# PACIFIC REGION TECHNICAL NOTES

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Update on Stability Indicies for Interior B.C. Stations

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INTRODUCTION:

IN MARCH 1978 A NUMBER OF STABILITY INDICIES COMBINED WITH DYNAMIC PARAMETERS SUCH AS 500MB 700MB 850MB WINDS,AND 500 MB HTS WERE EXAMINED TO DETERMINE THEIR REALTIONSHIP TO CONVECTION USING 1977 DATA(PACIFIC REGION TECHNICAL NOTES 78-005). A SIMILAR ANALYSIS WAS PERFORMED ON 1978 SUMMER DATA THIS PAST WINTER TO CONFIRM OR IMPROVE RESULTS OF THE PREVIOUS ANALYSIS.AN ADDITIONAL STABILITY INDEX,THE BOYDEN INDEX, AND 1000-500MB THICKNESS WAS ADDED TO THE DATA.

METHOD

THE ANALYSIS WAS SIMILAR TO THE ONE CARRIED OUT LAST YEAR WITH FORT NELSON DATA ADDED TO THE LIST.THE DATA SET CONSISTED OF 120 OBSERVATION DAYS FROM MAY 10 TO SEPTEMBER 6 1978.

THE BOYDEN INDEX IS DEFINED AS;

BOYDEN INDEX = H1000 - H700 - T700 - 200

WHERE H1000 = 1000MB HT(DECAMETERS)
H700 = 700MB HT( " )
T700 = 700MB TEMP (CELCIUS)

RESULTS

1. FOR YXS RESULTS WERE SIMILAR TO THOSE OBTAINED IN 1978. THE CURVE FOR THE PAST SUMMER INDICATES SLIGHTLY HIGHER VALUES ARE NEEDED FOR CONVECTION.NO GOOD EXPLANATION COULD BE FOUND FOR THIS.IT MIGHT BE RELATED TO THE SMALL DATA SAMPLE OR DIFFERENT METHODS OF VERIFICATION. RESULTS ARE SUMMARIZED IN FIG 1.

2. FOR YVK RESULTS FOR THE K-INDEX WERE SIMILAR TO 1977 DATA. SLY INDEX DATA WAS AVAILABLE AND APPEARED SLIGHTLY SUPERIOR [redacted].

3. AT GEG WHERE THE [redacted] APPEARED TO BE A FAIRLY GOOD DISCRIMINATOR [redacted]. LARGER DATA SET 1978 WOULD FAVOR THE K-INDEX AS A BETTER INDICATOR WITH 500 MB HTS AND WIND DIRECTION A GOOD SECONDARY SEPARATOR. RESULTS ARE SUMMARIZED IN FIG 3.

4. FOR YYE THE SLY INDEX APPEARED TO BE A SLIGHTLY BETTER PRIMARY DISCRIMINATOR FOR CONVECTION THAN THE K-INDEX. 500MB HTS AND 500MB WIND DIRECTION APPPEARED TO BE A GOOD SECONDARY SEPARATOR. RESULTS ARE SUMMARIZED IN FIG 4.

CONCLUSION:

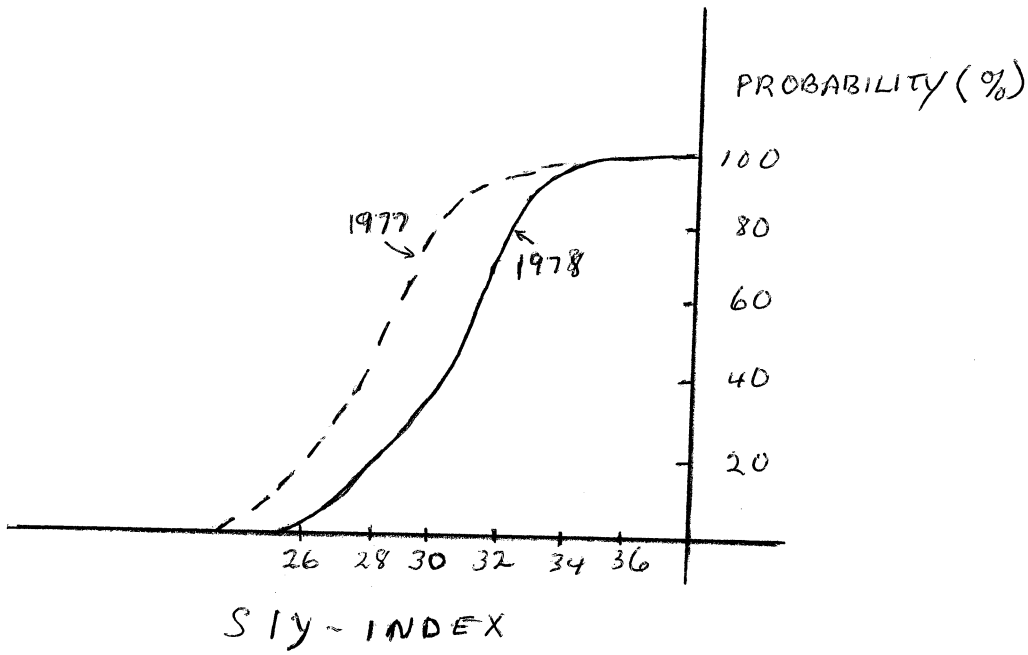
IN MOST CASES BOTH THE K-INDEX AND THE SLY INDEX APPEAR TO BE GOOD PRIMARY DISCRIMINATORS OF CONVECTION WITH THE SLY INDEX APPEARING TO HAVE A SLIGHT EDGE AT SOME STATIONS. THE SLY INDEX IS SENSITIVE TO ELEVATION AND MIGHT BE USED TO PREDICT CONVECTION OVER HIGHER TERRAIN.

NEITHER THE BOYDEN INDEX OR THE THICKNESS APPEARED TO BE CORRELATED WITH CONVECTION AT THE ABOVE INTERIOR STATIONS.

FIGURE 1

PROBABILITY OF AFTERNOON CONVECTIVE CLOUD*

VS SLY - INDEX AT YXS




- the indeterminate range sly 28 - 31 (26-29 in 77)

use secondary criteria

1. 500 mb hts < 569 convective cloud

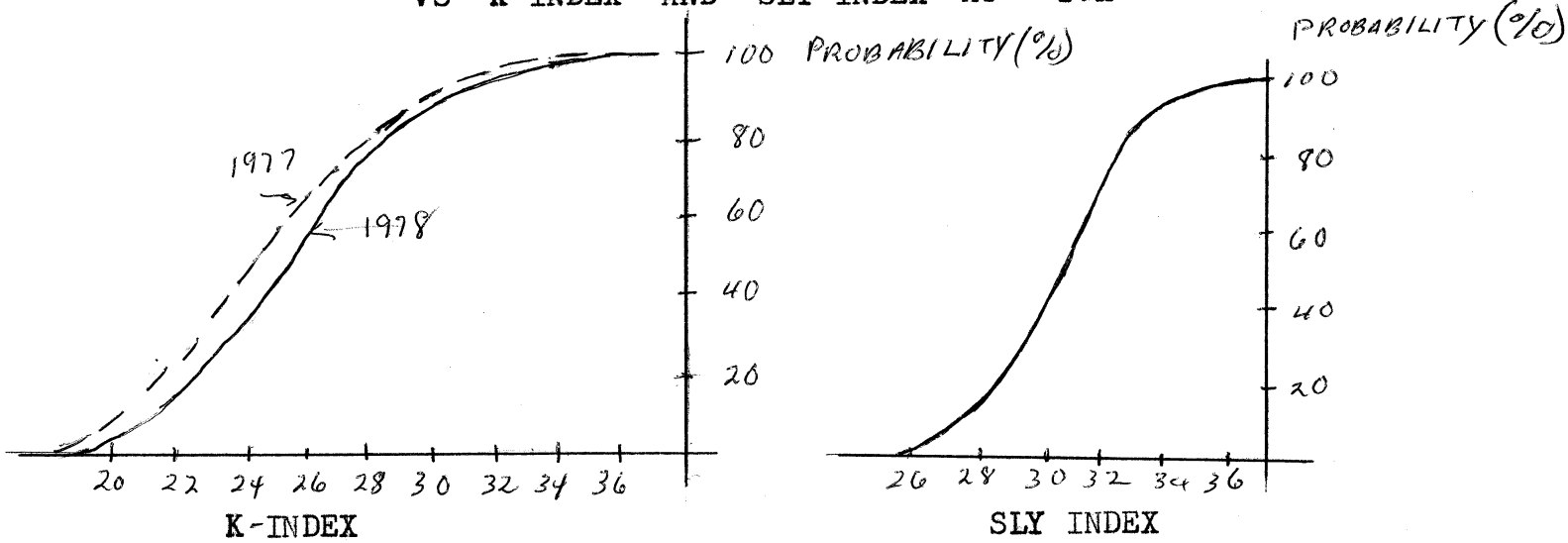
   > 573 No Convection

2. 500 mb hts 569 - 573 500 mb wind direction
   000°- 280° convective cloud

*Probability derived from frequency of occurrence convective cloud = Occurrence of cb or substantial Tcu or ACC

FIGURE 2

PROBABILITY OF AFTERNOON CONVECTIVE CLOUD* VS K INDEX AND SLY INDEX AT YVK




- the indeterminate range for Sly index 28 - 32 use as secondary criteria

500 mb hts $\geq$ 570 no convection

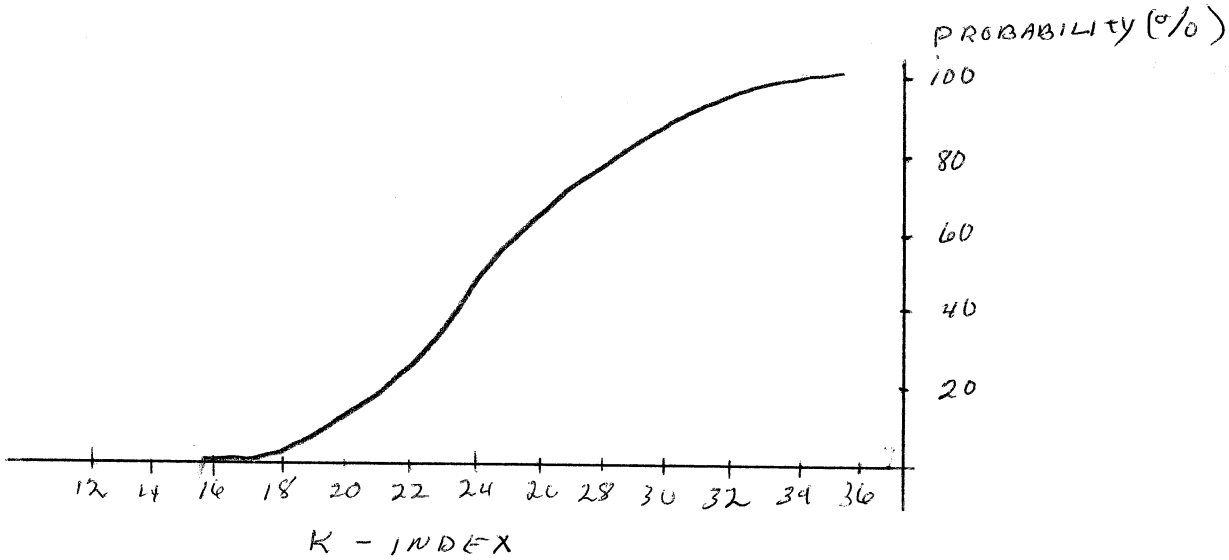
500 mb hts $<$ 570 no convection if 500 mb wind speed $>$ 33 kts

* probability derived from frequency of occurrence convective cloud = occurrence of CB or substantial Tcu or ACC

FIGURE 3

PROBABILTY OF AFTERNOON CONVECTIVE CLOUD*

VS K-INDEX AT GEG




- INDETERMINATE RANGE K-INDEX 22 - 26

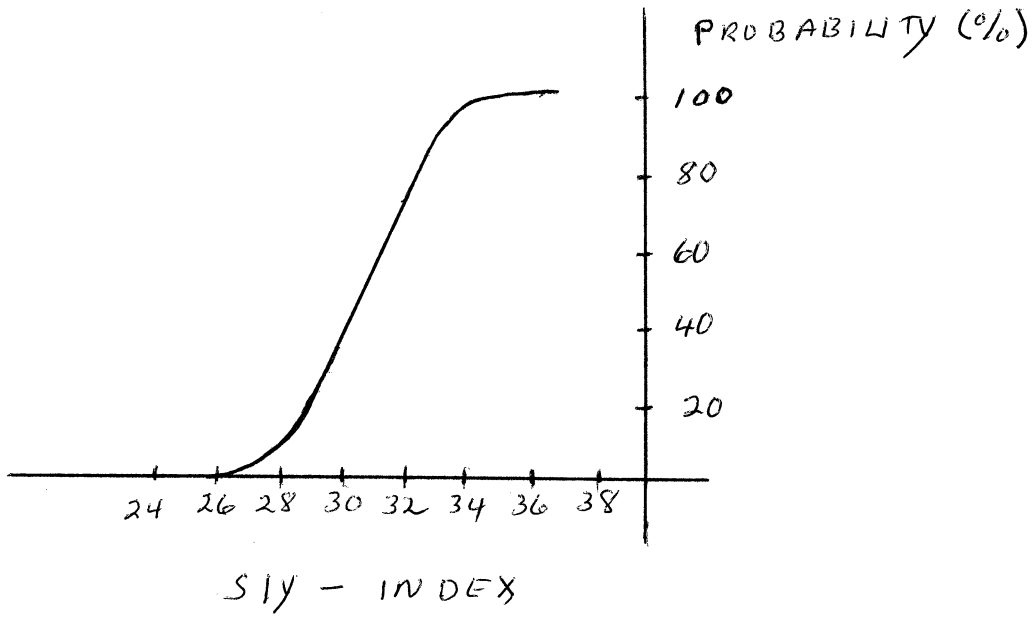
1. 5ØØ MB HTS > 575 NO CONVECTION

2. 5ØØ MB HTS ≤ 575 NO CONVECTION IF 5ØØ MB WIND 29Ø - 36Ø

* Probability derived from frequency of occurrence of convective cloud = occurrence of CB or substantial TCU or ACC

FIGURE 4

PROBABILITY OF AFTERNOON CONVECTIVE CLOUD* VS SLY INDEX AT YYE




- indeterminate range Sly 29 - 31

1. 500 mb hts > 571 no convection

   500 mb hts < 571 no convection if 500 wind 180° - 260°

*Probability derived from frequency of occurrence convective cloud = occurrence of CB or substantial TCU or ACC