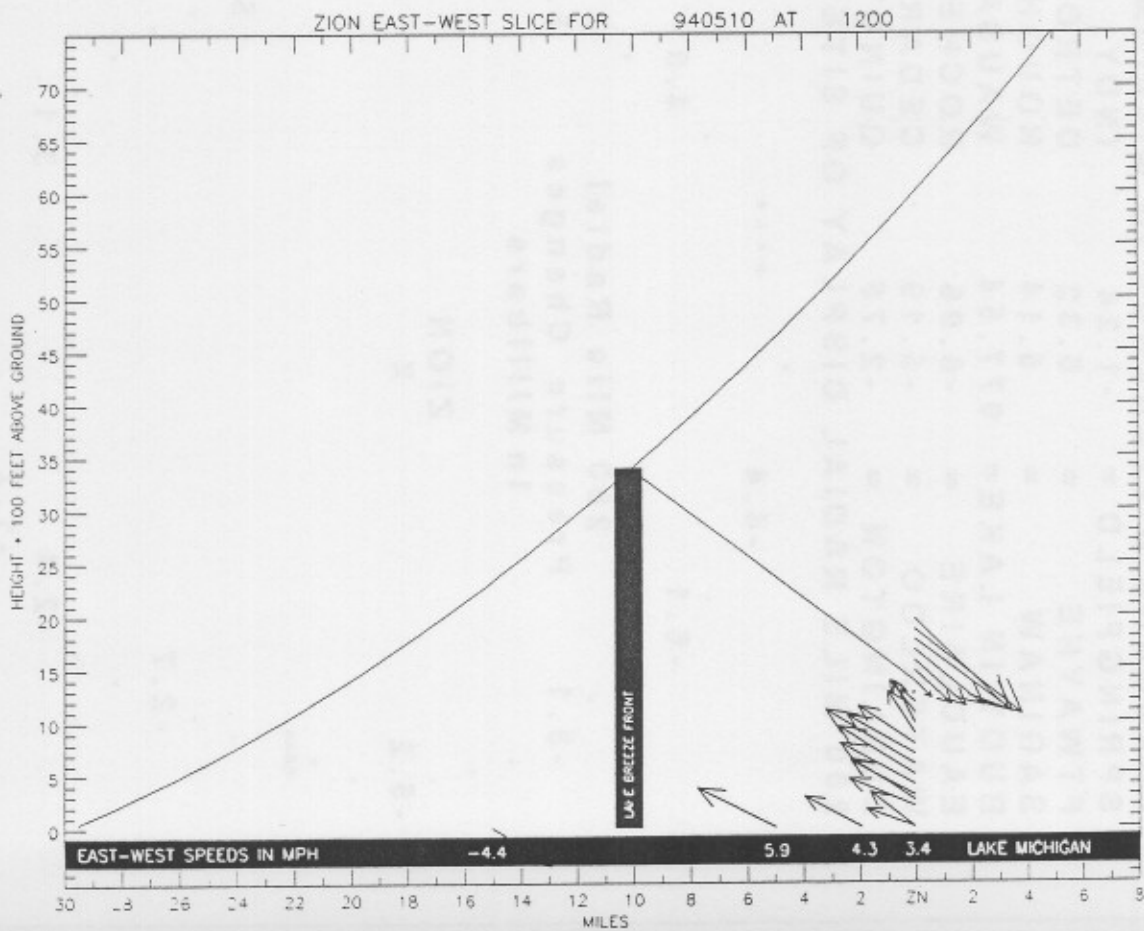
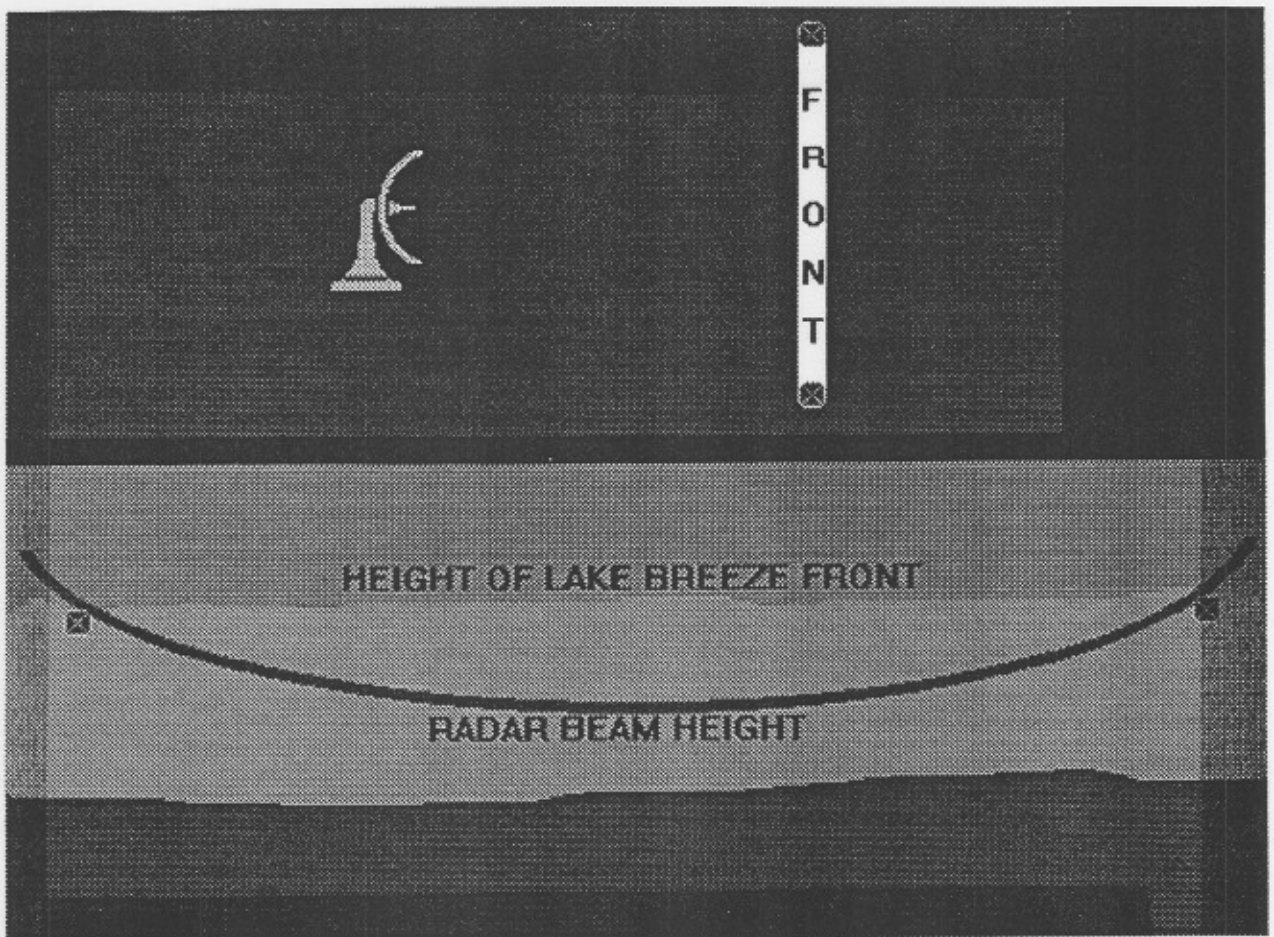


IDNS Mesoscale Meteorological Studies and Forecasting for the Zion Nuclear Power Plant

Tom Bellinger
Illinois Department of Nuclear Safety

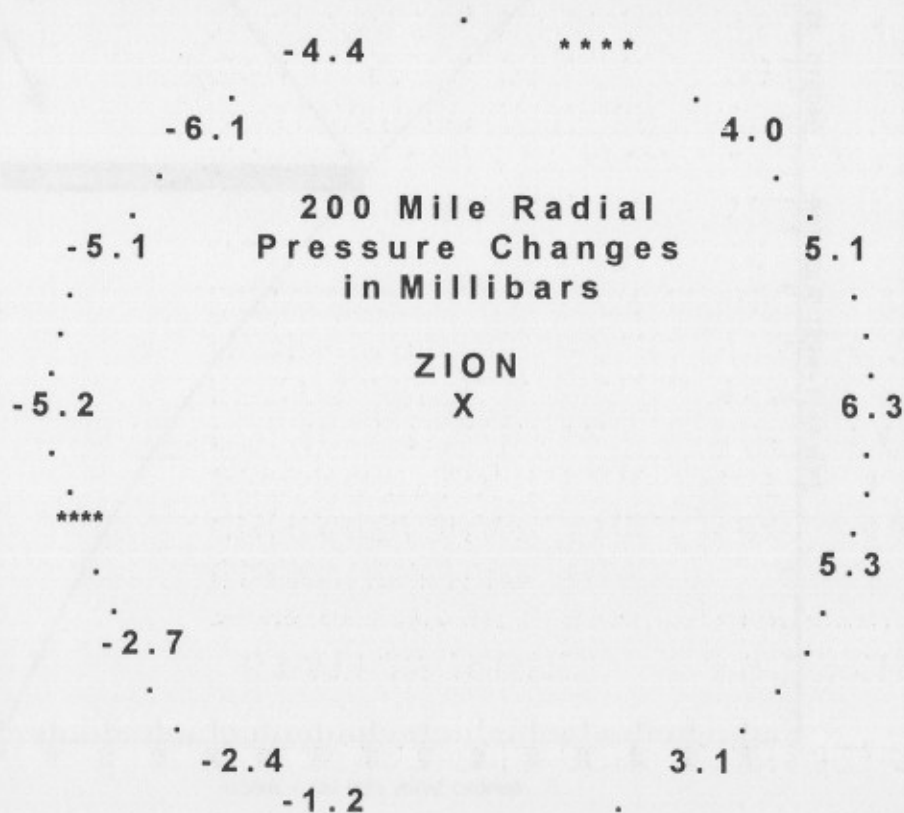


AVERAGE ZION PRESSURE IS = 1015.6

PRESSURE DIFFERENCE IN MILLIBARS FROM ZION TO EACH SITE IS:

SPRINGFIELD =	-1.24	INDY =	3.12
FTWAYNE =	5.32	DETROIT =	6.31
SAGINAW =	5.14	HOUGHTON =	4.04
BUOY IN LAKE =	977.54	WAUSAU =	-4.37
EAUCLAIRE =	-6.06	ROCHESTER =	-5.09
WATERLOO =	-5.19	CEDAR RAPIDS =	*****
BURLINGTON =	-2.75	QUINCY =	-2.38

200 MILE RADIAL DISPLAY OF SITES



Mesoscale effects are
generally possible when
all values are between
-4.0 and +4.0

+ USINFO NBU,ORD,SPI, UIN,FWA,IND,DTW,HTL,
MBS,RST,AUW,EAU,MKE,ALO,BRL,CID PCWXTD

OBSERVATIONS FOR 8AM(14Z) 21-MAR-96

STATION NAME	PRS	P	CHG	WIND	WX/CLD	TMP	DEW
=====	===	=====	=====	=====	=====	===	===
GLENVIEW NAS, IL							
CHICAGO/OHARE, IL ..	154		+9	3509	SCT	23	12
SPRINGFIELD, IL	169		+8	3608		29	18
QUINCY, IL	185		+10	3411	CLR	27	21
FORT WAYNE, IN	112		+9	3113	OVC	27	17
INDIANAPOLIS, IN ...	124		+12	3109	OVC	27	22
DETROIT/WAYNE, MI ..	086		+12	3412	S-	23	15
HOUGHTON LAKE, MI ..	117			3509	SW-	15	7
SAGINAW, MI	105		+7	3610	OVC	21	11
ROCHESTER, MN	220		+6	3609	-SCT	16	4
WAUSAU, WI	199		+3	3307	CLR	15	4
EAU CLAIRE, WI	231		+9	3506	-SCT	15	3
MILWAUKEE, WI	159		+5	3615	BKN	19	7
WATERLOO, IA	214		+8	0111	CLR	19	8
BURLINGTON, IA	184		+11	0111	CLR	26	15
CEDAR RAPIDS, IA ...				3512	CLR	21	9

+ BINFO 457 PCWT!

OBSERVATIONS FOR 8AM(14Z) 21-MAR-96

BUOY PRS P CHG WIND TMP WTR

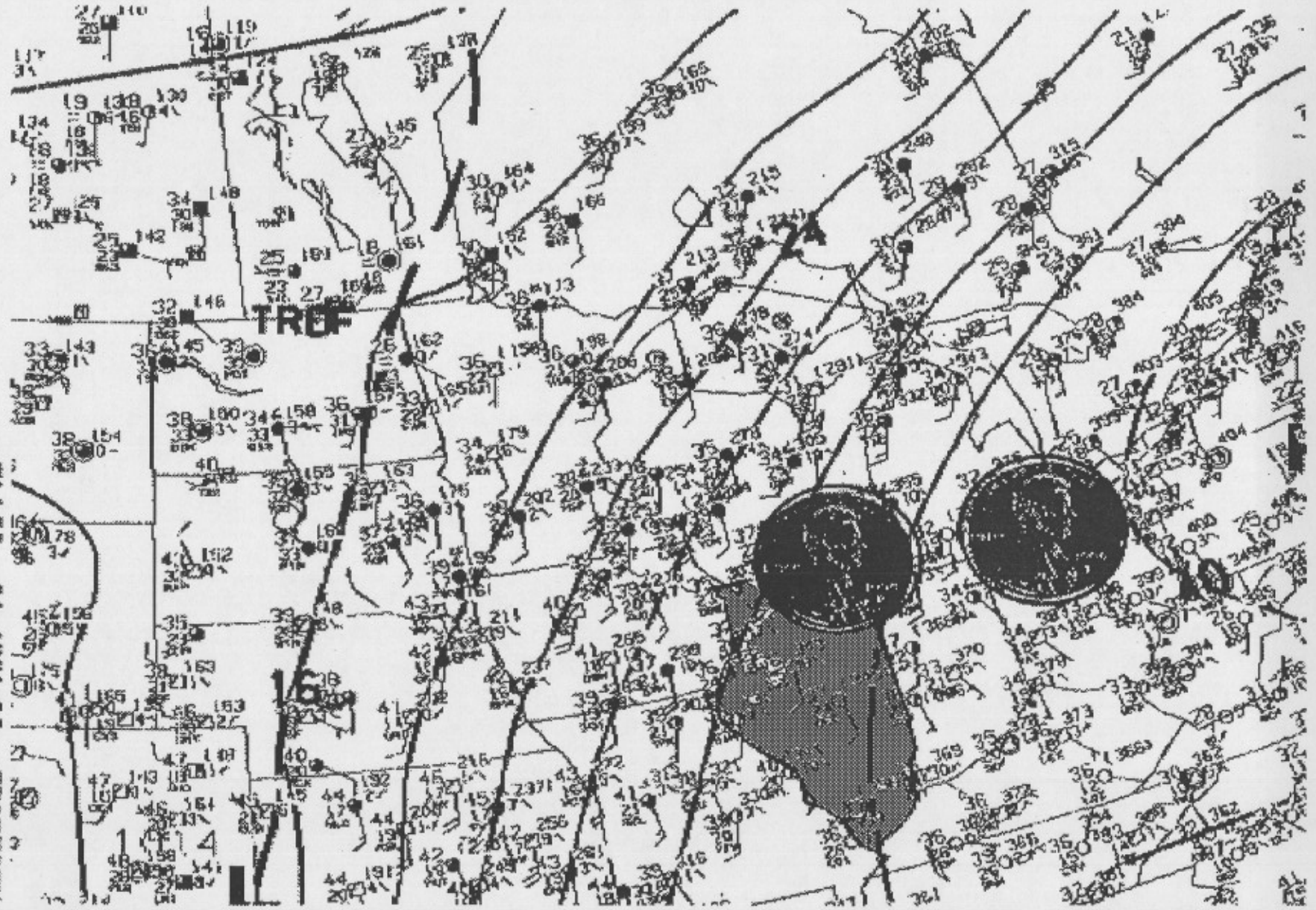
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45007

Mesoscale Forecasting

"The Penny Method"

WSI NASFC1
RECEIVED: 11-MAR-96 1644Z



RULES OF THUMB FOR ZION MESOSCALE REGIMES AND PLUME TYPES

LAKE BREEZE (NON-GAUSSIAN) - ALL OF THE FOLLOWING MUST BE TRUE
MUST BE MARCH THROUGH OCTOBER.
MUST BE 0700 AM - 0859 PM.
WIND SPEED AT 250' LESS THAN OR EQUAL TO 11.0.
WIND SPEED AT 35' LESS THAN OR EQUAL TO 9.0.
WIND DIRECTION 0-190 AT 250'.
WIND DIRECTION 0-185 AT 35'.
LAND TEMP - LAKE TEMP GREATER THAN OR EQUAL TO 0.01.
NO PRECIPITATION.

RIBBON PLUME (NON-GAUSSIAN) - ALL OF THE FOLLOWING MUST BE TRUE
ANY TIME OF DAY OR YEAR.
ALL WIND DIRECTIONS FROM 180-360.
LAND TEMP - LAKE TEMP GREATER THAN OR EQUAL TO 0.01.

LAND BREEZE (NON-GAUSSIAN) - ALL OF THE FOLLOWING MUST BE TRUE
MUST BE MARCH THROUGH OCTOBER.
MUST BE 0700 PM - 0859 AM.
WIND SPEED AT 250' LESS THAN OR EQUAL TO 12.079 MPH.
WIND SPEED AT 35' LESS THAN OR EQUAL TO 5.592 MPH.
WIND DIRECTION 180-360 AT 35' ONLY.
VERTICAL STABILITY E, F, OR G.
LAND TEMP - LAKE TEMP LESS THAN OR EQUAL TO -4.0.
NO PRECIPITATION.

FUMIGATION (NON-GAUSSIAN) - ALL OF THE FOLLOWING MUST BE TRUE
MUST BE MARCH THROUGH OCTOBER.
MUST BE 0900 AM - 0659 PM.
ALL WIND DIRECTIONS FROM 0-180.
VERTICAL STABILITY D,E,F, OR G.
LAND TEMP - LAKE TEMP GREATER THAN OR EQUAL TO 0.01.
NO PRECIPITATION.

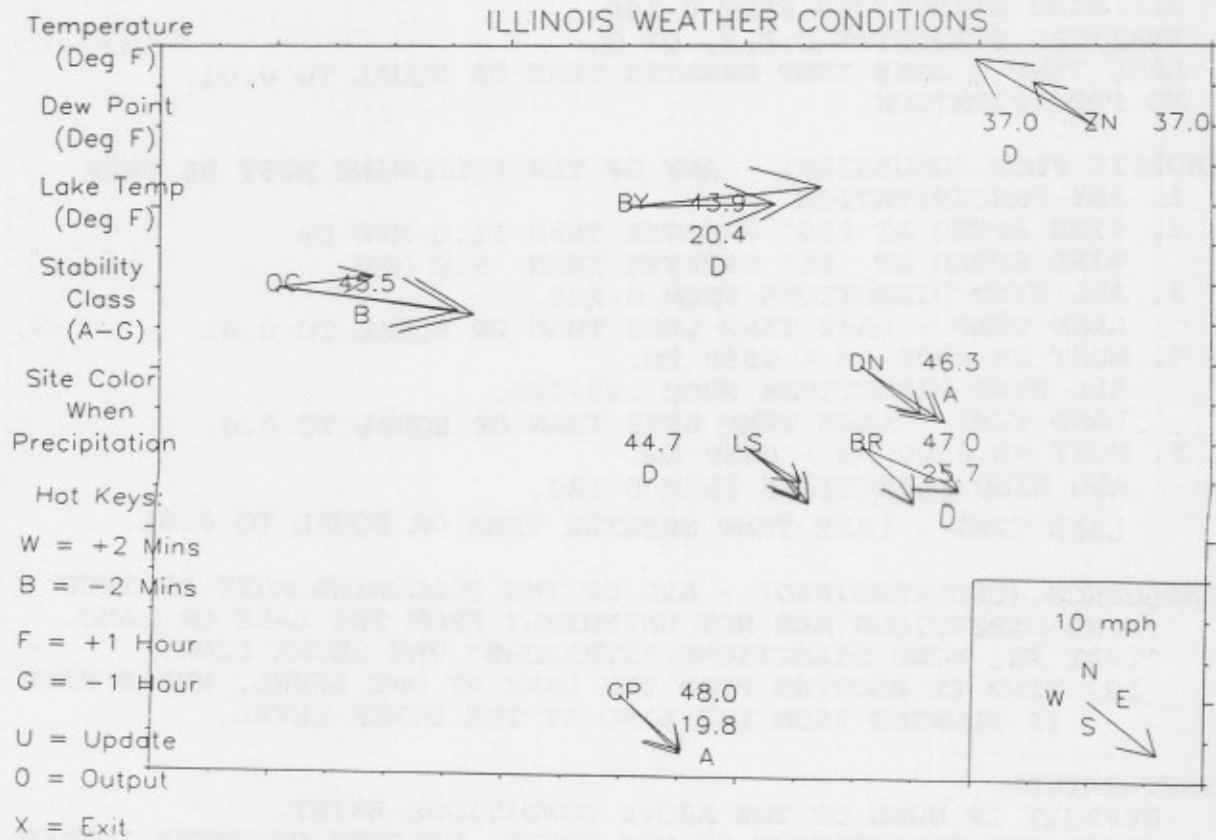
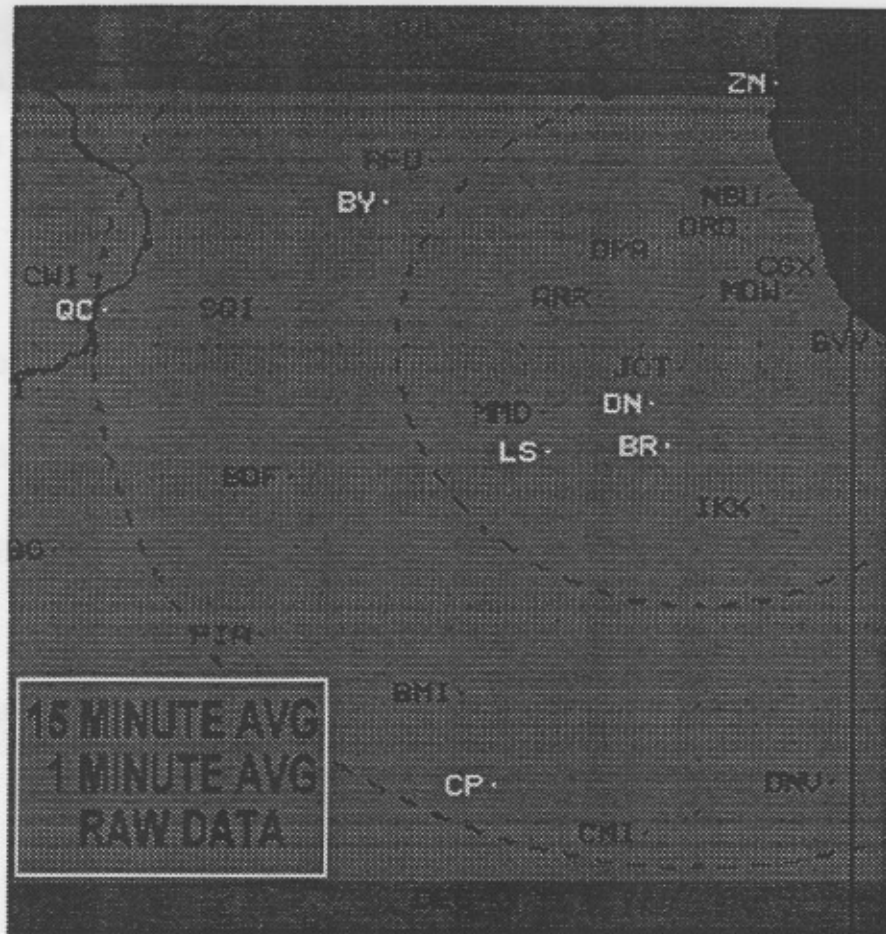
SYNOPTIC FLOW (GAUSSIAN) - ANY OF THE FOLLOWING MUST BE TRUE

1. ANY PRECIPITATION
2. WIND SPEED AT 250' GREATER THAN 11.0 MPH OR
WIND SPEED AT 35' GREATER THAN 9.0 MPH.
3. ALL WIND DIRECTIONS FROM 0-180.
LAND TEMP - LAKE TEMP LESS THAN OR EQUAL TO 0.0.
4. MUST BE 0800 AM - 0859 PM.
ALL WIND DIRECTIONS FROM 180-360.
LAND TEMP - LAKE TEMP LESS THAN OR EQUAL TO 0.0.
5. MUST BE 0900 PM - 0659 AM.
ALL WIND DIRECTIONS FROM 0-180.
LAND TEMP - LAKE TEMP GREATER THAN OR EQUAL TO 0.01.

CONFLUENCE (UNDETERMINED) - ALL OF THE FOLLOWING MUST BE TRUE
WIND DIRECTIONS ARE NOT UNIFORMLY FROM THE LAKE OR LAND.
THAT IS, WIND DIRECTIONS "STRADDLE" THE SHORE LINE.
IE. WIND IS BLOWING FROM THE LAKE AT ONE LEVEL, WHILE WIND
IS BLOWING FROM THE LAND AT THE OTHER LEVEL.

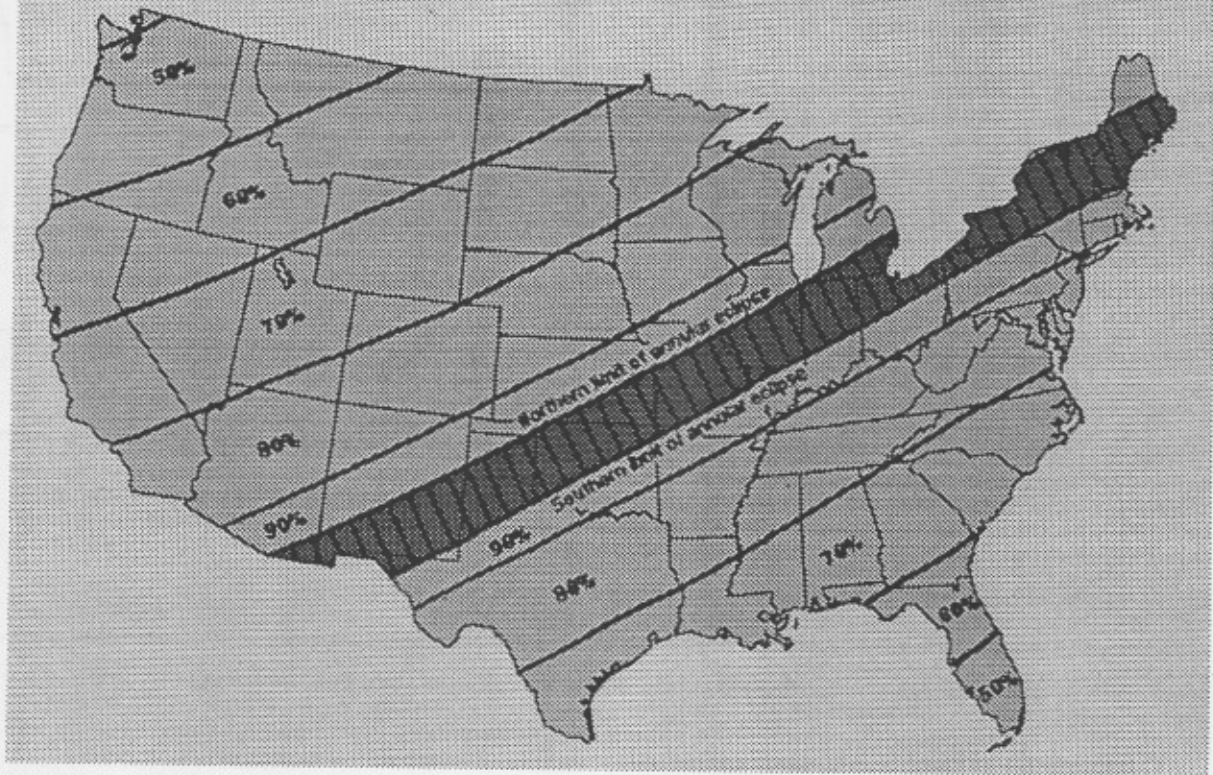
UNDETERMINED

DEFAULT IF NONE OF THE ABOVE CONDITIONS EXIST.
CHECK FOR CALIBRATION OF MET TOWER, DEICING OF WATER INTAKE,
VERY CALM CONDITIONS, TRANSITIONAL PERIODS, IMPROPER OVERRIDE VALUE
FOR AIR-LAKE TEMPERATURE, ETC.

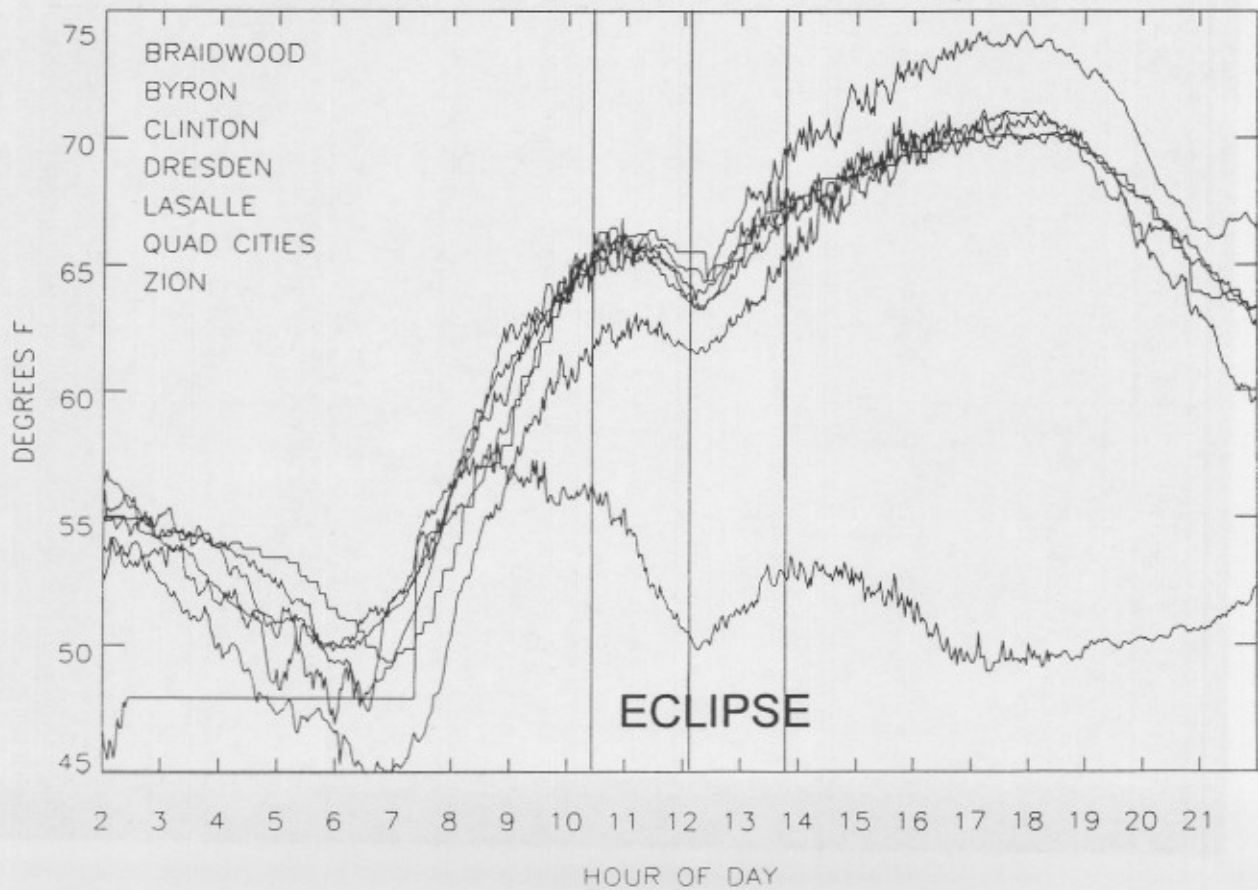


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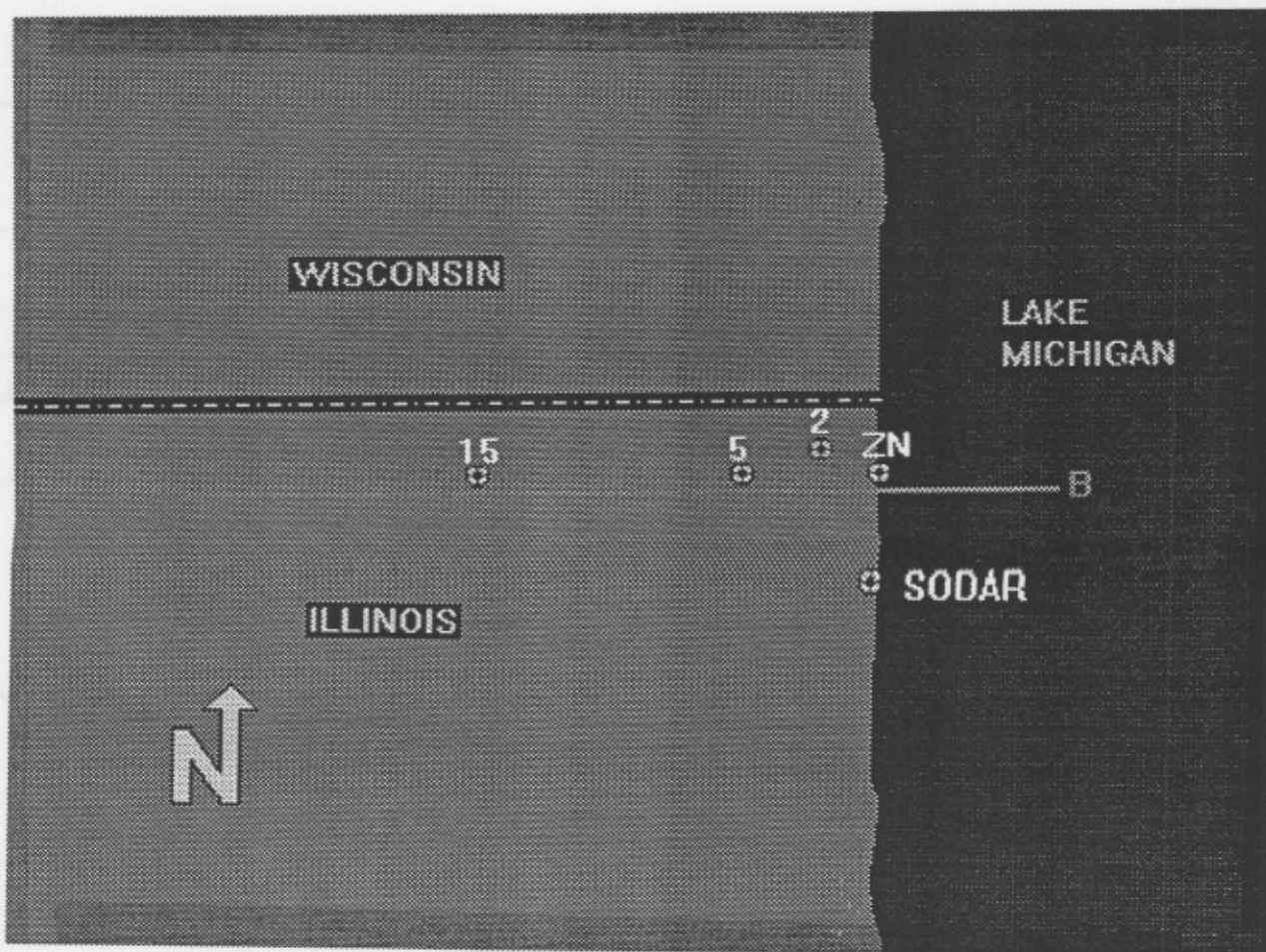
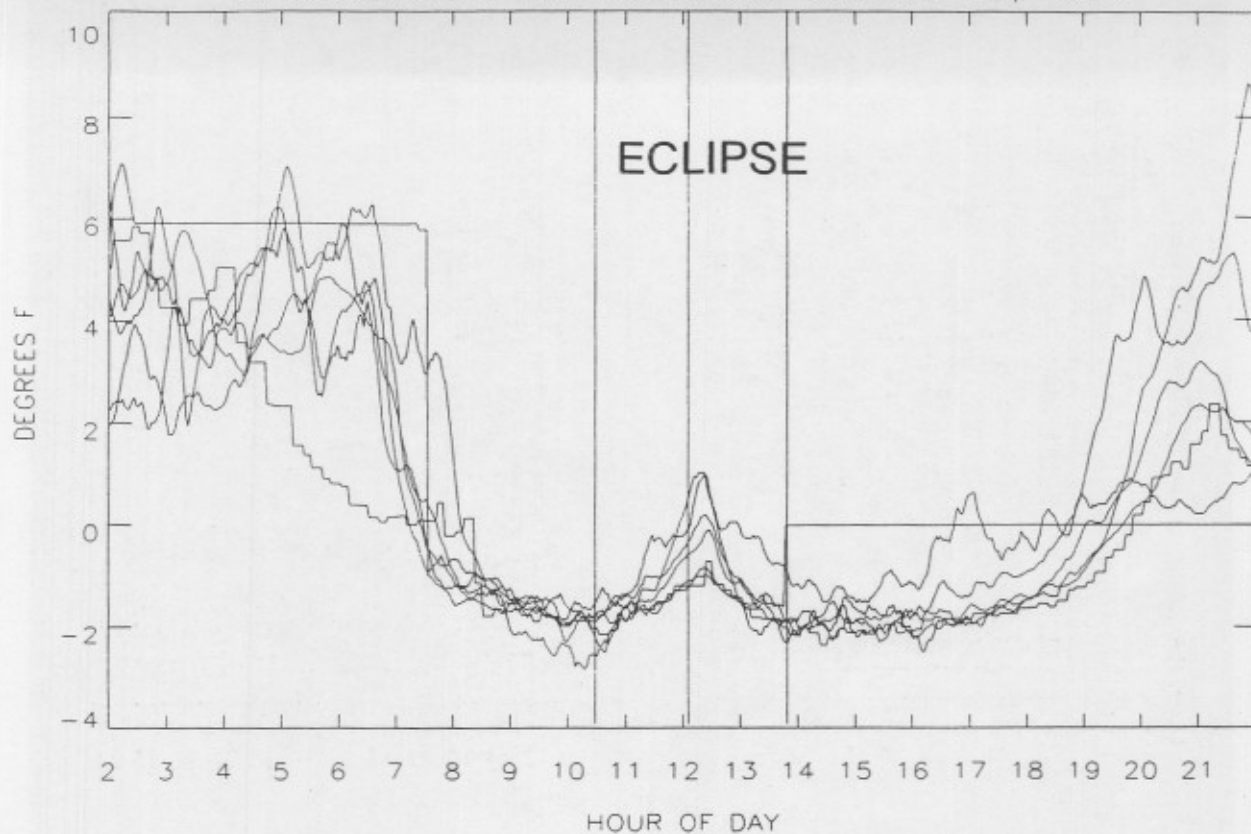
The Annular Eclipse of May 10, 1994



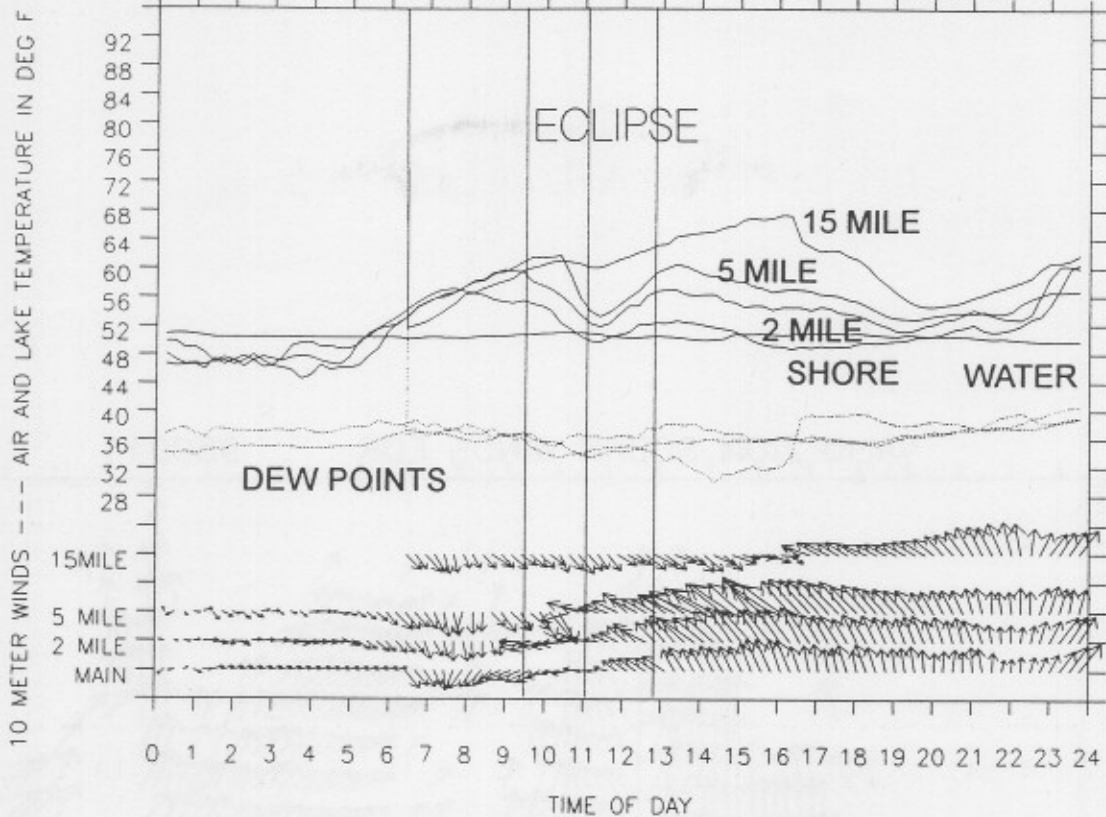
ILLINOIS TEMPERATURES FOR MAY 10, 1994



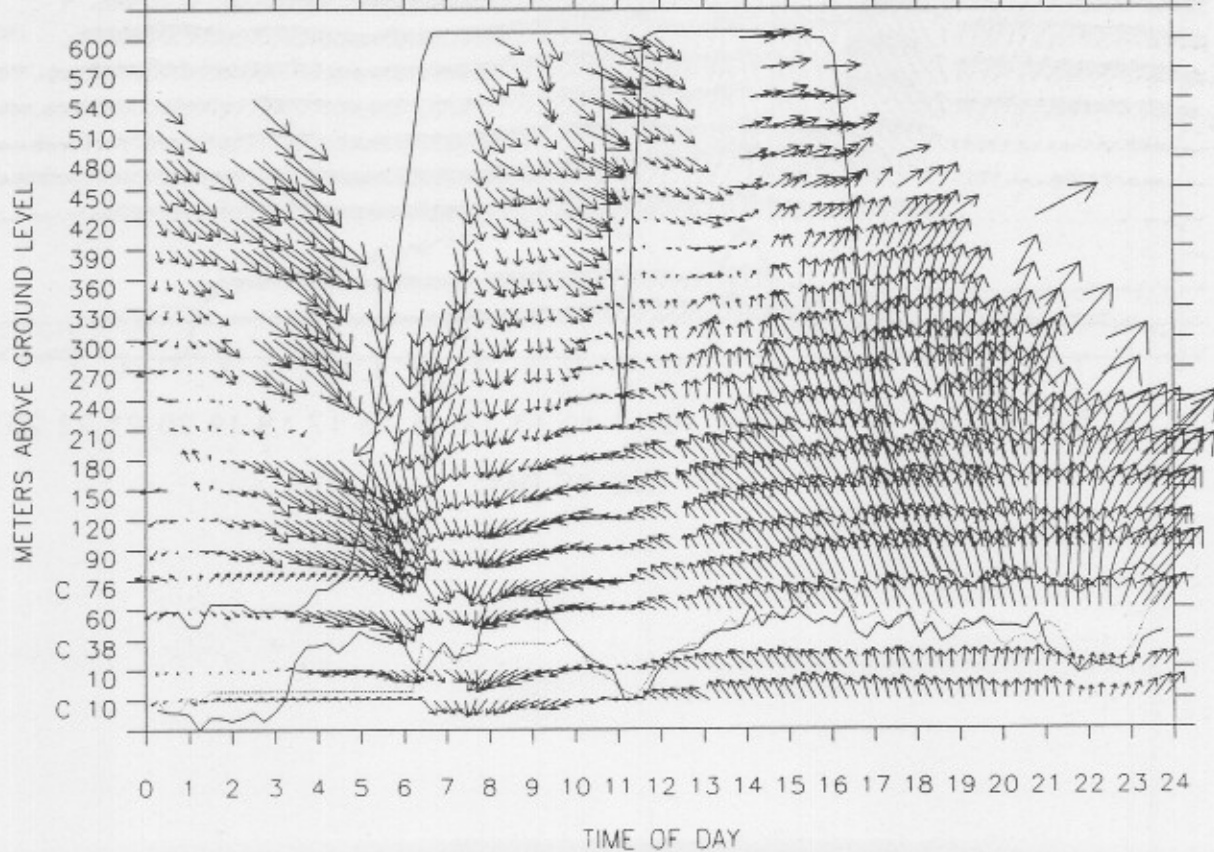
ILLINOIS DELTA TEMPERATURES FOR MAY 10, 1994



ZION SUPPLEMENTAL TOWER DATA FOR 940510



VALID ZION SODAR WINDS FOR 940510



ZION PLUME DISPERSION AND TRANSPORT

TOWER LEVEL	250'	35'
WIND DIRECTION	150.4	129.2
DOWNWIND SECTOR	QRA	PQR
WIND SPEED (MPH)	6.7	7.4
SIGMA THETA	7.2	11.5
HORIZONTAL STABILITY	E	D
DELTA T (F)	-1.85	
VERTICAL STABILITY	B	
WIND SHEAR	NORMAL	
LAND TEMPERATURE	74.7	DIFF
LAKE TEMPERATURE	63.6	11.1
(1)MESOSCALE REGIME (VIA RDL)	LAKE BREEZE	
PLUME TYPE	NON-GAUSSIAN	

05-AUG-95**13:01**