



**WESTERN REGION TECHNICAL ATTACHMENT
NO. 00-08
AUGUST 8, 2000**

HAINES INDEX APPLICATION FOR AWIPS

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Introduction

The Haines Index was developed in 1988 by Donald Haines, a research meteorologist with the USDA Forest Service, as a means of using atmospheric conditions to forecast fire 'blow up' potential. The Haines Index has been used for several years now by fire weather forecasters in determining when conditions will be favorable for fires to quickly become large and unpredictable (blow up). This Technical Attachment (TA) describes an application that can be installed on AWIPS to determine the Haines Index from a sounding.

Haines Index

Haines based his index on two parameters: lower atmospheric stability and moisture content. Because of differing terrain, Haines developed different criteria for low elevation (950-850mb), mid elevation (850-700mb), and high elevation (700-500mb) locations. The stability term is determined by the difference in temperature between two layers in the atmosphere according to the site's elevation, and the moisture term is determined by the dewpoint depression (850mb dewpoint depression for low and mid level sites, and 700mb depression for high elevation sites). The stability and moisture terms are then combined to give the Haines Index. The following table shows how the Haines Index is derived.

<u>Elevation</u>	<u>Stability Term</u>	<u>Moisture Term</u>
Low	950 Temp - 850 Temp	850 Dewpoint Depression
	1... 3 C or less	1... 5 C or less
	2... 4 to 7 C	2... 6 to 9 C
	3... 8 C or more	3... 10 C or more
Mid	850 Temp - 700 Temp	850 Dewpoint Depression
	1... 5 C or less	1... 5 C or less
	2... 6 to 10 C	2... 6 to 12 C
	3... 11 C or more	3... 13 C or more

High	700 Temp - 500 Temp	700 Dewpoint Depression
	1... 17 C or less	1... 14 C or less
	2... 18 to 21 C	2... 15 to 20 C
	3... 22 C or more	3... 21 C or more

Haines Index = Stability Term + Moisture Term

Installation on AWIPS

Perl/tk is required for this program. If your workstation does not have this, you can quickly download it from ATN 4.2-66 at www.wrh.noaa.gov. To install the Haines Index software, go to the Local Applications Database isl715.nws.noaa.gov/LAD and search for Haines (Mike Seaman). Use the instructions under Install Doc to install the application onto AWIPS.

Use on AWIPS

This Haines Index program uses the mandatory levels from upper-air balloons stored in the text database. Because 950mb is not a mandatory level, 925mb is used instead, realizing that the calculated lapse rates may be slightly larger for low elevation stations. From the Local Tools pull-down menu, select Haines Index. This will bring up a window with buttons for RAOB sites along and west of the Rockies. When a button is selected, a new window will pop-up with the Haines Index for all elevations available from the sounding (low, mid and high). If a site is above 925 mb, only the mid and high elevations are displayed, and if the site is above 850mb, only the high elevation is displayed. Also shown in the table is the date and time of the sounding, and the components of the Haines Index for each elevation.

Additional Comments

Always check the date and time to make sure they are current. Occasionally they will have obviously bogus information (time of -4300). This is because there are at least a couple of different formats in which the mandatory levels appear in the text database. This program can decode the most common of these which is in the format

USUS10 KWBC 111200 CCAA
TTAA 61121 72572

This format seemed to comprise about 90-95% of all mandatory level files in the text database However, occasionally mandatory obs are in the format

USUS45 KSLC 111232
MANSLC
72572 TTAA 61121 72572

This software is not able to decode obs in this format.

References

Haines, D.A. 1988: A Lower Atmospheric Severity Index for Wildland Fires. *National Weather Digest* **Vol 13**, No. 2, pp 23-27.

Werth, Paul, Richard Ochoa: 1993. The Evaluation of Idaho Wildfire Growth Using the Haines Index. *Weather and Forecasting*: **Vol 8**, No. 2, pp 223-234.