



**SNOWFALL EVENT
OVER SIERRA DE
ARTEAGA COAHUILA, MÉX.
30 - 31 DIC 2013**

CARMEN CANUL POOT
METEOROLOGICAL SERVICE OF MÉXICO

INSTRUCTORS: MICHEL DAVISON AND JOSÉ GÁLVEZ



- **Satellite Imagery Interpretation**
- **Streamline Analysis at 850mb, 500mb and 250mb**
- **(MJO) , Sea-Surface Temperature /Anomalies.**
- **Rainfall forecast models used are: GFS, ECMWF and UKMET.**
- **Using macros and commands in WINGRIDDS: to assess the vertical structure of atmosphere.**
- **Chart production with Quantitative Precipitation Forecast for Mexico, Central America, Caribbean and northern of South America) over four days.**

MAIN TASKS AT THE TROPICAL DESK

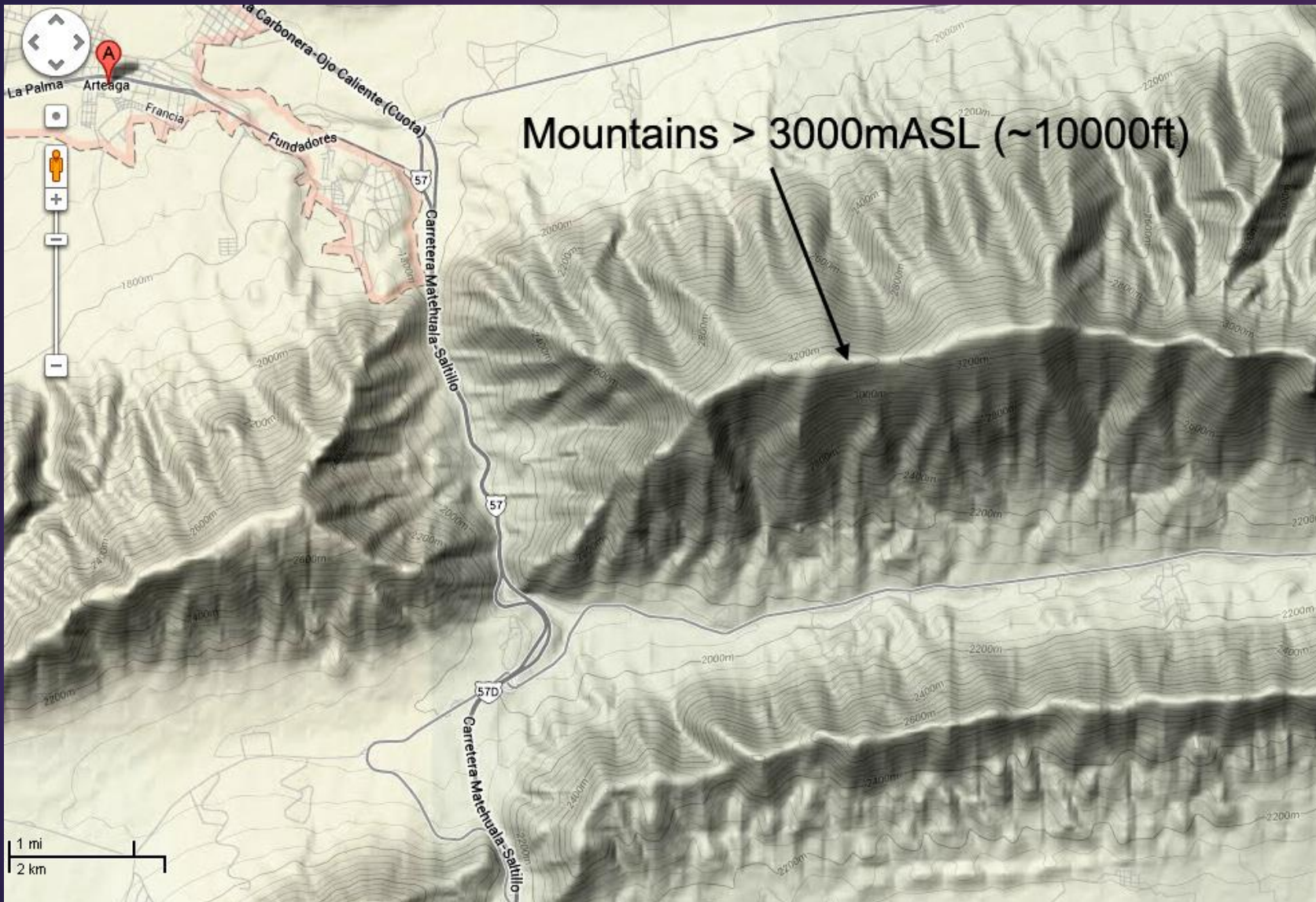


AREA OF SNOWFALL

Arteaga is a state population Mexican of Coahuila, is part of the Metropolitan Zone of Saltillo.

Sierra de Arteaga considered the Switzerland of Mexico

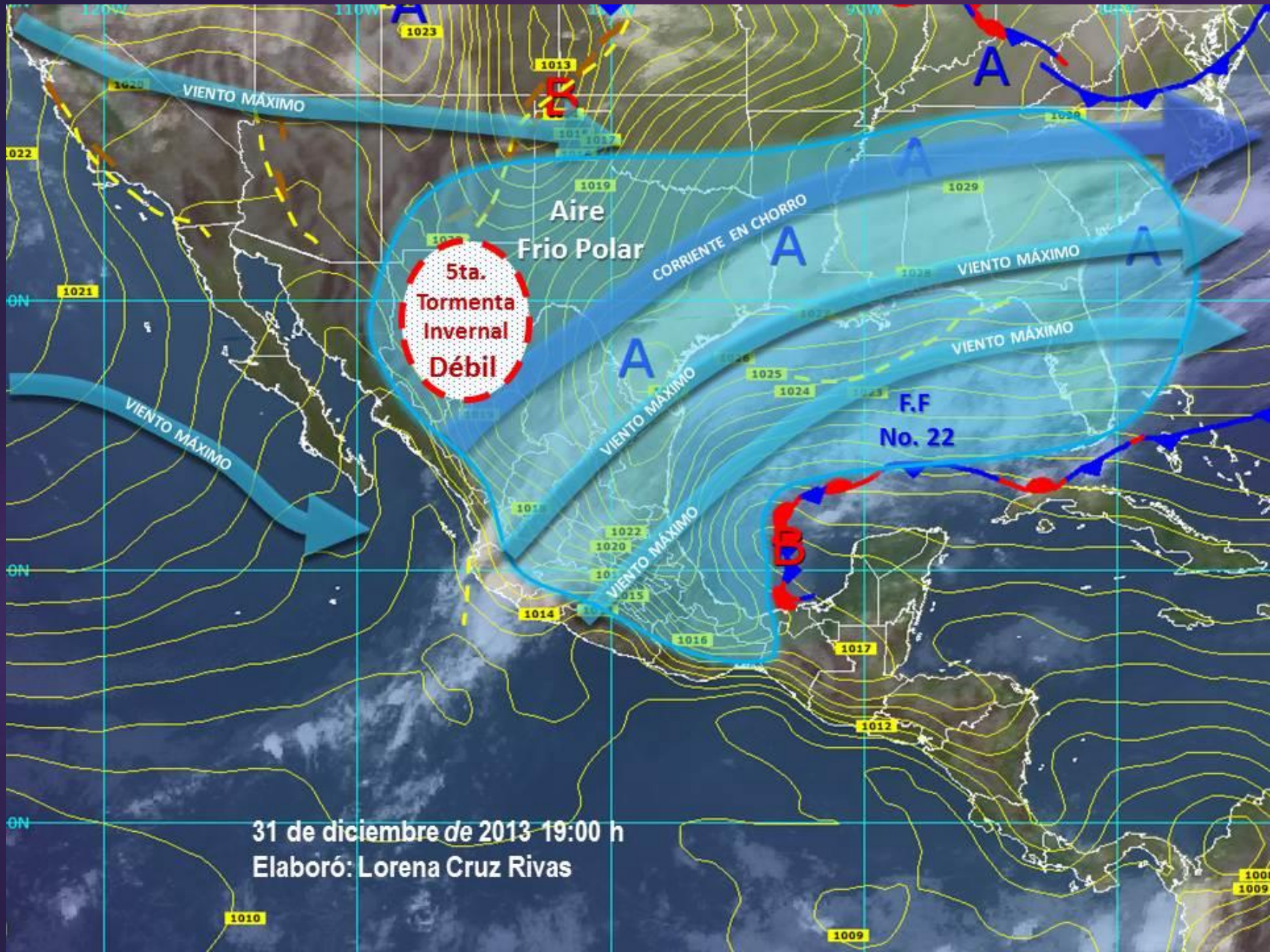
Other places around:
Los Oyameles tourist place
Mesa de la tablas



Elevación

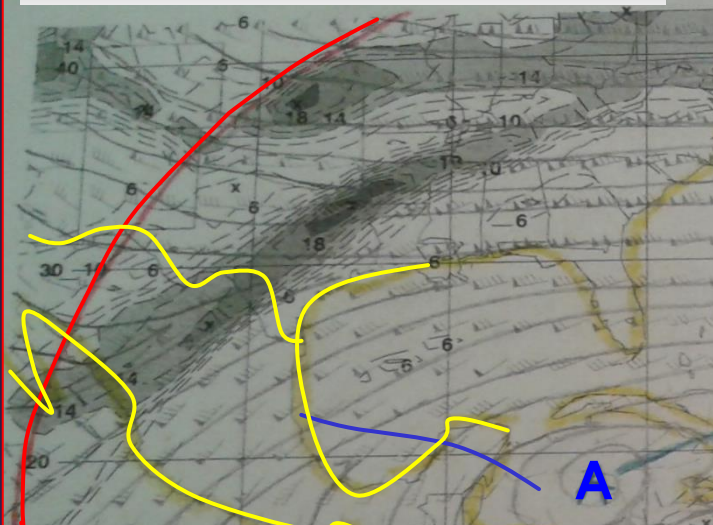
Its highest point is the formation The Coahuilón to 3700 m and is located in the Sierra de Arteaga.

Lat 25° 26' 43''
Long 100° 50' 48''



31 de diciembre de 2013 19:00 h
Elaboró: Lorena Cruz Rivas

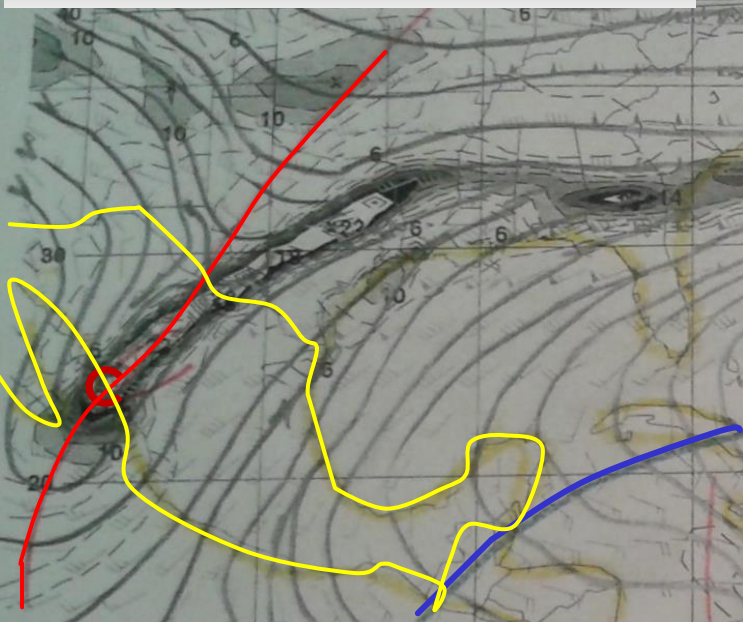
250 hPa



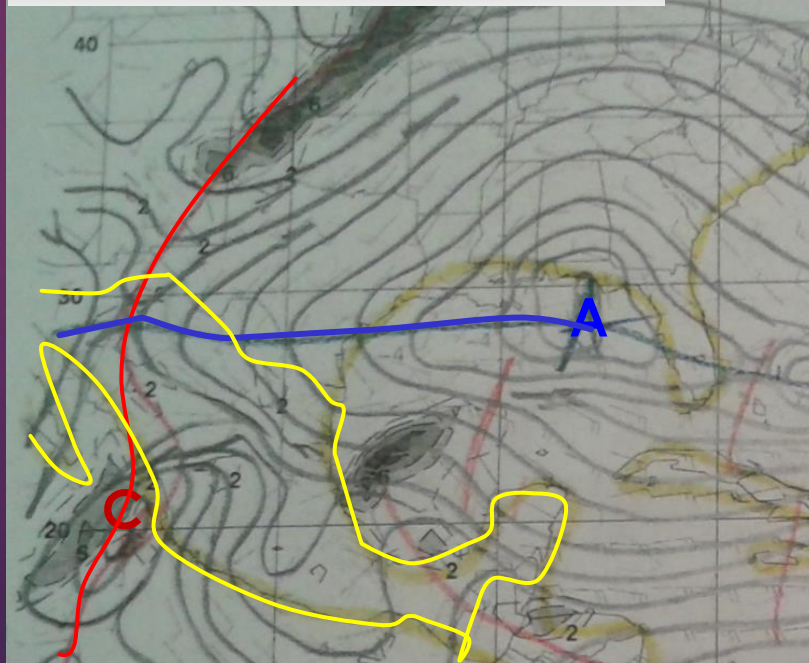
STREAM LINES ANALYSIS

250 hPa
500 hPa
850 hPa

500 hPa

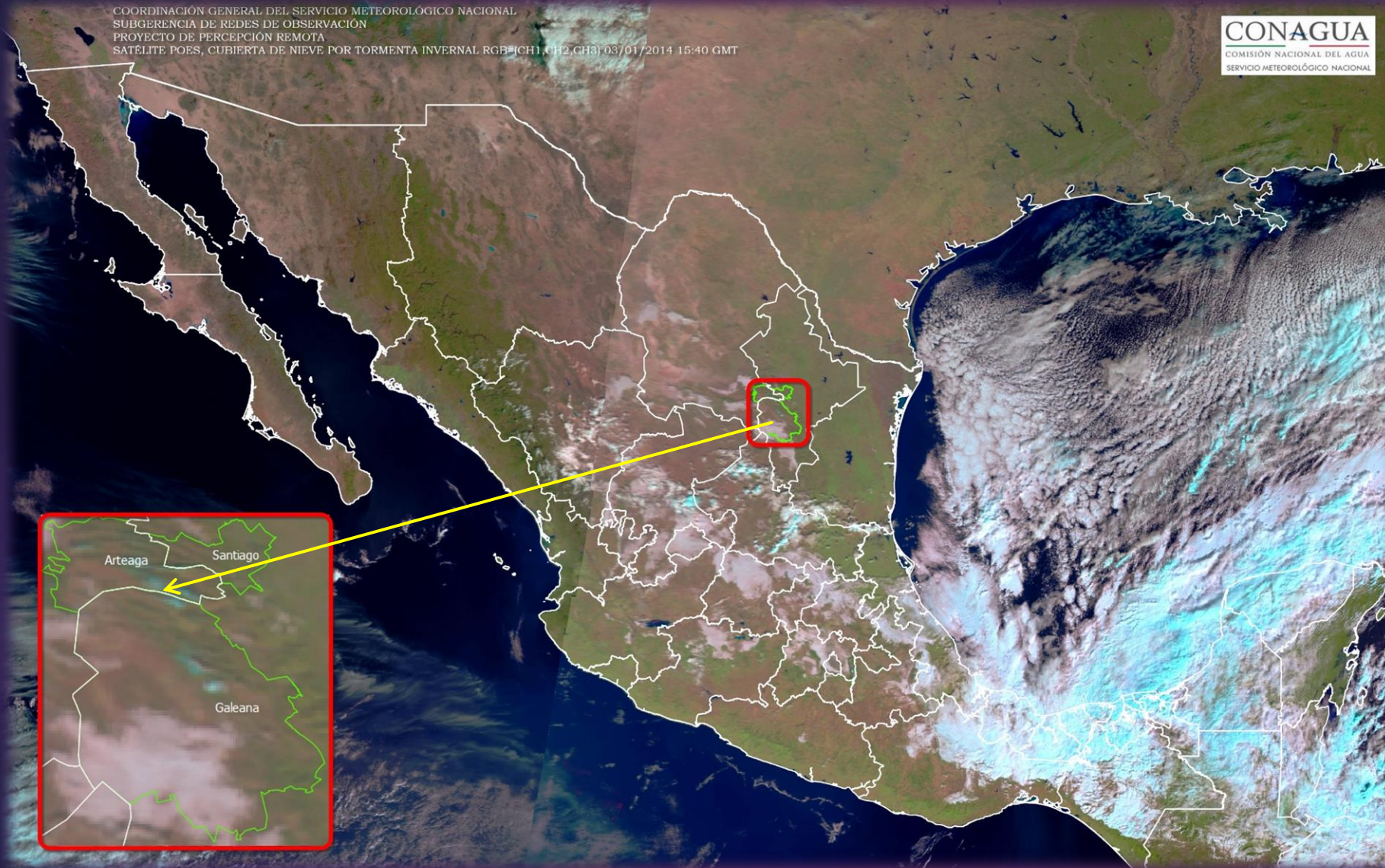


850 hPa



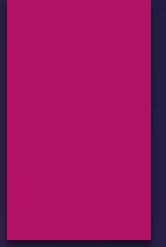
COORDINACIÓN GENERAL DEL SERVICIO METEOROLÓGICO NACIONAL
SUBGERENCIA DE REDES DE OBSERVACIÓN
PROYECTO DE PERCEPCIÓN REMOTA
SATELITE POES, CUBIERTA DE NIEVE POR TORMENTA INVERNAL RGB (CH1, CH2, CH3) 03/01/2014 15:40 GMT

CONAGUA
COMISIÓN NACIONAL DEL AGUA
SERVICIO METEOROLÓGICO NACIONAL

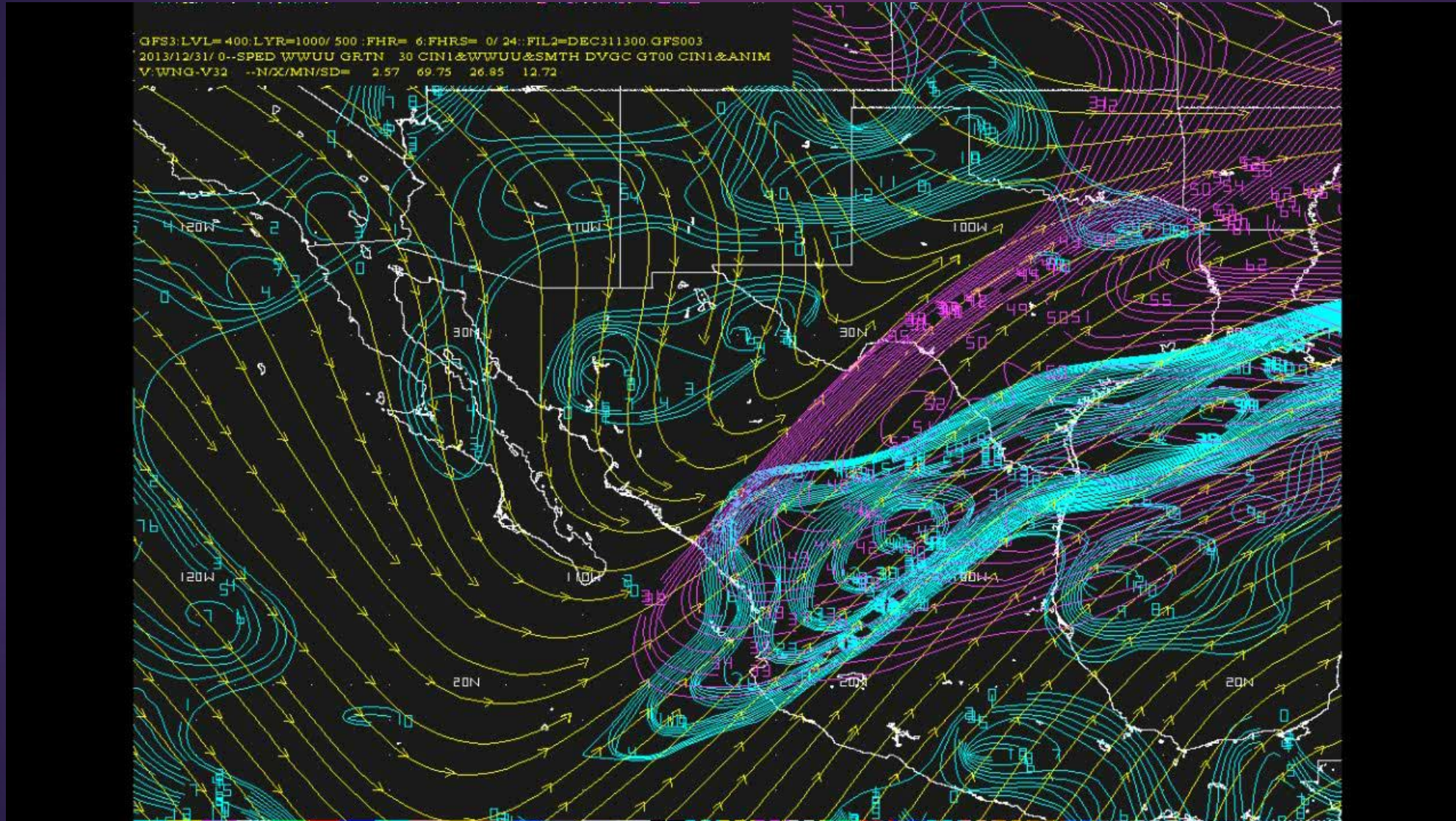


SATELLITE POES

Snow cover for
Winter storm

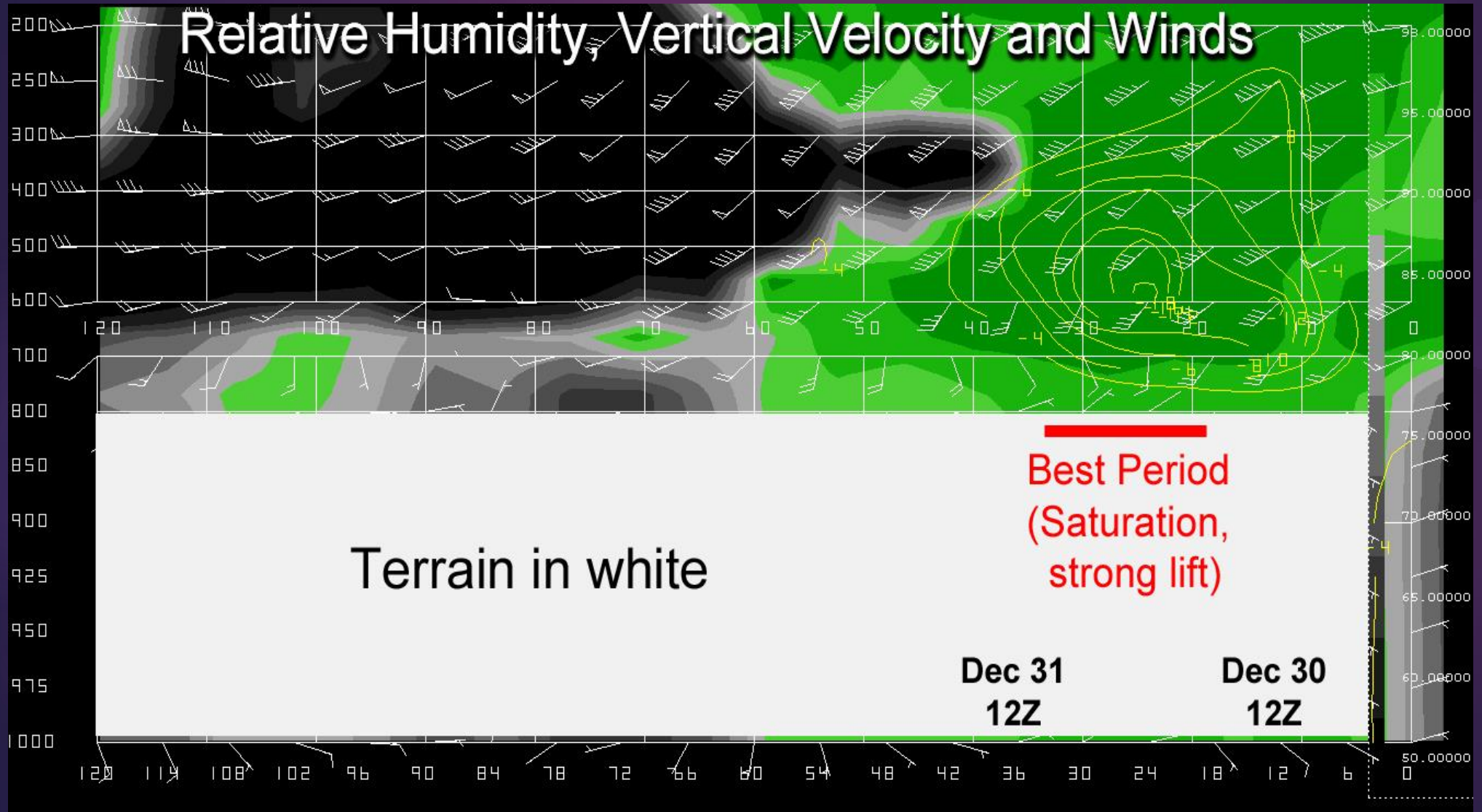


400 – 200 Hpa Divergencia promediada En la misma capa

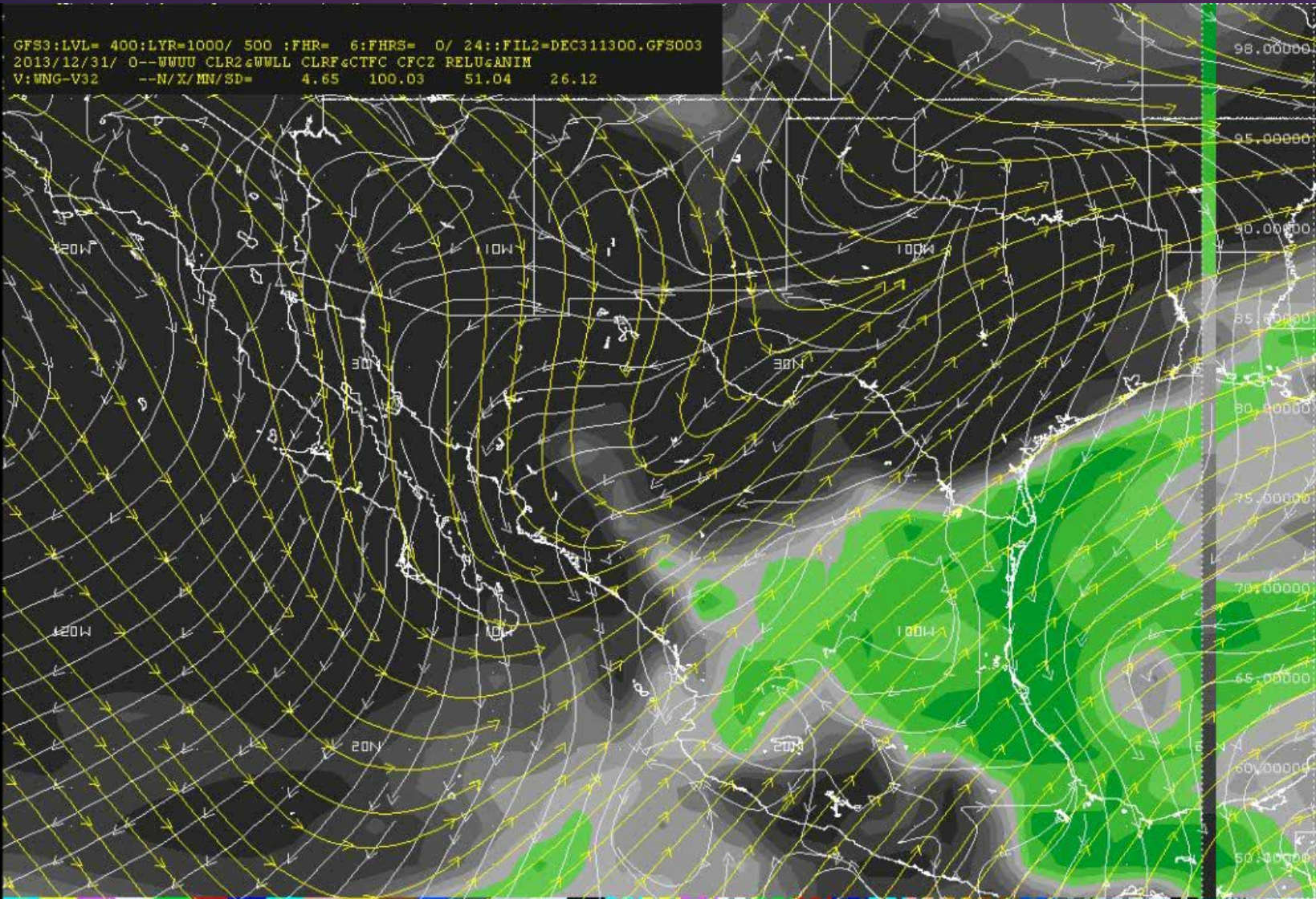


Entrada derecha
del jet.

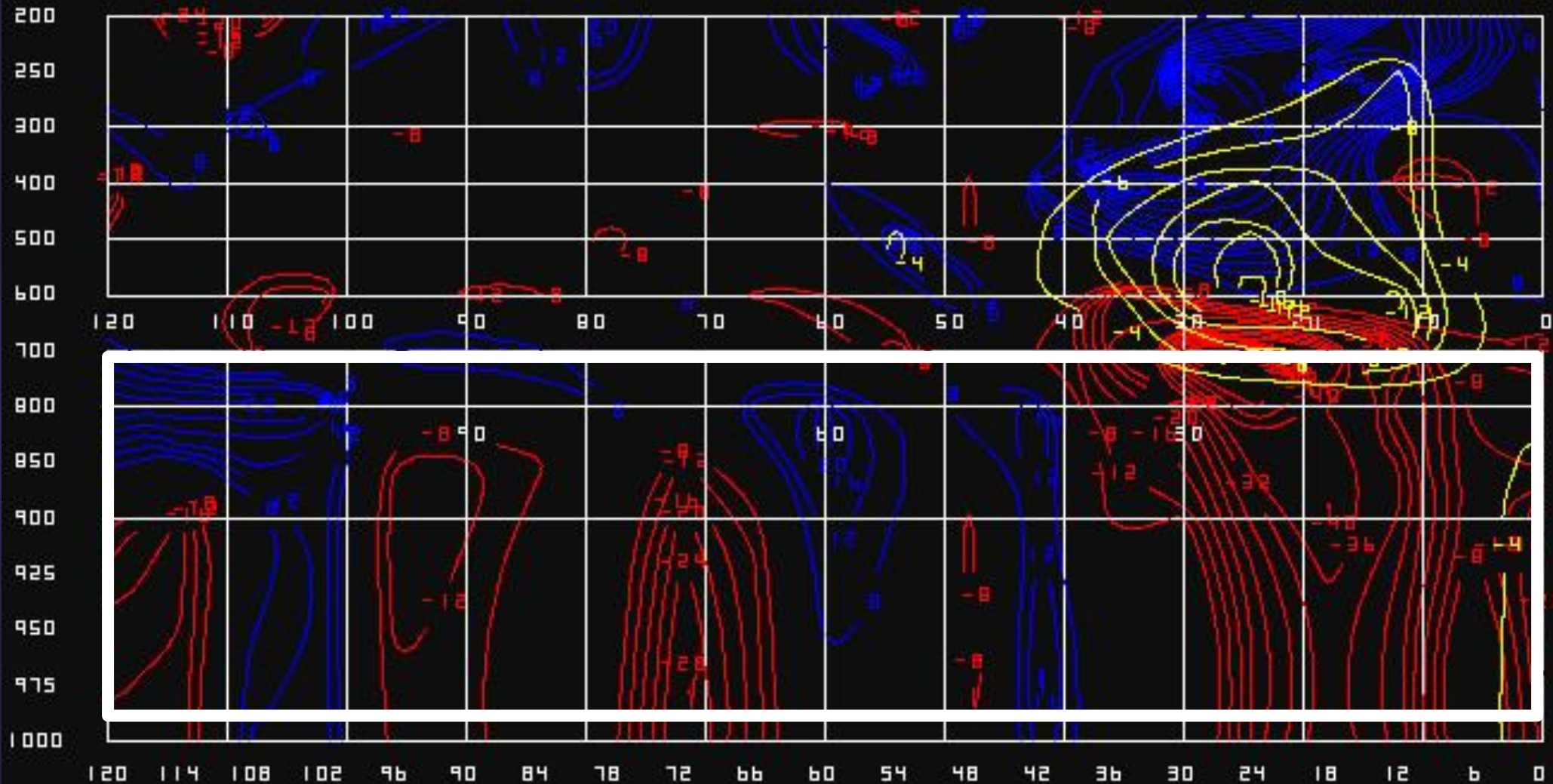
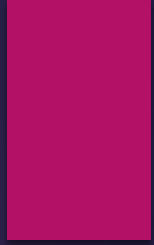
TIME SECTION (RELATIVE HUMIDITY, VERTICAL VELOCITY AND WINDS)



RELATIVE HUMIDITY AND WINDS 1000-500 hPa



DIVERGENCE AND VERTICAL VELOCITY



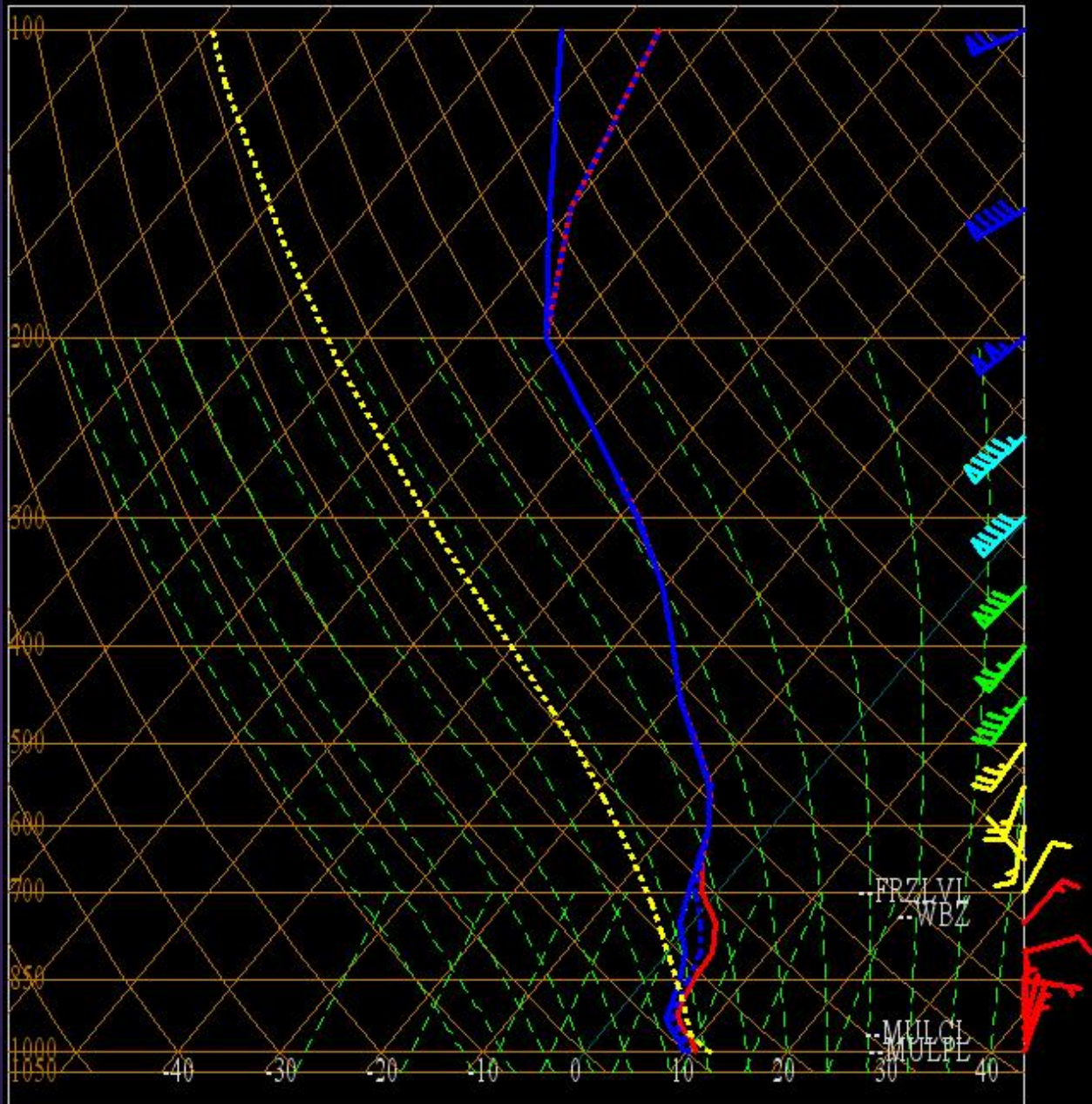
MODEL DATA GFS3 00 UTC TUE 31 DEC 2013

STATION ID : N/A / 0 - STATION NOT FOUND

LAT/LON: 25.10 / -100.30

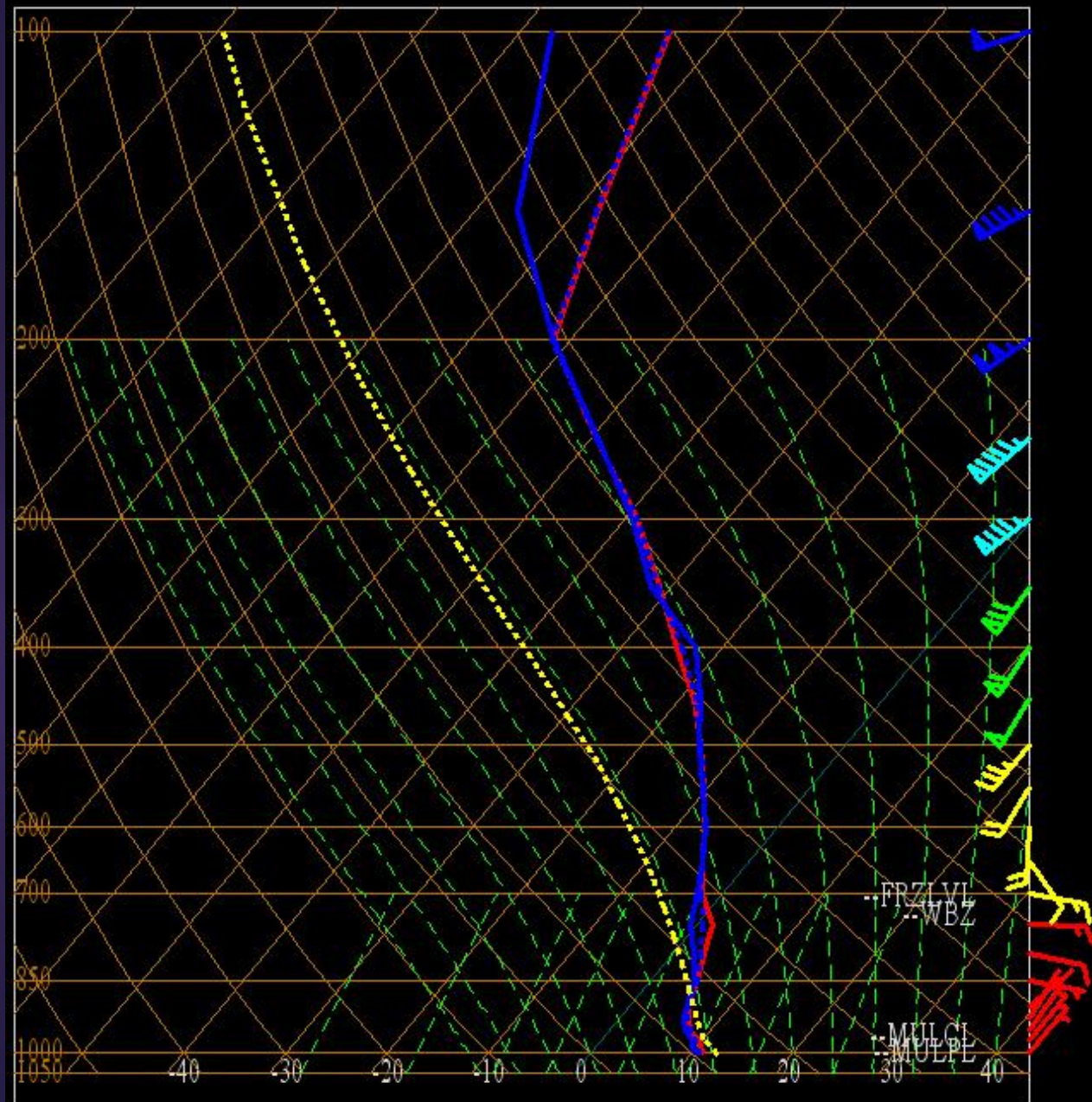
GRDX/GRDY 259 / 115

FRZLVL: 2929.05 PRECIP TYPE: RAIN
PWATER: 3.04 1000-500 THKNS: 5556.79
CONVT: 12.35 1000-700 THKNS: 2916.68
HSIZE: 0.00 1000-850 THKNS: 1338.46
DENBUOY: 0.00 700-500 THKNS: 2640.11
-- PARCEL -- 850-500 THKNS: 4218.33
CAPE: -1.00 850-700 THKNS: 1578.22
CIN: 1.00
LIFTED: 11.51
KINDEX: 20.47
TOTAL: 34.50
CRSTOT: 16.13
VERTOT: 18.37
SHWLTR: 9.81
SWEATX: 68.79
VVMAX: 0.00
-- WIND --
AVG DIR: 220.43
AVG SPD: 25.30
BRSHEAR: 35.27
STORM MOTION (DIR/SPD): 304.25 / 9.20
STORM REL HELICITY: -990.91
STORM REL HOLICITY: -1511.82
-- OTHER --
BRN: -0.03
EHI: 0.01
VGP: NaN
SCP: 0.01
STP: 0.01



GFS
Skew
T-log P

00Z



MODEL DATA GFS3 12 UTC TUE 31 DEC 2013

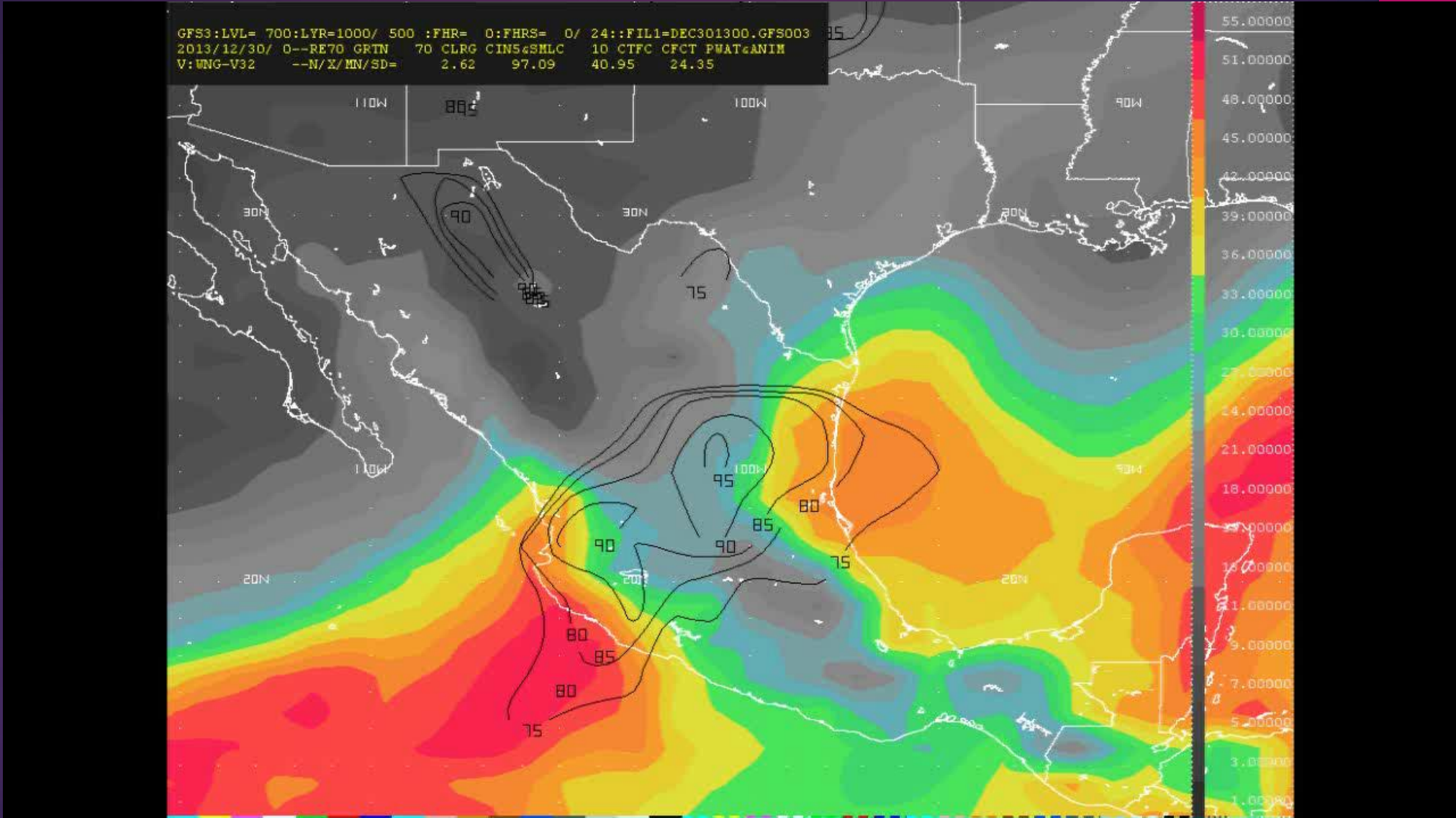
STATION ID : N/A / 0 - STATION NOT FOUND
 LAT/LON: 25.10 / -100.30
 GRDX/GRDY 259 / 115

 FRZLVL: 2855.34 PRECIP TYPE: RAIN
 PWATER: 3.10 1000-500 THKNS: 5544.65
 CONV: 12.53 1000-700 THKNS: 2912.09
 HSIZE: 0.00 1000-850 THKNS: 1339.35
 DENBUOY: 0.00 700-500 THKNS: 2632.55
 -- PARCEL -- 850-500 THKNS: 4205.30
 CAPE: -1.00 850-700 THKNS: 1572.74
 CIN: 1.00
 LIFTED: 10.61
 KINDEX: 21.96
 TOTAL: 35.43
 CRSTOT: 17.07
 VERTOT: 18.36
 SHWLTR: 9.14
 SWEATX: 80.48
 VVMAX: 0.00
 -- WIND --
 AVG DIR: 216.91
 AVG SPD: 23.98
 BRSHEAR: 26.67
 STORM MOTION (DIR/SPD): 296.72 / 8.06
 STORM REL HELICITY: -906.68
 STORM REL HOLICITY: -1231.95
 -- OTHER --
 BRN: -0.04
 EHI: 0.01
 VGP: NaN
 SCP: 0.01
 STP: 0.01

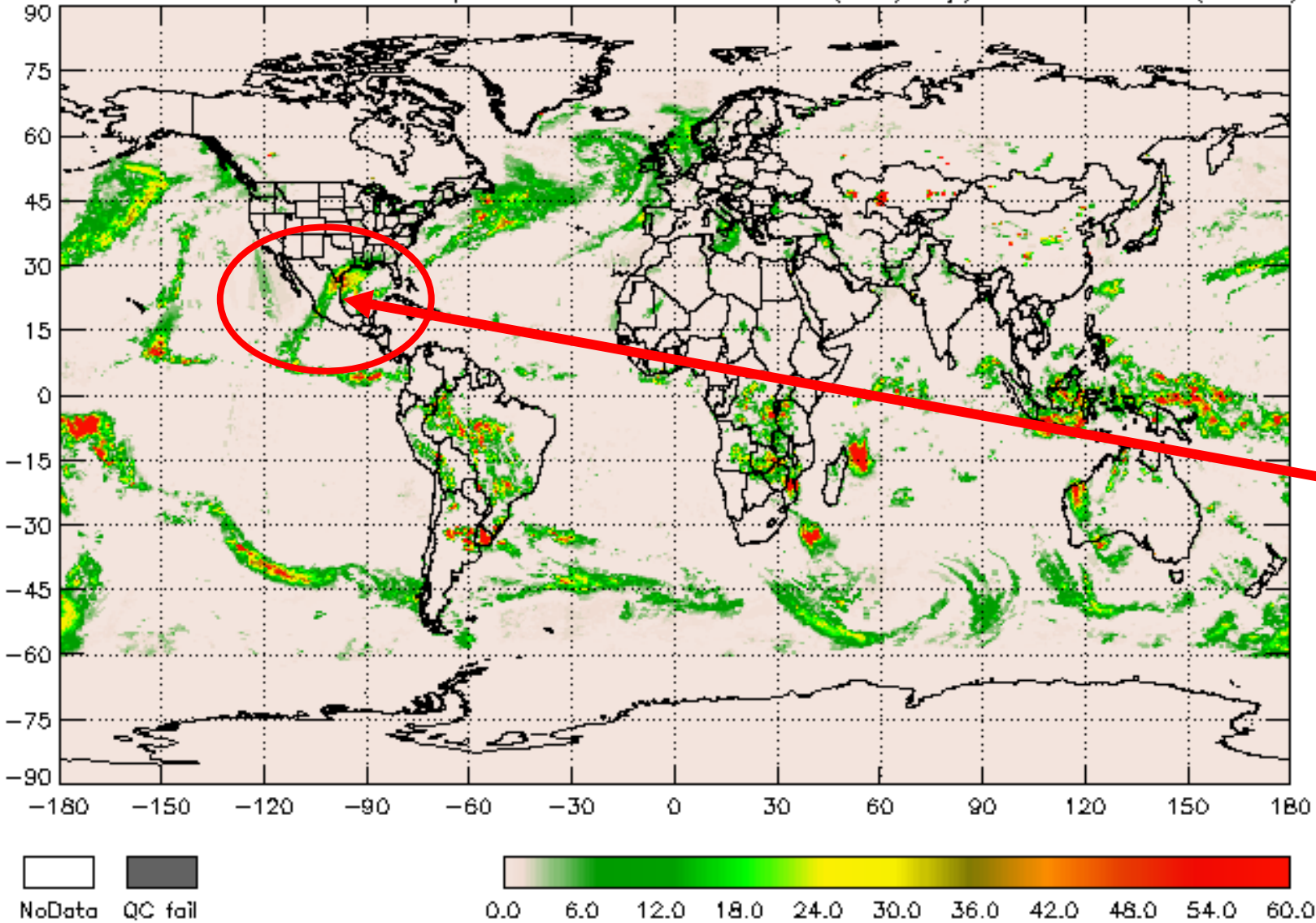
GFS
Skew
T-log P

12Z

GFS PRECIPITABLE WATER (SHADED) AND 700-500 hPa REL HUMIDITY (CONTOURS)



MIRS N18_METOPA_F16 Precipitation Estimate 12-12Z (mm/day) 2013-12-31 (V3251)

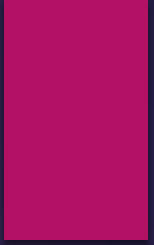
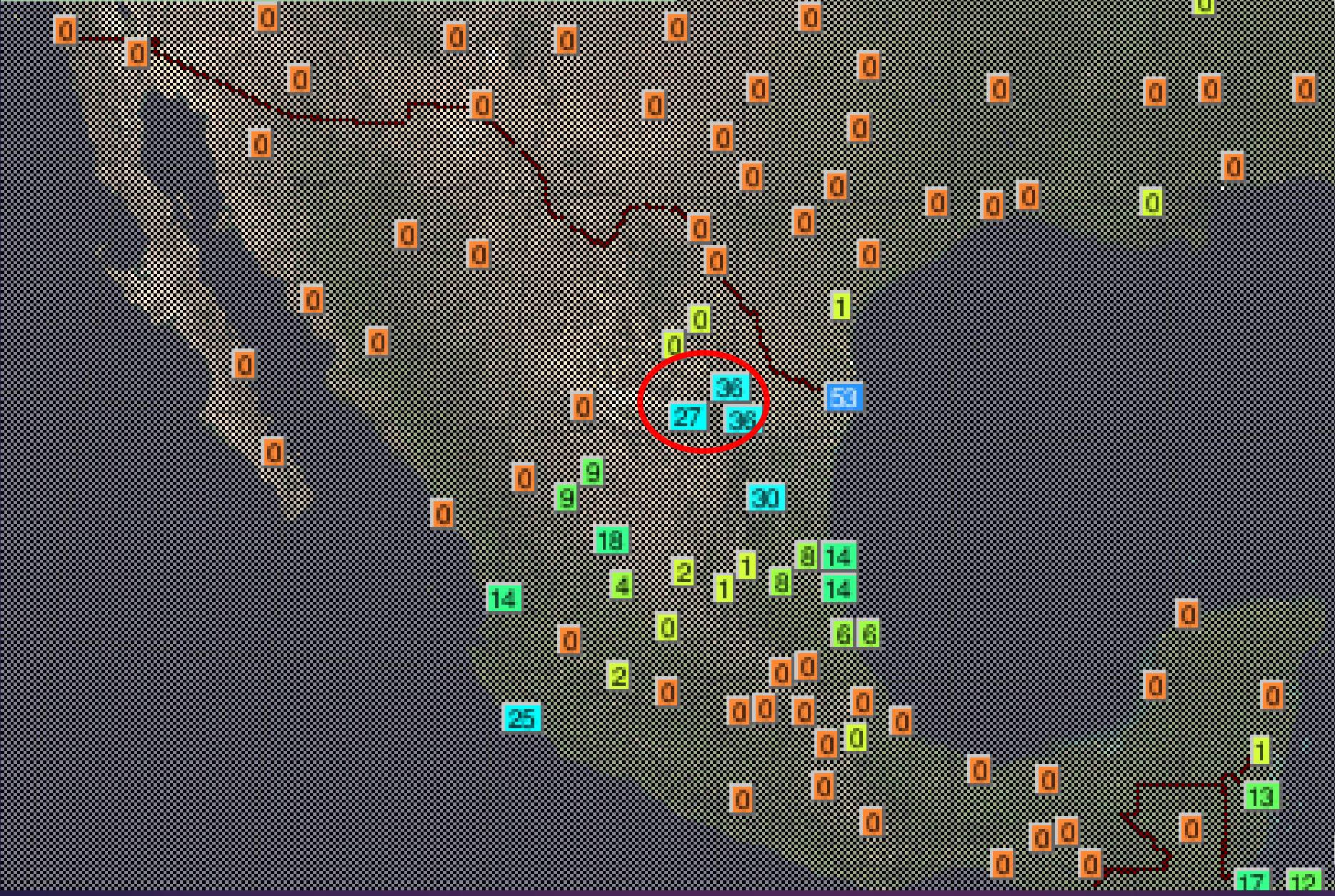


PRECIPITATION ESTIMATE mm/day

24-h Accumulated
Precipitation
30- 40mm
Estimate based on
Microwave-
Satellite
observations.

<http://mirs.nesdis.noaa.gov>

PREC. (mm en 24 H) 31/12/2013 12:00 UTC



RAIN
VALIDATION
WITH SYNOP
OGIMET

Informe meteorológico especial de lluvias

Servicio Meteorológico Nacional

México, D.F. a 31 de diciembre de 2013
Informe No. 365

Emisión: 11:00 horas

Validez del reporte de las 8:00 horas del día 30 de diciembre a las 8:00 horas del día 31 de diciembre de 2013.

Estados en el litoral del Pacífico

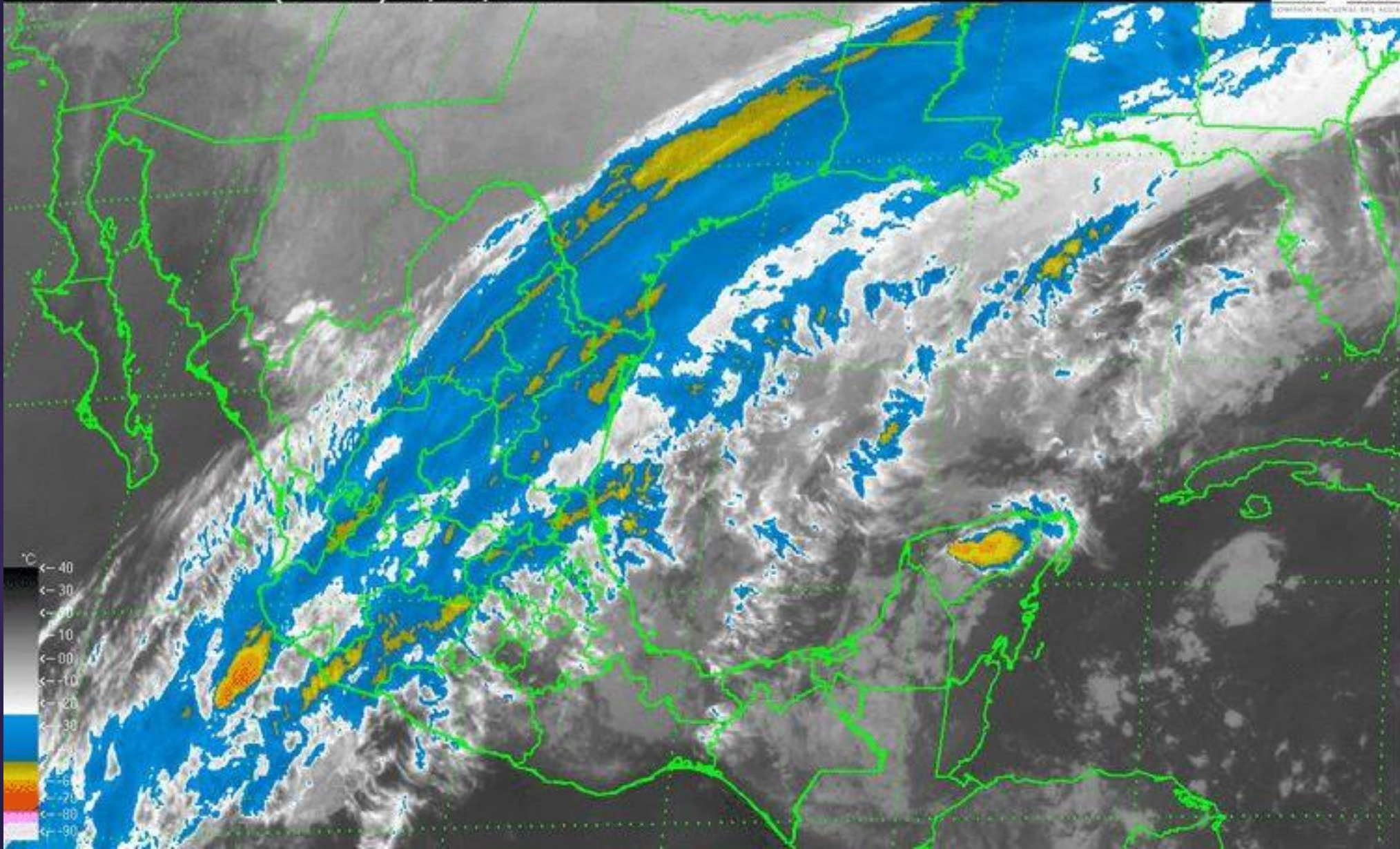
Estado	Lluvia intensa a torrencial > 70 mm	Lluvia fuerte a muy fuerte De 20 a 70 mm	Lluvia ligera a moderada < 20 mm	Lugar de lluvia Máxima	Fenómenos reportados
Estados del interior de la República					
Aguascalientes			13.8	Potrerillos	
Chihuahua		32.0		Saltillo	T
Coahuila					
Distrito Federal					
Durango			10.0	Santa Elena	
Guanajuato			2.8	Xichu	
Hidalgo			7.1	Huejutla	
México					
Morelos					
Nuevo León	88.0			Cerro Prieto	T
Puebla			11.5	Cuetzalan	
Querétaro					
San Luis Potosí		40.0		Matehuala	T
Tlaxcala					
Zacatecas		55.0		Boca del Tesoro	T

RAIN
VALIDATION

SMN

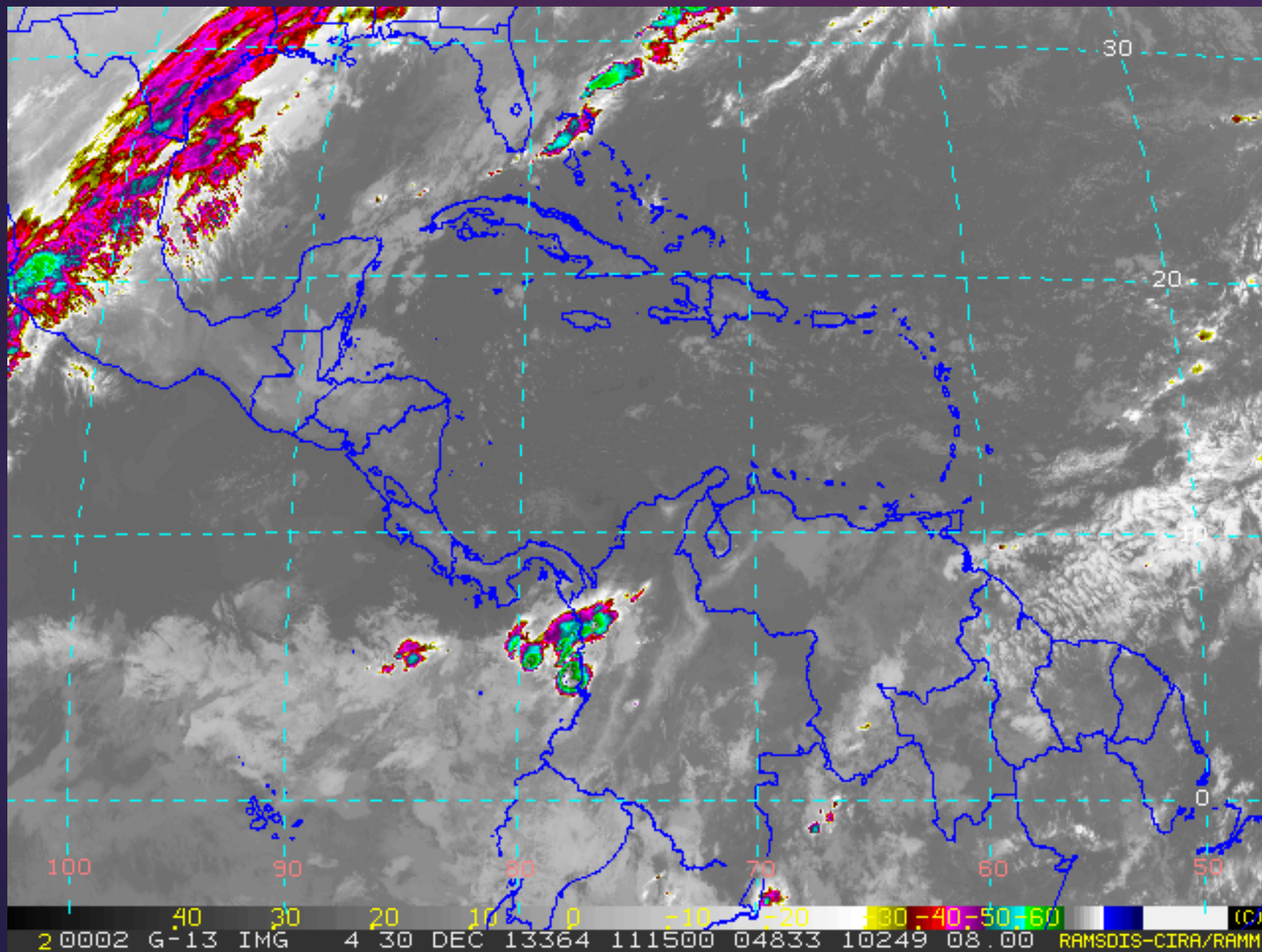
CGSMN GOES 13 IR4 (0:15 Z) 31/Dic/2013

CONAGUA
COMISIÓN NACIONAL DEL AGUA



GOES 13

INFRA-RED
SATELLITE
IMAGERY



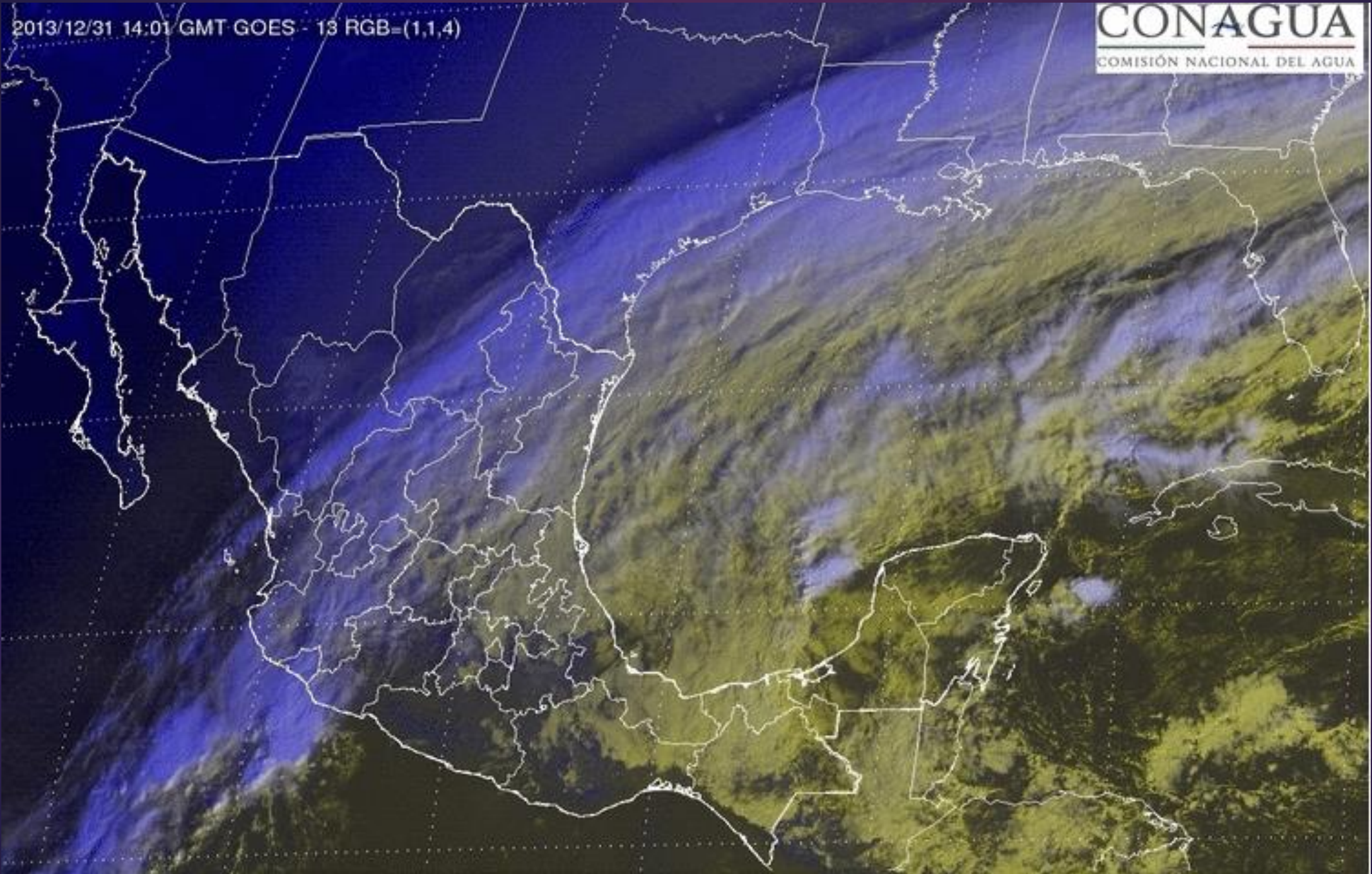
GOES 13

RAMSDIS-
CIRA/RAM

2 0002 G-13 IMG 4 30 DEC 13364 111500 04833 10249 08.00 RAMSDIS-CIRA/RAMM (C)

2013/12/31 14:01 GMT GOES - 13 RGB=(1,1,4)

CONAGUA
COMISIÓN NACIONAL DEL AGUA



GOES 13

**RGB
VIS-INFRA-RED
SATELLITE
IMAGERY**



Sierra de Arteaga Coah.

Second **snowfall depth 30 a 50 cms**, Los Oyameles altitude 2800m

December 31th 2013 early

Centro de Predicción Met.
De la Dirección Local Coahuila:
Guadalupe Gallo.



**LOS OYAMELES,
COAH. DEC 31 2013**

Latitud: 25°13'16.76" N
Longitud: 100°23'40.01" O
Altitud: 2841 m
La s

Benefits of the Tropical Desk

- **Forecast accuracy is best accomplished with good understanding of the thermodynamic and dynamic principles of the atmosphere.**
- **Understanding that Models are forecast aids. Forecast confidence increases with accurate analysis and model consensus.**
- **Improve the rainfall forecasting**
- **System identification and monitoring; influences of topography and air mass characteristics.**
- **G.D.I (Galvez-Davison Index). Tools and Techniques :**



THANK YOU