

GDSO

GEORGI DOBROVOLSKI SOLAR OBSERVATORY

ANNUAL REPORT

**FOR
1997**

COMPILED BY HOWARD BARNES

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GDSO 1973 - 1998
25 YEARS
OF SOLAR OBSERVING

СОЛНЕЧНАЯ ОБСЕРВАТОРИЯ ИМЕНИ ГЕОРГИЯ ДОБРОВОЛЬСКОГО

TIMES USED (AND NOT USED) IN THIS PUBLICATION .

The term “Greenwich Mean Time” (GMT) is *not* used in this publication as it is ambiguous and is used, both mistakenly and *wrongly*, in the sense of the Greenwich civil atomic scale, Co-ordinated Universal Time (UTC). From 1675, until the beginning of 1925, Greenwich Mean Time was measured by the Royal Observatory, from GREENWICH MEAN MID-DAY, 12 hours **BEHIND** Universal Time (UT).

For the purposes of lengthy solar observations, the GDSO considers all seven Universal Times (UT0, UT1, UT2, UT0R, UT1R, UT2R and UTC) as being the same. Times in this loose sense are labelled UT. If a stated time in this publication is not labelled at all, then it is to be considered as being UT. In Sections A & B, UT is given to the nearest fifth minute (within the time period of the observations); in Section D, it is given to the nearest minute.

For ‘central meridian’ purposes, the GDSO also considers Terrestrial [Dynamical] Time (TT) as being the same as UT. From July 1997 to, at least, June 1998 (inclusive), TT-UTC = +63.1840 seconds, an approximate equivalent to the amount of time the Earth has lost, as a ‘clock’, since 1900.

As this publication has an international distribution, both New Zealand Standard Time (NZST) [UTC + 12 hours] and New Zealand Daylight Time (NZDT) [UTC + 13 hours] are ignored.

BILLION.

If the word ‘billion’ is ever used in any GDSO reports, it is to be taken in its literal sense of ‘million to the power of two’, that is 1 million million. The value of 1000 million may be occasionally referred to, in the GDSO reports, as the ‘sesquillion’, literally ‘million to the power of one and a half’.

THE DECIMAL POINT.

From this issue onwards, the full-stop (.) will be used as the decimal point. The previous practice of using the comma, will cease.

PREFACE.

The Sun was observed 194 times throughout 1997, showing a slow but sure upward trend in sunspot activity. The actual number of sunspots reached a high of 62 in September. The highest monthly mean Wolf Number was 47.23 for December 1997, having started the year with a observed mean value of a mere 5.53 . The annual observed mean Wolf Number for 1997 was 22.96 . The corrected Wolf Number (R_{GD}) for 1997 is *provisionally* 21.67 . The final corrected Wolf Number (R_{GD}) for 1996 is 8.25 .

Spotless discs accounted for 20.6% of 1997's observations, compared with 50.5% for 1996.

Minimum, as far as the GDSO is concerned, was May 1996, with a $R_{GD}(S^W)$ value of 7.74 , and a $R_{GD}(S^{B13})$ of 7.48 . The Waldmeier smoothing method (see page xi) does give a $R_{GD}(S^W)$ value of 7.72 for August 1996, but as no other indices and smoothing methods do not back this value up then we are discounting it as minimum.

Group complexity ranged from 2.4 to 10.7 throughout 1997, with an annual mean of 6.1871, approximately the same for 1995, an increase of 7.5% on 1996's value of 5.7578.

The number of penumbrae per region has risen to 1.04, compared with 1996's value of 0.93 (mis-quoted as 0.97 in 1996's report). This [1997's value] is greater than 1995's value.

X-ray mean daily outputs have also increased, with November 1997 having a value of 68.55 microWatts / m², and 1997 having an annual MDO of 7.29 (compared with 1.45 for 1996).

2800 MHz radio flux readings are also up on 1996's values; an annual adjusted mean of 80.9×10^{-22} W / m² / Hz compared with 72.02 for 1996; the baseline of these data should be considered as approximately 67.

All this shows that solar activity is increasing 'all round'. In June 1997, I predicted that this new cycle, Cycle 23, would have a low maximum, a prediction based on a very slow and sluggish start in the rise of the smoothed Wolf Number. The rise, at that stage, was only about 30% of the rise at the same period of Cycle 22 (1986-87). This prediction gave a maximum value of $R_{GD}(S^W) = 120 \pm 25$, at about 3½ years into the cycle. This, I feel, is still somewhat valid, though activity has risen at a sharper rate since September 1997. If minimum is said to be August 1996 or even as late as October 1996, then the sharp rise since September 1997 can be interpreted as a greater maximum (greater than 120 or even greater than last maximum) in October 1999 \pm 3 months. However, time will tell!

The Annual Report for 1998 will be published in April 1999.

HOWARD BARNES.
April 1998.

v.

**THE GEORGI DOBROVOLSKI
SOLAR OBSERVATORY.**

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100% Amateur.

100% Privately Owned & Funded.

Observatory's Telescope:

76mm f12 refractor

-oOo-

ERRATA.

(in addition to any other errata)

1995's Report;

page F34 (Table Q5) QC(S^{B13}) column

January-June 1994 inclusive

should read as follows;

8.4064

8.0087

7.5446

7.0835

6.6556

6.2846

-oOo-

CONTENTS.

Table numbers in square brackets.

Times used (and not used) in this Publication	ii
The Billion	ii
The Decimal Point	ii
Preface	iii
GDSO Telescope and Location	v
Errata	v
Contents	vii - viii
List of Definitions and Constants	ix-x
Formulæ (Analytical)	xi
Smoothing Formulæ	xii
GDSO Observational Data for 1997	A1-7
GDSO Sunspot Regional Data for 1997	B1-10
NOAA Total Areas and Monthly Means for 1997	C1
NOAA Total Area Monthly Means and Smoothed Values for 1989-1997	C2
Solar X-Ray Flares for 1997	D1-6
X-Ray Flare Analysis for 1996-1997	D7
Smoothed X-Ray Flare Values for 1989-1997	D8
NRCC 2800MHz Solar Flux for 1997	E1-3
Smoothed Adjusted NRCC 2800MHz Solar Flux for 1989-1997	E4
WOLF NUMBERS:	
[W1] GDSO Monthly WOLF NUMBER Means for 1997	F2
[W2] GDSO Rotational WOLF NUMBER Means for Rotations 1917-1930	F2
[W3] GDSO Corrected WOLF NUMBERS for 1996-1997	F3
[W4] GDSO Corrected WOLF NUMBERS for Rotations 1905-1930	F4
[W5] GDSO Smoothed WOLF NUMBERS for 1996-1997	F5
[W6] GDSO Quarterly and Yearly WOLF NUMBER Means for 1993-1997	F6
ACTIVE AREAS (g):	
[G3] GDSO Corrected ACTIVE AREA (g) Values for 1996-1997	F7
[G4] GDSO Corrected ACTIVE AREA (g) Values for Rotations 1888-1930	F8
[G5] GDSO Smoothed ACTIVE AREA (g) Values for 1996-1997	F9
[G6] GDSO Quarterly and Yearly ACTIVE AREA (g) Means for 1993-1997	F10
PETTISINDICES:	
[P1] GDSO Monthly PETTISINDEX Means for 1997	F11
[P2] GDSO Rotational PETTISINDEX Means for Rotations 1917-1930	F11
[P3] GDSO Corrected PETTISINDICES for 1994-1997	F12-13
[P4] GDSO Corrected PETTISINDICES for Rotations 1888-1930	F14-15
[P5] GDSO Smoothed PETTISINDICES for 1994-1997	F16-17
[P6] GDSO Quarterly and Yearly PETTISINDEX Means for 1993-1997	F18
BECKINDICES:	
[B1] GDSO Monthly BECKINDEX Means for 1997	F19
[B2] GDSO Rotational BECKINDEX Means for Rotations 1917-1930	F19
[B3] GDSO Corrected BECKINDICES for 1996-1997	F20
[B4] GDSO Corrected BECKINDICES for Rotations 1900-1930	F21
[B5] GDSO Smoothed BECKINDICES for 1995-1997	F22
[B6] GDSO Quarterly and Yearly BECKINDEX Means for 1993-1997	F23

CONTENTS continued:

CLASSIFICATION VALUES:

[C1] GDSO Monthly CLASSIFICATION VALUE Means for 1997	F24
[C2] GDSO Rotational CLASSIFICATION VALUE Means for Rotations 1917-1930	F24
[C3] GDSO Corrected CLASSIFICATION VALUES for 1996-1997	F25
[C4] GDSO Corrected CLASSIFICATION VALUES for Rotations 1900-1930	F26
[C5] GDSO Smoothed CLASSIFICATION VALUES for 1995-1997	F27
[C6] GDSO Quarterly and Yearly CLASSIFICATION VALUE Means for 1993-1997	F28

QUALITY COUNTS:

[Q1] GDSO Monthly QUALITY COUNT Means for 1997	F29
[Q2] GDSO Rotational QUALITY COUNT Means for Rotations 1917-1930	F29
[Q3] Compared QUALITY COUNTS (incomplete) for 1996-1997	F30
[Q5] GDSO Smoothed QUALITY COUNTS for 1996-1997	F30
[Q6] GDSO Quarterly and Yearly QUALITY COUNT Means for 1993-1997	F31

INTER-SOL INDICES:

[I-1] GDSO Monthly INTER-SOL INDEX Means for 1997	F32
[I-2] GDSO Rotational INTER-SOL INDEX Means for Rotations 1917-1930	F32
[I-3] GDSO Corrected INTER-SOL INDICES for 1996-1997	F33
[I-4] GDSO Corrected INTER-SOL INDICES for Rotations 1903-1930	F34
[I-5] GDSO Smoothed INTER-SOL INDICES for 1995-1997	F35
[I-6] GDSO Quarterly and Yearly INTER-SOL INDEX Means for 1993-1997	F36

MISCELLANEOUS DATA:

[M7] GDSO Region Classification Percentages for 1995-1997	F37
[M8] GDSO Region Classification Means for 1995-1997	F38
[M9A] GDSO Observed and Smoothed Penumbrae / Group Means for 1996-1997	F39
[M9B] GDSO Observed and Smoothed Sunspots / Group Means for 1996-1997	F40
[M9C] GDSO Observed and Smoothed Group Complexity Indices (GCI) for 1996-1997	F41

GRAPHS:

GDSO WOLF NUMBERS Observed & Smoothed 1983-1997	F42-43
GDSO WOLF NUMBERS Corrected & Smoothed 1983-1997	F44
GDSO ACTIVE AREAS (g) Observed & Smoothed 1983-1997	F45-46
GDSO ACTIVE AREAS (g) Corrected & Smoothed 1984-1997	F47
GDSO PETTISINDICES Observed & Smoothed 1988-1997	F48-49
GDSO PETTISINDICES Corrected & Smoothed 1988-1994	F50
GDSO BECKINDICES Observed & Smoothed 1983-1997	F51-52
GDSO BECKINDICES Corrected & Smoothed 1983-1997	F53
GDSO CLASSIFICATION VALUES Observed & Smoothed 1991-1997	F54-55
GDSO CLASSIFICATION VALUES Corrected & Smoothed 1991-1997	F56
GDSO QUALITY COUNTS Observed & Smoothed 1983-1997	F57-58
GDSO INTER-SOL INDICES Observed & Smoothed 1983-1997	F59-60
GDSO INTER-SOL INDICES Corrected & Smoothed 1993-1997	F61
GDSO PENUMBRAE PER GROUP Observed & Smoothed 1989-1997	F62
GDSO SPOTS PER GROUP Observed & Smoothed 1983-1997	F63
GDSO GROUP COMPLEXITY INDICES Observed & Smoothed 1989-1997	F64
NOAA SUNSPOT AREA TOTALS Observed & Smoothed 1983-1997	F65
NOAA X-RAY FLARE OUTPUT VALUES Observed & Smoothed 1983-1997	F66
NRCC 2800 MHz SOLAR FLUX Adjusted & Smoothed 1983-1997	F67

LIST OF DEFINITIONS IN THIS PUBLICATION.

WN (Wolf Number):

$$R_{GD} = k(10g + f)$$

where f = number of sunspots,
 g = number of sunspot regions
 & k = up- or downgrading figure
 to bring observatories to a
 world standard.

WN = observed Wolf Number,
 same as above, but $k = 1$.

BX (Beckindex):

$$BX_{GD} = k \left(\sum_{i=1}^g G_i f_i \right)$$

where g = number of regions,
 f = number of sunspots,
 G = region constant,
 & k = up- or downgrading figure
 to bring observatories to a
 world standard.

BX = observed Beckindex, same as
 above, but $k = 1$.

QC (Quality Count):

$$QC = \sum_{i=1}^g Z_i$$

where g = number of regions,
 Z = region constant based on
 Zurich classes.

Micro-hemisphere (μh):

This unit of area, equal to 1 000 000th of the visible hemisphere of the Sun, is used in Section C of the report. It is approximately equal to 3 000 000 square kilometres. A small spot's area would be in the vicinity of 5 or 10 μh , while a large region's area would be greater than 1000 μh . A very large region would have an area greater than 2000 μh .

SN (Pettisindex):

$$PX_{GD} = k(10p + s)$$

where s = number of penumbral-free
 sunspots,
 p = number of penumbrae,
 & k = up- or downgrading figure
 to bring observatories to a
 world standard.

SN = observed Pettisindex, same as
 above, but $k = 1$.

CV (Classification Value):

$$CV_{GD} = k \left(\sum_{i=1}^g M_i \right)$$

where g = number of regions,
 M = region constant based on
 McIntosh classes,
 k = up- or downgrading figure
 to bring observatories to a
 world standard.

CV = observed Classification Value,
 same as above, but $k = 1$.

IS = Inter-Sol Index:

$$IS_{GD} = k(gr + f)$$

where gr = number of multi-spot regions,
 f = number of sunspots,
 & k = up- or downgrading figure
 to bring observatories to a
 world standard.

IS = observed Inter-Sol Index, same as
 above, but $k = 1$.

GROUP CONSTANTS.

The following are group constants for Beckindices, Classification Values and Quality Counts.

BECKINDICES

A	B	C	D	E	F	G	H	J
4	4	8	18	25	36	50	44	37

CLASSIFICATION VALUES

AXX = 1	CRO = 5	DKI = 46	EHC = 59	ESO = 26	FRI = 18
BXI = 3	CSI = 12	DKO = 43	EHI = 53	FAC = 33	FRO = 15
BXO = 2	CSO = 11	DRI = 16	EHO = 50	FAI = 24	FSC = 36
CAI = 9	DAC = 31	DRO = 13	EKC = 56	FAO = 21	FSI = 30
CAO = 8	DAI = 22	DSC = 34	EKI = 47	FHC = 60	FSO = 27
CHI = 42	DAO = 19	DSI = 28	EKO = 44	FHI = 54	HAX = 7
CHO = 41	DHC = 58	DSO = 25	ERI = 17	FHO = 51	HHX = 40
CKI = 39	DHI = 52	EAC = 32	ERO = 14	FKC = 57	HKX = 37
CKO = 38	DHO = 49	EAI = 23	ESC = 35	FKI = 48	HRX = 4
CRI = 6	DKC = 55	EAO = 20	ESI = 29	FKO = 45	HSX = 10

QUALITY COUNTS

A	B	C	D	E	F	G	H	J
1	2	3	4	5	6	4	3	2

FORMULÆ.

The following are three formulæ used in the analysis of sunspot data etc.

σ (sample standard deviation) is computed as:

$$\sqrt{(\sum x^2 - (\sum x)^2/n) / (n - 1)}$$

The annual σ result is computed from total pool of k values.

σ 'SIDC' (annual standard deviation based on the SIDC's formula) is computed as:

$$(\sum (\sigma \times \text{NOBS})) / \sum \text{NOBS}$$

$E\sigma$ (estimate of standard deviation) is computed as:

$$\sqrt{\sum (\sigma^2 \times \text{NOBS})} / \sum \text{NOBS}$$

SMOOTHING FORMULÆ.

The following are the three formulæ used in the smoothing of GDSO sunspot data. All are based on monthly means (\bar{x}).

Data suffixed (S^{HBm}) are computed as:

$$\left((\bar{x}_{+3} + \bar{x}_{-3}) + 2(\bar{x}_{+2} + \bar{x}_{-2}) + 3(\bar{x}_{+1} + \bar{x}_{-1}) + 4\bar{x}_0 \right) / 16$$

Data suffixed (S^{W}) are computed as:

$$\left(\sum_{-5}^{+5} \bar{x} + (\bar{x}_{+6} + \bar{x}_{-6})/2 \right) / 12$$

Data suffixed (S^{B13}) are computed as:

$$\left(0.75(\bar{x}_{+6} + \bar{x}_{-6}) + 2(\bar{x}_{+5} + \bar{x}_{-5}) + 3(\bar{x}_{+4} + \bar{x}_{-4}) + 4(\bar{x}_{+3} + \bar{x}_{-3}) + 5(\bar{x}_{+2} + \bar{x}_{-2}) + 6(\bar{x}_{+1} + \bar{x}_{-1}) + 6.5\bar{x}_0 \right) / 48$$



SECTION A

SOLAR OBSERVATIONAL DATA for **1997** obtained using the 76 mm refractor.

ALL TIMES IN UNIVERSAL TIME (UT).

g = Active Area or group count for WHOLE solar disc .

f = Sunspot count for WHOLE solar disc .

WN = Wolf Number (k in formula neglected) .

TWN = Truncated Wolf Number (Wolf Number minus A and B class regions) .

p = Penumbra count for WHOLE solar disc .

s = Penumbra-free spot count for WHOLE solar disc .

SN = Pettisindex .

BX = Beckindex .

CV = Classification Value .

QC = Quality Count .

IS = Inter-Sol Index

See page ix for all definitions.

Q = Quietness [steadiness] of image (on the Kiepenheuer scale),

1 = steady , 5 = heavy boiling .

S = Sharpness [clarity] of image (on the Kiepenheuer scale),

1 = fine features visible , 5 = umbrae & penumbrae indistinguishable from each other.

T = Transparency of the Earth's atmosphere, where 1 = excellent , 5 = worthless.

If any of Q, S or T is greater (worse) than 4, the observation will be abandoned.

CR = Carrington Rotation Number, with fraction of rotation stated.

Rotation 1 commenced at 1853/11/09;1144 UT (approximately).

DATE	UT	g	f	WN	TWN	p	s	SN	BX	CV	QC	IS	Q	S	T	CR
JANUARY 1997																
03	2150	0	0	0	0	0	0	0	0	0	0	0	1.5	2.5	2.0	1917.9378
04	2020	1	5	15	0	0	5	5	20	3	2	6	1.5	2.0	2.0	.9721
05	2110	1	3	13	0	0	3	3	12	3	2	4	2.0	2.0	2.5	1918.0099
11	2145	0	0	0	0	0	0	0	0	0	0	0	2.0	2.5	2.5	.2303
12	2015	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.0	.2646
13	2010	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.0	.3010
14	2055	0	0	0	0	0	0	0	0	0	0	0	1.0	2.0	2.0	.3387
15	2030	1	3	13	13	1	1	11	24	8	3	4	2.0	2.5	2.5	.3747
16	2025	1	2	12	0	0	2	2	8	2	2	3	2.0	2.5	2.5	.4111
17	2030	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.0	.4478
19	2030	0	0	0	0	0	0	0	0	0	0	0	1.5	1.5	2.0	.5210
21	2025	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.0	.5940
23	2135	0	0	0	0	0	0	0	0	0	0	0	2.5	3.0	3.0	.6689

A2

DATE	UT	g	f	WN	TWN	p	s	SN	BX	CV	QC	IS	Q	S	T	CR
JANUARY 1997 continued.																
25	2150	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.0	1918.7424
26	2020	1	2	12	0	0	2	2	8	2	2	3	1.5	1.5	2.0	.7767
27	2120	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.0	.8149
29	2155	1	3	13	13	1	2	12	24	6	3	4	1.5	1.5	2.0	.8889
30	2020	1	4	14	14	2	2	22	72	22	4	5	2.0	2.5	3.0	.9230
31	2010	1	3	13	0	0	3	3	12	3	2	4	1.5	2.0	2.5	.9594
FEBRUARY 1997																
04	2015	2	18	38	38	4	11	51	224	43	7	20	1.0	1.5	2.0	1919.1058
05	2100	2	7	27	27	3	4	34	106	39	7	9	1.5	2.0	2.5	.1435
07	2005	1	1	11	0	0	1	1	4	1	1	1	1.5	2.5	2.5	.2153
12	2005	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.0	.3981
14	1955	0	0	0	0	0	0	0	0	0	0	0	1.5	1.5	2.5	.4710
21	2205	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.0	.7304
22	2055	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.5	.7652
25	2115	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.5	.8754
26	2020	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.0	.9106
27	2105	0	0	0	0	0	0	0	0	0	0	0	2.0	3.0	3.0	.9484
MARCH 1997																
06	2010	1	1	11	11	1	0	10	37	10	2	1	1.5	1.5	2.0	1920.2031
07	2050	1	2	12	12	1	1	11	16	11	3	3	2.0	1.5	2.0	.2408
09	2130	2	3	23	12	1	2	12	20	12	4	4	1.5	2.0	2.0	.3150
12	2000	1	6	16	0	0	6	6	24	3	2	7	2.0	2.0	2.5	.4225
13	2045	1	4	14	0	0	4	4	16	3	2	5	2.0	2.0	2.5	.4602
15	2045	1	2	12	0	0	2	2	8	2	2	3	1.5	2.0	2.5	.5335
17	2010	1	1	11	0	0	1	1	4	1	1	1	1.5	1.5	2.0	.6058
18	2020	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.5	.6427
23	2005	0	0	0	0	0	0	0	0	0	0	0	1.0	2.0	2.0	.8254
26	2015	0	0	0	0	0	0	0	0	0	0	0	1.5	2.5	2.5	.9356
27	2020	1	2	12	0	0	2	2	8	2	2	3	1.5	1.5	2.0	.9723
28	2010	1	8	18	18	1	6	16	64	9	3	9	2.0	2.0	2.0	1921.0087
30	2030	1	11	21	21	3	5	35	198	22	4	12	1.0	2.0	2.0	.0825
31	2020	1	9	19	19	1	6	16	72	9	3	10	1.5	2.0	2.0	.1189

A3

DATE	UT	g	f	WN	TWN	p	s	SN	BX	CV	QC	IS	Q	S	T	CR
APRIL 1997																
01	2225	1	10	20	20	1	8	18	80	8	3	11	2.0	2.5	2.5	1921.1587
02	2145	2	23	43	43	4	12	52	587	42	7	24	1.5	2.0	2.5	.1944
03	2035	2	14	34	34	4	5	45	232	42	7	16	1.5	1.5	2.0	.2292
04	2050	2	11	31	31	3	4	34	158	31	7	13	1.5	1.5	2.0	.2663
05	2100	2	5	25	14	1	4	14	36	13	4	6	1.5	2.0	2.0	.3032
08	2205	1	2	12	0	0	2	2	8	2	2	3	2.0	2.5	2.0	.4148
09	2025	3	13	43	19	2	9	29	178	26	7	15	1.5	1.5	2.0	.4489
10	2055	2	13	33	22	2	5	25	220	23	5	14	1.0	2.0	2.0	.4864
11	2045	1	6	16	16	2	2	22	108	22	4	7	2.0	2.5	2.5	.5228
12	2040	2	9	29	29	2	6	26	72	21	6	11	1.0	1.5	2.0	.5593
14	2055	2	8	28	16	2	4	24	116	24	6	10	1.5	2.0	2.0	.6330
15	2110	3	15	45	34	4	9	49	256	39	9	17	1.5	2.0	2.5	.6701
16	2035	2	7	27	27	2	5	25	85	22	5	8	1.5	2.0	2.5	.7059
17	2115	1	3	13	0	0	3	3	12	3	2	4	2.0	2.5	2.5	.7436
19	2050	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.5	.8163
20	2100	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.0	.8533
21	2120	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.5	.8905
24	2220	0	0	0	0	0	0	0	0	0	0	0	2.0	2.5	2.5	1922.0021
26	2115	2	4	24	13	1	3	13	28	13	4	5	1.5	2.0	2.5	.0739

MAY 1997

01	2100	0	0	0	0	0	0	0	0	0	0	0	1.0	1.5	2.0	1922.2570
02	2115	1	1	11	0	0	1	1	4	1	1	1	1.5	2.0	2.0	.2941
04	2120	0	0	0	0	0	0	0	0	0	0	0	2.0	2.5	2.0	.3677
05	2100	1	1	11	11	1	0	10	37	10	2	1	1.5	1.5	2.0	.4039
06	2120	1	1	11	11	1	0	10	37	10	2	1	1.5	1.5	2.0	.4411
07	2205	1	1	11	11	1	0	10	37	10	2	1	2.0	2.0	2.5	.4790
12	2210	1	1	11	11	1	0	10	37	10	2	1	2.5	3.0	3.0	.6628
13	2100	1	4	14	14	1	3	13	32	12	3	5	2.5	2.5	2.5	.6977
14	2055	1	3	13	13	1	2	12	24	12	3	4	2.0	2.5	2.5	.7343
15	2235	1	1	11	11	1	0	10	37	10	2	1	1.5	2.5	2.5	.7736
26	2335	1	1	11	0	0	1	1	4	1	1	1	2.5	3.5	3.5	1923.1794
28	2215	2	3	23	0	0	3	3	12	3	3	4	1.5	2.0	2.0	.2508
29	2240	1	5	15	0	0	5	5	20	3	2	6	2.5	2.5	3.0	.2882

A4

DATE	UT	g	f	WN	TWN	p	s	SN	BX	CV	QC	IS	Q	S	T	CR
JUNE 1997																
03	2105	1	7	17	17	2	4	24	126	22	4	8	2.0	2.5	2.5	1923.4696
04	2150	1	5	15	15	2	2	22	90	22	4	6	2.0	2.5	2.5	.5075
05	2235	1	7	17	17	2	2	22	126	22	4	8	1.5	2.0	2.5	.5454
06	2110	1	5	15	15	2	1	21	90	19	4	6	2.5	2.5	2.5	.5800
08	2055	2	2	22	0	0	2	2	8	2	2	2	2.0	2.5	2.0	.6532
11	2215	1	2	12	0	0	2	2	8	2	2	3	1.5	2.0	2.5	.7655
12	2100	2	3	23	0	0	3	3	12	3	3	4	2.0	2.5	2.5	.8004
13	2055	2	6	26	0	0	6	6	24	5	4	8	2.0	2.0	2.0	.8370
14	2200	2	7	27	15	1	6	16	48	14	5	9	2.0	2.5	3.0	.8754
15	2110	2	9	29	18	1	8	18	68	13	4	10	2.0	2.5	2.5	.9109
19	2140	2	4	24	0	0	4	4	16	4	3	5	1.5	2.0	2.5	1924.0588
20	2140	1	1	11	0	0	1	1	4	1	1	1	2.0	2.0	2.5	.0955
21	2130	1	1	11	0	0	1	1	4	1	1	1	1.5	2.0	2.5	.1321
22	2145	0	0	0	0	0	0	0	0	0	0	0	2.0	2.5	3.0	.1692
23	2110	1	3	13	0	0	3	3	12	2	2	4	2.5	2.5	2.5	.2051
24	2115	2	4	24	0	0	4	4	16	4	3	5	2.5	2.5	2.5	.2420
26	2140	1	8	18	0	0	8	8	32	3	2	9	2.0	2.0	2.5	.3162
27	2135	1	3	13	0	0	3	3	12	3	2	4	2.0	2.5	2.5	.3528

JULY 1997

03	2145	1	1	11	0	0	1	1	4	1	1	1	2.0	2.5	2.5	1924.5737
04	2130	1	1	11	0	0	1	1	4	1	1	1	2.0	2.0	2.5	.6101
05	2135	0	0	0	0	0	0	0	0	0	0	0	2.0	2.5	2.5	.6469
06	2130	1	1	11	0	0	1	1	4	1	1	1	2.0	2.0	2.5	.6836
08	2135	2	4	24	0	0	4	4	16	4	3	5	2.0	2.0	2.5	.7572
10	2200	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.5	.8314
11	2140	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.5	.8676
12	2135	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.5	.9043
13	2205	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.0	.9418
14	2125	0	0	0	0	0	0	0	0	0	0	0	2.0	1.5	2.0	.9775
15	2130	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.0	1925.0144
20	2130	1	1	11	0	0	1	1	4	1	1	1	1.0	2.0	2.5	.1982
21	2150	0	0	0	0	0	0	0	0	0	0	0	1.0	2.5	2.5	.2355

A5

DATE	UT	g	f	WN	TWN	p	s	SN	BX	CV	QC	IS	Q	S	T	CR
JULY 1997 continued.																
22	2135	1	1	11	0	0	1	1	4	1	1	1	2.0	2.5	3.0	1925.2718
23	2210	2	7	27	0	0	7	7	28	6	4	9	1.5	1.5	2.0	.3095
24	2125	3	16	46	33	3	10	40	206	37	9	19	1.0	2.0	2.5	.3451
25	2155	4	16	56	33	4	9	49	216	46	10	19	1.5	1.5	2.0	.3826
27	2205	1	1	11	0	0	1	1	4	1	1	1	2.5	3.0	3.0	.4563
28	2230	0	0	0	0	0	0	0	0	0	0	0	1.5	2.0	2.0	.4937
30	2125	0	0	0	0	0	0	0	0	0	0	0	2.0	2.0	2.5	.5655

AUGUST 1997

03	2120	1	4	14	14	1	2	12	32	9	3	5	2.0	2.0	2.0	1925.7123
04	2130	1	2	12	12	1	1	11	16	11	3	3	2.5	3.0	2.5	.7493
07	2120	3	14	44	33	4	8	48	238	51	9	16	2.5	2.5	2.5	.8593
08	2155	3	16	46	21	2	13	33	218	27	8	19	2.0	2.5	2.5	.8969
09	2135	1	6	16	16	1	4	14	48	9	3	7	2.0	2.5	3.0	.9331
11	2220	4	9	49	36	3	5	35	118	32	9	11	2.0	2.0	2.0	1926.0077
13	2245	4	9	49	49	4	3	43	130	37	10	11	2.0	2.5	2.5	.0818
14	2125	4	6	46	22	2	4	24	90	23	7	7	1.5	2.0	2.5	.1165
15	2210	2	2	22	22	2	0	20	74	20	4	2	2.0	2.5	2.5	.1543
16	2145	2	2	22	11	1	1	11	41	11	3	2	1.5	2.0	2.5	.1904
17	2120	2	4	24	11	1	3	13	49	13	4	5	1.5	2.0	2.5	.2265
19	2105	1	1	11	11	1	0	10	37	10	2	1	2.0	2.5	2.5	.2995
21	2055	2	2	22	11	1	1	11	41	11	3	2	1.5	2.0	2.5	.3727
23	2100	0	0	0	0	0	0	0	0	0	0	0	2.0	2.5	2.5	.4462
24	2240	0	0	0	0	0	0	0	0	0	0	0	1.0	2.0	2.5	.4855
26	2050	1	9	19	19	1	7	17	72	9	3	10	1.5	2.0	2.5	.5561
27	2115	2	14	34	23	2	12	32	238	15	5	15	1.5	2.5	2.5	.5934
28	2245	2	23	43	32	3	17	47	400	32	5	24	2.0	2.5	2.5	.6324
29	2135	3	34	64	41	3	23	53	570	34	7	36	1.5	2.0	2.0	.6673
30	2115	2	29	49	35	3	17	47	641	35	7	31	1.5	2.0	2.5	.7035
31	2045	3	26	56	34	4	18	58	608	34	7	27	1.0	2.0	2.5	.7394

A6

DATE	UT	g	f	WN	TWN	p	s	SN	BX	CV	QC	IS	Q	S	T	CR
SEPTEMBER 1997																
03	2220	4	17	57	33	4	10	50	306	48	12	20	2.0	2.0	2.5	1926.8519
05	2145	4	19	59	36	3	12	42	230	37	10	22	2.0	3.0	3.0	.9244
10	2055	3	62	92	92	7	38	108	1284	127	13	65	1.0	1.5	2.5	1927.1065
11	2055	3	53	83	83	9	35	125	1108	172	13	56	1.5	2.5	2.5	.1432
12	2050	3	41	71	71	9	20	110	843	148	13	44	1.5	2.0	2.5	.1798
13	2035	4	38	78	78	8	19	99	756	148	16	42	1.5	2.0	2.5	.2161
15	2030	3	28	58	58	7	13	83	454	103	11	31	1.5	2.0	2.5	.2893
16	2055	3	22	52	52	6	11	71	366	115	11	25	2.0	2.5	3.0	.3266
17	2105	2	18	38	38	2	14	34	144	47	6	20	2.0	2.0	2.5	.3635
18	2040	1	8	18	18	1	6	16	64	9	3	9	1.5	2.5	2.5	.3995
19	2120	1	5	15	15	1	3	13	40	9	3	6	2.0	2.5	2.5	.4372
20	2050	1	3	13	13	1	2	12	24	12	3	4	2.0	2.0	2.0	.4731
27	2000	1	6	16	16	2	3	23	108	22	4	7	1.5	2.0	2.0	.7285
28	2135	1	4	14	14	2	1	21	72	19	4	5	2.0	3.0	3.5	.7676
29	2120	1	3	13	13	1	1	11	24	8	3	4	1.5	2.5	2.5	.8038
30	2115	2	4	24	24	2	1	21	61	18	5	5	1.5	2.0	2.5	.8404
OCTOBER 1997																
01	2010	2	4	24	11	1	3	13	49	13	4	5	1.5	2.0	2.5	1927.8754
05	2050	2	3	23	11	1	2	12	45	12	4	4	2.0	3.0	3.5	1928.0230
06	2015	2	3	23	0	0	3	3	12	3	3	4	2.0	2.0	2.5	.0587
07	2040	2	3	23	0	0	3	3	12	3	3	4	1.5	2.0	2.5	.0960
12	2045	2	13	33	21	3	6	36	206	33	6	15	2.0	2.5	3.0	.2794
13	2040	2	9	29	18	2	5	25	148	23	5	10	2.0	3.0	3.5	.3159
14	2220	2	5	25	14	1	3	13	36	10	4	6	2.0	2.5	2.5	.3551
15	2100	3	10	40	29	2	7	27	76	22	7	12	2.0	2.0	2.0	.3897
16	1945	3	13	43	43	4	9	49	164	49	10	16	1.5	2.0	2.5	.4244
19	2010	2	6	26	26	2	3	23	48	21	6	8	1.5	2.5	2.5	.5350
20	2030	2	6	26	13	1	4	14	36	11	5	8	1.5	2.0	2.5	.5721
21	2025	2	5	25	14	1	4	14	36	13	4	6	2.0	2.5	2.5	.6086
26	2005	2	2	22	11	1	1	11	41	11	3	2	1.5	2.5	2.5	.7913
27	2015	3	9	39	14	1	8	18	52	17	7	12	2.0	3.0	3.5	.8282
29	1930	2	14	34	34	3	6	36	232	33	7	16	1.5	2.0	2.0	.9003
30	2055	2	19	39	39	3	10	40	292	34	7	21	2.0	3.0	2.5	.9391
31	2150	2	11	31	31	3	3	33	178	33	7	13	2.0	3.0	3.0	.9771

A7

DATE	UT	g	f	WN	TWN	p	s	SN	BX	CV	QC	IS	Q	S	T	CR
NOVEMBER 1997																
03	1920	2	32	52	41	5	12	62	562	56	5	33	2.0	2.0	2.5	1929.0832
08	1945	2	3	23	0	0	3	3	12	2	2	4	2.0	2.0	2.5	.2669
09	2025	2	8	28	17	1	6	16	60	10	4	9	2.0	3.0	3.5	.3046
10	1935	2	13	33	21	2	7	27	206	24	6	15	2.0	2.5	2.5	.3399
14	2020	3	14	44	33	3	11	41	188	41	8	16	2.0	2.0	2.5	.4876
17	1920	2	22	42	42	4	12	52	499	44	8	24	2.0	3.0	3.0	.5959
18	2220	2	30	50	50	5	18	68	648	44	8	32	1.5	2.5	3.0	.6371
19	1945	2	22	42	42	4	13	53	482	44	8	24	2.0	2.5	2.5	.6698
20	2000	2	27	47	47	2	19	39	216	50	6	29	2.0	2.0	2.5	.7068
23	2205	3	15	45	45	5	7	57	273	55	11	18	2.5	4.0	3.5	.8198
24	1855	3	11	41	41	5	5	55	177	53	9	13	2.0	2.5	3.0	.8516
25	1955	2	3	23	12	1	2	12	20	12	4	4	2.0	2.0	2.5	.8897
26	2000	2	10	30	19	4	2	42	229	33	6	11	2.0	2.5	2.5	.9264
27	1945	2	21	41	30	4	6	46	504	33	6	22	2.0	2.0	2.5	.9627

DECEMBER 1997

08	1935	5	17	67	41	3	13	43	148	64	12	20	2.0	2.0	2.5	1930.3651
10	2130	4	19	59	37	4	12	52	263	45	9	21	2.5	2.5	2.5	.4412
11	2105	5	29	79	56	7	14	84	499	75	13	32	2.0	2.5	2.5	.4772
12	2040	4	20	60	48	6	9	69	351	65	12	23	2.0	3.0	3.0	.5131
13	2020	3	10	40	40	3	6	36	109	31	8	12	1.5	2.5	2.5	.5492
14	2020	4	11	51	28	4	6	46	175	47	9	13	1.5	2.0	2.5	.5858
17	2015	2	8	28	17	2	4	24	130	29	5	9	2.5	2.5	3.0	.6955
18	2030	1	9	19	19	1	7	17	72	12	3	10	2.5	2.5	2.5	.7325
21	2010	2	8	28	28	4	3	43	124	45	7	10	2.5	3.0	3.0	.8417
25	2015	3	21	51	39	5	11	61	521	74	10	24	2.0	2.5	2.5	.9882
26	2005	2	17	37	37	4	9	49	463	69	8	19	2.0	2.5	2.5	1931.0246
28	2020	2	20	40	40	5	8	58	360	74	8	22	2.0	2.0	2.5	.0981
31	2005	3	25	55	55	5	9	59	360	83	11	28	1.5	2.0	2.0	.2075

**SECTION B****SUNSPOT REGIONAL BREAKDOWNS.**

This section states all regions observed by the GDSO in the format of ;

- * NOAA / SEC region number (if known);
- * co-ordinates of regions in degrees of heliographic latitude (B) [+ if NORTH , - if SOUTH] , and in degrees of heliographic longitude (CMD) in respect to the central meridian [+ if WEST , - if EAST] . CMD increases with time .
- * f (spots) , p (penumbrae) , s (outlying spots) and five columns which state the distribution of umbrae within penumbrae (see page B2) ;
- * GDSO's determination of the McIntosh classifications of each observed region .

The central meridian value (CM) is based on the Carrington system of heliographic longitude.

All regions observed are listed in increasing longitudinal order. East is to the LEFT of North when it comes to co-ordinates on the Sun.

Observations during 1997 are numbered 3181 to 3374 inclusive.

ALL TIMES IN UNIVERSAL TIME (UT).

OBS = Number of GDSO observation.

CM values are stated in degrees.

REG. No are NOAA/SEC region numbers.

B = HELIOGRAPHIC LATITUDE OF REGION (+ IF NORTH, - IF SOUTH).

CMD = HELIOGRAPHIC DEGREES AWAY FROM THE CENTRAL MERIDIAN (- IF EAST, + IF WEST). EAST IS TO THE **LEFT** OF NORTH.

f = NUMBER OF SUNSPOTS IN REGION.

p = NUMBER OF PENUMBRAE IN REGION.

s = NUMBER OF PENUMBRAL-FREE SUNSPOTS IN REGION.

gr = NUMBER OF MULTI-SPOT GROUPS (in individual lines, single spot regions = 0, multi-spot regions = 1).

grfp = NUMBER OF UMBRAE WITHIN PENUMBRAE WITHIN THE GROUPS gr.

grf = NUMBER OF NON-PENUMBRAL SPOTS WITHIN THE GROUPS gr.

efp = NUMBER OF SINGLE PENUMBRAL SPOTS.

ef = NUMBER OF SINGLE NON-PENUMBRAL SPOTS.

LETTERS IN 'CLASS' COLUMN ARE McINTOSH CLASSIFICATIONS DETERMINED BY THE GDSO.

BRUNNER (SINGLE LETTER 'ZURICH') CLASSIFICATIONS ARE THE SAME AS THE INITIAL McINTOSH CLASS LETTER, EXCEPT THE FOLLOWING:

E?O, F?O = G; and HAX, HRX & HSX = J.

$gr + efp + ef = g.$

$grfp + grf + efp + ef = f.$

$grf + ef = s.$

OBS	DATE	UT	CM	REG.No	B	CMD	f	p	s	gr	grfp	grf	efp	ef	Class.	Remarks
3181	1997 / 01 / 03	2150	22.40	—	—	—	0	0	0	0	0	0	0	0	—	—
3182	1997 / 01 / 04	2020	10.05	8009	-02	+03	5	0	5	1	0	5	0	0	BXI	—
3183	1997 / 01 / 05	2110	356.43	8009	-02	+17	3	0	3	1	0	3	0	0	BXI	—
3184	1997 / 01 / 11	2145	277.10	—	—	—	0	0	0	0	0	0	0	0	—	—
3185	1997 / 01 / 12	2015	264.76	—	—	—	0	0	0	0	0	0	0	0	—	—
3186	1997 / 01 / 13	2010	251.63	—	—	—	0	0	0	0	0	0	0	0	—	—
3187	1997 / 01 / 14	2055	238.05	—	—	—	0	0	0	0	0	0	0	0	—	—
3188	1997 / 01 / 15	2030	225.12	8011	-06	-25	3	1	1	1	2	1	0	0	CAO	—
3189	1997 / 01 / 16	2025	212.00	8011	-06	-12	2	0	2	1	0	2	0	0	BXO	—
3190	1997 / 01 / 17	2030	198.78	—	—	—	0	0	0	0	0	0	0	0	—	—
3191	1997 / 01 / 19	2030	172.45	—	—	—	0	0	0	0	0	0	0	0	—	—
3192	1997 / 01 / 21	2025	146.16	—	—	—	0	0	0	0	0	0	0	0	—	—
3193	1997 / 01 / 23	2135	119.19	—	—	—	0	0	0	0	0	0	0	0	—	—
3194	1997 / 01 / 25	2150	92.72	—	—	—	0	0	0	0	0	0	0	0	—	—
3195	1997 / 01 / 26	2020	80.37	8014	-14	-38	2	0	2	1	0	2	0	0	BXO	—
3196	1997 / 01 / 27	2120	66.65	—	—	—	0	0	0	0	0	0	0	0	—	—
3197	1997 / 01 / 29	2155	40.00	8015	+06	-35	3	1	2	1	1	2	0	0	CRI	—
3198	1997 / 01 / 30	2020	27.70	8015	+05	-24	4	2	2	1	2	2	0	0	DAI	—
3199	1997 / 01 / 31	2010	14.63	8015	+05	-11	3	0	3	1	0	3	0	0	BXI	—

B3

OBS	DATE	UT	CM	REG.No	B	CMD	f	p	s	gr	grfp	grf	efp	ef	Class.	Remarks
3200	1997/02/04	2015	321.92	8016	-20	+02	10	1	8	1	2	8	0	0	CAI	—
				8015	+05	+45	8	3	3	1	5	3	0	0	DSC	—
3201	1997/02/05	2100	308.34	8016	-20	+16	2	1	1	1	1	1	0	0	CSO	—
				8015	+05	+61	5	2	3	1	2	3	0	0	DSI	—
3202	1997/02/07	2005	282.51	8016	-20	+42	1	0	1	0	0	0	0	1	AXX	—
3203	1997/02/12	2005	216.68	—	—	—	0	0	0	0	0	0	0	0	—	—
3204	1997/02/14	1955	190.43	—	—	—	0	0	0	0	0	0	0	0	—	—
3205	1997/02/21	2205	97.06	—	—	—	0	0	0	0	0	0	0	0	—	—
3206	1997/02/22	2055	84.53	—	—	—	0	0	0	0	0	0	0	0	—	—
3207	1997/02/25	2115	44.84	—	—	—	0	0	0	0	0	0	0	0	—	—
3208	1997/02/26	2020	32.17	—	—	—	0	0	0	0	0	0	0	0	—	—
3209	1997/02/27	2105	18.58	—	—	—	0	0	0	0	0	0	0	0	—	—
3210	1997/03/06	2010	286.87	8020	+06	-76	1	1	0	0	0	0	1	0	HSX	—
3211	1997/03/07	2050	273.33	8020	+06	-62	2	1	1	1	1	1	0	0	CSO	—
3212	1997/03/09	2130	246.61	8020	+07	-34	2	1	1	1	1	1	0	0	CSO	—
				8021	-30	-31	1	0	1	0	0	0	0	0	1	AXX
3213	1997/03/12	2000	207.90	8020	+07	+03	6	0	6	1	0	6	0	0	BXI	—
3214	1997/03/13	2045	194.31	8020	+07	+16	4	0	4	1	0	4	0	0	BXI	—
3215	1997/03/15	2045	167.95	8022	-05	+32	2	0	2	1	0	2	0	0	BXO	—
3216	1997/03/17	2010	141.91	8022	-04	+58	1	0	1	0	0	0	0	1	AXX	—
3217	1997/03/18	2020	128.63	—	—	—	0	0	0	0	0	0	0	0	—	—
3218	1997/03/23	2005	62.84	—	—	—	0	0	0	0	0	0	0	0	—	—
3219	1997/03/26	2015	23.19	—	—	—	0	0	0	0	0	0	0	0	—	—
3220	1997/03/27	2020	9.96	8026	-25	-74	2	0	2	1	0	2	0	0	BXO	—
3221	1997/03/28	2010	356.86	8026	-25	-61	8	1	6	1	2	6	0	0	CAI	—
3222	1997/03/30	2030	330.29	8026	-25	-34	11	3	5	1	6	5	0	0	DAI	—
3223	1997/03/31	2020	317.20	8026	-25	-22	9	1	6	1	3	6	0	0	CAI	—
3224	1997/04/01	2225	302.85	8026	-25	-09	10	1	8	1	2	8	0	0	CAO	—
3225	1997/04/02	2145	290.03	8027	-29	-78	1	1	0	0	0	0	1	0	HSX	—
				8026	-24	+02	22	3	12	1	10	12	0	0	EAC	—
3226	1997/04/03	2035	277.48	8027	-28	-66	2	1	1	1	1	1	0	0	CSO	—
				8026	-24	+13	12	3	4	1	8	4	0	0	DAC	—
3227	1997/04/04	2050	264.14	8027	-29	-53	4	1	2	1	2	2	0	0	CAI	—
				8026	-24	+24	7	2	2	1	5	2	0	0	DAI	—
3228	1997/04/05	2100	250.86	8027	-28	-40	4	1	3	1	1	3	0	0	CSI	—
				8026	-23	+38	1	0	1	0	0	0	0	0	1	AXX

B4

OBS	DATE	UT	CM	REG.No	B	CMD	f	p	s	gr	grfp	grf	efp	ef	Class.	Remarks
3229	1997 / 04 / 08	2205	210.66	8027	-28	-01	2	0	2	1	0	2	0	0	BXO	—
3230	1997 / 04 / 09	2025	198.38	8027	-28	+11	3	0	3	1	0	3	0	0	BXI	—
				8030	+11	+15	1	0	1	0	0	0	0	1	AXX	—
				8029	+24	+17	9	2	5	1	4	5	0	0	DAI	—
3231	1997 / 04 / 10	2055	184.91	?	+08	-02	1	0	1	0	0	0	0	1	AXX	—
				8029	+24	+31	12	2	4	1	8	4	0	0	DAI	—
3232	1997 / 04 / 11	2045	171.80	8029	+24	+44	6	2	2	1	4	2	0	0	DAI	—
3233	1997 / 04 / 12	2040	158.64	8031	-30	+34	5	1	4	1	1	4	0	0	CSI	small
				8029	+24	+56	4	1	2	1	2	2	0	0	CAI	small
3234	1997 / 04 / 14	2055	132.11	8032	-22	-21	2	0	2	1	0	2	0	0	BXO	—
				8031	-30	+62	6	2	2	1	4	2	0	0	DAI	—
3235	1997 / 04 / 15	2110	118.76	8032	-22	-09	11	2	7	1	4	7	0	0	DRI	—
				?	-18	+14	1	0	1	0	0	0	0	1	AXX	—
				8031	-30	+76	3	2	1	1	2	1	0	0	DAI	—
3236	1997 / 04 / 16	2035	105.88	8032	-23	+04	6	1	5	1	1	5	0	0	CSI	—
				8031	-30	+84	1	1	0	0	0	0	1	0	HSX	—
3237	1997 / 04 / 17	2115	92.30	8032	-23	+19	3	0	3	1	0	3	0	0	BXI	—
3238	1997 / 04 / 19	2050	66.12	—	—	—	0	0	0	0	0	0	0	0	—	—
3239	1997 / 04 / 20	2100	52.82	—	—	—	0	0	0	0	0	0	0	0	—	—
3240	1997 / 04 / 21	2120	39.43	—	—	—	0	0	0	0	0	0	0	0	—	—
3241	1997 / 04 / 24	2220	359.24	—	—	—	0	0	0	0	0	0	0	0	—	—
3242	1997 / 04 / 26	2115	333.41	8035	+18	-10	1	0	1	0	0	0	0	1	AXX	—
				8036	-19	+35	3	1	2	1	1	2	0	0	CSI	—
3243	1997 / 05 / 01	2100	267.47	—	—	—	0	0	0	0	0	0	0	0	—	—
3244	1997 / 05 / 02	2115	254.11	?	+24	-06	1	0	1	0	0	0	0	1	AXX	very small
3245	1997 / 05 / 04	2120	227.64	—	—	—	0	0	0	0	0	0	0	0	—	—
3246	1997 / 05 / 05	2100	214.60	8038	+20	-74	1	1	0	0	0	0	1	0	HSX	—
3247	1997 / 05 / 06	2120	201.20	8038	+20	-61	1	1	0	0	0	0	1	0	HSX	—
3248	1997 / 05 / 07	2205	187.57	8038	+20	-46	1	1	0	0	0	0	1	0	HSX	—
3249	1997 / 05 / 12	2210	121.41	8038	+20	+19	1	1	0	0	0	0	1	0	HSX	—
3250	1997 / 05 / 13	2100	108.82	8038	+20	+29	4	1	3	1	1	3	0	0	CSI	—
3251	1997 / 05 / 14	2055	95.64	8038	+20	+42	3	1	2	1	1	2	0	0	CSI	—
3252	1997 / 05 / 15	2235	81.50	8038	+20	+57	1	1	0	0	0	0	1	0	HSX	small
3253	1997 / 05 / 26	2335	295.42	8046	-26	-27	1	0	1	0	0	0	0	1	AXX	big
3254	1997 / 05 / 28	2215	269.69	8047	+27	-57	2	0	2	1	0	2	0	0	BXO	—
				8046	-26	+00	1	0	1	0	0	0	0	1	AXX	—
3255	1997 / 05 / 29	2240	256.23	8047	+26	-44	5	0	5	1	0	5	0	0	BXI	—

OBS	DATE	UT	CM	REG.No	B	CMD	f	p	s	gr	grfp	grf	efp	ef	Class.	Remarks
3256	1997 / 06 / 03	2105	190.94	8048	-29	-05	7	2	4	1	3	4	0	0	DAI	—
3257	1997 / 06 / 04	2150	177.29	8048	-28	+11	5	2	2	1	3	2	0	0	DAI	—
3258	1997 / 06 / 05	2235	163.64	8048	-27	+21	7	2	2	1	5	2	0	0	DAI	—
3259	1997 / 06 / 06	2110	151.19	8048	-27	+35	5	2	1	1	4	1	0	0	DAO	—
3260	1997 / 06 / 08	2055	124.86	8050	+27	-57	1	0	1	0	0	0	0	1	AXX	—
				8048	-28	+62	1	0	1	0	0	0	0	1	AXX	—
3261	1997 / 06 / 11	2215	84.41	8050	+29	-18	2	0	2	1	0	2	0	0	BXO	—
3262	1997 / 06 / 12	2100	71.86	8052	+17	-44	2	0	2	1	0	2	0	0	BXO	—
				8050	+29	-07	1	0	1	0	0	0	0	1	AXX	—
3263	1997 / 06 / 13	2055	58.67	8052	+17	-30	4	0	4	1	0	4	0	0	BXI	—
				8050	+29	+07	2	0	2	1	0	2	0	0	BXO	—
3264	1997 / 06 / 14	2200	44.84	8052	+18	-17	5	1	4	1	1	4	0	0	CSI	—
				8050	+29	+20	2	0	2	1	0	2	0	0	BXO	—
3265	1997 / 06 / 15	2110	32.06	8052	+18	-05	8	1	7	1	1	7	0	0	CSI	—
				8050	+28	+32	1	0	1	0	0	0	0	1	AXX	small
3266	1997 / 06 / 19	2140	338.84	8053	-27	-20	3	0	3	1	0	3	0	0	BXI	—
				8052	+18	+49	1	0	1	0	0	0	0	1	AXX	very small
3267	1997 / 06 / 20	2140	325.61	8053	-27	-08	1	0	1	0	0	0	0	1	AXX	—
3268	1997 / 06 / 21	2130	312.46	8053	-27	+05	1	0	1	0	0	0	0	1	AXX	very small
3269	1997 / 06 / 22	2145	299.08	—	—	—	0	0	0	0	0	0	0	0	—	—
3270	1997 / 06 / 23	2110	286.16	8055	+15	+04	3	0	3	1	0	3	0	0	BXO	—
3271	1997 / 06 / 24	2115	272.89	8056	+17	+04	3	0	3	1	0	3	0	0	BXI	—
				8055	+15	+18	1	0	1	0	0	0	0	1	AXX	—
3272	1997 / 06 / 26	2140	246.18	8056	+17	+31	8	0	8	1	0	8	0	0	BXI	—
3273	1997 / 06 / 27	2135	232.99	8056	+17	+45	3	0	3	1	0	3	0	0	BXI	—
3274	1997 / 07 / 03	2145	153.48	8058	-21	-31	1	0	1	0	0	0	0	1	AXX	—
3275	1997 / 07 / 04	2130	140.38	8059	-30	-03	1	0	1	0	0	0	0	1	AXX	small
3276	1997 / 07 / 05	2135	127.10	—	—	—	0	0	0	0	0	0	0	0	—	—
3277	1997 / 07 / 06	2130	113.91	8059	-31	+23	1	0	1	0	0	0	0	1	AXX	resighted
3278	1997 / 07 / 08	2135	87.40	8060	+05	-08	3	0	3	1	0	3	0	0	BXI	—
				8059	-31	+50	1	0	1	0	0	0	0	1	AXX	—
3279	1997 / 07 / 10	2200	60.70	—	—	—	0	0	0	0	0	0	0	0	—	—
3280	1997 / 07 / 11	2140	47.65	—	—	—	0	0	0	0	0	0	0	0	—	—
3281	1997 / 07 / 12	2135	34.46	—	—	—	0	0	0	0	0	0	0	0	—	—
3282	1997 / 07 / 13	2205	20.96	—	—	—	0	0	0	0	0	0	0	0	—	—
3283	1997 / 07 / 14	2125	8.09	—	—	—	0	0	0	0	0	0	0	0	—	—
3284	1997 / 07 / 15	2130	354.81	—	—	—	0	0	0	0	0	0	0	0	—	—
3285	1997 / 07 / 20	2130	288.65	8063	-25	+11	1	0	1	0	0	0	0	1	AXX	small
3286	1997 / 07 / 21	2150	275.23	—	—	—	0	0	0	0	0	0	0	0	—	—
3287	1997 / 07 / 22	2135	262.14	8064	+23	-76	1	0	1	0	0	0	0	1	AXX	small
3288	1997 / 07 / 23	2210	248.59	8064	+23	-61	3	0	3	1	0	3	0	0	BXI	—
				8062	+27	+08	4	0	4	1	0	4	0	0	BXI	—

OBS	DATE	UT	CM	REG.No	B	CMD	f	p	s	gr	grfp	grf	efp	ef	Class.	Remarks
3308	1997 / 08 / 24	2240	185.22	—	—	—	0	0	0	0	0	0	0	0	—	—
3309	1997 / 08 / 26	2050	159.81	8076	+30	-54	9	1	7	1	2	7	0	0	CAI	—
3310	1997 / 08 / 27	2115	146.37	8076	+30	-40	13	2	11	1	2	11	0	0	DAI	—
				8078	+17	-28	1	0	1	0	0	0	0	1	AXX	—
3311	1997 / 08 / 28	2245	132.33	8076	+29	-25	22	3	16	1	6	16	0	0	DAI	—
				8078	+18	-14	1	0	1	0	0	0	0	1	AXX	very small
3312	1997 / 08 / 29	2135	119.76	?	+32	-36	1	0	1	0	0	0	0	1	AXX	—
				8076	+28	-14	31	3	20	1	11	20	0	0	DAC	—
				8080	+19	+16	2	0	2	1	0	2	0	0	BXO	—
3313	1997 / 08 / 30	2115	106.73	8076	+29	-01	25	3	13	1	12	13	0	0	EAC	—
				8080	+18	+28	4	0	4	1	0	4	0	0	BXI	—
3314	1997 / 08 / 31	2045	93.81	8081	+33	-75	1	0	1	0	0	0	0	1	AXX	—
				8076	+28	+12	24	4	16	1	8	16	0	0	EAC	—
				8080	+18	+41	1	0	1	0	0	0	0	1	AXX	—
3315	1997 / 09 / 03	2220	53.31	8083	-27	-56	5	2	1	1	4	1	0	0	DAI	—
				8081	+34	-38	3	0	3	1	0	3	0	0	BXO	—
				?	+20	+09	1	0	1	0	0	0	0	1	AXX	small
				8076	+28	+53	8	2	5	1	3	5	0	0	EAI	—
3316	1997 / 09 / 05	2145	27.22	8084	+22	-65	1	0	1	0	0	0	0	1	AXX	—
				8083	-27	-30	9	2	3	1	6	3	0	0	DAI	—
				8082	+20	-23	7	1	6	1	1	6	0	0	CSI	—
				8076	+26	+79	2	0	2	1	0	2	0	0	BXO	—
3317	1997 / 09 / 10	2055	321.65	8085	-26	-30	24	3	14	1	10	14	0	0	EHC	—
				8084	+22	-02	22	2	17	1	5	17	0	0	DAI	—
				8083	-28	+32	16	2	7	1	9	7	0	0	DKI	—
3318	1997 / 09 / 11	2055	308.45	8085	-26	-16	22	3	15	1	7	15	0	0	EHC	—
				8084	+22	+12	19	3	14	1	5	14	0	0	DHC	2nd & 3rd penumbrae small
				8083	-28	+46	12	3	6	1	6	6	0	0	DKC	—
3319	1997 / 09 / 12	2050	295.28	8085	-26	-04	15	3	10	1	5	10	0	0	EHC	—
				8084	+22	+25	20	3	9	1	11	9	0	0	DHC	—
				8083	-28	+59	6	3	1	1	5	1	0	0	DAC	—
3320	1997 / 09 / 13	2035	282.22	8086	+27	-52	4	1	2	1	2	2	0	0	CAI	—
				8085	-26	+09	16	3	8	1	8	8	0	0	EHC	—
				8084	+22	+38	14	2	7	1	7	7	0	0	DSI	—
				8083	-28	+73	4	2	2	1	2	2	0	0	DHI	—
3321	1997 / 09 / 15	2030	255.86	8086	+27	-28	14	3	7	1	7	7	0	0	DAC	—
				8085	-25	+37	5	1	2	1	3	2	0	0	CHO	class correct
				8084	+22	+62	9	3	4	1	5	4	0	0	DAC	—

B8

OBS	DATE	UT	CM	REG.No	B	CMD	f	p	s	gr	grfp	grf	efp	ef	Class.	Remarks
3322	1997 / 09 / 16	2055	242.43	8086	+27	-15	13	3	8	1	5	8	0	0	DAC	—
				8085	-25	+53	3	1	1	1	2	1	0	0	CKO	—
				8084	+22	+75	6	2	2	1	4	2	0	0	DKI	—
3323	1997 / 09 / 17	2105	229.13	8086	+28	-02	15	1	13	1	2	13	0	0	CAI	—
				8085	-25	+68	3	1	1	1	2	1	0	0	CKO	—
3324	1997 / 09 / 18	2040	216.16	8086	+28	+11	8	1	6	1	2	6	0	0	CAI	—
3325	1997 / 09 / 19	2120	202.60	8086	+28	+24	5	1	3	1	2	3	0	0	CAI	—
3326	1997 / 09 / 20	2050	189.67	8086	+26	+36	3	1	2	1	1	2	0	0	CSI	—
3327	1997 / 09 / 27	2000	97.74	8088	-29	+27	6	2	3	1	3	3	0	0	DAI	—
3328	1997 / 09 / 28	2135	83.68	8088	-29	+41	4	2	1	1	3	1	0	0	DAO	—
3329	1997 / 09 / 29	2120	70.62	8088	-29	+54	3	1	1	1	2	1	0	0	CAO	—
3330	1997 / 09 / 30	2115	57.46	8090	-27	-70	1	1	0	0	0	0	1	0	HSX	—
				8088	-29	+68	3	1	1	1	2	1	0	0	CAO	—
3331	1997 / 10 / 01	2010	44.87	8091	+22	-75	3	0	3	1	0	3	0	0	BXI	—
				8090	-27	-58	1	1	0	0	0	0	0	1	0	HSX
3332	1997 / 10 / 05	2050	351.72	8091	+24	-23	2	0	2	1	0	2	0	0	BXO	—
				8090	-27	-05	1	1	0	0	0	0	0	1	0	HSX
3333	1997 / 10 / 06	2015	338.85	8091	+24	-09	2	0	2	1	0	2	0	0	BXO	—
				8090	-28	+08	1	0	1	0	0	0	0	0	1	AXX
3334	1997 / 10 / 07	2040	325.43	8092	+25	-58	2	0	2	1	0	2	0	0	BXO	—
				8090	-28	+22	1	0	1	0	0	0	0	0	1	AXX
3335	1997 / 10 / 12	2045	259.42	8093	+31	-04	11	3	4	1	7	4	0	0	DAC	—
				8094	+22	+49	2	0	2	1	0	2	0	0	BXO	—
3336	1997 / 10 / 13	2040	246.27	8093	+31	+09	8	2	4	1	4	4	0	0	DAI	—
				8094	+21	+61	1	0	1	0	0	0	0	0	1	AXX
3337	1997 / 10 / 14	2220	232.17	8096	+14	-62	1	0	1	0	0	0	0	1	AXX	big
				8093	+31	+23	4	1	2	1	2	2	0	0	CAI	—
3338	1997 / 10 / 15	2100	219.71	8097	+17	-81	1	0	1	0	0	0	0	1	AXX	big
				8096	+14	-50	4	1	2	1	2	2	0	0	CAI	—
				8093	+31	+35	5	1	4	1	1	4	0	0	CSI	—
3339	1997 / 10 / 16	1945	207.21	8097	+17	-69	3	1	2	1	1	2	0	0	CAI	—
				8096	+14	-37	4	1	3	1	1	3	0	0	CSI	—
				8093	+30	+48	6	2	4	1	2	4	0	0	DSI	—
3340	1997 / 10 / 19	2010	167.41	8097	+17	-29	3	1	1	1	2	1	0	0	CAI	—
				8096	+13	+02	3	1	2	1	1	2	0	0	CSI	—
3341	1997 / 10 / 20	2030	154.03	8097	+16	-15	3	1	1	1	2	1	0	0	CAO	—
				8096	+13	+14	3	0	3	1	0	3	0	0	BXI	—
3342	1997 / 10 / 21	2025	140.89	8097	+16	-02	4	1	3	1	1	3	0	0	CSI	—
				8096	+13	+27	1	0	1	0	0	0	0	1	AXX	—
3343	1997 / 10 / 26	2005	75.13	8099	+20	-54	1	1	0	0	0	0	1	0	HSX	—
				8098	-26	+26	1	0	1	0	0	0	0	0	1	AXX

B9

OBS	DATE	UT	CM	REG.No	B	CMD	f	p	s	gr	grfp	grf	efp	ef	Class.	Remarks
3344	1997 / 10 / 27	2015	61.85	8100	-20	-70	3	0	3	1	0	3	0	0	BXI	—
				8099	+20	-41	4	1	3	1	1	3	0	0	CSI	—
				8098	-24	+39	2	0	2	1	0	2	0	0	BXO	—
3345	1997 / 10 / 29	1930	35.89	8100	-21	-46	12	2	5	1	7	5	0	0	DAI	—
				8099	+20	-15	2	1	1	1	1	1	0	0	CSO	—
3346	1997 / 10 / 30	2055	21.92	8100	-20	-32	14	2	6	1	8	6	0	0	DAI	—
				8099	+20	-01	5	1	4	1	1	4	0	0	CSI	—
3347	1997 / 10 / 31	2150	8.24	8100	-20	-18	9	2	2	1	7	2	0	0	DAI	—
				8099	+19	+15	2	1	1	1	1	1	0	0	CSI	—
3348	1997 / 11 / 03	1920	330.05	—	-15	-15	1	0	1	0	0	0	0	1	AXX	—
				8100	-20	+22	31	5	11	1	20	11	0	0	DKC	—
3349	1997 / 11 / 08	1945	263.90	8104	+28	-60	1	0	1	0	0	0	0	1	AXX	—
				8103	+22	+40	2	0	2	1	0	2	0	0	AXX	class correct
3350	1997 / 11 / 09	2025	250.35	8104	+29	-45	1	0	1	0	0	0	0	1	AXX	—
				8103	+21	+55	7	1	5	1	2	5	0	0	CAI	pen. small
3351	1997 / 11 / 10	1935	237.63	8106	+27	+27	2	0	2	1	0	2	0	0	BXO	—
				8103	+20	+66	11	2	5	1	6	5	0	0	DAI	—
3352	1997 / 11 / 14	2020	184.48	8108	+20	-69	8	2	6	1	2	6	0	0	DSI	—
				8107	-24	+36	5	1	4	1	1	4	0	0	CSI	—
				8106	+28	+81	1	0	1	0	0	0	0	1	AXX	—
3353	1997 / 11 / 17	1920	145.47	8109	-18	-53	3	1	2	1	1	2	0	0	CSI	—
				8108	+20	-32	19	3	10	1	9	10	0	0	EAC	—
3354	1997 / 11 / 18	2220	130.65	8109	-18	-39	6	1	5	1	1	5	0	0	CSI	—
				8108	+20	-18	24	4	13	1	11	13	0	0	EAC	—
3355	1997 / 11 / 19	1945	118.88	8109	-19	-27	4	1	3	1	1	3	0	0	CSI	—
				8108	+19	-05	18	3	10	1	8	10	0	0	EAC	—
3356	1997 / 11 / 20	2000	105.57	8109	-19	-14	2	1	1	1	1	1	0	0	CSO	—
				8108	+19	+08	25	1	18	1	7	18	0	0	CKI	—
3357	1997 / 11 / 23	2205	64.88	8111	+23	-62	4	1	3	1	1	3	0	0	CSI	—
				8109	-19	+28	2	1	1	1	1	1	0	0	CSO	—
				8108	+19	+49	9	3	3	1	6	3	0	0	EAC	—
3358	1997 / 11 / 24	1855	53.43	8111	+23	-50	4	1	3	1	1	3	0	0	CSI	—
				8109	-19	+41	1	1	0	0	0	0	1	0	HSX	small
				8108	+19	+62	6	3	2	1	4	2	0	0	DAC	—
3359	1997 / 11 / 25	1955	39.70	8111	+23	-37	1	0	1	0	0	0	0	1	AXX	big
				8108	+19	+75	2	1	1	1	1	1	0	0	CSO	—
3360	1997 / 11 / 26	2000	26.48	8113	+20	-77	9	4	1	1	8	1	0	0	EAC	—
				8111	+23	-23	1	0	1	0	0	0	0	1	AXX	big
3361	1997 / 11 / 27	1945	13.44	8113	+20	-64	20	4	5	1	15	5	0	0	EAC	—
				8111	+22	-09	1	0	1	0	0	0	0	1	AXX	—

B10

OBS	DATE	UT	CM	REG.No	B	CMD	f	p	s	gr	grfp	grf	efp	ef	Class.	Remarks	
3362	1997 / 12 / 08	1935	228.58	8118	-39	-41	2	1	1	1	1	1	0	0	CSO	—	
				8120	-21	-38	5	0	5	1	0	5	0	0	BXI	—	
				8116	+27	-01	8	1	6	1	2	6	0	0	CAI	—	
				8115	+32	+55	1	0	1	0	0	0	0	0	1	AXX	—
				8113	+20	+81	1	1	0	0	0	0	0	1	0	HHX	—
3363	1997 / 12 / 10	2130	201.17	8118	-39	-13	1	1	0	0	0	0	1	0	HSX	—	
				8120	-21	-10	6	0	6	1	0	6	0	0	BXI	—	
				8116/9	+31	+27	11	3	5	1	6	5	0	0	DAC	—	
				8121	+25	+54	1	0	1	0	0	0	0	0	1	AXX	big
3364	1997 / 12 / 11	2105	188.22	8118	-39	00	1	1	0	0	0	0	1	0	HSX	—	
				8120	-21	+03	2	0	2	1	0	2	0	0	BXO	—	
				8122	+31	+02	13	3	5	1	8	5	0	0	DAC	—	
				8116/9	+30	+40	12	3	6	1	6	6	0	0	DAC	—	
				8121	+25	+67	1	0	1	0	0	0	0	0	1	AXX	big
3365	1997 / 12 / 12	2040	175.27	8118	-39	+13	1	1	0	0	0	0	1	0	HSX	—	
				8120	-21	+16	2	0	2	1	0	2	0	0	BXO	—	
				8122	+30	+17	9	2	4	1	5	4	0	0	DAI	—	
				8116/9	+30	+52	8	3	3	1	5	3	0	0	DAC	—	
3366	1997 / 12 / 13	2020	162.28	8118	-40	+26	1	1	0	0	0	0	1	0	HSX	—	
				8122	+30	+30	6	1	4	1	2	4	0	0	CAI	—	
				8116/9	+29	+65	3	1	2	1	1	2	0	0	CSI	—	
3367	1997 / 12 / 14	2020	149.10	8123	+20	-62	1	0	1	0	0	0	0	1	AXX	—	
				8118	-40	+40	1	1	0	0	0	0	1	0	HSX	—	
				8122	+30	+44	7	3	3	1	4	3	0	0	DSC	—	
				8119	+31	+77	2	0	2	1	0	2	0	0	BXO	—	
3368	1997 / 12 / 17	2015	109.63	8123	+18	-22	7	2	3	1	4	3	0	0	DSI	—	
				8122	+30	+82	1	0	1	0	0	0	0	0	1	AXX	—
3369	1997 / 12 / 18	2030	96.31	8123	+18	-08	9	1	7	1	2	7	0	0	CSI	—	
3370	1997 / 12 / 21	2010	56.98	8124	-22	-68	6	3	2	1	4	2	0	0	DSC	—	
				8123	+18	+31	2	1	1	1	1	1	0	0	CSO	—	
3371	1997 / 12 / 25	2015	4.24	8126	+20	-57	2	1	0	1	2	0	0	0	HHX	—	
				8124	-22	-15	17	4	9	1	8	9	0	0	EAC	—	
				8127	-18	+40	2	0	2	1	0	2	0	0	BXO	—	
3372	1997 / 12 / 26	2005	351.16	8126	+20	-44	2	1	0	1	2	0	0	0	HKX	—	
				8124	-22	-02	15	3	9	1	6	9	0	0	EAC	—	
3373	1997 / 12 / 28	2020	324.68	8126	+20	-18	6	2	0	1	6	0	0	0	DKO	—	
				8124	-22	+22	14	3	8	1	6	8	0	0	DAC	—	
3374	1997 / 12 / 31	2005	285.31	8130	-29	-06	10	2	5	1	5	5	0	0	DAI	—	
				8126	+21	+22	9	1	2	1	7	2	0	0	CKI	—	
				8124	-22	+62	6	2	2	1	4	2	0	0	DAI	—	


SECTION C
DAILY SUNSPOT AREA TOTALS - 1997.

All data obtained from United States observatories through the US NOAA.

Data in this section may have accumulated errors of up to 50 units or micro-hemispheres.

All dates are UT dates.

Unit used is 1 000 000th of the visible solar hemisphere, or micro-hemisphere.

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DATE
01	0	20	0	70	0	70	0	0	240	160	230	560	01
02	0	60	0	120	0	120	10	10	240	80	340	610	02
03	0	180	0	160	10	150	0	30	250	90	660	610	03
04	10	170	0	160	0	110	0	20	320	70	1030	320	04
05	20	150	0	100	120	120	0	30	400	40	940	350	05
06	10	100	120	60	90	110	0	120	410	20	840	320	06
07	0	30	100	30	70	90	30	140	640	10	690	290	07
08	0	0	120	30	90	30	10	230	1000	10	580	270	08
09	20	0	70	30	90	20	50	90	1370	20	40	270	09
10	30	0	50	130	90	10	10	40	1590	40	120	280	10
11	20	0	30	140	90	10	0	220	1450	50	160	230	11
12	0	0	30	80	60	40	0	140	1050	90	100	250	12
13	0	0	20	90	70	30	0	180	940	110	180	260	13
14	0	0	50	110	70	40	10	140	790	110	350	230	14
15	30	0	30	210	50	30	0	120	770	180	450	220	15
16	20	0	30	180	40	70	0	100	790	170	390	240	16
17	0	0	30	40	10	30	0	60	490	190	450	200	17
18	0	20	0	10	60	40	0	60	200	130	380	130	18
19	0	10	0	10	160	20	0	60	90	90	290	70	19
20	0	0	0	0	150	10	10	50	60	60	310	110	20
21	0	0	0	0	260	0	0	60	90	50	360	190	21
22	0	0	0	10	250	10	10	60	230	10	410	260	22
23	0	0	0	0	170	10	60	20	290	0	350	700	23
24	20	10	0	0	150	10	90	0	300	0	320	520	24
25	0	10	0	0	130	40	200	90	320	20	260	470	25
26	0	0	0	30	100	40	180	160	260	30	360	460	26
27	0	0	40	30	40	30	180	110	240	140	620	420	27
28	0	0	80	30	30	10	10	220	260	190	680	410	28
29	20	—	100	0	50	0	0	280	220	210	720	470	29
30	30	—	140	0	30	0	0	220	260	250	940	430	30
31	10	—	90	—	50	—	0	240	—	290	—	430	31
MEAN	7.74	27.14	36.45	62.00	83.23	43.33	27.74	106.45	518.67	93.87	451.67	341.29	MEAN

Quarterly Means:

First: 23.67

Second: 63.08

Third: 214.35

Fourth: 293.91

Yearly Mean : 149.67

SMOOTHED NOAA AREA MONTHLY VALUES.

Data based upon NOAA monthly mean values.

Unit used in observed values is 1 000 000th of the visible solar hemisphere.

Smoothing methods used are the Waldmeier and the 'Barnes 13' methods.

MONTH	Observed	S^W	S^{B13}	MONTH	Observed	S^W	S^{B13}	MONTH	Observed	S^W	S^{B13}
1989 Jan	2079.35	1564.13	1620.16	1992 Jan	1686.13	1317.28	1414.31	1995 Jan	132.90	179.43	182.37
Feb	1782.86	1582.70	1668.39	Feb	1982.59	1234.93	1305.57	Feb	168.21	171.06	170.53
Mar	2137.42	1679.76	1719.01	Mar	835.48	1166.64	1182.91	Mar	225.16	157.06	155.58
Apr	1342.00	1737.96	1747.03	Apr	936.67	1104.07	1060.09	Apr	105.52	139.51	139.57
May	1274.84	1761.96	1764.04	May	498.39	1067.26	959.54	May	135.48	131.25	128.24
Jun	2594.67	1784.67	1773.20	Jun	515.67	1006.95	878.13	Jun	97.67	122.45	117.81
Jul	997.10	1756.19	1761.72	Jul	858.06	893.08	809.54	Jul	106.13	111.01	106.88
Aug	2131.94	1700.94	1743.11	Aug	811.29	804.63	768.76	Aug	58.71	101.19	96.88
Sep	2254.33	1634.98	1709.44	Sep	524.17	763.15	759.76	Sep	39.00	86.78	87.21
Oct	1384.84	1587.66	1659.76	Oct	1008.06	739.60	765.05	Oct	192.58	75.13	79.09
Nov	1726.33	1579.00	1605.93	Nov	993.33	717.29	761.52	Nov	64.33	67.18	70.31
Dec	1679.68	1511.03	1527.38	Dec	690.97	709.78	745.08	Dec	46.45	61.27	61.41
1990 Jan	1457.10	1459.84	1447.69	1993 Jan	438.39	684.60	715.70	1996 Jan	52.90	60.08	55.17
Feb	1079.29	1486.09	1395.16	Feb	1107.50	641.55	677.16	Feb	12.41	62.15	51.98
Mar	1257.74	1446.84	1352.14	Mar	715.16	607.36	627.39	Mar	35.16	62.24	50.12
Apr	1086.00	1397.79	1330.49	Apr	491.67	576.55	568.65	Apr	16.00	52.80	47.11
May	1323.23	1399.05	1336.24	May	408.06	536.41	513.58	May	34.19	50.41	48.42
Jun	915.00	1397.33	1360.66	Jun	425.67	506.04	472.47	Jun	57.00	57.46	55.03
Jul	1448.06	1423.16	1415.21	Jul	343.87	509.95	449.23	Jul	118.39	57.05	60.02
Aug	2310.97	1501.82	1491.35	Aug	292.26	489.23	430.96	Aug	96.13	55.78	62.23
Sep	1133.33	1579.25	1562.42	Sep	222.67	431.42	416.70	Sep	3.67	56.45	62.76
Oct	1328.71	1606.24	1621.17	Oct	570.00	389.84	412.00	Oct	1.29	58.42	63.88
Nov	1812.67	1619.14	1672.53	Nov	468.00	363.45	405.48	Nov	198.33	62.38	65.16
Dec	1551.94	1677.50	1724.80	Dec	487.42	342.04	391.53	Dec	81.67	63.85	62.97
1991 Jan	2294.84	1733.70	1764.60	1994 Jan	735.81	324.62	367.72	1997 Jan	7.74	59.50	57.91
Feb	2219.29	1728.98	1774.15	Feb	312.86	313.35	332.85	Feb	27.14	56.16	54.89
Mar	1976.13	1709.40	1762.20	Mar	122.26	309.96	294.64	Mar	36.45	78.04	62.75
Apr	1015.33	1733.23	1748.30	Apr	86.67	304.13	261.59	Apr	62.00	103.36	76.77
May	1703.55	1722.53	1726.30	May	179.68	279.85	234.28	May	83.23	117.77	92.63
Jun	1935.33	1712.83	1703.53	Jun	140.33	253.46	214.76	Jun	43.33	139.15	116.86
Jul	1776.45	1717.23	1681.24	Jul	210.97	218.07	200.97	Jul	27.74	—	—
Aug	1869.35	1685.73	1655.18	Aug	154.84	186.92	196.12	Aug	106.45	—	—
Sep	1105.00	1628.36	1632.35	Sep	278.67	185.18	201.64	Sep	518.67	—	—
Oct	1929.03	1577.56	1609.92	Oct	374.19	190.25	204.67	Oct	93.87	—	—
Nov	955.67	1524.07	1571.61	Nov	81.00	189.20	200.08	Nov	451.67	—	—
Dec	2176.13	1414.70	1502.53	Dec	240.97	185.58	192.28	Dec	341.29	—	—

A grey rectangular box with a black border. On the left side, there is a white circle with orange rays emanating from its right side, resembling a sun. To the right of the circle, the text "SECTION D" is written in a bold, black, sans-serif font.

SECTION D

MAJOR SOLAR FLARE TIMINGS .

In this section, data on flares are given in the format of beginning, maximum and ending times, along with the flares' x-ray strengths (in microWatts per square metre). This report deals with 1997's flares.

Flares with a strength of less than 1 microWatt per square metre are not stated.

Analysis of these flare data appears on pages D7 and D8 of this report.

MAJOR SOLAR FLARES for 1997.

ALL TIMES IN UNIVERSAL TIME (UT).

Times are as at the Earth, the flares actually occurred 8 minutes earlier than the stated times. Data were collected through the US NOAA from a 24-hour satellite watch over the year concerned.

Strength of the flares are stated in microWatts per square metre ($\mu\text{W}/\text{m}^2$).

If any flares are not $\geq 1 \mu\text{W}/\text{m}^2$ in strength, then they are not listed. If the strength of a flare is not known (by the GDSO), or if the strength is questionable, it is also not listed.

If no major flares ($\geq 1 \mu\text{W}/\text{m}^2$) are observed on any particular day, then the date is left out of the list.

- ◆ A in time columns means the flare continued *after* the end of the observation.
- ◆ B in time columns means the flare started *before* the observation began.
- ◆ OA after maximum time column means the maximum was that time *or after*. This occurs only when the ending time is suffixed with an A and that that time is the same as the maximum time.
- ◆ OB after the maximum time column means the maximum was that time *or before*. This occurs only when the beginning time is suffixed with a B and that that time is the same as the maximum time.
- ◆ U in time columns means 'uncertain'.

If times go beyond 24 hours UT, then 0015 is stated as 2415, etc.

UNIVERSAL TIME					UNIVERSAL TIME				
DATE	BEG.	MAX.	END.	STR	DATE	BEG.	MAX.	END.	STR
NO MAJOR FLARES OBSERVED FROM 1997/01/01 TO 1997/02/01 INCLUSIVE.					1997/04/02	0031	0040	0048	2.2
1997/02/02	0636B	0638U	0646A	2.6		0529	0530	0532	1.3
02/04	1116B	1118U	1132A	1.8	04/03	1230	1327	1408	1.2
NO MAJOR FLARES OBSERVED FROM 1997/02/05 TO 1997/02/18 INCLUSIVE.					04/07	1354	1403	1524	6.8
1997/02/19	2220	2222	2228	3.9	04/09	1050	1140	1150	1.5
02/20	0134	0139	0143	1.0	04/14	0758	0842	0854	1.2
	0758	0803	0805	3.4	04/15	0715	0735	0741	1.0
	1137	1144	1146	4.8		1409	1413	1432	1.0
NO MAJOR FLARES OBSERVED FROM 1997/02/21 TO 1997/03/26 INCLUSIVE.					NO MAJOR FLARES OBSERVED FROM 1997/04/16 TO 1997/05/11 INCLUSIVE.				
1997/03/27	1022	1035	1041	1.0	1997/05/12	0445	0452	0556	1.3
03/28	0109	0120	0135	1.5	05/20	2145	2210	2216	4.2
1997/04/01	0506B	0508U	0515	6.0	05/21	0607	0628	0702	2.7
	0757	0759	0807	2.2		2008B	2008U	2112A	13
	1023	1032	1038	2.1	05/27	0939	0957U	1007	4.6
	1343	1348	1410	19		1553	1604	1617	1.0

UNIVERSAL TIME					UNIVERSAL TIME				
DATE	BEG.	MAX.	END.	STR	DATE	BEG.	MAX.	END.	STR
1997/05/28	0315	0342	0406	1.2	1997/09/01	0152	0201	0214	2.2
NO MAJOR FLARES OBSERVED FROM 1997/05/29 TO 1997/06/28 INCLUSIVE.						0233	0238	0241	1.1
1997/06/29	2345	2347	2400	1.1	09/02	1228	1229	1245	10
NO MAJOR FLARES OBSERVED FROM 1997/06/30 TO 1997/07/11 INCLUSIVE.						1638B	1638U	1649A	1.2
1997/07/12	1514	1524	1536	1.2		2114	2115	2121	4.1
NO MAJOR FLARES OBSERVED FROM 1997/07/13 TO 1997/07/24 INCLUSIVE.					09/03	2358	2358	2409	2.8
1997/07/25	0512	0536	0610	1.2		0208	0210	0222	2.7
	1854	1856	1909	1.1		0531	0537	0553	1.7
	2011	2028	2115	4.4		0641	0641	0651	1.0
NO MAJOR FLARES OBSERVED FROM 1997/07/26 TO 1997/08/08 INCLUSIVE.						1511	1519	1543	1.1
1997/08/09	1210	1211	1220	1.0	09/05	1324	1325	1333	1.7
	1254	1302	1306	3.7	09/06	2046	2052	2054	1.1
	1505	1524	1306	1.1	09/07	0300	0317	0349	1.6
	1634	1634	1637	8.5		0445	0449	0454	1.4
	2341	2350	2355	3.2		0614	0615	0619	3.1
08/10	0720	0729	0735	3.0	09/08	0952	0958	1006	1.0
	0836	0842	0849	1.0		1026	1027	1031	2.3
	2000	2019	2028	4.6		1359	1402	1409	1.8
	2342	2403	2419	5.5		1733	1738	1756	3.5
08/11	0917B	0918U	0923	1.1		1928	1932	2110	10
08/14	0129	0132	0147	1.0	09/09	0948	0951	1035	9.7
NO MAJOR FLARES OBSERVED FROM 1997/08/15 TO 1997/08/24 INCLUSIVE.						1837	1842	1940	2.5
1997/08/25	1519	1523	1543	1.2	09/10	1008	1014	1027	1.0
	1639	1655	1714	1.2	09/12	0211	0214	0217	1.1
08/26	0054	0054	0101	4.0		1859	1900	1914	1.1
	0531B	0532U	0614	4.5		2008	2008	2016	1.0
08/29	0417	0428	0438	4.0	09/13	1945	1956	2001	2.4
	1727	1729	1754	1.0	09/14	0254	0254	0258	2.8
	2314B	2317U	2447	14		0351	0414	0420	1.2
08/30	1115	1121	1133	1.9		1057B	1116U	1158A	2.7
08/31	1129	1133	1138	2.7		1202	1210	1214	1.9
	1910	1914	1920	1.2		1701	1702	1708	1.5
	2222	2223	2232	1.4	09/15	2013	2022	2039	1.0
						0206	0213	0224	4.4
						0644	0652	0708	3.1
						1358	1403	1416	1.5
						1832	1837	1847	1.4
						2132	2132	2142	1.8

DATE	UNIVERSAL TIME				DATE	UNIVERSAL TIME			
	BEG.	MAX.	END.	STR		BEG.	MAX.	END	STR
1997/09/16	2010	2030	2041	1.8	1997/09/29	1623	1625	1635	2.6
	2214	2215	2247	3.4					
09/17	0105	0136	0139	5.6	1997/10/02	0242	0245	0256	1.0
	0342	0405	0423	1.7					
	1138B	1141U	1210	17					
	1345	1357	1410	1.2					
	1729	1731	1736	1.2					
	1749	1750	1810	10					
	2239	2251	2258	7.1					
	2358	2401	2402	1.6					
09/18	0553	0558	0601	1.1					
	0803	0818	0820	1.4					
	1208	1213	1222	2.9					
	1705	1710	1713	1.5					
	1933	1936	1938	1.5					
	1947	1953	1956	1.6					
09/19	0001	0013	0027	1.8					
	0147	0150	0153	8.6					
	0535	0548	0557	1.5					
	0911	0929	0940	2.6					
09/20	0949	1044	1220	2.3					
09/21	0411	0417	0420	2.6					
09/22	0050	0051	0053	1.7					
	0607	0625	0635	1.4					
	0907	0912	0927	2.2					
	1122	1123U	1129	1.0					
	1306	1315	1324	2.6					
	1412B	1418U	1451	4.7					
	1811	1814	1824	5.1					
09/23	2105	2117	2123	1.9					
	2127	2131	2136	1.4					
	2136	2214	2350	1.5					
09/24	0217	0221	0225	1.1					
	0247	0247	0309	59					
	0534	0534	0543	4.5					
	0656	0700	0716	2.5					
	0911	0913	0923	2.2					
	1103B	1110U	1121	30					
	1825	1831	1854	8.3					
09/25	0319	0327	0345	2.7					
	1143	1154	1223	7.2					
09/26	0315	0318	0343	4.4					
09/28	1411	1442	1534	1.0					

CONTINUED.

UNIVERSAL TIME					UNIVERSAL TIME				
DATE	BEG.	MAX.	END.	STR	DATE	BEG.	MAX.	END.	STR
1997/11/04	0806	0808	0827	3.4	1997/11/14	0127	0129	0132	3.6
cont.	0948	0951	0954	2.6		0709	0713	0715	1.4
	1021	1025	1028	1.8		0938	0943	1040	4.6
	1730	1736	1739	2.5	11/15	0133	0136	0201	2.2
	2107	2118	2252	5.9		1025	1041	1052	1.0
1997/11/05	0622	0637	0713	7.0		2237	2242	2338	10
	0917	0921	0923	3.0	11/16	0123	0130	0134	1.0
	1000	1006	1012	8.1		1819	1826	1829	1.9
	1130	1140	1155	6.8		2016	2021	2023	1.4
	1631	1631	1637	1.4	11/17	1328	1354	1401	2.6
	1739	1744	1750	1.2		1414	1417	1420	1.3
	1841	1842	1916	2.3		1459	1507	1522	8.6
11/06	0246	0249	0252	1.1	11/19	1700	1910	2140	1.6
	0314	0317	0331	1.9	11/21	0625	0628	0632	1.1
	1122B	1156	1244	940		1248	1328	1336	1.7
	1131	1136	1144	4.7		1600	1600	1605	1.2
11/07	0919	0925	0939	1.0		1702	1704	1708	1.1
	2103	2109	2115	1.1	11/22	0613	0630	0654	1.0
11/08	0748	0819	0833	1.7		1852	1900	1911	1.1
11/10	0525	0531	0544	1.6	11/23	0239	0240	0259	2.0
	0703	0709	0717	4.0		1538	1540	1556	1.5
	1139	1146	1151	1.4	11/24	0358	0401	0418	3.4
	1251	1307	1315	1.5		1849	1859	1917	1.4
11/11	0244	0431	0438	1.2		1930	1950	2010	16
	0716	0717	0723	4.7	11/25	0230	0254	0305	2.1
	1022	1022	1024	1.8		0327	0337	0347	3.9
	1157	1202	1206	1.3		0527	0543	0557	5.0
11/12	0633	0644	0653	2.4		0814	0818	0823	1.1
	1055	1104	1108	1.0		1050	1103	1120	2.3
	1702	1713	1723	1.6		1438	1445	1456	1.1
	2054	2102	2110	2.0		1936	1952	1959	9.3
11/13	0624	0631	0635	1.1		2217	2224	2232	1.3
	1047	1050	1053	1.3		2258	2306	2321	1.1
	1103	1112	1126	1.4	11/26	0242	0311	0319	1.8
	1142	1145	1147	2.0		0412	0417	0429	3.6
	1426	1433	1436	1.3		0442	0443	0444	4.7
	1504	1508	1513	2.3		0749	0754	0759	1.3
	1742	1744	1754	1.0		1754B	1810	1819	1.3
	1800	1804	1807	1.6		1828	1835	1844	20
	1859	1903	1906	1.1					
	2009	2018	2021	1.7					

D6

DATE	UNIVERSAL TIME				DATE	UNIVERSAL TIME			
	BEG.	MAX.	END.	STR		BEG.	MAX.	END	STR
1997/11/27	0201	0203	0205	1.3	1997/12/02	1622	1632	1642	1.3
	0324	0330	0335	1.1	12/03	0021	0029	0036	2.2
	1025	1035	1044	1.4		0058	0118	0137	1.6
	1148	1153	1200	1.0		0326	0330	0402	2.1
	1302	1317	1338	260		0412	0417	0446	1.0
	1501	1507	1519	2.3		0706	0715	0734	1.0
	1613	1626	1639	3.8		1203	1213	1220	1.1
11/28	0019	0025	0045	5.1		1404	1408	1416	1.5
	0456	0506	0633	68	12/04	0543	0550	0604	1.4
	1136	1207	1315	3.4	12/06	0834	0842	0850	1.2
	1513	1514	1520	2.2		1944	1952	2006	1.5
	1541	1542	1549	1.6	12/12	0717	0718	0733	1.4
	1814B	1816U	1856A	1.9		1046	1052	1056	1.8
	1920	1933	1951	2.4		1145	1154	1159	2.3
	1954	2009	2017	11		1218	1225	1229	1.3
11/29	0506	0508	0520	3.2	12/14	1537	1551	1710	1.2
	0923	0929	0953	5.0	12/15	1842	1844	1900	1.1
	1931	1934	1950	1.2		2339	2350	2404	2.4
	2233	2242	2358	64	12/19	1800	2030	2153	1.1
11/30	0653	0655	0707	2.9	12/21	0341	0354	0407	7.0
	0708	0710	0718	2.6	12/22	0155	0220	0238	3.3
	2045	2051	2100	4.0		0830	0830	0834	1.4
						1524	1536	1546	6.5
1997/12/01	0039	0040	0042	1.1	12/26	0554	0554	0611	2.0
	0235	0235	0331	12	12/27	1632	1634	1704	3.2
	1226	1232	1249	1.3	12/31	0659	0703	0714	1.5
	1326	1328	1344	6.6		1445	1500	1507	1.0
	1845B	1845U	1855	2.4		1827	1828	1831	1.3
	1914	1923	2000	4.3		2022	2023	2056	4.5
	2139	2143	2146	1.0					
	2235	2241	2252	1.0					

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X-RAY FLARE ANALYSIS, 1996 - 1997.

The following is an analysis of solar x-ray flares showing monthly values of 'mean daily output' (MDO), 'mean x-ray strength' (MXS), and 'mean daily mean' (MDM), all expressed in microWatts / square metre.

All data are based on US NOAA satellite data.

d = number of days of data.

n = number of events.

	DATE	MDO	MXS	MDM	d	n
1996	January	0.0742	1.1500	0.0742	31	2
	February	0.0000	—	0.0000	29	0
	March	0.0517	1.5000	0.0517	29	1
	April	1.5567	9.3400	0.3113	30	5
	May	0.3935	2.0333	0.3468	31	6
	June	0.0400	1.2000	0.0400	30	1
	July	10.8226	14.5870	1.8611	31	23
	August	0.5778	1.9500	0.3407	27	8
	September	0.0000	—	0.0000	23	0
	October	0.0000	—	0.0000	31	0
	November	2.4467	2.5310	0.7661	30	29
	December	0.7581	2.1364	0.4342	31	11
1996	Means	1.4501	5.9523	0.3638	353	86
1997	January	0.0000	—	0.0000	31	0
	February	0.6250	2.9167	0.4060	28	6
	March	0.0806	1.2500	0.0806	31	2
	April	1.5167	3.7917	0.6925	30	12
	May	0.9032	4.0000	0.5597	31	7
	June	0.0367	1.1000	0.0367	30	1
	July	0.2548	1.9750	0.1108	31	4
	August	2.2839	3.2182	0.7927	31	22
	September	10.8833	3.9817	2.7423	30	82
	October	0.4516	2.8000	0.3113	31	5
	November	68.5467	15.4617	12.9153	30	133
	December	2.9000	2.4297	1.0652	31	37
1997	Means	7.2879	8.5534	1.6260	365	311

SMOOTHED NOAA X-RAY FLARE MONTHLY VALUES.

Data based upon NOAA monthly mean values of MEAN DAILY OUTPUT.

Unit used in observed values is 1 microWatt per square metre.

Smoothing methods used are the Waldmeier and the 'Barnes 13' methods.

MONTH	Observed	S ^W	S ^{B13}	MONTH	Observed	S ^W	S ^{B13}	MONTH	Observed	S ^W	S ^{B13}
1989 Jan	135.6936	79.28	89.60	1992 Jan	54.6903	58.17	63.67	1995 Jan	3.2074	2.63	2.77
Feb	79.2464	85.54	97.21	Feb	89.1345	54.76	56.50	Feb	6.0214	2.28	2.62
Mar	243.1742	96.00	103.18	Mar	17.6419	52.65	49.04	Mar	2.0867	1.91	2.36
Apr	32.0867	103.41	105.54	Apr	20.7900	48.72	41.95	Apr	4.2033	1.93	2.16
May	73.3710	109.71	107.23	May	8.6903	45.07	36.91	May	0.9968	2.02	1.93
Jun	134.3300	112.36	108.38	Jun	29.5033	39.88	33.41	Jun	0.0900	1.93	1.65
Jul	30.4839	107.57	107.22	Jul	32.8677	32.92	30.76	Jul	0.3129	1.70	1.36
Aug	161.2613	101.08	105.03	Aug	22.4097	28.60	29.57	Aug	0.1065	1.32	1.11
Sep	126.6900	90.73	100.38	Sep	46.5033	26.86	29.57	Sep	0.1400	0.99	0.95
Oct	124.2936	83.59	94.95	Oct	36.5387	26.98	29.77	Oct	4.4581	0.79	0.85
Nov	132.0633	86.83	90.31	Nov	48.0033	26.69	28.81	Nov	0.4000	0.66	0.76
Dec	68.2710	84.92	83.05	Dec	13.1419	26.50	27.00	Dec	0.0000	0.63	0.68
1990 Jan	35.4710	80.44	75.07	1993 Jan	4.9903	25.02	24.87	1996 Jan	0.0742	1.07	0.77
Feb	23.5786	75.46	67.80	Feb	35.1929	22.98	22.79	Feb	0.0000	1.52	0.99
Mar	50.5194	66.48	61.39	Mar	29.7258	20.41	20.19	Mar	0.0517	1.54	1.17
Apr	53.3733	58.31	56.79	Apr	11.5833	17.45	17.29	Apr	1.5567	1.35	1.30
May	129.9839	50.96	52.76	May	11.0258	14.47	14.72	May	0.3935	1.24	1.48
Jun	31.7767	48.24	49.79	Jun	22.5900	12.88	12.85	Jun	0.0400	1.36	1.75
Jul	25.4194	50.28	48.81	Jul	4.1323	13.66	11.68	Jul	10.8226	1.39	1.90
Aug	46.9516	53.84	49.26	Aug	2.1548	12.97	10.41	Aug	0.5778	1.41	1.83
Sep	25.3100	66.92	54.04	Sep	5.0633	10.51	9.26	Sep	0.0000	1.44	1.64
Oct	29.6032	78.00	61.88	Oct	6.9581	8.91	8.72	Oct	0.0000	1.44	1.46
Nov	50.3567	75.54	68.99	Nov	6.1400	7.99	8.44	Nov	2.4467	1.46	1.29
Dec	84.7516	84.67	81.19	Dec	16.8774	6.64	7.98	Dec	0.7581	1.48	1.10
1991 Jan	68.0935	98.65	96.78	1994 Jan	20.0742	5.62	7.31	1997 Jan	0.0000	1.04	0.82
Feb	76.2179	101.35	109.88	Feb	3.4821	5.72	6.52	Feb	0.6250	0.67	0.67
Mar	311.9323	103.22	119.35	Mar	2.3968	5.81	5.58	Mar	0.0806	1.20	0.87
Apr	57.7133	108.43	123.92	Apr	0.4333	5.47	4.62	Apr	1.5167	1.67	1.17
May	66.6355	112.27	125.54	May	0.0516	5.04	3.76	May	0.9032	4.44	2.43
Jun	314.3200	114.38	124.46	Jun	1.2467	4.19	3.00	Jun	0.0367	7.28	4.44
Jul	78.4839	115.72	118.55	Jul	1.0323	2.88	2.43	Jul	0.2548	—	—
Aug	58.6742	115.70	110.04	Aug	7.6323	2.28	2.33	Aug	2.2839	—	—
Sep	60.8567	103.98	100.04	Sep	1.6600	2.37	2.45	Sep	10.8833	—	—
Oct	116.6613	90.18	91.07	Oct	2.3194	2.52	2.57	Oct	0.4516	—	—
Nov	55.4533	86.22	83.88	Nov	0.4500	2.71	2.71	Nov	68.5467	—	—
Dec	130.3129	71.94	73.36	Dec	2.1677	2.70	2.78	Dec	2.9000	—	—



SECTION E

2800 MHz (107 mm) SOLAR FLUX.

Daily readings on the wavelength of 107 mm are obtained at Penticton BC, Canada, at approximately 2000 UT (local apparent mid-day) .

These figures are on an approximate scale of 60 to 500; the actual lowest observed value is 63.0 on 1954/06/27, adjusted to 65.1 . The highest observed value being 457.0 was obtained on 1947/04/07, being adjusted to 457.9 .

The lowest adjusted value is 61.8 on 1953/02/24, observed as 63.1 . The highest adjusted value is the 1947/04/07 value of 457.9 .

The most recent maximum observed value is 324.3 in June 1989 (adjusted to 334.7), and the most recent minimum observed value is 64.9 in July 1996 (adjusted to 67.0). The most recent minimum adjusted value is 65.7 in February 1996 (observed as 67.5).

The values for 1997 are on pages E2 and E3 of this report. The first of these two tables contains the observed values, some of which are corrected for the occasional burst. The second table contains values adjusted to the distance of 1AU (149 597 870 km).

1 Flux Unit = 100 yoctoWatts / square metre / Hertz
 = 1×10^{-22} Watt / square metre / Hertz.

THE TERM 'JANSKY' IS NOT USED IN THIS PUBLICATION DUE TO THE TERM'S ORIGINAL USE AS $1 \text{ W} / \text{m}^2 / \text{Hz}$.

All flux data, courtesy of the Herzberg Institute of Astrophysics, National Research Council, Canada.

DAILY 2800 MHz SOLAR RADIO FLUX OBSERVED INDICES 1997.

All data obtained by the Dominion Radio Astrophysical Observatory, Penticton, British Columbia, Canada.

All observations carried out at local apparent mid-day, approximately 2000 UT.

Unit used is $1 \times 10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$.

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DATE
01	72.4	71.3	—	76.3	72.2	77.3	70.0	71.0	93.4	87.1	93.0	117.0	01
02	72.1	78.4	72.3	80.5	72.1	76.9	70.1	70.8	91.7	85.9	97.8	112.2	02
03	73.3	79.6	74.0	78.8	71.1	75.2	69.0	72.2	93.1	85.7	109.8	112.2	03
04	73.8	80.7	74.0	78.5	70.9	73.9	69.7	72.7	93.0	83.4	117.9	107.3	04
05	74.4	75.3	74.6	80.2	72.3	73.9	69.7	74.8	96.0	84.4	113.8	103.8	05
06	73.1	74.2	75.4	78.1	72.1	74.2	68.3	76.8	97.6	83.7	105.3	108.8	06
07	73.3	75.7	74.1	76.8	72.0	74.7	70.2	77.9	102.0	83.5	94.4	99.0	07
08	73.8	75.2	74.7	76.1	71.9	73.2	69.8	77.8	119.4	82.9	89.6	98.1	08
09	73.7	73.2	75.1	78.1	71.6	73.1	70.0	78.1	116.1	83.5	86.4	96.7	09
10	75.4	72.3	74.7	77.6	—	71.9	68.5	78.3	114.9	84.2	89.4	95.1	10
11	74.0	71.1	74.3	77.1	72.3	70.8	68.6	79.5	108.6	86.1	91.5	96.4	11
12	74.5	70.9	74.3	76.4	72.2	69.6	67.4	80.8	109.0	88.7	87.2	92.5	12
13	74.6	71.1	74.1	78.8	73.8	70.1	67.1	82.0	107.6	88.3	90.1	89.3	13
14	74.9	71.3	75.5	77.4	73.5	70.6	68.1	79.5	102.5	84.8	93.0	90.0	14
15	75.8	71.8	75.8	78.7	73.0	70.7	69.2	77.7	98.0	86.9	96.2	89.1	15
16	74.8	72.0	75.7	75.0	72.2	72.1	69.6	77.9	95.4	87.5	96.2	84.7	16
17	74.1	73.1	75.1	71.7	72.8	69.6	69.9	75.6	93.1	88.2	94.2	85.6	17
18	74.6	72.9	74.3	70.1	74.1	71.2	70.1	75.8	88.1	86.6	91.5	86.2	18
19	75.3	72.5	73.7	69.9	74.2	70.1	70.5	74.3	88.4	84.7	99.1	89.7	19
20	76.8	72.6	71.5	69.7	79.1	70.2	71.2	74.6	87.7	82.8	88.7	89.6	20
21	74.1	73.2	70.5	70.1	84.8	67.6	71.3	74.6	85.2	85.0	95.9	92.0	21
22	73.0	73.5	70.6	70.7	81.0	69.5	72.2	75.5	88.9	80.7	100.2	97.0	22
23	73.4	74.6	70.7	68.9	76.2	69.0	75.7	76.5	91.7	79.7	99.8	104.1	23
24	74.2	74.6	71.0	69.8	76.9	69.9	78.7	77.7	92.9	78.6	103.3	107.8	24
25	73.1	73.9	70.6	68.7	78.0	71.7	80.4	82.0	88.5	81.4	102.1	104.7	25
26	74.1	73.8	69.8	70.9	79.9	71.8	76.6	83.8	89.1	82.0	108.1	104.7	26
27	73.5	73.8	72.2	73.1	78.3	71.7	74.5	81.9	88.4	84.4	111.1	95.9	27
28	72.9	72.8	73.2	72.4	77.4	71.2	74.2	90.5	87.2	85.5	116.3	102.1	28
29	74.6	—	75.3	71.9	75.6	70.2	72.7	91.5	89.7	87.2	112.1	104.4	29
30	73.6	—	74.0	72.6	75.1	69.8	71.0	92.0	87.7	88.2	112.4	101.3	30
31	72.4	—	74.7	—	72.5	—	70.4	96.4	—	90.5	—	104.5	31

MEAN	74.0	73.8	73.5	74.5	74.6	71.7	71.1	79.0	96.2	84.9	99.5	98.8	MEAN
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1997 Yearly Mean : 81.0

DAILY 2800 MHz SOLAR RADIO FLUX INDICES - 1997 — ADJUSTED TO 1 AU.

All data obtained by the Dominion Radio Astrophysical Observatory, Penticton, British Columbia, Canada.

All observations carried out at local apparent mid-day, approximately 2000 UT.

Unit used is $1 \times 10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$.

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DATE
01	70.0	69.2	—	76.2	73.4	79.6	72.4	73.2	95.1	87.3	91.6	113.7	01
02	69.7	76.2	71.1	80.4	73.3	79.1	72.4	72.9	93.3	86.0	96.2	109.0	02
03	70.8	77.4	72.8	78.8	72.3	77.4	71.4	74.3	94.7	85.8	108.0	109.0	03
04	71.4	78.4	72.8	78.6	72.1	76.1	72.0	74.9	94.6	83.4	115.9	104.2	04
05	71.9	73.3	73.4	80.3	73.6	76.1	72.0	76.9	97.6	84.3	111.9	100.7	05
06	70.6	72.2	74.2	78.3	73.4	76.4	70.6	79.0	99.1	83.6	103.5	105.6	06
07	70.9	73.7	73.1	77.0	73.3	76.9	72.6	80.1	103.6	83.4	92.7	96.0	07
08	71.3	73.2	73.6	76.3	73.3	75.4	72.1	79.9	121.1	82.7	87.9	95.1	08
09	71.3	71.2	74.1	78.3	73.0	75.3	72.3	80.3	117.7	83.3	84.8	93.8	09
10	72.9	70.4	73.8	78.0	—	74.2	70.8	80.4	116.4	84.0	87.6	92.2	10
11	71.6	69.3	73.4	77.4	73.8	73.0	70.9	81.6	110.0	84.7	89.6	93.4	11
12	72.1	69.1	73.4	76.9	73.7	71.8	69.6	83.0	110.3	88.3	85.4	89.6	12
13	72.1	69.3	73.3	79.3	75.4	72.3	69.3	84.2	108.9	87.8	88.2	86.5	13
14	72.4	69.6	74.7	77.9	75.1	72.9	70.3	81.6	103.7	84.3	91.0	87.1	14
15	73.3	70.1	75.0	79.2	74.7	73.0	71.5	79.6	99.1	86.4	94.1	86.3	15
16	72.4	70.3	75.0	75.6	73.9	74.4	71.9	79.8	96.4	86.9	94.1	82.0	16
17	71.7	71.4	74.4	72.3	74.4	71.8	72.2	77.4	94.0	87.5	92.0	82.9	17
18	72.2	71.2	73.7	70.7	75.8	73.5	72.3	77.7	89.0	85.9	89.4	83.5	18
19	72.9	70.4	73.1	70.6	76.0	72.4	72.8	76.1	89.1	84.0	96.8	86.8	19
20	74.3	71.0	71.0	70.4	81.1	72.5	73.5	76.3	88.4	82.1	86.5	86.7	20
21	71.8	71.6	70.0	70.9	86.9	69.8	73.6	76.3	85.8	84.2	93.6	89.0	21
22	70.7	71.9	70.1	71.5	83.0	71.8	74.5	77.2	89.6	79.9	97.7	93.8	22
23	71.1	73.0	70.3	69.7	78.1	71.3	78.1	78.2	92.3	78.8	97.3	100.7	23
24	71.9	73.1	70.6	70.7	78.9	72.2	81.2	79.4	93.5	77.7	100.6	104.3	24
25	70.9	72.6	70.2	69.6	80.1	74.1	83.0	83.7	88.9	80.5	99.4	101.3	25
26	71.9	72.4	69.5	71.8	82.0	74.2	79.0	85.5	89.5	81.0	105.2	101.3	26
27	71.3	72.4	71.9	74.1	80.4	74.1	76.8	83.5	88.8	83.3	108.2	92.7	27
28	70.8	71.5	72.9	73.4	79.5	73.6	76.5	92.3	87.5	84.4	113.2	98.7	28
29	72.4	—	75.1	72.9	77.6	72.6	75.0	93.3	90.0	86.0	109.0	101.0	29
30	71.5	—	73.8	73.7	77.2	72.1	73.2	93.8	87.9	86.9	109.3	98.0	30
31	70.3	—	74.6	—	74.5	—	72.5	98.2	—	89.2	—	101.1	31

MEAN	71.6	72.0	72.8	75.0	76.3	74.0	73.4	81.0	97.2	84.3	97.4	95.7	MEAN
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1997 Yearly Mean : 80.9

SMOOTHED NRCC 2800MHz SOLAR FLUX MONTHLY VALUES.

Data based upon NRCC monthly mean values ADJUSTED TO THE DISTANCE OF 1 AU.
Unit used in observed values is 1×10^{-22} Watt m^{-2} Hz $^{-1}$.

Smoothing methods used are the Waldmeier and the 'Barnes 13' methods.

MONTH	Adjusted	s ^W	s ^{B13}	MONTH	Adjusted	s ^W	s ^{B13}	MONTH	Adjusted	s ^W	s ^{B13}
1989 Jan	227.8	190.0	193.3	1992 Jan	210.6	181.3	188.1	1995 Jan	80.0	80.5	81.1
Feb	217.0	194.0	198.4	Feb	226.5	174.1	180.8	Feb	83.5	80.2	80.7
Mar	203.0	199.7	202.7	Mar	169.6	167.7	171.9	Mar	84.2	79.8	80.2
Apr	190.9	204.4	206.3	Apr	159.7	162.1	162.4	Apr	78.2	79.1	79.3
May	194.4	209.3	209.6	May	128.2	158.1	153.4	May	77.1	78.4	78.5
Jun	247.2	213.0	212.1	Jun	120.4	153.5	145.5	Jun	78.1	77.7	77.7
Jul	187.8	212.5	212.8	Jul	136.5	146.2	138.6	Jul	76.3	76.9	76.7
Aug	222.5	209.7	212.7	Aug	125.1	138.7	133.4	Aug	75.7	76.0	75.8
Sep	228.4	207.3	212.1	Sep	118.0	133.6	130.7	Sep	72.8	74.8	74.8
Oct	207.4	206.4	210.8	Oct	129.9	130.4	129.8	Oct	77.5	73.9	73.9
Nov	230.0	206.2	208.5	Nov	142.0	128.0	129.5	Nov	72.6	73.3	73.2
Dec	206.3	203.3	204.6	Dec	134.7	127.1	129.0	Dec	70.3	72.8	72.5
1990 Jan	203.4	200.3	200.4	1993 Jan	117.2	125.4	127.7	1996 Jan	72.1	72.4	71.9
Feb	174.1	200.4	197.0	Feb	139.1	122.7	125.7	Feb	69.8	72.2	71.6
Mar	187.0	198.6	194.2	Mar	135.0	120.3	122.9	Mar	70.0	72.1	71.4
Apr	186.6	195.5	192.2	Apr	116.7	117.8	119.1	Apr	69.9	71.6	71.3
May	194.0	192.3	190.5	May	114.9	114.5	114.8	May	71.7	71.4	71.4
Jun	176.3	189.9	189.7	Jun	112.8	111.1	110.5	Jun	71.8	71.8	71.7
Jul	186.6	190.4	190.5	Jul	102.2	109.5	107.0	Jul	73.5	72.0	72.0
Aug	228.1	193.8	192.6	Aug	96.0	107.5	103.9	Aug	74.2	72.0	72.2
Sep	179.3	198.1	195.0	Sep	87.9	103.9	101.2	Sep	70.1	72.3	72.4
Oct	180.9	200.4	197.4	Oct	99.7	100.4	99.3	Oct	68.7	72.6	72.6
Nov	180.3	200.9	200.1	Nov	93.8	97.5	97.8	Nov	76.9	73.0	72.9
Dec	198.5	202.5	203.4	Dec	101.5	94.7	96.3	Dec	75.3	73.3	73.2
1991 Jan	222.1	205.4	206.9	1994 Jan	111.3	92.6	94.8	1997 Jan	71.6	73.4	73.3
Feb	237.2	206.2	209.2	Feb	97.2	91.0	92.8	Feb	72.0	73.6	73.5
Mar	227.6	205.8	210.3	Mar	89.5	89.9	90.5	Mar	72.8	75.1	74.3
Apr	200.1	206.7	210.5	Apr	79.7	89.1	88.2	Apr	75.0	76.8	75.5
May	194.5	207.0	209.6	May	81.7	87.9	86.1	May	76.3	78.3	76.9
Jun	213.3	207.3	208.1	Jun	79.7	86.5	84.3	Jun	74.0	80.0	78.6
Jul	218.9	207.6	206.3	Jul	83.2	84.4	82.7	Jul	73.4	81.7	80.8
Aug	215.5	206.7	204.2	Aug	78.0	82.5	81.7	Aug	81.0	—	—
Sep	182.5	203.8	202.1	Sep	79.9	81.7	81.4	Sep	97.2	—	—
Oct	200.0	199.7	200.1	Oct	87.1	81.4	81.5	Oct	84.3	—	—
Nov	168.3	195.3	197.6	Nov	79.1	81.2	81.4	Nov	97.4	—	—
Dec	217.0	188.6	193.6	Dec	81.5	80.9	81.3	Dec	95.7	—	—

A grey rectangular box with a black border. On the left side, there is a white circle with orange rays emanating from its right edge, resembling a sun. To the right of the sun icon, the text "SECTION F" is written in a bold, black, sans-serif font.

SECTION F

ANALYSES AND GRAPHS.

TABLE W1:

MONTHLY WOLF NUMBER MEANS OF GDSO DATA for 1997.

g = mean of Active Areas or groups on the solar disc.

f = mean of sunspots on the solar disc.

WN = mean Wolf Number (k neglected; see list of definitions).

TWN = mean Truncated Wolf Number (Wolf Number without A and B class regions).

n = total number of observations.

w = mean weight.

Q = mean quietness [steadiness] of image (on the Kiepenheuer scale).

S = mean sharpness [clarity] of image (on the Kiepenheuer scale).

T = mean transparency of the atmosphere (1 = excellent, 5 = opaque).

C = mean condition [(Q+S+T)/3].

MONTH	g	f	WN	TWN	n	w	Q	S	T	C
Jan	0.42	1.32	5.53	2.11	19	0.5019	1.76	2.11	2.24	2.0351
Feb	0.50	2.60	7.60	6.50	10	0.5056	1.65	2.05	2.35	2.0167
Mar	0.86	3.50	12.07	6.64	14	0.5372	1.57	1.89	2.18	1.8810
Apr	1.47	7.53	22.26	16.74	19	0.5179	1.61	2.03	2.26	1.9649
May	0.92	1.69	10.92	6.31	13	0.4780	1.88	2.27	2.42	2.1923
Jun	1.33	4.28	17.61	5.39	18	0.4460	1.97	2.31	2.50	2.2593
Jul	0.85	2.45	10.95	3.30	20	0.4923	1.72	2.08	2.40	2.0667
Aug	2.05	10.10	30.57	21.57	21	0.4688	1.76	2.26	2.45	2.1587
Sep	2.31	20.69	43.81	40.88	16	0.4694	1.69	2.25	2.56	2.1667
Oct	2.18	7.94	29.71	19.35	17	0.4424	1.79	2.44	2.68	2.3039
Nov	2.21	16.50	38.64	31.43	14	0.4222	2.00	2.46	2.75	2.4048
Dec	3.08	16.46	47.23	37.31	13	0.4322	2.04	2.42	2.58	2.3462
Year	1.52	7.80	22.96	16.09	194	0.4765	1.78	2.21	2.44	2.1460

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TABLE W2:

ROTATIONAL WOLF NUMBER MEANS OF GDSO DATA.

Abbreviations as above.

ROT.	start date, UT	g	f	WN	TWN	n	w	Q	S	T	C
1917	1996/12/09.28	1.00	3.08	13.08	9.92	13	0.5428	1.54	1.96	2.15	1.8846
1918	1997/01/05.61	0.41	1.18	5.29	2.35	17	0.4995	1.79	2.09	2.26	2.0490
1919	1997/02/01.95	0.50	2.60	7.60	6.50	10	0.5056	1.65	2.05	2.35	2.0167
1920	1997/03/01.29	0.82	1.91	10.09	3.18	11	0.5341	1.59	1.86	2.23	1.8939
1921	1997/03/28.60	1.45	8.35	22.85	18.15	20	0.5279	1.58	2.00	2.20	1.9250
1922	1997/04/24.87	0.83	1.42	9.75	7.92	12	0.4922	1.79	2.17	2.33	2.0972
1923	1997/05/22.10	1.46	4.77	19.38	7.46	13	0.4394	2.00	2.42	2.54	2.3205
1924	1997/06/18.31	0.78	1.72	9.50	0.00	18	0.4637	1.92	2.14	2.47	2.1759
1925	1997/07/15.50	1.40	5.60	19.60	10.80	15	0.4770	1.80	2.23	2.43	2.1556
1926	1997/08/11.72	2.33	11.44	34.78	23.67	18	0.4765	1.67	2.22	2.47	2.1204
1927	1997/09/07.97	2.07	19.93	40.60	39.79	15	0.4782	1.63	2.20	2.53	2.1222
1928	1997/10/05.24	2.19	8.19	30.06	19.88	16	0.4388	1.81	2.47	2.69	2.3229
1929	1997/11/01.54	2.21	16.50	38.64	31.43	14	0.4222	2.00	2.46	2.75	2.4048
1930	1997/11/28.84	3.30	15.20	48.20	35.30	10	0.4183	2.10	2.50	2.65	2.4167

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TABLE W3:

CORRECTED WOLF NUMBERS for 1996 - 1997.

As the GDSO is in suburban Auckland, it can suffer terrible atmospheric conditions, hence the 'observed' Wolf Numbers have to be upgraded to give reflections of international results. International [Wolf Number] results are computed by the Sunspot Index Data Centre, at the Observatoire Royal de Belgique, Bruxelles, Belgium.

Below are the 'observed' Wolf Numbers along with the monthly k co-efficients and the corrected values (R_{GD}) for 1996 - 1997. The SIDC's final values (R_I) are also stated.

$I/GDSO$ = SIDC's mean (of days observed by the GDSO) divided by the GDSO's monthly mean.
 $I/GDSO_A$ = SIDC's mean (of days with GDSO k values) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

s = sample standard deviation of k values.

s 'SIDC' = annual s computed on the SIDC formula.

Es = annual estimate of standard deviation.

p = provisional data.

	WN	k	R_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k	R_I
1996 Jan	10.68	0.9754	10.42	0.1981	0.9745	0.9821	22	12	11.5
Feb	9.75	0.5505	5.37	0.2156	0.6795	0.4872	8	4	4.4
Mar	10.05	0.8238	8.28	0.2376	0.9110	0.7644	19	10	9.2
Apr	4.28	0.8364	3.57	0.1098	1.0000	0.8281	18	5	4.8
May	7.06	0.8059	5.69	0.0942	0.8110	0.8110	18	8	5.5
Jun	11.21	0.7306	8.19	0.1364	0.9427	0.7192	14	7	11.8
Jul	12.92	0.7657	9.90	0.1768	0.6429	0.7519	13	7	8.2
Aug	20.35	0.7527	15.32	0.2515	0.6965	0.6965	17	17	14.4
Sep	2.85	0.4615	1.31	—	0.3243	0.4615	13	1	1.6
Oct	0.00	—	0.00	—	∞	∞	19	0	0.9
Nov	18.69	0.9206	17.20	0.1405	0.9365	0.9365	16	10	17.9
Dec	10.76	1.1157	12.01	0.1931	1.1639	1.0984	17	9	13.3
1996 Means	9.78	0.8429	8.25	—	0.8630	0.8250	—	—	8.6
	$s = 0.2300$		s 'SIDC' = 0.1863			$Es = 0.0206$			
1997 Jan	5.53	0.8445	4.67	0.2366	1.1429	0.8381	19	8	5.7
Feb	7.60	1.0104	7.68	0.3064	1.0132	0.9079	10	3	7.6
Mar	12.07	0.9921	11.98	0.3775	1.0355	0.9645	14	11	8.7
Apr	22.26	0.8387	18.67	0.2512	0.8392	0.7920	19	15	15.5
May	10.92	1.0893	11.90	0.7426	1.0211	1.0458	13	10	18.5
Jun	17.61	0.7026	12.37	0.1448	0.6877	0.6877	18	17	12.7
Jul	10.95	0.9462	10.36	0.4846	1.0000	0.8128	20	10	10.4
Aug	30.57	0.9499	29.04	0.4281	0.9019	0.8879	21	19	24.4
Sep	43.81	1.1756	51.50	0.3054	1.0999	1.0999	16	16	51.3
Oct	29.71	0.8707p	25.87p	0.1756p	0.8693p	0.8693p	17	17	23.3p
Nov	38.64	1.0371p	40.08p	0.2885p	1.0129p	1.0129p	14	14	39.3p
Dec	47.23	0.9728p	45.95p	0.1887p	0.9495p	0.9495p	13	13	41.5p
1997 Means	22.96	0.9438p	21.67p	—	0.9495p	0.9226p	—	—	21.6p
	$s = 0.3588p$		s 'SIDC' = 0.3135p			$Es = 0.0282p$			

TABLE W4:
CORRECTED **WOLF NUMBERS** for Rotations 1905 - 1930.

As a k value is attributed to each spotted observation, the k value for any specific rotation is the mean of all the k values for the rotation concerned.

The corrected values are labelled R_{GD} .

$$R_{GD} = WN \times k.$$

s = sample standard deviation of k values.

$I/GDSO$ = International mean (of days observed by the GDSO) divided by the GDSO's rotation mean.

$I/GDSO_A$ = International mean (of days observed by the GDSO) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

ROTA- TION	START DATE, UT	WN	k	R_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k
1905	1996/01/17.06	6.31	0.9353	5.90	0.2195	0.9208	0.9333	16	8
1906	1996/02/13.40	6.43	0.6737	4.33	0.3329	0.9444	0.5778	14	5
1907	1996/03/11.73	11.94	0.8088	9.66	0.2010	0.7953	0.7574	18	11
1908	1996/04/08.03	2.93	0.7854	2.30	0.1197	1.1707	0.7805	14	3
1909	1996/05/05.28	8.47	0.8059	6.82	0.0942	0.8110	0.8110	15	8
1910	1996/06/01.50	10.23	0.7267	7.43	0.1521	0.9774	0.7131	13	5
1911	1996/06/28.70	13.80	0.7529	10.39	0.2070	0.5435	0.7282	10	5
1912	1996/07/25.90	20.25	0.7158	14.50	0.2014	0.7130	0.6883	16	15
1913	1996/08/22.13	9.42	0.8110	7.64	0.3180	0.6460	0.7157	12	6
1914	1996/09/18.39	0.00	—	0.00	—	∞	∞	14	0
1915	1996/10/15.67	0.00	—	0.00	—	∞	∞	17	0
1916	1996/11/11.97	20.44	0.9783	19.99	0.2173	0.9664	0.9664	16	12
1917	1996/12/09.28	13.08	1.0302	13.47	0.1682	1.1059	1.0353	13	8
1918	1997/01/05.61	5.29	0.8604	4.56	0.2509	1.2111	0.8556	17	7
1919	1997/02/01.95	7.60	1.0104	7.68	0.3064	1.0132	0.9079	10	3
1920	1997/03/01.29	10.09	1.0360	10.45	0.4396	1.1171	1.0090	11	8
1921	1997/03/28.60	22.85	0.8528	19.49	0.2349	0.8315	0.8074	20	17
1922	1997/04/24.87	9.75	0.8434	8.22	0.1192	0.8974	0.8302	12	8
1923	1997/05/22.10	19.38	0.9380	18.18	0.6804	0.8492	0.8492	13	13
1924	1997/06/18.31	9.50	0.7023	6.67	0.1783	0.8363	0.6608	18	11
1925	1997/07/15.50	19.60	1.1185	21.92	0.6103	0.9932	0.9558	15	11
1926	1997/08/11.72	34.78	0.8609	29.94	0.2735	0.8482	0.8339	18	16
1927	1997/09/07.97	40.60						15	
1928	1997/10/05.24	30.06						16	
1929	1997/11/01.54	38.64						14	
1930	1997/11/28.84	48.20						10	

TABLE W5:
SMOOTHED WOLF NUMBERS for 1996 - 1997.

The following are smoothed Wolf Numbers in three different systems. See page xii for all smoothing formulæ.

YEAR	MONTH	WN	WN(S ^{HBm})	WN(S ^W)	WN(S ^{B13})	R _{GD}	R _{GD} (S ^W)	R _{GD} (S ^{B13})
1996	Jan	10.68	11.69	11.91	11.75	10.42	9.54	9.45
	Feb	9.75	9.64	12.06	11.18	5.37	9.52	8.88
	Mar	10.05	8.80	12.10	10.73	8.28	9.47	8.45
	Apr	4.28	8.37	10.72	10.00	3.57	8.35	7.80
	May	7.06	9.42	9.76	9.64	5.69	7.74	7.48
	Jun	11.21	10.43	9.93	9.84	8.19	8.06	7.67
	Jul	12.92	10.65	9.67	9.99	9.90	7.87	7.86
	Aug	20.35	11.06	9.36	9.90	15.32	7.72	7.95
	Sep	2.85	9.85	9.36	9.68	1.31	7.97	8.03
	Oct	0.00	9.08	10.19	9.86	0.00	8.76	8.45
	Nov	18.69	9.48	11.10	10.32	17.20	9.64	9.13
	Dec	10.76	9.11	11.53	10.63	12.01	10.08	9.62
1997	Jan	5.53	10.06	11.71	10.92	4.67	10.27	9.99
	Feb	7.60	11.18	12.06	11.61	7.68	10.86	10.70
	Mar	12.07	12.45	14.19	13.30	11.98	13.52	12.43
	Apr	22.26	14.06	17.14	15.54	18.67	—	—
	May	10.92	15.47	19.20	17.71	11.90	—	—
	Jun	17.61	18.60	21.56	20.36	12.37	—	—
	Jul	10.95	21.86	23.96	23.50	10.36	—	—
	Aug	30.57	26.92	26.18	26.74	29.04	—	—
	Sep	43.81	32.51	29.80	30.20	51.50	—	—
	Oct	29.71	34.98	—	—	—	—	—
	Nov	38.64	37.29	—	—	—	—	—
	Dec	47.23	39.66	—	—	—	—	—

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TABLE W6:
 QUARTERLY AND YEARLY **WOLF NUMBER** MEANS for 1993 - 1997.

YEAR/ QUARTER	WN	WN(S ^{HBm})	WN(S ^W)	WN(S ^{B13})	R _{GD}	g	f
1993 / 1	81.90	80.42	73.28	76.53	73.63	5.12	30.71
2	54.60	59.48	62.35	61.10	54.18	3.24	22.16
3	39.76	44.49	54.29	50.08	36.88	2.90	10.78
4	49.88	48.08	45.41	46.65	53.42	2.88	21.12
1993	55.65	58.12	58.83	58.59	54.23	3.48	20.81
1994 / 1	52.27	47.06	40.24	42.74	40.01	3.35	18.81
2	23.46	31.01	38.77	35.96	18.75	1.72	6.24
3	31.10	31.99	31.82	31.50	27.59	2.22	8.86
4	32.96	31.29	29.55	30.43	28.61	2.23	10.68
1994	34.70	35.34	35.09	35.16	28.92	2.37	11.03
1995 / 1	29.36	27.88	26.72	27.21	27.57	1.93	10.07
2	20.27	21.97	21.94	21.95	15.94	1.13	9.00
3	12.76	16.12	18.25	17.41	11.06	0.92	3.55
4	17.32	14.68	13.37	13.78	14.08	1.34	3.91
1995	20.25	20.16	20.07	20.09	17.33	1.34	6.85
1996 / 1	10.29	10.04	12.03	11.22	8.76	0.73	2.94
2	7.22	9.41	10.14	9.83	5.70	0.52	2.02
3	12.81	10.52	9.46	9.86	9.54	0.88	3.98
4	9.27	9.23	10.94	10.27	9.39	0.54	3.88
1996	9.78	9.80	10.64	10.29	8.25	0.66	3.19
1997 / 1	8.14	11.23	12.65	11.94	7.66	0.58	2.33
2	17.64	16.04	19.30	17.87	14.88	1.28	4.84
3	27.40	27.10	26.65	26.81	28.21	1.70	10.39
4	37.73	37.31	—	—	—	2.45	13.18
1997	22.96	22.92	—	—	—	1.52	7.80

NB: WN(S^{HBm}), WN(S^W) & WN(S^{B13}) quarterly values are means of 3 monthly values.

WN(S^{HBm}), WN(S^W) & WN(S^{B13}) yearly values are means of 12 monthly values.

R_{GD} quarterly values are computed as quarterly WN means multiplied by quarterly k means.

Annual values of R_{GD} are annual Wolf Number means multiplied by annual k means.

TABLE G3:
CORRECTED ACTIVE AREA (g) VALUES for 1996 - 1997.

As the GDSO is in suburban Auckland, it can suffer terrible atmospheric conditions, hence the 'observed' Active Area means have to be upgraded to give reflections of international results. International [Active Area] results are computed by the Solar Section of the British Astronomical Association. Below are the 'observed' Active Area (g) means along with the monthly k co-efficients and the corrected values (g_{GD}) for 1996 - 1997. The BAA's final values (g_B) are also stated.

$I/GDSO$ = BAA's mean (of days observed by the GDSO) divided by the GDSO's monthly mean.

$I/GDSO_A$ = BAA's mean (of days with GDSO k values) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

s = sample standard deviation of k values.

s 'SIDC' = annual s computed on the SIDC formula.

Es = annual estimate of standard deviation.

	g	k	g_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k	g_B
1996 Jan	0.77	1.0556	0.82	0.3125	0.9412	1.0000	22	12	0.77
Feb	0.75	0.7500	0.56	0.2887	1.0000	0.6667	8	4	0.41
Mar	0.68	0.9000	0.62	0.2108	1.0000	0.8462	19	10	0.74
Apr	0.33	1.0000	0.33	0.0000	1.3333	1.0000	18	5	0.43
May	0.44	1.0000	0.44	0.0000	1.0000	1.0000	18	8	0.41
Jun	0.86	0.9444	0.81	0.1361	1.0000	0.9091	14	6	1.16
Jul	0.85	0.9286	0.79	0.1890	0.7273	0.8750	13	7	0.54
Aug	1.41	0.8529	1.20	0.3859	0.7500	0.7500	17	17	1.03
Sep	0.23	0.7500	0.17	0.3536	0.6667	0.6667	13	2	0.16
Oct	0.00	—	0.00	—	∞	∞	19	0	0.09
Nov	0.88	1.1500	1.01	0.3375	1.1429	1.1429	16	10	0.67
Dec	0.82	1.0000	0.82	0.0000	1.0000	1.0000	17	9	0.90
1996 Means	0.66	0.9593	0.63	—	0.9453	0.9098	—	—	0.64
	$s = 0.2718$		s 'SIDC' = 0.2199			$Es = 0.0277$			
1997 Jan	0.42	1.1250	0.47	0.3536	1.6250	1.1250	19	8	0.58
Feb	0.50	1.3333	0.67	0.5774	1.4000	1.2000	10	3	0.71
Mar	0.86	1.0500	0.90	0.3689	1.0000	1.0000	14	10	0.67
Apr	1.47	1.0556	1.56	0.4163	1.0000	0.9643	19	15	1.30
May	0.92	1.3500	1.25	1.0014	1.1667	1.2727	13	10	1.74
Jun	1.33	0.9412	1.25	0.1661	0.9167	0.9167	18	17	1.30
Jul	0.85	1.1944	1.02	0.6821	1.2352	1.0625	20	9	0.90
Aug	2.05	1.2456	2.55	0.5967	1.1163	1.1163	21	19	2.09
Sep	2.31	1.0469	2.42	0.3191	1.0000	1.0000	16	16	2.66
Oct	2.18	1.0882	2.37	0.4087	1.0541	1.0541	17	17	2.06
Nov	2.21	1.1548	2.56	0.4504	1.1613	1.1613	14	14	2.36
Dec	3.08	1.1282	3.47	0.2599	1.1000	1.1000	13	13	2.77
1997 Means	1.52	1.1214	1.70	—	1.0918	1.0653	—	—	1.59
	$s = 0.4777$		s 'SIDC' = 0.4407			$Es = 0.0395$			

TABLE G4:
CORRECTED **ACTIVE AREA (g)** VALUES for Rotations 1905 - 1930.

As a k value is attributed to each spotted observation, the k value for any specific rotation is the mean of all the k values for the rotation concerned.

The corrected values are labelled g_{GD} .

$$g_{GD} = g \times k.$$

s = sample standard deviation of k values.

$I/GDSO$ = International mean (of days observed by the GDSO) divided by the GDSO's rotation mean.

$I/GDSO_A$ = International mean (of days observed by the GDSO) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

ROTA- TION	START DATE, UT	g	k	g_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k
1905	1996/01/17.06	0.56	1.1250	0.63	0.3536	1.0000	1.1250	16	8
1906	1996/02/13.40	0.50	0.8000	0.40	0.2739	1.0000	0.7143	14	5
1907	1996/03/11.73	0.83	0.9091	0.76	0.2023	1.0000	0.8571	18	11
1908	1996/04/08.03	0.21	1.0000	0.21	0.0000	1.6667	1.0000	14	3
1909	1996/05/05.28	0.53	1.0000	0.53	0.0000	1.0000	1.0000	15	5
1910	1996/06/01.50	0.77	0.9333	0.72	0.1491	1.0000	0.8889	13	5
1911	1996/06/28.70	1.00	0.9000	0.90	0.2236	0.6000	0.8571	10	5
1912	1996/07/25.90	1.31	0.8000	1.05	0.2535	0.7619	0.7143	16	15
1913	1996/08/22.13	0.75	1.0000	0.75	0.5000	0.8889	0.8889	12	7
1914	1996/09/18.39	0.00	—	0.00	—	∞	∞	14	0
1915	1996/10/15.67	0.00	—	0.00	—	∞	∞	17	0
1916	1996/11/11.97	1.00	1.1250	1.12	0.3108	1.1250	1.1250	16	12
1917	1996/12/09.28	1.00	1.0000	1.00	0.0000	1.0000	1.0000	13	8
1918	1997/01/05.61	0.41	1.1429	0.47	0.3780	1.7143	1.1429	17	7
1919	1997/02/01.95	0.50	1.3333	0.67	0.5774	1.4000	1.2000	10	3
1920	1997/03/01.29	0.82	1.0714	0.88	0.4499	1.0000	1.0000	11	7
1921	1997/03/28.60	1.45	1.0784	1.56	0.3638	1.0000	1.0000	20	17
1922	1997/04/24.87	0.83	0.9375	0.78	0.1768	0.9000	0.8889	12	8
1923	1997/05/22.10	1.46	1.2692	1.86	0.8807	1.1579	1.1579	13	13
1924	1997/06/18.31	0.78	0.9000	0.70	0.2108	1.0000	0.8462	18	10
1925	1997/07/15.50	1.40	1.3712	1.92	0.8160	1.2381	1.1905	15	11
1926	1997/08/11.72	2.33	1.1302	2.64	0.4644	1.0238	1.0238	18	16
1927	1997/09/07.97	2.07	1.1333	2.34	0.3994	1.0968	1.0968	15	15
1928	1997/10/05.24	2.19	1.0312	2.26	0.3454	1.0000	1.0000	16	16
1929	1997/11/01.54	2.21	1.1548	2.56	0.4504	1.1613	1.1613	14	14
1930	1997/11/28.84	3.30	1.1167	3.68	0.2663	1.0909	1.0909	10	10

TABLE G5:
SMOOTHED ACTIVE AREA (g) VALUES for 1996 - 1997.

The following are smoothed Active Area (g) values in three different systems.
See page xii for all smoothing formulæ.

YEAR	MONTH	g	$g(S^{HBm})$	$g(S^W)$	$g(S^{B13})$	g_{GD}	$g_{GD}(S^W)$	$g_{GD}(S^{B13})$
1996	Jan	0.77	0.8916	0.8800	0.8811	0.82	0.8582	0.8667
	Feb	0.75	0.7246	0.8886	0.8314	0.56	0.8542	0.8067
	Mar	0.68	0.6424	0.8892	0.7885	0.62	0.8441	0.7553
	Apr	0.33	0.5970	0.7868	0.7264	0.33	0.7527	0.6902
	May	0.44	0.6607	0.6936	0.6840	0.44	0.6688	0.6419
	Jun	0.86	0.7316	0.6764	0.6794	0.81	0.6367	0.6269
	Jul	0.85	0.7422	0.6544	0.6780	0.79	0.6063	0.6216
	Aug	1.41	0.7445	0.6293	0.6629	1.20	0.5964	0.6144
	Sep	0.23	0.6426	0.6262	0.6399	0.17	0.6127	0.6062
	Oct	0.00	0.5659	0.6809	0.6439	0.00	0.6756	0.6256
	Nov	0.88	0.5740	0.7480	0.6735	0.88	0.7603	0.6759
	Dec	0.82	0.5794	0.7876	0.7042	0.82	0.8122	0.7293
1997	Jan	0.42	0.6619	0.8074	0.7382	0.47	0.8403	0.7852
	Feb	0.50	0.7639	0.8342	0.7984	0.67	0.9062	0.8743
	Mar	0.86	0.8865	0.9474	0.9147	0.90	1.0559	1.0181
	Apr	1.47	1.0094	1.1249	1.0644	1.56	1.2482	1.1896
	May	0.92	1.1281	1.2713	1.2092	1.25	1.4170	1.3563
	Jun	1.33	1.3025	1.4210	1.3703	1.25	1.5972	1.5411
	Jul	0.85	1.4781	1.5704	1.5532	1.02	1.7700	1.7498
	Aug	2.05	1.7394	1.7142	1.7409	2.55	1.9229	1.9587
	Sep	2.31	2.0288	1.9233	1.9373	2.42	—	—
	Oct	2.18	2.1962	—	—	2.37	—	—
	Nov	2.21	2.3381	—	—	2.56	—	—
	Dec	3.08	2.4919	—	—	3.47	—	—

TABLE G6:
 QUARTERLY & YEARLY **ACTIVE AREA (g)** MEANS for 1993 - 1997.

YEAR/ QUARTER	g	$g(S^{HBm})$	$g(S^W)$	$g(S^{B13})$	g_{GD}
1993 / 1	5.12	5.10	4.73	4.90	4.56
2	3.24	3.70	4.03	3.90	2.88
3	2.90	3.01	3.36	3.19	3.00
4	2.88	2.89	2.94	2.94	3.14
1993	3.48	3.67	3.77	3.73	3.41
1994 / 1	3.35	2.99	2.62	2.74	3.07
2	1.72	2.21	2.55	2.44	1.66
3	2.22	2.23	2.22	2.20	2.34
4	2.23	2.14	1.99	2.06	2.26
1994	2.37	2.39	2.34	2.36	2.34
1995 / 1	1.93	1.81	1.75	1.77	2.21
2	1.13	1.33	1.45	1.40	1.07
3	0.92	1.11	1.23	1.18	0.96
4	1.34	1.12	0.95	1.01	1.42
1995	1.34	1.34	1.35	1.34	1.41
1996 / 1	0.73	0.75	0.89	0.83	0.70
2	0.52	0.66	0.72	0.70	0.51
3	0.88	0.71	0.64	0.66	0.76
4	0.54	0.57	0.74	0.67	0.46
1996	0.66	0.67	0.75	0.72	0.63
1997 / 1	0.58	0.77	0.86	0.82	0.65
2	1.28	1.15	1.27	1.21	1.38
3	1.70	1.75	1.74	1.74	1.98
4	2.45	2.34	—	—	2.75
1997	1.52	1.50	—	—	1.70

NB: $g(S^{HBm})$, $g(S^W)$ & $g(S^{B13})$ quarterly values are means of 3 monthly values.
 $g(S^{HBm})$, $g(S^W)$ & $g(S^{B13})$ yearly values are means of 12 monthly values.
 g_{GD} quarterly values are computed as quarterly g means multiplied by quarterly k means.
 Annual values of g_{GD} are annual Active Area means multiplied by annual k means.

TABLE P1:

MONTHLY **PETTISINDEX** MEANS OF GDSO DATA for **1997**.

p = mean of penumbrae on the solar disc.

s = mean of penumbral-free sunspots on the solar disc.

SN = mean Pettisindex (k neglected; see list of definitions).

n = total number of observations.

w = mean weight.

Q = mean quietness [steadiness] of image (on the Kiepenheuer scale).

S = mean sharpness [clarity] of image (on the Kiepenheuer scale).

T = mean transparency of the atmosphere (1 = excellent, 5 = opaque).

C = mean condition $[(Q+S+T)/3]$.

MONTH	p	s	SN	n	w	Q	S	T	C
Jan	0.21	1.05	3.16	19	0.5019	1.76	2.11	2.24	2.0351
Feb	0.70	1.60	8.60	10	0.5056	1.65	2.05	2.35	2.0167
Mar	0.57	2.50	8.21	14	0.5372	1.57	1.89	2.18	1.8810
Apr	1.58	4.26	20.05	19	0.5179	1.61	2.03	2.26	1.9649
May	0.54	1.15	6.54	13	0.4780	1.88	2.27	2.42	2.1923
Jun	0.56	3.33	8.89	18	0.4460	1.97	2.31	2.50	2.2593
Jul	0.35	1.80	5.30	20	0.4923	1.72	2.08	2.40	2.0667
Aug	1.90	6.62	25.67	21	0.4688	1.76	2.26	2.45	2.1587
Sep	4.06	11.81	52.44	16	0.4694	1.69	2.25	2.56	2.1667
Oct	1.71	4.71	21.76	17	0.4424	1.79	2.44	2.68	2.3039
Nov	3.21	8.79	40.93	14	0.4222	2.00	2.46	2.75	2.4048
Dec	4.08	8.54	49.31	13	0.4322	2.04	2.42	2.58	2.3462
Year	1.57	5.23	20.95	194	0.4765	1.78	2.21	2.44	2.1460

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TABLE P2:

ROTATIONAL **PETTISINDEX** MEANS OF GDSO DATA.

Abbreviations as above.

ROT.	start date, UT	p	s	SN	n	w	Q	S	T	C
1917	1996/12/09.28	0.85	2.15	10.62	13	0.5428	1.54	1.96	2.15	1.8846
1918	1997/01/05.61	0.24	0.88	3.24	17	0.4995	1.79	2.09	2.26	2.0490
1919	1997/02/01.95	0.70	1.60	8.60	10	0.5056	1.65	2.05	2.35	2.0167
1920	1997/03/01.29	0.27	1.64	4.36	11	0.5341	1.59	1.86	2.23	1.8939
1921	1997/03/28.60	1.70	4.75	21.75	20	0.5279	1.58	2.00	2.20	1.9250
1922	1997/04/24.87	0.67	0.75	7.42	12	0.4922	1.79	2.17	2.33	2.0972
1923	1997/05/22.10	0.77	3.46	11.15	13	0.4394	2.00	2.42	2.54	2.3205
1924	1997/06/18.31	0.00	1.72	1.72	18	0.4637	1.92	2.14	2.47	2.1759
1925	1997/07/15.50	1.07	3.80	14.47	15	0.4770	1.80	2.23	2.43	2.1556
1926	1997/08/11.72	2.11	7.39	28.50	18	0.4765	1.67	2.22	2.47	2.1204
1927	1997/09/07.97	3.93	11.33	50.67	15	0.4782	1.63	2.20	2.53	2.1222
1928	1997/10/05.24	1.75	4.81	22.31	16	0.4388	1.81	2.47	2.69	2.3229
1929	1997/11/01.54	3.21	8.79	40.93	14	0.4222	2.00	2.46	2.75	2.4048
1930	1997/11/28.84	3.90	8.50	47.50	10	0.4183	2.10	2.50	2.65	2.4167

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TABLE P3:

CORRECTED **PETTISINDICES** for **1995 - 1997**.

As the GDSO is in suburban Auckland, it can suffer terrible atmospheric conditions, hence the 'observed' Pettisindices have to be upgraded to give reflections of international results. International Pettisindex results are computed by Siegfried Gonzi, St Paul, Austria, on behalf of Sonne, Germany.

Below are the 'observed' Pettisindices along with the monthly k co-efficients and the corrected values (PX_{GD}) for 1995 - 1997. Sonne's final values (PX_I) are also stated.

$I/GDSO$ = Sonne's mean (of days observed by the GDSO) divided by the GDSO's monthly mean.

$I/GDSO_A$ = Sonne's mean (of days with GDSO k values) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

s = sample standard deviation of k values.

s'SIDC' = annual **s** computed on the SIDC formula.

Es = annual estimate of standard deviation.

		SN	k	PX_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k	PX_I
1995	Jan	12.17	1.4950	18.19	0.7658	1.3973	1.3059	18	11	26.4
	Feb	33.67	1.3853	46.64	0.2365	1.3267	1.3267	12	12	38.9
	Mar	32.23	1.5108	48.70	0.4718	1.4260	1.4117	26	23	45.4
	Apr	24.59	1.7374	42.72	1.3850	1.1914	1.1746	17	10	25.5
	May	20.67	2.0527	42.42	2.1111	1.1425	1.1048	18	13	22.8
	Jun	17.40	1.6447	28.62	1.5956	1.3333	1.3276	20	19	22.6
	Jul	12.56	1.4442	18.13	1.0607	1.3363	1.3009	18	14	16.3
	Aug	12.18	1.2578	15.32	0.3957	1.3623	1.2367	17	8	15.6
	Sep	5.31	1.4872	7.90	0.4347	1.5647	1.4588	16	7	11.1
	Oct	23.00	1.3158	30.26	0.3092	1.3043	1.2910	13	9	27.2
	Nov	9.00	1.1018	9.92	0.3770	1.1852	1.1852	18	14	10.4
	Dec	7.38	1.9049	14.07	1.1237	1.5312	1.4896	13	9	9.8
1995	Means	17.83	1.5317	27.32	—	1.3255	1.2967	—	—	22.6
		s = 1.0622		s 'SIDC' = 0.8923		Es = 0.0876				
1996	Jan	5.73	2.3187	13.28	1.3253	1.6825	1.7016	22	11	12.8
	Feb	3.38	1.7389	5.87	2.2113	1.2593	1.1111	8	4	3.7
	Mar	8.11	1.3180	10.68	0.2460	1.4026	1.3247	19	10	11.3
	Apr	3.44	2.9134	10.04	2.6319	1.2258	1.1613	18	6	3.5
	May	8.44	1.7195	14.52	1.0468	1.5197	1.5066	18	8	10.6
	Jun	7.57	1.3192	9.99	0.3583	1.4906	1.3774	14	7	13.4
	Jul	12.92	1.3876	17.93	0.8315	1.2560	1.2575	13	9	16.6
	Aug	14.29	1.6494	23.58	0.9274	1.3827	1.3827	17	17	17.3
	Sep	0.54	0.8333	0.45	0.2357	1.4286	0.7143	13	2	1.5
	Oct	0.00	—	0.00	—	∞	∞	19	0	0.5
	Nov	22.75	2.0425	46.47	1.6165	1.0934	1.0852	16	10	21.7
	Dec	10.35	1.2338	12.77	0.2691	1.2841	1.2841	17	9	14.9
1996	Means	8.16	1.7187	14.02	—	1.3300	1.3047	—	—	10.7
		s = 1.2351		s 'SIDC' = 1.0201		Es = 0.1265				

TABLE P3 continued:

CORRECTED **PETTISINDICES** — 1995 - 1997.

	SN	k	PX _{GD}	s	I/GDSO	I/GDSO _A	n	n _k	PX _I
1997 Jan	3.16	1.9301	6.10	1.8460	1.2000	1.1724	19	7	2.7
Feb	8.60	3.3725	29.00	4.0092	1.1744	1.1628	10	3	9.5
Mar	8.21	2.6215	21.53	2.2516	1.7391	1.7304	14	11	10.5
Apr	20.05	1.9036	38.17	1.5208	1.3386	1.3307	19	15	20.9
May	6.54	3.2662	21.36	5.5809	1.7294	1.7176	13	11	20.3
Jun	8.89	2.2612	20.10	1.8026	1.5938	1.5875	18	17	14.4
Jul	5.30	4.0134	21.27	6.1102	1.3019	1.2075	20	10	6.8
Aug	25.67	1.5009	38.52	0.4494	1.4471	1.4397	21	19	31.1
Sep	52.44	1.4903	78.15	0.3601	1.3600	1.3600	16	16	73.8
Oct	21.76	1.6329	35.54	0.7439	1.3730	1.3730	17	17	27.7
Nov	40.93	1.7525	71.73	1.8656	1.2478	1.2478	14	14	54.8
Dec	49.31	1.2996	64.08	0.3025	1.2153	1.2153	13	13	58.4
1997 Means	20.95	2.0724	43.42	—	1.3517	1.3461	—	—	27.6
	s = 2.5430		s 'SIDC' = 1.8475						Es = 0.2066

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TABLE P4:
CORRECTED **PETTISINDICES** for Rotations 1888 - 1930.

As a k value is attributed to each spotted observation, the k value for any specific rotation is the mean of all the k values for the rotation concerned.

The corrected values are labelled PX_{GD} .

$$PX_{GD} = SN \times k.$$

s = sample standard deviation of k values.

$I/GDSO$ = International mean (of days observed by the GDSO) divided by the GDSO's rotation mean.

$I/GDSO_A$ = International mean (of days observed by the GDSO) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

ROTA- TION	START DATE, UT	SN	k	PX_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k
1888	1994/10/10.24	53.44	1.2670	67.71	0.2917	1.2035	1.2035	16	16
1889	1994/11/06.53	11.94	1.2787	15.27	0.8862	1.1379	1.0743	17	12
1890	1994/12/03.84	27.95	1.7717	49.52	1.4729	1.2316	1.2316	19	19
1891	1994/12/31.17	10.40	1.5314	15.93	0.9798	1.3782	1.2436	15	7
1892	1995/01/27.51	26.55	1.4517	38.54	0.2113	1.3733	1.3733	11	11
1893	1995/02/23.85	31.35	1.4734	46.19	0.4685	1.4438	1.4272	23	20
1894	1995/03/23.17	34.75	1.5433	53.63	1.0374	1.2029	1.1942	20	17
1895	1995/04/19.45	11.38	1.2722	14.48	0.8130	1.1284	1.1149	13	7
1896	1995/05/16.69	24.39	2.0772	50.66	1.9174	1.2893	1.2597	18	15
1897	1995/06/12.89	15.61	1.6772	26.18	1.6678	1.3238	1.3167	18	17
1898	1995/07/10.09	9.36	1.4379	13.45	1.2978	1.2366	1.1756	14	10
1899	1995/08/06.30	11.27	1.3438	15.14	0.2893	1.4734	1.3195	15	6
1900	1995/09/02.54	5.67	1.4872	8.43	0.4347	1.5529	1.4588	15	7
1901	1995/09/29.81	24.92	1.3158	32.79	0.3092	1.3010	1.2910	12	9
1902	1995/10/27.10	8.57	1.0905	9.35	0.3673	1.2083	1.1917	14	11
1903	1995/11/23.40	8.50	1.3627	11.58	0.3752	1.3193	1.3193	14	9
1904	1995/12/20.72	9.62	2.3164	22.27	1.2652	1.7600	1.7419	13	6
1905	1996/01/17.06	1.25	2.4896	3.11	1.5239	1.5500	1.5789	16	8
1906	1996/02/13.40	2.07	1.5911	3.30	1.9434	1.3103	1.1034	14	5
1907	1996/03/11.73	9.28	1.7025	15.80	1.2134	1.3653	1.2934	18	12
1908	1996/04/08.03	3.36	3.0768	10.33	3.3984	1.2766	1.2340	14	3
1909	1996/05/05.28	10.13	1.7195	17.42	1.0468	1.5197	1.5066	15	8
1910	1996/06/01.50	6.46	1.3497	8.72	0.3825	1.5833	1.4405	13	6
1911	1996/06/28.70	11.30	1.2730	14.38	0.9205	1.0619	1.0714	10	7
1912	1996/07/25.90	16.31	1.7199	28.06	0.9833	1.4215	1.4176	16	15
1913	1996/08/22.13	5.50	1.2317	6.77	0.3290	1.3333	1.3030	12	7
1914	1996/09/18.39	0.00	—	0.00	—	∞	∞	14	0
1915	1996/10/15.67	0.00	—	0.00	—	∞	∞	17	0
1916	1996/11/11.97	25.44	1.8786	47.79	1.5207	1.1007	1.1007	16	12

TABLE P4 continued:

CORRECTED **PETTISINDICES** for Rotations 1888 - 1930.

ROTA- TION	START DATE, UT	SN	k	PX _{GD}	<i>s</i>	I/GDSO	I/GDSO _A	n	n _k
1917	1996/12/09.28	10.62	1.1483	12.19	0.4176	1.2681	1.2609	13	8
1918	1997/01/05.61	3.24	2.2184	7.18	1.8414	1.2727	1.2642	17	6
1919	1997/02/01.95	8.60	3.3725	29.00	4.0092	1.1744	1.1628	10	3
1920	1997/03/01.29	4.36	2.9559	12.90	2.5956	1.9167	1.8958	11	8
1921	1997/03/28.60	21.75	1.9125	41.60	1.4202	1.3793	1.3770	20	17
1922	1997/04/24.87	7.42	1.3288	9.86	0.2734	1.4045	1.3708	12	9
1923	1997/05/22.10	11.15	3.6807	41.05	5.2832	1.6621	1.6621	13	13
1924	1997/06/18.31	1.72	2.2765	3.92	1.2745	2.3548	2.1290	18	11
1925	1997/07/15.50	14.47	3.4723	50.23	5.8781	1.3088	1.2903	15	11
1926	1997/08/11.72	28.50	1.4628	41.69	0.3647	1.3957	1.3879	18	16
1927	1997/09/07.97	50.67	1.5508	78.57	0.3380	1.3961	1.3961	15	15
1928	1997/10/05.24	22.31	1.6340	36.46	0.7683	1.3641	1.3641	16	16
1929	1997/11/01.54	40.93	1.7525	71.73	1.8656	1.2478	1.2478	14	14
1930	1997/11/28.84	47.50	1.3140	62.41	0.3424	1.2042	1.2042	10	10

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TABLE P5:
SMOOTHED PETTISINDICES for 1994 - 1997.

The following are smoothed Pettisindices in three different systems. See page xii for all smoothing formulæ.

YEAR	MONTH	SN	SN(S ^{HBm})	SN(S ^W)	SN(S ^{B13})	PX _{GD}	PX _{GD} (S ^W)	PX _{GD} (S ^{B13})
1994	Jan	81.53	59.83	42.62	48.52	102.71	58.68	63.56
	Feb	45.18	50.80	41.14	45.12	41.11	57.92	58.22
	Mar	39.88	40.68	40.49	41.10	37.74	56.54	52.38
	Apr	17.88	30.37	40.72	37.25	23.45	53.17	46.84
	May	18.50	24.69	39.63	33.83	22.80	48.84	42.79
	Jun	18.29	23.34	36.04	30.84	29.56	45.31	40.54
	Jul	30.82	26.12	30.76	28.50	63.20	39.82	38.82
	Aug	25.86	28.60	27.39	27.49	35.10	36.53	38.12
	Sep	25.00	30.62	26.59	27.69	30.25	37.22	38.70
	Oct	57.27	31.44	26.55	28.08	64.03	38.48	39.46
	Nov	17.05	28.34	26.92	27.96	23.15	40.10	39.90
	Dec	26.55	27.06	26.98	27.34	47.04	40.88	39.82
1995	Jan	12.17	25.61	26.18	26.46	18.19	38.96	39.02
	Feb	33.67	25.49	24.85	25.40	46.64	36.26	38.09
	Mar	32.23	25.83	23.46	23.95	48.70	34.50	36.87
	Apr	24.59	23.99	21.21	21.93	42.72	32.16	34.71
	May	20.67	21.50	19.44	20.10	42.42	30.21	32.15
	Jun	17.40	17.52	18.31	18.42	28.62	28.28	29.14
	Jul	12.56	14.91	17.24	16.64	18.13	26.70	25.96
	Aug	12.18	13.30	15.71	14.72	15.32	24.80	22.78
	Sep	5.31	12.17	13.45	12.87	7.90	21.52	19.68
	Oct	23.00	12.02	11.56	11.40	30.26	18.57	17.20
	Nov	9.00	10.30	10.17	10.08	9.92	16.05	15.16
	Dec	7.38	8.74	9.25	8.95	14.07	14.11	13.67
1996	Jan	5.73	7.24	8.86	8.19	13.28	13.32	12.81
	Feb	3.38	5.88	8.96	7.85	5.87	13.66	12.54
	Mar	8.11	6.01	8.85	7.69	10.68	13.69	12.45
	Apr	3.44	6.50	7.69	7.34	10.04	12.12	12.02
	May	8.44	7.91	7.31	7.38	14.52	12.38	12.23
	Jun	7.57	8.66	8.00	7.94	9.99	13.85	13.11
	Jul	12.92	8.67	8.02	8.35	17.93	13.50	13.67
	Aug	14.29	8.99	8.13	8.53	23.58	14.16	14.28
	Sep	0.54	8.39	8.35	8.55	0.45	15.58	15.03
	Oct	0.00	8.45	9.05	8.89	0.00	17.20	16.35
	Nov	22.75	9.52	9.66	9.37	46.47	18.66	17.99
	Dec	10.35	9.07	9.64	9.48	12.77	19.37	19.12

TABLE P5 continued:

SMOOTHED **PETTISINDICES** for **1994 - 1997**.

YEAR	MONTH	SN	SN(S ^{HBm})	SN(S ^w)	SN(S ^{B13})	PX _{GD}	PX _{GD} (S ^w)	PX _{GD} (S ^{B13})
1997	Jan	3.16	9.47	9.37	9.39	6.10	19.93	20.11
	Feb	8.60	9.91	9.53	9.62	29.00	20.69	21.47
	Mar	8.21	9.84	12.17	10.96	21.53	24.55	23.98
	Apr	20.05	10.49	15.24	12.81	38.17	29.27	26.88
	May	6.54	10.89	16.90	14.57	21.36	31.80	29.39
	Jun	8.89	13.95	19.28	17.17	20.10	34.99	32.82
	Jul	5.30	17.79	21.70	20.55	21.27	—	—
	Aug	25.67	24.04	23.55	24.11	38.52	—	—
	Sep	52.44	31.42	27.57	28.11	78.15	—	—
	Oct	21.76	34.04	—	—	35.54	—	—
	Nov	40.93	36.62	—	—	71.73	—	—
	Dec	49.31	39.37	—	—	64.08	—	—

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TABLE P6:
 QUARTERLY AND YEARLY **PETTISINDEX** MEANS for 1993 - 1997.

YEAR/ QUARTER	SN	SN(S ^{HBm})	SN(S ^W)	SN(S ^{B13})	PX _{GD}	p	s
1993 / 1	93.48	93.38	82.24	87.32	102.21	8.00	13.48
2	67.44	68.58	70.22	69.22	98.35	5.76	9.89
3	37.41	46.33	62.14	55.77	55.47	3.18	5.57
4	61.27	55.91	48.56	51.46	98.00	5.25	8.77
1993	63.78	66.05	65.79	65.94	90.31	5.45	9.27
1994 / 1	54.62	50.44	41.42	44.92	56.86	4.58	8.85
2	18.24	26.13	38.80	33.98	24.94	1.44	3.80
3	27.03	28.45	28.25	27.89	41.06	2.19	5.14
4	30.96	28.95	26.82	27.79	44.64	2.47	6.23
1994	32.39	33.49	33.82	33.64	43.47	2.64	5.96
1995 / 1	26.09	25.64	24.83	25.27	—	2.00	6.09
2	20.69	21.01	19.65	20.15	—	1.51	5.60
3	10.16	13.46	15.47	14.74	—	0.78	2.31
4	12.66	10.35	10.33	10.14	—	1.02	2.43
1995	17.83	17.62	17.57	17.58	27.32	1.36	4.24
1996 / 1	6.27	6.38	8.89	7.91	—	0.41	2.18
2	6.40	7.69	7.67	7.55	—	0.50	1.40
3	9.72	8.69	8.17	8.47	—	0.72	2.51
4	10.38	9.01	9.45	9.25	—	0.83	2.12
1996	8.16	7.94	8.54	8.30	14.02	0.61	2.03
1997 / 1	6.07	9.74	10.36	9.99	—	0.44	1.65
2	12.52	11.78	17.14	14.85	—	0.94	3.12
3	26.04	24.42	24.27	24.26	—	1.96	6.39
4	36.00	36.68	—	—	—	2.89	7.14
1997	20.95	20.65	—	—	43.42	1.57	5.23

NB: SN(S^{HBm}), SN(S^W) & SN(S^{B13}) quarterly values are means of 3 monthly values.

SN(S^{HBm}), SN(S^W) & SN(S^{B13}) yearly values are means of 12 monthly values.

PX_{GD} quarterly values are computed as quarterly SN means multiplied by quarterly k means.

Annual values of PX_{GD} are annual Pettisindex means multiplied by annual k means.

Incomplete data will be published next issue.

TABLE B1:

MONTHLY **BECKINDEX** MEANS OF GDSO DATA for **1997**.

BX = mean Beckindex (k neglected; see list of definitions).

n = total number of observations.

w = mean weight.

Q = mean quietness [steadiness] of image (on the Kiepenheuer scale).

S = mean sharpness [clarity] of image (on the Kiepenheuer scale).

T = mean transparency of the atmosphere (1 = excellent, 5 = opaque).

C = mean condition $[(Q+S+T)/3]$.

MONTH	BX	n	w	Q	S	T	C
Jan	9.47	19	0.5019	1.76	2.11	2.24	2.0351
Feb	33.40	10	0.5056	1.65	2.05	2.35	2.0167
Mar	33.36	14	0.5372	1.57	1.89	2.18	1.8810
Apr	114.53	19	0.5179	1.61	2.03	2.26	1.9649
May	21.62	13	0.4780	1.88	2.27	2.42	2.1923
Jun	38.67	18	0.4460	1.97	2.31	2.50	2.2593
Jul	24.50	20	0.4923	1.72	2.08	2.40	2.0667
Aug	174.33	21	0.4688	1.76	2.26	2.45	2.1587
Sep	367.75	16	0.4694	1.69	2.25	2.56	2.1667
Oct	97.82	17	0.4424	1.79	2.44	2.68	2.3039
Nov	291.14	14	0.4222	2.00	2.46	2.75	2.4048
Dec	275.00	13	0.4322	2.04	2.42	2.58	2.3462
Year	121.05	194	0.4765	1.78	2.21	2.44	2.1460

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TABLE B2:

ROTATIONAL **BECKINDEX** MEANS OF GDSO DATA.

Abbreviations as above.

ROT.	start date, UT	BX	n	w	Q	S	T	C
1917	1996/12/09.28	32.46	13	0.5428	1.54	1.96	2.15	1.8846
1918	1997/01/05.61	9.41	17	0.4995	1.79	2.09	2.26	2.0490
1919	1997/02/01.95	33.40	10	0.5056	1.65	2.05	2.35	2.0167
1920	1997/03/01.29	12.09	11	0.5341	1.59	1.86	2.23	1.8939
1921	1997/03/28.60	124.10	20	0.5279	1.58	2.00	2.20	1.9250
1922	1997/04/24.87	22.75	12	0.4922	1.79	2.17	2.33	2.0972
1923	1997/05/22.10	48.92	13	0.4394	2.00	2.42	2.54	2.3205
1924	1997/06/18.31	6.89	18	0.4637	1.92	2.14	2.47	2.1759
1925	1997/07/15.50	67.60	15	0.4770	1.80	2.23	2.43	2.1556
1926	1997/08/11.72	202.50	18	0.4765	1.67	2.22	2.47	2.1204
1927	1997/09/07.97	359.80	15	0.4782	1.63	2.20	2.53	2.1222
1928	1997/10/05.24	100.88	16	0.4388	1.81	2.47	2.69	2.3229
1929	1997/11/01.54	291.14	14	0.4222	2.00	2.46	2.75	2.4048
1930	1997/11/28.84	239.20	10	0.4183	2.10	2.50	2.65	2.4167

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TABLE B3:
CORRECTED **BECKINDICES** for **1996 - 1997**.

As the GDSO is in suburban Auckland, it can suffer terrible atmospheric conditions, hence the 'observed' Beckindices have to be upgraded to give reflections of international results. International [Beckindex] results are computed by Sonne, Germany.

Below are the 'observed' Beckindices along with the monthly k co-efficients and the corrected values (BX_{GD}) for 1996 - 1997. Sonne's final values (BX_I) are also stated.

$I/GDSO$ = Sonne's mean (of days observed by the GDSO) divided by the GDSO's monthly mean.

$I/GDSO_A$ = Sonne's mean (of days with GDSO k values) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

s = sample standard deviation of k values.

s 'SIDC' = annual s computed on the SIDC formula.

Es = annual estimate of standard deviation.

	BX	k	BX_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k	BX_I
1996 Jan	27.18	3.2408	88.09	1.5620	2.2174	2.2256	22	12	83
Feb	13.00	1.2034	15.64	1.3228	1.1442	1.0962	8	4	15
Mar	34.00	2.3341	79.36	1.0404	1.9396	1.8498	19	10	66
Apr	12.22	3.5916	43.90	2.5276	1.9318	1.9000	18	6	20
May	40.56	2.2007	89.25	1.1725	1.6082	1.6068	18	8	52
Jun	33.29	2.4140	80.35	1.2448	1.9077	1.8528	14	6	74
Jul	69.38	1.7096	118.62	1.0367	1.5698	1.5805	13	8	132
Aug	77.53	2.8193	218.58	1.9829	1.9302	1.9302	17	17	124
Sep	2.15	0.6667	1.44	—	0.5714	0.6667	13	1	6
Oct	0.00	—	0.00	—	∞	∞	19	0	0
Nov	194.19	2.4194	469.81	1.7640	1.1796	1.1796	16	10	206
Dec	30.35	2.4465	74.26	1.3547	2.3508	2.3450	17	9	82
1996 Means	44.51	2.5183	112.09	—	1.6262	1.6165	—	—	72
	$s = 1.6190$		s 'SIDC' =	1.5365		$Es = 0.1681$			
1997 Jan	9.47	1.3927	13.19	1.2602	1.1333	1,0833	19	8	9
Feb	33.40	5.8260	194.59	7.2968	1.7305	1,7156	10	3	45
Mar	33.36	3.8158	127.28	2.7857	2.5589	2,5503	14	11	60
Apr	114.53	2.1340	244.40	1.5397	1.3061	1,3001	19	15	114
May	21.62	5.9564	128.75	8.0021	3.5409	3,5884	13	10	129
Jun	38.67	2.6361	101.93	1.8356	1.9382	1,9325	18	17	77
Jul	24.50						20		
Aug	174.33				DATA		21		
Sep	367.75						16		
Oct	97.82				UNOBTAINABLE		17		
Nov	291.14						14		
Dec	275.00				AT TIME OF PRINT.		13		
1997 Means	121.05			—			—	—	
	$s =$		s 'SIDC' =			$Es =$			

TABLE B4:

CORRECTED **BECKINDICES** for Rotations 1900 - 1930.

As a k value is attributed to each spotted observation, the k value for any specific rotation is the mean of all the k values for the rotation concerned.

The corrected values are labelled BX_{GD} .

$$BX_{GD} = BX \times k.$$

s = sample standard deviation of k values.

$I/GDSO$ = International mean (of days observed by the GDSO) divided by the GDSO's rotation mean.

$I/GDSO_A$ = International mean (of days observed by the GDSO) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

ROTA- TION	START DATE, UT	BX	k	BX_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k
1900	1995/09/02.54	18.13	2.1162	38.37	0.8117	2.4926	2.4191	15	7
1901	1995/09/29.81	98.50	2.9966	295.16	0.9109	2.6168	2.6142	12	9
1902	1995/10/27.10	26.21	1.7558	46.03	1.0226	1.9074	1.8965	14	11
1903	1995/11/23.40	24.00	2.7432	65.84	2.0038	2.0536	2.0536	14	9
1904	1995/12/20.72	45.69	2.2268	101.75	1.7748	2.1970	2.1751	13	7
1905	1996/01/17.06	3.50	3.8802	13.58	1.3077	3.0179	3.1731	16	8
1906	1996/02/13.40	8.00	1.1627	9.30	1.1491	1.1429	1.0893	14	5
1907	1996/03/11.73	37.44	2.7472	102.87	1.5554	1.9525	1.8635	18	12
1908	1996/04/08.03	13.14	3.6415	47.86	2.7935	1.9185	1.8967	14	3
1909	1996/05/05.28	48.67	2.2007	107.10	1.1725	1.6082	1.6068	15	8
1910	1996/06/01.50	33.38	2.1218	70.84	1.1387	1.7627	1.7023	13	5
1911	1996/06/28.70	53.20	1.8072	96.14	1.4066	1.4925	1.5153	10	6
1912	1996/07/25.90	96.38	2.1728	209.40	1.1354	1.7477	1.7458	16	15
1913	1996/08/22.13	17.17	3.7852	64.98	2.8313	2.9757	3.0248	12	6
1914	1996/09/18.39	0.00	—	0.00	—	∞	∞	14	0
1915	1996/10/15.67	0.00	—	0.00	—	∞	∞	17	0
1916	1996/11/11.97	201.31	2.3164	466.32	1.6392	1.2155	1.2155	16	12
1917	1996/12/09.28	32.46	2.3145	75.13	1.6169	2.2867	2.2796	13	8
1918	1997/01/05.61	9.41	1.5774	14.85	1.2387	1.2625	1.2062	17	7
1919	1997/02/01.95	33.40	5.8260	194.59	7.2968	1.7305	1.7156	10	3
1920	1997/03/01.29	12.09	4.3859	53.03	3.0811	3.6692	3.6391	11	8
1921	1997/03/28.60	124.10	2.1725	269.61	1.4754	1.4037	1.4025	20	17
1922	1997/04/24.87	22.75	3.3535	76.29	2.6782	3.0842	3.0892	12	8
1923	1997/05/22.10	48.92	4.6357	226.79	7.1684	2.0314	2.0314	13	13
1924	1997/06/18.31	6.89						18	
1925	1997/07/15.50	67.60						15	
1926	1997/08/11.72	202.50						18	
1927	1997/09/07.97	359.80						15	
1928	1997/10/05.24	100.88						16	
1929	1997/11/01.54	291.14						14	
1930	1997/11/28.84	239.20						10	

TABLE B5:
SMOOTHED **BECKINDICES** for **1995 - 1997**.

The following are smoothed Beckindices in three different systems. See page xii for all smoothing formulæ.

YEAR	MONTH	BX	BX(S ^{HBm})	BX(S ^W)	BX(S ^{B13})	BX _{GD}	BX _{GD} (S ^W)	BX _{GD} (S ^{B13})
1995	Jan	51.17	146.5	151.5	153.8	129.45	354.5	361.5
	Feb	167.83	145.3	144.5	148.4	423.24	335.8	354.9
	Mar	171.23	152.1	136.8	140.7	490.44	321.5	342.4
	Apr	187.05	146.2	121.4	128.7	444.11	294.7	317.4
	May	138.94	132.6	107.8	115.9	284.69	268.4	288.3
	Jun	112.05	105.8	98.1	102.7	318.05	245.3	256.8
	Jul	50.17	81.2	90.0	88.9	146.12	228.6	223.6
	Aug	57.65	62.8	82.5	75.3	109.48	209.9	189.4
	Sep	17.00	50.1	70.4	61.9	35.98	175.8	155.8
	Oct	90.92	45.6	57.4	50.6	272.46	142.0	128.4
	Nov	27.06	37.6	46.0	41.3	45.12	117.2	106.7
	Dec	20.62	31.5	38.6	35.1	65.04	99.1	90.7
1996	Jan	27.18	27.2	36.1	32.1	88.09	88.1	81.2
	Feb	13.00	23.1	37.7	31.9	15.64	91.5	79.2
	Mar	34.00	25.1	37.9	32.7	79.36	94.6	80.1
	Apr	12.22	28.9	33.5	32.6	43.90	81.8	78.2
	May	40.56	37.3	36.7	35.6	89.25	88.1	84.1
	Jun	33.29	42.4	44.1	41.4	80.35	106.2	97.3
	Jul	69.38	44.2	43.7	45.4	118.62	103.5	106.2
	Aug	77.53	51.6	43.9	47.7	218.58	107.8	114.1
	Sep	2.15	52.0	44.7	48.8	1.44	117.3	121.3
	Oct	0.00	55.2	48.9	51.6	0.00	127.6	131.1
	Nov	194.19	62.6	52.4	54.1	469.81	137.6	141.2
	Dec	30.35	52.2	51.8	52.9	74.26	140.2	143.5
1997	Jan	9.47	49.9	50.2	50.3	13.19	—	—
	Feb	33.40	48.0	52.3	50.4	194.59	—	—
	Mar	33.36	44.3	71.6	58.7	127.28	—	—
	Apr	114.53	50.1	90.9	70.5	244.40	—	—
	May	21.62	54.3	99.0	81.9	128.75	—	—
	Jun	38.67	79.5	113.3	100.0	101.93	—	—
	Jul	24.50	108.0	129.4	123.9	—	—	—
	Aug	174.33	153.7	142.3	148.7	—	—	—
	Sep	367.75	202.0	172.0	176.4	—	—	—
	Oct	97.82	215.2	—	—	—	—	—
	Nov	291.14	231.1	—	—	—	—	—
	Dec	275.00	248.3	—	—	—	—	—

TABLE B6:
 QUARTERLY AND YEARLY **BECKINDEX** MEANS for 1993 - 1997.

YEAR/ QUARTER	BX	BX(S ^{HBm})	BX(S ^W)	BX(S ^{B13})	BX _{GD}	n
1993 / 1	719.52	697.68	606.54	651.69	1010.68	42
2	537.29	526.39	499.38	504.95	1028.45	45
3	187.51	289.56	473.01	397.96	396.38	49
4	472.15	431.47	334.44	372.20	849.77	48
1993	468.74	486.28	478.34	481.70	851.20	184
1994 / 1	396.63	364.85	278.17	313.45	619.09	52
2	75.63	124.91	253.11	202.96	152.68	54
3	133.74	147.99	150.35	146.41	303.69	58
4	194.79	168.33	148.88	156.57	449.72	57
1994	197.14	201.52	207.63	204.85	402.62	221
1995 / 1	131.91	147.96	144.30	147.66	355.50	56
2	144.04	128.22	109.09	115.76	357.72	55
3	42.25	64.68	80.95	75.34	102.42	51
4	44.02	38.24	47.30	42.32	108.28	44
1995	94.18	94.77	95.41	95.27	238.54	206
1996 / 1	27.51	25.10	37.26	32.23	70.94	49
2	28.32	36.17	38.11	36.57	75.95	50
3	52.28	49.28	44.10	47.28	125.21	43
4	69.67	56.67	51.05	52.87	169.46	52
1996	44.51	41.81	42.63	42.24	112.09	194
1997 / 1	22.81	47.39	58.05	53.14	73.21	43
2	63.06	61.30	101.08	84.13	204.78	50
3	176.05	154.59	147.92	149.64	—	57
4	211.68	231.54	—	—	—	44
1997	121.05	123.71	—	—	—	194

NB: BX(S^{HBm}), BX(S^W) & BX(S^{B13}) quarterly values are means of 3 monthly values.
 BX(S^{HBm}), BX(S^W) & BX(S^{B13}) yearly values are means of 12 monthly values.
 BX_{GD} quarterly values are computed as quarterly BX means multiplied by quarterly k means.
 Annual values of BX_{GD} are annual Beckindex means multiplied by annual k means.

TABLE C1:

MONTHLY CLASSIFICATION VALUE MEANS OF GDSO DATA for 1997.

CV = mean Classification Value (k neglected; see list of definitions).

n = total number of observations.

w = mean weight.

Q = mean quietness [steadiness] of image (on the Kiepenheuer scale).

S = mean sharpness [clarity] of image (on the Kiepenheuer scale).

T = mean transparency of the atmosphere (1 = excellent, 5 = opaque).

C = mean condition $[(Q+S+T)/3]$.

MONTH	CV	n	w	Q	S	T	C
Jan	2.58	19	0.5019	1.76	2.11	2.24	2.0351
Feb	8.30	10	0.5056	1.65	2.05	2.35	2.0167
Mar	6.00	14	0.5372	1.57	1.89	2.18	1.8810
Apr	17.42	19	0.5179	1.61	2.03	2.26	1.9649
May	6.31	13	0.4780	1.88	2.27	2.42	2.1923
Jun	7.89	18	0.4460	1.97	2.31	2.50	2.2593
Jul	4.95	20	0.4923	1.72	2.08	2.40	2.0667
Aug	20.52	21	0.4688	1.76	2.26	2.45	2.1587
Sep	65.12	16	0.4694	1.69	2.25	2.56	2.1667
Oct	20.06	17	0.4424	1.79	2.44	2.68	2.3039
Nov	35.79	14	0.4222	2.00	2.46	2.75	2.4048
Dec	54.85	13	0.4322	2.04	2.42	2.58	2.3462
Year	20.09	194	0.4765	1.78	2.21	2.44	2.1460

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TABLE C2:

ROTATIONAL CLASSIFICATION VALUE MEANS OF GDSO DATA.

Abbreviations as above.

ROT.	start date, UT	CV	n	w	Q	S	T	C
1917	1996/12/09.28	9.77	13	0.5428	1.54	1.96	2.15	1.8846
1918	1997/01/05.61	2.71	17	0.4995	1.79	2.09	2.26	2.0490
1919	1997/02/01.95	8.30	10	0.5056	1.65	2.05	2.35	2.0167
1920	1997/03/01.29	4.00	11	0.5341	1.59	1.86	2.23	1.8939
1921	1997/03/28.60	17.90	20	0.5279	1.58	2.00	2.20	1.9250
1922	1997/04/24.87	7.33	12	0.4922	1.79	2.17	2.33	2.0972
1923	1997/05/22.10	10.08	13	0.4394	2.00	2.42	2.54	2.3205
1924	1997/06/18.31	1.39	18	0.4637	1.92	2.14	2.47	2.1759
1925	1997/07/15.50	13.27	15	0.4770	1.80	2.23	2.43	2.1556
1926	1997/08/11.72	22.72	18	0.4765	1.67	2.22	2.47	2.1204
1927	1997/09/07.97	64.67	15	0.4782	1.63	2.20	2.53	2.1222
1928	1997/10/05.24	20.50	16	0.4388	1.81	2.47	2.69	2.3229
1929	1997/11/01.54	35.79	14	0.4222	2.00	2.46	2.75	2.4048
1930	1997/11/28.84	48.70	10	0.4183	2.10	2.50	2.65	2.4167

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TABLE C3:
CORRECTED CLASSIFICATION VALUES for 1996 - 1997.

As the GDSO is in suburban Auckland, it can suffer terrible atmospheric conditions, hence the 'observed' Classification Values have to be upgraded to give reflections of international results. International [Classification Value] results are computed by Kjell Inge Malde, Norway.

Below are the 'observed' Classification Values along with the monthly k co-efficients and the corrected values (CV_{GD}) for 1996 - 1997. Norway's final values (CV_I) are also stated.

$I/GDSO$ = Norway's mean (of days observed by the GDSO) divided by the GDSO's monthly mean.
 $I/GDSO_A$ = Norway's mean (of days with GDSO k values) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

s = sample standard deviation of k values.

s'SIDC' = annual s computed on the SIDC formula.

Es = annual estimate of standard deviation.

	CV	k	CV_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k	CV_I	
1996 Jan	4.18	1.7419	7.28	0.9534	1.7935	1.7667	22	11	9.32	
Feb	2.62	1.3622	3.58	1.7624	0.8571	0.7143	8	4	1.86	
Mar	6.32	1.4871	9.39	0.5733	1.4833	1.4250	19	10	9.42	
Apr	4.00	2.6190	10.48	3.2586	1.1389	1.0139	18	6	3.63	
May	8.33	1.5304	12.75	1.0680	1.2200	1.0800	18	8	9.10	
Jun	6.14	1.8456	11.34	0.6106	1.9070	1.6860	14	7	13.93	
Jul	18.08	1.1953	21.61	0.6334	0.9064	0.8936	13	10	14.45	
Aug	18.41	1.6144	29.72	1.0440	1.0703	1.0703	17	17	18.55	
Sep	0.46	0.2000	0.09	—	0.1667	0.2000	13	1	0.83	
Oct	0.00	—	0.00	—	∞	∞	19	0	1.03	
Nov	21.25	1.1803	25.08	0.3785	1.0206	0.9971	16	10	18.80	
Dec	11.06	1.2509	13.83	0.5158	1.2500	1.2340	17	9	14.16	
1996 Means	8.37	1.5378	12.87	—	1.1947	1.1370	—	—	9.64	
	s = 1.1540			s 'SIDC' = 0.9581					Es = 0.1227	
1997 Jan	2.58							19		
Feb	8.30	DATA						10		
Mar	6.00	UNOBTAINABLE						14		
Apr	17.42	UNOBTAINABLE						19		
May	6.31	AT						13		
Jun	7.89	TIME						18		
Jul	4.95	TIME						20		
Aug	20.52	OF						21		
Sep	65.12	OF						16		
Oct	20.06	PRINT.						17		
Nov	35.79	PRINT.						14		
Dec	54.85	PRINT.						13		
1997 Means	20.09			—			—	—		
	s =			s 'SIDC' =					Es =	

TABLE C4:

CORRECTED CLASSIFICATION VALUES for Rotations 1900 - 1930.

As a k value is attributed to each spotted observation, the k value for any specific rotation is the mean of all the k values for the rotation concerned.

The corrected values are labelled CV_{GD} .

$$CV_{GD} = CV \times k.$$

s = sample standard deviation of k values.

$I/GDSO$ = International mean (of days observed by the GDSO) divided by the GDSO's rotation mean.

$I/GDSO_A$ = International mean (of days observed by the GDSO) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

ROTA-TION	START DATE, UT	CV	k	CV_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k
1900	1995/09/02.54	5.27	1.4097	7.42	0.5120	1.3253	1.2253	15	7
1901	1995/09/29.81	45.17	0.8302	37.50	0.1900	0.7882	0.7775	12	9
1902	1995/10/27.10	16.57	0.9476	15.70	0.6060	0.7888	0.7845	14	11
1903	1995/11/23.40	7.79	1.3019	10.14	0.3912	1.2468	1.2468	14	9
1904	1995/12/20.72	7.00	2.0174	14.12	1.4978	1.8110	1.8189	13	6
1905	1996/01/17.06	1.25	1.5729	1.97	0.9672	1.2500	1.0000	16	8
1906	1996/02/13.40	1.64	1.2897	2.12	1.5348	0.8696	0.7391	14	5
1907	1996/03/11.73	7.39	1.5517	11.47	0.7681	1.4135	1.3383	18	12
1908	1996/04/08.03	4.07	3.6548	14.88	4.6294	1.2807	1.1228	14	3
1909	1996/05/05.28	10.00	1.5304	15.30	1.0680	1.2000	1.0800	15	8
1910	1996/06/01.50	5.38	1.8824	10.14	0.6604	1.9714	1.7000	13	6
1911	1996/06/28.70	12.90	1.2363	15.95	0.6188	0.9690	0.9535	10	8
1912	1996/07/25.90	23.50	1.4945	35.12	1.1423	0.9255	0.9229	16	15
1913	1996/08/22.13	5.42	1.4860	8.05	0.6930	1.5692	1.5938	12	6
1914	1996/09/18.39	0.00	—	0.00	—	∞	∞	14	0
1915	1996/10/15.67	0.00	—	0.00	—	∞	∞	17	0
1916	1996/11/11.97	25.25	1.1387	28.75	0.3571	0.9777	0.9777	16	12
1917	1996/12/09.28	9.77						13	
1918	1997/01/05.61	2.71				DATA		17	
1919	1997/02/01.95	8.30						10	
1920	1997/03/01.29	4.00				UNOBTAINABLE		11	
1921	1997/03/28.60	17.90						20	
1922	1997/04/24.87	7.33				AT		12	
1923	1997/05/22.10	10.08						13	
1924	1997/06/18.31	1.39				TIME		18	
1925	1997/07/15.50	13.27						15	
1926	1997/08/11.72	22.72						18	
1927	1997/09/07.97	64.67				OF		15	
1928	1997/10/05.24	20.50						16	
1929	1997/11/01.54	35.79				PRINT.		14	
1930	1997/11/28.84	48.70						10	

TABLE C5:
SMOOTHED **CLASSIFICATION VALUES** for **1995 - 1997**.

The following are smoothed Classification Values in three different systems.
See page xii for all smoothing formulæ.

YEAR	MONTH	CV	CV(S ^{HBm})	CV(S ^W)	CV(S ^{B13})	CV _{GD}	CV _{GD} (S ^W)	CV _{GD} (S ^{B13})
1995	Jan	9.17	23.96	28.31	27.31	12.63	34.46	34.10
	Feb	27.75	22.97	26.83	25.55	38.94	32.70	32.71
	Mar	27.31	23.22	24.52	23.59	42.76	31.01	31.04
	Apr	19.00	22.67	22.13	21.80	28.62	28.08	28.70
	May	31.00	22.22	21.01	20.83	29.36	26.17	26.82
	Jun	13.05	18.78	19.88	19.97	20.24	24.73	25.13
	Jul	21.06	18.05	18.80	18.95	28.83	23.39	23.27
	Aug	10.94	17.29	17.54	17.68	14.29	21.70	21.04
	Sep	4.94	16.83	15.62	16.30	6.96	18.83	18.67
	Oct	41.69	17.96	14.12	15.01	34.61	16.69	16.79
	Nov	14.39	14.86	12.55	13.25	14.33	15.24	15.05
	Dec	7.77	11.67	11.32	11.39	11.85	14.18	13.42
1996	Jan	4.18	8.44	10.91	9.98	7.28	13.51	12.23
	Feb	2.62	5.52	11.10	9.19	3.58	13.85	11.90
	Mar	6.32	5.26	11.22	8.76	9.39	14.21	12.08
	Apr	4.00	6.23	9.30	8.05	10.48	12.48	11.89
	May	8.33	8.35	7.84	7.86	12.75	11.48	12.03
	Jun	6.14	9.71	8.27	8.55	11.34	12.01	12.78
	Jul	18.08	10.47	8.34	9.17	21.61	—	—
	Aug	18.41	10.70	8.51	9.40	29.72	—	—
	Sep	0.46	9.56	8.73	9.28	0.09	—	—
	Oct	0.00	9.05	9.28	9.34	0.00	—	—
	Nov	21.25	9.44	9.75	9.52	25.08	—	—
	Dec	11.06	8.67	9.74	9.35	13.83	—	—
1997	Jan	2.58	8.77	9.27	8.94	—	—	—
	Feb	8.30	8.97	8.81	8.79	—	—	—
	Mar	6.00	8.62	11.59	10.05	—	—	—
	Apr	17.42	9.16	15.12	12.10	—	—	—
	May	6.31	9.49	16.56	13.98	—	—	—
	Jun	7.89	13.27	18.99	16.76	—	—	—
	Jul	4.95	17.84	21.55	20.38	—	—	—
	Aug	20.52	24.39	23.33	24.22	—	—	—
	Sep	65.12	32.90	27.27	28.41	—	—	—
	Oct	20.06	34.92	—	—	—	—	—
	Nov	35.79	37.02	—	—	—	—	—
	Dec	54.85	39.67	—	—	—	—	—

TABLE C6:
 QUARTERLY & YEARLY **CLASSIFICATION VALUE** MEANS for 1993 - 1997.

YEAR/ QUARTER	CV	CV(S ^{HBm})	CV(S ^W)	CV(S ^{B13})	CV _{GD}
1993 / 1	115.02	114.27	104.09	108.88	102.54
2	70.40	78.39	86.65	83.26	116.19
3	54.45	59.98	69.89	65.49	60.42
4	63.67	59.64	55.74	57.43	71.86
1993	74.58	78.07	79.09	78.76	89.23
1994 / 1	52.25	51.65	45.83	47.94	49.87
2	25.67	31.26	42.91	38.42	34.37
3	36.03	35.09	32.40	33.19	38.21
4	34.46	32.67	29.21	30.59	46.17
1994	36.91	37.67	37.59	37.53	41.58
1995 / 1	21.57	23.38	26.55	25.49	31.89
2	20.76	21.23	21.01	20.87	28.00
3	12.63	17.39	17.32	17.64	17.19
4	20.50	14.83	12.66	13.21	22.51
1995	18.91	19.21	19.39	19.30	25.32
1996 / 1	4.76	6.40	11.07	9.31	7.51
2	6.16	8.10	8.47	8.15	11.99
3	12.88	10.24	8.53	9.28	18.22
4	10.15	9.05	9.59	9.40	12.32
1996	8.37	8.45	9.41	9.04	12.87
1997 / 1	5.02	8.78	9.89	9.26	—
2	11.10	10.64	16.89	14.28	—
3	27.58	25.04	24.05	24.34	—
4	35.34	37.20	—	—	—
1997	20.09	20.42	—	—	—

NB: CV(S^{HBm}), CV(S^W) & CV(S^{B13}) quarterly values are means of 3 monthly values.
 CV(S^{HBm}), CV(S^W) & CV(S^{B13}) yearly values are means of 12 monthly values.
 CV_{GD} quarterly values are computed as quarterly CV means multiplied by quarterly k means.
 Annual values of CV_{GD} are annual Classification Value means multiplied by annual k means.

TABLE Q1:

MONTHLY QUALITY COUNT MEANS OF GDSO DATA for 1997.

QC = mean Quality Count (see list of definitions).

n = total number of observations.

w = mean weight.

Q = mean quietness [steadiness] of image (on the Kiepenheuer scale).

S = mean sharpness [clarity] of image (on the Kiepenheuer scale).

T = mean transparency of the atmosphere (1 = excellent, 5 = opaque).

C = mean condition $[(Q+S+T)/3]$.

MONTH	QC	Σg	n	w	Q	S	T	C
Jan	1.05	8	19	0.5019	1.76	2.11	2.24	2.0351
Feb	1.50	5	10	0.5056	1.65	2.05	2.35	2.0167
Mar	2.00	12	14	0.5372	1.57	1.89	2.18	1.8810
Apr	4.11	28	19	0.5179	1.61	2.03	2.26	1.9649
May	1.77	12	13	0.4780	1.88	2.27	2.42	2.1923
Jun	2.78	24	18	0.4460	1.97	2.31	2.50	2.2593
Jul	1.60	17	20	0.4923	1.72	2.08	2.40	2.0667
Aug	4.86	43	21	0.4688	1.76	2.26	2.45	2.1587
Sep	8.12	37	16	0.4694	1.69	2.25	2.56	2.1667
Oct	5.41	37	17	0.4424	1.79	2.44	2.68	2.3039
Nov	6.50	31	14	0.4222	2.00	2.46	2.75	2.4048
Dec	11.00	40	13	0.4322	2.04	2.42	2.58	2.3462
Year	4.14	295	194	0.4765	1.78	2.21	2.44	2.1460

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TABLE Q2:

ROTATIONAL QUALITY COUNT MEANS OF GDSO DATA.

Abbreviations as above.

ROT.	start date, UT	QC	Σg	n	w	Q	S	T	C
1917	1996/12/09.28	2.54	13	13	0.5428	1.54	1.96	2.15	1.8846
1918	1997/01/05.61	1.06	7	17	0.4995	1.79	2.09	2.26	2.0490
1919	1997/02/01.95	1.50	5	10	0.5056	1.65	2.05	2.35	2.0167
1920	1997/03/01.29	1.64	9	11	0.5341	1.59	1.86	2.23	1.8939
1921	1997/03/28.60	4.20	29	20	0.5279	1.58	2.00	2.20	1.9250
1922	1997/04/24.87	1.75	10	12	0.4922	1.79	2.17	2.33	2.0972
1923	1997/05/22.10	3.23	19	13	0.4394	2.00	2.42	2.54	2.3205
1924	1997/06/18.31	1.11	14	18	0.4637	1.92	2.14	2.47	2.1759
1925	1997/07/15.50	3.47	21	15	0.4770	1.80	2.23	2.43	2.1556
1926	1997/08/11.72	5.44	42	18	0.4765	1.67	2.22	2.47	2.1204
1927	1997/09/07.97	7.47	31	15	0.4782	1.63	2.20	2.53	2.1222
1928	1997/10/05.24	5.50	35	16	0.4388	1.81	2.47	2.69	2.3229
1929	1997/11/01.54	6.50	31	14	0.4222	2.00	2.46	2.75	2.4048
1930	1997/11/28.84	8.80	33	10	0.4183	2.10	2.50	2.65	2.4167

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TABLE Q3:
 COMPARED QUALITY COUNTS for 1996 - 1997.

Data unobtainable.

TABLE Q5:
 SMOOTHED QUALITY COUNT VALUES for 1996 - 1997.

The following are smoothed Quality Count values in three different systems.
 See page xii for all smoothing formulæ.

YEAR	MONTH	QC	QC(S ^{HBm})	QC(S ^W)	QC(S ^{B13})
1996	Jan	1.41	1.8948	2.0829	2.0021
	Feb	1.25	1.5554	2.0811	1.8972
	Mar	1.89	1.4831	2.0641	1.8259
	Apr	0.83	1.4745	1.8184	1.7108
	May	1.50	1.6985	1.6268	1.6438
	Jun	1.93	1.8471	1.6407	1.6709
	Jul	2.31	1.8328	1.6291	1.6977
	Aug	3.24	1.8203	1.6245	1.6872
	Sep	0.38	1.5952	1.6393	1.6478
	Oct	0.00	1.4814	1.7803	1.6788
	Nov	2.75	1.5819	1.9280	1.7678
	Dec	2.24	1.6079	1.9748	1.8352
1997	Jan	1.05	1.8135	1.9808	1.8927
	Feb	1.50	2.0225	2.0190	2.0049
	Mar	2.00	2.2178	2.4090	2.2910
	Apr	4.11	2.4350	2.9567	2.6754
	May	1.77	2.5819	3.3384	3.0421
	Jun	2.78	3.0806	3.8598	3.5287
	Jul	1.60	3.6638	4.3712	4.1349
	Aug	4.86	4.5781	4.7154	4.7542
	Sep	8.12	5.8294	5.2908	5.4068
	Oct	5.41	6.4612	—	—
	Nov	6.50	6.9812	—	—
	Dec	11.00	7.4800	—	—

TABLE Q6:
 QUARTERLY AND YEARLY **QUALITY COUNT** MEANS for 1993 - 1997.

YEAR/ QUARTER	QC	QC(S ^{HBm})	QC(S ^W)	QC(S ^{B13})
1993 / 1	16.83	16.59	14.91	15.66
2	10.47	11.67	12.55	12.19
3	7.86	8.63	10.49	9.66
4	9.17	9.00	8.63	8.82
1993	10.89	11.47	11.65	11.59
1994 / 1	10.00	8.84	7.51	7.99
2	4.30	5.71	7.21	6.67
3	5.83	5.90	5.85	5.80
4	5.96	5.71	5.28	5.49
1994	6.47	6.54	6.46	6.49
1995 / 1	5.14	4.82	4.75	4.78
2	3.29	3.73	3.82	3.78
3	2.37	2.86	3.12	3.02
4	3.09	2.53	2.31	2.38
1995	3.52	3.49	3.50	3.49
1996 / 1	1.57	1.64	2.08	1.91
2	1.38	1.67	1.70	1.68
3	2.09	1.75	1.63	1.68
4	1.58	1.56	1.89	1.76
1996	1.64	1.66	1.82	1.76
1997 / 1	1.47	2.02	2.14	2.06
2	3.02	2.70	3.38	3.08
3	4.63	4.69	4.79	4.77
4	7.41	6.97	—	—
1997	4.14	4.10	—	—

NB: QC(S^{HBm}), QC(S^W) & QC(S^{B13}) quarterly values are means of 3 monthly values.
 QC(S^{HBm}), QC(S^W) & QC(S^{B13}) yearly values are means of 12 monthly values.

TABLE I-1:

MONTHLY INTER-SOL INDEX MEANS OF GDSO DATA for 1997.

IS = mean Inter-Sol Index (k neglected; see list of definitions).

n = total number of observations.

w = mean weight.

Q = mean quietness [steadiness] of image (on the Kiepenheuer scale).

S = mean sharpness [clarity] of image (on the Kiepenheuer scale).

T = mean transparency of the atmosphere (1 = excellent, 5 = opaque).

C = mean condition [(Q+S+T)/3].

MONTH	IS	n	w	Q	S	T	C
Jan	1.74	19	0.5019	1.76	2.11	2.24	2.0351
Feb	3.00	10	0.5056	1.65	2.05	2.35	2.0167
Mar	4.14	14	0.5372	1.57	1.89	2.18	1.8810
Apr	8.63	19	0.5179	1.61	2.03	2.26	1.9649
May	2.00	13	0.4780	1.88	2.27	2.42	2.1923
Jun	5.17	18	0.4460	1.97	2.31	2.50	2.2593
Jul	2.90	20	0.4923	1.72	2.08	2.40	2.0667
Aug	11.14	21	0.4688	1.76	2.26	2.45	2.1587
Sep	22.81	16	0.4694	1.69	2.25	2.56	2.1667
Oct	9.53	17	0.4424	1.79	2.44	2.68	2.3039
Nov	18.14	14	0.4222	2.00	2.46	2.75	2.4048
Dec	18.69	13	0.4322	2.04	2.42	2.58	2.3462
Year	8.87	194	0.4765	1.78	2.21	2.44	2.1460

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TABLE I-2:

ROTATIONAL INTER-SOL INDEX MEANS OF GDSO DATA.

Abbreviations as above.

ROT.	start date, UT	IS	n	w	Q	S	T	C
1917	1996/12/09.28	3.77	13	0.5428	1.54	1.96	2.15	1.8846
1918	1997/01/05.61	1.59	17	0.4995	1.79	2.09	2.26	2.0490
1919	1997/02/01.95	3.00	10	0.5056	1.65	2.05	2.35	2.0167
1920	1997/03/01.29	2.45	11	0.5341	1.59	1.86	2.23	1.8939
1921	1997/03/28.60	9.50	20	0.5279	1.58	2.00	2.20	1.9250
1922	1997/04/24.87	1.67	12	0.4922	1.79	2.17	2.33	2.0972
1923	1997/05/22.10	5.77	13	0.4394	2.00	2.42	2.54	2.3205
1924	1997/06/18.31	2.06	18	0.4637	1.92	2.14	2.47	2.1759
1925	1997/07/15.50	6.67	15	0.4770	1.80	2.23	2.43	2.1556
1926	1997/08/11.72	12.56	18	0.4765	1.67	2.22	2.47	2.1204
1927	1997/09/07.97	21.87	15	0.4782	1.63	2.20	2.53	2.1222
1928	1997/10/05.24	9.81	16	0.4388	1.81	2.47	2.69	2.3229
1929	1997/11/01.54	18.14	14	0.4222	2.00	2.46	2.75	2.4048
1930	1997/11/28.84	17.40	10	0.4183	2.10	2.50	2.65	2.4167

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TABLE I-3:
CORRECTED INTER-SOL INDICES for 1996 - 1997.

As the GDSO is in suburban Auckland, it can suffer terrible atmospheric conditions, hence the ‘observed’ Inter-Sol Indices have to be upgraded to give reflections of international results. International [Inter-Sol Index] results are computed by Paderborn Public Observatory, Germany.

Below are the ‘observed’ Inter-Sol Indices along with the monthly k co-efficients and the corrected values (IS_{GD}) for 1996 - 1997. Paderborn’s final values (IS_I) are also stated. $I/GDSO$ = Paderborn’s mean (of days observed by the GDSO) divided by the GDSO’s monthly mean.

$I/GDSO_A$ = Paderborn’s mean (of days with GDSO k values) divided by the GDSO’s observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

s = sample standard deviation of k values.

s ‘SIDC’ = annual s computed on the SIDC formula.

Es = annual estimate of standard deviation.

	IS	k	IS_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k	IS_I
1996 Jan	3.27	1.3135	4.30	1.2004	1.2839	1.2764	22	13	5.51
Feb	2.62	1.7188	4.51	2.4604	0.9176	0.8133	8	4	1.77
Mar	3.84	1.1373	4.37	0.4143	1.2542	1.0614	19	10	4.60
Apr	1.17	1.7246	2.01	1.0786	1.5210	1.2662	18	6	2.10
May	3.06	1.2333	3.77	0.5081	1.5122	1.3525	18	8	3.76
Jun	3.14	1.3133	4.13	0.4642	1.4861	1.1786	14	7	5.15
Jul	5.08	1.6155	8.20	2.3201	1.0753	1.0261	13	10	5.59
Aug	7.24	1.1408	8.25	0.4762	1.0442	1.0442	17	17	6.59
Sep	0.69	1.5731	1.09	1.6219	2.0611	0.6811	13	2	1.22
Oct	0.00	—	0.00	—	∞	∞	19	0	0.08
Nov	10.69	1.2830	13.71	0.9696	0.9300	0.9300	16	10	9.55
Dec	3.12	1.2073	3.76	0.3749	1.2242	1.1698	17	9	4.51
1996 Means	3.65	1.3242	4.83	—	1.1219	1.0771	—	—	4.18
	$s = 1.0949$		s ‘SIDC’ = 0.9478			$Es = 0.1182$			
1997 Jan	1.74	1.0382	1.80	0.5883	1.1045	1.0109	19	8	1.35
Feb	3.00	2.1229	6.37	1.4795	1.3477	1.3340	10	3	3.58
Mar	4.14	1.4911	6.18	0.5629	1.3621	1.3526	14	11	4.10
Apr	8.63	1.1052	9.54	0.4172	1.0294	1.0060	19	15	7.29
May	2.00	2.3395	4.68	2.1315	1.7615	1.7323	13	11	7.40
Jun	5.17	1.2191	6.30	0.3620	1.1539	1.1424	18	17	6.69
Jul	2.90	1.8880	5.48	1.9826	1.4459	1.2784	20	10	3.95
Aug	11.14	1.6212	18.07	1.0102	1.2694	1.2554	21	19	11.70
Sep	22.81	1.2019	27.42	0.3785	1.0110	1.0110	16	16	24.10
Oct	9.53	1.2749	12.15	0.6311	1.1119	1.1119	17	17	9.54
Nov	18.14						14		
Dec	18.69						13		
1997 Means	8.87			—			—	—	
	$s =$		s ‘SIDC’ =			$Es =$			

TABLE I-4:

CORRECTED **INTER-SOL INDICES** for Rotations 1903 - 1930.

As a k value is attributed to each spotted observation, the k value for any specific rotation is the mean of all the k values for the rotation concerned.

The corrected values are labelled IS_{GD} .

$$IS_{GD} = IS \times k.$$

s = sample standard deviation of k values.

$I/GDSO$ = International mean (of days observed by the GDSO) divided by the GDSO's rotation mean.

$I/GDSO_A$ = International mean (of days observed by the GDSO) divided by the GDSO's observed mean for the *same* days.

n = number of GDSO observations.

n_k = number of k values.

ROTA- TION	START DATE, UT	IS	k	IS_{GD}	s	$I/GDSO$	$I/GDSO_A$	n	n_k
1903	1995/11/23.40	2.57	1.4688	3.78	0.6532	1.2606	1.2467	14	9
1904	1995/12/20.72	5.62	0.9524	5.35	0.4109	1.2108	1.1941	13	7
1905	1996/01/17.06	0.75	1.4389	1.08	1.4193	1.4217	1.3767	16	9
1906	1996/02/13.40	1.71	1.5477	2.65	2.1648	1.2904	0.8196	14	5
1907	1996/03/11.73	4.33	1.2174	5.28	0.5628	1.1445	1.0618	18	12
1908	1996/04/08.03	0.93	2.0825	1.93	1.2480	1.8754	1.4354	14	3
1909	1996/05/05.28	3.67	1.2333	4.52	0.5081	1.4785	1.3525	15	8
1910	1996/06/01.50	2.92	1.3791	4.03	0.4713	1.5758	1.2197	13	6
1911	1996/06/28.70	4.50	1.7365	7.81	2.6153	1.0600	1.0056	10	8
1912	1996/07/25.90	8.00	1.0160	8.13	0.2646	1.0062	0.9999	16	15
1913	1996/08/22.13	2.58	1.4974	3.87	0.8716	1.2458	1.1148	12	7
1914	1996/09/18.39	0.00	—	0.00	—	∞	∞	14	0
1915	1996/10/15.67	0.00	—	0.00	—	∞	∞	17	0
1916	1996/11/11.97	11.31	1.3608	15.39	0.9004	0.9812	0.9777	16	12
1917	1996/12/09.28	3.77	1.0053	3.79	0.2384	1.0355	0.9822	13	8
1918	1997/01/05.61	1.59	1.0899	1.73	0.6155	1.1863	1.0852	17	7
1919	1997/02/01.95	3.00	2.1229	6.37	1.4795	1.3477	1.3340	10	3
1920	1997/03/01.29	2.45	1.5359	3.77	0.6122	1.3570	1.3367	11	8
1921	1997/03/28.60	9.50	1.1386	10.82	0.4376	1.0647	1.0561	20	17
1922	1997/04/24.87	1.67	2.1172	3.53	1.9120	1.9240	1.7765	12	9
1923	1997/05/22.10	5.77	1.5670	9.04	1.3608	1.2239	1.2239	13	13
1924	1997/06/18.31	2.06	1.2921	2.66	0.5906	1.3524	1.1670	18	11
1925	1997/07/15.50	6.67	1.8749	12.50	1.8359	1.3507	1.3115	15	11
1926	1997/08/11.72	12.56	1.5616	19.61	1.1169	1.1705	1.1560	18	16
1927	1997/09/07.97	21.87	1.2450	27.22	0.3699	1.0307	1.0307	15	15
1928	1997/10/05.24	9.81	1.2785	12.55	0.6516	1.1085	1.1085	16	16
1929	1997/11/01.54	18.14						14	
1930	1997/11/28.84	17.40						10	

TABLE I-5:
SMOOTHED INTER-SOL INDICES for 1995 - 1997.

The following are smoothed Inter-Sol Indices in three different systems.
See page xii for all smoothing formulæ.

YEAR	MONTH	IS	IS(S ^{HBm})	IS(S ^W)	IS(S ^{B13})	IS _{GD}	IS _{GD} (S ^W)	IS _{GD} (S ^{B13})
1995	Jan	5.17	10.73	10.90	11.02	6.76	13.31	13.35
	Feb	14.42	11.06	10.37	10.80	17.22	12.51	13.09
	Mar	14.62	11.58	9.92	10.41	18.38	11.89	12.65
	Apr	11.71	10.97	9.09	9.69	12.29	11.06	11.86
	May	9.22	9.90	8.39	8.94	12.05	10.37	11.01
	Jun	8.95	8.11	7.93	8.18	11.50	9.74	10.06
	Jul	5.33	6.66	7.50	7.31	6.95	9.21	8.99
	Aug	5.24	5.66	6.93	6.39	6.06	8.58	7.89
	Sep	1.75	4.89	5.99	5.52	2.65	7.45	6.84
	Oct	9.08	4.67	5.10	4.82	10.06	6.42	6.03
	Nov	3.11	4.05	4.41	4.22	4.14	5.64	5.35
	Dec	2.38	3.61	3.91	3.74	3.26	4.99	4.80
1996	Jan	3.27	3.27	3.66	3.46	4.30	4.74	4.51
	Feb	2.62	2.82	3.73	3.37	4.51	4.88	4.47
	Mar	3.84	2.81	3.77	3.34	4.37	4.91	4.46
	Apr	1.17	2.83	3.35	3.22	2.01	4.42	4.33
	May	3.06	3.30	3.28	3.27	3.77	4.40	4.40
	Jun	3.14	3.64	3.63	3.53	4.13	4.82	4.72
	Jul	5.08	3.76	3.60	3.70	8.20	4.74	4.90
	Aug	7.24	4.14	3.55	3.76	8.25	4.71	4.95
	Sep	0.69	3.89	3.58	3.76	1.09	4.86	4.98
	Oct	0.00	3.85	3.90	3.91	0.00	5.25	5.19
	Nov	10.69	4.20	4.17	4.09	13.71	5.61	5.45
	Dec	3.12	3.79	4.21	4.11	3.76	5.73	5.53
1997	Jan	1.74	3.97	4.20	4.07	1.80	5.71	5.56
	Feb	3.00	4.11	4.27	4.18	6.37	6.01	5.86
	Mar	4.14	4.20	5.36	4.78	6.18	7.51	6.74
	Apr	8.63	4.62	6.68	5.61	9.54	9.12	7.84
	May	2.00	4.85	7.38	6.42	4.68	—	—
	Jun	5.17	6.37	8.34	7.57	6.30	—	—
	Jul	2.90	8.02	9.36	9.02	5.48	—	—
	Aug	11.14	10.70	10.22	10.53	18.07	—	—
	Sep	22.81	13.70	11.88	12.18	27.42	—	—
	Oct	9.53	14.63	—	—	12.15	—	—
	Nov	18.14	15.62	—	—	—	—	—
	Dec	18.69	16.54	—	—	—	—	—

TABLE I-6:

QUARTERLY & YEARLY **INTER-SOL INDEX** MEANS for 1993 - 1997.

YEAR/ QUARTER	IS	IS(S ^{HBm})	IS(S ^W)	IS(S ^{B13})	IS _{GD}
1993 / 1	34.50	33.10	29.19	30.97	38.51
2	24.47	25.08	24.86	24.80	29.91
3	12.51	16.31	23.03	20.36	14.79
4	23.15	21.22	17.96	19.20	24.12
1993	23.23	23.93	23.76	23.84	26.48
1994 / 1	21.27	19.23	15.86	17.21	23.36
2	7.41	10.37	14.99	13.22	10.49
3	10.26	11.14	11.08	10.94	13.94
4	12.09	11.29	11.04	11.18	15.23
1994	12.62	13.01	13.24	13.14	16.11
1995 / 1	11.54	11.12	10.40	10.74	14.64
2	9.89	9.66	8.47	8.94	12.22
3	4.18	5.74	6.81	6.41	5.49
4	4.66	4.11	4.47	4.26	5.96
1995	7.81	7.66	7.54	7.59	9.92
1996 / 1	3.39	2.96	3.72	3.39	4.43
2	2.40	3.26	3.42	3.34	3.36
3	4.60	3.93	3.57	3.74	6.14
4	4.31	3.95	4.09	4.03	5.37
1996	3.65	3.53	3.70	3.63	4.83
1997 / 1	2.81	4.10	4.61	4.34	3.97
2	5.66	5.28	7.47	6.53	8.30
3	11.53	10.81	10.49	10.58	17.65
4	14.98	15.60	—	—	—
1997	8.87	8.95	—	—	—

NB: IS(S^{HBm}), IS(S^W) & IS(S^{B13}) quarterly values are means of 3 monthly values.

IS(S^{HBm}), IS(S^W) & IS(S^{B13}) yearly values are means of 12 monthly values.

IS_{GD} quarterly values are computed as quarterly IS means multiplied by quarterly k means.

Annual values of IS_{GD} are annual Inter-Sol means multiplied by annual k means.

MISCELLANEOUS DATA.

TABLE M7:

REGION CLASSIFICATION PERCENTAGES 1995 - 1997.

		A	B	C	D	E	F	G	H	J	Σg	NOBS
1995	Jan	11.1	22.2	50.0	11.1	0.0	0.0	0.0	0.0	5.6	18	18
	Feb	21.2	18.2	30.3	15.2	3.0	0.0	0.0	0.0	12.1	33	12
	Mar	15.8	12.3	35.1	29.8	0.0	0.0	0.0	0.0	7.0	57	26
	Apr	15.8	15.8	31.6	21.1	15.8	0.0	0.0	0.0	0.0	19	17
	May	10.5	15.8	15.8	42.1	0.0	0.0	0.0	10.5	5.3	19	18
	Jun	16.7	16.7	41.7	12.5	8.3	0.0	0.0	0.0	4.2	24	20
	Jul	10.0	20.0	40.0	15.0	0.0	0.0	0.0	10.0	5.0	20	18
	Aug	12.5	12.5	37.5	25.0	0.0	0.0	0.0	0.0	12.5	16	17
	Sep	18.2	18.2	27.3	0.0	0.0	0.0	0.0	0.0	36.4	11	16
	Oct	26.9	7.7	42.3	11.5	0.0	0.0	0.0	3.8	7.7	26	13
	Nov	25.0	10.0	40.0	0.0	0.0	0.0	0.0	10.0	15.0	20	18
	Dec	30.8	15.4	30.8	7.7	0.0	0.0	0.0	0.0	15.4	13	13
1995		17.8	14.9	35.5	18.1	2.2	0.0	0.0	2.5	9.1	276	206
1996	Jan	58.8	5.9	29.4	5.9	0.0	0.0	0.0	0.0	0.0	17	22
	Feb	50.0	33.3	16.7	0.0	0.0	0.0	0.0	0.0	0.0	6	8
	Mar	7.7	23.1	53.8	15.4	0.0	0.0	0.0	0.0	0.0	13	19
	Apr	33.3	16.7	16.7	33.3	0.0	0.0	0.0	0.0	0.0	6	18
	May	0.0	25.0	12.5	62.5	0.0	0.0	0.0	0.0	0.0	8	18
	Jun	25.0	16.7	33.3	8.3	0.0	0.0	0.0	0.0	16.7	12	14
	Jul	27.3	18.2	9.1	45.5	0.0	0.0	0.0	0.0	0.0	11	13
	Aug	29.2	25.0	25.0	16.7	0.0	0.0	0.0	0.0	4.2	24	17
	Sep	33.3	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	13
	Oct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	19
	Nov	14.3	21.4	14.3	35.7	14.3	0.0	0.0	0.0	0.0	14	16
	Dec	0.0	14.3	42.9	14.3	0.0	0.0	0.0	0.0	28.6	14	17
1996		25.0	20.3	26.6	21.1	1.6	0.0	0.0	0.0	5.5	128	194
1997	Jan	0.0	62.5	25.0	12.5	0.0	0.0	0.0	0.0	0.0	8	19
	Feb	20.0	0.0	40.0	40.0	0.0	0.0	0.0	0.0	0.0	5	10
	Mar	16.7	33.3	33.3	8.3	0.0	0.0	0.0	0.0	8.3	12	14
	Apr	17.9	14.3	28.6	28.6	3.6	0.0	0.0	0.0	7.1	28	19
	May	25.0	16.7	16.7	0.0	0.0	0.0	0.0	0.0	41.7	12	13
	Jun	33.3	41.7	8.3	16.7	0.0	0.0	0.0	0.0	0.0	24	18
	Jul	47.1	29.4	11.8	11.8	0.0	0.0	0.0	0.0	0.0	17	20
	Aug	20.9	16.3	16.3	14.0	4.7	0.0	0.0	0.0	27.9	43	21
	Sep	5.4	5.4	29.7	43.2	13.5	0.0	0.0	0.0	2.7	37	16
	Oct	18.9	21.6	35.1	16.2	0.0	0.0	0.0	0.0	8.1	37	17
	Nov	25.8	3.2	35.5	12.9	19.4	0.0	0.0	0.0	3.2	31	14
	Dec	12.5	15.0	17.5	30.0	5.0	0.0	0.0	7.5	12.5	40	13
1997		19.7	18.4	24.1	21.1	5.4	0.0	0.0	1.0	10.2	294	194

MISCELLANEOUS DATA continued.

TABLE M8:
REGION CLASSIFICATION MEANS 1995 - 1997.

YEAR	MONTH	A	B	C	D	E	F	G	H	J	Σg	NOBS
1995	Jan	0.11	0.22	0.50	0.11	0.00	0.00	0.00	0.00	0.06	18	18
	Feb	0.58	0.50	0.83	0.42	0.08	0.00	0.00	0.00	0.33	33	12
	Mar	0.35	0.27	0.77	0.65	0.00	0.00	0.00	0.00	0.15	57	26
	Apr	0.18	0.18	0.35	0.24	0.18	0.00	0.00	0.00	0.00	19	17
	May	0.11	0.17	0.17	0.44	0.00	0.00	0.00	0.11	0.06	19	18
	Jun	0.20	0.20	0.50	0.15	0.10	0.00	0.00	0.00	0.05	24	20
	Jul	0.11	0.22	0.44	0.17	0.00	0.00	0.00	0.11	0.06	20	18
	Aug	0.12	0.12	0.35	0.24	0.00	0.00	0.00	0.00	0.12	16	17
	Sep	0.12	0.12	0.19	0.00	0.00	0.00	0.00	0.00	0.25	11	16
	Oct	0.54	0.15	0.85	0.23	0.00	0.00	0.00	0.08	0.15	26	13
	Nov	0.28	0.11	0.44	0.00	0.00	0.00	0.00	0.11	0.17	20	18
	Dec	0.31	0.15	0.31	0.08	0.00	0.00	0.00	0.00	0.15	13	13
1995		0.24	0.20	0.48	0.24	0.03	0.00	0.00	0.03	0.12	276	206
1996	Jan	0.45	0.05	0.23	0.05	0.00	0.00	0.00	0.00	0.00	17	22
	Feb	0.38	0.25	0.12	0.00	0.00	0.00	0.00	0.00	0.00	6	8
	Mar	0.05	0.16	0.37	0.11	0.00	0.00	0.00	0.00	0.00	13	19
	Apr	0.11	0.06	0.06	0.11	0.00	0.00	0.00	0.00	0.00	6	18
	May	0.00	0.11	0.06	0.28	0.00	0.00	0.00	0.00	0.00	8	18
	Jun	0.21	0.14	0.29	0.07	0.00	0.00	0.00	0.00	0.14	12	14
	Jul	0.23	0.15	0.08	0.38	0.00	0.00	0.00	0.00	0.00	11	13
	Aug	0.41	0.35	0.35	0.24	0.00	0.00	0.00	0.00	0.06	24	17
	Sep	0.08	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3	13
	Oct	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	19
	Nov	0.12	0.19	0.12	0.31	0.12	0.00	0.00	0.00	0.00	14	16
	Dec	0.00	0.12	0.35	0.12	0.00	0.00	0.00	0.00	0.24	14	17
1996		0.16	0.13	0.18	0.14	0.01	0.00	0.00	0.00	0.04	128	194
1997	Jan	0.00	0.26	0.11	0.05	0.00	0.00	0.00	0.00	0.00	8	19
	Feb	0.10	0.00	0.20	0.20	0.00	0.00	0.00	0.00	0.00	5	10
	Mar	0.14	0.29	0.29	0.07	0.00	0.00	0.00	0.00	0.07	12	14
	Apr	0.26	0.21	0.42	0.42	0.05	0.00	0.00	0.00	0.11	28	19
	May	0.23	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.38	12	13
	Jun	0.44	0.56	0.11	0.22	0.00	0.00	0.00	0.00	0.00	24	18
	Jul	0.40	0.25	0.10	0.10	0.00	0.00	0.00	0.00	0.00	17	20
	Aug	0.43	0.33	0.33	0.29	0.10	0.00	0.00	0.00	0.57	43	21
	Sep	0.12	0.12	0.69	1.00	0.31	0.00	0.00	0.00	0.06	37	16
	Oct	0.41	0.47	0.76	0.35	0.00	0.00	0.00	0.00	0.18	37	17
	Nov	0.57	0.07	0.79	0.29	0.43	0.00	0.00	0.00	0.07	31	14
	Dec	0.38	0.46	0.54	0.92	0.15	0.00	0.00	0.23	0.38	40	13
1997		0.30	0.28	0.37	0.32	0.08	0.00	0.00	0.02	0.15	294	194

MISCELLANEOUS DATA continued.

TABLE M9A:
PENUMBRA/GROUP MEANS 1996 - 1997.

The following $\overline{p/g}$ data are obtained by averaging each p/g value from every observation within the period concerned, ie. the number of penumbrae per group per observation.

The $\overline{p/g}$ data are obtained by dividing the total number of penumbrae by the total number of groups within the period concerned, ie. the number of penumbrae per group, the true arithmetical mean.

s values are sample standard deviations.

n = number of observations.

OWS = observations *with* sunspots.

YEAR	MTH	$\overline{p/g}$	<i>s</i>	$\overline{p/g(S^W)}$	$\overline{p/g(S^{B13})}$	$\overline{p/g}$	$\overline{p/g(S^W)}$	$\overline{p/g(S^{B13})}$	n	OWS
1996	Jan	0.2949	0.4914	0.7807	0.6967	0.4706	0.7808	0.6998	22	13
	Feb	0.1250	0.2500	0.7928	0.7251	0.1667	0.7863	0.7228	8	4
	Mar	0.9000	0.5164	0.7617	0.7595	0.8462	0.7476	0.7498	19	10
	Apr	0.8333	0.9832	0.6998	0.7770	0.8333	0.6826	0.7624	18	6
	May	1.5000	1.0690	0.7205	0.7999	1.5000	0.7004	0.7807	18	8
	Jun	0.7619	0.6516	0.7952	0.8323	0.6667	0.7757	0.8077	14	7
	Jul	1.3000	1.4181	0.8208	0.8463	1.2727	0.7959	0.8146	13	10
	Aug	0.7647	0.7314	0.8727	0.8489	0.7083	0.8485	0.8157	17	17
	Sep	0.0000	0.0000	0.9070	0.8435	0.0000	0.8924	0.8160	13	2
	Oct	—	—	0.9063	0.8543	—	0.8948	0.8323	19	0
	Nov	2.1000	2.1187	0.8786	0.8753	2.0000	0.8666	0.8587	16	10
	Dec	1.1667	0.7500	0.8329	0.8746	1.0714	0.8180	0.8645	17	14
1996		0.9705	1.1273	—	—	0.9297	—	—	194	96
1997	Jan	0.5000	0.7559	0.7774	0.8524	0.5000	0.7717	0.8533	19	8
	Feb	1.1667	1.0408	0.7394	0.8312	1.4000	0.7450	0.8427	10	3
	Mar	0.6818	0.9020	0.8160	0.8362	0.6667	0.8275	0.8530	14	11
	Apr	1.0333	0.6522	0.9174	0.8407	1.0714	0.9334	0.8604	19	15
	May	0.6364	0.5045	0.9231	0.8211	0.5833	0.9432	0.8438	13	11
	Jun	0.5294	0.8564	0.9063	0.8210	0.4167	0.9309	0.8465	18	17
	Jul	0.2000	0.4216	0.9314	0.8640	0.4118	0.9608	0.8913	20	10
	Aug	0.9518	0.3207	0.9378	0.9213	0.9302	0.9635	0.9469	21	19
	Sep	1.6510	0.7675	0.9785	0.9907	1.7568	0.9919	1.0122	16	16
	Oct	0.7843	0.5230	—	—	0.7838	—	—	17	17
	Nov	1.4524	0.7856	—	—	1.4516	—	—	14	14
	Dec	1.4103	0.5417	—	—	1.3250	—	—	13	13
1997		0.9416	0.7658	—	—	1.0374	—	—	194	154

MISCELLANEOUS DATA continued.

TABLE M9B:
SUNSPOT/GROUP MEANS 1996 - 1997.

The following $\overline{f/g}$ data are obtained by averaging each $\overline{f/g}$ value from every observation within the period concerned, ie. the number of penumbrae per group per observation.

The f/g data are obtained by dividing the total number of penumbrae by the total number of groups within the period concerned, ie. the number of penumbrae per group, the true arithmetical mean.

s values are sample standard deviations.

Σg = number of regions observed.

n = number of observations.

YEAR	MTH	$\overline{f/g}$	s	$\overline{f/g(S^W)}$	$\overline{f/g(S^{B13})}$	$\overline{f/g}$	$\overline{f/g(S^W)}$	$\overline{f/g(S^{B13})}$	Σg	n	OVS
1996	Jan	2.6282	2.8949	3.5568	3.2754	3.8235	3.5785	3.3875	17	22	13
	Feb	2.7500	1.4434	3.6040	3.4442	3.0000	3.6129	3.5283	6	8	4
	Mar	4.8000	2.1108	3.6009	3.6363	4.6923	3.6065	3.6755	13	19	10
	Apr	2.8333	2.2286	3.4493	3.7428	2.8333	3.4532	3.7421	6	18	6
	May	5.8750	3.3568	3.6859	3.9129	5.8750	3.6671	3.8663	8	18	8
	Jun	3.6905	4.6671	4.1381	4.1489	3.0833	4.0955	4.0485	12	14	7
	Jul	5.5500	4.6812	4.2159	4.2589	5.2727	4.1174	4.1073	11	13	10
	Aug	4.6765	3.7622	4.3095	4.2959	4.4167	4.1800	4.1289	24	17	17
	Sep	2.0000	1.4142	4.3624	4.2996	2.3333	4.2463	4.1476	3	13	2
	Oct	—	—	4.4390	4.3933	—	4.3157	4.2478	0	19	0
	Nov	12.1500	11.9188	4.3687	4.4738	11.3571	4.2420	4.3383	14	16	10
	Dec	3.3889	1.9650	4.1936	4.3993	3.0714	4.0788	4.2922	14	17	9
1996		4.9375	5.4421	—	—	4.8281	—	—	128	194	96
1997	Jan	3.1250	0.9910	4.0412	4.2558	3.1250	3.9844	4.1966	8	19	8
	Feb	4.5000	4.0927	3.9124	4.1385	5.2000	3.9062	4.1202	5	10	3
	Mar	4.3182	3.5936	4.1759	4.1410	4.0833	4.2031	4.1528	12	14	11
	Apr	5.1556	2.7592	4.5761	4.1604	5.1071	4.6307	4.2107	28	19	15
	May	1.8636	1.4507	4.5462	4.0941	1.8333	4.6200	4.1858	12	13	11
	Jun	3.5000	2.2430	4.4658	4.1609	3.2083	4.5522	4.2806	24	18	17
	Jul	2.0833	1.6087	4.6432	4.4200	2.8824	4.7401	4.5532	17	20	10
	Aug	5.0526	4.2005	4.7174	4.6995	4.9302	4.8238	4.8401	43	21	19
	Sep	7.9479	5.3607	4.8845	4.9939	8.9459	4.9718	5.1296	37	16	16
	Oct	3.6569	2.3158	—	—	3.6486	—	—	37	17	17
	Nov	7.7738	4.9414	—	—	7.4516	—	—	31	14	14
	Dec	5.8359	2.4560	—	—	5.3500	—	—	40	13	13
1997		4.7675	3.7654	—	—	5.1497	—	—	294	194	154

MISCELLANEOUS DATA continued.

TABLE M9C:

GROUP COMPLEXITY INDICES 1996 - 1997.

The Group Complexity Index (GCI) is an index for showing how complex sunspot groups can get throughout the sunspot cycle. It is not an activity index like the Wolf Number etc.

The GCI is computed as $(\bar{p} + \bar{f})/\bar{g}$ as long as there is the same number of observations for each component, as well as the same observations for each component, whatever period is concerned. If the three components are not common to all observations, then incomplete observations are ignored.

The minimum GCI value is 1 (spotless observations do not count), and the approximate maximum value is about 20.

Σg = number of regions observed.

n = number of observations.

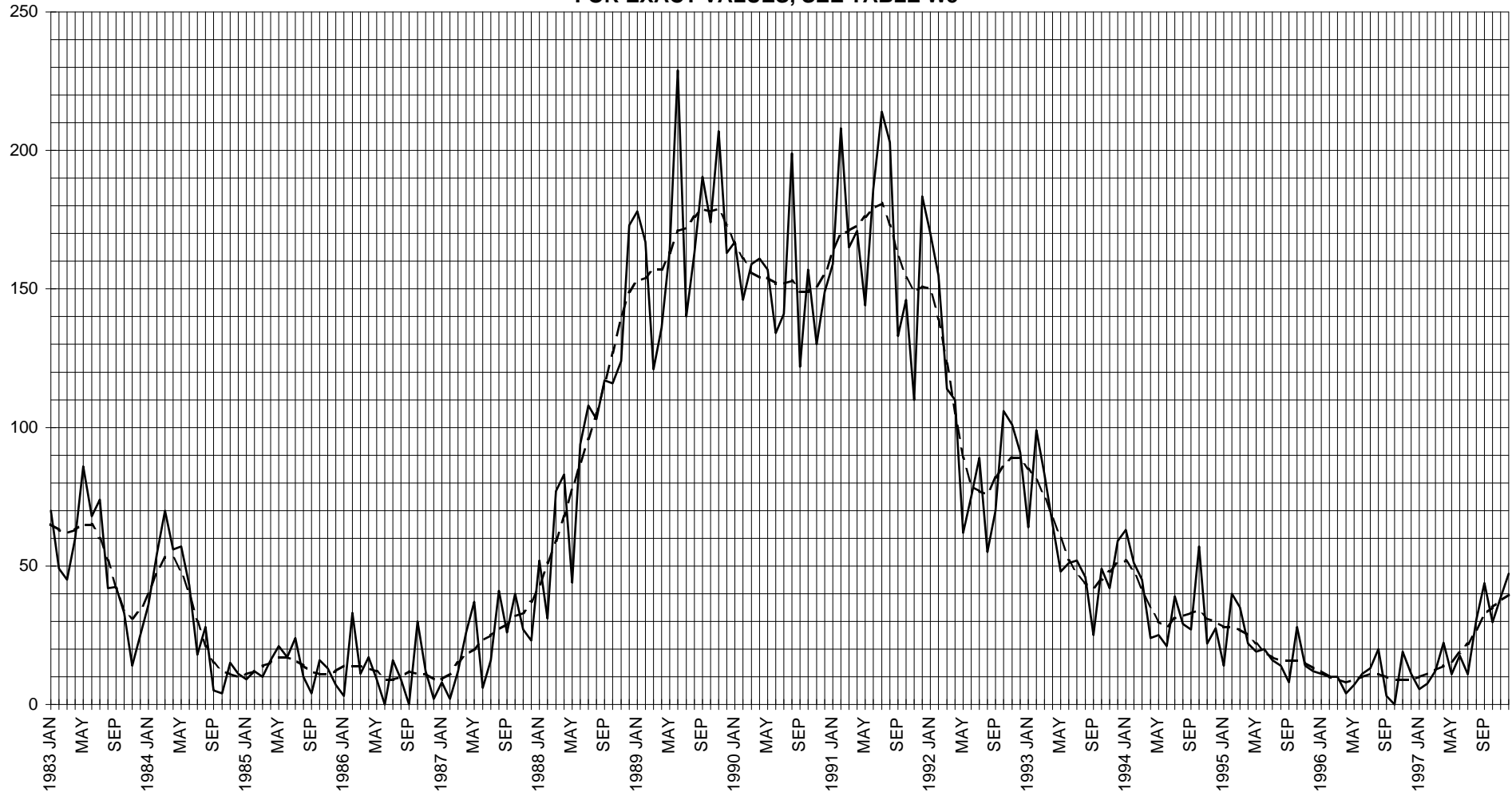
OWS = observations *with* sunspots.

YEAR	MTH	\bar{p}/\bar{g}	\bar{f}/\bar{g}	GCI	GCI(S ^w)	GCI(S ^{B13})	Σg	n	OWS
1996	Jan	0.4706	3.8235	4.2941	4.3593	4.0873	17	22	13
	Feb	0.1667	3.0000	3.1667	4.3992	4.2512	6	8	4
	Mar	0.8462	4.6923	5.5385	4.3541	4.4253	13	19	10
	Apr	0.8333	2.8333	3.6667	4.1358	4.5045	6	18	6
	May	1.5000	5.8750	7.3750	4.3675	4.6471	8	18	8
	Jun	0.6667	3.0833	3.7500	4.8712	4.8562	12	14	7
	Jul	1.2727	5.2727	6.5455	4.9134	4.9219	11	13	10
	Aug	0.7083	4.4167	5.1250	5.0285	4.9447	24	17	17
	Sep	0.0000	2.3333	2.3333	5.1387	4.9636	3	13	2
	Oct	—	—	—	5.2105	5.0802	0	19	0
	Nov	2.0000	11.3571	13.3571	5.1086	5.1970	14	16	10
	Dec	1.0714	3.0714	4.1429	4.8968	5.1567	14	17	9
1996		0.9297	4.8281	5.7578	—	—	128	194	96
1997	Jan	0.5000	3.1250	3.6250	4.7561	5.0500	8	19	8
	Feb	1.4000	5.2000	6.6000	4.6513	4.9630	5	10	3
	Mar	0.6667	4.0833	4.7500	5.0307	5.0058	12	14	11
	Apr	1.0714	5.1071	6.1786	5.5641	5.0712	28	19	15
	May	0.5833	1.8333	2.4167	5.5632	5.0296	12	13	11
	Jun	0.4167	3.2083	3.6250	5.4831	5.1271	24	18	17
	Jul	0.4118	2.8824	3.2941	5.7010	5.4445	17	20	10
	Aug	0.9302	4.9302	5.8605	5.7873	5.7870	43	21	19
	Sep	1.7568	8.9459	10.7027	5.9638	6.1418	37	16	16
	Oct	0.7838	3.6486	4.4324	—	—	37	17	17
	Nov	1.4516	7.4516	8.9032	—	—	31	14	14
	Dec	1.3250	5.3500	6.6750	—	—	40	13	13
1997		1.0374	5.1497	6.1871	—	—	294	194	154

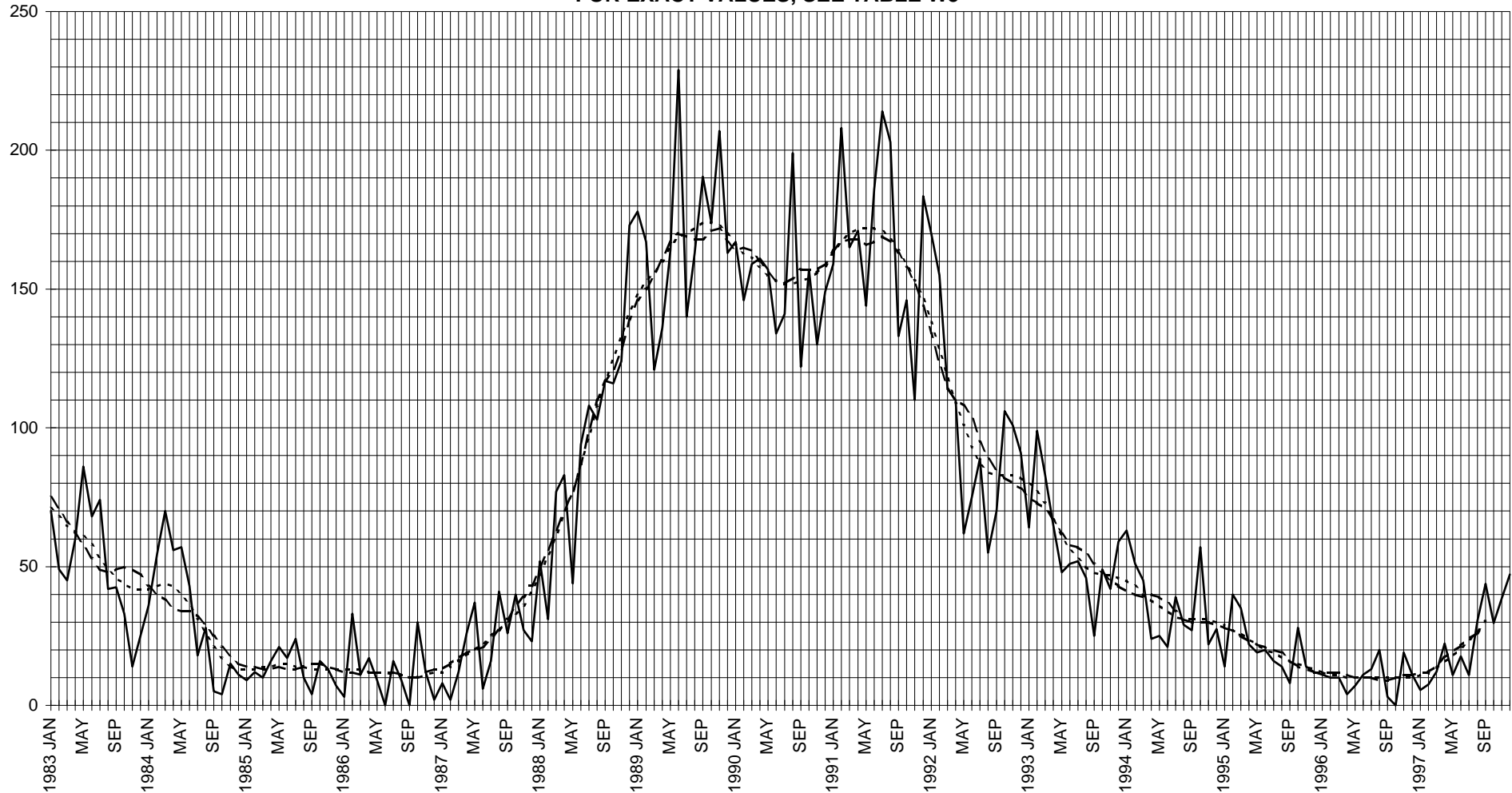
OBSERVED and SMOOTHED GDSO WOLF NUMBERS (WN and WN[SHBm]) 1983-1997

SOLID = OBSERVED, DASHED = SHBm

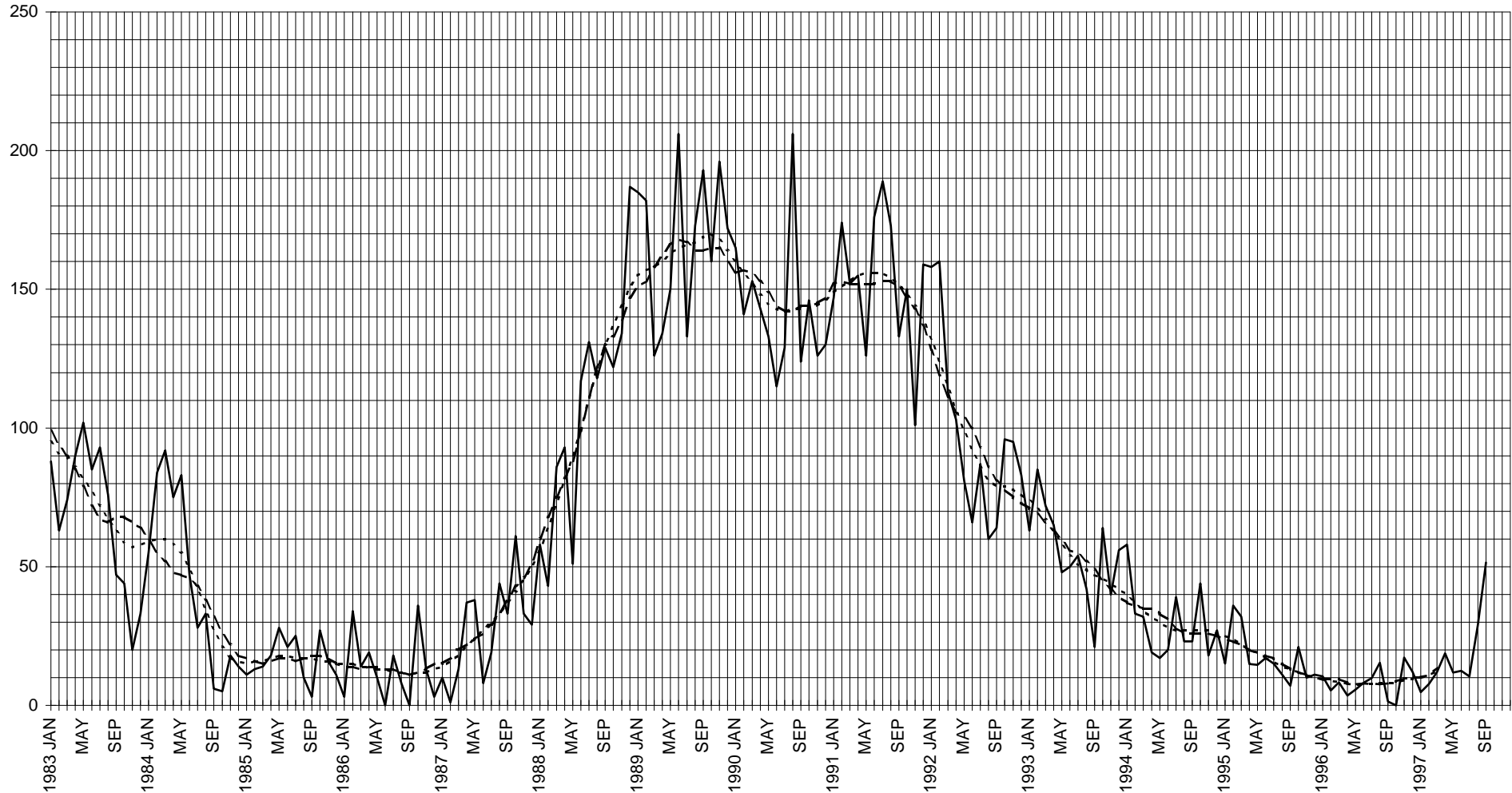
FOR EXACT VALUES, SEE TABLE W5



OBSERVED and SMOOTHED GDSO WOLF NUMBERS (WN, WN[SW] and WN[SB13]) 1983-1997
SOLID = OBSERVED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE TABLE W5



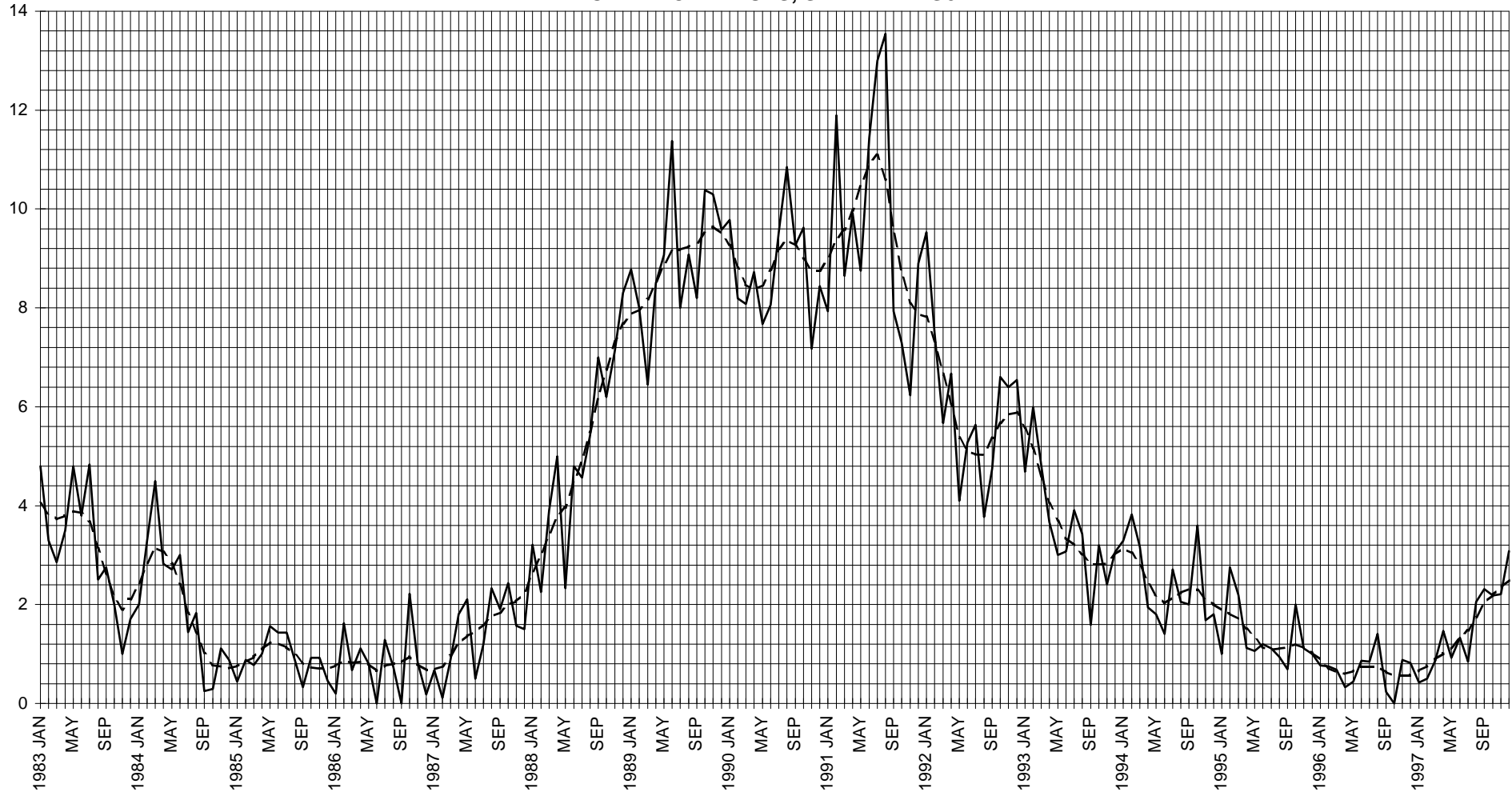
CORRECTED and SMOOTHED GDSO WOLF NUMBERS (R_{GD} , $R_{GD}[SW]$ and $R_{GD}[SB13]$) 1983-1997
SOLID = CORRECTED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE TABLE W5



OBSERVED and SMOOTHED GDSO ACTIVE AREAS (g and g[SHBm]) 1983-1997

SOLID = OBSERVED, DASHED = SHBm

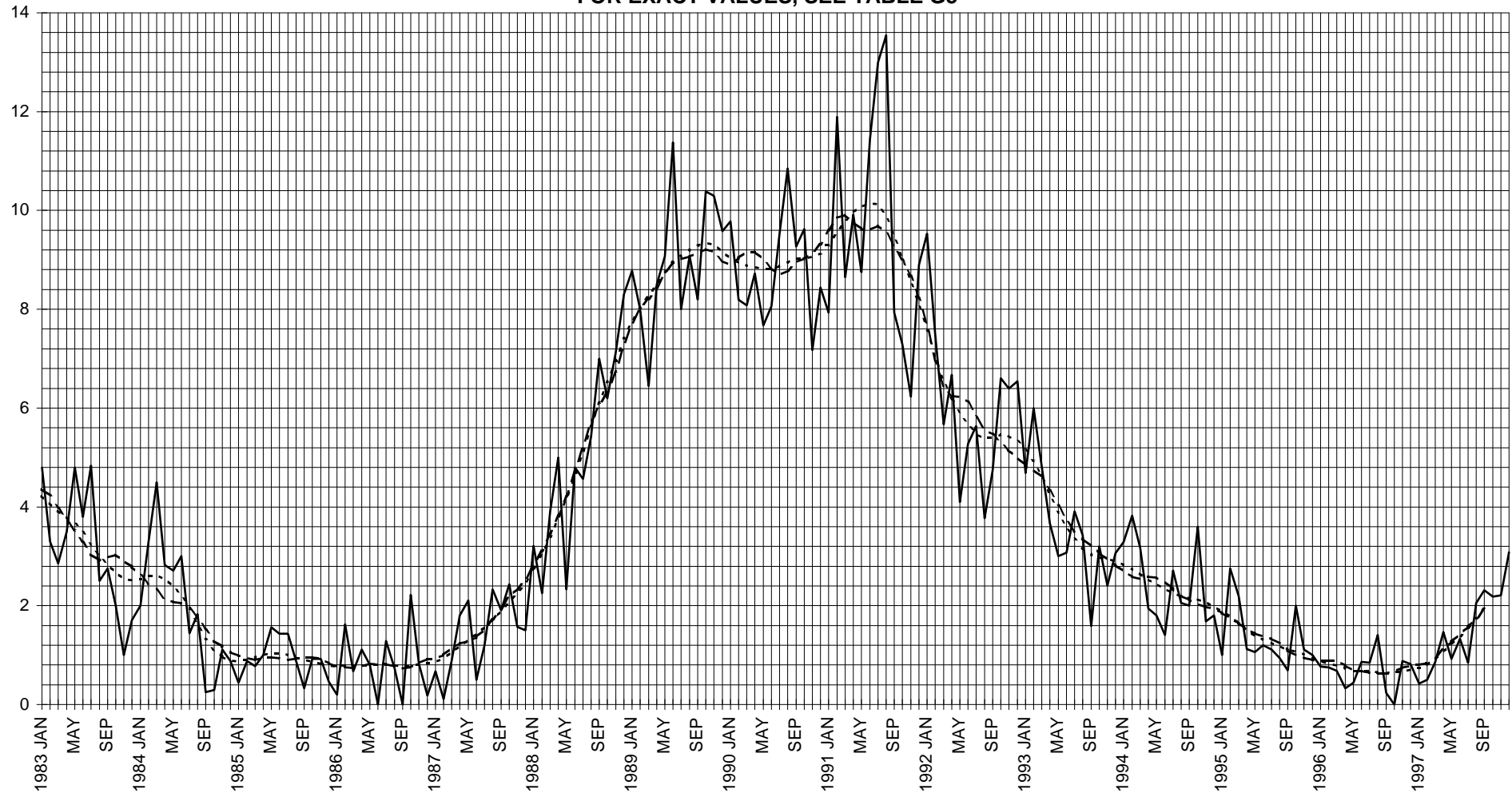
FOR EXACT VALUES, SEE TABLE G5



OBSERVED and SMOOTHED GDSO ACTIVE AREAS (g, g[SW] and g[SB13]) 1983-1997

SOLID = OBSERVED, DASHED = SW, DOTTED = SB13

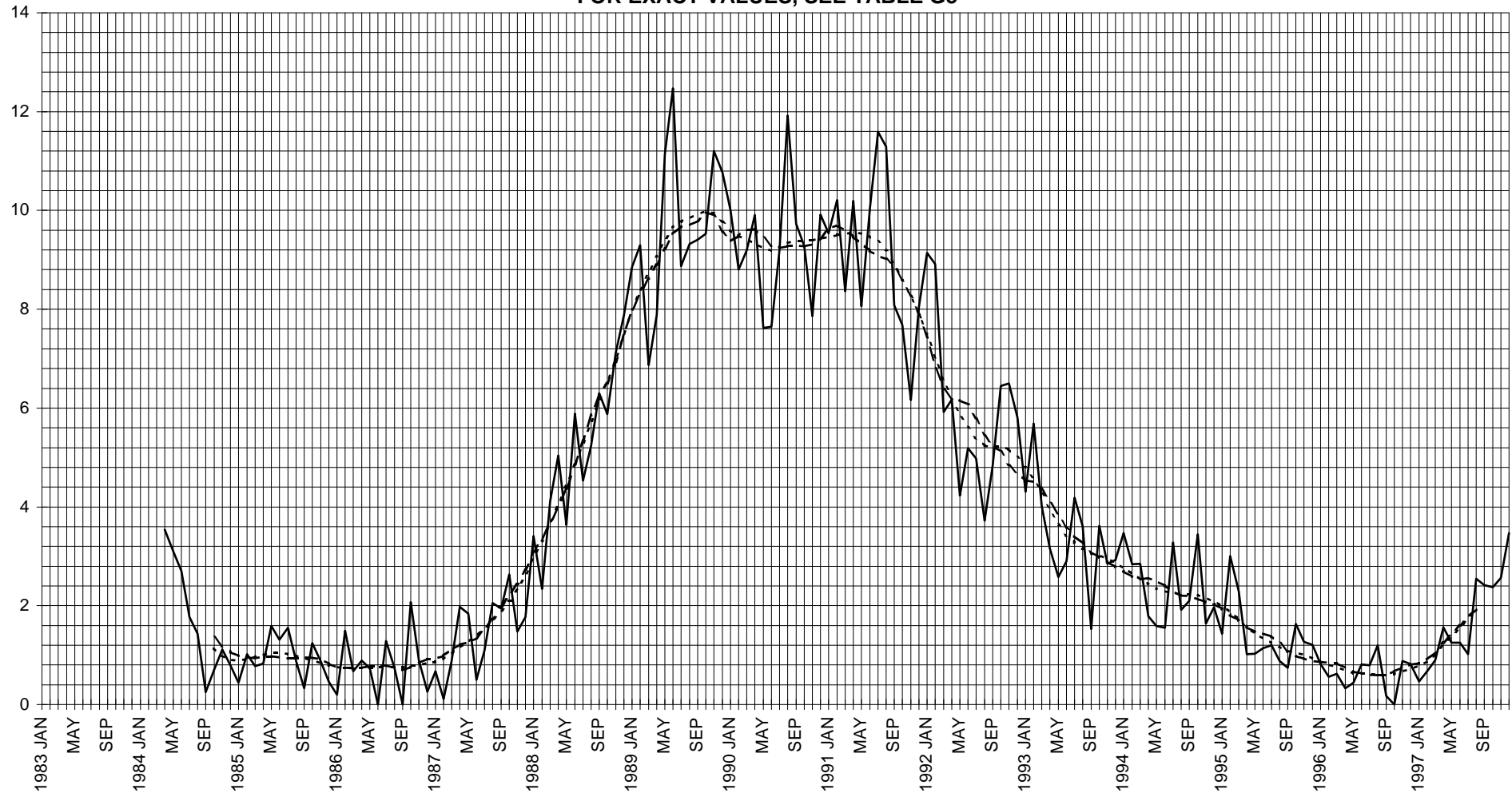
FOR EXACT VALUES, SEE TABLE G5



CORRECTED and SMOOTHED GDSO ACTIVE AREAS (gGD, gGD[SW] and gGD[SB13]) 1984-1997

SOLID = CORRECTED, DASHED = SW, DOTTED = SB13

FOR EXACT VALUES, SEE TABLE G5

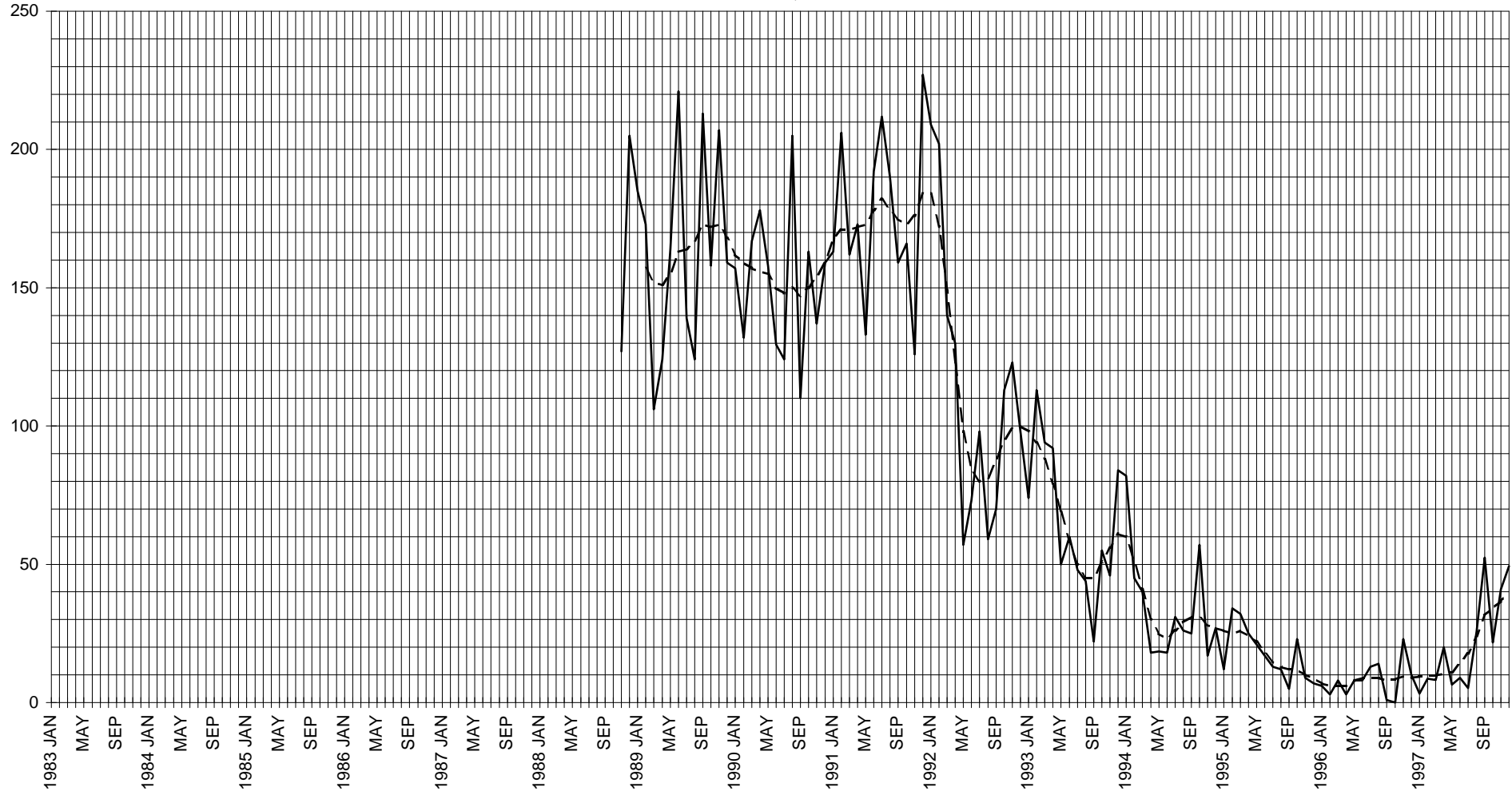


DATA START AT APRIL 1984

OBSERVED and SMOOTHED GDSO PETTISINDICES (SN and SN[SHBm]) 1988-1997

SOLID = OBSERVED, DASHED = SHBm

FOR EXACT VALUES, SEE TABLE P5

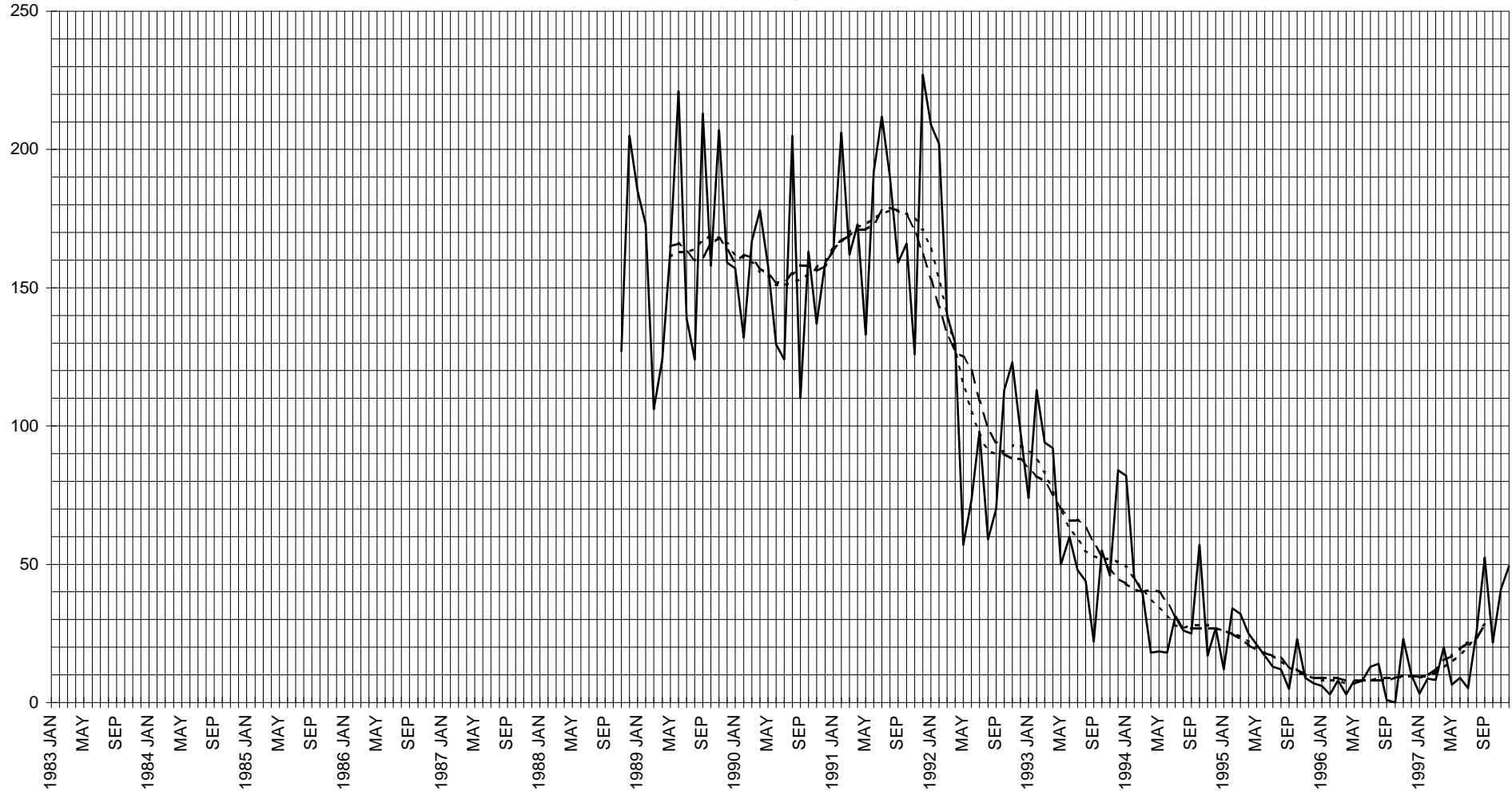


DATA START AT NOVEMBER 1988

OBSERVED and SMOOTHED GDSO PETTISINDICES (SN, SN[SW] and SN[SB13]) 1988-1997

SOLID = OBSERVED, DASHED = SW, DOTTED = SB13

FOR EXACT VALUES, SEE TABLE P5

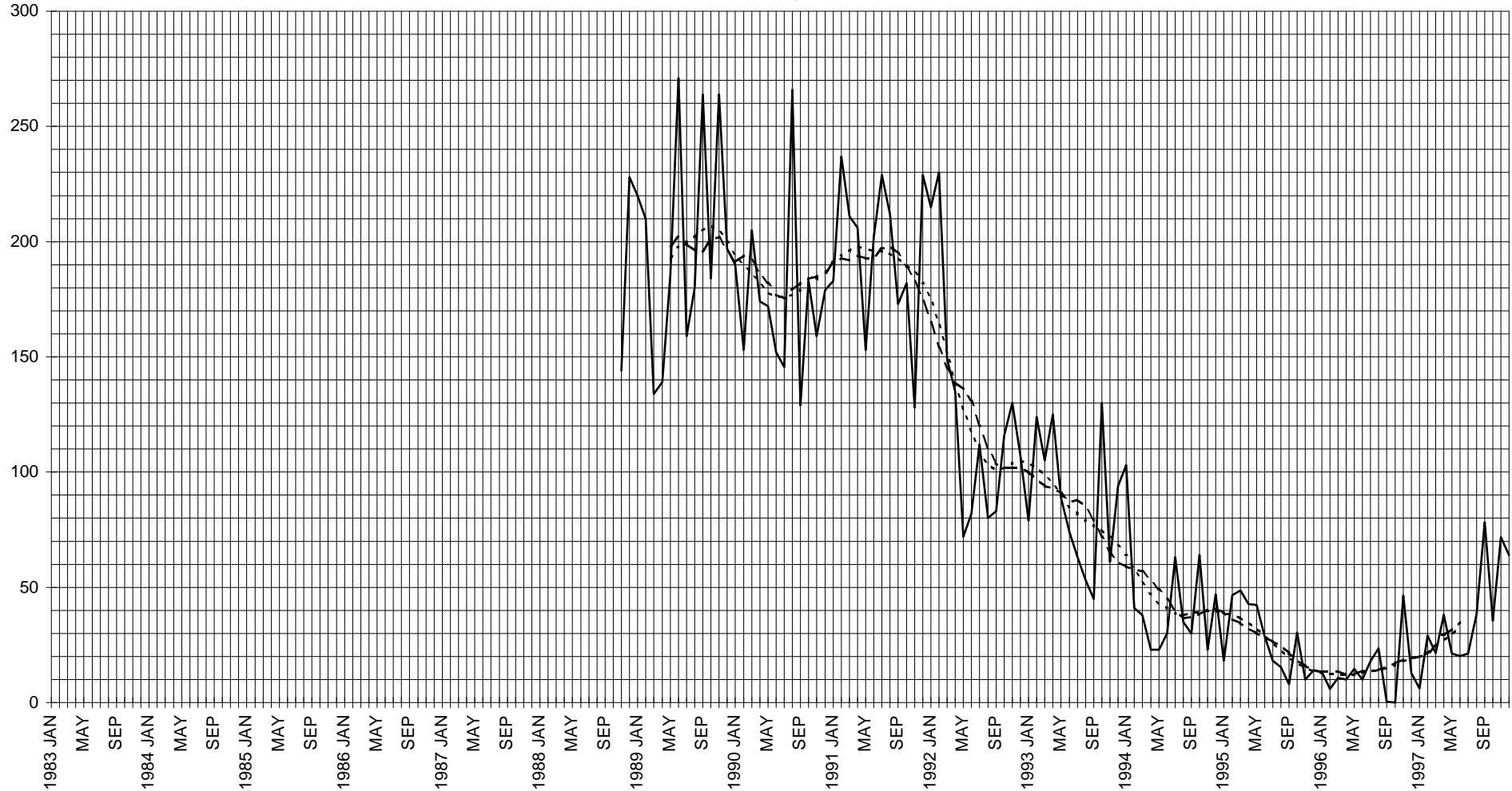


DATA START AT NOVEMBER 1988

CORRECTED and SMOOTHED GDSO PETTISINDICES (PXGD, PXGD[SW] and PXGD[SB13]) 1988-1997

SOLID = CORRECTED, DASHED = SW, DOTTED = SB13

FOR EXACT VALUES, SEE TABLE P5

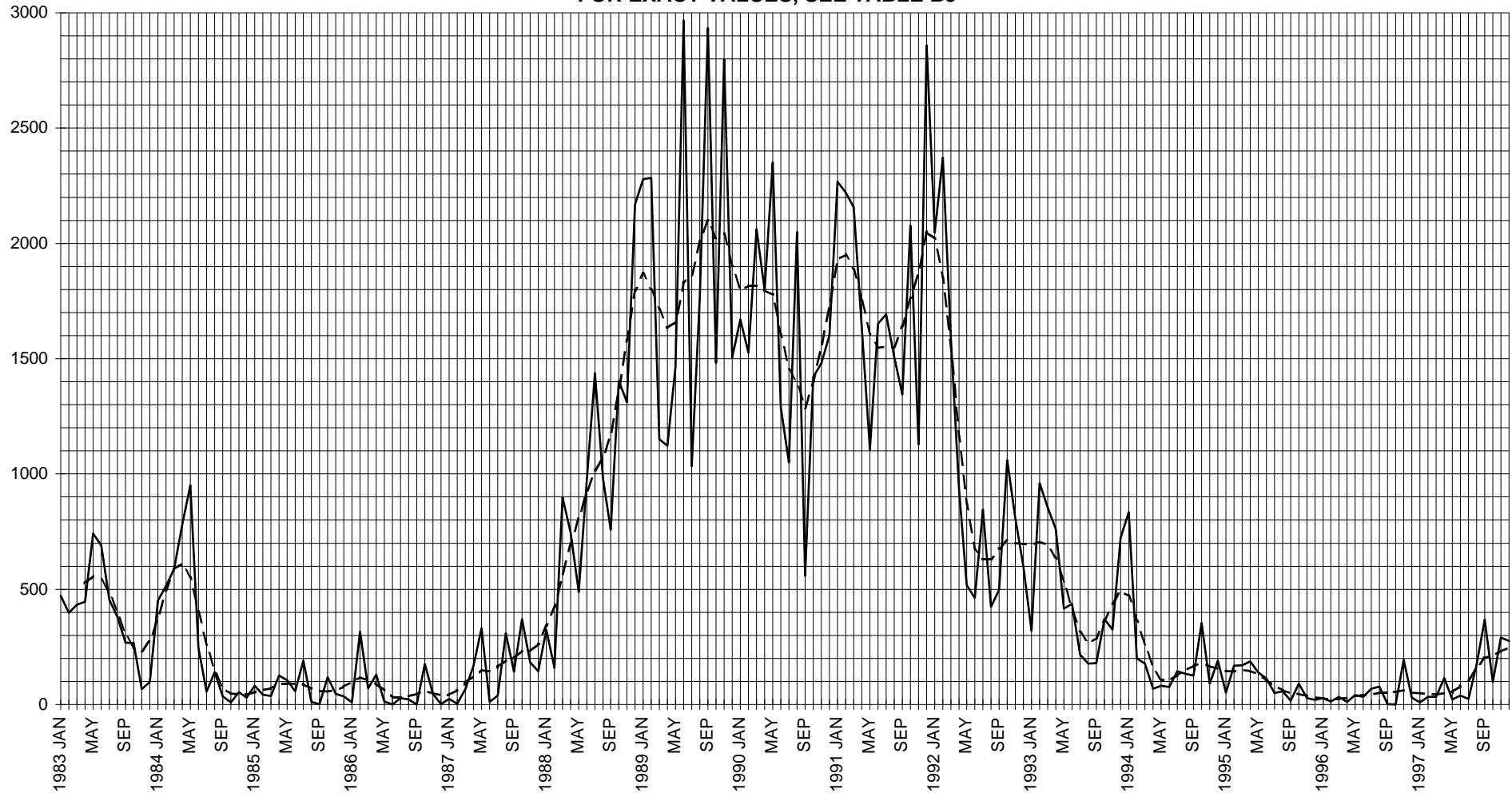


DATA START AT NOVEMBER 1988

OBSERVED and SMOOTHED GDSO BECKINDICES (BX and BX[SHBm]) 1983-1997

SOLID = OBSERVED, DASHED = SHBm

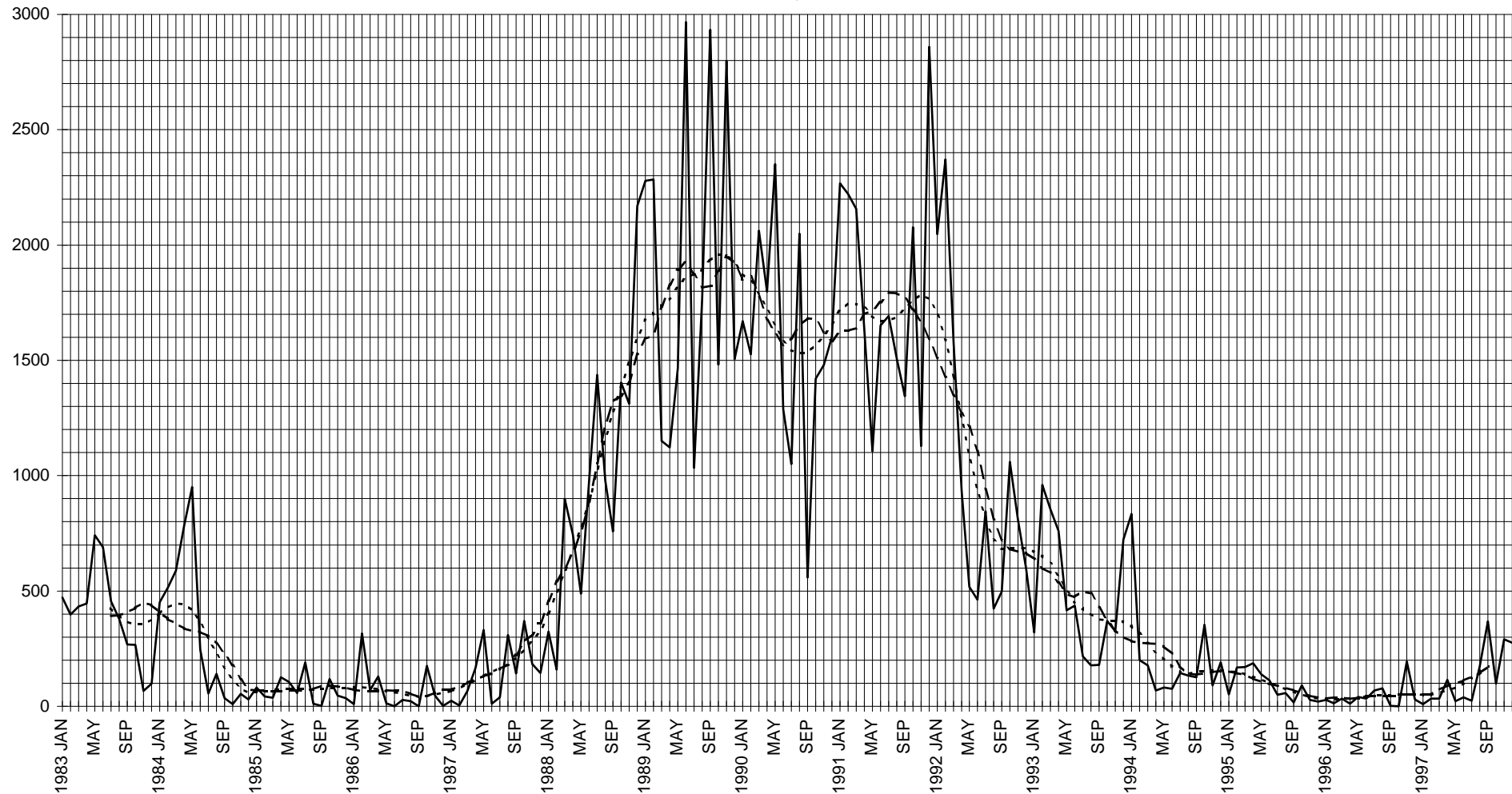
FOR EXACT VALUES, SEE TABLE B5



OBSERVED and SMOOTHED GDSO BECKINDICES (BX, BX[SW] and BX[SB13]) 1983-1997

SOLID = OBSERVED, DASHED = SW, DOTTED = SB13

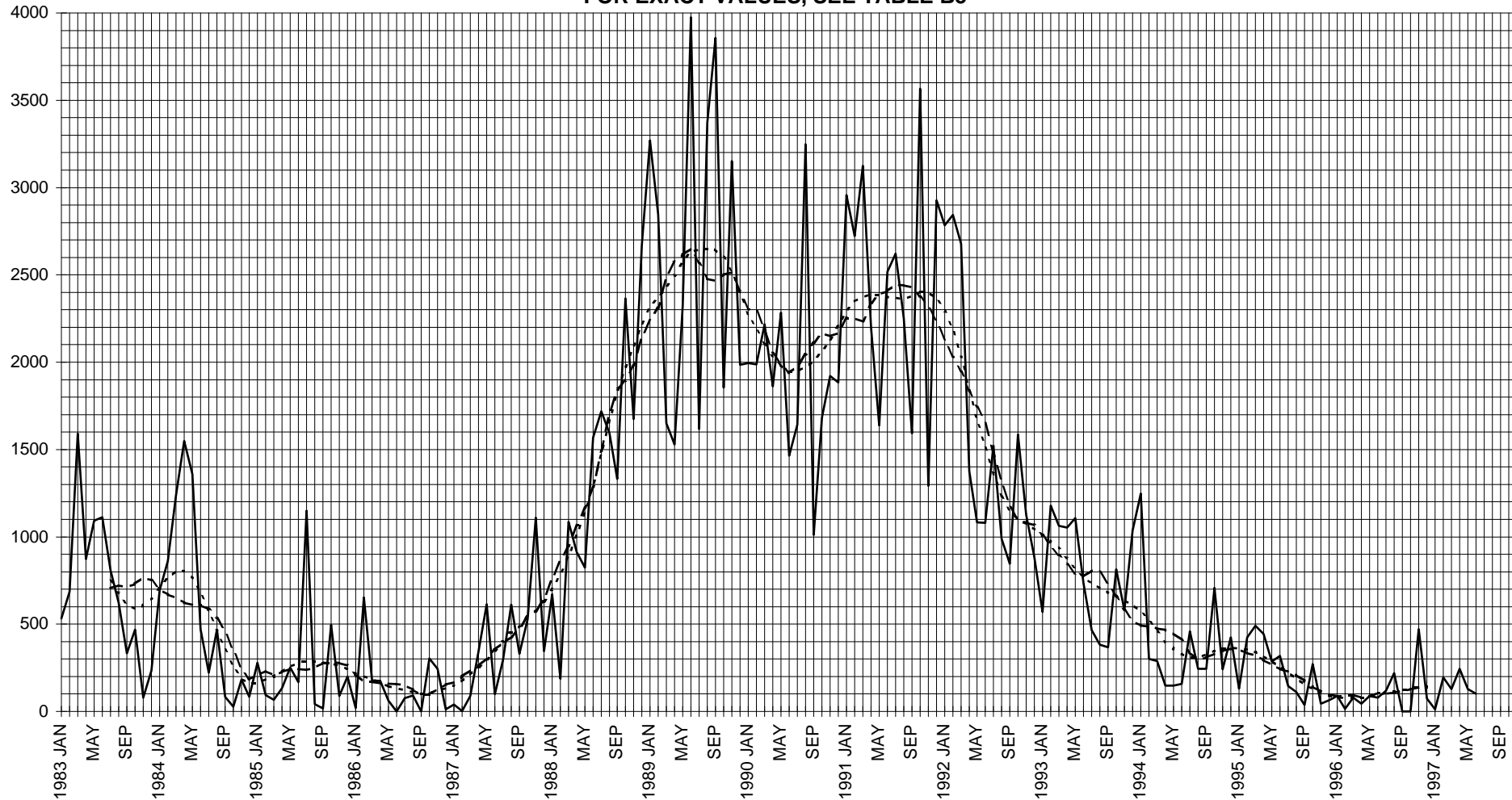
FOR EXACT VALUES, SEE TABLE B5



CORRECTED and SMOOTHED GDSO BECKINDICES (BXGD, BXGD[SW] and BXGD[SB13]) 1983-1997

SOLID = CORRECTED, DASHED = SW, DOTTED = SB13

FOR EXACT VALUES, SEE TABLE B5



OBSERVED and SMOOTHED GDSO CLASSIFICATION VALUES (CV and CV[SHBm]) 1991-1997

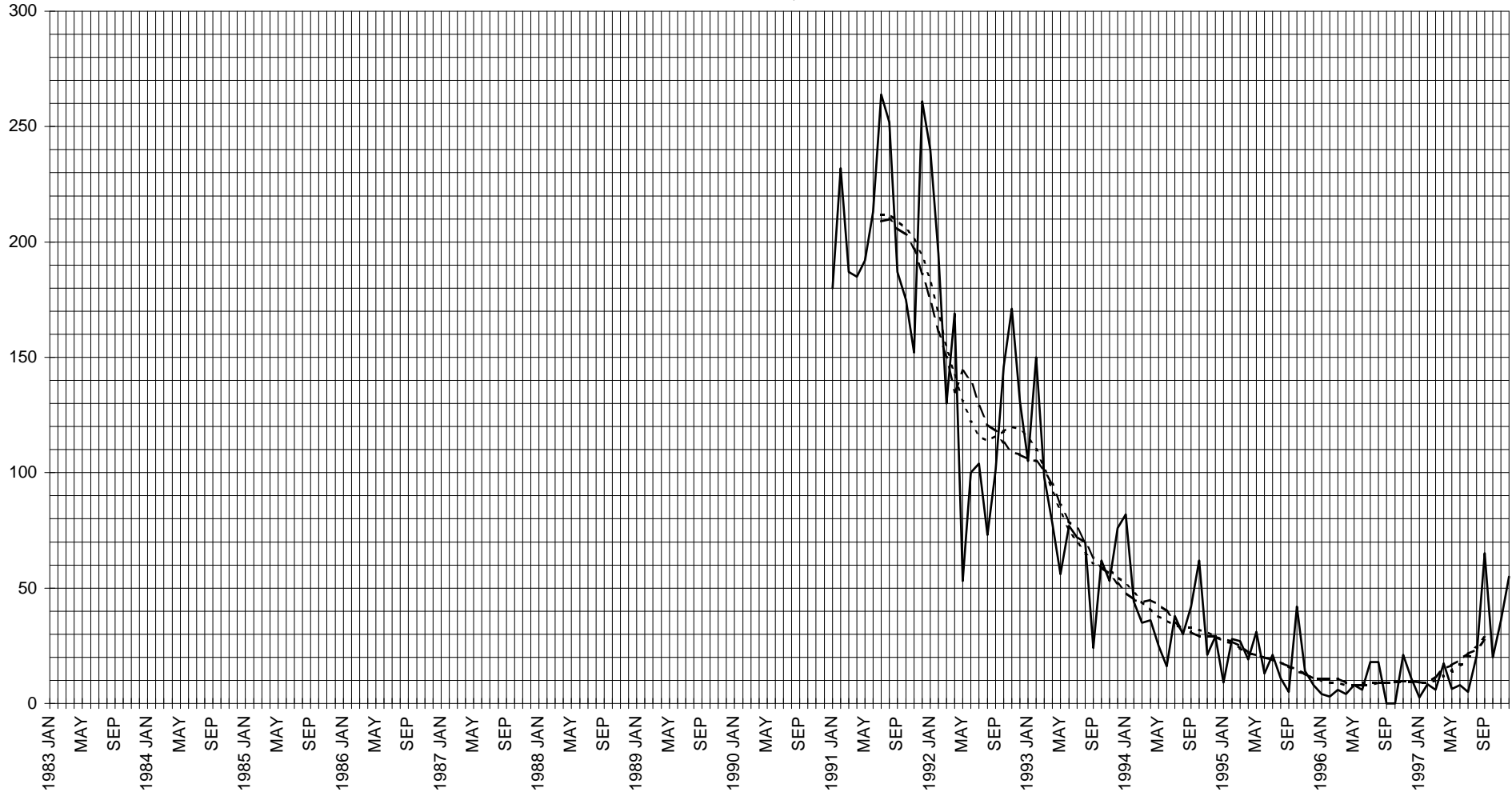
SOLID = OBSERVED, DASHED = SHBm

FOR EXACT VALUES, SEE TABLE C5



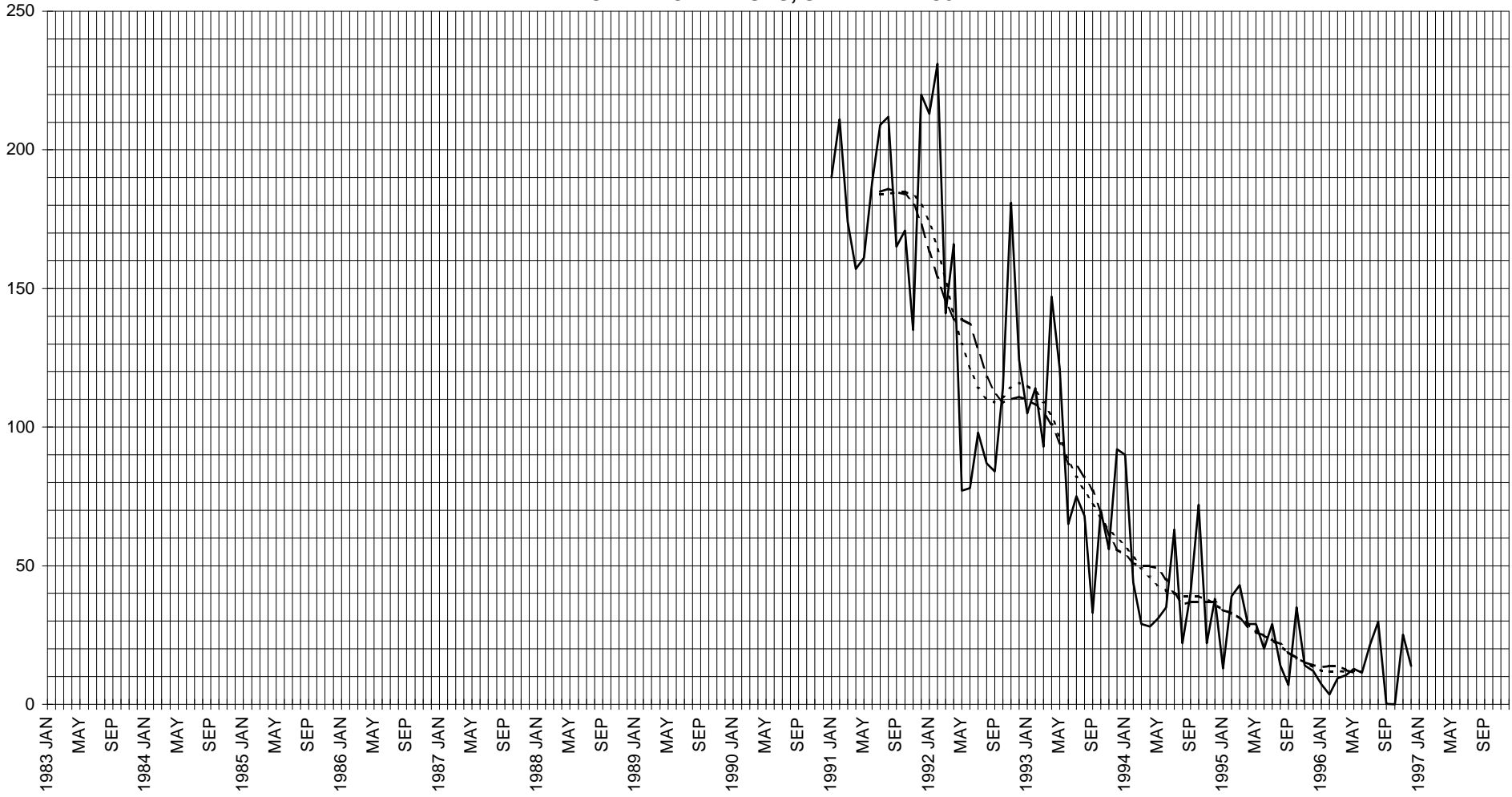
DATA START AT JANUARY 1991

OBSERVED and SMOOTHED GDSO CLASSIFICATION VALUES (CV, CV[SW] and CV[SB13]) 1991-1997
SOLID = OBSERVED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE TABLE C5



DATA START AT JANUARY 1991

CORRECTED and SMOOTHED GDSO CLASSIFICATION VALUES (CVGD, CVGD[SW] and CVGD[SB13]) 1991-1997
SOLID = CORRECTED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE TABLE C5

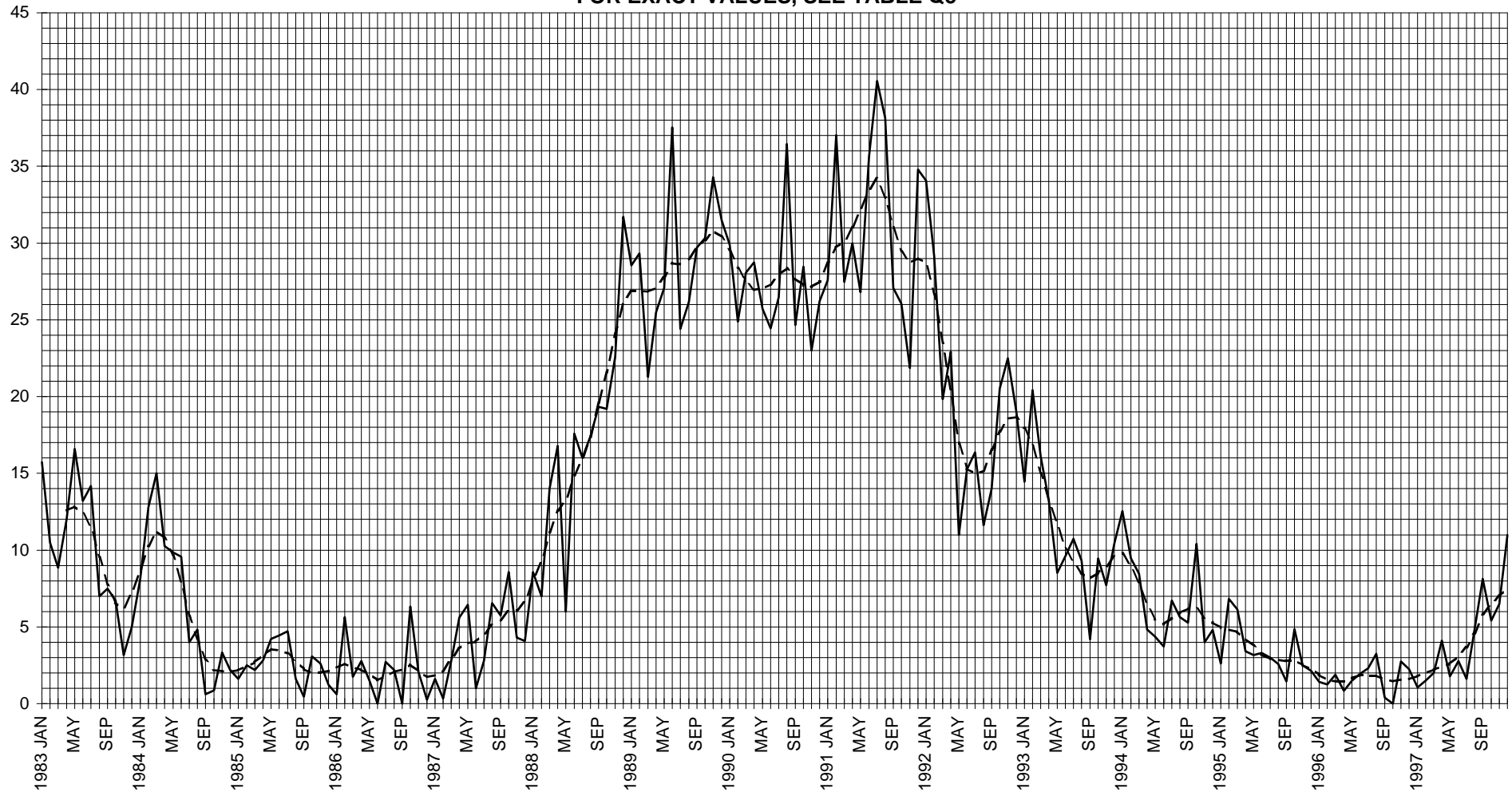


DATA START AT JANUARY 1991

OBSERVED and SMOOTHED GDSO QUALITY COUNTS (QC and QC[SHBm]) 1983-1997

SOLID = OBSERVED, DASHED = SHBm

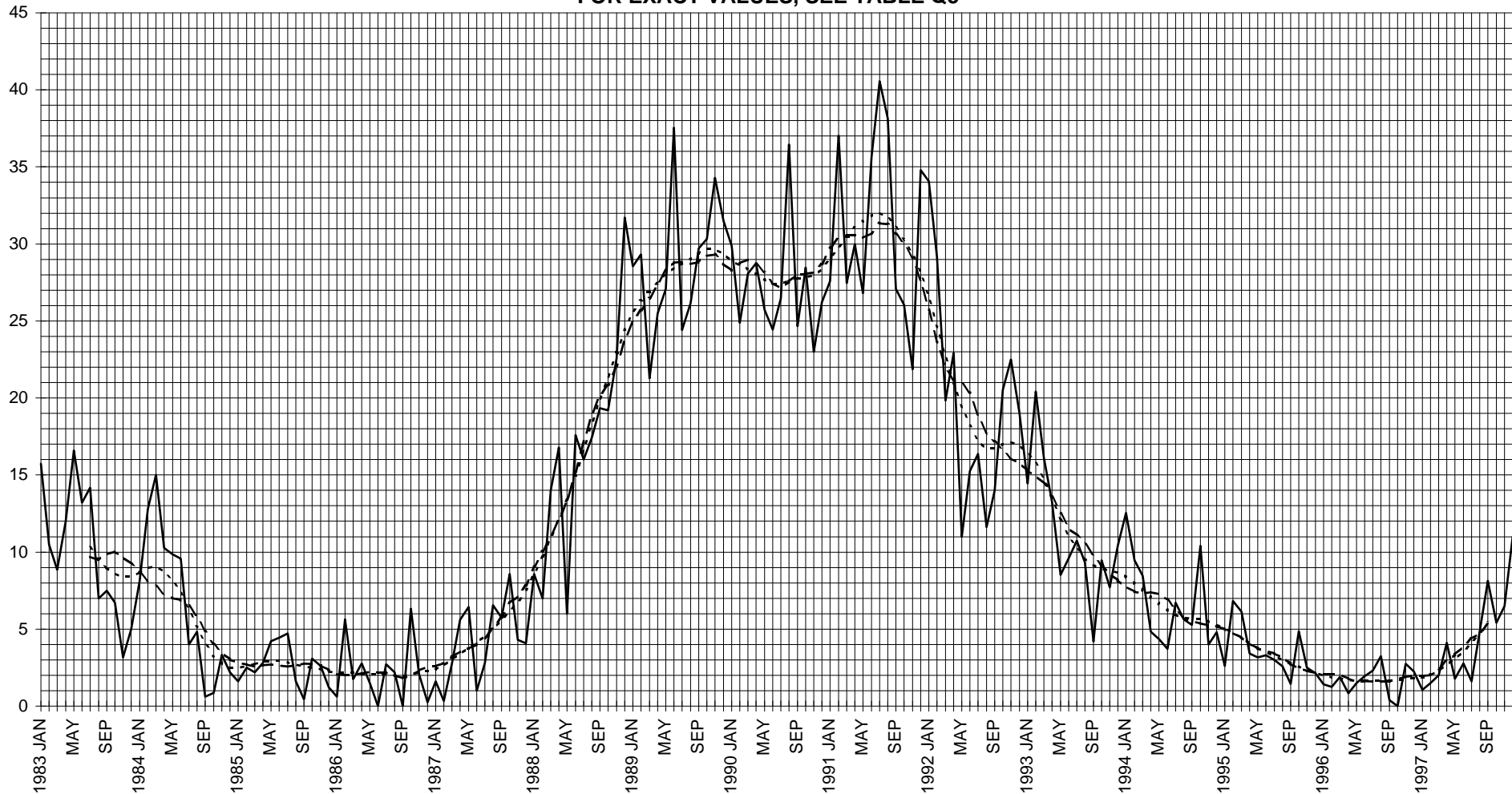
FOR EXACT VALUES, SEE TABLE Q5



OBSERVED and SMOOTHED GDSO QUALITY COUNTS (QC, QC[SW] and QC[SB13]) 1983-1997

SOLID = OBSERVED, DASHED = SW, DOTTED = SB13

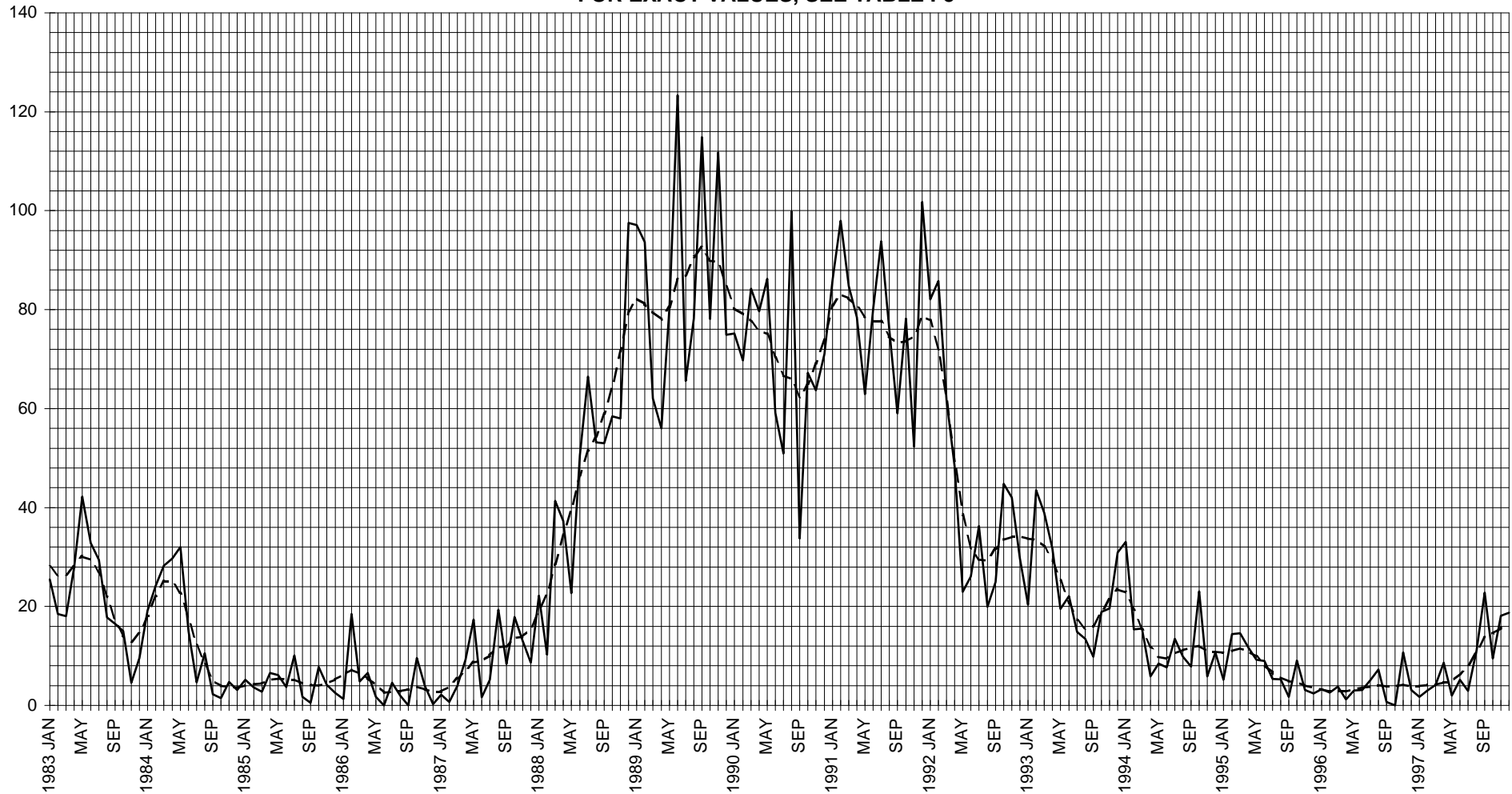
FOR EXACT VALUES, SEE TABLE Q5



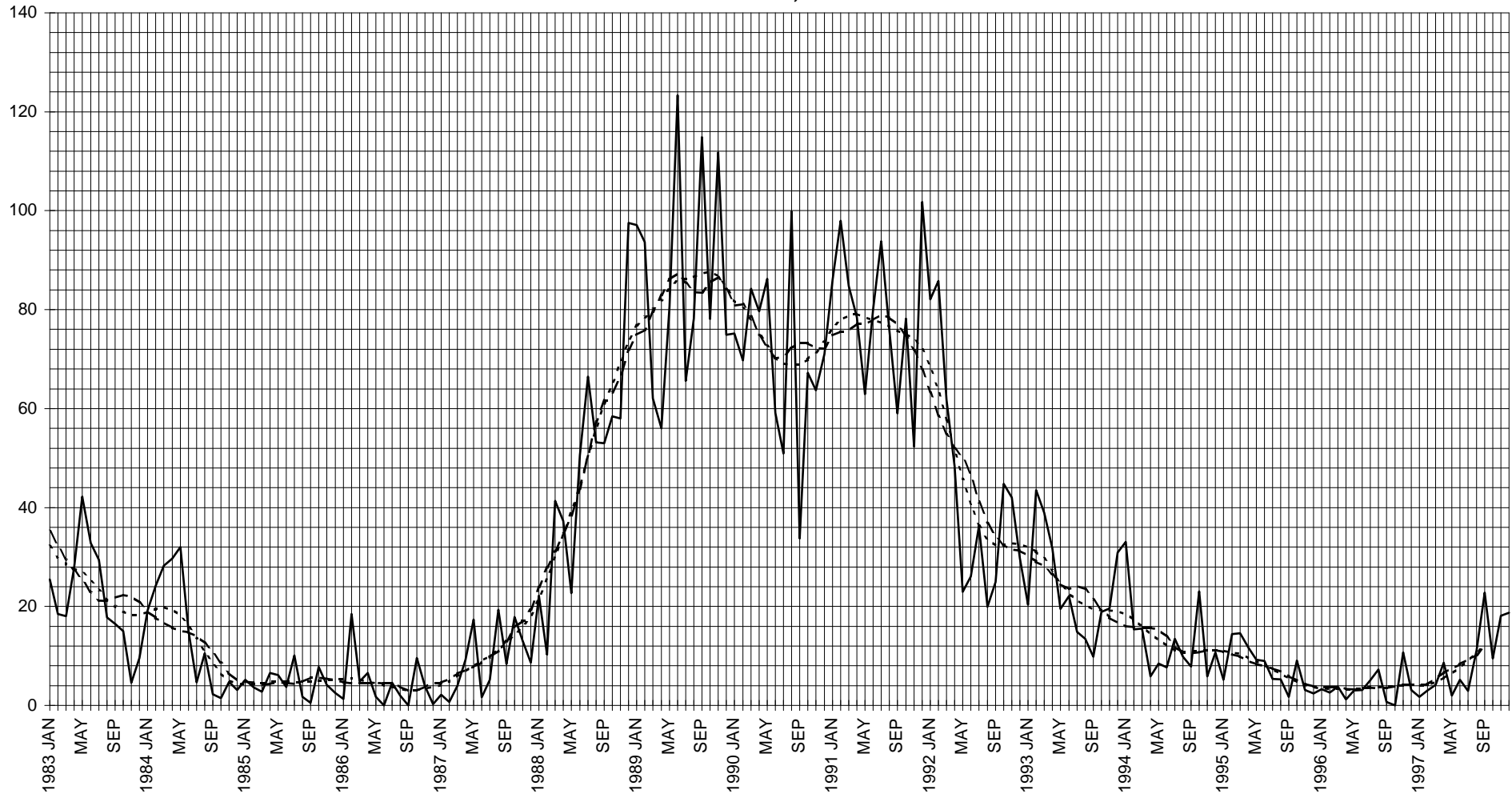
OBSERVED and SMOOTHED GDSO INTER-SOL INDICES (IS and IS[SHBm]) 1983-1997

SOLID = OBSERVED, DASHED = SHBm

FOR EXACT VALUES, SEE TABLE I-5



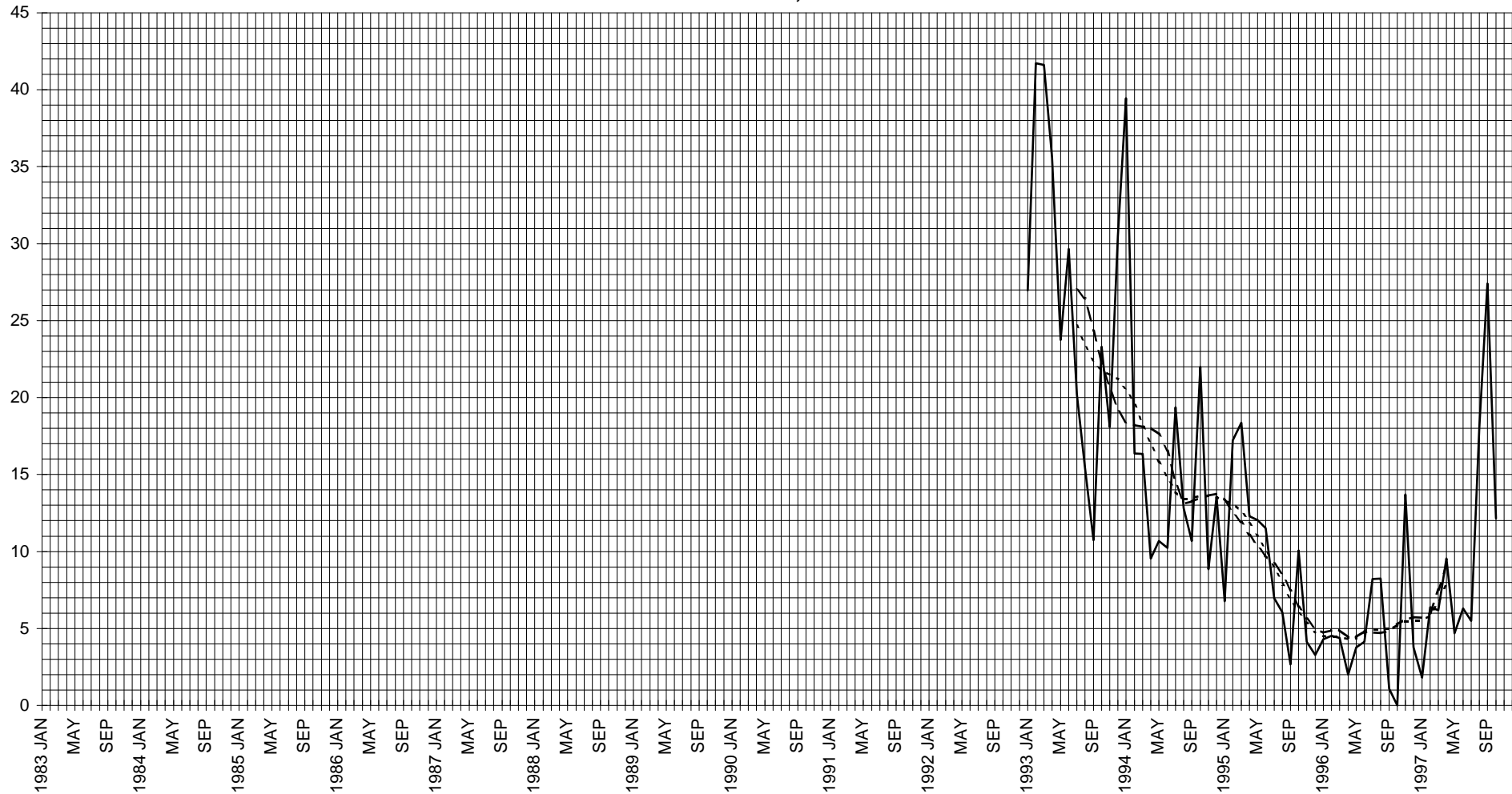
OBSERVED and SMOOTHED GDSO INTER-SOL INDICES (IS, IS[SW] and IS[SB13]) 1983-1997
SOLID = OBSERVED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE TABLE I-5



CORRECTED and SMOOTHED GDSO INTER-SOL INDICES (ISGD, ISGD[SW] and ISGD[SB13]) 1993-1997

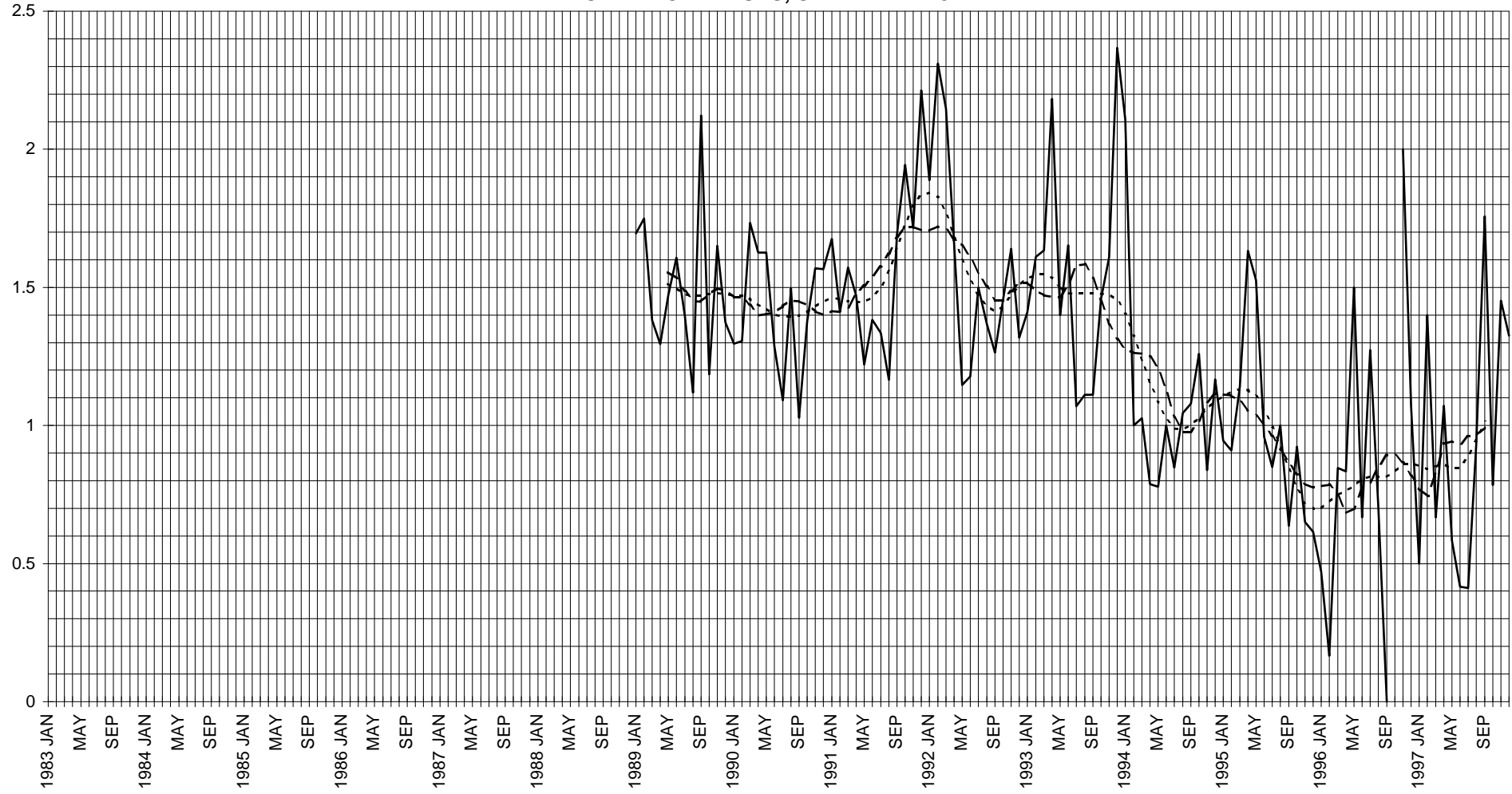
SOLID = CORRECTED, DASHED = SW, DOTTED = SB13

FOR EXACT VALUES, SEE TABLE I-5



DATA START AT JANUARY 1993

OBSERVED and SMOOTHED GDSO PENUMBRAE PER SUNSPOT GROUP (p/g, p/g[SW] and p/g[SB13]) 1989-1997
SOLID = OBSERVED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE TABLE M9A

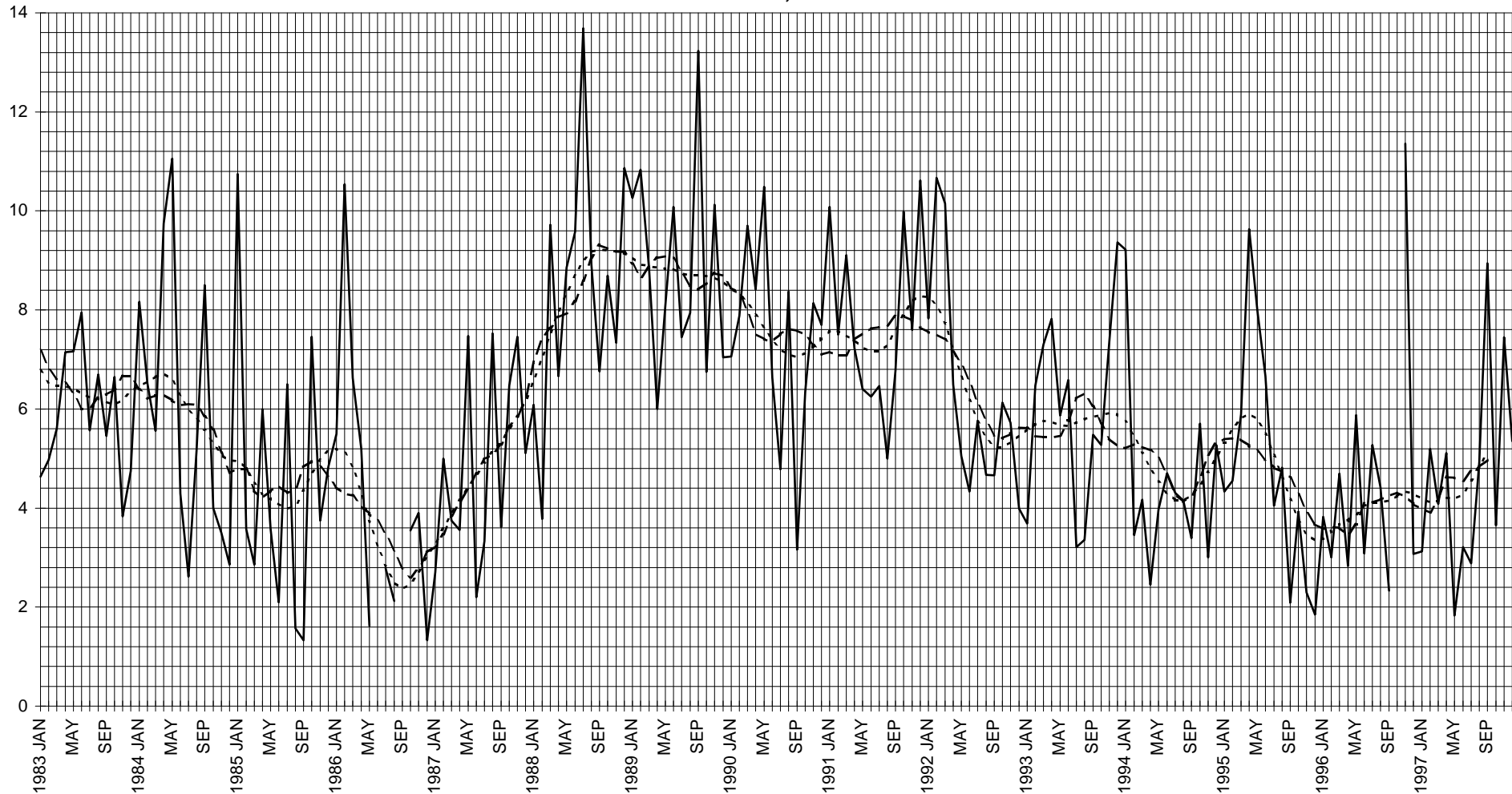


DATA START AT JANUARY 1989.
AS THERE WERE NO GROUPS IN OCTOBER 1996, p/g IS NON-EXISTENT FOR THAT MONTH

OBSERVED and SMOOTHED GDSO SPOTS PER SUNSPOT GROUP (f/g, f/g[SW] and f/g[SB13]) 1983-1997

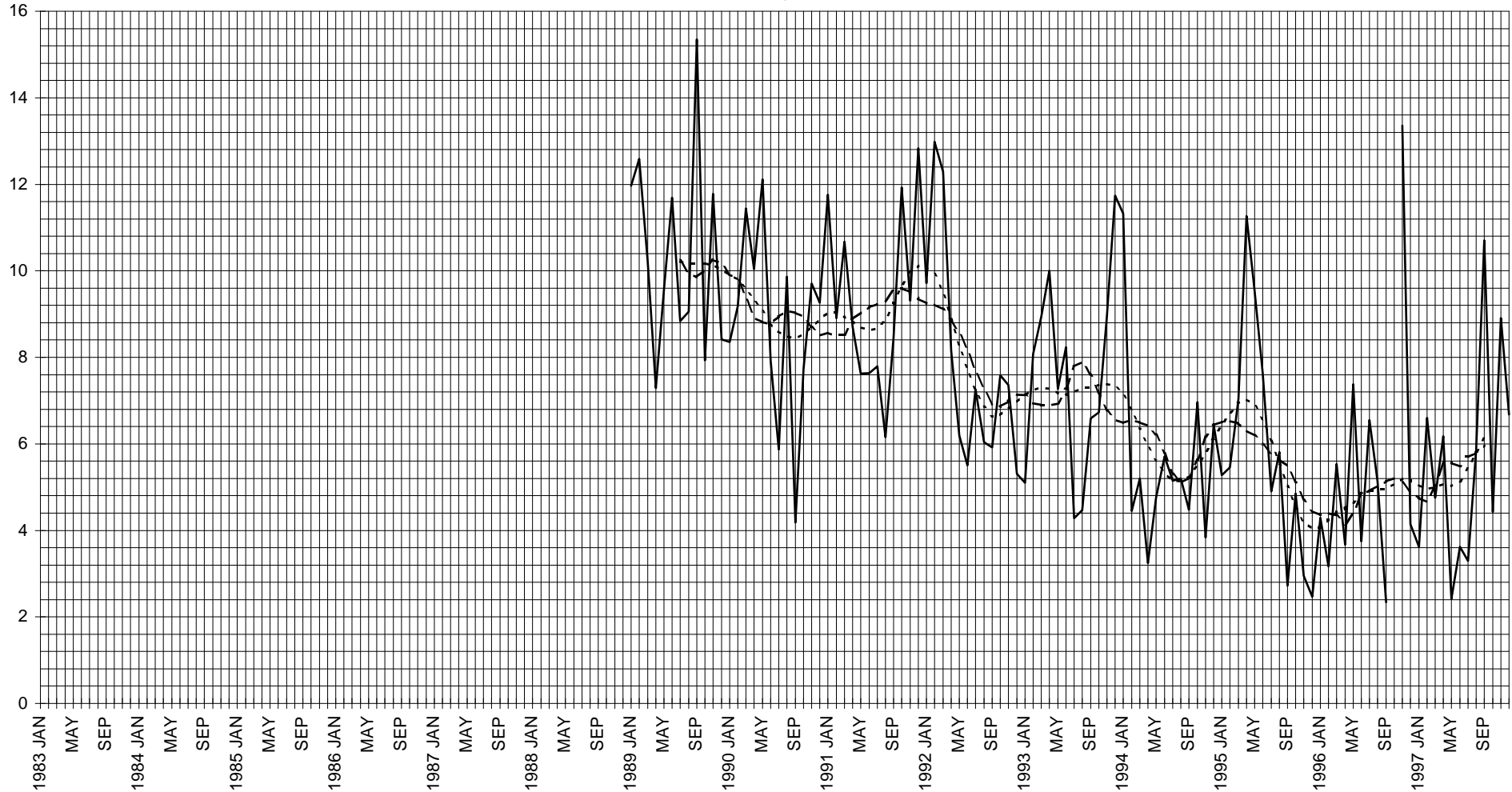
SOLID = OBSERVED, DASHED = SW, DOTTED = SB13

FOR EXACT VALUES, SEE TABLE M9B



AS THERE WERE NO GROUPS IN JUNE 1986, SEPTEMBER 1986 AND OCTOBER 1996, f/g IS NON-EXISTENT FOR THOSE MONTHS

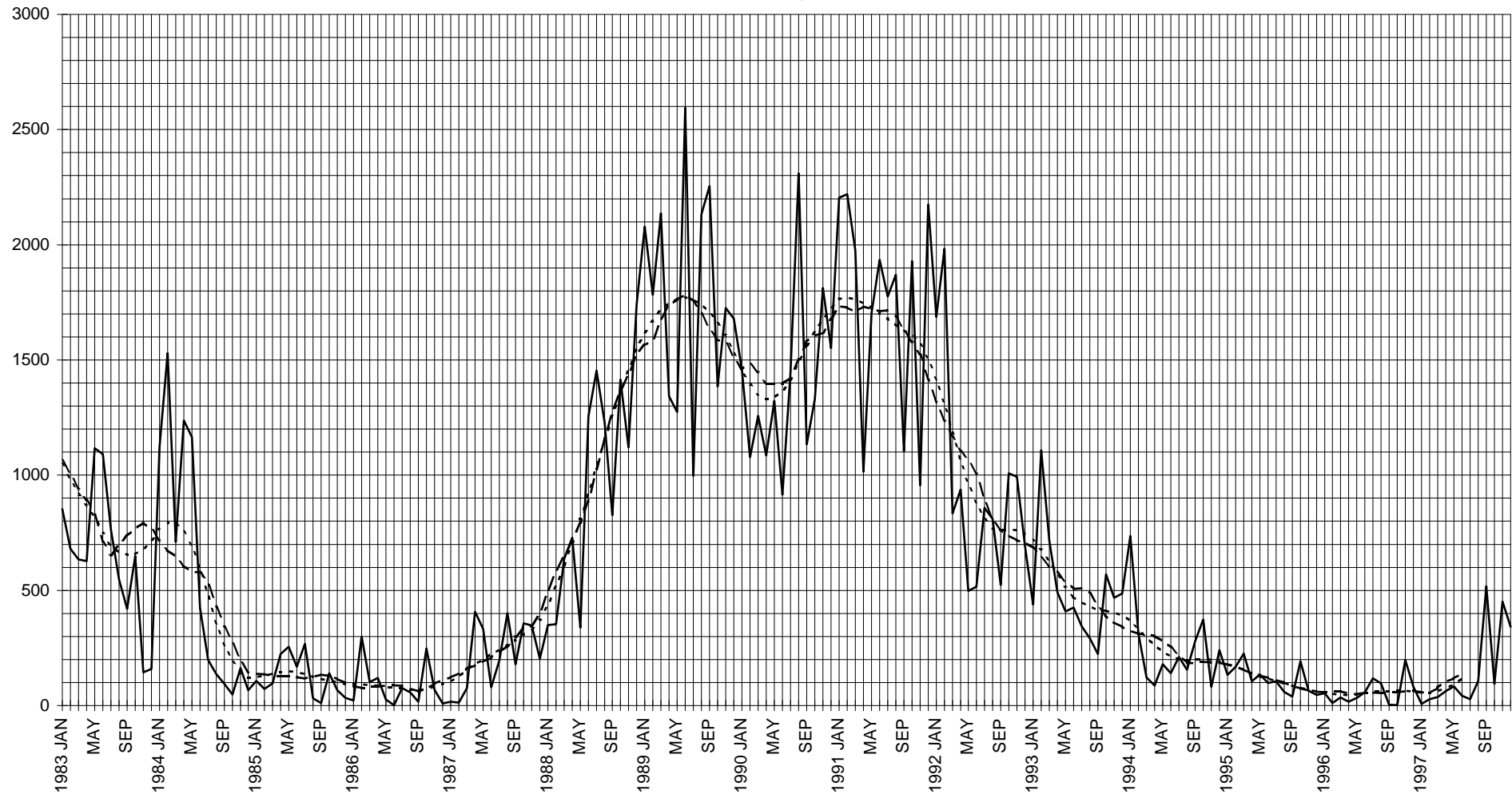
OBSERVED and SMOOTHED GDSO GROUP COMPLEXITY INDICES (GCI, GCI[SW] and GCI[SB13]) 1989-1997
SOLID = OBSERVED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE TABLE M9C



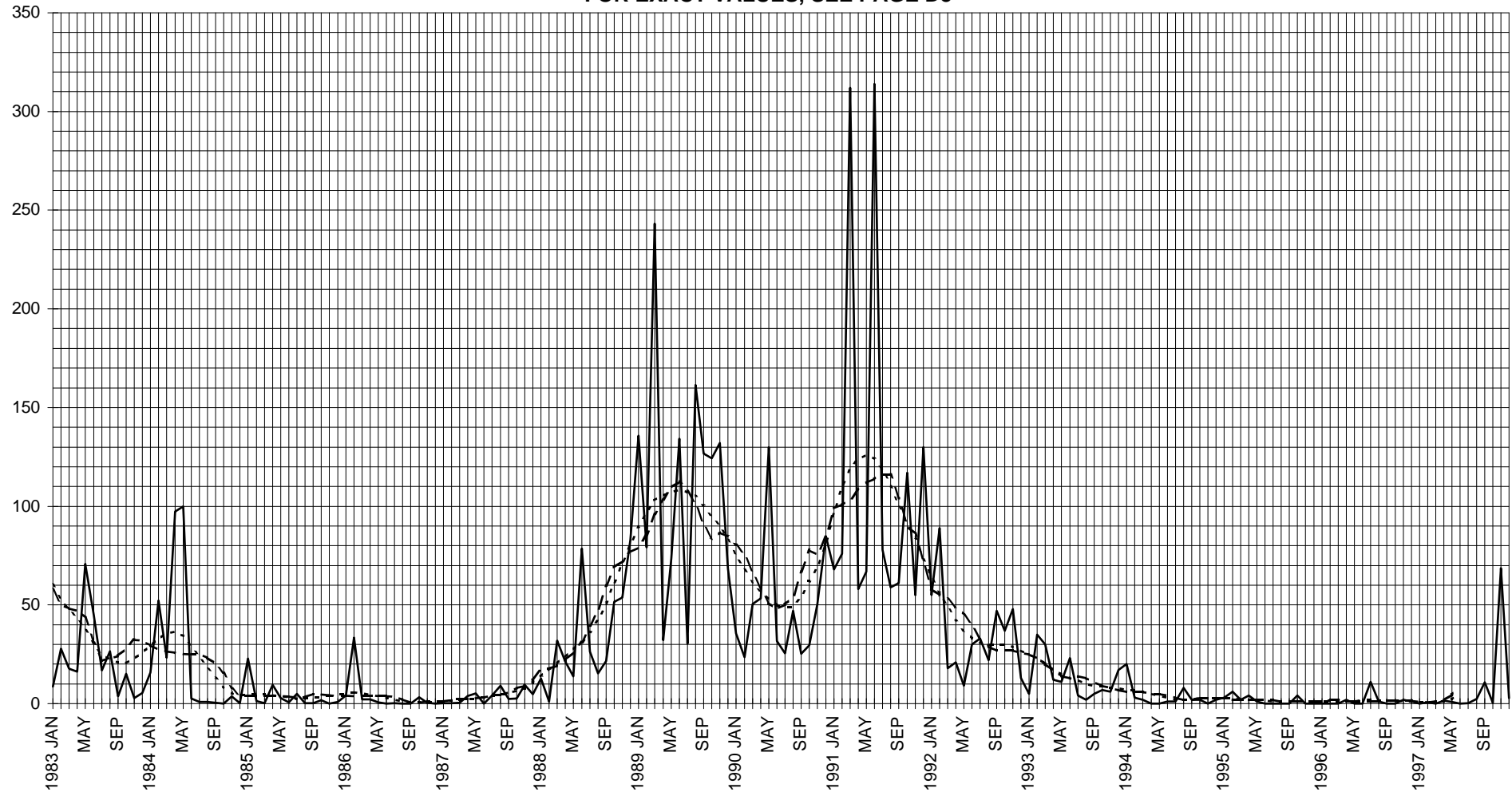
DATA START AT JANUARY 1989.

AS THERE WERE NO GROUPS IN OCTOBER 1996, GCI IS NON-EXISTENT FOR THAT MONTH

OBSERVED and SMOOTHED NOAA SUNSPOT AREA VALUES (in MICRO-HEMISPHERES) 1983-1997
SOLID = OBSERVED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE PAGE C2



OBSERVED and SMOOTHED NOAA X-RAY FLARE MEAN DAILY OUTPUT VALUES (IN MICROWATTS PER SQUARE METRE) 1983-1997
SOLID = OBSERVED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE PAGE D8



ADJUSTED and SMOOTHED NRCC 2800 MHz SOLAR FLUX (IN 10^{-22} WATTS/SQUARE METRE/HERTZ) 1983-1997
SOLID = ADJUSTED, DASHED = SW, DOTTED = SB13
FOR EXACT VALUES, SEE PAGE E4

