



PACIFIC REGION TECHNICAL NOTES

No. 78-025

MAP TYPING AT THE PACIFIC WEATHER CENTRE

Fred Eddy, Meteorologist

Pacific Weather Centre, Vancouver

A) DATA BASE

- 1) 10 YEAR PERIOD, 1963 TO 1972 INCLUSIVE.
- 2) A 7X9 ARRAY OF CMC GRID POINT DATA FOR THE 1000 AND 500MB LEVELS (SEE FIGURE 1).
- 3) CARD 4 CLIMATE DATA. 13 DATA ITEMS WERE SELECTED FROM THE CLIMATOLOGICAL CARD 4 SUMMARIES FOR 17 STATIONS IN B.C. THE 17 STATIONS ARE:-VR,VJ,XX,CD,AZ,ZT,PR,ZP,XT,KA,YF,CG,XC,WL,QZ,XS & YD. THE 13 DATA ITEMS ARE:- YEAR,MONTH,DAY,MAX TEMP,MIN TEMP,06Z PCPN, 12Z PCPN,18Z PCPN,00Z PCPN,TOTAL 24HR PCPN,THUNDERSTORM DAY,WIND > 30KTS AND WIND > 35KTS.
- 4) SUNSHINE DATA FROM THE MONTHLY SUMMARIES FOR 15 BC STATIONS. THESE STATIONS ARE:-VR,GONZALES,CD,EP,PR,ZP,SUMMERLAND,CLIVER,VK,KA, TRAIL,CG,WL,XS & YD.

B) FACTORS CONSIDERED

- 1) THE 7X9 ARRAY:- THIS AREA WAS SELECTED DUE TO HISTORICAL CONSIDERATIONS (THE ORIGINAL GRID POINT SET AT PAWC), TIME FACTORS AND SYNOPTIC CONSIDERATIONS (COVERS BC AND THE AREA GENERALLY 12HR UP STREAM). A LARGER AREA WOULD INCREASE THE COMPUTER TIME ENORMOUSLY -THE PRESENT AREA USING 30 MONTHS OF DATA (3MONTH PERIOD FOR 10 YEARS) TAKES ROUGHLY 24HOURS ON THE HP 2100 COMPUTER TO PRODUCE 25 MAP TYPES (APROX 27,215,000 CORRELATIONS--EACH EXTRA GRID POINT ADDS 431,985 CORRELATIONS). THE SIZE OF THE AREA (WINDOW) DETERMINES THE THRESHOLD OF THE SCALE OF THE FEATURES ONE WISHES TO CORRELATE. THE 7X9 ARRAY APPEARS TO FALL INTO THE SYNOPTIC SCALE.
- 2) THE THRESHOLD CORRELATION VALUE:- IDEALISTICALLY IT WOULD BE 1.0 (A PERFECT FIT) BUT MOTHER NATURE BEING WHAT SHE IS, ONE HAS TO DECIDE ON A VALUE THAT WOULD STILL GIVE A GOOD FIT BUT ALSO GIVE ENOUGH MAPS TO OBTAIN A REALISTIC SAMPLE OF MAP TYPES. AFTER MUCH TESTING IT WAS DECIDED THAT THE VALUE 0.9 FOR 500MB AND 0.8 FOR 1000MB WOULD BE SUITABLE (THE 500MB FIELD IS USUALLY A SMOOTHER THAN 1000MB). AT THE PRESENT TIME 25 MAP TYPES ARE RECOGNIZED AT EACH OF THE TWO LEVELS.
- 3) THE TIME PERIOD:- WITH TEN YEARS OF DATA AVAILABLE, ONE COULD CONSIDER YEARLY,SEASONAL OR MONTHLY MAP TYPES. AFTER MUCH MUCH DISCUSSION AND TESTING, IT WAS DECIDED TO DO MONTHLY MAP TYPES. EACH MONTH USED NOT ONLY THE DATA FOR THAT PARTICULAR MONTH BUT ALSO DATA FROM ADJACENT MONTHS (EG JUNE MAP TYPE USED MAY,JUNE AND JULY DATA) SO THERE WOULD BE AN OVERLAP BETWEEN THE MONTHLY MAP TYPES. IT ALSO INSURED A REASONABLE DATA BASE FOR THE MONTHLY MAP TYPES.

- C) CLIMATOLOGY:- ONCE THE MAP TYPE CATOLOGUE WAS OBTAINED THEN SOME SIMPLE STATISTICS (MEANS & EXTREMES) WERE CALCULATED FOR EACH OF THE 25 MAP TYPES FOR THE TWO LEVELS USING CARD 4 DATA FROM THE 17 STATIONS. TWO STATIONS HAD INCOMPLETE DATA FOR THE TEN YEARS (CG, 1966-1972 & XC, 1968-1972). THIS CARD 4 DATA WAS CONVERTED TO METRIC UNITS. SUNSHINE DATA WAS CONVERTED FROM HOURS OF SUNSHINE TO A PERCENTAGE OF MAXIMUM POSSIBLE SUNSHINE FOR THE FOLLOWING STATIONS:- VR,GCNZALES(USED WITH VJ DATA),CD,EP(USED WITH AZ DATA),PR,ZP,KA,CG, SUMMERLAND(USED WITH YF DATA),WL,XS & YD.
- D) THE PRESENT STATE:- A MAP TYPE CATOLOGUE HAS BEEN OBTAINED FOR THE MONTHS OCTOBER THROUGH JULY. AUGUST AND SEPTEMBER MAP TYPES WILL BE DONE AS WE MOVE INTO THESE MONTHS. A COMPUTER PROGRAM HAS BEEN WRITTEN WHICH WILL TAKE THE CURRENT CMC GRID POINT DATA AND OBTAIN CORRELATIONS VALUES FOR THE 25 MAP TYPES AT BOTH LEVELS. THE PROGRAM WILL THEN PRINT OUT THE STATISTICS FOR A REQUESTED MAP TYPE (USUALLY THE HIGHEST CORRELATING ONE). THE PROGRAM ALSO PRINTS OUT THE DATES ON WHICH THE 1000MB AND 500MB MAPS IN THE CATOLOGUE OF THE HIGHEST CORRELATION MAP TYPE HAD OCCURED ON THE SAME DAY.
- E) FUTURE PLANS:- TO EXPERIMENT WITH RETROGRESSION TECHNIQUES USING 1000-500MB THICKNESS AND HEIGHT GRADIENTS IN ORDER TO SEE WHETHER ONE CAN REDUCE THE VARIANCE OF THE DISPLAYED STATISTICS.

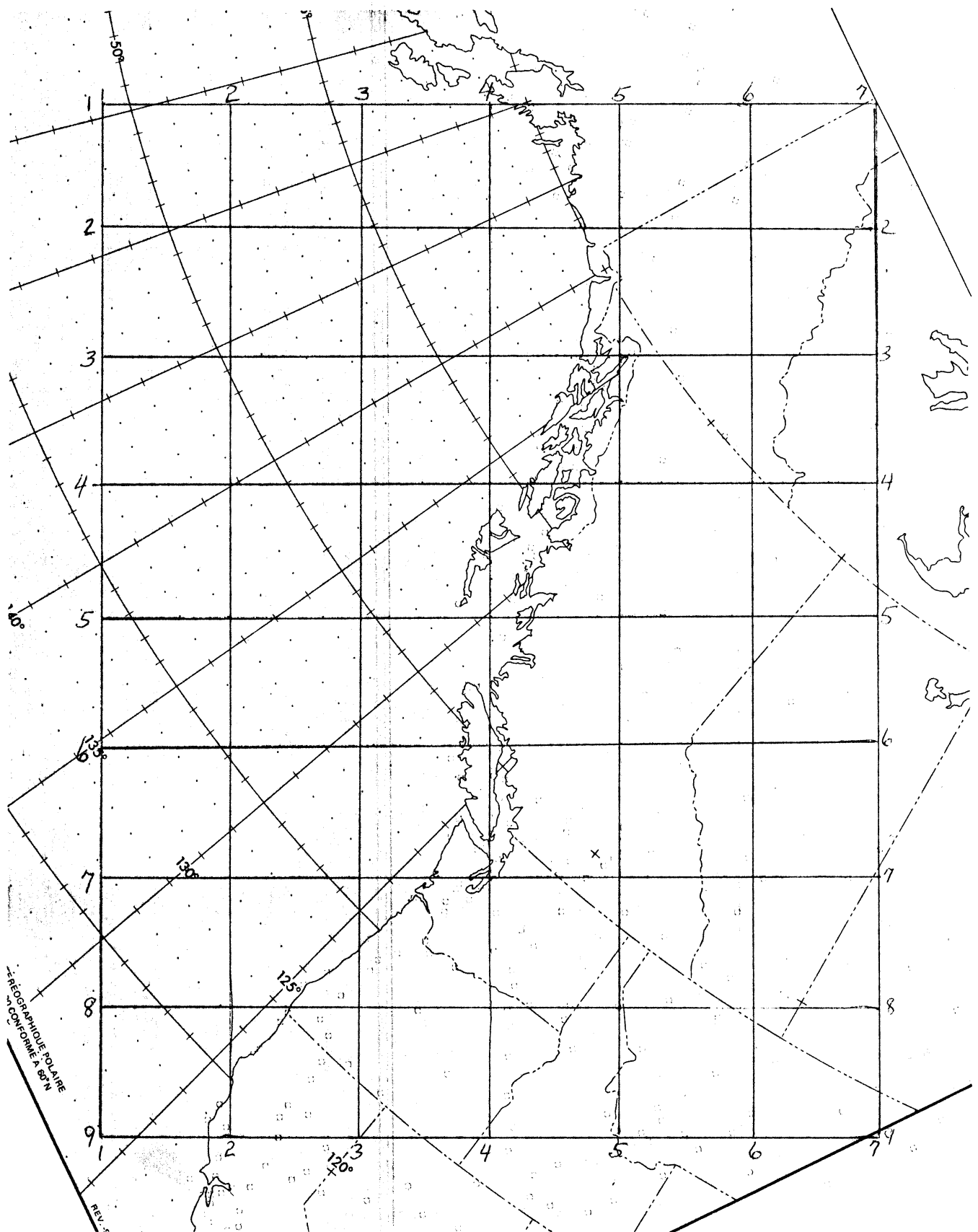


Figure 1

The 7 X 9 For CMC Grid Point Data