WESTERN REGION TECHNICAL ATTACHMENT
NO. 86-23
July 22, 1986

SEA-LEVEL PRESSURE IN THE MOUNTAIN STATES

The attached letter from Dr. Phillips of NMC describes the kind of improvements we can expect in sea-level pressure forecasts made by the NGM with new physics. The new physics package is being implemented on July 23, 1986. The changes include addition of longwave and shortwave radiation, including a diurnal cycle, surface fluxes of heat and moisture over land, and a revised convective precipitation procedure. Forecasters should carefully study Technical Procedures Bulletin No. 363 for details and impacts of the model revisions.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
National Meteorological Center
W/NMC2x2, WWB, Room 204
Washington, DC 20233

July 8, 1986 W/NMC2x2:NAP

MEMORANDUM FOR: Glenn E. Rasch
Chief, Scientific Services Division
National Weather Service Western Region

FROM: Norman A. Phillips
Principal Scientist, NWS NAP

SUBJECT: Sea-level Pressure in the Mountain States

You should soon be getting the TPB that will describe the implementation o/a July 23 of the new NGM. In it I mention that improved forecast of low-level temperatures will improve the "prediction" of sea-level pressure in areas of high terrain. I did not include an example in the TPB because there were a lot of figures already. So I am sending you the enclosed example.

It shows the effect on sea-level pressure reduction of the ability of the new radiation package to warm up air entering the Washington-Oregon area from the northwest. Last summer (and this summer, too) the bottom layer temperatures in the operational NGM have been too cold in this type of flow , leading to too high a value for the sea-level pressure. The new system does much better in the Northwest. The results on this case also look better in the Southwest and Mexico.

You may be interested in the examples of 12-hour temperature "errors" in the bottom model layers in the area of Southern California that are discussed in the TPB. They suggest that the model orography and the data and analysis in that area are too coarse to match the detail that we have in the surface properties.

Our inspection of the lower sigma layer temperature "errors" have led us to realize that much of the cold bias at 850mbs that was mentioned in McPherson's June 12 letter to the SSD's is in the plateau area, and is also present in the present NGM. (See Fig. 15 in the TPB.) The TPB mentions how we plan to deal with the overall tropospheric cold bias if it is also a winter-time phenomenon.

In your reaction, please pay a lot of attention to the two parts of Fig. 15 in the TPB.

Enclosures

cc: SSD, Southern Region
OM/O
NMC Copy 1: Hoke, Tuccillo, Petersen, McPherson
Copy 2: Brown, Saylor, Bonner

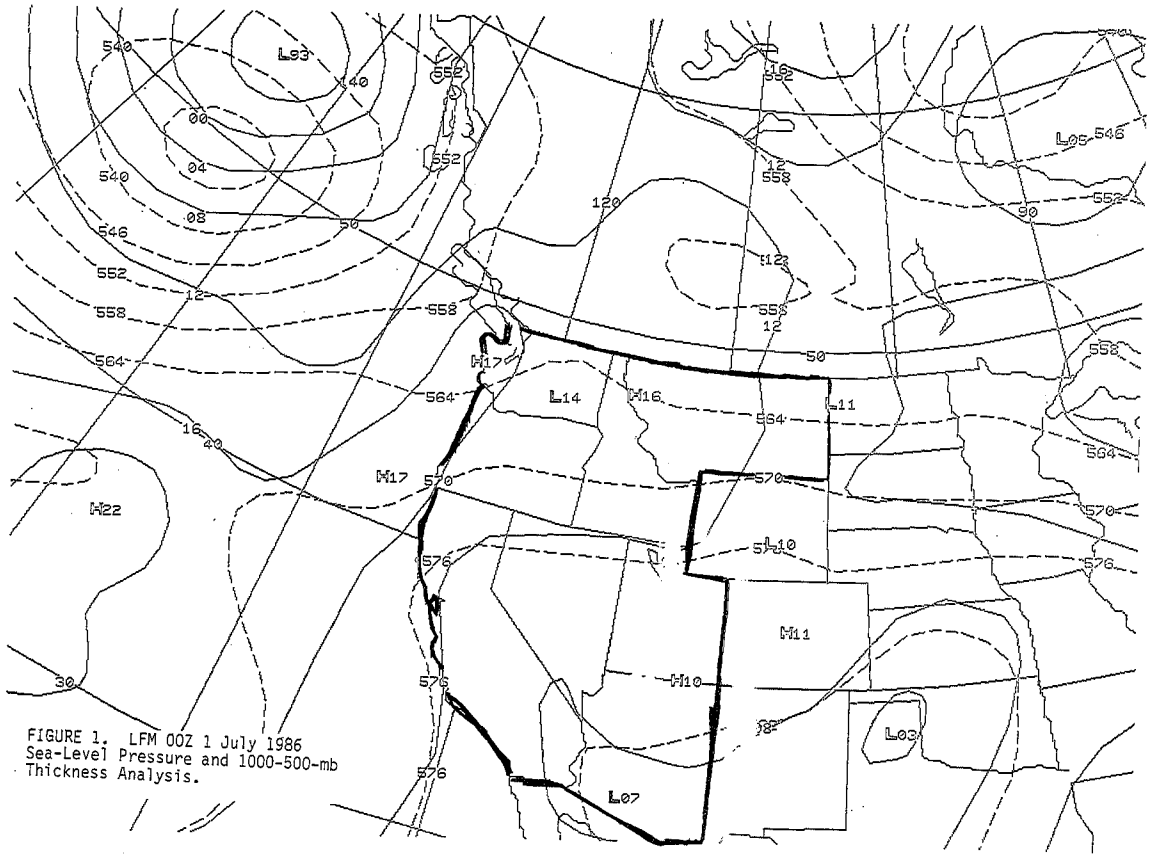

FIGURE 1. LFM 00Z 1 July 1986 Sea-Level Pressure and 1000-500-mb Thickness Analysis.

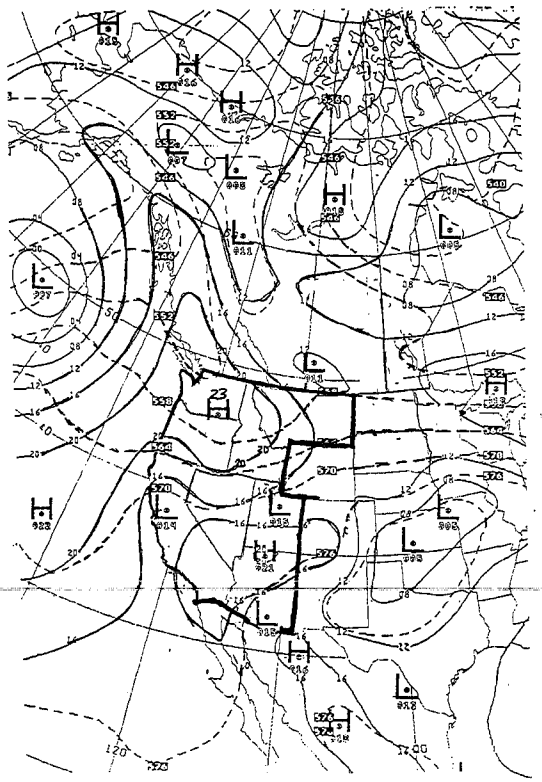

FIGURE 2. 48-hr OPNL NGM Forecast for 00Z 1 July 1986. Sea-Level Pressure and 1000-500-mb Thickness.

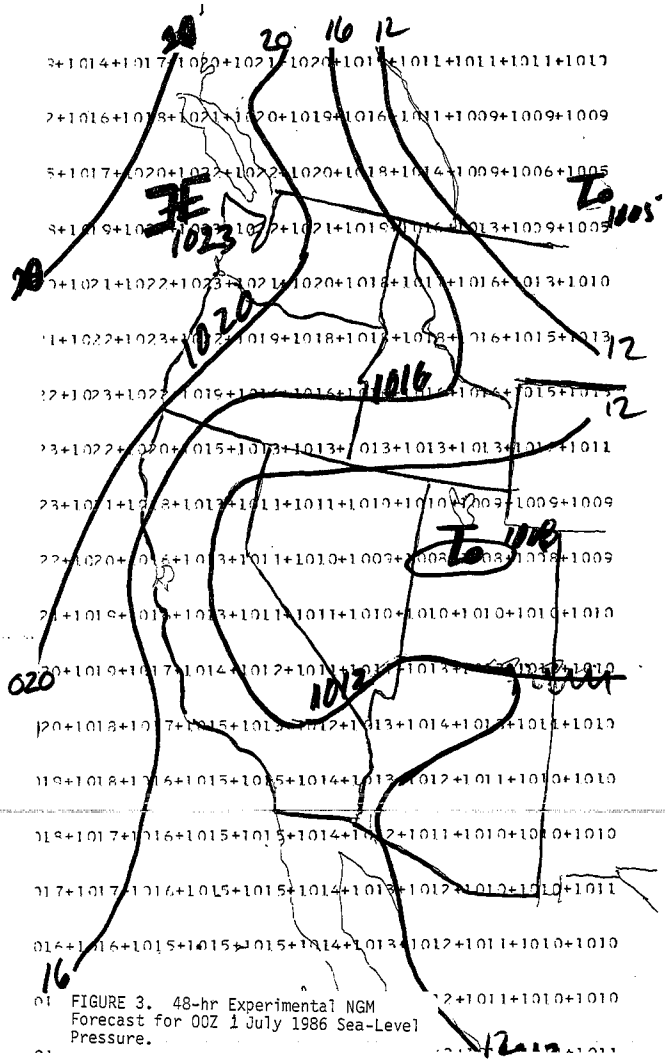

FIGURE 3. 48-hr Experimental NGM Forecast for 00Z 1 July 1986 Sea-Level Pressure.