Appendix 2a

MSU Test of P-Model

Table 2 is a copy of the output of P-model evaluation (JDAY 126 = Oct. 6-7). Period denotes the length of the prediction. The column headed by PRED is the actual prediction of the 1.5m air temperature. The OBSVD column is the observed value and the error is the difference between the observed and the predicted value with a positive value indicating a high prediction.

Table 3 contains a histogram indicating the nature of the distribution of the error about the mean error. The statistics of the analysis of the errors follows in that table.

Figure 1 presents the analysis graphically.

The following items were prepared by Mr. Robert Dillon, Programmer I, IFAS/Climatology from information he received by phone from one of Dr. Stewart Gage's technicians on October 1, 1981 (see Table 1). Mr. Dillon ran the key station data from MSU through the P-model to obtain these results.

TABLE 1

KEYSITE # 1 ( THL ) JULIAN DAY: 126 YEAR: 1981

| TIME | SOIL | 10CM SOIL | 50CM SOIL | 1.5M AIR | 3.0M AIR | 9.0M AIR | DEW POINT | WIND SPEED | WIND DIRCT | NET RADTN | REF VOLTG |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 18.0 | 0.0 | 0.0 | 0.0 | 50.5 | 51.0 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 19.0 | 0.0 | 0.0 | 0.0 | 48.7 | 47.9 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 20.0 | 0.0 | 0.0 | 0.0 | 44.8 | 43.0 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 21.0 | 0.0 | 0.0 | 0.0 | 41.5 | 40.7 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 22.0 | 0.0 | 0.0 | 0.0 | 39.7 | 38.6 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 23.0 | 0.0 | 0.0 | 0.0 | 36.1 | 34.9 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 0.0 | 0.0 | 0.0 | 0.0 | 33.3 | 33.1 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 1.0 | 0.0 | 0.0 | 0.0 | 33.9 | 32.7 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 2.0 | 0.0 | 0.0 | 0.0 | 33.1 | 31.6 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 3.0 | 0.0 | 0.0 | 0.0 | 31.8 | 30.8 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 4.0 | 0.0 | 0.0 | 0.0 | 30.4 | 29.7 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 5.0 | 0.0 | 0.0 | 0.0 | 29.4 | 29.8 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 6.0 | 0.0 | 0.0 | 0.0 | 29.4 | 31.0 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |
| 7.0 | 0.0 | 0.0 | 0.0 | 36.6 | 39.0 | 0.0 | 0.0 | 0.0 | 0.0 | -.078 | 0.000 |

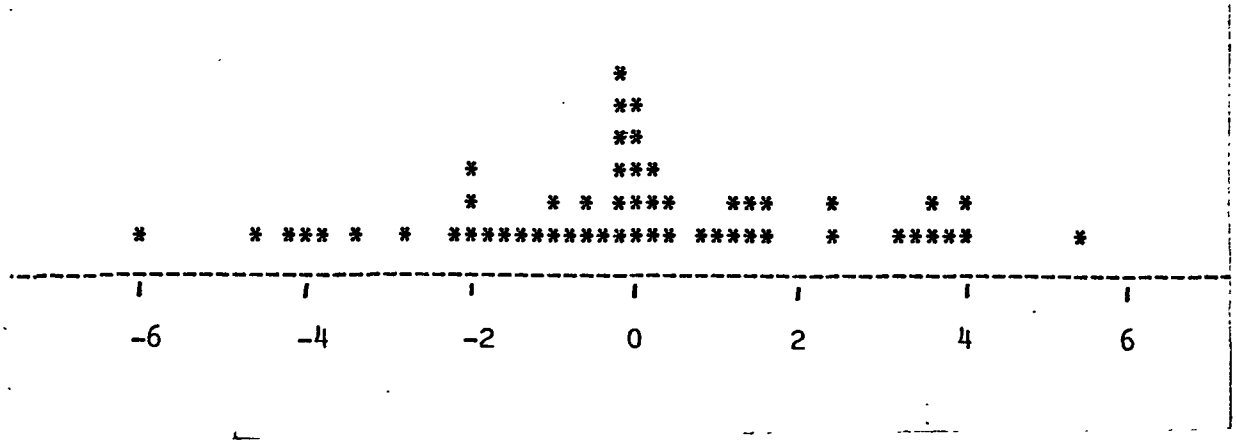
Table 1. Data received from MSU in appropriate format for input to P-Model. 0.0 indicates missing data.

Table 2. Copy of output from P-model run indicating the detail of each of the 55 error calculations.

PMODL ANALYSIS Table 2.

| YEAR | JDAY | STATION | HOUR | PERIOD | PRED | OBSVD | ERROR |
|---|---|---|---|---|---|---|---|
| 1981 | 126 | MICHIGAN | 2100 | 1 | 42.9 | 41.5 | 1.4 |
| 1981 | 126 | MICHIGAN | 2200 | 2 | 41.3 | 39.6 | 1.7 |
| 1981 | 126 | MICHIGAN | 2300 | 3 | 39.9 | 36.0 | 3.9 |
| 1981 | 126 | MICHIGAN | 0 | 4 | 38.6 | 33.2 | 5.4 |
| 1981 | 126 | MICHIGAN | 100 | 5 | 37.4 | 33.8 | 3.6 |
| 1981 | 126 | MICHIGAN | 200 | 6 | 36.3 | 33.0 | 3.3 |
| 1981 | 126 | MICHIGAN | 300 | 7 | 35.3 | 31.7 | 3.6 |
| 1981 | 126 | MICHIGAN | 400 | 8 | 34.3 | 30.3 | 4.0 |
| 1981 | 126 | MICHIGAN | 500 | 9 | 33.4 | 29.3 | 4.0 |
| 1981 | 126 | MICHIGAN | 600 | 10 | 32.5 | 29.3 | 3.1 |
| 1981 | 126 | MICHIGAN | 2200 | 1 | 39.1 | 39.6 | -.5 |
| 1981 | 126 | MICHIGAN | 2300 | 2 | 37.3 | 36.0 | 1.2 |
| 1981 | 126 | MICHIGAN | 0 | 3 | 35.6 | 33.2 | 2.4 |
| 1981 | 126 | MICHIGAN | 100 | 4 | 34.1 | 33.8 | .3 |
| 1981 | 126 | MICHIGAN | 200 | 5 | 32.8 | 33.0 | -.2 |
| 1981 | 126 | MICHIGAN | 300 | 6 | 31.5 | 31.7 | -.2 |
| 1981 | 126 | MICHIGAN | 400 | 7 | 30.3 | 30.3 | .0 |
| 1981 | 126 | MICHIGAN | 500 | 8 | 29.2 | 29.3 | -.1 |
| 1981 | 126 | MICHIGAN | 600 | 9 | 28.2 | 29.3 | -1.2 |
| 1981 | 126 | MICHIGAN | 2300 | 1 | 37.4 | 36.0 | 1.4 |
| 1981 | 126 | MICHIGAN | 0 | 2 | 35.7 | 33.2 | 2.5 |
| 1981 | 126 | MICHIGAN | 100 | 3 | 34.1 | 33.8 | .3 |
| 1981 | 126 | MICHIGAN | 200 | 4 | 32.7 | 33.0 | -.3 |
| 1981 | 126 | MICHIGAN | 300 | 5 | 31.5 | 31.7 | -.2 |
| 1981 | 126 | MICHIGAN | 400 | 6 | 30.3 | 30.3 | .0 |
| 1981 | 126 | MICHIGAN | 500 | 7 | 29.2 | 29.3 | -.1 |
| 1981 | 126 | MICHIGAN | 600 | 8 | 28.2 | 29.3 | -1.1 |
| 1981 | 126 | MICHIGAN | 0 | 1 | 34.0 | 33.2 | .8 |
| 1981 | 126 | MICHIGAN | 100 | 2 | 32.4 | 33.8 | -1.4 |
| 1981 | 126 | MICHIGAN | 200 | 3 | 31.0 | 33.0 | -2.0 |
| 1981 | 126 | MICHIGAN | 300 | 4 | 29.7 | 31.7 | -2.0 |
| 1981 | 126 | MICHIGAN | 400 | 5 | 28.4 | 30.3 | -1.9 |
| 1981 | 126 | MICHIGAN | 500 | 6 | 27.2 | 29.3 | -2.1 |
| 1981 | 126 | MICHIGAN | 600 | 7 | 26.0 | 29.3 | -3.3 |
| 1981 | 126 | MICHIGAN | 100 | 1 | 30.9 | 33.8 | -2.9 |
| 1981 | 126 | MICHIGAN | 200 | 2 | 29.2 | 33.0 | -3.8 |
| 1981 | 126 | MICHIGAN | 300 | 3 | 27.6 | 31.7 | -4.1 |
| 1981 | 126 | MICHIGAN | 400 | 4 | 26.1 | 30.3 | -4.2 |
| 1981 | 126 | MICHIGAN | 500 | 5 | 24.7 | 29.3 | -4.7 |
| 1981 | 126 | MICHIGAN | 600 | 6 | 23.3 | 29.3 | -6.1 |
| 1981 | 126 | MICHIGAN | 200 | 1 | 32.5 | 33.0 | -.5 |
| 1981 | 126 | MICHIGAN | 300 | 2 | 31.5 | 31.7 | -.2 |
| 1981 | 126 | MICHIGAN | 400 | 3 | 30.6 | 30.3 | .3 |
| 1981 | 126 | MICHIGAN | 500 | 4 | 29.8 | 29.3 | .4 |
| 1981 | 126 | MICHIGAN | 600 | 5 | 29.0 | 29.3 | -.3 |
| 1981 | 126 | MICHIGAN | 300 | 1 | 32.0 | 31.7 | .3 |
| 1981 | 126 | MICHIGAN | 400 | 2 | 31.5 | 30.3 | 1.1 |
| 1981 | 126 | MICHIGAN | 500 | 3 | 30.9 | 29.3 | 1.6 |
| 1981 | 126 | MICHIGAN | 600 | 4 | 30.4 | 29.3 | 1.0 |
| 1981 | 126 | MICHIGAN | 400 | 1 | 30.2 | 30.3 | -.1 |
| 1981 | 126 | MICHIGAN | 500 | 2 | 29.2 | 29.3 | -.1 |
| 1981 | 126 | MICHIGAN | 600 | 3 | 28.3 | 29.3 | -1.0 |
| 1981 | 126 | MICHIGAN | 500 | 1 | 28.6 | 29.3 | -.8 |
| 1981 | 126 | MICHIGAN | 600 | 2 | 27.4 | 29.3 | -1.9 |
| 1981 | 126 | MICHIGAN | 600 | 1 | 27.7 | 29.3 | -1.7 |

Table 3.




PMODL ERROR HISTOGRAM
(DEGREES FAHRENHEIT)

POPULATION = 55

MEAN ERROR = -.024

STND. DEV. = 2.374

Table 3. Statistics from P-model analyses, MSU test, May 6-7, 1981.

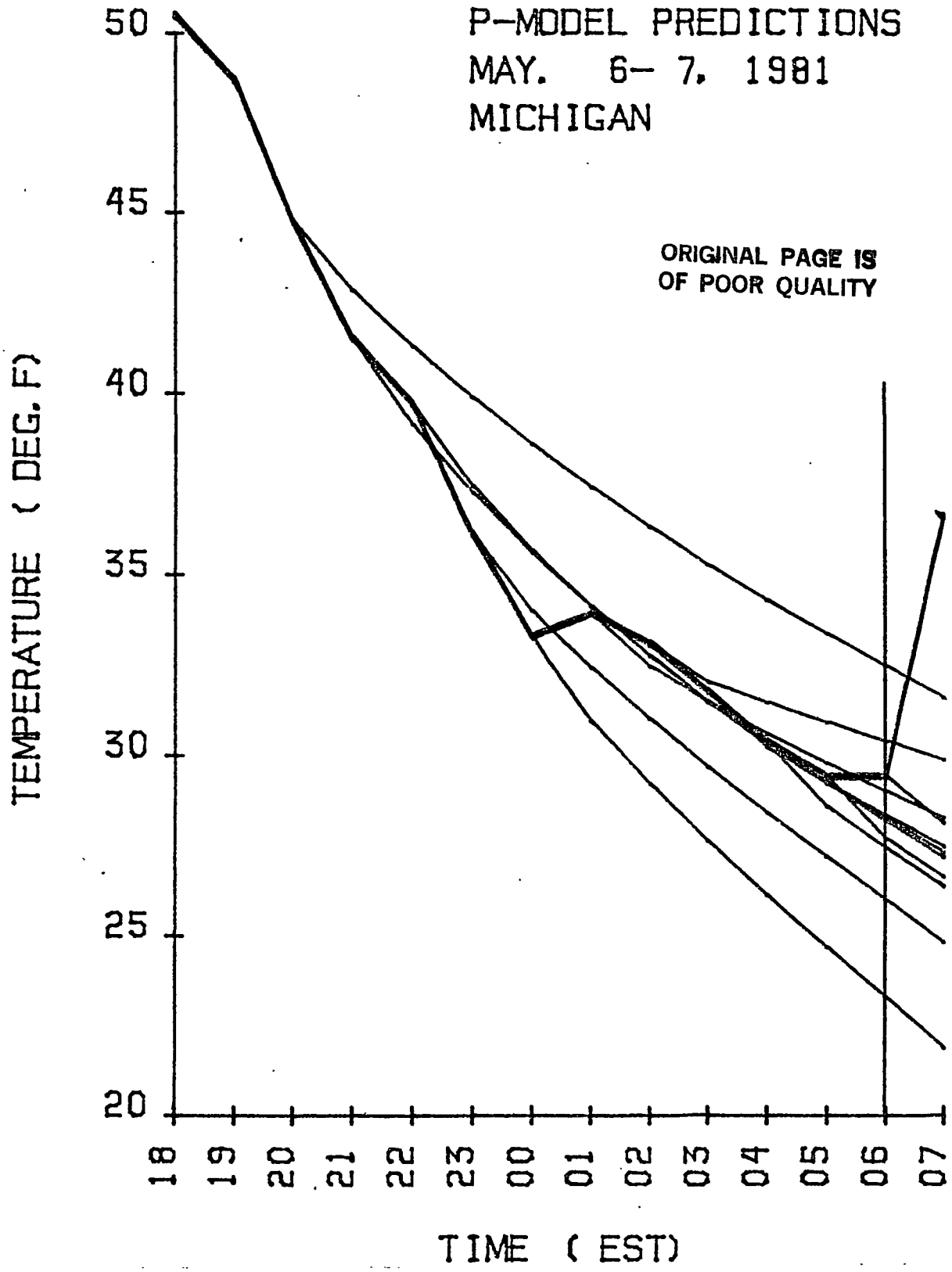



Figure 1. Results of P-model run on data submitted by the Michigan subcontractor. The thicker trace follows the 1.5 meter air temperature at the site while the thin lines trace out the P-model predictions for the remainder of the night beginning at the hour that they depart from the thicker (observed) trace. The vertical line at 6AM marks the point at which the analysis of the P-model performance was stopped because it is obvious the sun came up prior to the 0700 observations.