

## ARCTIC OUTBREAKS AT BOISE

I looked at 29 events since 1962 where the temperature fell to below zero degrees F. at Boise. I found that of the 29 events 22 were Arctic Outbreaks, 4 were inversions, 2 reinforcing systems (not new outbreaks) and, 1 event was a spill over from a very cold airmass that had already overspread the area east of the Rockies. Cold air was already in place in the Southeast United States before it backed into Idaho.

The 22 Arctic Outbreak cases were the ones I was interested in. A breakdown of these cases showed a split; 16 events where the arctic air spilled into the Treasure Valley from the Upper Snake River Valley and 6 events where the cold air came from Washington. There were definite patterns displayed with each scenario. The cold air track from the Upper Snake River Valley was triggered by surface low pressure in the Upper Great Basin (Northern Nevada, Northern Utah and Southwest Wyoming) and surface high pressure moving south through Alberta, Canada (Figure 1). The second pattern (Figure 2), that pulled cold air into the Treasure Valley from Washington was not as clear cut. I found that surface low pressure over the Southwest United States (Central and Southern California, Southern Nevada, Southern Utah, Arizona and New Mexico) and surface high pressure moving south through British Columbia **and** Alberta caused arctic air to spill into the Columbia River Valley of Washington first, and then into the Treasure Valley. I believe this cold air was generally deep enough to overspread not only Idaho, but most of the area west of the Rockies.

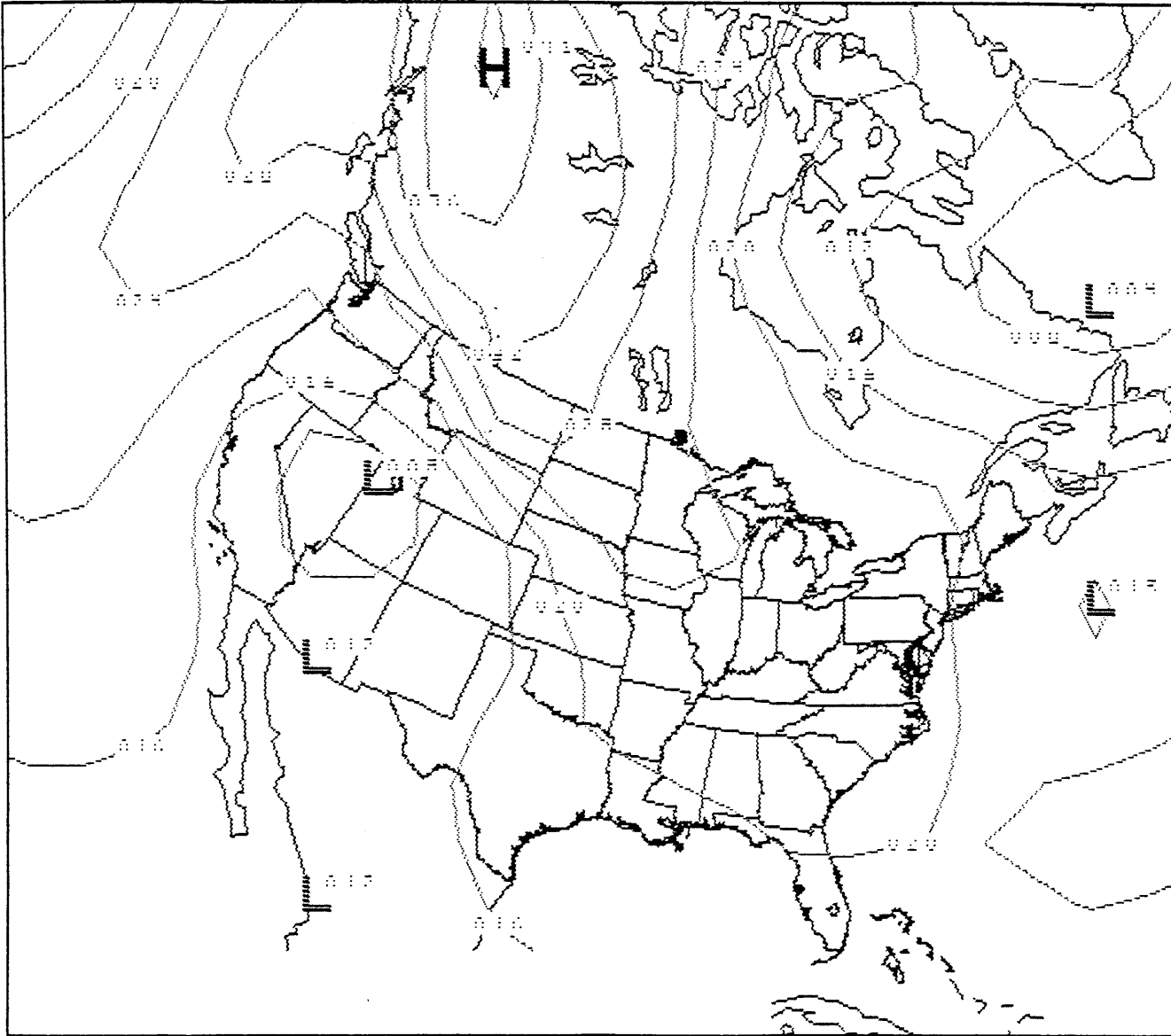
### SOME OBSERVATIONS:

Surface pressure gradient **did not** appear to be a factor. Sea Level Pressure differences between the surface highs and lows ranged from 16 to 50 mb.

Snow on the ground **did** appear to be a factor. In 14 of the 16 cases where the cold air spilled into the Treasure Valley from the east Boise had 1" or greater snow on the ground. In 5 of the 6 events where Boise received cold air from the northwest we had 1" or greater snow on the ground. Remember, I only looked at cases where Boise fell below zero degrees F.; other events may have occurred where the temperature **did not** fall below zero degrees F. because the lack of snow on the ground allowed the airmass to modify first.

Of the 22 Arctic Outbreak cases examined **only 2** cases displayed one of the typical patterns 12 hours in advance. The balance displayed the typical pattern for **at least** 24 hours in advance. I noticed that in most cases it **did not** matter what happened to the surface pattern once the trigger had been established for about 12 hours, cold air spilled into the Treasure Valley.

One Arctic Outbreak occurred in late November and one in early February. The other 20 cases occurred in December and January.



NmcDraw

FIG 1

NimDraw

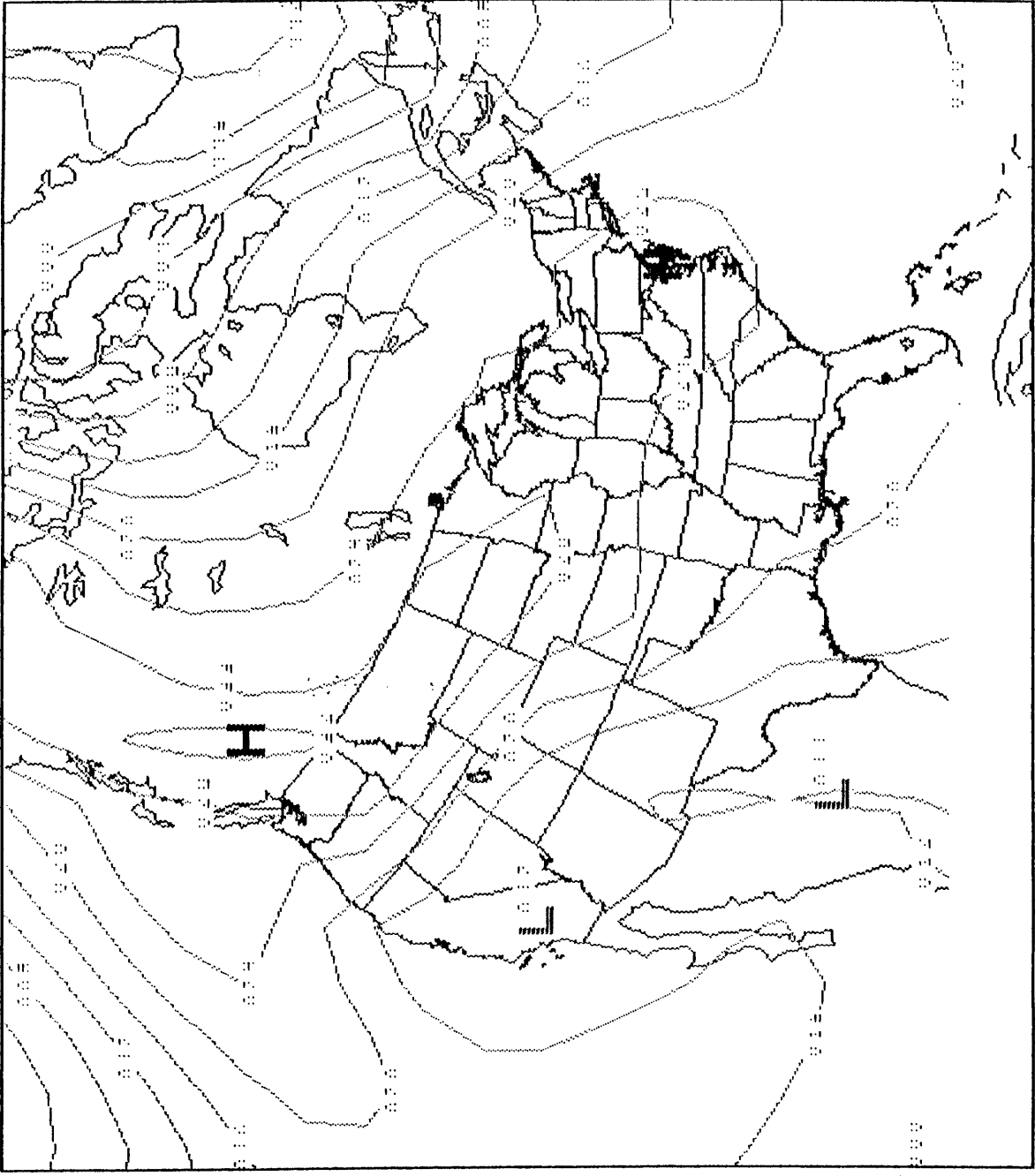


FIG 2