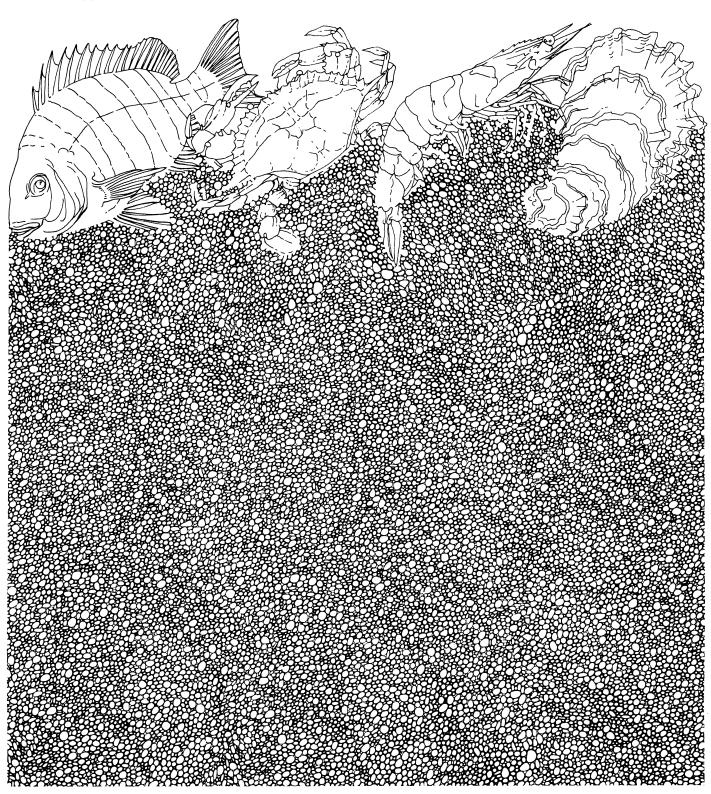
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Trends in the Galveston Bay Oyster Fishery, 1979-1984

by: R.P. Hofstetter

Management Data Series Number 125 1988 Texas Parks and Wildlife Department Coastal Fisheries Branch



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Texas Parks and Wildlife Department Coastal Fisheries Branch 4200 Smith School Road Austin, Texas 78744

ABSTRACT

Spring floods of the Trinity River destroyed Eastern oyster (Crassostrea virginica) populations on 217 ha of Trinity Bay reefs and damaged populations on an additional 100-120 ha in 1979. Heavy rainfall from summer tropical storms in 1979 caused further flooding that inhibited spawning and slowed oyster growth. The 1979-80 season was delayed 45 days by the Texas Parks and Wildlife Commission (TPWC) to allow oysters to increase in size and to improve in condition. Substantial spat set during 1980 was enhanced by the planting of oyster shell over 313 ha of public reefs in central Galveston Bay. The 1980 year class dominated the population structure through 1983 and provided a record oyster harvest (~2.7 million kg) during the 1982-83 season. Poor spat set in both 1982 and 1983 resulted in decreased market oyster abundance. Fishing pressure remained high during the 1983-84 season and market oyster abundance dropped to such a low level the TPWC closed the season 30 days early on 30 March 1984. A moderate spat set in 1984 indicated that market oyster abundance should increase in later years.

INTRODUCTION

About 70% of the 1977-1984 Texas mean annual Eastern oyster (<u>Crassostrea virginica</u>) meat landings (3.1 million kg worth \$4.1 million) was harvested from the Galveston Bay system (Osburn et al. 1985). Forty-seven private oyster leases (1012 ha) produced over 306,000 kg (worth \$1.1 million) of these landings.

The oyster fishery is regulated by season, size limit, gear and cargo restrictions. The normal fishing season is from 1 November through 30 April. The Texas Parks and Wildlife Commission (TPWC) has the authority to close an area to the taking of oysters if the area is being overworked or damaged (State of Texas 1985). The Texas Parks and Wildlife Department (TPWD) has monitored population abundance and size of oysters on selected reefs in the Galveston Bay system since the early 1950's (Hofstetter 1977). These studies have been used to determine the status of oyster populations and to recommend closures.

The objectives of this study were to:

- Monitor the population structure and size of oysters on selected public reefs in Trinity, Galveston, East and West Bays during January 1979-September 1984 and,
- 2) Monitor the number of commercial oyster boats.

MATERIALS AND METHODS

Fixed oyster sample sites were established on public oyster reefs in the Galveston Bay system. Sites were sampled quarterly but the number varied among years: 33 during both 1979 and 1980, 34 during 1981, 35 during 1982, 38 during 1983 and 41 during 1984. These sites were grouped by area: Central, East Bay, Trinity Bay, West Shore and West Bay (Figures 1 and 2; Table 1). Oyster samples were collected with an eight-tooth Louisiana style oyster dredge (45 cm wide; 25 cm high) with a capacity of approximately 35 liters (1 standard bushel). The dredge was pulled across each reef site as many times as required to fill a 35-liter box with unculled oysters and shell. All live oysters were measured (nearest mm) with dividers along the anterioposterior axis of the right valve. Oysters were grouped into: spat (\leq 25 mm), small oysters (26-75 mm) and market oysters (\geq 76 mm). Individual area means for each group were obtained by dividing the total number of oysters in each group by the number of sites within each bay area.

Pre-season oyster samples were collected at 10 central bay sites (Redfish Bar) during September or October each year and at several other stations during 1981-1984 with the same dredge used in quarterly sampling. The dredge was pulled five times for 1 minute each at each site. Market oysters were culled, counted and the mean

no./5 minute drag was obtained by dividing the total number caught by the number of sites sampled.

Three sites in the central bay area (Todd's Dump, North Redfish Reef and Bart's Pass) have been monitored since 1956. Oyster data from these sites were averaged to obtain quarterly and annual mean numbers of spat, small and market oysters.

Oyster boats dredging on public reefs (except in West Bay) were counted periodically throughout each oyster season. Texas boats were distinguished from out-of-state boats when possible. The total number of Texas and out-of-state boats observed each month was divided by the number of observations to obtain a monthly mean.

Bottom water samples were collected at each site. Salinity was determined (nearest o/oo) using a refractometer (Appendix A) and temperature (nearest C) was determined with a mercury thermometer (Appendix B).

RESULTS

Oyster Relative Abundance, 1979-1984.

During 1979, Trinity River flooding (8.9 billion m³ discharged from Livingston Reservoir) caused 100% mortality among oysters on 217 ha of oyster reefs and partial mortality on 100-120 ha of additional reefs (Hofstetter 1981). Heavy local rainfall associated with tropical storms caused severe flooding on the west side of Galveston Bay and most tributaries entering West Bay during July and September (Benefield and Baker 1980). Low spring and summer salinities (Appendix A) inhibited spat setting throughout the bay. Summer 1979 sets averaged 10-50 spat/35 liters (Table 2). Small oysters from an excellent 1978 spat set (Hofstetter 1983) were abundant at Central and West Shore stations, averaging 131-201 oysters/35 liters. Small oyster abundance did not increase in East Bay or Trinity Bay even though the 1978 set had ranged upwards to 95 and 247 spat/35 liters, respectively. Market oysters increased in fall samples (averaging 15-50 oysters/35 liters) except in Trinity Bay where losses had occurred at upper bay stations because of the Trinity River flooding.

During summer and fall 1980 a substantial spat set, averaging 164-263 spat/35 liters, was found in all areas (Table 2). Small oysters had also increased in fall samples, averaging 200-292 oysters/35 liters. Sample abundance of small oysters in Trinity Bay and East Bay equalled that of other areas. Market oysters were most abundant in Central summer samples (48/35 liters) and West Shore winter samples (64/35 liters) as the 1978 year class was recruited. Numbers also increased in East Bay and Trinity Bay samples, averaging 18-20 market oysters/35 liters.

The 1981 set averaged 64-120 spat/35 liters with peak setting noted during spring (Table 2). Small oysters, recruited from the 1980 year class, were abundant everywhere, averaging 130-346/35 liters. However, sample abundance decreased in Trinity Bay after a spring mean of 223 oysters/35 liters was recorded. Market oyster abundance ranged from a low of 18/35 liters in East Bay summer samples to a high of 63/35 liters in West Shore winter samples.

During summer and fall 1982, light sets averaging 10-37 spat/35 liters were found (Table 2). Small oysters were most abundant in winter samples, averaging 140-283 oysters/35 liters. Market oysters increased in all areas from the 1980 year class, and averaged 44-87 oyster/35 liters in fall samples.

The 1983 set averaged 10-81 spat/35 liters in summer samples (Table 2). Small sets were noted at Trinity Bay and West Shore stations. Most spat (584) were collected in July at Carancahua Reef in West Bay (Appendix C). Increased spat set was found at some stations on Redfish Bar after Hurricane Alicia came ashore near San Luis Pass on 18 August 1983 (Appendix C). No damage to oyster populations was detected after hurricane passage. Small oysters decreased in abundance, averaging 55-78/35 liters in fall samples, except in Trinity Bay where the mean was 91 oysters/35 liters. Market oyster populations declined in Central and West Shore samples by fall but changed little in Trinity Bay, averaging 33-36 oysters/35 liters. Although some oysters near shore were killed during a freeze in late December 1983, oysters in deeper waters did not appear to be affected.

Spat set during 1984 averaged 44-233 spat/35 liters in summer samples (Table 2). The distribution was uneven; Central stations west of the Houston Ship Channel received relatively light sets (39-80 spat/35 liters) while moderate to heavy sets (168-246 spat/35 liters) were noted on reefs off Smith Point (Appendix C). Bayview and Dollar Reefs along the west shore received very light sets (2-3 spat/35 liters). The heaviest set (456 spat/35 liters) was found at Dry Hole Reef in Trinity Bay (Appendix C). Market oysters became less abundant, averaging 24-31/35 liters in Central, East Bay and Trinity Bay samples during the three quarters sampled. In West Bay, the number of market oysters in three summer samples ranged from 11 to 46 (Appendix B). West shore samples contained the most market oysters, averaging 43-74/35 liters (Table 2).

Oyster Population Trends, 1956-1984

There was a general decline in spat and small oysters from 1956 to a low point from 1973 through 1977 (Figure 3; Table 3). After 3 years (1975-1977) of very poor recruitment the 1978 spat set approached that of 1971. In 1980 and 1981 the spat set was the heaviest since 1967. Small oyster abundance, resulting from increased spat set which began in 1978, reached a record high in 1981 and remained high through 1982. Market oysters became most abundant

in 1982 and market oyster populations remained high through 1983. By 1984 market oysters became less abundant, but did not decrease to the low level recorded in 1978.

Although the mean annual spat sets recorded during 1979-1984 did not equal those found during the late 1950's, small oyster abundance was similar to that observed during 1956-1964 (Figure 4; Table 3) and reached record levels during 1981 and 1982. As these oysters were recruited, market oyster abundance increased, reaching a record high during fall 1982 (Figure 5; Table 3). The mean annual number of market oysters in 1982 was the highest ever recorded followed by the second highest number in 1983.

Pre-season Abundance of Market Oysters, 1976-1984

The pre-season abundance (no./5 minute drag) of market oysters collected at Redfish Bar sites fell from an average of 127/drag in 1976 to a low of 24/drag in 1978 (Table 4). By 1979 the number of market oysters increased to 61/drag and abundance continued to increase to a record high of 190/drag in 1982. East Bay samples averaged 234/drag while Trinity Bay samples averaged 109/drag. Abundance dropped sharply in 1983, ranging from 62/drag in Trinity Bay to 82/drag in East Bay and 91/drag at Redfish Bar. West Bay samples contained the largest number, averaging 108/drag. By 1984 the average number had dropped to 51/drag at Redfish Bar and 21/drag in West Bay.

Trends in Fishing Pressure, 1979-1984

Because market oysters were scarce, the TPWC closed Galveston Bay to oystering effective 15 December 1978. The opening of the 1979-1980 season was delayed until 15 December 1979 to allow more spat to reach cullable size (>19 mm) and to allow market oysters, which were in poor condition due to local flooding, to improve in quality. Fishing pressure was light, ranging from 15 to 28 boats/day with few (4-9) out-of-state boats participating (Figure 6; Table 5). the 1980-1981 season the number of out-of-state boats averaged 14-34/day and Texas boats averaged 13-34/day. Few out-of-state boats returned during the 1981-1982 season (1-3/day) but the number of Texas boats increased to 36-68/day. More boats were observed working in February 1982 than in any other month. The number of Texas boats continued to increase during the 1982-1983 season, averaging 72-109/day. Out-of-state boats were scarce (3-6/day). At the beginning of the 1983-1984 season out-of-state boats were common, averaging 23/day during November, but the number dropped to 6-14/day, thereafter. Texas boats averaged 47-85/day with the highest number observed in February.

To prevent oysters from reaching the low levels experienced in 1978, the TPWC requested that the Galveston Bay system be closed to oystering when the mean number of market oysters dropped to 30 in

timed samples across Redfish Bar. This level was reached in March and the bay was closed 30 March 1984.

DISCUSSION

During summer and early fall 1979, oysters were in poor condition due to low salinity caused by spring and summer flooding. Oyster growth was slowed. By October 1979 the modal size of oysters in central Galveston Bay was 58 mm and 16% of the population was of legal, harvestable size (76 mm). The TPWC delayed the opening of the 1979-1980 harvest season until 15 December 1979 to allow time for oysters to increase in size and improve in condition. By delaying the season for 45 days, more (22%) of the oysters reached legal size in improved condition and the percentage of oysters under legal culling size decreased from 8% in October to 2% in December.

Spreading of oyster shell across 313 ha of public oyster reefs in central Galveston Bay during June-July 1980 enhanced the spat set in that area (Hofstetter 1981). Plantings had originally been scheduled for summer 1979 but were postponed due to low salinity. If plantings had been made, the resulting spat set, based upon sets observed at central bay stations, would have been only 13% of that observed during summer 1980.

Abundant setting and excellent survival of the 1980 year class throughout Galveston Bay led to a record harvest of 2.7 million kg of oyster meats during the 1982-1983 season. This was accomplished with a higher than normal number of oyster boats working reefs in Trinity, East, West and Bastrop Bays as well as central Galveston Bay. The number of oyster boats remained high during the 1983-1984 season even though the quantity of market oysters decreased.

It is probable that fishing pressure on public reefs in the Galveston Bay system will continue to be high in future seasons. Monitoring of oyster populations throughout the bay system will be necessary to insure that populations remain healthy. In October 1984 a new sampling program was initiated to provide more frequent and broader coverage of the Galveston Bay system (Benefield et al. 1986).

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Table 1. Oyster sampling sites in the Galveston Bay system during 1979-1984. Q = stations sampled quarterly. T = pre-season timed samples.

$\frac{1983}{Q} \frac{1984}{Q}^{a}$		1982	81	198	Λ	100	70	10-				
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		4 1	1	4	1	4	1	4	94-53-10	29-30-15	. Todd's Dump	4.
	•	4 1	1	4	1	4	1	4	9 4-53-05	29-30-40	. Switchover	
		4 1	1	4	1	4	1	4	94-53-10	29-29-30	. Experimental	6.
		4 1	1	4	1	4	1	4	94-51-35	20-30-10	. North Redfish	
		4 1	1	4	1	4	1	4	94-51-05	29-29-30	. South Redfish	
•	•	4 1	1	4	1	4	1	4	94-49-50	29-29-45	. Central Redfish	
4 1 3 1	•	4 1	1	4	1	4	1	4	94-49-15	29-30-35	. East Redfish	
4 1 3 1		4 1	1	4	1	4	. 1	4	94-49-30	29-31-55	. Bart's Pass	
4 1 3 1	4	4 1	1	4	1	4	1	4	94-47-30	29-31-20	. Gaspipe	
											t Bay	
4 0 3 0		0 0	0	0	0	0	0	0	94-44-55	29-30-45	. Catfish	
4 0 3 0		4 0	0	4	0	4	0	4	94-39-55	29-32-05	. Moody	
4 0 3 0	4	0 0	0	0	0	0	0	0	94-38-20	29-32-20	. Cowshed	
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^aQuarterly sampling discontinued October 1984

Table 2. Mean number of spat (Sp), small (Sm) oysters and market (Mkt) oysters in 35 l oyster dredge samples collected quarterly, by area, during January 1979-September 1984.

	Mkt	24	25	56	30	33	32	36	05	07	34	28	36	67	52	24	73	9	09	28	67	41	37	31
Mean	Sm	147	120	66	109	96	75	115	270	262	275	241	569	224	162	118	107	88	70	99	72	9	72	125
	Sp	21	9	24	∞	5	2	190	132	71	100	29	26	12	7	20	30	10	∞	42	13	9		132
re	Mkt	37	34	20	20	52	57	29	9	63	67	42	40	55	62	6 4	75	92	93	79	71	74	61	43
West Shore	S	184	157	150	131	112	71	151	292	288	766	546	265	3	139	124		86	72	89	62	51	63	124
We	Sp	27	6	10	7	3	-	167	144	80	120	28	18	13	7	17	37	12	11	10	10	7	7	777
Bay	Mkt	23	27	-	-	2	2	3	18	22	56	23	31	33	34	24	77	35	33	34	36	25	27	28
Trinity B	1 1	53	97	16	20	61	29	81	266	220	223	130	178	140	131	28	98	99	65	72	91	70	11	140
Tri	Sp	9	2	20	6	10	2	219	73	26	16	24	20	∞	4	10	27	11	6	14	15	7	2	185
 	Mkt	13	10	∞	15	16	12	16	20	56	19	18	28	62	20	54	87	99	45	73	29	30	30	28
ast Ba	Sm	92	51	25	52	41	33	59	200	201	280	232	230	200	156	107	72	89	99	53	55	94	48	89
F	Sp	28	9	19	2	7	3	263	129	83	99	9	19	6	3	12	19	∞	2	53	9	. 2	2	234
	Mkt	20	22	30	40	45	41	48	70	70	31	24	39	67	55	99	85	65	09	54	34	31	56	24
Central	Sm	201	163	142	150	125	103	130	273	286	307	297	346	283	205	158	133	96	78	70	78	81	90	137
	Sp	25	5	22	∞	5	_	164	164	90	26	104	39	15	5	31	31	10	∞	81	19	∞	5	119
	Quarter	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec.	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep
	Year	1979				1980				1981				1982				1983				1984		

Table 3. Mean number of oyster spat (Sp), small (SM) oysters and market (Mkt) oysters in 35 l oyster dredge samples collected quarterly at three Redfish Bar sites in central Galveston Bay during 1956-1984. ND = no data.

l L	₩ Kt		37	23	25	25	42	36	36	20	41	36	31	29	76	97	34	40	7.5	31	20	25	38	97	91	78	36	30	89	54	25	
al mean	Sm		182	157	247	230	168	177	201	208	109	110	75	146	107	$\frac{102}{10}$	108	170	139	45	71	62	25	20	43	109	146	294	168	88	88	
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Oct-Dec	C _m		257	111	334	122	244	201	332	159	135	120	83	161	107	123	85	274	72	42	87	54	56	14	110	126	260	312	109	102	QN	!
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		Year		1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1963	1967	1960	1969	1970	1971	1972	1973	19/4	1975	1976	1971	1978	1979	1980	1981	1982	1983	1984

Table 4. Mean number of market oysters collected with a 35 l oyster dredge in September-November timed samples (five l-minute drags) on select reef areas during 1976-1984. ND = no data.

Year	Trinity Bay	Redfish Bar	East Bay	West Bay
1976	ND	127	ND	ND
1977	ND	81	ND	ND
1978	ND	24	ND	ND
1979	ND	61	ND	ND
1980	ND	82	ND	ND
1981	133	103	42	ND
1982	109	190	234	ND
1983	69	91	82	108
1984	ND	51	ND	21

Table 5. Mean number/day of Texas (Tex) and Out-of-State (OS) oyster boats observed dredging on public reefs in Galveston Bay (excluding West Bay) during each month of the 1962-1963 through the 1983-1984 oyster seasons (Nov-Apr). ND = no data.

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Apri	0.5	losed	losed	-	losed	losed	15	15	ND	6	13	Q	ND	QN	ND	4	6	7 (1osed	7	14	ND	ND	losed
	Tex	ن	ت	.	ပ	Ö	22	20	QN	_	19	ND	ND	QN	ND	20	11	10	S	10	13	ND	ON	ပ
	Total																	28						
March	SO	CN	C N	2 !	N N	12	17	25	13	20	35	ON	ND	3	9		9	9	losed	6	ND	-	5	14
	Tex	CN	, C	2	ND	24	34	34	20	23	35	ND	ND	11	12	36	18	22	S	11	ND	36	72	47
	1-																							
ary	Tota																	19						95
February	08	S		N.	ND	47	17	25	32	59	32	QN	18	ND	ND	0	∞	9	lose	7	13	2	5	10
1	Tex	CN	C N	ON C	ND	41	33	52	32	24	30	ND	20	ND	ND	27	36	13	O	16	22	89	109	85
	11																							
rv	Tota																	65						29
January	0.5	UN		ND	ND	41	53	21	32	45	34	20	20	ND	12	N	7	9	3lose	6	13	3	7	11
	Тех	GN	di di	IND	ND	9/	41	35	27	36	38	44	59	ON	18	ND	33	43	J	19	26	48	109	99
	Total	~	,		0	7	~	.+	_	.0	2	5	3	2	_	6	3	9	7	7	∞	2	7	5
mber	Tot	Ē	.	0	09	10.	92											99	•	2	68		_	5
December	0S	Z Z		S	ON O	41		42					32					5 11	0	. 4	(*)	_	9	_
	Tex	E		IN	N	99	33	32	32	21	43	55	21	12	23	22	74	7	7	23	34	70	91	7
,	Total	ı,	٠.	_	7	78	80	2	09	_∞	8	· (2)	6	7	5.	0		30	0	•	75	_	82	0,
November	To			_	_										9								_	3
Nov	i			_	ON O			37							1		3 28	_	, ,	Closed	1 33			2.3
	Tex	l I	Į ;	Z	N	37	21	25	12	24	23	70	39	15	16	2.1	7	7			2			4
	ou	067 62ª	, a	1-64	1964-65 ^a	-66a	29-996	967-68	69-896	1-70	1-71	971-72	972-73	973-74	974-75	975-76	5-77	977-78.	978-79 ^b	008-	980-81	-87	7-83	3-84 d
	Season	1067	1904	1963-64	1964	1965-66	1966	1967	1968	1969-70	1970-71	1971	1972	1973	1974	1975	1976-	1977	1978	1670	1980	1981	1982-8	1983

^aSeason closed 31 March

^bBay closed by TPW Commission on 15 December 1978

^cBay opened 15 December 1979

 $^{\mathrm{d}}\mathrm{Bay}$ closed by TPW Commission on 30 March 1984

Figure 1. Oyster reefs in Trinity, Galveston and East Bays sampled during 1979-1984.

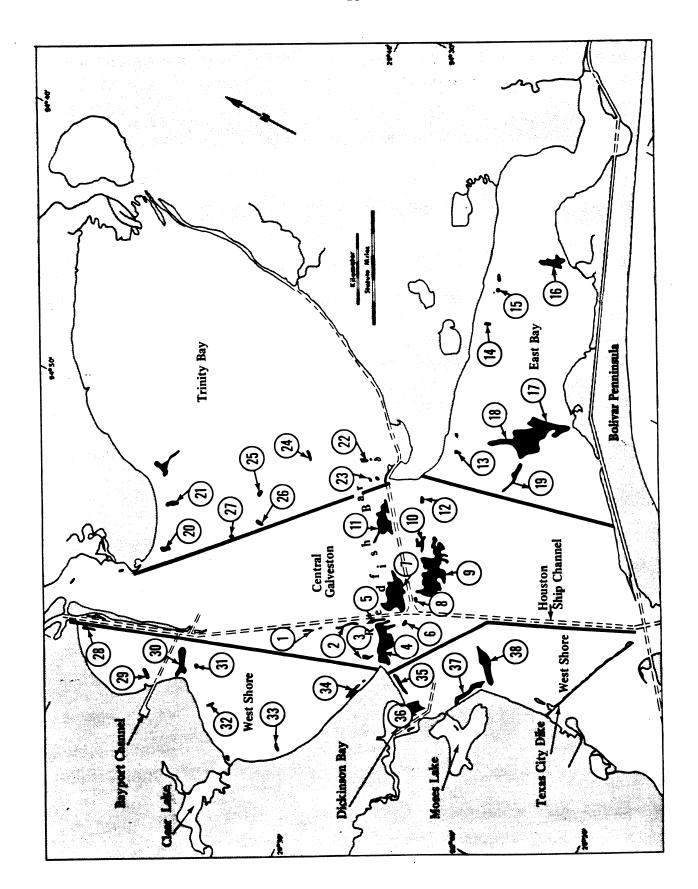


Figure 2. Oyster reefs in West Bay sampled during 1979-1984.

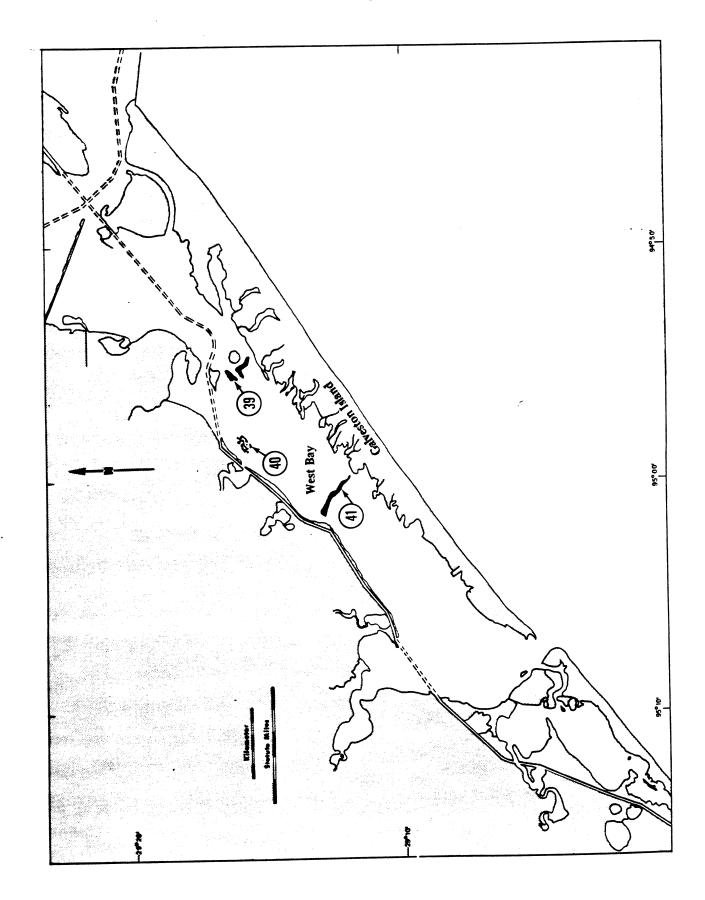


Figure 3. Annual mean number of oyster spat in 35-liter samples collected quarterly at three Redfish Bar sites in central Galveston Bay during 1956-1984.

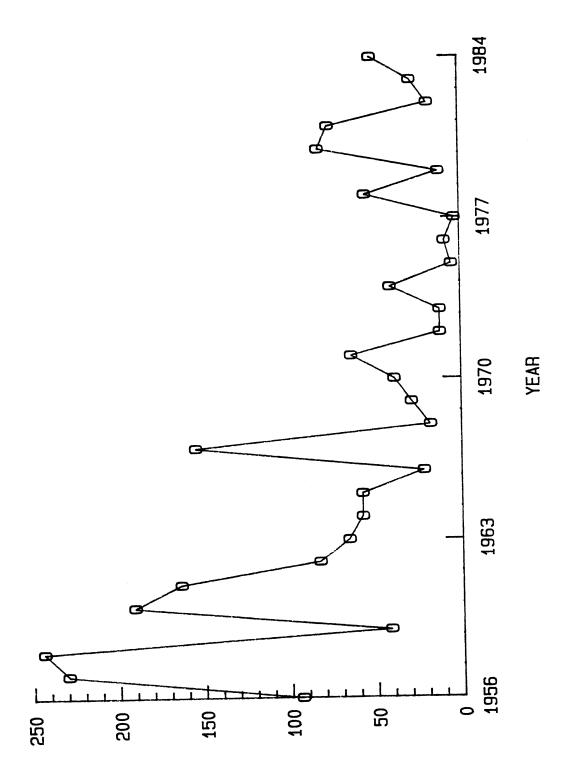
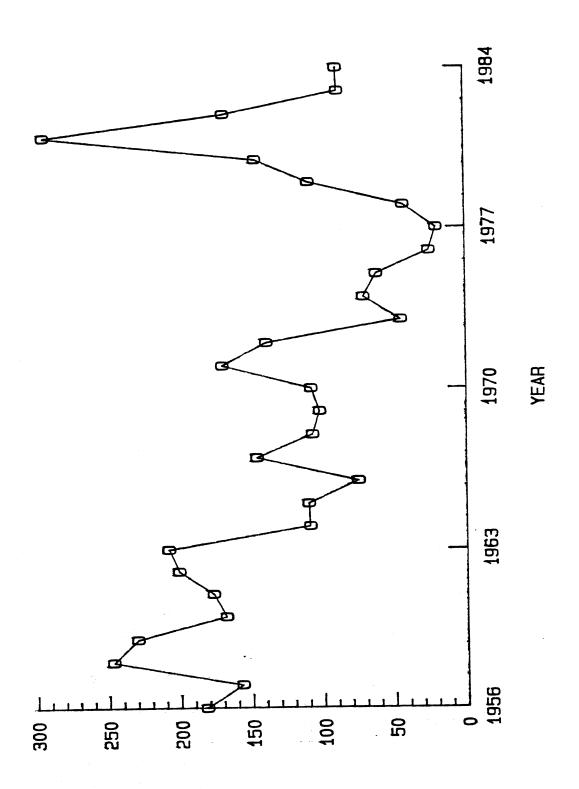
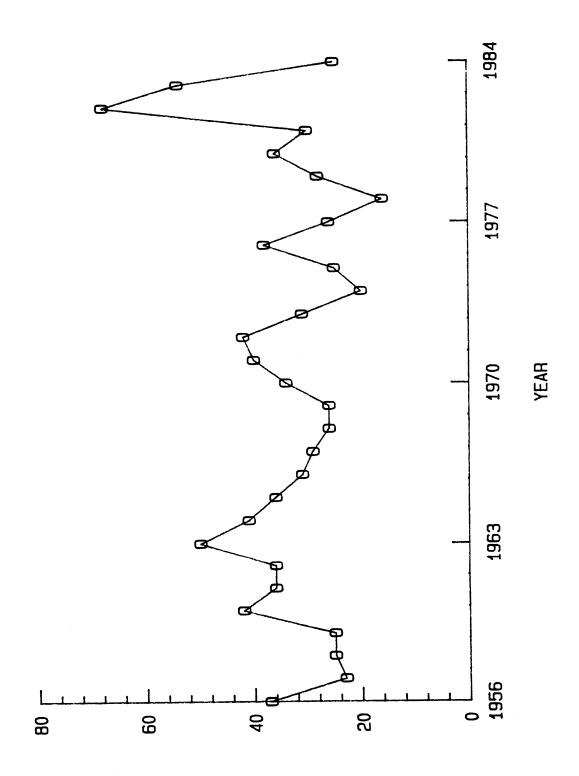


Figure 4. Annual mean number of small oysters in 35-liter oyster dredge samples collected quarterly at three Redfish Bar sites in central Galveston Bay during 1956-1984.



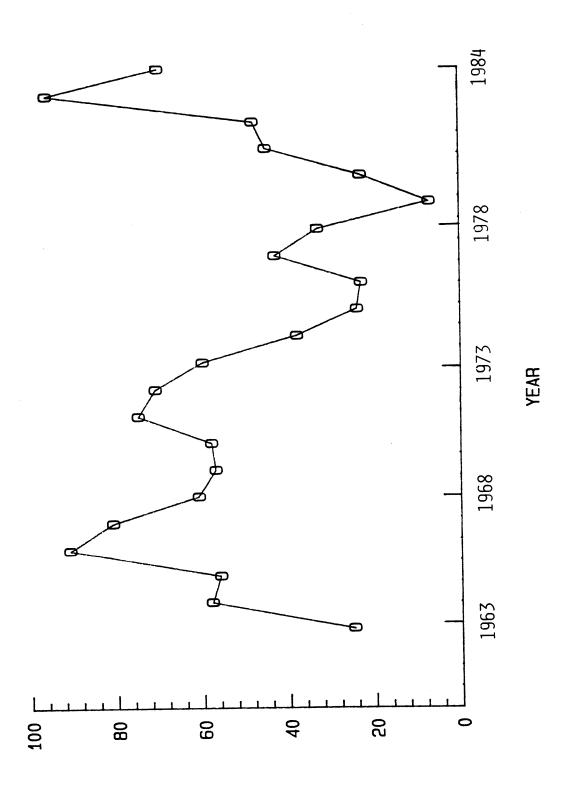
NUMBER OF SMALL OYSTERS

Figure 5. Annual mean number of market oysters in 35-liter oyster dredge samples collected quarterly at three Redfish Bar sites in central Galveston Bay during 1956-1984.



NUMBER OF MARKET OYSTERS

Figure 6. Total mean number of oyster boats observed dredging on public reefs in Galveston Bay (excluding West Bay) during the 1962-1963 (1963) through 1983-1984 (1984) oyster seasons.



NUMBER OF BOATS

Appendix A. Salinity (o/oo) at quarterly oyster sample sites in Galveston Bay during 1979-1984.

Table A.1. Salinity (o/oo) at quarterly oyster sample sites in Galveston Bay during 1979-1984. W = Jan-Mar, Sp = Apr-June, S = July-Sep, F = Oct-Dec. ND = no data.

Area		197	79			19	980				81	
site	W	SP	S	F	W	SP	S	F	W	SP	S	<u>F</u>
Central			_		_		0.0	2.2	2.4	MD	21	10
Beacon 63	14	4	7	18	7	17	20	23	24	ND	22	10
Beacon 59	13	4	7	18	8	17	21	23	25	ND	13	10
Eagle Point	18	4	7	17	8	18	22	23	23	19 19	13	9
Todd's Dump	20	4	6	17	9	19	22	23	26	19	13	9
Switchover	20	4	7	17	8	19	21	23	24	19	15	8
Experimental	23	4	7	18	9	20	21	23	25	18	14	7
North Redfish	24	1	7	17	11	17	23	23	25	18	15	7
South Redfish	26	2	7	18	13	16	24	22	24		13	6
Cent. Redfish	26	1	7	17	16	14	24	22	23	18	11	4
East Redfish	22	1	4	17	12	13	23	23	22	19	8	2
Bart's Pass	19	1	4	17	10	14	21	22	21	18		5
Gaspipe	21	1	4	16	11	13	21	20	21	20	10	5
East Bay												
Catfish	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Moody	8	4	4	16	9	8	18	20	18	26	11	10
Cowshed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Frenchy	6	4	4	16	9	8	18	20	21	25	10	13
Hanna	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Deep Hanna	10	3	5	12	12	16	20	23	23	26	16	14
Bull Hill	13	2	4	12	10	17	19	21	24	26	17	13
Trinity Bay												
Dow	9	1	2	14	5	14	20	21	22	22	13	2
Beezley	8	2	2	13	4	11	21	21	22	18	12	2
Vingtune	4	1	2	11	6	8	19	18	20	ND	13	6
Spoonbill	5	0	2	11	6	9	20	18	21	ND	13	5
Lonesome	7	0	2	12	6	10	18	21	20	ND	14	6
Tern	7	0	4	14	7	11	18	22	22	19	16	6
Dry Hole	8	1	5	14	7	12	18	22	23	19	16	6
Lost	9	2	4	10	7	11	18	23	22	ND	17	6
West Shore												
Morgan's Point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Yacht Club	11	3	3	16	8	14	18	22	23	16	18	10
Red Bluff	14	3	8	17	10	14	18	21	22	16	19	10
Bent Pipe	10	3	8	17	9	15	19	21	22	16	17	- 8
Scott	10	4	7	16	7	16	19	22	22	17	17	8
Bayview	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	17	9
San Leon	11	4	7	17	7	17	22	23	23	17	17	9
April Fool	13	4	5	17	11	21	21	24	28	20	18	13
Dickinson	16	4	5	17	12	23	21	24	27	20	18	12
	16	5	6	18	13	24	22	24	28	20	18	13
Levee	16	4	6	18	18	26	22	26	30	22	22	13
Dollar	10	7	U	10	10							
West Bay	3270	377	NID	ND	MD	ND	ND	ND	ND	ND	ND	ND
Carancahua	ND	ND	ND	ND	ND	ND	MD	MD	110			.,,,

Table A.l. (Cont'd.)

Area		19	982			198	33			198		a
site	W	SP	S	F	W	SP	S	F	W	SP	S	\overline{F}^{a}
Central			• •			1 /	M	1.6	1.5	20	22	ND
Beacon 63	15	10	19	16	12	14	ND	16	15	20	23	ND
Beacon 59	15	8	23	16	14	15	ND	16	15		23	ND
Eagle Point	14	8	16	19	11	15	6	16	18	20	21	ND
Todd's Dump	13	9	16	18	11	15	6	13	18	20	21	ND
Switchover	14	4	16	18	11	15	6	15	18	20	26	ND
Experimental	15	10	16	18	14	15	10	14	18	21	26 25	ND
North Redfish	11	8	14	18	9	9	12	11	18	20	25 25	ND
South Redfish	12	8	17	18	9	9	12	13	18	20		
Cent. Redfish	10	3	16	18	9	10	6	8	16	22	23	ND
East Redfish	10	1	16	16	9	10	6	10	15	20	21	ND
Bart's Pass	10	1	15	14	8	9	5	12	14	18 -		ND
Gaspipe	11	1	17	14	7	11	5	12	15	21	20	ND
East Bay												
Catfish	ND	ND	ND	ND	2	15	8	10	15	21	22	ND
Moody	16	5	12	12	2	15	4	10	15	20	18	ND
Cowshed	ND	ND	ND	ND	0	16	4	ND	14	18	18	ND
Frenchy	16	9	13	14	2	15	2	ND	14	20	20	ND
Hanna	18	6	21	16	4	18	6	15	16	24	24	ND
Deep Hanna	18	5	18	14	3	15	8	12	16	23	25	ND
Bull Hill	18	4	20	12	4	15	10	12	16	23	25	ND
Trinity Doy												
Trinity Bay Dow	6	8	6	12	0	15	6	10	14	14	20	ND
= - "	5	3	4	11	0	12	6	9	13	13	18	ND
Beezley	8	4	3	14	2	10	5	6	12	16	19	ND
Vingtune		4	5 5	14	3	12	5	7	12	16	21	ND
Spoonbill	7	•			0	14	6	6	12	17	20	ND
Lonesome	10	5	ND	14		11	- 9	11	12	17	21	ND
Tern	6	6	ND	16	1	12	9	9	14	17	21	ND
Dry Hole	7	8	ND	16	3			10	12	16	21	ND
Lost	7	8	ND	16	0	12	9	10	12	10	21	ND
West Shore												
Morgan's Point	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	20	ND
Yacht Club	14	8	14	15	13	12	- 8	12	14	16	20	ND
Red Bluff	14	8	16	15	13	12	9	12	15	17	21	ND
Bent Pipe	15	8	12	18	12	12	11	12	15	16	22	ND
Scott	14	8	13	20	12	14	10	12	15	19	22	ND
Bayview	10	8	18	17	10	13	6	14	15	19	24	ND
San Leon	9	8	17	18	10	13	7	15	15	21	22	ND
April Fool	17	5	17	19	11	15	9	18	15	21	22	ND
Dickinson	17	7	17	17	12	19	10	16	16	23	24	ND
	17	7	18	18	12	20	9	19	18	23	25	ND
Levee		5		18	12	20	8	18	16	23	26	ND
Dollar	19	5	20	10	1 2	20	0	10	10	23	20	110
West Bay												
Carancahua	ND	ND	ND	ND	ND	25	ND	ND	15	ND	30	ND

 $^{^{\}rm a}$ sampling discontinued

Appendix B. Water temperature (C) at quarterly oyster sample sites in Galveston Bay during 1979-1984.

Table B.l. Water temperature (C) at quarterly oyster sample sites in Galveston Bay during 1979-1984. W = Jan-Mar, SP = Apr-Jun, S = Jul-Sep. F = Oct-Dec. ND = no data.

Area		19					980				981	
site	W	SP	S	F	W	SP	S	F	W	SP	S	F
Central	1.0	0.7	0.7	1.0	0	20	20	1 /	1.1	2.6	20	10
Beacon 63	19	27	27	12	9	20	30	14	11	26	30	19 18
Beacon 59	20	27	27	12	9	20	30	15	11	26	30	
Eagle Point	20	25	27	14	9	20	30	15	11	26	31	18 18
Todd's Dump	20	27	28	14	9	21	30	15	11	26	31	18
Switchover	20	27	28	14	9	23	30	15	11	26	31 31	18
Experimental	11	25	27	14	10	21	30	15	11	26	31	19
North Redfish	11	25	30	14	11	23	30	15	11	26		19
South Redfish	11	25	30	14	11	23	30	14	11	26	31	
Cent. Redfish	11	25	30	13	11	23	30	15	11	26	30	19
East Redfish	11	2 5	30	13	11	23	30	15	11	26	30	19
Bart's Pass	11	24	29	14	11	23	30	15	10	25	30	18
Gaspipe	11	25	28	13	11	24	29	15	10	25	30	18
East Bay												
Catfish	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Moody	20	25	28	11	14	24	31	9	12	22	30	18
Cowshed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Frenchy	20	25	28	12	14	24	30	8	12	22	30	19
Hanna	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Deep Hanna	20	26	28	11	14	24	30	10	11	23	29	19
Bull Hill	20	26	ND	11	13	25	31	10	11	23	29	20
Trinity Bay												
Dow	15	21	21	10	11	24	30	14	15	23	30	21
Beezley	15	21	21	10	10	24	30	14	16	24	31	21
Vingtune	16	20	29	10	14	23	30	14	15	24	29	20
Spoonbill	16	20	28	10	14	24	30	15	15	24	29	20
Lonesome	14	21	21	10	12	24	30	14	15	24	30	20
Tern	15	21	22	10	11	24	30	15	15	24	30	22
Dry Hole	14	25	21	10	13	24	29	15	15	24	30	22
Lost	14	25	21	10	11	24	30	15	15	ND	30	21
West Shore	NT	110	***			***	***		3370	170		
Morgan's Point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Yacht Club	15	27	28	11	11	23	30	15	11	27	31	22
Red Bluff	14	25	28	11	10	23	30	15	11	27	30	20
Bent Pipe	14	25	28	11	10	23	30	15	11	27	31	21
Scott	15	26	28	11	9	23	30	15	11	27	31	22
Bayview	ND	ND	ND	ND	ND	ND	ND	ND	ND	27	30	22
San Leon	20	27	28	14	10	2 5	30	17	12	28	32	22
April Fool	20	25	24	14	12	2 5	31	17	14	27	30	20
Dickinson	20	25	24	14	11	25	30	16	14	27	30	20
Levee	20	25	24	14	12	25	30	16	13	27	30	21
Dollar	20	25	24	14	12	25	30	16	12	27	30	21
West Bay												
Carancahua	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

• Table B.1. (Cont'd)

Area		10	982			198	33			198		
site	W	SP	S	F	W	SP	S	F	W	SP	S	\overline{F}^{a}
5110												
Central					41					· 07	20	NID
Beacon 63	9	24	31	18	12	23	30	17	16	27	30	ND ND
Beacon 59	9	24	31	18	13	23	31	17	16	26	30	ND
Eagle Point	8	24	31	20	11	24	29	18	12	27	30	ND
Todd's Dump	9	28	31	20	11	24	29	18	12	27	30	
Switchover	9	27	31	20	12	24	29	18	12	26	30	ND ND
Experimental	10	28	31	20	11	24	29	18	12	27	30	
North Redfish	18	27	31	19	15	26	29	17	11	27	30	ND
South Redfish	18	27	30	19	15	26	29	17	12	26	30	ND
Cent. Redfish	18	27	30	19	15	26	27	17	12	26	30	ND
East Redfish	18	27	30	19	15	26	27	17	12	26	30	ND
Bart's Pass	18	27	30	19	15	26	27	17	12	26	30	ND
Gaspipe	18	27	30	19	15	26	27	16	11	26	29	ND
East Bay										6.6	0.0	310
Catfish	ND	ND	ND	ND	16	26	28	23	18	26	29	ND
Moody	20	29	30	18	17	27	28	22	18	26	29	ND
Cowshed	ND	ND	ND	18	16	27	28	22	18	26	29	ND
Frenchy	22	29	30	18	17	26	28	22	18	26	29	ND
Hanna	19	28	31	18	18	26	28	22	21	26	29	ND
Deep Hanna	19	28	31	19	18	27	.28	. 22	21	26	29	ND
Bull Hill	19	28	31	19	18	26	29	22	21	26	29	ND
Trinity Bay										26	20	ND
Dow	15	25	31	1 5	18	23	31	15	12	26	30	ND
Beezley	15	27	31	14	18	23	31	15	12	26	30	ND
Vingtune	13	26	30	14	19	22	29	14	17	26	29	ND
Spoonbill	15	27	30	14	18	22	29	15	18	26	30	ND
Lonesome	14	26	ND	15	19	23	30	15	17	26	30	ND
Tern	13	27	ND	18	17	24	30	15	17	26	30	ND
Dry Hole	13	27	\mathbf{N} D	18	17	24	30	15	17	26	29	ND
Lost	13	. 27	ND	18	17	24	31	15	17	26	29	ND
West Shore												
Morgan's Point	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	30	NE
Yacht Club	8	24	30	21	13	24	30	18	12	24	30	ND
Red Bluff	9	24	31	21	12	23	30	18	11	24	30	NI
Bent Pipe	9	24	31	21	12	23	31	18	11	24	30	NI
Scott	8	24	31	. 21	12	24	30	18	11	24	30	NI
Bayview	. 9	24	31	21	_ 13	24	31	18	17	25		NI
San Leon	13	24	32	21	12	24	31	18	19	25	31	NI
April Fool	12	27	31	17	14	23	31	9	17	28	29	NI
Dickinson	13	. 27	31	17	14	23	31	10	17	27 27	29	NI
Levee	12	27	31	17	14	. 23	31	. 9	17		29	NI
Dollar	11	27	31	17	14	23	30	·: 9	17	27	29	NI
West Bay									• •		20	277
Carancahua	ND	ND	ND	ND	ND	31	ND	ND	13	ND	30	NI
										4.		

asampling discontinued

Appendix C. Number of spat, small, and market oysters in quarterly 35-liter oyster dredge samples from public reefs in Galveston Bay during 1979-1984.

Table C.1. Number of oyster spat in quarterly 35 1 oyster dredge samples from public reefs in Galveston Bay during 1979-1984. W = Jan-Mar, SP = Apr-June, S = Jul-Sep, F = Oct-Dec. ND = no data.

Area		197					980				981	
site	W	SP	S	F	W	SP	S	F	W	SP	S	F
Central												
Beacon 63	11	10	78	11	16	3	311	178	95	187	133	115
Beacon 59	32	5	68	19	11	1	128	142	6 5	124	100	3 5
Eagle Point	8	4	0	2	0	1	91	55	24	22	49	13
Todd's Dump	2 5	8	6	5	7	1	110	79	43	123	114	12
Switchover	21	1	6	0	3	0	46	27	27	135	347	21
Experimental	32	13	1	6	1	0	111	96	64	110	67	27
North Redfish	38	8	1	2	2	0	127	237	151	116	179	31
South Redfish	45	9	11	6	0	0	81	178	198	86	37	29
Cent. Redfish	31	1	20	3	1	1	153	192	87	100	58	45
East Redfish	36	3	9	21	10	7	302	372	96	112	80	60
Bart's Pass	13	2	27	10	4	1	244	168	74	19	24	30
Gaspipe	29	0	31	8	2	2	268	241	150	31	62	49
East Bay												
Catfish	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Moody	22	0	1	2	1	0	231	11	8	50	24	8
Cowshed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Frenchy	54	7	1	3	1	0	196	ND	8	4	3 5	6
Hanna	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Deep Hanna	26	8	45	5	7	3	438	144	124	101	60	27
Bull Hill	10	8	28	11	6	10	187	231	193	109	139	35
Trinity Bay									•	0.6	0	-
Dow	0	0	5	8	9	0	12	21	3	36	0	7
Beezley	2	1	13	12	3	2	34	13	8	20	8	21
Vingtune	0	3	4	3	3	1	77	18	6	32	2	4
Spoonbill	3	1	5	3	2	0	462	59	3	ND	1	2
Lonesome	3	12	18	6	8	3	348	90	57	122	67	99
Tern	8	1	78	11	7	3	118	101	36	267	47	16
Dry Hole	6	1	190	20	38	4	527	168	45	105	42	7
Lost	22	1	84	11	7	2	176	115	52	ND	24	8
West Shore									***	MD	ND	NID
Morgan's Point		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Yacht Club	0	4	0	2	7	2	57	19	14	25	10	11
Red Bluff	8	0	3	9	8	1	16	48	14	40	25	20
Bent Pipe	2	1	14	4	2	2	36	19	23	2	11	12
Scott	2	0	8	11	1	0	3	13	3	8	2	2
Bayview	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	(
San Leon	8	7	0	0	2	1	71	70	41	470	108	
April Fool	37	19	1	0	0	0	224	102	49	43	129	8
Dickinson	63	4	0	1	0	3	132	141	30	140	78	10
Levee	108	39	4	2	2	1	406		134	200	90	
Dollar	12	5	60	36	2	3	558	490	416	150	126	88
West Bay												
Carancahua	ND	ND	ND	ND	ND	ND			ND	ND		
Green's Cut	ND	ND	ND	ND	ND	ND			ND	ND		
Confederate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NI

Table C.1. (Cont'd.).

Area			982				83				84	<u></u> а
site	W	SP	S	F	W	SP	S	F	W	SP	S	$\frac{\overline{F}^{a}}{\underline{F}}$
					<u> </u>							
Central												
Beacon 63	44	8	79	49	51	18	6	51	22	8	39	ND
Beacon 59	30	5	59	30	14	15	19	22	27	5	73	ND
Eagle Point	2	6	8	22	3	6	80	7	3	1	68	ND
Todd's Dump	3	1	4	3 5	9	3	23	21	5	3	77	ND
Switchover	8	0	6	33	2	1	31	11	1	12	47	ND
Experimental	2	4	25	33	14	6	121	11	10	10	80	ND
North Redfish	17	1	33	46	8	6	132	3	1	0	119	ND
South Redfish	16	9	13	63	8	17	152	28	6	5	91	ND
Cent. Redfish	25	1	19	17	0	5	117	7	4	5	175	ND
East Redfish	18	8	37	8	4	4	90	22	5	2	168	ND
Bart's Pass	8	4	50	14	5	3	111	17	11	1	246	ND
Gaspipe	7	9	21	24	5	11	91	24	3	7	240	ND
East Bay	MID	NT.	NID	MD	5	8	32	9	3	6	397	ND
Catfish	ND	ND	ND	ND			11	6	0	0	278	ND
Moody	2	2	11	11 ND	4	1		3	0	0	232	ND
Cowshed	ND	ND	ND	ND	6	3	2 1	3	0	0	232	ND
Frenchy	2	0	3	5	11	3	29	2	2	2	272	ND
Hanna	10	3	14	27	12	4		12	3	2	338	ND
Deep Hanna	14	3	16	29	17	5	53			2	330 83	ND
Bull Hill	18	7	17	21	4	8	244	6	6	2	0.3	ND
Trinity Bay												
Dow	4	3	2	60	7	12	4	14	14	0	38	ND
Beezley	21	8	0	57	25	24	8	17	12	3	26	ND
Vingtune	1	1	0	2	2	6	10	0	2	2	75	ND
Spoonbill	4	0	4	3	0	1	21	9	3	1	73	ND
Lonesome	16	14	6	20	2	7	2	9	0	2	223	ND
Tern	10	0	28	22	20	8	15	11	5	1	213	ND
Dry Hole	4	2	20	14	16	8	35	27	8	3	456	ND
Lost	4	2	18	3 5	13	6	13	35	10	1	373	ND
West Shore												
Morgan's Point	ND	ND	ND	ND	ND	ND	ND	ND	ND	9	47	ND
Yacht Club	14	0	6	5	6	4	3	14	5	ĺ	35	ND
Red Bluff	18	3	15	14	3	8	2	10	10	1	82	ND
	7	1	20	3	3	3	0	26	3	Ō	69	ND
Bent Pipe Scott	4	0	3	14	7	18	1	0	1	0	12	ND
	5	0	0	11	3	1	8	0	0	0	2	ND
Bayview	4	3	1	24	5	7	25	5	2	0	51	ND
San Leon	12		10	23	14	6	12	1	0	3	67	ND
April Fool		1	10 5	23 36		9	20	2	0	8	76	ND
Dickinson	10	0	24	36 85	20	18	21	7	3	10	46	ND
Levee Dollar	19 34	6 11	90	158	26 28	35	13	38	16	7	3	ND
DOLLAL	J4	11	70	100	20		1.0	30	10	•		.,,,
West Bay						_					0.00	
Carancahua	ND	ND	ND	ND	ND	271	584	ND	47	ND	231	ND
Green's Cut	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	ND
Confederate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35

^asampling discontinued

Table C.2. Number of small oysters in quarterly 35 l oyster dredge samples from public reefs in Galveston Bay during 1979-1984. W = Jan-Mar, SP = Apr-Jun, S = Jul-Sep, F = Oct-Dec. ND = no data.

Area		19	79				980			1	981	
site	W	SP	S	F	W	SP	S	F	W	SP	S	F
Central												
Beacon 63	326	299	226	166	181	180	226	422	425	352	291	393
Beacon 59	245	194	210	161	148	83	131	314	296	341	100	307
Eagle Point	39 9	376	386	255	150	156	183	340	222	388	318	367
Todd's Dump	153	164	102	156	164	128	143	262	241	288	344	316
Switchover	336	332	287	212	139	77	84	155	193	127	235	369
Experimental	97	107	53	181	160	134	146	341	325	202	245	303
North Redfish	130	166	107	104	77	67	113	243	316	334	261	287
South Redfish	169	123	119	167	66	108	82	162	398	285	430	3 24
Cent. Redfish	152	34	89	56	133	46	108	259	301	345	528	377
East Redfish	202	61	53	129	99	89	111	244	234	423	302	435
Bart's Pass	58	34	17	118	95	97	90	276	226	354	223	3 33
Gaspipe	145	70	51	91	93	76	142	261	250	244	282	344
East Bay												
Catfish	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Moody	30	13	6	11	8	8	47	50	53	63	53	88
Cowshed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Frenchy	92	35	16	36	26	20	5	ND	18	51	49	76
Hanna	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Deep Hanna	152	71	54	66	59	45	85	215	308	445	328	269
Bull Hill	93	86	24	93	70	59	100	33 5	426	560	500	488
Trinity Bay												
Dow	12	7	3	8	13	13	33	84	62	91	144	139
Beezley	28	9	0	12	16	14	21	92	119	98	32	59
Vingtune	46	58	1	8	4	10	45	203	253	175	0	9
Spoonbill	184	141	6	19	14	30	77	267	29	ND	104	122
Lonesome	24	58	1	28	40	57	59	326	361	289	1	137
Tern	61	57	32	103	114	124	103	331	272	310	217	327
Dry Hole	22	23	54	161	222	121	201	515	399	376	250	283
Lost	46	19	30	62	64	106	112	307	265	ND	293	346
West Shore												
Morgan's Point		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Yacht Club	107	129	110	85	122	81	212	260	281	255	186	167
Red Bluff	158	97	121	64	151	76	63	286	219	236	238	220
Bent Pipe	83	53	74	68	79	69	151	321	296	269	157	105
Scott	76	59	62	6 5	43	46	77	150	182	155	148	188
Bayview	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	49	68
San Leon	340	280	221	110	143	71	327	430	345	214	234	412
April Fool	206	217	159	141	89	55	131	185	189	130	270	236
Dickinson	450	164	184	346	135	115	206	312	251	280	411	448
Levee	217	410	361	129	176	108	176	451	502	566	483	543
Dollar	19	5	54	174	70	18	14	231	329	292	288	267
West Bay										•		•
Carancahua	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Green's Cut	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Confederate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table C.2. (Cont'd.)

W	SP	S	F	W	O.D.		-	W	SP	S	
			Г	W	SP	S	F	W	or_		$\frac{\mathbf{F}}{\mathbf{F}}$
				0.50			106	1.50	1.51	200	ND
362	202	177	174	252	145	176	106	150	151	209	ND ND
											ND
											ND
											ND
											ND
											ND
											ND
											ND
											ND
											ND
318	277	230	220	94	64	73	9 5	99	139	220	ND
ND	ND	ND	ND	172	105	47	90	76			ND
123	88	87	61	55	34	38	37	22	20		ND
ND	ND	ND	ND	52	28	3 5	22	15	19	26	ND
97	64	25	37	42	31	20	14	8	12	46	ND
194	154	114	61	80	44	27	20	31	27	70	ND
	206	136	86	108	63	49	56	51	29	37	ND
355	267	172	115	113	89	155	147	122	151	221	ND
150	92	18	89	53	102	88	94	77	71	100	ND
									105	131	ND
									33	102	ND
		•							84	126	ND
									34	112	ND
									81	132	ND
											ND
275	228	145	142	82	73	78	116	90	115	165	ND
MD	ND	ND	ND	ND	ND	ND	ND	ND	138	197	ND
											ND
											ND
											ND
											ND
											ND
											ND
											ND
											ND
											ND
											ND
243	40	172	10/	137	107	42	77	12	13	J	MD
				• = =			***	10/	3770	100	
											ND
											ND
ND	ND	ND	ND	ND	ND	ND	ND	ИИ	ממ	82	ND
	123 ND 97 194 232 355 150 70 16 135 62 224 189	189	189	189	189 184 183 91 58 210 177 138 87 75 336 227 125 130 56 260 168 138 92 70 286 156 159 82 87 265 255 204 151 72 287 156 166 147 37 322 277 137 144 86 231 205 129 158 132 318 277 230 220 94 ND ND ND ND 172 123 88 87 61 55 ND ND ND ND 52 97 64 25 37 42 194 154 114 61 80 355 267 172 115 113 150 92 18 89 53 70 79 0 57 43 16 <td>189</td> <td>189</td> <td>189 184 183 91 58 53 102 103 210 177 138 87 75 59 67 154 336 227 125 130 56 53 35 74 260 168 138 92 70 72 34 27 286 156 159 82 87 78 62 37 286 156 159 82 87 78 62 37 265 255 204 151 72 88 16 63 287 156 166 147 37 61 36 46 322 277 137 144 86 98 30 51 231 205 129 158 132 92 93 114 318 277 230 220 94 64 73 95 ND ND ND ND 172 105 47 90 123</td> <td>189 184 183 91 58 53 102 103 129 210 177 138 87 75 59 67 154 82 336 227 125 130 56 53 35 74 57 260 168 138 92 70 72 34 27 71 286 156 159 82 87 78 62 37 60 265 255 204 151 72 88 16 63 60 287 156 166 147 37 61 36 65 59 322 277 137 144 86 98 30 51 60 231 205 129 158 132 92 93 114 63 318 277 230 220 94 64 73 95 99 ND ND ND ND 172 105 47 90 76</td> <td>189 184 183 91 58 53 102 103 129 133 210 177 138 87 75 59 67 154 82 82 336 227 125 130 56 53 35 74 57 78 260 168 138 92 70 72 34 27 71 63 286 156 159 82 87 78 62 37 60 46 265 255 204 151 72 88 16 63 60 67 287 156 166 147 37 61 36 46 59 71 322 277 137 144 86 98 30 51 60 85 231 205 129 158 132 92 93 114 63 47 318 277 230 220 94 64 73 95 99 139</td> <td>189</td>	189	189	189 184 183 91 58 53 102 103 210 177 138 87 75 59 67 154 336 227 125 130 56 53 35 74 260 168 138 92 70 72 34 27 286 156 159 82 87 78 62 37 286 156 159 82 87 78 62 37 265 255 204 151 72 88 16 63 287 156 166 147 37 61 36 46 322 277 137 144 86 98 30 51 231 205 129 158 132 92 93 114 318 277 230 220 94 64 73 95 ND ND ND ND 172 105 47 90 123	189 184 183 91 58 53 102 103 129 210 177 138 87 75 59 67 154 82 336 227 125 130 56 53 35 74 57 260 168 138 92 70 72 34 27 71 286 156 159 82 87 78 62 37 60 265 255 204 151 72 88 16 63 60 287 156 166 147 37 61 36 65 59 322 277 137 144 86 98 30 51 60 231 205 129 158 132 92 93 114 63 318 277 230 220 94 64 73 95 99 ND ND ND ND 172 105 47 90 76	189 184 183 91 58 53 102 103 129 133 210 177 138 87 75 59 67 154 82 82 336 227 125 130 56 53 35 74 57 78 260 168 138 92 70 72 34 27 71 63 286 156 159 82 87 78 62 37 60 46 265 255 204 151 72 88 16 63 60 67 287 156 166 147 37 61 36 46 59 71 322 277 137 144 86 98 30 51 60 85 231 205 129 158 132 92 93 114 63 47 318 277 230 220 94 64 73 95 99 139	189

^asampling discontinued

• Table C.3. Number of market oysters in quarterly 35 1 oyster dredge samples from public reefs in Galveston Bay during 1979-1984. W = Jan-Mar, SP = Apr-June, S = Jul-Sep, F = Oct-Dec. ND = no data.

Area		197	79		1980				1981			
site	W	SP	S	F	W	SP	S	F	W	SP	S	F
Central	, -	1.0	1 2	3 /:	25	20	32	50	41	32	36	13
Beacon 63	15	18	13	34 10	25 25	36	49	30	30	37	22	28
Beacon 59	13	21	5		108	91	85	46	38	40	36	58
Eagle Point	23	28	30	89 60	43	91 74	72	43	32	38	17	6 5
Todd's Dump	24	33	51	70	105	7 4 77	75	53	48	29	27	28
Switchover	26	35	68 44	30	32	44	51	40	44	50	33	66
Experimental	11	8	38	30 48	33	32	40	28	43	22	14	25
North Redfish	15	9	36 17	23	42	23	42	47	32	32	16	21
South Redfish	14	18		23 51	39	28	39	41	48	27	16	44
Cent. Redfish	43	23	51		39	26	30	42	35	16	32	49
East Redfish	28	13	16	45	32 11	13	23	22	28	18	25	32
Bart's Pass	9	24	16	12	43	13 27	23 37	42	57	36	20	41
Gaspipe	22	30	12	6	43	21	37	42	57	30	20	-, -
East Bay								110	MD	ND	ND	ND
Catfish	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND 11	9	8 8
Moody	5	2	7	3	7	5 ND	6	7 ND	15 ND	ND	ND	ND
Cowshed	ND	ND	ND	ND	ND	ND	ND	ND	33	иD 9	19	21
Frenchy	1	7	14	12	13	. 5	6	ND	ND	ND	ND	ND
Hanna	ND	ND	ND	ND	ND	ND	ND	ND 37	34	ND 24	19	34
Deep Hanna	12	10	2	29	21	23	18	37 27	22	32	24	47
Bull Hill	34	23	11	15	22	13	32	21	22	32	24	47
Trinity Bay									F	17	21	49
Dow	32	43	0	0	0	0	2	6	5	17 14	21 4	13
Beezley	21	33	0	0	1	0	1	4	3	6	0	0
Vingtune	27	18	0	0	0	0	0	7	4	ND	10	10
" Spoonbill	17	21	1	0	4	0	0	6	1 9	ND 19	0	0
Lonesome	11	7	0	0	0	0	0	6 34	52	19 44	38	49
Tern	23	27	0	0	0	0	1		61	59	55	78
Dry Hole	25	34	4	5	3	4	7	49	42		53	49
Lost	26	35	6	6	11	10	13	31	42	ND	23	49
West Shore												
Morgan's Point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NI
Yacht Club	19	16	38	56	49	47	69	60	64	49 67	60 60	66
Red Bluff	26	29	26	24	25	33	64	73	93 62	67 53	60 50	37 27
Bent Pipe	28	25	24	47	38	49	61	71	82	53 46	50 55	2 . 50
Scott	26	31	20	45	41	68	65	84 ND	78 ND	46	59	5.4 5.4
Bayview	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND 53	34	44
San Leon	44	56	30	105	93	137	87	73	76	53 76		
April Fool	87	54	101	64	103	72	57	78	57	76	44	4(
Dickinson	82	61	184	68	90	87	85	91	92	57	39	62
Levee	19	29	27	44	25	19	42	45	24	43	20	1
Dollar	1	1	0	0	2	1	0	1	1	0	1	2
West Bay												
Carancahua	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	N1
Green's Cut	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	N
Confederate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	N:

Table C.3. (Cont'd).

Area site	1982					198	33		1984			
	W	SP	S	F	W	SP	S	F	W	SP	S	$\frac{F}{F}$
_												
Central	2.5	22	22	42	42	59	25	28	58	31	27	ND
Beacon 63	25 18	46	20	51	69	51	33	30	26	22	13	ND
Beacon 59		48 68	99	76	71	60	80	42	32	26	17	ND
Eagle Point	58		99	76 99	60	45	40	28	18	27	28	ND
Todd's Dump	43	57 27		99 82	64	51	63	23	41	29	35	ND
Switchover	52	37	46		63	62	64	23	19	21	13	ND
Experimental	52	63	76	78	88	63	36	25	25	14	18	ND
North Redfish	43	40	65	84	61	45	33	47	3 5	27	12	ND
South Redfish	58	55 0.5	40	53		82	33 44	45	21	15	13	ND
Cent. Redfish	83	85	115	114	89		58	30	53	39	34	ND
East Redfish	58	71	76	124	62	55		42	31	26	39	ND
Bart's Pass	47	45	84	116	51	83	90		19	35	35	ND
Gaspipe	48	56	53	101	55	67	82	46	19	3)	3 5	ND
East Bay												
Catfish	ND	ND	ND	ND	72	74	94	67	45	36	45	ND
Moody	31	26	42	101	40	28	55	69	24	35	24	ND
Cowshed	ND	ND	ND	ND	57	42	107	67	3 5	25	21	ND
Frenchy	33	38	22	51	26	41	42	49	24	16	22	ND
Hanna	93	55	68	77	86	23	68	53	24	23	9	ND
Deep Hanna	53	60	63	83	56	53	71	50	26	37	33	ND
Bull Hill	102	71	77	122	58	57	72	60	33	41	42	ND
Dull Hill	102	, -	• •									
Trinity Bay		0.0			7.0	F.0	()	61	53	55	44	ND
Dow	55	89	14	44	72	58	62			10	18	ND
Beezley	22	18	0	0	1	0	0	0	1		18	ND
Vingtune	0	0	0	3	0	1	0	11	14	17	30	ND ND
Spoonbill	38	17	16	48	29	50	42	48	28	40		
Lonesome	0	1	0	0	0	0	0	3	2	4	8	ND
Tern	47	38	32	71	62	60	56	54	47	47	46	ND
Dry Hole	58	56	71	100	62	64	47	65	29	19	23	ND
Lost	41	56	59	91	51	33	67	49	24	23	37	ND
West Shore												
Morgan's Point	ND	ND	ND	ND	ND	ND	ND	ND	ND	73	52	ND
Yacht Club	70	74	84	72	97	97	71	62	64	43	42	ND
Red Bluff	57	59	76	66	85	9 5	81	90	81	71	48	ND
Bent Pipe	36	59	42	53	6 5	62	87	56	93	79	36	ND
Scott	84	77	85	77	83	79	71	76	63	57	40	ND
Bayview	69	84	83	77	93	95	59	81	100	79	81	ND
San Leon	65	72	66	92	111	110	104	84	85	~ 71	40	ND
April Fool	55	62	48	60	83	93	96	77	71	60	48	ND
Dickinson	79	78	86	133	125	118	95	72	77	49	37	ND
	26	51	48	72	82	96	62	81	68	65	25	ND
Levee Dollar	9	0	21	44	95	83	66	31	39	22	23	ND
	-	-										
West Bay	3770	377), TO	MIT	MIL	72	36	ND	35	ND	11	ND
Carancahua	ND	ND	ND	ND	ND				ND	ND	46	ND
Green's Cut	ND	ND	ND	ND	ND	ND	ND	ND				
Confederate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	ND

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