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1. SUMMARY

This work was conducted in support of an ongoing investigation of sediment dispersal and evolution of a mixed-sediment disposal mound off Cape Fear, NC, by the US Army Corps of Engineers (USACE) and Evans-Hamilton, Inc. (EHI) project number 6000.21. This is the third of three surveys performed by the Virginia Institute of Marine Science, College of William and Mary, under the direction of Grace Battisto. In this survey, over 70 bottom sediment grabs were collected in an effort to characterize the grain-size distribution of the sediment on and around the mound. The top five centimeters of sub-cores from each of the sediment grabs were analyzed for percent by weight of clay, silt, sand and gravel using wet sieve and pipette methods. The same samples were also analyzed for grain-size volume distribution and D50 grain-size for mud (5 to <63 microns) and sand (63 microns to <500 microns) using a Laser In-Situ Scattering Transmissometer (LISST 100). Sediment fractions greater than 500 microns were digitally photographed for documentation purposes.

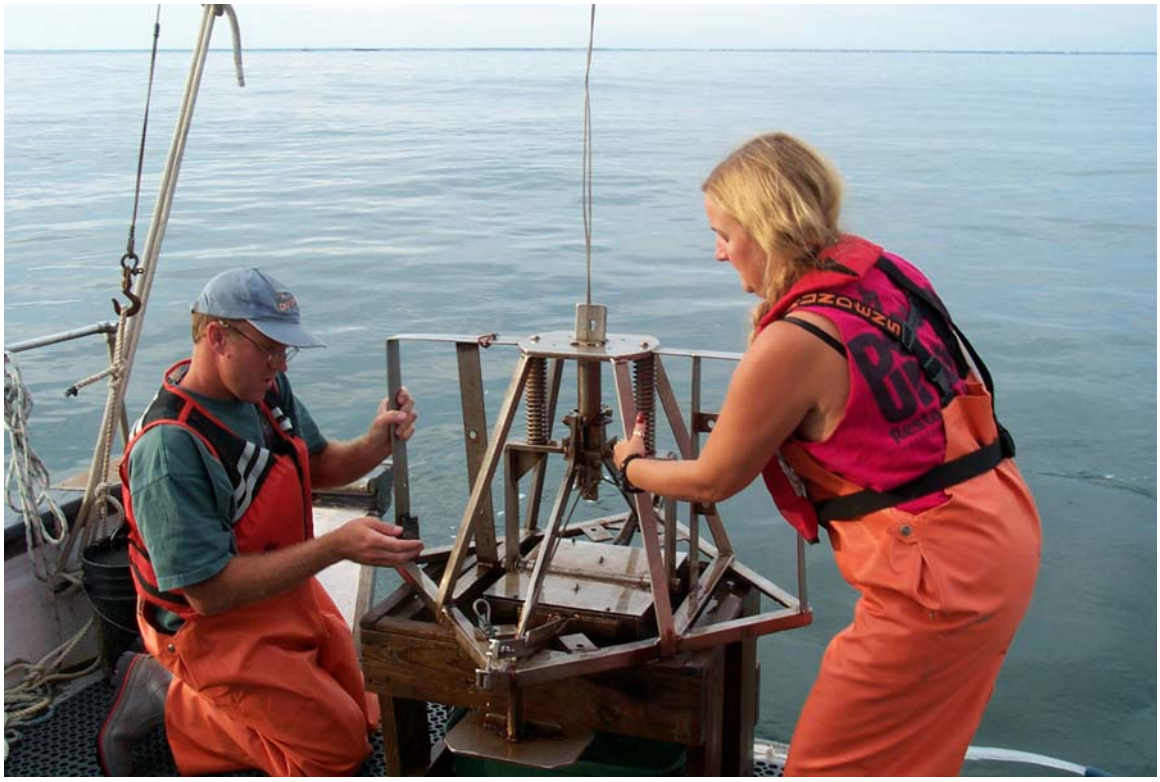


FIGURE 1. Smith-Mac bottom sediment grab used to collect an approximately 10 cm thick box core with the sediment-water interface left relatively intact.

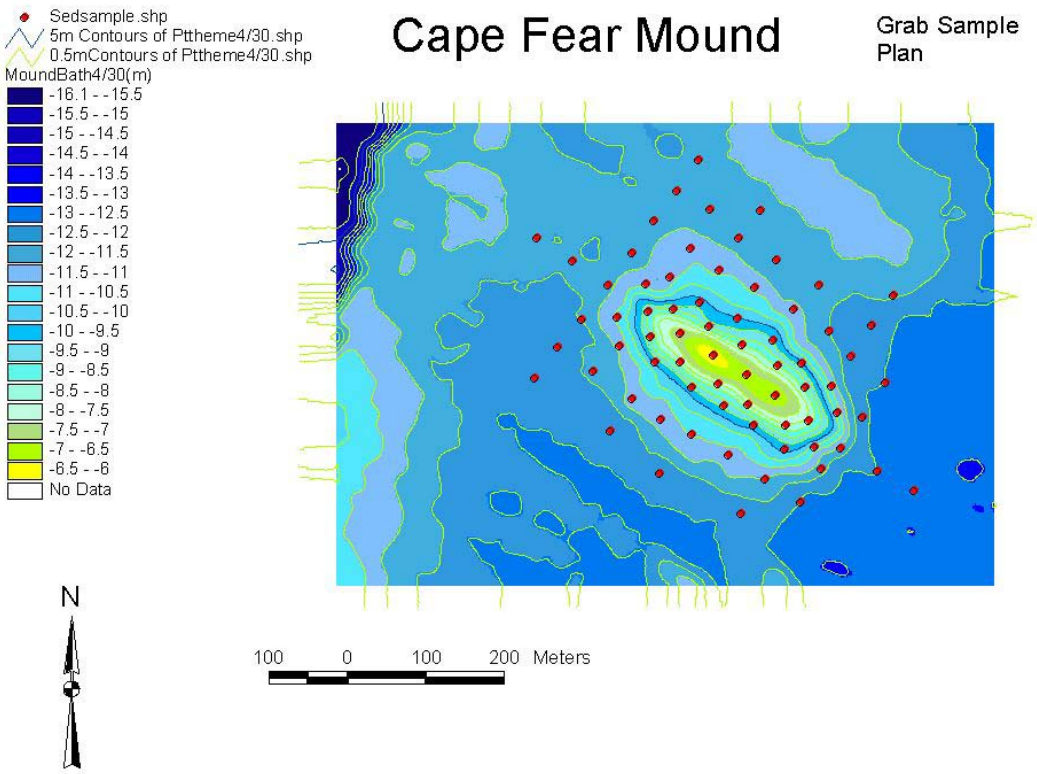


Figure 2. Proposed sediment grab site locations as suggested by Dr. Donald K. Stauble, USACE via E-mail from Carl Miller, USACE. Figure provided by Donald Stauble.

2. METHODS

A Smith-Mac sediment grab was used on board the VIMS vessel R/V Langley to collect the sediment grabs (Figure 1) at stations on and around the mound. Proposed station locations as suggested by Dr. Donald K. Stauble, USACE, (Figure 2 and Table 1) were loaded into the Nautical Technologies Ltd. software package "CAPN Voyager" version 6.1.9. Using this software in NAV format, which shows the position of the vessel using the differential GPS transponder mounted on the boom directly above the sediment grab, the Langley was maneuvered until the grab was directly over the proposed station. As the grab hit bottom, the actual location was recorded using the "mark" function in the

program (Table 1). Repeat grabs were taken at proposed sites 6, 41 and 60 because the first grab station was determined to be too far from the proposed site. The first grab station at these three sites were labeled 6A, 41A and 60A, respectively, and were kept and included in the data set. A nine-centimeter diameter sub-core was sampled from each grab, and the top five centimeters of the sub-core was removed for later analysis at the lab (Figure 3). Duplicate sub-cores were sampled from at least ten percent of the grabs.

Table 1. Proposed and Actual Grab station locations.

Proposed	Proposed		Actual	Actual	
ID	Latitude	Longitude	Station ID	Latitude	Longitude
1	33.8051	-78.0367	739	33.8052	-78.0370
2	33.8049	-78.0362	738	33.8048	-78.0360
3	33.8046	-78.0358	748	33.8045	-78.0357
4	33.8043	-78.0352	758	33.8043	-78.0352
5	33.8040	-78.0348	759	33.8040	-78.0348
6	33.8038	-78.0343	766	33.8038	-78.0343
dupl			767		
6A			725	33.8036	-78.0344
7	33.8035	-78.0339	771	33.8037	-78.0339
8	33.8033	-78.0335	784	33.8034	-78.0334
9	33.8030	-78.0330	785	33.8030	-78.0330
10	33.8027	-78.0326	718	33.8027	-78.0326
11	33.8024	-78.0321	719	33.8025	-78.0320
12	33.8022	-78.0316	720	33.8022	-78.0313
13	33.8046	-78.0352	746	33.8045	-78.0352
14	33.8043	-78.0349	757	33.8043	-78.0350
15	33.8041	-78.0344	764	33.8042	-78.0343
dupl			765		
16	33.8039	-78.0339	769	33.8039	-78.0339
17	33.8036	-78.0334	799	33.8037	-78.0334
18	33.8034	-78.0331	788	33.8034	-78.0330
dupl			789		
19	33.8031	-78.0326	786	33.8031	-78.0326
20	33.8042	-78.0356	721	33.8041	-78.0354
dupl			722		
21	33.8040	-78.0352	723	33.8040	-78.0353
22	33.8037	-78.0348	760	33.8036	-78.0346
23	33.8034	-78.0343	726	33.8033	-78.0341
dupl			727		
24	33.8037	-78.0339	770	33.8036	-78.0338
25	33.8030	-78.0333	783	33.8031	-78.0333
26	33.8027	-78.0330	717	33.8027	-78.0328
27	33.8049	-78.0354	737	33.8049	-78.0356
28	33.8047	-78.0349	745	33.8046	-78.0348

Table 1 (continued). Proposed and Actual Grab station locations.

Proposed ID		Proposed Latitude	Proposed Longitude	Actual Station ID	Actual Latitude	Actual Longitude
29		33.8044	-78.0345	756	33.8043	-78.0346
30		33.8042	-78.0340	768	33.8040	-78.0339
31		33.8023	-78.0335	779	33.8021	-78.0334
32		33.8037	-78.0331	798	33.8037	-78.0332
33		33.8034	-78.0327	787	33.8035	-78.0327
34		33.8030	-78.0323	802	33.8030	-78.0324
	dupl			803		
35		33.8042	-78.0361	747	33.8044	-78.0362
36		33.8039	-78.0356	749	33.8039	-78.0356
37		33.8037	-78.0351	724	33.8036	-78.0350
38		33.8034	-78.0346	773	33.8034	-78.0345
39		33.8032	-78.0342	772	33.8032	-78.0342
40		33.8030	-78.0338	728	33.8030	-78.0338
41		33.8027	-78.0334	729	33.8027	-78.0338
41A				782	33.8028	-78.0332
42		33.8025	-78.0329	730	33.8025	-78.0327
43		33.8053	-78.0351	736	33.8054	-78.0353
44		33.8050	-78.0346	744	33.8050	-78.0347
45		33.8047	-78.0342	755	33.8048	-78.0342
46		33.8045	-78.0337	792	33.8046	-78.0338
47		33.8043	-78.0332	791	33.8042	-78.0333
48		33.8040	-78.0327	790	33.8040	-78.0327
49		33.8037	-78.0324	797	33.8038	-78.0325
50		33.8034	-78.0320	796	33.8035	-78.0321
51		33.8039	-78.0365	750	33.8039	-78.0366
52		33.8036	-78.0360	752	33.8036	-78.0360
	dupl			753		
53		33.8033	-78.0354	762	33.8031	-78.0354
54		33.8030	-78.0350	761	33.8031	-78.0351
55		33.8029	-78.0346	774	33.8029	-78.0345
56		33.8026	-78.0341	781	33.8026	-78.0342
57		33.8024	-78.0336	780	33.8024	-78.0336
58		33.8021	-78.0332	777	33.8021	-78.0332
	dupl			778		
59		33.8057	-78.0348	735	33.8055	-78.0352

Table 1 (continued). Proposed and Actual Grab station locations.

Proposed ID	Proposed Latitude	Proposed Longitude	Actual Station ID	Actual Latitude	Actual Longitude
60	33.8054	-78.0343	740	33.8057	-78.0343
60A			793	33.8053	-78.0346
61	33.8051	-78.0340	743	33.8050	-78.0340
62	33.8048	-78.0334	754	33.8049	-78.0335
63	33.8046	-78.0329	800	33.8046	-78.0327
dupl			801		
64	33.8041	-78.0321	795	33.8040	-78.0320
65	33.8035	-78.0368	751	33.8034	-78.0367
66	33.8029	-78.0357	763	33.8028	-78.0357
67	33.8024	-78.0351	775	33.8025	-78.0350
68	33.8019	-78.0340	776	33.8020	-78.0339
69	33.8060	-78.0345	734	33.8058	-78.0346
70	33.8054	-78.0337	741	33.8053	-78.0338
dupl			742		
71	33.8044	-78.0318	794	33.8045	-78.0317
offshore	33.7989	-78.0343	804	33.7987	-78.0343
baldhead	33.8444	-78.0339	732	33.8445	-78.0340
oak	33.8945	-78.0842	733	33.8945	-78.0842

Figure 3. Extruder used to remove the top 5 cm of sub-core for later analysis.

2.1 Percent grain-size distribution by weight

Wet sieve methods were used to determine the percent fractions of mud (<63 microns), sand (63-500 micron) and gravel (>500 micron) for an aliquot of sample from each sub-core. Ten milliliters of a stock mesophosphate solution (0.3 g sodium carbonate and 51 g sodium mesophosphate solution /L de-ionized water) was added to each aliquot and put in a sonicator to prevent flocculation during the size separation process. Pipette analyses were used to separate the mud into clay and silt fractions. Percent by weight was determined for each fraction of the total weight of the aliquot.

2.2 Percent grain-size distribution by volume

The sand and mud fractions from the previous section were used to determine the volume grain-size distribution for each fraction. For the mud distribution, 2-15 ml of the mud fraction was brought to a total of 90 ml with a 10% solution of the stock sodium mesophosphate solution above. For the sand distribution, enough sand was added to 90

ml of the 10% sodium mesophosphate solution to give a good response from the LISST. Each solution was placed in a stirring chamber within the laser path length of the LISST, and at least 100 seconds of data were collected at 1 Hz. The LISST records grain-size distribution ranging from 5 to 500 microns in 32 bins. An average for each of these bins was calculated.

For the mud distribution, the averaged response of the first 17 bins, corresponding to the 5 to 63 microns grain-size range, were added together to get a total mud response. The response of each of these bins was then divided by the total mud response and multiplied by 100 to give a logarithmically spaced percent volume grain-size distribution for the mud fraction. The D50 mud grain-size is the bin-size that corresponds to 50 percent of the cumulative response of these 17 bins.

For the sand distribution, the averaged response for bins 18-32, corresponding to the 63 to 500 microns range, were added together to get a total sand response. The response of each of these bins was then divided by the total sand response and multiplied by 100 to give a logarithmically spaced percent volume grain-size distribution for the sand fraction. The D50 sand grain-size is the bin-size that corresponds to 50 percent of the cumulative response of these 15 bins.

2.3 Documentation of >500 micron sediment fraction

Digital photographs were taken of the sediment fraction greater than 500 microns. These photos could potentially be used at a later date to determine the size distribution of this fraction. The pictures were taken in the close-up mode with an Olympus E-10 digital camera mounted on a close-up stand with the lens 26 cm from the sample using two 75 watt bulbs for illumination.

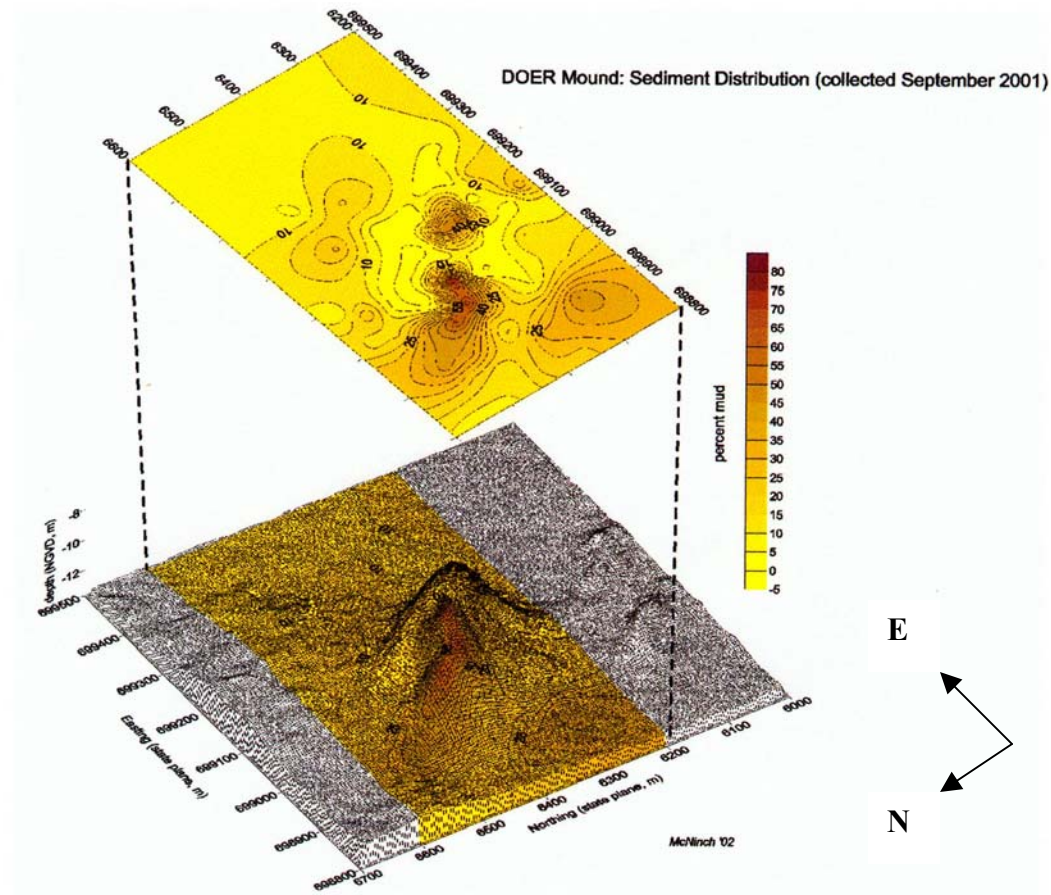


FIGURE 4. Percent mud by weight results plotted in state plane co-ordinates draped across mound elevation plot. Figure provided by Jesse McNinch, VIMS.

3. RESULTS

3.1 Percent grain-size distribution by weight

Table 2 lists the percent grain-size distribution by weight for each station. The sand fraction contains only the 60-500 micron range in order to be consistent with the size range of the distribution measured by the LISST. Figure 5 shows North Carolina state plane coordinate contour plots of each fraction by weight. The orientation in Figure 5 is rotated 130 degrees clockwise relative to Figure 4 such that North is now upwards.

Figure 5A shows that the percent mud concentrations are greatest over the mound peak with accumulation at lesser concentrations southwest of the mound. Figures 5B and 5C

show that the mud present on the mound consists mainly of clay, while the main constituent of the mud accumulation southwest of the mound is silt. Figure 5E shows that the major accumulations of sediment >500 microns (shell hash, etc) tends to be located mainly on or near the mound, suggesting that these larger particles were brought into the area with the dredge spoil.

3.2 Percent grain-size distribution by volume

Figures 7.1 – 7.87 show two graphs for each station. The **A** graph of each pair is the percent grain-size distribution calculated from the LISST volume distribution of the mud fraction. In each bar graph, the first peak represents the clay portion of the mud and the second peak is the silt portion. If the clay peak is proportionally greater than the silt peak, then the mud D50 grain-size will be in the clay region, represented by a red line and listed in Table 2. Conversely, when the silt peak is greater, the mud D50 is larger.

Figure 6A shows the distribution of the mud D50 in NC state plane co-ordinates. Clay grain-size tends to dominate over the peak of the mound, resulting in a D50 of around 6 microns. Two pools dominated by D50 grain-size greater than 20 microns, due to a larger proportion of silt in the mud fraction, are located south of the mound peak.

Figure 6B shows the distribution of sand D50 in NC state plane co-ordinates. The D50 grain-size of the sand fraction on the mound tends to be greater than 300 microns, with the exception of two pools located at either end of the peak, where the sand D50 grain-size is in the 200-250 micron range. The sand fraction on either side of the mound look to be in the 140-250 range and run in patches parallel to the mound peak.

3.3 Documentation of >500 micron sediment fraction

Figures 8.1 – 8.8 display digital photographs of the sediment fraction >500 microns. The photographs show that while there are sand grains greater than 500 microns, the material also consists of shell hash and detritus material.

Table 2. Percent Grain-size distribution by weight and LISST D50 grain-sizes

Station	Proposed ID	State plane Co-ord Northing (m)	Easting (m)	% Grain-size Distribution by weight % Clay	% Silt	% Sand	% >500 micron	LISST Grain-size D50 MUD D50	SAND D50
717	26	6282.949	699177.4	3.62	1.32	86.73	8.33	47	356
718	10	6286.854	699198.9	2.54	0.20	95.67	1.58	7	330
719	11	6255.938	699251.7	2.89	1.31	95.48	0.32	22	266
720	12	6223.275	699315.3	2.71	8.50	86.49	2.31	21	310
721	20	6430.338	698932.0	12.06	7.25	77.59	3.10	11	365
722	20			15.35	6.77	76.15	1.73	6	355
723	21	6419.409	698949.1	16.00	6.58	75.30	2.12	6	361
724	37	6375.261	698972.7	12.14	4.99	79.02	3.85	6	359
725	6	6381.348	699028.2	2.06	0.76	88.38	8.81	6	366
726	23	6352.062	699059.4	1.70	0.58	97.58	0.14	16	247
727	23			1.90	0.45	97.05	0.60	16	344
728	40	6311.664	699087.5	1.59	0.28	95.36	2.77	18	324
729	41	6279.973	699080.2	3.02	0.89	92.04	4.05	14	309
730	42	6257.158	699186.9	12.15	5.49	81.12	1.23	6	306
732	baldhead	10917.098	699025.7	1.58	0.97	97.46	0.00	18	199
733	oak	16426.839	694319.1	1.54	0.68	92.30	5.48	16	362
734	69	6619.680	699007.7	7.10	11.62	80.67	0.62	18	278
735	59	6596.428	698955.4	20.99	8.91	68.34	1.76	6	302
736	43	6575.263	698946.7	17.41	9.99	57.76	14.83	6	280
737	27	6525.919	698911.7	27.55	14.90	55.59	1.96	6	331
738	2	6509.320	698877.2	13.83	7.44	73.61	5.12	7	316
739	1	6553.742	698787.0	1.77	0.84	95.57	1.82	19	361
740	60	6609.607	699036.3	9.87	9.27	80.15	0.71	13	198
741	70	6571.622	699085.6	3.90	3.35	92.40	0.35	21	210
742	70			2.67	0.94	96.24	0.15	15	260
743	61	6541.241	699061.2	15.65	9.39	72.09	2.87	6	300
744	44	6531.014	698997.6	10.30	5.26	81.63	2.80	6	358
745	28	6493.360	698986.2	27.13	13.93	58.27	0.68	6	340
746	13	6484.016	698956.4	27.48	17.38	52.06	3.08	6	149

Table 2 (continued). Percent Grain-size distribution by weight and LISST D50 grain-sizes

Station	Proposed ID	State plane Co-ord Northing (m)	Easting (m)	% Grain-size Distribution by weight % Clay	% Silt	% Sand	% <500 micron	LISST Grain-size D50 MUD D50	SAND D50
747	35	6465.908	698862.5	6.28	4.42	89.30	0.00	12	276
748	3	6479.837	698907.6	20.24	14.93	63.70	1.13	6	258
749	36	6413.516	698913.5	3.97	4.74	90.20	1.09	19	161
750	51	6414.134	698825.2	12.81	10.83	76.36	0.00	13	230
751	65	6354.360	698819.8	8.00	15.80	75.93	0.28	17	148
752	52	6378.037	698878.2	11.76	24.63	63.06	0.55	17	164
753	52			10.66	16.35	72.53	0.46	17	128
754	62	6520.830	699106.0	5.13	8.39	86.48	0.00	16	174
755	45	6509.647	699044.4	3.80	2.00	93.73	0.47	6	232
756	29	6458.102	699011.4	0.91	0.60	95.29	3.21	7	350
757	14	6457.027	698976.1	38.85	23.98	29.06	8.10	6	249
758	4	6462.365	698954.6	29.11	19.57	51.33	0.00	6	306
759	5	6420.193	698992.0	44.73	24.51	27.36	3.40	6	343
760	22	6384.096	699006.3	21.99	9.31	62.42	6.28	5	311
761	54	6324.866	698962.1	2.93	1.91	94.33	0.83	31	198
762	53	6326.490	698939.7	9.59	5.99	84.18	0.25	7	206
763	66	6296.410	698907.4	20.46	25.35	54.20	0.00	12	205
764	15	6445.396	699035.0	2.40	0.87	94.66	2.07	8	305
765	15	6445.396	699035.0	8.88	4.87	85.17	1.09	6	342
766	6	6407.712	699038.9	57.75	21.09	21.16	0.00	6	307
767	6			61.62	22.04	16.11	0.23	6	206
768	30	6431.545	699075.6	2.04	0.72	95.36	1.88	13	308
769	16	6410.646	699074.7	8.34	2.99	87.98	0.70	6	254
770	24	6383.551	699083.6	1.35	0.41	97.54	0.70	6	297
771	7	6388.680	699078.3	1.13	0.46	97.30	1.11	6	364
772	39	6339.923	699046.7	1.26	1.26	94.63	2.85	11	364
773	38	6361.630	699016.5	1.19	0.70	94.33	3.78	8	362
774	55	6298.409	699018.4	5.96	3.06	80.55	10.43	7	368
775	67	6256.595	698977.4	6.85	7.37	85.54	0.24	12	259

Table 2 (continued). Percent Grain-size distribution by weight and LISST D50 grain-sizes

Station	Proposed ID	State plane Co-ord Northing (m)	Easting (m)	% Grain-size Distribution by weight % Clay	% Silt	% Sand	% <500 micron	LISST Grain-size D50 MUD D50	SAND D50
776	68	6205.964	699075.9	2.35	3.80	93.48	0.37	21	212
777	58	6210.629	699136.8	9.81	13.85	76.34	0.00	17	185
778	58			11.31	8.13	79.46	1.09	11	128
779	31	6218.453	699124.6	20.93	9.28	69.10	0.69	6	180
780	57	6245.098	699107.0	2.80	1.30	95.90	0.00	17	209
781	56	6275.188	699044.5	9.43	5.98	83.20	1.39	16	194
782	41a	6293.513	699142.2	1.79	0.81	95.84	1.56	21	332
783	25	6321.291	699127.1	37.43	17.38	32.15	13.05	6	260
784	8	6358.221	699122.3	32.81	17.45	46.89	2.85	6	239
785	9	6318.301	699161.9	16.83	7.85	71.49	3.83	6	364
786	19	6329.190	699192.1	3.33	1.08	90.34	5.25	6	352
787	33	6367.333	699184.1	3.28	0.32	95.00	1.41	6	354
788	18	6363.540	699155.7	1.46	0.23	86.57	11.74	6	340
789	18			1.43	0.00	97.15	1.42	12	373
790	48	6426.683	699183.5	1.92	0.00	95.66	2.42	13	251
791	47	6446.300	699127.9	2.03	0.96	96.49	0.52	21	229
792	46	6492.107	699085.5	1.37	1.02	97.28	0.33	15	215
793	60A	6571.075	699010.0	8.91	4.11	86.86	0.11	7	267
794	71	6487.127	699275.9	2.48	1.25	93.01	3.26	15	380
795	64	6428.825	699251.9	10.10	10.96	77.80	1.14	13	269
796	50	6368.633	699241.2	10.25	3.81	85.76	0.18	11	205
797	49	6400.836	699206.6	8.83	2.71	85.38	3.09	13	244
798	32	6397.627	699142.6	1.60	0.81	96.90	0.69	14	354
799	17	6389.232	699116.7	1.66	0.54	96.50	1.30	6	350
800	63	6490.879	699187.2	12.69	10.18	74.77	2.36	19	238
801	63			14.63	15.27	70.10	0.00	15	207
802	34	6320.146	699218.1	3.33	1.28	94.91	0.47	13	290
803	34			3.44	0.42	96.14	0.00	15	267
804	offshore	5838.446	699040.4	40.88	19.20	39.45	0.47	7	278

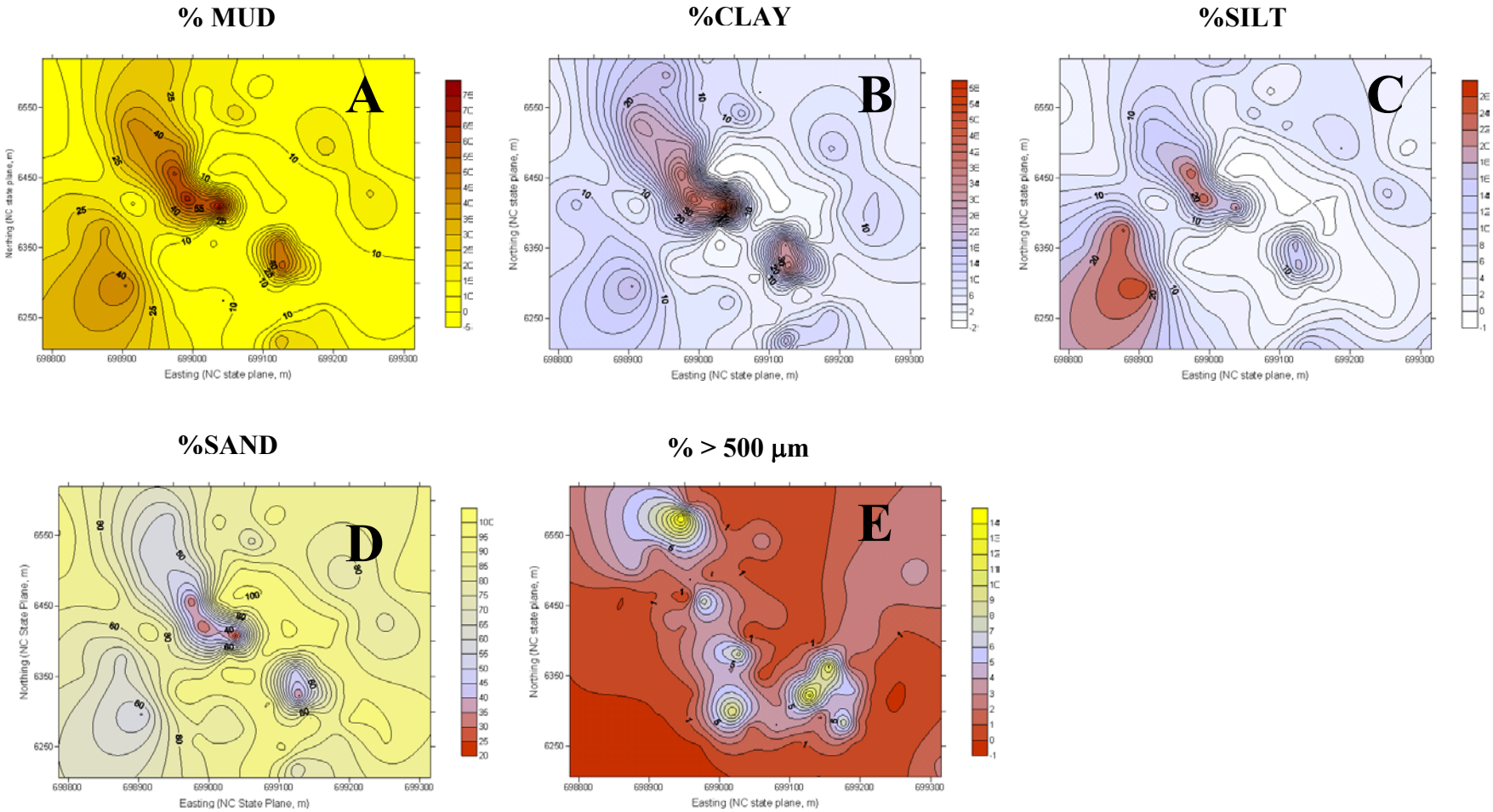


Figure 5. Percent grain-size distribution by weight results. Each fraction (% clay, %silt, %sand and %>500 micron) is plotted separately in state plane coordinates (graphs B, C, D and E, respectively). The %mud is the %clay and %silt results combined (graph A). The orientation is rotated about 130 degrees clockwise relative to Figure 4 such that North is now upwards.

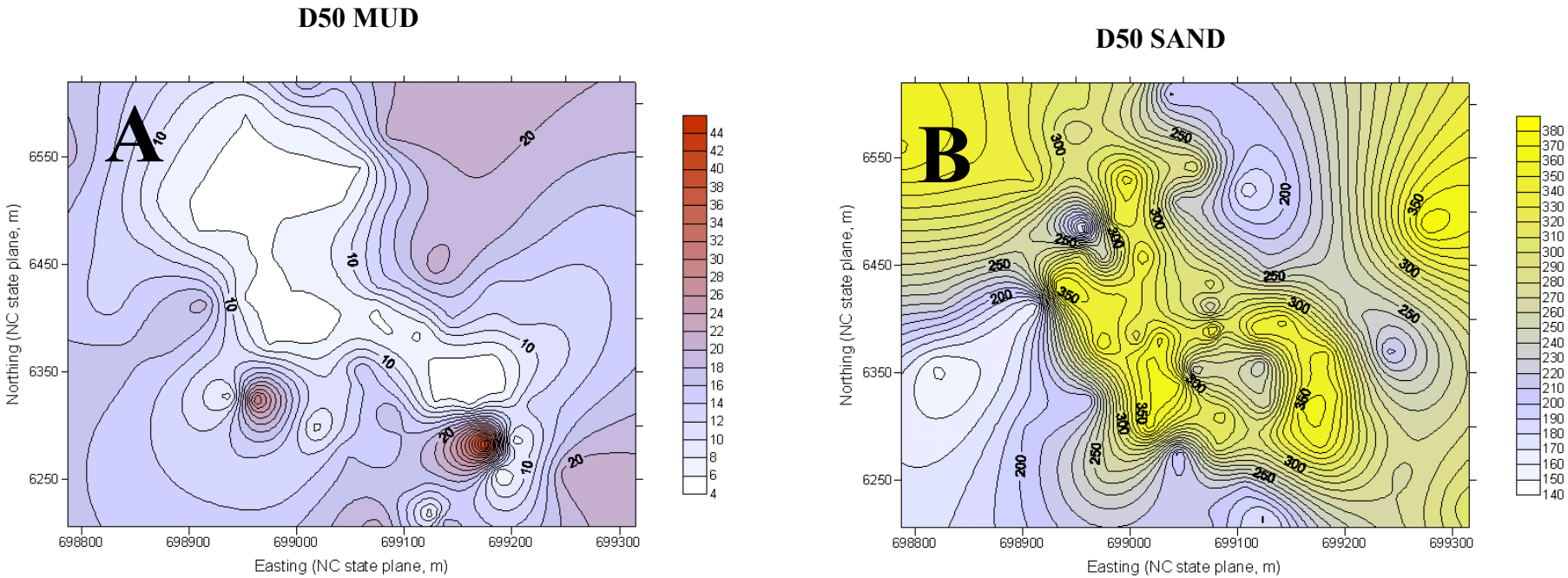
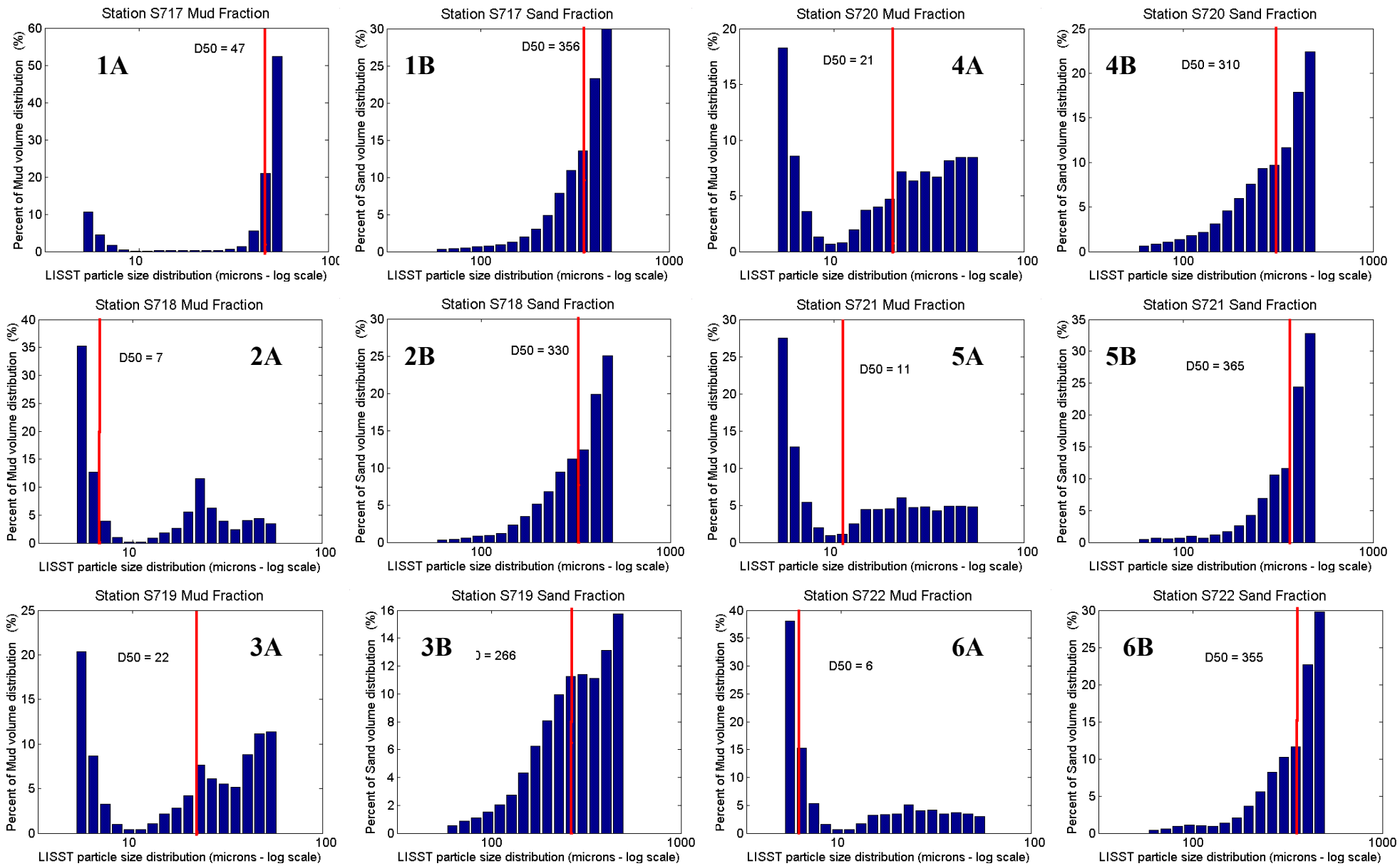
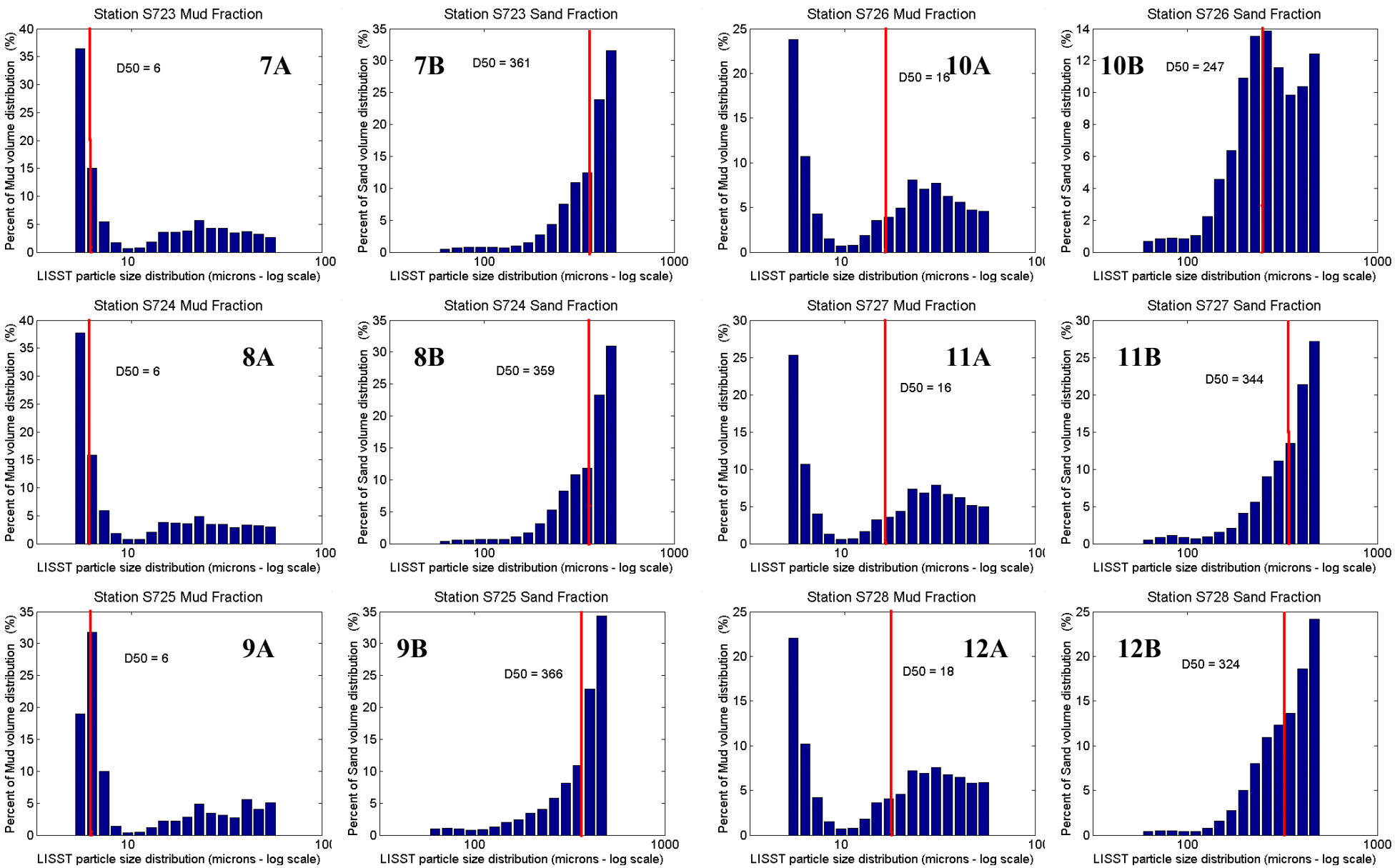


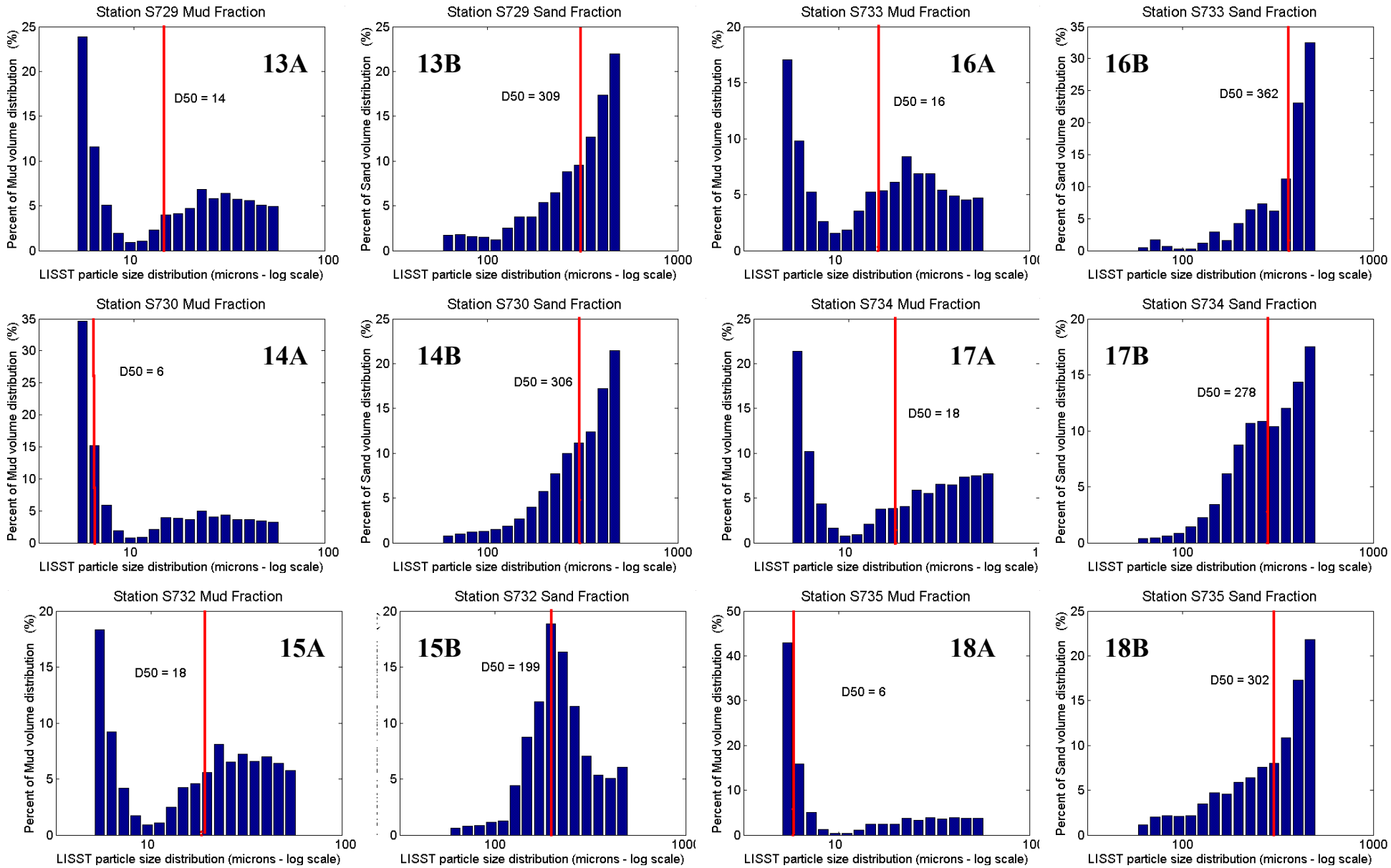
Figure 6. LISST D50 grain-sizes plotted in state plane co-ordinates. The Mud fraction D50 grain-sizes are plotted in graph A and the Sand fraction D50 grain-sizes are plotted in graph B. The orientation is rotated about 130 degrees clockwise relative to Figure 4 such that North is now upwards.



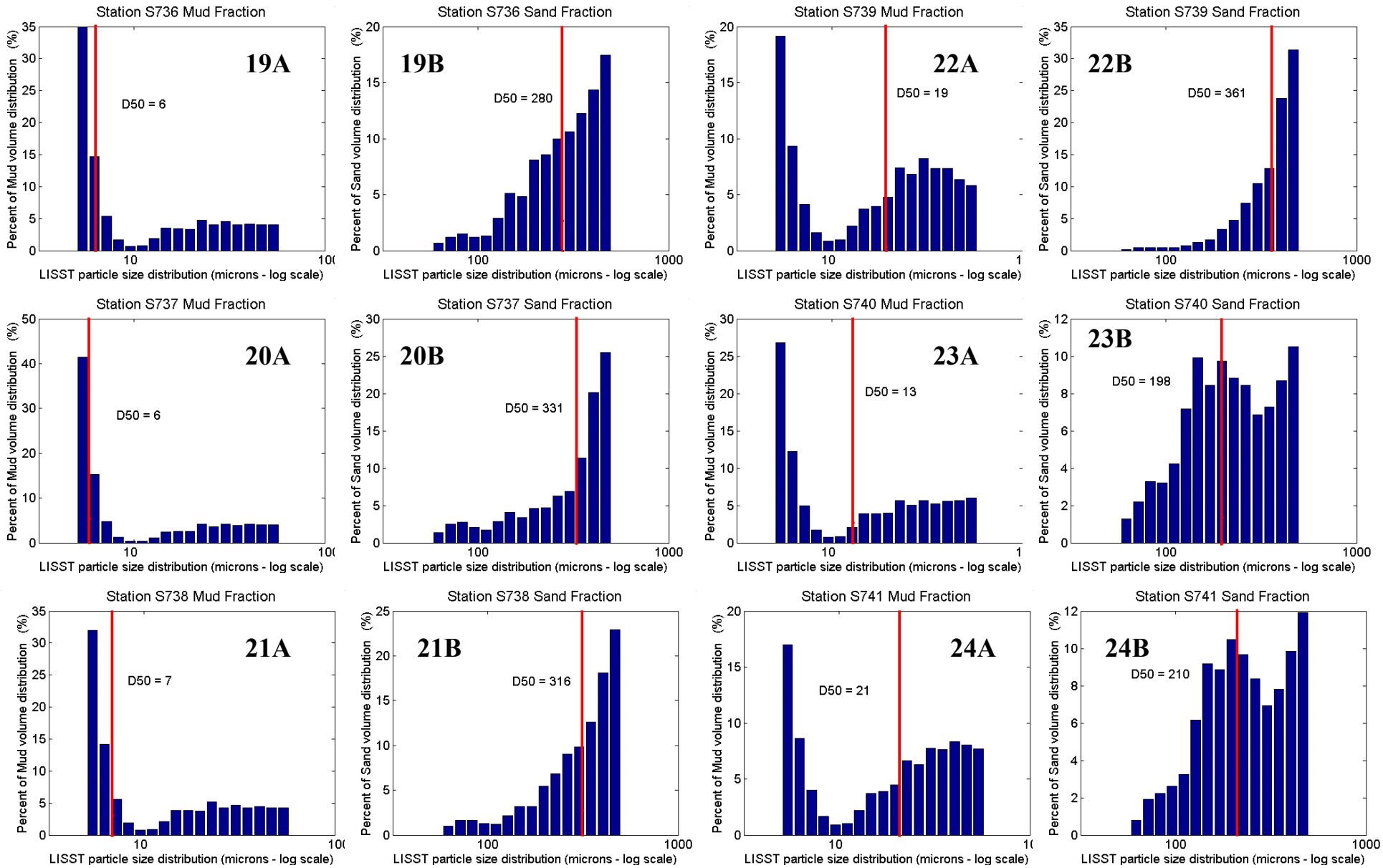
Figures 7.1 - 7.6 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



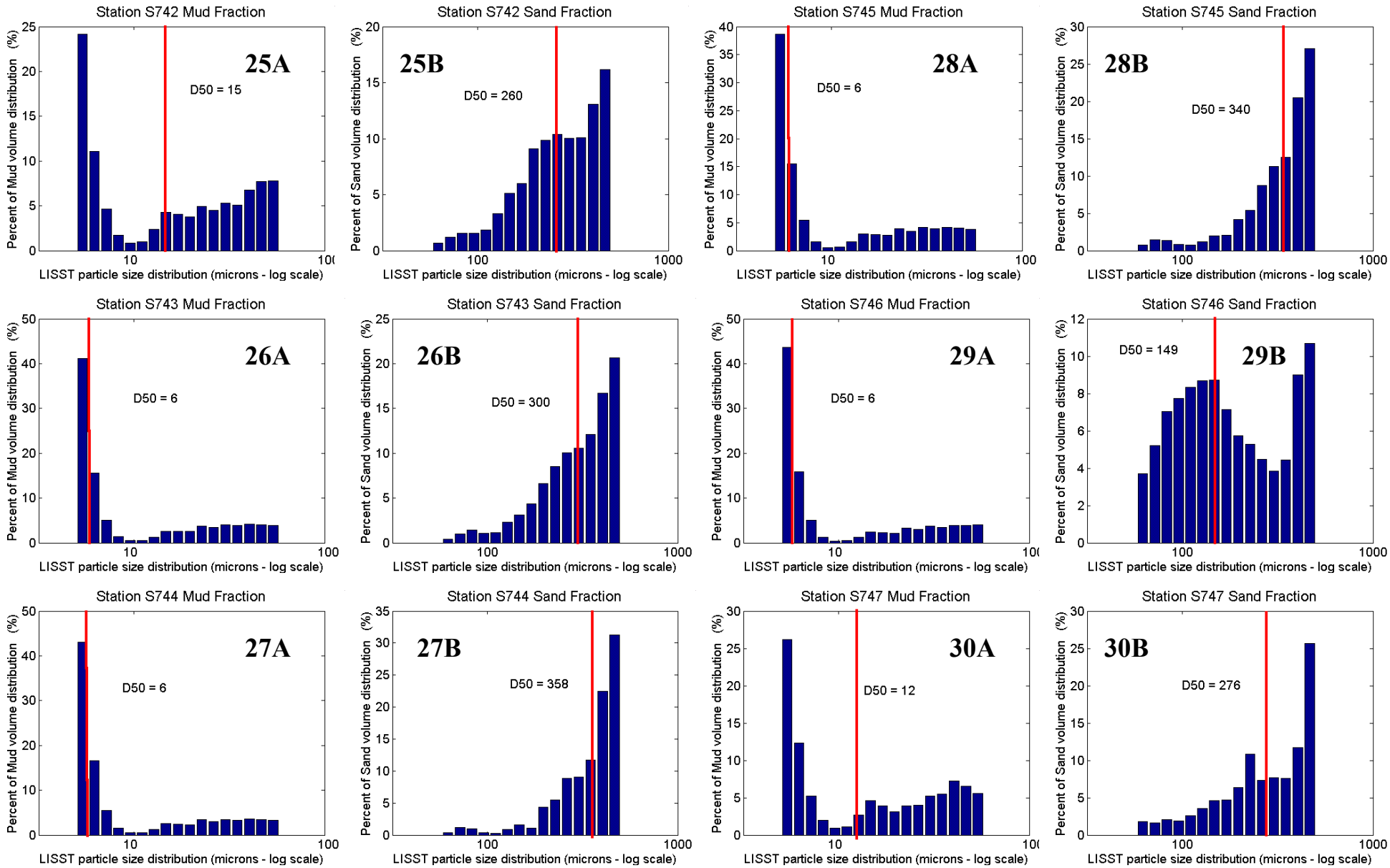
Figures 7.7 - 7.12 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



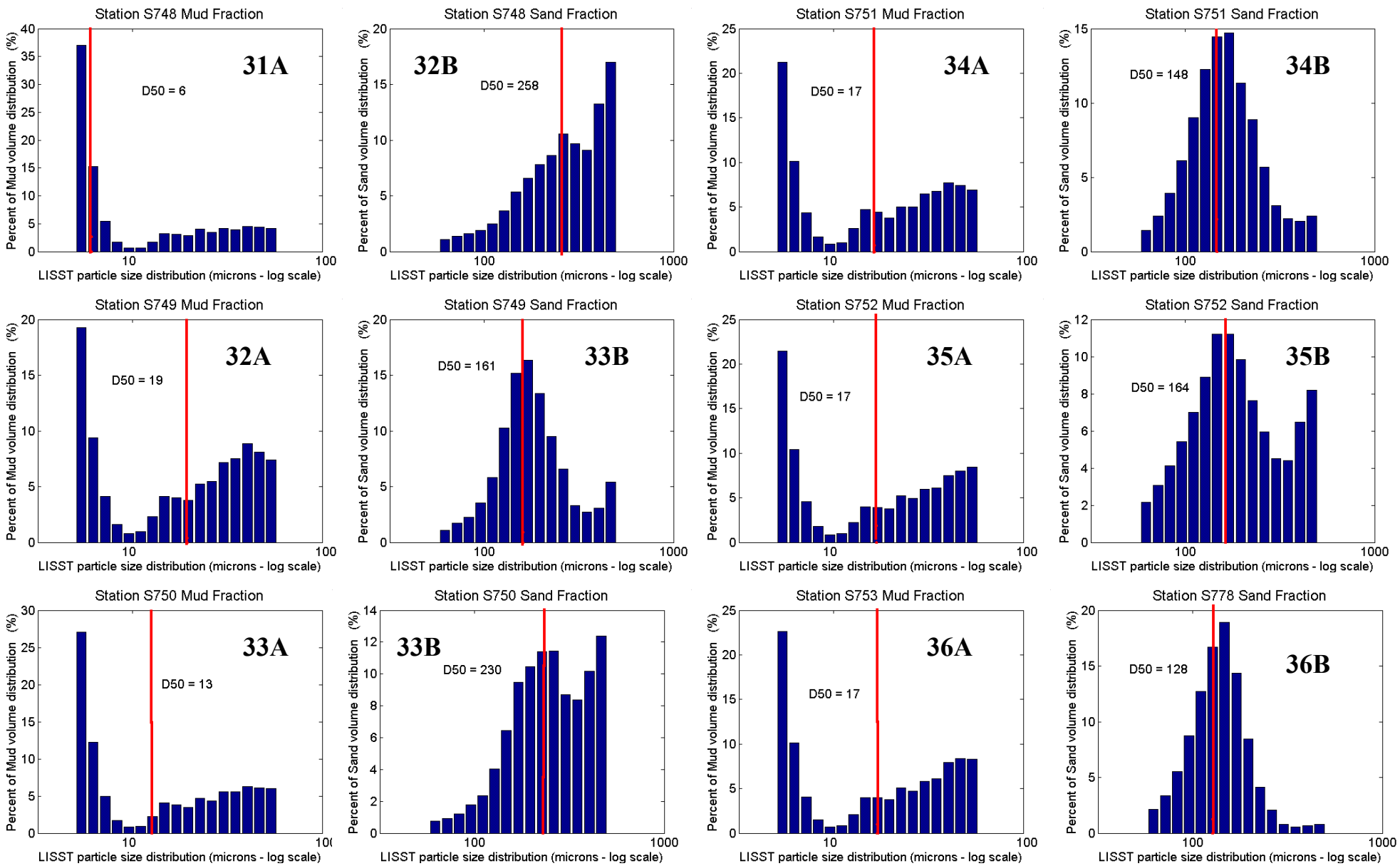
Figures 7.13 - 7.18 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



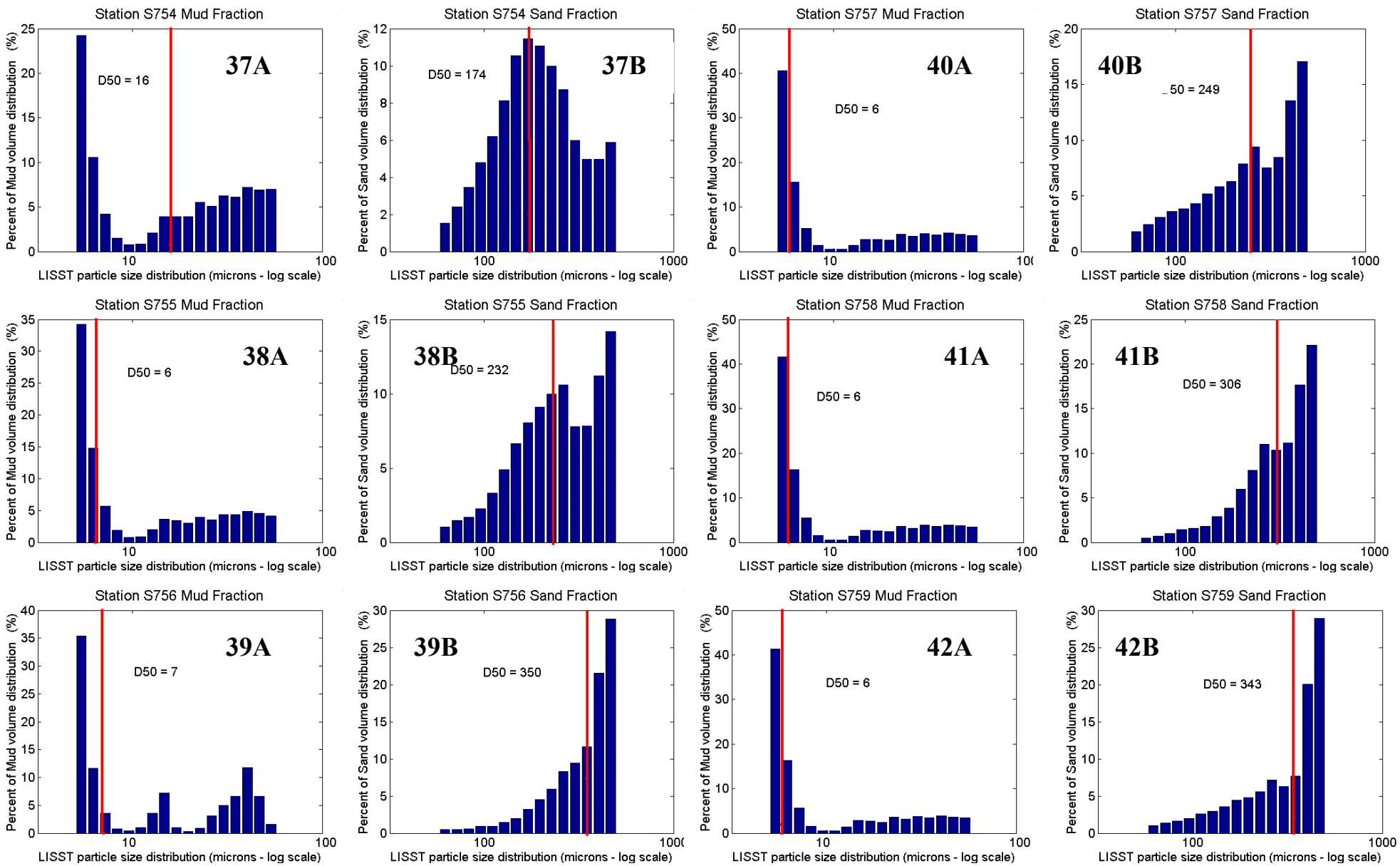
Figures 7.19 - 7.24 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



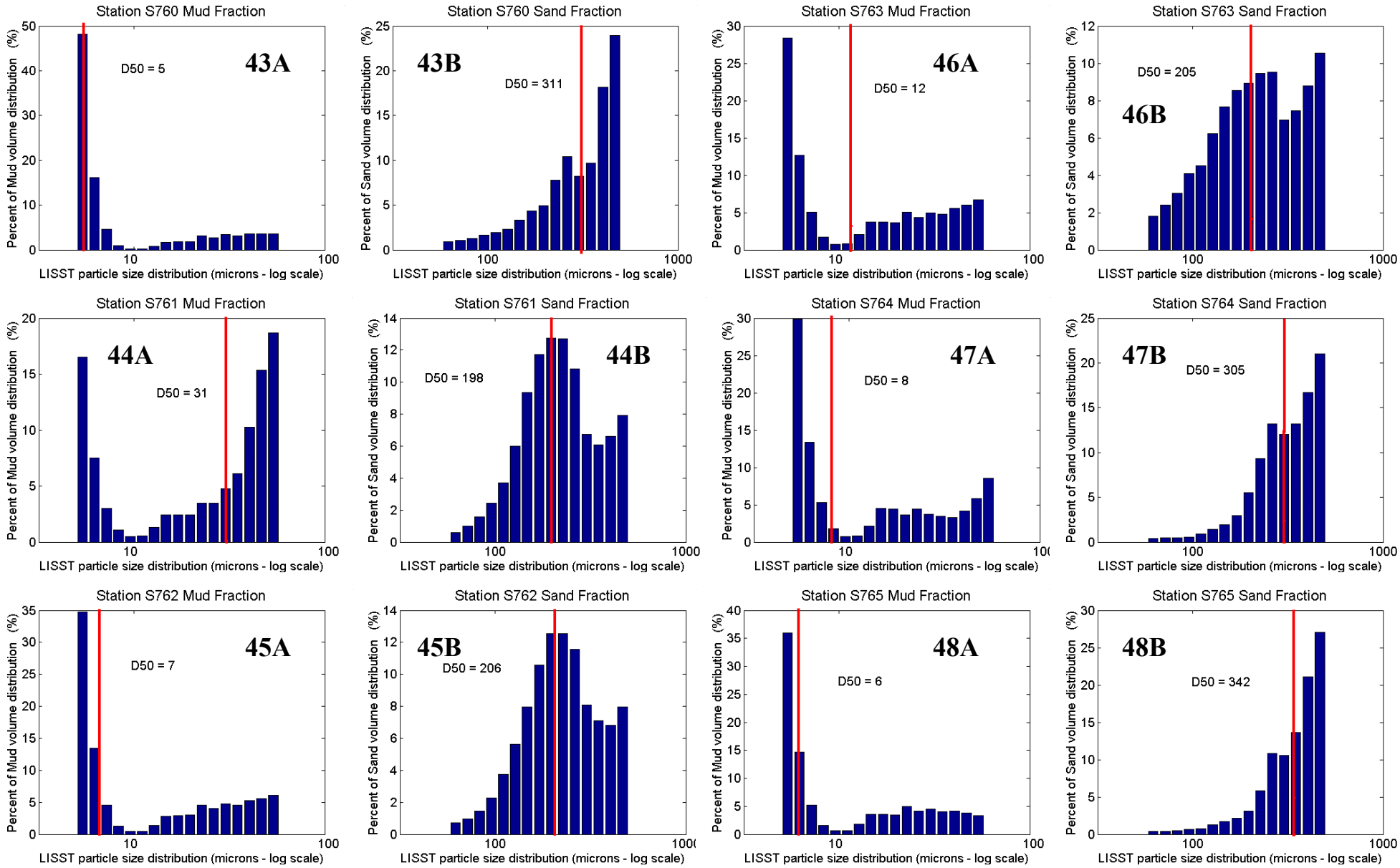
Figures 7.25 - 7.30 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



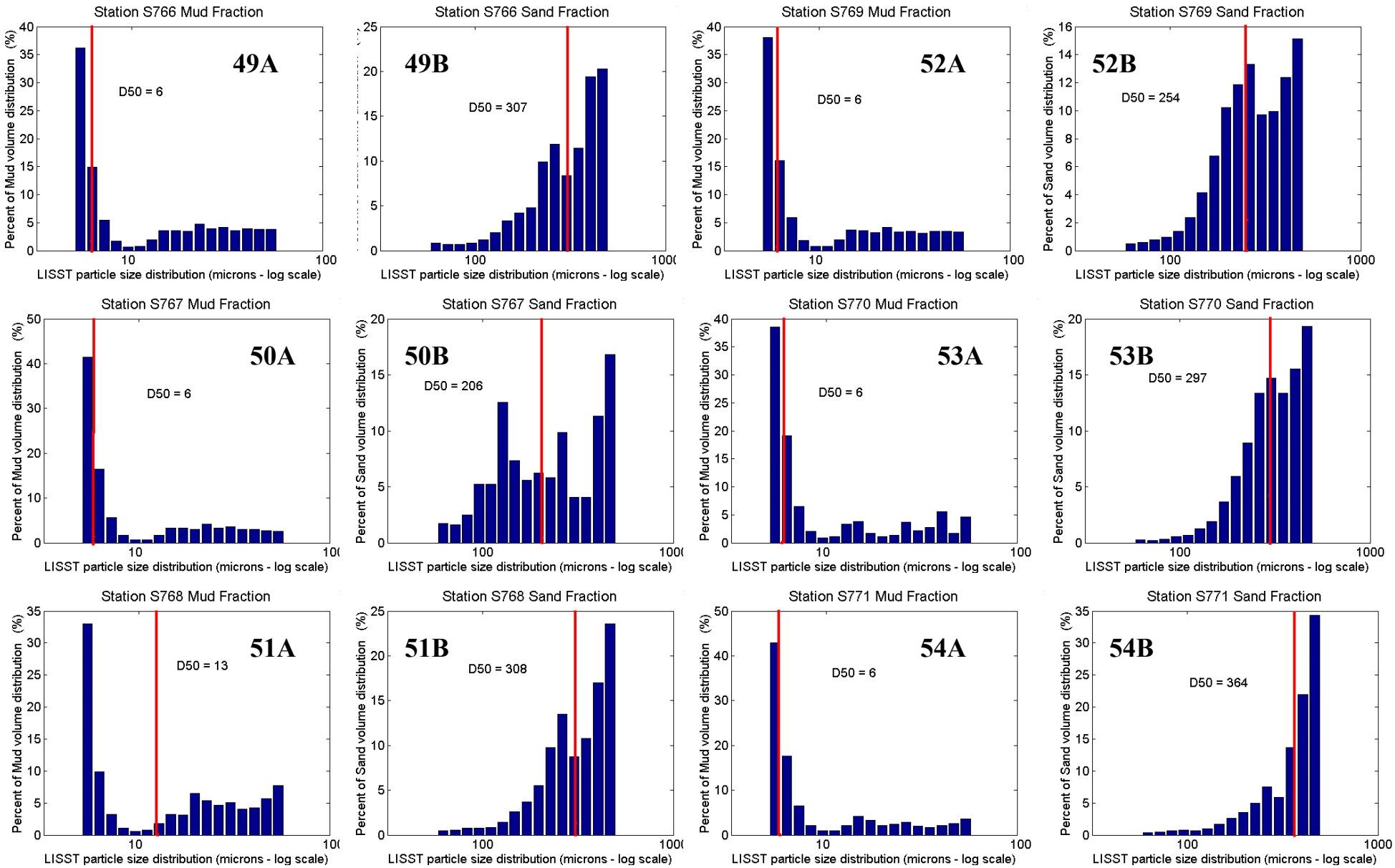
Figures 7.31 - 7.36 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



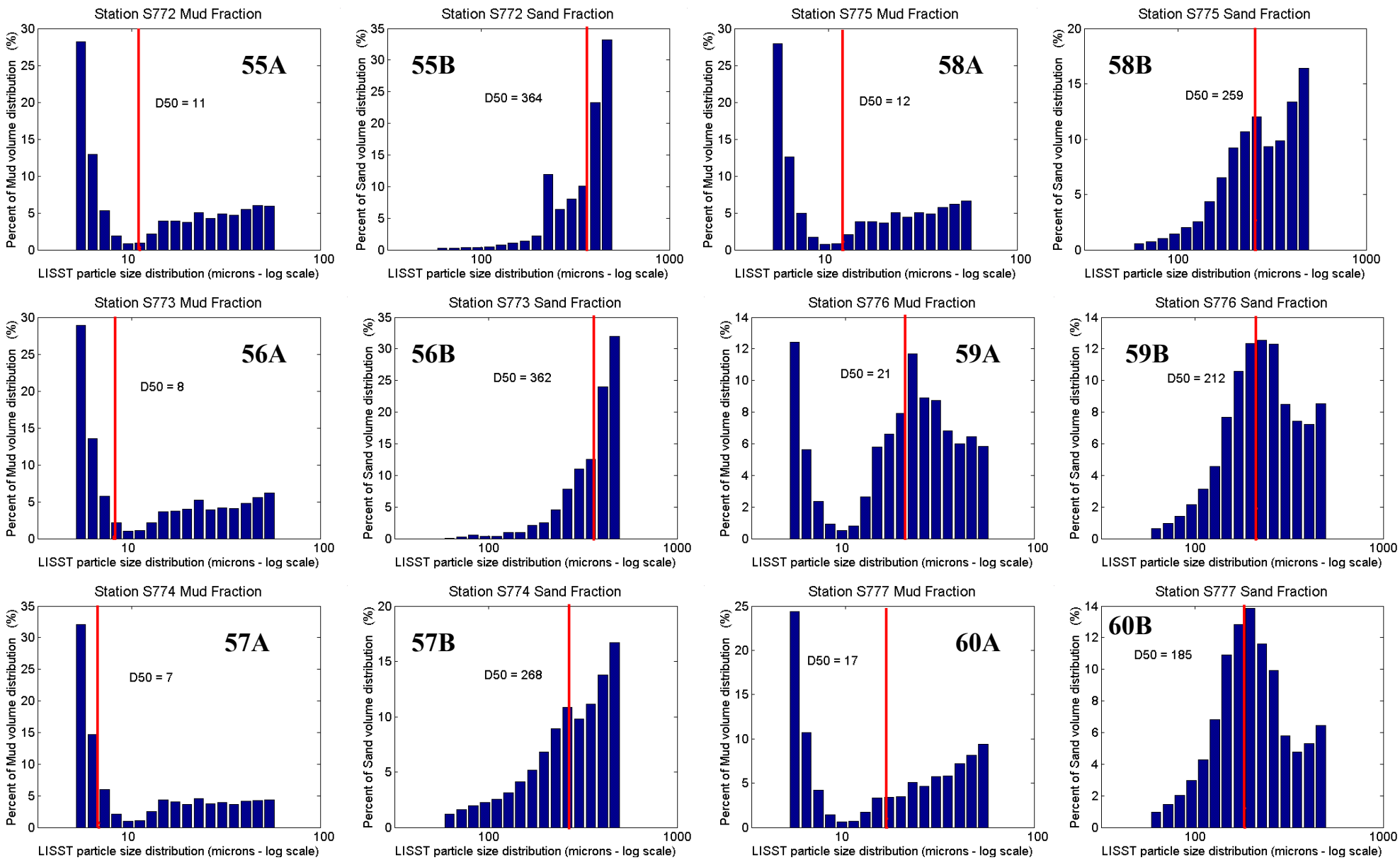
Figures 7.37 - 7.42 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



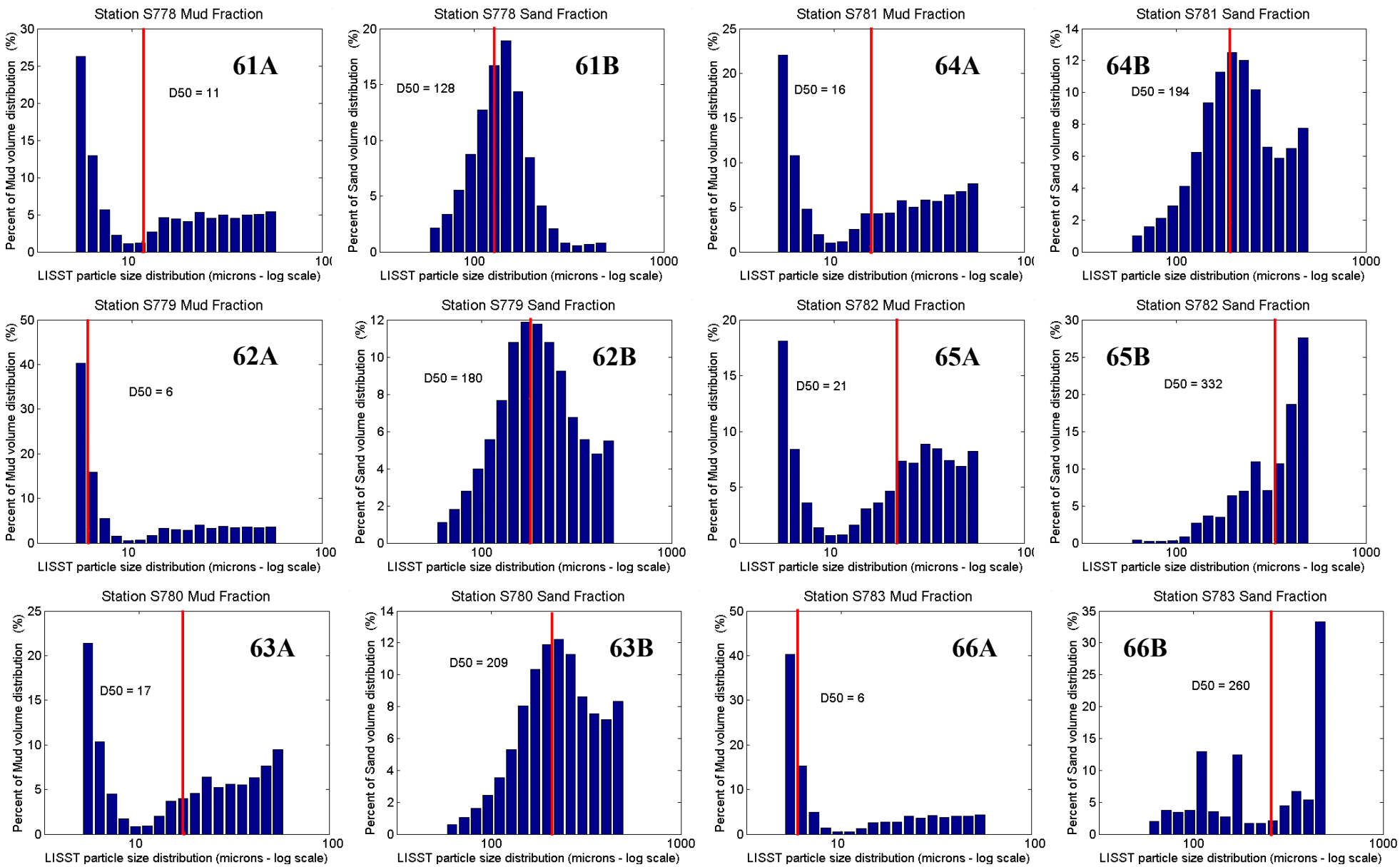
Figures 7.43 - 7.48 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



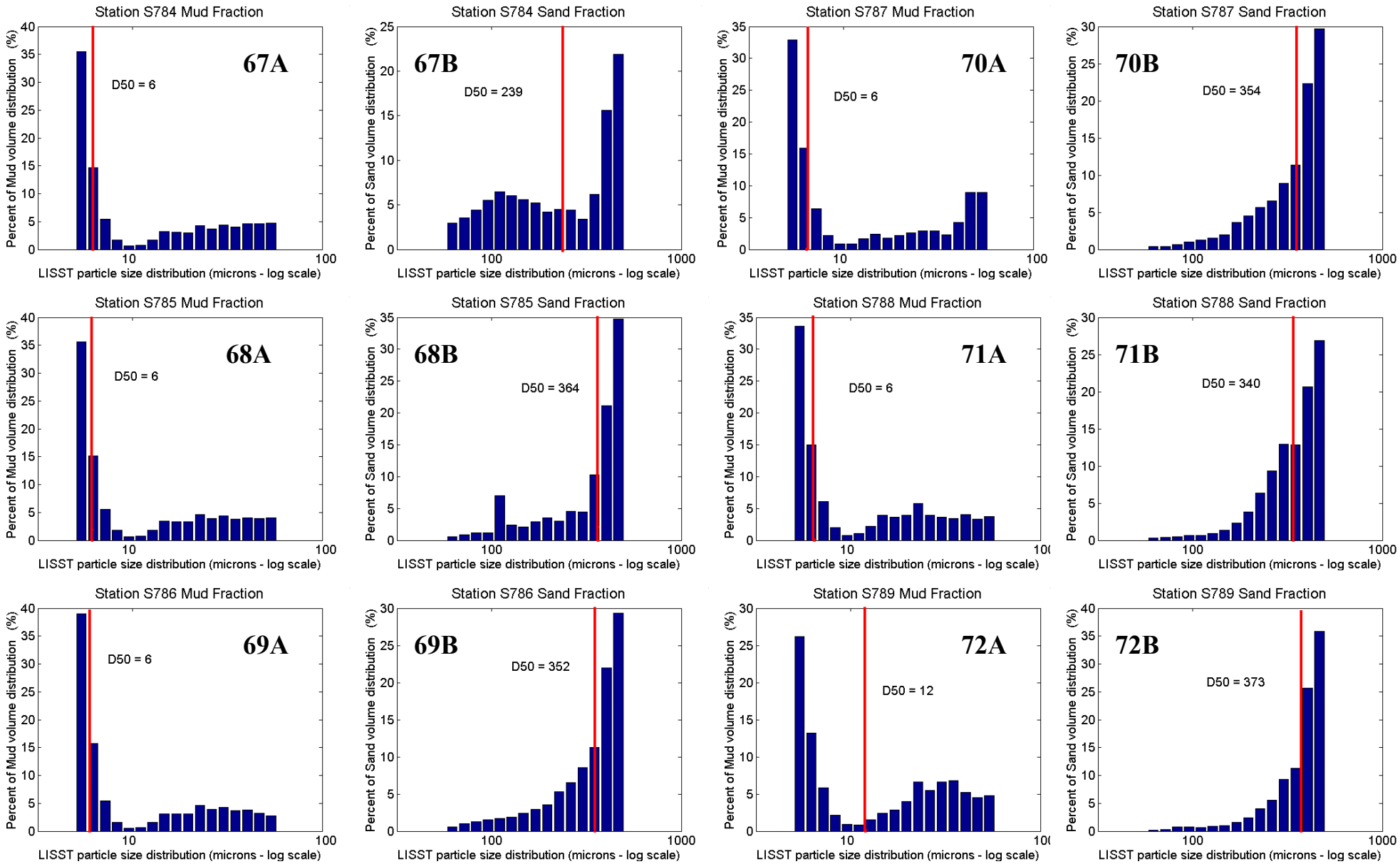
Figures 7.49 - 7.54 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



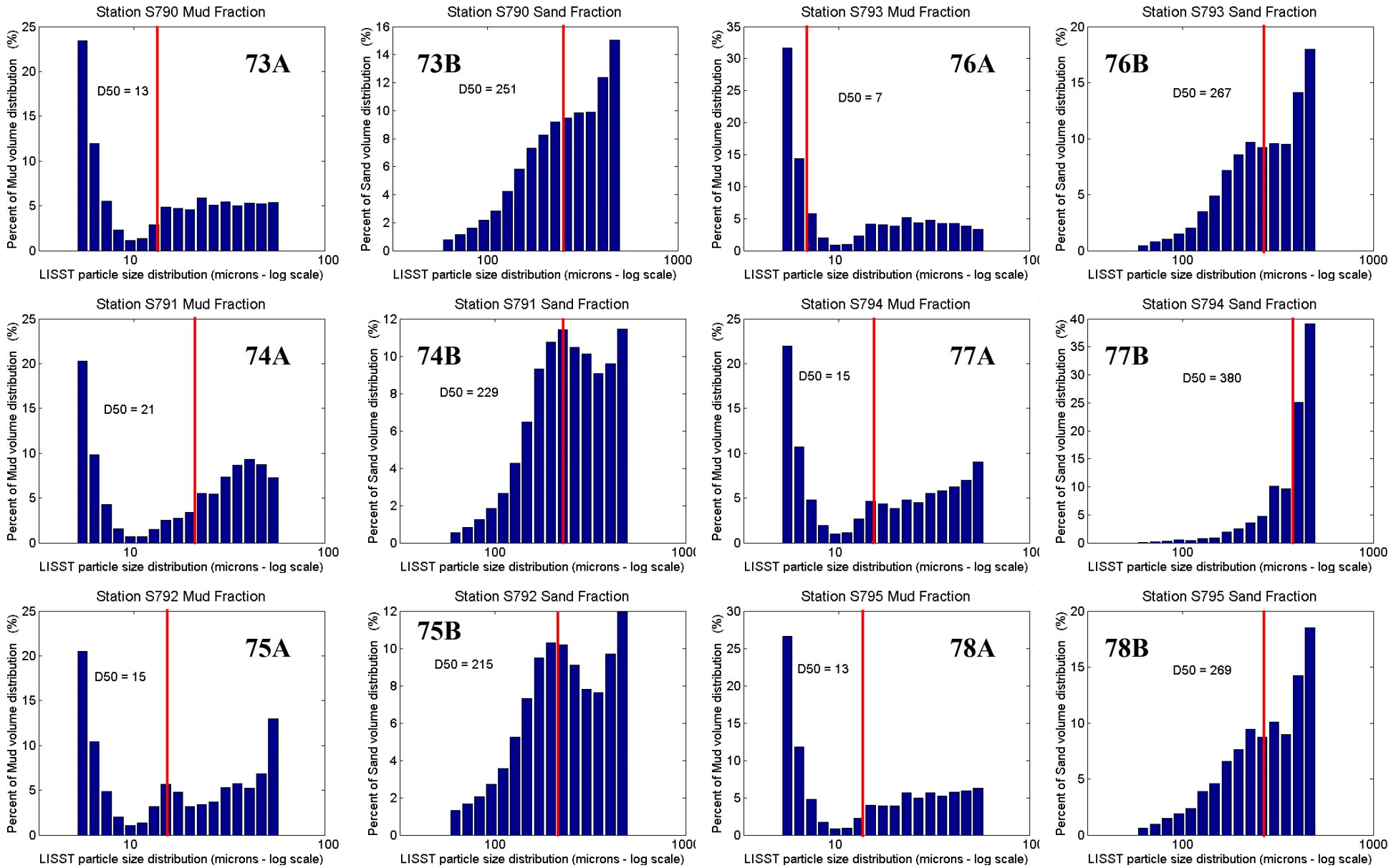
Figures 7.55 - 7.60 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



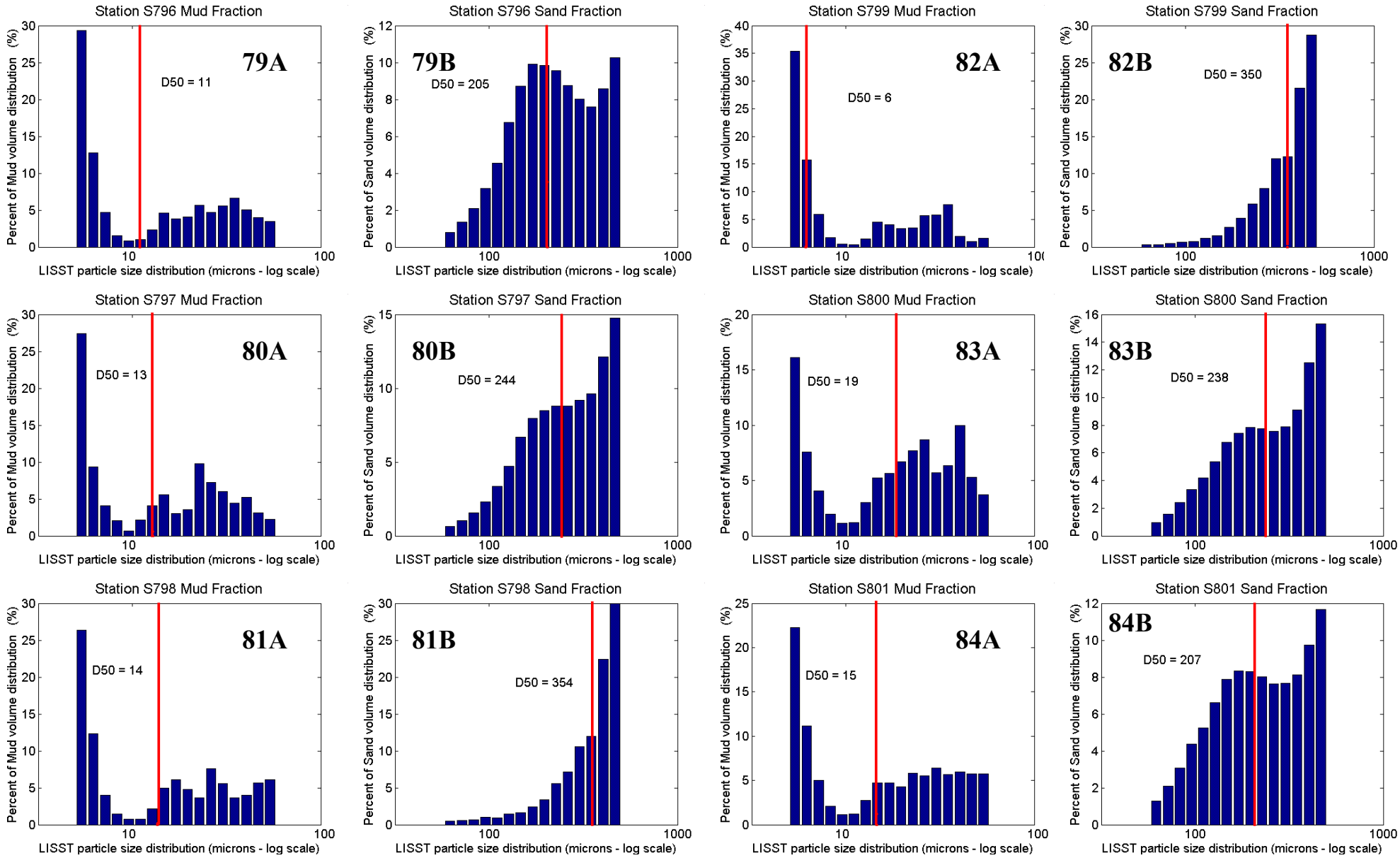
Figures 7.61 - 7.66 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



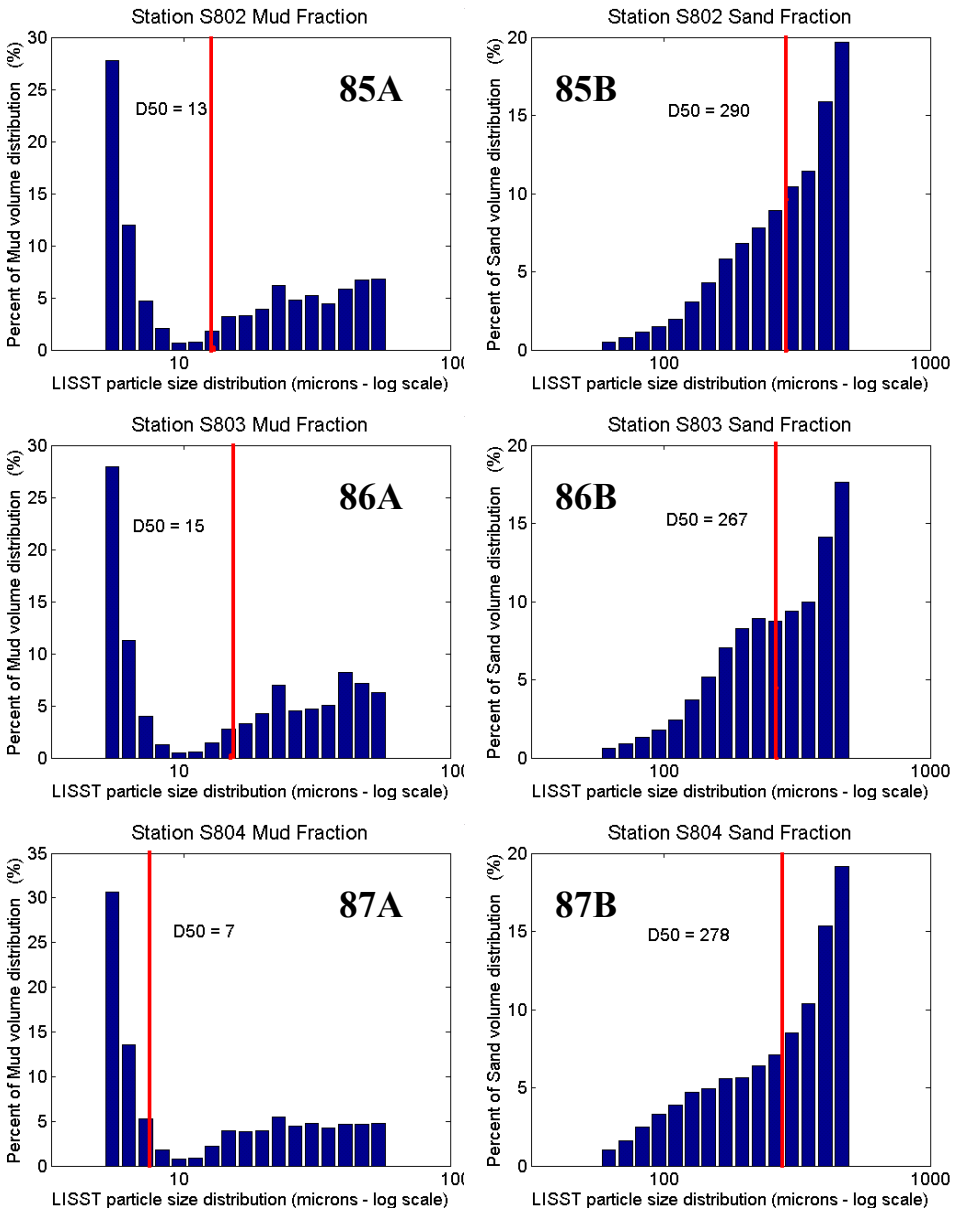
Figures 7.67 - 7.72 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



Figures 7.73 - 7.78 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



Figures 7.79 - 7.84 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.



Figures 7.85 - 7.87 LISST percent grain-size distributions by volume. Each station has two graphs. The A graph is the distribution of the mud fraction and the B graph is the distribution for the sand fraction. The red line on each graph is the D50 grain size for that fraction.

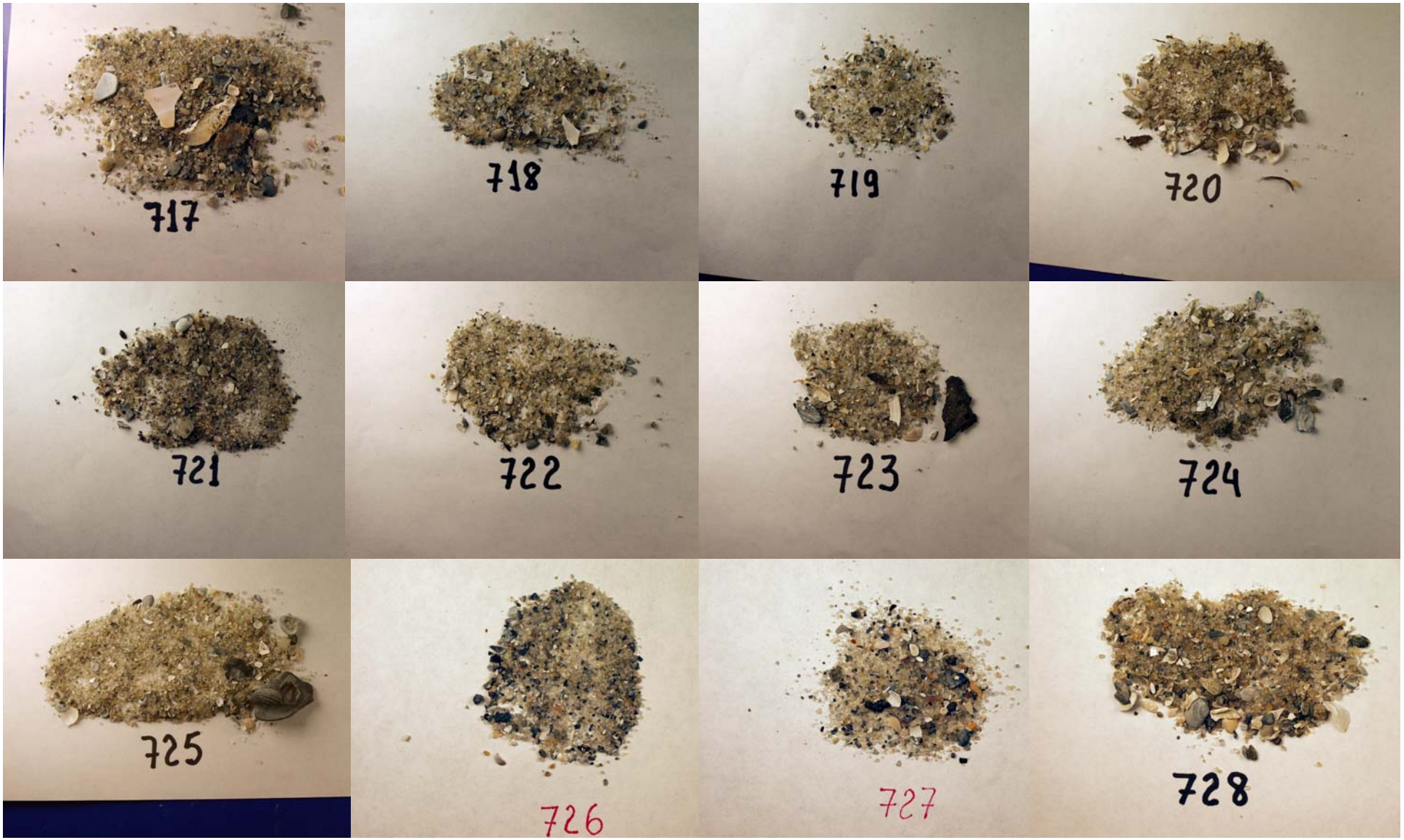


FIGURE 8.1 Digital Photographs for stations 717-728 of sediment >500 microns.

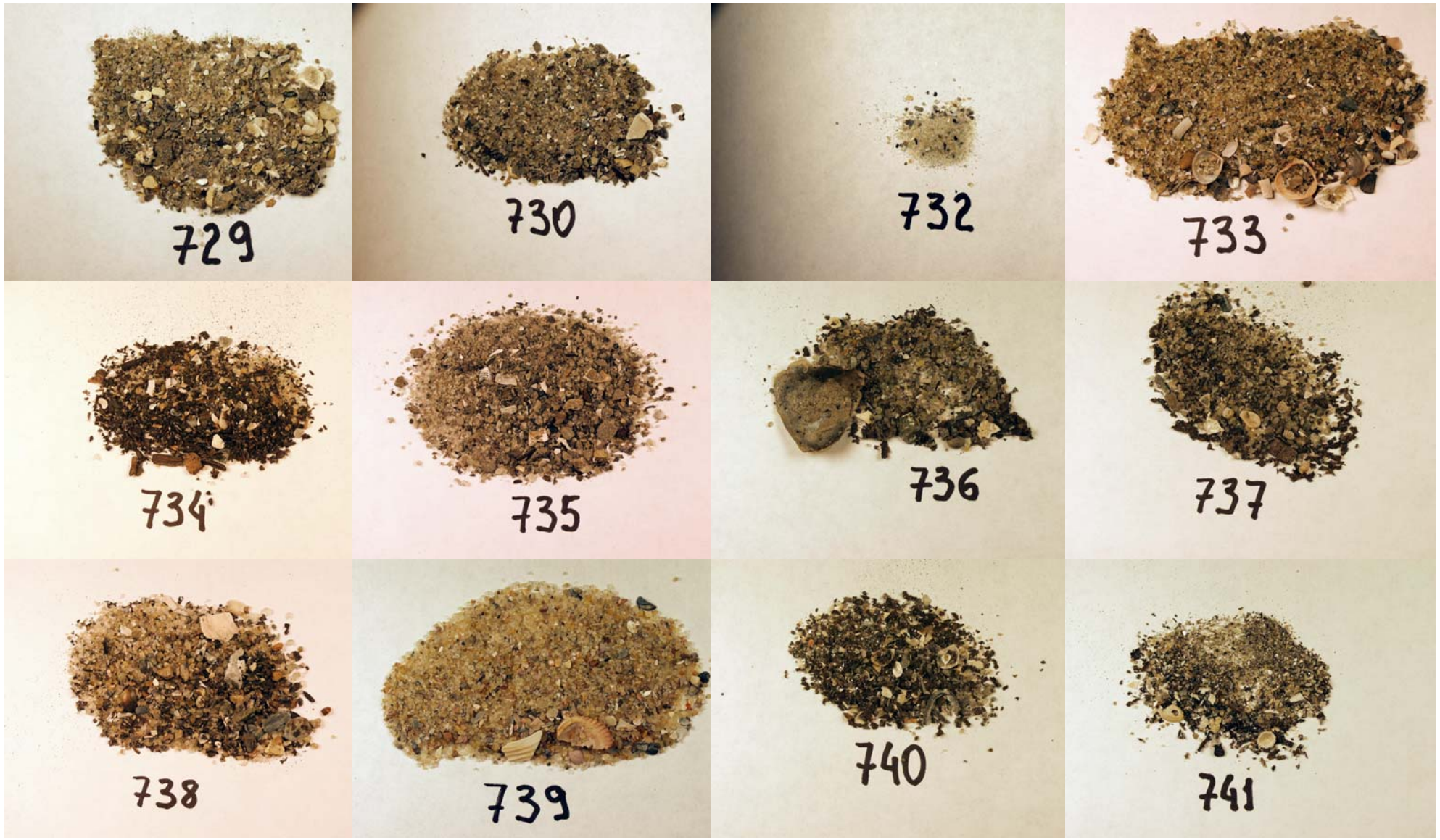


FIGURE 8.2 Digital Photographs for stations 729-741 of sediment >500 microns.

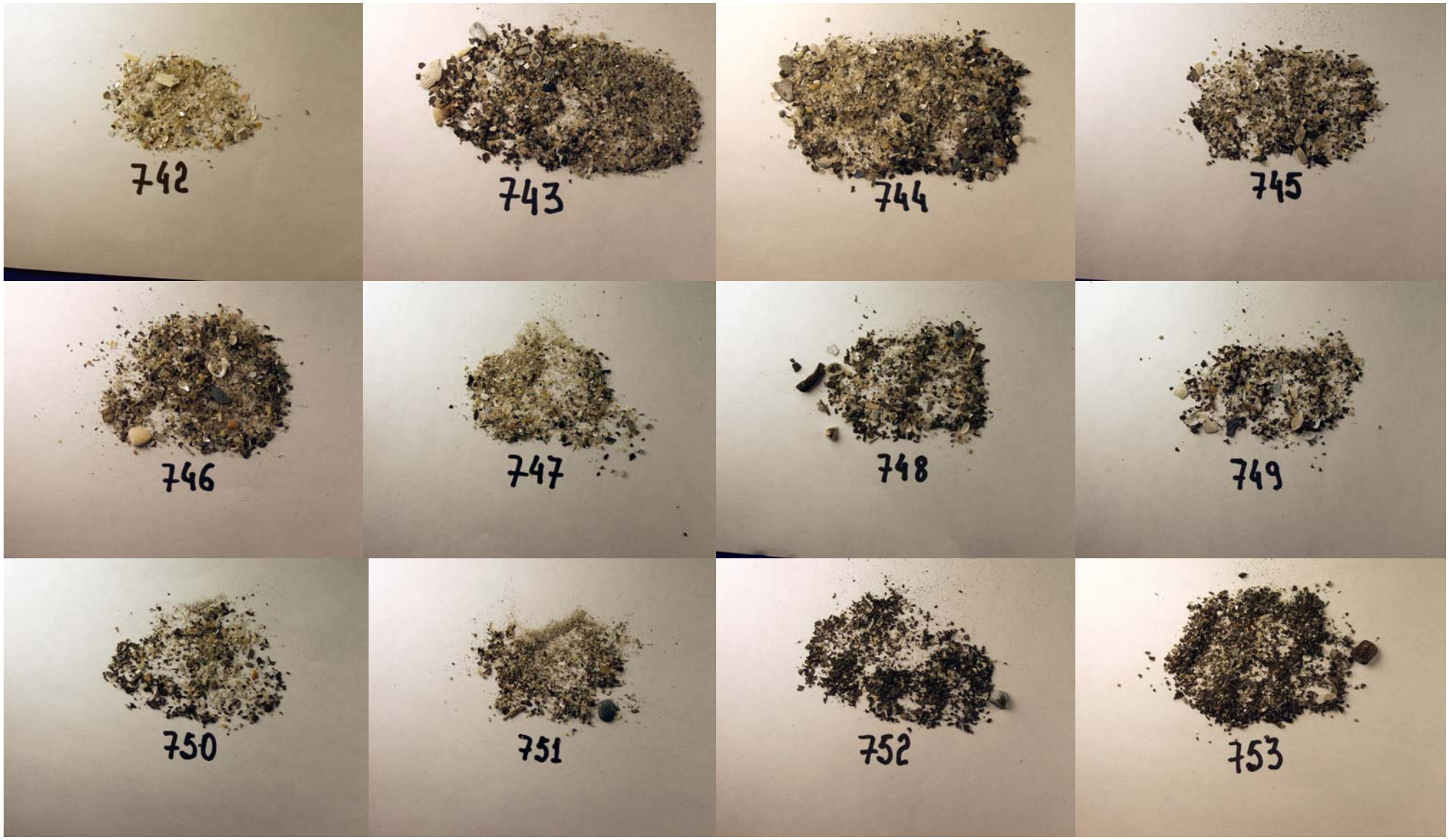


FIGURE 8.3 Digital Photographs for stations 742-753 of sediment >500 microns.

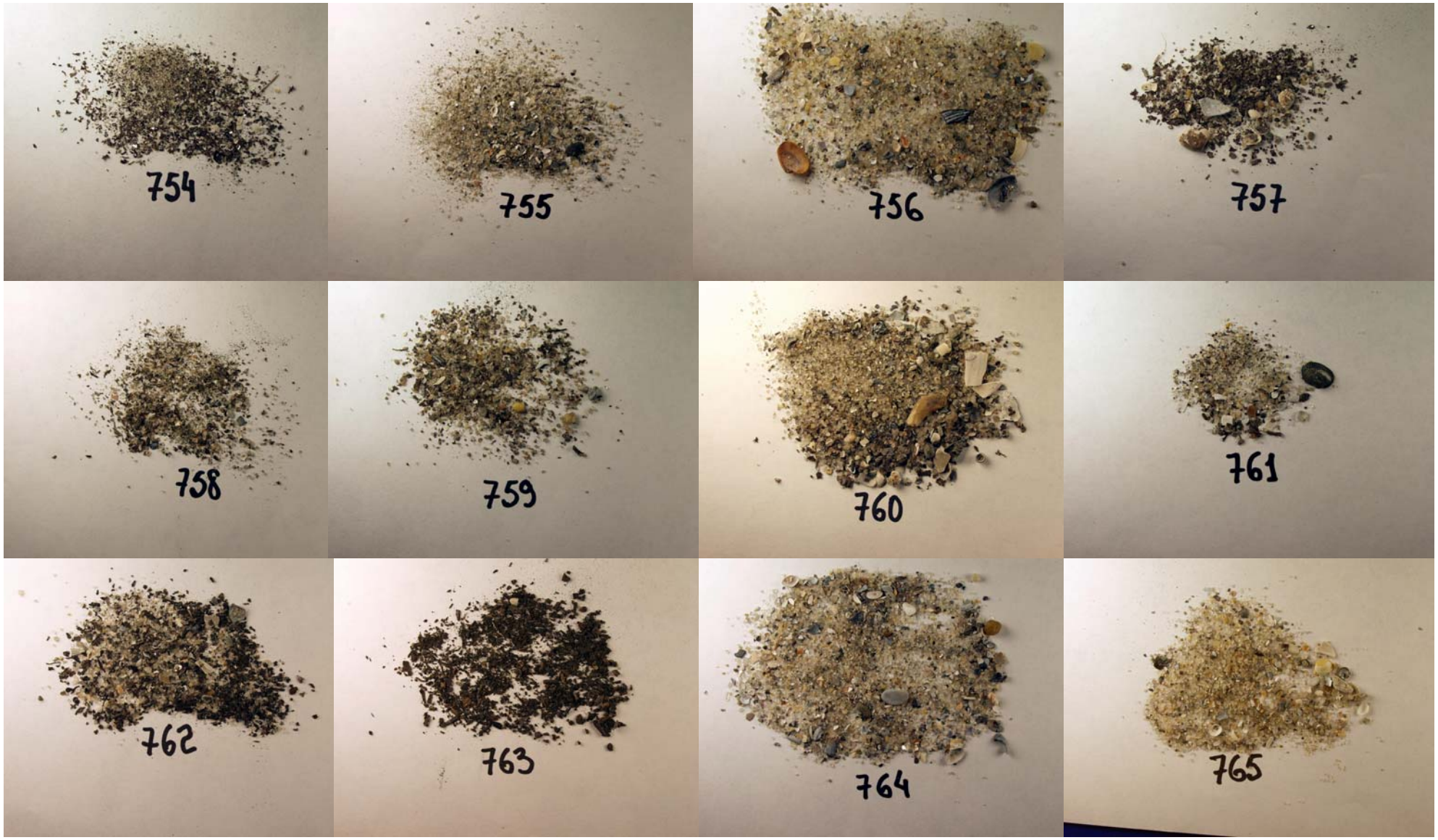


FIGURE 8.4 Digital Photographs for stations 754-765 of sediment >500 microns.

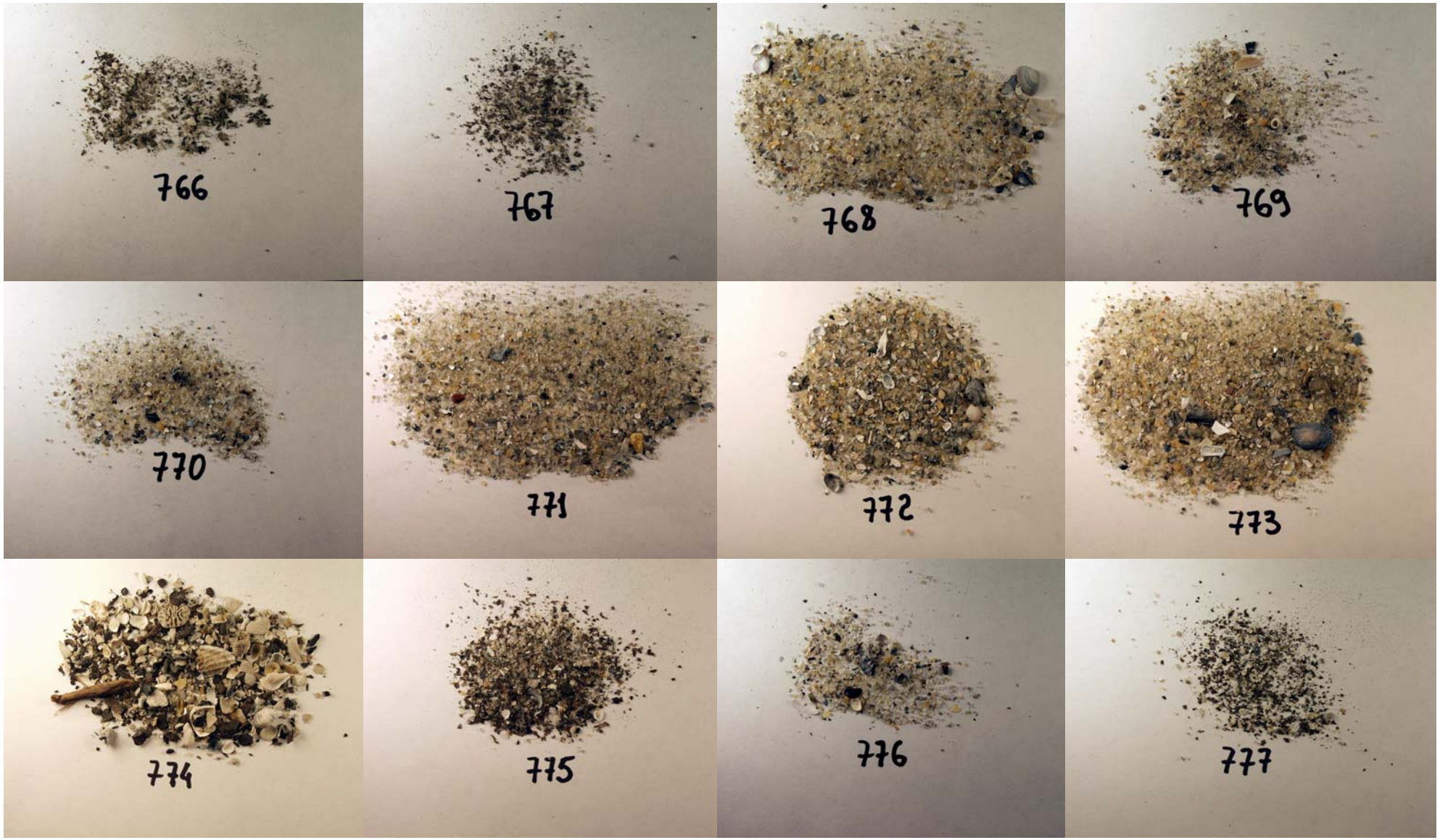


FIGURE 8.5 Digital Photographs for stations 766-777 of sediment >500 microns.

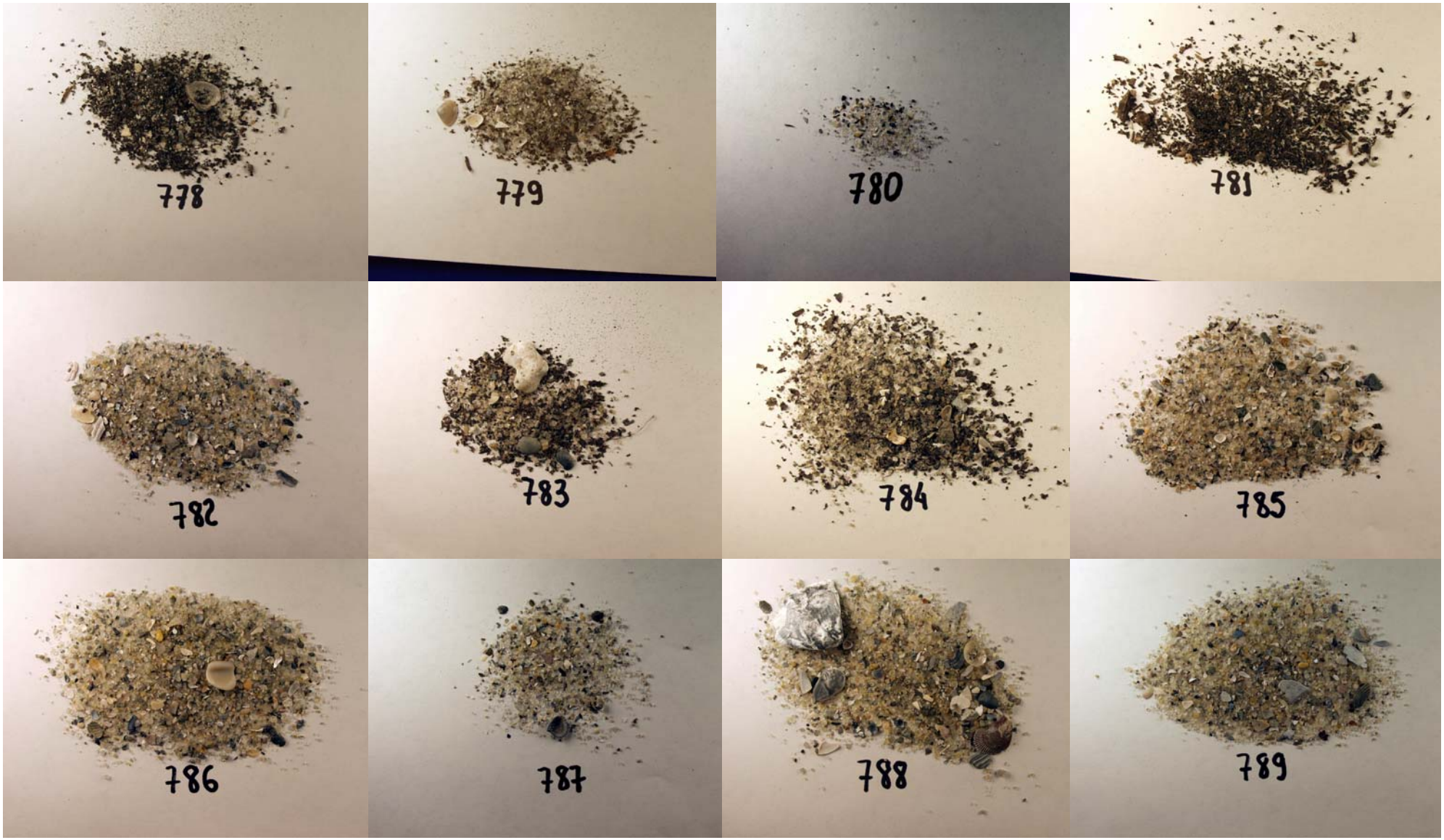


FIGURE 8.6 Digital Photographs for stations 778-789 of sediment >500 microns.

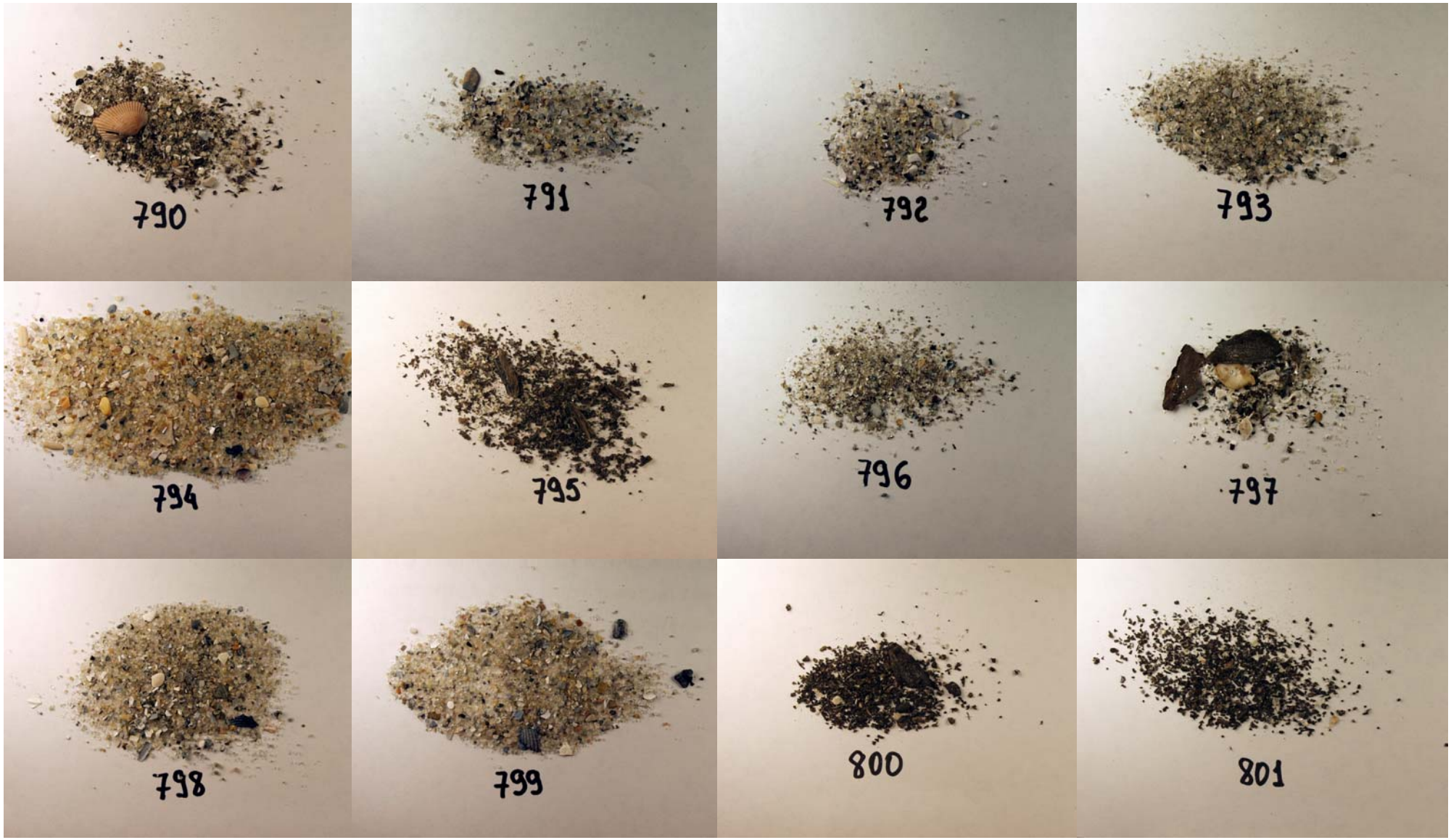


FIGURE 8.7 Digital Photographs for stations 790-801 of sediment >500 microns.

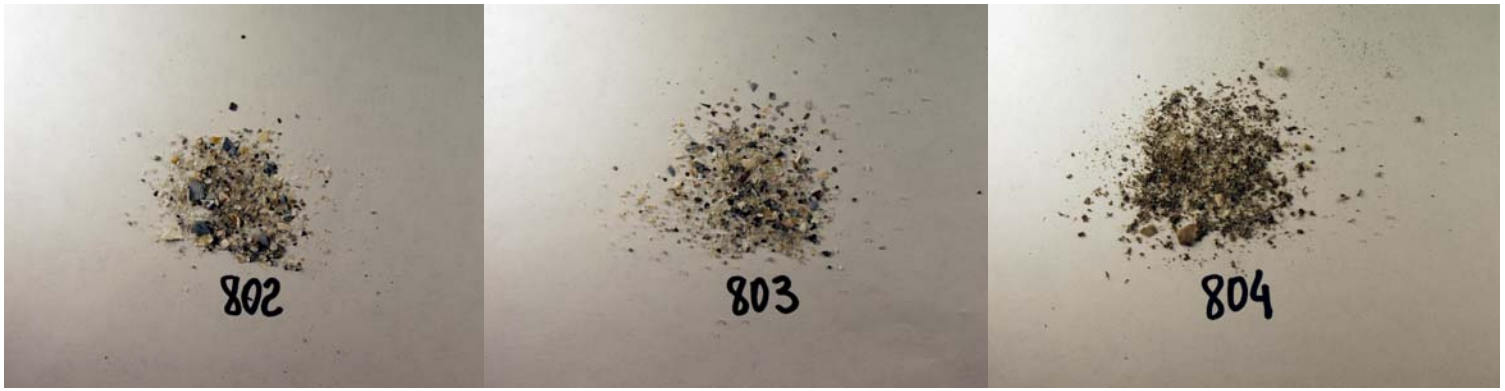


FIGURE 8.8 Digital Photographs for stations 802-804 of sediment >500 microns.