SOLAR RADIATION DATA FOR SEPTEMBER 1948

[Solar Radiation Investigation Section, I. F. HAND, in Charge]

Explanation of Tables 1 and 2 and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the MONTHLY WEATHER REVIEW, vol. 72, No. 1, January 1944, p. 43. A list of pyrheliometric stations is given on page 45 of that issue. An explanation of the formula used in computing the air mass values for each station listed in table 1 appears in vol. 75, No. 3, March 1947, p. 47.

TABLE 1.—*Solar radiaton intensities during September 1948*

[Gram calories per minute per square centimeter of normal surface]

MADISON, WIS.

Date	Sun's zenith distance: A. M. 78.7°	75.7°	70.7°	60.0°	0.0°	P. M. 60.0°	70.7°	75.7°	78.7°	Vapor pressure: 7:30 a. m.[1]	1:30 p. m.[1]
	Air mass: 4.81	3.84	2.88	1.92	*0.96	1.92	2.88	3.84	4.81		
September	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*	*mb.*
3			0.90	1.06	1.28					12.7	15.3
4			.79	.96	1.27					14.2	15.8
9				1.21	1.37					10.6	10.6
10				1.25	1.38					9.8	10.2
11					1.32					12.3	14.8
13				1.04	1.36					15.3	14.2
14				1.13						11.8	11.8
15			.70	.88	1.32					11.4	16.5
18			.54	.73	1.24					19.0	21.1
23			.92	1.16	1.46					9.1	10.6
25			.88	1.02	1.36	1.18	.96			9.1	9.4
27				1.04	1.42	1.07	.87			7.8	9.1
28			.94	1.16	1.37	1.08				8.1	9.1
Means			.81	1.05	1.35	1.07	(.92)				
Departures			−.15	−.08	−.01	−.08	−.10				

LINCOLN, NEBR.

	Air mass: 4.77	3.81	2.86	1.91	*0.95	1.91	2.86	3.81	4.77		
September	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*	*mb.*
1			0.75	0.92	1.20					22.6	21.8
3				1.01	1.28	0.99	0.77			19.6	21.8
4				.99	1.22	1.03				19.0	20.4
8					1.40	1.17	.99	0.86	0.77	13.7	11.0
9				1.09	1.36					11.4	12.3
11			.99	1.17	1.32					14.6	19.0
13					1.20	1.01	.79	.62	.48	14.2	16.4
14	0.54	0.68	.82	1.01	1.24	1.06	.86	.73	.62	15.8	17.7
15		.82	.94	1.12	1.32	1.10	.92	.82	.69	15.8	14.6
16	.58	.69	.82	1.01	1.22					16.4	16.4
21					1.30	1.14	.88	.84	.71	17.7	18.3
25					1.33	1.14	.97	.84	.75	11.0	10.6
27	.68	.79	.88	1.09	1.32	1.14	.94	.84		8.4	11.4
28	.64	.77	.92	1.07	1.31	1.12	.97	.84	.62	8.4	10.2
29				1.16	1.34	1.17	.99	.84	.71	8.4	10.6
30	.68	.79	.94	1.09	1.28					8.4	9.4
Means	.62	.76	.88	1.06	1.29	1.10	.91	.80	.67		
Departures	−.11	−.08	−.09	−.08	−.11	−.05	−.06	−.03	−.05		

TABLE MOUNTAIN, CALIF.

	Air mass: 3.76	3.01	2.26	1.51	*0.75	1.51	2.26	3.01	3.76		
September	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*	*mb.*
2				1.28							
3				1.32							
6				1.43							
7				1.41							
8				1.40							
12				1.35							
19				1.48							
20				1.49							
22				1.50							
23	1.14	1.21	1.32	1.44							
26				1.46							
27				1.47							
30				1.41							
Means	(1.14)	(1.21)	(1.32)	1.42							
Departures	0	−.01	0	+.02							

BOSTON, MASS.

	Air mass: 4.96	3 96	2.97	1.98	*0.99	1.98	2.97	3.96	4.96		
September	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*	*mb.*
1	0.84	1.03	1.17	1.25						10.6	9.4
3	.48	.65	.77	.67						14.8	14.2
13	.53	.63	.82	.96						19.0	20.4
15			.89	1.08						9.1	6.4
16		.90	1.03	1.12						6.6	9.1
17	.56	.67	.79	.90						7.4	11.0
21		1.00								10.6	7.2
22		1.01	1.10	1.22						7.2	9.1
23		.74	.83	1.13						9.4	10.6
27			.94	1.00						9.8	12.3
28				1.05						10.6	12.3
29	.60	.70	.76	.83						13.2	15.3
Means	.60	.81	.91	1.02							
Departures	+.04	+.07	+.01	+.01							

BLUE HILL, MASS.

	Air mass: 4.86	3.89	2.92	1.94	*0.97	1.94	2.92	3.89	4.86		
September	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*	*mb.*
1	0.91	1.01	1.13.	1.29	1.50	1.27	1.11	0.98	0.84	10.7	10.0
3	.47	.61	.73	.92			.51	.41	.32	13.3	19.7
5	.32	.41	.57	.77		.68	.58	.43	.37	18.9	18.6
6	.29	.40	.51	.74		.62	.53	.40	.32	19.8	17.1
7	.39	.47	.58	.90		1.01	.84	.67	.56	14.8	12.1
8	.55	.69	.77	.95		1.04	.81	.70	.58	18.2	17.2
9	.55	.64	.70	.92						10.5	17.1
12	.49	.57	.72	1.05			.63	.49	.39	13.8	13.8
13	.54	.62	.75	.93			.69	.53	.40	19.1	17.9
14						1.23	1.06	.90	.80	12.9	9.7
15			1.12	1.24						8.4	7.9
16	.97	1.07	1.15	1.27		1.24		.99	.87	6.9	6.8
17	.60	.72	90	1.09						9.1	7.3
21	.94	1.01	1.14							11.0	8.2
22	1.00	1.08	1.19	1.34						6.9	7.9
23	.91	1.01	1.12							9.4	10.4
24						1.21	1.07	.98	.88	9.2	8.8
25	.94	1.03	1.11	1.17		1.35	1.20	1.09	.98	8.6	8.4
26	.88	.98	1.12	1.26		1.12	.92	.80	.71	9.1	9.8
27	.90	1.03	1.15	1.27		1.13	.99	.87	.76	9.3	8.8
28	.74	.83	.95	1.13		1.01	.86	.77	.70	10.2	11.0
29	.65	.76	.85	1.04		1.12	.91	.75	.60	13.0	10.1
30	.44	.54	.67							13.2	12.6
Means	.67	.77	.90	1.07	1.50	1.08	.85	.74	.63		
Departures	−.08	−.09	−.08	−.05	+.12	−.04	−.07	−.04	−.03		

* Extrapolated.
[1] 75th meridian time.

TABLE 2.—*Daily totals and weekly means of solar radiation (direct + diffuse) received on a horizontal surface*

[Gram calories per square centimeter]

Date	Washington, D. C.	Madison, Wis.	Lincoln, Nebr.	New York, N. Y.	Fresno, Calif.	Fairbanks, Alaska	Columbia, Mo.	Boston, Mass.	Nashville, Tenn.	Twin Falls, Idaho	La Jolla, Calif.	Riverside, Calif.	Blue Hill, Mass.	Newport, R. I.	Salt Lake City, Utah	Put-in-Bay, Ohio	State College, Pa.	Davis, Calif.	Toronto, Canada	Ithaca, N. Y.	Boulder, Colo.	East Wareham, Mass.	Honolulu, T. H.	Pearl Harbor, T. H.	East Lansing, Mich.	Summit, Mont.	Soda Springs, Calif.	Grand Lake, Colo.
1948	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Sept. 3	509	547	556	424	606	-----	430	305	338	531	445	577	422	555	562	464	454	572	365	301	-----	553	685	648	398	502	661	580
Sept. 4	386	526	565	293	561	-----	537	242	180	537	319	581	295	463	531	482	433	554	447	288	-----	468	692	619	433	461	578	626
Sept. 5	368	469	561	314	581	-----	-----	442	300	532	470	590	473	491	563	401	427	539	442	332	-----	433	633	573	330	357	623	522
Sept. 6	372	369	309	455	570	-----	570	384	370	531	536	588	429	510	560	407	247	537	393	322	-----	482	578	466	210	428	608	398
Sept. 7	230	485	98	257	572	-----	579	441	256	535	-----	-----	496	536	572	290	274	527	257	258	-----	502	625	550	195	557	607	383
Sept. 8	376	118	557	210	579	-----	119	477	414	527	424	-----	506	486	555	439	198	527	420	187	-----	500	632	520	223	556	606	630
Sept. 9	442	462	444	346	566	-----	623	392	102	519	400	-----	456	482	543	283	319	522	215	168	-----	470	700	653	428	486	566	568
Means	383	425	442	328	576	-----	476	383	280	530	432	-----	440	503	555	395	336	540	363	265	-----	487	649	576	317	478	607	530
Departures	−8	+44	+3	−33	+12	-----	−15	+10	−105	+30	−47	-----	+54	+80	+23	−24	−22	−4	−9	−101	-----	+85	+9	+1	−32	−19	+2	+2
Sept. 10	18	567	482	117	534	-----	582	306	464	514	288	-----	331	365	534	447	190	516	308	145	-----	321	676	652	362	539	586	616
Sept. 11	479	520	553	502	539	-----	536	310	538	505	502	-----	335	314	530	430	376	500	282	234	452	280	599	652	323	512	579	537
Sept. 12	506	498	509	484	557	-----	593	401	559	504	330	-----	464	492	544	516	494	518	434	288	508	462	694	620	399	403	576	519
Sept. 13	492	521	513	383	540	-----	567	417	275	475	408	-----	436	472	524	455	476	494	439	314	490	445	694	613	367	486	577	588
Sept. 14	396	491	526	488	556	-----	555	422	499	459	428	-----	463	498	529	529	539	517	382	353	-----	482	706	639	391	474	573	489
Sept. 15	496	483	540	514	564	-----	568	417	534	365	451	-----	494	484	300	265	442	510	335	350	406	405	696	577	72	449	565	522
Sept. 16	330	456	453	490	509	-----	543	474	519	366	452	-----	508	551	300	463	486	165	411	340	217	512	682	550	324	346	440	184
Means	388	505	511	426	543	-----	563	392	484	456	408	-----	433	454	466	443	429	460	370	289	415	415	678	615	320	458	556	568
Departures	+7	+159	+90	+66	+12	-----	+117	+63	+98	−16	−39	-----	+63	+68	−14	+53	+22	−38	+24	−52	−10	+47	+15	+23	+32	+30	+6	+8
Sept. 17	360	331	470	260	488	-----	541	306	476	234	263	463	400	444	468	404	395	247	317	243	317	427	637	514	268	220	415	334
Sept. 18	358	443	495	378	525	-----	524	313	396	246	254	436	346	338	347	222	291	392	159	186	380	332	649	584	200	156	380	530
Sept. 19	212	409	474	346	564	-----	416	366	429	179	511	483	279	426	241	398	289	531	263	111	256	442	678	610	294	484	587	266
Sept. 20	331	91	225	178	544	-----	476	66	448	466	475	371	49	69	496	187	124	527	283	104	397	44	686	583	92	353	595	500
Sept. 21	18	51	493	419	513	-----	509	455	488	465	467	324	471	503	505	107	195	515	348	234	491	459	667	603	178	426	555	573
Sept. 22	336	360	370	491	549	-----	130	425	426	426	471	469	492	519	490	400	394	428	452	173	402	470	681	544	327	313	521	429
Sept. 23	388	429	295	338	546	-----	548	212	479	402	291	451	321	367	472	366	372	512	156	158	-----	468	532	487	170	263	309	552
Means	286	302	403	344	533	-----	449	306	449	345	390	428	337	381	431	298	294	450	283	173	374	378	647	561	218	316	480	455
Departures	−77	−52	−4	+16	+41	-----	+17	+25	+78	−80	−12	−28	−14	+29	−5	−44	−38	−31	−37	−180	−60	+55	+20	+2	−79	−10	−10	+1
Sept. 24	126	327	132	283	536	-----	551	326	464	120	352	329	342	286	446	287	181	521	294	94	-----	173	550	448	115	95	282	542
Sept. 25	380	460	498	424	557	72	532	436	471	90	466	450	433	480	287	499	343	470	432	300	-----	467	644	563	299	100	368	511
Sept. 26	443	461	485	464	552	85	537	391	271	402	473	455	436	485	475	497	494	498	418	300	-----	445	553	566	382	311	497	354
Sept. 27	398	451	486	448	539	183	509	358	336	448	450	438	423	480	482	478	488	505	379	319	233	438	430	408	350	86	529	351
Sept. 28	162	445	478	363	520	119	389	409	106	450	464	433	417	450	348	359	379	487	384	307	412	402	372	391	384	450	519	370
Sept. 29	160	184	478	379	504	52	84	356	239	436	368	441	419	433	422	202	213	479	289	234	375	412	589	552	170	141	473	422
Sept. 30	82	102	424	100	494	83	210	172	276	421	317	439	262	317	439	292	255	424	202	142	145	339	614	575	115	322	435	237
Means	250	347	426	352	529	-----	400	354	309	338	413	426	390	419	414	373	336	484	343	242	-----	382	536	500	245	215	443	398
Departures	−94	+46	+68	+41	+67	-----	+60	+55	−28	−88	+38	−17	+47	+78	+9	+37	−8	+23	+21	−77	-----	+31	−32	−25	−28	−34	−12	−19
ACCUMULATED DEPARTURES ON SEPTEMBER 30, 1948																												
	−3724	+6860	+6293	−6041	+12152	-----	-----	−3710	-----	−1981	−3815	-----	−3899	+385	−511	-----	−2380	−4018	+1932	−22071	-----	−1365	-----	-----	−602	-----	-----	-----

TABLE 3.—*Daily totals and weekly means of solar and sky radiation plus the radiation reflected from the ground, as received on a vertical surface facing south at Blue Hill, Mass., during September 1948*

Date	3	4	5	6	7	8	9	Mean	10	11	12	13	14	15	16	Mean
Gm cal/cm²	296	-----	360	334	386	401	362	357	250	236	383	368	390	410	432	353

Date	17	18	19	20	21	22	23	Mean	24	25	26	27	28	29	30	Mean
Gm cal/cm²	327	291	275	36	443	464	293	304	308	471	477	441	443	453	233	404

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