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SPECIAL PUBLICATION

THE QUALITY OF THE BOTTOM
A GLOSSARY OF TERMS

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A B S T R A C T

Notations of bottom types which appear on navigation charts are a valuable source of data used in compiling bottom sediment charts. The correct and consistent interpretation of these notations in terms of the sediment classification (Mud, Mud-Sand, Gravel, Shell and Coral) used on U. S. Navy Hydrographic Office bottom sediment charts is essential in maintaining high standards of reliability. This glossary indicates how bottom sediment notations are reconciled to this classification.

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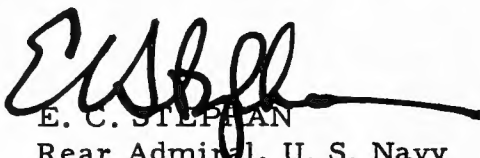
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FOREWORD

This glossary is designed for use in the Hydrographic Office training programs which include instruction in the preparation of bottom sediment charts. It defines bottom type notations given on navigation charts in an effort to make more uniform their interpretation and use in bottom sediment charts produced by this Office. In addition, the glossary should assist researchers in comparing and evaluating notations and symbols which appear on navigation and bottom sediment charts.



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THE QUALITY OF THE BOTTOM

Various kinds of charts are compiled to describe, in one way or another, the type or quality of the ocean bottom. The commonest type is a chart which shows the relative size of the particles that make up the bottom sediments. For this purpose the U. S. Navy Hydrographic Office uses the standard categories of mud, sand, gravel, and rock. The two additional sediment categories used are shell and coral; however, these do not relate directly to size but indicate origin and chemical composition. Other charts of a more specialized nature may be made in addition to the standard bottom sediment chart, such as charts showing the presence or proportion of calcium carbonate or the distribution of globigerina.

The chief sources of data used in compiling bottom sediment charts are navigation charts. To use these sources effectively, one needs to know (with as much precision as possible) the meaning of the various abbreviations used on these charts to indicate the type or quality of the bottom. This glossary was compiled to meet this need.

The following list is based on the International Hydrographic Bureau, Glossary of Cartographic Terms, 1951 and the U. S. Navy Hydrographic Office Chart No. 1, "Nautical Chart Symbols and Abbreviations," 1957. The definitions herein are based, for the most part, on "Websters New Collegiate Dictionary," 1954, "The Glossary of Geology and Related Sciences," American Geological Institute, 1957, and H. O. Pub. No. 220, "Navigation Dictionary," 1956.

Often some indication of the type or quality of the bottom is given by landforms of the adjacent coast and by other notations not usually classified under the general heading "Quality of the Bottom." Such symbols can be found in H. O. Chart No. 1, page 1, "The Coastline" and page 12, "Dangers."

The abbreviations and terms are listed in the order given in the H. O. Chart No. 1, rather than in alphabetical order. On nautical charts the initial letter of the abbreviation of names is in capitals and the initial letter of the abbreviation of adjectives is in small letters. When these abbreviations appear on a chart, they may or may not be followed by a period depending on the date of the chart.

1. Grd. Ground; the bottom of the ocean; the sea floor.
2. S. Sand; loose detrital material consisting of small but easily distinguishable separate grains ranging between 0.0025 and 0.0787 inch (0.0625 and 2.0000 millimeters) in diameter.
3. M. Mud; pelagic or terrigenous detrital material consisting of particles smaller than sand; that is, an undifferentiated sediment made up of particles mostly within the silt-clay range smaller than 0.0025 inch (0.0625 millimeter).
4. Oz. Ooze; an unconsolidated deep sea deposit composed of 30 percent or more of the shells (tests) of foraminifera, diatoms, and other marine organisms, for example, diatom ooze and globigerina ooze.
5. Ml. Marl; a calcareous clay which may include silts and sand. This sediment is classed as mud-sand.
6. Cl. Clay; fine-grained sediments with particle size smaller than approximately 0.00008 inch (0.004 millimeter). When not separately designated on a bottom sediment chart, clay is classed as mud.
7. G. Gravel; loose detrital material which consists of fragments ranging in size from approximately 0.08 to 10.08 inches (2 to 256 millimeters).
8. Sn. Shingle; rounded, often flat waterworn rock fragments (very coarse gravel). Shingle is classed as gravel on bottom sediment charts.
9. P. Pebbles; small, usually rounded rock fragments ranging in size from 0.16 to 2.59 (4 to 64 millimeters) in diameter. Pebbles are classed as gravel on bottom sediment charts.
10. St. Stones; detached particles of rock usually smaller than 10 inches (256 millimeters) in diameter. Stones are classed as gravel on bottom sediment charts.

11. Rk.,rky. Rock; rocky; the naturally occurring material that forms the firm, hard, and solid masses of the ocean floor. On navigation charts the abbreviation Rk. usually indicates a rocky formation or a single large boulder which may constitute a danger to navigation.
12. Ck. Chalk; soft earthy limestone of marine origin composed chiefly of minute shells. It is white, gray, or buff in color. Chalk is classed as rock on bottom sediment charts.
13. Qz. Quartz; silicon dioxide. The most common inorganic constituent of the detrital particles on the ocean floor.
14. Co. Coral; the hard calcareous skeletons of certain tiny marine animals, or the stony solidified mass of a number of such skeletons. In warm waters colonial coral forms extensive reefs of limestone. In cool or cold water coral usually appears in the form of isolated solitary individuals. Occasionally, large reefs formed in cold waters by calcareous algae (Lithothamnion) have been noted on navigation charts as coral.
- 14a. Co. Hd. Coral head; a mass of coral, usually forming a portion of a reef. Frequently, coral heads are large enough to be dangerous to navigation. On the basis of size, coral heads would be classed as rock, but are shown as coral on bottom sediment charts.
15. Mad.
Md.
Mds. Madreporic; a branching coral; also any perforated stone coral. Madreporic is classed as coral on bottom sediment charts.
16. Vol. Volcanic.
- 16a. Vol.
Ash Volcanic ash; usually fine-grained material ejected by a volcano. Volcanic ash is classed as sand on bottom sediment charts.
17. La. Lava; fluid rock such as that which issues from a volcano or a fissure in the earth's surface; also the same material solidified by cooling. Since this material usually is massive, it is classed as rock on bottom sediment charts.

18. Pm. Pumice; an excessively cellular, glassy lava. It is very light and floats on water until it becomes water logged and sinks. Pumice is classed as gravel on bottom sediment charts.
19. T. Tufa; a chemical sedimentary rock composed of calcium carbonate or silica. Tufa is included with rock on bottom sediment charts. On U. S. Navy Hydrographic charts for the western coast of France the notation T may mean tangue, a calcareous deposit derived from a variety of marine organisms.
20. Sc. Scoriae; volcanic slag, pyroclastic ejecta; fragments of scoriae between 0.16 and 1.26 inches (4 and 32 millimeters) in size are essentially equivalent to volcanic cinders. Scoriae are classed as gravel on bottom sediment charts.
21. Cn. Cinders; volcanic cinders (see scoriae).
22. Mn. Manganese; manganese dioxide; the black oxide of a metal. Manganese dioxide usually is found on the ocean bottom in the form of nodules. Manganese nodules are classed as gravel on bottom sediment charts.
23. Sh. Shell; the hard outer covering of an animal. Shell usually falls within the gravel size limits, but because of its origin shell usually is classed separately on bottom sediment charts.
24. Oys. Oysters; sessile mollusks with an unequal, irregular bivalved shell. Oysters frequently occur in large banks. Oysters are classed as shell on bottom sediment charts.
25. Ms. Mussels; sessile mollusks with a regular bivalved shell. Mussels frequently occur in large banks. Mussels are classed as shell on bottom sediment charts.
26. Spg. Sponge; a Porifera, a sessile invertebrate with a skeleton formed of a mass of elastic fibers (spongin) and spicules.

27. Grs. Grass; seagrass, seed-bearing marine plants found in brackish and saline shallow water. They attain lengths to 8 feet. Occasionally, the notation Grs. on a navigation chart may refer to seaweed or kelp. The presence of grass usually denotes a mud-sand bottom.
28. Wd. Weeds; seaweed, a plant growing in the sea, especially an alga.
- 28a. Kelp; brown algae of the order Laminariales, including the largest known algae. Kelp typically grows on a rock or stone bottom. They attain their greatest size in cold waters, with lengths to 100 feet and blades 4 or more feet wide.
29. Sea tangle; tangle; any of various seaweeds or kelps, especially of the genus Laminaria.
30. Ballast; broken stone or gravel which has been used in a vessel to improve its stability or control the draft.
31. Spicules; minute calcareous or siliceous bodies that support the tissues of various invertebrates, such as, sponges, radiolarians, and holothurians.
32. Fr. Foraminifera; minute one-celled marine organisms which secrete a calcareous test (shell), or the test of such an organism. Foraminifera may be an important constituent of some deep sea deposits. If the Foraminifera constitute 30 percent or more of the samples, the sediment is referred to as foraminiferal ooze. On the basis of size, foraminiferal ooze usually is classified as mud-sand on bottom sediment charts.
33. Gl. Globigerina; a very common form of sediment-producing Foraminifera. Globigerina ooze covers large portions of the deep ocean bottom. On the basis of size a globigerina ooze is classified as mud-sand.
34. Di. Diatoms; microscopic algae which secrete siliceous tests (shells). Diatomaceous ooze covers large areas of the ocean bottom. Diatomaceous ooze is classed as mud on bottom sediment charts.

35. Rd. Radiolaria; minute marine protozoans which have a siliceous skeleton of spicules and radiating threadlike pseudopodia. Radiolarian ooze contains large proportions of radiolarian skeletons and is an important constituent of the deep ocean deposits. Radiolarian ooze is classed as mud on bottom sediment charts.
36. Pt. Pteropods; pelagic, swimming-type gastropods in which the foot is modified into a pair of winglike lobes or fins. Pteropod ooze contains conspicuous shells of these pelagic molluscs and is an important constituent of the deep ocean deposits. Pteropod ooze usually is classed as mud on bottom sediment charts.
37. Po. Polyzoa; Broyozoa, a colonial animal that secretes a calcareous, horny, or membranous covering in a multitudinous variety of forms and structures. Bryozoa may form insignificant colonies on shells, or they may be an important constituent of a reef.
38. Cirripeda; barnacles.
- 38a. Fucus; rockweed, any of a genus of olive-green or brown algae. Fucus grows attached to rocks; hence the name rockweed.
- 38b. Mattes; an uneven growth of seagrass.
39. fine. Fine.
40. crs. Coarse.
41. sft. Soft.
42. hrd. Hard.
43. stf. Stiff.
44. sml. Small.
45. lrg. Large.
46. stk. Sticky.

47. brk. Broken.
- 47a. Ground (shell); shell that has been ground up by wave or current action. Broken shell.
48. Rotten.
49. Streaky.
50. Sp., Specks; speckled
spk.
51. gty. Gritty.
52. Decayed.
53. fly. Flinty; resembling flint, a dense, fine-grained form of silica which is very tough and breaks with a conchoidal fracture and cutting edges.
54. glac. Glacial.
55. Tenacious; sticky, coherent.
56. wh. White.
57. bk. Black.
58. vi. Violet.
59. bu. Blue.
60. gn. Green.
61. yl. Yellow.
62. or. Orange.
63. rd. Red.
64. br. Brown.
65. ch. Chocolate.

66. gy. Gray.
67. lt. Light.
68. dk. Dark.
69. Ca. Calcareous; limey, containing lime.
70. Varied.
71. Uneven.

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This report defines bottom sediment notations that appear on both U. S. and foreign navigation charts. It also indicates how bottom sediment notations are reconciled to U. S. Hydrographic Office sediment classification.

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