DEEP SEA DRILLING PROJECT
PROCESSED SMEAR SLIDE DATA BASE

I. INTRODUCTION

A. BACKGROUND AND METHODS

The Deep Sea Drilling Project (DSDP) processed smear slide data base was designed to act as a source file for the DSDP SCREEN computer program. The DSDP SCREEN file is a separate data base which contains computer generated lithologic classifications of DSDP sedimentary material (see Davies 1977). The file provides the user with a standardized lithologic data base.

The processed smear slide data is derived directly from the smear slide data collected on board the Glomar Challenger. Each smear slide represents a small portion of sediment distributed on a glass slide for microscopic evaluation of mineral and fossil composition. The information was recorded as either relative or numerical abundances depending on the preference of the shipboard party for a particular leg. Since the DSDP SCREEN program requires numeric values in order for it to calculate a lithologic code, the chief difference between the processed and unprocessed smear slide data is that the processed data contains only numeric abundances. Relative abundances are equated to numeric ranges as outlined below. A separate smear side data base containing the original data with relative percentages was also generated by the DSDP.

Since ranges cannot be used by the SCREEN program the approximate average of the numeric range was used.

Relative Scale	Abbrev.	Numeric Range	Value used
Trace	T	Less than 5%	3%
Rare	R	5 to 10%	7%
Common	C	10 to 30%	20%
Abundant	A	30 to 60%	45%
Dominant	D	60 to 100%	80%

Once a numeric value has been assigned to each relative abundance the conversion process *normalizes the values to 100% for each smear slide. For example, if a describer reported five minerals to be common (5x20%), one to be abundant (45%) and one dominant (80%), the total would be 225% before normalization. *Following normalization the component minerals would be reassigned numeric values of 9%, 20% and 35% respectively.

There are three distinct types of physical records used within the data base and are referred to as the lead record, sediment name-age record and the smear component record. the formats of each of these records is outlined later in this document.

Each slide description involves a lead record followed by at least one name-age record and one component record. Since slide descriptions may involve lengthy component lists additional component records may be employed as necessary. The sediment name, taken from visual core descriptions, may also be quite lengthy and may involve more than one record.

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*This is not the case. Data in this file have been assigned numeric values, but the values are not normalized. Values exceeding 100% are flagged at the end of this document file. (NGDC note; confirmed by P. Woodbury 8/23/88)

B. LEGS IN DATA SET

The data base contains data for legs 1-96;

C. BIBLIOGRAPHY

Davies, Thomas A., Musich, Lillian F. and Woodbury, Peter B., 1977, Automated Classification of Deep-Sea Sediments: Journal of Sedimentary Petrology, Volume 47, No. 2, June 1977, pp. 650-656.

Musich, L., 1984. Sediment Smear Slides: Preparation and Handling. In: Sedimentology, Physical Properties, and Geochemistry in the Initial Reports of the Deep Sea Drilling Project. Volumes 1-44: An Overview. G. Ross Heath, ed. (Published by National Geophysical Data Center) pp. 63-70.

Supko, Peter R., Perch-Nielsen, Katharina, and Carlson, Richard L., 1977. Introduction and Explanatory Notes, Leg 39. Deep Sea Drilling Project, Appendix A - Classification of Sediments. In Supko, P.R., Perch-Nielsen, K. et al., 1977. Initial Reports of the Deep Sea Drilling Project, Volume 39. Washington (U.S. Government Printing Office) pp. 19-24.

van Andel, T.H., Winterer, E.L., and Duncan, J., 1973, Report of Subcommittee on sediment classification, of advisory panel on sedimentary petrology and physical properties: Unpublished JOIDES Report.

II. FORMAT AND FIELD DESCRIPTIONS

A. RECORD FORMATS

= LEAD RECORD =

Record length = 84 characters

COLUMN	FIELD	FORMAT
1-2	LEG	A2
3-5	SITE	A3
6	HOLE	A1
7	CORE	A3
10-11	SECTION	A3
12-15	TOP INTERVAL DEPTH (centimeters)	F4.1
16-23	TOP OF CORE DEPTH (meters)	F8.2
24-31	SAMPLE DEPTH (meters)	F8.2
32-33	NUMBER OF PHYSICAL RECORDS	I2
34	space	X1
35-38	SLIDE DESCRIBER	A4
no initials are present in this field (NGDC note)		
39	* SCREEN PROGRAM DATA FLAG	A1
40	DOMINANT OR MINOR LITH. ("D" OR "M")	A1
41-43	PERCENT SAND	I3
44-46	PERCENT SILT	I3
47-49	PERCENT CLAY	I3
50-51	space	X2
52	ABUNDANCE CODE ("R" OR "N")	A1
53-54	space	X2
55-57	LENGTH OF SEDIMENT NAME IN CHARACTERS	I3
58-60	NUMBER OF COMPONENTS	I3
61-63	* TOTAL SILICEOUS COMPONENTS	I3
64-66	* TOTAL CALCEROUS COMPONENTS	I3
67-69	* TOTAL SLOW SEDIMENTATION INDICATORS	I3
70-72	* TOTAL SHALLOW WATER INDICATORS	I3
73-75	* TOTAL VOLCANICS	I3
76-78	* DOLOMITE	I3
79-81	* EVAPORITES	I3
82-84	* TOTAL PERCENT COMPONENTS REPORTED	I3

* SCREEN RELATED DATA FIELDS
These data fields are not part of the original smear slide description but rather are used by the DSDP in the production of its SCREEN data base (see page 9).

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= SEDIMENT NAME AND AGE RECORD =
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Record length = 84 characters

COLUMN	FIELD	FORMAT
1-72	SEDIMENT NAME a. Additional records are used if name exceeds 72 characters. b. If no name then blank fill.	A72
73-80	NUMERIC AGE CODE	I8
81-84	space	X4

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= SMEAR SLIDE COMPONENT RECORD =
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Record length = 84 characters

COLUMN	FIELD	FORMAT
1-6	PRIMARY COMPONENT CODE	I6
7-12	SECONDARY COMPONENT CODE	I6
13-72	UP TO 10 MORE COMPONENT CODES a. Additional records are used if necessary.	10I6
73-84	space	X12

B. FIELD DESCRIPTIONS

The definition of leg, site, hole, core and section may be found in th 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, therefore an encoded value 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.

NUMBER OF RECORDS:

The total number of physical records which together comprise a complete smear slide description. Since there is always a lead record and at least one sediment name and age record, the number of records is never less than two.

SLIDE DESCRIBER:

The initials of the person who described the smear slide. (NGDC Note: no initials were found in this field at all)

SLIDE TYPE CODE: (NGDC NOTE: This field is not in the data file)

CODE	TYPE OF SLIDE
A	ACID TREATED AND SIEVED
C	COARSE FRACTION SAMPLE
S	REGULAR SMEAR SLIDE
T	SEDIMENT THIN SECTION

PERCENT SAND, SILT OR CLAY:

The percent of each fraction as determined by the smear slide describer. The DSDP maintained a separate grain size data base.

DOMINANT OR MINOR LITHOLOGY: (NGDC NOTE: in col. 40, supposed to be in 51)

The slide may be prepared from either a sample that was representative of the entire section (dominant=D) or a distinct small layer or bleb within the section (minor=M).

ABUNDANCE CODE:

This code indicates whether abundance was originally recorded as numerical abundance (N) or as relative abundance (R).

LENGTH OF SEDIMENT NAME:

The number of characters (including blanks) which are in the sediment name. Each sediment name-age record may contain up to 72 characters of the name. Additional records may be included as needed.

NUMBER OF COMPONENTS:

The number of components on the smear slide description. Each component record may contain twelve component codes and as many component records may be used as necessary.

COMPONENT CODES:

The six digit component codes identify a particular smear slide component and its absolute abundance. The first four digits represents one of the components from the list below. The fifth and sixth digits represent the abundance (100% abundance is represented by 99). For example, the component code 320315 would mean that 15 percent of the smear slide contained phosphorite.

CODE	ABBREV	COMPONENT NAME
1000	ESTCAR	ESTIMATED CARBONATE
1100	AUTCAR	AUTHIGENIC CARBONATE
1110	OTHCAR	CARBONATE
1120	OOLITE	OOLITE
1130	DOLOMI	DOLOMITE
1140	ARAGON	ARAGONITE
1200	UNICAL	UNIDENT CALC FOSSIL
1210	NANNOS	NANNOFOSSIL
1221	FORAMS	FORAMINIFERA
1300	PTEROP	PTEROPOD
1410	LAMELI	LAMELLIBRANCH
1420	CALSPI	CALCAREOUS SPICULE
1430	CORAL	CORAL
1440	BRYOZO	BRYOZOA
1450	ALGAE	ALGAE
1460	OSTRCO	OSTRACOD
1999	UNCOMP	MYSTERY COMPONENT

2000	OTHSI	OTHER SILICEOUS MTRL.
2100	AUTSIL	AUTHIGENIC SILICA
2110	CHALC	CHALCEDONY
2120	OPAL	OPAL
2130	CHFRA	CHERT FRAGMENT
2200	SIFOSS	SILICEOUS FOSSIL
2210	RADS	RADILARIA
2220	DIAT	DIATOM
2230	SIFLAG	SILICOFLAGELLATE
2240	OPALPH	OPAL PHYTOLITH

2300	OTHPAL	OTHER FOSSIL
2310	SPICUL	SPICULE
3000	MINS	OTHER MINERAL
3111	SIDERI	SIDERITE
3112	RDCHRO	RHODOCHROSITE
3113	FLOURI	FLOURITE
3151	ANHYD	ANHYDRITE
3152	GYPSUM	GYPSUM
3153	HALITE	HALITE
3200	PHOPHT	PHOSPHATE
3201	MONAZI	MONAZITE
3202	COLLOP	COLLOPHANE
3203	PHOSPH	PHOSPHORITE
3250	SULFID	SULFIDE
3251	BARI	BARITE
3311	QTZ	QUARTZ
3312	CRISTO	CRISTOBALITE
3320	FELD	FELDSPAR
3350	ZEOL	ZEOLITE
3351	ANAL	ANALCITE
3400	MICA	MICA
3402	BIOTIT	BIOTITE
3450	CLAMIN	CLAY MINERAL
3452	MONTMO	MONTMORILLONITE
3453	ILLITE	ILLITE
3500	SERPEN	SERPENTINE
3501	GLAUC	GLAUCONITE
3550	OPMINR	OPAQUE MINERAL
3551	PYRITE	PYRITE
3552	FE	IRON
3553	LIMONI	LIMONITE
3554	MAGNET	MAGNETITE
3555	ILMENI	ILMENITE
3600	HVYMIN	HEAVY MINERAL
3601	AUGITE	AUGITE
3604	RUTILE	RUTILE
3605	ZIR	ZIRCON
3606	TOUR	TOURMALINE
3607	GARNET	GARNET
3608	APAT	APATITE
3609	STAURO	STAUROLITE

3611	KYANIT	KYANITE
3612	EPID	EPIDOTE
3613	HORNBL	HORNBLENDE
3614	AMPH	AMPHIBOLE
3615	TOPAZ	TOPAZ
3616	SPHENE	SPHENE
3617	ZOISIT	ZOISITE
3620	SILMAN	SILLIMANITE
3621	HYPERS	HYPERSTHENE
3622	DIOPSI	DIOPSIDE
3623	TREMOL	TREMOLITE
3625	PYROXE	PYROXENE
3626	GLAUPH	GLAUCOPHANE

3627	SPINEL	SPINEL
3628	SPHALE	SPHALERITE
3629	ANATAS	ANATASE
3634	OLIVIN	OLIVINE
3651	GLAS	GLASS
3652	PALAG	PALAGONITE
3700	VOLFRA	COLC MATERIAL FRAG
3705	VOLCLY	VOLCANIC CLAY
3710	BASALT	BASALT
3711	PUMICE	PUMICE
3712	SCORIA	SCORIA
3751	MANGAN	MANGANESE
3752	ISOAG	ISOTROPIC SILVER
3753	MOLYBD	MOLYBDENUM
3754	MAGNSM	MAGNESIUM
3800	ROCFRA	ROCK FRAGMENT
3850	ORGDEB	ORGANIC DEBRIS
3870	CHIT	CHITANOZOA
3871	FECPEL	FECAL PELLET
3872	CARBFR	CARBON FRAGMENT
3901	LIMNIC	LIMNIC
3902	AUTCRY	AUTHIGENIC CRYSTAL
3903	MESOST	MESOSTASIS
3904	MICAGG	MICROGRANULAR AGGREGATE
3905	MICPHE	MICROPHENOCRYST
3906	ISOMIN	ISOTROPIC MINERAL
3907	SPHERU	SPHERULITE
3908	TERDET	TERIGENOS DETRITUS
3909	ALTERI	ALTERITE
3910	MICRON	MICRONODULE
3911	DETMAT	DETRITAL MATERIAL
3912	DETMIN	DETRITAL MINERAL
3915	AMPHOX	AMORPHOUS OXIDE

SCREEN RELATED FIELD DESCRIPTIONS

The following data fields are not part of the original smear slide description but rather are used by the DSDP in the production of it's screen data base. The SCREEN data base contains computer-generated lithologic classifications of the sedimentary material collected by the DSDP. The computer program outlined in Davies et al., 1977, uses a modified deep-sea sediment classification scheme developed by the JOIDES Advisory Panel on Sedimentary Petrology and Physical Properties (van Andel et al., 1973). The file provides the user with a standardized lithologic data base. The file also contains information on basic composition, average density, porosity, geologic age and the shipboard observer's lithologic description.

SCREEN PROGRAM DATA FLAG:

Special character used to relay data disposition information to the DSDP SCREEN production program.

TOTAL SILICEOUS COMPONENTS:

The sum of the biogenic silica component percentages.

TOTAL CALCAREOUS COMPONENTS:

The sum of the calcareous component percentages.

SLOW SEDIMENT INDICATORS:

The sum of the component percentages which imply the sediment was deposited at a slow depostional rate. These include manganese oxide, fish debris, limonite, etc. .

SHALLOW WATER INDICATORS:

The sum of the component percentages which imply the sediment was deposited in shallow water. These include shell debris, glauconite, terrigenous material, etc. .

TOTAL VOLCANICS:

The sum of the volcanic component percentages such as glass, pumice and palagonite.

DOLOMITE:

Since dolomite must be considered both as a mineral and a rock type, the percent dolomite was encoded separately in order for the SCREEN program to properly classify the sample.

EVAPORITES:

The sum of the evaporite component percentages. These include anhydrite, gypsum, halite, etc. .

TOTAL PERCENT COMPONENTS REPORTED:

Ideally, the total components should always sum to 100%. However due to faulty reporting or when relative abundances necessitate conversion to numerical percentages this number may be more or less than 100%. In these cases the totals are normalized prior to their being processed by the SCREEN program. (NGDC Note: totals were NOT normalized for SCREEN as indicated. Confirmed by P. Woodbury 8/88)

SEDIMENT NAME:

The name given to the sediment by the describer on the corresponding visual core description.

NUMERIC AGE CODE:

An eight digit hierarchical code which represents a specific age. The code is designed to provide age level information as outlined below. Age assignments are determined by comparing the smear slide depth against the depths within the DSDP age profile data base. The corresponding age code is then transferred to the smear slide data base.

CODE DIGIT	AGE LEVEL
1	(1) ERA
2-3	(2) PERIOD
4	(3) SUBPERIOD
5	(4) EPOCH
6	(5) SUBEPOCH
7	(6) STAGE
8	(7) SUBSTAGE

Smearslide errors include the following:

Cores and Sections within cores were out of sequence throughout the Smearslide data base. In some cases there are two sets of information for one interval which match except for a small change in a percentage for one component. This suggests that during an update at DSDP new or corrected information for an interval may have been placed in the file out of order. The Smearslide data base has been completely re-sorted, but "duplicate" records were not eliminated. NGDC personnel felt that data users are better qualified to select "correct" entries where multiple data exist, perhaps by comparing the data to the Initial Reports.

The following is a list of verified out-of-order cores found, others may have existed in the file:

Leg 3, Hole 13, Core 1	Leg 3, Hole 20C, Cores 2,4,5
Leg 9, Hole 80A, Cores 2,3	Leg 17, Hole 171, Core 28
Leg 19, Hole 183, Cores 12-15,17	Leg 21, Hole 207A, Cores 20,26
Leg 22, Hole 217, Cores 1,25	Leg 24, Hole 231, Cores 36,37
Leg 25, Hole 239, Cores 1,11-14,18	Leg 25, Hole 241, Core 1
Leg 27, Hole 262, Core 28	Leg 29, Hole 277, Core 1
Leg 30, Hole 286, Core 2	Leg 30, Hole 289, Core 13
Leg 32, Hole 303, Cores 2,4	Leg 50, Hole 416A, Cores 21,22
Leg 75, Hole 530A, Cores 69,70	

Age codes within the Smearslide data base frequently contained even numbers, which are not valid. After discussing this with DSDP staff, we found that these even numbers were interpolations due to uncertain ages. After consulting Peter Woodbury of the DSDP, even numbers and all digits to their right were replaced with zeros to show the lack of precision past the last valid age level.

Core/Hole renumbering: 1) The original Smearslide data file referenced Hole 1A for Leg 1. Hole 1A does not exist in the Coredepths file or the Initial Reports. After comparing cores in Hole 1 and cores listed under "Hole 1A" in the Smearslide file, the cores from Hole 1 were assigned "X 1", etc. Hole 1A was then changed to Hole 1.
2) Leg 16, Hole 155, Cores S13 and S14 (sidewall cores), were changed to S1 and S2 to match the numbering scheme for sidewall cores at that hole used by the Coredepths file and other data files.
3) Leg 93, Hole 603, Cores 2, 3, 5, 7, 11, 13, 15, 17, 19, 22, 24, and 53 were represented in the Coredepths file as H_. An "H" was appended to those cores in the Smearslide file.

Columns 34-38 of the lead record should contain a space followed by the describer's initials: Echos of parts of the %silt/clay fields were found in nearly half of the records - these were removed by NGDC staff. The other records were blank in the describer's initials field. No confirmed, valid describers' initials were found in this file.

There are frequent occurrences of numeric entries in columns 73-84 of the smear slide component record. These numeric entries sometimes appear as age codes or look like '00000000010'. The second type of entry contains nine zeros and a three digit number, which is not always '101'. There should only be spaces in columns 73-84. (NGDC staff have removed these characters after consultation with DSDP data management)

The "Slide Type Code", which was column 40 on the lead record in the original documentation is not present. Instead, column 40 contains either a "D" or an "M" for dominant or minor lithology (column 51 in original documentation).

The total components fields on the lead record in columns 61-81 have not been normalized. Percentages well over 200% will result from adding up individual components in some cases. See NGDC NOTES under the field explanation for "TOTAL PERCENT COMPONENTS REPORTED" above.

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