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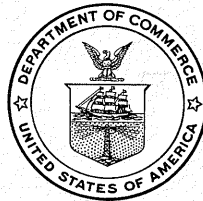
WEATHER BUREAU
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In cooperation with U. S. Department of the Army, Corps of Engineers

Mean Precipitable Water in the United States

Prepared by

A. L. SHANDS



TECHNICAL PAPER NO. 10

DIVISION OF CLIMATOLOGICAL AND HYDROLOGIC SERVICES
HYDROMETEOROLOGICAL SECTION

U. S. DEPARTMENT OF COMMERCE

Weather Bureau

Washington, D. C.

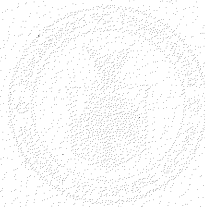
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By

W. M. K. ...



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MEAN PRECIPITATION WATER IN THE UNITED STATES

[Prepared by A. L. SHANDS, Weather Bureau, Washington, D. C.]

The basic data for the tabulations, graphs, and maps in this study come from Ratner's compilation of mean monthly upper-air pressures, temperatures, and relative humidities at 29 stations in the United States^{1/}. The values of precipitable-water content (amount of water vapor in the atmosphere, in terms of equivalent depth of liquid water) were computed by a method standard in the Hydrometeorological Section. The relationship

$$\text{precipitable water} = \frac{1}{g} \int q dp$$

is approximated (including conversion to inches of depth) by the formula

$$0.4 \bar{q} \Delta p$$

applied to the pressure differences between the standard levels or the significant levels of a sounding^{2/}. Values of q , specific humidity, were obtained by conversion from w , mixing ratio, after w was computed by means of the slide rule devised by the Weather Bureau. Where relative humidities were missing in Ratner's tables (for the highest levels), a value equal to the preceding, lower-level humidity was assumed. All computations of precipitable water were made to 8 km.

Plotted on the same page with each tabulation of the mean precipitable water, by layers and by months at a particular station, are two curves applying to the same station. One (solid) is simply a graphical

presentation of the annual variation of the monthly mean depth of precipitable water, surface to 8 km. The other curve (dashed) shows the annual variation of a theoretical value of depth of precipitable water, also surface to 8 km, plotted on the same scale for purposes of comparison.

The theoretical value for each month is a function of the month's mean surface dewpoint, as computed from Ratner's data, on the assumption of saturation and pseudoadiabatic lapse rate between the mean surface pressure and the mean 8-km pressure, both taken from Ratner's data. Such a theoretical value, computed as a function of sea-level dewpoint where sea level is assumed to be 1000 mb in a saturated atmosphere with pseudoadiabatic lapse rate, has been successfully used in hydrometeorological computations of storm rainfall^{3/}; it is here proposed as a standard of comparison for the moisture content of mean soundings or, for that matter, any other soundings.

In hydrometeorological practice, such comparison has occasionally been used as the basis for an adjustment of the moisture content extrapolated from surface dewpoint^{4/}, but it is evident that the comparison with a mean sounding is not necessarily a sound basis for modifying extrapolations to extreme conditions. However, the comparative shapes of the two curves plotted show an interesting climatological relationship. In general, the theoretical value is an underestimate in the colder months and an overestimate in the warmer months. The underestimate of the winter months is probably caused in part by the characteristic surface-layer temperature and moisture inversion occurring at the usual hour of the soundings. Nevertheless, because the two curves usually cross

twice, the theoretical curve may be considered, in general, a fair approximation of the mean precipitable-water content. The variation in curve contrast from station to station may repay further study.

Each of the maps following the 29 station tabulations and graphs shows the distribution of mean annual or mean monthly precipitable-water content from the surface to 8 km and also from 2 to 8 km*. The latter layer has been chosen for representation in order to eliminate or modify the important effect of topography (specifically, elevation of station) on the value of the depth of precipitable water. Two kilometers was chosen as the standard level clearing all the 29 station elevations considered in the study. The transfer of high or maximum values to mountain areas in the 2-8 charts indicates that the elevation effect is not a simple one, the average moisture content at free-air levels being greater the closer the free level is to the ground surface.

It is the 2-8 chart which should be the more closely comparable to the moisture-flow pattern of a mean isentropic chart^{5/} or to the moisture-flow patterns of mean constant-level or constant-pressure charts. However, the 2-8 chart (as well as the sfc-8 chart) presents an integration of the moisture pattern through depth, so that there should be differences unless the isentropic or other surface is actually representative of the moisture throughout the depth considered.

Without attributing too much accuracy to the result, the sfc-8 observed values at the 29 stations have been arithmetically averaged to obtain annual and monthly mean values of precipitable-water depth for the United States as a whole. The values are presented in the following table.

*To be referred to, hereafter, as the sfc-8 and 2-8 charts.

MAXIMUM OBSERVED DEPTHS OF PRECIPITABLE WATER
Surface to 5 Kilometers

Station	Elevation (Meters)	Max. Precip. Water Surface to 5 Km (Inches)	Date of Occurrence	Last Year of Record Checked
Albuquerque, N. Mex.	1620	1.08	8/ 3/39	1939
Apalachicola, Fla.	7	2.18	8/10/43	1943
Atlanta, Ga.	300	2.32	8/14/43	1943
Billings, Mont.	1088	1.21	6/22/37	1940
Bismarck, N. Dak.	505	2.19	7/ 8/41	1943
Boston, Mass.	5	2.17	8/22/37	1939
Brownsville, Tex.	6	2.72	9/23/41	1943
Buffalo, N.Y.	215	1.95	7/18/42	1942
Charleston, S.C.	14	2.34	9/27/39	1939
Cheyenne, Wyo.	1873	0.93	9/ 2/38	1939
Cleveland, Ohio	245	2.13	8/ 9/31	1939
Dallas, Tex.	149	2.27	8/18/32	1934
Dayton, Ohio (Wright Field)	244	2.27	8/22/36	1939
Denver, Colo.	1616	1.21	7/25/41	1943
Detroit, Mich. (Selfridge Field)	217	1.92	8/22/36	1940
El Paso, Tex.	1194	1.50	8/28/36	1939
Ely, Nev.	1908	0.90	7/30/39	1939
Fargo, N. Dak.	274	2.14	8/14/38	1939
Galveston, Tex. (Ft. Crockett)	3	2.08	7/29/34	1939
Glasgow, Mont.	648	1.13	6/26/44	1944
Great Falls, Mont.	1127	1.22	7/27/41	1943
International Falls, Minn.	343	1.71	8/22/43	1943
Joliet, Ill.	178	2.54	7/ 7/39	1943
Lake Charles, La.	5	2.45	9/16/42	1943
Lakehurst, N.J.	39	2.08	7/10/37	1939
Miami, Fla.	4	2.64	8/14/39	1941
Minneapolis-St. Paul, Minn.	225	2.32	7/28/41	1943
Mitchel Field, L.I., N.Y.	29	2.26	8/ 3/35	1939
Montgomery, Ala. (Maxwell Field)	52	2.14	8/ 7/35	1939
Nashville, Tenn. (Murfreesboro)	180	2.47	8/12/41	1943
Norfolk, Va.	4	2.44	7/ 1/42	1943
Oakland, Calif. (Sunnyvale)	2	1.93	8/27/35	1940
Ogden, Utah	1355	1.01	8/ 6/43	1943
Oklahoma City, Okla.	391	2.21	7/13/41	1943
Omaha, Nebr.	308	2.19	8/11/41	1943
Pembina, N. Dak.	243	1.70	8/ 6/33	1939
Pensacola, Fla.	24	2.29	9/26/39	1939
Phoenix, Ariz.	339	1.80	8/ 4/40	1943

Portland, Maine	20	1.71	6/12/40	1940
Rapid City, S. Dak.	981	1.15	6/ 6/44	1944
St. Louis, Mo.	171	2.22	8/10/41	1943
Salt Lake City, Utah	1293	1.20	7/ 5/37	1939
San Antonio, Tex.	240	2.75	7/11/41	1943
San Diego, Calif.	19	2.10	8/25/35	1940
Sault Ste. Marie, Mich.	221	2.24	8/15/38	1940
Seattle, Wash.	22	1.59	7/11/37	1940
Shreveport, La.	51	2.19	9/ 9/37	1939
Spokane, Wash.	596	1.54	6/25/36	1940
Washington, D.C.	25	2.53	7/ 4/41	1943

Acknowledgments

The author was assisted by other members of the Hydrometeorological Section. A. K. Showalter, formerly Chief of Section, was in particular responsible for the continuous encouragement of the collection of "maximum observed" values. Most of the computations of mean values from Ratner's data were performed by Mrs. M. W. Lamoreux and Mrs. Elva H. Townsend. W. E. Kinnear planned and supervised the drafting.

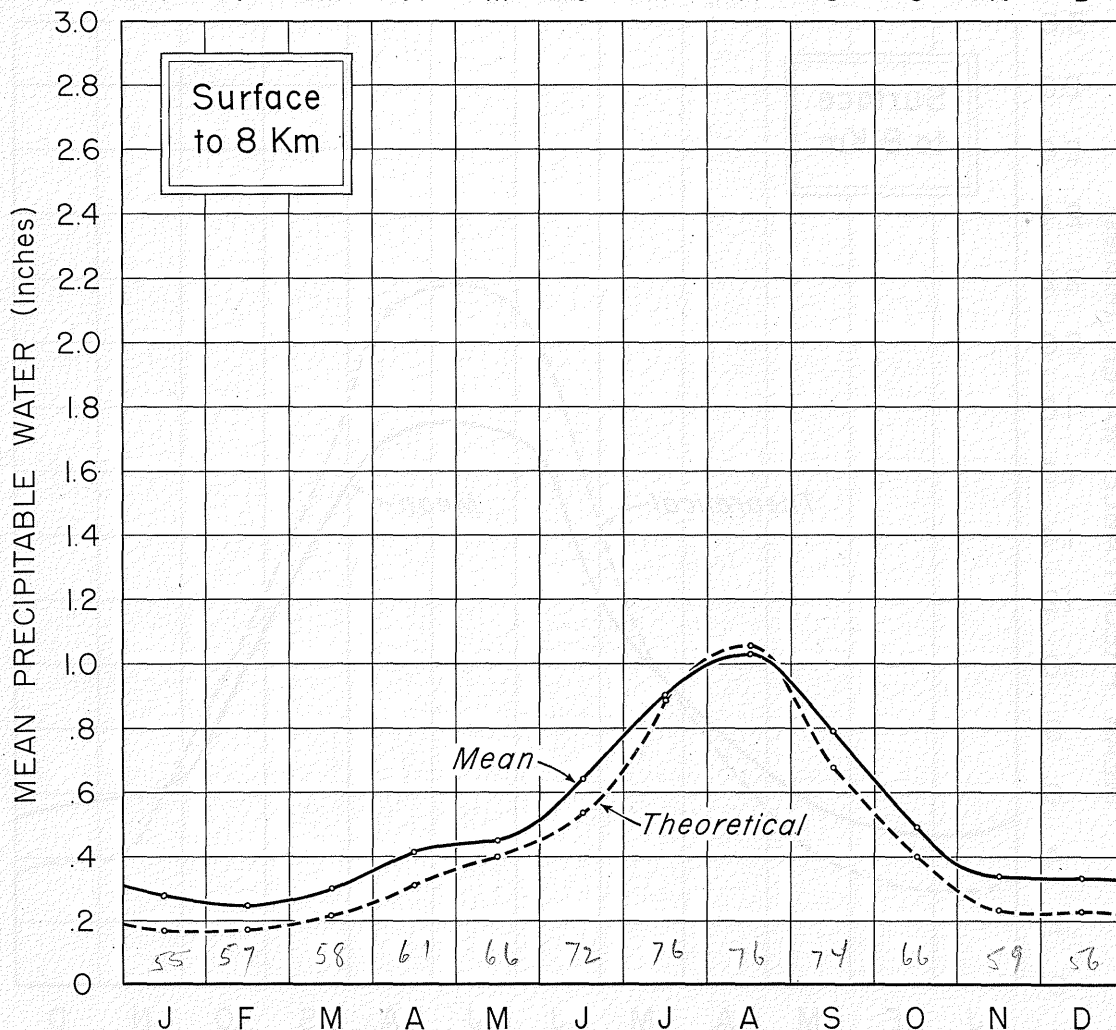
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1. B. Ratner, Upper air average values of temperature, pressure, and relative humidity over the United States and Alaska, U.S. Weather Bur., 1945.
2. S. B. Solot, Computation of depth of precipitable water in a column of air, Monthly Weather Review, v. 67, Apr. 1939, p. 100-103.
3. Hydrometeorological Sec., Off. Hyd. Dir., U.S. Weather Bur., Maximum possible precipitation over the Ohio River Basin above Pittsburgh, Pennsylvania, Hydrometeorological Rpt. No. 2, in coop. with Corps of Engineers, U.S. War Dept., 1941.
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5. J. Namias, Isentropic analysis, chap. VIII in Weather analysis and forecasting, by S. Petterssen, New York, McGraw-Hill, 1940.

MEAN PRECIPITABLE WATER (Inches)

Albuquerque, N. Mex.

LAYER (Km)	Elev. 1620 M					July 1939 - July 1940,		Mar. 1941 - Dec. 1943				
	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 2	.040	.041	.047	.062	.073	.094	.127	.142	.112	.075	.053	.055
2 - 2.5	.049	.047	.057	.072	.080	.111	.149	.162	.130	.088	.065	.066
2.5 - 3	.041	.039	.047	.059	.064	.089	.119	.136	.108	.072	.049	.052
3 - 4	.065	.056	.067	.096	.100	.134	.187	.225	.177	.110	.074	.074
4 - 5	.041	.033	.038	.063	.065	.095	.139	.164	.123	.070	.050	.044
5 - 6	.024	.019	.022	.033	.039	.063	.092	.107	.078	.042	.028	.025
6 - 7	.012	.010	.011	.018	.021	.037	.060	.064	.042	.023	.015	.014
7 - 8	.006	.006	.006	.009	.011	.020	.032	.035	.022	.011	.008	.006
Sfc - 8	.278	.251	.295	.412	.453	.643	.905	1.035	.792	.491	.342	.336
	J	F	M	A	M	J	J	A	S	O	N	D



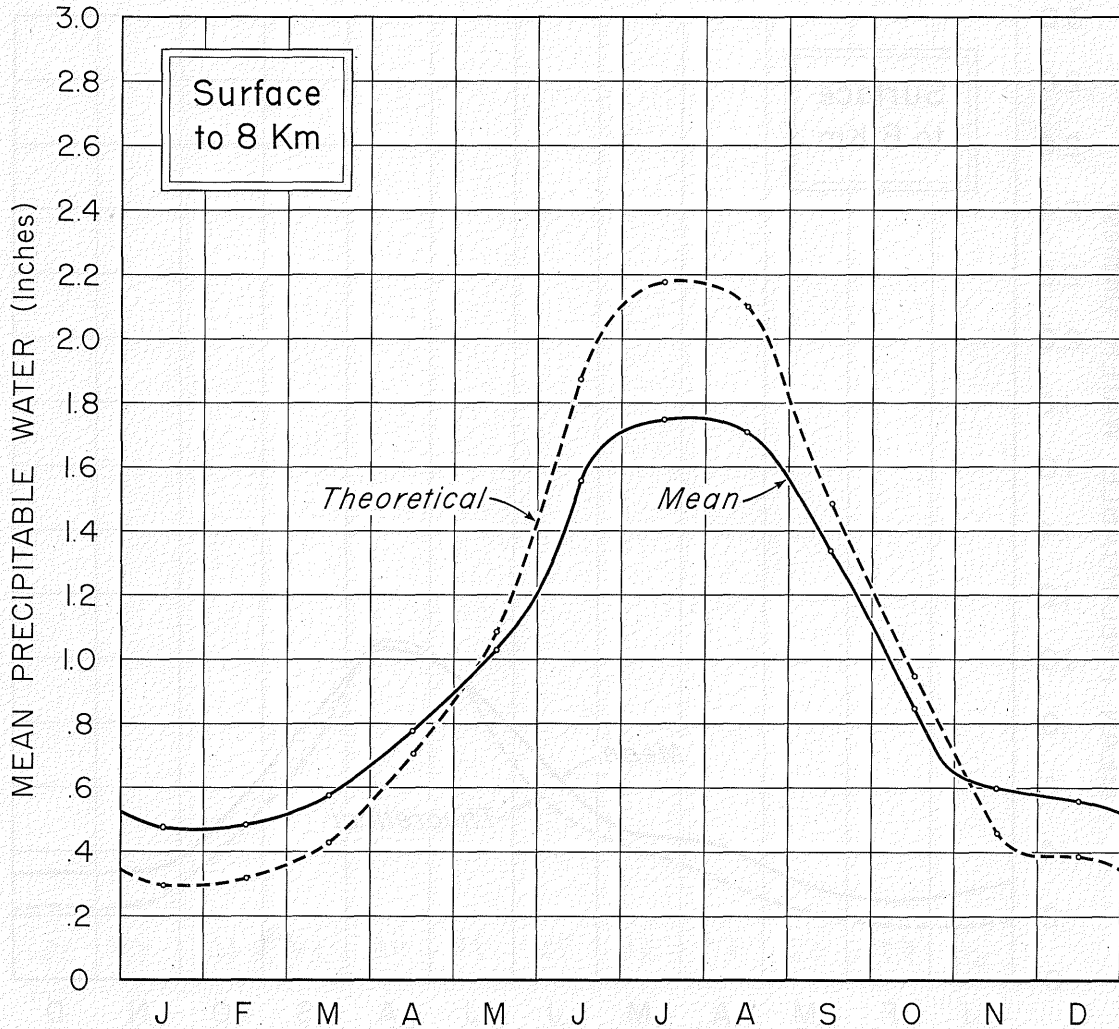
MEAN PRECIPITABLE WATER (Inches)

Atlanta, Ga.

Elev. 300 M

July 1939 - July 1940, Feb. 1941 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.034	.036	.046	.064	.084	.124	.128	.132	.103	.078	.048	.041
0.5 - 1	.081	.082	.106	.143	.190	.282	.309	.296	.240	.176	.111	.103
1 - 1.5	.071	.071	.092	.119	.160	.237	.252	.253	.209	.153	.092	.087
1.5 - 2	.060	.063	.075	.096	.137	.200	.219	.211	.181	.123	.078	.072
2 - 2.5	.049	.054	.060	.081	.110	.159	.180	.174	.139	.096	.061	.060
2.5 - 3	.042	.044	.046	.065	.086	.126	.143	.139	.111	.074	.048	.045
3 - 4	.062	.062	.066	.093	.116	.182	.218	.202	.151	.100	.069	.064
4 - 5	.037	.038	.040	.056	.070	.115	.140	.135	.093	.062	.042	.042
5 - 6	.021	.021	.024	.031	.042	.072	.084	.087	.058	.039	.026	.024
6 - 7	.012	.012	.013	.017	.023	.044	.050	.052	.034	.022	.015	.014
7 - 8	.006	.006	.007	.009	.013	.024	.029	.029	.019	.013	.008	.007
Sfc - 8	<u>.475</u>	<u>.489</u>	<u>.575</u>	<u>.774</u>	<u>1.031</u>	<u>1.565</u>	<u>1.752</u>	<u>1.710</u>	<u>1.338</u>	<u>.846</u>	<u>.598</u>	<u>.559</u>
	J	F	M	A	M	J	J	A	S	O	N	D

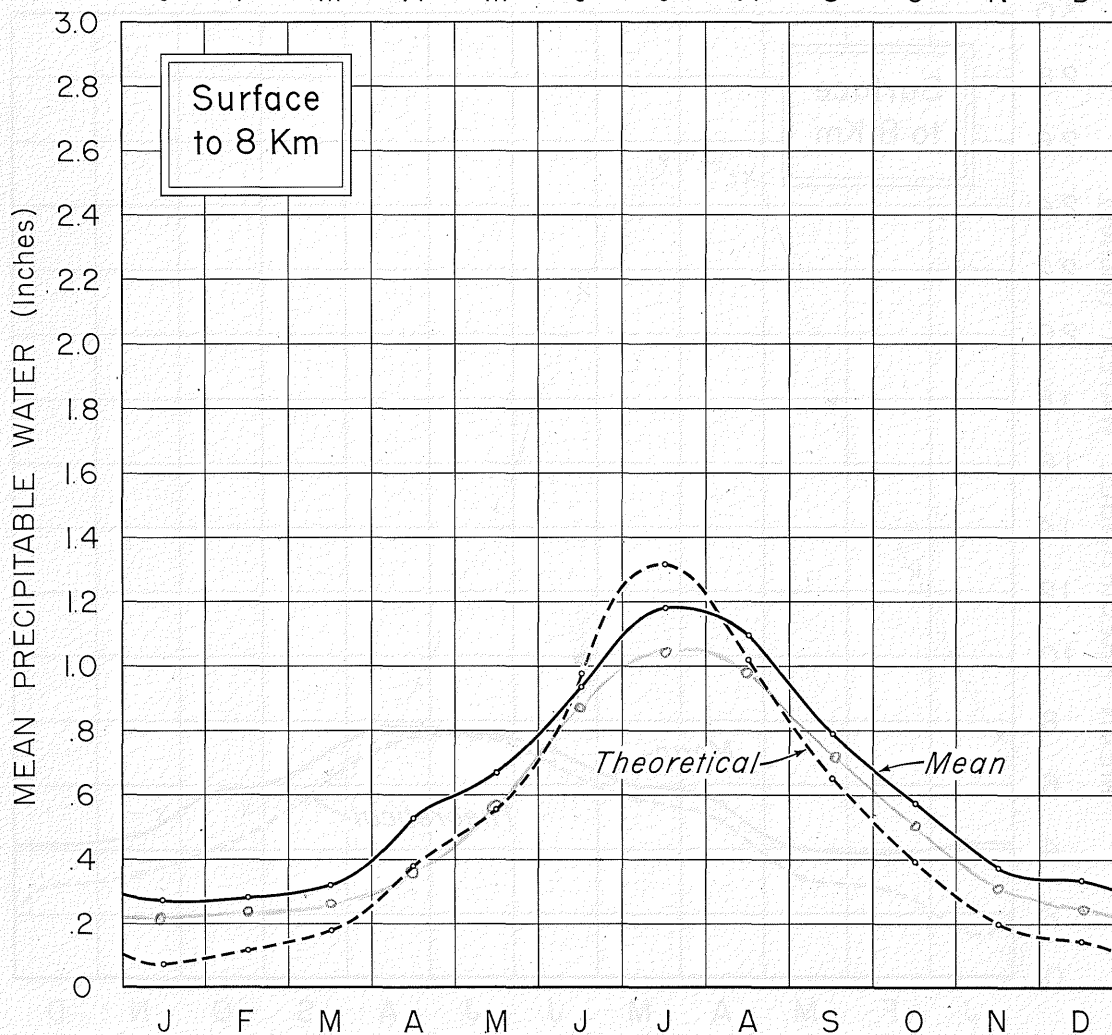


MEAN PRECIPITABLE WATER (Inches) Bismarck, N. Dak.

Elev. 505 M

July 1939 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 1	.034	.042	.056	.097	.126	.183	.229	.202	.148	.106	.064	.052
1 - 1.5	.039	.044	.052	.087	.116	.162	.200	.182	.133	.098	.063	.055
1.5 - 2	.040	.041	.044	.073	.096	.133	.172	.155	.110	.081	.054	.049
2 - 2.5	.035	.035	.036	.062	.079	.108	.133	.129	.089	.064	.044	.040
2.5 - 3	.030	.029	.036	.050	.061	.084	.108	.104	.071	.053	.036	.032
3 - 4	.043	.041	.043	.071	.087	.120	.153	.144	.103	.079	.051	.048
4 - 5	.025	.025	.026	.042	.052	.070	.090	.086	.065	.046	.030	.030
5 - 6	.014	.014	.015	.024	.030	.039	.052	.050	.039	.027	.018	.017
6 - 7	.007	.007	.007	.013	.016	.022	.029	.027	.021	.015	.010	.009
7 - 8	.003	.003	.003	.007	.008	.011	.016	.015	.012	.007	.005	.004
Sfc - 8	<u>.270</u>	<u>.281</u>	<u>.318</u>	<u>.526</u>	<u>.671</u>	<u>.932</u>	<u>1.182</u>	<u>1.094</u>	<u>.791</u>	<u>.576</u>	<u>.375</u>	<u>.336</u>
	J	F	M	A	M	J	J	A	S	O	N	D



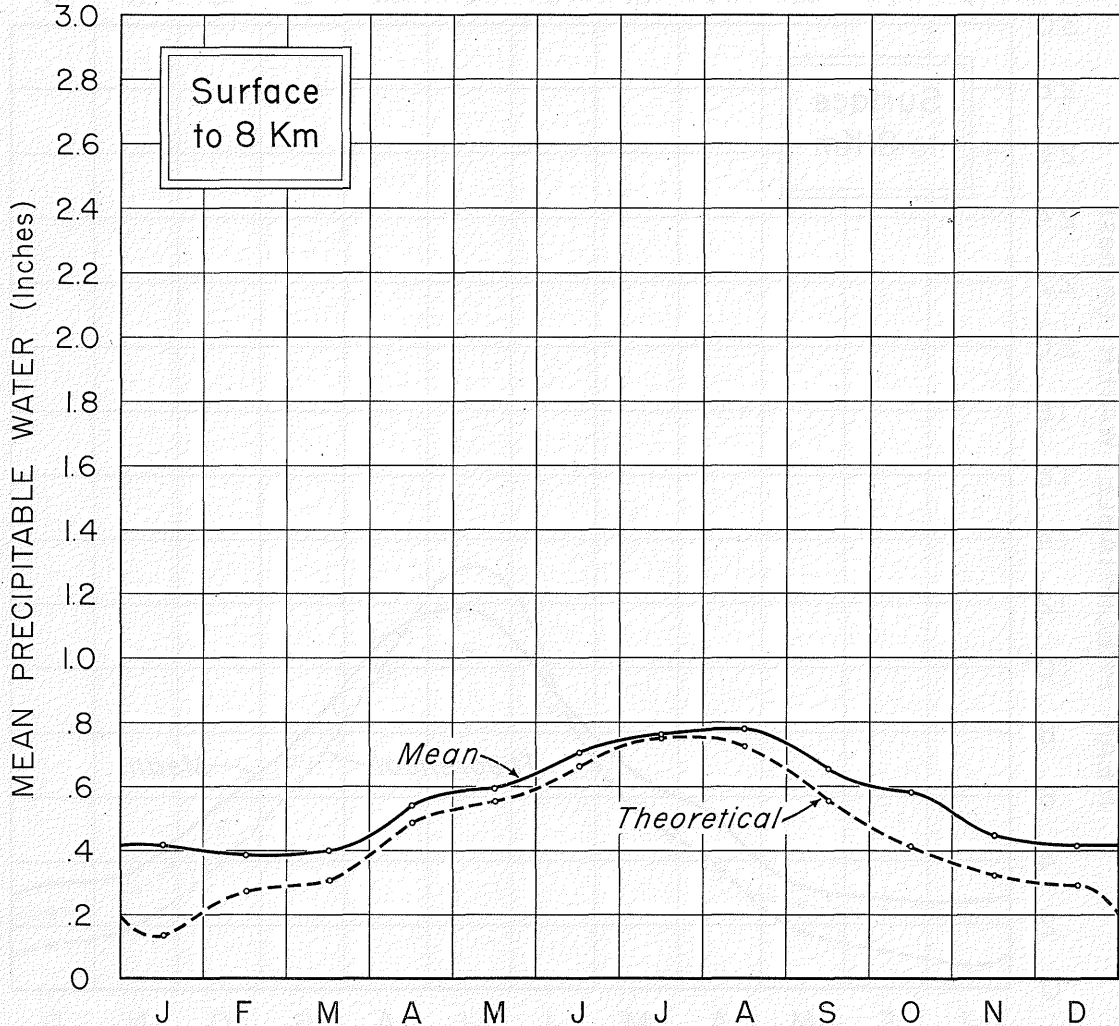
MEAN PRECIPITABLE WATER (Inches)

Boise, Idaho

Elev. 868 M

Sept. 1939 - July 1940, Apr. 1941 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 1	.018	.022	.024	.031	.035	.043	.043	.042	.038	.032	.027	.023
1 - 1.5	.080	.082	.077	.110	.120	.137	.137	.141	.123	.114	.087	.080
1.5 - 2	.074	.070	.068	.088	.095	.108	.113	.122	.102	.093	.071	.068
2 - 2.5	.055	.051	.057	.071	.076	.090	.094	.098	.084	.075	.057	.055
2.5 - 3	.047	.041	.040	.058	.063	.076	.076	.081	.069	.062	.046	.045
3 - 4	.065	.058	.058	.084	.091	.110	.120	.126	.102	.091	.067	.064
4 - 5	.038	.034	.035	.050	.056	.068	.081	.081	.064	.056	.044	.040
5 - 6	.022	.018	.020	.028	.031	.041	.052	.048	.038	.033	.026	.023
6 - 7	.011	.009	.011	.015	.018	.023	.030	.027	.021	.018	.014	.012
7 - 8	.006	.004	.005	.007	.009	.013	.016	.014	.011	.010	.007	.006
Sfc - 8	<u>.416</u>	<u>.389</u>	<u>.395</u>	<u>.542</u>	<u>.594</u>	<u>.709</u>	<u>.762</u>	<u>.780</u>	<u>.652</u>	<u>.584</u>	<u>.446</u>	<u>.416</u>
	J	F	M	A	M	J	J	A	S	O	N	D



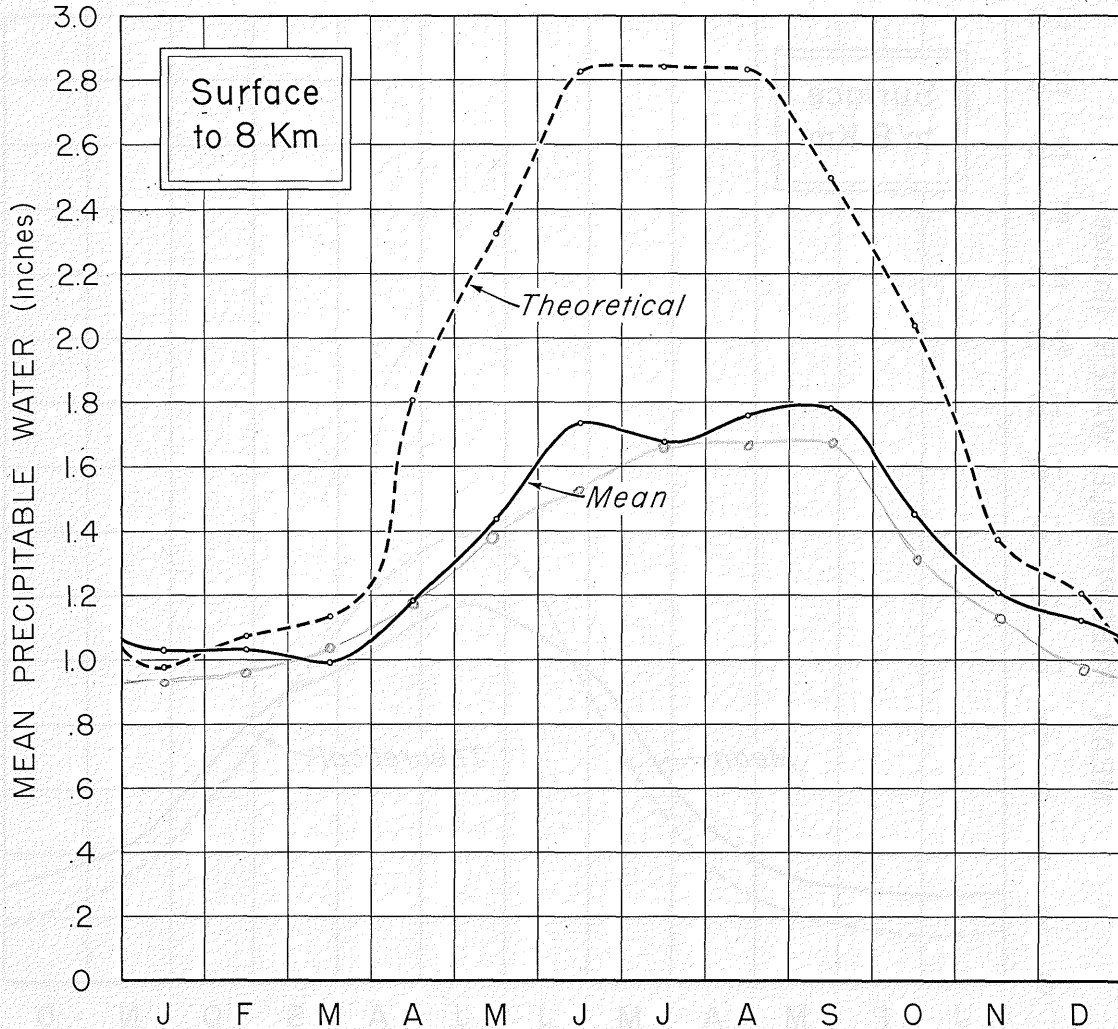
MEAN PRECIPITABLE WATER (Inches)

Brownsville, Tex.

Elev. 6 M

Aug. 1940 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.194	.206	.211	.292	.344	.382	.384	.387	.365	.312	.241	.222
0.5 - 1	.170	.170	.174	.220	.266	.305	.301	.323	.301	.257	.201	.195
1 - 1.5	.145	.135	.135	.161	.193	.232	.216	.222	.238	.193	.164	.157
1.5 - 2	.127	.112	.108	.125	.142	.188	.166	.174	.188	.150	.132	.126
2 - 2.5	.091	.089	.086	.090	.110	.136	.127	.137	.148	.120	.105	.097
2.5 - 3	.073	.070	.068	.068	.087	.104	.102	.109	.121	.096	.084	.077
3 - 4	.101	.103	.093	.096	.123	.152	.151	.169	.173	.139	.123	.105
4 - 5	.059	.065	.056	.062	.078	.104	.099	.110	.111	.086	.075	.066
5 - 6	.035	.044	.032	.038	.048	.066	.064	.067	.072	.052	.044	.040
6 - 7	.020	.025	.018	.022	.028	.041	.039	.040	.042	.030	.025	.024
7 - 8	.011	.014	.011	.014	.017	.025	.023	.023	.026	.017	.014	.013
Sfc - 8	1.026	1.033	.992	1.188	1.436	1.735	1.672	1.761	1.785	1.452	1.208	1.122
	J	F	M	A	M	J	J	A	S	O	N	D



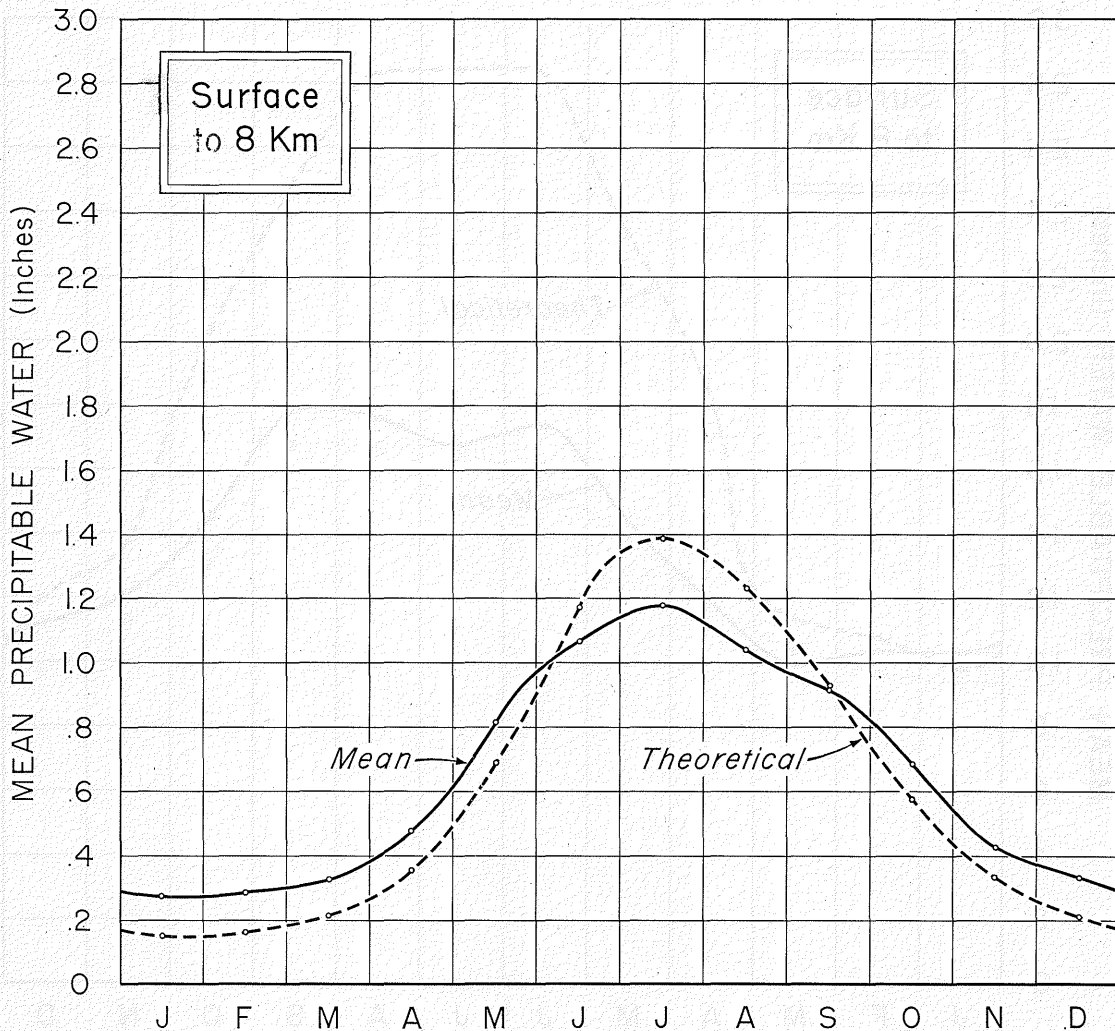
MEAN PRECIPITABLE WATER (Inches)

Buffalo, N. Y.

Elev. 221 M

Sept. 1939 - July 1940, Jan. 1941 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.027	.029	.036	.054	.088	.125	.138	.130	.106	.077	.048	.035
0.5 - 1	.046	.048	.057	.087	.144	.193	.214	.194	.166	.120	.079	.057
1 - 1.5	.039	.040	.045	.071	.118	.163	.176	.158	.137	.102	.065	.047
1.5 - 2	.034	.035	.039	.060	.100	.136	.149	.130	.116	.083	.051	.041
2 - 2.5	.029	.029	.033	.048	.081	.107	.111	.101	.088	.068	.042	.034
2.5 - 3	.024	.024	.028	.039	.068	.082	.084	.077	.068	.054	.033	.028
3 - 4	.034	.036	.040	.054	.096	.116	.136	.111	.097	.077	.048	.041
4 - 5	.020	.023	.024	.033	.060	.068	.089	.067	.063	.047	.029	.022
5 - 6	.011	.013	.014	.019	.035	.040	.043	.040	.039	.029	.016	.017
6 - 7	.006	.007	.007	.011	.019	.024	.024	.024	.023	.016	.009	.008
7 - 8	.003	.004	.003	.005	.010	.013	.015	.013	.012	.009	.005	.005
Sfc - 8	<u>.273</u>	<u>.288</u>	<u>.326</u>	<u>.481</u>	<u>.819</u>	<u>1.067</u>	<u>1.179</u>	<u>1.045</u>	<u>.915</u>	<u>.682</u>	<u>.425</u>	<u>.335</u>
	J	F	M	A	M	J	J	A	S	O	N	D



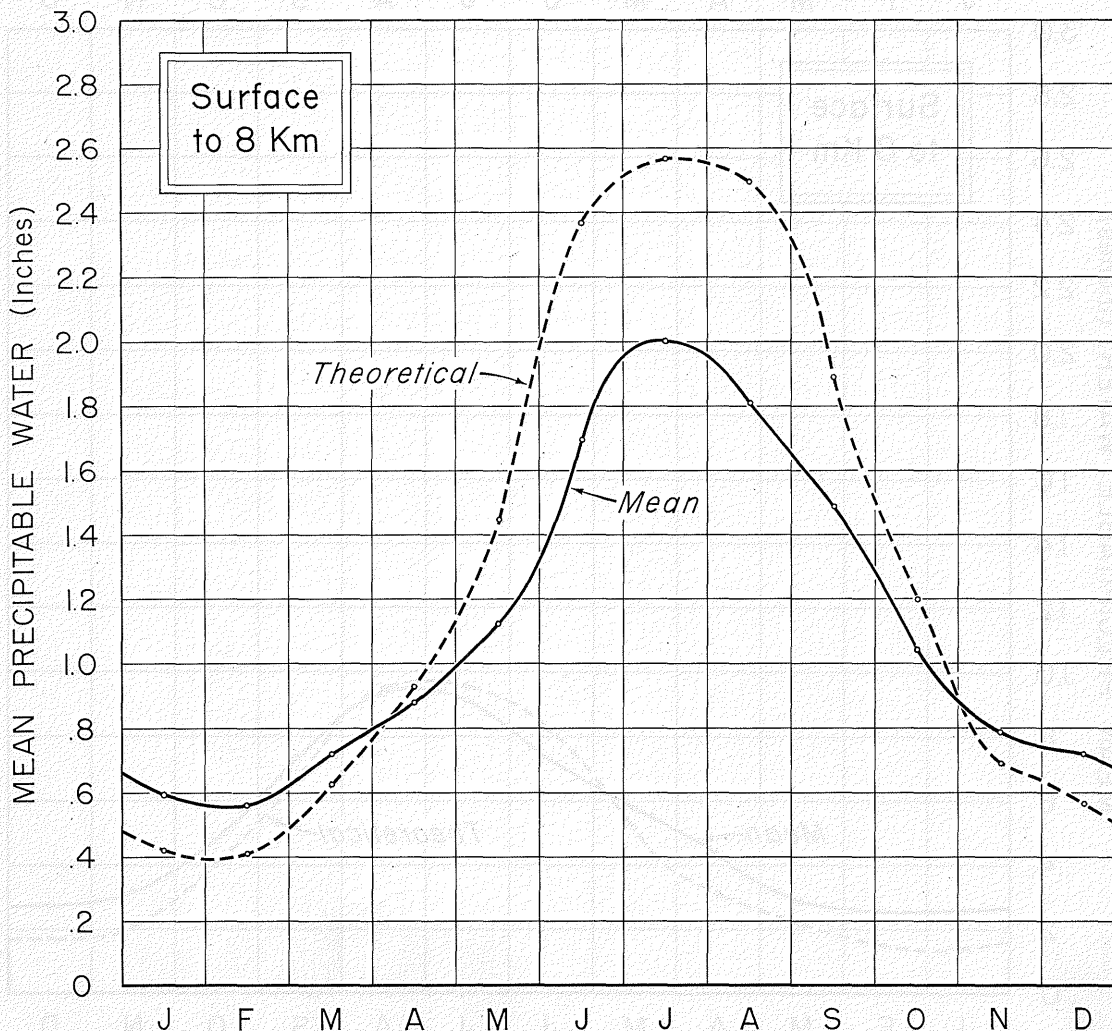
MEAN PRECIPITABLE WATER (Inches)

Charleston, S. C.

Elev. 14 M

July 1939 - Dec. 1943

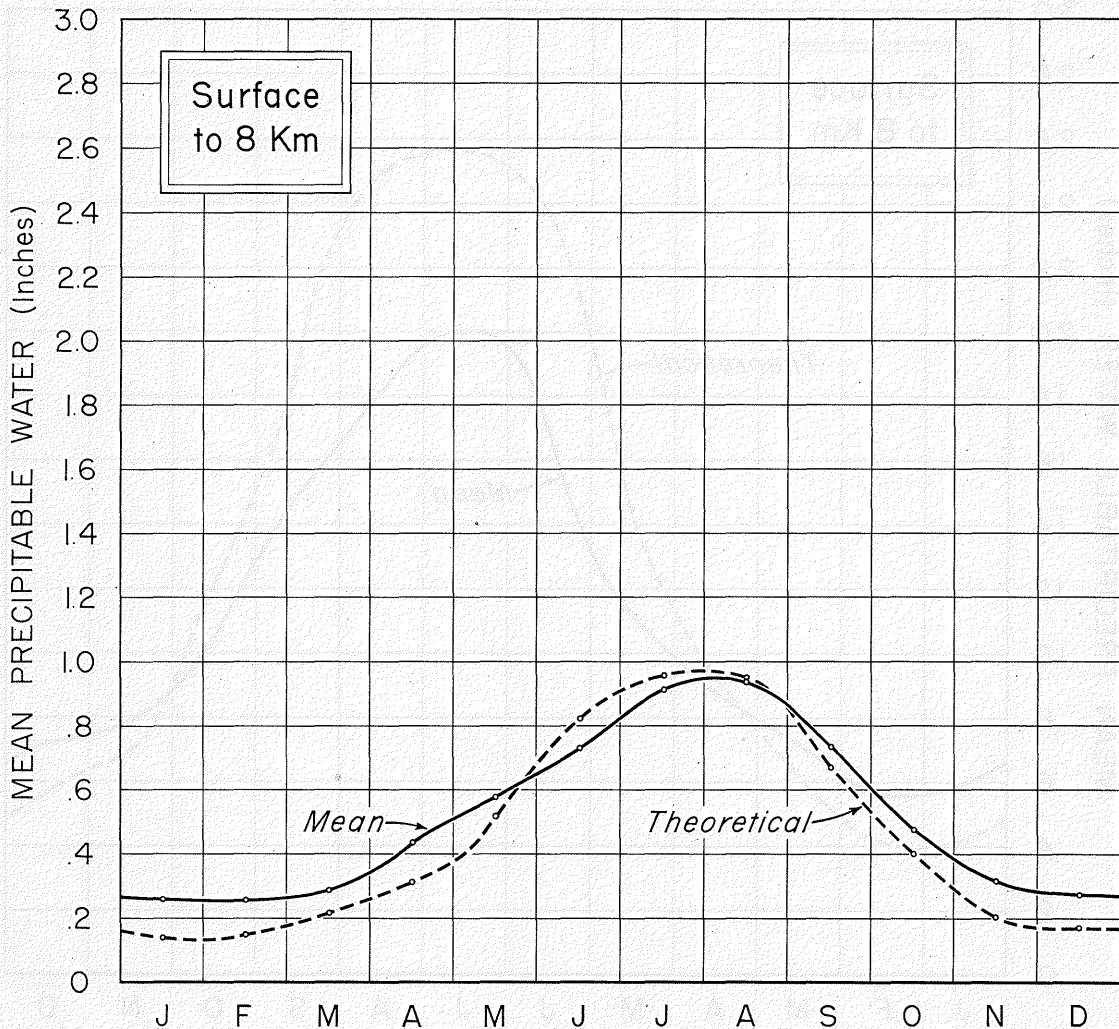
LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.109	.103	.145	.176	.235	.356	.352	.343	.287	.213	.150	.133
0.5 - 1	.096	.088	.121	.148	.198	.276	.301	.291	.248	.183	.131	.120
1 - 1.5	.081	.072	.099	.122	.150	.220	.247	.235	.210	.151	.108	.100
1.5 - 2	.066	.060	.082	.097	.122	.179	.209	.194	.168	.121	.089	.081
2 - 2.5	.053	.051	.065	.075	.098	.141	.167	.155	.129	.091	.072	.066
2.5 - 3	.043	.043	.050	.061	.079	.117	.134	.127	.104	.068	.056	.053
3 - 4	.063	.063	.072	.085	.108	.168	.298	.190	.146	.095	.080	.075
4 - 5	.041	.040	.044	.052	.064	.111	.129	.123	.090	.056	.050	.045
5 - 6	.024	.025	.025	.031	.038	.070	.083	.079	.054	.035	.029	.027
6 - 7	.013	.014	.014	.018	.021	.042	.053	.047	.034	.020	.017	.016
7 - 8	.007	.007	.007	.009	.012	.024	.031	.026	.020	.011	.009	.009
Sfc - 8	.596	.566	.724	.874	1.125	1.704	2.004	1.810	1.490	1.044	.791	.725
	J	F	M	A	M	J	J	A	S	O	N	D



MEAN PRECIPITABLE WATER (Inches)

Denver, Colo.

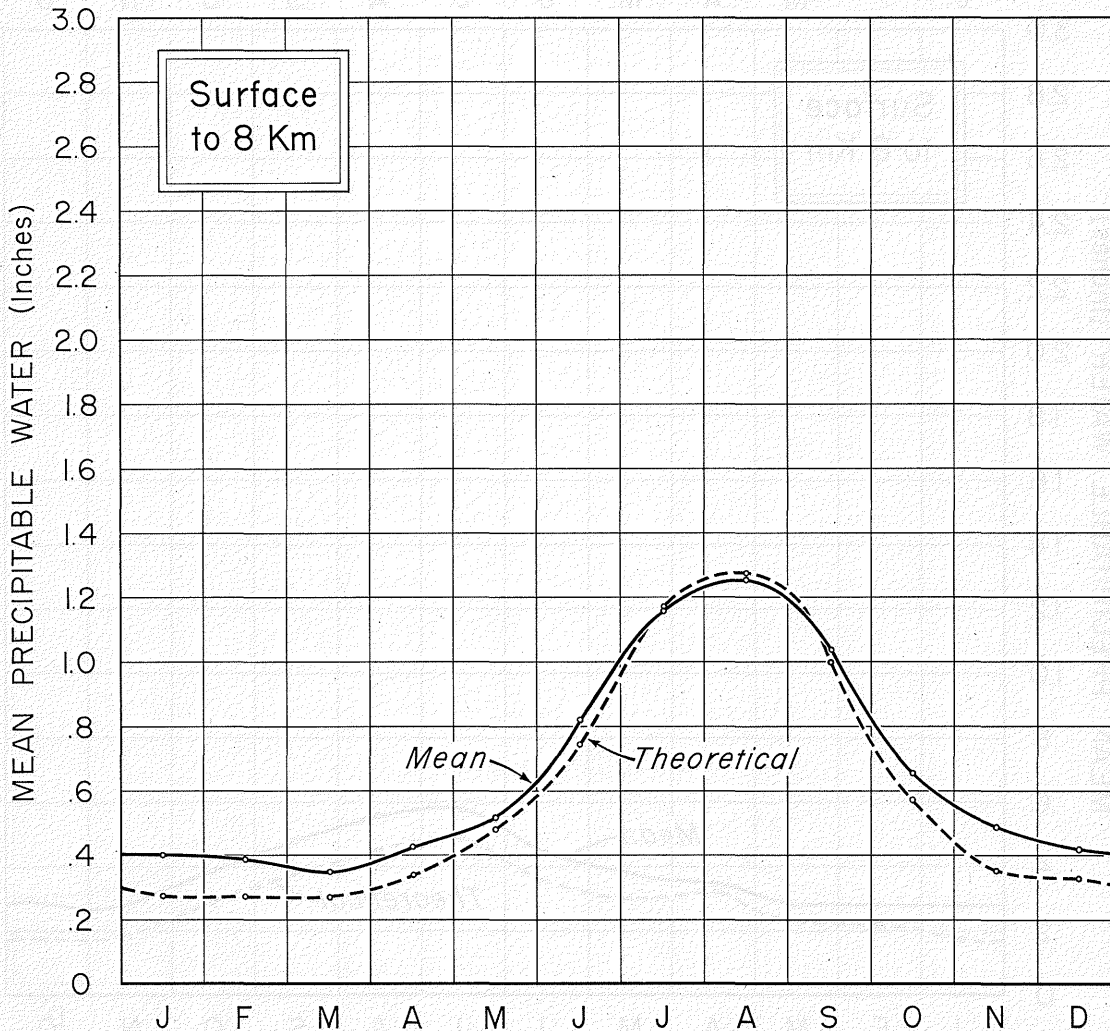
Elev. 1616 M		July 1939 - Dec. 1943											
LAYER (Km)		J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 2		.041	.042	.050	.068	.098	.124	.139	.138	.111	.078	.051	.041
2 - 2.5		.050	.053	.057	.083	.107	.135	.149	.158	.132	.090	.063	.048
2.5 - 3		.040	.041	.045	.067	.085	.106	.123	.131	.107	.072	.051	.042
3 - 4		.058	.056	.062	.096	.128	.157	.194	.205	.160	.101	.071	.062
4 - 5		.036	.033	.037	.061	.077	.101	.138	.145	.107	.064	.042	.038
5 - 6		.020	.019	.021	.035	.045	.059	.088	.088	.066	.039	.024	.022
6 - 7		.010	.009	.011	.018	.025	.034	.052	.052	.037	.021	.012	.016
7 - 8		.005	.004	.005	.009	.012	.017	.028	.027	.019	.011	.006	.006
Sfc - 8		<u>.260</u>	<u>.257</u>	<u>.288</u>	<u>.437</u>	<u>.577</u>	<u>.733</u>	<u>.911</u>	<u>.944</u>	<u>.739</u>	<u>.476</u>	<u>.320</u>	<u>.275</u>
		J	F	M	A	M	J	J	A	S	O	N	D



MEAN PRECIPITABLE WATER (Inches)

El Paso, Tex.

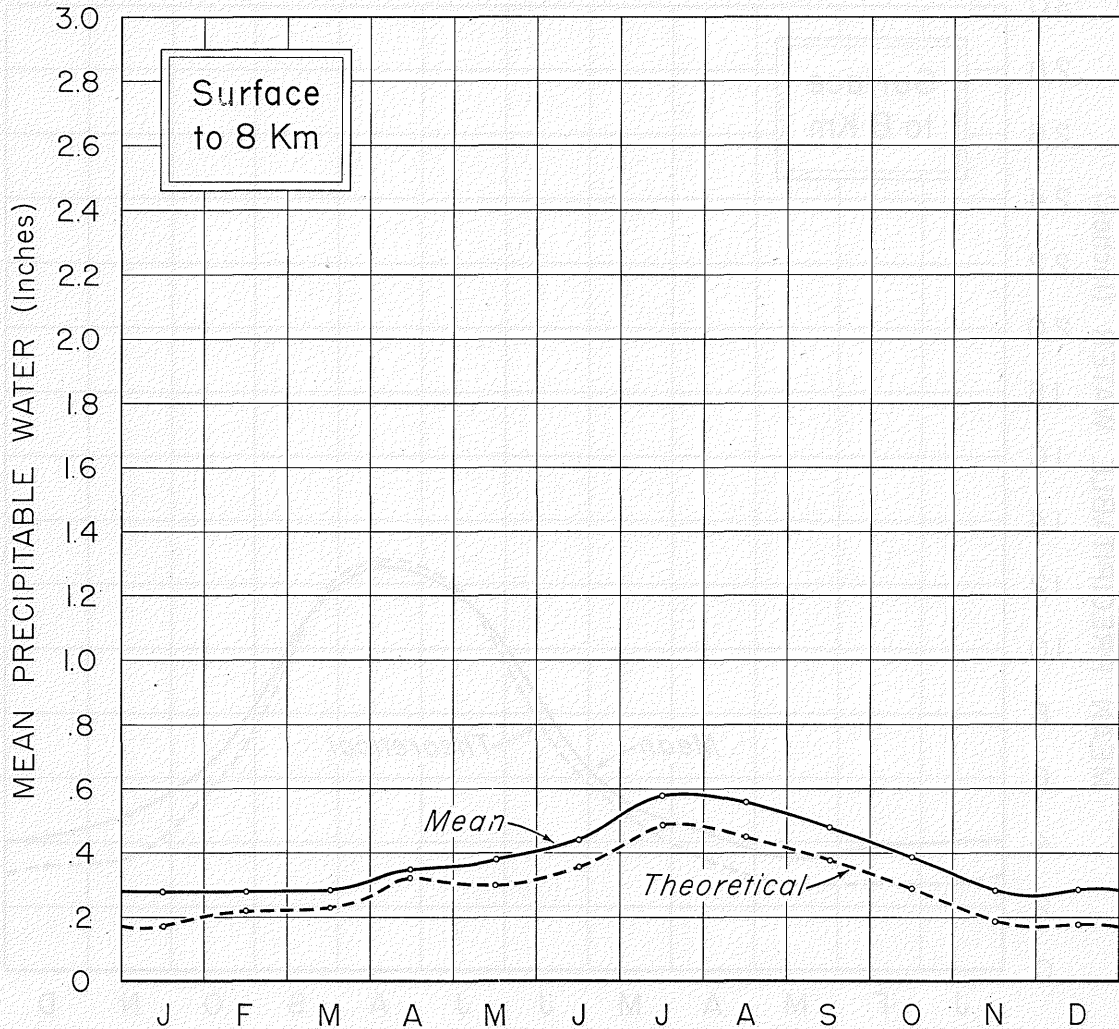
Elev. 1195 M					July 1939 - Dec. 1943							
LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 1.5	.051	.049	.046	.055	.067	.096	.127	.137	.116	.082	.061	.055
1.5 - 2	.076	.074	.071	.080	.098	.141	.185	.203	.174	.122	.093	.083
2 - 2.5	.063	.060	.055	.064	.078	.119	.155	.171	.150	.098	.075	.064
2.5 - 3	.052	.048	.042	.053	.062	.096	.137	.153	.127	.084	.060	.050
3 - 4	.071	.071	.060	.075	.089	.149	.216	.237	.193	.120	.086	.072
4 - 5	.042	.042	.037	.048	.058	.102	.154	.163	.128	.073	.054	.044
5 - 6	.025	.024	.021	.028	.036	.062	.098	.099	.080	.042	.031	.025
6 - 7	.013	.013	.011	.015	.021	.036	.059	.059	.046	.024	.017	.014
7 - 8	.007	.007	.006	.008	.011	.019	.034	.032	.025	.014	.011	.007
Sfc - 8	<u>.400</u>	<u>.388</u>	<u>.349</u>	<u>.426</u>	<u>.520</u>	<u>.820</u>	<u>1.165</u>	<u>1.254</u>	<u>1.039</u>	<u>.659</u>	<u>.488</u>	<u>.414</u>
	J	F	M	A	M	J	J	A	S	O	N	D



MEAN PRECIPITABLE WATER (Inches)

Ely, Nev.

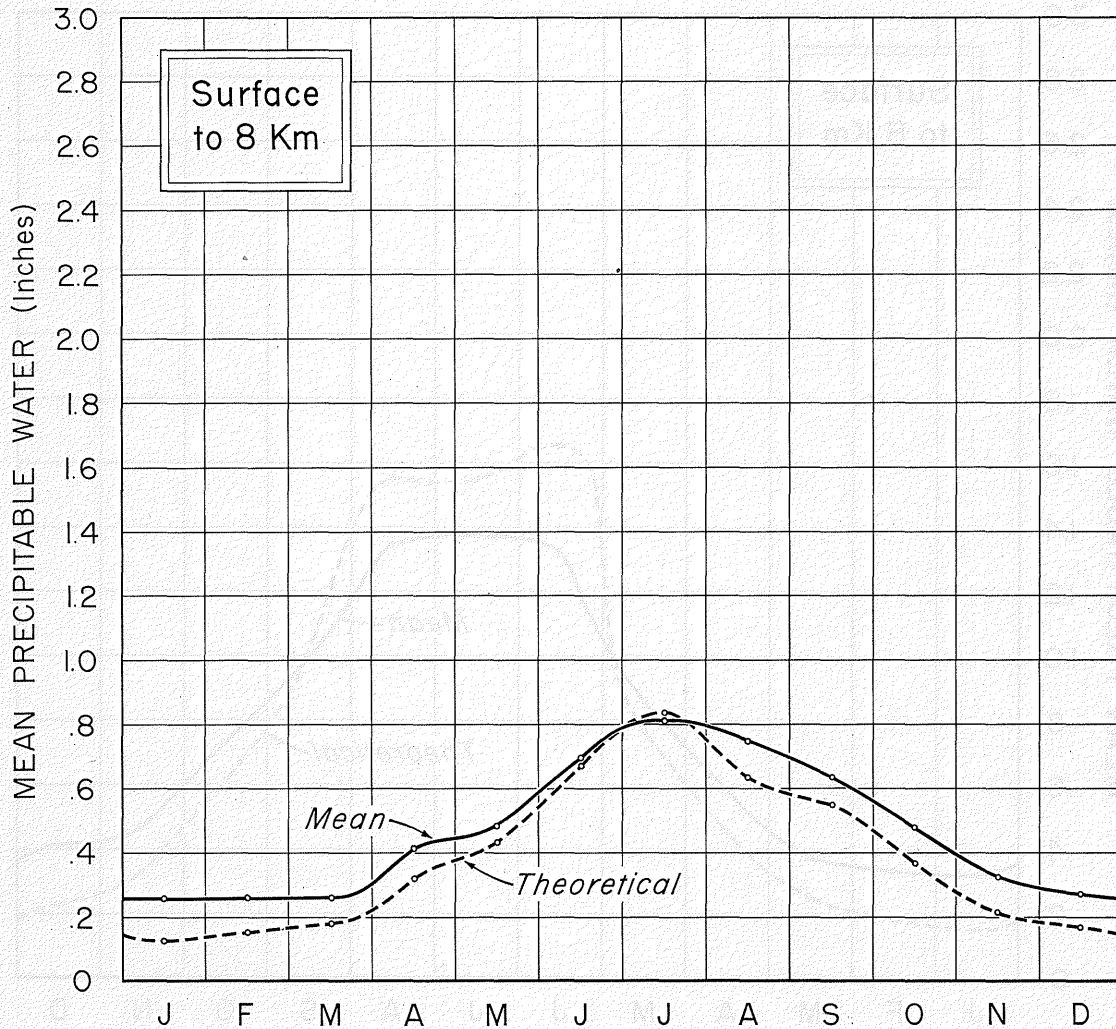
LAYER (Km)	Elev. 1908 M					July 1939 - Dec. 1943						
	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 2	.010	.012	.011	.016	.017	.016	.023	.022	.019	.016	.011	.012
2 - 2.5	.057	.063	.067	.081	.081	.094	.115	.109	.098	.082	.063	.060
2.5 - 3	.050	.051	.051	.065	.064	.078	.099	.093	.084	.069	.050	.052
3 - 4	.071	.072	.070	.087	.093	.112	.139	.134	.121	.098	.067	.075
4 - 5	.043	.041	.041	.050	.058	.068	.091	.089	.075	.060	.047	.046
5 - 6	.025	.022	.024	.029	.035	.039	.058	.059	.044	.035	.026	.026
6 - 7	.013	.011	.012	.015	.020	.022	.035	.036	.025	.018	.014	.013
7 - 8	.006	.005	.006	.008	.010	.012	.020	.021	.013	.009	.007	.006
Sfc - 8	<u>.275</u>	<u>.277</u>	<u>.282</u>	<u>.351</u>	<u>.378</u>	<u>.441</u>	<u>.580</u>	<u>.563</u>	<u>.479</u>	<u>.387</u>	<u>.285</u>	<u>.290</u>
	J	F	M	A	M	J	J	A	S	O	N	D



MEAN PRECIPITABLE WATER (Inches)

Great Falls, Mont.

Elev. 1128 M						Aug. 1940 - Dec. 1943						
LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 1.5	.034	.038	.043	.064	.080	.111	.119	.105	.096	.073	.048	.040
1.5 - 2	.047	.048	.051	.074	.090	.122	.138	.124	.110	.081	.057	.050
2 - 2.5	.040	.040	.041	.061	.071	.100	.112	.103	.093	.068	.048	.041
2.5 - 3	.034	.033	.033	.050	.058	.080	.094	.089	.078	.056	.040	.034
3 - 4	.048	.046	.045	.072	.086	.130	.144	.138	.113	.086	.058	.050
4 - 5	.028	.027	.026	.046	.052	.075	.092	.092	.070	.054	.035	.030
5 - 6	.016	.015	.014	.026	.029	.044	.056	.052	.042	.031	.020	.017
6 - 7	.007	.007	.007	.014	.016	.023	.034	.029	.023	.017	.011	.008
7 - 8	.003	.003	.004	.007	.008	.013	.018	.016	.012	.009	.005	.004
Sfc - 8	<u>.257</u>	<u>.257</u>	<u>.264</u>	<u>.414</u>	<u>.490</u>	<u>.698</u>	<u>.807</u>	<u>.748</u>	<u>.637</u>	<u>.475</u>	<u>.322</u>	<u>.274</u>
	J	F	M	A	M	J	J	A	S	O	N	D



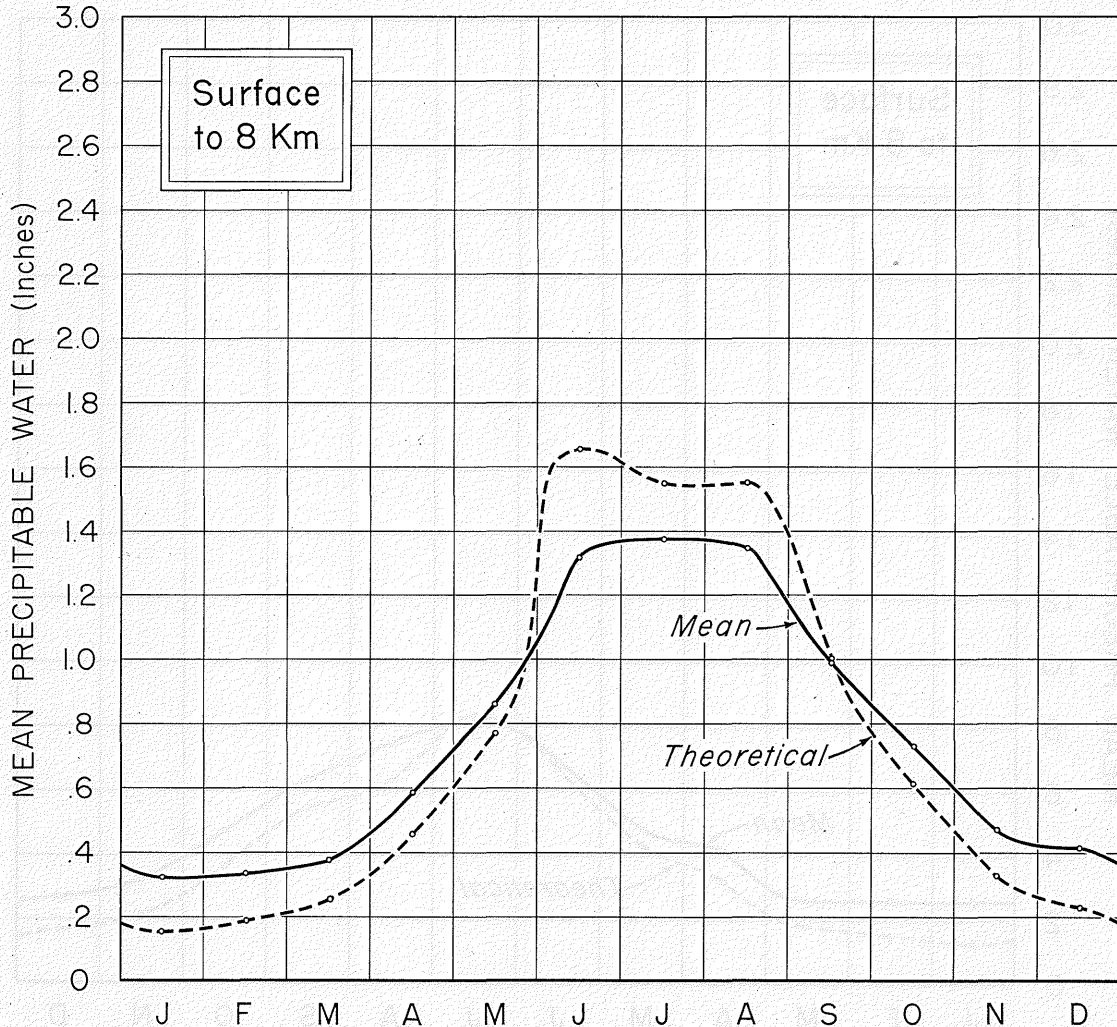
MEAN PRECIPITABLE WATER (Inches)

Joliet, Ill.

Elev. 178 M

July 1939 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.032	.038	.048	.073	.107	.170	.173	.173	.127	.092	.058	.044
0.5 - 1	.047	.054	.065	.100	.148	.224	.254	.237	.171	.127	.080	.065
1 - 1.5	.046	.048	.054	.084	.127	.190	.213	.196	.142	.105	.067	.058
1.5 - 2	.042	.042	.043	.070	.100	.156	.164	.163	.121	.086	.056	.051
2 - 2.5	.035	.035	.035	.057	.082	.129	.126	.133	.094	.072	.047	.042
2.5 - 3	.030	.029	.029	.045	.071	.123	.101	.103	.076	.057	.038	.036
3 - 4	.042	.041	.045	.068	.101	.139	.148	.144	.111	.083	.056	.054
4 - 5	.025	.025	.028	.043	.062	.085	.092	.092	.070	.051	.035	.033
5 - 6	.014	.015	.016	.024	.036	.052	.054	.057	.042	.030	.020	.019
6 - 7	.007	.008	.009	.012	.020	.031	.032	.033	.025	.017	.011	.010
7 - 8	.003	.004	.004	.013	.010	.019	.018	.018	.014	.010	.006	.006
Sfc - 8	<u>.323</u>	<u>.339</u>	<u>.376</u>	<u>.589</u>	<u>.864</u>	<u>1.318</u>	<u>1.375</u>	<u>1.349</u>	<u>.993</u>	<u>.730</u>	<u>.474</u>	<u>.418</u>
	J	F	M	A	M	J	J	A	S	O	N	D



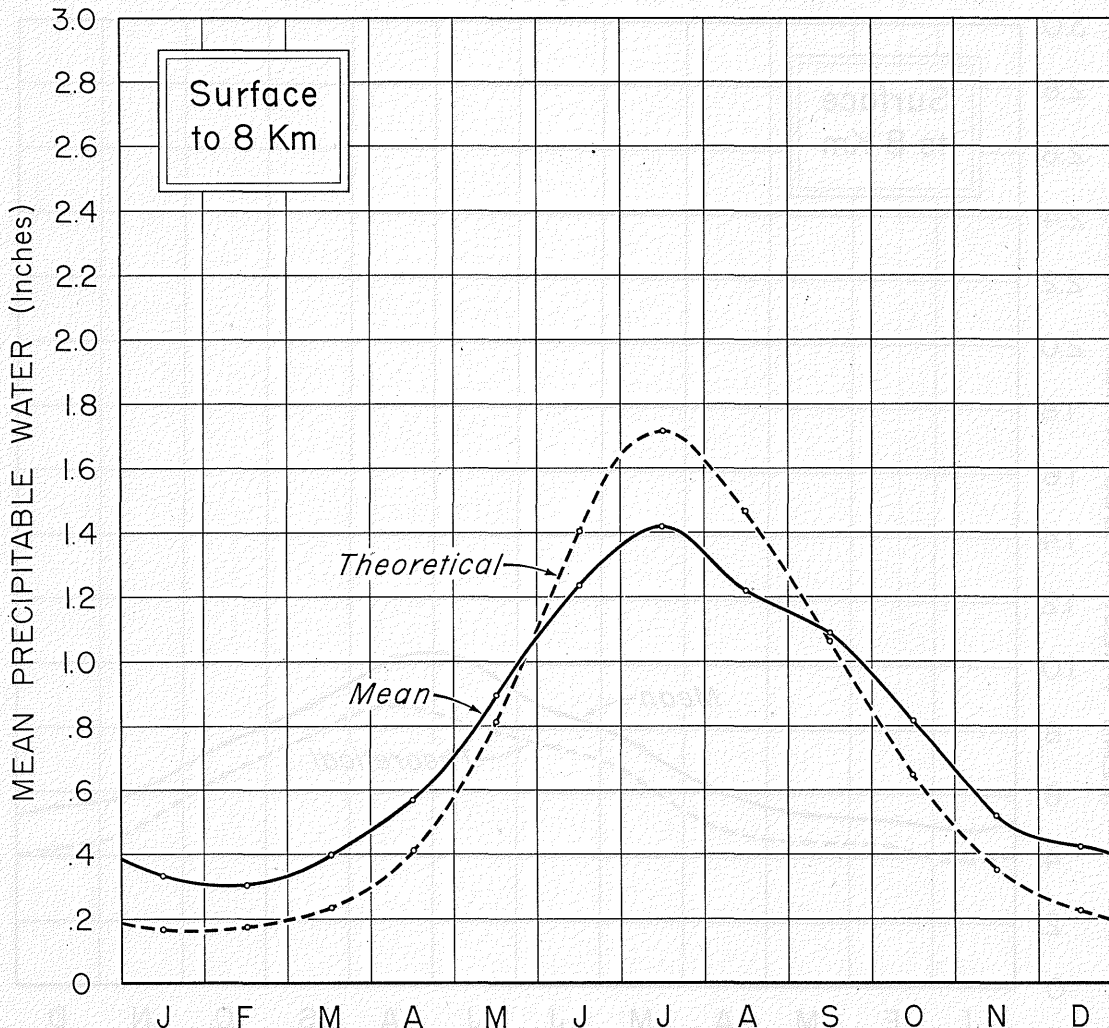
MEAN PRECIPITABLE WATER (Inches)

Lakehurst, N. J.

Elev. 39 M

Oct. 1939 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.048	.049	.063	.094	.154	.213	.251	.226	.190	.136	.083	.060
0.5 - 1	.046	.044	.056	.088	.144	.192	.226	.198	.176	.120	.073	.059
1 - 1.5	.042	.038	.048	.075	.121	.168	.183	.162	.140	.100	.062	.051
1.5 - 2	.038	.035	.043	.062	.099	.137	.152	.132	.115	.083	.054	.044
2 - 2.5	.034	.029	.037	.052	.083	.111	.126	.103	.091	.072	.046	.041
2.5 - 3	.028	.024	.030	.043	.067	.088	.104	.078	.077	.061	.041	.036
3 - 4	.041	.037	.046	.064	.097	.131	.148	.130	.118	.095	.062	.053
4 - 5	.026	.024	.031	.043	.062	.084	.098	.078	.073	.064	.043	.035
5 - 6	.017	.015	.028	.027	.038	.056	.067	.052	.052	.042	.028	.023
6 - 7	.010	.009	.010	.016	.022	.037	.041	.036	.036	.026	.018	.014
7 - 8	.006	.005	.005	.009	.014	.024	.026	.023	.021	.016	.010	.008
Sfc - 8	<u>.336</u>	<u>.309</u>	<u>.397</u>	<u>.573</u>	<u>.901</u>	<u>1.241</u>	<u>1.422</u>	<u>1.218</u>	<u>1.089</u>	<u>.815</u>	<u>.520</u>	<u>.424</u>
	J	F	M	A	M	J	J	A	S	O	N	D



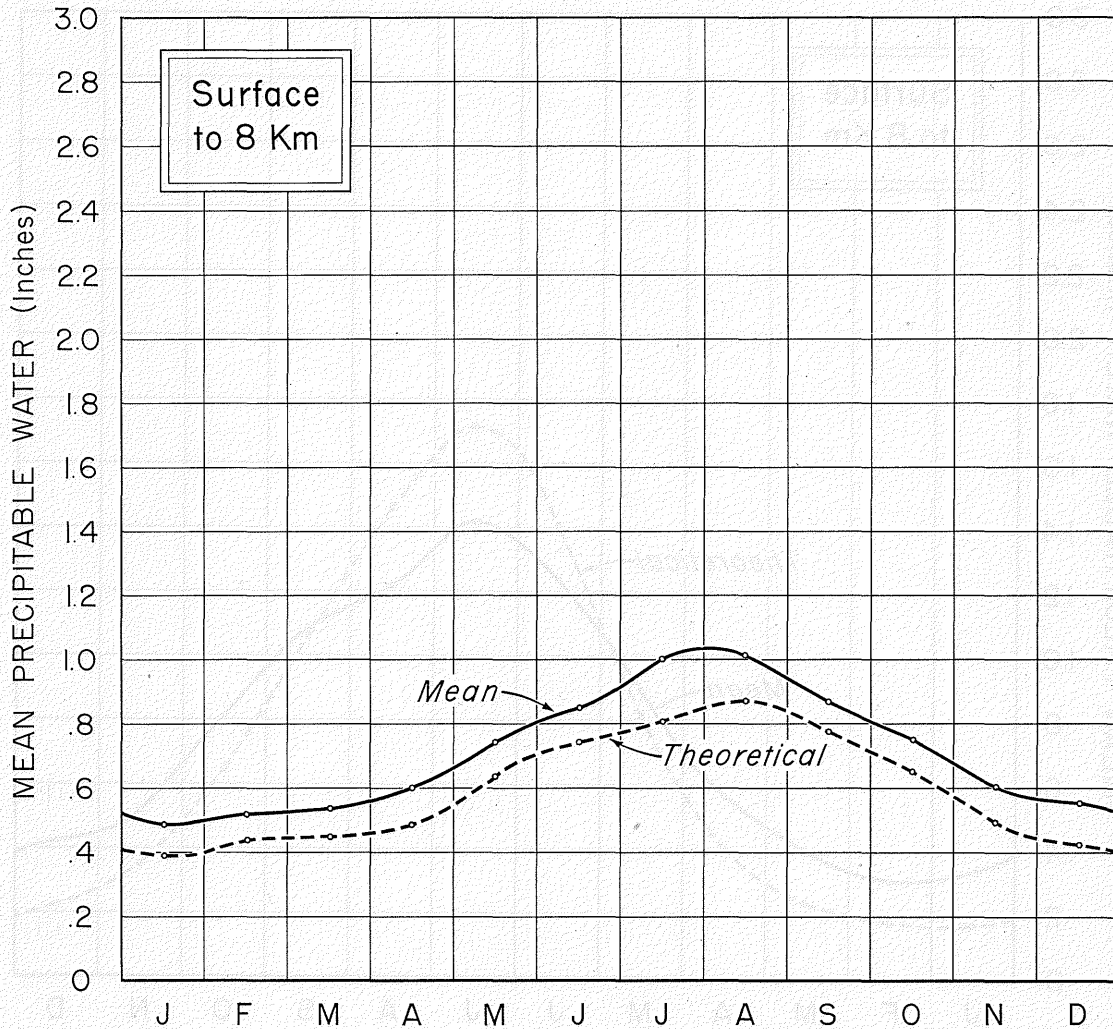
MEAN PRECIPITABLE WATER (Inches)

Medford, Oreg.

Elev. 409 M

Sept. 1939 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.020	.022	.022	.025	.029	.032	.034	.033	.033	.030	.026	.021
0.5 - 1	.097	.107	.108	.120	.138	.153	.162	.172	.153	.145	.118	.107
1 - 1.5	.081	.090	.092	.100	.120	.132	.147	.154	.139	.127	.102	.091
1.5 - 2	.066	.073	.075	.082	.103	.117	.135	.141	.124	.104	.085	.077
2 - 2.5	.054	.058	.060	.070	.086	.099	.120	.122	.102	.082	.066	.060
2.5 - 3	.044	.044	.047	.054	.068	.080	.099	.100	.079	.065	.052	.048
3 - 4	.060	.060	.065	.073	.092	.108	.136	.134	.107	.090	.071	.066
4 - 5	.035	.035	.037	.039	.052	.063	.080	.073	.065	.054	.042	.041
5 - 6	.020	.019	.021	.022	.031	.037	.048	.042	.039	.031	.024	.024
6 - 7	.010	.010	.011	.012	.017	.021	.027	.025	.021	.017	.013	.013
7 - 8	.005	.005	.005	.006	.009	.011	.015	.014	.011	.009	.007	.006
Sfc - 8	<u>.492</u>	<u>.523</u>	<u>.543</u>	<u>.603</u>	<u>.745</u>	<u>.853</u>	<u>1.003</u>	<u>1.010</u>	<u>.873</u>	<u>.754</u>	<u>.606</u>	<u>.554</u>
	J	F	M	A	M	J	J	A	S	O	N	D



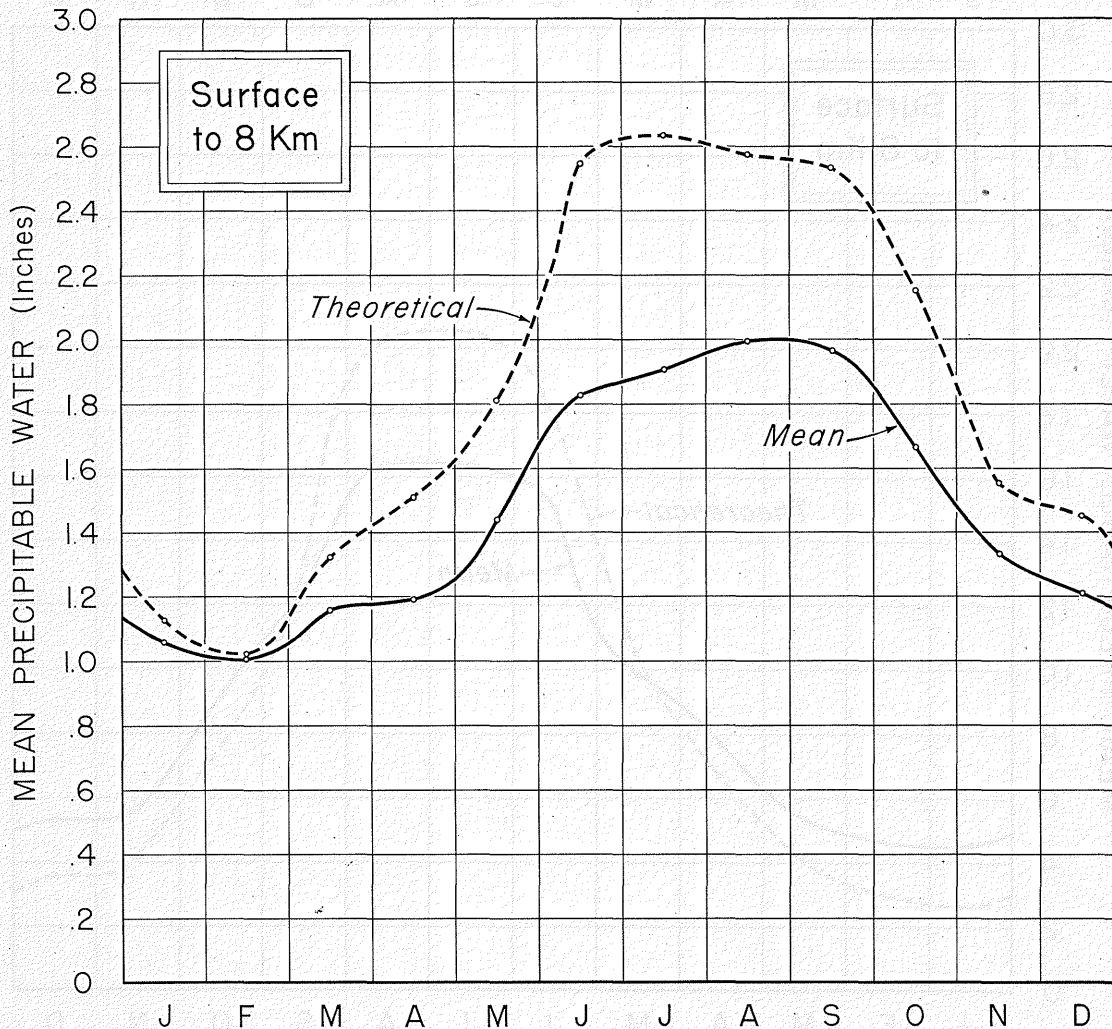
MEAN PRECIPITABLE WATER (Inches)

Miami, Fla.

Elev. 4 M

July 1939 - July 1940, Nov. 1940 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.218	.198	.239	.258	.296	.365	.380	.380	.367	.336	.271	.254
0.5 - 1	.194	.174	.211	.216	.257	.302	.315	.336	.324	.293	.235	.218
1 - 1.5	.154	.140	.165	.173	.210	.243	.253	.266	.259	.237	.196	.175
1.5 - 2	.122	.123	.127	.137	.162	.193	.202	.215	.221	.189	.156	.135
2 - 2.5	.089	.085	.095	.103	.125	.153	.160	.167	.171	.147	.118	.102
2.5 - 3	.068	.066	.075	.076	.093	.124	.129	.134	.140	.111	.088	.075
3 - 4	.096	.092	.105	.103	.125	.177	.185	.197	.201	.152	.118	.105
4 - 5	.057	.058	.064	.059	.074	.117	.123	.128	.130	.093	.070	.065
5 - 6	.033	.036	.038	.035	.046	.076	.080	.087	.084	.055	.043	.041
6 - 7	.019	.022	.021	.020	.040	.049	.050	.054	.050	.034	.026	.024
7 - 8	.010	.013	.018	.012	.014	.028	.031	.031	.029	.020	.015	.013
Sfc - 8	1.060	1.007	1.158	1.192	1.442	1.827	1.908	1.995	1.976	1.667	1.336	1.207
	J	F	M	A	M	J	J	A	S	O	N	D



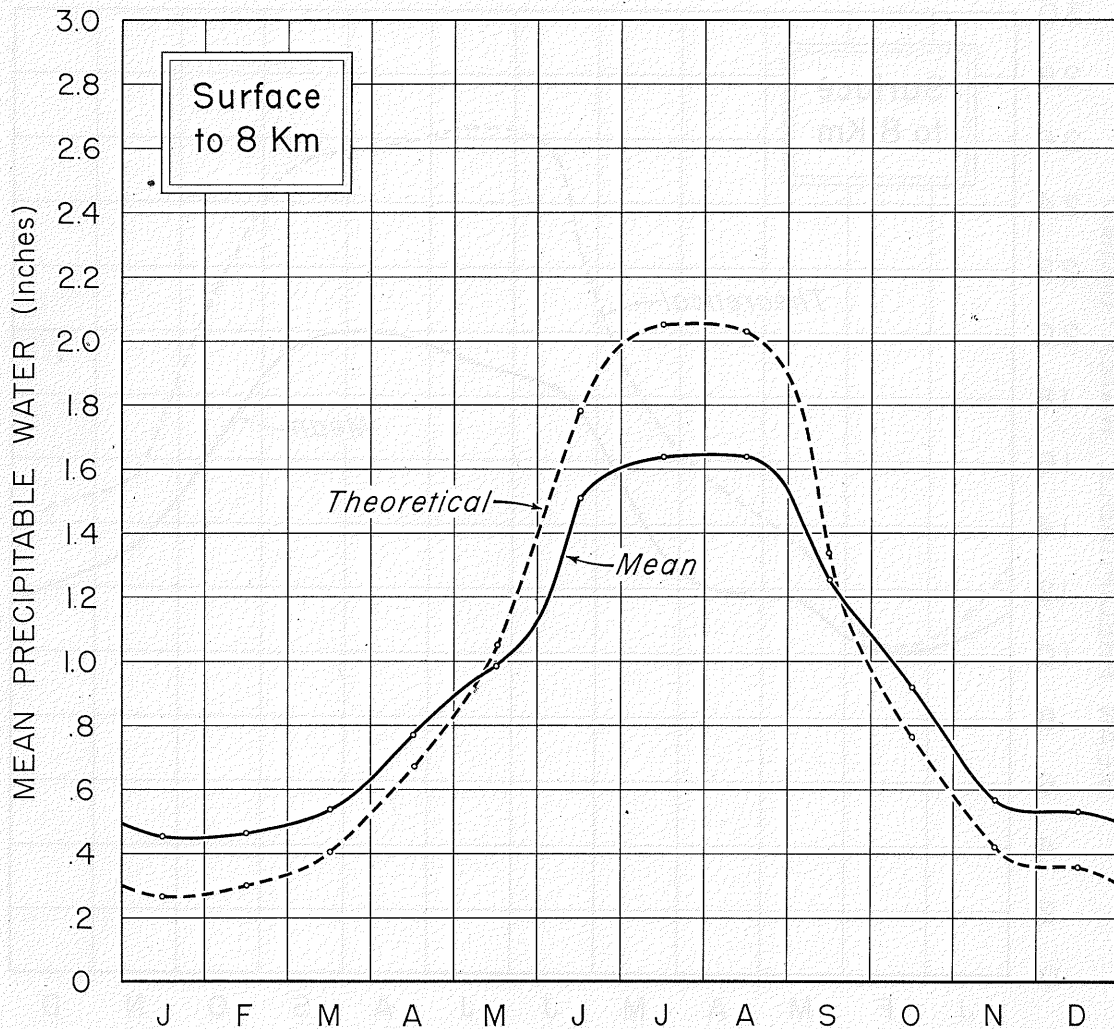
MEAN PRECIPITABLE WATER (Inches)

Nashville, Tenn.

Elev. 180 M

July 1938 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.051	.055	.068	.095	.135	.191	.211	.208	.155	.112	.071	.062
0.5 - 1	.075	.075	.091	.131	.177	.258	.287	.278	.216	.158	.099	.088
1 - 1.5	.065	.064	.077	.111	.130	.219	.247	.240	.183	.132	.083	.077
1.5 - 2	.057	.056	.064	.093	.109	.183	.207	.204	.152	.109	.068	.067
2 - 2.5	.048	.046	.053	.078	.102	.144	.160	.160	.124	.086	.055	.054
2.5 - 3	.038	.038	.041	.061	.079	.119	.124	.126	.101	.069	.044	.043
3 - 4	.052	.056	.063	.088	.110	.165	.175	.179	.141	.100	.064	.062
4 - 5	.034	.036	.040	.055	.067	.105	.107	.112	.086	.086	.040	.038
5 - 6	.020	.022	.024	.031	.041	.064	.064	.070	.052	.037	.024	.023
6 - 7	.011	.012	.013	.017	.023	.038	.037	.040	.031	.021	.013	.013
7 - 8	.006	.006	.007	.009	.013	.022	.021	.023	.017	.012	.007	.007
Sfc - 8	.457	.466	.541	.769	.986	1.508	1.640	1.640	1.258	.922	.568	.534
	J	F	M	A	M	J	J	A	S	O	N	D



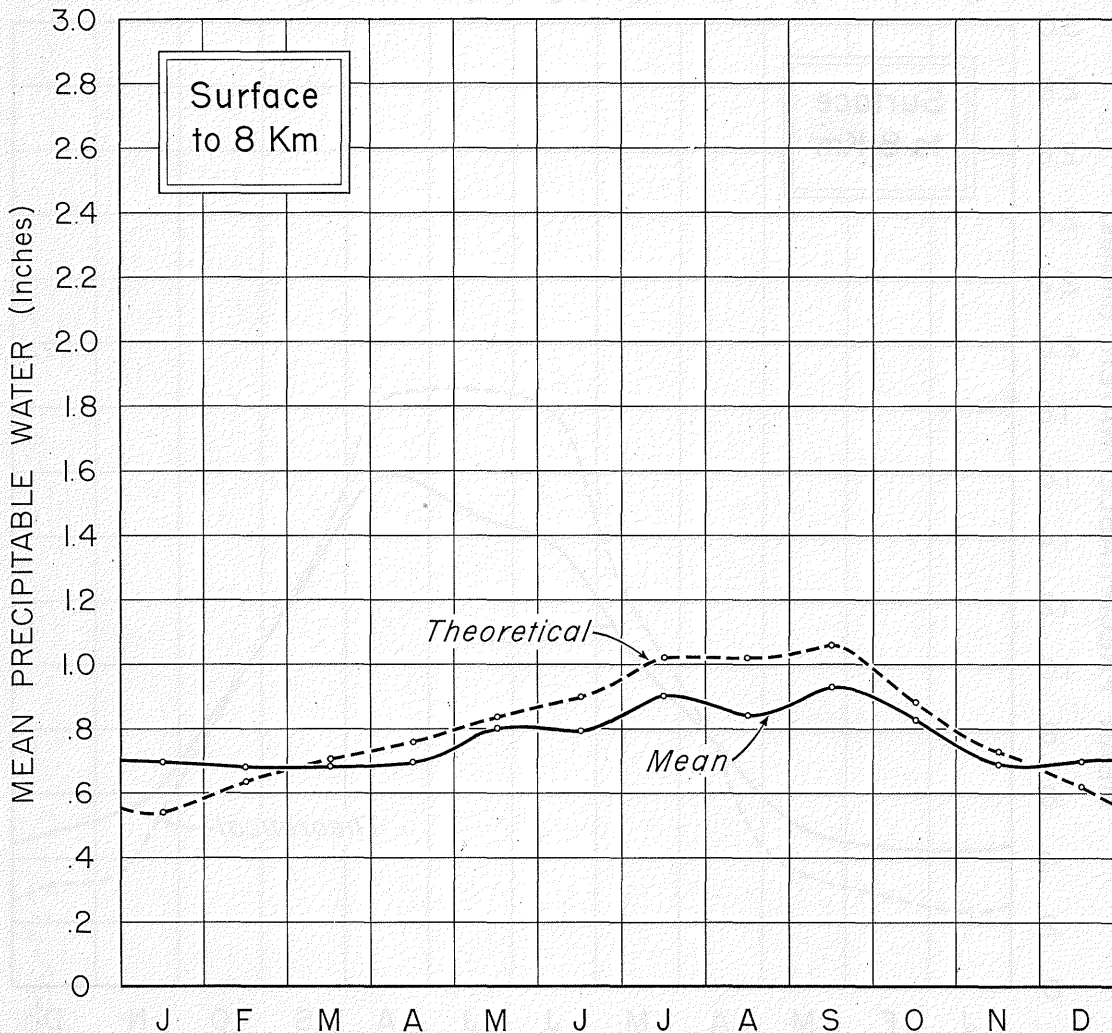
MEAN PRECIPITABLE WATER (Inches)

Oakland, Calif.

Elev. 2 M

July 1938 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.139	.143	.150	.158	.168	.180	.200	.196	.201	.174	.145	.142
0.5 - 1	.121	.120	.122	.126	.140	.151	.165	.164	.166	.150	.121	.121
1 - 1.5	.099	.095	.094	.099	.106	.111	.123	.107	.130	.116	.096	.098
1.5 - 2	.080	.076	.073	.074	.084	.083	.094	.078	.098	.091	.075	.078
2 - 2.5	.061	.061	.059	.057	.065	.064	.073	.064	.074	.070	.059	.063
2.5 - 3	.048	.046	.044	.044	.051	.048	.056	.051	.057	.054	.045	.050
3 - 4	.067	.065	.064	.061	.073	.066	.081	.075	.084	.074	.065	.069
4 - 5	.041	.038	.040	.038	.053	.041	.053	.050	.054	.045	.040	.042
5 - 6	.024	.022	.022	.022	.036	.027	.033	.033	.032	.029	.025	.024
6 - 7	.013	.012	.012	.013	.017	.016	.019	.018	.019	.018	.015	.014
7 - 8	.007	.006	.006	.006	.009	.009	.010	.010	.010	.009	.008	.007
Sfc - 8	.700	.684	.686	.698	.802	.796	.907	.846	.925	.830	.694	.708
	J	F	M	A	M	J	J	A	S	O	N	D



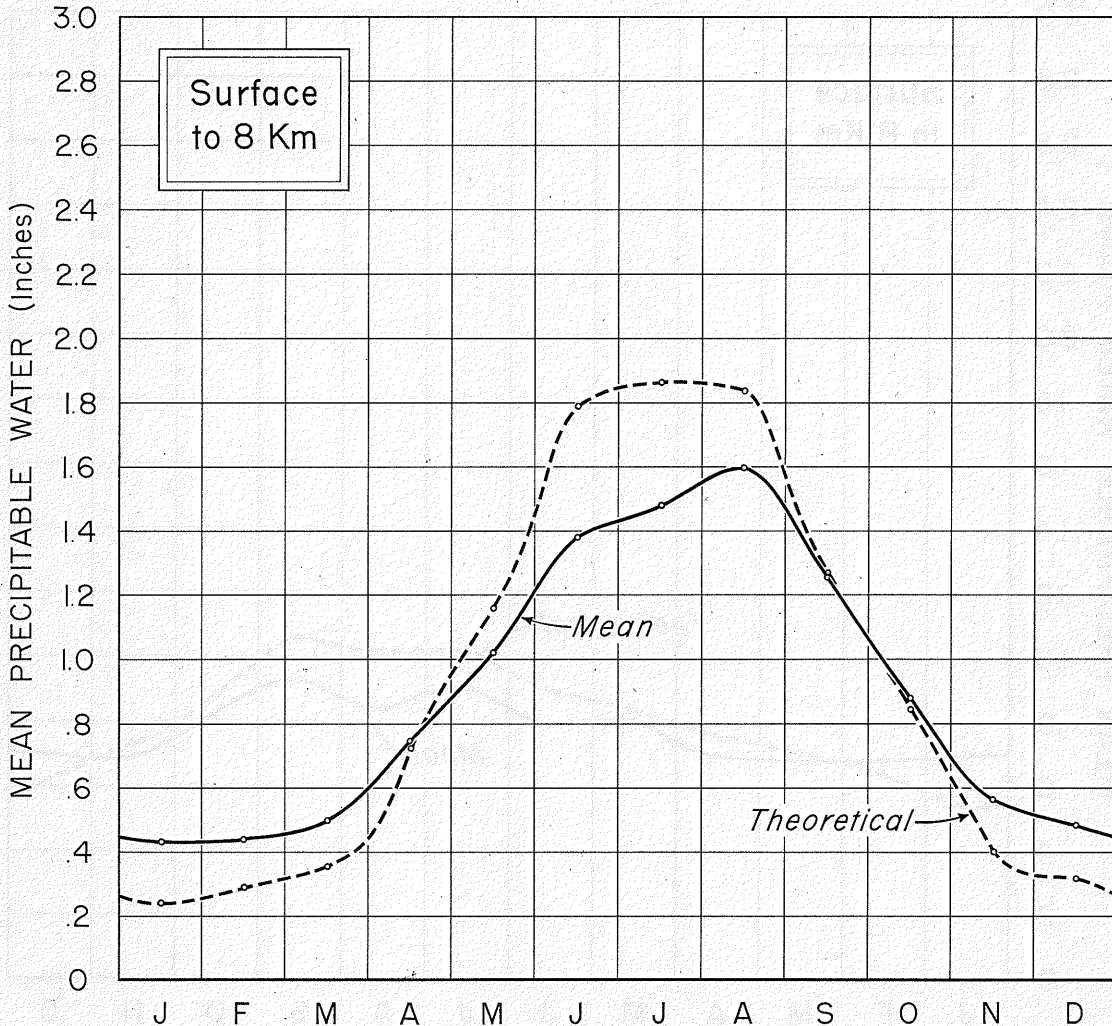
MEAN PRECIPITABLE WATER (Inches)

Oklahoma City, Okla.

Elev. 391 M

July 1938 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.016	.018	.022	.037	.052	.065	.066	.068	.056	.038	.024	.022
0.5 - 1	.073	.080	.094	.144	.203	.272	.277	.281	.222	.169	.102	.087
1 - 1.5	.068	.070	.080	.122	.169	.223	.236	.240	.193	.141	.089	.079
1.5 - 2	.058	.059	.066	.100	.139	.186	.206	.207	.163	.121	.078	.066
2 - 2.5	.048	.048	.054	.082	.111	.144	.162	.174	.134	.095	.062	.051
2.5 - 3	.040	.040	.043	.066	.085	.115	.127	.143	.111	.075	.051	.042
3 - 4	.057	.057	.062	.091	.120	.165	.177	.207	.162	.105	.070	.060
4 - 5	.035	.035	.037	.054	.071	.102	.108	.132	.101	.064	.042	.038
5 - 6	.021	.019	.021	.031	.041	.059	.066	.075	.060	.038	.024	.022
6 - 7	.011	.011	.011	.017	.022	.035	.037	.043	.035	.022	.014	.012
7 - 8	.006	.006	.006	.009	.012	.019	.021	.025	.019	.011	.007	.006
Sfc - 8	<u>.433</u>	<u>.443</u>	<u>.496</u>	<u>.753</u>	<u>1.025</u>	<u>1.385</u>	<u>1.483</u>	<u>1.595</u>	<u>1.256</u>	<u>.879</u>	<u>.563</u>	<u>.485</u>
	J	F	M	A	M	J	J	A	S	O	N	D



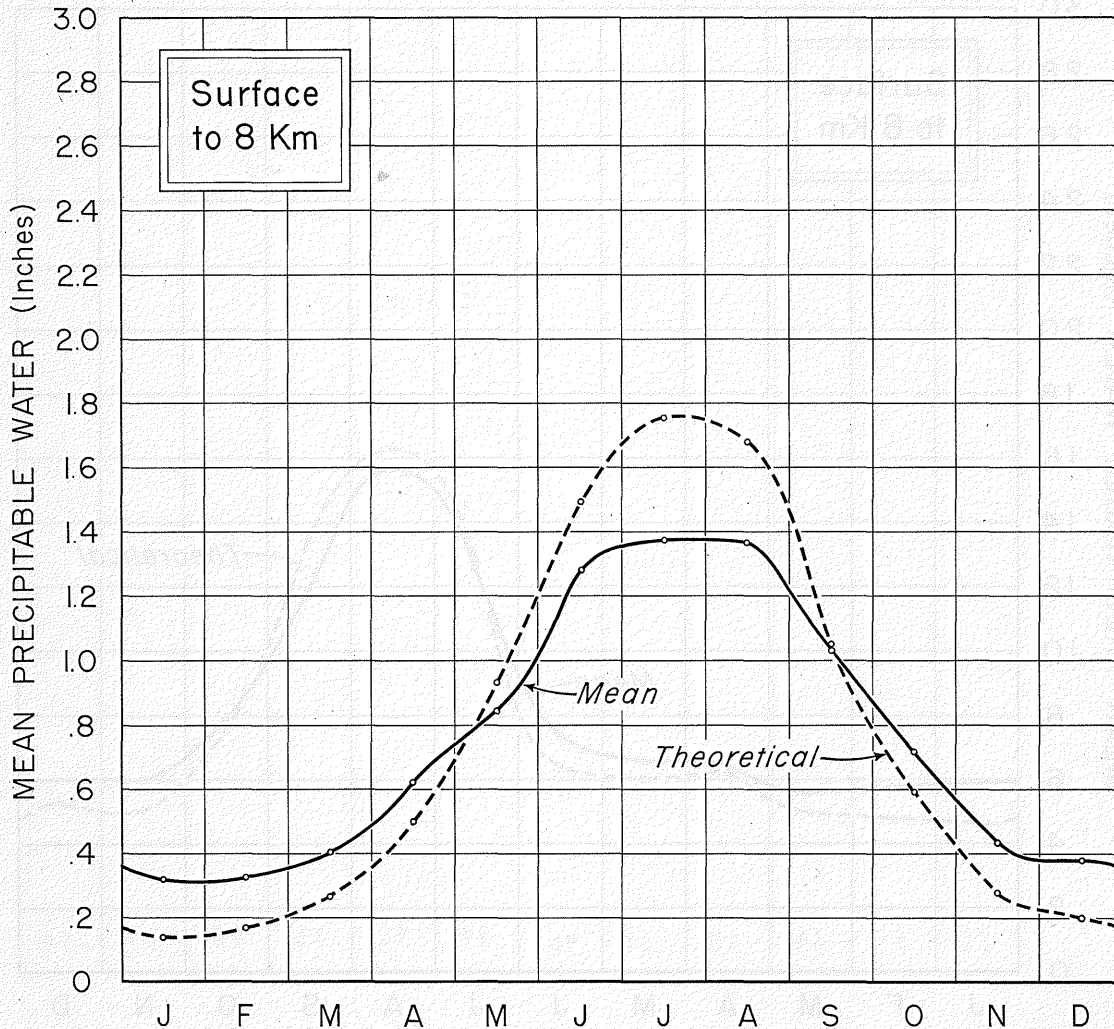
MEAN PRECIPITABLE WATER (Inches)

Omaha, Nebr.

Elev. 308 M

July 1938 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.019	.022	.031	.048	.070	.109	.114	.110	.081	.056	.033	.026
0.5 - 1	.049	.050	.071	.111	.154	.229	.249	.246	.186	.126	.078	.059
1 - 1.5	.046	.044	.059	.096	.129	.195	.210	.209	.152	.110	.066	.053
1.5 - 2	.042	.041	.052	.079	.108	.163	.172	.173	.131	.092	.055	.048
2 - 2.5	.035	.035	.043	.065	.087	.133	.136	.139	.104	.074	.045	.041
2.5 - 3	.029	.030	.035	.055	.073	.106	.110	.110	.086	.060	.038	.035
3 - 4	.042	.044	.051	.078	.105	.149	.160	.164	.123	.088	.054	.052
4 - 5	.027	.028	.030	.046	.062	.093	.105	.102	.077	.054	.033	.033
5 - 6	.015	.016	.018	.026	.035	.055	.063	.060	.047	.031	.019	.020
6 - 7	.008	.009	.010	.014	.019	.031	.035	.035	.027	.017	.010	.010
7 - 8	.004	.004	.004	.007	.010	.017	.019	.019	.014	.009	.005	.005
Sfc - 8	<u>.316</u>	<u>.323</u>	<u>.404</u>	<u>.625</u>	<u>.852</u>	<u>1.280</u>	<u>1.373</u>	<u>1.367</u>	<u>1.028</u>	<u>.717</u>	<u>.436</u>	<u>.382</u>
	J	F	M	A	M	J	J	A	S	O	N	D



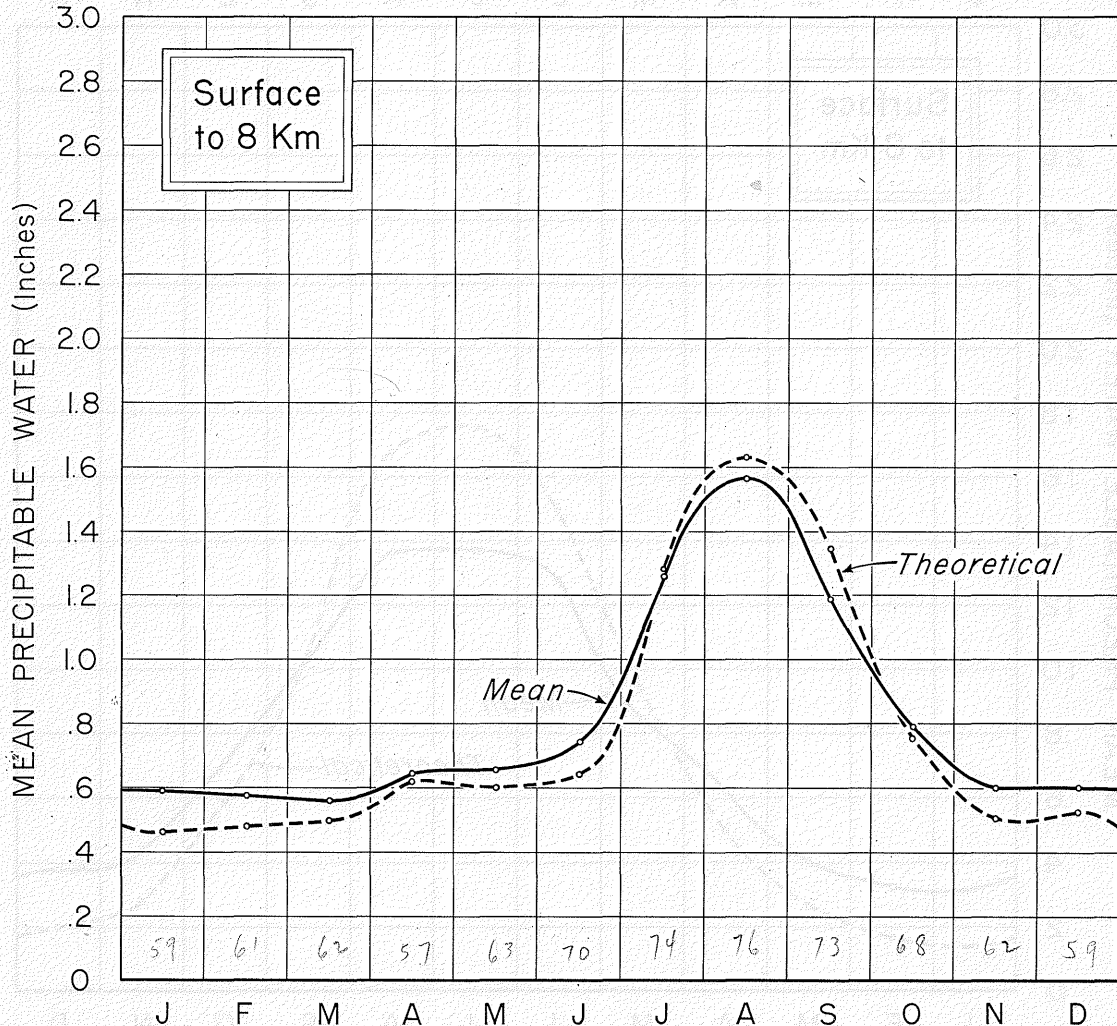
MEAN PRECIPITABLE WATER (Inches)

Phoenix, Ariz.

Elev. 339 M

July 1939 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.041	.040	.041	.046	.044	.045	.072	.086	.075	.053	.039	.041
0.5 - 1	.116	.119	.117	.129	.128	.129	.200	.240	.206	.144	.113	.122
1 - 1.5	.093	.092	.092	.100	.099	.107	.164	.202	.162	.118	.093	.096
1.5 - 2	.074	.075	.073	.081	.078	.087	.142	.184	.143	.099	.078	.078
2 - 2.5	.061	.058	.057	.066	.065	.075	.124	.162	.124	.083	.064	.063
2.5 - 3	.051	.047	.045	.053	.052	.062	.109	.141	.104	.068	.052	.050
3 - 4	.070	.066	.061	.076	.078	.096	.174	.222	.162	.101	.071	.068
4 - 5	.043	.039	.039	.046	.053	.064	.124	.147	.102	.059	.041	.040
5 - 6	.024	.023	.022	.027	.033	.042	.081	.096	.060	.033	.025	.022
6 - 7	.012	.013	.012	.015	.018	.023	.047	.057	.032	.019	.015	.012
7 - 8	.006	.007	.006	.008	.010	.013	.026	.031	.018	.010	.008	.007
Sfc - 8	.591	.579	.565	.647	.658	.743	1.263	1.568	1.188	.787	.599	.599
	J	F	M	A	M	J	J	A	S	O	N	D

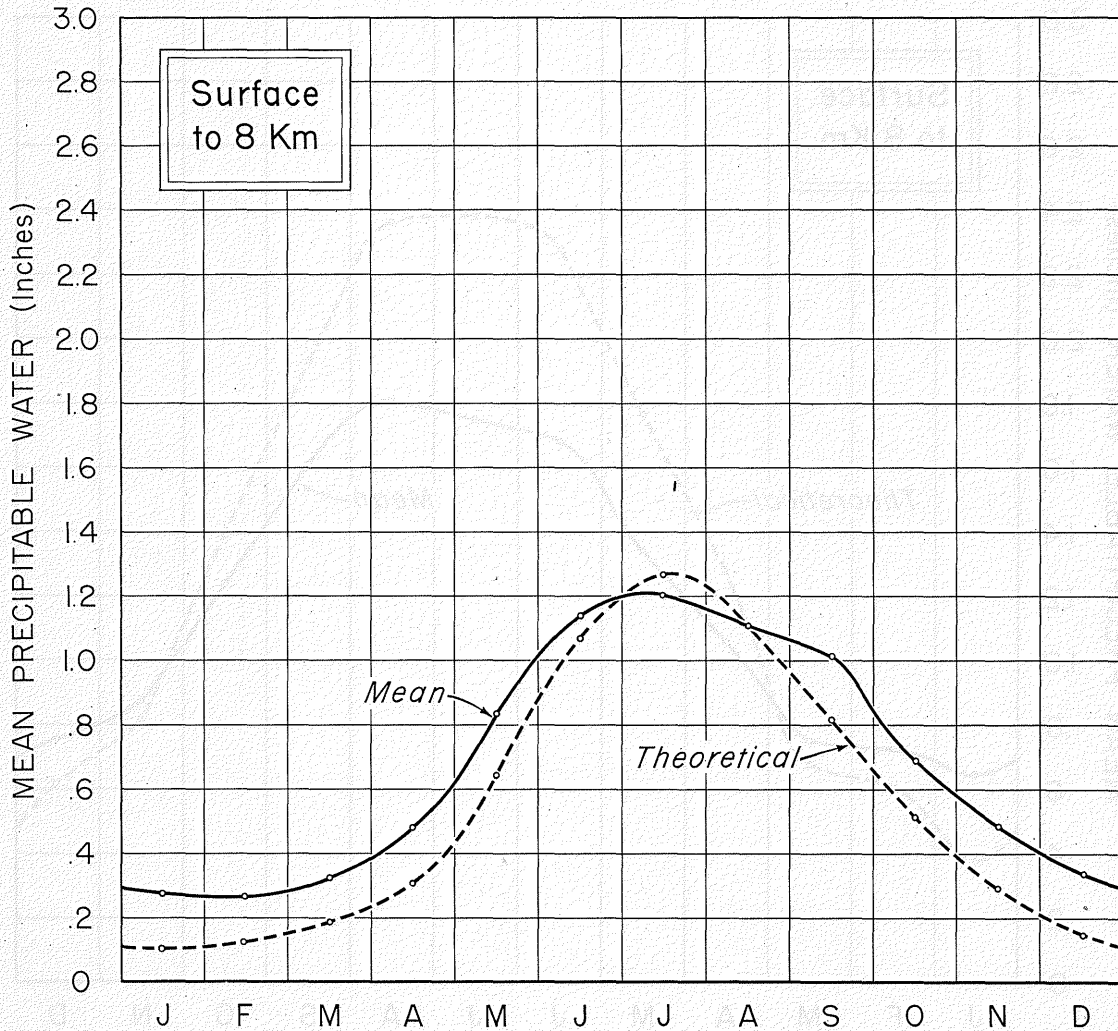


MEAN PRECIPITABLE WATER (Inches)

Portland, Maine

Elev. 20 M June - July 1940, Nov. 1940 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.036	.042	.055	.085	.146	.189	.221	.200	.168	.120	.084	.050
0.5 - 1	.038	.040	.050	.079	.139	.185	.195	.179	.156	.112	.076	.050
1 - 1.5	.035	.035	.043	.065	.114	.158	.165	.154	.134	.091	.065	.044
1.5 - 2	.030	.032	.036	.054	.093	.132	.138	.129	.120	.078	.055	.040
2 - 2.5	.027	.025	.031	.045	.077	.112	.113	.102	.099	.063	.047	.033
2.5 - 3	.023	.022	.026	.037	.063	.086	.088	.084	.075	.050	.038	.028
3 - 4	.037	.032	.038	.054	.094	.124	.121	.120	.113	.072	.056	.041
4 - 5	.023	.019	.024	.033	.054	.074	.075	.072	.070	.046	.035	.026
5 - 6	.014	.011	.014	.019	.031	.044	.044	.038	.043	.028	.020	.015
6 - 7	.008	.006	.007	.010	.016	.024	.025	.020	.024	.016	.011	.008
7 - 8	.004	.003	.004	.005	.009	.014	.014	.011	.013	.009	.006	.004
Sfc - 8	<u>.275</u>	<u>.267</u>	<u>.328</u>	<u>.486</u>	<u>.836</u>	<u>1.142</u>	<u>1.199</u>	<u>1.109</u>	<u>1.015</u>	<u>.685</u>	<u>.493</u>	<u>.339</u>
	J	F	M	A	M	J	J	A	S	O	N	D



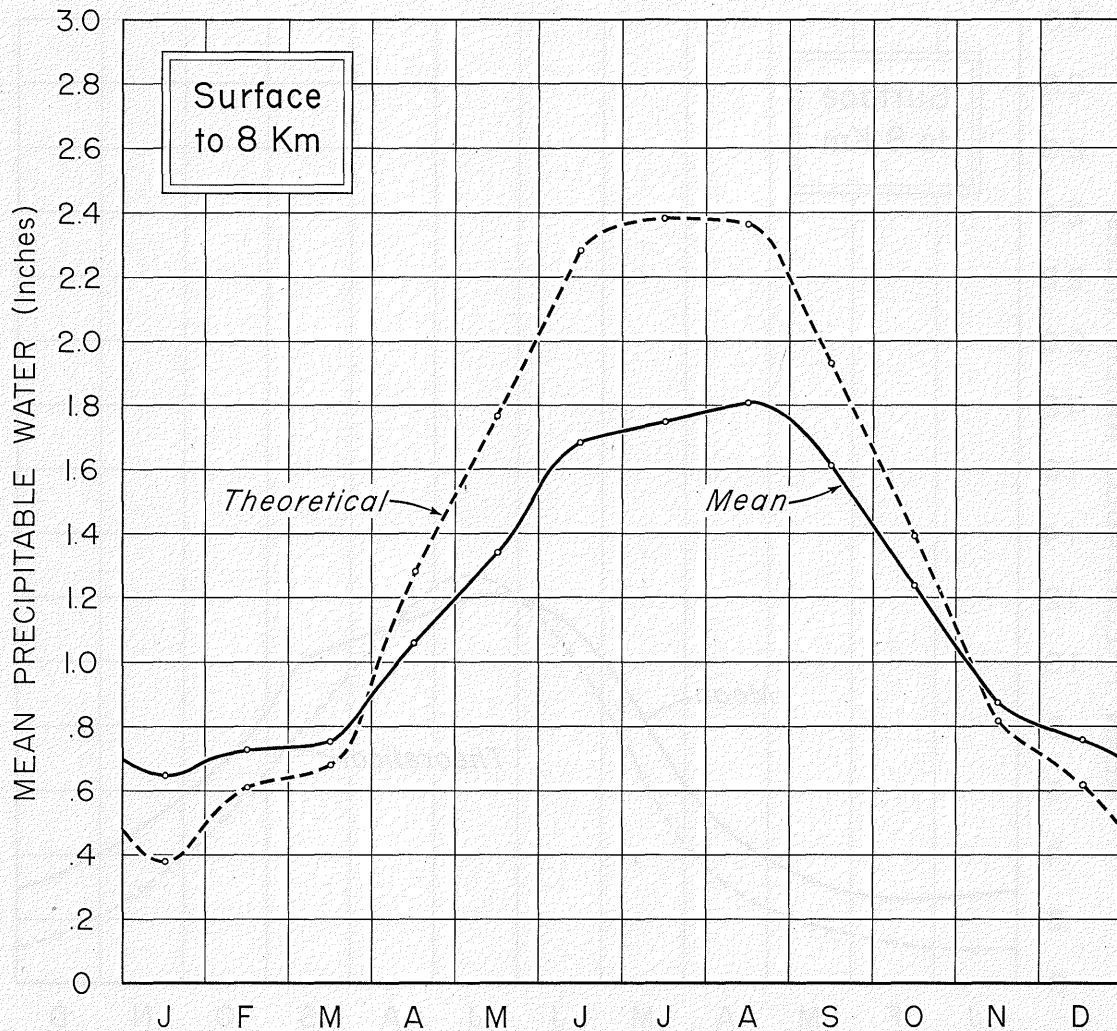
MEAN PRECIPITABLE WATER (Inches)

San Antonio, Tex.

Elev. 240 M

July 1939 - July 1940, Mar. 1941 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.064	.086	.096	.146	.186	.217	.214	.209	.180	.146	.102	.088
0.5 - 1	.103	.130	.142	.208	.260	.313	.323	.323	.282	.217	.148	.139
1 - 1.5	.089	.110	.114	.171	.214	.259	.259	.267	.234	.183	.135	.118
1.5 - 2	.081	.091	.092	.132	.171	.204	.216	.221	.198	.151	.108	.095
2 - 2.5	.068	.074	.074	.102	.132	.158	.163	.167	.155	.120	.084	.074
2.5 - 3	.055	.055	.055	.077	.090	.123	.124	.128	.123	.093	.065	.058
3 - 4	.081	.079	.080	.102	.126	.173	.184	.194	.179	.135	.096	.080
4 - 5	.050	.047	.050	.058	.075	.111	.117	.129	.118	.087	.060	.051
5 - 6	.029	.030	.029	.034	.045	.067	.076	.085	.074	.054	.038	.031
6 - 7	.017	.018	.016	.019	.027	.038	.046	.054	.044	.032	.023	.017
7 - 8	.009	.010	.008	.011	.016	.022	.026	.031	.025	.018	.013	.010
Sfc - 8	.646	.730	.756	1.060	1.342	1.685	1.748	1.808	1.612	1.236	.872	.761
	J	F	M	A	M	J	J	A	S	O	N	D



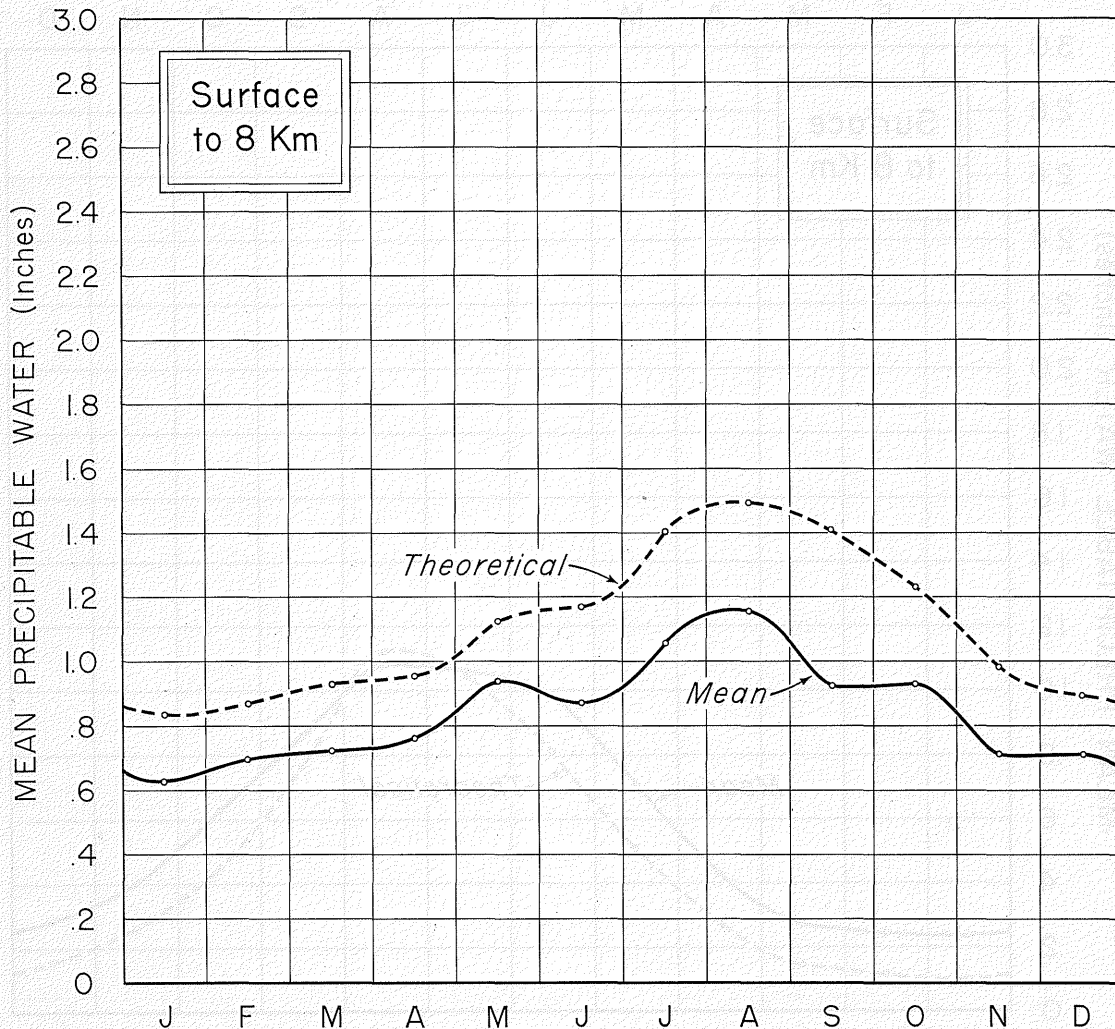
MEAN PRECIPITABLE WATER (Inches)

San Diego, Calif.

Elev. 19 M

Feb. - July 1940, Oct. 1940 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.144	.158	.168	.171	.295	.203	.225	.238	.219	.205	.165	.168
0.5 - 1	.114	.123	.131	.139	.154	.160	.166	.177	.172	.163	.124	.120
1 - 1.5	.083	.093	.101	.107	.113	.108	.115	.126	.117	.113	.092	.090
1.5 - 2	.061	.070	.075	.079	.079	.073	.094	.108	.088	.083	.068	.070
2 - 2.5	.047	.057	.057	.058	.062	.062	.082	.095	.073	.067	.050	.056
2.5 - 3	.036	.043	.040	.047	.048	.052	.074	.087	.062	.057	.040	.041
3 - 4	.054	.064	.053	.066	.071	.081	.115	.131	.086	.092	.059	.060
4 - 5	.038	.044	.040	.042	.047	.058	.080	.087	.047	.063	.045	.044
5 - 6	.026	.029	.030	.029	.035	.039	.055	.054	.028	.043	.034	.031
6 - 7	.016	.017	.018	.018	.024	.022	.035	.034	.018	.029	.023	.020
7 - 8	.008	.010	.010	.010	.014	.013	.018	.021	.012	.017	.014	.012
Sfc - 8	627	708	723	766	942	871	1059	1158	922	932	714	712
	J	F	M	A	M	J	J	A	S	O	N	D



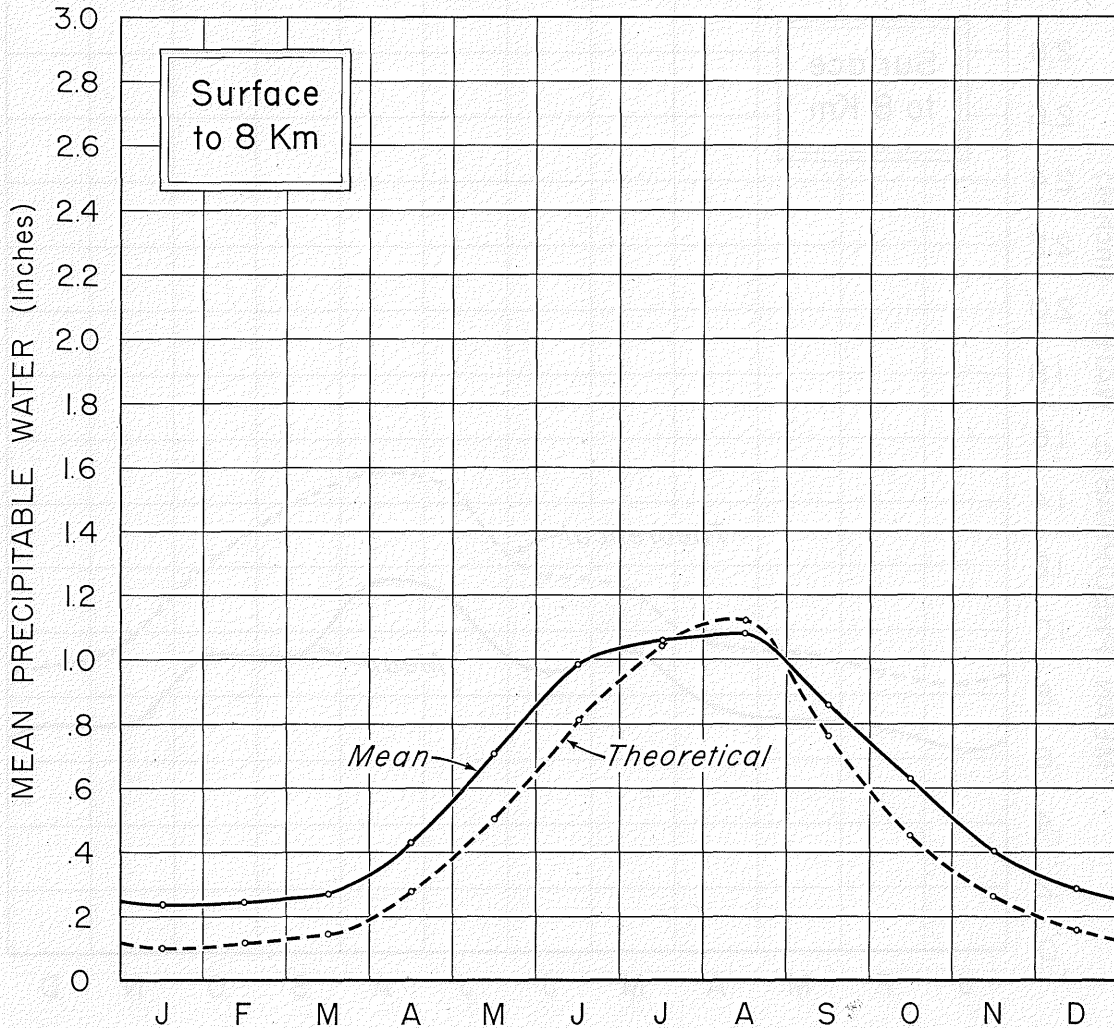
MEAN PRECIPITABLE WATER (Inches)

Sault Ste. Marie, Mich.

Elev. 221 M

July 1938 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.021	.022	.027	.048	.070	.100	.118	.121	.094	.067	.043	.029
0.5 - 1	.036	.038	.045	.076	.124	.167	.200	.194	.158	.108	.068	.048
1 - 1.5	.034	.035	.038	.064	.105	.145	.157	.158	.126	.092	.058	.044
1.5 - 2	.031	.031	.033	.052	.086	.123	.133	.136	.104	.078	.049	.038
2 - 2.5	.026	.027	.028	.042	.072	.105	.105	.109	.085	.064	.040	.032
2.5 - 3	.022	.023	.024	.034	.060	.081	.084	.088	.067	.052	.034	.017
3 - 4	.032	.032	.036	.049	.086	.118	.116	.121	.095	.076	.049	.038
4 - 5	.019	.019	.021	.033	.052	.071	.068	.074	.058	.045	.030	.023
5 - 6	.010	.011	.012	.019	.031	.042	.041	.044	.037	.027	.018	.013
6 - 7	.005	.005	.006	.009	.017	.023	.023	.024	.021	.015	.009	.006
7 - 8	.002	.003	.003	.004	.009	.012	.012	.013	.011	.008	.005	.003
Sfc - 8	<u>.238</u>	<u>.246</u>	<u>.273</u>	<u>.430</u>	<u>.712</u>	<u>.987</u>	<u>1.057</u>	<u>1.082</u>	<u>.856</u>	<u>.632</u>	<u>.403</u>	<u>.291</u>
	J	F	M	A	M	J	J	A	S	O	N	D



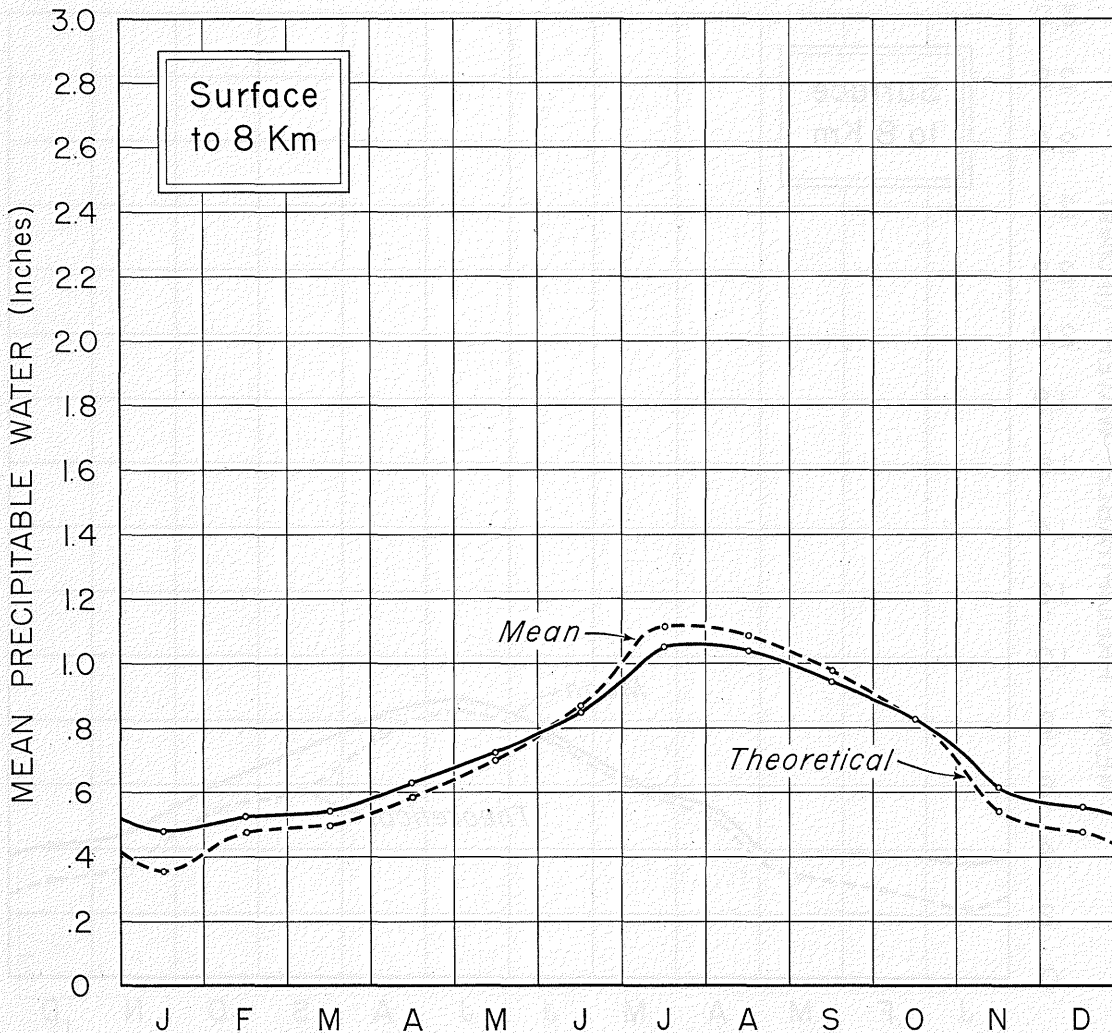
MEAN PRECIPITABLE WATER (Inches)

Seattle, Wash.

Elev. 22 M

Feb. 1940 - Dec. 1943

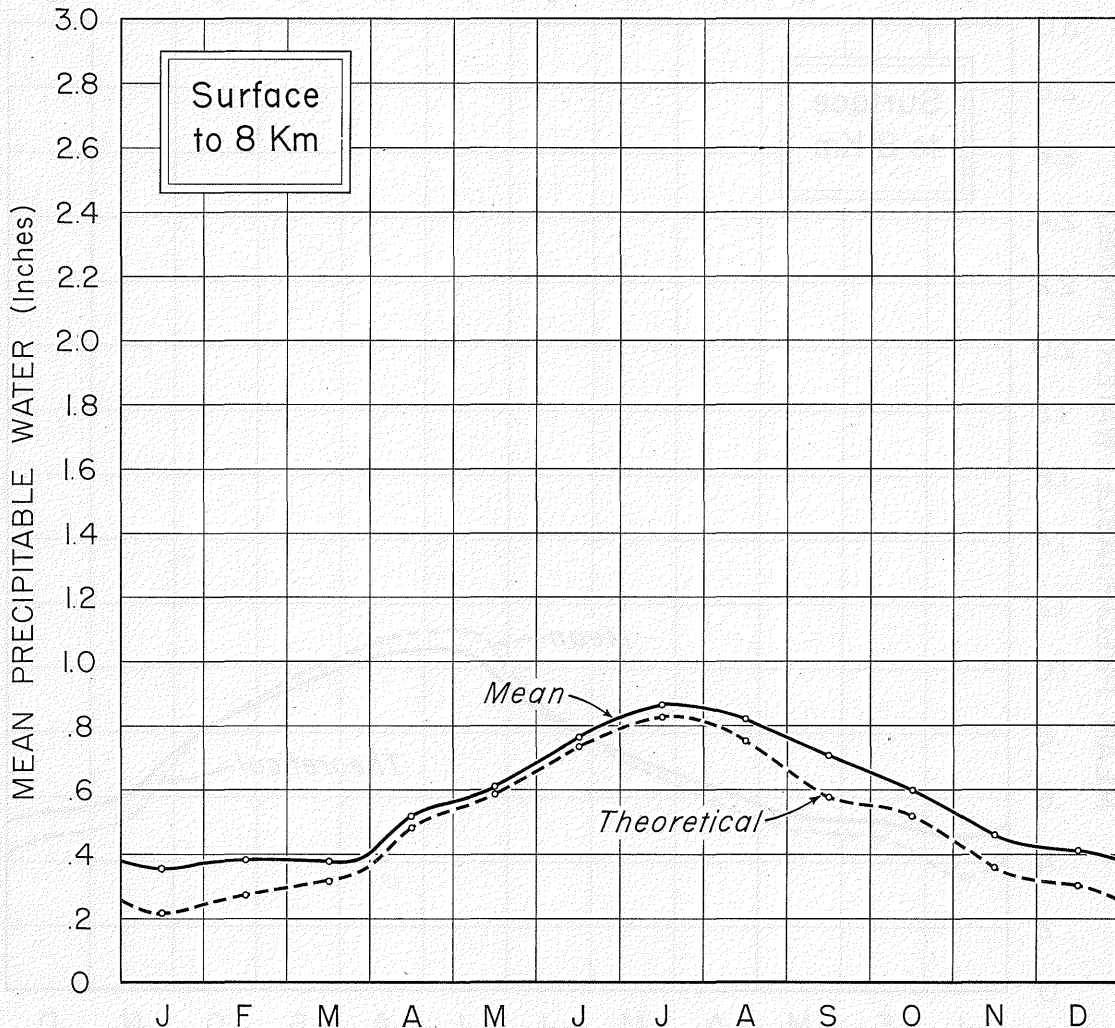
LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.089	.104	.109	.124	.140	.158	.195	.191	.175	.160	.117	.108
0.5 - 1	.079	.090	.093	.105	.120	.136	.177	.173	.154	.142	.099	.090
1 - 1.5	.067	.075	.076	.086	.100	.114	.150	.144	.130	.118	.081	.076
1.5 - 2	.054	.059	.059	.069	.083	.097	.125	.118	.109	.092	.068	.060
2 - 2.5	.043	.047	.047	.056	.067	.080	.096	.100	.088	.073	.056	.049
2.5 - 3	.034	.038	.038	.045	.050	.063	.075	.078	.070	.056	.042	.039
3 - 4	.048	.051	.051	.063	.070	.086	.101	.106	.098	.079	.061	.054
4 - 5	.031	.030	.031	.038	.042	.052	.060	.061	.057	.049	.040	.034
5 - 6	.019	.017	.019	.022	.025	.033	.037	.037	.034	.030	.025	.022
6 - 7	.010	.009	.010	.013	.015	.020	.022	.021	.020	.018	.015	.013
7 - 8	.005	.004	.006	.007	.009	.011	.013	.012	.012	.010	.008	.006
Sfc - 8	<u>.479</u>	<u>.524</u>	<u>.539</u>	<u>.628</u>	<u>.721</u>	<u>.850</u>	<u>1.051</u>	<u>1.041</u>	<u>.947</u>	<u>.827</u>	<u>.612</u>	<u>.551</u>
	J	F	M	A	M	J	J	A	S	O	N	D



MEAN PRECIPITABLE WATER (Inches)

Spokane, Wash.

LAYER (Km)	Elev. 598 M					Sept. 1939 - July 1940, Dec. 1940 - Dec. 1943						
	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 1	.051	.067	.068	.094	.106	.124	.133	.123	.107	.099	.076	.070
1 - 1.5	.060	.071	.071	.096	.111	.128	.144	.137	.116	.106	.084	.076
1.5 - 2	.053	.059	.055	.073	.089	.109	.120	.117	.096	.087	.065	.060
2 - 2.5	.045	.046	.042	.058	.073	.091	.099	.101	.082	.070	.053	.049
2.5 - 3	.037	.038	.035	.048	.058	.076	.082	.083	.068	.057	.042	.039
3 - 4	.053	.052	.048	.068	.081	.106	.120	.116	.100	.081	.060	.054
4 - 5	.032	.029	.028	.040	.047	.062	.075	.069	.063	.048	.038	.033
5 - 6	.017	.015	.016	.024	.026	.035	.048	.040	.038	.028	.021	.018
6 - 7	.009	.007	.008	.012	.014	.020	.027	.023	.022	.015	.011	.010
7 - 8	.004	.003	.004	.006	.007	.011	.015	.013	.013	.008	.006	.005
Sfc - 8	<u>.361</u>	<u>.387</u>	<u>.375</u>	<u>.519</u>	<u>.612</u>	<u>.762</u>	<u>.863</u>	<u>.822</u>	<u>.705</u>	<u>.599</u>	<u>.456</u>	<u>.414</u>
	J	F	M	A	M	J	J	A	S	O	N	D



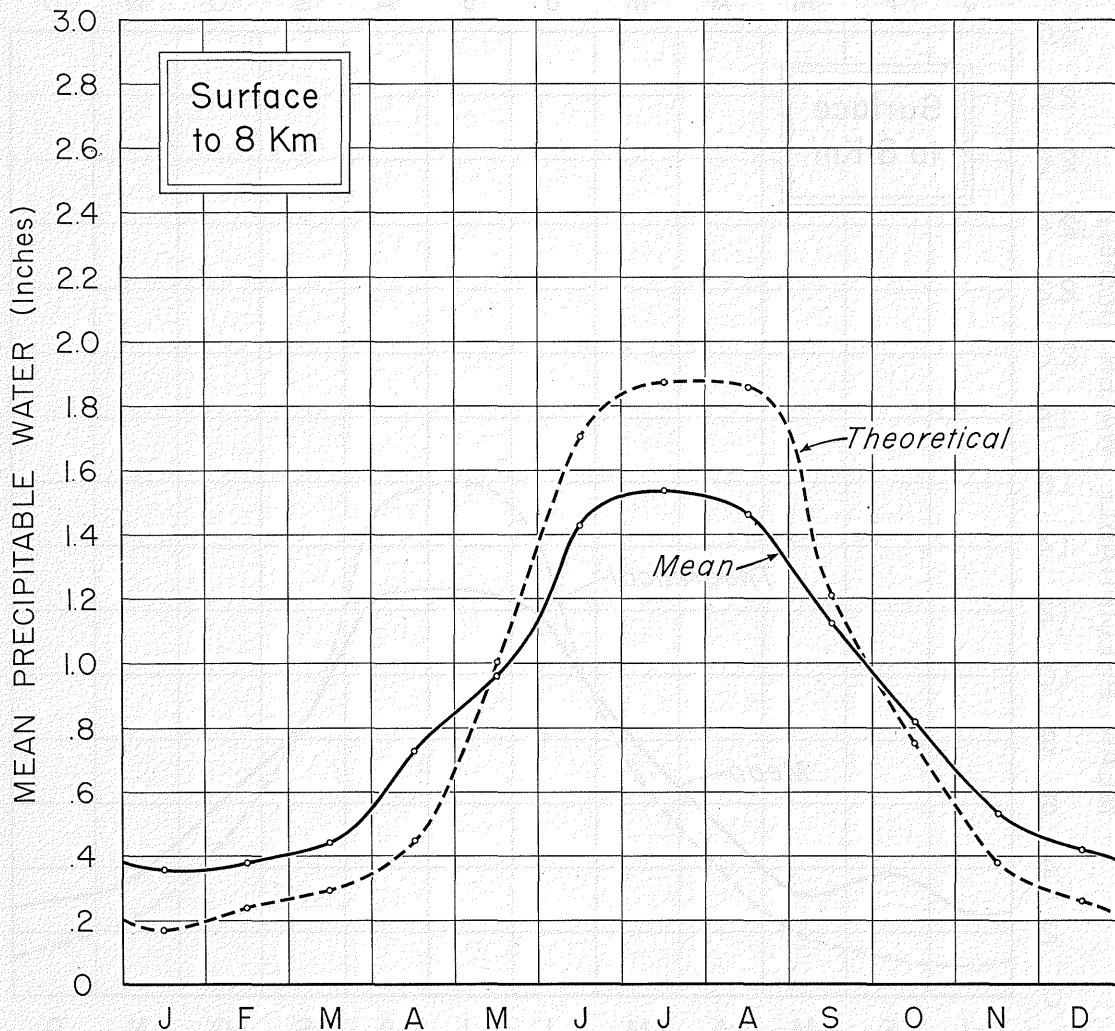
MEAN PRECIPITABLE WATER (Inches)

St. Louis, Mo.

Elev. 171 M

Sept. 1939 - July 1940, Jan. 1941 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.036	.046	.054	.094	.126	.189	.201	.188	.146	.105	.066	.051
0.5 - 1	.052	.060	.072	.121	.167	.245	.264	.246	.190	.141	.091	.071
1 - 1.5	.048	.053	.063	.104	.139	.206	.228	.208	.162	.120	.078	.062
1.5 - 2	.045	.046	.052	.089	.117	.170	.199	.176	.135	.100	.064	.052
2 - 2.5	.038	.039	.045	.074	.094	.135	.155	.138	.107	.079	.053	.043
2.5 - 3	.032	.032	.038	.058	.076	.106	.114	.110	.085	.065	.044	.034
3 - 4	.046	.048	.054	.083	.108	.159	.162	.159	.125	.095	.064	.049
4 - 5	.028	.030	.033	.051	.065	.102	.101	.108	.082	.055	.040	.029
5 - 6	.016	.016	.019	.029	.039	.063	.060	.067	.050	.032	.022	.018
6 - 7	.008	.009	.010	.016	.022	.037	.035	.039	.029	.018	.012	.010
7 - 8	.004	.005	.005	.008	.012	.021	.021	.023	.016	.010	.006	.005
Sfc - 8	.353	.384	.445	.727	.965	1.433	1.540	1.462	1.127	.820	.540	.424
	J	F	M	A	M	J	J	A	S	O	N	D

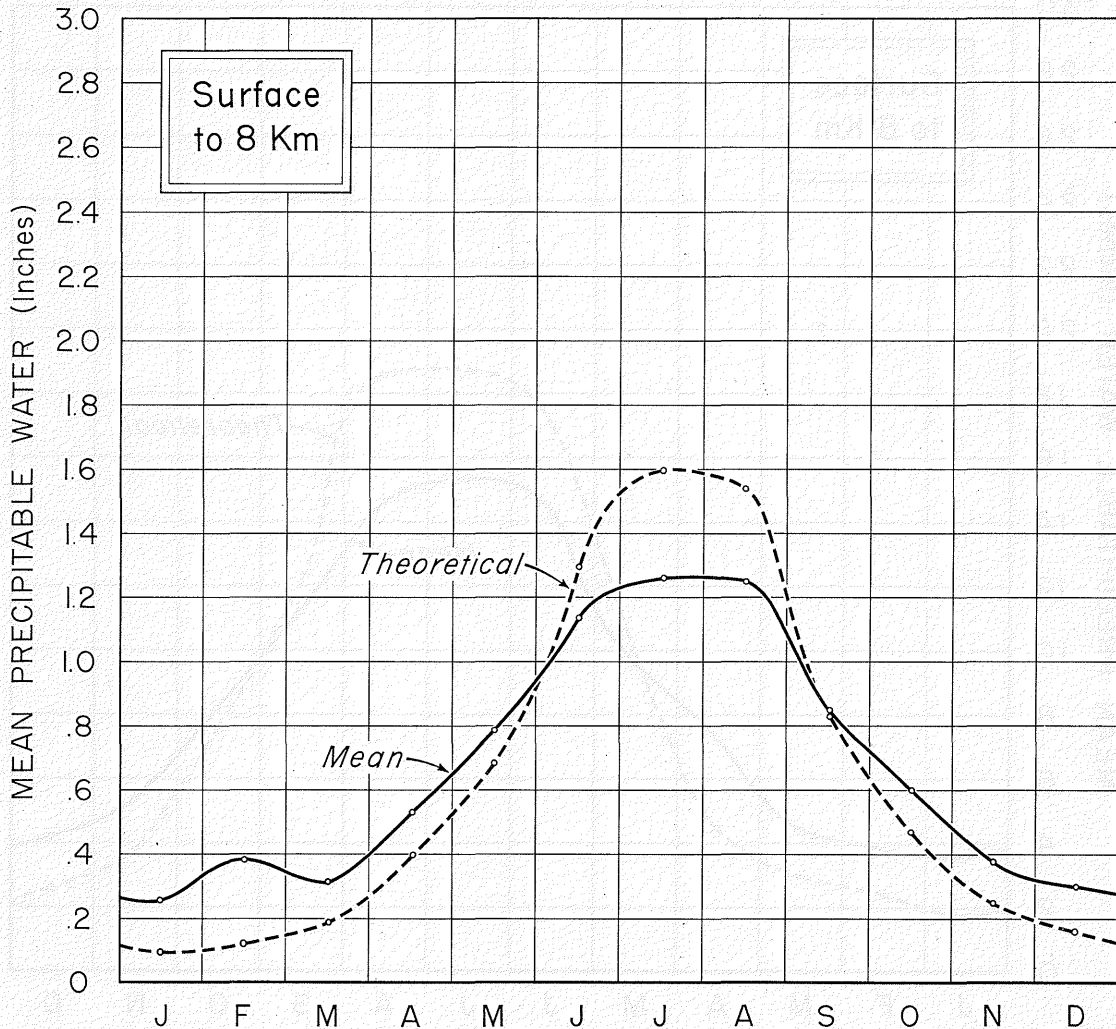


MEAN PRECIPITABLE WATER (Inches) St. Paul and Minneapolis, Minn.

Elev. 225 M

Sept. 1939 - July 1940, Jan. 1941 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.018	.022	.031	.055	.082	.125	.148	.148	.093	.063	.039	.028
0.5 - 1	.036	.161	.054	.095	.136	.206	.225	.224	.151	.108	.068	.051
1 - 1.5	.036	.038	.046	.078	.117	.174	.187	.188	.128	.085	.055	.044
1.5 - 2	.035	.033	.037	.066	.098	.147	.158	.156	.106	.075	.045	.037
2 - 2.5	.029	.029	.031	.055	.083	.110	.131	.119	.084	.059	.037	.031
2.5 - 3	.024	.024	.026	.043	.067	.089	.097	.097	.067	.050	.030	.026
3 - 4	.036	.035	.038	.063	.093	.125	.136	.136	.094	.071	.044	.038
4 - 5	.022	.022	.023	.038	.054	.077	.083	.085	.059	.044	.029	.025
5 - 6	.013	.012	.014	.022	.031	.046	.051	.050	.035	.026	.017	.014
6 - 7	.006	.006	.007	.012	.017	.025	.030	.029	.020	.014	.009	.008
7 - 8	.003	.003	.004	.006	.009	.014	.017	.016	.010	.007	.005	.004
Sfc - 8	<u>.258</u>	<u>.385</u>	<u>.311</u>	<u>.533</u>	<u>.787</u>	<u>1.138</u>	<u>1.263</u>	<u>1.248</u>	<u>.847</u>	<u>.602</u>	<u>.378</u>	<u>.306</u>
	J	F	M	A	M	J	J	A	S	O	N	D



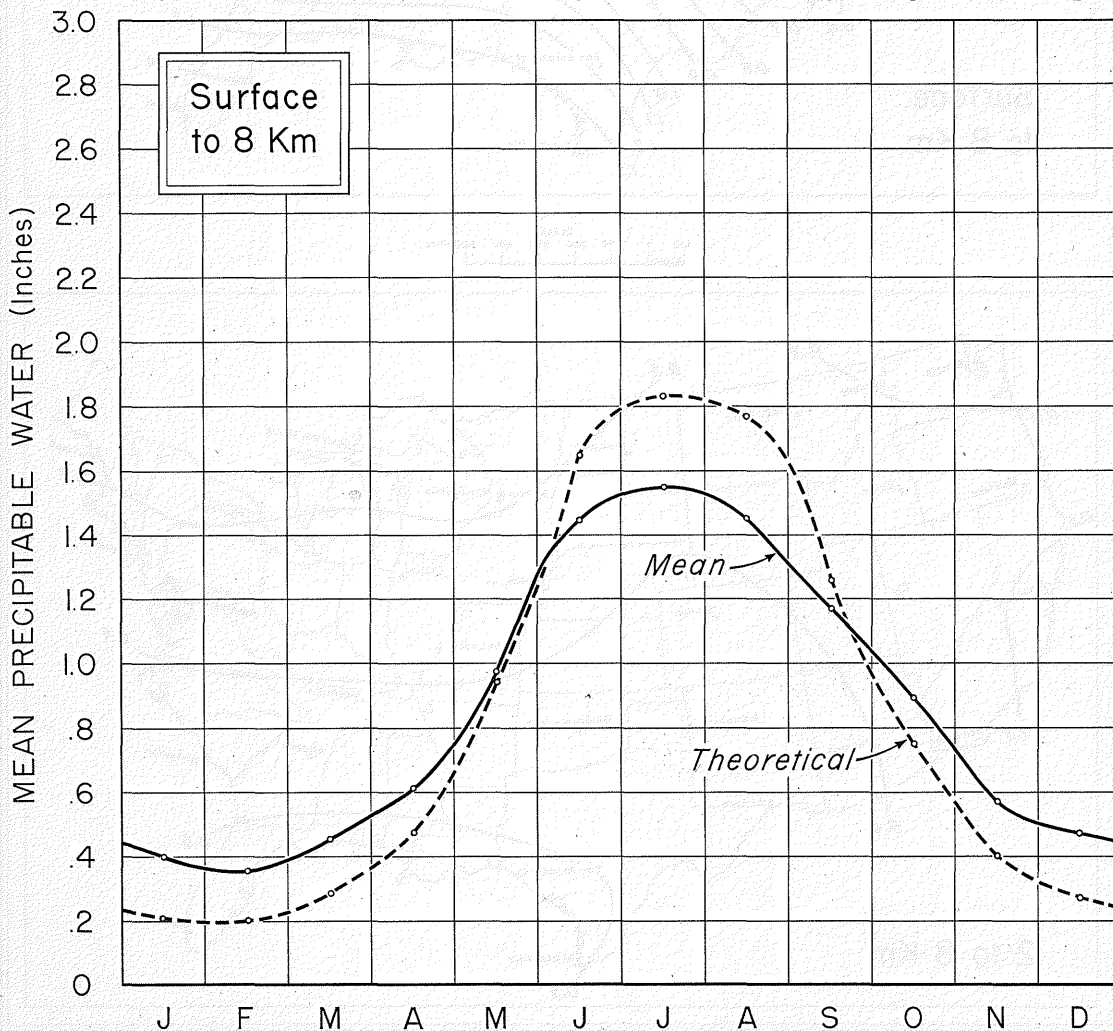
MEAN PRECIPITABLE WATER (Inches)

Washington, D. C.

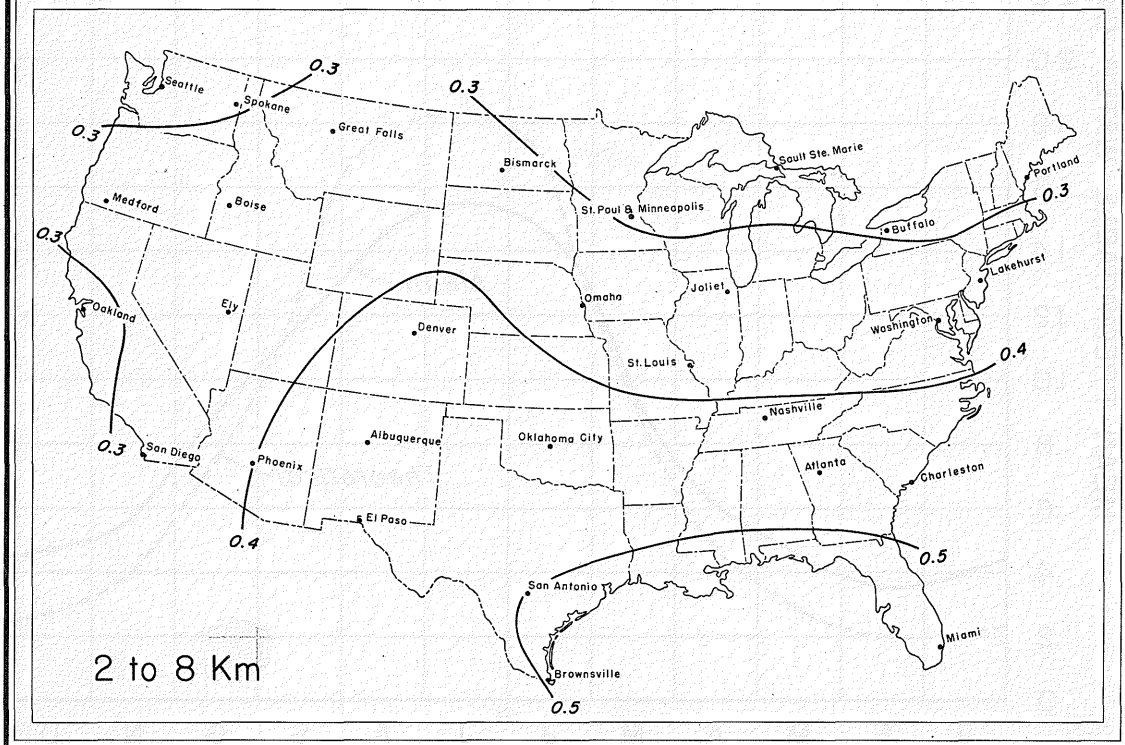
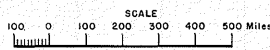
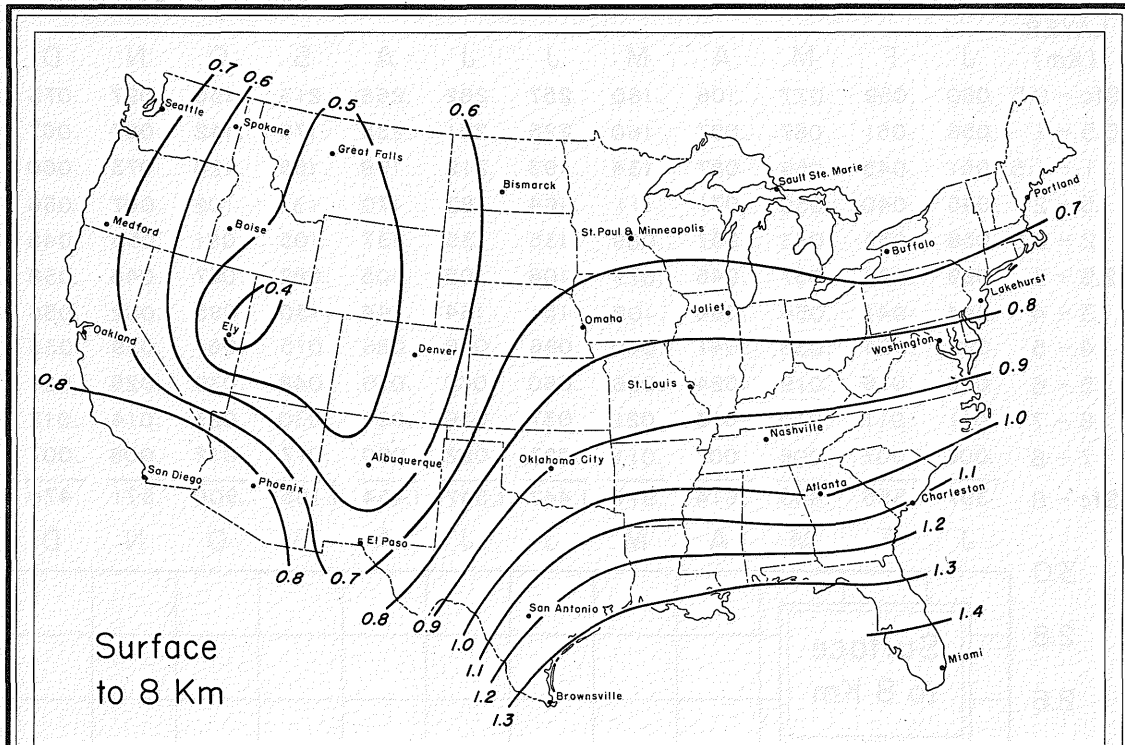
Elev. 25 M

Jan. 1940 - Dec. 1943

LAYER (Km)	J	F	M	A	M	J	J	A	S	O	N	D
Sfc - 0.5	.060	.059	.077	.106	.180	.257	.282	.268	.213	.150	.097	.073
0.5 - 1	.056	.051	.067	.097	.160	.225	.251	.235	.179	.142	.087	.067
1 - 1.5	.051	.045	.059	.087	.134	.193	.212	.198	.155	.128	.073	.060
1.5 - 2	.045	.040	.050	.071	.111	.164	.182	.170	.131	.102	.067	.056
2 - 2.5	.038	.033	.043	.057	.089	.135	.135	.137	.105	.081	.055	.048
2.5 - 3	.029	.028	.037	.045	.073	.106	.105	.105	.082	.067	.044	.038
3 - 4	.044	.041	.054	.066	.102	.151	.164	.144	.130	.095	.062	.056
4 - 5	.029	.024	.033	.041	.060	.096	.098	.088	.075	.061	.039	.036
5 - 6	.028	.016	.019	.024	.036	.060	.060	.055	.048	.039	.025	.021
6 - 7	.011	.011	.010	.013	.021	.037	.036	.034	.030	.023	.014	.012
7 - 8	.006	.007	.006	.007	.011	.023	.022	.020	.017	.012	.008	.007
Sfc - 8	<u>.397</u>	<u>.355</u>	<u>.455</u>	<u>.614</u>	<u>.977</u>	<u>1.447</u>	<u>1.547</u>	<u>1.454</u>	<u>1.165</u>	<u>.900</u>	<u>.571</u>	<u>.474</u>
	J	F	M	A	M	J	J	A	S	O	N	D

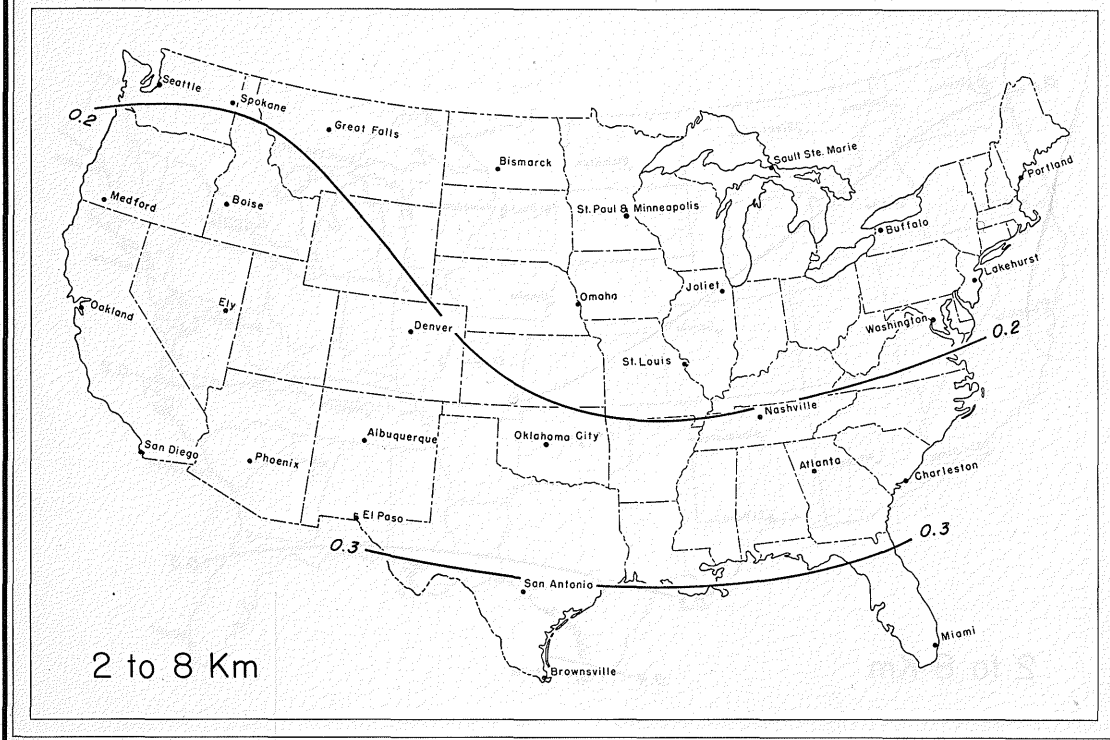
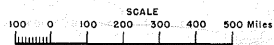
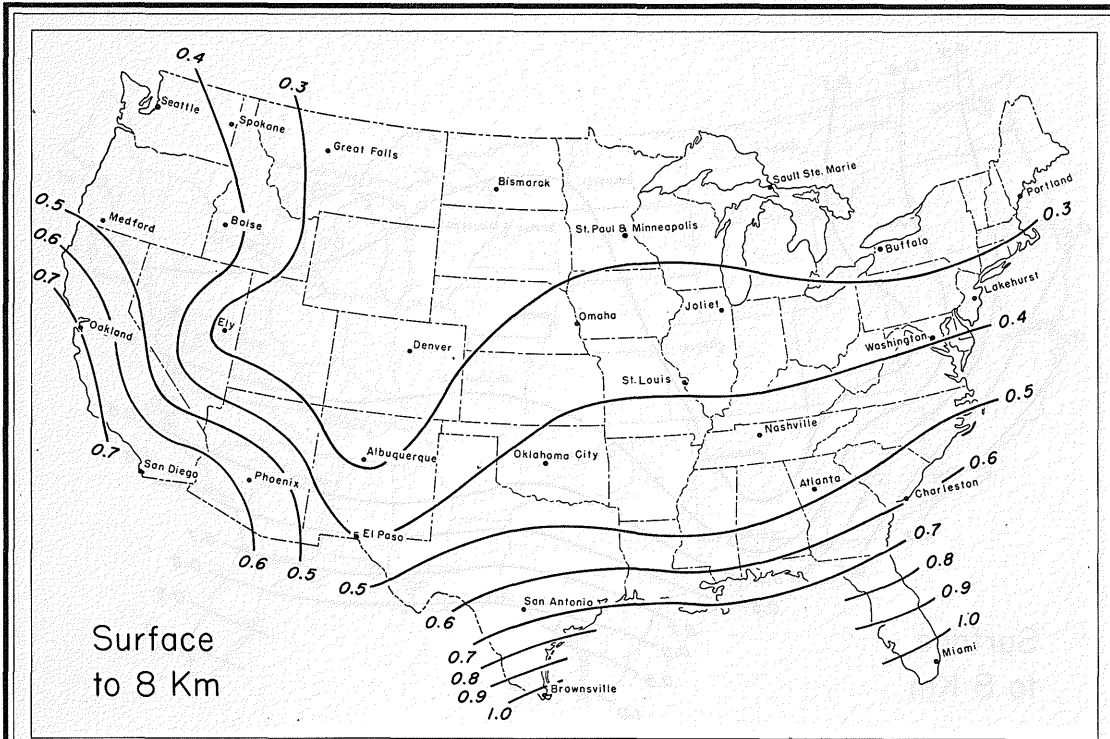


MEAN PRECIPITABLE WATER (Inches) Annual



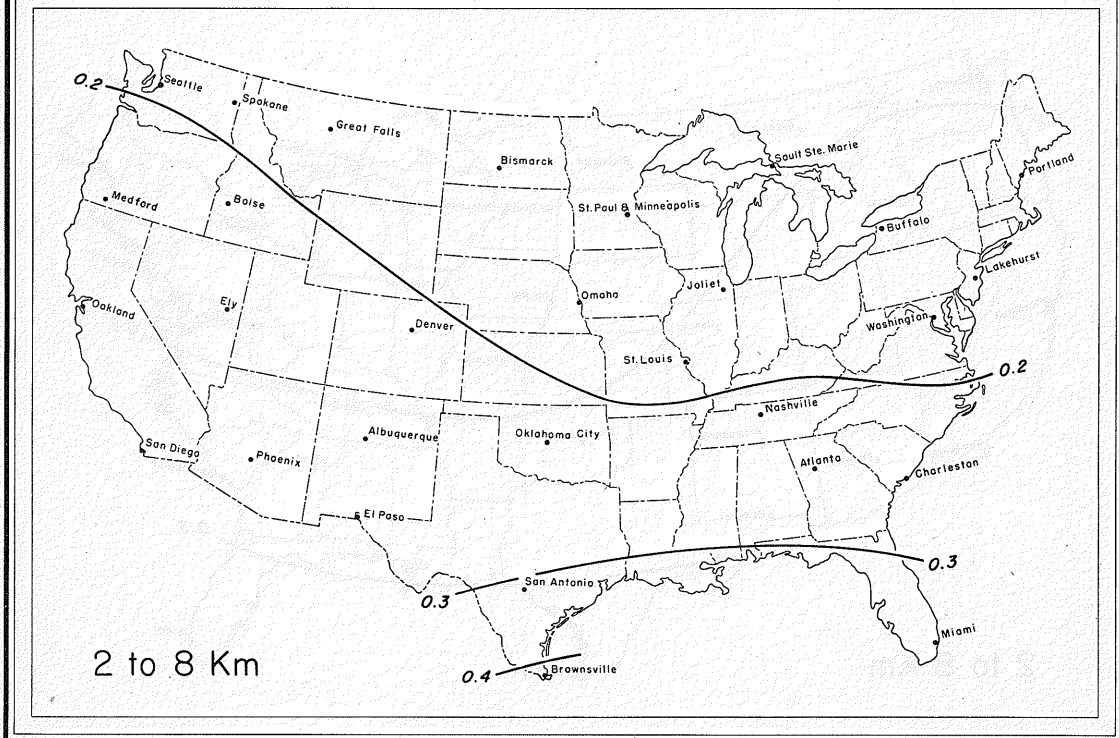
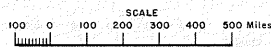
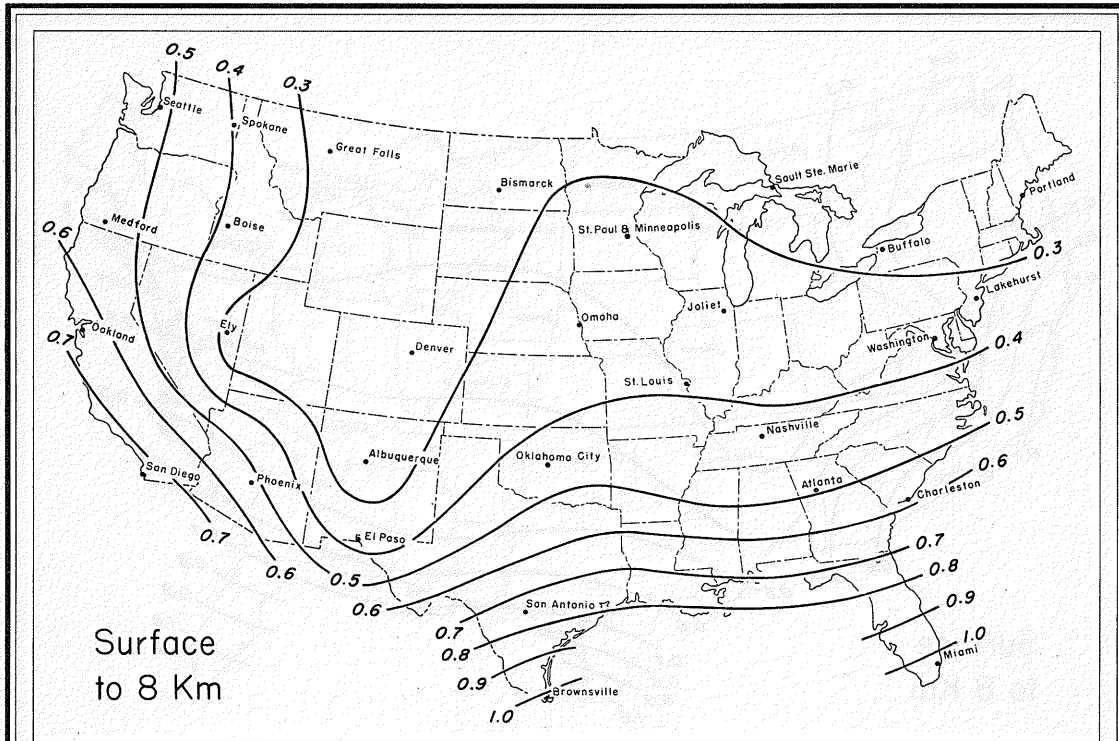
MEAN PRECIPITABLE WATER (Inches)

January

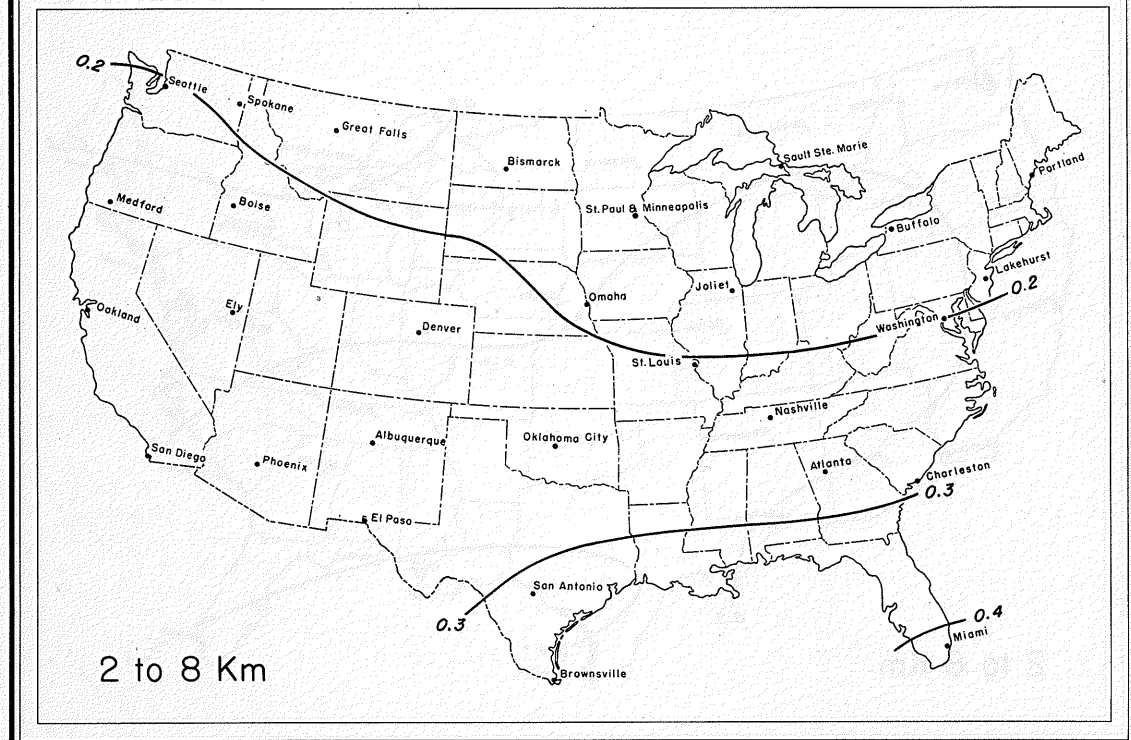
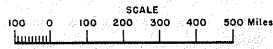
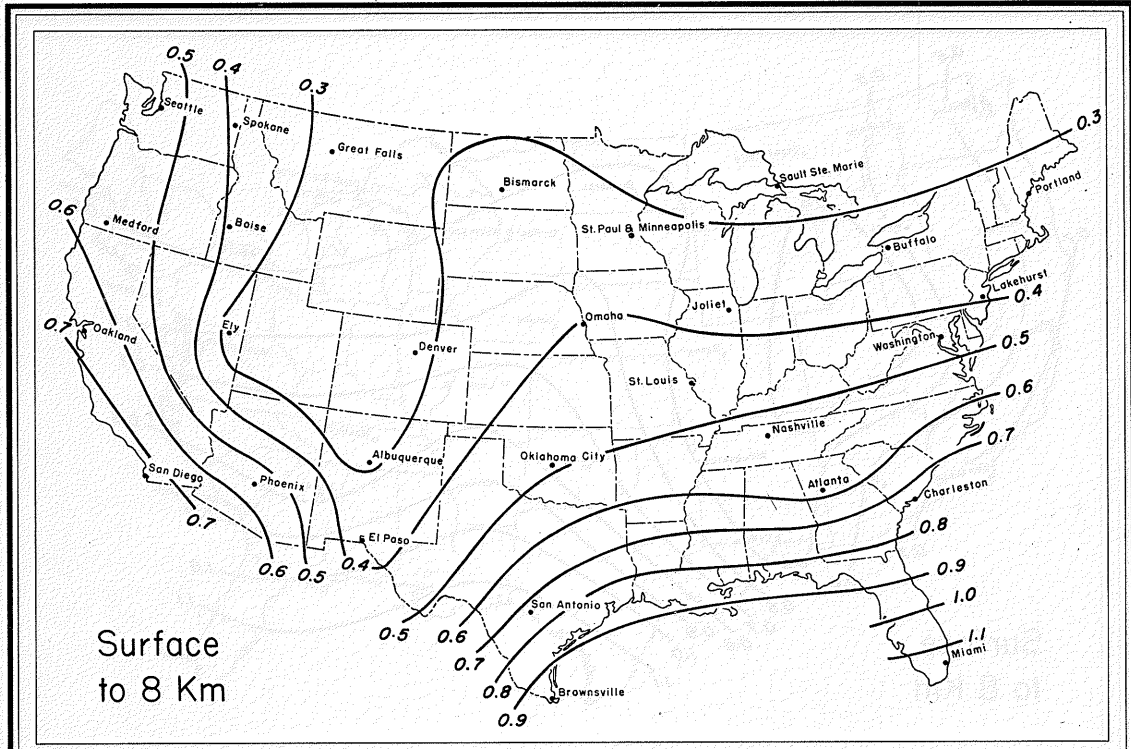


MEAN PRECIPITABLE WATER (Inches)

February

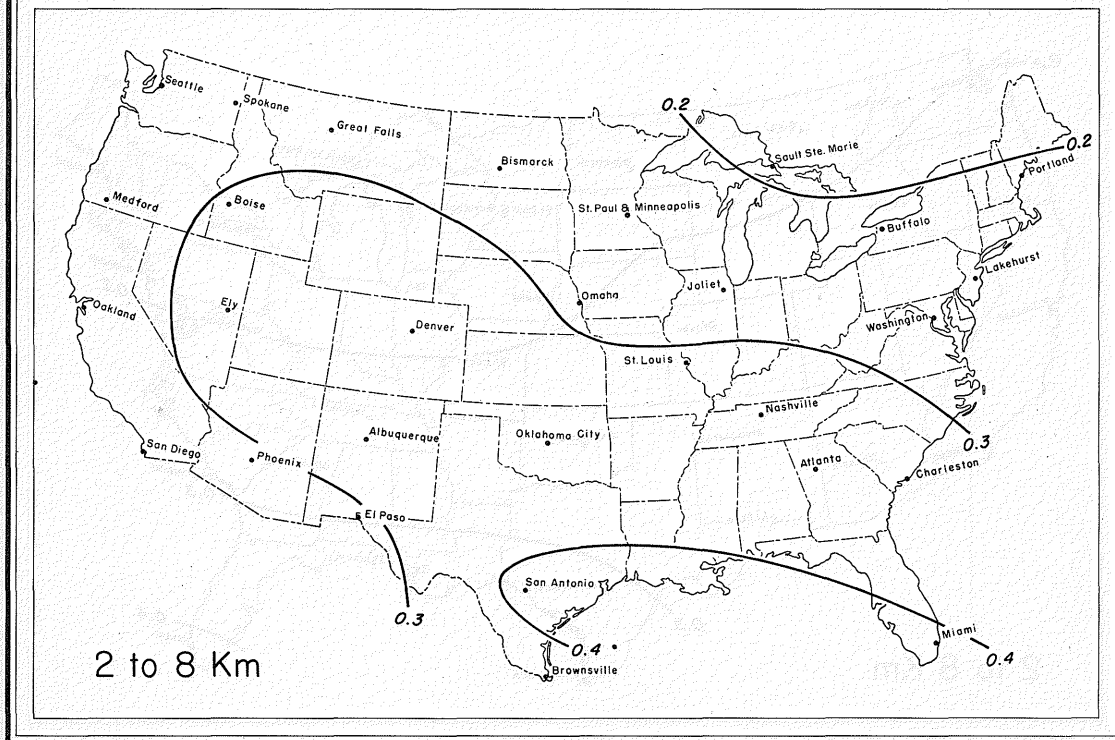
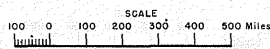
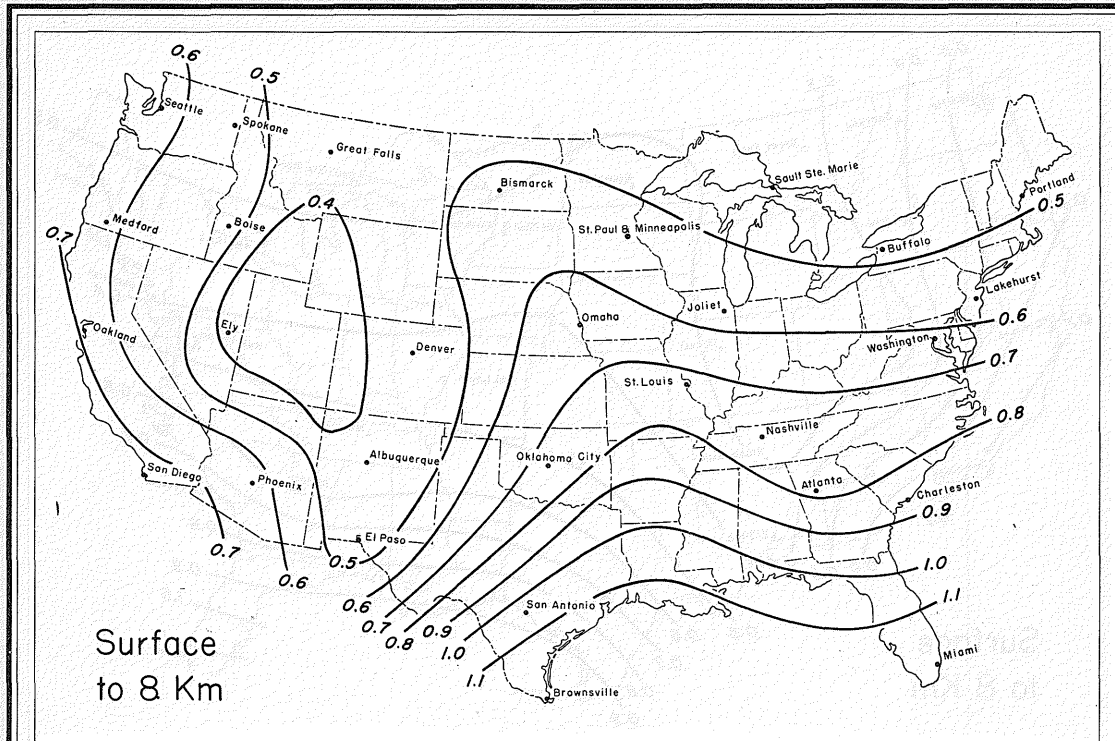


MEAN PRECIPITABLE WATER (Inches) March



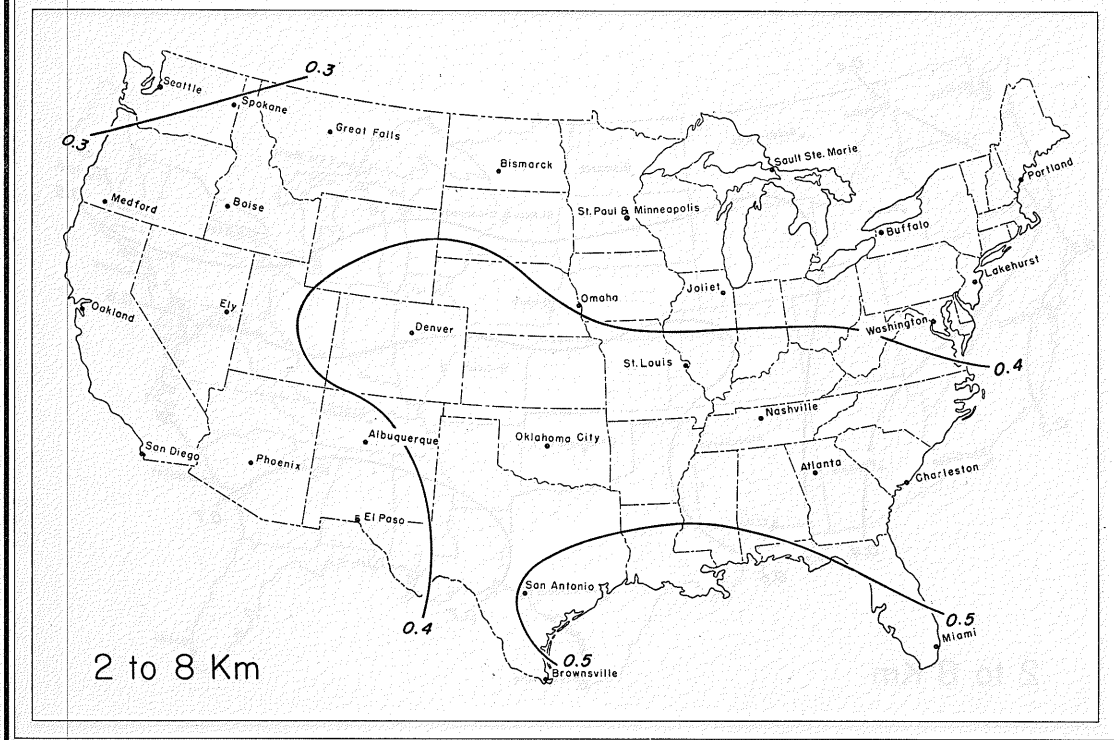
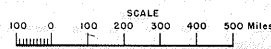
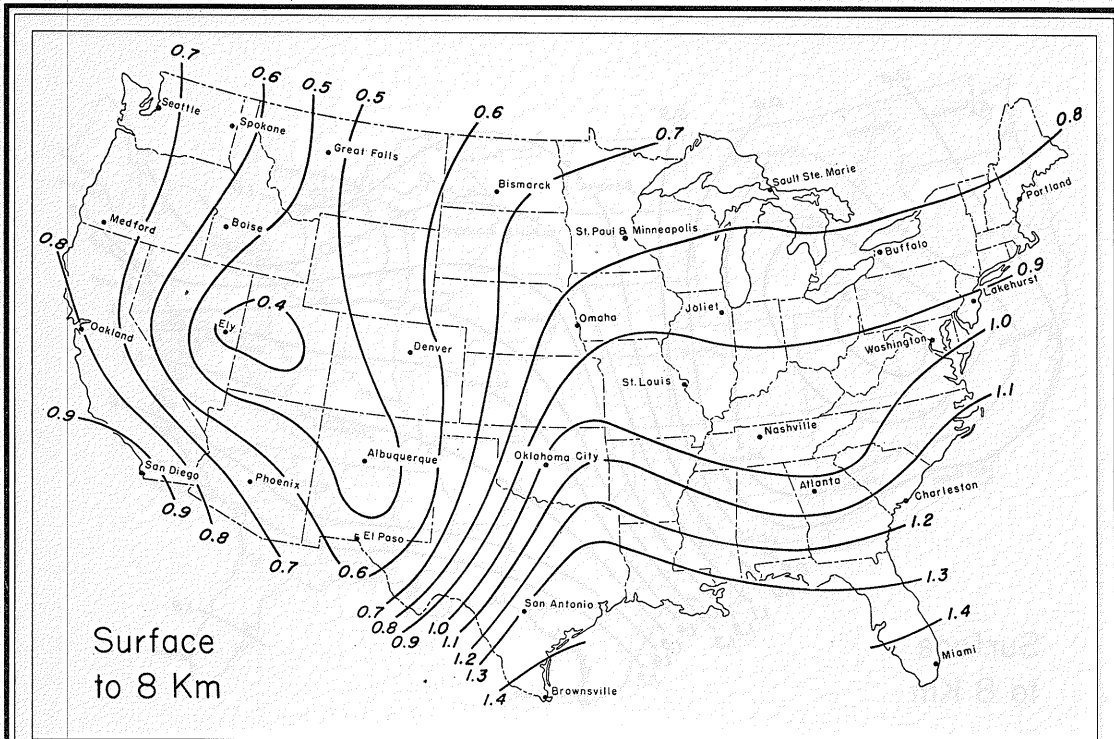
MEAN PRECIPITABLE WATER (Inches)

April



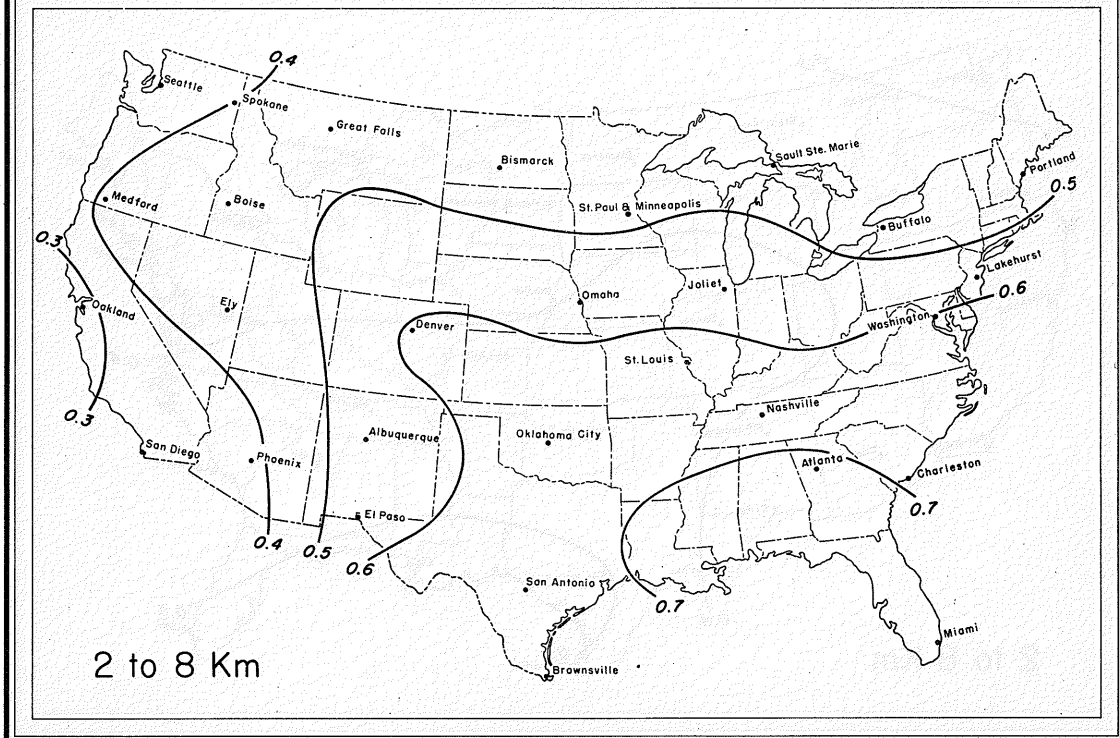
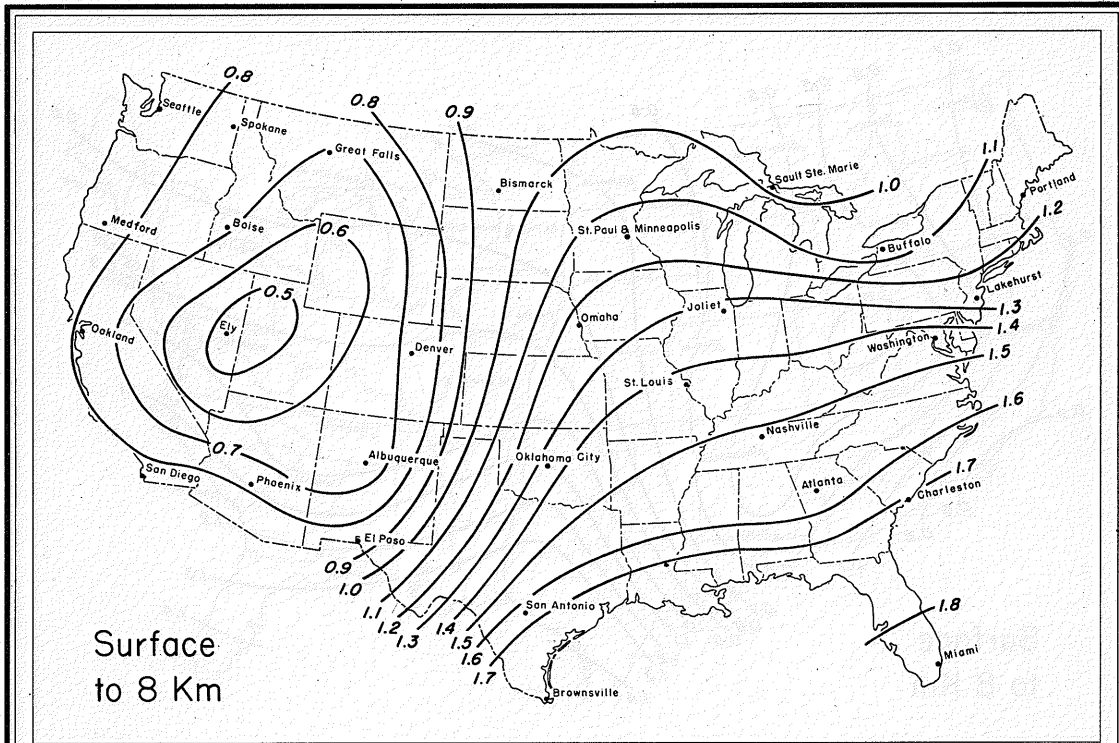
MEAN PRECIPITABLE WATER (Inches)

May



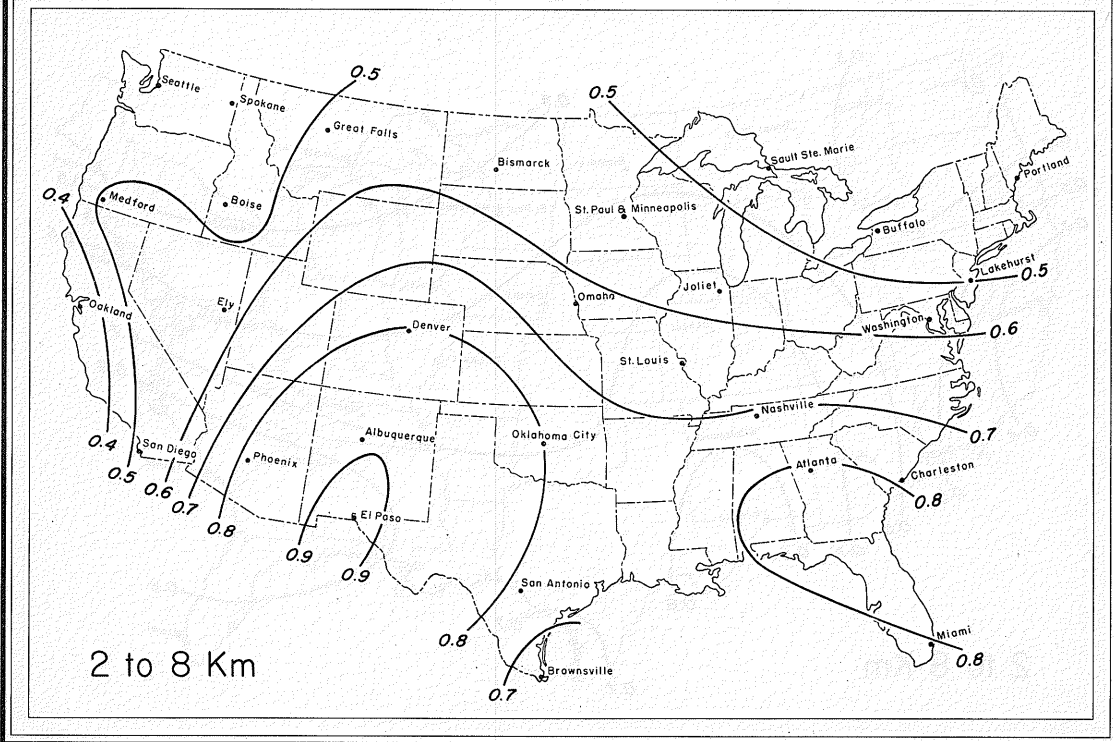
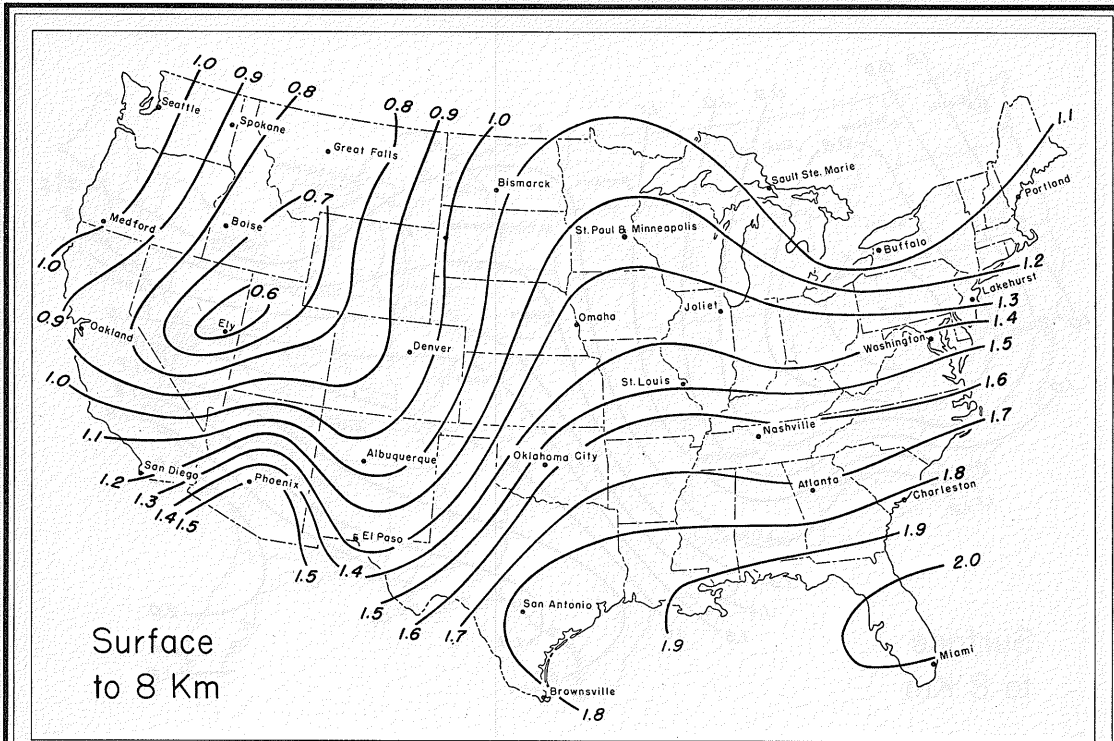
MEAN PRECIPITABLE WATER (Inches)

June

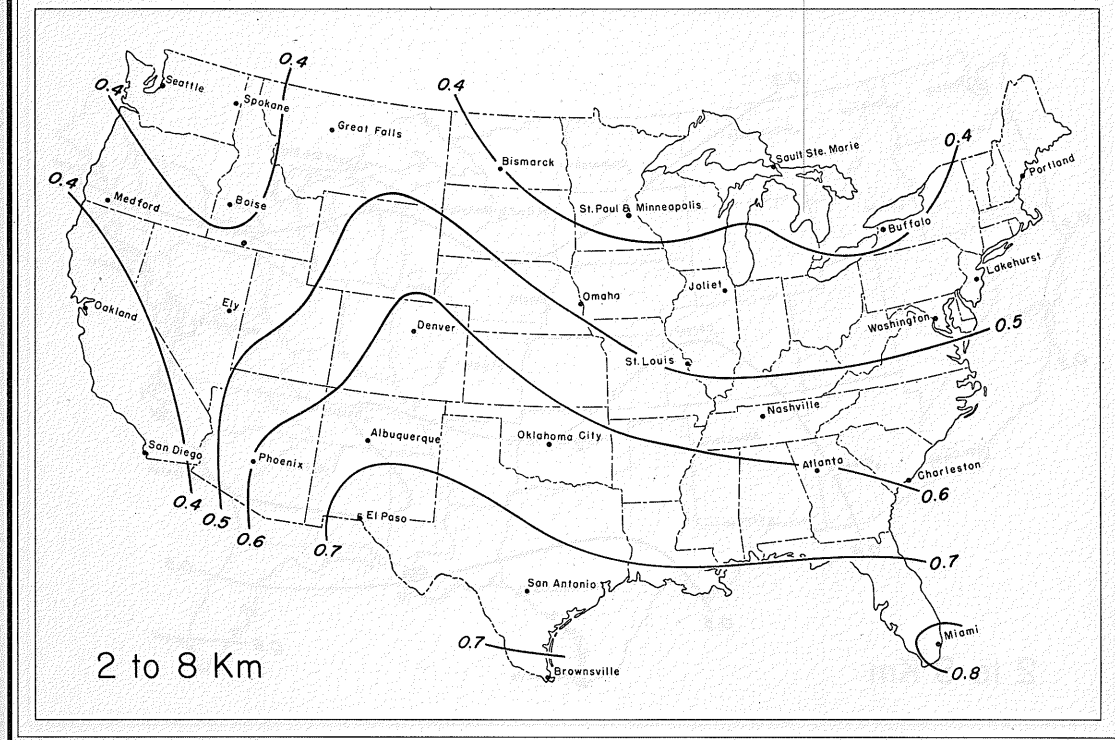
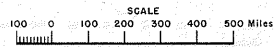
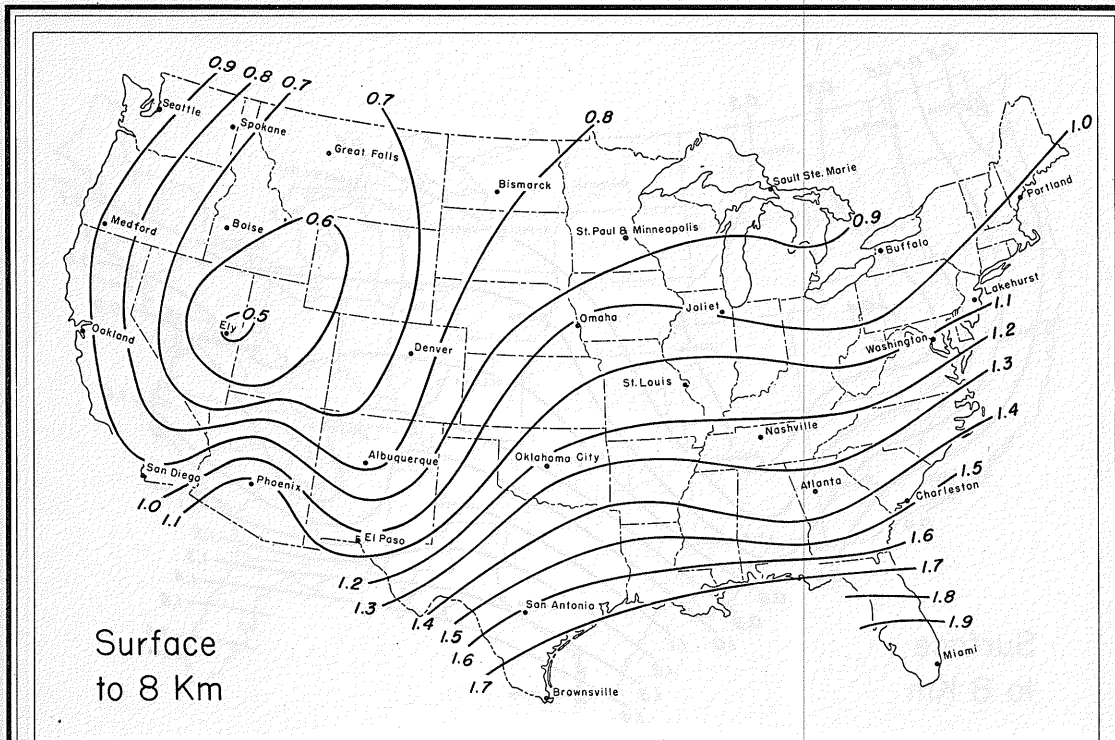


MEAN PRECIPITABLE WATER (Inches)

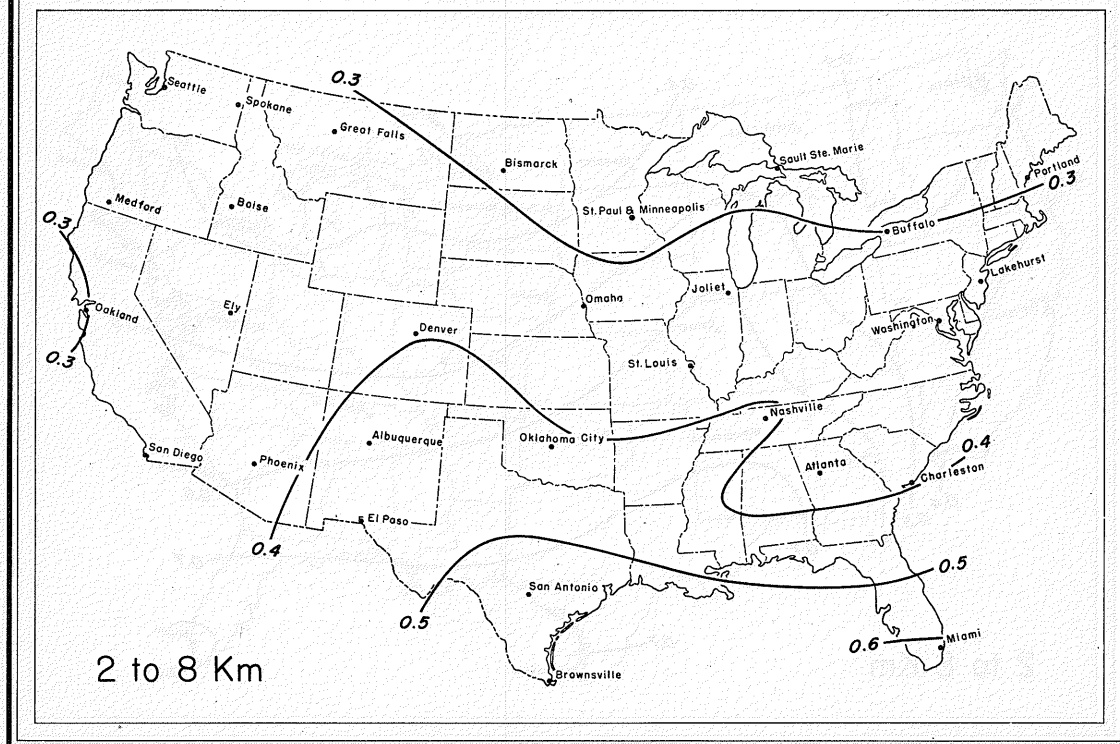
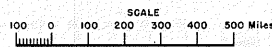
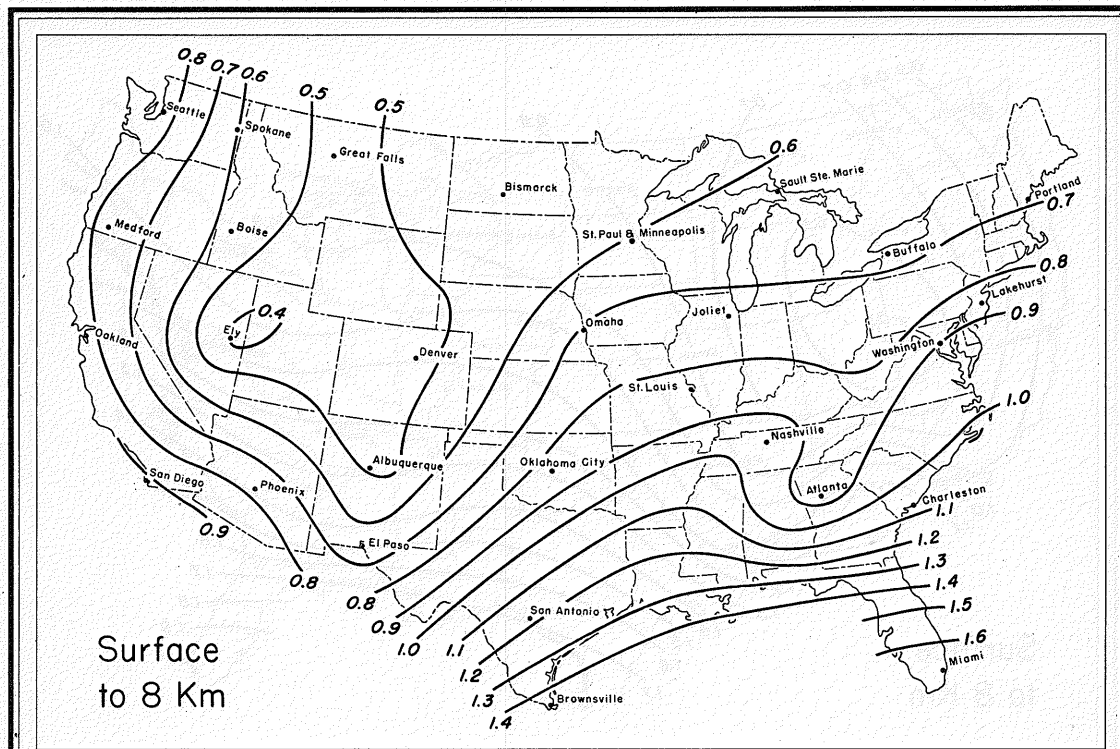
August



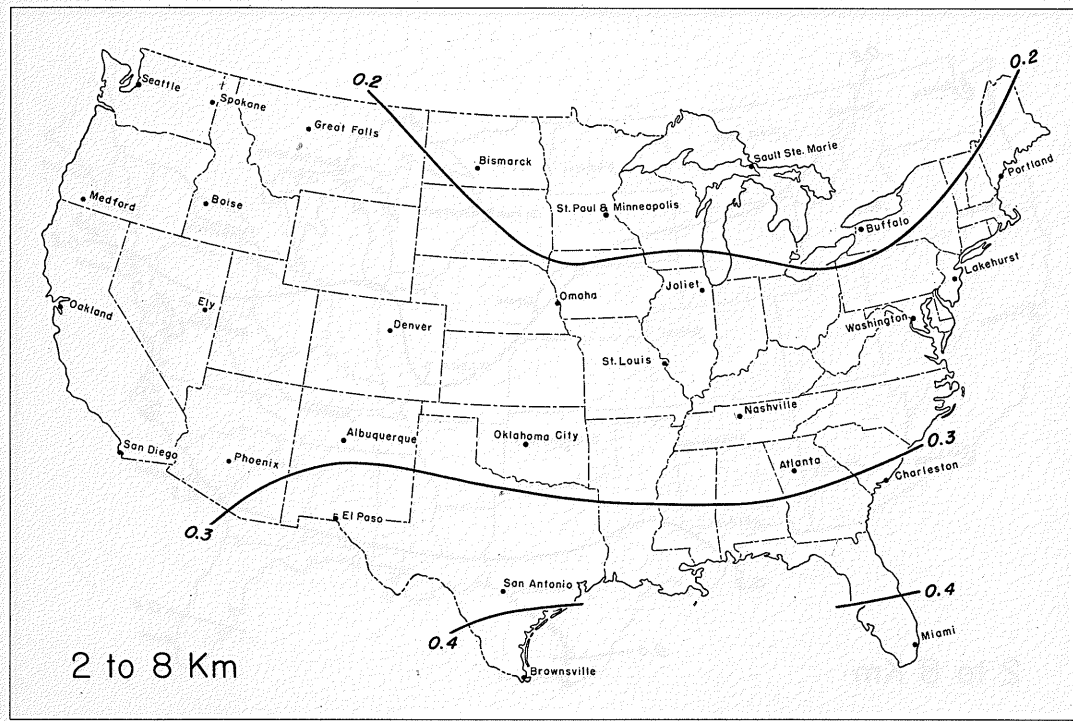
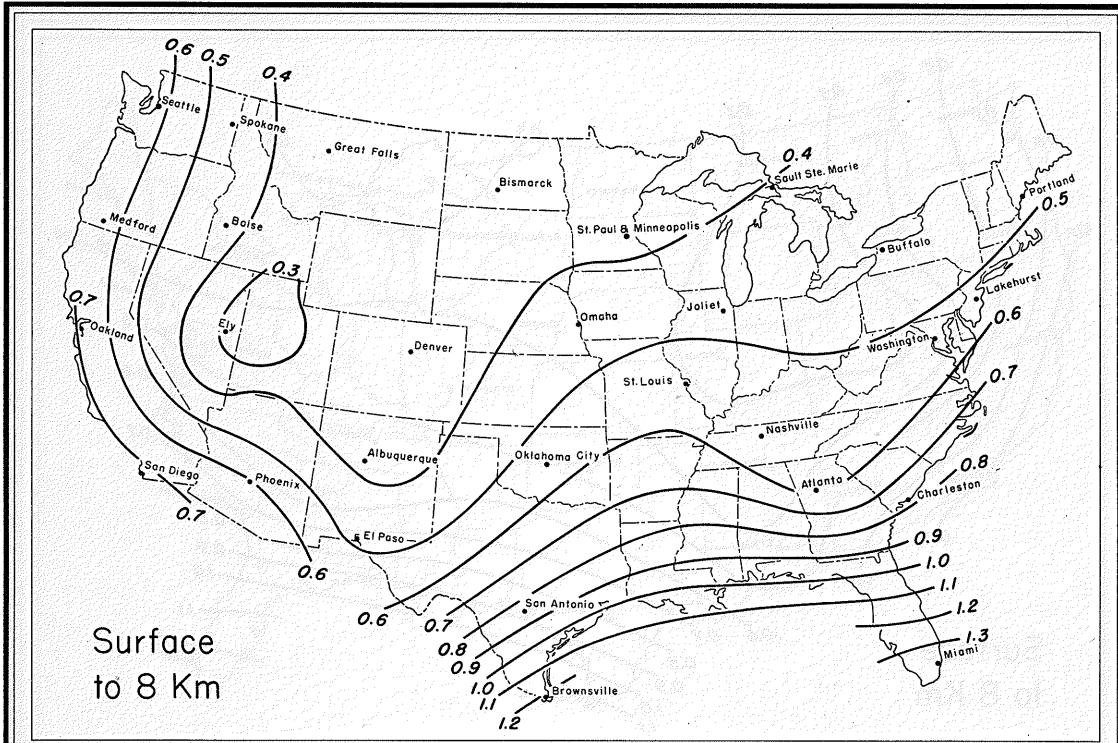
MEAN PRECIPITABLE WATER (Inches) September



MEAN PRECIPITABLE WATER (Inches) October



MEAN PRECIPITABLE WATER (Inches) November



MEAN PRECIPITABLE WATER (Inches) December

