

# NWS OCEAN PREDICTION CENTER

Weather by the National Oceanic and  
Atmospheric Administration (NOAA)

Ocean Prediction Center Website:

<http://www.opc.ncep.noaa.gov>

Paul Vukits

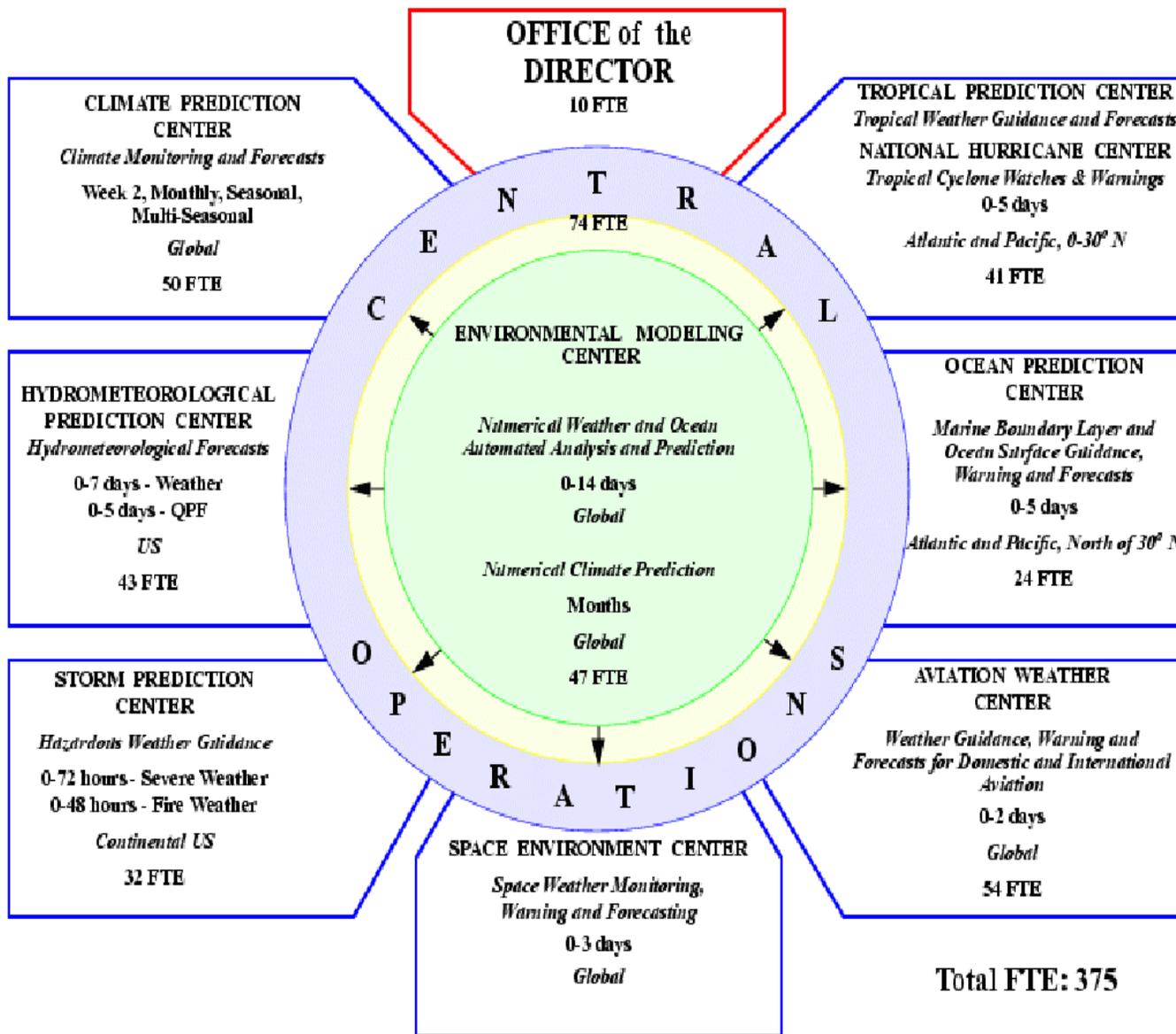
Lead Forecaster

Paul.Vukits@noaa.gov





# NATIONAL CENTERS for ENVIRONMENTAL PREDICTION



# NWS Ocean Prediction Center

## Responsibilities

- **Marine Wind Warnings via:**
  - **High Seas Text Forecasts**  
North Pacific and North Atlantic
  - **Offshore Waters Text Forecasts**  
New England Waters  
Mid-Atlantic Waters to Bermuda  
Washington and Oregon Waters  
California and North Mexican Waters
- **Weather Facsimile Charts**  
North Pacific and North Atlantic  
Surface, 500 mb, Sea State analyses  
Surface and 500 mb Forecasts to 5 days
- **Data Quality Control of Marine Observations**  
Approx. 12,000 Observations per day

# USCGC Search and Rescues



# EgyptAir 990 Flight Path

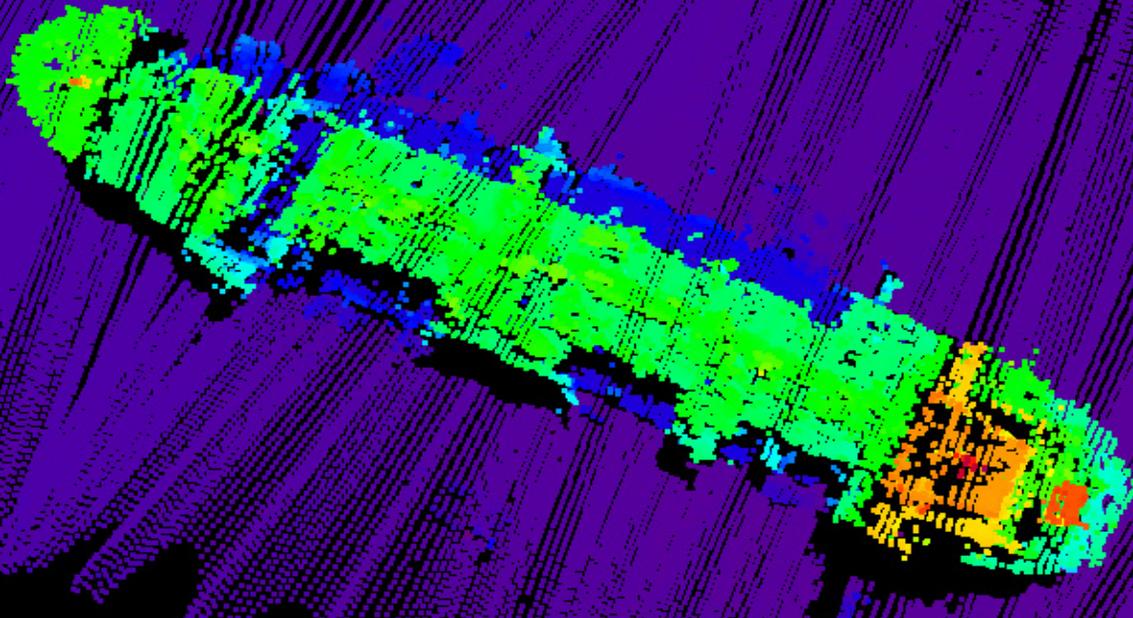


# TWA 800 Wreckage Recovery



# NOAA HAZMAT

*Bow Mariner wreckage*



*NOAA Ship Rude*



# WIND WARNINGS



**HURRICANE**

**≥ 64 knots**

**STORM**

**≥ 48 knots**

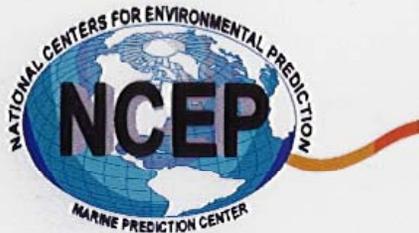


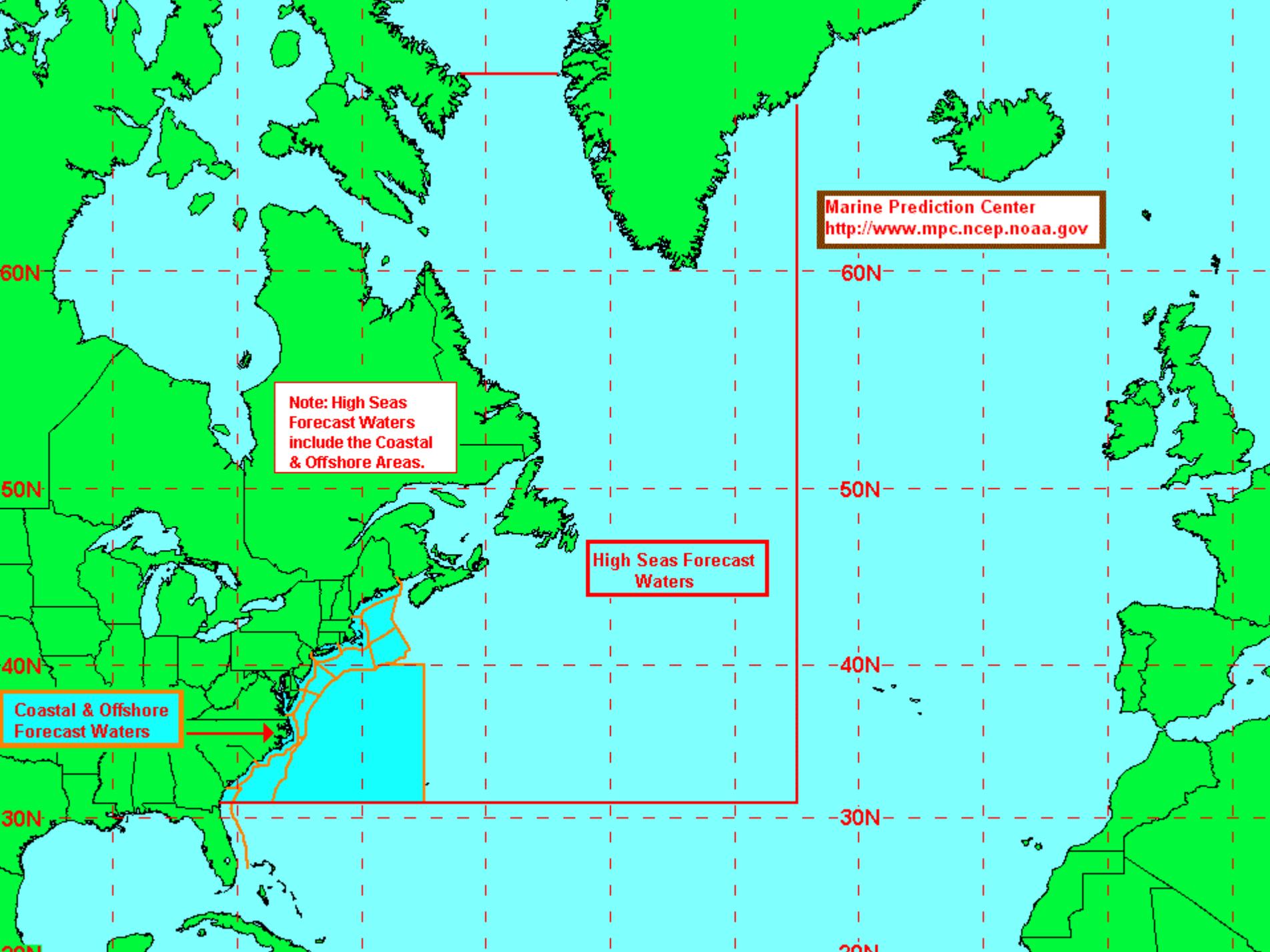
**GALE**

**34 to 47 knots**

**TROPICAL STORM**

**34 to 63 knots**





Marine Prediction Center  
<http://www.mpc.ncep.noaa.gov>

Note: High Seas Forecast Waters include the Coastal & Offshore Areas.

High Seas Forecast Waters

Coastal & Offshore Forecast Waters

# High Seas Text Forecast

HIGH SEAS FORECAST FOR METAREA IV  
NATIONAL WEATHER SERVICE WASHINGTON DC/TPC MIAMI FL  
OCEAN PREDICTION CENTER/OFB 1630 UTC JAN 31 2005  
SUPERSEDED BY NEXT ISSUANCE IN 6 HOURS

SECURITE  
NORTH ATLANTIC NORTH OF 31N TO 67N AND WEST OF 35W.

SYNOPSIS VALID 1200 UTC JAN 31  
24 HOUR FORECAST VALID 1200 UTC FEB 01.  
48 HOUR FORECAST VALID 1200 UTC FEB 02.

WARNINGS.

...STORM WARNING...

.LOW 35N 71W 1002 MB MOVING SE 15 KT NEXT 24 HOURS...THEN  
BECOMING ABOUT STATIONARY. WINDS 35 TO 50 KT SEAS 14 TO 21 FT  
WITHIN 150 NM NW SEMICIRCLE. ELSEWHERE WINDS 25 TO 40 KT SEAS 8  
TO 15 FT OVER FORECAST WATERS S OF 40N BETWEEN 65W AND 77W.  
.24 HOUR FORECAST LOW 33N 62W 1001 MB. FORECAST WINDS 35 TO 45  
KT SEAS 15 TO 24 FT WITHIN 240 NM NW QUADRANT. ELSEWHERE  
FORECAST WINDS 25 TO 35 KT SEAS 10 TO 18 FT OVER FORECAST WATERS  
S OF 40N BETWEEN 54W AND 70W.  
.48 HOUR FORECAST LOW 33N 61W 994 MB. FORECAST WINDS 40 TO 50 KT  
SEAS 18 TO 28 FT WITHIN 420 NM NW AND W QUADRANTS. ELSEWHERE  
FORECAST WINDS 25 TO 40 KT SEAS 11 TO 20 FT OVER FORECAST WATERS  
S OF 42N BETWEEN 50W AND 70W.

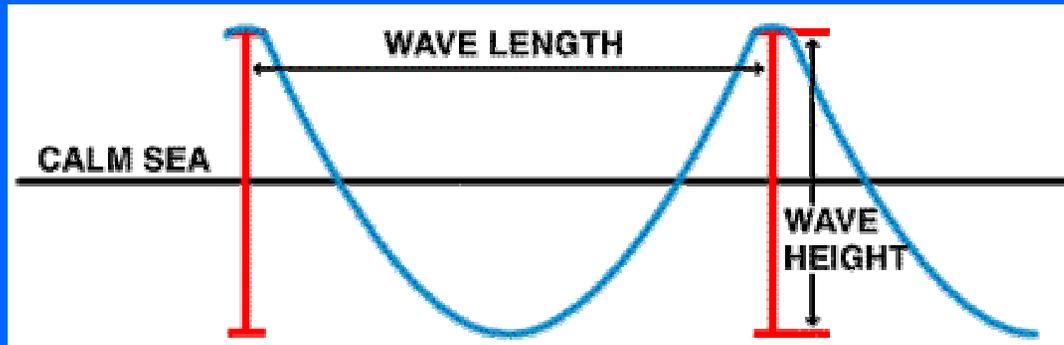
...STORM WARNING...

.LOW 48N 43W 998 MB MOVING N 25 KT NEXT 24 HOURS...THEN TURNING  
MORE NE. WINDS 30 TO 45 KT SEAS 18 TO 28 FT WITHIN 420 NM E AND  
NE QUADRANTS. ALSO WINDS 25 TO 35 KT SEAS 11 TO 17 FT WITHIN 540  
NM W AND NW QUADRANTS AND ELSEWHERE OVER FORECAST WATERS N OF  
40N AND E OF 50W.  
.24 HOUR FORECAST LOW 59N 44W 990 MB. FORECAST WINDS 40 TO 55 KT  
SEAS 21 TO 32 FT WITHIN 540 NM SE QUADRANT. ELSEWHERE FORECAST



OPC Forecasts 10 Meter Level Winds

# How are waves described?



Wave height is the height of the wave from the wave top, called the wave crest, to the bottom of the wave, called the wave trough. Wave length is defined as the horizontal distance between two successive crests or troughs.

During storms, the wave heights increase while the wave lengths decrease. Wave heights during storms may exceed 10 meters (33 feet). The wave length during storms tend to decrease; some may be as small as 15 meters (50 feet).

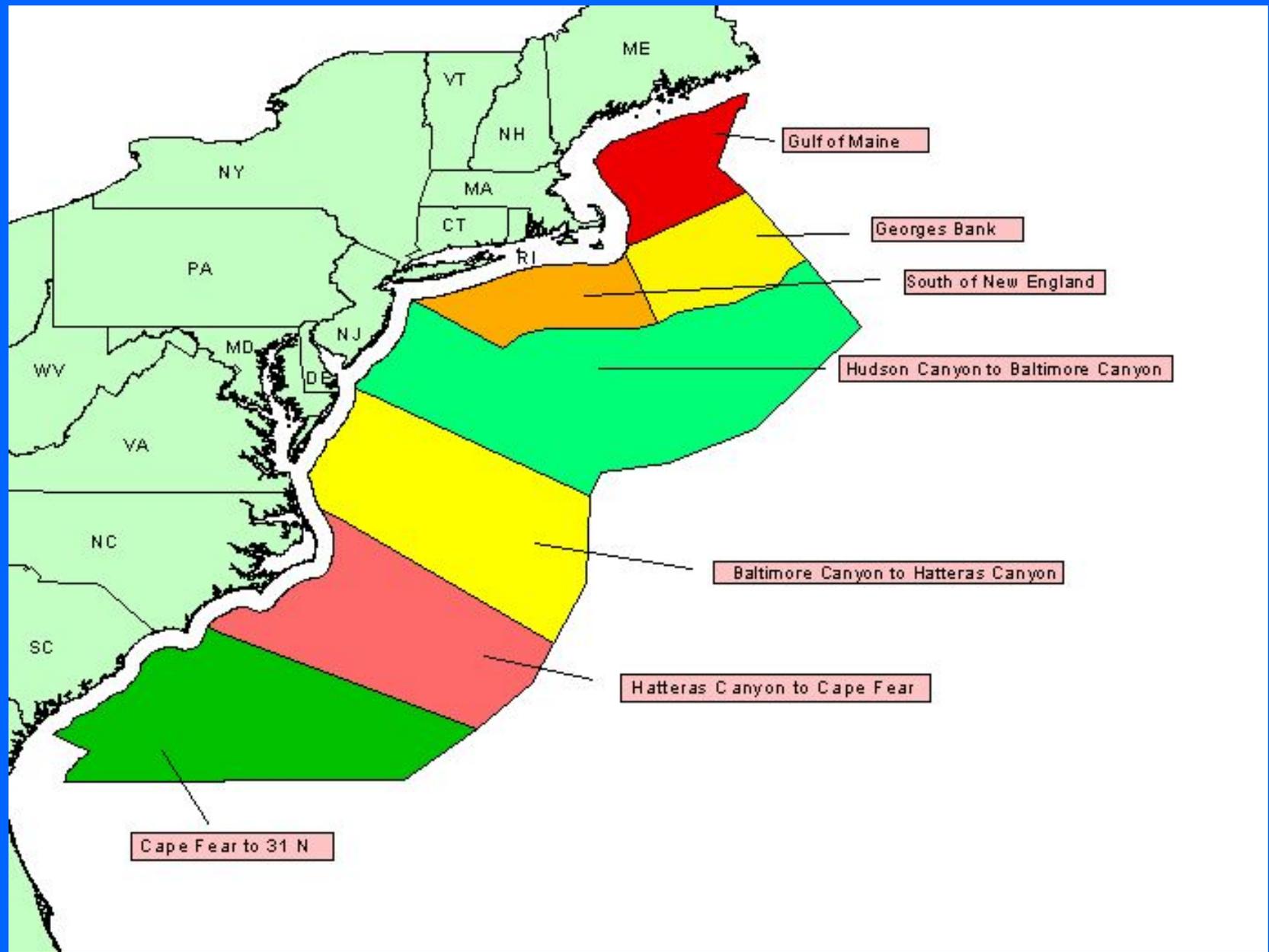
Significant wave height is approximately equal to the average of the highest one-third of the waves



# Wind waves 3

- Generally, it is assumed that individual wave heights can be described using a Rayleigh distribution. This implies that for a significant wave height  $H_s = 10\text{m}$  (33ft), one can expect :
  - 1 in 10 waves to be larger than 10.7m (36ft).
  - 1 in 100 waves to be larger than 15.1m (51ft).
  - 1 in 1000 waves to be larger than 18.6m (62ft).
- This implies that the largest individual wave that one might encounter in a storm is roughly twice as high as the significant wave height !
- In rapidly changing conditions the disparity between the significant wave height and the largest individual waves might even be larger.

# U.S. Offshore Marine Text Forecasts by Zone



# Offshore Text Forecast

OFFSHORE WATERS FORECAST  
NATIONAL WEATHER SERVICE WASHINGTON DC  
OCEAN PREDICTION CENTER/OCEAN FORECAST BRANCH  
930 AM EST MON 31 JAN 2005

W CENTRAL N ATLC CONTINENTAL SHELF AND SLOPE WATERS BEYOND 20 NM  
TO 250 NM OFFSHORE...INCLUDING S OF GEORGES BANK FROM 1000 FMS  
TO 250 NM OFFSHORE

ANZ084-312030-  
HUDSON CANYON TO BALTIMORE CANYON INCLUDING THE WATERS S OF 1000  
FMS OUT TO 40N 65W TO 38N 67W TO 36N 70W  
930 AM EST MON 31 JAN 2005

## **STORM WARNING**

### **GALE FORCE WINDS POSSIBLE WED AND THU**

...N WALL OF GULF STREAM NEAR 37.4N 72.1W...38.2N 69.6W...38N  
68W...38.4N 66.6W...38.4N 66W...

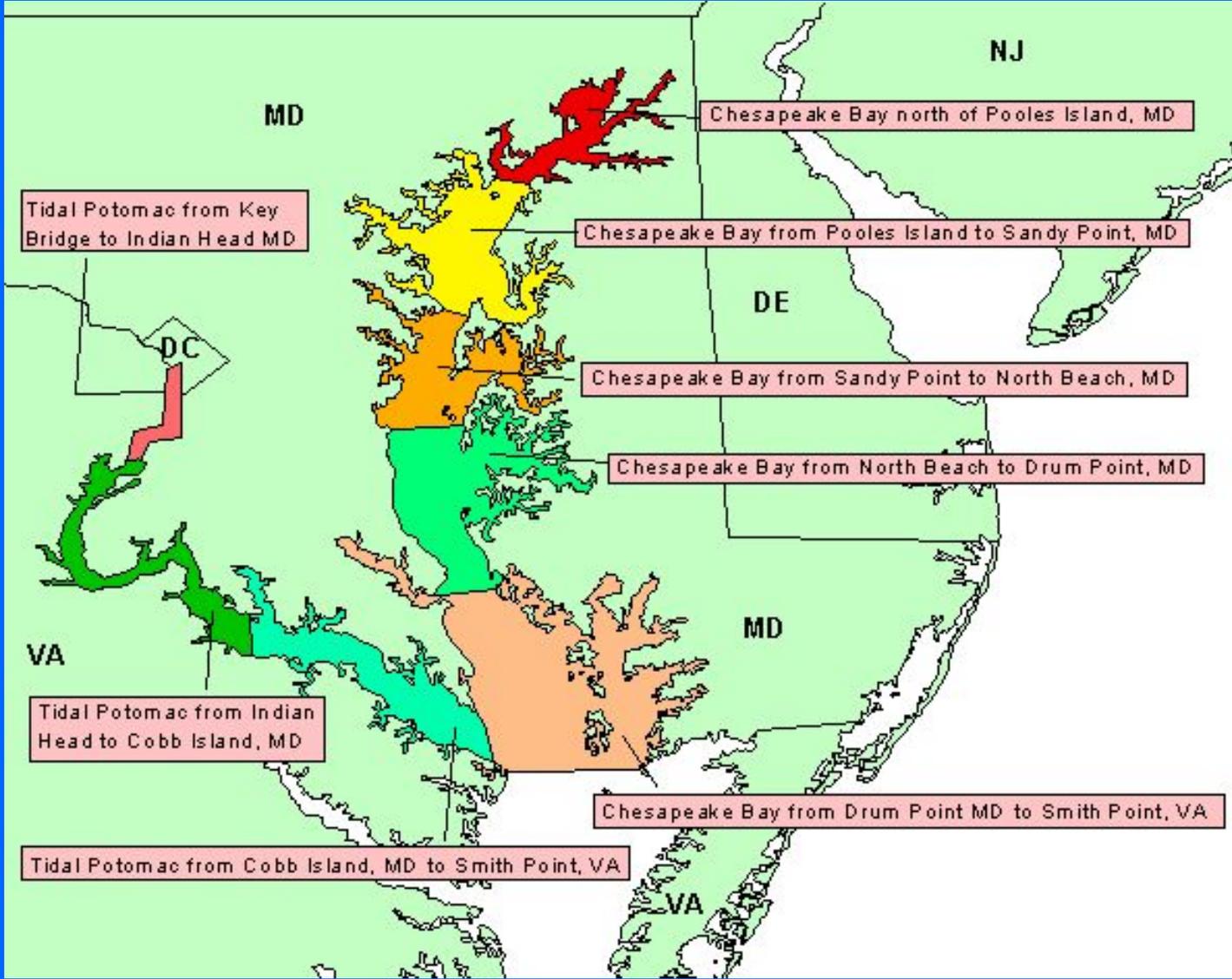
### **THIS AFTERNOON**

NE WINDS 30 TO 40 KT...40 TO 50 KT FROM THE  
GULF STREAM SE...AND 20 TO 30 KT W OF 1000 FMS. NE WINDS  
DECREASING TO 15 TO 25 KT W OF 72W AND TO 25 TO 35 KT E OF  
72W...EXCEPT TO 45 KT SE OF GULF STREAM. SEAS 9 TO 16  
FT...HIGHEST SE...BECOMING 6 TO 12 FT W OF 1000 FMS...AND 10 TO  
16 FT E OF 1000 FMS...EXCEPT BUILDING TO 22 FT OVER GULF STREAM.  
RAIN...A FEW TSTMS...AND FOG SE PORTION WITH VSBY LESS THAN 1  
NM. RAIN ENDING THIS AFTERNOON AND VSBY IMPROVING.

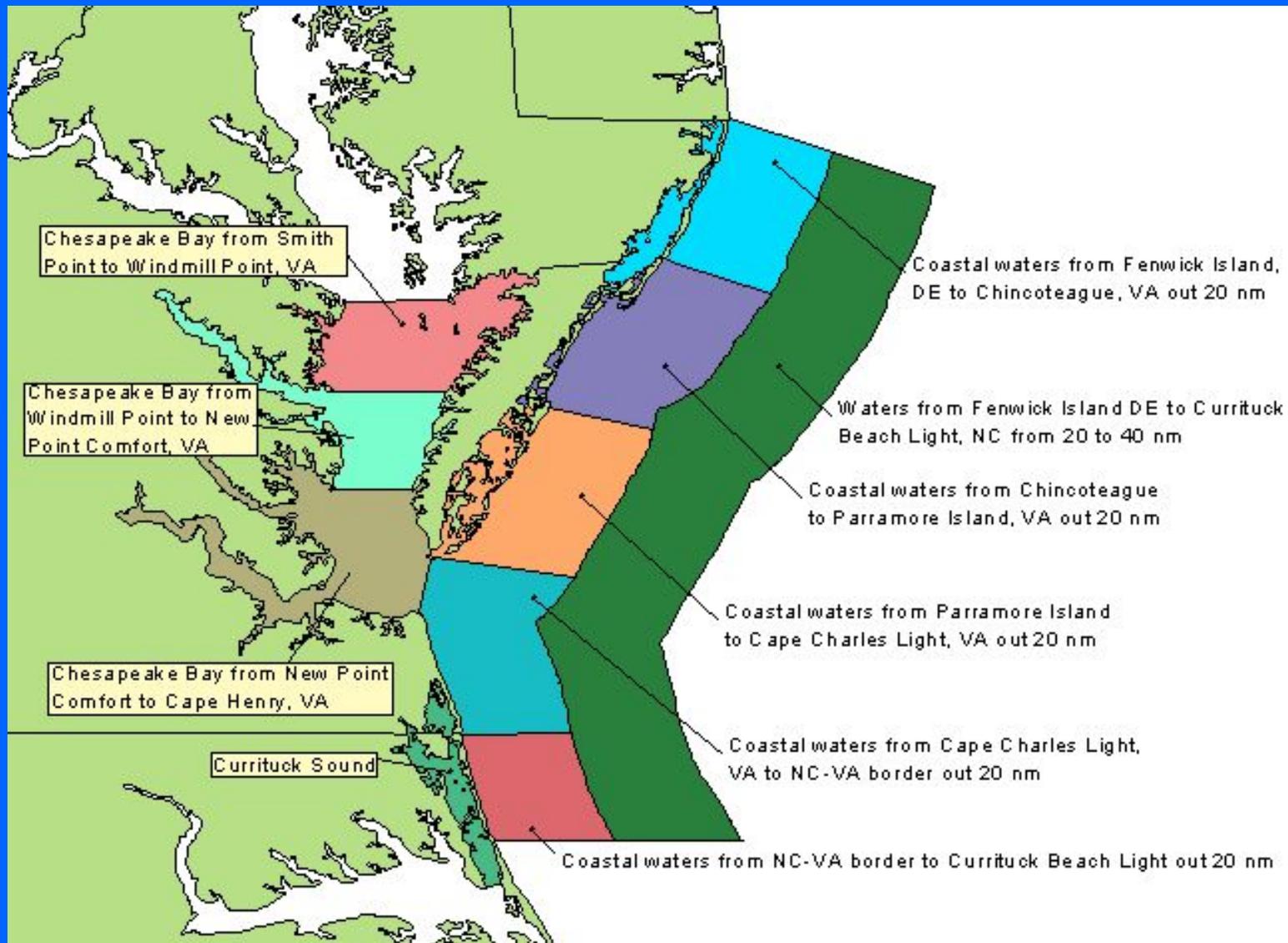
### **TONIGHT**

NE WINDS DECREASING TO 15 TO 25 KT...EXCEPT TO 30 KT  
FAR E WATERS LATE. SEAS 6 TO 11 FT...EXCEPT BECOMING 11 TO 18 FT

# Coastal Marine Zone Forecasts by the Baltimore/Washington, DC Forecast Office



# Coastal Marine Zone Forecasts by the Wakefield, VA Forecast Office



# Coastal Text Forecast

## COASTAL WATERS FORECAST

NATIONAL WEATHER SERVICE BALTIMORE MD/WASHINGTON DC

919 AM EST MON JAN 31 2005

TIDAL POTOMAC RIVER AND MARYLAND PORTION OF CHESAPEAKE BAY.

FORECASTS OF WAVE HEIGHTS DO NOT INCLUDE EFFECTS OF WIND DIRECTION  
RELATIVE TO TIDAL CURRENTS. EXPECT HIGHER WAVES WHEN WINDS ARE  
BLOWING AGAINST THE TIDAL FLOW.

ANZ500-312300-

### **SYNOPSIS FOR THE TIDAL POTOMAC AND MD PORTION OF THE CHESAPEAKE BAY**

HIGH PRESSURE OVER THE WATERS THROUGH THE MIDDLE OF THE WEEK.  
ANOTHER AREA OF LOW PRES WILL MOVE ALONG THE SOUTHEAST STATES THU  
AND FRI...BUT SHOULD STAY TO OUR SOUTH.

ANZ535-536-312300-

TIDAL POTOMAC FROM KEY BRIDGE TO INDIAN HEAD-  
TIDAL POTOMAC FROM INDIAN HEAD TO COBB ISLAND-  
919 AM EST MON JAN 31 2005

### **THIS AFTERNOON**

N WINDS 10 KT. WAVES 1 FT OR LESS IN ICE FREE WATERS.

### **TONIGHT**

N WINDS 5 TO 10 KT. WAVES LESS THAN 1 FT.

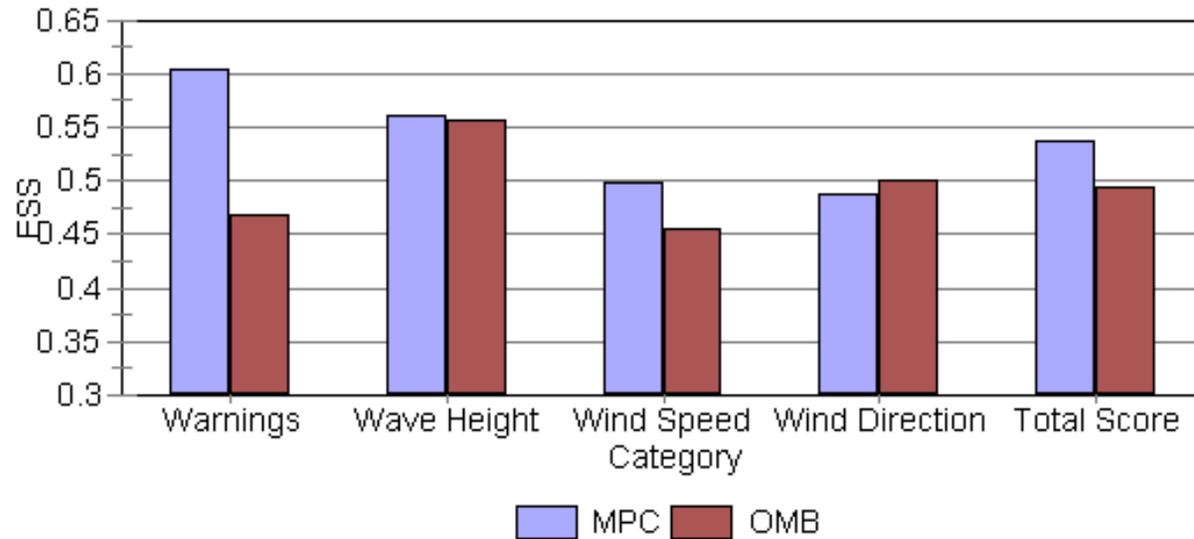
### **TUE**

N WINDS AROUND 5 KT. WAVES LESS THAN 1 FT.

### **TUE NIGHT**

N WINDS AROUND 5 KT. WAVES LESS THAN 1 FT.

## Total Score



**OPC Verification vs. Ocean Modeling Branch (1997–2000)**

# Ocean Prediction Center Homepage

<http://www.opc.ncep.noaa.gov>

http://www.opc.ncep.noaa.gov/ [Navigation icons: back, forward, stop, refresh, home, search, print, etc.] Paul [User profile icon]



## National Weather Service Ocean Prediction Center

www.nws.noaa.gov



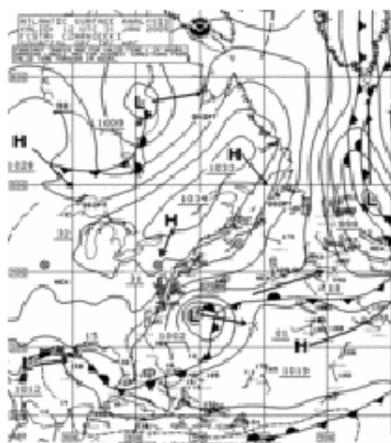
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Search OPC

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  - Vision & Mission
  - Strategic Plan
  - Staff
  - Accomplishments
- Fax Graphics With Transmission Time
  - Atlantic
  - Pacific
- Transmission Schedules And Frequencies
  - Coastal/Offshore/High Seas Forecasts
  - Voice/HF FAX
  - WorldWide HF FAX
- Unified Surface Analysis
  - N Hemispheric
  - Surface Analysis
  - OPC Atlantic Products**
  - Blank Base Maps
  - Offshore/NAVTEX

NOAA>NWS>NCEP>Ocean Prediction Center

### Atlantic Analysis



Last Update: Monday, 31-Jan-2005 16:02:11 UTC



Latest Atlantic offshore & adjacent waters sea state analysis (feet)

Last Update: Monday, 31-Jan-2005 16:23:44 UTC

### Atlantic Forecast

[www.weather.gov/om/marine/home.htm](http://www.weather.gov/om/marine/home.htm)

http://www.nws.noaa.gov/om/marine/home.htm

NOAA's National Weather Service  
**Marine Forecasts**

www.nws.noaa.gov

Site Map News Organization Search  Go

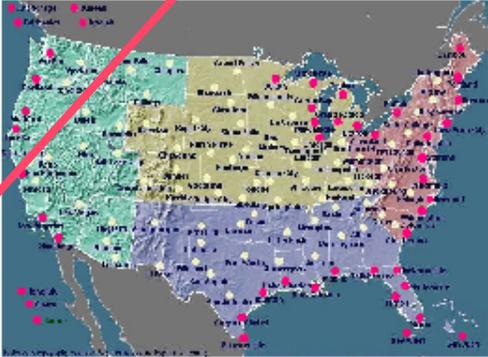
Landlubber's forecast:  
"City, St" or zip code

Home  
Parent Office  
Marine and Coastal Weather Services Branch

Items of Interest  
Marine Forecasts  
**Text, Graphic**  
Observations  
Dissemination  
Publications  
Links  
FAQ  
Contacts  
Feedback

**National Weather Service Marine Forecasts**

**Marine Forecast Offices and Centers** provide links to their products as well as additional regionally focused information. Click on map for links.



**Items of Interest to Mariners**

- A new name. We're now the "National Weather Service Marine Forecasts" page.
- Read about the dangers of [Rip Currents.....2nd largest U.S. weather killer!](#)
- Read about NWS involvement in "[The Perfect Storm](#)".
- [Change to segmented format effective Nov 03.....delayed to Dec 08](#)
- [Changes to NWS Communication Identifiers effective Nov 09](#)
- [Changes to two AK marine zone boundaries effective Nov 30](#)
- [VTEC coding to become effective Feb 08](#)
- [Marine Weather in the News, More, More, More, More, More](#)

# Communications

How can you receive weather warnings and forecasts?  
INMARSAT NAVTEX



NOAA Weather Radio

Single Side-Band

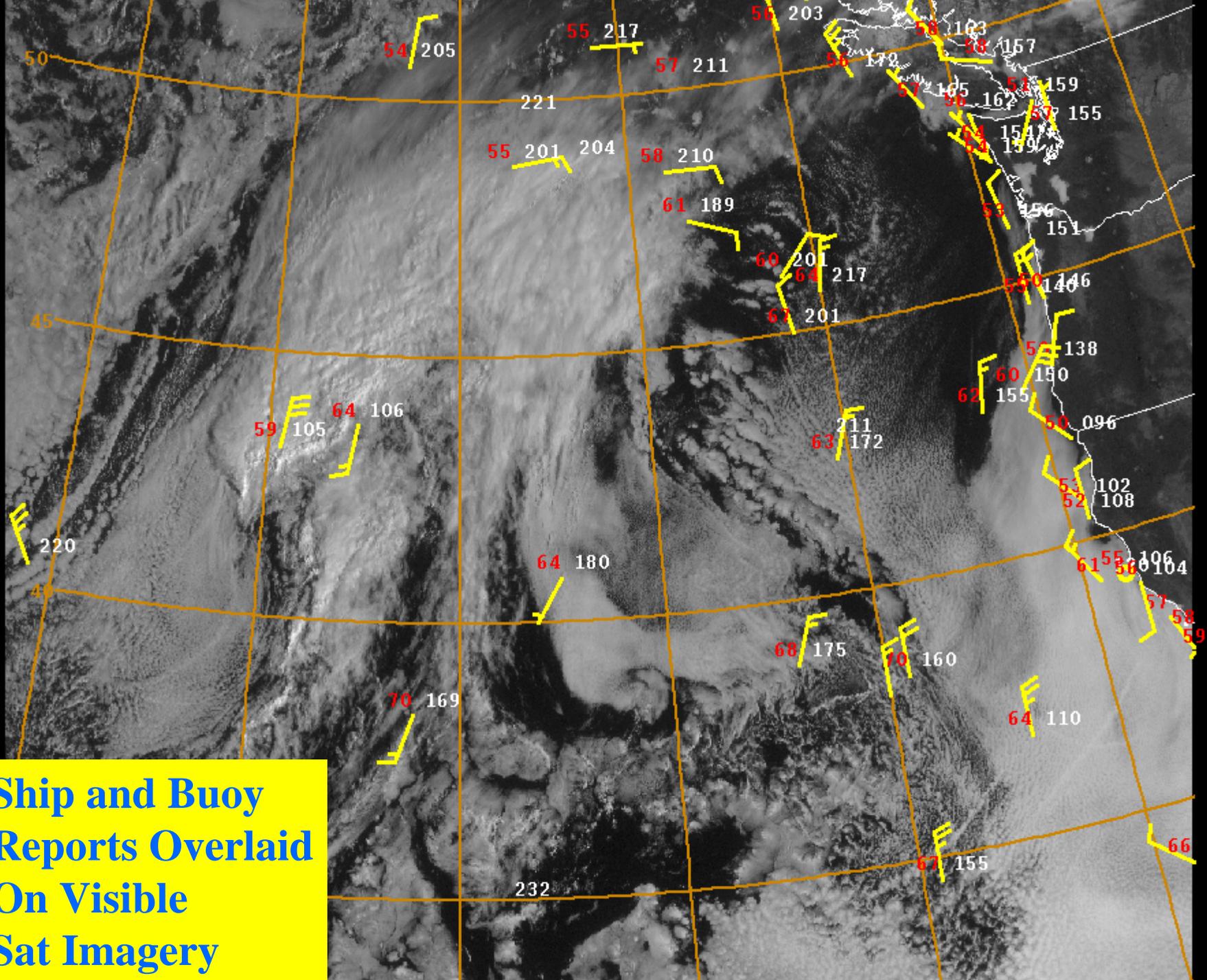
Weatherfax



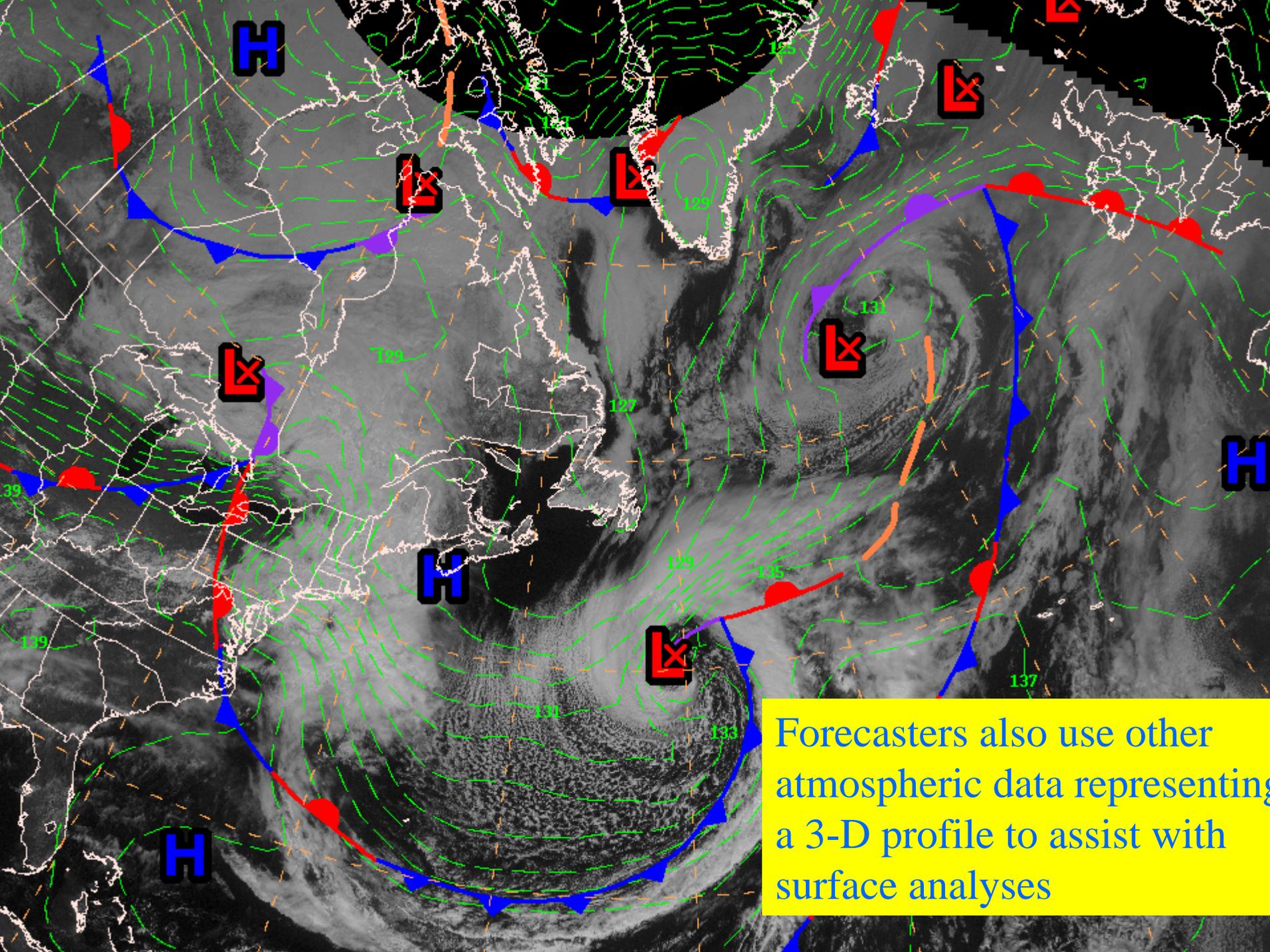
# The Forecast Process



*Man Machine Mix*



**Ship and Buoy  
Reports Overlaid  
On Visible  
Sat Imagery**



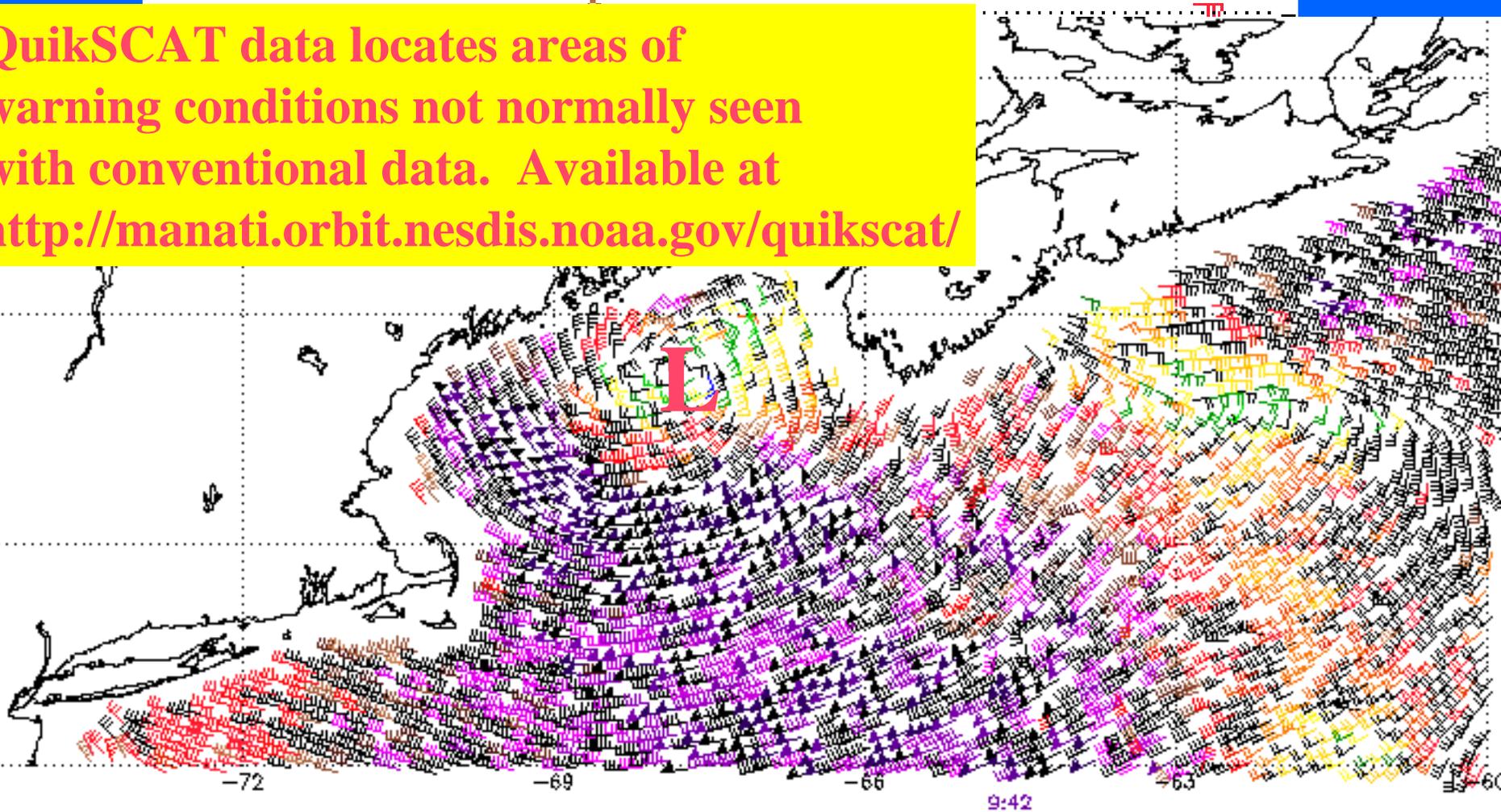
Forecasters also use other atmospheric data representing a 3-D profile to assist with surface analyses

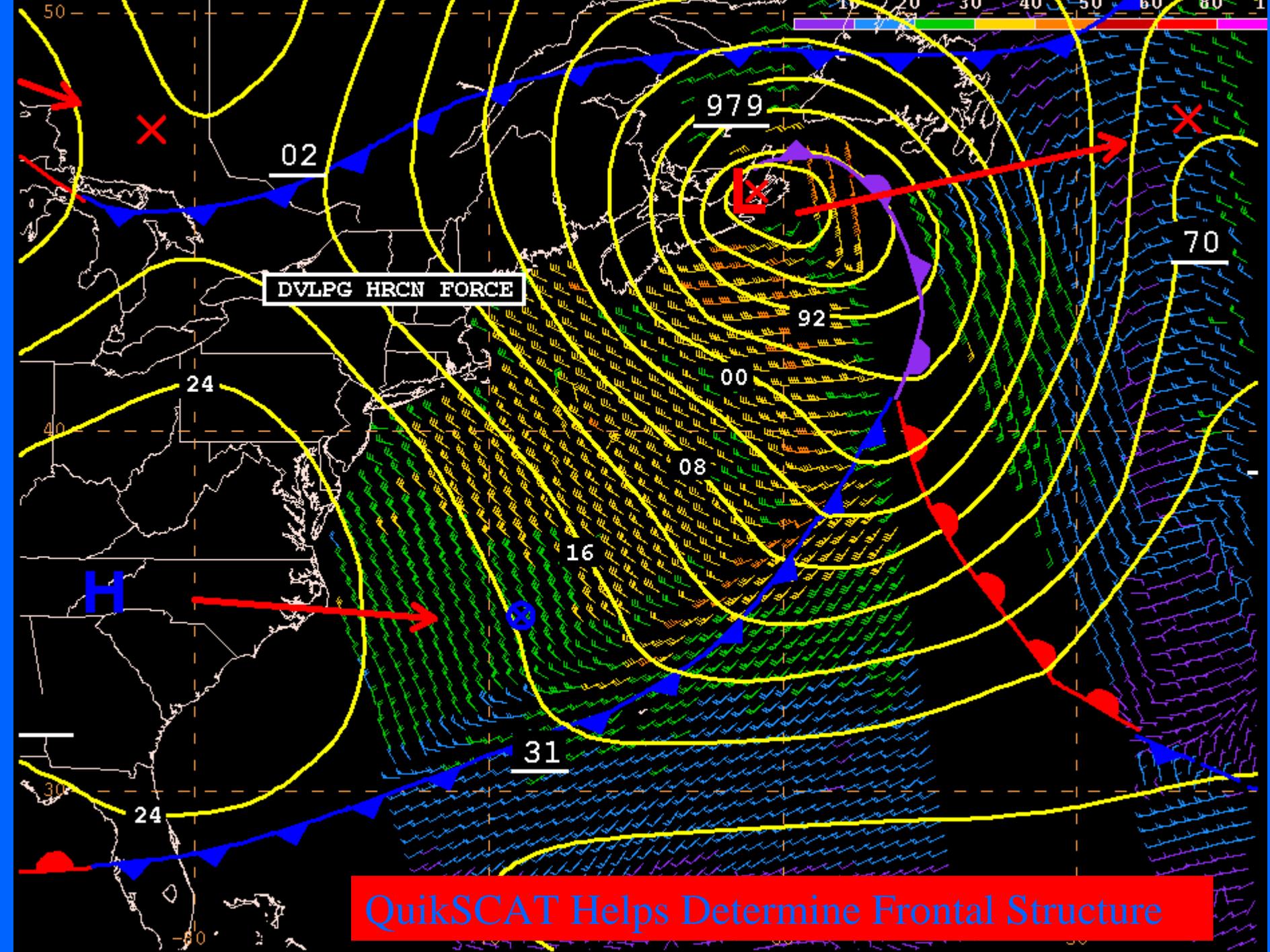
# Nor'easter

ng



QuikSCAT data locates areas of warning conditions not normally seen with conventional data. Available at <http://manati.orbit.nesdis.noaa.gov/quikscat/>

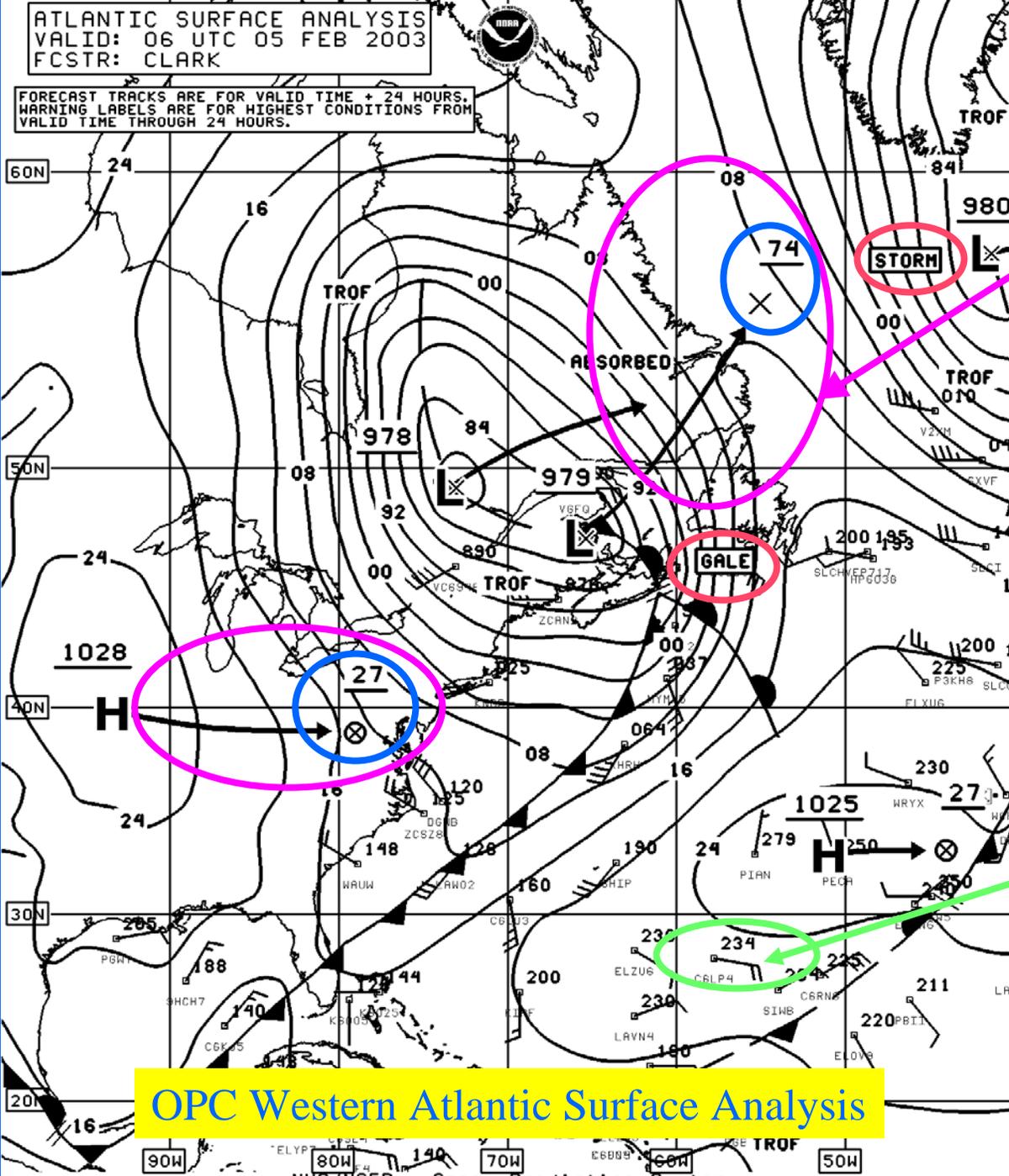




QuikSCAT Helps Determine Frontal Structure

ATLANTIC SURFACE ANALYSIS  
 VALID: 06 UTC 05 FEB 2003  
 FCSTR: CLARK

FORECAST TRACKS ARE FOR VALID TIME + 24 HOURS.  
 WARNING LABELS ARE FOR HIGHEST CONDITIONS FROM  
 VALID TIME THROUGH 24 HOURS.



**H** → ⊗ 30  
 1024 24HR HIGH PRES MOVMT  
 AND PRES IN MBS  
 HIGH PRES CENTER  
 WITH PRES IN MBS

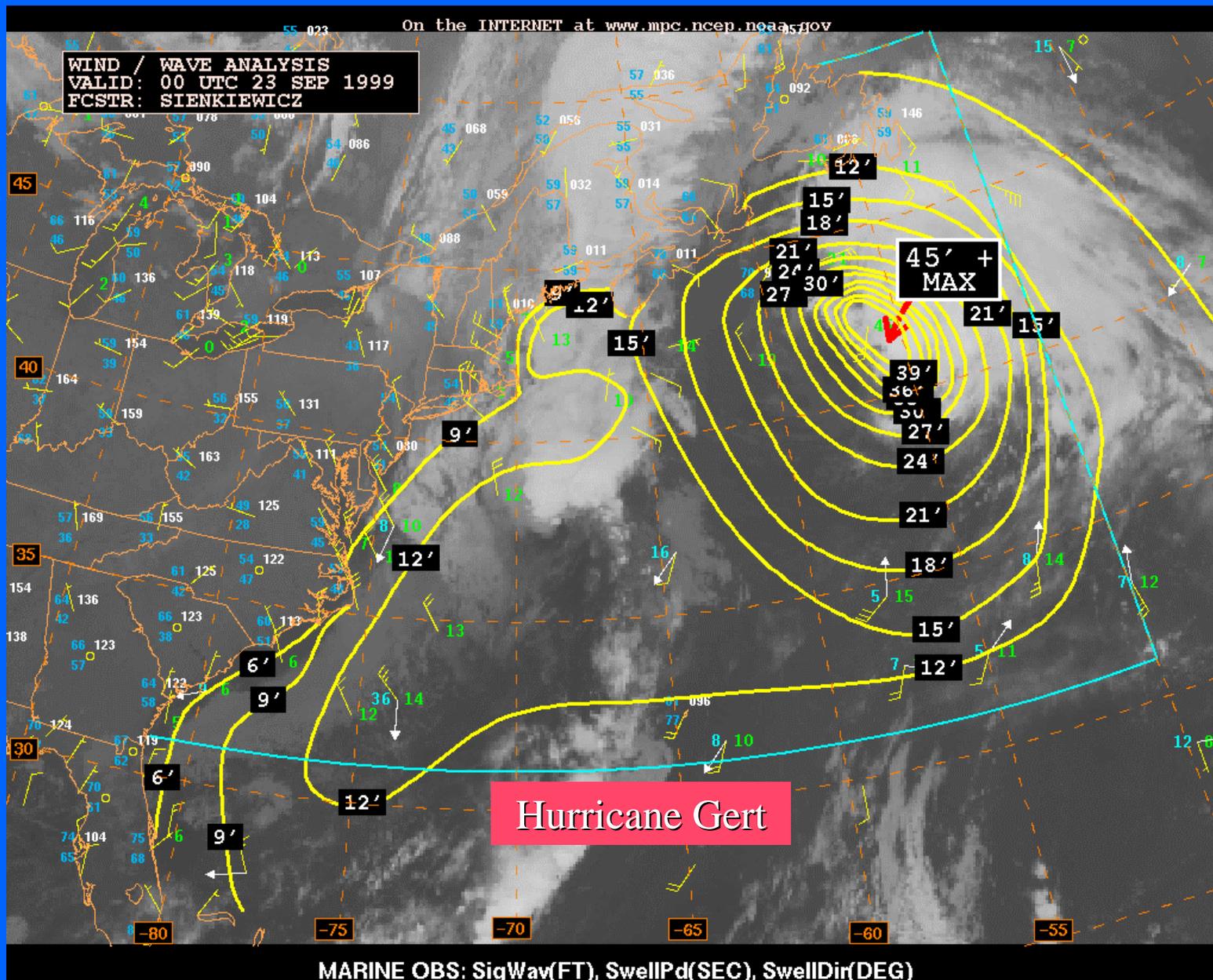
**L** → ⊗ 99  
 996 24HR LOW PRES MOVMT  
 AND PRES IN MBS  
 LOW PRES CENTER  
 WITH PRES IN MBS

—▲— COLD FRONT  
 —△— WARM FRONT  
 —|— STNRY FRONT  
 —∩— OCCLUDED FRONT  
 —∩— RIDGE  
 —|— TROF  
 —|— TRPCL STORM  
 —|— TRPCL WAVE

**OPC Western Atlantic Surface Analysis**

Calm  
 5 Knots  
 10 Knots  
 15 Knots  
 20 Knots  
 50 Knots  
 65 Knots

# OPC Western Atlantic Sea State Analysis



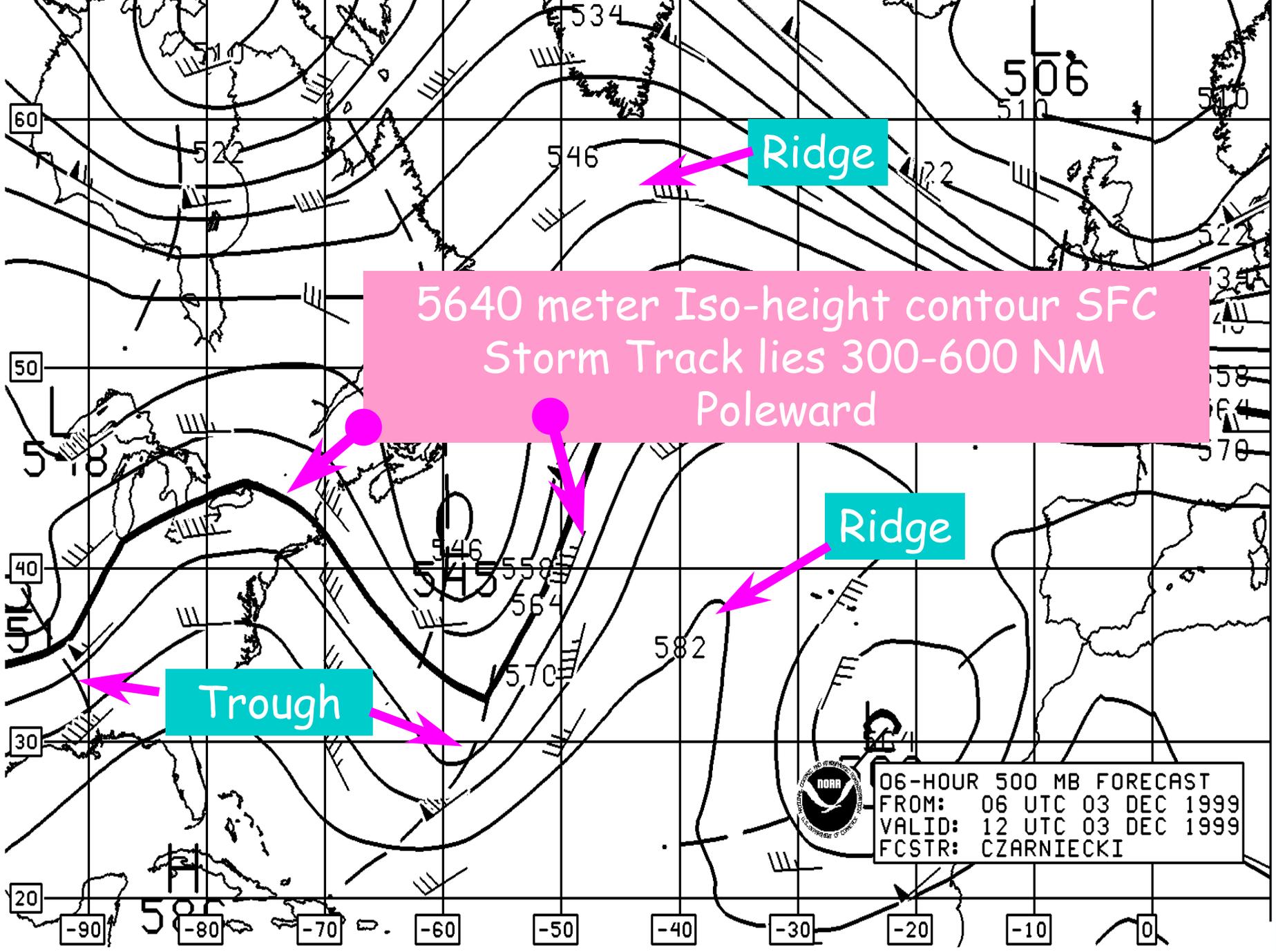
## Jet Stream

current of rapidly moving air

The jet stream is a current of fast moving air found in the upper levels of the atmosphere. This rapid current is typically thousands of kilometers long, a few hundred kilometers wide, and only a few kilometers thick. Jet streams are usually found somewhere between 10-15 km (6-9 miles) above the earth's surface. The position of this upper-level jet stream denotes the location of the strongest SURFACE temperature contrast (as in the diagram below).



During the winter months, Arctic and tropical air masses create a strong surface temperature contrast resulting in a strong jet



Ridge

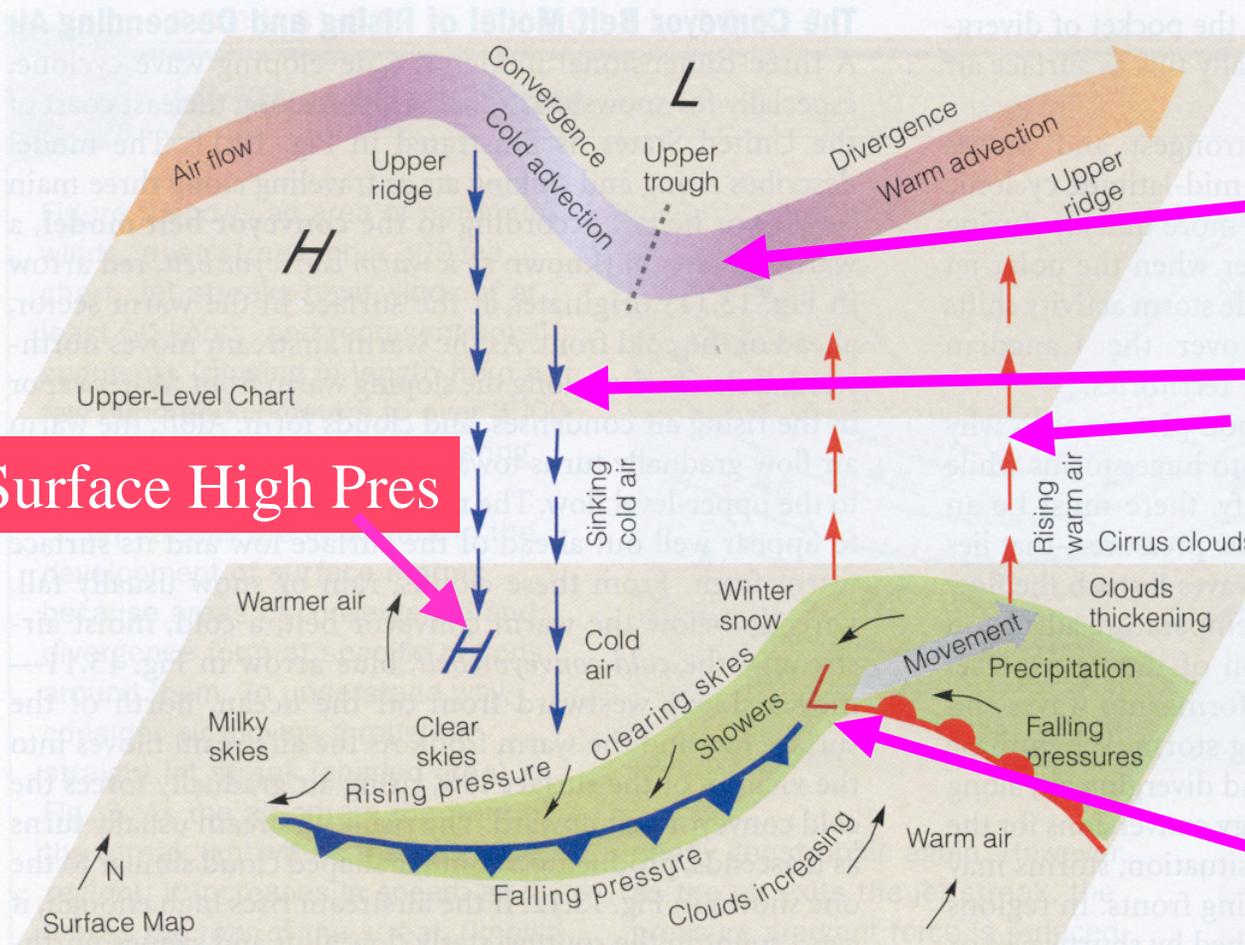
5640 meter Iso-height contour SFC  
Storm Track lies 300-600 NM  
Poleward

Trough

Ridge

NOAA  
06-HOUR 500 MB FORECAST  
FROM: 06 UTC 03 DEC 1999  
VALID: 12 UTC 03 DEC 1999  
FCSTR: CZARNIECKI

# Schematic 3-D atmospheric profile of upper level air flow, vertical motions, and synoptic scale surface low features



**FIGURE 13.10**  
Summary of clouds, weather, and vertical motions associated with a developing wave cyclone.

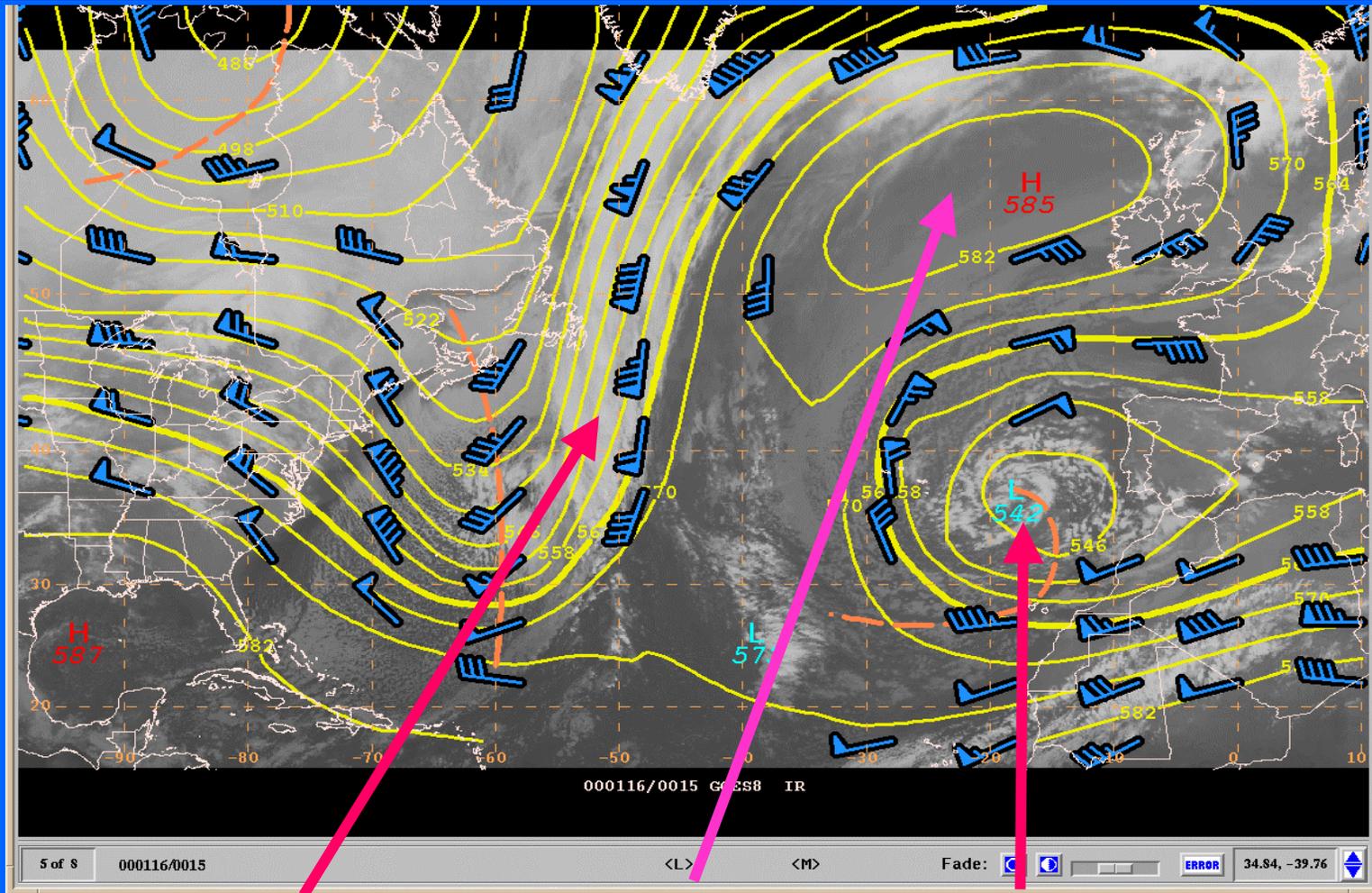
Upper Level Flow pattern

Vertical motions

Surface High Pres

Surface Low Pres and Fronts

# 500 Mb overlaid on Satellite Imagery Reveal vertical motion...

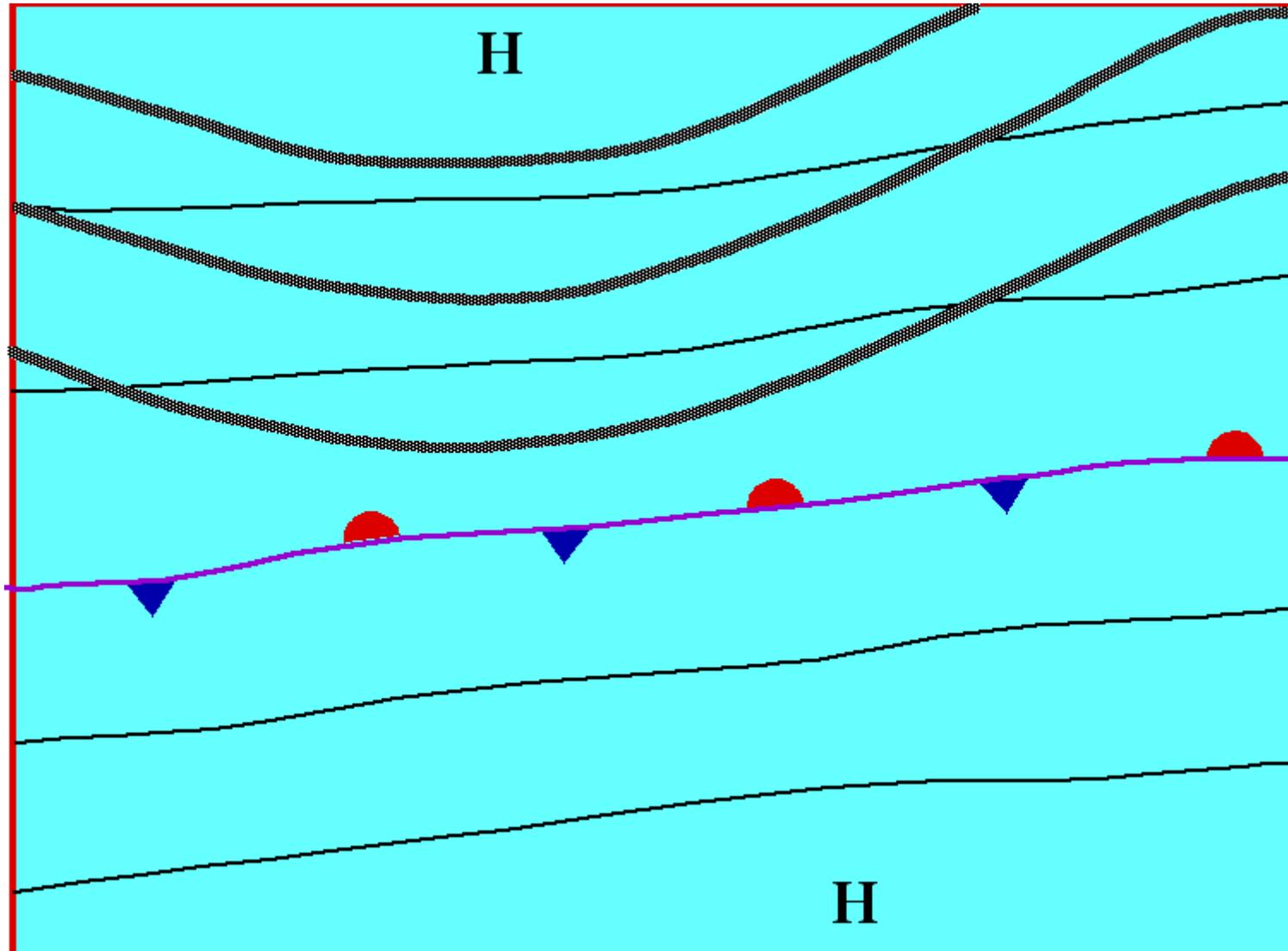


Rising air

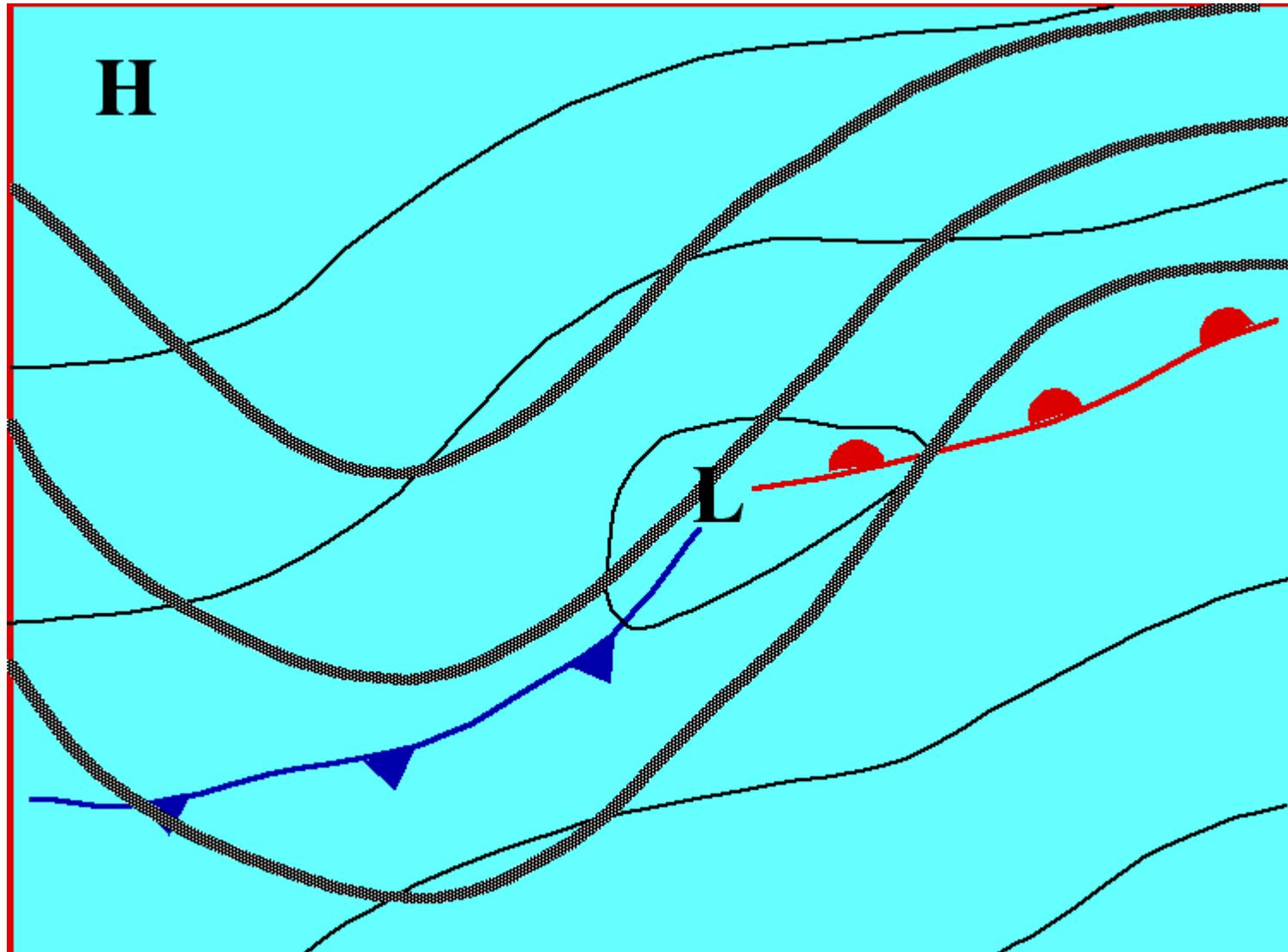
Sinking air

Rising air

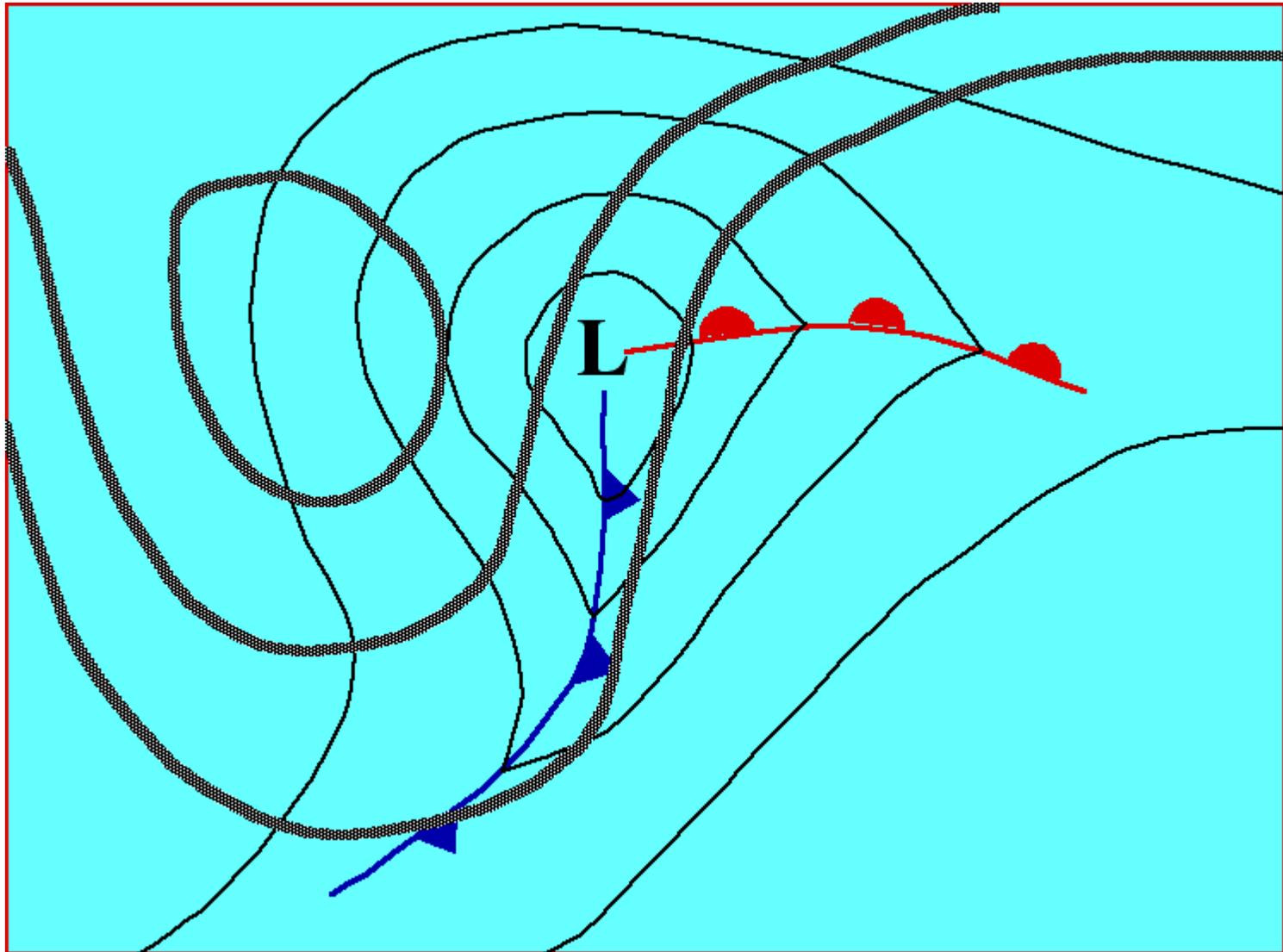
# Life Cycle of 3-D Low Pressure-Day 1



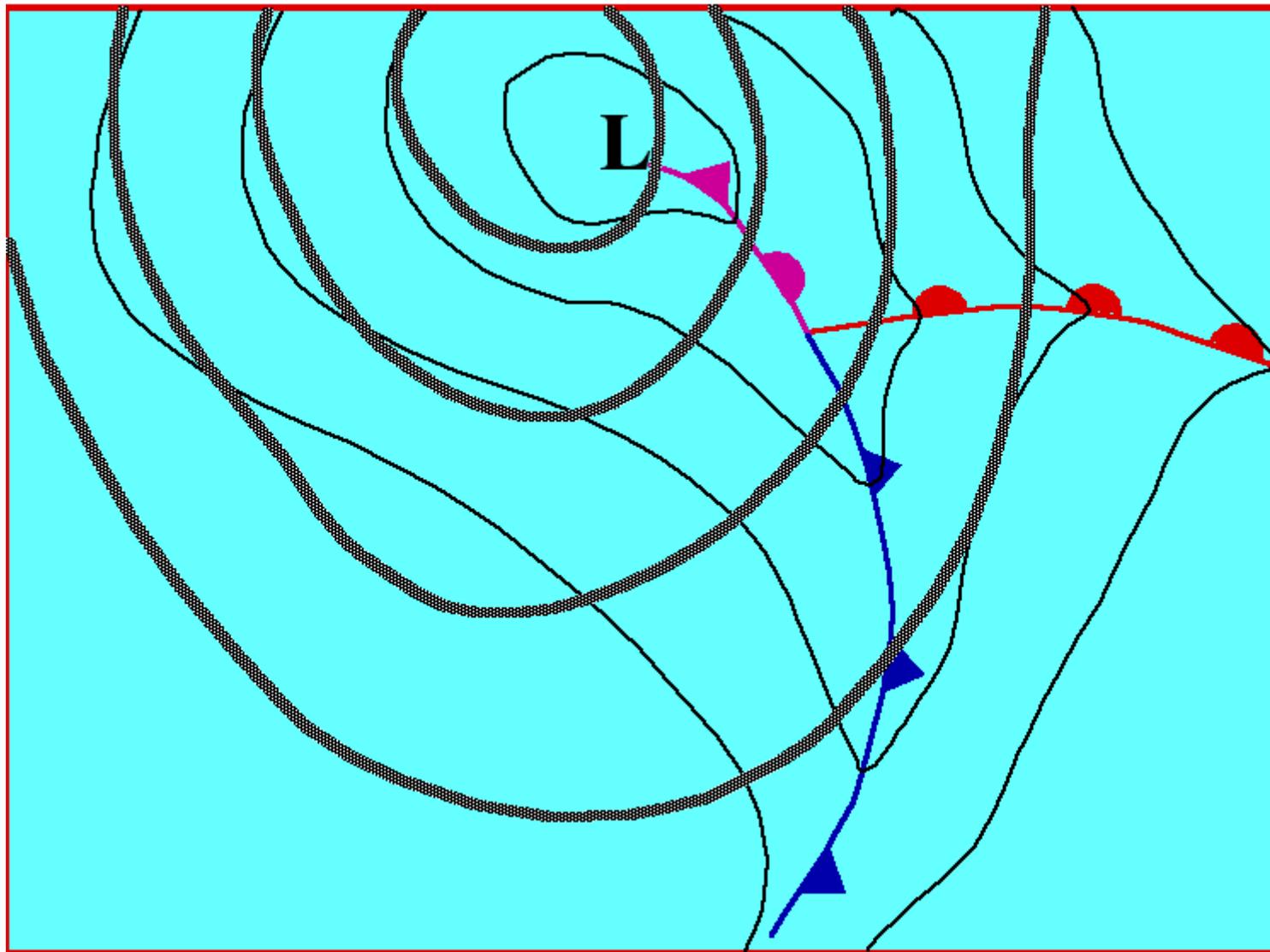
# Life Cycle of 3-D Wave Cyclone-Day 2



# Life Cycle of 3-D Wave Cyclone-Day 3



# Life Cycle of 3-D Wave Cyclone-Day 4



# Rules of Thumb

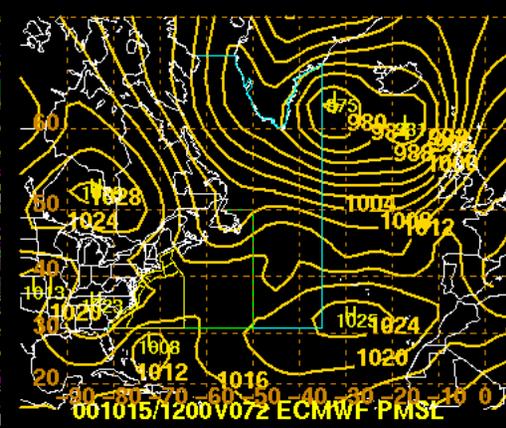
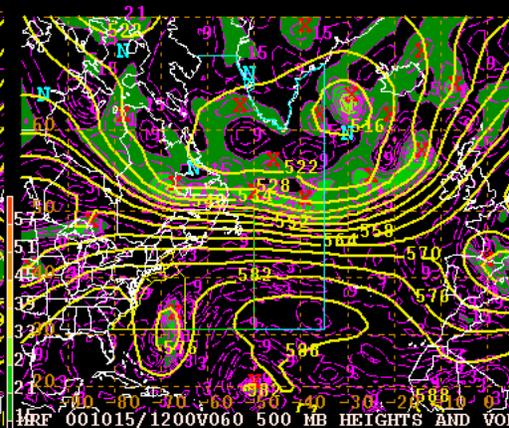
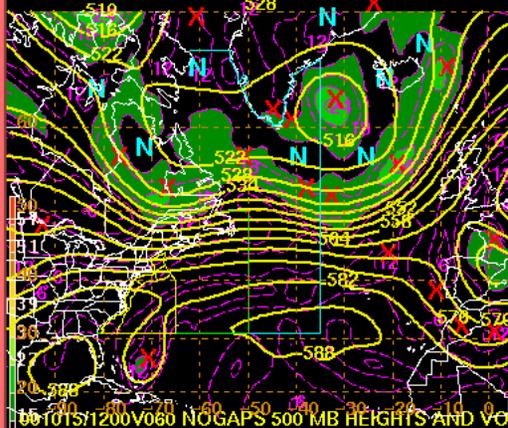
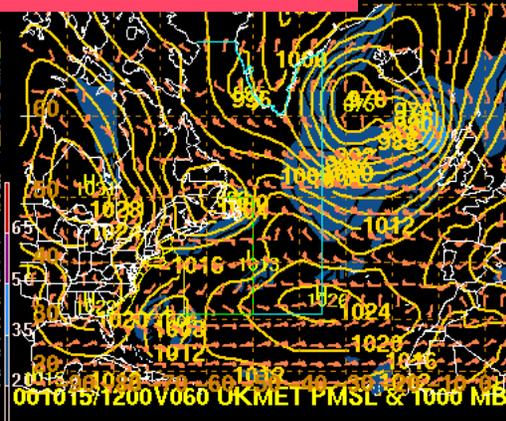
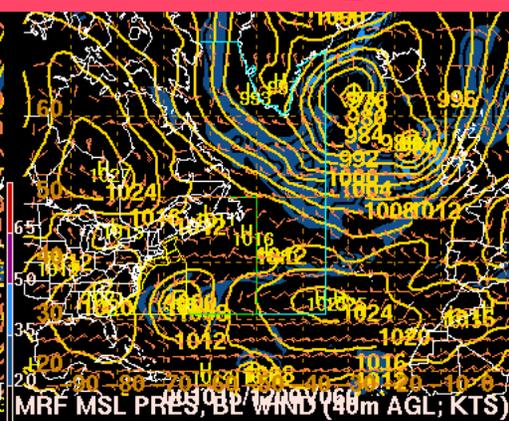
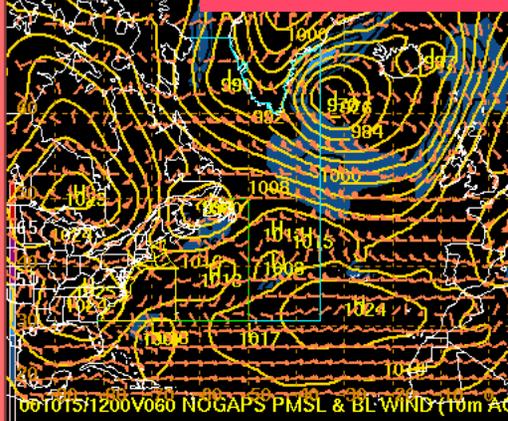
- Surface lows track at  $1/3$  to  $1/2$  of 500 Mb wind speeds above the surface low pressure
- Surface lows will track parallel to the ISO-height contours
- Surface storm track (low pressure centers) lie between 300 and 600 nautical miles north of the **5640 meter contour** (as depicted on MPC 500 Mb charts).

# Rules of Thumb (cont'd)

- **5640 meter iso-height contour** represents the southern extent of surface beaufort force 6 (22-26 knots) westerlies in summer and force 7(27-33 knots) in the winter
- Up to 50 percent of the 500 Mb wind speed can be translated to the surface behind the 500 Mb trough axis (northwesterly flow), in the colder air

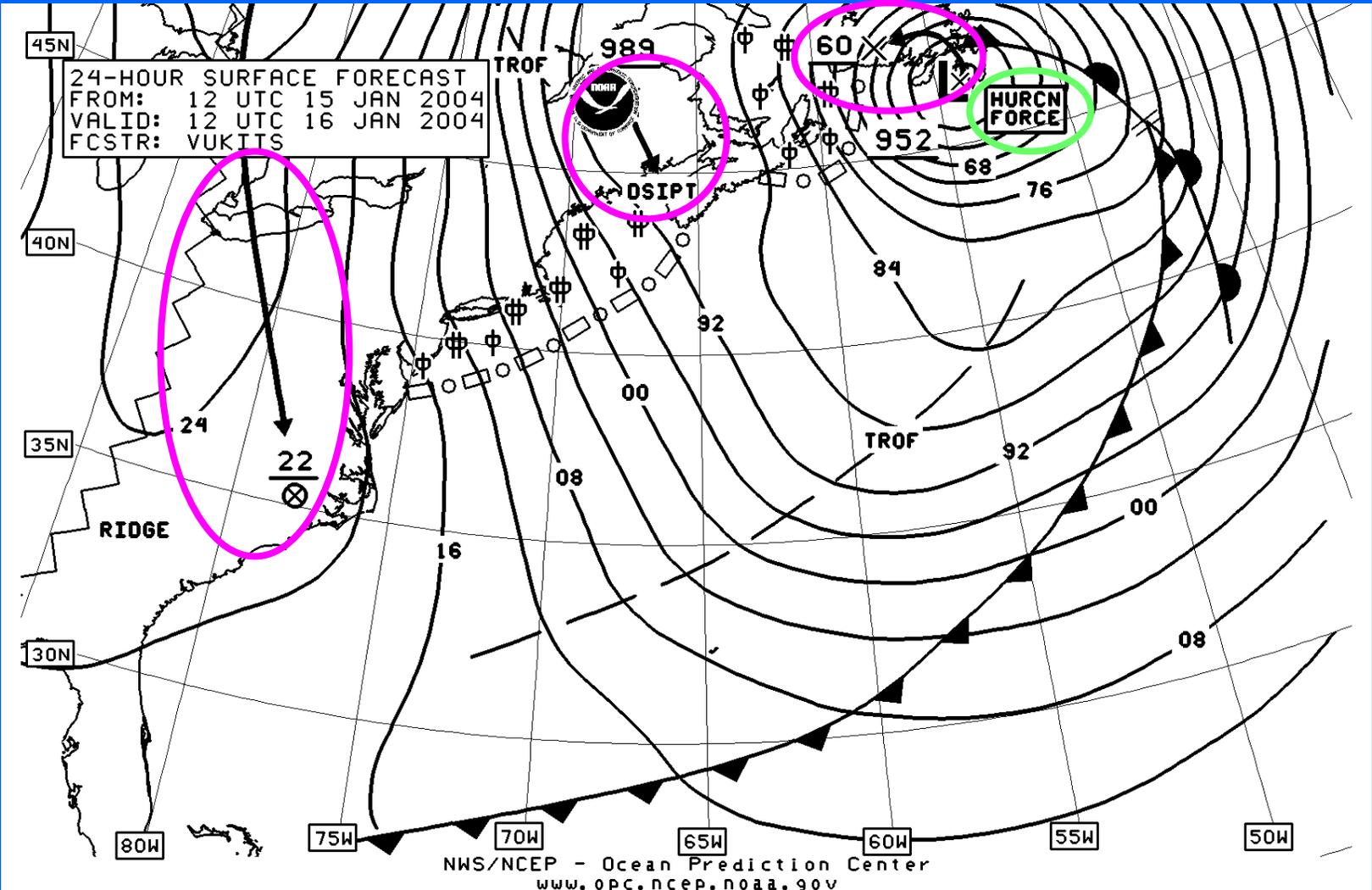


# OPC can view and compare more models.



Multiple Models

- Colors: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



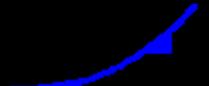
# GRAPHICAL PRODUCTS LEGEND (01 OCT 2002)

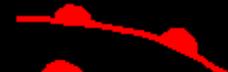
 30  
 1024 24HR HIGH PRES MOVMT  
 AND PRES IN MBS

HIGH PRES CENTER  
 WITH PRES IN MBS

 99  
 996 24HR LOW PRES MOVMT  
 AND PRES IN MBS

LOW PRES CENTER  
 WITH PRES IN MBS

 COLD FRONT

 WARM FRONT

 STNRY FRONT

 OCCLUDED FRONT

 RIDGE

 TROF

 HURCN

 TRPCL STORM

 TRPCL WAVE

 MODERATE ICING

 HEAVY ICING

## WIND BARBS:

 = 5 KT

 = 10 KT

 = 15 KT

 = 20 KT

 = 25 KT

 = 35 KT

 = 50 KT

 = 60 KT

 = 65 KT

 = 75 KT

 = 100 KT

 = 110 KT

 = 120 KT

## TEXT ABBREVIATIONS:

GALE = 34-47 KT

STORM = 48-63 KT

HURCN => 64 KT

KT = KNOTS, G = GUSTS

HR = HOUR

MBS = MILLIBARS

PRES = PRESSURE

HURCN = HURRICANE

DSIPT = DISSIPATED

STNRY = STATIONARY

WKNG = WEAKENING

RPDLY = RAPIDLY

FRMG = FORMING

MOVG = MOVING

TROF = TROUGH

INLD = INLAND

TRPCL = TROPICAL

DVLPG = DEVELOPING

COMB = COMBINING

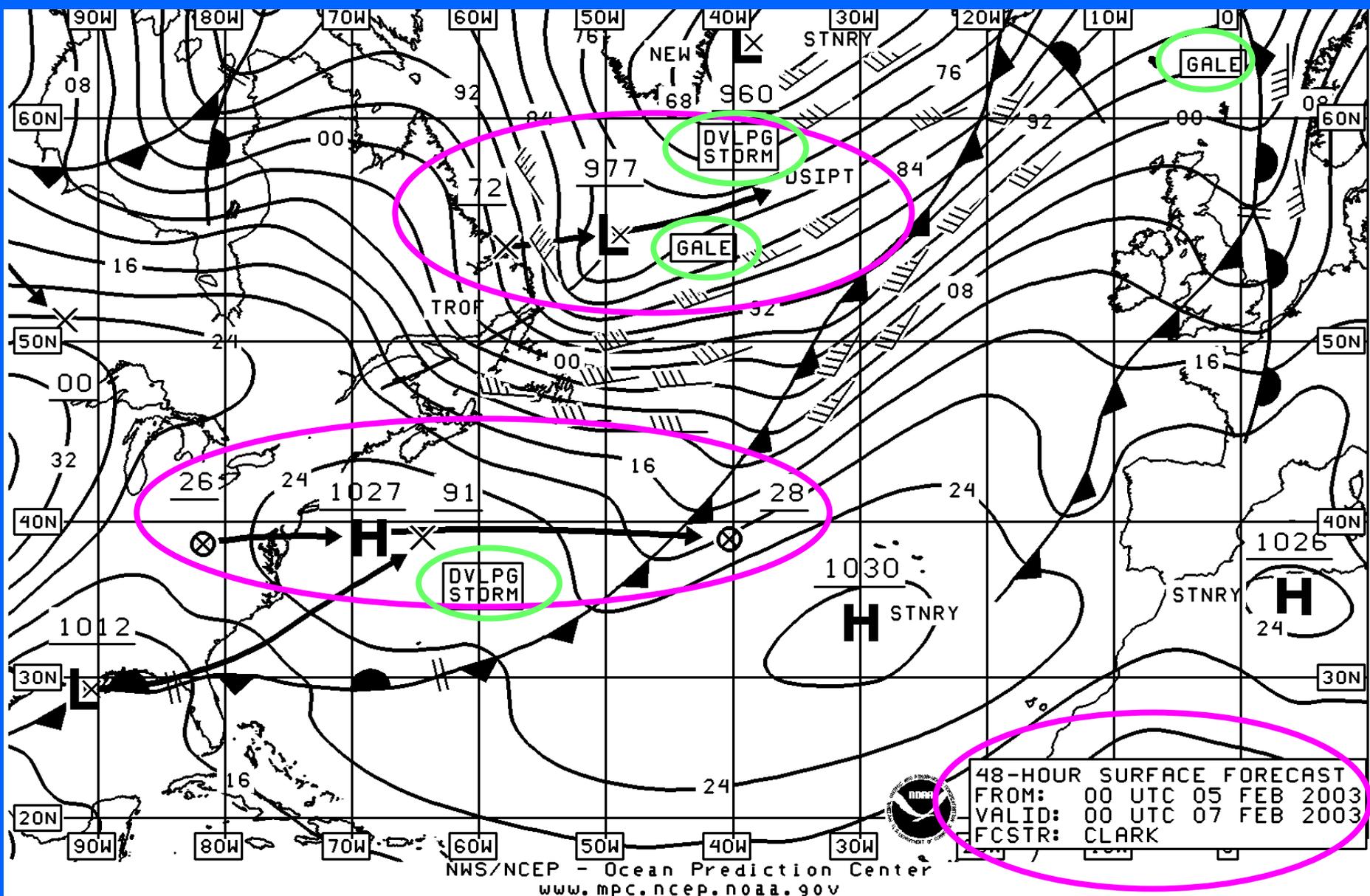
DCRS = DECREASING

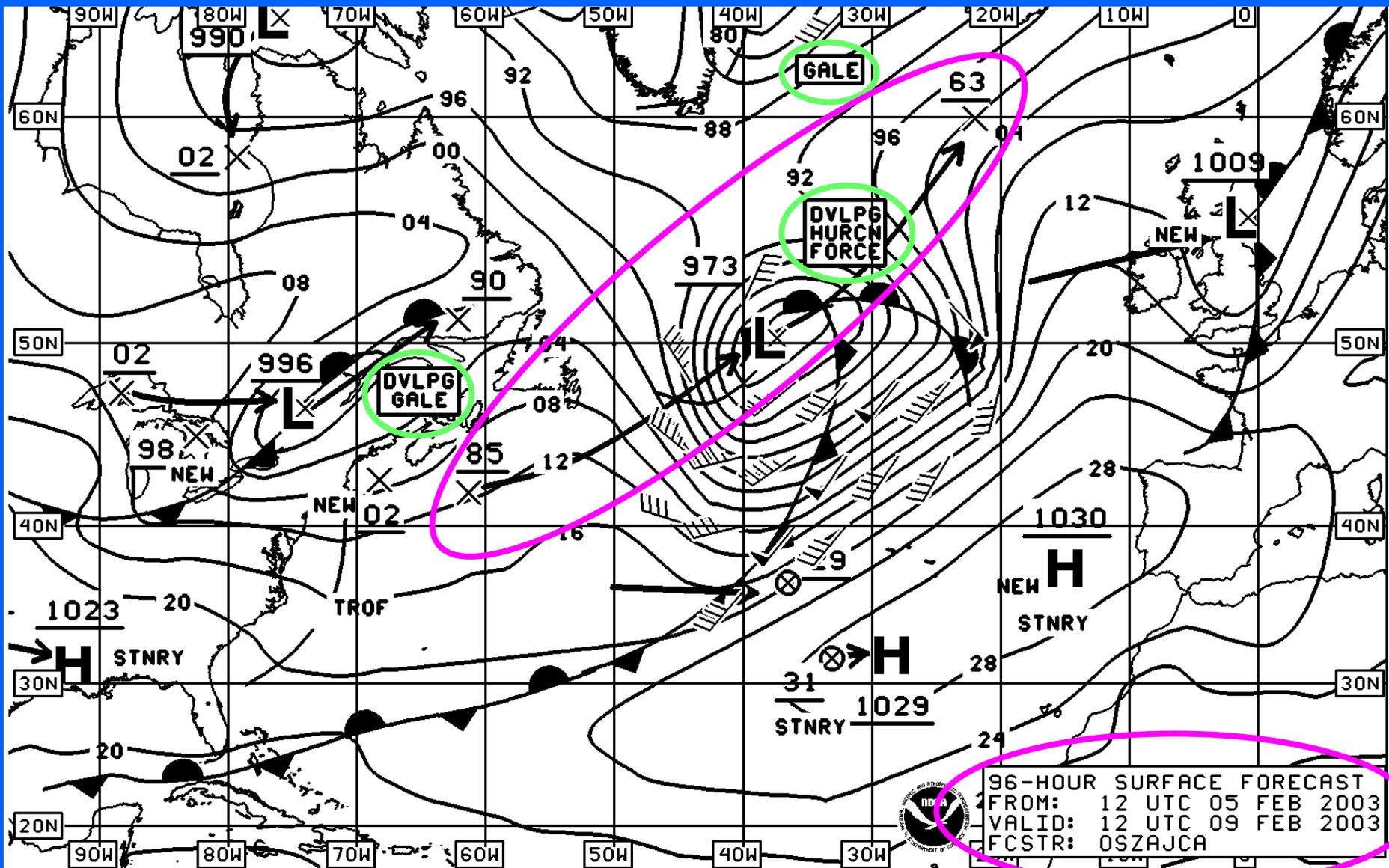
INCR = INCREASING

INTSFYG = INTENSIFYING

PSN = POSITION

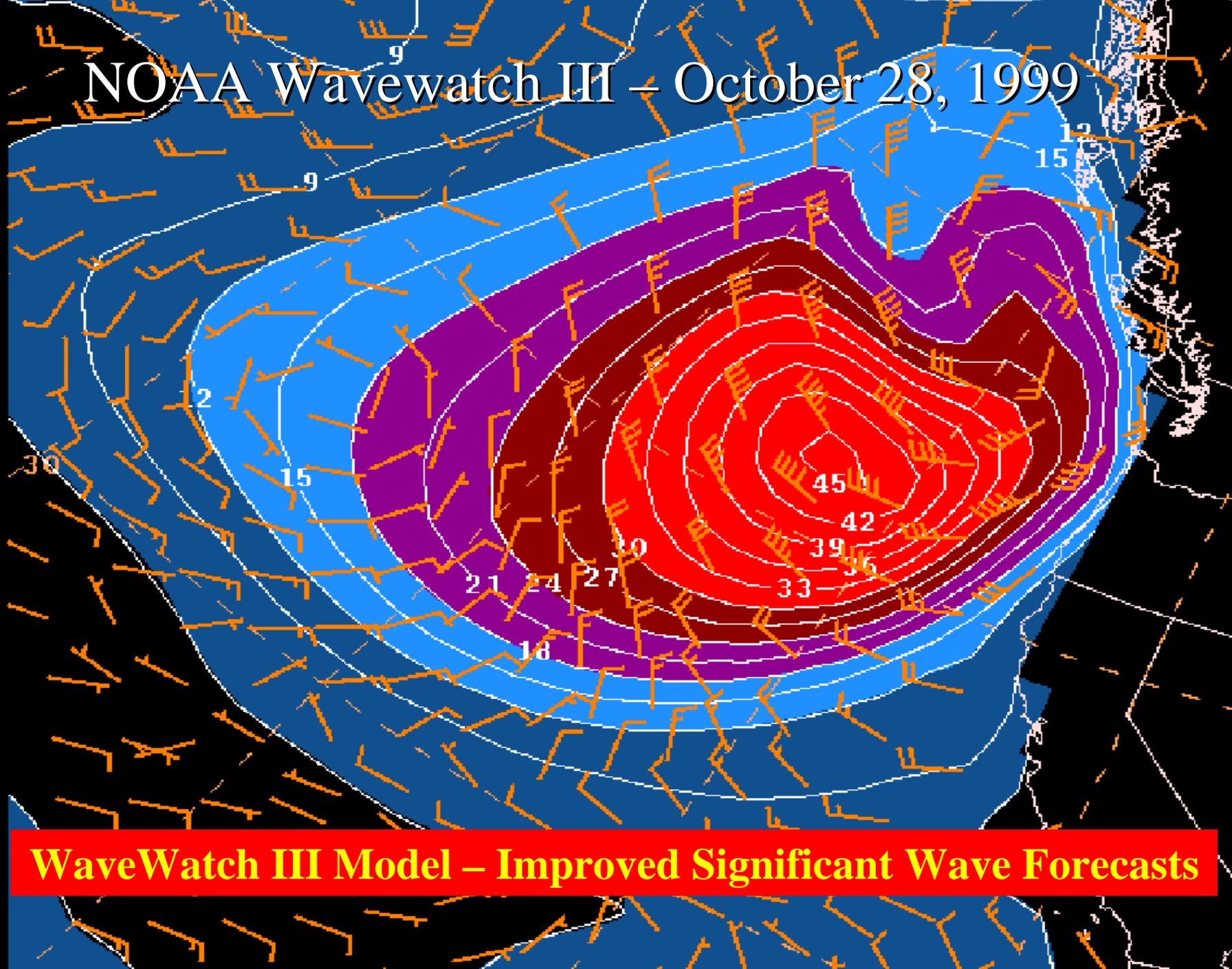
NOTE: WHEN APPROPRIATE THIS CHART MAY BE  
 REPLACED WITH A BULLETIN DETAILING  
 RADIOFAX PROGRAM CHANGES



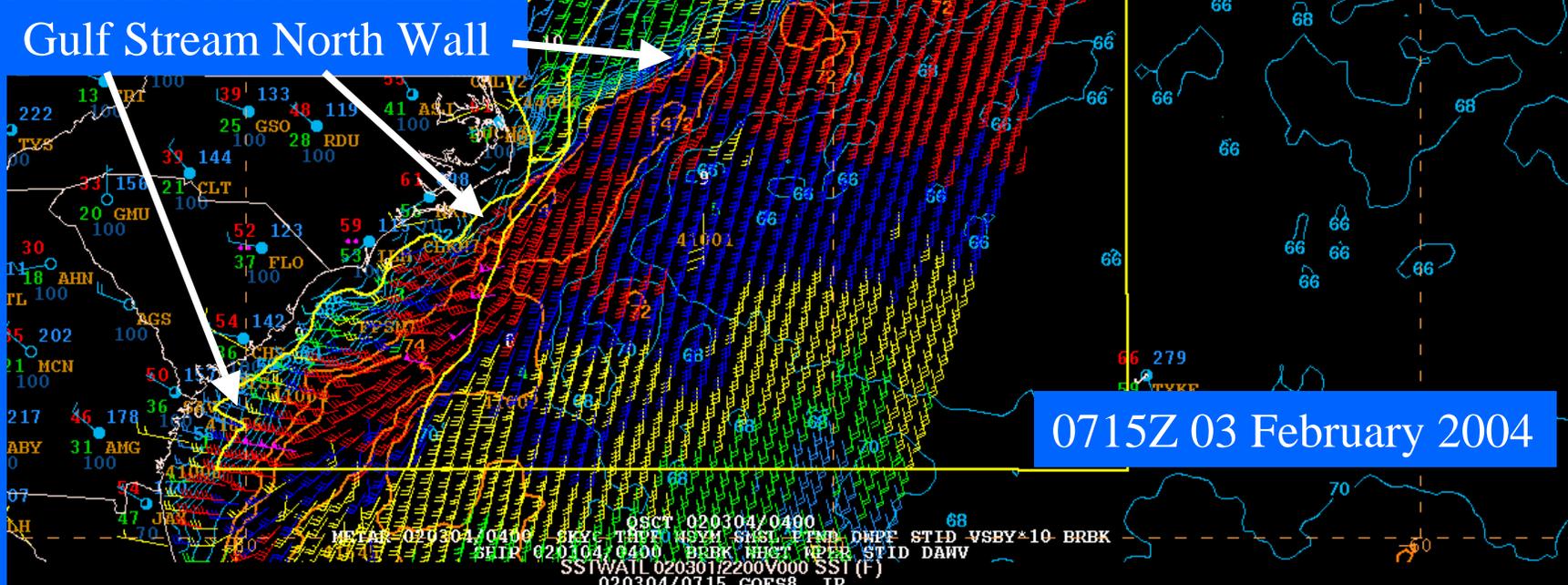
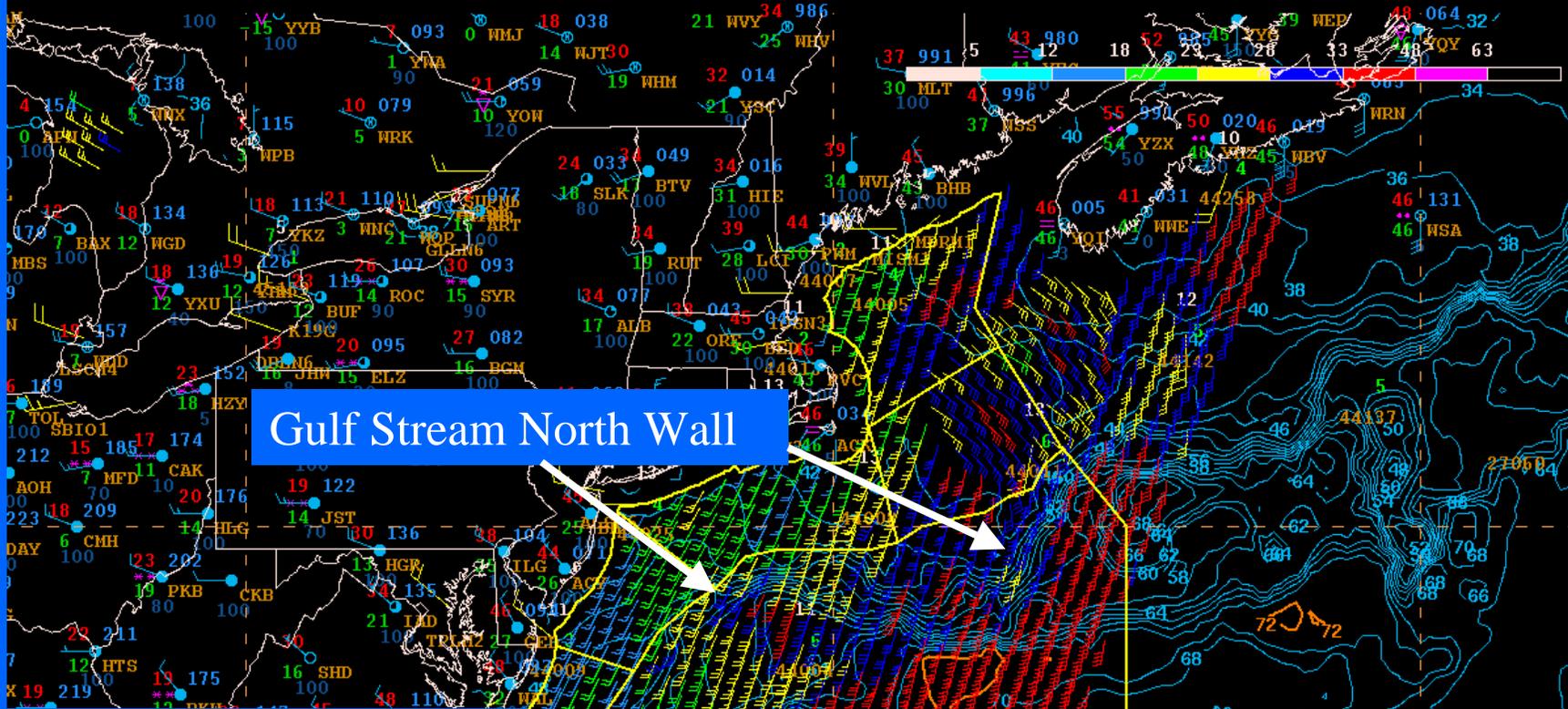


96-HOUR SURFACE FORECAST  
 FROM: 12 UTC 05 FEB 2003  
 VALID: 12 UTC 09 FEB 2003  
 FCSTR: OSZAJCA

# NOAA Wavewatch III – October 28, 1999



**WaveWatch III Model – Improved Significant Wave Forecasts**



45N

24-HOUR WIND/WAVE FORECAST  
FROM: 00 UTC 05 FEB 2003  
VALID: 00 UTC 06 FEB 2003  
FCSTR: SCHOENBERG



SIGNIFICANT WAVE HEIGHT IS SHOWN [THE AVERAGE HEIGHT OF THE HIGHEST ONE-THIRD OF THE WAVES]

40N

FORECAST GULFSTREAM POSITIONS  
NORTH WALL = THICK SOLID LINES  
SOUTH WALL = THICK DASHED LINES

35N

30N

80W

75W

70W

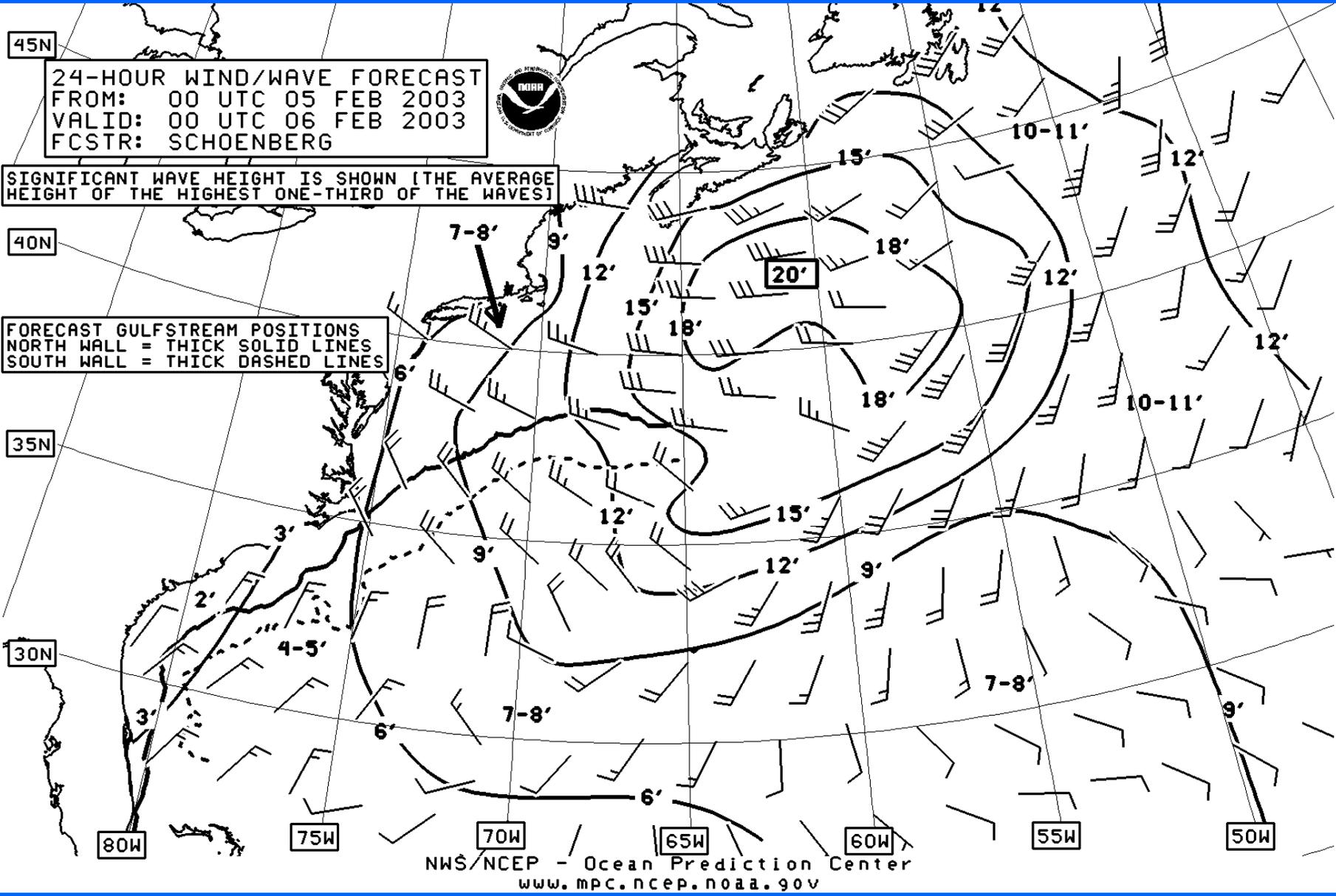
65W

60W

55W

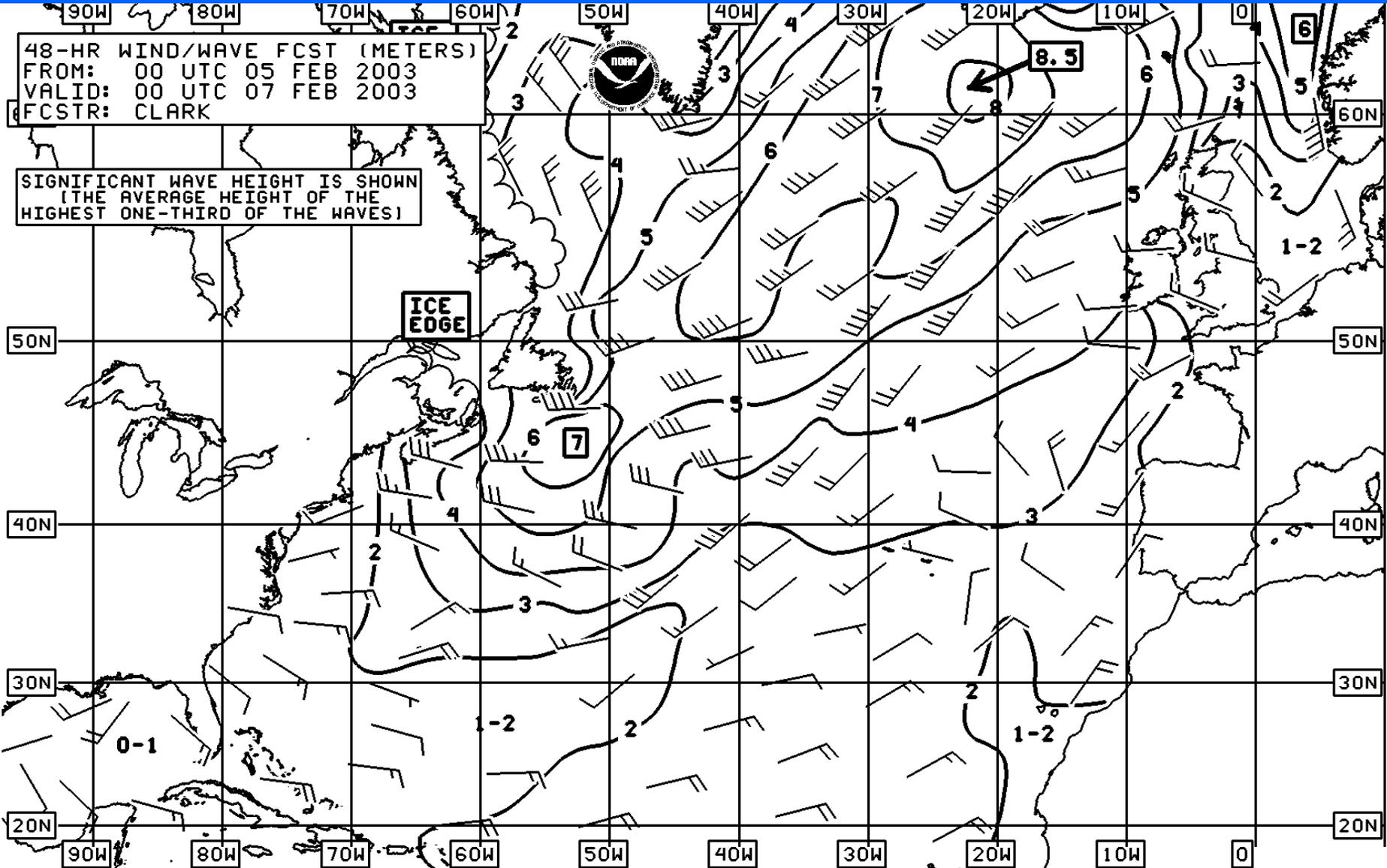
50W

NWS/NCEP - Ocean Prediction Center  
www.mpc.ncep.noaa.gov



48-HR WIND/WAVE FCST (METERS)  
FROM: 00 UTC 05 FEB 2003  
VALID: 00 UTC 07 FEB 2003  
FCSTR: CLARK

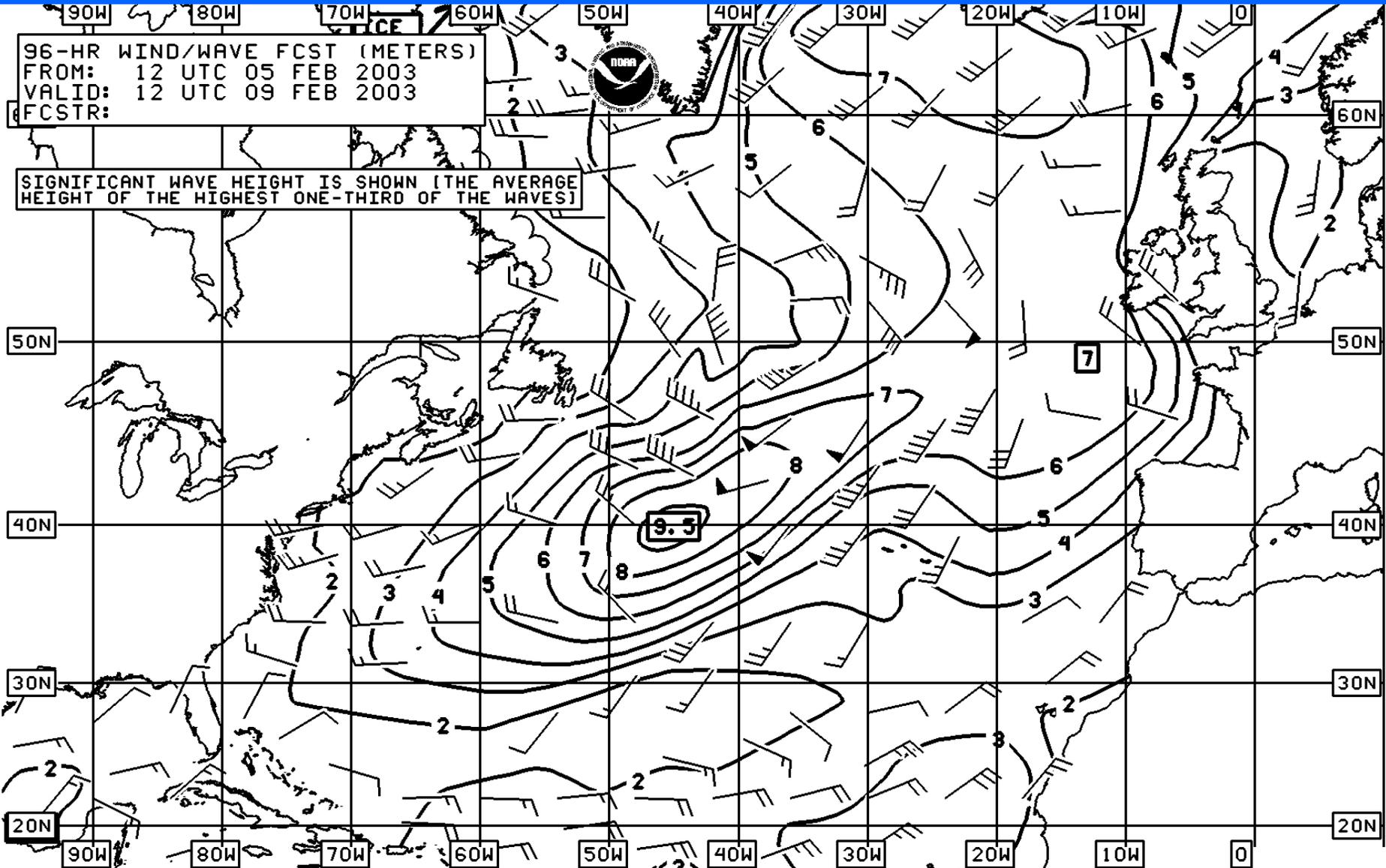
SIGNIFICANT WAVE HEIGHT IS SHOWN  
(THE AVERAGE HEIGHT OF THE  
HIGHEST ONE-THIRD OF THE WAVES)



96-HR WIND/WAVE FCST (METERS)  
FROM: 12 UTC 05 FEB 2003  
VALID: 12 UTC 09 FEB 2003  
FCSTR:



SIGNIFICANT WAVE HEIGHT IS SHOWN (THE AVERAGE  
HEIGHT OF THE HIGHEST ONE-THIRD OF THE WAVES)

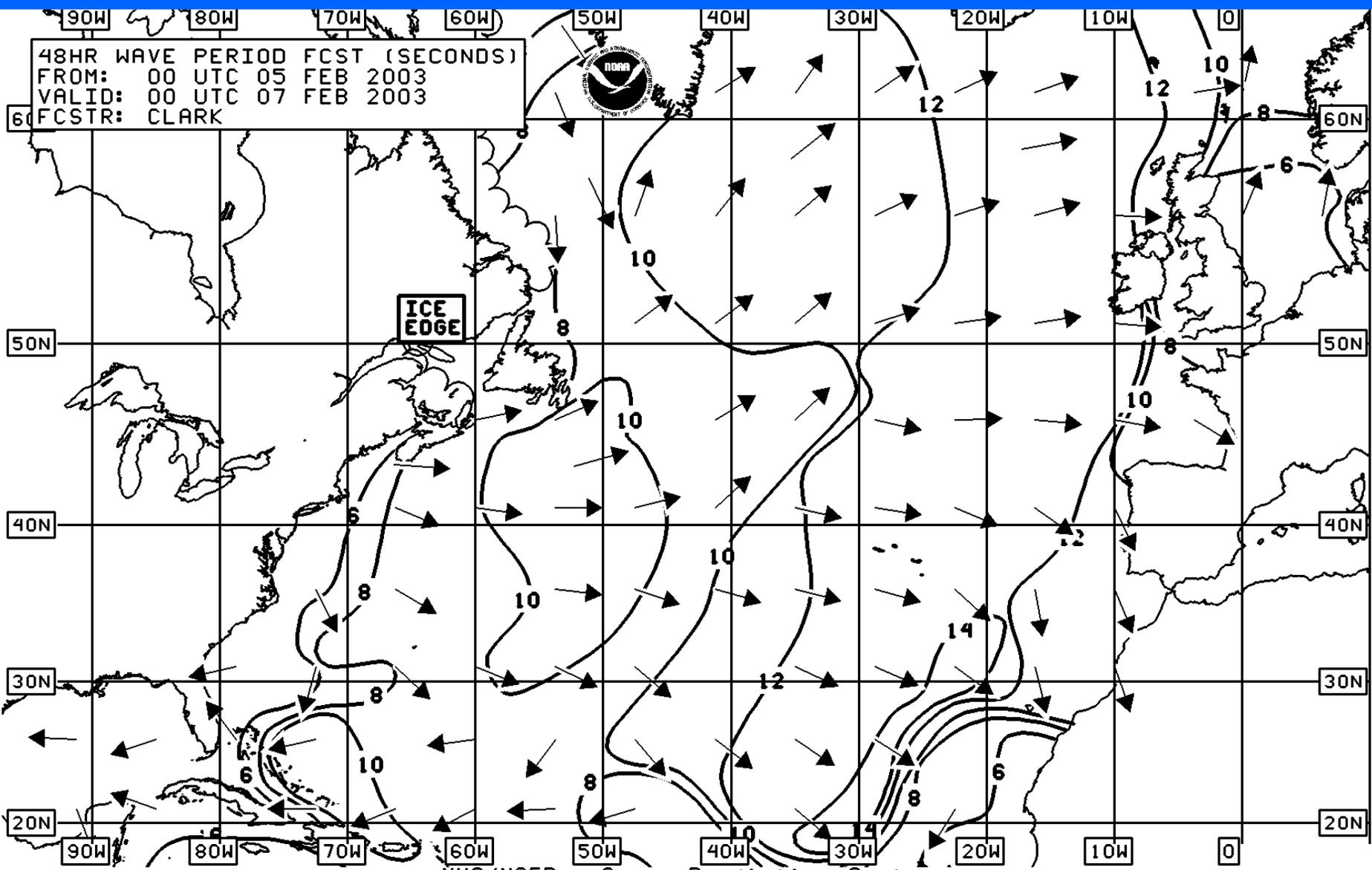


48HR WAVE PERIOD FCST (SECONDS)

FROM: 00 UTC 05 FEB 2003

VALID: 00 UTC 07 FEB 2003

FCSTR: CLARK

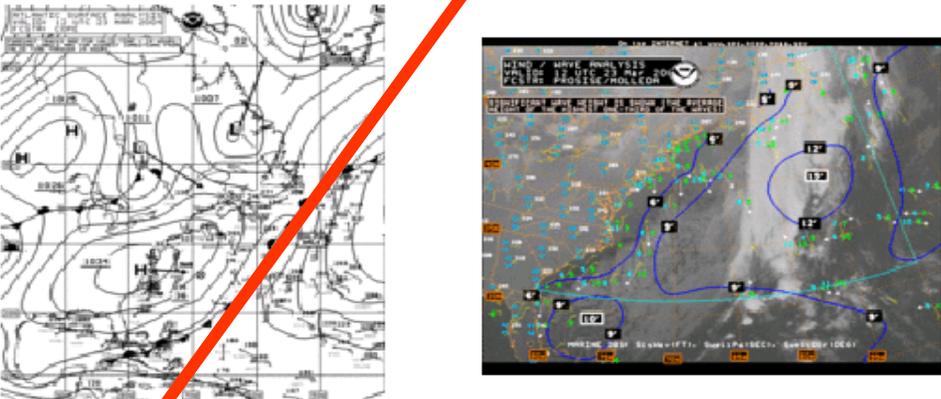


# Menu Items-Radio Fax Users Guide

Ocean Prediction Center - Microsoft Internet Explorer

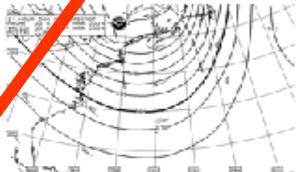
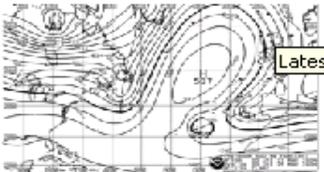
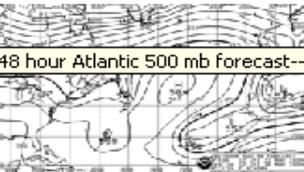
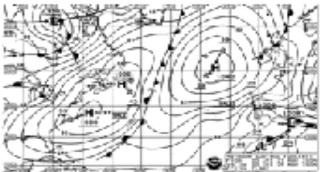
File Edit View Favorites Tools Help | Links | Back | Search | Favorites | Media | Google | Address | http://www.opc.ncep.noaa.gov/

High Seas  
Morning Briefing  
OPC Pacific Products  
Blank Base Maps  
Offshore/NAVTEX  
High Seas  
Morning Briefing  
Receiving Products  
Without Web Access  
Receive Products By  
E-mail  
Wireless PDA  
Download  
Receiving Previous  
Versions Of Products  
Obtaining OPC  
Graphic Products  
from NCDC  
Multi-national Atlantic  
& Pacific Text  
Products  
Coastal/Offshore/  
High Seas Forecast  
Other Products  
Experimental  
GRIDDED Products  
Experimental  
GRIDDED QuikSCAT  
Winds Products  
**About Using Our  
Products**  
Terminology/WX  
Symbols  
Graphical Products  
Legend  
Radio Facsimile  
User's Guide  
Marine Weather Sites  
Other Links  
Other NWS Marine  
Product



Last Update: Tuesday, 23-Mar-2004 14:47:24 UTC    Last Update: Tuesday, 23-Mar-2004 13:55:57 UTC

### Atlantic Forecast

24 hour	48 hour	96 hour
		
Last Update: Tuesday, 23-Mar-2004 04:46:11 UTC	Last Update: Tuesday, 23-Mar-2004 04:42:35 UTC	Last Update: Monday, 22-Mar-2004 18:33:45 UTC
		
Last Update: Tuesday, 23-Mar-2004 06:17:43 UTC	Last Update: Tuesday, 23-Mar-2004 05:28:33 UTC	Last Update: Monday, 22-Mar-2004 19:29:08 UTC

Latest 48 hour Atlantic 500 mb forecast--High Seas  
500 mb  
Surface

http://www.opc.ncep.noaa.gov/shml/A\_48hr500bw.gif

Start | Single... | Single... | Classi... | Charl... | Revis... | Ocea... | 107.7... | 107.7... | Internet | 11:04 AM

# Radio Fax Users Guide Table of Contents

## Ocean Prediction Center's Radiofacsimile Charts User's Guide

---

Ocean Prediction Center Home Page; URL: <http://www.opc.ncep.noaa.gov/>

Last Updated: September 8, 2000

### Table of Contents

● [Introduction to Ocean Prediction Center's \(OPC\) Radiofacsimile Program](#)

● [500 MB Products](#)  
[500 MB Analysis](#)

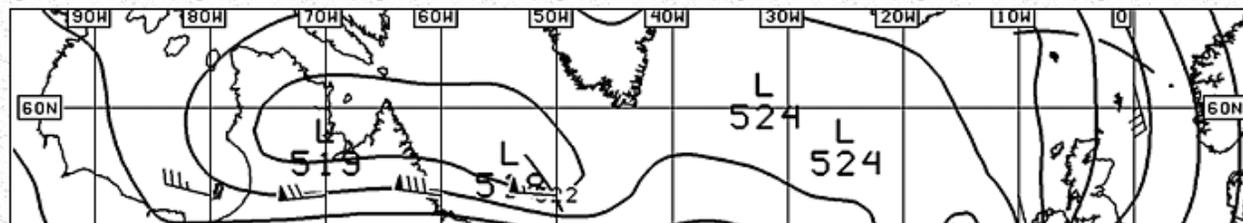
# Radio Fax Users Guide Product Description

## Upper Air 500-MB Products

The 500-mb charts are produced from a computer model of the atmosphere. These products are automated unmodified computer outputs that depict height contours above the earth's surface (geopotential heights) at 60 meter intervals. Wind speeds of 30 knots and greater are shown with wind barb increments of 5 or 10 knots. Embedded within the 500-mb height field are short wave troughs, generally 50 degrees or less in longitude. These are drawn on the charts as bold dashed lines. These short wave troughs will assist the mariner in locating surface low pressure systems or developing lows on frontal waves. The 500-mb winds approximate the speed of motion of surface extra-tropical lows (often about 1/3 to 1/2 of the 500-mb wind speed) and surface wind force (approximately 50 percent), particularly in the colder SW quadrant. The 5640 meter height contour is highlighted since this height contour is widely used by the professional mariner for general surface storm track direction and the southern extent of Beaufort Force 7 (28-33 knot) or greater surface winds in the winter, and force 6 (22-27 knot) winds in summer. The 500-mb products are not intended to be used alone. The mariner is strongly advised to examine other Radiofacsimile products described in this User's Guide in order to derive a complete picture of weather and sea state conditions.

[\[Click for Table of Contents\]](#)

### *500-mb Analyses*



Done

Internet



Microsoft PowerPoint - [P...]

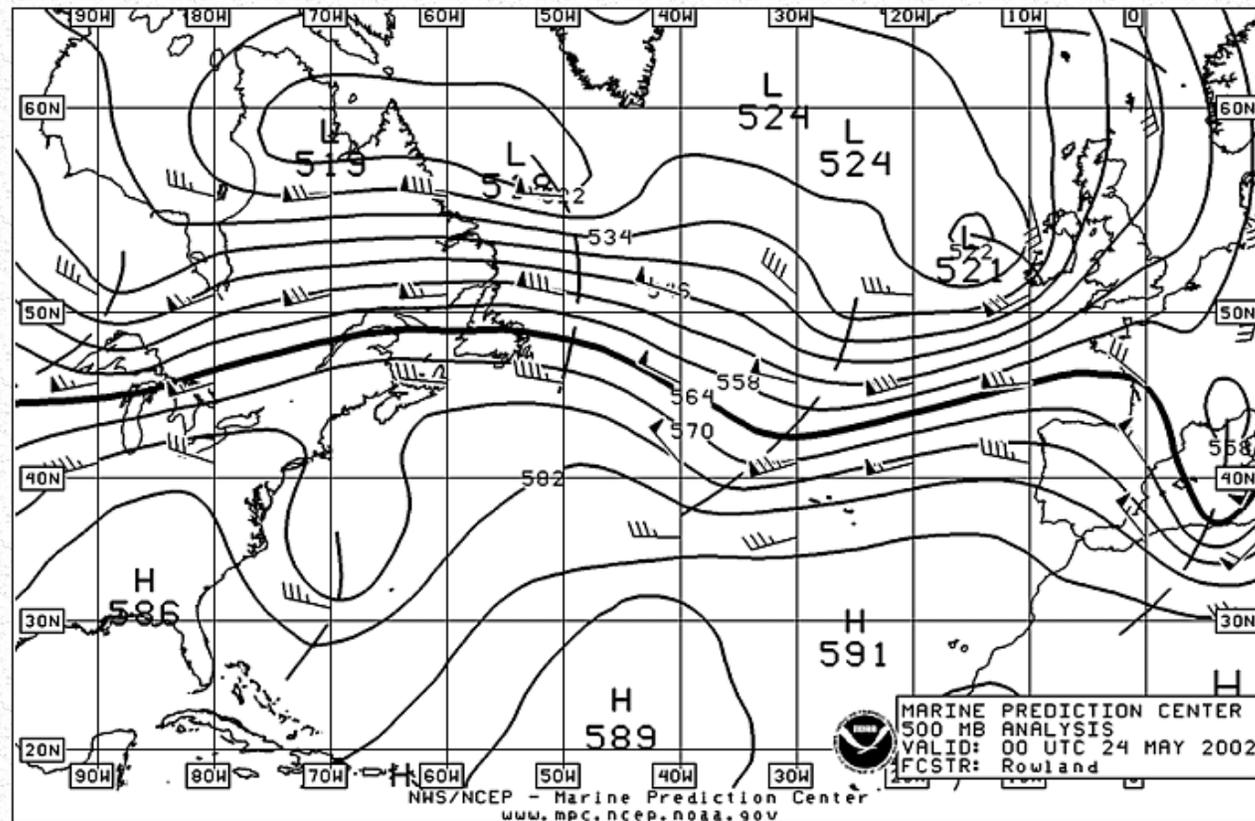
OPC's Radiofacsimile C...



Wed, 12 Feb 2003 6:20:52 AM

# Radio Fax Users Guide Product Description

## 500-mb Analyses



These analyses are generated twice a day at 00Z and 12Z. They depict synoptic scale flow patterns, location, and amplitude of long and short waves. These synoptic scale features can be compared with previous analyses to determine the movement and trends of the upper air pattern. They can be used in conjunction with the surface analyses, sea state analyses, and meteorological satellite imagery, which are valid at the same synoptic time.

# Menu Items-Radio Fax Schedule

File Edit View Favorites To  
Address http://www.opc.ncep.noaa.gov/

www.nws.noaa.gov



## Ocean Prediction Center



Site Map News Organization Search All NWS search Go

Search OPC  
OPC search Go

Home  
About Us  
Vision & Mission  
Strategic Plan  
Staff  
Accomplishments  
Fast Graphics With  
Transmission Time  
Atlantic  
Pacific  
Transmission  
Schedules And  
Frequencies  
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Seas Forecasts  
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Offshore/NAVTEX  
High Seas  
Morning Briefing  
OPC Pacific Products  
Blank Base Maps  
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Morning Briefing  
Receiving Products

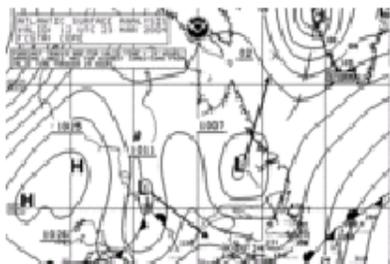
### Top News of the Day

- **NOTICE:** There is a problem with the size of the charts being uploaded to our web site. Some of the graphics are greater than 1 mB in size. We are aware of the problem and will be implementing a fix to the problem. Thanks!
- **NOAA Issues Draft Policy to Foster "Fair Weather" Partnerships**  
The National Oceanic and Atmospheric Administration (NOAA) is requesting public comment on a newly drafted policy governing NOAA's National Weather Service interactions and cooperation with the greater consortium of public, private and academic weather and climate institutions.  
-- [Details](#)
- GRIDDED QuikSCAT Winds are coming in the future.  
-- [Details](#)

NOAA>NWS>NCEP>Ocean Prediction Center

**NOTE:** Automatic update every 10 minutes.

### Atlantic Analysis



# Atlantic Radiofacsimile Schedule - Broadcast Times

NOAA National Weather Service Washington, D.C.  
Radiofacsimile Schedule transmitted via  
U.S.C.G. Marshfield, Massachusetts (NMF) 28 November 2000

Thu, 20 Feb 2003 21:18:15 UTC

Standard Time							UTC
Atlantic Time	Eastern Time	Central Time	Mountain Time	Pacific Time	Alaska Time	Hawaii Time	difference
-4	-5	-6	-7	-8	-9	-10	

[problems or comments?](#)

Print Schedule [valid November 28, 2000](#)

[Latest Radiofacsimile Schedule Change](#) effective November 28, 2000

Worldwide Radiofacsimile Broadcast Schedule [PDF](#)

Time	Chart	FTPMAIL ID	Graphic Format	Last Update
0230Z	Test Pattern	PZZZ94		
0233Z	00Z Preliminary Surface Analysis (28N-52N, 45W-85W)	PYAA11	<a href="#">[TIF GIF]</a>	
0243Z	Schedule Part 1	PLAZ01		
0254Z	Schedule Part 2	PLAZ02		
0305Z	Request For Comments	PLAZ02	<a href="#">[TIF GIF]</a>	
0315Z	00Z Sea State Analysis (28N-52N, 45W-85W)	PWAA88	<a href="#">[TIF GIF B/W GIF]</a>	01:14 GMT, 20 February 2003
0325Z	00Z Surface Analysis Part 1 (15N-65N, 10E-45W)	PWAA88	<a href="#">[TIF GIF B/W GIF]</a>	04:30 GMT, 20 February 2003

# Atlantic Radio Fax Schedule-Product Type

0338Z	00Z Surface Analysis Part 2 (15N-65N, 40W-95W)	PYAA02	[TIF GIF/B/W GIF]	03:12 GMT, 20 February 2003
0351Z	Satellite Picture (20N-55N, 55W-95W)	EVNT00		
0402Z	Retransmit 0325Z			
0415Z	Retransmit 0338Z			
0428Z	00Z 500mb Analysis (15N-65N, 10E-95W)	PPAA50	[TIF GIF/B/W GIF]	01:18 GMT, 20 February 2003
0745Z	Test Pattern	PZZZ94		
0755Z	06Z Preliminary Surface Analysis (28N-52N, 45W-85W)	PYAA12	[TIF GIF]	
0805Z	24Hr Surface VT 00Z (28N-52N, 45W-85W)	PPAE00	[TIF GIF/B/W GIF]	04:11 GMT, 20 February 2003
0815Z	24Hr Wind/WV VT 00Z (28N-52N, 45W-85W)	PWAE98	[TIF GIF/B/W GIF]	04:49 GMT, 20 February 2003
0825Z	24Hr 500mb Forecast VT 00Z (15N-65N, 10E-95W)	PPAE50	[TIF GIF/B/W GIF]	05:20 GMT, 20 February 2003
0835Z	36Hr 500mb Forecast VT 12Z (15N-65N, 10E-95W)	PPAG50	[TIF GIF/B/W GIF]	05:15 GMT, 20 February 2003
0845Z	48Hr 500mb VT 00Z (15N-65N, 10E-95W)	PPAI50	[TIF GIF/B/W GIF]	05:17 GMT, 20 February 2003
0855Z	48Hr Surface VT 00Z (15N-65N, 10E-95W)	QDTM85	[TIF GIF/B/W GIF]	06:16 GMT, 20 February 2003
0905Z	48Hr Wind/WV VT 00Z (15N-65N, 10E-95W)	PJAI98	[TIF GIF/B/W GIF]	06:36 GMT, 20 February 2003
0915Z	48Hr Peak Wave Period/Direction VT 00Z (15N-65N, 10E-95W)	PJAI88	[TIF GIF/B/W GIF]	05:23 GMT, 20 February 2003
0925Z	06Z Surface Analysis Part 1(15N-65N, 10E-45W)	PYAA03	[TIF GIF/B/W GIF]	09:26 GMT, 20 February 2003
0938Z	06Z Surface Analysis Part 2 (15N-65N, 40W-95W)	PYAA04	[TIF GIF/B/W GIF]	09:26 GMT, 20 February 2003

# Atlantic Radio Fax Schedule-FTP E-mail Code

2125Z	18Z Surface Analysis Part 1 (15N-65N, 10E-45W)	PYAA07	<a href="#">[TIF GIF B/W GIF]</a>	21:01 GMT, 20 February 2003
2138Z	18Z Surface Analysis Part 2 (15N-65N, 40W-95W)	PYAA08	<a href="#">[TIF GIF B/W GIF]</a>	21:01 GMT, 20 February 2003
2151Z	Satellite Picture (00N-60N, 40W-130W)	EVNT18		
2202Z	Retransmit 2125Z			
2215Z	Retransmit 2138Z			

Contractions: VT=VALID TIME, Hr=Hour, WV=Wave, Bul=Bulletin

Assigned Frequencies (KHZ): Day = 6340.5,9110,12750  
Night= 4235, 6340.5, 9110, 12750

Comments On this Schedule Or Quality Of Charts Are Invited.

## For additional information contact:

National Weather Service  
National Centers for Environmental Prediction  
Ocean Prediction Center  
Attn: David Feit, W/NP41  
5200 Auth Rd  
Camp Springs, Maryland 20746

Phone: 301-763-8441  
Fax: 301-763-8592, 301-763-8085  
Email: [David.Feit@noaa.gov](mailto:David.Feit@noaa.gov)

Last Updated

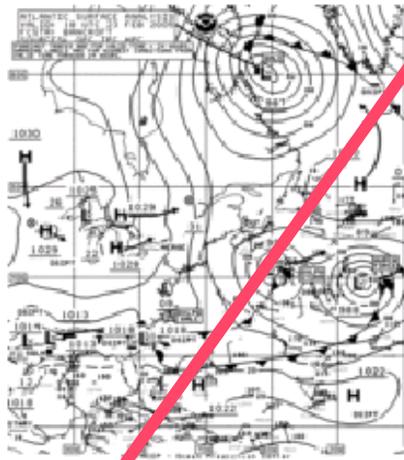
Telephone Numbers

# Receive Radiofax Charts via FTP E-mail at Sea

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  - Strategic Plan
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- Fax Graphics With Transmission Time
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  - Product Loops
- Receiving Products Without Web Access
- Receive Products By E-mail

• Watch weather and waves in motion! Visit our new [Product Loops webpage!](#)

[NOAA](#)>[NWS](#)>[NCEP](#)>Ocean Prediction Center



Last Update: Wednesday, 23-Feb-2005 21:08:37 UTC

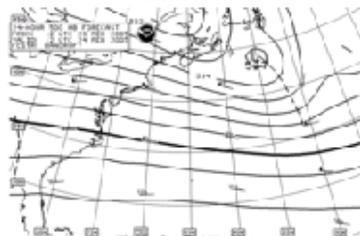
## Atlantic Analysis



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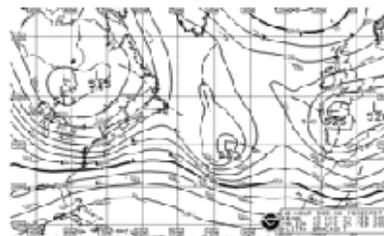
## Atlantic Forecast

24 hour



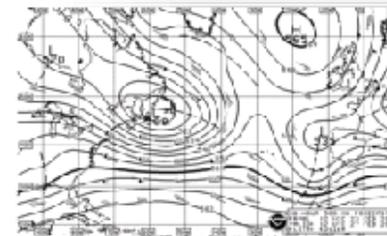
Last Update: Wednesday, 23-Feb-2005

48 hour



Last Update: Wednesday, 23-Feb-2005

96 hour



Last Update: Wednesday, 23-Feb-2005

# Instructions on getting Charts via E-mail at Sea

The following examples demonstrate the use of FTPMAIL. Indexes of currently available marine products, the list FTPMAIL commands, and suggestions for TIFF viewers may be obtained following these instructions.

To use FTPMAIL:

- o Send an e-mail via the Internet to: ftpmail@weather.noaa.gov
- o Put anything you like on the subject line
- o Enter a command script in the body of the message

NOTE: Correct capitalization for commands, directory and file names is critical

Example scripts are:

help

Connect to default\_site (weather.noaa.gov) and send back this help file to e-mail address of requestor

open  
cd fax  
get PWAE98.TIF  
quit

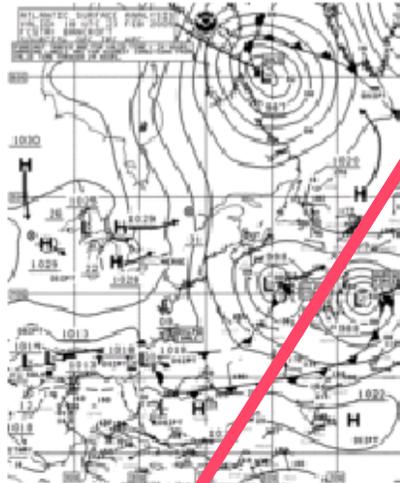
Connect to default\_site (weather.noaa.gov) and send back the chart file PWAE98.TIF to e-mail address of requestor

open  
cd data  
cd forecasts  
cd marine

# OPC Text Forecasts via Wireless PDAs/Cell Phones

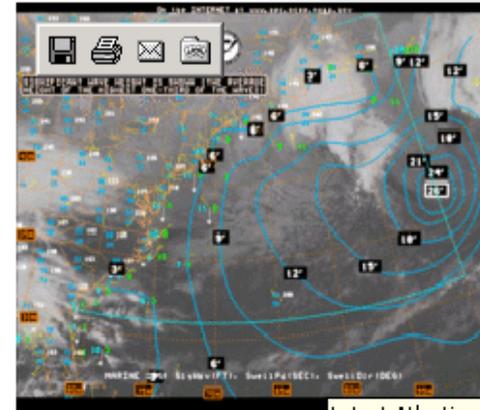
<http://www.opc.ncep.noaa.gov/mobile/index.wml>

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- OPC Atlantic Products
  - Blank Base Maps
  - Offshore/NAVTEX
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Last Update: Wednesday, 23-Feb-2005 21:08:37 UTC

## Atlantic Analysis

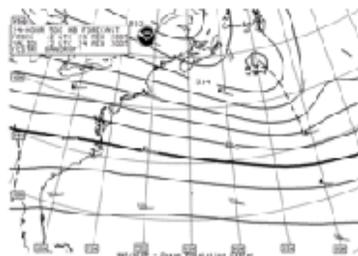


Latest Atlantic offshore & adjacent waters sea analysis (feet)

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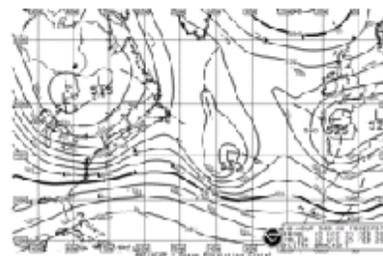
## Atlantic Forecast

24 hour



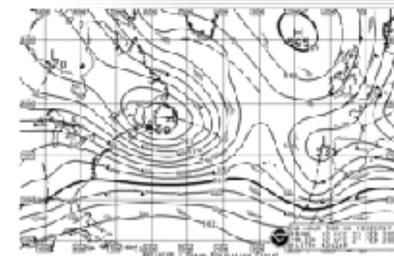
Last Update: Wednesday, 23-Feb-2005  
17:13:58 UTC

48 hour

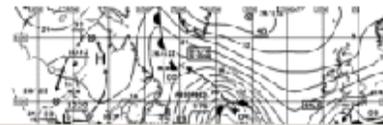


Last Update: Wednesday, 23-Feb-2005  
17:12:07 UTC

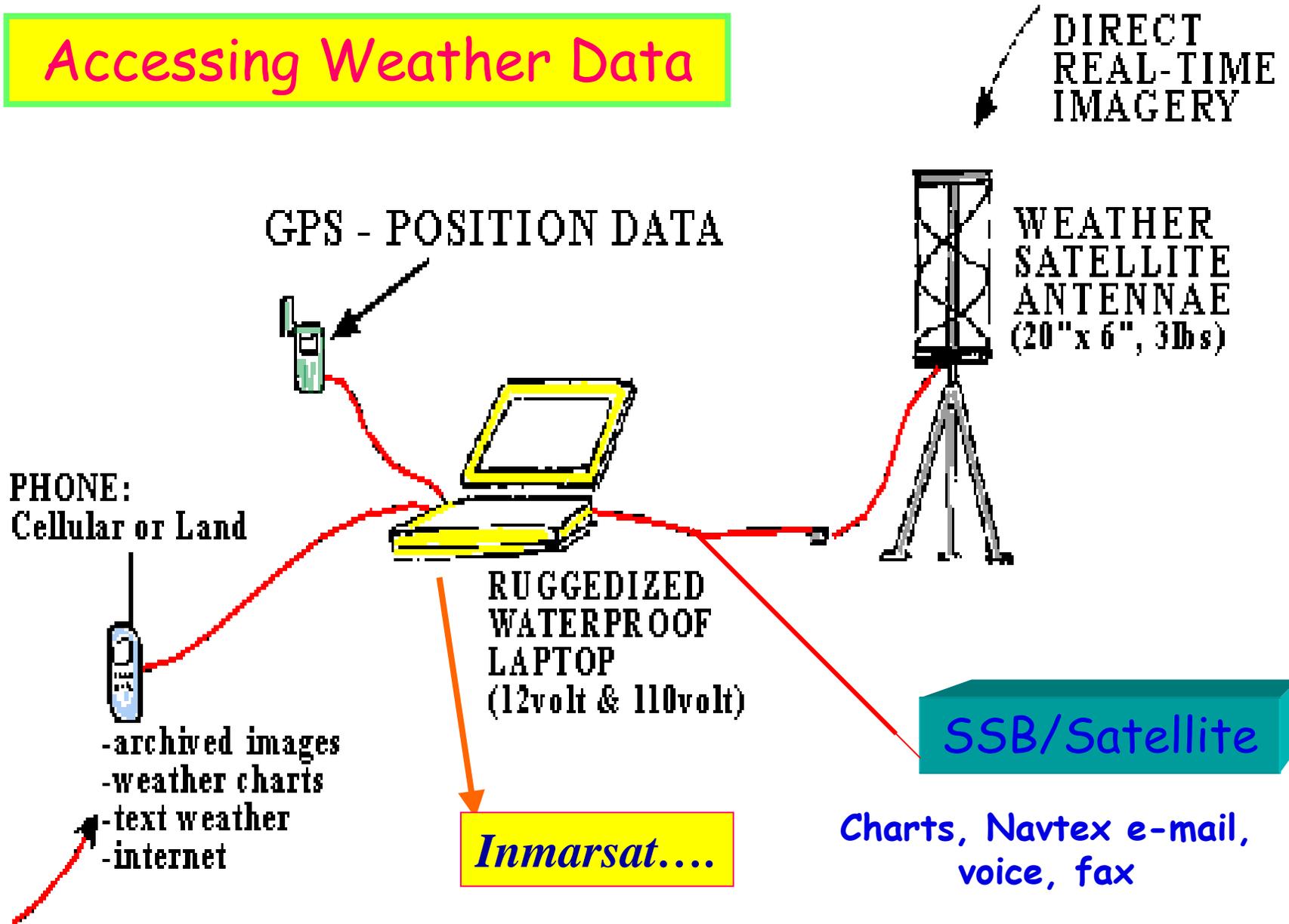
96 hour

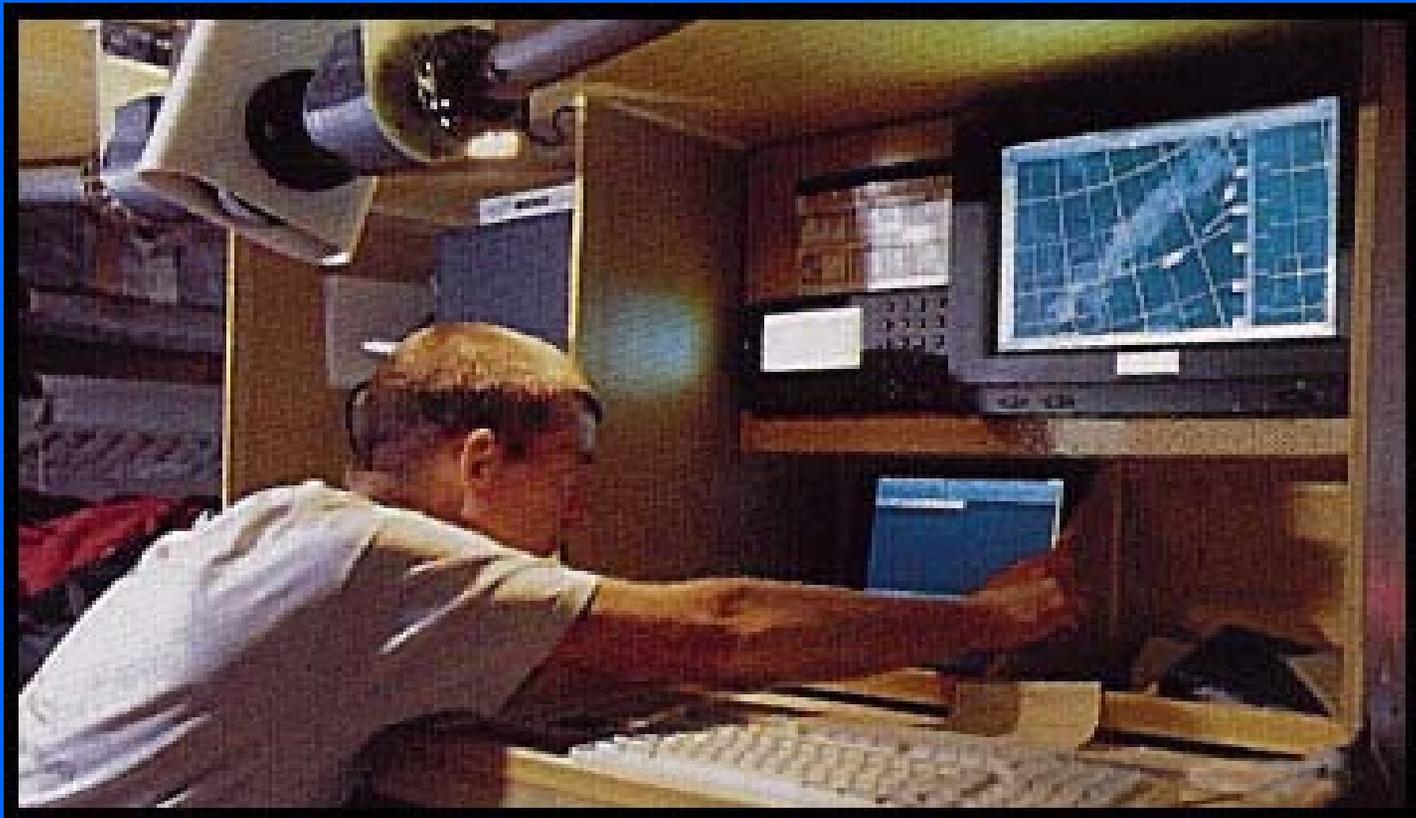


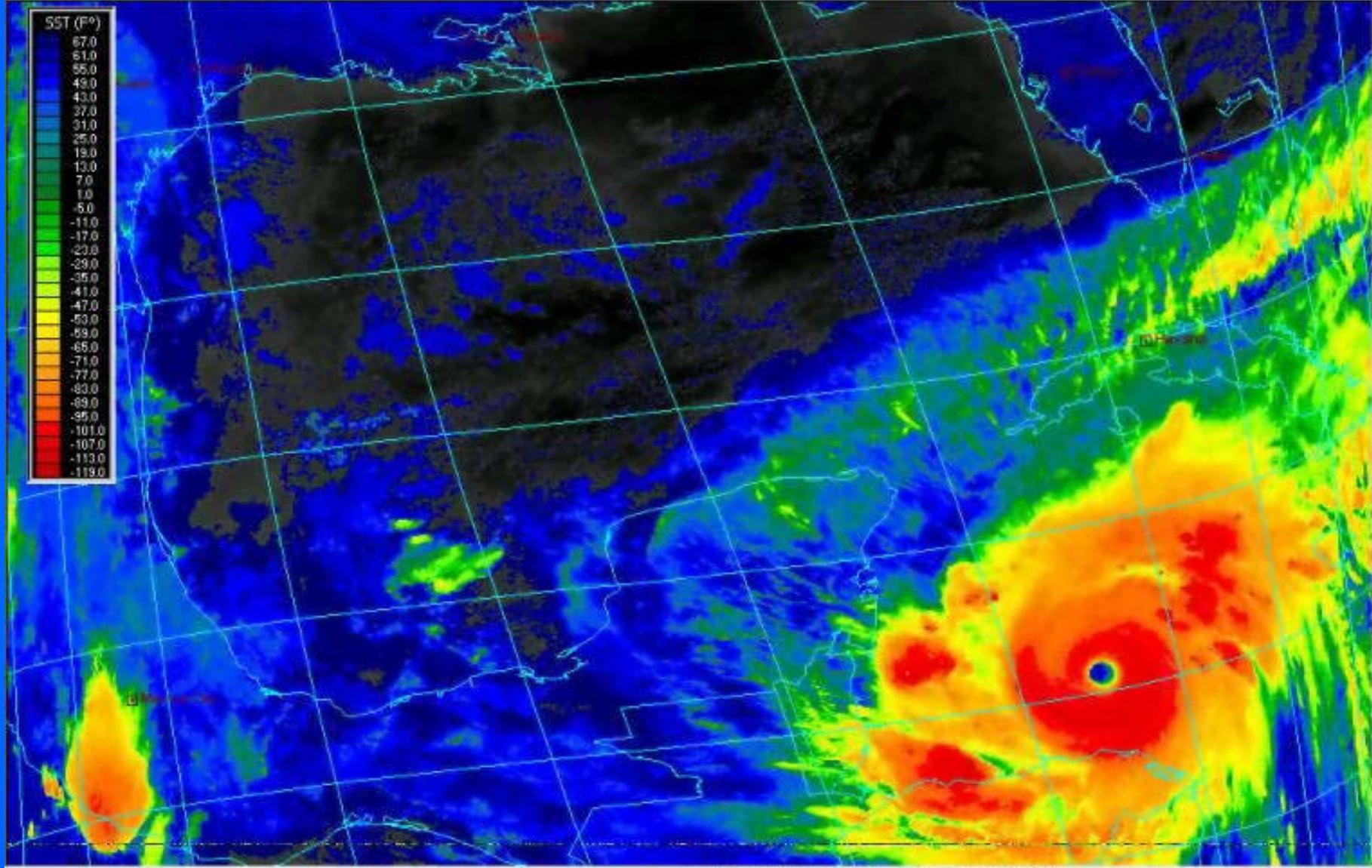
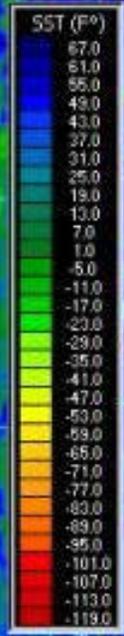
Last Update: Wednesday, 23-Feb-2005  
16:24:15 UTC



# Accessing Weather Data







34.767 S 139.133 E T. Zone: 9.0 UTC 13:25:11

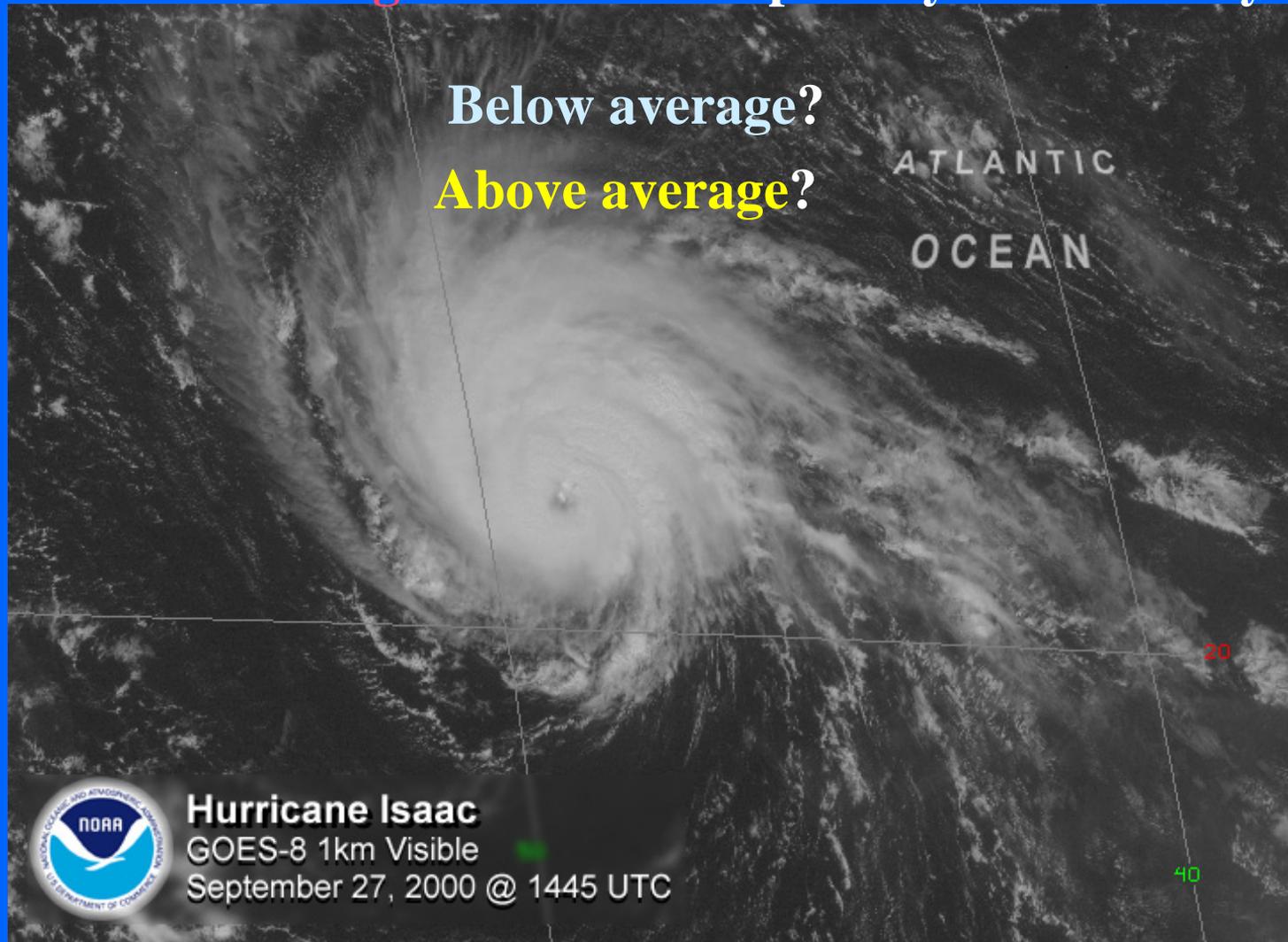
# TROPICAL CYCLONES



**Hurricane Isabel 18 Sep 2003**

# The 2004 Atlantic Hurricane Season

Was it an **average** season for tropical cyclone activity?



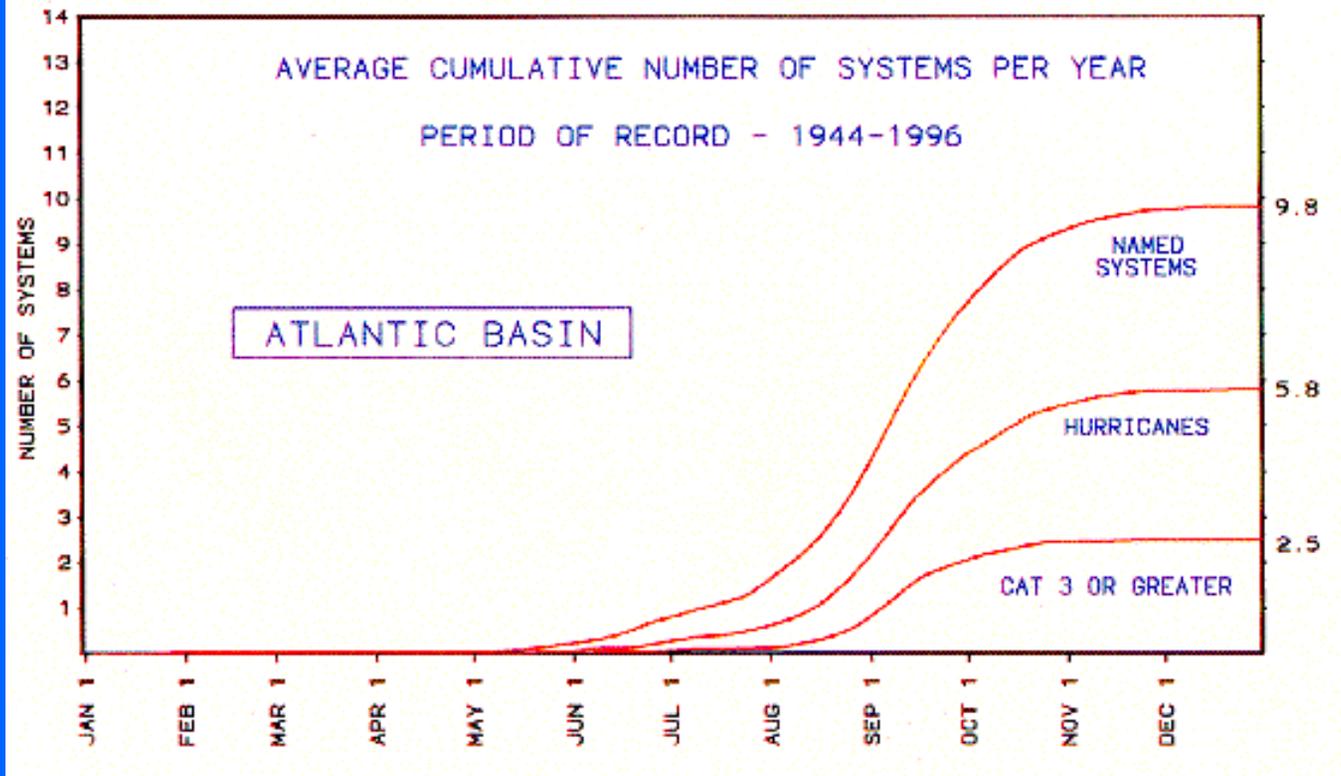
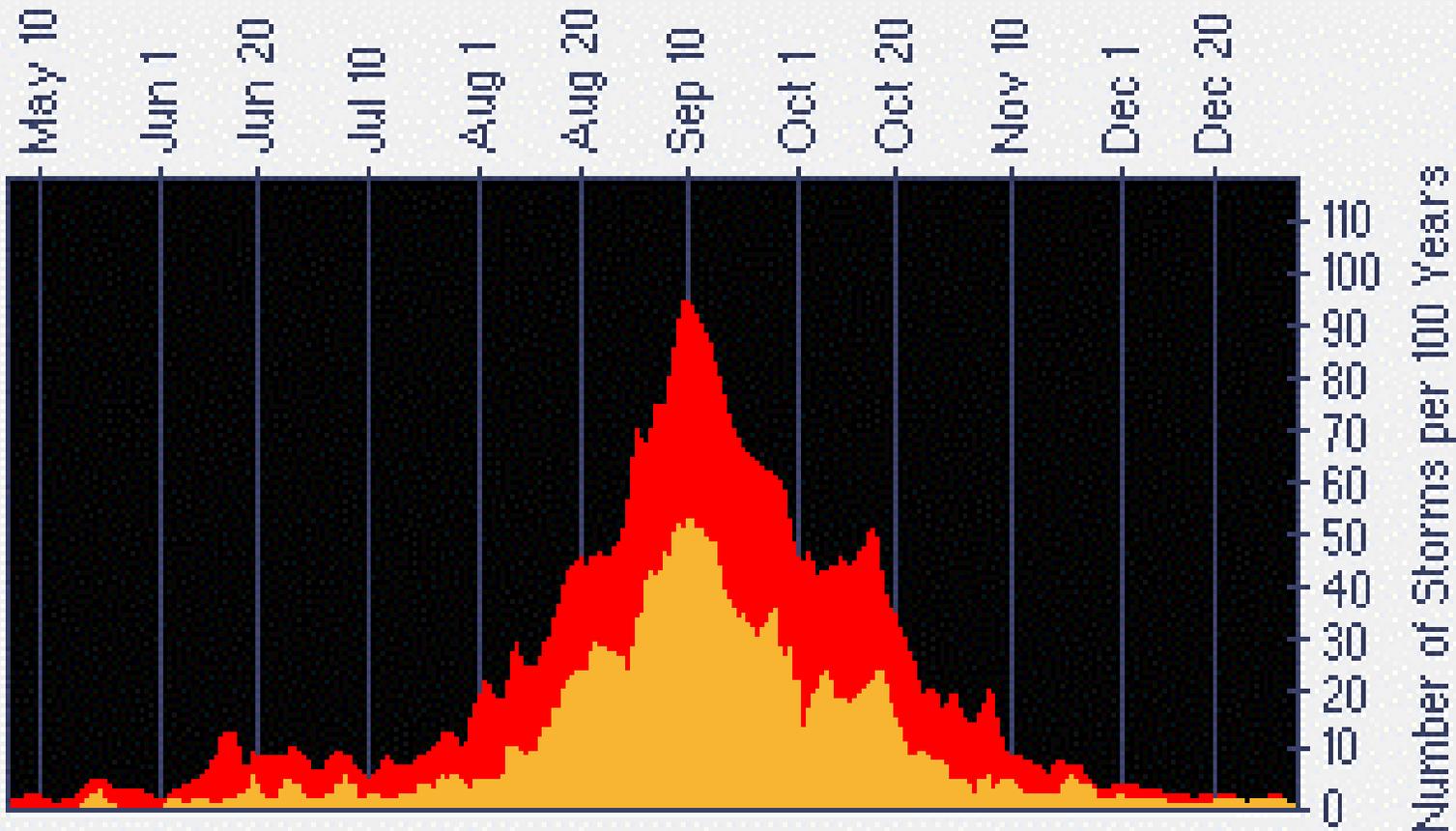


Table 1. Progress of the average Atlantic season (1944-1996). Date upon which the following number of events would normally have occurred.

Number	Named systems	Hurricanes	Category 3 or greater
1	July 11	Aug 14	Sep 4
2	Aug 8	Aug 30	Sep 28
3	Aug 21	Sep 10	-
4	Aug 30	Sep 24	-
5	Sep 7	Oct 15	-
6	Sep 14	-	-
7	Sep 23	-	-
8	Oct 5	-	-
9	Oct 21	-	-



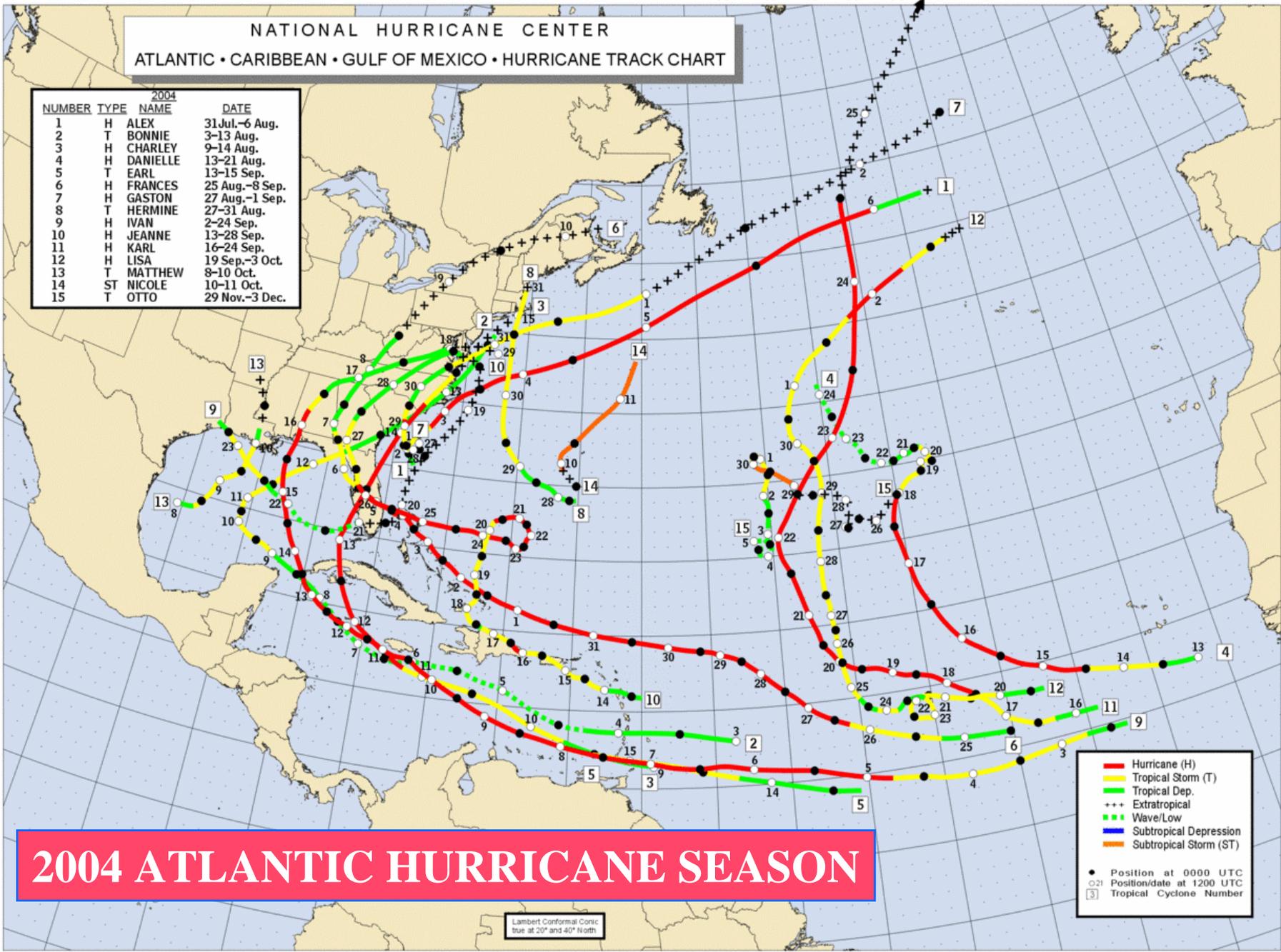
 Hurricanes and Tropical Storms  
 Hurricanes

NOAA

120° 115° 110° 105° 100° 95° 90° 85° 80° 75° 70° 65° 60° 55° 50° 45° 40° 35° 30° 25° 20° 15° 10° 5° West 0° East 5°

**NATIONAL HURRICANE CENTER**  
**ATLANTIC • CARIBBEAN • GULF OF MEXICO • HURRICANE TRACK CHART**

2004			
NUMBER	TYPE	NAME	DATE
1	H	ALEX	31 Jul.-6 Aug.
2	T	BONNIE	3-13 Aug.
3	H	CHARLEY	9-14 Aug.
4	H	DANIELLE	13-21 Aug.
5	T	EARL	13-15 Sep.
6	H	FRANCES	25 Aug.-8 Sep.
7	H	GASTON	27 Aug.-1 Sep.
8	T	HERMINE	27-31 Aug.
9	H	IVAN	2-24 Sep.
10	H	JEANNE	13-28 Sep.
11	H	KARL	16-24 Sep.
12	H	LISA	19 Sep.-3 Oct.
13	T	MATTHEW	8-10 Oct.
14	ST	NICOLE	10-11 Oct.
15	T	OTTO	29 Nov.-3 Dec.



**2004 ATLANTIC HURRICANE SEASON**

- Hurricane (H)
- Tropical Storm (T)
- Tropical Dep.
- +++ Extratropical
- - - Wave/Low
- Subtropical Storm (ST)

- Position at 0000 UTC
- Position/date at 1200 UTC
- ③ Tropical Cyclone Number

Lambert Conformal Conic  
 True at 20° and 40° North

Return to Historical Hurricane Tracks Home Query Storm Tracks

# Hurricane Connie 1955

Query Storm Tracks

Refresh Layers

Legend

Locator Map Show All Storms Zoom Out Full Extent Last Extent Identify Extract Data Print Help



- Data Layer
- Hurricane Track Labels
- Hurricane Track
  - Category 3-5
  - Category 1-2
  - Tropical Storm
  - Tropical Depression
  - Subtropical Storm
  - Subtropical Depression
  - Extratropical Storm
  - Tropical Low
  - Tropical Wave
  - Tropical Disturbance
- Roads
- US Interstates
- Local Political Boundaries
- Political Boundaries
- Water Features

NOAA Coastal Services Center

0 229mi

Hurricane Track

Rec	YEAR	MONTH	DAY	STORM ID	STORM NAME	LAT	LONG	WIND SPEED(KTS)	PRESSURE(MB)	WIND SPEED(MPH)	CATEGORY	BASIN
1	1955	8	3	780	CONNIE	15.3	-35.6	30	0	35	TD	North Atlantic
2	1955	8	3	780	CONNIE	15.7	-39.2	35	0	40	TS	North Atlantic
3	1955	8	3	780	CONNIE	16.1	-42.7	40	0	45	TS	North Atlantic
4	1955	8	4	780	CONNIE	16.4	-45.3	40	0	45	TS	North Atlantic
5	1955	8	4	780	CONNIE	16.7	-47	40	0	45	TS	North Atlantic

# Hurricane Isabel 2003

Return

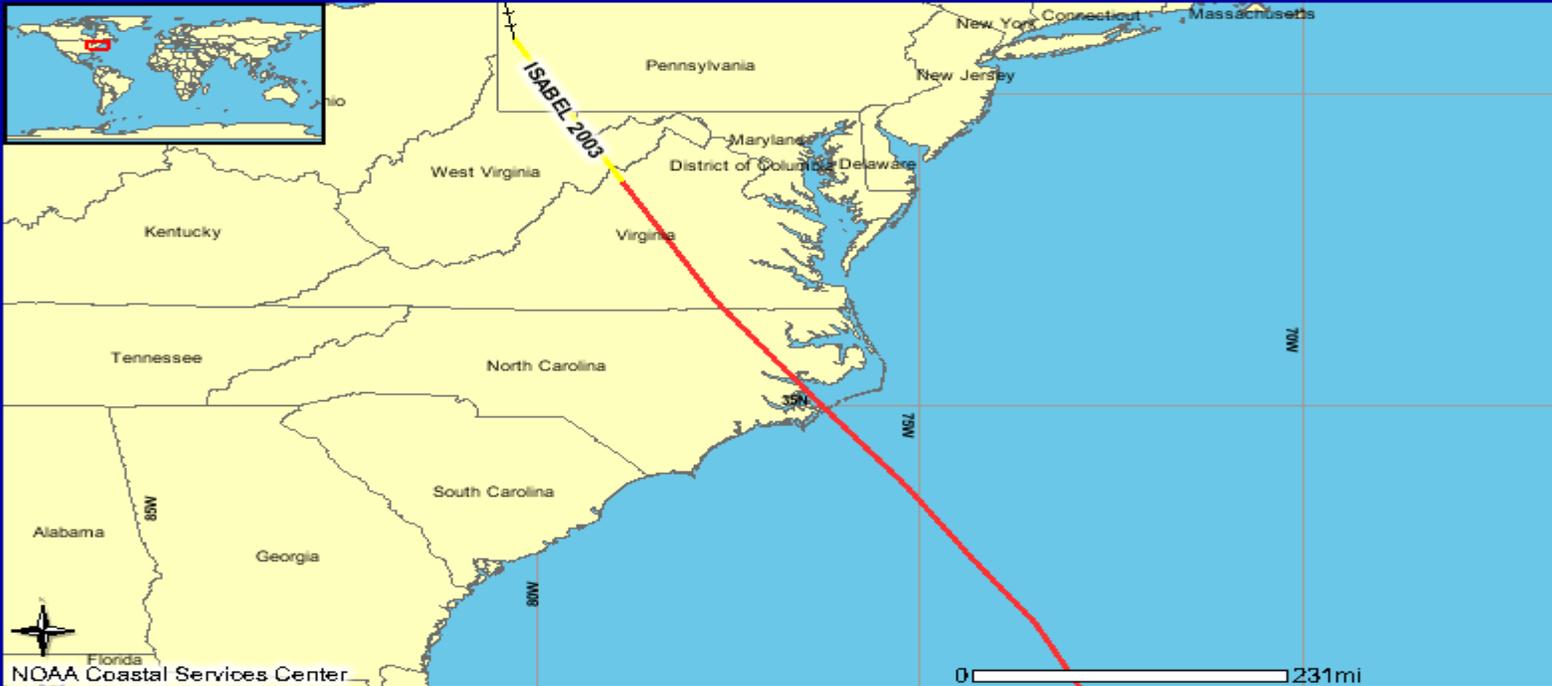
Query

Tracks

Refresh Layers

Legend

Location Map Show All Storms Zoom In Full Extent Last Extent Extract Data Print Help



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  - Category 1-2
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  - Subtropical Depression
  - Extratropical Storm
  - Tropical Low
  - Tropical Wave
  - Tropical Disturbance
- Roads
- US Interstates
- Local Political Boundaries
- Political Boundaries
- Water Features

Hurricane Track												
Rec	YEAR	MONTH	DAY	STORM ID	STORM NAME	LAT	LONG	WIND SPEED(KTS)	PRESSURE(MB)	WIND SPEED(MPH)	CATEGORY	BASIN
1	2003	9	6	1297	ISABEL	13.8	-31.4	30	1009	35	TD	North Atlantic
2	2003	9	6	1297	ISABEL	13.9	-32.7	35	1005	40	TS	North Atlantic
3	2003	9	6	1297	ISABEL	13.6	-33.9	40	1003	45	TS	North Atlantic
4	2003	9	6	1297	ISABEL	13.4	-34.9	45	1000	50	TS	North Atlantic
5	2003	9	7	1297	ISABEL	13.5	-35.8	55	994	65	TS	North Atlantic

Forecast Period (hours)	12	24	36	48	72	96	120
NHC Forecast Error (nm)	22	39	52	60	80	104	146
NHC Mean Error (1993-2002)( nm)	45	81	116	150	225	282	374



**Hurricane Isabel Impact - Frisco Breach**

# New Breach that Severed Hatteras Island

09/08/1999, Before

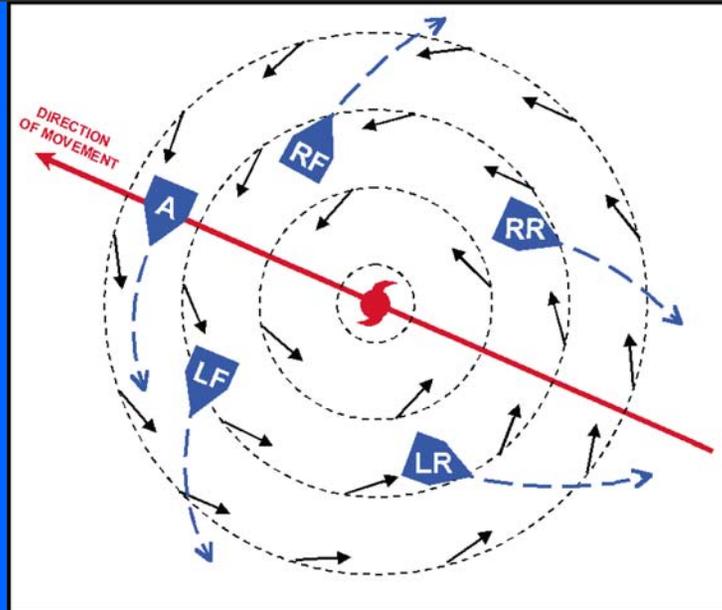


09/21/2003, After



# Caught At Sea...Navigating To Clear a Cyclone

Vessel Location	Navigation Action
Ahead Of Tropical Cyclone (A)	Put the wind at 160° relative to the ship on the starboard side making best course and speed into the left semi-circle of the system.
Right Semicircle Of Tropical Cyclone (RF)	Put the wind at 045° relative to the ship on the starboard side attempting to make best course and speed to clear the system. Wind & wave in this region can often drastically reduce ship forward speed.
Left Semicircle Of Tropical Cyclone (LF)	Put the wind at 135° relative to the ship on the starboard side making best course and speed to increase separation between ship and tropical cyclone.
Behind The Tropical Cyclone (LR, RR)	Maintain best riding course and speed to increase separation between ship and tropical cyclone.



# Links-Tropical Cyclone Information

www.nws.noaa.gov



## National Weather Service Ocean Prediction Center



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Quality Control of Marine Weather Observations

Monthly Statistics

QC data

Imagery/Photos

Satellite

NOAA's Photo Gallery

OPC's Photo Gallery

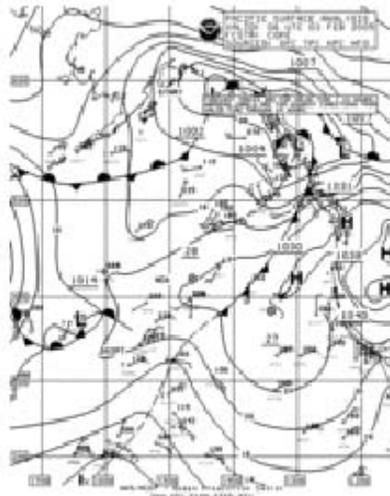
Ocean Application Branch

Science Operations Officer

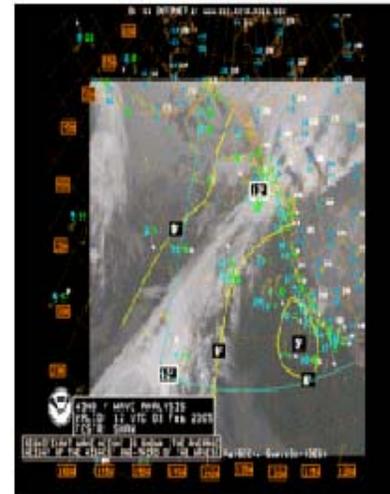
Use Of QUIKSCAT By OPC

Publications by and

### Pacific Analysis

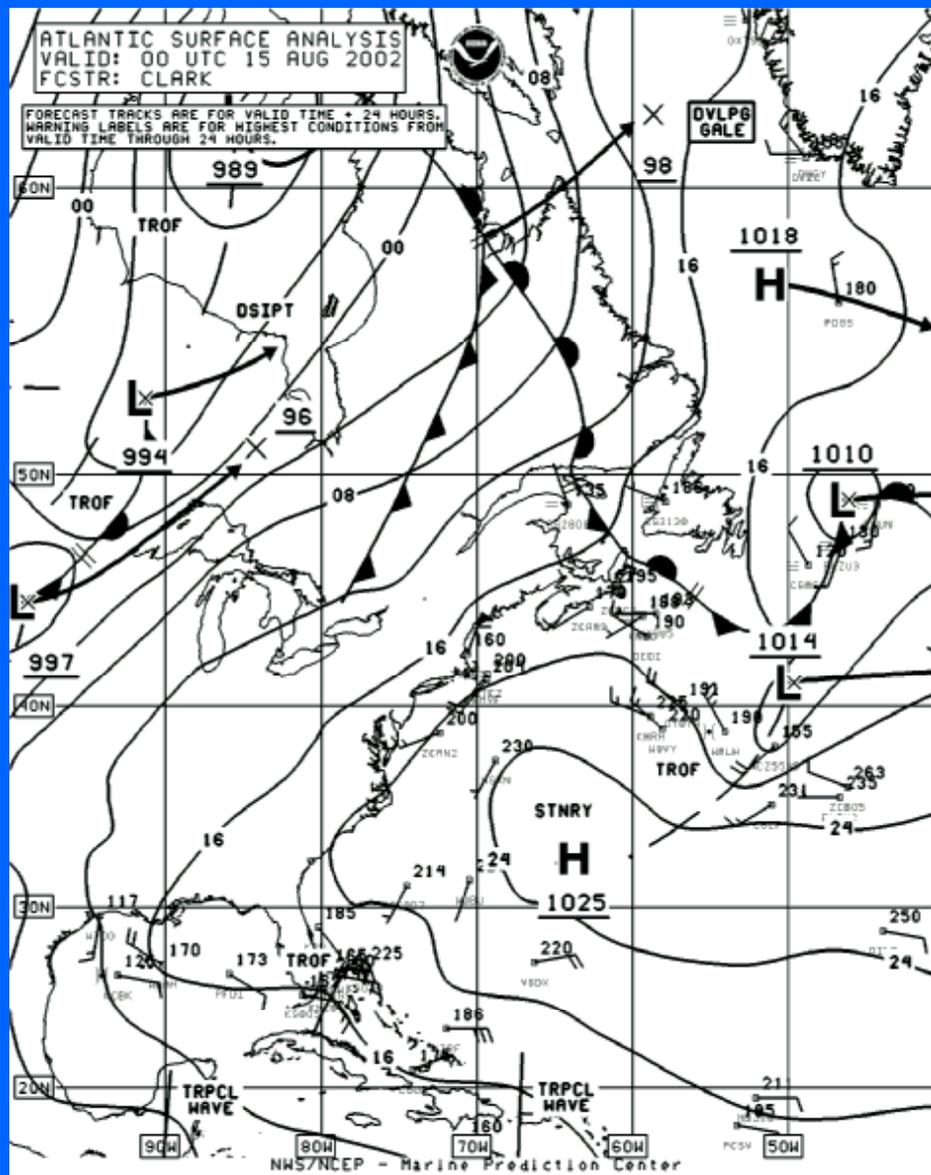


Last Update: Thursday, 03-Feb-2005 08:41:56 UTC



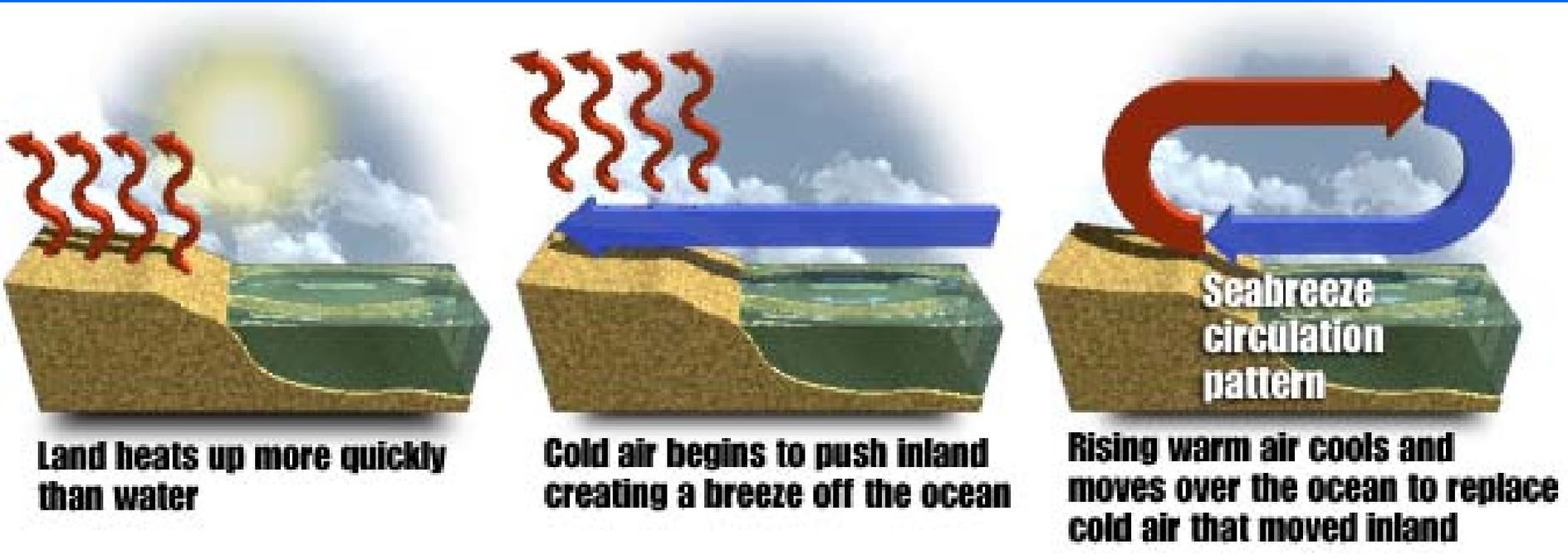
Last Update: Thursday, 03-Feb-2005 13:42:41 UTC

### Pacific Forecast

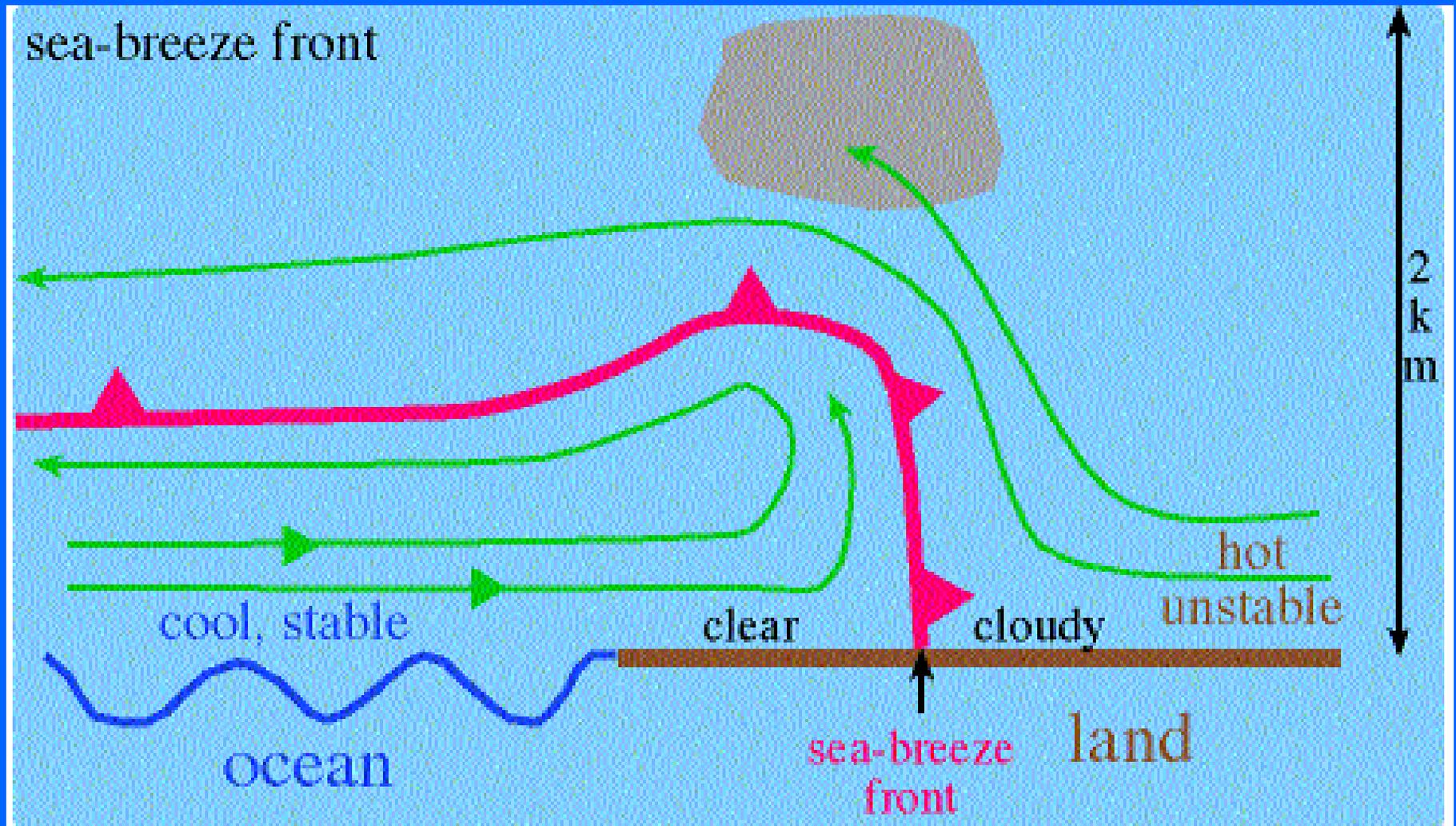


# BERMUDA HIGH PRESSURE SCENARIO

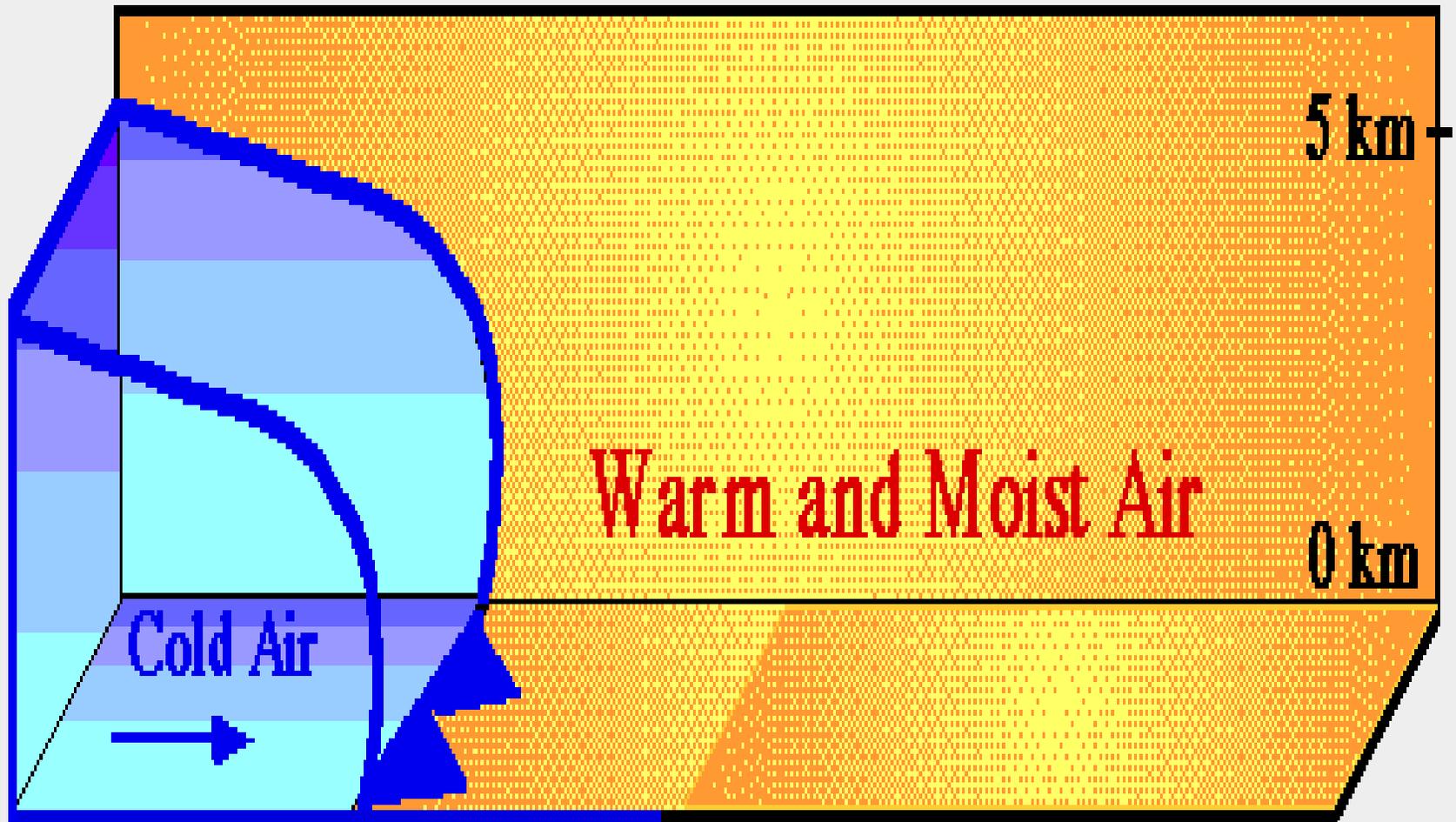
## SEA BREEZES



# SEA BREEZE FRONT



# Animation of cold front



**Cold Front**

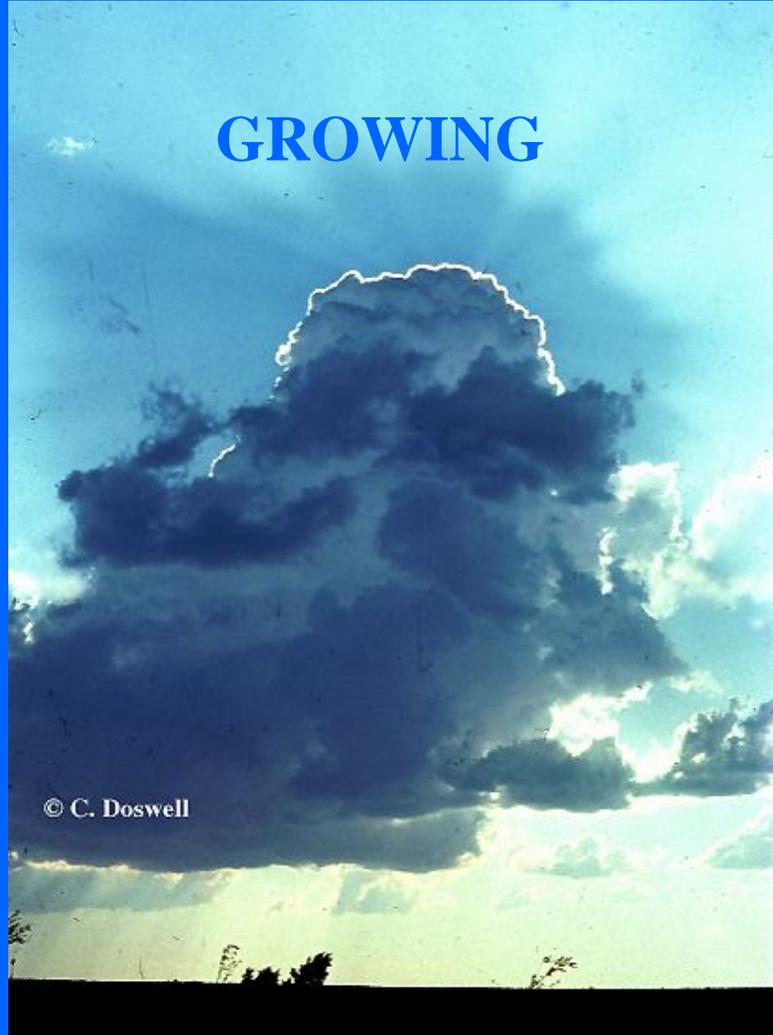
100 km

Department of Atmospheric Sciences  
University of Illinois at Urbana-Champaign

# *THUNDERSTORMS*



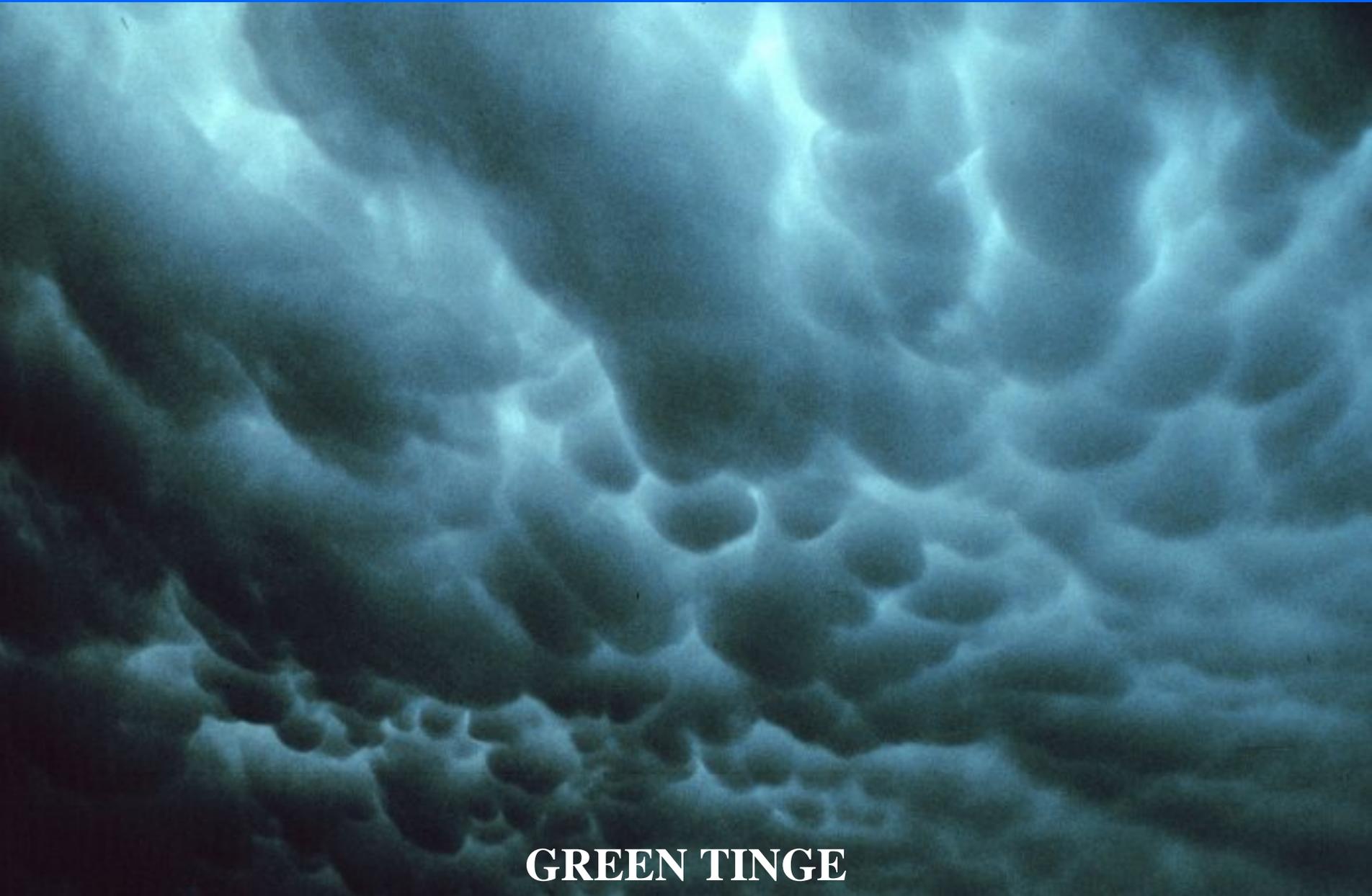
**GROWING**



**MATURE**



# MAMMATUS



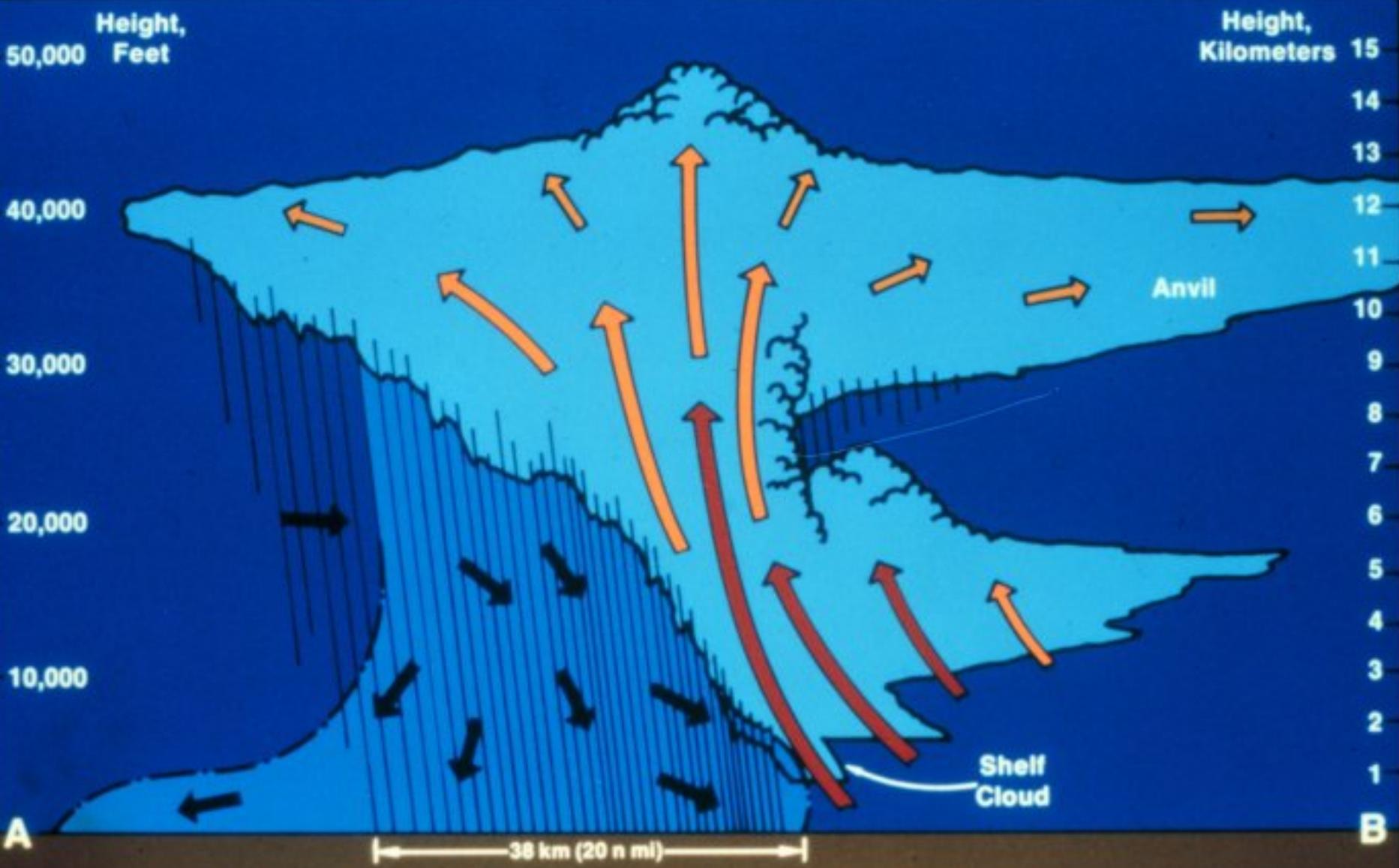
GREEN TINGE

# MICROBURSTS



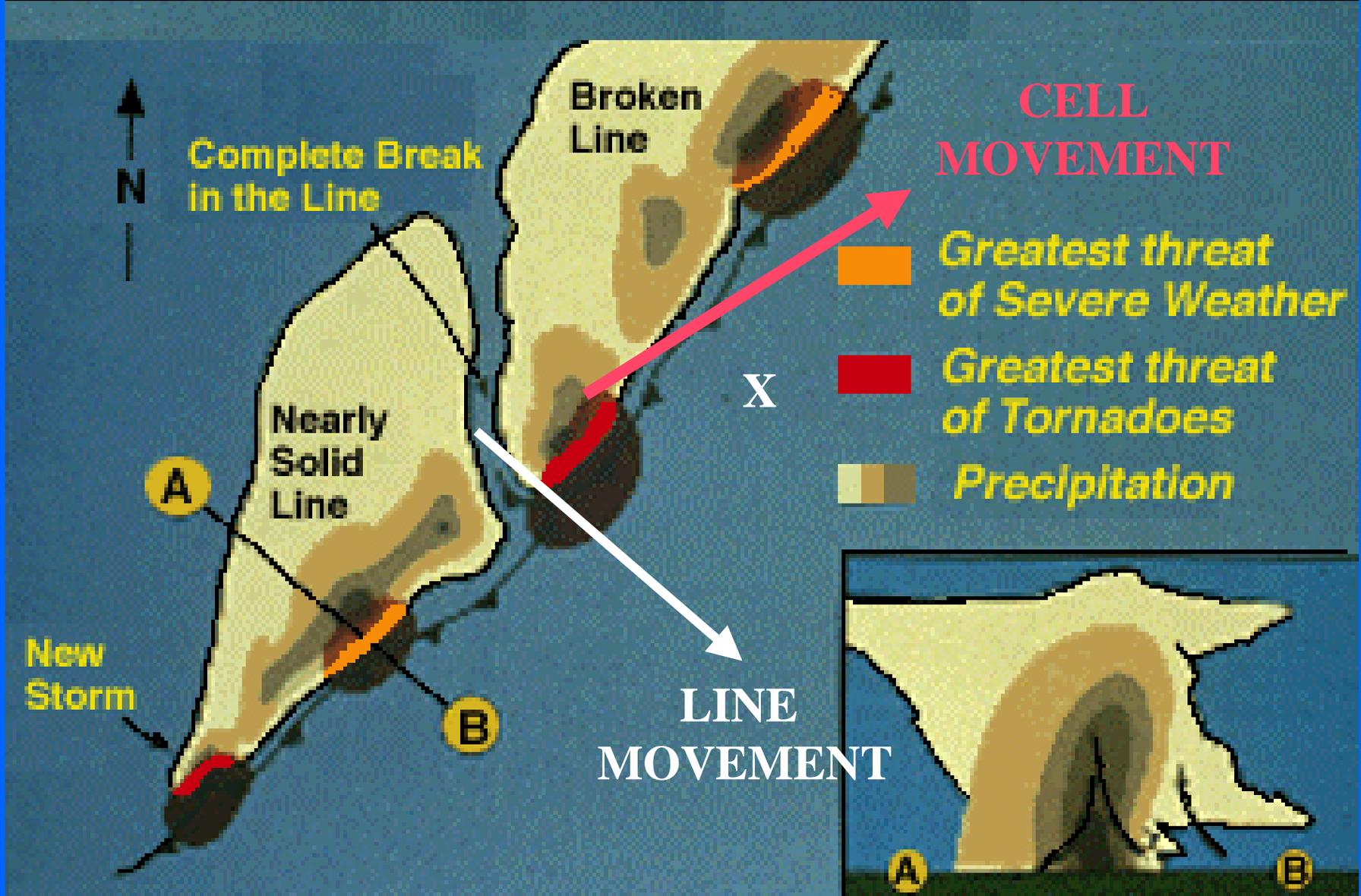
© C. Doswell

# SQUALL LINES



**SCHEMATIC CROSS SECTIONAL VIEW OF SQUALL LINE**

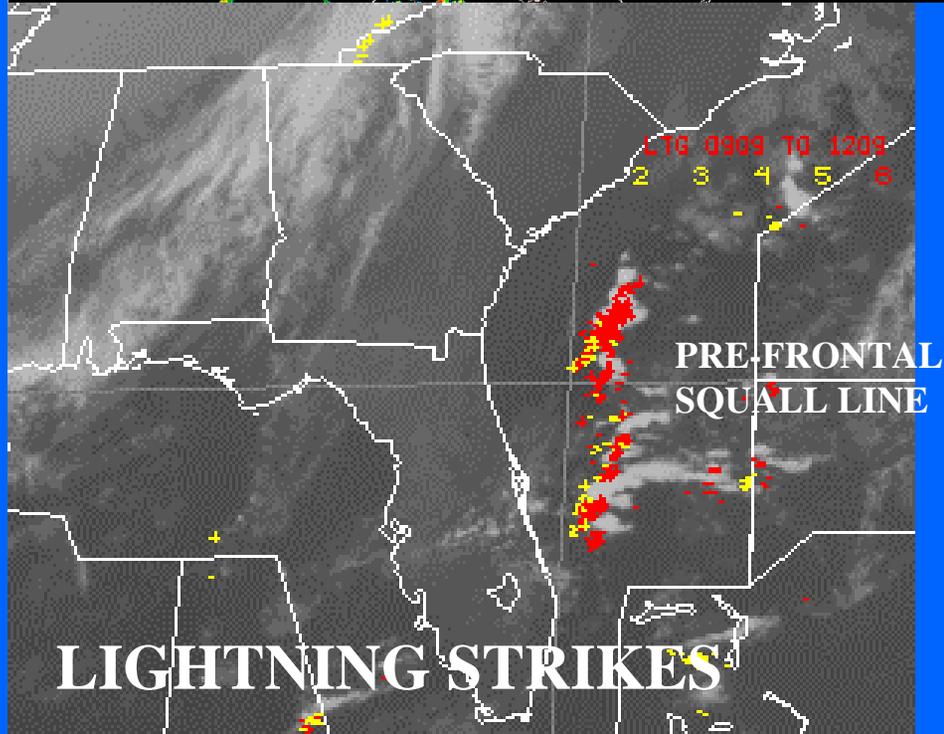
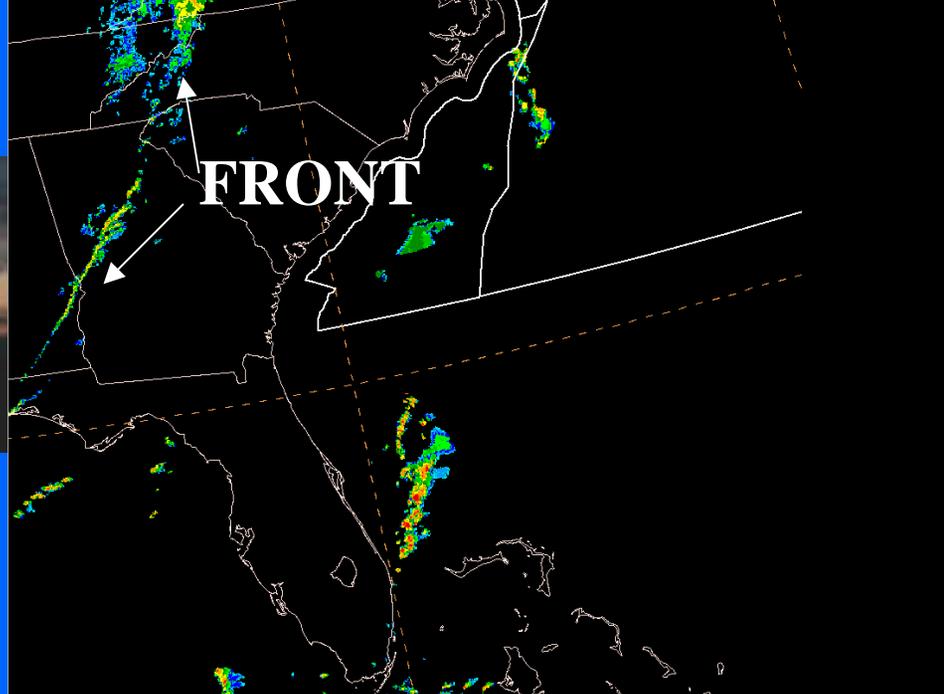
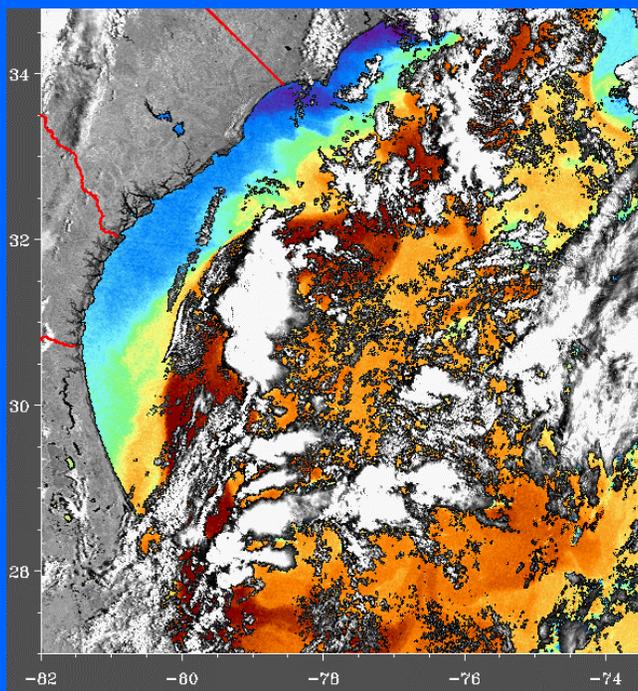
# MULTICELL LINE STORM (SQUALL LINE)



# THE GULF STREAM



## SPAWNING GROUND FOR T-STORMS



# Waterspouts



# LIGHTNING



# How fast thunder travels

Lightning makes thunder. Flash is seen instantly.

0 SECONDS

Thunder travels a mile in 5 seconds. Time between lightning and thunder gives distance.

3 SECONDS

BAM!

5 SECONDS



ONE MILE



# National Weather Service Radar Image

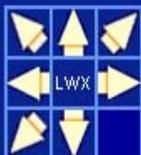
## Sterling, VA Radar



Short Range Base Reflectivity

Local forecast by "City, St" or zip code

### Adjacent Radars



### Base Reflectivity

- Short Range  Loop
- Long Range  Loop
- Composite Reflectivity
- Short Range  Loop
- Long Range  Loop
- Rainfall
- 1-Hour Total  Loop
- Storm Total  Loop

### U.S. Views

- National  Loop
- Alaska  Loop
- Hawaii  Loop
- Guam  Loop
- Puerto Rico  Loop
- Radars by State

### Additional Links

- [Radar Information](#)
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[Baltimore, MD/Washington, DC Homepage](#)

04:58 PM EST Wed Feb 19th 2003

Radar Image from National Weather Service: KLMX 21:58 UTC 02/19/2003



National Weather Service • Since

# NWS Sterling, VA Homepage

## National Weather Service Forecast Office Baltimore/Washington

www.nws.noaa.gov



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[Flood Potential Outlook](#)

### Quick Glimpse at the Weather

### Baltimore/Washington DC



Click on map for forecasts, warnings, and observations for a specific location. Click here for a summary of all warnings and advisories

Severe Thunderstorm Watch   
Short Term Forecast   
Special Weather Statement 

# **THUNDERSTORM TIPS**

**Know the forecast!**

**NOAA WX Radio**

**Fronts, troughs, boundaries**

**Watch the sky!!!**

**Gulf Stream**

**Flow parallel to the Stream**

**Max activity at night**

**AM Radio**

**Radar (rain clutter/sea clutter)**

**Act early!**



# Titanic Telegram

## POSTAL TELEGRAPH - COMMERCIAL CABLES

RECEIVED AT  
POSTAL TELEGRAPH BUILDING  
1345 PENNSYLVANIA AVENUE  
WASHINGTON, D. C.  
TELEPHONES MAIN 6600-6601

CLARENCE H. MACKAY, PRESIDENT.

# TELEGRAM

DELIVERY No.

795

The Postal Telegraph-Cable Company (Incorporated) transmits and delivers this message subject to the terms and conditions printed on the back of this blank.

16W-24126

DESIGN PATENT No. 40529

280 Ny. Rn. 22

S S Amerika via S S Titanic and Cape Race N.F. April, 14, 1912

Hydrographic Office, Washington DC

Amerika passed two large icebergs in 41 27 N 50 8 W on the 14th  
of April

Knutp, 10; 51p

*Telegraphed 13 10 0 New York  
April 15, 1912*

*PC*

*Gamm*

62496 filed with 2995	HYDRO. OFFICE Rec: APR 15 1912	Enclosures.
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*Wm*