PART I

BIOMASS AND PRIMARY PRODUCTION IN SEAGRASSES AND MACROALGAE

FINAL DATA REPORT

K.H. DUNTON

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Biomass and Primary Production in Seagrasses and Macroalgae

K. H. Dunton

Two years of field study in San Antonio Bay and a one year study in Corpus Christi Bay on the growth and productivity of Ruppia maritima and Halodule wrightii have recently been completed. Preliminary results show that growth in both species is greatest during the late spring and early summer months, and minimal from October thru March. Epiphyte biomass can be substantial during certain periods in late summer and early fall in San Antonio Bay and during the winter in Corpus Christi Bay. During these periods epiphyte biomass usually equals or exceeds seagrass shoot biomass on an areal basis.

In San Antonio Bay, seagrasses occupy only a very narrow band along the shoreline, to depths no greater than 0.5 m, compared to 0.7 to 0.8 m in Corpus Christi Bay. The restriction of Ruppia maritima to only the shallowest regions of San Antonio Bay is undoubtedly caused by light limitation. Continuous underwater measurements of quantum irradiance reveal that light levels at the greatest depth of seagrass distribution in San Antonio Bay are often less than 200 $\mu E\ m^{-2}\ s^{-1}$ at an average depth of 0.5 m. Since saturation irradiance (I_k) is about 200 $\mu E\ m^{-2}\ s^{-1}$ (10% full sunlight) for most seagrasses, Ruppia is clearly light limited at depths greater than about 0.5 m. In contrast light levels at Indian Point in Corpus Christi Bay are considerably higher, usually averaging 200 $\mu E\ m^{-2}\ s^{-1}$ or greater at a 0.75 m depth. I attribute the lower light levels in San Antonio Bay to its physiography. A combination of shallow depths, a long wind fetch, and the relative absence of long shoals and islands permits substantial resuspension of flocculent sediments which attenuate light transmission through the water column.

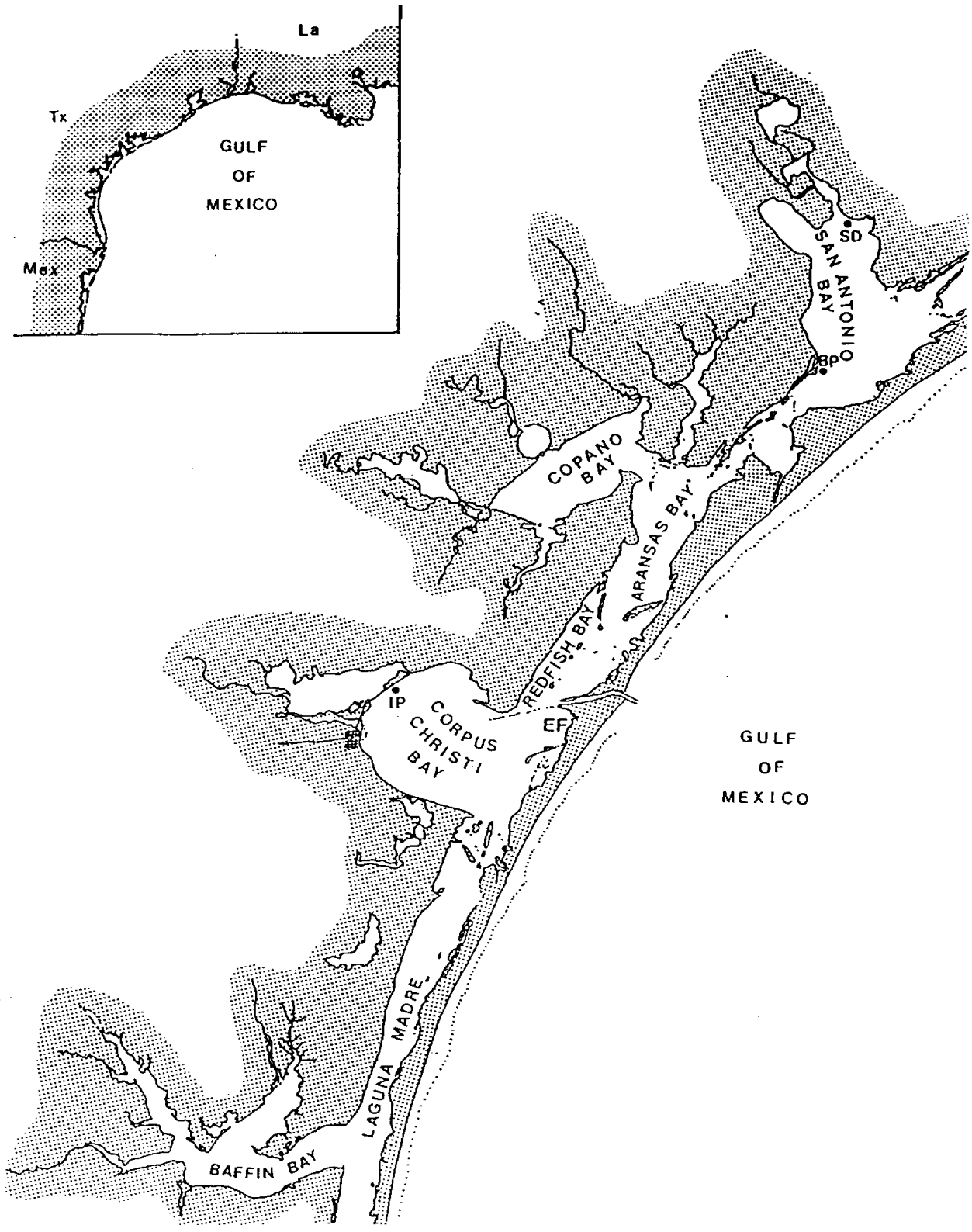

Figure 1. Map of the southeast Texas coast, showing location of the study sites in San Antonio Bay (Seadrift, SD; Blackjack, BP), and Corpus Christi Bay (East Flats, EF; Indian Point, IP).

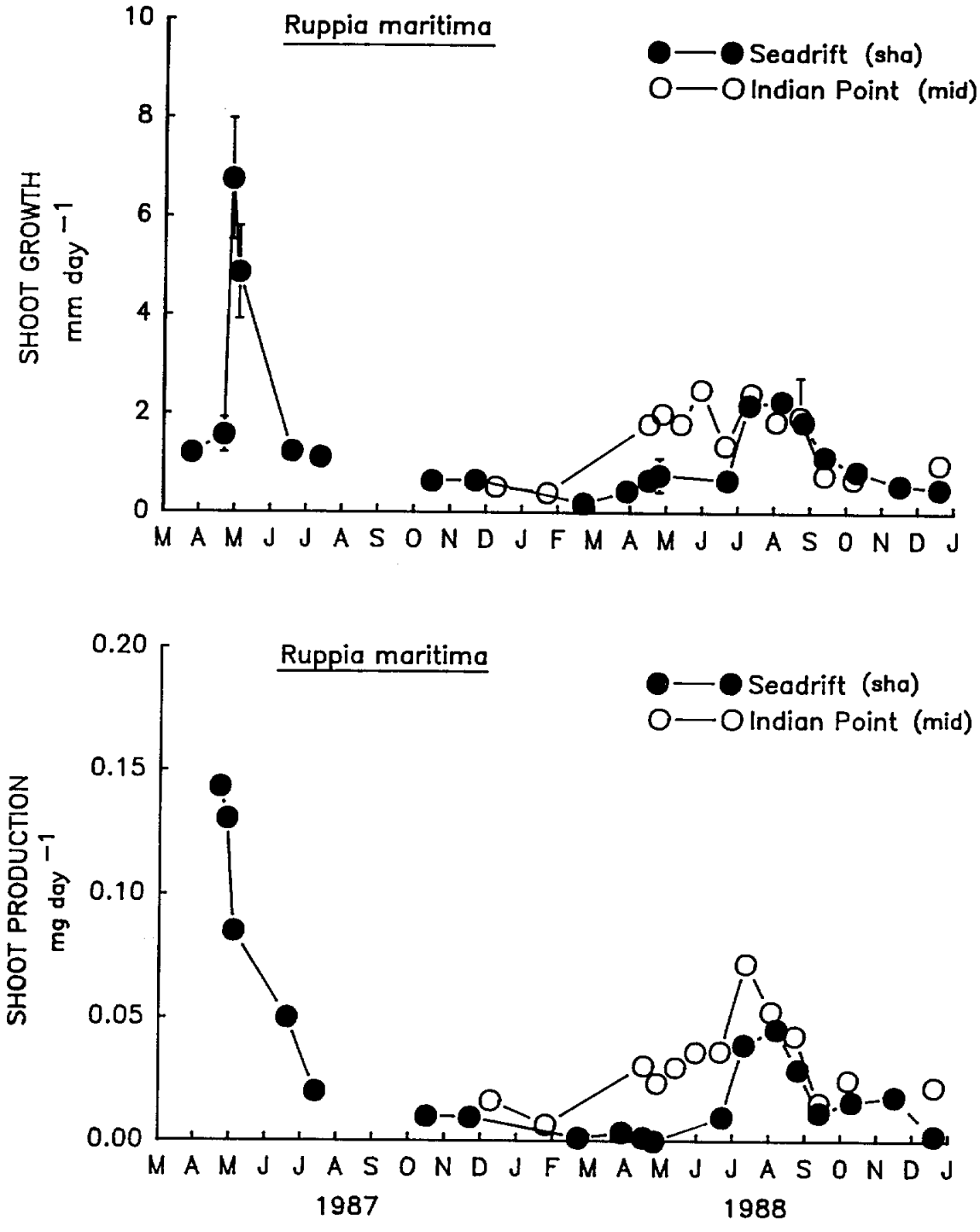

Figure 2. Ruppia maritima. Seasonal patterns of growth and production at 0.3m depths at Seadrift (SD) in San Antonio Bay and Indian Point (IP) in Corpus Christi Bay since March 1987.

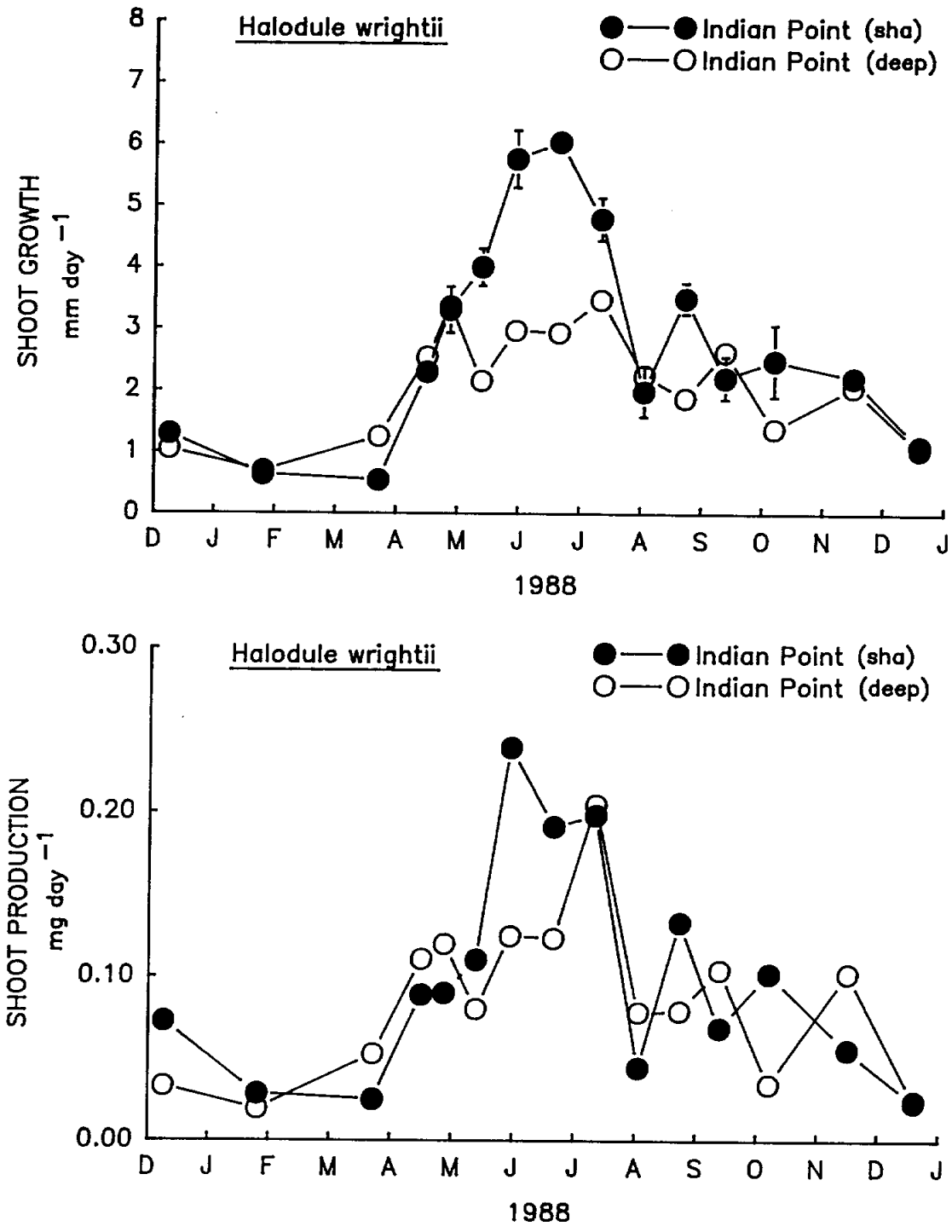

Figure 3. Halodule wrightii. Seasonal patterns of growth and production of shallow and deep habitats at Indian Point (Corpus Christi Bay) since November 1987.

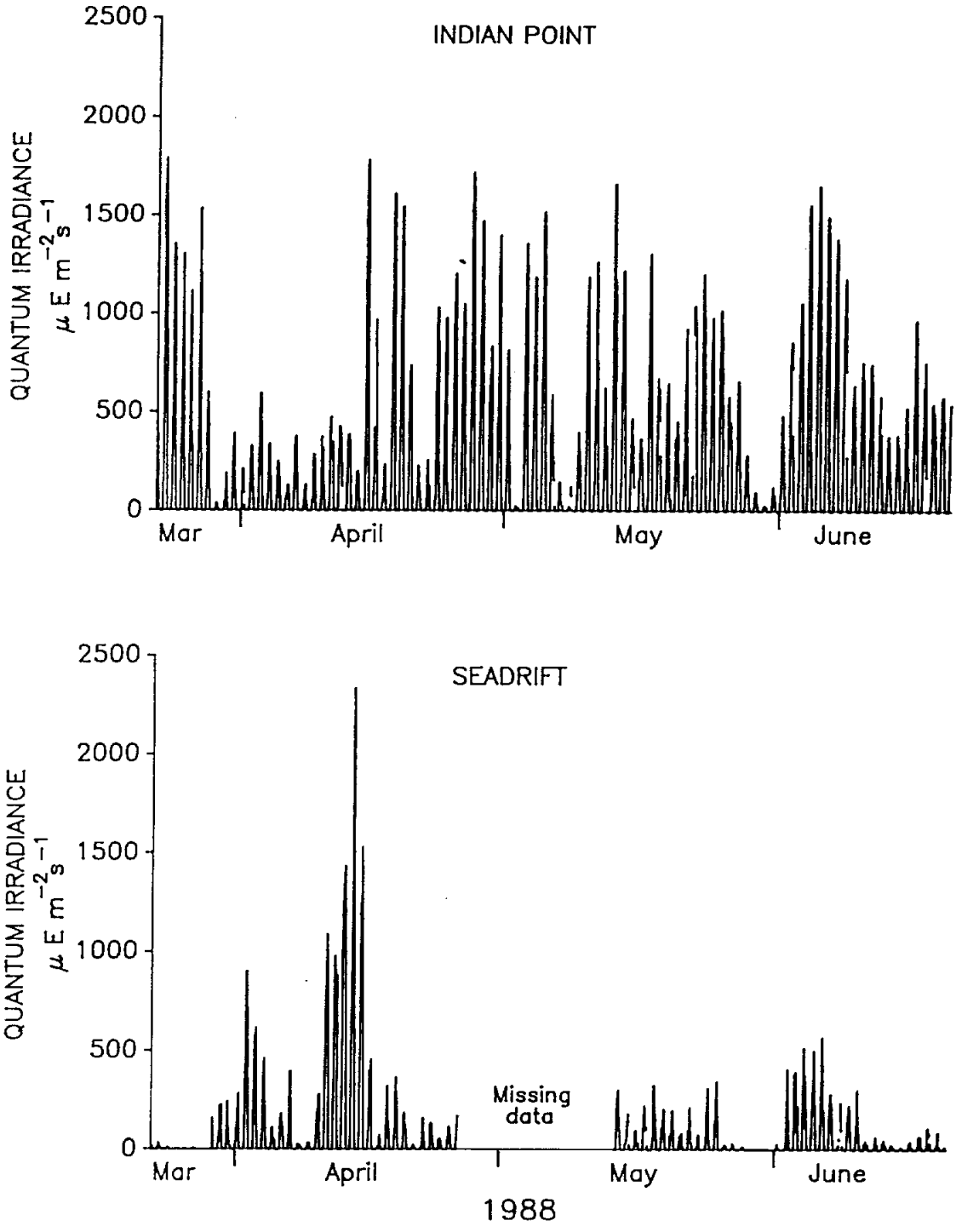

Figure 4. Underwater quantum irradiance at the deepest levels of seagrass penetration at Seadrift (SD) in San Antonio Bay and Indian Point (IP) in Corpus Christi Bay over a 3-month period in 1988. Measurements were made once a minute and integrated hourly.

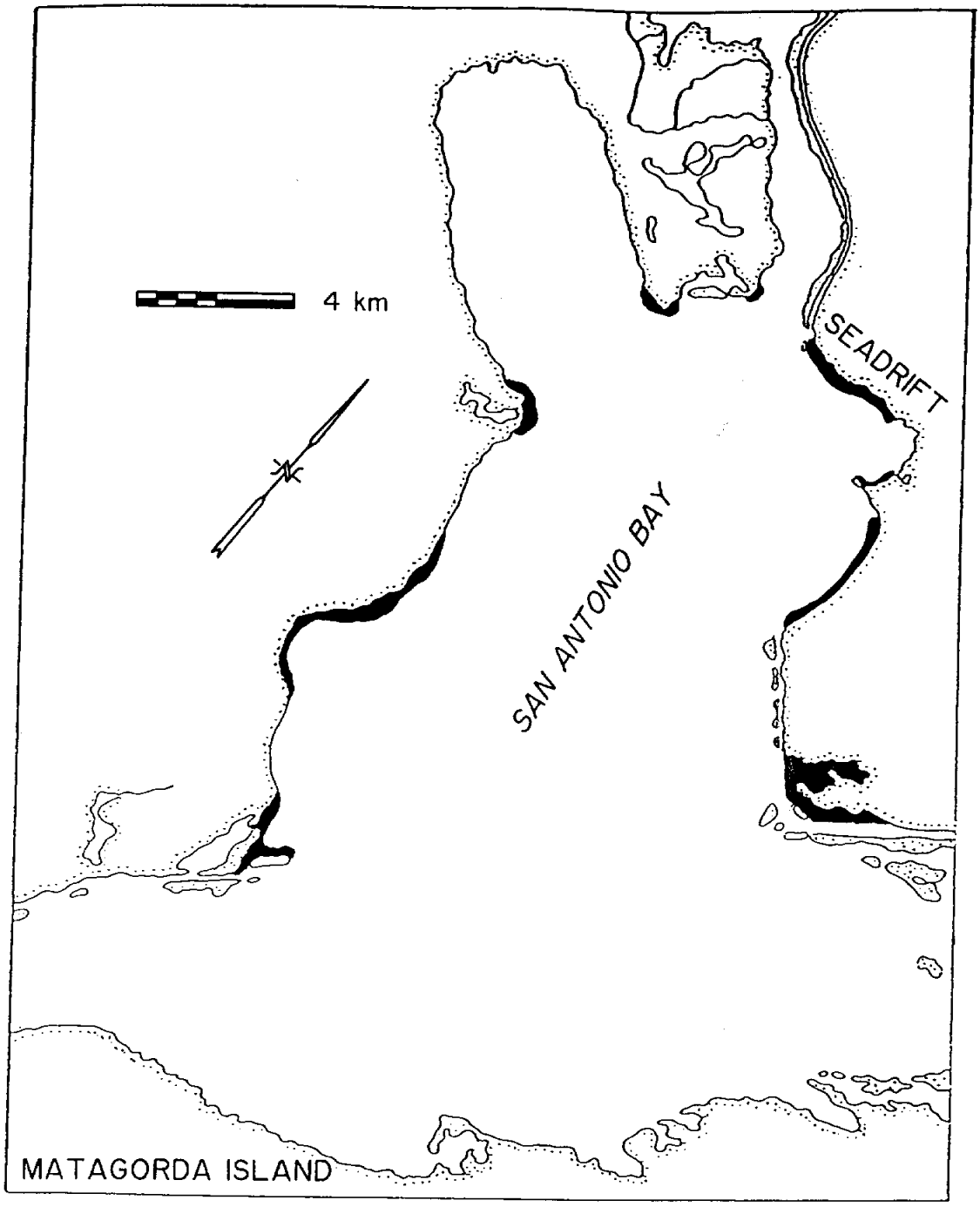

Figure 5. Distribution of seagrasses in San Antonio Bay. Data includes that of Irby (1973). Ruppia maritima was the only species found during this study in 1987.

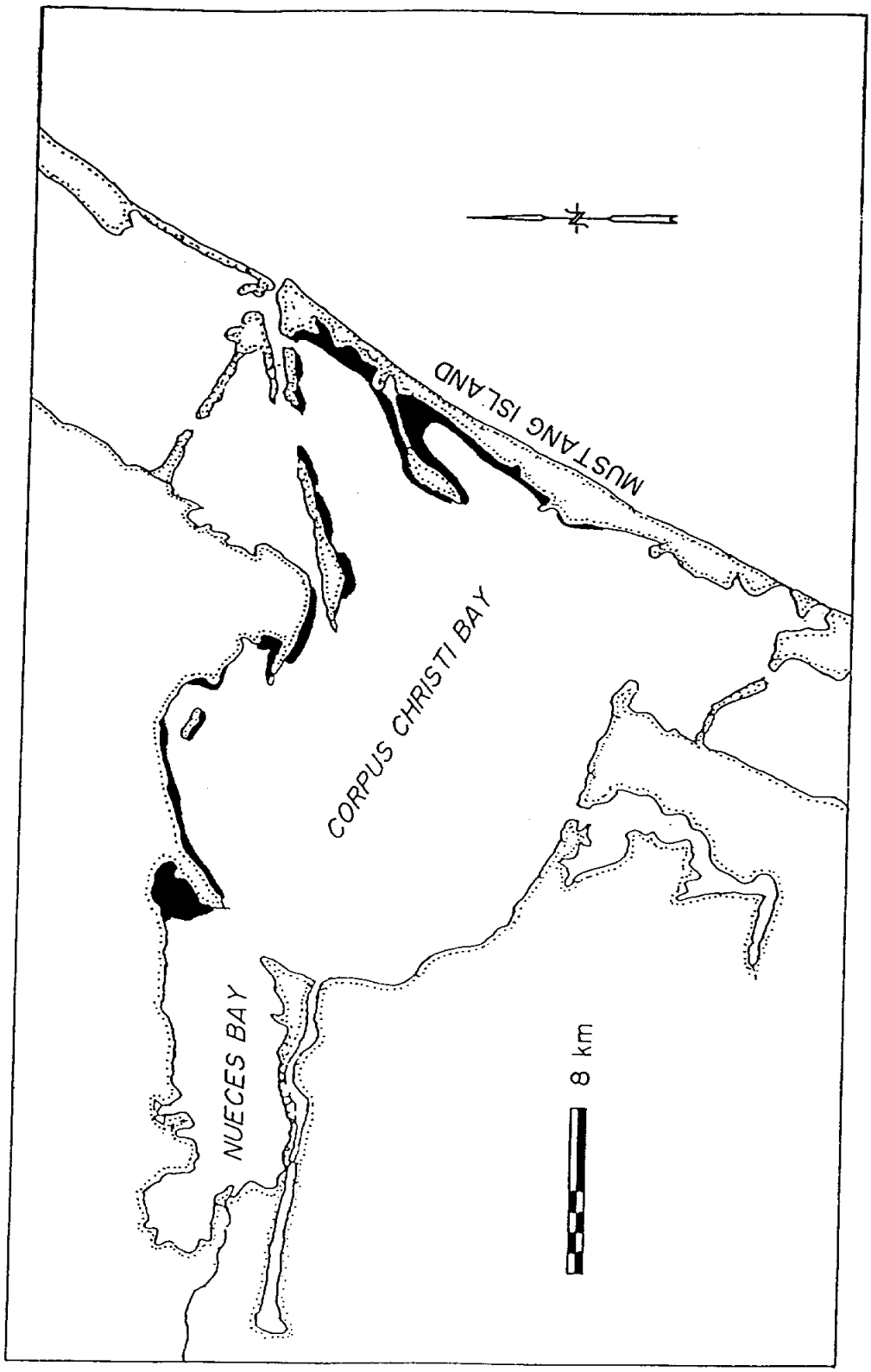

Figure 6. Distribution of seagrasses in Corpus Christi and Nueces bays from limited aerial and ground based surveys in 1988. Halodule wrightii dominates in Corpus Christi Bay, and Ruppia maritima is the predominant species in Nueces Bay.

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Seagrass Productivity

Sta	Depth		Start	End	# Day	PRODUCTIVITY g/m2/day x	SE	n	SHOOT GROWTH mm/day x	SE	n	SHOOT PRODUCTION mg/day/sh x	SE	n
BLACKJACK PENINSULA														
BP	SHA	A	04/07/87	04/22/87	15	0.5613	0.0514	3	4.7790	0.8193	34	0.1295	0.0004	3
BP	SHA	A	04/22/87	04/27/87	5	1.6380	0.3050	3	8.6260	1.0030	72	0.1798	0.0002	3
BP	SHA	M	04/27/87	05/04/87	7	0.5741	0.1620	3	6.6640	0.2899	49	0.0628	0.0002	3
BP	SHA	J	05/04/87	06/02/87	31	0.0370	0.0177	3	1.4920	0.1477	16	0.0351	0.0006	3
BP	SHA	J	06/02/87	06/19/87	17	0.0161	0.0085	2	0.5882	0.0898	3	0.0617	0.0007	2
BP	SHA	J	06/19/87	07/13/87	25	nd	nd	nd	nd	nd	nd	nd	nd	nd
BP	SHA	O	07/13/87	10/14/87	20	0.3042	0.0639	3	1.5761	0.0799	90	0.0315	0.0001	3
BP	SHA	N	10/14/87	11/21/87	38	0.3300	0.0715	3	0.6279	0.0224	177	0.0095	0.0001	3
BP	SHA	F	11/21/87	02/16/88	67	nd	nd	nd	nd	nd	nd	nd	nd	nd
BP	SHA	A	02/16/88	04/02/88	46	0.0053	0.0032	3	0.1030	0.0490	19	0.0052	0.0001	3
BP	SHA	A	04/02/88	04/14/88	12	nd	nd	nd	nd	nd	nd	nd	nd	nd
BP	SHA	A	04/14/88	04/26/88	12	0.1699	0.0418	3	2.1538	0.1824	78	0.0375	0.0001	3
BP	SHA	M	04/26/88	05/10/88	14	0.1264	0.0254	3	1.7690	0.1602	60	0.0390	0.0001	3
BP	SHA	J	05/10/88	06/01/88	22	0.0559		1	1.9026	0.3689	7	0.0432		1
BP	SHA	J	06/01/88	06/22/88	21	nd	nd	nd	nd	nd	nd	nd	nd	nd
BP	SHA	J	06/22/88	07/15/88	23	0.5169	0.1191	3	3.2919	0.1451	70	0.1369	0.000918	3
BP	SHA	A	07/15/88	08/05/88	21	0.1469	0.0238	3	1.4243	0.0742	56	0.0486	0.000211	3
BP	SHA	A	08/05/88	08/25/88	20	nd	nd	nd	nd	nd	nd	nd	nd	nd
BP	SHA	S	08/25/88	09/21/88	27	0.1155	0.0214	3	1.4430	0.0993	77	0.0264	0.000178	3
BP	SHA	O	09/21/88	10/12/88	21	0.1313	0.0503	3	1.1576	0.1000	79	0.0210	0.000221	3
BP	SHA	N	10/12/88	11/11/88	30	0.0173	0.0000	3	0.8703	0.1000	17	0.0188	0.000066	3
BP	SHA	D	11/11/88	12/19/88	38	nd	nd	nd	nd	nd	nd	nd	nd	nd
BP	DEEP	A	04/07/87	04/22/87	15	1.6910	0.1950	3	5.3770	0.1636	117	0.1299	0.0004	3
BP	DEEP	A	04/22/87	04/27/87	5	1.8410	0.2564	3	8.8520	0.3004	82	0.1854	0.0001	3
BP	DEEP	M	04/27/87	05/04/87	7	1.4710	0.2241	3	7.1340	0.2640	73	0.1756	0.0003	3
BP	DEEP	J	05/04/87	06/02/87	31	0.3663	0.0833	3	2.4160	0.1089	48	0.0689	0.0006	3
BP	DEEP	J	06/02/87	06/19/87	17	0.0252	0.0043	2	1.0510	0.1601	8	0.0671	0.0003	2
BP	DEEP	J	06/19/87	07/13/87	25	nd	nd	nd	nd	nd	nd	nd	nd	nd
BP	DEEP	O	07/13/87	10/14/87	20	0.6473	0.0364	3	2.5008	0.1076	96	0.0411	0.0001	3
BP	DEEP	N	10/14/87	11/21/87	38	0.1452	0.0098	3	0.5502	0.0254	98	0.0083	0.0001	3
BP	DEEP	F	11/21/87	02/16/88	67	0.0365	0.0051	3	0.1846	0.0161	90	0.0035	0.0000	3
BP	DEEP	A	02/16/88	04/02/88	46	0.3279	0.2220	3	0.5359	0.0338	86	0.0584	0.0019	3
BP	DEEP	A	04/02/88	04/14/88	12	0.0742	0.0162	3	1.3810	0.1133	70	0.0162	0.0001	3
BP	DEEP	A	04/14/88	04/26/88	12	0.1740	0.0337	3	2.1135	0.1529	80	0.0389	0.0001	3
BP	DEEP	M	04/26/88	05/10/88	14	0.3764	0.1323	3	2.9614	0.1467	74	0.0572	0.0004	3
BP	DEEP	J	05/10/88	06/01/88	22	0.1123	0.0662	3	1.9429	0.1200	39	0.0534	0.000879	3
BP	DEEP	J	06/01/88	06/22/88	21	0.4410	0.0764	3	2.3133	0.1067	89	0.0743	0.000353	3
BP	DEEP	J	06/22/88	07/15/88	23	0.2962	0.1434	3	2.7065	0.1465	47	0.1168	0.001574	3
BP	DEEP	A	07/15/88	08/05/88	21	0.1307	0.0319	3	1.1179	0.0881	65	0.0373	0.000204	3
BP	DEEP	A	08/05/88	08/25/88	20	0.3768	0.0326	3	2.0280	0.0835	90	0.0499	0.000126	3
BP	DEEP	S	08/25/88	09/21/88	27	0.3077	0.0707	3	1.6344	0.0856	90	0.0340	0.000267	3
BP	DEEP	O	09/21/88	10/12/88	21	0.0814	0.0177	3	1.3848	0.1300	49	0.0308	0.000144	3
BP	DEEP	N	10/12/88	11/11/88	30	0.2978	0.0756	3	1.1373	0.0750	90	0.0341	0.000297	3

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Sta	Depth		Start	End	# Day	PRODUCTIVITY g/m2/day x	SE	n	SHOOT GROWTH mm/day x	SE	n	SHOOT PRODUCTION mg/day/sh x	SE	n
BP	DEEP	D	11/11/88	12/19/88	38	0.0032	0.0019	2	0.7789	0.1524	5	0.0079	0.000254	2
	SEADRIFT													
SD	SHA	M	03/04/87	03/25/87	21	0.0547	0.0125	3	1.1990	0.0924	31	nd	nd	nd
SD	SHA	A	04/07/87	04/22/87	15	0.0571	0.0072	3	1.5610	0.3582	19	0.1433	0.0006	3
SD	SHA	A	04/22/87	04/27/87	5	0.5257	0.0070	3	6.7460	1.2320	30	0.1304	0.0000	3
SD	SHA	M	04/27/87	05/04/87	7	0.2728	0.0745	3	4.8510	0.9500	26	0.0850	0.0002	3
SD	SHA	J	05/04/87	06/03/87	32	nd	nd	nd	nd	nd	nd	nd	nd	nd
SD	SHA	J	06/03/87	06/19/87	17	0.0152	0.0038	2	1.2280	0.2677	8	0.0500	0.0004	2
SD	SHA	J	06/19/87	07/13/87	25	0.0032		1	1.1200	0.0611	3	0.0200		1
SD	SHA	O	07/13/87	10/14/87	20	0.0081	0.0032	3	0.6383	0.1700	15	0.0100	0.0002	3
SD	SHA	N	10/14/87	11/21/87	38	0.0703	0.0260	3	0.6501	0.0467	81	0.0096	0.0002	3
SD	SHA	F	11/21/87	02/22/88	93	0.0012	0.0007	3	0.1923	0.0355	17	0.0013	0.0001	3
SD	SHA	M	02/22/88	03/29/88	36	0.0040	0.0013	3	0.4405	0.0748	21	0.0036	0.0000	3
SD	SHA	A	03/29/88	04/14/88	16	0.0030	0.0010	3	0.6641	0.0883	40	0.0014	0.0000	3
SD	SHA	A	04/14/88	04/26/88	12	0.0000	0.0000	3	0.7639	0.3459	6	0.0000	0.0000	3
SD	SHA	J	04/26/88	06/02/88	37	nd	nd	nd	nd	nd	nd	nd	nd	nd
SD	SHA	J	06/02/88	06/23/88	21	0.0247	0.0247	2	0.6625	0.0977	34	0.0098	0.000282	2
SD	SHA	J	06/23/88	07/11/88	24	0.2821	0.0500	3	2.1884	0.0558	90	0.0393	0.000294	3
SD	SHA	A	07/11/88	08/04/88	23	0.3565	0.0632	3	2.2700	0.0966	90	0.0456	0.000344	3
SD	SHA	A	08/04/88	08/25/88	22	0.1380	0.0207	3	1.8421	0.0919	74	0.0291	0.000187	3
SD	SHA	S	08/25/88	09/12/88	19	0.0724	0.0162	3	1.1421	0.0775	90	0.0117	0.000057	3
SD	SHA	O	09/12/88	10/10/88	28	0.1208	0.0263	3	0.8471	0.0793	90	0.0160	0.000113	3
SD	SHA	N	10/10/88	11/14/88	35	0.0088		1	0.5714	0.0434	3	0.0181		1
SD	SHA	D	11/14/88	12/20/88	36	0.0019	0.0013	3	0.4981	0.0775	16	0.0023	0.000063	3
SD	DEEP	M	03/04/87	03/25/87	21	0.1135	0.0129	3	1.5920	0.1155	30	0.0262		1
SD	DEEP	A	04/07/87	04/22/87	15	0.5847	0.3168	3	2.1230	0.1279	45	0.2269	0.0020	3
SD	DEEP	A	04/22/87	04/27/87	5	1.8040	0.4677	3	6.7560	0.3058	42	0.3618	0.0006	3
SD	DEEP	M	04/27/87	05/04/87	7	0.3421	0.1009	3	4.7010	0.0437	35	0.0706	0.0002	3
SD	DEEP	J	05/04/87	06/03/87	32	0.0146	0.0136	2	0.6562	0.1579	7	0.0110	0.0006	2
SD	DEEP	J	06/03/87	06/19/87	17	0.0195	0.0176	2	1.2940	0.1608	6	0.0441	0.0010	2
SD	DEEP	J	06/19/87	07/13/87	25	nd	nd	nd	nd	nd	nd	nd	nd	nd
SD	DEEP	O	07/13/87	10/14/87	20	0.7727	0.1125	3	2.4117	0.1093	98	0.0478	0.0002	3
SD	DEEP	N	10/14/87	11/21/87	38	0.0541	0.0179	3	0.3558	0.0302	90	0.0045	0.0001	3
SD	DEEP	F	11/21/87	02/22/88	93	0.0017	0.0003	3	0.2058	0.0277	21	0.0015	0.0000	3
SD	DEEP	M	02/22/88	03/29/88	36	0.0020	0.0011	2	0.3981	0.0334	3	0.0083	0.0002	2
SD	DEEP	A	03/29/88	04/14/88	16	0.0020	0.0010	3	0.8125	0.1160	21	0.0018	0.0000	3
SD	DEEP	A	04/14/88	04/26/88	12	0.0013	0.0001	2	1.6111	0.3303	6	0.0028	0.0000	2
SD	DEEP	J	04/26/88	06/02/88	37	0.0074		1	1.3063	0.1345	3	0.0153		1
SD	DEEP	J	06/02/88	06/23/88	21	0.0781	0.0102	3	1.3760	0.0751	77	0.0172	0.000070	3
SD	DEEP	J	06/23/88	07/11/88	24	0.2412	0.0251	3	2.0167	0.0672	90	0.0389	0.000149	3
SD	DEEP	A	07/11/88	08/04/88	23	0.6013	0.0469	3	1.4769	0.0668	130	0.0242	0.000095	3
SD	DEEP	A	08/04/88	08/25/88	22	0.6218	0.0169	3	1.5940	0.0784	145	0.0218	0.000039	3

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Sta	Depth		Start	End	# Day	PRODUCTIVITY g/m2/day x	SE	n	SHOOT GROWTH mm/day x	SE	n	SHOOT PRODUCTION mg/day/sh x	SE	n
SD	DEEP	S	08/25/88	09/12/88	19	0.5834	0.1165	3	1.6161	0.0851	150	0.0229	0.000122	3
SD	DEEP	O	09/12/88	10/10/88	28	0.2871	0.0887	3	1.5521	0.0679	95	0.0225	0.000241	3
SD	DEEP	N	10/10/88	11/14/88	35	0.1182	0.0113	3	0.6309	0.0314	90	0.0166	0.000108	3
SD	DEEP	D	11/14/88	12/20/88	36	0.0155	0.0038	2	0.7392	0.0492	42	0.0068	0.000092	2
	EAST FLATS													
EF	MID	D	11/04/87	12/7/87	33	0.1736	0.0015	3	0.9449	0.0538	90	0.0266	0.0001	3
EF	MID	J	12/07/87	01/27/88	51	0.0308	0.0079	3	0.3137	0.0334	43	0.0133	0.0003	3
EF	MID	M	01/27/88	03/24/88	57	0.1329	0.0091	3	0.7404	0.0362	90	0.0216	0.0002	3
EF	MID	A	03/24/88	04/12/88	19	0.8586	0.0732	3	3.0924	0.1267	90	0.0970	0.0002	3
EF	MID	A	04/12/88	04/28/88	16	0.5209	0.0809	3	3.1047	0.1821	83	0.0818	0.0003	3
EF	MID	M	04/28/88	05/17/88	19	nd	nd	nd	nd	nd	nd	nd	nd	nd
EF	MID	J	05/17/88	06/03/88	12	0.5152	0.0543	3	5.8279	0.4104	61	0.1492	0.000296	3
EF	MID	J	06/03/88	06/22/88	18	0.2712	0.0816	3	2.6754	0.2344	51	0.1006	0.000700	3
EF	MID	J	06/22/88	07/12/88	23	0.3279	0.1636	3	2.4605	0.2973	27	0.2251	0.002998	3
EF	MID	A	07/12/88	08/01/88	19	0.2232	0.0626	3	4.7000	0.3450	30	0.1379	0.000863	3
EF	MID	A	08/01/88	08/22/88	21	0.0514	0.0076	3	2.3069	0.2776	18	0.0529	0.000196	3
EF	MID	S	08/22/88	09/14/88	21	0.2466	0.0875	3	2.0338	0.1371	69	0.0586	0.000582	3
EF	MID	O	09/14/88	10/12/88	28	0.4356	0.0583	3	2.3304	0.0821	88	0.0769	0.000409	3
EF	MID	N	10/12/88	11/11/88	30	0.3630	0.0438	3	1.9533	0.0737	86	0.0740	0.000311	3
EF	MID	D	11/11/88	12/19/88	38	0.1711	0.0068	3	1.3374	0.0388	89	0.0356	0.000056	3
	INDIAN POINT													
IP	SHA	D	10/21/87	12/08/87	48	0.2788	0.0320	3	1.2920	0.1034	71	0.0728	0.0005	3
IP	SHA	J	12/08/87	01/25/88	31	0.1357	0.0157	3	0.6362	0.0526	86	0.0286	0.0001	3
IP	SHA	M	01/25/88	03/22/88	57	0.0920	0.0162	3	0.5457	0.0597	68	0.0251	0.0003	3
IP	SHA	A	03/22/88	04/15/88	24	0.2785	0.0216	3	2.3001	0.1992	59	0.0890	0.0003	3
IP	SHA	A	04/15/88	04/27/88	12	0.1699	0.0701	3	3.3095	0.3815	35	0.0900	0.0007	3
IP	SHA	M	04/27/88	05/12/88	15	0.4578	0.1777	3	4.0041	0.3049	65	0.1102	0.0009	3
IP	SHA	M	05/12/88	05/31/88	13	0.6195	0.1311	3	5.7644	0.4667	48	0.2393	0.000948	3
IP	SHA	J	05/31/88	06/20/88	21	0.7018	0.1809	3	6.0412	0.2353	67	0.1913	0.001281	3
IP	SHA	J	06/20/88	07/11/88	21	0.5777	0.0507	3	4.7892	0.3541	54	0.1983	0.001454	3
IP	SHA	A	07/11/88	08/01/88	21	0.0397	0.0035	2	1.9870	0.4134	11	0.0446	0.000433	2
IP	SHA	A	08/01/88	08/22/88	21	0.3013	0.0035	3	3.5034	0.2569	42	0.1330	0.000347	3
IP	SHA	S	08/22/88	09/12/88	21	0.0891	0.0508	3	2.2103	0.3497	24	0.0688	0.001050	3
IP	SHA	O	09/12/88	10/07/88	25	0.0602	0.0068	3	2.4908	0.5888	11	0.1015	0.000966	3
IP	SHA	N	10/07/88	11/14/88	38	0.2615	0.0897	3	2.2176	0.1718	77	0.0557	0.000836	3
IP	SHA	D	11/14/88	12/20/88	36	0.0874	0.0213	3	1.1122	0.0656	68	0.0238	0.000305	3
IP	MID	D	10/21/87	12/08/87	48	0.2411	0.0614	3	0.5242	0.0284	93	0.0165	0.0002	3
IP	MID	J	12/08/87	01/25/88	31	0.1744	0.0397	3	0.4047	0.0205	147	0.0066	0.0001	3
IP	MID	M	01/25/88	03/22/88	57	nd	nd	nd	nd	nd	nd	nd	nd	nd
IP	MID	A	03/22/88	04/15/88	24	0.3392	0.0249	3	1.7991	0.1177	90	0.0307	0.0001	3

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Sta	Depth		Start	End	# Day	PRODUCTIVITY g/m2/day x	SE	n	SHOOT GROWTH mm/day x	SE	n	SHOOT PRODUCTION mg/day/sh x	SE	n
IP	MID	A	04/15/88	04/27/88	12	0.3574	0.0593	3	2.0069	0.1244	96	0.0236	0.0001	3
IP	MID	M	04/27/88	05/12/88	15	0.3316	0.0447	3	1.8007	0.0996	90	0.0301	0.0001	3
IP	MID	M	05/12/88	05/31/88	13	0.2764	0.0836	3	2.4983	0.1308	90	0.0363	0.000153	3
IP	MID	J	05/31/88	06/20/88	21	0.1245	0.0975	2	1.3622	0.1469	38	0.0366	0.000767	2
IP	MID	J	06/20/88	07/11/88	21	0.1166	0.0540	3	2.4238	0.2466	30	0.0721	0.001024	3
IP	MID	A	07/11/88	08/01/88	21	0.0426	0.0178	3	1.8540	0.2596	15	0.0527	0.000723	3
IP	MID	A	08/01/88	08/22/88	21	0.0139		1	1.9524	0.8095	2	0.0429		1
IP	MID	S	08/22/88	09/12/88	21	0.0277	0.0038	3	0.7677	0.1458	33	0.0156	0.000112	3
IP	MID	O	09/12/88	10/07/88	25	0.0175	0.0097	3	0.6920	0.1436	13	0.0249	0.000369	3
IP	MID	N	10/07/88	11/14/88	38	nd	nd	nd	nd	nd	nd	nd	nd	nd
IP	MID	D	11/14/88	12/20/88	36	0.0907	0.0127	3	0.9956	0.0374	76	0.0221	0.000184	3
IP	DEEP	D	10/21/87	12/08/87	48	0.1757	0.0182	3	1.0468	0.0590	90	0.0332	0.0002	3
IP	DEEP	J	12/08/87	01/25/88	31	0.1122	0.0151	3	0.6982	0.0359	90	0.0194	0.0001	3
IP	DEEP	M	01/25/88	03/22/88	57	0.2368	0.0170	3	1.2535	0.0734	82	0.0529	0.0003	3
IP	DEEP	A	03/22/88	04/15/88	24	0.6028	0.0364	3	2.5417	0.0946	89	0.1106	0.0002	3
IP	DEEP	A	04/15/88	04/27/88	12	0.6972	0.0432	3	3.3657	0.1676	90	0.1197	0.0002	3
IP	DEEP	M	04/27/88	05/12/88	15	0.2557	0.0403	3	2.1582	0.1447	59	0.0803	0.0003	3
IP	DEEP	M	05/12/88	05/31/88	13	0.7535	0.4493	3	2.9765	0.2213	72	0.1247	0.001200	3
IP	DEEP	J	05/31/88	06/20/88	21	0.7241	0.2974	3	2.9385	0.1853	72	0.1232	0.001449	3
IP	DEEP	J	06/20/88	07/11/88	21	1.0935	0.0727	3	3.4740	0.1426	87	0.2048	0.000490	3
IP	DEEP	A	07/11/88	08/01/88	21	0.2158	0.0912	3	2.2502	0.1164	51	0.0784	0.000933	3
IP	DEEP	A	08/01/88	08/22/88	21	0.3501	0.0346	3	1.8800	0.0834	79	0.0792	0.000238	3
IP	DEEP	S	08/22/88	09/12/88	21	0.2923	0.0425	3	2.6273	0.1711	52	0.1042	0.000439	3
IP	DEEP	O	09/12/88	10/07/88	25	0.2773	0.0506	3	1.3848	0.0936	90	0.0345	0.000233	3
IP	DEEP	N	10/07/88	11/14/88	38	0.4020	0.0555	3	2.0600	0.1134	68	0.1021	0.001245	3
IP	DEEP	D	11/14/88	12/20/88	36	0.0974	0.021	3	1.0508	0.0817	73	0.0247	0.000218	3

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Seagrass Biomass

STA	DEPTH	DATE	EpFr(x) (shoots)	EpFr(SE) (shoots)	EpFr(n) (shoots)	EP(x) (g/m2)	EP(SE) (g/m2)	EP(n)	mg\SH(x) (mg/sh)	mg\SH(SE) (mg/sh)	mg\SH(n)	EpFr(x) (total)	EpFr(SE) (total)	EpFr(n) (total)
BP	Sha	11/19/86	nd	nd	nd	102.31	7.85	2	3.270	0.310	2	0.73	0.00	2
BP	Sha	1/27/87	nd	nd	nd	0.40		1	1.370		1	0.02		1
BP	Sha	3/3/87	nd	nd	nd	nd	nd	nd	0.690	0.130	2	0.00		2
BP	Sha	4/7/87	nd	nd	nd	nd	nd	nd	3.050	0.100	3	0.00		3
BP	sha	6/2/87	nd	nd	nd	57.67	19.15	3	6.550	1.130	3	0.52	0.03	3
BP	Sha	7/13/87	nd	nd	nd	nd	nd	nd	0.670	0.340	3	nd	nd	nd
BP	Sha	9/24/87	0.931		1	203.58	24.00	3	0.005	0.000	3	0.48		1
BP	Sha	2/16/88	0.000	0.000	3	0.00	0.00	3	0.001	0.000	3	0.00		3
BP	Sha	05/10/88	0.573	0.100	3	11.09	3.47	3	0.002	0.000	3	0.36	0.04	3
BP	Sha	10/12/88	0.591	0.043	3	12.69	5.21	3	0.002	0.000	3	0.37	0.02	3
BP	Deep	11/19/86	nd	nd	nd	45.23	0.63	2	2.380	0.490	2	0.68	0.01	2
BP	Deep	1/27/87	nd	nd	nd	0.00		1	1.580		1	0.00		1
BP	Deep/M	3/3/87	nd	nd	nd	nd	nd	nd	1.320	0.080	4	0.00		4
BP	Deep	4/7/87	nd	nd	nd	nd	nd	nd	2.230	0.170	3	0.00		3
BP	Deep	6/2/87	nd	nd	nd	62.57	8.87	3	5.250	0.420	3	0.51	0.04	3
BP	Deep	7/13/87	nd	nd	nd	1.18	0.50	3	1.850	0.100	3	0.21	0.06	3
BP	Deep	9/24/87	0.000		1	0.00		1	0.002	0.000	3	0.00		1
BP	Deep	2/16/88	0.000	0.000	3	0.00	0.00	3	0.001	0.000	3	0.00		3
BP	Deep	05/10/88	1.062	0.047	3	29.45	4.12	3	0.003	0.000	3	0.51	0.01	3
BP	Deep	10/12/88	0.684	0.186	3	35.34	7.50	3	0.003	0.000	3	0.39	0.07	3
SD	Sha	11/19/86	nd	nd	nd	1.37	0.26	2	1.930	0.060	2	0.06	0.00	2
SD	Sha	1/27/87	nd	nd	nd	0.52		1	0.690		1	0.05		1
SD	Sha	3/4/87	nd	nd	nd	0.71	0.35	2	0.400	0.040	3	0.32	0.06	2
SD	Sha	4/7/87	nd	nd	nd	16.57	5.23	3	0.720	0.150	3	0.80	0.04	3
SD	Sha	6/3/87	nd	nd	nd	0.00	0.00	0	1.650	0.720	3	0.00	0.00	0
SD	Sha	7/13/87	nd	nd	nd	7.12	2.36	3	2.710	0.080	3	0.50	0.04	3
SD	Sha	9/24/87	2.223		1	220.34	40.49	3	0.004	0.000	3	0.69		1
SD	Sha	2/22/88	0.000	0.000	3	0.00	0.00	3	0.000	0.000	3	0.00		3
SD	Sha	05/10/88	0.000	0.000	3	0.00	0.00	3	0.001	0.000	3	0.00		3
SD	Sha	10/10/88	0.359	0.035	3	6.48	3.04	3	0.002	0.000	3	0.26	0.02	3
SD	Mid	11/19/86	nd	nd	nd	3.91	2.23	2	3.200	1.410	2	0.16	0.10	2
SD	Mid	3/4/87	nd	nd	nd	0.58		1	0.320		1	0.17		1
SD	Mid	6/3/87	nd	nd	nd	4.89	0.74	3	4.960	1.130	3	0.21	0.03	3
SD	Mid	7/13/87	nd	nd	nd	14.98	1.59	3	2.490	0.110	3	0.50	0.03	3
SD	Deep	11/19/86	nd	nd	nd	3.80	1.60	2	1.780	0.480	2	0.14	0.01	2
SD	Deep	1/27/87	nd	nd	nd	0.00		1	0.570		1	0.00		1
SD	Deep	3/4/87	nd	nd	nd	0.48	0.51	3	0.510	0.006	3	0.05	0.05	3
SD	Deep	4/7/87	nd	nd	nd	4.98	0.74	3	0.360	0.040	3	0.62	0.05	3
SD	Deep	6/3/87	nd	nd	nd	1.49	0.26	3	0.490	0.230	3	0.48	0.09	3
SD	Deep	7/13/87	nd	nd	nd	1.25	0.48	3	1.070	0.150	3	0.26	0.05	3
SD	Deep	9/24/87	nd	nd	nd	nd	nd	nd	0.003	0.000	3	nd	nd	nd
SD	Deep	2/22/88	0.000	0.000	3	0.00	0.00	3	0.000	0.000	3	0.00		3
SD	Deep	05/10/88	0.000	0.000	3	0.00	0.00	3	0.001	0.000	3	0.00		3
SD	Deep	10/10/88	0.655	0.157	3	21.97	2.87	3	0.002	0.000	3	0.39	0.06	3

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STA	DEPTH	DATE	EpFr(x) (shoots)	EpFr(SE) (shoots)	EpFr(n) (shoots)	EP(x) (g/m2)	EP(SE) (g/m2)	EP(n)	mg\SH(x) (mg/sh)	mg\SH(SE) (mg/sh)	mg\SH(n)	EpFr(x) (total)	EpFr(SE) (total)	EpFr(n) (total)
TS	Sha	11/19/86	nd	nd	nd	1.76	0.08	2	1.220	0.110	2	0.09	0.000	2
TS	Sha	1/27/87	nd	nd	nd	2.98		1	0.510		1	0.67		1
TS	Sha	3/4/87	nd	nd	nd	0.00	0.00	2	1.460	0.780	3	0.00		2
TS	Sha	4/7/87	nd	nd	nd	nd	nd	nd	0.830	0.350	3	nd	nd	nd
TS	Sha	7/13/87	nd	nd	nd	nd	nd	nd	3.400	0.310	3	nd	nd	nd
TS	Deep	11/19/86	nd	nd	nd	4.98	2.66	2	2.310	0.420	2	0.34	0.01	2
TS	Deep	1/27/87	nd	nd	nd	0.00		1	0.390		1	0.00		1
TS	Deep	3/4/87	nd	nd	nd	0.00	0.00	3	1.490	0.070	3	0.00		3
TS	Deep	4/7/87	nd	nd	nd	0.01		1	1.890	0.890	3	0.17		1
TS	Deep	6/3/87	nd	nd	nd	0.00	0.00	3	3.310	0.200	3	0.00		3
TS	Deep	7/13/87	nd	nd	nd	6.46	1.55	3	2.820	0.240	3	0.18	0.02	3
TS	Deep	9/24/87	0.098	0.032	3	12.04	2.73	3	0.006	0.000	3	0.09	0.03	3
EF	Mid	11/4/87	0.211		1	5.10	2.22	3	0.003	0.001	3	0.17		1
EF	Mid	1/27/88	nd	nd	nd	nd	nd	nd	0.002	0.000	3	nd	nd	nd
EF	Mid	05/17/88	0.658	0.036	3	36.55	3.52	3	0.006	0.001	3	0.40	0.01	3
EF	Mid	10/12/88	0.902	0.185	3	62.10	12.70	3	0.010	0.001	3	0.46	0.05	3
IP	Sha	10/21/87	0.654		1	28.81	9.30	3	0.008	0.000	3	0.40		1
IP	Sha	1/25/88	0.949	0.085	3	39.24	7.02	3	0.006	0.000	3	0.48	0.02	3
IP	Sha	05/12/88	0.422	0.085	3	5.01	5.01	3	0.005		1	0.29	0.04	3
IP	Sha	10/07/88	0.425	0.067	3	21.38	6.49	3	0.012	0.003	3	0.30	0.03	3
IP	Mid	10/21/87	0.275		1	48.48	3.64	3	0.007	0.001	3	0.22		1
IP	Mid	1/25/88	2.609	0.512	3	189.01	10.92	3	0.003	0.000	3	0.71	0.04	3
IP	Mid	05/12/88	0.061	0.051	3	1.36	1.12	3	0.001	0.000	3	0.05	0.04	3
IP	Mid	10/07/88	0.379	0.017	3	10.83	9.23	3	0.011	0.007	3	0.27	0.01	3
IP	Deep	10/21/87	0.000		1	0.00		1	0.006	0.000	3	0.00		1
IP	Deep	1/25/88	23.610	2.376	3	575.23	172.00	3	0.005	0.001	3	0.96	0.00	3
IP	Deep	05/12/88	2.137	1.230	3	67.00	41.04	3	0.007	0.001	3	0.59	0.12	3
IP	Deep	10/07/88	1.300	0.055	3	45.98	4.33	3	0.006	0.001	3	0.56	0.01	3

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STA	DEPTH		DATE	DEN(x) (#/m2)	DEN(SE) (#/m2)	DEN(n)	SH(x) (g/m2)	SH(SE) (g/m2)	SH(n)	RR(x) (g/m2)	RR(SE) (g/m2)	RR(n)	DET(x) (g/m2)	DET(SE) (g/m2)	DET(n)
BP	Sha	N	11/19/86	11490.00	1780.10	2	37.02	2.23	2	22.52	2.83	2	3.48		1
BP	Sha	J	01/27/87	14726.50		1	20.16		1	32.17		1	5.44		1
BP	Sha	M	03/03/87	11570.90	2994.30	2	8.34	3.57	2	14.75	6.56	2	1.20	0.68	2
BP	Sha	A	04/07/87	8037.50	1484.20	3	24.45	4.31	3	10.28	3.45	3	0.80	0.37	3
BP	sha	J	06/02/87	8107.90	2608.70	3	49.65	12.08	3	19.38	3.27	3	0.31	0.21	3
BP	Sha	J	07/13/87	485.50	247.20	3	0.48	0.24	3	3.23	1.41	3	0.98	0.19	3
BP	Sha	S	09/24/87	40835.10	4079.53	3	218.67	25.77	3	109.06	10.06	3	3.77	1.92	3
BP	Sha	F	02/16/88	12730.63	328.13	3	9.95	0.24	3	53.94	2.52	3	8.63	2.74	3
BP	Sha	M	05/10/88	12568.79	3448.58	3	19.00	4.61	3	20.91	6.25	3	9.24	2.01	3
BP	Sha	O	10/12/88	9763.74	3291.87	3	20.49	6.89	3	26.22	9.50	3	1.73	1.06	3
BP	Deep	N	11/19/86	9233.90	1466.10	2	21.21	1.01	2	22.38	0.44	2	5.17	0.25	2
BP	Deep	J	01/27/87	16830.30		1	26.57		1	26.28		1	7.01		1
BP	Deep/M	M	03/03/87	6554.10	880.20	4	8.43	0.84	4	8.83	1.86	4	4.64	2.02	4
BP	Deep	A	04/07/87	14888.40	2189.20	3	33.96	7.07	3	18.79	3.50	3	3.69	1.19	3
BP	Deep	J	06/02/87	11191.60	763.20	3	59.28	8.77	3	23.83	3.64	3	3.13	0.63	3
BP	Deep	J	07/13/87	2373.50	460.90	3	4.30	0.70	3	18.00	1.81	3	4.87	1.21	3
BP	Deep	S	09/24/87	12730.63	1233.68	3	29.59	1.25	3	32.26	5.37	3	1.10	0.31	3
BP	Deep	F	02/16/88	12838.51	328.13	3	11.04	1.58	3	42.14	3.08	3	9.19	1.73	3
BP	Deep	M	05/10/88	8684.88	954.35	3	27.60	3.33	3	15.03	1.43	3	2.49	0.57	3
BP	Deep	O	10/12/88	17315.81	1950.93	3	54.20	5.82	3	50.56	7.20	3	2.97	0.73	3
SD	Sha	N	11/19/86	10438.05	2346.50	2	20.30	5.17	2	19.48	9.06	2	6.76	1.36	2
SD	Sha	J	01/27/87	14241.00		1	9.81		1	30.26		1	2.91		1
SD	Sha	M	03/04/87	7606.00	1192.90	3	2.95	0.14	3	15.62	4.30	3	3.95	1.48	3
SD	Sha	A	04/07/87	4908.80	328.10	3	3.61	0.94	3	8.68	1.37	3	4.15	0.59	3
SD	Sha	J	06/03/87	2211.70	636.00	3	5.11	1.14	3	2.07	0.66	3	0.24	0.14	3
SD	Sha	J	07/13/87	3182.70	1726.20	3	8.35	4.31	3	1.96	0.91	3	0.59	0.13	3
SD	Sha	S	09/24/87	28482.08	6474.74	3	108.61	21.99	3	51.07	9.23	3	1.09	0.31	3
SD	Sha	F	02/22/88	755.21	377.61	3	0.24	0.12	3	4.31	2.85	3	8.58	1.60	3
SD	Sha	M	05/10/88	863.09	300.34	3	0.43	0.09	3	0.59	0.18	3	1.02	0.65	3
SD	Sha	O	10/10/88	9062.48	2807.65	3	17.18	6.61	3	85.48	24.40	3	1.71	0.76	3
SD	Mid	N	11/19/86	9548.00	5664.10	2	22.57	4.72	2	26.53	9.54	2	5.93	1.48	2
SD	Mid	M	03/04/87	8577.00		1	2.75		1	14.79		1	3.98		1
SD	Mid	J	06/03/87	4096.40	1133.50	3	18.68	3.59	3	0.00	0.00	0	0.00	0.00	0
SD	Mid	J	07/13/87	6257.40	1183.10	3	15.51	3.04	3	3.09	0.53	3	0.61	0.29	3
SD	Deep	N	11/19/86	12461.00	809.10	2	22.57	7.43	2	24.40	2.84	2	3.59	0.49	2
SD	Deep	J	01/27/87	8577.00		1	4.85		1	10.31		1	4.52		1
SD	Deep	M	03/04/87	19096.00	2173.20	3	9.67	1.03	3	31.31	3.87	3	10.18	2.15	3
SD	Deep	A	04/07/87	8792.80	2277.80	3	3.37	1.24	3	8.11	0.96	3	8.08	2.44	3
SD	Deep	J	06/03/87	4261.50	945.20	3	1.95	0.73	3	3.03	0.47	3	0.67	0.22	3
SD	Deep	J	07/13/87	2913.00	247.20	3	3.17	0.65	3	2.33	0.32	3	1.34	0.21	3
SD	Deep	S	09/24/87	15697.51	1214.66	3	44.08	3.81	3	27.12	3.16	3	0.44	0.15	2
SD	Deep	F	02/22/88	5771.94	607.93	3	1.95	0.24	3	36.57	5.49	3	25.02	8.22	3
SD	Deep	M	05/10/88	593.38	235.13	3	0.62	0.21	3	1.90	1.21	3	12.18	5.94	3
SD	Deep	O	10/10/88	16344.83	2055.52	3	35.37	4.11	3	160.24	30.87	3	2.19	0.66	2

BIOMASS
01/05/89

STA	DEPTH		DATE	DEN(x) (#/m2)	DEN(SE) (#/m2)	DEN(n)	SH(x) (g/m2)	SH(SE) (g/m2)	SH(n)	RR(x) (g/m2)	RR(SE) (g/m2)	RR(n)	DET(x) (g/m2)	DET(SE) (g/m2)	DET(n)
TS	Sha	N	11/19/86	15293.00	2022.80	2	18.40	0.83	2	40.27	2.23	2	2.30	0.18	2
TS	Sha	J	01/27/87	2912.90		1	1.49		1	7.95		1	14.79		1
TS	Sha	M	03/04/87	1078.90	235.20	3	1.26	0.40	3	0.80	0.38	3	1.42	1.22	3
TS	Sha	A	04/07/87	1024.90	460.90	3	0.78	0.31	3	1.32	0.44	3	0.43	0.24	3
TS	Sha	J	07/13/87	2211.70	377.60	3	7.36	1.05	3	2.35	0.55	3	0.80	0.16	3
TS	Deep	N	11/19/86	3855.90	1322.80	2	9.43	4.63	2	24.41	3.60	2	8.33	3.95	2
TS	Deep	J	01/27/87	485.50		1	0.19		1	0.71		1	14.66		1
TS	Deep	M	03/04/87	4207.60	1468.40	3	6.16	2.00	3	29.81	13.39	3	5.14	3.12	3
TS	Deep	A	04/07/87	7228.40	656.30	3	11.59	4.91	3	16.75	8.00	3	18.46	1.73	3
TS	Deep	J	06/03/87	6689.00	863.10	3	21.90	2.08	3	24.50	8.82	3	12.40	2.62	3
TS	Deep	J	07/13/87	9817.70	999.00	3	28.09	5.02	3	44.12	9.11	3	14.32	3.31	3
TS	Deep	S	09/24/87	20066.92	4139.72	3	122.88	27.82	3	81.98	26.11	3	9.34	1.51	3
EF	Mid	N	11/04/87	8091.50	901.06	3	24.14	10.50	3	205.00	25.62	3	127.71	50.59	3
EF	Mid	J	01/27/88	3398.43	428.17	3	7.74	1.19	3	73.32	14.39	3	157.34	19.25	3
EF	Mid	M	05/17/88	9386.14	1555.03	3	55.48	3.55	3	53.66	16.81	3	155.69	36.98	3
EF	Mid	O	10/12/88	7012.63	888.02	3	69.10	5.09	3	90.02	12.19	3	17.66	2.27	3
IP	Sha	O	10/21/87	5556.16	1998.15	3	44.02	14.22	3	122.80	23.77	3	47.84	8.24	3
IP	Sha	J	01/25/88	7390.24	1160.76	3	41.36	7.40	3	135.83	13.64	3	56.75	7.11	3
IP	Sha	M	05/12/88	9709.80		1	50.20		1	50.90		1	60.70		1
IP	Sha	O	10/07/88	4099.69	725.73	3	47.72	8.96	3	83.41	19.28	3	44.83	13.00	3
IP	Mid	O	10/21/87	26108.57	755.23	3	176.03	13.21	3	85.21	1.90	3	77.62	37.28	3
IP	Mid	J	01/25/88	23842.95	907.49	3	72.44	4.18	3	100.58	5.82	3	41.14	15.44	3
IP	Mid	M	05/12/88	16992.15	1257.01	3	24.40	1.24	3	21.17	3.70	3	23.96	4.74	3
IP	Mid	O	10/07/88	1618.30	948.24	3	30.89	26.67	3	8.76	4.45	3	10.00		1
IP	Deep	O	10/21/87	4585.18	1082.94	3	33.86	0.90	3	110.88	17.17	3	30.27	12.48	3
IP	Deep	J	01/25/88	4531.24	705.42	3	24.36	7.29	3	99.69	12.39	3	16.77	6.65	3
IP	Deep	M	05/12/88	4423.35	300.34	3	30.34	2.03	3	66.86	6.85	3	32.70	6.04	3
IP	Deep	O	10/07/88	6473.20	1298.01	3	35.49	3.67	3	209.32	56.12	3	39.76	10.82	3

LIGHT TRANSMISSION*
SAN ANTONIO BAY
15 July 1987

STATION	TRANSMISSION (% m-1)
N. River	0.2
S. River	nd
3	3.7
4	4.0
5	10.5
6	14.9
7	8.8
8	5.6
B	6.0
10	3.3
11	1.4
12	1.5
13	2.5
14	4.7
15	1.6
C	3.6
17	3.2
18	2.6
19	4.3
D	1.3
21	4.0
22	2.4
23	7.7
24	5.2
25	2.6
26	6.8
27	12.7
28	2.1
29	6.6
30	0.8

* With LI-190SA and LI-193SA sensors

AVERAGE LIGHT TRANSMISSION
(% M-1)
1987
NUECES ESTUARY

STA	20/21 OCT	19 NOV	8/9 DEC
1	0.04	0.20	2.28
2		0.36	0.37
3	3.44	0.49	10.23
4	0.06	0.01	7.43
4A	0.38	0.37	5.84
5	1.48	0.18	1.41
6	2.12	0.05	2.60
7	0.12	0.51	1.81
8	0.02	2.40	10.86
9	0.01	0.00	1.62
10	0.32	1.96	
11	0.02	0.15	2.19
12	0.02	0.58	5.96
13	0.13	0.64	10.75
14	0.30	0.98	0.71
15	3.50	0.42	3.30
16	0.19	0.65	11.42
17	22.70	14.96	34.65
18	28.90	5.84	39.06
19	10.50 (0.5m)	10.86	38.29
	42.30 (1-3m)		
20	34.60	10.13	45.38
21	10.40 (0.5-1m)	14.52	44.04
	42.30 (1.5-3m)		
22	7.50 (0.5m)	0.46	23.93
	27.00 (1-1.5m)		
23	32.20	8.29	58.28
24	18.30 (0.5-1m)	14.81	30.73
	28.90 (1.5-3m)		
25	11.30 (0.5m)	10.03	52.73
	23.00 (1-2m)		
26	21.00 (0.5m)	9.35	46.77
	35.10 (1-3m)		
27	12.70 (0.5-1m)	7.06	34.99
	40.90 (2-3m)		
28	34.40	3.44	37.58
29	7.30 (0.5m)	19.20	41.90
	28.40 (1-3m)		
30	15.70 (0.5-1m)	7.65	19.99
	27.70 (1.5-2m)		
31	39.70	7.43	35.35
32	14.10 (0.5m)	4.37	16.53
	27.00 (1-1.5m)		
33	21.00 (0.5m)	6.52	34.65
	37.50 (1-3m)		
34	12.50 (0.5-1m)	14.23	45.84
	27.80 (1.5-2m)		

AVERAGE LIGHT TRANSMISSION
(% M-1)
1987
NUECES ESTUARY

All data collected using LI-190SA and LI-192SA sensors

NOTES:

1. October: At most stations, turbidity decreased from surface to bottom. This trend was more pronounced in Corpus Christi Bay, and least pronounced in Nueces Bay.

   Station 2: Data too variable to report
   4A: River
   7: Channel
   15: Strong surface current
   16: Dredging area, rough

2. 20 Oct: Corpus Christi Bay
   21 Oct: Nueces Bay
   8 Dec: Corpus Christi Bay
   9 Dec: Nueces Bay

LIGHT TRANSMISSION-NUECES BAY
16 FEBRUARY 1988

STA	DEPTH (m)	SURFACE PFFR	UNDERWATER PFFR	k	% m-1
1	0.5	1082.0	0.025	-21.35	0.00
2	0.5	1061.0	0.048	-19.99	0.00
3	0.5	793.5	2.230	-11.75	0.00
5	0.5	804.6	0.058	-19.07	0.00
	1.0	813.4	0.000	0.00	0.00
6	0.5	607.6	0.039	-19.30	0.00
7	0.5	671.4	0.812	-13.44	0.00
8	0.5	556.5	0.368	-14.64	0.00
9	0.5	286.3	1.861	-10.07	0.00
10	0.5	477.6	1.349	-11.74	0.00
11	0.5	308.4	1.038	-11.39	0.00
	1.0	310.8	0.004	-11.19	0.00
12	0.5	544.2	47.690	-4.87	0.77
13	0.5	427.9	41.800	-4.65	0.95
	1.0	442.4	5.348	-4.42	1.21
16	0.5	1129.0	128.000	-4.35	1.29
	1.0	639.7	50.510	-2.54	7.90
	1.5	643.0	22.570	-2.23	10.72
	2.0	1051.0	29.400	-1.79	16.73
	3.0	1132.0	11.950	-1.52	21.94
	4.0	1553.0	9.903	-1.26	28.26
	5.0	1542.0	2.564	-1.28	27.81

LIGHT TRANSMISSION-CORPUS CHRISTI BAY
17 February 1988

STA	DEPTH	SURFACE	UNDERWATER	k	% m-1
17	0.5	755.0	311.20	-1.77	16.99
	1	732.8	208.90	-1.26	28.51
	1.5	710.1	120.00	-1.19	30.57
	2	697.3	74.51	-1.12	32.69
	3	760.7	30.34	-1.07	34.17
	4	570.8	10.28	-1.00	36.63
	5	553.2	4.96	-0.94	38.95
18	0.5	250.4	84.70	-2.17	11.44
	1	254.0	48.24	-1.66	18.99
	1.5	263.7	24.84	-1.57	20.70
	2	303.4	15.89	-1.47	22.89
	3	355.0	5.32	-1.40	24.65
19	0.5	338.3	80.75	-2.87	5.70
	1	356.6	57.07	-1.83	16.00
	1.5	358.4	39.00	-1.48	22.79
	2	364.4	17.65	-1.51	22.01
	3	360.4	8.47	-1.25	28.65
20	0.5	550.5	119.30	-3.06	4.70
	1	600.2	68.20	-2.17	11.36
	1.5	619.9	33.49	-1.95	14.29
	2	633.4	16.07	-1.84	15.93
	3	781.6	4.20	-1.74	17.51
21	0.5	554.3	191.40	-2.13	11.92
	1	590.4	129.70	-1.52	21.97
	1.5	468.4	73.07	-1.24	28.98
	2	490.0	62.91	-1.03	35.83
	3	449.1	22.04	-1.00	36.61
22	0.5	1054.0	288.80	-2.59	7.51
	1	1009.0	206.50	-1.59	20.47
	1.5	930.6	138.60	-1.27	28.10
	2	922.3	105.10	-1.09	33.76
23	0.5	665.6	165.20	-2.79	6.16
	1	707.4	101.60	-1.94	14.36
	1.5	680.4	66.53	-1.55	21.22
	2	694.5	41.65	-1.41	24.49
	3	680.4	16.04	-1.25	28.67
	4	740.0	4.34	-1.28	27.67
24	0.5	552.0	134.20	-2.83	5.91
	1	637.7	82.37	-2.05	12.92
	1.5	706.0	57.81	-1.67	18.86
	2	771.0	40.26	-1.48	22.85
	3	809.9	12.21	-1.40	24.70
	4	899.0	5.63	-1.27	28.12
	5	1010.0	3.03	-1.16	31.30
25	0.5	952.0	210.80	-3.02	4.90
	1	949.1	146.10	-1.87	15.39
	1.5	941.0	99.02	-1.50	22.29
	2	900.0	50.22	-1.44	23.62

LIGHT TRANSMISSION-CORPUS CHRISTI BAY
17 February 1988

STA	DEPTH	SURFACE	UNDERWATER	k	% m-1
26	0.5	520.7	151.90	-2.46	8.51
	1	510.5	93.65	-1.70	18.34
	1.5	513.5	70.20	-1.33	26.54
	2	515.3	46.26	-1.21	29.96
	3	512.5	21.77	-1.05	34.89
	4	516.2	8.93	-1.01	36.26
	5	500.5	2.91	-1.03	35.71
27	0.5	548.4	188.10	-2.14	11.76
	1	543.8	97.60	-1.72	17.95
	1.5	528.0	44.59	-1.65	19.25
	2	527.2	28.84	-1.45	23.39
	3	528.2	11.90	-1.26	28.24
	4	529.8	1.74	-1.43	23.93
28	0.5	981.2	197.90	-3.20	4.07
	1	907.1	84.47	-2.37	9.31
	1.5	751.2	29.95	-2.15	11.67
	2	768.1	21.26	-1.79	16.64
29	0.5	625.3	244.30	-1.88	15.26
	1	644.6	92.04	-1.95	14.28
	1.5	1223.0	74.06	-1.87	15.42
	2	1003.0	89.38	-1.21	29.85
30	0.5	701.3	249.60	-2.07	12.67
	1	688.4	202.70	-1.22	29.45
	1.5	686.8	148.40	-1.02	36.01
	2	696.5	120.30	-0.88	41.56
32	0.5	342.3	92.78	-2.61	7.35
	1	319.8	48.26	-1.89	15.09
	1.5	295.6	28.80	-1.55	21.17
	2	283.5	17.14	-1.40	24.59
33	0.5	350.8	142.30	-1.80	16.45
	1	365.5	72.10	-1.62	19.73
	1.5	367.6	33.78	-1.59	20.36
	2	370.5	18.07	-1.51	22.08
	3	403.5	5.54	-1.43	23.95
	4	428.6	1.19	-1.47	22.96
	5	446.5	0.27	-1.48	22.77
C	0.5	391.1	157.20	-1.82	16.16
	1	373.2	98.10	-1.34	26.29
	1.5	366.6	63.11	-1.17	30.95
	2	300.9	26.62	-1.21	29.74
	3	286.6	7.47	-1.22	29.65
D	0.5	535.6	205.30	-1.92	14.69
	1	529.3	159.30	-1.20	30.10
	1.5	530.6	125.80	-0.96	38.31
	2	516.6	88.26	-0.88	41.33
	3	516.2	52.16	-0.76	46.58

LIGHT TRANSMISSION - CORPUS CHRISTI BAY
12 APRIL 1988

STA	DEPTH (m)	SURFACE PFFR	UNDERWATER PFFR	k	% m-1
17	0.5	1957	1407.0	-0.66	51.69
	1	1893	613.0	-1.13	32.38
	1.5	1956	523.4	-0.88	41.53
	2	1900	240.6	-1.03	35.59
	3	1863	71.2	-1.09	33.69
	4	1884	30.6	-1.03	35.68
18	0.5	1725	1005.0	-1.08	33.94
	1	1807	517.0	-1.25	28.61
	1.5	1802	311.4	-1.17	31.02
	2	1780	185.6	-1.13	32.29
19(C)	0.5	1999	1041.0	-1.30	27.12
	1	2011	782.8	-0.94	38.93
	1.5	1998	461.0	-0.98	37.62
	2	1990	243.5	-1.05	34.98
	3	1980	87.6	-1.04	35.37
20	0.5	2028	1415.0	-0.72	48.68
	1	2043	793.1	-0.95	38.82
	1.5	2015	414.4	-1.05	34.84
	2	2013	248.5	-1.05	35.14
	3	2023	66.1	-1.14	31.96
21	0.3	2055	1302.0	-1.52	21.84
	0.5	2053	1365.0	-0.82	44.21
	1	2046	602.1	-1.22	29.43
	1.5	2048	566.2	-0.86	42.44
	2	2061	198.0	-1.17	31.00
22	0.3	2043	1674.0	-0.66	51.48
	0.5	2046	1397.0	-0.76	46.62
	1	2037	684.0	-1.09	33.58
	1.5	2040	336.1	-1.20	30.05
23	0.3	1565	1160.0	-1.00	36.85
	0.5	1549	840.0	-1.22	29.41
	1	1577	451.4	-1.25	28.62
	1.5	1601	240.0	-1.27	28.22
	2	1571	135.5	-1.23	29.37
	3	1576	40.5	-1.22	29.51
24	0.3	1441	1126.0	-0.82	43.95
	0.5	1138	508.4	-1.61	19.96
	1	1440	164.8	-2.17	11.44
	1.5	1464	84.7	-1.90	14.96
	2	1456	33.3	-1.89	15.12
	3	1454	6.4	-1.81	16.37
	4	1460	1.3	-1.75	17.41
25	0.3	1348	926.9	-1.25	28.70
	0.5	1350	620.0	-1.56	21.09
	1	1420	297.2	-1.56	20.93
	1.5	1355	138.2	-1.52	21.83
	2	1366	61.1	-1.55	21.15
	3	1398	11.5	-1.60	20.21
26	0.3	1146	948.7	-0.63	53.27
	0.5	1105	466.7	-1.72	17.84

LIGHT TRANSMISSION - CORPUS CHRISTI BAY
12 APRIL 1988

STA	DEPTH (m)	SURFACE PFFR	UNDERWATER PFFR	k	% m-1
	1	1036	138.1	-2.02	13.33
	1.5	1034	69.4	-1.80	16.52
	2	1044	28.4	-1.80	16.49
	3	1076	5.6	-1.75	17.36
	4	1093	1.1	-1.74	17.61
	5	1113	0.1	-1.81	16.32
27	0.5	1680	842.2	-1.38	25.13
	1	1729	481.3	-1.28	27.84
	1.5	1700	234.6	-1.32	26.70
	2	1714	124.2	-1.31	26.92
	3	1711	29.6	-1.35	25.86
28	0.5	1986	670.6	-2.17	11.40
	1	1989	406.4	-1.59	20.43
	1.5	1984	171.6	-1.63	19.56
	2	1977	68.3	-1.68	18.58
29	0.3	1799	1281.0	-1.13	32.24
	0.5	1804	1107.0	-0.98	37.65
	1	1781	554.1	-1.17	31.11
	1.5	1818	293.3	-1.22	29.64
	2	1818	165.7	-1.20	30.19
	3	1814	51.9	-1.18	30.58
	4	1814	15.4	-1.19	30.37
30	0.3	1833	1468.0	-0.74	47.70
	0.5	1846	1130.0	-0.98	37.47
	1	1847	715.0	-0.95	38.71
	1.5	1886	460.0	-0.94	39.04
	2	1884	269.0	-0.97	37.79
31(D)	0.3	1780	1340.0	-0.95	38.81
	0.5	1762	1008.0	-1.12	32.73
	1	1800	555.4	-1.18	30.86
	1.5	1823	329.3	-1.14	31.95
	2	1793	181.4	-1.15	31.81
	3	1792	29.6	-1.37	25.46
32	0.2	1071	860.4	-1.09	33.46
	0.4	1117	441.0	-2.32	9.79
	0.5	979	338.2	-2.12	11.94
	1	981	129.6	-2.02	13.21
33	0.2	993	990.7	-0.01	99.10
	0.4	933	664.3	-0.85	42.77
	0.5	1134	403.4	-2.07	12.65
	1	1143	140.7	-2.09	12.31
	1.5	1106	80.5	-1.75	17.44
	2	1094	26.6	-1.86	15.58
	3	1115	4.1	-1.87	15.47
34	0.5	1554	1305.0	-0.35	70.52
	1	1555	718.1	-0.77	46.18
	1.5	1563	561.0	-0.68	50.51
	2	1571	307.4	-0.82	44.23

LIGHT TRANSMISSION - NUECES BAY
13 APRIL 1988

STA	DEPTH (m)	SURFACE PFFR	UNDERWATER PFFR	k	% m-1
1	0.2	1212	1121.0	-0.39	67.69
	0.3	1566	599.3	-3.20	4.07
	0.4	1462	755.1	-1.65	19.17
2	0.1	1619	1529.0	-0.57	56.44
	0.2	1594	1558.0	-0.11	89.21
	0.3	1619	1354.0	-0.60	55.11
4	0.1	1830	1530.0	-1.79	16.69
	0.2	1807	1409.0	-1.24	28.82
	0.3	1821	1099.0	-1.68	18.58
5	0.2	1844	1275.0	-1.84	15.80
	4	1824	406.4	-0.38	68.70
	0.5	1845	133.1	-5.26	0.52
	1	1874	0.4	-8.56	0.02
6	0.2	1906	1450.0	-1.37	25.48
	0.3	1906	1175.0	-1.61	19.94
	0.4	1895	1077.0	-1.41	24.35
7(A)	0.2	1921	1695.0	-0.63	53.48
	0.4	1913	1022.0	-1.57	20.86
	0.5	1855	485.0	-2.68	6.84
	1	1856	0.3	-8.84	0.01
8	0.1	1944	1699.0	-1.35	26.00
	0.2	1925	1470.0	-1.35	25.97
	0.4	1914	877.9	-1.95	14.25
9	0.2	1382	1376.0	-0.02	97.85
	0.4	1383	682.0	-1.77	17.08
	0.5	1397	399.9	-2.50	8.19
10	0.1	1980	1863.0	-0.61	54.38
	0.2	1949	1764.0	-0.50	60.73
	0.4	1970	1035.0	-1.61	20.01
	0.5	1976	718.6	-2.02	13.23
11	0.2	1980	1660.0	-0.88	41.42
	0.4	1965	1041.0	-1.59	20.43
	0.5	1984	563.7	-2.52	8.07
12	0.2	2002	1339.0	-2.01	13.38
	0.4	1516	560.9	-2.49	8.33
13(B)	0.2	1998	1866.0	-0.34	71.05
	0.4	2004	1452.0	-0.81	44.69
	0.5	2032	912.7	-1.60	20.17
14	0.2	1984	1646.0	-0.93	39.30
	0.4	1944	852.2	-2.06	12.72
	0.5	1978	276.2	-3.94	1.95
15	0.2	1654	1642.0	-0.04	96.42
	0.4	1711	1230.0	-0.83	43.82
	0.5	1677	828.4	-1.41	24.40
16	0.5	1713	767.0	-1.61	20.05
	1	1674	318.7	-1.66	19.04
	1.5	1737	163.3	-1.58	20.68
	2	1701	107.7	-1.38	25.16
35	0.2	1903	1527.0	-1.10	33.27
	0.4	1909	708.8	-2.48	8.40

LIGHT TRANSMISSION - NUECES BAY
13 APRIL 1988

STA	DEPTH (m)	SURFACE PFFR	UNDERWATER PFFR	k	% m-1
	0.5	1879	437.8	-2.91	5.43

LIGHT TRANSMISSION - NUECES BAY
10 May 1988

STA	DEPTH	SURFACE PFFR	UNDERWATER PFFR	k	% m-1
17	0.5	1166	404.4	-2.12	12.03
	1	1356	306.3	-1.49	22.59
	1.5	1616	223.5	-1.32	26.74
	2	1643	117.9	-1.32	26.79
18	0.5	1204	530.8	-1.64	19.44
	1	1258	235.6	-1.68	18.73
	1.5	1263	85.4	-1.80	16.59
	2	988	38.2	-1.63	19.65
19	0.5	1306	544.0	-1.75	17.35
	1	1156	190.7	-1.80	16.50
	1.5	1091	83.9	-1.71	18.08
	2	1158	40.7	-1.67	18.75
20	0.5	1426	397.0	-2.56	7.75
	1	1182	239.5	-1.60	20.26
	1.5	1277	138.4	-1.48	22.73
	2	1504	103.8	-1.34	26.27
21	0.5	1787	671.5	-1.96	14.12
	1	1801	259.7	-1.94	14.42
	1.5	1834	116.4	-1.84	15.91
	2	1842	58.6	-1.72	17.83
22	0.5	1402	580.2	-1.76	17.13
	1	1944	531.3	-1.30	27.33
	1.5	1981	263.3	-1.35	26.04
	2	1418	60.6	-1.58	20.68
23	0.5	1579	534.4	-2.17	11.45
	1	1750	377.0	-1.54	21.54
	1.5	1788	250.0	-1.31	26.94
	2	1794	151.8	-1.23	29.09
24	0.5	1242	590.2	-1.49	22.58
	1	1240	310.9	-1.38	25.07
	1.5	1192	131.8	-1.47	23.04
	2	1301	35.0	-1.81	16.41
25	0.5	941	198.8	-3.11	4.47
	1	1301	138.6	-2.24	10.65
	1.5	1271	86.5	-1.79	16.67
	2	1275	59.5	-1.53	21.60
26	0.5	1070	124.7	-4.30	1.36
	1	1091	103.2	-2.36	9.46
	1.5	810	42.8	-1.96	14.08
	2	1008	20.3	-1.95	14.21
27	0.5	973	263.6	-2.61	7.35
	1	1214	201.8	-1.79	16.62
	1.5	1591	182.9	-1.44	23.64
	2	1532	129.5	-1.24	29.07
28	0.5	1104	182.5	-3.60	2.73
	1	1189	120.4	-2.29	10.13
	1.5	1516	75.3	-2.00	13.51
	2	1216	33.5	-1.80	16.60
29	0.5	1010	393.1	-1.89	15.15

LIGHT TRANSMISSION - NUECES BAY
10 May 1988

STA	DEPTH	SURFACE PFFR	UNDERWATER PFFR	k	% m-1
	1	1034	295.0	-1.25	28.53
	1.5	1460	311.4	-1.03	35.70
	2	1819	277.9	-0.94	39.09
30	0.3	1256	803.5	-1.49	22.56
	0.5	1168	529.0	-1.58	20.51
	1	1677	541.0	-1.13	32.26
31	0.5	1366	281.4	-3.16	4.24
	1	1019	194.1	-1.66	19.05
	1.5	1058	130.7	-1.39	24.80
	2	1589	116.8	-1.31	27.11
32	0.3	736	198.9	-4.36	1.28
	0.5	698	153.0	-3.03	4.81
	1	714	89.9	-2.07	12.58
	1.5	726	49.3	-1.79	16.64
33	0.5	925	130.2	-3.92	1.98
	1	904	46.7	-2.96	5.16
	1.5	900	22.0	-2.47	8.43
	2	858	10.6	-2.20	11.13
34	0.5	1094	415.4	-1.94	14.42
	1	1019	156.8	-1.87	15.39
	1.5	1001	85.9	-1.64	19.46
	2	1412	58.7	-1.59	20.39

LIGHT TRANSMISSION - NUECES BAY
11 May 1988

STA	DEPTH (m)	SURFACE PFFR	UNDERWATER PFFR	k	% m-1
1	0.4	754	45.2	-7.04	0.0879
	0.5	719	22.5	-6.93	0.0979
2	0.2	851	401.2	-3.76	2.3235
	0.5	1131	3.6	-11.48	0.0010
3	0.2	837	126.5	-9.44	0.0079
	0.4	746	41.1	-7.25	0.0713
	0.5	838	0.0		
4	0.2	1979	31.8	-20.65	0.0000
	0.4	1998	0.0		
4A	0.2	1129	264.0	-7.27	0.0699
	0.4	919	0.0		
5	0.2	1811	166.3	-11.94	0.0007
	0.4	1798	112.6	-6.93	0.0981
	0.5	1824	0.0		
6	0.4	615	0.0		
	0.5	593	0.0		
7	0.4	1088	102.3	-5.91	0.2711
	0.5	1131	0.0		
8	0.4	1958	0.0		
	0.5	1775	0.0		
9	0.4	997	28.8	-8.86	0.0141
	0.5	909	0.0		
10	0.4	1940	3.1	-16.14	0.0000
	0.5	1976	0.0		
11	0.4	1402	24.9	-10.08	0.0042
	0.5	1404	0.0		
12	0.4	766	5.0	-12.59	0.0003
	0.5	765	0.0		
13	0.4	1475	43.4	-8.81	0.0149
	0.5	1715	0.0		
14	0.4	1153	158.8	-4.96	0.7040
	0.5	1182	19.1	-8.25	0.0262
	1	1267	0.0		
15	0.4	544	193.3	-2.58	7.5402
	0.5	530	69.3	-4.07	1.7116
16	0.4	429	55.7	-5.10	0.6069
	0.5	500	6.5	-8.69	0.0169
	1	488	0.0		

LIGHT TRANSMISSION - NUECES BAY
12 July 1988

STA	DEPTH	k	% m-1
1	0.2	-7.50	0.06
	0.3	-4.40	1.23
	0.5	-2.19	11.22
2	0.3	-2.99	5.04
	0.5	-1.85	15.68
3	0.3	-5.72	0.33
	0.5	-3.93	1.96
4a	0.2	-6.77	0.11
	0.5	-3.18	4.16
4b	0.2	-7.44	0.06
	0.5	-2.08	12.46
5	0.2	-10.90	0.00
	0.5	-6.85	0.11
6	0.2	-17.38	0.00
	0.5	-11.38	0.00
7	0.2	-22.50	0.00
	0.5	-9.19	0.01
8	0.2	-2.94	5.27
	0.5	-2.21	11.02
9	0.2	-5.45	0.43
	0.5	-2.48	8.35
11	0.2	-5.31	0.50
	0.5	-3.62	2.69
12	0.2	-5.92	0.27
	0.5	-3.25	3.88
13	0.2	-6.79	0.11
14	0.2	-11.13	0.00
	0.5	-1.12	32.60
15	0.2	-6.81	0.11
	0.5	-4.40	1.23
16	0.2	-4.30	1.35
	0.5	-2.75	6.40

LIGHT TRANSMISSION - CORPUS CHRISTI BAY
14 July 1988

STA	DEPTH	k	% m-1
C	0.2	-2.07	12.62
	0.5	-0.57	56.70
D	0.3	-0.92	39.88
	0.5	-0.86	42.12
	1	-1.16	31.30
17	0.2	-0.11	89.47
	0.5	-0.77	46.10
18	0.2	-0.87	41.82
	0.5	-1.53	21.62
21	0.2	-2.17	11.43
	0.5	-3.01	4.93
22	0.4	-1.02	35.93
	1	-0.91	40.30
23	0.3	-1.64	19.46
	0.5	-2.04	12.96
24	0.5	-1.01	36.24
25	0.2	-0.79	45.16
	0.5	-0.82	43.96
26	0.5	-0.16	84.82
	1	-0.39	67.70
27	0.2	-1.53	21.74
	0.5	-1.21	29.92
	1	-1.08	34.10
28	0.2	-1.12	32.77
	0.5	-1.27	28.09
	1	-1.32	26.60
29	0.2	-0.96	38.45
	0.5	-1.21	29.70
	1	-2.02	13.20
30	0.2	-1.41	24.53
	0.5	-1.28	27.77
	1	-0.98	37.70
32	0.5	-0.55	57.61
	1	-0.68	50.90
33	0.2	-0.38	68.09
	0.5	-0.11	89.49
	1	-0.74	47.90
34	0.2	-1.62	19.76
	0.5	-1.44	23.72