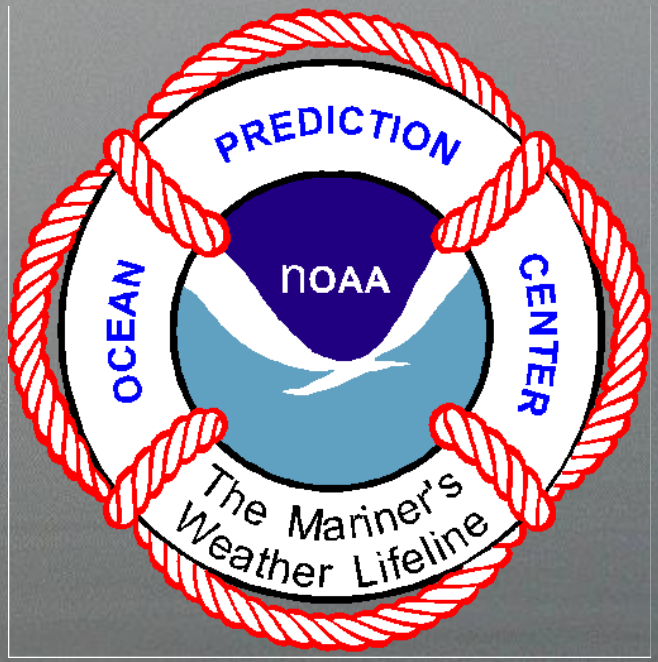
WEATHER AWARENESS

Joe Sienkiewicz

Chief, Ocean Applications Branch

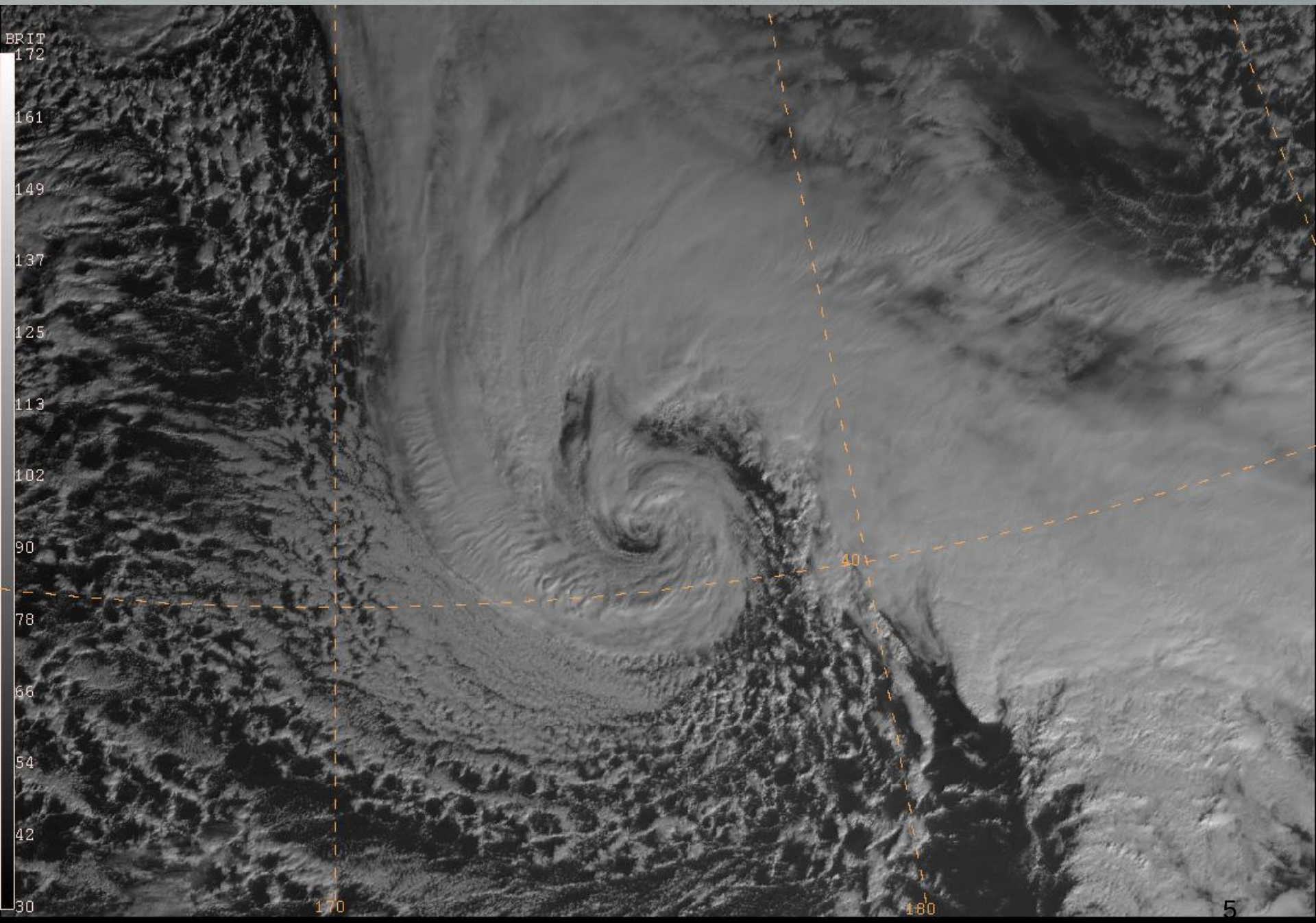
Science and Operations Officer

NOAA Ocean Prediction Center



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

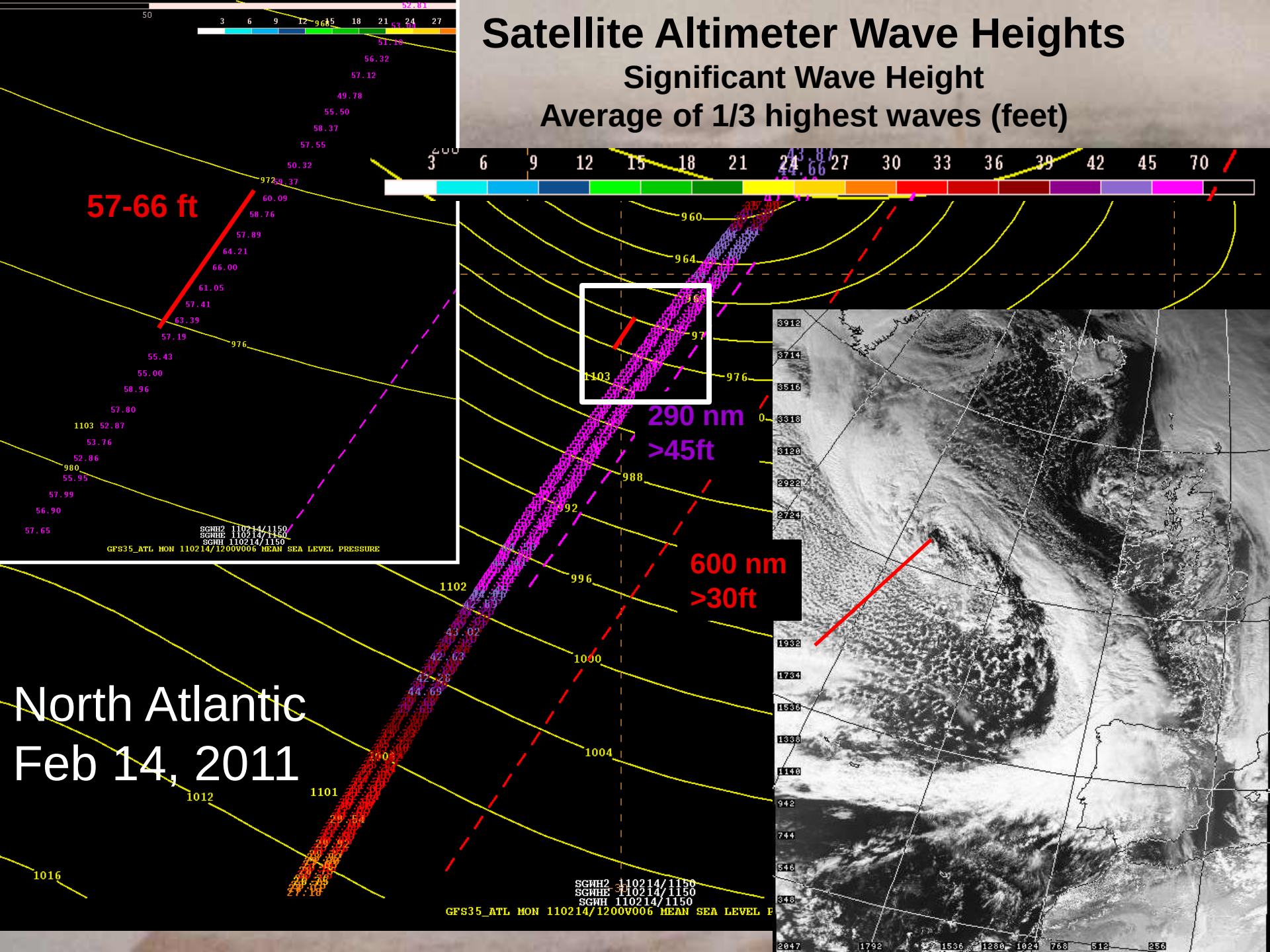
6 9:02AM


BRIT
172
161
149
137
125
113
102
90
78
66
54
42
30
170
40
160
080110/2230 MTS VIS

Satellite Altimeter Wave Heights

Significant Wave Height

Average of 1/3 highest waves (feet)

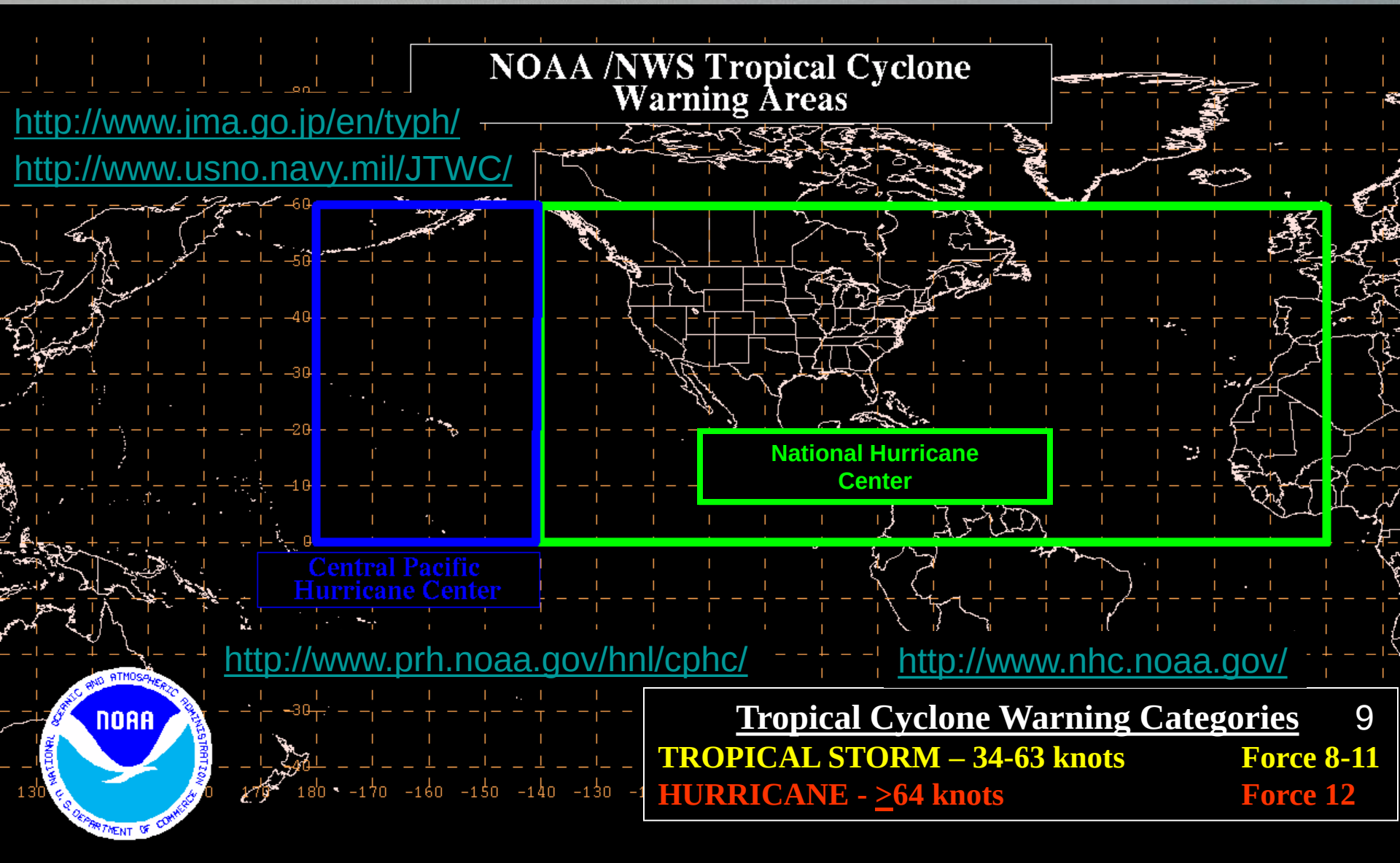


OPC mission/responsibility

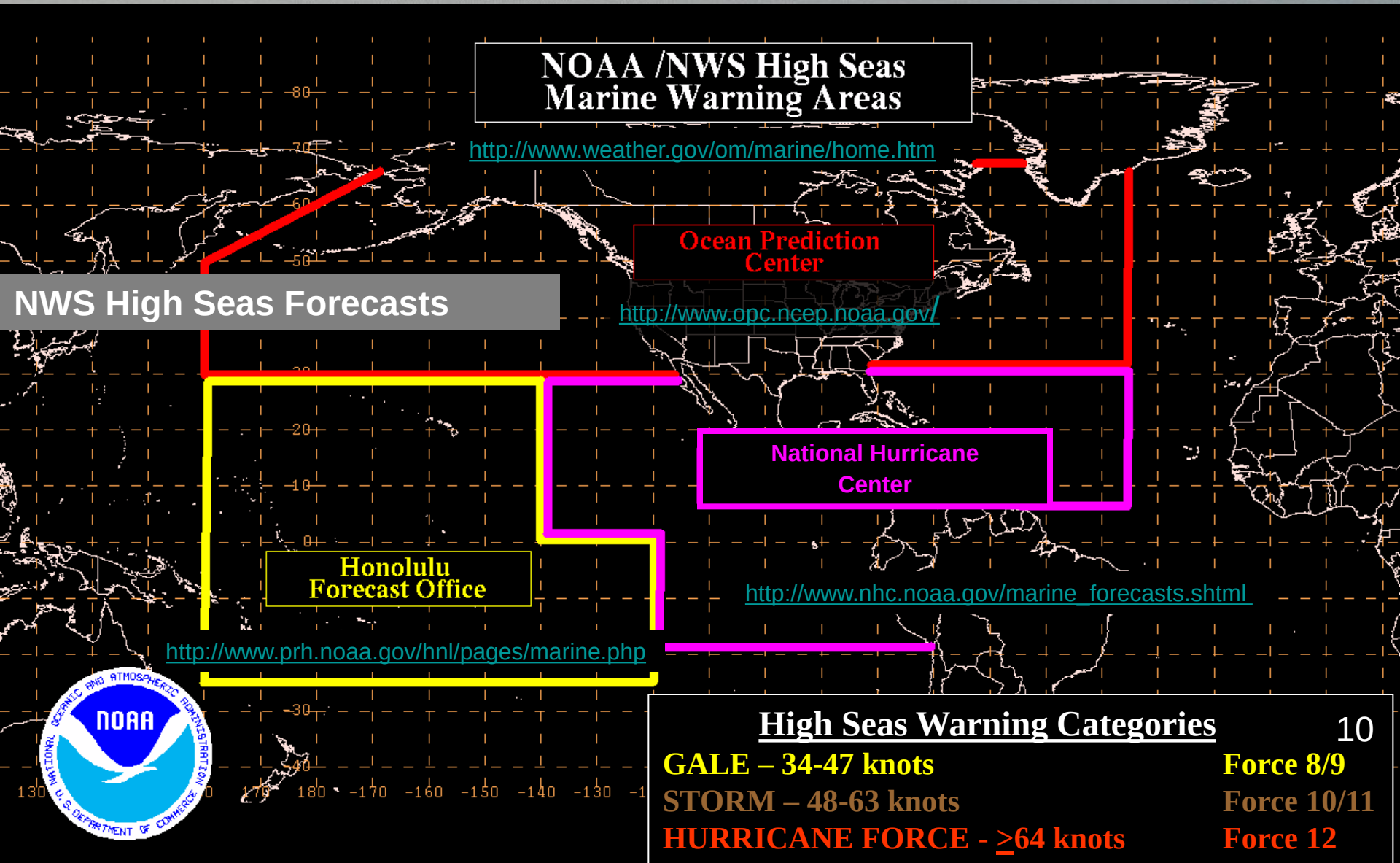
- Protection of life and property, safety at sea, and enhancement of economic opportunity

- Partially fulfill U.S. responsibilities with the World Meteorological Organization and Safety of Life at Sea Convention (SOLAS)
  - Text warning bulletins, graphic analyses and forecast products (Global Maritime Distress Safety System)
  - Traditional focus wind and waves
  - Expanding to operational oceanographic products
  - Increasing guidance role in Arctic
- Forecast support
  - Incident response, government operations
- Science based organization

NOAA Forecast Responsibility

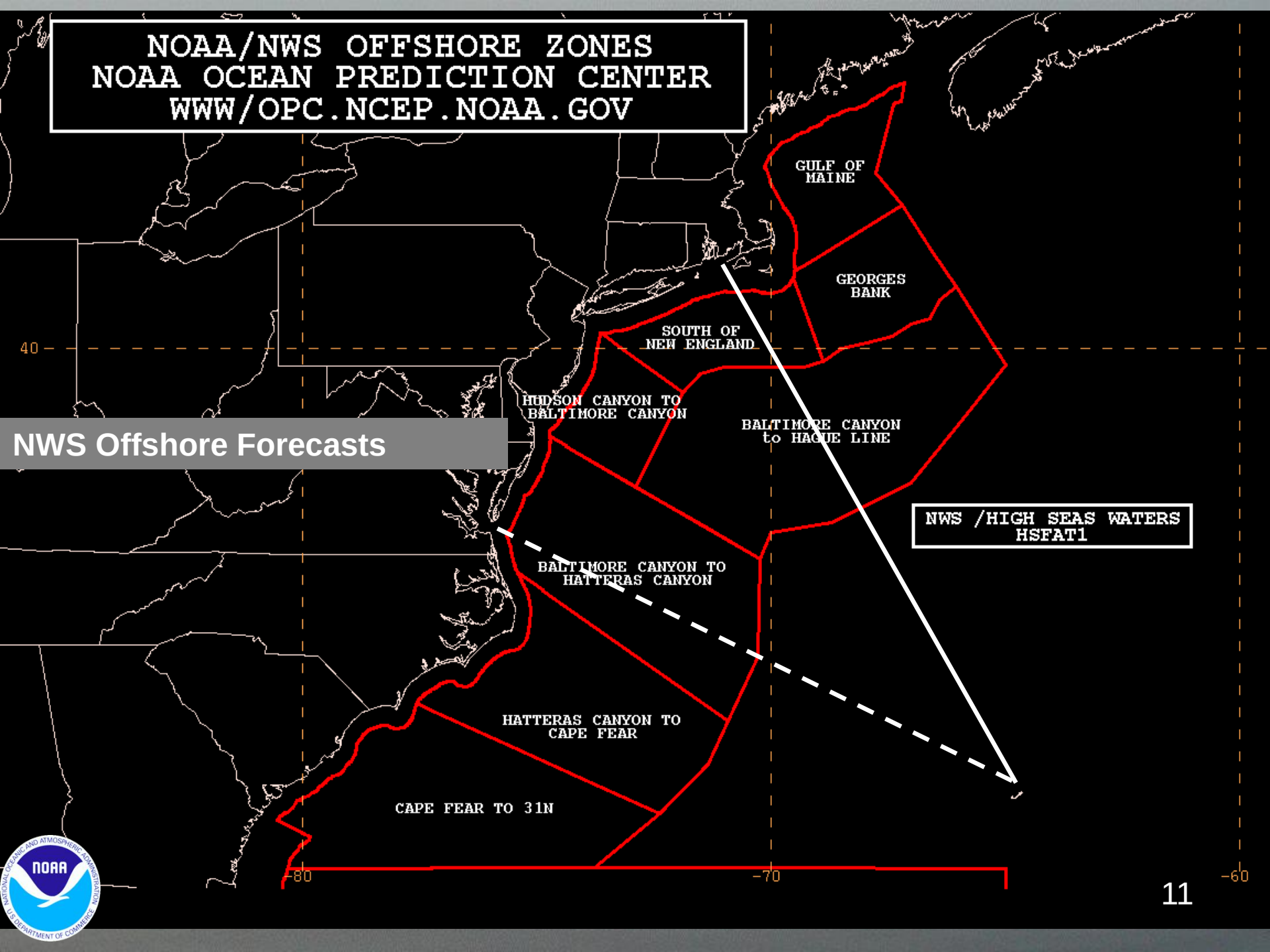


NOAA Forecast Responsibility



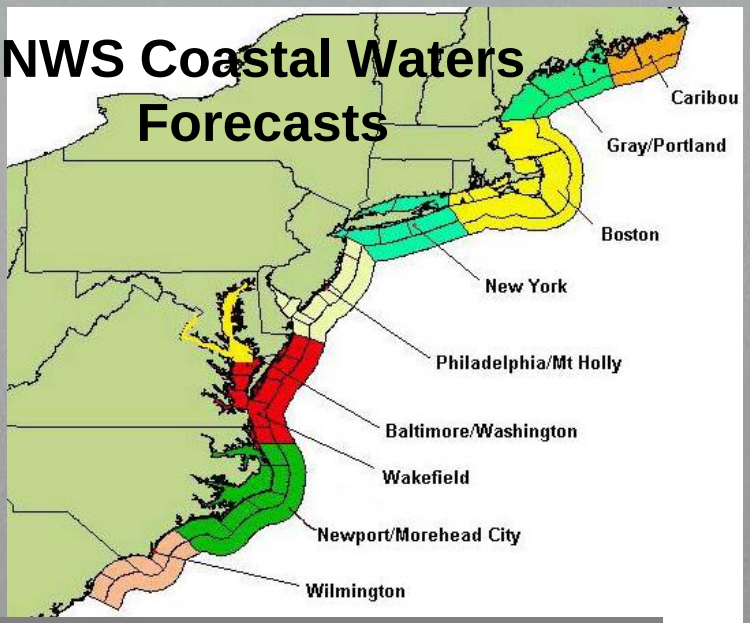
High Seas Warning Categories 10

GALE – 34-47 knots	Force 8/9
STORM – 48-63 knots	Force 10/11
HURRICANE FORCE - ≥64 knots	Force 12



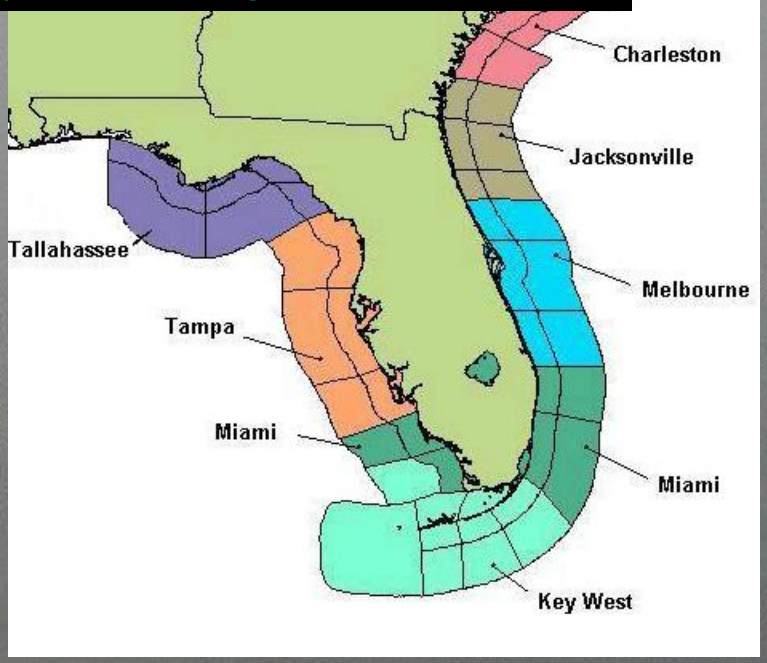
NWS Offshore Forecasts

NWS Coastal Waters Forecasts



NWS Coastal Waters Forecasts

http://www.weather.gov/om/marine/home.htm



Your National Weather Service forecast

18NM E Hampton VA Chesapeake Bay

Enter Your "City, ST" or zip code Go

NWS Wakefield, VA

Experimental Marine Point Forecast

37.02°N 75.98°W

Mobile Weather Information

Comments/Suggestions

Last Update: 7:10 am EDT Mar 19, 2009

Forecast Valid: 2pm EDT Mar 19, 2009-6pm EDT Mar 25, 2009

Forecast at a Glance

This Afternoon	Tonight	Friday	Friday Night	Saturday	Saturday Night	Sunday	Sunday Night	Monday
N 15kt 1ft	NNE 17kt 3ft	N 18kt 4ft	NNE 17kt 2-3ft	NNE 14kt 2-3ft	E 8kt 1ft	WSW 7kt 1ft	S 8kt 1ft	N 8kt 1ft
		Small Craft Advisory	Small Craft Advisory					

Marine Point Forecast

Hazardous marine condition(s):

Small Craft Advisory

This Afternoon: SW wind 11 to 15 kt becoming N. A chance of showers after 3pm. Waves around 1 ft.

Tonight: NNE wind around 17 kt. Showers likely before 6pm, then rain likely, mainly before midnight. Waves around 3 ft.

Friday: N wind around 18 kt, with gusts as high as 26 kt. A chance of rain before 10am. Waves around 4 ft.

Friday Night: NNE wind 13 to 17 kt, with gusts as high as 23 kt. Mostly clear. Waves 2 to 3 ft.

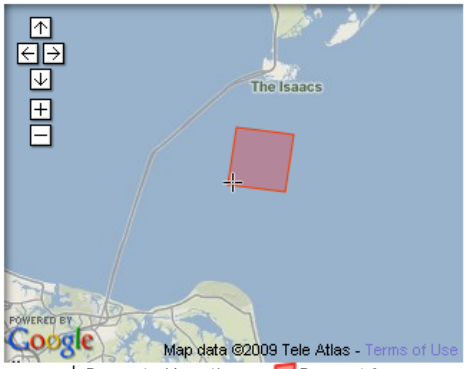
Saturday: NNE wind 9 to 14 kt becoming ENE in the afternoon. Sunny. Waves 2 to 3 ft.

Saturday Night: E wind 5 to 8 kt becoming SW after midnight. Mostly clear. Waves around 1 ft.

Sunday: SW wind 5 to 7 kt becoming S in the afternoon. Sunny. Waves around 1 ft.

Detailed Point Forecast [Move Down]

Click Map for Forecast Disclaimer



Requested Location Forecast Area

Lat/Lon: 37.02°N 75.98°W **Elevation:**0 ft

Current Conditions [Move Up]

CHYV2 8638999 - Cape Henry, VA

Lat: 36.93°N Lon: 76.01°W Elev: 0

Last Update on Mar 19, 12:42 pm EDT

Offshore Waters Forecast

ANZ089-182030- 500 AM EDT TUE MAR 29 2011

.**SYNOPSIS** FOR MID ATLC WATERS...

...DEVELOPING LOW PRES WILL MOVE OFF THE CAROLINA COAST WED NIGHT AND PASS NE ACROSS THE CENTRAL WATERS WED NIGHT INTO THU.

A SECOND LOW WILL MOVE NE NEAR THE CAROLINA COAST THU...THEN INTENSIFY WHILE CONTINUING NE ACROSS THE NRN WATERS FRI…

Offshore Waters Forecast

BALTIMORE CANYON TO HAGUE LINE S OF 1000 FM
500 AM EDT TUE MAR 29 2011

...GALE FORCE WINDS EXPECTED WED NIGHT INTO THU...

.TODAY...NW WINDS 20 TO 25 KT. SEAS 7 TO 11 FT...EXCEPT W OF 70W 5 TO 8 FT. HIGHEST WINDS AND SEAS E.

.TONIGHT...NW WINDS 15 TO 20 KT. SEAS SUBSIDING TO 4 TO 9 FT... HIGHEST SE.

.WED...NW WINDS DIMINISHING TO 10 TO 15 KT...EXCEPT W OF 69W TO VARIABLE 10 KT OR LESS. SEAS BUILDING TO 2 TO 4 FT...EXCEPT E OF 70W 4 TO 7 FT...HIGHEST SE.

.WED NIGHT...E TO NE WINDS INCREASING TO 15 TO 25 KT...**EXCEPT FAR S PART TO 25 TO 35 KT**. SEAS BUILDING TO 4 TO 8 FT. HIGHEST WINDS AND SEAS S. SCATTERED SHOWERS S PORTION.

.THU...E TO NE WINDS 20 TO 30 KT**...EXCEPT FAR S PART TO 35 KT** EARLY. SEAS 4 TO 8 FT...EXCEPT SW PORTION BUILDING TO 7 TO 11 FT...HIGHEST SW.

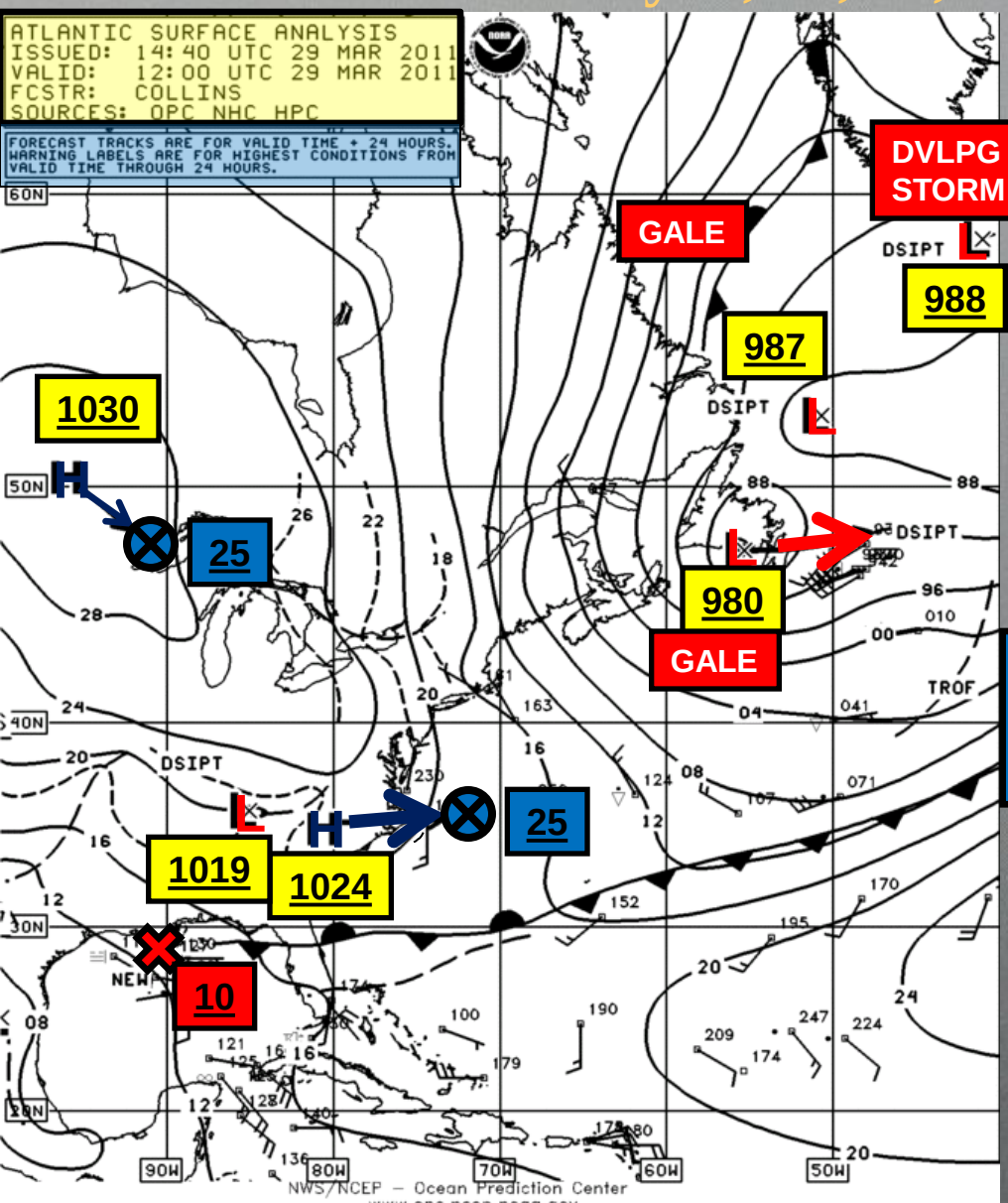
.FRI...E TO SE WINDS INCREASING TO 25 TO 35 KT THEN BECOMING SW TO W. SEAS BUILDING TO 9 TO 15 FT...HIGHEST SE.

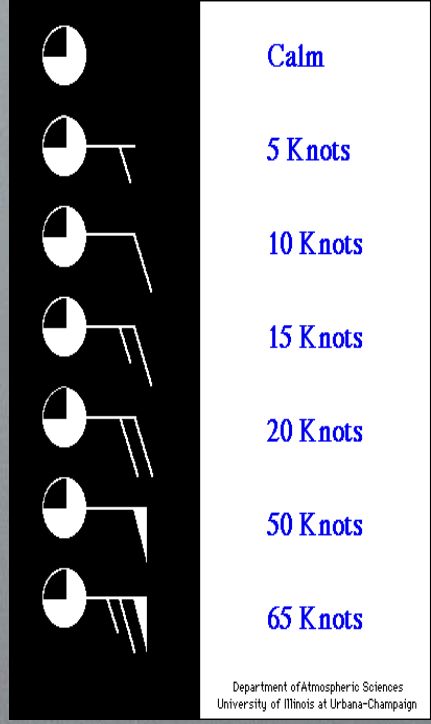
.SAT...W TO NW WINDS 25 TO 30 KT. SEAS 8 TO 15 FT...HIGHEST SE.

$$

Surface Charts

Analysis, 24, 48, 96 HR Forecasts





Fronts

Observations

Isobars

Pressure Centers

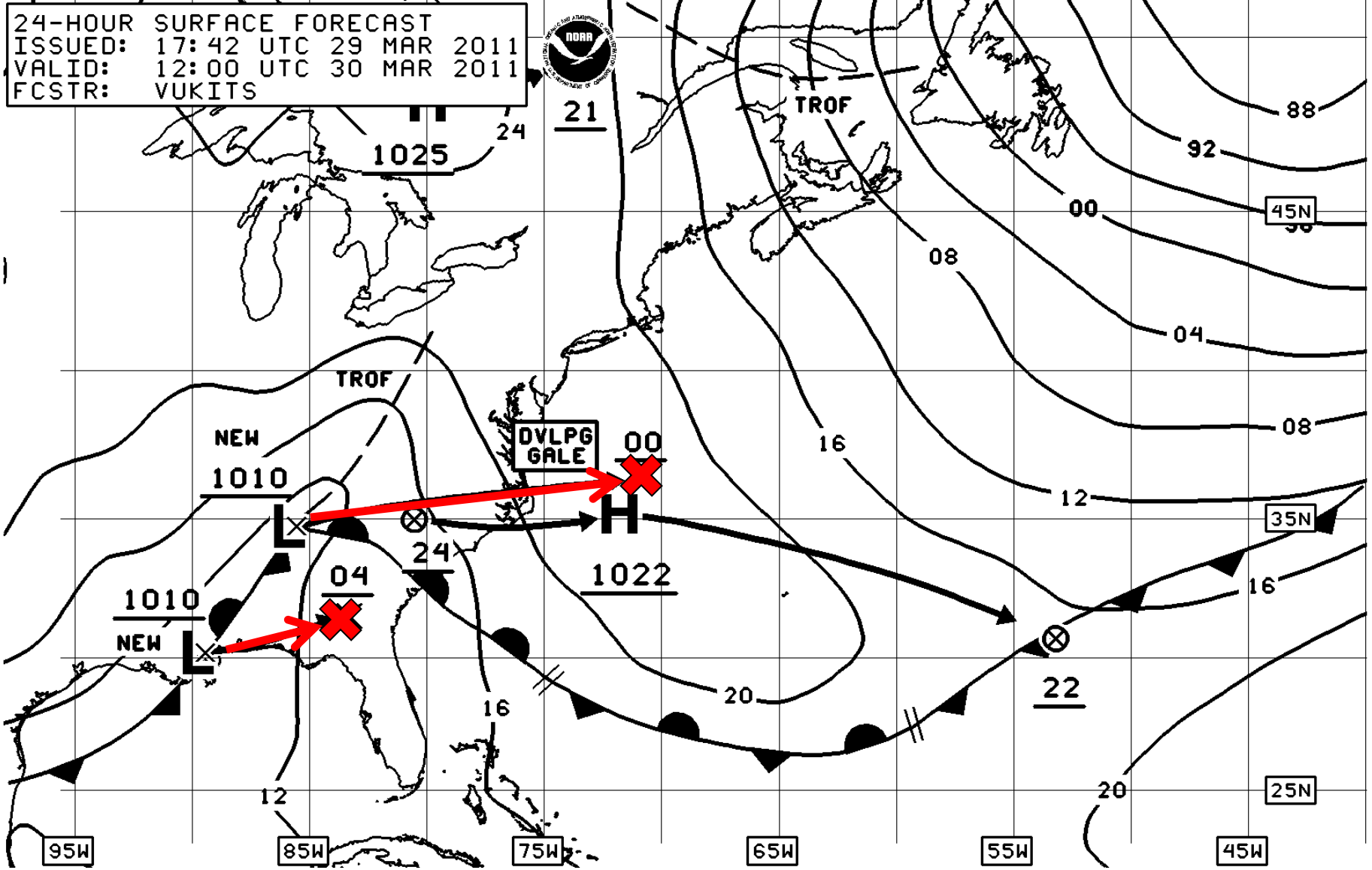
24 hr forecast position/ intensity

WARNINGS

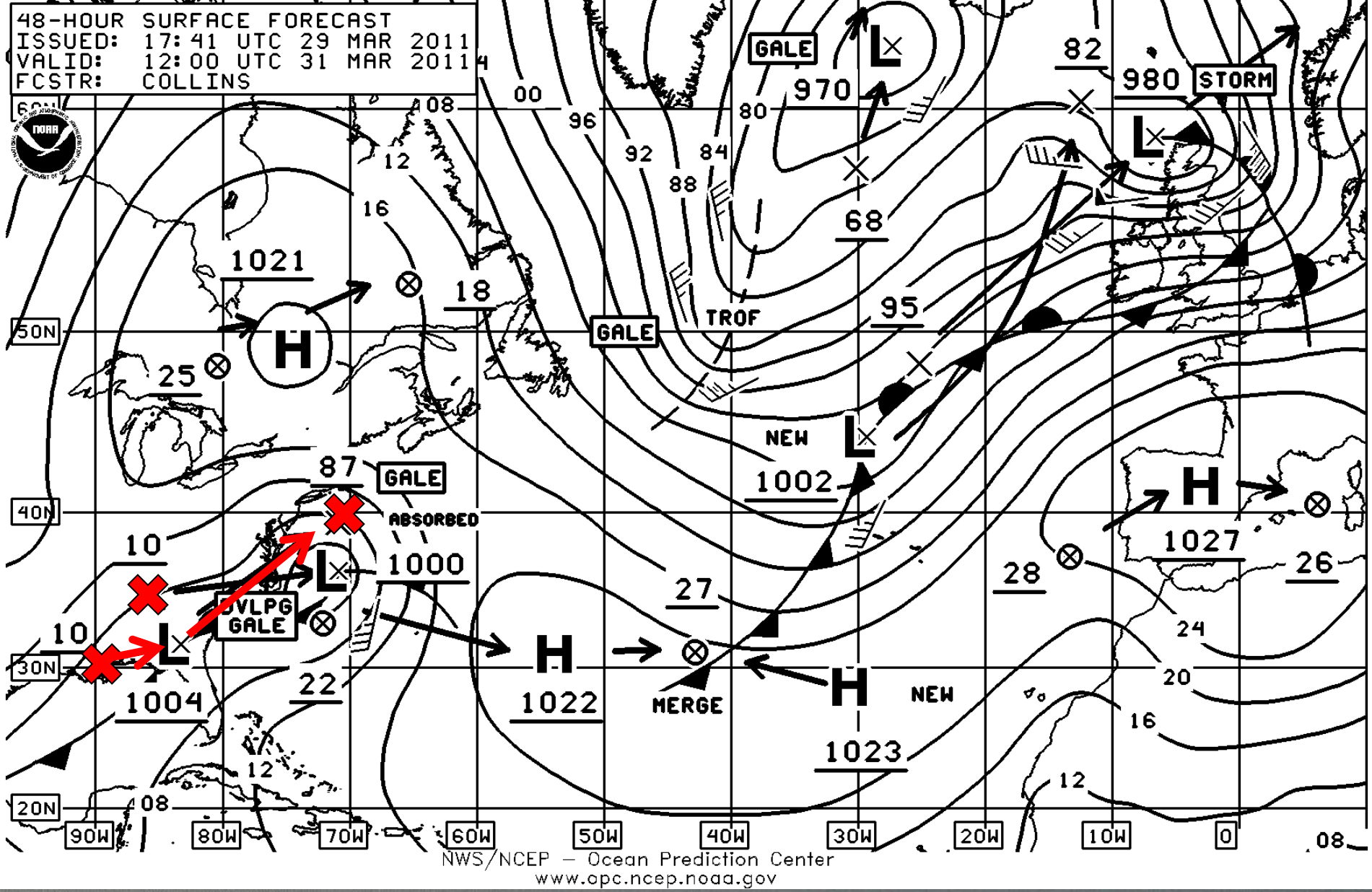
Front – boundary between air masses of different temperature characteristics

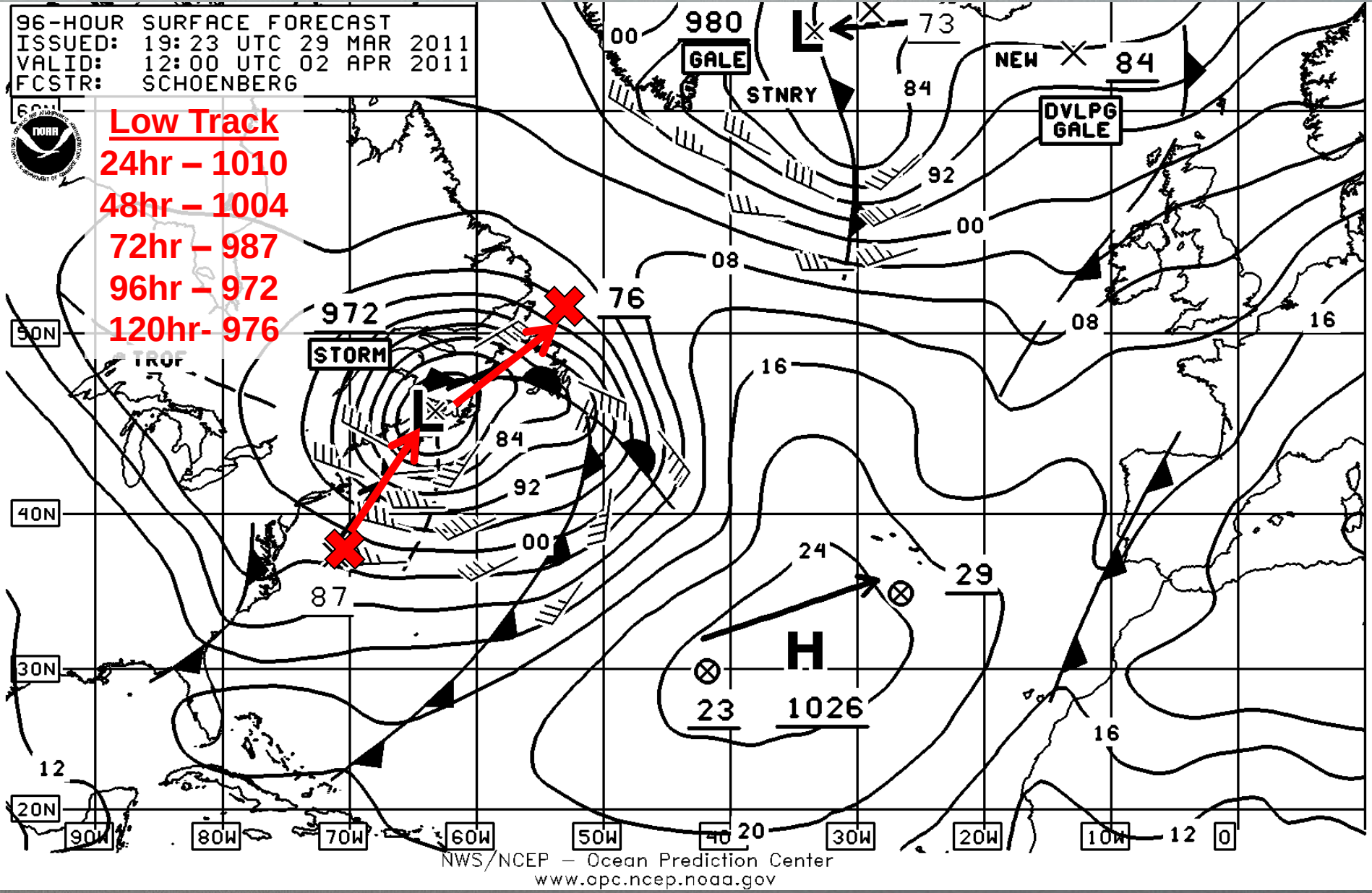
Global average sea level pressure

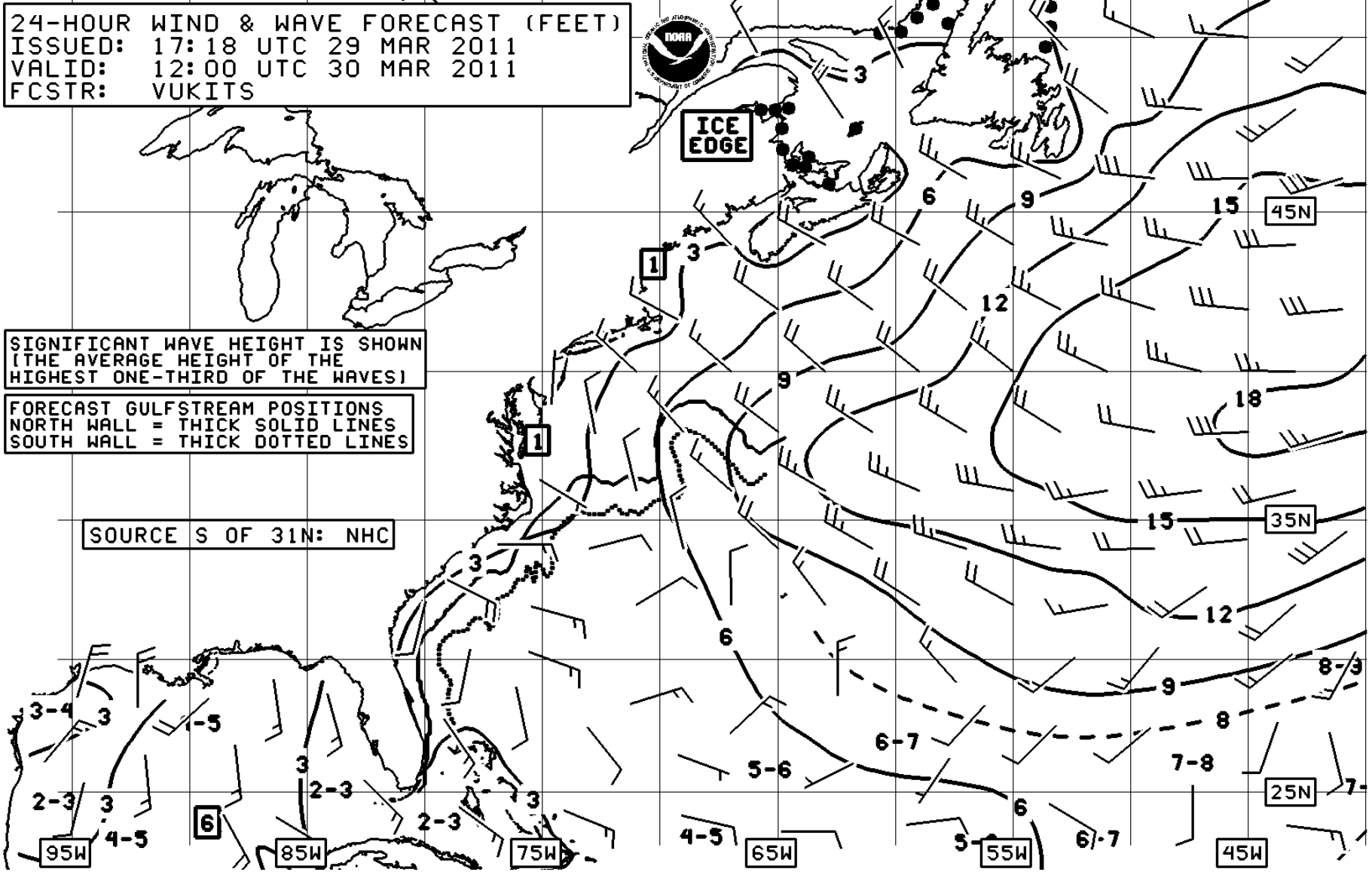
1013.2 millibars



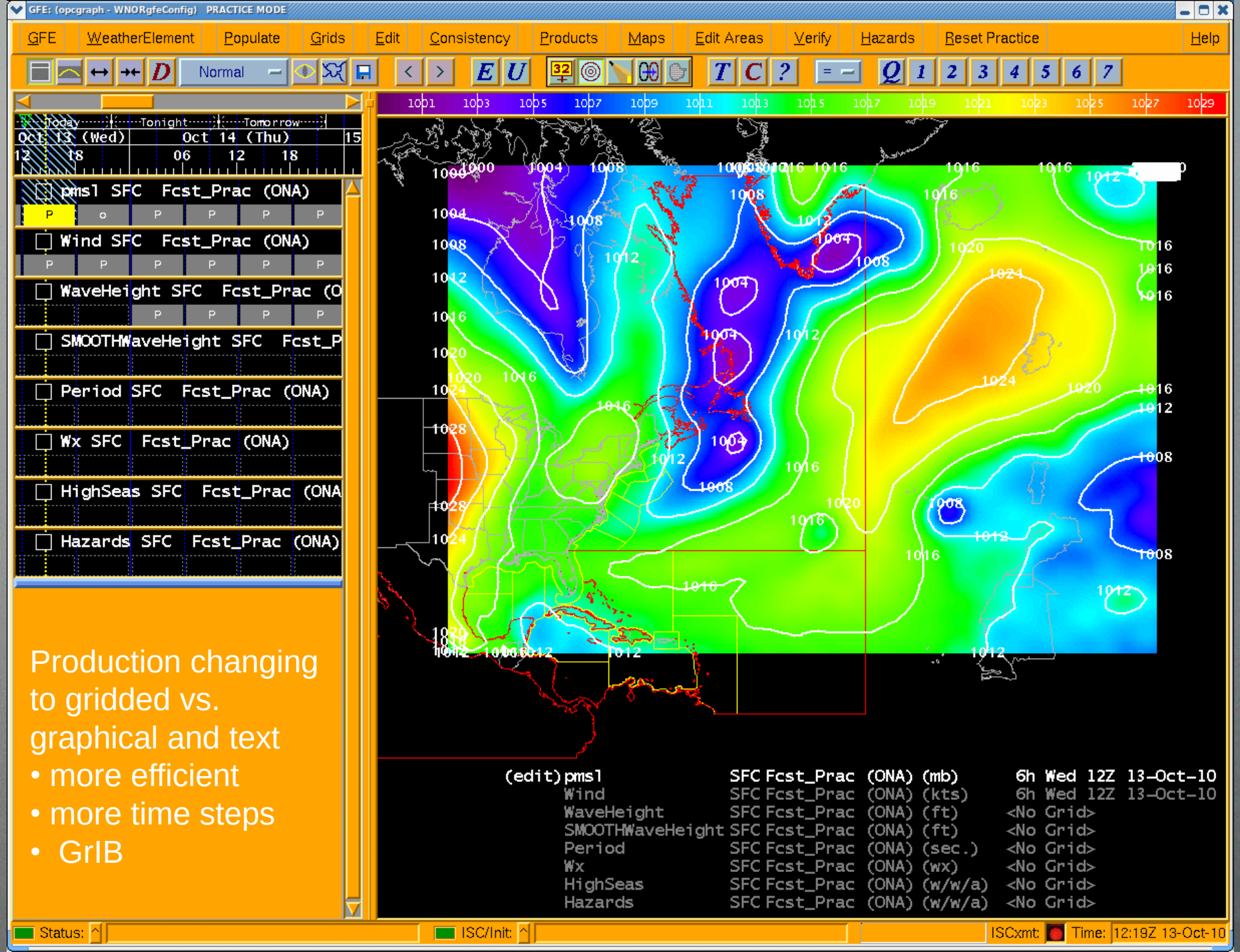
NWS/NCEP – Ocean Prediction Center
www.opc.ncep.noaa.gov


48-HOUR SURFACE FORECAST
ISSUED: 17:41 UTC 29 MAR 2011
VALID: 12:00 UTC 31 MAR 2011
FCSTR: COLLINS
GALE
STORM
TROF
NEW
ABSORBED
DVLPG GALE
MERGE
1021
1000
1004
1022
1002
1023
1027
970
980
NWS/NCEP – Ocean Prediction Center
www.opc.ncep.noaa.gov


96-HOUR SURFACE FORECAST
ISSUED: 19:23 UTC 29 MAR 2011
VALID: 12:00 UTC 02 APR 2011
FCSTR: SCHOENBERG
Low Track
24hr – 1010
48hr – 1004
72hr – 987
96hr – 972
120hr- 976
980
GALE
STNRY
NEW
84
DVLPG GALE
73
92
00
08
76
972
STORM
16
84
92
00
87
24
29
H
1026
23
12
20
60N
50N
40N
30N
20N
90W
80W
70W
60W
50W
40W
30W
20W
10W
0
NWS/NCEP – Ocean Prediction Center
www.opc.ncep.noaa.gov



NWS/NCEP – Ocean Prediction Center
www.opc.ncep.noaa.gov


GFE: (opcgraph - WNORgfeConfig) PRACTICE MODE
GFE
WeatherElement
Populate
Grids
Edit
Consistency
Products
Maps
Edit Areas
Verify
Hazards
Reset Practice
Help
Normal
Today
Tonight
Tomorrow
Oct 13 (Wed)
Oct 14 (Thu)
pmsl SFC Fcst_Prac (ONA)
Wind SFC Fcst_Prac (ONA)
WaveHeight SFC Fcst_Prac (O
SMOOTHWaveHeight SFC Fcst_P
Period SFC Fcst_Prac (ONA)
Wx SFC Fcst_Prac (ONA)
HighSeas SFC Fcst_Prac (ONA
Hazards SFC Fcst_Prac (ONA)
Production changing to gridded vs. graphical and text
• more efficient
• more time steps
• GrIB
(edit) pmsl SFC Fcst_Prac (ONA) (mb) 6h Wed 12Z 13-Oct-10
Wind SFC Fcst_Prac (ONA) (kts) 6h Wed 12Z 13-Oct-10
WaveHeight SFC Fcst_Prac (ONA) (ft) <No Grid>
SMOOTHWaveHeight SFC Fcst_Prac (ONA) (ft) <No Grid>
Period SFC Fcst_Prac (ONA) (sec.) <No Grid>
Wx SFC Fcst_Prac (ONA) (wx) <No Grid>
HighSeas SFC Fcst_Prac (ONA) (w/w/a) <No Grid>
Hazards SFC Fcst_Prac (ONA) (w/w/a) <No Grid>
Status:
ISC/Init:
ISCxmt:
Time: 12:19Z 13-Oct-10

Search OPC
Go
Home
General Information
Marine Weather
Ocean Products
Coastal Guidance
Contact Us
Local forecast by "City, St" or "ZIP"
Go

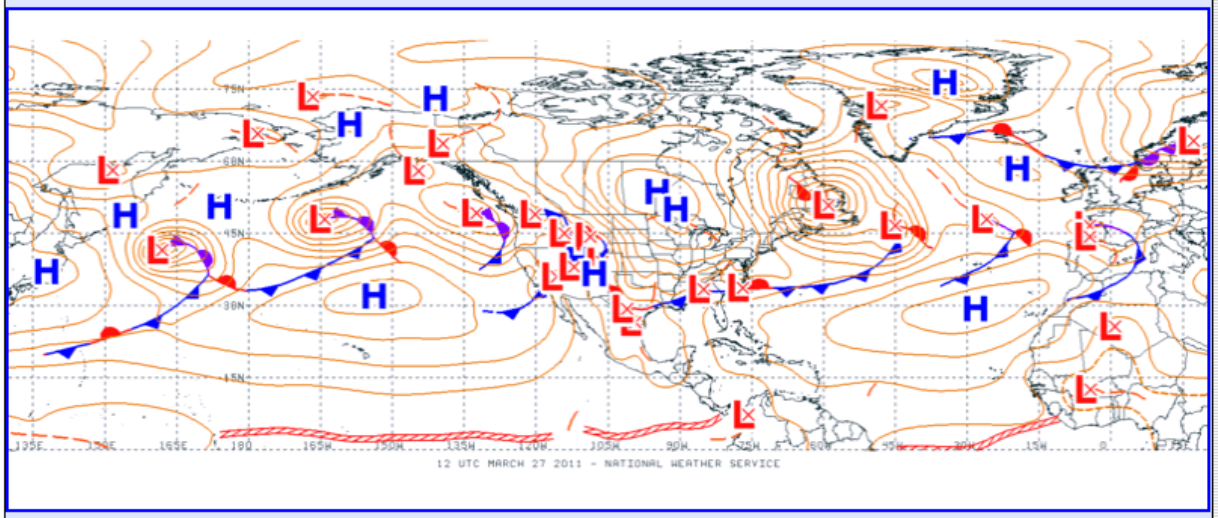
http://www.opc.ncep.noaa.gov/

Top News--Last updated March 16, 2011

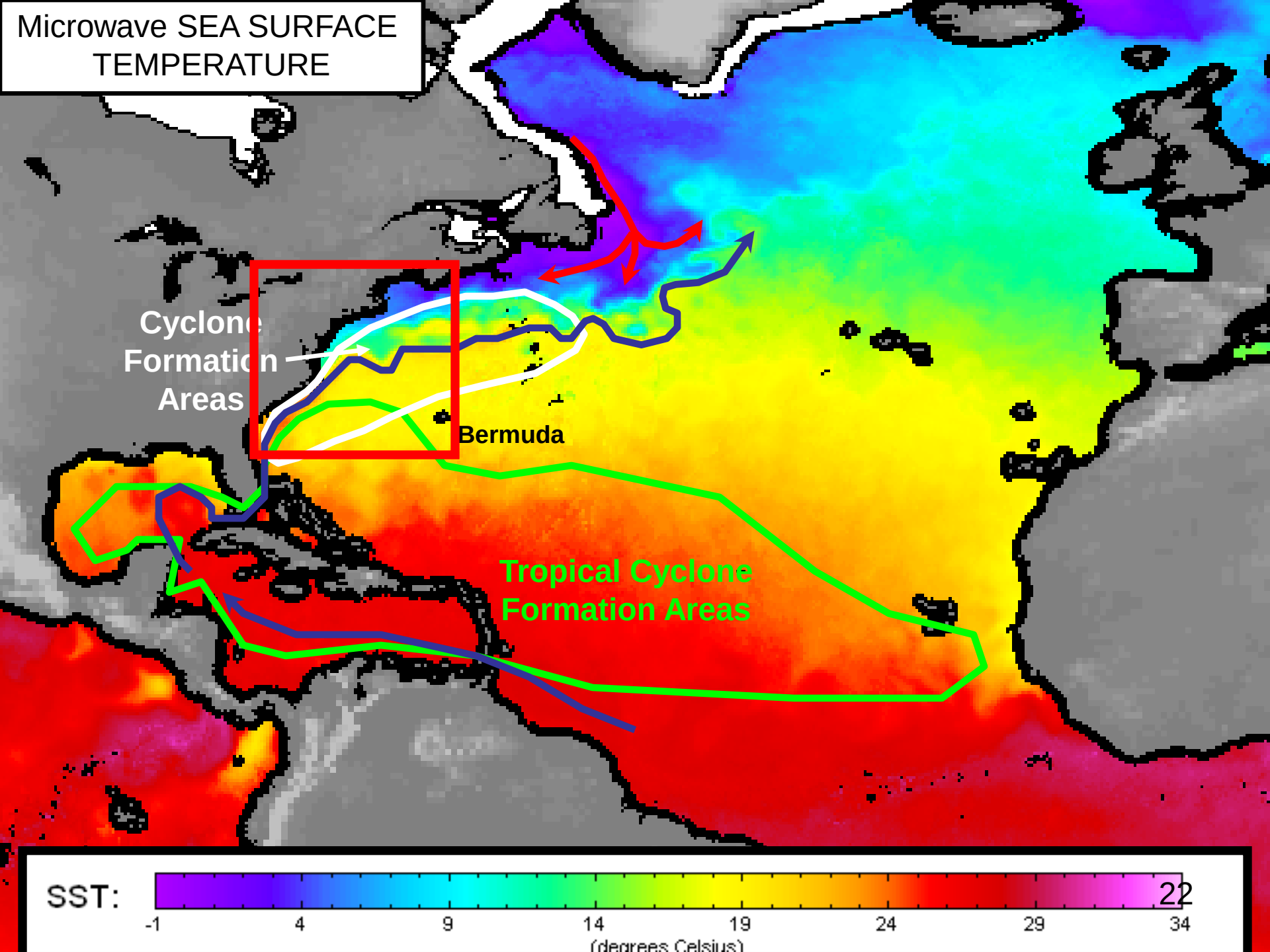
- The first edition of the NCEP online Newsletter is now available!
- If you use file transfer protocol (ftp) to access data from the OPC web site you may use http://ftp.opc.ncep.noaa.gov or ftp://ftp.opc.ncep.noaa.gov to retrieve files.

NOAA>NWS>NCEP> OPC>Unified Analysis

Unified Analysis | Atlantic | Pacific

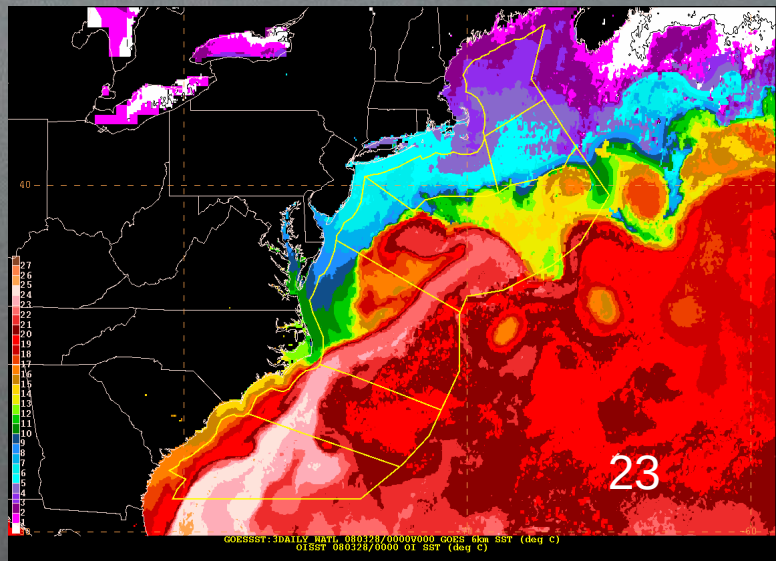


Last Update: Sunday, 27-Mar-2011 15:59:48 UTC


Microwave SEA SURFACE TEMPERATURE
Cyclone Formation Areas
Bermuda
Tropical Cyclone Formation Areas
SST:
-1
4
9
14
19
24
29
34
(degrees Celsius)

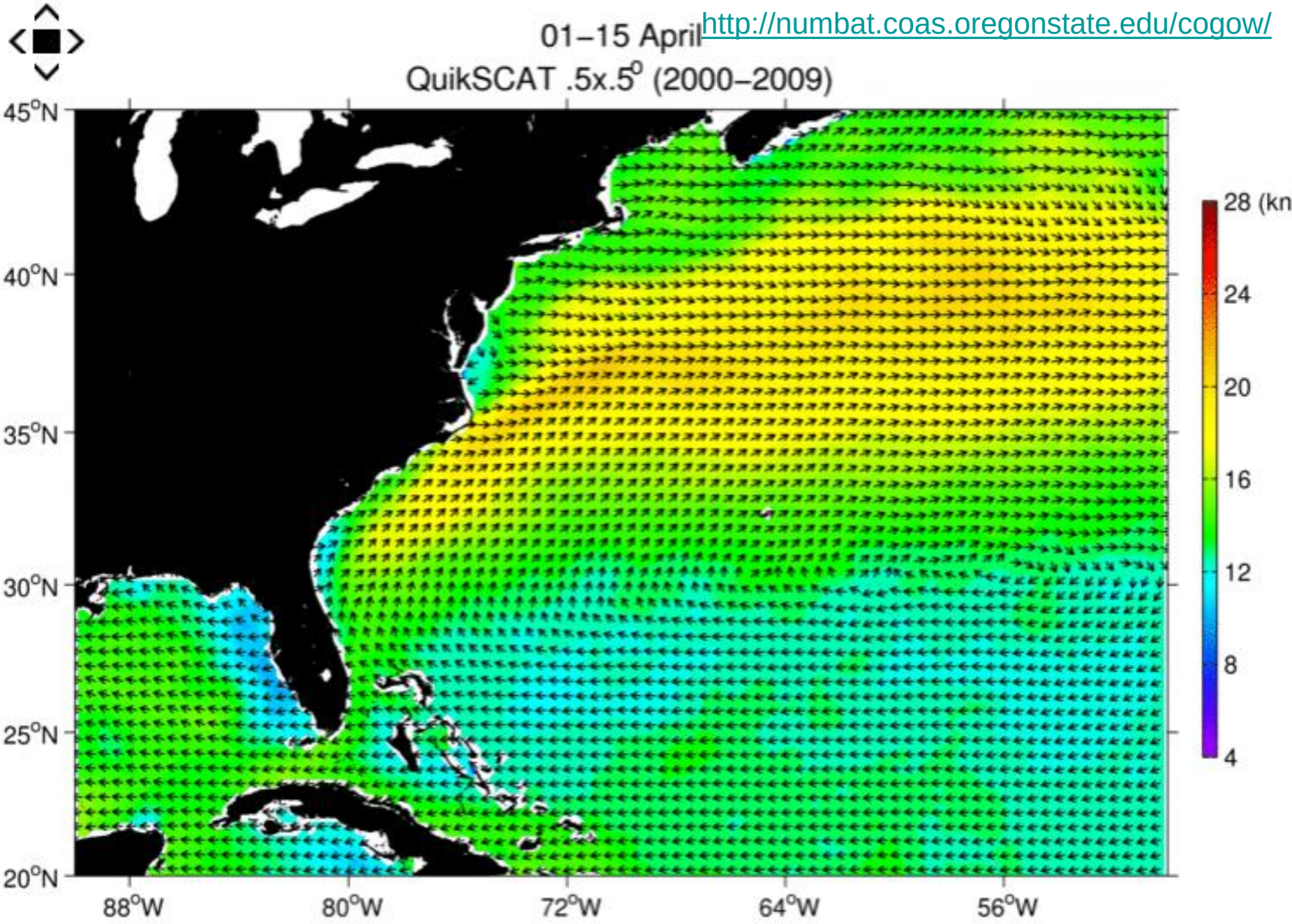
Gulf Stream

- **Weather maker / changer**
  - Natural front (ocean and atmosphere)
  - Stronger winds over warmer water
  - Thunderstorms and squalls
- **Extremely sharp transition – North Wall**
  - Wind against current – can generate breaking seas
  - Eddies (Rings) as significant as Stream

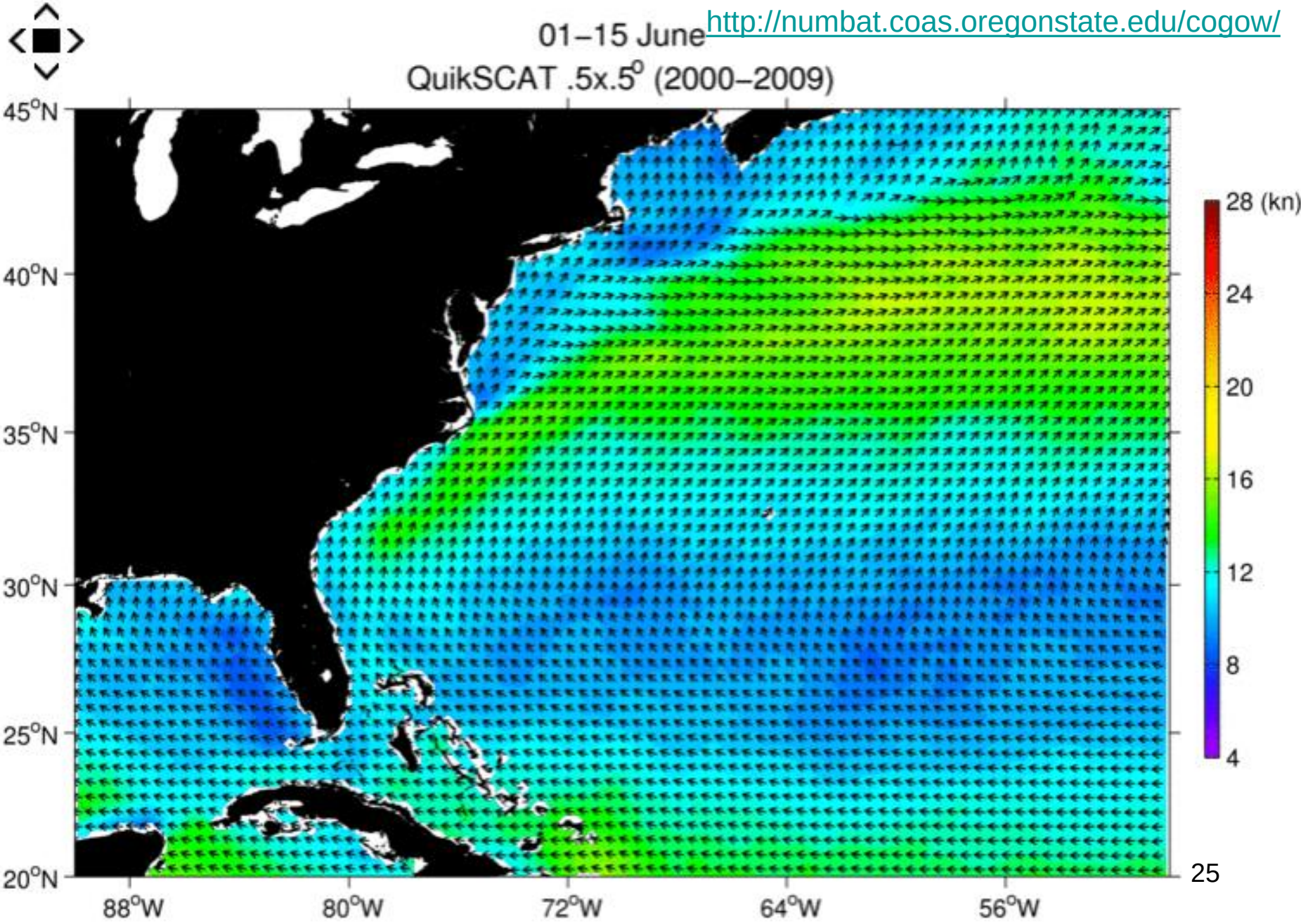


Oregon State - Climatology of Global Ocean Winds (COGOW)

http://numbat.coas.oregonstate.edu/cogow/

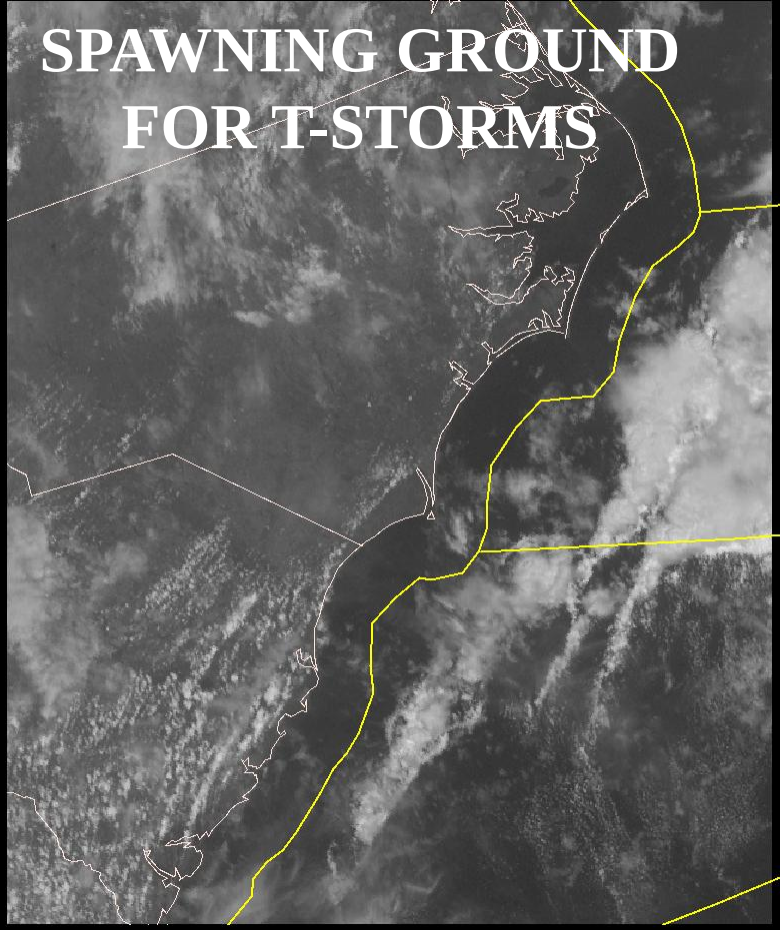


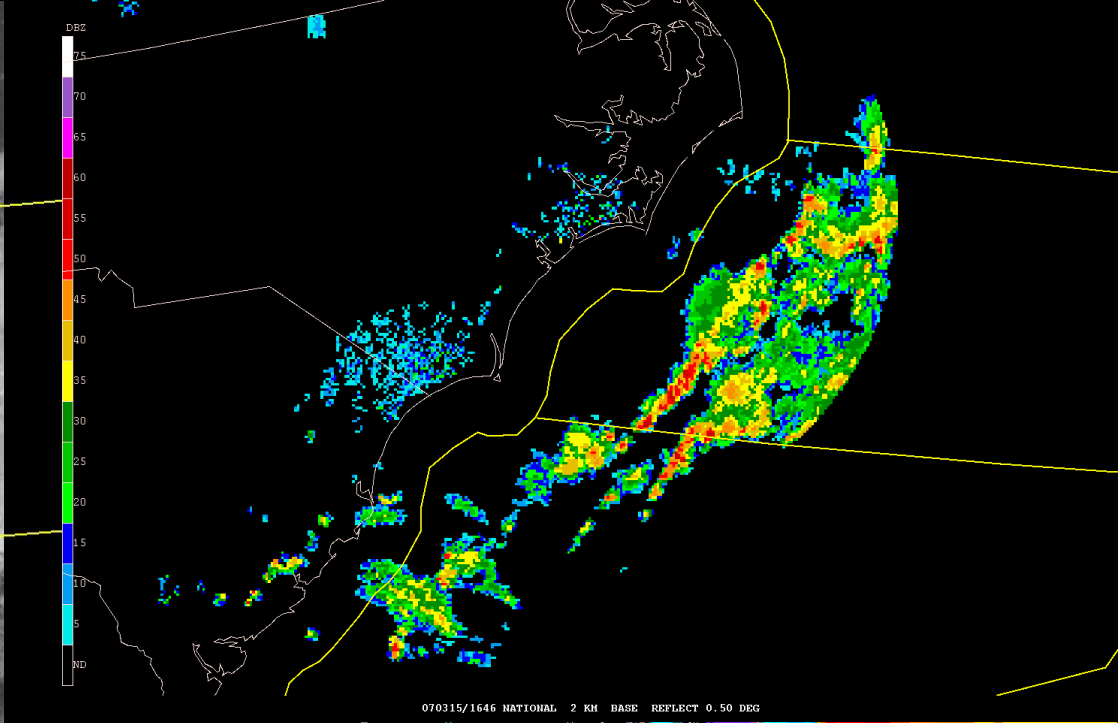
Oregon State - Climatology of Global Ocean Winds (COGOW)



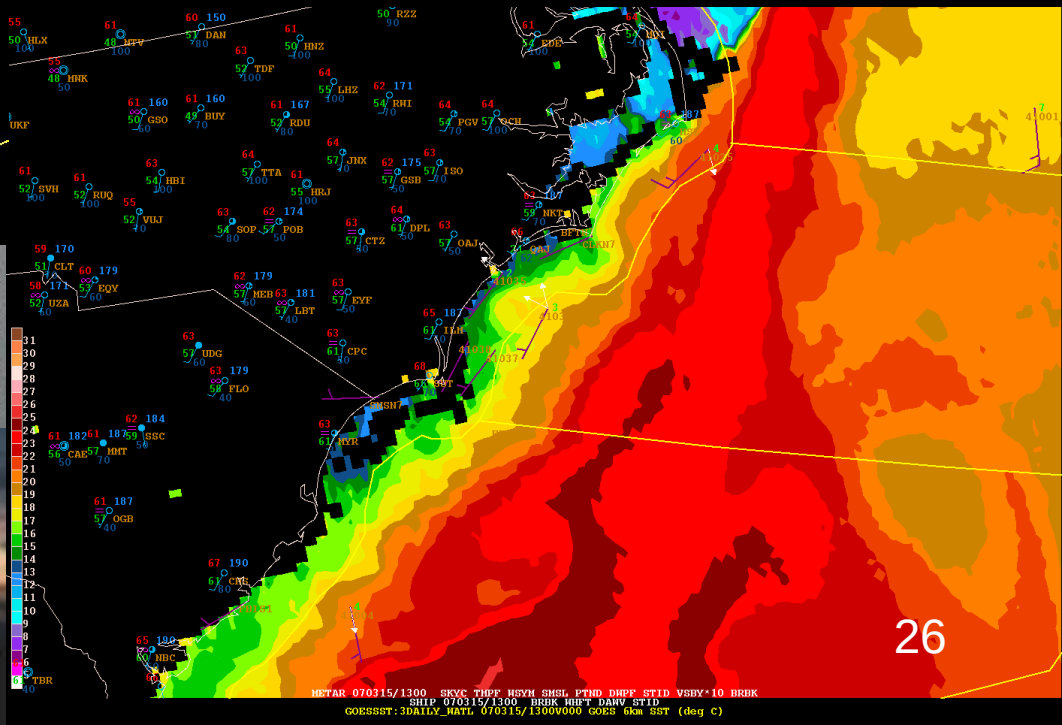
http://numbat.coas.oregonstate.edu/cogow/

SPAWNING GROUND FOR T-STORMS

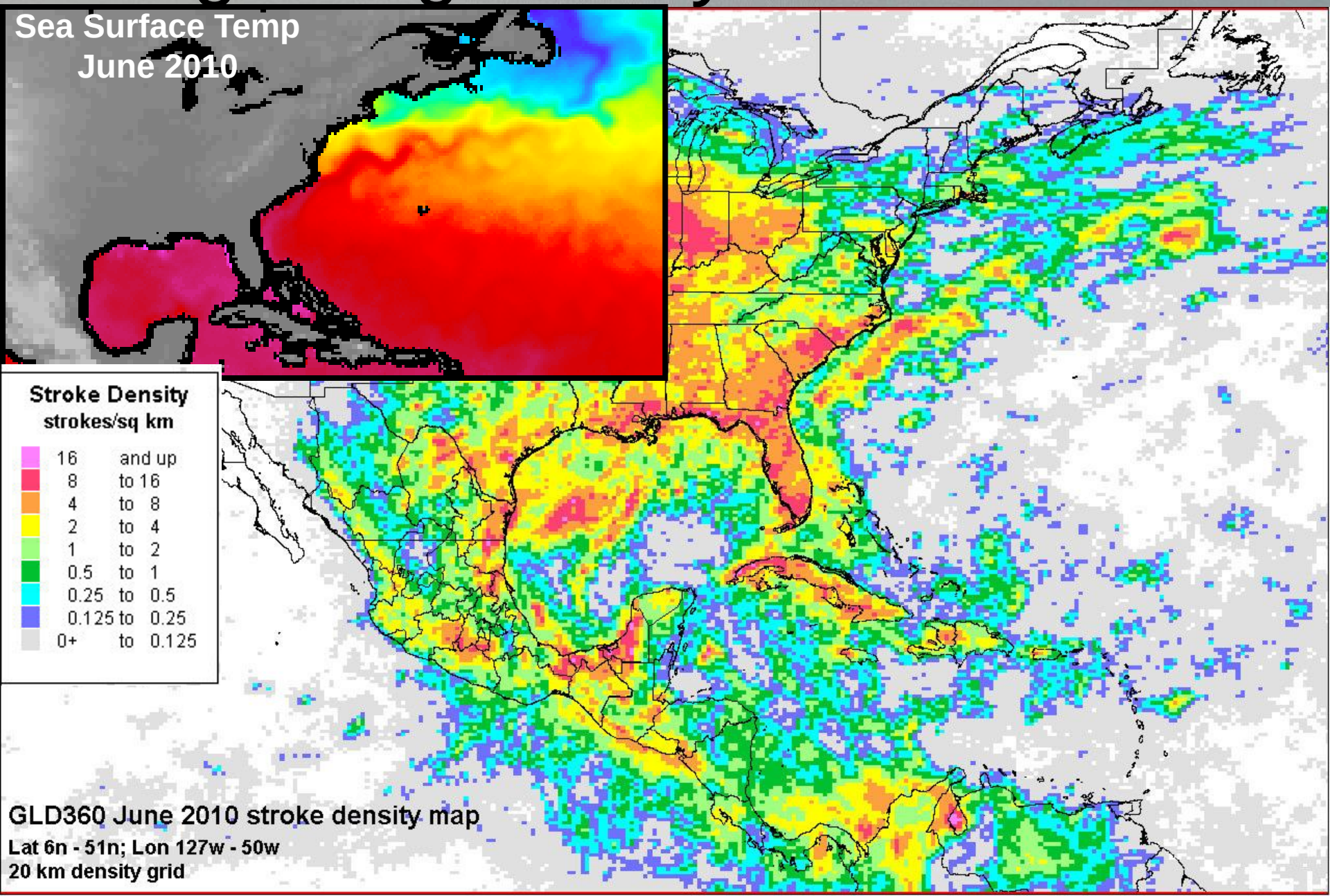




THE GULF STREAM



Lightning activity – June 2010

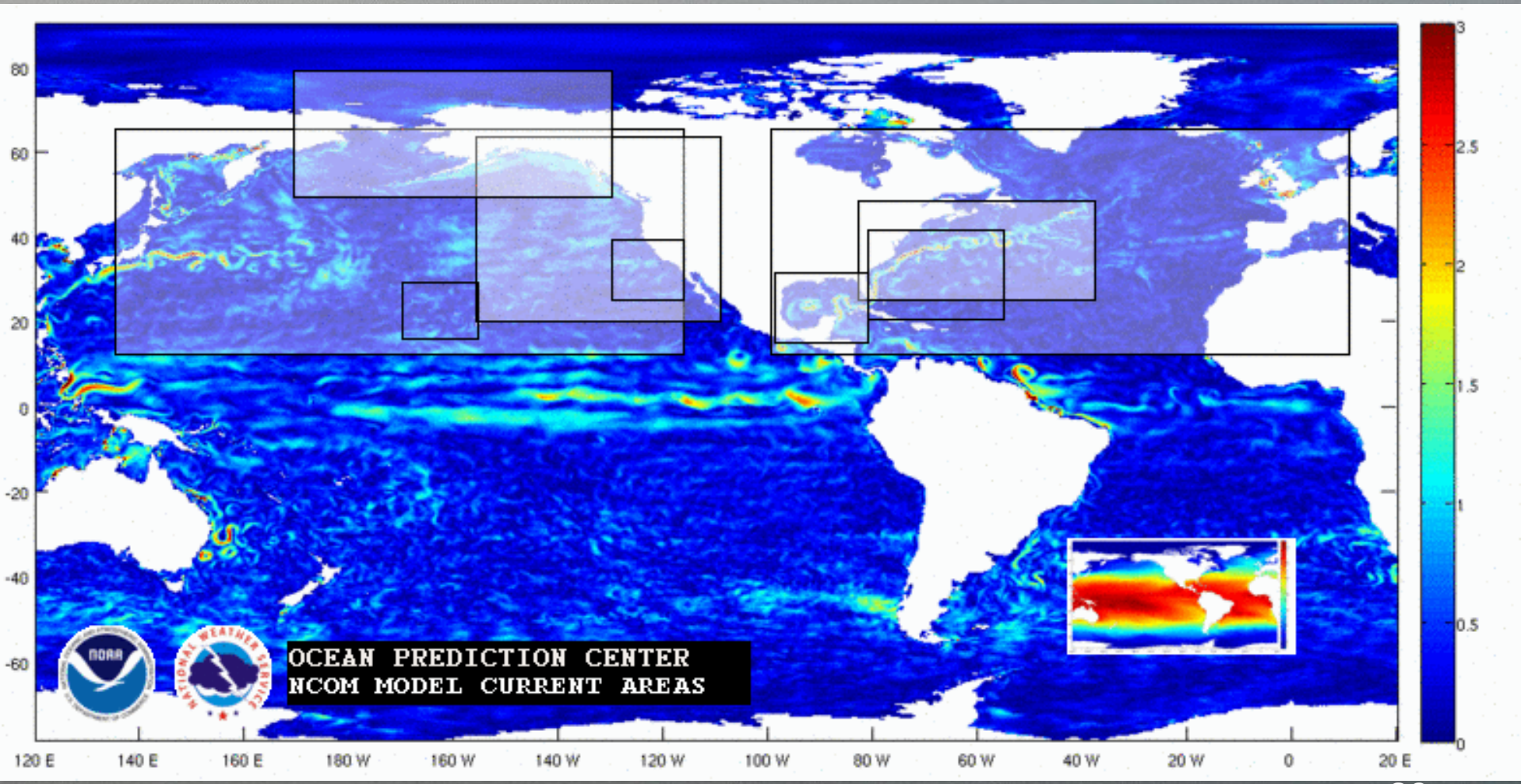


Wind Against Current

Plum Gut, NY

NAVY Coastal Ocean Model

http://www.opc.ncep.noaa.gov/newNCOM/NCOM_currents.shtml



NAVY Coastal Ocean Model

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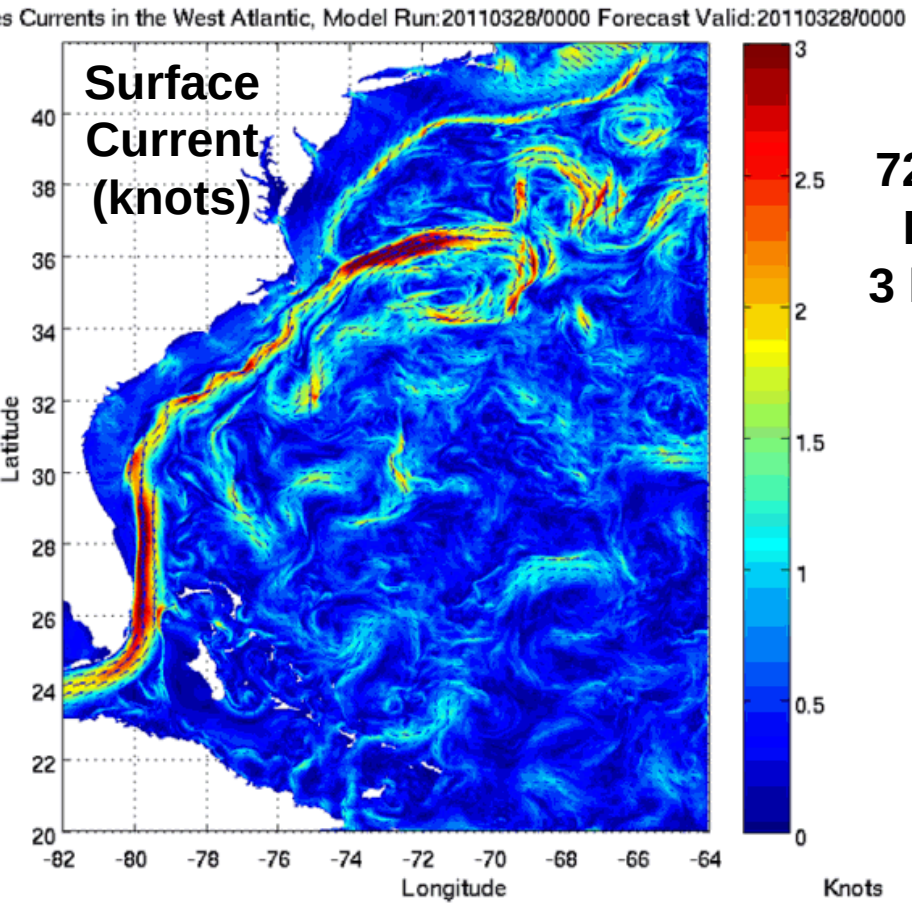
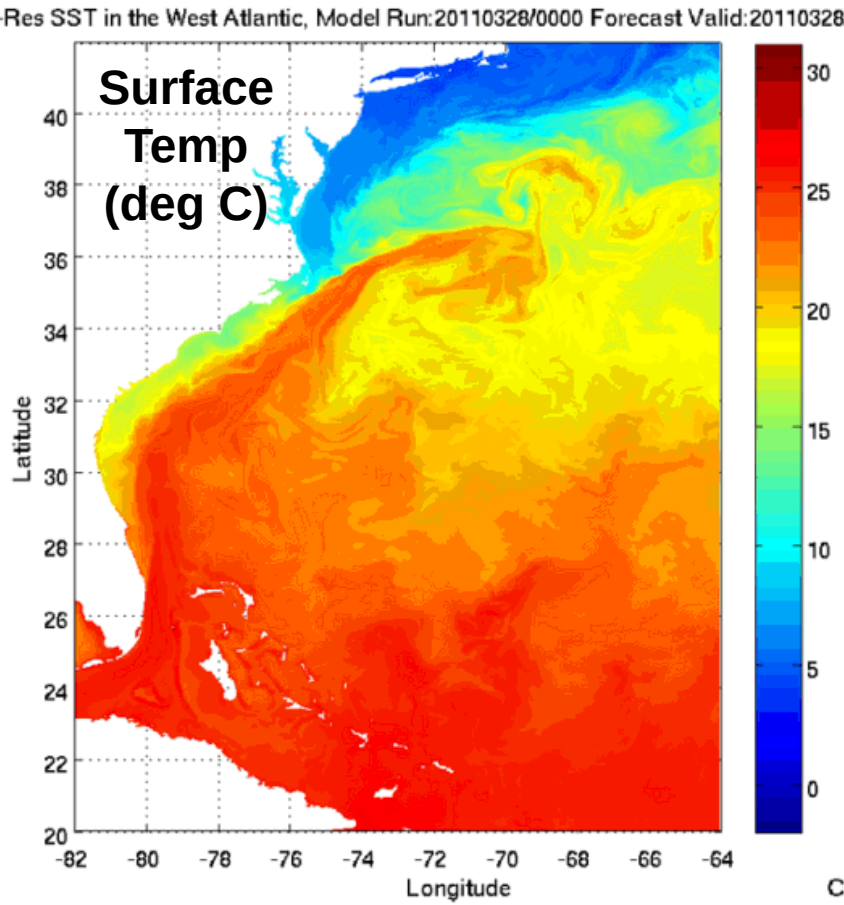


72 hour Loop 3 hourly

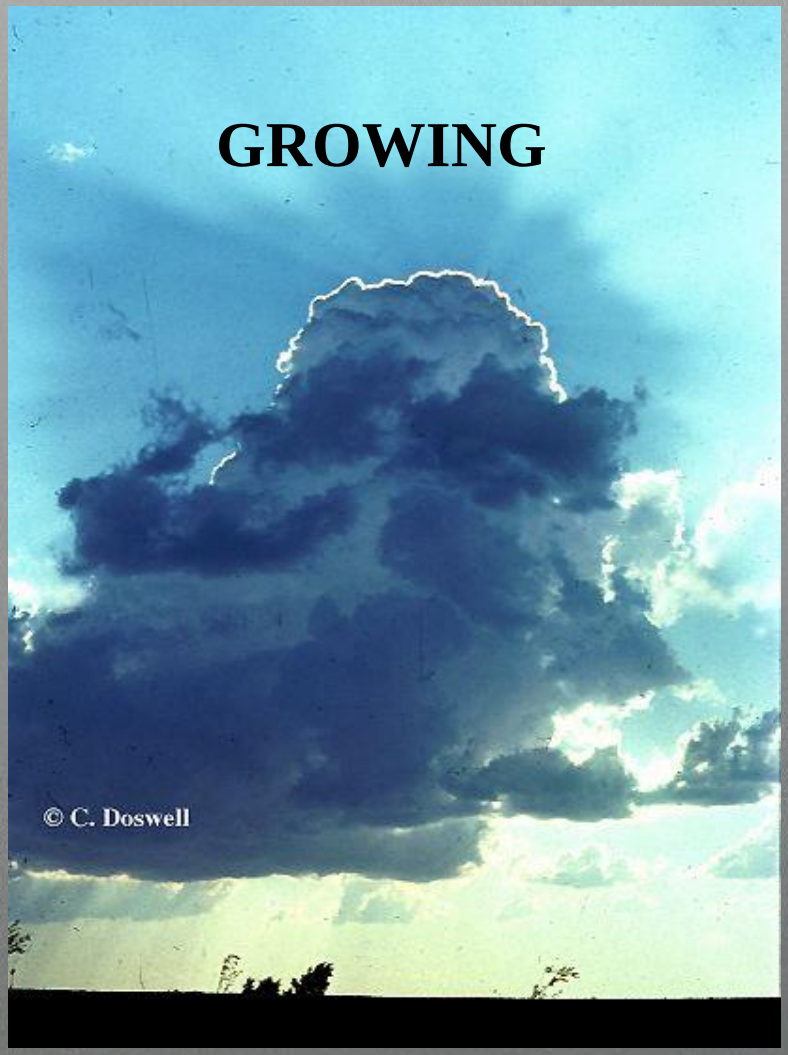


THUNDERSTORMS

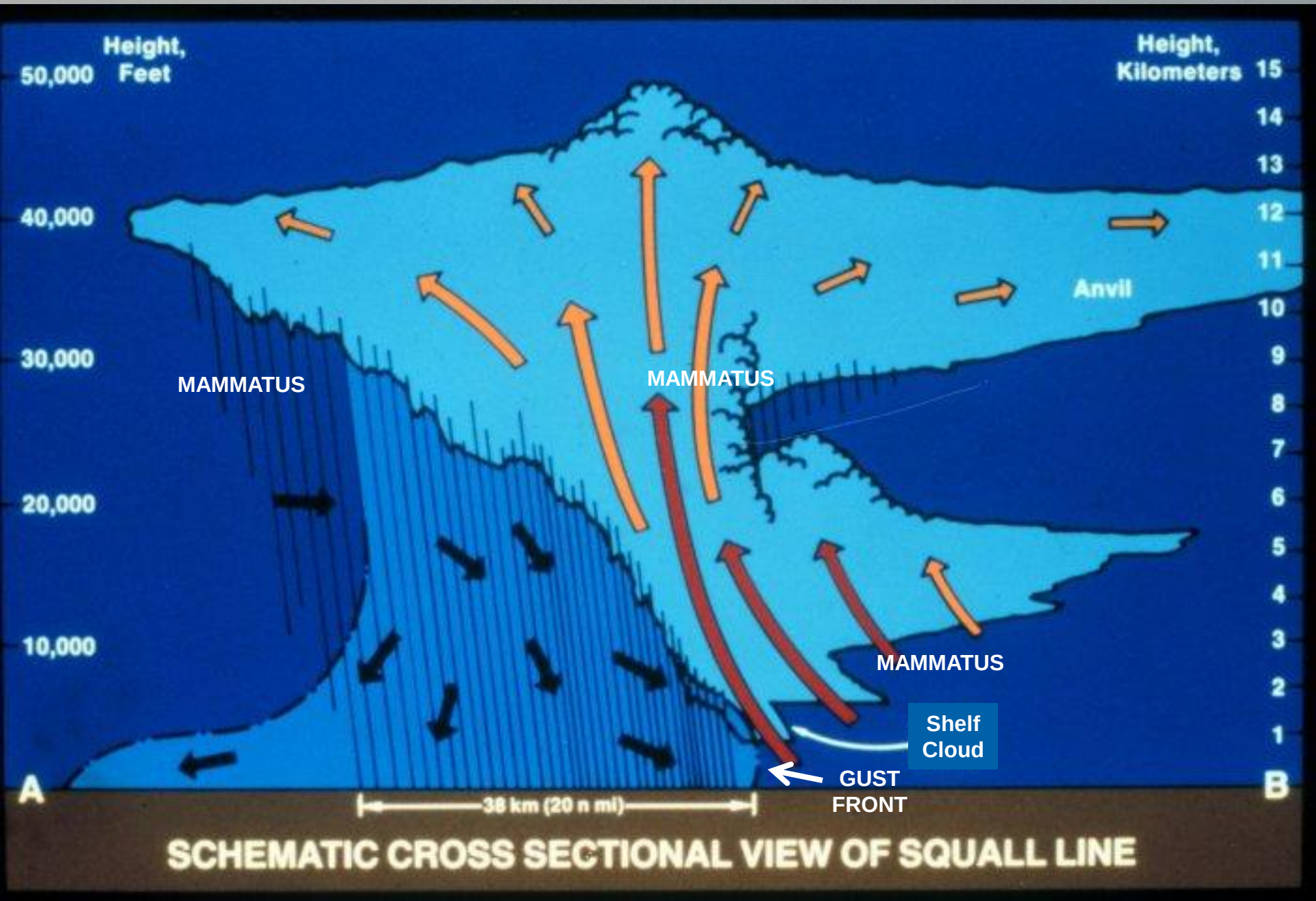
CUMULUS CLOUDS

MATURE

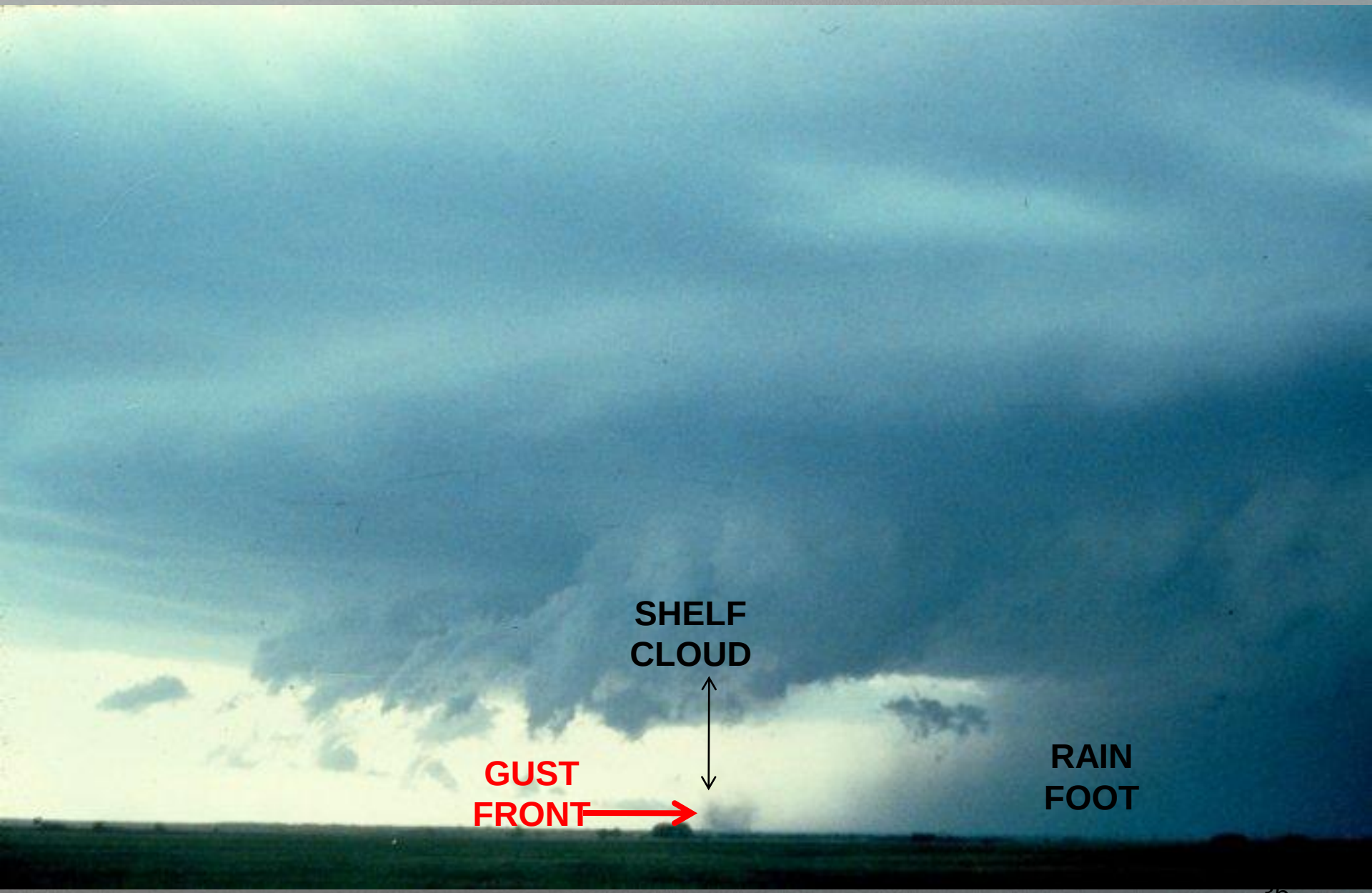
GROWING



SQUALL LINES

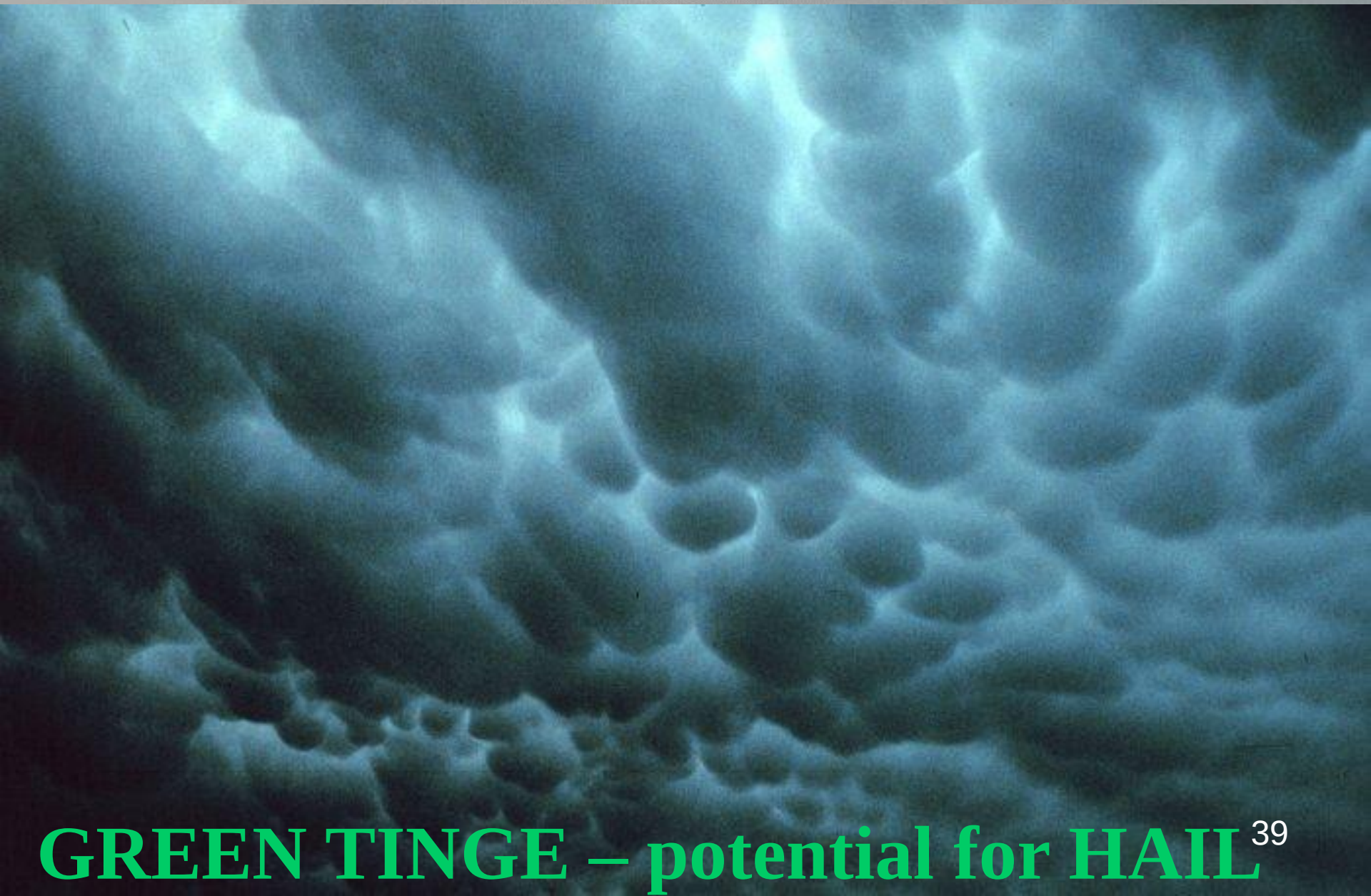


SCHEMATIC CROSS SECTIONAL VIEW OF SQUALL LINE

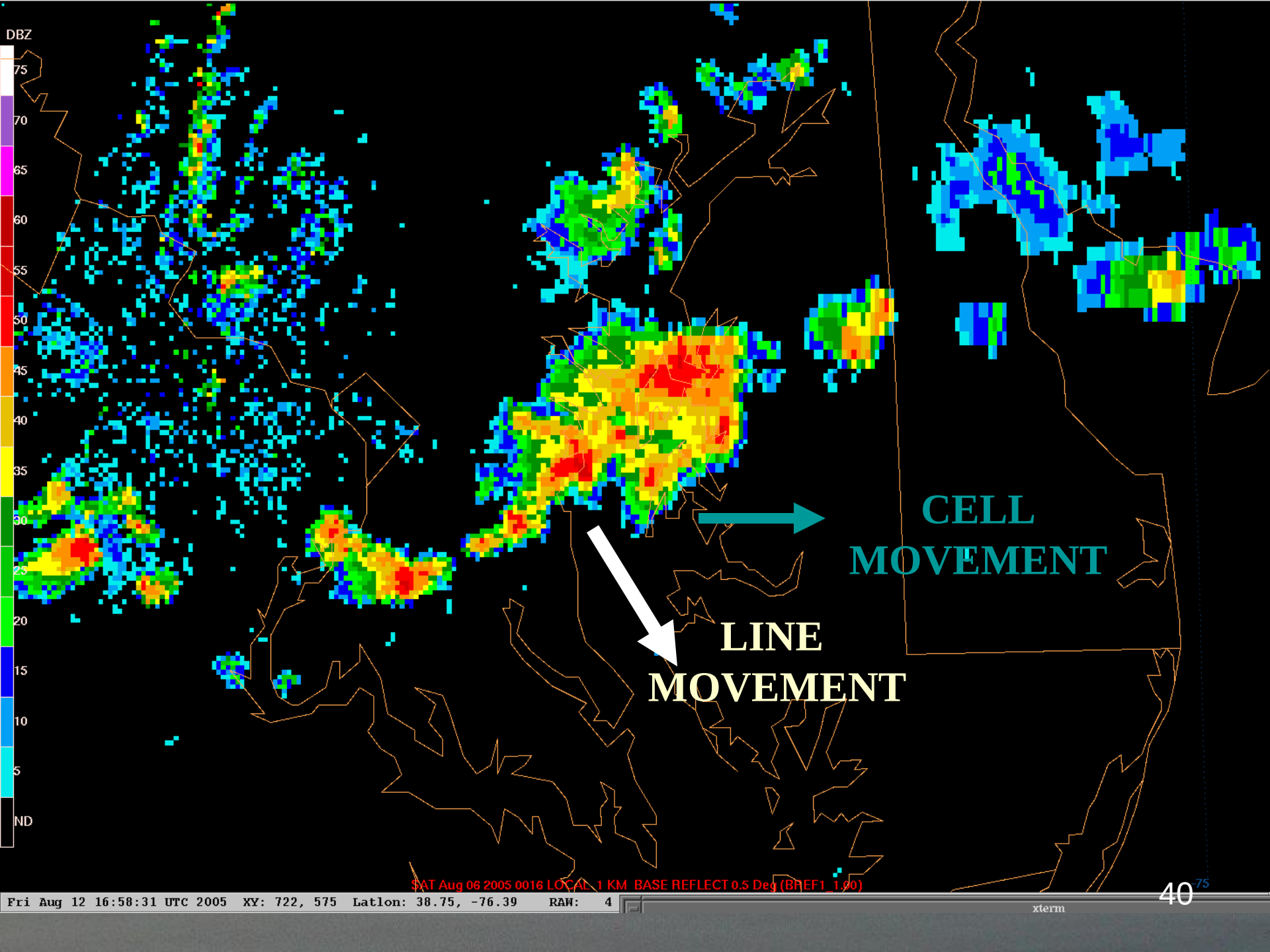

SHELF
CLOUD
GUST
FRONT
RAIN
FOOT

SHELF
CLOUD

MAMMATUS



GREEN TINGE – potential for HAIL


DBZ
75
70
65
60
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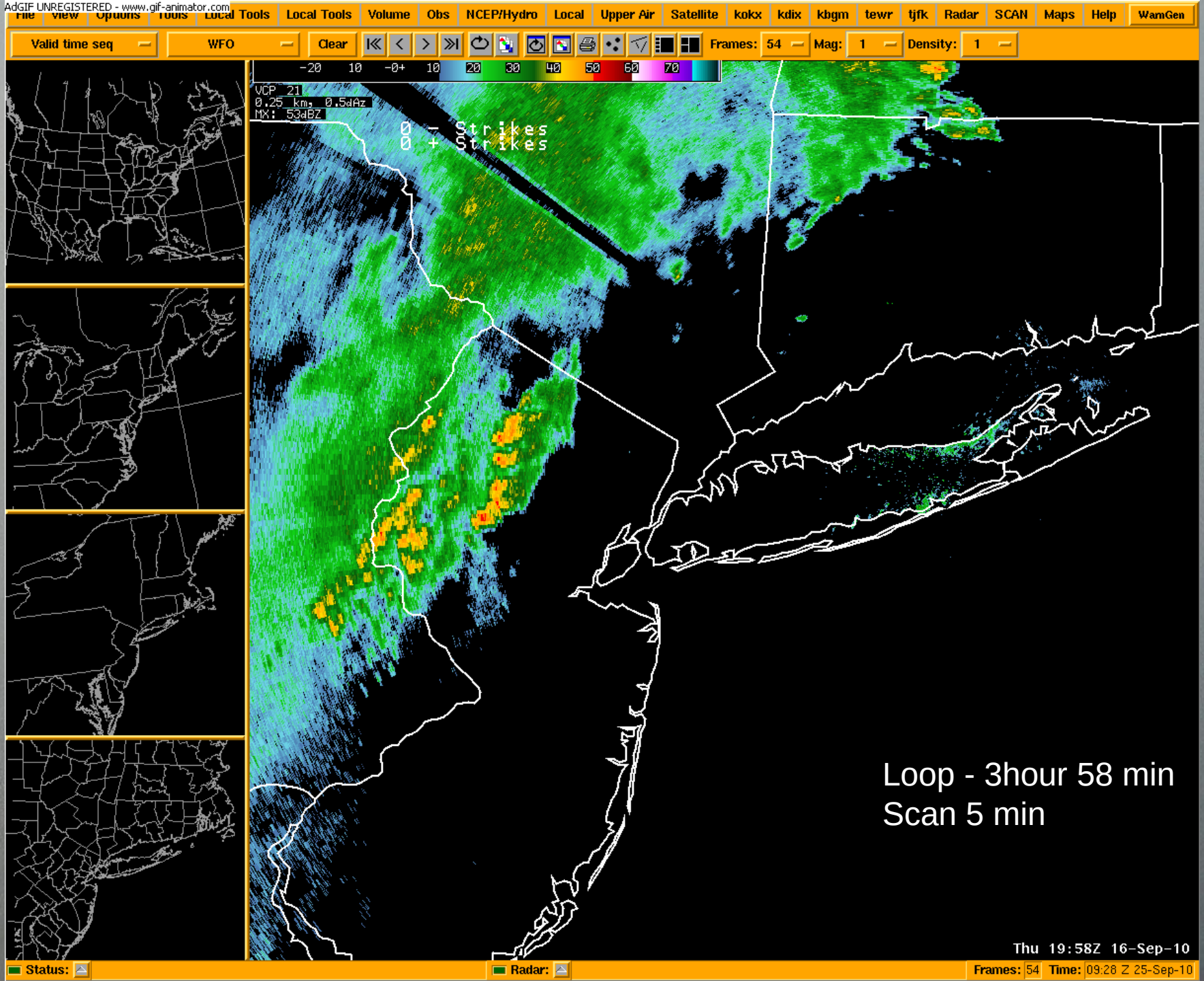
35
30
25
20
15
10
5
ND
CELL
MOVEMENT
LINE
MOVEMENT
SAT Aug 06 2005 0016 LOCAL 1 KM BASE REFLECT 0.5 Deg (BREF1_1.00)
Fri Aug 12 16:58:31 UTC 2005 XY: 722, 575 Latlon: 38.75, -76.39 RAW: 4
xterm

AdGIF UNREGISTERED - www.gif-animator.com



THUNDERSTORM TIPS

Know the forecast!

- **NOAA WX Radio**
- **Fronts, troughs, boundaries**

Watch the sky!!! ACT EARLY!!!!

PDA, Cell phone, laptop (NWS radar), Satellite Radio

- ***Beware of false sense of security!***

Gulf Stream

- **Flow parallel to the Stream**
- **Maximum activity at night**

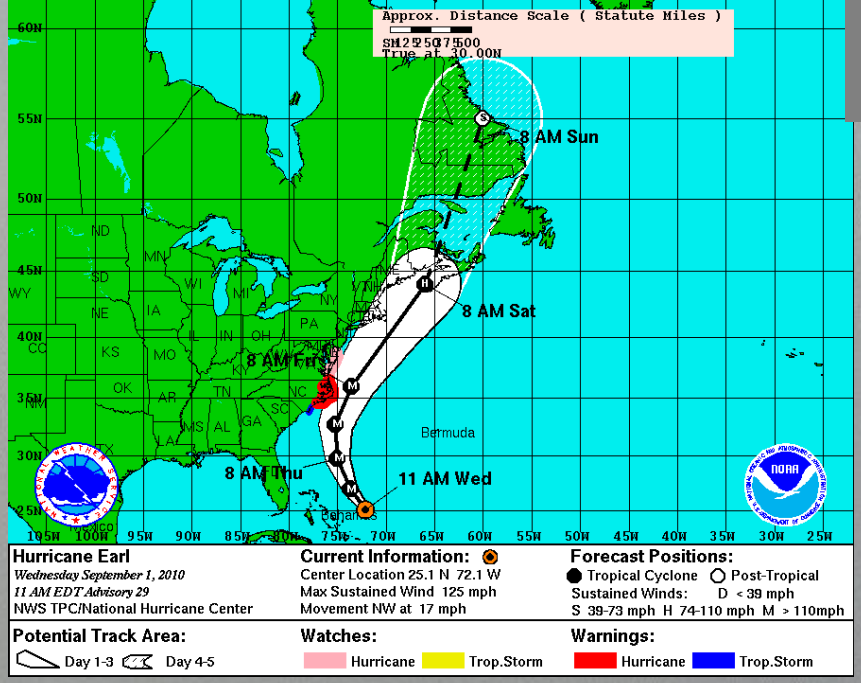
AM Radio, Radar (rain clutter/sea clutter)

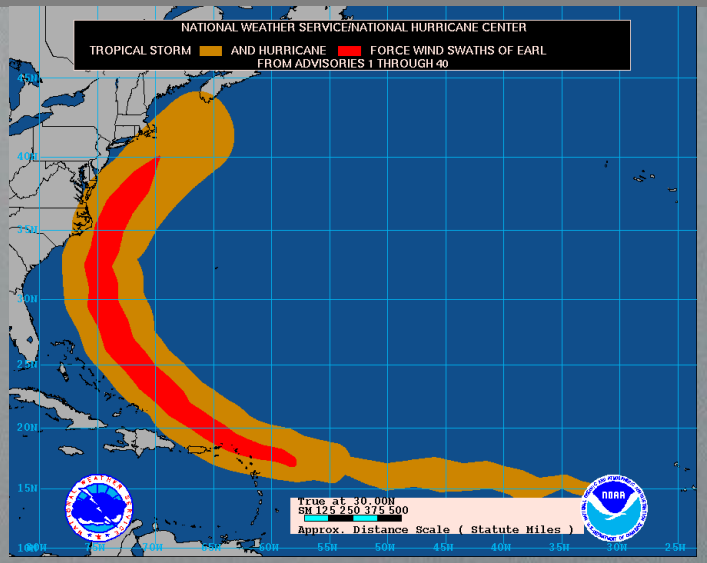
Squall Drill

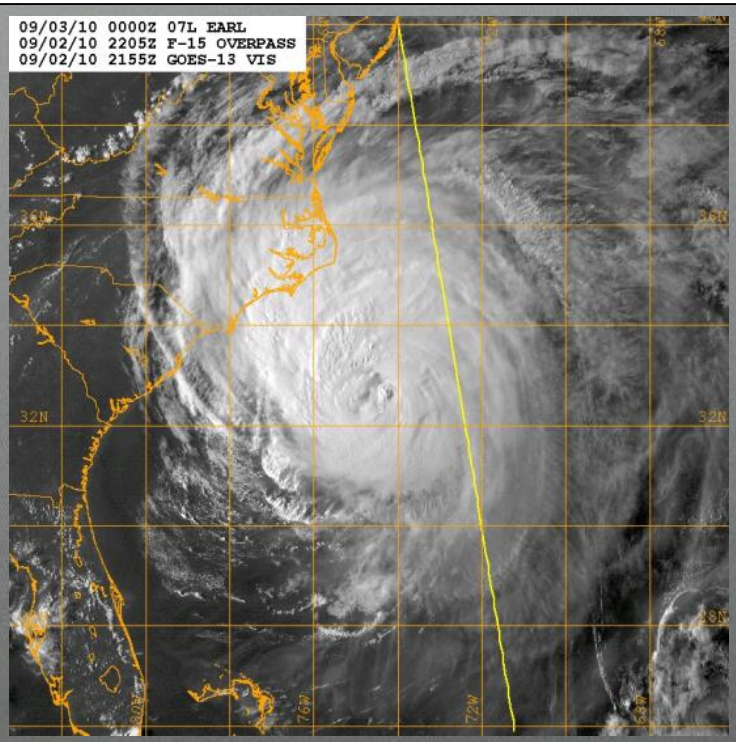
- **Sails down and stowed**
- **Anchor (s) (holding ground)**
- **Jacklines with harnesses - ahead of time**
- **Assigned tasks**

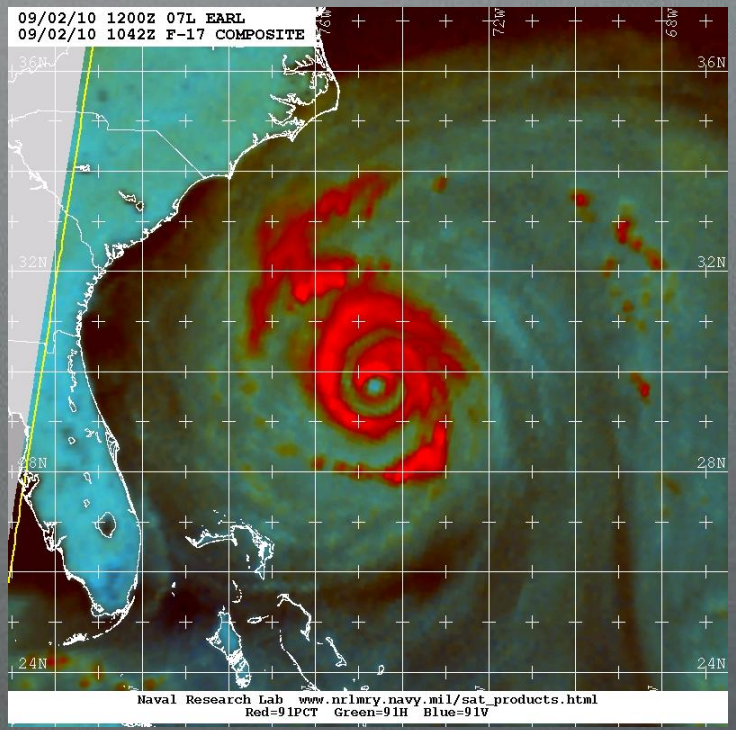
2009 7 25

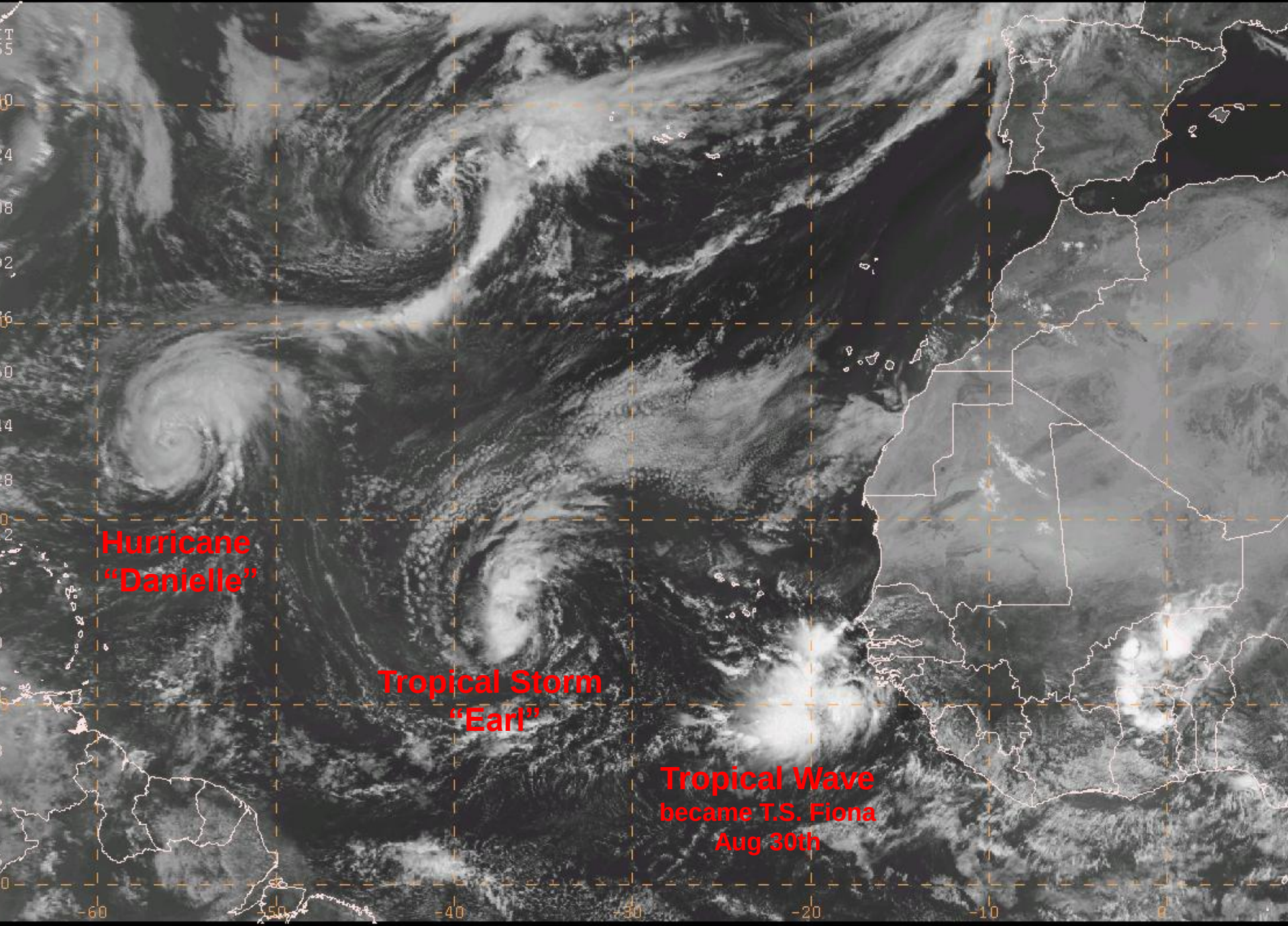
TROPICAL CYCLONES

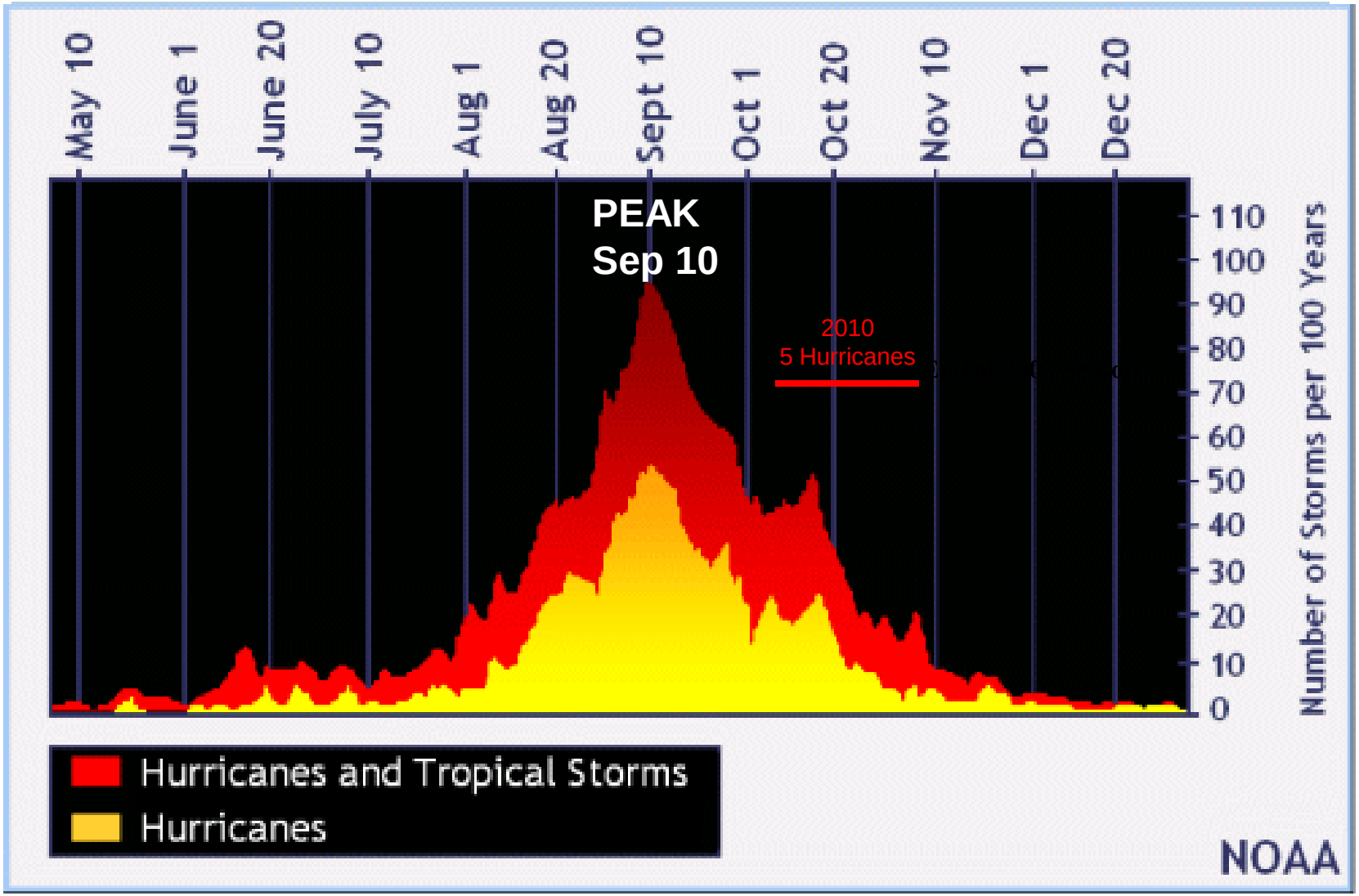


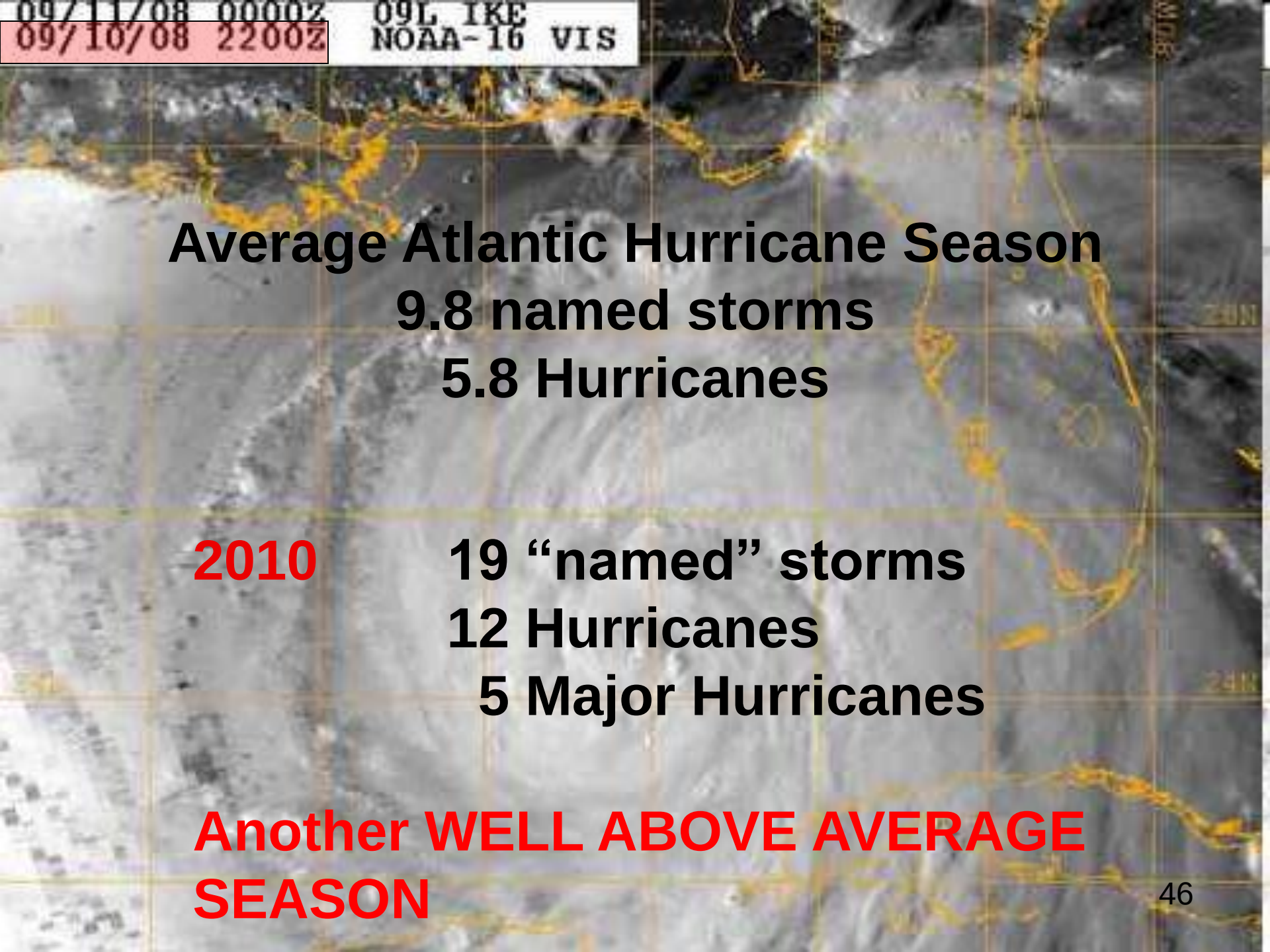







Hurricane
"Danielle"
Tropical Storm
"Earl"
Tropical Wave
became T.S. Fiona
Aug 30th
-60
-50
-40
-30
-20
-10
0
100826/1215 METEOSAT9 VIS_0.6

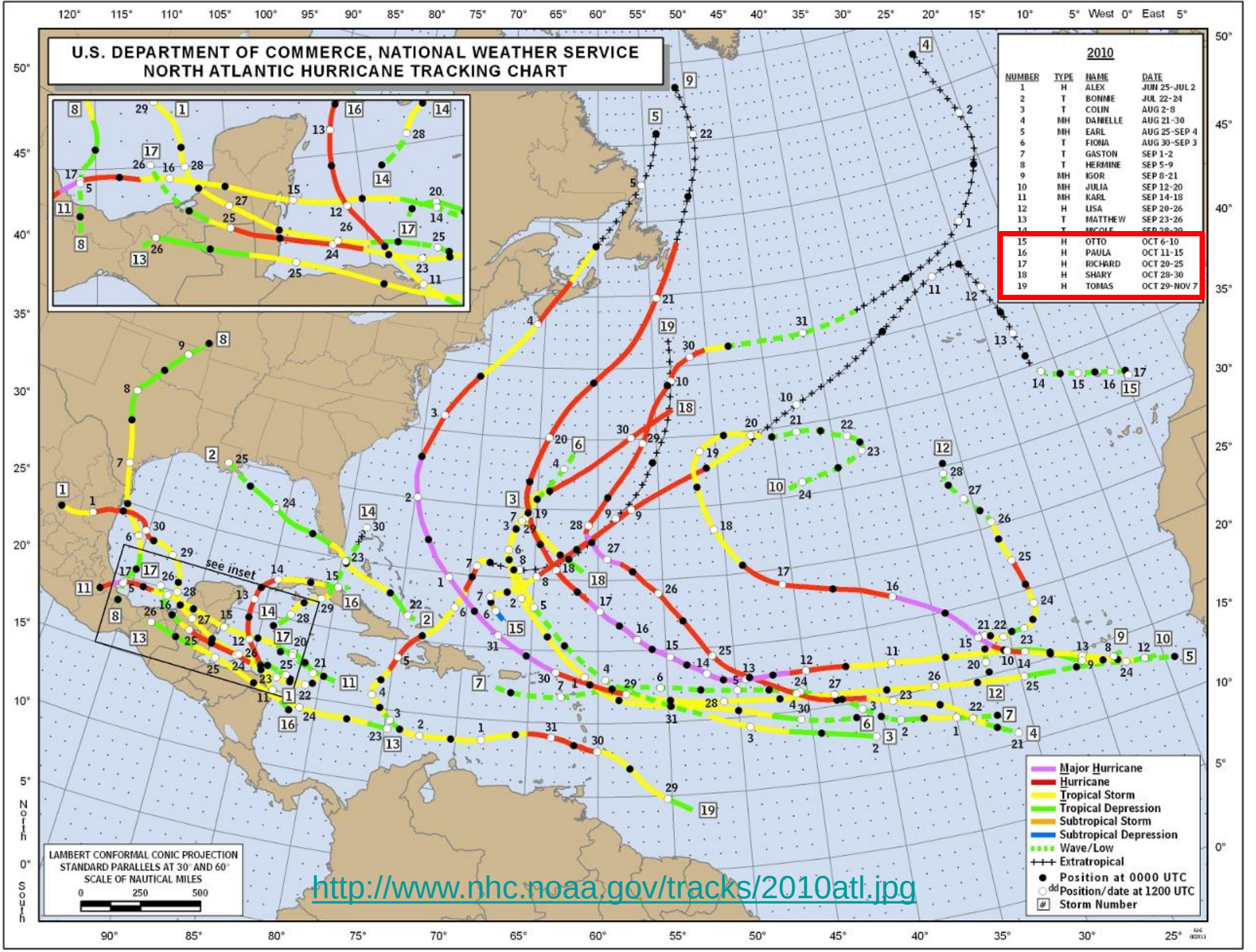

May 10
June 1
June 20
July 10
Aug 1
Aug 20
Sept 10
Oct 1
Oct 20
Nov 10
Dec 1
Dec 20
PEAK
Sep 10
2010
5 Hurricanes
110
100
90
80
70
60
50
40
30
20
10
0
Number of Storms per 100 Years
Hurricanes and Tropical Storms
Hurricanes
NOAA



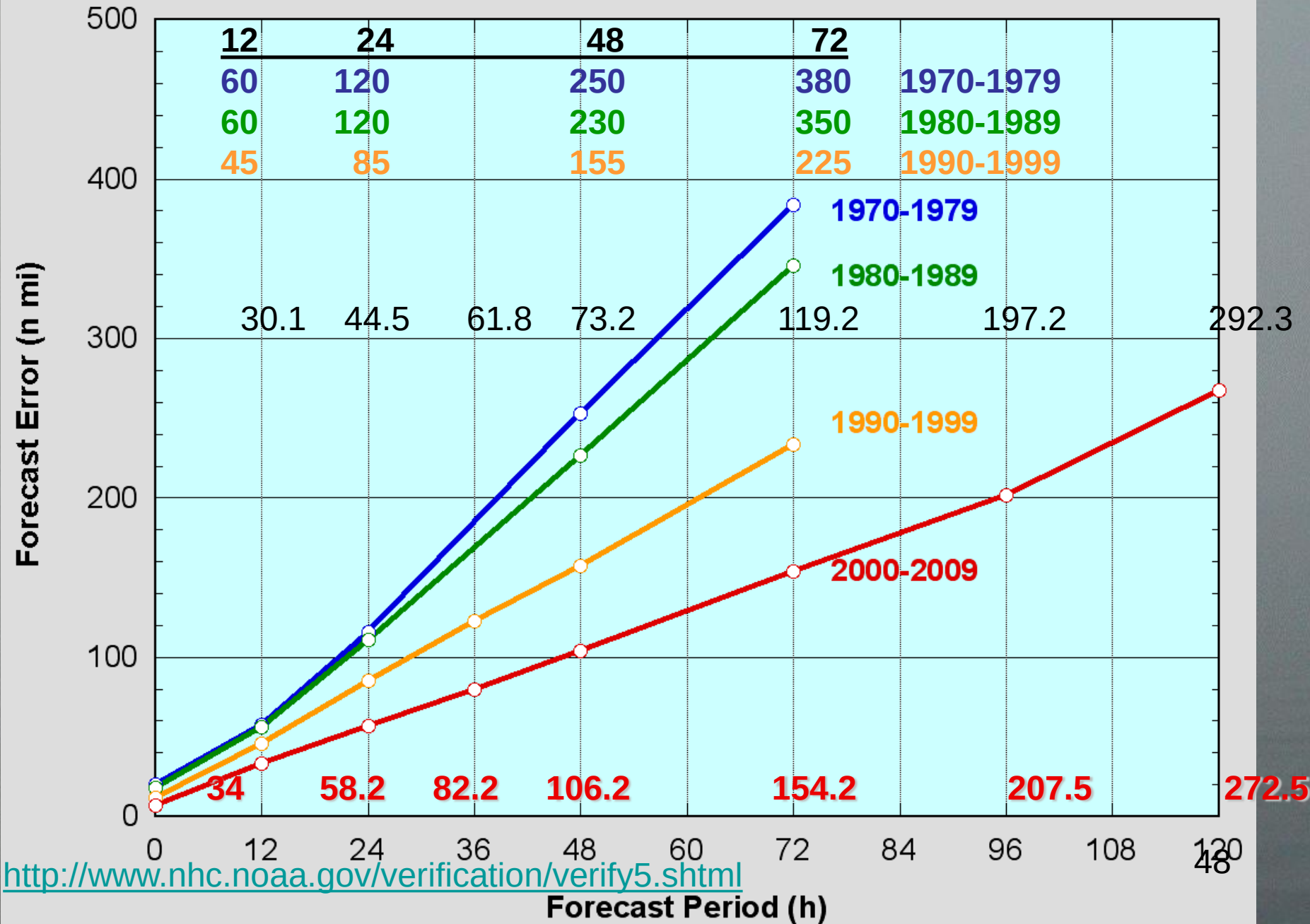
Average Atlantic Hurricane Season
9.8 named storms
5.8 Hurricanes

2010 **19 “named” storms**
12 Hurricanes
5 Major Hurricanes

Another WELL ABOVE AVERAGE SEASON


U.S. DEPARTMENT OF COMMERCE, NATIONAL WEATHER SERVICE
NORTH ATLANTIC HURRICANE TRACKING CHART
2010
NUMBER TYPE NAME DATE
1 H ALEX JUN 25-JUL 2
2 T BONNIE JUL 22-24
3 T COLIN AUG 2-8
4 MH DANIELLE AUG 21-30
5 MH EARL AUG 25-SEP 4
6 T FIONA AUG 30-SEP 3
7 T GASTON SEP 1-2
8 T HERMINE SEP 5-9
9 MH IGOR SEP 8-21
10 MH JULIA SEP 12-20
11 MH KARL SEP 14-18
12 H LISA SEP 20-26
13 T MATTHEW SEP 23-26
15 H OTTO OCT 6-10
16 H PAULA OCT 11-15
17 H RICHARD OCT 20-25
18 H SHARY OCT 28-30
19 H TOMAS OCT 29-NOV 7
see inset
Major Hurricane
Hurricane
Tropical Storm
Tropical Depression
Subtropical Storm
Subtropical Depression
Wave/Low
Extratropical
Position at 0000 UTC
dd Position/date at 1200 UTC
Storm Number
LAMBERT CONFORMAL CONIC PROJECTION
STANDARD PARALLELS AT 30° AND 60°
SCALE OF NAUTICAL MILES
0 250 500
http://www.nhc.noaa.gov/tracks/2010atl.jpg

NHC Official Average Track Errors
Atlantic Basin Tropical Storms and Hurricanes

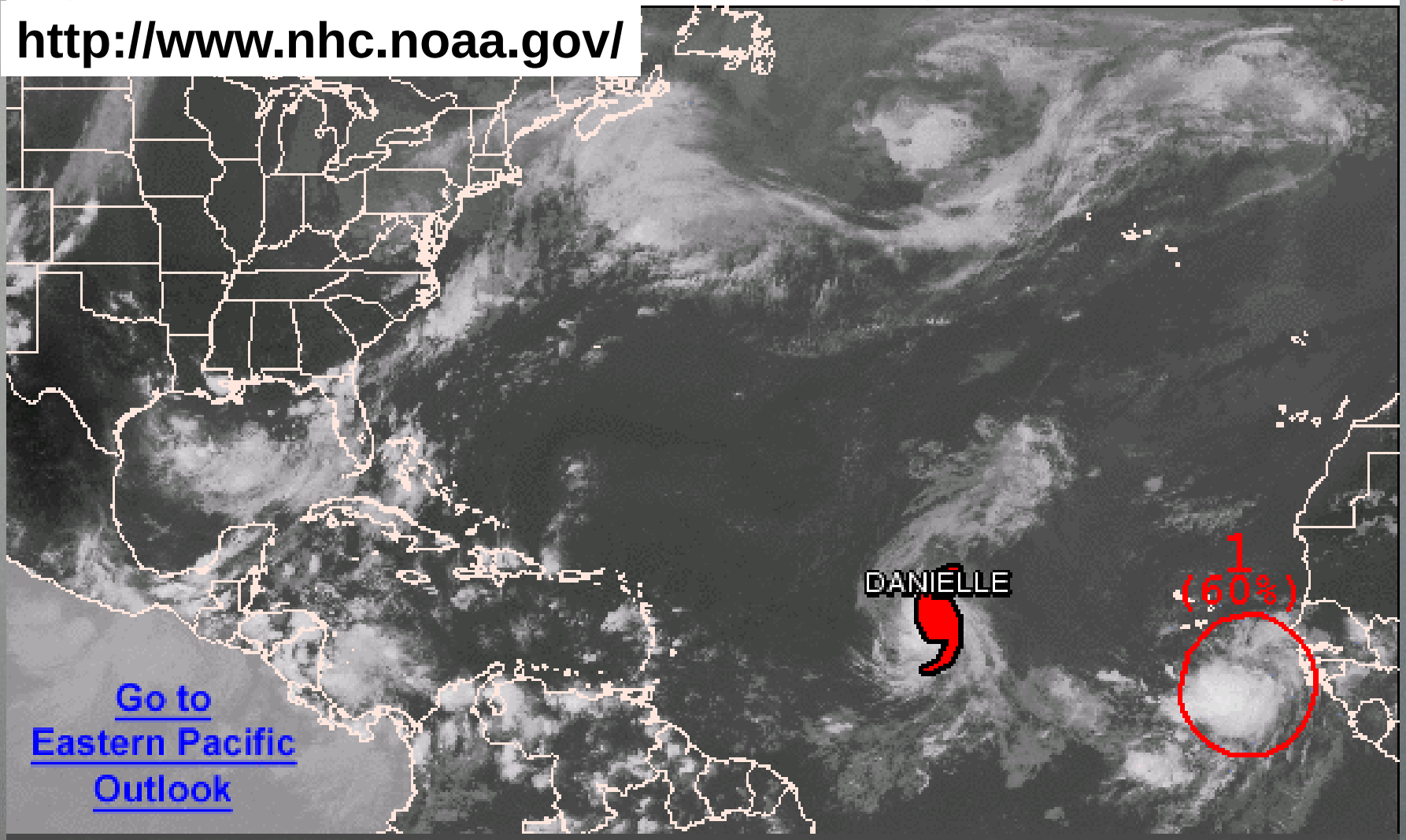


http://www.nhc.noaa.gov/verification/verify5.shtml

Graphical Tropical Weather Outlook

National Hurricane Center Miami, Florida

http://www.nhc.noaa.gov/



Outlined areas denote current position of systems discussed in the Tropical Weather Outlook. Color indicates probability of tropical cyclone formation within 48 hours.

Low <30% Medium 30-50% High >50%

Dealing with Hurricane Season

- **Know where to receive latest information, continue to monitor!!!**
  - http://www.weather.gov/om/marine/home.htm
- **We continue to get better at forecasting track and formation!**
  - http://www.nhc.noaa.gov/verification/figs/OFCL_ATL_trk_error_trend.gif
- **Intensity still a big problem!!!**
  - http://www.nhc.noaa.gov/verification/figs/OFCL_ATL_int_error_trend.gif
- **Have seen more cyclones later in season…well into October November and December**
- **Know the climatology…formation areas and favored tracks**
  - http://www.nhc.noaa.gov/pastprofile.shtml
- **Hurricanes are just as dangerous in the northern latitudes**
  - **They move faster and are more efficient wave producers**

Communications

How can you receive weather warnings and forecasts?

INMARSAT

PDA Cell Phone

NAVTEX

Satellite Radio

NOAA Weather Radio

E-mail

Single Side Band

SAT phone

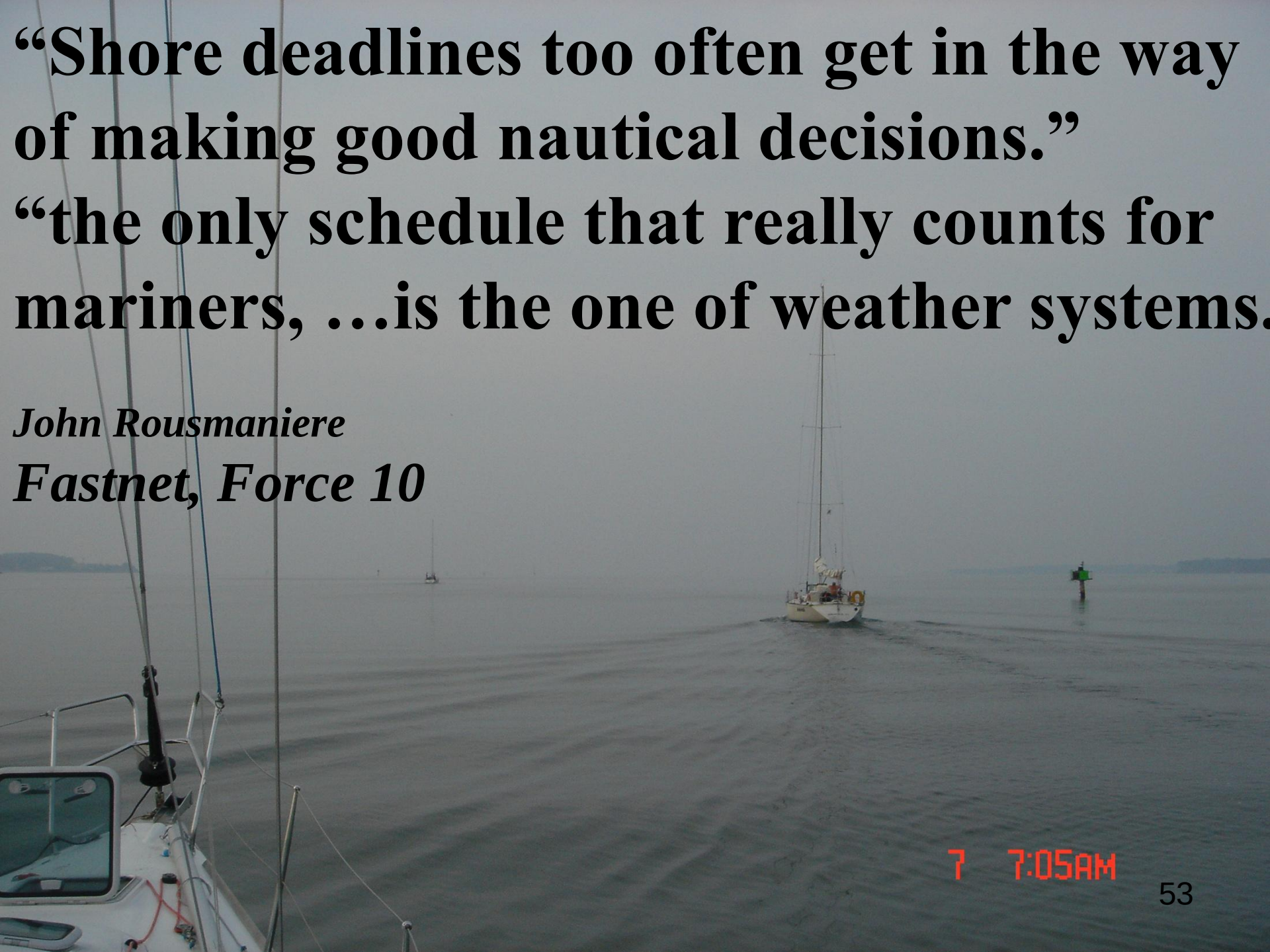
Weatherfax

Before departing

- **Departure time may be the single most important decision for a successful voyage.**
- **Know the forecast…and update!**
- **Monitor the weather via Internet….same products…get in rhythm**
- **Private weather routing service?**

Underway

- **Monitor the weather..as part of watch keeping/navigation**
  Wind speed and/or direction changes, barometer, seas
- **Is the weather evolving as planned?**
  If not…determine and redefine options
- **KNOW THE CURRENT FORECAST!!!**
  - **Weatherfax, SSB, NOAA WX RADIO, ftpmail, etc…**



“Shore deadlines too often get in the way of making good nautical decisions.”
“the only schedule that really counts for mariners, …is the one of weather systems.

John Rousmaniere
Fastnet, Force 10