

APPENDIX 10

**Historical Shoreline and
Beach Volume Changes
1941–2006**

APPENDIX TABLE A10. [page 1 of 3] Shoreline position data for four reaches by transect along Sullivan's Island 1941–2008. Distances are measured from the survey control line (Middle Street) to the seaward vegetation line (upper portion of the table) and the wet-dry sand contact line (approximate mean high water). The lower half of the table presents rates of change in feet and equivalent sand volume in cubic yards as explained in the text.

Shoreline	Year	REACH A – CHARLESTON HARBOR								REACH D – BREACH INLET										
		0	5	10	15	20	25	30	35	158	160	165	168	170	175	178	180	185	188	190
Distance shown from BL		0	5	10	15	20	25	30	35	158	160	165	168	170	175	178	180	185	188	190
Edge of Vegetation	1941	84	676	880	734	677	646	560	843	1136	1411	1517	1361	1188	981	830	731	381	21	
Edge of Vegetation	1949	84	676	880	734	677	646	528	850	1338	1402	1538	1420	1289	1029	880	826	522	182	
Edge of Vegetation	1953	84	676	880	734	677	646	547	834	1320	1387	1509	1451	1333	1062	888	817	548	227	
Edge of Vegetation	1963	84	676	880	734	677	646	544	852	1478	1442	1266	1212	1174	978	845	676	358	176	47
Edge of Vegetation	1967	84	676	880	734	677	646	562	849	1377	1348	1281	1239	1166	958	826	595	212	46	57
Edge of Vegetation	1973	84	676	880	734	677	646	535	803	1356	1323	1293	1205	1184	977	829	560	194	63	2
Edge of Vegetation	1979	84	676	880	734	677	646	524	854	1361	1390	1393	1296	1208	989	877	625	232	80	76
Edge of Vegetation	1983	84	676	880	734	677	646	564	896	1423	1440	1415	1298	1245	1002	872	637	205	71	57
Edge of Vegetation	1999	84	676	880	734	677	646	529	832	1328	1309	1237	1217	1228	967	851	520	164	42	66
Edge of Vegetation	2006	84	676	880	734	677	646	549	819	1277	1303	1242	1209	1209	986	837	504	180	51	78
Edge of Vegetation	2008	84	676	880	734	677	646	575	820											
Change 1941-2008		0	0	0	0	0	0	15	-23	141	-108	-275	-152	21	5	7	-227	-201	30	
Avg Change (1941-2008) - 68 years		0	0	0	0	0	0	0.2	-0.3	2.1	-1.6	-4.1	-2.3	0.3	0.1	0.1	-3.4	-3.0	0.4	
Equip unit vol change (1 ft = -0.6 cy/ft)		0	0	0	0	0	0	9	-13.8	84.6	-64.8	-165	-91.2	12.6	3	4.2	-136.2	-120.6	18	
Shoreline	Year	Reach A								Reach D										
	Year	0+00	5+00	10+00	15+00	20+00	25+00	30+00	35+00	158+00	160+00	165+00	168+00	170+00	175+00	178+00	180+00	185+00	188+00	190+00
Wet - Dry Beach	1941	84	676	880	734	677	646	675	905	1628	1716	1782	1727	1663	1322	1015	857	534	235	-
Wet - Dry Beach	1949	84	676	880	734	677	646	631	1003	1484	1532	1576	1543	1507	1339	1307	1209	769	413	102
Wet - Dry Beach	1953	84	676	880	734	677	646	645	905	1520	1601	1576	1642	1548	1468	1229	1140	732	477	244
Wet - Dry Beach	1963	84	676	880	734	677	646	660	941	1866	1862	1601	1376	1187	1024	925	848	377	206	91
Wet - Dry Beach	1967	84	676	880	734	677	646	637	957	1423	1394	1372	1316	1262	1101	988	787	272	110	-
Wet - Dry Beach	1973	84	676	880	734	677	646	620	873	1429	1442	1423	1310	1251	1029	874	586	212	115	75
Wet - Dry Beach	1979	84	676	880	734	677	646	562	868	1410	1635	1522	1433	1362	1129	968	837	293	119	81
Wet - Dry Beach	1983	84	676	880	734	677	646	564	896	1655	1625	1539	1478	1409	1146	986	838	285	96	83
Wet - Dry Beach	1999	84	676	880	734	677	646	643	847	1424	1394	1367	1293	1268	1031	888	573	234	94	81
Wet - Dry Beach	2006	84	676	880	734	677	646	601	842	1344	1366	1382	1287	1275	1000	891	581	239	115	98
Change 1941-2008		0	0	0	0	0	0	-74	-63	-204	-322	-415	-434	-395	-291	-127	-284	-300	-141	
Avg Change (1941-2008) - 67 years		0	0	0	0	0	0	-1.1	-1.0	-3.1	-4.9	-6.3	-6.6	-6.0	-4.4	-1.9	-4.3	-4.5	-2.1	
Equip unit vol change (1 ft = -0.6 cy/ft)		0	0	0	0	0	0	-44.4	-37.8	-122.4	-193.2	-249	-260.4	-237	-174.6	-76.2	-170.4	-180	-84.6	
Distance shown from BL		0	5	10	15	20	25	30	35	158	160	165	168	170	175	178	180	185	188	190
Equip unit vol change (1 ft = -0.6 cy/ft) @veg		0	0	0	0	0	0	9	-13.8	84.6	-64.8	-165	-91.2	12.6	3	4.2	-136.2	-120.6	18	
Equip unit vol change (1 ft = -0.6 cy/ft) @wet/dry		0	0	0	0	0	0	-44.4	-37.8	-122.4	-193.2	-249	-260.4	-237	-174.6	-76.2	-170.4	-180	-84.6	
Average unit vol (@ veg vs @ wet/dry line)		0	0	0	0	0	0	-17.7	-25.8	-18.9	-129	-207	-175.8	-112.2	-85.8	-36	-153.3	-150.3	-33.3	
Net Volume Change (cy) to next		0	0	0	0	0	(8,850)	(21,750)	(6,030)	(29,580)	(168,000)	(114,840)	(57,600)	(99,000)	(36,540)	(37,860)	(151,800)	(55,080)	(6,660)	
Cumulative volume Change (cy) per reach		0	0	0	0	0	(8,850)	(30,600)	(36,630)	(29,580)	(197,580)	(312,420)	(370,020)	(469,020)	(505,560)	(543,420)	(695,220)	(750,300)	(756,960)	
Average Annual Volume Change (cy/yr) by reach		0	0	0	0	0	(132)	(457)	(547)	(441)	(2,949)	(4,663)	(5,523)	(7,000)	(7,546)	(8,111)	(10,376)	(11,199)	(11,298)	
Change 1941-1983 (@Veg Line)		0	0	0	0	0	0	4	53	287	29	-102	-63	57	21	42	-94	-176	50	
Avg Change (1941-1983) - 42 years		0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	6.8	0.7	(2.4)	(1.5)	1.4	0.5	1.0	(2.2)	(4.2)	1.2	
Equip unit vol change (1 ft = -0.6 cy/ft)		0	0	0	0	0	0	2.4	31.8	172.2	17.4	-61.2	-37.8	34.2	12.6	25.2	-56.4	-105.6	30	
Net Volume Change (cy) to next		0	0	0	0	0	1,200	17,100	22,320	37,920	(21,900)	(29,700)	(720)	23,400	11,340	(6,240)	(81,000)	(22,680)	6,000	
Cumulative volume Change (cy) per reach		0	0	0	0	0	1,200	18,300	40,620	37,920	16,020	(13,680)	(14,400)	9,000	20,340	14,100	(66,900)	(89,580)	(83,580)	
Average Annual Volume Change (cy/yr) by reach		0	0	0	0	0	29	436	967	903	381	(326)	(343)	214	484	336	(1,593)	(2,133)	(1,990)	
Change 1983-2008 (@Veg Line)		0	0	0	0	0	0	11	-76	-146	-137	-173	-89	-36	-16	-35	-133	-25	-20	
Avg Change (1983-2008) - 25 years		0.0	0.0	0.0	0.0	0.0	0.0	0.4	(3.0)	(5.8)	(5.5)	(6.9)	(3.6)	(1.4)	(0.6)	(1.4)	(5.3)	(1.0)	(0.8)	
Equip unit vol change (1 ft = -0.6 cy/ft)		0	0	0	0	0	0	6.6	-45.6	-87.6	-82.2	-103.8	-53.4	-21.6	-9.6	-21	-79.8	-15	-12	
Net Volume Change (cy) to next		0	0	0	0	0	3,300	(19,500)	(26,280)	(33,960)	(93,000)	(47,160)	(15,000)	(15,600)	(9,180)	(20,160)	(47,400)	(8,100)	(2,400)	
Cumulative volume Change (cy) per reach		0	0	0	0	0	3,300	(16,200)	(42,480)	(33,960)	(126,960)	(174,120)	(189,120)	(204,720)	(213,900)	(234,060)	(281,460)	(289,560)	(291,960)	
Average Annual Volume Change (cy/yr) by reach		0	0	0	0	0	132	(648)	(1,699)	(1,358)	(5,078)	(6,965)	(7,565)	(8,189)	(8,556)	(9,362)	(11,258)	(11,582)	(11,678)	
Change 1941-2008 (@Veg Line)		0	0	0	0	0	0	15	-23	141	-108	-275	-152	21	5	7	-227	-201	30	
Avg Change (1941-2008) - 67 years		0.0	0.0	0.0	0.0	0.0	0.0	0.2	(0.3)	2.1	(1.6)	(4.1)	(2.3)	0.3	0.1	0.1	(3.4)	(3.0)	0.4	
Equip unit vol change (1 ft = -0.6 cy/ft)		0	0	0	0	0	0	9	-13.8	84.6	-64.8	-165	-91.2	12.6	3	4.2	-136.2	-120.6	18	
Net Volume Change (cy) to next		0	0	0	0	0	4,500	(2,400)	(3,960)	3,960	(114,900)	(76,860)	(15,720)	7,800	2,160	(26,400)	(128,400)	(30,780)	3,600	
Cumulative volume Change (cy) per reach		0	0	0	0	0	4,500	2,100	(1,860)	3,960	(110,940)	(187,800)	(203,520)	(195,720)	(193,560)	(219,960)	(348,360)	(379,140)	(375,540)	
Average Annual Volume Change (cy/yr) by reach		0	0	0	0	0	67	31	(28)	59	(1,656)	(2,803)	(3,038)	(2,921)	(2,889)	(3,283)	(5,199)	(5,659)	(5,605)	

APPENDIX TABLE A10. [page 2 of 3] Shoreline position data for four reaches by transect along Sullivan's Island 1941–2008. Distances are measured from the survey control line (Middle Street) to the seaward vegetation line (upper portion of the table) and the wet-dry sand contact line (approximate mean high water). The lower half of the table presents rates of change in feet and equivalent sand volume in cubic yards as explained in the text.

Shoreline	Year	REACH B - WEST STUDY AREA														
		38	40	45	48	50	55	58	60	65	68	70	75	78	80	85
Distance shown from BL																
Edge of Vegetation	1941	938	913	905	888	882	901	954	994	1044	1064	1039	911	852	917	1112
Edge of Vegetation	1949	939	946	939	900	875	863	868	879	1027	1027	1110	904	873	885	1087
Edge of Vegetation	1953	932	943	897	861	836	828	884	904	1069	1075	998	927	983	1083	1198
Edge of Vegetation	1963	934	1017	1007	983	1008	1096	1197	1272	1542	1514	1358	1241	1184	1220	1272
Edge of Vegetation	1967	948	1064	1203	1202	1203	1429	1557	1653	1599	1547	1506	1362	1199	1222	1268
Edge of Vegetation	1973	891	1049	1151	1404	1511	1548	1630	1691	1785	1717	1656	1506	1274	1279	1240
Edge of Vegetation	1979	969	1093	1434	1585	1676	1793	1797	1874	1866	1833	1815	1598	1328	1368	1333
Edge of Vegetation	1983	1009	1175	1505	1551	1713	1855	1885	1945	1943	1919	1878	1665	1395	1434	1379
Edge of Vegetation	1999	928	1078	1471	1642	1721	1859	1810	1773	1726	1660	1595	1339	1108	1120	1153
Edge of Vegetation	2006	948	1097	1427	1591	1683	1896	1960	1956	1837	1720	1609	1448	1230	1205	1160
Edge of Vegetation	2008	939	1097	1485	1643	1728	1968	2060	2027	1921	1789	1686	1452	1242	1230	1232
Change 1941-2008		1	184	580	755	846	1067	1106	1033	877	725	647	541	390	313	120
Avg Change (1941-2008) - 68 years		0.0	2.7	8.5	11.1	12.4	15.7	16.3	15.2	12.9	10.7	9.5	8.0	5.7	4.6	1.8
Equip unit vol change (1 ft = -0.6 cy/ft)		0.6	110.4	348	453	507.6	640.2	663.6	619.8	526.2	435	388.2	324.6	234	187.8	72
Shoreline	Year	Reach B														
		38+00	40+00	45+00	48+00	50+00	55+00	58+00	60+00	65+00	68+00	70+00	75+00	78+00	80+00	85+00
Wet - Dry Beach	1941	1012	1051	1051	1039	1035	1061	1101	1130	1147	1139	1116	989	1013	1103	1387
Wet - Dry Beach	1949	1082	1113	1035	994	972	954	1018	1076	1198	1227	1236	1236	1204	1236	1418
Wet - Dry Beach	1953	1062	1075	966	956	941	939	1021	1114	1411	1473	1481	1447	1290	1328	1462
Wet - Dry Beach	1963	1080	1199	1256	1251	1250	1291	1439	2260	1830	1708	1636	1444	1269	1296	1541
Wet - Dry Beach	1967	1122	1226	1349	1427	1502	1712	1756	1768	1779	1770	1751	1618	1351	1347	1352
Wet - Dry Beach	1973	1038	1171	1488	1645	1735	1877	1921	1964	1913	1937	1777	1606	1463	1471	1335
Wet - Dry Beach	1979	1049	1202	1509	1674	1779	1972	1955	1958	2014	1957	1903	1684	1449	1457	1475
Wet - Dry Beach	1983	1088	1264	1573	1730	1829	2004	2018	2022	2051	2034	1991	1775	1468	1491	1496
Wet - Dry Beach	1999	1017	1192	1612	1809	1918	1922	1859	1864	1838	1772	1713	1542	1382	1359	1309
Wet - Dry Beach	2006	1030	1191	1527	1705	1816	2054	2113	2124	2061	1937	1843	1605	1345	1321	1284
Change 1941-2008		18	140	476	666	781	993	1012	994	914	798	727	616	332	218	-103
Avg Change (1941-2008) - 67 years		0.3	2.1	7.2	10.1	11.8	15.0	15.3	15.1	13.8	12.1	11.0	9.3	5.0	3.3	-1.6
Equip unit vol change (1 ft = -0.6 cy/ft)		10.8	84	285.6	399.6	468.6	595.8	607.2	596.4	548.4	478.8	436.2	369.6	199.2	130.8	-61.8
Distance shown from BL		38	40	45	48	50	55	58	60	65	68	70	75	78	80	85
Equip unit vol change (1 ft = -0.6 cy/ft) @veg		0.6	110.4	348	453	507.6	640.2	663.6	619.8	526.2	435	388.2	324.6	234	187.8	72
Equip unit vol change (1 ft = -0.6 cy/ft) @wet/dry		10.8	84	285.6	399.6	468.6	595.8	607.2	596.4	548.4	478.8	436.2	369.6	199.2	130.8	-61.8
Average unit vol (@ veg vs @ wet/dry line)		5.7	97.2	316.8	426.3	488.1	618	635.4	608.1	537.3	456.9	472.2	347.1	216.6	159.3	5.1
Net Volume Change (cy) to next		20,580	207,000	222,930	182,880	553,050	376,020	248,700	572,700	298,260	173,820	379,650	169,110	75,180	82,200	12,240
Cumulative volume Change (cy) per reach		20,580	227,580	450,510	633,390	1,186,440	1,562,460	1,811,160	2,383,860	2,682,120	2,855,940	3,235,590	3,404,700	3,479,880	3,562,080	3,574,320
Average Annual Volume Change (cy/yr) by reach		307	3,397	6,724	9,454	17,708	23,320	27,032	35,580	40,032	42,626	48,292	50,816	51,939	53,165	53,348
Change 1941-1983 (@Veg Line)		71	262	600	663	831	954	931	951	899	855	839	754	543	517	267
Avg Change (1941-1983) - 42 years		1.7	6.2	14.3	15.8	19.8	22.7	22.2	22.6	21.4	20.4	20.0	18.0	12.9	12.3	6.4
Equip unit vol change (1 ft = -0.6 cy/ft)		42.6	157.2	360	397.8	498.6	572.4	558.6	570.6	539.4	513	503.4	452.4	325.8	310.2	160.2
Net Volume Change (cy) to next		39,960	258,600	227,340	179,280	535,500	339,300	225,840	555,000	315,720	203,280	477,900	233,460	127,200	235,200	88,020
Cumulative volume Change (cy) per reach		39,960	298,560	525,900	705,180	1,240,680	1,579,980	1,805,820	2,360,820	2,676,540	2,879,820	3,357,720	3,591,180	3,718,380	3,953,580	4,041,600
Average Annual Volume Change (cy/yr) by reach		951	7,109	12,521	16,790	29,540	37,619	42,996	56,210	63,727	68,567	79,946	85,504	88,533	94,133	96,229
Change 1983-2008 (@Veg Line)		-70	-78	-20	92	15	113	175	82	-22	-130	-192	-213	-153	-204	-147
Avg Change (1983-2008) - 25 years		(2.8)	(3.1)	(0.8)	3.7	0.6	4.5	7.0	3.3	(0.9)	(5.2)	(7.7)	(8.5)	(6.1)	(8.2)	(5.9)
Equip unit vol change (1 ft = -0.6 cy/ft)		-42	-46.8	-12	55.2	9	67.8	105	49.2	-13.2	-78	-115.2	-127.8	-91.8	-122.4	-88.2
Net Volume Change (cy) to next		(17,760)	(29,400)	12,960	12,840	38,400	51,840	30,840	18,000	(27,360)	(38,640)	(121,500)	(65,880)	(42,840)	(105,300)	(44,460)
Cumulative volume Change (cy) per reach		(17,760)	(47,160)	(34,200)	(21,360)	17,040	68,880	99,720	117,720	90,360	51,720	(69,780)	(135,660)	(178,500)	(283,800)	(328,260)
Average Annual Volume Change (cy/yr) by reach		(710)	(1,886)	(1,368)	(854)	682	2,755	3,989	4,709	3,614	2,069	(2,791)	(5,426)	(7,140)	(11,352)	(13,130)
Change 1941-2008 (@Veg Line)		1	184	580	755	846	1067	1106	1033	877	725	647	541	390	313	120
Avg Change (1941-2008) - 67 years		0.0	2.7	8.7	11.3	12.6	15.9	16.5	15.4	13.1	10.8	9.7	8.1	5.8	4.7	1.8
Equip unit vol change (1 ft = -0.6 cy/ft)		0.6	110.4	348	453	507.6	640.2	663.6	619.8	526.2	435	388.2	324.6	234	187.8	72
Net Volume Change (cy) to next		22,200	229,200	240,300	192,120	573,900	391,140	256,680	573,000	288,360	164,640	356,400	167,580	84,360	129,900	43,560
Cumulative volume Change (cy) per reach		22,200	251,400	491,700	683,820	1,257,720	1,648,860	1,905,540	2,478,540	2,766,900	2,931,540	3,287,940	3,455,520	3,539,880	3,669,780	3,713,340
Average Annual Volume Change (cy/yr) by reach		331	3,752	7,339	10,206	18,772	24,610	28,441	36,993	41,297	43,754	49,074	51,575	52,834	54,773	55,423

APPENDIX TABLE A10. [page 3 of 3] Shoreline position data for four reaches by transect along Sullivan's Island 1941–2008. Distances are measured from the survey control line (Middle Street) to the seaward vegetation line (upper portion of the table) and the wet-dry sand contact line (approximate mean high water). The lower half of the table presents rates of change in feet and equivalent sand volume in cubic yards as explained in the text.

Shoreline		REACH C - EAST STUDY AREA																				
		88	90	95	98	100	105	108	110	115	118	120	125	128	130	135	138	140	145	148	150	155
Distance shown from BL		1121	1086	981	912	864	660	677	686	711	713	733	817	860	862	868	879	925	980	1074	1134	1132
Edge of Vegetation		1158	1078	1106	1069	1049	925	900	866	825	794	803	805	832	865	872	884	963	1019	1018	1096	1131
Edge of Vegetation		1208	1189	1129	1080	994	1073	1065	1038	952	936	961	858	904	887	871	894	931	1011	1005	1100	1113
Edge of Vegetation		1853	1270	1263	1231	1206	1195	1164	1126	1092	1010	983	937	880	852	840	908	919	932	1000	1059	1158
Edge of Vegetation		1242	1208	1167	1170	1160	1145	1111	1092	1000	947	917	885	852	862	892	906	912	1061	1142	1178	1289
Edge of Vegetation		1202	1157	1083	1037	985	904	862	840	808	811	736	825	844	831	912	1000	1175	1373	1385	1356	1249
Edge of Vegetation		1292	1256	1167	1104	1073	972	941	1073	972	986	933	979	942	970	990	1105	1306	1408	1423	1321	1321
Edge of Vegetation		1343	1296	1185	1120	1092	972	934	908	917	984	963	957	941	938	1061	1081	1141	1336	1439	1406	1314
Edge of Vegetation		1899	1115	1088	1043	1055	1076	1137	1164	1193	1278	1329	1368	1460	1502	1722	1689	1652	1653	1562	1511	1497
Edge of Vegetation		1127	1104	1121	1181	1219	1282	1313	1331	1406	1447	1512	1543	1529	1541	1518	1491	1478	1489	1512	1524	1444
Edge of Vegetation		2006	1243	1244	1243	1296	1319	1320	1392	1424	1467	1532	1540	1591	1574	1582	1548	1527	1521	1558	1573	1584
Change 1941-2008		122	158	262	384	455	640	715	738	756	819	807	774	714	720	680	648	596	578	499	450	312
Avg Change (1941-2008) - 69 years		1.8	2.3	3.9	5.6	6.7	9.7	10.5	10.9	11.1	12.0	11.9	11.4	10.5	10.6	10.0	9.5	8.8	8.5	7.3	6.6	4.7
Eqv unit vol change (1 ft = -0.6 cy/ft)		73.2	94.8	157.2	230.4	273	396	429	442.8	453.6	491.4	484.2	464.4	428.4	432	408	388.8	357.6	346.8	299.4	270	187.2
Shoreline		Year	88-90	90-95	95-98	98-100	100-105	105-108	108-110	110-115	115-118	118-120	120-125	125-128	128-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165
Wet - Dry Beach		1941	1265	1205	1201	1177	1130	973	888	861	920	1041	1095	1191	1212	1213	1212	1193	1195	1216	1245	1270
Wet - Dry Beach		1949	1408	1406	1406	1406	1305	1231	1169	1175	1180	1157	1143	1122	1115	1102	1067	1052	1052	1108	1182	1227
Wet - Dry Beach		1953	1546	1578	1563	1548	1486	1450	1425	1368	1334	1314	1265	1236	1218	1174	1150	1140	1132	1148	1169	1270
Wet - Dry Beach		1963	1350	1315	1269	1248	1235	1204	1186	1172	1125	1065	1011	931	931	937	971	1011	1046	1154	1231	1688
Wet - Dry Beach		1967	1319	1289	1226	1205	1196	1172	1146	1121	1037	993	970	967	983	997	1046	1121	1132	1265	1347	1471
Wet - Dry Beach		1973	1247	1198	1118	1044	1024	946	913	896	865	858	862	933	1041	1125	1132	1198	1245	1483	1461	1440
Wet - Dry Beach		1979	1471	1431	1286	1232	1213	1181	1160	1213	1181	1090	1145	1107	1079	1083	1113	1165	1221	1426	1653	1725
Wet - Dry Beach		1983	1474	1437	1321	1255	1225	1173	1148	1135	1104	1090	1079	1059	1053	1056	1102	1174	1242	1480	1674	1753
Wet - Dry Beach		1989	1276	1253	1220	1247	1282	1385	1451	1477	1501	1512	1523	1545	1565	1588	1811	1841	1857	1895	1892	1904
Wet - Dry Beach		2006	1282	1284	1360	1443	1534	1483	1528	1545	1575	1597	1614	1646	1652	1647	1605	1584	1644	1676	1694	1662
Change 1941-2008		-3	79	159	266	404	510	640	684	625	556	519	455	440	434	393	391	388	428	431	424	302
Avg Change (1941-2008) - 67 years		0.0	1.2	2.4	4.0	6.1	7.7	9.7	10.4	9.5	8.4	7.9	6.9	6.7	6.6	6.0	5.9	5.9	6.5	6.5	6.4	4.6
Eqv unit vol change (1 ft = -0.6 cy/ft)		-1.8	47.4	95.4	159.6	242.4	306	384	410.4	375	333.6	311.4	273	264	260.4	235.8	234.6	232.8	258.8	258.6	254.4	181.2
Distance shown from BL		88	90	95	98	100	105	108	110	115	118	120	125	128	130	135	138	140	145	148	150	155
Eqv unit vol change (1 ft = -0.6 cy/ft) @veg		73.2	94.8	157.2	230.4	273	396	429	442.8	453.6	491.4	484.2	464.4	428.4	432	408	388.8	357.6	346.8	299.4	270	187.2
Eqv unit vol change (1 ft = -0.6 cy/ft) @wet/dry		-1.8	47.4	95.4	159.6	242.4	306	384	410.4	375	333.6	311.4	273	264	260.4	235.8	234.6	232.8	258.8	258.6	254.4	181.2
Average unit vol (@ veg vs @ wet/dry line)		35.7	71.1	126.3	195	257.7	351	405.6	426.6	414.3	412.5	397.8	368.7	346.2	321.9	311.7	295.2	301.8	279	264.2	264.2	181.2
Net Volume Change (cy) to meet		21,360	98,700	96,390	90,540	304,350	227,250	166,620	420,450	248,040	162,060	383,250	214,470	138,480	334,680	190,080	121,380	298,500	174,240	108,240	233,200	49,590
Cumulative volume Change (cy) per reach		21,360	120,060	216,450	306,990	611,340	885,590	1,055,270	1,425,660	1,673,700	1,835,760	2,219,010	2,433,480	2,571,960	3,096,090	3,271,470	3,515,970	3,690,210	3,798,450	4,027,650	4,027,650	4,071,240
Average Annual Volume Change (cy/yr) by reach		319	1,792	3,231	4,582	9,124	12,516	15,003	21,279	24,981	27,399	33,120	36,321	38,387	43,373	46,210	48,022	52,477	55,078	56,693	60,025	60,765
Change 1941-1983 (@Veg Line)		222	210	204	208	228	312	257	222	206	271	230	140	41	76	193	202	216	356	365	472	182
Avg Change (1941-1983) - 42 years		5.3	5.0	4.9	5.0	5.4	7.4	6.1	5.3	4.9	6.5	3.3	1.0	1.8	4.6	4.8	5.1	8.5	8.7	6.5	4.3	4.3
Eqv unit vol change (1 ft = -0.6 cy/ft)		133.2	126	122.4	124.8	136.8	187.2	154.2	133.2	123.6	162.6	138	84	24.6	45.6	115.8	121.2	129.6	213.6	219	163.2	109.2
Net Volume Change (cy) to meet		51,840	124,200	74,160	52,200	162,000	102,420	57,480	128,400	85,860	60,120	111,000	32,580	14,400	80,700	50,100	171,600	129,780	76,440	136,200	84,420	84,420
Cumulative volume Change (cy) per reach		51,840	176,040	250,200	302,520	464,520	566,940	624,420	752,820	838,680	898,800	1,009,800	1,032,380	1,056,420	1,137,120	1,208,220	1,258,380	1,429,980	1,559,760	1,636,200	1,772,400	1,856,820
Average Annual Volume Change (cy/yr) by reach		1,234	4,191	5,957	7,203	11,060	13,449	14,867	17,924	19,949	21,400	24,043	24,819	25,153	27,074	28,767	29,961	34,047	37,137	38,957	42,200	44,210
Change 1983-2008 (@Veg Line)		-100	-52	58	176	227	348	458	516	550	548	577	634	673	644	487	446	380	222	134	178	130
Avg Change (1983-2008) - 25 years		(4.0)	(2.1)	2.3	7.0	9.1	13.9	18.3	20.6	22.0	21.9	23.1	25.4	26.9	25.8	19.5	17.8	15.2	8.9	5.4	7.1	5.2
Eqv unit vol change (1 ft = -0.6 cy/ft)		-60	-31.2	34.8	105.6	136.2	208.8	274.8	309.6	330	328.8	346.2	380.4	403.8	386.4	292.2	267.6	228	133.2	80.4	106.8	78
Net Volume Change (cy) to meet		(18,240)	1,800	42,120	48,360	172,500	145,080	116,880	319,640	197,640	135,000	363,300	285,260	158,040	339,300	161,940	99,120	180,600	64,080	37,440	92,400	(2,880)
Cumulative volume Change (cy) per reach		(18,240)	(16,440)	25,680	74,040	246,540	391,620	508,500	828,300	1,025,940	1,160,940	1,524,240	1,759,500	1,917,540	2,256,840	2,428,780	2,525,900	2,704,500	2,768,580	2,806,020	2,894,420	2,895,540
Average Annual Volume Change (cy/yr) by reach		(730)	(659)	1,027	2,962	9,862	15,665	20,340	33,132	41,038	46,438	60,970	70,380	76,702	90,274	96,991	100,956	108,180	110,743	112,241	115,937	115,822
Change 1941-2008 (@Veg Line)		122	158	262	384	455	640	715	738	756	819	807	774	714	720	680	648	596	578	499	450	312
Avg Change (1941-2008) - 67 years		1.8	2.4	3.9	5.7	6.8	9.9	10.7	11.0	11.3	12.2	12.0	11.6	10.7	10.7	10.1	9.7	8.9	8.6	7.4	6.7	4.7
Eqv unit vol change (1 ft = -0.6 cy/ft)		73.2	94.8	157.2	230.4	273	396	429	442.8	453.6	491.4	484.2	464.4	428.4	432	408	388.8	357.6	346.8	299.4	270	187.2
Net Volume Change (cy) to meet		33,600	126,000	116,280	100,680	334,500	247,500	174,360	448,200	283,500	195,120	474,300	281,840	172,080	420,000	239,040	149,280	352,200	193,860	113,880	228,600	81,540
Cumulative volume Change (cy) per reach		33,600	159,600	275,880	376,560	711,060	958,560	1,132,920	1,481,120	1,864,620	2,059,740	2,334,040	2,801,880	2,973,960	3,343,440	3,633,000	3,782,280	4,134,480	4,328,340	4,442,220	4,670,820	4,752,360
Average Annual Volume Change (cy/yr) by reach		501	2,382	4,118	5,620	10,613	14,307	16,909	23,821	27,830	30,742	41,819	44,387	50,656	54,224	56,452	61,709	64,602	66,302	69,714	70,931	70,931

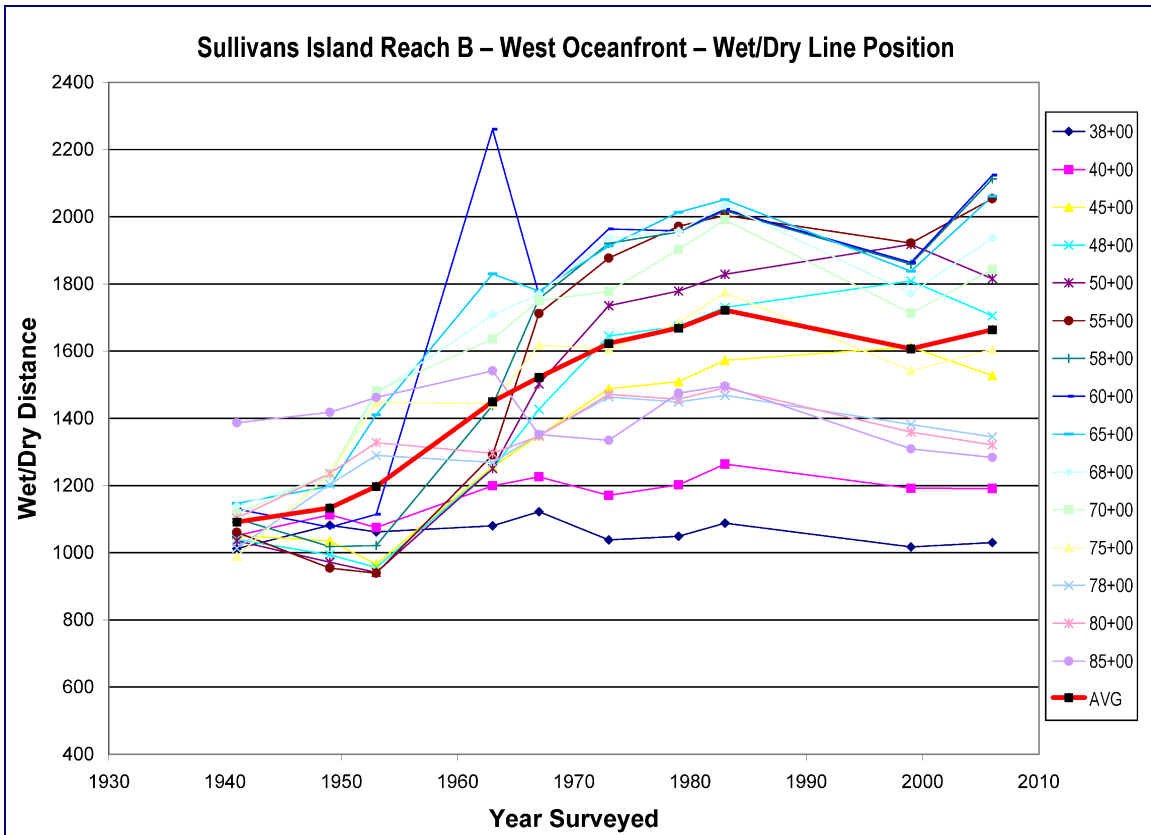
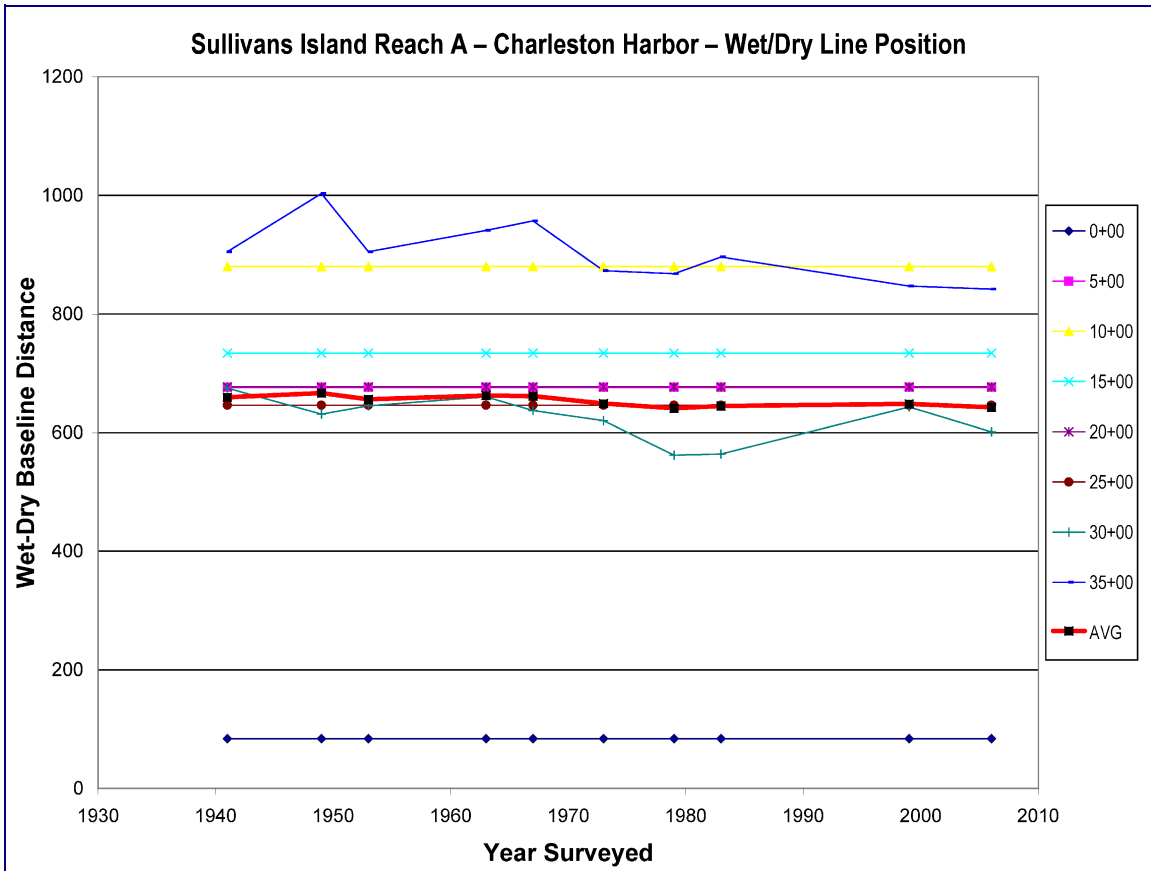


FIGURE A10-1. Trends in the approximate mean high waterline (wet-sand/dry-sand line on aerial photographs) position by reach for 1941 to 2008 based on the data in Appendix Table A10.

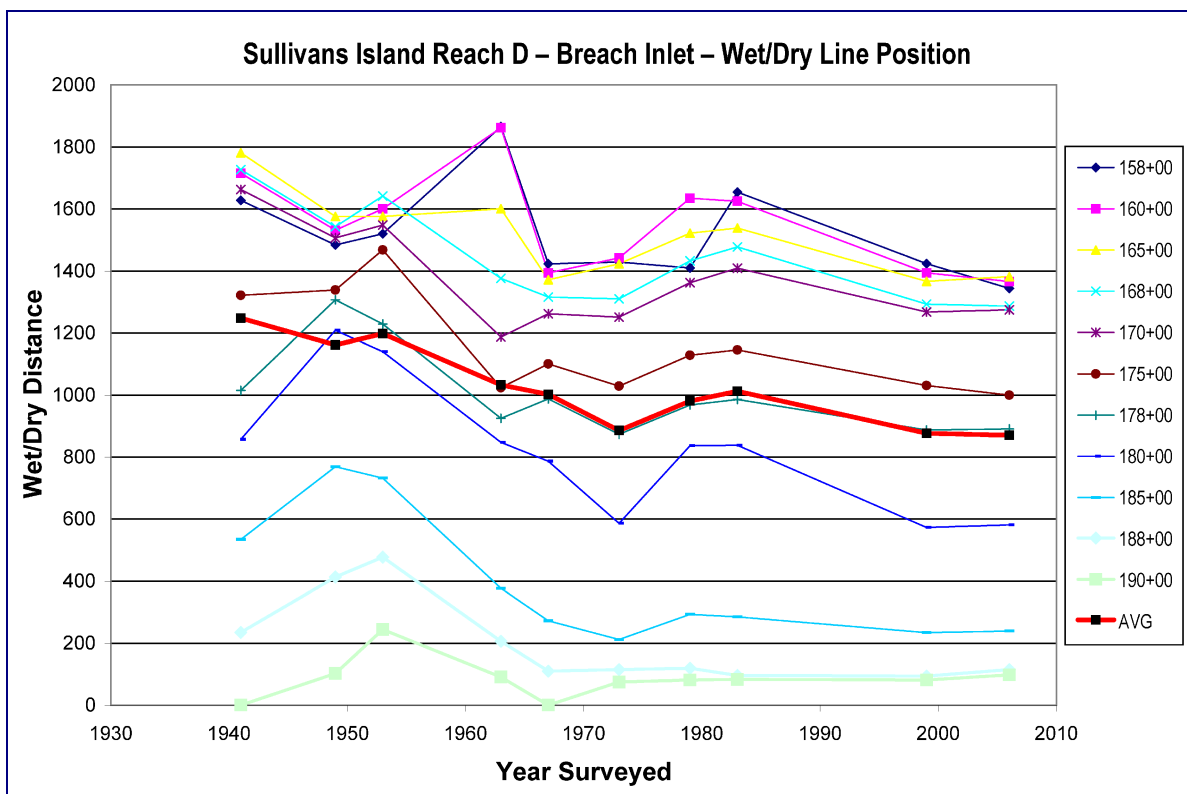
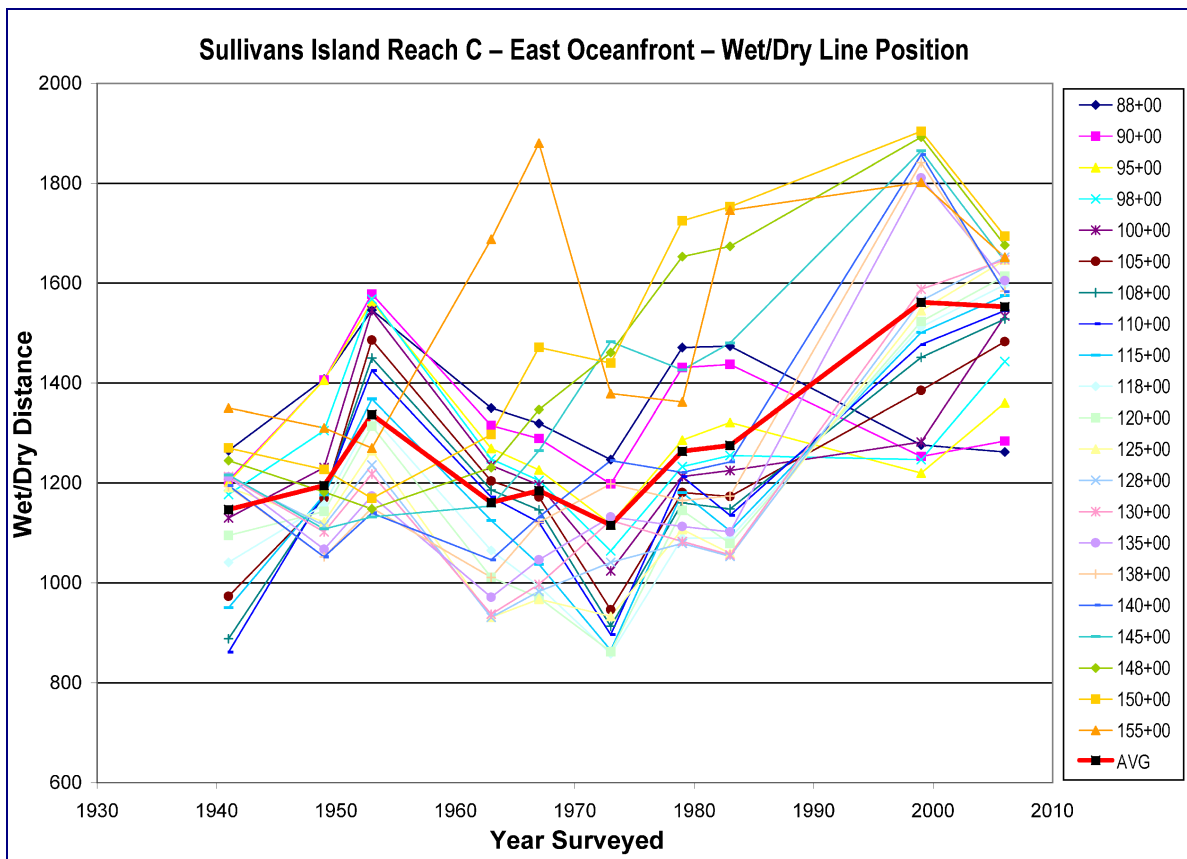


FIGURE A10-2. Trends in the approximate mean high waterline (wet-sand/dry-sand line on aerial photographs) position by reach for 1941 to 2008 based on the data in Appendix Table A10.