

NATIONAL RIVERS AUTHORITY

SOUTH WESTERN REGION

RIVER OTTER ENVIRONMENTAL STUDY - 1993/94

**CONSULTANTS REPORT : RIVER OTTER :
ENVIRONMENTAL DATA REVIEW**

W S Atkins

February 1994

Volume 3 : Figures and Tables



NRA

National Rivers Authority

South West Region

WS Atkins Water

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DOCUMENT CONTROL SHEET

Client: **National Rivers Authority**

Project: **River Otter Environmental Data Review**

Title: **ENVIRONMENTAL DATA REVIEW**

Date: **February 1994**

VOLUME 3 : FIGURES AND TABLES

COPY NO: **02**

COPY HOLDER: **NRA (Master)**

2	Final Draft	J. Wright	H. Westbrook	M. Chenters	J. Wright	18/02/94
1	Draft	J Wright	H Westbrook	-	-	15/2/94
Revision	Purpose	Originated	Checked	Reviewed	Authorized	Date

ENVIRONMENT AGENCY



105019

CONTENTS

		Page No.
	List of Figures	(iii)
	List of Tables	(vi)
	List of Appendices	(vi)
0.	Summary	VOLUME 1 0-1
1.	Introduction	VOLUME 2 1-1
2.	Methodology	2-1
	2.1 Introduction	2-1
	2.2 Hydrology Data	2-1
	2.3 Water Quality Data	2-1
	2.4 Aquatic Invertebrate Data	2-2
	2.5 Aquatic Plant Data	2-2
	2.6 Fisheries Data	2-2
	2.7 Other Data	2-2
3.	Results	3-1
	3.1 Hydrology	3-1
	3.2 Water Quality	3-23
	3.3 Aquatic Invertebrate Biology	3-30
	3.4 Aquatic Plant Data	3-33
	3.5 Fisheries	3-35
	3.6 Sedimentation	3-37
	3.7 Eutrophication	3-38
	3.8 Drainage Patterns	3-39
	3.9 Summary of Change	3-40
4.	Conclusions and Recommendations	4-1
	4.1 Hydrology	4-1
	4.2 Water Quality	4-6
	4.3 Aquatic Invertebrate Data	4-9
	4.4 Aquatic Plant Data	4-9
	4.5 Fisheries	4-10
	4.6 Sedimentation	4-10
	4.7 Eutrophication	4-10
	4.8 Drainage Patterns	4-11
	4.9 Changes	4-11
	Figures)	
	Tables)	VOLUME 3
	Appendices	VOLUME 4

List of Figures

Figure

- 2.2.1 River Otter - Location plan of ground water monitoring network
- 2.2.2 River Otter - Hydrology monitoring locations
- 2.2.3 River Otter - Catchment Geology
- 2.3.1 River Otter Monitoring locations
- 2.3.2 River Otter - Discharge locations
- 2.7.1 River Otter - Planning designations
- 3.1.1 River Otter Catchment - Rainfall Distribution
- 3.1.2 Annual Rainfall at Dotton PS Raingauge: 1973-92
- 3.1.3 Honiton Rain gauge (RF 354167) Double Mass Plot
- 3.1.4 Feniton Raingauge (RF 354295) Double Mass Plot
- 3.1.5 Dotton Raingauge (RF 354658) Double Mass Plot
- 3.1.6 Kersbrook Raingauge (RF 354778) Double Mass Plot
- 3.1.7 Double Mass Plot: Holyford vs Combined Rainfall Gauges
- 3.1.8 Double Mass Plot: Axminster vs Combined Rainfall Gauges
- 3.1.9 Double Mass Plot: Forde Abbey vs Combined Rainfall Gauges
- 3.1.10 Double Mass Plot: Warmbrook vs Combined Rainfall Gauges
- 3.1.11 Double Mass Plot: Otter Rainfall vs Axe Rainfall
- 3.1.12 River Otter at Dotton: Annual mean flows
- 3.1.13 River Otter at Fenny Bridges: Annual mean flows
- 3.1.14 River Axe at Whitford: Annual mean flows
- 3.1.15 Annual Mean Flows at Percentage of Study Period Mean
- 3.1.16 Surface Runoff vs. Rainfall (Dotton)
- 3.1.17 Surface Runoff vs Rainfall (Fenny Bridges)
- 3.1.18 Surface Runoff vs Rainfall (Fairmile)
- 3.1.19 Surface Runoff vs Rainfall (Whitford)
- 3.1.20 Double Mass Plot: Dotton WWTW vs Fenny Bridges
- 3.1.21 Axe Flows vs Combined Axe Raingauges: Double Mass Plot
- 3.1.22 Dotton vs Whitford Flows: Double Mass Plot
- 3.1.23 Fenny Bridges vs Whitford Flows: Double Mass Plot
- 3.1.24 Hydrograph - Dotton
- 3.1.25 Hydrograph - Dotton 0-5 cumecs in detail
- 3.1.26 Hydrograph - Fenny Bridges
- 3.1.27 Hydrograph - Fenny Bridges 0-5 cumecs in detail
- 3.1.28 Hydrograph - Whitford
- 3.1.29 Hydrograph - Whitford 0-5 cumecs in detail
- 3.1.30 Mean Summer (JJA) Flows as Percentage of Study Period Mean Summer Flow
- 3.1.31 August Mean Flows - Comparison of Otter and Axe
- 3.1.32 August Mean Flows - Variance about the August mean
- 3.1.33 River Otter at Dotton : Summer Modal Flows
- 3.1.34 River Otter at Fenny Bridges: Summer (JJA) Modal Flows
- 3.1.35 River Axe at Whitford Summer Modal Flows
- 3.1.36 River Otter at Dotton: Summer (JJA) Modal Water Levels
- 3.1.37 River Otter at Fenny Bridges: Summer (JJA) Modal Water Levels
- 3.1.38 River Axe at Whitford: Summer Modal Water Levels
- 3.1.39 Heathlands - Measured Ground Water Levels
- 3.1.40 Alfrington No. 1 - Measured Ground Water Levels
- 3.1.41 Berry House - Measured Ground Water Levels
- 3.1.42 Wiggaton No. 4 - Measured Ground Water Levels

- 3.1.43 Borehole Hydrograph - The Haywain
- 3.1.44 Potential Recharge - Berry House
- 3.1.45 Potential Recharge - Wiggaton No. 4
- 3.1.46 Abstraction Locations in the River Otter Catchment
- 3.1.47 Licensed and Actual Abstractions - Entire Otter Catchment 1972-1992
- 3.1.48 Summary of Abstractions
- 3.1.49 Cumulative Licensed Abstractions (SWU)
- 3.1.50 Cumulative Licensed Abstractions (Non-SWU)
- 3.1.51 Cumulative Licensed Abstractions (SWU & Non-SWU)
- 3.2.1 River Otter - Water Quality Data: Biochemical Oxygen Demand
- 3.2.2 River Otter - Water Quality Data: Total Ammonia
- 3.2.3 River Otter - Water Quality Data: Water pH
- 3.2.4 River Otter - Water Quality Data: Dissolved Oxygen
- 3.2.5 River Otter - Water Quality Data: Water Temperature
- 3.2.6 River Otter - Water Quality Data: Orthophosphate
- 3.2.7 River Otter - Water Quality Data: Nitrate
- 3.2.8 River Otter - Water Quality Data: Suspended Solids
- 3.2.9 NWC River Quality Classifications 1974-1992
- 3.2.10 Means and 95% Confidence Intervals: Dissolved Oxygen, Hoemoor Farm, 1974 - 1993
- 3.2.11 Means and 95% Confidence Intervals: Biochemical Oxygen Demand, Hoemoor Farm, 1974 - 1993
- 3.2.12 Means and 95% Confidence Intervals: Total Ammonia, Hoemoor Farm, 1974 - 1993
- 3.2.13 Means and 95% Confidence Intervals: Nitrate, Hoemoor Farm, 1974 - 1993
- 3.2.14 Means and 95% Confidence Intervals: Orthophosphate, Hoemoor Farm, 1974 - 1993
- 3.2.15 Means and 95% Confidence Intervals: pH, Hoemoor Farm, 1974 - 1993
- 3.2.16 Means and 95% Confidence Intervals: Suspended Solids, Hoemoor Farm, 1974 - 1993
- 3.2.17 Means and 95% Confidence Intervals: Biochemical Oxygen Demand, Clapperlane Bridge, 1974 - 1993
- 3.2.18 Means and 95% Confidence Intervals: Dissolved Oxygen, Clapperlane Bridge, 1974 - 1993
- 3.2.19 Means and 95% Confidence Intervals: Total Ammonia, Clapperlane Bridge, 1974 - 1993
- 3.2.20 Means and 95% Confidence Intervals: Nitrate, Clapperlane Bridge, 1974 - 1993
- 3.2.21 Means and 95% Confidence Intervals: Orthophosphate, Clapperlane Bridge, 1974 - 1993
- 3.2.22 Means and 95% Confidence Intervals: Ph, Clapperlane Bridge, 1974 - 1993
- 3.2.23 Means and 95% Confidence Intervals: Dissolved Oxygen, Weston, 1974 - 1993
- 3.2.24 Means and 95% Confidence Intervals: Biochemical Oxygen Demand, Weston, 1974 - 1993
- 3.2.25 Means and 95% Confidence Intervals: Total Ammonia, Weston, 1974 - 1993
- 3.2.26 Means and 95% Confidence Intervals: Nitrate, Weston, 1974 - 1993

- 3.2.27 Means and 95% Confidence Intervals: Orthophosphate, Weston, 1974 - 1993
- 3.2.28 Means and 95% Confidence Intervals: Biochemical Oxygen Demand, Ottery St Mary, 1974 - 1993
- 3.2.29 Means and 95% Confidence Intervals: Total Ammonia, Ottery St Mary, 1974 - 1993
- 3.2.30 Means and 95% Confidence Intervals: Dissolved Oxygen, Ottery St Mary, 1974 - 1993
- 3.2.31 Means and 95% Confidence Intervals: Nitrate, Ottery St Mary, 1974 - 1993
- 3.2.32 Means and 95% Confidence Intervals: Orthophosphate, Ottery St Mary, 1974 - 1993
- 3.2.33 Means and 95% Confidence Intervals: Biochemical Oxygen Demand, Tipton St John, 1974 - 1993
- 3.2.34 Means and 95% Confidence Intervals: Total Ammonia, Tipton St John, 1974 - 1993
- 3.2.35 Means and 95% Confidence Intervals: Dissolved Oxygen, Tipton St John, 1974 - 1993
- 3.2.36 Means and 95% Confidence Intervals: Nitrate, Tipton St John, 1974 - 1993
- 3.2.37 Means and 95% Confidence Intervals: Orthophosphate, Tipton St John, 1974 - 1993
- 3.2.38 Means and 95% Confidence Intervals: Dissolved Oxygen, Dotton Mill, 1974 - 1993
- 3.2.39 Means and 95% Confidence Intervals: Biochemical Oxygen Demand, Dotton Mill, 1974 - 1993
- 3.2.40 Means and 95% Confidence Intervals: Total Ammonia, Dotton Mill, 1974 - 1993
- 3.2.41 Means and 95% Confidence Intervals: Nitrate, Dotton Mill, 1974 - 1993
- 3.2.42 Means and 95% Confidence Intervals: Orthophosphate, Dotton Mill, 1974 - 1993
- 3.2.43 Means and 95% Confidence Intervals: Dissolved Oxygen, Otterton, 1974 - 1993
- 3.2.44 Means and 95% Confidence Intervals: Biochemical Oxygen Demand, Otterton, 1974 - 1993
- 3.2.45 Means and 95% Confidence Intervals: Total Ammonia, Otterton, 1974 - 1993
- 3.2.46 Means and 95% Confidence Intervals: Nitrate, Otterton, 1974 - 1993
- 3.2.47 Means and 95% Confidence Intervals: Orthophosphate, Otterton, 1974 - 1993
- 3.3.1 River Otter - Biological Data: ASPT Scores
- 3.5.1 River Otter - Fisheries Data: Rod Catches 1968 - 92
- 3.5.2 River Otter - Fisheries Data: Annual Catch - Honiton

List of Tables

Table	3.1.1	Summary of gauging station statistics (text)
	3.1.2	Ranked rainfall and runoff years (text)
	3.1.3	Net Authorised and Actual Abstraction for River Otter Reach Catchments
	3.2.1	Data Summary for Unionised Ammonia, Copper and Zinc.
	3.2.2	Sample Sites within Identified Reaches (text)
	3.2.3	Regression Analysis for Various Parameters at Differing Locations on the River Otter
	3.2.4	Water Quality Trend Analysis
	3.3.1	BMWP and ASPT Scores for Sites on the River Otter
	3.4.1	1991 and 1992 Summer Survey Scores (text)
	3.6.1	Total Net Abstraction for River Otter Catchments 1972-1992
	3.10.1	Summary of Chronological Change and Impact

FIGURES



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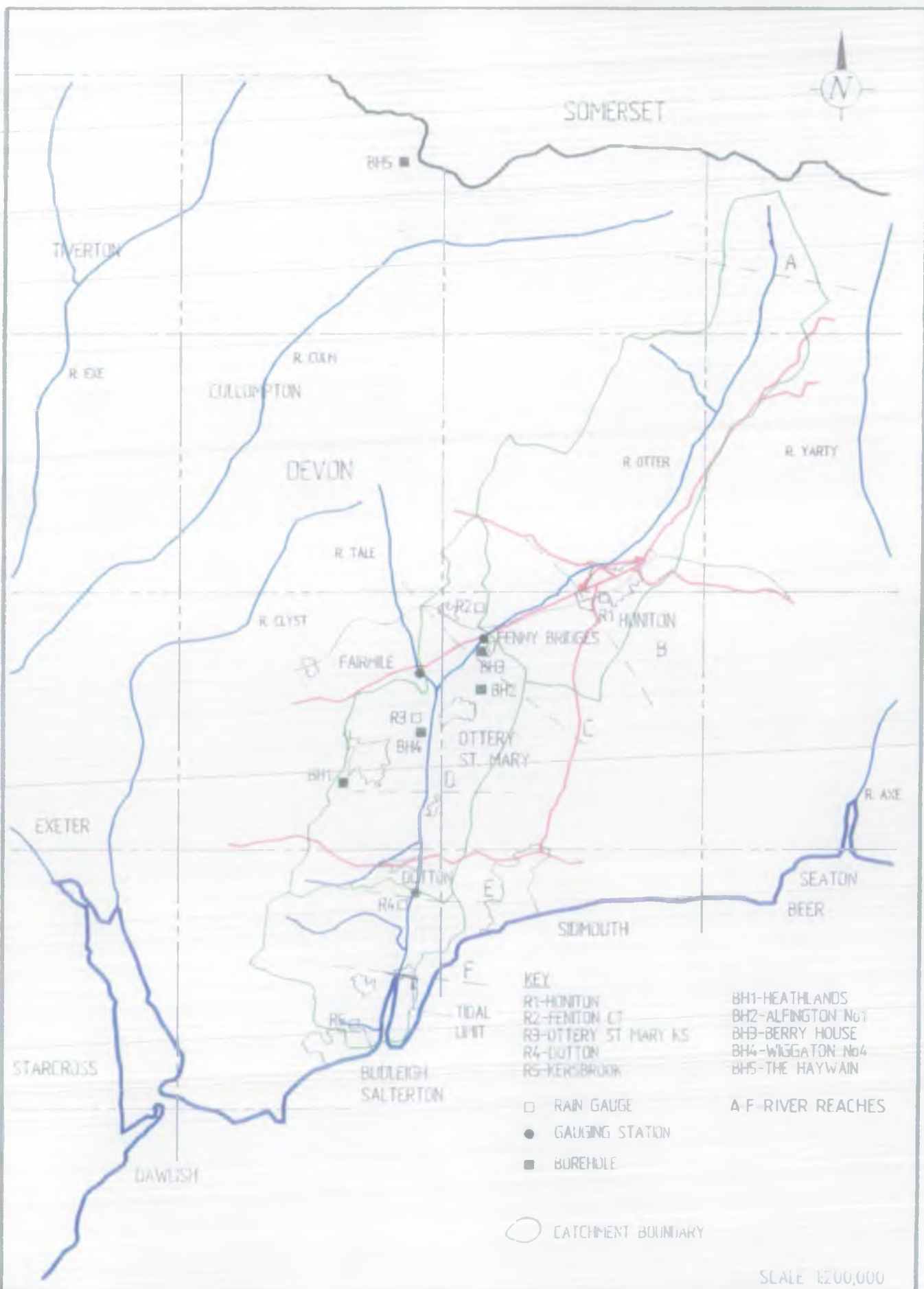
- | | | | |
|----|------------------------|----|---------------------|
| 1 | KENTON VICARAGE | 37 | BROOMINGTON |
| 2 | DUCKALLER No. 4 | 38 | LINDEN LEE |
| 3 | DUCKALLER No. 4A | 39 | BEER |
| 4 | WESTLAKE FARM 323 | 40 | HIGHER PITT COTTAGE |
| 5 | BRICKHOUSE FARM | 41 | HEATHLANDS |
| 6 | DUCKALLER No. 7 | 42 | LONGMEAD |
| 7 | DUCKALLER No. 1 | 43 | LANCERCOMBE |
| 8 | COFTON FARM | 44 | HIGHERCOMBE |
| 9 | COFTON CROSS | 45 | WIGGATON No. 4 |
| 10 | BRANSCOMBE FARM | 46 | GREATWELL No. 9 |
| 11 | SHUTTERTON | 47 | GREATWELL No. 3 |
| 12 | TIDWELL No. 1 | 48 | SALSTON COTTAGE |
| 13 | KERSBROOK No. 1B | 49 | TWO ACRE |
| 14 | KERSBROOK No. 1A | 50 | GREATWELL No. 5A |
| 15 | TIDWELL FARM | 51 | ALFINGTON No. 1 |
| 16 | EAST BUDLEIGH No. 4 | 52 | ALFINGTON No. 2 |
| 17 | EAST BUDLEIGH No. 5 | 53 | BERRY HOUSE |
| 18 | MATES WOOD | 54 | CITY HOSPITAL |
| 19 | EAST BUDLEIGH No. 7 | 55 | HILL HEAD |
| 20 | OTTERTON No. 4 | 56 | BUISSELS No. 7A |
| 21 | BICTON No. 3 | 57 | HEATHFIELD COTTAGE |
| 22 | BICTON No. 1 | 58 | BRAMPFORD SPEKE |
| 23 | OTTERTON No. 2 | 59 | FENTON COURT |
| 24 | OTTERTON No. 3 | 60 | SUNNYSIDE FARM |
| 25 | HOUGHTON FARM | 61 | LOWER EAST HORNER |
| 26 | NORTHMOSTOWN No. 4 | 62 | KINGDOM COTTAGE |
| 27 | PASSAFORD FARM | 63 | HILL HOUSE |
| 28 | COLATON RALEIGH No. 2A | 64 | LITTLE PIRZWELL |
| 29 | COLATON RALEIGH No. 4A | 65 | ASHILL |
| 30 | WOODBURY COMMON No. 2 | 66 | GATENS FARM |
| 31 | BURROW | 67 | SOUTHEY BARTON |
| 32 | HARPFORD No. 9A | 68 | THE HAYWAIN |
| 33 | HARPFORD No. 1 | 69 | CANTERBURY GREEN |
| 34 | HARPFORD No. 2 | 70 | KINGSTON FARM |
| 35 | WOODBURY ED | 71 | WARREN HOUSE |
| 36 | CLARENDON HOUSE | 72 | DUTTON No. 4 |
| | | 73 | DUTTON No. 6 |
| | | 74 | WARREN HOUSE |
| | | 75 | GREATWELL No. 8 |
| | | 76 | HAYES WOOD COTTAGE |
| | | 77 | WOOLLEYS No. 1 |

KEY

- RECOMMENDED "CONTROL" SITES
- RECOMMENDED "KNOWN IMPACT" SITES
- RECOMMENDED "POSSIBLE IMPACT" SITES

SCALE 1:250,000

Ref: K1512.001/R4-007 Rev: 2 Date: 15/11/93



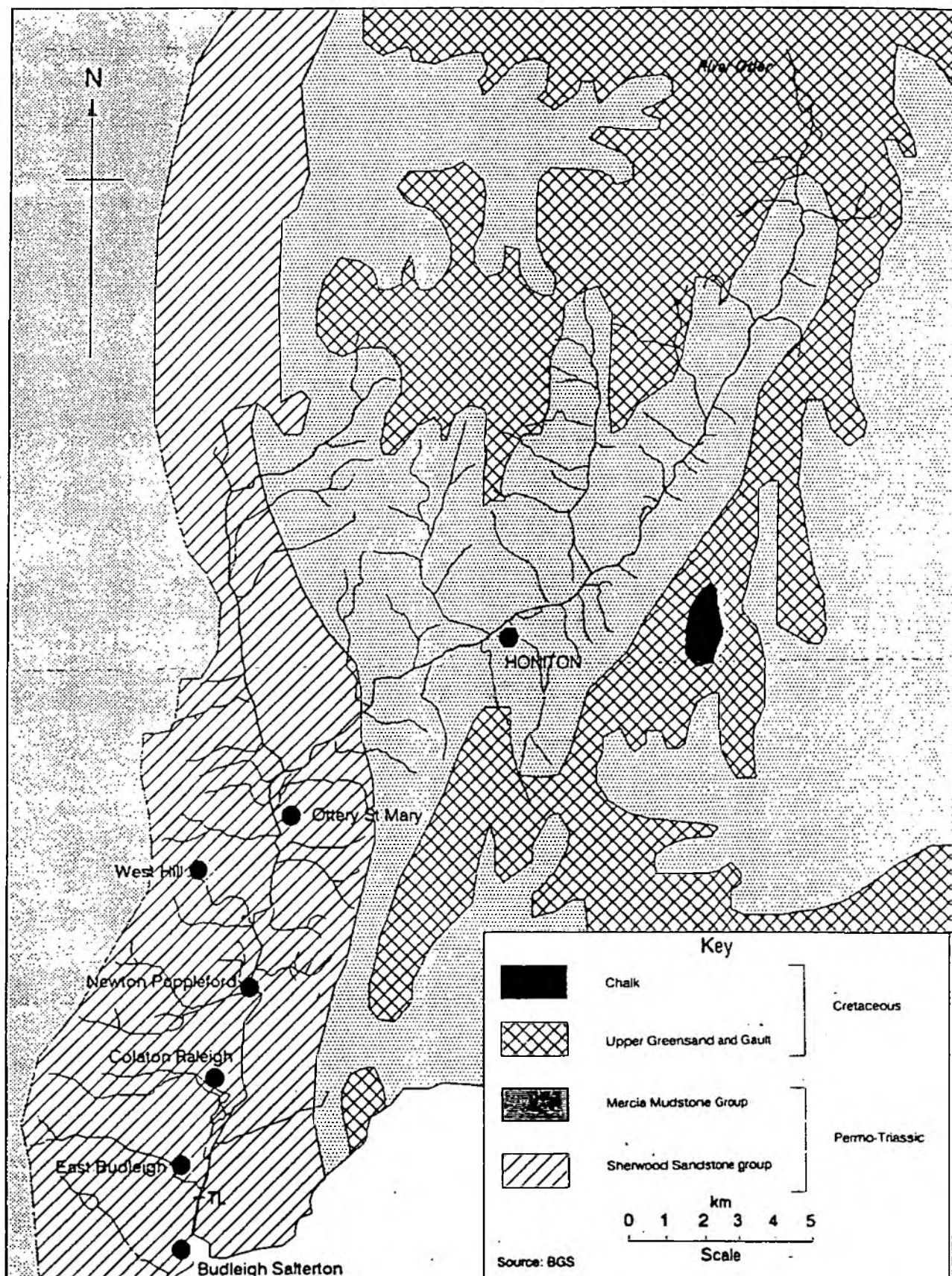
WS Atkins

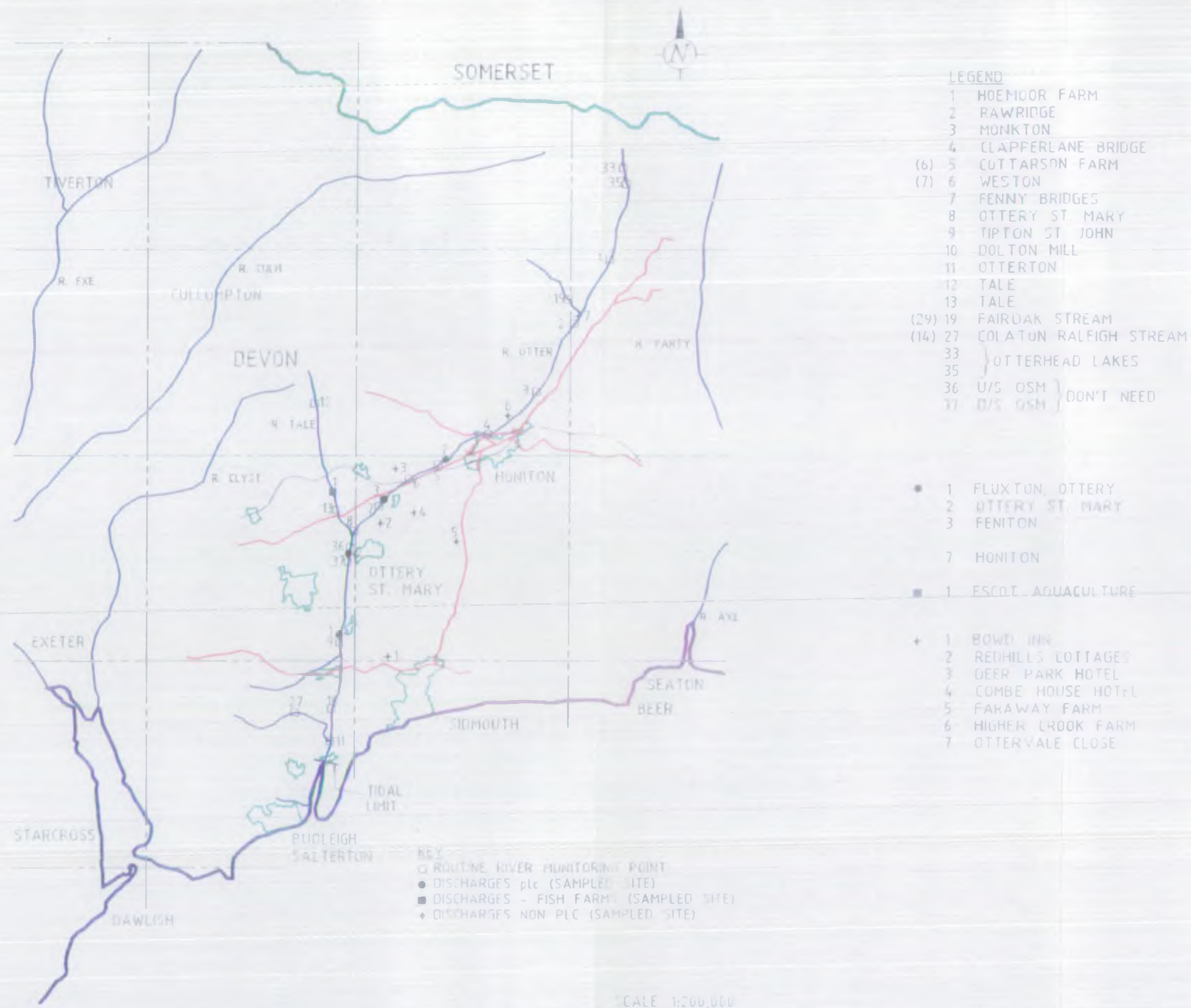
NATIONAL RIVERS AUTHORITY
 RIVER OTTER
 HYDROLOGY MONITORING LOCATIONS

FIGURE 2.2.2

Figure 2.2.3

The River Otter Catchment Geology







LEGEND

- 1 FLUXTON, OTTERY
- 2 OTTERY ST MARY
- 5 FENITON
- 7 HONITON
- 1 ESCOT AQUACULTURE
- ◆ 1 BOWD INN
- ◆ 2 REDHILLS COTTAGES
- ◆ 3 DEER PARK HOTEL
- ◆ 4 COMBE HOUSE HOTEL
- ◆ 5 FARAWAY FARM
- ◆ 6 HIGHER CROOK FARM
- ◆ 7 OTTERVALE CLOSE
- ✕ 1 WITHYCOMBE RALEIGH COMMON
- ✕ 2 AYLESBEARE COMMON
- ✕ 3 WOODS FARM, SIDMOUTH
- ✕ 4 OLD BRICKWORKS, CHINEWAY
- ✕ 5 CHINEWAY HILL, OTTERY ST. MARY
- ✕ 6 HOLECOMBE LANE, OTTERY ST. MARY
- ✕ 7 ASH FARM, FENITON
- ✕ 8 HEATHPARK INDUSTRIAL ESTATE, HONITON
- ✕ 9 GUEST BROTHERS, FENITON
- ✖ 2 REDHILLS COTTAGES
- ✖ 3 DEER PARK HOTEL
- ✖ 4 COMBE HOUSE HOTEL
- ✖ 5 FARAWAY FARM
- ✖ 6 HIGHER CROOK FARM
- ✖ 7 OTTERVALE CLOSE

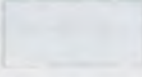
KEY

- DISCHARGES - PLC (SAMPLED SITE)
- DISCHARGES - FISH FARMS (SAMPLED SITE)
- ◆ DISCHARGES - NON PLC (SAMPLED SITE)
- ✕ WASTE DISPOSAL SITES
- ✖ NO RECEIVING WATER CONTROL SITES

SCALE 1:200,000



KEY:

-  AREA OF GREAT LANDSCAPE VALUE
-  COASTAL PRESERVATION AREA
-  RURAL DEVELOPMENT AREA
-  BLACKDOWN HILLS AREA OF OUTSTANDING NATURAL BEAUTY
-  EAST DEVON AREA OF OUTSTANDING NATURAL BEAUTY
-  NATURE CONSERVATION ZONE

SCALE 1:250,000

Figure 3.1.1

The River Otter Catchment Rainfall Distribution

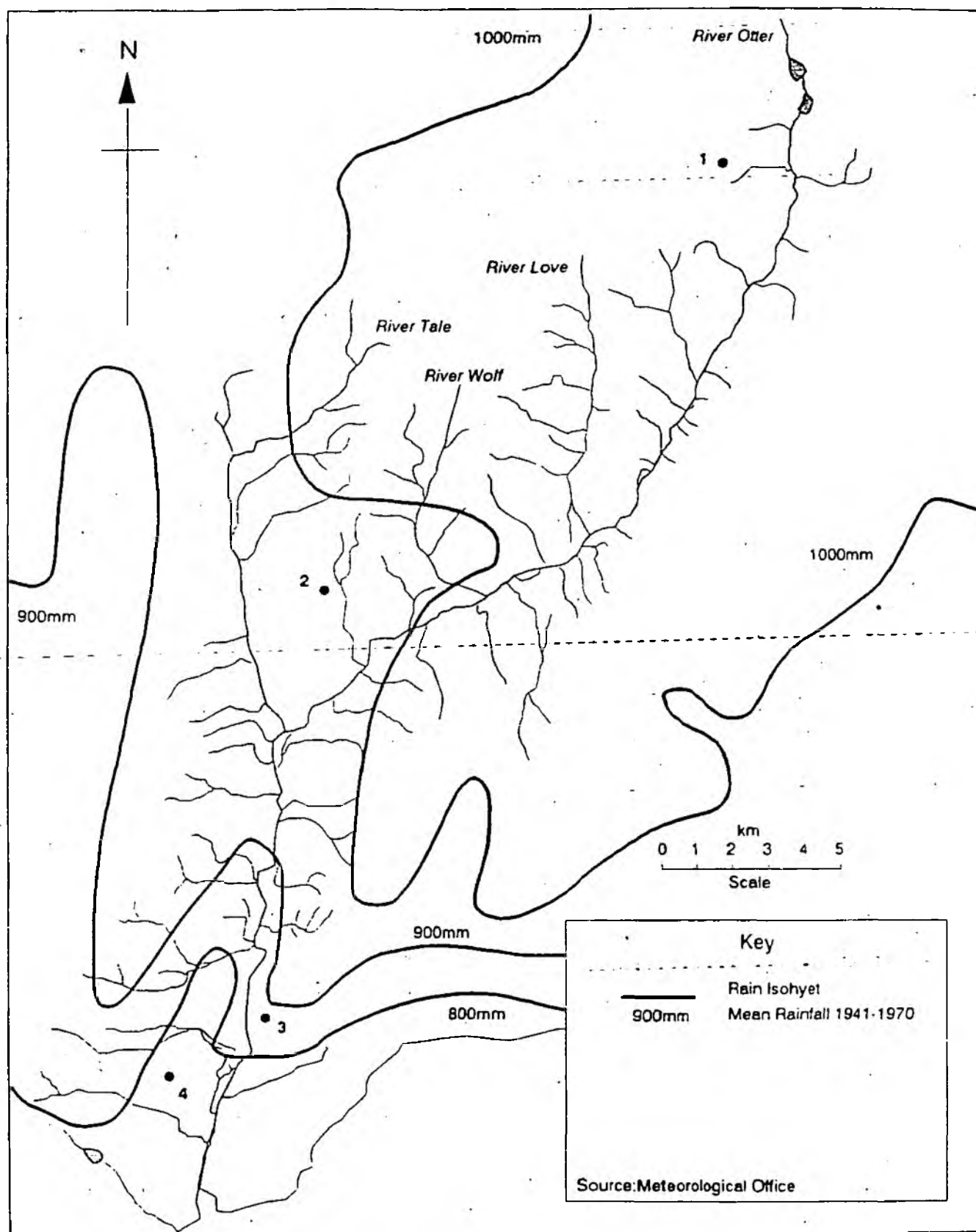


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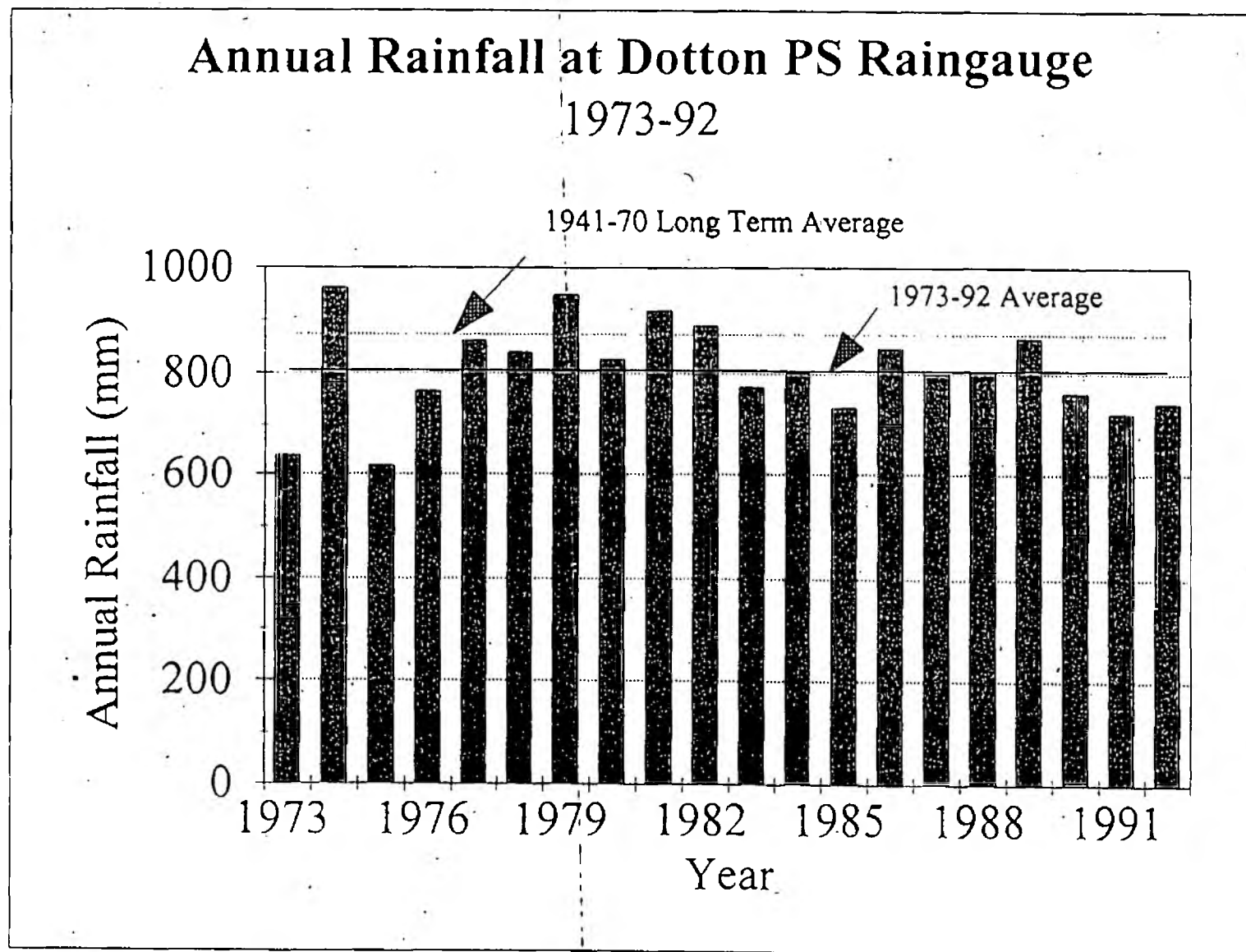


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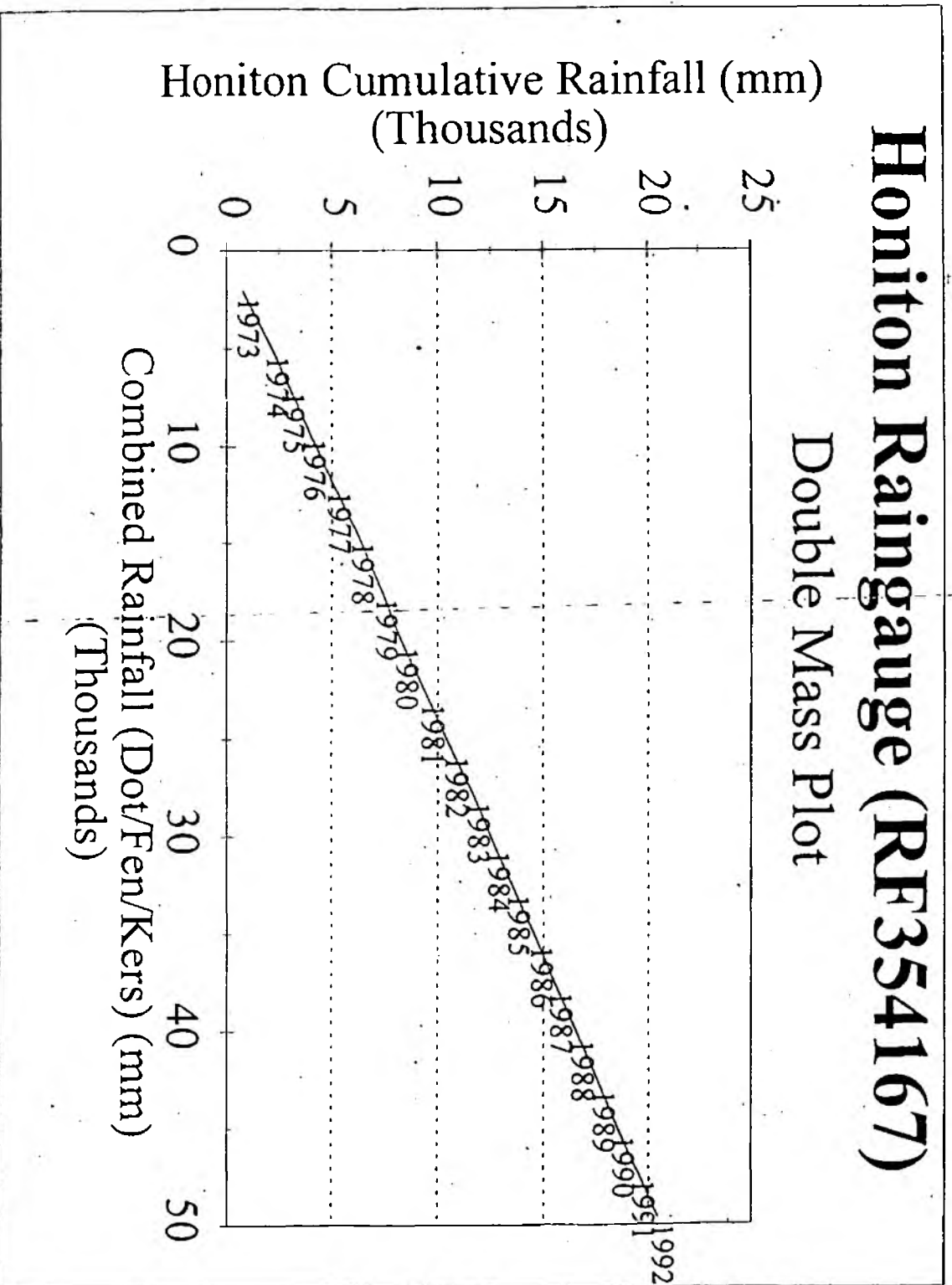


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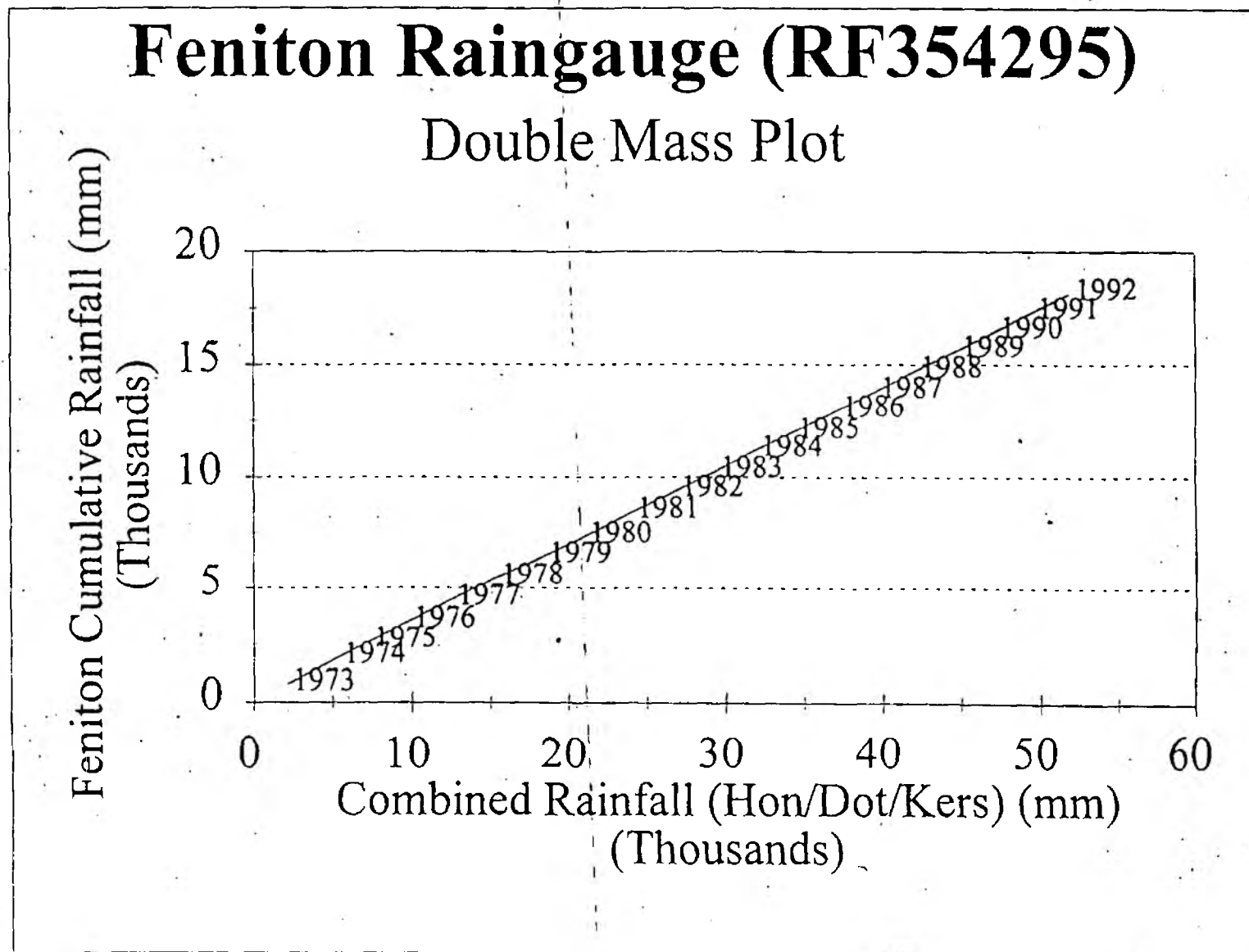


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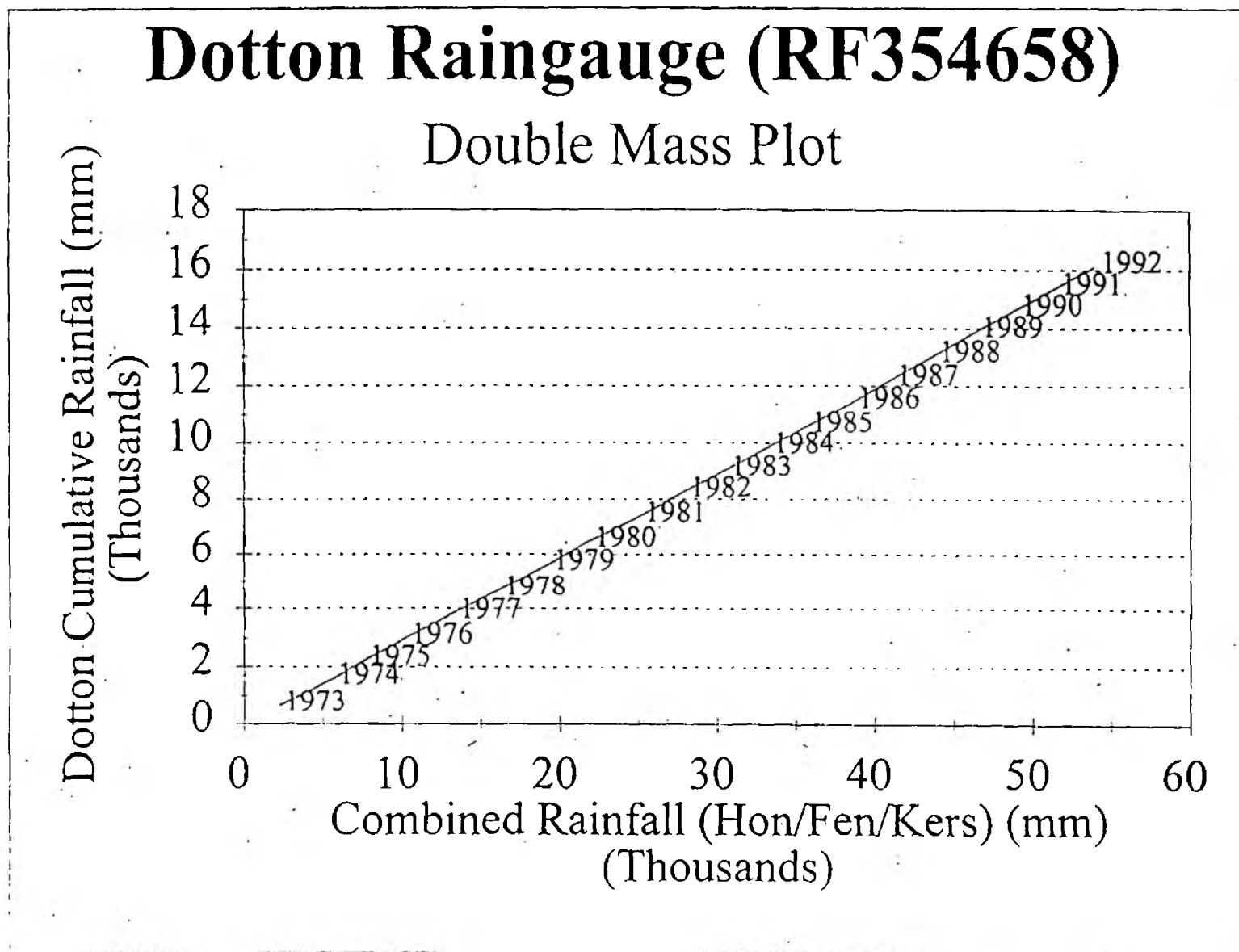


Figure 3.1.6

Kersbrook Raingauge (RF354778)

Double Mass Plot

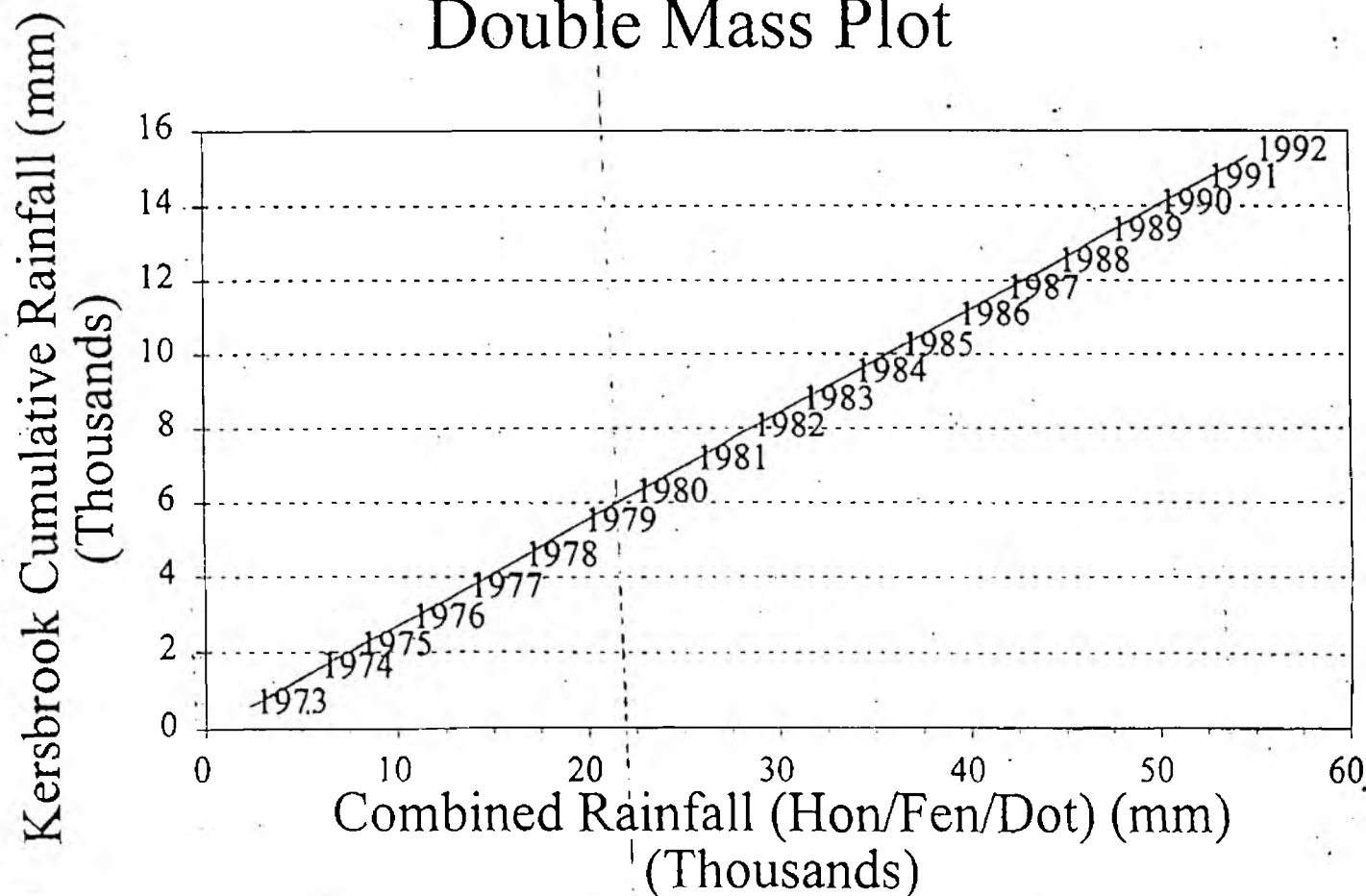


Figure 3.1.7

Double Mass Plot

Holyford vs Combined Rainfall Gauges

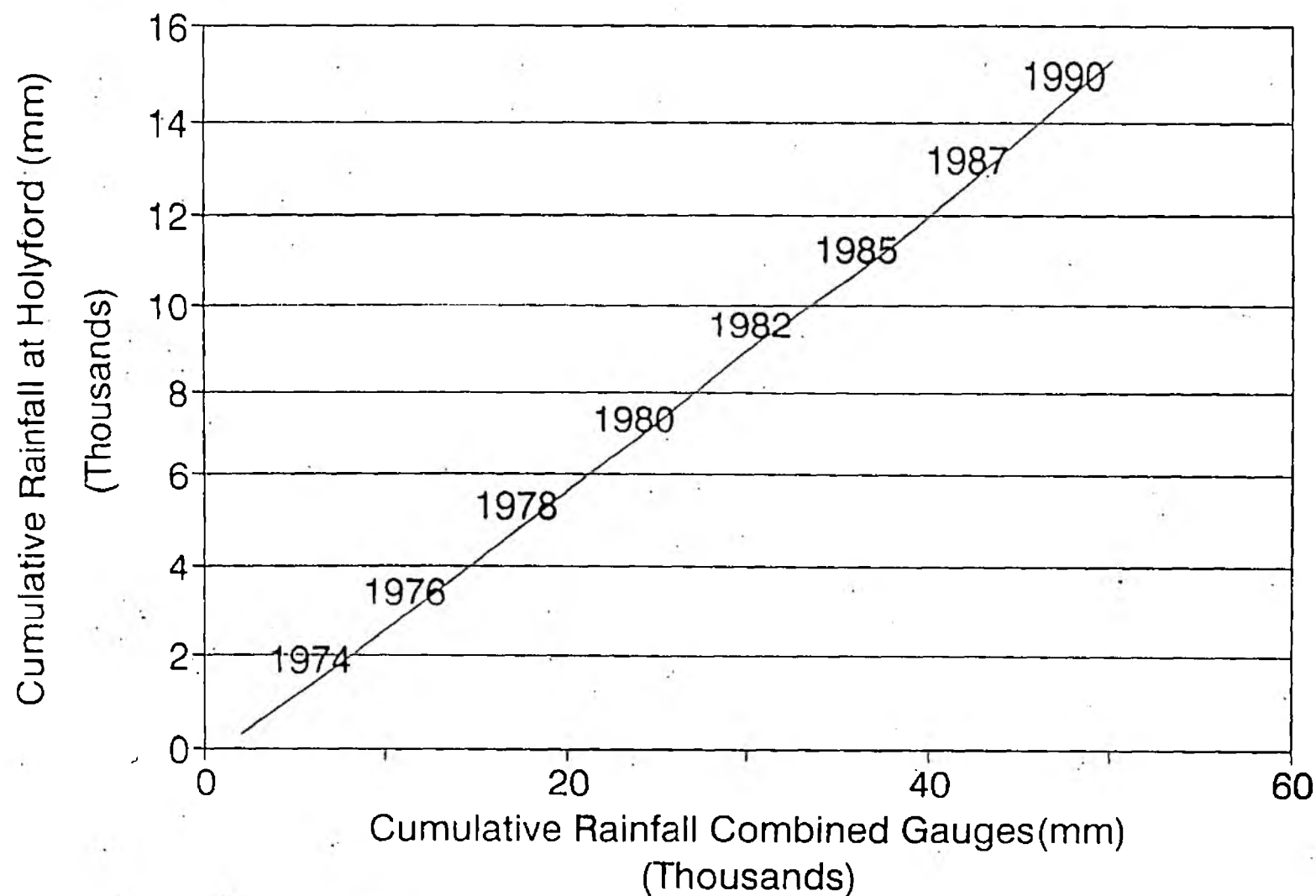


Figure 3.1.8

Double Mass Plot

Axminster vs Combined Rainfall Gauges

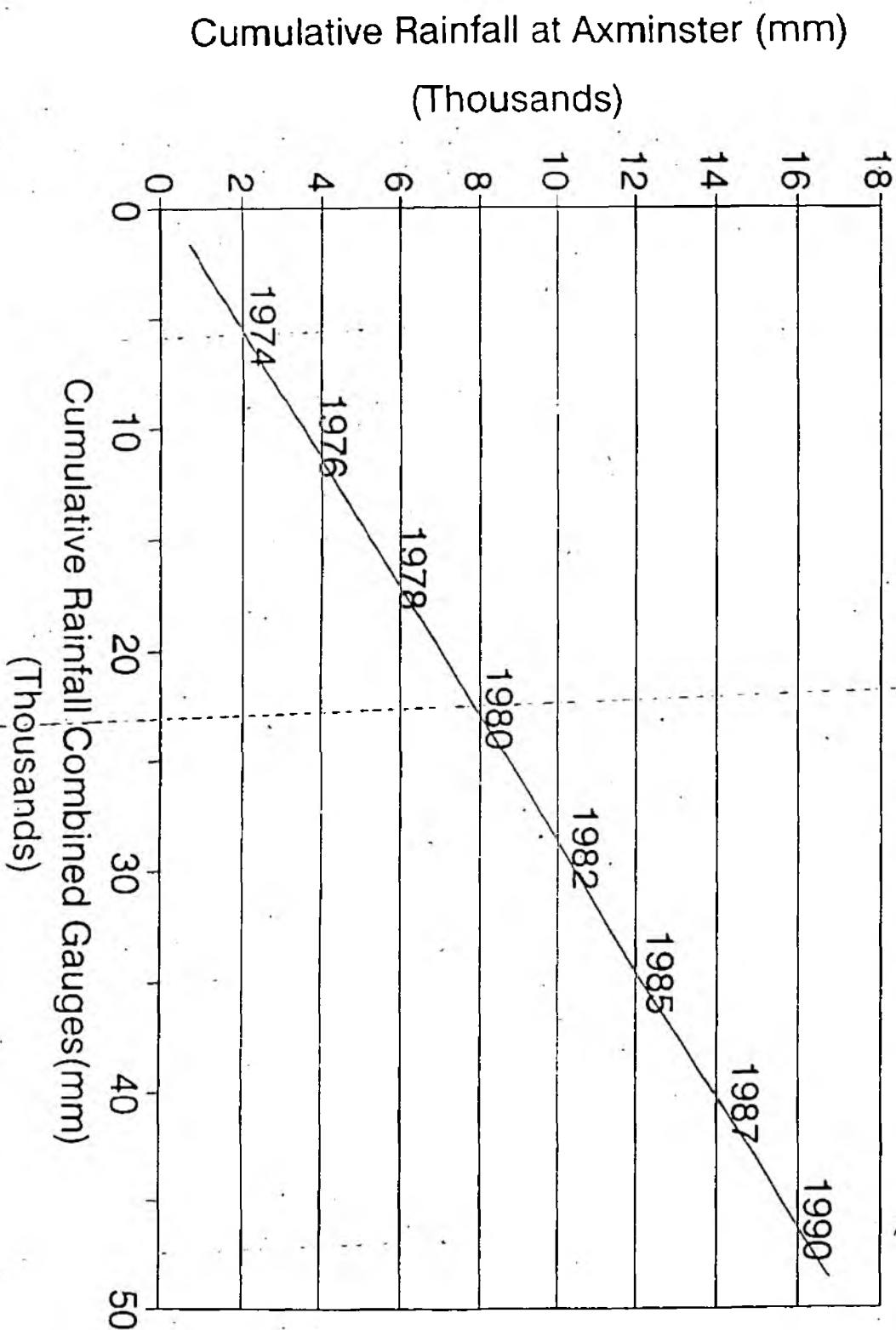


Figure 3.1.9

Double Mass Plot

Forde Abbey vs Combined Rainfall Gauges

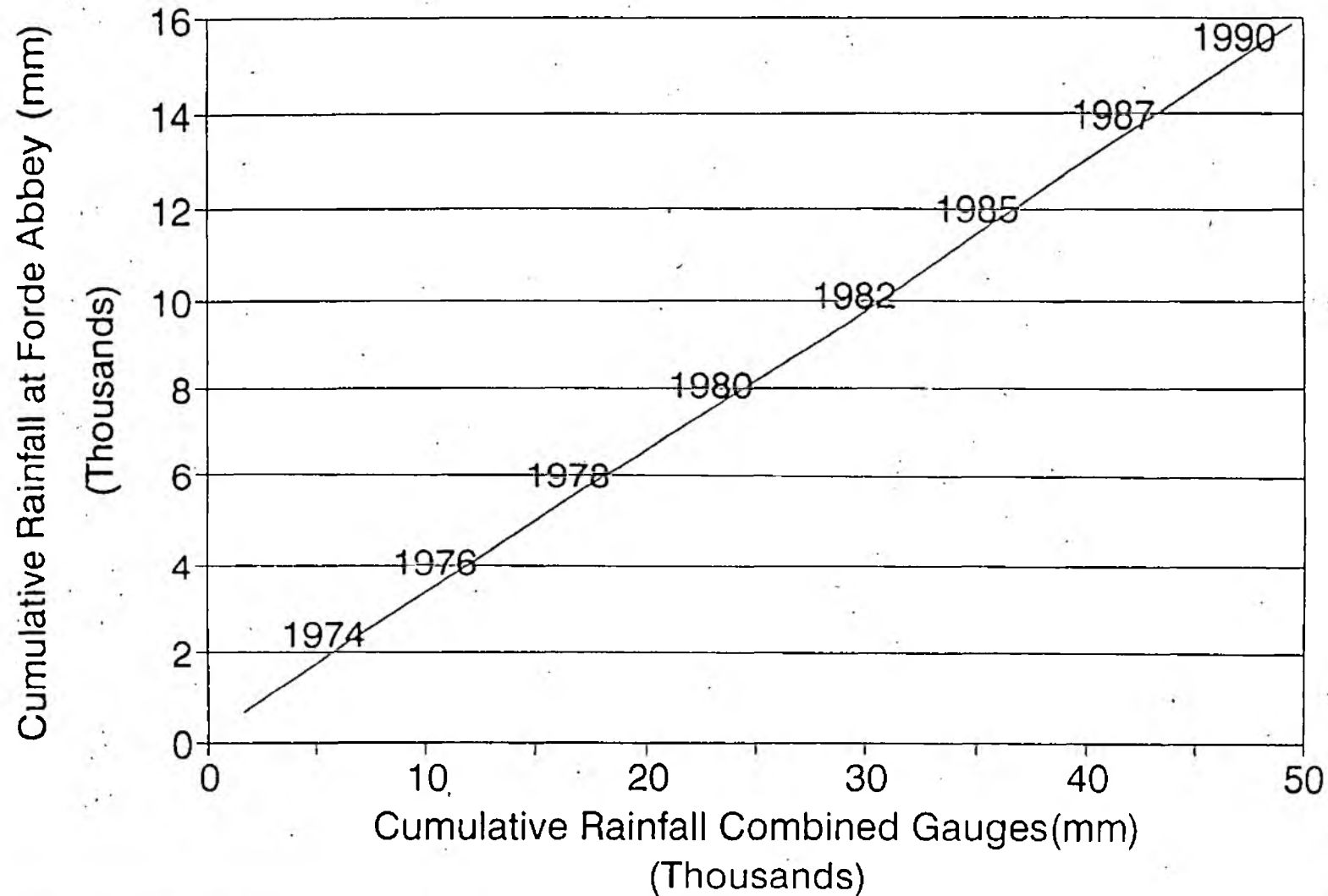


Figure 3.1.10

Double Mass Plot

Warmbrook vs Combined Rainfall Gauges

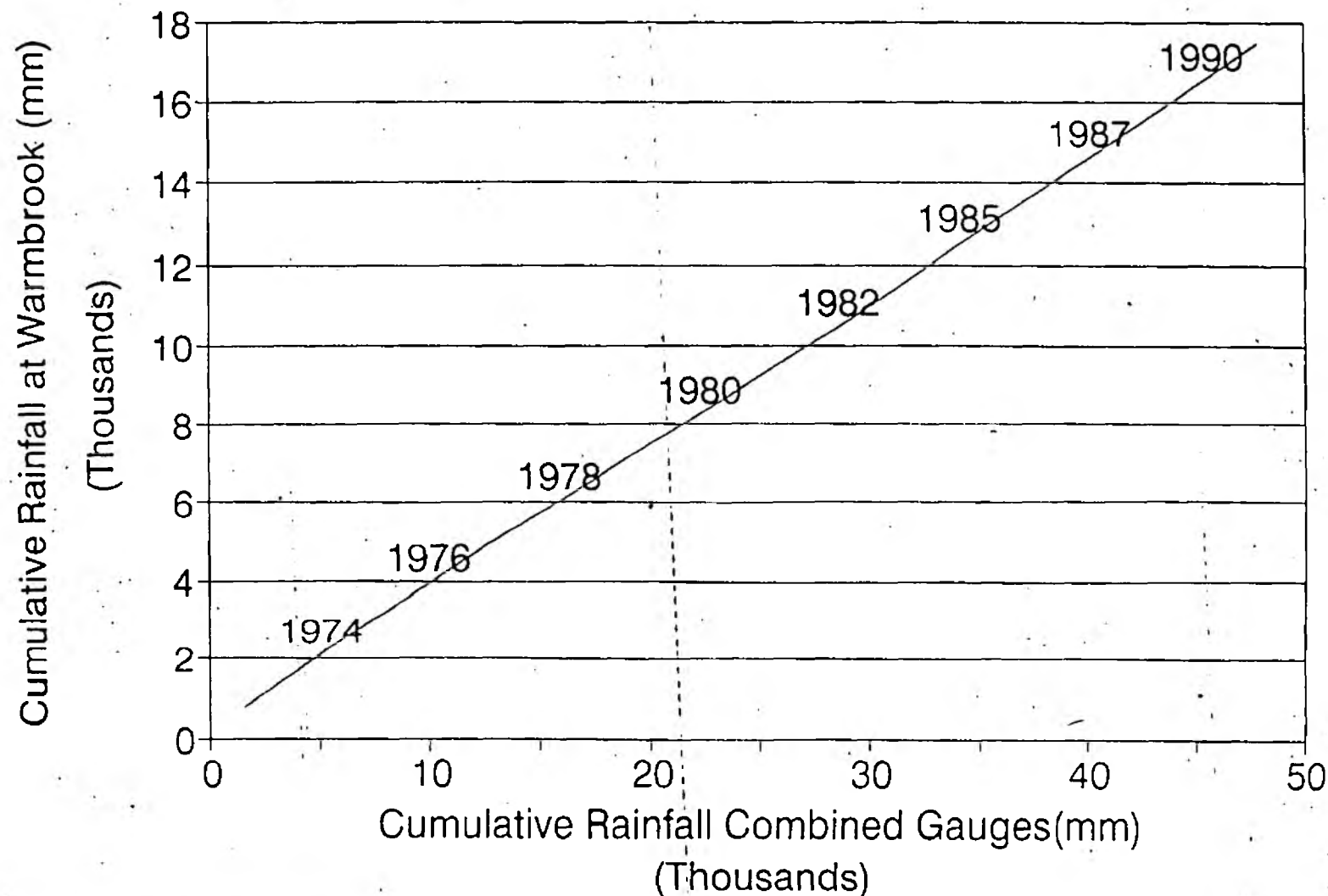


Figure 3.1.11

Double Mass Plot

Otter Rainfall vs Axe Rainfall

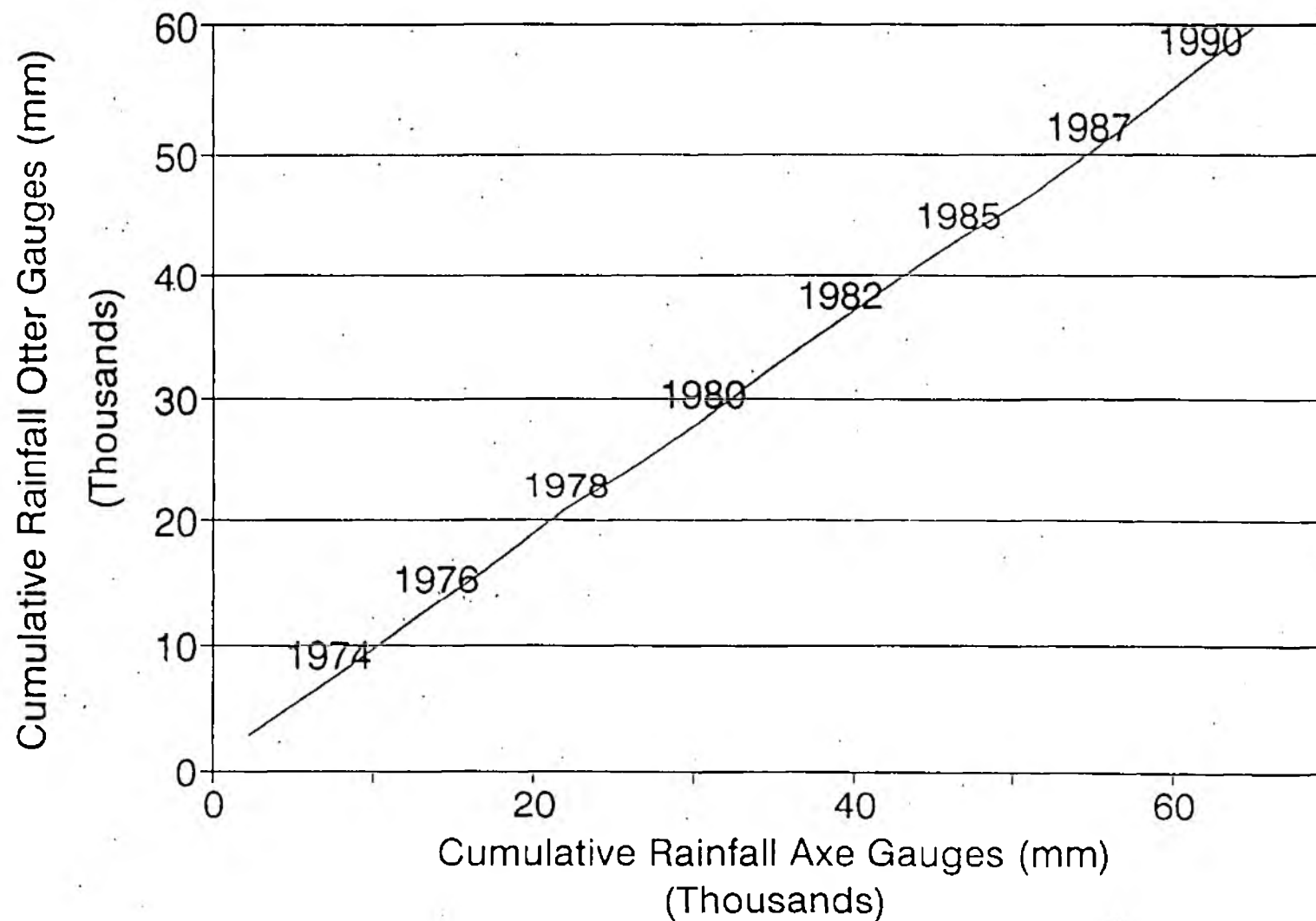


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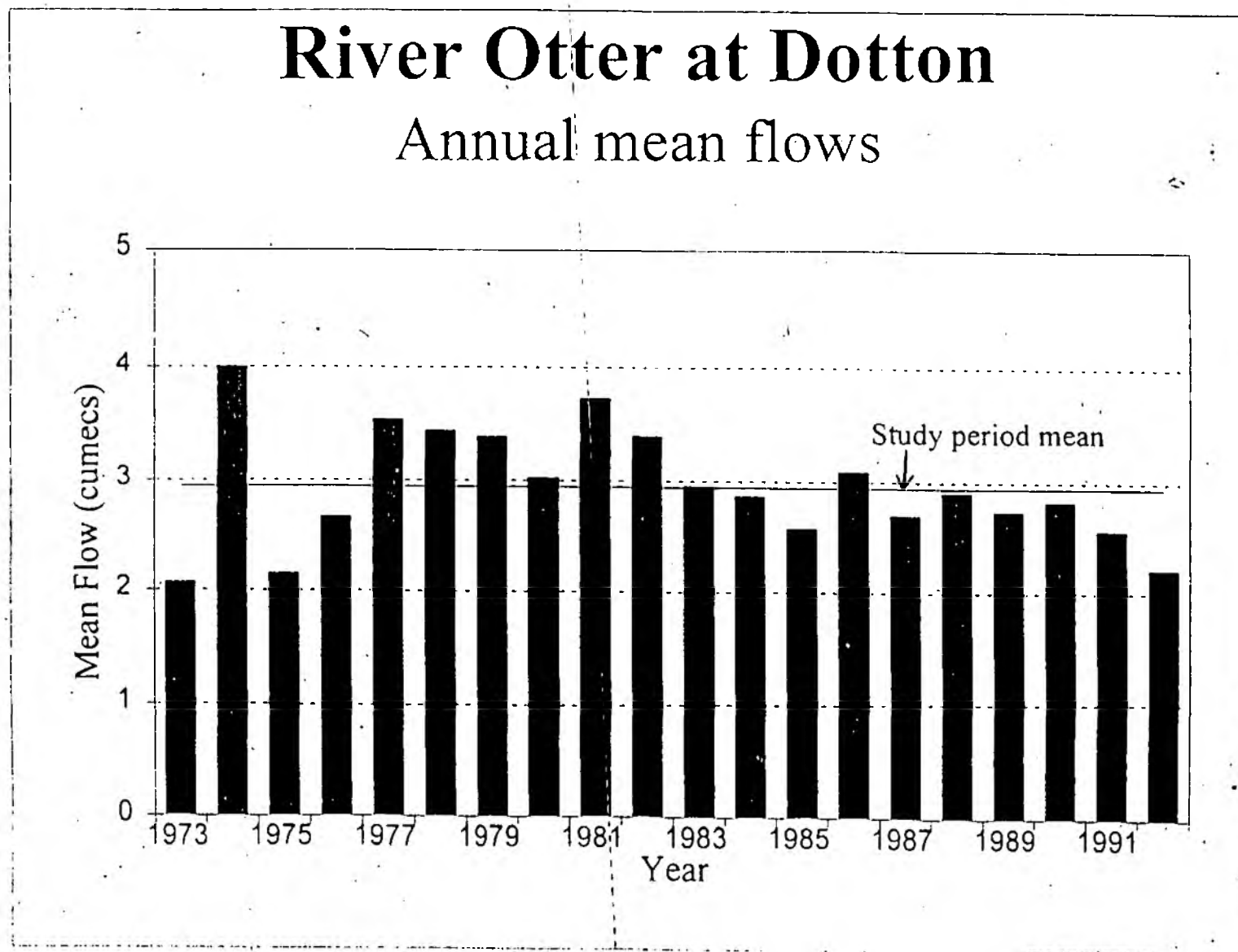


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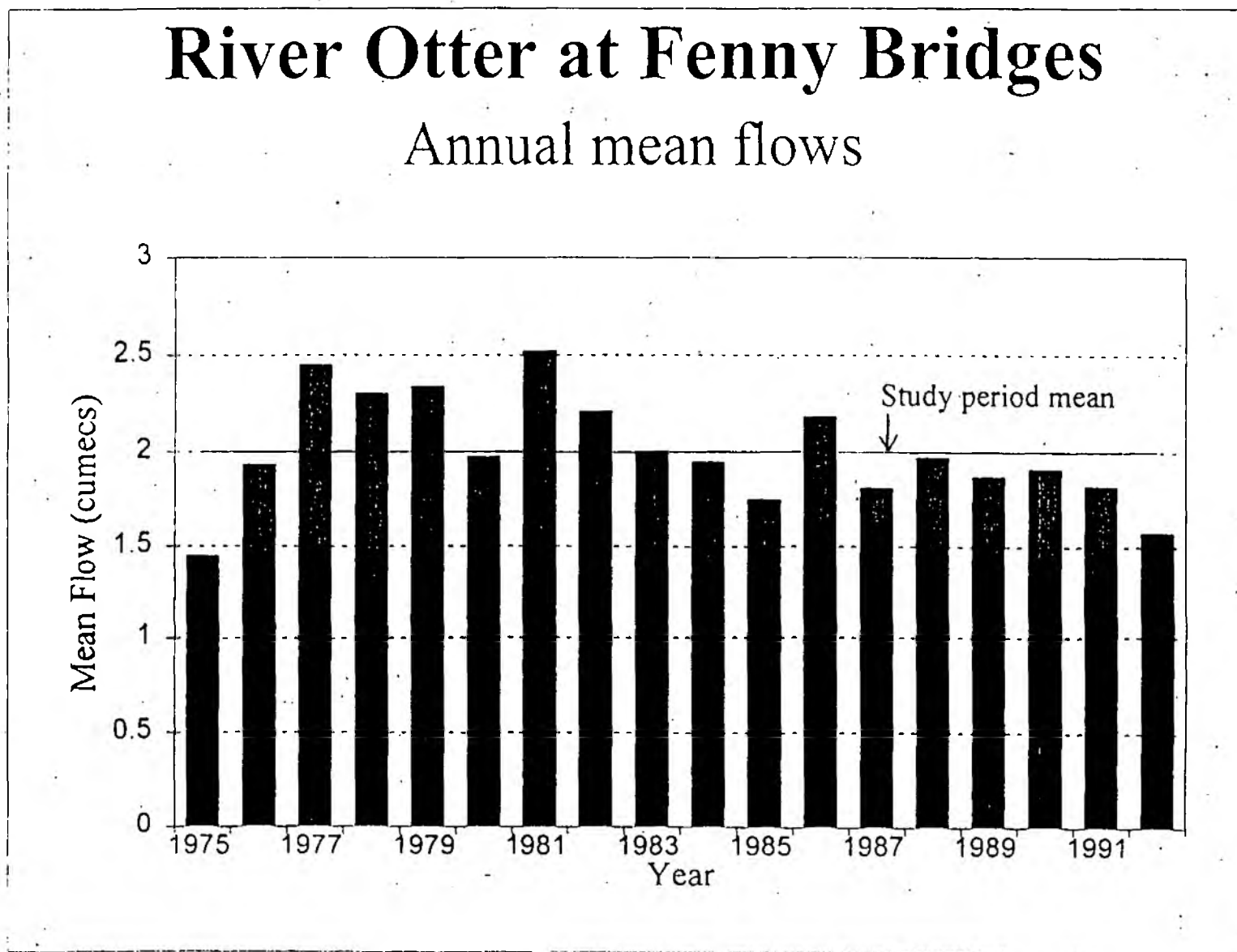


Figure 3.1.14

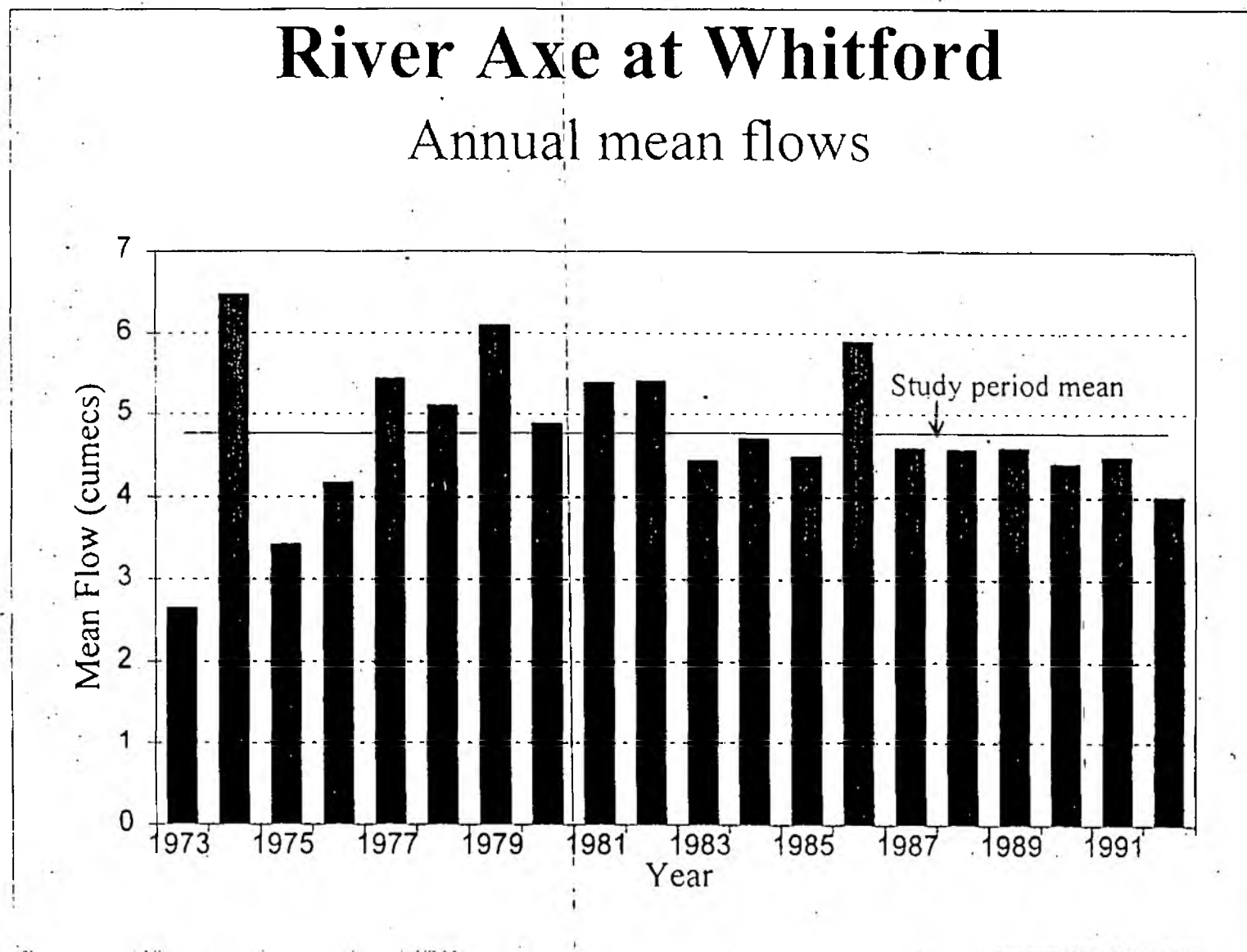


Figure 3.1.15

Annual Mean Flows as Percentage of Study Period Mean

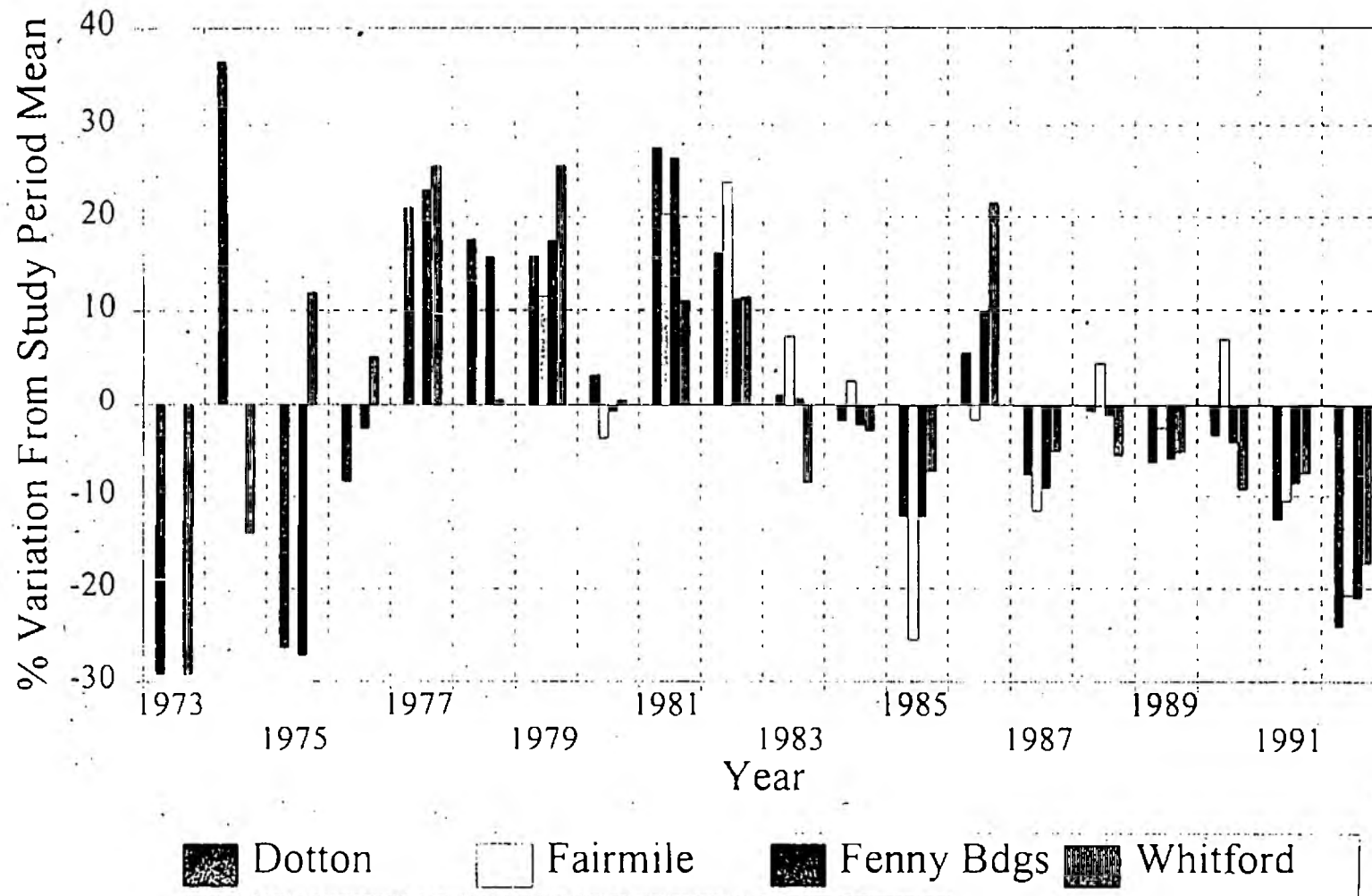


Figure 3.1.16

Surface Runoff vs Rainfall

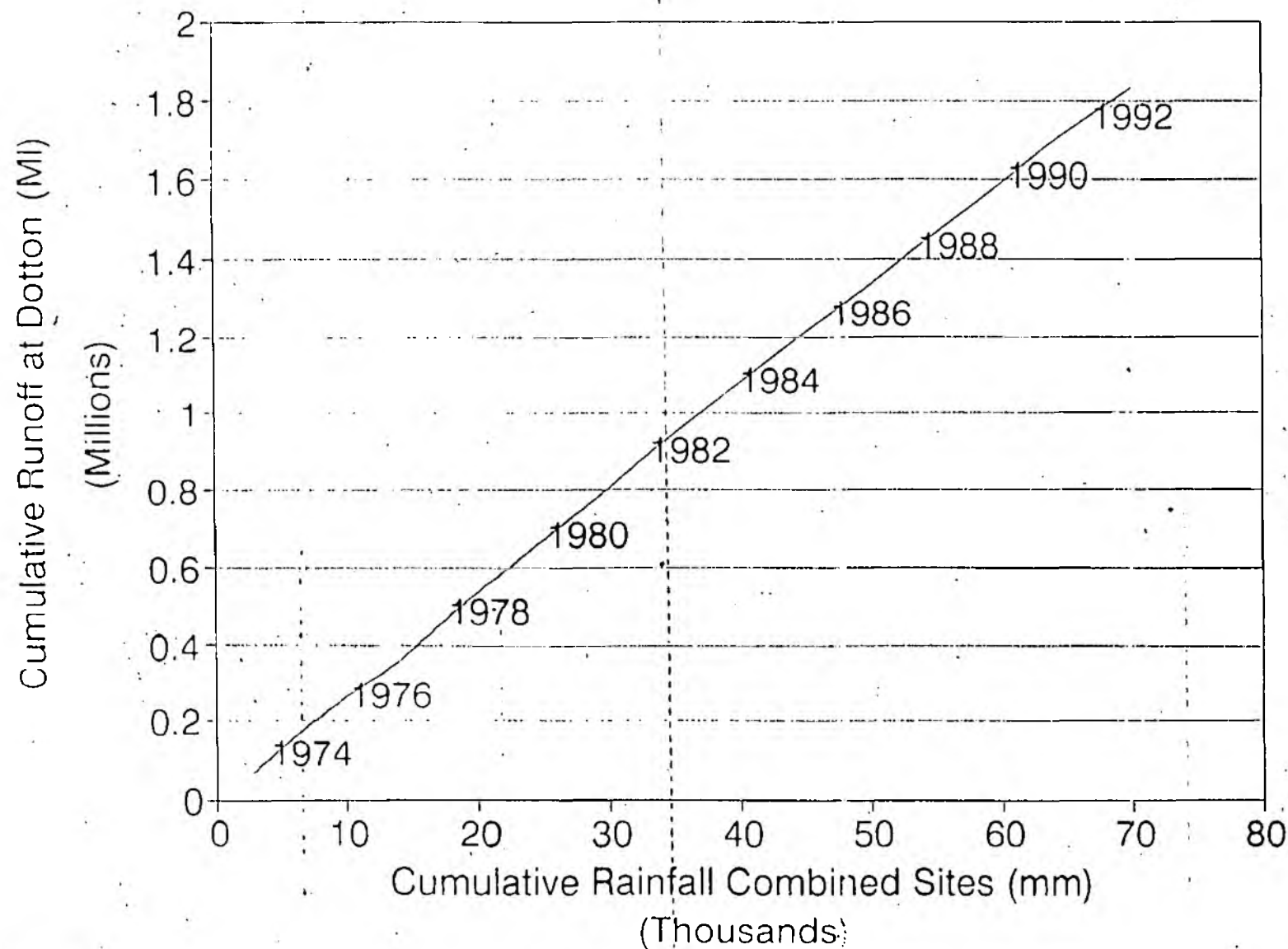


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Surface Runoff vs Rainfall

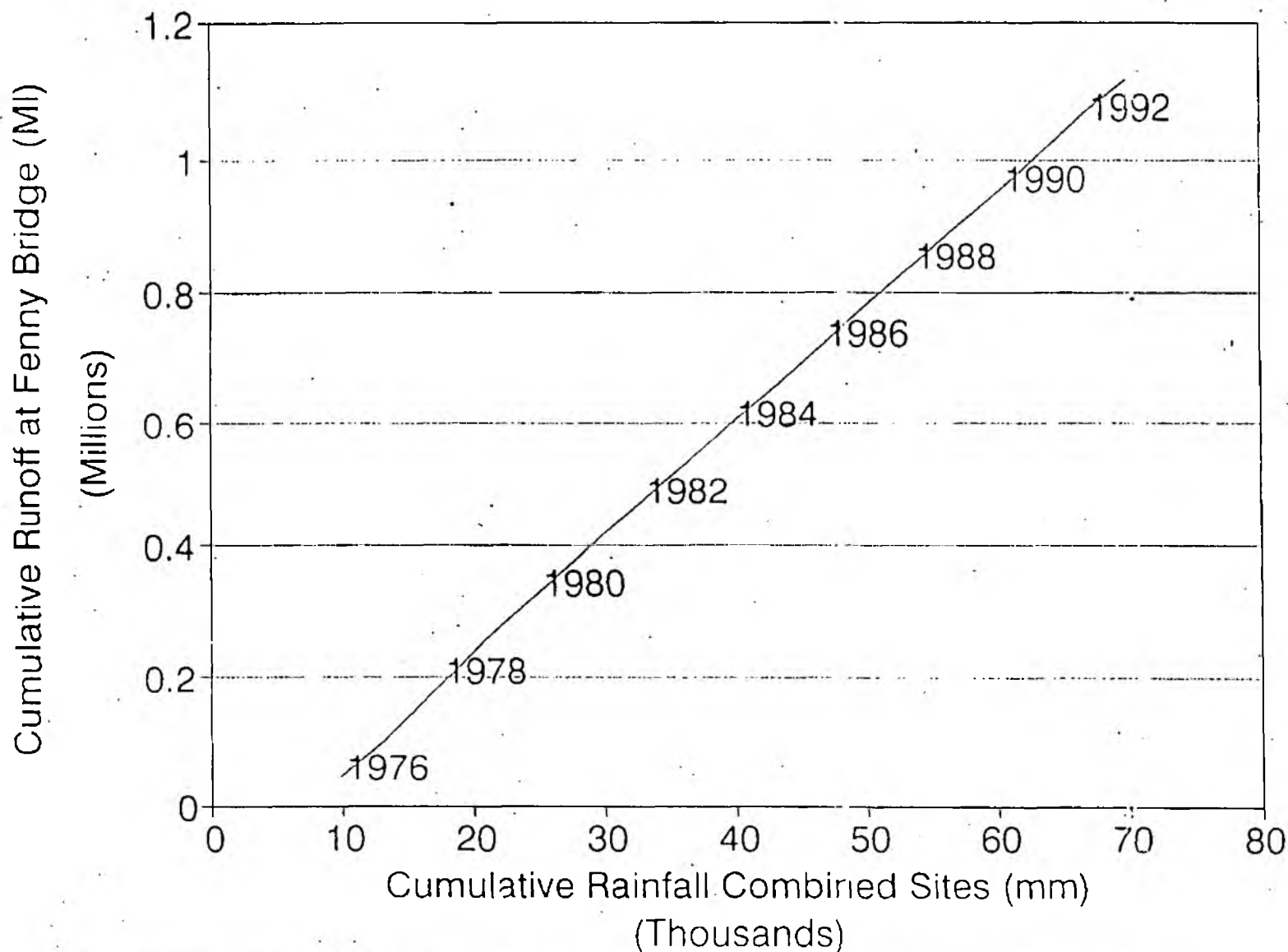


Figure 3.1.18

Surface Runoff vs Rainfall

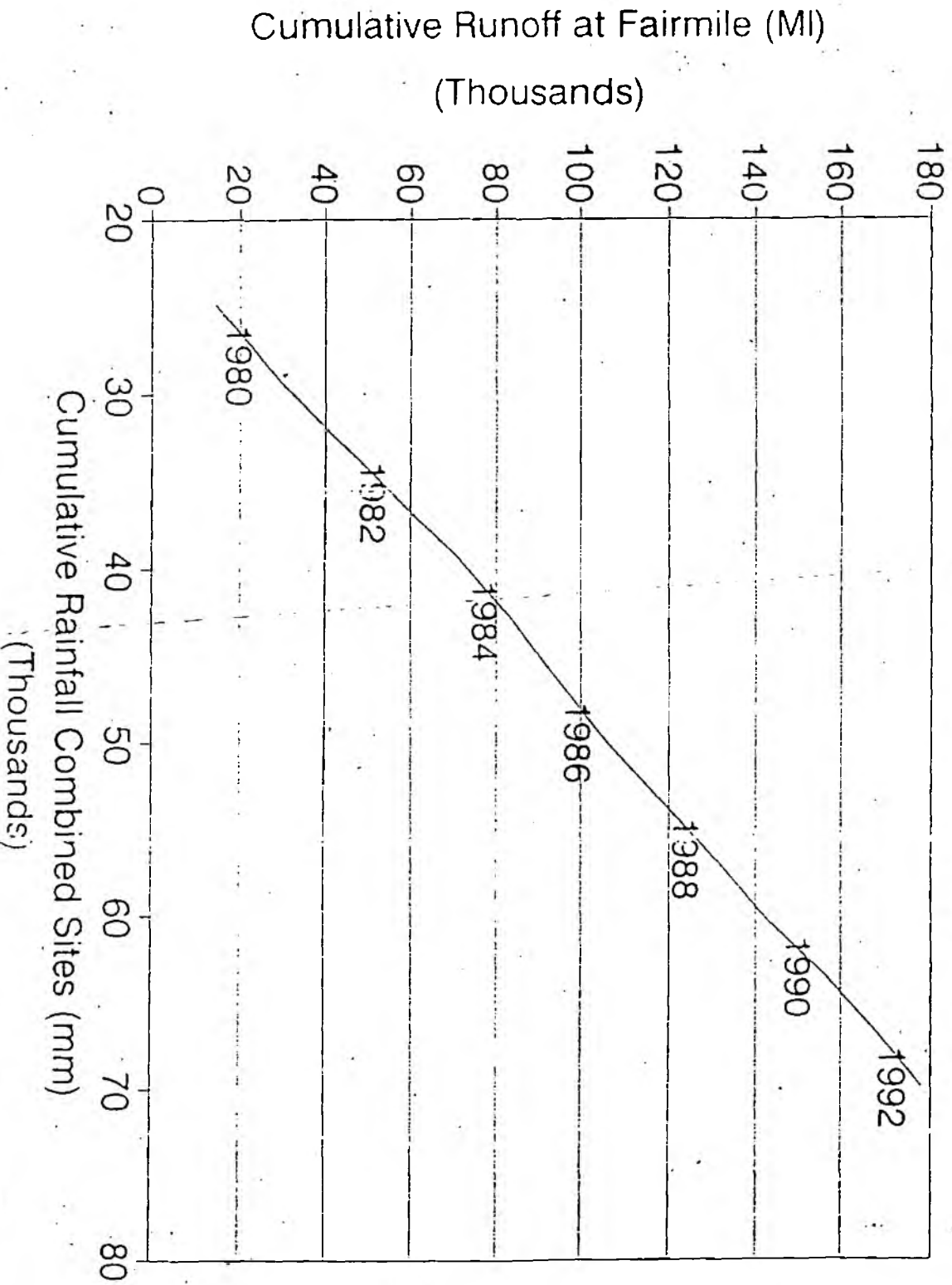


Figure 3.1.19

Surface Runoff vs Rainfall

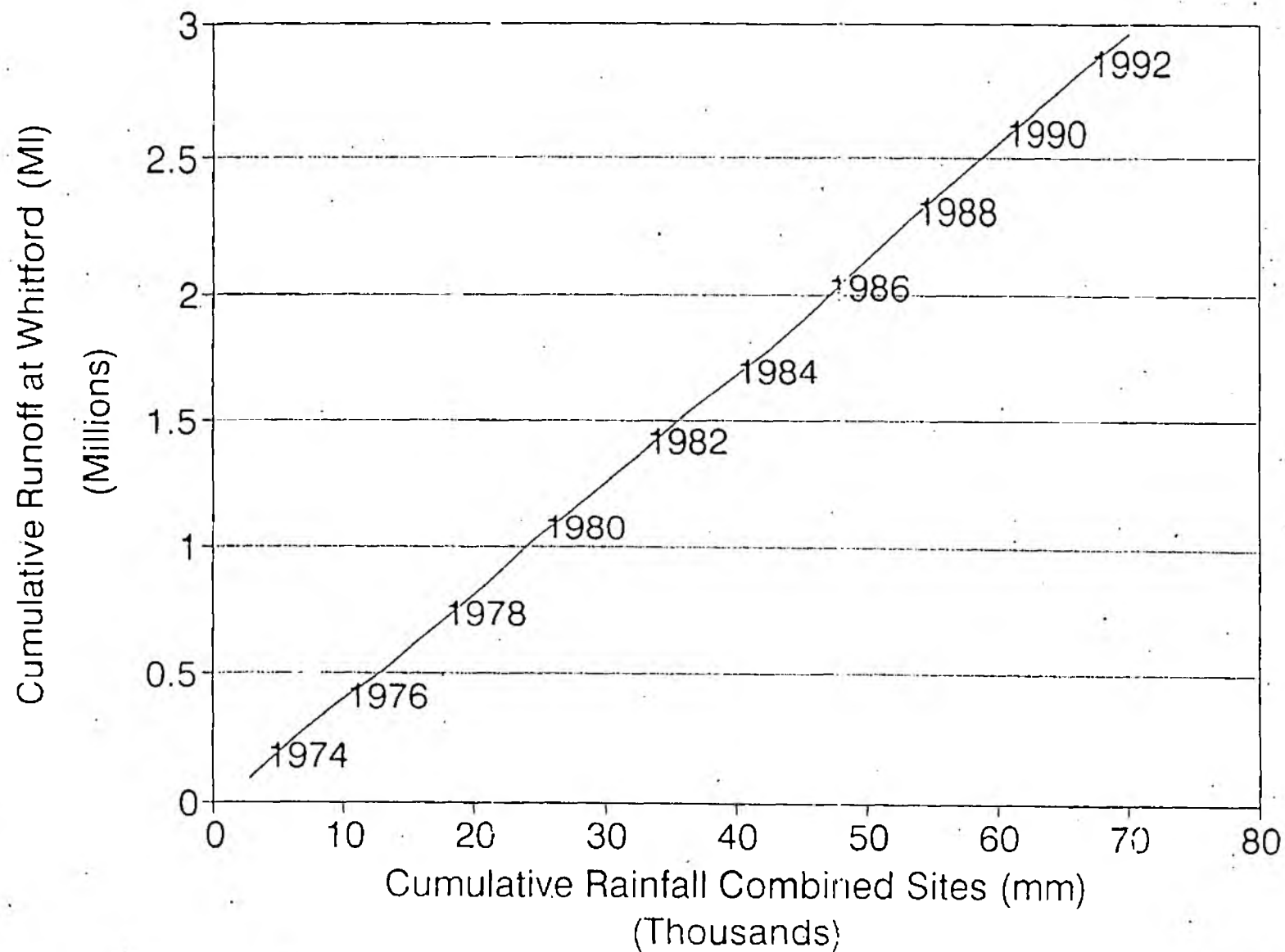


Figure 3.1.20

Double Mass Plot

Dotton WWTW vs Fenny Bridges

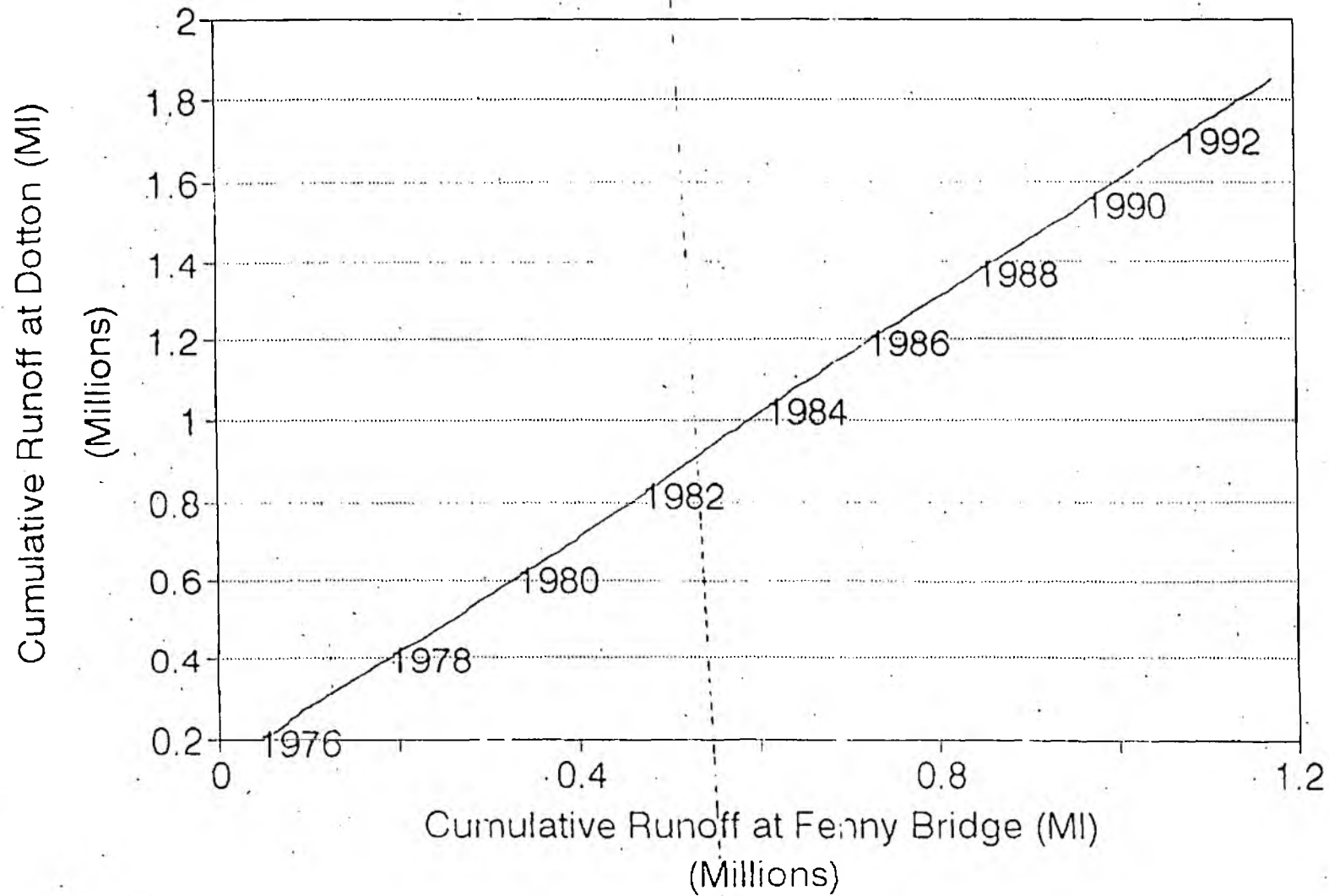


Figure 3.1.21

Axe Flows Vs Combined Axe Raingauges

Double Mass Plot

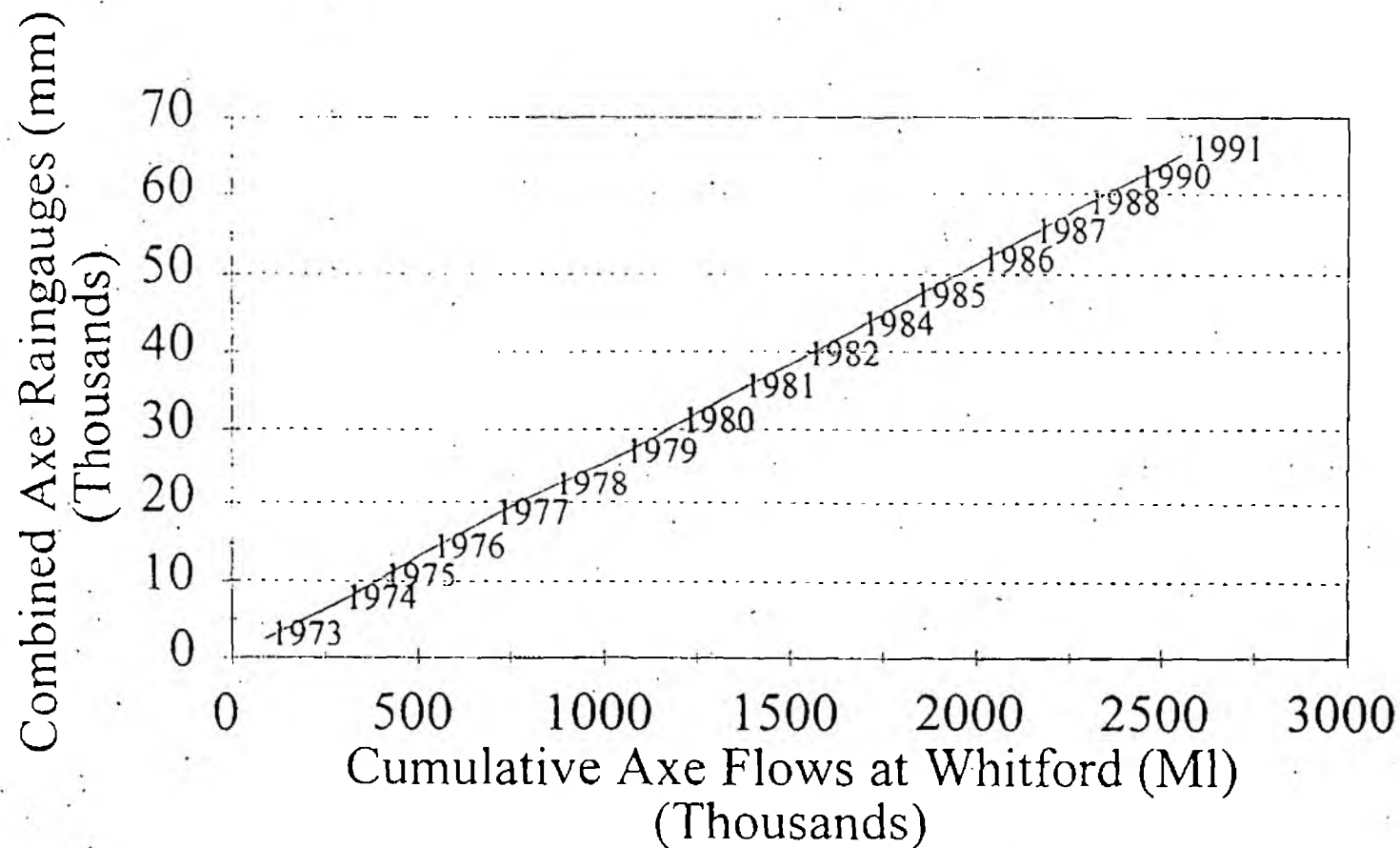


Figure 3.1.22

Dotton vs Whitford Flows

Double Mass Plot

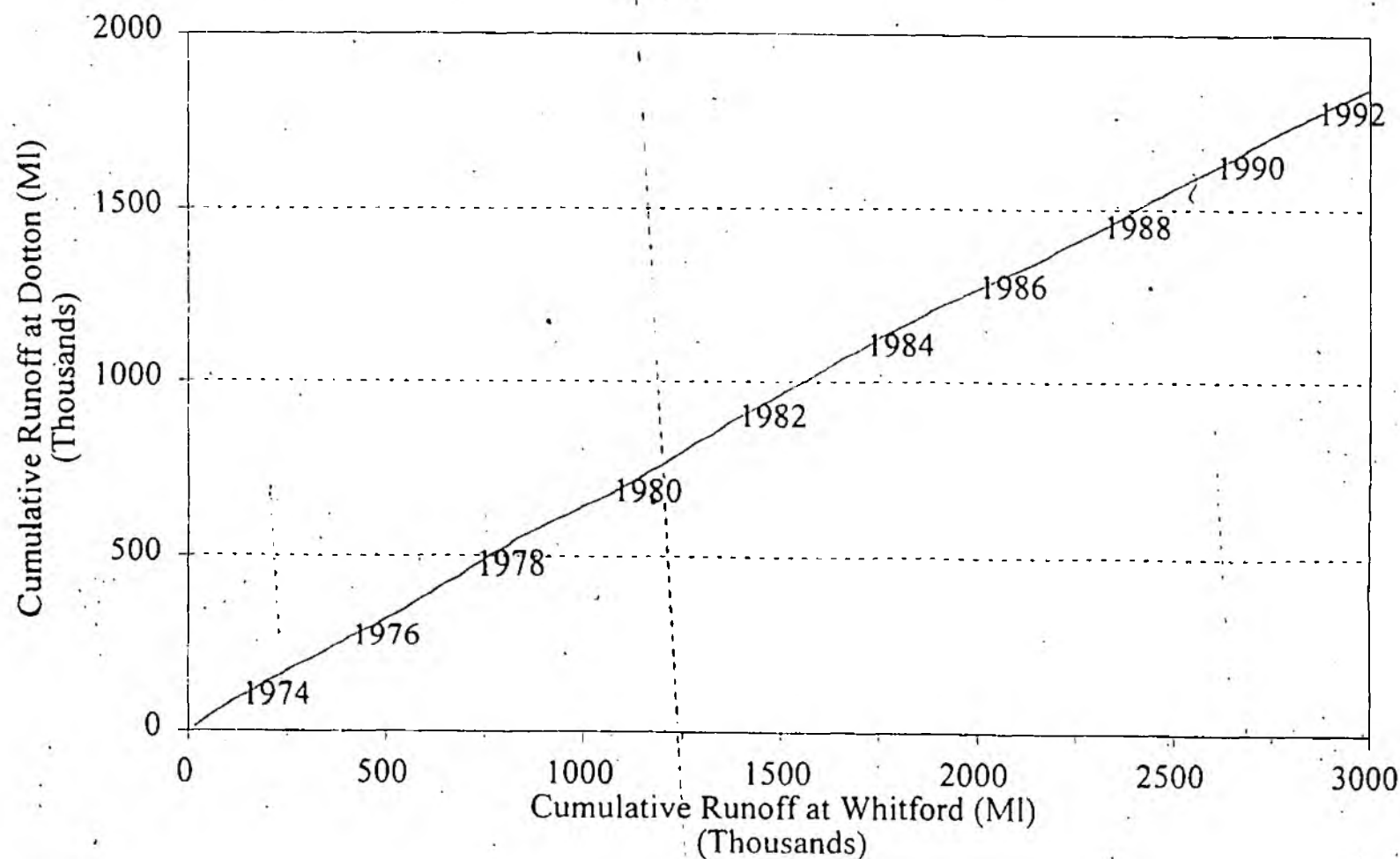


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Fenny Bridges vs Whitford Flows

Double Mass Plot

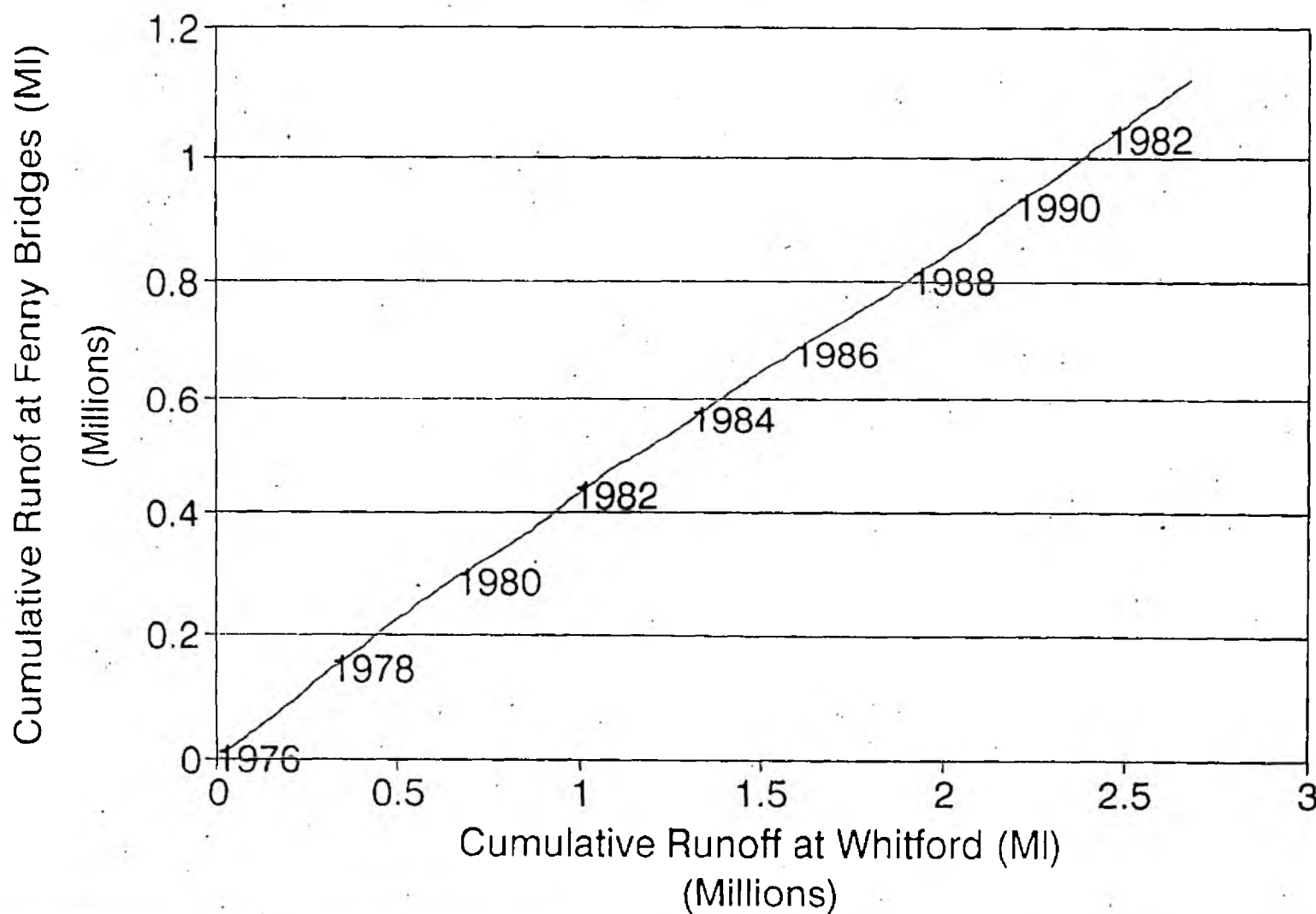


Figure 3.1.24

Hydrographs

Dotton

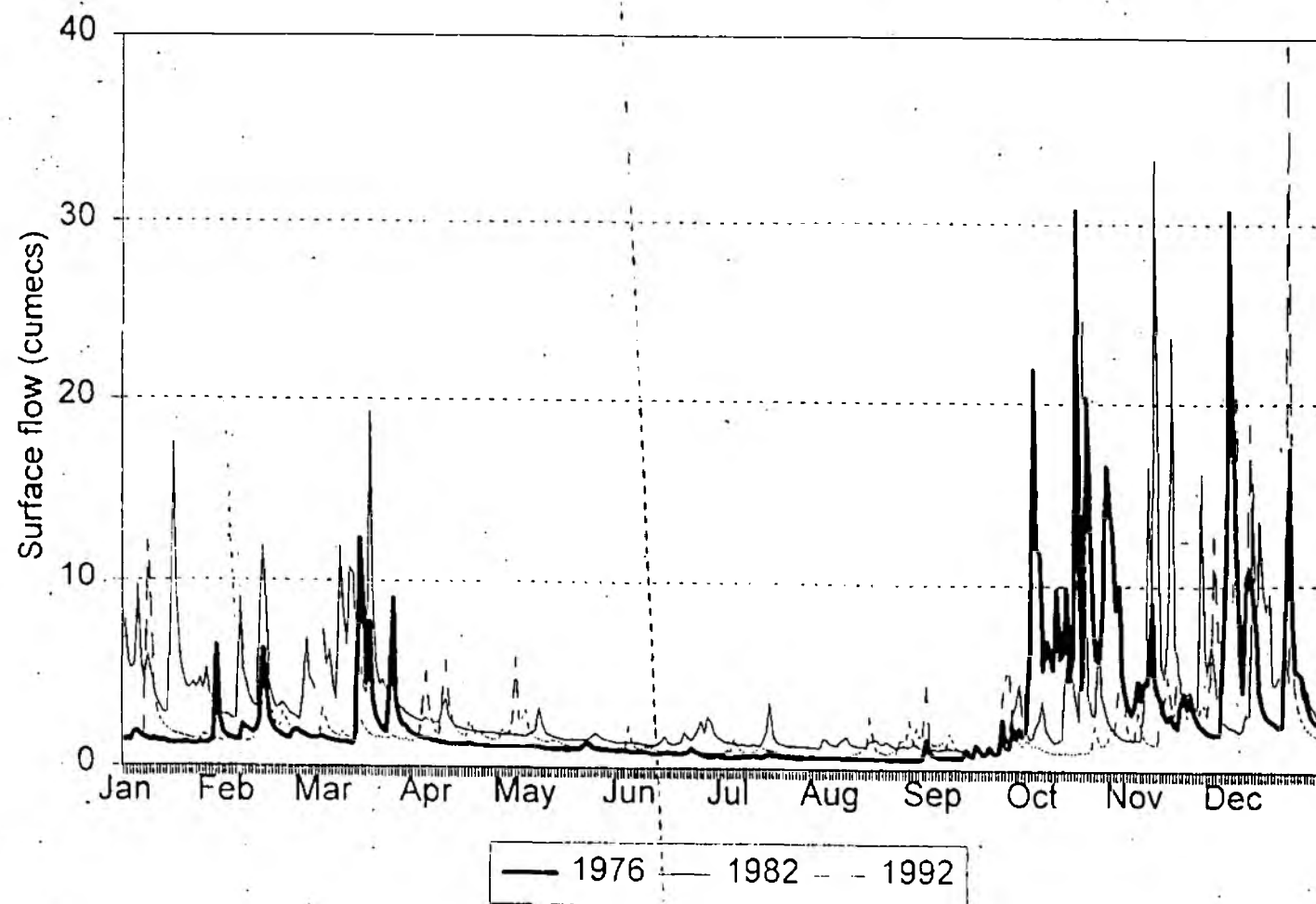


Figure 3.1.25

Hydrographs

Dotton: 0-5 cumecs in detail

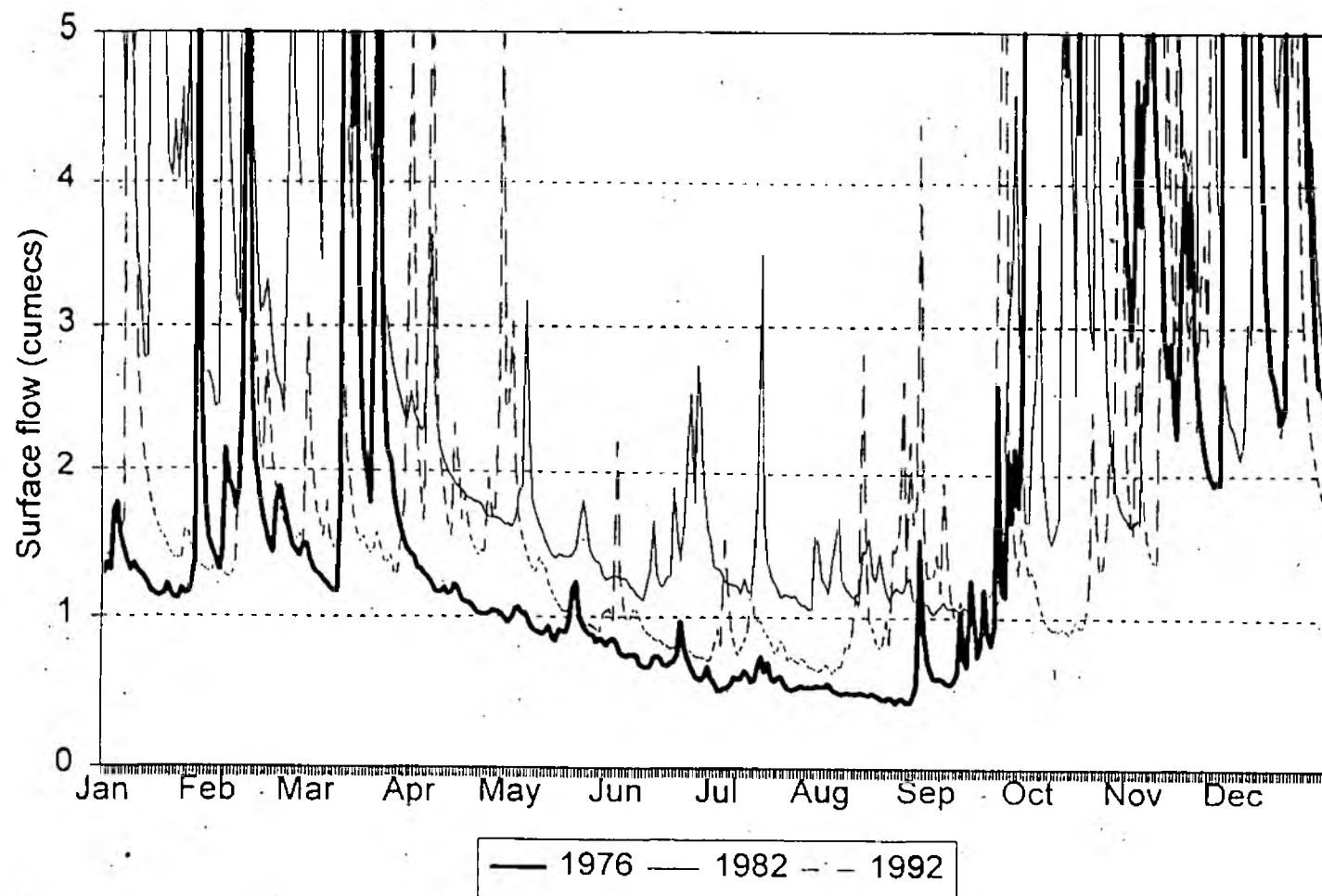


Figure 3.1.26

Hydrographs

Fenny Bridges

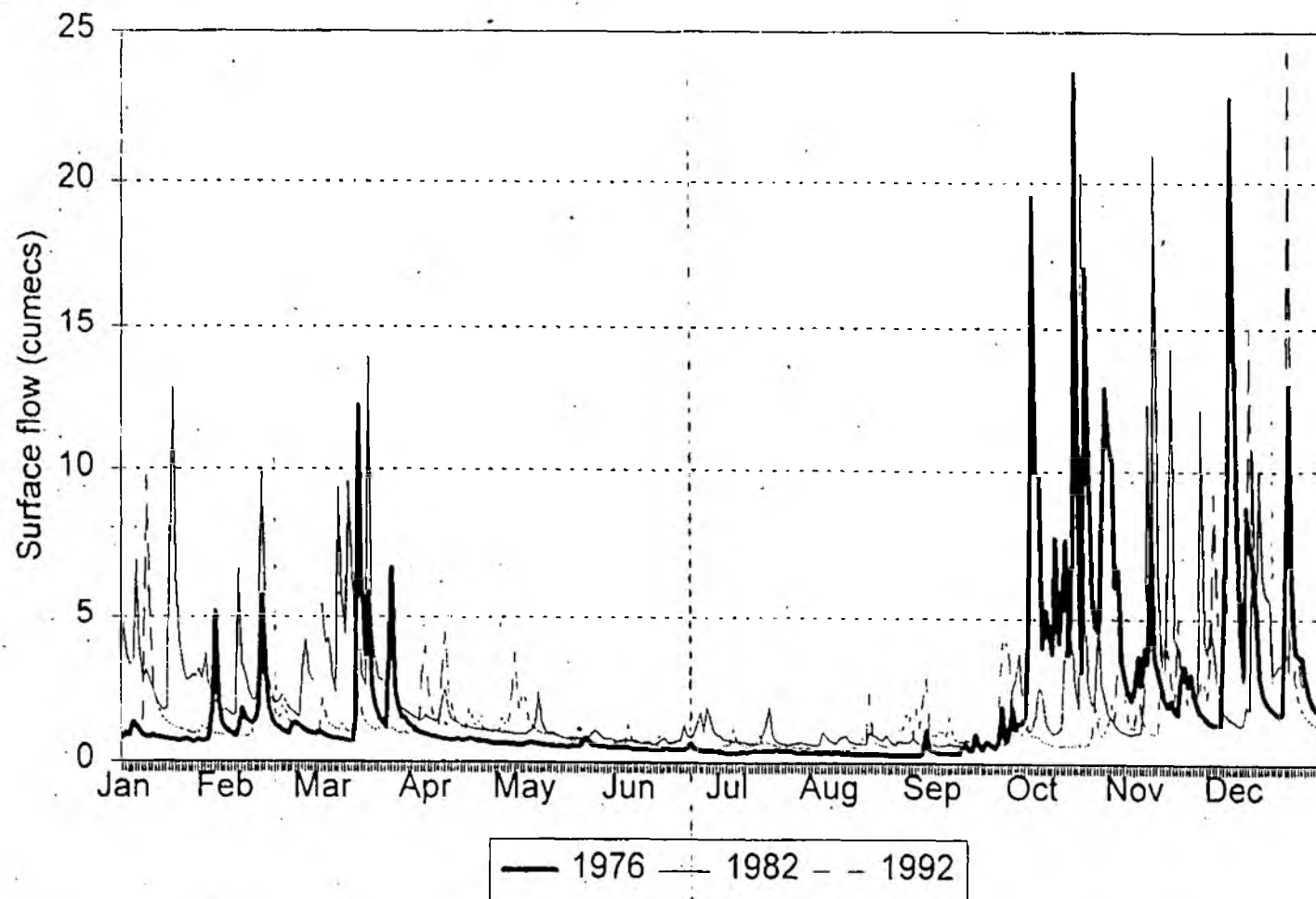


Figure 3.1.27

Hydrographs

Fenny Bridges: 0-5 cumecs in detail

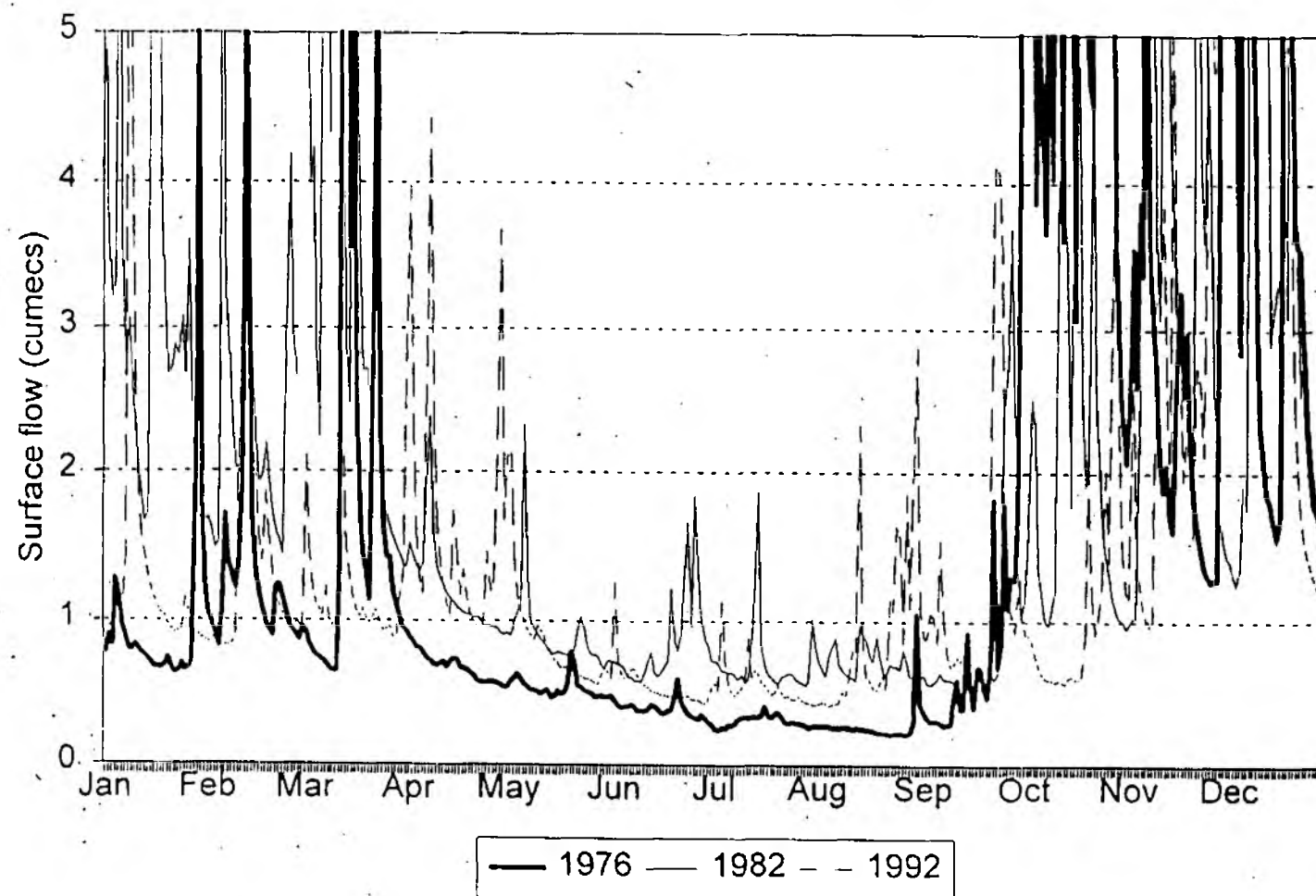


Figure 3.1.28

Hydrographs

Whitford

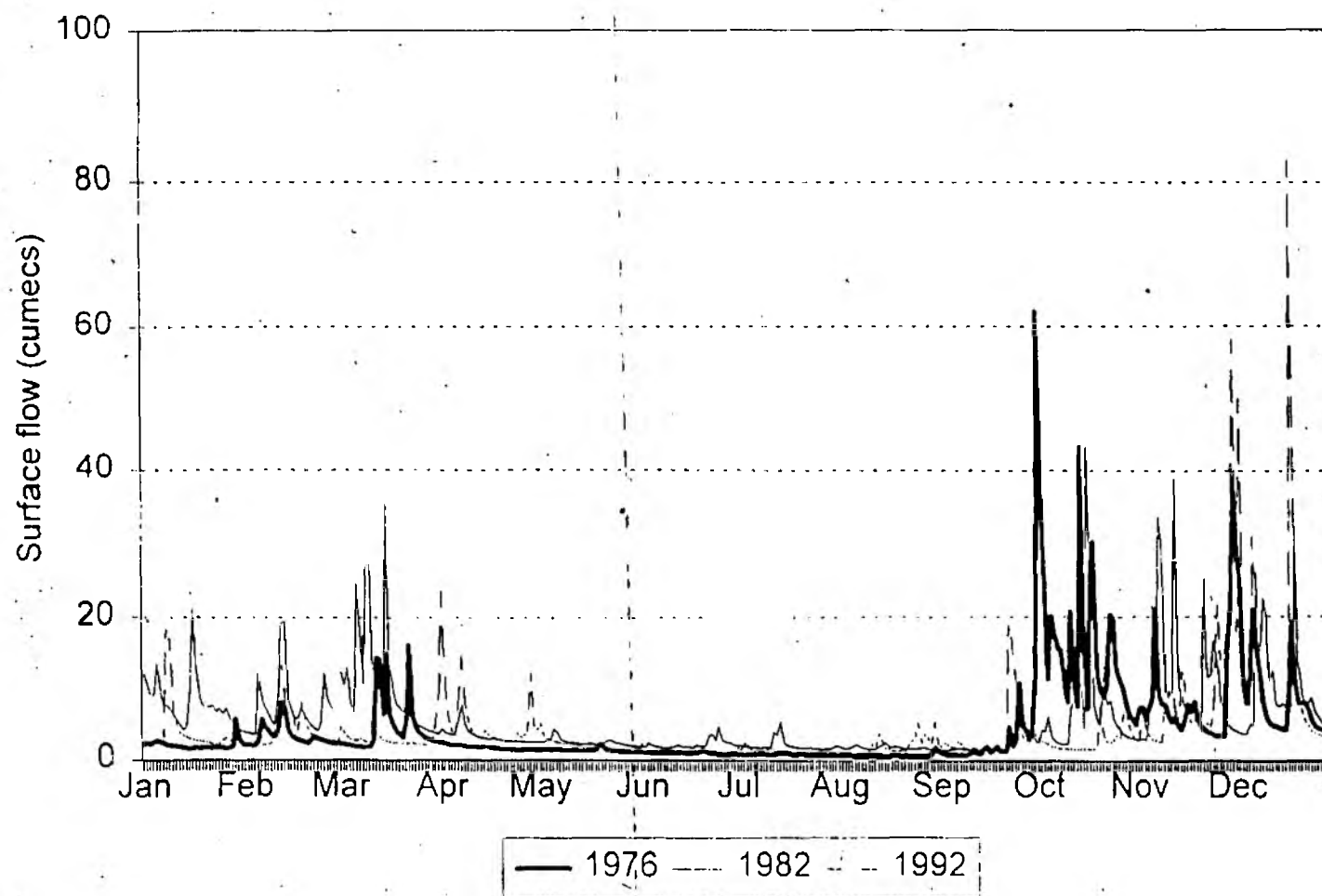


Figure 3.1.29

Hydrographs

Whitford: 0-5 cumecs in detail

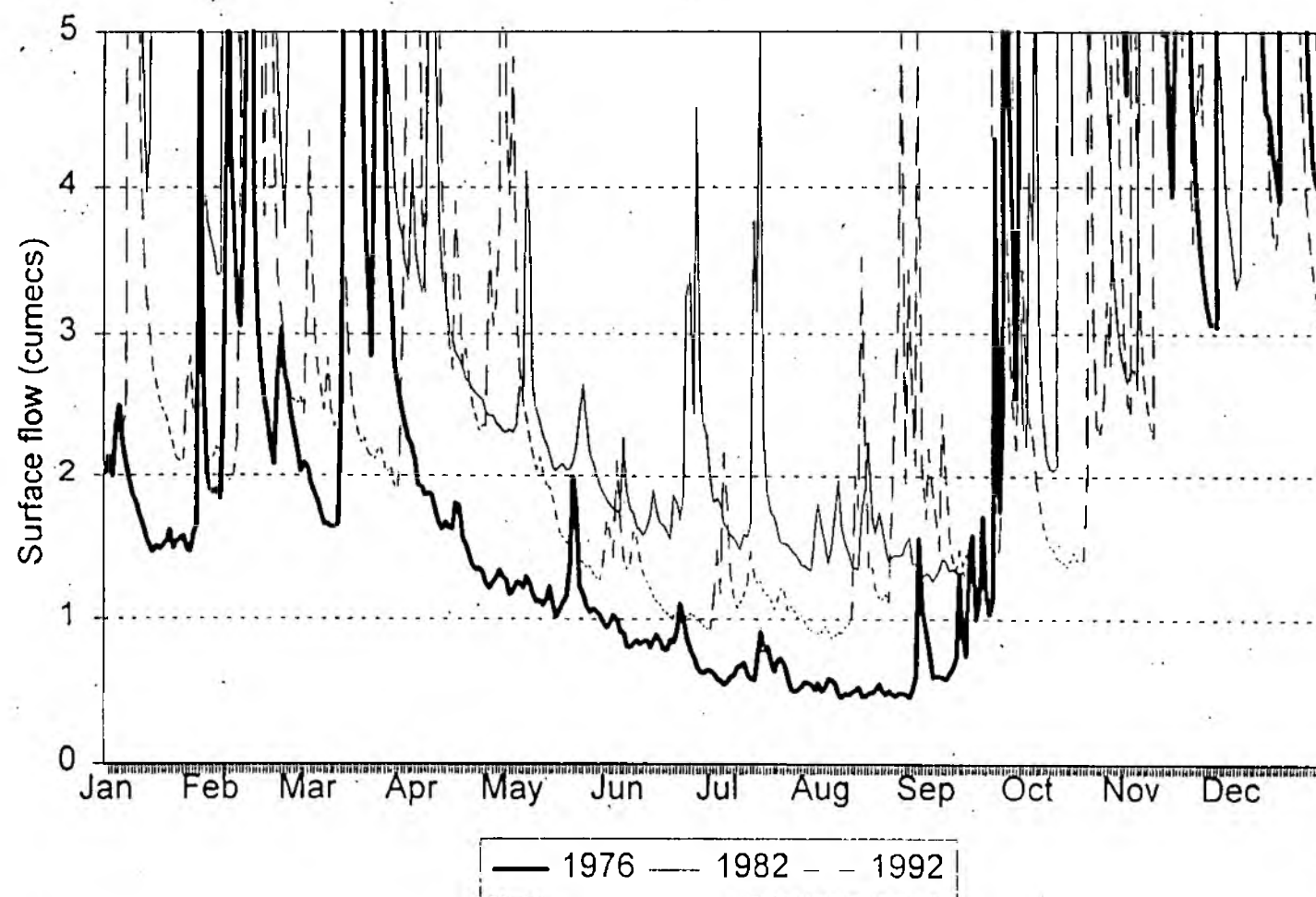


Figure 3.1.30

Mean Summer (JJA) Flows as Percentage of Study Period Mean Summer Flow

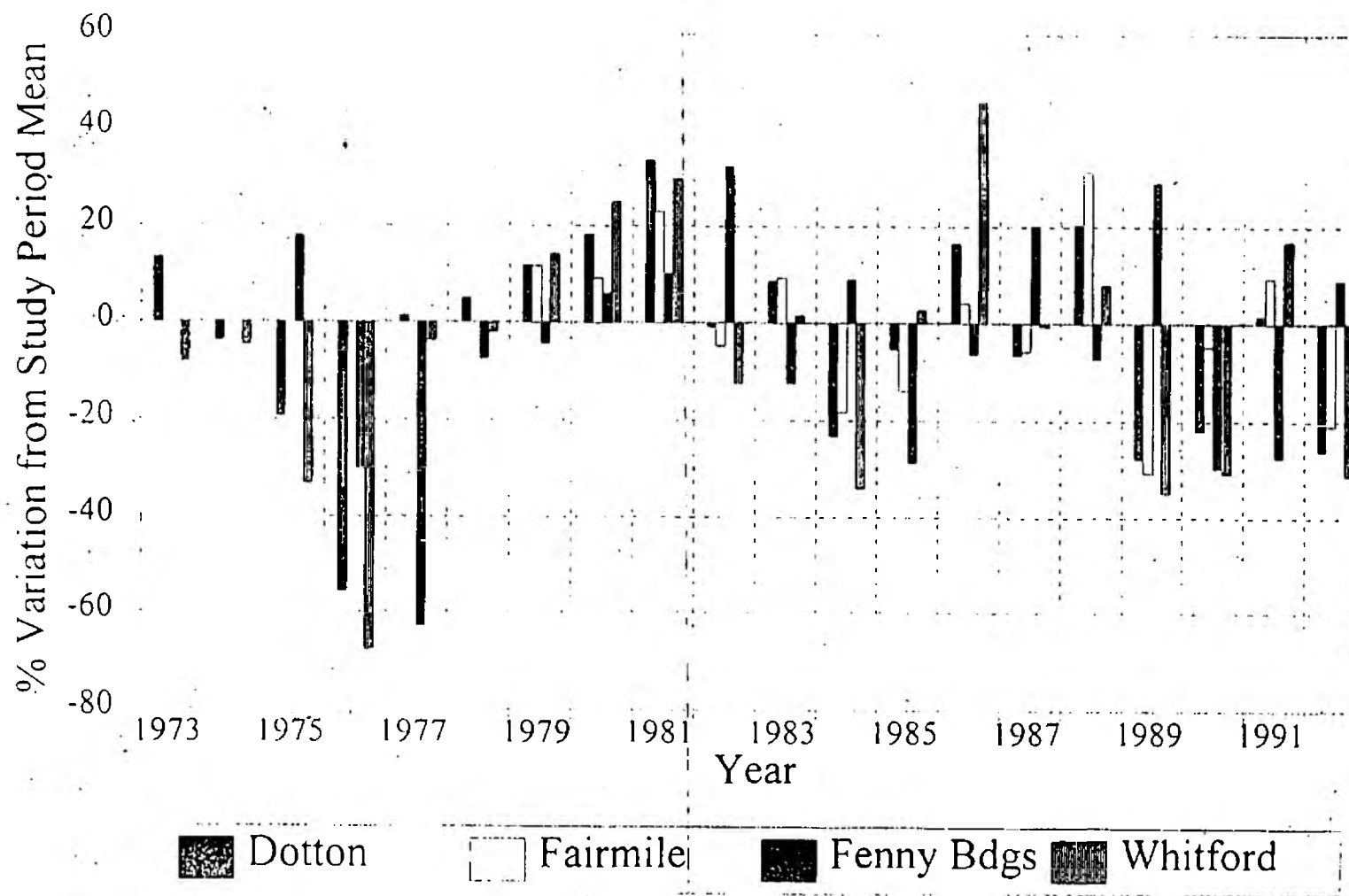


Figure 3.1.31

August Mean Flows

Comparison of Otter and Axe

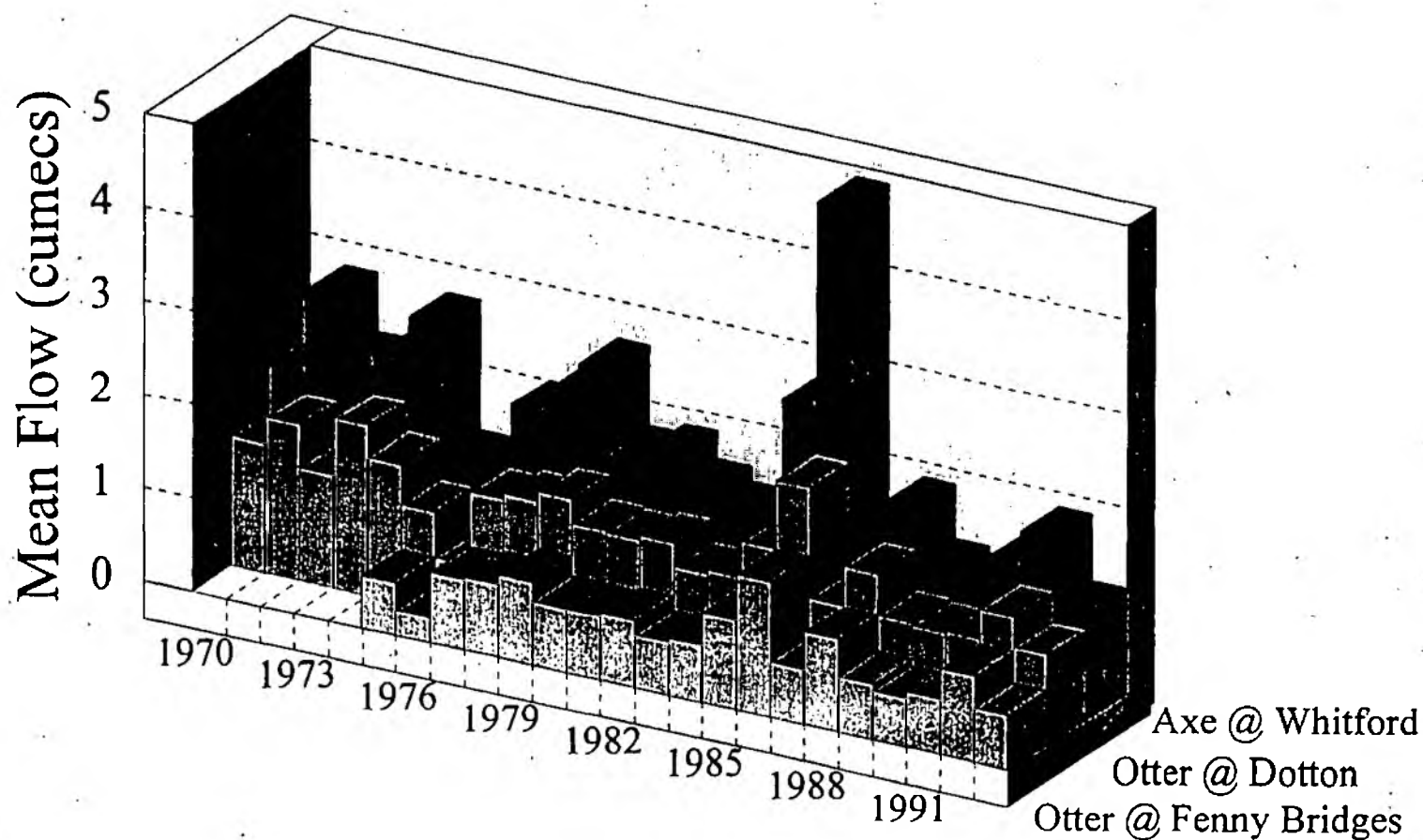


Figure 3.1.32

August Mean Flows

Variance about the August mean

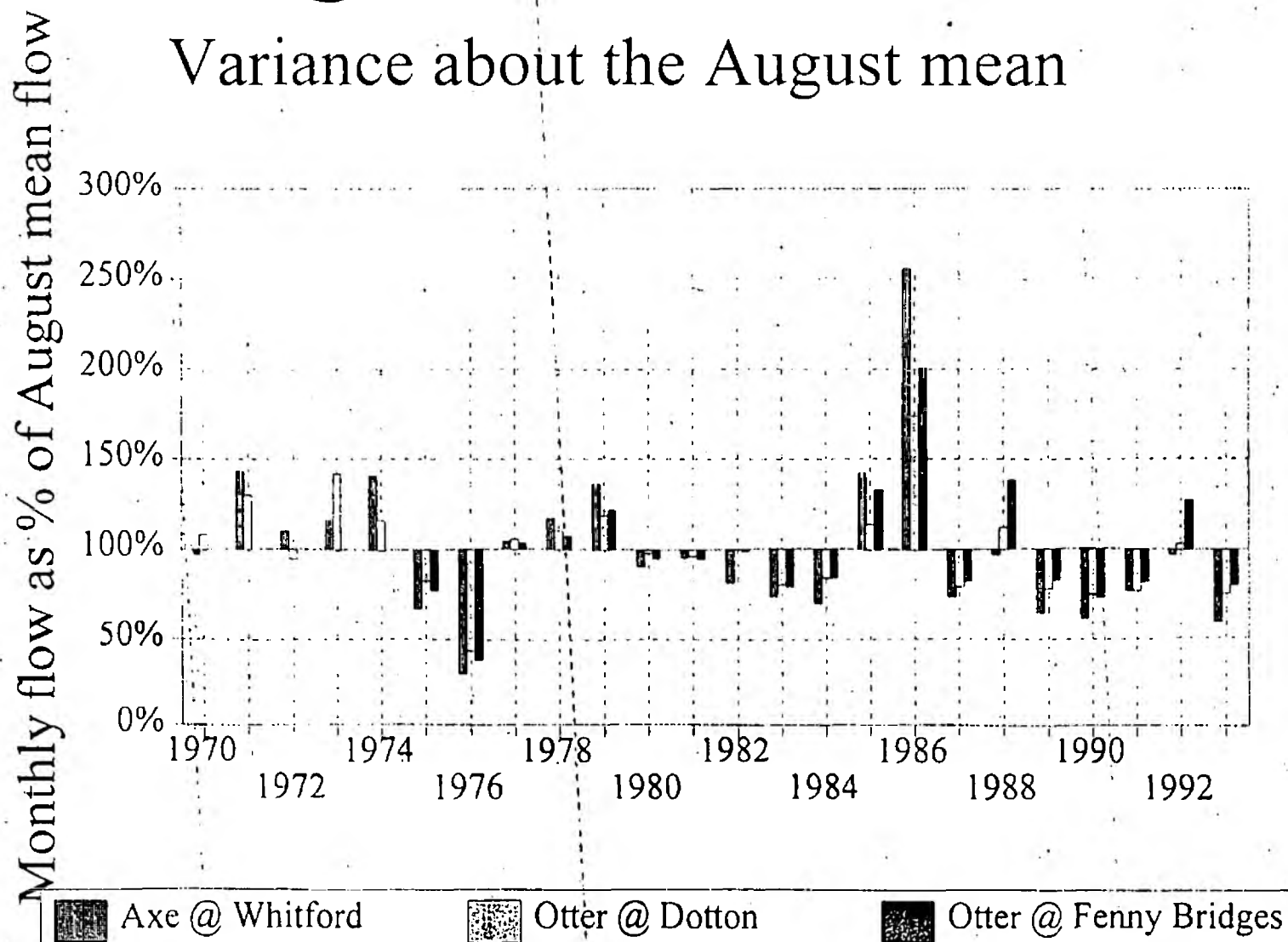


Figure 3.1.33

River Otter at Dotton

Summer Modal Flows

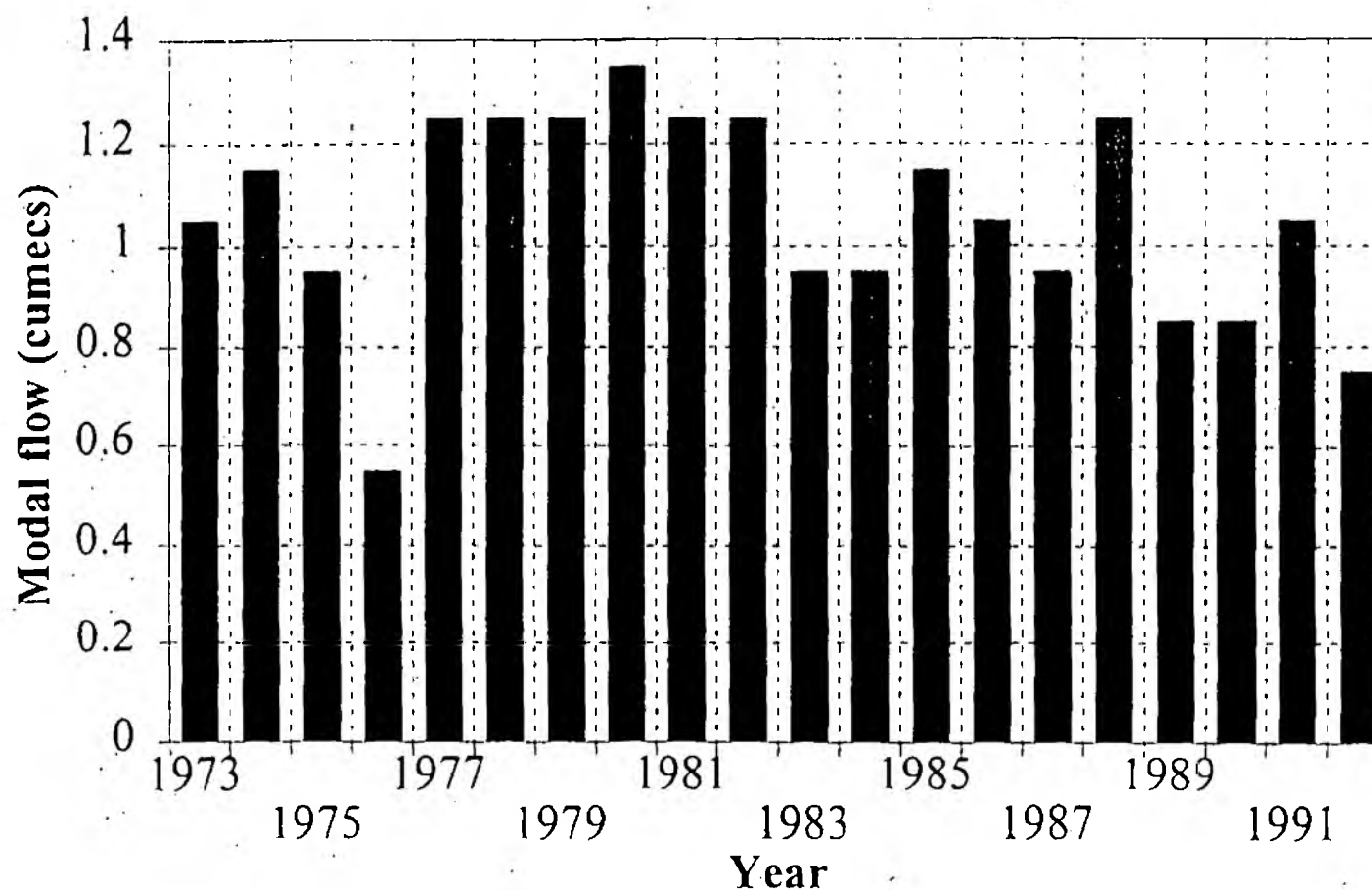


Figure 3.1.34

River Otter at Fenny Bridges

Summer (JJA) Modal Flows

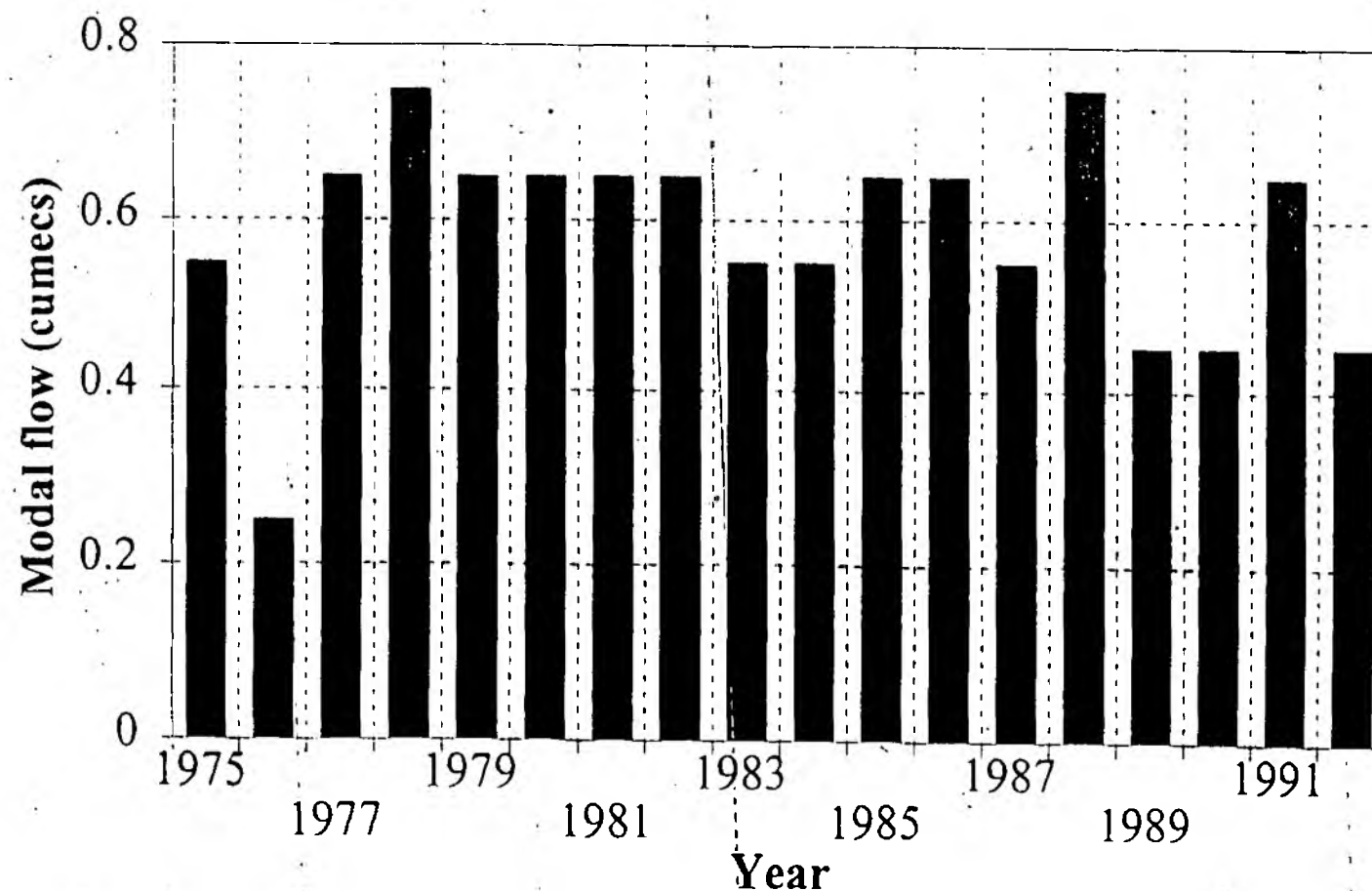


Figure 3.1.35

River Axe at Whitford

Summer Modal Flows

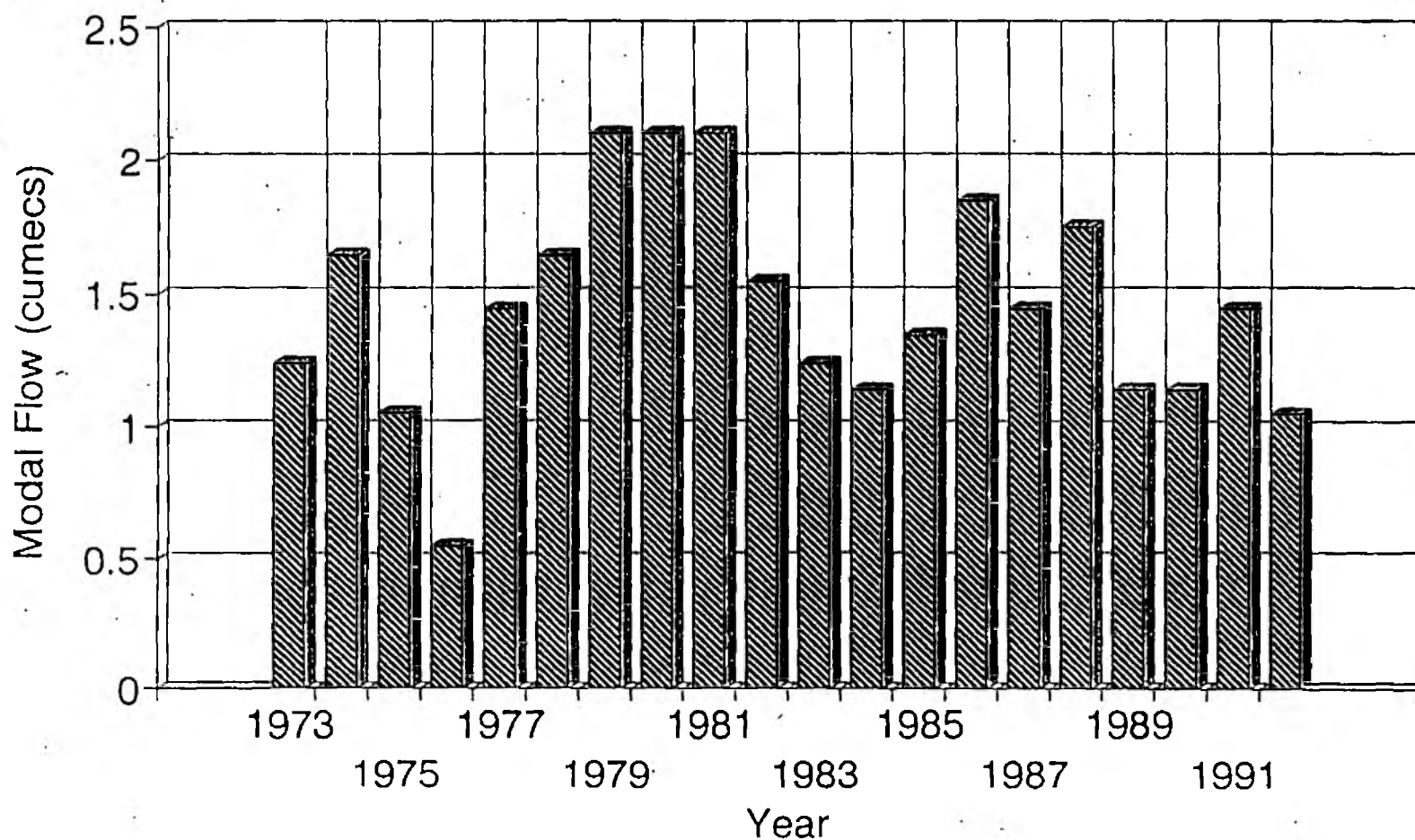


Figure 3.1.36

River Otter at Dotton

Summer Modal Water Levels

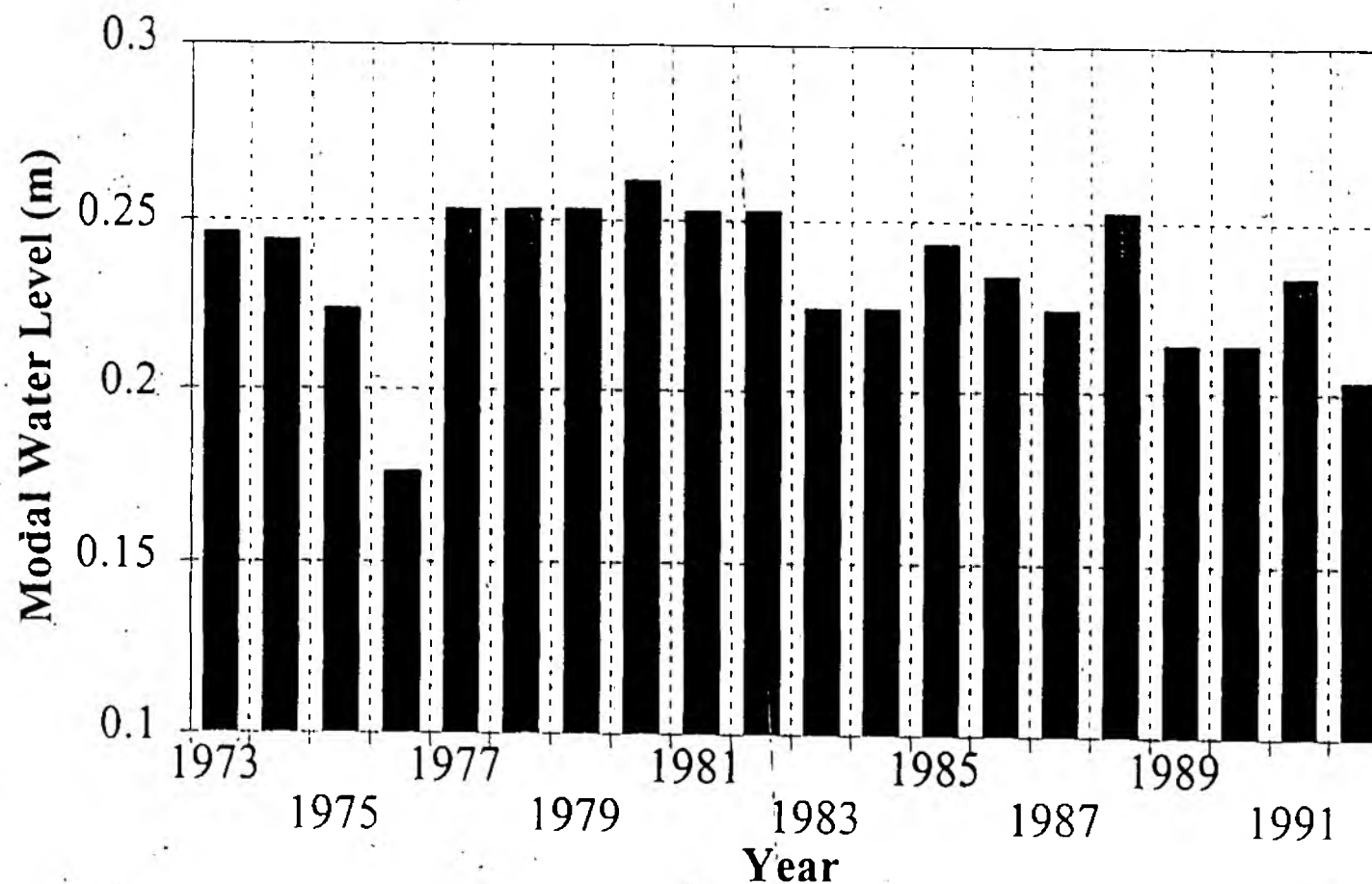


Figure 3.1.37

River Otter at Fenny Bridges

Summer (JJA) Modal Water Levels

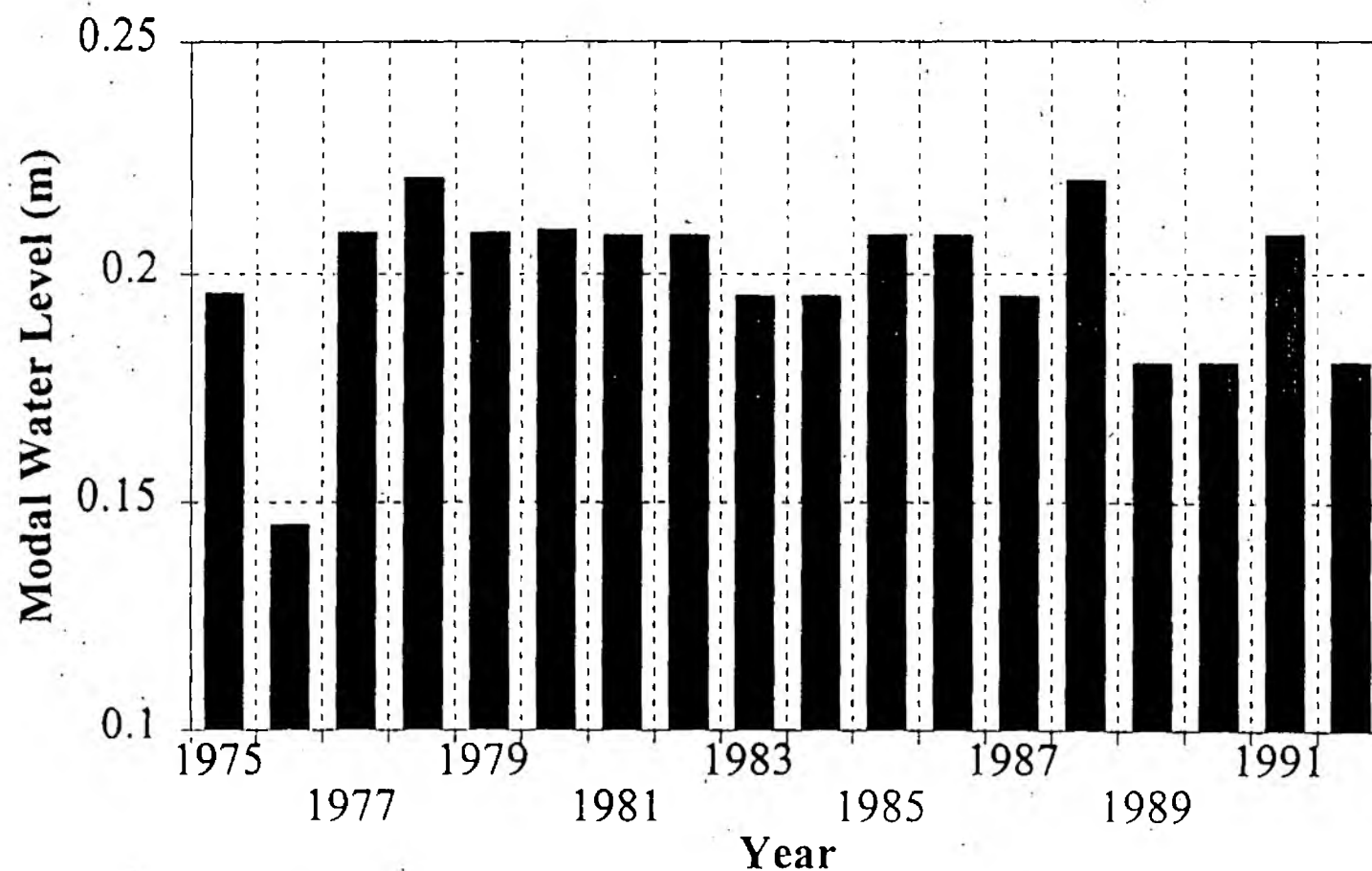


Figure 3.1.38

River Axe at Whitford

Summer Modal Water Levels

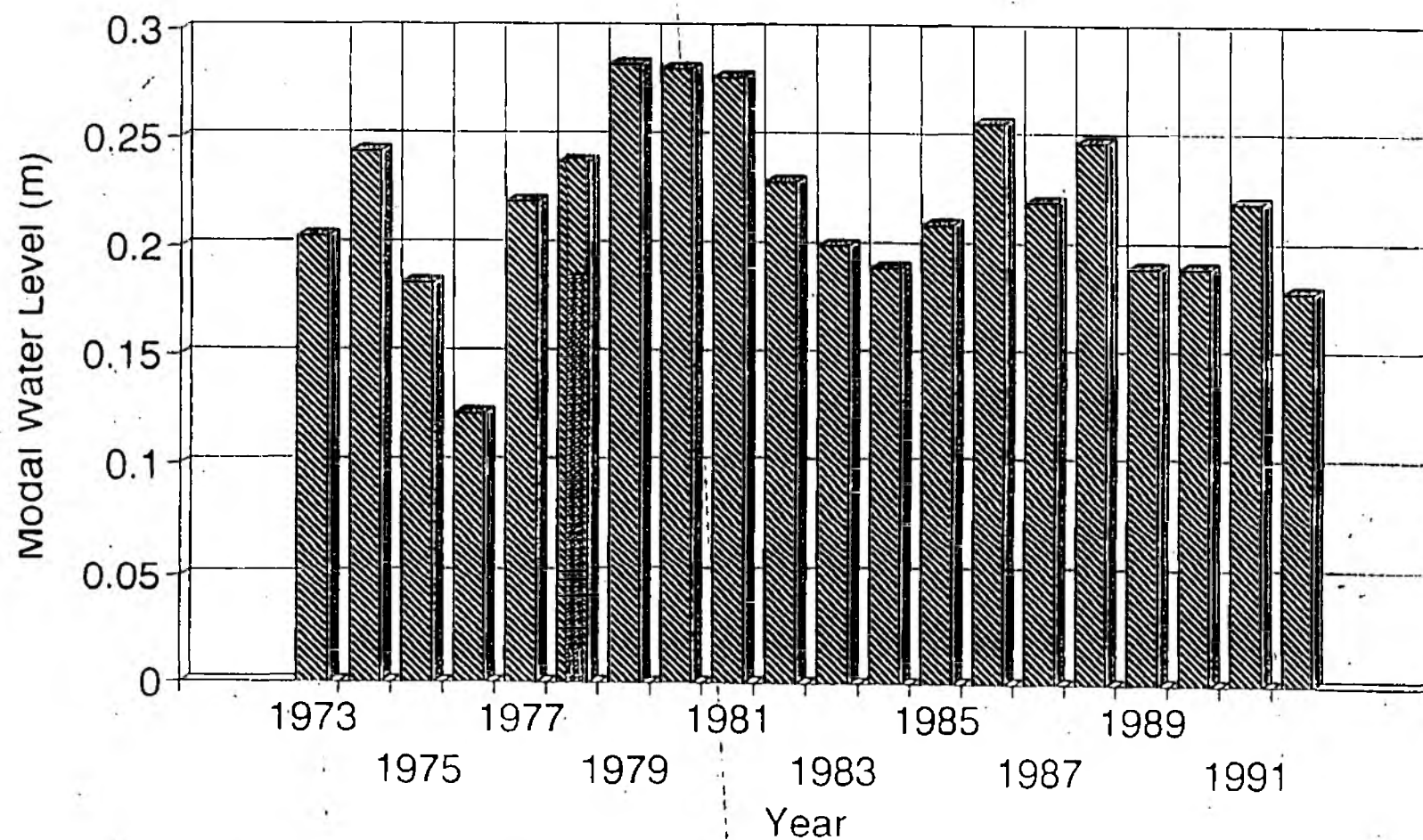
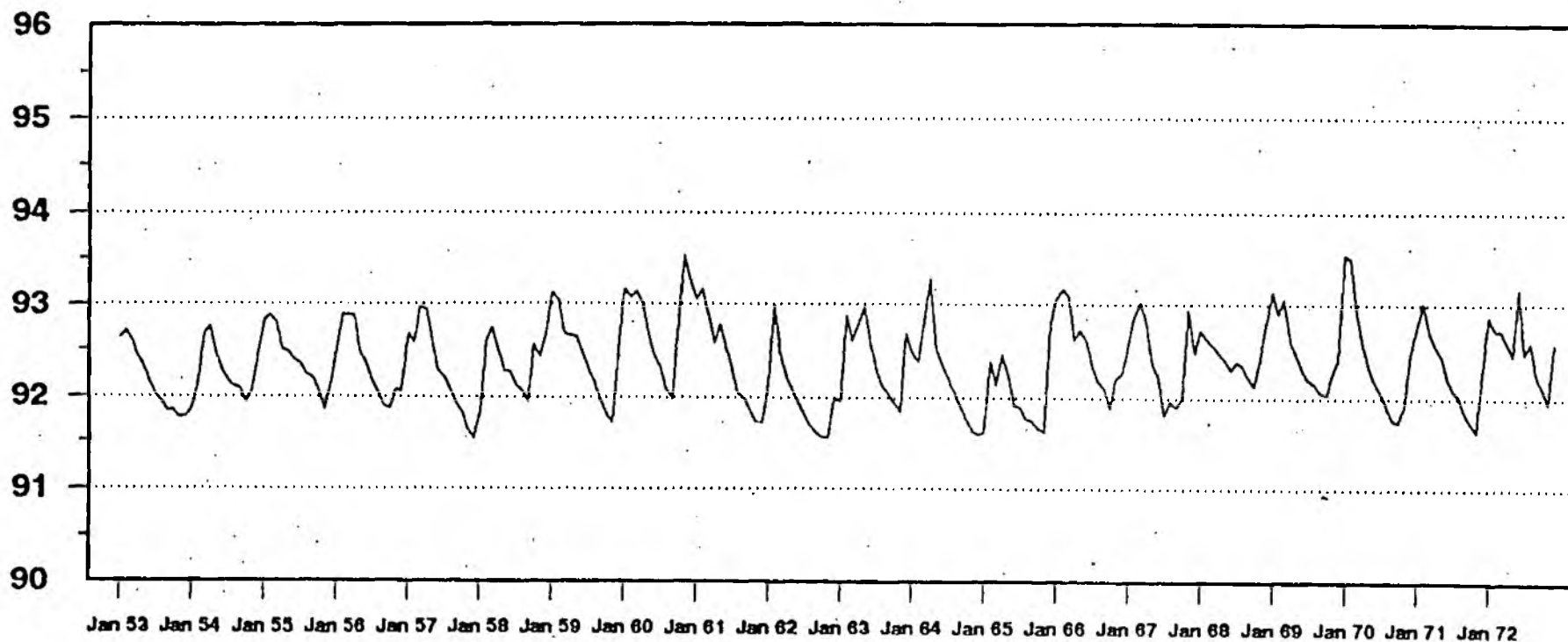


Figure 3.1.39a

Heathlands measured Groundwater Levels 1953-1972

Groundwater Level - m.a.o.d



Month

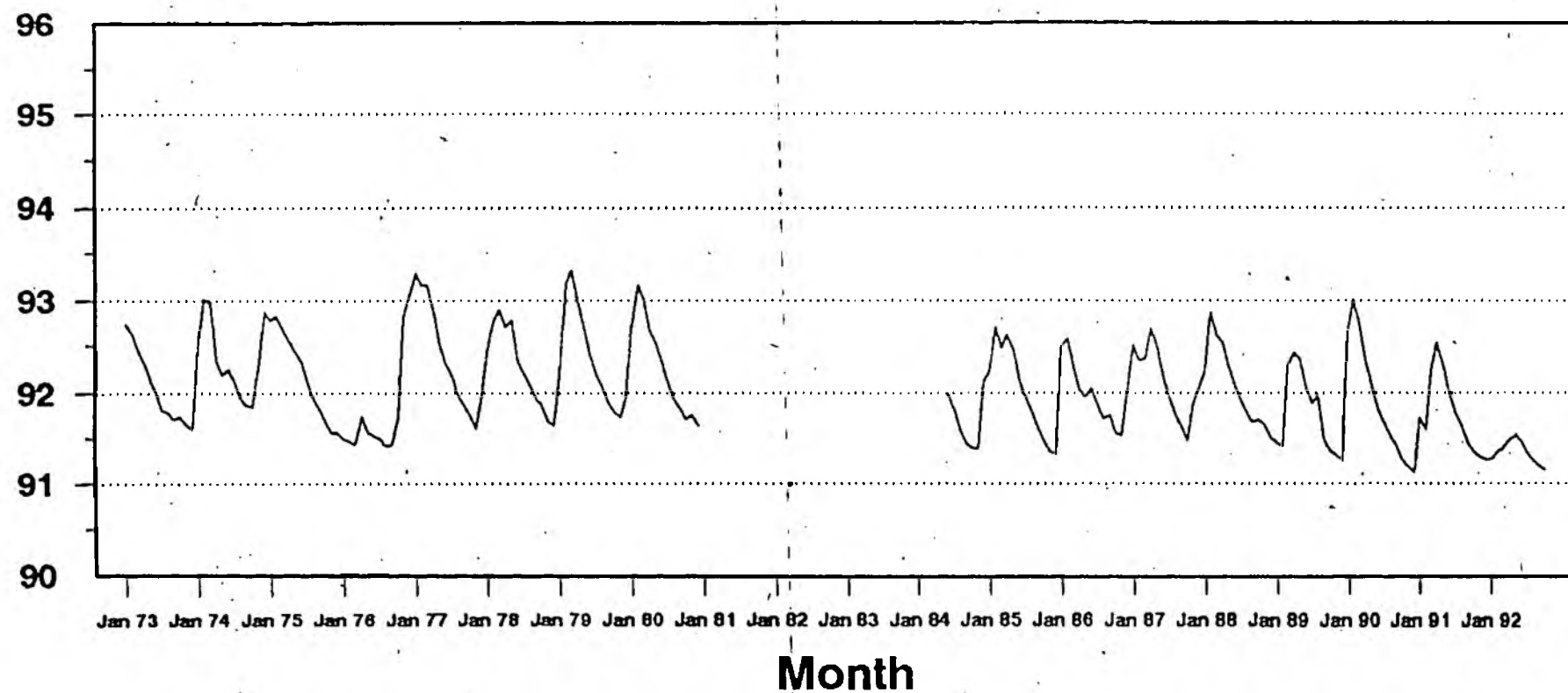
Heathlands

c:\grdwater\data\oldbores.wk3

Figure 3.1.39b

Heathlands **Measured Groundwater Level** **1973-1992**

Groundwater Level - m.a.o.d



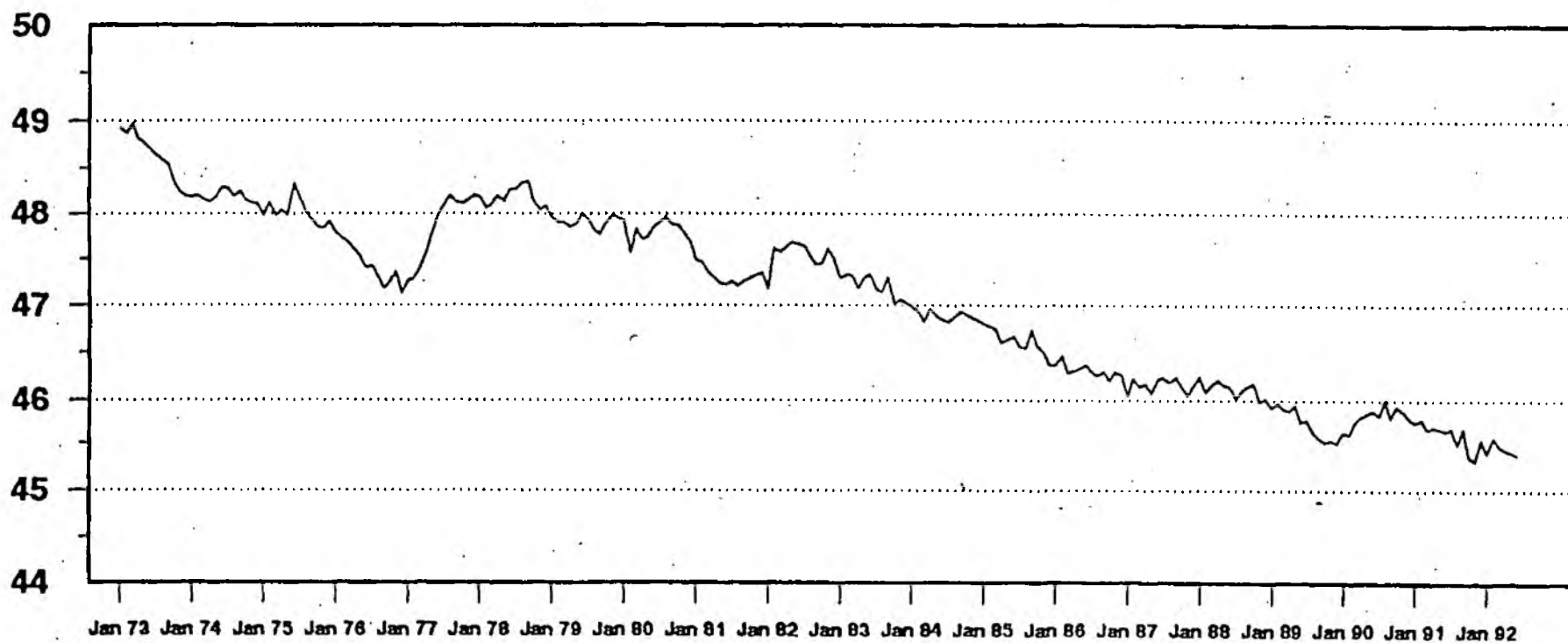
Heathlands

c:\grdwater\contgrp.wk3

Figure 3.1.40

Alfington No.1
measured Groundwater Levels
1973-1992

Groundwater Level - m.a.o.d



Month

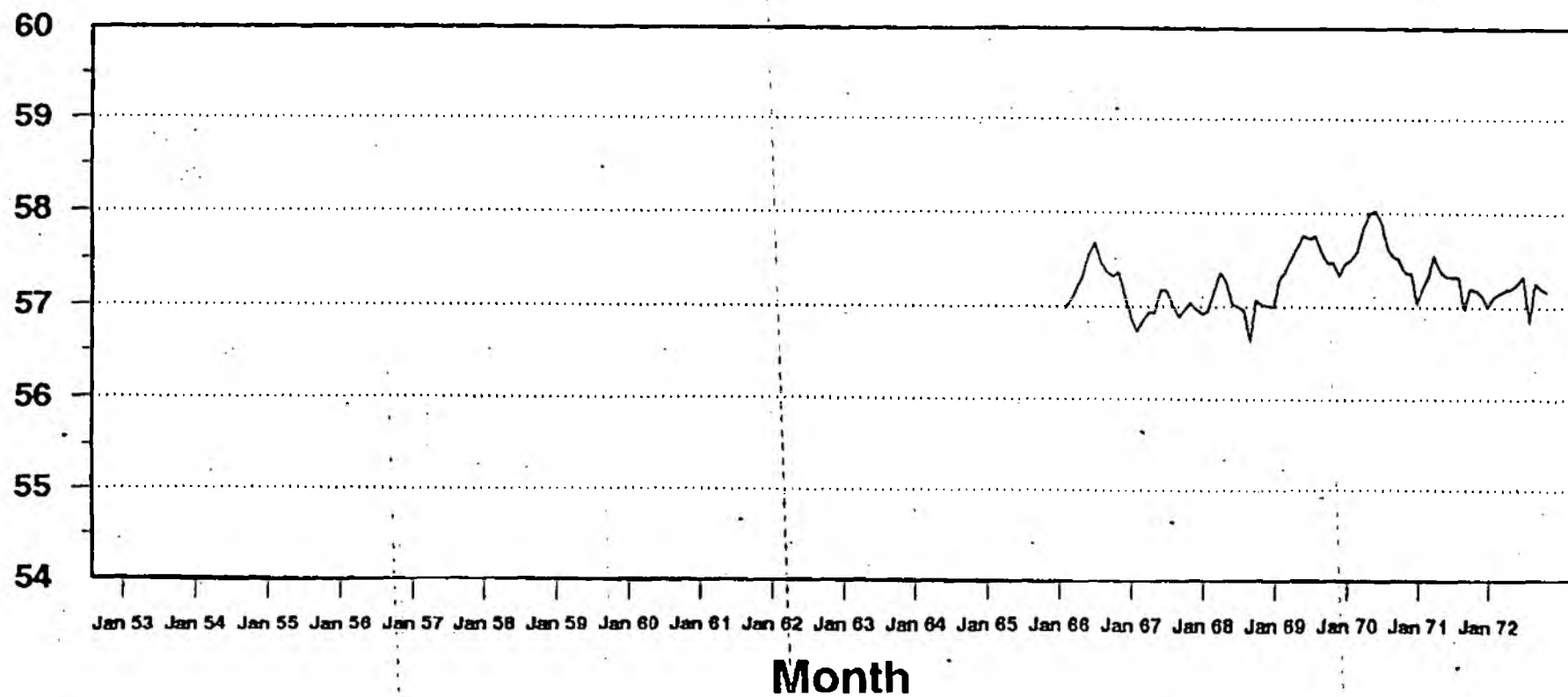
Alfington 1

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Figure 3.1.41a

Berry House
measured Groundwater Levels
1953-1972

Groundwater Level - m.a.o.d



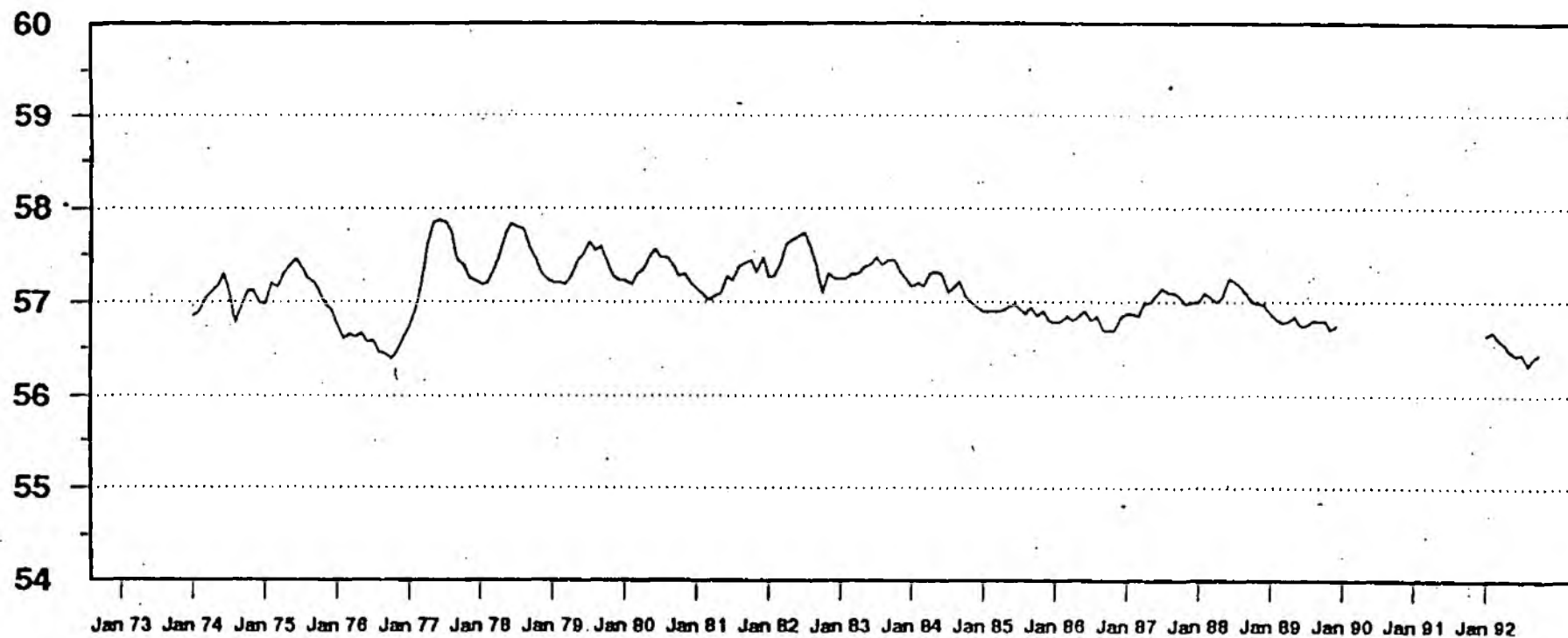
Berry House

c:\grdwater\data\oldbores.wk3

Figure 3.1.41b

Berry House **Measured Groundwater Level** **1973-1992**

Groundwater Level - m.a.o.d



Month

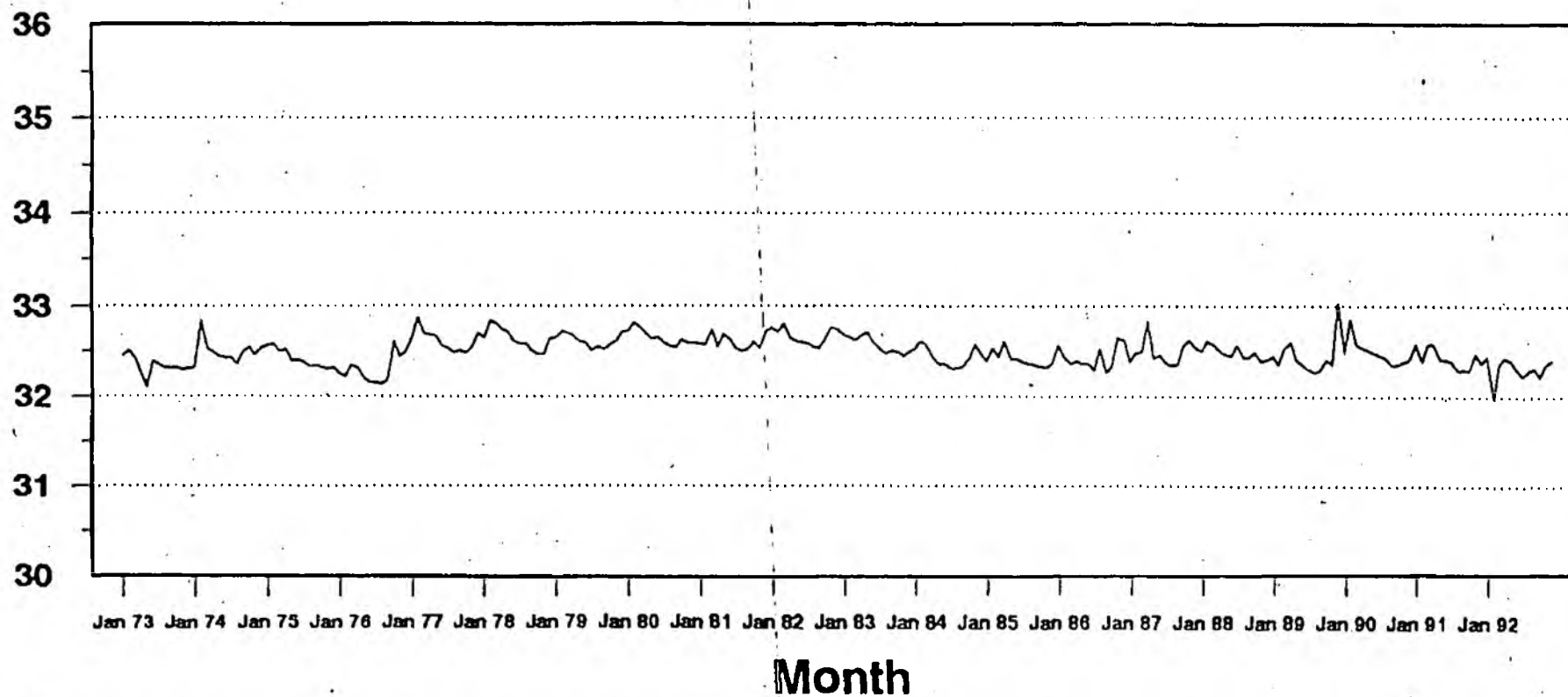
Berry House

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Figure 3.1.42

Wiggaton No.4
measured Groundwater Levels
1973-1992

Groundwater Level - m.a.o.d



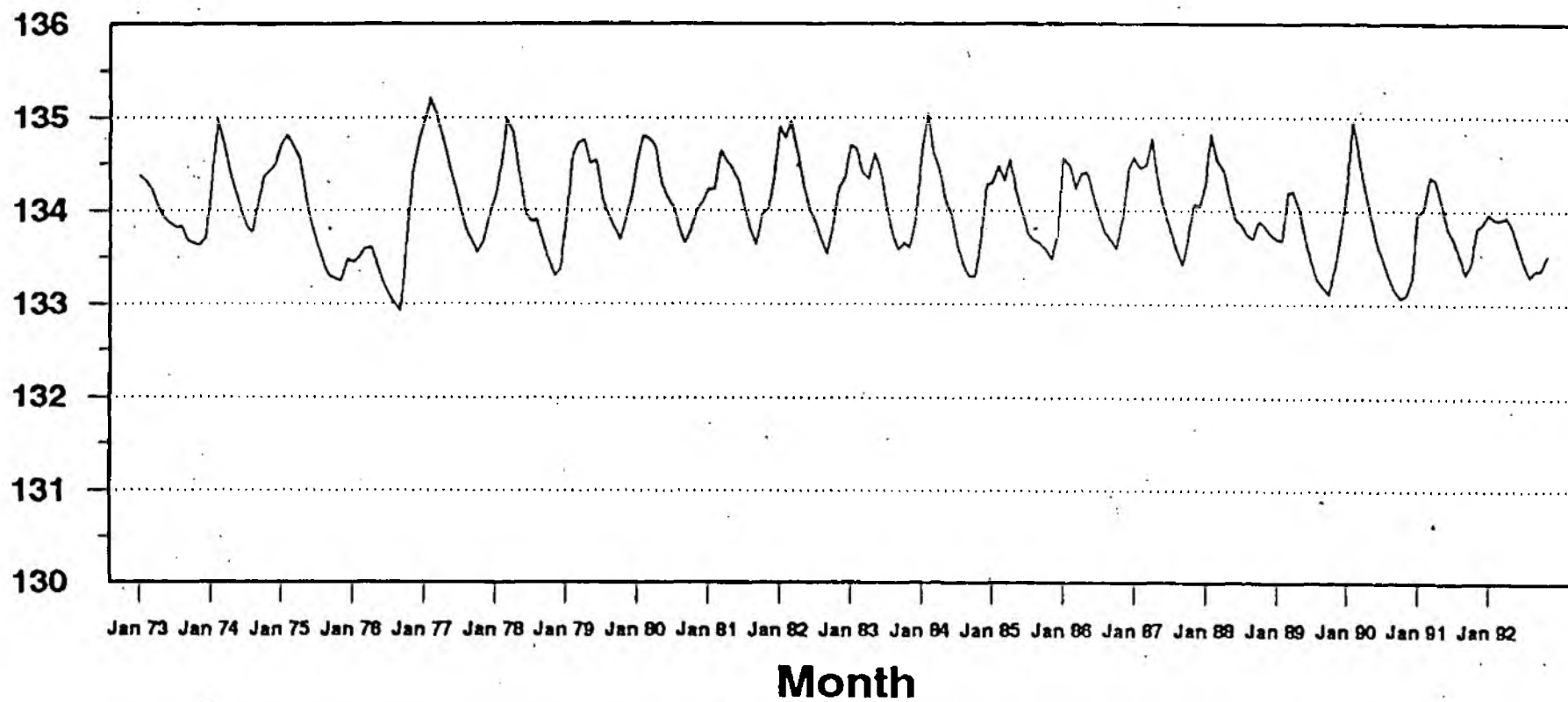
Wiggaton No.4

c:\grdwater\data\contsite.wk3

Figure 3.1.43

The Haywain
measured Groundwater Levels
1973-1992

Groundwater Level - m.a.o.d



The Haywain

c:\grdwater\graphs\contoth.wk3

Figure 3.1.44

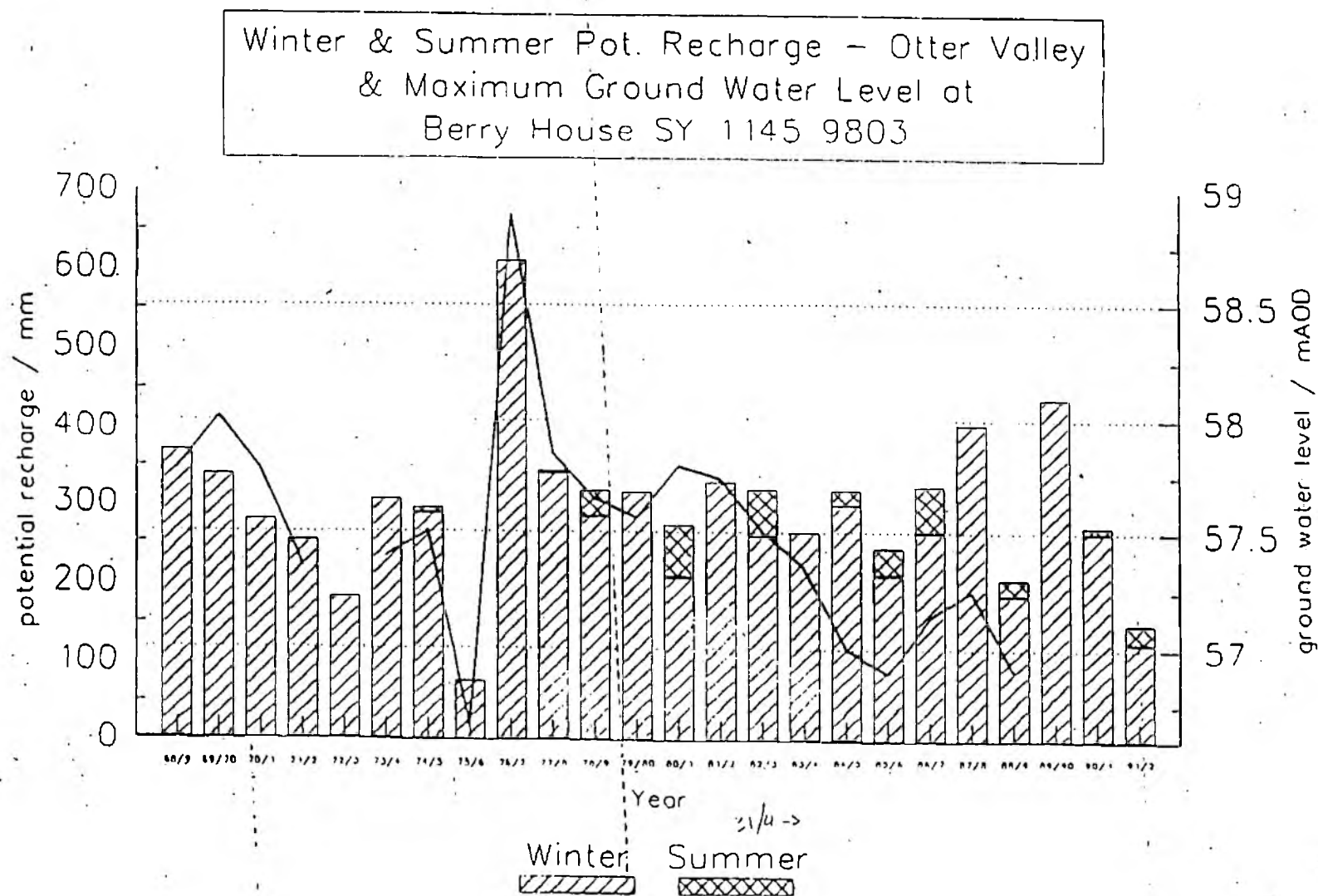
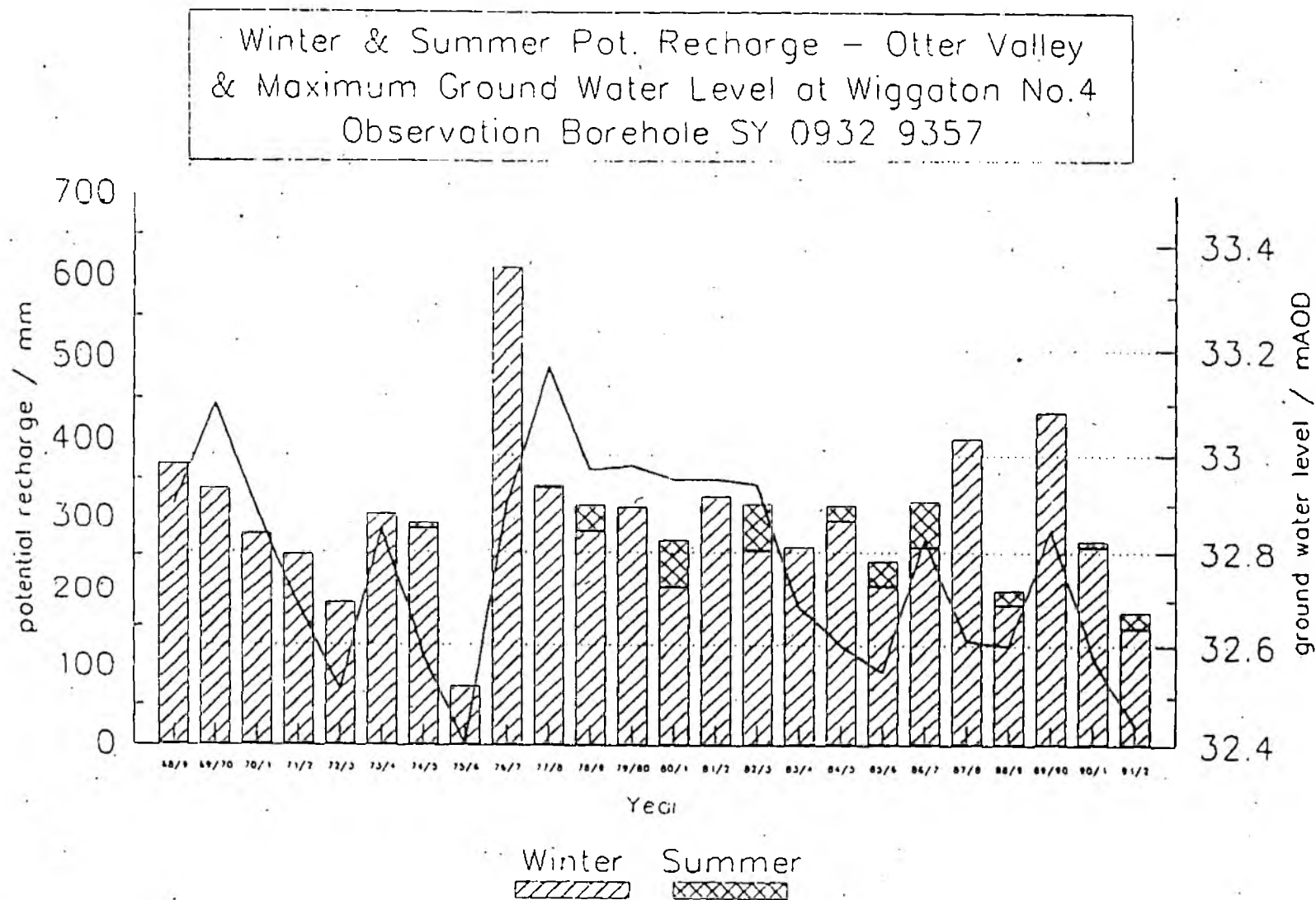


Figure 3.1.45



PE data - '68-81 Exeter Airport, '82-92 Bicton

RF data - Dotton Gauging Station

00228\00228017.ch1

Figure 3.1.46

Abstraction Locations on the River Otter Catchment

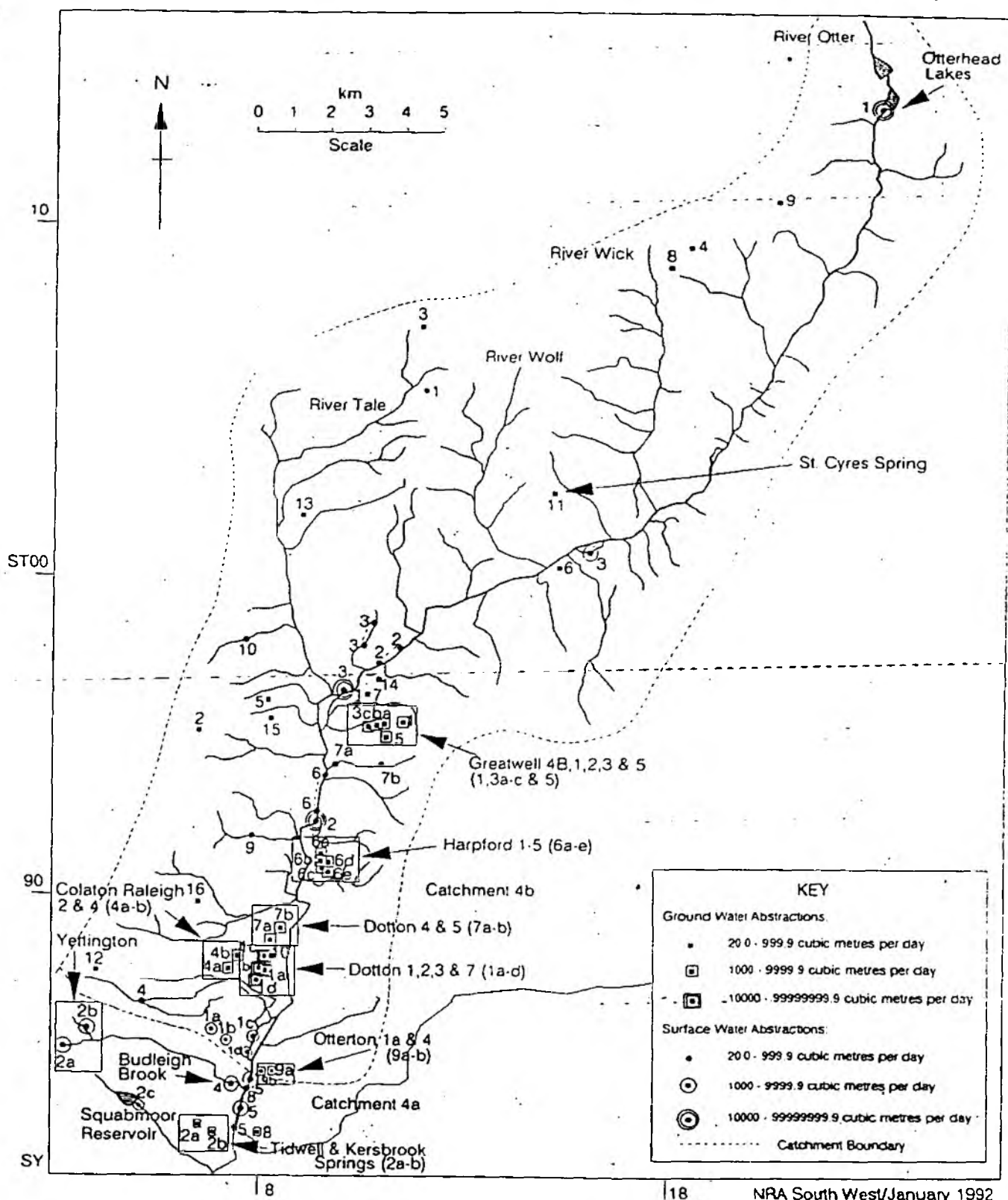
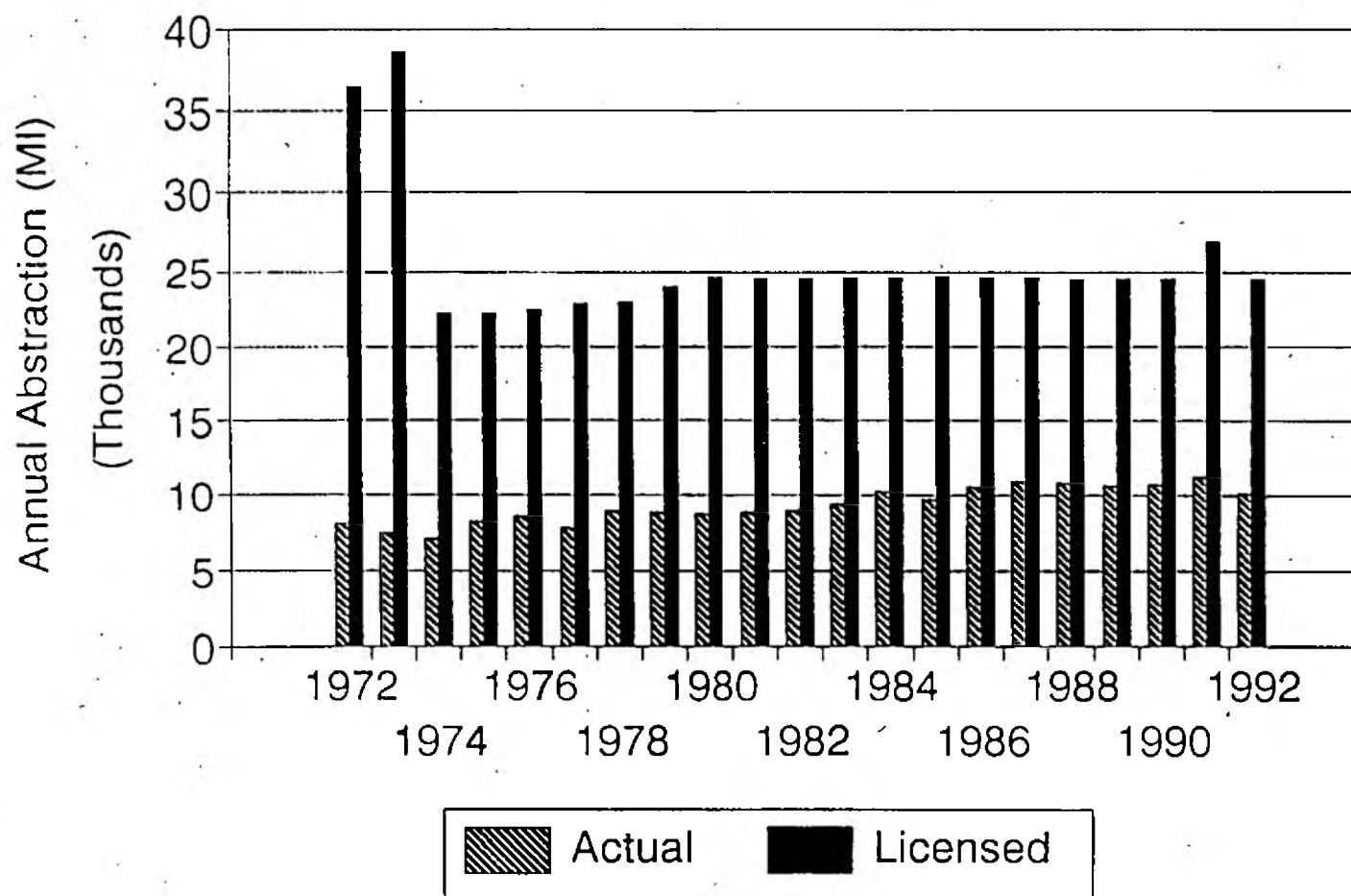


Figure 3.1.47

Licensed and Actual Abstractions

Entire Otter Catchment 1972-1992



Note: Actual abstraction data taken from Table 3.6.1
Licensed abstraction data taken from Appendices

Figure 3.1.48

Histograms showing Total Authorised and Net Actual Abstractions per Reach, and Pie Diagrams showing Cumulative Ground and Surface Water Abstractions 1992

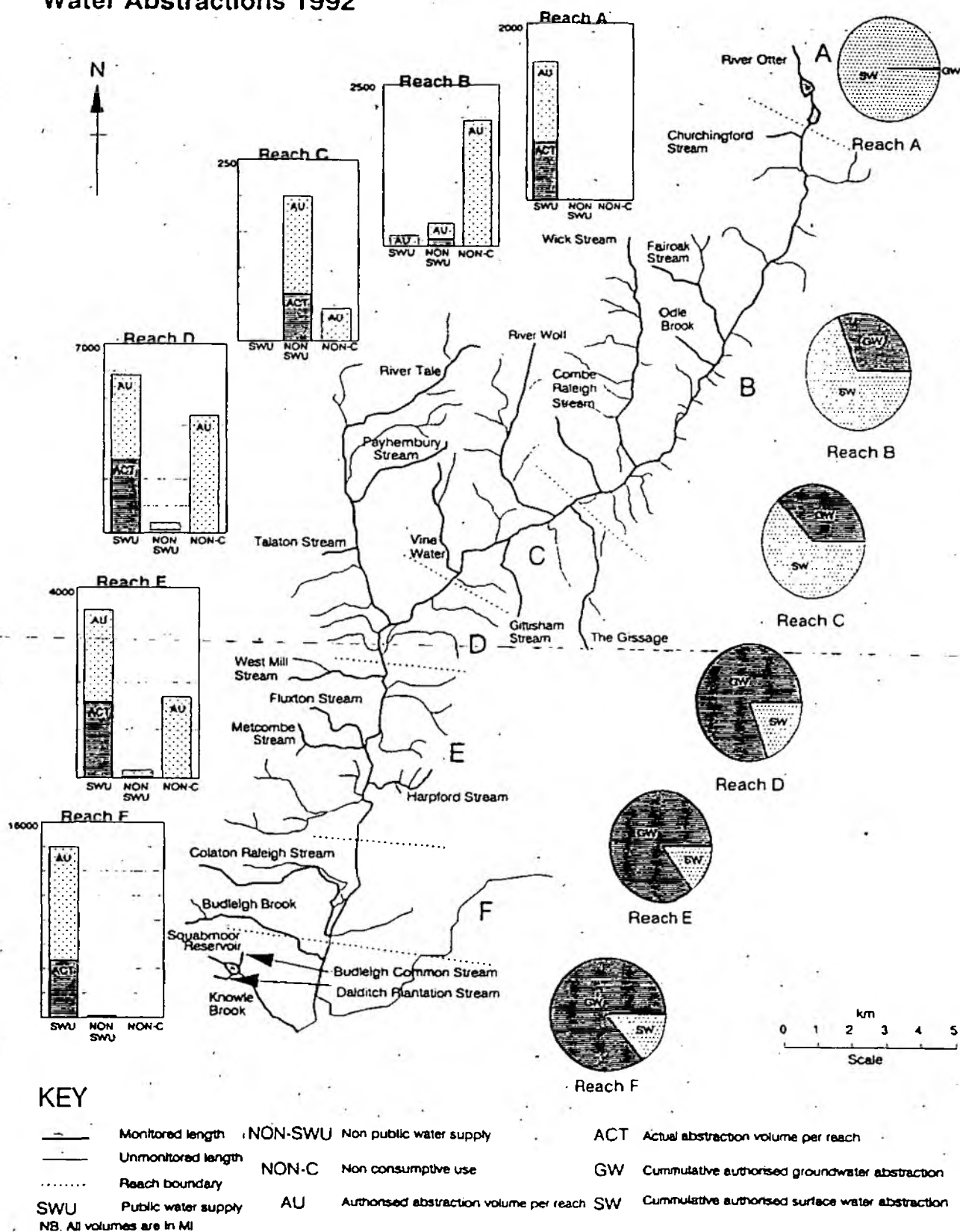


Figure 3.1.49

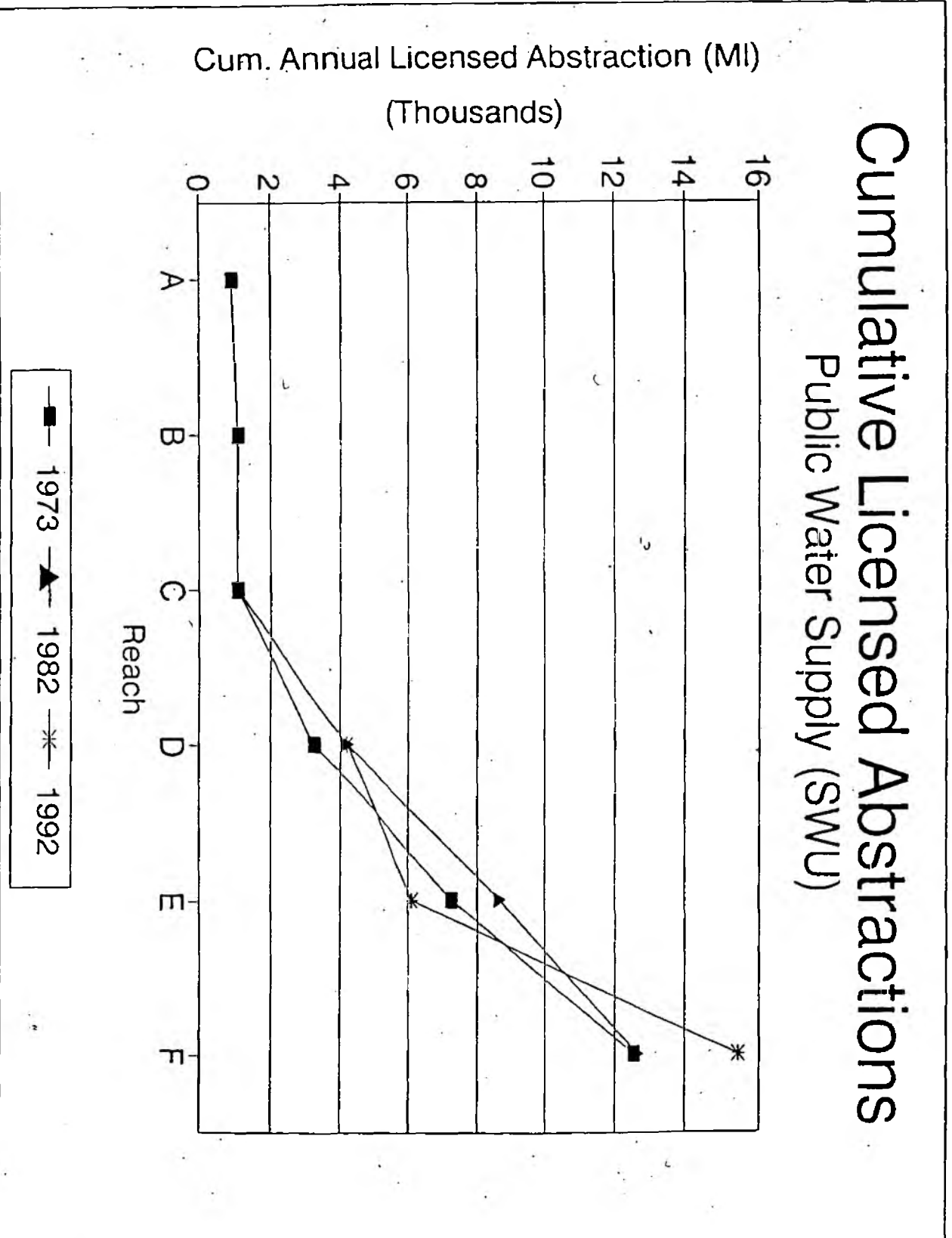


Figure 3.1.50

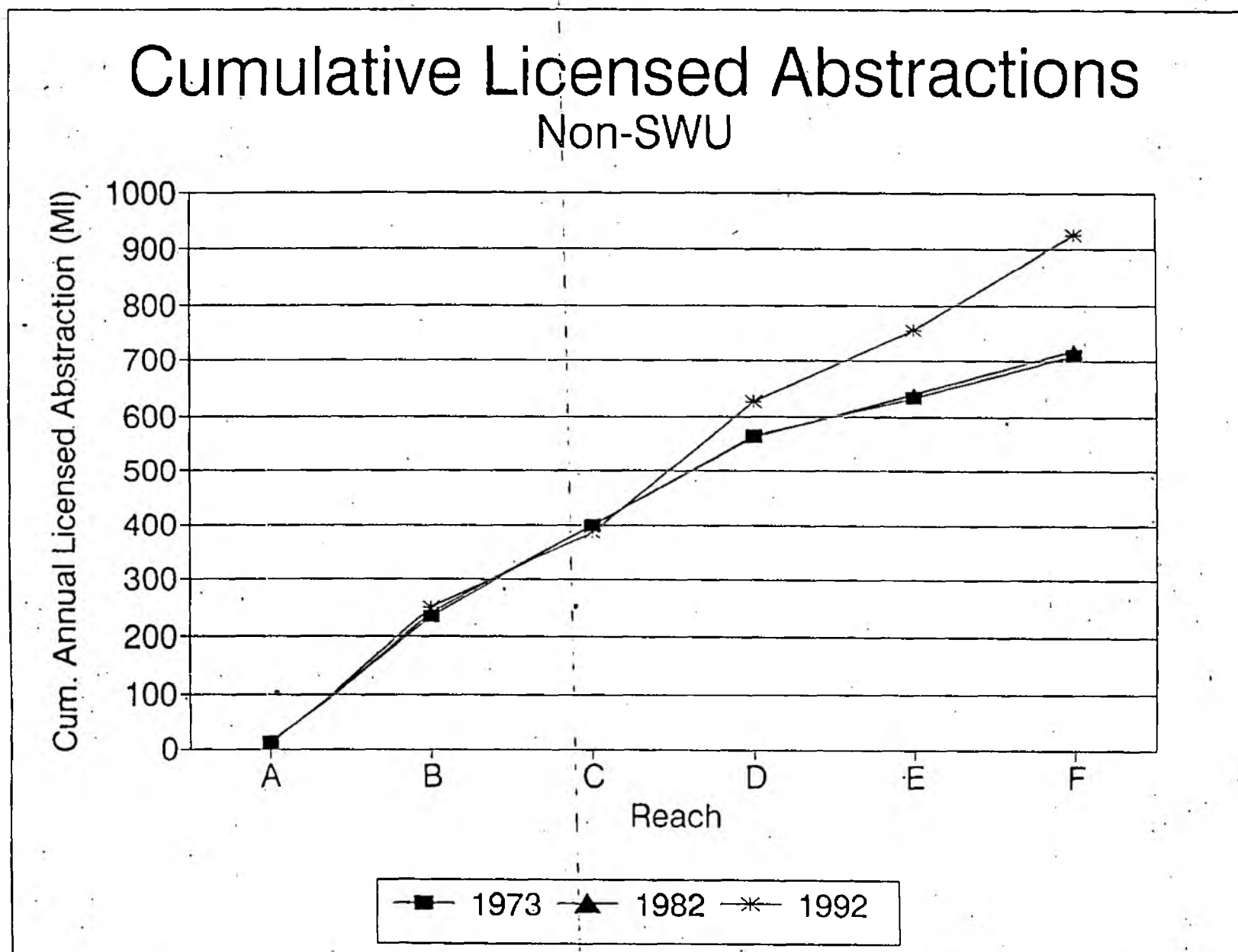
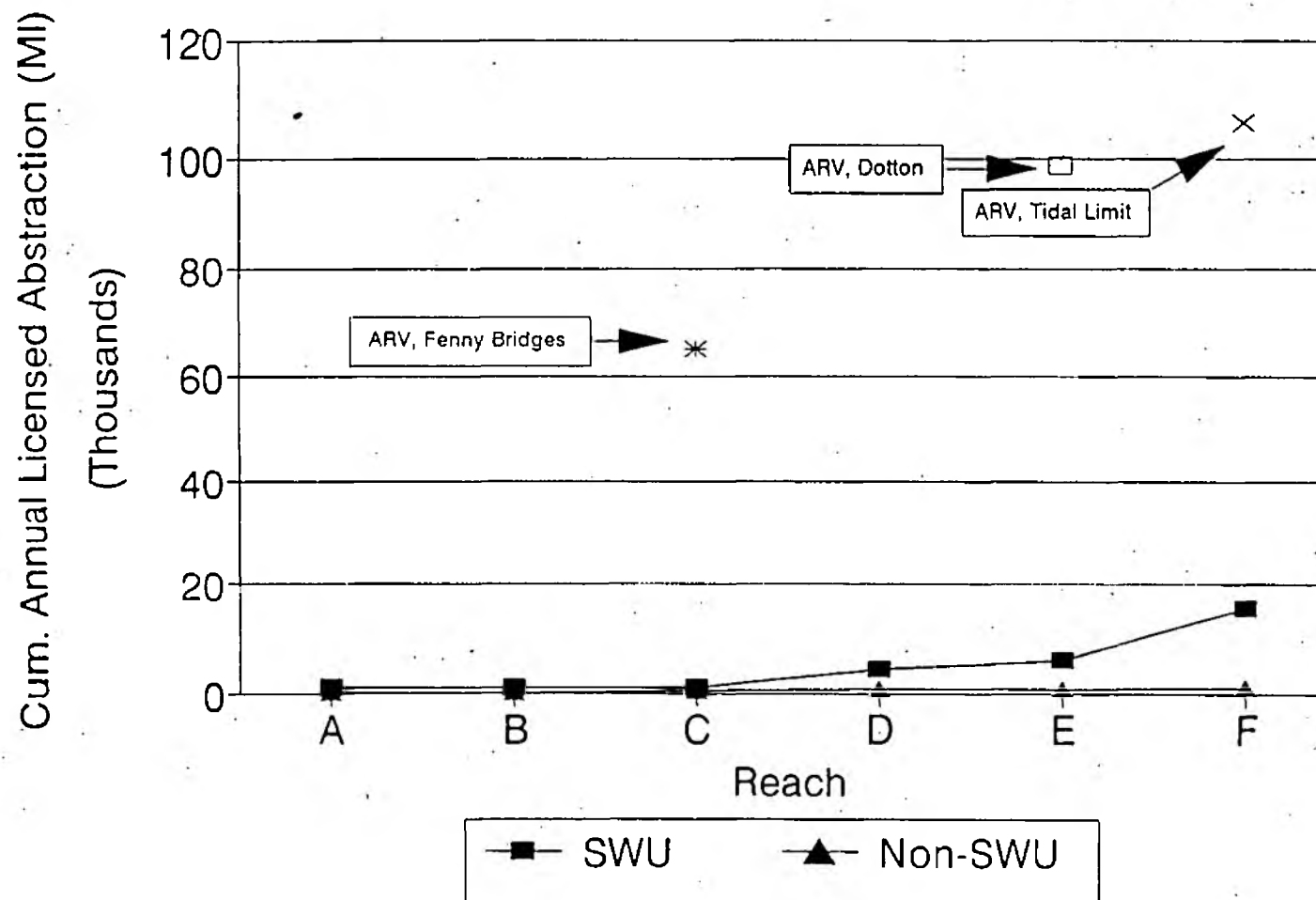


Figure 3.1.51

Cumulative Licensed Abstractions, 1992

Public Water Supply (SWU) and Non-SWU



Note: ARV = Annual Runoff Volume
Abstraction data taken from Table 3.1.1

Figure 3.2.1A: River Otter – Water Quality Data
Biochemical Oxygen Demand

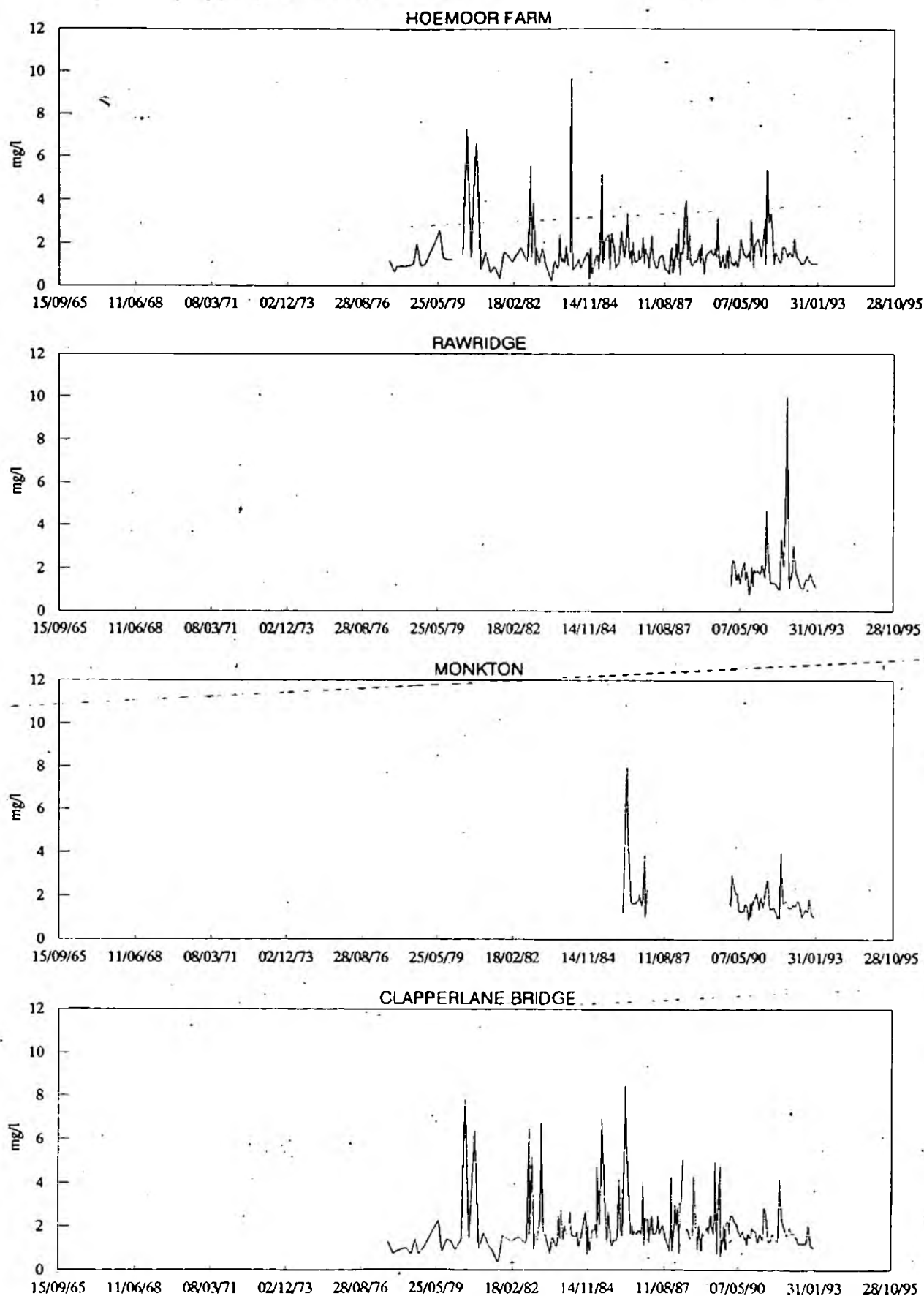


Figure 3.2.1B: River Otter – Water Quality Data
Biochemical Oxygen Demand

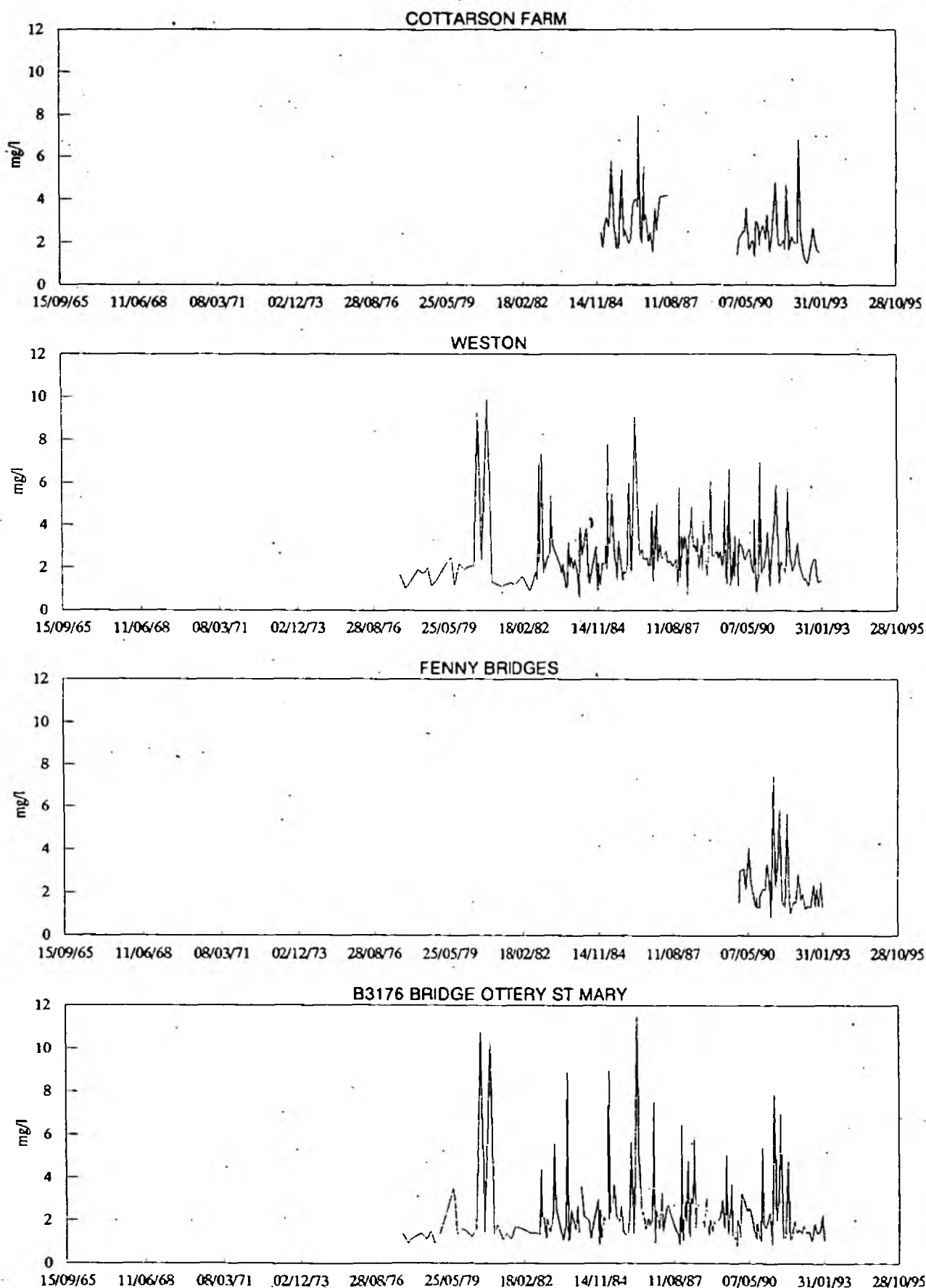


Figure 3.2.1C: River Otter – Water Quality Data
Biochemical Oxygen Demand

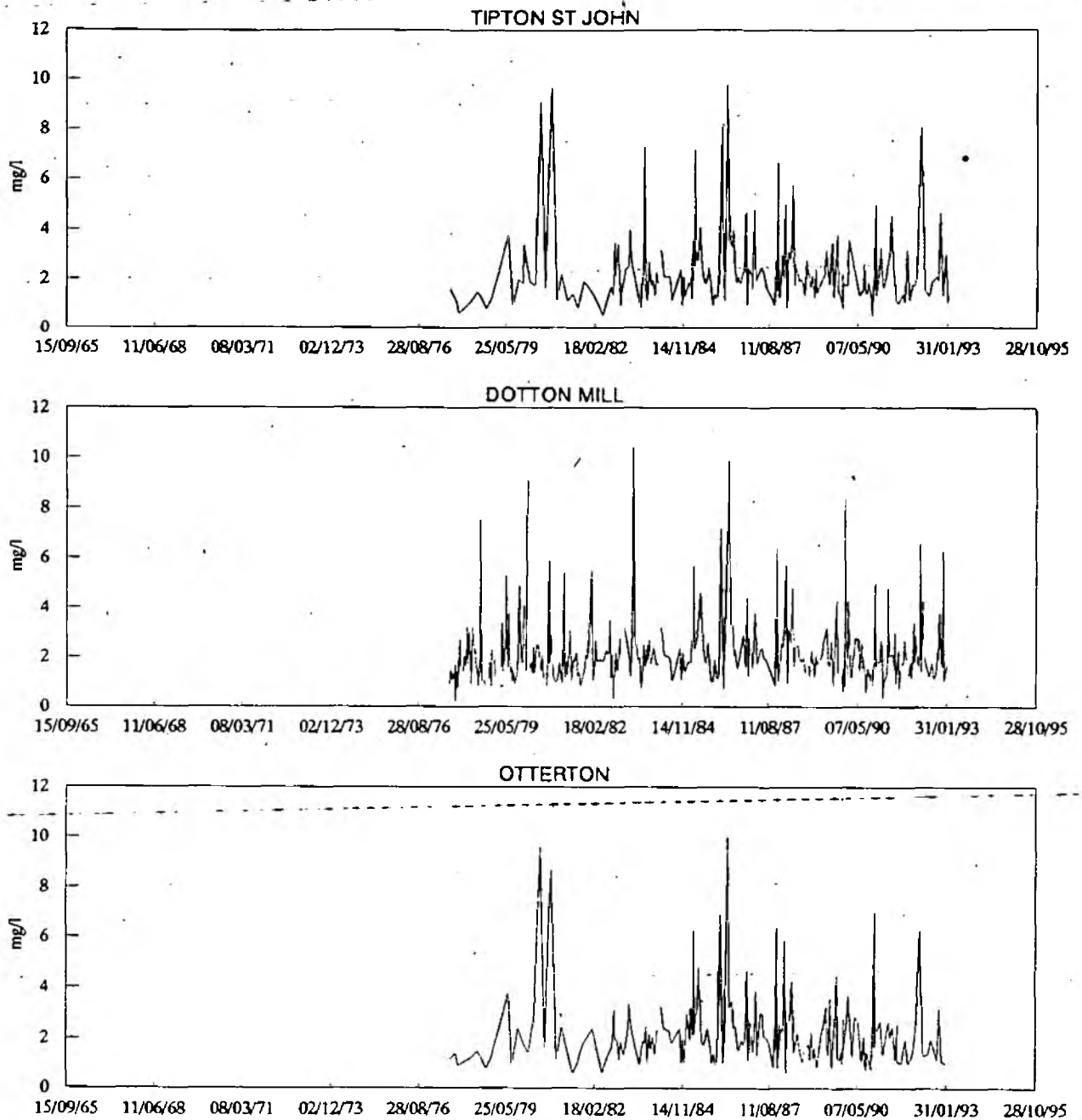


Figure 3.2.2A: River Otter – Water Quality Data
Total Ammonia

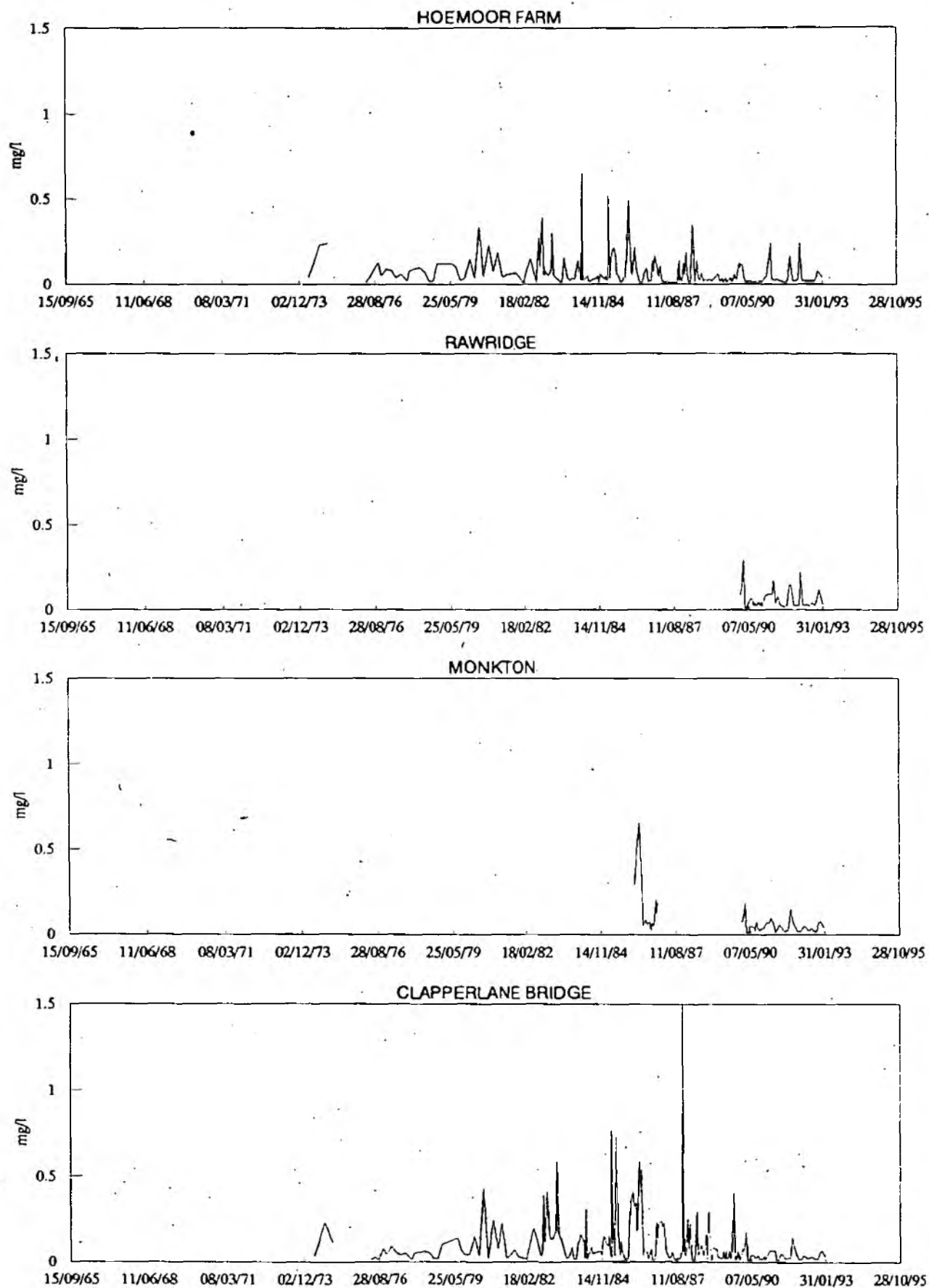


Figure 3.2.2B: River Otter – Water Quality Data
Total Ammonia

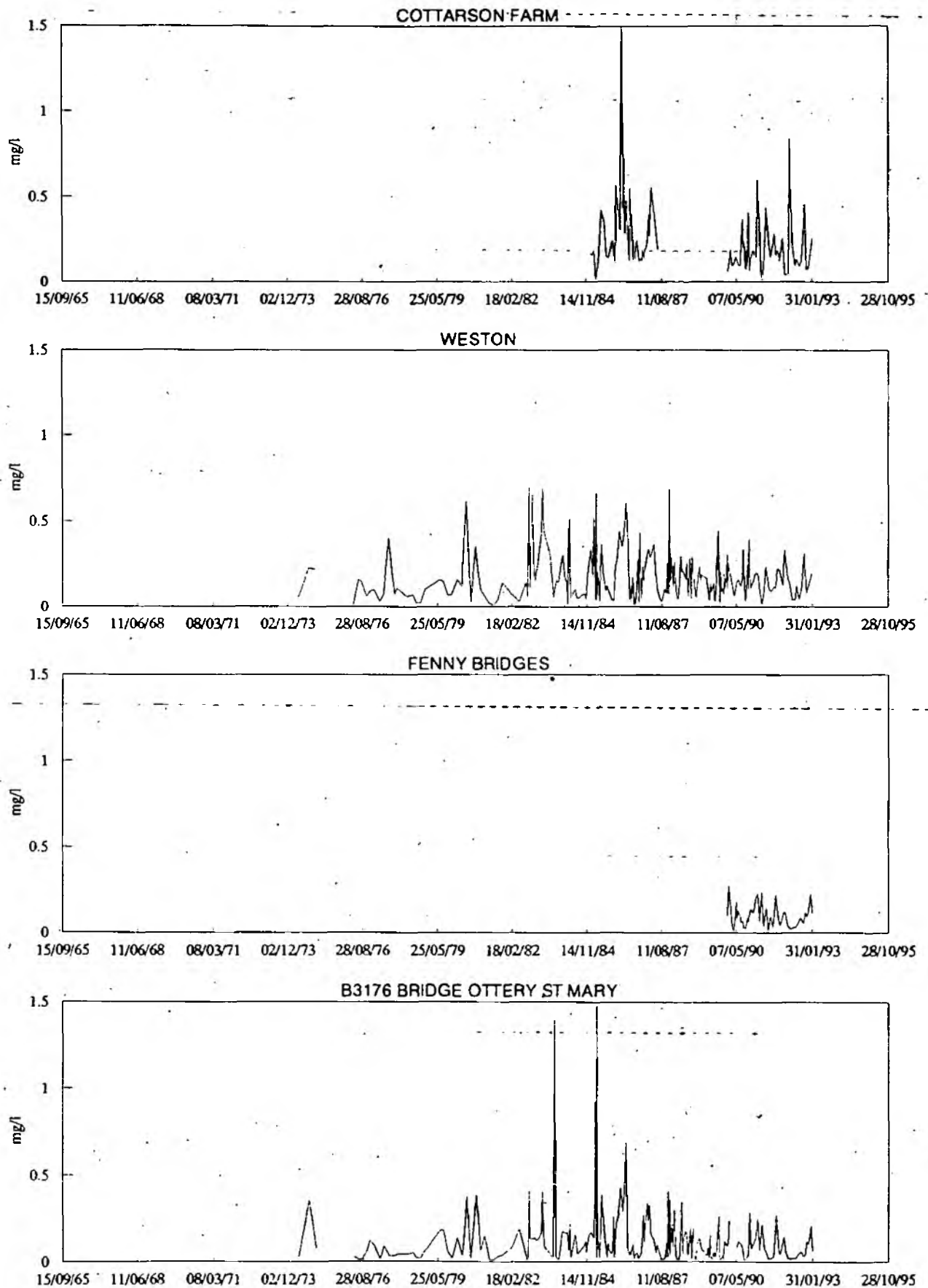


Figure 3.2.2C: River Otter – Water Quality Data
Total Ammonia

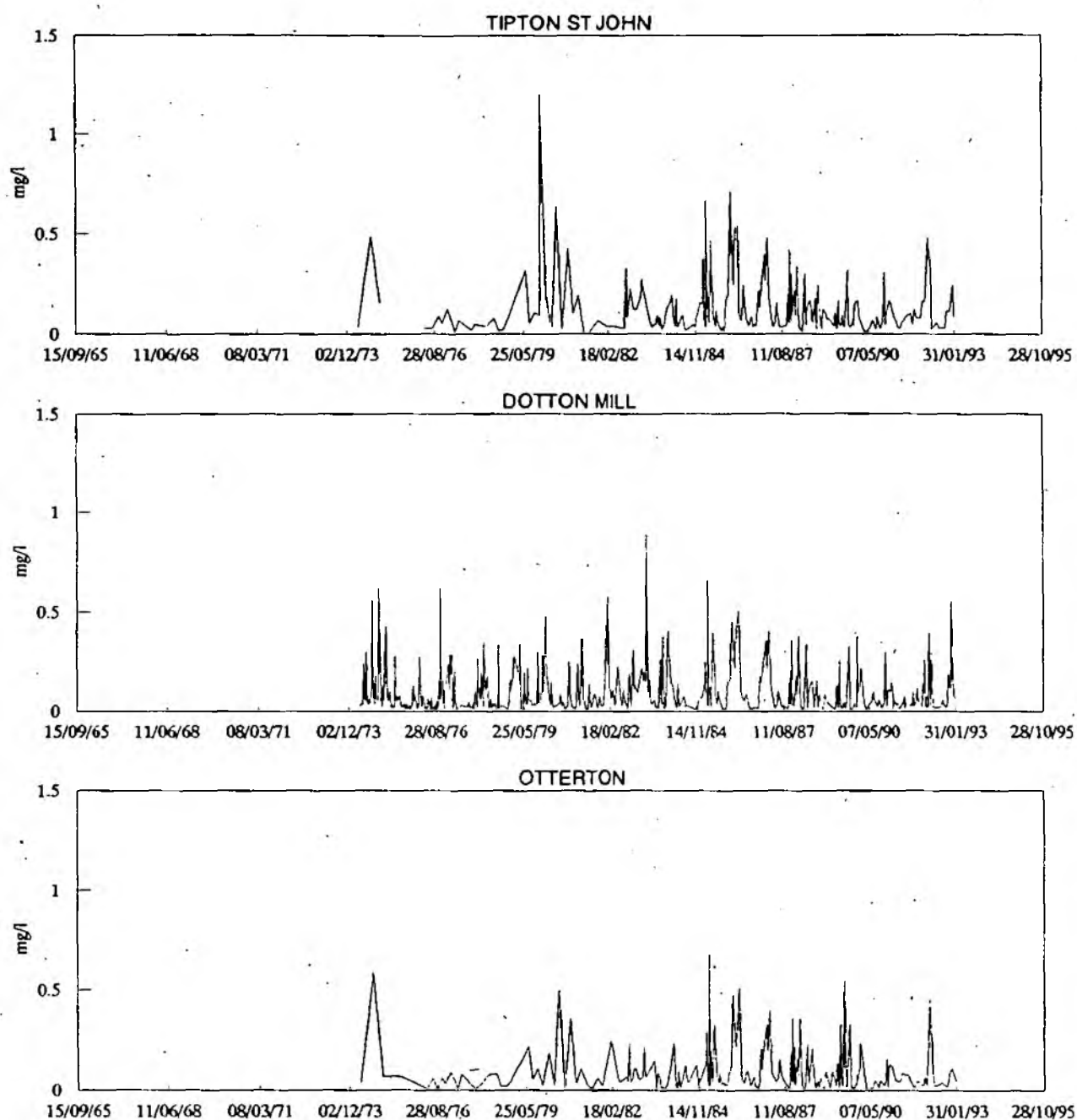


Figure 3.2.3A: River Otter – Water Quality Data
Water pH

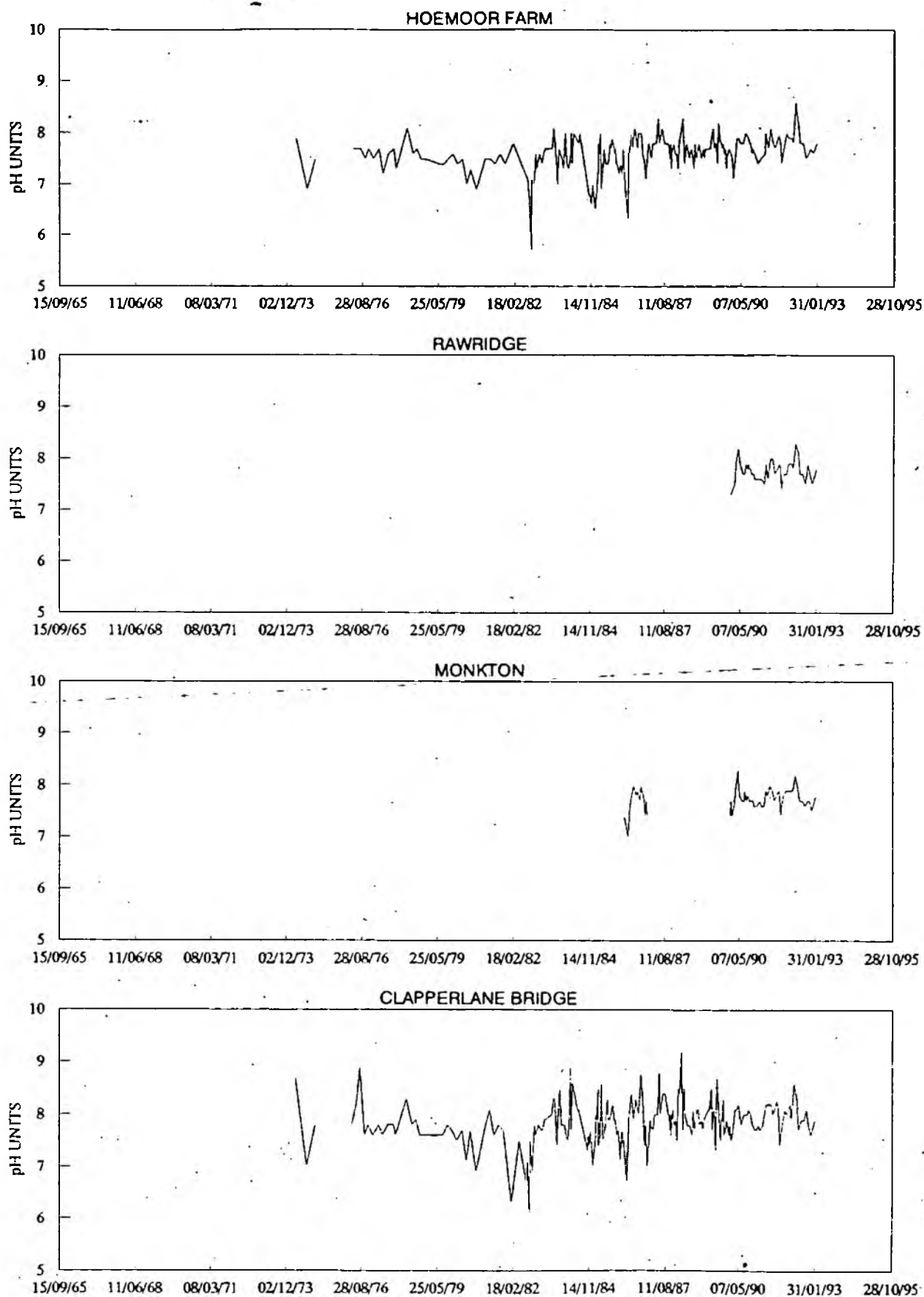


Figure 3.2.3B: River Otter – Water Quality Data
Water pH

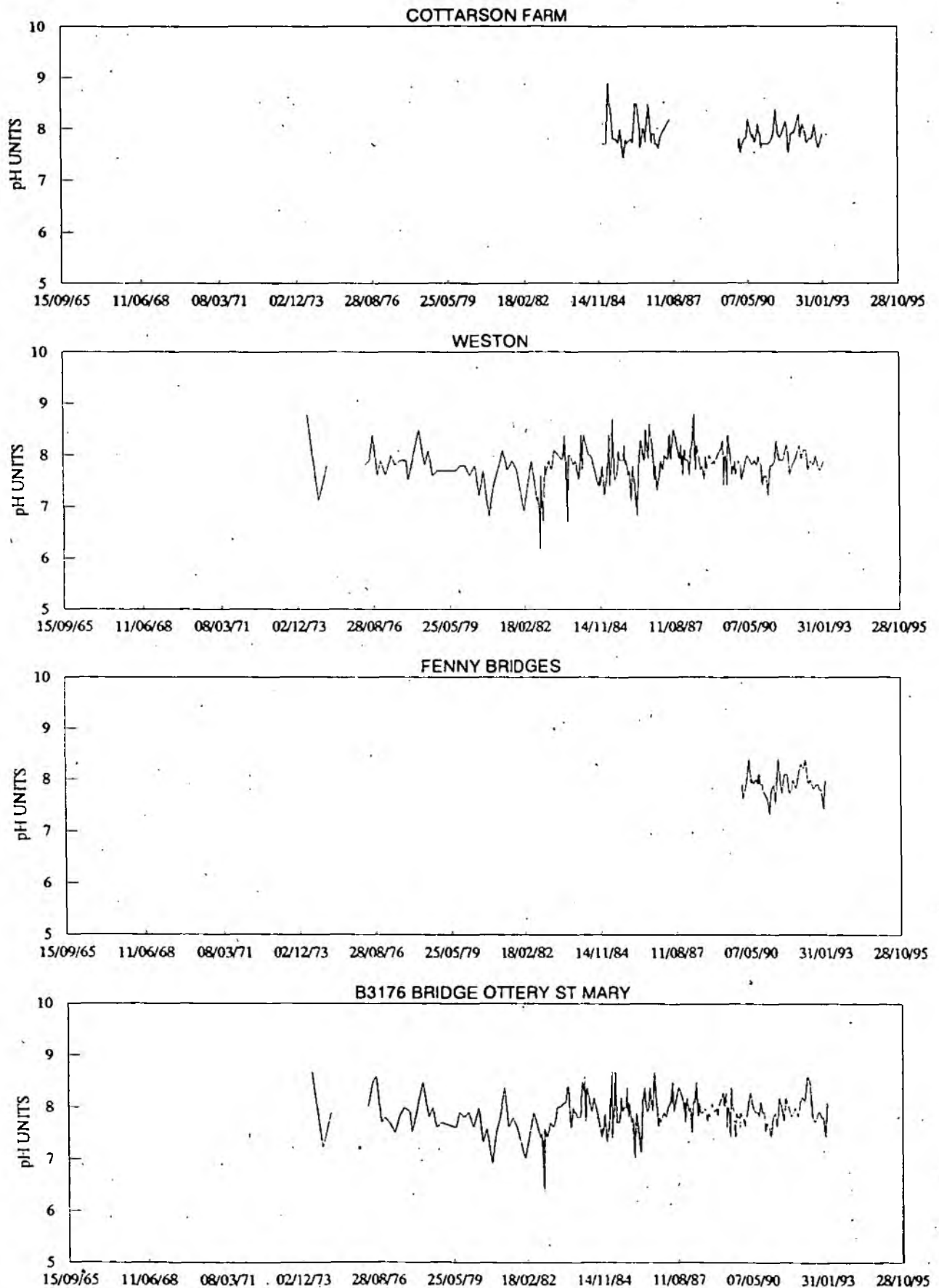


Figure 3.2.3C: River Otter – Water Quality Data
Water pH

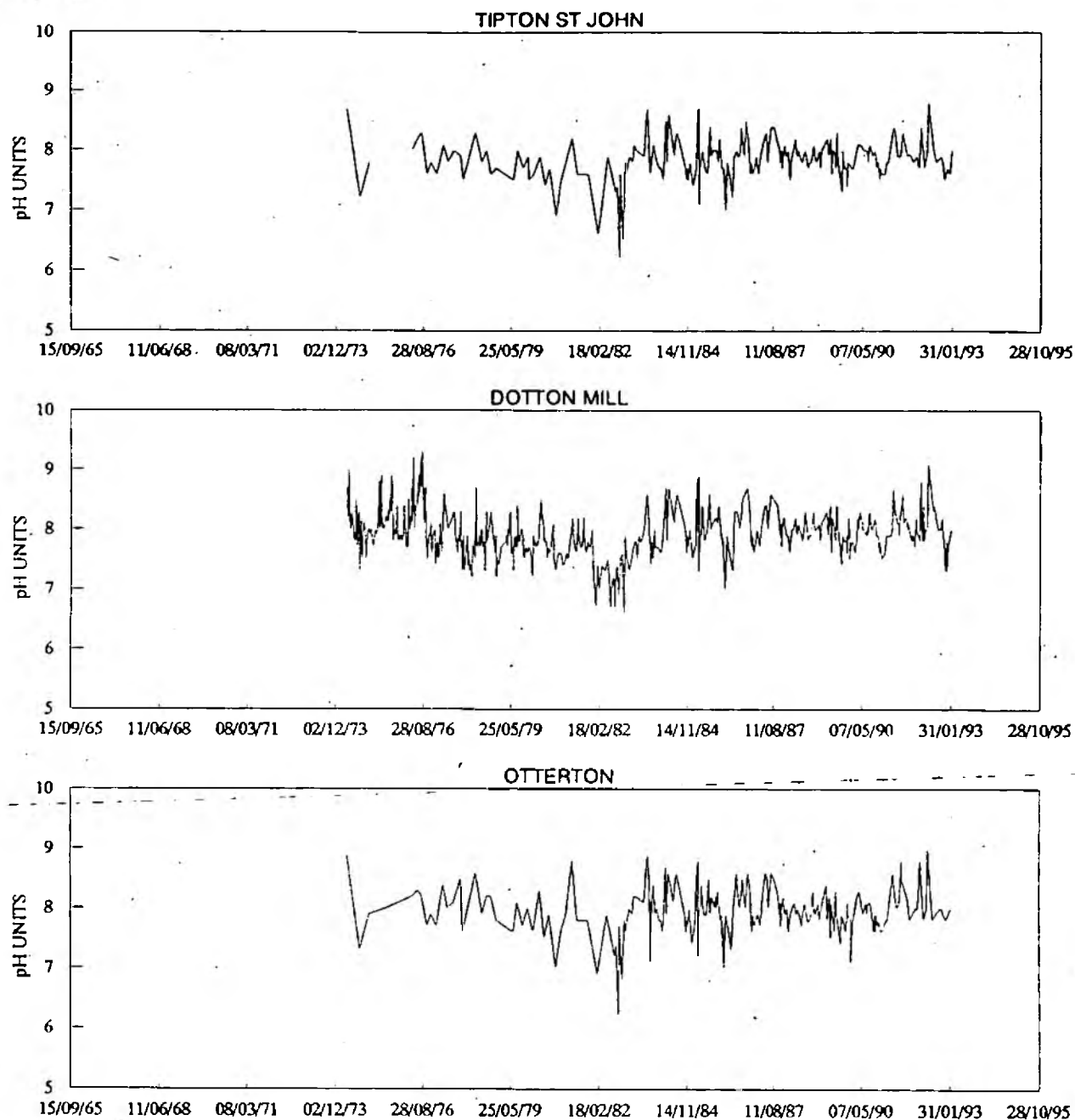


Figure 3.2.4A: River Otter – Water Quality Data
Dissolved Oxygen

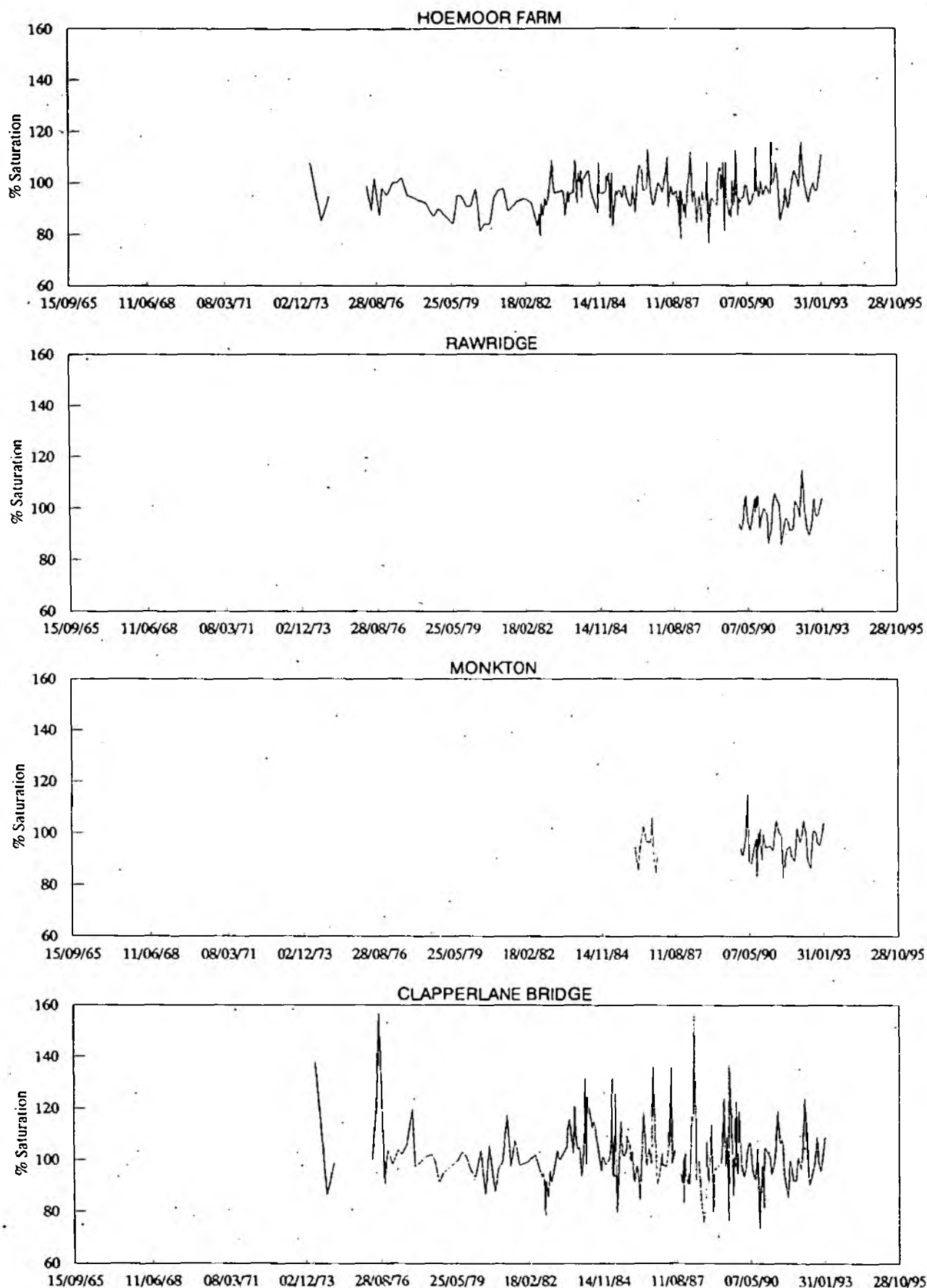


Figure 3.2.4B: River Otter – Water Quality Data
Dissolved Oxygen

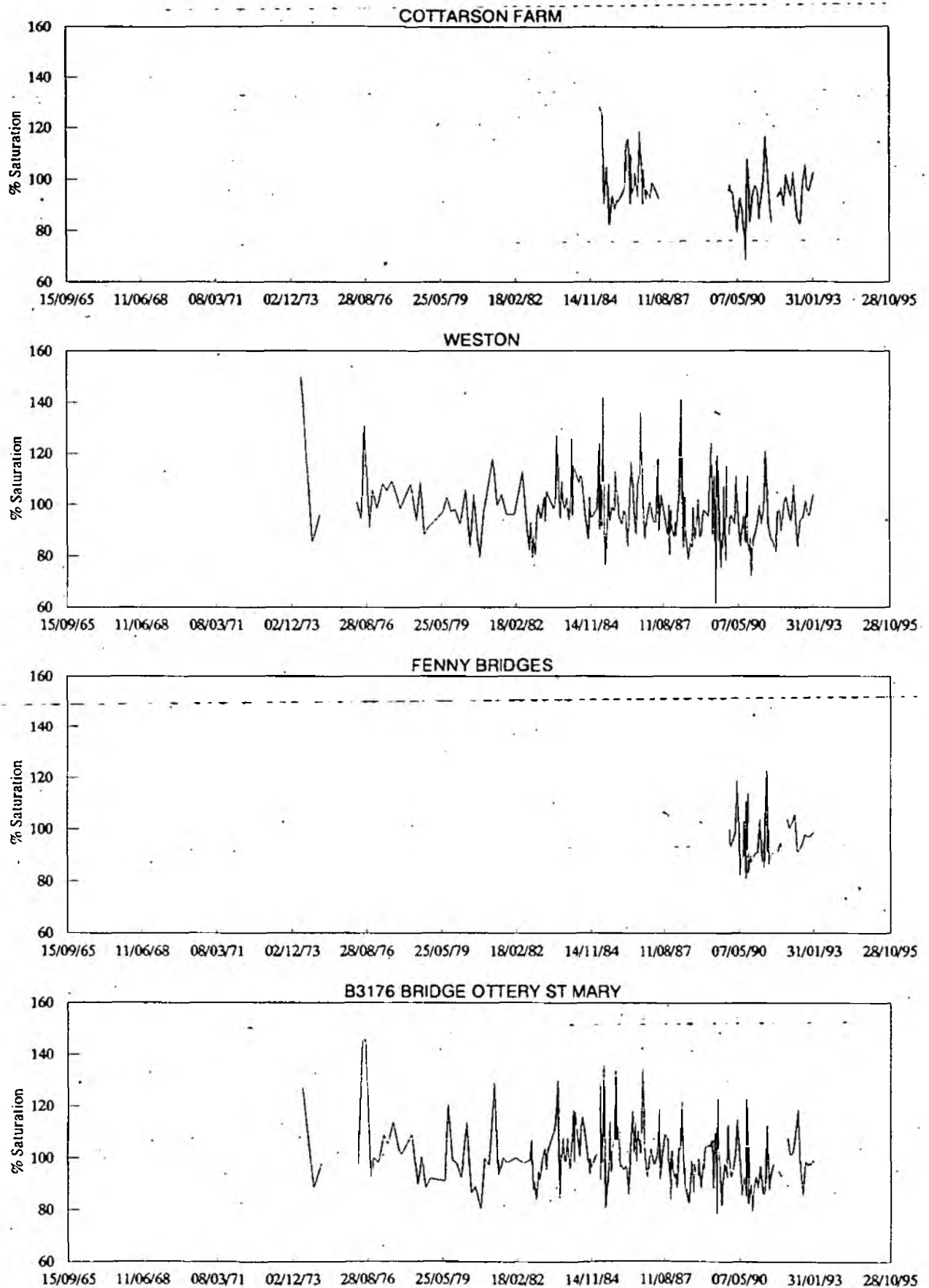


Figure 3.2.4C: River Otter – Water Quality Data
Dissolved Oxygen

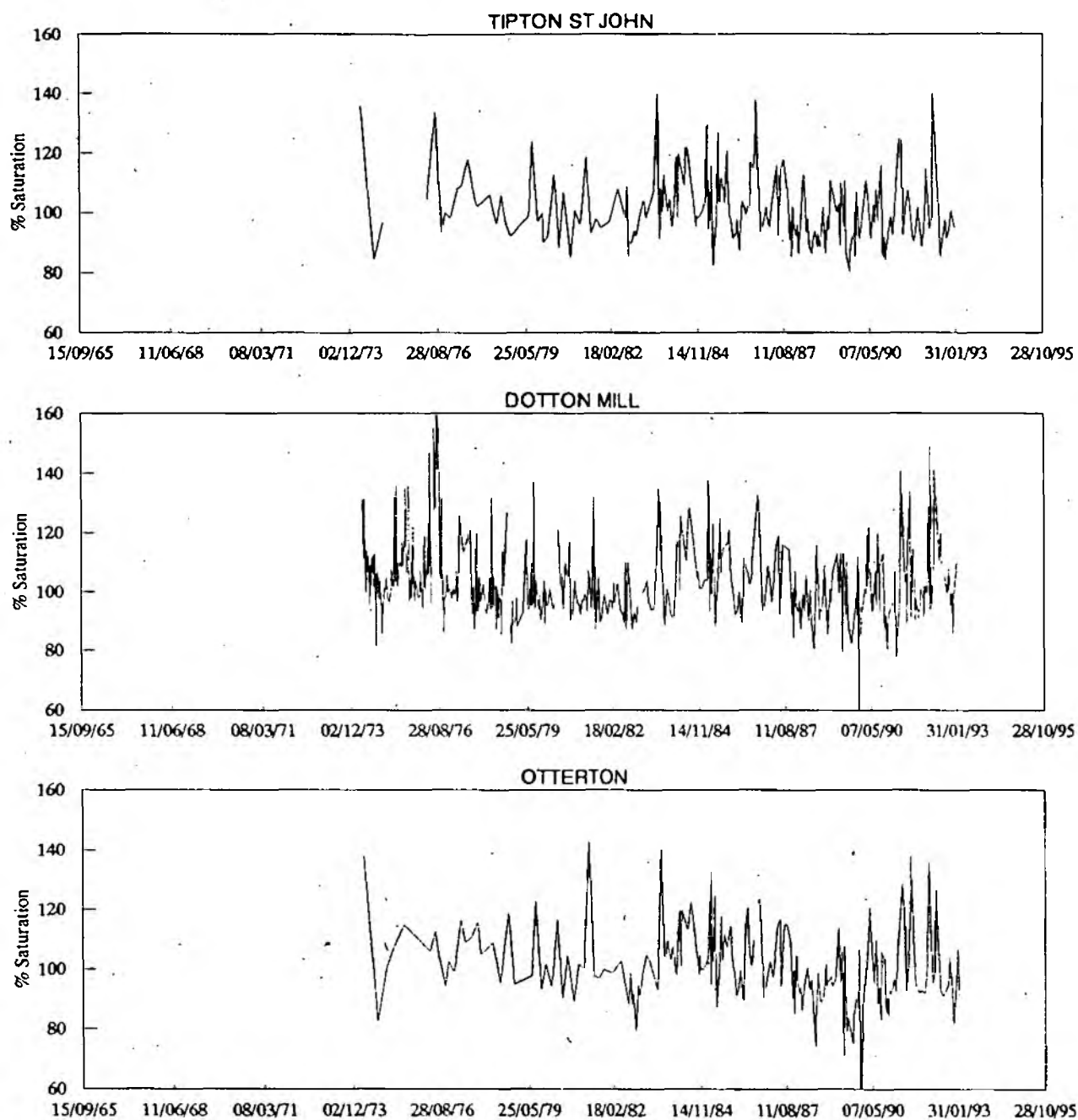


Figure 3.2.5A: River Otter – Water Quality Data
Water Temperature

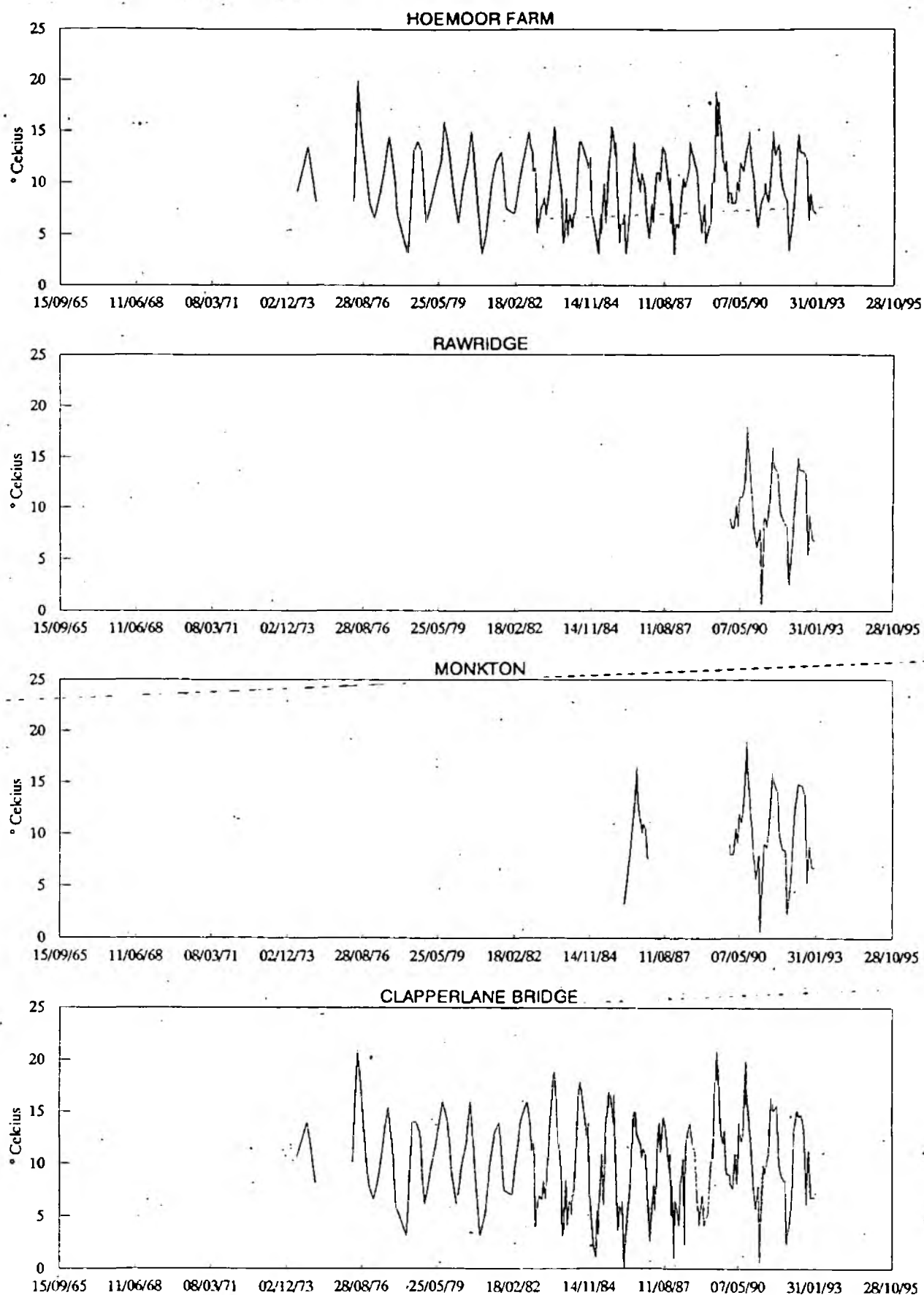


Figure 3.2.5B: River Otter – Water Quality Data
Water Temperature

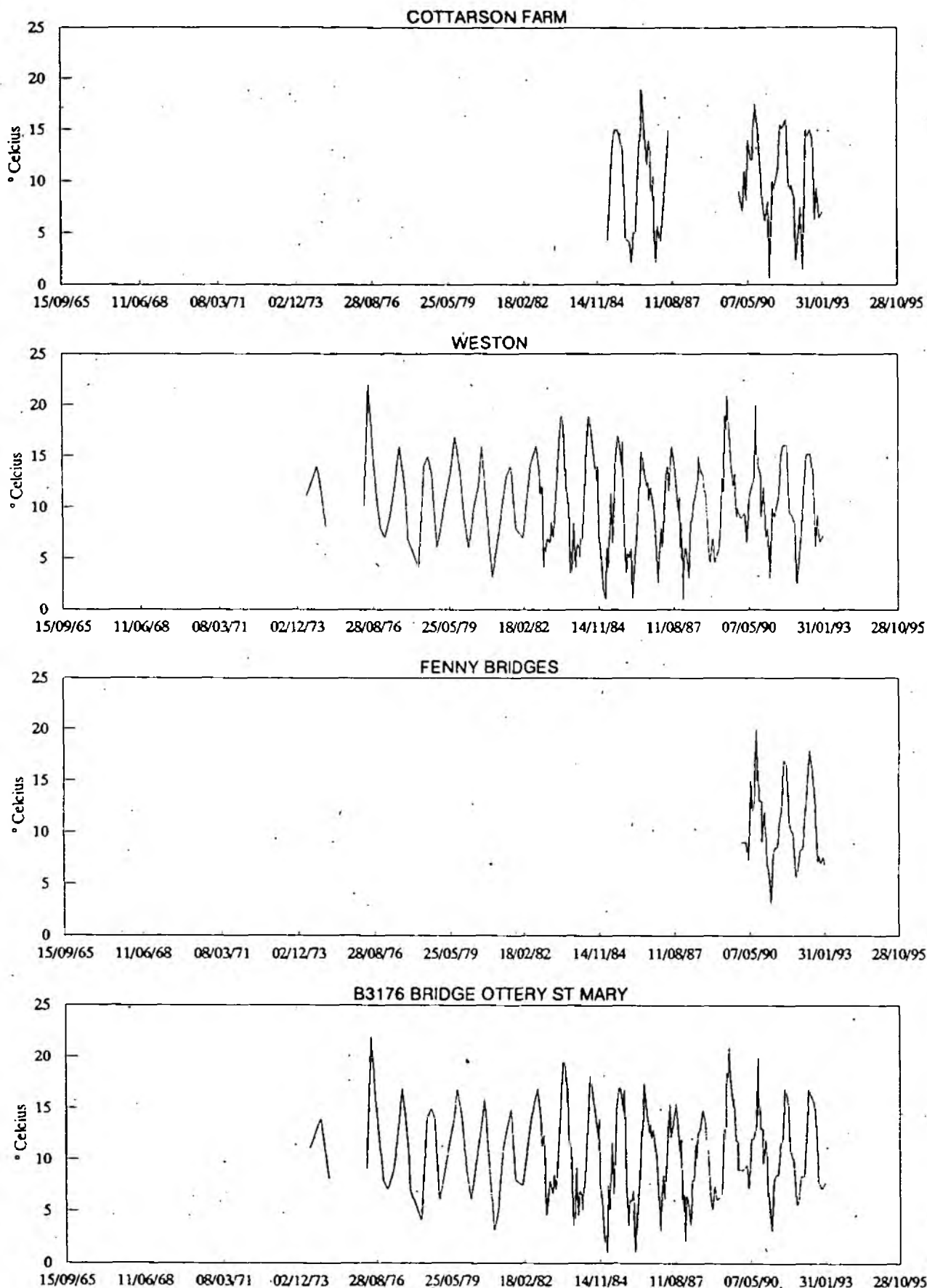


Figure 3.2.5C: River Otter – Water Quality Data
Water Temperature

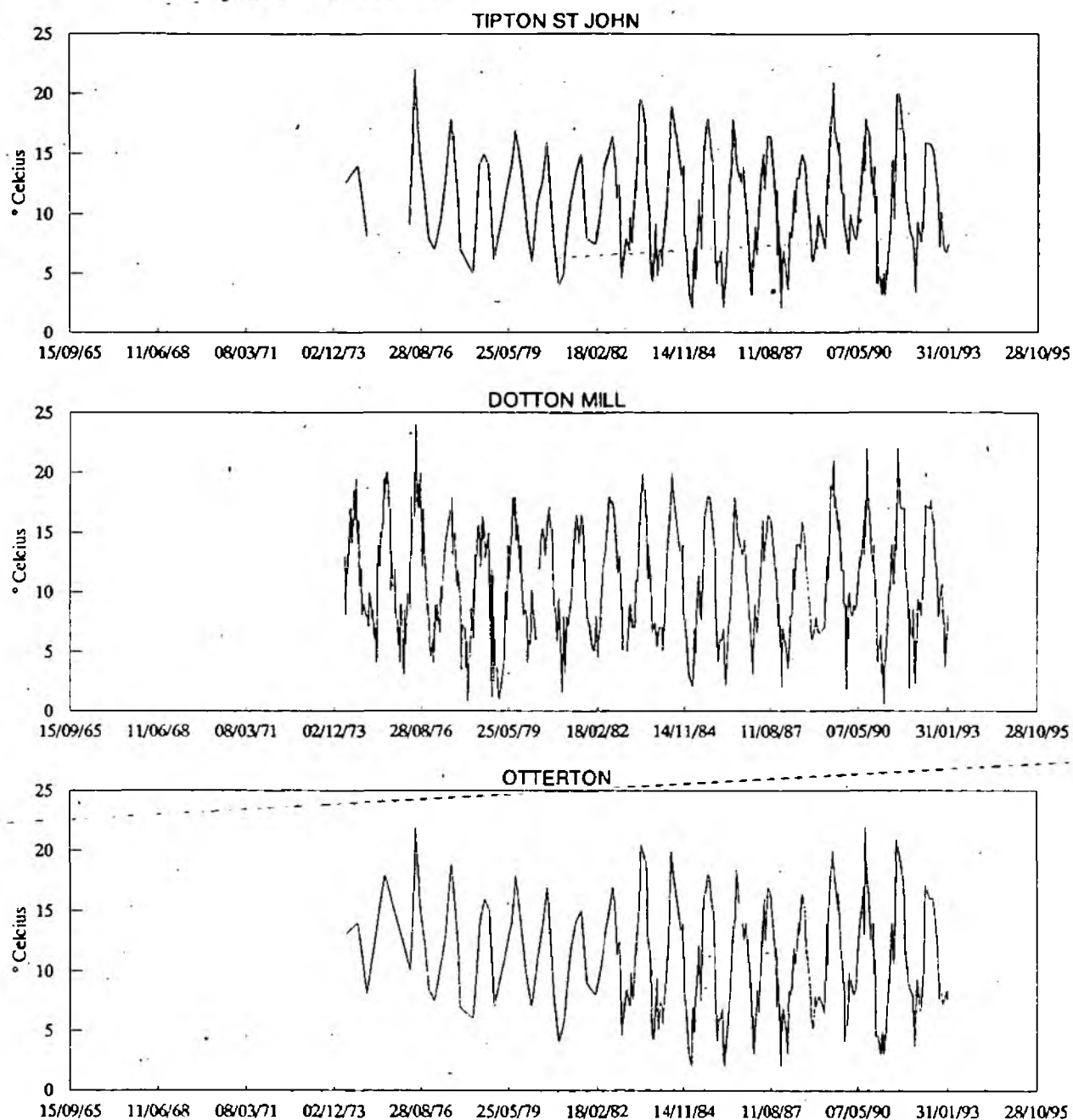


Figure 3.2.6A: River Otter – Water Quality Data
Orthophosphate

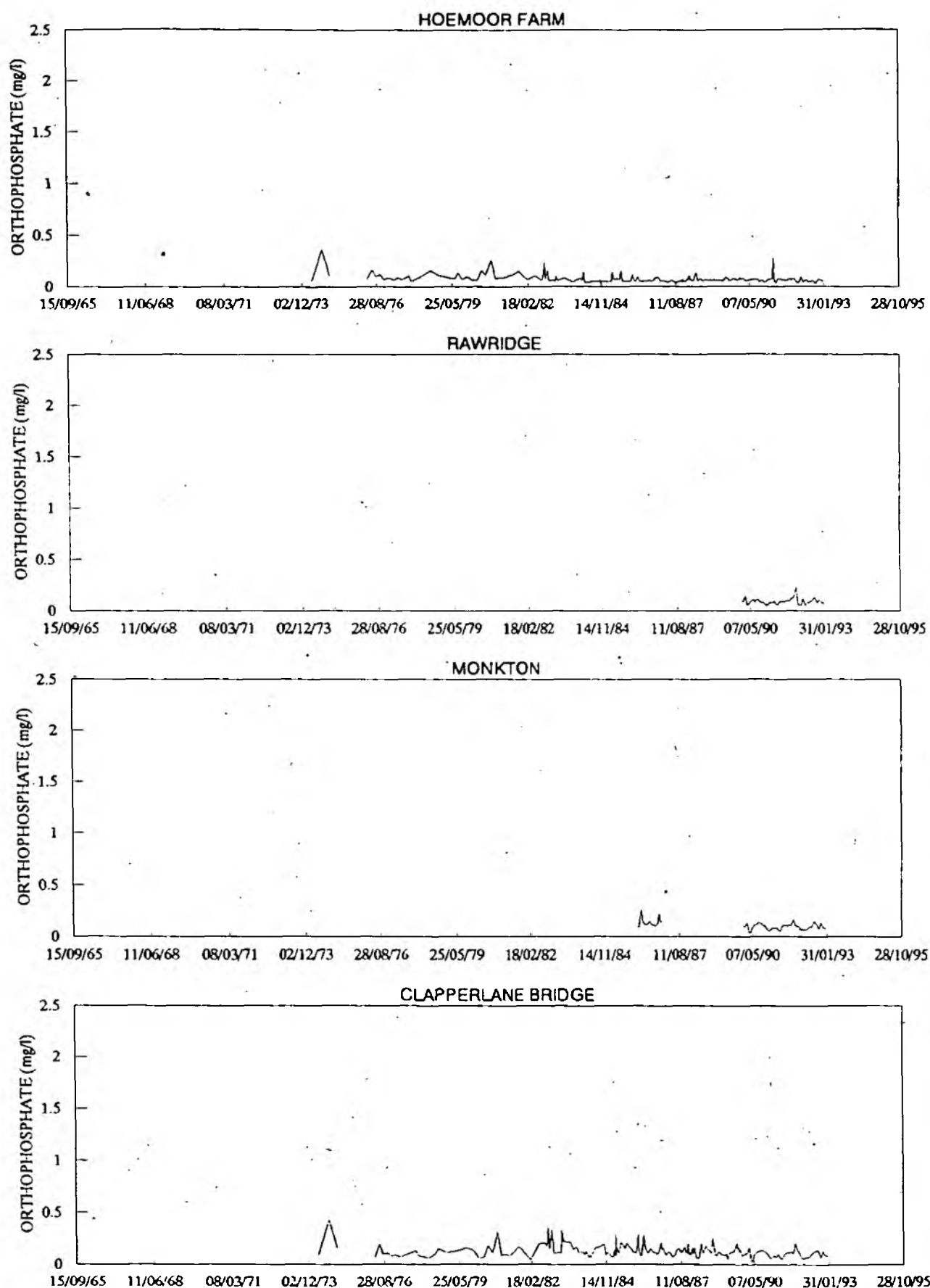


Figure 3.2.6B: River Otter – Water Quality Data
Orthophosphate

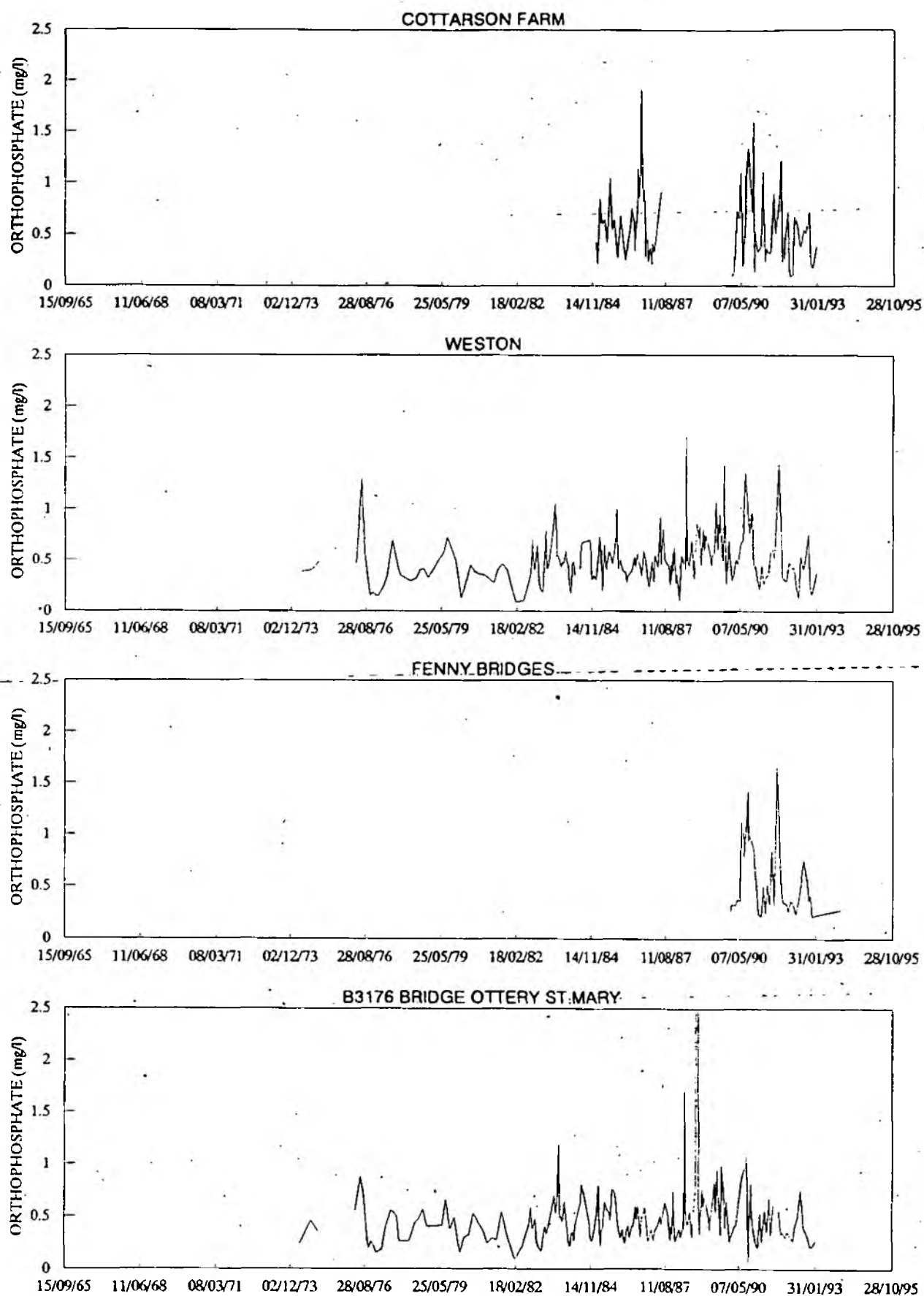


Figure 3.2.6C: River Otter – Water Quality Data
Orthophosphate

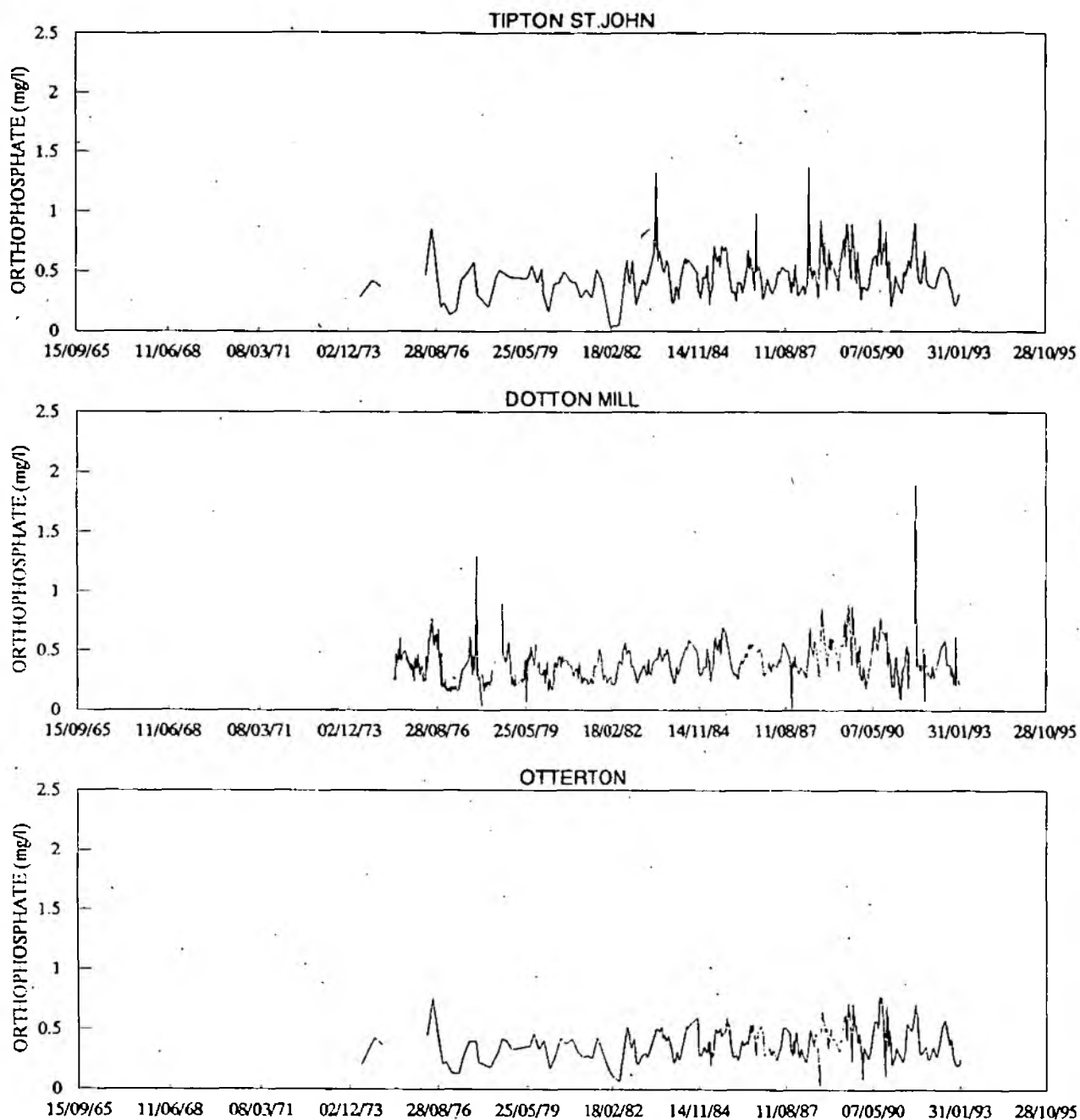


Figure 3.2.7A: River Otter – Water Quality Data
Nitrate

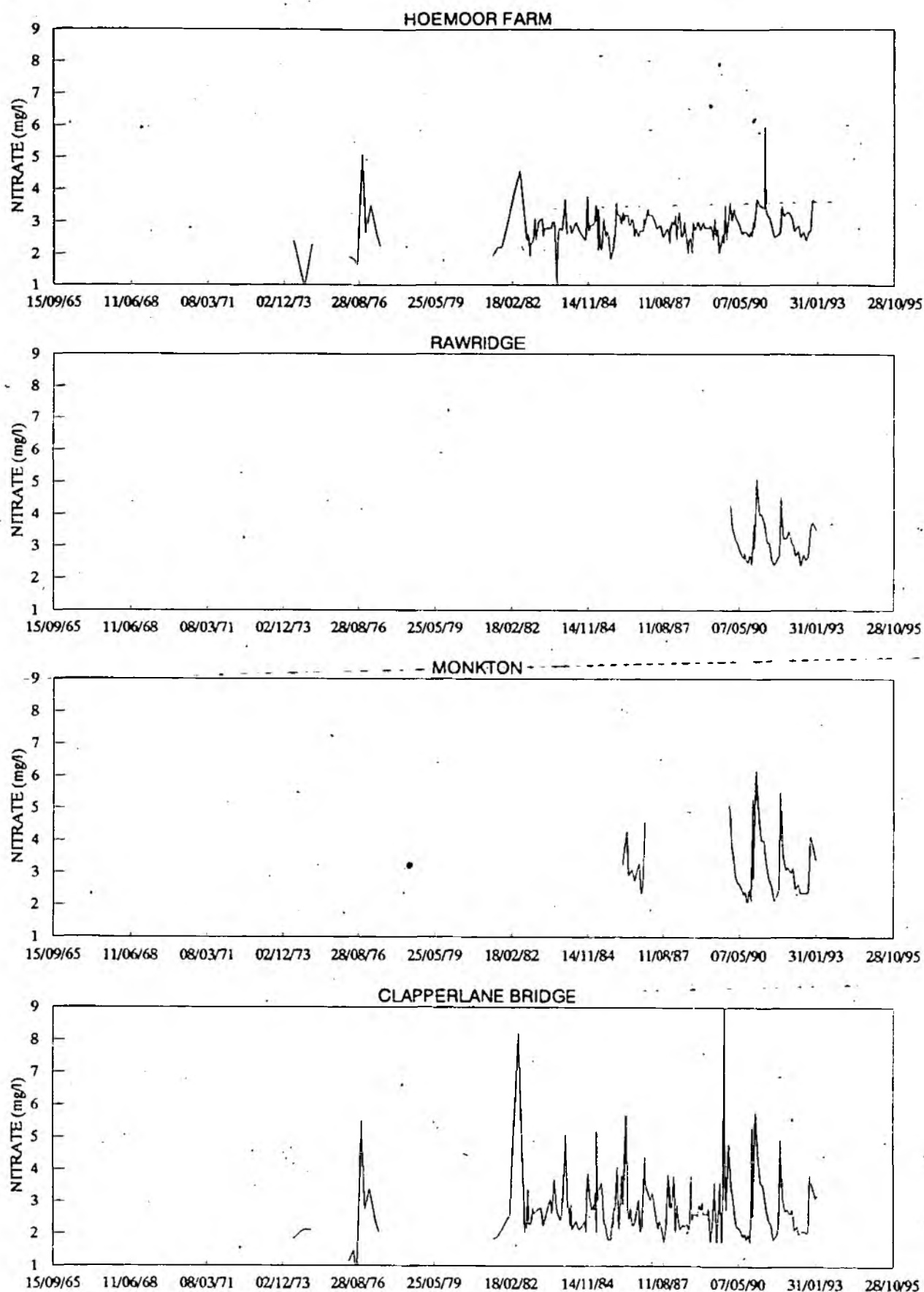


Figure 3.2.7B: River Otter – Water Quality Data
Nitrate

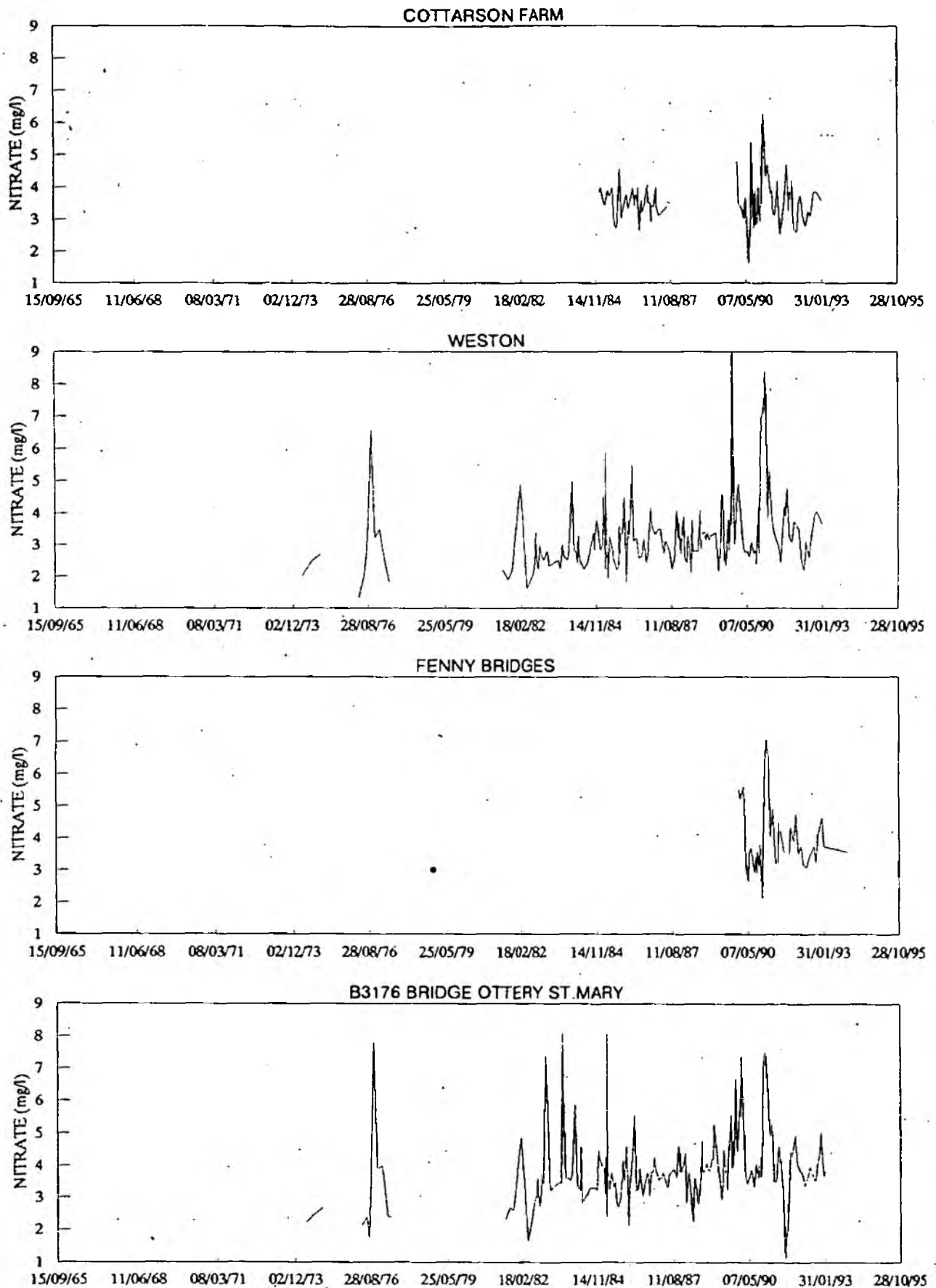


Figure 3.2.7C: River Otter – Water Quality Data
Nitrate

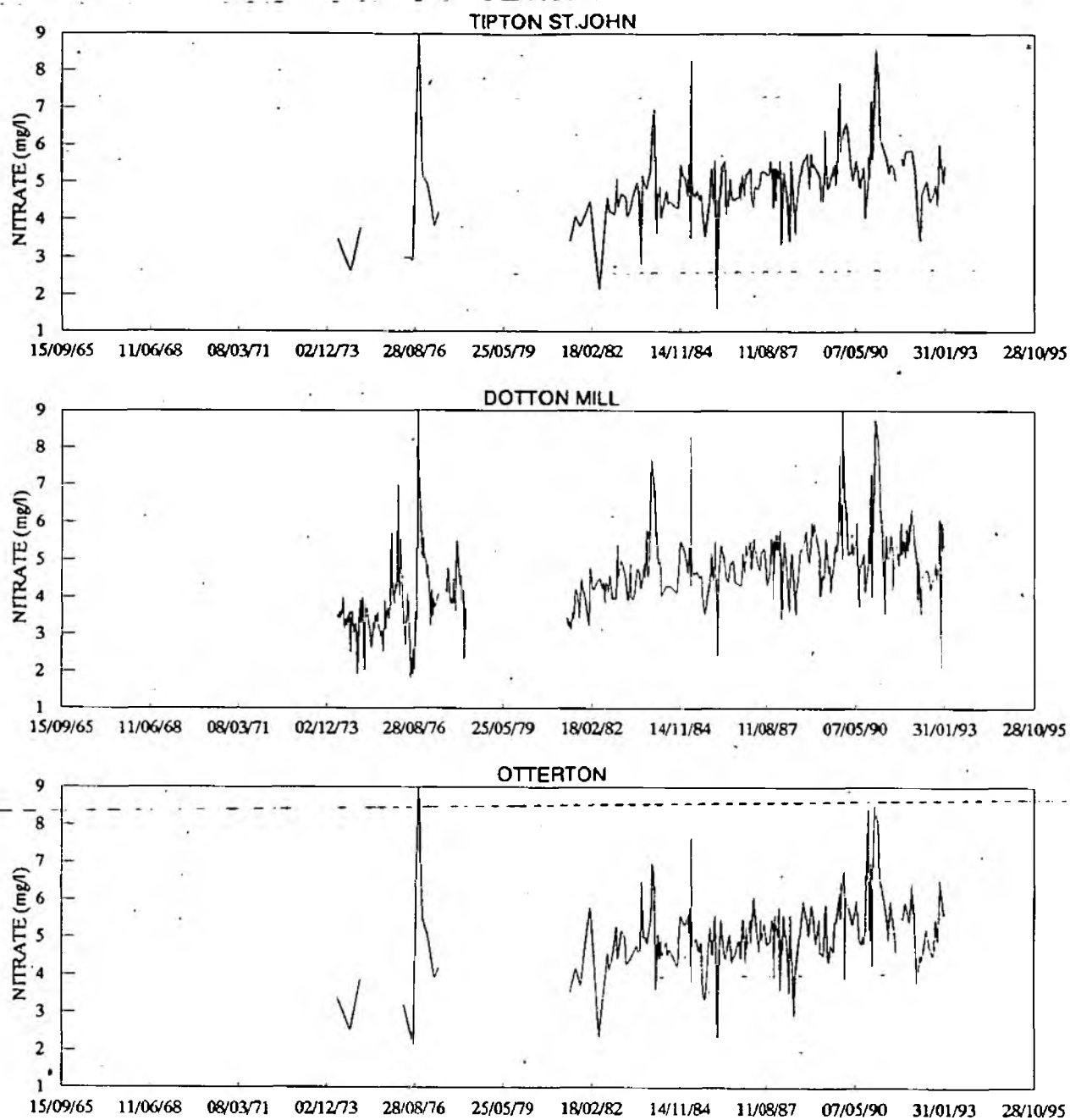


Figure 3.2.8A: River Otter – Water Quality Data
Suspended Solids

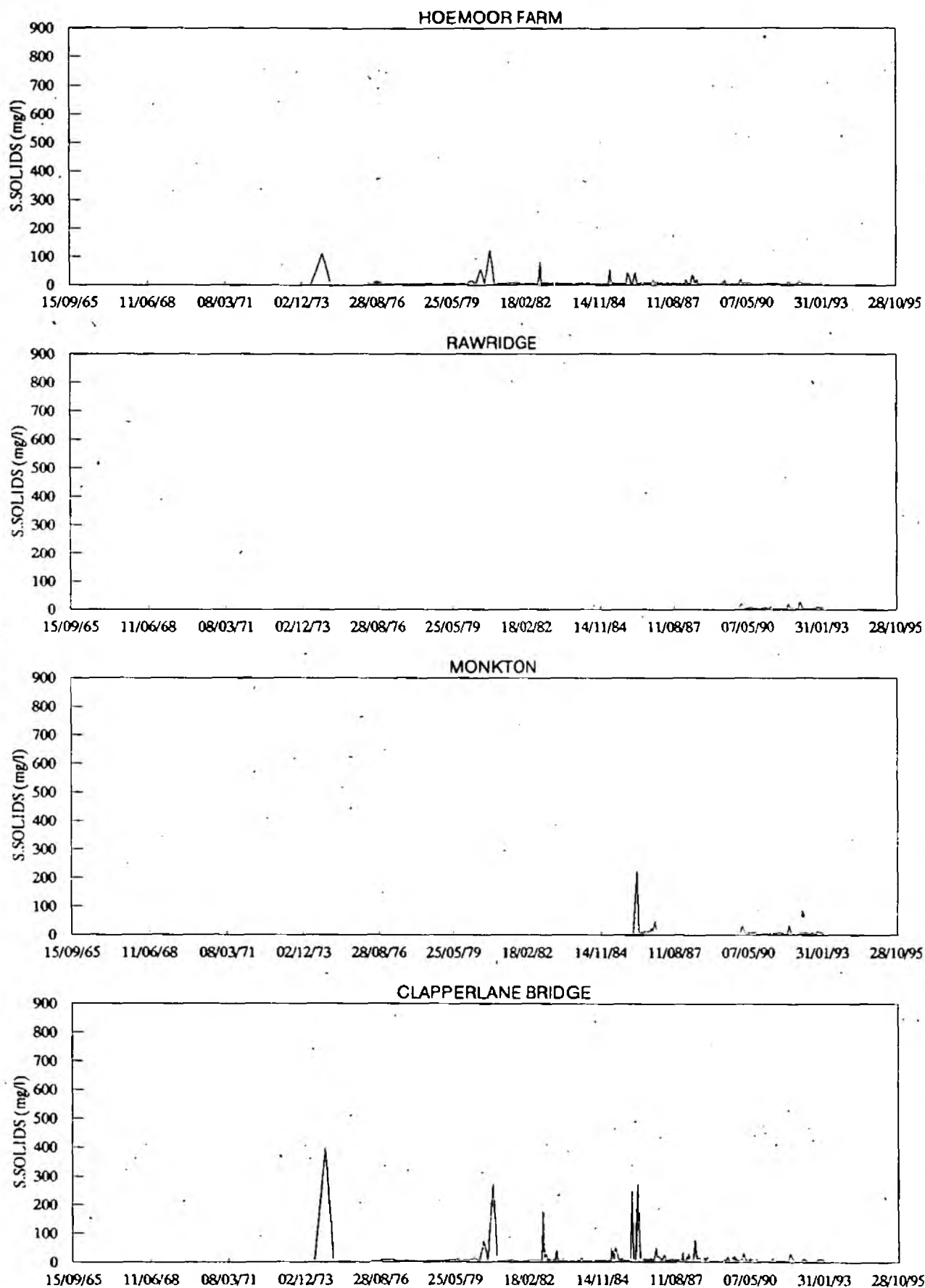


Figure 3.2.8B: River Otter – Water Quality Data
Suspended Solids

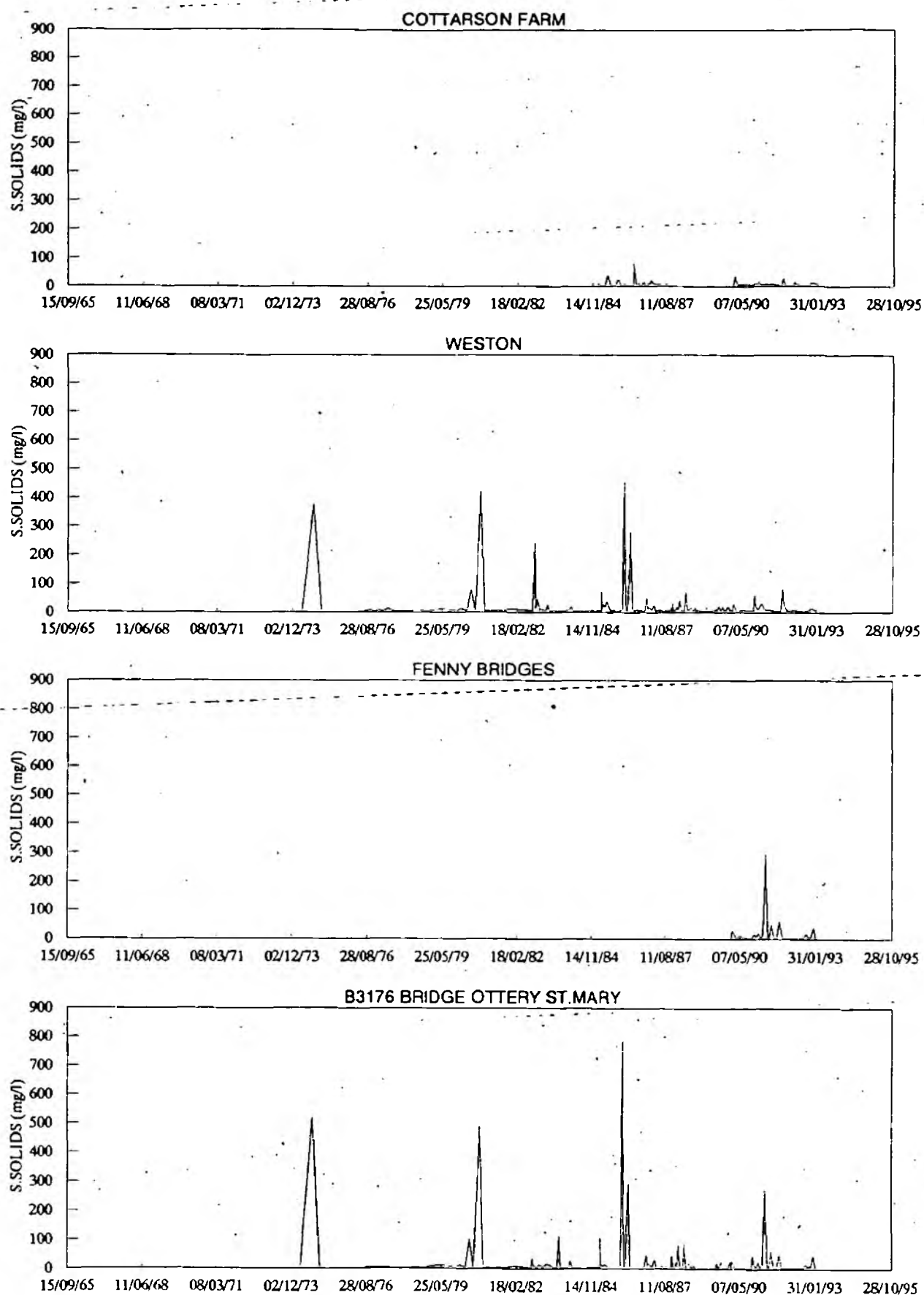
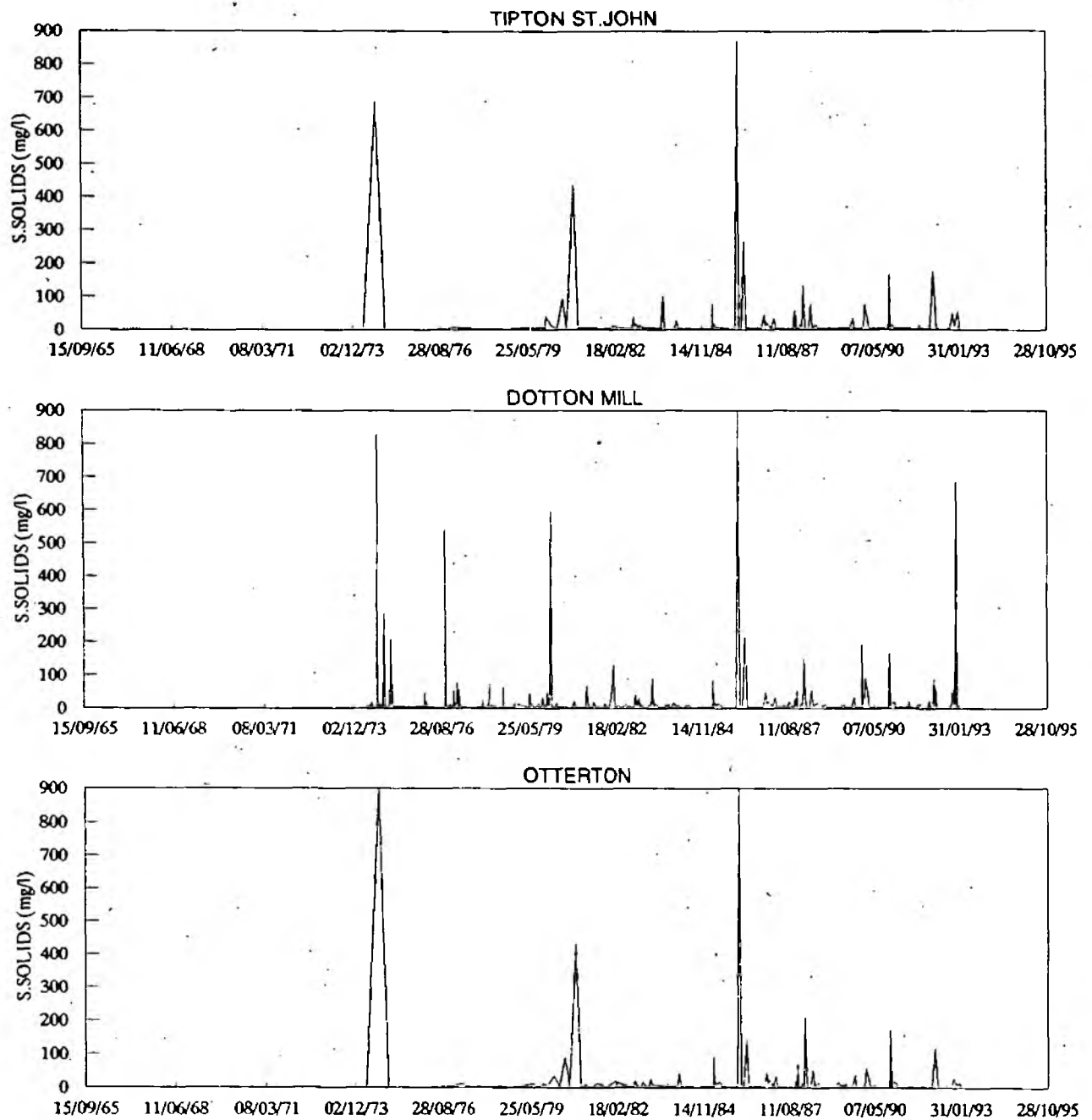


Figure 3.2.8C: River Otter – Water Quality Data
Suspended Solids

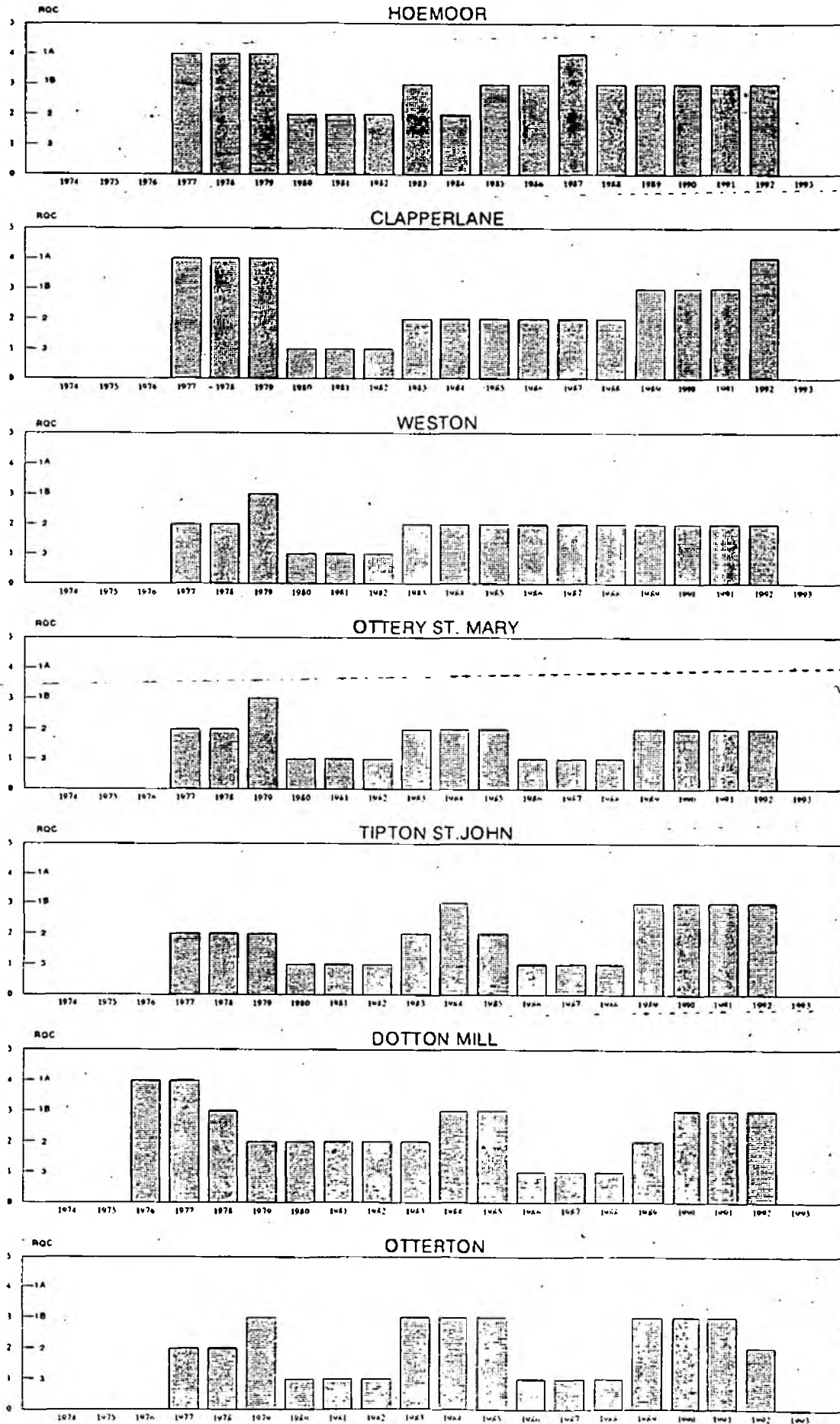


NWC. RIVER QUALITY CLASSIFICATIONS 1974-92

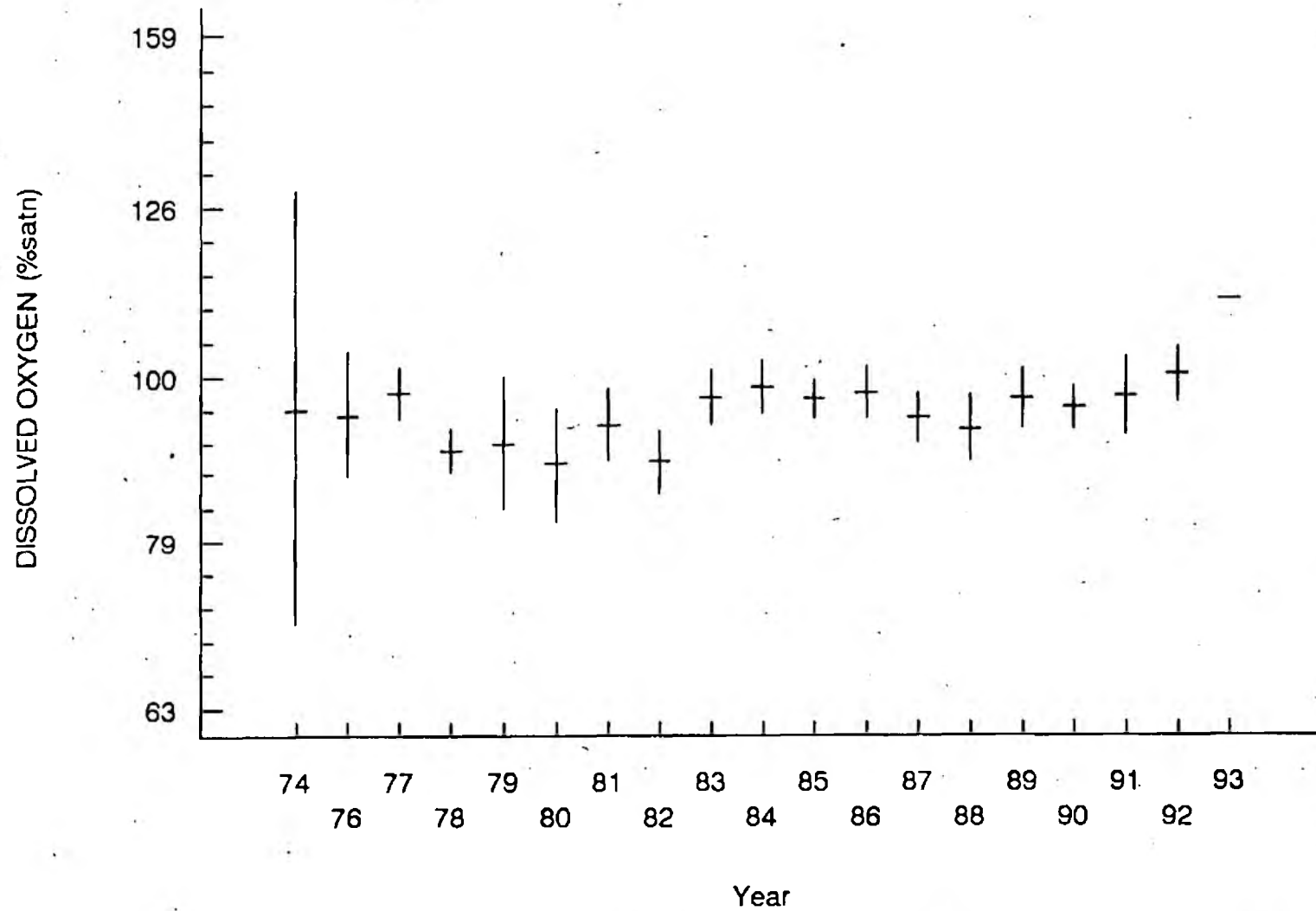
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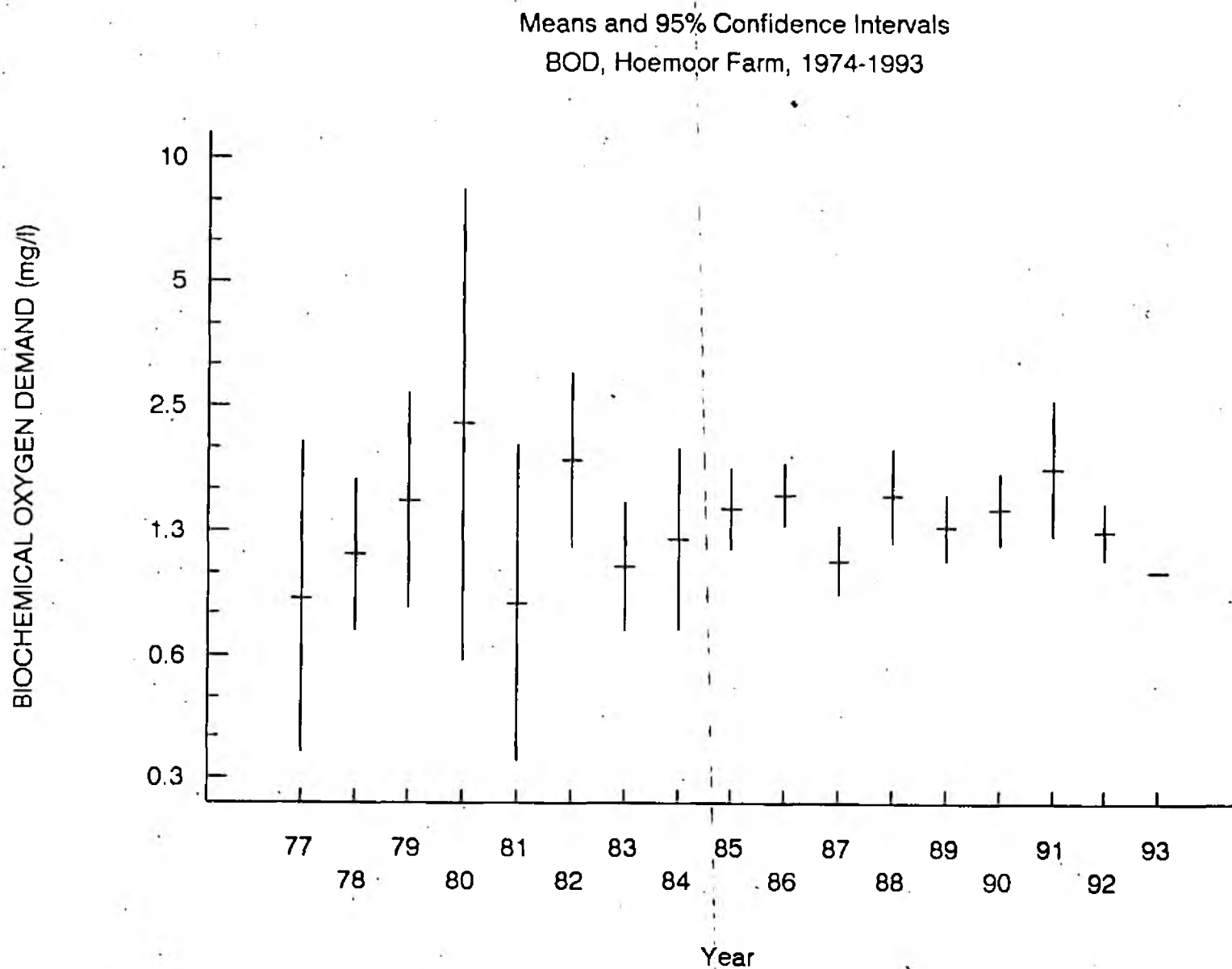
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FIGURE 3.2.9

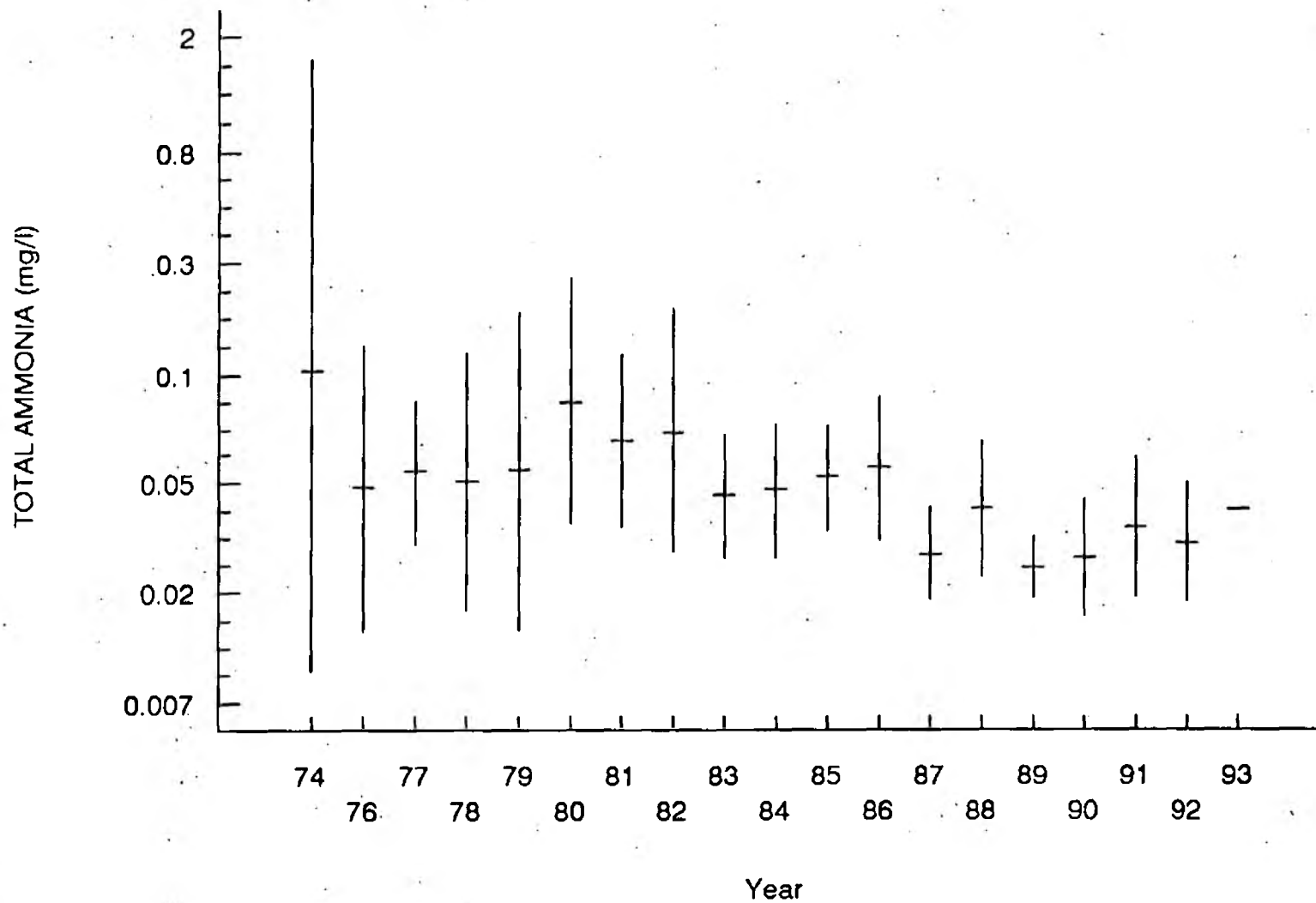


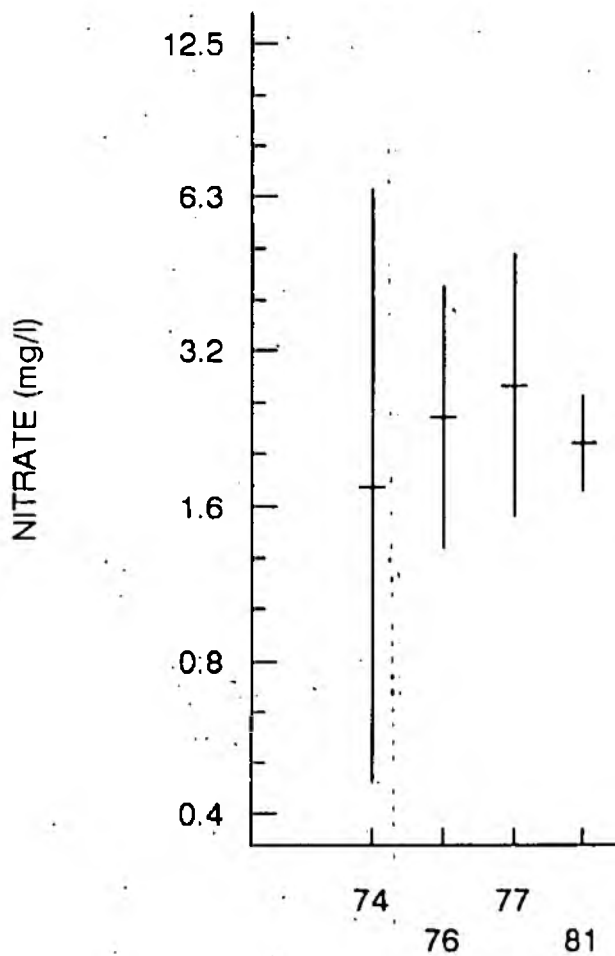
Means and 95% Confidence Intervals
DO, Hoemoor Farm, 1974-1993





Means and 95% Confidence Intervals
Total Ammonia, Hoemoor Farm, 1974-1993





Means and 95% Confidence Intervals
Nitrate, Hoemoor Farm, 1974-1993

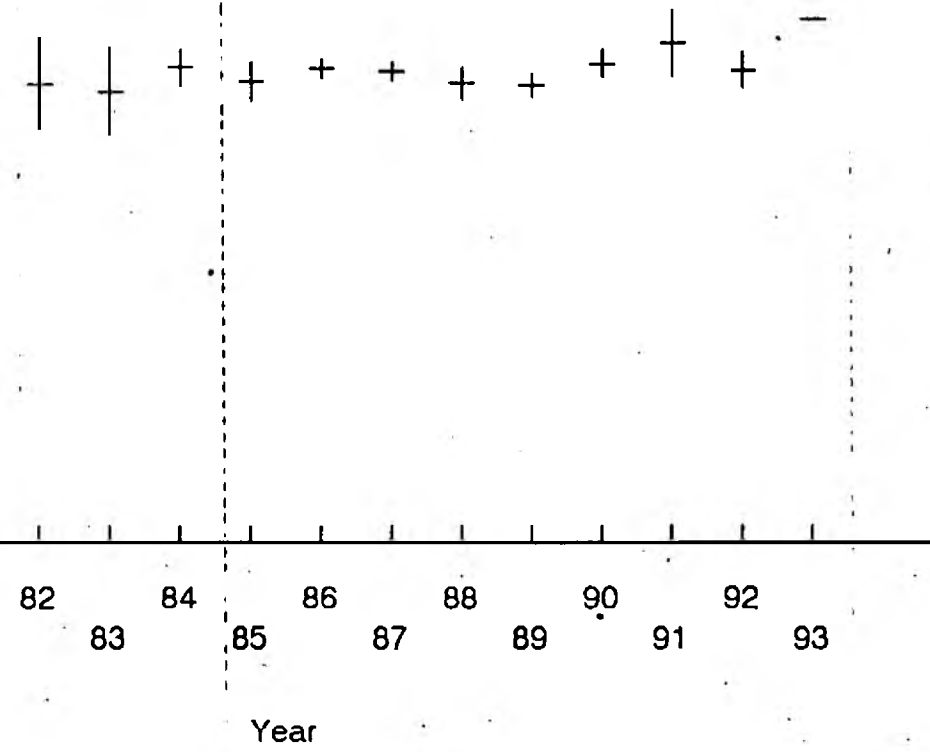
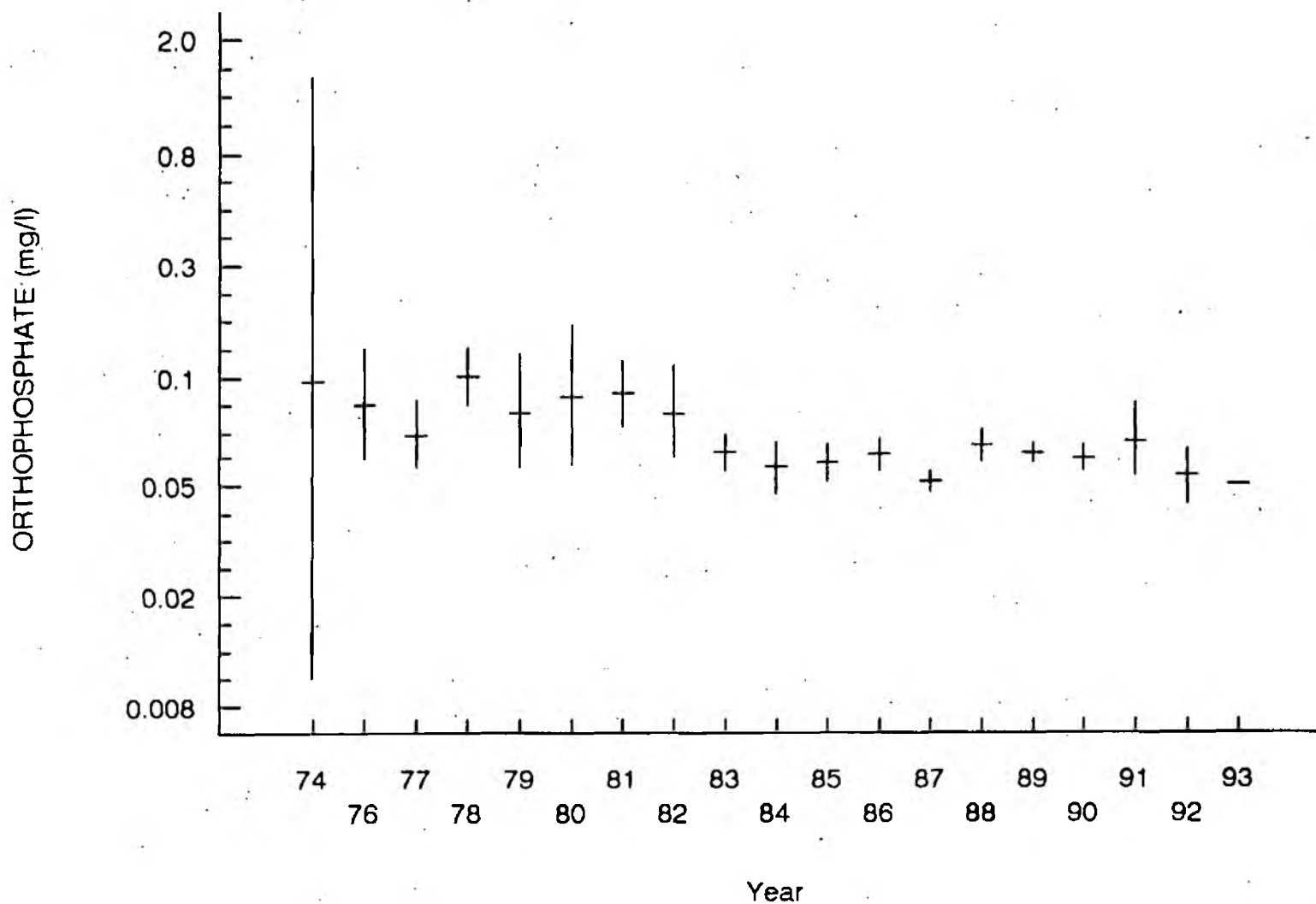
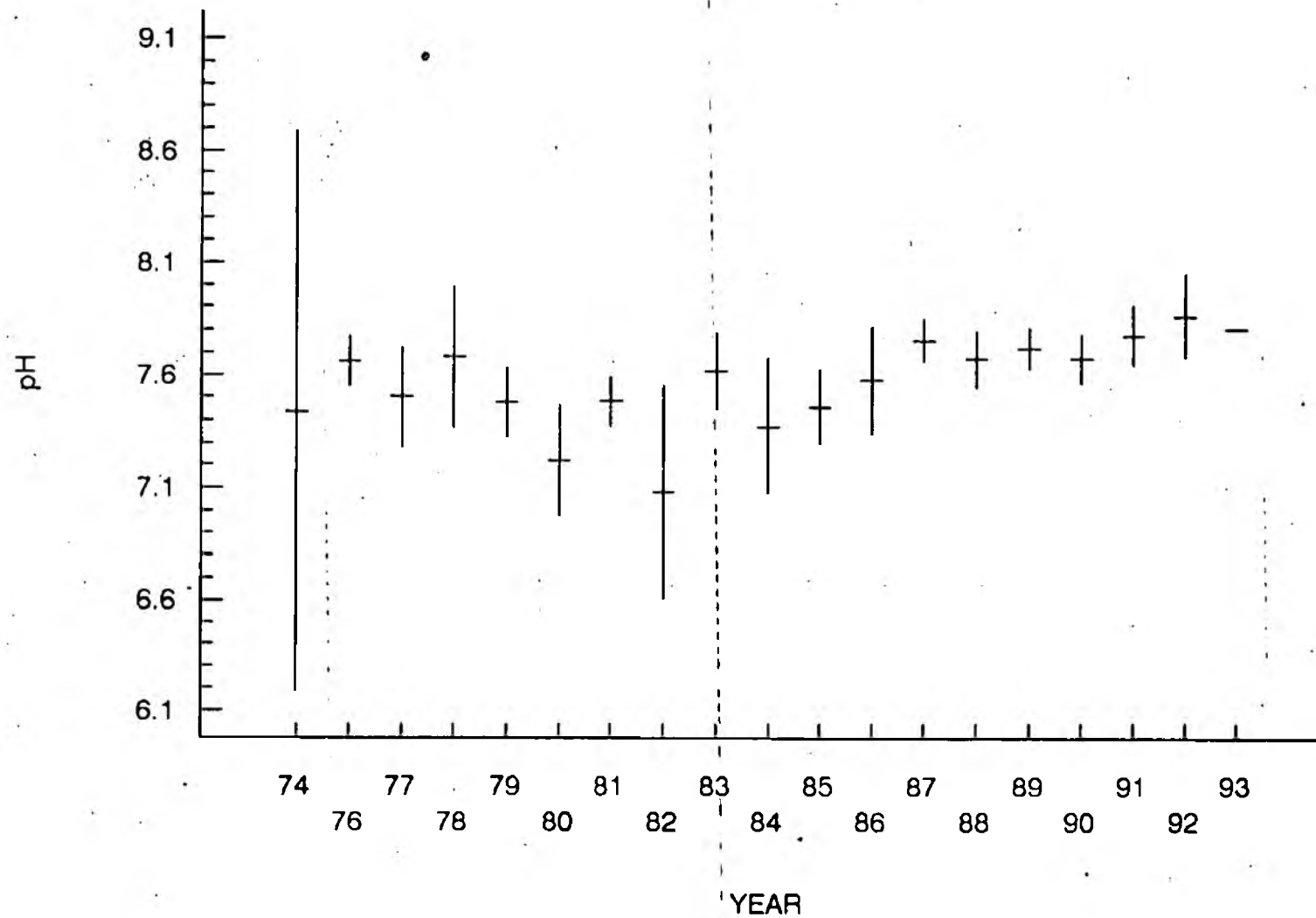


Figure 3.2.13

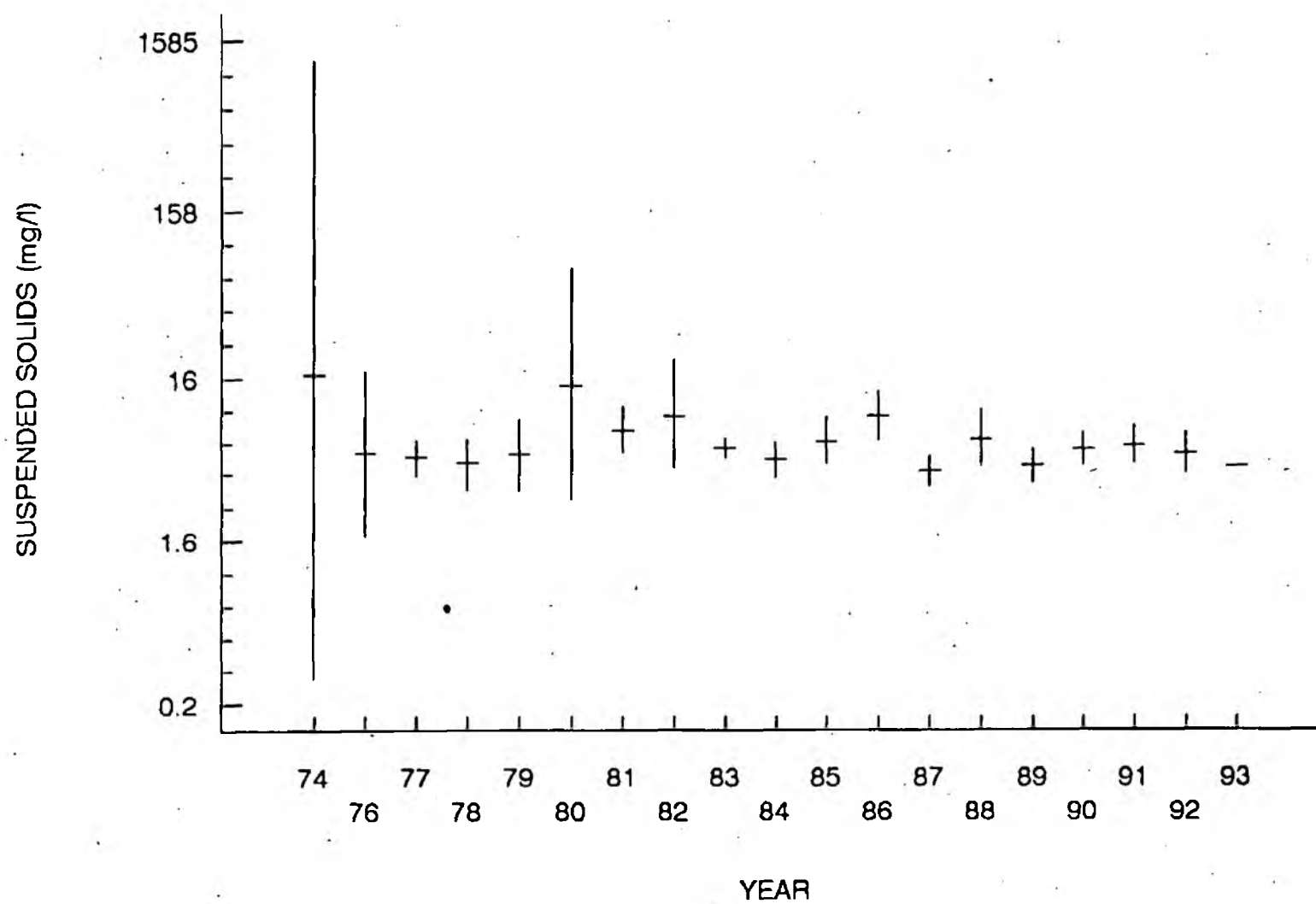
Means and 95% Confidence Intervals
Orthophosphate, Hoemoor Farm, 1974-1993

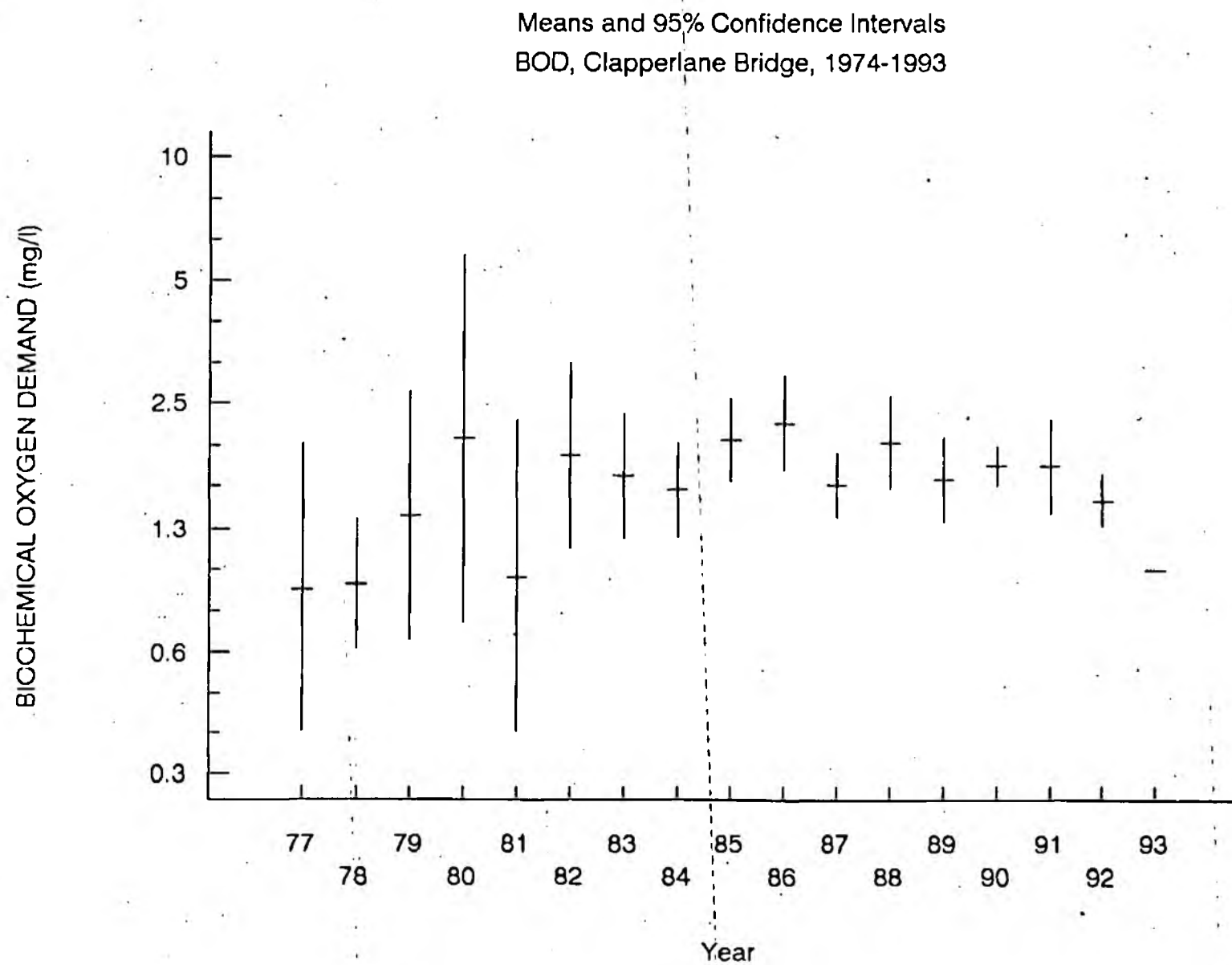


Means and 95% Confidence Intervals
pH, Hoemoor Farm, 1974-1993

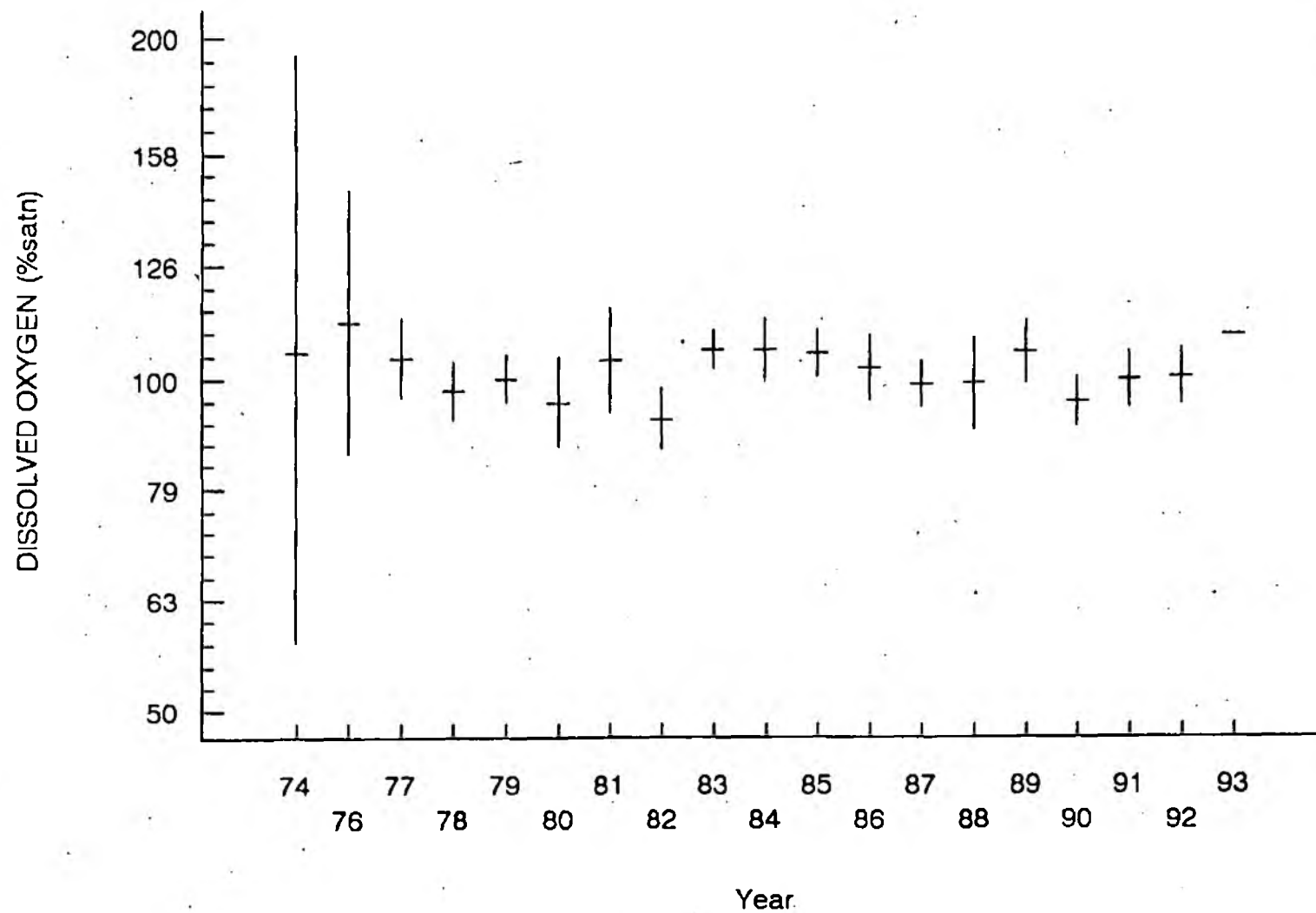


Means and 95% Confidence Intervals
S.Solids, Hoemoor Farm, 1974-1993

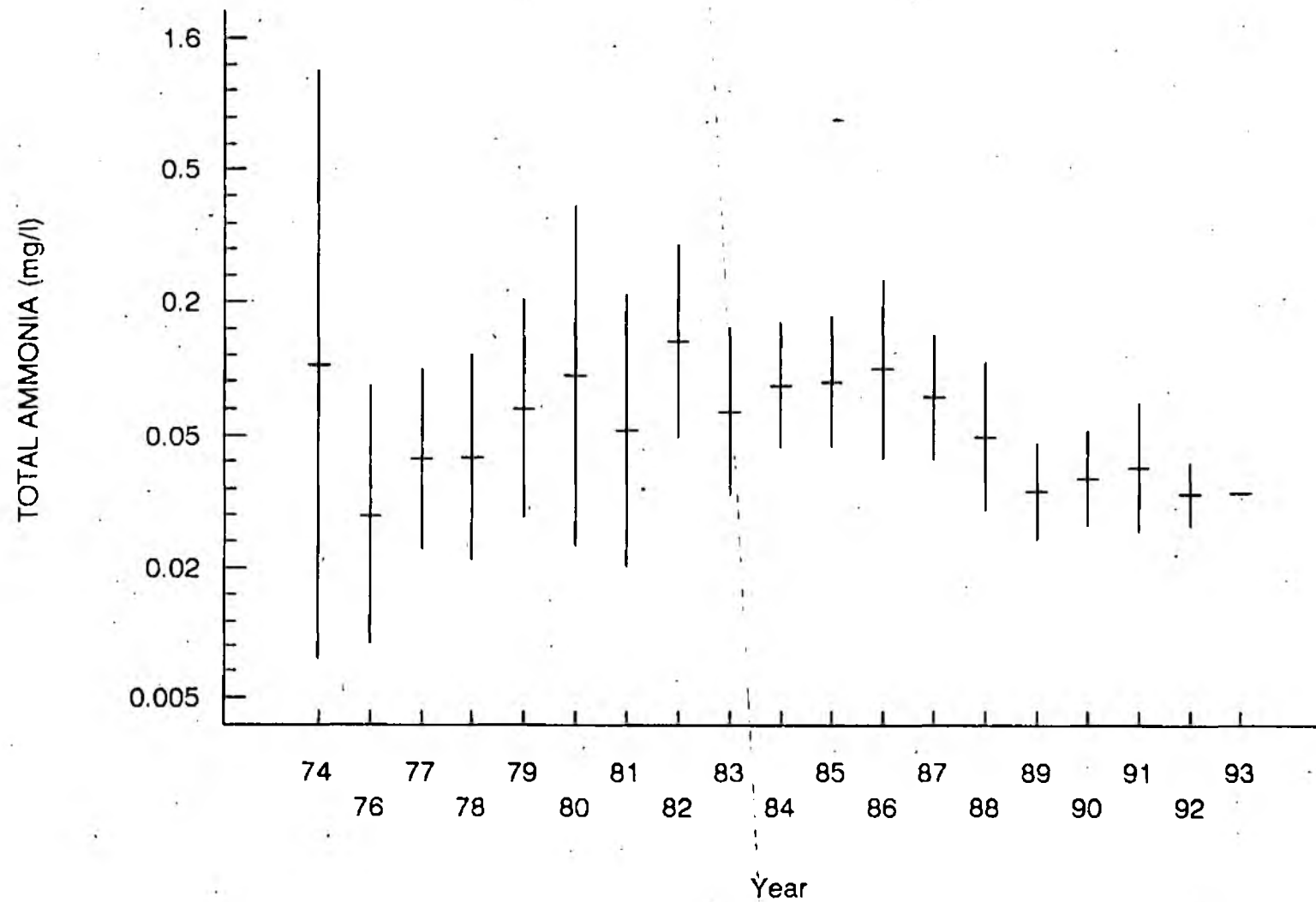




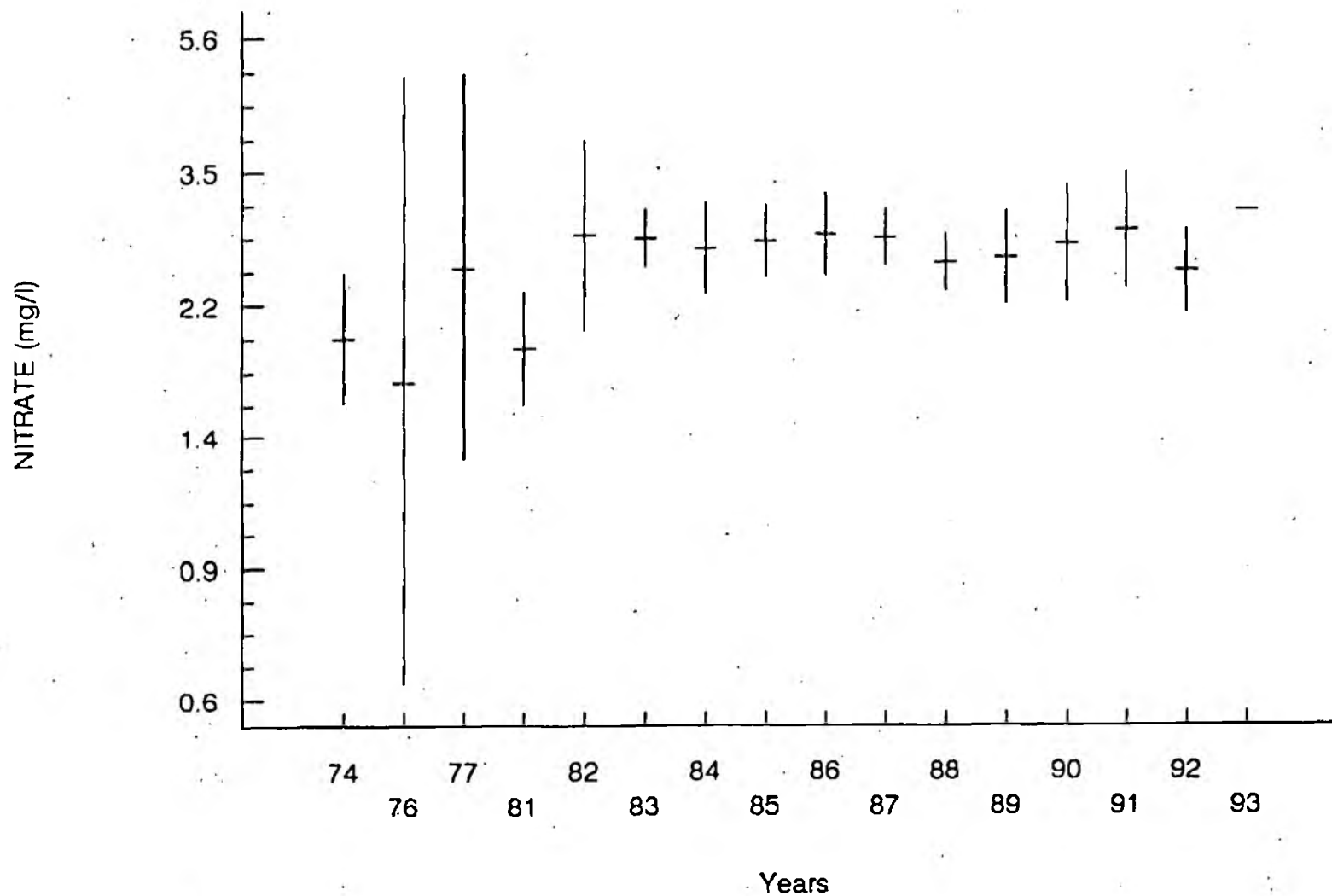
Means and 95% Confidence Intervals
DO, Clapperlane Bridge, 1974-1993



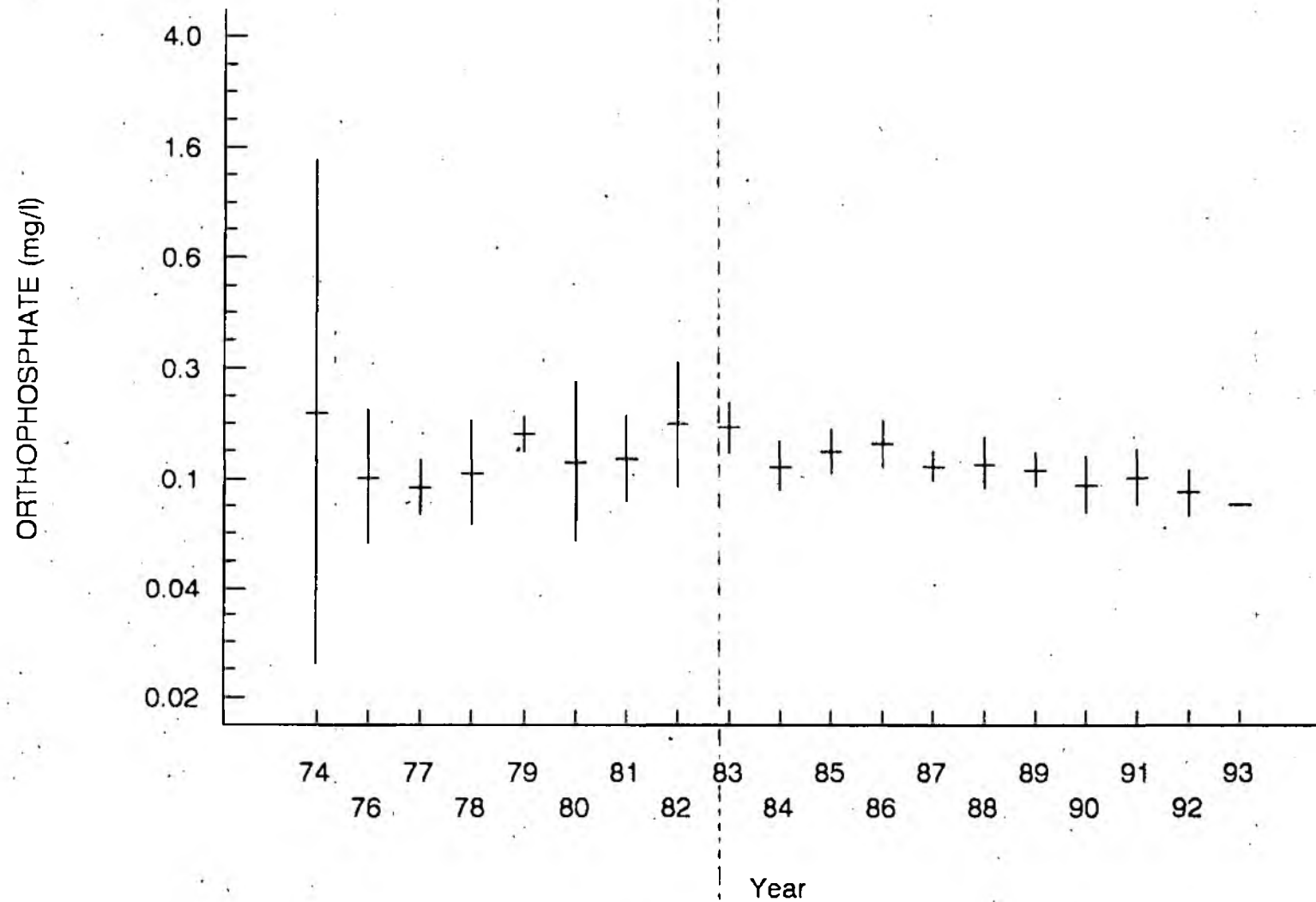
Means and 95% Confidence Intervals
Total Ammonia, Clapperlane Bridge, 1974-1993



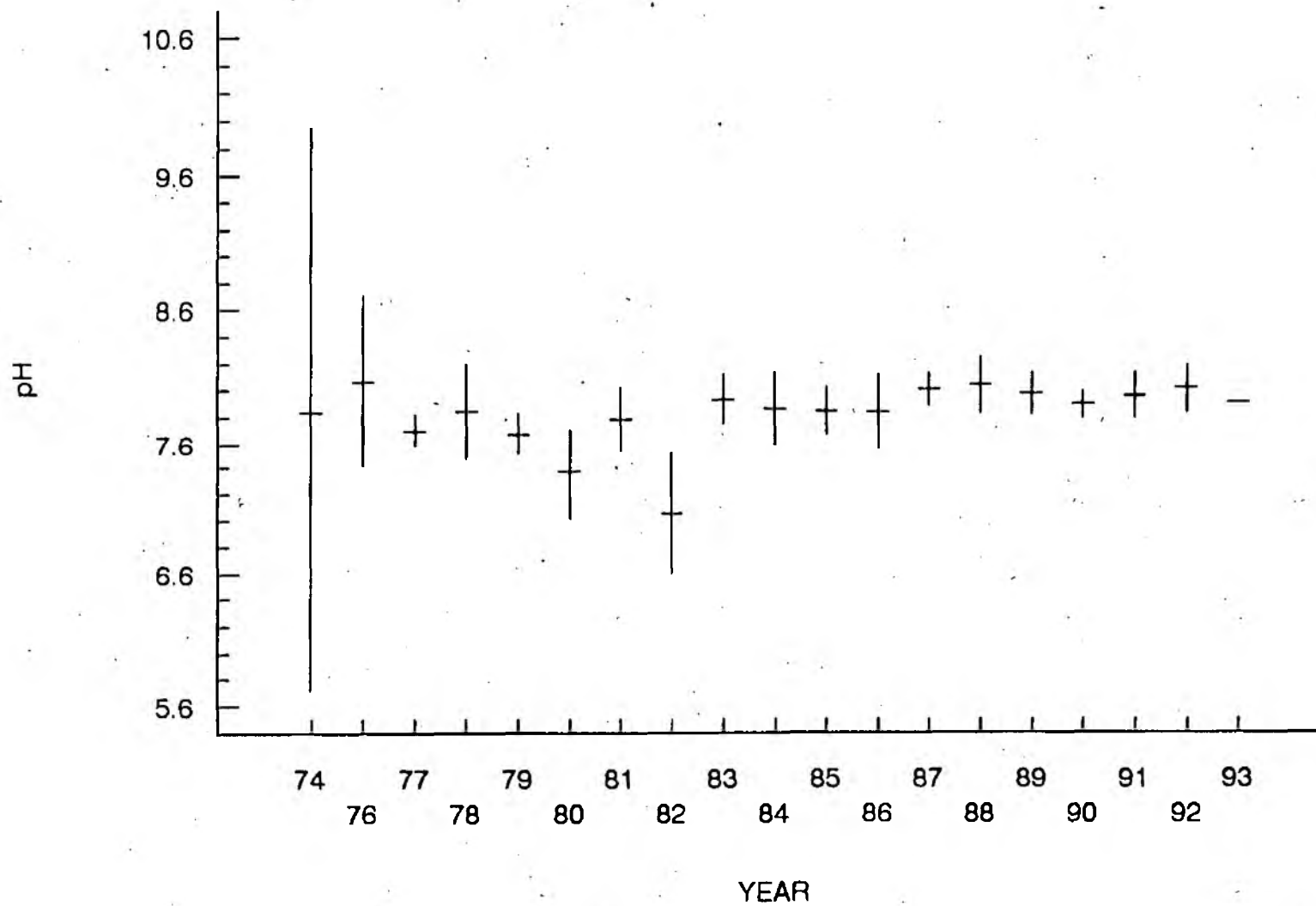
Means and 95% Confidence Intervals
Nitrate, Clapperlane Bridge, 1974-1993



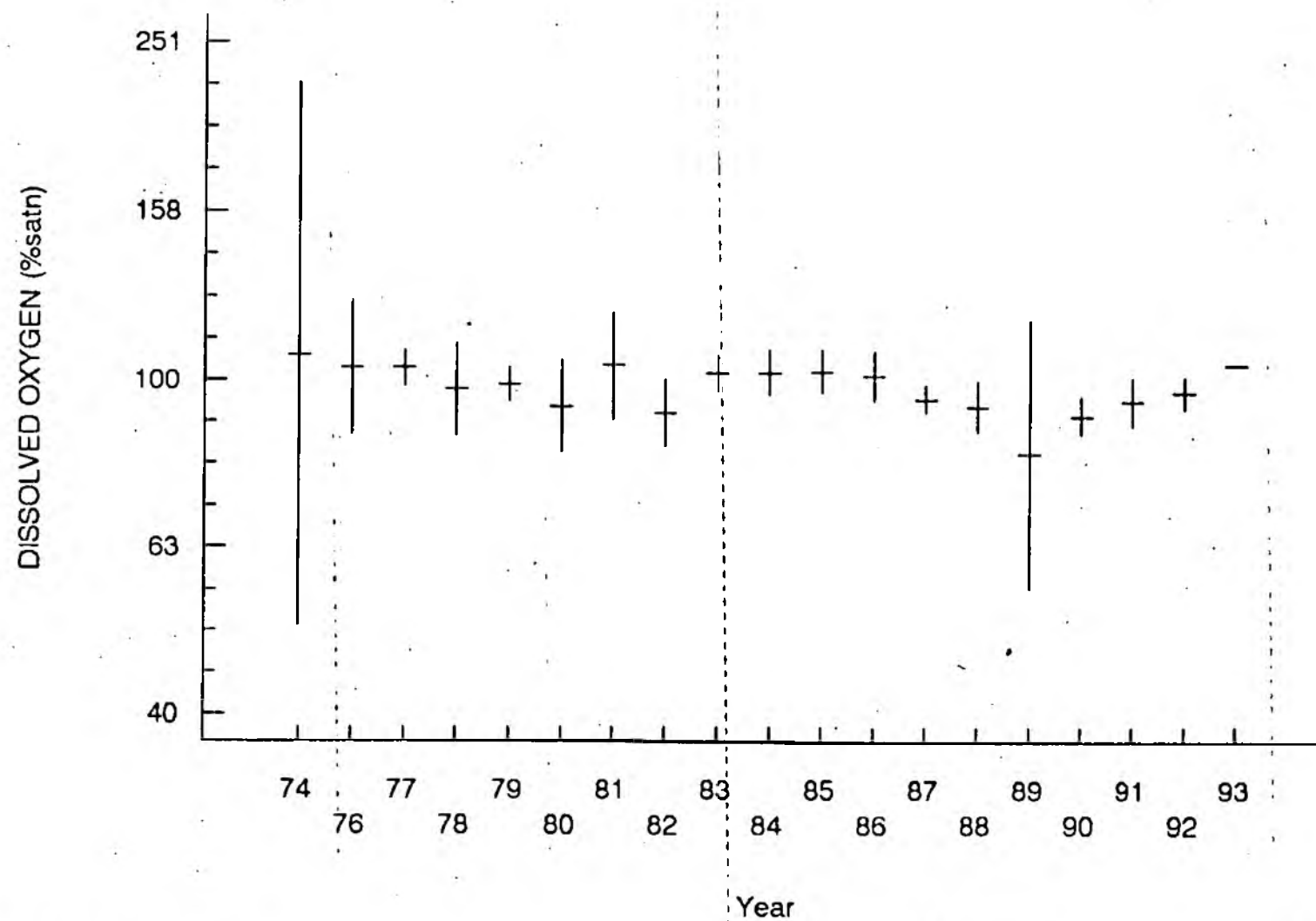
Means and 95% Confidence Intervals
Orthophosphate, Clapperlane Bridge, 1974-1993



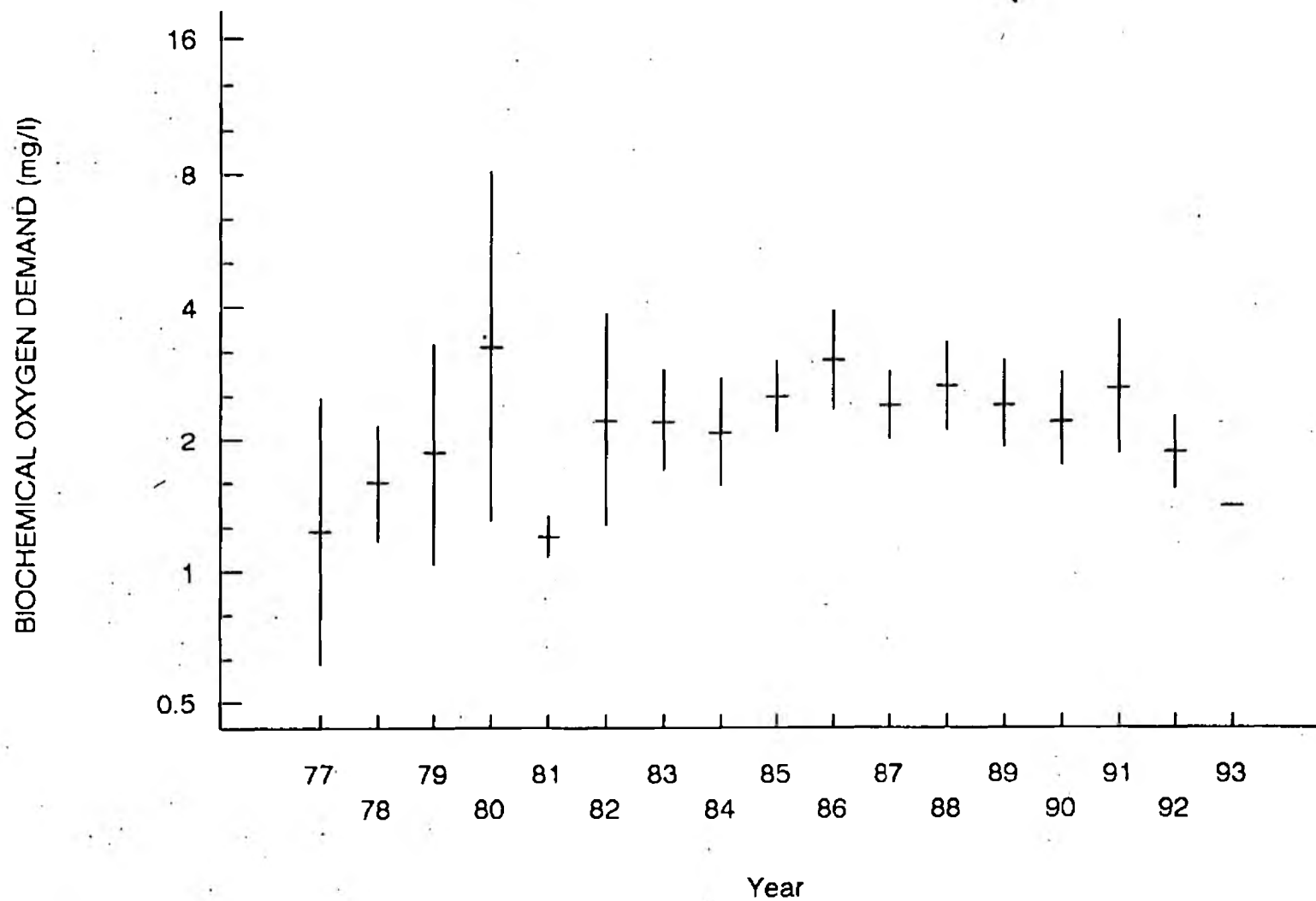
Means and 95% Confidence Intervals
pH, Clapperlane Bridge, 1974-1993



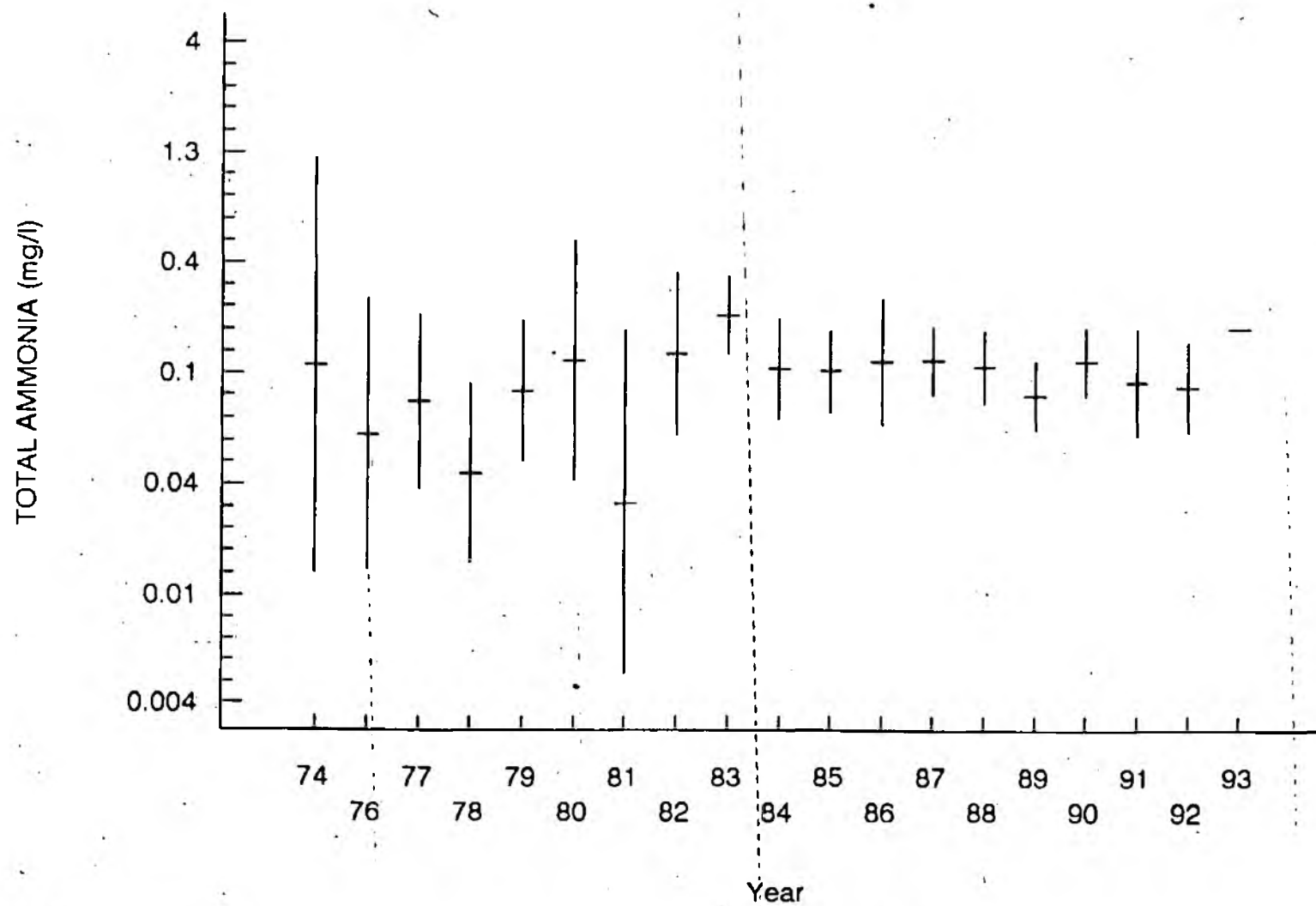
Means and 95% Confidence Intervals
DO, Weston, 1974-1993



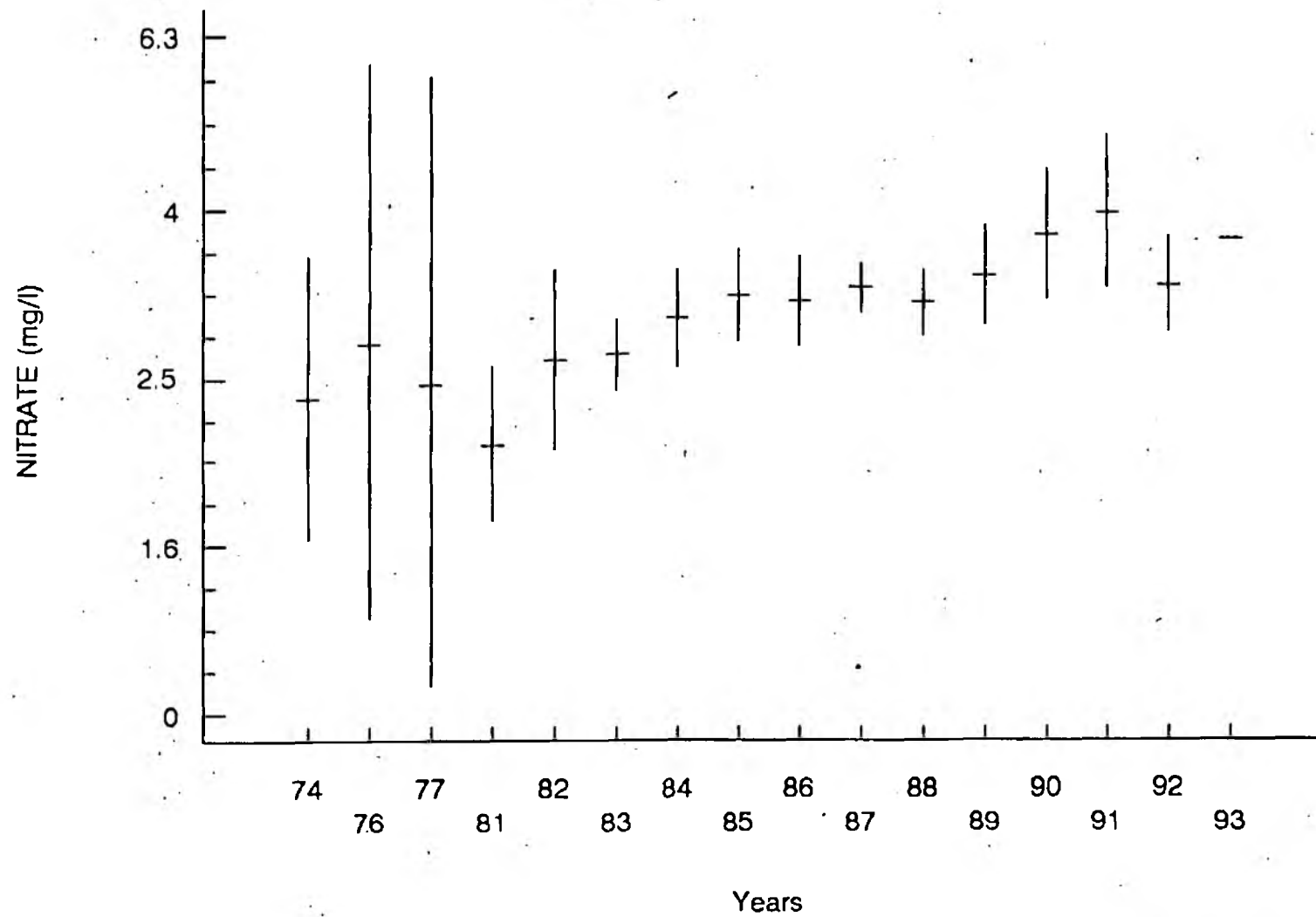
Means and 95% Confidence Intervals
BOD, Weston, 1974-1993



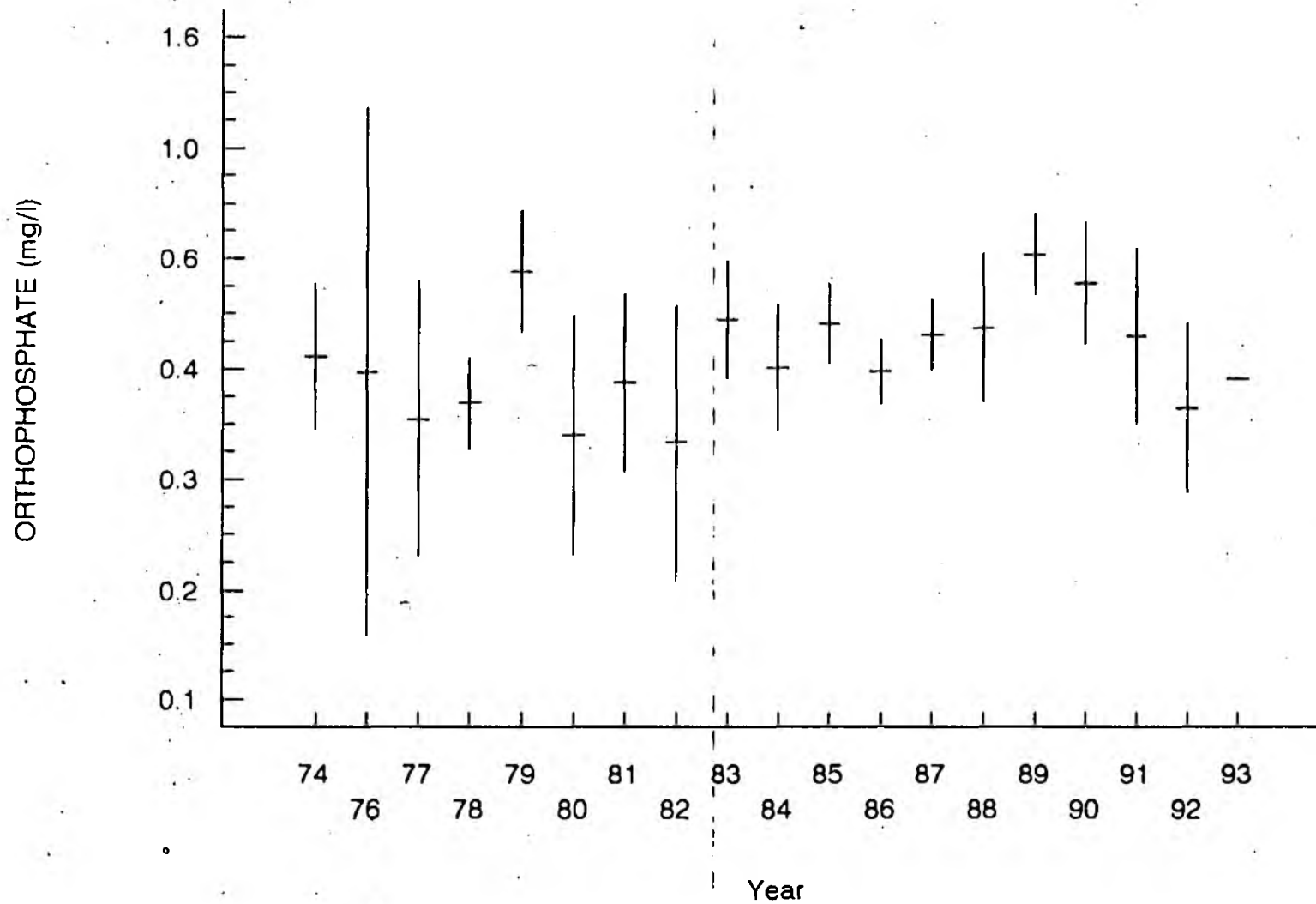
Means and 95% Confidence Intervals
Total Ammonia, Weston, 1974-1993



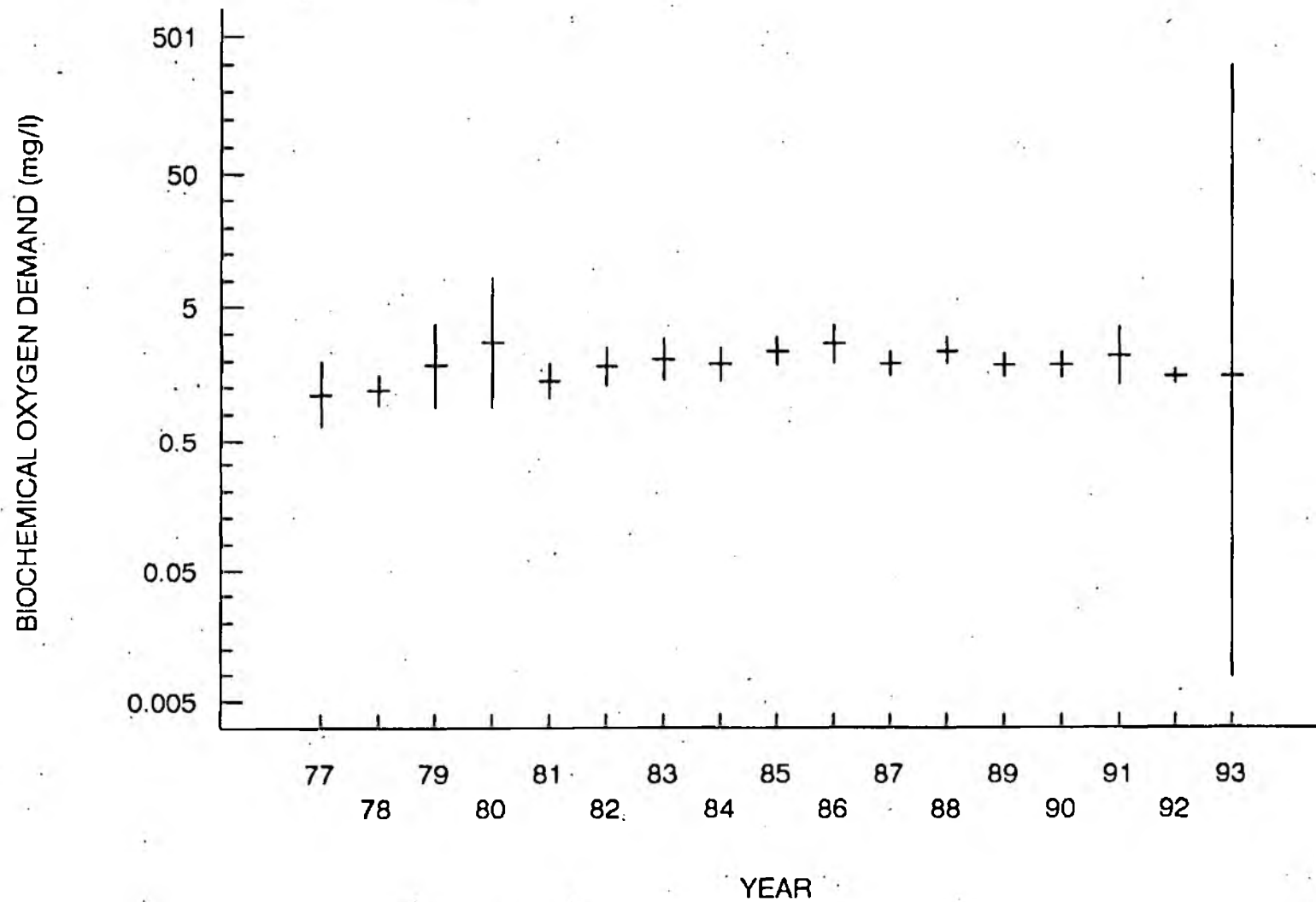
Means and 95% Confidence Intervals
Nitrate, Weston, 1974-1993

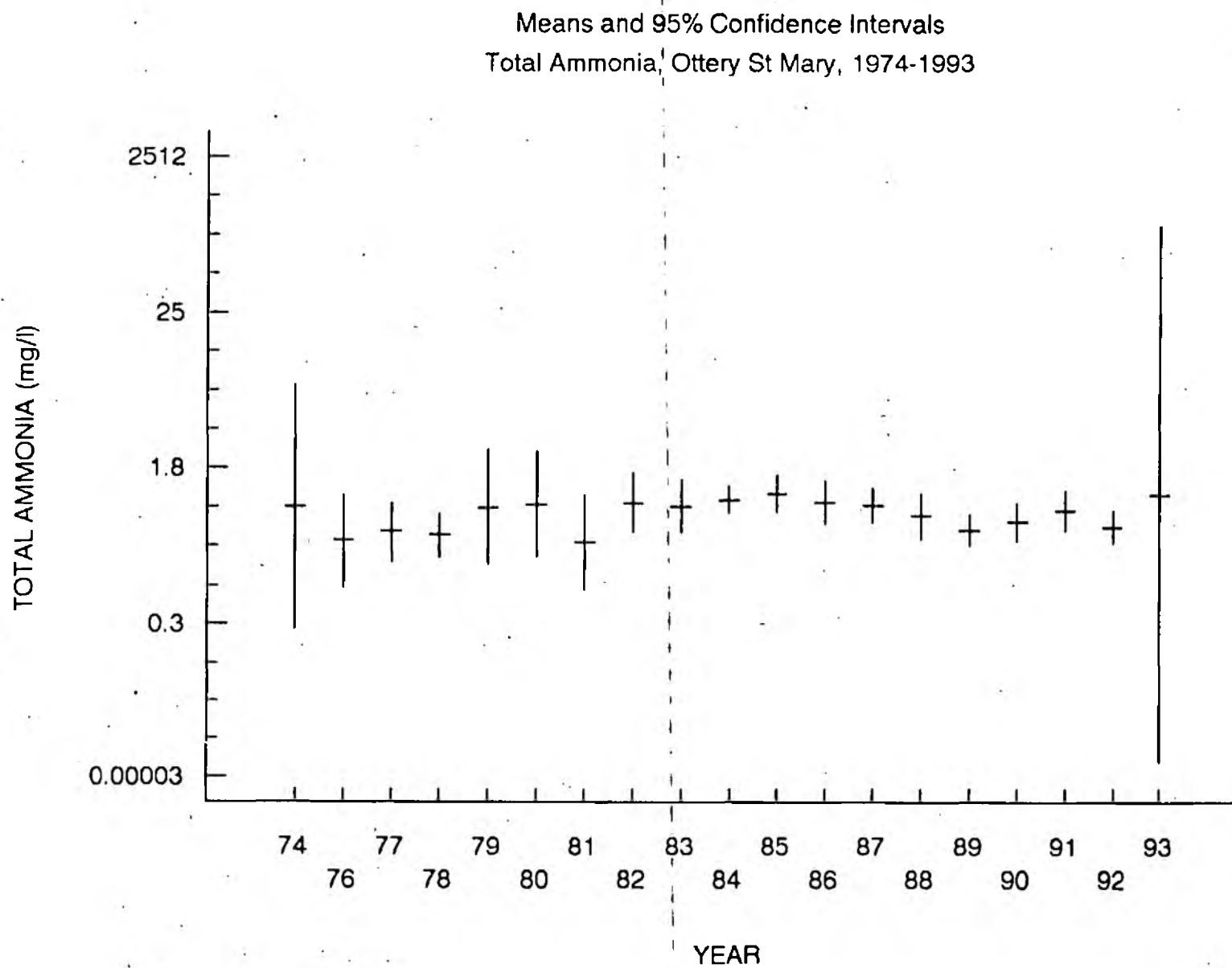


Means and 95% Confidence Intervals
Orthophosphate, Weston, 1974-1993

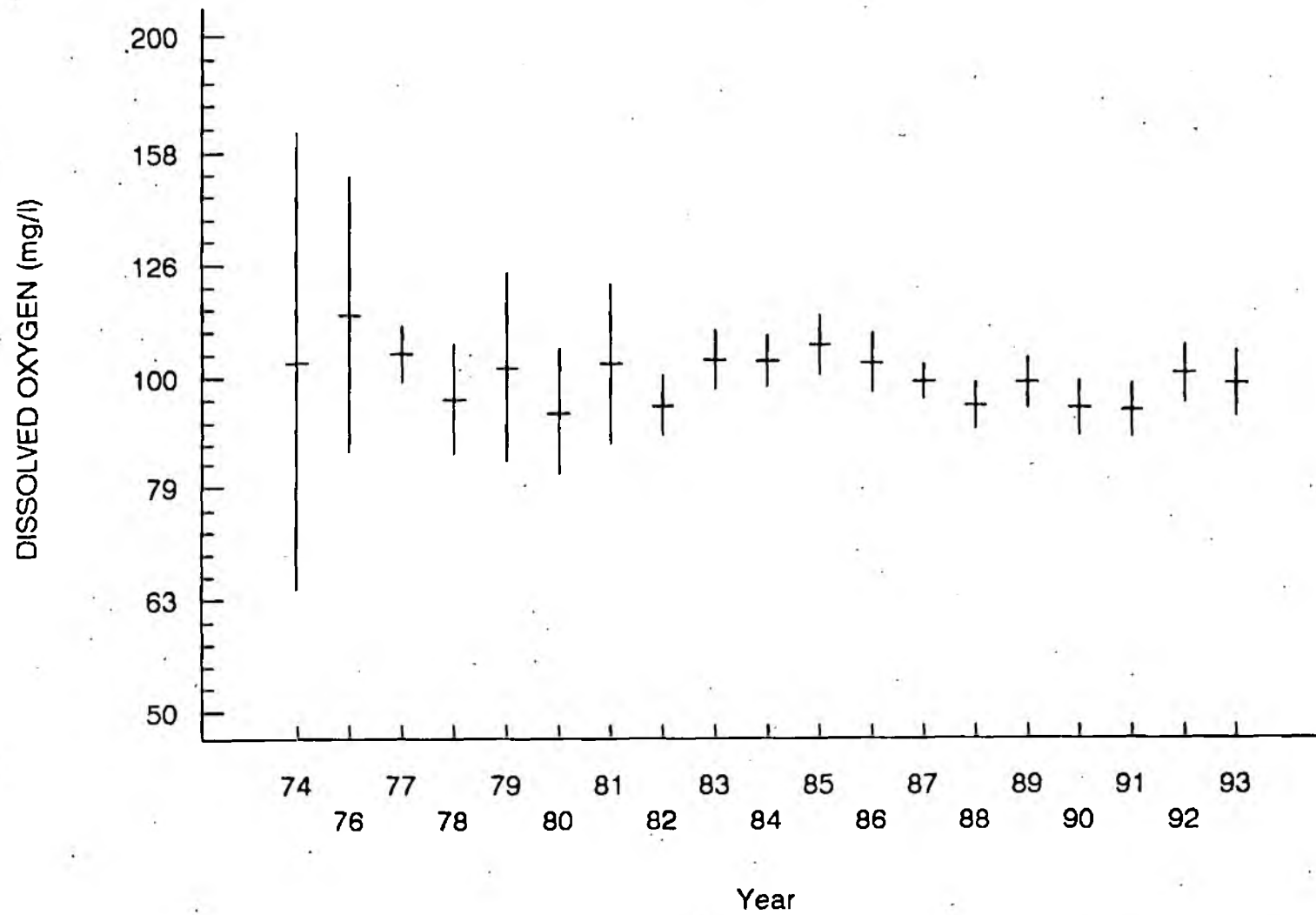


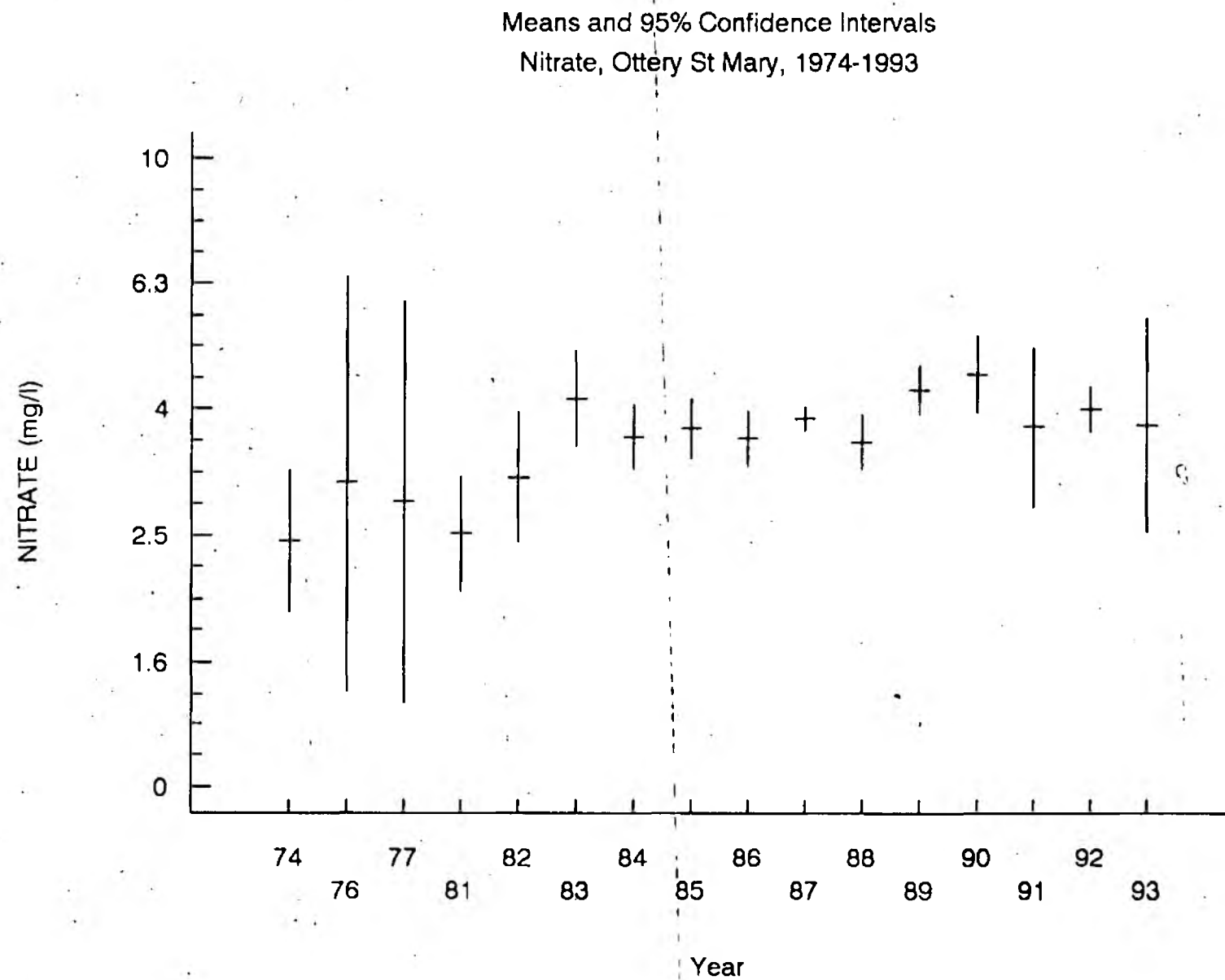
Means and 95% Confidence Intervals
BOD, Ottery St.Mary, 1974-1993



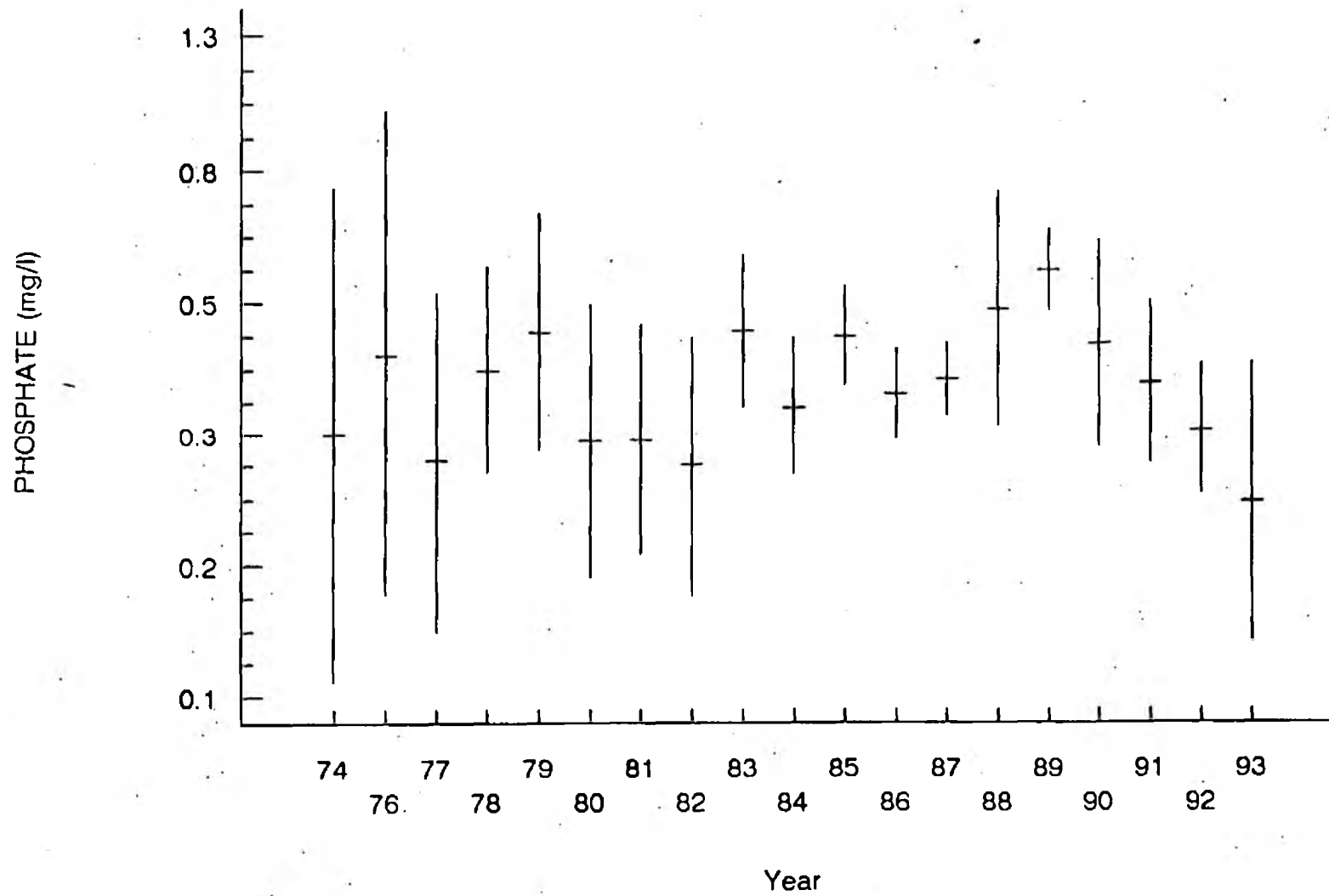


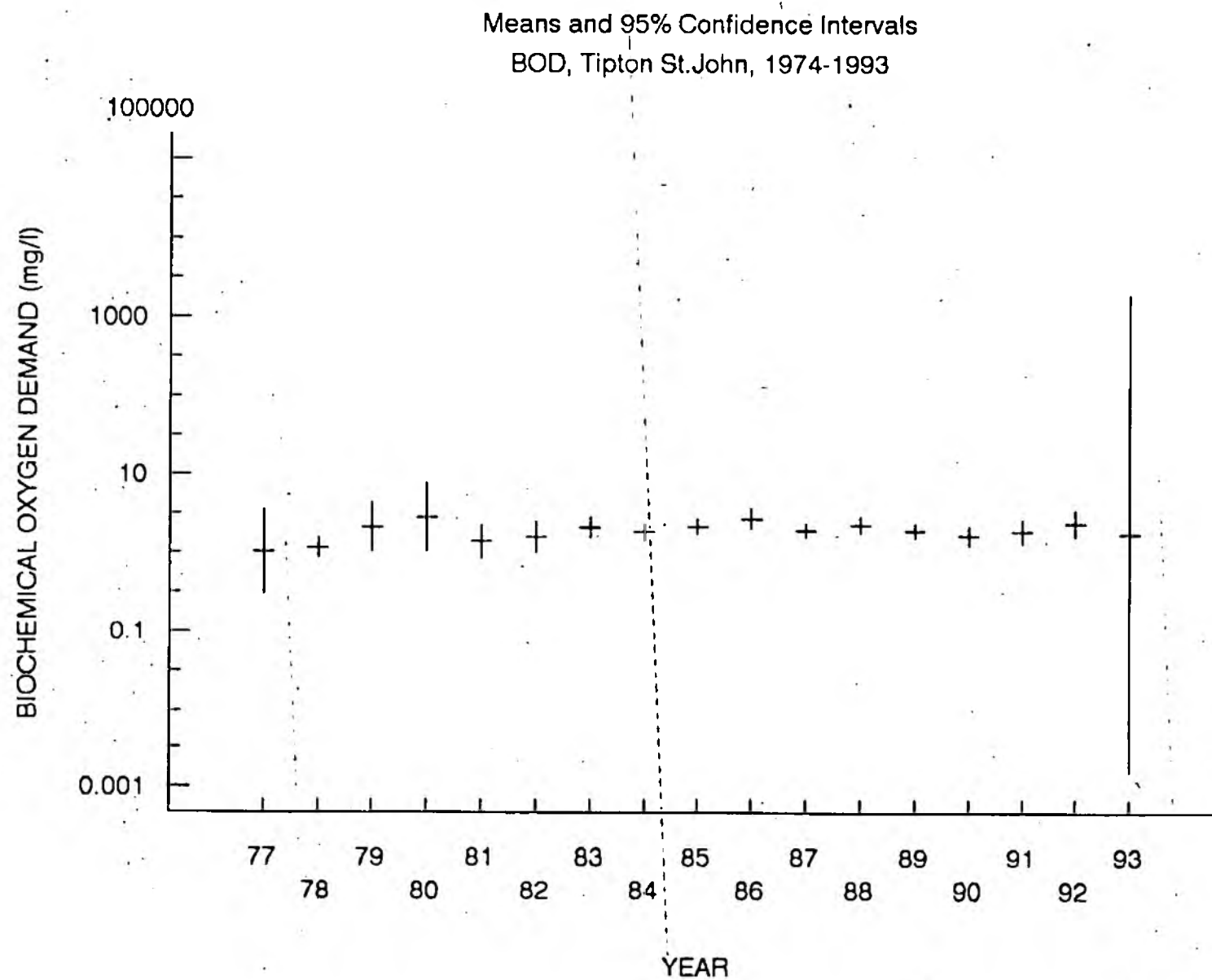
Means and 95% Confidence Intervals
DO, Ottery St. Mary, 1974-1993



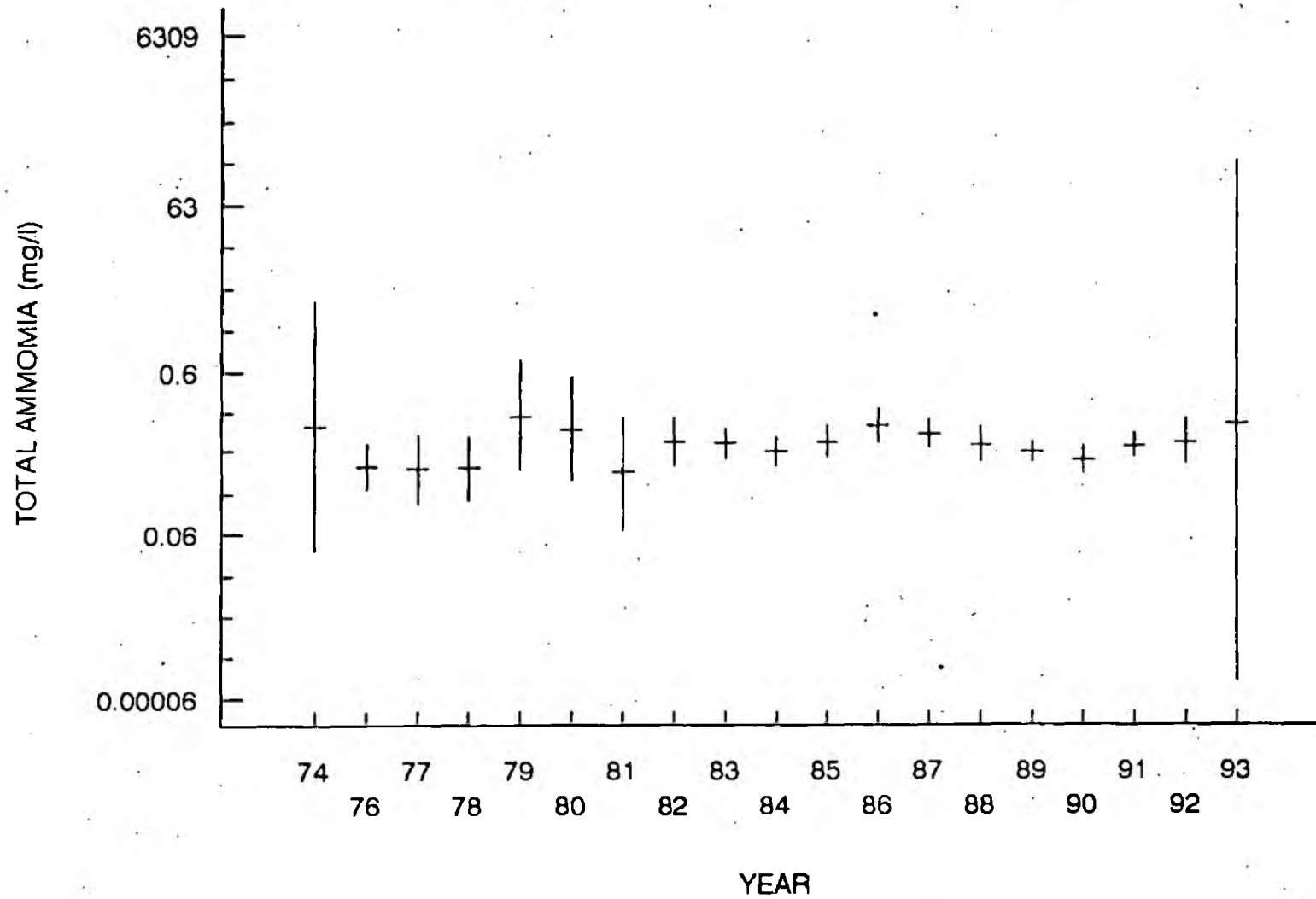


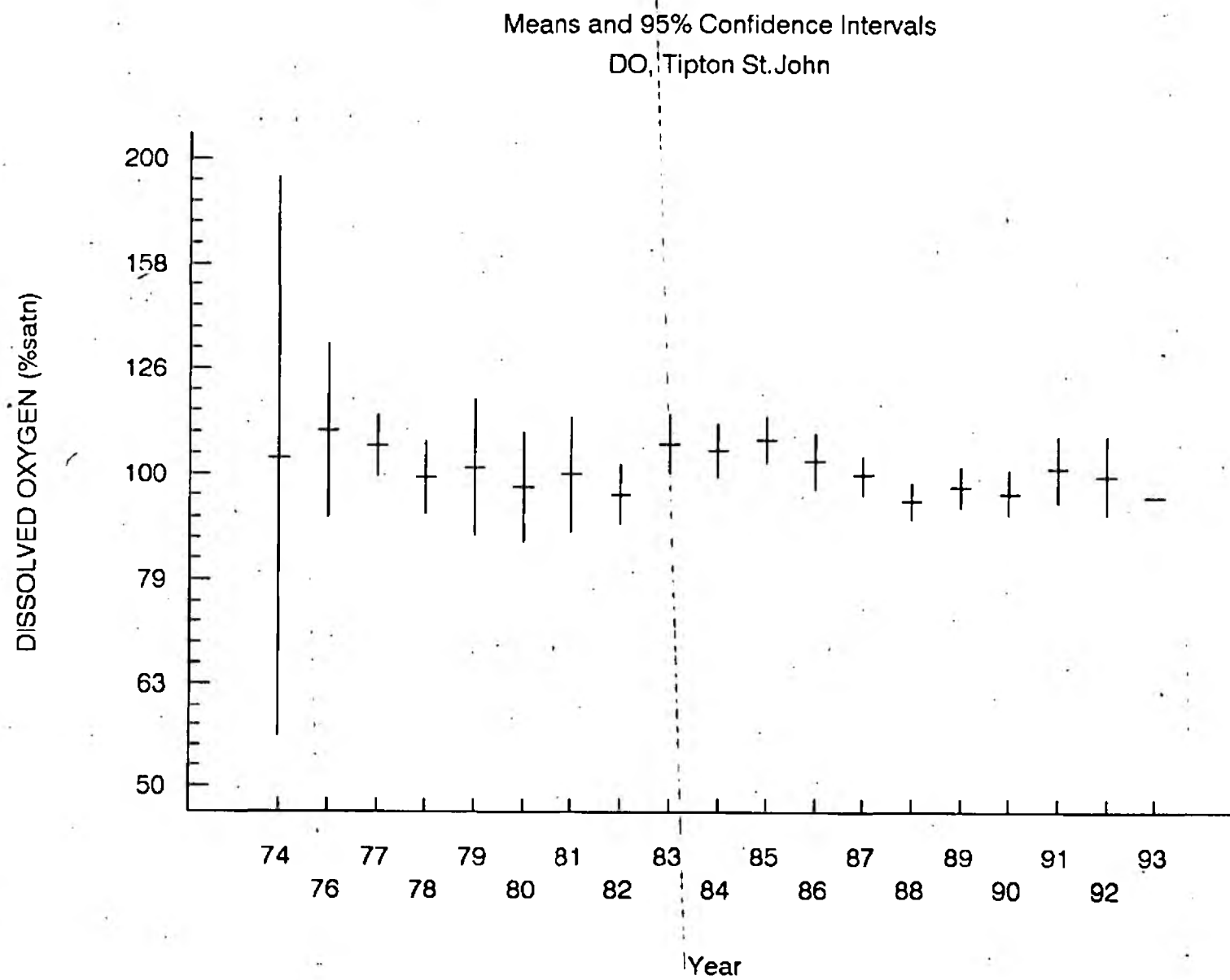
Means and 95% Confidence Intervals
Orthophosphate, Ottery St. Mary, 1974-1993



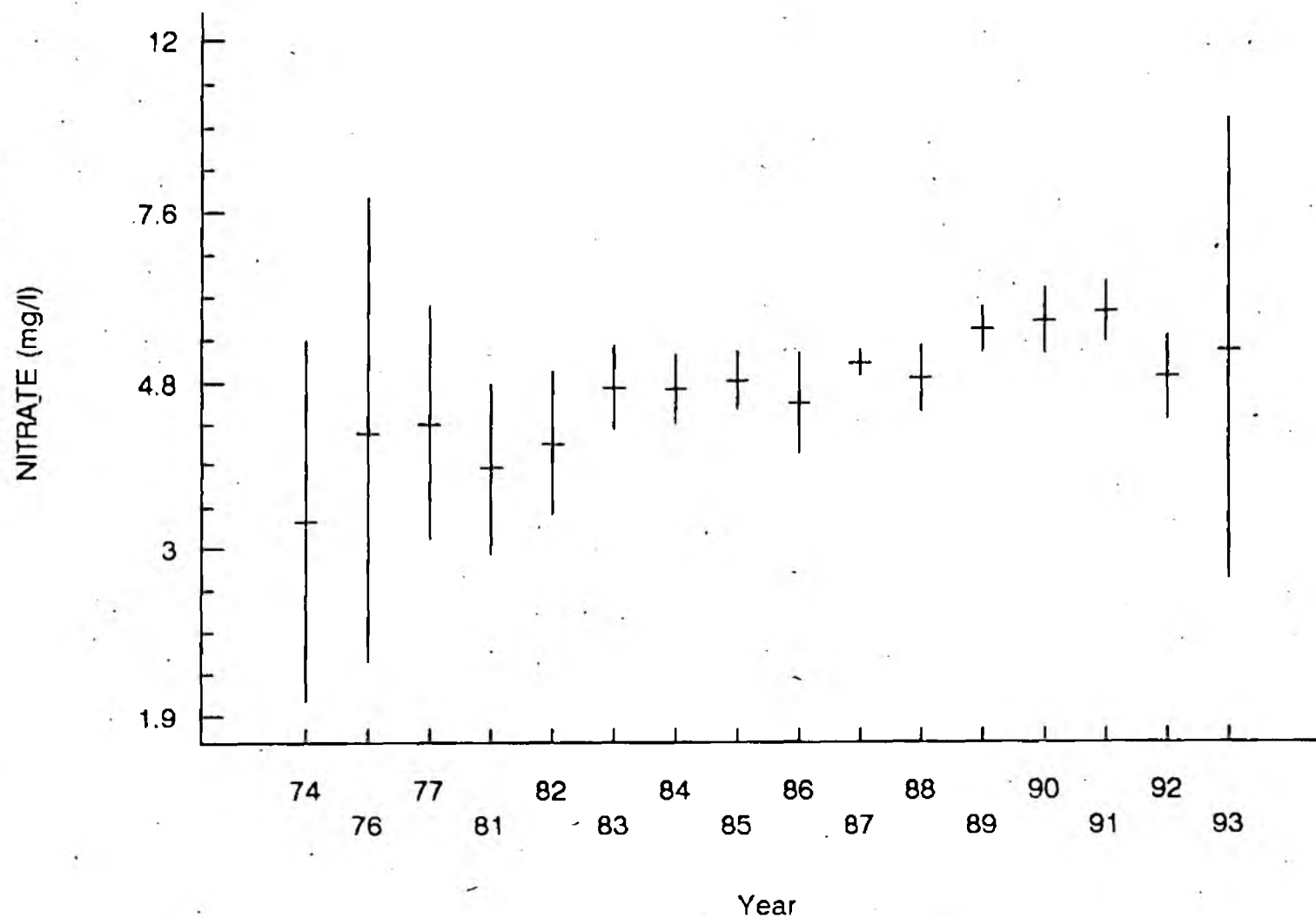


Means and 95% Confidence Intervals
Total Ammonia, Tipton St. John, 1974-1993

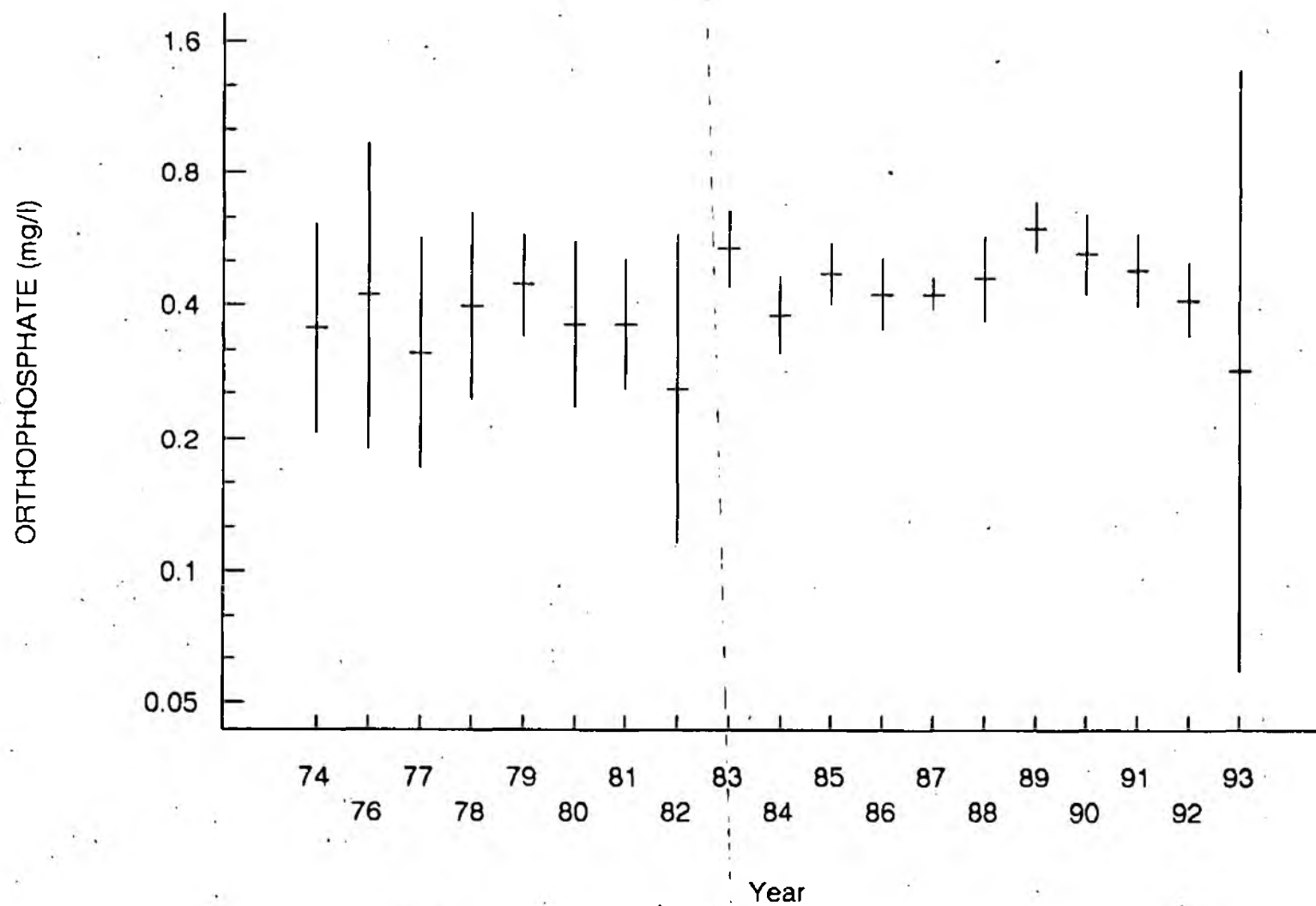




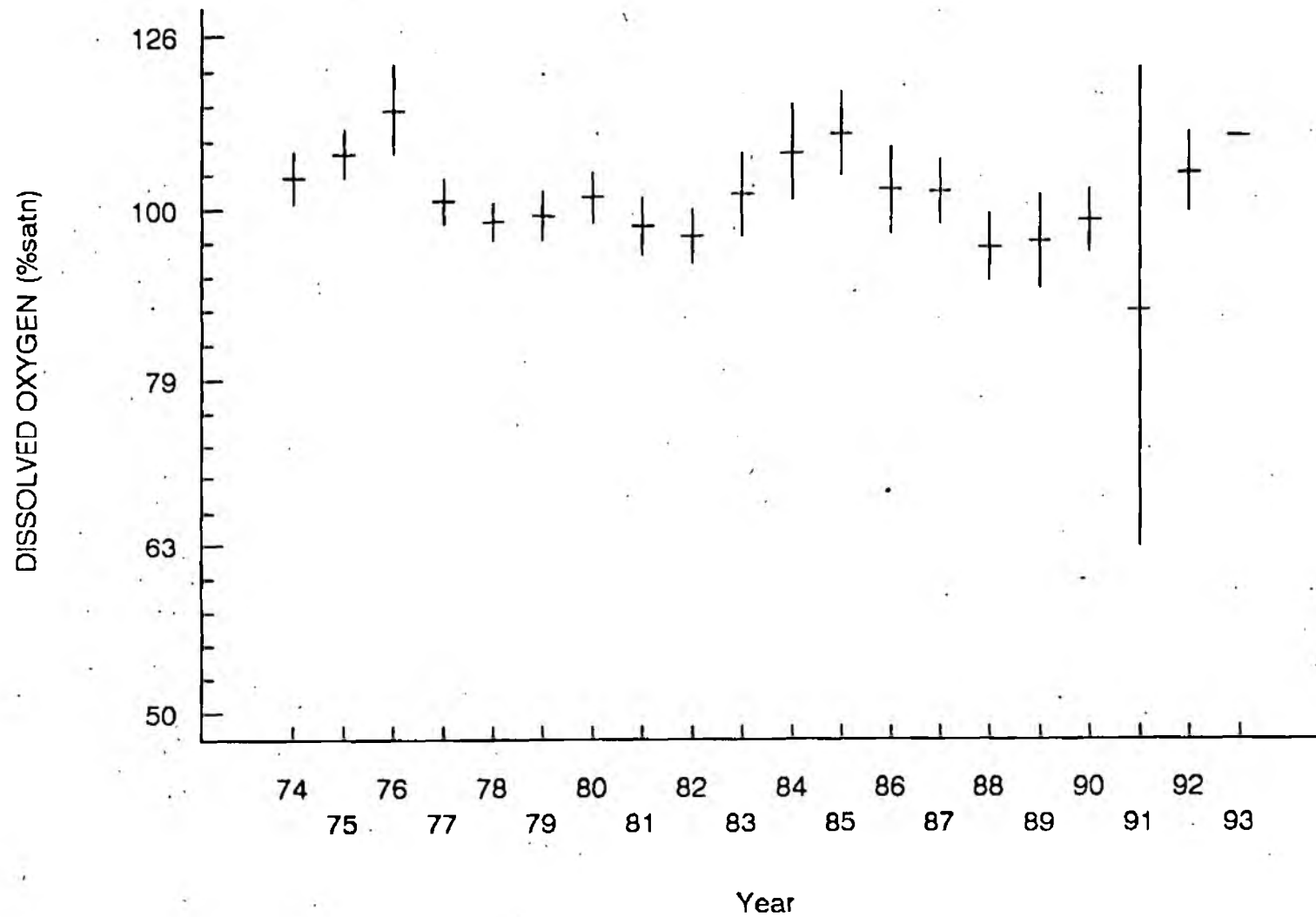
Means and 95% Confidence Intervals
Nitrate, Tipton St John, 1974-1993

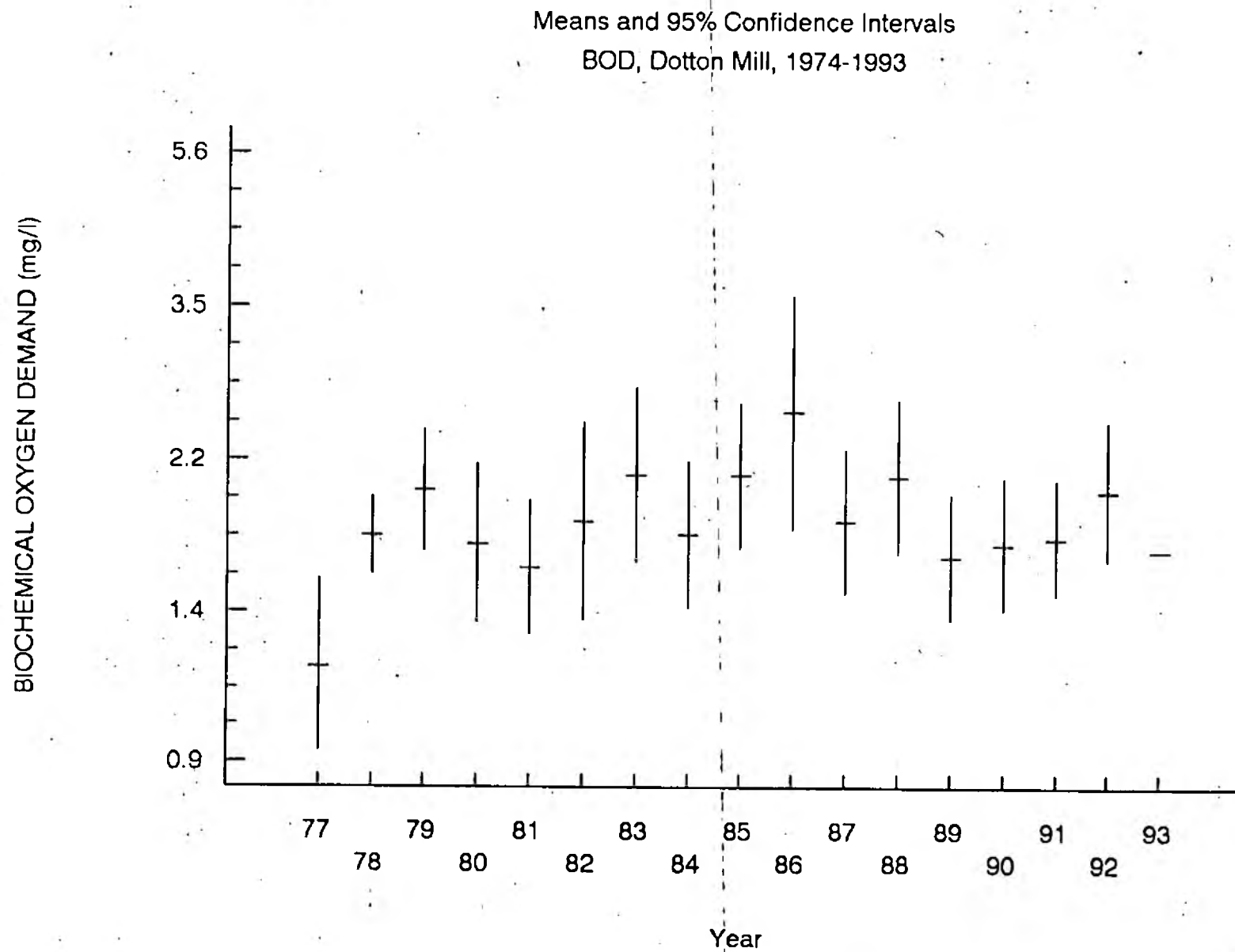


Means and 95% Confidence Intervals
Orthophosphate, Tipton St John, 1974-1993

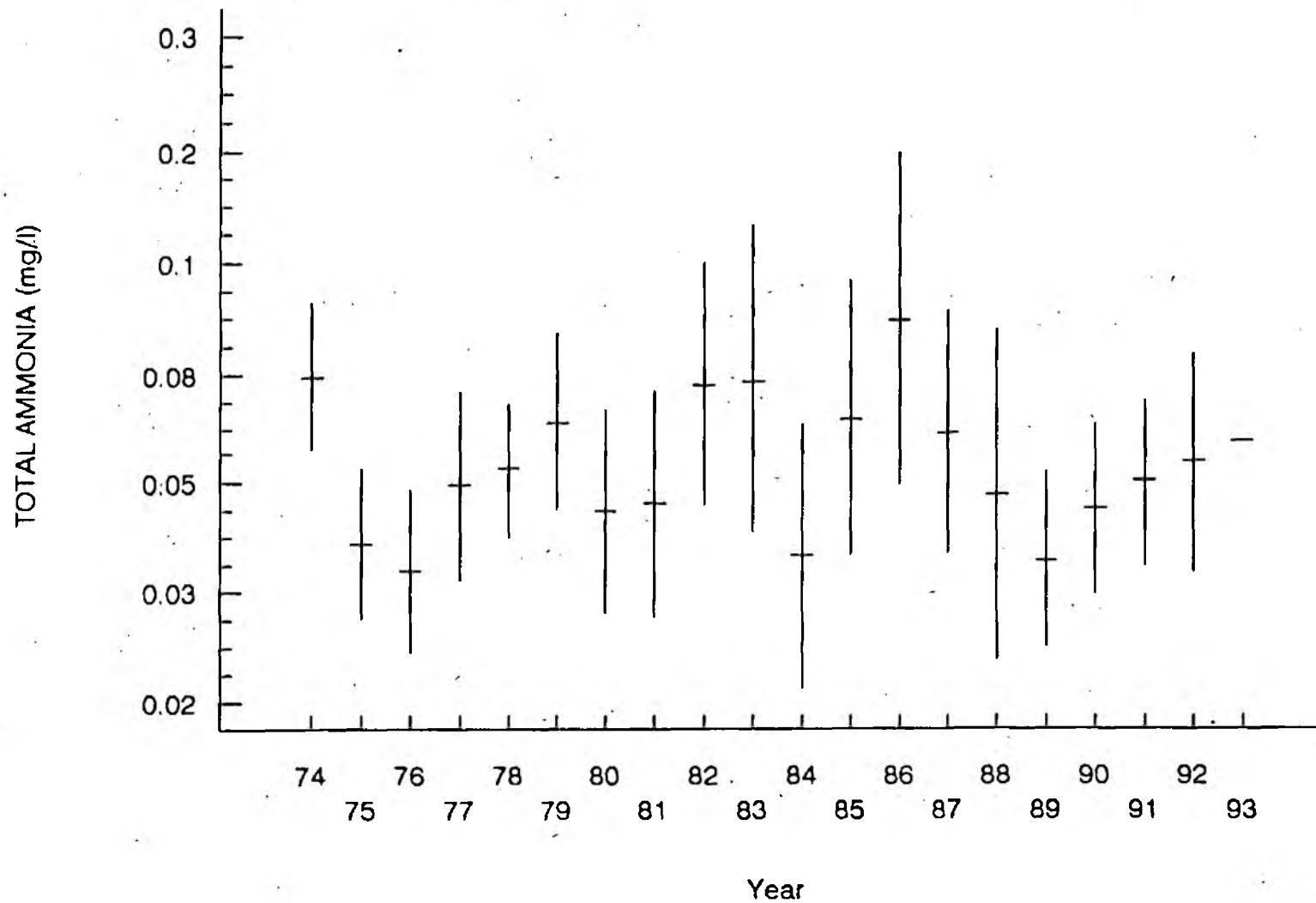


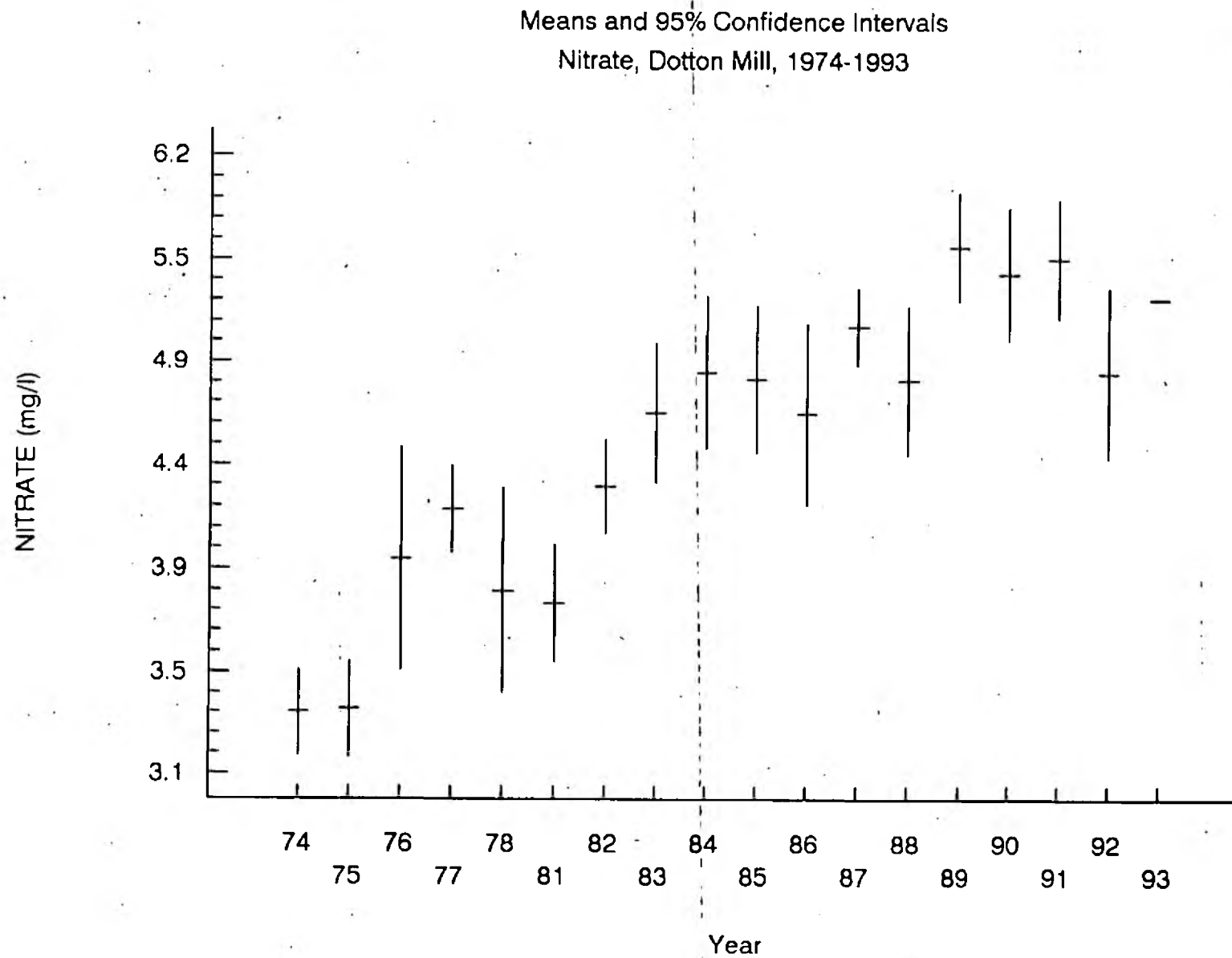
Means and 95% Confidence Intervals
DO, Dotton Mill, 1974-1993



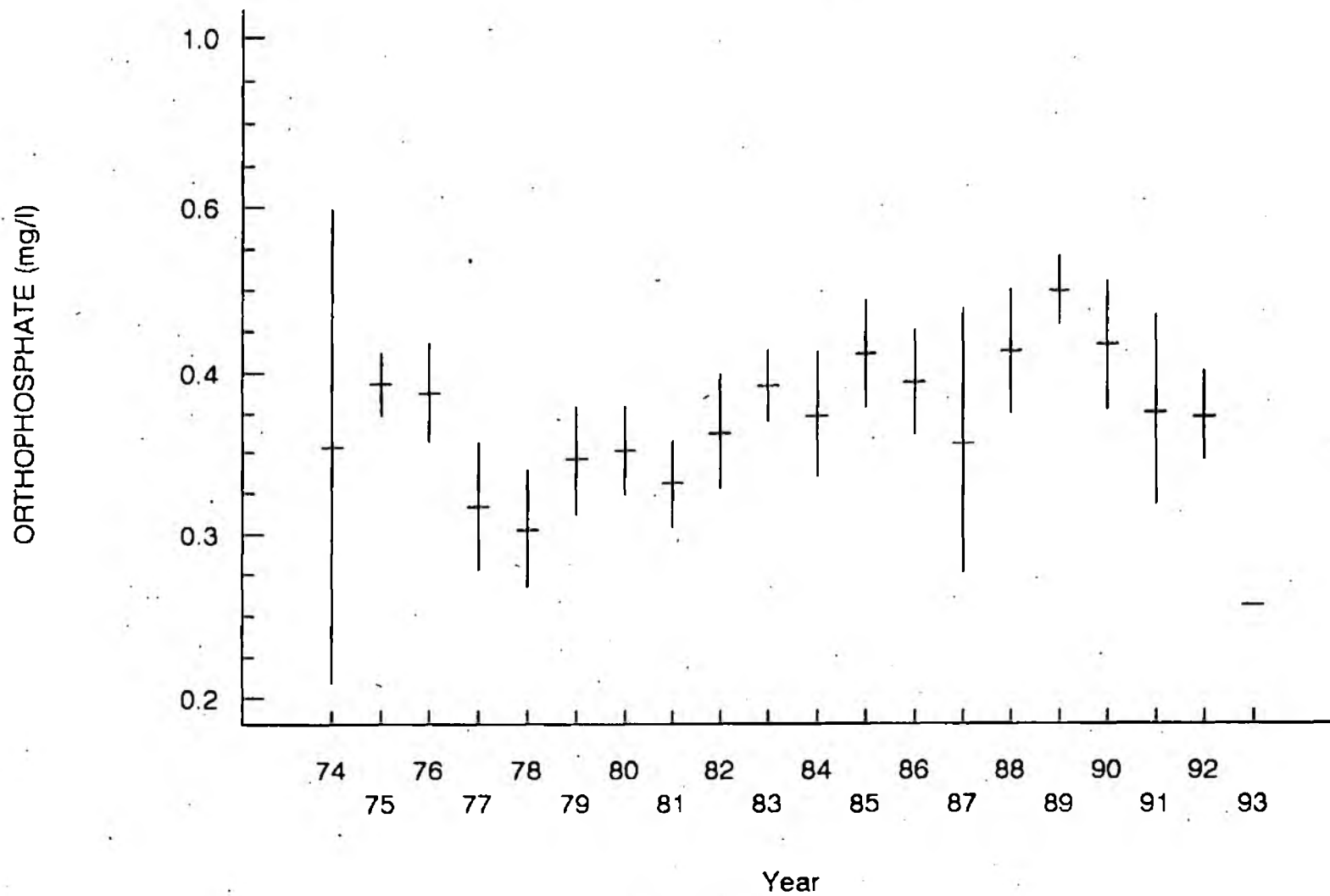


Means and 95% Confidence Intervals
Total Ammonia, Dotton Mill, 1974-1993

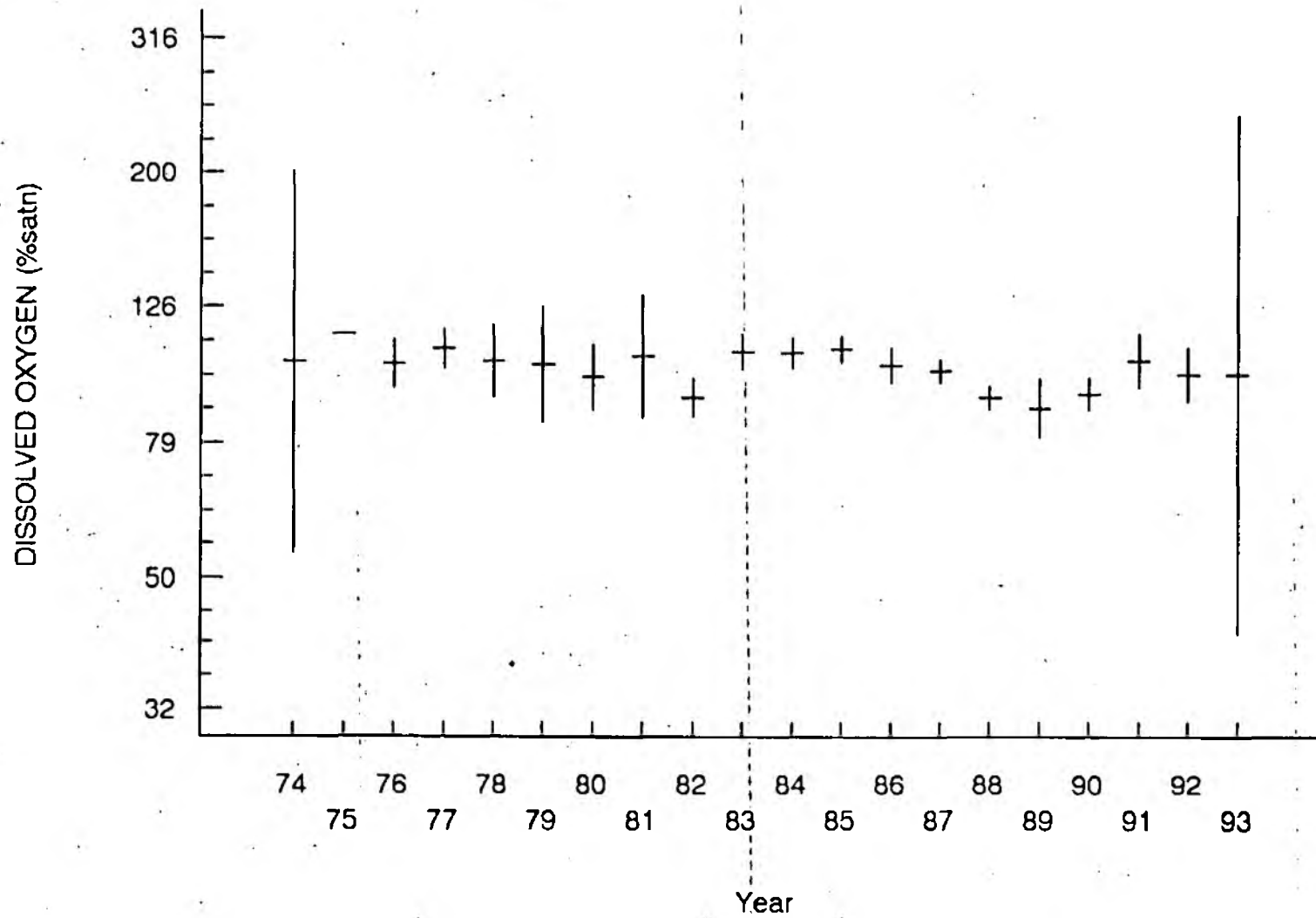




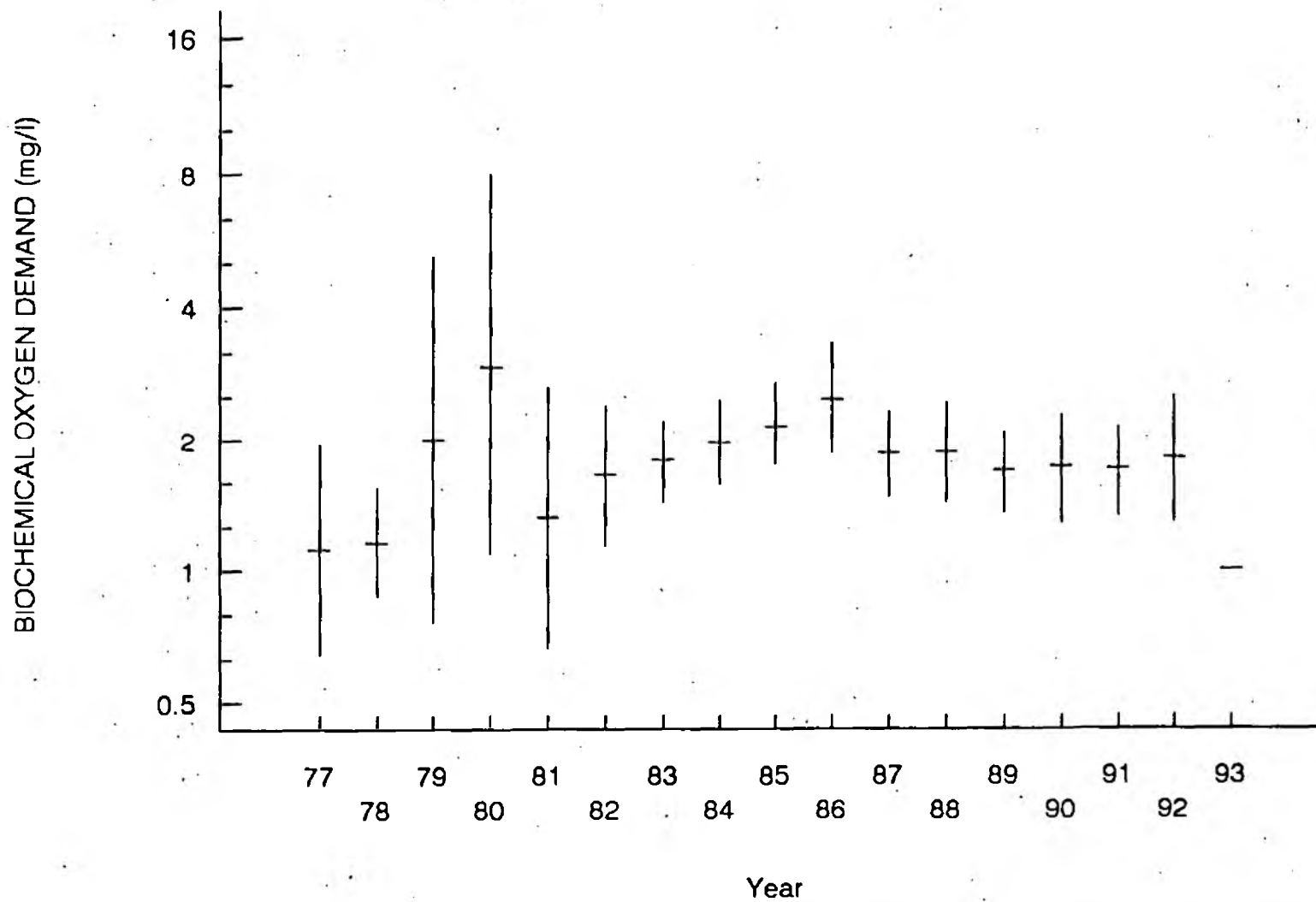
Means and 95% Confidence Intervals
Orthophosphate, Dotton Mill, 1974-1993



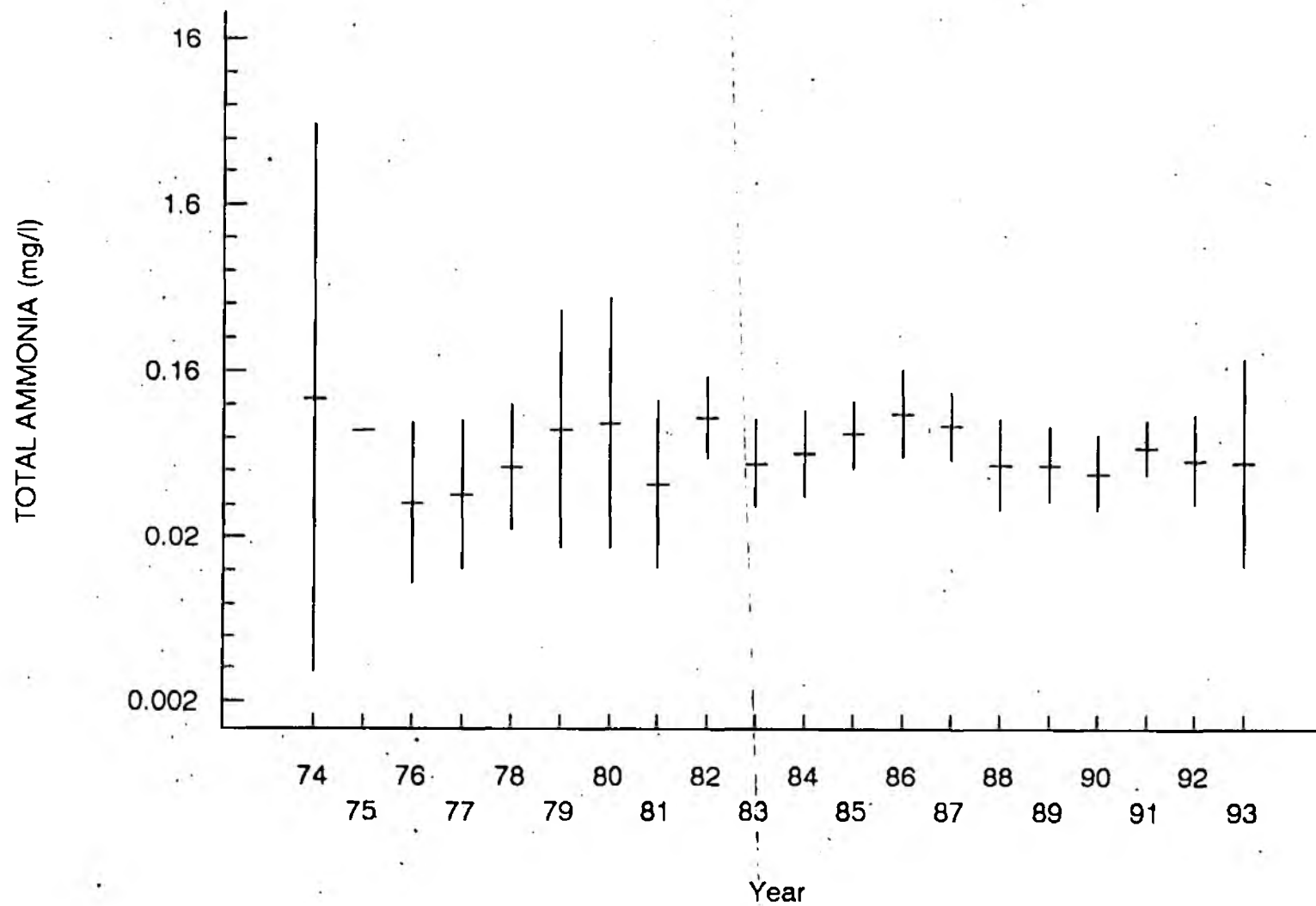
Means and 95% Confidence Intervals
DO, Otterton, 1974-93

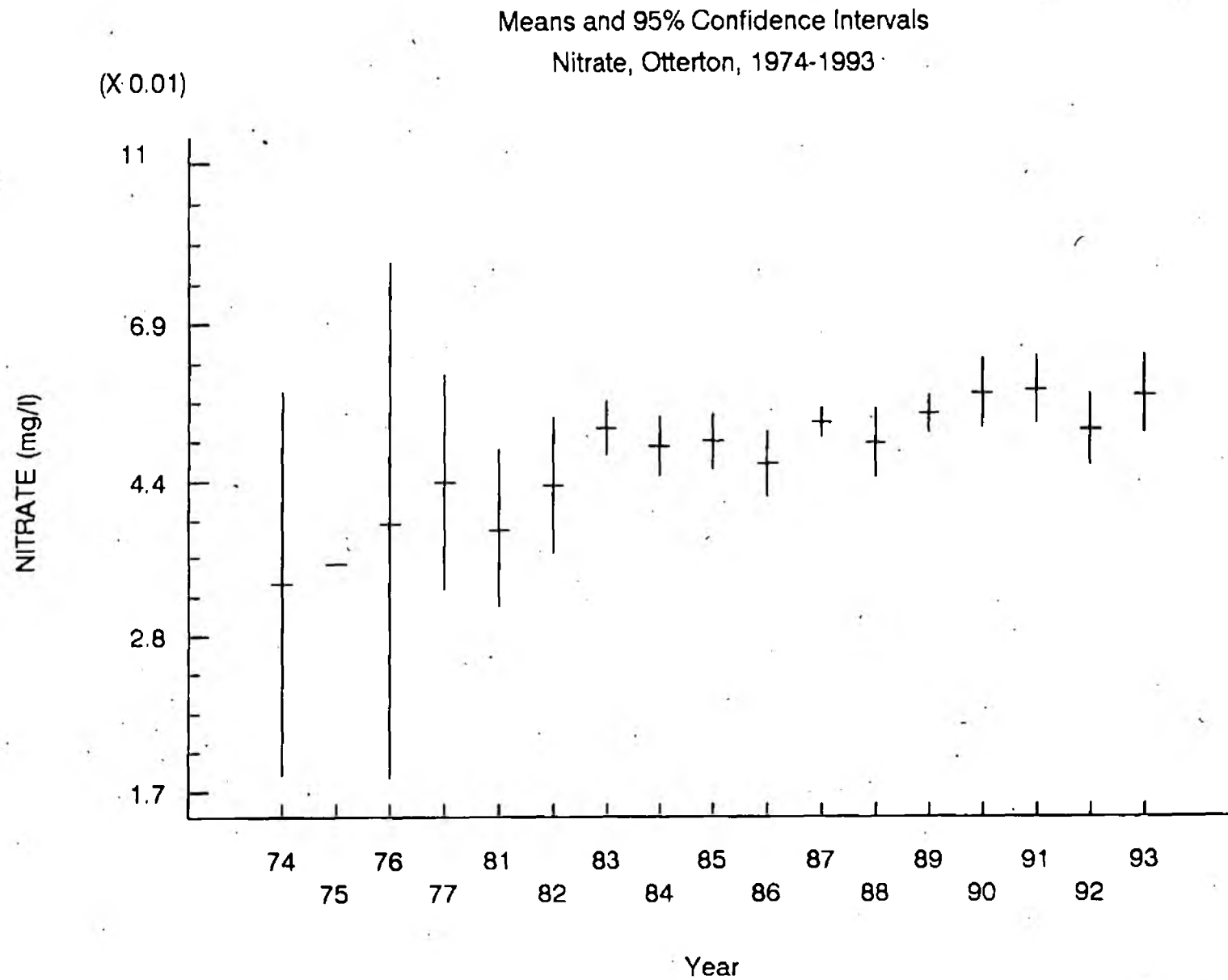


Means and 95% Confidence Intervals
BOD, Otterton, 1974-1993



Means and 95% Confidence Intervals
Total Ammonia, Otterton, 1974-1993





Means and 95% Confidence Intervals
Orthophosphate, Otterton, 1974-1993

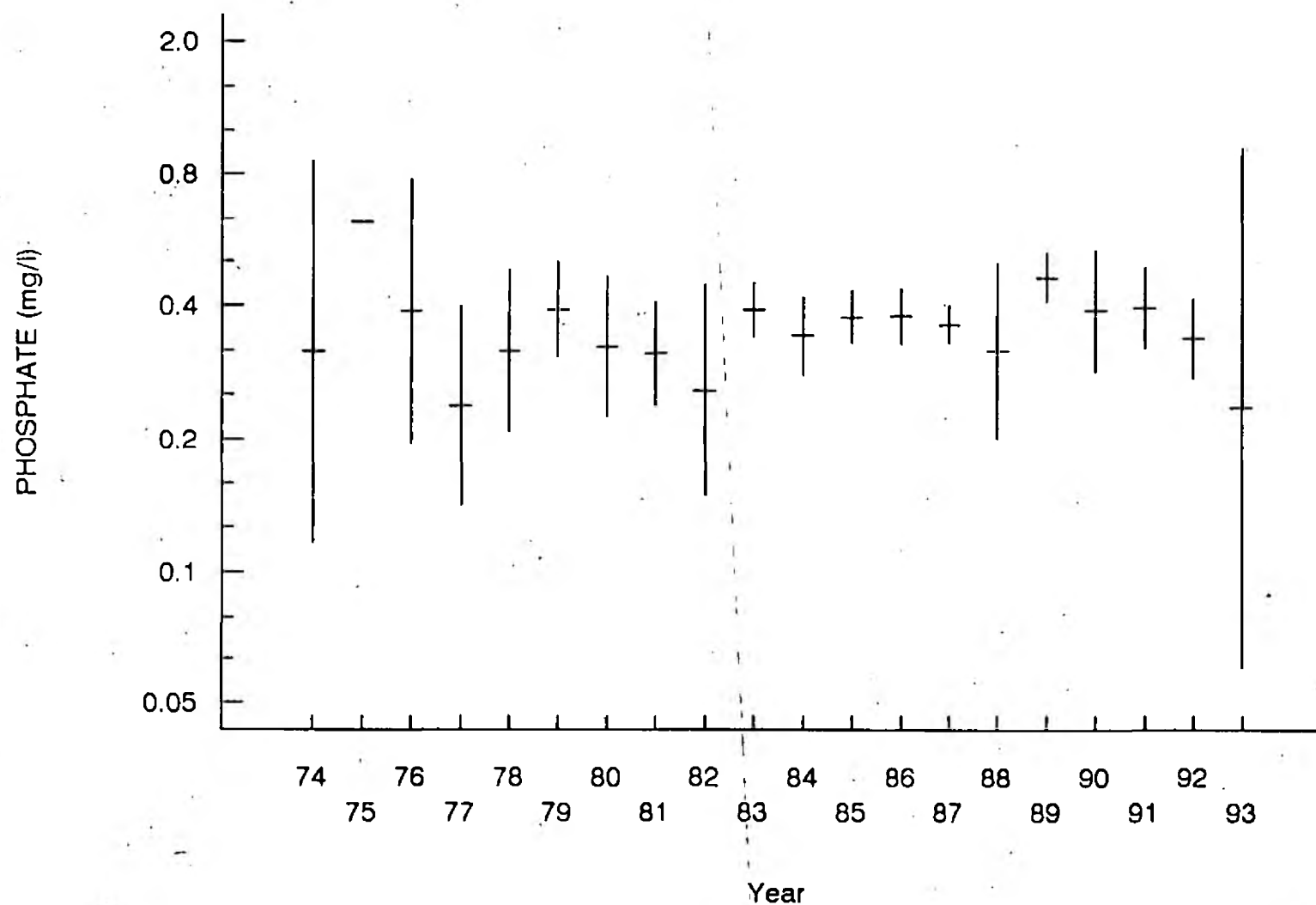


Figure 3.3.1A: River Otter – Biological Data
ASPT Scores

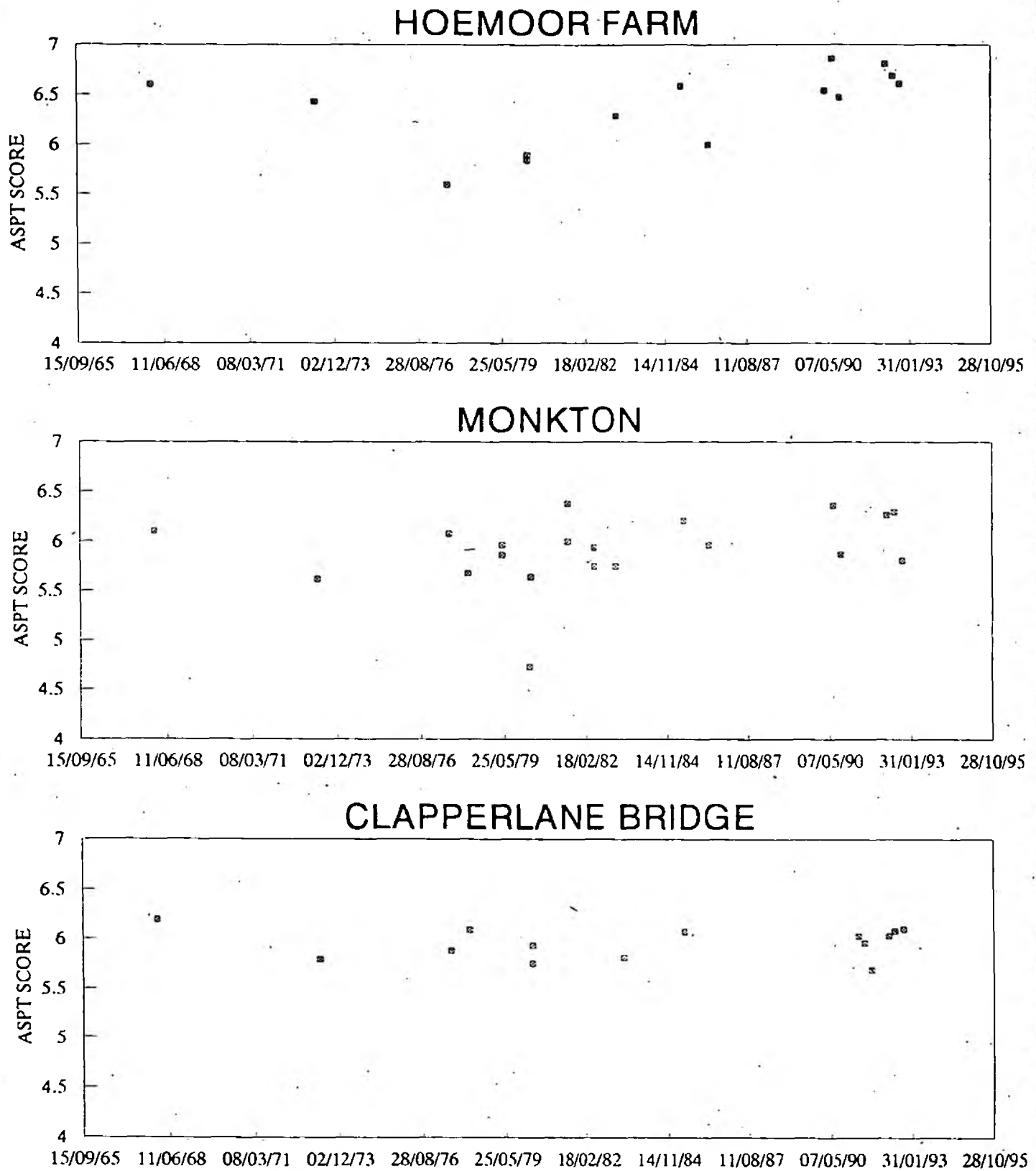
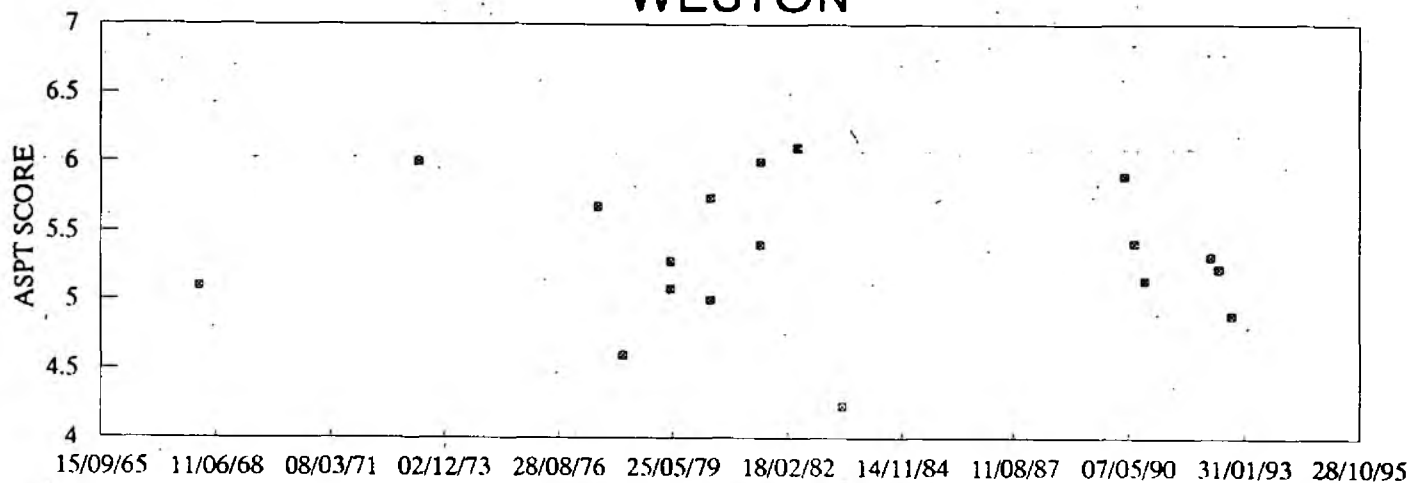
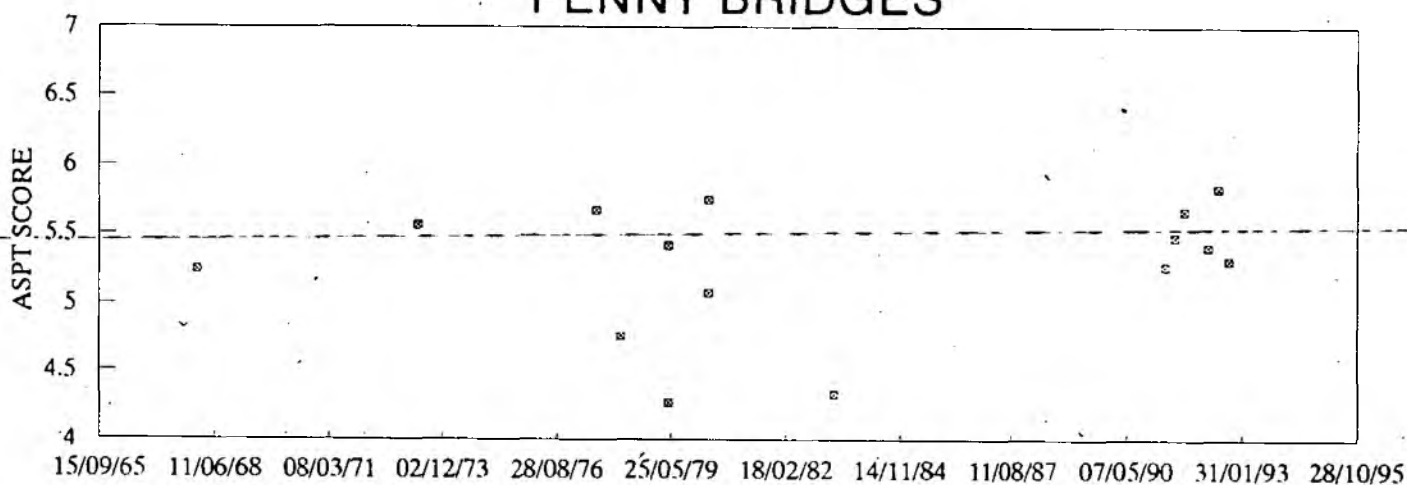


Figure 3.3.1B: River Otter – Biological Data
ASPT Scores

WESTON



FENNY BRIDGES



B3176 BRIDGE OTTERY ST.MARY

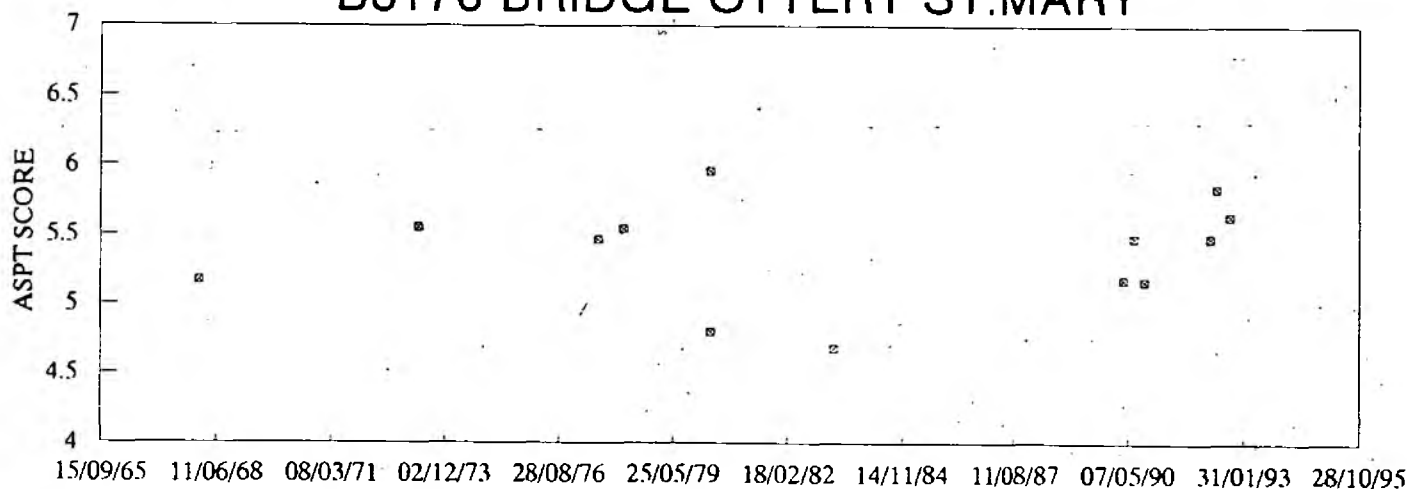


Figure 3.3.1C: River Otter – Biological Data
ASPT Scores

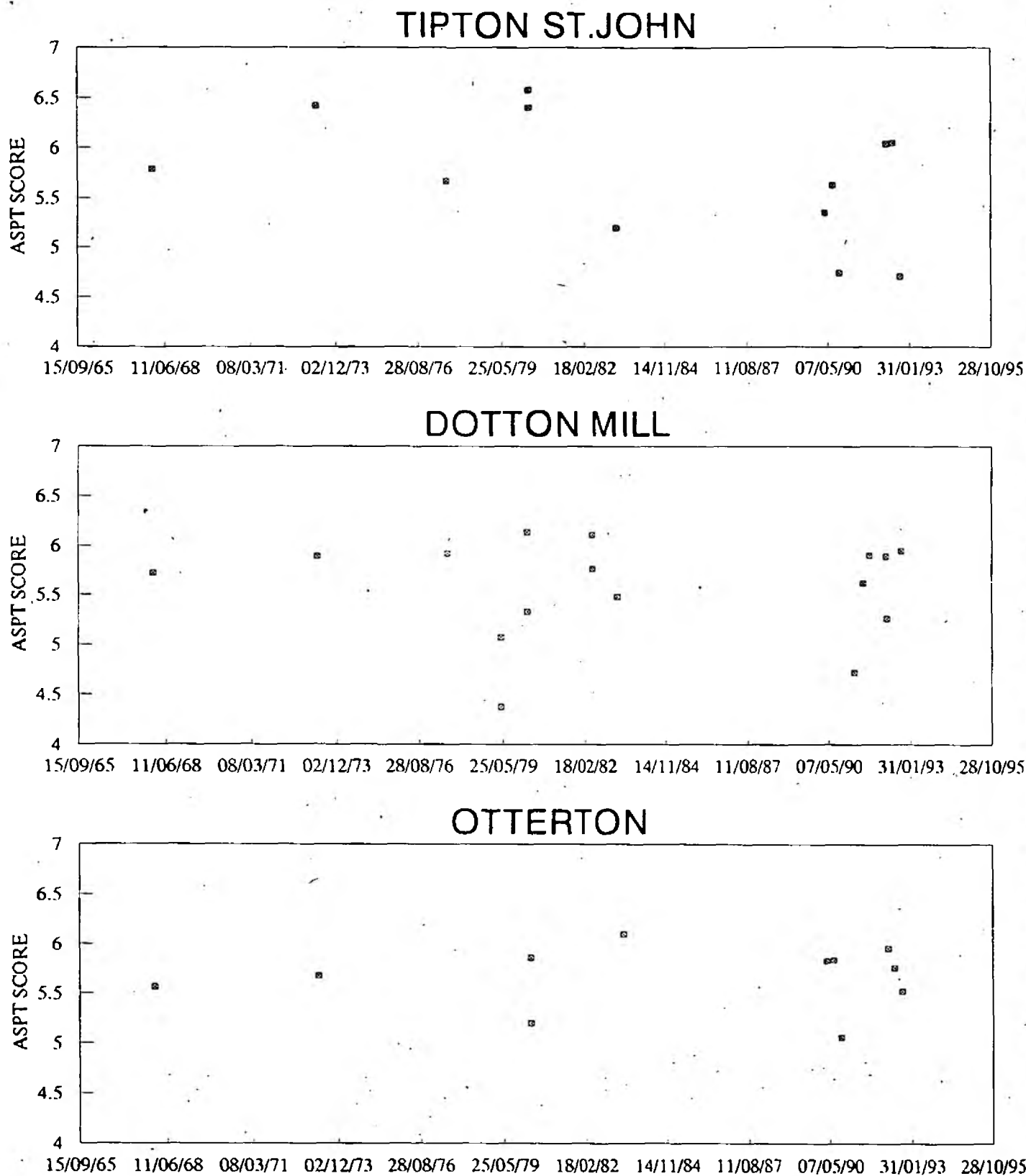


Figure 3.5.1: River Otter – Fisheries Data
Rod Catches 1968–92

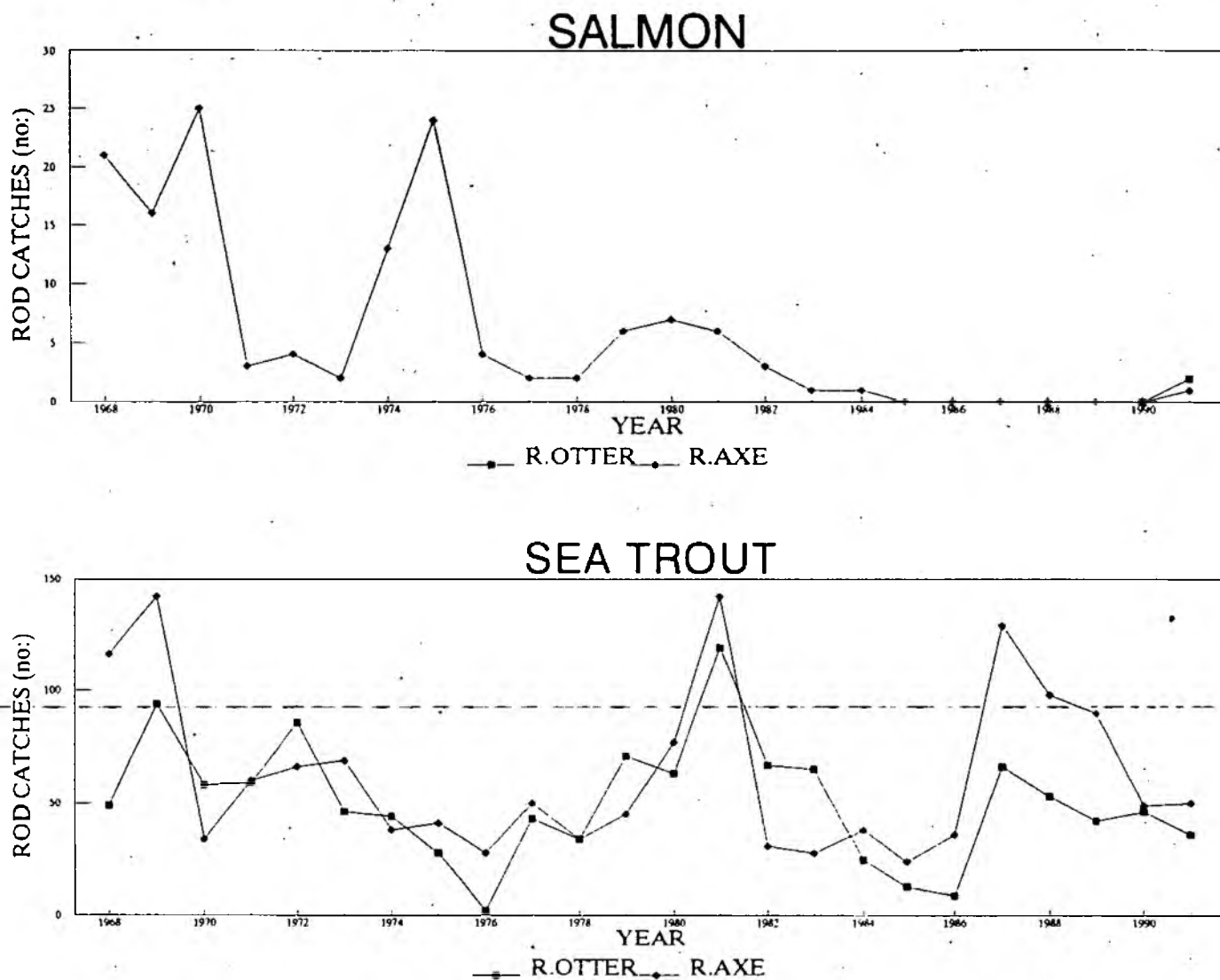
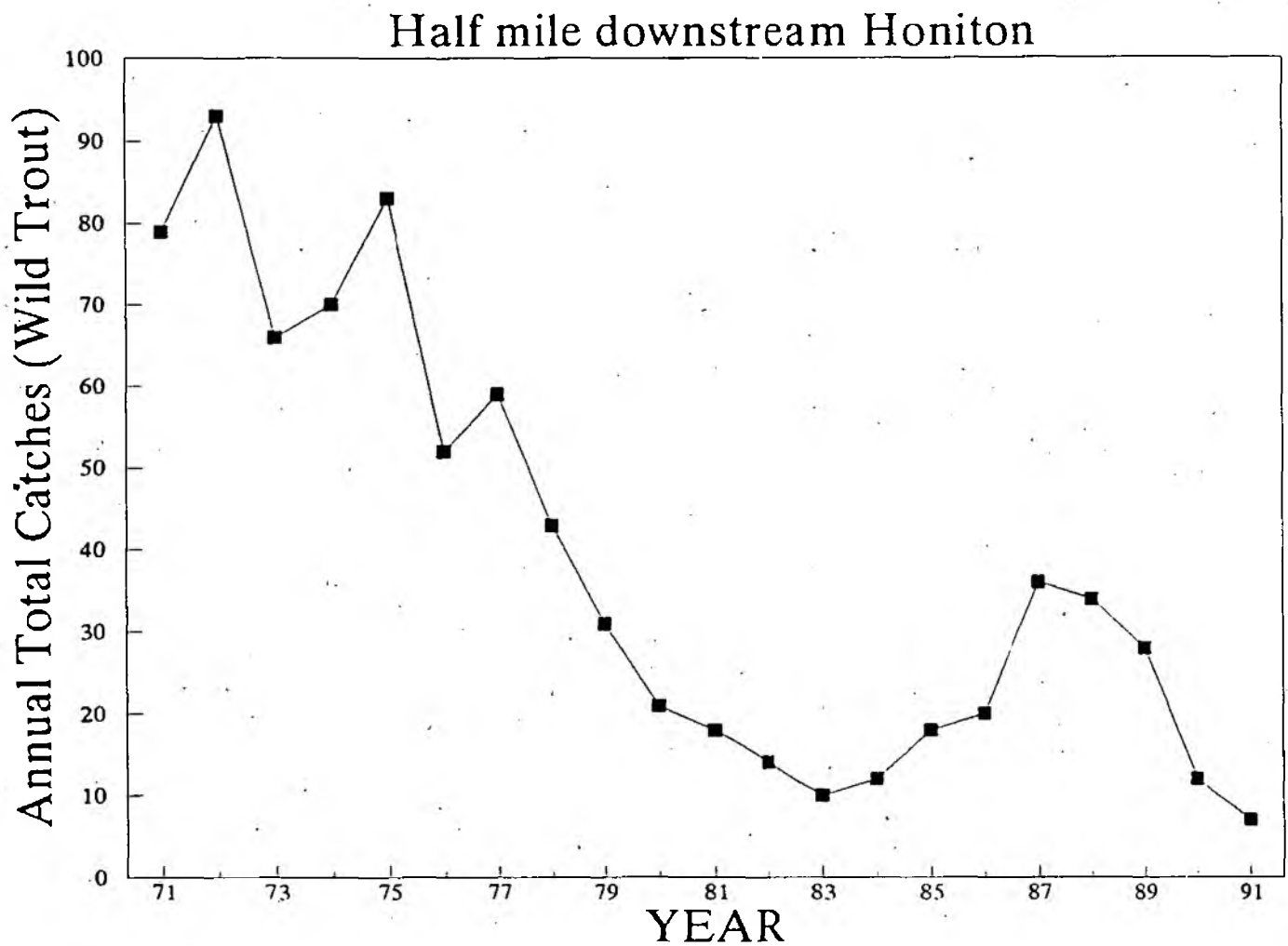


Figure 3.5.2: River Otter – Fisheries Data
Annual Catch – Honiton



Graph produced by River Otter Association

TABLES

Table 3.1.3 i)
Net Authorised and Actual Abstraction (megalitres) for River Otter Reach Catchments 1973, 1982 and 1992

Reach Catch.	Category	1973 Auth.	1973 Cum. Auth.	1973 Actual	1973 Cum. Actual	1982 Auth.	1982 Cum. Auth.	1982 Actual	1982 Cum. Actual	1992 Auth.	1992 Cum. Auth.	1992 Actual	1992 Cum. Actual
A	S.W.U. - Otterhead	909	909	69	69	909	909	434	434	909	909	658	658
	Non-S.W.U.	10	919	5	74	8	917	4	438	8	917	4	662
	Total	919	919	74	74	917	917	438	438	917	917	662	662
B	S.W.U. - St Cyres Spring	166	1085	176	249	166	1083	173	611	166	1083	5	667
	Non-S.W.U.	224	1309	112	361	233	1316	113	724	242	1325	121	788
	Total	390	1309	287	361	399	1316	286	724	408	1325	126	786
C	S.W.U. (no sources)	0	1309	0	361	0	1316	0	724	0	1325	0	788
	Non-S.W.U.	166	1474	72	433	167	1473	79	803	134	1469	66	863
	Total	166	1474	72	433	167	1473	79	803	134	1469	66	863
D	S.W.U. - Grestwell b/h group	2208	3682	1618	1961	3117	4690	1617	2420	3118	4677	2753	3606
	Non-S.W.U.	166	3848	76	2027	165	4755	76	2496	242	4819	139	3745
	Total	2374	3848	1694	2027	3282	4786	1693	2496	3360	4819	2892	3748
E	S.W.U. - Harpford b/h group	2393	6241	1644	3671	2884	7639	1664	4160	1716	6636	1409	6164
	- Dotton 4,6 b/h	1593	7834	647	4238	1693	9232	730	4890	230	6766	176	6332
	Non-S.W.U.	88	7902	34	4272	78	9310	36	4926	129	6894	37	6369
	Total	4064	7902	2245	4272	4555	9310	2430	4926	2075	6894	1624	6369
F	S.W.U. - Dotton 1-3,7 b/h	3615	11817	2220	6492	3916	13225	2889	7616	3916	10809	2634	7903
	- Col. Ral. 2,4 b/h	0	11817	0	6492	946	14170	163	7978	946	11784	373	6276
	- Otterton 1A, 4 b/h	0	11817	0	6492	0	14170	0	7978	2313	14067	1248	8624
	- Tidwell 5p b/h	1292	13209	889	7361	2126	16295	917	8895	2124	16191	661	10076
	Non-S.W.U.	77	13286	31	7392	77	16372	37	8932	170	16361	66	10133
	Total	6384	13286	3120	7392	7062	16372	4066	8932	6467	16361	4764	10133
Total Abstraction		13286		7392		16372		8932		16361		10133	

Reach Catchments

- A - River Otter to just downstream of Otterhead Lakes (ST 2260 1300)
 B - Just downstream of Otterhead lakes (ST 2260 1300) to Honiton (ST 1523 0121)
 C - Honiton (ST 1523 0121) to Penny Bridges (SY 1148 9875)
 D - Penny Bridges (SY 1148 9875) to Ottery St. Mary (SY 0940 8520)
 E - Ottery St. Mary (SY 0940 8520) to Dotton (SY 0873 6658) incl. Salton Stream and Blackbrook
 F - Dotton (SY 0873 6658) to Tidal Limit (SY 0756 6310) incl. Coleridge Raleigh Stream and Kersbrook Stream

Notes

S.W.U. = Public Water Supply
 Both surface and ground water abstractions are included.

Nett actual figures quoted are derived from actual returns where available
 and a formula based estimate used for missing data.
 Non-consumptive abstractions are not included.

All figures have been rounded to the nearest Megalitres.

Table 3.1.3 ii)
Net Authorised and Actual Abstraction (megalitres) for River Otter Reach Catchments 1973, 1982 and 1992

Reach Catch.	Category	1973 Auth.	1973 Cum. Auth.	1973 Nett Act.	1973 Cum. Nett Act.	1982 Auth.	1982 Cum. Auth.	1982 Nett Act.	1982 Cum. Nett Act.	1992 Auth.	1992 Cum. Auth.	1992 Nett Act.	1992 Cum. Nett Act.
A	Consumptive	919	919	74	74	917	917	438	438	917	917	662	662
	Non-Consumptive	3	3	-	-	3	3	-	-	3	3	-	-
	Total	922	922	74	74	920	920	438	438	920	920	662	662
B	Consumptive	390	1309	287	361	399	1316	288	724	408	1325	128	788
	Non-Consumptive	1960	1963	-	-	1960	1963	-	-	1960	1963	-	-
	Total	2350	3272	287	361	2359	3279	288	724	2368	3288	128	788
C	Consumptive	168	1474	72	433	157	1473	79	603	134	1459	65	853
	Non-Consumptive	484	2427	-	-	58	2021	-	-	45	2006	-	-
	Total	629	3901	72	433	215	3494	79	603	179	917	65	853
D	Consumptive	2374	3848	1594	2027	3282	4755	1693	2496	3380	4819	2892	3745
	Non-Consumptive	4422	6849	-	-	4424	6445	-	-	4373	6361	-	-
	Total	6796	10697	1594	2027	7706	11200	1693	2496	7733	11200	2892	3745
E	Consumptive	4054	7902	2245	4272	4555	9310	2430	4926	2075	6894	1624	6369
	Non-Consumptive	18423	25272	-	-	1705	8150	-	-	1705	6086	-	-
	Total	22477	33174	2245	4272	6260	17460	2430	4926	3780	14980	1624	6369
F	Consumptive	8384	13286	3120	7392	7062	16372	4006	8932	9467	16361	4764	10133
	Non-Consumptive	43	25315	-	-	43	8193	-	-	43	8129	-	-
	Total	8427	38601	3120	7392	7105	24565	4006	8932	9510	24490	4764	10133

Notes.

Consumptive uses are those where there is an appreciable loss to the source of supply. These include public and private water supply, agriculture, spray irrigation and evaporative cooling.

Non-consumptive uses are those where water abstracted is returned to the source of supply with minimal loss after use and with minimal delay, or subject to a continuous abstraction/return arrangement. They include fish farming, hydropower generation, non-evaporative cooling and amenity flows to ponds.

All figures are rounded to the nearest Megalitre.

Both surface and ground water abstractions are included.

Nett actual figures quoted as derived from actual returns where available and a formula based estimate used for missing data.

Reach Catchments

- A - River Otter to just downstream of Otterhead Lakes (ST 2260 1300)
- B - Just downstream of Otterhead lakes (ST 2260 1300) to Honiton (ST 1525 0121)
- C - Honiton (ST 1525 0121) to Fenny Bridges (SY 1148 8875)
- D - Fenny Bridges (SY 1148 8875) to Ottery St. Mary (SY 0840 8520)
- E - Ottery St. Mary (SY 0840 8520) to Dotton (SY 0875 8858) Incl. Salston Stream and Blackbrook
- F - Dotton (SY 0875 8858) to Tidal Limit (SY 0758 8310) Incl. Colston Raleigh Stream and Kersbrook Stream

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21/12/93-11.15

TABLE 3.2.1

DATA SUMMARY FOR UNIONISED AMMONIA, COPPER AND ZINC

SITE		AMMONIA UNIONISED (mg/l)	COPPER (mg/l)	ZINC (mg/l)
HOEMOOR FARM	MAX	0.00264	0.005	0.005
	MIN	0.00002	0.005	0.005
	MEAN	0.00048	0.005	0.005
	NUMBER	211.00000	4	4
RAWRIDGE	MAX	0.00262	0.007	0.01
	MIN	0	0.007	0.01
	MEAN	0.00062	0.007	0.01
	NUMBER	43.00000	1	1
MONKTON	MAX	0.00447	NO DATA	NO DATA
	MIN	0.00000	NO DATA	NO DATA
	MEAN	0.00071	NO DATA	NO DATA
	NUMBER	58.00000	NO DATA	NO DATA
CLAPPERLANE	MAX	0.02827	0.005	0.004
	MIN	0	0	0.005
	MEAN	0.00116	0.0034	0.004
	NUMBER	213.00000	4	4
COTTARSON FARM	MAX	0.02052	0.008	0.025
	MIN	0	0	0
	MEAN	0.00348	0.0046	0.0092
	NUMBER	82.00000	45	45
WESTON	MAX	0.02170	0.045	0.097
	MIN	0.00010	0.002	0.005
	MEAN	0.00237	0.0058	0.0114
	NUMBER	213.00000	152	152
FENNYBRIDGES	MAX	0.00391	NO DATA	NO DATA
	MIN	0	NO DATA	NO DATA
	MEAN	0.00143	NO DATA	NO DATA
	NUMBER	45.00000	NO DATA	NO DATA
OTTERY ST.MARY	MAX	0.02410	0.005	0.009
	MIN	0	0.005	0.007
	MEAN	0.00167	0.005	0.008
	NUMBER	214.00000	3	3
TIPTON ST.JOHN	MAX	0.00762	0.005	0.009
	MIN	0.00003	0.005	0.005
	MEAN	0.00161	0.005	0.007
	NUMBER	215.00000	3	3
DOTTON MILL	MAX	0.01277	0.095	0.069
	MIN	0	0	0.002
	MEAN	0.00134	0.057	0.0163
	NUMBER	528.00000	332	331
OTTERTON	MAX	0.02106	0.012	0.043
	MIN	0.00003	0.0019	0.005
	MEAN	0.00171	0.0048	0.0113
	NUMBER	219.00000	13	13

TABLE 3.2.3

**Regression Analysis for Various Parameters at Differing
Location on the River Otter for all Months**

Variable	Site	r	df	F-ratio	Probability Level
Log BOD	Otterton	-0.036	204	0.258	0.612
Log BOD	Dotton Mill	0.060	383	1.404	0.237
Log BOD	Tipton St John	0.058	201	.0685	0.409
Log BOD	Ottery St Mary	0.010	198	0.021	0.884
Log BOD	Fenny Bridges	-0.189	44	1.627	0.209
Log BOD	Weston	0.808	198	1.302	0.255
Log BOD	Cottarson Farm	-0.339	80	10.369	0.002**
Log BOD	Clapperlane Bridge	0.0961	200	1.866	0.174
Log BOD	Monkton	-0.368	56	8.800	0.004**
Log BOD	Rawridge	-0.037	41	0.057	0.812
Log BOD	Hoemoor Farm	0.050	197	0.501	0.480
Log Total Ammonia	Otterton	-0.035	217	0.265	0.607
Log Total Ammonia	Dotton Mill	0.006	524	<0.001	0.995
Log Total Ammonia	Tipton St John	0.023	213	0.108	0.743
Log Total Ammonia	Ottery St Mary	-0.028	212	0.160	0.689
Log Total Ammonia	Fenny Bridges	-0.002	44	<0.001	0.991
Log Total Ammonia	Weston	0.068	211	0.987	0.321
Log Total Ammonia	Cottarson Farm	-0.209	80	3.661	0.059
Log Total Ammonia	Clapperlane Bridge	-0.168	210	6.125	0.014*
Log Total Ammonia	Monkton	-0.517	56	20.460	<0.001***
Log Total Ammonia	Rawridge	-0.033	41	0.046	0.831
Log Total Ammonia	Hoemoor Farm	-0.307	210	21.895	<0.001***

Table 3.2.3 cont.

Variable	Site	r	df	F-ratio	Probability Level
pH	Otterton	0.0368	217	0.295	0.588
pH	Dotton Mill	0.0106	525	0.059	0.809
pH	Tipton St John	0.122	213	3.232	0.074
pH	Ottery St Mary	0.111	212	2.623	0.107
pH	Fenny Bridges	0.019	44	0.016	0.899
pH	Weston	0.132	211	3.758	0.054
pH	Cottarson Farm	-0.106	80	0.913	0.342
pH	Clapperlane Bridge	0.224	212	11.216	0.001***
pH	Monkton	0.217	56	2.760	0.102
pH	Rawridge	0.124	41	0.643	0.427
pH	Hoemoor Farm	0.301	210	20.889	<0.001***
Log DO	Otterton	-0.244	216	13.629	<0.001***
Log DO	Dotton Mill	-0.150	513	11.825	<0.001***
Log DO	Tipton St John	-0.201	213	8.923	0.003**
Log DO	Ottery St Mary	-0.202	209	8.917	0.003**
Log DO	Fenny Bridges	0.0869	42	0.320	0.575
Log DO	Weston	-0.205	210	9.222	0.003**
Log DO	Cottarson Farm	-0.248	76	4.990	0.029*
Log DO	Clapperlane Bridge	-0.089	210	1.685	0.196
Log DO	Monkton	0.104	56	0.612	0.437
Log DO	Rawridge	0.048	41	0.095	0.760
Log DO	Hoemoor Farm	0.171	210	6.313	0.013*

Table 3.2.3 cont.

Variable	Site	r	df	F-ratio	Probability Level
Temperature	Otterton	-0.081	216	1.431	0.233
Temperature	Dotton Mill	-0.093	520	4.530	0.034*
Temperature	Tipton St John	-0.037	213	0.287	0.593
Temperature	Ottery St Mary	-0.043	212	0.392	0.532
Temperature	Fenny Bridges	-0.158	44	1.132	0.293
Temperature	Weston	-0.029	211	0.181	0.671
Temperature	Cottarson Farm	-0.014	77	0.015	0.904
Temperature	Clapperlane Bridge	-0.022	211	0.105	0.746
Temperature	Monkton	-0.004	56	0.001	0.977
Temperature	Rawridge	-0.138	41	0.798	0.377
Temperature	Hoemoor Farm	-0.023	210	0.112	0.738
Log Ortho-p	Otterton	0.129	217	3.692	0.056
Log Ortho-p	Dotton Mill	0.207	471	21.118	<0.001***
Log Ortho-p	Tipton St John	0.223	213	11.106	0.001**
Log Ortho-p	Ottery St Mary	0.132	211	3.760	0.054
Log Ortho-p	Fenny Bridges	-0.362	44	6.632	0.013*
Log Ortho-p	Weston	0.198	210	8.583	0.004**
Log Ortho-p	Cottarson Farm	-0.167	80	2.309	0.133
Log Ortho-p	Clapperlane Bridge	-0.174	212	6.624	0.011*
Log Ortho-p	Monkton	-0.362	56	8.425	0.005**
Log Ortho-p	Rawridge	0.012	41	0.006	0.940
Log Ortho-p	Hoemoor Farm	-0.388	210	37.127	<0.001***

Table 3.2.3 cont.

Variable	Site	r	df	F-ratio	Probability Level
Log Nitrate	Otterton	0.432	196	45.016	<0.001***
Log Nitrate	Dotton Mill	0.598	415	231.449	<0.001***
Log Nitrate	Tipton St John	0.427	191	42.686	<0.001***
Log Nitrate	Ottery St Mary	0.324	192	22.460	<0.001***
Log Nitrate	Fenny Bridges	-0.072	43	0.225	0.638
Log Nitrate	Weston	0.352	192	27.148	<0.001***
Log Nitrate	Cottarson Farm	-0.029	80	0.067	0.797
Log Nitrate	Clapperlane Bridge	0.142	192	3.958	0.048*
Log Nitrate	Monkton	-0.102	56	0.584	0.448
Log Nitrate	Rawridge	-0.045	41	0.082	0.775
Log Nitrate	Hoemoor Farm	0.298	189	18.377	<0.001***
Log S. Solids	Otterton	-0.099	217	2.154	0.144
Log S. Solids	Dotton Mill	0.056	523	1.643	0.200
Log S. Solids	Tipton St John	-0.003	213	0.002	.0960
Log S. Solids	Ottery St Mary	0.008	212	0.014	0.906
Log S. Solids	Fenny Bridges	-0.016	44	0.011	0.916
Log S. Solids	Weston	0.006	211	0.008	0.930
Log S. Solids	Cottarson Farm	-0.115	80	1.067	0.305
Log S. Solids	Clapperlane Bridge	-0.047	212	0.460	0.498
Log S. Solids	Monkton	-0.486	56	17.271	<0.001***
Log S. Solids	Rawridge	-0.017	41	0.012	0.913
Log S. Solids	Hoemoor Farm	-0.149	210	4.794	0.030*

(p<0.05 = *; p<0.01 = **; p<0.001 = ***)

TABLE 3.2.4
WATER QUALITY TREND ANALYSIS – ALL MONTHS

REACH	B		C	D	E		F
SITE	HOEMOOR FARM	CLAPPERLANE BRIDGE	WESTON	OTTERY ST.MARY	TIPTON ST.JOHN	DOTTON MILL	OTTERTON
DISSOLVED OXYGEN (%sat)	Increase 91 – 97 = 6.5%	No significant trend	Decrease 104 – 93 = 11%	Decrease 106 – 95 = 11%	Decrease 106 – 96 = 9%	Decrease 105 – 98 = 7%	Decrease 110 – 94 = 15%
TEMPERATURE (Degrees celsius)	No significant trend	No significant trend	No significant trend	No significant trend	No significant trend	Decrease 11.3 – 9.8 = 13.3%	No significant trend
pH	Increase 7.3 – 7.8 = 7%	Increase 7.6 – 8.1 = 7%	No significant trend	No significant trend	No significant trend	No significant trend	No significant trend
BIOCHEMICAL OXYGEN DEMAND (mg/l)	No significant trend	No significant trend	No significant trend	No significant trend	No significant trend	No significant trend	No significant trend
TOTAL AMMONIA (mg/l)	Decrease 0.10 – 0.02 = 80%	Decrease 0.09 – 0.04 = 55%	No significant trend	No significant trend	No significant trend	No significant trend	No significant trend
NITRATE (mg/l)	Increase 2.3 – 3.1 = 35%	Increase 2.3 – 2.9 = 26%	Increase 2.2 – 3.7 = 66%	Increase 2.8 – 4.4 = 57%	Increase 3.6 – 5.7 = 58%	Increase 3.4 – 5.7 = 68%	Increase 3.6 – 5.7 = 58%
ORTHO-PHOSPHATE (mg/l)	Decrease 0.10 – 0.05 = 50%	Decrease 0.14 – 0.10 = 28%	Increase 0.34 – 0.53 = 56%	Increase 0.35 – 0.47 = 34%	Increase 0.33 – 0.52 = 57%	Increase 0.31 – 0.43 = 39%	Increase 0.30 – 0.40 = 33%
SUSPENDED SOLIDS (mg/l)	Decrease 8.1 – 5.0 = 38%	No significant trend	No significant trend	No significant trend	No significant trend	No significant trend	No significant trend

Values quoted are those predicted by regression analysis of the determinand over time at April 1974 (first value) and March 1993 (second value).
A span of 7300 days was assumed.

TABLE 3.3.1
BMWP and ASPT scores for Sites on the River Otter

Site Name	Grid Ref	Sample Date	BMWP No: Families	BMWP Score	BMWP ASPT
River Otter, Hoemoor Farm	221 104	11/01/68	15	99	6.6
		12/04/73	21	135	6.43
		03/08/77	15	84	5.6
		26/03/80	14	83	5.9
		26/03/80	28	164	5.86
		25/03/83	21	132	6.29
		25/05/85	29	191	6.59
		29/04/86	25	150	6.0
		29/03/90	26	170	6.54
		26/06/90	28	192	6.86
		21/09/90	30	194	6.47
		10/04/92	31	211	6.81
		14/07/92	32	214	6.69
		08/10/92	31	205	6.61
River Otter, Monkton	185 031	17/01/68	18	110	6.1
		12/04/73	21	118	5.62
		03/08/77	25	152	6.08
		17/03/78	22	125	5.68
		03/05/79	14	82	5.86
		03/05/79	28	167	5.96
		26/03/80	11	52	4.73
		09/04/80	25	141	5.64
		03/07/81	15	90	6.00
		03/07/81	29	185	6.38
		25/05/82	20	115	5.75
		25/05/82	35	208	5.94
		09/03/83	20	115	5.75
		07/06/85	24	149	6.21
		29/04/86	24	143	5.96
		26/06/90	25	159	6.36
		21/09/90	23	135	5.87
		10/04/92	30	188	6.27
		14/07/92	27	170	6.30
		12/10/92	26	151	5.81
River Otter, Clapperlane Bridge	163 012	23/01/68	21	130	6.19
		12/04/73	19	110	5.79
		03/08/77	17	100	5.88
		17/03/78	23	140	6.09
		09/04/80	14	83	5.93
		09/04/80	20	115	5.75
		25/05/83	26	151	5.81
		07/06/85	27	164	6.07
		11/04/91	33	199	6.03
		27/06/91	27	161	5.96
		20/09/91	29	165	5.69
		10/04/92	34	205	6.03
		26/06/92	25	152	6.08
		12/10/92	30	183	6.10

Site Name	Grid Ref	Sample Date	BMWP No: Families	BMWP Score	BMWP ASPT
River Otter, Weston	142 000	17/01/68	20	102	5.1
		12/04/73	19	114	6.0
		03/08/77	16	91	5.68
		10/03/78	15	69	4.6
		03/05/79	15	65	5.08
		03/05/79	18	95	5.28
		09/04/80	10	50	5.00
		09/04/80	23	132	5.74
		03/07/81	11	59	5.40
		03/07/81	19	114	6.00
		14/05/82	19	116	6.11
		14/05/82	26	158	6.10
		08/06/83	13	55	4.23
		29/03/90	31	183	5.90
		26/06/90	27	146	5.41
		20/09/90	22	113	5.14
		15/04/92	22	117	5.32
		26/06/92	22	115	5.23
		12/10/92	19	93	4.89
River Otter, Fenny Bridges	114 987	17/01/68	17	89	5.24
		26/04/73	16	89	5.56
		03/08/77	27	153	5.67
		10/03/78	17	81	4.76
		03/05/79	11	47	4.27
		03/05/79	12	65	5.42
		11/04/80	13	66	5.08
		11/04/80	20	115	5.75
		11/04/83	18	78	4.33
		11/04/91	26	137	5.27
		01/07/91	27	148	5.48
		20/09/91	27	153	5.67
		15/04/92	29	157	5.41
River Otter, Ottery St Mary	093 960	13/07/92	24	140	5.83
		12/10/92	26	138	5.31
		17/01/68	18	93	5.17
		12/04/73	22	122	5.55
		03/08/77	26	142	5.46
		17/03/78	13	72	5.54
		11/04/80	25	149	4.8
		11/04/80	15	72	5.96
		15/03/83	16	75	4.68
		28/03/90	22	114	5.18
		26/06/90	21	115	5.48
		20/09/90	29	150	5.17
		15/04/92	31	170	5.48
River Otter, Tipton St John	089 919	13/06/92	25	146	5.84
		09/10/92	22	124	5.64
		23/01/68	19	110	5.79
		12/04/73	19	122	6.42
		03/08/77	21	119	5.67
		11/04/80	12	79	6.58
		11/04/80	22	141	6.4
		08/04/83	24	125	5.20
		28/03/90	17	91	5.35
		06/07/90	19	107	5.63
		20/09/90	23	109	4.74
		15/04/92	25	151	6.04
		07/07/92	19	115	6.05
		09/10/92	17	80	4.71

Site Name	Grid Ref	Sample Date	BMWP No: Families	BMWP Score	BMWP ASPT
River Otter, Dotton Mill	087 885	23/01/68	18	103	5.72
		26/04/73	18	106	5.89
		03/08/77	24	142	5.89
		03/05/79	8	35	4.37
		03/05/79	14	71	5.07
		14/03/80	12	64	5.33
		14/03/80	22	135	6.14
		25/05/82	17	98	5.76
		25/05/82	28	171	6.11
		07/04/83	21	115	5.48
		21/03/91	18	85	4.72
		02/07/91	21	118	5.62
		19/09/91	21	124	5.90
		15/04/92	27	142	5.26
		07/04/92	18	106	5.89
		09/10/92	22	131	5.95
River Otter, Otterton	079 852	23/01/68	18	100	5.56
		12/04/73	18	102	5.67
		11/04/80	9	47	5.20
		11/04/80	21	123	5.86
		08/06/83	10	61	6.10
		28/03/90	23	134	5.83
		25/06/90	19	111	5.84
		20/09/90	18	91	5.06
		15/04/92	24	143	5.96
		07/07/92	21	121	5.76
		09/10/92	21	116	5.52

Table 3.6.1 ii)
Total Net Abstraction (megalitres) for River Otter Catchments 1972-92

Reach Catch.	Category	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Mean 72-92	% from g/w	Mean as a % Mean a run-off
A	Total Volume - Reach	156	74	52	705	1475	4	444	494	481	435	438	478	872	526	595	320	697	857	713	633	662	628	5	0.62
	Cumulative Volume	156	74	52	705	1475	4	444	494	481	435	438	478	872	626	595	320	697	857	713	633	662	628	5.46427	0.62
B	Total Volume - Reach	257	287	230	220	220	258	237	265	281	257	288	266	244	244	224	233	280	301	279	306	128	282	100	0.25
	Cumulative Volume	413	381	282	925	1695	260	681	759	782	692	724	744	1116	770	619	553	977	1158	992	938	768	781	37.6783	0.77
C	Total Volume - Reach	73	72	72	72	73	74	78	86	76	78	79	80	80	81	83	64	63	65	68	66	65	72	86.7493	0.07
	Cumulative Volume	486	433	354	997	1768	334	766	845	838	788	803	824	1196	831	882	617	1040	1223	1060	1003	853	653	41.2618	0.65
D	Total Volume - Reach	1372	1594	1806	1520	1456	1421	1592	1633	1630	1623	1693	1911	2116	2102	2374	3164	3014	3186	3241	3285	2892	2120	99.6397	2.1
	Cumulative Volume	1858	2027	1860	2517	3226	1755	2348	2478	2468	2591	2496	2735	3312	2933	3256	3781	4054	4409	4301	4286	3745	2973	62.7518	2.96
E	Total Volume - Reach	2744	2246	1791	1984	1928	2154	2261	2456	2267	2325	2430	2642	2694	2613	3010	3098	2780	2168	2497	1982	1624	2361	99.9769	2.34
	Cumulative Volume	4602	4272	3851	4451	6154	3909	4809	4934	4735	4916	4926	5377	6006	6446	6266	6879	6834	6577	6798	6270	5369	5334	60.8343	5.29
F	Total Volume - Reach	3635	3120	3433	3785	3433	3866	4224	3873	3579	3817	4006	3957	4194	4273	4313	4183	4014	4102	3946	5019	4764	3986	69.5049	3.95
	Cumulative Volume	8137	7392	7084	8268	8587	7774	8833	8807	8814	8733	6932	9334	10200	9719	10579	11042	10848	10679	10743	11289	10133	9320	88.6595	9.24
% from ground water		86	94	93	86	79	94	89	89	90	90	91	90	87	90	90	93	90	88	89	91	91	90		
Actual run-off (MI/yr)		129329	70313	134259	72921	91427	119018	115191	114513	102193	126910	116055	100356	97472	87147	105030	90906	98797	91668	94066	86676	76485	100911		
Cum. Abs as a % of run-off		6	11	6	11	9	7	8	8	8	7	8	8	10	11	10	12	11	12	11	13	13	9.24		

Notes.

Nett actual figures quoted are derived from actual returns where available and a formula based estimate used for missing data.
Non-consumptive abstractions are not included.

All figures have been rounded to the nearest Megalitre.

Due to rounding there is a 1 MI difference in mean abstraction for Reach B and Reach F between this table and table 3.6.1 (i).

Reach Catchments

A - River Otter to just downstream of Otterhead Lakes (ST 2280 1300)
B - Just downstream of Otterhead lakes (ST 2280 1300) to Honiton (ST 1525 0121)
C - Honiton (ST 1525 0121) to Fenny Bridges (SY 1148 9875)
D - Fenny Bridges (SY 1148 9875) to Ottery St Mary (SY 0940 9520)
E - Ottery St Mary (SY 0940 9520) to Dotton (SY 0875 8858) incl. Salston Stream and Blackbrook
F - Dotton (SY 0875 8858) to Tidal Limit (SY 0756 8310) incl. Colston Raleigh Stream and Kerbrook Stream

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Table 3.6.1 i)
Total Net Abstraction (megalitres) for River Otter Catchments 1972-92

Reach Catch.	Category	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Total Abs. 72-92	Mean Abs. 72-92
A	S.W.U. - Otterhead	151	89	48	701	1471	0	440	490	477	431	434	474	868	522	591	318	693	853	709	629	838	11025	525
	Non-S.W.U.	8	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	88	4
B	S.W.U. - St Cyres Spring	143	175	117	108	107	143	125	152	168	144	173	149	127	127	107	115	163	186	164	193	5	2892	138
	Non-S.W.U.	114	112	113	112	113	113	112	113	113	113	113	117	117	117	117	117	117	115	115	112	121	2408	118
C	S.W.U. (No sources)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Non-S.W.U.	73	72	72	72	73	74	75	88	78	78	79	80	80	61	63	64	63	65	68	66	65	1502	72
D	S.W.U. - Greatwell b/s group	1281	1518	1430	1438	1355	1348	1517	1557	1555	1748	1617	1815	2005	2010	2280	3054	2915	3080	3121	3112	2783	42507	2024
	Non-S.W.U.	91	78	78	84	103	73	78	78	75	75	76	96	111	92	94	110	99	106	120	173	139	2020	88
E	S.W.U. - Harpford b/s group	1762	1844	1137	1518	1401	1840	1847	1699	1801	1598	1664	1731	1758	1806	1791	1703	1562	1367	1415	1401	1409	33374	1689
	- Dotton 4.5 b/s	848	667	620	412	493	280	680	721	419	691	730	878	900	870	1181	1356	1180	782	1042	643	178	15426	738
	Non-S.W.U.	38	34	34	34	34	34	34	38	47	38	38	38	38	37	38	39	38	39	40	38	37	773	37
F	S.W.U. - Dotton 1-3,7 b/s	1933	2220	2390	2743	2479	2487	2569	2678	2500	2368	2889	2744	2495	2371	2612	2253	2218	2226	2339	2455	2534	61601	2457
	- Col. Rel. 2,4 b/s	0	0	0	39	78	310	648	143	233	277	183	302	824	874	768	884	839	939	895	528	373	8813	420
	- Otterton 1A,4 b/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1284	1248	2532	121
	- Tidwell 5p b/s	1652	869	1012	973	820	1024	1058	1001	1007	1137	917	630	767	958	898	967	920	883	828	890	681	19857	936
	Non-S.W.U.	60	31	31	30	58	44	49	83	39	35	37	81	88	73	37	59	37	74	85	62	58	1111	53
	Total Abstraction	8137	7392	7084	8266	8567	7774	8833	8807	8814	8733	8932	9334	10200	9719	10579	11042	10848	10679	10743	11289	10133	195726	9320

Notes

S.W.U. = Public Water Supply
Both surface and ground water abstractions are included.

Nett actual figures quoted are derived from actual returns where available
and a formula based estimate used for missing data.
Non-consumptive abstractions are not included.

All figures have been rounded to the nearest Megalitre.

Due to rounding there is a 1 Ml difference in mean abstraction for
Reach B and Reach F between this table and table 3.6.1 (i).

Reach Catchments

- A - River Otter to just downstream of Otterhead Lakes (ST 2260 1300)
- B - Just downstream of Otterhead Lakes (ST 2260 1300) to Honiton (ST 1525 0121)
- C - Honiton (ST 1525 0121) to Ferry Bridges (SY 1148 9875)
- D - Ferry Bridges (SY 1148 9875) to Ottery St Mary (SY 0940 8520)
- E - Ottery St Mary (SY 0940 8520) to Dotton (SY 0875 8858) incl. Salston Stream and Blackbrook
- F - Dotton (SY 0875 8858) to Tidal Limit (SY 0756 8310) incl. Cofeton Raleigh Stream and Kerbrook Stream

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TABLE 3.10.1
Summary of Chronological Change and Impact

REACH AND LOCATION	DISCHARGE	TRIBUTARIES	PARAMETER	YEAR																				OBSERVED IMPACT SEVERITY & CONFIDENCE (13)	CONFIRMED TREND (5)	POSSIBLE TREND (6)	CONCERN OVER IMPACT (7)	
				73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92					93
A	NONE	NONE	Total net actual abstraction (mega litres x 10 ⁻³)	0.1	0.1	0.7	1.5	0.0	0.4	0.5	0.5	0.4	0.4	0.5	0.9	0.5	0.6	0.3	0.7	0.9	0.7	0.8	0.7					
B Hoemoor Farm			Nitrate (1)		O	80	-32	-39	27	20	-15	-6	-5	33	-11	9	0	-5	2	27	-7	-7	-15	-32	Increase, Marked, ***	Increase	-	Marked Worsening
			Phosphate (1)		O	ND	-35	-24	80	-24	24	-8	-7	-34	-9	4	4	4	41	-9	-4	30	-32	-13	Decline, Marked, ***	Decline	-	None Improvement
			DO (2)		ND	ND	ND	1A	1A	1A	1A	1A	1B	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	ND	Increase, Marked, *	Increase	-	None Improvement
			BOD (2)		ND	ND	ND	ND	ND	1A	2	2	2	1B	2	1B	1B	1A	1B	1A	1B	1B	1B	ND	No Trend	-	Increase	Slight Worsening
			Total Ammonia (2)		ND	ND	ND	1A	1A	1A	1B	1B	1B	1B	1B	1B	1B	1A	1A	1A	1A	1A	1A	ND	Decline, Marked, ***	Decline	-	None Improvement
			S.Solids (2)		ND	ND	ND	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	ND	Decline, Marked, *	Decline	-	None Improvement
			Temperature																						No Trend	None	Decline	None
			pH																						Increase, Marked, ***	Increase	-	None
			ASPT (3)	6.4			5.6			5.88	5.9			6.29		6.59	6				6.47		6.66	6.81	No Trend	-	None	None
			Summary (8)							P																		
					Fairbrook Stream																							
		Ode Brook																										
B Rawridge																												
B Monkton																												
		River Wick																										
B Cleppertane Bridge			Nitrate		O	ND	-5	35	ND	ND	ND	-24	50	-3	-3	3	2	-2	-9	3	5	4	-14	-23	Increase, Marked, *	Increase	-	Marked Worsening
			Phosphate		O	ND	-48	-13	18	32	-7	-10	40	-12	-27	15	8	-19	7	-9	-6	4	-14	-23	Decline, Marked, *	Decline	-	None Improvement
			DO		ND	ND	ND	1A	1A	1A	1A	1A	1B	1A	1A	1A	1A	1A	1A	1A	1B	1B	1A	ND	No Trend	-	Decline	Slight Worsening
			BOD		ND	ND	ND	ND	ND	1A	2	2	2	2	2	2	2	2	2	1B	1B	1B	1A	ND	No Trend	-	Decline	None Improvement
			Total Ammonia		ND	ND	ND	1A	1A	1A	1B	1B	1B	1B	1B	1B	1B	2	1B	1B	1A	1A	1A	ND	Increase, Marked, *	Decline	-	Marked Worsening
			S.Solids		ND	ND	ND	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	No Trend	-	Decline	None Improvement
			Temperature																						No Trend	-	Decline	None
			pH																						Increase, Marked, ***	Increase	-	None

TABLE 3.10.1
Summary of Chronological Change and Impact

REACH AND LOCATION	DISCHARGE	TRIBUTARIES	PARAMETER	YEAR																				OBSERVED IMPACT SEVERITY & CONFIDENCE (13)	CONFIRMED TREND (5)	POSSIBLE TREND (6)	CONCERN OVER IMPACT (7)	
				73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92					93
	Express Dairy		Total net actual abstraction (megalitres x 10 ³)	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.1					
C Cottarson Farm		River Wolf																										
C Weston			Nitrate		0	ND	20	-13	ND	ND	ND	-16	27	1	11	7	-2	3	-4	6	12	6	-18	13	Increase, Marked, ***	Increase	-	Marked Worsening
			Phosphate		0	ND	15	-27	5	73	-47	19	-9	49	17	18	-20	18	11	27	-8	-18	-26	2	Increase, Marked, **	Increase	-	Marked Worsening
			DO		ND	ND	ND	1A	1A	1A	1B	1B	1B	1B	1A	1A	1A	1A	1A	1B	1B	1A	ND	Decline, Marked, **	Decline	-	Marked Worsening	
			BOD		ND	ND	ND	ND	ND	1A	3	3	3	2	2	2	2	2	2	2	2	2	2	ND	No Trend	-	Increase	None Worsening
			Total Ammonia		ND	ND	ND	1B	1B	1B	1B	1B	1B	1B	1B	1B	1B	1B	1B	1B	1B	1B	1B	ND	No Trend	-	Increase	None Worsening
			S Solids		ND	ND	ND	<25	<25	<25	>25	>25	>25	<25	<25	<25	>25	<25	<25	<25	<25	<25	<25	ND	No Trend	-	Increase	None Worsening
			Temperature																					No Trend	-	Decline	None	
			pH																					No Trend	-	Increase	None	
			ASPT	6			5.68	4.60	5.06	5.00	5.40	6.10	4.23								5.14	4.89			-	None		
			Summary								P										5.90	5.32						
		Gittisham Stream																										
	Fenton STW		Total net actual abstraction (megalitres x 10 ³)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1					
D Fenny Bridges		Vine Water																										
D Ottery St Mary			Nitrate		0	ND	28	-9	ND	ND	ND	-12	24	33	-13	3	-4	7	-6	21	6	-16	5	-6	Increase, Marked, ***	Increase	-	Marked Worsening
			Phosphate		0	ND	45	-33	28	13	-29	-2	-2	54	-24	26	-18	4	31	-3	-13	-20	-16	-26	No Trend	-	Increase	Slight Worsening
			DO		ND	ND	ND	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	ND	Decline, Marked, **	Decline	-	Marked Worsening
			BOD		ND	ND	ND	ND	ND	1B	3	3	3	2	1B	2	2	2	2	2	2	2	2	ND	No Trend	-	Increase	Slight Worsening
			Total Ammonia		ND	ND	ND	1A	1A	1A	1B	1B	1B	1B	1A	2	2	1B	1B	1B	1A	1A	1A	ND	No Trend	-	Decline	None Improvement
			S.Solids		ND	ND	ND	<25	<25	<25	>25	>25	<25	<25	<25	<25	>25	>25	>25	<25	<25	>25	<25	ND	No Trend	-	Increase	Slight Worsening
			Temperature																					No Trend	-	Decline	None	
			pH																					No Trend	-	Increase	None	
			ASPT	5.56			5.48	5.54		4.80	5.96		4.88								5.17	5.48	5.64		-	None		
			Summary								P					P												
		River Tale																										

TABLE 3.10.1
Summary of Chronological Change and Impact

REACH AND LOCATION	DISCHARGE	TRIBUTARIES	PARAMETER	YEAR																				OBSERVED IMPACT SEVERITY & CONFIDENCE (13)	CONFIRMED TREND (5)	POSSIBLE TREND (6)	CONCERN OVER IMPACT (7)	
				73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92					93
	Ottery St Mary STW	Salston Stream																										
	Fluxton STW																											
	Ottery St Mary (Fluxton) STW	Fluxton Stream																										
		Metacombe Stream																										
			Total net actual abstraction (megallitres x 10 ⁶)	1.6	1.5	1.5	1.5	1.4	1.6	1.8	1.8	1.8	1.7	1.9	2.1	2.1	2.4	3.2	3.0	3.2	3.2	3.3	2.9					
E Tipton St John			Nitrate	O	ND	30	1	ND	ND	ND	12	8	18	O	2	-8	11	-4	14	2	2	-18	7	Increase, Marked,***	Increase	-	Marked Worsening	
			Phosphate	O	ND	31	27	21	8	-18	-2	-7	62	-29	24	-9	-3	14	25	-10	-10	-14	-32	Increase, Marked,**	Increase	-	Marked Worsening	
			DO	ND	ND	ND	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	ND	Decline, Marked,**	Decline	-	Marked Worsening	
			BOD	ND	ND	ND	ND	ND	1B	3	3	3	2	1B	1B	2	2	2	1B	1B	1B	1B	ND	No Trend	-	Increase	Slight Worsening	
			Total Ammonia	ND	ND	ND	1A	1A	2	2	2	1B	1A	1B	1B	1B	1B	1B	1B	1B	1A	1B	ND	No Trend	-	Increase	Slight Worsening	
			S.Solids	ND	ND	ND	<25	<25	<25	>25	<25	<25	<25	<25	<25	>25	>25	>25	>25	<25	<25	<25	<25	ND	No Trend	-	Decline	None Improvement
			Temperature																					No Trend	-	Decline	None	
			pH																					No Trend	-	Increase	None	
			ASPT	6.42			5.67			6.40	6.58		5.2								4.74	4.71			Decline	-	Decline	
			Summary																									
	Tipton St John STW																											
E Dotton Mill			Nitrate	O	1	20	4	-8	ND	ND	-2	14	8	5	-1	-4	10	-8	16	-3	2	-12	8	Increase, Marked,***	Increase	-	Marked Worsening	
			Phosphate	O	20	3	-25	-8	18	0.1	-9	17	11	-8	18	-8	-8	18	17	-11	-11	-11	-43	Increase, Marked,***	Increase	-	Marked Worsening	
			DO	ND	ND	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	ND	Decline, Marked,***	Decline	-	Marked Worsening	
			BOD	ND	ND	ND	1A	1B	1B	1B	1B	2	2	1B	1B	2	2	2	2	1B	1B	1B	ND	No Trend	-	Increase	Slight Worsening	
			Total Ammonia	ND	ND	1A	1A	1A	1A	1B	1A	1B	1B	1B	1B	1B	1B	1B	1B	1B	1A	1A	ND	No Trend	-	Increase	Slight Worsening	
			S.Solids	ND	ND	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	>25	>25	>25	>25	<25	<25	<25	<25	ND	No Trend	-	Increase	Slight Worsening
			Temperature																					Decline, Slight,*	Decline	-	None	
			pH																					No Trend	-	Increase	None	
			ASPT	5.89			5.89		4.37	5.33	5.78	5.48									4.72	5.20						
			Summary						5.07	8.14	8.11										5.80	5.85						

TABLE 3.10.1
Summary of Chronological Change and Impact

REACH AND LOCATION	DISCHARGE	TRIBUTARIES	PARAMETER	YEAR																				OBSERVED IMPACT SEVERITY & CONFIDENCE (13)	CONFIRMED TREND (5)	POSSIBLE TREND (6)	CONCERN OVER IMPACT (7)		
				73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92					93	
	Dotton STW																												
		Colston Raleigh Stream																											
			Total net actual abstraction (megalitres x 10 ⁻³)	2.2	1.8	2.0	1.9	2.2	2.3	2.5	2.3	2.3	2.4	2.6	2.7	2.8	3.0	3.1	2.8	2.2	2.5	2.0	1.6						
F Otterton			Nitrate		O	-5	-17	9	ND	ND	ND	-13	-14	-18	-5	2	-6	13	-8	8	8	0	-11	-11	Increase, Marked, ***	Increase	-	Marked Worsening	
			Phosphate		O	86	-32	-39	27	20	-15	-8	-5	33	-11	9	0	-5	2	27	-7	-7	-15	-32	No Trend	-	Increase	Slight Worsening	
			DO		ND	ND	ND	1A	1A	1A	1A	1A	1B	1A	1A	1A	1A	1A	1A	1B	1B	1B	1A	ND	Decline, Marked, ***	Decline	-	Marked Worsening	
			BOD		ND	ND	ND	ND	ND	1B	3	3	3	1B	1B	1B	2	2	2	1B	1B	1B	2	ND	No Trend	-	Decline	None Improvement	
			Total Ammonia		ND	ND	ND	1A	1A	1A	1B	1B	1B	1A	1A	1A	1B	1B	1B	1B	1B	1B	1A	ND	No Trend	-	Decline	None Improvement	
			S.Solids		ND	ND	ND	<25	<25	<25	>25	>25	<25	<25	<25	>25	>25	>25	>25	<25	<25	<25	<25	ND	No Trend	-	Decline	None Improvement	
			Temperature																					No Trend	-	Decline	None		
			pH																					No Trend	-	Increase	None		
				ASPT	5.67						5.20	5.86		6.10								5.06	5.52						
				Summary							P																		
			Total net actual abstraction (megalitres x 10 ⁻³)	3.1	3.5	3.8	3.4	3.9	4.2	3.9	3.9	3.8	4.0	4.0	4.2	4.3	4.3	4.2	4.0	4.1	3.9	5.0	4.8						
G																													
H																													
I																													
J																													
River Otter			Rainfall (10)	8-8	10-12	8-8	8-10	8-10	8-10	8-10	8-8	8-8	4-8	8-8	8-8	8-10	8-10	8-10	8-10	4-8	8-8	8-8	-	Decline, Slight, ***	Decline		Marked Worsening		
			Flow (11) Fenny Bridges			1-1.5	2-2.5	2-2.5	2-2.5	1.5-2	2.5-3	2-2.5	2-2.5	1.5-2	1.5-2	2-2.5	2-2.5	1.5-2	1.5-2	1.5-2	1.5-2	1.5-2	1.5-2		Decline from 1981, Marked, ***	Decline		Marked Worsening	
			Flow (11) (Dotton)	2-2.5	3.5-4	2-2.5	2.5-3	3-3.5	3-3.5	3-3.5	3.5-4	3-3.5	3-3.5	2.5-3	2.5-3	2.5-3	3-3.5	2.5-3	2.5-3	2.5-3	2.5-3	2.5-3	2-2.5		Decline from 1981, Marked, ***	Decline		Marked Worsening	

FOOTNOTES:-

(1) Values represent percentage change from the previous year. Increases in values exceeding 10% are highlighted. Data is derived from Figures 3.2.10 – 3.2.47

(2) Values represent the NWC scores for: Dissolved Oxygen (% saturation); 1A>80%, 1B>60%, 2>40%, 3>10%, 4<10.

BOD(ATU); 1A<3, 1B<5, 2<8, 3<17, 4>17.

Total Ammonia as Nitrogen; 1A<0.31, 1B<0.70, 2<1.58

Suspended Solids; 1A, 1B and 2 <25

Data derived from Figures 3.2.10 – 3.2.47. Values that have resulted in degradation from the previous year are highlighted.

(3) ASPT scores are derived from Figures 3.3.1A – C and quoted as a range in some years.

(4) Observed impact, severity and confidence are derived from the regression analysis presented in Tables 3.2.3 and 3.2.4

(5) Confirmed trend as shown by regression analysis presented in tables 3.2.3 and 3.2.4

(6) Possible trend, an extension of the observed impact.

(7) Concern over impact, a subjective judgement.

(8) Summary. Where 3 or more of the parameters are shown to have worsened by either more than the 10%, or from one class to another, then that year is denoted 'P' as a poor year.

(9) Abstractions are summarised as a range of ML/day x10 from figure 3.1.5. Values that have increased from the previous year are highlighted.

(10) Rainfall are summarised as a range of mm/year x100 from Figure 3.1.11.

(11) Flows are summarised as a range of cumecs from Figures 3.1.21 and 3.2.22.

(12) Estimated Abstractions have been derived from confidential information. These figures do not take into account recharge and are therefore an over-estimate.

(13) Observed impact, severity and confidence are subjective.

ND = No Data

P = 'Poor Year'

17 = 'Worsening of water quality'

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