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=  DEEP SEA DRILLING PROJECT  =
=    DENSITY-POROSITY DATA    =
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I. INTRODUCTION

A. BACKGROUND AND METHODS

Water content and density measurements were regularly made aboard the Glomar Challenger on core samples selected by the shipboard party. These samples were completed at sea, nearly always by the chemistry technician. One of three different techniques was normally used but the specific method was not stored in the data record. The technique may be determined, if necessary, by examination of the prime data sheets or the appropriate chemistry laboratory notebook. These data are available on microfilm from the National Geophysical Data Center.

Typical records in this data set contain either a complete suite of values (Water Content, Porosity, Density, Grain Density) or Water Content only, dependent upon the existence of a volume measurement. All calculations were duplicated post-cruise by computer and discrepancies with shipboard values were rectified. Except for 5 sites from Leg 96 (see SALT CORRECTION LEG 96) all data were encoded directly from the worksheets used aboard the ship and calculations done without a salt correction.

Syringe Technique (Boyce, 1976)

Beginning with leg 1 the syringe technique was used for soft sediments until it was gradually supplanted by other techniques beginning at about Leg 30. The accuracy of the syringe technique was limited because the weight of the wet sediment plus its weighing container could not exceed one gram. It continued to be occasionally utilised for extremely unconsolidated sediments.

Chunk Technique (Boyce, 1976; Boyce, 1984)

The 'chunk' technique (Boyce,1976) was used initially for sediments that were too hard for the syringe technique; since volume was not measured it yielded only water content values. Sometime just prior to Leg 30 the introduction of a triple beam balance, modified for making direct weighings of irregularly-shaped samples in air and in water, permitted the determination of volume,

and therefore density and porosity, of any sediment sample that would not rapidly disaggregate in water (Boyce, 1984.). Subsequently, appropriate sample size was limited only by the capacity of the balance used: approximately 300 grams.

Cylinder Technique (Boyce, 1984)

The cylinder technique involved sampling the sediments with sharpened stainless steel rings of known weight and volume and then proceeding as with the syringe technique. Until Leg 79 these samples were sent to the sediment laboratory at DSDP for processing. Subsequent to the closing of that facility they were processed aboard the vessel.

B. LEGS IN THE DATA SET

Data type	Legs
No Data	41
Water content	1-40, 42-96
Porosity and/or density	2-40, 42-49, 51-86, 88-96

C. REFERENCES

Boyce, R. E., 1976. Definitions and laboratory techniques of compressional sound velocity parameters and wet-water content, wet-bulk density, and porosity parameters by gravimetric and gamma ray attenuation techniques. In Schlanger, S. O., Jackson, E. D., et al., Initial Reports of the Deep Sea Drilling Project, Vol. 33: Washington (U.S. Govt. Printing Office), 931-958.

Boyce, R. E., 1984. Methods for laboratory-measured physical properties. In Hay, W. W., Sibuet, J. C., et al., Initial Reports of the Deep Sea Drilling Project, Vol. 75 Part 2: Washington (U.S. Govt. Printing Office), 1179-1187.

II. FORMAT AND FIELD DESCRIPTIONS

A. DATA FORMAT

Record length is 68 characters.(26268 records)
(Originally 80, blank fields removed by NGDC)

COLUMN	FIELD	FORMAT
1-2	LEG	A2
3-5	SITE	A3
6-6	HOLE	A1
7-9	CORE	A3
10-11	SECTION	A2
12-15	TOP INTERVAL DEPTH (centimeters)	F4.1
16-19	BOTTOM INTERVAL DEPTH (centimeters)	F4.1
20-27	TOP OF CORE DEPTH (meters)	F8.2
28-35	SAMPLE DEPTH (meters)	F8.2
36-43	WET WATER CONTENT (no units)	F8.2
44-51	POROSITY (no units)	F8.2
52-59	WET BULK DENSITY (g/cc)	F8.2*
60-67	GRAIN DENSITY (g/cc)	F8.2*
68	SALT CORRECTION LEG 96 (* or blank)	A1

* NGDC note: F8.3 in original documentation, but all data follow format F8.2

B. FIELD DESCRIPTIONS

The definition of leg, site, hole, core and section may be found in the explanatory notes. In addition, the special core designations, as well as the methods of sample labeling and calculating absolute sample depths are discussed.

INTERVAL DEPTH:

The depth, in centimeters, within a section at which the top or bottom of a measurement was taken. Values are encoded with an implicit decimal point an encoded value of 805 represents 80.5 centimeters.

CORE DEPTH:

The subbottom depth in meters to the top of the core.

SAMPLE DEPTH:

The subbottom depth in meters to the point of measurement.

WET WATER CONTENT:

Wet water content is the ratio of the mass of water in a sediment sample to the mass of that wet sample, multiplied by 100.

POROSITY:

Porosity is the ratio of the volume of the porespace in a sediment sample to the volume of that wet sample. The volume of the porespace is directly proportional to the mass of water in the sediment sample.

WET BULK DENSITY:

Wet bulk density is the ratio of the mass of a wet sediment sample to the volume of that wet sample, expressed in grams per cubic centimeter.

GRAIN DENSITY:

Grain density is the ratio of the bulk density minus the porosity to the complement of the porosity as shown in the following equation.

(Bulk Density - Porosity)/(1 - Porosity)

The grain density value is inherently inaccurate because of its sensitivity to errors in the porosity and density values from which it is calculated.

SALT CORRECTION LEG 96:

There was NO SALT CORRECTION used in calculating the data in this database, with one exception: for five sites drilled on Leg 96 the original work sheets were never returned to the Data Group. Therefore it was impossible to check or recalculate the data which was reported. It was labelled "SALT CORRECTED". The salt correction factor used in these calculations is unknown. This applies only to sites: 615, 617, 621, 623, and 624. The rest of the values in this database, including the remainder of Leg 96, were calculated using a pore fluid density of 1.0 grams/cc.