WEATHER AWARENESS

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NOAA National Weather Service

Ocean Prediction Center

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

http://www.facebook.com/OceanPredictionCenter
Satellite Altimeter Wave Heights
Significant Wave Height
Average of 1/3 highest waves (feet)

North Atlantic
Feb 14, 2011
NWS / Ocean Prediction Center
mission/responsibility

• Protection of life and property, safety at sea, and enhancement of economic opportunity
  – Issue Warnings and Forecasts

• Partially fulfill U.S. responsibilities with the World Meteorological Organization and Safety of Life at Sea Convention (SOLAS)
  – Global Maritime Distress Safety System *GMDSS*
    (http://www.gmdss.com/)

• Forecast support
  – Government incident response (USCG, NOAA)
  – Government operations (USCG, Navy, NOAA)

• Science AND service based organization
Safety of Life At Sea, 1914

http://www.imo.org

• Chapter III – Safety of Navigation
  • Part I – Ice and Derelicts
  • Part II – Meteorological Information
• Chapter V - Radiotelegraphy
Safety of Life At Sea, 1974

http://www.imo.org

- Chapter IV – Radio Communication
  - GMDSS
    http://www.navcen.uscg.gov/?pageName=GMDSS

- Chapter V – Safety of Navigation
  - Meteorological services
NWS Coastal Waters Forecasts

Coastal waters from Cape Charles Light VA to NC VA border out 20 nm (ANZ656) - Atlantic Ocean

Hazardous marine condition(s):
- Hazardous Weather Outlook
- Small Craft Advisory

Synopsis: A COLD FRONT CROSSSES THE MARINE AREA TONIGHT. HIGH PRESSURE RETURNS THURSDAY THROUGH FRIDAY. A FRONTAL BOUNDARY WITH LOW PRESSURE MOVING ALONG IT MOVES ACROSS THE AREA FRIDAY NIGHT THROUGH SATURDAY. HIGH PRESSURE ARRIVES AGAIN SUNDAY AND MONDAY.

Tonight: SW winds 15 to 20 kt with gusts to around 30 kt...becoming W late. Seas 3 ft with a dominant period of 4 seconds. A slight chance of showers and storms until early morning.

Thu.: NW winds 20 kt. Seas 4 to 5 ft with a dominant period of 4 seconds.

Thu Night: N winds 10 to 15 kt. Seas 4 to 5 ft...subsiding to 3 ft after midnight.

Fri.: N winds 5 to 10 kt...becoming E in the afternoon. Seas 2 to 3 ft.

Fri Night: S winds 10 to 15 kt...becoming SW after midnight. Seas 2 ft.

Sat.: W winds 10 to 15 kt...becoming NW in the afternoon. Seas 2 to 3 ft. A chance of showers.

Sat Night: N winds 10 to 15 kt. Seas 3 to 4 ft. A chance of showers.

Sun.: NE winds 5 to 10 kt...becoming SE in the afternoon...then becoming S 10 to 15 kt. Seas 3 to 4 ft...subsiding to 2 ft.

Mon.: SW winds 10 to 15 kt...increasing to 15 to 20 kt. Seas 2 to 3 ft.

Winds and seas higher in and near storms.

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

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Grid Domains

5 km resolution –
- covers offshore domains
- basis for GRIB files
NOAA Forecast Responsibility

NOAA /NWS High Seas Marine Warning Areas

Ocean Prediction Center
http://www.opc.ncep.noaa.gov/

National Hurricane Center
http://www.nhc.noaa.gov/marine_forecasts.shtml

Honolulu Forecast Office

High Seas Warning Categories

GALE – 34-47 knots
Force 8/9

STORM – 48-63 knots
Force 10/11

HURRICANE FORCE - >64 knots
Force 12

http://www.weather.gov/om/marine/home.htm
http://www.nhc.noaa.gov/
NOAA Forecast Responsibility

Wind Warning Categories

- **GALE** – 34-47 knots (Force 8/9)
- **STORM** – 48-63 knots (Force 10/11)

HURRICANE FORCE – 64 knots and greater (Force 12)

Tropical Cyclone Warning Categories

- **TROPICAL STORM** – 34-63 knots (Force 8-11)
- **HURRICANE** – ≥64 knots (Force 12)

http://www.nhc.noaa.gov/
http://www.prh.noaa.gov/hnl/cphc/
http://www.nhc.noaa.gov/
http://www.usno.navy.mil/JTWC/
Atlantic Analysis

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

Atlantic Graphical Forecasts

http://www.vos.noaa.gov/MWL/dec_08/milobar_chart.shtml
Pacific Analysis

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

Pacific Forecasts

http://www.vos.noaa.gov/MWL/dec_08/milibar_chart.shtml
North American Ensemble Forecast System
Probability of winds 25 kt or greater based on 42 GLOBAL numerical models

MON 120402/0000Z096  PROBABILITY (%) of 10m WIND >= 25kt NAEFS

If you are having problems seeing these loops (requiring the Adobe Flash Player plugin) try the static images link.

The North American Ensemble Forecast System (NAEFS) is a weather modeling system run jointly by the Meteorological Service of Canada (MSC) and the U.S. National Weather Service (NWS) to provide numerical weather prediction (NWP) products to weather forecasters in both countries for a forecast period that runs out to 2 weeks in the future.
Surface Charts
Analysis, 24, 48, 96 HR Forecasts

Fronts
Observations
Isobars

Pressure Centers L, H
L – rising air converging
H – sinking air diverging

24 hr forecast position/intensity

WARNINGS

Fronts – warm, cold, occluded
boundaries between air of different temperature
- Pressure trough
- Wind shift
- Weather (rain, clouds)

Global average sea level pressure
1013.2 millibars
Clouds (Infrared Image)
Temperature (deg F)
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
THE GULF STREAM

SPAWNING GROUND FOR T-STORMS
Wind Against Current

Plum Gut, NY
NAVY Coastal Ocean Model

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

Surface Current (knots)

72 hour Loop
3 hourly

Surface Temp (deg C)
THUNDERSTORMS
CUMULUS CLOUDS
MATURE

GROWING
MAMMATUS

GREEN TINGE – potential for HAIL
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
TROPICAL CYCLONES

Note: The cone contains the probable path of the storm center but does not show the size of the storm. Harsh weather conditions can occur outside of the cone.
Hurricane "Danielle"

Tropical Storm "Earl"

Tropical Wave became T.S. Fiona Aug 30th

Wave over Africa
End of 2003 Season

PEAK Sep 10

http://www.nhc.noaa.gov/climo/
Average Atlantic Hurricane Season
9.8 named storms
5.8 Hurricanes

2011 18 “named” storms
7 Hurricanes
3 Major Hurricanes

Another WELL ABOVE AVERAGE SEASON
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

http://weather.noaa.gov/pub/fax/ftpmail.txt

E-mail
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?
• Know your limitations!

Underway
• Monitor the weather…
  • 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