

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS
SOLAR SECTION



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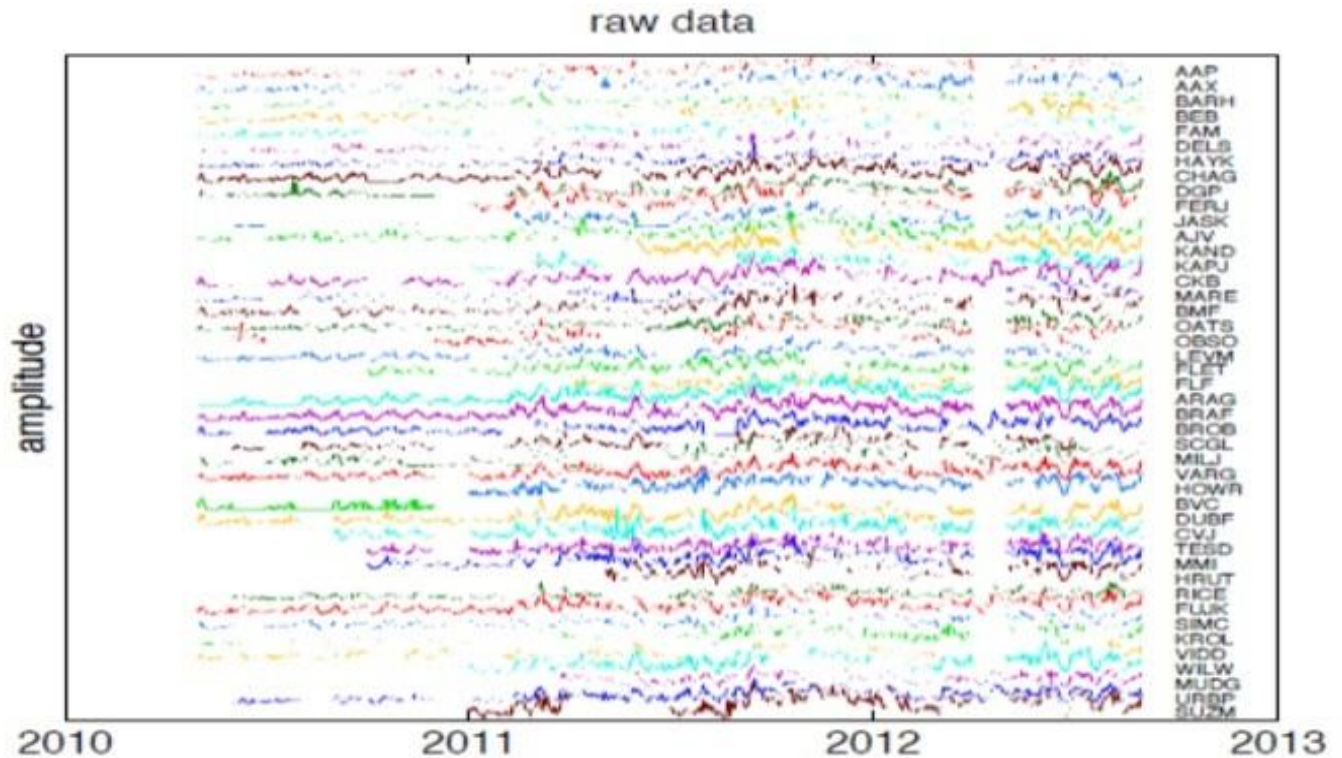
Web: <http://www.aavso.org/solar-bulletin>

Email: solar.aavso@gmail.com

ISSN 0271-8480

Volume 70 Number 6

June, 2014

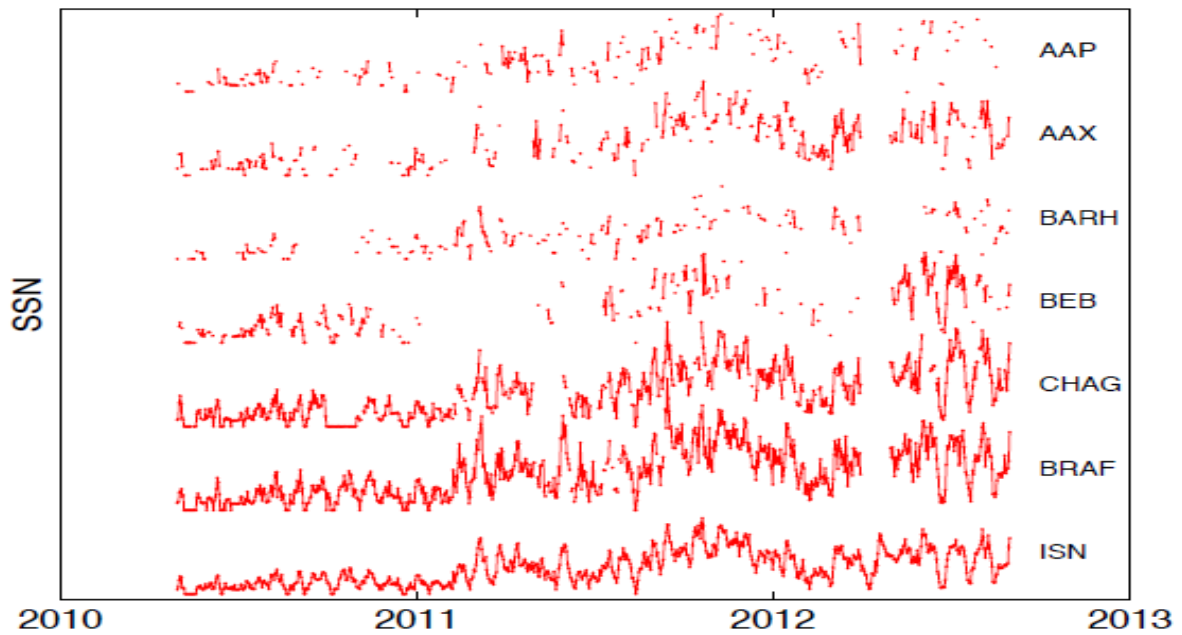


Keep your trash: Do not throw away (or average) any data

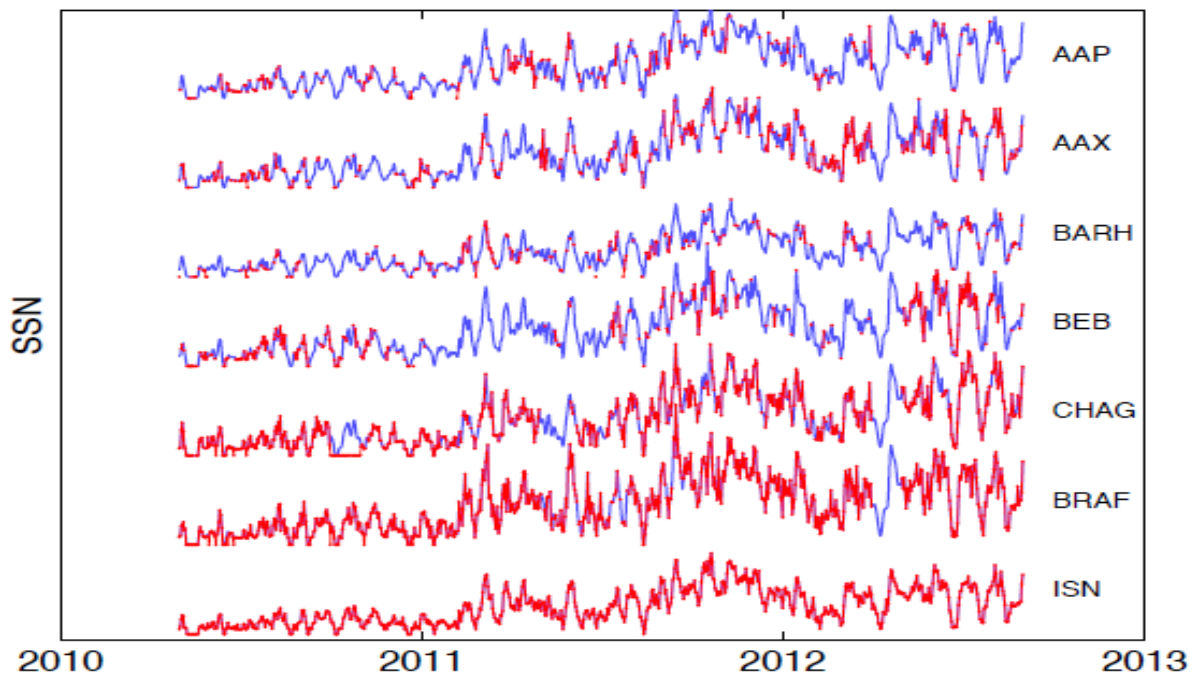
Working hypothesis: all observations proceed from the same unknown "true" sunspot number

$$SSN_{\text{observed}}(t) = k SSN_{\text{true}}(t) + \text{error}(t)$$

Original data



Interpolated data



Here are a few graphs where Thierry Dudok de Wit (Laboratoire de Physique et Chimie de l'Environnement et de l'Espace), shows how important it is to use all the AAVSO daily observations from all observers to create the American Relative (Ra) index. These examples show how some observer's data is sparser than others, but by interpolating across all daily observations it is possible to come close to the actual sunspot number. The fourth SSN workshop presentations are here: > http://ssnworkshop.wikia.com/wiki/Presentations_4

Sudden Ionospheric Disturbance Report



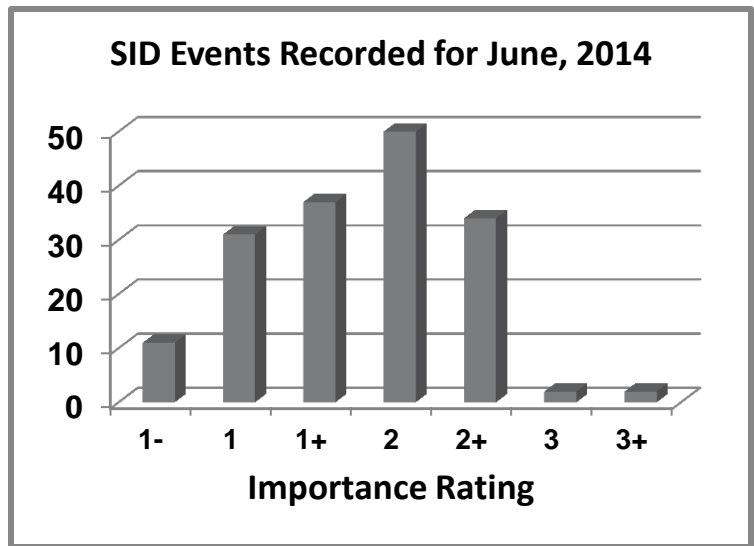
Two of many M class flares this month, June 12, 2014. Graph from A139 F Francione & C Re, Turin, Italy 45.9kHz (NSY) 20.9kHz (HWU) 24.0kHz (NAA)

Sudden Ionospheric Disturbances (SID) Records During June, 2014

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
140601	137	2	140607	1021	1	140610	925	2
140601	1155	-1	140607	1350	2	140610	931	2
140603	410	2	140608	37	2	140610	1017	2
140603	1130	-1	140608	106	2	140610	1143	1+
140603	1315	1+	140608	919	2+	140610	1242	2+
140603	1429	1	140608	1610	2+	140610	1252	2
140603	1722	-1	140608	1631	2+	140610	1416	3+
140603	1822	1	140608	1739	2+	140610	1441	1+
140603	2022	1+	140608	2123	2+	140610	1617	1
140603	2308	1+	140609	119	1+	140610	1730	1
140604	631	1	140609	422	1	140611	446	2+
140604	646	1	140609	726	1	140611	456	1+
140604	1246	2+	140609	832	2	140611	535	2
140604	1326	2+	140609	940	2+	140611	633	1
140605	1312	2	140609	1229	2	140611	748	-1
140606	1102	2	140609	1236	2+	140611	808	1+
140606	1312	1+	140609	1325	2	140611	906	2
140606	1322	1+	140609	1645	2+	140611	1249	1+
140606	1911	1	140609	1709	2	140611	1357	1+
140606	1933	2	140609	1715	2+	140611	1503	1
140607	502	-1	140609	1838	-1	140611	1630	1
140607	625	1+	140610	628	1	140611	1843	1+
140607	706	1	140610	825	2	140611	2102	1

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
140612	44	1	140613	1202	1	140616	740	1+
140612	129	1+	140613	1302	2+	140616	1805	1+
140612	422	2	140613	1525	-1	140617	513	2
140612	510	1+	140613	1621	1	140617	823	2
140612	646	-1	140613	1654	1+	140618	335	2+
140612	939	1+	140613	2101	1+	140620	1119	2
140612	1021	1+	140614	348	3	140620	1122	2+
140612	1030	2+	140614	940	2+	140621	1120	1+
140612	1321	2	140614	953	2+	140621	1128	2+
140612	1607	2	140614	1002	2	140624	29	2+
140612	1735	1+	140614	1101	2	140626	919	2
140612	1814	2	140615	509	1+	140626	925	1+
140612	2002	2	140615	606	2	140628	159	1+
140612	2113	2	140615	802	2+	140628	205	2
140613	40	1+	140615	811	2	140628	657	2+
140613	314	1	140615	948	1+	140628	723	1
140613	320	1	140615	1131	2+	140628	743	1+
140613	339	2	140615	1139	2	140628	1243	1+
140613	648	1	140615	1249	2+	140629	528	1+
140613	755	2	140615	1314	2+	140629	806	1
140613	801	-1	140615	1524	1	140629	1152	2
140613	918	1+	140615	1558	2	140629	1201	-1
140613	1052	2	140615	1718	2	140629	1524	1+
140613	1059	2+	140616	1	1	140630	702	2
			140616	207	3	140630	1036	1+
						140630	1320	2
						140630	1326	2+

Solar Events

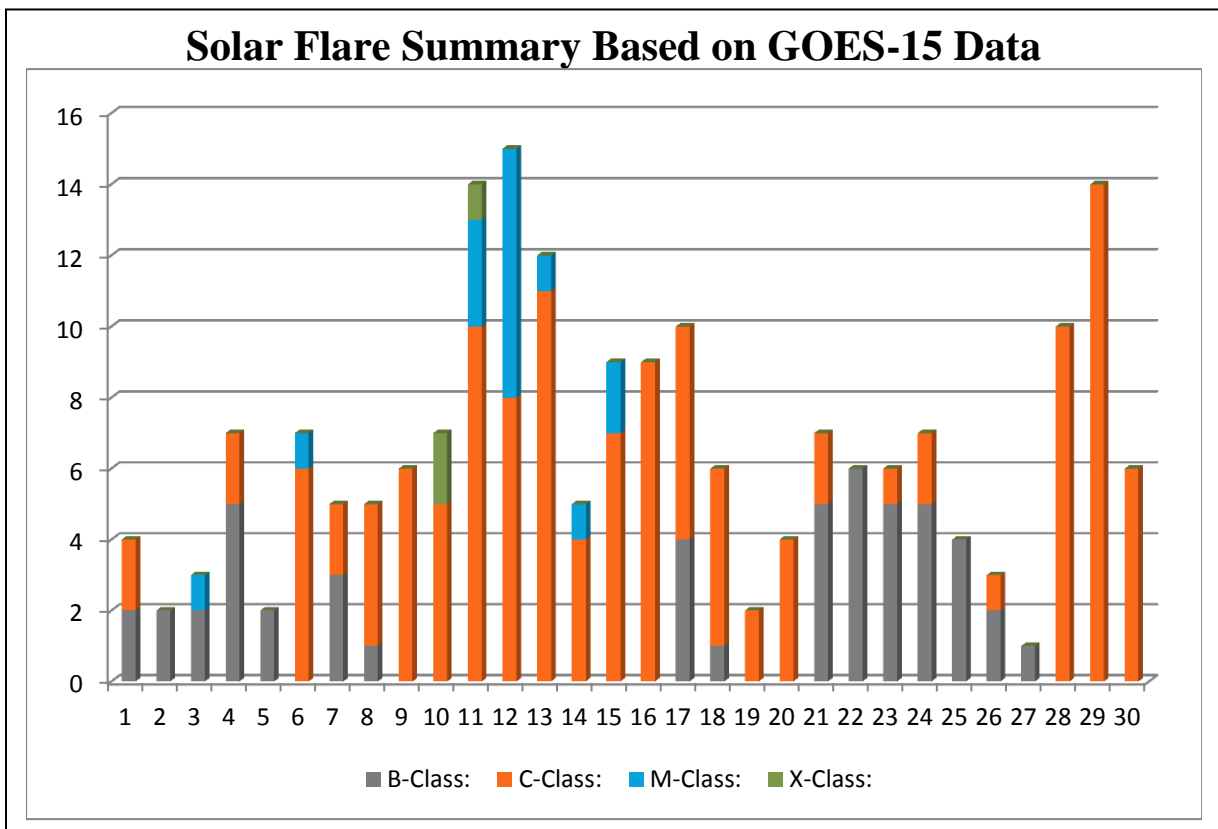


Importance rating: Duration (min)	1-: <19	1: 19-25	1+: 26-32	2: 33-45	2+: 46-85	3: 86-125	3+: >125
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Sudden Ionospheric Disturbances (SID) Observers During June, 2014

Observer	Code	Station(s) monitored	Observer	Code	Station(s) monitored
A McWilliams	A94	NML	J Karlovsky	A131	DHO NSY
R Battaiola	A96	HWU	R Green	A134	JJI NWC
J Wallace	A97	NAA	R Mrlak	A136	GQD NSY
L Loudet	A118	GQD NAA	S Aguirre	A138	NLK
B Terrill	A120	NWC	F Francione & C Re	A139	HWU NAA NSY
F Adamson	A122	NWC	I Ryumshin	A142	DHO HWU
S Oatney	A125	NLK NML	R Rogge	A143	DHO GQD ICV
K Cotar	A129	DHO GBZ			

There were 198 solar flares measured by GOES-15 for June, 2014: Three X class, 16 M class, 129 C class and 50 B class flares. Far more flares this month compared to last. There were 15 AAVSO SID observers who submitted reports this month.



American Relative Sunspot Numbers (Ra) for
 May, 2014 [**boldface = maximum, minimum**]

DAY	NumObs	RAW	Ra
1	32	87	62
2	38	96	75
3	41	114	82
4	38	115	85
5	37	123	91
6	37	124	92
7	32	118	83
8	24	118	80
9	29	121	85
10	34	111	79
11	39	139	99
12	35	135	101
13	33	126	91
14	29	150	104
15	31	132	98
16	35	125	90
17	42	128	94
18	42	99	70
19	39	78	57
20	33	81	58
21	36	80	60
22	35	60	42
23	30	85	61
24	38	101	70
25	43	99	74
26	28	83	60
27	28	66	48
28	21	64	44
29	36	41	31
30	42	51	37
31	39	49	38
Average	34.7	100	72.3

Obs	#Obs	Name
AAP	2	A. Patrick Abbott
AAX	13	Alexandre Amorim
AJV	19	J. Alonso
AMG	2	Margarete J. Amorim
ARAG	31	Gema Araujo
ASA	22	Salvador Aguirre
BARH	11	Howard Barnes
BATR	7	Roberto Battaiola
BERJ	12	Jose Alberto Berdejo

BMF	18	Michael Boschat
BRAB	29	Brenda Branchett
BRAF	21	Raffaello Braga
BROB	28	Robert Brown
BXD	20	Alexandru Burda
CADA	1	Adair Cardoso
CHAG	30	German Morales Chavez
CIOA	16	Ioannis Chouinavas
CKB	15	Brian Cudnik
CNT	14	Dean Chantiles
CVJ	11	Jose Carvajal
DGP	20	Gerald Dyck
DJOB	18	Jorge del Rosario
DUBF	26	Franky Dubois
FAM	8	Fabio Mariuzza
FERJ	18	Javier Ruiz Fernandez
FJAE	11	Dr.John Alan Freeman
FLET	25	Tom Fleming
FLF	16	Fredirico Luiz Funari
FUJK	26	K. Fujimori
HALB	7	Brian Halls
HAYK	20	Kim Hay
HOWR	18	Rodney Howe
JASK	21	Krystyna Wirkus
JENJ	11	Jamey Jenkins
JGE	6	Gerardo Jimenez Lopez
JJMA	12	Jessica M.Johnson
KAND	21	Kandilli Observatory
KAPJ	20	John Kaplan
KNJS	24	James & Shirley Knight
KROL	21	Larry Krozel
LEVM	21	Monty Leventhal
LKR	13	Kristine Larsen
LRLA	7	Richard Lovison
MARE	10	Enrico Mariani
MCE	25	Etsuiku Mochizuki
MGAA	3	Gael Mariani
MILJ	4	Jay Miller
MJHA	13	John McCammon
MMI	26	Michael Moeller
MUDG	11	George Mudry
OATS	11	Susan Oatney
OBSO	20	IPS Observatory
ONJ	17	John O'Neill
RLM	7	Mat Raymonde
SCGL	24	Gerd-Lutz Schott
SDOH	31	SDO-Jan Alvestad

SDP	1	Dolores Sharples	19	37	83	60
SIMC	10	Clyde Simpson	20	39	75	56
SMNA	5	Michael Stephanou	21	39	83	62
SONA	15	Andries Son	22	37	74	54
SPIA	7	Piotr Skorupski	23	40	47	34
STAB	27	Brian Gordon-States	24	35	39	29
SUZM	26	Miyoshi Suzuki	25	35	48	34
TESD	28	David Teske	26	33	57	39
URBP	23	Piotr Urbanski	27	33	56	40
VARG	24	A. Gonzalo Vargas	28	36	59	44
WAU	2	Artur Wargin	29	32	89	65
WILW	24	William M. Wilson	30	37	119	89
WKM	2	Michael Wiskirken	Average	35.7	92.1	67.3

Total Observers: 69
Total Observations: 1108

Errata for the May, 2014 numbers:

BSAB had 27 observations and DEMF had 10 observations as late entries to the SunEntry database.

American Relative Sunspot Numbers (Ra) for June, 2014 [boldface = maximum, minimum]

DAY	NumObs	RAW	Ra
1	37	57	42
2	37	61	43
3	38	65	47
4	34	64	46
5	35	73	57
6	35	113	83
7	39	121	90
8	39	131	97
9	32	154	109
10	34	146	104
11	34	163	115
12	34	180	130
13	34	157	115
14	32	119	86
15	38	68	51
16	36	78	59
17	36	88	66
18	34	96	71

Obs	#Obs	Name
AAP	1	A. Patrick Abbott
AAX	9	Alexandre Amorim
AJV	18	J. Alonso
ARAG	29	Gema Araujo
ASA	9	Salvador Aguirre
BARH	6	Howard Barnes
BATR	2	Roberto Battaiola
BERJ	20	Jose Alberto Berdejo
BMF	20	Michael Boschat
BRAB	29	Brenda Branchett
BRAF	19	Raffaello Braga
BROB	30	Robert Brown
BSAB	16	Santanu Basu
BXD	17	Alexandru Burda
CADA	1	Adair Cardoso
CHAG	30	German Morales Chavez
CIOA	9	Ioannis Chouinavas
CKB	24	Brian Cudnik
CNT	11	Dean Chantiles
CVJ	14	Jose Carvajal
DEMF	8	Frank Dempsey
DGP	19	Gerald Dyck
DJOB	13	Jorge del Rosario
DUBF	23	Franky Dubois
FAM	6	Fabio Mariuzza
FERJ	25	Javier Ruiz Fernandez
FJAE	7	Dr. John Alan Freeman
FLET	21	Tom Fleming
FLF	11	Fredirico Luiz Funari
FTAA	7	Tadeusz Figiel
FUJK	21	K. Fujimori
HAYK	17	Kim Hay

HOWR	28	Rodney Howe	SCGL	29	Gerd-Lutz Schott
JASK	23	Krystyna Wirkus	SDOH	30	Solar Dynamics Obs - HMI
JGE	9	Gerardo Jimenez Lopez	SDP	2	Dolores Sharples
JJMA	11	Jessica M.Johnson	SIMC	5	Clyde Simpson
KAND	29	Kandilli Observatory	SONA	10	Andries Son
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MCE	20	Etsuiku Mochizuki	WGI	3	Guido Wollenhaupt
MGAA	3	Gael Mariani	WILW	21	William M. Wilson
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MJHA	24	John McCammon			
MMI	27	Michael Moeller			
MUDG	7	George Mudry			
OATS	8	Susan Oatney			
OBSO	14	IPS Observatory			
ONJ	14	John O'Neill			
RLM	4	Mat Raymonde			
			Total	Observers:	67
			Total	Observations:	1071

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