POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory in cooperation with Harvard, Yerkes, Perkins, and Mount Wilson Observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column]

Date	Eastern standard civil time		Heliographic			Area		Total area for each day
			Diff. long.	Longitude	Latitude	Spot	Group	
1932	h	m	°	°	°			
Sept. 1 (Mount Wilson)	11	20	+42.0	277.5	−9.0	10		10
Sept. 2 (Naval Observatory)	11	30	+54.0	276.2	−9.0	6		6
Sept. 3 (Naval Observatory)	10	21		No spots				
Sept. 4 (Naval Observatory)	12	35		No spots				
Sept. 5 (Naval Observatory)	13	17		No spots				
Sept. 6 (Naval Observatory)	11	25		No spots				
Sept. 7 (Naval Observatory)	10	19		No spots				
Sept. 8 (Naval Observatory)	14	41		No spots				
Sept. 9 (Naval Observatory)	12	4		No spots				
Sept. 10 (Naval Observatory)	10	42		No spots				
Sept. 11 (Naval Observatory)	11	34		No spots				
Sept. 12 (Naval Observatory)	11	53	−60.0	29.9	+6.0	6		6
Sept. 13 (Naval Observatory)	10	40		No spots				
Sept. 14 (Naval Observatory)	11	59		No spots				
Sept. 15 (Perkins Observatory)				No spots				
Sept. 16 (Naval Observatory)	13	30		No spots				
Sept. 17 (Naval Observatory)	11	12		No spots				
Sept. 18 (Naval Observatory)	13	5		No spots				
Sept. 19 (Naval Observatory)	11	46		No spots				
Sept. 20 (Mount Wilson)	13	0		No spots				
Sept. 21 (Mount Wilson)	12	30	−27.0	303.7	+12.0		12	
			+70.0	400.7	−3.0		32	44
Sept. 22 (Mount Wilson)	12	50	−12.0	305.4	+12.0		7	7
Sept. 23 (Naval Observatory)	11	2		No spots				
Sept. 24 (Naval Observatory)	10	14		No spots				
Sept. 25 (Naval Observatory)	13	32		No spots				
Sept. 26 (Naval Observatory)	10	57		No spots				
Sept. 27 (Mount Wilson)	12	30	+24.0	275.6	+12.0		12	12
Sept. 28 (Naval Observatory)	11	29	+32.0	270.9	−7.0		9	9
Sept. 29 (Naval Observatory)	10	22	+44.0	270.3	−7.0		12	12
Sept. 30 (Naval Observatory)	10	32	+61.0	274.1	−6.0	6		6
Mean daily area for September								4

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR SEPTEMBER, 1932

(Dependent alone on observations at Zurich and its station at Arosa)

[Data furnished through the courtesy of Prof. W. Brunner, University of Zurich, Switzerland]

September, 1932	Relative numbers	September, 1932	Relative numbers	September, 1932	Relative numbers
1	7	11	0	21	19
2	7	12	14	22	8
3	7	13	7	23	0
4	0	14	0	24	8
5	0	15	0	25	8
6	0	16	0	26	0
7	0	17	0	27	
8	0	18	0	28	8
9	0	19	8	29	8
10	0	20	0	30	7

Mean: 29 days=4.0.

a=Passage of an average-sized group through the central meridian.
b=Passage of a large group or spot through the central meridian.
c=New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central zone.
d=Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[The Aerological Division, W. R. Gregg, in charge]

By L. T. SAMUELS

Free-air temperatures for September were close to normal in practically all cases with negative departures predominating. (Table 1.) Relative humidity departures were generally negative except at the southern stations.

Free-air resultant wind velocities for the month were considerably below normal with variable resultant directions at most stations, the departures from normal being greatest in the southern sections of the country. In these sections a preponderance of northerly components prevailed as compared with the normal resultant directions.

Airplane observations were made on five days during the month at Fairbanks, Alaska, in connection with the International Polar Year program.

TABLE 1.—*Free-air temperatures and relative humidities during September, 1932*

TEMPERATURE (° C.)

Altitude (meters) m. s. l.	Atlanta, Ga. (303 meters)[1]		Chicago, Ill. (195 meters)[2]		Cleveland, Ohio (246 meters)[3]		Dallas, Tex. (146 meters)[3]		Ellendale, N. Dak. (444 meters)		Norfolk, Va. (3 meters)[4]		Omaha, Nebr. (300 meters)[5]		Pensacola, Fla. (2 meters)[4]		San Diego, Calif. (9 meters)[4]		Washington, D. C. (2 meters)[4]	
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal
Surface	19.1	(6)	12.9	(6)	14.4	(6)	21.1	(6)	14.7	+0.3	20.8	−2.4	12.9	(6)	23.0	−1.1	18.7	−1.8	18.2	−2.6
500	19.7	(6)	15.6	(6)	16.6	(6)	22.7	(6)	14.7	+0.3	19.7	−1.8	14.6	(6)	22.6	−0.5	15.6	−1.6	17.9	−1.4
1,000	18.7	+0.4	14.6	−0.4	14.6	−0.4	21.1	+1.4	13.2	+0.3	16.7	−2.3	16.5	+0.2	19.9	−0.7	20.9	+1.7	16.7	−0.9
1,500	15.7	+0.1	11.8	−0.4	11.0	−1.2	17.6	+0.2	10.3	−0.6			14.1	0.0						
2,000	12.5	−0.5	9.3	−0.4	8.6	−1.1	14.8	0.0	7.5	−0.9	11.7	−1.7	11.6	+0.2	14.6	−0.5	19.7	+2.6	12.1	−0.9
2,500	9.7	−0.5	6.8	−0.2	6.3	−0.7	12.3	0.0	4.8	−0.7			8.8	+0.5						
3,000	7.1	−0.4	4.0	−0.6	3.3	−1.3	10.0	+0.3	2.0	−0.5	7.2	−0.7	5.8	+0.6	9.5	−0.1	12.3	+0.9	7.4	−0.8
4,000	1.0	−1.2	−1.9	−1.0	−2.5	−1.6	3.7	−0.4	−0.9	+2.1			−0.5	+0.1	4.0	+0.1			0.6	−1.7
5,000	−5.6	−1.6	−8.1	−0.6	−9.2	−1.7	−1.9	−0.7					−7.4	−1.4	−1.4	+0.3				

RELATIVE HUMIDITY (PER CENT)

Surface	87	(6)	82	(6)	78	(6)	84	(6)	58	−10	78	+4	87	(6)	86	0	79	+7	76	+1
500	83	(6)	65	(6)	67	(6)	68	(6)	57	−9	68	+1	72	(6)	80	0	89	+9	65	−3
1,000	76	+6	56	−9	66	+1	65	−5	53	−7	66	+2	46	−13	78	+2	58	+2	61	−2
1,500	73	+3	53	−10	69	+6	73	+10	53	−2			44	−12						
2,000	70	+4	49	−10	58	−1	73	+15	52	0	64	+2	44	−10	69	+1	30	−1	57	−3
2,500	63	0	45	−11	53	−3	63	+11	49	−3			44	−11						
3,000	57	−3	43	−9	52	0	54	+6	47	−4	59	+5	45	−9	61	+1	26	+1	47	−6
4,000	56	−2	44	−3	43	−4	59	+19	28	−18			44	−7	57	+2			47	−2
5,000	51	−18	39	−5	41	−3	64	+28					39	−10	64	+7				

[1] Temperature and humidity departures based on normals of Due West, S. C.
[2] Temperature and humidity departures based on normals of Royal Center, Ind.
[3] Temperature departures based on normals determined by interpolating between those of Groesbeck, Tex., and Broken Arrow, Okla. Humidity departures based on normals of Groesbeck, Tex.
[4] Naval air stations.
[5] Temperature and humidity departures based on normals of Drexel, Nebr.
[6] Surface and 500 meter departures omitted because of difference in time between airplane observations and those of kites upon which the normals are based.

Weather Bureau airplane observations made near 5 a. m.; Navy airplane observations near 7 a. m.; Ellendale kite observations near 9 a. m. (Seventy-fifth meridian time).

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot-balloon observations made near 7 a. m. (E. S. T.) during September, 1932*

[Wind from North=360° East=90° etc.]

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,528 meters)		Atlanta, Ga. (309 meters)		Bismarck, N. Dak. (518 meters)		Brownsville, Tex. (12 meters)		Burlington, Vt. (132 meters)		Cheyenne, Wyo, (1,873 meters)		Chicago, Ill. (195 meters)		Cleveland, Ohio (245 meters)		Dallas, Tex. (154 meters)		Havre, Mont. (762 meters)		Jacksonville, Fla. (14 meters)		Key West, Fla. (11 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	56	1.2	28	1.2	208	0.5	339	0.6	200	1.3	293	2.7	254	0.7	192	0.4	59	1.0	268	1.6	38	0.5	98	1.4
500			73	4.0			92	2.3	230	3.3			309	1.2	327	1.4	122	4.3			97	3.8	99	3.8
1,000			87	4.1	243	5.2	90	3.0	266	3.0			292	2.4	304	3.3	127	3.4	257	4.0	93	3.7	115	2.9
1,500			89	2.7	273	5.3	76	2.2	298	5.5			288	4.1	300	3.9	119	1.9	282	5.6	78	2.6	113	1.3
2,000	143	1.7	86	1.8	279	6.8	31	2.1	309	6.7	288	3.6	301	4.4	290	5.0	84	1.1	285	5.9	49	1.4	116	0.7
2,500	249	1.1	20	0.5	278	9.1	29	2.7	318	8.2	299	3.9	282	6.9	283	5.3	79	1.3	286	8.0	37	1.5	95	0.3
3,000	309	1.9	356	0.7	284	9.9	28	3.3	312	9.2	285	6.2	233	5.7	274	6.0	64	2.0	290	8.9	23	0.8	130	0.4
4,000	323	3.0	302	2.9	288	12.3	326	0.8	303	9.9	287	8.7			275	4.9	39	2.3	292	8.6	293	1.8	108	0.3
5,000	315	3.6	295	6.5			96	1.7			285	8.7			277	4.9	302	1.8	293	5.4	282	2.2	357	0.6

	Los Angeles, Calif. (217 meters)		Medford, Oreg. (410 meters)		Memphis, Tenn. (85 meters)		New Orleans, La. (25 meters)		Oakland, Calif. (8 meters)		Oklahoma, City, Okla. 402 meters)		Omaha, Nebr. (306 meters)		Phoenix, Ariz. (356 meters)		Sale Lake City, Utah (1,294 meters)		Sault Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D. C. (10 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	56	0.3	179	0.4	31	1.0	40	2.0	335	0.7	93	1.3	160	1.4	116	1.8	141	3.1	348	0.2	158	0.2	322	1.1
500	95	0.2	284	0.4	77	4.4	69	4.4	313	0.9	150	1.9	177	3.0	114	1.7			273	2.5	7	1.9	312	2.4
1,000	21	1.6	304	0.6	58	2.5	74	2.7	343	3.8	202	3.2	218	3.7	219	0.6			292	6.3	10	2.3	334	3.0
1,500	281	1.0	81	1.1	30	2.1	50	2.3	352	2.0	201	2.6	260	3.9	263	1.2	148	3.5	300	7.0	327	1.0	330	3.6
2,000	220	3.3	82	0.8	6	2.9	8	2.9	306	1.3	182	1.5	270	5.4	279	0.8	180	1.6	285	6.3	308	1.7	312	3.9
2,500	166	3.8	245	1.3	356	3.9	360	4.6	277	1.3	187	0.6	273	6.3	300	0.7	230	1.3	282	6.6	293	2.8	302	5.4
3,000	146	6.1	262	2.8	346	1.6	338	5.3	285	1.7	53	0.1	300	6.0	57	0.6	275	2.9	277	6.8	293	4.8	295	5.3
4,000			284	3.5	21	3.1					2	1.6	286	8.2	121	2.4	283	6.5	266	8.2			270	2.9
5,000																	276	7.2	267	8.6				

RIVERS AND FLOODS

By RICHMOND T. ZOCH

[River and Flood Division, Montrose W. Hayes in charge]

Floods occurred in the following rivers during the month of September: The Tombigbee in Alabama, the Solomon and Smoky Hill in Kansas, the West Fork, Trinity, Nueces, and Rio Grande Rivers in Texas, and the Colorado in Arizona. Since some of the rivers in Texas reached flood stage in the latter part of the month and continued into September the floods of Texas will be discussed in a later issue of the REVIEW.

The table herewith gives the usual data for all the overflows, except those in Texas. No damage resulted from any of these floods.

Table of flood stages in September, 1932

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
EAST GULF OF MEXICO DRAINAGE	*Feet*			*Feet*	
Tombigbee: Lock No. 3, Ala	33	7	7	33.0	7
MISSISSIPPI SYSTEM					
Missouri Basin					
Solomon: Beloit, Kans	18	13	13	18.5	13
Smoky Hill: Lindsborg, Kans	21	15	16	22.4	15
GULF OF CALIFORNIA DRAINAGE					
Colorado: Parker, Ariz	7	1	1	9.0	1