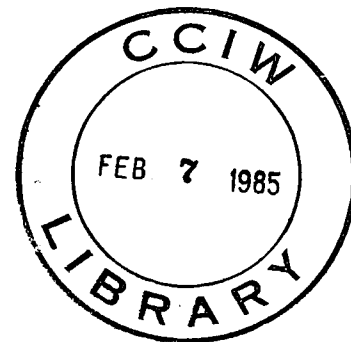


**HYDRAULICS DIVISION
TECHNICAL NOTE**



DATE: January 1985 **REPORT NO:** 85-02

TITLE: Particle Size Data Report - Rondeau Bay
Sediment

AUTHOR: K. Salisbury, Research Technologist,
Technical Services Section

REASON FOR REPORT: This report responds to a request for particle
size data from Mr. S. Painter, Aquatic Ecology
Division, National Water Research Institute.

CORRESPONDENCE FILE NO: Study 84-330

1.0 INTRODUCTION

This report provides the results of particle size analysis on four sediments from Rondeau Bay submitted by Mr. S. Painter, Aquatic Ecology Division, National Water Research Institute.

The size-analyses were performed using the Sedigraph Analyzer and Sieve Method (Duncan and LaHaie, 1979).

2.0 PROCEDURE

(1) The Sieve and Sedigraph Method which provides sand, silt and clay percentages was used to analyse 17 samples.

Briefly the procedure consists of:

1. Splitting the sample to 2g.
2. Removing particles large enough to block Sedigraph Suction Tube (0.088 mm).
3. Dispersing sample in a Calgon suspension.
4. Automatic analysis with the Sedigraph.
5. Processing the results with SIZDIST: a FORTRAN IV computer program (Sandilands and Duncan, 1980).

3.0 RESULTS

(1) For the Sieve and Sedigraph Method, the output consists of:

1. A histogram of the frequency distribution.
2. The percentage and cumulative percentages of the material occurring within each 1/2 PHI unit.
3. Moment measure statistics (Krumbein & Pettijohn, 1938) and graphic (Folk and Ward, 1957) statistics.
4. Percentiles.
5. Percent gravel, sand, silt and clay.
6. Ratios used to plot Folk's Ternary Classification.
7. Shepard (1954) and Folk (1974) Ternary Classifications.

PHI CONVERSION

The results of samples analyzed in the Sedimentology Lab are presented using the PHI scale (Krumbein, 1934). The conversion from this PHI equation, $\phi = -\log_2 \xi$ (where ξ is the diameter in millimeters) to the Wentworth scale is listed below.

PHI (ϕ)	Millimeters	Microns	Wentworth Size Class
-5.0	32		
-4.5	24		
-4.0	16		Pebble (-2 to -6 ϕ)
-3.5	12		
-3.0	8		
-2.5	6		
-2.0	4		
-1.5	2.83		Granule
-1.0	2.00		
-0.5	1.41		Very coarse sand
0.0	1.00		
0.5	0.71		Coarse sand
1.0	0.51	500	
1.5	0.35	350	Medium sand
2.0	0.25	250	
2.5	0.177	177	Fine sand
3.0	0.125	125	
3.5	0.088	88	Very fine sand
4.0	0.0625	62.5	
8.0	0.0039	3.9	Silt+ Clay+

4.0 REFERENCES

- Duncan, G.A. and LaHaie, G.G. 1979. Size Analysis Procedures used in the Sedimentology Laboratory, NWRI. NWRI, CCIW, Hydraulics Division Manual, September 1979.
- Folk, R.L. 1974. Petrology of Sedimentary Rocks. Hemphill Publishing Co., Austin, Texas, 182 p.
- Folk, R.L. and Ward W.C. 1957. Brazos River Bar: A Study in the Significance of Grain Size Parameters. Jour. Sed. Petrology, V. 27, pp 3-26.
- Krumbein, W.C. and Pettijohn, F.J. 1938. Manual of Sedimentary Petrography. Appleton-Century-Crofts, New York, 549 p.
- Sandilands, R.G. and Duncan, G.A. 1980. SIZDIST - A Computer Program for Size Analysis. NWRI, CCIW, Hydraulics Division Technical Note No. 80-08.
- Shepard, F.P. 1954. Nomenclature Based on Sand-Silt Ratios. Jour. Sed. Petrology, V. 24, pp. 151-158.

APPENDIX 1

SIZDIST OUTPUT

RONDEAU BAY TYPE1

SIEVE ONLY

SAMPLE WT.=152.4600

PHI PCT. CUMPCT.

01/14/85

-4.50			****
-4.00	4.49	4.49	**
-3.50	1.83	6.32	*
-3.00	.62	6.94	**
-2.50	2.49	9.43	**
-2.00	1.57	11.00	****
-1.50	4.32	15.32	*****
-1.00	12.70	28.02	*****
-.50	10.59	38.61	*****
0.00	4.66	43.28	****
.50	3.67	46.95	*****
1.00	5.24	52.19	*****
1.50	6.53	58.72	*****
2.00	17.03	75.75	*****
2.50	11.35	87.10	***
3.00	2.98	90.08	**
3.50	1.82	91.90	**
4.00	2.35	94.25	*****
****	5.75	100.00	

MEAN ST.DEV. SKEWNESS KURTOSIS

.22 1.99 -.23 -.52 KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -4.0 TO 4.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES	MEDIAN	.79	5TH -3.85	16TH -1.47	25TH -1.12
			75TH 1.98	84TH 2.36	95TH*****
PCT. GRAVEL	28.02	SAND 66.23	SILT+CLAY 5.75		
GRAVEL+SAND	94.25			GRAV+SAND/SILT+CLAY	16.38
LABELS SHEPARD -SAND		FOLK(GMS)-GRAVELLY SAND		(SCS)-	

COMMENTS - ORGANIC DETRITUS PRESENT

RONDEAU BAY TYPE2

SIEVE, AND SEDIGRAPH SAMPLE WT.=, 48.5200

PHI PCT. CUMPCT.

01/14/85

-1.00			
-0.50	.06	.06	
0.00	.16	.23	
.50	.43	.66	
1.00	5.21	5.87	*****
1.50	8.76		*****
2.00	14.63	14.63	*****
2.50	10.76	29.27	*****
3.00	8.62	40.02	*****
3.50	5.50	48.64	*****
4.00	2.70	54.14	***
4.50	0.00	56.84	
5.00	1.82	56.84	**
5.50	4.25	58.67	****
6.00	4.25	62.92	****
6.50	4.56	67.18	*****
7.00	4.86	71.73	*****
7.50	3.95	76.60	****
8.00	3.95	80.55	****
8.50	2.13	84.50	**
9.00	1.82	86.63	**
9.50	3.04	88.45	***
10.00	1.22	91.49	*
10.50	1.22	92.71	*
11.00	1.52	93.92	**
11.50	1.52	95.44	**
12.00	.30	96.96	
*****	2.74	97.26	***
		100.00	

MEAN ST.DEV. SKEWNESS KURTOSIS

4.27 2.95 .34 -.71

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -.5 TO 12.0 PHI

4.20 3.10 .53 .82

FOLK GRAPHIC STATISTICAL PARAMETERS FOLK AND WARD, 1957

PERCENTILES	MEDIAN	3.12	5TH	.92	16TH	1.55	25TH	1.85
			75TH	6.84	84TH	7.94	95TH	10.85
PCT. GRAVEL	0.00	SAND	56.84	SILT (PIPETTE)	6.00	CLAY (PIPETTE)		0.00
				(SEDIGRAPH)	27.66	(SEDIGRAPH)		15.50
GRAVEL+SAND	56.84	SILT/(SILT+CLAY)	64.08	PCT.GRAV+SAND/SILT+CLAY				1.32
LABELS SHEPARD	-SILTY SAND	FOLK(GMS)-MUDDY SAND		(SCS)-MUDDY SAND				

RONDEAU BAY TYPE 3

SIEVE, AND SEDIGRAPH SAMPLE WT.=, 57.0300

PHI PCT. CUMPCT.

01/14/85

-1.00			
-0.50	.11	.11	
0.00	.40	.51	
.50	2.28	2.79	**
1.00	8.82	11.61	*****
1.50	11.96	23.57	*****
2.00	13.12	36.68	*****
2.50	4.40	41.08	****
3.00	1.16	42.24	*
3.50	.32	42.56	
4.00	.12	42.68	
4.50	0.00	42.68	
5.00	0.00	42.68	
5.50	3.58	46.26	****
6.00	0.00	46.26	
6.50	3.58	49.84	****
7.00	10.75	60.59	*****
7.50	3.58	64.17	****
8.00	7.17	71.34	*****
8.50	3.58	74.92	****
9.00	3.58	78.50	****
9.50	3.58	82.09	****
10.00	0.00	82.09	
10.50	3.58	85.67	****
11.00	3.58	89.25	****
11.50	3.58	92.83	****
12.00	1.79	94.63	**
*****	5.37	94.63	*****
	100.00		

MEAN ST.DEV. SKEWNESS KURTOSIS

5.13 3.67 .08 -1.44

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE -.5 TO 12.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES	MEDIAN	6.51	5TH	.63	16TH	1.18	25TH	1.55
			75TH	8.51	84TH	10.27	95TH	*****
PCT. GRAVEL	0.00	SAND	42.68	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	28.66	(SEDIGRAPH)	28.66	
GRAVEL+SAND	42.68	SILT/(SILT+CLAY)	50.00	PCT. GRAV+SAND/SILT+CLAY			.74	
LABELS SHEPARD -SAN SIL CLY FOLK(GMS)-SANDY MUD				(SCS)-SANDY MUD				

COMMENTS -
ORGANIC DETRITUS

RONDEAU BAY TYPE4

SEDIGRAPH ANALYSIS

01/14/85

PHI	PCT. CUM PCT.		
3.50			
4.00	0.00		
4.50	2.22	0.00	**
5.00	2.22	2.22	**
5.50	6.67	4.44	*****
6.00	11.11	11.11	*****
6.50	11.11	22.22	*****
7.00	13.33	33.33	*****
7.50	10.00	46.67	*****
8.00	8.89	56.67	*****
8.50	5.56	65.56	*****
9.00	6.67	71.11	*****
9.50	2.22	77.78	**
10.00	4.44	82.22	****
10.50	2.22	84.44	**
11.00	3.33	86.67	***
11.50	2.22	90.00	**
12.00	1.11	92.22	*
*****	6.67	93.33	*****
		100.00	

MEAN ST.DEV. SKEWNESS KURTOSIS

7.33 1.72 .31 -.23

KRUMBEIN + PETTIJOHN (1938) MOMENT MEASURES FOR SIZE RANGE 4.0 TO 12.0 PHI

> 5 PERCENT OF THE FINES ARE NOT RESOLVED, OBTAIN FOLK STATS. GRAPHICALLY

PERCENTILES	MEDIAN	7.17	5TH	5.04	16TH	5.72	25TH	6.13
			75TH	8.79	84TH	9.95	95TH	*****
PCT. GRAVEL	.00	SAND	0.00	SILT (PIPETTE)	0.00	CLAY (PIPETTE)	0.00	
				(SEDIGRAPH)	65.56	(SEDIGRAPH)	34.44	
GRAVEL+SAND	.00	SILT/(SILT+CLAY)	65.56	PCT.GRAV+SAND/SILT+CLAY			.00	

LABELS SHEPARD -CLAYEY SILT FOLK(GMS)-MUD (SCS)-MUD

COMMENTS - ORGANIC DETRITUS

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