National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

Jordan Soil and Climatic Information System

D B M S VOLUME

Data Entry	Data Retrieval	Data Maintenance	Data Dictionary	General Information

Gerhard Bechtold
Amman
July 1993

JOSCIS - USER GUIDE and REFERENCE MANUAL

DEDICATION

This copy of the JOSCIS USER GUIDE and REFERENCE MANUAL is a gift from the Soil Survey and Land Research Centre (SSLRC) Cranfield Institute of Technology UK, to the staff of the Computer Section staff - Mr Mohammed Sameh, Eng Muhanned Kalaldeh, Mrs Etihad Rihani and Mr Khaled Atef Hatamleh - who contributed in a significant way to the development and operation of JOSCIS. On behalf of SSLRC, I would like to record my thanks to these staff for their hard work and dedication to the tasks allotted to them. Without their contribution JOSCIS would not be what it is today.

R J A Jones

Dr R J A Jones
Senior Data Management Specialist
National Soil Map and Land Use Project Jordan

Date: 26 July 1993

Amman Jordan

This copy (in two volumes) of the JOSCIS User Guide and Reference Manual is not to be removed from the Computer Section Office at Sweileh without the express permission of the above mentioned staff.

(Dr R J A Jones is also
Head Of Computing & Information Systems
Soil Survey and Land Research Centre,
Cranfield Institute of Technology,
Bedford UK)

National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

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USER GUIDE and REFERENCE MANUAL

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JOSCIS

Jordan Soil & Climatic Information System

The work described in this manual has been undertaken as part of a contract (No. SEM/03/628/005) of the Commission of the European Communities (CEC) to Hunting Technical Services Ltd (HTS) for the National Soil Map and Land Use Project under the auspices of the Ministry of Agriculture (MoA), Hashemite Kingdom of Jordan. The information system JOSCIS has been developed by the Project's Computer Specialist Gerhard K Bechtold of the Soil Survey and Land Research Centre (SSLRC), Cranfield Institute of Technology, UK, under the guidance and supervision of Dr R J A Jones, Senior Data Management Specialist to the Project and employee of SSLRC, and M G Jarvis, Overseas Consultancy Manager, SSLRC. Mr R D Law (HTS) has had overall responsibility for the National Soil Map and Land Use Project in Jordan and Mr Austin Hutcheon (HTS) and other members of the field team gave valuable assistance in the design of the field recording cards for collecting the soil information. The manual has been written by Gerhard Bechtold and edited by Dr Jones who also contributed to the introductory sections.

INTRODUCTION

The Jordan Soil and Climatic Information System - JOSCIS - has been established as an integral part of the National Soil Map and Land Use Project. The Terms of Reference for this project suggested that 'a country which does not already have a national geo-referenced database should seriously consider implementing such a system during its first major mapping operation'. It is clear that any subsequent national resource survey such as the National Soil Map and Land Use Project calls for the establishment of an appropriate geo-referenced database if the results are to be fully utilised for planning the sustainable use of land.

Without computer methods, the data from natural resource surveys can only be deposited in filing cabinets and at best retrieved by laborious manual methods. Experience suggests that at most 5 per cent of the data would ever be used again. The very large costs of collecting data are clearly incompatible with such a low level of re-use. Hence JOSCIS was borne out of the requirement to store all the data accumulated during the National Soil Map and Land Use Project in a readily accessible format.

Following the experience of natural resource survey systems throughout the world, the consultants (SSLRC and HTS) proposed the inclusion of other soil related data, such as climatic, topographic, geological, cadastral, and land use and land cover information. The inclusion of this broad range of data related to soils would provide an information base sufficiently detailed to make the interpretations needed to support decisions about future land use.

The importance of spatial data analysis dictates that any land information system today must comprise the usual processing capabilities of a geographical information system (GIS) in addition to a flexibly structured and comprehensive database management system (DBMS). The main components of JOS-CIS conform to this model and are shown on page 1-4 together with the main types of data.

Therefore, the main components are:

a) DBMS: Database Management System, of Soil and Climatic Data

b) GIS: Geographical Information System

The DBMS is largely a bespoke system running under dBase IV, with program modules developed and running under Clipper 5 (version 5.01). The modules are stand-alone executable (EXE) programs accessing the soil and climatic databases in dBase IV (DBF files). The programs can be called on DOS level or through a menu system, such as Automenu.

As Clipper 5 uses a different indexing system from dBase IV, two different sets of index files are set up for each database (DBF) file: NTX for Clipper and NDX for dBase. The design of JOSCIS is based on land information systems developed by SSLRC in other parts of the world, but the program code is entirely the work of Gerhard Bechtold.

A proprietary GIS system, the SPatial ANalysis System - SPANS - developed by INTERA TYDAC Technologies Inc, has been adopted for compiling a geographic database for Jordan and undertaking a wide range of spatial analysis. Digitizing of data has been undetaken using SPANS 4.3 but the system now runs under SPANS 5.22. An interface between the DBMS and the GIS has been programmed to facilitate data transfer and processing. However, the Project's SPANS software licence does not allow individual customisation of the GIS interface and the link between the DBMS and the GIS is not as transparent as it could be.

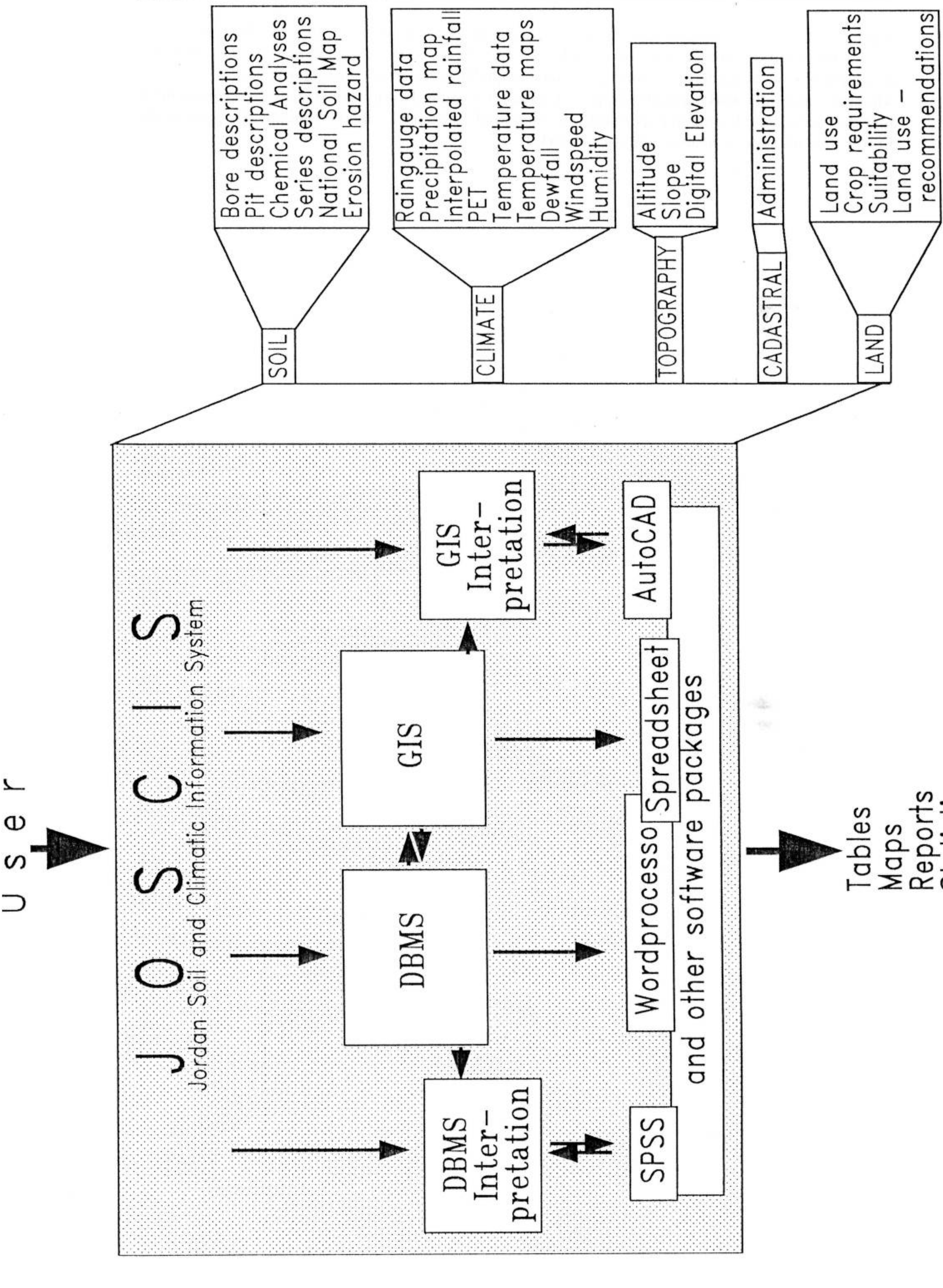
Transfer of data to other software packages is incorporated, in the form of ASCII files with defined syntax, for the following packages:

Wordprocessors - Wordstar 2000, MS_Word 5
Speadsheets - Lotus 1-2-3(vers.2 and 3, with fixed length), Excel (with comma (,) as delimiter)
GIS - SPANS 4 and SPANS 5
Graphics - TechniPlot. Data from SPANS 4 and SPANS 5 can be imported

This current version (1.0) of JOSCIS represents the first phase in the development of the system and coincides with the end (July 1993) of Gerhard Bechtold's current input to the project. Because the system has been programmed in a modular way it's capabilities can be enhanced in the future. Both SSLRC and HTS believe that there is considerable scope for enhancement, particularly in the interpretation of the data and in the modelling capability of the system.

JOSCIS 1.0 already contains all the data collected during the Level 1 survey and significant amounts of data collected during the Level 2 survey activities. In this respect, it is a very significant soil database, containing more computerised soil descriptions in a centrally managed facility than can be found in the central databases of many EC countries!

Through a technology transfer agreement, the Jordanian Ministry of Agriculture has been granted a licence to undertake further development of JOSCIS. The Project's managers now propose that this development will be undertaken mainly by suitably qualified Jordanian computer specialists some of whom are currently working in the Project's Computer Section. However, it is strongly recommended that the locally based computer specialists are supported by external experts from SSLRC particularly for the difficult systems analysis and design work.


User
JOSCIS
Jordan Soil and Climatic Information System
DBMS Inter-pretation
DBMS
GIS
GIS Inter-pretation
SPSS
Wordprocesso
Spreadsheet
AutoCAD
and other software packages
Tables
Maps
Reports
Statistic
SOIL
Bore descriptions
Pit descriptions
Chemical Analyses
Series descriptions
National Soil Map
Erosion hazard
CLIMATE
Raingauge data
Precipitation map
Interpolated rainfall
PET
Temperature data
Temperature maps
Dewfall
Windspeed
Humidity
TOPOGRAPHY
Altitude
Slope
Digital Elevation
CADASTRAL
Administration
LAND
Land use
Crop requirements
Suitability
Land use -
recommendations

LAND EVALUATION

An important tool available to the policy maker for planning the sustainable use of resources is land evaluation, the procedure to assess the suitability of land for particular kinds of use. A wide range of factors can be incorporated into a land evaluation - geology, soils, climate, water, farming systems, crops, management, economy and population - but the first step is to assess land suitability for a particular kind of use. The land suitability can be assessed from a combination of Land Qualities using an FAO type framework (FAO 1976). A Land Quality is an attribute of the land which acts in a distinct manner in its influence on the suitability of land for a specific crop or use. Land qualities are combinations of land characteristics, for example, water availability is a land quality obtained by balancing the available water store in the soil against evapotranspiration and rainfall.

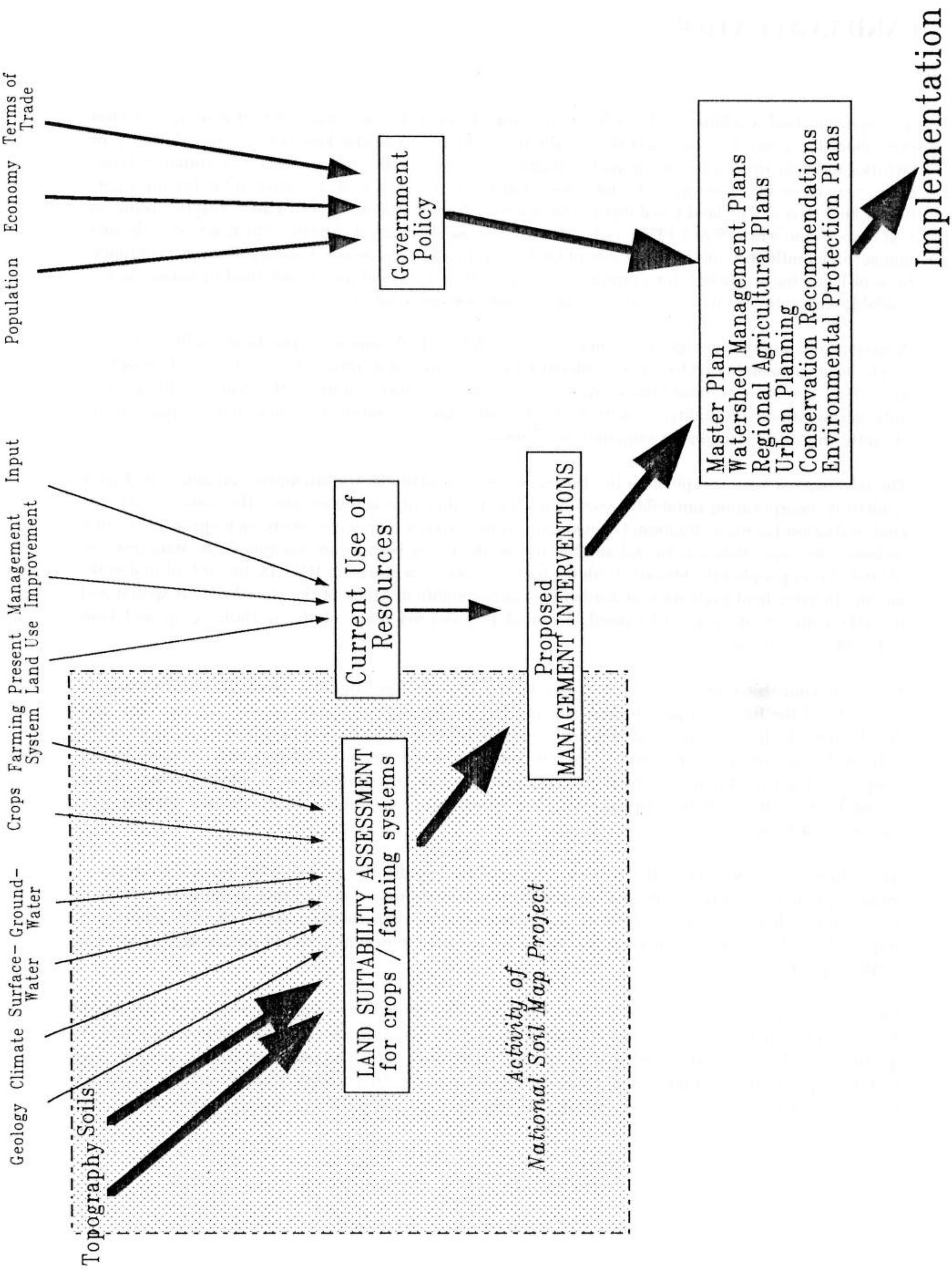
A simple land suitability might use a matrix approach based on combining two land qualities, for example water availability and oxygen availability (assessed as soil drainage status). The land suitability assessment can then become progressively more complex by incorporating other land qualities - fertility, germination, erodability, workability, trafficability, etc. The most important land qualities can be given the most weighting in the suitability assessment.

The information base compiled by the Project is an ideal platform for attempting an automated land evaluation incorporating suitability assessments for specific crops and uses. Since the main objective of land evaluation (in most situations) is *management intervention* then increasingly such approaches must be based on sound digital data and an objective methodology because intervening in the management of land affects people's livelihoods. With the basic datasets now stored in JOSCIS, the task of undertaking an objective land evaluation of Jordan is greatly simplified. Much of the stored data is spatial and the GIS component of JOSCIS should be used to construct maps of the resulting crop and land suitability assessments.

However, land suitability assessment should have a broader basis than the physical characteristics of the land and the figure on page 6 illustrates the factors that ought to be taken into account. The land suitabilities which currently could be calculated from existing JOSCIS data need to be evaluated in the light of the current use of resources - present land use, management techniques and changing inputs. Proposed scenarios for management intervention can then be appraised in economic terms - What would be the effect on the population? How would proposed intervention schemes interact with Government Policy?

The scheme on page 6 identifies pathways for establishing effective planning for watershed management, regional agriculture, conservation, and environmental protection. Looking to the future, JOSCIS could and perhaps should be expanded to encompass this comprehensive approach. The addition of improved land use data, population statistics and economic information would go a long way towards improving the outputs.

In the medium term (Level 3), an automated land evaluation based on the suitability approach should be attempted and the GIS utilised to output the results. A wide range of thematic maps could be produced addressing various 'what if' scenarios. In the long term (beyond level 3), the results of an iterative approach (by progressively changing limits for particular criteria) would best serve the needs of policy makers and planners in Jordan and an expanded JOSCIS would be the perfect starting point.


Population
Economy
Terms of Trade
Government Policy
Input
Management Improvement
Present Land Use
Farming System
Crops
Ground-Water
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Climate
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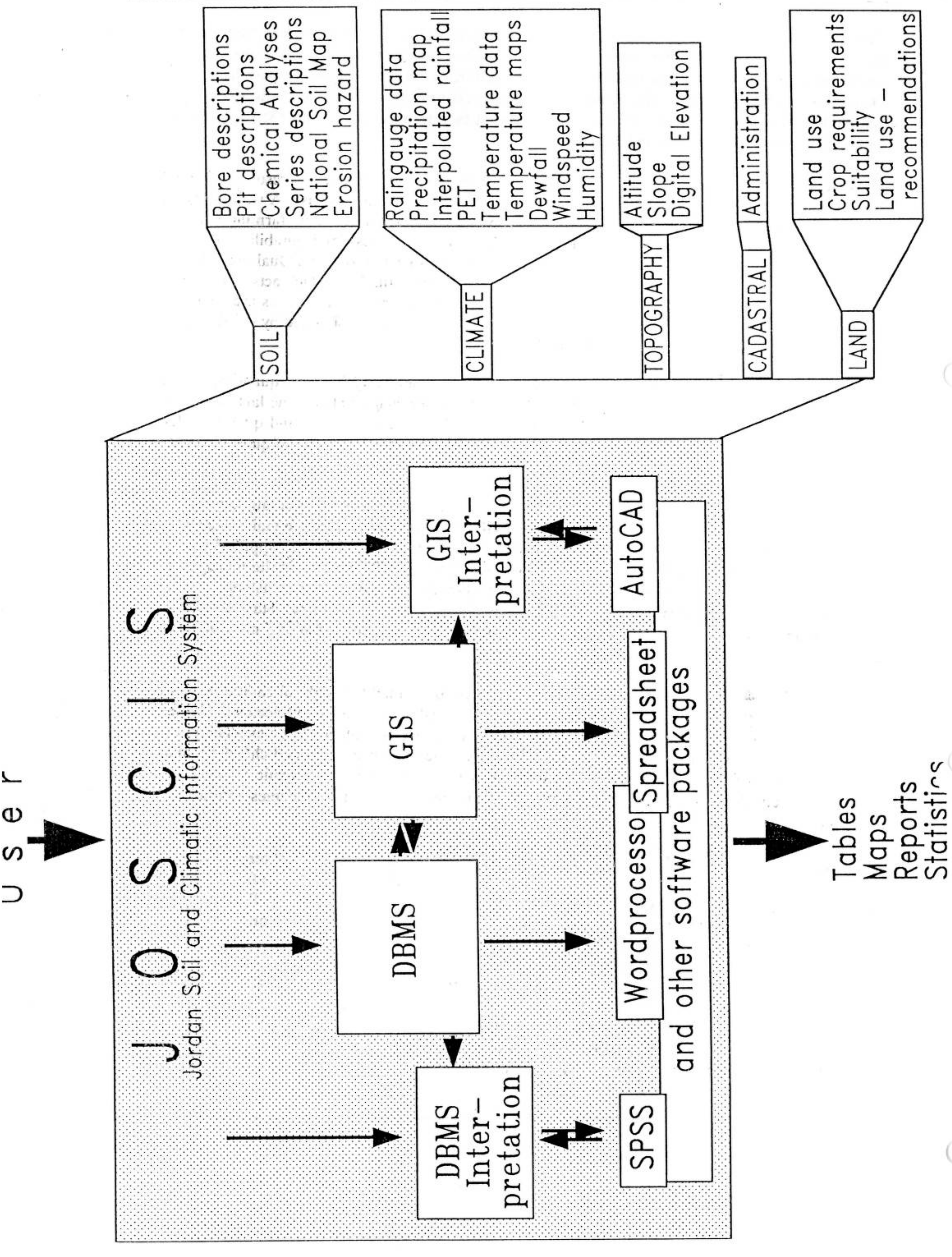
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DBMS
GIS
DBMS Inter-pretation
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Spreadsheet
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and other software packages
Tables
Maps
Reports
Statistic
SOIL
Bore descriptions
Pit descriptions
Chemical Analyses
Series descriptions
National Soil Map
Erosion hazard
CLIMATE
Raingauge data
Precipitation map
Interpolated rainfall
PET
Temperature data
Temperature maps
Dewfall
Windspeed
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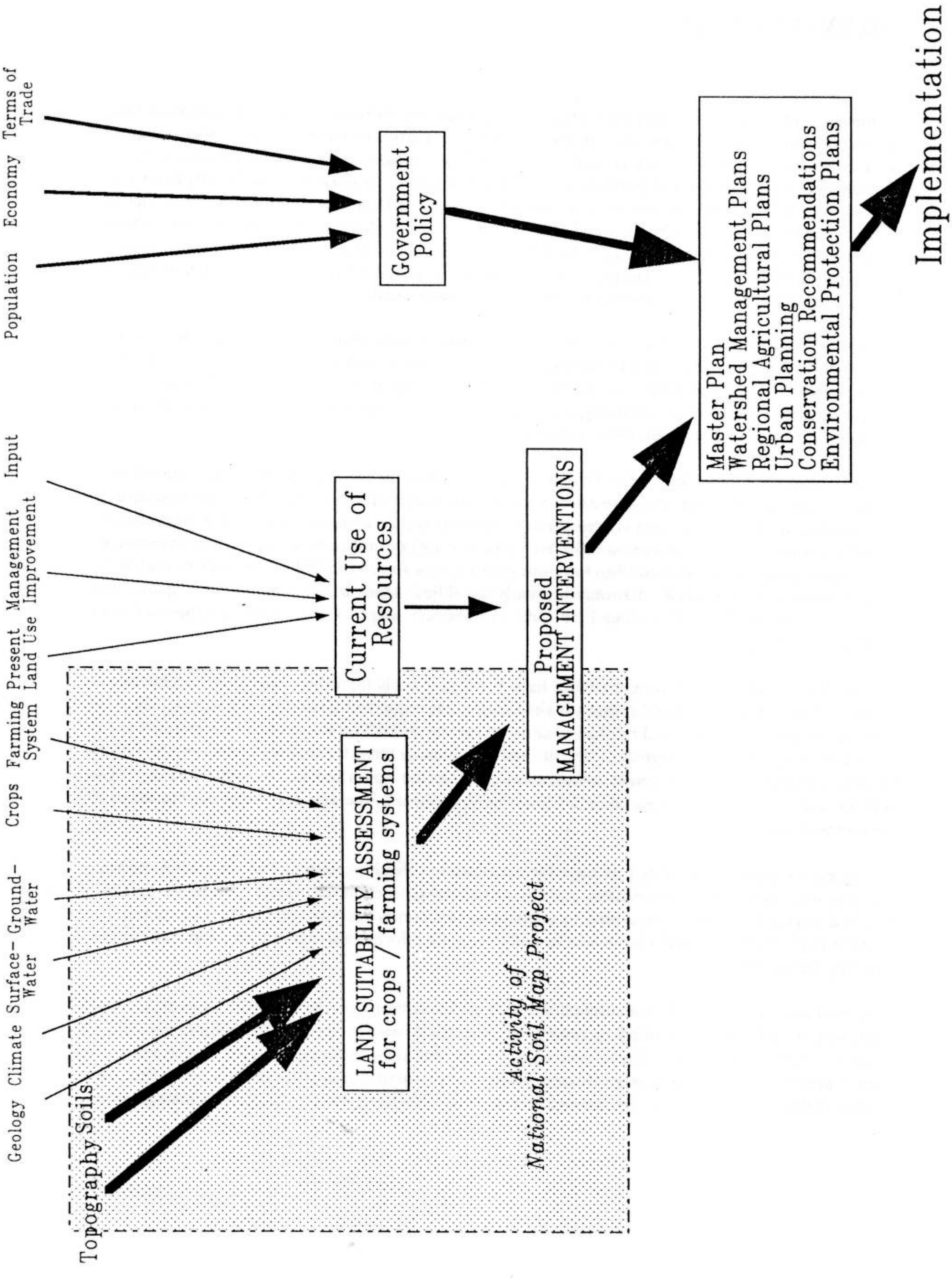
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JOSCIS

Jordan Soil & Climatic Information System

ACKNOWLEDGEMENT

This set of program modules was developed for a soil and climatic information system, to support the Ministry of Agriculture of Jordan with data about soils, land use, and climate both on site specific data and on a spatial basis in a Geographical Information System. The development of the system was done in Jordan over a period of three and a half years and I like to express my appreciation to all my colleagues, in particular to:

Dr.Bob Jones and Mike Jarvis, SSLRC, for permanent logistic support and advice in technical and administrative matters and to keep up my motivation,

Austin Hutcheon, Rob Davison and Alan Stapleton, for constructive discussions, productive support, and incredible patience during alpha and beta testing of the system,

and last but not least,

Muhanned Kalaldeh, Mohammed Sameh, Etihad Rihani and Khaled Hatamleh, for very hard and excellent work on data entry and for keeping up a good working environment.

Gerhard Bechtold, SSLRC, Amman, July 1993

TABLE OF CONTENTS - MANUAL

LAYOUT OF MANUAL

This manual for JOSCIS 1.0 is divided into two basic volumes. All the program modules and data sets are described in these volumes:

D	Database management system - DBMS
G	Geographical information system - GIS

Each volume is further divided into sections of appropriate length and on the basis of the tasks which are of interest to the user. In this sense, the whole manual is a User Guide but, to facilitate system support and maintenance, the documentation has been prepared as a Technical Reference Manual as well. Individual program listings are not included but the DBMS volume (D) contains a comprehensive data dictionary.

Each volume is divided into a several major sections identified in numeric sequence. These sections are further subdivided, each subsection having its own numeric code or identifier. The page layout contains headers and footers. The header contains the volume and subsection name and an appropriate alphanumeric code followed by the page number within the subsection; for example, G 3.1- 3 is page 3 of the subsection 3.1 in the GIS volume of the JOSCIS 1.0 manual. Since most subsections have less than 20 pages, this approach should guide the user quickly through the manual from the Table of Contents.

Conventions used

User specified input is normally specified in a bold type face, example: **copy**. The entry of alphabetic and numeric characters follows the traditional convention:

'a'	alphabetic character, for example a, b,.....z
'n'	integer number, for example 1,2,3......9

Hence a request for input in the form of 'aannnn' could be satisfied by 'cg4579'.

Characters enclosed by '<' and '>' indicate that the user must depress a key. For example,

<ENTER>	depress ENTER key
<ESC>	depress ESCAPE key

User specified inputs such as filename as identified as follows:

{<u>filename</u>}

AutoCAD

commands to be typed in uppercase bold	**ZOOM**
defined filename to be typed in lower case bold	**joscis**
file extension in uppercase	DXF

ACTIVITIES OF COMPUTER SECTION

The Computer Section of the National Soil and Land Use Project is responsible for a number of operational tasks on a regular basis. These include:

1. Data entry
2. Data checking
3. Data appending - to masterfiles
4. Data maintenance - of database master files etc
5. Data retrieval - for Project staff, Ministry of Agriculture and external clients
6. Data security - backup and archive of data and software
7. Hardware security and maintenance
8. Digitizing maps - of soils (drawn by the field staff) and areas where fieldwork is currently taking place
9. Computer support for Project staff

1) Data entry

The procedures for data entry are described in detail in the DBMS Volume Section D 2. The most regular activity is soil data entry - field pit and bore records - Section D 2.1. The entry of soil data is an ongoing task starts as soon as the field recording cards are passed to the Computer Section and is commonly done every working day. Entry of other data is done sporadically.

Data type	**Section/page**
Soil pit and bore data	**D 2.1-1**
Chemical/analytical	**D 2.2-1**
Soil sample	**D 2.3-1**
Precipitation	**D 2.4-1**

The **proformas (cards)** for recording the soil pit and bore data in the field are shown at the end of this Section **(Page 2-9)**. These cards were designed in close consultation with the filed staff and drawn up in VP Graphics (VPG). Examples of completed cards are shown on pages D 1-4, D 1-5, D 1-8 and D 1-9.

The **flow of soil pit and bore data** through the Computer Section and into JOSCIS, is summarised in the flow chart on **pages 2-4 and 2-5** in this Section.

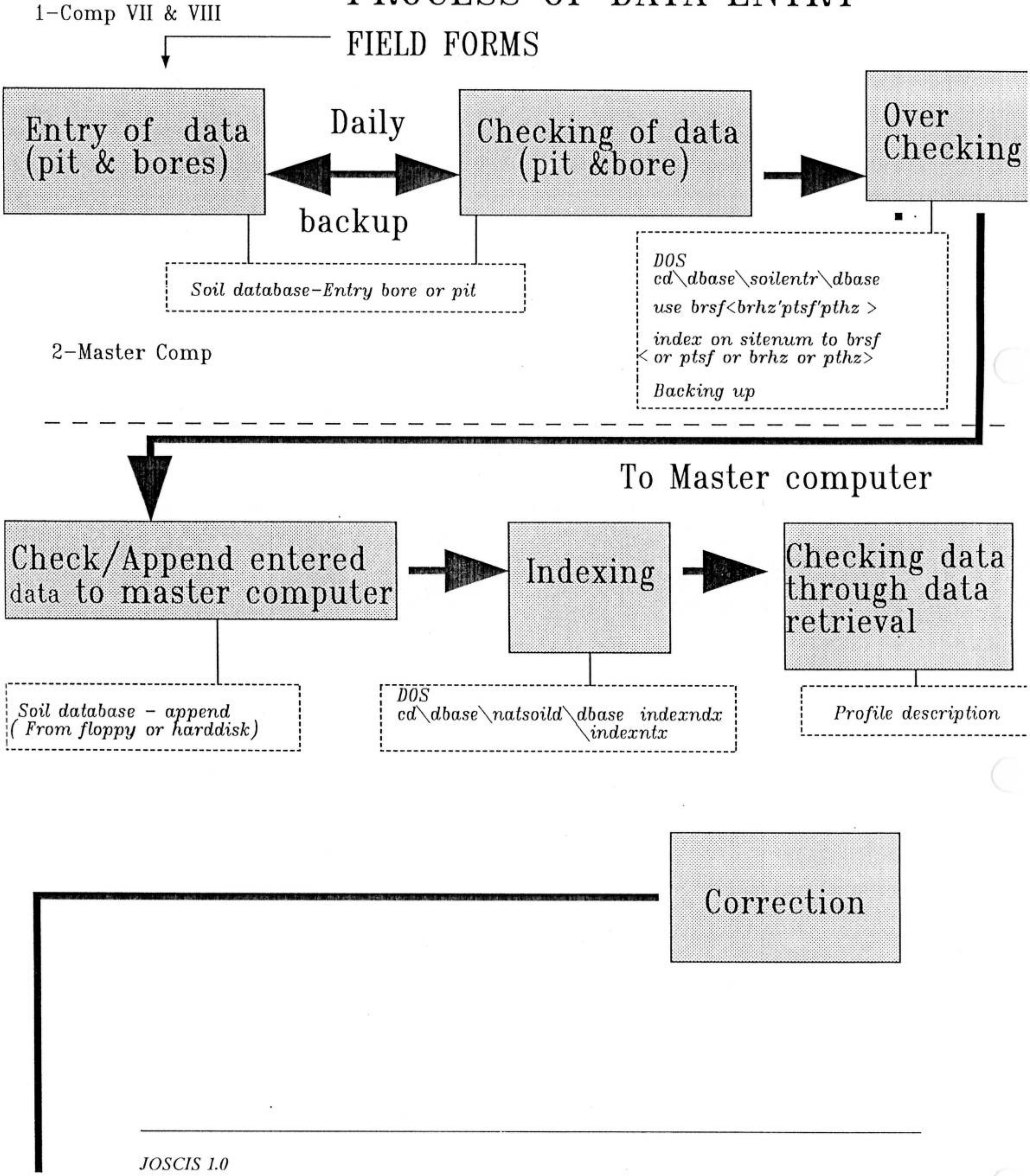
2) Data checking

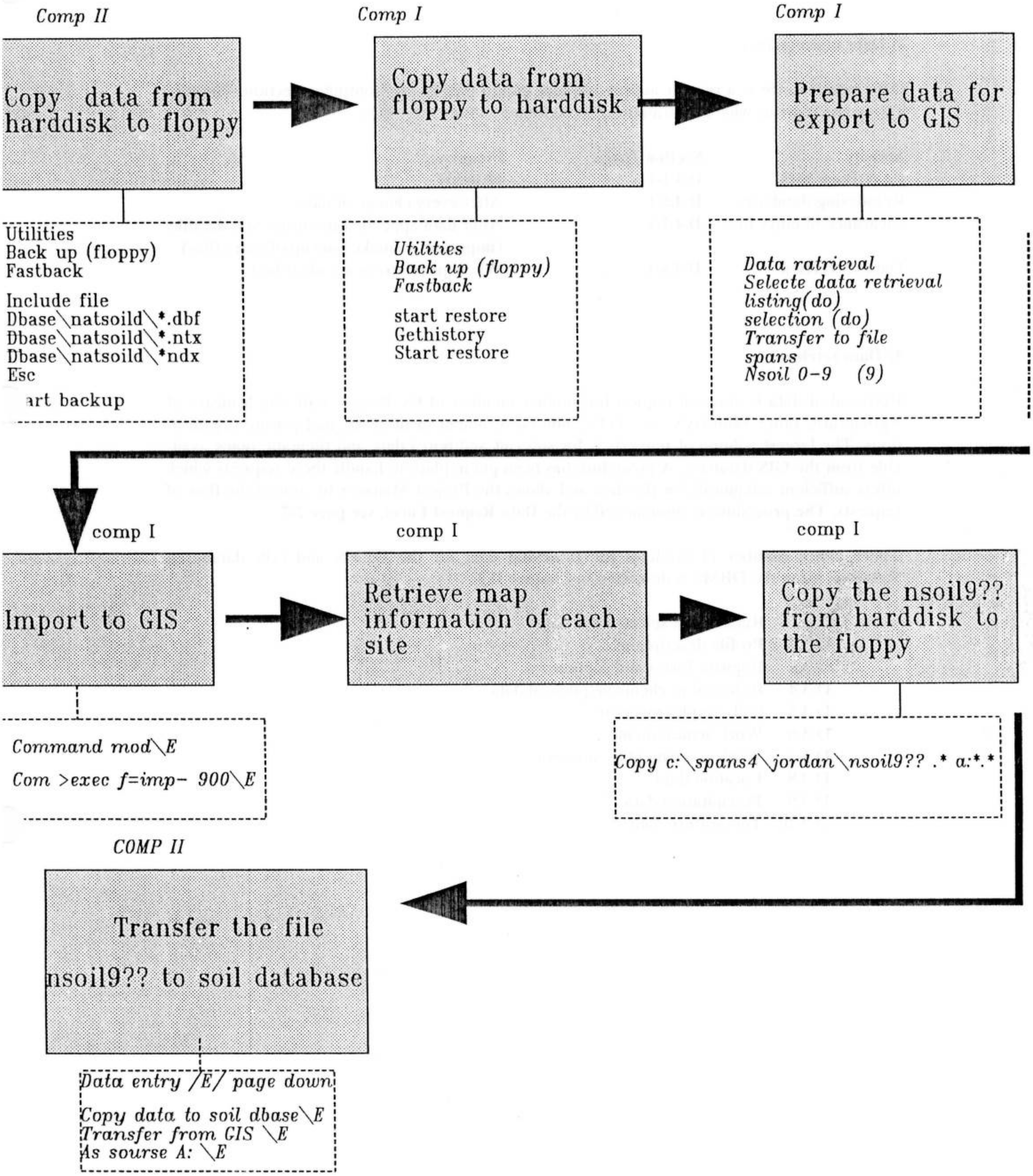
Checking of entered data is another on-going task and applies mainly to the soil pit and bore data. **Checking and overchecking** of these data are described on page **D 2.1-1**.

3) Data appending

Soil pit and bore data are **appended to the master files** when a batch of soil pit and/or bore cards have been key punched, checked and overchecked. The user instructions are given on page **D 2.1-2** and the technical details are given on page **D 4.2-1**.

PROCESS OF DATA ENTRY




Comp II
Copy data from harddisk to floppy
Utilities
Back up (floppy)
Fastback
Include file
Dbase\natsoild*.dbf
Dbase\natsoild*.ntx
Dbase\natsoild*ndx
Esc
art backup
Comp I
Copy data from floppy to harddisk
Utilities
Back up (floppy)
Fastback
start restore
Gethistory
Start restore
Comp I
Prepare data for export to GIS
Data ratrieval
Selecte data retrieval
listing(do)
selection (do)
Transfer to file
spans
Nsoil 0-9 (9)
comp I
Import to GIS
Command mod\E
Com >exec f=imp- 900\E
comp I
Retrieve map information of each site
comp I
Copy the nsoil9?? from harddisk to the floppy
Copy c:\spans4\jordan\nsoil9?? .* a:*.*
COMP II
Transfer the file nsoil9?? to soil database
Data entry /E/ page down
Copy data to soil dbase\E
Transfer from GIS \E
As sourse A: \E

4) Data maintenance

Data maintenance is a regular activity of great importance in the Computer Section. The following summarises where information can be found on these activities:

Activity	Section /page	Frequency
Pit & Bore data	D 4.1-1	Monthly
Reindexing databases	D 4.5-1	After every change of data
Clearance of entry files	D 4.7-1	After data appended to master soil datafile (important to make backup of entry files)
Data correction	D 4.8-1	When gross errors are identified

5) Data retrieval

Retrieval of data is done on request for another member of the Project staff, the Ministry of Agriculture, other Ministry's, EC, GTZ, non-Government institutions, and private organisations. The largest volume of requests is for soil (pit and bore) data and thematic maps available from the GIS database. A procedure has been put in place to handle these requests which offers sufficient safeguards for the data and allows the Project Manager to control the flow of requests. The procedure is summarised by the **Data Request Form, see page 2-7**.

There are a number of modules for retrieving data for the DBMS and GIS databases. Retrieval using the DBMS is described in **Chapter D 3**.

D 3.1 Retrieval of selected soil data
D 3.2 Profile descriptions
D 3.3 Register forms and summaries
D 3.4 Retrieval pf chemical/physical data
D 3.5 Soil samples inventory
D 3.6 Work achievements
D 3.7 Work assessment by surveyor
D 3.8 Location data
D 3.9 Precipitation data
D 3.10 Temprature data

DATA REQUEST FORM

National Soil Map Project, Computer Section

0 Project-internal output
0 Request from outside the Project

Requested by: ____________________

through: ____________________

As we would like to keep a record of information we supplied, we would like to ask you to fill this form:

FOR INTERNAL AND EXTERNAL REQUESTS:

0 GIS
0 Map outprint (colour)
0 Map outprint (laser)
0 Map outprint (plotter)
0 Statistics
0 Digital data/files
0 other outprint: ____________________

0 other services: ____________________

Number:

Name of map(s):

Scale (size):

0 DMS
0 Register form
0 Selected data retrieval
0 Profile description
0 Chemical analyses
0 Precipitation data
0 Temperature data
0 Digital data/files
0 Programs
0 other data: ____________________

Number:

Pit/bore number:

0 Assistance
0 Data maintenance/transfer
0 Software
0 Hardware
0 other: ____________________

Date/time of request:
of handout:
(at the earliest, 1 day after request)

FOR EXTERNAL REQUESTS:

0 Government
0 Ministry of Agriculture
Section:
0 other Ministry: ____________________

0 Non-government institution
0 EEC
0 GTZ
0 Project: ____________________

0 Private

0 Presentation
0 Report
0 Permanent demo/exhibition
0 Temporary demo/exhibition
0 Lecture/lesson, where:
0 Only used as working document
0 Not used for any presentation

Objective/Purpose: ____________________

Approved by:
(date) (signature)

Information: available / not available
Official letter/request: Yes / No

Information supplied by:
Manhours:
Remarks:

6) Data security

Data security is crucially important in any computerised system. It is a fundamemtal activity for all members of the Computer Section. On the **DBMS side, Backup** is covered by Section **D 6.1. Backup of Systems software** in addition to JOSCIS software and data is described in Section **D 6.2.**

Hardware/software	Frequency
Daily	D 6.2-3
Bi-weekly	D 6.2-3
Monthly	D 6.2-4
Half annually	D 6.2-4

Backup of data of on the GIS side is described in Sections **G 6.2 and G 6.3.**

7) Hardware security and maintenance

Hardware is secured by locking all the rooms in the Computer Section outside normal working hours. In addition the master computer (80486) is locked with the special key so that it cannot be booted up even if it is switched on. Over the past four years this policy has ensured that there has been no unauthorised removal or corruption of data, software or equipment. It is strongly recommended that the existing security procedures continue.

Hardware maintenance is described in Section **D 6.2.**

8) Digitizing maps

The digitizing process is described in detail in the GIS Volume (G) Chapter G 2. Processing of digitized data covered in Chapter G 3 and printing and plotting in Chapter G 4. All the tasks described in these Chapters are highly specialised and should not be attempted in the absence of the Geographical Informations Systems Officer.

Retrieval of maps is described in Chapter G 4.

9) Computer support

Staff of the Computer Section continually give support to other Project staff in their general use of computers and help extracting data from JOSCIS. Often the demand is such that the normal work pattern of the Section is disrupted. The Project Manager and Senior Counterpart for the DBMS and GIS should ensure that such demands do not get out of hand. It is important for the data flow to continue as the field temas need the constant feed back which comes from the analysis of entered data.

FIELD RECORDING CARDS FOR SOIL PITS AND BORES

Land system: __ . __ . __

Facet: ___

Site Number: _____

Survey level: 1 2 3 oth Type: Check / Bore / Chisel / Pit / Section Date: __ / __ /19__ Coords: ______ E / _______ N Altitude: ____ m JTM UTM(36) UTM(37) Position: ______________ Location: ________ ______________ Series: ___________ _______________ Phase: ____________ Taxon: ____ Family: ___/___ ____________________	GEOLOGY Rock: _____ vf Ign-bas f Ign-int med Ign-ac crs Sed-det vc Sed-chm Sed-pyr Met-unf Met-fol Unc-all Unc-col Unc-aeol	PARENT MATERIAL V Alluv H Collv Hz Aeoln M Anthr Mz Bdr-frsh L Bdr-wth Grav Evap Ston Sednt Bould Marin	SLOPE Aspect: ___ % ___ Cvx Ccv Rec Cnc Irr Cmp	EROSION 0 Sheet Sli Rill Mod Gul Sev Wind Undif	MICROREI < 25 Sa 25–50 Ui 50–100 Gi 100–200 Ri > 200 cm Mi Te Bi Ot

Notes:

	BOUND.	COLOUR	TEXTURE	MOTTLE	COARSE MAT.	HCl	CONCENTRAT.	CONSI
0 to ----- Type:	0 0 ab s cl w gr ir di br nr nr	COLOUR: Dry: _____ ____/____ Moist: _____ ____/____ Sampled ? Y / N ___________	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5–15 d c >15 mm p m Colour: ______	2–5 srn Qz 5–20 rnd Cht 20–75 ang Grn 75–250 tab Sst >250 mm pl hd Lst irr so Lst Bas ____ % oth:	nil sl mod str viol nr	< 5 so Ca 5–15 mod Na >15 mm h Gyp vh Mn Cly ____ %	lo lo so vfr sh fr mh fi h vfi vh xfi xh cmt nr nr
to ----- Type:	0 0 ab s cl w gr ir di br nr nr	COLOUR: Dry: _____ ____/____ Moist: _____ ____/____ Sampled ? Y / N ___________	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5–15 d c >15 mm p m Colour: ______	2–5 srn Qz 5–20 rnd Cht 20–75 ang Grn 75–250 tab Sst >250 mm pl hd Lst irr so Lst Bas ____ % oth:	nil sl mod str viol nr	< 5 so Ca 5–15 mod Na >15 mm h Gyp vh Mn Cly ____ %	lo lo so vfr sh fr mh fi h vh xfi xh cmt nr nr

Sample area: __/__
API Unit: ___

AP Scale 1: ______
AP-No.: _______

LIMIT	DIAGNOST	
cm	cm	c
Lith (___)	Vert	Vert
Paralith	Camb	Camb
P.gyp	Sal	Sal
P.calc	Calc	Calc
Grav/Stn	Gyp	Gyp
Bould	P.calc	P.calc
Cmpct	P.gyp	P.gyp
Undif	Argil	Argil

RUN OFF	DRAINAGE	SURFACE COVER	SURFACE FEATURE	SURFACE CONDITION		LAND USE	
		___ % of:	___ % of:				
0	V.poor	Nil	Litter	Dry	Loose	Cereals	Impr.grazing
Slow	Poor	Rock	Salts	Moist	Soft	Oth field crops	Impr.grazing/browse
Med	Imperf.	Boulder	NaCl	Wet	Sl hard	Mixed	Nat.grazing
Rap	Mod.well	Stones	CaS04		Md hard	Tree crops	Nat.grazing/browse
V.rap	Well	Gravel	MgS04		Hard	Mix tree/annual	Planted forest
	Somewh.ex.	Grit	Polygons		V hard	Horticultural	Nat.forest/woodl.
	Excess.	Pan	Vesicul		X hard	Forage	Forest/grazing
		Pavem	Aeol Sand			Fallow	Industrial/Mining
		Crust	Cracks: ___ cm			Tilled	Urban
		Type:	Capping: ___ cm			Greenhouse	Recreational
		____	Mulching				Un-vegetated

DIAGRAM

0 cm

50

100

150

200

CROSS SECTION:

IRRIGATED: Y / N

CROPS / VEGETATION SPEC.

Type:	No.:
____________	___
____________	___
____________	___
____________	___

Ground cover: __ %

NCE	STRUCTURE						COATINGS				VOIDS			CRACKS			ROOTS			DIAGNOST	
npl	vw	vf	sg	vw	vf	sg	0	thn	Ca	grav	0	<.5	tub	0	<1	hor	0	< 1	Fib	Vert	P.gyp
slpl	weak	fin	gr	weak	fin	gr	wk	md	Cly	peds	f	.5-2	sphr	f	1-5	irr	f	1-2	Wdy	Camb	Argil
mpl	mod	med	cr	mod	med	cr	md	thk	Fe	pores	c	2-5	irr	c	5-10	vert	c	2-5	Fib+ Wdy	Sal	Moll
vpl	str	crs	sbk	str	crs	sbk	str		Mn		m	> 5 mm		m	> 10 mm		m	> 5 mm		Calc	Ochr
nr	vstr	vc	abk	vstr	vc	abk			Si											Gyp	Agr
			pr			pr			Na Gy OM Sl.sid Sand	Notes:										P.calc	
			col pl m			col pl m															

NCE	STRUCTURE						COATINGS				VOIDS			CRACKS			ROOTS			DIAGNOST	
npl	vw	vf	sg	vw	vf	sg	0	thn	Ca	grav	0	<.5	tub	0	<1	hor	0	< 1	Fib	Vert	P.gyp
slpl	weak	fin	gr	weak	fin	gr	wk	md	Cly	peds	f	.5-2	sphr	f	1-5	irr	f	1-2	Wdy	Camb	Argil
mpl	mod	med	cr	mod	med	cr	md	thk	Fe	pores	c	2-5	irr	c	5-10	vert	c	2-5	Fib+ Wdy	Sal	Moll
vpl	str	crs	sbk	str	crs	sbk	str		Mn		m	> 5 mm		m	> 10 mm		m	> 5 mm		Calc	Ochr
nr	vstr	vc	abk	vstr	vc	abk			Si											Gyp	Agr
			pr			pr			Na Gy OM Sl.sid Sand	Notes:										P.calc	
			col pl m			col pl m															

Land system: __ . __ . __ Sample area: __ / __ AP Scale 1: ______

Site Number: _____

Facet: ___ API Unit: ___ AP-No.: _____

Survey level: 1 2 3 oth
Type: Check / Bore / Chisel / Pit / Section
Date: __ / __ /19__

Coords: ______ E / ________ N
Altitude: ____ m JTM UTM(36) UTM(37)
Position: ______________
____
Location: ______________
Series: __________
Phase: ______________
____
Taxon: ____ Family: ____ / ____
____

GEOLOGY		PARENT MATERIAL		SLOPE	EROSION		MICRO-RELIEF	
Rock: _____				Aspect: ___ % ___				
vf	Ign-bas	V	Alluv	Cvx	0	Sheet	< 25	Sand
f	Ign-int	H	Collv	Ccv	Sli	Rill	25- 50	Undl
med	Ign-ac	Hz	Aeoln	Rec	Mod	Gul	50-100	Gul
crs	Sed-det	M	Anthr	Cnc	Sev	Wind	100-200	Rills
vc	Sed-chm	Mz	Bdr-frsh	Irr		Undif	> 200 cm	Moun
	Sed-pyr	L	Bdr-wth	Cmp				Terrc
	Met-unf	Grav	Evap					Bnch
	Med-fol	Ston	Sednt					Oth
	Unc-all	Bould	Marin					
	Unc-col							
	Unc-aeol							

RUN OFF	DRAINAGE	SURFACE COVER % of: ___	SURFACE FEATURE % of: ___	SURFACE CONDITION	
0	V.poor	Nil	Litter	Dry	Loose
Slow	Poor	Rock	Salts	Moist	Soft
Mod	Imperf.	Boulder	NaCl	Wet	Sl hard
Rap	Mod.well	Stones	CaSO4		Md hard
V.rap	Well	Gravel	MgSO4		Hard
	Somewh.ex.	Grit	Polygons		V hard
	Excess.	Pan	Vesicul		X hard
		Pavem	Aeol Sand		
		Crust	Cracks: ___ cm		
		Type: ______	Capping: ___ cm		
			Mulching		

LAND USE	
Cereals	Impr.grazing
Oth field crops	Impr.grazing/browse
Mixed	Nat.grazing
Tree crops	Nat.grazing/browse
Mix tree/annual	Planted forest
Horticultural	Nat.forest/woodl.
Forage	Forest/grazing
Fallow	Industrial/Mining
Tilled	Urban
Greenhouse	Recreational
	Un-vegetated

LIMIT ___ cm	DIAGNOST ___ cm	___ cm
Lithic (___)	Vert	Vert
Paralith	Camb	Camb
P.gyp	Sal	Sal
P.calc	Calc	Calc
Grav/Ston	Gyps	Gyps
Bould	P.calc	P.calc
Cmpct	P.gyp	P.gyp
Undif	Argil	Argil

CROSS SECTION

IRRIGATED: Y / N

CROPS / VEGETATION SPEC.

Type:	No.:
____________	___
____________	___
____________	___
____________	___

Ground Cover: __ %

DIAGRAM

0 cm
50
100
150

Notes:

ıte Number: -----

	COLOUR TEXTURE		MOTTLE	COARSE MAT.	HCl	CONCENTR.	NOTES
) ---- 'pe:	COLOUR: Dry: ----- ---/--- Mst: ----- ---/--- TEXT.: -----------	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5-15 d c >15 mm p m Colour: ------	2-5 srn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd LSt irr so Lst ---- % Bas oth:	nil sl mod str viol nr	< 5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- %	
---- ype:	COLOUR: Dry: ----- ---/--- Mst: ----- ---/--- TEXT.: -----------	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5-15 d c >15 mm p m Colour: ------	2-5 srn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd LSt irr so Lst ---- % Bas oth:	nil sl mod str viol nr	< 5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- %	
----- ype:	COLOUR: Dry: ----- ---/--- Mst: ----- ---/--- TEXT.: -----------	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5-15 d c >15 mm p m Colour: ------	2-5 srn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd LSt irr so Lst ---- % Bas oth:	nil sl mod str viol nr	< 5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- %	
----- ype:	COLOUR: Dry: ----- ---/--- Mst: ----- ---/--- TEXT.: -----------	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5-15 d c >15 mm p m Colour: ------	2-5 srn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd LSt irr so Lst ---- % Bas oth:	nil sl mod str viol nr	< 5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- %	
-- ype:	COLOUR: Dry: ----- ---/--- Mst: ----- ---/--- TEXT.: -----------	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5-15 d c >15 mm p m Colour: ------	2-5 srn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd LSt irr so Lst ---- % Bas oth:	nil sl mod str viol nr	< 5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- %	

National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

Jordan Soil and Climatic Information System

D B M S

V O L U M E

Data Entry	Data Retrieval	Data Maintenance	Data Dictionary	General Information

Gerhard Bechtold
Amman
July 1993

TABLE OF CONTENTS

TABLE OF CONTENTS

[Document update: 15-April-1995,Khaled Hatamleh]

[Document update: 15-April-1995,Khaled Hatamleh]

INTRODUCTION TO DBMS

For land resource appraisal, a comprehensive database is required comprising tables of related data (attributes) and digital maps. Several models of data structure can be involved. This volume (D) describes the data which are held as relational tables. The capture, storage, retrieval and manipulation of the digital map data are described in Volume G of this manual. All spatial and locational data are geo-referenced and the geo-reference is a primary key in the system

The following sections describe the operation of the JOSCIS relational database containing the soil, climate and land data. For example,

soil:	pit and borehole descriptions
	chemical analyses
	series descriptions
climate	rain gauge recordings, dewfall
	temperature
	humidity
land	crop requirements
	suitability scheme

The soil data differ from the other parameters in that they relate to different layers in the soil as well as to the soil surface. In this sense the soil data are three dimensional. Adopting the principles of relational databases, all the data are multi-dimensional but it is important to appreciate that one to many (1:m) relationships must be catered for in the storage of soil borehole (bores) and pit data. For example, a soil borehole description has much information about the site - namely slope, rockiness, land use or vegetation, etc - and data on the characteristics of each layer or horizon such as the thickness, texture, structure, stone content, colour etc. In terms of the database structure, the surface features data for soil bores and pits are stored in separate databases from the horizon data, the joining being made possible by using geo-reference and horizon depth as keys.

The JOSCIS DBMS has been programmed in Clipper/dBASE. Database file formats conform to dBASE IV DBF standards. Interactive searching is possible by directly accessing the databases files using dBASE commands (for most of the Project, dBASE IV v 1.1). However, a user friendly interface was needed for the casual user and this has been programmed in Clipper 5 (v5.01). Clipper constitutes a powerful environment for system development and dramatically improves performance over standard dBASE IV.

During the soil survey work (1989-93), a large number of sites throughout Jordan have been visited and the soils examined, described and sampled by experienced soil surveyors. At the end of July 1993, a total of 22,498 sites had been visited.

Soil pits have been excavated (to a depth of at least 1.2m) to characterise the main soil units. At these pit sites (page D 1-3), a wide range of properties for the surface and sub-surface layers (horizons) in the soil have been recorded using a large (A3) field recording card (pages D 1-4,D 1-5) specifically designed for this project.

On page D 1-7, the locations of sites where inspection soil boreholes, called bores, have been excavated are shown. A smaller range of properties for the surface and sub-surface horizons in the soil have been recorded on A4 field recording cards (pages D 1-8, D 1-9) also specifically designed for this project.

Samples have been taken from a small proportion of the soil pits and have been analysed for physical and chemical properties. Those sites with analytical data are shown on page D 1-10

The pit and bore sites are shown together on page D 1-11 and this gives the overall distribution of sites visited (totalling 22,498). This distribution is most dense in the Highlands of Jordan but the country as a whole has been well covered by the survey teams.

Rain gauge sites are shown on page D 1-12. The precipitation data recorded at these sites are included at the end of this volume.

Future developments

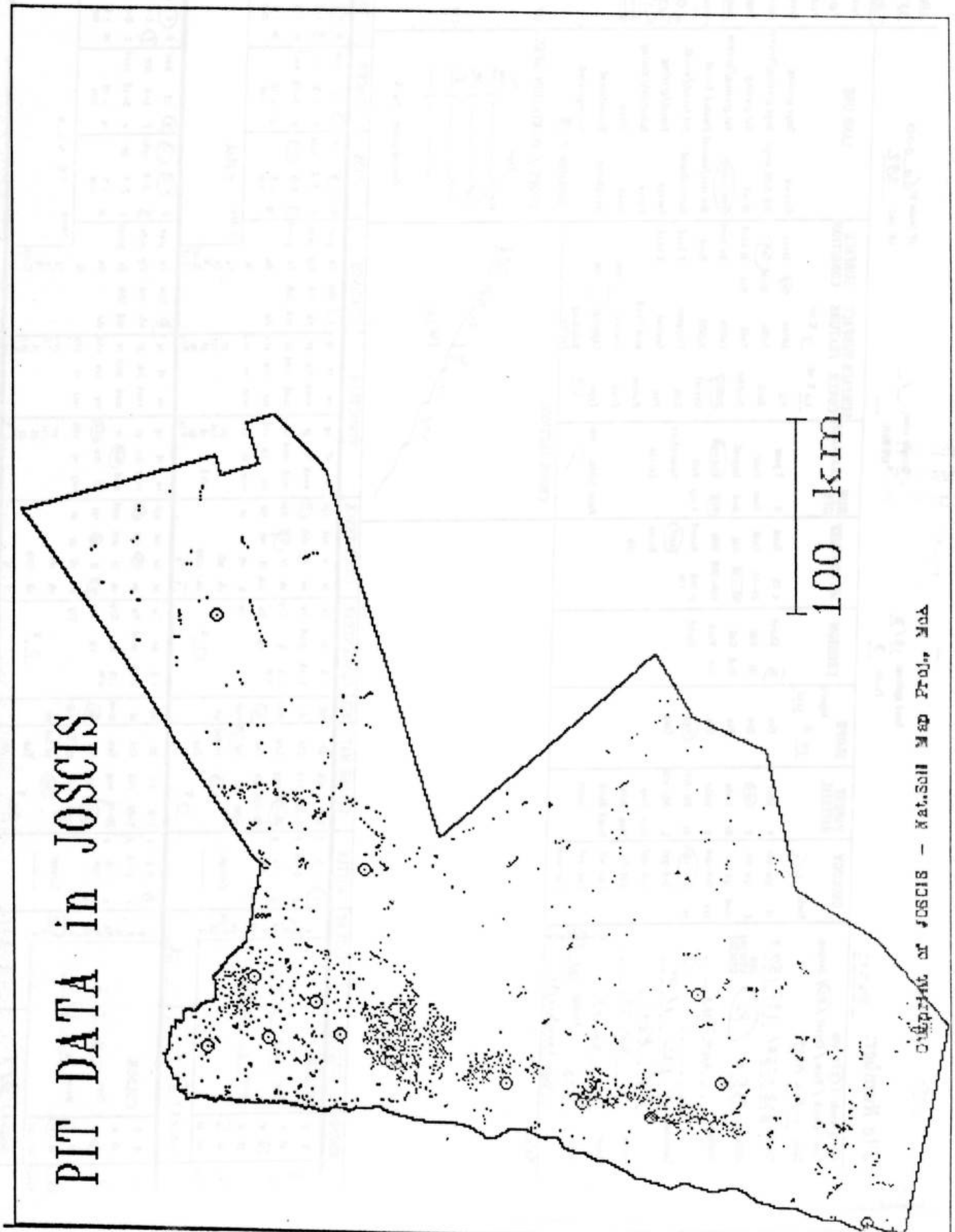
In the immediate future, the Project staff will be fully engaged keeping the current entry and retrieval systems operational. Level 2 fieldwork continues and the current proposal under Level 3 includes a significant number of further soil observations. All these data will need to be added to the JOSCIS databases.

There is probably some scope for introducing additional forms of output but more important is the addition of interpretation modules in both the DBMS and the GIS. Given appropriate crop and land information, the physical criteria currently stored in the system can be matched up with the requirements of specific crops and land utilisation types. Thus an automated land evaluation should be possible (see Introduction to the Manual page 1-5).

Evaluation of the land for specific uses should follow the FAO framework (1976) and would lead to simple suitability assessment - well, moderately, or marginally suited, or unsuited. Suitablity assessments could be made for points or areas (as combinations of points). The distribution of suitability classes could then be displayed by the GIS.

In summary therefore, suggested options for version 2.0 of JOSCIS are:

- Module for moisture assessments (soil moisture balance modelling with daily and weekly moisture input/output calculations, potential evapotranspiration (PET);
- Module for land evaluation (soil suitability, climatic suitability, land suitability, recommended land use measures, yield assessements, economic evaluation, erosion assessment);
- Improved output facilities, link with other/new software;
- Open architecture design, including output form design;
- Network support;
- Support for mouse and Windows 3.x/NT.


PIT DATA in JOSCIS
100 km
Copyright of JOSCIS - Nat.Soil Map Proj., MoA

Land system: 18/2 Facet: 3 . Sample area: 1 API Unit: --- AP Scale 1: 60 000 AP-No.: 382

Site Number: PK 232

Site	GEOLOGY	PARENT MATERIAL	SLOPE	EROSION	MICRORELIEF	RUN OFF	DRAINAGE	SURFACE COVER	SURFACE FEATURE	SURFACE CONDITION	LAND USE
Survey level: 1 (2) 3 oth Type: Check / Bore / Chisel / (Pit) / Section Date: 10/ 6 /1993 Coords: 233 555 E/ 137 152 N Altitude: 955 m (Pl) JTM UTM(36) UTM(37) Position: Upper Slope Location: 2 1km 11 0° Kufr Kiel Series: High 27 Phase: Shallow Taxon: 3D5D Family: GV C X K XC S M Lithic Xerochrepts	Rock: LST vf Ign-bas f Ign-int med Ign-ac crs Sed-det vc (Sed-chm) Sed-pyr Met-unf Met-fol Unc-all Unc-col Unc-aeol	V Alluv H (Coll) Hz Aeoln M Anthr Mz Bdr-frsh L Bdr-wth Grav Evap Ston Sednt Bould Marin Calcrt	10 % Aspect: 330 Cvx Ccv Rec Cnc (Irr) Cmp	(0) Sheet Sli Rill Mod Gul Sev Wind Undif	< 25 Sand 25-50 Undl (50-100) Gul 100-200 Rills > 200 cm Mound (Terrc) Buchs Oth	0 Slow Med (Rap) V.rap	V.poor Poor Imperf. (Mod.well) Well Somewh.ex Excess. Water table: --- cm	10 % of: Nil Rock Boulder (Stones) Gravel Grit Pan Pavem Crust Type: LST	2 % of: Litter Salts NaCl CaSO4 MgSO4 Polygons Vesicul Aeol Sand Cracks: --- cm Capping: --- cm Mulching Patina	(Dry) Loose Moist (Soft) Wet Sl hard Md hard Hard V hard X hard	Cereals / Impr.grazing Oth field crops / Impr grazing/browse Mixed / Nat.grazing (Tree crops) / Nat.grazing/browse Mix tree/annual / Planted forest Horticultural / Nat.forest/woodl. Forage / Forest/grazing Fallow / Industrial/Mining Tilled / Urban Greenhouse / Recreational Un-vegetated IRRIGATED: Y (N)

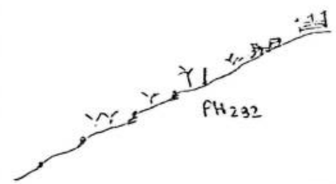
LIMIT	DIAGNOST	
35 cm	16 cm --- cm	
(Lith)( )	Vert	Vert
Paralith	(Camb)	Camb
P.gyp	Sal	Sal
P.calc	Calc	Calc
Grav/Stn	Gyp	Gyp
Bould	P.calc	P.calc
Cmpct	P.gyp	P.gyp
Undif	Argil	Argil

DIAGRAM

0 cm — 50 — 100 — 150

Notes:

CROSS SECTION:



CROPS / VEGETATION SPEC.

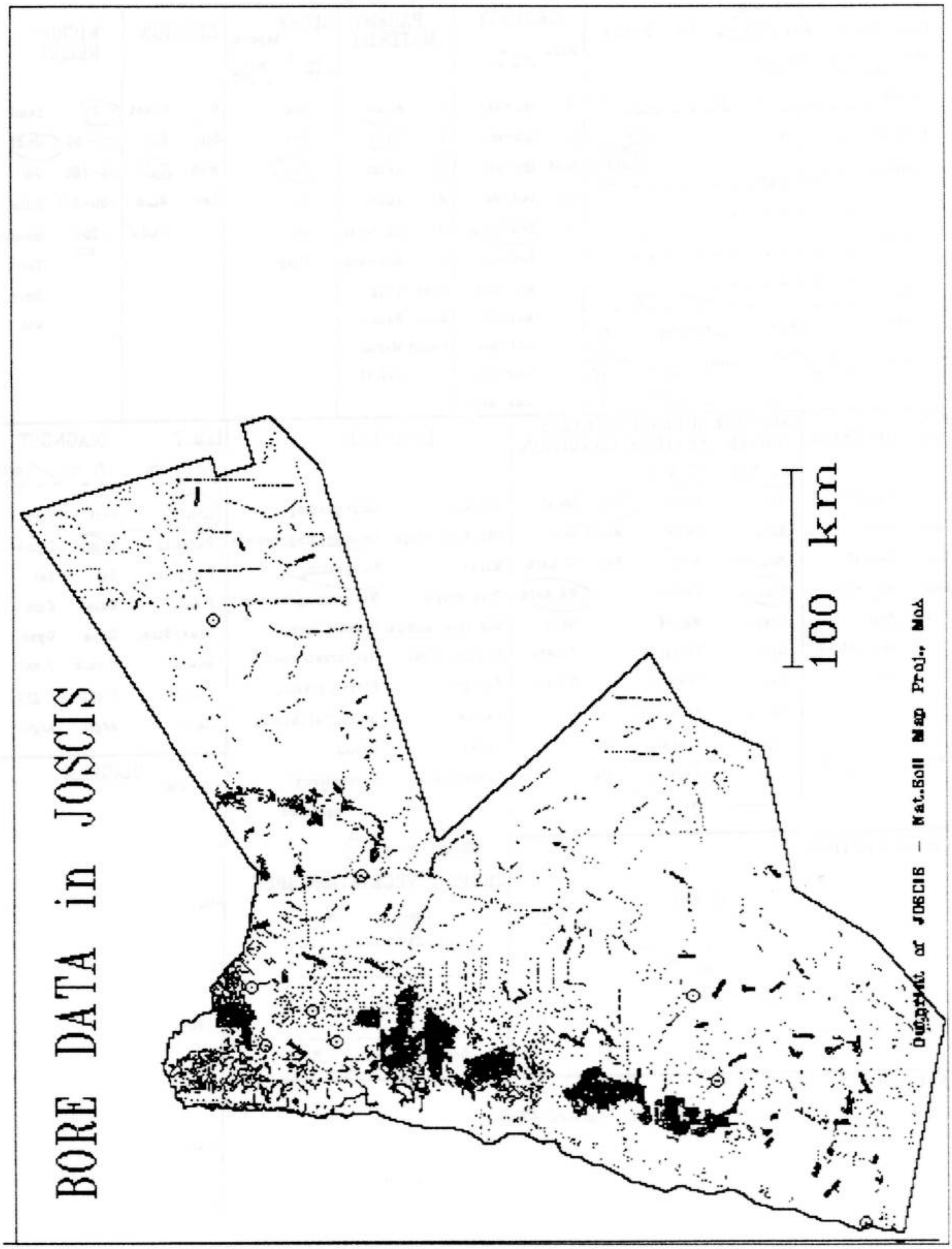
Type:	No.:
زيتون	20
لوز	10
تين	5
---	---

Ground cover: 25 %

	BOUND.	COLOUR	TEXTURE	MOTTLE	COARSE MAT.	HCI	CONCENTRAT.	CONSISTENCE	STRUCTURE	COATINGS	VOIDS	CRACKS	ROOTS	DIAGNOST
0 to 16 Type:	0 0 ab s (c) w gr ir di (br) nr nr	COLOUR: Dry: 7.5YR 5/4 Moist: 6 3/4 Sampled ? (Y) / N cl	V F H Hz M Mz L Lv (Cmh) Cl Q	(0) < 5 f 5-15 d c >15 mm p m Colour: ---	2-5 srn Qz 5-20 rnd Cht (20-75) ang Grn 75-250 tab Sst >250 mm pl (Sd Lst) (irr) so Lst Bas 10 % oth:	nil sl mod (str) viol ar	< 5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly 0 %	lo lo nst npl so vfr slst (spl) sh fr (mst) mpl mh fi vst vpl h vfi nr nr vh efi eh cmp	vw vf sg / vw vf sg weak fin gr / weak fin gr mod med cr / mod med cr str crs sbk / str crs sbk vstr vc abk / vstr vc abk pr col pl m Wdg	(0) thn Ca grav vk md Cly peds md thk Fe pores str Mn Si Na Cy M Sl sid Sand	0 (C5) tub f 5-2 sphr (c) 2-5 (irr) m >5 mm Notes: Tilled	(0) <1 hor f 1-5 irr c 5-10 vert m >10 mm	0 (<1) (Fib) (f) 1-2 Wdy c 2-5 Fib+ Wdy m >5 mm	Vert P.gyp Camb Argil Sal Moll Calc Ochr Gyp Agr P.calc
16 to 35 Type:	0 0 ab s (cl) w gr ir di (br) nr nr	COLOUR: Dry: 7.5YR 5/6 Moist: 5 4/4 Sampled ? (Y) / N sicl	V F H Hz M Mz L Lv (Cmh) Cl Q	(0) < 5 f f 5-15 d c >15 mm p m Colour: ---	2-5 srn Qz 5-20 rnd Cht 20-75 ang Grn (5-250) tab Sst >250 mm pl (Sd Lst) (irr) so Lst Bas 60 % oth:	nil sl mod (str) viol ar	< 5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly 0 %	lo lo nst npl so (vfr) slst (spl) sh fr mst mpl (mh) fi (vst) vpl h vfi nr nr vh efi eh cmp vr nr	vw vf sg / vw vf sg weak fin gr / weak fin gr mod (med) cr / mod med cr (str) crs (sbk) / str crs sbk vstr vc abk / vstr vc abk pr col pl m Wdg	(0) thn Ca grav vk md Cly peds md thk Fe pores str Mn Si Na Cy M Sl sid Sand	0 (C5) (tub) f (5-2) sphr c 2-5 irr m >5 mm Notes: 5% 1 soil	(0) <1 hor f 1-5 irr c 5-10 vert m >10 mm	0 (<1) (Fib) (f) 1-2 Wdy c 2-5 Fib+ Wdy m >5 mm	Vert P.gyp Camb Argil Sal Moll Calc Ochr Gyp Agr P.calc

Site Number: -----

	HORIZ	COLOUR	TEXTURE	MOTTLE	COARSE MAT.	HCl	CONCENTRAT.	CONSISTENCE	STRUCTURE		COATINGS	VOIDS	CRACKS	ROOTS	DIAG
to ----- Type:	0 0 ab a cl w gr ir di br nr nr	COLOUR: Dry: ----- ----/---- Moist: ----- ----/---- Sampled ? Y / N	V F H Hz M Mz L Qv Qmh Ql Q ----------	0 <5 f f 5-15 d c >15 mm p m Colour: ------	2-5 arn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd Lst irr so Lst x Bas ---- oth:	nil sl mod str viol nr	<5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- x	lo lo nst npl so vfr slst slpl sh fr mst mpl mh fi vst vpl h vfi nr nr vh xfi xh cmp nr nr	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	0 thn Ca grav wk md Cly peds md thk Fe pores str Mn Si Na Gy OM Sl.sid Sand Wedg	0 <.5 tub f .5-2 sphr c 2-5 irr m >5 mm Notes:	0 <1 hor f 1-5 irr c 5-10 vert m >10 mm	0 <1 Fib f 1-2 Wdy c 2-5 Fib+Wdy m >5 mm	Vert Camb Sal Calc Gyp P.calc
to ----- Type:	0 0 ab a cl w gr ir di br nr nr	COLOUR: Dry: ----- ----/---- Moist: ----- ----/---- Sampled ? Y / N	V F H Hz M Mz L Qv Qmh Ql Q ----------	0 <5 f f 5-15 d c >15 mm p m Colour: ------	2-5 arn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd Lst irr so Lst x Bas ---- oth:	nil sl mod str viol nr	<5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- x	lo lo nst npl so vfr slst slpl sh fr mst mpl mh fi vst vpl h vfi nr nr vh xfi xh cmp nr nr	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	0 thn Ca grav wk md Cly peds md thk Fe pores str Mn Si Na Gy OM Sl.sid Sand Wedg	0 <.5 tub f .5-2 sphr c 2-5 irr m >5 mm Notes:	0 <1 hor f 1-5 irr c 5-10 vert m >10 mm	0 <1 Fib f 1-2 Wdy c 2-5 Fib+Wdy m >5 mm	Vert Camb Sal Calc Gyp P.calc
to ----- Type:	0 0 ab a cl w gr ir di br nr nr	COLOUR: Dry: ----- ----/---- Moist: ----- ----/---- Sampled ? Y / N	V F H Hz M Mz L Qv Qmh Ql Q ----------	0 <5 f f 5-15 d c >15 mm p m Colour: ------	2-5 arn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd Lst irr so Lst x Bas ---- oth:	nil sl mod str viol nr	<5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- x	lo lo nst npl so vfr slst slpl sh fr mst mpl mh fi vst vpl h vfi nr nr vh xfi xh cmp nr nr	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	0 thn Ca grav wk md Cly peds md thk Fe pores str Mn Si Na Gy OM Sl.sid Sand Wedg	0 <.5 tub f .5-2 sphr c 2-5 irr m >5 mm Notes:	0 <1 hor f 1-5 irr c 5-10 vert m >10 mm	0 <1 Fib f 1-2 Wdy c 2-5 Fib+Wdy m >5 mm	Vert Camb Sal Calc Gyp P.calc
to ----- Type:	0 0 ab a cl w gr ir di br nr nr	COLOUR: Dry: ----- ----/---- Moist: ----- ----/---- Sampled ? Y / N	V F H Hz M Mz L Qv Qmh Ql Q ----------	0 <5 f f 5-15 d c >15 mm p m Colour: ------	2-5 arn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd Lst irr so Lst x Bas ---- oth:	nil sl mod str viol nr	<5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- x	lo lo nst npl so vfr slst slpl sh fr mst mpl mh fi vst vpl h vfi nr nr vh xfi xh cmp nr nr	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	0 thn Ca grav wk md Cly peds md thk Fe pores str Mn Si Na Gy OM Sl.sid Sand Wedg	0 <.5 tub f .5-2 sphr c 2-5 irr m >5 mm Notes:	0 <1 hor f 1-5 irr c 5-10 vert m >10 mm	0 <1 Fib f 1-2 Wdy c 2-5 Fib+Wdy m >5 mm	Vert Camb Sal Calc Gyp P.calc
to ----- Type:	0 0 ab a cl w gr ir di br nr nr	COLOUR: Dry: ----- ----/---- Moist: ----- ----/---- Sampled ? Y / N	V F H Hz M Mz L Qv Qmh Ql Q ----------	0 <5 f f 5-15 d c >15 mm p m Colour: ------	2-5 arn Qz 5-20 rnd Cht 20-75 ang Grn 75-250 tab Sst >250 mm pl hd Lst irr so Lst x Bas ---- oth:	nil sl mod str viol nr	<5 so Ca 5-15 mod Na >15 mm h Gyp vh Mn Cly ---- x	lo lo nst npl so vfr slst slpl sh fr mst mpl mh fi vst vpl h vfi nr nr vh xfi xh cmp nr nr	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	vw vf sg weak fin gr mod med cr str crs abk vstr vc sbk pr col pl m	0 thn Ca grav wk md Cly peds md thk Fe pores str Mn Si Na Gy OM Sl.sid Sand Wedg	0 <.5 tub f .5-2 sphr c 2-5 irr m >5 mm Notes:	0 <1 hor f 1-5 irr c 5-10 vert m >10 mm	0 <1 Fib f 1-2 Wdy c 2-5 Fib+Wdy m >5 mm	Vert Camb Sal Calc Gyp P.calc


BORE DATA in JOSCIS
100 km
of JOSCIS – Nat.Soil Map Proj., MoA

Site Number: 41949

Land system: 11/13 Facet: 2

Sample area: -- / -- API Unit: ---

AP Scale 1: ------ AP-No.: -------

Survey level: 1 2 3 oth

Type: Check / Bore / Chisel / Pit / Section

Date: 28 / 6 / 1993

Coords: 230 760 E / 6447 400 N

Altitude: 935 m JTM UTM(36) UTM(37)

Position: Midslope

Location:

Series: KAR 18

Phase: stony, gravelly

Taxon: FBFX Family: Qah / C Y XC S M

Lithic xeric carbonated

GEOLOGY	PARENT MATERIAL	SLOPE	EROSION	MICRO-RELIEF
Rock: Lst		4 % Aspect: NW		
vf Ign-bas	V Alluv	Cvx	0 Sheet	< 25 Sand
f Ign-int	H Collv	Ccv	Sli Rill	25-50 Undf
med Ign-ac	Hz Aeoln	Rec	Mod Gul	50-100 Gul
crs Sed-det	M Anthr	Cnc	Sev Wind	100-200 Rills
vc Sed-chm	Mz Bdr-frsh	Irr	Undif	> 200 cm Mounc
Sed-pyr	L Bdr-wth	Cmp		Terrc
Met-unf	Grav Evap			Bnch
Met-fol	Ston Sednt			Oth
Unc-all	Bould Marin			
Unc-col	Calcrt			
Unc-aeol				

RUN OFF	DRAINAGE	SURFACE COVER	SURFACE FEATURE	SURFACE CONDITION
		20 % of:	0 % of:	
0	V.poor	Nil	Litter	Dry Loose
Slow	Poor	Rock	Salts	Moist Soft
Mod	Imperf.	Boulder	NaCl	Wet Sl hard
Rap	Mod.well	Stones	$CaSO_4$	Md hard
V.rap	Well	Gravel	$MgSO_4$	Hard
	Somewh.ex.	Grit	Polygons	V hard
	Excess.	Pan	Vesicul	X hard
		Pavem	Aeol Sand	
		Crust	Cracks: --- cm	
Water table: / cm		Type: Cst	Capping: --- cm	
			Mulching Patina	

LAND USE

Cereals	Impr.grazing
Oth field crops	Impr.grazing/browse
Mixed	Nat.grazing
Tree crops	Nat.grazing/browse
Mix tree/annual	Planted forest
Horticultural	Nat.forest/woodl.
Forage	Forest/grazing
Fallow	Industrial/Mining
Tilled	Urban
Greenhouse	Recreational
	Un-vegetated

IRRIGATED: Y / N

CROPS / VEGETATION SPEC.

Type:	No.:
Aso	---
-----------	---
-----------	---
-----------	---

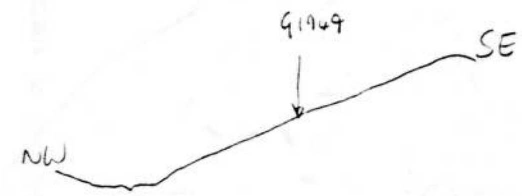
Ground Cover: 3 %

LIMIT	DIAGNOST	
40 cm	10 cm	/ cm
Lithic (	)Vert	Vert
Paralith	Camb	Camb
P.gyp	Sal	Sal
P.calc	Calc	Calc
Grav/Ston	Gyps	Gyps
Bould	P.calc	P.calc
Cmpct	P.gyp	P.gyp
Undif	Argil	Argil

DIAGRAM

- 0 cm
- 50
- 100
- 150

CROSS SECTION

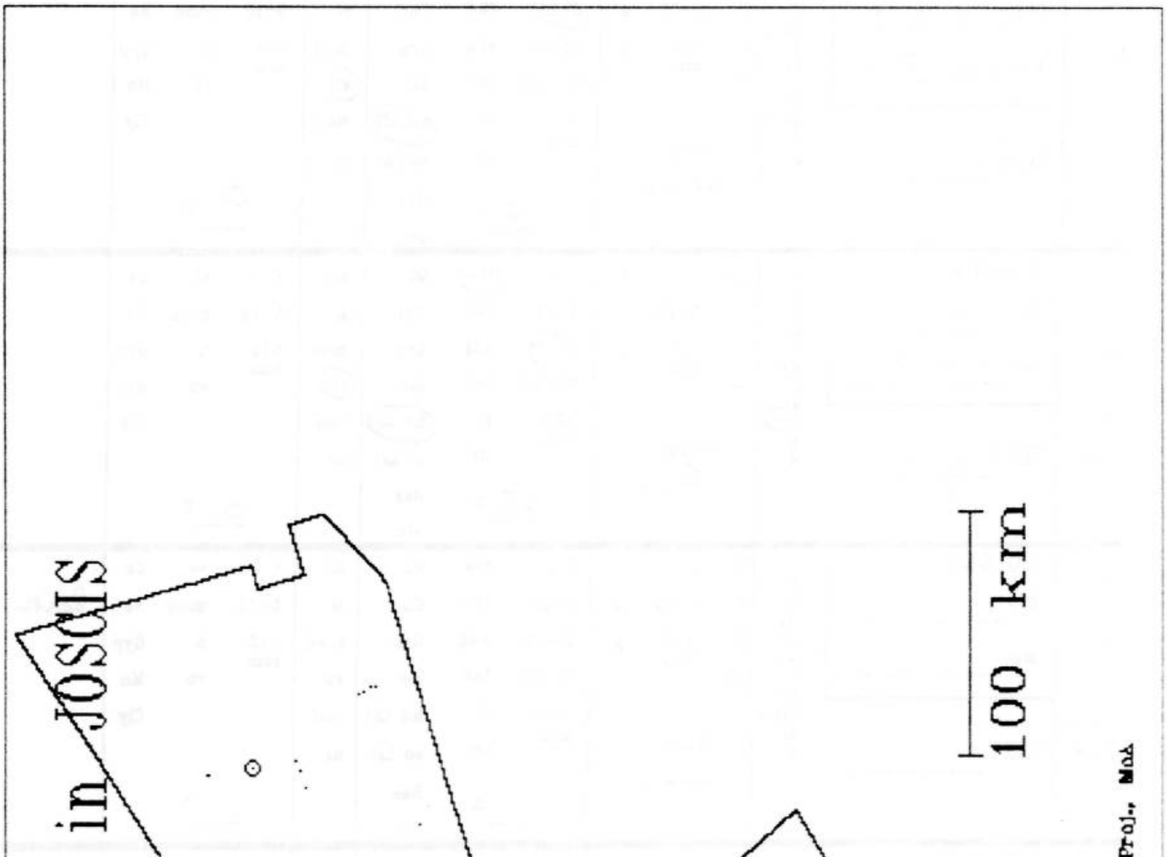


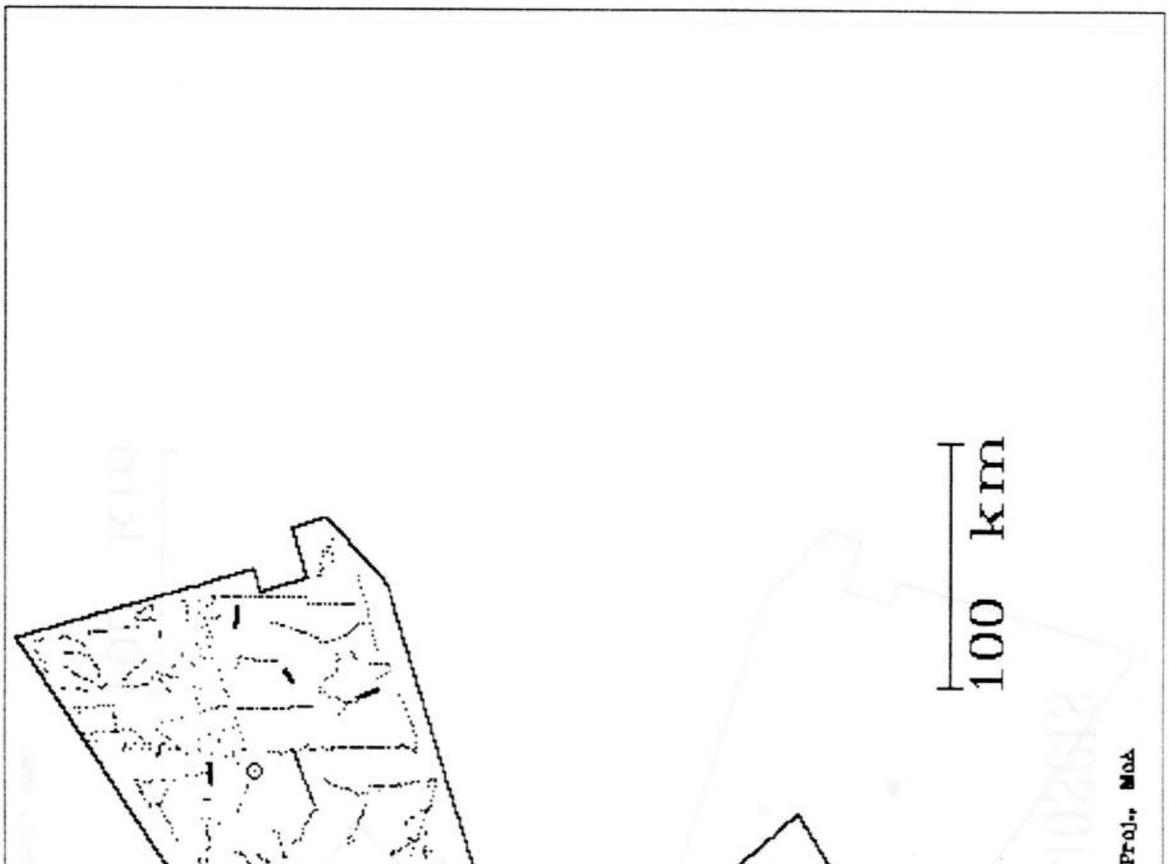
Notes:

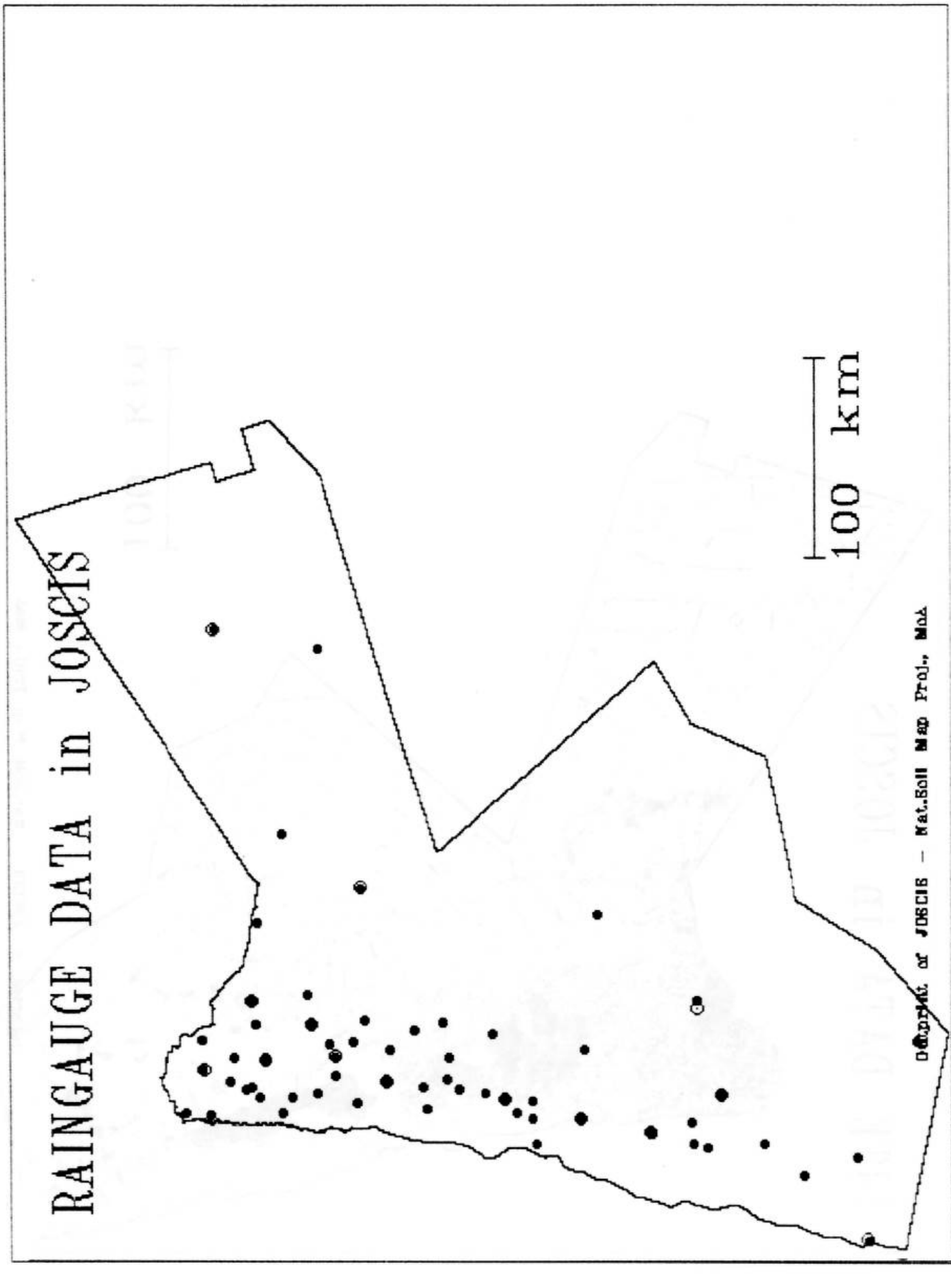
Lithic xeric carbonated

Site Number: 9/949

	COLOUR TEXTURE		MOTTLE	COARSE MAT.	HCl	CONCENTR.	NOTES
0 to 10 Type:	COLOUR: Dry: 10YR 6/6 Mst: 10YR 5/6 TEXT.: SiL	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5–15 d c >15 mm p m Colour: 0	2–5 srn Qz 5–20 rnd Cht 20–75 ang Grn 75–250 tab Sst >250 mm pl hd LSt irr so Lst Bas 15 % oth:	nil sl mod str viol nr	< 5 so Ca 5–15 mod Na >15 mm h Gyp vh Mn Cly 0 %	
10 to 40 Type:	COLOUR: Dry: 10YR 6/6 Mst: 10YR 5/6 TEXT.: vgSiCL	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5–15 d c >15 mm p m Colour: 0	2–5 srn Qz 5–20 rnd Cht 20–75 ang Grn 75–250 tab Sst >250 mm pl hd LSt irr so Lst Bas 45 % oth:	nil sl mod str viol nr	< 5 so Ca 5–15 mod Na >15 mm h Gyp vh Mn Cly 0 %	
+ to ----- Type:	COLOUR: Dry: ----- ---/ --- Mst: ----- ---/ --- TEXT.: -----------	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5–15 d c >15 mm p m Colour: ------	2–5 srn Qz 5–20 rnd Cht 20–75 ang Grn 75–250 tab Sst >250 mm pl hd LSt irr so Lst Bas ---- % oth:	nil sl mod str viol nr	< 5 so Ca 5–15 mod Na >15 mm h Gyp vh Mn Cly ---- %	Rock
 to ----- Type:	COLOUR: Dry: ----- ---/ --- Mst: ----- ---/ --- TEXT.: -----------	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5–15 d c >15 mm p m Colour: ------	2–5 srn Qz 5–20 rnd Cht 20–75 ang Grn 75–250 tab Sst >250 mm pl hd LSt irr so Lst Bas ---- % oth:	nil sl mod str viol nr	< 5 so Ca 5–15 mod Na >15 mm h Gyp vh Mn Cly ---- %	
 to ----- Type:	COLOUR: Dry: ----- ---/ --- Mst: ----- ---/ --- TEXT.: -----------	V F H Hz M Mz L Qv Qmh Ql Q	0 < 5 f f 5–15 d c >15 mm p m Colour: ------	2–5 srn Qz 5–20 rnd Cht 20–75 ang Grn 75–250 tab Sst >250 mm pl hd LSt irr so Lst Bas ---- % oth:	nil sl mod str viol nr	< 5 so Ca 5–15 mod Na >15 mm h Gyp vh Mn Cly ---- %	


ANALYSED SITE DATA in JOSCIS
100 km
Output of JOSCIS – Nat.Soil Map Proj., MoA


SITE DATA in JOSCIS
100 km
Original of JOSCIS - Nat.Soil Map Proj., MoA


RAINGAUGE DATA in JOSCIS
100 km
Copyright of JOSCIS - Nat.Soil Map Proj., MoA

National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

Jordan Soil and Climatic Information System

D B M S
V O L U M E

Data Entry | Data Retrieval | Data Maintenance | Data Dictionary | General Information

SOIL DATA ENTRY

EVERY TIME, for each set of field cards:

1) Entry:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Entry of ... Observations

[call of program 'pitentrc' or 'borentrc' in \dbase\soilentr\ ]

The entire entry scheme is menu driven and self-explicatory !
In any stage of the entry, it is possible to exit (quit, without saving) the program by <ESC> Y
It is recommended, to enter 300000 for easting and 300000 for northing, if coordinates are not given.
In 99 % of the cases, the system will detect automatically, which coordinate system is applied (JTM, UTM(36), UTM (37), or Palestine Grid)
Correction of data during entry can be done with <UP> key, followed by first three letters of the dataset to be changed

2) Check:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Entry of ... Observations

[call of program 'pitentrc' or 'borentrc' in \dbase\soilentr\ ]

3) Overcheck:

DOS
cd\dbase\soilentr
dbase

For bores:

use brsf
index on sitenum to brsf
edit
- and check/correct the data !

use brhz
index on sitenum + str(horiz,2) to brhz
edit
- and check/correct the data !

For pits:

use ptsf
index on sitenum to ptsf
edit
- and check/correct the data !

use pthz
index on sitenum + str(horiz,2) to pthz
edit
- and check/correct the data !

quit

4) Transfer entered data via floppy disk to the master computer:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Copy daily entered data to backup disk

5) Append (on master DBMS computer):

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Append entered data (from floppy/harddisk)
[call of program 'dat_impc' in \dbase\natsoild\ ]
For technical reference, see Section D 4.2 of this Volume!

6) Indexing:

DOS
cd\dbase\natsoild
dbase indexndx

indexntx
Clipper Files
All Clipper Files

7) Test retrieval:

JOSCIS: Soil & Climatic Data
JOSCIS: Retrieval of Soil Data
Profile Descriptions

[call of program 'desretrc' in \dbase\natsoild\ ]

Select 1 site for each surveyor and check 1 or 2 entries of surface data and 1 or 2 entries of a horizon

8) Backup:

see Section D 6.1 of this Volume

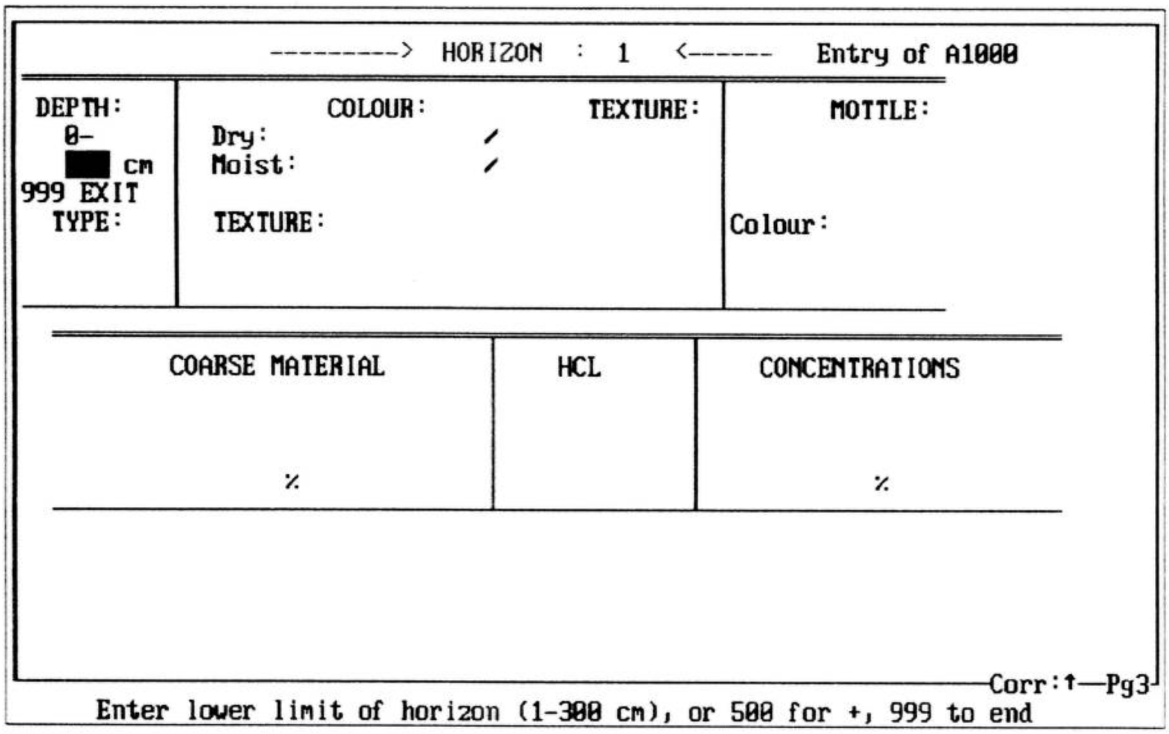
****

After the successful completion of the appending procedure, the system in the entry computer has to be prepared for new entry:

DOS
cd\dbase\soilentr
addnewfc
'Bore' or 'Pit' or both

```
Your initials:                                          Entry of A1000
      GER        E N T R Y   F O R M   F O R

                 B O R E   D E S C R I P T I O N S

  SITE NUMBER: A1000
  ____________________________________________________________

  SURVEY LEVEL:
  TYPE:
  DATE:
  COORDS:           E /          N

  ALTITUDE:       (m)
  POSITION:
  LOCATION:
  SERIES:
  PHASE:
  TAXONOMY:                          Family:          /

                                                      Corr:↑—Pg1
              Enter coordinates (m in selected grid system)
```

```
                                                        Entry of A1000
 Land SYSTEM: /              SAMPLE AREA:  /            AP Scale:
      FACET:                  API Unit:  -----          AP-No.:

 | GEOLOGY    | PARENT   | SLOPE     | EROSION | MICRO-  |
 | Rock:      | MATERIAL |  Aspect:  |         | RELIEF  |
 |            |          |     %     |         |         |

 RUN  DRAINAGE | Surface  Surface  Surface   | Land USE | LIMIT   DIAGNOST
 OFF           | COVER    FEATURE  CONDITION |          |
               |   %        %                |          |   cm       cm    cm
                                    Irrigated:
                            Crop 1:
                            Crop 2:
                            Crop 3:
                            Groundcover:        %

                                                      Corr:↑—Pg2
                      Enter land system unit
```


---------> HORIZON : 1 <------ Entry of A1000
DEPTH:
0-
cm
999 EXIT
TYPE:
COLOUR:
Dry: /
Moist: /
TEXTURE:
TEXTURE:
MOTTLE:
Colour:
COARSE MATERIAL
%
HCL
CONCENTRATIONS
%
Corr:↑—Pg3
Enter lower limit of horizon (1-300 cm), or 500 for +, 999 to end

CHEMICAL / ANALYTICAL DATA ENTRY

Entry of chemical data is to be done only at the computer with the Master Soil Database. Data are entered menu driven to file **'analtot.dbf'**.

The entry procedure is accessed by:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Data
Entry of Chemical Data
[call of program 'chmentrc' in \dbase\natsoild\ ]

The entry follows the same system as the entry of pit and bore descriptions.

The entire entry scheme is menu driven and self-explicatory !

Data have to be checked in the same way as for pits/bores.
It is possible to enter additional horizons in a later stage.
Analytical data have always to be clearly assigned to an observed horizon (as defined in the pit/bore description) and entered to the Master Soil Database.

Always have a current backup (of file 'analtot.dbf') before you enter or change any data !

In any stage of the entry, it is possible to exit (quit, without saving) the program by <ESC> Y.

Data with value '0' have to be entered with 0 <ENTER>, not available data fields have to be bypasssed with <ENTER> only.

Your initials:
GER

ENTRY FORM OF CHEMICAL DATA

Entry of PA400

PROFILE No.: PA400 with following horizons:

1	a	0- 13
2	b	13- 40
3	c	40- 70
4	d	70-110

LAB No.	DEPTH cm	SAND	SILT	CLAY	SAND Coa-rse	Med	Fine	Very fine	GR V			OR	PERM
1	0	x								x	x		
1	-	x								x	x		
1	-	x								x	x		

Enter number of horizon (see horizon numbers in box), or 9 to quit

Entry of PA400

MOISTURE 10 kPa	33 kPa	1500 kPa	pH Pa-ste	EXTRACTABLE BASES Ca	Mg	Na	K	CEC		Na exc	ESP	ECe	SAT
									x	x			
									x	x			
									x	x			

Ca CO3 tot	GYP-SUM	GYPS REQ	Soluble CATIONS Ca	Mg	Na	K	Soluble ANIONS Cl	SO4	CO3	HCO3	NO3

Enter pH (paste)

Corr:↑—Pg2
ct

SOIL SAMPLE INVENTORY ENTRY

Soil samples are collected in the field, shipped to the Project office in Amman. They are then registered by office staff. This inventory is entered to the computer with the Master Soil Database.

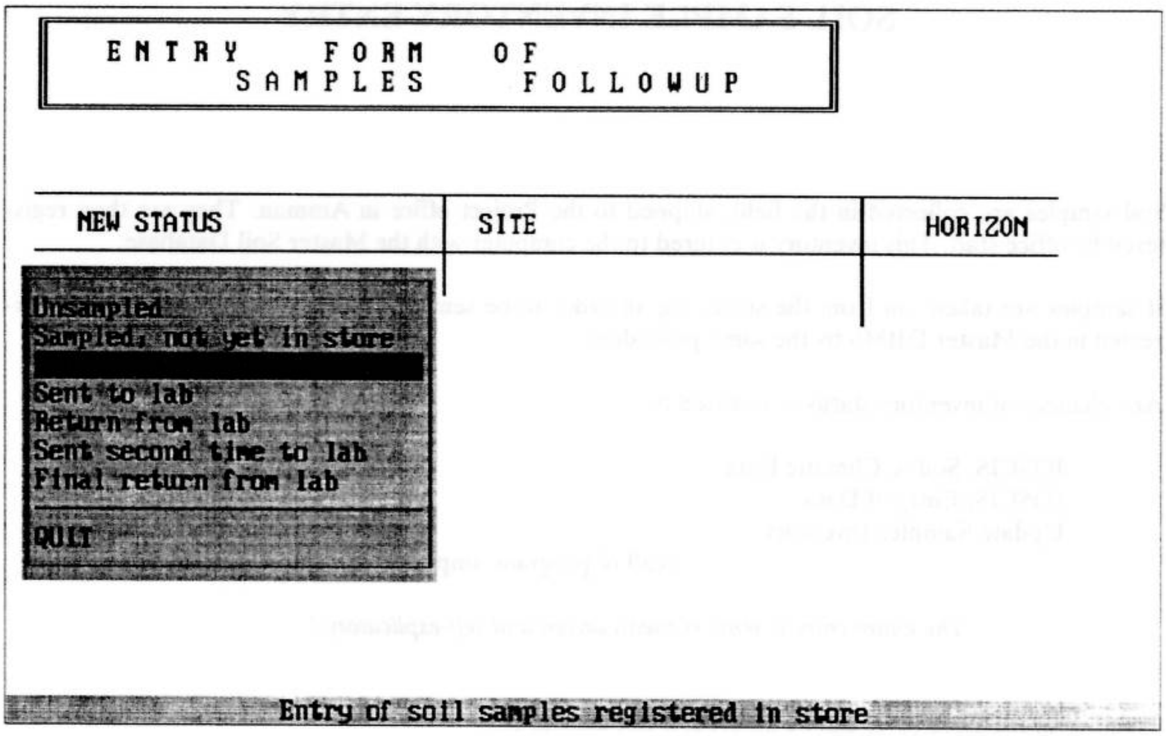
If samples are taken out from the store, e.g. in order to be sent to the laboratory, this has to be corrected in the Master DBMS by the same procedure.

Any changes of inventory status is accessed by:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Data
Update Samples Inventory
[call of program 'smpentrc' in \dbase\natsoild\ ]

The entire entry scheme is menu driven and self-explicatory !

Number of the store (1-9) can be entered; if not known: 0


ENTRY FORM OF
SAMPLES FOLLOWUP
NEW STATUS
SITE
HORIZON
Unsampled
Sampled, not yet in store
Sent to lab
Return from lab
Sent second time to lab
Final return from lab
QUIT
Entry of soil samples registered in store

PRECIPITATION DATA ENTRY

1) Entry:

Entry of newly available precipitation data to precipitation database (not necessarily precipitation master data base, preferably on an entry computer which has a copy of the precipitation dataset loaded):

At entry computer:

JOSCIS: Soil & Climatic Data
JOSCIS: Climatic Database
Entry of Precipitation Data

[call of program 'prcentrc' in \dbase\prec\ ]

(Station:)	{Short station name} example: AMMAN
(Year:)	{Calendar year} example: 1994
(Month:)	{Calendar month} example: 1 (for January)
(Day:)	{Calendar day}

After entry of daily precipitation data, give **99** and **9999** and **99999** respectively, to quit the program

2) Appending to Master Precipitation Database:

Precipitation data are entered by station and by (hydrological) year. The data then have to be appended by station and by year to the master precipitation database.

2a) Copy out from entry computer:

cd\dbase\prec

To list which station data are available:

dir prc*.dbf /o:n	(to list all precipitation data files), or:
dir prc*.dbf /o:n > LPT1:	(to print out all precipitation data files)

Mark these files which have been updated / corrected,
i.e. with a recent time stamp !

copy prcaaaaa.dbf A:*.*
where aaaaa is the short name of the updated station

2b) Appending to master computer:

JOSCIS: Soil & Climatic Data
JOSCIS: Climatic Database
Appending of Precipitation Data
[call of program 'prc_impc' in \dbase\prec\ ]

Precipitation data
Insert disk from entry computer in drive A: or B: !
Select drive !
(Station:) {Short station name}
example: AMMAN;
i.e. maximum 5 characters
(Period: Year) {Hydrological year}
example: 1994 for hydrological
year 1994/95

Watch the counter 'Changes' and see if any changes are made !

If 'Changes' remains 0, either: data for this station/year were already appended
or: no data were entered in the entry computer for this station/year
or: the data entered on the external computer were not copied to diskette

Station:AMMAN (AL 19) Year:1993 Month:

50/51:	136.5	63/64:	341.2	76/77:	190.4	89/90:	156.2
51/52:	363.2	64/65:	272.3	77/78:	247.7	90/91:	197.9
52/53:	305.6	65/66:	217.9	78/79:	133.6	91/92:	539.9
53/54:	290.2	66/67:	461.9	79/80:	583.3	92/93:	no data
54/55:	159.2	67/68:	254.8	80/81:	301.1	93/94:	no data
55/56:	331.7	68/69:	322.8	81/82:	214.7	94/95:	no data
56/57:	358.4	69/70:	175.5	82/83:	422.0	95/96:	no data
57/58:	219.6	70/71:	293.9	83/84:	200.2	96/97:	no data
58/59:	205.8	71/72:	312.5	84/85:	279.5	97/98:	no data
59/60:	184.4	72/73:	195.1	85/86:	138.1	98/99:	no data
60/61:	249.0	73/74:	447.9	86/87:	264.2	99/00:	no data
61/62:	246.9	74/75:	248.3	87/88:	359.3	00/01:	no data
62/63:	140.7	75/76:	201.8	88/89:	243.7		

JAN/93	FEB/93	MAR/93	APR/93	MAY/93	JUN/93
0.0	0.0	0.0	0.0	0.0	0.0
JUL/93	AUG/93	SEP/93	OCT/93	NOV/93	DEC/93
0.0	0.0	0.0	0.0	0.0	0.0

Enter number of month, or 99 to return to year, or 66 to enter annual value

MONTHLY RAINFALL DATA RECORDING FORM

Station: (AL 19)

Year: Month: Day:

1	0.0	11	0.0	21	0.0
2	0.0	12	0.0	22	0.0
3	0.0	13	0.0	23	0.0
4	0.0	14	0.0	24	0.0
5	0.0	15	0.0	25	0.0
6	0.0	16	0.0	26	0.0
7	0.0	17	0.0	27	0.0
8	0.0	18	0.0	28	0.0
9	0.0	19	0.0	29	0.0
10	0.0	20	0.0	30	0.0
				31	0.0

Monthly total: 0.0
Annual total: no data

Enter number of day, or 99 to return to month, or 66 to enter monthly value

National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

Jordan Soil and Climatic Information System

D B M S
V O L U M E

Data Entry | Data Retrieval | Data Maintenance | Data Dictionary | General Information

RETRIEVAL of SELECTED SOIL DATA

Program **MSTRETRC** is the MASTER RETRIEVAL progam, also called SELECTED DATA RETRIEVAL. It allows - almost - any combination of selection of data and its listing.

First option is the selection between:
- All sites (pits and bores)
- Only pits
- Only bores
- Predefined subset (see below; a subset is a part of the entire Soil Database, selected in a previous step)

Next step is to select the list of the **parameters to be displayed** (see first screen sample on following page). There is a limit of 10 parameters, but in practice, output devices do not allow a sufficient wide display (example: screen width of 80, matrix printer of 80 or 132 or 240 characters). The site number (identifier of pit/bore) is always displayed. If horizon data are to be displayed, the number of the horizon is displayed in front of the horizon data, and a horizontal line printed between the individual sites.

The following step is the **selection** of sites, i.e. the definition of the criteria, which have to be fulfilled that a site is selected (see second screen sample on following page).

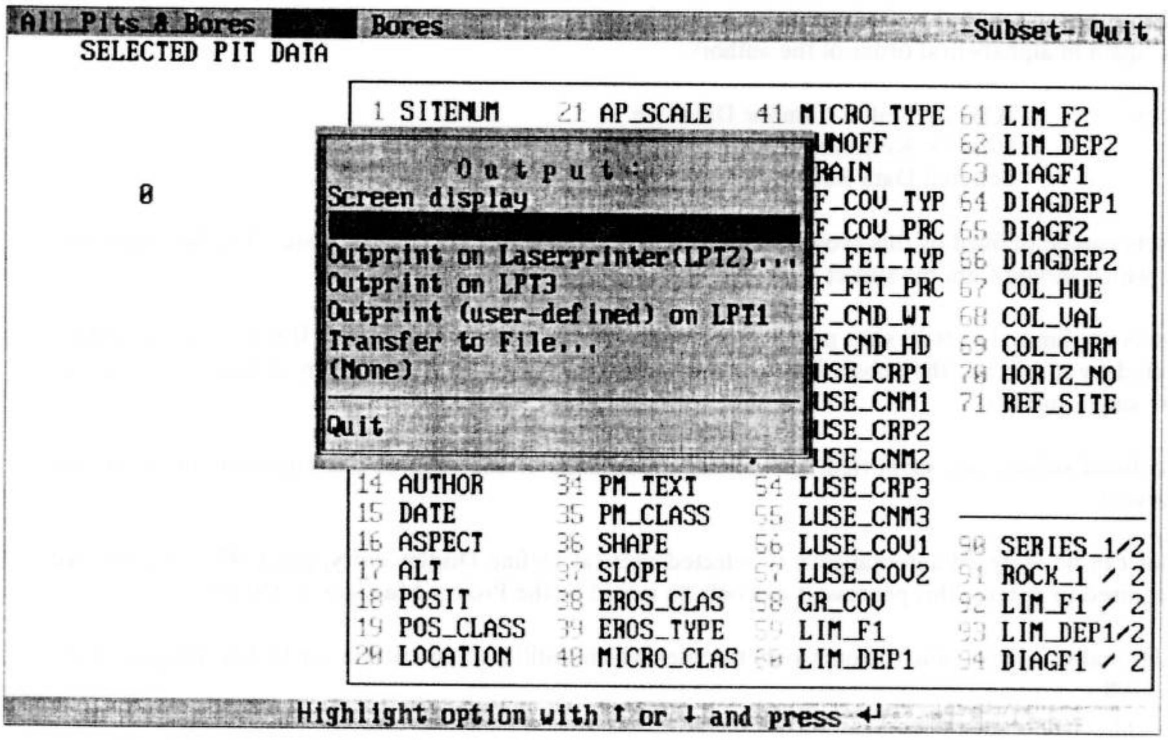
If search should be executed for analysed sites, it can be recommended to select: analytical data - lab number - from 1 till 900000 (i.e. not 0).

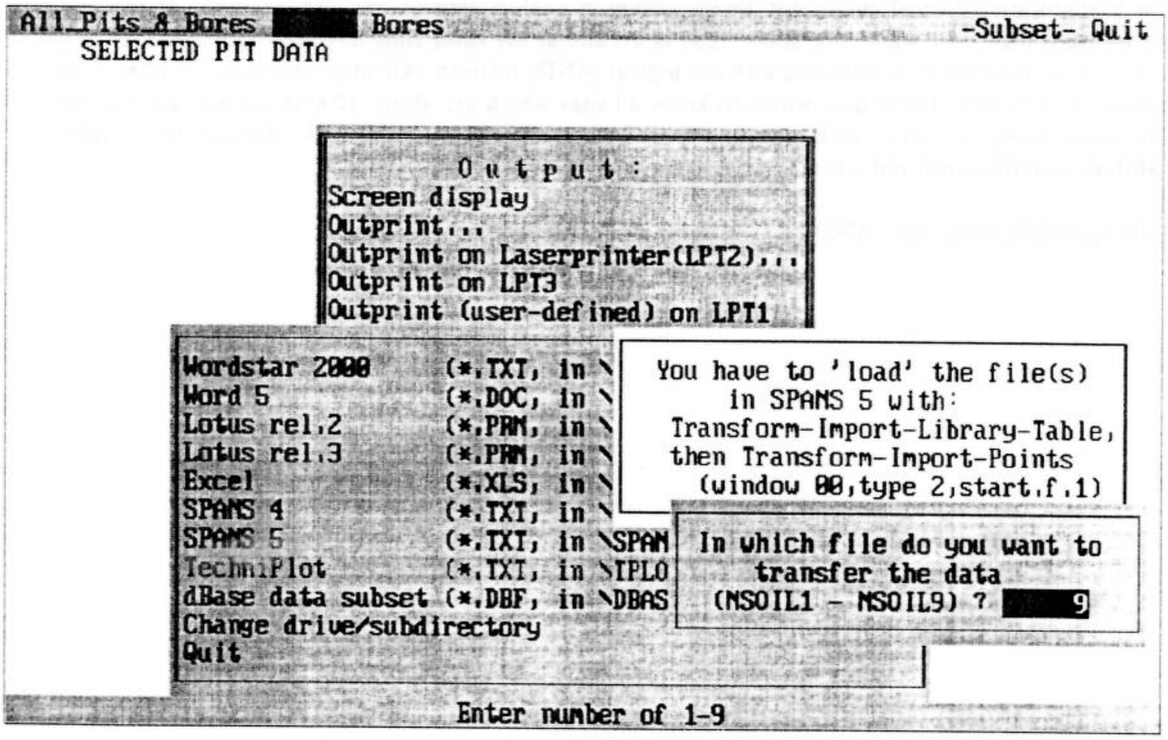
General **output** options are (see third screen sample on following page):
- display on screen
- printout on printer on Epson mode (on LPT1 or LPT3)
- printout on laser printer (on LPT2)
- printout on any printer with user defined character set (on LPT1, see file 'gen_prnt and explanation in Section D 5.2 of this Volume)
- transfer to a file for Wordstar 2000 (ASCII file)
- transfer to a file for Word 5 (ASCII file)
- transfer to a file for Lotus 2 (ASCII file)
- transfer to a file for Lotus 3 (ASCII file)
- transfer to a file for TechniCurv/Techniplot (ASCII file)
- transfer to a file for SPANS 4 (ASCII file)
- transfer to a file for SPANS 5 (ASCII file)

All options for file transfer output have a target default subdirectory (which can be changed), and a target file name '**NSOILn**' (where n is a number between 1 and 9).

```
All_Pits_&_Bores        Bores                                   -Subset- Quit
   SELECTED PIT DATA

1.Define Display:       1 SITENUM      21 AP_SCALE     41 MICRO_TYPE   61 LIM_F2
                        2 COORDS_E     22 AP_NO        42 RUNOFF       62 LIM_DEP2
                        3 COORDS_N     23 SERIES_1     43 DRAIN        63 DIAGF1
                        4 SYSTC        24 SERIES_2     44 SF_COV_TYP   64 DIAGDEP1
    0 --> NEXT MENU     5 GCORDS_E     25 PHASE        45 SF_COV_PRC   65 DIAGF2
   99 CHANGE DATASET    6 GCORDS_N     26 PART_SC_1    46 SF_FET_TYP   66 DIAGDEP2
                        7 REGION       27 PART_SC_2    47 SF_FET_PRC   67 COL_HUE
   SITENUM              8 LANDSYST     28 MINERAL      48 SF_CND_WT    68 COL_VAL
                        9 FACET        29 USDA_GRP     49 SF_CND_HD    69 COL_CHRM
                       10 SAMPLAREA1   30 ROCK_1       50 LUSE_CRP1    70 HORIZ_NO
                       11 SAMPLAREA2   31 ROCK_2       51 LUSE_CNM1    71 REF_SITE
                       12 SURVLEVEL    32 GEOL_TEXT    52 LUSE_CRP2
                       13 TYPENUM      33 GEOL_CLAS    53 LUSE_CNM2
                       14 AUTHOR       34 PM_TEXT      54 LUSE_CRP3
                       15 DATE         35 PM_CLASS     55 LUSE_CNM3
                       16 ASPECT       36 SHAPE        56 LUSE_COV1
                       17 ALT          37 SLOPE        57 LUSE_COV2
                       18 POSIT        38 EROS_CLAS    58 GR_COV
                       19 POS_CLASS    39 EROS_TYPE    59 LIM_F1       97 SERIES ASS
                       20 LOCATION     40 MICRO_CLAS   60 LIM_DEP1     98 COUNT ONLY
   Enter no.of field, or 0 to start, 98 to count only, 99 to change dataset
```

```
All_Pits_&_Bores        Bores                                   -Subset- Quit
   SELECTED PIT DATA

2.Define criteria       1 SITENUM      21 AP_SCALE     41 MICRO_TYPE   61 LIM_F2
   for SELECTION:       2 COORDS_E     22 AP_NO        42 RUNOFF       62 LIM_DEP2
                        3 COORDS_N     23 SERIES_1     43 DRAIN        63 DIAGF1
                        4 SYSTC        24 SERIES_2     44 SF_COV_TYP   64 DIAGDEP1
       0 DO -->         5 GCORDS_E     25 PHASE        45 SF_COV_PRC   65 DIAGF2
      97 Delete last    6 GCORDS_N     26 PART_SC_1    46 SF_FET_TYP   66 DIAGDEP2
      99 QUIT           7 REGION       27 PART_SC_2    47 SF_FET_PRC   67 COL_HUE
                        8 LANDSYST     28 MINERAL      48 SF_CND_WT    68 COL_VAL
                        9 FACET        29 USDA_GRP     49 SF_CND_HD    69 COL_CHRM
                       10 SAMPLAREA1   30 ROCK_1       50 LUSE_CRP1    70 HORIZ_NO
                       11 SAMPLAREA2   31 ROCK_2       51 LUSE_CNM1    71 REF_SITE
                       12 SURVLEVEL    32 GEOL_TEXT    52 LUSE_CRP2
                       13 TYPENUM      33 GEOL_CLAS    53 LUSE_CNM2
                       14 AUTHOR       34 PM_TEXT      54 LUSE_CRP3
                       15 DATE         35 PM_CLASS     55 LUSE_CNM3
                       16 ASPECT       36 SHAPE        56 LUSE_COV1    90 SERIES_1/2
                       17 ALT          37 SLOPE        57 LUSE_COV2    91 ROCK_1 / 2
                       18 POSIT        38 EROS_CLAS    58 GR_COV       92 LIM_F1 / 2
                       19 POS_CLASS    39 EROS_TYPE    59 LIM_F1       93 LIM_DEP1/2
                       20 LOCATION     40 MICRO_CLAS   60 LIM_DEP1     94 DIAGF1 / 2
   Enter no. of field, or 0 to start, 97 to delete entries, 99 to Quit
```


All_Pits_&_Bores Bores -Subset- Quit
SELECTED PIT DATA
0
1 SITENUM 21 AP_SCALE 41 MICRO_TYPE 61 LIM_F2
UNOFF 62 LIM_DEP2
RAIN 63 DIAGF1
F_COV_TYP 64 DIAGDEP1
F_COV_PRC 65 DIAGF2
F_FET_TYP 66 DIAGDEP2
F_FET_PRC 67 COL_HUE
F_CND_WT 68 COL_VAL
F_CND_HD 69 COL_CHRM
USE_CRP1 70 HORIZ_NO
USE_CNM1 71 REF_SITE
USE_CRP2
USE_CNM2
Output :
Screen display
Outprint on Laserprinter(LPT2)...
Outprint on LPT3
Outprint (user-defined) on LPT1
Transfer to File...
(None)
Quit
14 AUTHOR 34 PM_TEXT 54 LUSE_CRP3
15 DATE 35 PM_CLASS 55 LUSE_CNM3
16 ASPECT 36 SHAPE 56 LUSE_COV1 90 SERIES_1/2
17 ALT 37 SLOPE 57 LUSE_COV2 91 ROCK_1 / 2
18 POSIT 38 EROS_CLAS 58 GR_COV 92 LIM_F1 / 2
19 POS_CLASS 39 EROS_TYPE 59 LIM_F1 93 LIM_DEP1/2
20 LOCATION 40 MICRO_CLAS 60 LIM_DEP1 94 DIAGF1 / 2
Highlight option with ↑ or ↓ and press ↵


All_Pits_&_Bores Bores -Subset- Quit
SELECTED PIT DATA
Output :
Screen display
Outprint...
Outprint on Laserprinter(LPT2)...
Outprint on LPT3
Outprint (user-defined) on LPT1
Wordstar 2000 (*.TXT, in \
Word 5 (*.DOC, in \
Lotus rel.2 (*.PRN, in \
Lotus rel.3 (*.PRN, in \
Excel (*.XLS, in \
SPANS 4 (*.TXT, in \
SPANS 5 (*.TXT, in \SPAN
TechniPlot (*.TXT, in \TPLO
dBase data subset (*.DBF, in \DBAS
Change drive/subdirectory
Quit
You have to 'load' the file(s)
in SPANS 5 with:
Transform-Import-Library-Table,
then Transform-Import-Points
(window 00,type 2,start,f,1)
In which file do you want to
transfer the data
(NSOIL1 - NSOIL9) ? 9
Enter number of 1-9

SPANS transfer files are limited to 5000 sites (due to memory management limitations in SPANS).

After definition of these parameters, the database will be searched according to the selection criteria. The search starts with the pits in alphabetical order of the authors, it then searches through the bore sites, again in alphabetical order of the authors.

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Retrieval of Soil Data
Selected Data Retrieval

Subsets can be defined by this program: Ignore the Define-Display Option (choose DO), but select the sites which should form the subset with the Define-Selection option.

Subsets are limited to 5000 sites per selection (due to tremendious large sizes). If more sites would be selected by a criteria, the subset has to be split (for example, by latitude or by altitude) into two or more single subsets.

Predefined subsets are supported, as well as only a range of site (e.g. of one surveyor, or all of one surveyor).

Series can be assigned automatically to selected sites (at Define Display entry, enter '**97**'). A password is required to execute this process; it can only be issued by the Project Manager or SSLRC.

Additionally, it is possible to count only the sites which fulfill a given criteria (at Define Display entry, enter '**98**')

At definition of the selection criteria, combinations of 'AND' and 'OR' relations can be defined. They follow mathematical-logical rules, not always common english expressions. An example: If the user wants to ask for all sites, which are above 1200 m asl and **at the same time** have an organic matter content of > 1 %, this has to be selected with the logical 'AND' relation: All sites which are > 1200 m asl **and** have > 1 % OM. If the user wants to know all sites which are above 1200 m asl and additionally (in the same listing) all sites which have > 1 % OM, this would be a logical 'OR': All sites which fulfill the altitude condition **or** (and/or, not exclusive or) the OM condition.

It is also possible, to use the 'AND NOT' condition to exclude sites.

Output example for 'Selected Data Retrieval' - 'Pit' - List:.... - Only sites > 1200 m asl:

SELECTED PIT RETRIEVAL

For:
(ALT>=1200.AND.ALT<=3000)

SITENU	SURVLEVEL	ALT	SERIES_1	USDA_GRP	LIM_F1	LIM_
PA052	Phase I	1200	BAS 13	JDED Lithic Xerochrept	Boulders	35
PA053	Phase I	1250	SHOBAK 5	JDED Lithic Xerochrept	Lithic contact	37
PA058	Phase I	1250	QATR 8	JDEO Calcixerollic Xerochrept		190
PA061	Phase I	1395	HIGH 54	KECG Typic Xerorthent	Paralithic contact	25
PA062	Phase I	1390	HIGH 11	JDEO Calcixerollic Xerochrept	Lithic contact	105
PD077	Phase I	1455	SHOBAK 11	JDEO Calcixerollic Xerochrept		165
PD078	Phase I	1360	SHOBAK 29	FBFX (Lithic Xerochreptic Camborthi	Lithic contact	39
PD079	Phase I	1425	SHOBAK 29	FBFX (Lithic Xerochreptic Camborthi	Lithic contact	34
PD080	Phase I	1455	SHOBAK 11	JDEO Calcixerollic Xerochrept		143
PD081	Phase I	1460	SHOBAK 8	JDEP Typic Xerochrept		169
PD082	Phase II	1455	KHIDAD 32	KECA Lithic Xerorthent	Lithic contact	31
PD083	Phase II	1315	KHIDAD 38	JDEP Typic Xerochrept	Boulders	113
PD084	Phase II	1320	KHIDAD 34	JDEO Calcixerollic Xerochrept	Boulders	70
PD085	Phase II	1410	KHIDAD 46	JDEO Calcixerollic Xerochrept		178
PD086	Phase II	1455	KHIDAD 30	JDED Lithic Xerochrept	Lithic contact	29
PD087	Phase II	1480	KHIDAD 25	JDEP Typic Xerochrept		140
PD088	Phase II	1505	KHIDAD 32	KECA Lithic Xerorthent	Lithic contact	14
PD089	Phase II	1520	KHIDAD 34	JDEO Calcixerollic Xerochrept	Lithic contact	148
PD090	Phase II	1440	KHIDAD 44	JDEO Calcixerollic Xerochrept		140
PD091	Phase II	1330	KHIDAD 25	JDEP Typic Xerochrept	Lithic contact	98
PD092	Phase II	1470	KHIDAD 47	JDEP Typic Xerochrept		200
PD093	Phase II	1530	KHIDAD 32	KECA Lithic Xerorthent	Lithic contact	15
PD094	Phase II	1500	KHIDAD 38	JDEP Typic Xerochrept	Paralithic contact	70
PD095	Phase II	1470	KHIDAD 34	JDEO Calcixerollic Xerochrept	Gravel/stones	96
PD096	Phase II	1370	KHIDAD 34	JDEO Calcixerollic Xerochrept		101
PD097	Phase II	1550	KHIDAD 38	JDEP Typic Xerochrept		145
PD098	Phase II	1610	KHIDAD 32	KECA Lithic Xerorthent	Lithic contact	17
PD099	Phase II	1570	KHIDAD 38	JDEP Typic Xerochrept	Boulders	39
PD100	Phase II	1330	SHOBAK 29	FBFX (Lithic Xerochreptic Camborthi	Lithic contact	40
PD101	Phase II	1380	KHIDAD 61	FBFX (Lithic Xerochreptic Camborthi	Lithic contact	38
PD102	Phase II	1430	KHIDAD 34	JDEO Calcixerollic Xerochrept	Lithic contact	63
PD103	Phase II	1295	KHIDAD 58	FBBE Xerochreptic Paleorthid	Petrocalcic layer	44
PD104	Phase II	1455	KHIDAD 34	JDEO Calcixerollic Xerochrept	Paralithic contact	119
PD105	Phase II	1520	KHIDAD 26	JDEP Typic Xerochrept	Compaction	109
PD106	Phase II	1435	KHIDAD 25	JDEP Typic Xerochrept	Lithic contact	74
PD107	Phase II	1550	KHIDAD 38	JDEP Typic Xerochrept	Gravel/stones	113
....						
....						
PW179	Phase II	1525	KHIDAD 25	JDEP Typic Xerochrept	Paralithic contact	55
PW180	Phase II	1565	KHIDAD 22	JDED Lithic Xerochrept	Lithic contact	40
PW181	Phase II	1425	KHIDAD 37	JDEO Calcixerollic Xerochrept		120
PW182	Phase II	1460	KHIDAD 43	JDEO Calcixerollic Xerochrept	Gravel/stones	135
PW183	Phase II	1340	KHIDAD 58	FBBE Xerochreptic Paleorthid	Paralithic contact	30
PW184	Phase II	1380	KHIDAD 58	FBBE Xerochreptic Paleorthid	Petrocalcic layer	25
PW185	Phase II	1425	KHIDAD 31	JDEE Petrocalcic Xerochrept	Petrocalcic layer	20
PW186	Phase II	1475	KHIDAD 36	JDEO Calcixerollic Xerochrept		200
PW187	Phase II	1295	KHIDAD 48	KDDF Durorthidic Torrifluvent		120
PW188	Phase II	1440	KHIDAD 43	JDEO Calcixerollic Xerochrept		105
PW189	Phase II	1590	KHIDAD 23	JDEO Calcixerollic Xerochrept		180
PW190	Phase II	1438	KHIDAD 23	JDEO Calcixerollic Xerochrept		200
PW191	Phase II	1338	KHIDAD 8	FBEL Xerochreptic Calciorthid		135
PW192	Phase II	1600	KHIDAD 36	JDEO Calcixerollic Xerochrept		200
PW193	Phase II	1380	KHIDAD 23	JDEO Calcixerollic Xerochrept	Gravel/stones	150

307 sites
Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)

Output example for 'Selected Data Retrieval' - 'Pit' - List:.... - Only sites < 0 m asl:

```
SELECTED  PIT  RETRIEVAL

For:
(ALT>=-400.AND.ALT<=0)
```

SITENU	TEXTUR	TEMP_	TEMPS	TEMP_	AWHC	SNAM
PA387	S	24.5	27.2	32.4	38	HIM
PA388	S	24.6	27.3	32.5	25	HIM
PA389	LS	24.2	27.0	32.1	39	HIM
PA390	S	24.4	27.1	32.3	104	HIM
PA391	S	24.9	27.6	32.9	30	HIM
PA392	S	25.0	27.7	33.0	56	HIM
PB040	SL	0.0	0.0	0.0	146	TAD
PB041	SiCL	0.0	0.0	0.0	45	TAD
PB043	cS	0.0	0.0	0.0	62	TAD
PB044	C	0.0	0.0	0.0	146	TAD
PB045	SiC	0.0	0.0	0.0	125	SAF
PM102	CL	22.7	25.5	30.4	127	GOR
PM103	CL	22.7	25.5	30.4	133	GOR
PM104	CL	22.4	25.3	30.1	107	ZAY
PM105	CL	22.3	25.1	29.9	136	ZAY
PM106	SiCL	22.7	25.5	30.4	122	GOR
PM107	SL	22.8	25.6	30.4	101	GOR
PM108	SiCL	22.4	25.2	30.1	112	ZAY
PM109	SiCL	22.6	25.4	30.2	123	ZAY
PM110	SiCL	22.9	25.7	30.6	162	GOR
PM111	C	22.9	25.7	30.6	150	GOR
PM112	SiCL	23.3	26.1	31.1	154	GOR
PM113	fSL	23.5	26.3	31.3	51	GOR
PM114	CL	23.1	25.9	30.8	160	GOR
PM115	CL	23.4	26.2	31.1	161	GOR
PM116	SL	23.1	25.9	30.9	96	GOR
PM117	SCL	23.3	26.1	31.1	142	GOR
PM118	CL	23.4	26.2	31.1	156	GOR
PM119	CL	23.8	26.6	31.5	156	ZOR
PM120	CL	23.8	26.6	31.5	162	ZOR
PM121	CL	23.8	26.6	31.5	162	ZOR
PM122	CL	23.9	26.7	31.6	160	KAT
PM123	CL	23.0	25.8	30.7	160	GOR
PM124	CL	22.9	25.7	30.6	155	GOR
PM125	fSCL	23.3	26.1	31.0	139	GOR
PM126	CL	23.5	26.3	31.2	160	GOR
PM127	SiCL	23.8	26.5	31.5	166	GOR
PM128	SiCL	23.7	26.5	31.5	162	GOR
PM129	SiL	23.4	26.2	31.2	147	GOR
PM130	LS	23.2	26.0	30.9	77	GOR
....						
....						
PN129	SiCL	23.0	25.8	30.6	170	GOR
PN130	C	21.4	24.3	29.0	133	ZAY
PN131	SiCL	21.7	24.6	29.3	141	ZAY
PN132	C	21.3	24.2	28.9	149	ZAY
PN141	SiCL	24.6	27.4	32.5	144	GOR
PN142	SiCL	24.5	27.2	32.4	170	GOR
PN143	C	23.7	26.5	31.6	164	GOR
PQ011	SL	23.8	26.6	31.6	169	GOR
PR025	L	23.8	26.6	31.6	170	GOR
PW133	SCL	21.8	24.6	29.5	59	ZAR
PW134	SiC	22.2	25.0	29.9	139	ZAR

```
90 sites
Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)
```

PROFILE DESCRIPTIONS

Full text profile descriptions can be retrieved by program **DESRETRC**, either pit or bore descriptions.

It is possible to select one single site (e.g. PA10), a range of sites (e.g. PA12-PA21), or all of a predefined subset.

Most data are called from 'surface' and 'horizon' files (decoded from numeric values into full wording by reference through file 'gen_code').

Some data are calculated internally or generated from the GIS. It is therefore recommended that the following procedures are run frequently:

- the data maintenance module for internal calculations, such as temperature, horizon particle size class, control section particle size class etc., and
- the GIS data import module for site related data import, such as geology, administrative unit, soil mapping unit etc.

Predefined subsets are supported, as well as only a range of site (e.g. of one surveyor, or all of one surveyor).

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Retrieval of Soil Data
Profile Description

Output example for 'Pit':

SOIL PROFILE DESCRIPTION

INFORMATION ON THE SITE :

Profile No.:	PA100
Series / Phase:	Jafr 33 / Mod deep
Soil Mapping Unit:	Level I:MUS (91)
Soil Classification:USDA (1990):	Fine-loamy, mixed, calcareous, thermic Family of Cambic Gypsiorthids (FBDC)
ACSAD:	RHY h 2 a: Cambic Gypsiorthid
FAO/UNESCO:	CLjy: Yermic-Gypsic Calcisol
Author:	Austin Hutcheon
Date of examination:	04/12/90
Location:	1.5 KM E of Jebel Arfa
Sample Area No.:	
Map sheet:	1:25000: 3350-II-NW - 1:100000: 3350 - 1:250000: Bayir
Coordinates: Geographical:	36.86570 E/ 30.18379 N
JTM:	487068 E/ 339876 N
Elevation:	895 m asl
Landform: Position:	Upper pediment slope
Land System:	12/16 (Coalesced pediments and low domes on Muwaqqar chalk) -- 12.6.0 [GIS]
Land Facet:	2 (Low domes and pediments on bedrock)
Microrelief: Class:	Even (< 25 cm)
Type:	Undulating
Slope:	Gently sloping (2 %), rectilinear to N
Land Use:	4.4 Unvegetated, bare
Plant/Crop:	Desert pavement
Climate:Mean annual precipitation:	
Mean annual temperature:	Air: 18.7° C / Soil (50cm): 21.6° C
Soil moisture regime:	Aridic
Precipitation zone:	0-50 mm p.a.
Nearest raingauge:	Bayir (J 1)
Administrative unit/village:	

GENERAL INFORMATION ON THE SOIL :

Geology:	Sedimentary chemic./organ.:Limestone [q5 Fluv.deposits,sand,loes (Bender68]
Parent Material:	Bedrock-fresh
Drainage: Surface Runoff:	Slow
Soil Drainage Class:	
Surface Cover:	Gravel (80 %)
Surface Feature:	Polygons (80 %)
Soil Surface Conditions:	
Erosion:	Nil
Soil Depth:	74 cm (Lithic contact)
Diagnostic Horizon or Property:	Gypsic at 9 cm and calcic at 41 cm

PROFILE DESCRIPTION :

0 - 9 cm Pink (7.5YR 7/4) dry and strong brown (7.5YR 4/6) moist; very fine sandy clayloam; weak coarse platy breaking to moderate medium subangular blocky ; dry slightly hard; moist friable; slightly sticky; slightly plastic; many fine (0.5-2 mm) spherical pores; few fine (1-5 mm) vertical cracks; 1 % irregular chert fine gravel (2-5 mm); 1 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; clear smooth boundary to:

9 - 28 cm Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; silty clayloam; weak medium platy breaking to moderate fine subangular blocky ; dry soft; moist very friable; moderately sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) vertical cracks; 1 % sub-rounded chert fine gravel (2-5 mm); 10 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; clear smooth boundary to:

28 - 41 cm Reddish yellow (7.5YR 6/6) dry and yellowish red (5YR 4/6) moist; fine sandy clayloam; very weak fine subangular blocky; dry loose; moist loose; slightly sticky; slightly plastic; many very fine (<0.5 mm) tubular pores; 1 % irregular chert fine gravel (2-5 mm); 15 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; clear wavy boundary to:

41 - 74 cm Reddish yellow (5YR 6/6) dry and yellowish red (5YR 5/6) moist; fine sandy clayloam; moderate medium subangular blocky; dry moderately hard; moist very friable; moderately sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; 5 % platy hard limestone fine gravel (2-5 mm); 10 % medium (10-15 mm) moderately hard calcareous concretions; strong reaction to HCl; gradual smooth boundary to:

74+ cm Lithic contact to Limestone

Note: Analytical analyses are available for horizons: 1 / 2 / 3 / 4

Output example for 'Bore':

```
                          BORE  DESCRIPTION

INFORMATION ON THE SITE :

Bore No:                                        N0100

Series / Phase:                  Dhul 36
Soil Mapping Unit:               Level I:HAL (70)
Soil Classification:USDA (1990): Fine-loamy, mixed, calcareous, thermic Family of Xerochreptic Calciorthids
                                         (FBEL)
                  ACSAD:         RHK x c e 2 a: Xerochreptic Calciorthid
                  FAO/UNESCO:    CLh : Haplic Calcisol
Author:                          Neil Munro
Date of examination:             06/10/90
Location:                        5.2 km SW of  Hallabat
Sample Area No.:                 1/14
Map sheet:                       1:25000: 3254-II-SW - 1:100000: 3254 - 1:250000: Soueida
Coordinates: Geographical:       36.34354 E/ 32.02459 N
             JTM:                437995   E/ 544112   N
Elevation:                       627 m asl
Landform:    Position:           Lower slope  old fan
             Land System:        11/2 (Undulating dissected limestone plateau with rounded crests and
                                         basins) -- 11.3.0 [GIS]
             Land Facet:         4      (Coalesced alluvial fans of lower slopes)
Microrelief: Class:              Even (< 25 cm)
             Type:
Slope:                           Almost flat (1 %), concave to NW
Land Use:                        3.4  Nat.browse + grazing
Plant/Crop:                      Ajrum
Climate:Mean annual precipitation:
       Mean annual temperature:  Air: 17.9° C / Soil (50cm): 20.8° C
       Soil moisture regime:     Transition aridic-xeric
       Precipitation zone:       100-150 mm p.a.
       Nearest raingauge:        Nawasif (AL 13)
Administrative unit/village:

GENERAL INFORMATION ON THE SOIL :

Geology:                         Sedimentary chem./organ.  [q5  Fluv.deposits,sand,loes (Bender 1968)]
Parent Material:                 Alluvium
Drainage: Surface Runoff:        Rapid
        Soil Drainage Class:
Surface Cover:                   Gravel  (15 %)
Surface Feature:                 Capping
Soil Surface Conditions:         Dry  / Soft
Erosion:                         Moderate wind erosion
Soil Depth:                      125 cm  +
Diagnostic Horizon or Property:  Calcic at 25 cm

SHORT PROFILE DESCRIPTION :

     0 -  25   cm Very pale brown (10YR 7/4) dry and strong brown (7.5YR 5/6) moist; clayloam; 5 % chert
                gravel (5-20 mm); violent reaction to HCl;

    25 -  75   cm Light yellowish brown (10YR 6/4) dry and brownish yellow (10YR 6/6) moist; sandy
                clayloam; 20 % chert gravel (5-20 mm); 20 % small (<5 mm) soft calcareous concretions;
                violent reaction to HCl;

    75 - 125+ cm Strong brown (7.5YR 5/6) dry and strong brown (7.5YR 5/6) moist; sandy clayloam; 5 %
                chert gravel (5-20 mm); 20 % small (<5 mm) soft calcareous concretions; violent reaction to
                HCl.

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)
```

REGISTER FORMS
and
SUMMARIES

Register forms with listing of all sites which occur in a given unit, with a set of most important features, and summaries for the given unit can be retrieved through program **REGRETRC**.

The set of 'most important features' includes soil mapping unit (level I and II), land system, facet, colour, slope, depth, geology, parent material etc. They occur on all forms. Additionally, most register forms have information about limitation and diagnostics, those 'for mapping' about vegetation and AP.

All register forms can be retrieved for one or more soil mapping units (of level I, II, III), land system units, facets, series (field or final), USDA subgroup, or for the total of a subset.

Reference can always be made to a subset, data then will be retrieved only for sites which occur within this subset.

Summaries do not include individual site numbers, only the total (plus percentage) of sites which fall in a given class. Calculated classes are:

- Summary: Soil mapping units (Level I,II,III), region, land system, facet, series (field,final), USDA subgroup, colour, particle size class, mineralogy, diagnostics, limitations, slope, parent material, position class, drainage, geology off the GIS, geology (rocks) off the cards
- Short summary: Soil mapping units, series, USDA subgroup, and slope only
- USDA summary: USDA sub-group by texture class

Remark: The series listed in the register forms are derived from the field 'final series', if there is no entry there, then from the field 'preliminary series' (series_1).

Predefined subsets are supported, as well as only a range of site (e.g. of one surveyor, or all of one surveyor).

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Retrieval of Soil Data
Register forms / Summary

Output example for 'Series'-'Register form':

SOIL REGISTER FORM

(Field) SERIES: MADABA 8

SOIL MAPPING UNIT (GIS) I	II	SAMPLE AREA	LAND SYSTEM (GIS)	FACE card	SERIES (field)	USDA	FAMILY PSC	Min	Depth cm	COLOUR	SLOPE %	PM	GEOL. (GIS)	LIMITATION - cm - Lith.	Par-lith.	Stn Grv Bld	oth	DIAGNOSTICS - cm - Ca	Gy	Cb	oth	SITE	Level
ALI		-	8/ 6	4	Mad 8	JDEO	F	X	160	5YR 4/6	1	Bd/w	AMM-PH	160				135		23		PA376	2
SUF		-	8/14	2	Mad 8	JDEO	F	X	156+	7.5YR 4/6	6	Coll	Fluv(q							25		PA395	2
SUF		-	8/14	2	Mad 8	JDEO	F	X	160+	7.5YR 4/4	11	Coll	Fluv(q					105		7		PA396	2
ALI		-	8/14	3	Mad 8	JDEO	F	X	57	7.5YR 4/6	14	Co/B	Fluv(q	57						7		PA399	2
ALI		-	8/ 6	2	Mad 8	JDEO	F	X	153+	7.5YR 4/5	7	Co/B	Fluv(q					107		32		PA402	2
ALI		-	8/ 6	6	Mad 8	JDEO	F	X	68	7.5YR 4/6	7	Co/B	AMM-PH	68						8		PA404	2
MAD		-	8/15	6	Mad 8	JDEO	F	X	170+	7.5YR 4/6	5	Coll	Fluv(q					114		20		PA406	2
JAL		-	8/15	1	Mad 8	JDEO	F	X	150+	7.5YR 4/6	3	Coll	Fluv(q							12		PA408	2
MAD		-	8/15	1	Mad 8	JDEO	F	X	160+	7.5YR 4/6	6	Co/B	Fluv(q							3		PA[illegible]	2
JAL		-	8/13	1	Mad 8	JDEO	HzF	X	145+	7.5YR 4/5	1	Coll	Fluv(q					126		30		PE[illegible]	2
MAD		-	8/15	1	Madaba 8	JDEO	F	X	158+	7.5YR 4/4	1	Coll	Fluv(q					120		33		PD[illegible]	1
ALI		-	8/ 6	4	Mad 8	JDEO	F	X	143	7.5YR 4/6	10	Coll	AMM-PH			143				20		PH113	2
DAB		-	8/13		Mad 8	JDEO	Hz	X	130	7.5YR 5/6	2	Coll	Fluv(q				130	30				PH115	2
SUF		-	8/14	2	Mad 8	JDEO	HzF	X	145+	6YR 4/6	5	Coll	Fluv(q					102		22		PH136	2
YAD		-	8/17	1	Mad 8	JDEO	Hz	X	145+	7.5YR 4/6	2	Coll	Fluv(q					103		22		PH143	2
BAN		-	8/13	3	Mad 8	JDEO	HF	X	190+	7.5YR 5/7	2	Coll	Fluv(q						132	54		PM173	2
MAD		2/ 3	8/15	3	Madaba 8	JDEO	F	X	200+	7.5YR 4/4	2	Allv	Sir LS							50		PW118	1
MAD		2/ 3	8/15	1	Madaba 8	JDEO	F	X	200+	7.5YR 4/4	6	Allv	Fluv(q							30		PW124	1
ALI		-	8/ 6	4	Mad 8	JDEO	F	X	110+	7.5YR 4/6	4	Coll	AMM-PH							12		A1658	2
SUF		-	8/14		Mad 8	JDEO	F	X	110+	7.5YR 4/6	3	Coll	Fluv(q							11		A1672	2
ALI		-	8/ 6	2	Mad 8	JDEO	F	X	95+	7.5YR 4/5	6	Coll	AMM-PH							20		A1677	2
SUF		-	8/14	2	Mad 8	JDEO	F	X	110+	7.5YR 4/6	6	Coll	Fluv(q							20		A1682	2
SUF		-	8/14	2	Mad 8	JDEO	F	X	110+	7.5YR 4/6	7	Coll	MwqCHK							12		A1683	2
ALI		-	8/ 6	2	Mad 8	JDEO	F	X	110+	7.5YR 4/6	7	Coll	Fluv(q							10		A1684	2
SUF		-	8/14	2	Mad 8	JDEO	F	X	110+	7.5YR 4/6	5	Coll	AMM-PH							17		A1700	2
SUF		-	8/14	2	Mad 8	JDEO	F	X	110+	7.5YR 5/6	3	Coll	Fluv(q							12		A1702	2
ALI		-	8/ 6	2	Mad 8	JDEO	F	X	110+	7.5YR 4/5	4	Coll	AMM-PH							13		A1704	2
ALI		-	8/ 6	2	Mad 8	JDEO	F	X	100+	7.5YR 4/6	6	Coll	AMM-PH							20		A1705	2
JAL		-	8/13	6	Mad 8	JDEO	F	X	85	7.5YR 4/5	11	Coll	AMM-PH	85						30		A1728	2
JAL		-	8/13	6	Mad 8	JDEO	F	X	60	7.5YR 4/6	7	Coll	AMM-PH				60			5		A1730	2
ALI		-	8/ 6	4	Mad 8	JDEO	F	X	60	7.5YR 4/6	8	Co/B	AMM-PH	60						8		A1740	2
MAD		-	8/15	1	Mad 8	JDEO	F	X	90	7.5YR 5/6	2	Co/B	Fluv(q	90				40		18		A1755	2
MAD		-	8/15	1	Mad 8	JDEO	F	X	110+	7.5YR 5/6	2	Coll	Fluv(q					60		15		A175[illegible]	2
DAB		-	11/11	2	Mad 8	JDEO	F	X	52	7.5YR 5/6	16		AMM-PH	52						25		B[illegible]	2
BAN		-	8/12	2	Mad 8	JDEO	F	X	110+	7.5YR 4/6	4	Coll	AMM-PH							25		B0[illegible]	2
BAN		-	8/12	2	Mad 8	JDEO	HzF	X	100+	7.5YR 4/6	4	Coll	Sir LS							25		B0012	2
MAD		-	8/15	1	Mad 8	JDEO	F	X	110+	5YR 4/6	4	Coll	Fluv(q							30		B0020	2
MAD		-	8/15	1	Mad 8	JDEO	F	X	110+	7.5YR 5/6	4	Coll	Fluv(q							20		B0101	2
YAD		-	8/17	1	Mad 8	JDEO	HzF	X	100+	7.5YR 4/6	4	Coll	Fluv(q							60		B0296	2
YAD		-	8/17	1	Mad 8	JDEO	F	X	110+	7.5YR 4/6	3	Coll	Fluv(q					60		35		B0433	2
....																							
....																							
IRI		-	8/13		Mad 8	JDEO	F	X	30	7.5YR 5/6	5	Coll	Sir LS			30				15		W1491	1
JAL		-	8/13	1	Madaba 8	JDEO	F	X	45	7.5YR 4/6	1	Allv	Fluv(q			45				20		W1501	1
YAD		-	8/17	2	Madaba 8	JDEO	HF	X	120+	7.5YR 4/4	4	Coll	Fluv(q							25		W1506	1
MAD		2/ 3	8/15	1	Madaba 8	JDEO	V	X	60	7.5YR 4/6	1	Coll	Fluv(q				60			10		W1512	1
MAD		2/ 3	8/15	4	Madaba 8	JDEO	F	X	25	7.5YR 4/4	1	Coll	Fluv(q			25				5		W1513	1
MAD		2/ 3	8/15	1	Madaba 8	JDEO	V	X	120+	7.5YR 4/4	2	Coll	Fluv(q							30		W1515	1
BAN		2/ 3	8/13	3	Mad 8	JDEO	Mh	X	25	7.5YR 4/6	4	Coll	Sir LS			25				10		W1522	1
IRI		2/ 3	8/13	3	Mad 8	JDEO	HF	X	120+	5YR 4/6	7	Coll	Sir LS					20				W1523	1

127 observations

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (22/06/93)

Output example for 'Series'-'Summary':

```
                              SUMMARY

                        (Field) SERIES: MADABA 8

Land Region  (off GIS):

     4:      Jordan Valley Escarpment                                                   1 site =  0.8 %
     8:      Northern Highlands                                                       109 sites= 85.8 %
     9:      Central Highlands                                                         14 sites= 11.0 %
    11:      Highland Plateau                                                           3 sites=  2.4 %

Land System  (off GIS):

   4/ 4:     Deeply dissected canyons of major wadis                                    1 site =  0.8 %
   8/ 6:     Finely dissected limestone uplands and valleys on limestone and cherts    14 sites= 11.0 %
   8/12:     Undulating to rolling lands at margin of escarpment on Balqa group         4 sites=  3.1 %
   8/13:     Rolling hills with dendritic valley pattern on Umm Ghudran formation      22 sites= 17.3 %
   8/14:     Undulating to rolling terrain with deep, colluvial fill                   13 sites= 10.2 %
   8/15:     Gently undulating loessic/depositional plains with limestone outcrops     23 sites= 18.1 %
   8/17:     Gently undulating plain with mod.well developed drainage                  33 sites= 26.0 %
   9/ 1:     Undulating basalt with calcrete                                            8 sites=  6.3 %
   9/ 8:     Rolling to hilly terrain with colluvial/loess mantles on Balqa group       6 sites=  4.7 %
  11/11:     Hilly terrain on Bahina limestone and Sultani phosphorite                  1 site =  0.8 %
  11/13:     Dissected limestone plateau with steep, rocky terrain on Balqa group       2 sites=  1.6 %

Facet (off cards):

   4/ 4- 2: Steeply undulating slopes on bedrock with colluvium                         1 site =  0.8 %
   8/ 6- 2: Narrow convex crests                                                        6 sites=  4.7 %
   8/ 6- 3: Steep valley sides                                                          1 site =  0.8 %
   8/ 6- 4: Colluvial slopes                                                            4 sites=  3.1 %
   8/ 6- 6: Wadi floor and terrace                                                      1 site =  0.8 %
   8/12- 2: Colluvial mid slopes                                                        3 sites=  2.4 %
   8/12- 4: Weakly developed stream lines                                               1 site =  0.8 %
   8/13- 1: Rounded convex crests and plateaux on limestone                             7 sites=  5.5 %
   8/13- 2: Steep sided valley slopes                                                   4 sites=  3.1 %
   8/13- 3: Benched terrain of limestone/marl/chalk                                     4 sites=  3.1 %
   8/13- 4: Crests and slopes on chert                                                  2 sites=  1.6 %
   8/13- 5: Colluvial fills on plateaux and benches                                     1 site =  0.8 %
   8/13- 6: Colluvial fills of valleys with gullying                                    2 sites=  1.6 %
   8/14- 1: Undulating hills on limestone                                               2 sites=  1.6 %
   8/14- 2: Colluvial loessic mantles of valley sides                                   8 sites=  6.3 %
   8/14- 3: Dendritic network of wadi lines                                             2 sites=  1.6 %
   8/15- 1: Undulating, convex plain with deep fill on colluvium/loess                 13 sites= 10.2 %
   8/15- 2: Concave areas of plain on colluvium/loess                                   4 sites=  3.1 %
   8/15- 3: Weakly incised valley lines                                                 4 sites=  3.1 %
   8/15- 4: Convex limestone/calcrete outcrops                                          1 site =  0.8 %
   8/15- 6:                                                                             1 site =  0.8 %
   8/17- 1: Undulating plain of deep colluvial/loessic fill                            26 sites= 20.5 %
   8/17- 2: Incised valleys and gullies on plain                                        3 sites=  2.4 %
   8/17- 3: Broad valley floors                                                         3 sites=  2.4 %
   9/ 1- 1: Undulating plateau on calcareous rocks                                      2 sites=  1.6 %
   9/ 1- 3: Gently undulating plateau on calcrete over basalt                           5 sites=  3.9 %
   9/ 1- 5: Weakly defined valley lines cut into basalt plateau                         1 site =  0.8 %
   9/ 8- 1: Undulating loessic fans                                                     1 site =  0.8 %
   9/ 8- 2: Steep slopes above streams                                                  2 sites=  1.6 %
   9/ 8- 3: Valley alluvium and colluvial foot slopes/loess                             1 site =  0.8 %
   9/ 8- 4: Steep slope on chalk bedrock                                                1 site =  0.8 %
   9/ 8- 6: Valley floor terrace                                                        1 site =  0.8 %
  11/11- 2: Convex crests and slopes on bedrock                                         1 site =  0.8 %
  11/13- 2: Colluvial fills on upper slopes in hills                                    1 site =  0.8 %
  11/13- 3: Steep slopes on margins of wadis                                            1 site =  0.8 %
```

Output example for 'Series'-'Summary' (continued):

```
Soil mapping unit (Level I):

  ALI                                                        15 sites= 11.8 %
  BAN                                                         8 sites=  6.3 %
  DAB                                                         2 sites=  1.6 %
  IRI                                                         2 sites=  1.6 %
  JAL                                                        23 sites= 18.1 %
  MAD                                                        19 sites= 15.0 %
  MUJ                                                         1 site =  0.8 %
  RAB                                                         7 sites=  5.5 %
  SUF                                                        14 sites= 11.0 %
  WER                                                         8 sites=  6.3 %
  YAD                                                        28 sites= 22.0 %

USDA sub-group:

  JDEO: Calcixerollic Xerochrept                            127 sites=100.0 %
           (FAO: Calcaric Cambisol)

Colour:

   5YR   4/6                                                  3 sites=  2.4 %
   7.5YR 3/6                                                  1 site =  0.8 %
   7.5YR 4/4                                                 15 sites= 11.8 %
   7.5YR 4/5                                                  8 sites=  6.3 %
   7.5YR 4/6                                                 67 sites= 52.8 %
   7.5YR 4/7                                                  1 site =  0.8 %
   7.5YR 5/6                                                 21 sites= 16.5 %
   7.5YR 5/7                                                  1 site =  0.8 %
   7.5YR 5/8                                                  1 site =  0.8 %
   10YR  4/4                                                  3 sites=  2.4 %
   10YR  4/6                                                  2 sites=  1.6 %

Particle size class:

   Very fine                                                 11 sites=  8.7 %
   Fine                                                      75 sites= 59.1 %
   Fine-loamy                                                 7 sites=  5.5 %
   Fine-silty                                                30 sites= 23.6 %
   Loamy-skeletal                                             3 sites=  2.4 %
   Loamy                                                      1 site =  0.8 %

Strongly contrasting particle size class:

   over clayey                                               17 sites= 13.4 %
   over fine-silty                                            1 site =  0.8 %
   over loamy-skeletal                                        1 site =  0.8 %

Mineralogy:

   Mixed                                                    125 sites= 98.4 %

1. Diagnostic:

   Cambic                  at   1- 10 cm                     12 sites=  9.4 %
   Cambic                  at  11- 20 cm                     44 sites= 34.6 %
   Cambic                  at  21- 30 cm                     36 sites= 28.3 %
   Cambic                  at  31- 40 cm                     13 sites= 10.2 %
   Cambic                  at  41- 50 cm                      8 sites=  6.3 %
   Cambic                  at  51- 60 cm                      3 sites=  2.4 %
   Calcic                  at  11- 20 cm                      2 sites=  1.6 %
   Calcic                  at  21- 30 cm                      1 site =  0.8 %
   Calcic                  at  81- 90 cm                      1 site =  0.8 %
```

Output example for 'Series'-'Summary' (continued):

2. Diagnostic:

Calcic	at 31- 40 cm	1 site = 0.8 %
Calcic	at 51- 60 cm	3 sites= 2.4 %
Calcic	at 71- 80 cm	1 site = 0.8 %
Calcic	at 81- 90 cm	3 sites= 2.4 %
Calcic	at 91-100 cm	4 sites= 3.1 %
Calcic	at 101-110 cm	4 sites= 3.1 %
Calcic	at 111-120 cm	2 sites= 1.6 %
Calcic	at 121-130 cm	1 site = 0.8 %
Calcic	at 131-140 cm	1 site = 0.8 %
Gypsic	at 131-140 cm	1 site = 0.8 %

1. Limitation:

Lithic contact	at 51- 60 cm	6 sites= 4.7 %
Lithic contact	at 61- 70 cm	1 site = 0.8 %
Lithic contact	at 71- 80 cm	2 sites= 1.6 %
Lithic contact	at 81- 90 cm	2 sites= 1.6 %
Lithic contact	at > 150 cm	1 site = 0.8 %
Gravel/stones	at 21- 30 cm	3 sites= 2.4 %
Gravel/stones	at 41- 50 cm	2 sites= 1.6 %
Gravel/stones	at 51- 60 cm	4 sites= 3.1 %
Gravel/stones	at 61- 70 cm	3 sites= 2.4 %
Gravel/stones	at 71- 80 cm	7 sites= 5.5 %
Gravel/stones	at 81- 90 cm	1 site = 0.8 %
Gravel/stones	at 101-110 cm	1 site = 0.8 %
Boulders	at 41- 50 cm	1 site = 0.8 %
Boulders	at 61- 70 cm	2 sites= 1.6 %
Boulders	at 141-150 cm	1 site = 0.8 %
Compaction	at 51- 60 cm	2 sites= 1.6 %
Compaction	at 71- 80 cm	2 sites= 1.6 %
Compaction	at 81- 90 cm	1 site = 0.8 %
Compaction	at 91-100 cm	1 site = 0.8 %
Compaction	at 121-130 cm	1 site = 0.8 %

2. Limitation:

Slope:

1 - 2 %	43 sites= 33.9 %
3 - 4 %	40 sites= 31.5 %
5 - 6 %	19 sites= 15.0 %
7 - 8 %	15 sites= 11.8 %
9 - 13 %	7 sites= 5.5 %
14 - 25 %	3 sites= 2.4 %

Parent material:

Alluvium	5 sites= 3.9 %
Colluvium	109 sites= 85.8 %
Bedrock-fresh	1 site = 0.8 %
Bedrock-weathered	1 site = 0.8 %
Colluvium/Bedrock	9 sites= 7.1 %

Position (class):

Top/crest	6 sites= 4.7 %
Upper slope	25 sites= 19.7 %
Mid slope/slope	53 sites= 41.7 %
Lower slope/fan/pediment	13 sites= 10.2 %
Plain / plateau / terrace	27 sites= 21.3 %
Valley/bottom/Qa/basin/wadi	3 sites= 2.4 %

Output example for 'Series'-'Summary' (continued):

```
Drainage :

   Imperfect                                      3 sites=  2.4 %
   Moderately well                                9 sites=  7.1 %
   Well                                         107 sites= 84.3 %
   Somewhat excessive                             7 sites=  5.5 %

Geology (in general, off the GIS) :

   Quaternary deposits                           87 sites= 68.5 %
   Limestone (+conglom)                          40 sites= 31.5 %

Geology (one or two rock types, off the cards) :

   Limestone                                    126 sites= 99.2 %
   Chert                                         34 sites= 26.8 %
   Basalt                                         1 site =  0.8 %

               127 observations
   Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (22/06/93)
```

Output example for 'Series'-'Short Summary':

```
                         SHORT  SUMMARY

                    (Field) SERIES: MADABA 8

Soil mapping unit (Level I):

  ALI                                                  15 sites= 11.8 %
  BAN                                                   8 sites=  6.3 %
  DAB                                                   2 sites=  1.6 %
  IRI                                                   2 sites=  1.6 %
  JAL                                                  23 sites= 18.1 %
  MAD                                                  19 sites= 15.0 %
  MUJ                                                   1 site =  0.8 %
  RAB                                                   7 sites=  5.5 %
  SUF                                                  14 sites= 11.0 %
  WER                                                   8 sites=  6.3 %
  YAD                                                  28 sites= 22.0 %

USDA sub-group:

  JDEO: Calcixerollic Xerochrept                      127 sites=100.0 %
            (FAO: Calcaric Cambisol)

Slope:

   1 -  2 %                                            43 sites= 33.9 %
   3 -  4 %                                            40 sites= 31.5 %
   5 -  6 %                                            19 sites= 15.0 %
   7 -  8 %                                            15 sites= 11.8 %
   9 - 13 %                                             7 sites=  5.5 %
  14 - 25 %                                             3 sites=  2.4 %

              127 observations
  Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (22/06/93)
```

Output example for 'Series'-'USDA Summary':

```
                    USDA  SUMMARY

               (Field) SERIES: MADABA 8


USDA sub-group/particle-size-class family:

  JDEO: Calcixerollic Xerochrept
                  (FAO: Calcaric Cambisol)
                JDEO /  Very fine                    11 sites=  8.7 %
                JDEO /  Fine                         75 sites= 59.1 %
                JDEO /  Fine-loamy                    7 sites=  5.5 %
                JDEO /  Fine-silty                   30 sites= 23.6 %
                JDEO /  Loamy-skeletal                3 sites=  2.4 %
                JDEO /  Loamy                         1 site =  0.8 %
                    TOTAL:                          127 sites=100.0 %


Remark: In case of strongly contrasting particle size classes,
        only the upper class is considered !

               127 observations
    Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (22/06/93)
```

RETRIEVAL of CHEMICAL / PHYSICAL DATA

Chemical data (as collected from the laboratory, stored in file 'analtot') and physical data (as collected in the field, stored in file 'phystot') can be retrieved in various forms through program **CHMRETRC**.

Output formats are defined. There are 4 different layout designs: One 'report' format, one (extended, more detailed) 'worksheet' format, which does not work on DIN A4 outprint), and two 'entry' formats. Each format can be retrieved without any data to give an empty form to be filled in by hand.

Other output options include listing of parameters to be specified from a list of all analysed parameters. They will be retrieved in tabular listing. Options can be given for one particular depth or for a depth range.

Numeric ratios can be retrieved. Some are predefined, others can be selected by the user from the list of analysed parameters.

Statistical calculations, such as mean, standard deviation (for all numeric fields), regression, correlation coefficient (if two numeric values are retrieved) are calculated.

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Retrieval of Soil Data
Chemical Data Analysis

Output examples on following pages.

Output example for 'Forms' - 'Report form':

PROFILE No: PA001 (1.analysis)

LAB No.	DEPTH	SAND	SILT	CLAY	SAND Coa-rse	SAND Med	SAND Fine	SAND Very fine	GRAVEL	TXT.	PSC	BD	POR	PERM
		<------------- 3A3						------------>		3A3	3A3	4A3a		
	cm	<------- % of < 2 mm						---------->	%			g/cm3		
985	0- 17	92.4	2.8	4.8	8.6	56.0	23.7	4.1		S	L			
986	17- 38	90.0	4.8	5.2	7.7	50.9	24.9	6.5		S	L			
987	38- 88	86.2	7.1	6.7	9.8	52.4	20.7	3.3		LS	L			

DEPTH	MOISTURE 10 kPa	MOISTURE 33 kPa	MOISTURE 1500 kPa	pH Pa-ste	EXTRACTABLE BASES Ca	Mg	Na	K	CEC	CEC/ clay	Na exch	ESP	ECe	SAT
				8C1	<---- 5B5a			----->	5A10a	8A1a	8D1	5B6b	5D1b	8A
cm					<---- meq / 100 g			---->		rat	meq/100g		mS/cm	%
0- 17				7.3			0.1		2.6	0.53	0		0.8	24.5
17- 38				7.4			0.1		3.6	0.70	0.1	2.4	0.5	14.1
38- 88				7.5			0.2		3.6	0.54	0.2	4.8	1.1	11.1

DEPTH	Ca CO3 tot	GYP-SUM	GYPS REQU	SOLUBLE CATIONS Ca	Mg	Na	K	SOLUBLE ANIONS Cl	SO4	CO3	HCO3	NO3
	6E1a	6F1d	6F5	6N1b	6O1b	6P1a	6Q1a	6K1d	6L1d	6I1a	6J1a	6M1a
cm	%	%	t/ha	<---------------			meq / l				------------------>	ppm
0- 17	5.6	0.1		3.9	0.7	2.5	0.5	2.4	4.0		1.8	1
17- 38	3.7	0.1		2.8	0.6	1.0	0.4	0.8	2.2		1.8	1
38- 88	14.0	0.1		4.7	1.5	4.0	0.5	5.0	4.4		1.6	1

DEPTH	SALT tot	SAR	P total	P avail	N total	Org.C total	C/N	OM	MICRONUTRIENTS Cu	Zn	Fe	Mn	B
	8D5	5E	6S1a	6S2	6B1a	6A1d							
cm	%		ppm	ppm	%	%		%	<------		ppm		------->
0- 17		1.6	108	2.82	0.002	0.22	93.0	0.37					
17- 38		0.8											
38- 88		2.3											

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (13/06/93)

Output example for 'Forms' - 'Worksheet form':

PROFILE No: PA001 (1.analysis)

LAB No.	DEPTH	SAND	SILT	CLAY	SAND				GRAVEL	TXT.	PSC	GRAVEL	TEXTURE	PSC	BD	POR	PERM
					Coa-rse	Med	Fine	Very fine									
	cm	<------ % of < 2 mm ---------->							%	(lab)		%	(field)		g/cm3		
985	0- 17	92.4	2.8	4.8	8.6	56.0	23.7	4.1		S	L	2	S	L			
986	17- 38	90.0	4.8	5.2	7.7	50.9	24.9	6.5		S	L	5	S	L			
987	38- 88	86.2	7.1	6.7	9.8	52.4	20.7	3.3		LS	L	5	S	L			

DEPTH	MOISTURE			pH Pa-ste	pH 1:5	EXTRACTABLE BASES				CEC	CEC/ clay	Na exch	ESP	ECe	SAT	CEC/ clay-CaCO3 *clay	CEC (am-jad)
	10 kPa	33 kPa	1500 kPa			Ca	Mg	Na	K								
cm						<---- meq / 100 g ---->					ratio	meq/100g		mS/cm	%		
0- 17				7.3				0.1		2.6	0.53	0		0.8	24.5	56.3	5.0
17- 38				7.4				0.1		3.6	0.70	0.1	2.4	0.5	14.1	72.7	5.3
38- 88				7.5				0.2		3.6	0.54	0.2	4.8	1.1	11.1	63.2	5.8

DEPTH	Ca CO3 tot	GYP-SUM	GYPS REQU	SOLUBLE CATIONS				SOLUBLE ANIONS				
				Ca	Mg	Na	K	Cl	SO4	CO3	HCO3	NO3
cm	%	%	t/ha	<---------------- meq / l --------------------->								ppm
0- 17	5.6	0.1		3.9	0.7	2.5	0.5	2.4	4.0		1.8	1
17- 38	3.7	0.1		2.8	0.6	1.0	0.4	0.8	2.2		1.8	1
38- 88	14.0	0.1		4.7	1.5	4.0	0.5	5.0	4.4		1.6	1

DEPTH	Total Salt	SAR	P total	P avail	N total	Org.C total	C/N	OM	MICRONUTRIENTS				
									Cu	Zn	Fe	Mn	B
cm	%		ppm	ppm	%	%		%	<---------- ppm ---------->				
0- 17		1.6	108	2.82	0.0020	0.22	93.04	0.37					
17- 38		0.8											
38- 88		2.3											

GROUNDWATER

DEPTH TO WATERTABLE (cm)	pH	EC mmhos /cm	SOLUBLE ANIONS			
			Ca	Mg	Na	K

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (13/06/93)

Output example for 'Selected' - 'Texture':

SPECIFIC RETRIEVAL OF Texture
in Profile PA001 - PA080

SITE	DEPTH	S	Si	C	cS	mS	fS	vfS	Txt.	PSC
PA001	0- 17 cm	92.4	2.8	4.8	8.6	56.0	23.7	4.1	S	L sandy
PA001	17- 38 cm	90.0	4.8	5.2	7.7	50.9	24.9	6.5	S	L sandy
PA001	38- 88 cm	86.2	7.1	6.7	9.8	52.4	20.7	3.3	LS	L sandy
PA003	0- 12 cm	36.1	11.5	52.4	0.7	18.0	15.5	1.9	C	F fine/claye
PA003	12- 53 cm	9.0	33.7	57.3	0.2	3.4	3.6	1.8	C	F fine/claye
PA003	53- 80 cm	2.9	39.2	57.9	0.2	0.6	1.0	1.1	C	F fine/claye
PA021	0- 45 cm	37.7	39.3	23.0	2.3	13.9	9.6	11.9	L	H fine loamy
PA021	45- 80 cm	35.9	46.5	17.6	0.3	1.9	3.6	30.1	L	Mz coarse-sil
PA021	80-120 cm	36.6	44.4	18.5	0.4	4.8	9.0	22.4	L	Hz fine-silty
PA022	0- 20 cm	90.2	2.5	7.3	17.9	26.8	33.2	12.3	S	L sandy
PA022	20- 50 cm	69.5	12.3	18.2	4.6	21.6	25.6	17.7	fSL	H fine loamy
PA022	50- 86 cm	79.7	9.1	11.2	1.7	20.0	43.7	14.3	fSL	M coarse loa
PA026	0- 18 cm	11.2	59.4	29.4	0.3	0.6	3.4	6.9	SiCL	Hz fine-silty
PA026	18- 35 cm	11.3	54.6	34.2	0.1	0.5	3.2	7.5	SiCL	Hz fine-silty
PA026	35- 75 cm	3.1	71.7	25.2			0.3	2.8	SiL	Hz fine-silty
PA026	75-140 cm	2.4	57.4	39.7				2.4	SiCL	F fine/claye
PA036	0- 8 cm	68.1	18.0	13.9	3.8	14.9	34.7	14.7	fSL	M coarse loa
PA036	8- 35 cm	62.8	16.9	20.3	2.9	15.1	34.2	10.6	SCL	H fine loamy
PA036	35- 60 cm	54.6	23.9	21.5	4.7	16.9	25.8	7.2	SCL	H fine loamy
PA036	60-105 cm	55.7	24.3	20.0	6.4	15.2	26.3	7.8	fSL	H fine loamy
PA066	0- 9 cm	30.9	43.6	25.5	11.1	6.1	5.4	8.3	L	H fine loamy
PA066	9- 20 cm	32.7	45.5	21.8	10.6	7.6	6.0	8.5	L	H fine loamy
PA066	20- 48 cm	35.4	44.3	20.3	10.8	7.6	7.2	9.8	L	H fine loamy
PA069	0- 15 cm	16.0	44.9	39.1	7.4	2.9	1.4	4.3	SiCL	F fine/claye
PA069	15- 40 cm	12.8	37.5	49.7	4.8	2.8	1.3	3.9	C	F fine/claye
PA070	0- 5 cm	7.1	59.3	33.6	1.7	1.2	1.1	3.1	SiCL	Hz fine-silty
PA070	5- 25 cm	7.9	36.6	55.2	3.5	1.4	0.6	2.4	C	F fine/claye
PA070	25- 80 cm	8.3	35.0	56.7	3.6	1.3	0.7	2.7	C	F fine/claye
PA070	80-165 cm	14.8	30.0	55.2	6.2	4.2	2.0	2.4	C	F fine/claye
PA071	0- 20 cm	9.8	53.5	36.7	2.6	1.9	2.1	3.2	SiCL	F fine/claye
PA071	20- 43 cm	9.9	35.3	54.8	3.0	2.6	1.5	2.8	C	F fine/claye
PA071	43- 86 cm	10.0	33.0	57.0	3.0	3.0	1.5	2.5	C	F fine/claye
PA071	86-122 cm	10.7	37.3	52.0	3.4	3.1	1.7	2.5	C	F fine/claye
PA071	122-200 cm	9.6	35.9	54.5	3.1	2.9	1.7	1.9	C	F fine/claye
PA073	27- 55 cm	23.7	34.5	41.8	11.2	5.2	2.8	4.5	C	F fine/claye
PA073	55-110 cm	17.0	33.9	49.1	6.8	3.5	2.2	4.5	C	F fine/claye
PA073	110-153 cm	11.4	39.8	48.8	5.0	1.5	0.9	4.0	C	F fine/claye
PA074	0- 13 cm	22.8	45.7	31.5	11.0	4.6	2.7	4.5	CL	H fine loamy
PA074	13- 30 cm	21.0	36.6	42.4	10.7	4.3	2.0	4.0	C	F fine/claye
PA076	0- 14 cm	16.5	53.5	30.0	5.3	2.6	2.5	6.1	SiCL	Hz fine-silty
PA077	0- 19 cm	13.8	58.9	27.3	0.6	1.3	2.1	9.8	SiCL	Hz fine-silty
PA077	19- 47 cm	9.4	56.4	34.2	0.4	0.6	1.3	7.1	SiCL	Hz fine-silty
PA077	47- 96 cm	10.6	56.1	33.3	0.2	0.8	2.3	7.3	SiCL	Hz fine-silty
PA077	96-155 cm	6.2	55.9	37.9	0.2	0.8	1.2	4.0	SiCL	F fine/claye
PA078	0- 20 cm	5.8	38.1	56.1	1.3	1.0	0.6	2.9	C	F fine/claye
PA078	20- 45 cm	6.2	39.3	54.5	2.5	1.0	0.5	2.2	C	F fine/claye
PA078	45- 83 cm	7.7	44.4	47.9	2.5	1.3	0.8	3.1	SiC	F fine/claye
PA078	83-210 cm	9.7	34.5	55.8	4.4	1.9	0.9	2.5	C	F fine/claye

15 sites (with 48 horizons)

	Data:	Mean:	Standard deviation:
SAND	48	27.773	26.977
SILT	48	37.056	16.706
CLAY	48	35.146	16.664
SANDCOARSE	46	4.554	4.079
SANDMED	46	8.967	13.506
SANDFINE	47	8.489	11.676
SANDVFINE	48	6.502	5.713

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (13/06/93)

Output example for 'Depth/Mean' - 'Specified depth':

VALUES AT 10 cm DEPTH OF CLAY,CEC
of Sites at Depth 10 cm

SITE	DEPTH	CLAY	CEC
PA001	10- 10 cm	4.800	2.550
PA003	10- 10 cm	52.400	11.840
PA021	10- 10 cm	23.000	30.640
PA022	10- 10 cm	7.300	3.640
PA036	10- 10 cm	29.400	17.300
PA066	10- 10 cm	20.300	7.320
PA069	10- 10 cm	21.800	28.080
PA070	10- 10 cm	39.100	34.200
PA071	10- 10 cm	55.200	46.700
PA073	10- 10 cm	36.700	37.600
PA076	10- 10 cm	31.500	31.600
PA077	10- 10 cm	30.000	31.040
PA078	10- 10 cm	27.300	30.200
PA081	10- 10 cm	56.100	56.000
PA082	10- 10 cm	47.300	58.800
PA100	10- 10 cm	21.200	28.920
PA122	10- 10 cm	20.300	10.800
PA123	10- 10 cm	20.300	14.600
PA124	10- 10 cm	17.600	15.600
PA125	10- 10 cm	25.500	13.400
PA126	10- 10 cm	36.400	19.000
PA127	10- 10 cm	19.700	12.400
PA128	10- 10 cm	19.700	10.600
PA129	10- 10 cm	16.400	16.000
PA130	10- 10 cm	16.100	14.200
PA135	10- 10 cm	37.600	21.800
PA136	10- 10 cm	27.300	28.300
PA138	10- 10 cm	27.300	20.200
PA141	10- 10 cm	20.400	15.000
PA145	10- 10 cm	31.600	16.800
PA155	10- 10 cm	30.700	20.800
PA177	10- 10 cm	34.000	20.800
PA179	10- 10 cm	48.200	21.200
PA206	10- 10 cm	24.900	21.000
PA223	10- 10 cm	25.500	17.660
PA261	10- 10 cm	24.800	20.000
....			
....			
PW179	10- 10 cm	18.800	13.900
PY001	10- 10 cm	21.800	13.300
PY003	10- 10 cm	37.000	16.600
PY004	10- 10 cm	28.600	0.000
S0127	10- 10 cm	6.400	5.840
N0115	10- 10 cm	0.000	22.800
N0411	10- 10 cm	0.000	20.000
S0128	10- 10 cm	0.000	24.000

263 sites (with 263 horizons)

	Data:	Mean:	Standard deviation:
CLAY	253	26.188	13.321
CEC	256	17.318	11.240
Ratio	246	1.772	0.887

Correlation coefficient r = 0.798
Regression Y = -0.262 + 0.671 x
Regression X = 9.746 + 0.949 y

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (16/06/93)

Output example for 'Depth/Mean' - 'Mean of depth range':

MEAN OF DEPTH RANGE 10- 20 cm DEPTH OF CLAY,P_TOT,P_AVAIL,N_TOT
of Sites with Mean of Depth Range 10-20 cm

SITE	DEPTH	CLAY	P_TOT	P_AVAIL	N_TOT
PA001	10- 20 cm	4.920	108.400	2.820	0.002
PA003	10- 20 cm	56.320	0.000	0.000	0.000
PA021	10- 20 cm	23.000	0.000	0.000	0.000
PA022	10- 20 cm	18.200	0.000	12.700	0.041
PA036	10- 20 cm	30.360	2360.000	14.700	0.040
PA066	10- 20 cm	20.300	0.000	0.000	0.000
PA069	10- 20 cm	20.300	0.000	0.000	0.000
PA070	10- 20 cm	44.400	0.000	0.000	0.000
PA071	10- 20 cm	55.200	0.000	0.000	0.000
PA073	10- 20 cm	54.800	950.000	4.400	0.064
PA076	10- 20 cm	39.130	0.000	0.000	0.000
PA077	10- 20 cm	30.000	0.000	0.000	0.000
PA078	10- 20 cm	27.990	0.000	0.000	0.000
PA081	10- 20 cm	54.500	0.000	0.000	0.000
PA082	10- 20 cm	47.300	0.000	0.000	0.000
PA100	10- 20 cm	40.300	0.000	0.000	0.000
PA122	10- 20 cm	20.300	0.000	0.000	0.000
PA123	10- 20 cm	21.380	1016.000	8.210	0.028
PA124	10- 20 cm	17.600	0.000	0.000	0.000
PA125	10- 20 cm	38.590	983.000	15.490	0.031
PA126	10- 20 cm	37.360	0.000	0.000	0.000
PA127	10- 20 cm	19.700	0.000	0.000	0.000
....					
....					
PW003	10- 20 cm	18.800	0.000	0.000	0.000
PW003	10- 20 cm	9.400	22.600	4.110	0.005
PW008	10- 20 cm	4.200	0.000	0.000	0.000
PW018	10- 20 cm	21.718	0.000	0.000	0.000
PW041	10- 20 cm	25.800	985.000	24.400	0.116
PW042	10- 20 cm	20.300	1360.000	15.000	0.084
PW074	10- 20 cm	28.200	1160.000	14.800	0.074
PW076	10- 20 cm	13.900	645.000	3.600	0.010
PW084	10- 20 cm	17.600	1185.000	4.600	0.020
PW085	10- 20 cm	53.800	0.000	1.270	0.059
PW086	10- 20 cm	41.800	0.000	28.910	0.379
PW089	10- 20 cm	54.200	0.000	0.000	0.053
PW090	10- 20 cm	40.900	0.000	9.090	0.100
PW092	10- 20 cm	63.120	0.000	1.090	0.121
PW100	10- 20 cm	45.500	0.000	4.180	0.065
PW110	10- 20 cm	19.300	0.000	0.000	0.000
PW114	10- 20 cm	20.300	2603.400	5.400	0.018
PW157	10- 20 cm	27.891	2933.600	3.000	0.013
PW176	10- 20 cm	26.920	1302.000	16.900	0.070
PW179	10- 20 cm	18.800	886.000	7.060	0.046
PY001	10- 20 cm	22.791	778.000	9.650	0.040
PY003	10- 20 cm	37.000	0.000	6.900	0.000
PY004	10- 20 cm	40.960	0.000	14.300	0.000
S0127	10- 20 cm	6.400	0.000	0.000	0.000

255 sites (with 255 horizons)

	Data:	Mean:	Standard deviation:
CLAY	253	27.446	13.488
P_TOT	134	1206.880	846.954
P_AVAIL	148	12.296	12.272
N_TOT	148	0.070	0.051

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (16/06/93)

Output example for 'Correlations' - 'CEC/Clay':

CORRELATION OF CEC / Clay

SITE	DEPTH	RATIO	CEC	CLAY
PA001	0- 17 cm	0.5313	2.55	4.8
PA001	17- 38 cm	0.7000	3.64	5.2
PA001	38- 88 cm	0.5433	3.64	6.7
PA003	0- 12 cm	0.2260	11.84	52.4
PA003	12- 53 cm	0.1476	8.46	57.3
PA003	53- 80 cm	0.1834	10.62	57.9
PA021	0- 45 cm	1.3322	30.64	23.0
PA021	45- 80 cm	1.1313	19.91	17.6
PA021	80-120 cm	0.9032	16.71	18.5
PA022	0- 20 cm	0.4986	3.64	7.3
PA022	20- 50 cm	0.5297	9.64	18.2
PA022	50- 86 cm	0.5036	5.64	11.2
PA026	0- 18 cm	0.5884	17.30	29.4
PA026	18- 35 cm	0.5263	18.00	34.2
PA026	35- 75 cm	0.7738	19.50	25.2
PA026	75-140 cm	0.5360	21.28	39.7
PA036	0- 8 cm	0.4863	6.76	13.9
PA036	8- 35 cm	0.3606	7.32	20.3
PA036	35- 60 cm	0.3702	7.96	21.5
PA036	60-105 cm	0.2730	5.46	20.0
PA066	0- 9 cm	1.0000	25.50	25.5
PA066	9- 20 cm	1.2881	28.08	21.8
PA066	20- 48 cm	0.6640	13.48	20.3
PA069	0- 15 cm	0.8747	34.20	39.1
PA069	15- 40 cm	0.7586	37.70	49.7
....				
....				
PW110	0- 15 cm	0.3862	5.02	13.0
PW110	15- 35 cm	0.4109	11.34	27.6
PW110	35- 75 cm	0.3309	10.72	32.4
PW114	0- 10 cm	0.3117	5.86	18.8
PW114	10- 26 cm	0.2799	8.06	28.8
PW114	26- 65 cm	0.2165	7.34	33.9
PW114	65- 80 cm	0.1385	2.48	17.9
PW157	0- 12 cm	0.9176	15.60	17.0
PW157	12- 35 cm	0.5905	17.36	29.4
PW176	0- 20 cm	0.7394	13.90	18.8
PW179	0- 10 cm	0.5902	19.30	32.7
PW179	10- 55 cm	0.6101	13.30	21.8
PW179	55-160 cm	0.3525	2.15	6.1
PY001	8- 21 cm	0.4486	16.60	37.0
PY001	21-110 cm	0.6878	13.00	18.9
PY003	81-110 cm	0.2398	10.60	44.2
PY004	0- 5 cm	1.4073	15.34	10.9
PY004	5- 50 cm	0.9125	5.84	6.4
PY004	50- 90 cm	0.6117	6.30	10.3

257 sites (with 886 horizons)

	Data:	Mean:	Standard deviation:
CEC	886	17.909	11.743
CLAY	886	29.362	14.879
Ratio	886	0.620	0.309

Correlation coefficient $r = 0.791$
Regression $Y = 11.418 + 1.002\ x$
Regression $X = -0.416 + 0.624\ y$

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (16/06/93)

Output example for 'Quit' - 'Error report':

ERROR REPORT

Site:	Horizon: (cm)	Lab no:	Data:	Calculated:	Form:
PA001	0- 17	985	C/N ratio :	107.56	93.04
PA003	0- 12	1021	ESP (calculated-measured):	14.53	10.66
PA141	8- 23	922	Total of texture components:	91.0 %	--
PA287	10- 38	951	Total of texture components:	95.0 %	--
PB096	45- 87	79	Total of texture components:	104.0 %	--
PD100	0- 11	1640	Total of texture components:	110.0 %	--
PG029	0- 18	1370	C/N ratio :	122.09	0.00
PN001	25- 50	1056	ESP (calculated-measured):	13.00	7.03
PN002	20- 40	1059	ESP (calculated-measured):	29.00	24.99
	40-103	1060	ESP (calculated-measured):	20.30	8.94
PN003	15- 76	1062	ESP (calculated-measured):	11.40	7.42
PN009	55- 95	1066	ESP (calculated-measured):	26.10	17.79
PN023	0- 12	1018	C/N ratio :	34.88	33.57
	12- 45	1019	ESP (calculated-measured):	46.34	0.44
	45- 75	1020	ESP (calculated-measured):	33.43	15.89
PN025	17- 60	1016	ESP (calculated-measured):	22.84	5.42
	60- 95	1017	ESP (calculated-measured):	54.93	5.19
PN038	60-205	1041	ESP (calculated-measured):	12.99	6.75
PN039	20- 70	1044	ESP (calculated-measured):	29.38	24.66
	70-150	1045	ESP (calculated-measured):	54.70	28.50
PN050	0- 16	1222	ESP (calculated-measured):	61.16	39.74
PN051	2- 12	1226	ESP (calculated-measured):	69.70	40.15
	40-100	1228	ESP (calculated-measured):	98.90	53.16
PN053	12- 33	1237	ESP (calculated-measured):	54.11	29.40
	33- 65	1238	ESP (calculated-measured):	87.67	37.30
	65- 80	1239	ESP (calculated-measured):	81.00	38.12
PN061	8- 20	1209	ESP (calculated-measured):	35.40	5.11
PN076	20- 35	2200	Total of texture components:	96.0 %	--
PQ006	0- 5	609	Total of texture components:	29.8 %	--
	5- 74	610	Total of texture components:	2.4 %	--
	74- 92	611	Total of texture components:	3.8 %	--
PR001	0- 17	2606	Total of texture components:	86.4 %	--
	17- 51	2607	Total of texture components:	89.0 %	--
	51- 90	2608	Total of texture components:	90.9 %	--
....					
....					
PY001	0- 8	11958	Total of texture components:	73.0 %	--
	8- 21	11959	Total of texture components:	84.6 %	--
	21-110	11960	Total of texture components:	84.9 %	--
PY003	0- 14	11955	Total of texture components:	88.5 %	--
	14- 81	11956	Total of texture components:	92.7 %	--
	81-110	11957	Total of texture components:	65.5 %	--

341 sites (with 1209 horizons): 97 errors

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (16/06/93)

ANNEX

Chemical Data Calculation

1) Sand content [%] =

Sum of sand-coarse [%] + sand-med [%] + sand-fine [%] + sand-v.fine [%]

2) Texture classes:

follow USDA definition (e.g. version 1990, last page)

3) Texture particle size classes:

S, cS, fS, LfS, LS	--> L (sandy)
> 60 % clay content	--> V (very fine)
35-60 % clay content	--> F (fine/clayey)
sand-coarse + sand-med + sand-fine + sand-v.fine > 15 % and clay < 18 % (of fine earth)	--> M (coarse-loamy)
sand-coarse + sand-med + sand-fine + sand-v.fine > 15 % and clay > 18 % (of fine earth)	--> H (fine-loamy)
sand-coarse + sand-med + sand-fine + sand-v.fine < 15 % and clay < 18 % (of fine earth)	--> Mz (coarse-silty)
sand-coarse + sand-med + sand-fine + sand-v.fine < 15 % and clay > 18 % (of fine earth)	--> Hz (fine-silty)
If gravel content > 35 %:	--> additional Q

4) CEC / clay ratio =

$$\frac{\text{CEC [meq/100g]}}{\text{Clay [\%]}}$$

5) Na_{exch} [meq/100g] =

$$Na_{extr}\ \text{[meq/100g]} - \frac{Na_{sol}\ \text{[meq/100g]} * \text{saturation [\%]}}{1000}$$

6) ESP =

$$\frac{Na_{exch}\ \text{[meq/100g]}}{\text{CEC [meq/100g]}} * 100$$

7) CEC / clay - $CaCO_3$ * clay =

$$\frac{\text{CEC [meq/100g]}}{\text{Clay [\%]} - \dfrac{CaCO_3\text{ [\%]} * \text{Clay [\%]}}{100}} * 100$$

8) CEC_{amjad} =

$$\frac{66 * \left(\text{Clay [\%]} - \dfrac{CaCO_3\text{ [\%]} + \text{Clay [\%]}}{100}\right.}{100} + 2$$

9) SAR =

$$\frac{Na_{sol}\text{ [meq/100g]}}{\sqrt{\dfrac{Ca_{sol}\text{ [meq/100g]} + Mg_{sol}\text{ [meq/100g]}}{2}}}$$

10) C_{tot} =

$$\frac{\text{OM [\%]}}{1.72}$$

11) Total salt [%] =

$$\frac{0.064 * \text{ECe} * \text{saturation [\%]}}{100}$$

SOIL SAMPLES INVENTORY

The present status of soil samples (for each horizon of each pit) can be retrieved with program **SMPRETRC**

It gives information about whether a sample was taken, sent to headquarters and/or laboratory, and in which location it is presently stored.

If chemical analyses were requested from the lab, the analyses are shown for the sample.

Predefined subsets are supported, as well as only a range of sites (e.g. of one surveyor, or all of one surveyor).

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Retrieval of Soil Data
Soil Samples' Inventory

Output example:

INVENTORY OF SOIL SAMPLES

Samples registered in store:

Site	Horizon	Depth	Status	
PA001	d	88 - 170 cm:	Registered in store:	4
PA003	d	80 - 186 cm:	Registered in store:	4
PA004	a	0 - 10 cm:	Registered in store:	4
PA004	b	10 - 41 cm:	Registered in store:	4
PA004	c	41 - 70 cm:	Registered in store:	4
PA004	d	70 - 170 cm:	Registered in store:	4
PA004	e	170 - 200 cm:	Registered in store:	4
PA005	a	0 - 25 cm:	Registered in store:	4
PA005	b	25 - 47 cm:	Registered in store:	4
PA005	c	47 - 87 cm:	Registered in store:	4
PA005	d	87 - 120 cm:	Registered in store:	4
PA005	e	120 - 200 cm:	Registered in store:	4
PA006	a	0 - 15 cm:	Registered in store:	4
PA006	b	15 - 48 cm:	Registered in store:	4
PA006	c	48 - 79 cm:	Registered in store:	4
PA006	d	79 - 102 cm:	Registered in store:	4
PA006	e	102 - 130 cm:	Registered in store:	4
PA006	f	130 - 170 cm:	Registered in store:	4
PA006	g	170 - 240 cm:	Registered in store:	4
PA006	h	240 - 260 cm:	Registered in store:	4
PA007	a	0 - 10 cm:	Registered in store:	4
PA007	b	10 - 60 cm:	Registered in store:	4
PA007	c	60 - 87 cm:	Registered in store:	4
PA007	d	87 - 131 cm:	Registered in store:	4
PA007	e	131 - 172 cm:	Registered in store:	4
PA007	f	172 - 195 cm:	Registered in store:	4
PA008	a	0 - 19 cm:	Registered in store:	4
PA008	b	19 - 44 cm:	Registered in store:	4
PA008	c	44 - 105 cm:	Registered in store:	4
PA008	d	105 - 160 cm:	Registered in store:	4
PA008	e	160 - 200 cm:	Registered in store:	4
PA009	a	0 - 38 cm:	Registered in store:	4
PA009	b	38 - 80 cm:	Registered in store:	4
PA009	c	80 - 125 cm:	Registered in store:	4
PA009	d	125 - 145 cm:	Registered in store:	4
PA009	e	145 - 210 cm:	Registered in store:	4
PA010	a	0 - 15 cm:	Registered in store:	4
PA010	b	15 - 40 cm:	Registered in store:	4
PA010	c	40 - 95 cm:	Registered in store:	4
PA010	d	95 - 180 cm:	Registered in store:	4

40 samples
Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (24/05/93)

WORK ACHIEVEMENTS

Work achievements: number of pits and bores of each individual surveyor by month, can be retrieved with the program **WRKRETRC**.

Predefined subsets are supported.

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Retrieval of Soil Data
Monthly Work Achievements

Output example:

MONTHLY WORKING RATES OF SOIL PITS
of National Soil Map Project, Jordan

1 9 9 2

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Austin Hutch.	13	10	41	6	8	33	5					7	123
Neil Munro	9	10	24										43
Suleiman Saw.	6			16	4	4	5	13	17	12	6	3	86
Wail Rushdan	5		8	22	7	10	13	13	14	6	7	8	113
Mahmoud Hass.	22	6	14	17	2		3	21	17	19	18	8	47
Amjad Rihani	5				3		1					1	10
Hani Hamoud	7	5	18	19			5	24	19	21	15	10	143
Will Gibson	10			11	6	6	6	6	24	20	18	6	113
Rob Davison	5		9	9	5	18	3	2	14	20	11	5	101
Wail Sartawi	3												3
Bakr Al-Qudah	6	4										1	11
Ian Baillie							22	31	26	22	11		112
Total Team:	91	31	114	100	39	71	63	110	131	120	86	49	1005

===========
Project Total: 2183

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (24/05/93)

WORK ASSESSMENT by SURVEYOR

Program **INDRETRC** counts the actual observation of each surveyor for each individual data set. Thus, the number it calculates the number of cards (or in %) for which data were recorded.

Predefined subsets are supported.

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Retrieval of Soil Data
Performance of Data Recording

Output examples:

INDIVIDUAL DATA COLLECTION

With Entry Data About Surface Data - Pit Descriptions

MINERAL (mineralogy)		
Austin Hutcheon	98 % (	412 entries)
Neil Munro	94 % (	146 entries)
Suleiman Sawalha	96 % (	192 entries)
Wail Rushdan	100 % (	254 entries)
Mahmoud Hassan	99 % (	306 entries)
Amjad Rihani	100 % (	21 entries)
Alan Stapleton	100 % (	25 entries)
Hani Hamoud	100 % (	270 entries)
Will Gibson	98 % (	191 entries)
Rob Davison	98 % (	189 entries)
Wail Sartawi	100 % (	6 entries)
Bakr Al-Qudah	82 % (	9 entries)
<others>	94 % (	15 entries)
Ian Baillie	88 % (	98 entries)
Ahmed Ekuor	100 % (	2 entries)
Sameeh Alnuaimat	100 % (	2 entries)
Majed Bsoul	(	0 entries)
Eiad Khafaja	(	0 entries)
Ali Abuhammour	100 % (	1 entries)
TOTAL	98 % (	2139 entries)

SF_COV_TYP (surface cover type)

Austin Hutcheon	95 %	(399 entries)
Neil Munro	85 %	(133 entries)
Suleiman Sawalha	99 %	(198 entries)
Wail Rushdan	97 %	(248 entries)
Mahmoud Hassan	90 %	(277 entries)
Amjad Rihani	95 %	(20 entries)
Alan Stapleton	84 %	(21 entries)
Hani Hamoud	82 %	(221 entries)
Will Gibson	99 %	(194 entries)
Rob Davison	91 %	(175 entries)
Wail Sartawi	100 %	(6 entries)
Bakr Al-Qudah	91 %	(10 entries)
<others>	75 %	(12 entries)
Ian Baillie	77 %	(86 entries)
Ahmed Ekuor	100 %	(2 entries)
Sameeh Alnuaimat	100 %	(2 entries)
Majed Bsoul		(0 entries)
Eiad Khafaja		(0 entries)
Ali Abuhammour	100 %	(1 entries)
TOTAL	92 %	(2005 entries)

GR_COV (ground cover)

Austin Hutcheon	58 %	(244 entries)
Neil Munro	17 %	(26 entries)
Suleiman Sawalha	59 %	(117 entries)
Wail Rushdan	52 %	(133 entries)
Mahmoud Hassan	62 %	(190 entries)
Amjad Rihani	62 %	(13 entries)
Alan Stapleton	0 %	(0 entries)
Hani Hamoud	74 %	(201 entries)
Will Gibson	84 %	(164 entries)
Rob Davison	78 %	(150 entries)
Wail Sartawi	83 %	(5 entries)
Bakr Al-Qudah	91 %	(10 entries)
<others>	81 %	(13 entries)
Ian Baillie	87 %	(97 entries)
Ahmed Ekuor	50 %	(1 entries)
Sameeh Alnuaimat	100 %	(2 entries)
Majed Bsoul		(0 entries)
Eiad Khafaja		(0 entries)
Ali Abuhammour	100 %	(1 entries)
TOTAL	62 %	(1367 entries)

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (24/05/93)

LOCRETRC

This program enables a wide variety of options for:

a) Selection of sites next to a defined point
b) Selection of sites within a circle or square
c) Display/printout of coordinates
d) Search for village/raingauge names
e) Conversion of coordinates

These options are available for coordinates of pits, bores, raingauges, villages, or any point defined by its coordinates in any coordinate system.

It can serve as a main conversion program between JTM, UTM zone 36, UTM zone 37, Palestine Grid, and geographical coordinates (lat/long). [Pal.Grid is an approximation: mean maximum error is 5 m, the other conversions are mathematically correct, ± 1 cm].

Like all the other retrieval options, it supports predefined subsets.

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Retrieval of Soil Data
Location Retrieval

Output example for 'Nearest' - 'Pit':

NEAREST PIT

The pit closest to point 36.00000 E / 32.00000 N is:

PH092 (2725 m to the NE)

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)

Output example for 'Nearest' - 'Bore':

NEAREST BORE

The bore closest to point 36.00000 E / 32.00000 N is:

H1127 (2015 m to the N)

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)

Output example for 'Nearest' - 'Raingauge':

NEAREST RAINGAUGE

The raingauge closest to point 36.00000 E / 32.00000 N is:

Amman (airport) (AL 19) (2893 m to the S)

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)

Output example for 'Circle' - 'Pits':

CIRCLE WITH PITS

PITS around point 36.00000 E / 31.00000 N with a radius of 10 km

PR013	2353 m away
PR014	2564 m away
PR015	3557 m away
PT019	9742 m away
PY001	3902 m away
PY002	3008 m away
PY003	4046 m away

7 sites
Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)

Output example for 'Circle' - 'Bores':

CIRCLE WITH BORES

BORES around point 36.00000 E / 31.00000 N with a radius of 10 km

G0073	7037 m away
G0074	9024 m away
G0080	9727 m away
G0125	2066 m away
G0126	4488 m away
G0127	8436 m away
G0134	4692 m away
G0135	3542 m away
G0136	609 m away
G0137	1992 m away
G0138	3948 m away
G0139	4725 m away
G0140	7174 m away
G0141	9576 m away
G0143	7960 m away
G0145	9191 m away
G0157	4594 m away
G0158	7986 m away
G0165	8213 m away
G0166	7678 m away
S0826	9523 m away
S0887	2885 m away
S0888	6138 m away
S0889	8465 m away
S0895	3314 m away
S0896	4724 m away
S0897	6999 m away
S0898	8095 m away
S0916	9299 m away
S0917	8579 m away
S0918	9923 m away
S0926	2558 m away
S0927	3059 m away
S0928	2453 m away
S0929	2711 m away
S0930	4870 m away
S0931	6934 m away
S0932	5853 m away
S0934	8895 m away
S0936	8679 m away
S0948	7820 m away
T0040	9976 m away
T0041	9539 m away
T0042	9711 m away
T0051	9898 m away
T0052	9601 m away
T0055	3305 m away
T0056	3282 m away
T0061	8141 m away
T0062	3382 m away
T0063	3449 m away
T0064	5115 m away

52 sites
Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)

Output example for 'Circle' - 'Raingauges':

CIRCLE WITH RAINGAUGES

RAINGAUGES around point 36.00000 E / 31.00000 N with a radius of 30 km

Hasa	CF 5	19931 m away
Mazar	CD 13	29601 m away
Qatrana	CD 11	27218 m away

3 sites
Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (23/06/93)

Output example for 'Square' - 'Pits':

SQUARE WITH PITS

PITS in grid 30.70000-31.00000 / 36.00000-36.30000

PG026	36.25500 E / 30.76654 N
PT022	36.02727 E / 30.76918 N
PT023	36.00326 E / 30.73526 N
PT024	36.02505 E / 30.75650 N
PT025	36.01211 E / 30.79318 N
PY001	36.03446 E / 30.99489 N
PY003	36.03472 E / 30.99001 N

7 sites
Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (24/06/93)

Output example for 'Display/Conversion' - 'Point (by coordinates)':

COORDINATES OF ANY POINT(S)

JTM: E 404508 m
N 430768 m

UTM (36): E 786472 m
N 3433518 m

UTM (37): E 213528 m
N 3433518 m

Palestine Grid: E 245412 m (+- 10 m)
N 1045584 m (+- 10 m)

Geograph.coords: E 36.00000½ (source)
N 31.00000½ (source)

Map sheet (1:25000): 3252-III-SW

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/ITS/MoA, Jordan (24/06/93)

Output example for 'Display/Conversion' - 'Pit':

DISPLAY OF PIT

PA100

JTM: E 487068 m
N 339876 m

UTM (36): E 872305 m
N 3345520 m

UTM (37): E 294500 m
N 3341125 m

Palestine Grid: E 329433 m (+- 10 m)
N 955990 m (+- 10 m)

Geograph.coords: E 36.86570½ (source)
N 30.18379½ (source)

Map sheet (1:25000): 3350-II -NW

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/ITS/MoA, Jordan (24/06/93)

PRECIPITATION DATA

With program **PRCRETRC**, precipitation data can be retrieved either as actual values or averages calculated with their mean and standard deviation and expectation level.

Daily precipitation data are stored for the period early 1950 for many stations, upto the present, and for more than 50 raingauges (as listed in Section D 8 of this Volume).

Data can be listed either for the hydrological year (starting in October) or for the calendar year (starting in January). They can be retrieved on an annual, monthly or daily basis.

Data are stored individually for each station in file PRC?????.DBF.

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Interpretation of Soil Data
Retrieval of Precipitation Data

Output example for 'Precipitation' - 'Average' - 'Annual Mean w/ standard deviation and expectation':

```
                    Station AMMAN (AIRPORT) (AL 19) :

Annual mean:                                          270.8 mm
  Standard deviation                 s =              102.1 mm
    Period of 51/52-93/94 with 41 year(s) of data
    Expected precip. at reliability level of  50 %:   270.8 -   270.8 mm
                                              66 %:   226.9 -   314.7 mm
                                              75 %:   201.9 -   339.7 mm
                                              80 %:   184.9 -   356.8 mm
                                              90 %:   140.0 -   401.7 mm

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (24/06/93)
```

Output example for 'Precipitation' - 'Values' - 'Monthly Totals':

Station AMMAN (AIRPORT) (AL 19) :

October	1990 :	1.8 mm	(daily values)
November	1990 :	3.7 mm	(daily values)
December	1990 :	2.5 mm	(daily values)
January	1991 :	90.9 mm	(daily values)
February	1991 :	47.2 mm	(daily values)
March	1991 :	43.5 mm	(daily values)
April	1991 :	6.2 mm	(daily values)
May	1991 :	2.1 mm	(daily values)
June	1991 :	0.0 mm	(daily values)
July	1991 :	0.0 mm	(daily values)
August	1991 :	0.0 mm	(daily values)
September	1991 :	0.0 mm	(daily values)
October	1991 :	4.7 mm	(daily values)
November	1991 :	35.0 mm	(daily values)
December	1991 :	166.4 mm	(daily values)
January	1992 :	112.1 mm	(daily values)
February	1992 :	200.0 mm	(daily values)
March	1992 :	15.7 mm	(daily values)
April	1992 :	0.0 mm	(daily values)
May	1992 :	6.0 mm	(daily values)
June	1992 :	0.0 mm	(daily values)
July	1992 :	0.0 mm	(daily values)
August	1992 :	0.0 mm	(daily values)
September	1992 :	0.0 mm	(daily values)

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (24/06/93)

Output example for 'Precipitation' - 'Values' - 'Monthly Totals of 1 Month' - ' March':

Station AMMAN (AIRPORT) (AL 19) :

March	1975 :	33.2 mm	(daily values)
March	1976 :	68.6 mm	(daily values)
March	1977 :	52.5 mm	(daily values)
March	1978 :	66.7 mm	(daily values)
March	1979 :	35.3 mm	(daily values)
March	1980 :	77.8 mm	(daily values)
March	1981 :	20.5 mm	(daily values)
March	1982 :	43.3 mm	(daily values)
March	1983 :	46.1 mm	(daily values)
March	1984 :	78.5 mm	(daily values)
March	1985 :	42.3 mm	(daily values)
March	1986 :	6.2 mm	(daily values)
March	1987 :	39.4 mm	(daily values)
March	1988 :	63.4 mm	(daily values)
March	1989 :	31.8 mm	(daily values)
March	1990 :	65.9 mm	(daily values)
March	1991 :	43.5 mm	(daily values)
March	1992 :	15.7 mm	(daily values)
March	1993 :	No data available	

Outprint of JOSCIS - Nat.Soil Map Proj., SSLRC/HTS/MoA, Jordan (24/06/93)

1) Plotting of Total Annual Bar Charts:

1.a) Precipitation DBMS:

JOSCIS: Soil & Climatic Data
JOSCIS: Climatic Database
Retrieval of Precipitation Data

Average
Annual Mean (Oct-Sep)

(Station:)	{Station number}
(Start of Period:)	{First year} example: 51
(End of Period:)	{Last year} example: 93
(Output)	Screen display

and write down the value of annual mean

Values
Annual Totals (Oct-Sep)

(Station:)	{Station number}
(Start of Period:)	{First year} example: 51
(End of Period:)	{Last year} example: 93
(Output)	Transfer to File Lotus rel.2
(In which file ...:NSOIL)	**1**

Quit

1.b) Lotus:

Spreadsheet
Lotus

/
File
Import
Text

(Enter name of file ...:) **nsoil1.prn**

Move to first row with AAAAAAA AAAAAAAAA A ..., column A

/
Data
Parse

Format-Line
Create

Input-Column
and include 'format-line': L > > > >...., and all data rows
by dot, then moving down to bottom

Output-Range
and move down to blank rows

Go

Move to top (cell A1) and delete all previous rows:

/
Worksheet
Delete
Rows
Press dot, then move down to bottom of imported rows,
but not over parsed data rows

Delete intermediate year labels, because they might look too messy,
e.g. delete 1952/53, 1953/54, 1954/55, but not 1955/56,
delete 1956/57, 1957/58, 1958/59, 1959/60, but not 1960/61
etc.etc.
Hence every 4th division is labelled on the axis

/
Graph
Type
Bar

X
Mark column with year, from top to bottom

A
Mark column with precipitation values, from top to bottom

Options
Titles
First
{Name of station}
Titles
Second
Precipitation
Titles
X-Axis
Mean .... mm

Scale

Y scale
Lower
0
Upper
800
Manual
(Quit)

Colour
(Quit)

Save
{filename}
example: 'prcamman' for Amman
Quit

/
File
Save
{filename}
example: 'prcamman' for Amman

Quit from Lotus:
/
Quit
Yes

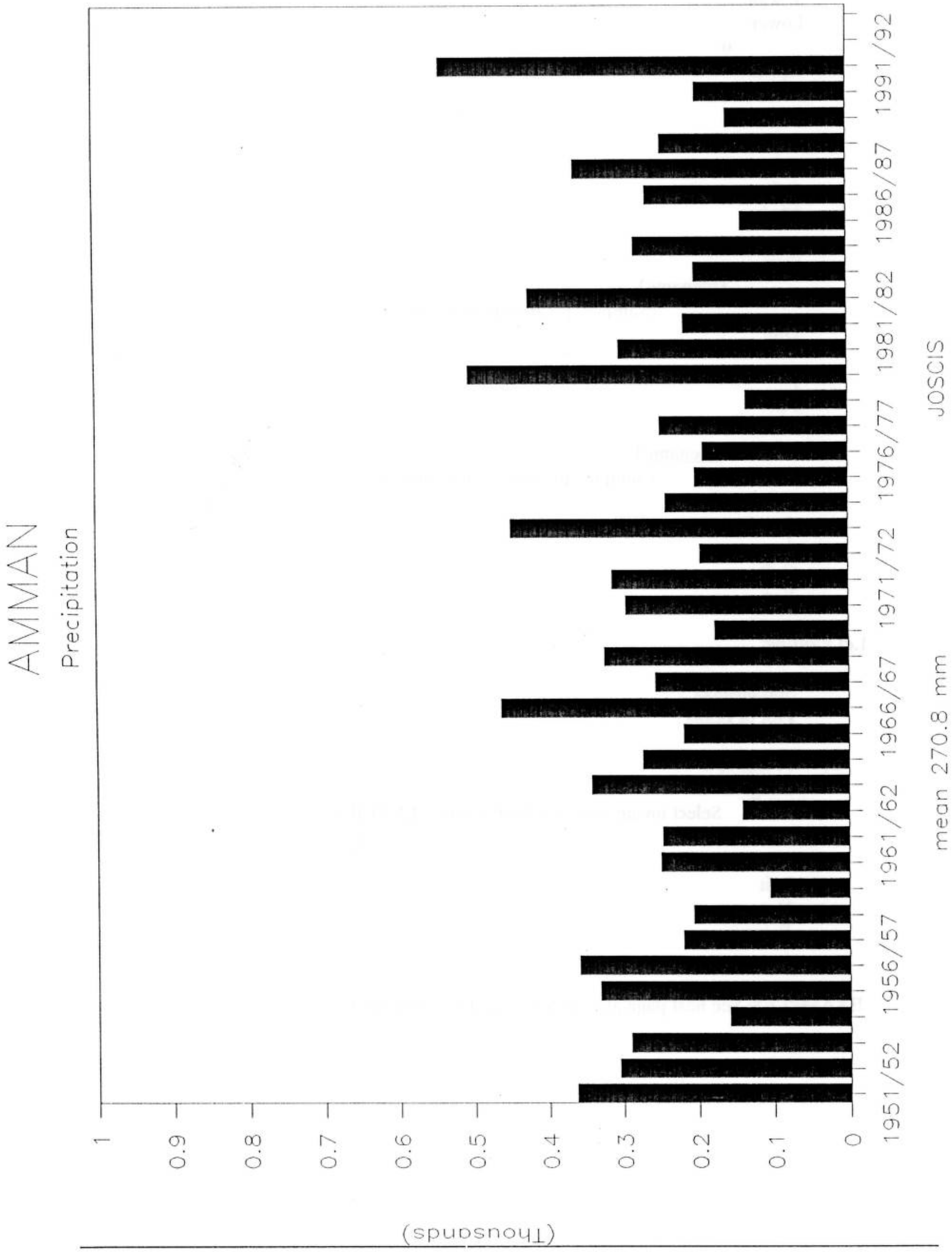
1.c) Plotting:

Spreadsheet
Plot of Lotus

Printgraph
Image-Select
Select image with <SPACE> and <ENTER>
Go

Exit
Yes
Exit

EXAMPLES: See next page and Section D 8 of this Volume !


AMMAN
Precipitation
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
mean 270.8 mm
JOSCIS

2) Plotting of Average Monthly Line Charts:

2.a) Precipitation DBMS:

JOSCIS: Soil & Climatic Data
JOSCIS: Climatic Database
Retrieval of Precipitation Data

Average	
Monthly Means (Oct-Sep)	
(Station:)	{<u>Station number</u>}
(Start of Period:)	{<u>First year</u>} example: 51
(End of Period:)	{<u>Last year</u>} example: 93
(Output)	Transfer to File Lotus rel.2
(In which file ...:NSOIL)	1
Quit	

2.b) Lotus:

Spreadsheet
Lotus

/
File
Import
Text

(Enter name of file ...:) **nsoil1.prn**

Move to first row with AAAAAAA AAAAAAAAA A ..., column A

/
Data
Parse
Format-Line
Create

Input-Column
and include 'format-line': L>>>>...., and all data rows by dot, then moving down to bottom

Output-Range
and move down to blank rows

Go

Move to top (cell A1) and delete all previous rows:

/
Worksheet
Delete
Rows

Press dot, then move down to bottom of imported rows, but not over parsed data rows

.

Shorten the names of months, e.g. 'October' to 'Oct'

/
Graph
Type
Line

X
Mark column with months, from top to bottom

A
Mark column with precipitation values, from top to bottom

Options
Titles
First
{Station}
Titles
Second
Mean Precipitation 19.. - ..
Scale
Y scale
Lower
0
Upper
100
Manual
(Quit)

(Quit)

Save
{slightly changed filename}
example: 'pr1amman' for Amman
Quit

/
File
Save
{slightly changed filename}
example: 'pr1amman' for Amman

Quit from Lotus:
/
Quit
Yes

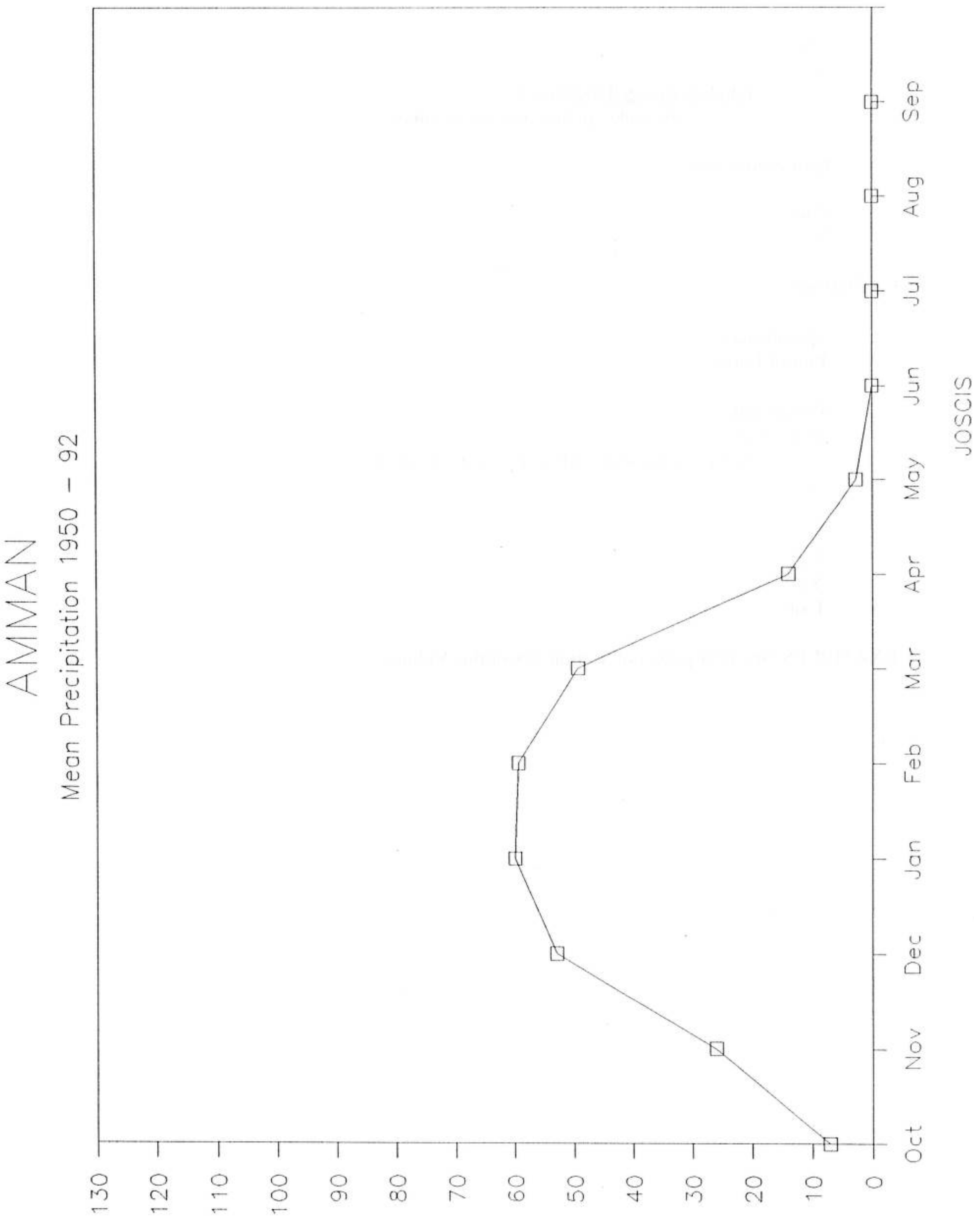
3.c) Plotting:

Spreadsheet
Plot of Lotus

Printgraph
Image-Select
Select image with <SPACE> and <ENTER>
Go

Exit
Yes
Exit

EXAMPLES: See next page and Section D 8 of this Volume !


AMMAN
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

TEMPERATURE DATA

Program **TEMPINTC** calculates the monthly and annual air temperature and annual soil temperature, based on regression equations of altitude, latitude, and longitude.

For pits and bores, all data are retrieved from surface data files. For any other sites, e.g. defined by coordinates, the altitude has to be entered.

Regression equation is of the form:

$$\text{temperature} = b_0 + b_1 * \text{alt} + b_2 * \text{lat} + b_3 * \text{long}$$

Annual air temperature:

31.57 - 0.006827 * alt - 1.2119 * lat + 0.8105 * long

Annual soil temperature:

derived from annual air temperature: 3.43 + 0.972*temda

January:	52.22 -	0.006489	* alt -	0.8991	* lat -	0.2979	* long
February:	44.38 -	0.006533	* alt -	1.1039	* lat +	0.1400	* long
March:	36.98 -	0.006762	* alt -	1.4586	* lat +	0.7324	* long
April:	27.35 -	0.006958	* alt -	1.5952	* lat +	1.2404	* long
May:	18.49 -	0.007074	* alt -	1.5679	* lat +	1.5767	* long
June:	14.43 -	0.007237	* alt -	1.5979	* lat +	1.8050	* long
July:	13.88 -	0.007172	* alt -	1.5997	* lat +	1.8644	* long
August:	14.84 -	0.007295	* alt -	1.5461	* lat +	1.7950	* long
September:	8.73 -	0.006784	* alt -	1.0431	* lat +	1.4681	* long
October:	38.04 -	0.006627	* alt -	0.7689	* lat +	0.3117	* long
November:	53.78 -	0.006656	* alt -	0.6570	* lat -	0.3807	* long
December:	55.73 -	0.006338	* alt -	0.7053	* lat -	0.5305	* long

Call by: JOSCIS: Soil & Climatic Database
JOSCIS: Interpretation of Soil Data
Temperature

Currently there are no reliable algorithms for predicting mean monthly soil temperatures.

Output example for 'Temperature' - 'Pit':

Pit PA100 :

	AIR TEMPERATURE :	SOIL TEMPERATURE:
January	9.0	
February	10.4	
March	13.9	
April	18.7	
May	23.0	
June	26.3	
July	27.9	
August	27.8	
September	25.3	
October	20.4	
November	13.9	
December	9.2	
ANNUAL	18.7	21.6

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Output example for 'Temperature' - 'Location by coordinates':

Location at 36.00000 E / 31.00000 N :

	AIR TEMPERATURE :	SOIL TEMPERATURE:
January	8.7	
February	9.6	
March	12.3	
April	16.6	
May	20.6	
June	23.7	
July	25.2	
August	25.3	
September	23.4	
October	19.7	
November	14.0	
December	9.3	
ANNUAL	17.3	20.2

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National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

Jordan Soil and Climatic Information System

D B M S
V O L U M E

Data Entry	Data Retrieval	Data Maintenance	Data Dictionary	General Information

MAINTENANCE of PIT and BORE DATA

EVERY MONTH:

1) Compile particle size classes:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data
[call of program 'mnt_impc' in \dbase\natsoild\ ]
Maintenance of Data
Particle size class / Horizon

You can press <Enter> at each warning/error message !

Maintenance of Data
Texture and PSC / Controlsection

You can press <Enter> at each warning/error message !

2) Compile colours:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data
[call of program 'mnt_impc' in \dbase\natsoild\ ]
Maintenance of Data
Dominant colour / Controlsection

3) Compile chemical data:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data
[call of program 'mnt_impc' in \dbase\natsoild\ ]
Maintenance of Data
Calculation of ESP, SAR, C/N, sand

4) Transfer GIS data for all sites:

4.a) JOSCIS: Soil & Climatic Data
JOSCIS: Retrieval of Soil Data
Selected Data Retrieval
[call of program 'mstretrc' in \dbase\natsoild\ ]
All Pits & Bores

(Define the Display:)	Do
(Define the Criteria for Selection:)	Do
(Output:)	Transfer to File
SPANS 5	
(In which file...:)	NSOIL9

- and watch the 'nsoil' number at right top of screen !

JOSCIS: Geographical Information System
SPANS - GIS: Processing & Retrieval
Jordan (total)

4.b) Transfer
Import
Library
Table

(Table file:) {<u>1.filename</u>}
example: nsoil901

and repeat this procedure for all following filenames (example 902,903,904...) !

4.c) Transform
Import
Points

(Table:)	{<u>1.filename</u>} example: nsoil901
(New point dataset:)	{<u>same filename, but **without 'n'**</u>} example: soil901
(Window:)	**00**
(Type:)	**2**
(Starting field:)	**1**

and repeat this procedure for all following filenames (example 902,903,904...) !

Steps 4.b) and 4.c) can be summarized and automatically executed for all files:

F4
DOS

Modify point import file 'imp_900.cmd' that the number of operations/files references are equal to the number of nsoil files as created above.

Example: 'nsoil905' indicates, there are 5 'nsoil9' files, see Annex 3 of this Section for an example of file 'imp_900' command file. You have to check and eventually modify the file with:

q imp_900.cmd

and modify, then save (<ESC>-F-S) and exit (<ESC>-Q-Q) from Q

Return to SPANS:
exit

File
Command Mode
exec f= {name of point import command file}

example: exec f=imp_900 - if number 9 was given for 'nsoil' number in Soil Database retrieval process.

See also Annex 1 !

exit

4.d) Model
Points
Append Class

(Point dataset:)	{1.filename **without 'n'**} example: soil901
(Map:)	{map name}
(Window:)	**00**
(New point datasset:)	{same filename, but **with 'n' and a letter instead of '9'**} example: nsoila01

and repeat this procedure for all following filenames (example 902,903,904...) !

4.e) Transform
Export
Library
Table

(Table:)	{1.filename **with 'n', but with letter instead of '9'**} example: nsoila01
(Format options:)	**0**
(Field delimiter:)	<ENTER>
(Eport headers:)	**N**

and repeat this procedure for all following filenames (example 902,903,904...) !

Steps 4.d) and 4.e) can be summarized and automatically executed for all files:

F4
DOS

Modify point export command file that the number of operations/files references are equal to the number of nsoil files as created above.

Example: 'nsoil905' indicates, there are 5 'nsoil9' files, see Annex 3 of this Section for an example of file 'gel_9_a' command file and a list of presently installed point export command files. You have to check and eventually modify file with:

q {point export command file with extension .CMD}

and modify, then save (<ESC>-F-S) and exit (<ESC>-Q-Q) from Q

Return to SPANS:
exit

File
Command Mode
exec f={name of point export command file}
example: exec f=gel_9_a
See also Annex 1 !
exit

Exit SPANS, i.e.
F4
Exit SPANS

4.f) JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Import GIS Data to Soil Database
Transfer from GIS

example:	Geology SPANS 5
example:	**A**
from:	**1**
to:	**20**
(Do you like to test ...:)	**N**
(Do you want to erase ...:)	**Y**

5) Generate temperature data:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data
[call of program 'mnt_impc' in \dbase\natsoild\ ]
Generation of Data
TEMP_ANN,TEMP_JAN...TEMP_DEC & TEMP_SOIL

6) Generate available water holding capacities:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data

[call of program 'mnt_impc' in \dbase\natsoild\ ]

Generation of Data
AWHC_TOP and AWHC_SUB

7) Generalize geological unit:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data

[call of program 'mnt_impc' in \dbase\natsoild\ ]

Generation of Data
GEOL_GNRL

8) Assess nearest raingauge:
(Can take long time: 1/2 - 2 hours !)

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data

[call of program 'mnt_impc' in \dbase\natsoild\ ]

Generation of Data
NEARGAUG

9) Assess nearest pit:
(Can take a very long time: A couple of hours !)

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data

[call of program 'mnt_impc' in \dbase\natsoild\ ]

Generation of Data
NEARPIT

10) Assess map sheet:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data

[call of program 'mnt_impc' in \dbase\natsoild\ ]

Generation of Data
SHEET...

ANNEX 1

Reference letters DBMS - GIS

Code letter	Information	Map	Point export command file
A	Geology	gel1tot	gel_9_a
B	Governorates	gov3tot	gov_9_b
C	Altitude	altxtot	alt_9_c
D	Land systems	soi1tot	so1_9_d
E	Project level II area	pr2dtot	pr2_9_e
F	Existing survey areas	exs1tot	exs_9_f
G	Moisture regime	aridtot	ari_9_g
H	Soil map level I	soi2tot	so2_9_h
I	Cloudiness	cloutot	clo_9_i
J	Humidity	humdtot	hum_9_j
K	Wind speed	wndstot	wnd_9_k
L	Precipitation	prc1tot	prc_9_l
M	Soil map level II	soi3tot	so3_9_m
N	Soil map level III	soi4tot	so4_9_n
O	Regions	reg3tot	reg_9_o
P	Sample areas	smpatot	smp_9_p
Q	Villages	villtot	cil_9_q
Z	Any temporary map	-	tmp_9_z

****

ANNEX 2

List of Point Command Files

DIS_100	Display of 'soil1..' point files
DIS_200	Display of 'soil1..' point files
DIS_900	Display of 'soil1..' point files
IMP_100	Import of 'nsoil1..' point files and transfer to 'soil1...' point files
IMP_200	Import of 'nsoil2..' point files and transfer to 'soil2...' point files
IMP_300	Import of 'nsoil3..' point files and transfer to 'soil3...' point files
IMP_700	Import of 'nsoil7..' point files and transfer to 'soil7...' point files
IMP_800	Import of 'nsoil8..' point files and transfer to 'soil8...' point files
IMP_900	Import of 'nsoil9..' point files and transfer to 'soil9...' point files

ALT_9_C	Read altitude units for 'soil9..' files, transfer to 'soilC..' files
ARI_9_G	Read moisture regime units for 'soil9..' files, transfer to 'soilG..' files
CLO_9_I	Read cloudiness units for 'soil9..' files, transfer to 'soilI..' files
EXS_9_F	Read existing survey areas for 'soil9..' files, transfer to 'soilF..' files
GEL_9_A	Read geological units for 'soil9..' files, transfer to 'soilA..' files
GOV_9_B	Read governorate units for 'soil9..' files, transfer to 'soilB..' files
HUM_9_J	Read humidity units for 'soil9..' files, transfer to 'soilJ..' files
PR2_9_E	Read project level 2 areas for 'soil9..' files, transfer to 'soilE..' files
PRC_9_L	Read precipiation units for 'soil9..' files, transfer to 'soilL..' files
REG_9_O	Read regions for 'soil9..' files, transfer to 'soilO..' files
SMP_9_P	Read sample areas for 'soil9..' files, transfer to 'soilP..'
SO1_9_D	Read regions/land systems/facets for 'soil9..' files, transfer to 'soilD..'
SO2_9_H	Read soil map units (1.level) for 'soil9..' files, transfer to 'soilH..'
SO3_9_M	Read soil map units (2.level) for 'soil9..' files, transfer to 'soilM..'
SO4_9_N	Read soil map units (3.level) for 'soil9..' files, transfer to 'soilN..'
TMP_9_Z	Read temporary map units for 'soil9..' files, transfer to 'soilZ..' files
VIL_9_Q	Read village units for 'soil9..' files, transfer to 'soilQ..' files
WND_9_K	Read wind speed units for 'soil9..' files, transfer to 'soilK..' files

****

ANNEX 3

Example of Point Command Files

a) 'Point import file' to import points (file 'imp_900.cmd'):

```
attimp f=nsoil901
attimp f=nsoil902
attimp f=nsoil903
attimp f=nsoil904
attimp f=nsoil905

impt f=nsoil901 o=soil901 t=2 n=1
impt f=nsoil902 o=soil902 t=2 n=1
impt f=nsoil903 o=soil903 t=2 n=1
impt f=nsoil904 o=soil904 t=2 n=1
impt f=nsoil905 o=soil905 t=2 n=1
```

b) 'Point export file' to read mapping units and transfer to export file (file 'gel_9_a.cmd'):

```
reclpnt p=soil901 o=nsoila01 m=gel1tot w=00
reclpnt p=soil902 o=nsoila02 m=gel1tot w=00
reclpnt p=soil903 o=nsoila03 m=gel1tot w=00
reclpnt p=soil904 o=nsoila04 m=gel1tot w=00
reclpnt p=soil905 o=nsoila05 m=gel1tot w=00
```

```
attexp a=nsoila01 f=0 d='' h=n
attexp a=nsoila02 f=0 d='' h=n
attexp a=nsoila03 f=0 d='' h=n
attexp a=nsoila04 f=0 d='' h=n
attexp a=nsoila05 f=0 d='' h=n
```

c) 'Point display file' for display (file 'dis_900.cmd'):

```
disline v=outxtot n=0 c=15 w=1 s=1

dispoint p=soil901 h=0 i=15 s=0 r=1 f=y u=0 c=0
dispoint p=soil902 h=0 i=15 s=0 r=1 f=y u=0 c=0
```

APPENDING SOIL PIT or BORE DATA
TECHNICAL REFERENCE

Program **DAT_IMPC** appends data of files 'ptsf/pthz' or 'brsf/brhz' selectively to Master Soil Database. Additionally, all data are checked for consistency and internal completeness. Geographical coordinates are calculated.

User instructions for appending soil pit or bore data are described in detail in Section D 2.1 of this Volume.

	Entry files:		Master files:
Pit:	ptsf/pthz	-->	ptsftot/pthztot/ptcmtot
Bore:	brsf/brhz	-->	brsf_? /brhz_? /brcm_? (?: initial of surveyor)

Essentially, if there are data errors in the data being appended this program will not allow the the process to continue. These errors first have to be corrected. It is always good policy to direct the output either to a printer or to an ASCII file to be able to read error messages.

Data errors such as missing coordinates or altitudes will result in warning messages only. It is recommended that the surveyor(s) be asked as soon as possible to supply the missing data. A list of error messages is shown below.

Call by: JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Append Entered Data

Recommended steps after appending:

a) If dBase will be used to view or edit data, data files have to be indexed for dBase environment through program 'INDEXNDX':
cd\dbase\natsoild
indexndx

b) To guarantee that data have been appended, call the description of a pit and of a bore of each surveyor, and check displayed data with entered data.

IT IS HIGHLY RECOMMENDED THAT A CURRENT BACKUP BE MADE BEFORE THE APPENDING PROCEDURE AND TO MAKE A BACKUP AFTER APPENDING !!

List of warning messages:

1	Not checked in surface entry file (brsf or ptsf)
2	Not checked in horizon entry file (brhz or pthz)
5	Occurs more than once in entry file
7	Incorrect site number in surface entry file
8	Incorrect site number in horizon entry file
9	Incorrect site number in surface master file
10	Incorrect site number in horizon master file
11	Horizon number does not match in entry files
12	Horizon number does not match in master files
13	Horizon numbers incorrect
14	Site numbers do not match in entry files
15	Site numbers do not match in master files
16	Author code wrong
21	No or unrealistic coordinates
22	Wrong coordinates
23	Wrong coordinates
24	Wrong coordinates
25	Wrong coordinates (outside Jordan)
26	No altitude
27	Wrong sample area
31	Gap in sequence of site numbers
32	Inconsistent dates
41	Checksite does not have reference
42	Checksite refers to another check
43	Checksite series and reference site series are differen
44	Checksite USDA and reference site USDA are different
45	Checksite has horizons (must be bore)
46	Reference site of check site does not exist

Further explanations of these codes and recommendations are listed in Section D 6.4 of this Volume.

Output example:

```
Surface and horizon data of pits are successfully APPENDED

WARNING 31: Gap in sequence of sitenumbers between site: PH272 and site: PH278
WARNING 31: Gap in sequence of sitenumbers between site: PM165 and site: PM167
WARNING 31: Gap in sequence of sitenumbers between site: PR003 and site: PR006
WARNING 31: Gap in sequence of sitenumbers between site: PR009 and site: PR012
WARNING 31: Gap in sequence of sitenumbers between site: PS087 and site: PS090
WARNING 31: Gap in sequence of sitenumbers between site: PS209 and site: PS990
WARNING 21: No/unrealistic coordinates of site: PA374  300000 E /  300000 N
WARNING 21: No/unrealistic coordinates of site: PB040  300000 E /  300000 N
WARNING 21: No/unrealistic coordinates of site: PB041  300000 E /  300000 N
WARNING 21: No/unrealistic coordinates of site: PB043  300000 E /  300000 N
WARNING 21: No/unrealistic coordinates of site: PB044  300000 E /  300000 N
WARNING 21: No/unrealistic coordinates of site: PM313  300000 E /  300000 N
WARNING 21: No/unrealistic coordinates of site: PN156  300000 E /  300000 N
WARNING 32: Inconsistencies of date at site: PB103  08/11/92
WARNING 32: Inconsistencies of date at site: PB112  13/11/92
WARNING 32: Inconsistencies of date at site: PG184  03/04/93
WARNING 32: Inconsistencies of date at site: PR001  06/06/86
WARNING 32: Inconsistencies of date at site: PS151  02/09/92
WARNING 32: Inconsistencies of date at site: PS188  15/03/93
WARNING 32: Inconsistencies of date at site: PS990  02/07/91
WARNING 32: Inconsistencies of date at site: PW260  01/05/93
WARNING 26: No altitude of site: PB040
WARNING 26: No altitude of site: PB041
WARNING 26: No altitude of site: PB043
WARNING 26: No altitude of site: PB044
WARNING 26: No altitude of site: PB045
WARNING 26: No altitude of site: PM313


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```

INTERNAL COMPILATION of MASTER DATA
TECHNICAL REFERENCE

Program **MNT_IMPC** executes routine data maintenance work in the Master Soil Database. Depending on the number of sites being added to the master files, all individual procedures should be executed every 3-12 weeks !

Call by: JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data

The maintenance procedures are:

- Generation of data:

-- Temperature (annual air, monthly air, annual soil, taxonomic soil classes),
calculated based on altitude, latitude, longitude via regression formulae,
will be assigned to CM files,
-- Available water holding capacity,
calculated based on texture, depth, bulk density, mineral fragments,
will be assigned to CM files,
-- Generalized geological unit,
based on geological unit,
will be assigned to CM files,
-- Nearest raingauge,
based on coordinates of raingauges (file 'gen_gaug')
will be assigned to CM files,
- TAKES LONG TIME ! -
-- Nearest pit,
based on coordinates of pits (file 'ptsftot')
will be assigned to CM files,
- TAKES AN EXTREMELY LONG TIME !!! -
-- Map sheet names of various scales,
based on coordinates of sites,
will be assigned to CM files,

- Maintenance of data:
-- Particle size class by horizon,
based on USDA definitions and texture,
will be assigned to horizon files

-- Particle size class by control section,
based on USDA definitions (it first calculates the control section) and
PSC of horizons,
will be assigned to surface files
-- Dominant colour by control section, taking the dominant horizons colour in the control section equivalent ,
will be assigned to surface files
-- Calculation of ESP, SAR, C/N, sand, organic matter in analytical data file ('analtot')
will be assigned to analytical file

Additionally, it allows addition of:

- a new surveyor (should not be done in dBase, because it does not only add the initials to file 'gen_auth', but also adds new, empty datafiles for data of the new surveyor),
- a new soil mapping unit (to file 'gen_smap')
- a new description code (to file 'gen_code')
- a new GIS - DBMS relation (to file 'gen_m2cm', see also Section D 4.4 of this Volume)
- a new cross-tabulation (to file 'gen_xtab')
- a new raingauge (to file 'gen_gaug')
- a new crop (to file 'gen_crop')
- and to define the composition of soil types/series within a soil mapping unit (in file 'gen_smap')

and the listing of following general datasets (GEN files) in various output formats and selection options:

- of surveyors (file 'gen_auth')
- of soil mapping units (file 'gen_smap')
- of description codes (file 'gen_code', see also Section D 5.2 of this Volume)
- of GIS - DBMS relations (file 'gen_m2cm', see also Section D 4.4 of this Volume)
- of cross-tabulations (file 'gen_xtab')
- of raingauges (file 'gen_gaug')
- of crops (file 'gen_crop')
- of villages (file 'gen_vill')
- of USDA taxonomy subgroups (file 'gen_taxo')

Step-by-step guide to execute a standard data maintenance is given in Section D 4.1 of this Volume, 'Maintenance of Pit and Bore Data'.

TRANSFER of GIS DATA
TECHNICAL REFERENCE

Program **GIS_IMPC** transfers point data from the Master Soil Database to the GIS and site related data back to the Soil Database,

DBMS --> GIS --> DBMS

To achieve this, the following steps have to be executed:
a) Export data from DBMS (through Selected Data Retrieval option)
b) Import data in SPANS (File-Import-Library-Table, then File-Import-Points)
c) Process data in SPANS (Model-Points-Append class)
d) Export data from SPANS (Transform-Export-Library-Tabl)
e) Import data through this program into Soil Database, CM files ('ptcmtot', 'brcm_?')

Step-by-step guide is explained in Section D 4.1 of this Volume, 'Maintenance of Pit and Bore Data'.

Call by: JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Import GIS Data to Soil Database

The function of this program is to extract data for each site from SPANS format through key variables and to copy them in above mentioned CM files. The key variables are found and defined in file 'gen_m2cm'. It is absolutely CRUCIAL that these key variables are defined in the correct way. They are explained in the following:

File 'gen_m2cm' defines the relation between the source: SPANS map, and the target: CM files of the DBMS.

A reference is established by 1 (and only 1) of 4 options:

1) **Direct relation**: Number of mapping unit in GIS (feature code when digitized and processed in SPANS) remains the same mapping unit in DBMS. This is the case with most maps, e.g. administrative maps, vegetation maps etc.

Example:

GIS		DBMS
1	-->	1
2	-->	2
3	-->	3
4	-->	4

2) **Mathematical relation**: Number of mapping unit in GIS will be used by a mathematical equation to define a numeric value for the DBMS.

Example: Equation for altitude mapping units is (value*100)-450.

GIS		DBMS
1	-->	-350
2	-->	-250
3	-->	-150
4	-->	-50

3) **Soil Map (letter) code**: Number of soil mapping unit in GIS relates to letter code (e.g. ABI) of soil map; reference is made through lookup table in file 'gen_smap'.

Example: Soil map level 1:

GIS		DBMS		
1	-->	1	and	KAR
2	-->	2	and	MAD
3	-->	3	and	BIN
4	-->	4	and	GER

4) **Mapping unit consists of 1, 2, or 3 different target units**: Number of mapping unit in GIS relates to 1, 2 or 3 numeric codes (e.g. region 1, land system 3, facet 5) in target fields; reference is made through lookup table in file 'gen_xtab'.

Example: Land system map:

GIS		DBMS		
1	-->	2	and	7
2	-->	12	and	1
3	-->	5	and	15
4	-->	7	and	9

A 'relation' can be defined menu driven through:

JOSCIS: Soil and Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data
[call of program 'mnt_impc' in \dbase\natsoild\ ]
Additional ...
Additional relation GIS - DBMS (gen_m2cm)

Or, records can be entered in file 'gen_m2cm' in \dbase\natsoild\ in dBase IV to satisfy following conditions:

1) **Direct relation:**

- NUMBER: Next highest consecutive number
- OPERAT: 1801-1899
- TARGF_1: Name of target field in CM file
  (If new map, you might have to create a new [numeric] field in ALL (!) CM files by modify structure command in dBase, and to add record in file 'gen_code')
  - TAKE CARE FOR CORRECT SPELLING! -
- CHECK_POS: 1 if there is reference to SF file, but in most cases: 0
- ORIGF_1: Name of reference field in SM file, only if check_pos = 1
- S_GIS_LETT: Next unused letter, has to be identical with newly defined CM file in SPANS
- SPANS_MAP, HEADING_L: Explicatory text

All other fields should remain empty (or 0, if numeric)
You can follow the example of map reference 'adm_gis'.

2) MATHEMATICAL RELATION:

- NUMBER: Next highest consecutive number
- OPERAT: 1801-1899
- TARGF_1: Name of target field in CM file
  (If new map, you might have to create a new [numeric] field in ALL (!) CM files by modify structure command in dBase, and to add record in file 'gen_code')
  - TAKE CARE FOR CORRECT SPELLING! -
- CHECK_POS: 1 if there is reference to SF, but in most cases: 0
- ORIGF_1: Name of reference field in SM file, only if check_pos = 1
- S_GIS_LETT: Next unused letter, has to be identical with newly defined CM file in SPANS
- FORMULA: either 1: for one formula giving result in TARGF_1,
  or 2: for two formulae giving results in TARGF_1 and TARGF_2
- FORMUL_1: Formula giving result in TARGF_1, has to contain the word 'mvalue_1' !
- FORM_X_1A and FORM_X_1B: If there is an exception, where formula 1 does not apply, the exceptional mapping unit no. FORM_X_1A will receive value of FORM_X_1B, thus GIS: FORM_X_1A --> DBMS: FORM_X_1B

- FORM_X_1C and FORM_X_1D: If there is a 2.exception where formula 1 does not apply, the exceptional mapping unit no. FORM_X_1C will receive value of FORM_X_1D, thus GIS: FORM_X_1C --> DBMS: FORM_X_1D
- SPANS_MAP, HEADING_L: Explicatory text

Only if there are two formulae (FORMULA=2):
- TARGF_2: Name of target field of 2.formula in CM (If new map, see comment above for TARGF_1)
- FORMUL_2: Formula giving result in TARGF_2, has to contain the word 'mvalue_1' !
- FORM_X_2A and FORM_X_2B: If there is an exception, where formula 2 does not apply, the exceptional mapping unit no. FORM_X_2A will receive value of FORM_X_2B, thus GIS:FORM_X_2A --> DBMS: FORM_X_2B
- FORM_X_2C and FORM_X_2D: If there is a 2.exception where formula 2 does not apply, the exceptional mapping unit no. FORM_X_2C will receive value of FORM_X_2D, thus GIS: FORM_X_2C --> DBMS: FORM_X_2D

All other fields should remain empty (or 0, if numeric)
You can follow the example of map reference 'alt_gis'.

3) SOIL MAP (LETTER) CODE:

- NUMBER: Next highest consecutive number
- OPERAT: 1801-1899
- TARGF_1: Name of target field in CM file with soil map number, containing numbers, e.g. SOIL1_GIS
- TARGF_2: Name of target field in CM file with map number, containing codes, e.g. SNAME1_GIS
  (If new map, you might have to create those 2 new fields (1 numeric, 1 string) in ALL (!) CM files by modify structure command in dBase, and to add 2 records in file 'gen_code'.
  - TAKE CARE FOR CORRECT SPELLING! -
- S_GIS_LETT: Next unused letter, has to be identical with newly defined CM file in SPANS
- GEN_SMAP: Number of soil map, should be identical with number in names of TARGF_1 and TARGF_2
- SPANS_MAP, HEADING_L: Explicatory text

All other fields should remain empty (or 0, if numeric)
You can follow the example of map reference 'soil1_gis'

File 'gen_smap' has to have for each unit of that particular map:

- code (e.g. ABI)	in field MAPUNIT
- mapping unit number	in field NUMBER
- no.of soil map (identical to GENSMAP)	in field LEVEL

4) MAPPING UNIT with 1,2, or 3 different target units:

- NUMBER: Next highest consecutive number
- OPERAT: 1801-1899
- TARGF_1: Name of target field in CM file
  (If new map, you might have to create a new [numeric] field in ALL (!) CM files by modify structure command in dBase, and to add record in file 'gen_code')
  - TAKE CARE FOR CORRECT SPELLING! -
- CHECK_POS: 1 if there is reference to SF, but in most cases: 0
- ORIGF_1: Name of reference field in SM file, only if check_pos = 1
- GENXTAB: Number of diff. target fields (1,2 or 3)
- S_GIS_LETT: Next unused letter, has to be identical with newly defined CM file in SPANS
- SPANS_MAP, HEADING_L: Explicatory text

- TARGF_2: Name of 2.target field in CM file, only if GENXTAB is 2 or 3
  (see comment above for TARGF_1)
- TARGF_3: Name of 3.target field in CM file, only if GENXTAB is 3
  (see comment above for TARGF_1)

All other fields should remain empty (or 0, if numeric)
You can follow the example of map reference 'adm_gis'.

File 'gen_xtab' has to have for each unit of that particular map:

- identifier number for that map	in field FIELD_NO
- mapping unit no. (e.g. 11)	in field CODE_NO
- 1.reference no.(e.g. 23)	in field UNIT_1
- 2.reference no.(e.g. 6)	if given in field UNIT_2
- 3.reference no.(e.g. 8)	if given in field UNIT_3

and at the top of these records:

- identifier number for that map	in field FIELD_NO
- name of source map in SPANS (=TARGF_1)	in field FIELD_NAME
- number of mapping units	in field CODE_MAX

INDEXING of DATA FILES
TECHNICAL REFERENCE

1) Indexing of datafiles for use in Clipper:

Program **INDEXNTX** reindexes all datafiles (DBF files in \dbase\natsoild\) for use in Clipper 5, thus creating updated **NTX** files.

Data files are all **'SF'** ('surface)', **'HZ'** ('horizon') and **'CM'** ('compiled, from GIS') files and all **GEN_** files with the general data set (see Section 5.1 with listing of all GEN_ files), plus 'analtot' and 'phystot'.

It should be RUN AFTER ANY CHANGE OF DATAFILES, particularly after appending data and after adding or deleting records in GEN_ files.

Call by: **cd\dbase\natsoild**
indexntx

Or: JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Reindex Data Files of Soil Database

2) Indexing of datafiles for use in dBase:

Program **INDEXNDX** reindexes all datafiles, as explained above, for access in dBase environment, thus creating updated **NDX** files. It should be executed right after or before this program, to ensure that datafiles are indexed as well for dBase environment.

Call by: **cd\dbase\natsoild**
dbase indexndx

IMPORT / EXPORT of SERIES and PHASES
TECHNICAL REFERENCE

1) Export of Series and Phases:

Program **SER_EXPC** exports assignments to series and phases which can then be imported to any other computers (e.g. master computer). Only fields 'series_1', 'series_2' and 'phase' are copied out (to files 'pt_tmp' for pits and 'br_tmp' for bores).

At the master computer, they have to be imported by the series import option (program 'ser_impc', see below).

Remark about series names: Soil series are grouped in series groups (in most cases, a local name) and a number witin this series family. The series group name can, but should not have more than 6 letters, but only the first 3 letters identify, thus MAD and MUD are different, but not MADABA and MADAB. (This was intentionally made because of different transliteration from Arabic to English). The number should range between 1 and 70.

Call by: JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Export of Series + Phases

2) Import of Series and Phases:

Program **SER_IMPC** imports assignments to series and phases which were made on an external computer. Only fields 'series_1', 'series_2', and 'phase' are copied to the master Soil Database.

On the external computer, they have to be exported by the series export option (program 'ser_expc'). The transfer files are called 'pt_tmp' (for pits) and 'br_tmp' (for bores).

Additionally, this program can make a check for syntax errors of series.

Remark about series names: Soil series are grouped in series groups (in most cases, a local name) and a number witin this series group. The series group name can, but should not have more than 6 letters, but only the first 3 letters identify, thus MAD and MUD are different, but not MADABA and MADAB. (This was intentionally made because of different transliteration from Arabic to English). The number should range between 1 and 70.

Call by: JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Import of Series + Phases to Soil Database

CLEARANCE of ENTRY FILES

Program **ADDNEWFC** clears data entry files at the entry computer(s), thus deleting all records except one blank record.

After a set of soil descriptions cards (either pit or bore cards) has been entered and checked (data entry files: 'brsf' & 'brhz', or 'ptsf' & 'pthz'), they should be 'overchecked', copied out, and appended to the master Soil Database (with program 'dat_impc').

After completion of this process, the data entry files have to be cleared to be prepared for new entry. This can be achieved through this program 'addnewfc'.

Be VERY CAREFUL with this program, because it unrecoverably deletes all data in the data entry files. Be sure to have back up copies of the data entry files before running this program.

Remark: One blank line should be in the data files, when data entry starts.

Call by: **cd\dbase\soilentr**
addnewfc

CORRECTION of PIT and BORE DATA

Program **ANYCORRC** gives the chance to change or correct data of soil pit or bore descriptions directly in the Master Soil Database. Data have to be entered for that particular site number through the entry scheme (see Section D 2.1 of this Volume).

It is automatically recognized, if data of a pit or of a bore is to changed. In case of bore correction, the author specific files are automatically opened.

Original data will be overwritten. It is not possible after any changes, to recover the previous data status.

Similar to corrections during pit/bore data entry, the program asks for the first three letters of the data set (field) to be corrected. It then displays the screen page, and opens the entry mask for entry of the new data set.

Call by:	JOSCIS: Soil & Climatic Data JOSCIS: Entry of Soil Data Correct Data in Master Files

DEFINITION of SOIL MAPPING UNITS

a) For a new soil map, soil mapping units have to be defined.
b) On an existing soil map, it might be necessary, to add a mapping unit.

Both tasks require the same steps:

1) Syntax rules for names (labels) of soil mapping units:

For a new map it is recommended, to define a syntax for labels.

At the present JOSCIS setup, names (labels) of soil mapping units have to start with a letter and shall contain not more than 6 letters or numbers and no spaces. For example, ABC, D1, DB12, LOM123 are valid names, but not ABCDEFG, 1MPL, AB_D. It is recommended to have a unique system for each soil map, for example, level I soil map: 3 letter code, level II soil map: 1 letter plus a number plus optionally an additional letter. See Annex for more examples.

2) Correction in Soil Database (DBMS):

Change of file 'gen_smap.dbf'

If you are not sure, whether a unit is already declared in the DBMS (in file 'gen_smap.dbf'), you can list them through:

JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data [call of program 'mnt_impc']
Listing
Soil mapping unit (gen_smap)

Either menu-driven:

2.a) JOSCIS: Soil & Climatic Data
JOSCIS: Entry of Soil Data
Maintenance of Master Data [call of program 'mnt_impc']
Additional ...
Soil mapping unit (gen_smap)

(Number of map:)	{level number}
(Name of new unit:)	{name}
(Enter full name:)	{name}
(Do you like to enter...:)	**N**

(Data can be saved (Y/N) ?) **Y**
(Do you want to enter another unit (Y/N) ?)

or 'manually':

b) DOS
cd\dbase\natsoild
dbase
use gen_smap index gen_smap
Edit file 'manually' !
Re-index after editing, both in dBase and in Clipper

It is recommended to print out the new listing !

3) Correction in SPANS:

Either menu-driven:

3.a) JOSCIS: Geographical Information System
JOSCIS: GIS - Processing & Retrieval
Edit
Library
Legends
From existing
(Legend:) {soil map file name}

After each 10 units, it has to saved, and re-entered again.

or 'manually':

3.b) JOSCIS: Geographical Information System
JOSCIS: GIS - Processing & Retrieval
Transform
Export
Library
Legends [copy to file 'leg.rep']

In DOS:

cd \spans521\jordan
copy leg.rep legdict.inp
q legdict.inp

Type/edit the new mapping unit(s)

Back to SPANS:

Transform
Import
Library
Legends [import from file 'legdict.inp']

For a new map, it is recommended to have a structured approach and have all mapping units following a given structure, e.g. following a broader unit system (regions for example), or a classification approach, or similar.

If a mapping unit is to be added in a later stage, it is possible to add this unit at the end, but this is not advisable !! It is strongly recommended, even though much more work might be involved, to give the 'new' mapping unit a place/number in the correct sequence, i.e. in the region or broader unit it belongs to. All units with higher numbers have to be re-numbered, i.e. their number has to be increased by 1 (if 1 unit is to be added):

both in file 'gen_smap'
and in SPANS legend library
and on all maps !

After any change in the soil mapping unit definitions of a map, the assignement of soil mapping unit numbers to all observation sites (pits and bores) have to be done again. See Section: Transfer of GIS data to DBMS, in this Manual.

ANNEX

Sample Outprint of Soil Mapping Units
of Level I and Level II
in DBMS

Level	Mapunit number	Mapunit name	Full name
Level I (three letter code):			
1	1	ZOR	Zor
1	2	KAT	Katar
1	3	GOR	Ghor
1	4	TAD	Muhtadi
1	5	ARA	Arabah
1	6	RIS	Rischi
1	7	GAR	Gharandal
1	8	LIS	Lisan
1	9	SAF	Safi
1	10	DHI	Dhira
1	11	TIR	Tirban
1	12	HAY	Haymir
1	13	TAW	Tawilah
1	14	MAR	Haymar
1	15	WAN	Suwwana
etc.etc.			
Level II (letter plus number):			
2	11	X1	X 1
2	12	X2	X 2
2	13	X3	X 3
2	14	X4	X 4
2	15	X5	X 5
2	16	X6	X 6
2	17	X7	X 7
2	18	X8	X 8
2	19	X9	X 9
2	21	T1	T 1
2	22	T2	T 2
2	23	T3	T 3
2	24	T4	T 4
2	25	T5	T 5
2	26	T6	T 6
2	27	T7	T 7
2	28	T8	T 8
2	29	T9	T 9

National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

Jordan Soil and Climatic Information System

D B M S
V O L U M E

Data Entry | Data Retrieval | Data Maintenance | Data Dictionary | General Information

DATABASE STRUCTURE

Database structure of all JOSCIS DBF database files are explained in the following pages.

Sources for data are:

F	Field
L	Lab
C	Computer

References to explanation for coded datafields are given in the last column. They refer to the number of description code block in Section D 5.2 of this Volume.

RECORDED SURFACE DATA
(Pit and Bore Descriptions)

Files '**brsf_a**' ... '**brsf_z**' and '**ptsftot**'
('**SF**' - Files)

Content: All 'surface' data of pit/bore descriptions, i.e. all data which were gathered in the field by the soil surveyors, related to the location and surface of the soil.

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Sitenumber	-	(5)	F	101
COORDS_E	Easting in applied projection	m	123456	F	102
COORDS_N	Northing in applied projection	m	1234567	F	102
SYSTC	Applied projection	code	1	F+C	1
GCORDS_E	Easting in geographical coordinates	degr	12.12345	C	103
GCORDS_N	Northing in geographical coordinates	degr	12.12345	C	103
REGION	Region	no.	12	F+c	
LANDSYST	Land system	no.	12	F+c	
FACET	Facet within land system	no.	12	F	
SAMPLAREA1	Sample area image number	no.	12	F+c	
SAMPLAREA2	Sample area consecutive number	no.	12	F+ c	
SURVLEVEL	Survey level (project phase)	code	1	F	2
TYPENUM	Type of observation	code	1	F	3
AUTHOR	Author (surveyor)	code	12	F+C	4
DATE	Date of observation	date	(8)	F	
ASPECT	Slope aspect	degr	123	F	15
ALT	Altitude (asl)	m	1234	F	
POSIT	Topographic position	-	(22)	F	5
POS_CLASS	Position (class)	code	1	-	6
LOCATION	Location	-	(25)	F	7
AP_SCALE	Scale of aerial photograph	no.	123	F	104
AP_NO	Number of aerial photograph	no.	12345	F	
SERIES_1	Series (field)	-	(15)	F	105
SERIES_2	Series (final)	-	(15)	F	106
PHASE	Phase	-	(12)	F	
PART_SC_1	Particle size class (taxon.family)	code	12	F	8
PART_SC_2	Strongly contrasting particle size class (taxon.family)	code	12	F	8
MINERAL	Mineralogy class (taxon.family)	code	12	F	9
USDA_GRP	Taxonomy Subgroup	code	(4)	F	107
ROCK_1	Rock type 1	code	12	F	10
ROCK_2	Rock type 2	code	12	F	10
GEOL_TEXT	Geological texture	code	12	F	11
GEOL_CLAS	Geological class	code	12	F	12
PM_TEXT	Texture of parent material	code	12	F+ c	13
PM_CLASS	Class of parent material	code	12	F+ c	14
SHAPE	Shape of slope	code	1	F	16
SLOPE	Slope gradient	%	123	F	

EROS_CLAS	Erosion class	code	1	F	17
EROS_TYPE	Erosion type	code	1	F	18
MICRO_CLAS	Microrelief class	code	1	F	19
MICRO_TYPE	Microrelief type	code	1	F	20
RUNOFF	Runoff	code	1	F	21
DRAIN	Drainage	code	1	F	22
SF_COV_TYP	Surface cover type	code	12	F	23
SF_COV_PRC	Percentage of surface cover	%	123	F	
SF_FET_TYP	Surface feature type	code	12	F	24
SF_FET_PRC	Percentage of surface feature	%	123	F	
SF_CND_WT	Wetness of surface	code	1	F	25
SF_CND_HD	Hardness of surface	code	1	F	26
LUSE_CRP1	Crop or vegetation species 1	-	(10)	F	
LUSE_CNM1	Number of crop/vegetation 1	no.	123	F	108
LUSE_CRP2	Crop or vegetation species 2	-	(10)	F	
LUSE_CNM2	Number of crop/vegetation 2	no.	12	F	108
LUSE_CRP3	Crop or vegetation species 3	-	(10)	F	
LUSE_CNM3	Number of crop/vegetation 3	no.	12	F	108
LUSE_COV1	Land use (dominant)	code	123	F	27
LUSE_COV2	Land use (secondary)	code	123	F	27
GR_COV	Ground cover	%	123	F	
LIM_F1	Limiting feature - I	code	1	F	28
LIM_DEP1	Limiting depth - I	cm	123	F	
LIM_F2	Limiting feature - II	code	1	F	28
LIM_DEP2	Limiting depth - II	cm	123	F	
DIAGF1	Diagnostic feature - I	code	12	F	29
DIAGDEP1	Depth of diagnostic feature - I	cm	123	F	
DIAGF2	Diagnostic feature - II	code	12	F	29
DIAGDEP2	Depth of diagnostic feature - II	cm	123	F	
COL_HUE	Dominant colour (hue)	code	1.1	F	30
COL_VAL	Dominant colour (value)	no.	1.1	F	
COL_CHRM	Dominant colour (chroma)	no.	1.1	F	
HORIZ_NO	Number of recorded horizons	no.	1	F	
REF_SITE	Reference site (for check sites)	-	(5)	F	109
SITENUM2	Sitenumber	-	(5)	C	110
TOCOPY	Flag for copy to subset	logical			
DATAENTRP	Data entry person	-	(3)	C	
DATACHCKP	Data checking person	-	(3)	C	
DATAENTRD	Date of last data entry/check	date	(8)	C	
DATACHCK	Data checked	Y/N	(1)	C	111

Total of 77 fields with an entire width of 309.

All data are entered in files 'brsf' and 'ptsf', after final checking and evalidation they are transferred to master files **'brsf_a'** ... **'brsf_z'** and **'ptsftot'** respectively.

Sorting index can be set on sitenumber ['sitenum'] through: 'use brsf_? index brsf_?' and 'use ptsftot index ptsftot' respectively.

RECORDED HORIZON DATA
(Pit Descriptions)

File '**pthztot**'
('**HZ**' - Files)

Content: All 'horizon' data of pit descriptions, i.e. all subsurface (horizon) data which were gathered in the field by the soil surveyors.

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Sitenumber	-	(5)	C	101
HORIZ	Number of horizon	no.	1	C	
DEP_FROM	Upper boundary of horizon	cm	123	C	
DEP_TO	Lower boundary of horizon	cm	123	F	
HOR_TYP	Type	code	12	F	31
DIV	Diagnostic type	no.	1	F	32
BDY_1	Clarity of boundary	code	1	F	33
BDY_2	Shape of boundary	code	1	F	34
COLDRY_HUE	Dry colour (hue)	code	1.1	F	30
COLDRY_VAL	Dry colour (value)	no.	1.1	F	
COLDRY_CHR	Dry colour (chroma)	no.	1.1	F	
COLWET_HUE	Wet colour (hue)	code	1.1	F	30
COLWET_VAL	Wet colour (value)	no.	1.1	F	
COLWET_CHR	Wet colour (chroma)	no.	1.1	F	
TEXT_1	Horizon texture: 1 part	code	1	F	35
TEXT_2	Horizon texture: 2.part	code	1	F	36
TEXT_3	Horizon texture: 3.part	code	1	F	37
TEXT_4	Horizon texture: 4.part	code	1	F	37
TEXT_USDA	Particle size class (USDA)	code	12	F	38
TEXTURE	Texture	letters	(5)	C	
MOTL_PRC	Percentage of mottles	code	1	F	39
MOTL_SIZ	Mottles size	code	1	F	40
MOTL_CONT	Mottle contrast	code	1	F	41
MOTL_COL	Mottles colour	-	(9)	F	42
CRS_PRC	Percentage of coarse material	%	12	F	
CRS_SIZ	Coarse material size	code	1	F	43
CRS_SHAP	Coarse material shape	code	1	F	44
CRS_TYP	Coarse material type	code	1	F	45
HCL	Reaction	code	1	F	46
CONC_PRC	Percentage of concentrations	%	12	F	
CONC_SIZ	Concentrations size	code	1	F	47
CONC_HARD	Concentrations hardness	code	1	F	48
CONC_TYP	Concentrations type	code	1	F	49
CONS_DSM	Consistence when dry	code	1	F	50
CONS_MVM	Consistence when moist	code	1	F	51
CONS_STK	Consistence stickiness	code	1	F	52
CONS_PLST	Consistence plasticity	code	1	F	53
STRC1_DEV	Structure grade (1.type)	code	1	F	54

STRC1_SIZ	Size of structure (1.type)	code	1	F	55
STRC1_TYP	Type of structure (1.type)	code	12	F	56
STRC2_DEV	Structure grade (2.type)	code	1	F	54
STRC2_SIZ	Size of structure (2.type)	code	1	F	55
STRC2_TYP	Type of structure (2.type)	code	12	F	56
COAT_DEV	Coating abundance	code	1	F	57
COAT_SIZ	Coating thickness	code	1	F	58
COAT_TYP	Coating type	code	12	F	59
COAT_MAT	Coated material	code	1	F	60
VOID_NO	Voids abundance	code	1	F	61
VOID_SIZ	Voids size	code	1	F	62
VOID_TYP	Voids type	code	1	F	63
CRCK_NO	Crack abundance	code	1	F	64
CRCK_SIZ	Cracks size	code	1	F	65
CRCK_TYP	Cracks type	code	1	F	66
ROOT_NO	Root abundance	code	1	F	67
ROOT_SIZ	Root size	code	1	F	68
ROOT_TYP	Root type	code	1	F	69
DIAGNOST	Diagnostic description	code	12	F	29
SAMPLD	Soil sample taken	code	1	F	70
STORE_NO	Number of store room	no.	1		
SITENUM2	Sitenumber	-	(5)	C	110
TOCOPY	Flag for copy to subset	logical			
DATAENTRP	Data entry person	-	(3)	C	
DATACHCKP	Data checking person	-	(3)	C	
DATAENTRD	Date of last data entry/check	date	(8)	C	
DATACHCK	Data checked	Y/N	(1)	C	111

Total of 65 fields with an entire width of 122.

All data are entered in file 'pthz', after final checking and evalidation they are transferred to master file '**pthztot**'.

Sorting index can be set on sitenumber + horizon number ['sitenum + STR(horiz,2)'] through: 'use pthztot index pthztot'.

RECORDED HORIZON DATA
(Bore Descriptions)

Files '**brhz_a**'... '**brhz_z**'
('**HZ**' - Files)

Content: All 'horizon' data of bore descriptions, i.e. all subsurface (horizon) data which were gathered in the field by the soil surveyors.

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Sitenumber	-	(5)	C	101
HORIZ	Number of horizon	no.	1	C	
DEP_FROM	Upper boundary of horizon	cm	123	C	
DEP_TO	Lower boundary of horizon	cm	123	F	
HOR_TYP	Type	code	12	F	41
COLDRY_HUE	Dry colour (hue)	code	1.1	F	39
COLDRY_VAL	Dry colour (value)	no.	1.1	F	
COLDRY_CHR	Dry colour (chroma)	no.	1.1	F	
COLWET_HUE	Wet colour (hue)	code	1.1	F	39
COLWET_VAL	Wet colour (value)	no.	1.1	F	
COLWET_CHR	Wet colour (chroma)	no.	1.1	F	
TEXT_1	Horizon texture: 1 part	code	1	F	59
TEXT_2	Horizon texture: 2.part	code	1	F	60
TEXT_3	Horizon texture: 3.part	code	1	F	61
TEXT_4	Horizon texture: 4.part	code	1	F	61
TEXT_USDA	Particle size class (USDA)	code	12	F	43
TEXTURE	Texture	letters	(5)	C	
MOTL_PRC	Percentage of mottles	code	12	F	
MOTL_SIZ	Mottles size	code	1	F	45
MOTL_CONT	Mottle contrast	code	1	F	46
MOTL_COL	Mottles colour	-	(9)	F	47
CRS_PRC	Percentage of coarse material	%	12	F	
CRS_SIZ	Coarse material size	code	1	F	49
CRS_SHAP	Coarse material shape	code	1	F	50
CRS_TYP	Coarse material type	code	1	F	51
HCL	Reaction	code	1	F	52
CONC_PRC	Percentage of concentrations	%	12	F	
CONC_SIZ	Concentrations size	code	1	F	54
CONC_HARD	Concentrations hardness	code	1	F	55
CONC_TYP	Concentrations type	code	1	F	56
SITENUM2	Sitenumber	-	(5)	C	110
TOCOPY	Flag for copy to subset	logical			
DATAENTRP	Data entry person	-	(3)	C	
DATACHCKP	Data checking person	-	(3)	C	
DATAENTRD	Date of last data entry/check	date	(8)	C	
DATACHCK	Data checked	Y/N	(1)	C	111

Total of 36 fields with an entire width of 90.

All data are entered in file 'brhz', after final checking and evalidation they are transferred to master files **'brhz_a'** ... **'brhz_d'** respectively.

Sorting index can be set on sitenumber + horizon number ['sitenum + STR(horiz,2)'] through 'use brhz_? index brhz_?'.

GIS - COMPILED DATA
(Pit and Bore Descriptions)

Files '**brcm_a**'...'**brcm_z**' and '**ptcmtot**'
('**CM**' - Files)

Content: Data being transferred from GIS based on the location of pits/bores (coordinates) through program module 'gis_impc', or being compiled by internal calculation through program module 'mnt_impc'.

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Sitenumber	-	(5)	C	
ALT_GIS	Altitude unit	map unit	12	c	71
SHEET_250	Toposheet 1:250,000	name	(9)	C	112
SHEET_100	Toposheet 1:100,000	no.	1234	C	112
SHEET_50	Toposheet 1:50,000	no.	(3)	C	112
SHEET_25	Toposheet 1:25,000	letters	(2)	C	112
TEXT_1	Horizon texture: 1 part	code	1	F	59
TEXT_2	Horizon texture: 2.part	code	1	F	60
TEXT_3	Horizon texture: 3.part	code	1	F	61
TEXT_4	Horizon texture: 4.part	code	1	F	61
TEXTURE	Texture	letters	(5)	C	
TEMP_ANN	Mean annual air temperature	degr	12.1	C	113
TEMP_JAN	Mean January air temperature	degr	12.1	C	113
TEMP_FEB	Mean February air temperature	degr	12.1	C	113
TEMP_MAR	Mean March air temperature	degr	12.1	C	113
TEMP_APR	Mean April air temperature	degr	12.1	C	113
TEMP_MAY	Mean May air temperature	degr	12.1	C	113
TEMP_JUN	Mean June air temperature	degr	12.1	C	113
TEMP_JUL	Mean July air temperature	degr	12.1	C	113
TEMP_AUG	Mean August air temperature	degr	12.1	C	113
TEMP_SEP	Mean September air temperature	degr	12.1	C	113
TEMP_OCT	Mean October air temperature	degr	12.1	C	113
TEMP_NOV	Mean November air temperature	degr	12.1	C	113
TEMP_DEC	Mean December air temperature	degr	12.1	C	113
TEMPSOIL	Mean annual soil temperature (50 cm)	degr	12.1	C	113
TEMP_USDA	Soil temperature class acc.to USDA	code	1	C	
AWHC_TOP	Avail.water holding capac.of topsoil	mm	123	C	114
AWHC_SUB	Avail.water holding capac.of subsoil	mm	123	C	114
MOISTPER	Longest consecutive moist period	days	123	c	115
DRYPER	Longest consecutive dry period	days	123	c	115
GOV_GIS	Governorate <gov3tot>	map unit	123	GIS	72
VILL_GIS	Village <villtot>	map unit	1234	GIS	
ADM_MOA	Administrative Unit: MoA	code	12345678	GIS	73
GEOL_GIS	Geological Unit <gel1tot>	map unit	123	GIS	74
GEOL_GNRL	General Geological Unit	map unit	12	GIS	75
REG_GIS	Region Unit <reg2tot>	map unit	123	GIS	76
SAMP_GIS	Sample Area Unit <smpatot>	map unit	123	GIS	

SOIL1_GIS	Soil Mapping Unit Number <soi2tot>	map unit	123	GIS	
SNAME1_GIS	Soil Mapping Unit Name <soi2tot>	-	(3)	GIS	
SOIL2_GIS	Soil Mapping Unit Level II <soi3tot>	map unit	123	GIS	
SNAME2_GIS	Soil Mapping Unit Name II <soi3tot>	-	(3)	GIS	
SOIL3_GIS	Soil Mapping Unit Level III <soi4tot>	map unit	123	GIS	
SNAME3_GIS	Soil Mapping Unit Name III <soi4tot>	-	(3)	GIS	
LST1_GIS	Land System Unit (1.level) <soi1tot>	map unit	123	GIS	
LST2_GIS	Land System Unit (2.level) <soi1tot>	map unit	123	GIS	
LST3_GIS	Land System Unit (3.level) <soi1tot>	map unit	123	GIS	
CLOUD_GIS	Cloud cover unit	map unit	12	GIS	78
HUMID_GIS	Relative air humidity unit	map unit	12	GIS	79
WIND_GIS	Wind speed unit	map unit	12	GIS	80
NEARGAUG	Nearest raingauge	-	(5)	GIS	
NEARPIT	Nearest pit	-	(5)	GIS	
PR2LEVEL	Project Level II area	code	1	GIS	81
EXSSTUD	Areas of existing surveys	code	1	GIS	82
ARID_GIS	Soil moisture regime <aridtot>	map unit	1	GIS	83
PRC_GIS	Precipitation zone <prc2tot>	map unit	123	GIS	
TMP	Temporary variables	no.	123	GIS	115
SITENUM2	Sitenumber	-	(5)	C	110
TOCOPY	Flag for copy to subset	logical			
DATAENTRD	Date of last data entry/check	date	(8)	C	

List can be extended in future:

Additional fields can be added with following procedure:

1) Add field to **all (!) CM** files (PTCMTOT and all BRCM_?. data files in \dbase\natsoild\
2) Correct GEN_CODE file: Add record(s) with name of new field)
3) Reindex both Clipper and dBase enviroment

If relational link is established between GIS and DBMS and maps are to be imported from GIS:

4) Update GEN_M2CM file: Add record (see Section D 4.4 of this Volume)
5) Create new CMD files in \spans521\jordan\

Total of 59 fields with an entire width of 204.

All data can be assigned automatically to files '**brcm_a**', '**brcm_d**' ... and '**ptcmtot**' respectively.

Index can be set on sitenumber ['sitenum'] through 'use brcm_? index brcm_?' and 'use ptcmtot index ptcmtot' respectively.

PIT/BORE ENTRY SETS

Files 'ptsf', 'pthz', 'brsf', 'brhz'

Content: All data of pit/bore descriptions, i.e. all data which were gathered in the field by the soil surveyors. They are entered in an intermediate step on entry computers, then 'appended' to the master data (DBMS) through program module 'dat_impe'.

Entry file	identical file structure as:
ptsf	ptsftot
pthz	pthztot
brsf	brsf_?
brhz	brhz_?

(where ? stands for initial of surveyor)

ANALYTICAL DATA

File 'analtot'

Content: All analytical (chemical and physical) data, as analysed in the laboratory

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Sitenumber	-	(5)	C	101
HORIZ	Number of horizon	no.	12	C	
ANAL1OR2	Number of analyses (1. or 2.)	no.	1	C	
DEP_FROM	Upper boundary of horizon	cm	123	C	
DEP_TO	Lower boundary of horizon	cm	123	F	
LABNUMBER	Lab number	no.	12345	L	
SANDCOARSE	Coarse sand	%	12.1	L	
SANDMED	Medium sand	%	12.1	L	
SANDFINE	Fine sand	%	12.1	L	
SANDVFINE	Very fine sand	%	12.1	L	
SAND	Sand	%	12.1	C	
SILT	Silt	%	12.1	L	
CLAY	Clay	%	12.1	L	
CLAYFINE	Fine clay	%	12.1	L	
TEXTURE	Texture	letters	(5)	C	
GRAVEL	Gravel	%	12.1	L	
BULKDENS	Bulk density	g/cc	12.12	L	
POROS	Porosity	%	123	L	
PERMEAB	Permeability		12.1	L	
MOIST_01	Moisture at 10 kPa		123	L	
MOIST_033	Moisture at 33 kPa		12.1	L	
MOIST_150	Moisture at 1500 kPa		12.1	L	
PH_PASTE	pH (paste)	pH	12.12	L	
PH_1_5	pH (1:5)	pH	12.12	L	
CA_EXTR	Ca (extractable)	meq/100g	12.12	L	
MG_EXTR	Mg (extractable)	meq/100g	12.12	L	
NA_EXTR	Na (extractable)	meq/100g	123.12	L	
K_EXTR	K (extractable)	meq/100g	12.12	L	
EXTR_METHD	Extraction method	code	1		81
CEC	CEC	meq/100g	12.12	L	
CEC_METHOD	CEC method	code	1	L	82
EC	ECe	mS/cm	123.12	L	
SATURAT	Saturation	%	12.12	L	
ESP	ESP	meq/100g	123.12	L	
ESP_CALC	ESP as calculated	meq/100g	12345.12	c	
CARB	Carbonate	%	12.12	L	
GYPSUM	Gypsum	%	12.123	L	
GYPSUMREQU	Gypsum requirement	t/ha	12.1	L	
CA_SOL	Ca (soluble)	meq/l	1234.12	L	
MG_SOL	Mg (soluble)	meq/l	123.12	L	
NA_SOL	Na (soluble)	meq/l	1234.12	L	

K_SOL	K (soluble)	meq/l	123.12	L	
CL_SOL	Cl (soluble)	meq/l	1234.12	L	
SO4_SOL	SO4 (soluble)	meq/l	123.12	L	
CO3_SOL	CO3 (soluble)	meq/l	123.12	L	
HCO3_SOL	HCO3 (soluble)	meq/l	12.12	L	
NO3_SOL	NO3 (soluble)	ppm	1234.12	L	
SAR	SAR		123.1	L	
SAR_CALC	SAR as calculated		1234.1	C	
K_AVAIL	K (avail)		1234.1	L	
P_TOT	P (total)	ppm	1234.12	L	
P_AVAIL	P (available)	ppm	12.12	L	
N_TOT	N (total)	%	12.123	L	
C_N	C/N		12.12	L	
OM	Organic matter	%	12.123	L	
CU	Cu	ppm	12.1	L	
ZN	Zn	ppm	12.1	L	
FE	Fe	ppm	12.1	L	
MN	Mn	ppm	1234	L	
BOR	B	ppm	123	L	
WATERTABLE	Groundwater table	cm	123	F	
PH_GROUNDW	Groundwater pH	pH	12.12	L	
EC_GROUNDW	Groundwater EC	mS/cm	123.1	L	
CA_GROUNDW	Groundwater Ca	meq/l	123.1	L	
MG_GROUNDW	Groundwater Mg	meq/l	123.1	L	
NA_GROUNDW	Groundwater Na	meq/l	123.1	L	
K_GROUNDW	Groundwater K	meq/l	12.1	L	
SITENUM2	Sitenumber	-	(5)	C	110
DATAENTRP	Data entry person	-	(3)	C	
DATACHCKP	Data checking person	-	(3)	C	
DATAENTRD	Date of last data entry/check	date	(8)	C	
DATACHCK	Data checked	Y/N	(1)	C	111
REQANAL_1	Request for analysis no.1	code	(2)		117
REQANAL_2	Request for analysis no.2	code	(3)		117
REQANAL_3	Request for analysis no.3	code	(12)		117
REQANAL_4	Request for analysis no.4	code	(2)		117
REQANAL_5	Request for analysis no.5	code	(2)		117
REQANAL_6	Request for analysis no.6	code	(1)		117
REQANAL_7	Request for analysis no.7	code	(4)		117

Total of 79 fields with an entire width of 362.

Sorting index can be set on sitenumber + no.of analysis + horizon number ['sitenum + STR(anal1or2,1) + STR(horiz,2)'] through 'use analtot index analtot'.

PHYSICAL DATA

File '**phystot**'

Content: All soil-physical data, as recorded in the field

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Sitenumber	-	(5)	C	101
DEP_FROM	Upper boundary of horizon	cm	123	C	
DEP_TO	Lower boundary of horizon	cm	123	F	
ANAL1OR2	Number of analysis (always: 1)	no.	1		
BD	Bulk density	g/cm3	1.12		
INFIL_REP1	Infiltration rate (1.replicate)		12.1	F	
INFIL_REP2	Infiltration rate (2.replicate)		12.1	F	
INFIL_REP3	Infiltration rate (3.replicate)		12.1	F	
INFIL_AVG	Infiltration rate (mean)		12.1	F	
K_HC_REP1	Hydrological conductivity (1.replicate)	k	12.1	F	
K_HC_REP2	Hydrological conductivity (2.replicate)	k	12.1	F	
K_HC_REP3	Hydrological conductivity (3.replicate)	k	12.1	F	
K_HC_AVG	Hydrological conductivity (mean)	k	12.1	F	
PHILIP_A	Philip factor A	-	12.1	F	
PHILIP_B	Philip factor B	-	12.1	F	
INF_IN_R1	Infiltration initial rate (1.replicate)	-	12.1	F	
INF_IN_R2	Infiltration initial rate (2.replicate)	-	12.1	F	
INF_IN_R3	Infiltration initial rate (3.replicate)	-	12.1	F	
INF_IN_AVG	Infiltration initial rate (mean)	-	12.1	F	
INF_CUM_R1	Infiltration cumulative rate (1.replicate)	-	12.1	F	
INF_CUM_R2	Infiltration cumulative rate (2.replicate)	-	12.1	F	
INF_CUM_R3	Infiltration cumulative rate (3.replicate)	-	12.1	F	
INF_CUM_AV	Infiltration cumulative rate (mean)	-	12.1	F	
SITENUM2	Sitenumber	-	(5)	C	110
DATAENTRP	Data entry person	-	(3)	C	
DATACHCKP	Data checking person	-	(3)	C	
DATAENTRD	Date of last data entry/check	date	(8)	C	
DATACHCK	Data checked	Y/N	(1)	C	111
REQANAL_1	Request for analysis no.1	code	(2)		117
REQANAL_2	Request for analysis no.2	code	(3)		117
REQANAL_3	Request for analysis no.3	code	(12)		117
REQANAL_4	Request for analysis no.4	code	(2)		117
REQANAL_5	Request for analysis no.5	code	(2)		117
REQANAL_6	Request for analysis no.6	code	(1)		117
REQANAL_7	Request for analysis no.7	code	(4)		117

Total of 28 fields with an entire width of 109.

Sorting index can be set on sitenumber + no.of analysis ['sitenum + STR(anal1or2,1)'] through 'use phystot index phystot'.

GENERAL DATA SET: **SURVEYORS**

File '**gen_auth**'

Content: Characteristics of all soil surveyors, working or having worked for collection of soil data entered in the DBMS. (Initial 'x' stands for any other surveyors, e.g. short term or project-external surveyors).

Name ('field')	Description	Unit	Width	Source	Expl
AUTH_NO	Consecutive number	no.	12		
AUTH_NAME	First name of surveyor	-	(10)		
AUTH_SURN	Surname of surveyor	-	(10)		
AUTH_ABBR	Abbreviation letter of surveyor	-	(1)		
PIT_FROM	First pit number	no.	123		
PIT_TO	Last pit number	no.	123		
BORE_FROM	First bore number	no.	1234		
BORE_TO	Last bore number	no.	1234		

E.g.

1	Austin	Hutcheon	A	1	999	1	9999
14	Ian	Baillie	B	1	999	1	9999
10	Rob	Davison	D	1	999	1	9999
15	Ahmed	Ekuor	E	1	999	1	9999
9	Will	Gibson	G	1	999	1	9999
8	Hani	Hamoud	H	1	999	1	9999
17	Majed	Bsoul	J	1	999	1	9999
18	Eiad	Khafaja	K	1	999	1	9999
16	Sameeh	Alnuaimat	L	1	999	1	9999
5	Mahmoud	Hassan	M	1	999	1	9999
2	Neil	Munro	N	1	999	1	9999
12	Bakr	Al-Qudah	Q	1	999	1	9999
6	Amjad	Rihani	R	1	999	1	9999
3	Suleiman	Sawalha	S	1	999	1	9999
7	Alan	Stapleton	T	1	999	1	9999
19	Ali	Abuhammour	U	1	999	1	9999
4	Wail	Rushdan	W	1	999	1	9999
13	<others>		X	1	999	1	9999
11	Wail	Sartawi	Y	1	999	1	9999

Total of 8 fields with an entire width of 38.

Sorting index can be set on author's initals ['auth_abbr'] through 'use gen_auth index gen_auth'.

This file can be modified via: National Soil Database - Entry of Data - Data Maintenance, or directly in dBase IV in \dbase\natsoild\.

GENERAL DATA SET: **FIELD CODES**

File '**gen_code**'

(Important key file !)

Content: Key reference for explanation (decoding) of all fields in files 'ptsftot', 'brsf_a'...'brsf_z', 'pthztot', 'pthz_a'...'pthz_z', 'ptcmtot', 'brcm_a'...'brcm_z', 'ptsf', 'brsf', 'pthz', 'brhz', 'chemtot', and 'gen_crop'.

Name ('field')	Description	Unit	Width	Source	Expl
FILE_NO	File type	code	1		
FIELD_NO	Consecutive number of field	no.	12		
FIELD_NAME	Name of field	-	(10)		
CODE_MAX	Max.number of codes	no.	123		
DECIM_NUMB	Number of decimals of numerics	no.	1		
CODE_NO	Consecutive number of code	no.	123		
CODE_NAME	Name of code	-	(28)		
CODE_ABBR	Abbreviation of code	-	(6)		

E.g.

1	1	SITENUM	-2	0	0	-	-
1	2	COORDS_E	-1	5	0	-	-
1	3	COORDS_N	-1	5	0	-	-
1	4	SYSTC	4	0	0	-	-
1	4	-	0	0	1	JTM	-
1	4	-	0	0	2	UTM(36)	-
1	4	-	0	0	3	UTM(37)	-
1	4	-	0	0	4	Pal.Grid	-
1	26	PART_SC_1	14	0	0	-	-
1	26	-	0	0	1	Very fine	V
1	26	-	0	0	2	Fine	F
1	26	-	0	0	3	Fine-loamy	H
1	26	-	0	0	14	Loamy	Mh

Total of 8 fields with an entire width of 55.

Sorting index can be set ['STR(file_no,1) + STR(field_no,3) + STR(code_no,3)'] through 'use gen_code index gen_code'

Presently 1371 records

Explanation:

FILE_NO:

1	ptsftot & brsf_?
2	pthztot
3	brhz_?
4	ptcmtot & brcm_?
5	analtot
6	phystot
7	gen_crop

FIELD_NAME must be identical to field names of dbf files
(see pages 1-9 of this paper)

CODE_MAX:

-3	date
-2	string (label)
-1	number
0	-
> 0	number of units (coded)

GENERAL DATA SET: **SOIL COLOUR NAMES**

File '**gen_col**'

Content: Full wording of colour, according to Munsell Soil Colour Chart.

Name ('field')	Description	Unit	Width	Source	Expl
HUE	Hue	code	1		
VALUE	Value	no.	1		
CHROMA	Chroma	no.	1		
COLOR_WORD	Name of colour	-	(25)		

E.g.

3	2	2	very dusky red
3	2	3	very dusky red

Total of 4 fields with an entire width of 29.

Sorting index can be set ['STR(hue,1) + STR(value,1) + STR(chroma,1)'] through 'use gen_col index gen_col'.

Presently 810 records (colours)

GENERAL DATA SET: **CROP CHARACTERISTICS / REQUIREMENTS**

File **'gen_crop'**

Content: Ecological requirements of crops, with rating for various suitability classes (S1: 80-100 % of maximum obtainable yield, S2: 60-80 %, S3: 40-60 %, S4: 20-40 %, N: 0-20 %). They should be as specific as possible for the ecological environment of Jordan.

Name ('field')	Description	Unit	Width	Source	Expl
CROP	Crop name	-	(13)		
INPUT	Input level	code	1		
TEM_MIN_S1	Minimum temperature for S1 suitability	degrees	12.1		
TEM_MIN_S2	Minimum temperature for S2 suitability	degrees	12.1		
TEM_MIN_S3	Minimum temperature for S3 suitability	degrees	12.1		
TEM_MIN_S4	Minimum temperature for S4 suitability	degrees	12.1		
TEM_MAX_S1	Maximum temperature for S1 suitability	degrees	12.1		
TEM_MAX_S2	Maximum temperature for S2 suitability	degrees	12.1		
TEM_MAX_S3	Maximum temperature for S3 suitability	degrees	12.1		
TEM_MAX_S4	Maximum temperature for S4 suitability	degrees	12.1		
LGP_MIN_S1	LGP minimum for S1 suitability	days	123		
LGP_MIN_S2	LGP minimum for S2 suitability	days	123		
LGP_MIN_S3	LGP minimum for S3 suitability	days	123		
LGP_MIN_S4	LGP minimum for S4 suitability	days	123		
LGP_MAX_S1	LGP maximum for S1 suitability	days	123		
LGP_MAX_S2	LGP maximum for S2 suitability	days	123		
LGP_MAX_S3	LGP maximum for S3 suitability	days	123		
LGP_MAX_S4	LGP maximum for S4 suitability	days	123		
LGP_MINREG	Temperature correlation for minimum LGP assessment	days/100m	123		
LGP_MAXREG	Temperature correlation for maximum LGP assessment	days/100m	123		
ROOT_MOIST	Rooting depth for moisture uptake	cm	123		
KC_TOT	Transpiration factor (kc) for total growth cycle	kc	12.12		
KC_INIT	Transpiration factor (kc) for initial growth cycle	kc	12.12		
KC_DEV	Transpiration factor (kc) for developing growth cycle	kc	12.12		
KC_MID	Transpiration factor (kc) for mid growth cycle	kc	12.12		
KC_LATE	Transpiration factor (kc) for late growth cycle	kc	12.12		
KC_HARV	Transpiration factor (kc) for harvest period	kc	12.12		
KY	ky	ky	12.12		
EXTR_MOIST	Moisture extraction ability	code	123		
AWHC_MOIST	Ability to take up avail.moisture	mm	123		
PERENNIAL	Perennial or seasonal crop	code	1		

GENERAL DATA SET: **LAND SYSTEMS / FACETS**

File '**gen_face**'

Content: Short descriptions of regions, land systems, and facets, as defined on soil-physiographic map ('soiltot', previously called 'land system map', done by Mr.N.Munro).

Name ('field')	Description	Unit	Width	Source	Expl
REGION	Region	no.	12		
LANDSYST	Landsystem	no.	12		
FACET	Facet number	no.	12		
DESCRIPT	Description	-	(70)		
SYST_NAME	Name of Landsystem	-	(50)		
ABBREV	Abbreviation (N.Munro)	-	(3)		
MAPUNIT	Soil mapping unit (R.Law)	-	(3)		

E.g.

1	0	0	Jordan Valley		
1	1	0	Alluvial plain of Jordan river	ZOR	ZOR
1	1	1	Gently undulating cover plain	KAT	KLM

Total of 7 fields with an entire width of 133.

Sorting index can be set on land systems + facets ['STR(region,2) + STR(landsyst,2) + STR(facet,2)'] through 'use gen_face index gen_face'.

Presently 1556 records (land regions + land systems + facets)

GENERAL DATA SET: **LAND SYSTEMS / FACETS**

File **'gen_face'**

Content: Short descriptions of regions, land systems, and facets, as defined on soil-physiographic map ('soiltot', previously called 'land system map', done by Mr.N.Munro).

Name ('field')	Description	Unit	Width	Source	Expl
REGION	Region	no.	12		
LANDSYST	Landsystem	no.	12		
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SYST_NAME	Name of Landsystem	-	(50)		
ABBREV	Abbreviation (N.Munro)	-	(3)		
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E.g.

1	0	0	Jordan Valley		
1	1	0	Alluvial plain of Jordan river	ZOR	ZOR
1	1	1	Gently undulating cover plain	KAT	KLM

Total of 7 fields with an entire width of 133.

Sorting index can be set on land systems + facets ['STR(region,2) + STR(landsyst,2) + STR(facet,2)'] through 'use gen_face index gen_face'.

Presently 1556 records (land regions + land systems + facets)

GENERAL DATA SET: **RAINGAUGES**

File '**gen_gaug**'

Content: Names and characteristics of rainfall stations (raingauges) with data available in the DBMS.

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Short name of raingauge	-	(5)		
GCORDS_E	Easting in geographical coordinates	degr	12.12345		
GCORDS_N	Northing in geographical coordinates	degr	12.12345		
GAUG_CODE	Water Authority code	-	(5)		
GAUG_NAME	Full name of raingauge	-	(15)		
PET_ZONE	PET zone	no.	123		
WIND_ZONE	Wind speed zone	no.	123		
ALT	Altitude	m	1234		

E.g.

BAQRA	35.61530	32.62890	AD 32	Baqra	0	0	-205
NUEIY	35.91200	32.41830	AD 11	Nueiyima0		0	785

Total of 8 fields with an entire width of 52.

Sorting index can be set on short name of raingauges ['sitenum'] through 'use gen_gaug index gen_gaug'.

Presently 59 records (raingauges)

GENERAL DATA SET: **RAINGAUGES**

File '**gen_gaug**'

Content: Names and characteristics of rainfall stations (raingauges) with data available in the DBMS.

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Short name of raingauge	-	(5)		
GCORDS_E	Easting in geographical coordinates	degr	12.12345		
GCORDS_N	Northing in geographical coordinates	degr	12.12345		
GAUG_CODE	Water Authority code	-	(5)		
GAUG_NAME	Full name of raingauge	-	(15)		
PET_ZONE	PET zone	no.	123		
WIND_ZONE	Wind speed zone	no.	123		
ALT	Altitude	m	1234		

E.g.

BAQRA	35.61530	32.62890	AD 32	Baqra	0	0	-205
NUEIY	35.91200	32.41830	AD 11	Nueiyima0		0	785

Total of 8 fields with an entire width of 52.

Sorting index can be set on short name of raingauges ['sitenum'] through 'use gen_gaug index gen_gaug'.

Presently 59 records (raingauges)

GENERAL DATA SET: **HELP**

File '**gen_help**'

Content: Provides help screens and explanation during execution of programs

Name ('field')	Description	Unit	Width	Source	Expl
PROGRAM_NO	Number of calling program (mprogram)	code	1234		
PROCED_NO	Number of calling procedure (mproced)	code	1234		
LINE_NO	Line number (for sequence)	number	123		
HELP_TXT	Help text	-	(60)		

Total of 4 fields with an entire width of 72.

Sorting index can be set on program no. + procedure no. + line no. ['STR(program_no,4) + STR(proced_no,4) + STR(line_no,3)'] through 'use gen_help index gen_help'.

Presently 827 records

GENERAL DATA SET: **LAND CHARACTERISTICS**

File **'gen_lch'**

Content: Quantitative or semi-quantitative land characteristics (soil parameters) of every soil series, or soil type.

Name ('field')	Description	Unit	Width	Source	Expl
SERIES	Series	-	(15)		
DRAIN	Numeric	code	1		
MIN_FR_TOP	Mineral fragments in topsoil	%	12		
MIN_FR_SUB	Mineral fragments in subsoil	%	12		
TEXT_1TOP	Texture (1)	code	1		
TEXT_2TOP	Texture (2)	code	1		
TEXT_3TOP	Texture (3)	code	1		
TEXT_4TOP	Texture (4)	code	1		
TEXT_1SUB	Texture (1)	code	1		
TEXT_2SUB	Texture (2)	code	1		
TEXT_3SUB	Texture (3)	code	1		
TEXT_4SUB	Texture (4)	code	1		
DEPTH	Depth	cm	123		
DEPTH_TOP	Topsoild depth	cm	123		
PONDING	Ponding	code	1		
FLOODING	Flooding	code	1		
STONES_SFC	Surface stoniness	%	12		
ROCKS_SFC	Surface rockiness	%	12		
EROSION	Surface erosion	code	1		
EROS_MEASU	Rec.measures to control erosion	code	1		
SLOPE	Mean slope	%	123		
SLOPE_MAX	Mean maximum slope	%	123		
POS_CLASS	Topographic position	code	12		
MICRO_REL	Microrelief	code	12		
SLOPE_SHP	Slope shape	code	1		
SLOPE_LNGT	Slope length	m	123		
GROUNDW	Groundwater depth	cm	123		
PERMEAB	Permeability	code	1		
CONS_DSM	Consistence when dry	code	1		
CONS_MVM	Consistence when wet	code	1		
CONS_STK	Consistence stickiness	code	1		
CONS_PLST	Consistence plasticity	code	1		
STRC_DEV	Structure grade	code	1		
STRC_SIZ	Structure size	code	1		
SEALING	Sealing	code	1		
CRACKS	Cracks (intensity)	code	1		
BULKDENS	Bulkdensity	g/cc	12.1		
OM	Organic matter	%	12.123		
N_TOT_TOP	N (tot) of topsoil	%	12.1234		

N_TOT_SUB	N (tot) of subsoil	%	12.1234
P_AVAIL	P (avail)	ppm	12.12
CA_EXTR	Ca (extractable)	meq/100g	12.12
MG_EXTR	Mg (extractable)	meq/100g	12.12
K_EXTR	K (extractable)	meq/100g	12.12
NA_EXTR	Na (extractable)	meq/100g	123.12
PH_TOP	pH of topsoil	pH	12.12
PH_SUB	pH of subsoil	pH	12.12
CEC_TOP	CEC of topsoil	meq/100g	12.12
SATURAT_TP	Saturation of topsoil	%	12
SATURAT_SB	Saturation of subsoil	%	12
EC_TOP	ECe of topsoil	mS/cm	12.12
EC_SUB	ECe of subsoil	mS/cm	12.12
ERODIBIL	Erodibility		1.12

E.g.

MADABA 1 4 ...
MADABA 2 2 ....

Total of 53 fields with an entire width of 152.

Sorting index can be set on series ['series'] through 'use gen_lch index gen_lch'.

GENERAL DATA SET: **LAND CHARACTERISTICS**

File '**gen_lch**'

Content: Quantitative or semi-quantitative land characteristics (soil parameters) of every soil series, or soil type.

Name ('field')	Description	Unit	Width	Source	Expl
SERIES	Series	-	(15)		
DRAIN	Numeric	code	1		
MIN_FR_TOP	Mineral fragments in topsoil	%	12		
MIN_FR_SUB	Mineral fragments in subsoil	%	12		
TEXT_1TOP	Texture (1)	code	1		
TEXT_2TOP	Texture (2)	code	1		
TEXT_3TOP	Texture (3)	code	1		
TEXT_4TOP	Texture (4)	code	1		
TEXT_1SUB	Texture (1)	code	1		
TEXT_2SUB	Texture (2)	code	1		
TEXT_3SUB	Texture (3)	code	1		
TEXT_4SUB	Texture (4)	code	1		
DEPTH	Depth	cm	123		
DEPTH_TOP	Topsoild depth	cm	123		
PONDING	Ponding	code	1		
FLOODING	Flooding	code	1		
STONES_SFC	Surface stoniness	%	12		
ROCKS_SFC	Surface rockiness	%	12		
EROSION	Surface erosion	code	1		
EROS_MEASU	Rec.measures to control erosion	code	1		
SLOPE	Mean slope	%	123		
SLOPE_MAX	Mean maximum slope	%	123		
POS_CLASS	Topographic position	code	12		
MICRO_REL	Microrelief	code	12		
SLOPE_SHP	Slope shape	code	1		
SLOPE_LNGT	Slope length	m	123		
GROUNDW	Groundwater depth	cm	123		
PERMEAB	Permeability	code	1		
CONS_DSM	Consistence when dry	code	1		
CONS_MVM	Consistence when wet	code	1		
CONS_STK	Consistence stickiness	code	1		
CONS_PLST	Consistence plasticity	code	1		
STRC_DEV	Structure grade	code	1		
STRC_SIZ	Structure size	code	1		
SEALING	Sealing	code	1		
CRACKS	Cracks (intensity)	code	1		
BULKDENS	Bulkdensity	g/cc	12.1		
OM	Organic matter	%	12.123		
N_TOT_TOP	N (tot) of topsoil	%	12.1234		

N_TOT_SUB	N (tot) of subsoil	%	12.1234
P_AVAIL	P (avail)	ppm	12.12
CA_EXTR	Ca (extractable)	meq/100g	12.12
MG_EXTR	Mg (extractable)	meq/100g	12.12
K_EXTR	K (extractable)	meq/100g	12.12
NA_EXTR	Na (extractable)	meq/100g	123.12
PH_TOP	pH of topsoil	pH	12.12
PH_SUB	pH of subsoil	pH	12.12
CEC_TOP	CEC of topsoil	meq/100g	12.12
SATURAT_TP	Saturation of topsoil	%	12
SATURAT_SB	Saturation of subsoil	%	12
EC_TOP	ECe of topsoil	mS/cm	12.12
EC_SUB	ECe of subsoil	mS/cm	12.12
ERODIBIL	Erodibility		1.12

E.g.

MADABA 1 4 ...
MADABA 2 2 ....

Total of 53 fields with an entire width of 152.

Sorting index can be set on series ['series'] through 'use gen_lch index gen_lch'.

GENERAL DATA SET: **MAP to DBMS TRANSFER**

File **'gen_m2cm'**

(Important key file !)

Content: Definition of transfer operations from SPANS maps to database CM files. ('m2cm' stands for 'map to CM file'), individually defined for each map. Accessed through operation 'Import of GIS data' (module 'gis_impc').

Name ('field')	Description	Unit	Width	Source	Expl
NUMBER	Sequential number	no.	123		
OPERAT	Operation	moperat value	1234		
SPANS_MAP	SPANS map (source)	name	(35)		
TARGF_1	Target field 1 in CM file	field name	(10)		
TARGF_2	Target field 2 in CM file	field name	(10)		
TARGF_3	Target field 3 in CM file	field name	(10)		
CHECK_POS	Check for position (to make use of 'original' data set)	number	1		
ORIGF_1	'Original' field 1 in SF file	field name	(10)		
ORIGF_2	'Original' field 2 in SF file	field name	(10)		
ORIGF_3	'Original' field 3 in SF file	field name	(10)		
S_GIS_LETT	Code letter for transfer (in SPANS CMD file)	letter	(1)		
FORMULA	Option to use formula (0 or 1 or 2)	no.	1		
GENXTAB	Option to use cross tabulation file	no.	1		
GENSMAP	Option to use soil map number decode	no.	12		
FORMUL_1	Formula for target field 1	formula	(20)		
FORM_X_1A	Exceptional mapping unit number of formula 1 (will receive value of FORM_X_1B)	no.	123		
FORM_X_1B	Assignment of exception of mapping unit FORM_X_1A for formula 1	no.	123		
FORM_X_1C	Additional exceptional mapping unit number of formula 1 (will receive value of FORM_X_1D)	no.	123		
FORM_X_1D	Assignment of exception of mapping unit FORM_X_1C for formula 1	no.	123		
FORMUL_2	Formula for target field 2	formula	(20)		
FORM_X_2A	Exceptional mapping unit number of formula 2 (will receive value of FORM_X_2B)	no.	123		
FORM_X_2B	Assignment of exception of mapping unit FORM_X_2A for formula 2	no.	123		
FORM_X_2C	Additional exceptional mapping unit number of formula 2 (will receive value of FORM_X_2D)	no.	123		
FORM_X_2D	Assignment of exception of mapping unit				

	FORM_X_2C for formula 2	no.	123456789
HEADING_L	Heading line	name	(60)

For further explanation, see Section D 4.4 of this Volume.

Total of 25 fields with an entire width of 233.

Sorting index can be set on sequential numbers ['number'] through 'use gen_m2cm index gen_m2cm'.

Presently 19 records

ATTENTION: Numbers have to be sequential, without gaps, without double occurrences. Number 0 can be given, in order to let a record (map) not appear on screen and not accessible.

Example for direct DBMS - GIS relation:

4 1825 Regions <reg3tot> REG_GIS 1 REGION O 0 0 0 0 0 0 0 0 0 0 0 0 Regions <reg3tot> áá> REG_GIS

Example for 'formula' DBMS - GIS relation:

1 1821 Altitude <altxtot> ALT_GIS 1 ALT C 1 0 0 (mvalue_1*100)-450 23 0 0 0 0 0 0 0 Altitude <altxtot> áá> ALT_GIS

Example for 'genxtab' DBMS - GIS relation:

5 1828 Land system/Physiography <soi1tot> LST1_GIS LST2_GIS LST3_GIS 1 REGION LANDSYST D 0 3 0 0 0 0 0 0 0 0 0 Land systems/Physiography <soi1tot> áá> LST1_GIS/..2../..3..

Example for 'gensmap' DBMS - GIS relation:

6 1827 Soil Map (Level I) <soi2tot> SOIL1_GIS SNAME1_GIS 0 H 0 0 1 0 0 0 0 0 0 0 0 Soil Map (Level I) <soi2tot> áá> SOIL1_GIS/SNAME1_GIS

GENERAL DATA SET: **MAP to DBMS TRANSFER**

File '**gen_m2cm**'

(Important key file !)

Content: Definition of transfer operations from SPANS maps to database CM files. ('m2cm' stands for 'map to CM file'), individually defined for each map. Accessed through operation 'Import of GIS data' (module 'gis_impc').

Name ('field')	Description	Unit	Width	Source	Expl
NUMBER	Sequential number	no.	123		
OPERAT	Operation	moperat value	1234		
SPANS_MAP	SPANS map (source)	name	(35)		
TARGF_1	Target field 1 in CM file	field name	(10)		
TARGF_2	Target field 2 in CM file	field name	(10)		
TARGF_3	Target field 3 in CM file	field name	(10)		
CHECK_POS	Check for position (to make use of 'original' data set)	number	1		
ORIGF_1	'Original' field 1 in SF file	field name	(10)		
ORIGF_2	'Original' field 2 in SF file	field name	(10)		
ORIGF_3	'Original' field 3 in SF file	field name	(10)		
S_GIS_LETT	Code letter for transfer (in SPANS CMD file)	letter	(1)		
FORMULA	Option to use formula (0 or 1 or 2)	no.	1		
GENXTAB	Option to use cross tabulation file	no.	1		
GENSMAP	Option to use soil map number decode	no.	12		
FORMUL_1	Formula for target field 1	formula	(20)		
FORM_X_1A	Exceptional mapping unit number of formula 1 (will receive value of FORM_X_1B)	no.	123		
FORM_X_1B	Assignment of exception of mapping unit FORM_X_1A for formula 1	no.	123		
FORM_X_1C	Additional exceptional mapping unit number of formula 1 (will receive value of FORM_X_1D)	no.	123		
FORM_X_1D	Assignment of exception of mapping unit FORM_X_1C for formula 1	no.	123		
FORMUL_2	Formula for target field 2	formula	(20)		
FORM_X_2A	Exceptional mapping unit number of formula 2 (will receive value of FORM_X_2B)	no.	123		
FORM_X_2B	Assignment of exception of mapping unit FORM_X_2A for formula 2	no.	123		
FORM_X_2C	Additional exceptional mapping unit number of formula 2 (will receive value of FORM_X_2D)	no.	123		
FORM_X_2D	Assignment of exception of mapping unit				

	FORM_X_2C for formula 2	no.	123456789
HEADING_L	Heading line	name	(60)

For further explanation, see Section D 4.4 of this Volume.

Total of 25 fields with an entire width of 233.

Sorting index can be set on sequential numbers ['number'] through 'use gen_m2cm index gen_m2cm'.

Presently 19 records

ATTENTION: Numbers have to be sequential, without gaps, without double occurrences. Number 0 can be given, in order to let a record (map) not appear on screen and not accessible.

Example for direct DBMS - GIS relation:

4 1825 Regions <reg3tot> REG_GIS 1 REGION O 0 0 0 0 0 0 0 0 0 0 0 0 Regions <reg3tot> áá> REG_GIS

Example for 'formula' DBMS - GIS relation:

1 1821 Altitude <altxtot> ALT_GIS 1 ALT C 1 0 0 (mvalue_1*100)-450 23 0 0 0 0 0 0 0 Altitude <altxtot> áá> ALT_GIS

Example for 'genxtab' DBMS - GIS relation:

5 1828 Land system/Physiography <soi1tot> LST1_GIS LST2_GIS LST3_GIS 1 REGION LANDSYST D 0 3 0 0 0 0 0 0 0 0 0 Land systems/Physiography <soi1tot> áá> LST1_GIS/..2../..3..

Example for 'gensmap' DBMS - GIS relation:

6 1827 Soil Map (Level I) <soi2tot> SOIL1_GIS SNAME1_GIS 0 H 0 0 1 0 0 0 0 0 0 0 Soil Map (Level I) <soi2tot> áá> SOIL1_GIS/SNAME1_GIS

GENERAL DATA SET: **PET**

File '**gen_pet**'

Content: Monthly evapotranspiration of every PET zone

Name ('field')	Description	Unit	Width	Source	Expl
PET_ZONE	PET zone	no.	123		
PET_JAN	PET of January (mm/day)	mm/day	12.1		
PET_FEB	PET of February (mm/day)	mm/day	12.1		
PET_MAR	PET of March (mm/day)	mm/day	12.1		
PET_APR	PET of April (mm/day)	mm/day	12.1		
PET_MAY	PET of May (mm/day)	mm/day	12.1		
PET_JUN	PET of June (mm/day)	mm/day	12.1		
PET_JUL	PET of July (mm/day)	mm/day	12.1		
PET_AUG	PET of August (mm/day)	mm/day	12.1		
PET_SEP	PET of September (mm/day)	mm/day	12.1		
PET_OCT	PET of October (mm/day)	mm/day	12.1		
PET_NOV	PET of November (mm/day)	mm/day	12.1		
PET_DEC	PET of December (mm/day)	mm/day	12.1		

E.g.

```
1  1.6  2.1  3.0  4.3 ................'
2
```

Total of 13 fields with an entire width of 52.

No sorting index will be set.

Process of these data is not complete yet.

GENERAL DATA SET: **PRINTER DRIVER**

File '**gen_prnt**'

Content: ASCII codes of line drawings. Essential for all outprints.

Name ('field')	Description	Unit	Width	Source	Expl
VARIAB	Line symbol	name	(9)		
CHR_DEFLT	ASCII number for default printer	no.	123		
CHR_UDEF	ASCII number for any user defined printer (presently set up for Epson GX 80)	no.	123		

E.g.
crosline 197 128'
dbblline 182 131'

Total of 3 fields with an entire width of 16.

Sorting index can be set on line symbol names ['variab'] through 'use gen_prnt index gen_prnt'.

19 records.

Following line fonts are defined:

NAME:	SYMBOL:	ASCII code (default):
vertline	│	179
horzline	─	196
crosline	┼	197
doubline	═	205
t__line	┬	194
dobvline	║	186
dblbline	╚	200
dbt_line	╧	207
dbttline	╩	202
dbrbline	╝	188
dbltline	╔	201
dbs_line	╤	209
dbssline	╦	203
dbrtline	╗	187
dborline	├	195
dbolline	┤	180
dbbrline	╟	199
dbbxline	╫	215
dbblline	╢	182

Remark: This file is essential for any outprint !

GENERAL DATA SET: SCREEN DRIVER

File **'gen_scrn'**

Content: Color definitions for screen display (color string for SETCOLOR() colour set). Essential file for any DBMS access.

Name ('field')	Description	Unit	Width	Source	Expl
VARIAB	Colour string variable	name	(11)		
SCR_COL	Color string for colour display	name	(25)		
SCR_BLCK	Color string for monochrome display in black	name	(25)		
SCR_WHT	Color string for monochrome display in white	name	(25)		

E.g.
'color_orig W+/B,N/W,N/N,N/N,W+/B W/N,N/W,N/N,N/N,W/N,
N/W,W/N,W/W,W/W,N/W'

Total of 4 fields with an entire width of 87.

Sorting index can be set on colour string variable ['variab'] through 'use gen_scrn index gen_scrn'.

13 records.

Remark: This file is essential for any program execution !

GENERAL DATA SET: **SOIL MAPPING UNIT COMPOSITION**

File '**gen_smap**'

Content: Cross reference of soil mapping units to soil names, region and landsystem units and to soil series associations.

Name ('field')	Description	Unit	Width	Source	Expl
LEVEL	Level of Soil Map (I or II or III or ...)	no.	12		
MAPUNIT	Name of Soil Mapping Unit	-	(6)		
NUMBER	Number of Soil Mapping Unit	no.	123		
NAME	Local name	-	(20)		
REGION	Region	no.	12		
LANDSYST	Landsystem	no.	12		
SER_1	Name of series no.1	-	(10)		
SER_1_PRC	Proportion of series no.1 in map unit	%	123		
SER_2	Name of series no.2	-	(10)		
SER_2_PRC	Proportion of series no.2 in map unit	%	12		
SER_3	Name of series no.3	-	(10)		
SER_3_PRC	Proportion of series no.3 in map unit	%	12		

E.g.

1	ABU152	Abu Hafna	1	9	MAD 1 50	MAD 12 50
1	ABY73	Abyad	11	9	HAD 1 70	DERW 1130

Total of 12 fields with an entire width of 73.

Sorting index can be set on soil mapping unit and soil map number (level) ['LEFT(mapunit+SPACE(6),6) + STR(level,2)'] through 'use gen_smap index gen_smap'.

Presently 244 records.

GENERAL DATA SET: **TAXONOMY CLASSIFICATIONS**

File '**gen_taxo**'

Content: Full wording of all USDA taxonomic units down to subgroups, as defined in USDA Soil Taxonomy 4.edition 1990 (white cover), and nearest equivalent to ACSAD and FAO taxonomy.

Name ('field')	Description	Unit	Width	Source	Expl
USDA_CODE	USDA 1990 code (order-subgroup)	-	(4)		
USDA_NAME	USDA 1990 name (order-subgroup)	-	(40)		
USDA_COD92	Equivalent USDA 1992 code	-	(4)		
ACSAD_CODE	ACSAD code	-	(6)		
FAO_CODE	FAO code of nearest equivalent (order-unit)	-	(4)		
FAO_NAME	FAO name of nearest equivalent (order-unit)	-	(30)		

E.g.

A	Histosol	A	H	HS	Histosol
FBFD	Lithic Camborthid	LMOO	RHH	LPy	Yermic Leptosol

Total of 6 fields with an entire width of 89.

Sorting index can be set on USDA code ['usda_code'] through 'use gen_taxo index gen_taxo'.

Presently 2752 records (order + suborders + groups + subgroups)

GENERAL DATA SET: **VILLAGES**

File '**gen_vill**'

Content: Characteristics and location of villages, as published by Royal Jordanian Geographic Centre.

Name ('field')	Description	Unit	Width	Source	Expl
VILLAGE	Name of village	-	(30)		
CODE	Internal adm code	code	1234		
DEVEL_UNIT	Development unit (MoA)	code	12		
STAT_UNIT	Statistical unit (Stat.Dep.)	code	12		
ALT	Altitude of village	m	1234		
POP_1988	Population (1988 census)	no.	1234567		
COORDS_E	Palestine grid easting	m	123456		
COORDS_N	Palestine grid northing	m	1234567		
SYSTC	Coordinate system	code	1		
GCORDS_E	Longitude	degr	12.12345		
GCORDS_N	Latitude	degr	12.12345		

E.g.
'Amman 1000 1 1 853 650345 234065 1130456 35.7854 31.9543'

Total of 11 fields with an entire width of 80.

Sorting index can be set on village names ['village'] through 'use gen_vill index gen_vill'.

Presently 1150 records (villages).

GENERAL DATA SET: **CROSS TABULATION REFERENCES**

File '**gen_xtab**'

Content: Cross reference for complex maps, referring from mapping unit number (sequential) to actual number, which can be interpreted in file 'gen_code'.

Name ('field')	Description	Unit	Width	Source	Expl
FIELD_NO	No. of field	no.	12		
FIELD_NAME	Name of field	-	(10)		
TARG_FIELD	No. of target field	-	(10)		
CODE_MAX	Maximum no. of codes	no.	123		
CODE_NO	No. of code	no.	123		
UNIT_1		no.	123		
UNIT_2		no.	123		
UNIT_3		no.	123		

E.g.

1	GEOL_GIS	GEOL_GNRL	66	0	0	0	0
1			0	1	1	0	0
1			0	2	2	0	0
3	LST1_GIS		421	0			
3				1	1	1	0
3				2	1	2	0
3			72	9	2	0	
3			73	9	3	0	

Total of 8 fields with an entire width of 38.

Sorting index can be set on field and code numbers ['STR(field_no,3) + STR(code_no,3)'] through 'use gen_xtab index gen_xtab'.

Explanation:

FIELD_NO:

1	geol_gis (geology)
2	lst1_old
3	lst1_gis
4	soil_gis
5	soilII_gis

Presently 751 records

PRECIPITATION DATABASE

File '**rainfram**'

Content: File 'rainfram.dbf' serves as an empty (no-data) dBase file with the entire structure syntax of precipitation database. All precipitation datafiles have this structure. By declaration of a new precipitation unit, a new 'dbf' file with file name 'PRCnnnn' (where nnnn stands for the raingauge's short name) and the identical file structure using file 'rainfram' will be created.

Each hydrological year consists of one field, each day (starting with 1 October) consists of one record.

At the end, records are added to enable / to speed up total calculations. See table below.

Name ('field')	Description	Unit	Width	Source	Expl
CONSECDAY	Consecutive day	no.	123		
MONTH	Month	no.	12		
DAY	Day of month	no.	12		
Y1950_51	Daily precipitation	mm	1234.1		
Y1951_52	Daily precipitation	mm	1234.1		
Y1952_53	Daily precipitation	mm	1234.1		
Y1953_54	Daily precipitation	mm	1234.1		
Y1954_55	Daily precipitation	mm	1234.1		
Y1955_56	Daily precipitation	mm	1234.1		
Y1956_57	Daily precipitation	mm	1234.1		
Y1957_58	Daily precipitation	mm	1234.1		
Y1958_59	Daily precipitation	mm	1234.1		
Y1959_60	Daily precipitation	mm	1234.1		
Y1960_61	Daily precipitation	mm	1234.1		
Y1961_62	Daily precipitation	mm	1234.1		
Y1962_63	Daily precipitation	mm	1234.1		
Y1963_64	Daily precipitation	mm	1234.1		
Y1964_65	Daily precipitation	mm	1234.1		
Y1965_66	Daily precipitation	mm	1234.1		
Y1966_67	Daily precipitation	mm	1234.1		
Y1967_68	Daily precipitation	mm	1234.1		
Y1968_69	Daily precipitation	mm	1234.1		
Y1969_70	Daily precipitation	mm	1234.1		
Y1970_71	Daily precipitation	mm	1234.1		
Y1971_72	Daily precipitation	mm	1234.1		
Y1972_73	Daily precipitation	mm	1234.1		
Y1973_74	Daily precipitation	mm	1234.1		
Y1974_75	Daily precipitation	mm	1234.1		
Y1975_76	Daily precipitation	mm	1234.1		
Y1976_77	Daily precipitation	mm	1234.1		
Y1977_78	Daily precipitation	mm	1234.1		
Y1978_79	Daily precipitation	mm	1234.1		
Y1979_80	Daily precipitation	mm	1234.1		

Y1980_81	Daily precipitation	mm	1234.1
Y1981_82	Daily precipitation	mm	1234.1
Y1982_83	Daily precipitation	mm	1234.1
Y1983_84	Daily precipitation	mm	1234.1
Y1984_85	Daily precipitation	mm	1234.1
Y1985_86	Daily precipitation	mm	1234.1
Y1986_87	Daily precipitation	mm	1234.1
Y1987_88	Daily precipitation	mm	1234.1
Y1988_89	Daily precipitation	mm	1234.1
Y1989_90	Daily precipitation	mm	1234.1
Y1990_91	Daily precipitation	mm	1234.1
Y1991_92	Daily precipitation	mm	1234.1
Y1992_93	Daily precipitation	mm	1234.1
Y1993_94	Daily precipitation	mm	1234.1
Y1994_95	Daily precipitation	mm	1234.1
Y1995_96	Daily precipitation	mm	1234.1
Y1996_97	Daily precipitation	mm	1234.1
Y1997_98	Daily precipitation	mm	1234.1
Y1998_99	Daily precipitation	mm	1234.1
Y1999_00	Daily precipitation	mm	1234.1
Y2000_01	Daily precipitation	mm	1234.1

Total of 54 fields with an entire width of 314.

Record no.	Month	Day	Values	Data
346	9	11	0.0	Daily data of 11 September
347	9	12	0.0	Daily data of 12 September
348	9	13	0.0	Daily data of 13 September
349	9	14	0.0	Daily data of 14 September
350	9	15	0.0	Daily data of 15 September
351	9	16	0.0	Daily data of 16 September
352	9	17	0.0	Daily data of 17 September
353	9	18	0.0	Daily data of 18 September
354	9	19	0.0	Daily data of 19 September
355	9	20	0.0	Daily data of 20 September
356	9	21	0.0	Daily data of 21 September
357	9	22	0.0	Daily data of 22 September
358	9	23	0.0	Daily data of 23 September
359	9	24	0.0	Daily data of 24 September
360	9	25	0.0	Daily data of 25 September
361	9	26	0.0	Daily data of 26 September
362	9	27	0.0	Daily data of 27 September
363	9	28	0.0	Daily data of 28 September
364	9	29	0.0	Daily data of 29 September
365	9	30	0.0	Daily data of 30 September
366	10	0	0.0	Total of October (if no daily data available)

367	11	0	0.0	Total of November	(if no daily data available)
368	12	0	0.0	Total of December	(if no daily data available)
369	1	0	0.0	Total of January	(if no daily data available)
370	2	0	0.0	Total of February	(if no daily data available)
371	3	0	0.0	Total of March	(if no daily data available)
372	4	0	0.0	Total of April	(if no daily data available)
373	5	0	0.0	Total of May	(if no daily data available)
374	6	0	0.0	Total of June	(if no daily data available)
375	7	0	0.0	Total of July	(if no daily data available)
376	8	0	0.0	Total of August	(if no daily data available)
377	9	0	0.0	Total of September	(if no daily data available)
378	99	0	0.0	Total of Year	(if no daily or monthly data available)
379	10	99	0.0	Total of October	(sum of days, if available; otherwise value of month)
380	11	99	0.0	Total of November	(sum of days, if available; otherwise value of month)
381	12	99	0.0	Total of December	(sum of days, if available; otherwise value of month)
382	1	99	0.0	Total of January	(sum of days, if available; otherwise value of month)
383	2	99	0.0	Total of February	(sum of days, if available; otherwise value of month)
384	3	99	0.0	Total of March	(sum of days, if available; otherwise value of month)
385	4	99	0.0	Total of April	(sum of days, if available; otherwise value of month)
386	5	99	0.0	Total of May	(sum of days, if available; otherwise value of month)
387	6	99	0.0	Total of June	(sum of days, if available; otherwise value of month)
388	7	99	0.0	Total of July	(sum of days, if available; otherwise value of month)
389	8	99	0.0	Total of August	(sum of days, if available; otherwise value of month)
390	9	99	0.0	Total of September	(sum of days, if available; otherwise value of month)
391	99	99	0.0	Total of Year	(sum of months, if available; otherwise value of year)

No sorting index.

391 records.

TEMPORARY FILE FOR SERIES/PHASES TRANSFER

Files '**pt_tmp**' and '**br_tmp**'

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Sitenumber	-	(5)		
SERIES	Series	-	(15)		
PHASE	Phase	-	(12)		

Total of 3 fields with an entire width of 33.

All data can be transferred from the master files to these temporary files.

No sorting index will be set.

This file is created automatically, if not available (in module 'ser_expc').

****

TEMPORARY FILE FOR GIS FILE UPDATE

File '**bpcmintm**'

Name ('field')	Description	Unit	Width	Source	Expl
SITENUM	Sitenumber	-	(5)		
SITENUM2	Sitenumber	-	(5)		
DATAENTRD	Date of data entry	-	(18)		

Total of 3 fields with an entire width of 19.

All data can be transferred from the master files to this temporary file.

No sorting index will be set.

This file is created automatically, if not available (in module 'gis_impc').

****

TEMPORARY FILE FOR GIS POINT DATA TRANSFER

File '**bpgisint**'

Name ('field')	Description	Unit	Width	Source	Expl
GCCORDS	SPANS coded coordinates	-	(8)		
GCORDS_E	Easting in geographical coords.	degr	12.12345		
GCORDS_N	Northing in geographical coords.	degr	12.12345		
SITENUM	Sitenumber	-	(5)		
INTERM_1	Interim value/spaces	no.	123		
INTERM_2	Interim value/spaces	no.	1234		
INTERM_3	Interim value/spaces	no.	1234		
SITESTRING	Transferred information	-	(10)		
VALUE	Interim value/spaces	no.	123456789		

E.g.
' 3e8dfb 35.39526 29.70165 ' PA004 ' 0 0 0 - 'PA004' 1 '

Total of 9 fields with an entire width of 63.

All data can be transferred from the master files to this temporary file.

Sorting index will be set automatically. This file is created automatically, if not available (in module 'gis_impc').

Purpose of this file is to assign values to point data (e.g. mapping units, such as geological unit, to all pits and bores), and import this information to the soil database.

****

TEMPORARY FILE FOR GIS RASTER DATA TRANSFER

File '**bpcl5tot**'

Name ('field')	Description	Unit	Width	Source	Expl
SOI2TOT	Soil mapping unit	no.	123		
ALTXTOT	Altitude mapping unit	no.	123		
PRC1TOT	Precipitation mapping unit	no.	123		
OUTXTOT	Outline of Jordan	no.	123		

(List will be extended)

E.g.
123 12 4 1

No sorting index will be set. This file is created automatically, if not available, through program 'SP5_CL_2' (?)

Purpose of this file is to import a raster set of map data to dBase environment, where they can be processed (with access to soil, prec etc. data). Files are then reexported to SPANS and compiled for map presentation.

DESCRIPTION CODES

1) Applied projection: ('systc')

1 JTM
2 UTM (36)
3 UTM (37)
4 Palestine Grid

2) Survey level: ('survlevel')

1 Phase I of the Project
2 Phase II of the Project
3 Phase III of the Project
4 other; outside Project

3) Type of observation: ('typenum')

1 Check
2 Bore
3 Chisel
4 Pit
5 Section

4) Author (surveyor): ('author')

1 Austin Hutcheon
2 Neil Munro
3 Suleiman Sawalha
4 Wail Rushdan
5 Mahmoud Hassan
6 Amjad Rihani
7 Alan Stapleton
8 Hani Hamoud
9 Will Gibson
10 Rob Davison
11 Wail Sartawi
12 Bakr Al-Qudah
13 <any other>
14 Ian Baillie
15 Ahmed Ekuor
16 Sameeh Alnuaimat
17 Majed Bsoul
18 Eiad Khafaja
19 Ali Abuhamoour

List can easily be updated through option Maintenance - Add surveyor (reference to file GEN_AUTH)

5) Topographic position: ('posit')

Wording, no coding, e.g. 'mid slope'
At entry, following abbreviations are accepted:
mid: middle
slp: slope
low: lower
rec: recent
up: upper

6) Position class ('pos_class')

1 Summit/top/crest
2 Upper slope
3 Slope/middle slope/sand sheet
4 Lower slope/toeslope/fan/pediment
5 Plain/plateau/terrace
6 Valley bottom/Qa/depression/basin/wadi

7) Location: ('location')

Reference to villages, roads etc.
Wording, no coding,
e.g. '2.5 km S of Disi Farm'
At entry, following abbreviations are accepted:
rd: road
p.p: police post
rw: railway
jb: jebel
sa: sample area
mah: mahattat

8) Family particle size class: ('part_sc_1') ('part_sc_2')

1	V	Very fine
2	F	Fine / Clayey (7 PSC)
3	H	Fine-loamy
4	Hz	Fine-silty
5	M	Coarse-loamy
6	Mz	Coarse-silty
7	L	Sandy
8	Qv	Clayey-skeletal
9	Qmh	Loamy-skeletal
10	Ql	Sandy-skeletal
11	Q	Fragmental
12		Pumiceous
13		Cindery
14	Mh	Loamy (7 PSC group)

9) Mineralogy classes: ('mineral')

1	C	Carbonatic
2	Y	Gypsic
3	X	Mixed
4	XC	Mixed-calcareous
5	S	Siliceous
6	M	Montmorillonitic

10) Rock type: ('rock_1') ('rock_2')

1	LST	Limestone
2	CHT	Chert
3	MRL	Marl
4	CHK	Chalk
5	SST	Sandstone
6	BAS	Basalt
7	GRN	Granite
8	ARK	Arkose
9	SHL	Shale
10	EVA	Evaporites
11	PPH	Phosphates
12	LST(f	Freshwater-LSt
13	DIO	Diorite
14	SCH	Schist
15	POR	Porphyrit

11) Geological texture: ('geol_text')

1	vf	Very fine
2	f	Fine
3	med	Medium
4	co	Coarse
5	vc	Very coarse

12) Geological class: ('geol_clas')

1	Ign-bas	Igneous Basic/Ultrabasic
2	Ign-int	Igneous Intermediate
3	Ign-ac	Igneous Acid
4	Sed-det	Sedimentary Detritus
5	Sed-chm	Sedimentary Chem/Org.Mat
6	Sed-pyr	Sedimentary Pyroclastic
7	Met-unf	Metamorphic Unfoliated
8	Met-fol	Metamorphic Foliated
9	Unc-all	Unconsolidated Alluvial
10	Unc-col	Unconsolidated Colluvial
11	Unc-aeol	Unconsolidated Aeolian

13) Texture of parent material: ('pm_text')

1	V	Clayey
2	H	Fine-loamy
3	Hz	Fine-silty
4	M	Coarse-loamy
5	Mz	Coarse-silty
6	L	Sandy
7	Grav	Gravelly
8	Ston	Stony
9	Bold	Bouldery

14) Class of parent material: ('pm_class')

1	Alluv	Alluvium
2	Collv	Colluvium
3	Aoeoln	Aeolian
4	Anthr	Anthropic
5	Bdr-frsh	Bedrock - fresh
6	Bdr-wth	Bedrock - weathered
7	Evap	Evaporites
8	Sednt	Sedentary
9	Marin	Marine
10	Calcrete	Calcrete
11	Mix	Mix
12	Alluv/Bedr	Alluvium/Bedrock
13	Aeol/Coll	Aeolian/Colluvium
14	Aeol/Alluv	Aeolian/Alluvium
15	Aeol/Bedr	Aeolian/Bedrock
16	Aeol/Calcrete	Aeolian/Calcrete
17	Alluv/Calcrete	Alluvium/Calcrete
18	Coll/Bedrock	Colluvium/Bedrock

15) Slope aspect: ('aspect')

Degrees off North,
Abbreviations such as S,SW,SES etc. are accepted and converted to degrees

16) Shape of slope: ('shape')

1	Cvx	Convex
2	Ccv	Concave
3	Rec	Rectilinear
4	Cnc	Convexoconcave
5	Irr	Irregular
6	Cmp	Composite

17) Erosion class: ('eros_clas')

1	O	Nil
2	Sli	Slight
3	Mod	Moderate
4	Sev	Severe

18) Erosion type: ('eros_type')

1 Sheet
2 Rill
3 Gully
4 Wind
5 Undifferentiated

19) Microrelief class: ('micro_clas')

1 Even (< 25 cm)
2 Slightly uneven (25- 50 cm)
3 Moderately uneven (50-100 cm)
4 Very uneven (100-200 cm)
5 Extremely uneven (> 200 cm)

20) Microrelief type: ('micro_type)

1 Sand
2 Undulating
3 Gullies
4 Rills
5 Mounds
6 Terraces
7 Benches
8 other
9 Stones, boulders

21) Run off: ('runoff')

1	O	None
2	Slow	Slow
3	Med	Medium
4	Rap	Rapid
5	V.Rap	Very rapid

22) Drainage: ('drain')

1 Very poor
2 Poor
3 Imperfect
4 Moderately well
5 Well
6 Somewhat excessive
7 Excessive

23) Surface cover type: ('sf_cov_typ')

1 Nil
2 Rock
3 Boulders
4 Stones
5 Gravel
6 Grit
7 Pan
8 Pavement
9 Crust
10 Other

24) Surface feature type: ('sf_fet_typ')

1 Litter
2 Salts
3 NaCl
4 $CaSO_4$
5 $MgSO_4$
6 Polygons
7 Vesiculs
8 Aeolian Sand
9 Cracks
10 Capping
11 Mulching
12 Patina
13 Other

25) Wetness of surface: ('sf_cnd_wet)

1 Dry
2 Moist
3 Wet

26) Hardness of surface: ('sf_cnd_hd')

1 Loose
2 Soft
3 Slightly hard
4 Moderately hard
5 Hard
6 Very hard
7 Extremely hard

27) Land use: ('luse_cov1') ('luse_cov2')

1	100	1	RAINFED CROPPING
2	101	1.1	Cereals
3	102	1.2	Other field crops
4	103	1.3	Mixed cropping
5	104	1.4	Tree crops, orchards
6	105	1.5	Mixed tree/annual crops
7	106	1.6	Horticultural crops
8	107	1.7	Forage
9	108	1.8	Fallow
10	109	1.9	Tilled
11	200	2	IRRIGATED CROPPING
12	201	2.1	Cereals, irrigated
13	202	2.2	Other field crops, irrigated
14	203	2.3	Mixed cropping, irrigated
15	204	2.4	Tree crops, irrigated
16	205	2.5	Mixed tree/annuals, irrig.
17	206	2.6	Horticultural crops, irr.
18	207	2.7	Forage, irrigated
19	208	2.8	Fallow, irrigated
20	209	2.9	Tilled, irrigated
21	210	2.10	Greenhouse
22	300	3	LIVESTOCK & FORESTRY
23	301	3.1	Improved grazing (grass), pasture
24	302	3.2	Impr.browse + grazing (shrub/grass)
25	303	3.3	Natural grazing (grass)

26	304	3.4	Nat.browse + grazing (shrub/grass)
27	305	3.5	Planted forest
28	306	3.6	Natural forest, woodland
29	307	3.7	Forest + grazing
30	400	4	NON-AGRICULTURAL LAND USE
31	401	4.1	Industrial, mining
32	402	4.2	Urban
33	403	4.3	Recreational
34	404	4.4	Unvegetated (bare ground)
35	405	4.5	Water bodies

28) Limiting feature: ('lim_f1') ('lim_f2')

1	l	Lithic contact
2	p	Paralithic contact
3	g	Petrogypsic layer
4	c	Petrocalcic layer
5	q	Gravel, and:
	s	Stones
6	b	Boulders
7	x	Compaction
8	-	Undifferentiated

29) Diagnostic feature: ('diagf1') ('diagf2') ('diagnost')

1	Vt	Vertic
2	Cb	Cambic
3	Sa	Salic
4	Ca	Calcic
5	Gyy	Gypsic
6	Pc	Petrocalcic
7	Pg	Petrogypsic
8	Ar	Argillic
9	M	Mollic Epipedon
10	Oc	Ochric Epipedon
11	Ag	Agric Epipedon
12		Candic
13		Natric
14		Lithic

30) Hue of dominant colour: ('col_hue') ('coldry_hue) ('colwet_hue)

1	5 R
2	7.5 R
3	10 R
4	2.5 YR
4.5	4 YR
5	5 YR
5.5	6 YR
6	7.5 YR
6.5	8 YR
7	10 YR
8	2.5 Y
9	5 Y

31) Type of horizon: ('hor_typ')

1	A
2	Ap
3	Ae
4	AC or AC_1
5	AC_2
6	AC_3
7	AB or AB_1
8	AB_2
9	B
10	Bk or Bk_1
11	Bk_2
12	Bw or Bw_1
13	Bw_2
14	Bw_3
15	Bt or Bt_1
16	Bt_2
17	Btk
18	C or R
19	Cv_1 or C_1
20	Cv_2 or C_2
21	Cv_3 or C_3
22	C_{1y}
23	C_{2y}
24	C_{3y}
25	Ck
26	Bky
27	By
28	BC
29	B_{Ca} or B_{Ca1} or B_{Ca2}

32) **Diagnostic type:** ('div')
= No. of geological layer

33) **Clarity of boundary:** ('bdy_1')

1	0	None	
2	ab	Abrupt	(< 2.5 cm)
3	cl	Clear	(2.5- 7 cm)
4	gr	Gradual	(7 - 12 cm)
5	di	Diffuse	(> 12 cm)
6	nr	Not recorded	

34) **Shape of boundary:** ('bdy_2')

1	0	None
2	s	Smooth
3	w	Wavy
4	ir	Irregular
5	br	Broken
6	nr	Not recorded

35) **Texture: 1.part:** ('text_1')

1	V	Very (35-50%)
2	X	Extremely (50-90%)

36) **Texture: 2.part:** ('text_2')

1	By	Bouldery
2	St	Stony
3	Gr	Gravelly
4	Gt	Gritty

37) **Texture: 3.part and 4.part:**('text_3')
('text_4')

1	cS	Coarse Sand
2	S	Sand
3	fS	Fine Sand
4	vfS	Very Fine Sand
5	Si	Silt
6	L	Loam
7	CL	Clayloam
8	C	Clay

38) **Particle size class (USDA):**('text_usda')

1	V	Very fine
2	F	Fine / clayey
3	H	Fine-loamy
4	Hz	Fine-silty
5	M	Coarse-loamy
6	Mz	Coarse-silty
7	L	Sandy
8	Qv	Clayey-skeletal
9	Qmh	Loamy-skeletal
10	Ql	Sandy-skeletal
11	Q	Fragmental
12		Pumiceous
13		Cindery
14	Mh	Loamy (7 PSC)

39) **Percentage of mottles:** ('motl_prc')

1	0	None
2	f	Few (< 2 %)
3	c	Common (2-20 %)
4	m	Many (> 20 %)

40) **Mottles size:** ('motl_siz')

1	< 5	Small (< 5 mm)
2	5-15	Medium (5-15 mm)
3	> 15	Large (>15 mm)

41) **Mottle contrast:** ('motl_cont')

1	f	Faint
2	d	Distinct
3	p	Prominent

42) **Mottles colour:** ('motl_col')
acc. to Munsell colour notation

43) **Coarse material size:** ('crs_siz')

1	2-5	Fine gravel (< 5 mm)
2	5-20	Gravel (5-20 mm)
3	20-75	Coarse gravel (20-75 mm)
4	75-250	Stones (75-250 mm)
5	>250	Boulders (> 250 mm)

44) Coarse material shape: ('crs_shap')

1	srn	Sub-rounded
2	rnd	Rounded
3	ang	Angular
4	tab	Tabular
5	pl	Platy
6	irr	Irregular

45) Coarse material type: ('crs_typ')

1	Qtz	Quartz
2	Cht	Chert
3	Grn	Granite
4	Sst	Sandstone
5	hdLSt	Hard limestone
6	soLSt	Soft limestone
7	Bas	Basalt
8	oth	Other

46) Reaction to 10 % HCl: ('hcl')

1	nil	No
2	sl	Slight
3	mod	Moderate
4	str	Strong
5	viol	Violent
6	nr	Not recorded

47) Concentrations size: ('conc_siz')

1	< 5	Small (< 5 mm)
2	5-15	Medium (5-15 mm)
3	> 15	Large (> 15 mm)

48) Concentrations hardness: ('conc_hard')

1	so	Soft
2	mod	Moderately hard
3	h	Hard
4	vh	Very hard

49) Concentrations type: ('conc_typ')

1	Ca	Calcareous concretions & second.Ca carbonate films
2	Na	Salt crystals
3	Gyp	Gypsum crystals & amorphous gypsum
4	Mn	Manganese modules
5	Cly	Clay concentrations
6		Calcium + gypsum

50) Consistence when dry: ('cons_dsm')

1	lo	Loose
2	so	Soft
3	sh	Slightly hard
4	mh	Moderately hard
5	h	Hard
6	vh	Very hard
7	xh	Extremely hard
8	nr	Not recorded

51) Consistence when wet: ('cons_mvm')

1	lo	Loose
2	vfr	Very friable
3	fr	Friable
4	fi	Firm
5	vfi	Very firm
6	xfi	Extremely firm
7	cmp	Compact
8	nr	Not recorded

52) Consistence stickiness: ('cons_stk')

1	nst	Non-sticky
2	slst	Slightly sticky
3	mst	Moderately sticky
4	vst	Very sticky
5	nr	Not recorded

53) Consistence plasticity: ('cons_plst')

1	npl	Non-plastic
2	slpl	Slightly plastic
3	mpl	Moderately plastic
4	vpl	Very plastic
5	nr	Not recorded

54) **Structure grade:** ('strc1_dev') ('strc2_dev')

1	vw	Very weak
2	weak	Weak
3	mod	Moderate
4	str	Strong
5	vstr	Very strong

55) **Size of structure:** ('strc1_dev') ('strc2_siz')

1	vf	Very fine
2	fin	Fine
3	med	Medium
4	crs	Coarse
5	vc	Very coarse

56) **Type of structure:** ('strc1_typ') ('strc2_typ')

1	sg	Single grain
2	gr	Granular
3	cr	Crumb
4	sbk	Subangular blocky structure
5	abk	Angular blocky structure
6	pr	Prismatic structure
7	col	Columnar structure
8	pl	Platy structure
9	m	Massive
10	wdg	Wedges

57) **Coating abundance:** ('coat_dev')

1	0	None
2	wk	Weak (patchy)
3	md	Moderate (broken)
4	str	Strong (continous)

58) **Coating thickness:** ('coat_siz')

1	thn	Thin
2	md	Moderately thick
3	thk	Thick

59) **Coating type:** ('coat_typ')

1	Ca	$CaCO_3$
2	Cly	Clay
3	Fe	FeO
4	Mn	MnO_2
5	Si	Si
6	Na	Na
7	Gy	Gypsum
8	OM	Organic matter
9	Slsid	Slickensides
10	Sand	Sand
11	$CaCO_3$ + clay	

60) **Coated material:** ('coat_mat')

1	grav	Gravel
2	peds	Peds
3	pores	Pores

61) **Voids abundance:** ('void_no')

1	0	None
2	f	Few
3	c	Common
4	m	Many

62) **Voids size:** ('void_siz')

1	<.5	Very fine (< .5 mm)
2	.5-2	Fine (.5-2 mm)
3	2-5	Medium (2-5 mm)
4	>5	Large (> 5 mm)

63) **Voids type:** ('void_typ')

1	tub	Tubular pores
2	sphr	Spherical pores
3	irr	Irregular

64) **Crack abundance:** ('crck_no')

1	0	None
2	f	Few
3	c	Common
4	m	Many

65) **Cracks size:** ('crck_siz')

1	<1	Very fine (< 1 mm)
2	1-5	Fine (1-5 mm)
3	5-10	Medium (5-10 mm)
4	>10	Large (> 10 mm)

66) **Cracks type:** ('crck_typ')

1	hor	Horizontal
2	irr	Irregular
3	vert	Vertical

67) **Root abundance:** ('root_no')

1	0	None
2	f	Few
3	c	Common
4	m	Many

68) **Root size:** ('root_siz')

1	<1	Very fine (< 1 mm)
2	1-2	Fine (1-2 mm)
3	2-5	Medium (2-5 mm)
4	>5	Large (> 5 mm)

69) **Root type:** ('root_typ')

1	Fib	Fibrous
2	Wdy	Woody
3	Fib+Wdy	Fibrous + woody

70) **Status of soil sample:** ('sampld')

0	Not taken
1	Taken in the field
2	Registered in store
3	Sent to lab
4	Returned from lab
5	Sent second time to lab
6	Returned from lab (2.time)

71) **Altitude mapping unit:** ('alt_gis')
assigned by computer through GIS

1	-400 - -300 m
2	-300 - -200 m
3	-200 - -100 m
4	-100 - 0 m
5	0 - 100 m
6	100 - 200 m
7	200 - 300 m
8	300 - 400 m
9	400 - 500 m
10	500 - 600 m
11	600 - 700 m
12	700 - 800 m
13	800 - 900 m
14	900 - 1000 m
15	1000 - 1100 m
16	1100 - 1200 m
17	1200 - 1300 m
18	1300 - 1400 m
19	1400 - 1500 m
20	1500 - 1600 m
21	1600 - 1700 m
22	1700 - 1800 m

(list originated from GIS list)

72) **Administrative unit (village):** ('adm_gis')
assigned by computer through GIS

73) **Ministry of Agriculture code of administrative unit:** ('adm-moa')
assigned by computer through GIS

74) **Geological unit:** ('geol_gis')
assigned by computer through GIS

75) **General geological unit (parent material):** ('geol_gnrl')
calculated by computer based on field above

1	Quaternary deposits
2	Qa
3	Basalt (quarternary)
4	Limestone

5 Sandstone
6 Basement (precambrian)
7 Water
8 others

76) **Region:** ('reg_gis')

assigned by computer through GIS
1 Jordan Valley
2 Wadi Arabah
3 Wadi Arabah Escarpment
4 Jordan Valley Escarpment
5 Arabah Hills
6 Rum-Disi
7 S Sandstone Plateau
8 N Highlands
9 Central Highlands
10 S Highlands
11 Highland Plateau
12 Jafr-Basin
13 E Plateau
14 Hafira-Jinz
15 N Lava Flows
16 NE Basalt Plateau
17 NE Plateau
18 N Highlands (High rainfall)
(list originated from GIS list)

77) **Image (Landsat):** ('imag_gis')

assigned by computer through GIS
1 NW
2 Central W
3 SW
4 Central N
5 Central E
6 SE
7 Extreme NE
(list originated from GIS list)

78) **Level 2 areas:** ('pr2level')
assigned by computer through GIS
1 Safawi
2 Madaba - N
3 Madaba - S
4 Tafila
5 Shobak
(list originated from GIS list)

79) **Existing surveys:** ('exsstud')
assigned by computer through GIS

1 Irbid 1 & 2
2 Upper Zarqa
3 Balqa
4 Lower Zarqa
5 Balqa & Lower Zarqa
6 Infill area
7 Unsurveyed
(list originated from GIS list)

80) **Soil moisture regime:** ('arid_gis')
assigned by computer through GIS

1 Aridic
2 Transition aridic - xeric
3 Xeric
4 Transition aridic - ustic
5 Ustic
(list originated from GIS list)

81) **Extraction method:** ('extr_methd)
Variable can be assigned

82) **CEC method:** ('cec_method

1 Method 10 a with prewash
2 Method 10 a without prewash

101) **Sitenumber** ('sitenum')
consists of a 5 character code:
- Bore and checksite:
  One initial of surveyor +
  4 digit number
  e.g. A0001
- Pit:
  P + one initial + 3 digit number
  e.g. PA001

102) **Coordinates** ('coords_e') ('coords_n')
JTM or UTM or Palestine Grid with Easting and Northing in meters

103) **Geographical coordinates:** ('gcords_e') ('gcords_n')
Longitude and latitude (geographical coordinates) in degrees in decimals (e.g. 36.47453)

104) **AP-Scale** ('ap_scale')
in thousands

105) **Field (preliminary) Series names** ('series_1')
consist of a geographical term and a number.

106) **Final Series names** ('series_2')
consist of a geographical term and a number.
They can be assigned either manually or by batch operation in Selected Data option.

107) **USDA taxonomy subgroup** ('usda_grp')
in four letter codes, of 1990 version

108) **Number of observed species** ('luse_cnm1') ('luse_cnm2') ('luse_cnm3')
of the mentioned species

109) **Reference site** ('ref_site')
given for checksites

110) **Second sitenumber** ('sitenum2')
only for internal checking

111) **Data checked in database:** ('datachck')
'Yes' or 'No'

112) **Topo sheet name/number** ('sheet_250') ('sheet_100') ('sheet_50') ('sheet_25')
calculated based on coordinates

113) **Temperature:** ('temp_ann') ('temp_jan...dec')
Mean annual/monthly temperature, calculated based on altitude, latitude, longitude, in degress Centigrade,

Output enables grouping into classes:

1	Mesic	(8-15 C)
2	Thermic	(15-22 C)
3	Hyperthermic	(> 22 C)

114) **Available water holding capacity** ('awhc_top') ('awhc_sub')
calculated by computer

115) **Consecutive dry/moist period:**
('moistper')
('dryper')

Longest period, in days.
At 6 or more out of 10 years,
OR: in most years

117) **Request for analyses:** ('reqanal_...')

Either "X" for total analysis within the analysis number,
or letters for selected analyses.

201) **Management input** ('input' in GEN_CROP)

1 Low
2 Medium
3 High
4 High/irrigated

202) **String/number/code identifier**
('code_max' in GEN_CODE

-3 Date
-2 String (name)
-1 Number
> 0 Codes

****

All information stored in file 'gen_code'

SUMMARY OF dBASE COMMANDS
USED FOR SOIL DATABASE

a) Go to DOS (Disk Operating System) and change to correct subdirectory:

cd \dbase\natsoild

b) Call up dBASE:

dbase

c) Following commands can be entered at the dBASE prompt
(small dot at left bottom of screen):

1 **USE**

Opens an existing database file.

example: use brsf_a
example: use brsf_a index brsf_a

(see Section D 5.1 of this Volume for a complete list of datafiles of JOSCIS)

2 **EDIT**

Displays **one data record** (one pitsite or one boresite or one horizon) for viewing or editing.

example: use brsf_a index brsf_a
seek "M0100"
edit

If the record contains more than 17 fields, PgDn will show the next 17 fields.

You can move around with the direction arrows. Recommend, you use the grey arrow keys between the alpahnumberic and the numeric keypad, not the numeric keypad.

You get out from the edit mode by <ALT> E, then E

Within the database file, various commands can be called up by:
<ALT> first letter of option,

example: <ALT> G, then L: Go to last record

3 **BROWSE**

Displays 17 records from the active database file.

example: use brsf_a index brsf_a
go top
browse

If the database file contains more than the fields being visible, you can scroll to the right with <TAB>, to the right end with <END>, back to the left with <HOME>.

You can move around with the direction arrows. Recommend, you use the grey arrow keys between the alpahnumberic and the numeric keypad, not the numeric keypad.

You get out from the browse mode by <ALT> E, then E

Within the database file, various commands can be called up by:
<ALT> first letter of option,

example: <ALT> G, then L: Go to last record

4 **SEEK**

Searches an indexed database file for the first data record containing the specified key expression. (All files are indexed under the same file name).

example: use brsf_a index brsf_a
seek "M0200"

5 **LOCATE** (*)

Locate searches the active database file for a record that matches a specified condition.

example: use brsf_a
locate for slope > 20

CONTINUE is the command to 'locate' for the next record.

6 **QUIT**

National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

Jordan Soil and Climatic Information System

D B M S
V O L U M E

Data Entry | Data Retrieval | Data Maintenance | Data Dictionary | General Information

BACKUP of DBMS:
DATA and SETTINGS

1) Soil Data:

C:\DBASE\NATSOILD\ *.dbf
***.ntx**
***.ndx**

Backup procedure with CP Backup (PCTools):
Utilities
Backup ... (CP Backup)

If target drive is to be changed: <ALT> T
Option (<ALT> O)
Selection options (S)
Include/exclude files (I)
If files are already listed: Clear list (<ALT> L)
C:\dbase\natsoild*.dbf
C:\dbase\natsoild*.n?x
Ok (<ALT> O)
Start Backup <F5>

Backups should be done at least after each 'append', or more often !
Will fit on 7+ HD disks

2) Retrieval Programs:

C:\DBASE\NATSOILD\ *.exe
index*.*

Backup procedure with CP Backup (PCTools):
Utilities
Backup ... (CP Backup)

If target drive is to be changed: <ALT> T
Option (<ALT> O)
Selection options (S)

Include/exclude files (I)
If files are already listed: Clear list (<ALT> L)
C:\dbase\natsoild*.exe
C:\dbase\natsoild\index*.*
Ok (<ALT> O)
Start Backup <F5>

Should fit on 3 HD disks

3) Precipitation Database:

C:\DBASE\PREC\ *.dbf
***.exe**

Backup procedure with CP Backup (PCTools):
Utilities
Backup ... (CP Backup)

If target drive is to be changed: <ALT> T
Option (<ALT> O)
Selection options (S)
Include/exclude files (I)
If files are already listed: Clear list (<ALT> L)
C:\dbase\prec*.dbf
C:\dbase\prec*.dbf
Ok (<ALT> O)
Start Backup <F5>

Backups should be done after each change
Will fit on 1 or 2 HD disks

HARDWARE:
CONSTRAINTS and MAINTENANCE

1) Constraints:

Following hardware problems can occur, but are of no significant handicap for the operation of JOSCIS or of the Project:

1) Computer: 80486
Problem: After turn on, computer does not boot, screen remains black
Explanation: Interrupt conflict between graphics cards
Action: Press Reset button and hold for a couple of seconds; or turn computer off and wait 10 minutes

2) Computer: 80486
Problem: Tape streamer is not recognized, software comes with error message: Streamer not found, etc.
Explanation: Excessive noise created by components sited near and around the parallel port, interfering at bus level at high transmission speed
Action: CMOS configuration has to be set to cache memory disabled by:
When booting: Press <Del>
Select 'Advanced CMOS Setup'
Move to 'Internal Cache Memory' and disable with PageDown
Move to 'External Cache Memory' and disable with PageDown
<Esc>
Select 'Write to CMOS and Exit'

After work with tape streamer, do not forget to set CMOS settings back to 'Enabled'

3) Computer: 80486
Problem: 'Fastback' does not work
Explanation: Same reason as explained above (problem no.2)
Action: Use other backup software (e.g. CPBackup), or change CMOS settings to cache memory disabled, as for tape streamer problem explained above

4) Computer I (80386)
Problem: Copy from drive A: to drive B:, or v.v., is not possible
Explanation: SCSI interface gives incomplete FDD support
Action: Copy to harddisk, then to floppy

5) Computer: I (80386)
Problem: Formatting or operations which require formatting (e.g. CPBackup including formatting) are not possible on drive B:
Explanation: SCSI interface gives incomplete FDD support
Action: Use other computer

6) Computer: I (80386)
Problem: Tape streamer is not recognized, software comes with error message: Streamer not found, etc.
Explanation: Signal interferences between dongle and tape streamer, noise (see explanation, problem no.2)
Action: Remove dongle, when using tape streamer

7) Computer: I (80386)
Problem: When accessing SPANS, error message 'Math coprocessor ...' appears on monoscreen
Explanation: Math coprocessor is not recognized or not functioning properly, can occur particularly after warm reboot
Action: Turn computer off, wait 3 minutes, and start again ('cold reboot')

8) Computer: VIII (80286)
Problem: CP Backup does not work in high speed mode
Explanation: Transmission problems at bus level at high speed
Action: Configure CP Backup to medium speed by:
Select in CPBackup: Configure - Backup - Medium Speed, and Test it.

2) Daily Maintenance:

Backup of data (recently entered) has to be done DAILY !

3) Bi-weekly Maintenance:

Every 2 weeks, following checking routines have to be performed:

3.a) Norton Disk Doctor:

Utilities
Norton
Disk Doctor
Diagnose Disk
Auto Weekly

3.b) CHKDSK:

DOS
chkdsk /f

3.c) Virus-Checker:

Utilities
Virus-Scanner
Checks
ChkVirus
CheckSign

- and watch for messages

3.d) Virus-Checker:

Utilities
Virus-Scanner
Checks
FindVirus

- and watch for messages

3.e) PcTools:

Utilities
PcTools
<F10>
PcTools
Recovery Tools
Disk Fix

Repair a Disk

4) Monthly Maintenance:

Every month, a thorough checking and reorganization process has to be performed:

4.a) Norton Speed Disk:

Utilities
Norton
Speed Disk
Optimize

4.b) PcTools:
Utilities
PcTools
<F10>
PcTools
Recovery Tools
DiskFix
Surface Scan
Read/Write only

5) Half-annual Backup:

Every 6 months, computer setup has to be completely backuped:

5.a) Check if system is on recover floppy disk, and Q in \UTIL\
(if not: format with system transfer)
5.b) **CHKDSK /f**
5.c) Printout of CONFIG.* and AUTOEXEC.* and file them
5.d) Copy CONFIG.* and AUTOEXEC.* to C:\DOS\
5.e) 'Clear' root directory (e.g. delete FILE*.CHK files etc)
5.f) **MIRROR /PARTN** to recover floppy disk
5.g) Update check document files
CHKDSK > DOC_CHKD
MEM > DOC_MEM
MEM /C > DOC_MEMC
MEM /D > DOC_MEMD
MEM /P > DOC_MEMP
DIR > DOC_DIR
TREE > DOC_TREE
5.h) Printout of DIRectory, TREE, MEMory
5.i) Copy all root files to recover floppy disk
5.j) On recover floppy disk, rename config.sys to config.ger
and autoexec.bat to autoexec.ger
5.k) Copy C:\AUTOMENU\ to recover floppy disk (subdirectory \AUTOMENU\)

5.l) In \DOS\ of recover floppy disk should be at least:
ansi - chkdsk - command - fdisk - format! - mem - mirror - sys
and: boot*.*
and if possible: emm* - fastopen - himem - more - smartdrv

5.m) Write down/print out BIOS settings

5.n) Norton Disk Doctor:

Utilities
Norton
Speed Disk
Rearrange
Optimize

5.o) Complete cleaning of the computer:
Open the computer, blow the dust out, in particular out of the transformer unit, and close again

INSTALLATION

Hardware requirements: IBM compatible computer, 80x86 processor, harddisk
Hardware recommended: 80386 or higher processor, harddisk with at least 40 MB, but in practice at least 100 MB

(example for soil database with 20000 sites:
17 MB dbf files, 4 MB ntx/ndx files, 8 MB exe files, 3.5 MB dBase)

Software setup:

1) Install subdirectory \dbase\natsoild
(not necessarily on drive C:)

2) If entry option will be installed:
Install subdirectory \dbase\soilentr

3) If precipitation database will be installed:
Install subdirectory \dbase\prec

4) Adjust CONFIG.SYS: It should define at least:

FILES=55
BUFFERS=40

If sufficient memory is available, cache is recommended:
DEVICEHIGH=C:\DOS\SMARTDRV.SYS 2048
(or modified, eg.DEVICE=... , or size adjusted)

5) Adjust AUTOEXEC.BAT: It should contain the following:

SET CLIPPER=F50;

If dBase is used: Add path to \dbase

WARNING MESSAGES

Following messages can occur during soil data appending (from entry file to master file, see also Sections D 4.1 and D 4.2 of this Volume):

Number Error --> Action:

1 Not checked in surface entry file
--> Back to pit/bore entry, and enter site data again;
or: change to disk/directory of entry file, enter dBase, enter 'ptsf'/'brsf' with correct index, and correct field 'datachck'

2 Not checked in horizon entry file
--> Back to pit/bore entry, and enter site data again; or: change to disk/directory of entry file, enter dBase, enter 'pthz'/'brhz' with correct index, and correct field 'datachck'

3-4 -

5 Occurs more than once in entry file
--> Change to disk/directory of entry file, enter dBase, enter 'ptsf'/'brsf' with correct index and delete record (mark record for deletion, then pack), enter 'pthz'/'brhz' with correct index, and delete record (mark record for deletion, then pack)

6 -

7 Incorrect sitenum in surface entry file
--> Change to disk/directory of entry file, enter dBase, enter 'ptsf'/'brsf' with correct index and compare and correct fields 'sitenum' and/or 'sitenum2'

8 Incorrect sitenum in horizon entry file
--> Change to disk/directory of entry file, enter dBase, enter 'pthz'/'brhz' with correct index and compare and correct fields 'sitenum' and/or 'sitenum2'

9 Incorrect sitenum in surface master file
--> Change to directory 'C:\dbase\natsoild', enter dBase, enter 'ptsftot'/'brsf_?' with correct index and compare and correct fields 'sitenum' and/or 'sitenum2'

10 Incorrect sitenum in horizon master file
--> Change to directory 'C:\dbase\natsoild', enter dBase, enter 'pthztot'/'brhz_?' with correct index and compare and correct fields 'sitenum' and/or 'sitenum2'

11 Horizon number does not match in entry files
--> Change to disk/directory of entry file, enter dBase, enter 'ptsf'/'brsf' with correct index, look for field 'horiz_no', then enter 'pthz'/'brhz' with correct index, look how many horizons were entered for that site, and compare these two figures. Either: correct 'horiz_no' in 'ptsf'/'brsf', or: add/delete horizon(s) in 'pthz'/'brhz'

12 Horizon number does not match in master files
--> Change to directory 'C:\dbase\natsoild', enter dBase, enter 'ptsftot'/'brsf_?' with correct index, look for field 'horiz_no', then enter 'pthztot'/'brhz_?' with correct index, look how many horizons were entered for that site, and compare these two figures. Either: correct 'horiz_no' in 'ptsftot'/'brsf_/', or: add/delete horizon(s) in 'pthztot'/'brhz_?'

13 Horizon numbers irregular
--> Change to disk/directory of entry file, enter dBase, enter 'pthz'/'brhz' with correct index, look for field 'horiz', check them, if they are consecutive and in the right sequence

14 Sitenumbers do not match in entry files
--> Change to disk/directory of entry file, enter dBase, enter 'ptsf'/'brsf' with correct index and compare and correct fields 'sitenum' and/or 'sitenum2'

15 Sitenumbers do not match in master files
--> Change to directory 'C:\dbase\natsoild', enter dBase, enter 'ptsftot'/'brsf_?' with correct index and compare and correct fields 'sitenum' and/or 'sitenum2'

16 Author code wrong
--> Change to disk/directory of entry file, enter dBase, enter 'ptsf'/'brsf' with correct index and compare sitenumber (2./1.letter stands for the author) with the decoded value of field 'author', and correct

17-20 -

21 No or unrealistic coordinates
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter/correct coordinates

22 Wrong coordinates
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter/correct coordinates

23 Wrong coordinates
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter/correct coordinates

24 Wrong coordinates
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter/correct coordinates

25 Wrong coordinates (outside Jordan)
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter/correct coordinates

26 No altitude
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter/correct altitude

27 Wrong sample area
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter/correct sample area numbers

28 -
29 -
30 -

31 Gap in sequence of sitenumbers
Check original cards, if that gap occurs there as well

32 Inconsistencies of dates
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter/correct date of survey

33-40 -

41 Checksite does not have reference
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and enter reference site

42 Checksite refers to another check
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and change reference site

43 Checksite series and reference site series are different
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and change reference site or series

44 Checksite taxonomy and reference site taxonomy are different
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and change reference site or taxonomy

45 Checksite has horizons (must be bore)
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and change type number from check site to bore

46 Reference site of checksite does not exist
--> Enter 'Correct master data' program (via JORDIS-Soil Database-Entry) and change reference site

Closes all open files, terminates dBaseIV processing, and exits to DOS.

7 **GOTO**

Positions the record pointer at a specified record.

example: use brsf_a index brsf_a
goto 4

8 **GO TOP**

Positions the record pointer at the first record in the database file.

example: use brsf_a index brsf_a
go toP

9 **GO BOTTOM**

Positions the record pointer at the last recrod in the database file.

example: use brsf_a index brsf_a
go bottom

10 **LIST** or **LIST FIELDS {<u>fields</u>}** or **LIST RECORD {<u>record</u>}** (*)

Shows the contents of all of of selected data records in the active database file.

example: use brsf_a index brsf_a
list
list sitenum,alt,usda_grp
list record 5

11 **DISPLAY** or **DISPLAY FIELDS {<u>fields</u>}** or
DISPLAY RECORD {<u>record</u>} (*)

Shows the contents of one or of selected data records in the active database file, screen by screen (similar to LIST).

example: use brsf_a index brsf_a
display
display records 3
display next 2

12 **DO**

Executes a program file.

example: do mstretrc

(see Section 6.7 of this Volume for a complete list of programs of JOSCIS)

13 **DIR**

Displays the file directory.

example: dir (Displays DBF files)
example: dir *.* (Displays all files)
example: dir *.prg (Displays program files)
example: dir *.ndx (Displays index files)
example: dir x*.dbf (Displays DBF file names beginning with X)
example: dir ??x???.prg (Displays .PRG file names having six letters and X as the third character)
example: dir ???.* (Displays all file names that are three characters long)

14 **DISPLAY STRUCTURE**

Displays the field definitions.

```
example: use brsf_a index brsf_a
         list structure
```

15 **COUNT** (*)

Counts the number of records in the active database file that match specified conditions.

```
example: use brsf_a index brsf_a
         count
         count for gcords_e < 31
```

16 **SUM** (*)

Totals the value of a numeric expression and stores the total in a memory variable, if desired.

```
example: use brsf_a index brsf_a
         sum horiz_no
         sum horiz_no for gcords_e < 31
```

17 **CALCULATE** (*)

Calculate computes financial and statistical functions with your data.

CALCULATE AVG(<field>), to calculate the average (mean)
CALCULATE MAX(<field>), to calculate the maximum in a field
CALCULATE MIN(<field>), to calculate the minimum in a field

example: calculate avg(horiz_no)
example: calculate max(horiz_no)

18 **SKIP**

Moves the record pointer forward or backward through the records in the database file.

example:
```
use brsf_a index brsf_a
goto 3
display
skip 3
display
```

19 **DELETE (*)**

Marks the records in the active database file with a deletion symbol.

example: delete for sitenum= "PX998"

20 **PACK**

Removes date records marked for deletion by the **DELETE** command.

example: pack

21 **CREATE**

Sets up a new file structure and adds data records, if desired.

example: create test

22 **MODIFY STRUCTURE**

Modifies the structure of a previously created database files.

The structure of a database file is the definition of field names, field types, field lengths, number of decimal places (for numeric fields), and a flag indicating the presence of an .mdx tag for each field.

Commands with a star (*) can be combined with a filter ('condition'):

FOR

or with various conditions:

FOR ___ .AND. ___
FOR ___ .OR. ___
FOR ___ .AND. .NOT. ___

example: list sitenum,gcords_e for gcords_e > 32
example: list sitenum for date > {01/01/91}

Recording containing characters ('names') can be treated in part with functions as:

LEFT(<field>,<length>)
RIGHT(<field>,<length>)
SUBSTR(<field>,<starting postion>,<length>)

example: list sitenum for left(sitenum,2) = "PA"
(to list all profiles starting with 'PA')
example: list sitenum for substr(series,6,1) = "4"
(to list all series which have a '4' at the 6.place; example: JAFR 4)

HARDWARE:
SETUP of PROJECT COMPUTERS

1) 80486 Computer:

Model:	Win 486
Processor:	80486 DX
Coprocessor:	inbuilt
Takt:	33 MHz
Memory:	640 KB conventional + 7168 KB extended (under XMS driver 2.77: 4891 KB available)
Harddisk:	643 MB, ESDI (type 1 in CMOS) with 40184 clusters, 512 bytes/sector, 32 sectors/clusters with 64 heads, 320 cylinders, 63 sectors/track
Floppy Disk Drives:	A: 1.44 MB - B: 1.2 MB
Graphic cards:	Diamond SpeedStar Plus 4.23 SVGA and Hercules
Ports:	2 P (378h and 278h) , 4 S (3F8h, 2F8h, 3E8h, and 2E8h), mouse
Bus:	ISA, 32 bits
BIOS:	American Megatrends, 6/6/91
Screens:	NEC 5FG (110 V, with separate transformer) and ADI DM-12 monoscreen
Keyboard:	101 enhanced

Main function:

Most powerful computer, therefore used as:
- master computer for DBMS:
  storage of DBMS master files with 'appending' etc.;
  from here, transfer to retrieval computers at least once a month
- master computer for GIS:
  storage of recently digitized data and of processed maps;
  from here, transfer of other GIS computer(s) at least once a month
- all time consuming processing in GIS
- map plotting (in AutoCAD)

Purchased: SCS Computers, Sheimasani, Amman; June 1992, JD 4500
Replacements: none

Setup:

Configuration (config.sys):

```
rem  - CONFIG.SYS of Gerhard's computer (80486) for DMS application
rem          as of 31/3/93
rem          - CONFIG.NRM -
BREAK=OFF
COUNTRY=01,,C:\DOS\COUNTRY.SYS
BUFFERS=40
FILES=55
LASTDRIVE=F
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /e:512  /p
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE noems
DOS=HIGH,UMB
DEVICEHIGH=C:\DOS\SMARTDRV.SYS 2048
DEVICEHIGH=C:\STAR\UTIL\FASTBIOS.SYS
DEVICEHIGH=C:\DOS\ANSI.SYS
STACKS=9,256
```

```
rem  - CONFIG.SYS of Gerhard's computer (80486) for GIS application
rem          as of 31/3/93
rem          - CONFIG.GIS -

BREAK=OFF
COUNTRY=01,,C:\DOS\COUNTRY.SYS
BUFFERS=40
FILES=55
LASTDRIVE=F
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /e:512  /p
DEVICE=C:\DOS\HIMEM.SYS
DOS=HIGH,UMB
DEVICEHIGH=C:\DOS\SMARTDRV.SYS 2048
DEVICEHIGH=C:\STAR\UTIL\FASTBIOS.SYS
DEVICEHIGH=C:\DOS\ANSI.SYS
STACKS=9,256
```

Autoexecution (autoexec.bat):

```
rem - AUTOEXEC.BAT of Gerhard's computer for DMS and GIS application
rem          as of 31/3/93
rem          - AUTOEXEC.NRM -

VERIFY OFF
SET COMSPEC=C:\DOS\COMMAND.COM
PATH C:\UTIL;C:\SPANS521;C:\;C:\DOS;C:\WINDOWS;C:\WS2000;C:\NU;
        C:\DBASE;C:\PCTOOLS;C:\CLIPPER5\BIN
C:\WINDOWS\WINWORD;C:\WINDOWS\NDW;C:\WINDOWS\EXCEL;
        C;\DOS;C:\WINDOWS
SET NU=C:\NU
IMAGE
LOADHIGH C:\TOOLKIT\GUARD
```

```
PROMPT $P$G
APPEND=C:\DOS
LOADHIGH C:\DOS\DOSKEY
LOADHIGH C:\DOS\FASTOPEN.EXE C:=200 /x
VER
LOADHIGH C:\MOUSEMS\GMOUSE 2
SET INCLUDE=C:\CLIPPER5\INCLUDE
SET LIB=C:\CLIPPER5\LIB
SET OBJ=C:\CLIPPER5\OBJ
SET PLL=C:\CLIPPER5\PLL
SET CLIPPER=F50;
COPY c:\dos\bootl + c:\dos\bootll c:\dos\bootlll
COPY c:\dos\bootlll c:\dos\bootll
C:\DOS\BOOTL
c:\untouch\utres -uc:\untouch\utscan.exe 640
c:\untouch\ut.exe periodic
\STAR\UTIL\VMODE MONITOR
MIRROR
CLS
AUTO
```

Memory (mem):

```
655360 bytes total conventional memory
655360 bytes available to MS-DOS
591568 largest executable program size

7340032 bytes total contiguous extended memory
      0 bytes available contiguous extended memory
5008384 bytes available XMS memory
        MS-DOS resident in High Memory Area
```

Harddisk (chkdsk):

```
Volume Serial Number is 0000-0FC8

658358272 bytes total disk space
   131072 bytes in 4 hidden files
  2146304 bytes in 126 directories
587169792 bytes in 6433 user files
  1572864 bytes in bad sectors
 67338240 bytes available on disk

    16384 bytes in each allocation unit
    40183 total allocation units on disk
     4110 available allocation units on disk

   655360 total bytes memory
   591568 bytes free
```

Present directories:

123 - ACAD - ASQ - AUTOMENU - CHECKIT - CLIPGR20 - CLIPPER5 - CPBACKUP - DBASE - DIGDAT - DOS - DRHALO4 - FASTBACK - GEOCLOCK - INSET - INTERM - LANDEV - MOUSE - MOUSEMS - NG - NU - PBRUSH - PCC - PCGLOBE - PCTOOLS - QB45 - SHARE - SPANS4 - SPANS521 - SPOOL - STAR - TMP - TODAY - TOOLKIT - TPLOT - TSENG2 - TX45 - UNTOUCH - UTIL - VPG - WINDOWS - WORD5 - WS2000

2) **Computer I (80386):**

Model: Hubcourt 386
Processor: 80386 DX
Coprocessor: 80387
Takt: 16 MHz
Memory: 640 KB conventional + 3456 KB extended
Harddisk: 324 MB, SCSI I-type (type 0 in BIOS)
with 40554 clusters, 512 bytes/sector, 16 sectors/cluster
with 38 heads, 1005 cylinders, 17 sectors/track
Floppy Disk Drives: A: 1.2 MB - B: 1.44 MB
Graphic cards: Paradise VGA with 512 KB memory
and MDA card
Ports: 2 P (3BCh and 278h), 2 S (3F8h and 2F8h), mouse (on IRQ 5)
Bus: ISA, 32 bits
BIOS: Award, 14/9/87
additional: 2 fans

Screens: NEC 3D
and Tandon-mono
Keyboard: 101 key enhanced

Main function:

Mainly used as:
- second computer for GIS ('work horse'):
digitization of maps;
complete copy of SPANS with all GIS data;
part of GIS processing
- copy of DBMS

Purchased: Hubcourt, UK; August 1989
Replacements: Harddisk (twice)
Fan
Floppy disk drive B: (1.44 MB)

Setup:

Configuration (config.sys):

```
rem   CONFIG.SYS of computer I (80386), as of 31/3/93
rem         for SPANS 5 / without 386Max
```

```
BREAK=OFF
COUNTRY=01,,C:\DOS\COUNTRY.SYS
BUFFERS=40
FILES=55
LASTDRIVE=F
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /E:512 /p
DEVICE=C:\DOS\HIMEM.SYS
DOS=HIGH,UMB
DEVICE=C:\DOS\SMARTDRV.SYS
DEVICEHIGH=C:\DOS\ANSI.SYS
STACKS=9,256
```

Autoexecution (autoexec.bat):

```
rem  AUTOEXEC.BAT of computer I (80386), as of 31/3/93
rem          for SPANS 5 / without 386Max

VERIFY OFF
SET COMSPEC=C:\DOS\COMMAND.COM
PATH C:\UTIL;C:\SPANS521;C:\DOS;C:\WS2000;C:\;C:\TYDIG;C:\NU;
        C:\CPBACKUP;C:\PCTOOLS;C:\FASTBACK;C:\QB45;C:\DBASE;
LOADHIGH C:\TOOLKIT\GUARD
SET CPBACKUP=C:\CPBACKUP\DATA
SET NU=C:\NU
PROMPT $P$G
C:\DOS\GRAPHICS
VER
C:\DOS\PRINT /D:LPT1
CD\UTIL
BE SA BRIGHT WHITE ON BLUE
FLIP NUM OFF
CD\
LOADHIGH C:\DOS\DOSKEY
LOADHIGH C:\DOS\FASTOPEN.EXE C:=200
SET INCLUDE=C:\CLIPPER5\INCLUDE
SET LIB=C:\CLIPPER5\LIB
SET OBJ=C:\CLIPPER5\OBJ
SET PLL=C:\CLIPPER5\PLL
SET CLIPPER=F50;
COPY C:\DOS\BOOTL + C:\DOS\BOOTLL   C:\DOS\BOOTLLL
COPY C:\DOS\BOOTLLL C:\DOS\BOOTLL
C:\DOS\BOOTL
\MOUSE\MOUSE
MIRROR
CLS
SET FASTBACK=C:\FASTBACK
AUTO
```

Memory (mem):

655360 bytes total conventional memory
655360 bytes available to MS-DOS
571232 largest executable program size

3538944 bytes total contiguous extended memory
0 bytes available contiguous extended memory
3211264 bytes available XMS memory
MS-DOS resident in High Memory Area

Harddisk (chkdsk):

Volume NSOIL1 created 01-05-1992 9:56a
Volume Serial Number is 1832-7960

332210176 bytes total disk space
98304 bytes in 5 hidden files
720896 bytes in 80 directories
318693376 bytes in 4514 user files
12697600 bytes available on disk

8192 bytes in each allocation unit
40553 total allocation units on disk
1550 available allocation units on disk

655360 total bytes memory
571232 bytes free

Present directories:

123 - 386MAX - ACAD - ASQ - AUTOMENU - BANNER - CHECKIT - CLIPPER5 - CPBACKUP - DBASE - DIGDAT - DOS - FASTBACK - HJ2 - MOUSE - MPS - NU - PBRUSH - PCTOOLS - QB45 - SHARE - SPANS4 - SPANS521 - TC - TMP - TOOLKIT - TX45 - TYDIG - UNTOUCH - UTIL - VPG - WORLD - WS2000

3) **Computer II (80286):**

Model:	Hubcourt AT/XT 286
Processor:	80286 DX
Coprocessor:	no
Takt:	
Memory:	640 KB + 4096 extended (with XMS driver 3.7, 2032 KB available)
Harddisk:	117 MB, IDE (type 41 in BIOS) with 58269 clusters, 512 bytes/sector, 4 sectors/cluster with 15 heads, 916 cylinders, 17 sectors/track

Floppy Disk Drives: A: 1.2 MB - B: 1.44 MB

Graphic card:	VGA (with 256 KB memory)
Ports:	2 P (378h and 278h), 2 S (3F8h and 2F8h), mouse
Bus:	ISA, 16 bits
BIOS:	Phoenix NEAT 286, 15/1/88 (extended: 4096 - all Shadow: disabled - Memory wait status: 0 - ROM wait status: 2 - 640-1024 k selection: disabled - EMS memory size: 1M - EMS wait status: 0 - EMS memory: disabled)
Screens:	NEC 3D
Keyboard:	101 enhanced

Main function:

DBMS data retrieval computer
entry to DBMS
graphics conversion

Purchased:	Hubcourt, UK, September 1989
Replacements:	Harddisk (original destroyed by lightening, extended memory

Setup:

Configuration (config.sys):

```
rem -  CONFIG.SYS file of computer II (80286), as of 31/3/93

DEVICE=C:\DOS\SETVER.EXE
BREAK = OFF
COUNTRY = 01,,C:\DOS\COUNTRY.SYS
BUFFERS=40
FILES=55
LASTDRIVE=E
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /E:512 /p
INSTALL=C:\DOS\FASTOPEN.EXE  C:=80
DEVICE=C:\DOS\ANSI.SYS
DEVICE=C:\DOS\DISPLAY.SYS CON=(EGA,437,1)
DEVICE=C:\WINDOWS\HIMEM.SYS /machine:at
DOS=HIGH
DEVICE=C:\DOS\SMARTDRV.SYS 2000
```

Autoexecution (autoexec.bat):

```
rem - AUTOEXEC file of computer II (80286), as of 31/3/93

@ECHO OFF
VERIFY OFF
PATH = C:\CPBACKUP;C:\WINDOWS;C:\DOS;C:\;C:\WS2000;C:\NU;C:\UTIL;
        C:\DBASE;C:\FASTBACK;C:\PCTOOLS;C:\WORD5;C:\CLIPPER5\BIN;
SET TEMP=C:\WINDOWS\TEMP
SET CPBACKUP=C:\CPBACKUP\DATA
SET NBACKUP=C:\NBACKUP
SET NU=C:\NU
NDD /Q
```

```
IMAGE
C:\TOOLKIT\GUARD
PROMPT $P$G
CD\UTIL
FLIP NUM OFF
BE SA BRIGHT WHITE ON BLUE
CD\
C:\DOS\DOSKEY
C:\DOS\GRAPHICS
VER
SET INCLUDE=C:\CLIPPER5\INCLUDE
SET LIB=C:\CLIPPER5\LIB
SET OBJ=C:\CLIPPER5\OBJ
SET PLL=C:\CLIPPER5\PLL
SET CLIPPER=F50;
c:\untouch\utres -uc:\untouch\utscan.exe 640
c:\untouch\ut.exe periodic
COPY C:\DOS\BOOTL + C:\DOS\BOOTLL    C:\DOS\BOOTLLL
COPY C:\DOS\BOOTLLL   C:\DOS\BOOTLL
rem \DOS\GWBASIC BOOTL
C:\DOS\BOOTL
MIRROR
CLS
SET FASTBACK=C:\FASTBACK
AUTO
```

Memory (mem):

```
655360 bytes total conventional memory
655360 bytes available to MS-DOS
556624 largest executable program size

4194304 bytes total contiguous extended memory
      0 bytes available contiguous extended memory
2080768 bytes available XMS memory
        MS-DOS resident in High Memory Area
```

Harddisk (chkdsk):

```
Volume NSOIL_II    created 08-22-1992 2:56p
Volume Serial Number is 3D47-15FF

 119332864 bytes total disk space
     77824 bytes in 5 hidden files
    249856 bytes in 86 directories
 118480896 bytes in 3278 user files
    524288 bytes available on disk

      2048 bytes in each allocation unit
     58268 total allocation units on disk
       256 available allocation units on disk
```

655360 total bytes memory
556624 bytes free

Present directories:

123 - ASQ - AUTOMENU - BANNER - BASPROGS - CHECKIT - CLIPPER5 - CPBACKUP - DBASE - DOS - DRGENIUS - DRHALO4 - FASTBACK - GEOCLOCK - HJ2 - NU - PBRUSH - PCC - PCGLOBE - PCTOOLS - PM - QB45 - SHARE - SPANS4 - SPANS521 - TMP - TODAY - TOOLKIT - TPLOT - TX45 - UNTOUCH - UTIL - VBPRIMER - VPG - WFW - WINDOWS - WORD5 - WS2000

4) Computer VII (80286):

Model:	Twinhead Superset 40
Processor:	80286 DX
Coprocessor:	no
Takt:	
Memory:	640 KB conventional + 384 KB extended (XMS driver 2.77)
Harddisk:	102 MB, RLL (type 34 in BIOS) with 51034 clusters, 512 bytes/sector, 4 sectors/cluster with 8 heads, 775 cylinders, 33 sectors/track
Floppy Disk Drives:	A: 1.2 MB
Graphic card:	VGA (with 256 KB memory)
Ports:	1 P (378h), 2 S (3F8h and 2F8h), mouse (serial, IRQ 3)
Bus:	ISA, 16 bits
BIOS	Phoenix, vers.4.03, of 15/1/88
Screens:	NEC 2A
Keyboard:	101 enhanced (arabic)

Main function:

mainly used as entry computer for soil data,
contains entire soil DBMS, therefore used as retrieval system for DBMS data
programming computer for Clipper development

Purchased: Sheimasani, Amman; 1991
Replacements: none

Setup:

Configuration (config.sys):

```
rem -  CONFIG.SYS file of computer VII (80286)
rem         last update: 30/11/92

BREAK=OFF
COUNTRY=01,,C:\DOS\COUNTRY.SYS
BUFFERS=40
```

```
FILES=55
LASTDRIVE=E
SHELL=C:\DOS\COMMAND.COM /P /E:400
INSTALL=C:\DOS\FASTOPEN.EXE C:=80
DEVICE=C:\DOS\HIMEM.SYS
DEVICE = C:\DOS\ANSI.SYS
DOS=HIGH
```

Autoexecution (autoexec.bat):

```
rem - AUTOEXEC file of computer VII (80286)
rem        last update: 30/11/92

SET CPBACKUP=C:\CPBACKUP\DATA
@ECHO OFF
VERIFY OFF
PATH = C:\CPBACKUP;C:\;C:\WS2000;C:\DOS;C:\NU;C:\WINDOWS;
        C:\UTIL;C:\DBASE;C:\FASTBACK;C:\PCTOOLS;C:\WORD5;
        C:\CLIPPER5\BIN;C:\NG;
SET NU=C:\NU
NDD /Q
IMAGE
C:\TOOLKIT\GUARD
FR /SAVE
PROMPT $P$G
CD\UTIL
FLIP NUM OFF
BE SA BRIGHT WHITE ON BLUE
CD\
C:\DOS\DOSKEY
C:\DOS\GRAPHICS
VER
SET INCLUDE=C:\clipper5\include;
SET LIB=C:\clipper5\lib;
SET OBJ=C:\clipper5\obj;
SET CLIPPER=F50;
c:\untouch\utres -uc:\untouch\utscan.exe 640
c:\untouch\ut.exe periodic
COPY C:\DOS\BOOTL + C:\DOS\BOOTLL    C:\DOS\BOOTLLL
COPY C:\DOS\BOOTLLL C:\DOS\BOOTLL
C:\DOS\BOOTL
\MOUSE\MOUSE
CLS
MIRROR
AUTO
SET FASTBACK=C:\FASTBACK
LH CPSCHED
```

Memory (mem):

```
655360 bytes total conventional memory
```

655360 bytes available to MS-DOS
589040 largest executable program size

393216 bytes total contiguous extended memory
0 bytes available contiguous extended memory
327680 bytes available XMS memory
MS-DOS resident in High Memory Area

Harddisk (chkdsk):

Volume NSOIL_7 created 01-27-1992 10:59a
Volume Serial Number is 1362-1203

104515584 bytes total disk space
77824 bytes in 4 hidden files
139264 bytes in 49 directories
99930112 bytes in 2322 user files
4368384 bytes available on disk

2048 bytes in each allocation unit
51033 total allocation units on disk
2133 available allocation units on disk

655360 total bytes memory
589040 bytes free

Present directories:

123 - ACAD - ASQ - AUTOMENU - CHECKIT - CLIPPER5 - CPBACKUP - DBASE - DOS - MOUSE - NAFITHA - NU - PCGLOBE - PCTOOLS - QB45 - TEST - TOOLKIT - TX45 - UNTOUCH - UTIL - VPG - WORD5 - WS2000

5) **Computer VIII (80286):**

Model: -
Processor: 80286 DX
Coprocessor: no
Takt:
Memory: 640 KB conventional + 384 KB expanded (EMS)
Harddisk: 78 MB, RLL (type 35 in BIOS)
Floppy Disk Drives: A: 1.2 MB
Graphic card: VGA with 256 KB memory
Ports: 1 P (3F8h and 2F8h), 2 S (378h)
Bus: ISA, 16 bits
BIOS: 15/10/90

Screen: Hubcourt

Keyboard: 101 enhanced (with arabic)

Main function:

mainly used as entry computer for soil data,
contains entire soil DBMS, therefore used as retrieval system for DBMS data

Purchased: Ghazal, Garden Streets, Amman, 1991
Replacements: -

Setup:

Configuration (config.sys):

```
rem - CONFIG.SYS file of computer VIII ( 80286 )
rem - Last updated on 23/12/92 by Khaled

BUFFERS=40
FILES=55
LASTDRIVE=E
SHELL=C:\DOS\COMMAND.COM /P /E:400
DEVICE=REMS.SYS
DEVICE=C:\DOS\SMARTDRV.SYS 340 /a
DEVICE=C:\DOS\ANSI.SYS
```

Autoexecution (autoexec.bat):

```
rem - AUTOEXEC of computer VIII (80286)
rem   last updated on 23/12/92 by Khaled
SET CPBACKUP=C:\CPBACKUP\DATA
@ECHO OFF
VERIFY OFF
PATH = C:\CPBACKUP;C:\DOS;C:\UTIL;C:\DBASE;C:\FASTBACK;C:\NU;
        C:\WS2000;C:\PCTOOLS;C:\WORD5;C:\CLIPPER5\BIN;C:\AUTOMENU;
SET NU=C:\NU
NDD /Q
IMAGE
C:\TOOLKIT\GUARD
PROMPT $P$G
CD\UTIL
FLIP NUM OFF
BE SA BRIGHT WHITE ON BLUE
CD\
C:\DOS\DOSKEY
VER
SET INCLUDE=c:\clipper5\include;
SET LIB=c:\clipper5\lib;
SET OBJ=c:\clipper5\obj;
SET CLIPPER=F50;
COPY C:\DOS\BOOTL + C:\DOS\BOOTLL  C:\DOS\BOOTLLL
COPY C:\DOS\BOOTLLL C:\DOS\BOOTLL
C:\DOS\BOOTL
```

```
c:\untouch\utres -ec:\untouch\utscan.exe 640
c:\untouch\ut.exe periodic
CLS
MIRROR
AUTO
SET FASTBACK=C:\FASTBACK
LH CPSCHED
```

Memory (mem):

```
655360 bytes total conventional memory
655360 bytes available to MS-DOS
532512 largest executable program size

393216 bytes total EMS memory
 32768 bytes free EMS memory
```

Harddisk (chkdsk):

```
Volume NSOIL_8    created 12-22-1992 9:26a
Volume Serial Number is 3D21-10E1

 79953920 bytes total disk space
    77824 bytes in 4 hidden files
   110592 bytes in 42 directories
 70629376 bytes in 1615 user files
    20480 bytes in bad sectors
  9115648 bytes available on disk

     2048 bytes in each allocation unit
    39040 total allocation units on disk
     4451 available allocation units on disk

   655360 total bytes memory
   532512 bytes free
```

Present directories:

123 - ASQ - AUTOMENU - CHECKIT - CLIPPER5 - CPBACKUP - DBASE - DOS - NU - PCTOOLS - TODAY - TOOLKIT - TX45 - UNTOUCH - UTIL - VPG - WORD5 - WS2000

PROGRAM INDEX
of
CLIPPER JOSCIS SOURCE CODE

1) DBMS Source Programs in Clipper 5:

Name of program	Size (kB)	Main function
WRKRETRC	18129	Retrieval of work achievement
INDRETRC	27287	Retrieval of individual field observations
SMPRETRC	23042	Retrieval of samples' inventory
CHMRETRC	215215	Retrieval of chemical data
REGRETRC	211185	Retrieval of register forms
DESRETRC	122546	Retrieval of pit/bore descriptions
MSTRETRC	134747	Master retrieval ('selected data retrieval')
PRCRETRC	42842	Retrieval of precipitation data
LOCRETRC	113725	Retrieval of location specific data
LIBRETRC	79926	(Library for retrieval/interpretation modules)
BORENTRC	102638	Entry of bore data
PITENTRC	141317	Entry of pit data
CHMENTRC	124999	Entry of chemical data
SMPENTRC	30327	Entry of samples status
PRCENTRC	44300	Entry of precipitation data
CRPENTRC	31562	Entry of crop requirements
LIBENTRC	98806	(Library for entry modules)
DAT_IMPC	124085	Import of pit/bore data from entry computers ('append')
MNT_IMPC	122672	Maintenance of soil data (texture, PSC, colour), addition
GIS_IMPC	57040	Import/transfer of GIS data to Soil Database
SER_IMPC	15236	Import of series
SER_EXPC	9870	Export of series
PRC_IMPC	10143	Import of precipitation data from entry computers
SP5_CL_2	6604	(Import of SPANS raster files to Clipper environment)
TEMPINTC	39872	Interpretation regarding temperature
MOISINTC	53473	Interpretation of moisture
SUITINTC	65293	Interpretation for suitability assessments

ADDNEWFC	8628	Clear entry files and prepare new entry files
INDEXNDX	8083	Index dBase masterfiles
INDEXNTX	15356	Index Clipper 5 master files
ANYCORRC	113866	Correction of pit/bore data in master files
PET	29064	PET assessment

2) DBMS Source Programs in QuickBasic 4.5:

DIG_SP5	7079	Correction of digitized files for SPANS5
SP5_ACAD	53164	Correction of SPANS 5 --> AutoCAD transfer
SP5_CL	7967	Transfer of SPANS 5 --> Clipper 5 and v.v.
DIST_ACA	985	Measurement of distances in AutoCAD

3) Additional programs in Clipper 5 (which can be deleted in a later stage):

CONVPALC	5701	
CONVGB	11149	
CONVNRA4	2953	
CONV_JOR	88022	
CONV_HOW	174509	
COL_DEC	20469	Decoding of colours

4) Link established between SPANS and Clipper:

DBMS ---> GIS:	mstretrc
	locretrc
DBMS <--- GIS:	gis_impc
DBMS <--> GIS:	moisintc
	suitintc

5) MPROGRAM values (in sequential sequence):

200	indretrc
400	locretrc
500	regretrc
600	desretrc
700	mstretrc
1000	moisintc
1100	wrkretrc
1300	prc_impc
1400	mnt_impc
1500	prcretrc
1600	suitintc
1700	tempintc
1800	gis_impc
1900	dat_impc
2300	smpretrc
2400	chmretrc
2800	indexntx
2900	addnewfc
3100	ser_impc
3700	ser_expc
5100	borentrc
5200	pitentrc
5300	chmentrc
5400	prcentrc
5500	smpentrc
5600	anycorrc
5700	crpentrc
5800	lchentrc

6) MPROGRAM values (in logical sequence):

5100	borentrc
5200	pitentrc
5300	chmentrc
5400	prcentrc
5500	smpentrc
5600	anycorrc
5700	crpentrc
5800	lchentrc
1100	wrkretrc
200	indretrc
2300	smpretrc
2400	chmretrc
500	regretrc
600	desretrc
700	mstretrc
400	locretrc
1500	prcretrc
1900	dat_impc
1800	gis_impc
1400	mnt_impc
3100	ser_impc
3700	ser_expc
1300	prc_impc
1700	tempintc
1000	moisintc
1600	suitintc
2800	indexntx
2900	addnewfc

7) MOPERAT values (in logical sequence):

indretrc: 11-12

11	Individual surveyor's number for bores
12	Individual surveyor's number for pits

wrkretrc: 21-24

21	Individual surveyor's statistics for bore surface data
22	Individual surveyor's statistics for bore horizon data
23	Individual surveyor's statistics for pit surface data
24	Individual surveyor's statistics for pit horizon data

smpretrc: 31-39

31	Listing of unsampled horizons
32	Listing of sampled unregistered horizons
33	Listing of sampled registered horizons
34	Listing of samples sent to lab
35	Listing of samples returned from lab
36	Listing of samples sent 2.time to lab
37	Listing of samples returned 2.time from lab
38	Listing of all samples/horizons

chmretrc: 40-49

41	Chemical data retrieval in report format
42	Chemical data retrieval in worksheet format
43	Chemical data retrieval in entry format I
44	Chemical data retrieval in entry format II
45	Specific depth/mean depth range retrieval
46	Chemical data correlations
47	Individual chemical data retrieval
48	Chemical data set error report

regretrc: 510-599

510 / 511	Register form per soil mapping units (level I)
520 / 521	Register forfacets
592 /	Register for facets for mapping
530 / 531	Register for sample areas
540 / 541	Register for series
550 / 551	Register for land systems
595 /	Register for land systems for mapping
560 / 561	Register for total subset
570 / 571	Register for USDA subgroup
580 / 581	Register form per soil mapping units (level II)
510 / 511	Summary for soil mapping units (level I)
520 / 521	Summary for facets

530 / 531 Summary for sample areas
540 / 541 Summary for series
550 / 551 Summary for land systems
560 / 561 Summary for total subset
570 / 571 Summary for USDA subgroups
580 / 581 Summary for soil mapping units (level II)

518 / 519 Short summary:series&slope&USDA-group: soil mapping units (level I)
528 / 529 Short summary:series&slope&USDA-group: land system/facets
538 / 539 Short summary:series&slope&USDA-group: sample areas
548 / 549 Short summary:series&slope&USDA-group: series
558 / 559 Short summary:series&slope&USDA-group: land systems
568 / 569 Short summary:series&slope&USDA-group: total subset
578 / 579 Short summary:series&slope&USDA-group: USDA subgroup
588 / 589 Short summary:series&slope&USDA-group: soil mapping units (level II)

516 / 517 Short summary:USDA-group/psc: soil mapping units (level I)
526 / 527 Short summary:USDA-group/psc: land system /facets
536 / 537 Short summary:USDA-group/psc: sample areas
546 / 547 Short summary:USDA-group/psc: series
556 / 557 Short summary:USDA-group/psc: land systems
566 / 567 Short summary:USDA-group/psc: total subset
576 / 577 Short summary:USDA-group/psc: USDA subgroup
586 / 587 Short summary:USDA-group/psc: soil mapping units (level II)

desretrc: 61-69
62 Pit description
63 Bore description
64 Subset pit/bore description

mstretrc: 70-79
71 Selected data retrieval of pits & bores
72 Selected data retrieval of pits
73 Selected data retrieval of bores
74 Selected data retrieval of subset

locretrc: 410-499
411 Nearest pit
412 Nearest bore
413 Nearest subset site
414 Nearest pit / bore
415 Nearest raingauge

421 Circle of pits
422 Circle of bores
423 Circle of subset sites
424 Circle of pits and bores
425 Circle of raingauges

431	Square of pits
432	Square of bores
433	Square of subset sites
434	Square of pits and bores
435	Square of raingauges
480	GIS display of pits
481	GIS display of bores
482	GIS display of pits and bores
483	GIS display of subset sites
490	Conversion of a point
491	Conversion of subset

prc_retrc: 1510-1549

1511	Precipitation: annual mean
1512	Precipitation: annual mean (with st.dev.)
1513	Precipitation: monthly mean
1514	Precipitation: monthly mean
1515	Precipitation: monthly mean (with st.dev.)
1521	Precipitation: annual total
1522	Precipitation: annual total
1523	Precipitation: monthly total
1524	Precipitation: monthly total
1525	Precipitation: daily values

dat_impc: 181-189

181	Pit data import to master DBMS from A:
182	Pit data import to master DBMS from B:
183	Pit data import to master DBMS from \dbase\soilentr\
185	Bore data import to master DBMS from A:
186	Bore data import to master DBMS from B:
187	Bore data import to master DBMS from \dbase\soilentr\

mnt_impc: 141-169

141	Generation of annual temperature	--> 'temp_ann'
141	Generation of monthly temperature	--> 'temp_jan'... '_dec'
141	Generation of soil temperature	--> 'tempsoil'
142	Generation of AWHC of topsoil	--> 'awhc_top'
142	Generation of AWHC of subsoil	--> 'awhc_sub'
143	Generalization of geology	--> 'geol_gnrl'
144	Assessment of nearest raingauge	--> 'neargaug'
145	Assessment of nearest pit	--> 'nearpit'
146	Assessment of Topographic sheet names	--> 'sheet_250'/ ..50..25

151	Generation of USDA texture class of horizon		--> 'text_usda'
152	Generation of USDA particle size class (I) by control section		--> 'part_sc_1'
152	Generation of USDA strongly contrasting particle size class by control sect.		--> 'part_sc_2'
153	Generation of hue of 'control section'		--> 'col_hue'
153	Generation of value of 'control section'		--> 'col_val'
153	Generation of chroma of 'control section'		--> 'col_chrm'
161	Addition of surveyor		
162	Addition of raingauge		
163	Addition of crop		

gis_impc: 121-139

1821	GIS import to	alt_gis from	altxtot	(ref to 'alt')
1823	GIS import to	adm_gis from	adm1tot	
1824	GIS import to	geol_gis from	gel1tot	
1825	GIS import to	reg_gis from	reg2tot	(ref to 'region')
1826	GIS import to	imag_gis from	smpatot	(ref to'samplarea1')
1826	GIS import to	samp_gis from	smpatot	(ref to'samplarea2')
1827	GIS import to	so_rg_gis from	-------	(ref to 'soil_reg')
1827	GIS import to	so_un_gis from	-------	(ref to 'soil_unit')
-	GIS import to	lst1_gis from	sys2tot	(ref to 'region')
-	GIS import to	lst2_gis from	sys2tot	(ref to 'landsyst')
1828	GIS import to	lst1_gis from	soi1tot	(ref to 'region')
1828	GIS import to	lst2_gis from	soi1tot	(ref to 'landsyst')
1828	GIS import to	lst3_gis from	soi1tot	
1829	GIS import to	neargaug from	raingaug.pnt	
1830	GIS import to	cloud_gis from	cloutot	
1831	GIS import to	humid_gis from	humdtot	
1832	GIS import to	wind_gis from	windtot	
1833	GIS import to	pr2level from	pr2xtot	
1834	GIS import to	exsstud from	exs1tot	
1835	GIS import to	arid_gis from	aridtot	
1836	GIS import to	prc_gis from	prc2tot	
1837	GIS import to	soilII_gis from	soi3tot	
1899	GIS import to	tmp from	tmp	

ser_impc: 131-139

133	Import of series of pits from A:??_tmp
134	Import of series of pits from B:??_tmp
135	Import of series of pits from \dbase\natsoild\??_tmp
136	Import of series of bores from A:??_tmp
137	Import of series of from B:??_tmp
138	Import of series of from \dbase\natsoild\??_tmp

ser_expc: 171-172

171	Export of series of pits

172	Export of series of bores

prc_impc: 1301-1309

1301	Import of precipitation data from A:
1302	Import of precipitation data from B:
1303	Import of precipitation data from dbase\prec\

tempintc: 1700-1799

1701	Temperature assessment of pit
1702	Temperature assessment of bore
1703	Temperature assessment of raingauge
1704	Temperature assessment of site (by coords)

moisintc: 1000-1099

1011	Moisture balance (% of AWHC)
1021	LGP (days): crop/soil-specific
1022	LGP (days): crop-specific
1023	LGP (days): soil-specific
1024	LGP (days): unspecific
1031	Water requirements (l/ha)
1041	P/PET curves (mm): mean
1042	P/PET curves (mm): actual by year

suitintc: 1600-1699

1611	Land suitability of pit
1612	Land suitability of bore
1613	Land suitability of raingauge
1614	Land suitability of any location
1619	Land suitability of entire map
1621	Soil suitability of pit
1622	Soil suitability of bore
1623	Soil suitability of raingauge
1624	Soil suitability of any location
1629	Soil suitability of entire map
1631	Climatic suitability of pit
1632	Climatic suitability of bore
1633	Climatic suitability of raingauge
1634	Climatic suitability of any location
1639	Climatic suitability of entire map

addnewfc: 191-192

191	Delete entire entry set of pits
192	Delete entire entry set of bores

8) MOPERAT values (in sequential sequence):

201	indretrc	Indiv.surveyor's statistics for bore surface data
202	indretrc	Indiv.surveyor's statistics for bore horizon data
203	indretrc	Indiv.surveyor's statistics for pit surface data
204	indretrc	Indiv.surveyor's statistics for pit horizon data
411	locretrc	Nearest pit
412	locretrc	Nearest bore
414	locretrc	Nearest pit / bore
415	locretrc	Nearest raingauge
416	locretrc	Nearest village
421	locretrc	Circle of pits
422	locretrc	Circle of bores
424	locretrc	Circle of pits and bores
425	locretrc	Circle of raingauges
426	locretrc	Circle of villages
431	locretrc	Square of pits
432	locretrc	Square of bores
434	locretrc	Square of pits and bores
435	locretrc	Square of raingauges
436	locretrc	Square of villages
480	locretrc	Conversion/transfer of a point
481	locretrc	Conversion/transfer of pit
482	locretrc	Conversion/transfer of bore
483	locretrc	Conversion/transfer of subset
485	locretrc	Conversion/transfer of raingauge
486	locretrc	Conversion/transfer of village
489	locretrc	Conversion of 'similar file'
510	regretrc	Register / Summary for soil mapping units
516	regretrc	USDA-group/psc summary for soil mapping units
518	regretrc	Short summary for soil mapping units
520	regretrc	Register / Summary for facets
526	regretrc	USDA-group/psc summary for facets
528	regretrc	Short summary for facets
530	regretrc	Register / Summary for sample areas
536	regretrc	USDA-group/psc summary for sample areas
538	regretrc	Short summary for sample areas
540	regretrc	Register / Summary for series
546	regretrc	USDA-group/psc summary for series
548	regretrc	Short summary for series
550	regretrc	Register / Summary for land systems
556	regretrc	USDA-group/psc summary for land systems
558	regretrc	Short summary for land systems
560	regretrc	Summary for total subset
560	regretrc	Register / Summary for total subset
566	regretrc	USDA-group/psc for total subset
568	regretrc	Short summary for total subset
570	regretrc	Register / Summary for USDA subgroups

576	regretrc	USDA-group/psc summary for USDA subgroups	
578	regretrc	Short summary for USDA subgroups	
592	regretrc	Register for facets for mapping	
595	regretrc	Register for land systems for mapping	
602	desretrc	Pit description	
603	desretrc	Bore description	
604	desretrc	Subset pit/bore description	
701	mstretrc	Selected data retrieval of pits & bores	
702	mstretrc	Selected data retrieval of pits	
703	mstretrc	Selected data retrieval of bores	
1011	moisintc	Moisture balance (% of AWHC)	
1021	moisintc	LGP (days): crop/soil-specific	
1022	moisintc	LGP (days): crop-specific	
1023	moisintc	LGP (days): soil-specific	
1024	moisintc	LGP (days): unspecific	
1031	moisintc	Water requirements (l/ha)	
1041	moisintc	P/PET curves (mm): mean	
1042	moisintc	P/PET curves (mm): actual by year	
1101	wrkretrc	Individual surveyor's number for pits & bores	
1102	wrkretrc	Individual surveyor's number for pits	
1103	wrkretrc	Individual surveyor's number for bores	
1301	prc_impc	Import of precipitation data from A:	
1302	prc_impc	Import of precipitation data from B:	
1303	prc_impc	Import of precipitation data from dbase\prec\	
1441	mnt_impc	Generation of annual temperature	-->'temp_ann'
1441	mnt_impc	Generation of monthly temperature	-->'temp_jan' ...dec'
1441	mnt_impc	Generation of soil temperature	--> 'tempsoil'
1442	mnt_impc	Generation of AWHC of topsoil	--> 'awhc_top'
1442	mnt_impc	Generation of AWHC of subsoil	--> 'awhc_sub'
1443	mnt_impc	Generalization of geology	-->'geol_gnrl'
1444	mnt_impc	Assessment of nearest raingauge	--> 'neargaug'
1445	mnt_impc	Assessment of nearest pit	-->'nearpit'
1446	mnt_impc	Assessment of topographic sheet names	--> 'sheet_250' ..50..25
1451	mnt_impc	Generation of USDA texture class of horizon	-->'text_usda'
1452	mnt_impc	Generation of USDA particle size class (I) by control section	-->'part_sc_1'
1452	mnt_impc	Generation of USDA strongly contrasting particle size class by control section	-->'part_sc_2'
1453	mnt_impc	Generation of colour hue of 'control section'	-->'col_hue'
1453	mnt_impc	Generation of colour value of 'control section'	-->'col_val'
1453	mnt_impc	Generation of col.chroma of 'control section'	-->'col_chrm'
1461	mnt_impc	Addition of surveyor	
1462	mnt_impc	Addition of raingauge	

1463	mnt_impc	Addition of crop	
1464	mnt_impc	Addition of soil mapping unit	
1465	mnt_impc	Definition of associations within soil mapping unit	
1466	mnt_impc	Addition of unit in x-tabulation table file	
1467	mnt_impc	Addition of GIS áá> DBMS relation for data transfer	
1468	mnt_impc	Addition of code unit for dbf files in gen_code file	
1481	mnt_impc	Listing of surveyors	(gen_auth)
1482	mnt_impc	Listing of taxonomy units	(gen_taxo)
1483	mnt_impc	Listing of soil mapping units	(gen_smap)
1484	mnt_impc	Listing of cross tabulations	(gen_xtab)
1485	mnt_impc	Listing of description codes	(gen_code)
1486	mnt_impc	Listing of GIS áá> DBMS relations	(gen_m2cm)
1487	mnt_impc	Listing of crops	(gen_crop)
1488	mnt_impc	Listing of raingauges	(gen_gaug)
1489	mnt_impc	Listing of villages	(gen_auth)
1511	prc_retrc	Precipitation: annual mean	
1512	prc_retrc	Precipitation: annual mean (with st.dev.)	
1513	prc_retrc	Precipitation: monthly mean	
1514	prc_retrc	Precipitation: monthly mean	
1515	prc_retrc	Precipitation: monthly mean (with st.dev.)	
1521	prc_retrc	Precipitation: annual total	
1522	prc_retrc	Precipitation: annual total	
1523	prc_retrc	Precipitation: monthly total	
1524	prc_retrc	Precipitation: monthly total	
1525	prc_retrc	Precipitation: daily values	
1611	suitintc	Land suitability of pit	
1612	suitintc	Land suitability bore	
1613	suitintc	Land suitability raingauge	
1614	suitintc	Land suitability any location	
1619	suitintc	Land suitability entire map	
1621	suitintc	Soil suitability of pit	
1622	suitintc	Soil suitability of bore	
1623	suitintc	Soil suitability of raingauge	
1624	suitintc	Soil suitability of any location	
1629	suitintc	Soil suitability of entire map	
1631	suitintc	Climatic suitability of pit	
1632	suitintc	Climatic suitability bore	
1633	suitintc	Climatic suitability raingauge	
1634	suitintc	Climatic suitability any location	
1639	suitintc	Climatic suitability entire map	
1701	temp_intc	Temperature assessment of pit	
1702	temp_intc	Temperature assessment of bore	
1703	temp_intc	Temperature assessment of raingauge	
1704	temp_intc	Temperature assessment of site (by coords)	
1800 ff	gis_impc	GIS import to CM file	
1901	dat_impc	Pit data import to master DBMS from A:	

1902	dat_impc	Pit data import to master DBMS from B:
1903	dat_impc	Pit data import to master DBMS from \dbase\soilentr\
1905	dat_impc	Bore data import to master DBMS from A:
1906	dat_impc	Bore data import to master DBMS from B:
1907	dat_impc	Bore data import to master DBMS from \dbase\soilentr\
2301	smpretrc	Listing of unsampled horizons
2302	smpretrc	Listing of sampled, unregistered horizons
2303	smpretrc	Listing of sampled, registered horizons
2304	smpretrc	Listing of samples sent to lab
2305	smpretrc	Listing of samples returned from lab
2306	smpretrc	Listing of samples sent 2.time to lab
2307	smpretrc	Listing of samples returned 2.time from lab
2308	smpretrc	Listing of all samples/horizons
2401	chmretrc	Chemical data retrieval in report format
2402	chmretrc	Chemical data retrieval worksheet format
2403	chmretrc	Chemical data retrieval entry format I
2404	chmretrc	Chemical data retrieval entry format II
2405	chmretrc	Specific depth/mean depth range retrieval
2406	chmretrc	Chemical data correlations
2407	chmretrc	Individual chemical data retrieval
2408	chmretrc	Chemical data set error report
2801	indexntx	Indexing of dbf files for Clipper
2901	addnewfc	Delete entire entry set of pits
2902	addnewfc	Delete entire entry set of bores
3103	ser_impc	Import of series of pits from A:??_tmp
3104	ser_impc	Import of series of pits from B:??_tmp
3105	ser_impc	Import of series of pits from \dbase\natsoild\??_tmp
3106	ser_impc	Import of series of bores from A:??_tmp
3107	ser_impc	Import of series of bores from B:??_tmp
3108	ser_impc	Import of series of bores from \dbase\natsoild\??_tmp
3701	ser_expc	Export of series of pits
3702	ser_expc	Export of series of bores
5101	borentrc	Entry of bore data
5201	pitentrc	Entry of pit data
5301	chmentrc	Entry of chemical/analytical data
5401	prcentrc	Entry of precipitation data
5501	smpentrc	Entry of sample inventory
5601	anycorrc	Correction of pit/bore data

5701	crpentrc	Entry of crop requirement data
5801	lchentrc	Entry of land characteristics

9) Variable 'usedsoftw':

101	Printout: LPT1: with Epson printer control codes
102	Printout: LPT2: with LaserJet printer control codes
103	Printout: LPT3: without printer control codes
104	Printout: LPT1: with Epson GX-80 printer control codes
2	Display
3	Transfer to ASCII: 'WS2000\DOCUMENT' directory
4	Transfer to ASCII: 'WORD5' directory
5	Transfer to ASCII: Lotus format, '123' directory
6	Transfer to ASCII: Excel format
7	Transfer to ASCII: SPANS 4 format, 'SPANS4\JORDAN' directory
8	Transfer to ASCII: SPANS 5 format, 'SPANS521\JORDAN' directory
9	Transfer to ASCII: Techniplot format, 'TPLOT\DATA' directory
10	Copy of subset to .DBF file, 'DBASE\NATSOILD' directory
99	none (piping to NUL:)
999	quit

10) Workareas in source programs:

1	surface data
2	horizon data,
3	compiled data,
4	surface pit data
5	horizon pit data
6	compiled pit data, or: referenced bore surface data (of check sites), or: bpcmintm (in 'dat_impc')
7	analtot, or: gen_pet
8	gen_crop
9	gen_gaug, or: referenced bore surface data (of check sites) (in 'regretrc' and 'dat_impc')
10	bpgisint/bpcl5int, or: subset target file (in 'libretrc')
11	gen_auth
12	gen_taxo
13	gen_face
14	gen_code
15	gen_lch
16	gen_xtab
17	gen_col
18	gen_smap
19	gen_m2cm
20	bp5_______ (transfer from/to SPANS)
29	gen_help

11) Programs written by Computer Section since 01-Aug-93

National Soil Map & Land Use Project

After departure of Mr. Gerhard Bechtold in August.1993 the following programs were developed :

Program	Size (Bytes)	Main Function
Compare	9111	Comparing no. of horizons in surface file with horizon file .
Lndsuit1	18004	Extraced data for import to lotus .
Gcoordkh	6533	Retrieval of geographical coordinates for Bore site.
Rajlomna	1591	
Rajnoan1	1562	Retrieval of data fo Rajil area .
Rjomnaec	1651	
Ser2	2033	Import series_2 and phase to DBMS
near1	1517	Extracts fields from DBMS concerning nearest pit
near2	1201	Returns ??cm files to their status before running near1
chm_new	112212	Retrieve chemical and physical data
sit_suit	40675	Interpretation of site suitability .
map_suit	72417	Interpretation of soil map_units suitability .
sts_suit	40829	Interpretation of all sites suitability .
prn_suit	1833	Print land suitability ratings and groups .

* A Modificaton done to menu which is used the retrieval program (lotus 123 rel.4"WIN) option is added in Libretrc.prg in computer VIII and Austin's computer, all retrieval programs were recompiled in that computer. Then the same modification was done in the other computers.

* Two Clipper programs (near1.exe,near2.exe) were developed to calculate the nearest pit in the maintenance program. (see D 4.1-5) faster.

  The procedure for running the nearest pit now is as follows:

  c:\dbase\natsoild\near1
  Run the nearest pit as before (see D 4.1-5).
  c:\dbase\natsoild\near2

* Some fields concerning the physical data (wilting point, field capacity, moisture under 100 kpa) were added to the chemical entry program.

* A Clipper program chm_new.prg was copied from chmretrc. prg program and developed to retrieve chemical and physical data (eg. aeration porosity, awhc 0.1 - 15, awhc 0.3 - 15,...).

* A modification done to chemical retrieval menu in a way that lets you retrieve chemical data as previous (see D 3.4) or to retrieve chemical and physical data.

[Document update: 15-April-1995, Etihad Rihani, Khaled Hatamleh]

11) Program written by Computer Section since 01-Aug-93

National Soil Map & Land Use Project

After Departure of Mr. Gerhard Bechtold in August, 1993 the following programs were developed:

Program	Size (Bytes)	Main Function
Compare	9111	Comparing no. of horizons in surface file with horizon file.
Lndsuit1	18004	Extracted data for import to lotus.
Gcoordkh	6533	Retrieval of geographical coordinates for Bore sites.
Rajlomna	1591	
Rajnoan1	1562	Retrieval of data for Rajil area.
Rjomnaec	1651	
Ser2	2033	Import series_2 and phase to DBMS.

* A Modification done to menu which uses ~~is used~~ the retrieval program (lotus 123 rel.4"WIN) option is added in Libretrc.prg in comp VIII and Austin Computer, and so all retrieval programs were recompiled in that computer.

[Document update: 24-Mar-94, E. Rihani & Dr Bob Jones]

National Soil Map and Land Use Project

Ministry of Agriculture, Jordan

J O S C I S

Jordan Soil and Climatic Information System

D B M S
V O L U M E

Glossary of DBMS Terms

GLOSSARY
of DATABASE TERMS

Algorithm	A set of rules for solving a problem. An algorithm must be specified before the rules can be written in a computer language.
ANSI	American National Standards Institute - an association formed by the American Government and industry to produce and disseminatewidely used industrial standards.
Archive	Accessible store for data not required for immediate use.
ASCII	Ammerican Standard Code for Information Interchange - standard binary coding system used to represent characters (alphabetic and numeric) in a computer or other digital device.
Attribute	An attribute is a property of an entity in a database, atributes are codes or descriptors of the entity.
Attribute value	A specific quality or measurement assigned to an attribute, for example 5.6 for pH.
Backup	Making a copy of a computer file or disk for safe keeping incase the original is lost or corrupted.
Bit	The smallest unit of computer storage, normally takes the value of the binary digits 0 or 1.
Booting	Act of starting up a computer system after connecting the power supply. Booting takes place when the BIOS (Basic Input/Output System loads the operating system. So-called because the computer becomes operational by 'pulling itself up by its own bootstraps'.
Bug	An error in a computer program or piece of electronics that causes it to malfunction.
Byte	A basic element of computer storage comprising 8 binary bits (eg 00110011).
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
Cadastre	The public register of the quantity, value and ownership of land, hence cadastral.
Code	Set of specific symbols and rules for representing data and programs so that they can be recognised by the computer; see ASCII
Compilation	Process for generation of executable code (EXE) from source code
Cursor	Moving pointer on a computer or video display unit used to locate a point.
Databank	A collection of data, in a common location, relating to a given set of subjects.
Database	Organised integrated collection of data stored so that they can be used by relevant applications, with data accessible by different logical paths. In theory, data are application independent.
DBMS	Database Management System - set of integrated programs and system routines for storing, verifying, retrieving and manipulation data in a database.
Data capture	Encoding of data into a computer by keyboard entry, digitizing, scanning and optical character or feature recognition.
Data compression	Reduction of physical volume of data stored.

Data model	An abstraction of the real world which incorporates only those properties thought to relevant to the problem at hand. The data model defines groups of entities, their attributes and the relationships between them.
Data set	Named collection of logicaly related features.
Data structure	Logical arrangement of data used by a system for data management; the way in which the data model is implemented in the computer.
Entity	Something about which data is stored in a databank or database.
EXE	Executable code in binary format; can not be edited or modified easily
Format	Specified arrangement of data; the format of a data record
GIS	Geographical Information System - for capturing, storing, validating, manipulating, analysing and displaying data which are spatially referenced.
Geo-reference	Location of an entity by registering x,y (and sometimes z) coordinates in a specific coordinate system.
GB (Gb)	Gigabyte- one thousand million bytes.
Grid	Planimetric frame of reference.
Grid cell	Two-dimensional object that represents an element in a regular surface.
Grid squares	Regular array of rectangular cells referenced to a grid - used as a basis for holding spatially referenced.
Hardware	Physical equipment for a computer system.
Integer	A number without a decimal component.
Land Evaluation	Assessment of the performance or potential of land for specific purposes. Based on the results of surveys of landform, soils, vegetation, climate and land use.
LIS	Land Information System - for capturing, storing, validating, manipulating, analysing and displaying data about land, its use, ownership and development.
Land Quality	Complex attribute of the land resulting from the combining of land characteristics. For example droughtiness is a land quality which is the result of combining the available water in the soil with the climatic moisture deficit.
Land Suitability	Fitness or suitability of land for a particular kind of use, for example, wheat growing.
Line	One dimensional object.
Macro	A text file containing a series of frequently used operations that can be executed by a single command.
Model	Simplified representation of a limited part of reality with related elements.
Module	A separate and distinct piece of of software or hardware that can be connected to other modules to form a system.
Output	Presentation of digital data to a format understandable by the user.
Overchecking	Final clearance of captured soil data (after several validation procedures) before appending to master data files (in JOSCIS).
Package	Set of computer programs that can be used for a particular application or set of applications.
Pixel	Picture element, the smallest non-divisible element of a digital image.
Point	A zero-dimensional object that specifies a geometric location. A set of coordinates that specifies location.
Program	A precise set of sequential instructions interpretable by computer to perform a sequence of tasks.
Relational database	A normalised structured set of data whereby each entity can be related to other entities, data are stored as two-dimensional tables related to one another.
Retrieval	Recovery or extraction of digital data from a database or computer file.
Software	Computer code - operating system, bespoke programs, and applications programs to instruct the computer to perform specific operations.
Source code	Computer program that has been written in English-like computer language which must be compiled to yield object code before it can be run on a computer.

Subset	Part of an entire database selected by one or more criteria in separate procedure.
Topology	Study of properties of a goemetric figure that are not dependent on position.
Transfer format	Format for transfer of data between computer systems or applications.
Update	Process of adding to and revising exisitng information to take account of change.

National Soil Map and Land Use Project

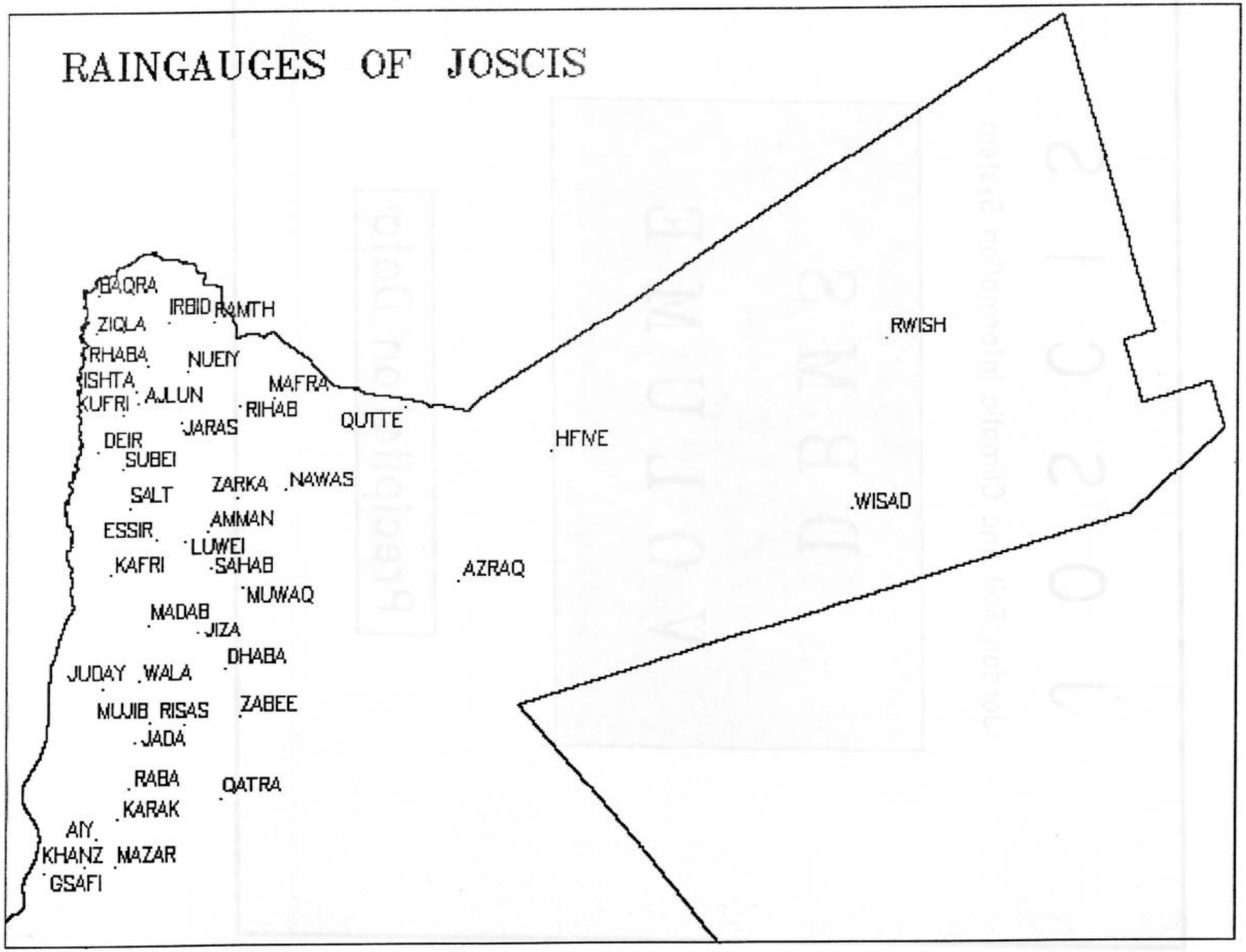
Ministry of Agriculture, Jordan

J O S C I S

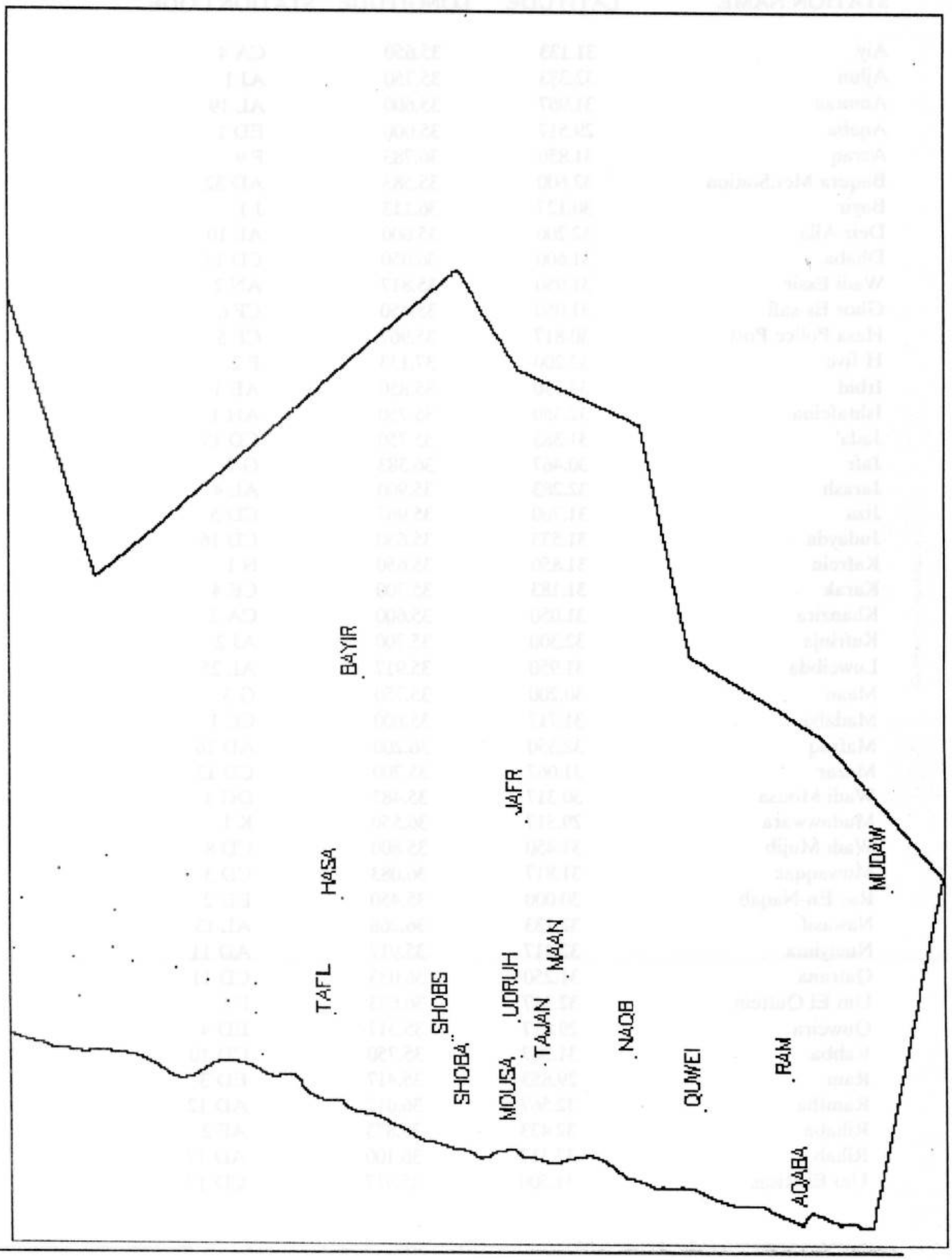
Jordan Soil and Climatic Information System

D B M S
V O L U M E

Precipitation Data


RAINGAUGES OF JOSCIS
BAQRA
IRBID
RAMTH
ZIQLA
RHABA
NUEIY
ISHTA
AJLUN
MAFRA
KUFRI
RIHAB
JARAS
QUTTE
HFIVE
RWISH
DEIR
SUBEI
ZARKA
NAWAS
SALT
WISAD
ESSIR
AMMAN
LUWEI
KAFRI
SAHAB
AZRAQ
MUWAQ
MADAB
JIZA
DHABA
JUDAY
WALA
MUJIB
RISAS
ZABEE
JADA
RABA
QATRA
KARAK
AIY
KHANZ
MAZAR
GSAFI

PRECIPITATION DATA



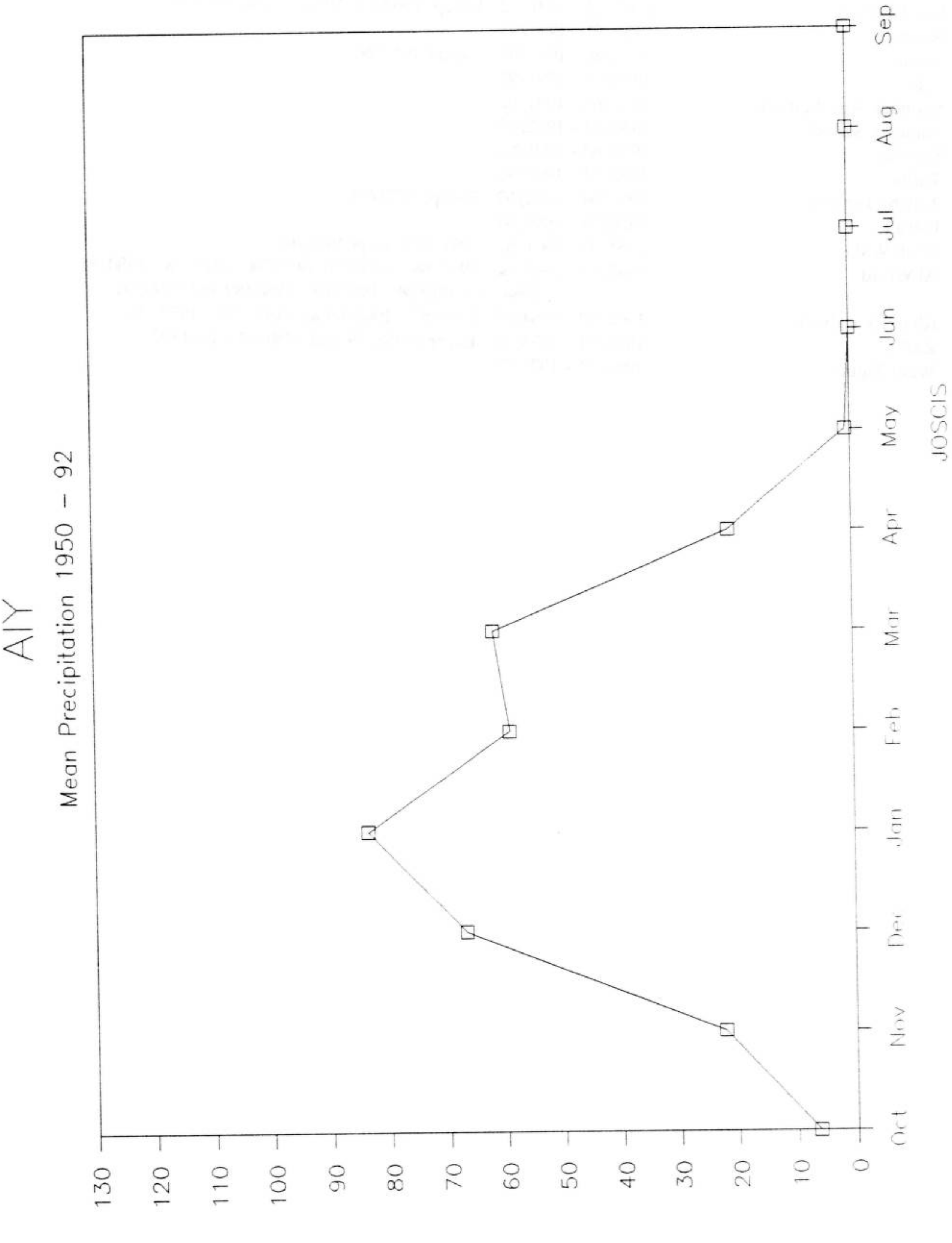
In JOSCIS, data are available for the following rainfall stations:

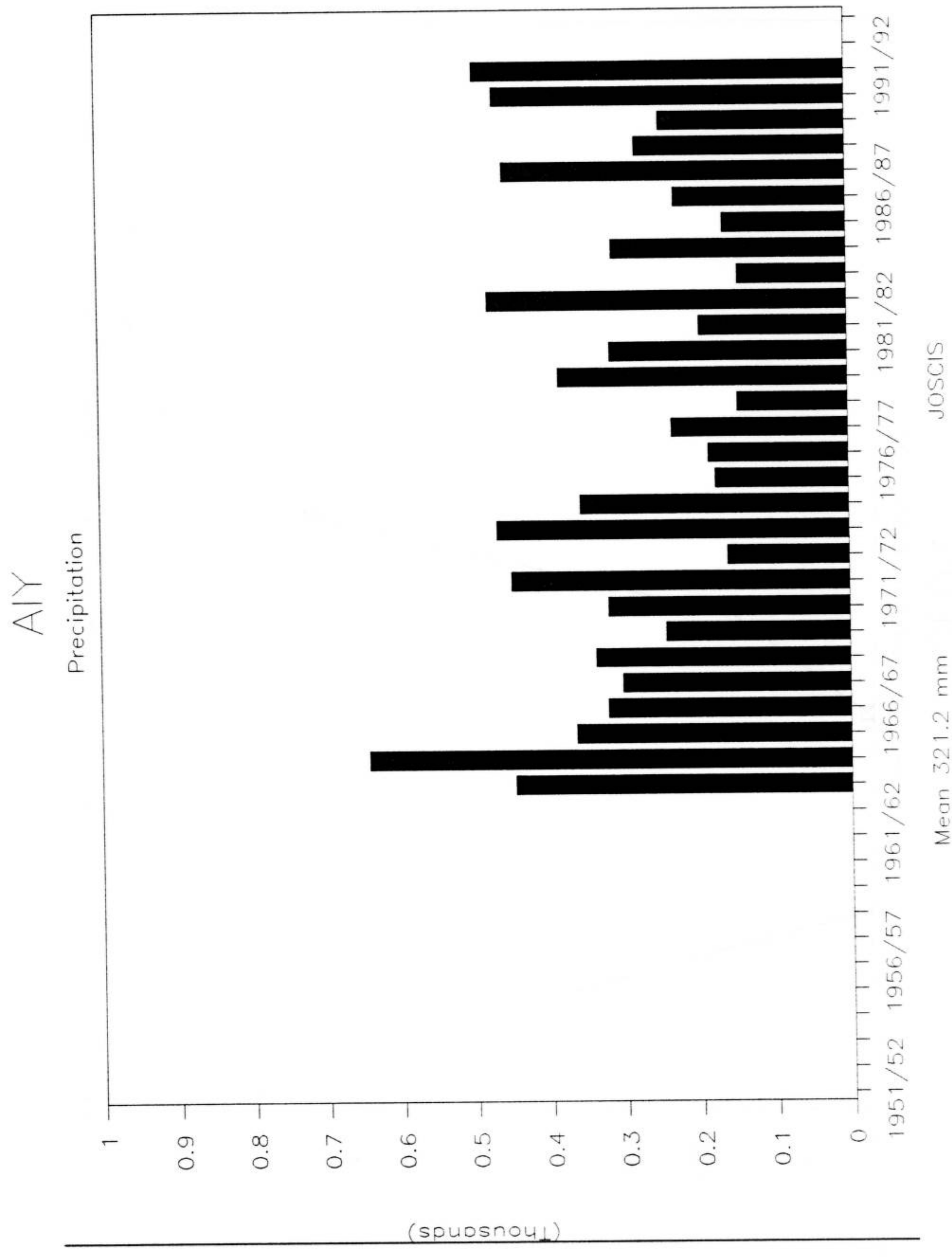
STATION NAME	LATITUDE	LONGITUDE	STATION CODE
Aiy	31.133	35.650	CA 4
Ajlun	32.333	35.750	AJ 1
Amman	31.967	35.600	AL 19
Aqaba	29.517	35.000	ED 1
Azraq	31.850	36.783	F 9
Baqura Met.Station	32.600	35.583	AD 32
Bayir	30.127	36.113	J 1
Deir Alla	32.200	35.600	AL 10
Dhaba	31.600	36.050	CD 15
Wadi Essir	31.950	35.817	AN 2
Ghor Es-safi	31.050	35.450	CF 6
Hasa Police Post	30.817	35.967	CF 5
H-five	32.200	37.133	F 2
Irbid	32.550	35.850	AE 1
Ishtafeina	32.350	35.750	AH 1
Jada'	31.383	35.750	CD 19
Jafr	30.467	36.383	G 2
Jarash	32.283	35.900	AL 4
Jiza	31.700	35.967	CD 5
Judayda	31.533	35.650	CD 16
Kafrein	31.850	35.650	N 1
Karak	31.183	35.700	CE 4
Khanzira	31.050	35.600	CA 2
Kufrinja	32.300	35.700	AJ 2
Luweibda	31.950	35.917	AL 25
Maan	30.200	35.750	G 3
Madaba	31.717	35.800	CC 1
Mafraq	32.350	36.200	AD 16
Mazar	31.067	35.700	CD 13
Wadi Mousa	30.317	35.483	DG 1
Mudawwara	29.517	36.550	K 1
Wadi Mujib	31.450	35.800	CD 8
Muwaqqar	31.817	36.083	CD 3
Ras En-Naqab	30.000	35.450	ED 2
Nawasif	32.133	36.268	AL 13
Nueiyima	32.417	35.917	AD 11
Qatrana	31.250	36.033	CD 11
Um El Quttein	32.317	36.633	F 1
Quweira	29.817	35.317	ED 4
Rabba	31.267	35.750	CD 10
Ram	29.853	35.417	ED 3
Ramtha	32.567	36.017	AD 12
Rihaba	32.433	35.873	AF 2
Rihab	32.317	36.100	AD 17
Um El Risas	31.500	35.917	CD 17

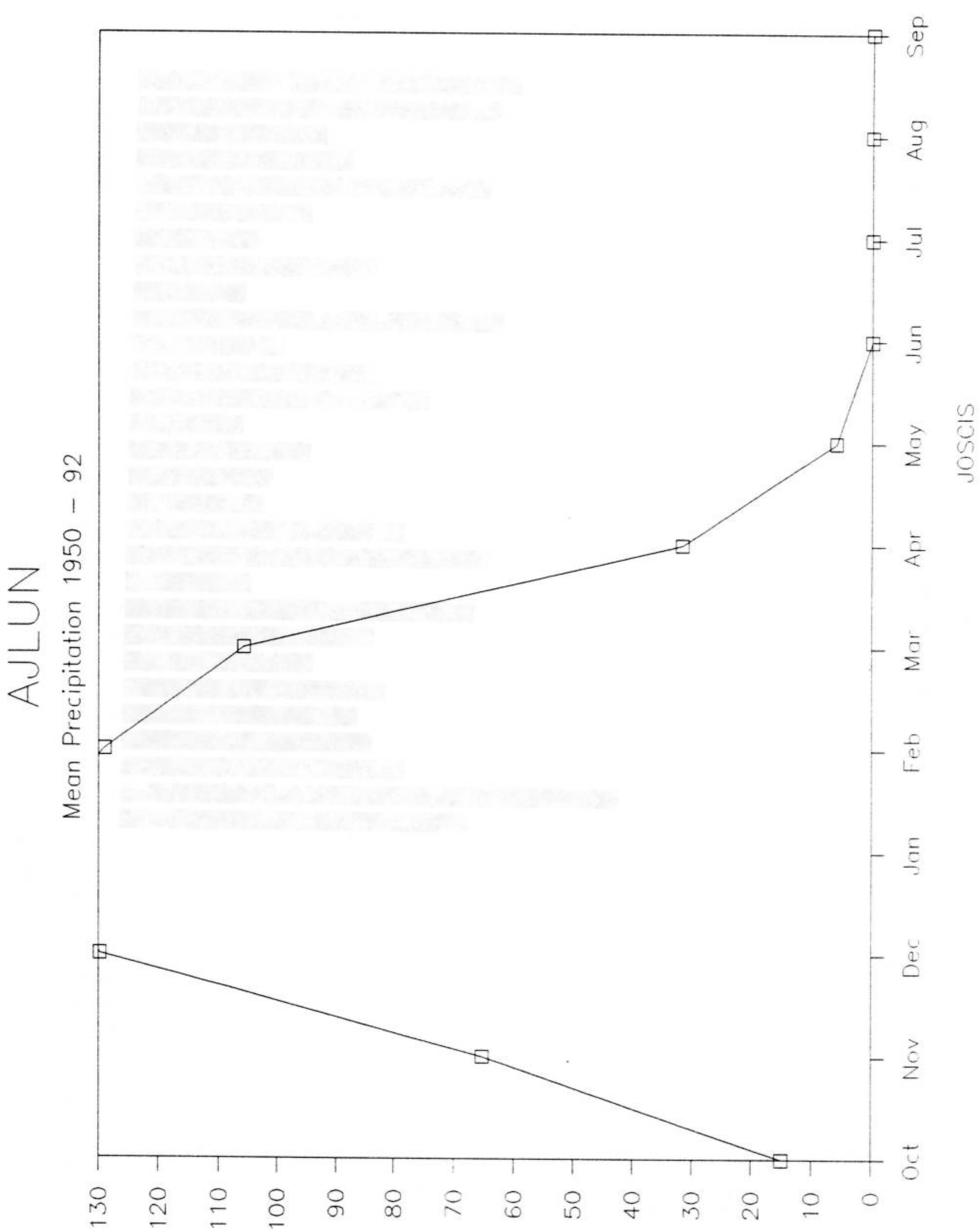
Ruweishid	32.500	38.200	H 1
Sahab	31.867	36.000	CD 1
Salt	32.033	35.733	AM 1
Shoubak Agr. Station	30.517	35.533	DA 2
Shoubak School	32.883	35.917	DA 1
Subeihi	32.150	35.700	AL 27
Tafila	30.833	35.600	DB 1
Taiyiba Janubia	30.250	35.450	DH 1
Udruh	30.333	35.583	G 9
Wadi Wala	31.550	35.783	CD 6
Al Wisad	31.867	38.050	F 7
Khan Es Zabeeb	31.767	36.167	CD 18
Zarka	32.067	36.100	AL 15
Wadi Ziglab	32.850	35.100	AF 1

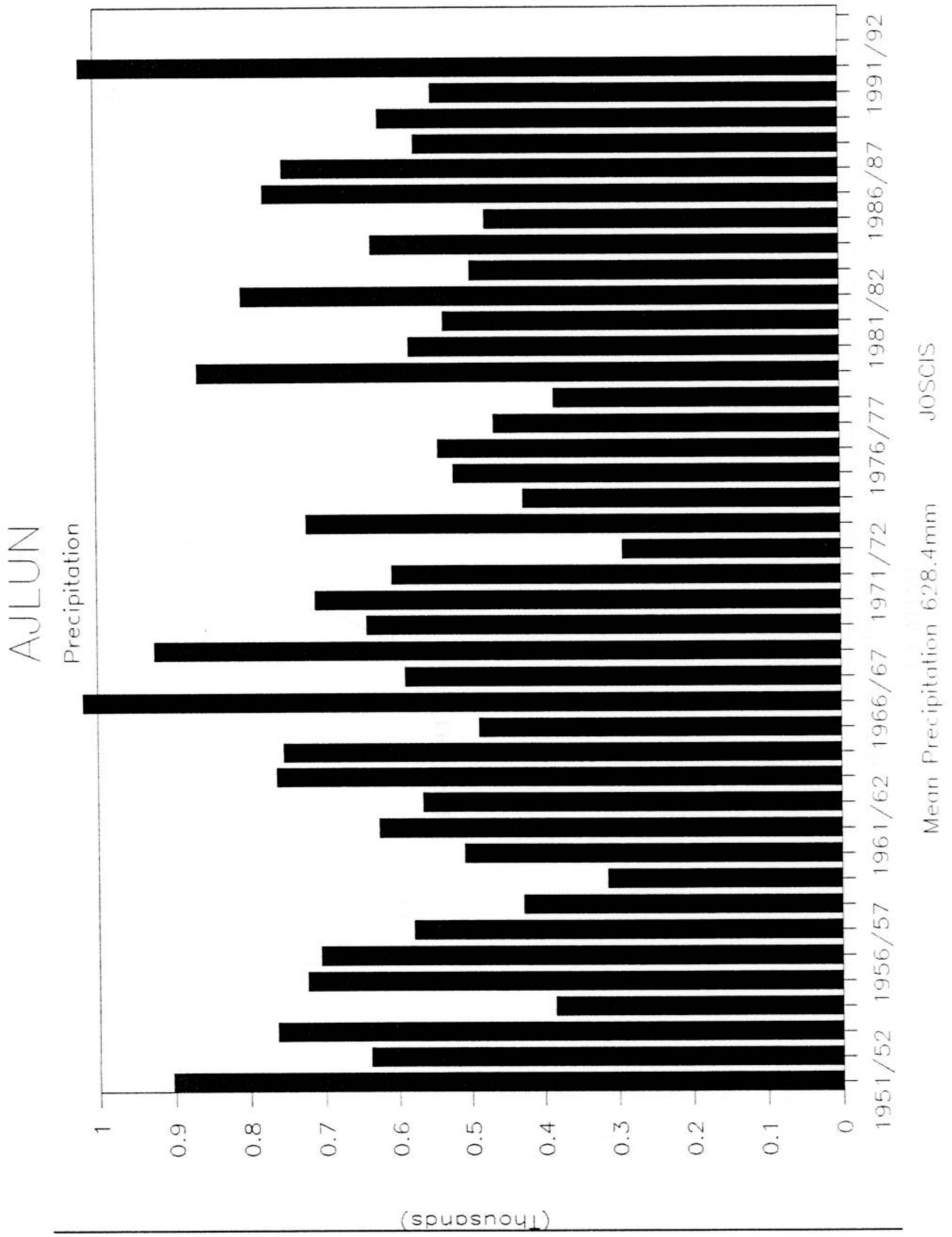
STATION NAME	YEARS OF RECORD
Aiy	1963/64 - 1991/92
Ajlun	1950/51 - 1991/92
Amman	1950/51 - 1991/92
Aqaba	1950/51 - 1991/92 Except 1956/57
Azraq	1954/55 - 1991/92
Baqura Met.Station	1950/51 - 1991/92 Except 1969/79 - 1970/71
Bayir	1952/53 - 1979/80 Except 1970/71 - 1972/73
Deir Alla	1952/53 - 1991/92
Dhaba	1963/64 , 1967/68, 1971/72 - 1991/92
Wadi Essir	1950/51 - 1991/92
Ghor Es-safi	1952/53 - 1967/68, 1972/73 - 1974/75, 1967/77 - 1991/92
Hasa Police Post	1964/65 - 1979/80, 1982/83 - 1991/92
H-five	1950/51 - 1991/92 Except 1989/90
Irbid	1950/51 - 1991/92
Ishtafeina	1952/53 - 1991/92
Jada'	1962/63 - 1991/92 Except 1979/80 - 1981/82
Jafr	1951/52 - 1989/90 Except 1959/60 and 1961/62
Jarash	1950/51 - 1991/92
Jiza	1951/52 - 1991/92 Except 1980/81
Judayda	1963/64 - 1991/92 Except 1976/77 and 1980/81
Kafrein	1951/52 - 1967/68 Except 1958/59
Karak	1950/51 - 1991/92
Khanzira	1951/52 - 1991/92 Except 1959/60
Kufrinja	1950/51 - 1991/92
Luweibda	1961/62 - 1977/78
Maan	1950/51 - 1991/92 Except 1959/60
Madaba	1950/51 - 1991/92
Mafraq	1950/51 - 1991/92
Mazar	1950/51 - 1991/92 Except 1956/57
Wadi Mousa	1950/51 - 1991/92
Mudawwara	1951/52 - 1974/75 Except 1960/61 - 1961/62
Wadi Mujib	1952/53 - 1973/74 Except 1966/67
Muwaqqar	1952/53 - 1991/92 Except 1979/80
Ras En-Naqab	1951/52 - 1991/92 Except 1959/60 - 1961/62
Nawasif	1961/62 - 1991/92
Nueiyima	1955/56 - 1991/92
Qatrana	1950/51 - 1991/92
Um El Quttein	1951/52 - 1974/75, 1977/78, 1979/80 - 1988/89, 1990/91 - 1991/92
Quweira	1962/63 - 1991/92 Except 1964/65 - 1965/66 and 1976/77
Rabba	1951/52 - 1991/92
Ram	1962/63 - 1975/76, 1978/79 - 1984/85, 1989/90 - 1991/92
Ramtha	1950/51 - 1991/92
Rihaba	1963/64 - 1991/92
Rihab	1950/51 - 1991/92

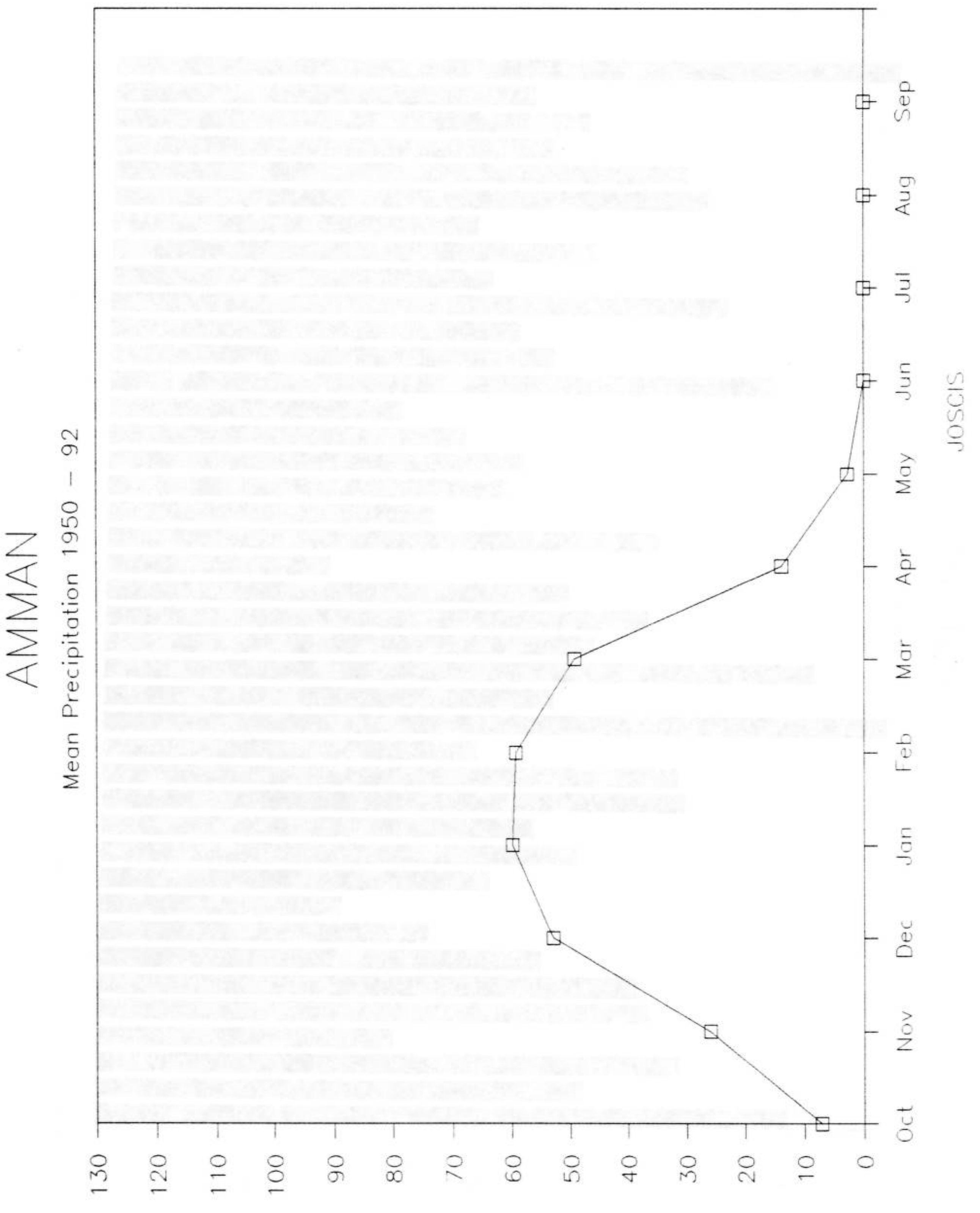
Um El Risas	1962/63 - 1991/92	Except 1967/68, 1976/77 and 1985/86
Ruweishid	1950/51 - 1990/91	
Sahab	1957/58 - 1991/92	Except 1959/60
Salt	1950/51 - 1991/92	
Shoubak Agr. Station	1962/63 - 1991/92	
Shoubak School	1950/51 - 1982/83	
Subeihi	1962/63 - 1991/92	
Tafila	1950/51 - 1991/92	
Taiyiba Janubia	1963/64 - 1991/92	Except 1972/73
Udruh	1950/51 - 1990/91	
Wadi Wala	1954/55 , 1961/62 - 1991/92 Except 1963/64	
Al Wisad	1963/64 - 1965/66, 1967/68 - 1970/71, 1973/74 , 1977/78 - 1980/81, 1984/85 - 1985/86, 1987/88 - 1988/89 and 1990/91	
Khan Es Zabeeb	1962/63 - 1964/65, 1966/67 - 1968/69 and 1970/71 - 1977/78	
Zarka	1950/51 - 1973/74	Except 1958/59 and 1980/81 - 1991/92
Wadi Ziglab	1950/51 - 1975/76	


AIY
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

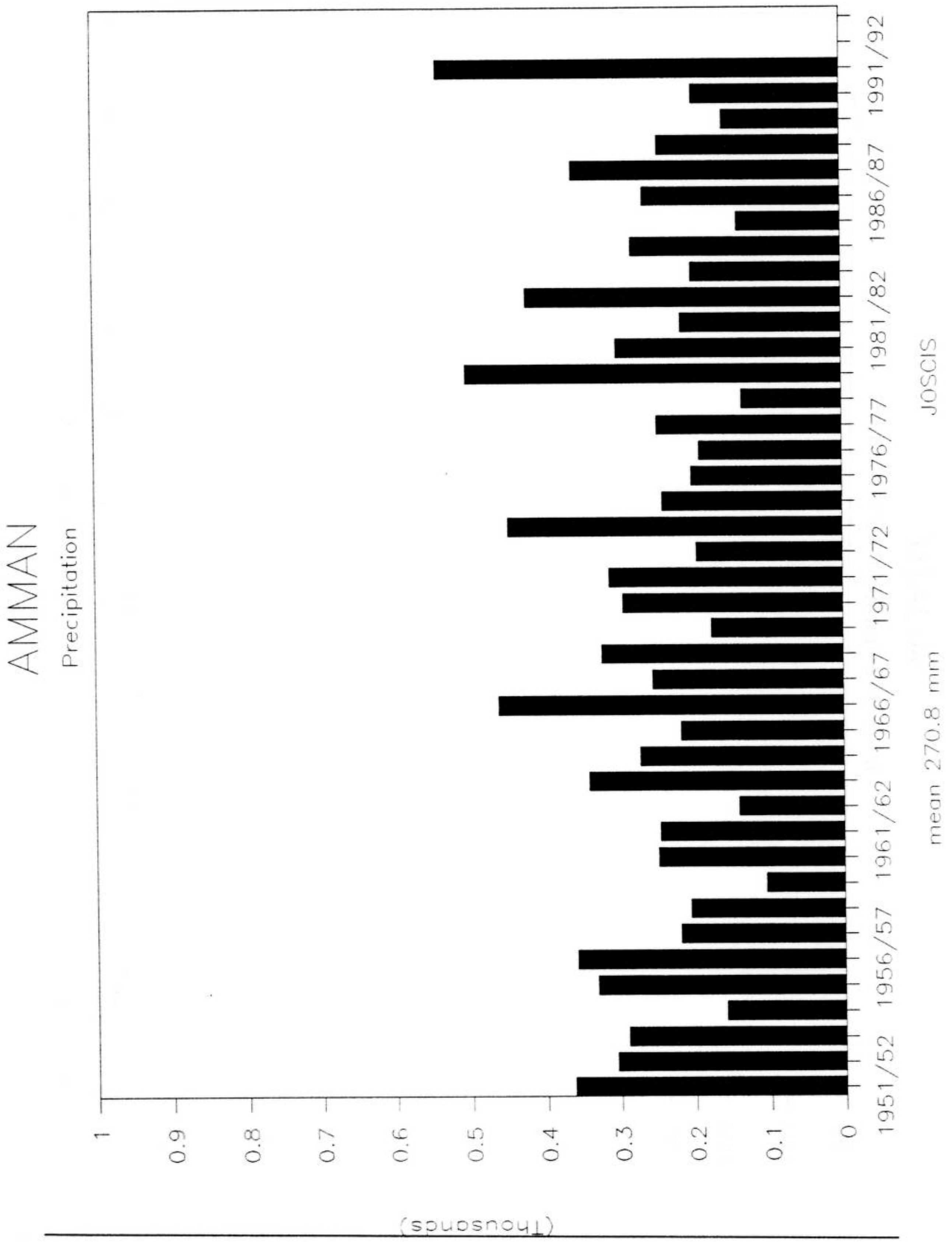

AIY
Precipitation
Mean 321.2 mm
JOSCIS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

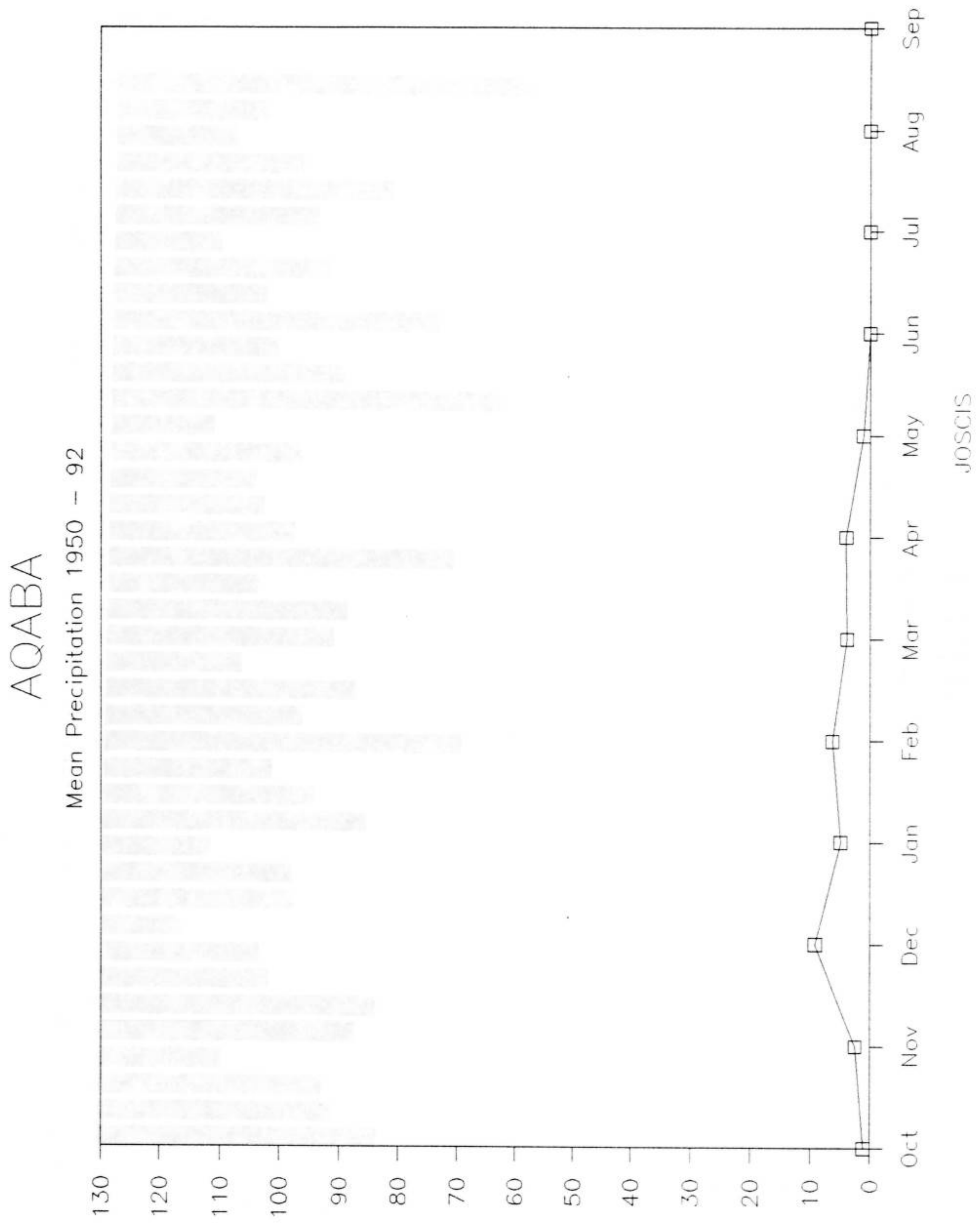

AJLUN
Mean Precipitation 1950 - 92
JOSCIS
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0

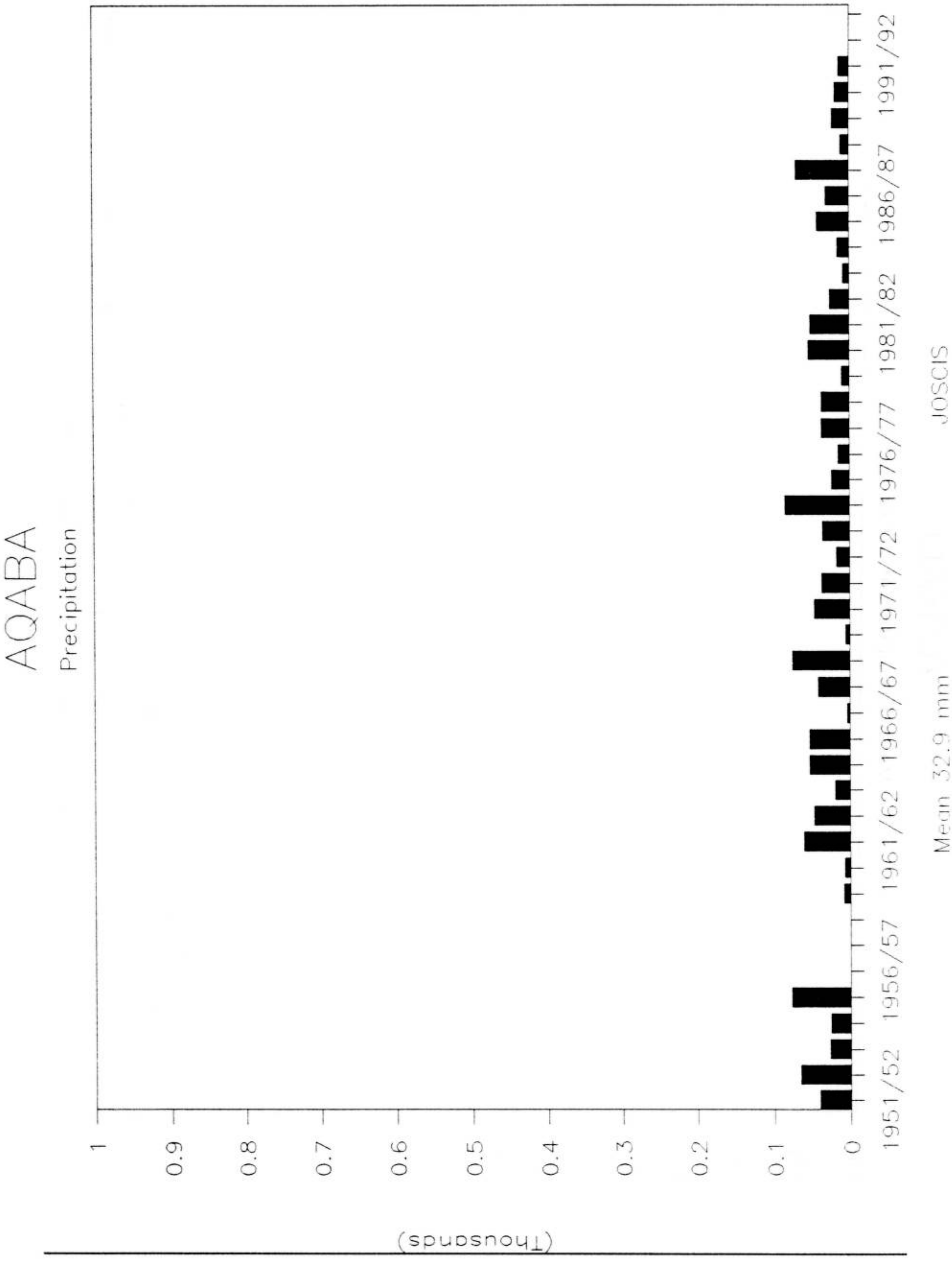

AJLUN
Precipitation
Mean Precipitation 628.4mm
JOSCIS
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

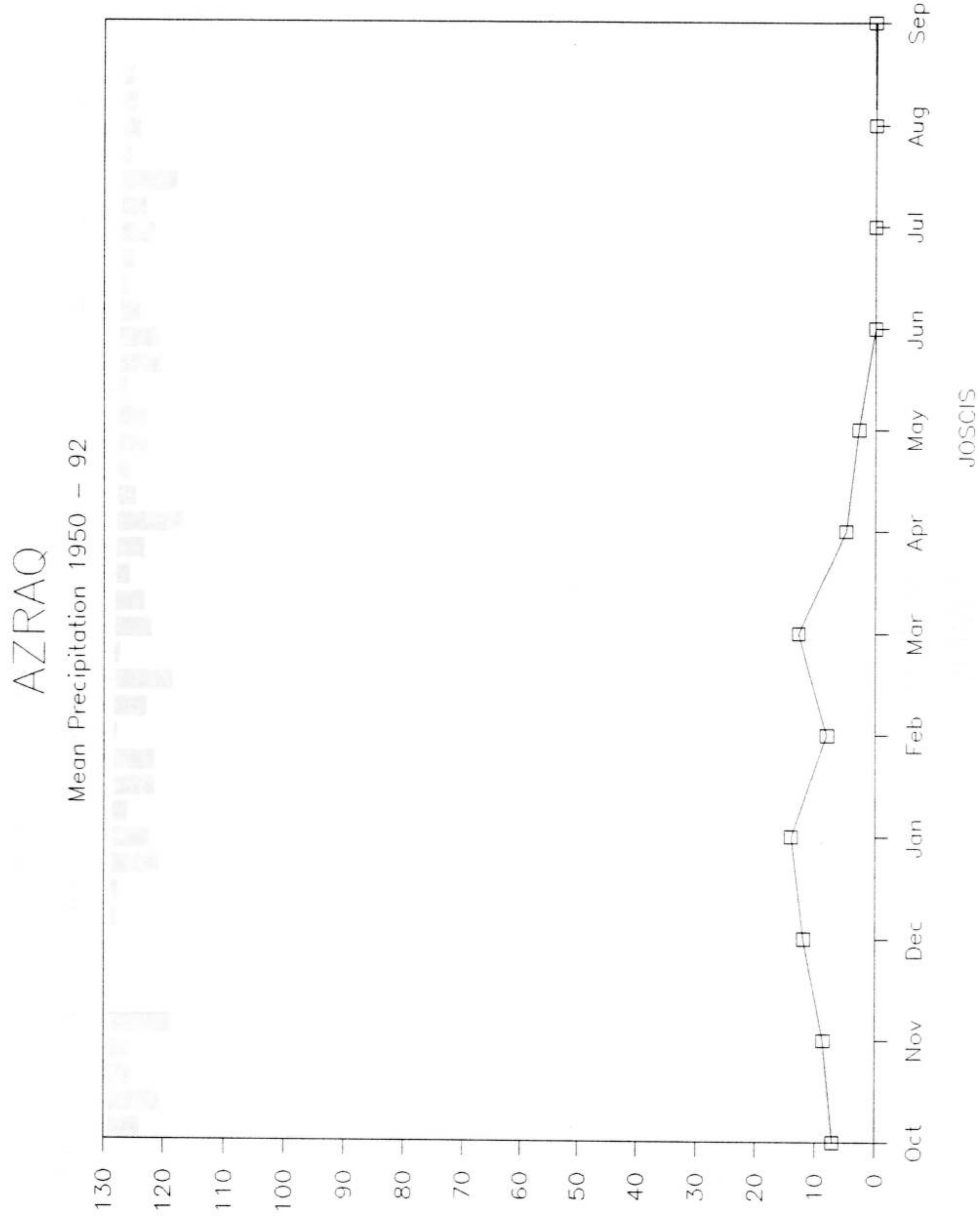


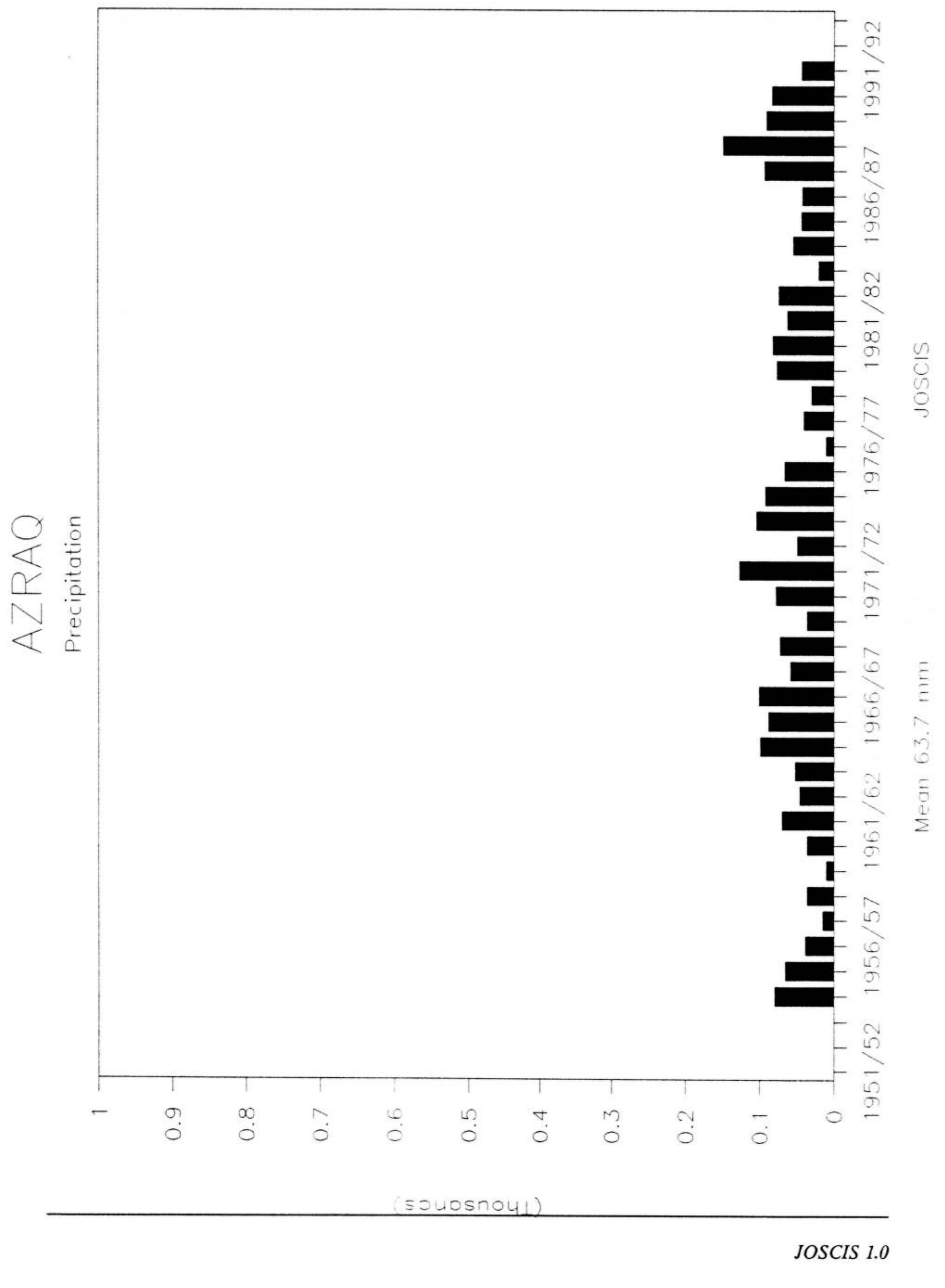
AMMAN
Mean Precipitation 1950 – 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

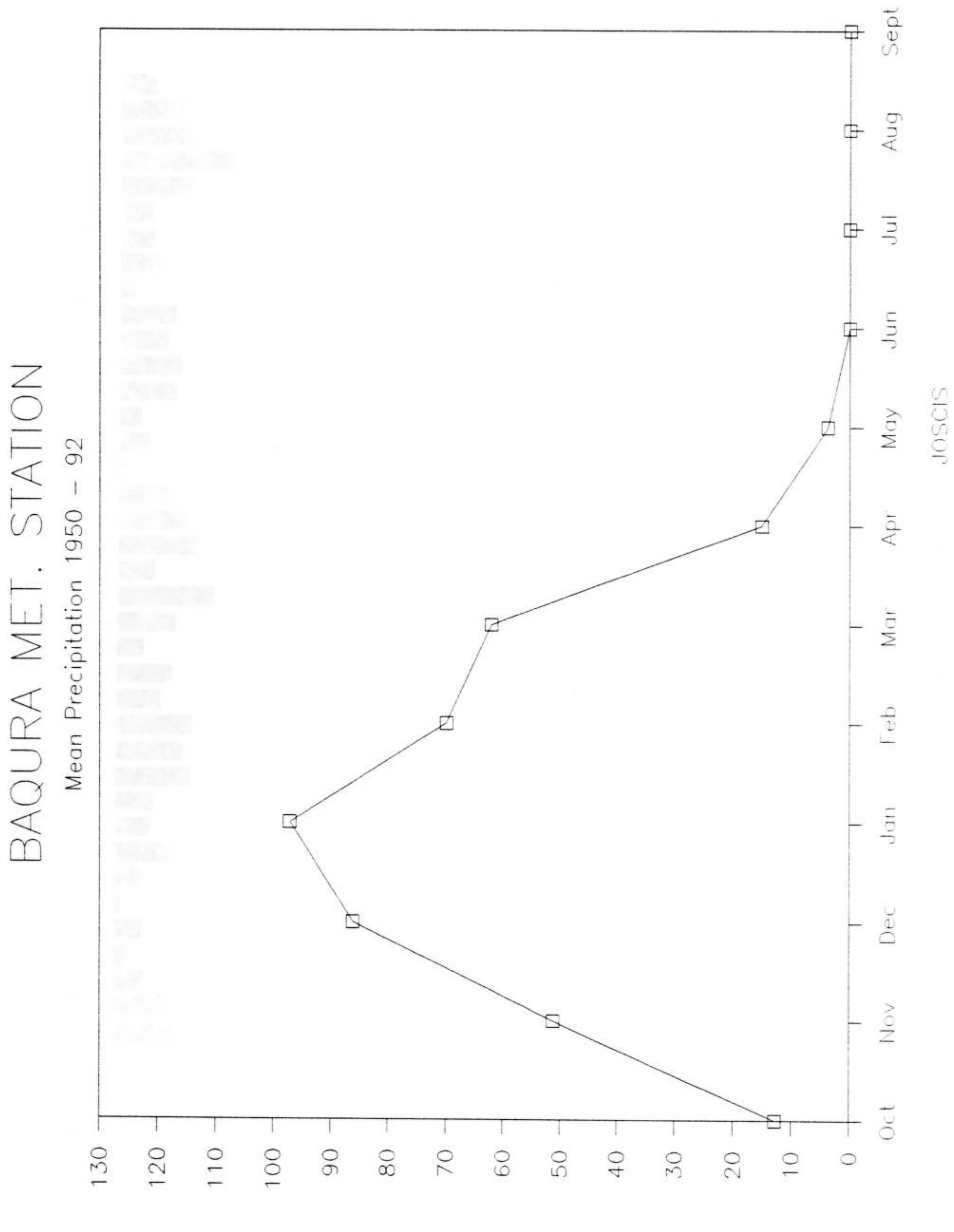

AMMAN
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)
mean 270.8 mm
JOSCIS

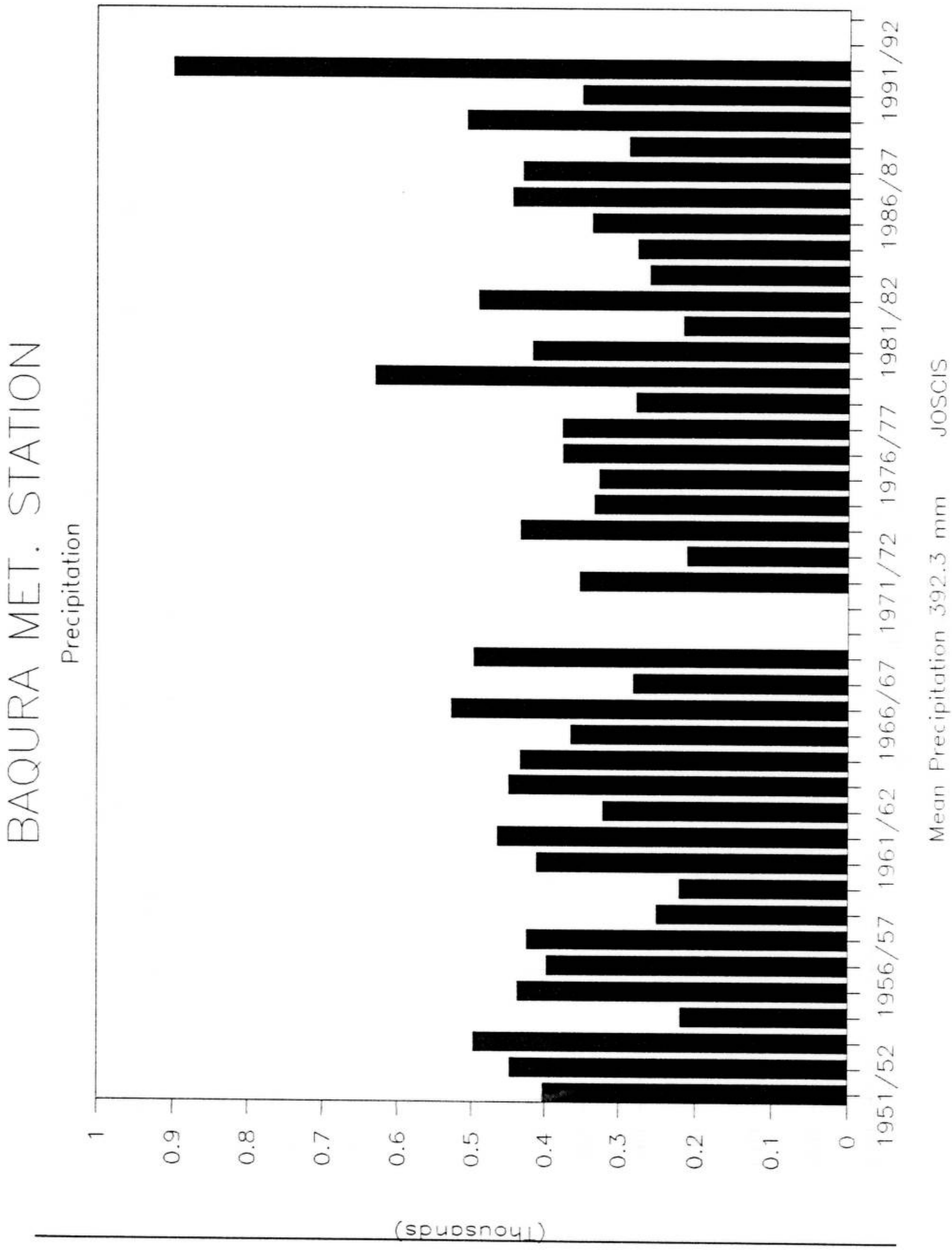

AQABA
Mean Precipitation 1950 – 92
JOSCIS
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
0
10
20
30
40
50
60
70
80
90
100
110
120
130

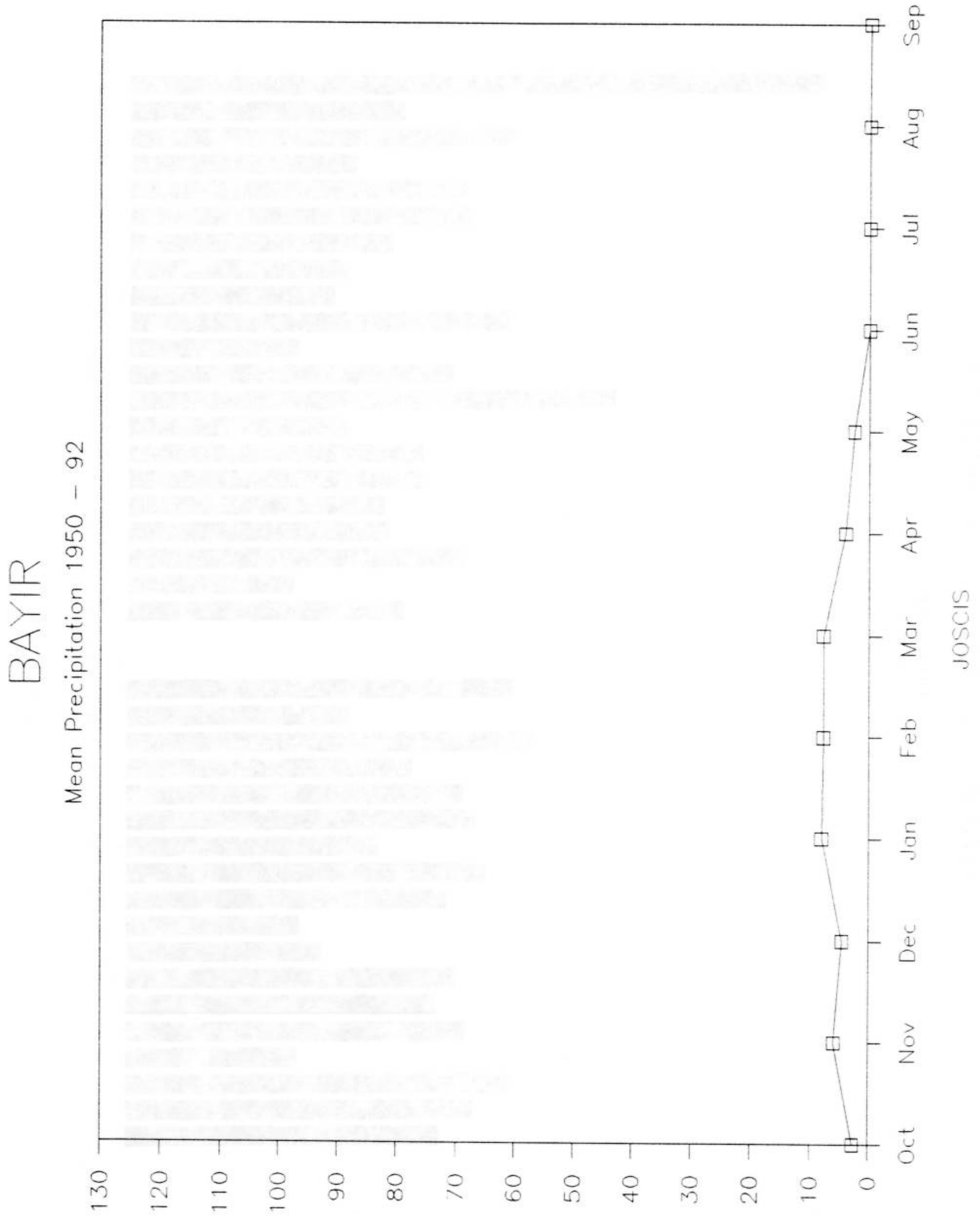

AQABA
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)
Mean 32.9 mm
JOSCIS

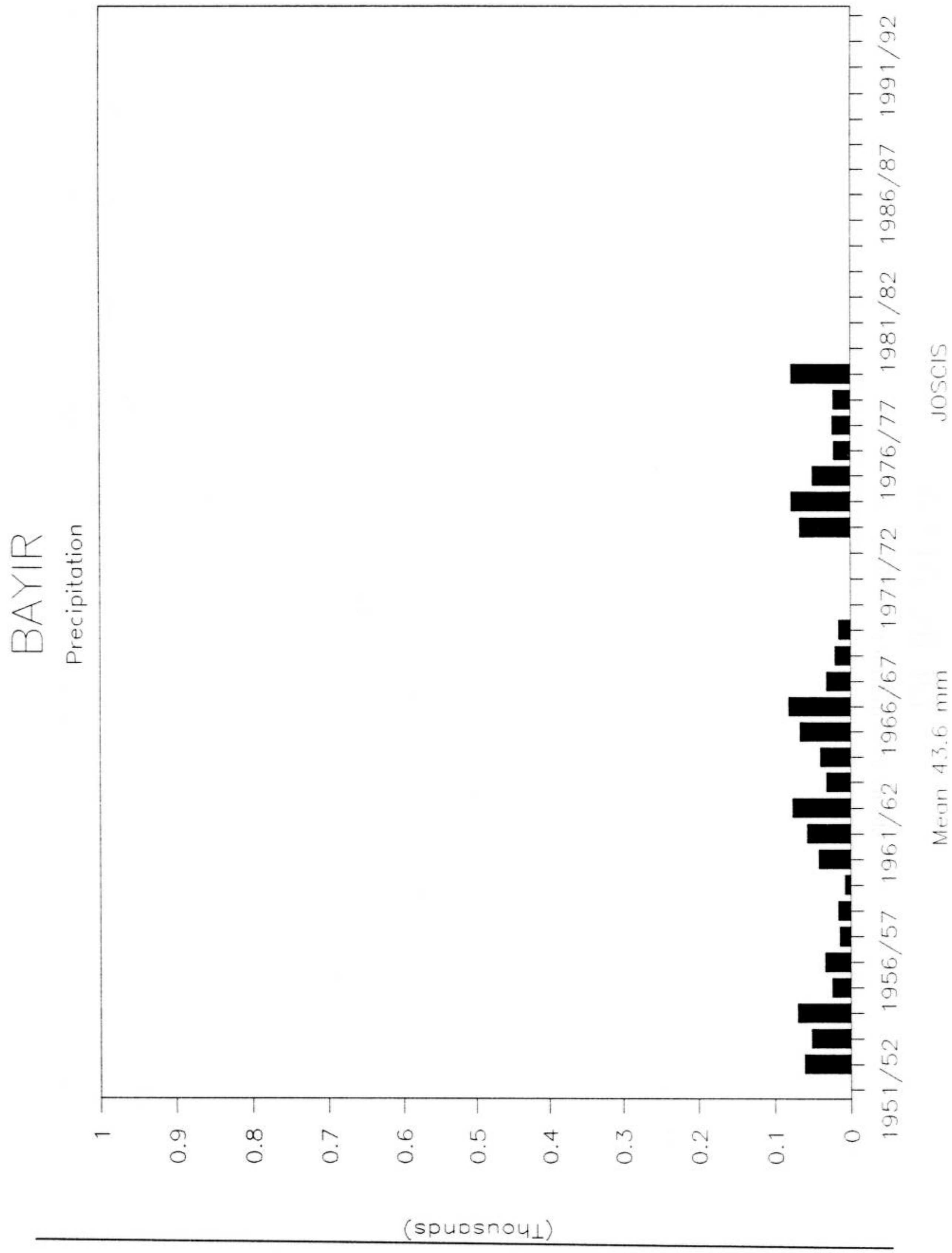

AZRAQ
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

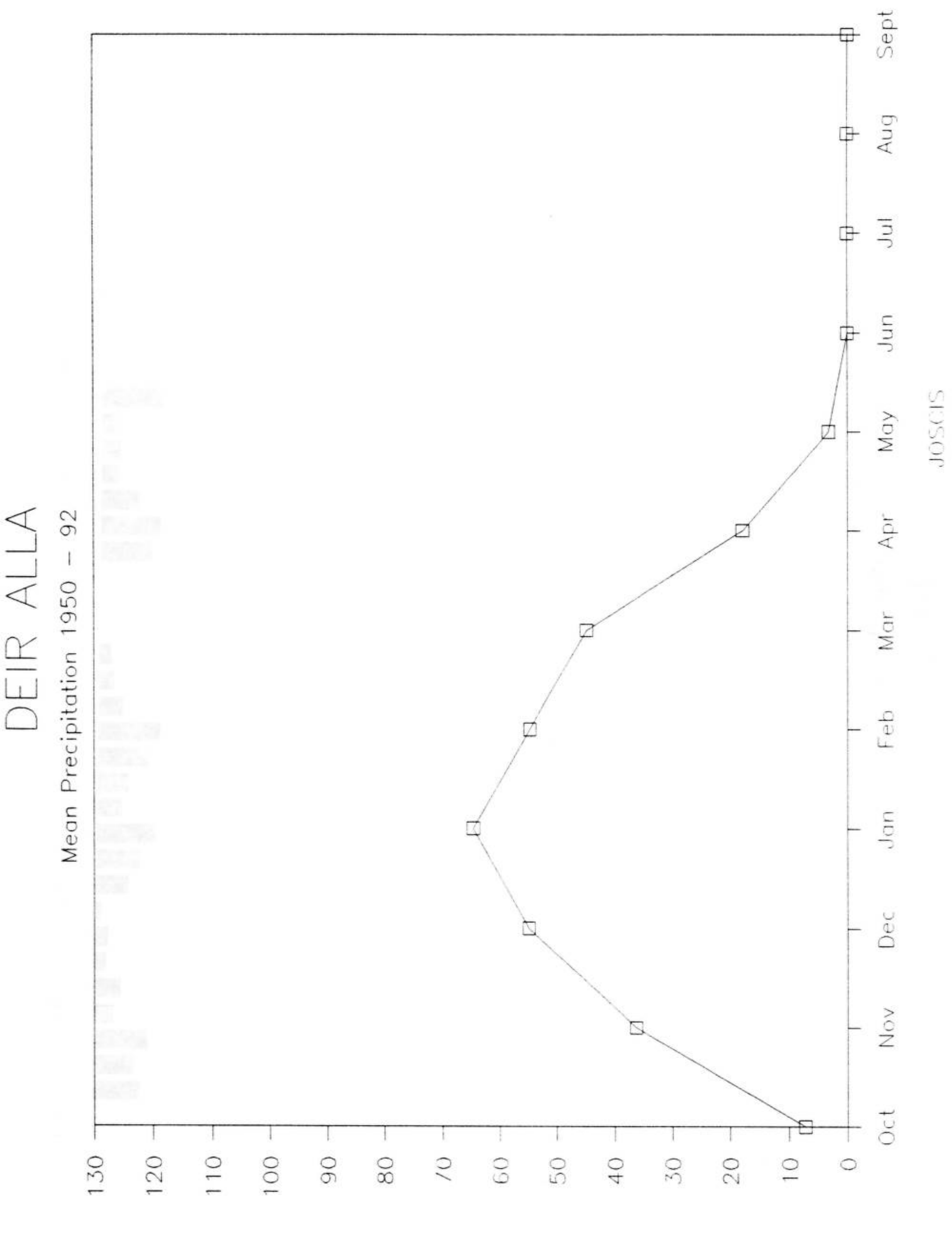

AZRAQ
Precipitation
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 63.7 mm
JOSCIS

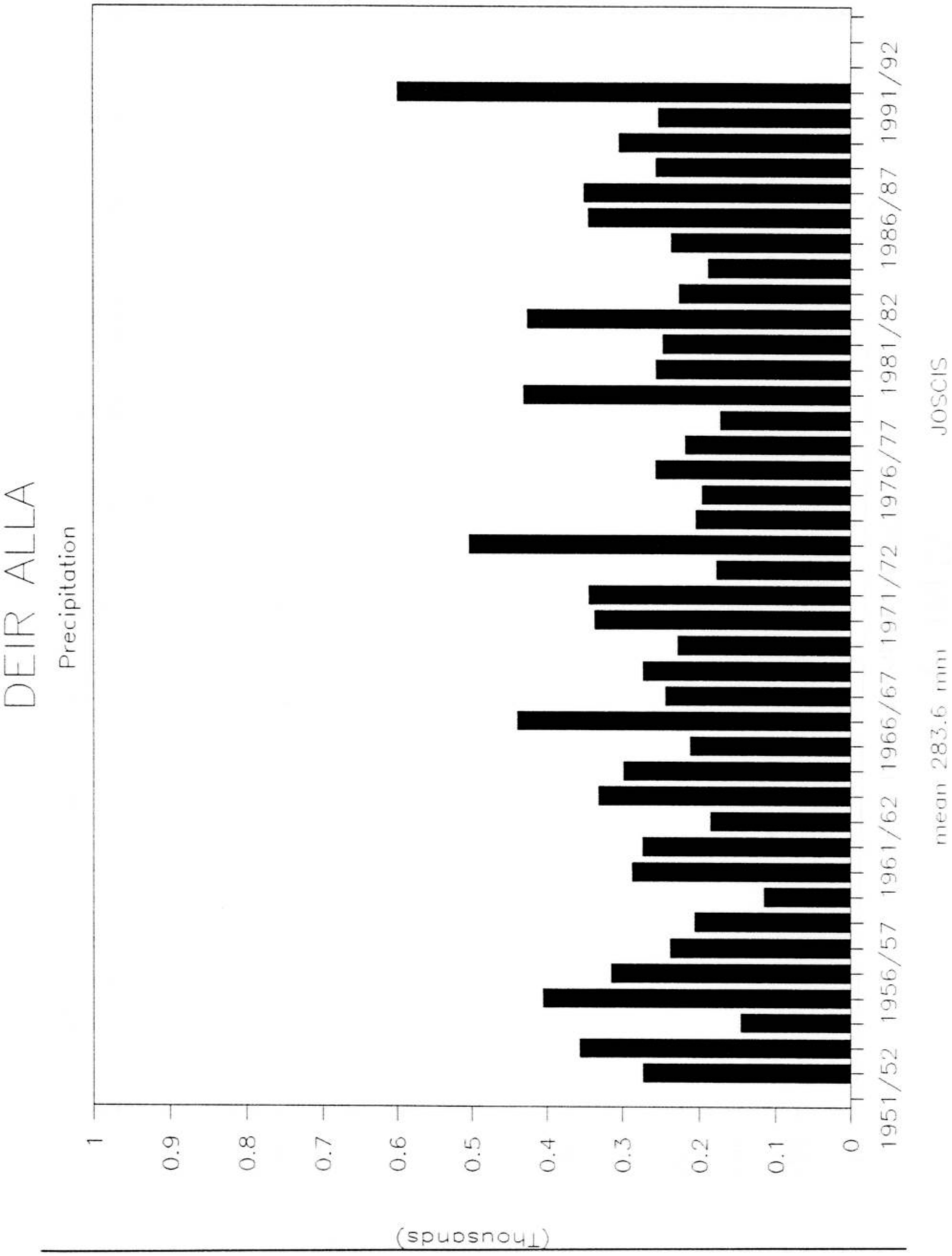

BAQURA MET. STATION
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

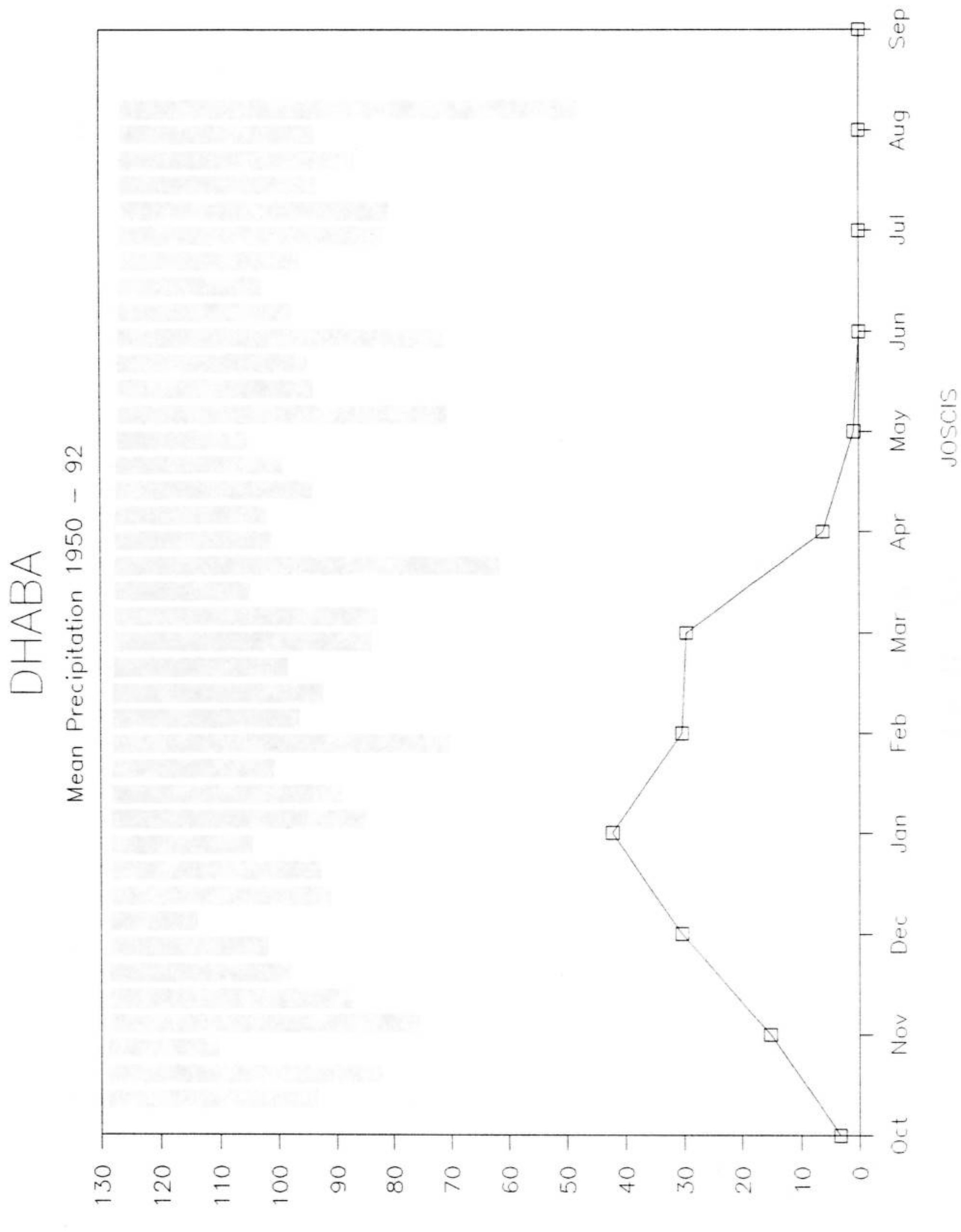

BAQURA MET. STATION
Precipitation
Mean Precipitation 392.3 mm
JOSCIS
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

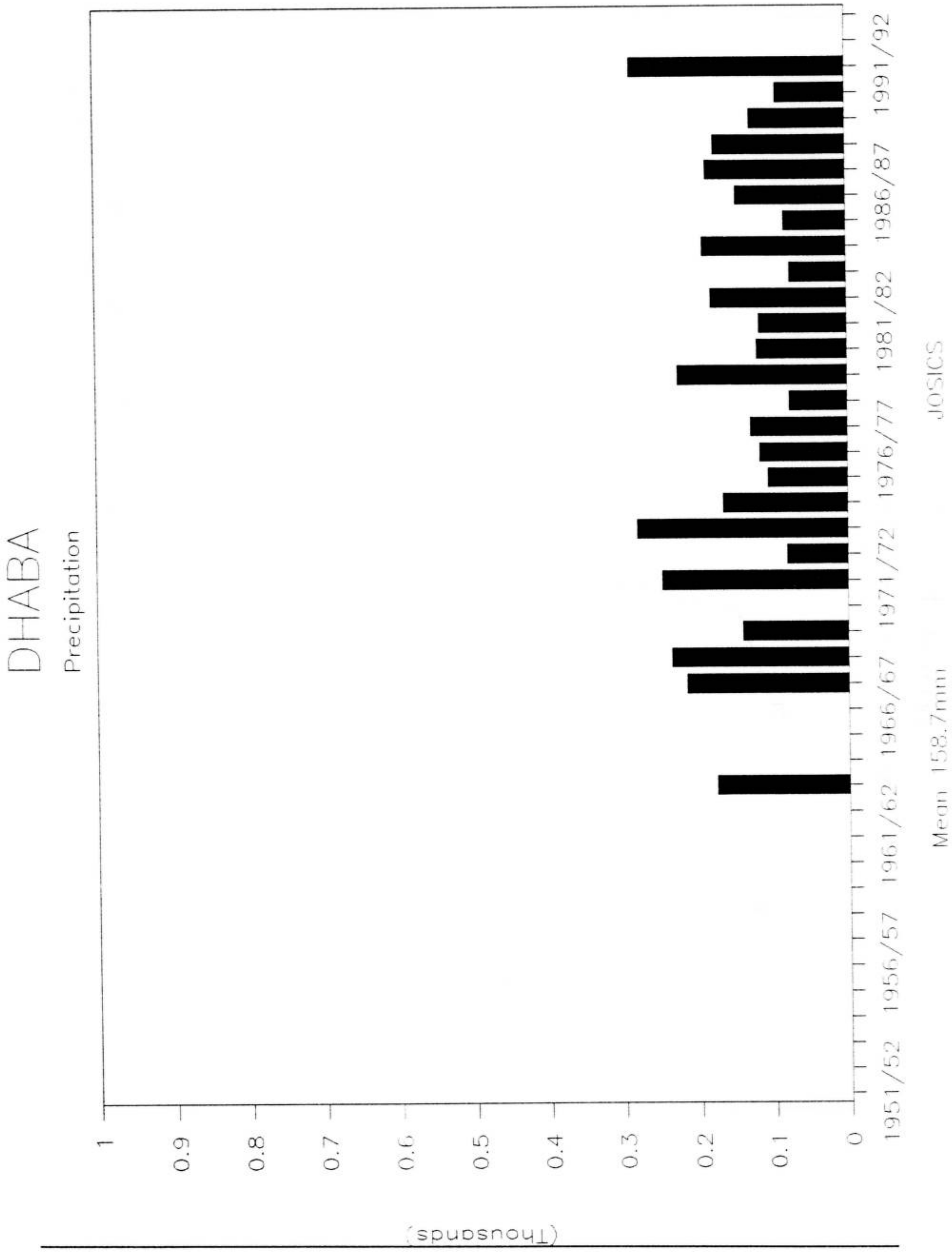

BAYIR
Mean Precipitation 1950 – 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
0
10
20
30
40
50
60
70
80
90
100
110
120
130
JOSCIS


BAYIR
Precipitation
Mean 43.6 mm
JOSCIS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

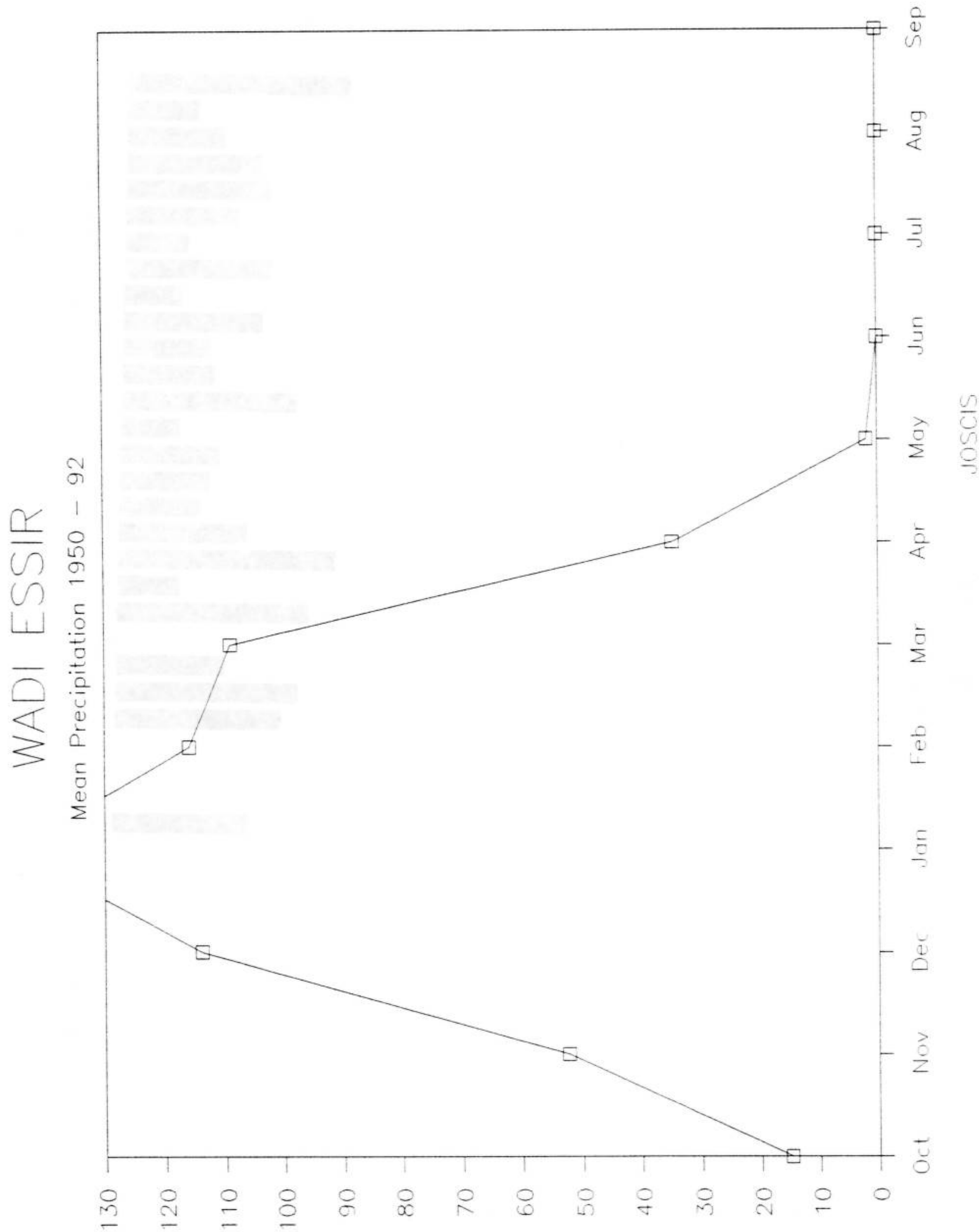

DEIR ALLA
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
JOSCIS

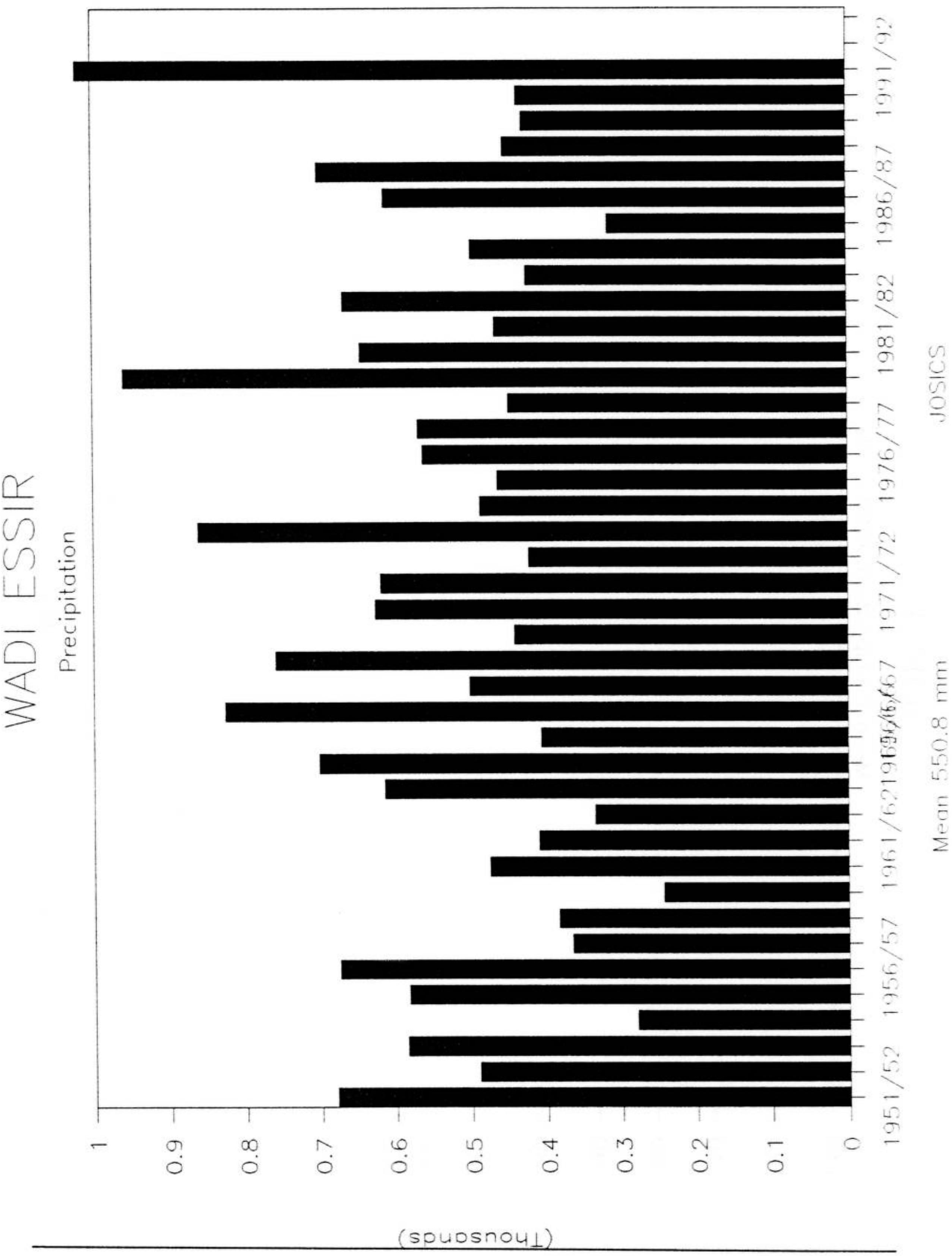

DEIR ALLA
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
mean 283.6 mm
JOSCIS
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)

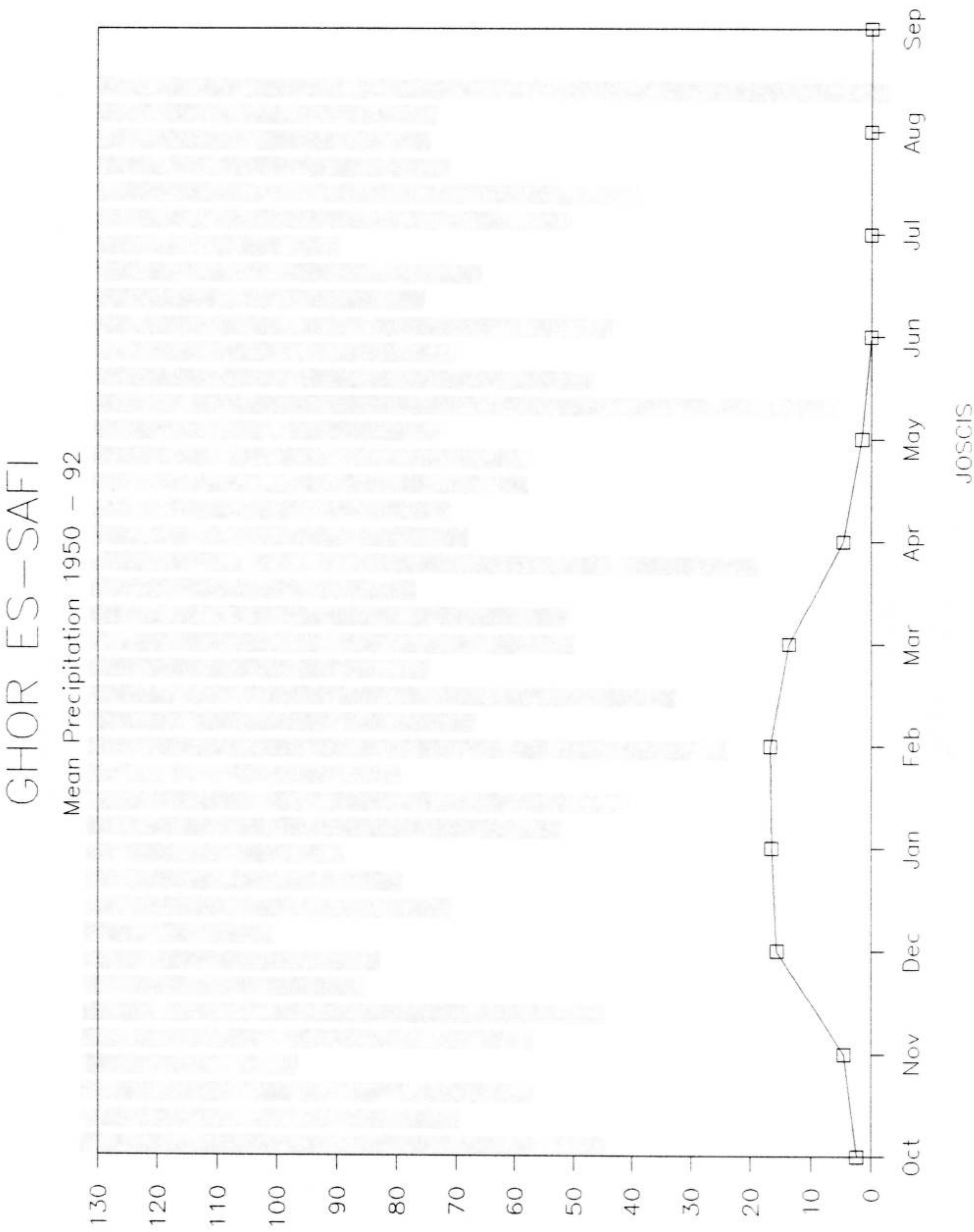

DHABA
Mean Precipitation 1950 - 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
130 120 110 100 90 80 70 60 50 40 30 20 10 0

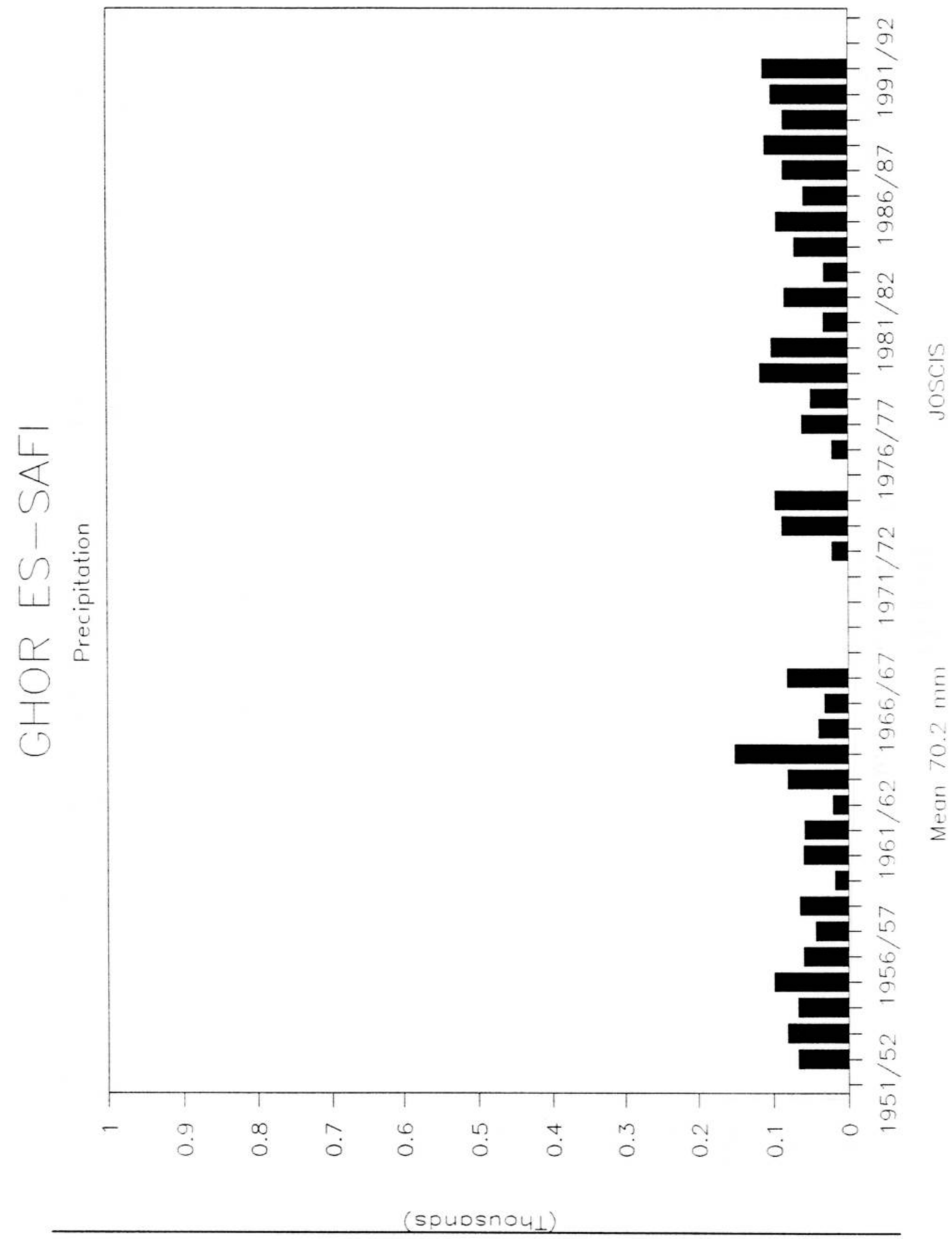


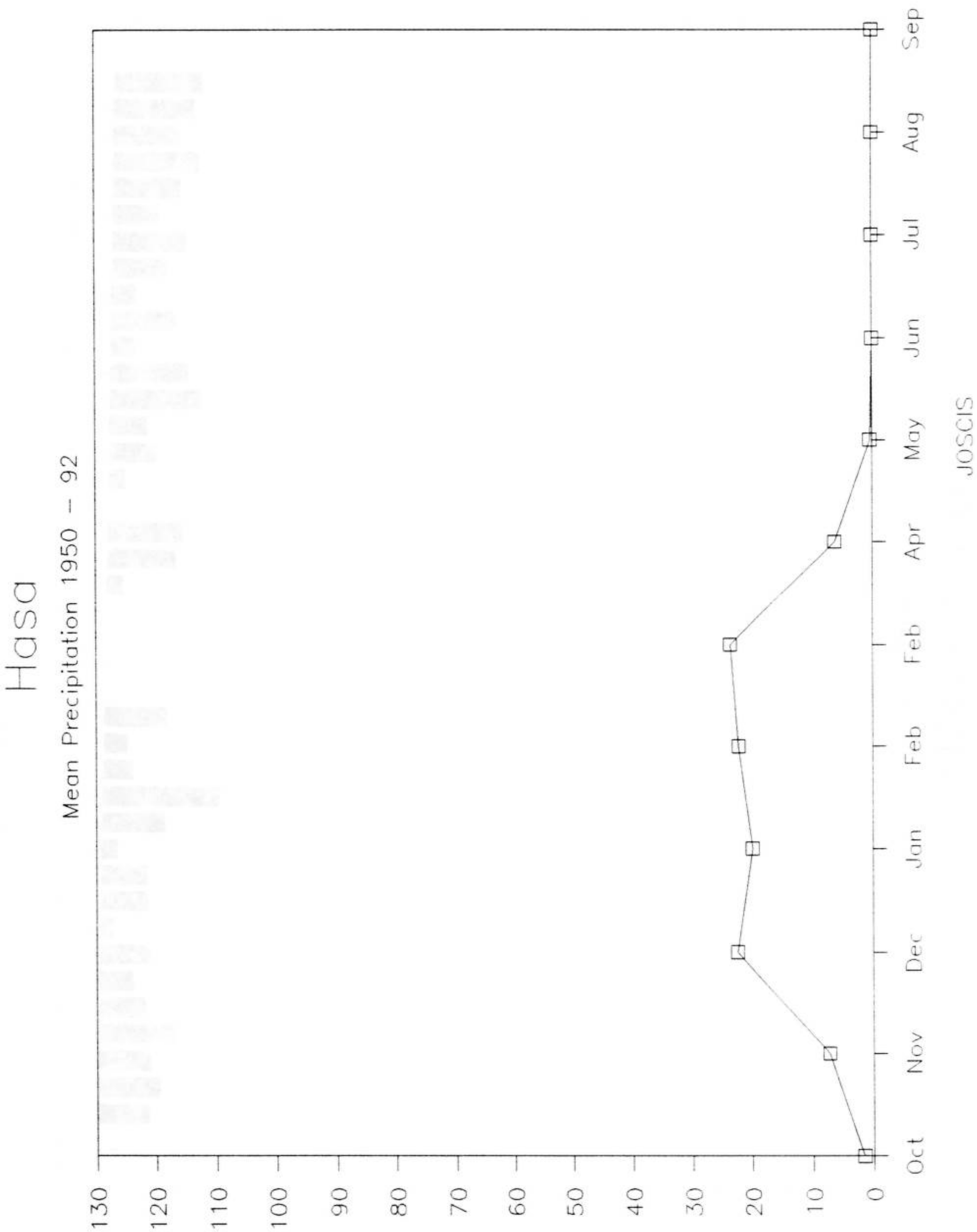
DHABA
Precipitation
Mean 158.7mm
JOSICS
1951/52 1956/57 1961/62 1966/67 1971/72 1976/77 1981/82 1986/87 1991/92
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
(Thousands)

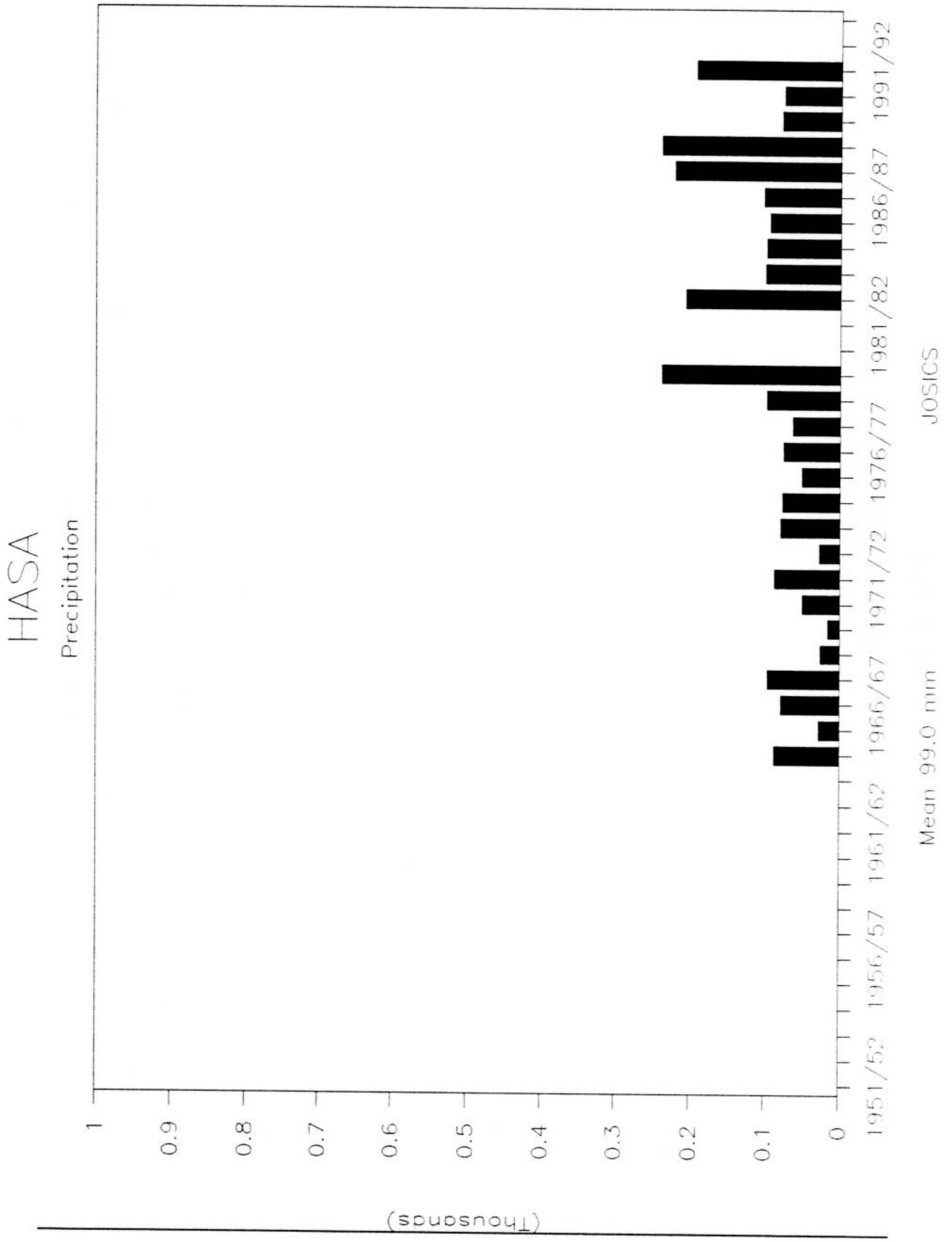

WADI ESSIR
Mean Precipitation 1950 - 92
130 120 110 100 90 80 70 60 50 40 30 20 10 0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
JOSCIS

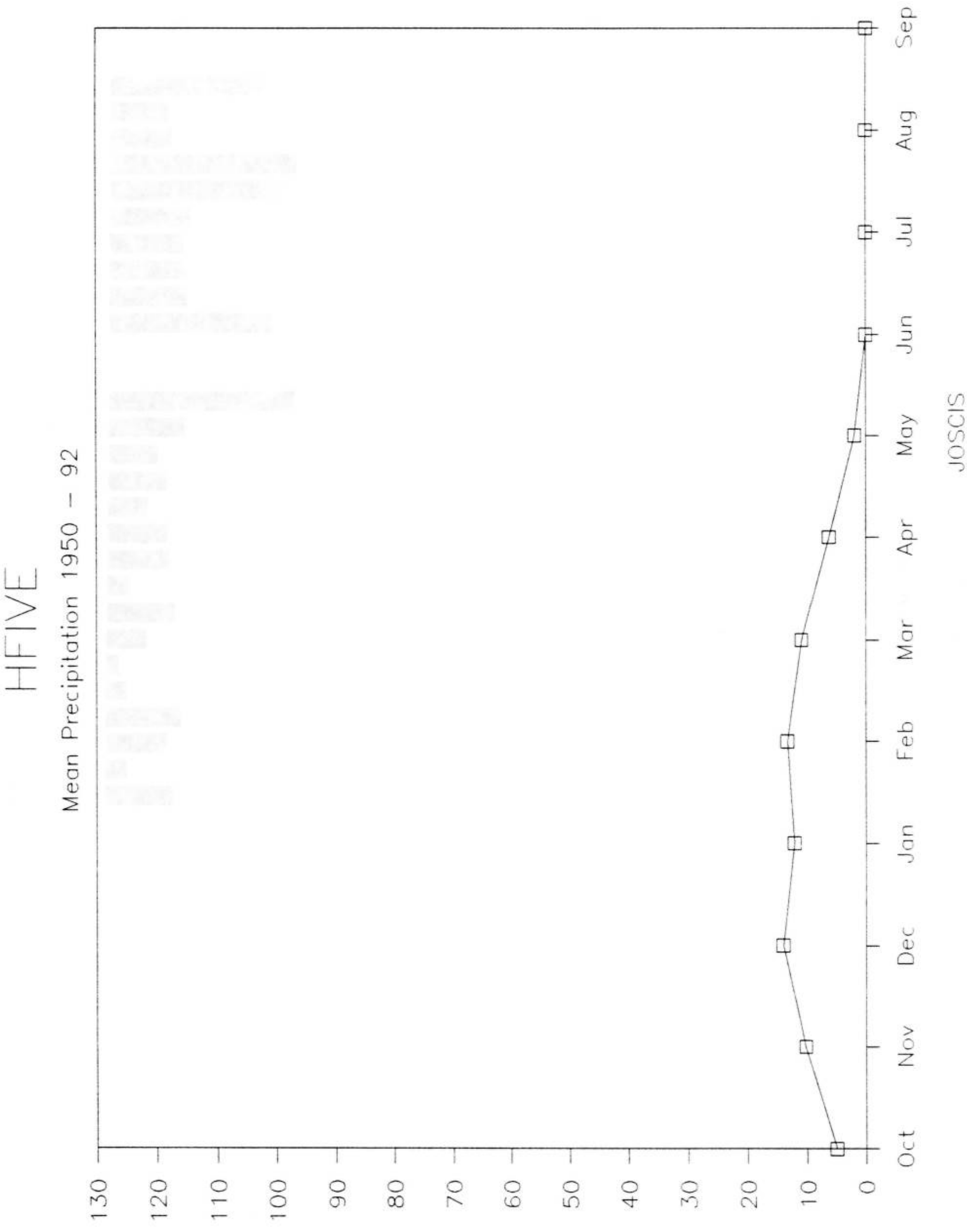

WADI ESSIR
Precipitation
JOSICS
Mean 550.8 mm
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

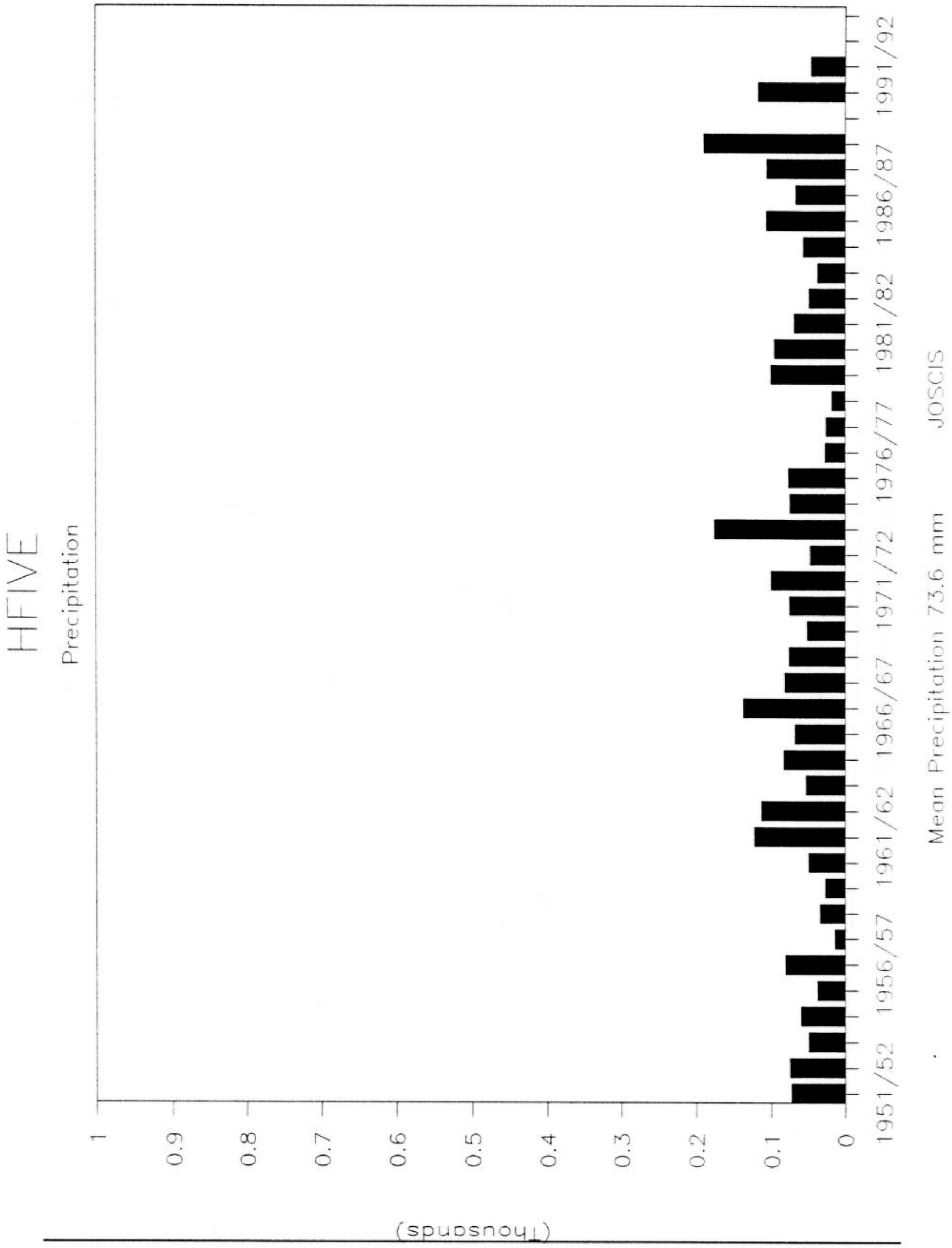

GHOR ES-SAFI
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

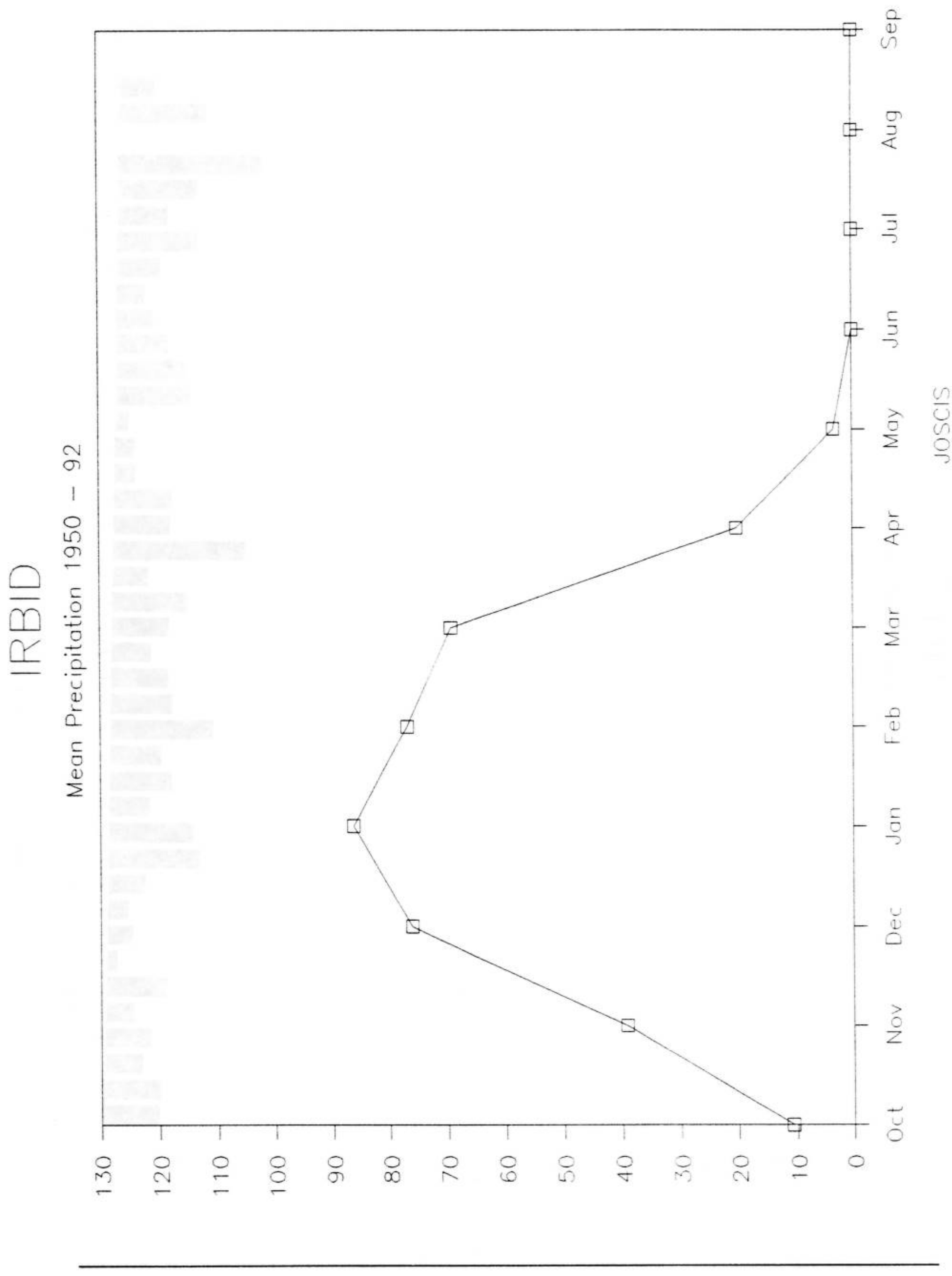

GHOR ES-SAFI
Precipitation
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 70.2 mm
JOSCIS

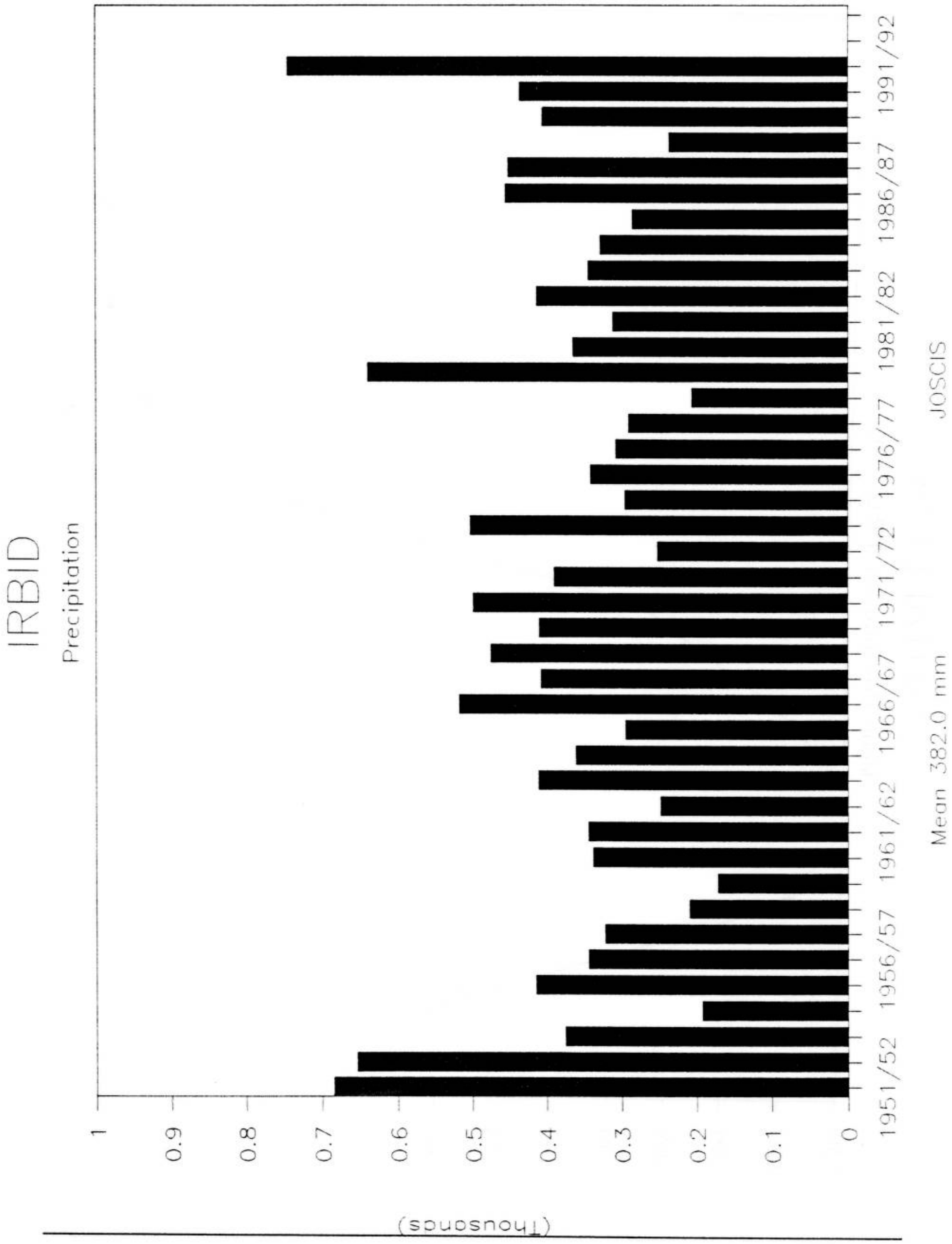

Hasa
Mean Precipitation 1950 – 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Feb
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

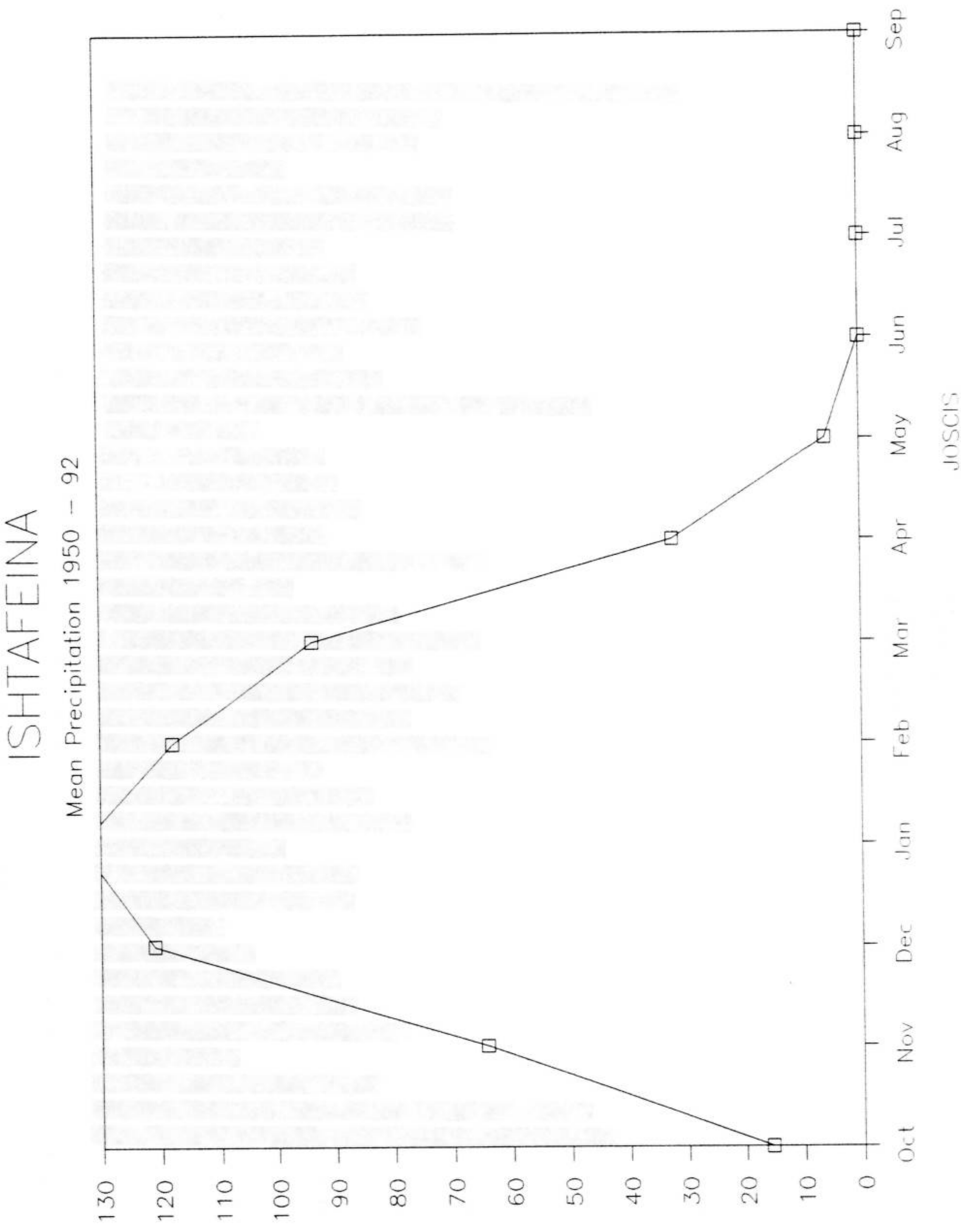

HASA
Precipitation
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 99.0 mm
JOSICS

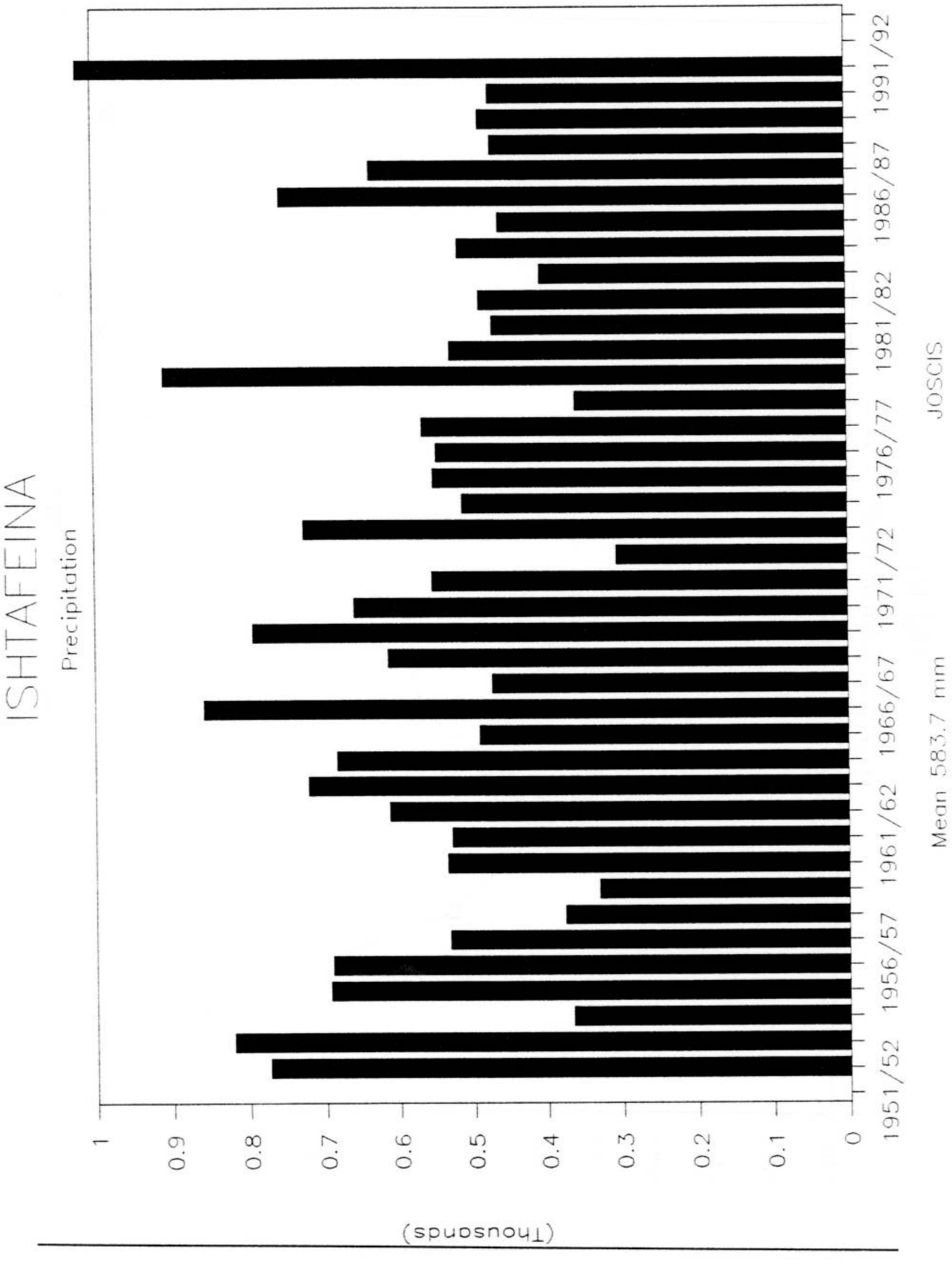

HFIVE
Mean Precipitation 1950 - 92
JOSCIS
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0

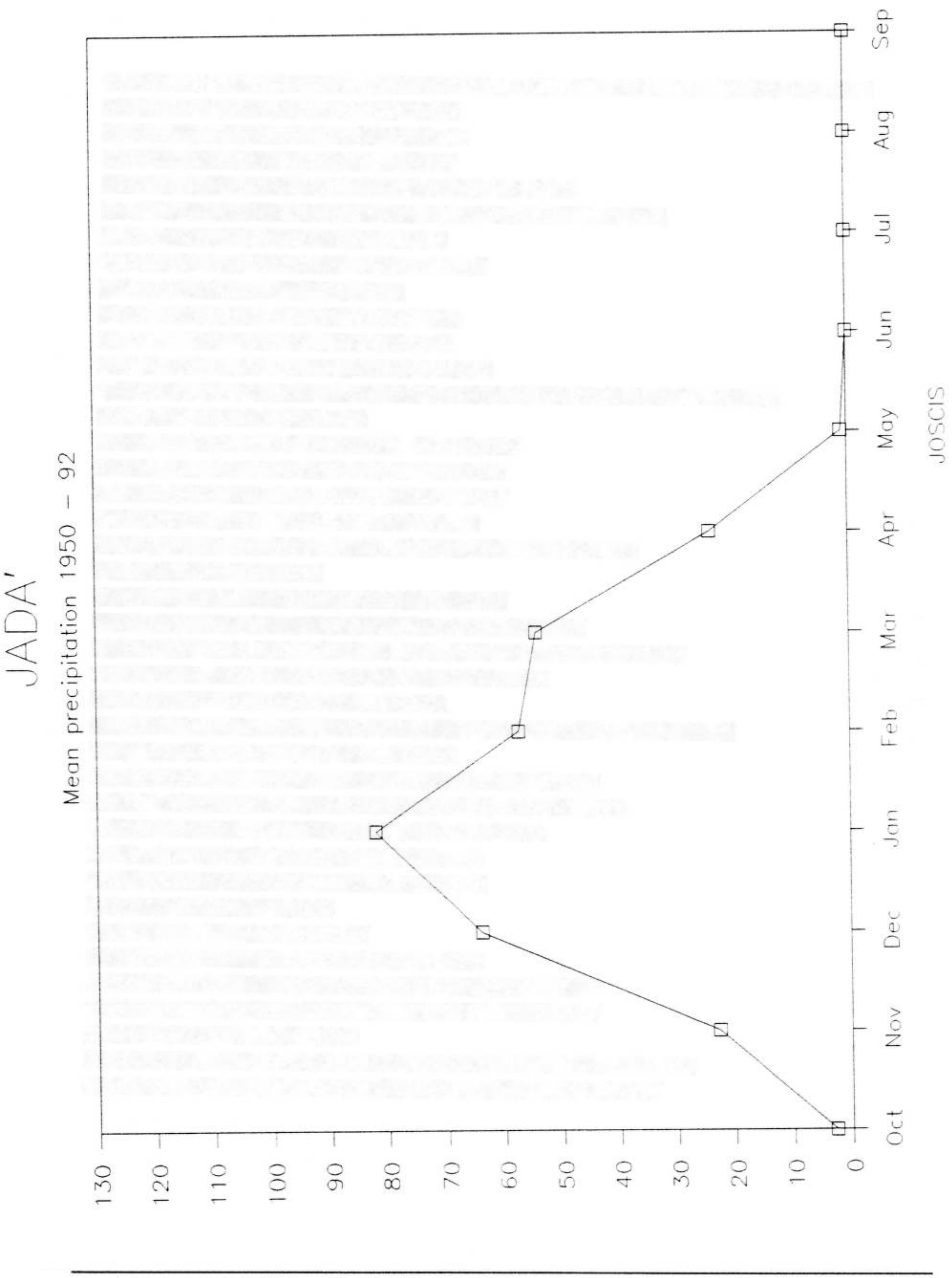

HFIVE
Precipitation
Mean Precipitation 73.6 mm
JOSCIS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

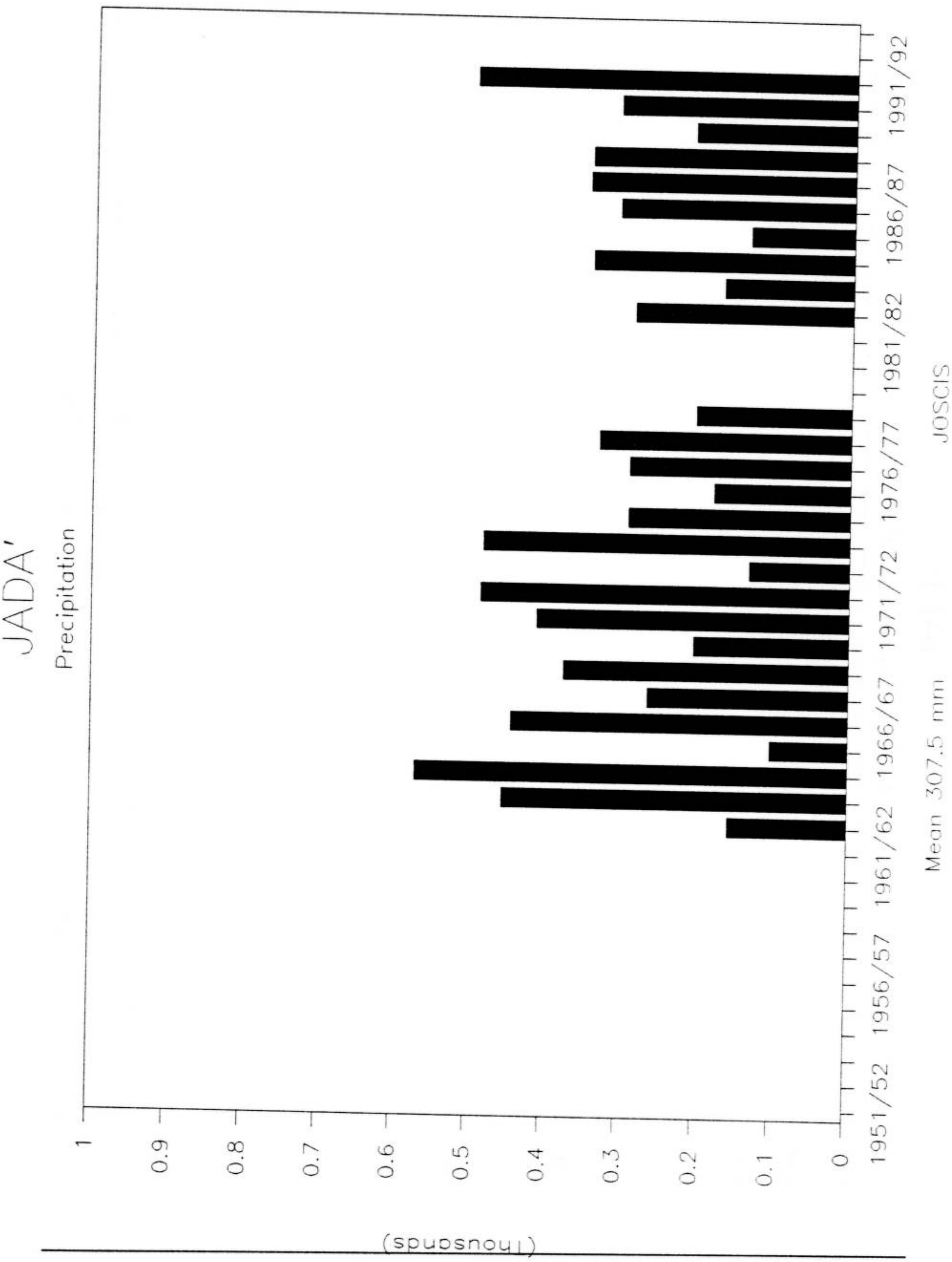

IRBID
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

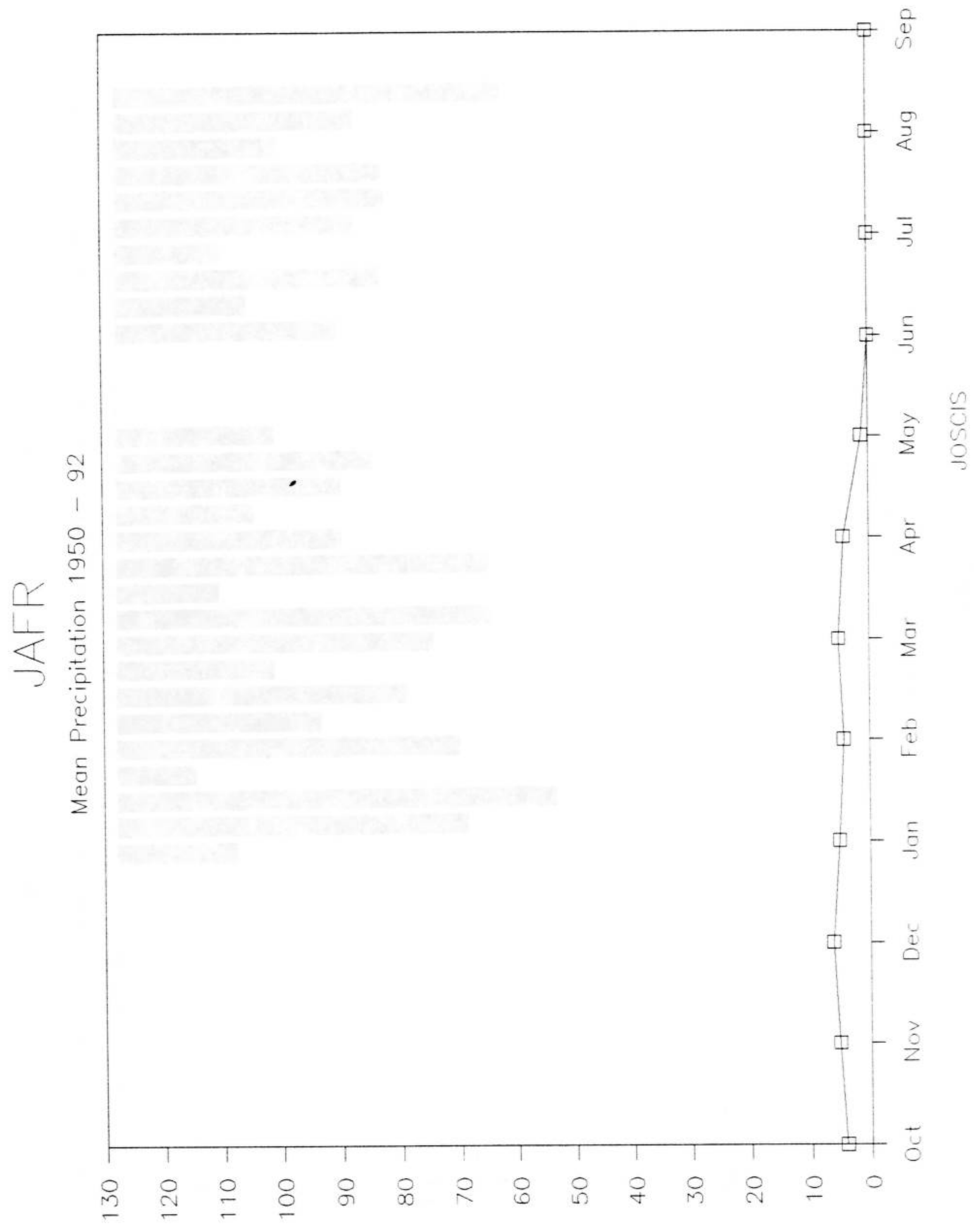

IRBID
Precipitation
JOSCIS
Mean 382.0 mm
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

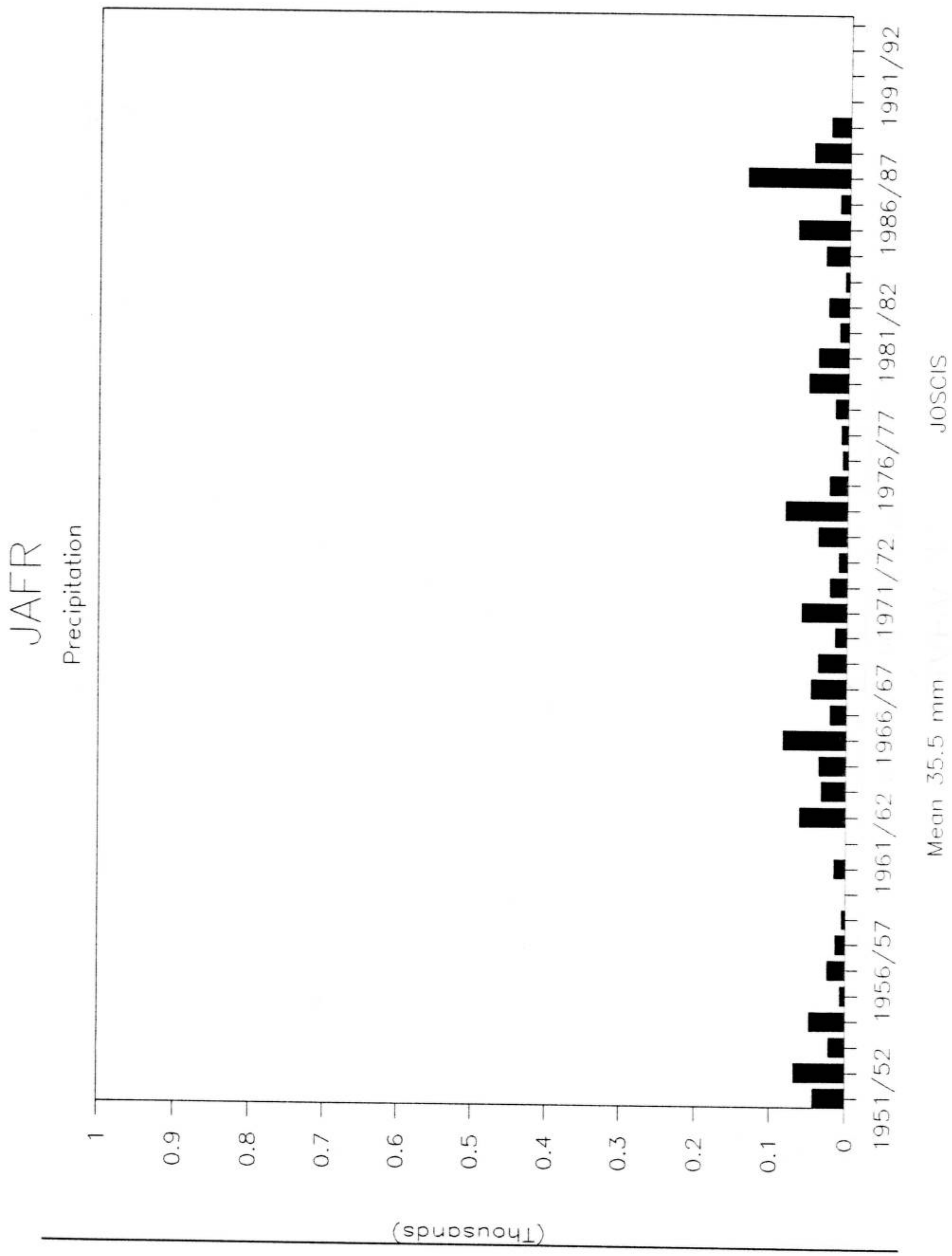

ISHTAFEINA
Mean Precipitation 1950 - 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
130 120 110 100 90 80 70 60 50 40 30 20 10 0

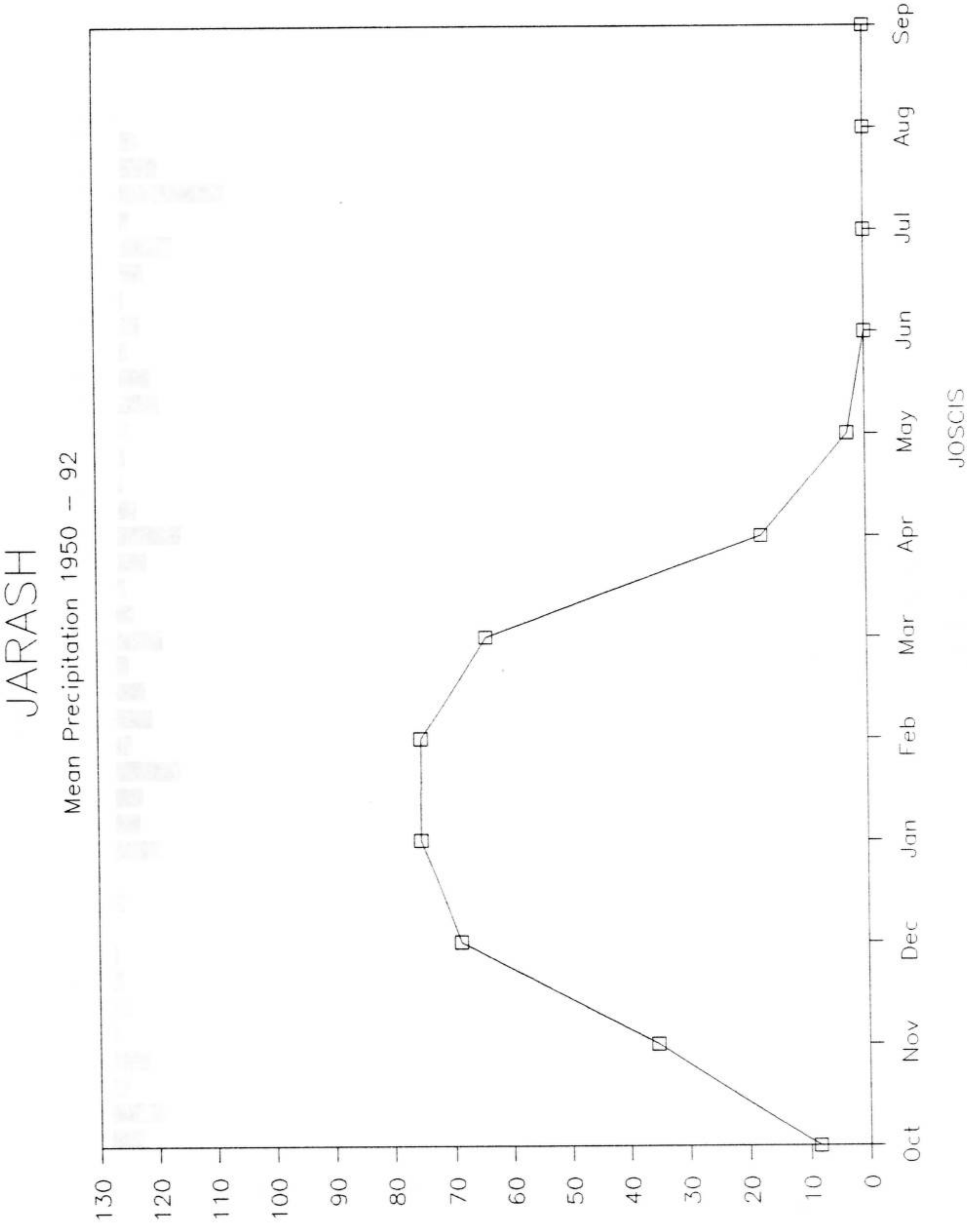

ISHTAFEINA
Precipitation
JOSCIS
Mean 583.7 mm
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

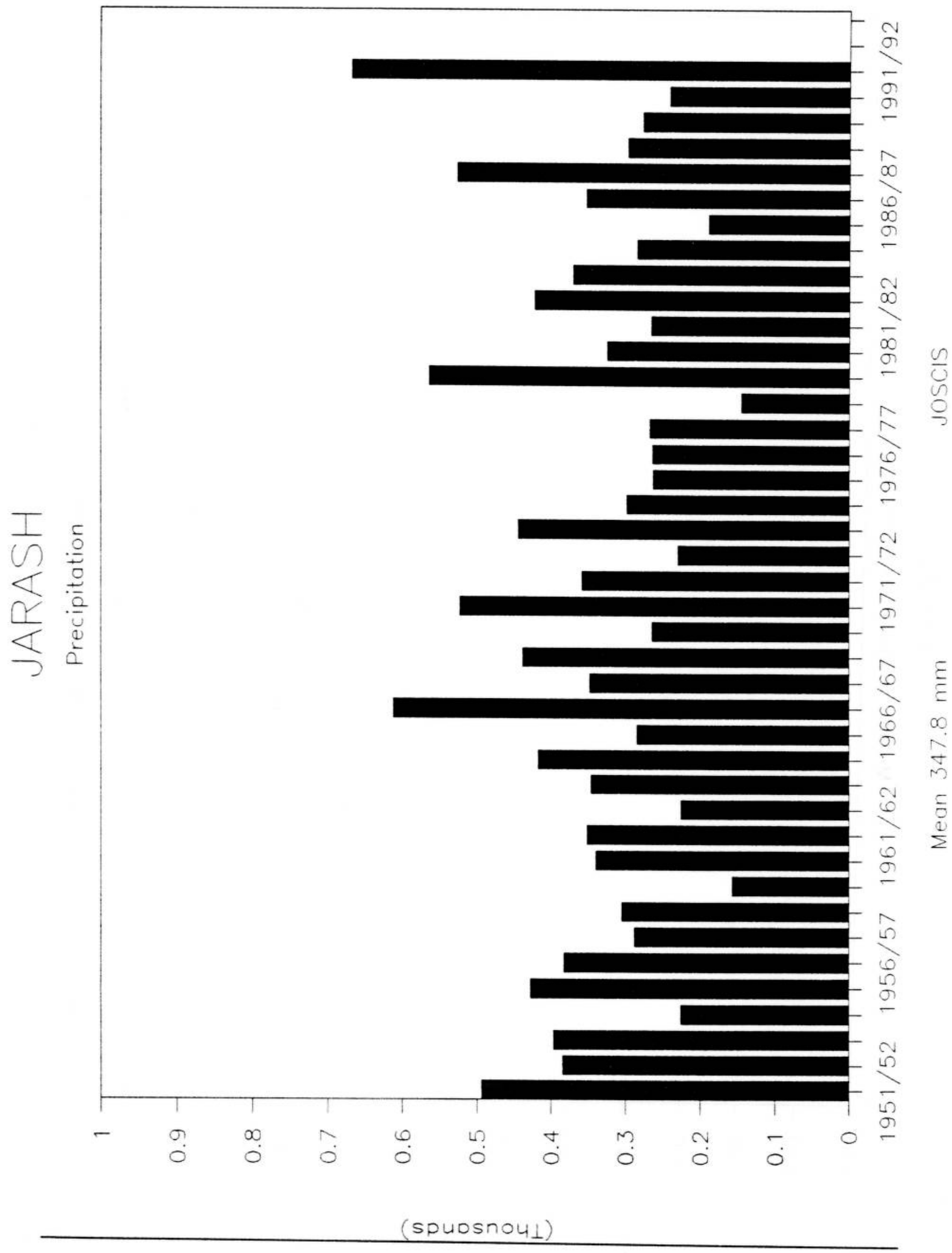

JADA'
Mean precipitation 1950 - 92
JOSCIS
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
0
10
20
30
40
50
60
70
80
90
100
110
120
130

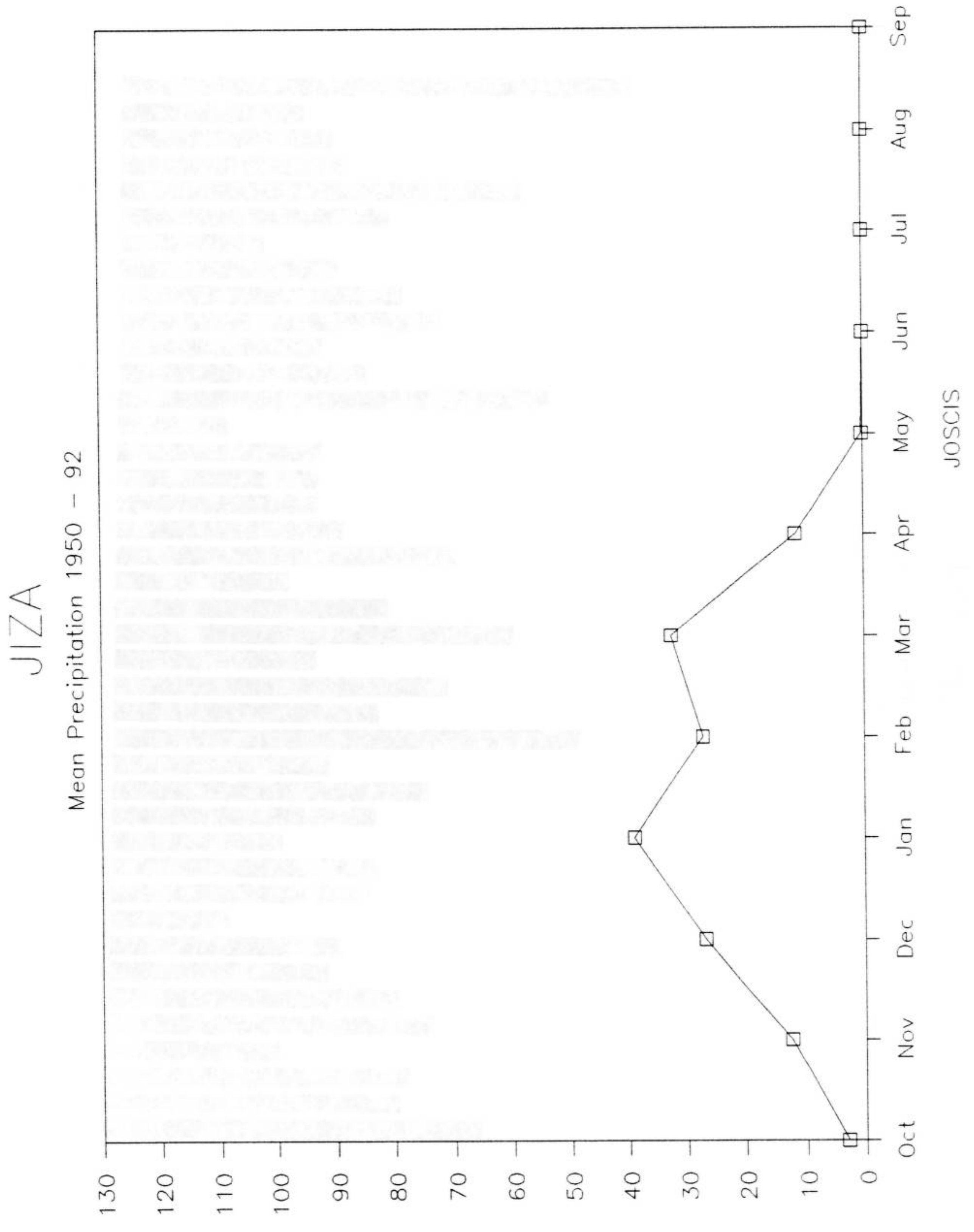

JADA'
Precipitation
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 307.5 mm
JOSCIS

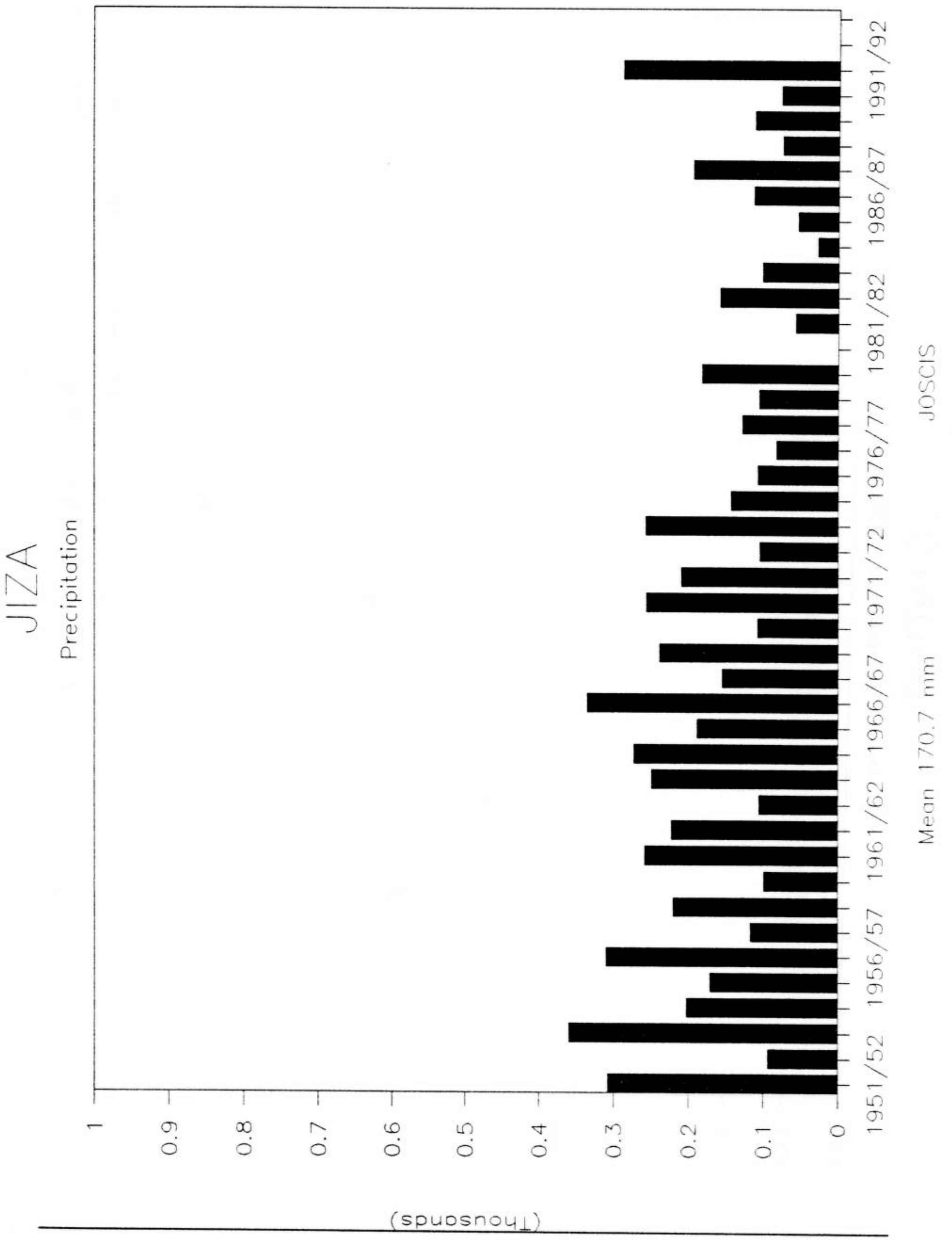

JAFR
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
0
10
20
30
40
50
60
70
80
90
100
110
120
130
JOSCIS

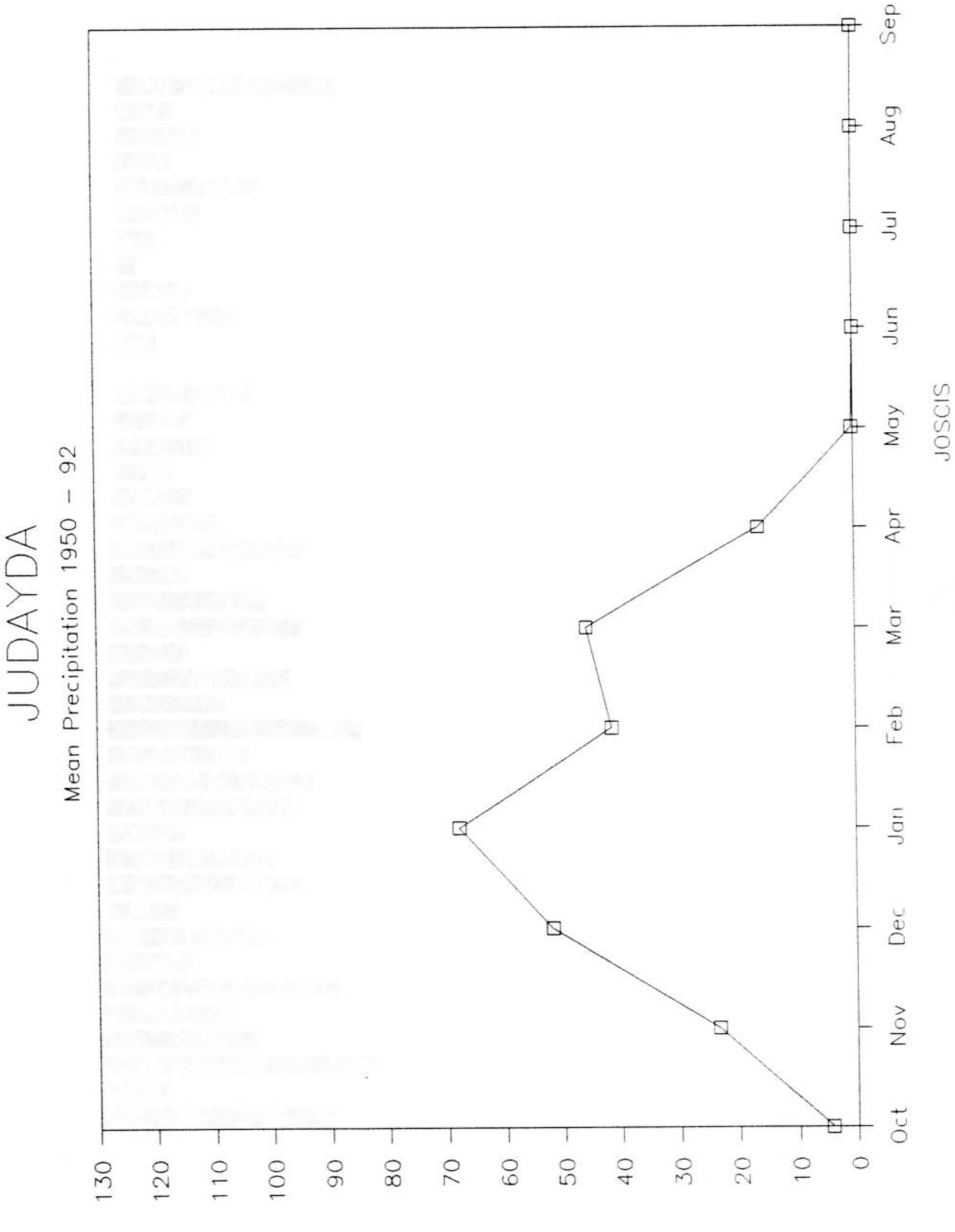

JAFR
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 35.5 mm
JOSCIS
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)

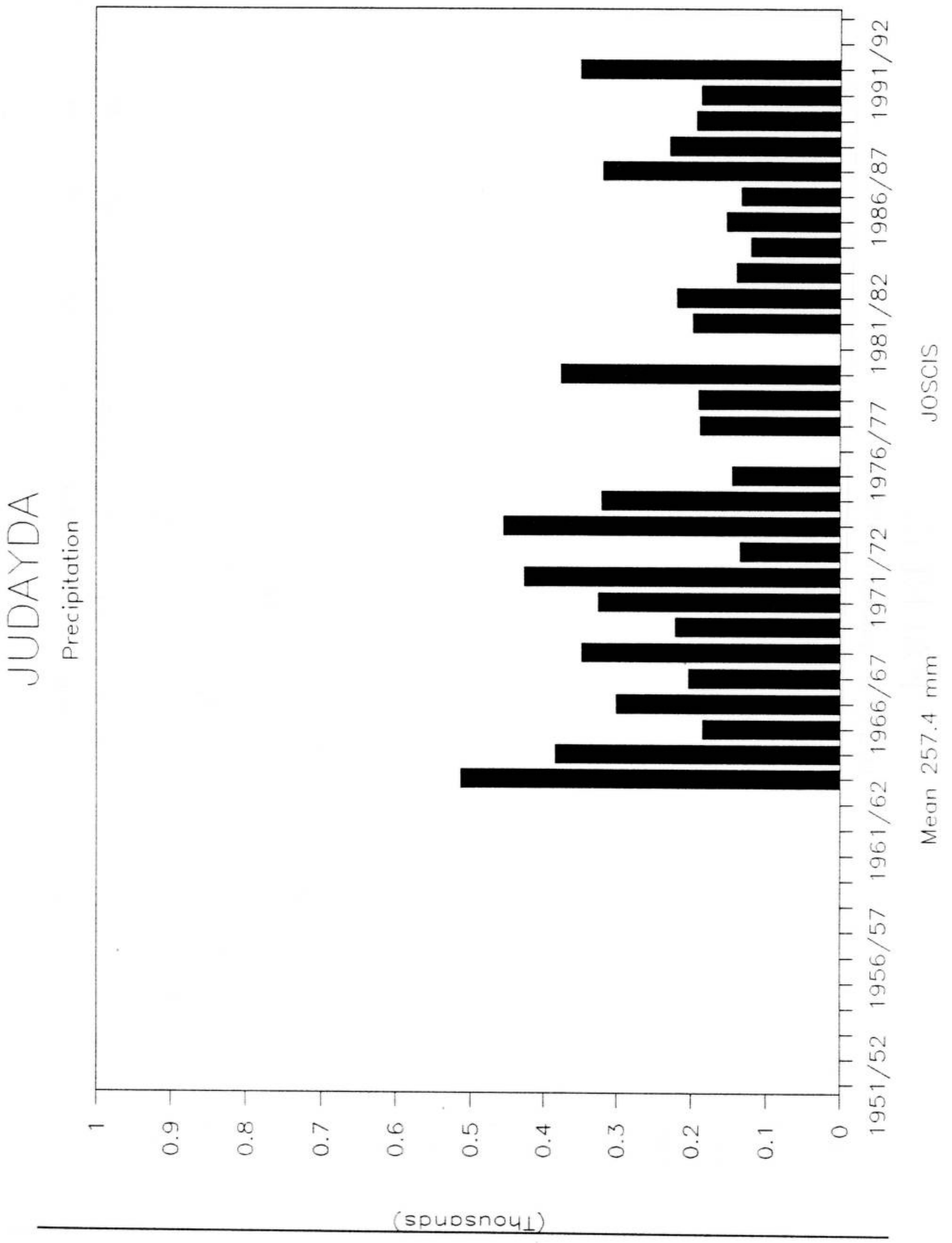

JARASH
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

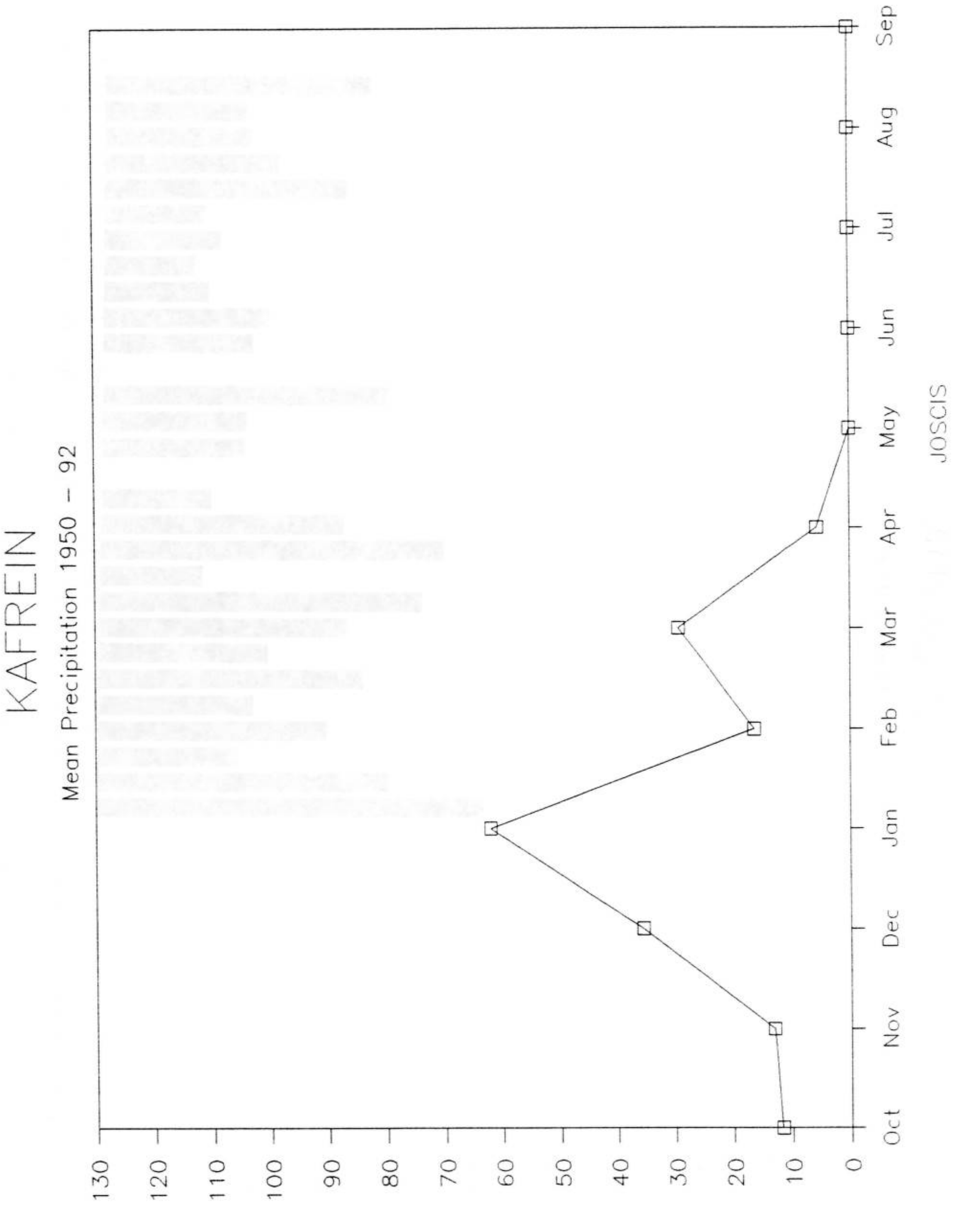

JARASH
Precipitation
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 347.8 mm
JOSCIS

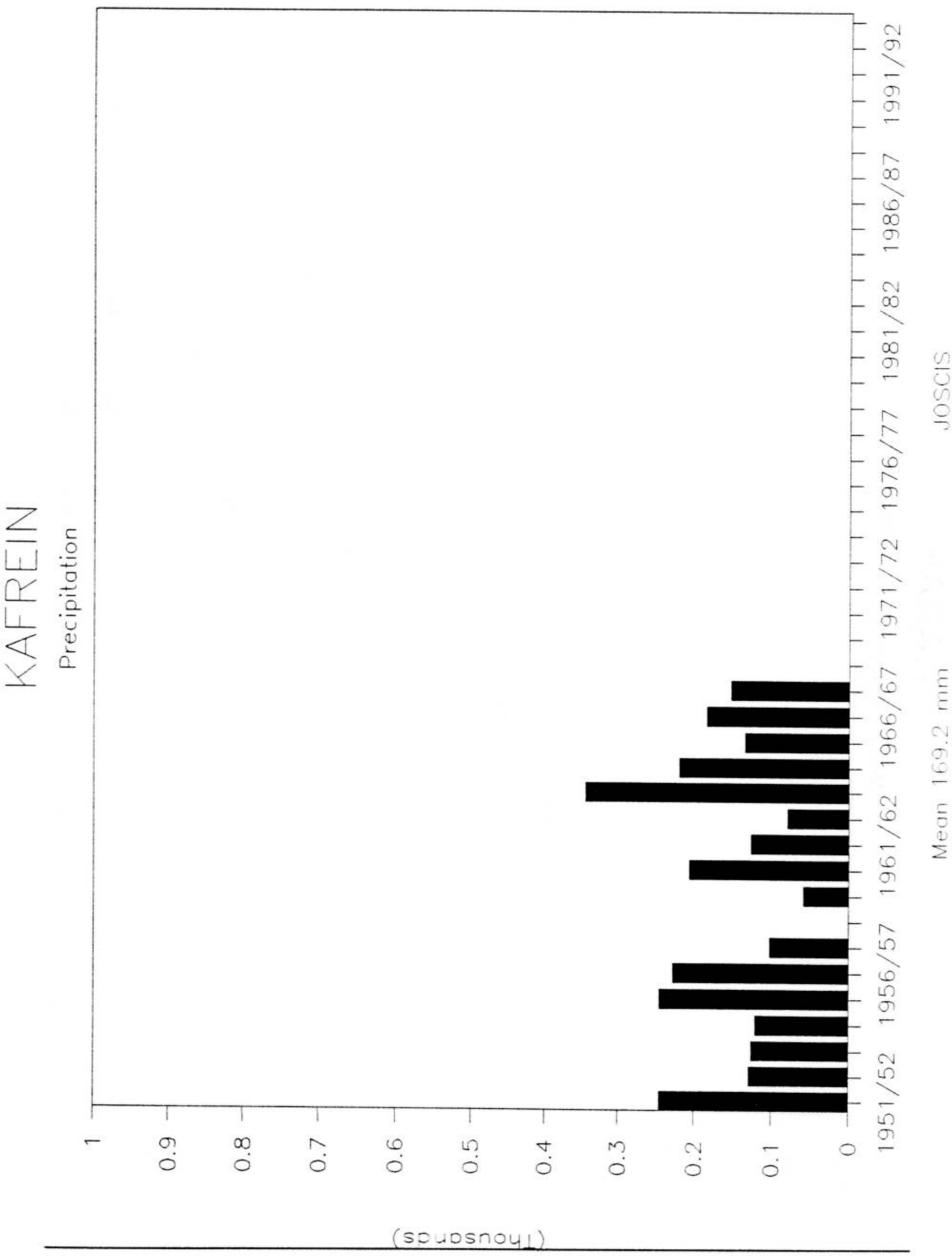

JIZA
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS
130
120
110
100
90
80
70
60
50
40
30
20
10
0

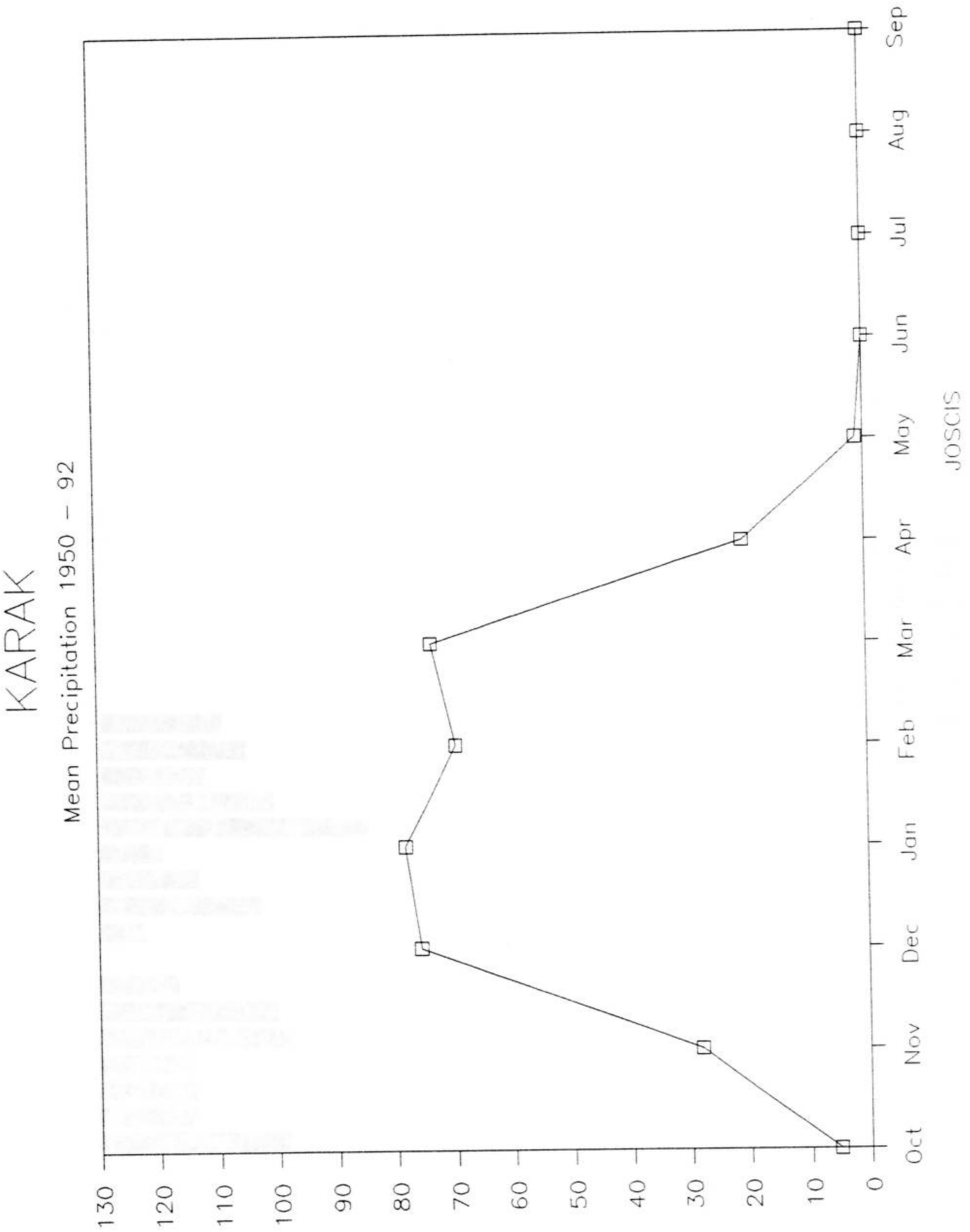

JIZA
Precipitation
Mean 170.7 mm
JOSCIS
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

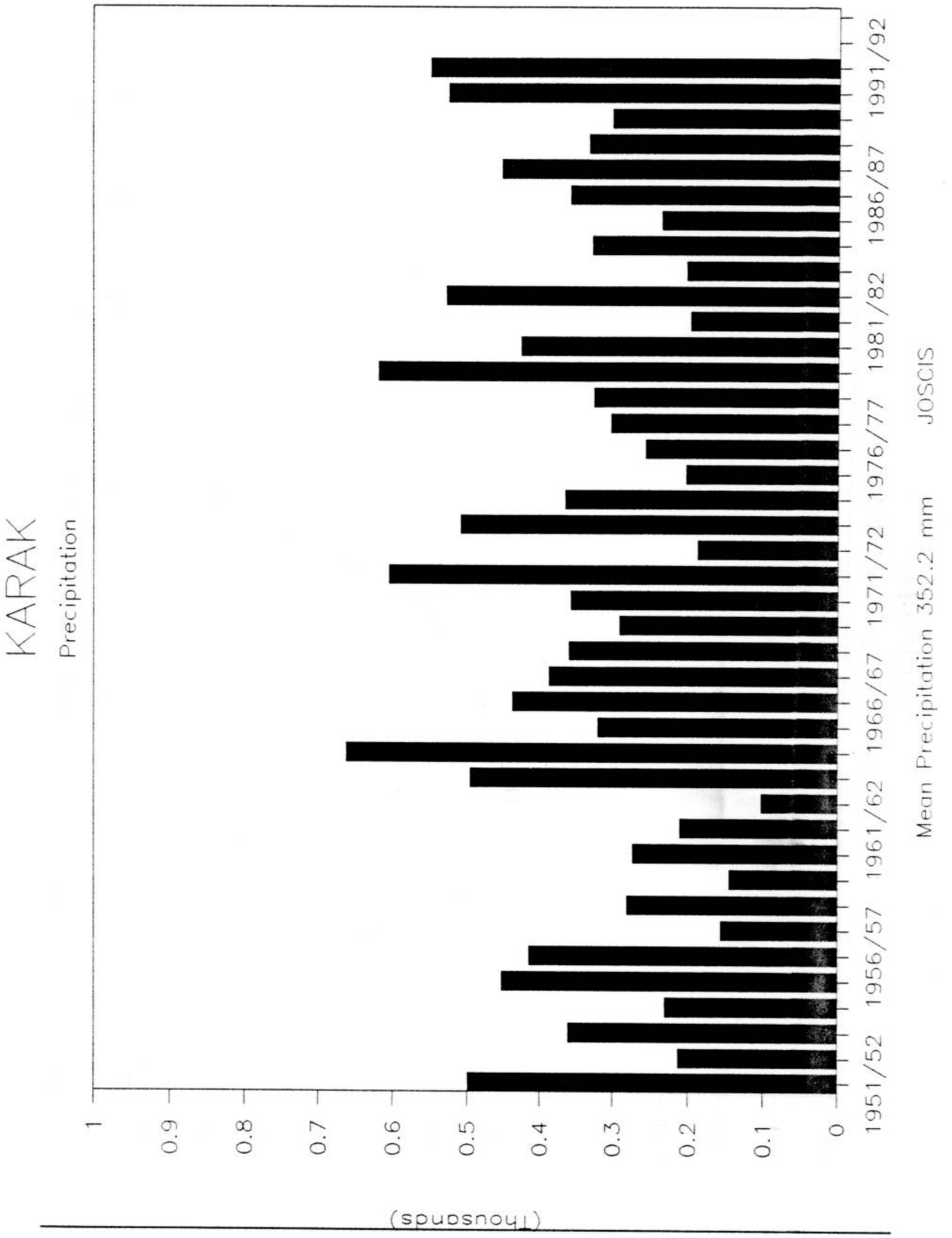

JUDAYDA
Mean Precipitation 1950 - 92
130 120 110 100 90 80 70 60 50 40 30 20 10 0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
JOSCIS

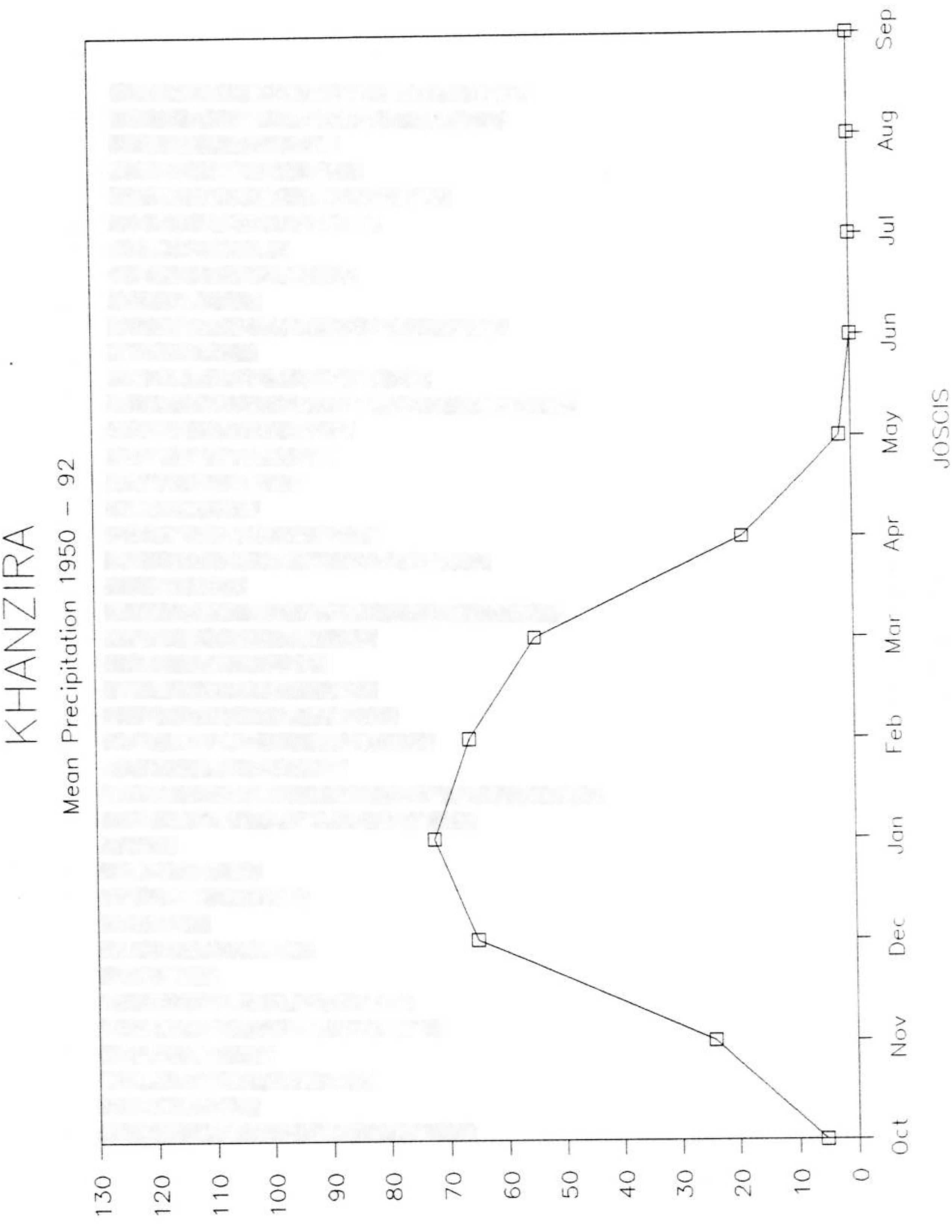

JUDAYDA
Precipitation
Mean 257.4 mm
JOSCIS
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

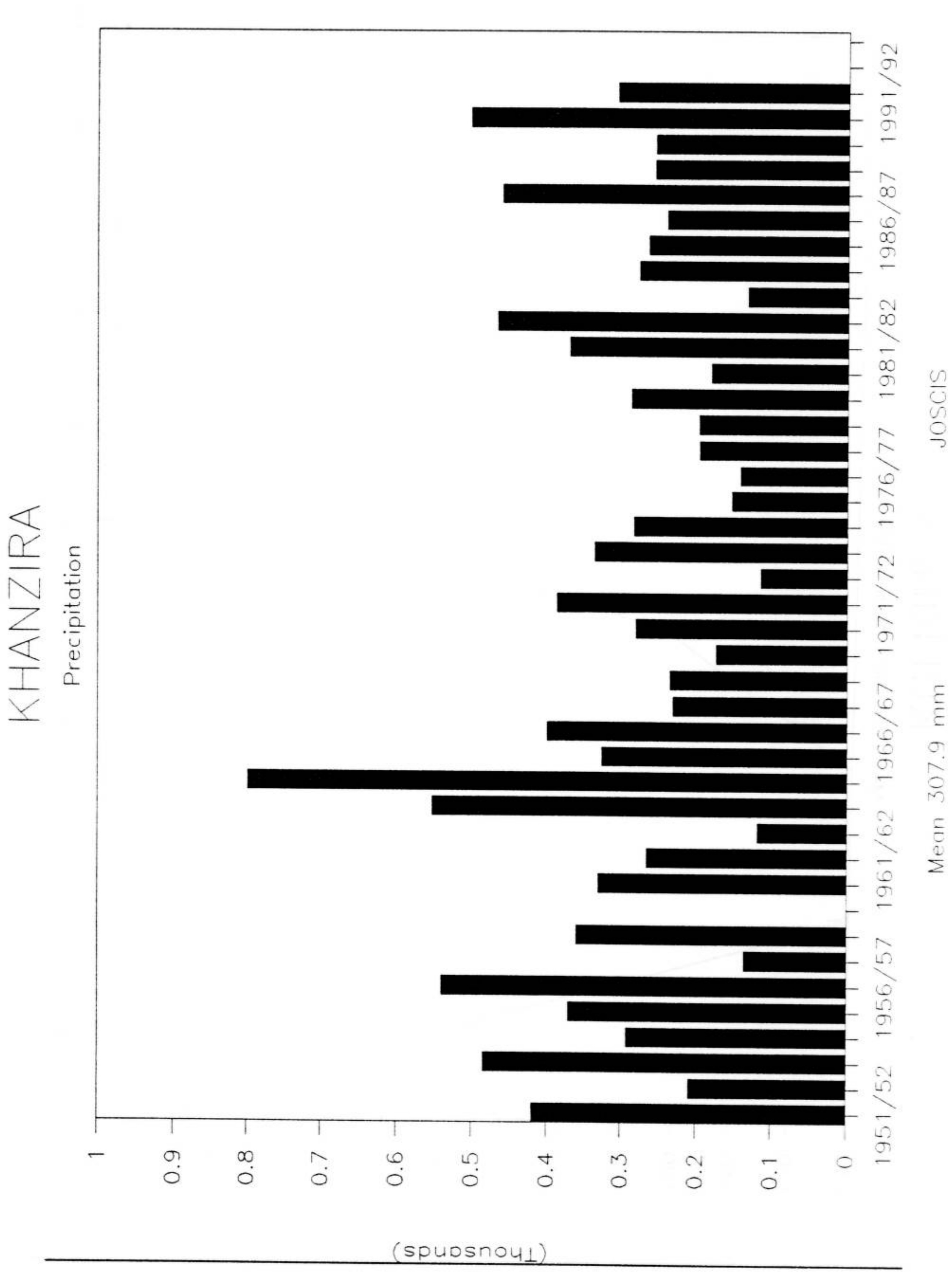

KAFREIN
Mean Precipitation 1950 - 92
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
0 10 20 30 40 50 60 70 80 90 100 110 120 130
JOSCIS

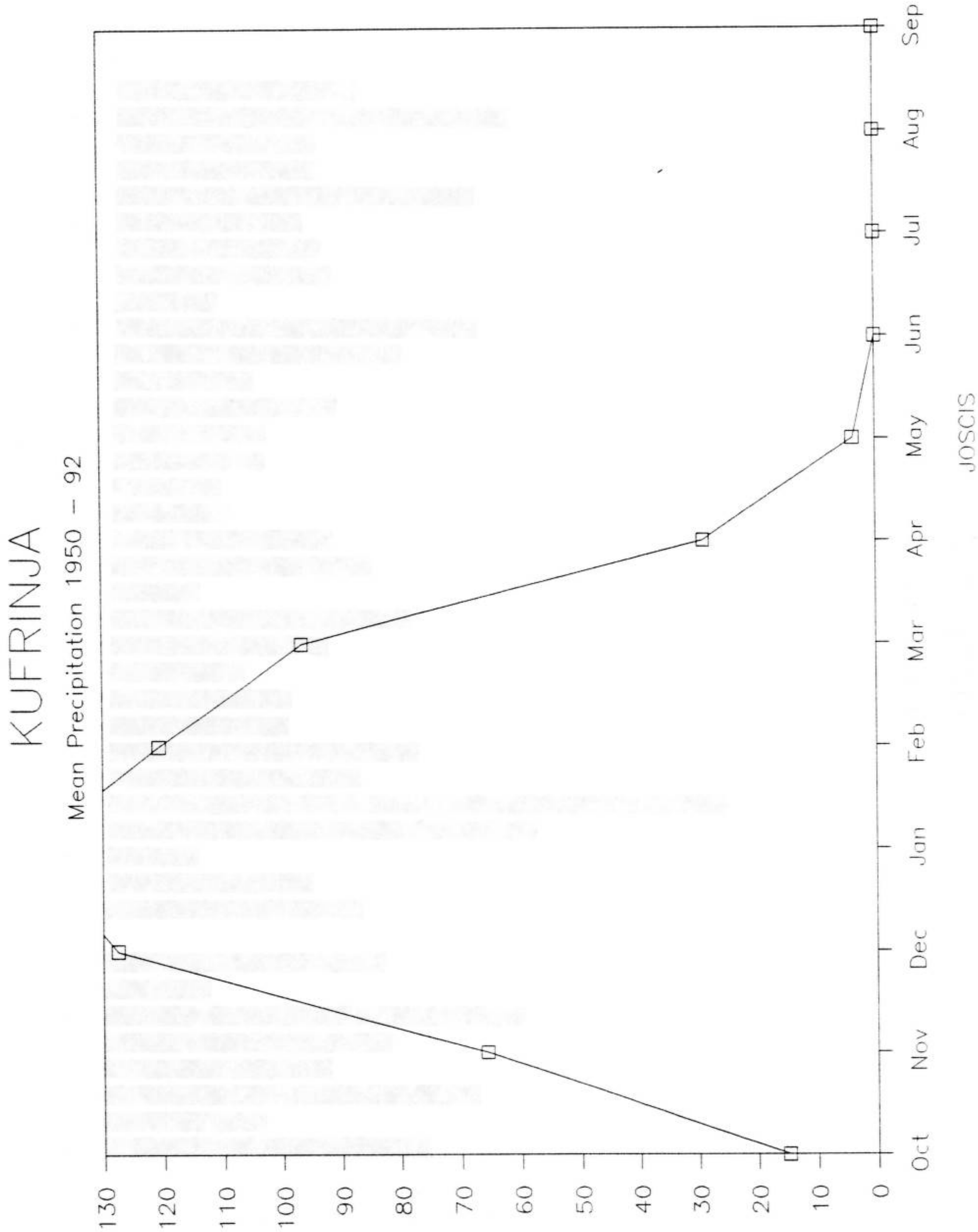

KAFREIN
Precipitation
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 169.2 mm
JOSCIS

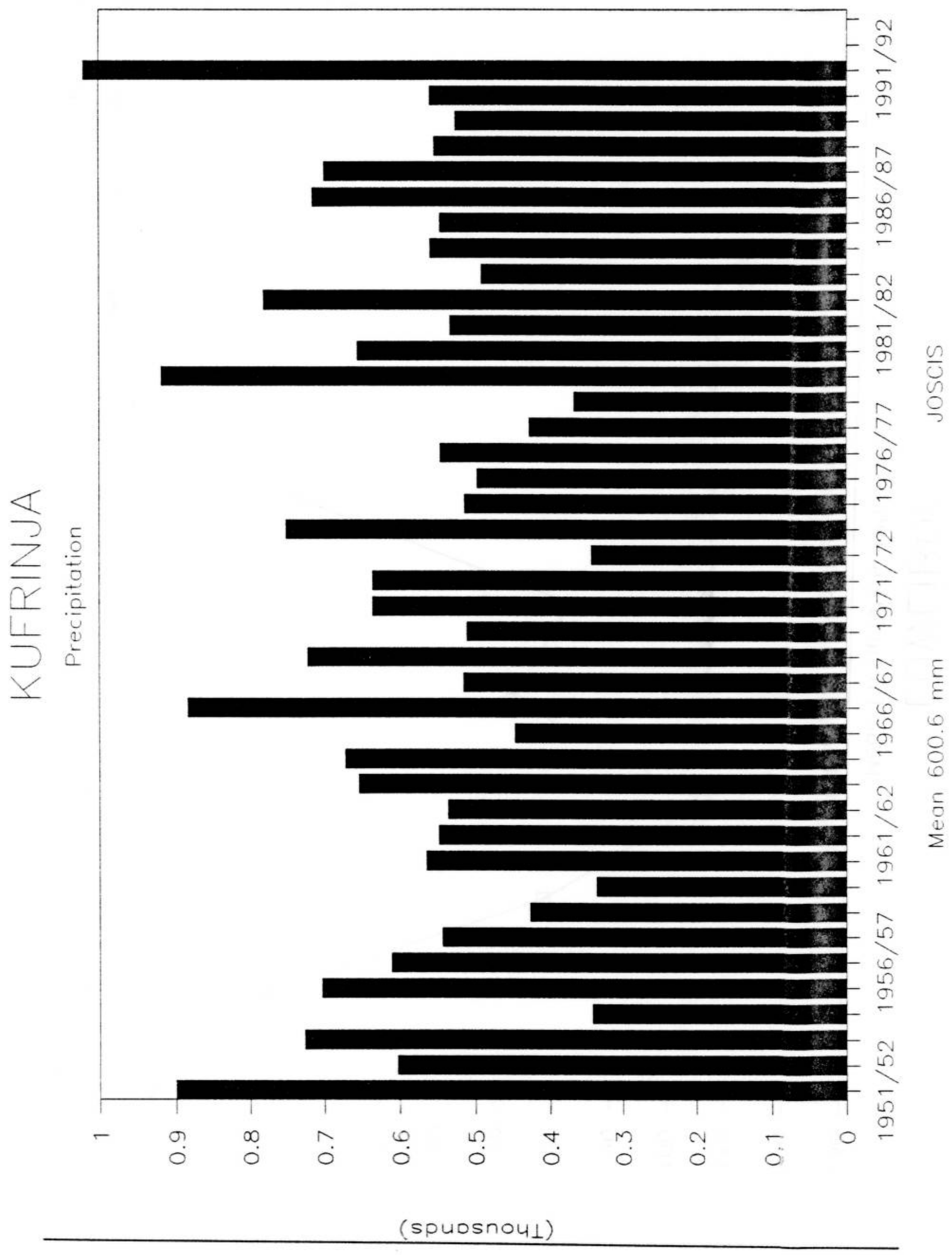

KARAK
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

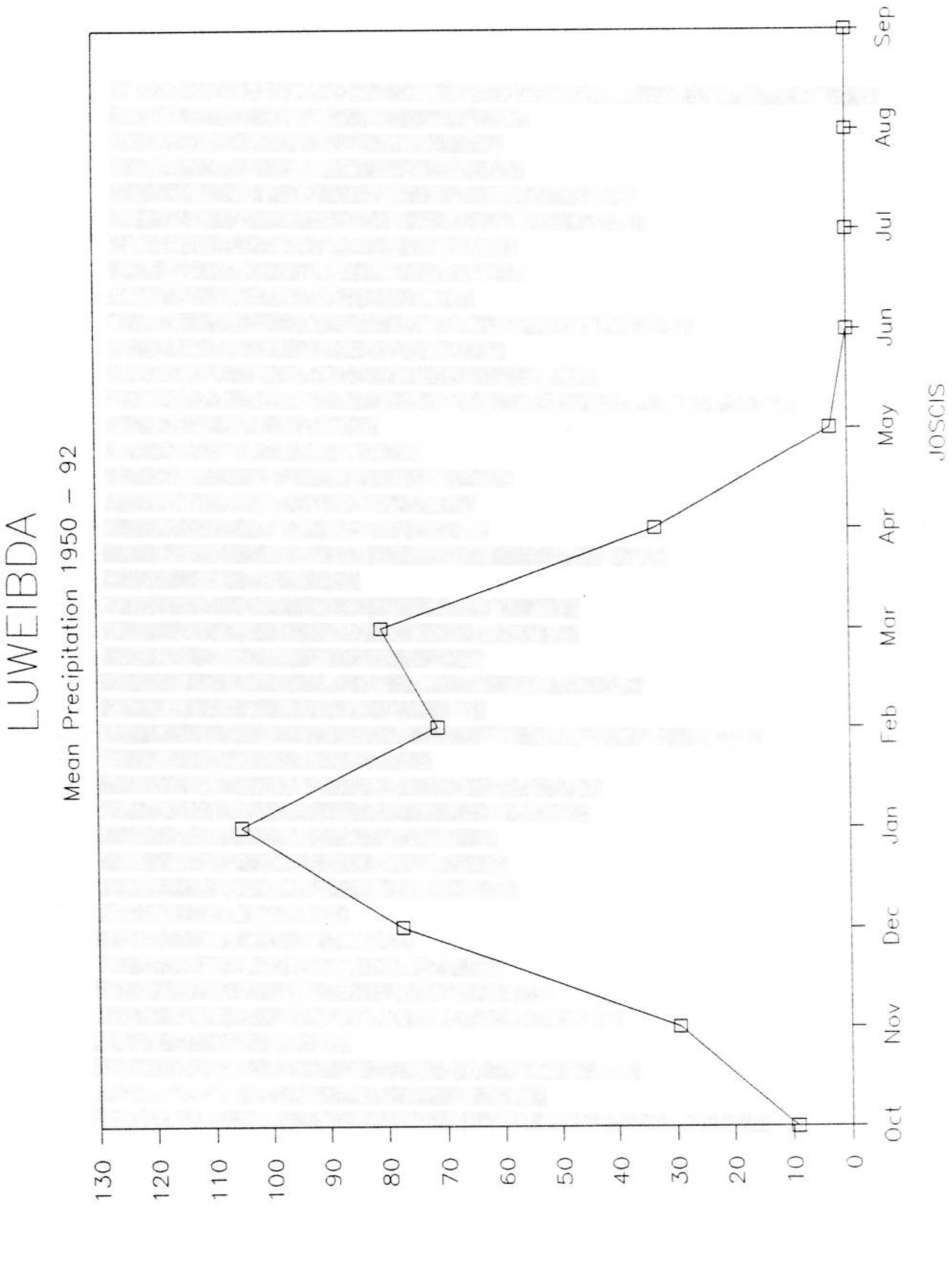

KARAK
Precipitation
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean Precipitation 352.2 mm
JOSCIS

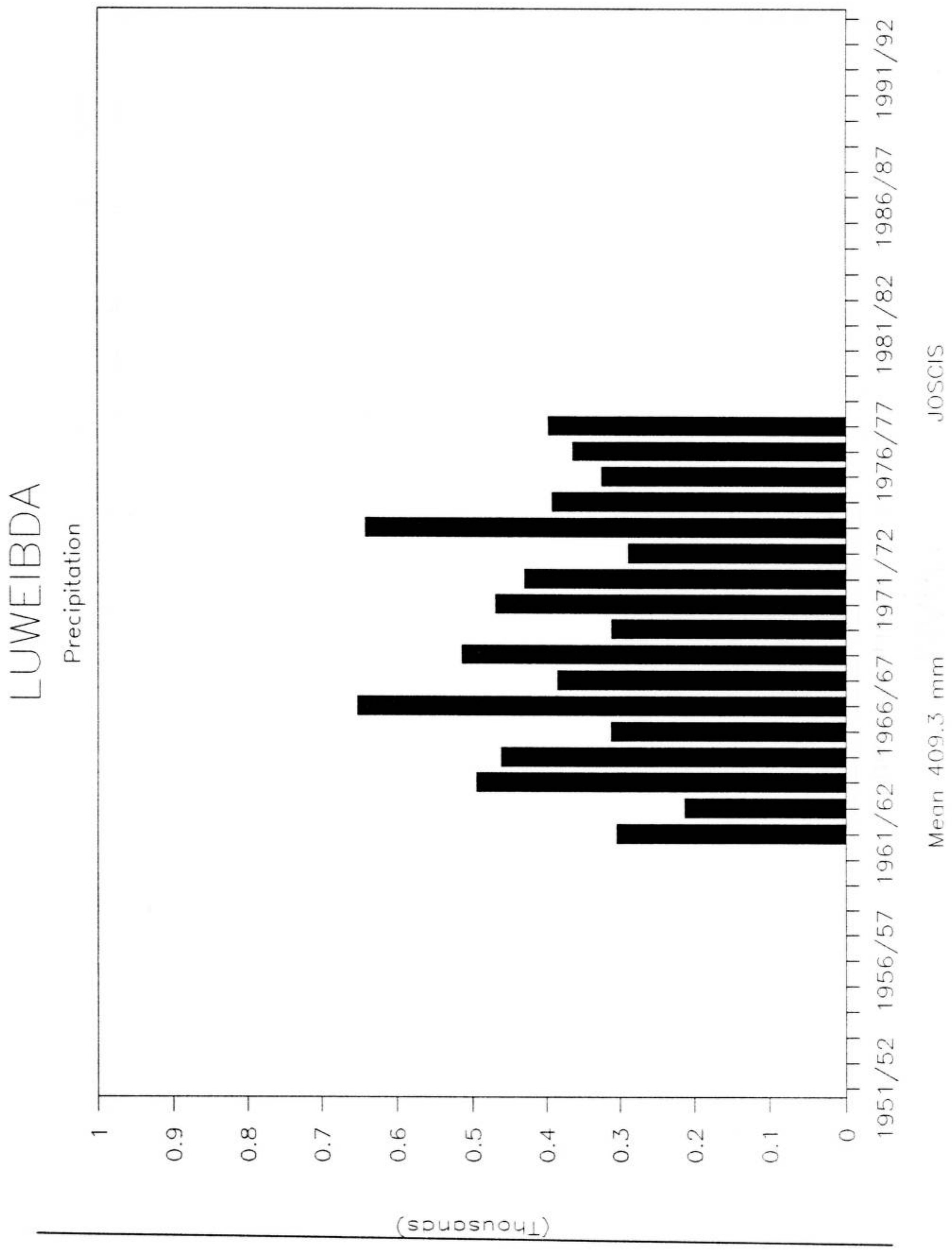

KHANZIRA
Mean Precipitation 1950 – 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

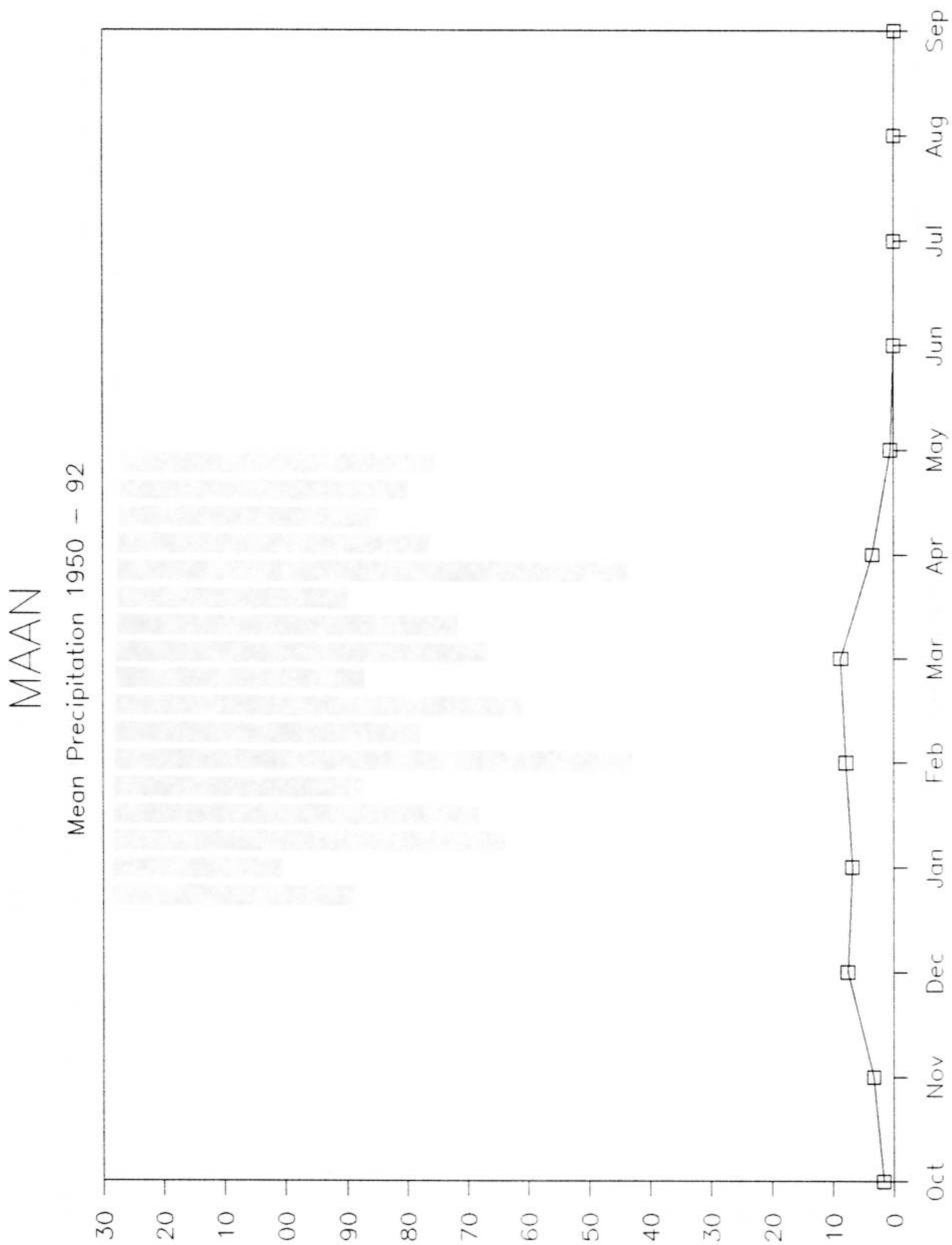

KHANZIRA
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 307.9 mm
JOSCIS
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

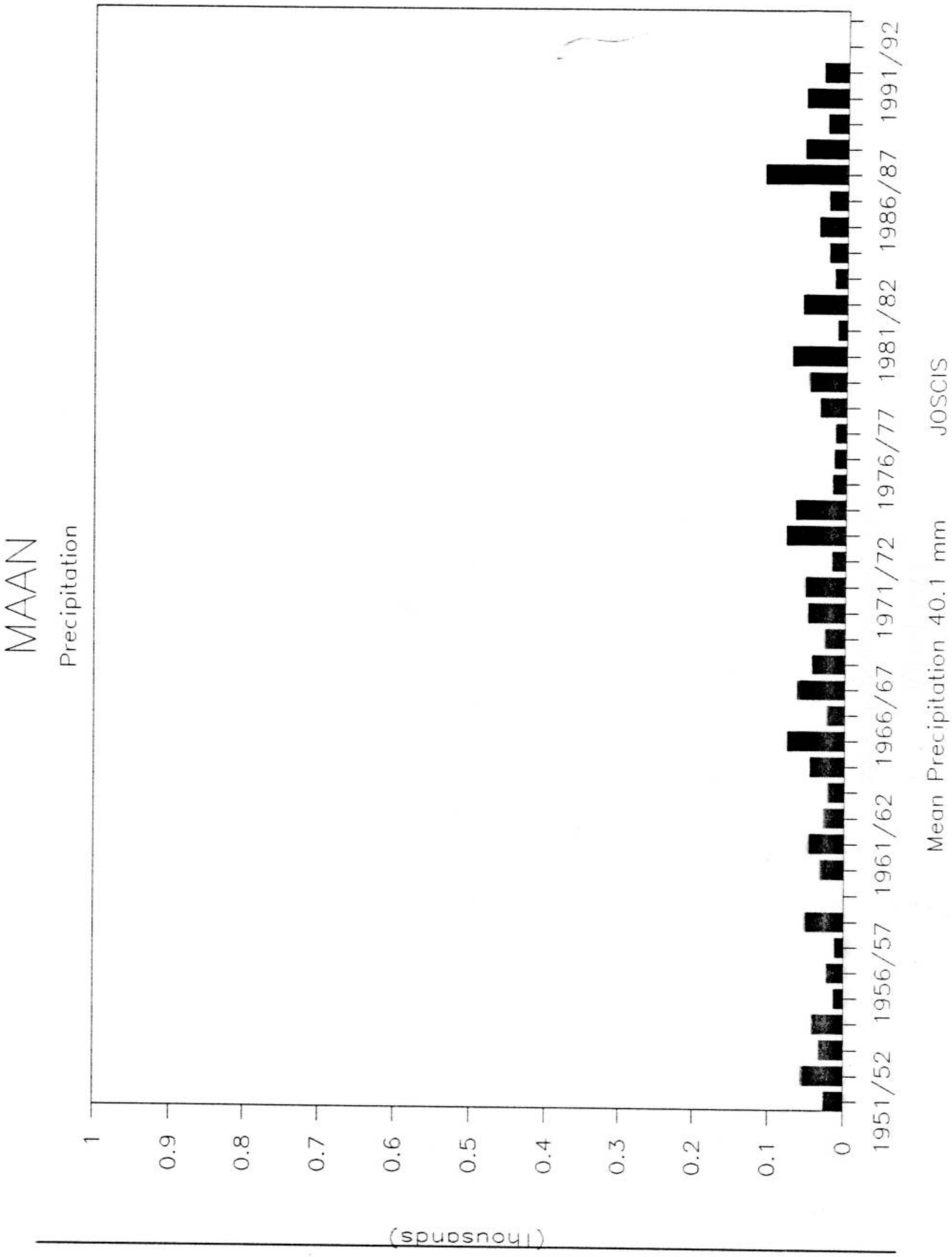

KUFRINJA
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

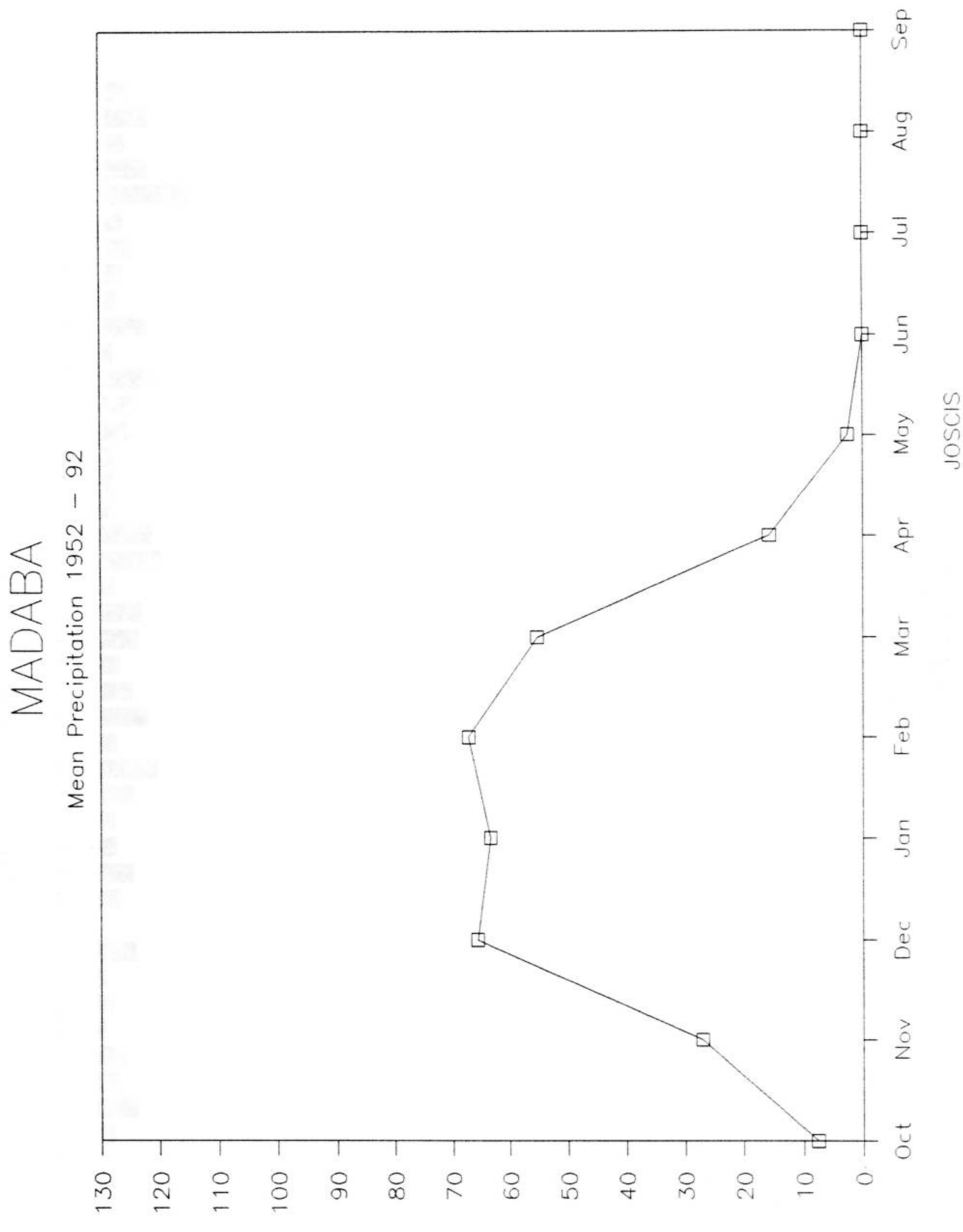

KUFRINJA
Precipitation
Mean 600.6 mm
JOSCIS
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

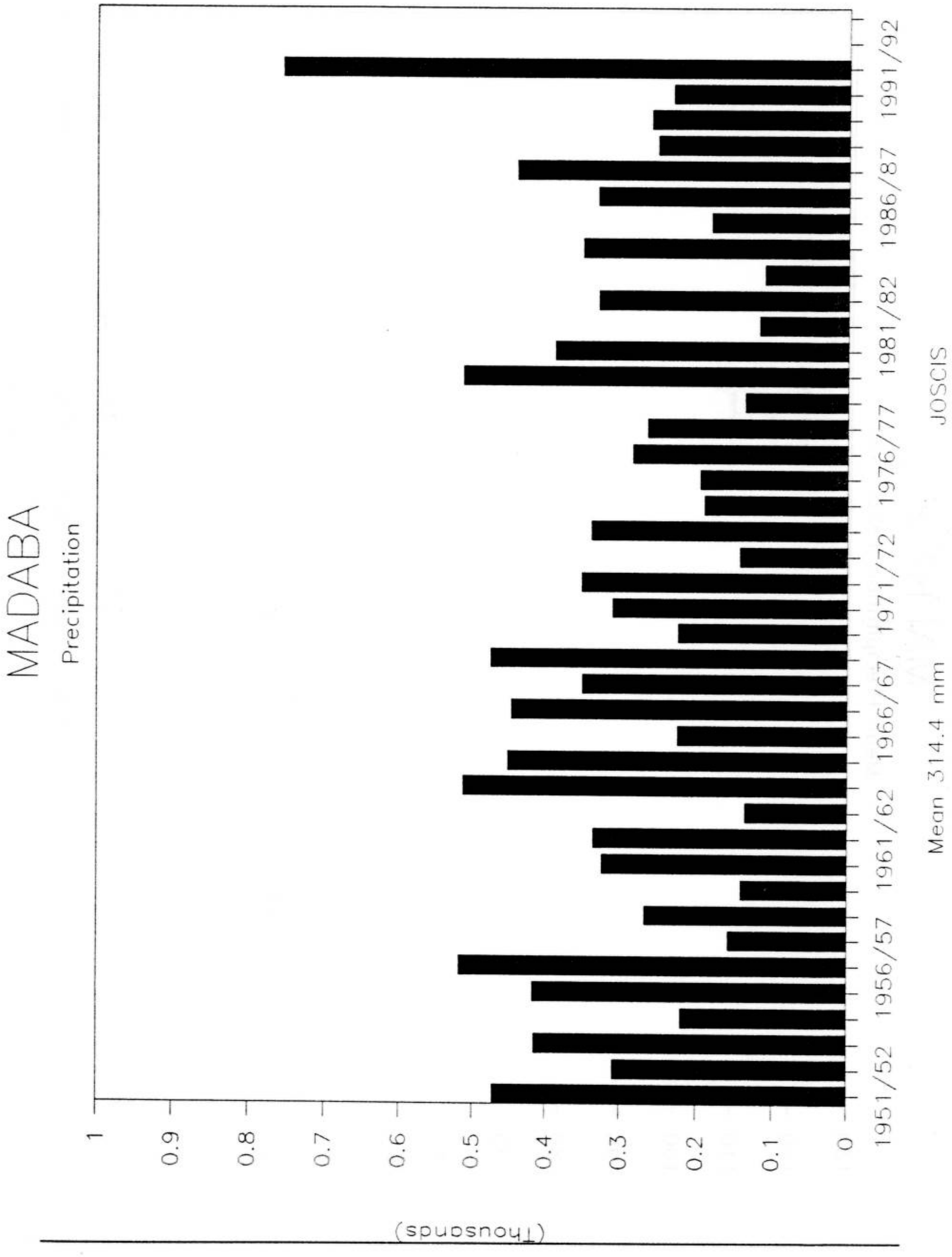

LUWEIBDA
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

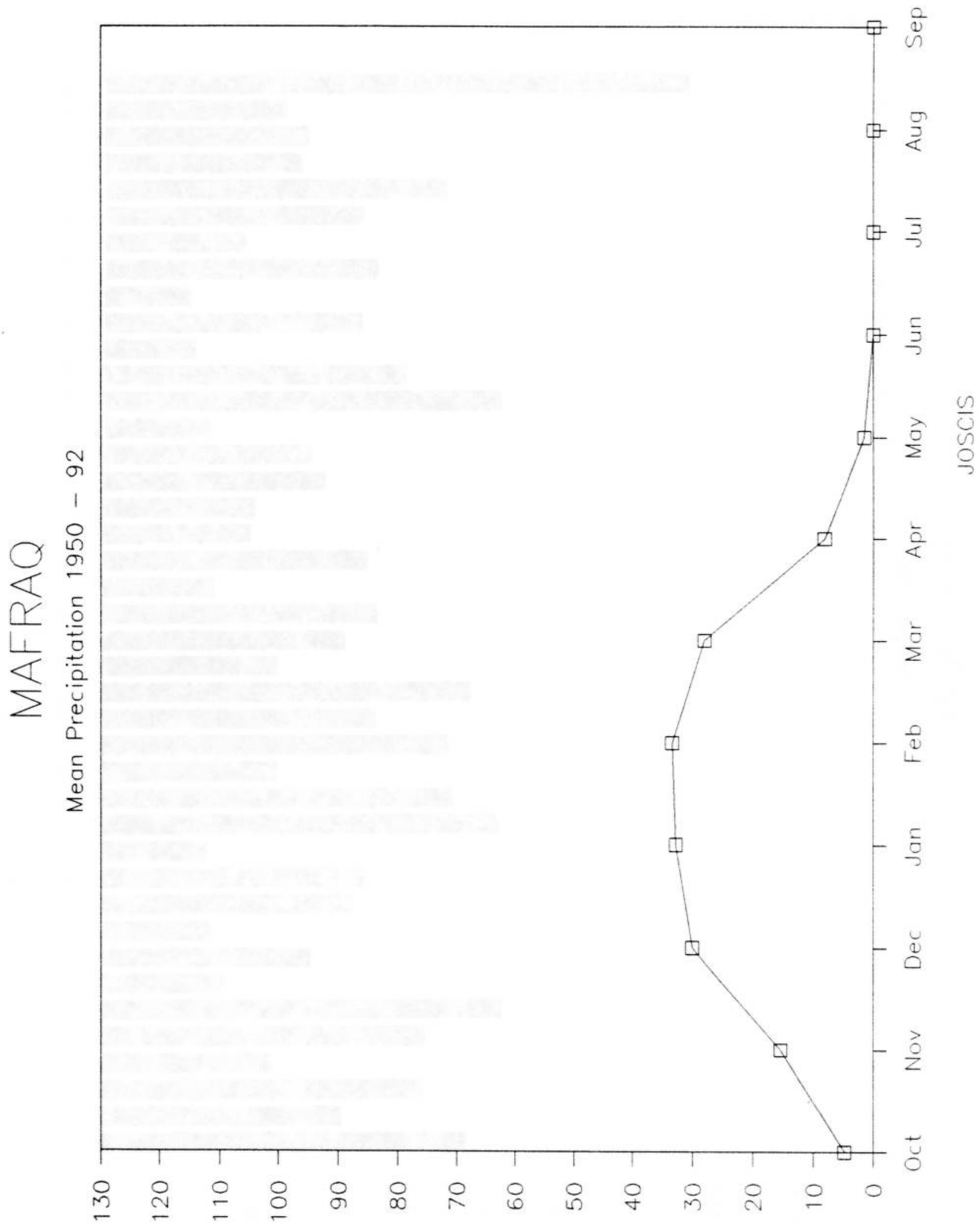

LUWEIBDA
Precipitation
Mean 409.3 mm
JOSCIS
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

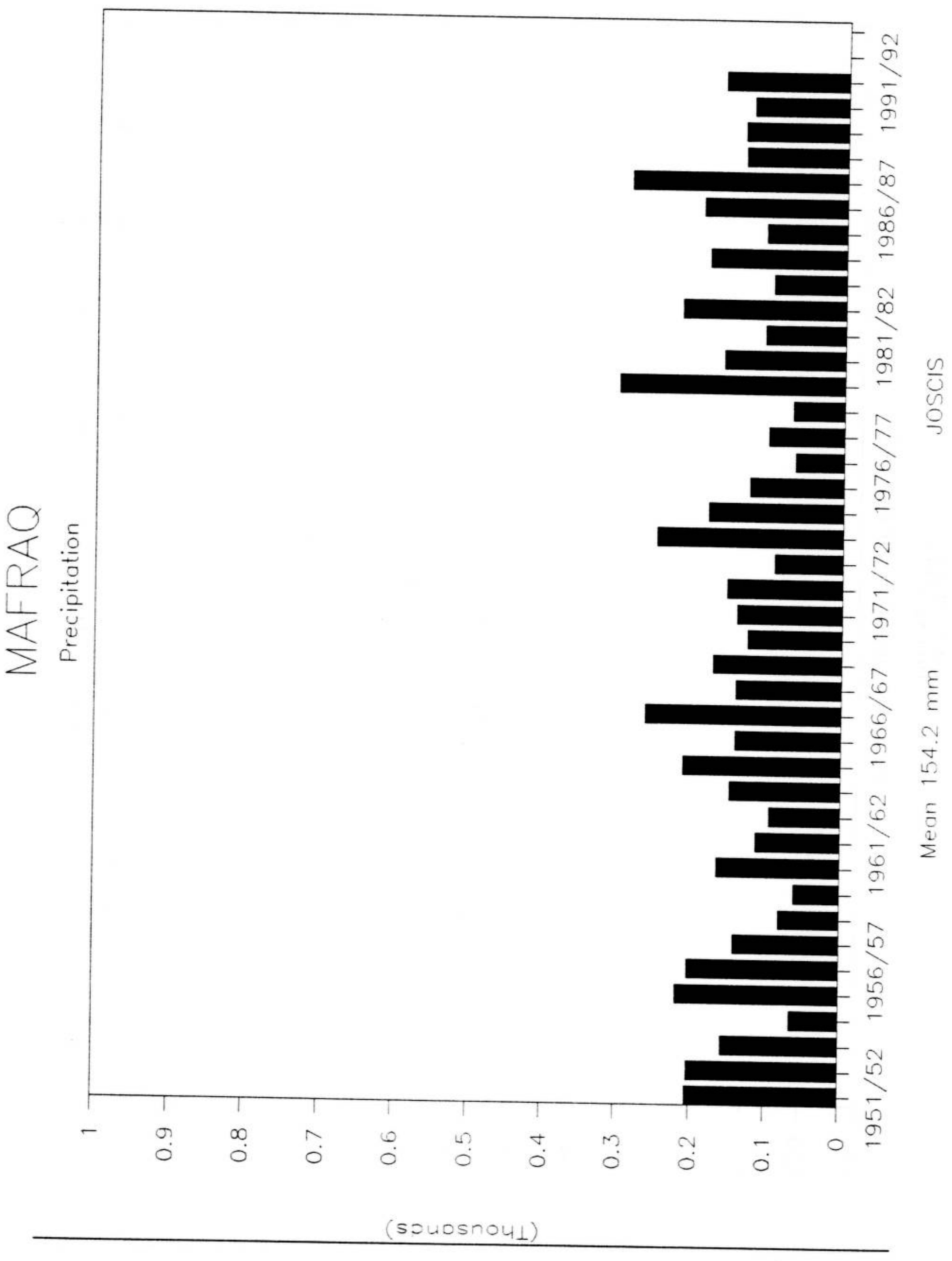

MAAN
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep


MAAN
Precipitation
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean Precipitation 40.1 mm
JOSCIS

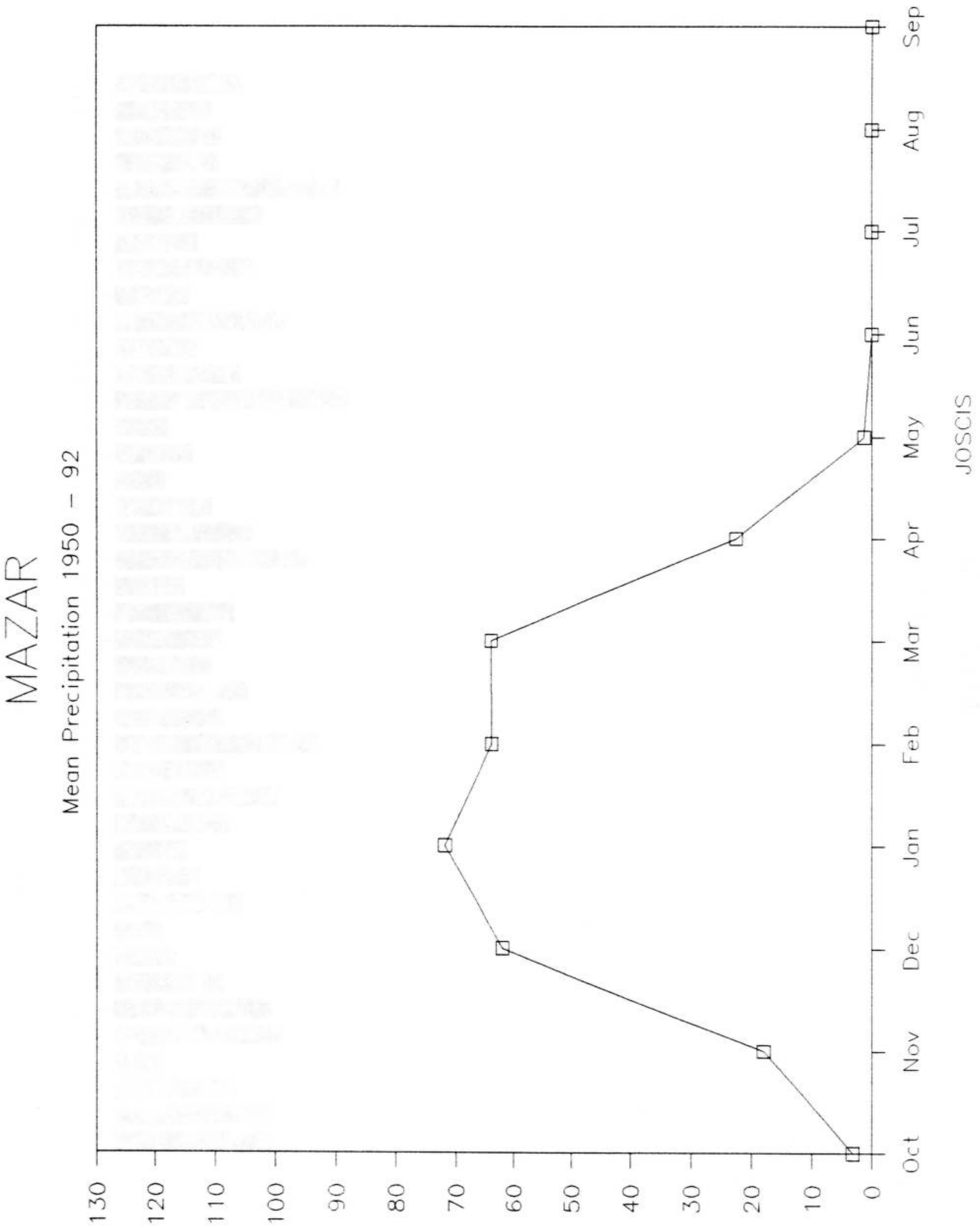

MADABA
Mean Precipitation 1952 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
0
10
20
30
40
50
60
70
80
90
100
110
120
130
JOSCIS

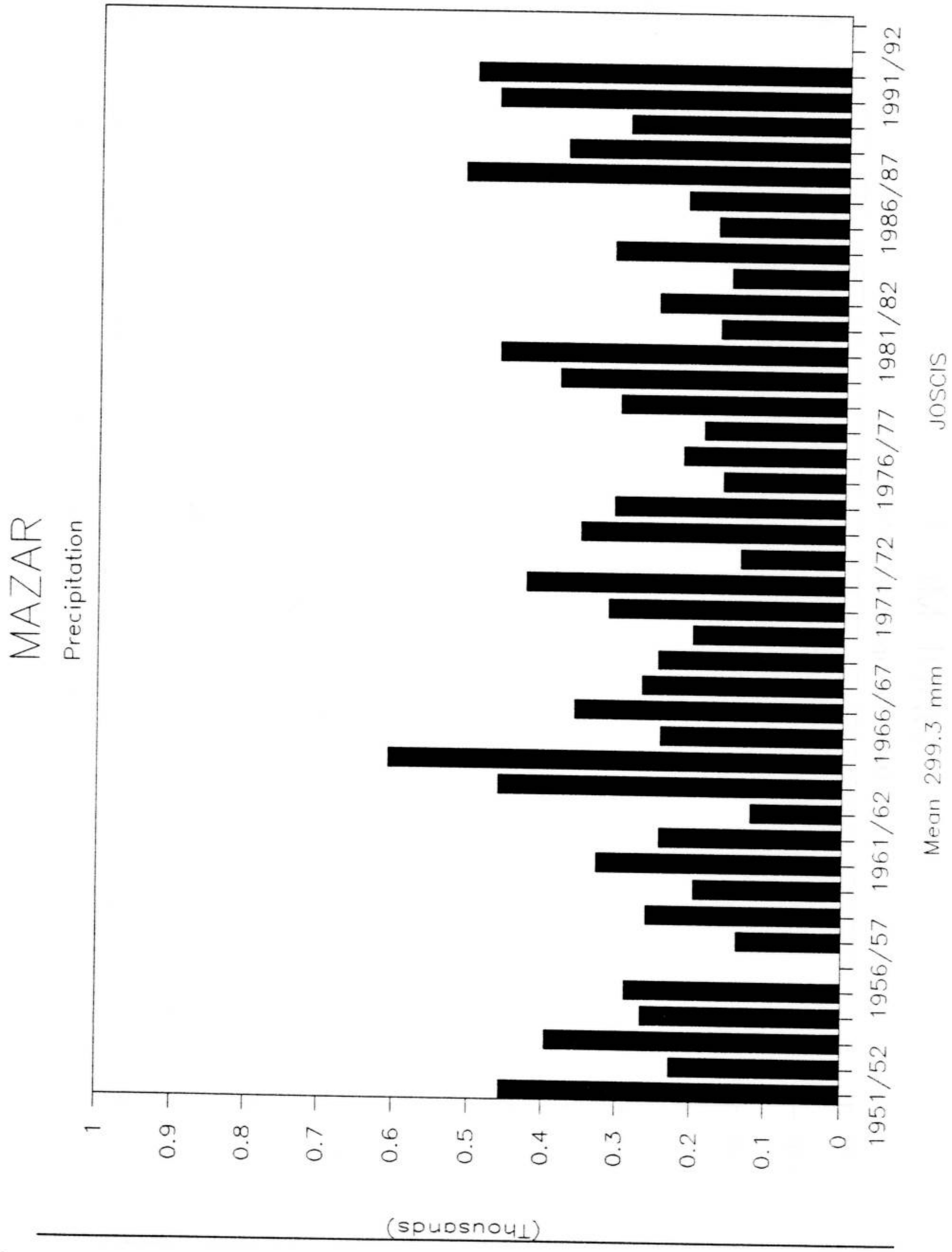

MADABA
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 314.4 mm
JOSCIS
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

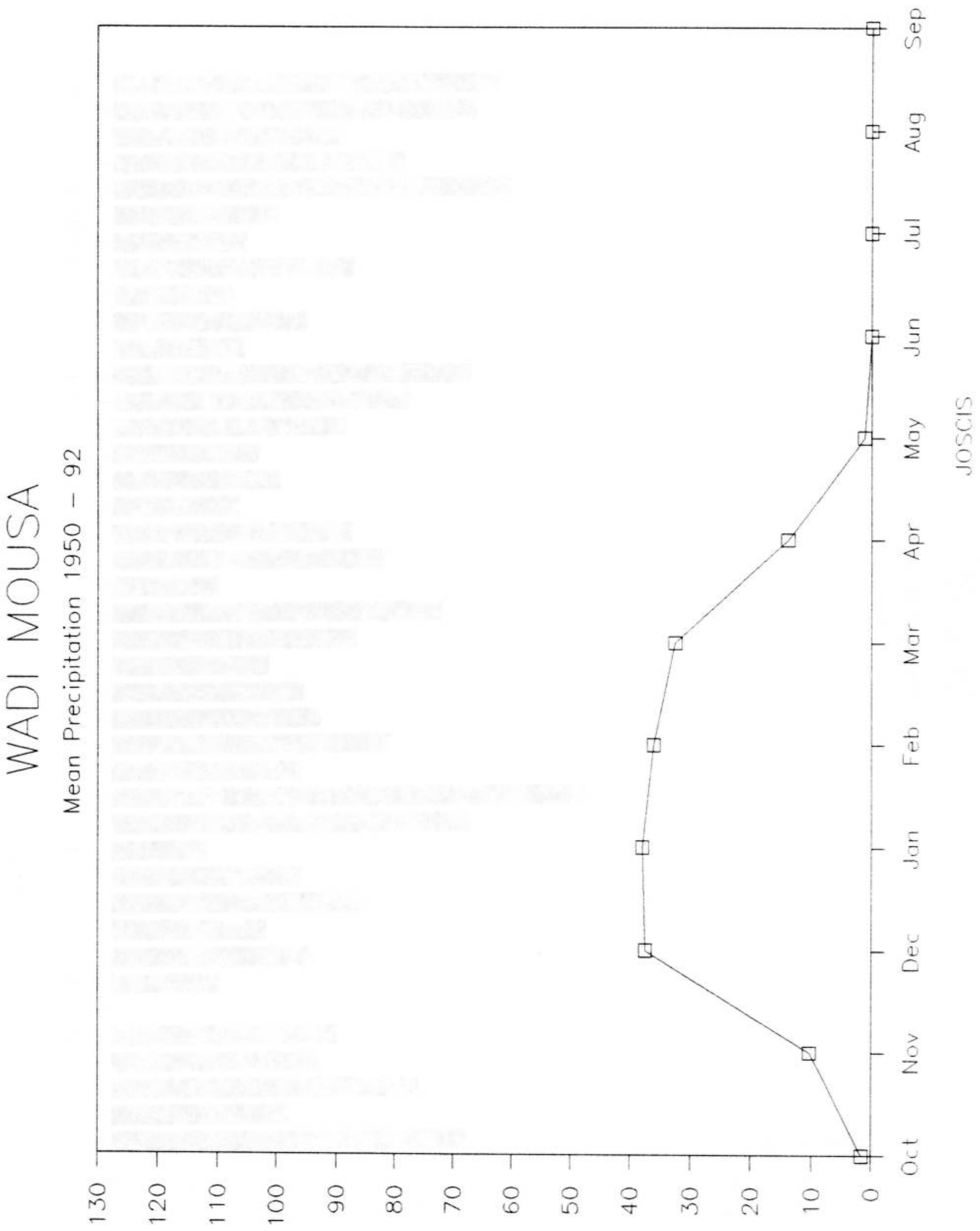

MAFRAQ
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

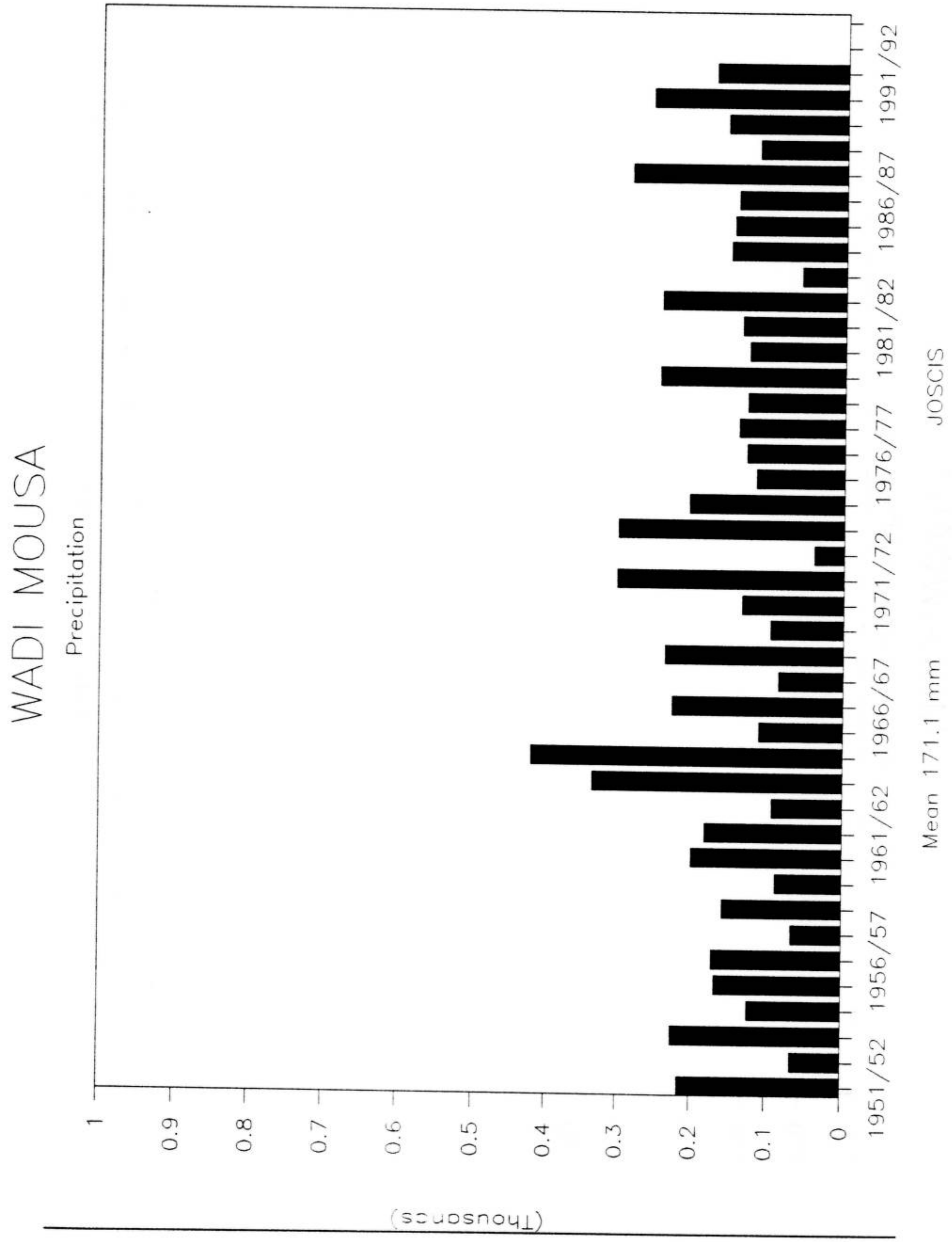


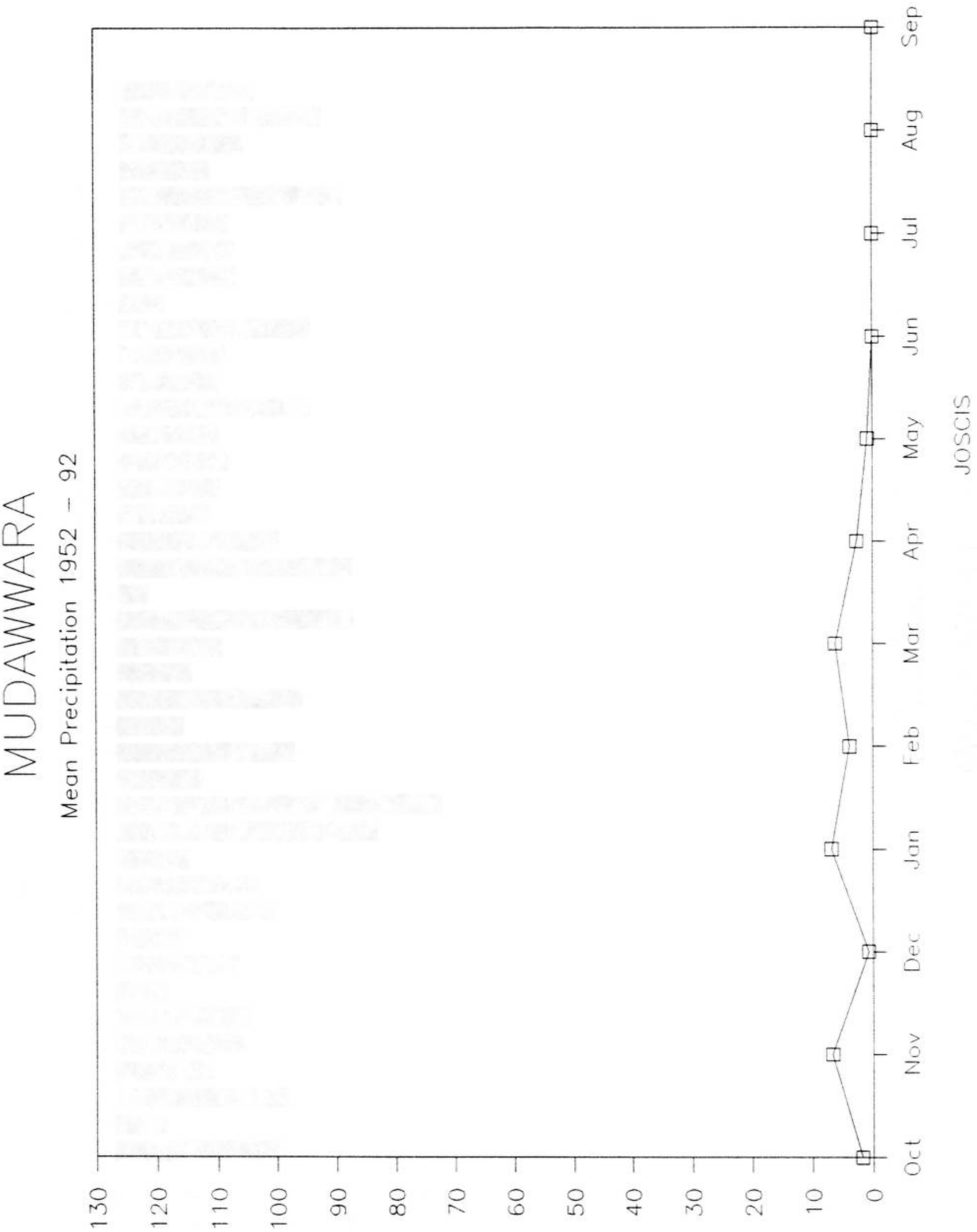
MAFRAQ
Precipitation
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 154.2 mm
JOSCIS

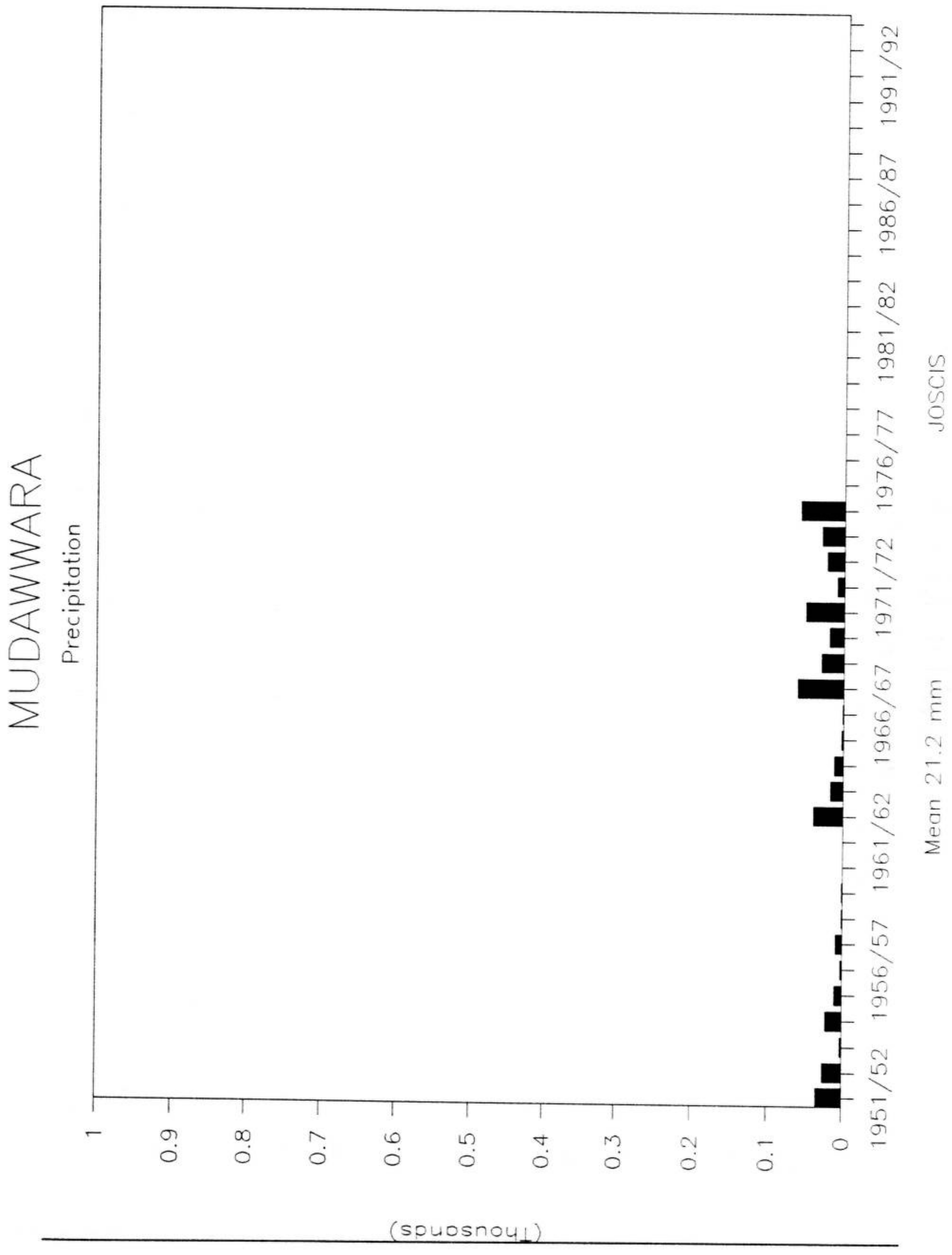

MAZAR
Mean Precipitation 1950 - 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
0 10 20 30 40 50 60 70 80 90 100 110 120 130

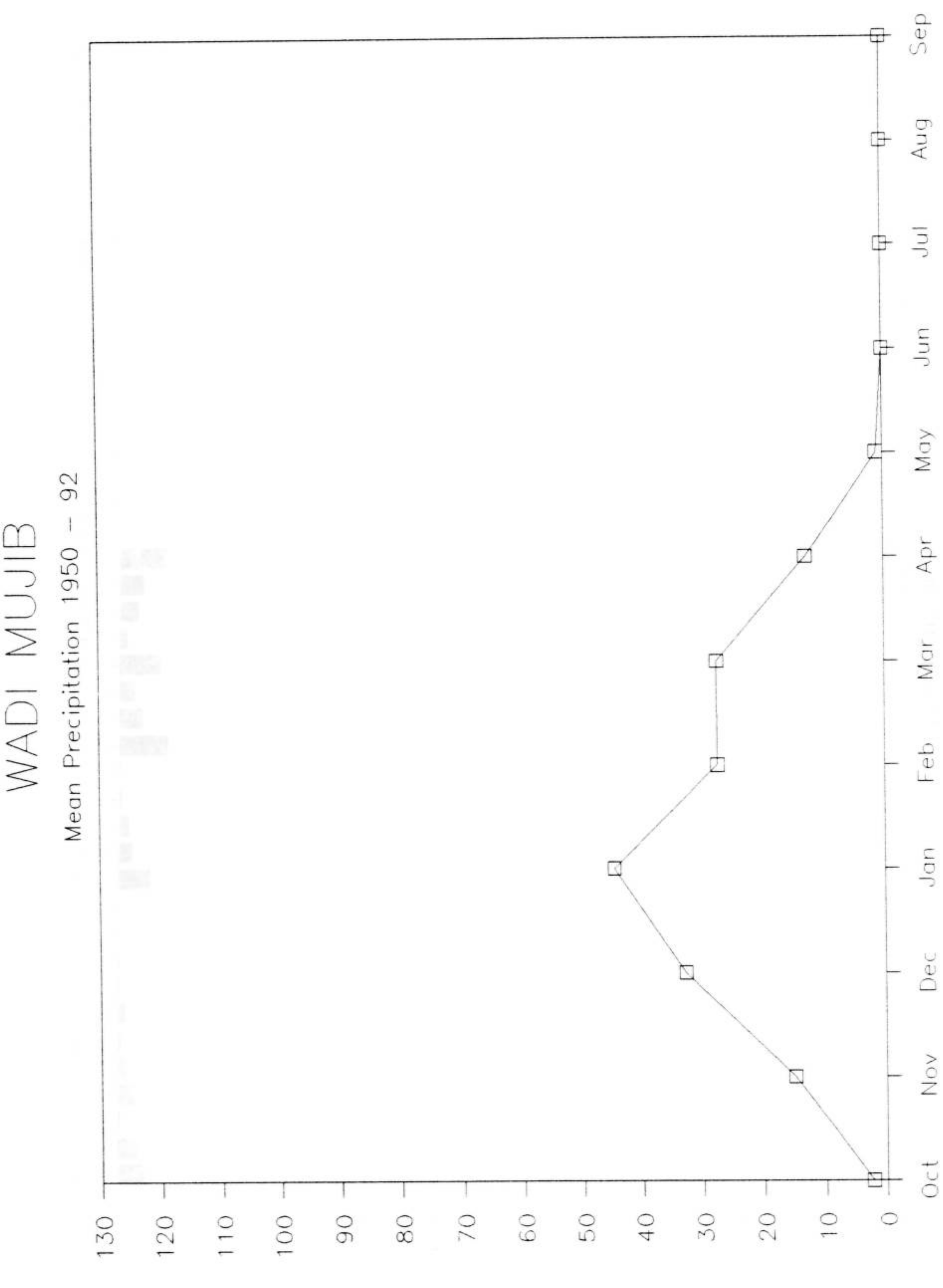

MAZAR
Precipitation
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 299.3 mm
JOSCIS

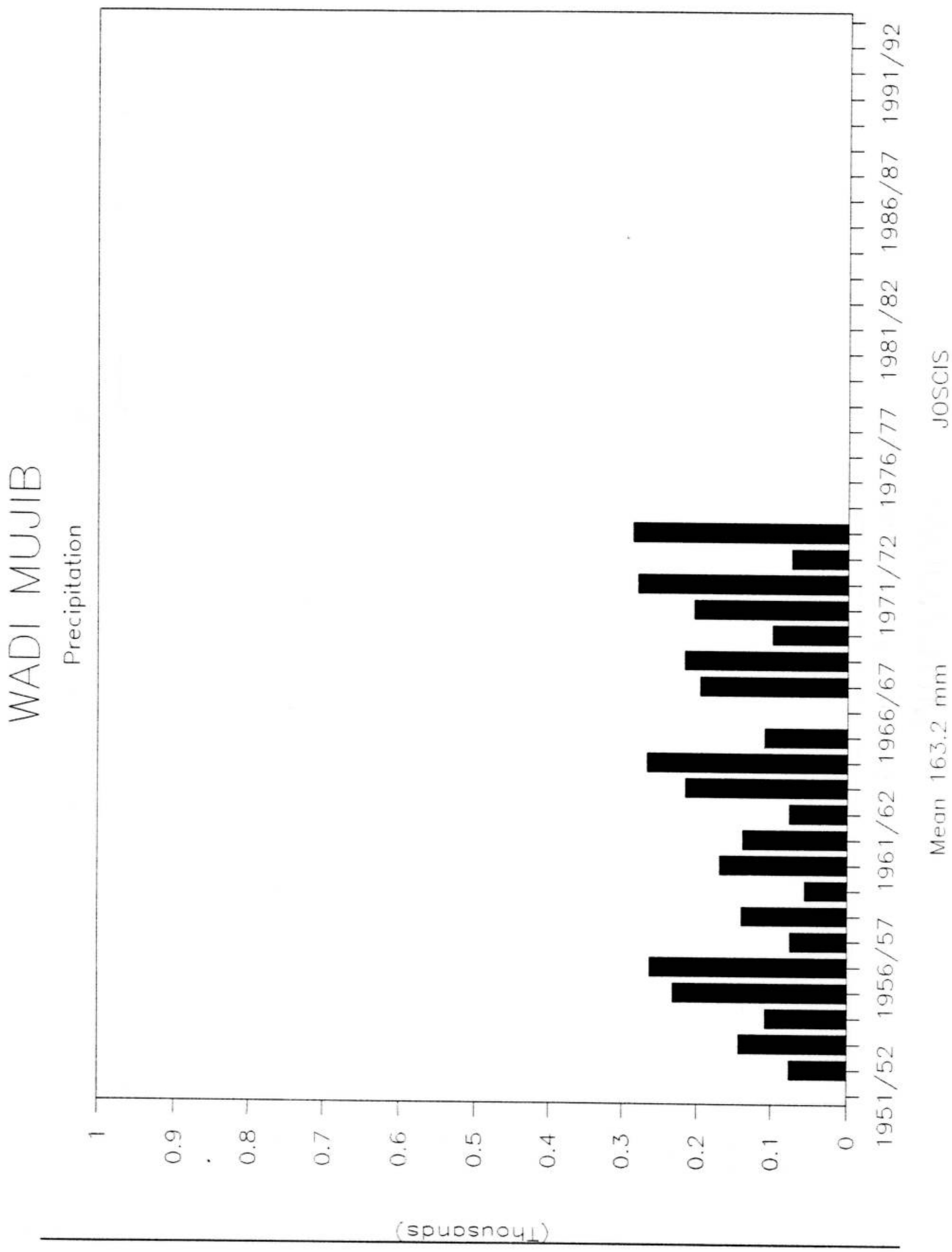

WADI MOUSA
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

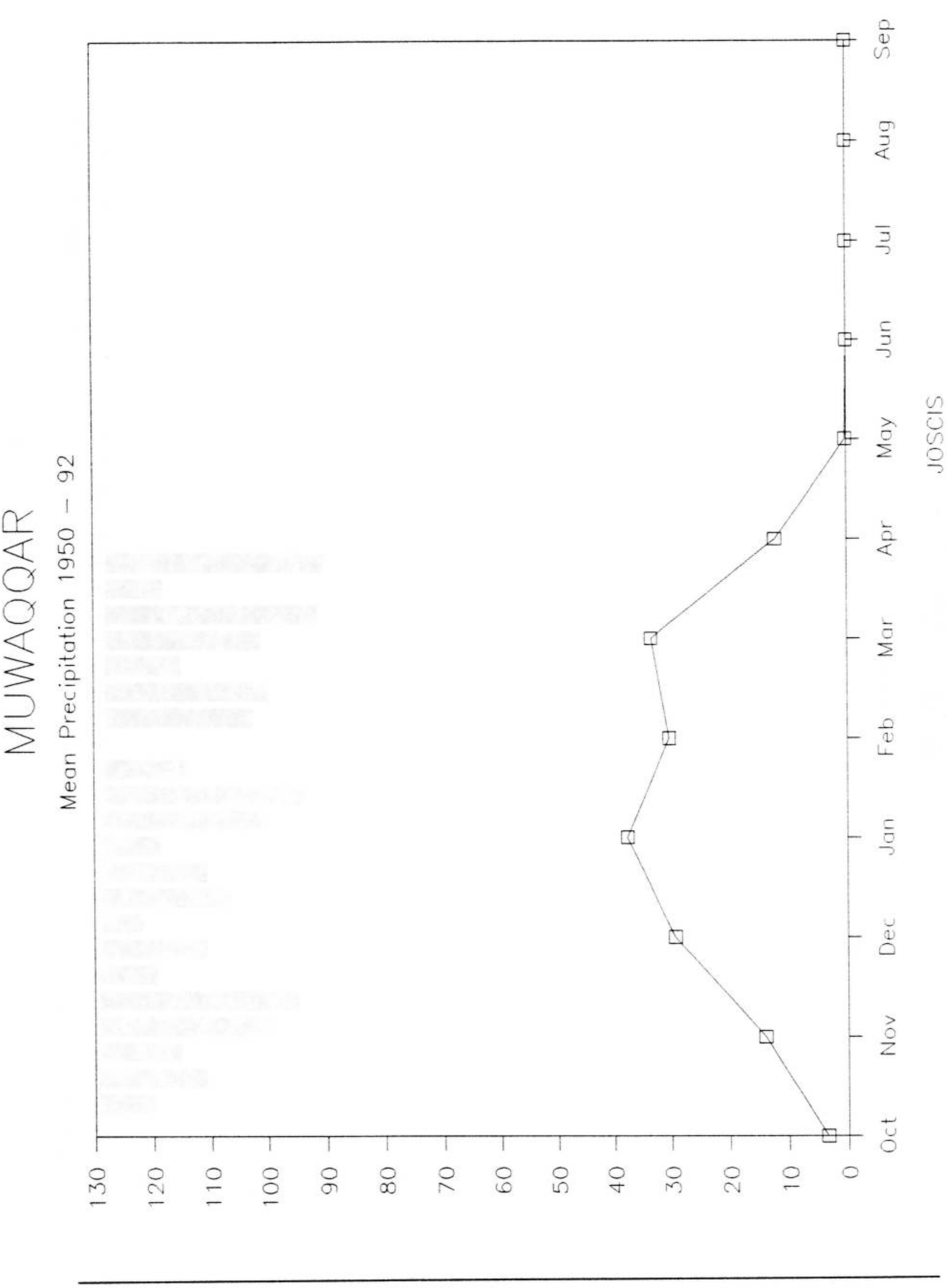

WADI MOUSA
Precipitation
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 171.1 mm
JOSCIS

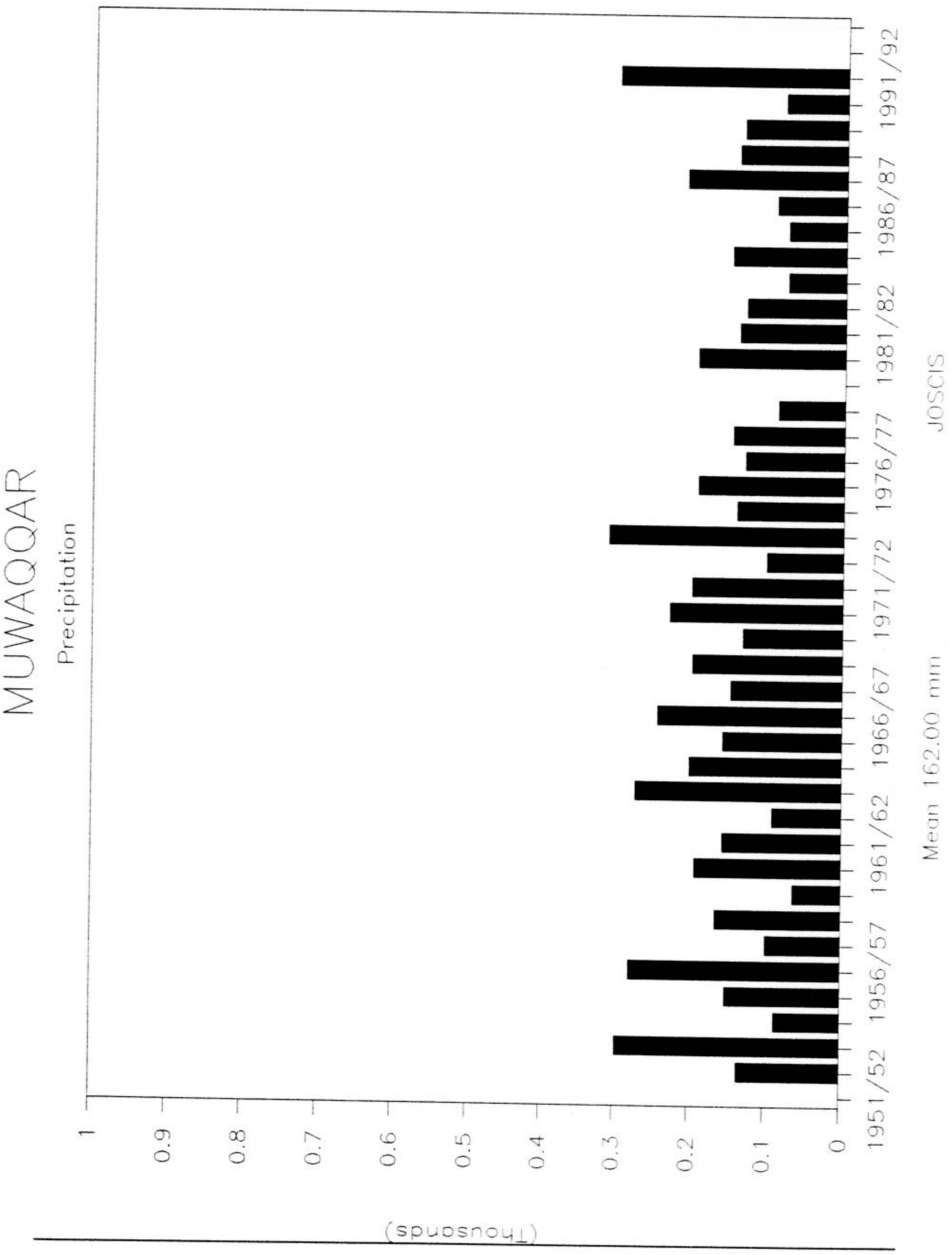

MUDAWWARA
Mean Precipitation 1952 - 92
JOSCIS
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0

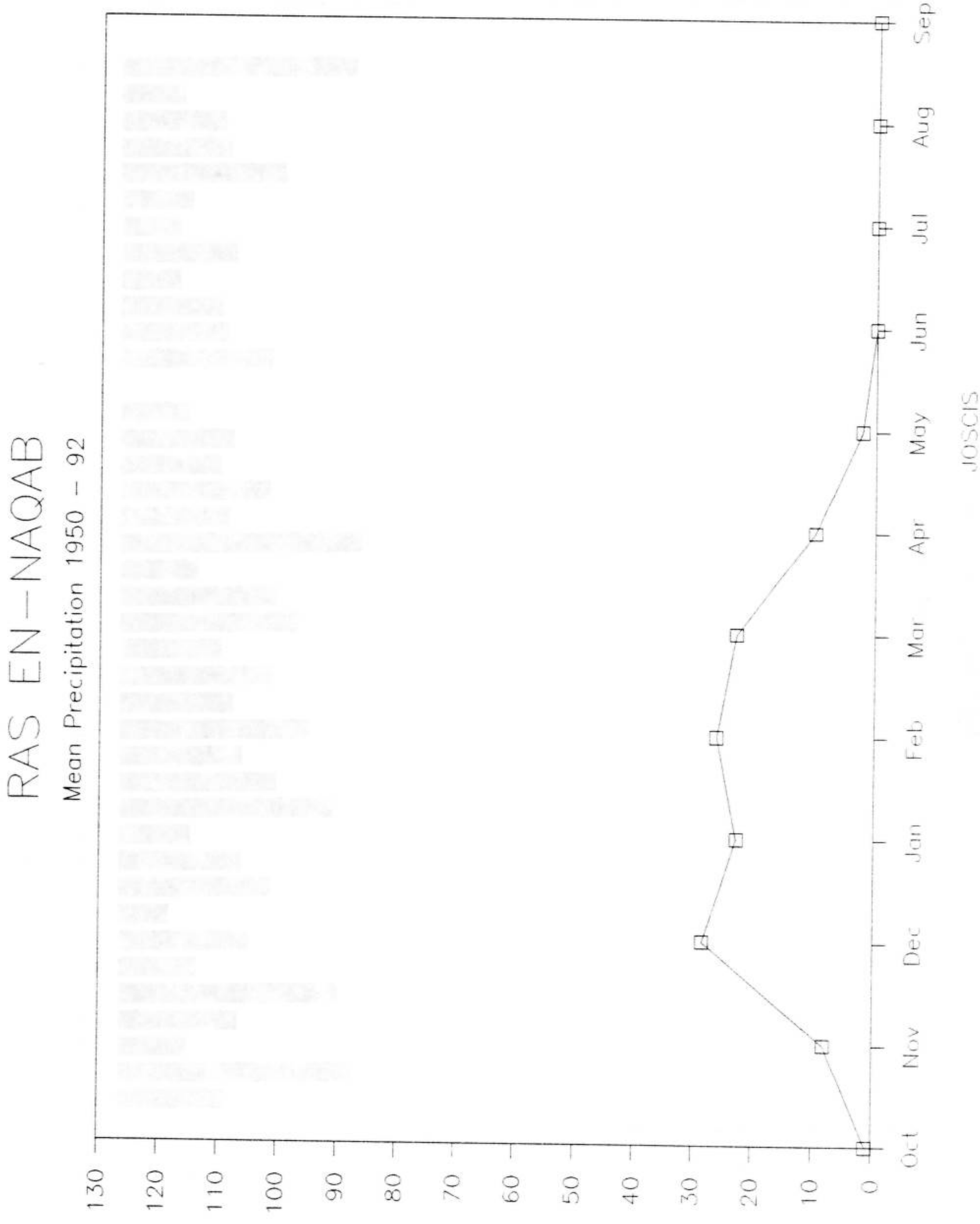

MUDAWWARA
Precipitation
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 21.2 mm
JOSCIS

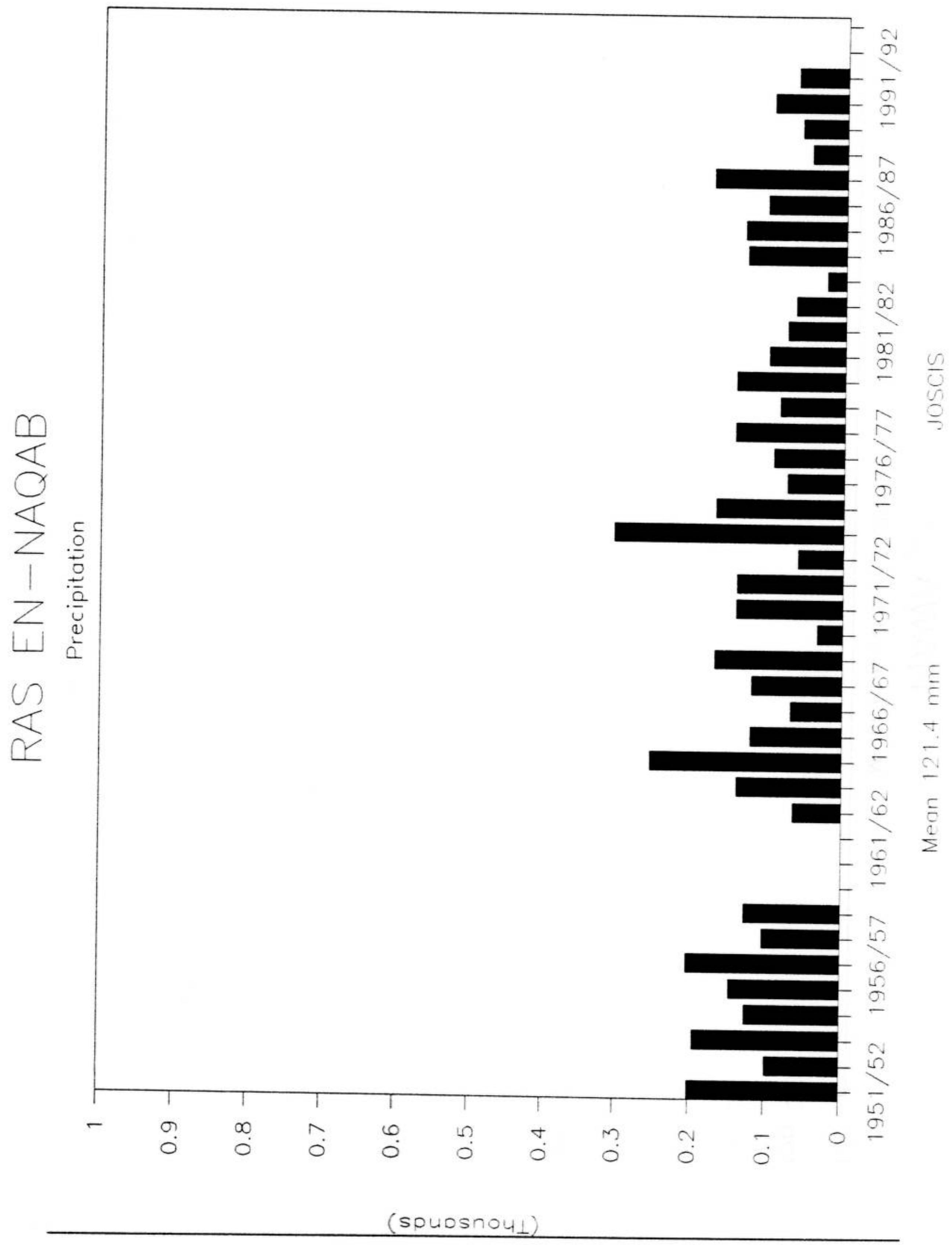

WADI MUJIB
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep

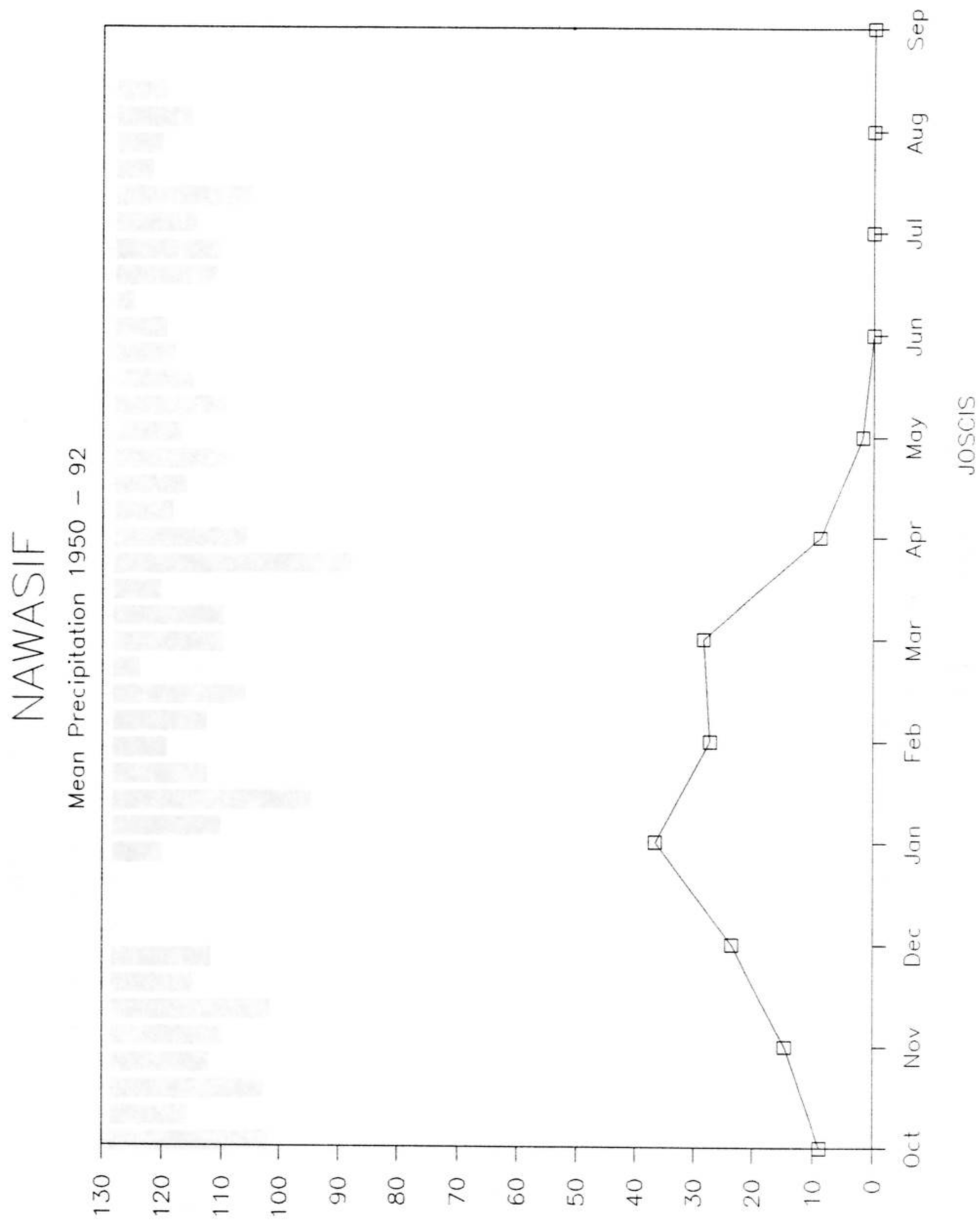

WADI MUJIB
Precipitation
Mean 163.2 mm
JOSCIS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

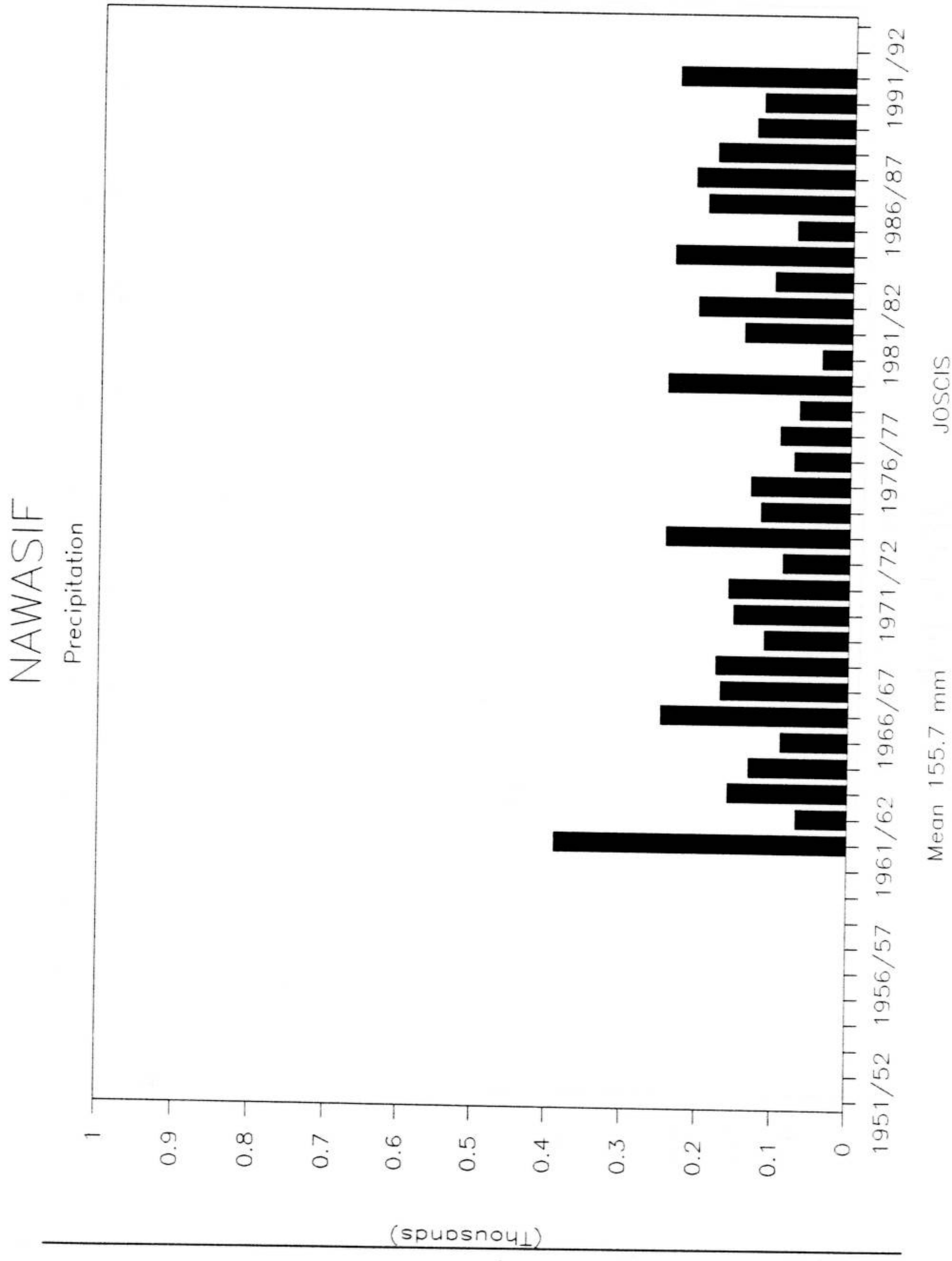

MUWAQQAR
Mean Precipitation 1950 – 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
130 120 110 100 90 80 70 60 50 40 30 20 10 0

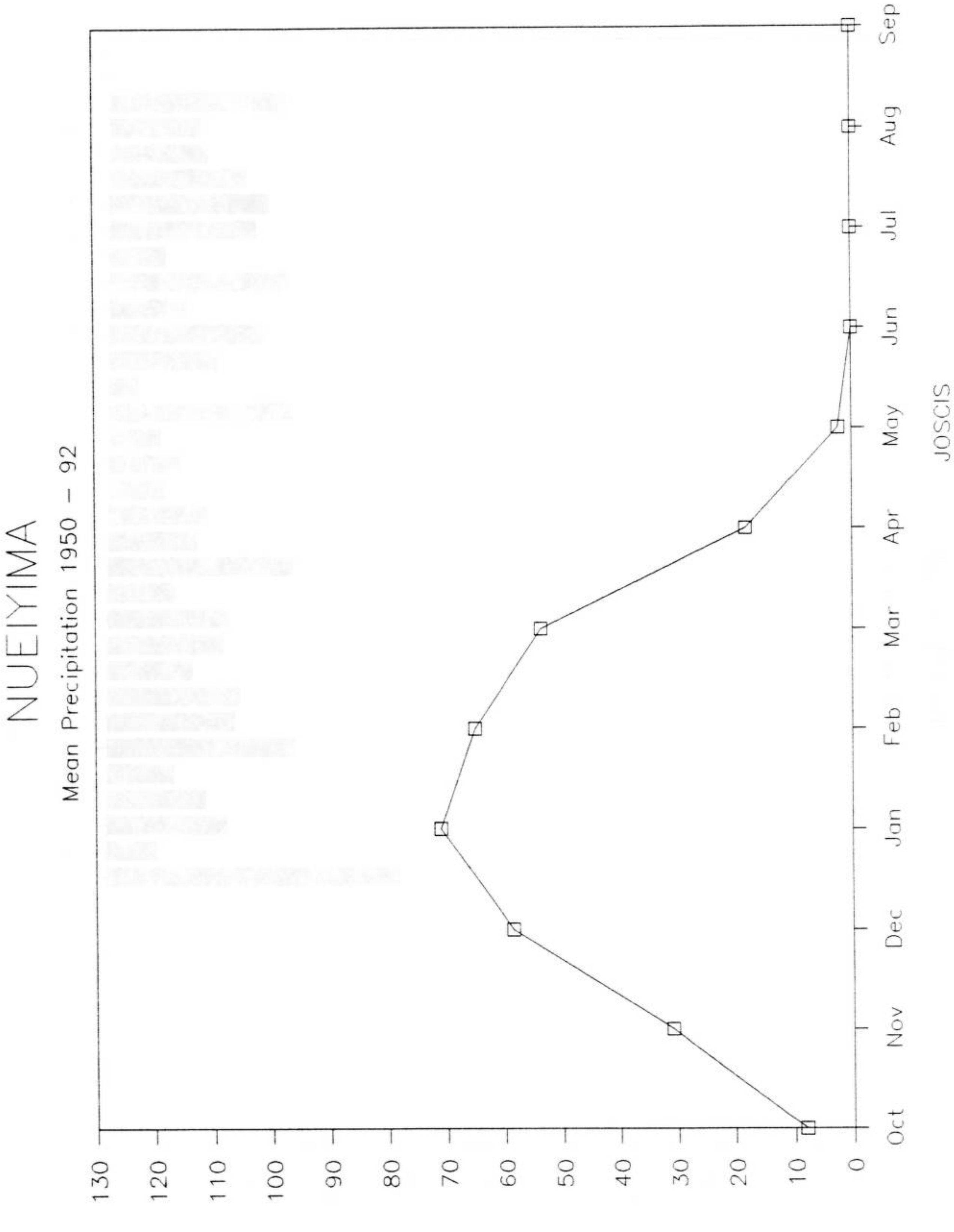

MUWAQQAR
Precipitation
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 162.00 mm
JOSCIS

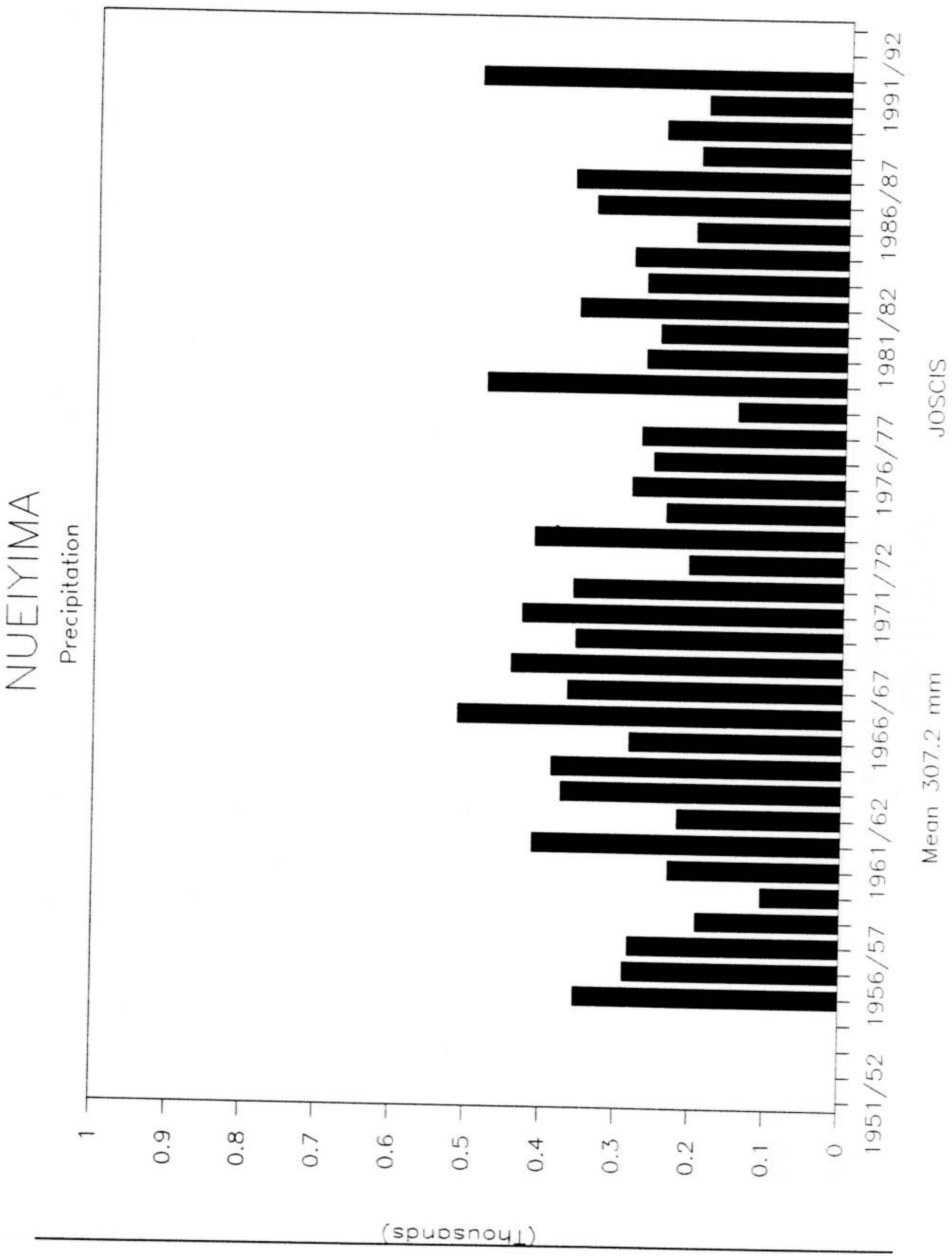

RAS EN—NAQAB
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

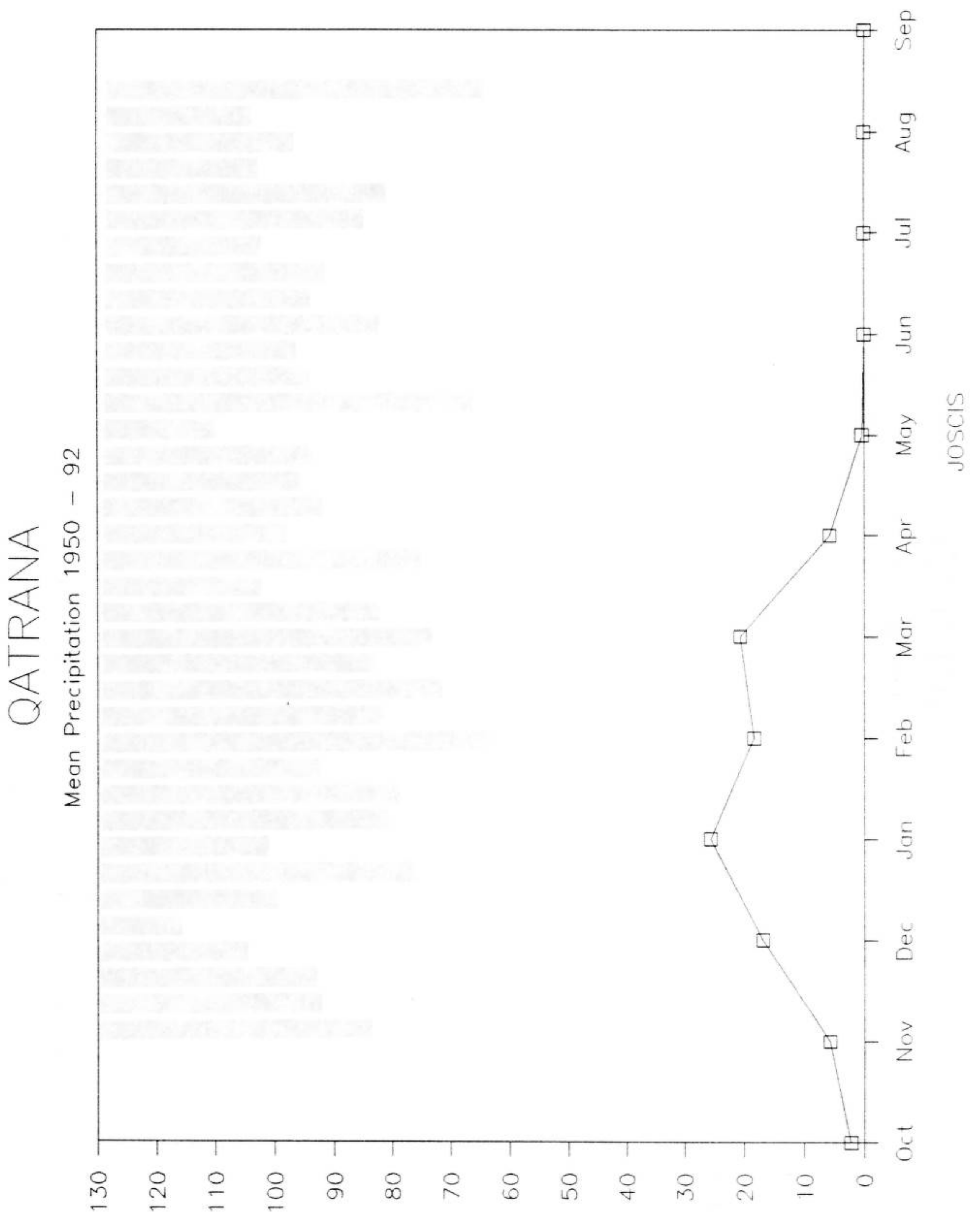

RAS EN-NAQAB
Precipitation
(Thousands)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
1951/52 1956/57 1961/62 1966/67 1971/72 1976/77 1981/82 1986/87 1991/92
Mean 121.4 mm
JOSCIS

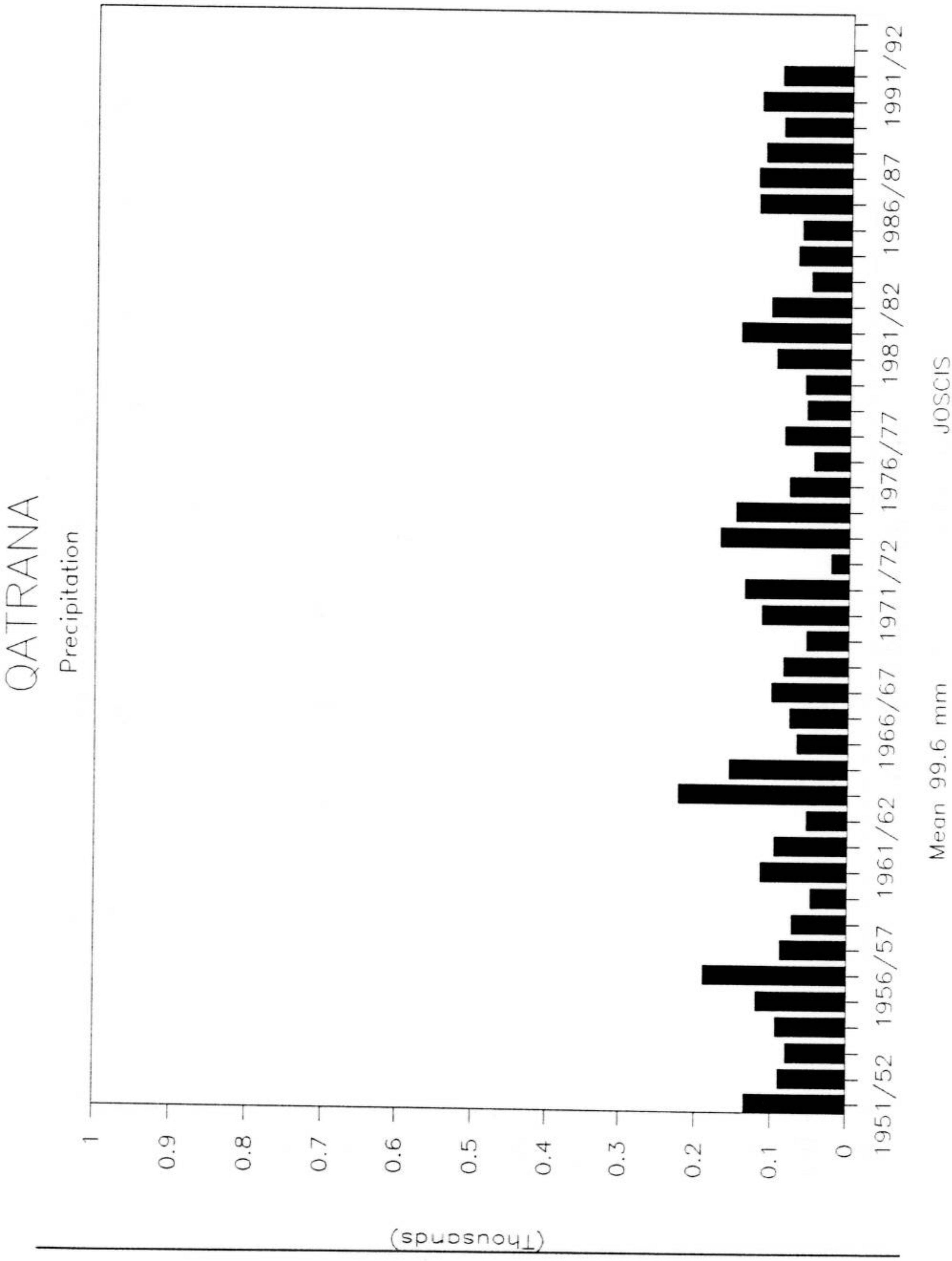

NAWASIF
Mean Precipitation 1950 - 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
130 120 110 100 90 80 70 60 50 40 30 20 10 0

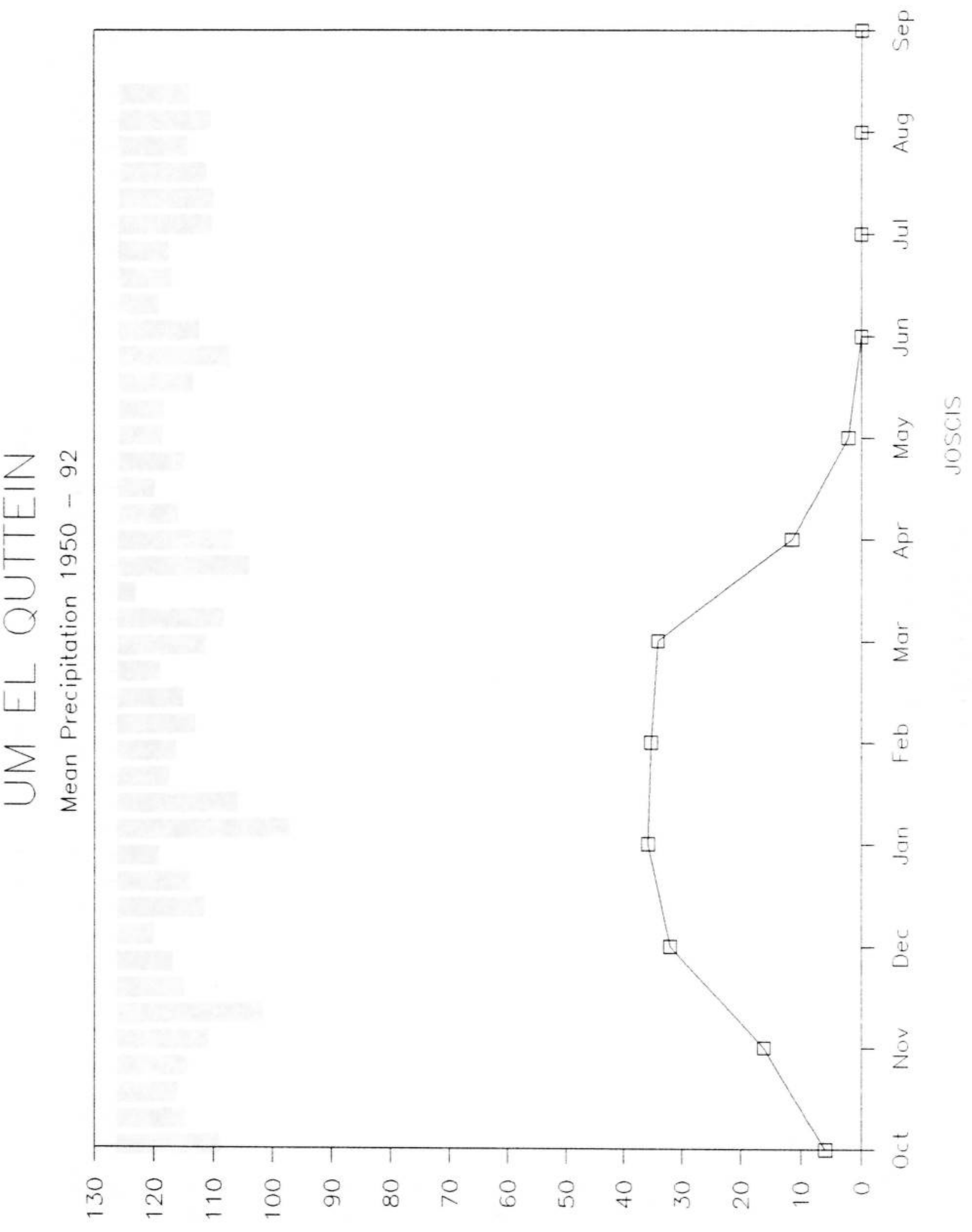

NAWASIF
Precipitation
Mean 155.7 mm
JOSCIS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

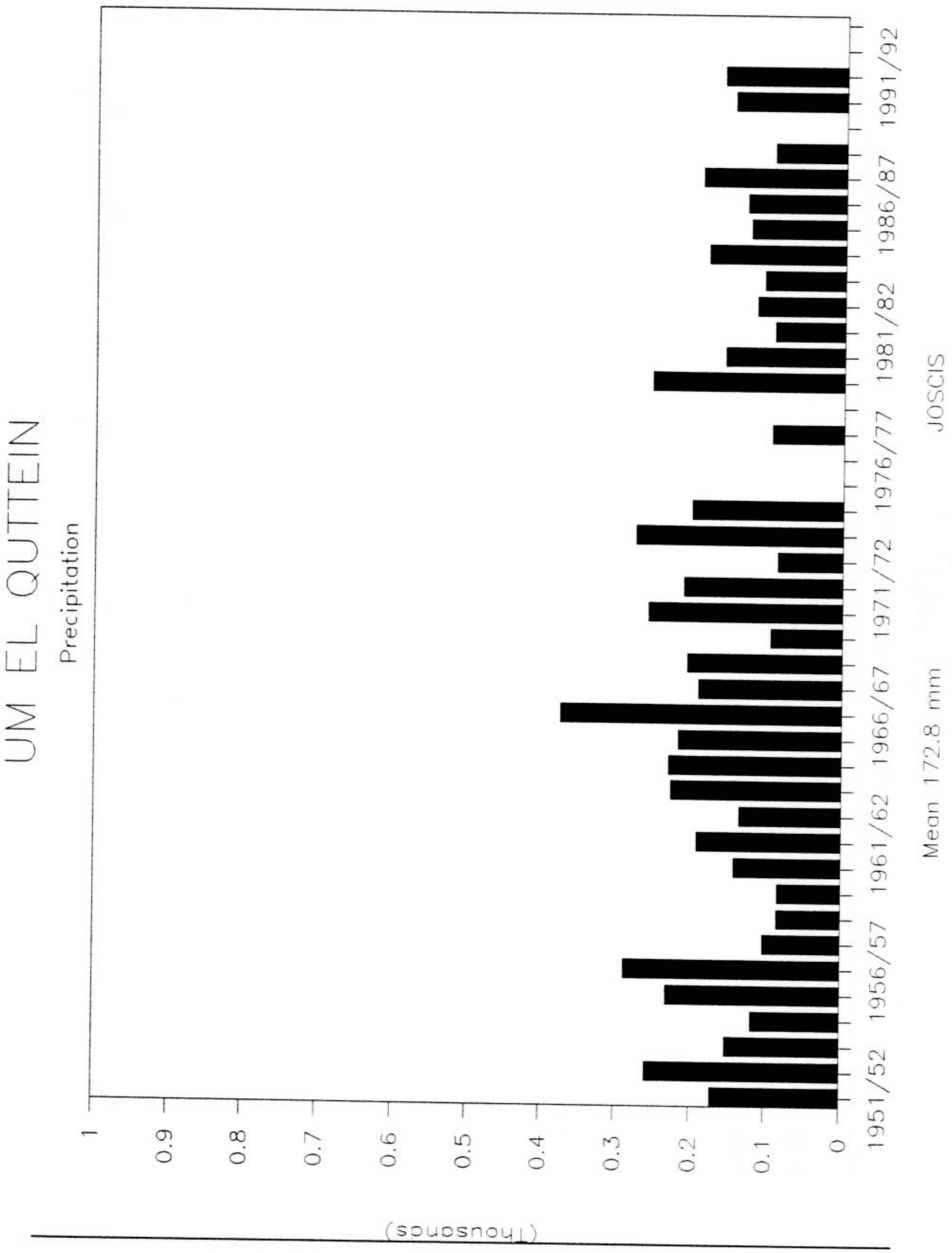

NUEIYIMA
Mean Precipitation 1950 - 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
130 120 110 100 90 80 70 60 50 40 30 20 10 0

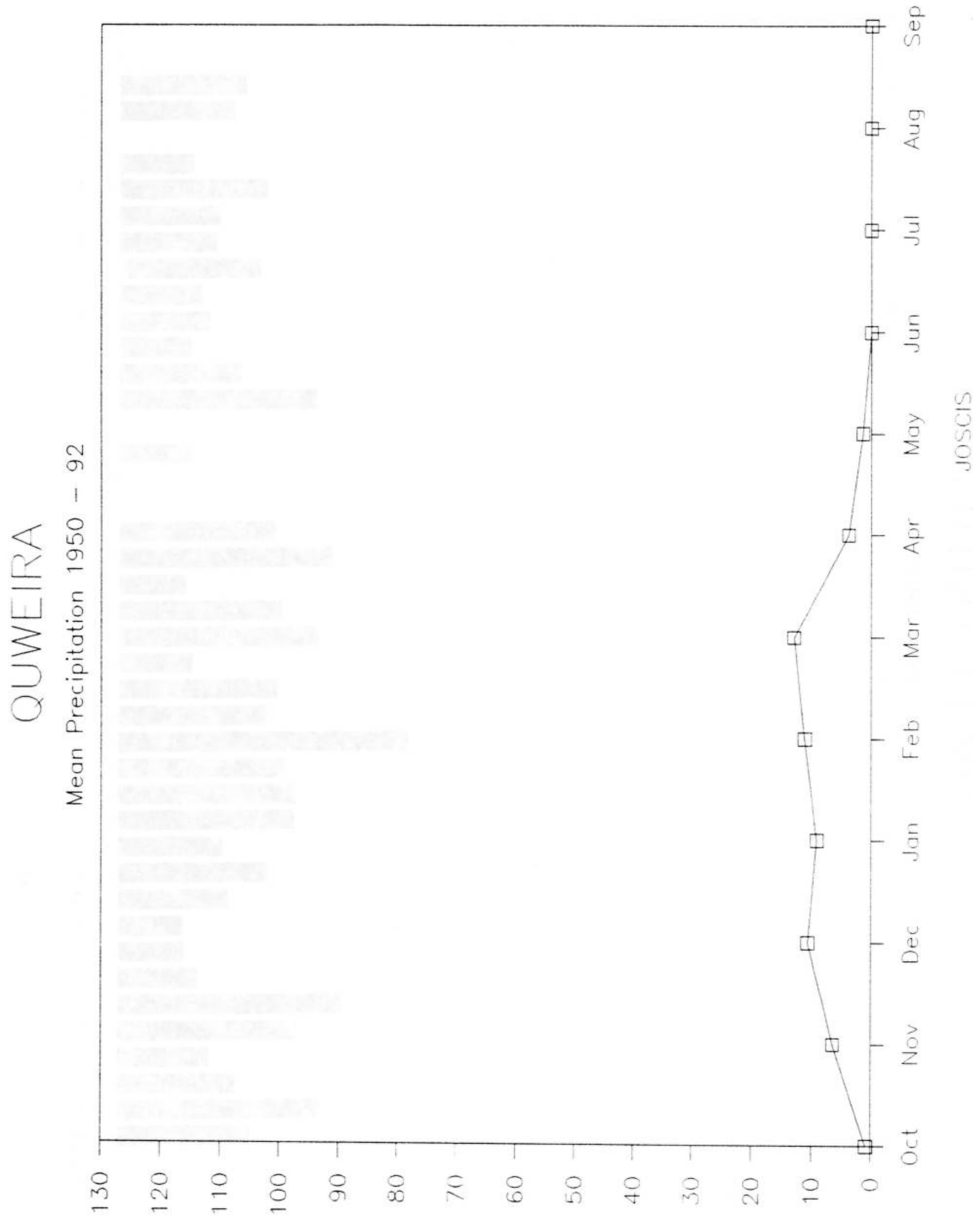

NUEIYIMA
Precipitation
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 307.2 mm
JOSCIS

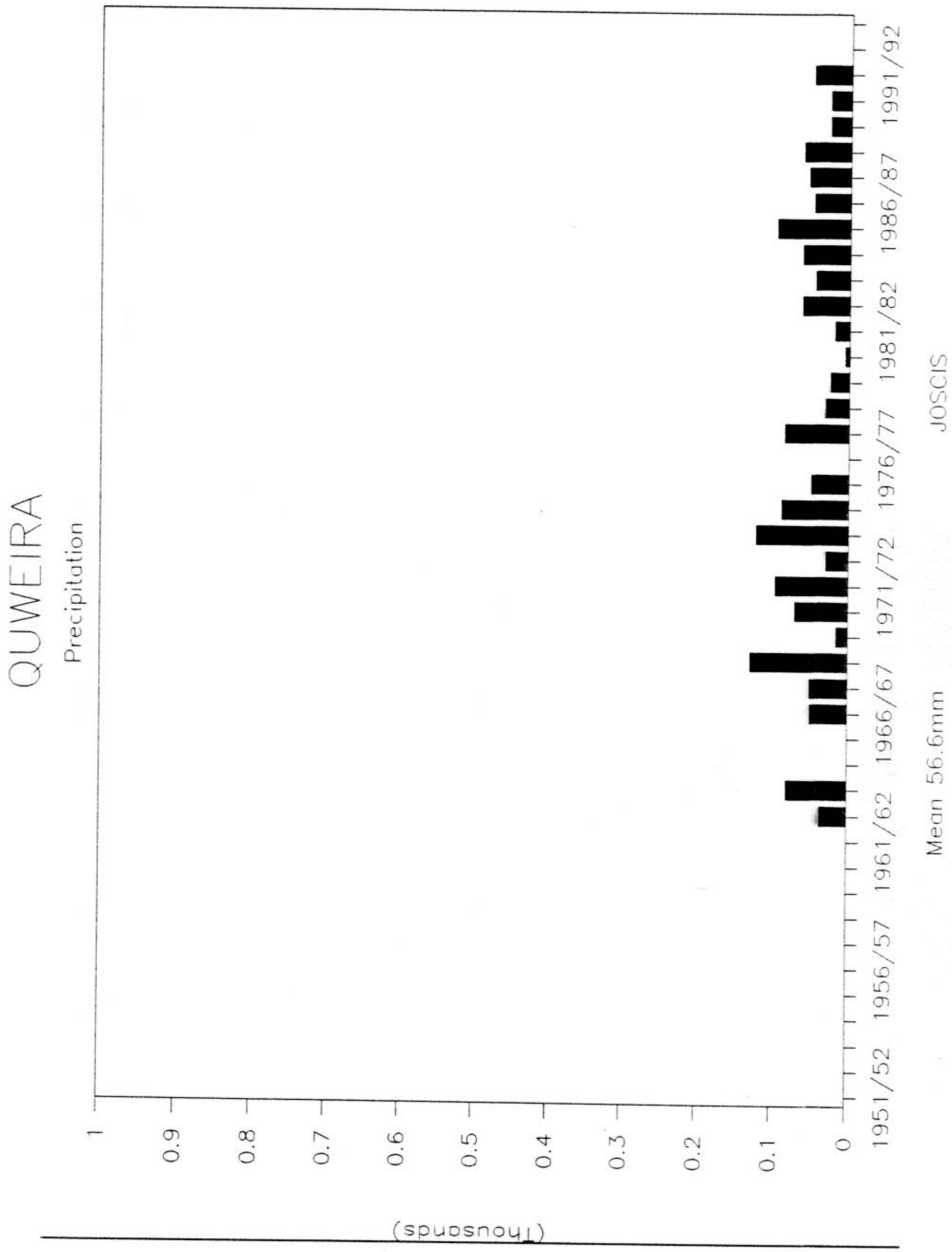

QATRANA
Mean Precipitation 1950 - 92
130 120 110 100 90 80 70 60 50 40 30 20 10 0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
JOSCIS

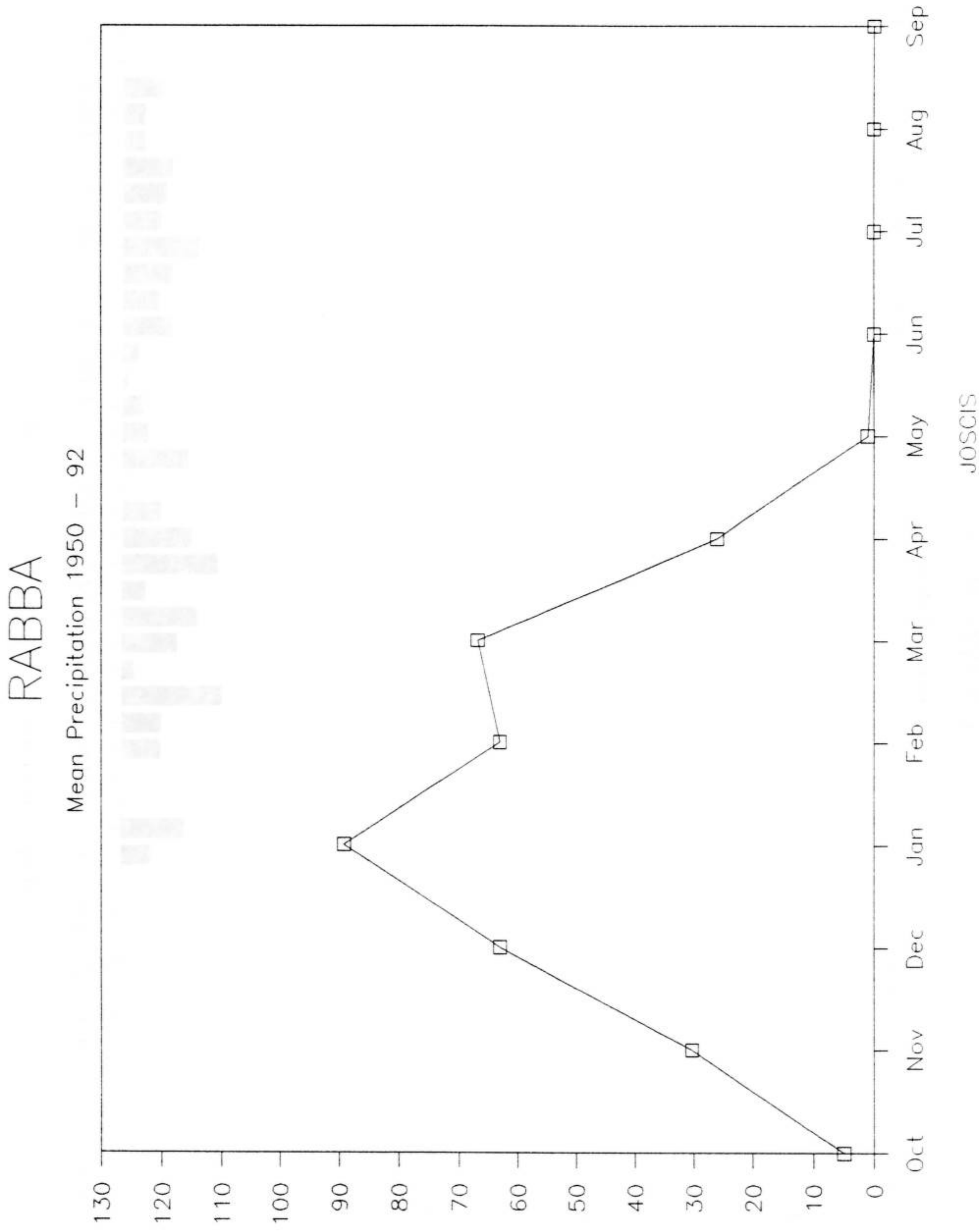

QATRANA
Precipitation
Mean 99.6 mm
JOSCIS
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

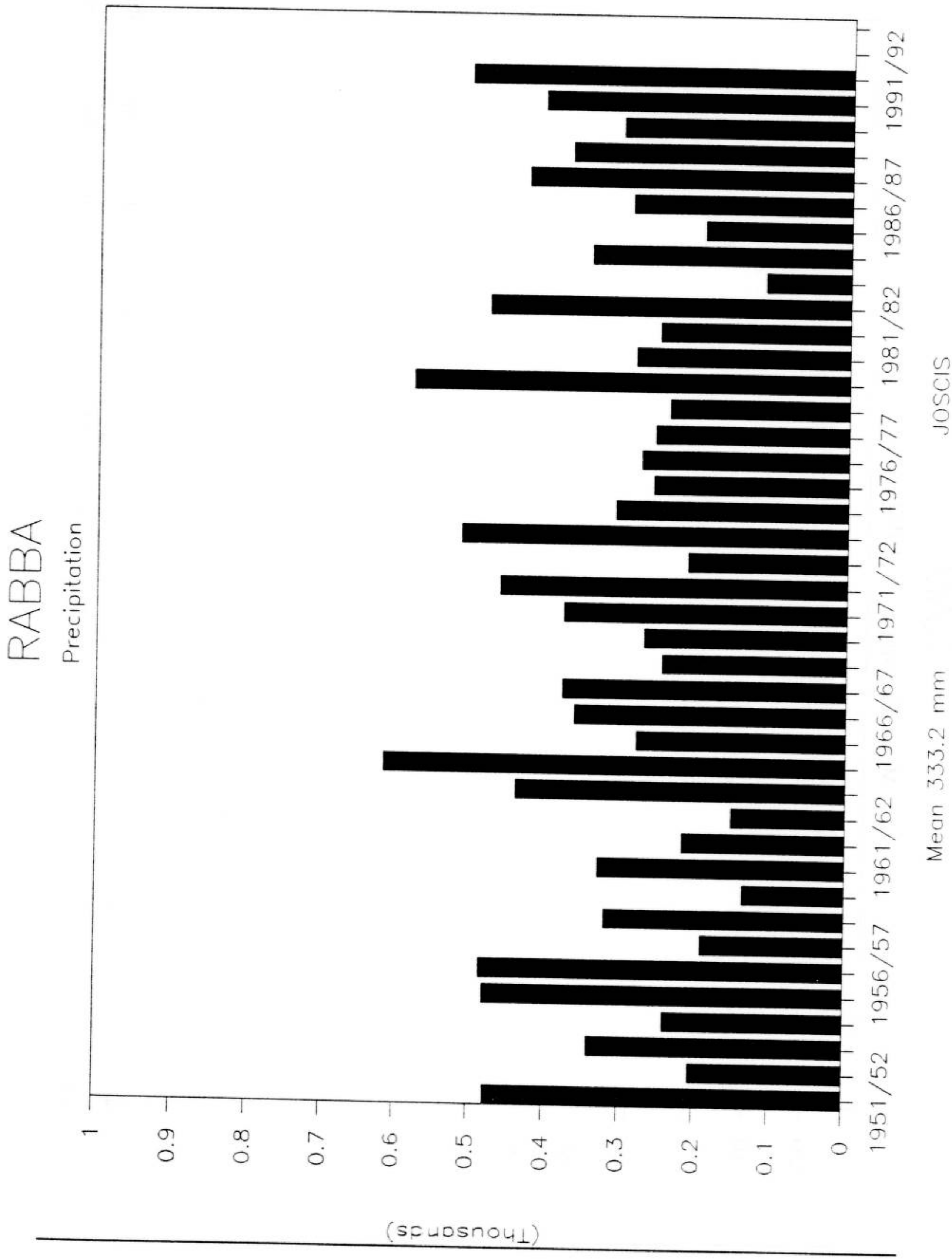

UM EL QUTTEIN
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

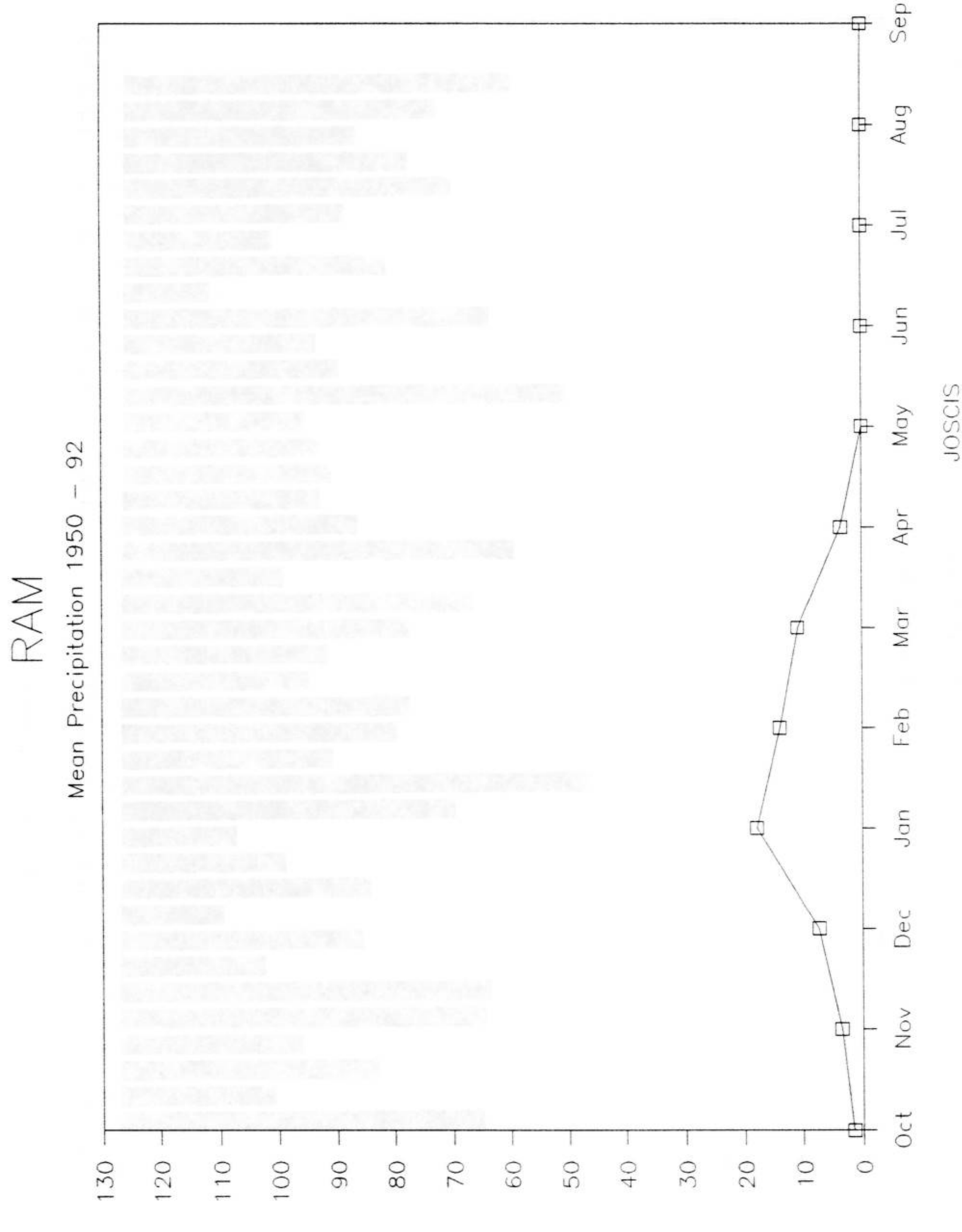

UM EL QUTTEIN
Precipitation
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 172.8 mm
JOSCIS

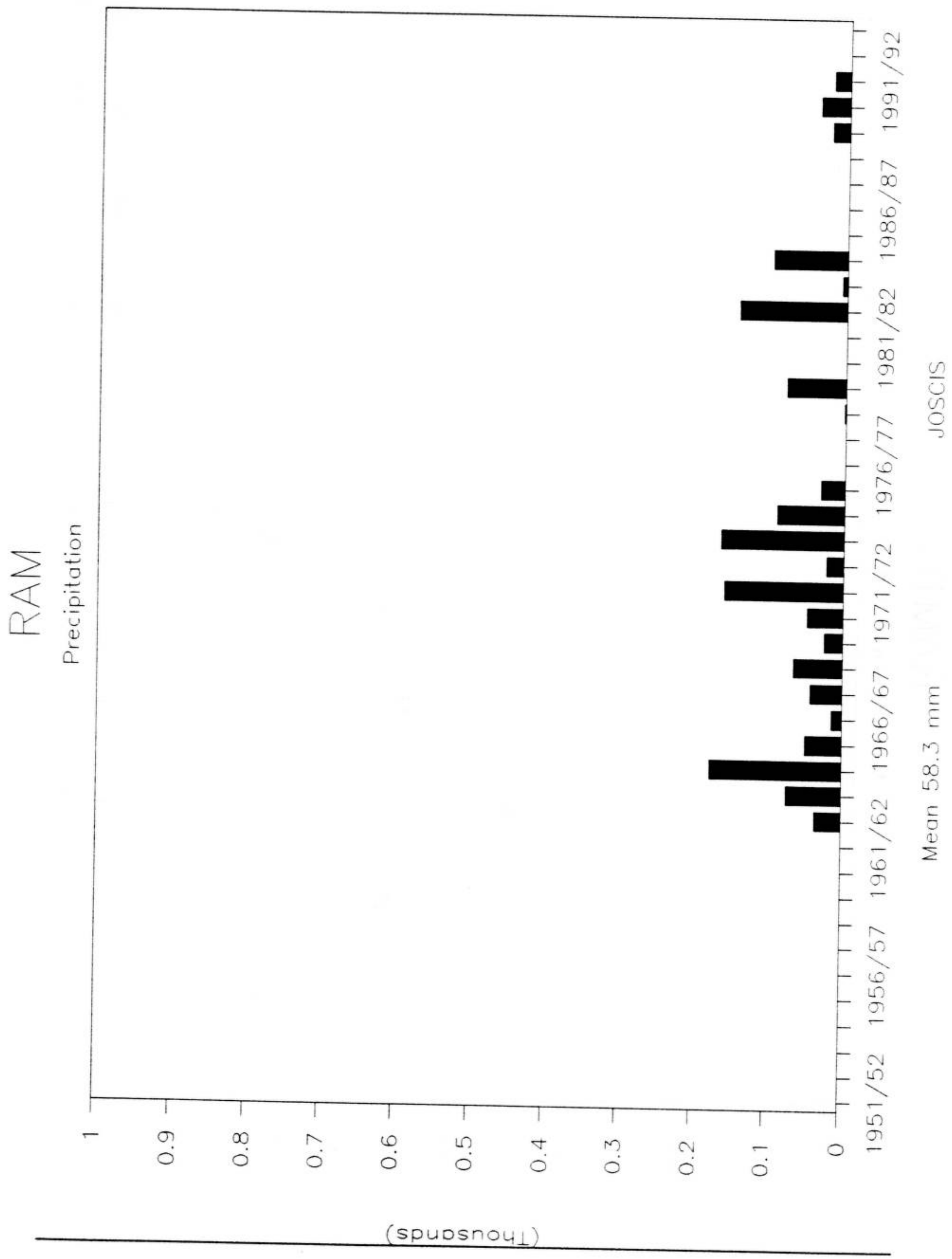

QUWEIRA
Mean Precipitation 1950 – 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

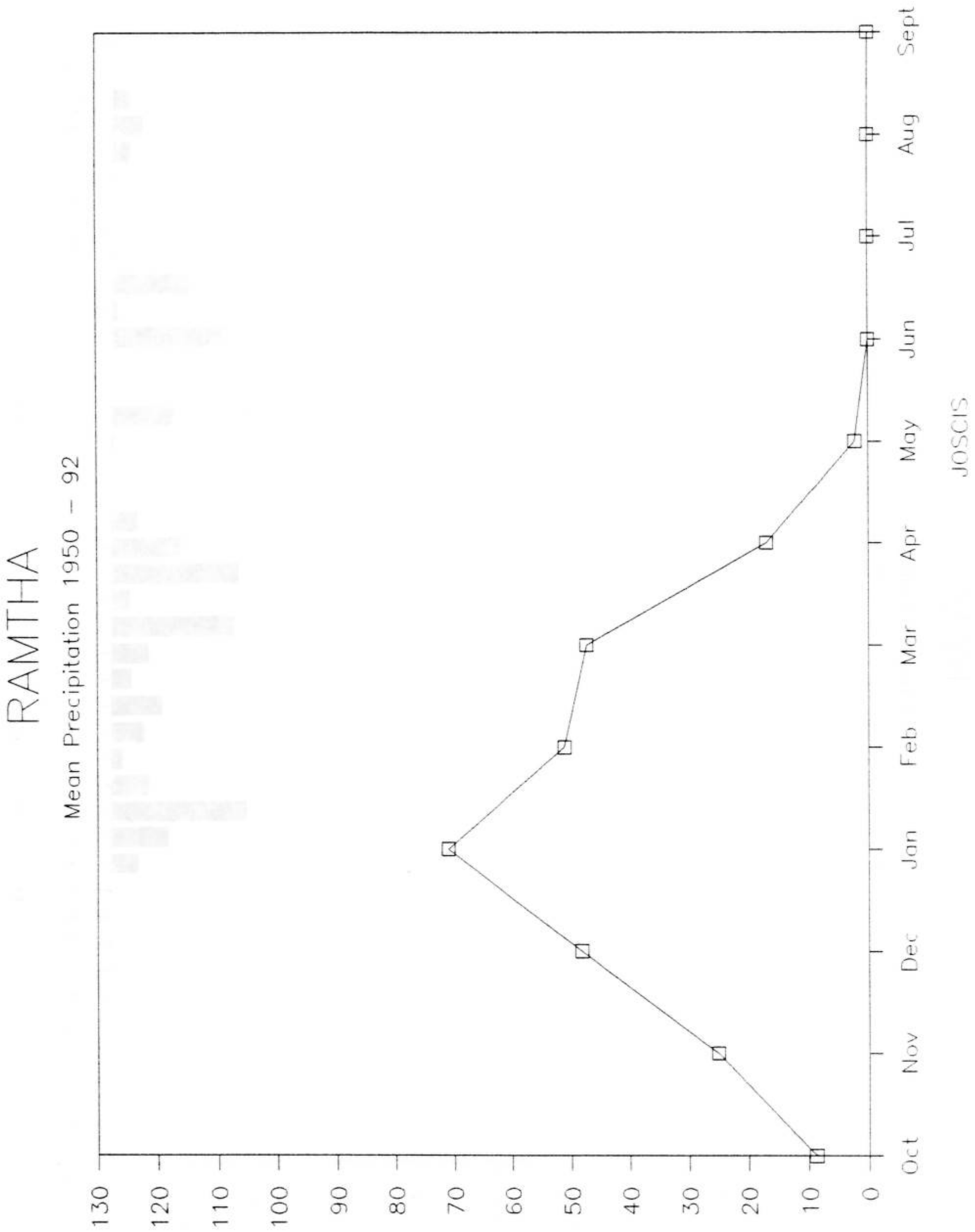

QUWEIRA
Precipitation
Mean 56.6mm
JOSCIS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

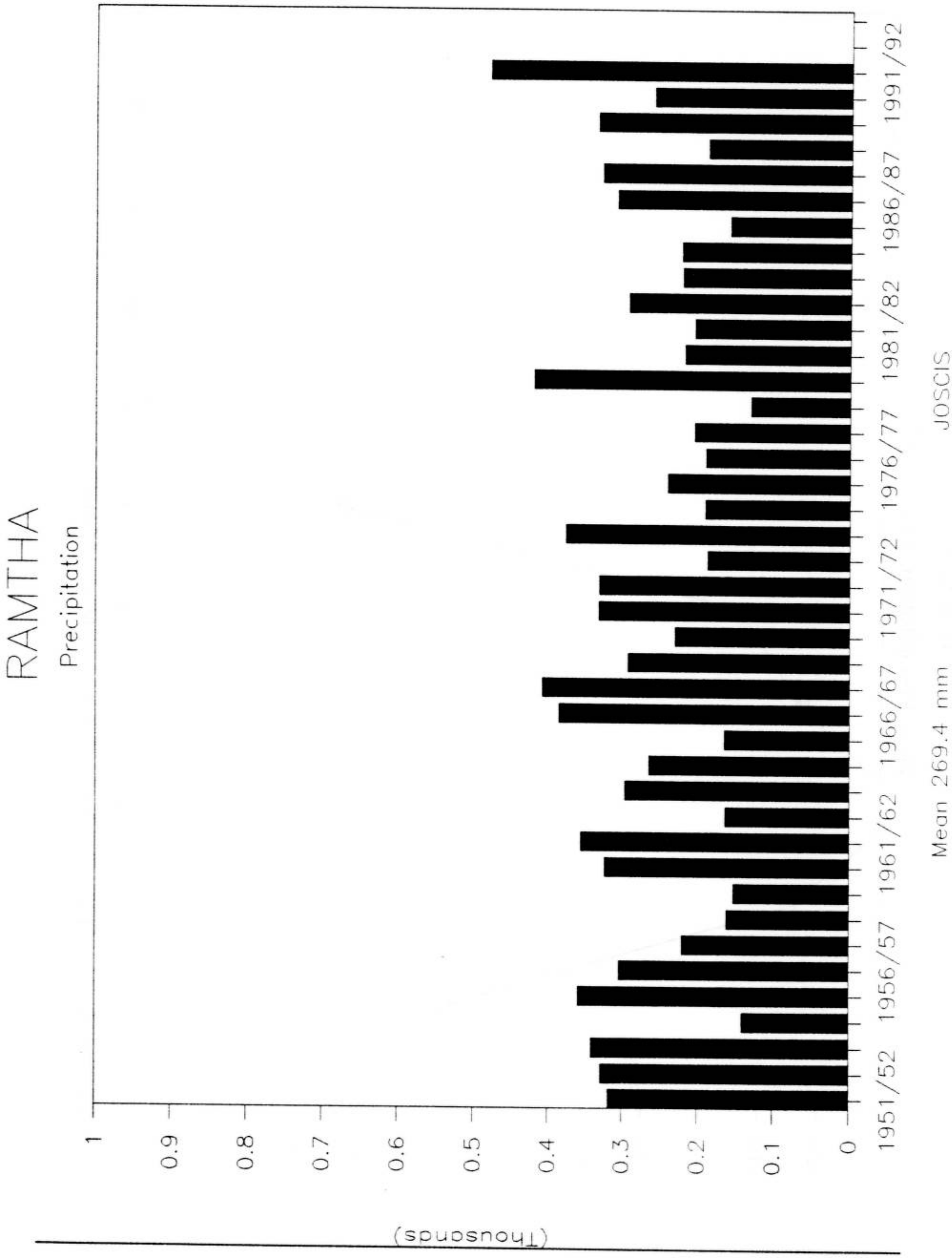

RABBA
Mean Precipitation 1950 - 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
130 120 110 100 90 80 70 60 50 40 30 20 10 0

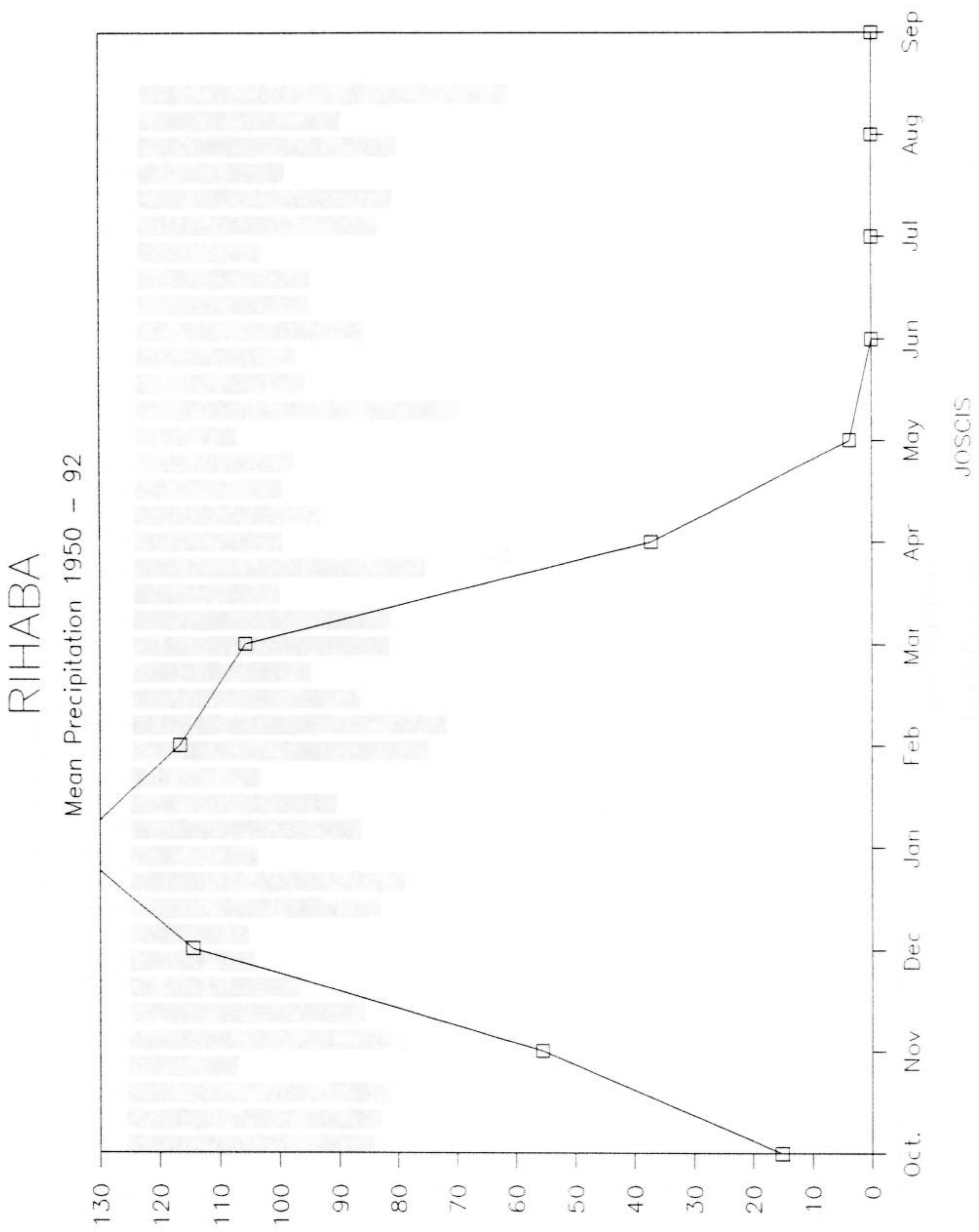

RABBA
Precipitation
Mean 333.2 mm
JOSCIS
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

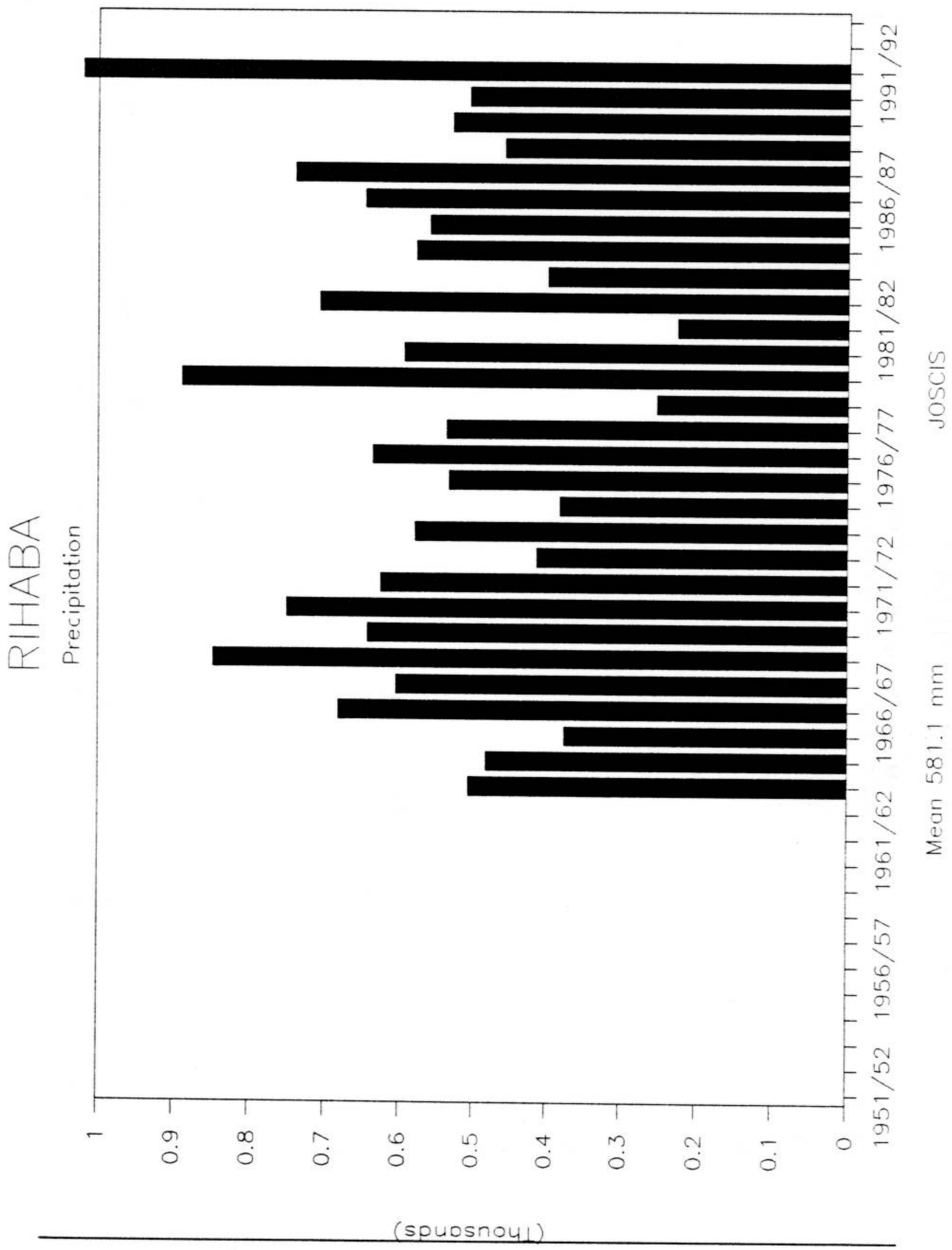

RAM
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

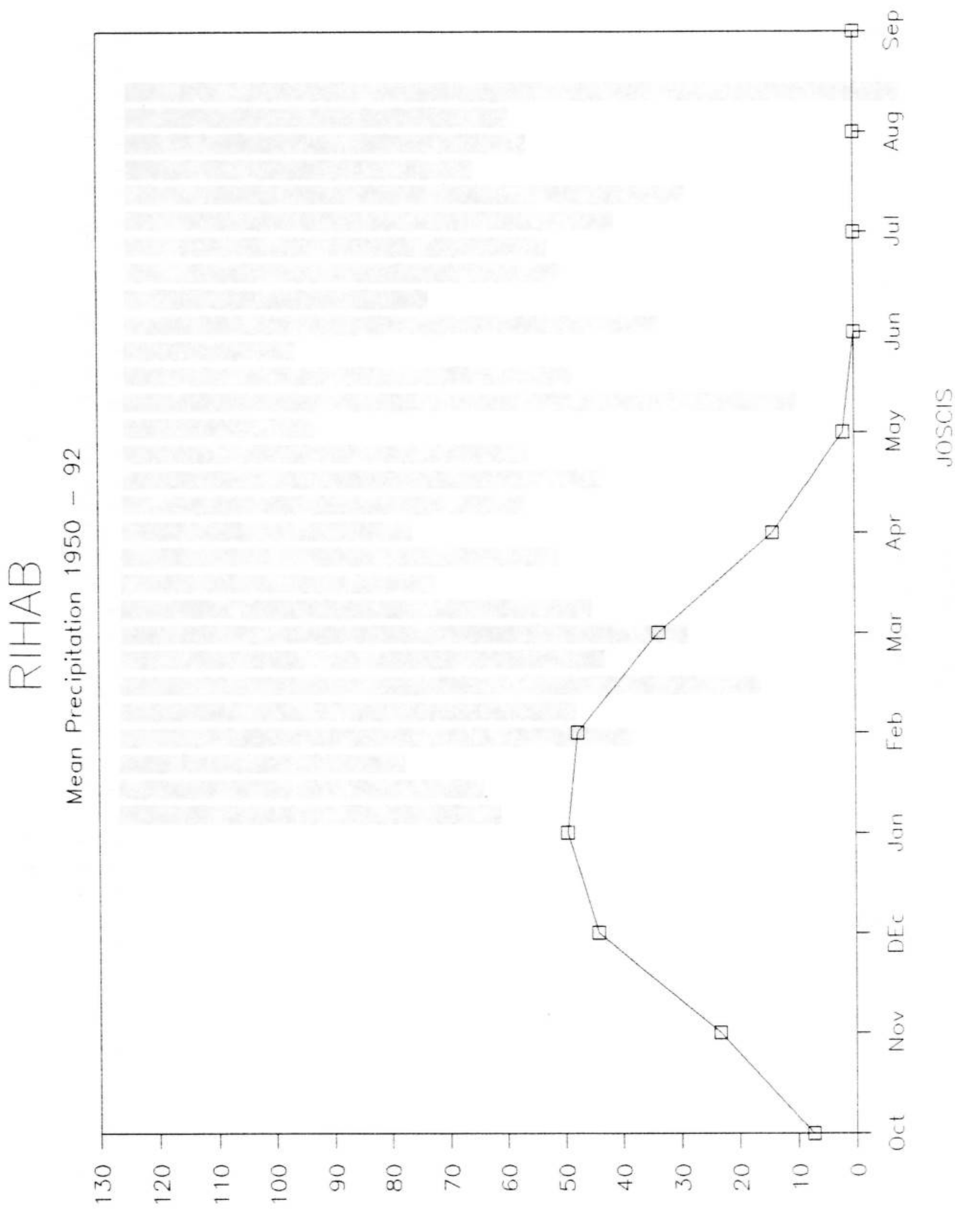

RAM
Precipitation
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 58.3 mm
JOSCIS

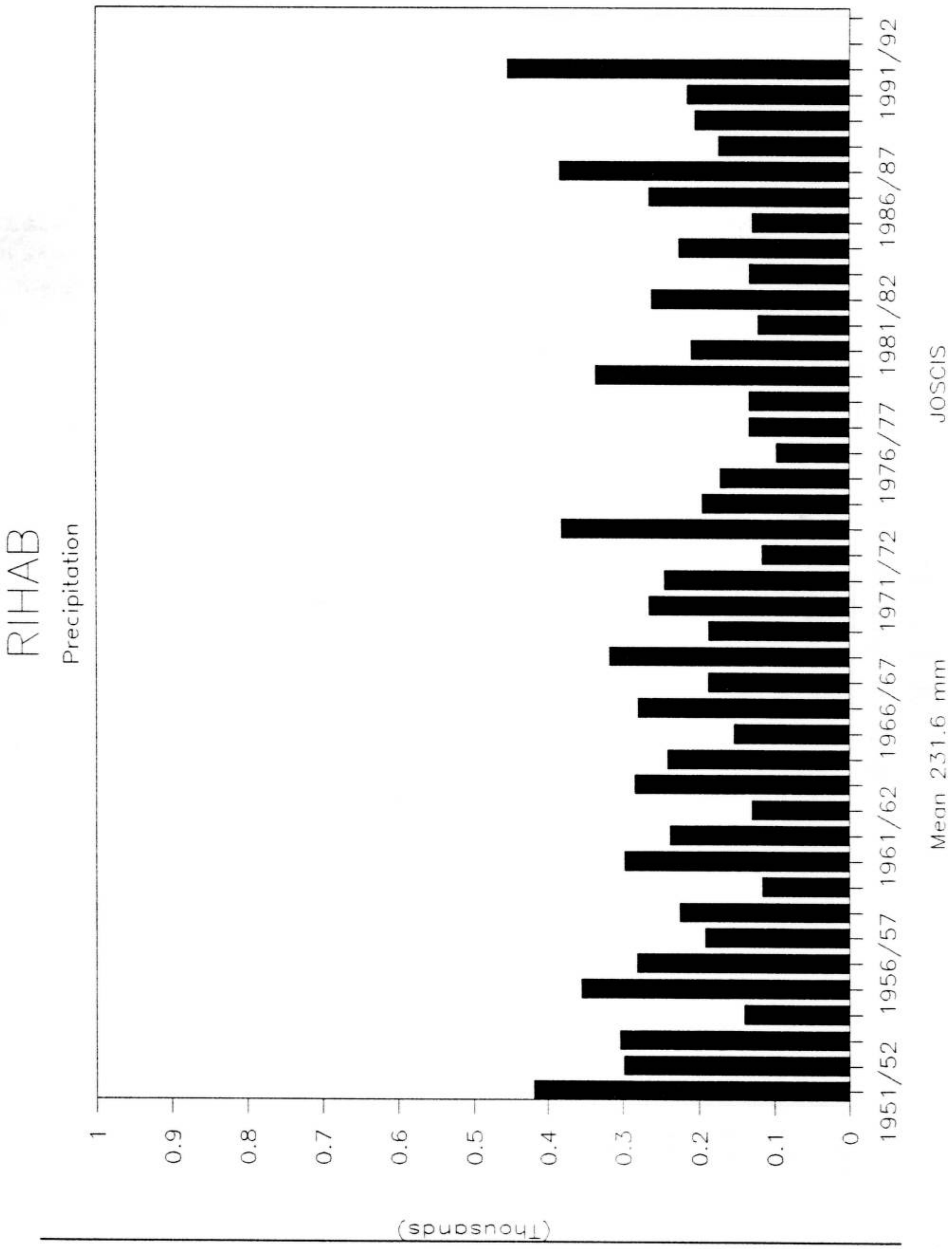

RAMTHA
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
JOSCIS

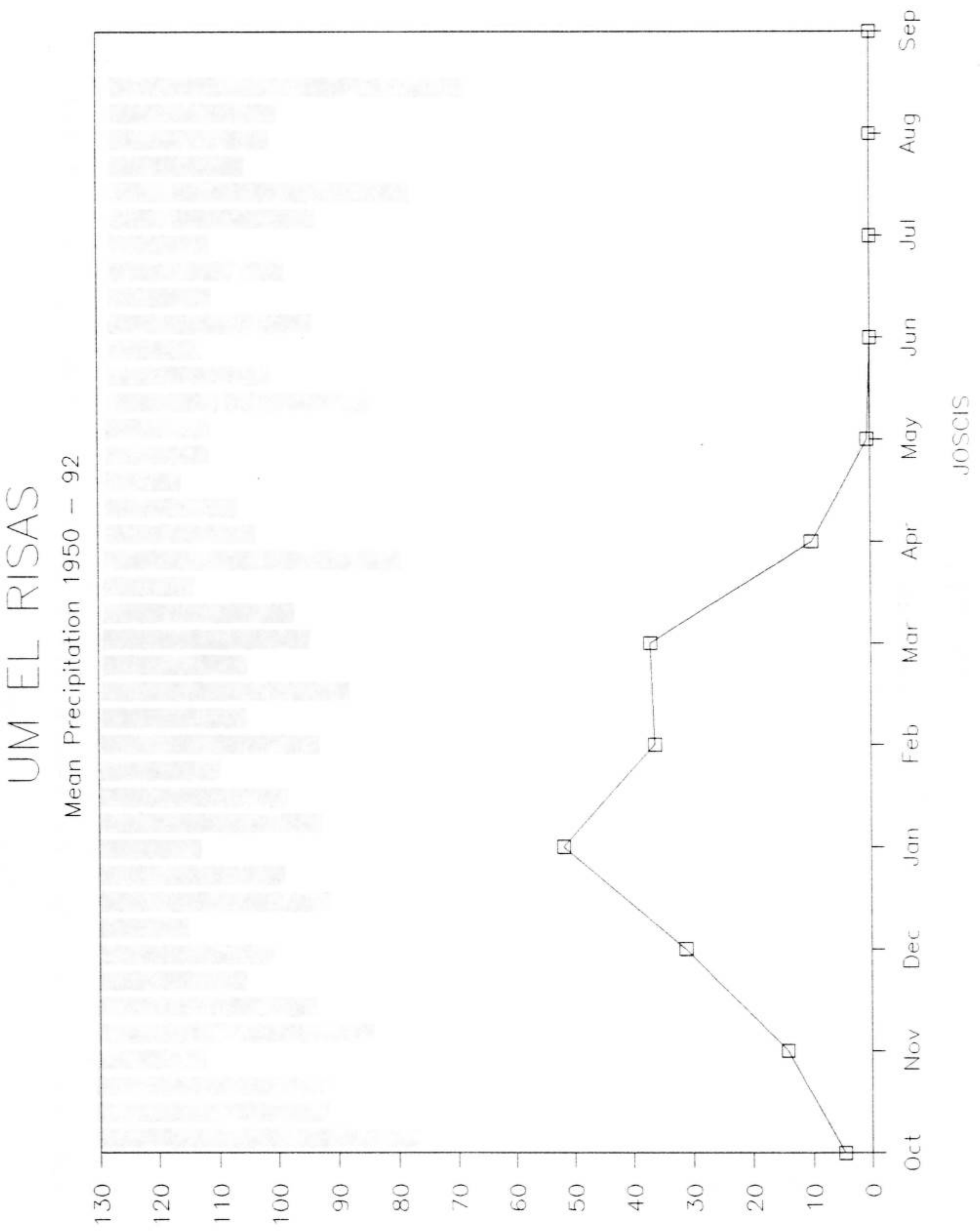

RAMTHA
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 269.4 mm
JOSCIS
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

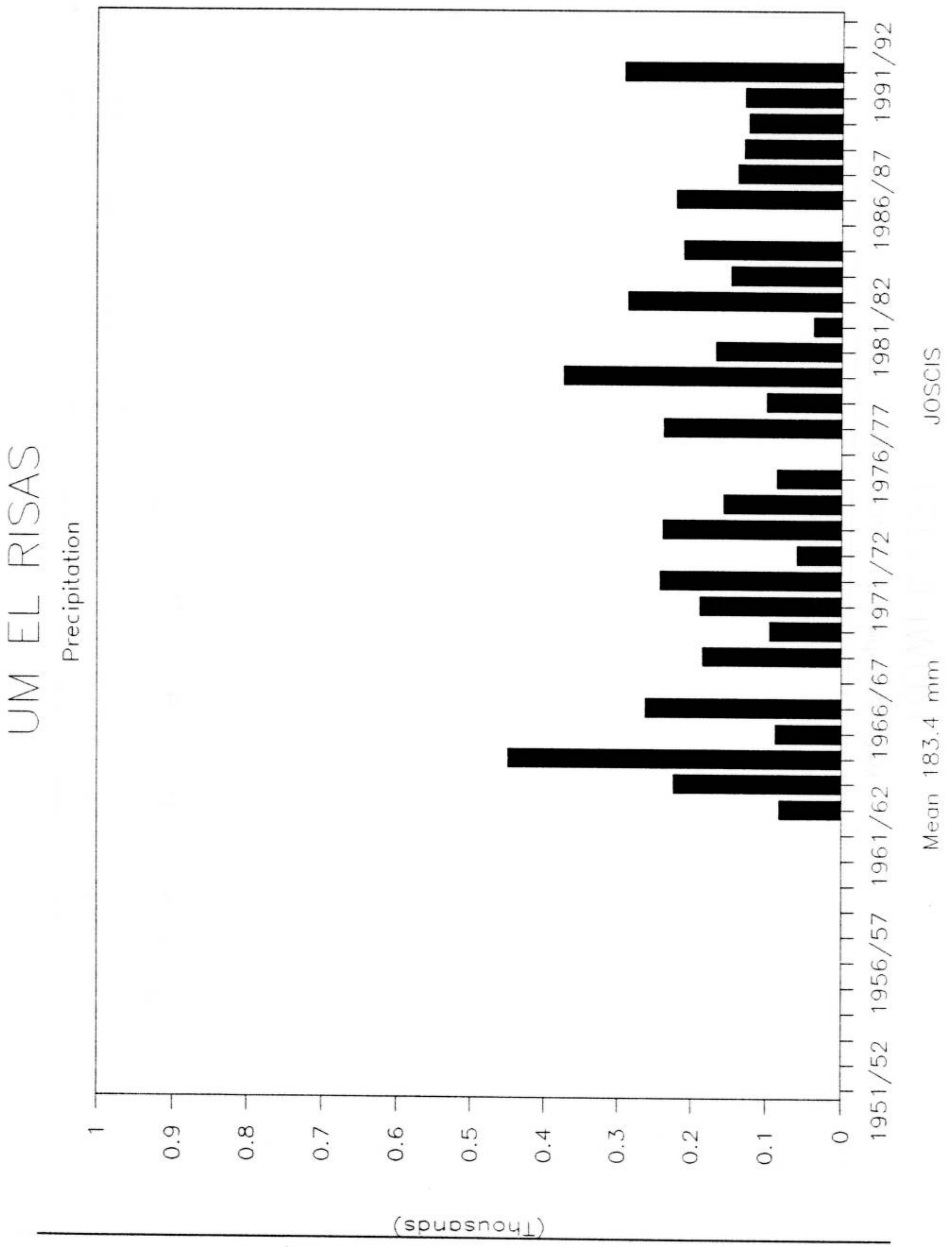

RIHABA
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct.
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

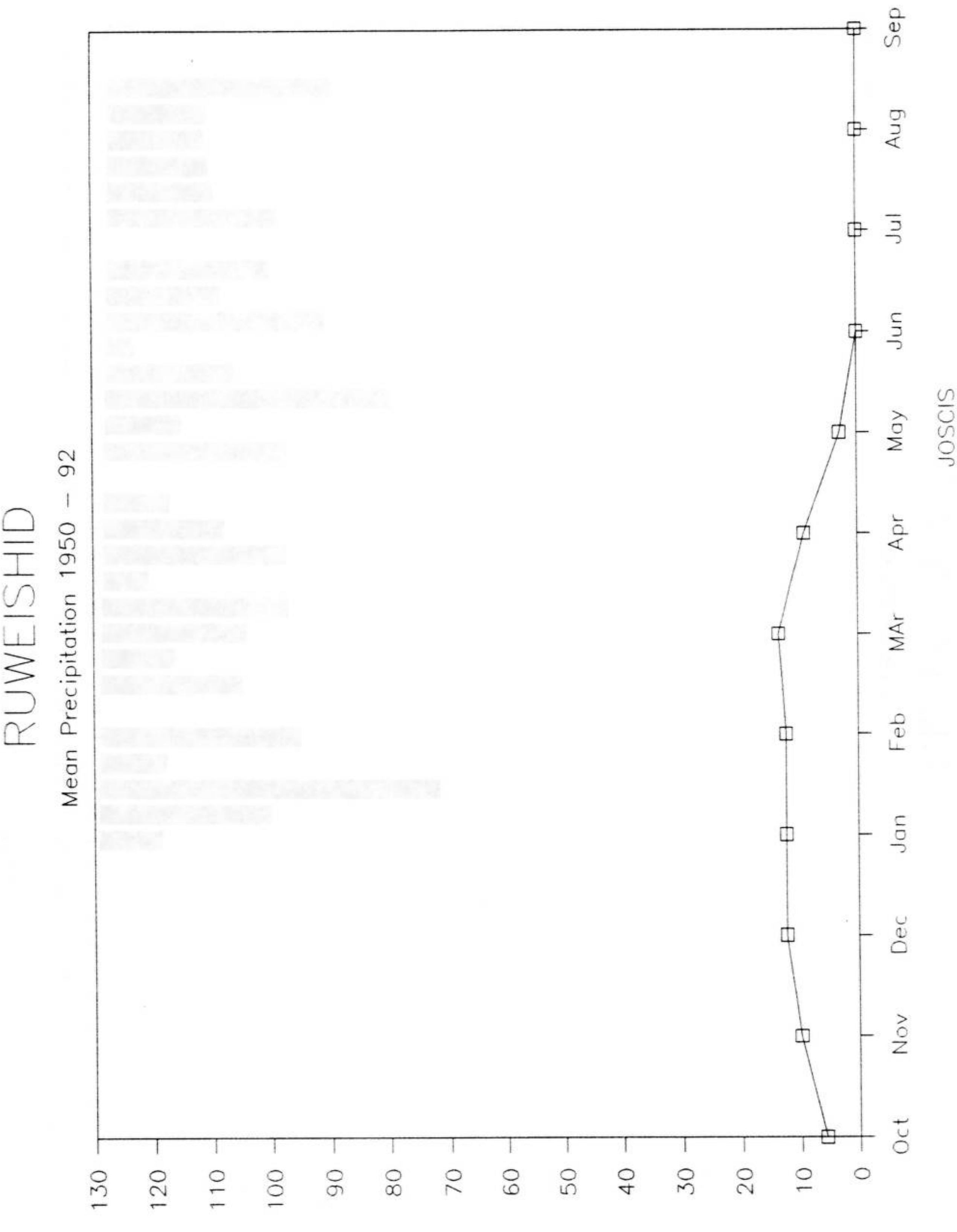

RIHABA
Precipitation
Mean 581.1 mm
JOSCIS
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

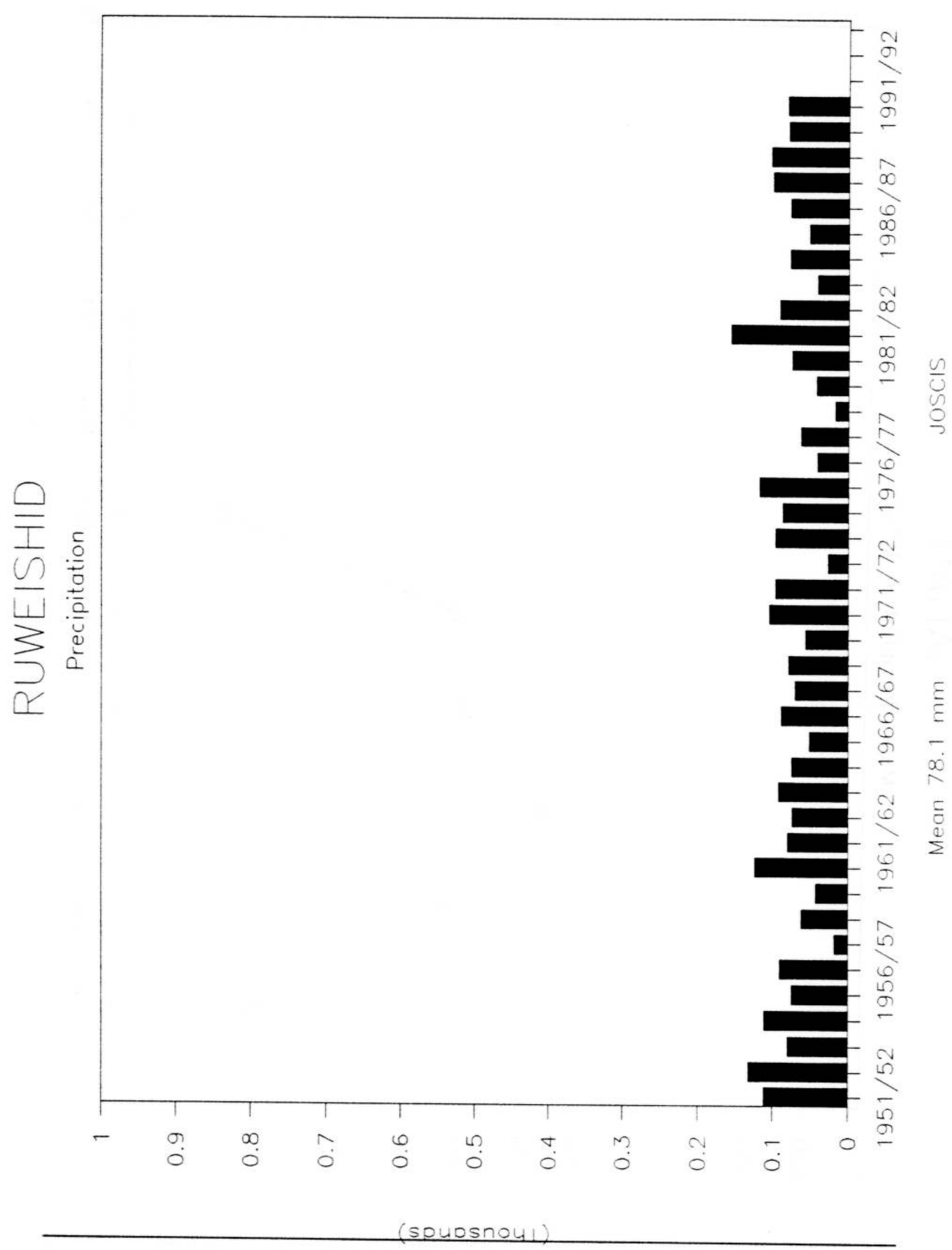

RIHAB
Mean Precipitation 1950 - 92
JOSCIS
Oct
Nov
DEc
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
0
10
20
30
40
50
60
70
80
90
100
110
120
130

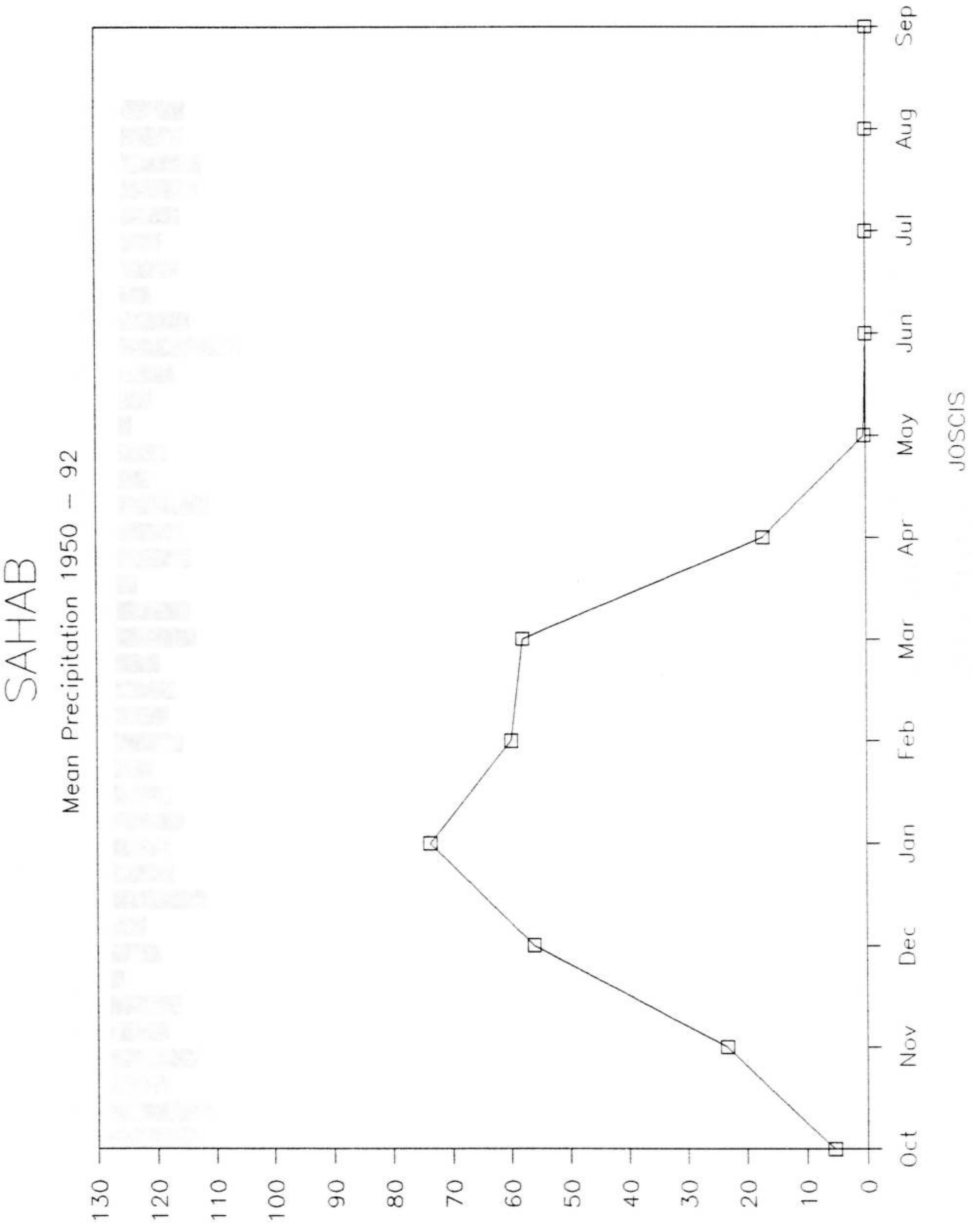

RIHAB
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 231.6 mm
JOSCIS
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

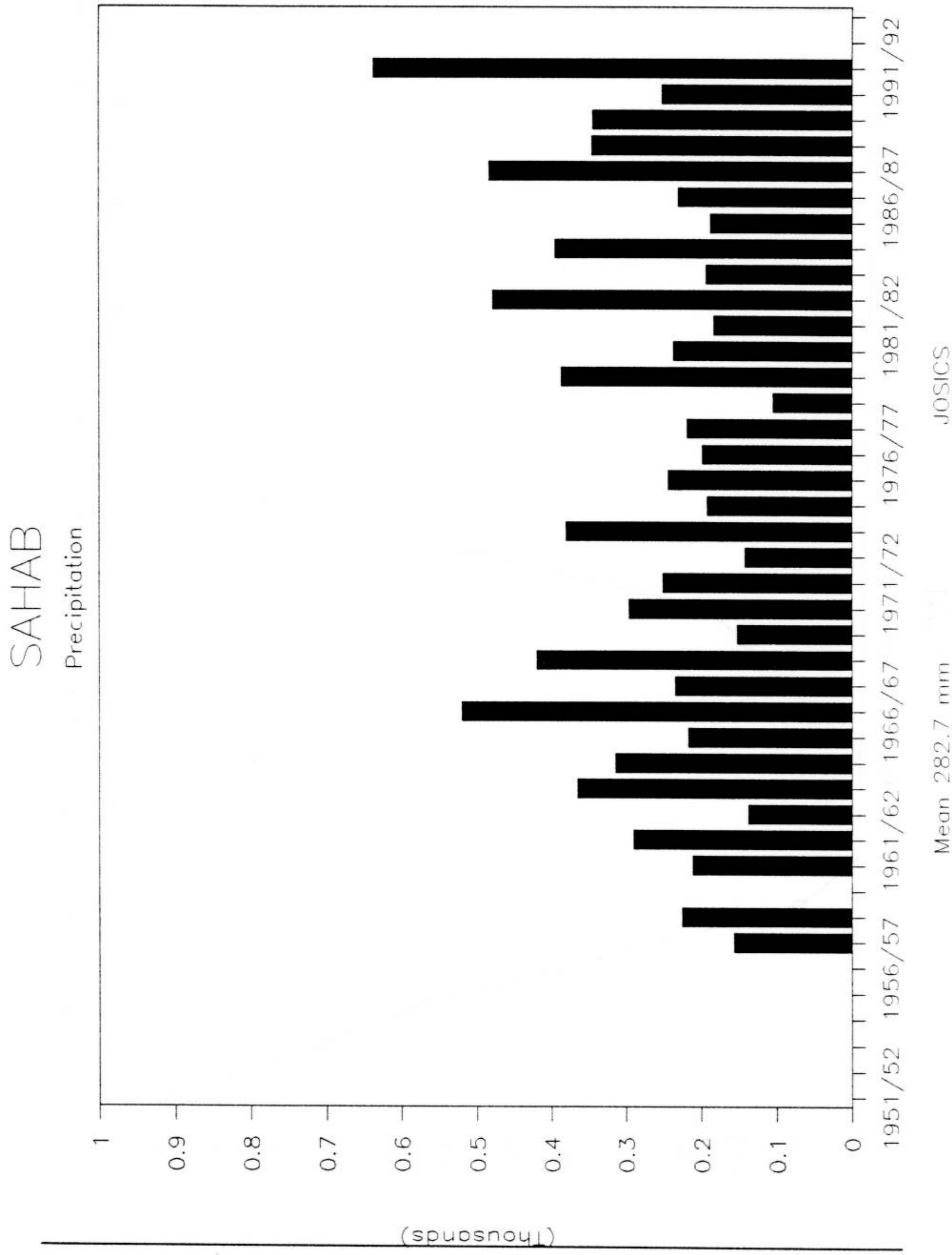

UM EL RISAS
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

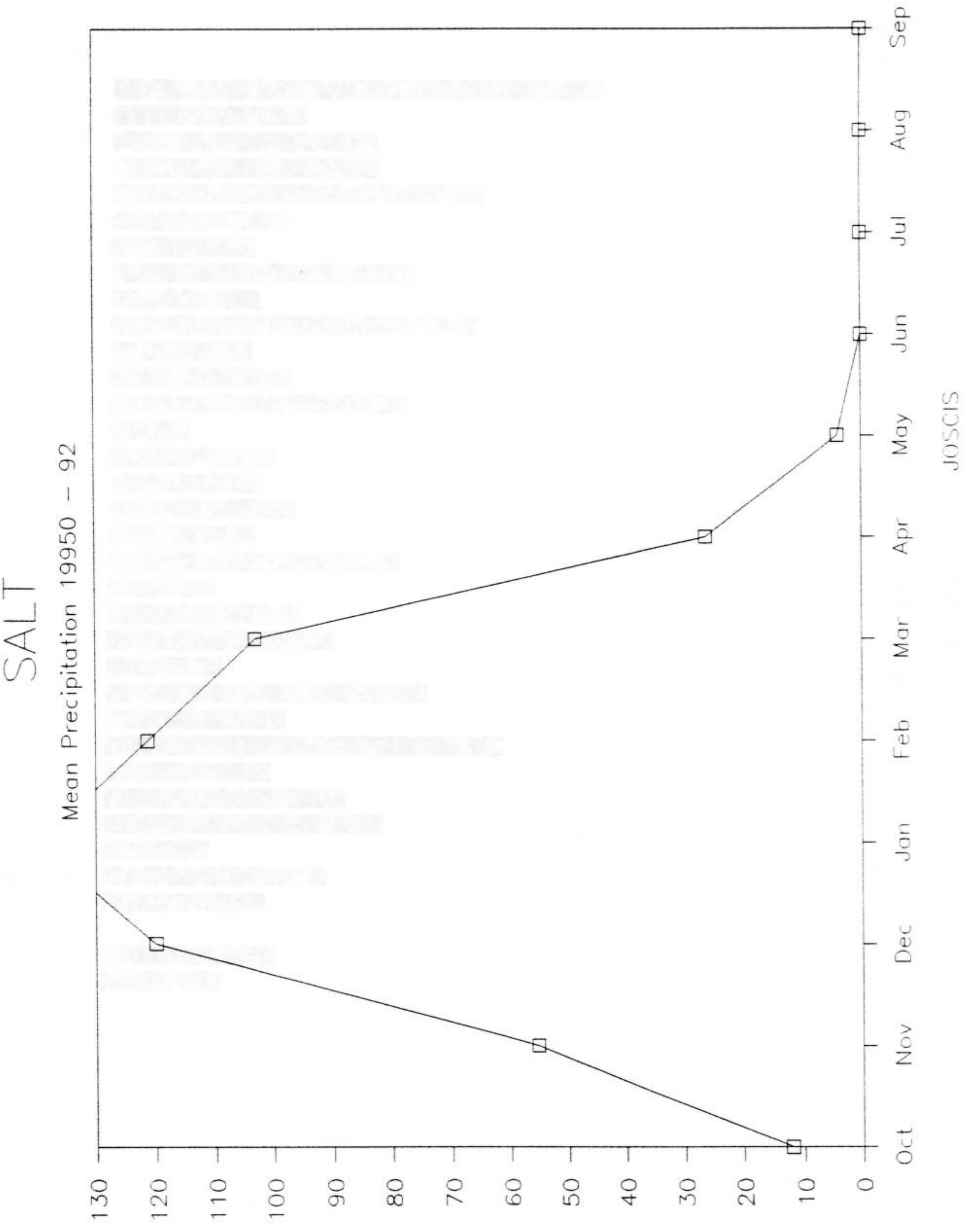

UM EL RISAS
Precipitation
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 183.4 mm
JOSCIS

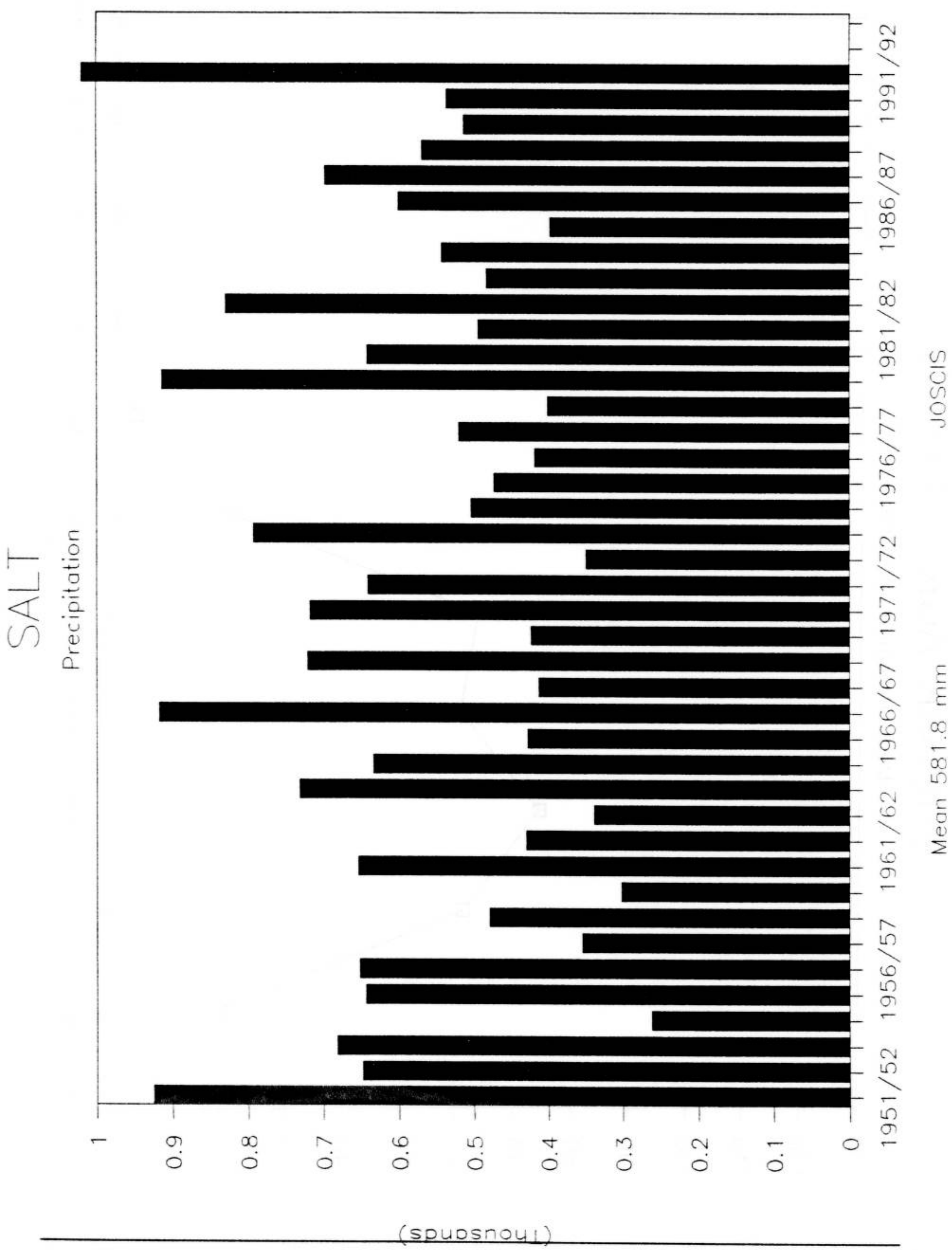

RUWEISHID
Mean Precipitation 1950 - 92
JOSCIS
Oct
Nov
Dec
Jan
Feb
MAr
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0

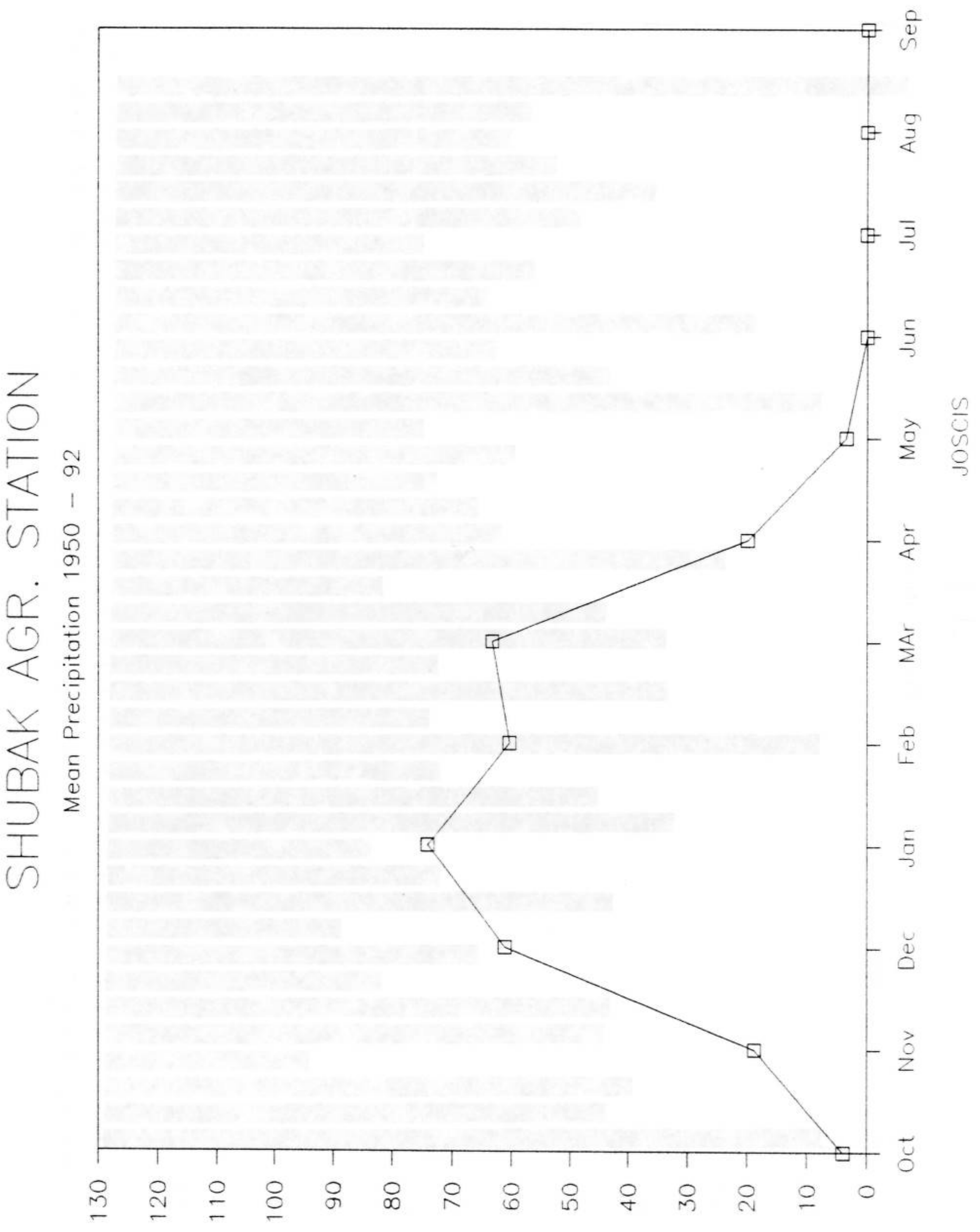

RUWEISHID
Precipitation
Mean 78.1 mm
JOSCIS
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

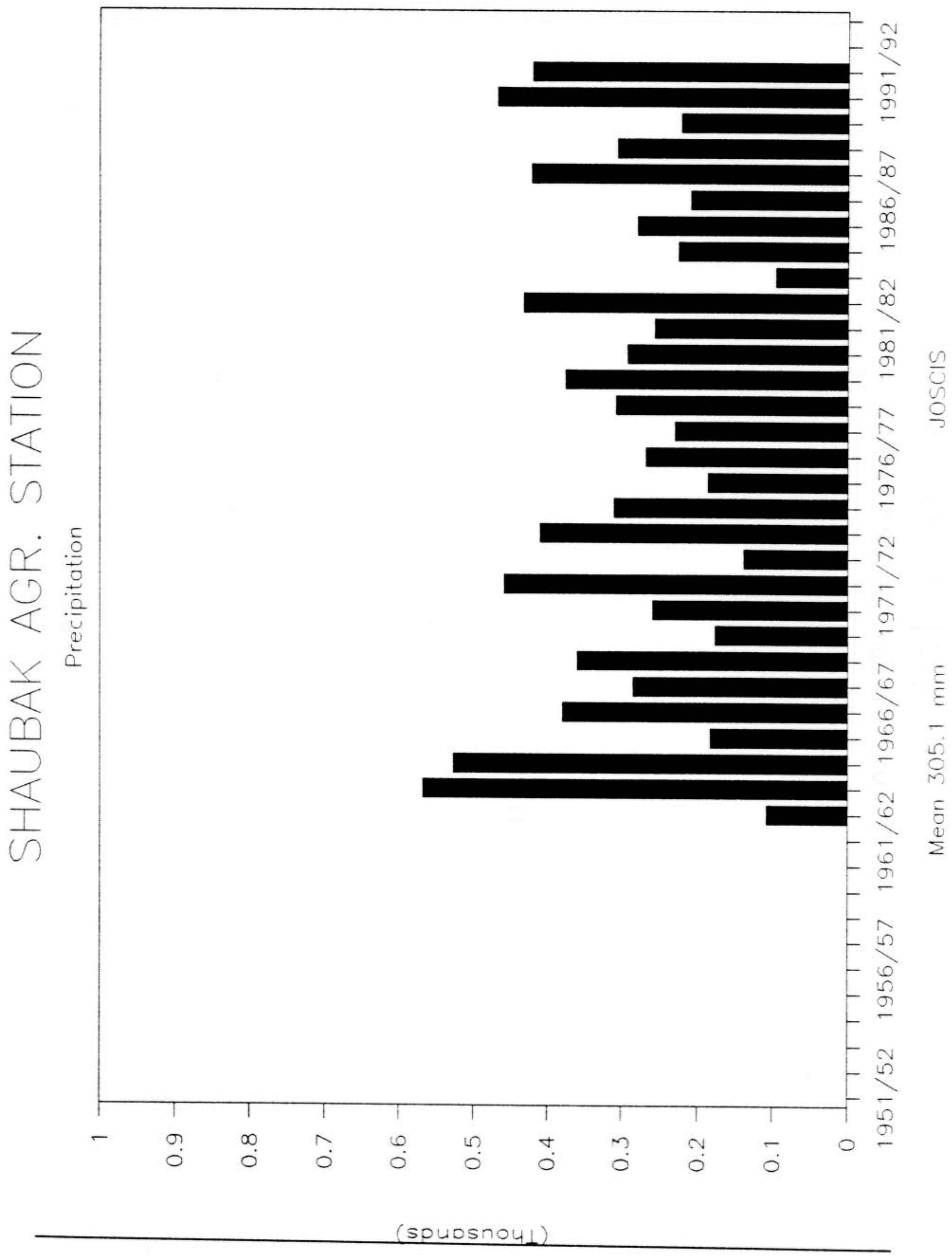

SAHAB
Mean Precipitation 1950 – 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

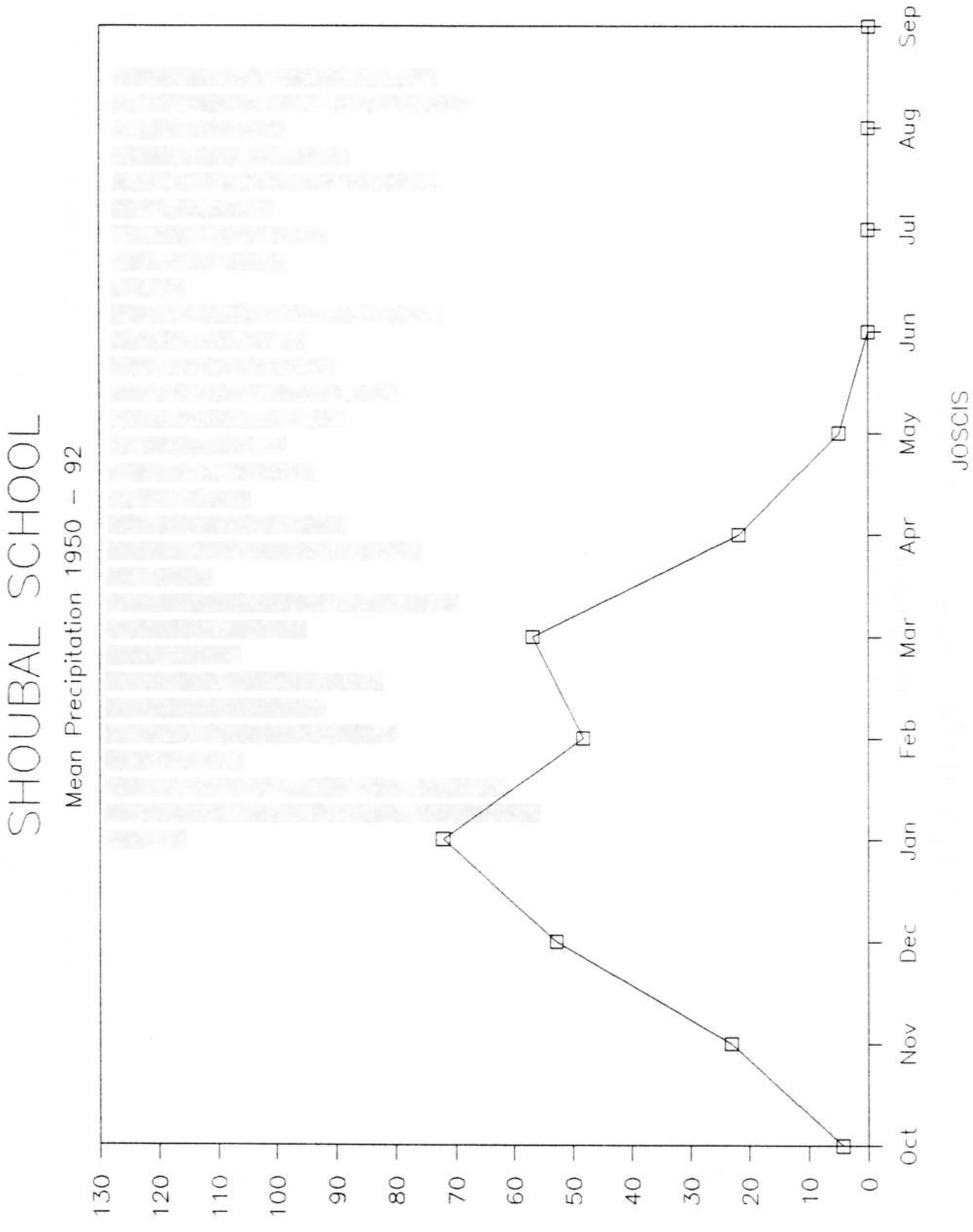

SAHAB
Precipitation
Mean 282.7 mm
JOSICS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

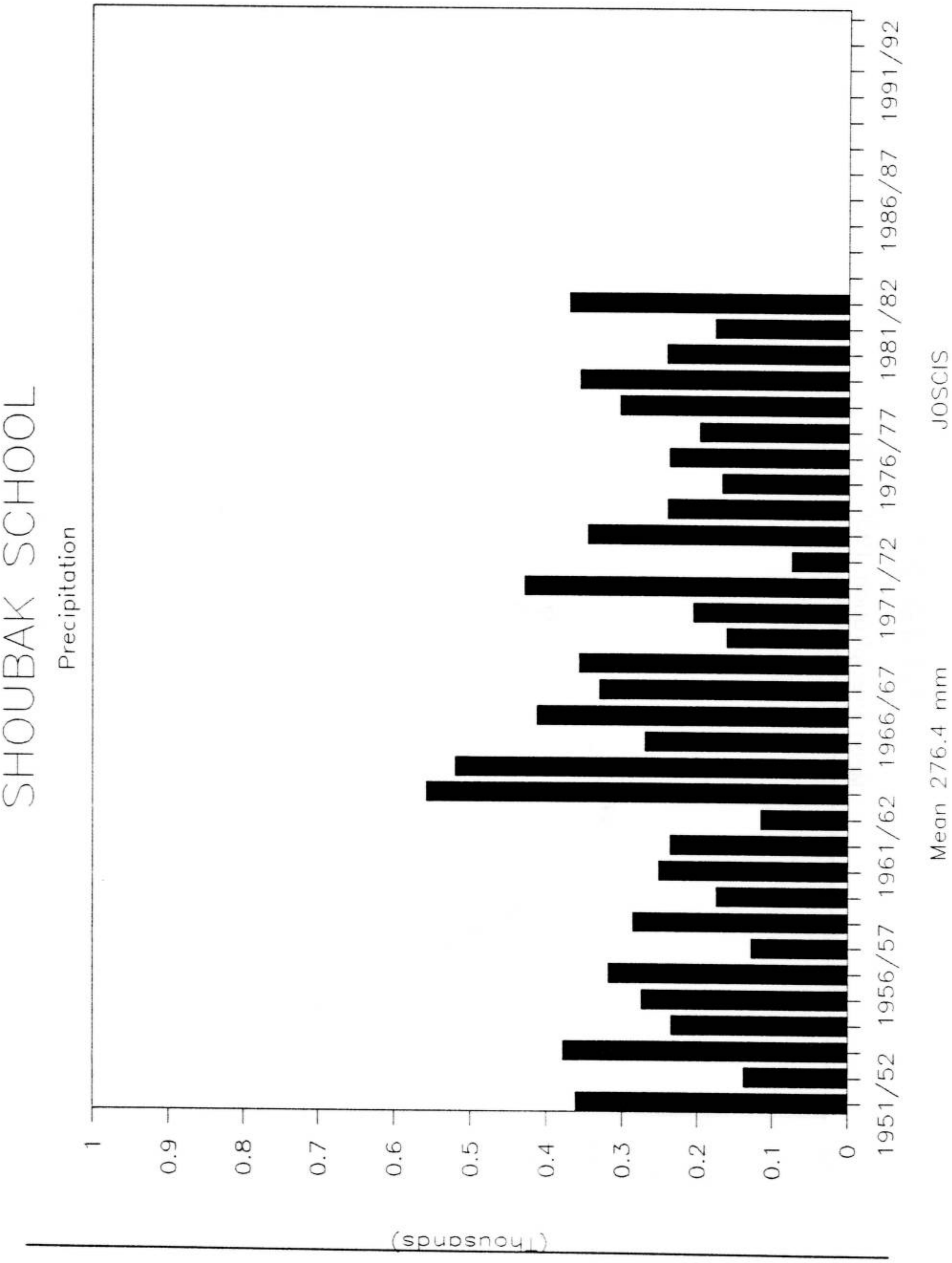

SALT
Mean Precipitation 19950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

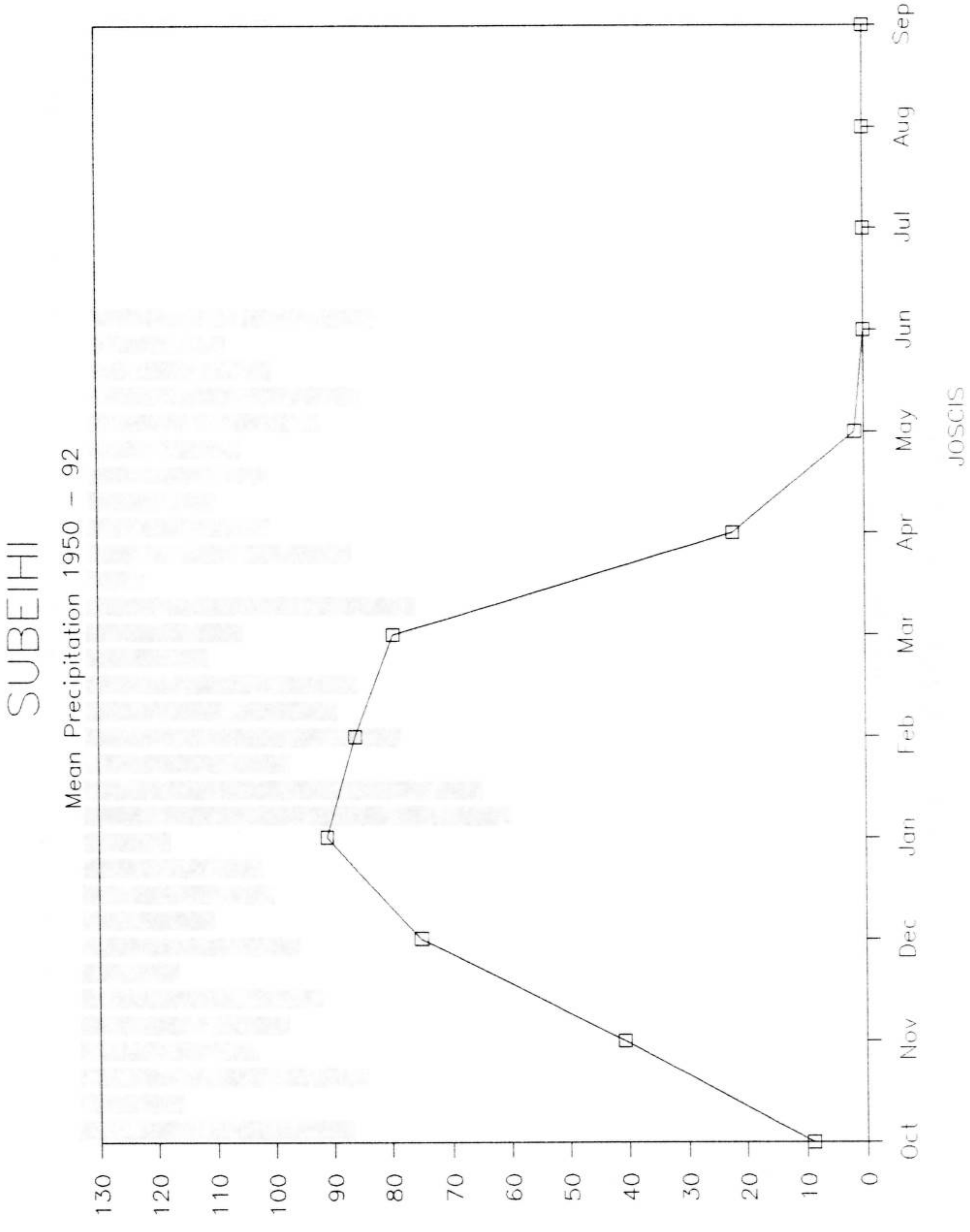

SALT
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)
Mean 581.8 mm
JOSCIS

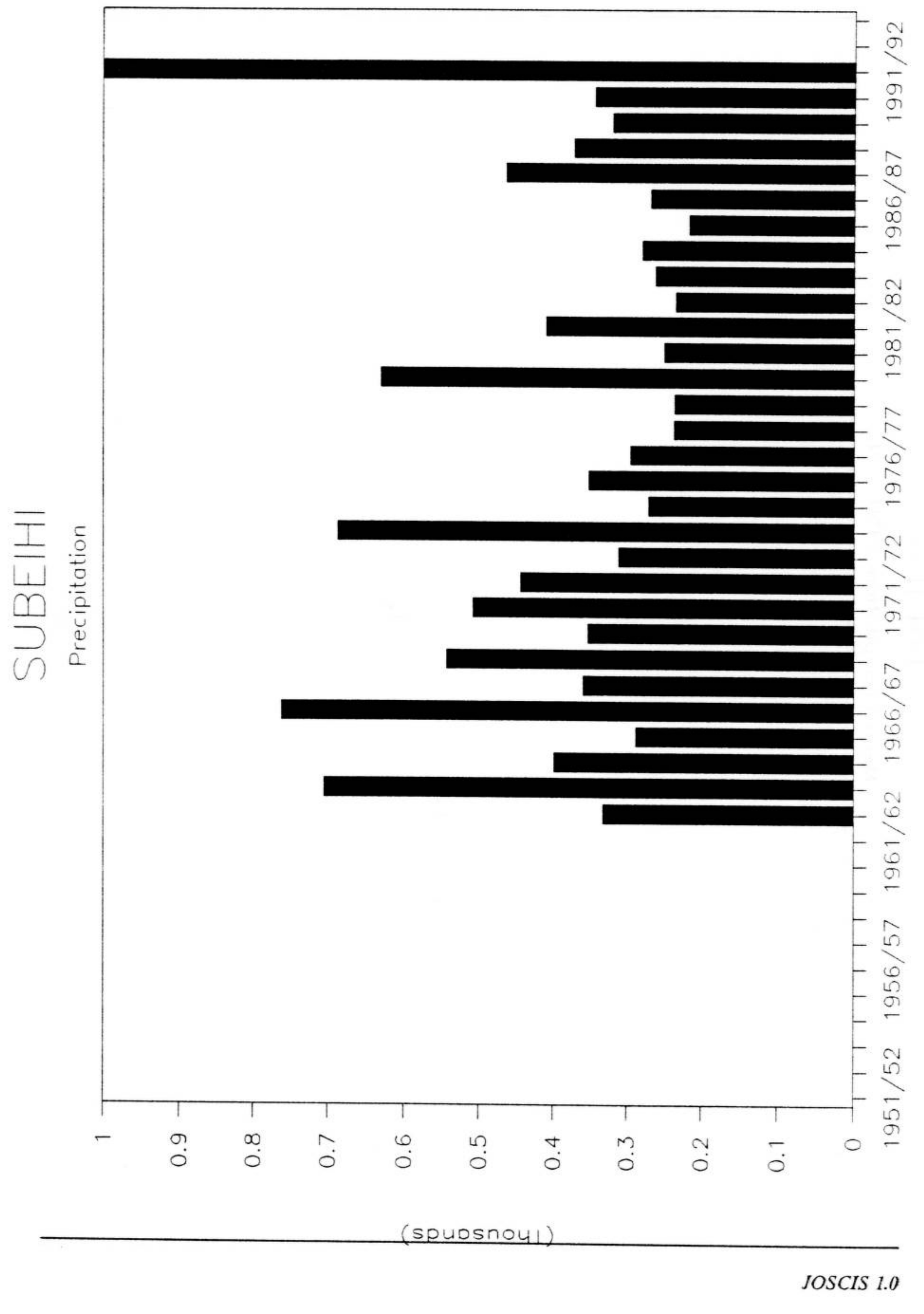

SHUBAK AGR. STATION
Mean Precipitation 1950 - 92
JOSCIS
Oct
Nov
Dec
Jan
Feb
MAr
Apr
May
Jun
Jul
Aug
Sep
0
10
20
30
40
50
60
70
80
90
100
110
120
130

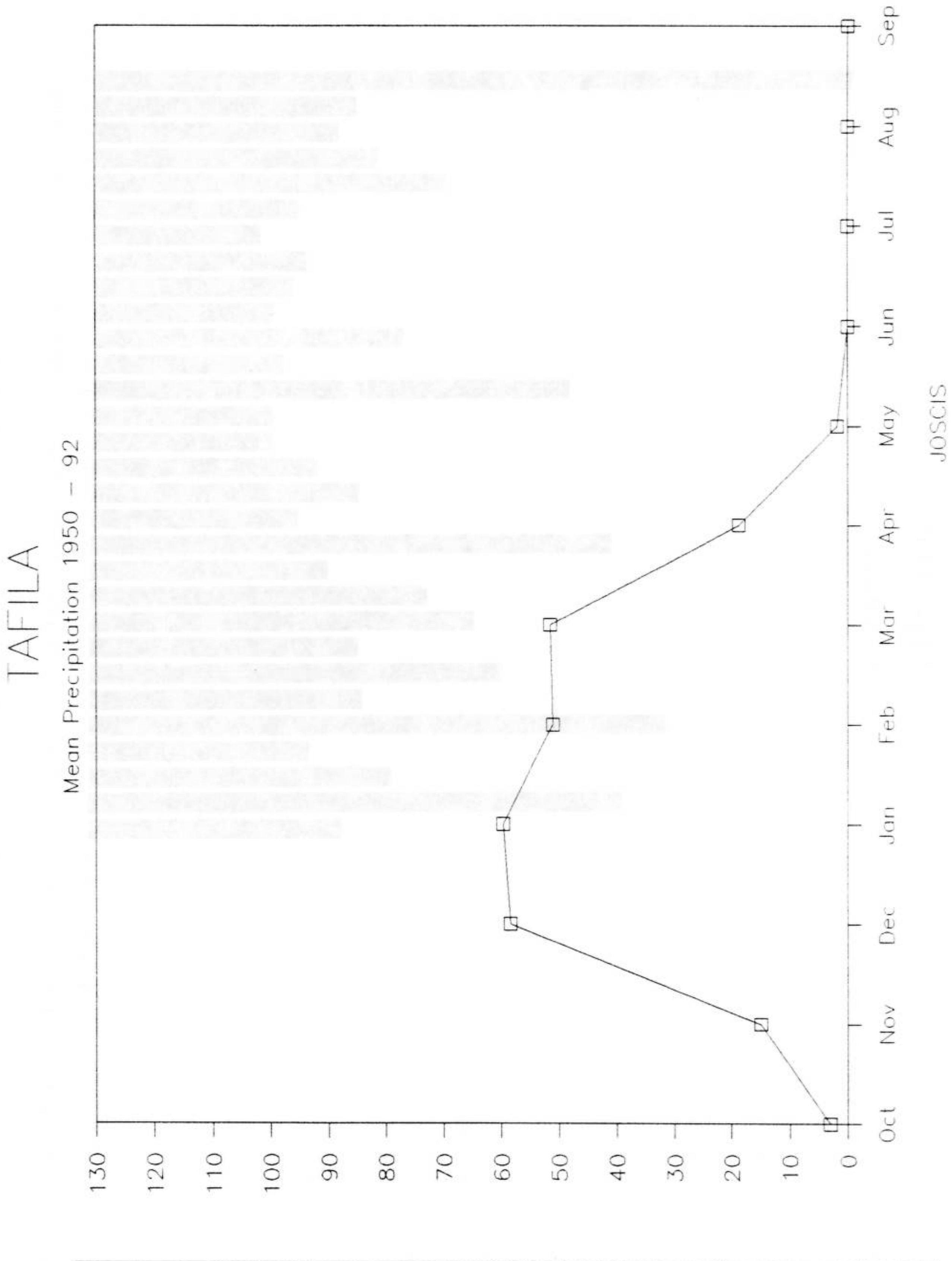

SHAUBAK AGR. STATION
Precipitation
Mean 305.1 mm
JOSCIS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92


SHOUBAL SCHOOL
Mean Precipitation 1950 - 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

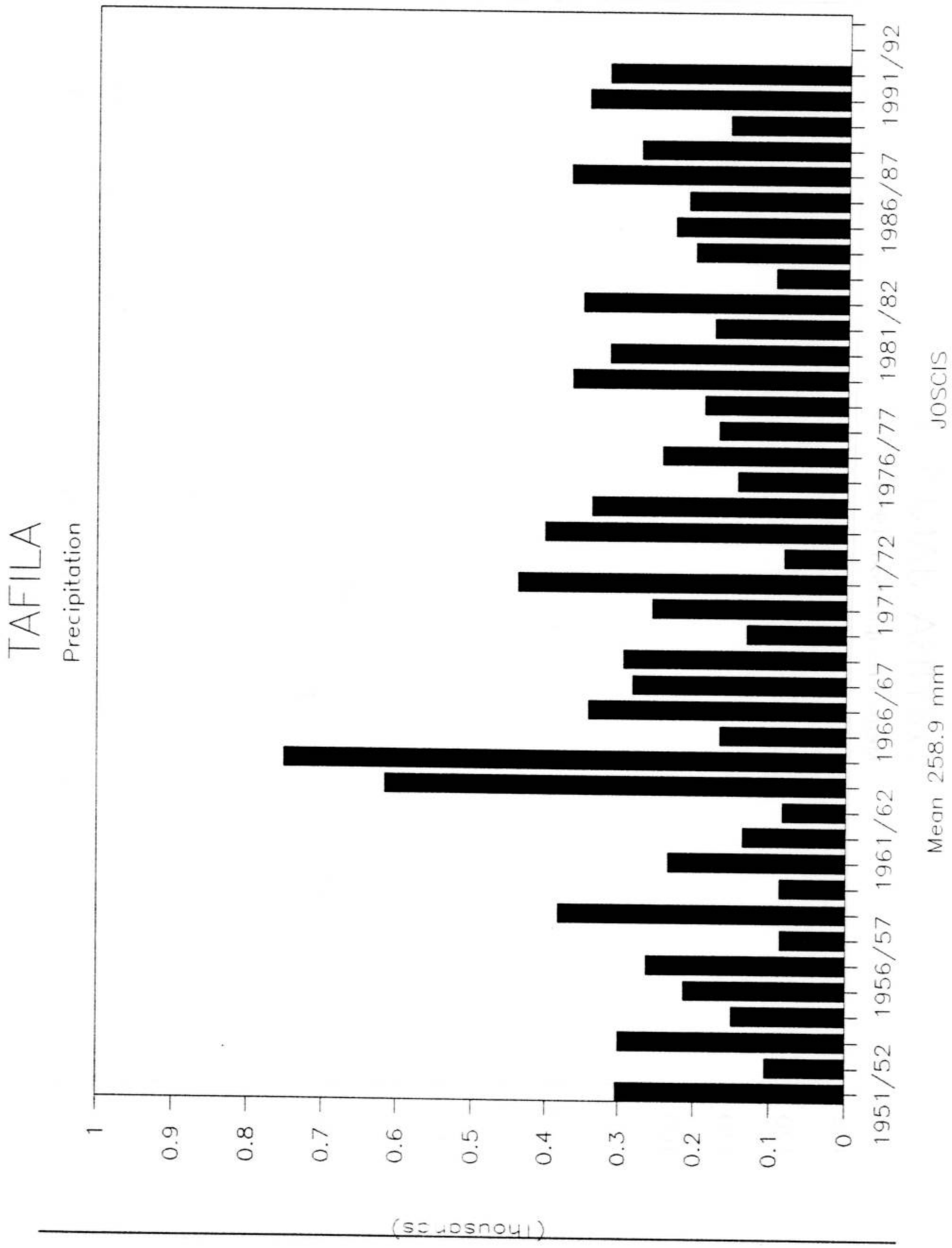

SHOUBAK SCHOOL
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)
Mean 276.4 mm
JOSCIS

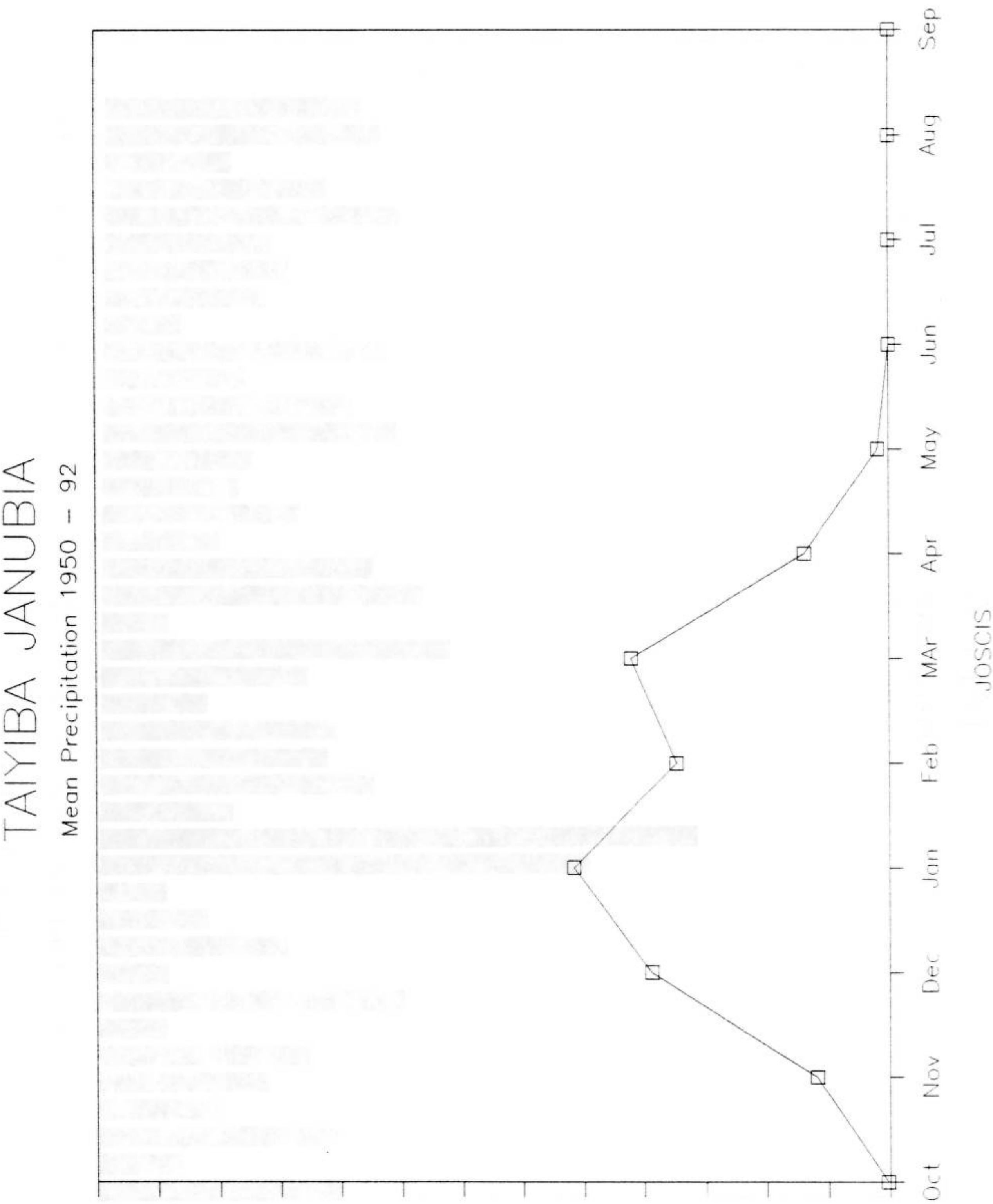

SUBEIHI
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

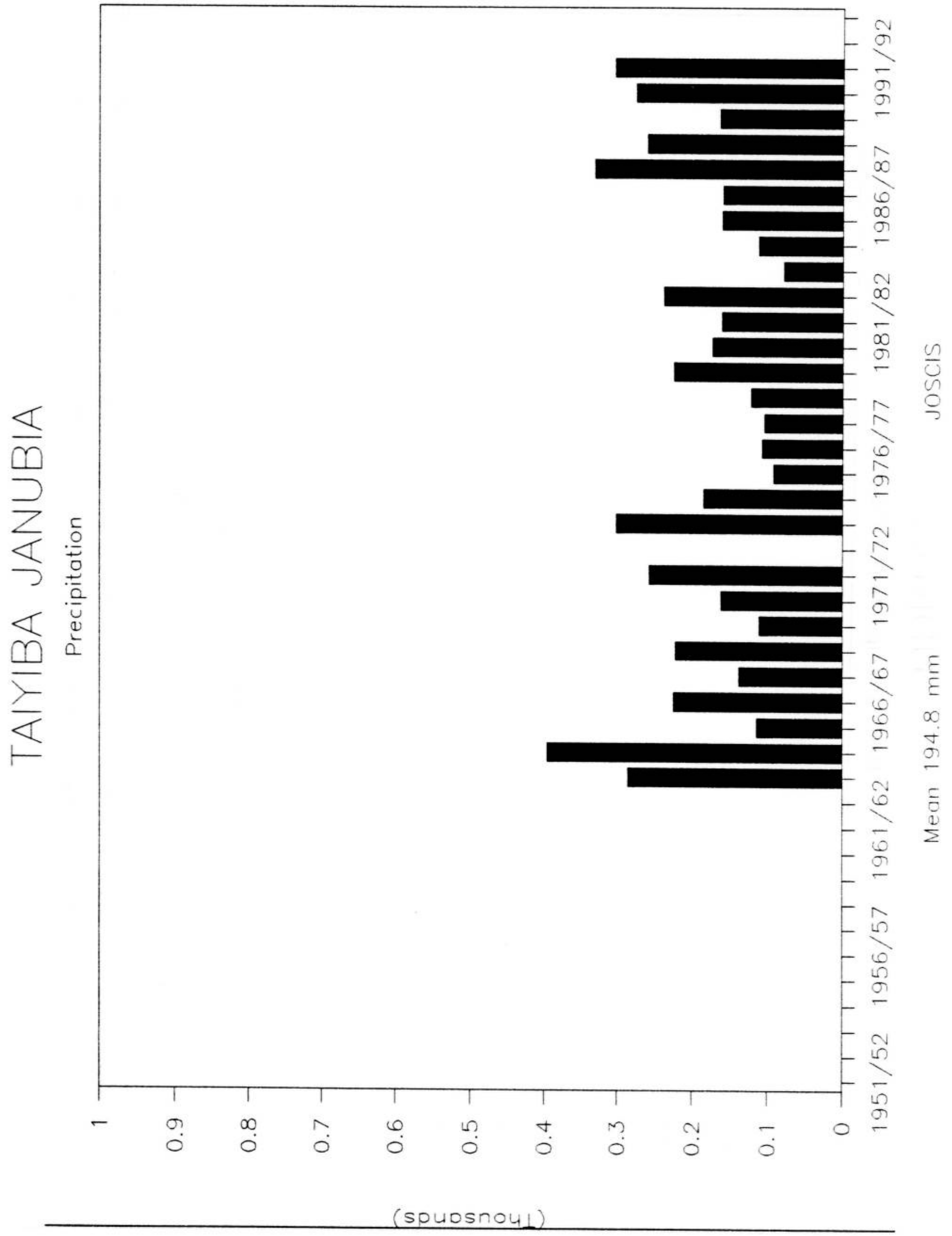

SUBEIHI
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 404.5 mm
JOSCIS
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

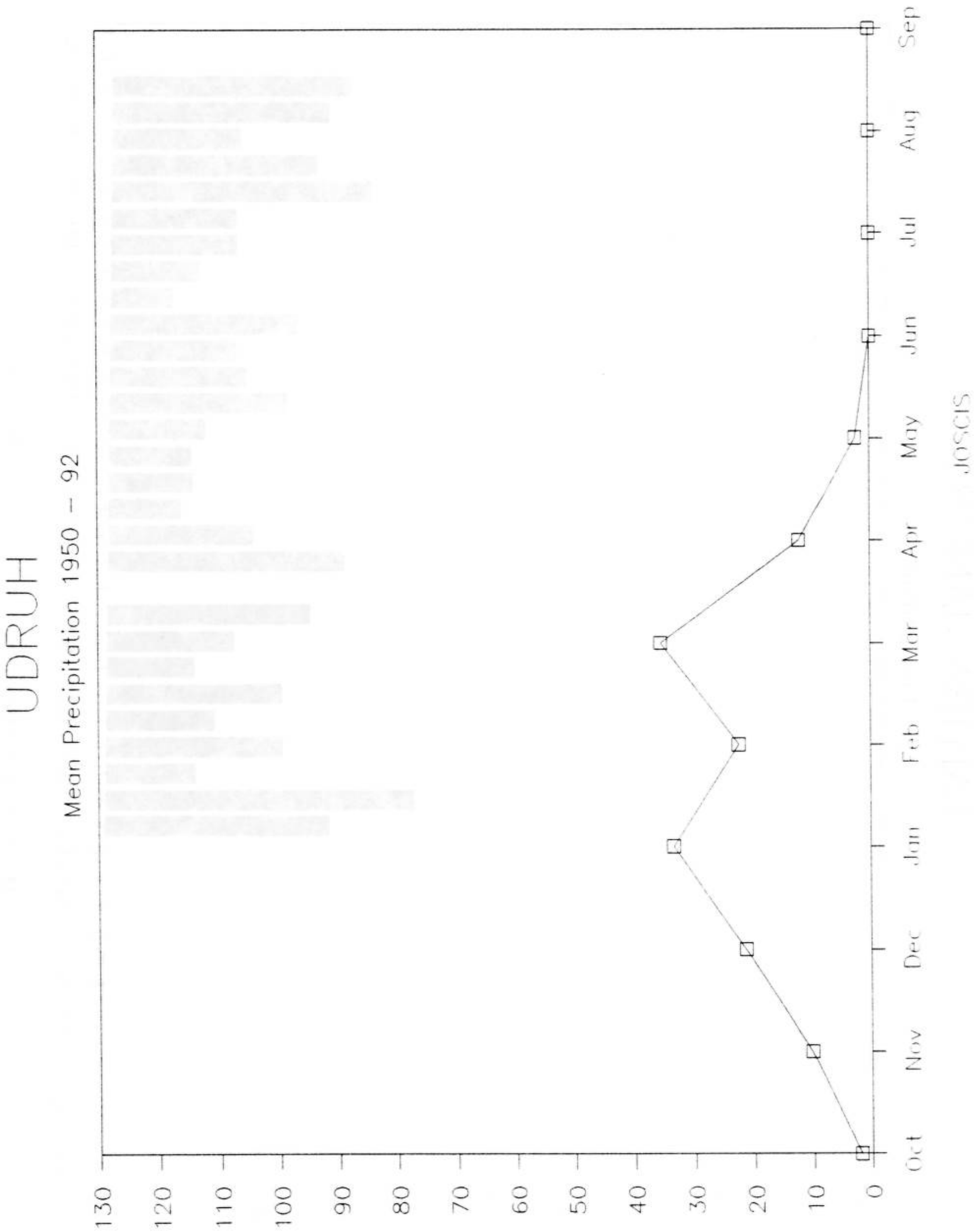


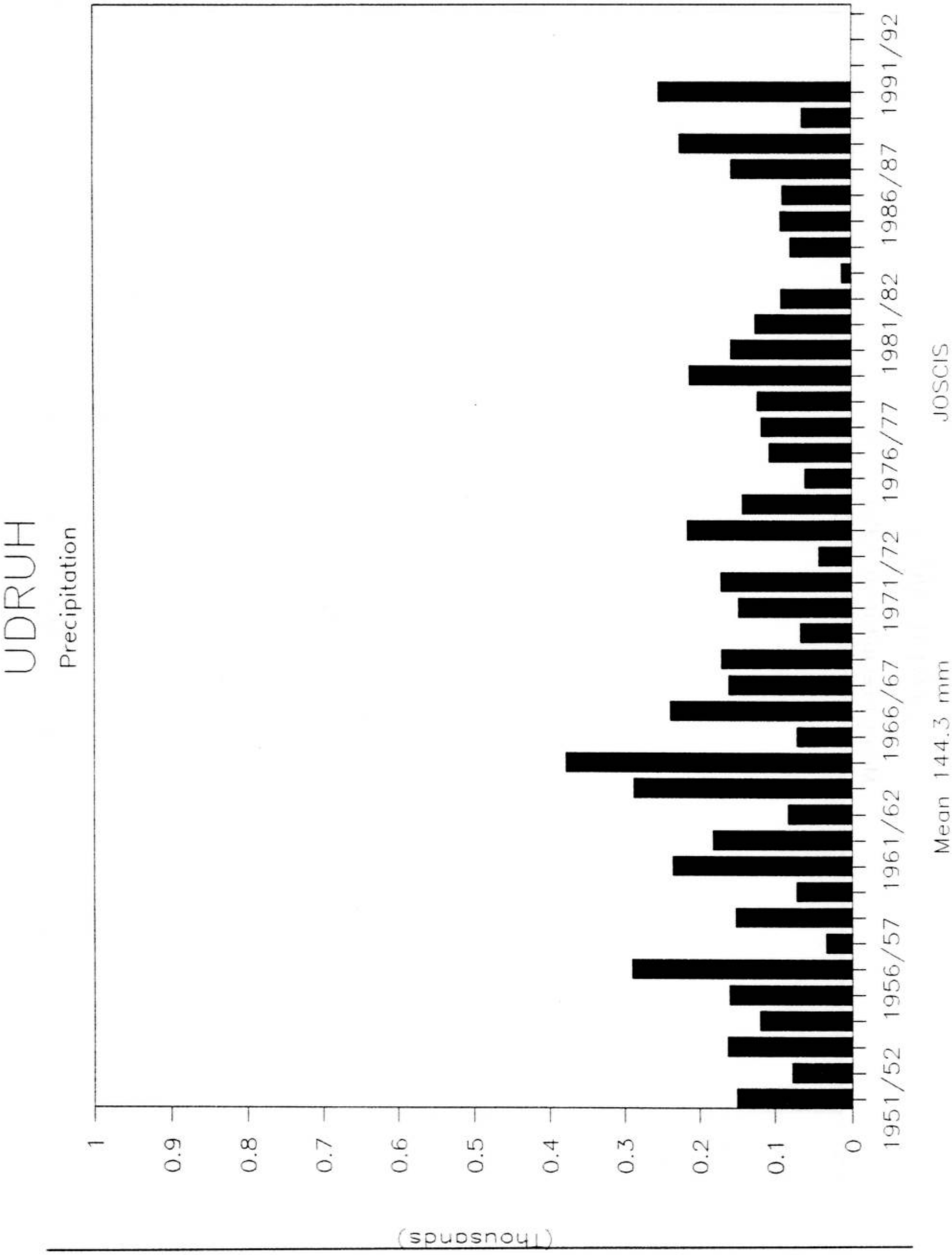
TAFILA
Mean Precipitation 1950 - 92
JOSCIS
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
0
10
20
30
40
50
60
70
80
90
100
110
120
130

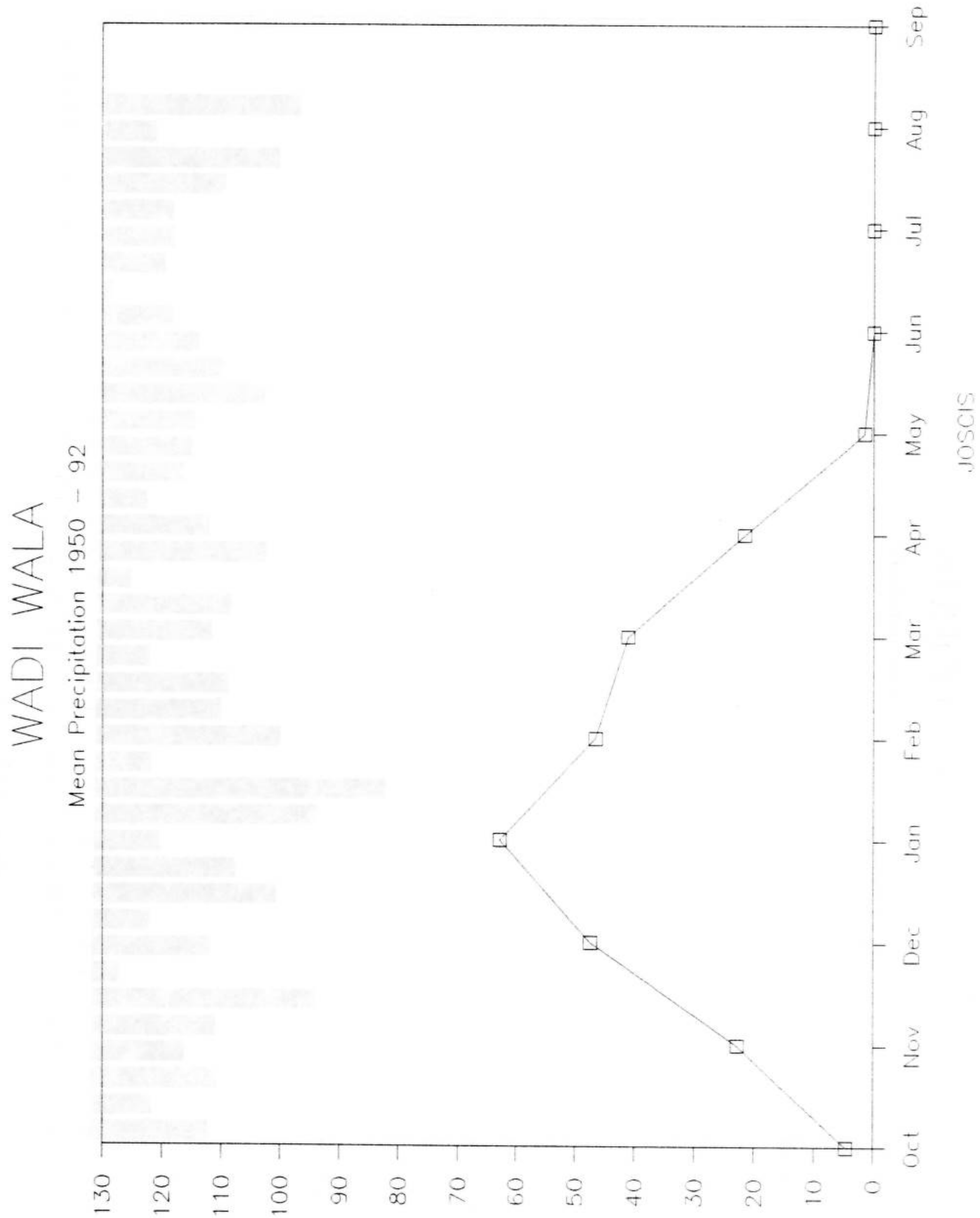

TAFILA
Precipitation
Mean 258.9 mm
JOSCIS
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

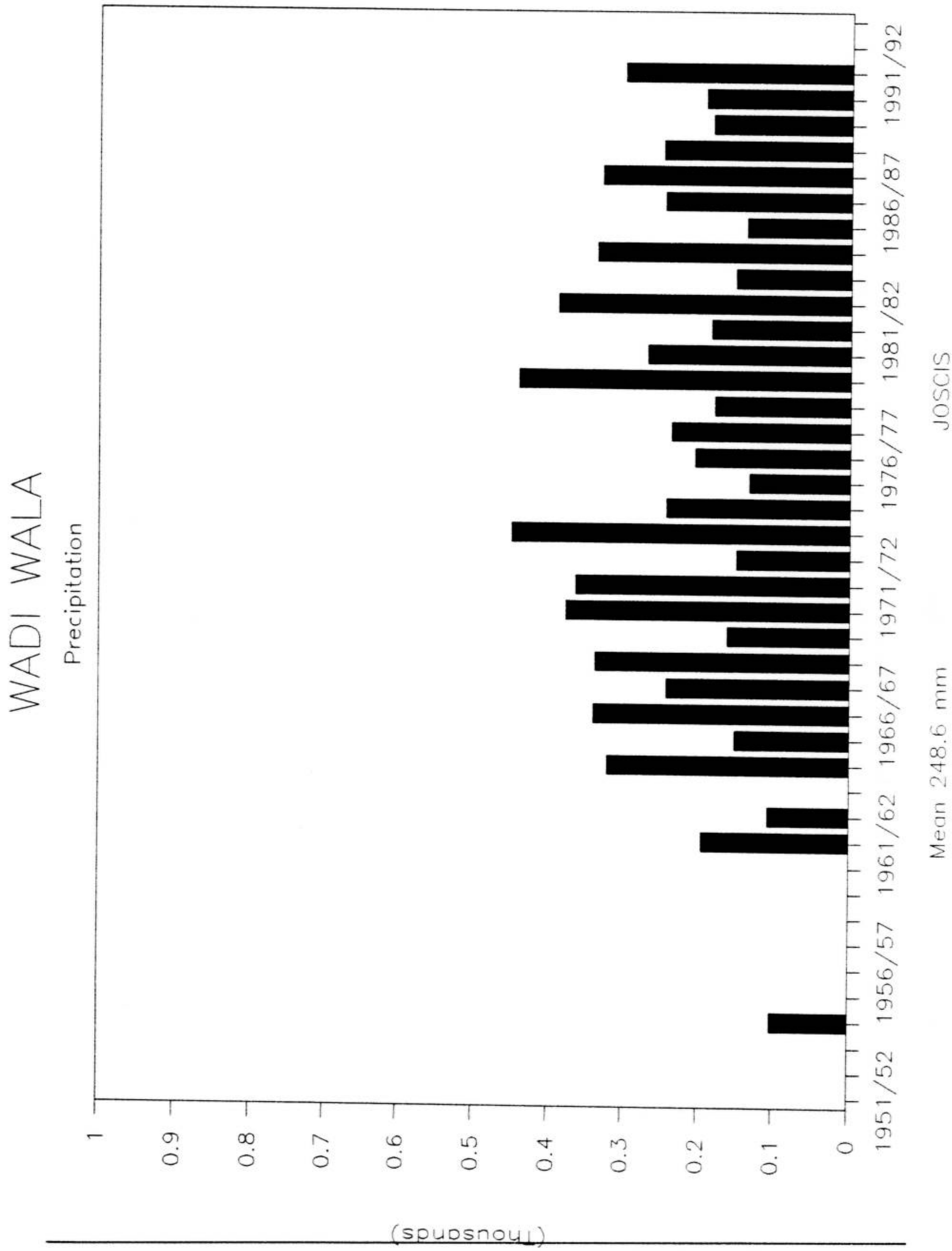

TAIYIBA JANUBIA
Mean Precipitation 1950 – 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
MAr
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

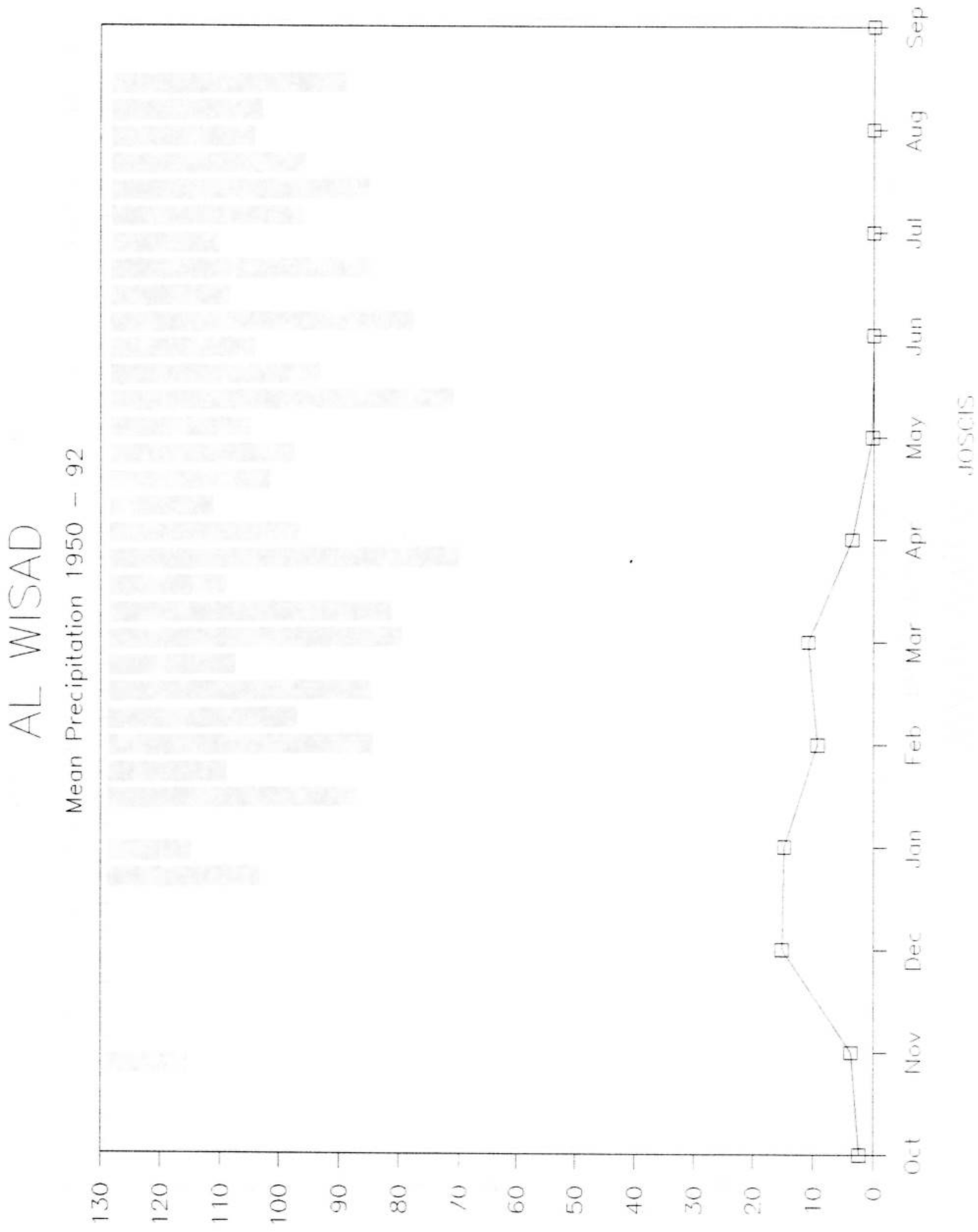

TAIYIBA JANUBIA
Precipitation
Mean 194.8 mm
JOSCIS
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

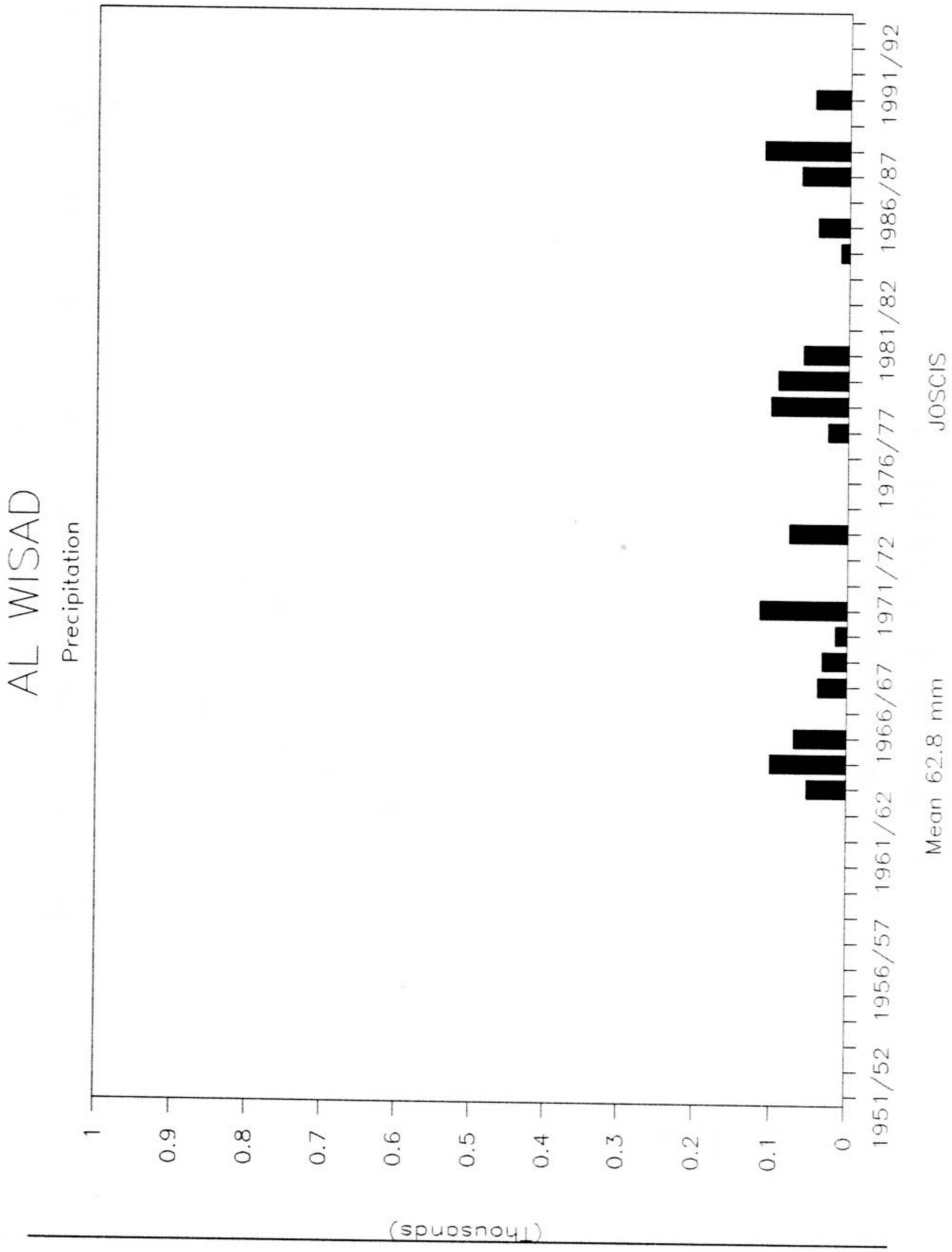

UDRUH
Mean Precipitation 1950 - 92
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JOSCIS

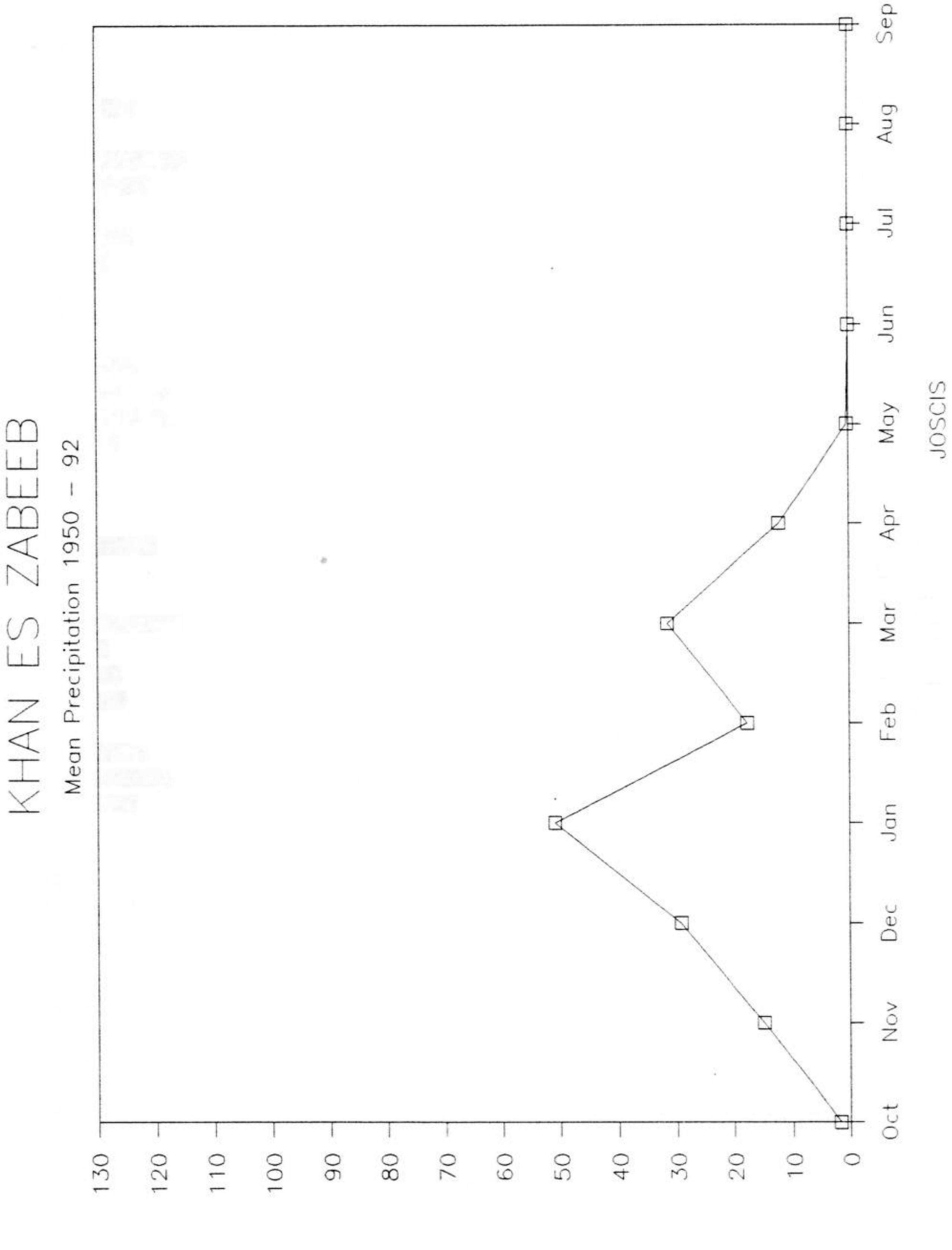

UDRUH
Precipitation
Mean 144.3 mm
JOSCIS
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
(Thousands)

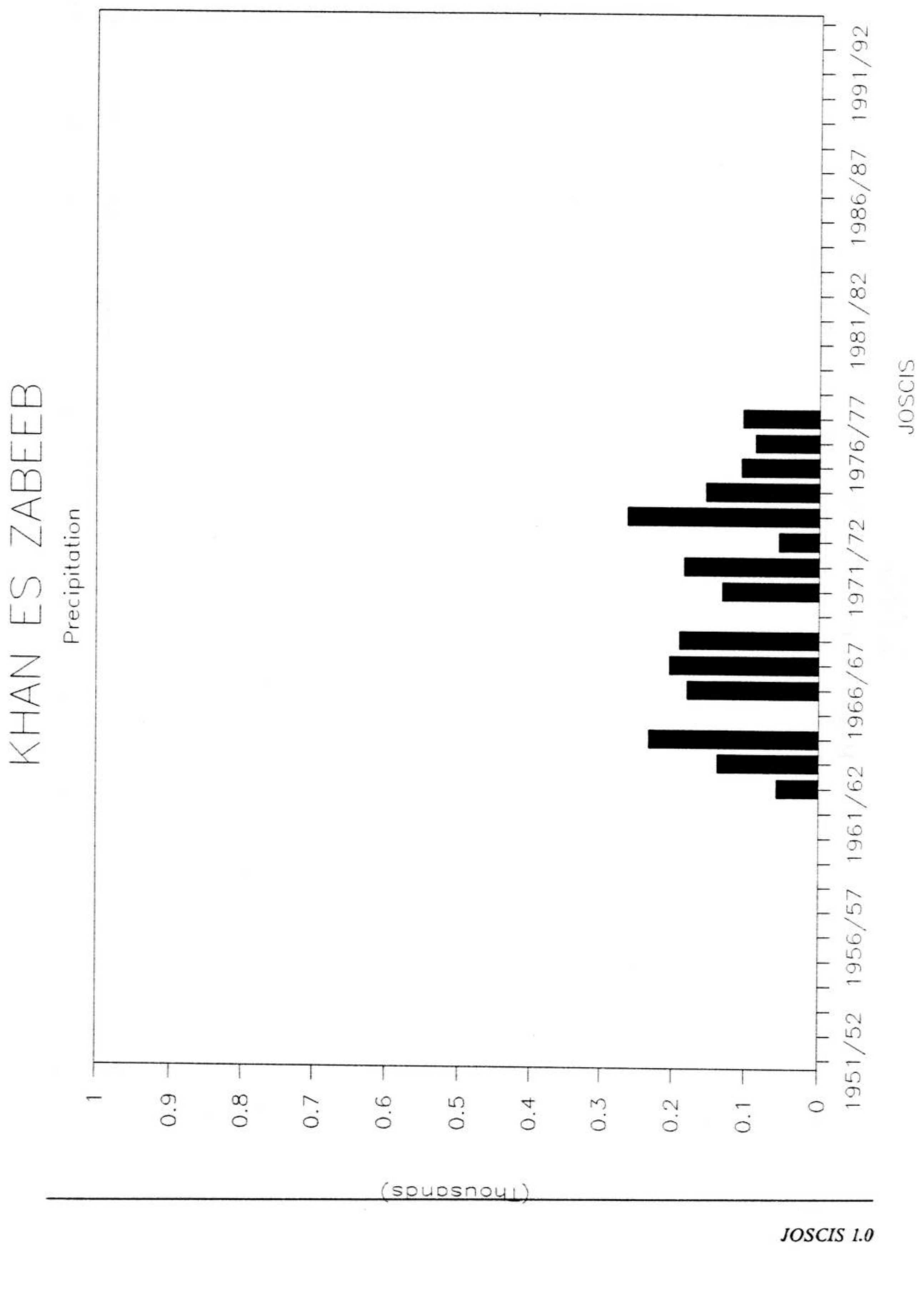

WADI WALA
Mean Precipitation 1950 - 92
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
0 10 20 30 40 50 60 70 80 90 100 110 120 130
JOSCIS

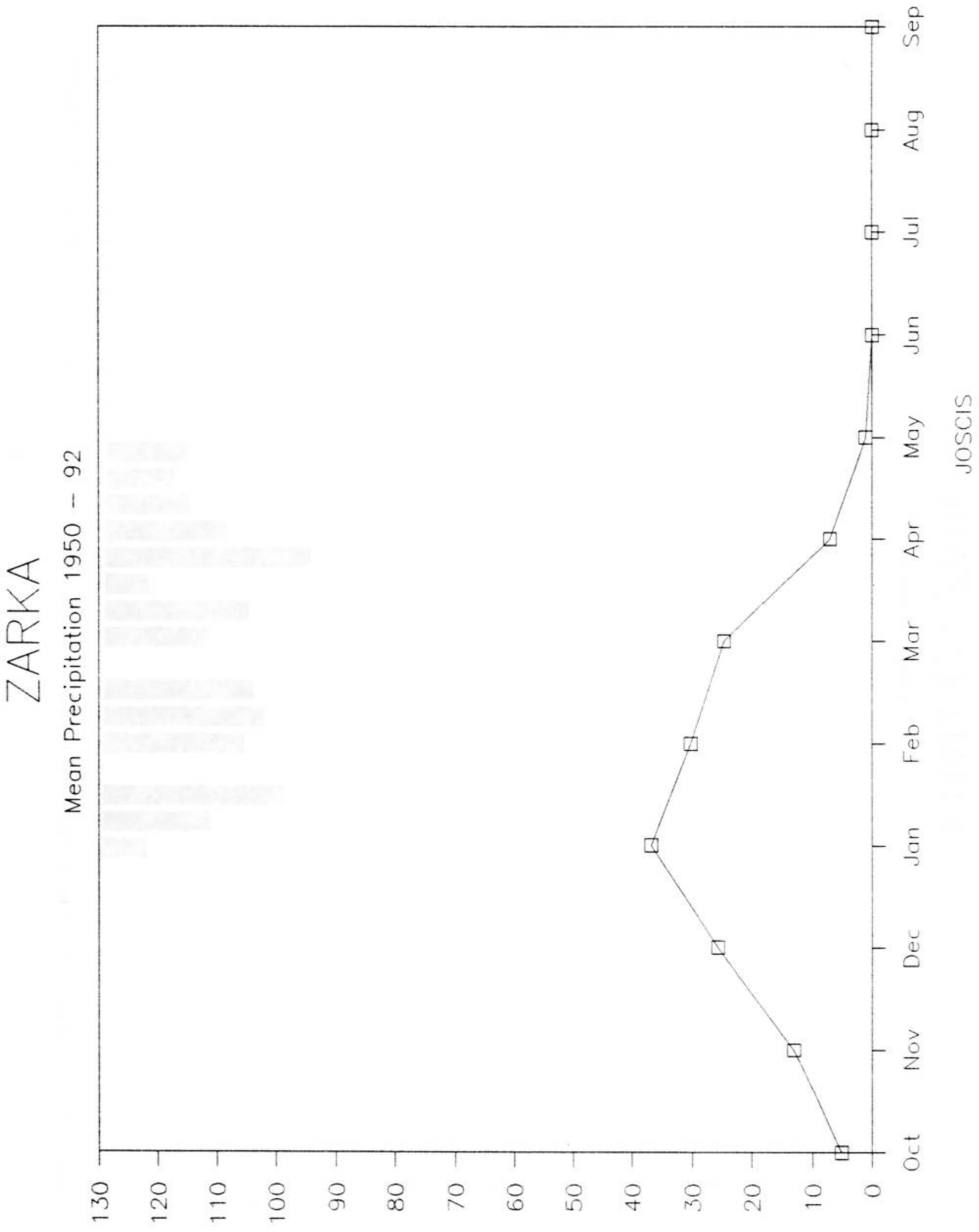

WADI WALA
Precipitation
JOSCIS
Mean 248.6 mm
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92

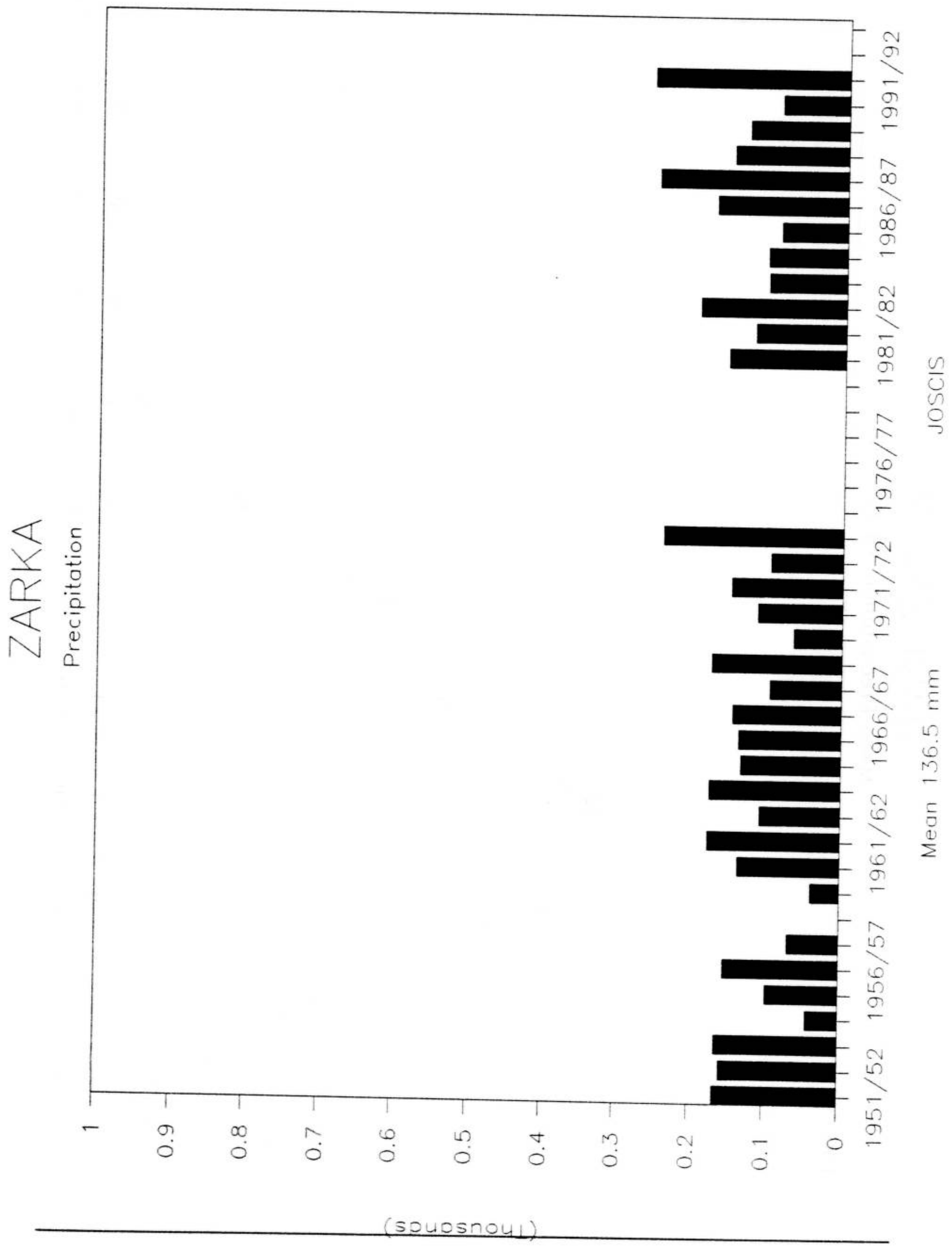

AL WISAD
Mean Precipitation 1950 – 92
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
JOSCIS

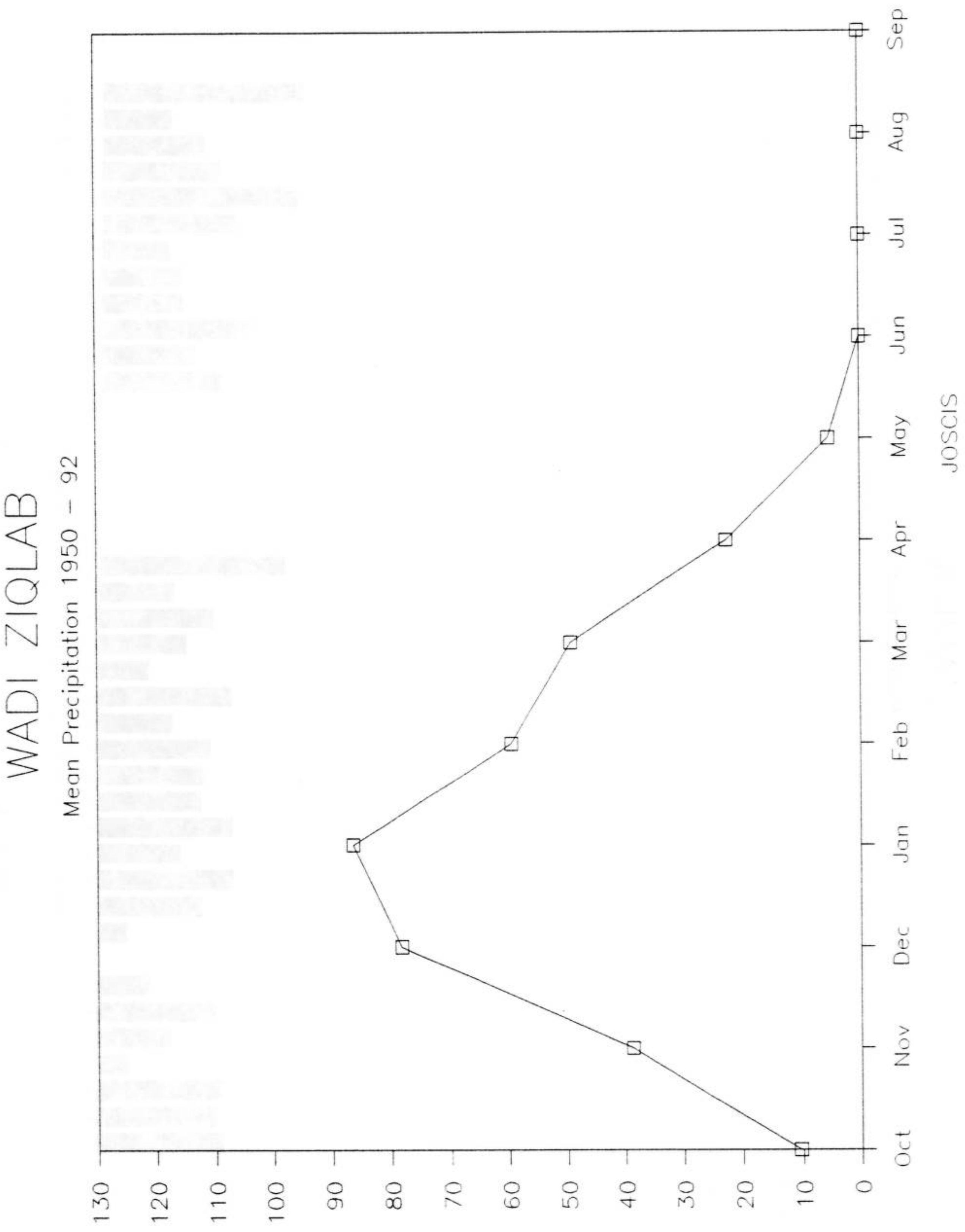

AL WISAD
Precipitation
Mean 62.8 mm
JOSCIS
(Thousands)
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

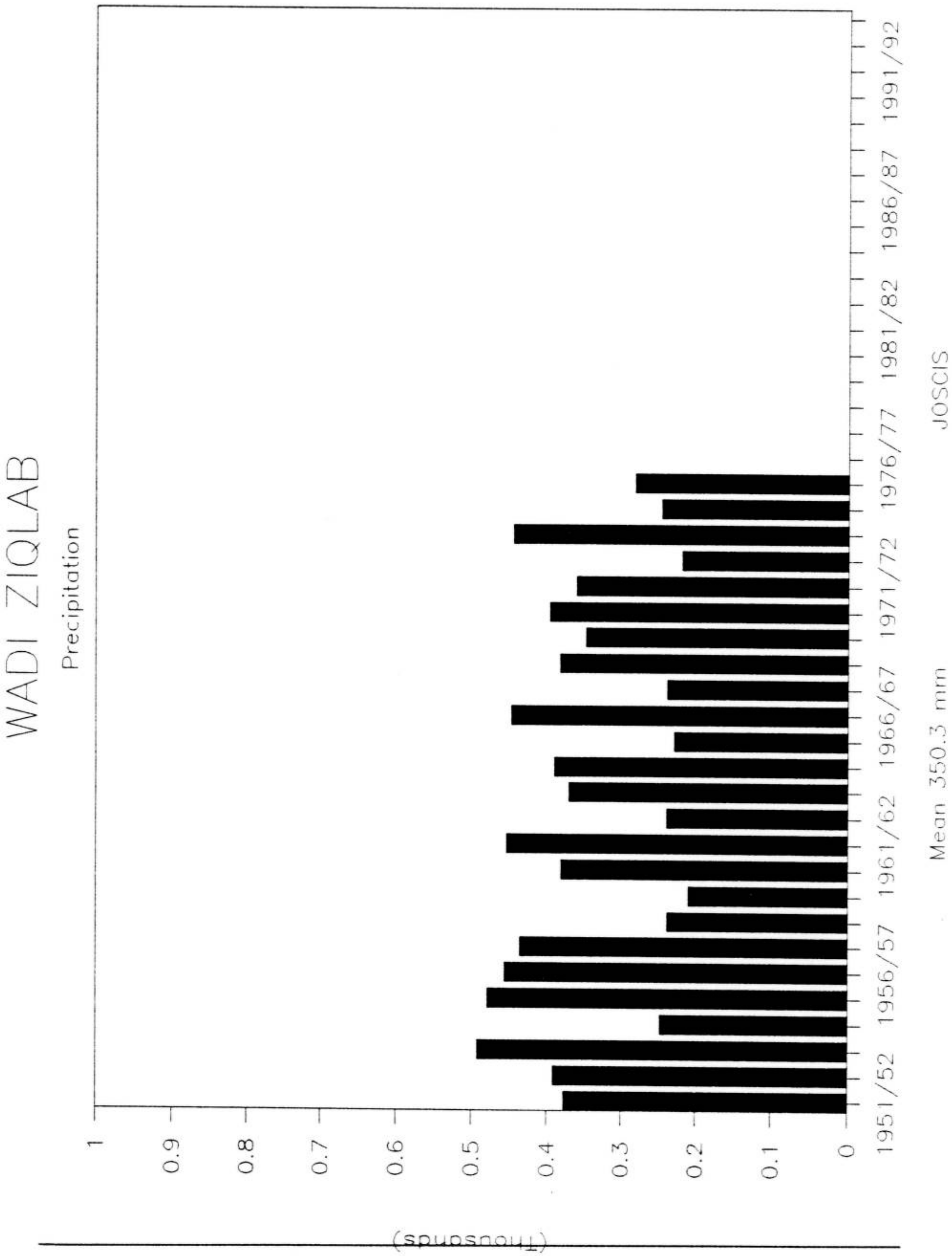

KHAN ES ZABEEB
Mean Precipitation 1950 - 92
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
0 10 20 30 40 50 60 70 80 90 100 110 120 130
JOSCIS


KHAN ES ZABEEB
Precipitation
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(Thousands)
JOSCIS


ZARKA
Mean Precipitation 1950 - 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
0 10 20 30 40 50 60 70 80 90 100 110 120 130


ZARKA
Precipitation
Mean 136.5 mm
JOSCIS
(Thousands)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92


WADI ZIQLAB
Mean Precipitation 1950 - 92
JOSCIS
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
0 10 20 30 40 50 60 70 80 90 100 110 120 130


WADI ZIQLAB
Precipitation
(Thousands)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1951/52
1956/57
1961/62
1966/67
1971/72
1976/77
1981/82
1986/87
1991/92
Mean 350.3 mm
JOSCIS

INTERPRETATION OF DATA

1) A menu exists for running 3 interpretation programs:

Interpretation of temperature.
Interpretation of moisture.
Interpretation of land suitability.

See D 6.7.1 Climate
Soil
Crop

2) Extraction of soil and climatic data for export to lotus spreadsheet for land suitability assessment .

The program Lndsuit1.prg.

c:\>cd\dbase\natsoild
c:\dbase\natsoild>lndsuit
The user selects the surveyor and the data are then extracted for all the bores in the surveyor database file .

The program can be run from any subdirectory as the path is set internally .

3) A submenu is added for running land suitability interpretation for phase III of the project:

Site suitability assessment.
Map units suitability assessment.
Print out suitability rating and groups.
Delete previous rating and groups.

See D 6.7.17

[Document update: 12-April-1995, Etihad Rihani & Khaled Hatamleh]

INTERPRETATION OF DATA

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   Interpretation of tempreature.
   Interpretation of moisture.
   Interpretation of land suitability.

See D 6.7-1 Climate
Soil
Crop

2) Extraction of soil and climatic data for export to lotus spreadsheet for land suitability assessments.

   The program Lndsuit1.PRG.

   c:>cd w\dbase\natsoild

   c:\dbase\natsoild>landsuit

   The user selects the surveyor and the data are then extracted for all the bores in the surveyor database file.

   The program can be run from any subdirectory as the path is set internally.

Recommendation

The land suitability evaluation module needs careful analysis and design.

[Document update: 24-Mar-94, E. Rihani & Dr Bob Jones]

INTERPRETATION OF DATA

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   erature
   Interpretation of temp~~reture.~~
   Interpretation of moisture.
   Interpretation of land suitability.

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Soil
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[Document update: 12-April-1995, Etihad Rihani & Khaled Hatamleh]

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See D 6.7.17

[Document update: 12-April-1995, Etihad Rihani & Khaled Hatamleh]

RETRIEVAL OF SITE SUITABILITY

In this retreival process you can find out suitability classes[(S1 (suitable), S2 (moderately suitable), S3 (marginally suitable), N6 (not suitable)], suitability groups and suitability limtations[(Soil (s), Climate (c), Topography, gradient or slope (t), Rock, stone or gravel on surface (r)]. For any site observation for any surveyor in any phase of the project by:

Main menu

JOSCIS - Soil and Climate Data
JOSCIS - Interpretation of Soil Data
Suitability
Site suitability assessment

[Document update: 12-April-1995, Etihad Rihani & Khaled Hatamleh]

RETRIEVAL OF MAP UNITS SUITABILITY

In this retreival process you can find out suitability classes [S1 (suitable), S2 (moderately suitable), S3 (marginally suitable), N6 (not suitable)], suitability groups, and suitability limitations [Soil (s), Climat (c), Topography, gradient or slope (t), Rock, stone or gravel on surface (r)]. For any Soil map unit in phase III of the soil map by:

Main menu

JOSCIS - Soil and Climate Data
JOSCIS - Interpretation of Soil Data suitability
Suitability
Map units suitability assessment.

you can extract the area for each soil map unit from GIS through map analyzed report (eg. Mafraq.rep)

eg.: Copy Mafraq.rep Mafraq. txt
Append map_area.dbf from Mafraq.txt
Run map_area.exe Clipper program.

[Document update: 12-April-1995, Etihad Rihani & Khaled Hatamleh]

PRINT OUT SUITABILITY

After preparing suitability classes and groups (See D10.1, D10.2) you can print them out by:

Main menu:

JOSCIS - Soil and Climate Data
JOSCIS - Interpretation of Soil Data Suitability
Suitability
Print out suitability

[Document update: 12-April-1995, Etihad Rihani & Khaled Hatamleh]

RETRIEVAL OF SITE SUITABILITY

MARGINALLY

In this retreival process you can find out suitability classes[(S1 (suitable), S2 (moderately suitable), S3 (~~magnially~~ suitable), N6 (not suitabli)], suitability groups and suitability limtations[(Soil (s), Climate (c), Topography, gradient or slope (t), Rock, stone or gravel on surface (r)]. For any site observation for any surveyor in any phase of the project by:

<u>Main menu</u>

JOSCIS - Soil and Climate Data
JOSCIS - Interpretation of Soil Data
Suitability
Site suitability assessment

[Document update: 12-April-1995, Etihad Rihani & Khaled Hatamleh]

RETRIEVAL OF MAP UNITS SUITABILITY

In this retreival process you can find out suitability classes [S1 (suitable), S2 (moderately suitable), S3 (marginally suitable), N6 (not suitable)], suitability groups, and suitability limitations [Soil (s), Climat (c), Topography, gradient or slope (t), Rock, stone or gravel on surface (r)]. For any Soil map unit in phase III of the soil map by:

Main menu

JOSCIS - Soil and Climate Data
JOSCIS - Interpretation of Soil Data suitability
Suitability
Map units suitability assessment.

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Main menu:

JOSCIS - Soil and Climate Data
JOSCIS - Interpretation of Soil Data Suitability
Suitability
Print out suitability

[Document update: 12-April-1995, Etihad Rihani & Khaled Hatamleh]

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