PACIFIC REGION TECHNICAL NOTES

NO. 78-036

OCT. 3, 1978

THE DRY LIGHTNING OUTBREAK OF AUGUST 4TH, 1978

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On August 4th, at approximately 1030 PDT dry lightning struck the Clearwater Ranger District and in the chain of events that followed lightning occuring on the 4th resulted in over 200 forest fires being reported by the 8th.

The following is a sequence of meteorological and presentation events commencing the afternoon of Thursday, August 3rd.

The upper ridge remained dominant in the Kamloops Forest District on the morning of the third but a southwesterly flow was developing in western portions of the district. A broad upper low just off the north coast, although weakening slightly, was drifting eastward. Forest conditions in the district were extremely dry and hazardous.

A Satellite photo for 1645Z of the 3rd indicated an area of moisture and instability rotating around the low and moving into thesouthwesterly flow that was developing in the Forest District.

The Fire Weather Forecast for Prince George Quesnel Lakes appeared most applicable to the situation and with minor adjustments for wind, that forecast was issued to all Rangers and the Duty Officer by 1600 PDT. The forecast gave a risk of dry lightning for the evening of Friday, Aubust 4th.

By the morning of August 4th, the upper ridge had shifted eastward allowing the upper low off the north coast to drift inland. Several lightning fires were reported in the Prince Rupert Forest District that morning. To the south, the area of instability and moisture had drifted into Washington and with a southwesterly flow, threatened B.C. with dry lightning.

After discussion with Fire Weather Forecaster, H.Raynor and duty briefer Bob Duffy at the Kamloops Weather Office, the following forecast was issued to the Duty Officer and all Ranger Districts. Dry lightning was expected to cross the

U.S.A border into the Kamloops Forest District by late morning.

At approximately 0945PDT an update based on satellite data was received from the Rire Weather Forecast Office warning of dry lightning by afternoon with the "hardest hit" areas to be the Monashee and N. Thompson. Support for this update was indicated by a 1500Z or 0800PDT observation of CB cloud in the Stampede Pass area of northern Washington. Note that no significant convective cloud appeared on any weather sequence between 0900PDT (1600Z) and 1100PDT (1800Z). Towering cumulus reported at Blue River at 1800Z indicated thunderstorms to follow, probably by afternoon.

At approcimately 1100PDT dry lightning was reported at the Clearwater Ranger District and at 1845Z (1145PDT) thunder was reported at Blue River. These two reports were the first indication on the AES circuitsof thunderstorm activity anywhere in the Kamloops Forest District. Immediately following the lightning report from the Clearwater Ranger District, a warning was issued to all Rangers to expect dry lightning at any time and to expect mostof it in the N.Thompson and Monashee areas. By early afternoon, dry lightningwas a fact in all eastern and northern portions of the Kamloops Forest District.

In retrospect, the first onslaught of lightning in the N. Thompson seems to have been triggered by cooling aloft as the upper low crossed thenorth coast and by upslope conditions along the N. Thompson River with more westerly winds in that area. The main body of lightning that followed and caused more activity came into the province from the U.S. and was as forecast, both dry and concentrated in the Monashee and North Thompson River areas.

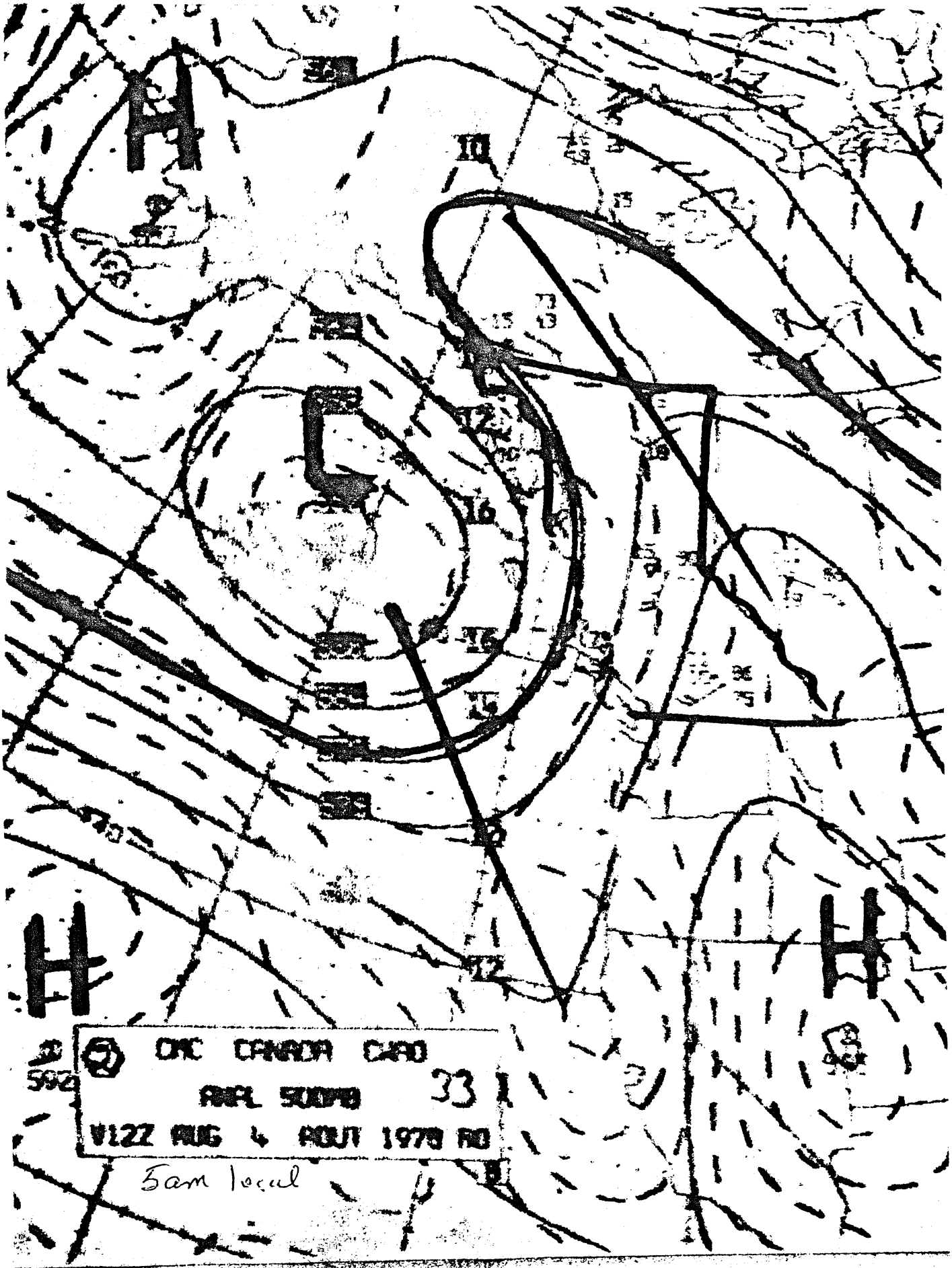
The reason for so many fires developing was of course, the extreme dryness of the forest and the lightning activity without rainfall. Except for the initial timing of the lightning activity and the area it struck, actual conditions followed forecast conditions quite closely. Timing was only out by perhaps an hour or two, the area of first lightning, however, was further in error.

The only problem then, was the location of the initial onslaught in the N. Thompson area. Nothing in the AES weather network indicated sufficient buildups to signify lightning activity prior to its occurrence. In retrospect, (although I did not see this photo til later) the satellite photo shows fairly active conditions up the N. Thompson River but in association with the reported conditions from the network, this activity would not signify lightning activity. (see photo Aug 4 - 1545Z)

In my opinion, the only mechanism or report that could definitely have located and determined the buildups of cumulus cloud on the 4th, was radar. Conditions observed in the district did not suggest requesting radar report from Mount Lolo prior to the lightning activity developing, only an operational weather radar, I feel would have spotted the N. Thompson storm early enough to give some warning of where the lightning would first hit.

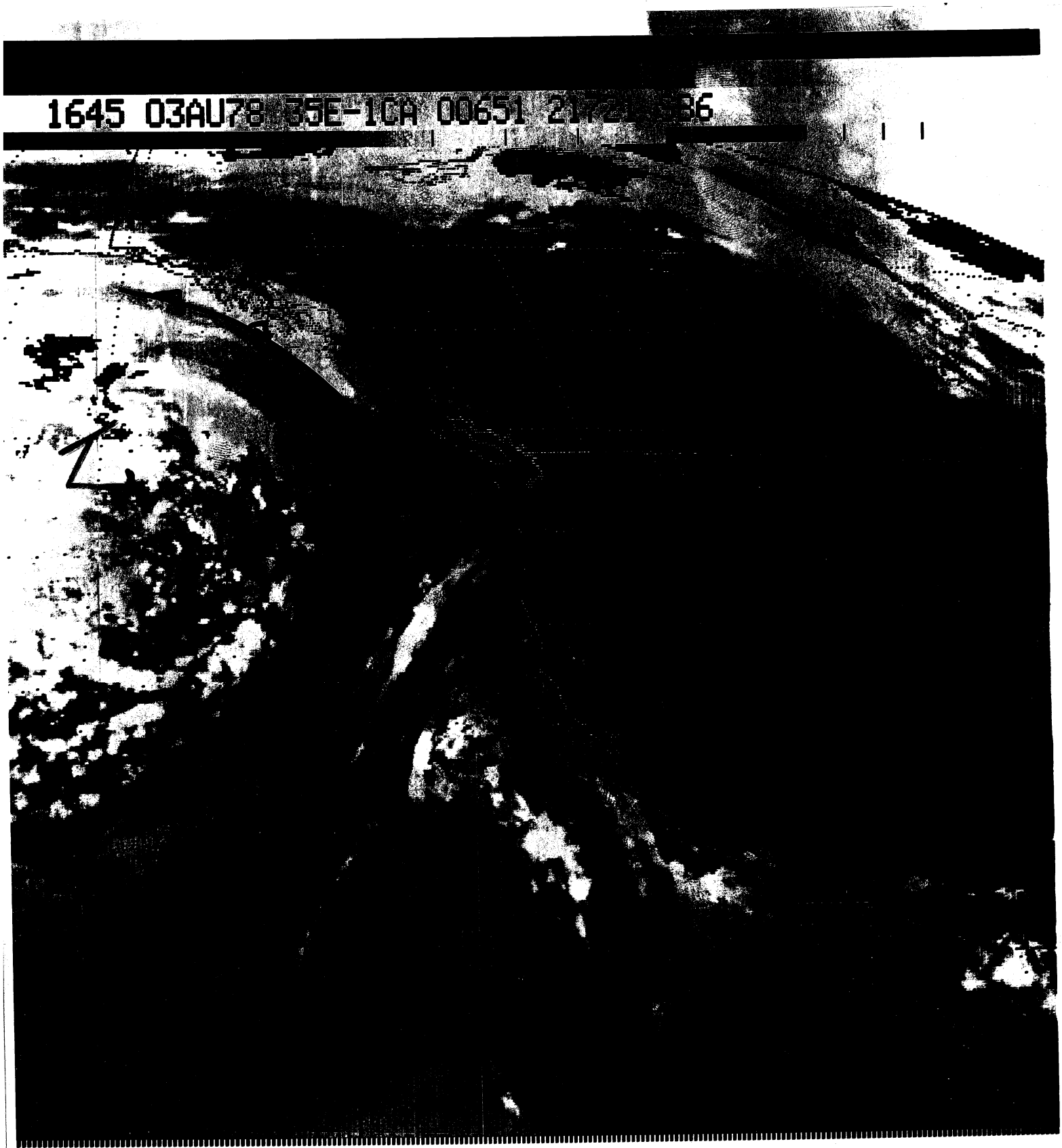
From a meteorological and presentation point of view, the lightning storm of Friday, August 4th, was well forecast in view of available data. A warning of dry lightning for Friday was available well in advance, the most significant portion of the lightning outbreak was extremely well forecast with respect to timing and area of most activity and very little adjusting of forecast conditions was required to properly warn the district.

To summarize, the only problem with the forecasts issued to the Kamloops Forest District on the morning of August 4th was where the initial strike would be and in this case an operational radar would have been the only way to determine the initial strike zone.


CNC CANADA CARD
33
AVRIL SOUPER
V122 AUG 4 AOUT 1978 AD
Sam local

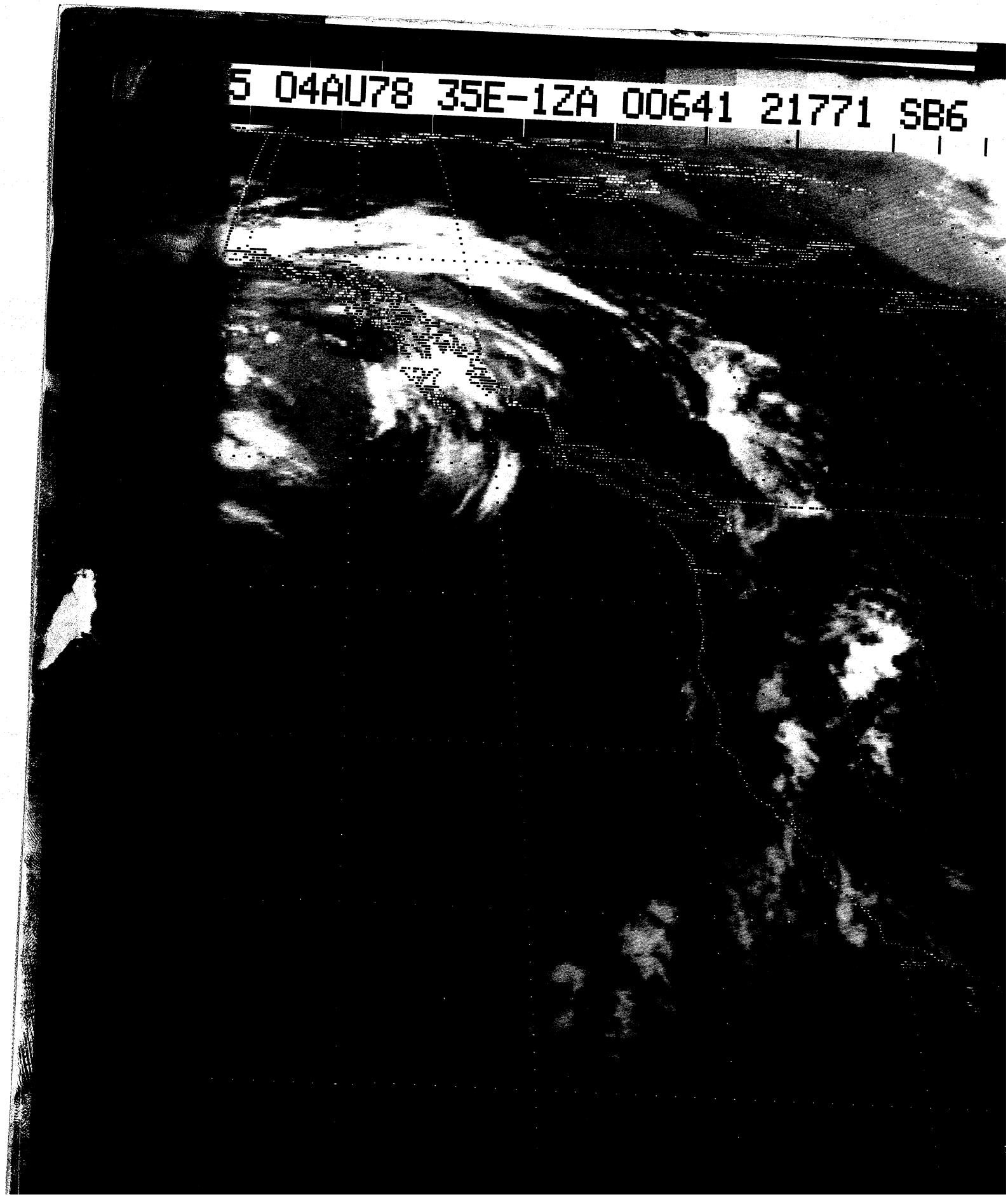
SATELLITE PHOTO

FOR 1645 Z AUG 3, 1978



SATELLITE PHOTO

FOR 1545 Z AUG 4, 1978



FORECASTS

FPCN33 CYUR 032045
FIRE WEATHER FORECAST FOR PRINCE GEORGE QUESNEL LAKES
FOR FRIDAY AUGUST 04 1978
WEATHER ZONES 14 15 16 18 19
UPPER RIDGE MOVING SLOWLY EASTWARD ACCROS DISTRICT FRIDAY GIVING SOUTHWEST FLOW OF WARM DRY AIR.SUNNY AND WARMER FRIDAY.POOR RECOVERY UPPER LEVELS TONIGHT.WINDS LIGHT EASTERLY Southerly
OUTLOOK...A WEAK UPPER LEVEL DISTURBANCE GIVES HIGH RISK OF except stronger in main N-S valleys and ridge tops.
DRY LIGHTNING FRIDAY NIGHT.

1PM FCST	TMP	RH	WIND	%CHNC RN
HUDTH CP	21	25	SE 5	5
ALEAZA	23	24	SE10	5
VALEMOUNT RS	25	26	SE11	5
HORSEFLY RS	25	29	SE12	5
BLUE RVR AP	29	21	NE 6	5

ISSUED AT 0800PDT AUG 4, 1978

Southerly flow at high levels over district.
Moisture from south with scattered dry lightning moving up from south should reach border district by late morning.
Winds light except stronger in main South-South valleys,and gusting to 50 near thunderstorms.
Humidities low.
Five day outlook...calls for cooler with more thundershowers over weekend.

FPCN36 CYUR 041500 AMD
ISSUED 0957PDT
FIRE WEATHER FORECAST FOR SOUTH INTERIOR
FOR FRIDAY AUGUST 04 1978
WEATHER ZONES 20 21
LATEST REPORTS AND SAT. PIC SUGGEST A POCKET OF POTENTIAL DRY THUNDERSTORMS JUST SOUTH OF THE OKANAGAN BORDER MOVING NORTH. BEST GUESS IS THAT MONASHEES AND NORTH THOMPSON WOULD HARDEST HIT BY THIS AFTERNOON.
END

ISSUED AT 1109 PDT

Dry lightning probable all areas this morning and continuing for the afternoon. Heaviest concentration in Monashee and N. Thompson.

OBSERVATIONS

Storm Pedro

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SAUS9 KWBC 041900
UIL RS 1455 E10 OVC 7 219/60/55/3405/017/ OCNL BINOVC 307 15//
BLI SA 1459 250 SCT 30 202/61/52/1811/012/ 315
BFI SA 1450 60 SCT E80 BKN 150 BKN 8 [illegible]/50/0508/014
SEA SA 1450 80 SCT E150 BKN 200 OVC 25 206/60/53/2106/014/BINOVVCC
307 1072
SMP SA 1455 20 SCT E35 BKN 90 BKN 230 OVC 25 188/54/52/2412/015/CB SW
 MOVG NE MDT CU ALQDS F IN VLY SW OCNL OBSCG STN/ 103 1963
EAT SA 1452 80 SCT 110 SCT 250 - SCT 30 142/70/52/3410/998/ 803
EPH SA 1451 60 SCT 100 SCT 250 SCT 25 142/81/48/3506/998/ 302
YKM SA 1457 70 SCT 100 SCT 250 SCT 50 144/73/55/2608/998/ 305 1161
MWH SA 1445 120 SCT E200 BKN 35 76/46/0907/997
GEG SA 1455 CLR 30 160/70/53/0610/006/FEW CU S-W/ 307 1150
CTB SA 1455 CLR 60 188/68/49/2908/016/ 408
HVR SA 1458 CLR 65 195/62/41/1503/012/WND LGT VRB 000
GTF SA 1455 CLR 50 197/68/43/2209/019/ 103
MSO SA 1452 CLR 30 219/58/40/0000/022/ FEW CI S 002 1001 TV M TN TEMP
64
HLN SA 1455 CLR 40 226/58/42/3103/024/ 105
BTM SA 1452 CLR 60 216/57/32/0000/031/ FEW CI/ 002
LVM SA 1458 CLR 30 226/59/43/1205/028/ 102V
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SACN1 CYVR 041600
YVR SA 1600 11 SCT 120 SCT 250 - SCT 15 202/17/13/1204/013/CF1AC1 CI1
=
YHC SA 1600 300 SCT 15+ 199/18/11/1004/012/CI1 =
WAE SA 1600 8 SCT 50 SCT 13 181/19/14/1803/011/K2CF1 VSBY
W S K =
YLY SA 1600 140 SCT 290 - SCT 350 - SCT 15 146/24/13/2018G31/998/
    AC1 CI1 CC1 =
WCL 0000/9.+/ 66/ 41/1805/305/000=
YKA SA 1600 E140 BKN 240 BKN 30 149/23/11/1408/999/AC7CI2 QAQOM YNY
  115.2 041700/1830 =
YRV SA 1600 130 SCT 320 - BKN 15+ 15+ 187/17/11/2701/009/AC1 CI2 =
WGE SA 1600 100 SCT 250 - SCT 15+ 18/11/0000/AC1 CI1 =
WCP SA 1600 120 SCT 300 - BKN 15+ 175/18/10/0000/006/AC2 CI1 =
YPU SA 1600 110 SCT 15+ 150/15/6/2002/002/AC1 =
YQZ SA 1600 160 SCT 240 - SCT 15 147/18/10/0000/997/AC1 CI1 =
YXS SA 1600 200 - BKN 45 142/18/8/2001/996/CI3 =
YZY SA 1600 120 SCT 230 - BKN 15+ 141/18/8/1704/996/AC1 CI2 =
YPZ SA 1600 250 SCT 15+ 145/20/12/1105/997/CI1 =
YYD SA 1600 60 SCT 280 - BKN 25 145/18/12/0000/998/CF1 CI1 TR CF =
YXT SA 1600 53 SCT 280 - BKN 15 177/16/7/1710/005/CU2 CI2 =
ZST SA 1600 E37 BKN 280 BKN 15 170/17/31/1910/003/CU7 CI1 =
YZP SA 1600 10 SCT E32 BKN 100 BKN 15+ 167/15/11/2403/002/CU2SC5AS2
    TCU ASCTD SHWR E =
YTC SA 1600 E18 OVC 10 189/13/13/1810E/009/SC10 =
YCJ SA 1600 15 SCT 82 SCT E170 BKN 210 BKN 15+ 194/14/13/2011/010/
    TCU1AC4AC1 CI 112 =

    SA 041600
    YWL SA 1600 160 SCT 260 - BKN 15+ 145/22/7/1412/001/AC3CS 0236=
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SA 041700
YWL SA 1700 160 SCT 260 - BKN 15+ 143/24/7/1210/000/AC2 CI3 99956=

SACN1 CYEG 041700
YXC 250 SCT 25 190/23/10/1604/014/ CI1 =

YAZ SA 1700 CLR 20 216/17/12/3113/017/ =
YXX SA 1700 300 SCT 30 200/19/12/2507/012/CI1 =
YHE SA 1700 100 SCT 300 SCT 15+ 191/22/10/2806/009/AC1 CI1 =
WHE * 9.+ 194/ 22/ 12/2910/010// 002 =
WKV 120 SCT 250 SCT 10 19/9/3210/AC1CI1 =
YDC SA 1700 90 SCT E120 BKN 250 BKN 15+ 159/21/9/0000/007/AC1 AC7CI1
=
YYF SA 1700 150 SCT 270 - SCT 15 150/25/13/3504/000/AC2 CI3 K =
YLW SA 1700 140 SCT 300 - BKN 20 153/26/12/0000/001/AC2 CI2 =
YCG SA 1700 280 - SCT 15+ 175/24/12/3605/007/CI2 =

SACN1 CYVR 041700
YVR SA 1700 11 SCT 250 - SCT 15 203/18/13/1510/013/CF1 CI1 =
YHC SA 1700 300 SCT 15+ 201/19/11/0604/013/CI1 =
YPW 30 SCT 15 18/13/3104/013/CU1 =
WAE SA 1700 8 - SCT 50 SCT 13 180/21/14/1706/009/K2 CF1 VSBY W6 =
YLY SA 1700 350 SCT 15 140/26/12/2010G18/996/CI1 =
WCL 0000/9.+/ 73/ 44/1606/005/000=
YKA SA 1700 60 SCT 150 SCT E240 BKN 30 144/25/10/1102/998/CU1 AC5 CS2
QAQOM YNY 115.2 041700/1830, TR CU =
YRV SA 1700 130 SCT 170 SCT 300 - BKN 15+ 182/20/11/2501/007/AC1 AC2
CI2 CC ASOCTD =
WCP SA 1700 70 SCT 250 - BKN 15+ 169/20/11/0702/004/CU1 CI4 =
YPU SA 1700 35 SCT 110 SCT 15+ 154/19/7/2004/000/CF1 AC1 TR CLD =
YQZ 160 SCT 250 - SCT 15 142/21/10/0000/996/AC1 CI1 =
YXS SA 1700 230 SCT 250 - SCT 40 141/21/8/1503/996/CC1 CI1 VSBY W 6 K
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CS ASOCTD =
YXT SA 1700 45 SCT 280 - BKN 15 178/17/7/1713/006/CU2 CI1 =
ZST SA 1700 E45 BKN 280 BKN 15 171/17/10/2107/003/CU6 CI2 =
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CU3 SC4AS2 TCU ASCTD =

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   002 =
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YZP SA 1800 E18 BKN 100 BKN 15+ 166/18/12/1307/002/TCU7AC1
CB TOP N 000 =
YTC SA 1800 E15 OVC 10 192/15/13/1410E/010/SC10 204 =
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