shelf varies in width from approximately 9 to 40 miles, and the shelf edge lies in water 70 to 100 fathoms deep. It is a smooth surface interrupted in only a few places by small hills. The contour chart reveals that the shelf is extremely irregular. In outline, it is narrowest off Cape Blanco and widest off the central coast in the vicinity of Florence. The average slope of the continental shelf varies about 10 feet per mile to about 55 feet per mile. In general, the slope of the shelf is greatest at the inner and outer edges and flattest in the central portions. Except for the hilly areas, the bottom is covered by sand, muddy sand, or mud. In the hilly areas, rock is commonly present.

The map of bottom sediments is based on more than 800 samples collected from the continental shelf at three-mile intervals north of Coos Bay and at two-mile intervals south of Coos Bay. The boundary lines between sediment types should be considered to be approximate, inasmuch as samples on either side of the boundary are two or three miles apart. It should also be kept in mind that bottom currents may shift the sediments somewhat from time to time.

The types of sediments indicated on the chart are based on the size of the sedimentary particles. The diameter of the particles making up the sediment was measured by passing the sediment through a sieve having standard size openings. The map shows the type of sediment exposed at the bottom. Samples were collected by means of a clamsheath type device which grabs approximately one-half pint of sample from the surface of the sediment. Rocky areas are indicated where rocks were collected and little or no sediment was recovered. Wherever sand occurs, it is likely that current activity on the bottom is regular and fairly strong (not as strong as in rocky areas, however). The bottom will generally be smooth and relatively featureless. Where basic or wave activity is persistent, it is not uncommon for ridges or ripples of sand to be produced.

The organisms common in the sandy bottom sediments include rapidly moving animals such as the commercially important Dungeness crab and English sole, slow creeping animals such as the Nassaureen small, and stationary buried organisms such as clams. Sand dollars (flat sea urchins) are found close to the coast. These animals generally feed on minute plant material in the water or on other animals or sometimes on decayed plant and animal remains.

Sand

Sand occurs in two major areas on the continental shelf, close to shore and at the shelf edge. The nearshore sand is generally gray, although the mud may vary from one part of the shelf to another. It extends from the nearshore shelf to a depth of about 50 fathoms off the northern and central coast. In the vicinity of the Umpqua River, sand is limited to shallower water, generally 30 fathoms or less, and forms a narrow belt along the coast at least as far south as the Rogue River. Sand which occurs as patches near the edge of the shelf is more variable in its characteristics than the nearshore sand. Shelf-edge sand may be somewhat coarser than the nearshore sand, and may vary in color from yellow or brown to dark green. In many areas, it contains appreciable amounts of broken shells.

Muddy sand

Gray to olive gray muddy sand generally grades into the sandy areas. It occurs seaward of 50 fathoms in the northern portion of the shelf and seaward of about 30 fathoms in the southern portion. It is also common on the upper continental slope beyond the shelf edge. In areas where this sediment is present, the bottom is usually smooth but somewhat softer than the sandy bottom. There is less current activity on the bottom, but it is possible that in some places a rippled surface will have developed. It is not uncommon to find Rex and Petrale sole living on this type of sediment. Sea cucumbers, sea urchins, starfish, and brittle stars are found on the bottom, and other invertebrates are also commonly associated with these sediments.

Mud

Muddy bottom is most common at or beyond the shelf edge. Mud is a finer grain sediment usually found in quiet water. It grades into muddy sand; the boundary between the two sediment types may be indistinguishable. Mud also occurs on the continental shelf southwest of the mouth of the Columbia River and off the Umpqua River. The muddy bottom is generally smooth and very soft. There is little or no current activity at the bottom, and burrowing organisms such as polychaete worms are very abundant. In addition, numerous see urchins, sea cucumbers, starfish, and brittle stars are found on the sediment. Dover sole and pandalid shrimps are among the most important animals common to this type of bottom.

Rock

Rocks are most common along the coastline and in bays where some distance offshore. Rock is also exposed in patches at the shelf edge. Rocky areas are generally higher than the rest of the shelf and are extremely rugged and irregular. They are areas of strong cur-
**Bottom Sediments**

The continental shelf sediments off Oregon have been the subject of scientific study for their importance to the coastal environment and the potential for economic resources. The continental shelf is the shallow area near the coast that extends from the low tide line to a position offshore where the bottom is covered by sand, muddy sand, or rock, depending on the distance from shore.

**Sand**

Sand occurs in two major areas on the shelf. Nearshore sand is present close to shore and is more variable in its characteristics. It is usually clean and fine-grained, and is the primary food source for many bottom-dwelling animals. The nearshore sand is limited to shallower water, generally about 30 fathoms or less, and forms a narrow belt along the coast at least as far north as Coos Bay. Shelf sand is deposited on the continental shelf—its shape, and what the bottom is made of. The information provided here is a result of the efforts of a number of the staff and students of Oregon State University. The original scientific research was carried out under contract with the Office of Naval Research. This publication is supported by NSF Institutional Sea Grant Research. The nearshore sand is more variable in its characteristics than the shelf sand, and may vary from year to year.

Sand occurs in two major areas on the shelf. The nearshore sand is present close to shore and is more variable in its characteristics. It is usually clean and fine-grained, and is the primary food source for many bottom-dwelling animals. The nearshore sand is limited to shallower water, generally about 30 fathoms or less, and forms a narrow belt along the coast at least as far north as Coos Bay. The shelf sand is deposited on the continental shelf.

**Muddy Sand**

Muddy sand is generally found in quieter water. It grades into muddy sand; the muddy sand feels slick, although it may have the appearance of fine sand. Mud is a finer grained sediment usually found in quiet water. It is generally gray to olive gray in color and may contain organic matter and living organisms such as polychaete worms and barnacles. Muddy sand is often found in areas where the water is too deep for sand to settle or where there is too much wave action for sand to remain.

**Rocks**

Rocks are most common along the coastline and in banks some distance offshore. Rock is also exposed in rough places along the coastline. The rough areas are areas of strong currents and are usually found near the shelf edge. The rough areas are areas of strong currents and are usually found near the shelf edge.

**Subsurface Sediments**

Operations such as dredging may disturb the surface sediment enough to encounter different sediments beneath the surface. Recent studies have indicated that sand probably underlies mud and muddy sand areas will penetrate the softer, finer grained sediments and will reach the sand a short distance beneath the surface. The mud and muddy sand areas will penetrate the softer, finer grained sediments and will reach the sand a short distance beneath the surface. The mud and muddy sand areas will penetrate the softer, finer grained sediments and will reach the sand a short distance beneath the surface.

**Continental Shelf Sediments Off Oregon**

A See Grant Publication

Unfold for bathymetrical and sediment charts.