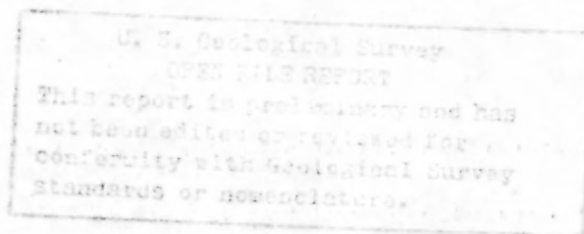


Semiquantitative spectrographic analyses of samples from parts of  
Chesapeake, Delaware, and Hudson estuaries

by James P. Owens, Karl Stefansson, and Leslie A. Sirkin

Samples of late Wisconsinan-Holocene bay fill were obtained from parts of Chesapeake, Delaware, and Hudson estuaries (fig. 1).

These samples were analyzed by the semiquantitative spectrographic technique (table 1, Chesapeake Bay; table 3, Delaware Bay; and table 5, Hudson River estuary). Samples of older (Pleistocene?) bay fill bordering Chesapeake Bay (table 2, Kent Island) and Delaware Bay (table 4, Artificial Island) were also analyzed by the same techniques.



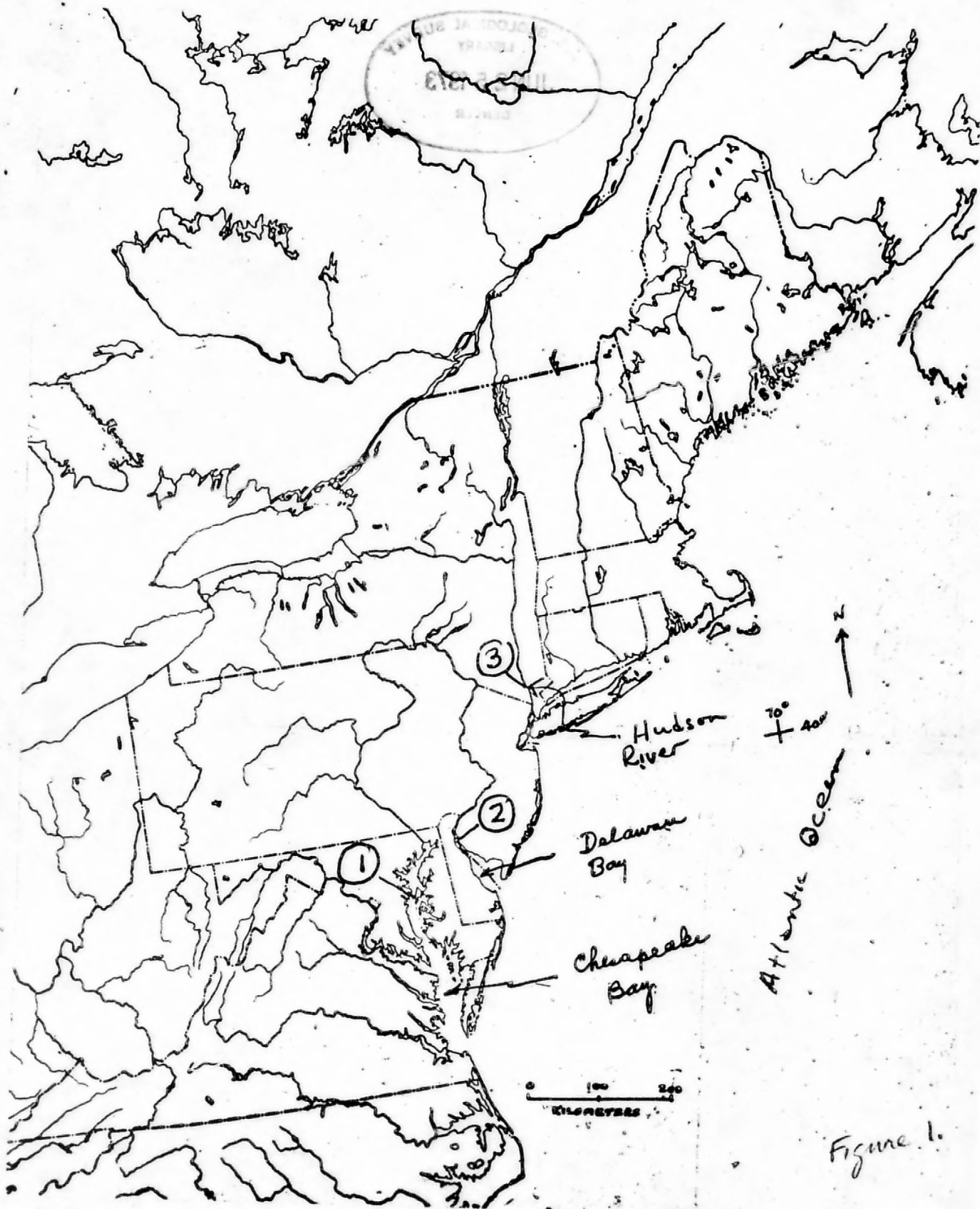


Figure 1.

< Designation indicates below the limits of detection for the method used, and > indicates inability of computer to scan line because of intensity of spectra. Analyst, A. Dorrzapf of U.S. Geological Survey.

Analysis no. 1. core 4 Sample 7 (107.5-109')

2. core 5 do 6 (142.5-144')

3. core 5 do 7 (152.5-154')

4. core 5 do 8 (162.5-164')

5. core 5 do 2 (102-103.5')

6. core 6 do 3 (107-108.5')

7. core 6 do 4 (112-113.5')

8. core 5 do 5 (122-123.5')

9. core 6 do 6 (132-133.5')

10. core 6 do 8 (152-153.5')

11. core 6 do 9 (162-163.5')

[illegible]

Table 2.--Semiquantitative spectrographic analysis of a sample from  
the older bay fill at Kent Island.  
Analyst, A. Dorrzapf, U.S. Geological Survey

SI %	> 25.3
AL %	3.54
TE %	1.25
MO %	0.383
CA %	0.384
BA %	> 0.316
K %	> 1.00
TI %	0.511
P %	< 0.046
MI %	0.016
AG PPM	< 0.10
AS PPM	< 100
AU PPM	< 6.81
B PPM	65.7
BA PPM	271
BE PPM	1.10
BI PPM	< 1.00
CD PPM	< 14.7
CE PPM	64.8
CO PPM	2.04
CR PPM	44.2
CS PPM	---
CU PPM	5.6
DY PPM	< 3.16
FR PPM	2.56
EU PPM	1.27
GA PPM	13.7
GD PPM	< 3.16
GE PPM	< 1.00
HF PPM	< 21.5
HG PPM	---
HO PPM	< 0.68
IR PPM	< 4.04
IS PPM	< 6.81
LA PPM	32.5
LI PPM	---
LJ PPM	< 3.16
MS PPM	1.69
MO PPM	< 1.47
NB PPM	14.5
NO PPM	35.2
RI PPM	6.47
OS PPM	< 21.5
PS PPM	< 10.0
PD PPM	< 0.22
TR PPM	< 5.69
PT PPM	< 6.81
RS PPM	---
RE PPM	< 10.0
RI PPM	< 0.68
RU PPM	< 0.32
SB PPM	< 68.1
SC PPM	6.89
SN PPM	4.28
SR PPM	< 3.16
CR PPM	> 21.5
TA PPM	< 4.04
TB PPM	< 16.4
TE PPM	< 31.6
TR PPM	< 21.5
TL PPM	< 3.16
UA PPM	< 1.10
U PPM	< 21.5
V PPM	87.8
W PPM	< 10.0
Y PPM	23.1
YB PPM	3.2
ZF PPM	18.8
ZR PPM	330
SiO2 %	> 73.4
Al2O3 %	10.5
Fe2O3 %	1.78
MgO %	0.635
CaO %	0.537
Na2O %	> 0.426
K2O %	> 1.20
TiO2 %	0.832
P2O5 %	< 0.106
MnO %	0.0068



TABLE 2

Table 3.--Semiquantitative spectrographic analyses of 23 samples from core CB 253 (Reedy Island dike) in the upper Delaware estuary. Analyst, A. Dorrzapf, U.S. Geological Survey. Analyses are numbered 1-23; depths from which samples were obtained are listed beside analysis number.

Analysis no. 1.	(20-22')
2.	(25-27')
3.	(30-32')
4.	(35')
5.	(37')
6.	(40-42')
7.	(45-47')
8.	(50-52')
9.	(55')
10.	(57')
11.	(60-62')
12.	(65-67')
13.	(70-72')
14.	(75')
15.	(77')
16.	(80-82')
17.	(85-87')
18.	(90-92')
19.	(97')
20.	(100-102')
21.	(105-107')
22.	(110-112')
23.	(115-117')



Table <sup>3</sup>~~2~~

1  
2  
3  
4  
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6  
7  
8  
9  
10-  
11  
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15-  
16  
17  
18  
19  
20-  
21  
22  
23  
24  
25-

Table 4.--Semiquantitative spectrographic analysis from three samples  
from Artificial Island. Analyst, A. Dorrzapf, U.S. Geological  
Survey.

Analysis no. 1. (30')  
2. (40')  
3. (58.5')

## ARTIFICIAL ISLAND AQUARIUM

	①	②	③
GI \$	25.4	30.4	32.6
AL \$	8.62	6.28	6.87
FE \$	6.59	5.00	4.36
MG \$	1.37	0.861	0.099
CA \$	0.542	0.728	0.632
HA \$	>0.316	>0.316	>0.316
K \$	>1.00	>1.00	>1.00
TE \$	0.372	0.429	0.396
P \$	<0.046	<0.046	0.131
ME \$	0.0598	0.0873	0.0544
AG PPM	<0.10	<0.10	<0.10
AS PPM	<100	<100	<100
AU PPM	<6.81	<6.81	<6.81
B PPM	72.4	59.0	70.3
BA PPM	360	400	360
BE PPM	3.70	2.86	2.78
BI PPM	<1.00	<1.00	<1.00
CD PPM	<14.7	<14.7	<14.7
CE PPM	111	122	96.7
CO PPM	15.1	15.6	17.0
CR PPM	106	82.1	78.8
CS PPM	---	---	---
CU PPM	<46.4	<46.4	<46.4
DY PPM	<3.16	<3.16	<3.16
ER PPM	<2.15	<2.15	<2.15
EU PPM	2.01	1.93	1.73
GA PPM	22.2	14.6	13.1
GD PPM	9.96	9.29	9.63
GE PPM	<1.00	<1.00	<1.00
HF PPM	<21.5	<21.5	<21.5
HG PPM	---	---	---
HO PPM	<0.68	<0.68	<2.09
IF PPM	<4.64	<4.64	<4.64
IR PPM	<6.81	<6.81	<6.81
LA PPM	53.0	51.7	45.8
LI PPM	---	---	---
LU PPM	<3.16	<3.16	<3.16
MC PPM	591	872	543
MD PPM	3.36	2.41	2.29
ME PPM	7.65	6.09	7.55
ND PPM	49.6	48.6	43.4
NI PPM	44.0	46.8	36.8
OS PPM	<21.5	<21.5	<21.5
PE PPM	15.3	14.2	<10.0
PD PPM	<0.22	<0.22	<0.22
PR PPM	9.11	8.16	8.13
PT PPM	<6.81	<6.81	<6.81
RB PPM	---	---	---
RE PPM	<10.0	<10.0	<10.0
RH PPM	<0.68	<0.68	<0.68
RU PPM	<0.32	<0.32	<0.32
SB PPM	<68.1	<68.1	<68.1
SC PPM	14.8	11.1	9.07
SN PPM	4.79	5.12	4.48
SE PPM	5.65	4.54	3.99
SR PPM	>21.5	>21.5	>21.5
TA PPM	<46.4	<46.4	<46.4
TB PPM	<46.4	<46.4	<46.4
TE PPM	<31.6	<31.6	<31.6
TF PPM	<21.5	<21.5	<21.5
TL PPM	<3.16	<3.16	<3.16
TM PPM	<3.16	<3.16	<3.16
U PPM	<21.5	<21.5	<21.5
V PPM	110	75.8	86.5
W PPM	<10.0	<10.0	<10.0
Y PPM	32.7	42.1	36.9
ZB PPM	3.56	3.68	3.40
ZH PPM	101	89.8	110
ZA PPM	171	255	235
GI02 \$	54.3	65.0	69.8
AL203 \$	16.3	11.9	13.0
FE203 \$	9.42	7.14	6.24
MG0 \$	2.28	1.43	1.16
CA0 \$	0.758	1.02	0.885
HA20 \$	>0.426	>0.426	>0.426
K20 \$	>1.20	>1.20	>1.20
TE02 \$	0.621	0.701	0.621
PE02 \$	<0.106	<0.106	0.331
ME02 \$	0.0996	0.139	0.0889

Table 34



Table 5.--Semiquantitative analyses from core 58 at the Newburgh Bridge in the Hudson River estuary. Analyses 1-8 are samples from the organic-rich estuarine beds and analyses 9-14 are the lacustrine facies.

Analyst: A. Dorrzapf, U.S. Geological Survey

Analysis no. 1. (66')

2. (91')

3. (100')

4. (105')

5. (125')

6. (145')

7. (155')

8. (160')

9. (181')

10. (211')

11. (231')

12. (239')

13. (243')

14. (266')

