

1985

Oyster Spatfall in Virginia Rivers: 1984 Annual Summary

James Whitcomb

Virginia Institute of Marine Science

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Recommended Citation

Whitcomb, J. (1985) Oyster Spatfall in Virginia Rivers: 1984 Annual Summary. Marine Resource Special Report. Virginia Institute of Marine Science, College of William and Mary. <https://doi.org/10.21220/V5B61X>

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MARINE RESOURCE SPECIAL REPORT



A Marine Advisory Service Publication of the
VIRGINIA SEA GRANT PROGRAM

Virginia Institute of Marine Science Gloucester Point, Virginia 23062

1984 Annual Summary

OYSTER SPATFALL IN VIRGINIA RIVERS

BY

James Whitcomb

The Virginia Institute of Marine Science (VIMS) conducts weekly surveys from June through early October to obtain oyster spatfall information. Spat counts are made on oyster shells strung on wire and suspended from stakes on public and private beds. The number of spat on shells is counted each week of the spawning season to determine the potential of a particular area for receiving a strike and to predict the most likely period the strikes will occur.

A moderate or heavy strike on shellstrings usually indicates a significant strike on exposed bottom cultch. This is especially true for cultch planted a week or two prior to the peak set.

However, a good strike on shellstrings in some localities may not always be accompanied by a good spatfall on naturally occurring bottom shell material or on shells planted too early or too late in the season. Bottom shells are often so fouled by other marine life that no room is left for small spat to attach. Moreover, even with a reasonable spatfall, survival of spat on the bottom in saltier waters may be extremely low due to predators, such as oyster drills, which eat the small spat.

Usually a light set of spat on shellstrings indicates a poor set on bottom cultch. During certain exceptional years, due probably to the absence of predators and fouling, a light set on our shellstrings may be accompanied by an above average set on the natural bottom.

The number of spat which set in one week on the smooth side of 10 shells is determined by microscopic examination; the average of the 10 shells is shown in this report as spat-per-shell-per-week. Weekly set is arbitrarily rated as follows: fair, 0.1 to 1.0; moderate, 1.1 to 10; heavy, 10.1 to 100. As an index of total seasonal spatfall, the weekly sets are

summed in this report for each station (total seasonal set). In evaluating setting levels, it should be recognized that in certain rivers, such as the Rappahannock, York and Potomac, the set is typically very low or zero in many sections and only fair in others. Other systems, including the lower James and Piankatank Rivers, Mobjack Bay and Seaside of the Eastern Shore, typically receive a moderate or heavy set and, as a result, often produce quantities of seed oysters or market oysters.

The shellstring study is supplemented each year in late fall by counts of spat on natural bottom cultch. This study is made after seasonal setting has stopped and indicates how many spat have survived. Half-bushel samples of bottom cultch were collected from selected locations with a dredge during the fall of 1984. Numbers of oyster spat setting on cultch were counted. The data are expressed as number of spat per bushel.

The tabular summaries of spat-per-shell-per-week were produced by a computer program which approximates more closely one week periods. Therefore, the values shown in previous annual reports are not recaptured exactly in this report.

Acknowledgements

We wish to express appreciation to the Virginia Marine Resources Commission personnel who did the work of putting out and collecting the shellstrings in the Mobjack Bay area, in the Piankatank River, Great Wicomico River and the Potomac River. Samples were collected by VIMS personnel at Wachapreague. The cooperation and assistance of all the above and their supervisors is gratefully acknowledged.

Drafts and final copy of this report were prepared by the VIMS Report Center.

Summary of Setting for 1984

With the exceptions of Wilson's Creek and the Piankatank River, the set on shellstring stations in the Bay and its tributaries was the lowest set in the past five-year period. More important, the high sets of the previous four years at the James River stations did not appear, and, the setting level in the James River more closely resembled the 1976-79 period.

On the seaside of the Eastern Shore, at the VIMS station, the set was near the average set of the past five years.

James River

At most of the stations in the James River setting began the first week of July and the peak of setting was near the end of August. The setting period extended from two to three months except at the two uppermost stations. At the latter two stations, setting began the fourth week of July and lasted only four to six weeks.

Samples of bottom cultch from areas adjacent to the shellstring stations showed that the set on natural bottom was low when compared with

the previous four years. Fouling was light at all stations and consisted of encrusting bryozoans and barnacles.

Following is a summary of the number of spat counted in a bushel sample of bottom material: Nansemond Ridge - 28; Naseway Shoal - 48; Brown Shoal - 14; White Shoal - 8; Thomas Rock - 12; Gun Rock - 66; Wreck Shoal Offshore - 69; Wreck Shoal Inshore - 169; Pt. of Shoal - 26; Mulberry Swash - 0; Horsehead Bar - 378; and Deepwater Shoal - 200.

York River

The total seasonal set at the VIMS pier was the lowest set on shellstrings since 1976. Setting began the fourth week of July and continued at a low level for six weeks.

Samples of bottom cultch on natural bottoms in the York River failed to produce a single spat. Following is a summary of the number of spat counted in a bushel sample of bottom material: Green Rock - 0; Pages Rock - 0; Aberdeen Rock - 0; and Bell Rock - 0.

Mobjack Bay

Setting at Tow Stake and Brown's Bay stations began the second and third week, respectively, of July and continued for, respectively, thirteen weeks and ten weeks. The total seasonal set was the lowest in the past five-year period.

Ware River

Setting at the Wilson's Creek station began the first week of July and continued until the first of October. The highest set occurred in the third week of July. In comparison with the previous four years, the 1984 total seasonal set was below the average, but would rank as the second best year.

East River

Setting began the last week of June at the East River station and continued for eleven weeks. The peak occurred in the last two weeks of July. The total seasonal set was the lowest in the past five-year period, but would be characterized as a fair set.

Pepper Creek

Setting began the third week in July and continued for nine weeks. The total seasonal set was the lowest in the past five years, but would be characterized as a fair set.

Piankatank River

Setting began around the second full week of July at all of the stations above Three Branches and one week later at Three Branches. Setting continued through the second full week of September at the two downriver stations and through the first full week of October at the two upriver stations. Total seasonal set at Burton Point and Ginney Point was near the

average for the past five years. Although the total seasonal set at Three Branches and Palace Bar stations was lowest in the past five years, the three upriver stations set would be characterized as moderate to high and the set at Three Branches would be characterized as fair.

Following is a summary of the number of spat counted in a bushel sample of bottom material: Three Branches - 92; Burton Point - 66; Capetune - 588; Palace Bar - 654; Island Bar - 298; and Ginney Point - 78.

Rappahannock River

Shellstring stations were not in place in the Rappahannock River in 1984. Following is a summary of the number of spat counted in a bushel sample of bottom material: Parrotts Island Rock - 4; Drumming Ground - 20; Corrotoman Point - 36; Hog House Bar - 0; Smokey Point Inshore - 0; Smokey Point Offshore - 0; Morattico Bar - 0; and Bowlers Rock - 0. This summary suggests that 1984 recruitment added little to the oyster stocks.

Great Wicomico River

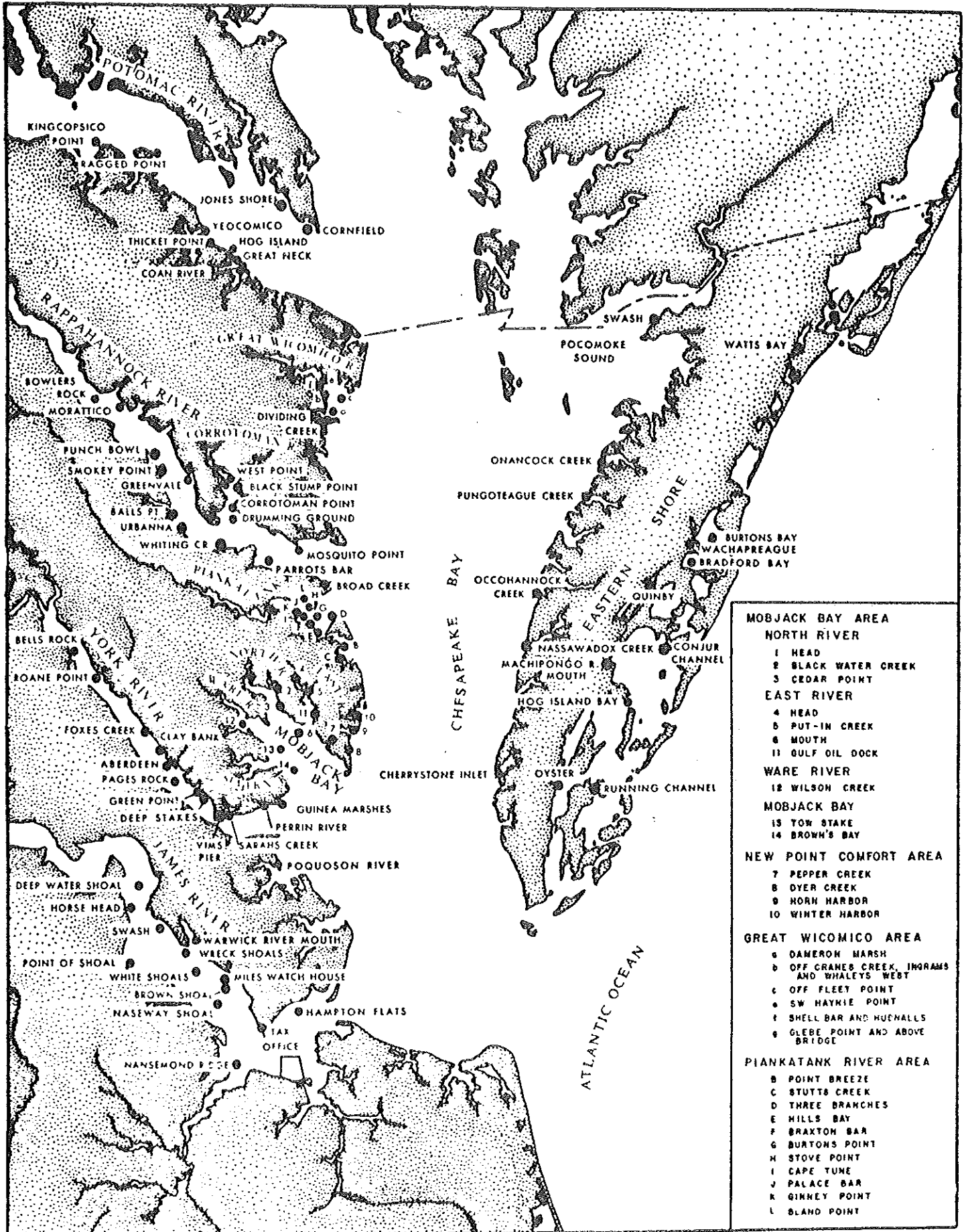
Spatfall appeared on the shellstrings upriver the second or third full week of July and continued until the middle or end of September, except at Glebe Point. The latter station, which was uppermost in the river, began setting at the same time but continued for only seven weeks. Downriver the continuous setting began in August and lasted two to four weeks. However, intermittent pulses of set appeared in July and September at the downriver stations. At all stations the set was the lowest in five years and at only one station, Shell Bar, and for a single week period, did the level of set exceed one spat per shell.

Samples of bottom cultch from areas adjacent to the shellstring stations showed that recruitment of spat on the bottom was low in 1984. Following is a summary of spat counts per bushel: Dameron Marsh East - 14; Fleet Point - 22; Whaleys East - 24; Cranes Creek - 28; Haynie Point - 30; and Rogue Point - 54.

Potomac River

There was no set on shellstrings at the Coan and Great Neck stations. On the remaining four stations the total seasonal set for all stations combined was thirteen spat. The shellstrings were on station from the middle of June to the middle of October. These are the lowest readings on shellstrings in the past five years for the Potomac. Although the Cornfield and Jones Shore stations had fair to high sets in 1980-83 period, the Potomac River has typically been a very low setting river.

SHELLSTRING SURVEY STATIONS



- MOBJACK BAY AREA**
- NORTH RIVER**
- 1 HEAD
- 2 BLACK WATER CREEK
- 3 CEDAR POINT
- EAST RIVER**
- 4 HEAD
- 5 PUT-IN CREEK
- 6 MOUTH
- 11 GULF OIL DOCK
- WARE RIVER**
- 12 WILSON CREEK
- MOBJACK BAY**
- 13 TOW STAKE
- 14 BROWN'S BAY
- NEW POINT COMFORT AREA**
- 7 PEPPER CREEK
- 8 DYER CREEK
- 9 HORN HARBOR
- 10 WINTER HARBOR
- GREAT WICOMICO AREA**
- 5 DAMERON MARSH
- 6 OFF GRAMES CREEK, IMGRAMS AND WHALEYS WEST
- 7 OFF FLEET POINT
- 8 SW HAYKIE POINT
- 9 SHELL BAR AND HUGHALLS
- 10 GLEBE POINT AND ABOVE BRIDGE
- PIANKATANK RIVER AREA**
- B POINT BREEZE
- C STUTTS CREEK
- D THREE BRANCHES
- E HILLS BAY
- F BRAXTON BAR
- G BURTONS POINT
- H STOVE POINT
- I CAPE TUNE
- J PALACE BAR
- K GINKEY POINT
- L BLAND POINT

VIRGINIA INSTITUTE OF MARINE SCIENCE
AND
SCHOOL OF MARINE SCIENCE,
THE COLLEGE OF WILLIAM AND MARY
GLOUCESTER POINT, VIRGINIA 23062

Spatfall on Shellstrings*
Annual Summary
1981-1984

JAMES RIVER

Dates Exposed**	Nansemond Ridge				Naseway Shoal				Brown Shoal			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	--	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Jul 2-9	0.4	0.4	0.0	0.4	6.4	0.9	0.2	0.1	1.6	0.3	0.0	0.3
Jul 9-16	0.3	1.8	1.5	0.4	28.7	5.3	7.7	0.0	3.6	4.1	1.6	0.1
Jul 16-23	11.7	1.2	2.4	0.7	61.8	19.6	7.7	1.2	2.9	5.1	4.2	0.2
Jul 23-30	7.3	3.4	9.4	0.6	14.3	20.6	57.8	1.9	1.1	1.2	10.0	1.2
Jul 30-Aug 6	8.2	2.7	14.5	0.6	114.2	21.6	41.1	0.7	3.0	3.3	8.5	1.1
Aug 6-13	1.9	3.3	10.4	0.2	47.5	8.9	39.2	0.4	5.9	1.6	2.1	0.3
Aug 13-20	1.6	2.8	0.1	3.0	23.8	10.2	4.8	5.5	1.7	3.3	0.3	1.1
Aug 20-27	--	1.7	1.2	3.5	3.5	3.9	19.4	13.3	1.1	1.0	1.3	6.2
Aug 27-Sep 3	--	1.7	0.6	3.4	2.7	2.6	5.1	13.3	0.2	3.6	0.5	6.0
Sep 3-10	--	1.7	2.5	2.0	0.7	2.6	20.4	4.4	0.2	0.6	0.7	2.2
Sep 10-17	--	0.6	2.6	0.1	1.0	1.3	18.1	0.1	0.3	2.6	0.7	0.0
Sep 17-24	0.0	0.6	0.6	0.1	0.3	3.1	2.1	0.1	0.1	0.5	1.2	0.0
Sep 24-Oct 1	0.1	0.3	0.4	0.1	0.5	1.7	0.6	0.0	0.0	1.3	0.1	0.0
Oct 1-8	--	1.0	0.3	0.0	0.5	1.3	0.3	0.0	0.0	0.5	0.1	0.0
Oct 8-15	--	0.0	0.2	0.0	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Oct 15-22	--	0.1	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0	0.0	0.0
Oct 22-29	--	0.1	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Oct 29-Nov 5	--	0.0	--		--	0.0	--		--	--	--	
TOTALS	31.5	23.4	46.7	15.1	308.6	103.8	224.7	41.0	21.8	29.0	31.3	18.7

* Shows spat per shell (smooth side only).

** Dates shown are for 1984. Dates in other years were approximately the same.
Not sampled in previous years.

General Guide to Setting:

0.1 to 1.0 spat per shell = fair
1.1 to 10.0 spat per shell = moderate
10.1 to 100 spat per shell = heavy

JAMES RIVER

Dates Exposed**	Miles Watch House				White Shoal				Wreck Shoal Offshore			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	0.3	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0
Jul 2-9	1.2	0.5	0.0	0.1	1.3	0.8	0.0	0.1	0.0	1.0	0.0	0.1
Jul 9-16	2.1	0.7	4.2	0.0	11.1	2.5	1.8	0.0	5.3	2.9	4.0	0.1
Jul 16-23	7.8	1.9	8.5	0.2	17.9	1.5	7.7	1.8	24.4	3.5	10.0	0.9
Jul 23-30	0.8	2.3	5.4	0.2	7.4	5.9	15.3	0.9	5.5	4.3	13.3	1.9
Jul 30-Aug 6	5.0	1.7	16.3	1.0	11.8	5.2	35.7	1.2	8.1	6.6	55.2	1.8
Aug 6-13	2.3	4.4	6.3	0.7	15.0	2.5	11.6	1.0	3.4	4.1	12.3	0.4
Aug 13-20	0.7	0.4	0.3	2.8	4.0	2.8	1.2	1.4	2.3	2.2	0.1	2.2
Aug 20-27	0.5	1.1	1.5	5.7	2.6	2.2	3.3	6.3	1.6	1.9	3.5	5.5
Aug 27-Sep 3	1.6	3.6	1.0	5.6	0.7	2.4	2.5	6.3	0.1	6.2	2.2	5.5
Sep 3-10	0.0	0.7	1.0	0.3	0.3	2.6	2.9	1.4	0.0	0.7	2.3	2.2
Sep 10-17	0.1	0.0	2.1	0.0	0.2	0.3	1.6	0.0	0.5	0.6	1.3	0.3
Sep 17-24	0.0	0.0	0.2	0.0	0.1	1.0	0.3	0.0	0.0	0.2	0.1	0.2
Sep 24-Oct 1	0.1	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.1	0.1	0.3	0.0
Oct 1-8	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.0	0.3	0.0	0.2	0.1
Oct 8-15	0.2	--	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Oct 15-22	0.0	--	0.0	0.0	--	0.0	0.0	0.0	--	--	0.0	0.0
TOTALS	22.8	17.3	46.8	16.7	73.6	30.0	84.6	20.4	52.4	34.3	104.8	21.2

JAMES RIVER

Dates Exposed**	Horsehead Bar				Mulberry Swash				Point of Shoal			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	1.3	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.4	0.0	0.1	0.0
Jul 2-9	2.1	1.6	0.0	0.0	2.1	0.1	0.0	0.0	2.5	0.5	0.0	0.1
Jul 9-16	10.1	0.6	5.7	0.0	11.9	3.7	0.0	0.0	6.4	0.3	4.4	0.0
Jul 16-23	40.3	1.3	15.5	0.0	51.2	3.7	15.5	0.7	40.1	1.6	18.3	0.3
Jul 23-30	3.9	4.8	8.3	2.9	1.7	7.6	15.9	10.3	3.2	1.9	9.0	2.7
Jul 30-Aug 6	5.3	2.2	36.2	2.2	4.9	16.4	218.0	1.8	10.1	2.6	10.9	2.2
Aug 6-13	4.5	1.7	14.1	1.1	8.2	7.3	49.8	3.6	2.6	2.7	9.1	4.0
Aug 13-20	2.2	0.7	1.4	2.3	2.4	2.1	2.5	2.5	3.3	0.3	1.7	4.1
Aug 20-27	2.6	0.0	8.8	9.0	1.9	1.3	15.2	7.6	4.1	0.2	10.2	4.8
Aug 27-Sep 3	0.7	1.6	2.4	9.0	0.5	12.1	7.5	7.6	1.3	4.4	3.2	4.8
Sep 3-10	0.1	0.2	2.6	0.8	0.0	0.8	7.8	2.6	0.1	1.3	7.6	0.2
Sep 10-17	0.1	0.1	1.1	0.4	0.2	0.1	0.5	0.3	0.0	1.3	2.5	0.1
Sep 17-24	0.1	0.0	0.5	0.0	0.0	0.4	1.1	0.2	0.0	0.7	0.4	0.0
Sep 24-Oct 1	0.0	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Oct 1-8	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Oct 8-15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct 15-22	--	--	0.0	0.0	--	--	0.0	0.0	--	--	0.0	0.0
Oct 22-29	--	--	0.0	0.0	--	--	0.0	0.0	--	--	0.0	0.0
TOTALS	73.3	15.0	96.6	28.1	87.6	55.6	333.8	37.2	74.1	18.1	77.4	23.5

JAMES RIVER

Dates Exposed**	Deepwater Shoal			
	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0
Jun 25-Jul 2	2.6	0.0	0.0	0.0
Jul 2-9	3.5	0.3	0.0	0.0
Jul 9-16	12.0	0.8	9.0	0.0
Jul 16-23	21.5	0.7	17.9	0.0
Jul 23-30	9.4	2.4	7.8	0.3
Jul 30-Aug 6	2.5	2.2	6.4	0.1
Aug 6-13	6.1	1.9	9.2	0.0
Aug 13-20	2.8	0.4	0.2	0.3
Aug 20-27	3.9	0.3	7.7	1.0
Aug 27-Sep 3	1.5	2.2	0.6	1.0
Sep 3-10	0.1	0.5	2.2	0.0
Sep 10-17	0.3	0.1	0.5	0.0
Sep 17-24	0.1	0.0	0.5	0.0
Sep 24-Oct 1	0.0	0.0	0.0	0.0
Oct 1-8	0.1	0.0	0.0	0.0
Oct 8-15	0.0	0.0	0.0	0.0
Oct 15-22	--	--	0.0	0.0
Oct 22-29	--	--	0.0	0.0
	-----	-----	-----	-----
TOTALS	66.4	11.8	62.0	2.7

Dates Exposed**	YORK RIVER				WARE RIVER				EAST RIVER			
	VIMS Ferry Pier				Off Wilson's Creek Station 12				Mouth Station 6			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	--	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	--	--	0.0	0.0	0.8	0.0	0.0	0.0	0.5	0.1	0.0	0.4
Jul 2-9	0.1	0.3	0.2	0.0	5.6	20.1	0.1	0.1	2.8	1.7	3.5	0.3
Jul 9-16	0.0	1.3	0.1	0.0	0.1	2.2	0.1	1.2	2.2	0.6	0.5	1.1
Jul 16-23	0.0	0.9	0.0	0.0	0.8	0.3	0.1	31.4	10.3	5.7	1.2	3.6
Jul 23-30	0.2	0.5	0.0	0.1	89.4	0.8	0.7	2.0	3.6	6.1	2.7	3.6
Jul 30-Aug 6	0.0	0.2	0.1	0.1	40.0	0.3	0.9	0.7	2.6	2.3	2.5	1.2
Aug 6-13	0.3	1.6	0.0	0.2	11.2	0.8	7.0	0.1	5.5	0.5	6.5	0.3
Aug 13-20	0.9	3.7	0.0	0.6	17.0	0.1	0.0	0.2	67.3	11.8	0.7	1.0
Aug 20-27	1.6	0.3	0.1	0.6	2.0	0.0	0.2	2.6	3.6	2.0	1.1	2.0
Aug 27-Sep 3	0.6	1.8	0.6	0.3	3.8	0.0	0.3	0.6	1.9	1.0	1.0	0.5
Sep 3-10	0.0	2.8	1.5	0.0	1.0	0.0	1.0	0.3	0.1	1.0	0.6	0.1
Sep 10-17	0.4	1.4	2.4	0.3	0.0	0.0	0.6	0.0	0.1	0.7	4.1	0.0
Sep 17-24	--	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	1.4	0.0
Sep 24-Oct 1	1.4	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.0
Oct 1-8	0.8	0.0	0.5	0.0	0.0	--	0.0	0.1	0.1	--	0.0	0.0
Oct 8-15	0.1	0.0	0.0	0.0	0.0	--	0.0	--	0.0	--	0.0	0.0
Oct 15-22	0.0	0.1	0.0	0.0	--	--	--	--	--	--	--	--
Oct 22-29	--	0.1	0.0	--	--	--	--	--	--	--	--	--
Oct 29-Nov 5	--	0.1	--	--	--	--	--	--	--	--	--	--
TOTALS	6.4	15.1	6.2	2.2	171.9	24.6	11.0	39.3	100.6	33.9	26.8	14.1

Dates Exposed**	PEPPER CREEK				MOBJACK BAY							
	Mouth				Off Brown's Bay				Tow Stake			
	Station 7				Station 14				Station 13			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	0.1	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.0
Jul 2-9	0.6	0.1	0.0	0.0	0.3	0.9	0.2	0.0	3.0	17.5	0.9	0.0
Jul 9-16	0.3	0.4	6.5	0.0	1.1	1.2	0.7	0.0	0.4	12.5	1.4	0.3
Jul 16-23	0.0	1.8	1.8	0.3	0.7	3.5	1.9	1.0	0.0	7.3	0.5	2.6
Jul 23-30	10.9	2.8	1.6	0.2	0.0	1.5	1.0	0.5	0.0	2.7	1.2	5.4
Jul 30-Aug 6	1.3	5.9	1.2	2.1	0.3	5.8	1.0	0.1	3.0	9.5	1.9	2.9
Aug 6-13	0.8	0.6	0.8	4.9	2.8	0.8	3.5	0.4	77.5	0.5	6.4	0.5
Aug 13-20	2.6	10.0	1.0	1.3	2.7	4.7	0.0	0.0	9.4	5.8	0.5	0.0
Aug 20-27	0.3	5.6	0.7	5.7	1.5	5.4	0.4	1.5	1.3	1.5	0.5	1.8
Aug 27-Sep 3	1.4	6.5	0.2	0.3	0.2	2.3	1.0	0.0	0.9	1.0	0.3	0.0
Sep 3-10	0.7	3.6	21.8	2.8	0.1	6.2	30.5	0.7	0.7	0.1	1.6	0.7
Sep 10-17	0.7	3.0	47.8	0.7	0.2	1.4	31.3	0.2	0.1	1.8	2.9	0.0
Sep 17-24	0.5	5.1	3.5	0.0	0.8	1.0	0.6	0.2	1.5	0.2	0.6	0.0
Sep 24-Oct 1	0.0	0.6	0.2	0.0	0.2	0.9	--	0.0	0.0	0.2	0.0	0.0
Oct 1-8	0.3	--	0.2	0.0	0.0	--	--	0.0	0.1	--	0.1	0.1
Oct 8-15	0.1	--	0.2	--	0.4	--	--	--	0.0	--	0.0	--
Oct 15-22	--	--	--	--	--	--	--	--	--	--	--	--
Oct 22-29	--	--	--	--	--	--	--	--	--	--	--	--
TOTALS	20.6	46.1	87.5	18.3	11.3	36.0	71.1	4.6	98.3	60.6	18.8	14.3

Dates Exposed**	PIANKATANK RIVER Burton Point Station G				PIANKATANK RIVER Three Branches Station D			
	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.1	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	0.0	0.3	0.0	0.0	0.1	0.7	0.0	0.0
Jul 2-9	0.0	1.5	0.1	0.0	0.0	2.4	0.0	0.0
Jul 9-16	2.0	2.4	0.1	0.2	5.2	5.2	0.0	0.0
Jul 16-23	5.2	1.4	0.0	12.1	10.9	1.3	6.9	1.8
Jul 23-30	8.4	1.1	9.3	1.3	6.9	0.3	3.1	2.1
Jul 30-Aug 6	20.7	0.8	3.9	9.6	1.7	1.6	6.6	1.6
Aug 6-13	12.3	0.7	1.1	9.5	7.3	28.6	0.4	9.4
Aug 13-20	4.0	0.6	1.7	5.0	1.4	1.9	1.2	1.7
Aug 20-27	2.0	0.7	1.6	0.5	0.6	1.4	1.2	0.6
Aug 27-Sep 3	0.0	14.0	0.9	0.4	0.2	0.5	2.0	0.0
Sep 3-10	0.0	0.5	4.2	0.1	0.1	0.8	4.2	0.2
Sep 10-17	0.0	0.1	4.0	0.1	0.1	0.0	1.4	0.2
Sep 17-24	0.0	0.0	0.2	0.0	0.0	0.1	0.2	0.0
Sep 24-Oct 1	0.1	0.0	0.0	0.0	0.6	0.0	0.0	0.0
Oct 1-8	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Oct 8-15	--	--	0.0	0.0	--	--	0.0	0.0
Oct 15-22	--	--	--	--	--	--	--	--
Oct 22-29	--	--	--	--	--	--	--	--
TOTALS	54.7	24.2	27.1	38.8	35.5	44.8	27.2	17.6

Dates Exposed**	PIANKATANK RIVER Palace Bar Station J				PIANKATANK RIVER Ginney Point Station K			
	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.1	0.0	0.0
Jun 25-Jul 2	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.0
Jul 2-9	0.0	3.4	0.4	0.0	0.0	3.2	0.3	0.0
Jul 9-16	6.3	6.4	0.4	0.4	4.4	6.2	0.2	0.4
Jul 16-23	12.6	4.0	1.0	9.2	21.0	15.1	2.5	0.3
Jul 23-30	46.8	1.7	24.3	25.5	2.5	4.2	34.9	65.6
Jul 30-Aug 6	2.9	9.6	89.3	12.3	2.7	11.0	67.3	19.6
Aug 6-13	9.2	23.7	2.6	1.5	2.9	0.8	7.5	4.8
Aug 13-20	3.0	4.5	1.2	3.8	3.6	6.6	1.4	7.4
Aug 20-27	1.0	2.1	1.2	2.2	--	2.1	1.3	11.2
Aug 27-Sep 3	0.5	6.5	6.7	3.4	--	9.1	15.8	3.6
Sep 3-10	0.5	0.7	17.8	0.2	--	0.5	35.8	3.1
Sep 10-17	0.0	0.5	0.3	0.1	--	0.3	2.2	3.1
Sep 17-24	0.1	0.2	0.7	0.1	--	0.2	2.2	3.1
Sep 24-Oct 1	0.2	0.0	0.2	0.5	0.1	0.0	0.1	2.6
Oct 1-8	0.2	0.0	0.0	0.5	0.1	0.0	0.0	1.8
Oct 8-15	--	--	0.1	0.0	--	--	0.0	--
Oct 15-22	--	--	--	--	--	--	--	--
Oct 22-29	--	--	--	--	--	--	--	--
TOTALS	83.3	63.4	146.2	59.7	37.3	59.5	171.7	126.6

GREAT WICOMICO RIVER

Dates Exposed**	Dameron Marsh Station a				Cranes Creek Station b				Fleet Point Station c			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
Jul 2-9	0.4	2.6	0.0	0.0	0.2	1.9	0.0	0.0	0.2	0.2	0.0	0.0
Jul 9-16	0.4	0.4	0.0	0.3	1.1	2.3	0.0	0.0	0.2	1.5	0.0	0.0
Jul 16-23	1.8	8.2	0.0	0.0	2.6	8.9	0.0	0.0	0.4	4.5	0.0	0.1
Jul 23-30	0.2	6.4	0.0	0.0	1.2	19.3	0.0	0.0	0.1	0.7	0.1	0.0
Jul 30-Aug 6	0.0	4.5	0.0	0.1	0.0	10.1	0.3	0.1	0.2	2.5	0.1	0.1
Aug 6-13	0.0	0.7	0.0	0.4	0.0	1.0	0.0	0.3	0.0	1.2	0.4	0.1
Aug 13-20	0.4	6.9	0.6	0.0	0.0	12.9	0.7	0.2	0.0	18.8	0.0	0.7
Aug 20-27	0.2	0.9	0.5	0.0	0.0	8.3	0.0	0.0	1.0	5.3	1.6	0.5
Aug 27-Sep 3	0.0	3.4	9.2	0.0	0.1	3.8	1.9	0.2	0.0	9.4	14.3	0.0
Sep 3-10	0.0	1.7	0.0	0.0	0.1	1.4	0.3	0.0	0.0	4.9	11.3	0.2
Sep 10-17	0.0	0.3	2.4	0.1	0.1	0.1	2.5	0.5	0.0	1.6	14.3	0.0
Sep 17-24	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	1.1	0.2	0.0
Sep 24-Oct 1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.2	1.1	0.4	0.0
Oct 1-8	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Oct 8-15	--	--	0.0	0.0	--	--	0.0	0.0	--	--	0.0	0.0
Oct 15-22	--	--	--	--	--	--	--	--	--	--	--	--
Oct 22-29	--	--	--	--	--	--	--	--	--	--	--	--
TOTALS	3.4	36.1	12.7	0.9	5.5	72.6	6.7	1.3	2.3	53.4	42.7	1.7

GREAT WICOMICO RIVER

Dates Exposed**	Whaley Flats Station b				Haynie Point Station e				Shell Bar Station f			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	---	0.0	0.0	0.0	---	0.0	0.0	0.0	---	0.1	0.0	0.0
Jun 25-Jul 2	0.0	0.2	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.6	0.0	0.0
Jul 2-9	0.2	2.3	0.0	0.0	0.2	16.2	0.0	0.0	0.0	25.1	0.0	0.0
Jul 9-16	0.0	1.8	0.0	0.0	1.9	3.8	0.0	0.0	2.2	3.9	0.0	0.5
Jul 16-23	0.9	12.4	0.0	0.0	19.2	13.9	0.0	0.2	16.5	18.9	0.0	2.3
Jul 23-30	0.7	3.5	0.0	0.0	3.8	10.9	0.0	0.0	30.7	10.3	0.0	0.9
Jul 30-Aug 6	0.0	2.9	0.0	0.0	0.0	8.0	0.1	0.0	0.0	47.8	0.0	0.2
Aug 6-13	0.0	0.3	0.0	0.1	0.0	6.6	0.1	0.0	0.0	6.4	0.0	0.1
Aug 13-20	0.2	5.3	0.0	0.1	0.0	2.6	0.4	0.1	0.0	1.6	0.9	0.1
Aug 20-27	0.7	1.2	0.2	0.2	0.1	7.9	0.1	0.0	0.0	5.2	1.1	0.5
Aug 27-Sep 3	0.0	3.3	2.0	0.0	0.1	10.0	2.6	0.0	0.3	0.3	23.3	0.6
Sep 3-10	0.0	2.7	0.0	0.0	0.0	1.7	5.0	0.2	0.4	0.1	8.0	0.0
Sep 10-17	0.1	0.3	2.0	0.0	0.0	1.3	4.5	0.2	0.2	0.0	23.0	0.3
Sep 17-24	0.0	0.3	0.0	0.0	0.0	0.3	0.1	0.0	0.1	2.7	1.2	0.2
Sep 24-Oct 1	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.2
Oct 1-8	---	0.0	0.0	---	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.0
Oct 8-15	---	---	0.0	---	---	---	0.0	0.0	---	---	0.0	0.0
Oct 15-22	---	---	0.0	---	---	---	0.0	0.0	---	---	0.0	0.0
TOTALS	2.8	36.5	4.2	0.4	25.3	85.7	12.9	0.7	50.3	124.3	57.7	5.9

GREAT WICOMICO RIVER

Dates Exposed**	Hudnall's Dock Station f				Glebe Point Station g			
	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.0	--	0.0
Jun 25-Jul 2	0.0	21.9	0.0	0.0	0.0	76.2	0.0	0.0
Jul 2-9	0.5	9.5	0.0	0.0	0.3	49.8	0.0	0.0
Jul 9-16	1.0	11.0	0.0	0.1	0.7	11.1	0.0	0.1
Jul 16-23	22.3	20.7	0.0	0.7	18.8	24.7	0.0	0.2
Jul 23-30	6.0	23.5	0.0	0.6	62.2	61.8	0.0	1.3
Jul 30-Aug 6	0.3	16.0	0.0	0.6	31.1	123.0	0.0	0.2
Aug 6-13	0.0	8.5	0.0	0.4	0.0	3.3	0.0	0.3
Aug 13-20	0.0	13.3	0.5	0.3	0.0	3.9	0.0	0.0
Aug 20-27	0.0	3.6	0.0	0.1	0.0	4.3	0.0	0.1
Aug 27-Sep 3	0.1	8.6	2.1	0.3	0.1	5.3	0.3	0.0
Sep 3-10	0.3	1.1	9.8	0.0	1.6	0.8	0.2	0.0
Sep 10-17	0.1	0.3	3.8	0.0	3.4	0.0	0.1	0.0
Sep 17-24	0.0	2.0	0.1	0.2	1.8	0.5	0.0	0.0
Sep 24-Oct 1	0.0	1.0	0.0	0.0	0.2	0.3	0.0	0.0
Oct 1-8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct 8-15				0.0			0.0	0.0
TOTALS	30.6	141.0	16.3	3.3	120.2	365.0	0.6	2.2

Dates Exposed**	POTOMAC RIVER											
	Cornfield				Jones Shore				Great Neck			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul 2-9	2.0	0.2	0.0	0.0	1.3	0.2	0.0	0.0	0.3	0.0	0.0	0.0
Jul 9-16	1.0	0.2	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Jul 16-23	0.0	0.4	0.0	0.1	2.0	0.3	0.0	0.2	0.1	0.0	0.0	0.0
Jul 23-30	0.0	0.3	0.0	0.0	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.0
Jul 30-Aug 6	0.0	4.8	0.0	0.0	0.0	1.6	0.2	0.0	0.0	0.2	0.0	0.0
Aug 6-13	1.3	7.9	0.0	0.0	3.8	4.1	0.0	0.3	0.0	0.2	0.0	0.0
Aug 13-20	7.9	12.2	0.0	0.0	1.6	5.7	0.0	0.0	0.0	0.0	0.0	0.0
Aug 20-27	7.9	66.9	0.4	0.1	1.6	45.8	0.2	0.0	0.0	0.9	0.0	0.0
Aug 27-Sep 3	3.9	117.3	3.0	0.0	2.5	177.8	0.0	0.1	0.0	0.7	1.4	0.0
Sep 3-10	0.0	21.1	5.7	0.0	0.1	12.2	3.1	0.0	0.0	1.0	0.2	0.0
Sep 10-17	2.0	6.4	9.0	0.0	0.0	68.8	6.3	0.0	0.0	0.0	0.2	0.0
Sep 17-24	0.6	7.2	3.1	0.0	1.8	62.6	3.8	0.0	0.0	0.0	0.0	0.0
Sep 24-Oct 1	--	0.5	1.6	0.0	0.0	1.0	0.5	0.0	0.1	0.1	0.1	0.0
Oct 1-8	--	0.0	0.1	0.0	--	0.1	0.4	0.0	--	0.0	0.0	0.0
Oct 8-15	--	0.1	0.0	--	--	0.0	0.0	0.0	--	0.0	0.0	0.0
TOTALS	26.6	246.0	22.9	0.2	15.4	381.1	14.5	0.7	0.5	3.1	1.9	0.0

Dates Exposed**	POTOMAC RIVER											
	Coan				Hog Island				Thicket Point			
	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
Jun 18-25	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	0.0	0.0	0.0
Jun 25-Jul 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul 2-9	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul 9-16	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jul 16-23	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Jul 23-30	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0
Jul 30-Aug 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug 6-13	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.1
Aug 13-20	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Aug 20-27	0.0	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Aug 27-Sep 3	0.2	1.1	0.2	0.0	0.1	0.4	0.0	0.1	0.3	0.0	0.0	0.0
Sep 3-10	0.1	0.9	0.6	0.0	0.0	0.3	1.0	0.1	0.0	1.1	0.1	0.0
Sep 10-17	0.0	0.0	0.1	0.0	0.3	0.2	0.1	0.0	0.0	--	0.2	0.0
Sep 17-24	0.0	0.2	0.0	0.0	0.6	0.0	0.0	0.1	0.0	--	0.0	0.0
Sep 24-Oct 1	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.0	0.4	--	0.8	0.0
Oct 1-8	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	--	0.0	0.0
Oct 8-15	--	0.0	0.0	0.0	--	0.0	0.0	0.0	--	--	0.0	0.0
Oct 15-22												
TOTALS	0.3	4.2	0.9	0.0	1.7	1.9	1.5	0.3	0.9	1.8	1.1	0.1

EASTERN SHORE, SEASIDE
VIMS Pier at
Wachapreague

Dates Exposed**	1981	1982	1983	1984
Jun 18-25	--	--	0.0	0.0
Jun 25-Jul 2	1.0	--	0.0	0.0
Jul 2-9	0.5	--	0.5	0.1
Jul 9-16	1.2	0.9	2.0	0.3
Jul 16-23	2.2	4.9	23.1	0.0
Jul 23-30	--	2.1	12.5	0.0
Jul 30-Aug 6	1.4	4.9	33.0	1.7
Aug 6-13	0.1	19.7	1.6	0.8
Aug 13-20	0.0	13.2	1.1	2.2
Aug 20-27	0.1	4.7	2.6	5.1
Aug 27-Sep 3	0.0	0.4	2.7	15.2
Sep 3-10	0.0	0.4	30.7	24.8
Sep 10-17	0.0	1.5	9.9	4.4
Sep 17-24	0.0	0.6	0.7	0.3
Sep 24-Oct 1	0.0	1.3	0.6	0.3
Oct 1-8	--	1.2	0.0	1.2
Oct 8-15	--	--	0.0	0.0
Oct 15-22	--	--	0.0	0.0
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TOTALS	6.5	55.8	121.0	56.4



WIMS

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Virginia Institute of Marine Science
Gloucester Point, VA 23062

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