This description of "fair weather" is prefaced in the *Glossary* as a "purely subjective description." Thus broken sky conditions of middle and/or high clouds may accurately be described as "fair weather". I suspect that the general public would interpret such conditions as a non-verification of a "fair weather" forecast, at least in some areas of the country. Mr. Murray's questionnaire similarly showed a misunderstanding of other terms commonly used in forecasts.

I suggest that the solution to finding a means of presenting interesting, yet accurate forecasts through the broadcast media will not be a one-sided affair. The "manufacturer" and the "salespeople" must get together with a little bit of give on both sides. The NWS will not be able to insist that their forecasts be read over the air exactly as written. Federal Communication Commission regulations do not restrict people in the media from presenting any forecast they chose. On the other hand, media people should not permit their on-the-air personnel, who are without some training and experience, to change the forecasts to whatever they think might sound interesting to their audience.

The media and the NWS administrators can get together only if there are some common terms in communication. This will require some of the NWS forecaster's time and facilities to discuss the forecasts with the weathercaster (preferably in person) while it will be the responsibility of the media to hire weathercasters that can communicate to some extent in the appropriate scientific language with the forecasters. The television weathercaster has the greatest opportunity of all the "salespeople" to make the forecasts interesting to the viewer. Using artistic and graphic techniques, the television weathercaster can present meaningful maps, charts, and graphs, relate current weather satellite photographs to known geographical features and then to meteorological significance, and finally, present the forecast in clear everyday terms. The media has the communications facilities to reach the general public. The NWS has the talents and the facilities to produce the most accurate forecasts possible. The message can best be communicated by cooperation between "manufacturer" and the "sales staff". In a long run both will benefit.

Readers interested in media forecasts should also read the panel discussion held at the Annual NWA Meeting appearing on page 29.

TRADING POST

Since our last issue, the following Technical Procedures Bulletins have been issued.

No.	Title
170	Operational Probability of Frozen (POF) Forecasts Based on Model Output Statistics (MOS)
171	Operational Probability of Precipitation (POP) Forecasts Based on Model Output Statistics (MOS) -- No 13
172	List of Operationally Obsolete Technical Procedures Bulletins
173	Realignment of FOUS 60-76 and New FOUS 77 Bulletins
174	Post-processing of the LFM Forecast
175	Facsimile Schedules NAFAX and FOFAX
176	Facsimile Schedule NAMFAX
177	Qualitative Beach Erosion Forecast for the Oceanic Coastlines of the Northeast and Mid Atlantic States

Persons interested in obtaining copies of these Bulletins can write directly to Dr. Duane Cooley, Chef, Technical Procedures Branch, Meterological Services Division, NWS W111, Gramax Bldg, Rm 1302, Rockville, MD. 20852.

A FORMULA FOR FORECASTING MINIMUM TEMPERATURES AT URBAN LOCATIONS...

Here is a nifty empirical formula which will quickly give a highly accurate forecast of minimum temperatures at two widely different geographical locations, Chicago and Washington, D.C.. It may also be applicable at other urban locations.

$$MN = \frac{2MX + D}{3} + \sqrt{\frac{100-c^2}{10}} \left(\frac{W}{2} - 14 + Q\right) + A$$

MN = Forecast minimum temperature

MX = Highest temperature between 1 pm and 4 pm the previous afternoon

D = Dewpoint at time of maximum

C = Average opaque cloudiness in tenths the entire 24 hours prior to the time of minimum

W = Average wind speed during the nighttime hours before the minimum (any W greater than 28, set equal to 28.)

Q = The smallest of the following two terms:

$$\frac{MX-D}{6} \quad \text{or} \quad \frac{32-D}{6}$$

This term Q should only be used when there is no snow cover and the dewpoint is less than 32 degrees.

A = Temperature advection expected at the surface from the time of maximum to the time of minimum.

This formula is best used in the previous afternoon's forecast when both the maximum and dewpoint are known. The expected night-time cloudiness should be averaged with the known daytime cloudiness. Also the night-time wind speeds have to be forecast; the average of the 00, 06,12, GMT, forecast MOS surface wind speeds are usually quite good for this.

The advection term must also be forecast and it is perhaps the most difficult one. I have been using a relationship that seems to work, and that is that usually, the surface advection during the night equals 0.5 of any warm advection at 850 mbs or 0.7 of any cold advection at 850 mbs. Since the advection at 850 mb is usually expressed in degrees C, those two figures should be multiplied by 9/5 giving about 0.9 and 1.25, respectively. So, to determine the surface advection, take the forecast 850 mb temperature change from the time of maximum to the time of minimum and multiply by the 0.9 or the 1.25 depending on the sign of that advection. (Care must be used in that forecasts do not include the diurnal 850 mb temperature change that occurs during the summer months.)

Six months of data (January 1976-June 1976) at Midway airport, an urban site in Chicago, Ill., were used in deriving this formula.

The results are extremely encouraging. After 5 months (August 1976-December 1976) of testing the formula at a different urban site, National Airport in Washington, D.C., the average error was 2.8 degrees. This compares quite favorably with the 3.2 degree average error at the Washington Forecast Office and the 3.8 degree average error of the MOS equations during the same 5 months.

The formula does not work when there is a front expected within 100 miles of the station or when there is precipitation from the time of maximum to the time of minimum. Also, it does not work when local geography, like a sea breeze or a down-slope wind affects the temperature. Thus, at those times, it should not be used.

Otherwise the formula does quite well, and it takes only about five minutes to use it once one is familiar with it.

David A. Gustin
National Weather Service Forecast Office
Washington, D.C.

PROVIDING CLIMATOLOGICAL INFORMATION

The Weather Service Office in Tuscon, Arizona receives an average of 25-40 inquiries a week, from around the world, asking about their climate.

OIC, Richard A. Wood, notes that "we have found that the attached sheet can be produced more cheaply than the Local Climatological Data (LCD) Annual Summary which is always in short supply at Tuscon." He suggests that if other NWS stations receive numerous requests for local weather data, they might consider preparing similar climate data sheets. One side of the sheet can describe the local weather, topography, etc. and the other side can include thirty year normals as seen on the facing page.

Normals, Means, And Extremes

TUCSON, ARIZONA

Month	Temperatures °F: Normal: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	Normal Degree days Base 65 °F: Heating	Cooling
(a)				34		34			
J	63.5	38.2	50.9	87	1953	16	1949	442	0
F	67.0	39.9	53.5	92	1957	20	1955	333	11
M	71.5	43.6	57.6	92	1950	20	1965	243	13
A	80.7	50.3	65.5	102	1943	27	1945	81	96
M	89.6	57.5	73.6	107	1958	38	1950	0	272
J	97.9	66.2	82.1	111	1970	47	1955	0	513
J	98.3	74.2	86.3	111	1958	63	1973	0	660
A	95.3	72.3	83.8	109	1944	61	1956	0	583
S	93.1	67.1	80.1	107	1950	44	1965	0	453
O	83.8	56.4	70.1	101	1955	26	1971	29	187
N	72.2	44.8	58.5	90	1947	24	1958	221	26
D	64.8	39.1	52.0	84	1954	16	1974	403	0
YR	81.5	54.1	67.8	111	JUN 1970	16	DEC 1974	1752	2814

Month	Precipitation in inches: Water equivalent: Normal	Maximum monthly	Year	Minimum monthly	Year	Maximum in 24 hrs	Year	Snow, Ice pellets: Maximum monthly	Year	Maximum in 24 hrs.	Year
(a)		34		34		34		34		33	
J	0.77	2.37	1957	T	1970	1.40	1946	4.7	1949	3.5	1949
F	0.70	2.27	1941	0.00	1972	1.49	1962	3.9	1965	3.9	1965
M	0.64	2.26	1952	0.00	1956	1.19	1952	5.7	1964	5.7	1964
A	0.35	1.66	1951	0.00	1972	0.75	1952	1.0	1956	1.0	1956
M	0.14	0.89	1943	0.00	1974	0.89	1943	0.0		0.0	
J	0.20	1.46	1954	0.00	1969	1.27	1954	0.0		0.0	
J	2.38	5.20	1958	0.27	1947	3.93	1958	0.0		0.0	
A	2.34	7.93	1955	0.46	1953	2.48	1961	0.0		0.0	
S	1.37	5.11	1964	0.00	1953	3.03	1964	0.0		0.0	
O	0.66	4.51	1972	0.00	1973	1.86	1972	T	1959	T	1959
N	0.56	1.90	1952	0.00	1970	1.86	1968	6.4	1958	6.4	1958
D	0.94	5.02	1965	0.00	1973	1.34	1967	6.8	1971	6.8	1971
YR	11.05	7.93	AUG 1955	0.00	MAY 1974	3.93	JUL 1958	6.8	DEC 1971	6.8	DEC 1971

Month	Relative humidity pct.: Hour 05 (Local time)	Hour 11	Hour 17	Hour 23	Wind: Mean speed m.p.h.	Prevailing direction	Fastest mile: Speed m.p.h.	Direction	Year	Pct. of possible sunshine	Mean sky cover, tenths, sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets 1.0 inch or more	Thunderstorms	Heavy fog, visibility ¼ mile or less	Temperatures °F: Max. (b) 90° and above	Max. 32° and below	Min. 32° and below	Min. 0° and below	Average station pressure mb. Elev 2555 feet m.s.l.
(a)	34	34	34	34	29	15	27	27		27	33	34	34	34	34	34	34	34	34	34	34	34	2
J	62	39	32	56	7.8	SE	40	E	1962	81	4.6	14	7	10	4	*	*	*	0	0	7	0	927.1
F	58	34	26	49	8.1	SE	59	E	1952	83	4.4	13	6	9	3	*	*	*	*	0	5	0	927.4
M	52	28	22	42	8.5	SE	41	SE	1955	86	4.5	15	7	9	4	*	*	*	*	0	1	0	924.4
A	42	21	16	31	8.8	SE	46	SE	1952	91	3.3	17	7	6	2	*	1	0	4	0	*	0	923.8
M	33	16	12	23	8.6	SE	42	NE	1965	93	2.7	20	7	4	1	0	1	0	18	0	0	0	923.0
J	33	17	13	24	8.5	SSE	50	SE	1961	93	2.2	22	6	2	2	0	2	0	28	0	0	0	922.1
J	58	33	28	47	8.2	SE	71	SE	1971	77	5.3	10	12	9	10	0	14	0	29	0	0	0	924.4
A	66	39	34	55	7.6	SE	54	NE	1969	81	4.6	12	12	7	9	0	13	0	28	0	0	0	924.3
S	55	32	27	44	8.1	SE	54	SE	1960	87	2.8	20	6	4	4	0	5	0	23	0	0	0	924.0
O	52	30	25	43	8.2	SE	47	SE	1948	88	2.8	20	7	4	3	0	2	0	9	0	*	0	925.9
N	55	32	29	49	8.0	SE	55	E	1951	85	3.5	17	7	6	3	*	*	*	*	0	1	0	927.2
D	62	39	35	56	7.8	SE	44	W	1943	80	4.4	15	6	10	4	*	*	*	0	0	6	0	928.0
YR	52	30	25	43	8.2	SE	71	SE	JUL 1971	86	3.8	195	90	80	50	1	40	1	140	0	21	0	925.1

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows:
Highest temperature 111 in June 1970 lowest temperature 16 in December 1974.