

Reports

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1985

## Monthly reports on the State of Rivers 1985

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*Virginia Institute of Marine Science*

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Monthly Report on the State of Rivers - April 1985

Sponsored by

Virginia Institute of Marine Science

and

Virginia State Water Control Board

Summary of Field Surveys

(1) Slackwater Runs

James: Temperature, salinity and DO were measured in the saline portion of the river on April 24.

York and Pamunkey: Temperature, salinity and DO were measured in the saline portion of the river on April 25.

Rappahannock: Temperature, salinity and DO were measured in the saline portion of the river on April 18.

Salinity, temperature and DO distributions for all three rivers are attached.

(2) Crab-fish Joint Trawl Surveys - W. A. Van Engel

The trawl surveys were conducted on the following dates:

James: April 15

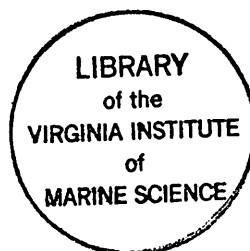
York and Pamunkey: April 11

Rappahannock: April 18

Surface and bottom temperature, salinity, DO and secchi depth were measured at designated stations.

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For further information make request to Dr. Albert Kuo, Virginia Institute of Marine Science, Gloucester Point, VA 23062, (804)642-7212.



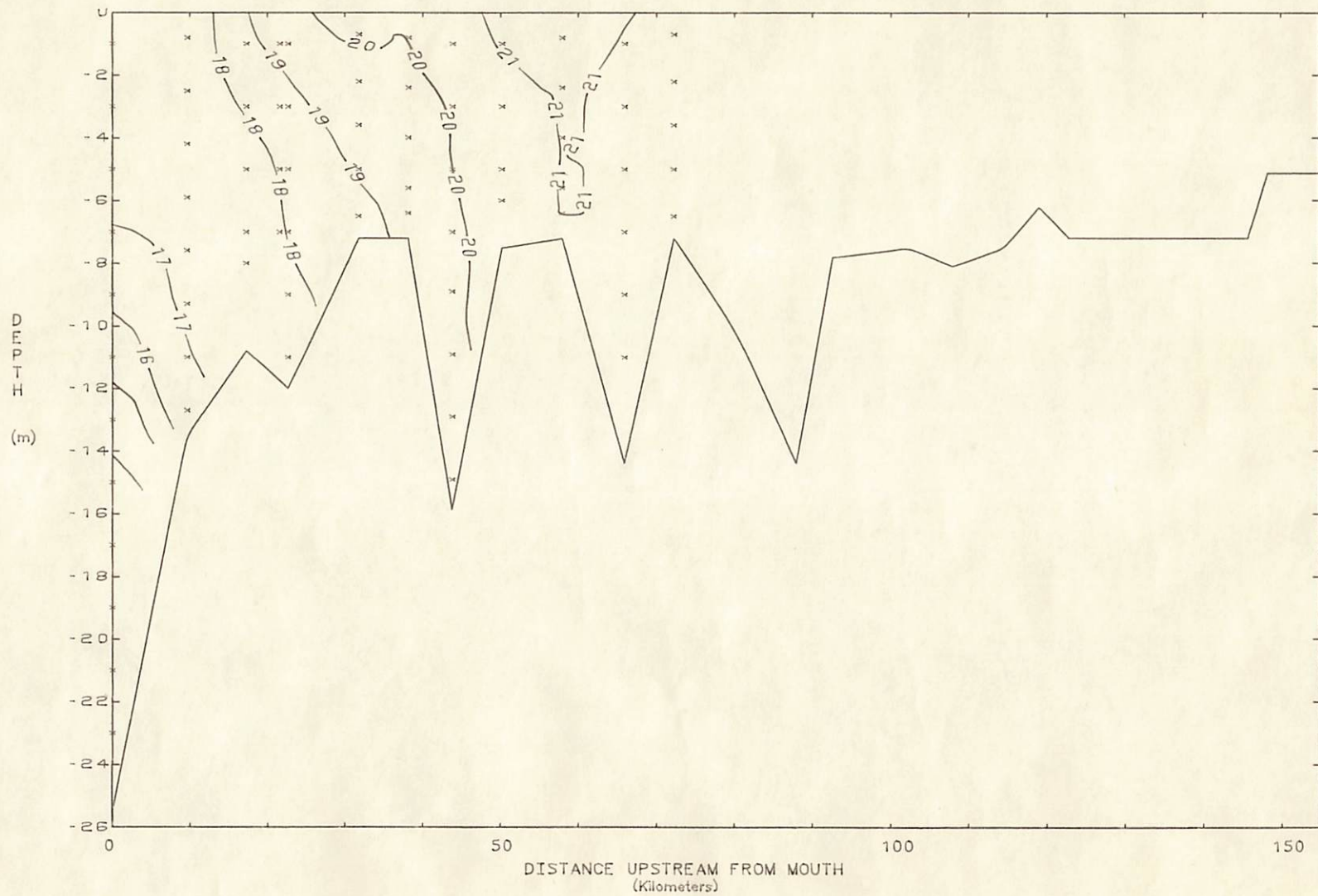
**Lesser Neap Tide****April 27****Comments on Slackwater Survey Data**

The salinity in all three rivers were higher than normal because of below-average precipitation. The limits of salt intrusion were 10 to 15 km further upstream than normal at this time of the year.

**Scheduled Surveys****(1) Slackwater Runs****James: May 22, June 19****York and Pamunkey: May 23, June 20****Rappahannock: May 17, June 14****(2) Crab-fish Joint Trawl Surveys - Dr. Austin****York River: June 7****James River: June 11****Rappahannock: June 13**

JAMES RIVER  
TEMPERATURE

24 APRIL 1985  
SLACK BEFORE FLOOD



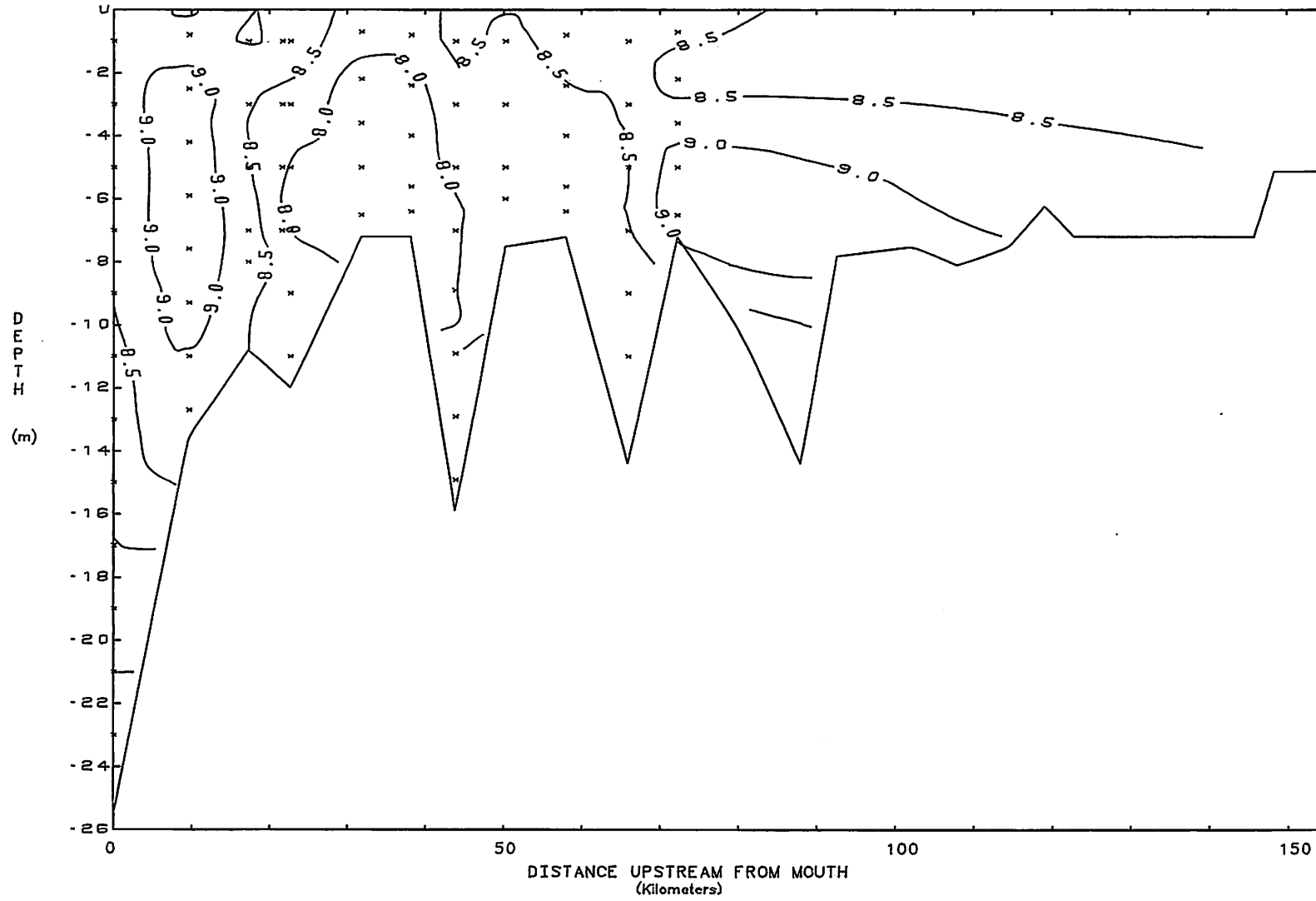
JAMES RIVER  
SALINITY

24 APRIL 1985  
SLACK BEFORE FLOOD



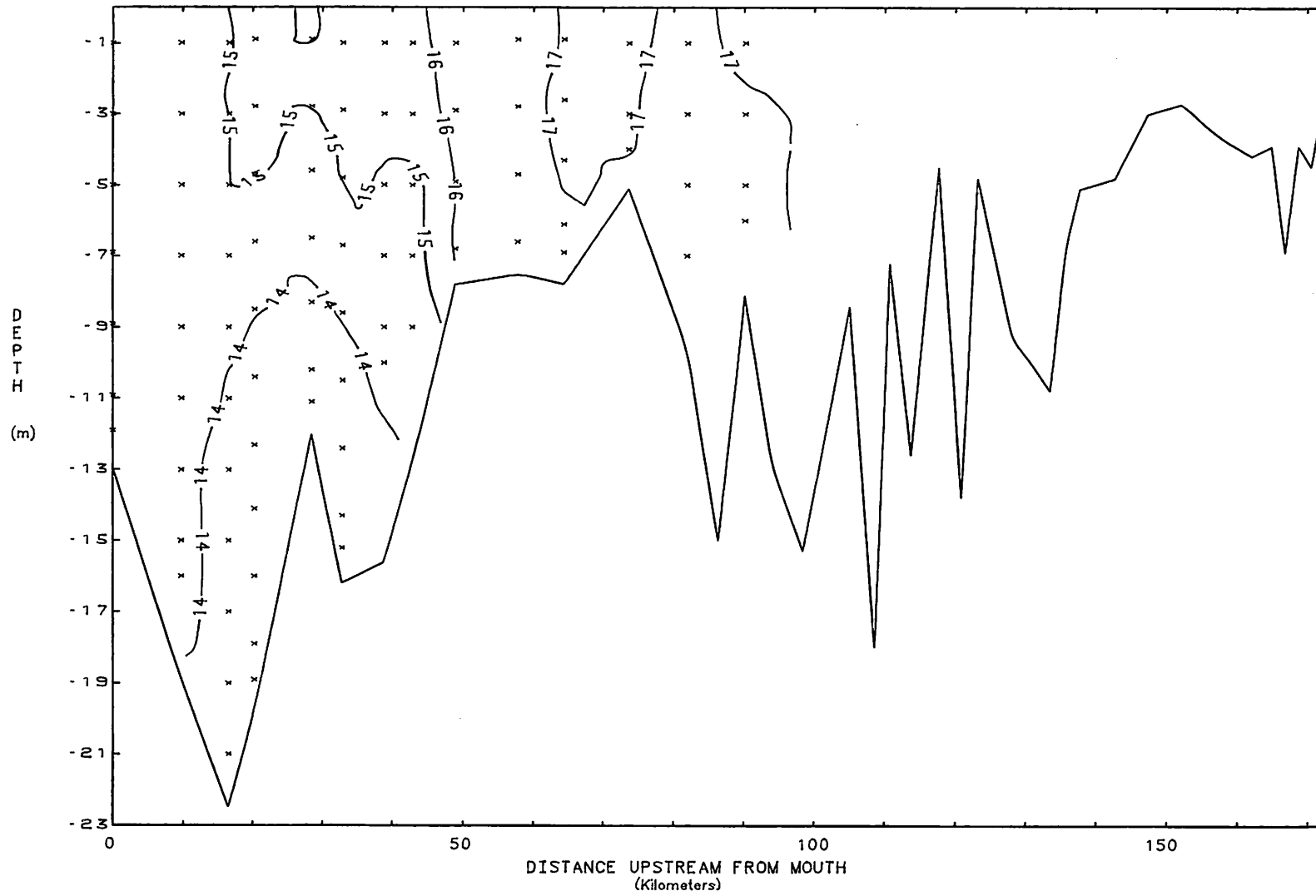
JAMES RIVER  
DISSOLVED OXYGEN

24 APRIL 1985  
SLACK BEFORE FLOOD



RAPPAHANNOCK RIVER  
TEMPERATURE

18 APRIL 1985  
SLACK BEFORE FLOOD





RAPPAHANNOCK RIVER  
SALINITY OXYGEN

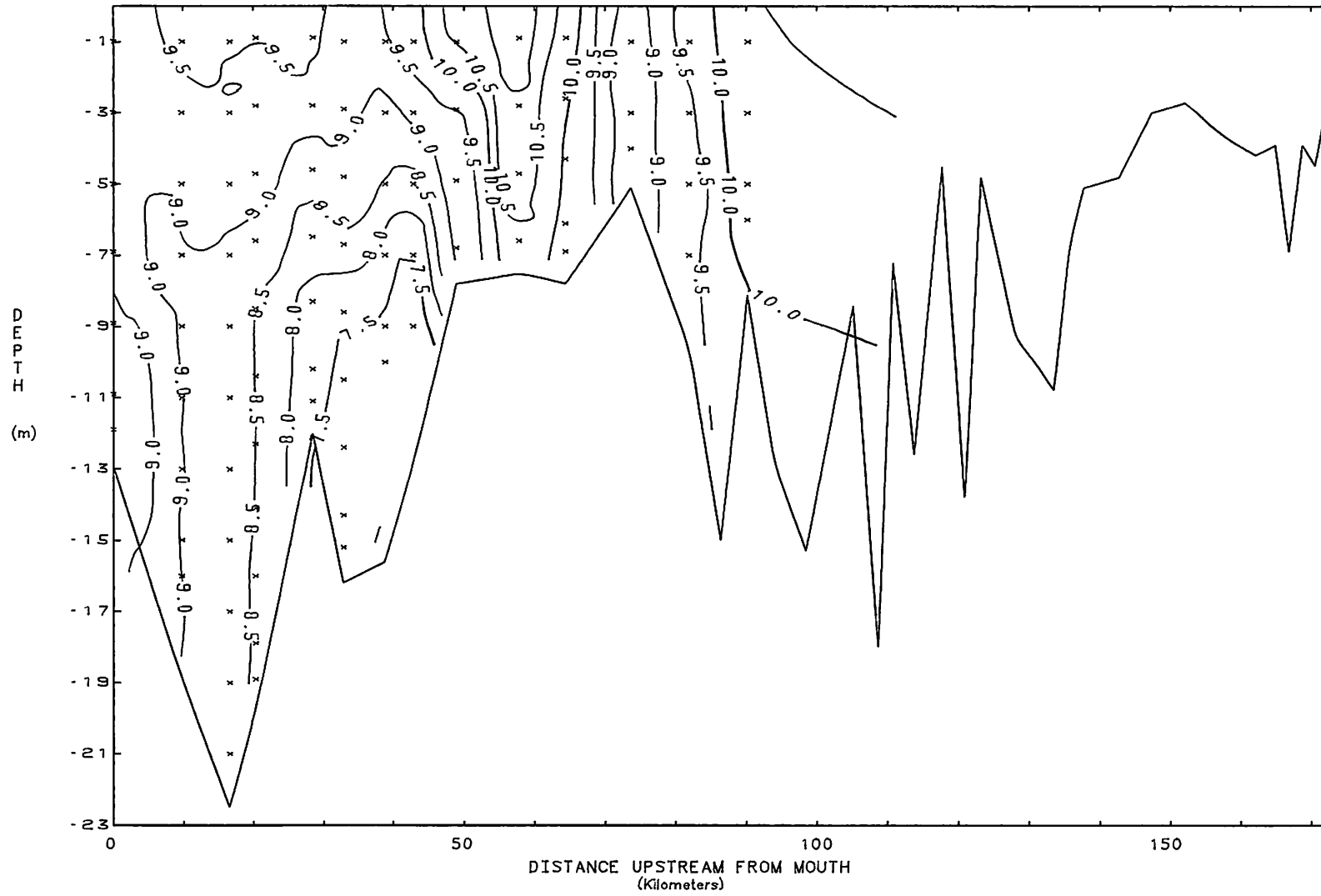
18 APRIL 1985  
SLACK BEFORE FLOOD





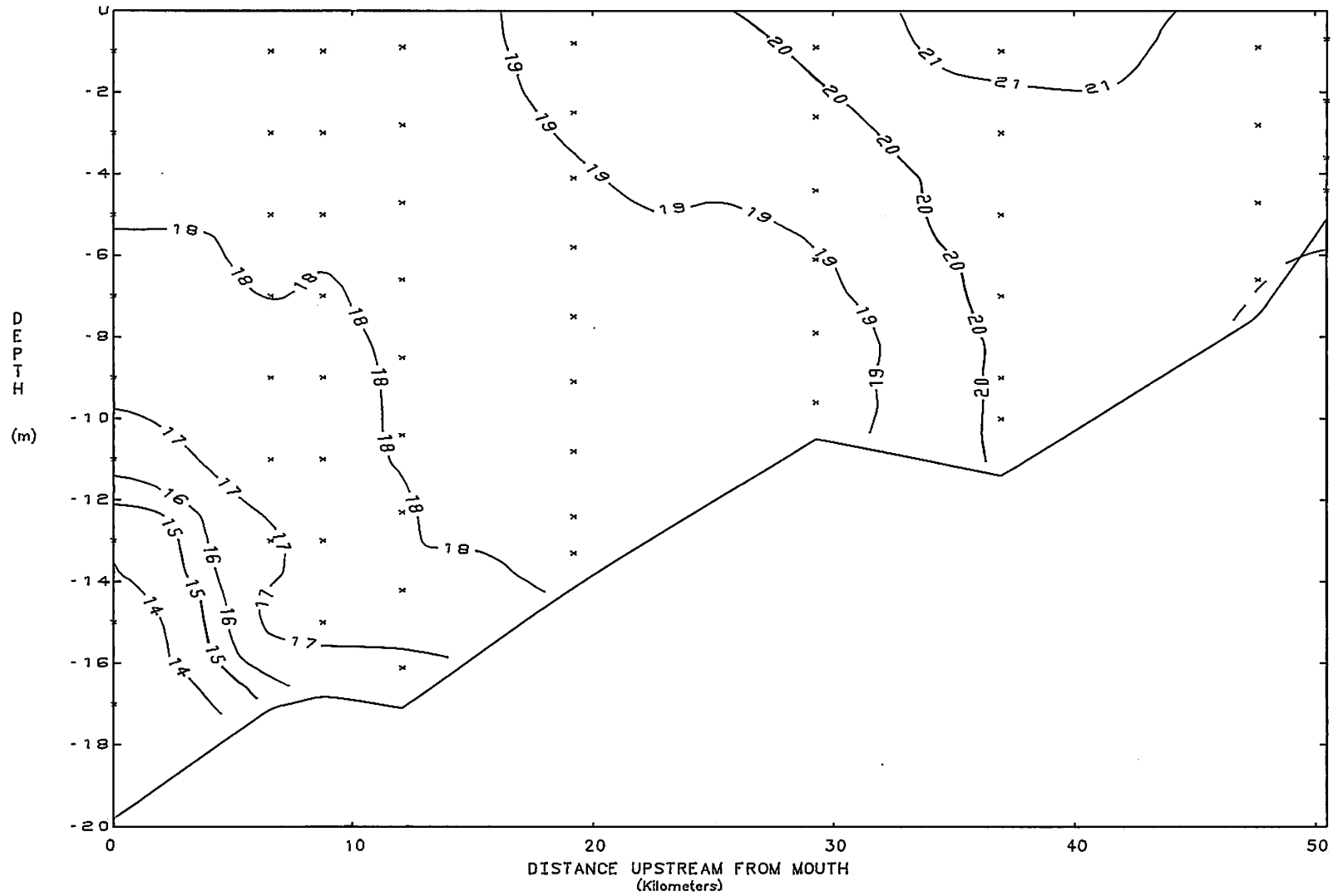
RAPPAHANNOCK RIVER  
DISSOLVED OXYGEN

18 APRIL 1985  
SLACK BEFORE FLOOD



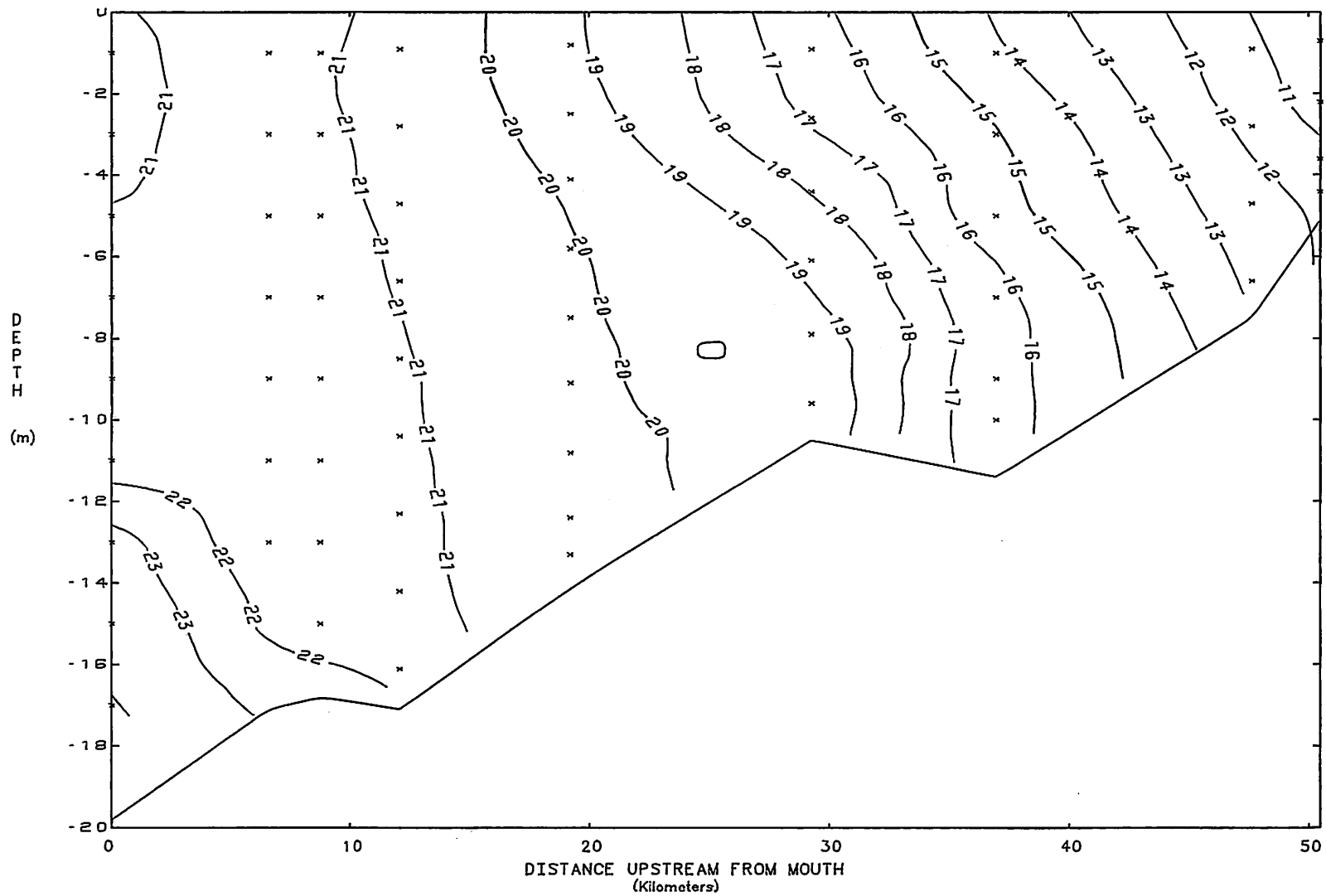
YORK RIVER  
TEMPERATURE

25 APRIL 1985  
SLACK BEFORE FLOOD



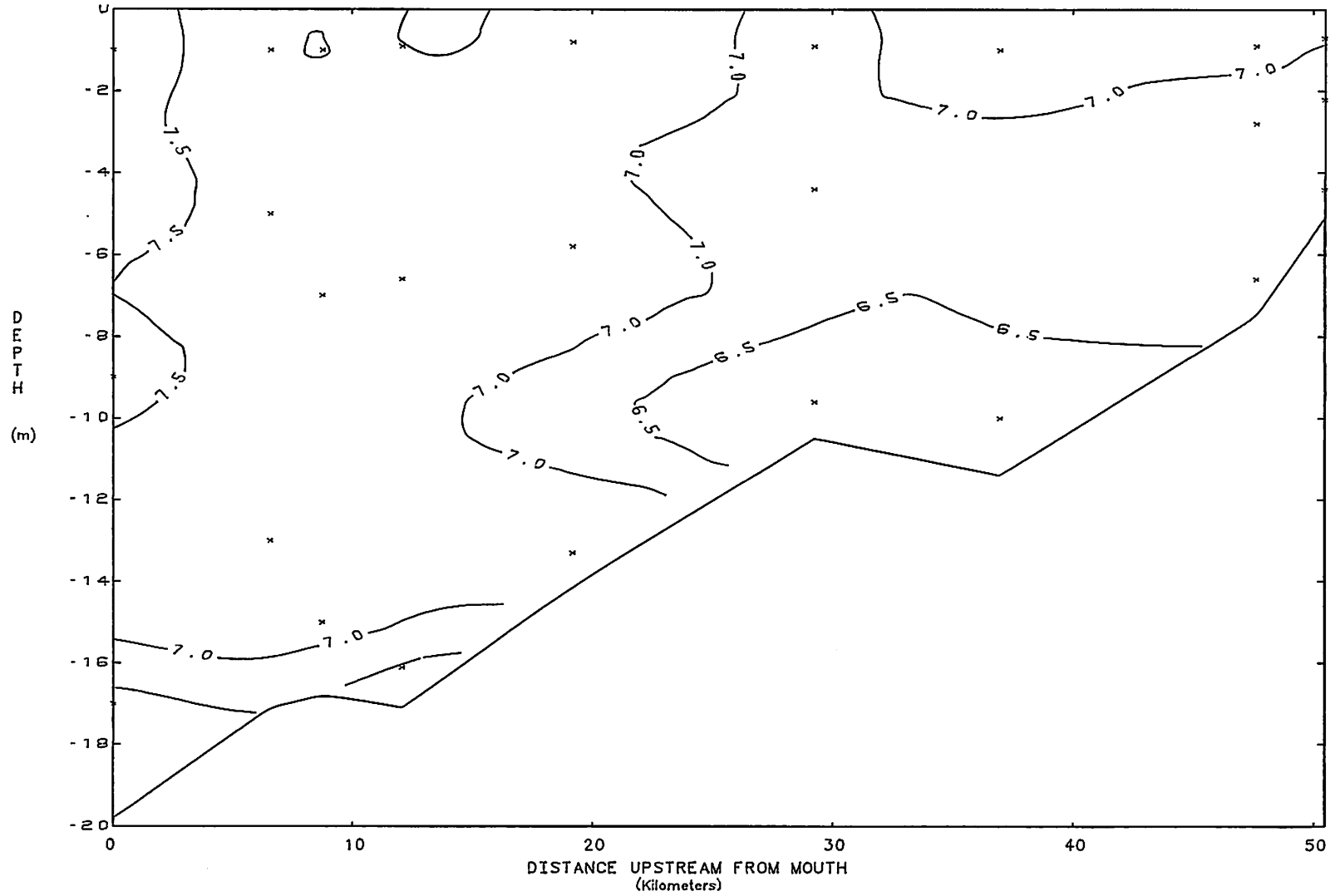
YORK RIVER  
SALINITY

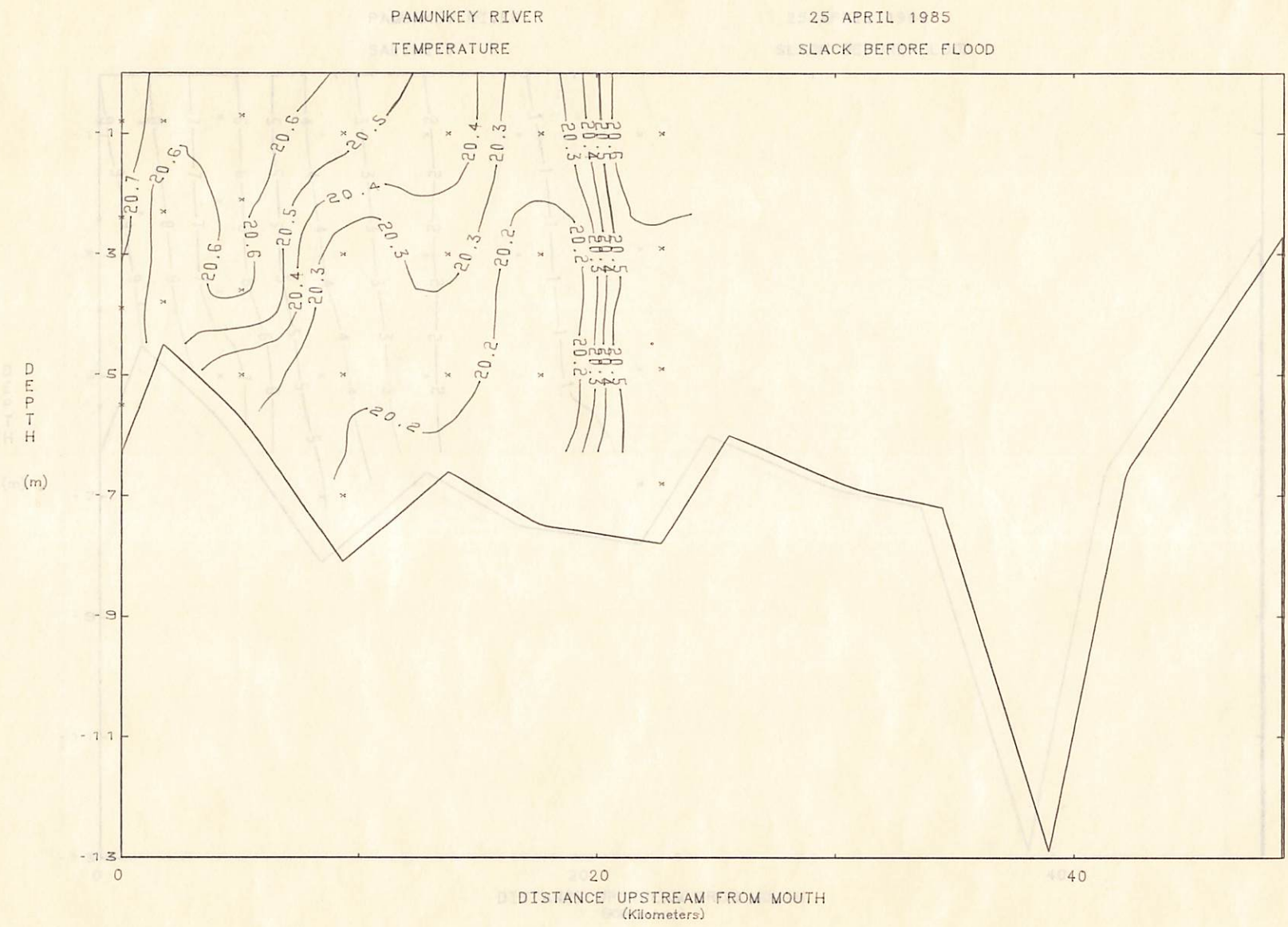
25 APRIL 1985  
SLACK BEFORE FLOOD



YORK RIVER  
DISSOLVED OXYGEN

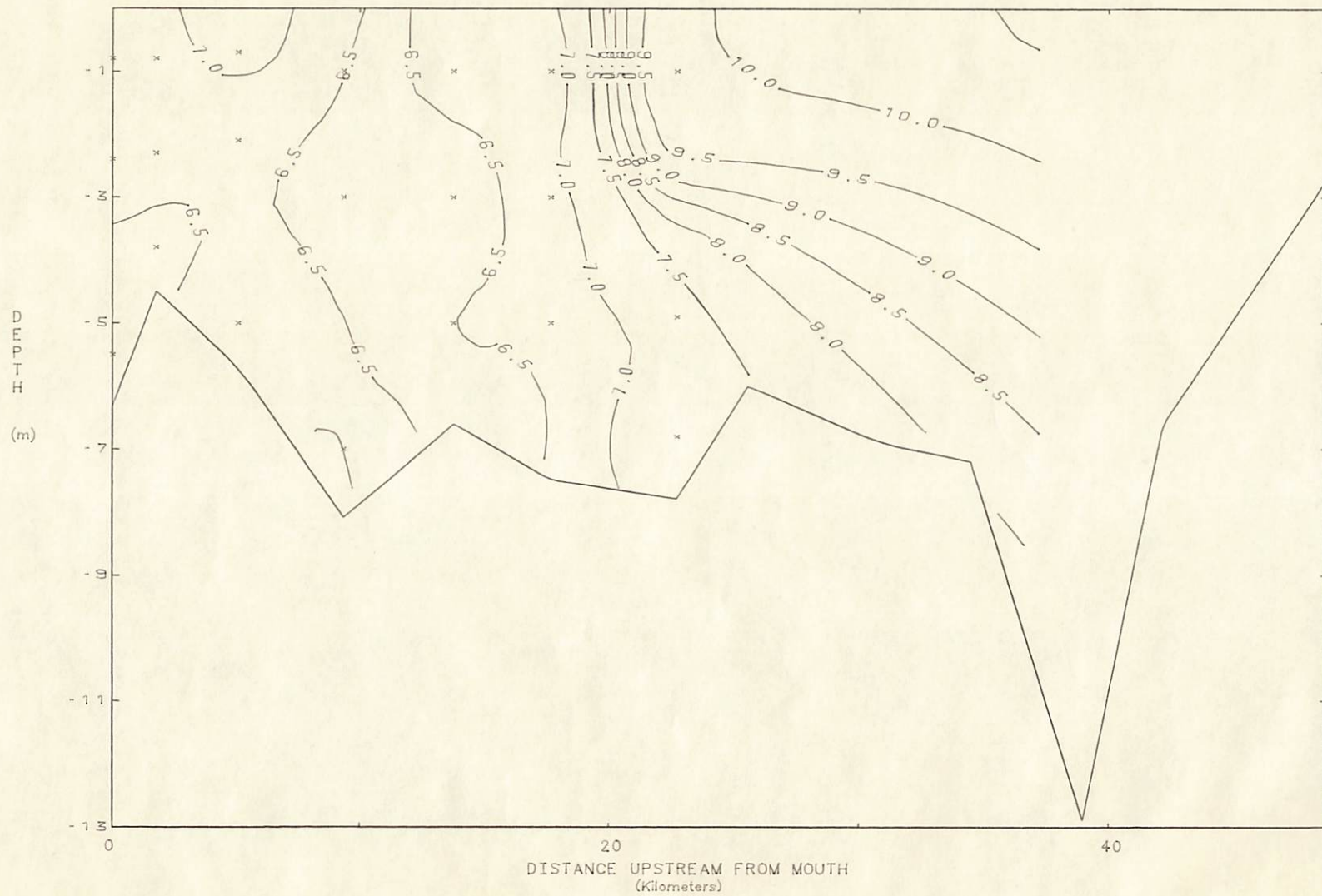
25 APRIL 1985  
SLACK BEFORE FLOOD





PAMUNKEY RIVER  
DISSOLVED OXYGEN

25 APRIL 1985  
SLACK BEFORE FLOOD



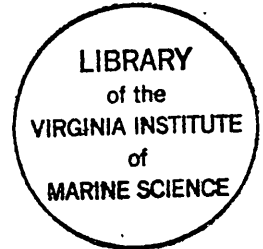
Monthly Report on the State of Rivers - May and June 1985

Sponsored by

Virginia Institute of Marine Science

and

Virginia State Water Control Board



Summary of Field Surveys

(1) Slackwater Runs

James: Temperature, salinity and DO were measured in the saline portion of the river on May 22 and June 19

York and Pamunkey: Temperature, salinity and DO were measured in the York on May 31 and throughout the saline portion of the river on June 20.

Rappahannock: Temperature, salinity and DO were measured in the saline portion of the river on May 16 and June 18.

Salinity, temperature and DO distributions for all three rivers are attached.

(2) Crab-fish Joint Trawl Surveys - W. A. Van Engel and H. Austin

The trawl surveys were conducted on the following dates:

James: May 14

York and Pamunkey: May 10, June 27

Rappahannock: May 16

Surface and bottom temperature, salinity, DO and secchi depth were measured at designated stations.

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For further information make request to Dr. Albert Kuo, Virginia Institute of Marine Science, Gloucester Point, VA 23062, (804)642-7212.



## Lesser Neap Tide

May 25, June 24

### Comments on Slackwater Survey Data

The salinity in the lower portions of estuaries continued to increase from April to June, which is normal for this season. However, the precipitation in late May and June prevented the limit of salt intrusion from moving further upriver.

The bottom hypoxia (low dissolved oxygen) began to appear in the lower Rappahannock in May, while it did not appear in the York until June. No bottom hypoxia was observed in the James. A pool of low DO water was observed around West Point in the York on May 31. The cause of this transient feature warrants investigation.

### Scheduled Surveys

#### (1) Slackwater Runs

James: August 15, September 17

York and Pamunkey: August 16, September 18

Rappahannock: August 14, September 16

#### (2) Crab-fish Joint Trawl Surveys - Dr. Austin

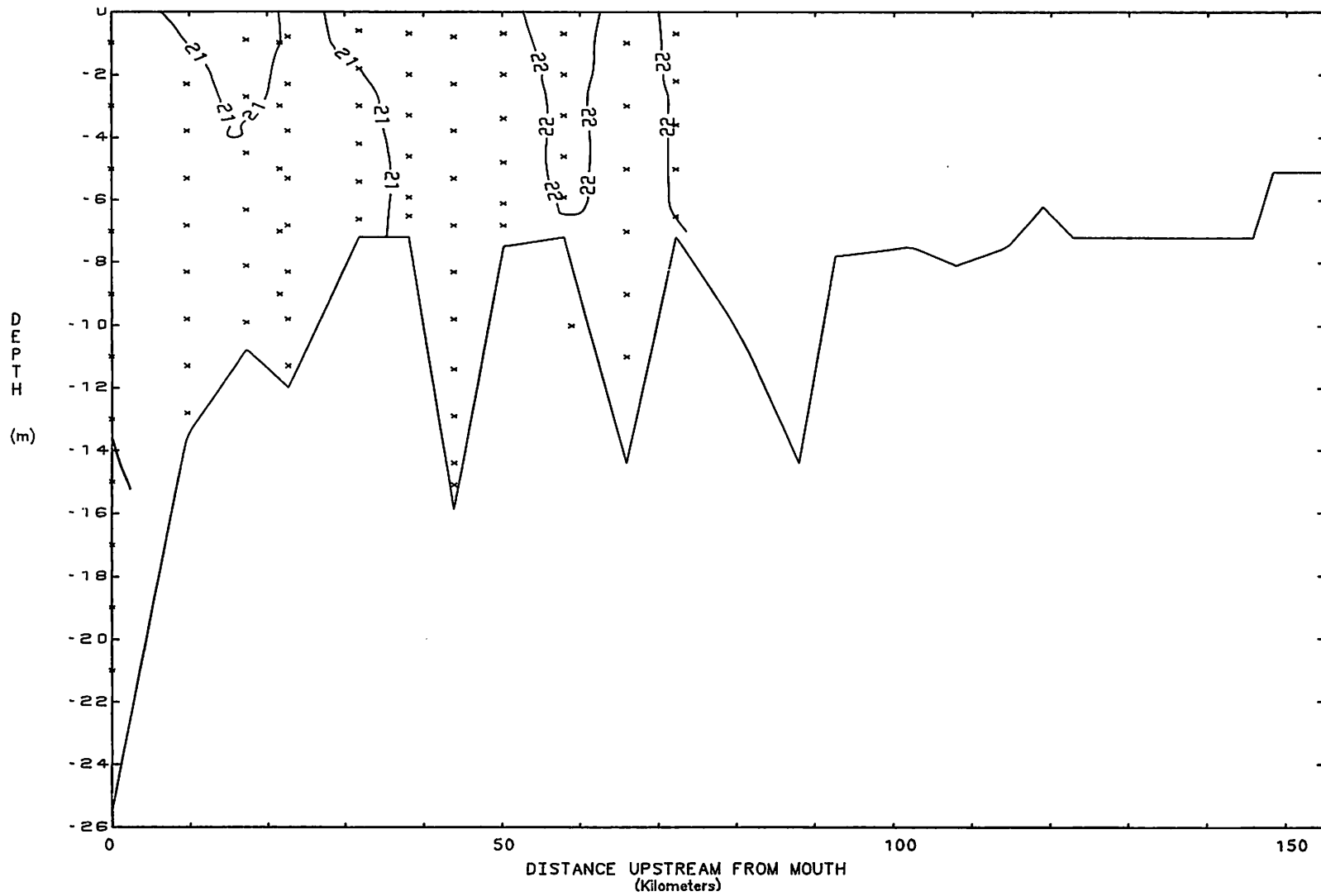
York River: August 16

James River: August 12

Rappahannock: August 22

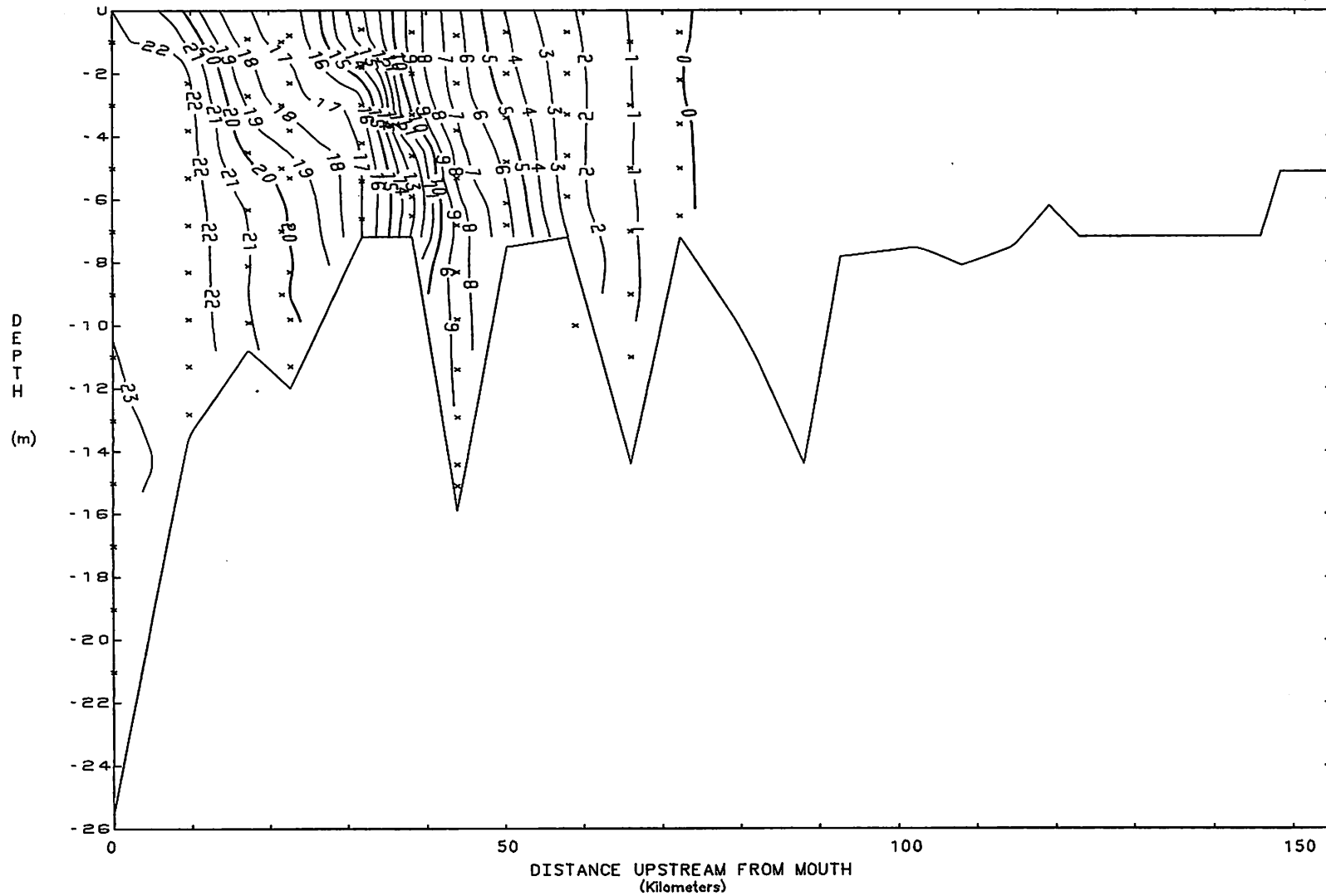
JAMES RIVER  
TEMPERATURE

22 MAY 1985  
SLACK BEFORE FLOOD



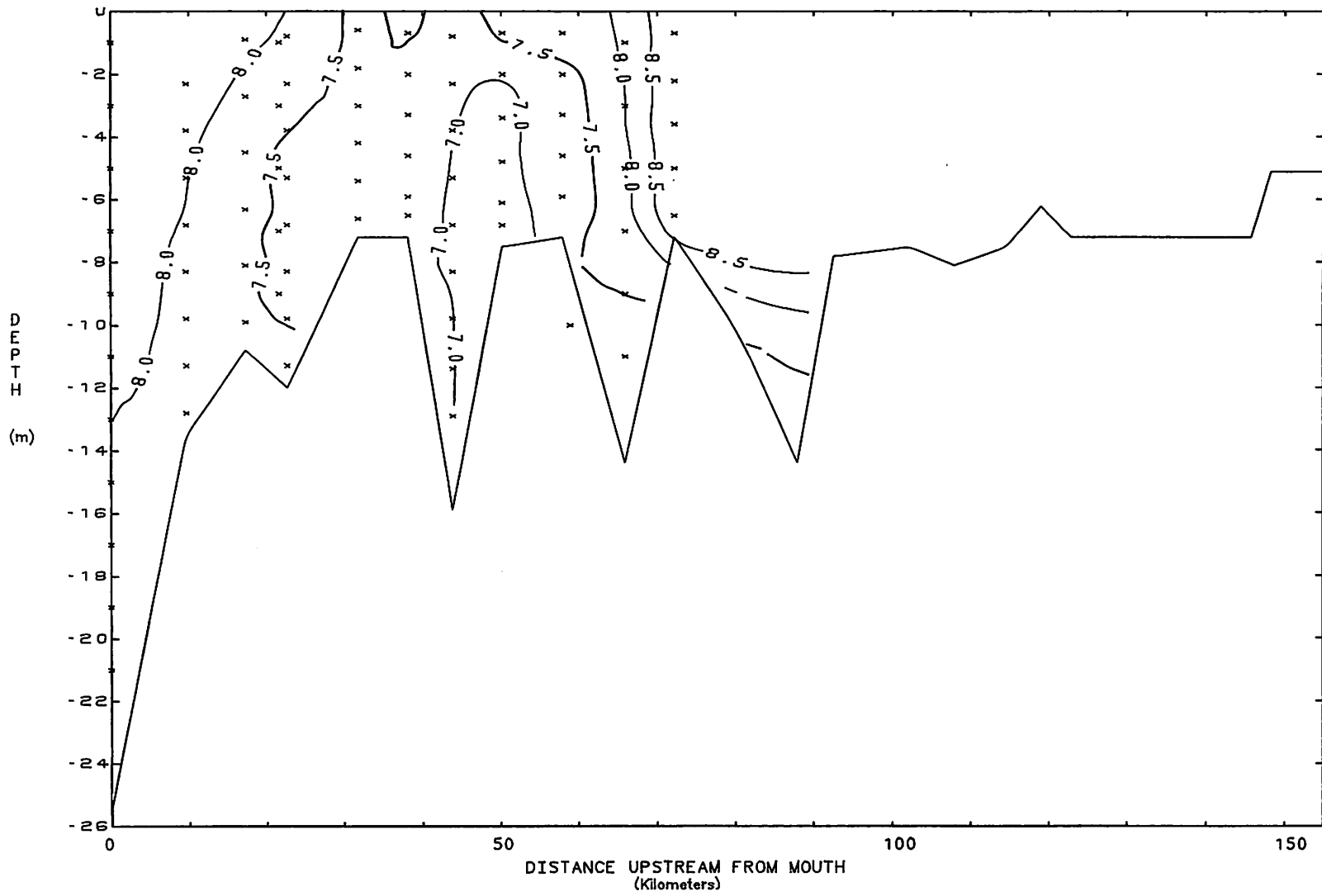
JAMES RIVER  
SALINITY

22 MAY 1985  
SLACK BEFORE FLOOD



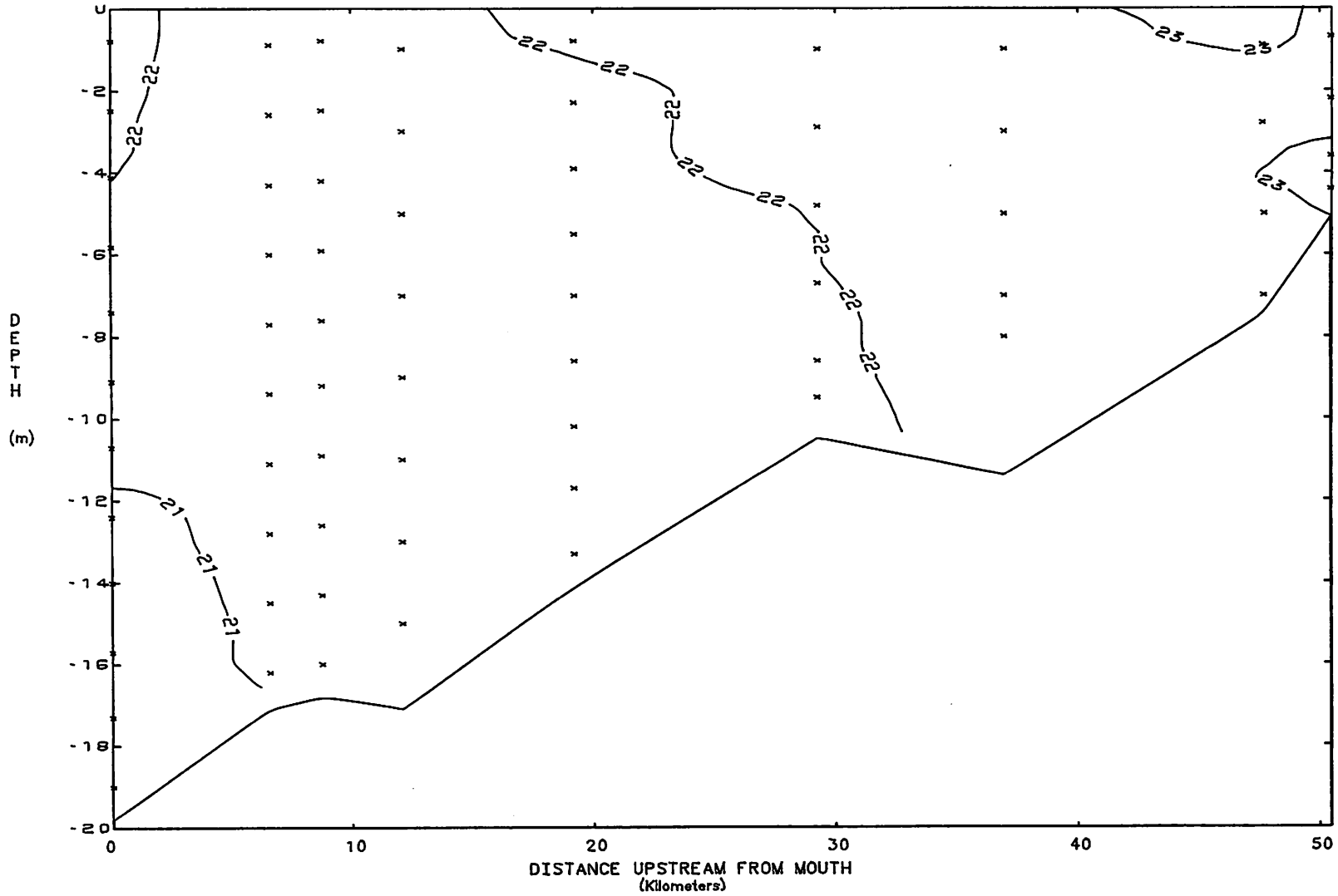
JAMES RIVER  
DISSOLVED OXYGEN

22 MAY 1985  
SLACK BEFORE FLOOD



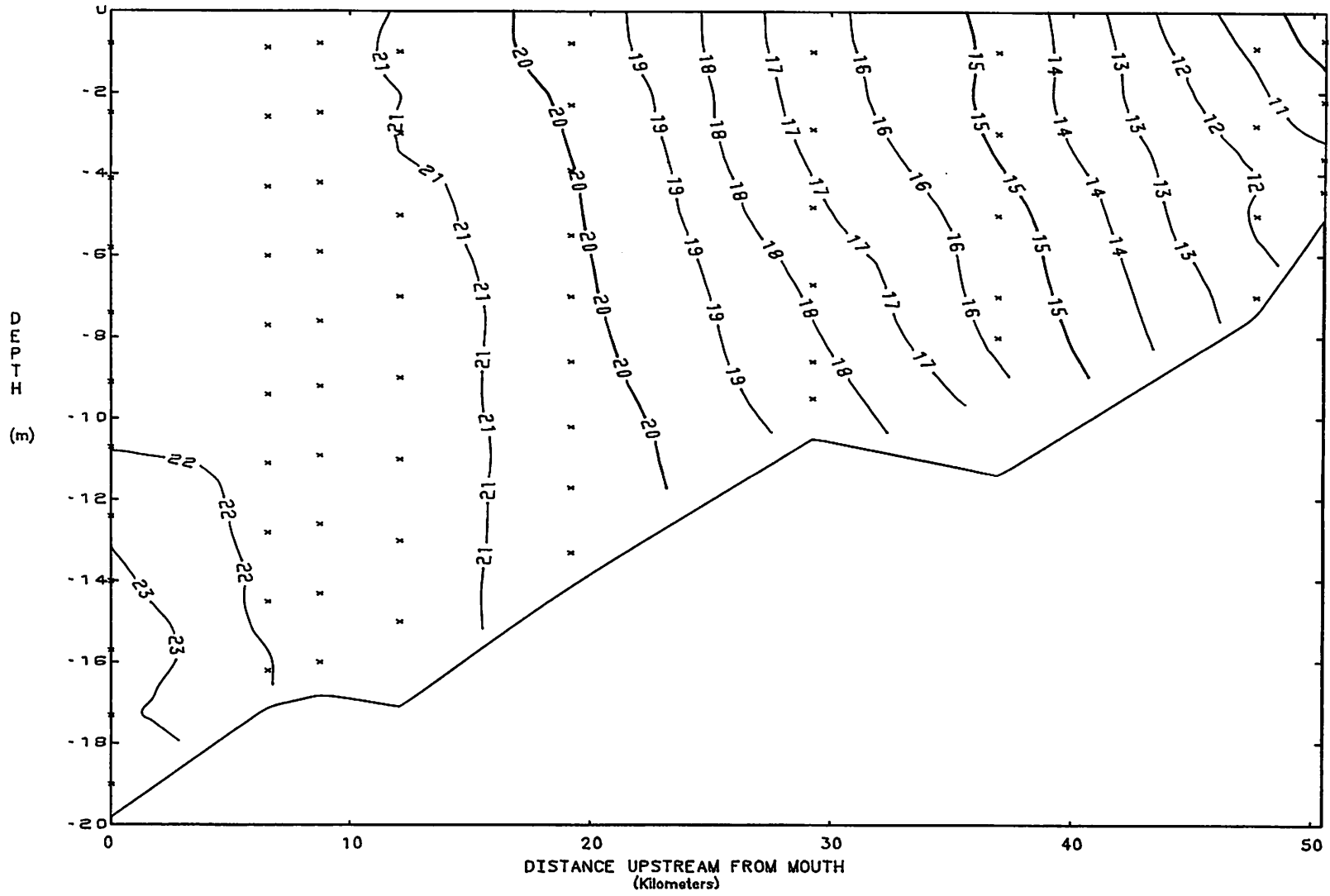
YORK RIVER  
TEMPERATURE

31 MAY 1985  
SLACK BEFORE FLOOD



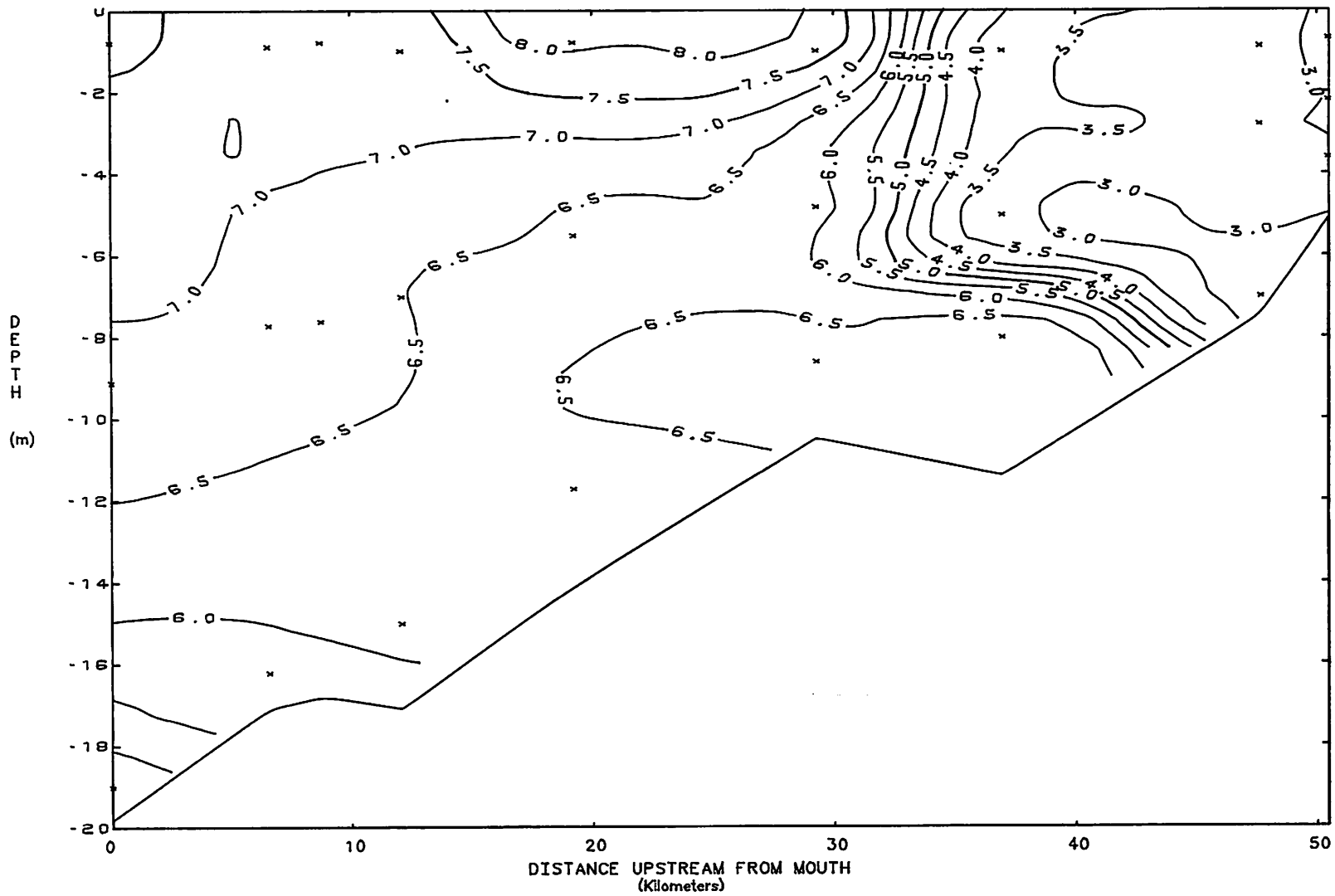
YORK RIVER  
SALINITY

31 MAY 1985  
SLACK BEFORE FLOOD



YORK RIVER  
DISSOLVED OXYGEN

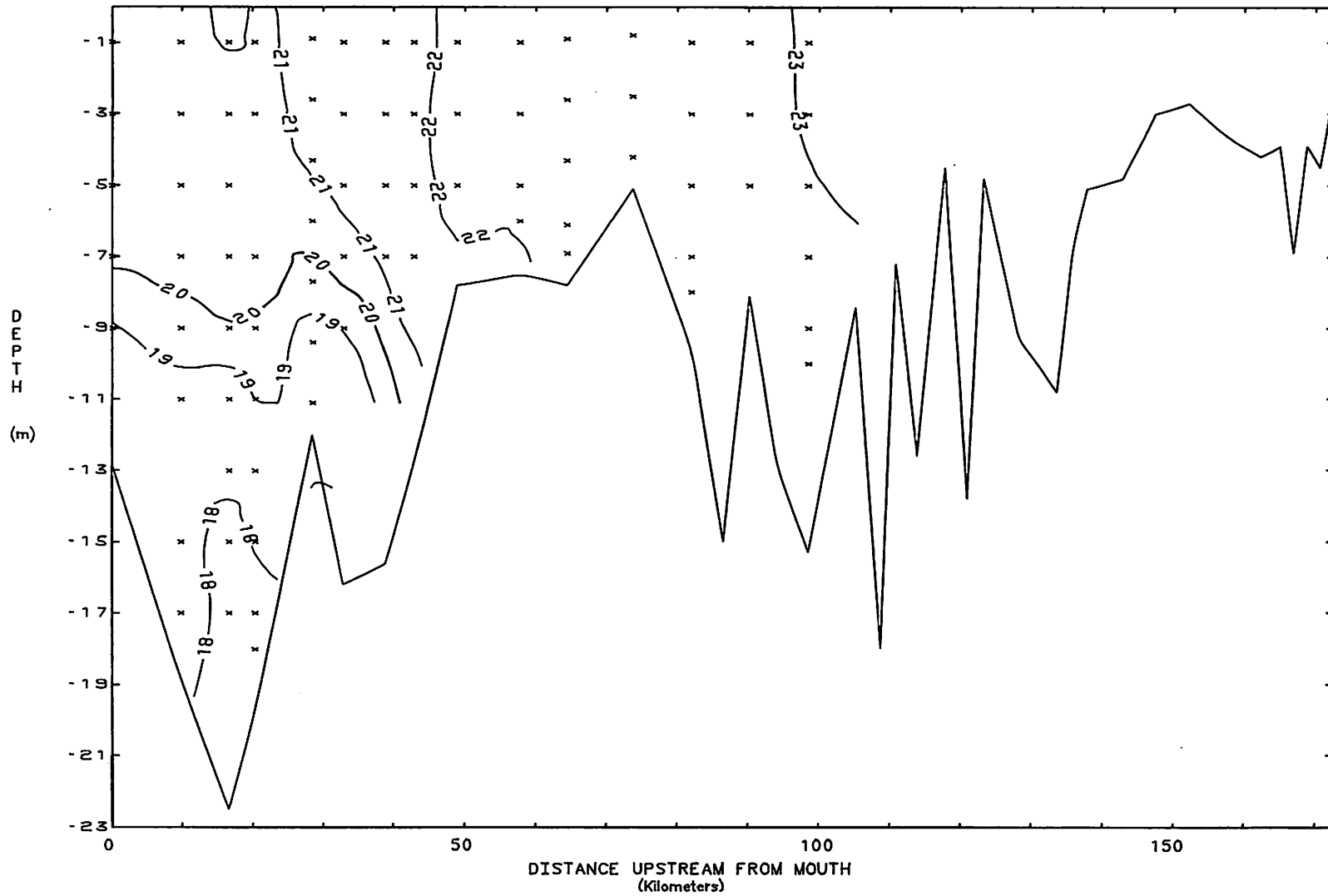
31 MAY 1985  
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RAPPAHANNOCK RIVER  
TEMPERATURE

16 MAY 1985  
SLACK BEFORE FLOOD

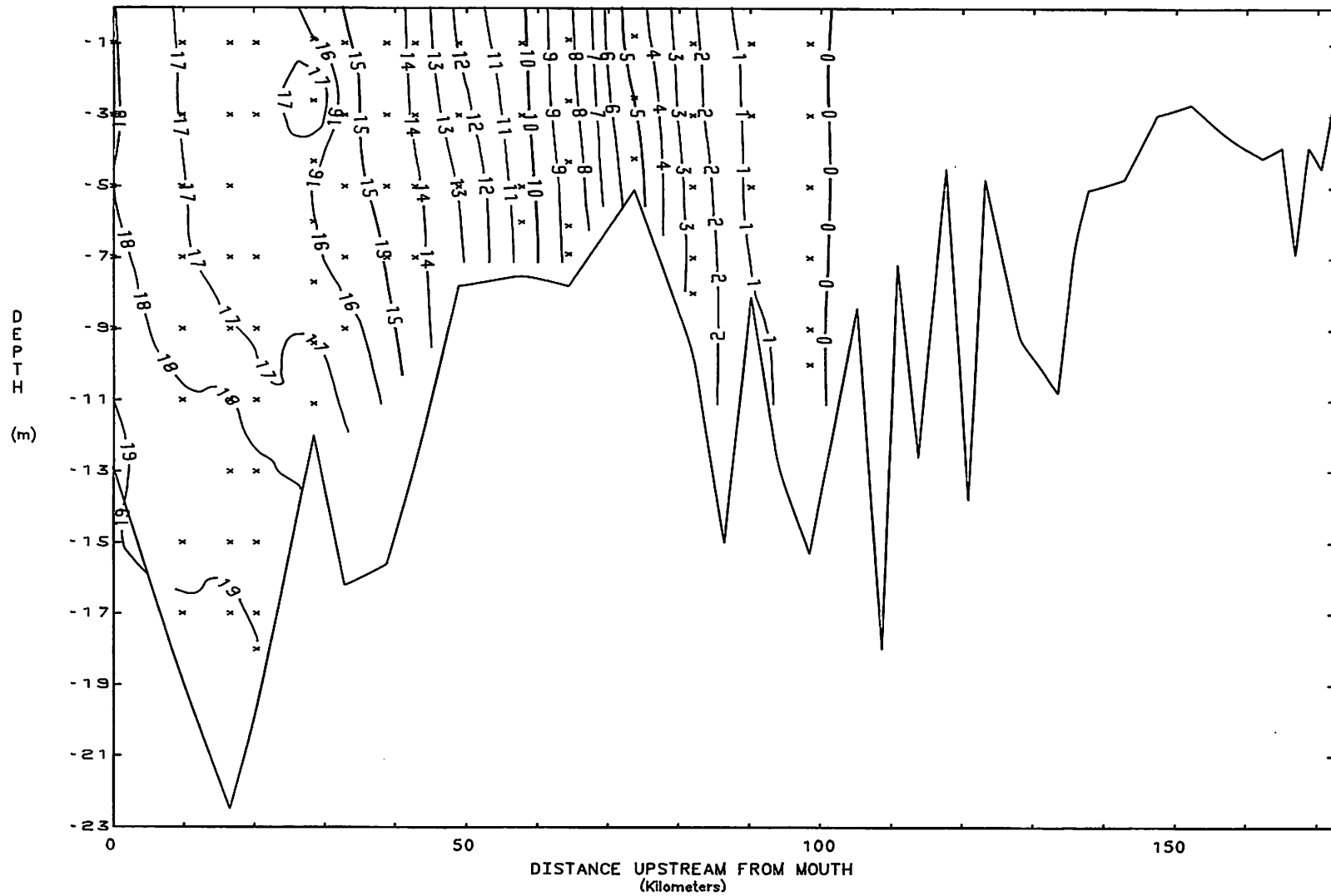


RAPPAHANNOCK RIVER

16 MAY 1985

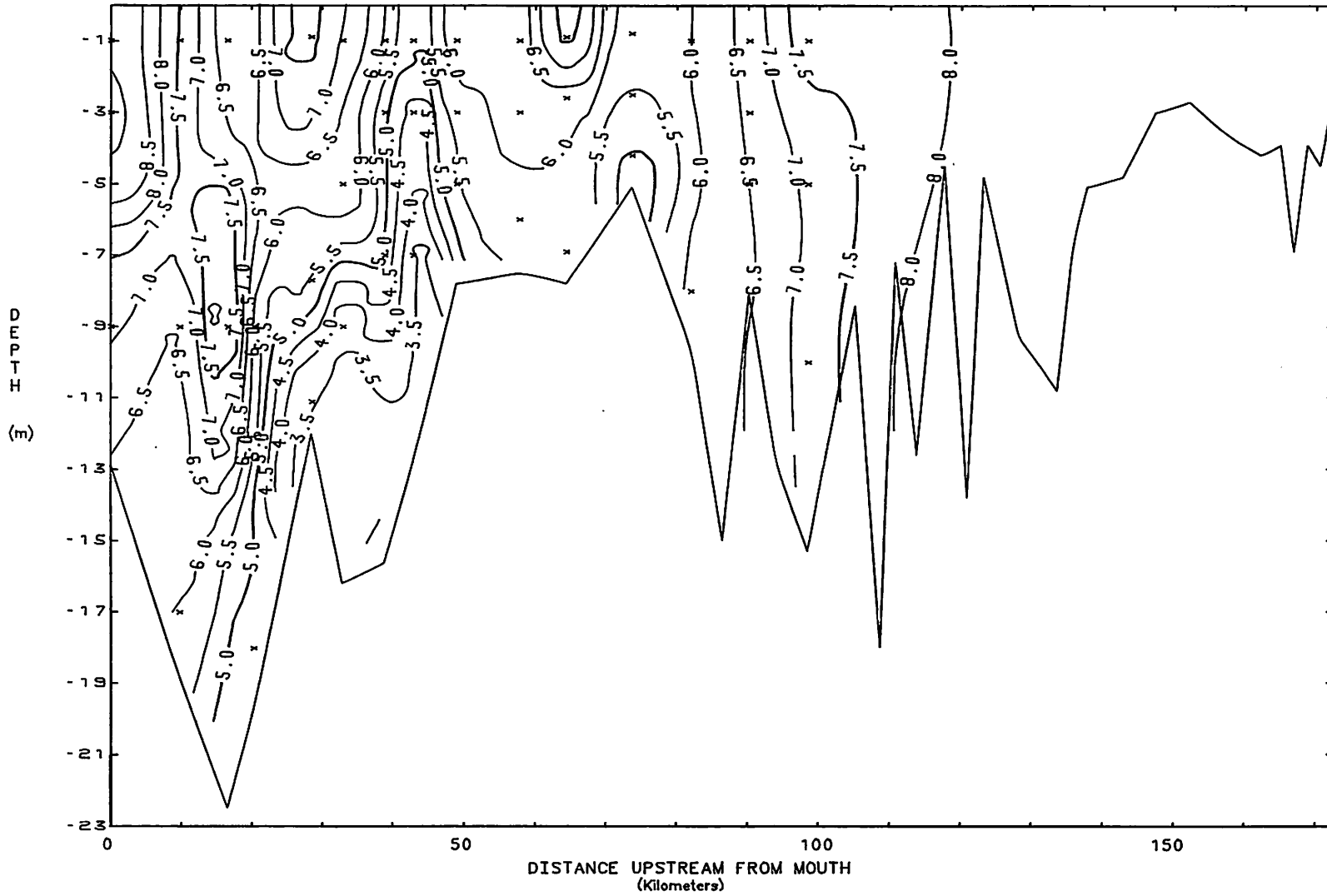
SALINITY

SLACK BEFORE FLOOD



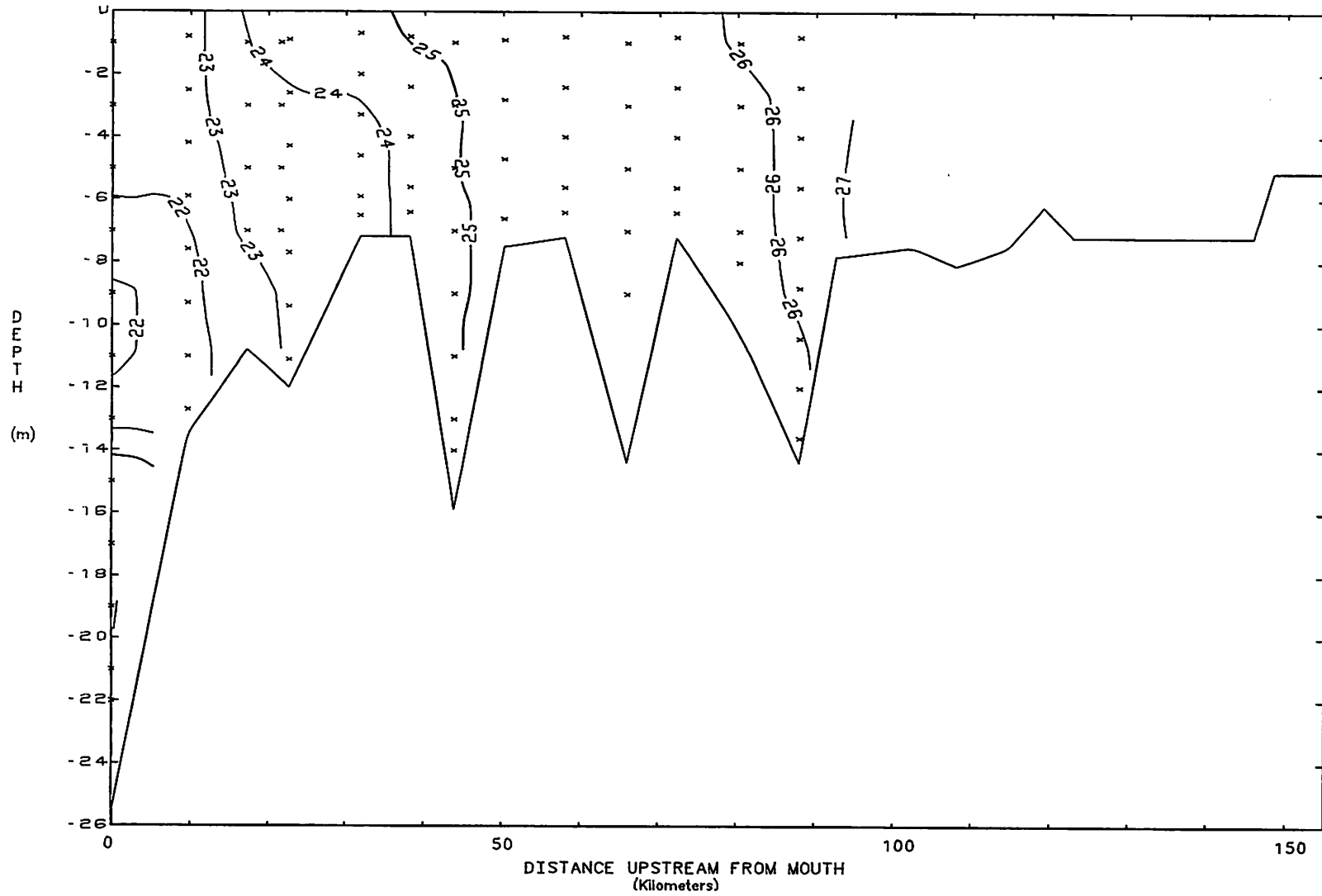
RAPPAHANNOCK RIVER  
DISSOLVED OXYGEN

16 MAY 1985  
SLACK BEFORE FLOOD



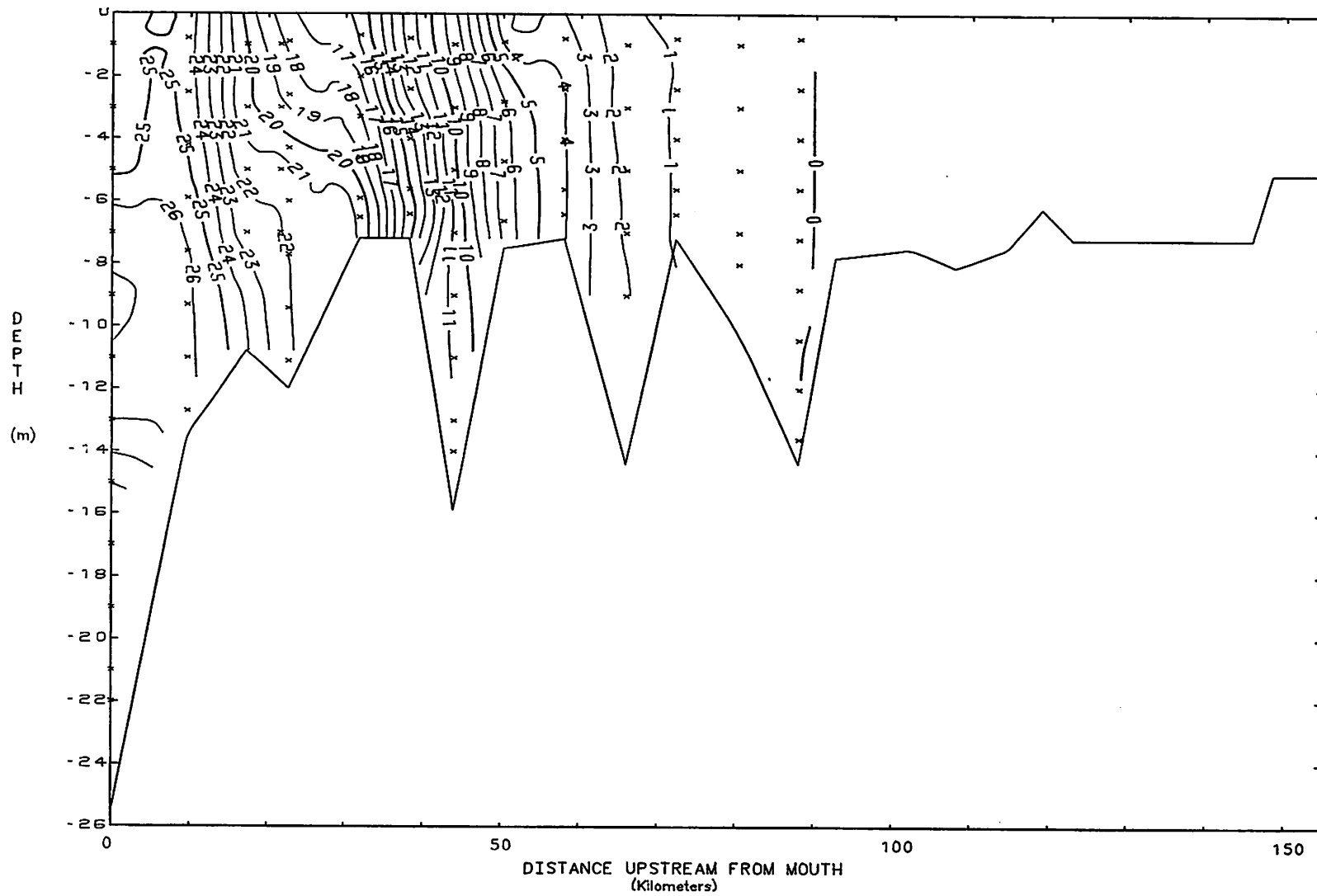
JAMES RIVER  
TEMPERATURE

19 JUNE 1985  
SLACK BEFORE FLOOD



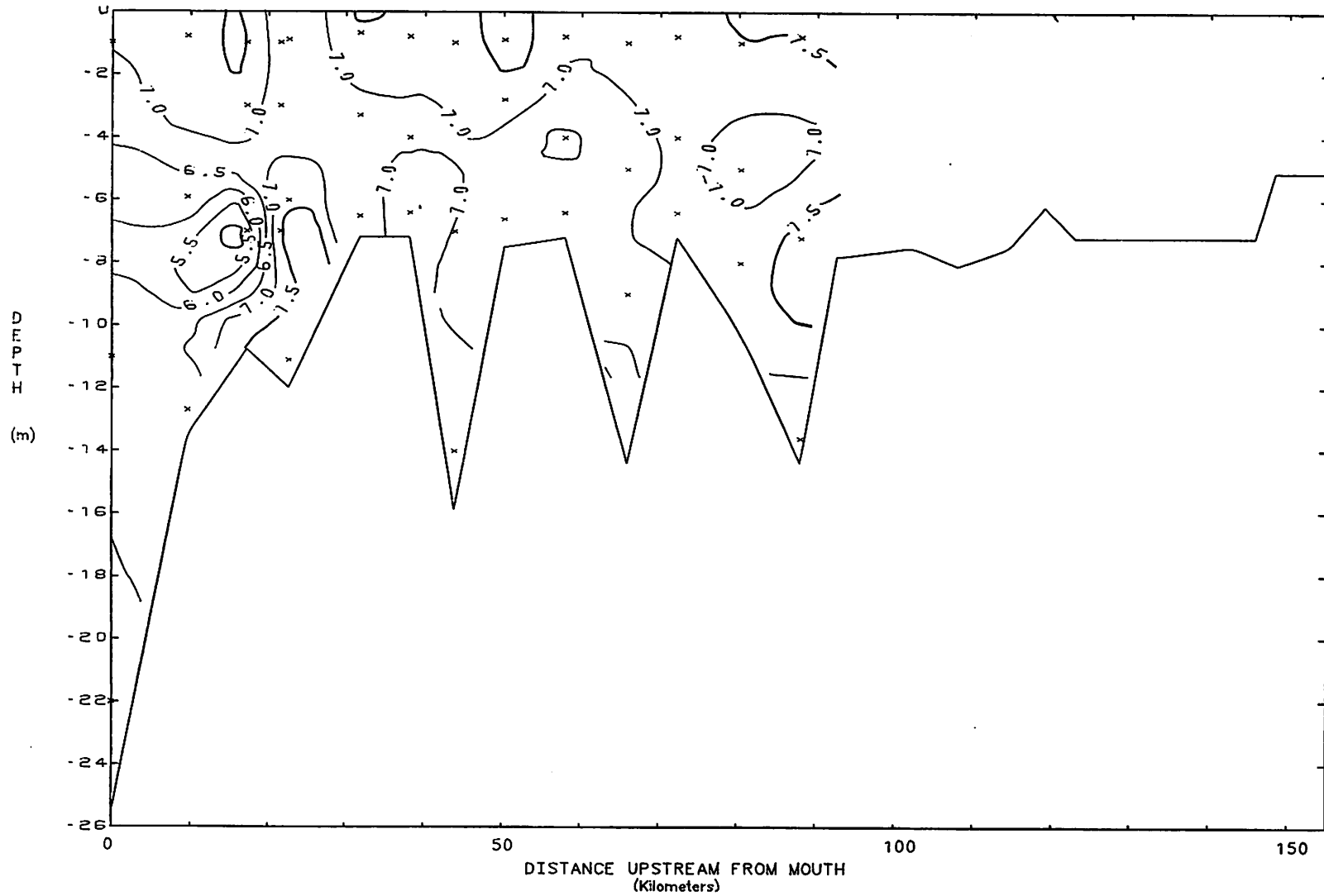
JAMES RIVER  
SALINITY

19 JUNE 1985  
SLACK BEFORE FLOOD



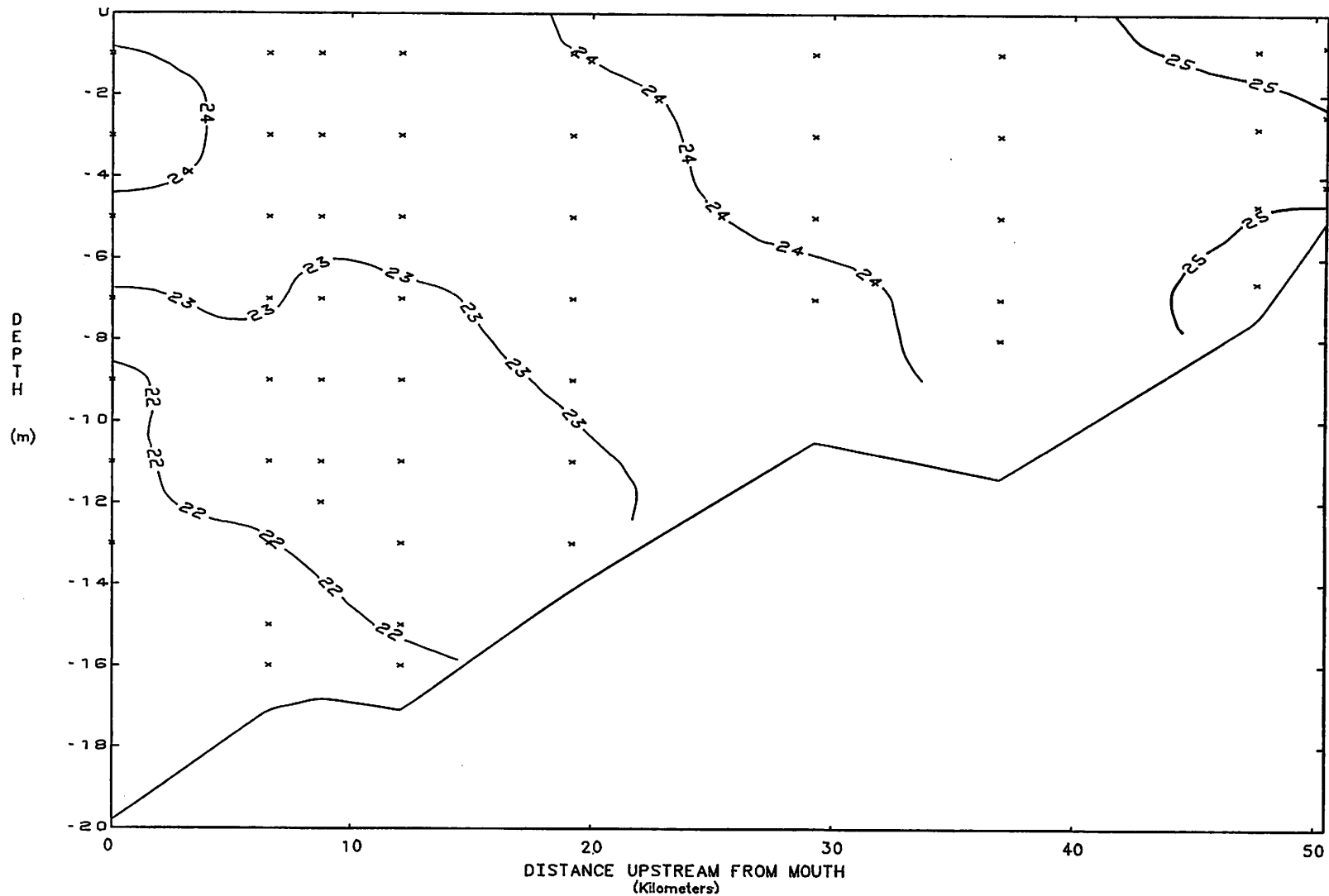
JAMES RIVER  
DISSOLVED OXYGEN

19 JUNE 1985  
SLACK BEFORE FLOOD



YORK RIVER  
TEMPERATURE

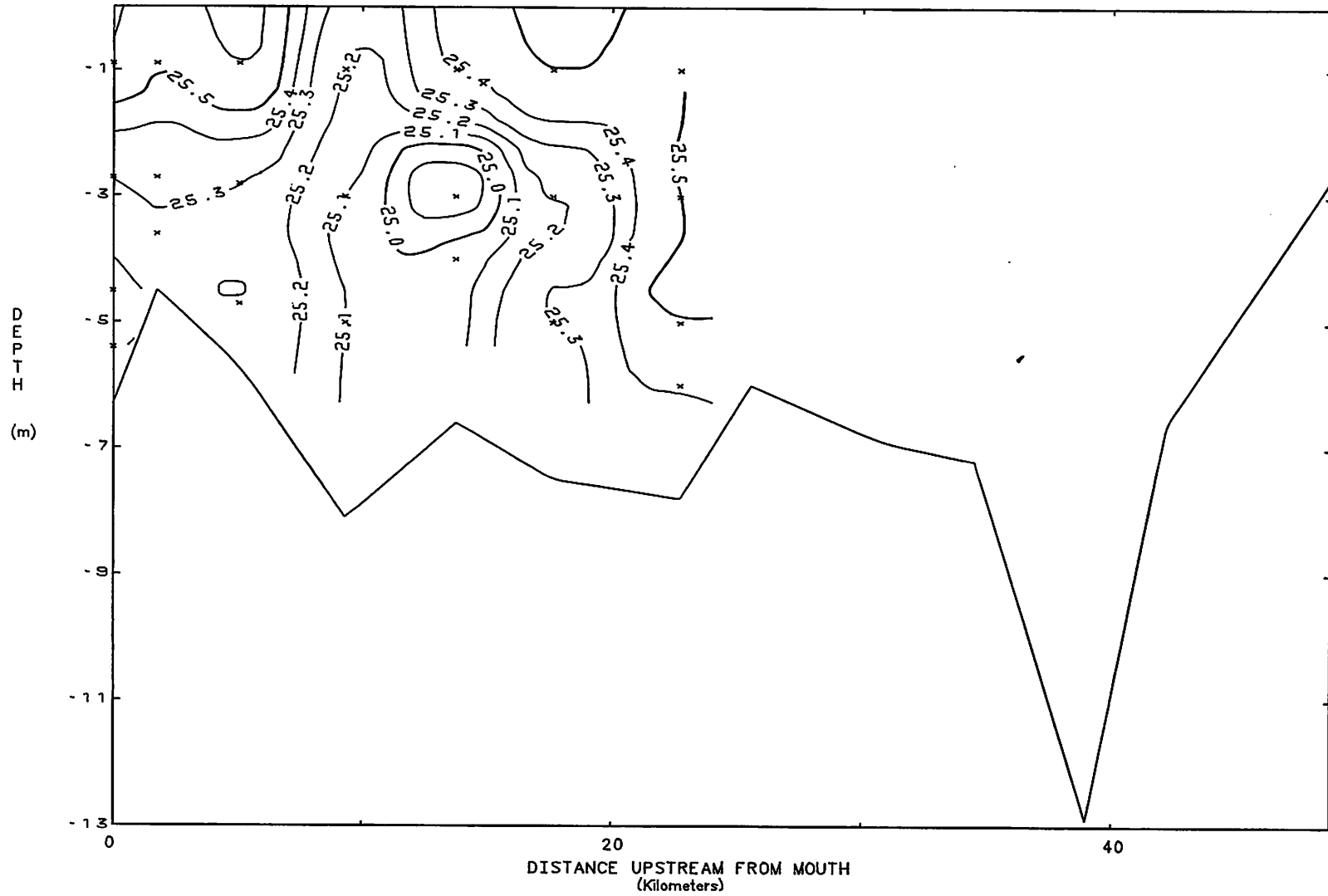
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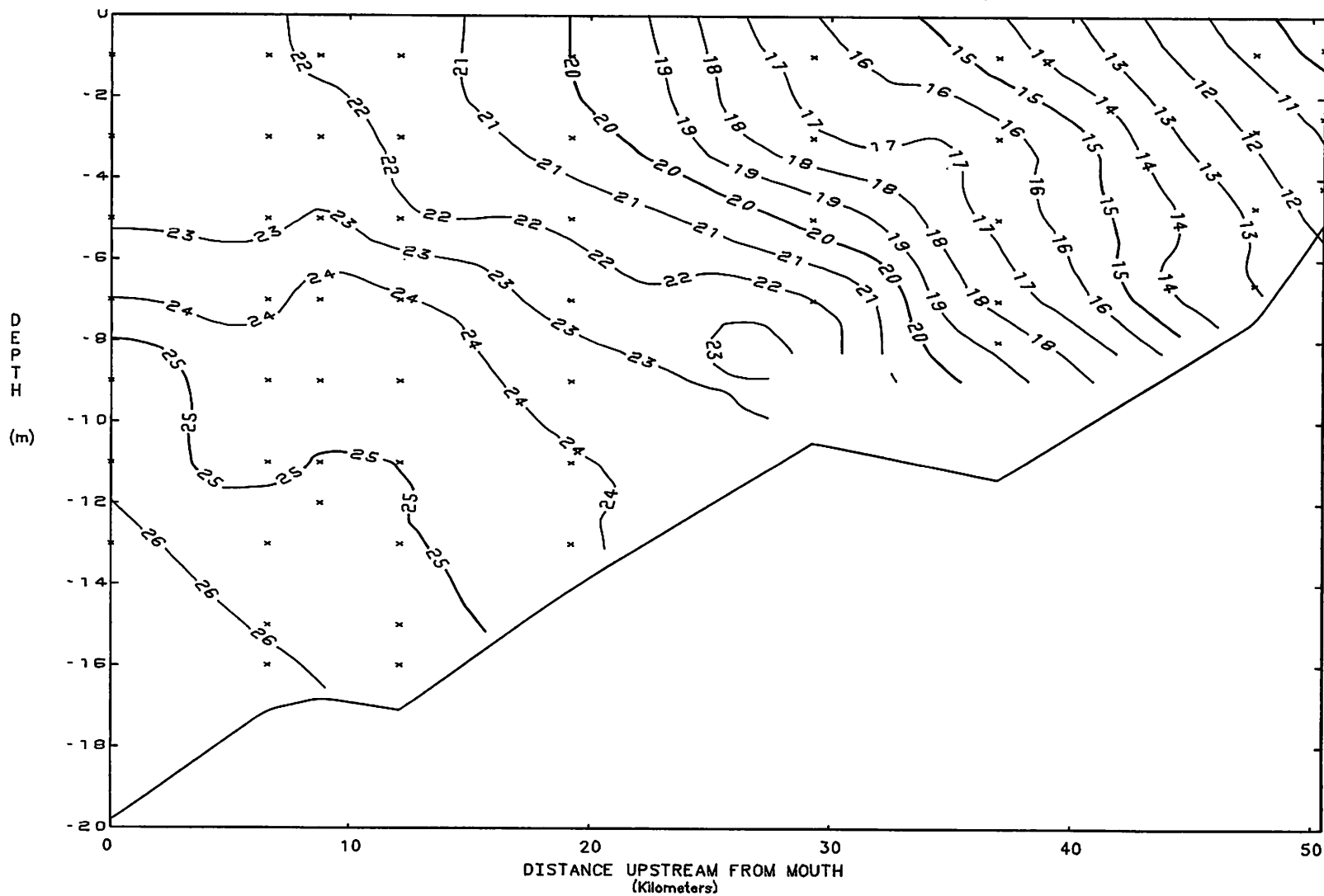
PAMUNKEY RIVER  
TEMPERATURE

20 JUNE 1985  
SLACK BEFORE FLOOD



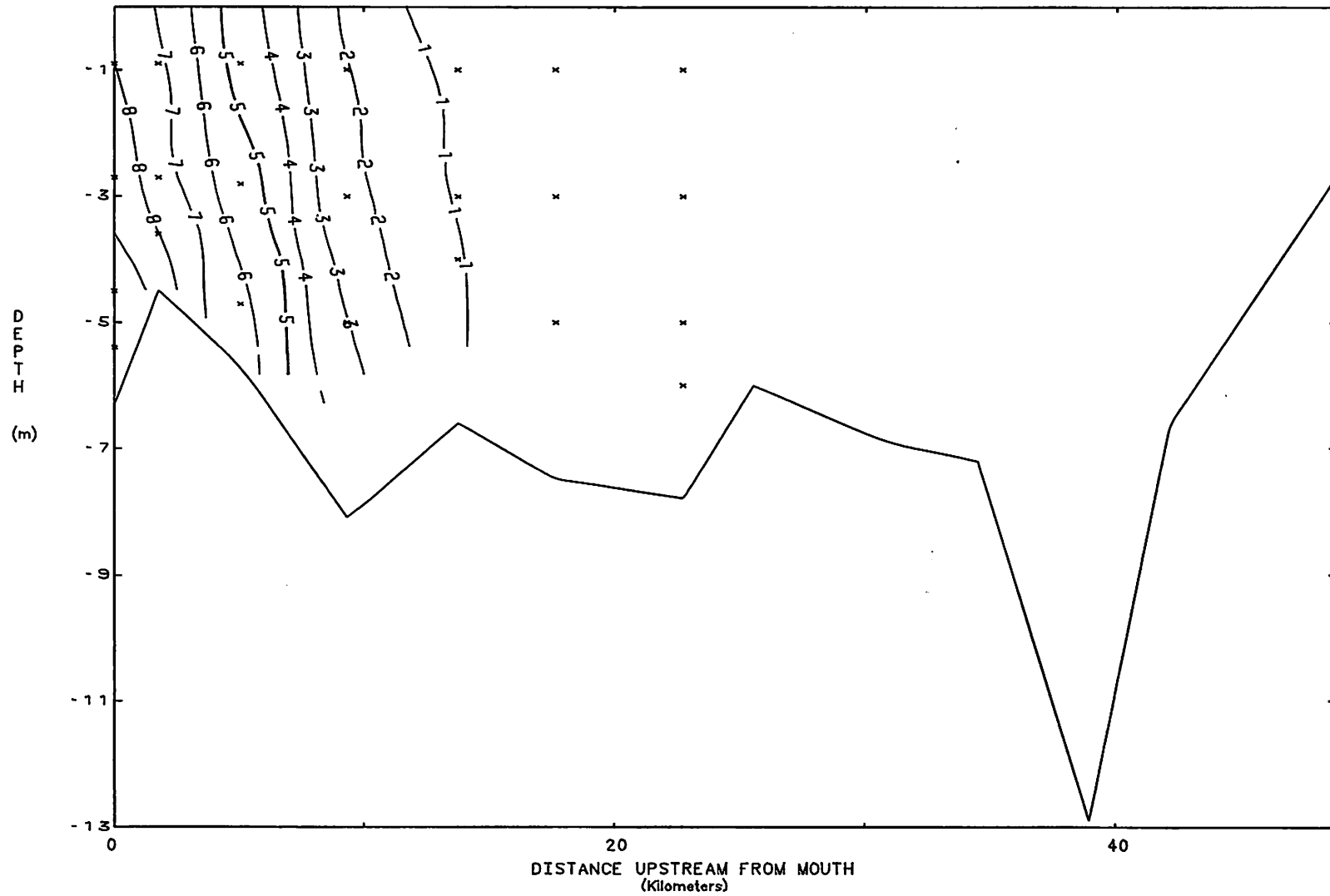
YORK RIVER  
SALINITY

20 JUNE 1985  
SLACK BEFORE FLOOD



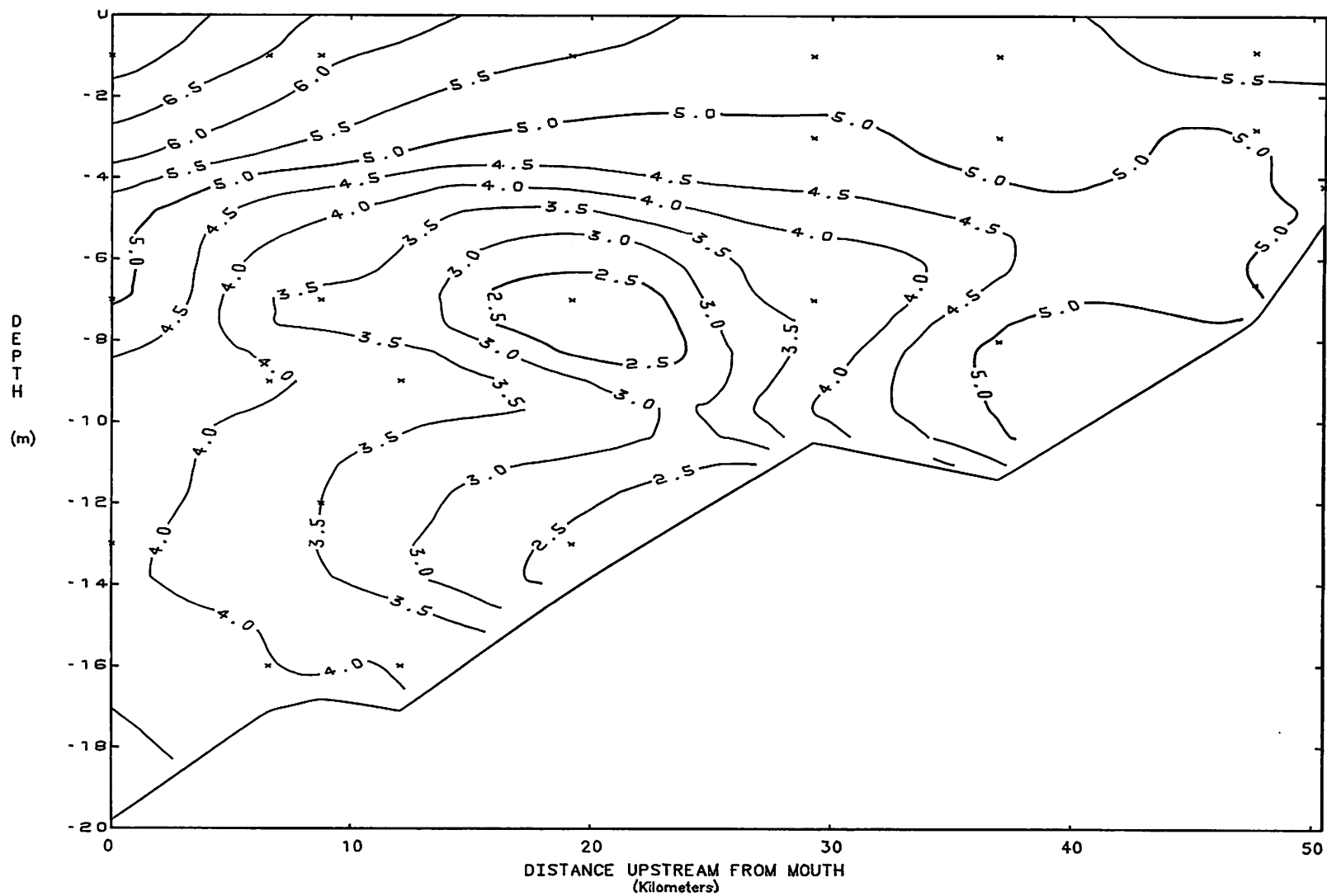
PAMUNKEY RIVER  
SALINITY

20 JUNE 1985  
SLACK BEFORE FLOOD



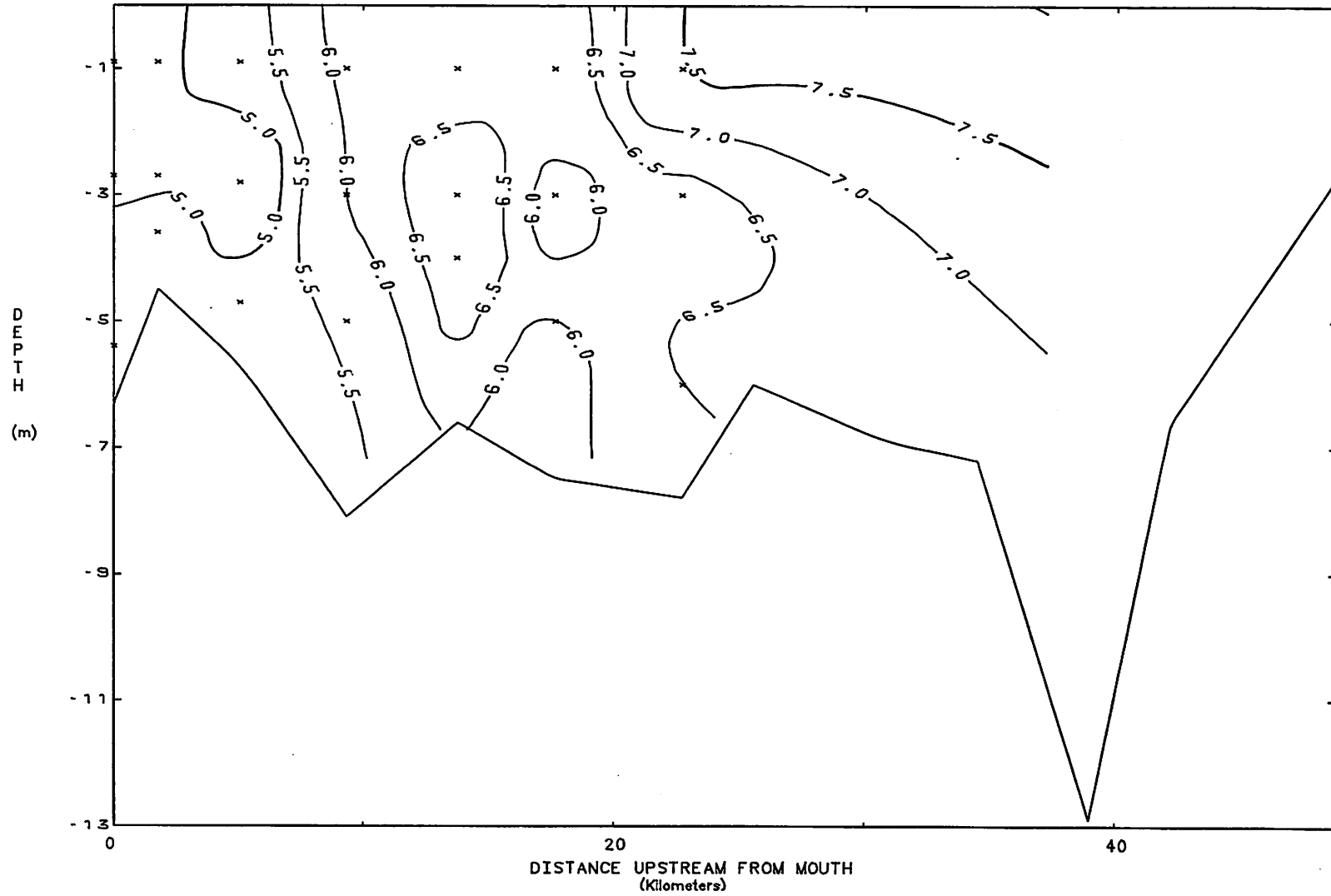
YORK RIVER  
DISSOLVED OXYGEN

20 JUNE 1985  
SLACK BEFORE FLOOD



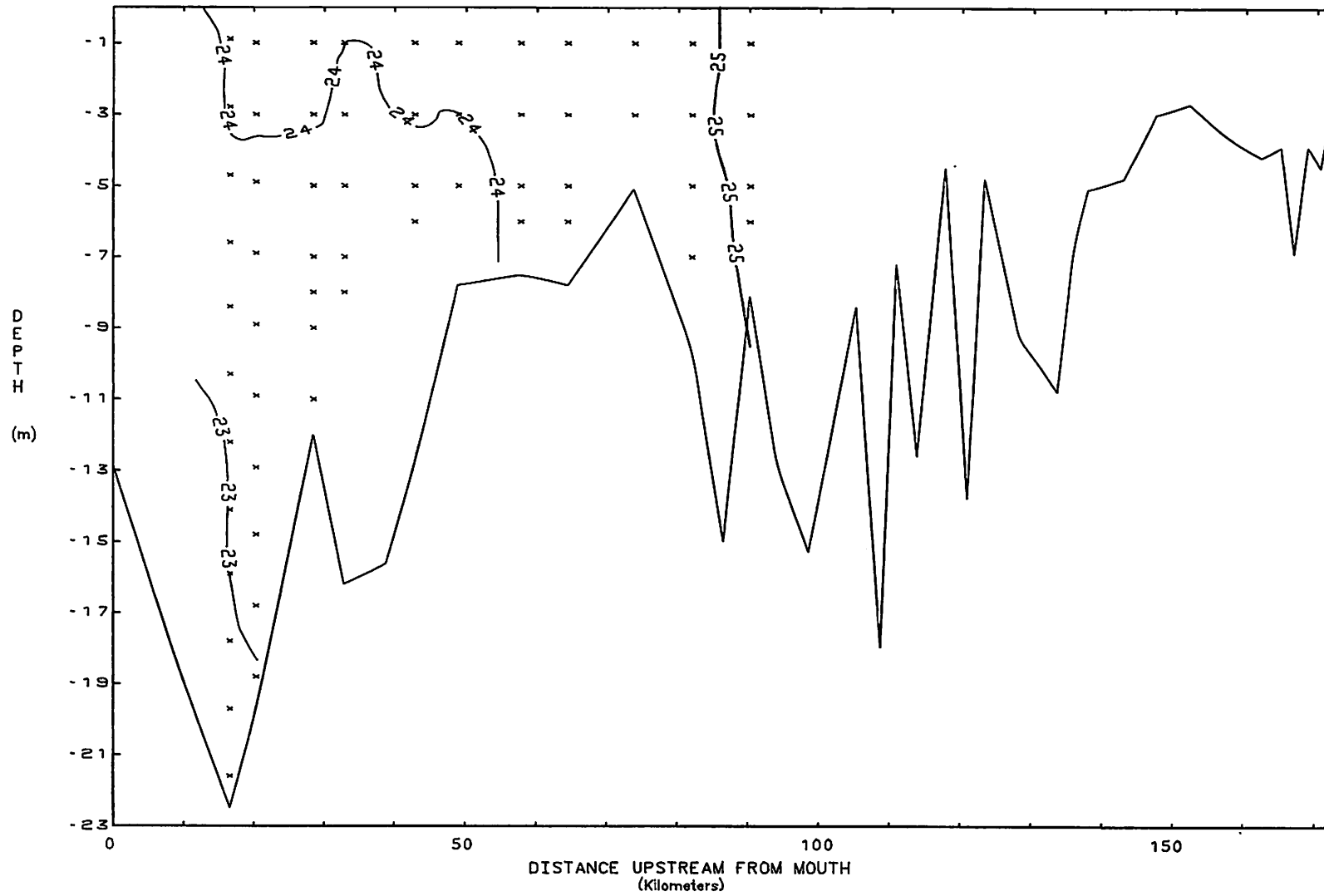
PAMUNKEY RIVER  
DISSOLVED OXYGEN

20 JUNE 1985  
SLACK BEFORE FLOOD



RAPPAHANNOCK RIVER  
TEMPERATURE

18 JUNE 1985  
SLACK BEFORE FLOOD

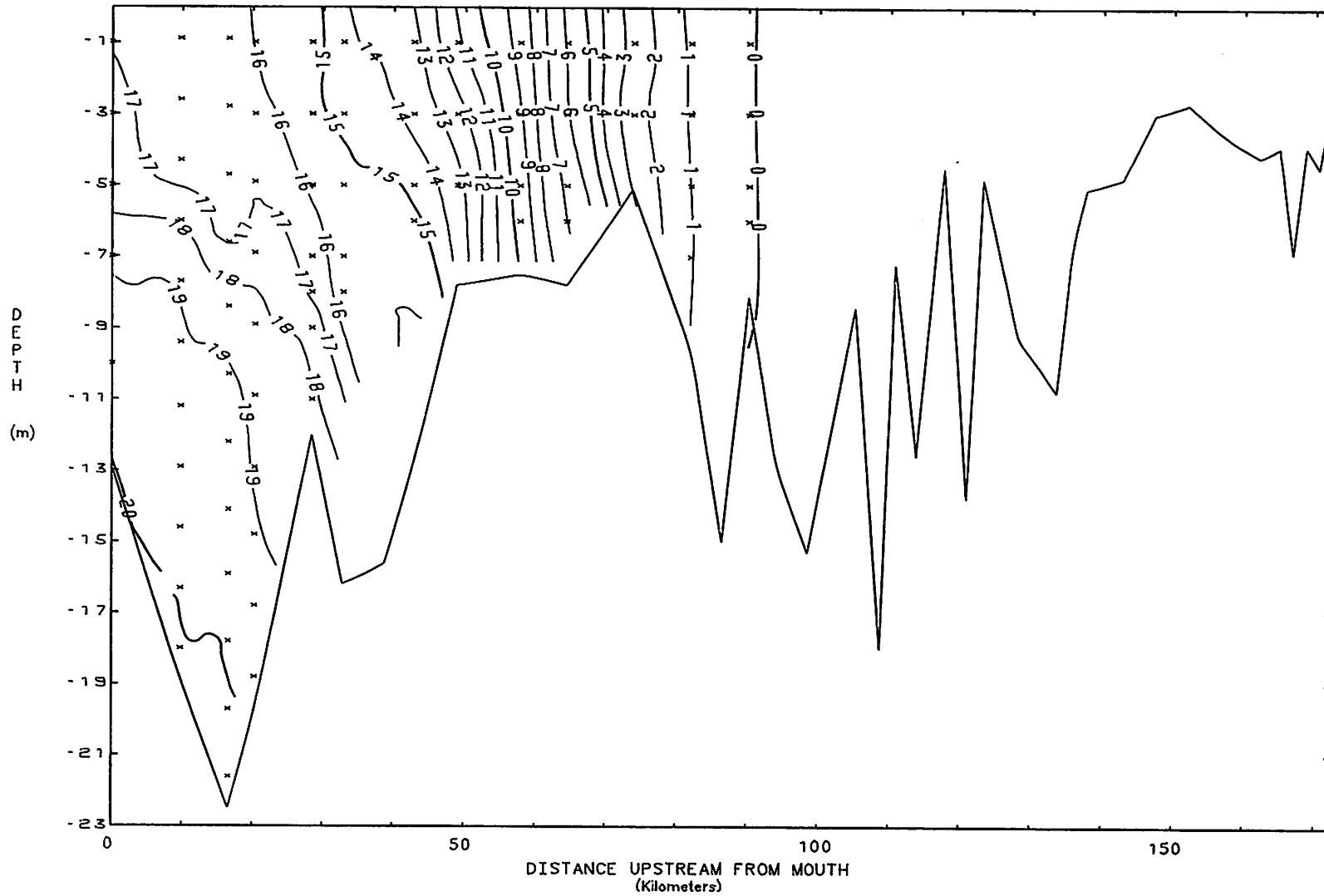


RAPPAHANNOCK RIVER

18 JUNE 1985

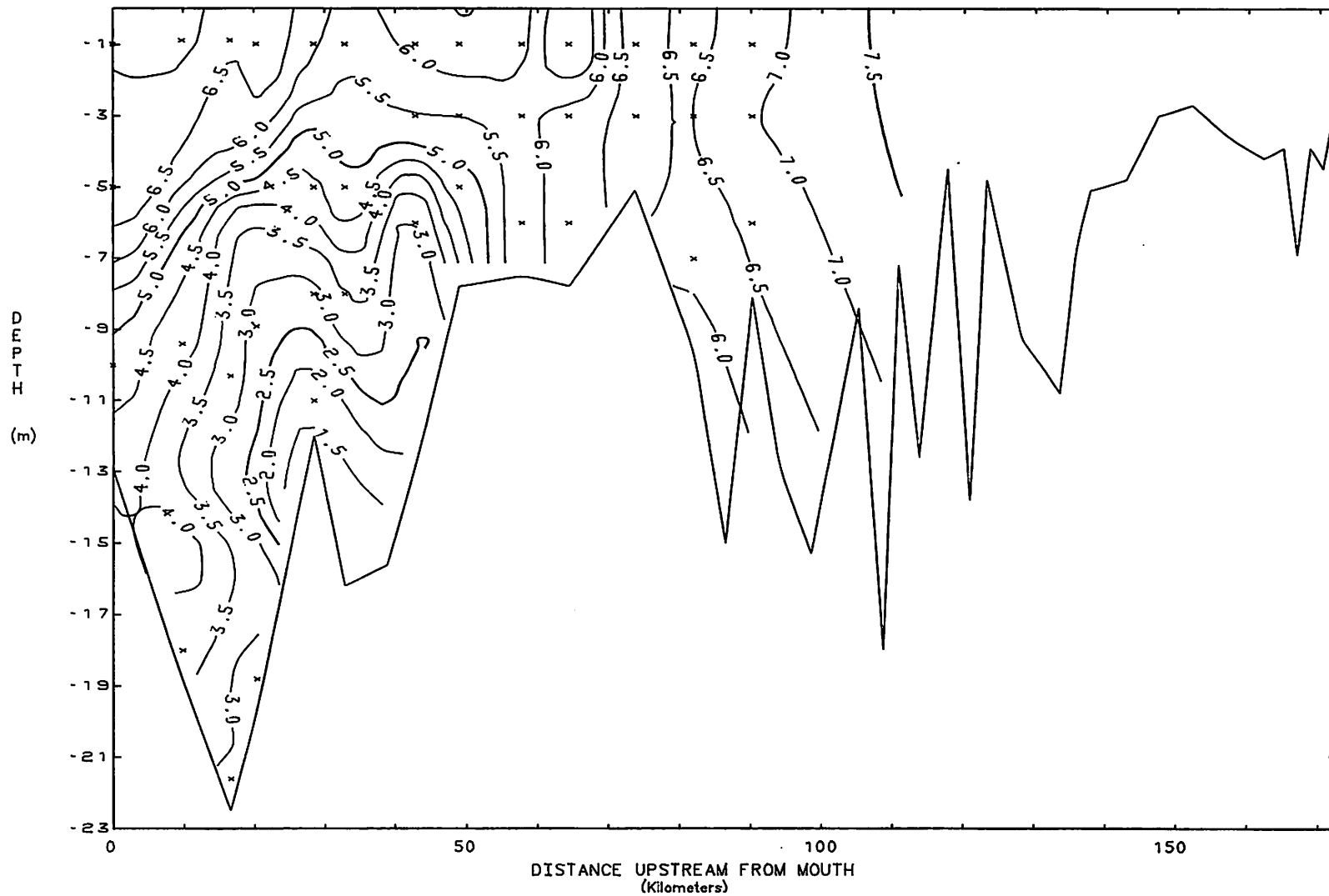
SALINITY

SLACK BEFORE FLOOD

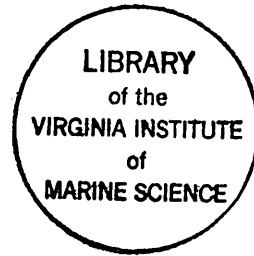


RAPPAHANNOCK RIVER  
DISSOLVED OXYGEN

18 JUNE 1985  
SLACK BEFORE FLOOD







Monthly Report on the State of Rivers - July 1985

Sponsored by

Virginia Institute of Marine Science

and

Virginia State Water Control Board

Summary of Field Surveys

(1) Slackwater Runs

James: Temperature, salinity and DO were measured in the saline portion of the river on July 17.

York and Pamunkey: Temperature, salinity and DO were measured in the saline portion of the river on July 18.

Rappahannock: Temperature, salinity and DO were measured in the saline portion of the river on July 23.

Salinity, temperature and DO distributions for all three rivers are attached.

(2) Crab-fish Joint Trawl Surveys - Dr. H. Austin

The trawl surveys were conducted on the following dates:

James: July 11

York and Pamunkey: July 17

Rappahannock: July 15

Surface and bottom temperature, salinity, DO and secchi depth were measured at designated stations.

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For further information make request to Dr. Albert Kuo, Virginia Institute of Marine Science, Gloucester Point, VA 23062, (804)642-7212.

Lesser Neap Tide

July 23

Comments on Slackwater Survey Data

Salinity increased in all three rivers from June to July surveys. The limits of salt intrusion moved about 10 to 15 km further upstream. The low bottom DO conditions persisted near the mouths of the York and Rappahannock Rivers.

Scheduled Surveys

(1) Slackwater Runs

James: September 17

York and Pamunkey: September 18

Rappahannock: September 16

(2) Crab-fish Joint Trawl Surveys - Dr. Austin

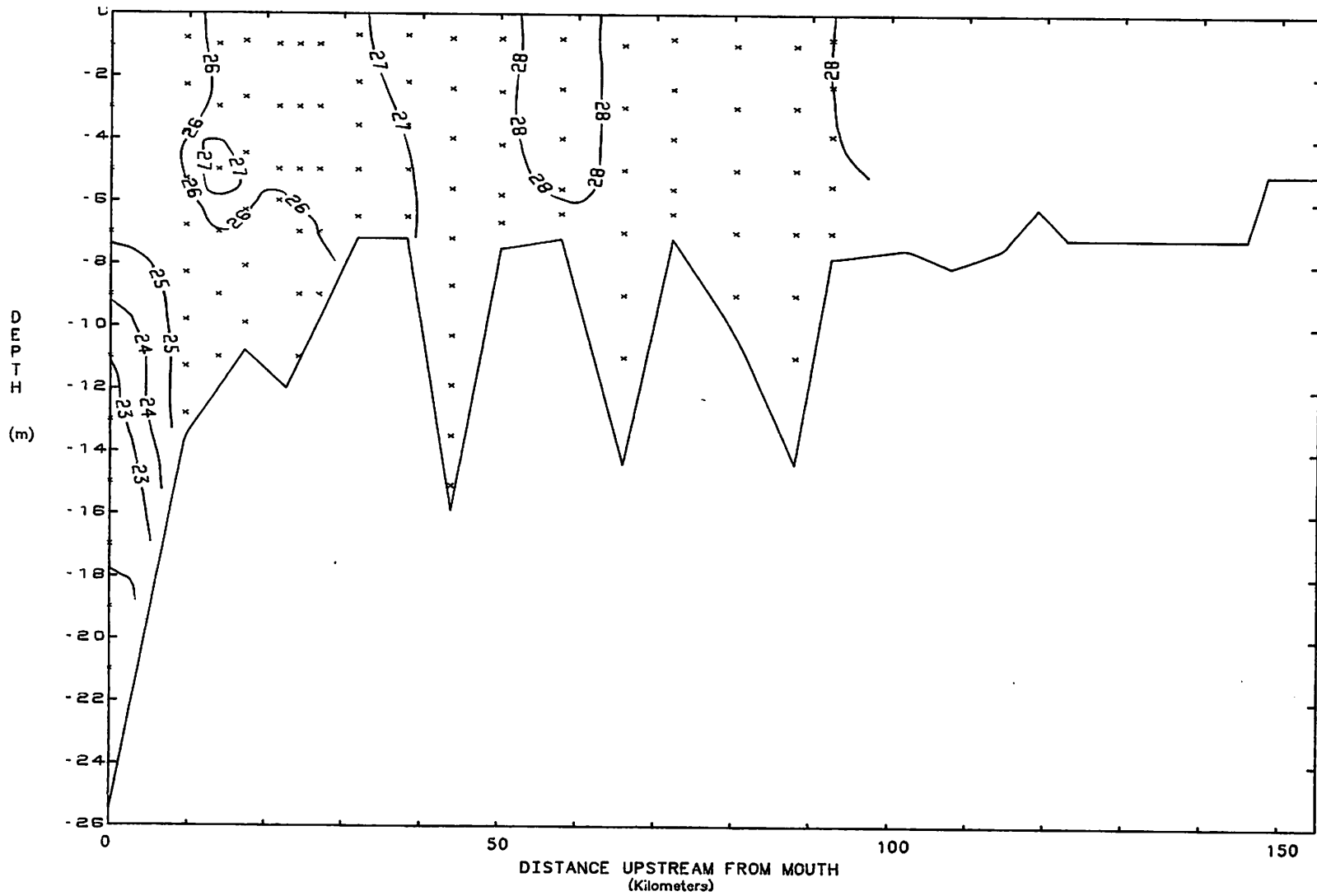
York River: August 16

James River: August 12

Rappahannock: August 22

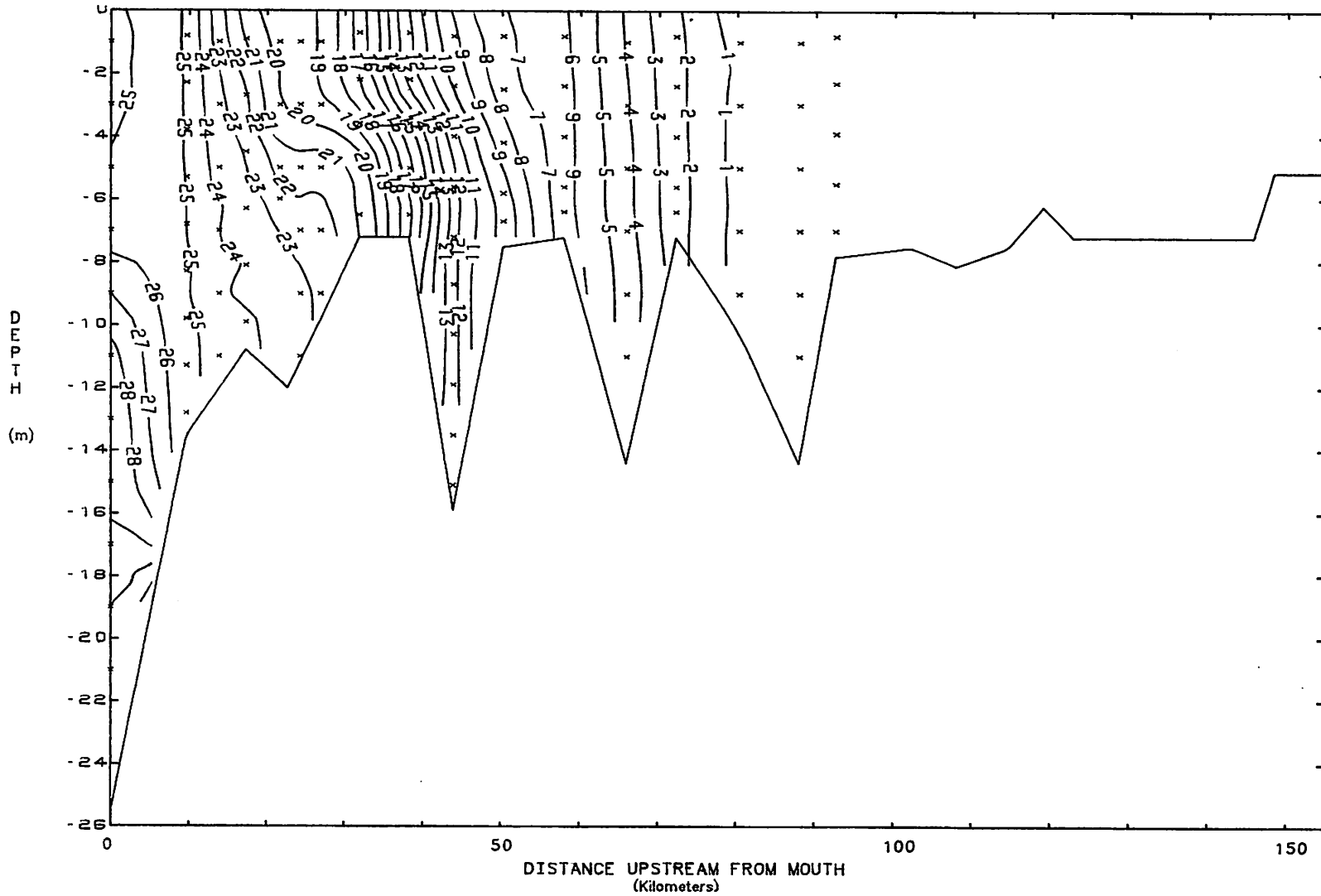
JAMES RIVER  
TEMPERATURE

17 JULY 1985  
SLACK BEFORE FLOOD



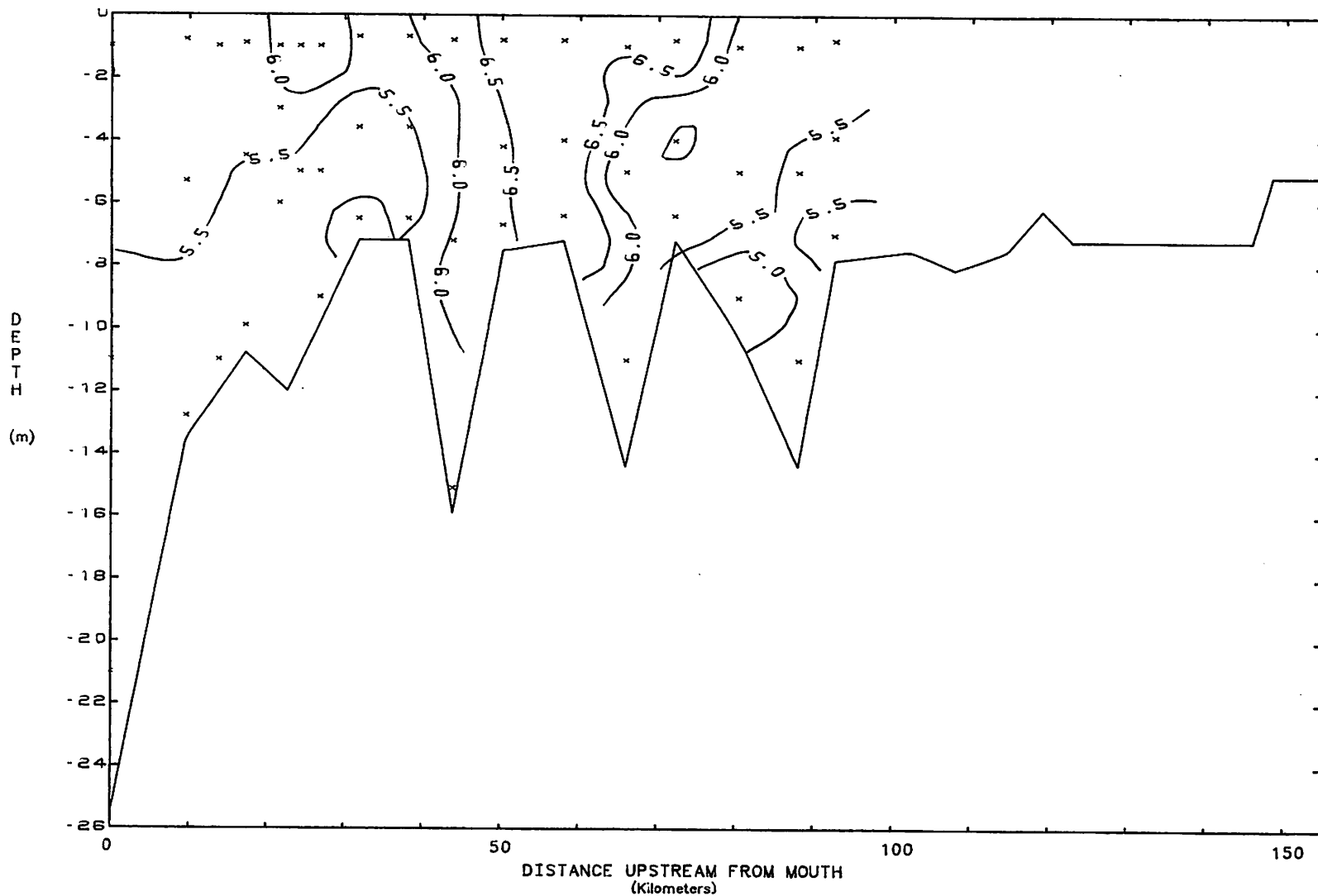
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SALINITY

17 JULY 1985  
SLACK BEFORE FLOOD



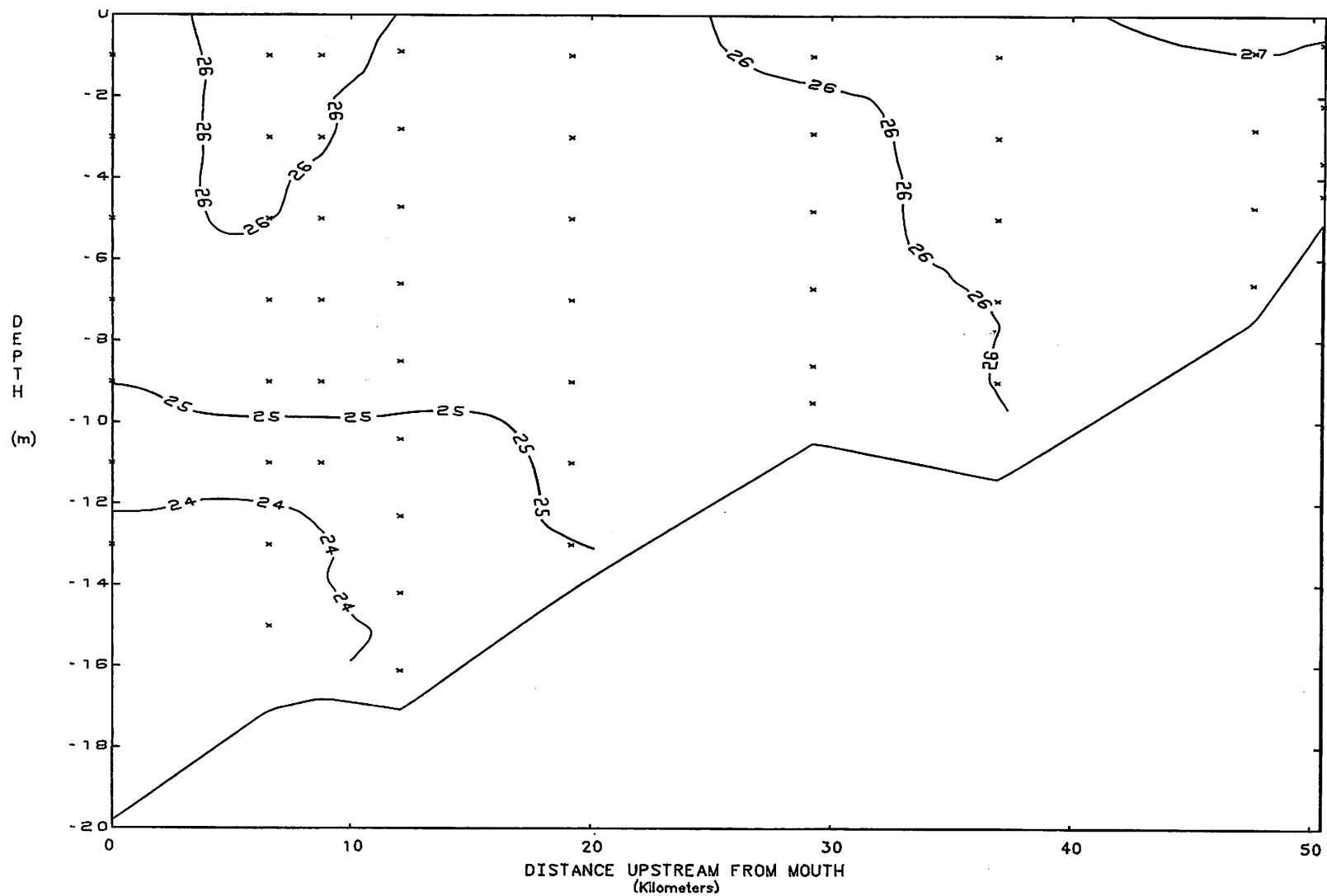
JAMES RIVER  
DISSOLVED OXYGEN

17 JULY 1985  
SLACK BEFORE FLOOD



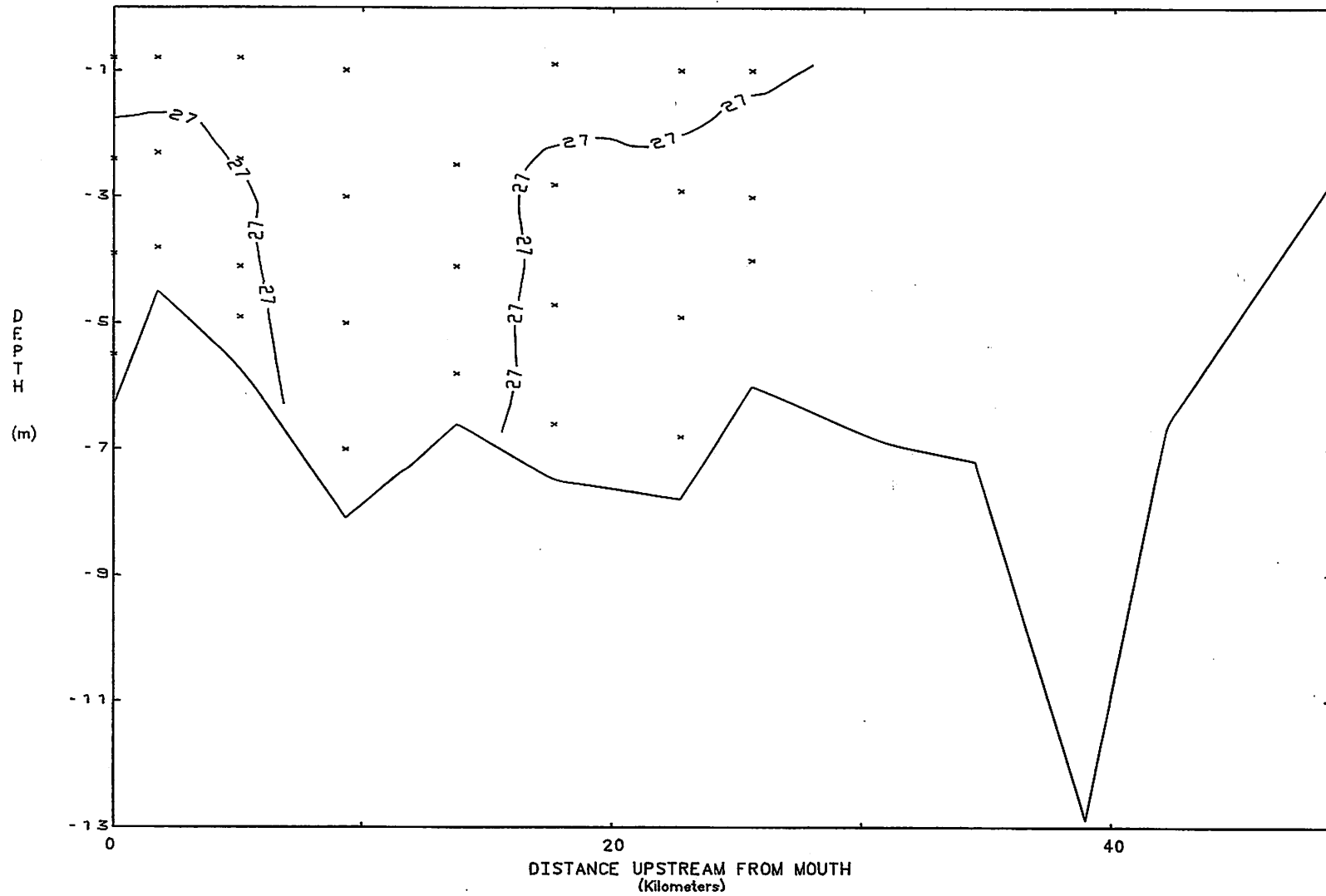
YORK RIVER  
TEMPERATURE

18 JULY 1985  
SLACK BEFORE EBB



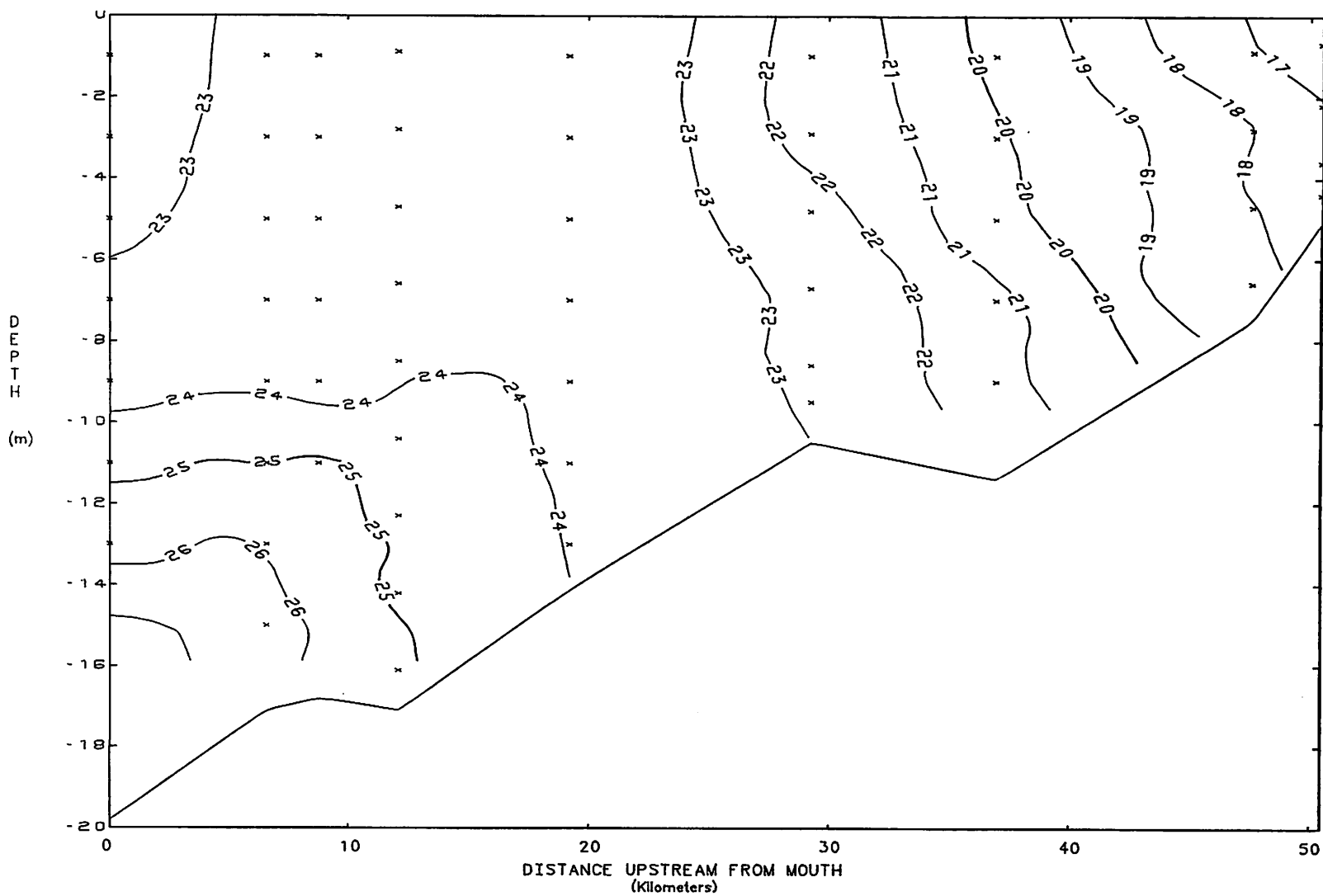
PAMUNKEY RIVER  
TEMPERATURE

18 JULY 1985  
SLACK BEFORE EBB



YORK RIVER  
SALINITY

18 JULY 1985  
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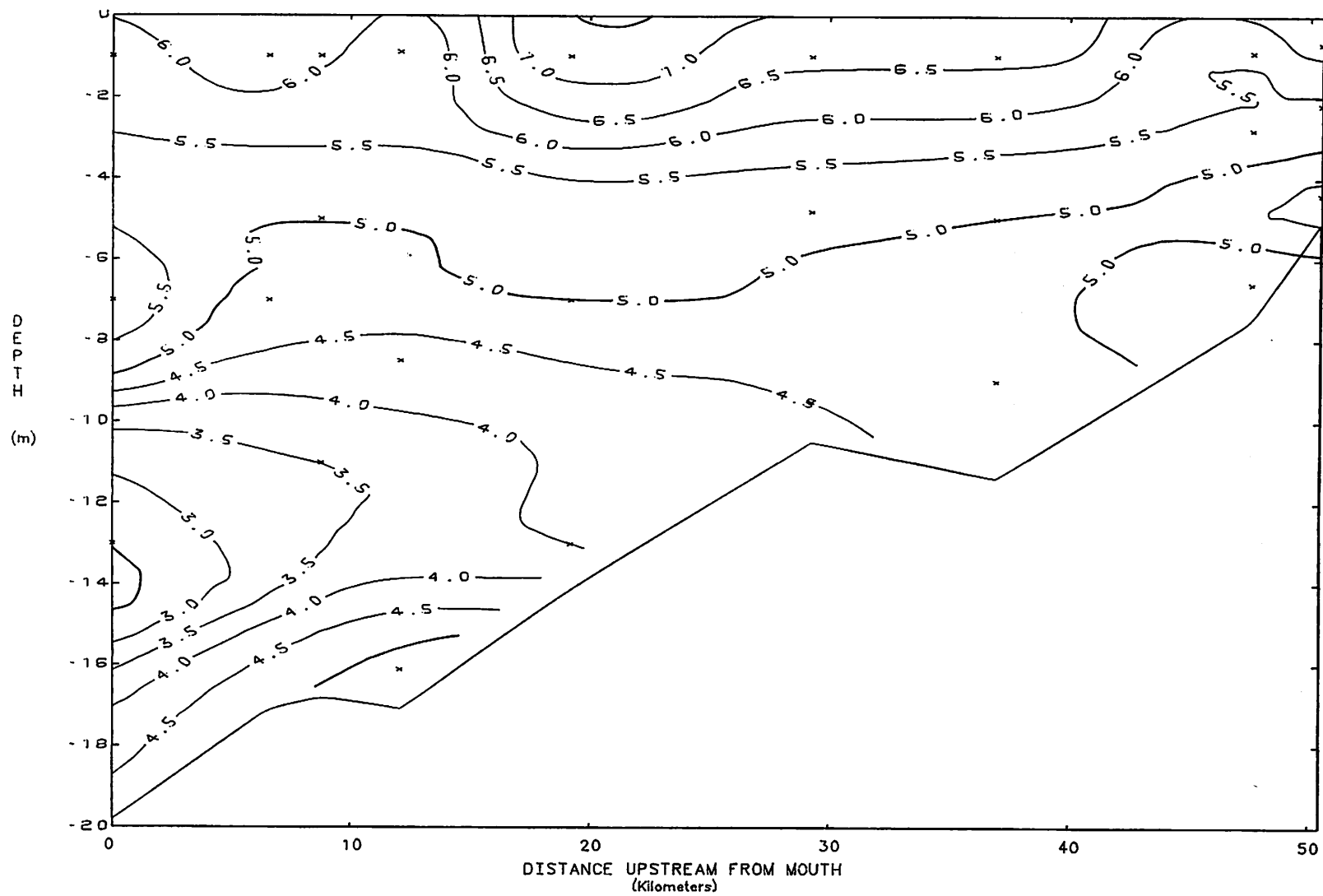






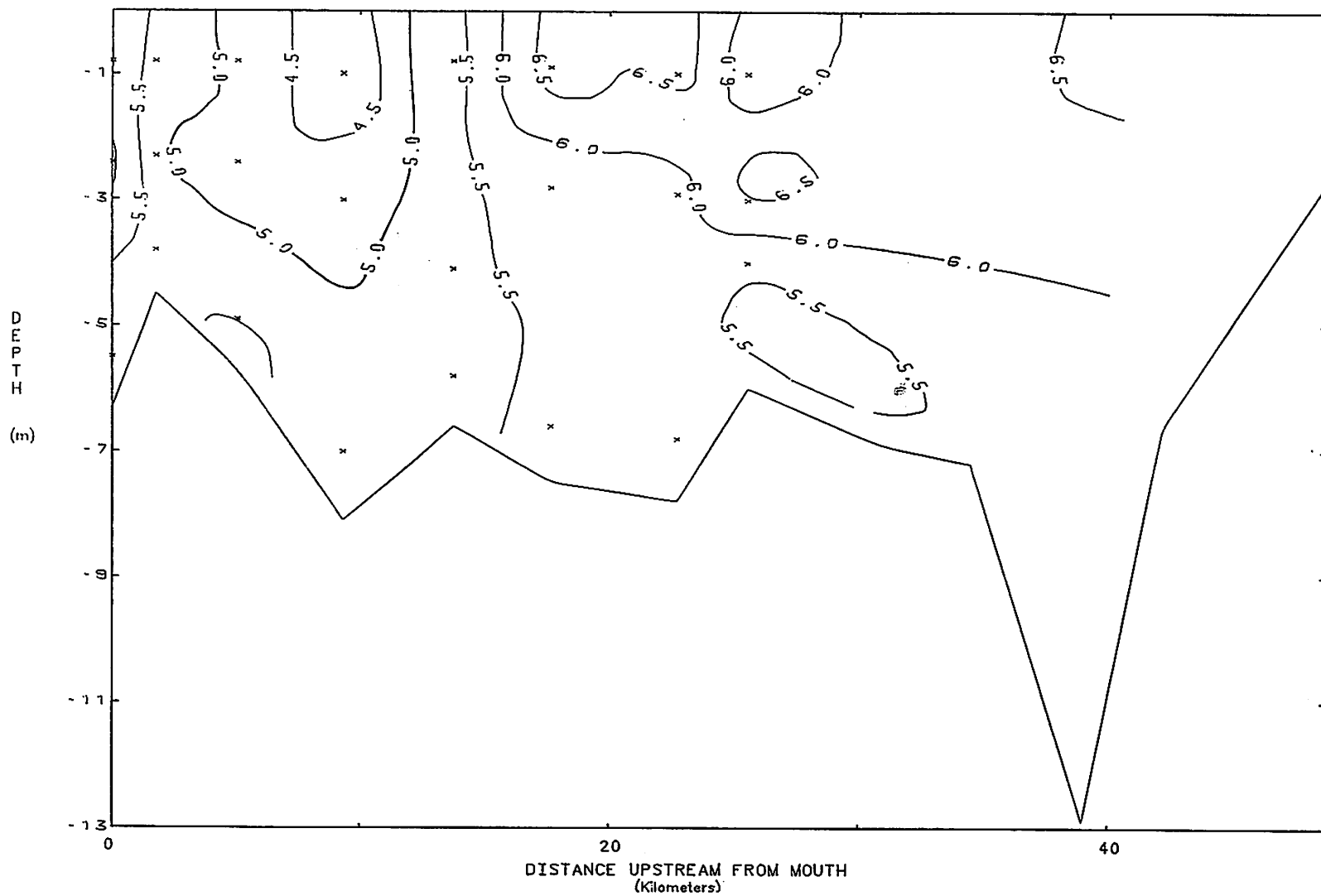
YORK RIVER  
DISSOLVED OXYGEN

18 JULY 1985  
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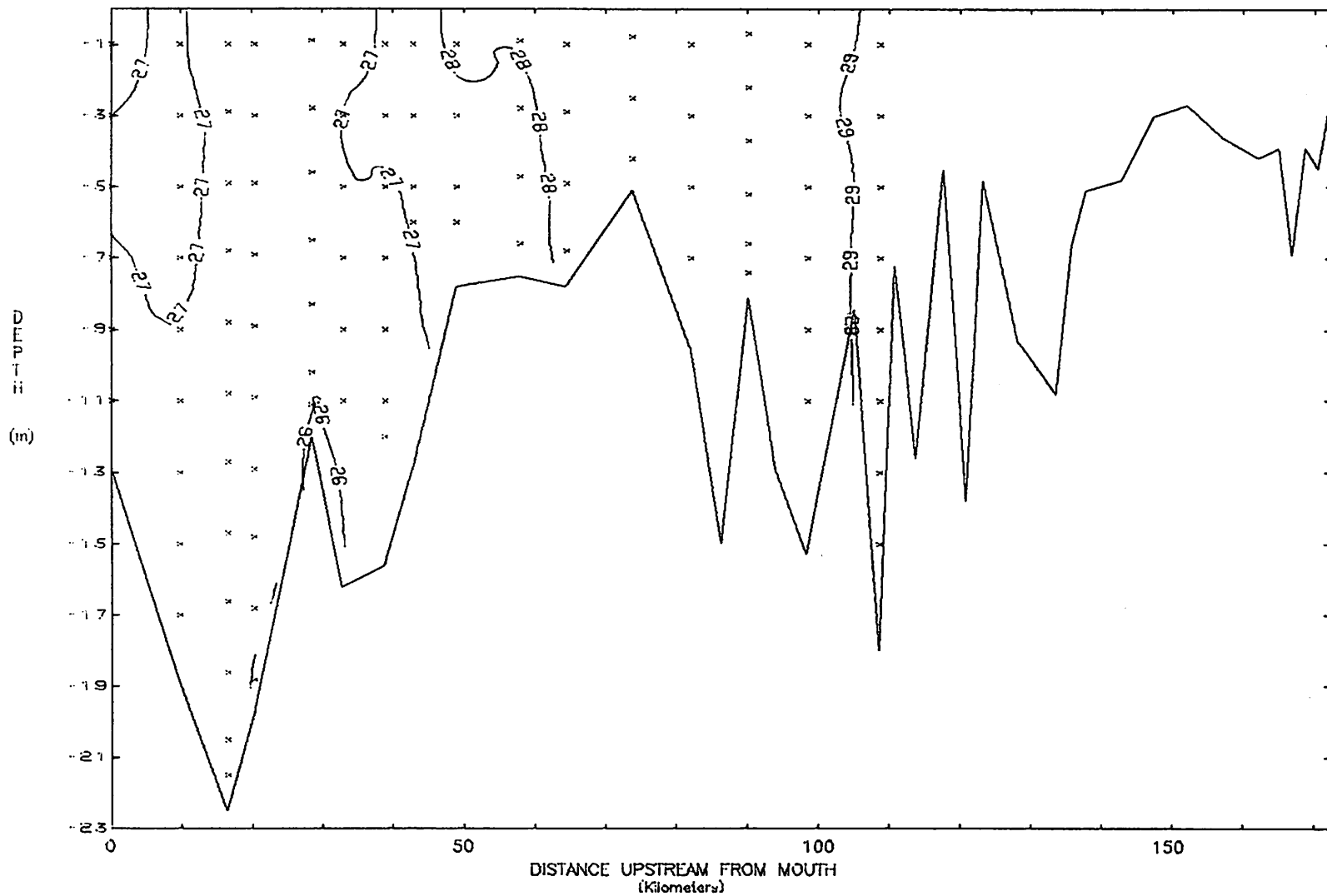
PAMUNKEY RIVER  
DISSOLVED OXYGEN

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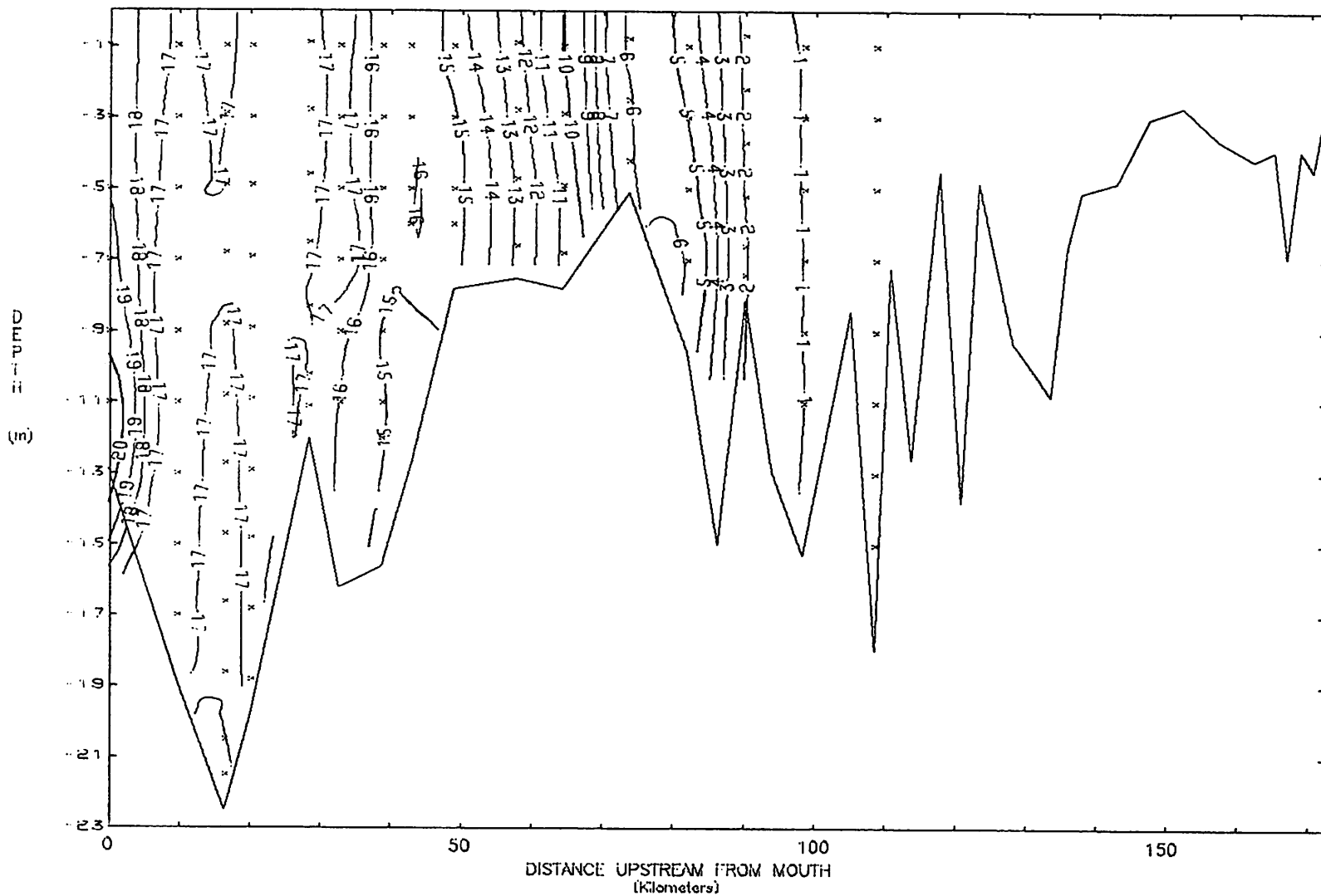
RAPPAHANNOCK RIVER  
TEMPERATURE

23 JULY 1985  
SLACK BEFORE FLOOD



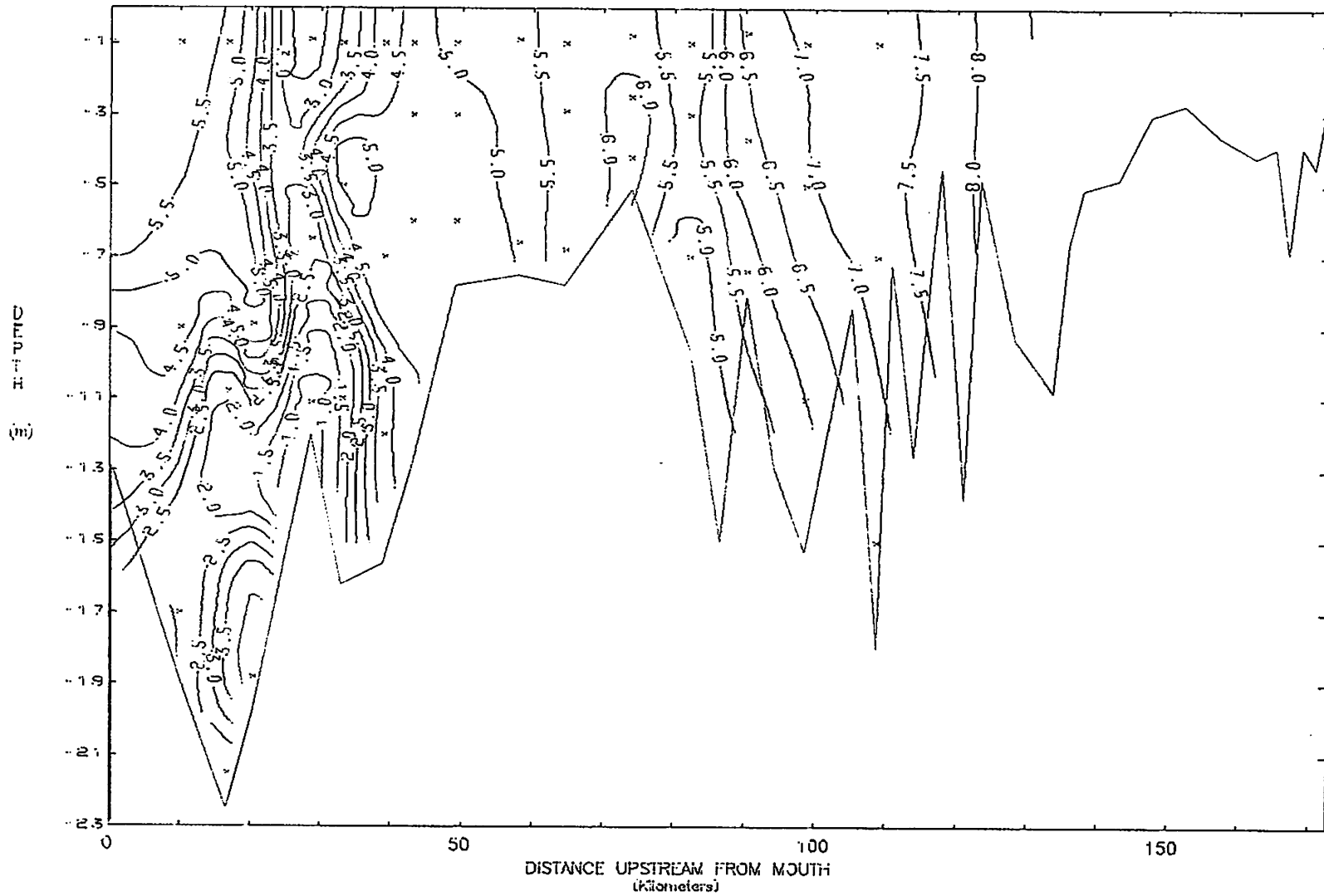
RAPPAHANNOCK RIVER  
SALINITY

23 JULY 1985  
SLACK BEFORE FLOOD



RAPPAHANNOCK RIVER  
DISSOLVED OXYGEN

23 JULY 1985  
SLACK BEFORE FLOOD



Monthly Report on the State of Rivers - September 1985

Sponsored by

Virginia Institute of Marine Science

and

Virginia State Water Control Board



Summary of Field Surveys

(1) Slackwater Runs

James: Temperature, salinity and DO were measured in the saline portion of the river on September 4.

York and Pamunkey: Temperature, salinity and DO were measured in the saline portion of the river on September 18.

Rappahannock: Temperature, salinity and DO were measured in the saline portion of the river on September 16.

Salinity, temperature and DO distributions for all three rivers are attached.

(2) Crab-fish Joint Trawl Surveys - Dr. H. Austin

The trawl surveys were conducted on the following dates:

James: August 12, September 18

York and Pamunkey: August 19, September 16

Rappahannock: no survey in August and September

Surface and bottom temperature, salinity, DO and secchi depth were measured at designated stations.

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For further information make request to Dr. Albert Kuo, Virginia Institute of Marine Science, Gloucester Point, VA 23062, (804)642-7212.

## Lesser Neap Tide

September 7

### Comments on Slackwater Survey Data

Salinity in the James was greatly depressed due to high stormwater runoff in late August and early September. Both longitudinal and vertical gradients were much stronger than normal. Salinity in the York and Pamunkey was depressed slightly while it remained as high as normal of the season in the Rappahannock.

Hypoxic condition in deep waters near the mouth of York and Rappahannock had largely dissipated. There was sign of DO depression at the mouth of the James.

### Scheduled Surveys

#### (1) Slackwater Runs

James: October 17, November 5

York and Pamunkey: October 18, November 6

Rappahannock: October 16, November 4

#### (2) Crab-fish Joint Trawl Surveys - Dr. Austin

York River: October 12

James River: October 17

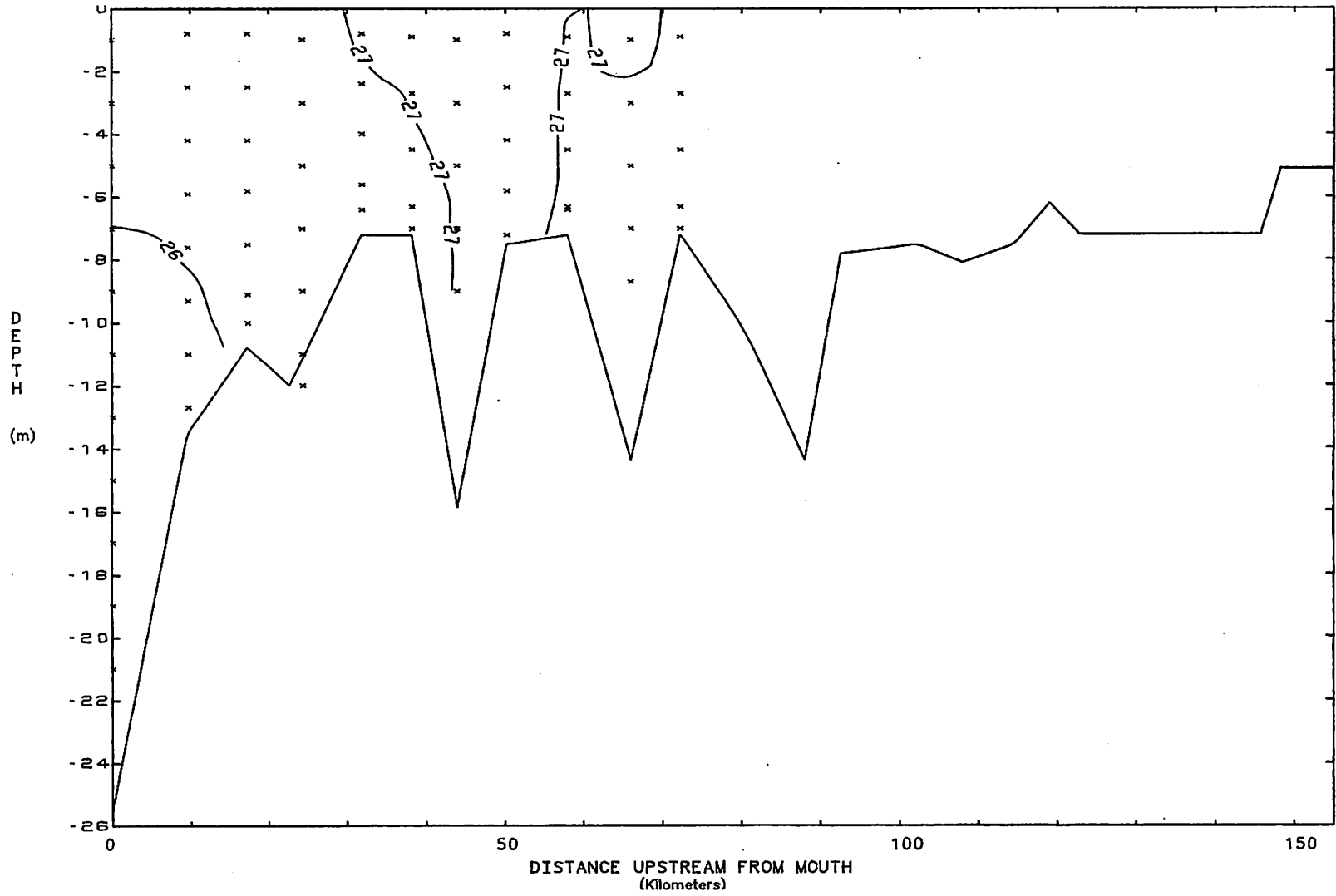
Rappahannock: October 14

Note: Because of heavy demand on personnels and vessels by more pressing projects, no slackwater run was conducted in August, 1985.



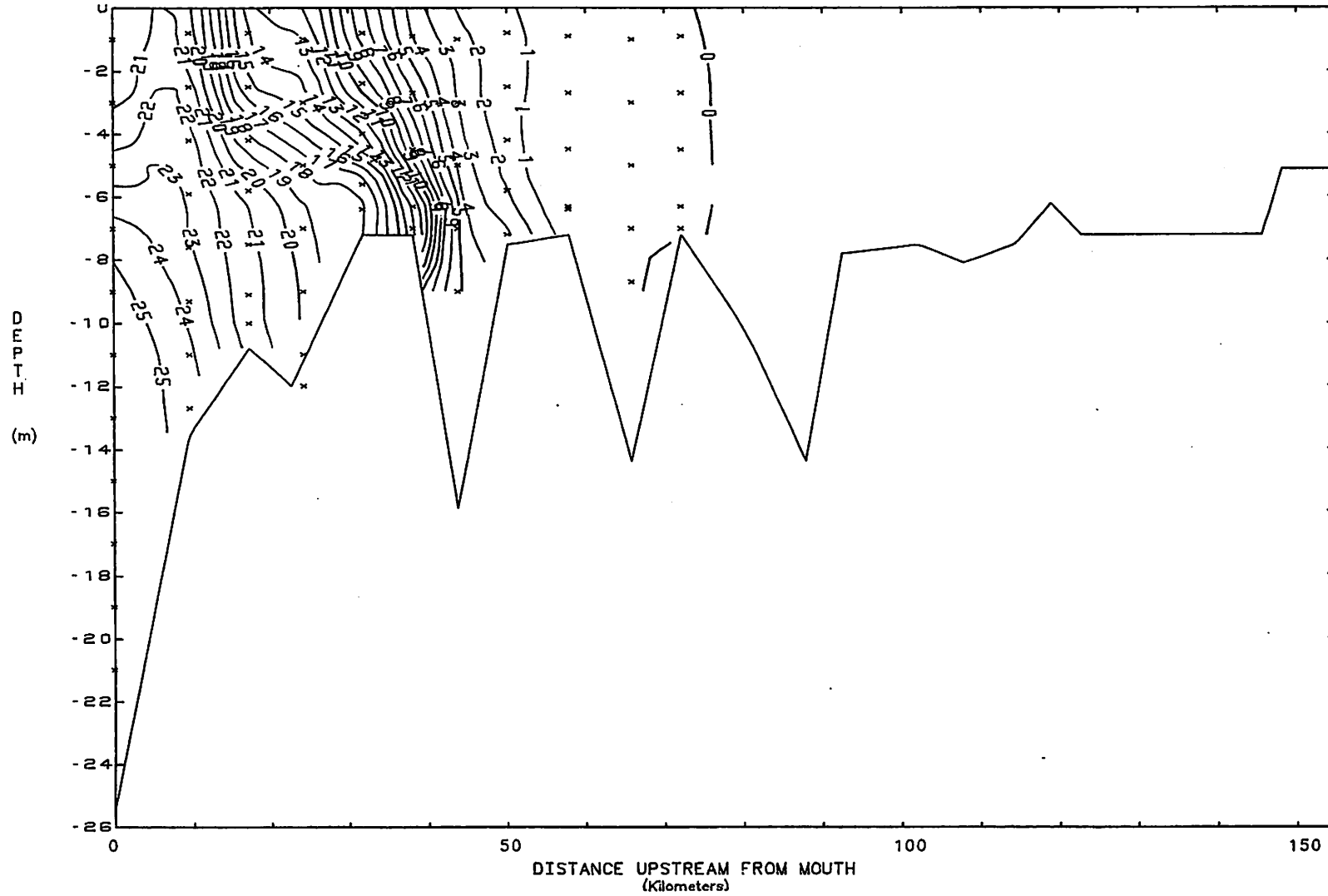
JAMES RIVER  
TEMPERATURE

04 SEPTEMBER 1985  
SLACK BEFORE FLOOD



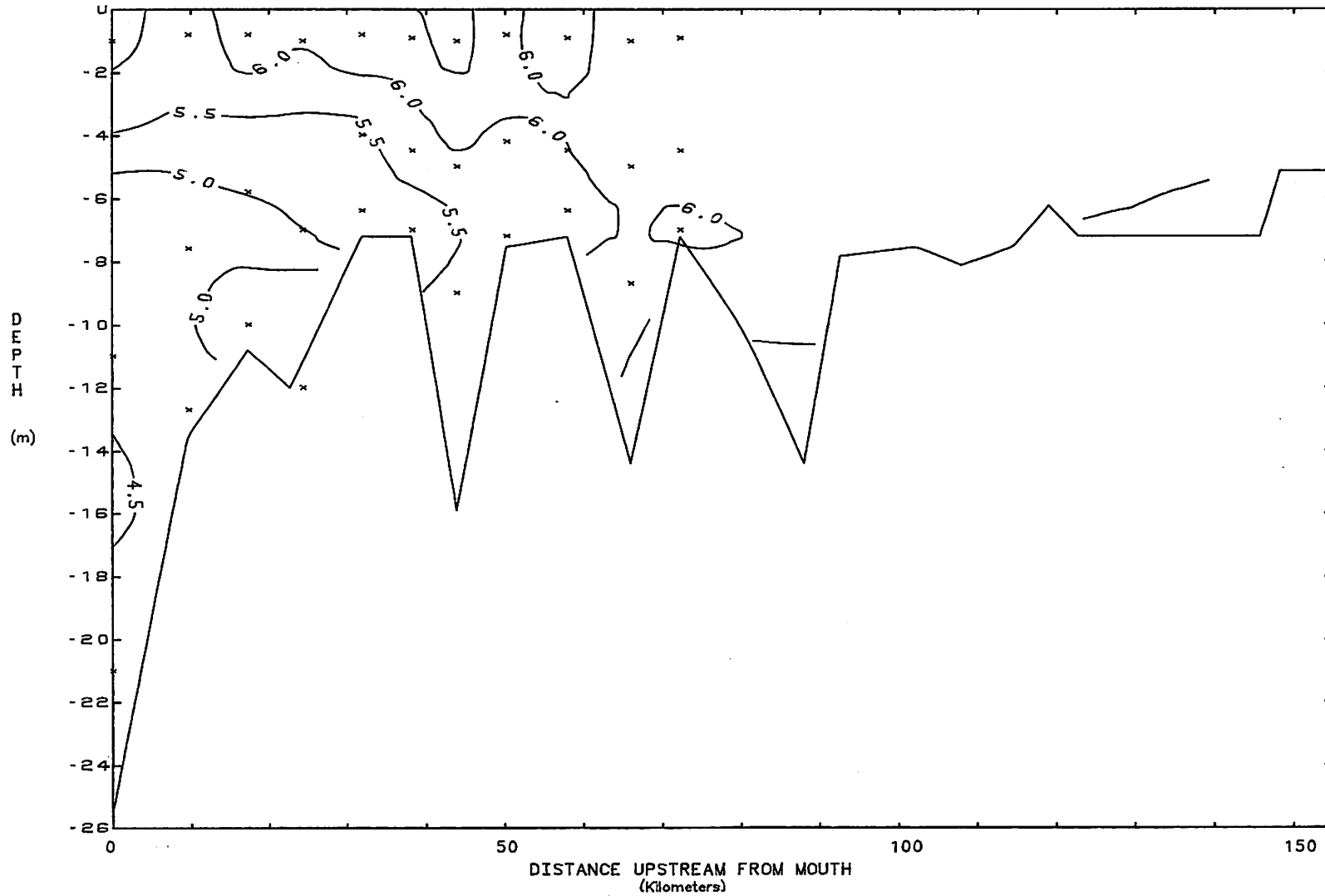
JAMES RIVER  
SALINITY

04 SEPTEMBER 1985  
SLACK BEFORE FLOOD



JAMES RIVER  
DISSOLVED OXYGEN

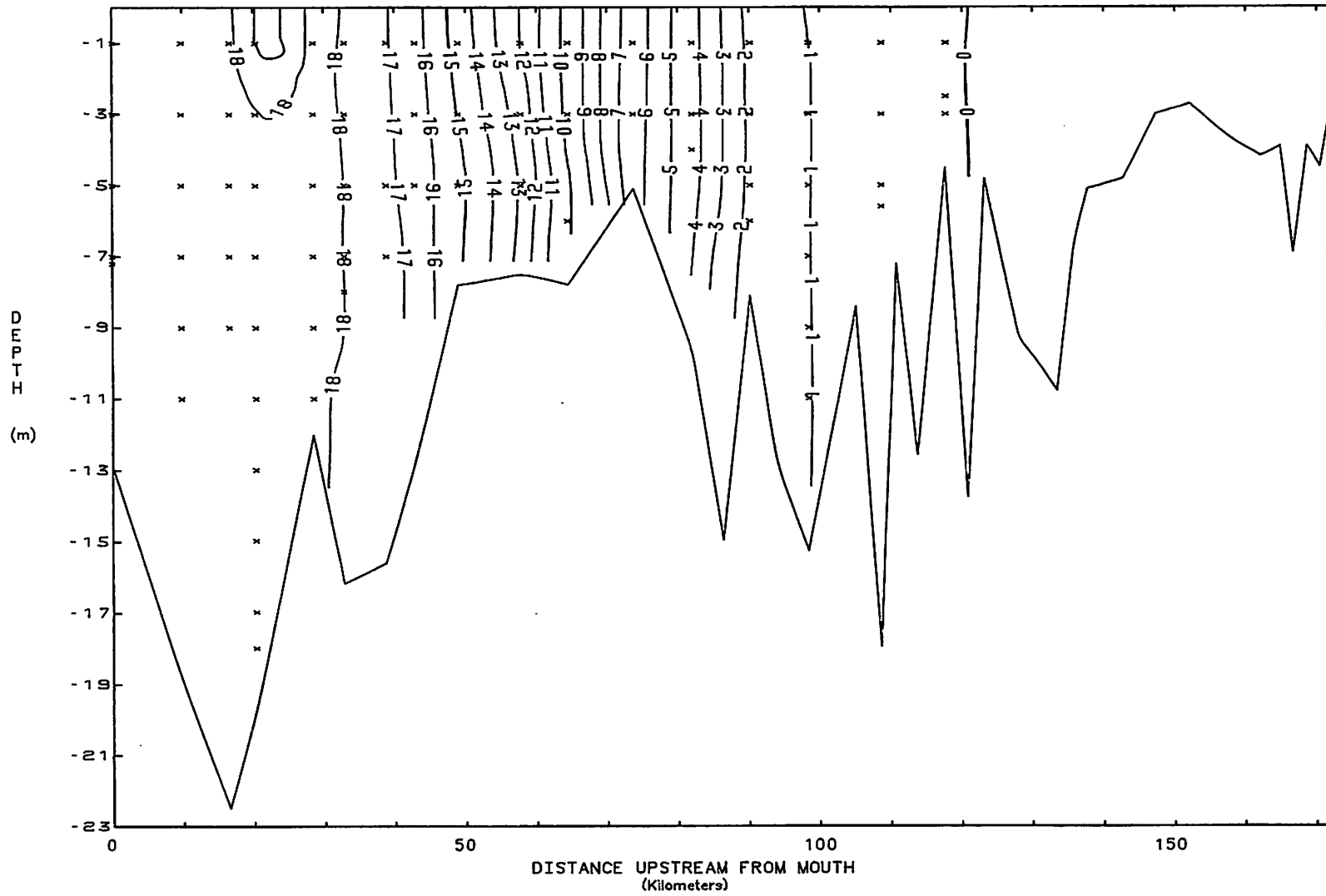
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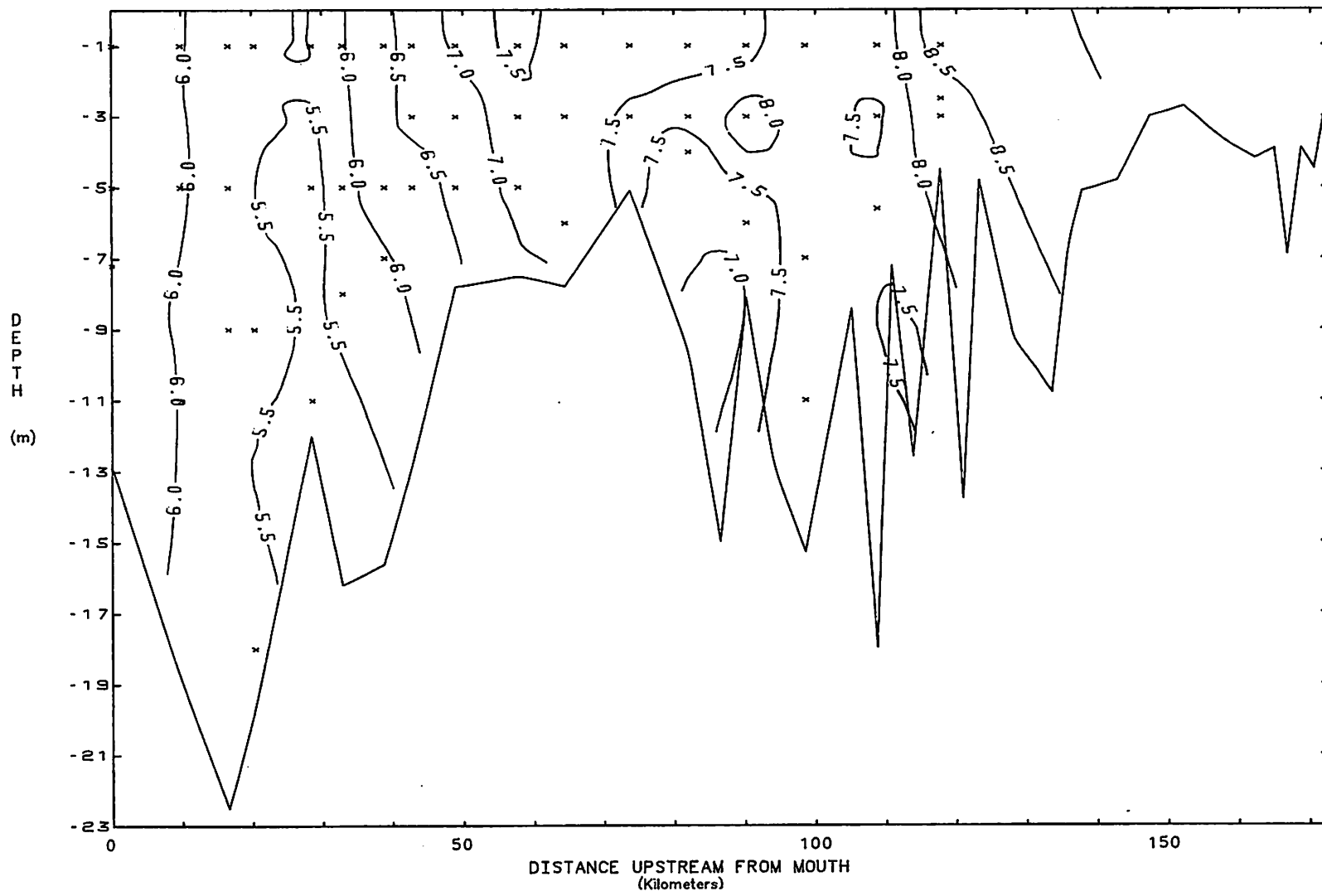
RAPPAHANNOCK RIVER  
SALINITY

16 SEPTEMBER 1985  
SLACK BEFORE FLOOD



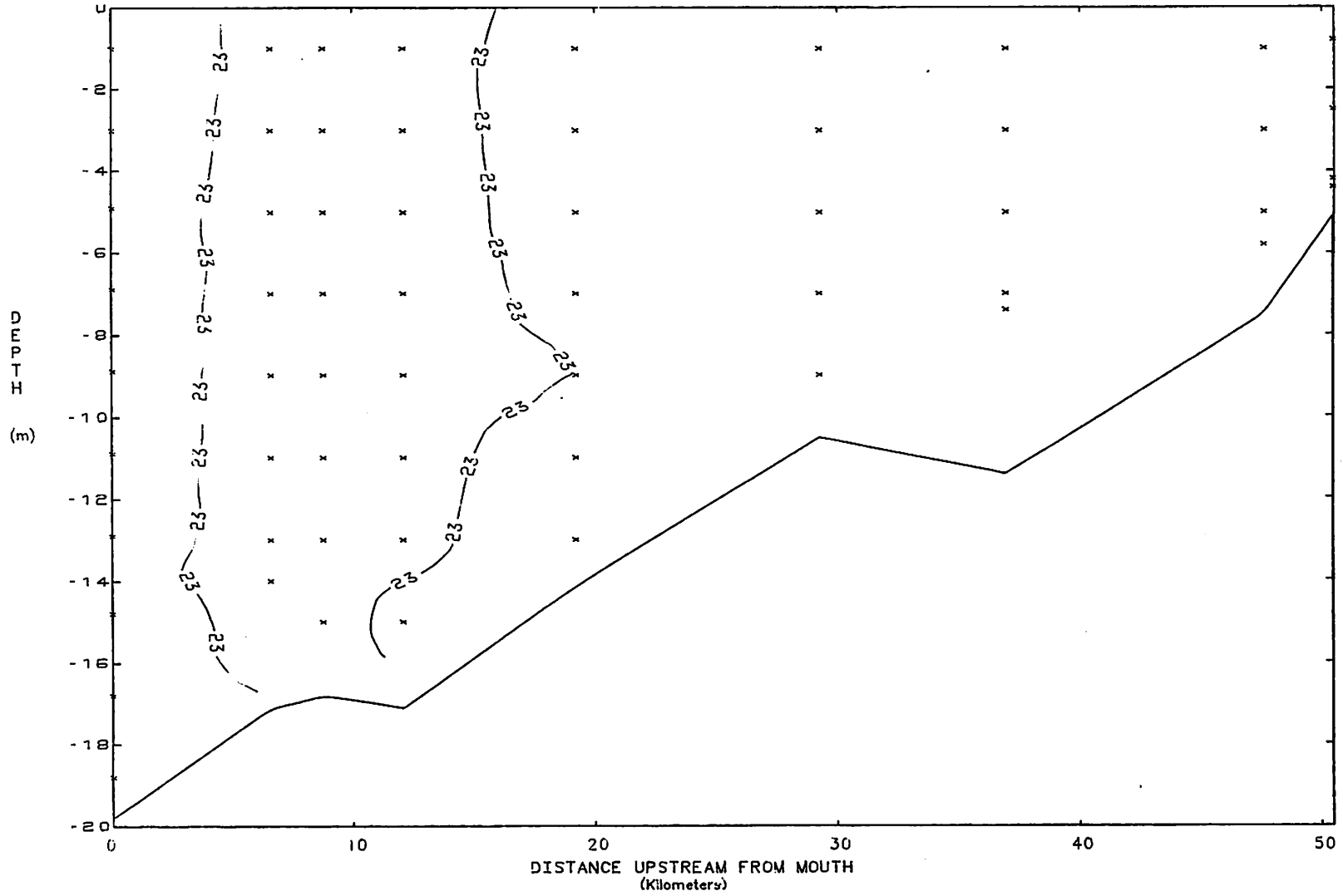
RAPPAHANNOCK RIVER  
DISSOLVED OXYGEN

16 SEPTEMBER 1985  
SLACK BEFORE FLOOD



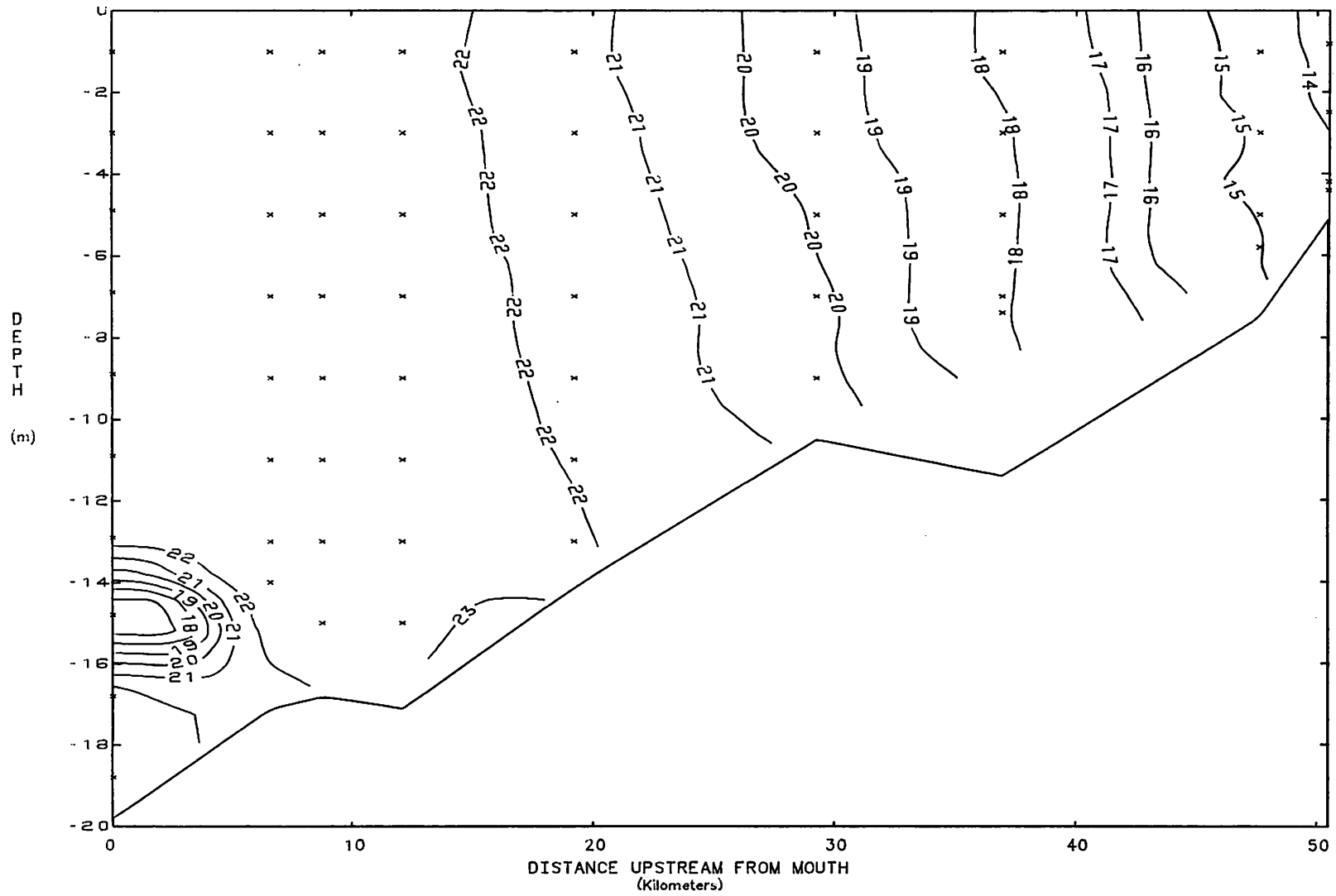
YORK RIVER  
TEMPERATURE

18 SEPTEMBER 1985  
SLACK BEFORE FLOOD



YORK RIVER  
SALINITY

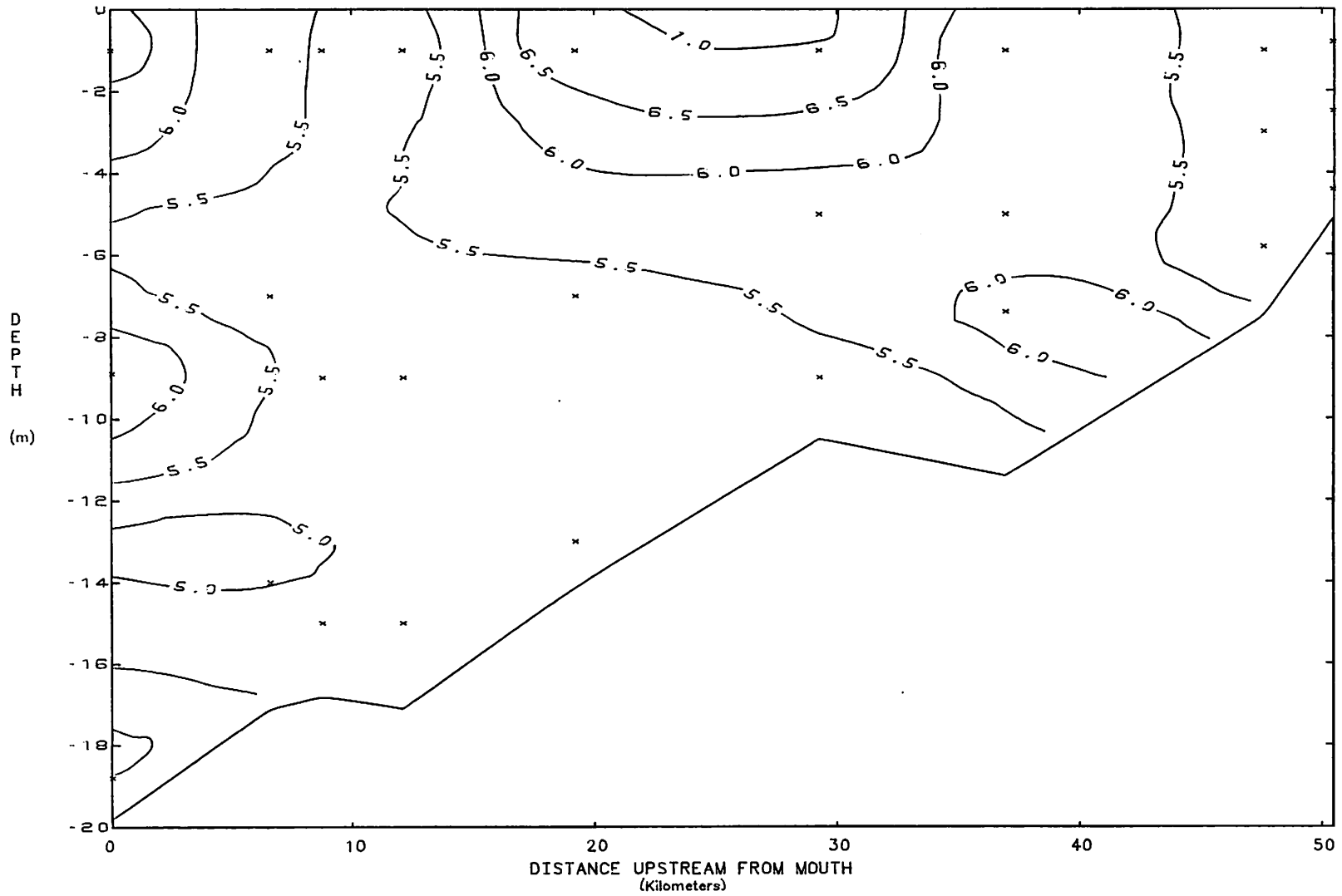
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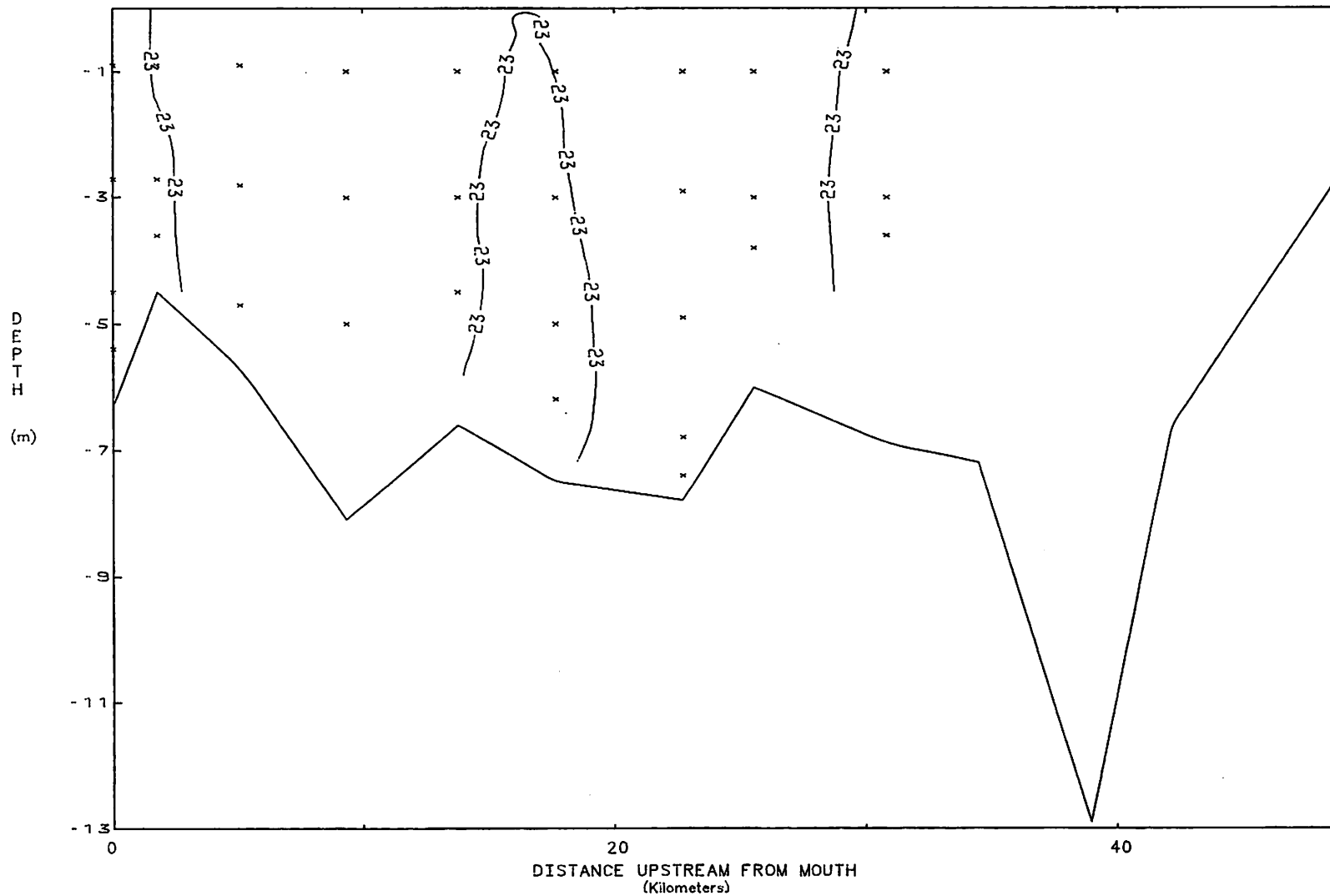
YORK RIVER  
DISSOLVED OXYGEN

18 SEPTEMBER 1985  
SLACK BEFORE FLOOD



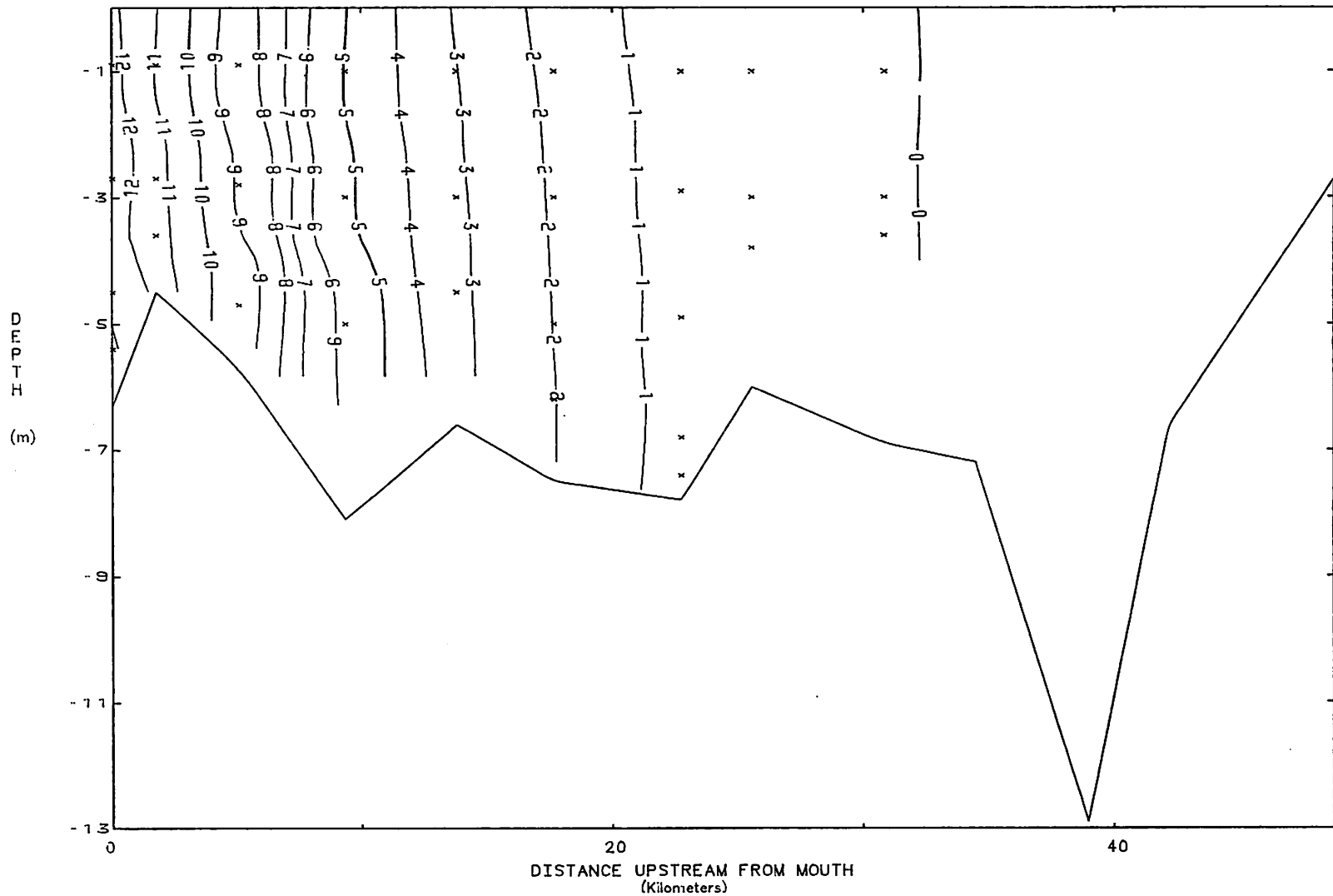
PAMUNKEY RIVER  
TEMPERATURE

18 SEPTEMBER 1965  
SLACK BEFORE FLOOD



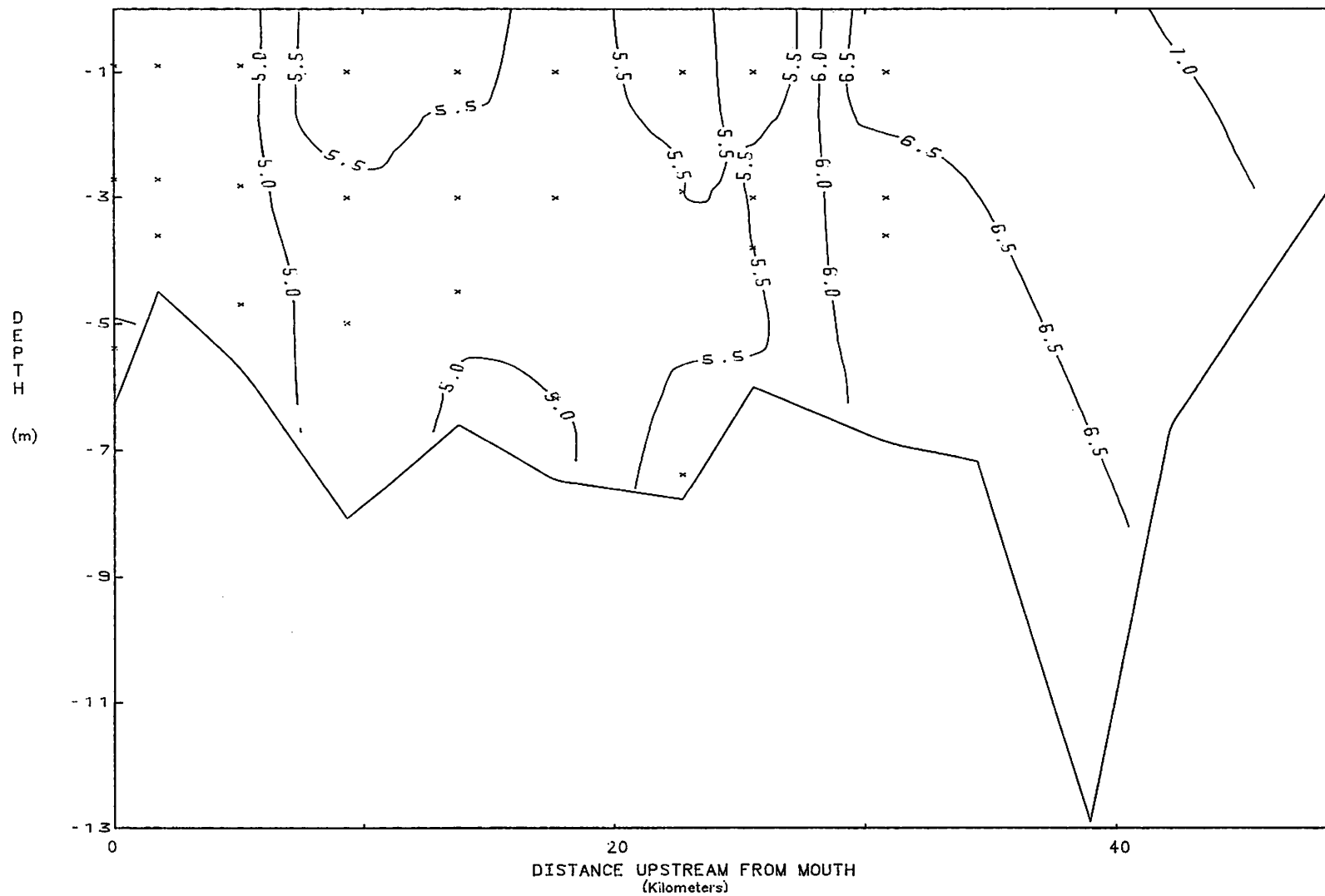
PAMUNKEY RIVER  
SALINITY

18 SEPTEMBER 1985  
SLACK BEFORE FLOOD



PAMUNKEY RIVER  
DISSOLVED OXYGEN

18 SEPTEMBER 1985  
SLACK BEFORE FLOOD



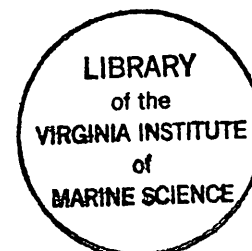
Monthly Report on the State of Rivers - October 1985

Sponsored by

Virginia Institute of Marine Science

and

Virginia State Water Control Board



Summary of Field Surveys

(1) Slackwater Runs

James: Temperature, salinity and DO were measured in the saline portion of the river on October 17.

York and Pamunkey: Temperature, salinity and DO were measured in the saline portion of the river on October 18.

Rappahannock: Temperature, salinity and DO were measured in the saline portion of the river on October 16.

Salinity, temperature and DO distributions for all three rivers are attached.

(2) Crab-fish Joint Trawl Surveys - Dr. H. Austin

The trawl surveys were conducted on the following dates:

James: October 17

York and Pamunkey: October 12

Rappahannock: October 14

Surface and bottom temperature, salinity, DO and secchi depth were measured at designated stations.

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For further information make request to Dr. Albert Kuo, Virginia Institute of Marine Science, Gloucester Point, VA 23062, (804)642-7212.

## Lesser Neap Tide

October 6

### Comments on Slackwater Survey Data

Salinity in the James and the York remained slightly depressed. Salinity in the Rappahannock continued its increasing trend which is normal of the season. It appears that some unusual high salinity water intruded into the lowest reach of the Rappahannock, set up strong stratification and local DO depletion. A DO depletion below 5 mg/l was observed in the Pamunkey River about 5 km upstream of West Point.

### Scheduled Surveys

#### (1) Slackwater Runs

James: November 5, December 4

York and Pamunkey: November 6, December 5

Rappahannock: November 4, December 3

#### (2) Crab-fish Joint Trawl Surveys - Dr. Austin

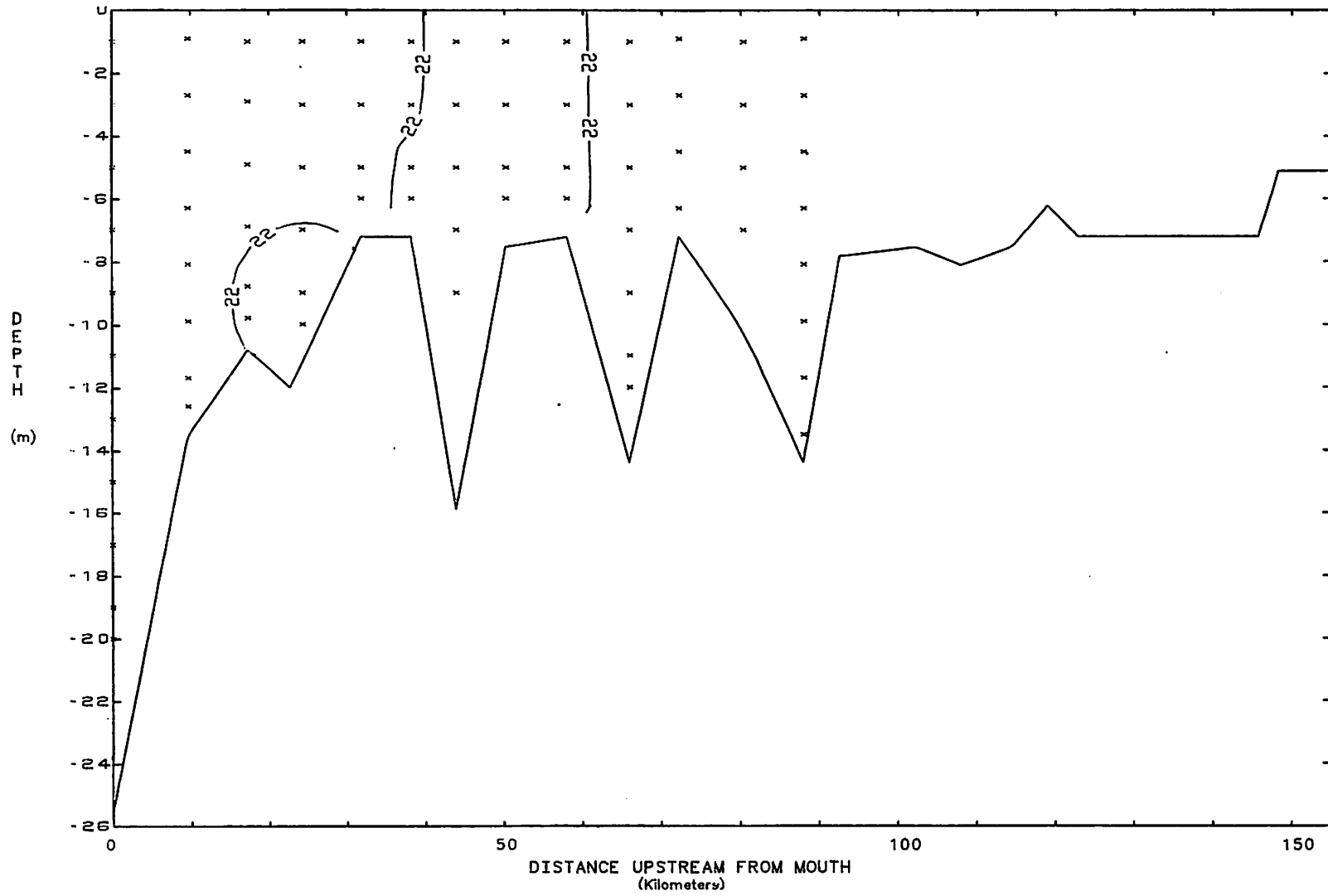
York River: November 25

James River: November 20

Rappahannock: November 22

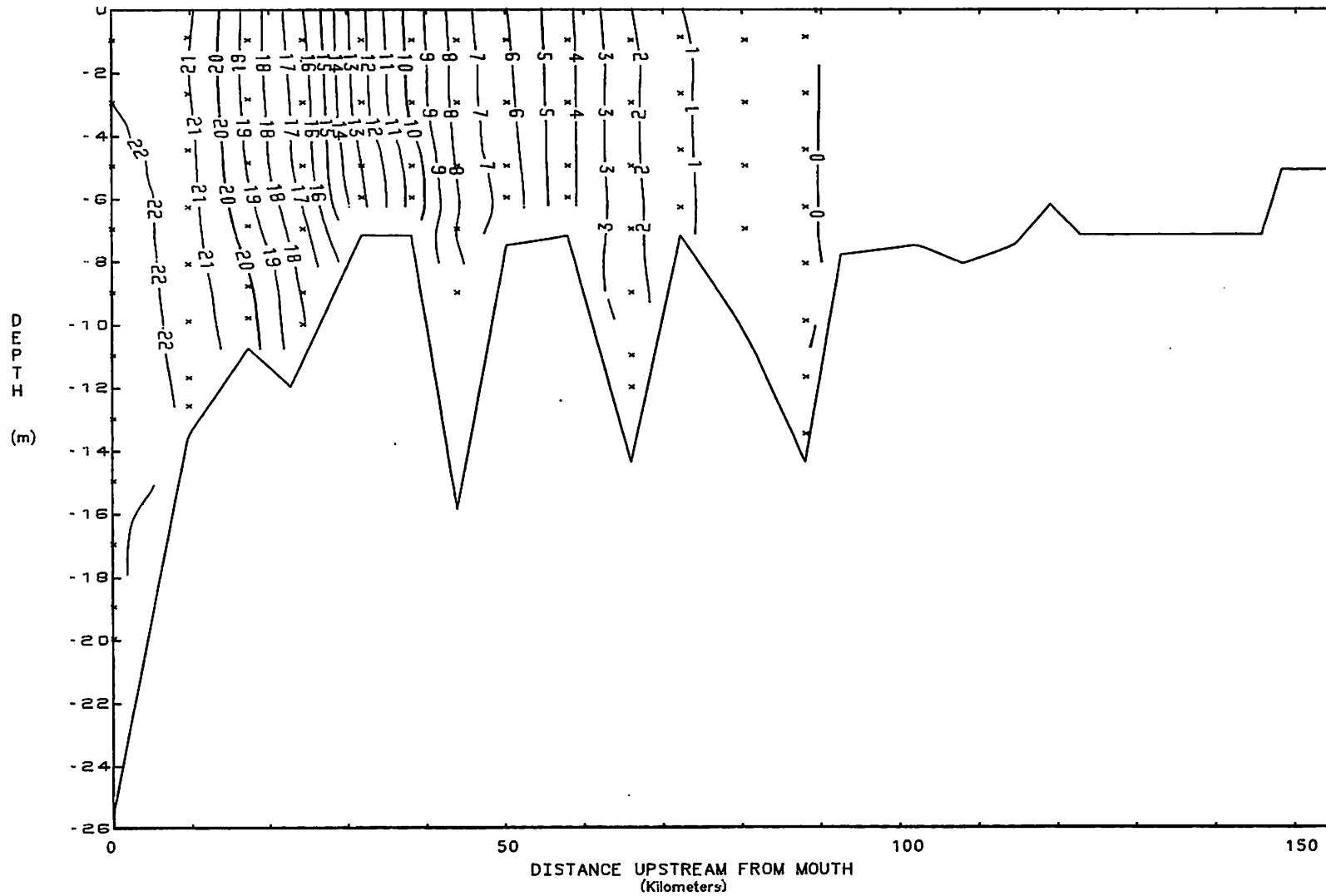
JAMES RIVER  
TEMPERATURE

17 OCTOBER 1985  
SLACK BEFORE FLOOD



JAMES RIVER  
SALINITY

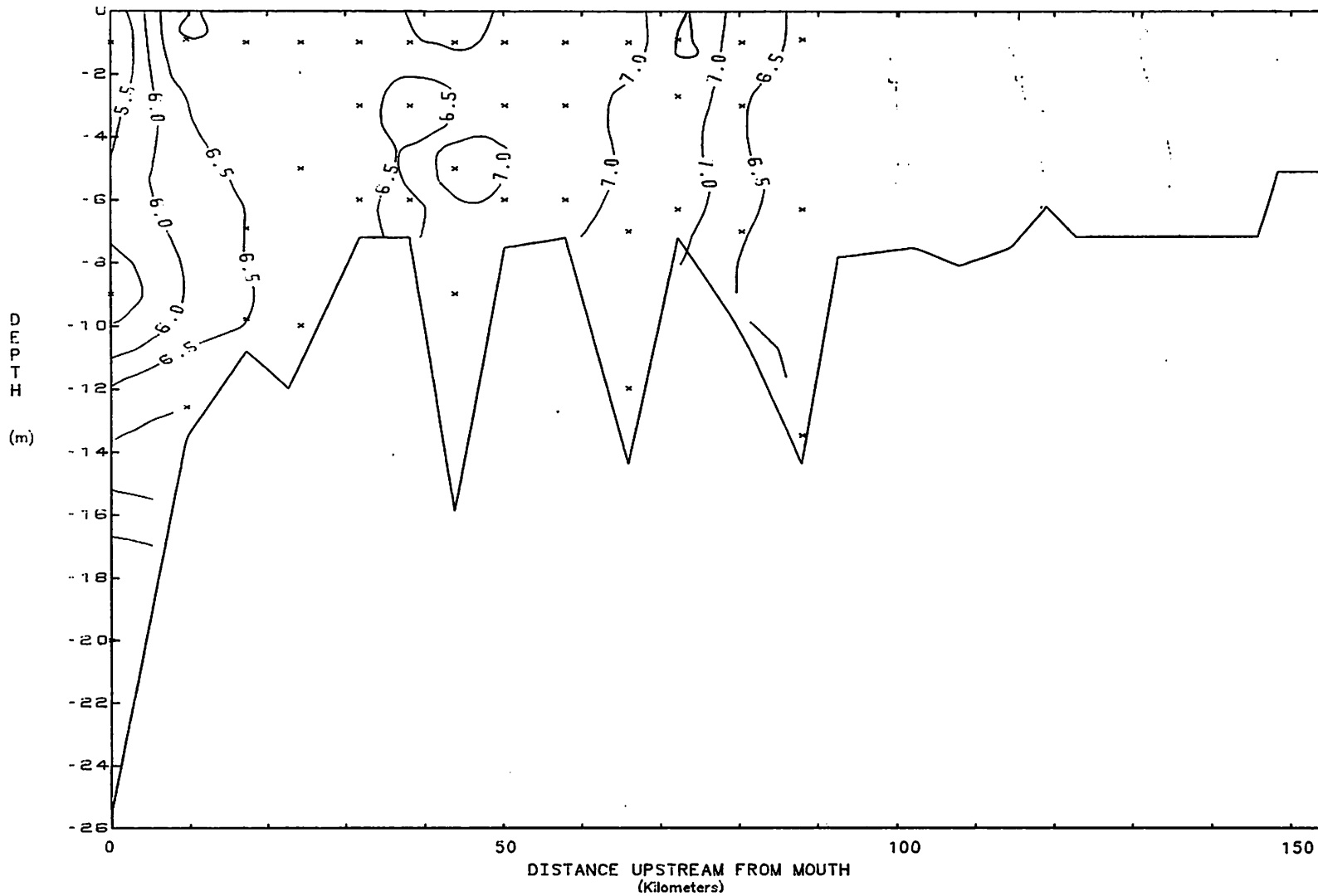
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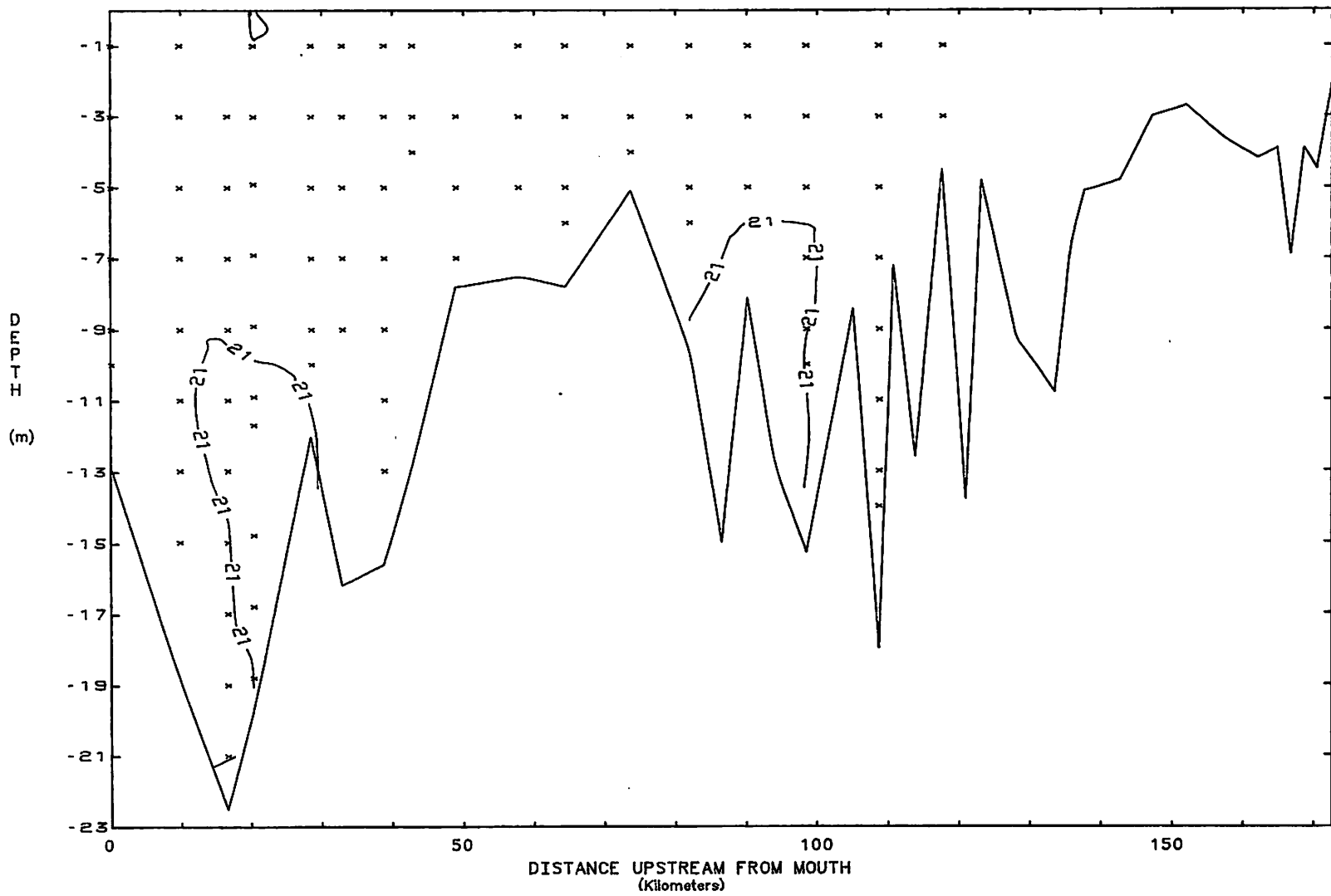
JAMES RIVER  
DISSOLVED OXYGEN

17 OCTOBER 1985  
SLACK BEFORE FLOOD



RAPPAHANNOCK RIVER  
TEMPERATURE

16 OCTOBER 1985  
SLACK BEFORE FLOOD

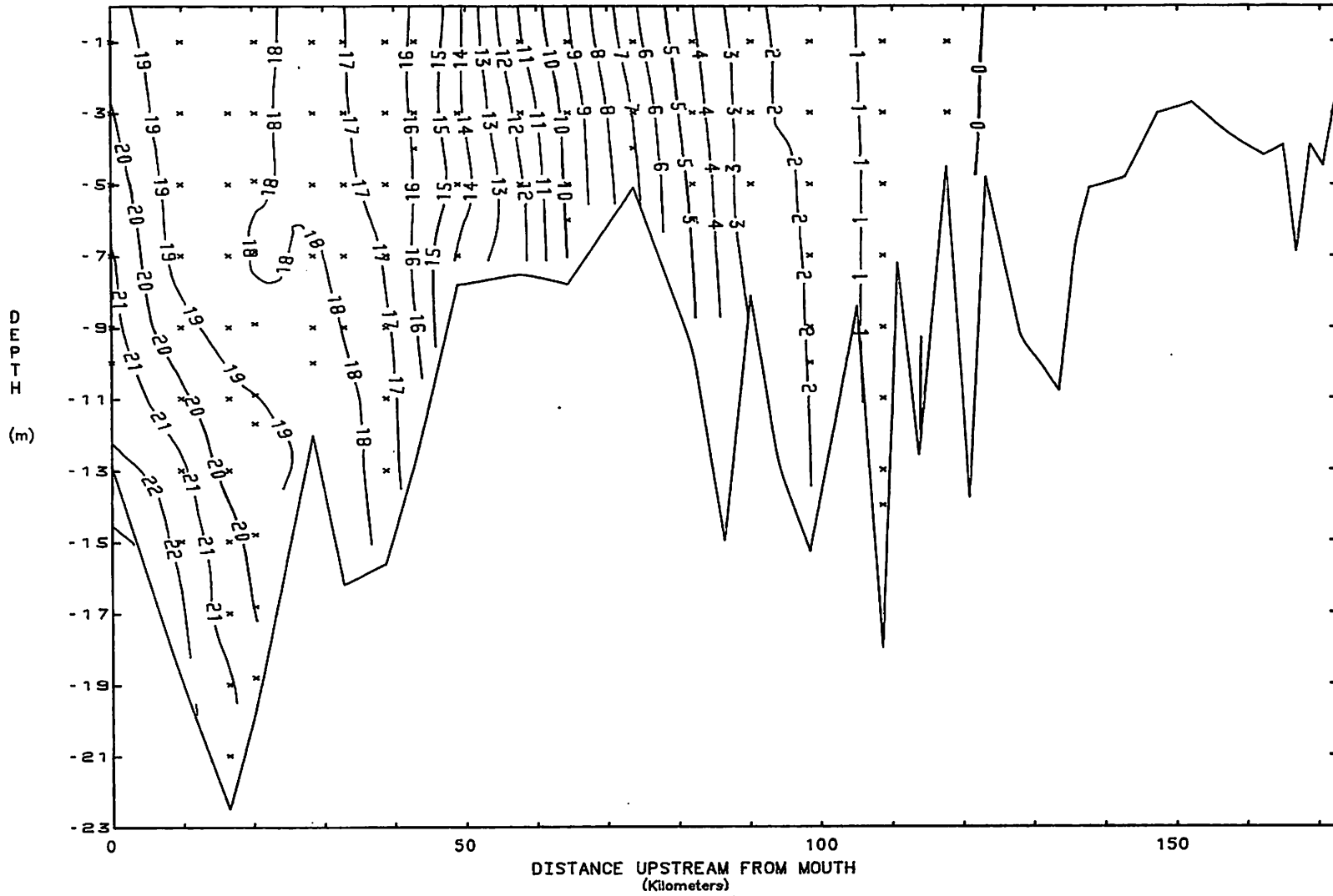


RAPPAHANNOCK RIVER

16 OCTOBER 1985

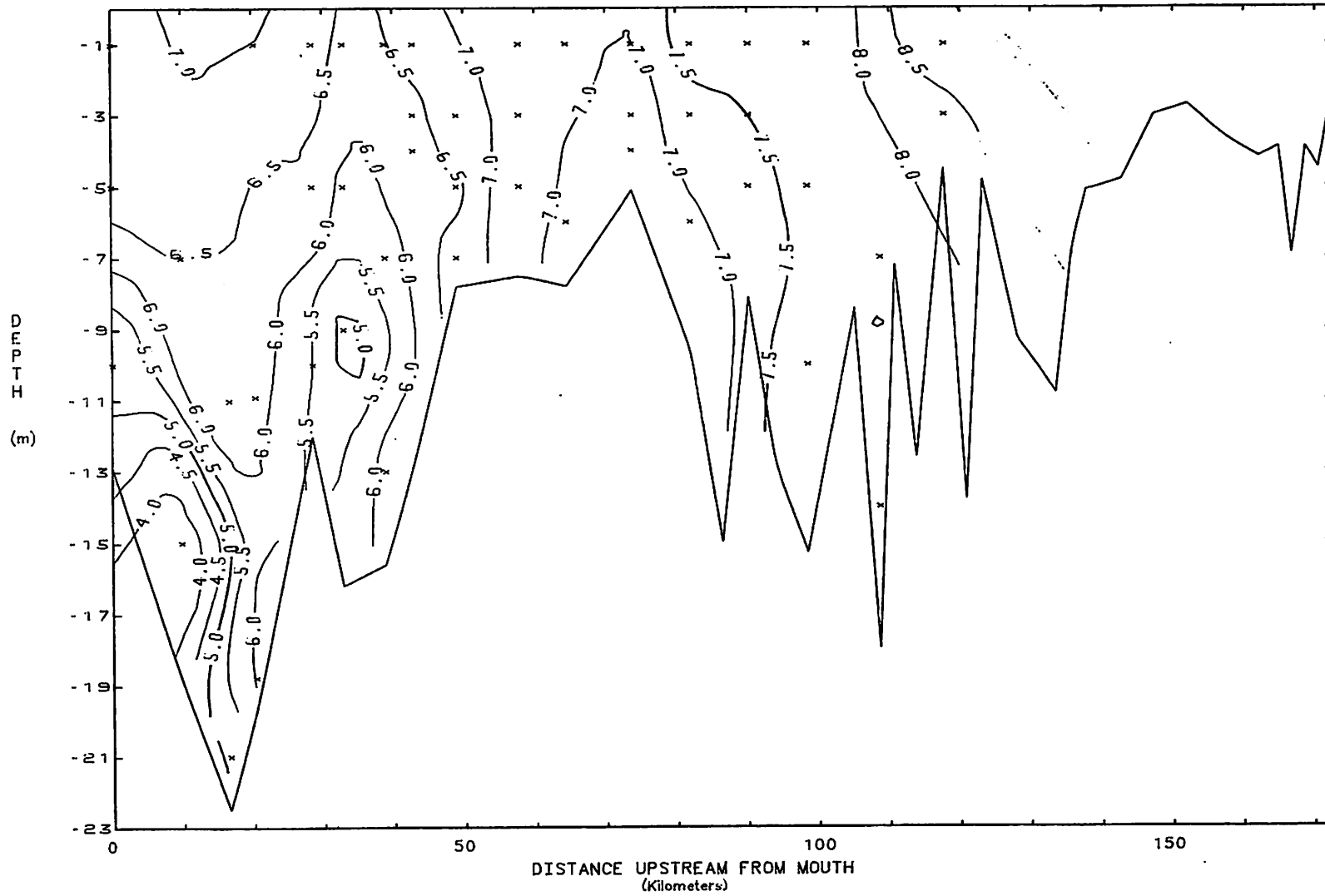
SALINITY

SLACK BEFORE FLOOD



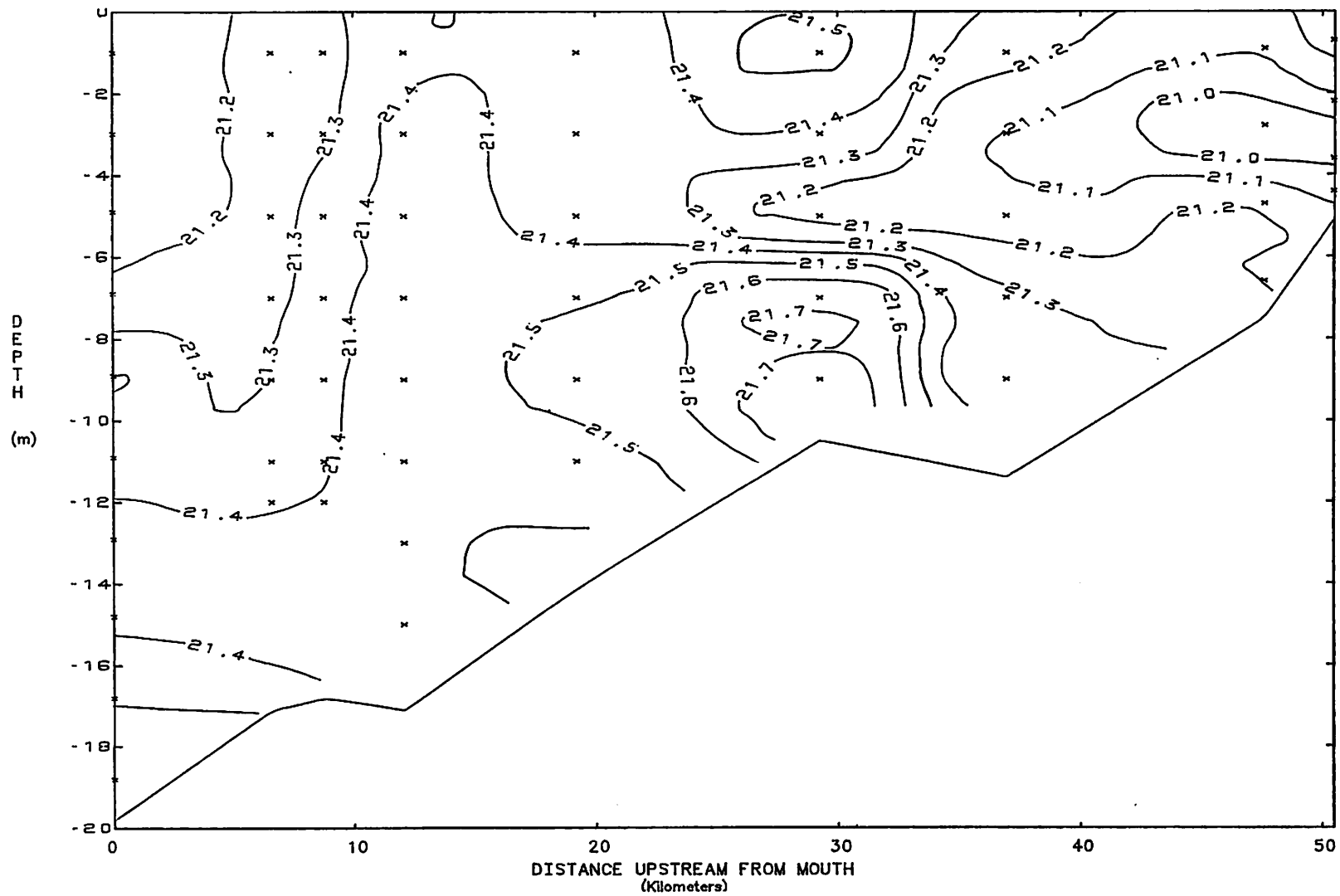
RAPPAHANNOCK RIVER  
DISSOLVED OXYGEN

16 OCTOBER 1985  
SLACK BEFORE FLOOD



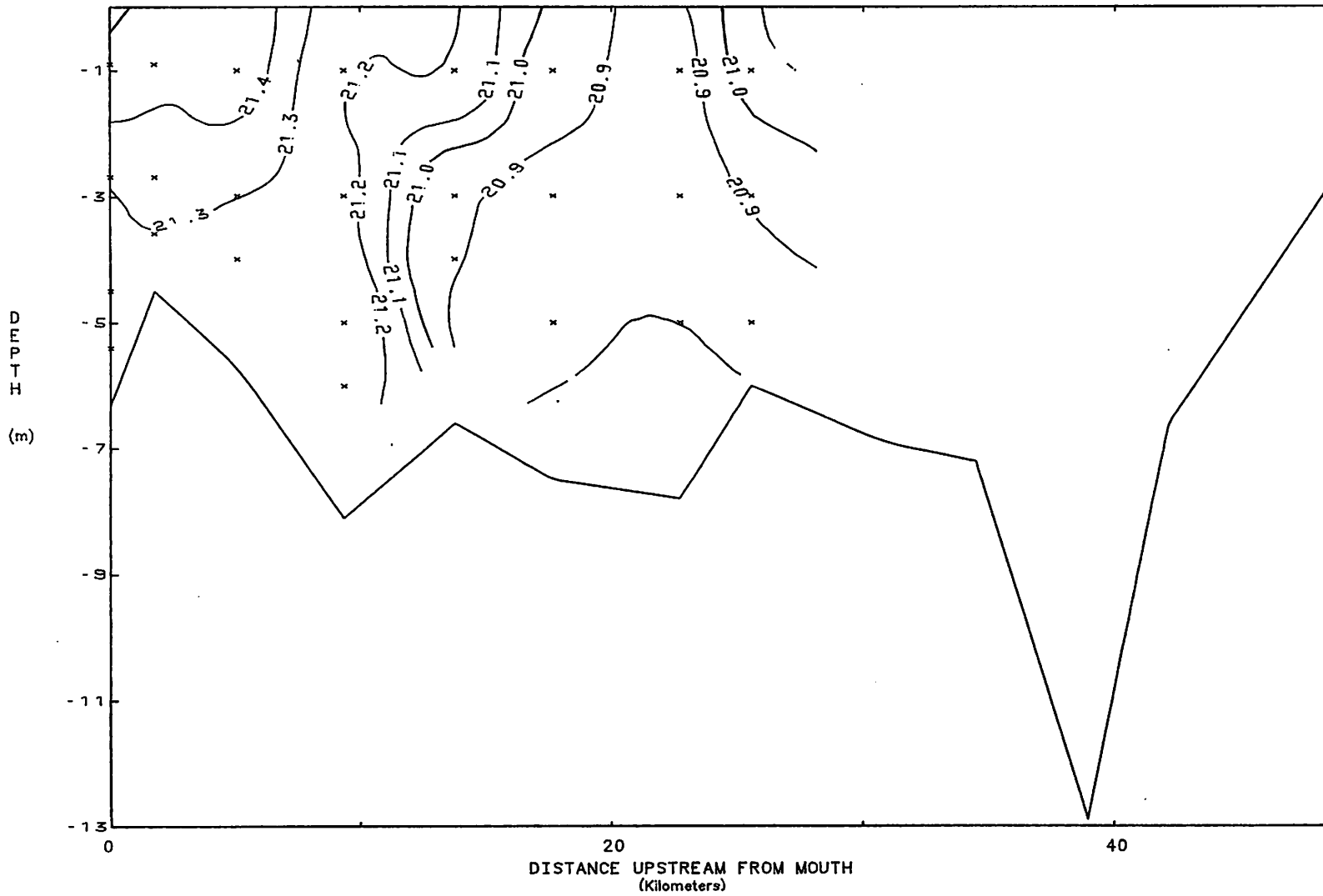
YORK RIVER  
TEMPERATURE

18 OCTOBER 1985  
SLACK BEFORE FLOOD



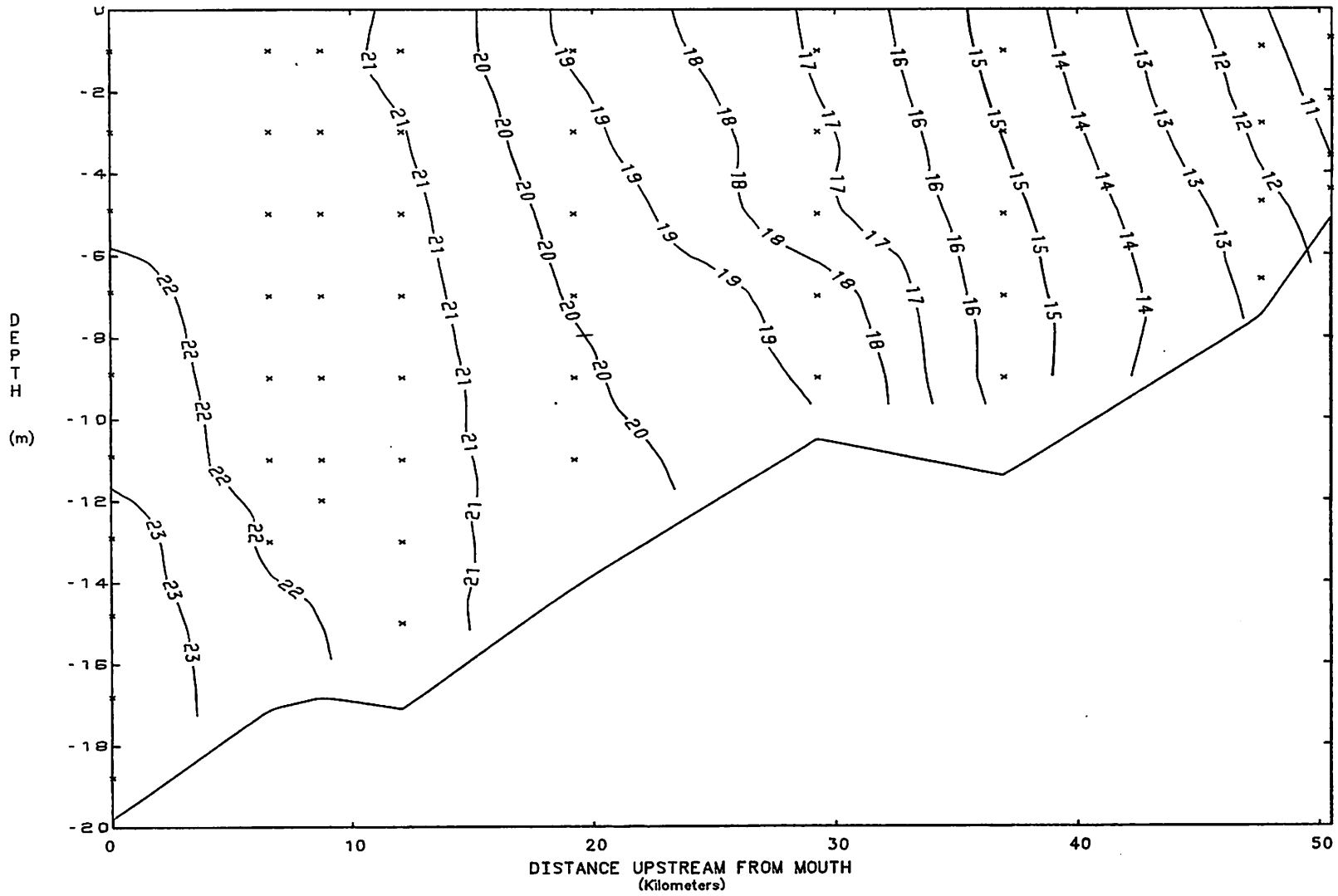
PAMUNKEY RIVER  
TEMPERATURE

18 OCTOBER 1985  
SLACK BEFORE FLOOD



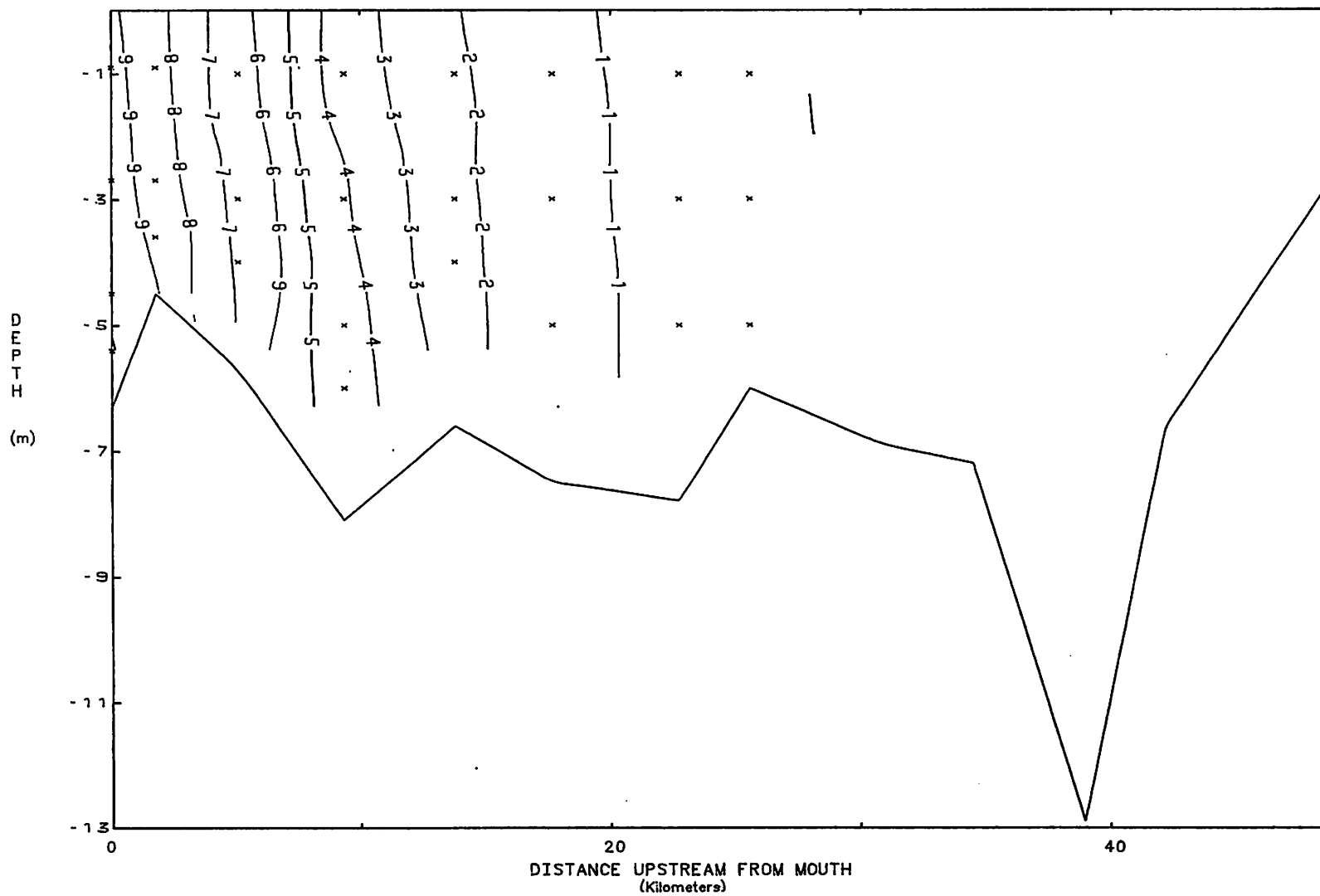
YORK RIVER  
SALINITY

18 OCTOBER 1985  
SLACK BEFORE FLOOD



PAMUNKEY RIVER  
SALINITY

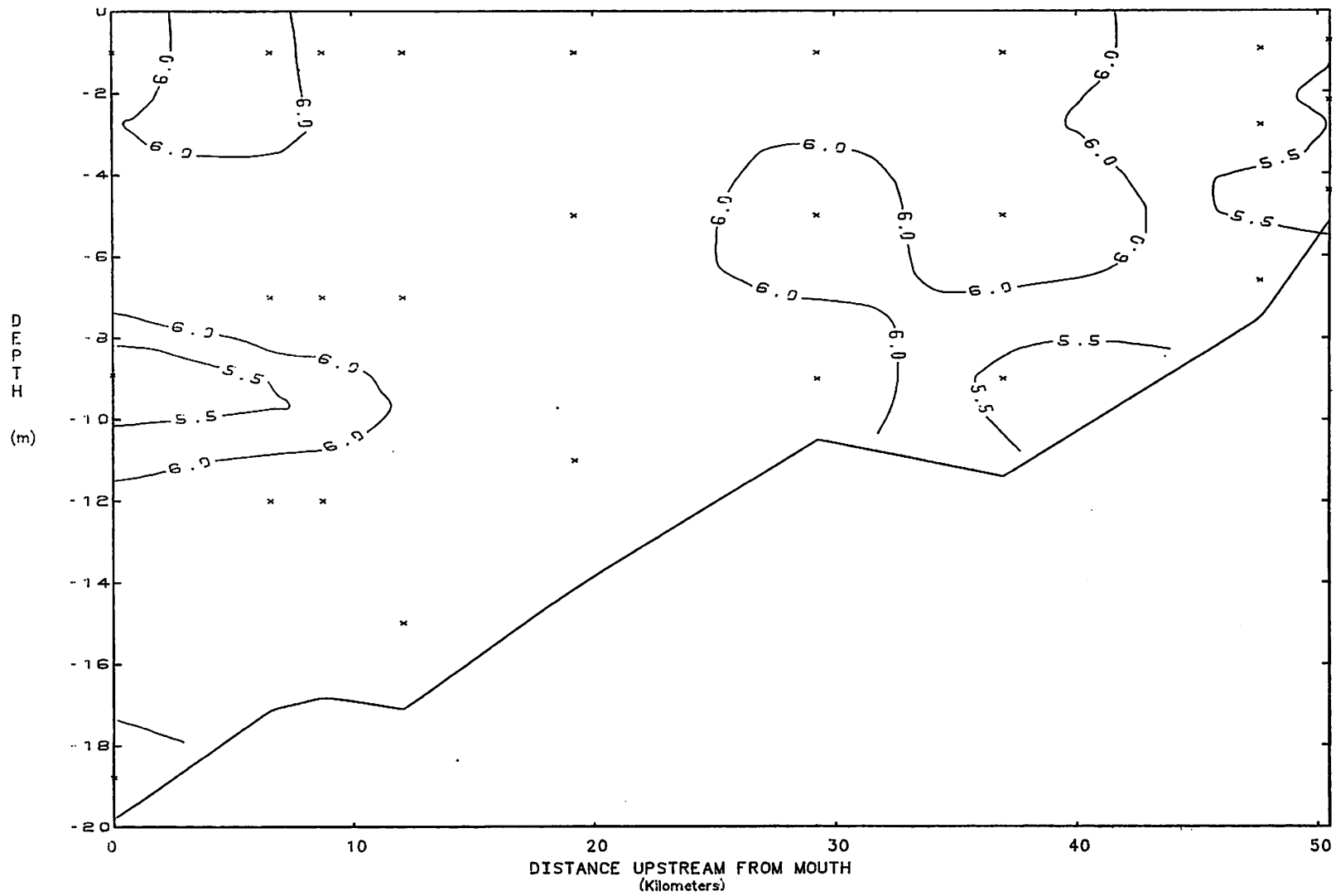
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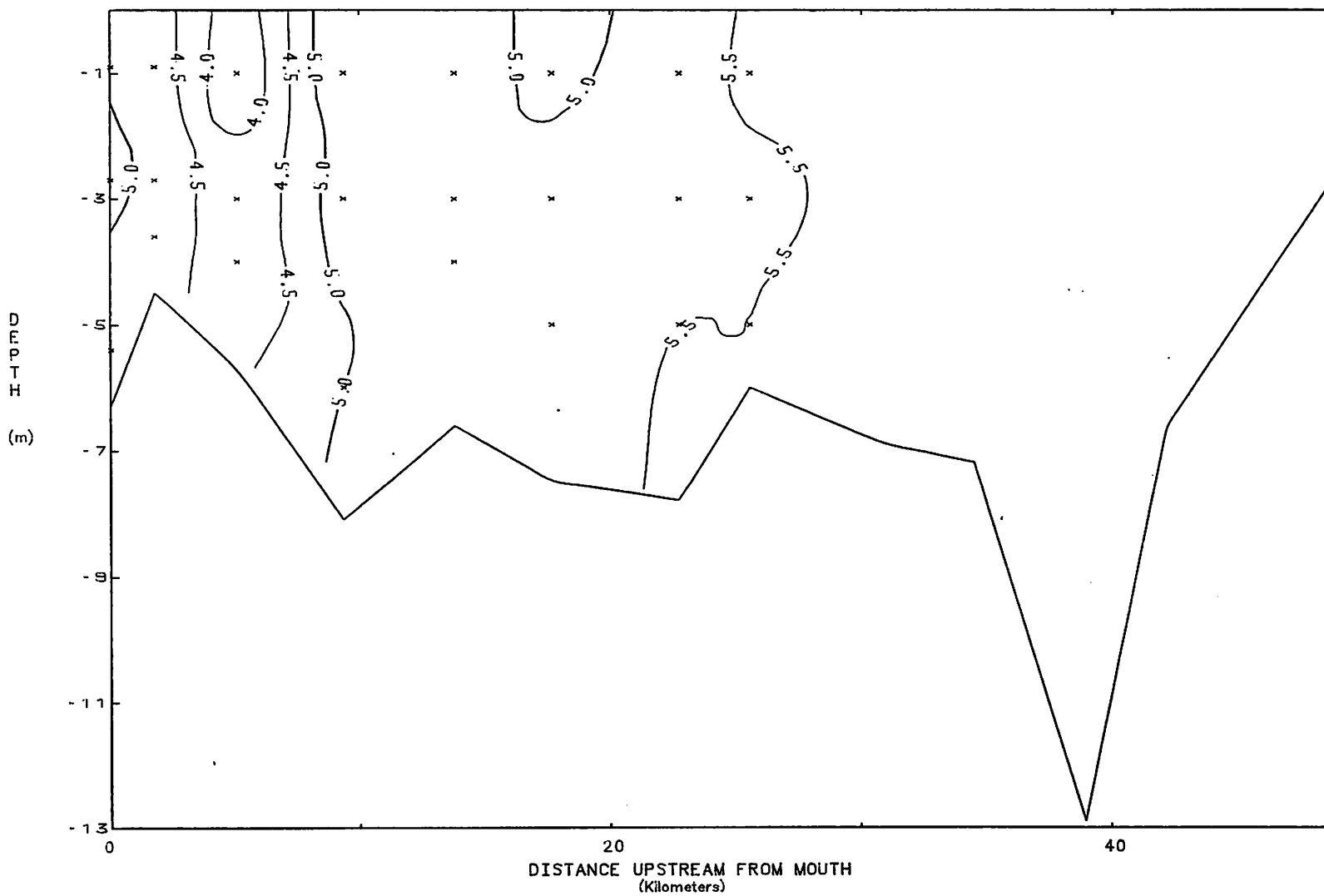
YORK RIVER  
DISSOLVED OXYGEN

18 OCTOBER 1985  
SLACK BEFORE FLOOD



PAMUNKEY RIVER  
DISSOLVED OXYGEN

18 OCTOBER 1985  
SLACK BEFORE FLOOD



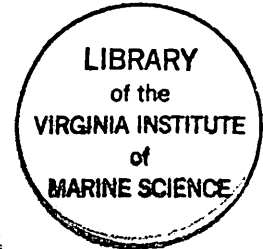
Monthly Report on the State of Rivers - November 1985

Sponsored by

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Summary of Field Surveys

(1) Slackwater Runs

James: Temperature, salinity and DO were measured in the saline portion of the river on November 18.

York and Pamunkey: Temperature, salinity and DO were measured in the saline portion of the river on November 19.

Rappahannock: Temperature, salinity and DO were measured in the saline portion of the river on November 15.

Salinity, temperature and DO distributions for all three rivers are attached.

(2) Crab-fish Joint Trawl Surveys - Dr. H. Austin

The trawl surveys were conducted on the following dates:

James: November 20

York and Pamunkey: November 22

Rappahannock: November 26

Surface and bottom temperature, salinity, DO and secchi depth were measured at designated stations.

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For further information make request to Dr. Albert Kuo, Virginia Institute of Marine Science, Gloucester Point, VA 23062, (804)642-7212.

**Lesser Neap Tide**

**November 4**

**Comments on Slackwater Survey Data**

Salinities in all three rivers were highly depressed and stratified due to large stormwater runoff in early November.

**Scheduled Surveys**

**(1) Slackwater Runs**

James: December 4

York and Pamunkey: December 5

Rappahannock: December 3

**(2) Crab-fish Joint Trawl Surveys - Dr. Austin**

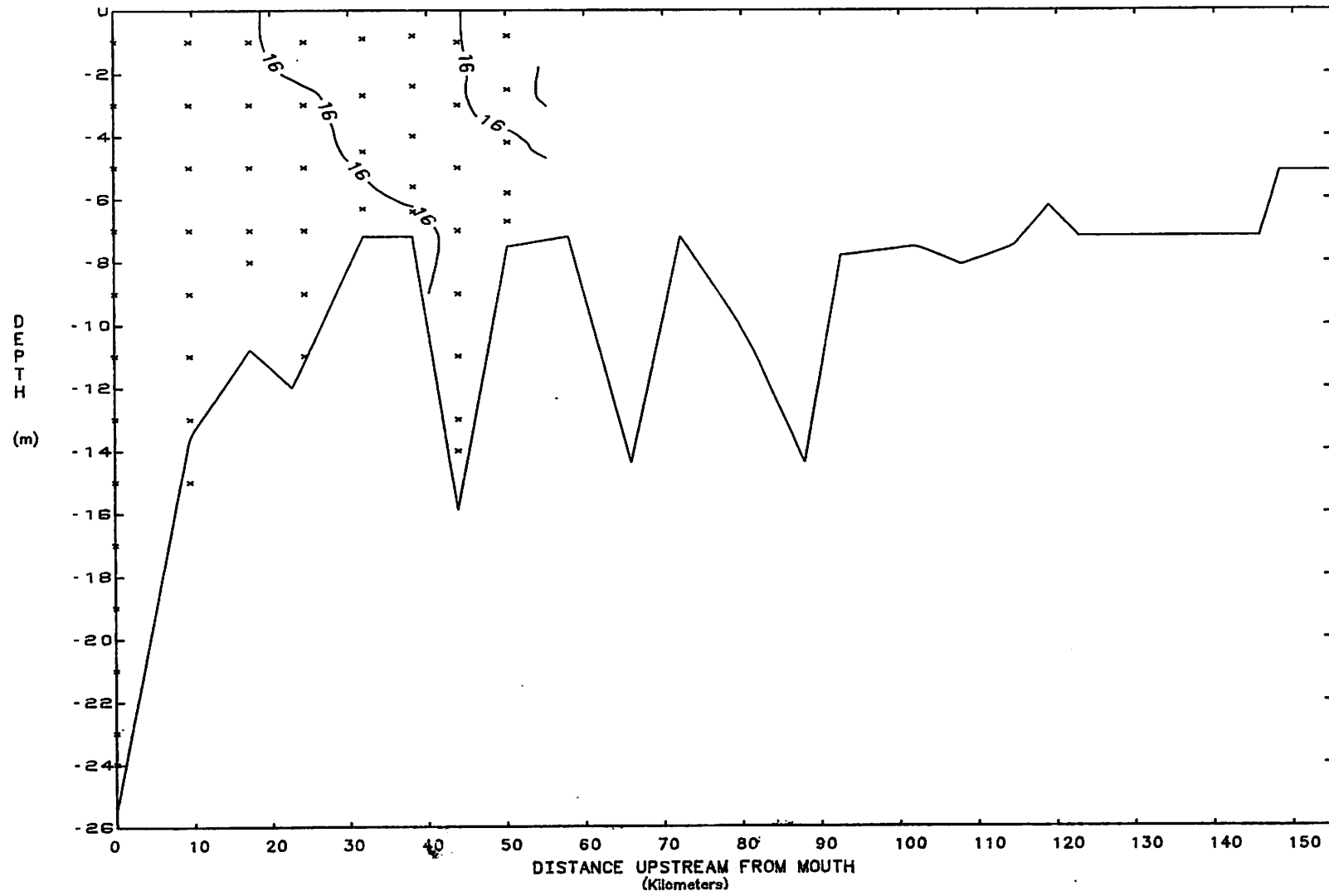
York River: December 9

James River: December 13

Rappahannock: December 11

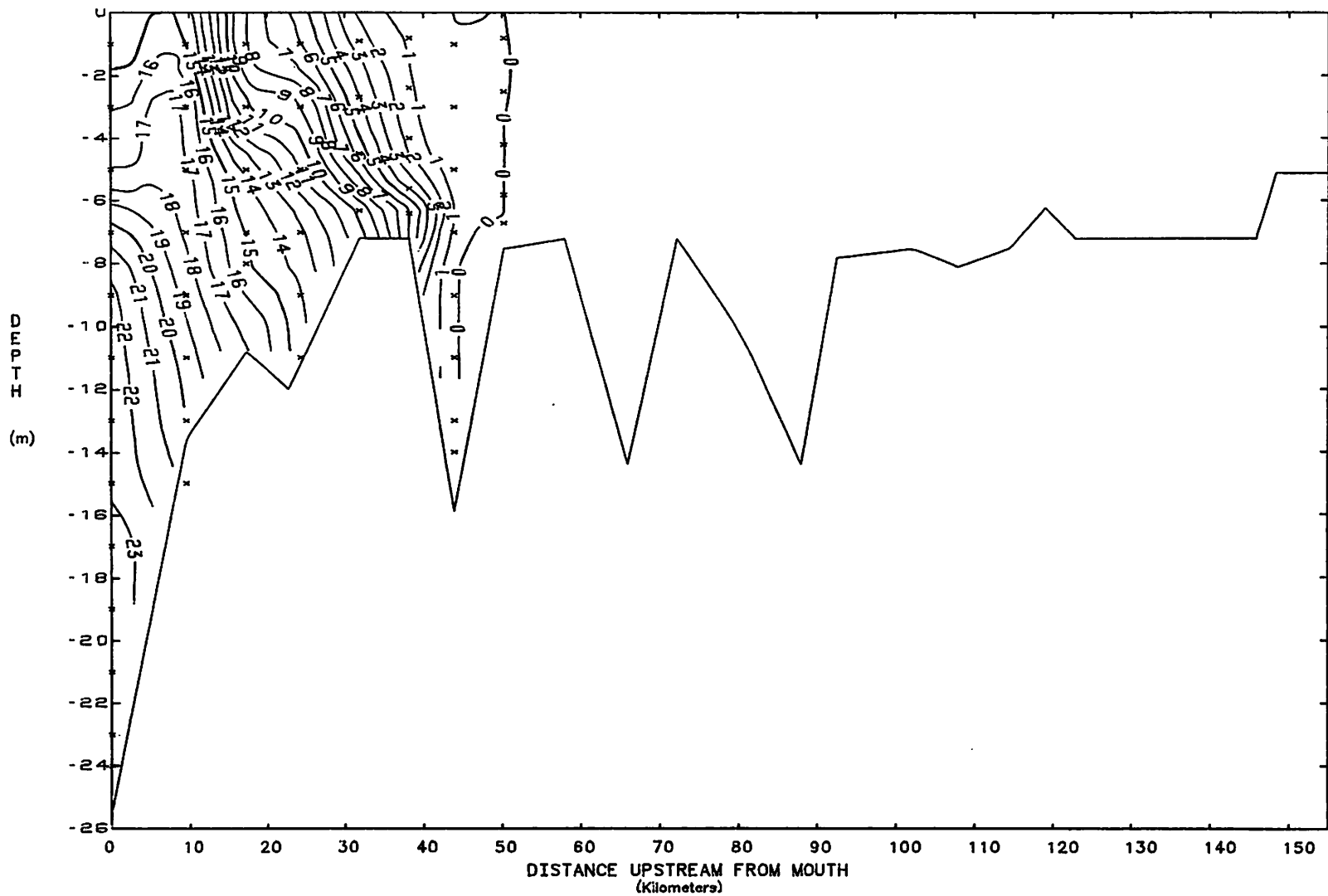
JAMES RIVER  
TEMPERATURE

18 NOVEMBER 1985  
SLACK BEFORE FLOOD



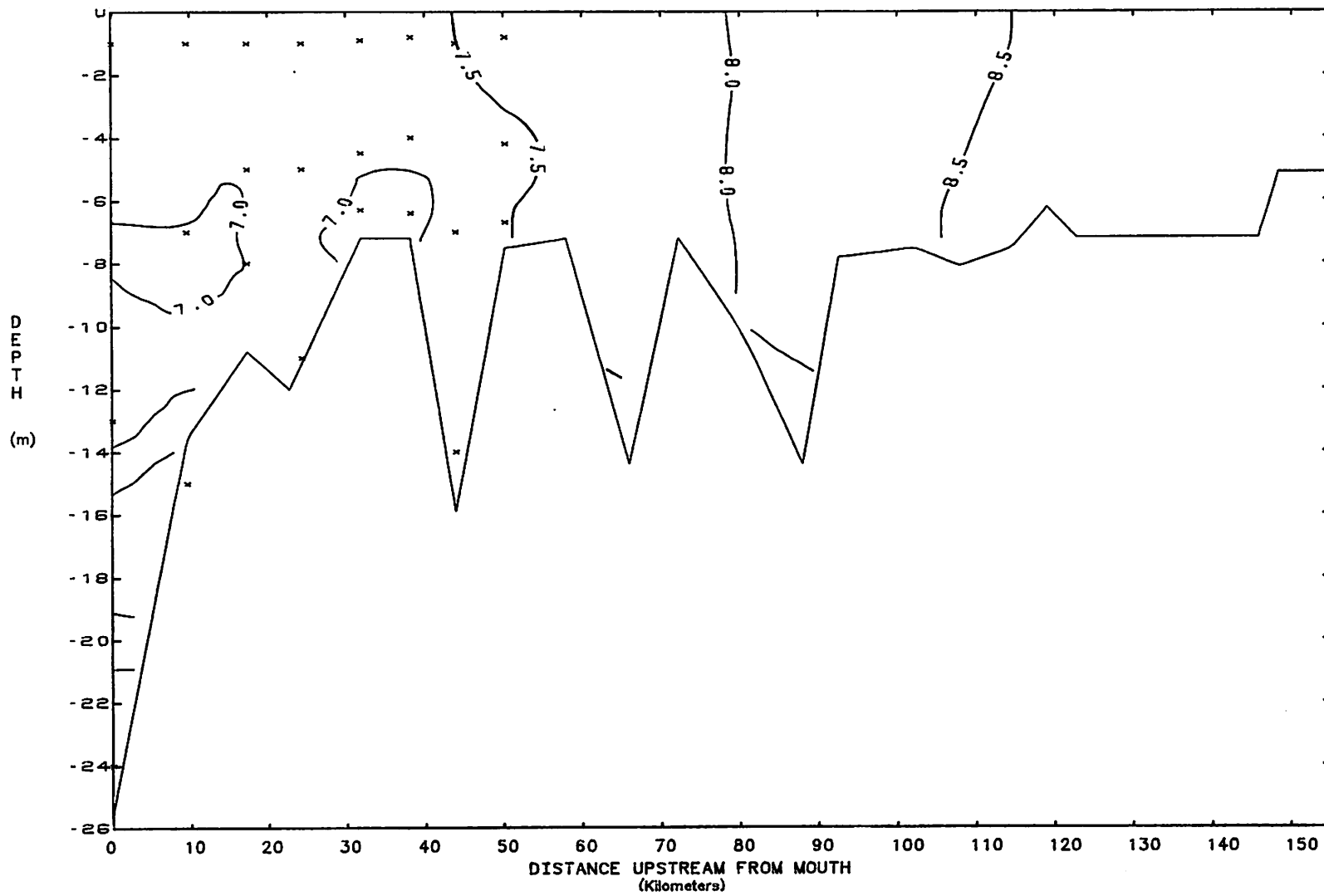
JAMES RIVER  
SALINITY

18 NOVEMBER 1985  
SLACK BEFORE FLOOD



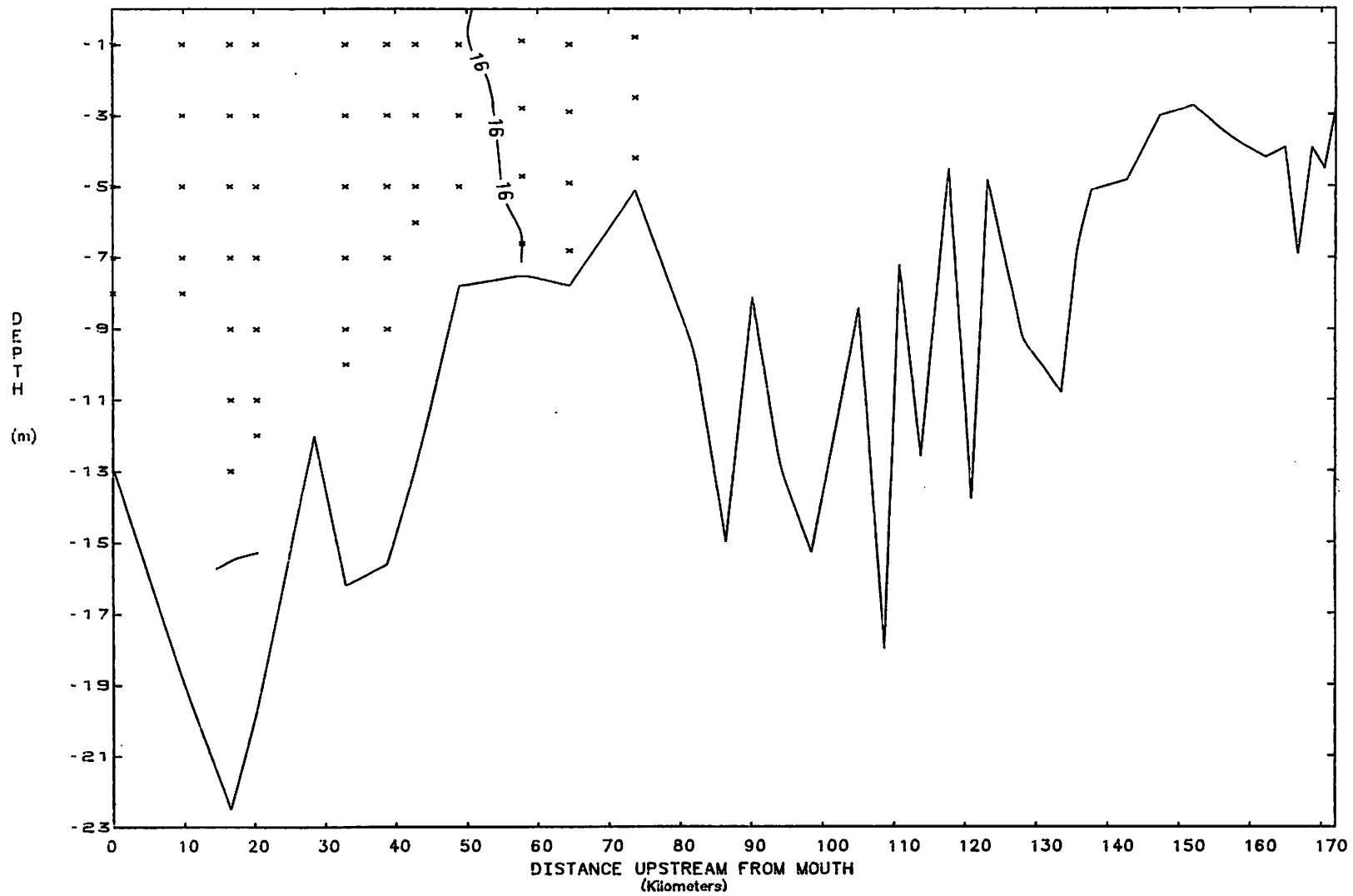
JAMES RIVER  
DISSOLVED OXYGEN

18 NOVEMBER 1985  
SLACK BEFORE FLOOD



RAPPAHANNOCK RIVER  
TEMPERATURE

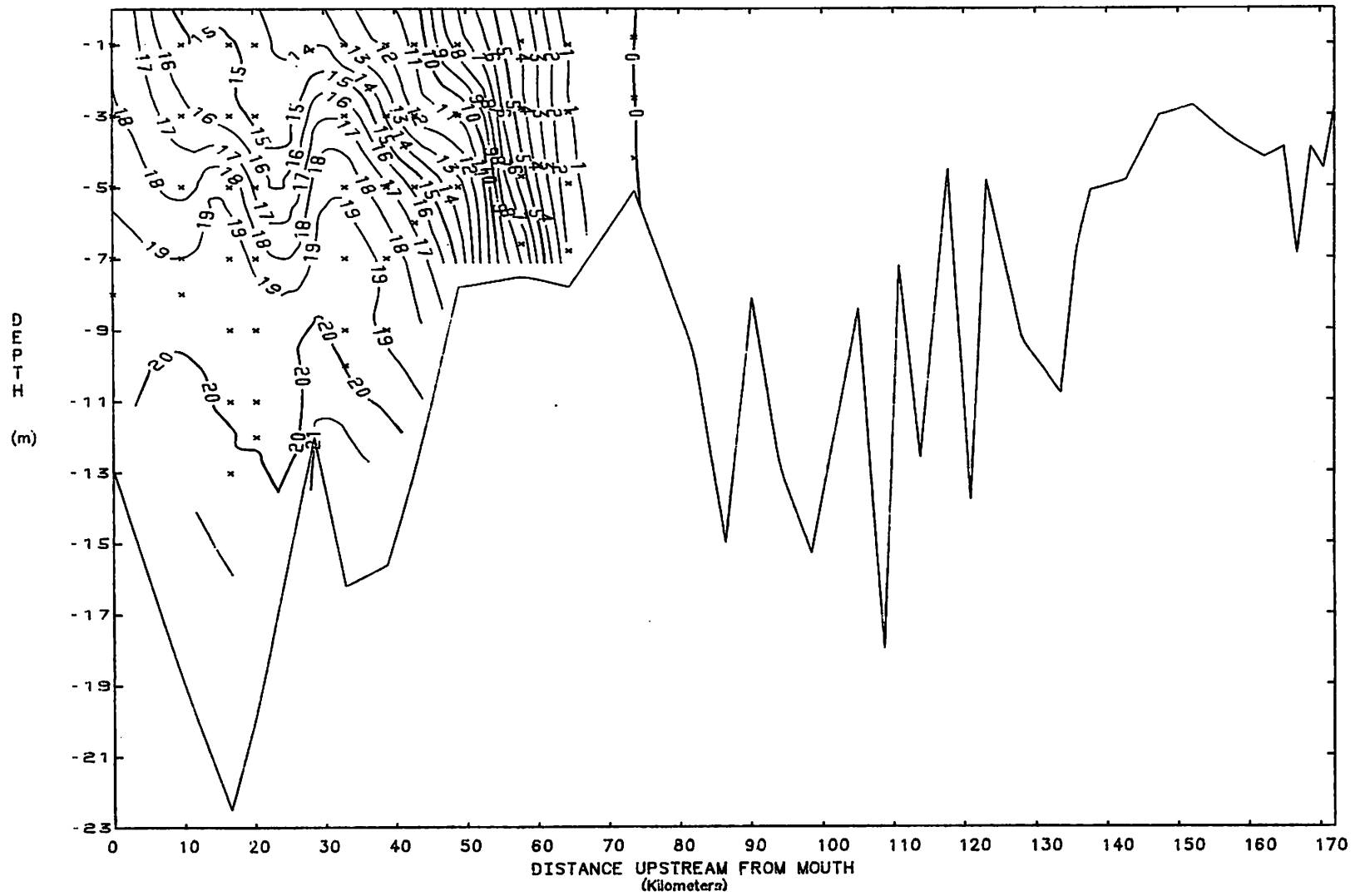
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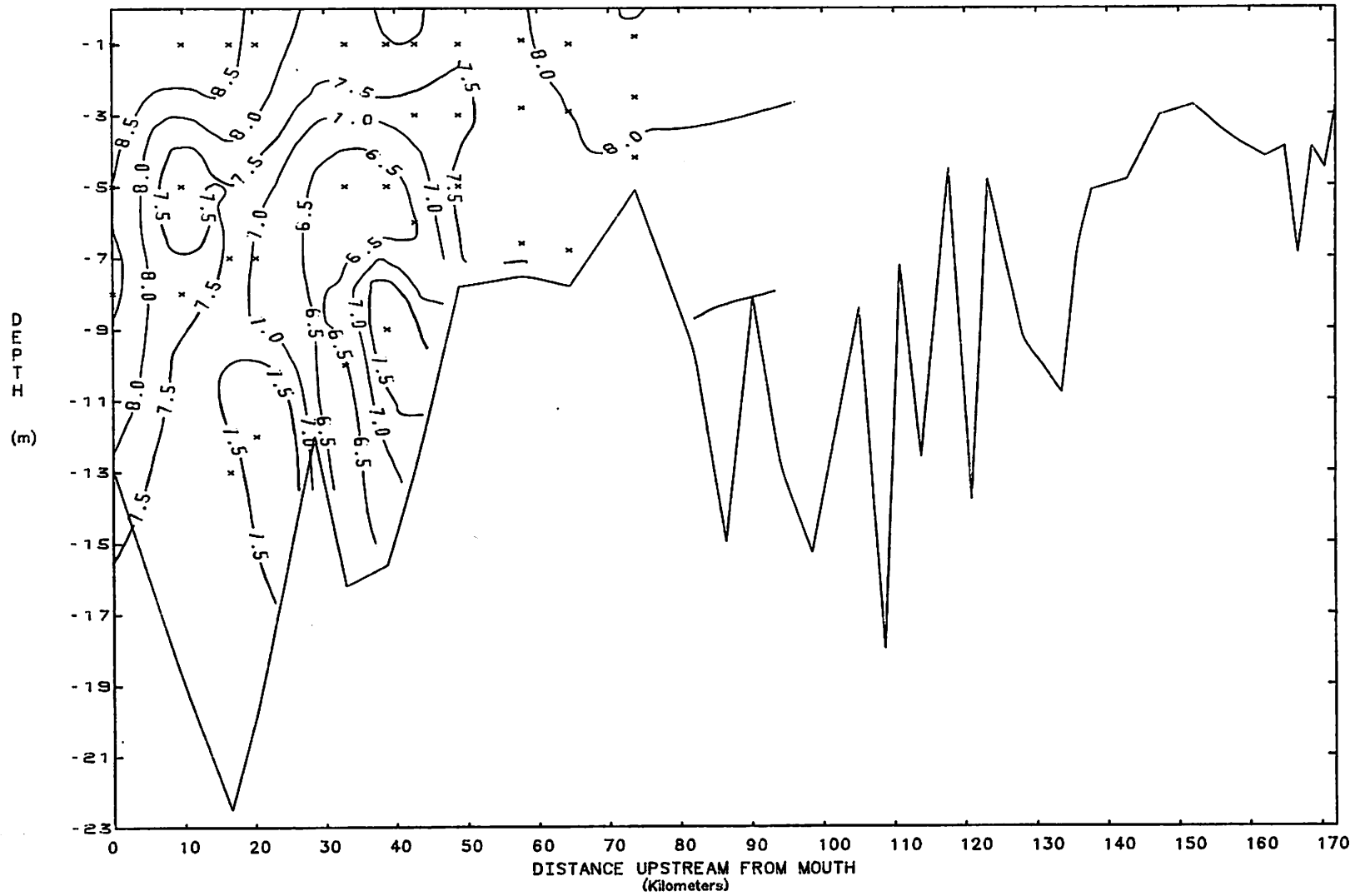
RAPPAHANNOCK RIVER  
SALINITY

15 NOVEMBER 1985  
SLACK BEFORE FLOOD



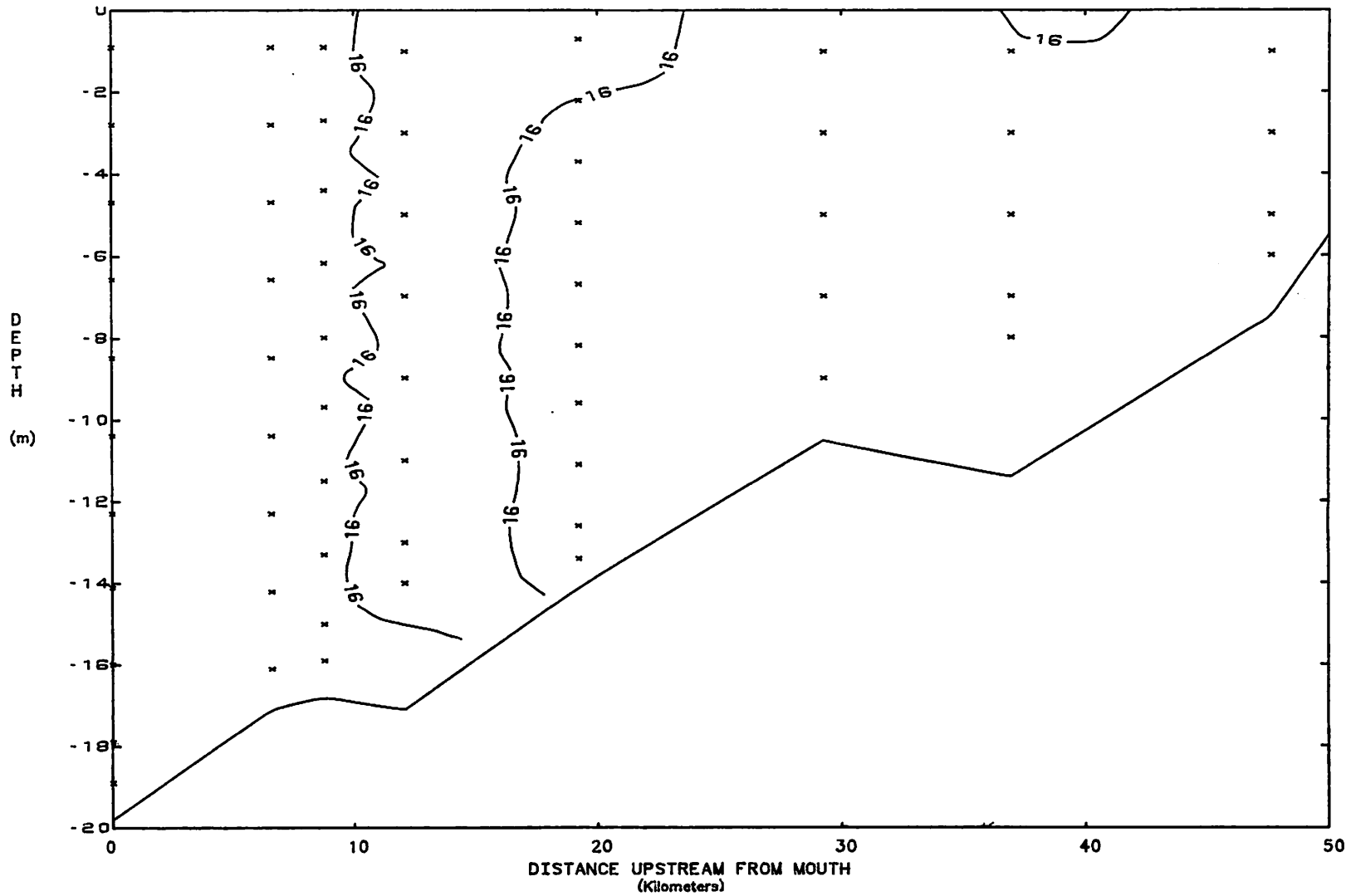
RAPPAHANNOCK RIVER  
DISSOLVED OXYGEN

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SLACK BEFORE FLOOD



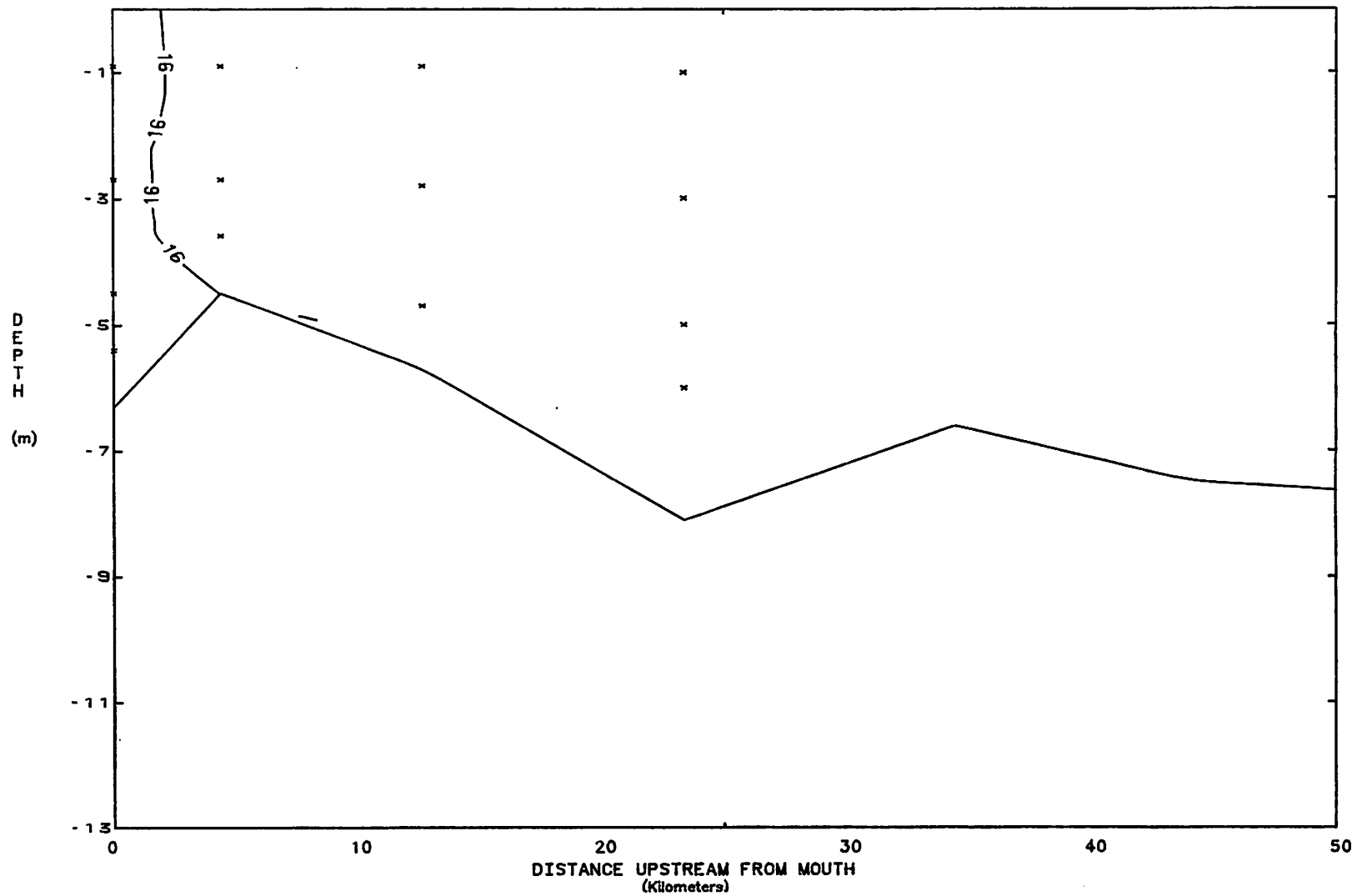
YORK RIVER  
TEMPERATURE

19 NOVEMBER 1985  
SLACK BEFORE FLOOD



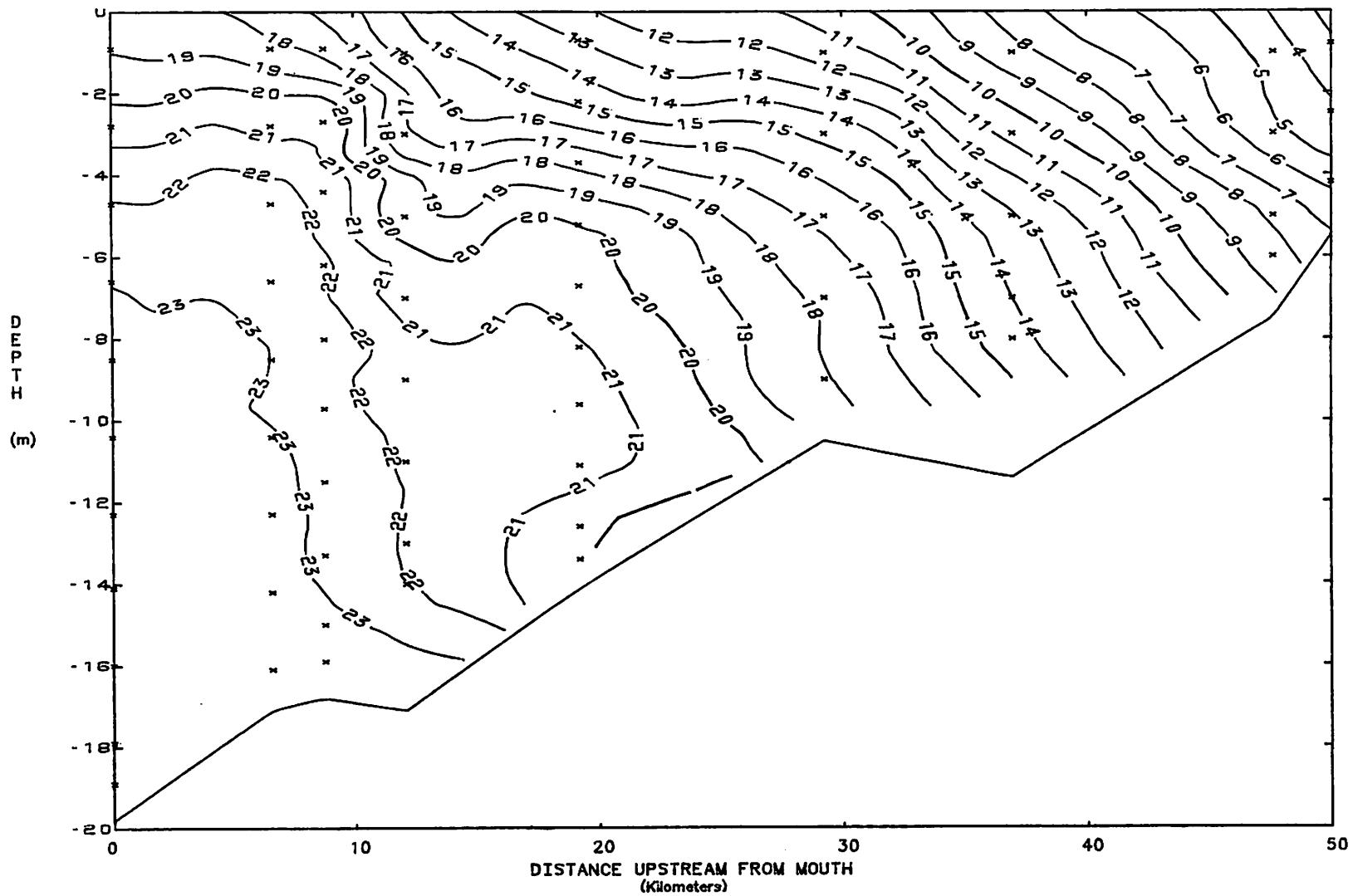
PAMUNKEY RIVER  
TEMPERATURE

19 NOVEMBER 1985  
SLACK BEFORE FLOOD



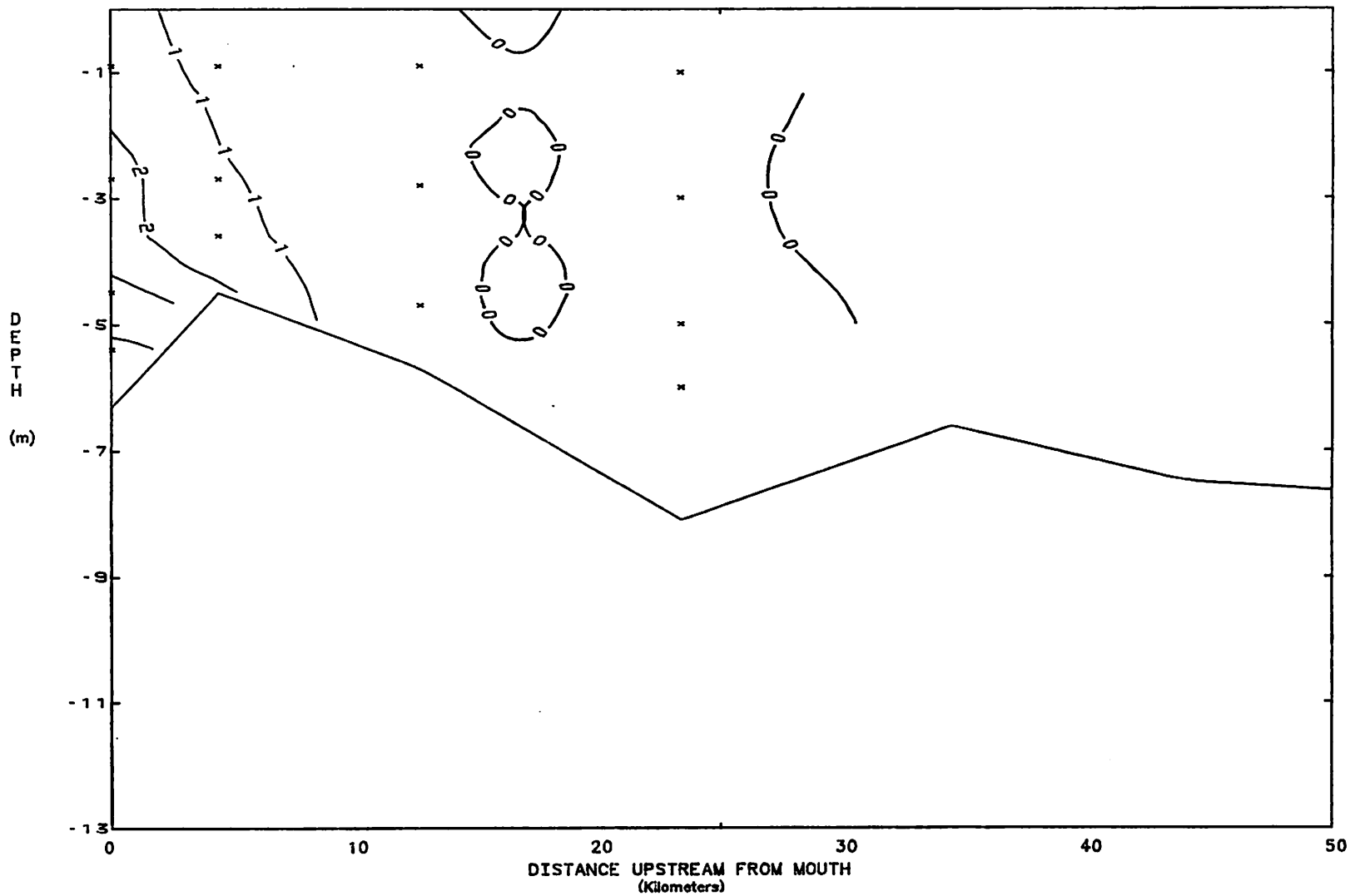
YORK RIVER  
SALINITY

19 NOVEMBER 1985  
SLACK BEFORE FLOOD



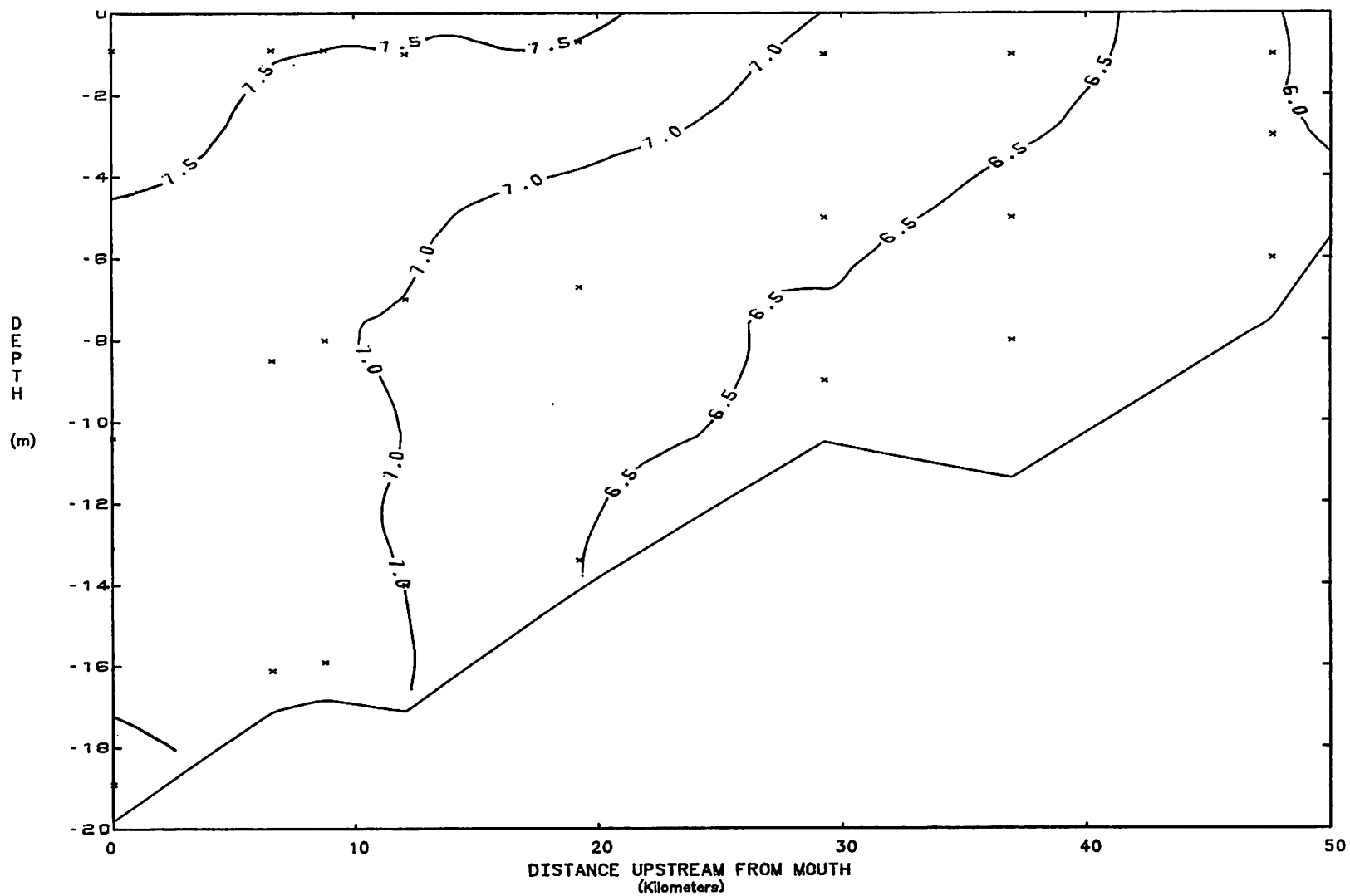
PAMUNKEY RIVER  
SALINITY

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YORK RIVER  
DISSOLVED OXYGEN

19 NOVEMBER 1985  
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PAMUNKEY RIVER  
DISSOLVED OXYGEN

19 NOVEMBER 1985  
SLACK BEFORE FLOOD

