

NAAMES Afternoon WX Discussion

Thursday, August 17, 2017

Michael Shook

Forecast Highlights

- Ship will be at 2016 S3 on Saturday!
- Quick look at St. John's, WHOI, and Wallops forecasts
- Hurricane Gert heading through North Atlantic
- Low pressure systems moves off to the NE, ridge and zonal flow suggests decent conditions early next week
- Long-range forecast currently indicates good conditions for a science test flight
- GOES-16 Satellite Imagery
- What's next in the tropics
- Solar Eclipse Forecast

Forecast Summary

Day 1 (Thursday) – August 17

Recommendation:

St. John's:

Day

Rec

St. J

Day

Rec

St. J

Day

Rec

St. John's:

Day 5 (Monday) – August 21

Recommendation:

St. John's:

Will start to
update this closer
to August 30th

Planned Ship Route & Forecast

A map of the North Pacific Ocean showing a planned ship route. The route is marked with orange circles and labels S1, S0, and S2. A large yellow text box is centered on the map. The map includes latitude and longitude lines, with labels like N42.5 and W25° visible. The background is a satellite-style map of the ocean and surrounding landmasses.

Sunday, 5/22 S3 Ops

Waves: SE 7-10 ft

Winds: NNE 15-25 kts

Clouds: Partly to mostly cloudy

Precip: none

Will start to
update this closer
to August 30th

Friday, 5/27 Transit to S6

Waves: NE 4-5 ft

Winds: NNW 20-25 kts

Clouds: mostly to partly cloudy

Precip: AM isolated rain shower

Clouds: mostly cloudy

Precip: none

Current Conditions at St. John's

St. John's, Canada ★🏠

✈ St. John's International | [Change Station](#) ▼

© 10:55 AM NDT on August 17, 2017 (GMT -0230)

Forecast History Calendar Rain / Snow Health

Elev 459 ft 47.62 °N, 52.73 °W | Updated 25 min ago



Fog

61 °F

Feels Like 61 °F



Wind from South

Today is forecast to be **WARMER** than yesterday.

Today

High 69 | Low 53 °F

80% Chance of Precip.

Yesterday

High 63 | Low 52 °F

Precip. 0 in



[Expect occasional thunderstorms to end at 4:15pm.](#)

✉ Sign up for your Daily Forecast Email

Pressure 29.62 in
Visibility 1.5 miles
Clouds Overcast 300 ft
Dew Point 61 °F
Humidity 100%
Rainfall 0.00 in
Snow Depth Not available.

Sun & Moon

5:59 am

8:09 pm

Waning Crescent,
23% visible

METAR CYYT 171300Z 18012KT 1 1/2SM -DZ BR
OVC003 16/16 A2960 RMK FG6SF2 SLP028
DENSITY ALT 1100FT

Radar

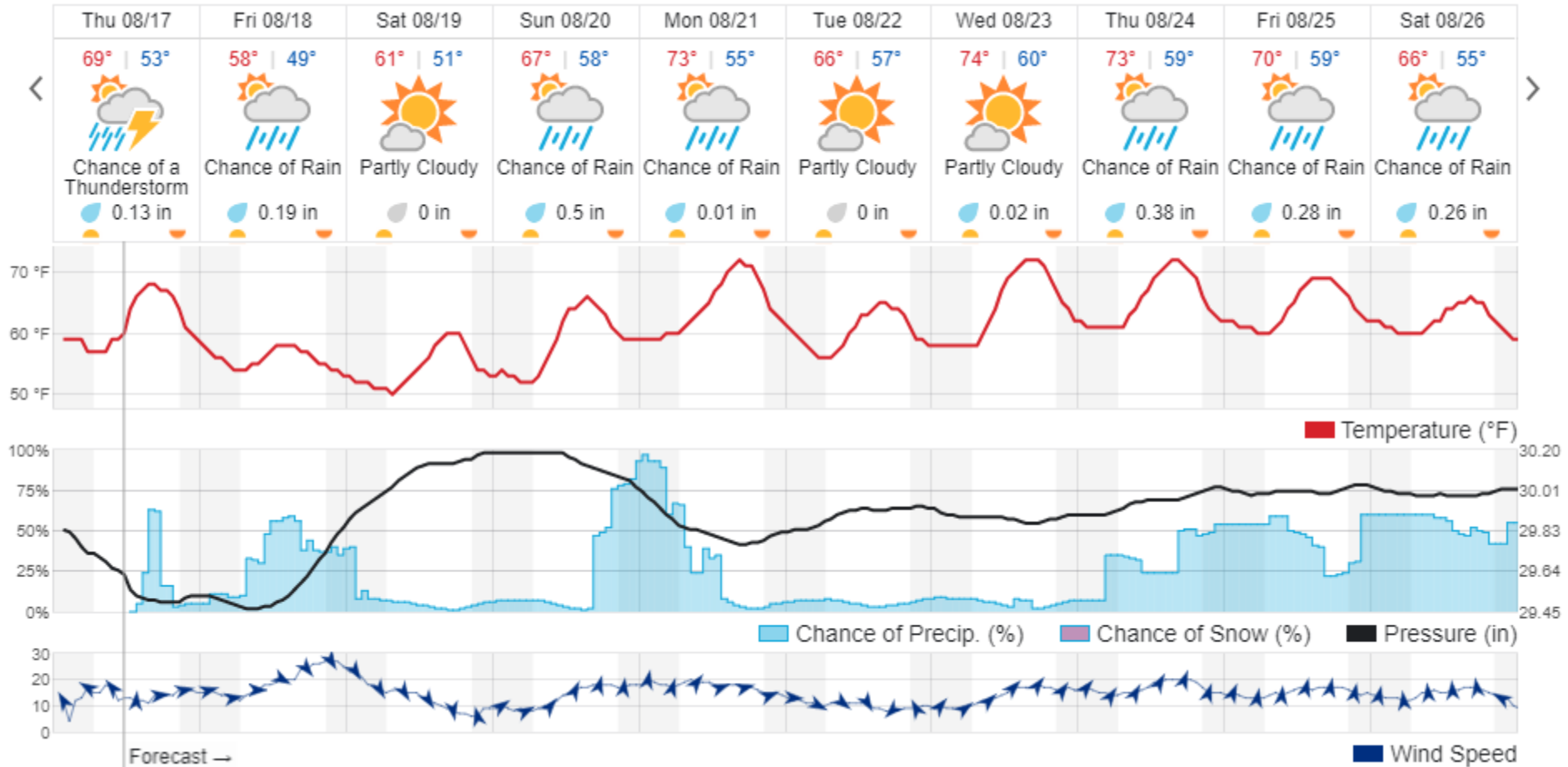
Satellite

[WunderMap](#) | [Nexrad](#)

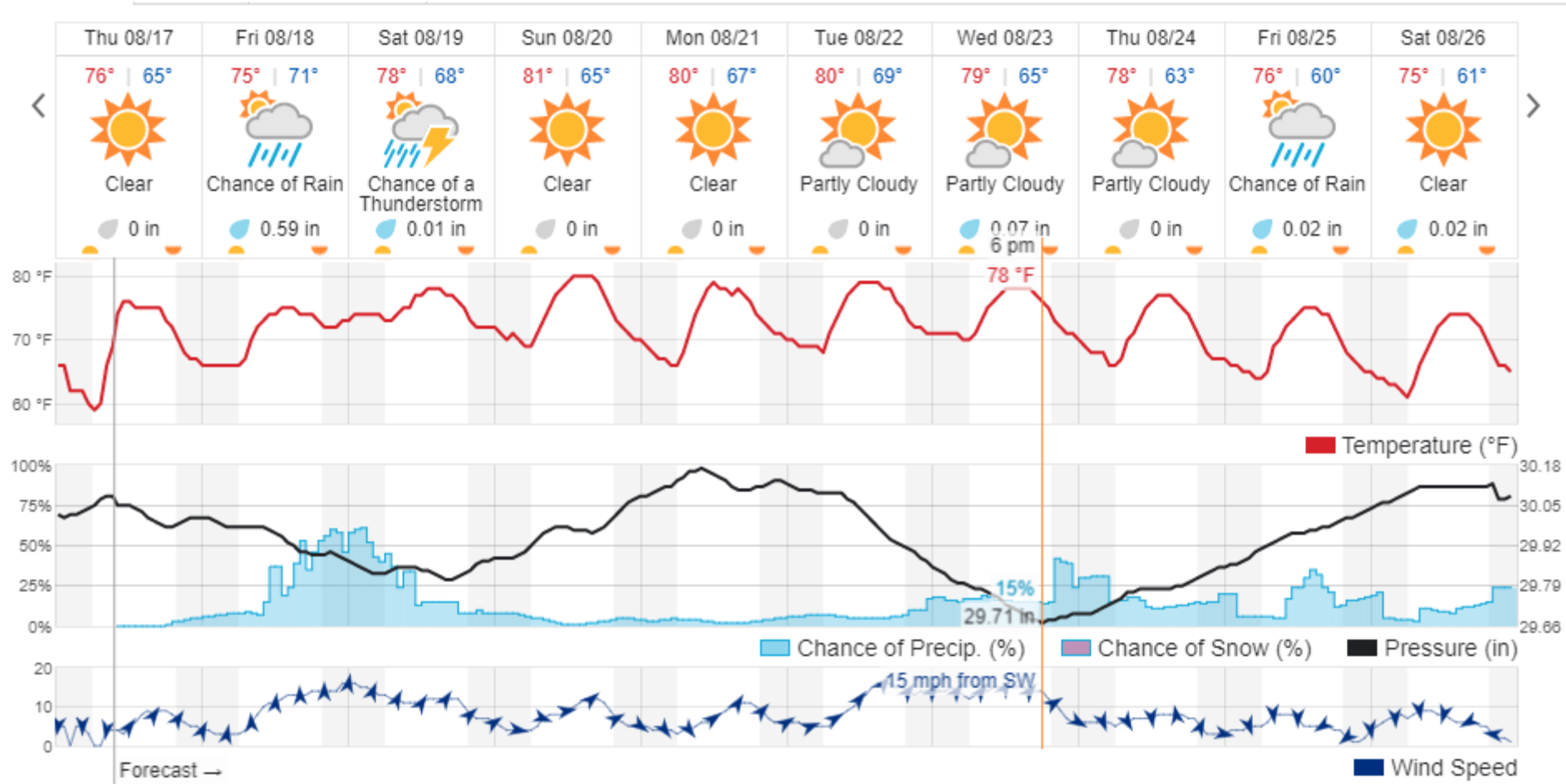


Show Webcams

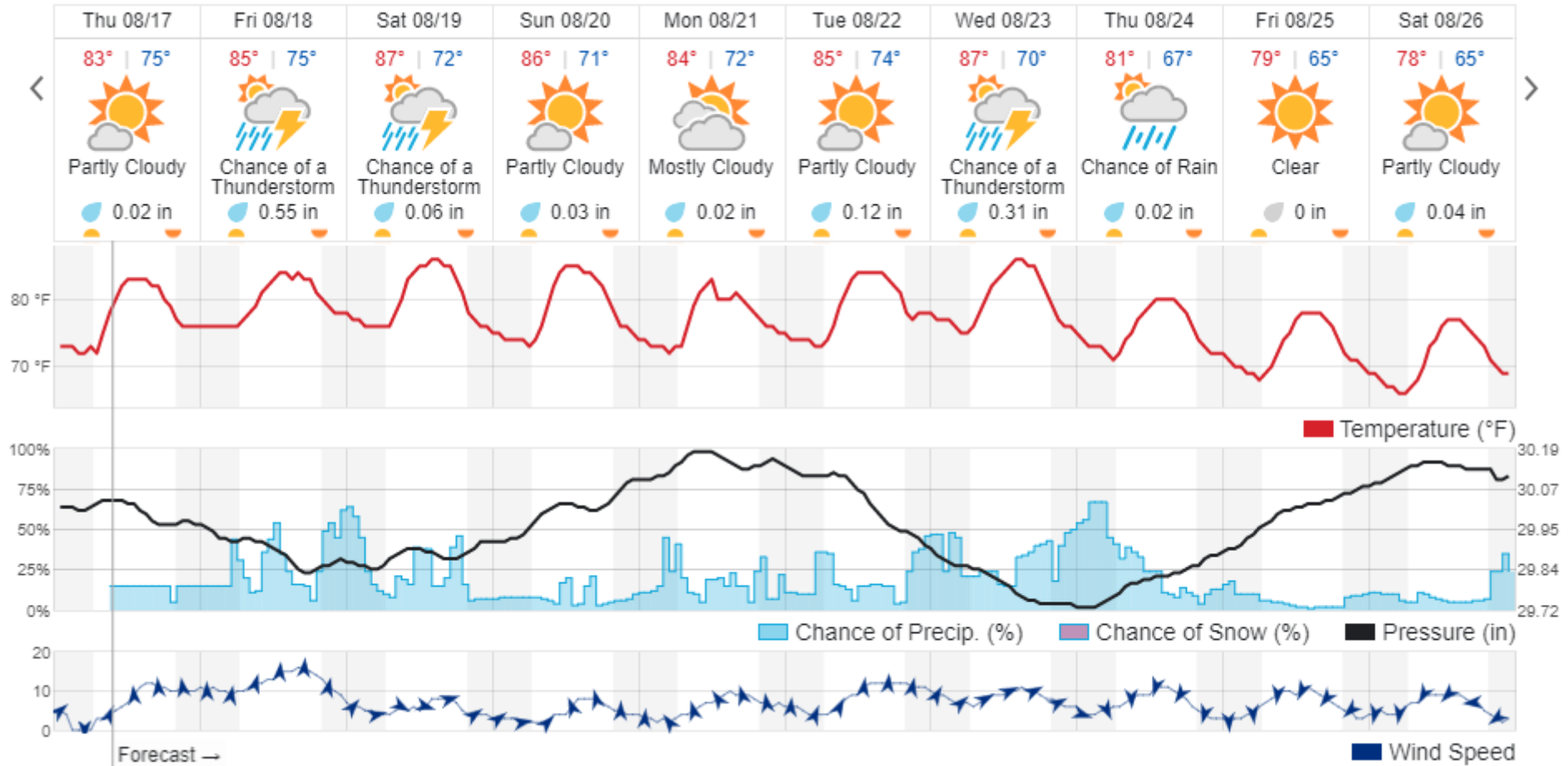
St. John's Forecast



WHOI Forecast



Wallops Forecast



St. John's METAR/TAF

METAR CYYT 211500Z 28006KT 250V320 15SM BKN180 16/05 A2979 RMK AC5 SLP092 DENSITY ALT 800FT=		
METAR	LOCATION	DATE - TIME
WIND 280 TRUE @ 6 KNOTS VARIATION 250 <-> 320 DEG		
WEATHER		
ALTIMETER 29.79 IN HG		

TAF CYYT 211138Z 2112/2212 26012KT P6SM BKN200 FM211500 25010KT P6SM SCT200 FM212300 26010KT P6SM -SHRA BKN040 BECMG 2200/2202 35012KT FM220300 36012KT P6SM BKN006 PROB30 2203/2206 4SM BR OVC003 FM220600 02010KT 4SM BR OVC003 FM221000 02010KT P6SM -SHRA

	VALIDITY [UTC] 21 MAY - 1138 to 22 MAY - 1200
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	CLOUDINESS [FEET AGL]
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	20000 BROKEN
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	20000 SCATTERED
--	-----------------

R	4000 BROKEN
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	600 BROKEN
--	------------

	300 OVERCAST
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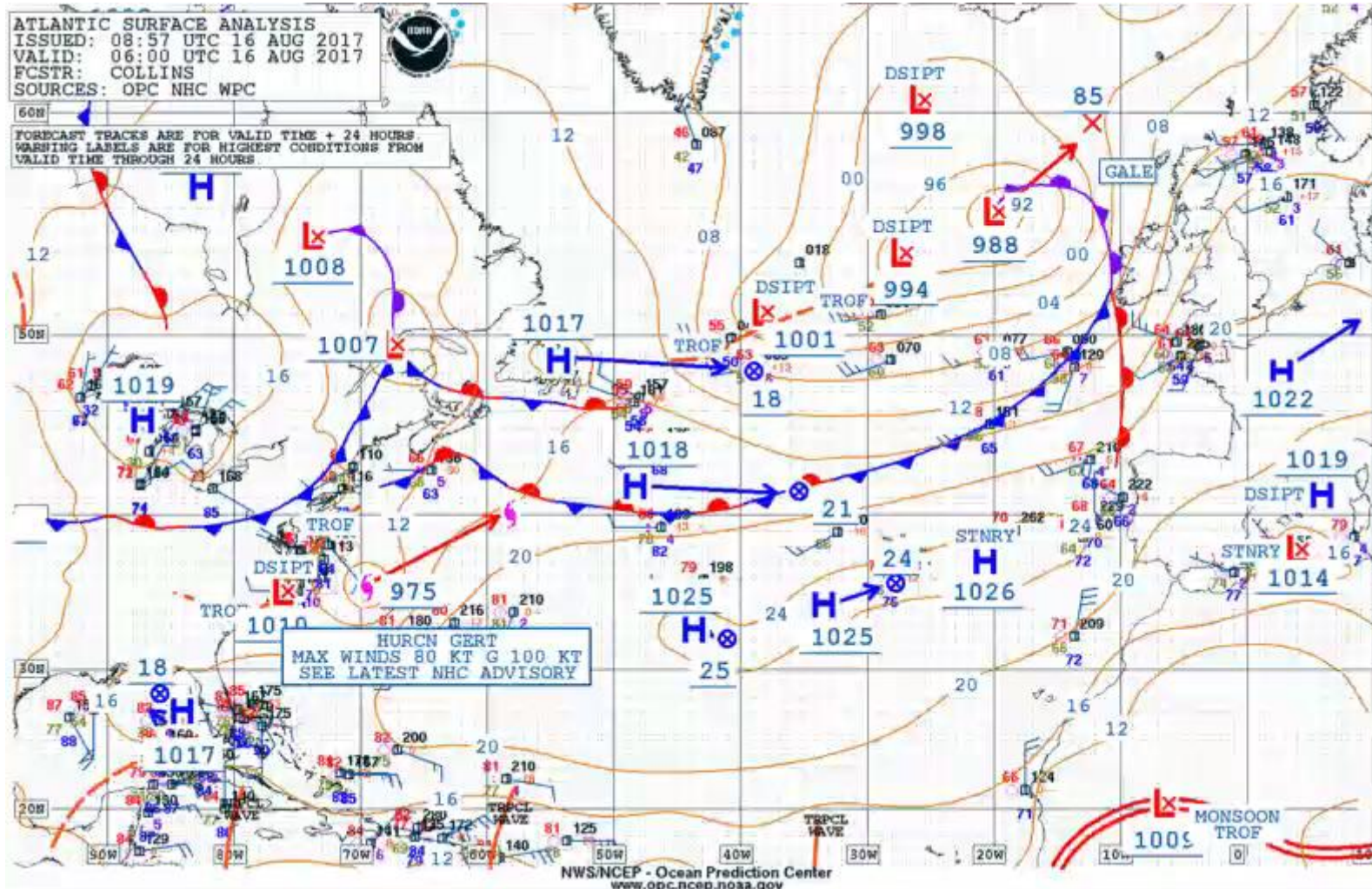
22 MAY - 0600 to 22 MAY - 1000	20 @ 10 KNOTS	4	MIST	300 OVERCAST
22 MAY - 1000 to 22 MAY - 1200	20 @ 10 KNOTS	6+	LIGHT RAIN SHOWER	300 SCATTERED 3000 OVERCAST

REMARKS

THE NEXT FORECAST WILL BE ISSUED BY 1800 UTC ON DAY 21

Will start including
these closer to
transit flight

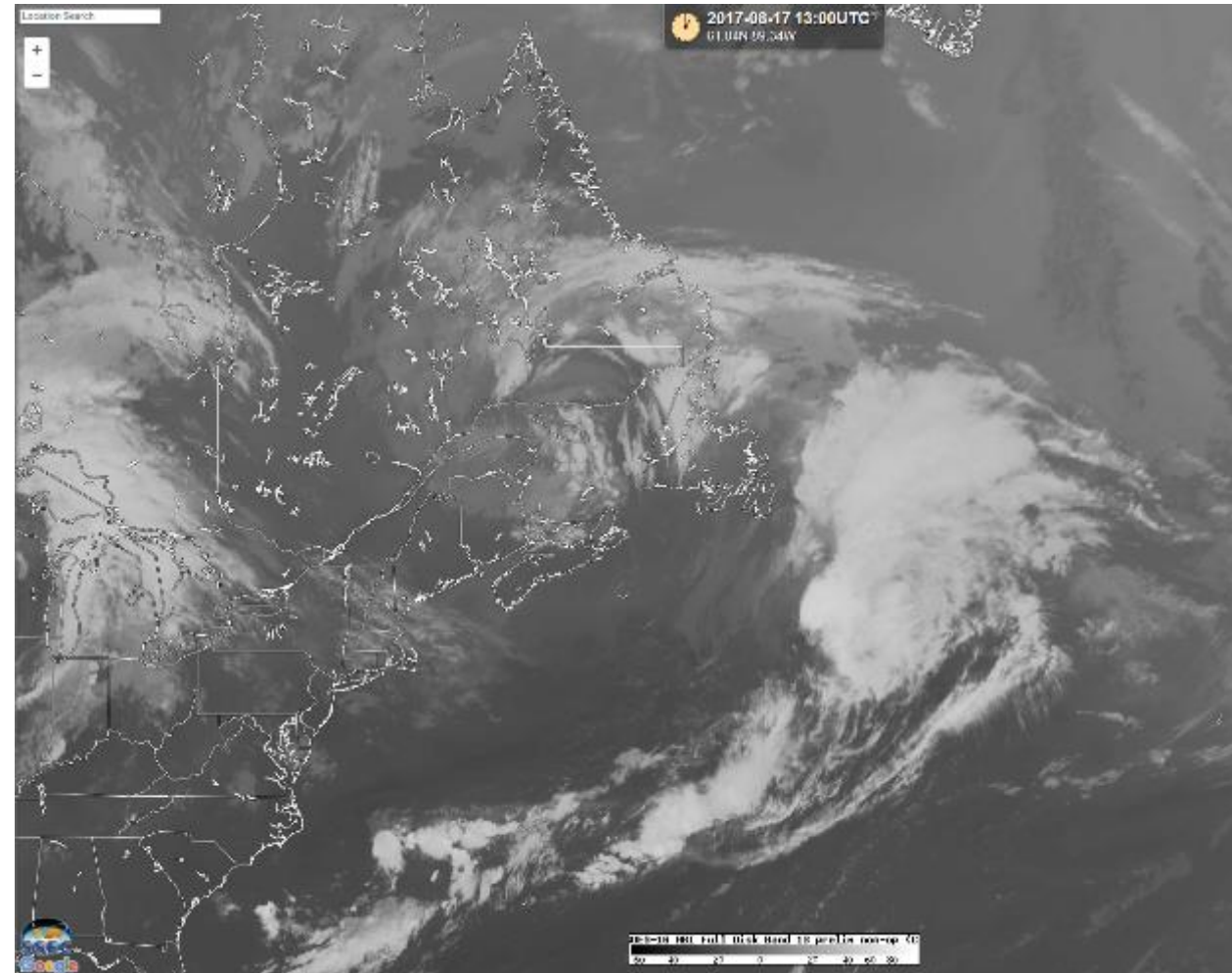
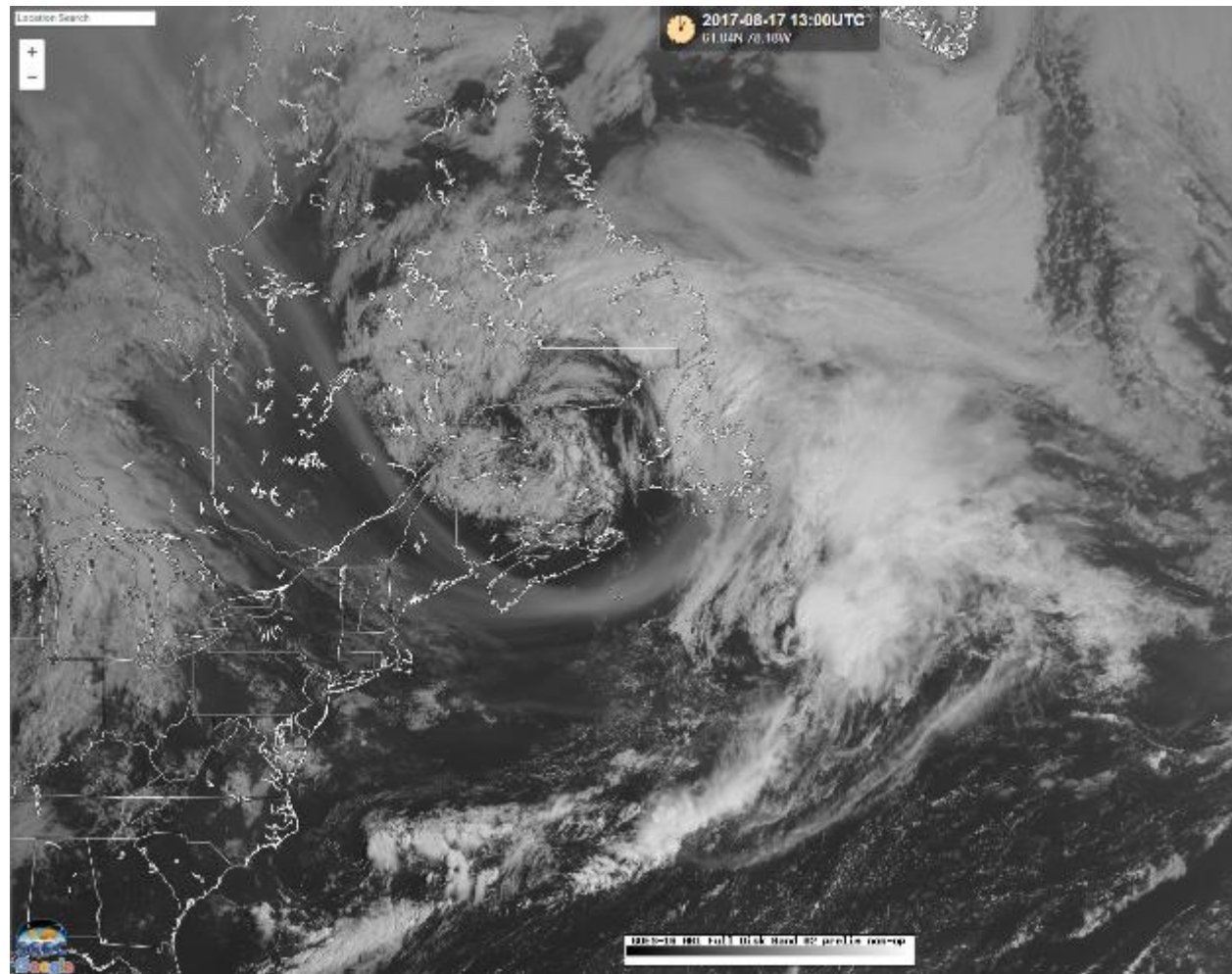
Surface Analysis and Synoptic Forecast



GOES-16 Imagery (8/17 13 UTC)

Visible (Red Band 2)

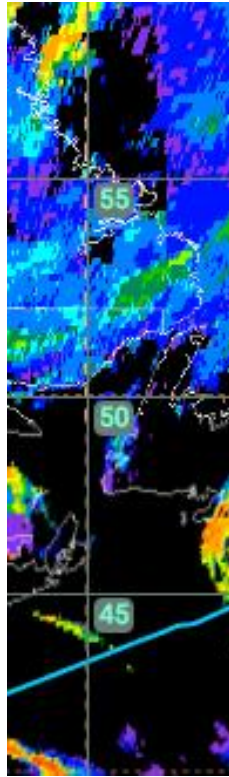
IR (Clean IR Band 13 - $10.3\text{ }\mu\text{m}$)



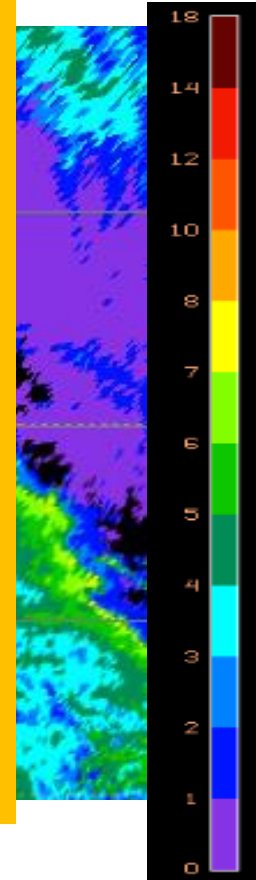
Cloud Products (5/21 13:45Z)

Cloud Top Height

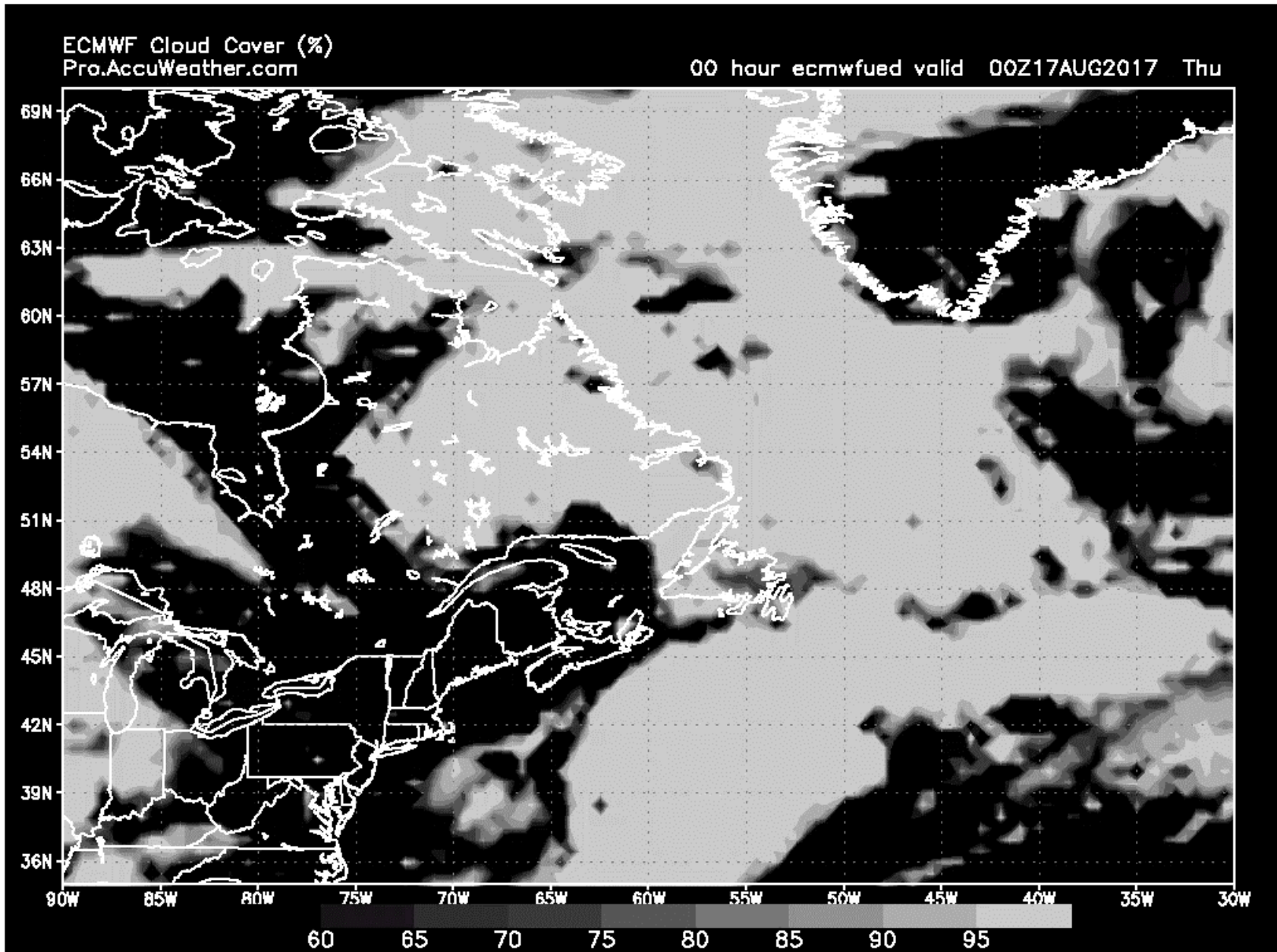
Cloud Base Height



Will start including
these when clouds
group starts
producing these



|ECMWF| Total Cloud Forecast



|ECMWF| 4-Panel Cloud Forecast

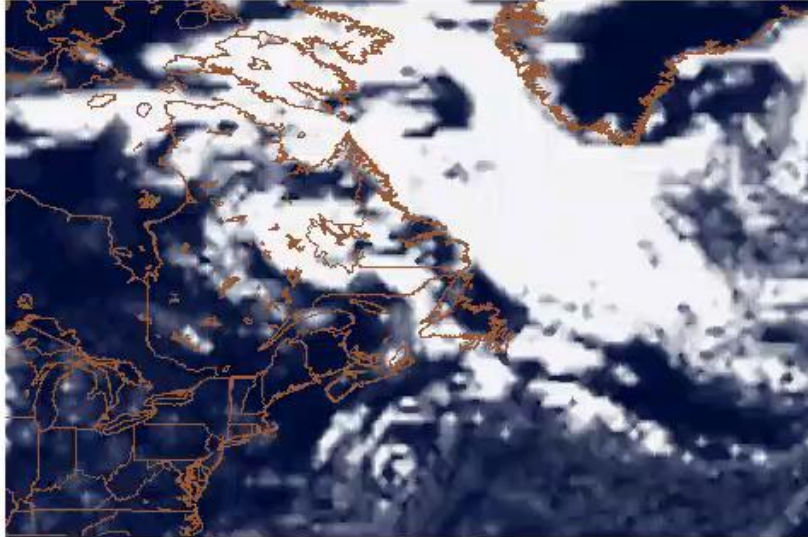
4-panel Cloud Cover (%)

00 hour forecast valid 00Z Thu, AUG 17, 2017

ECMWF Deterministic initialized 00Z Thu, AUG 17, 2017

AccuWeather Professional

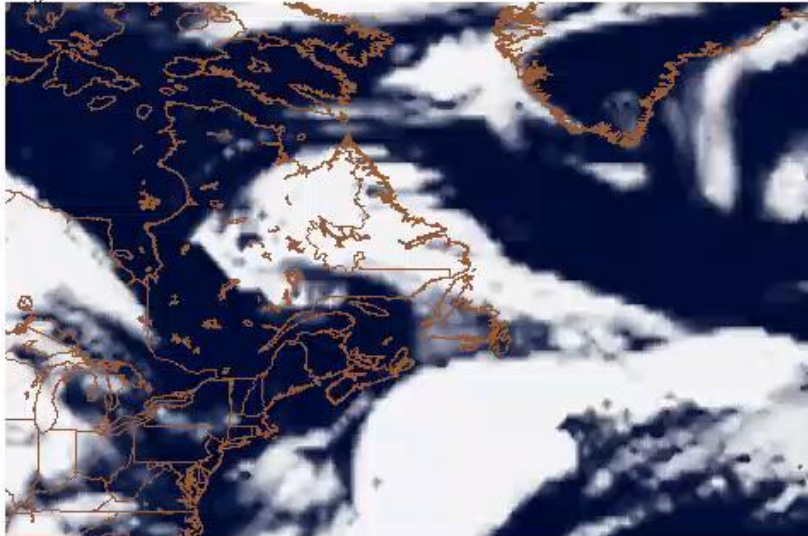
Low level Clouds



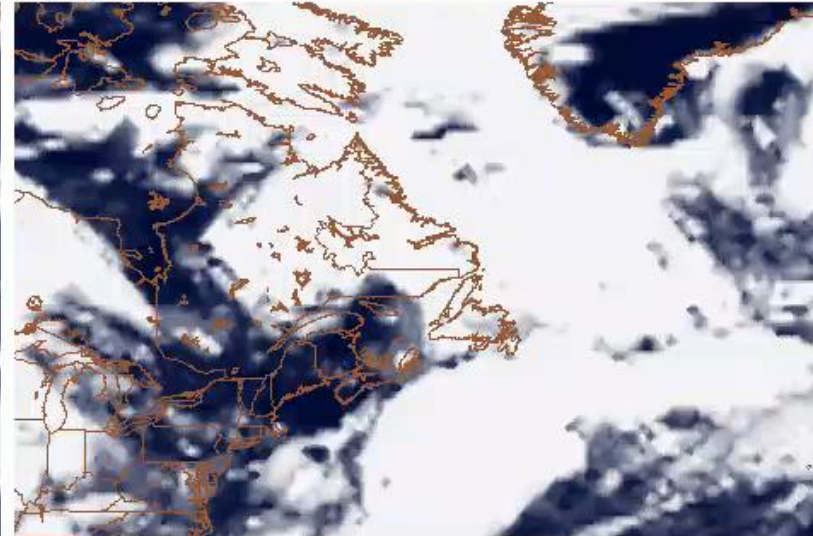
Mid level Clouds



High level Clouds

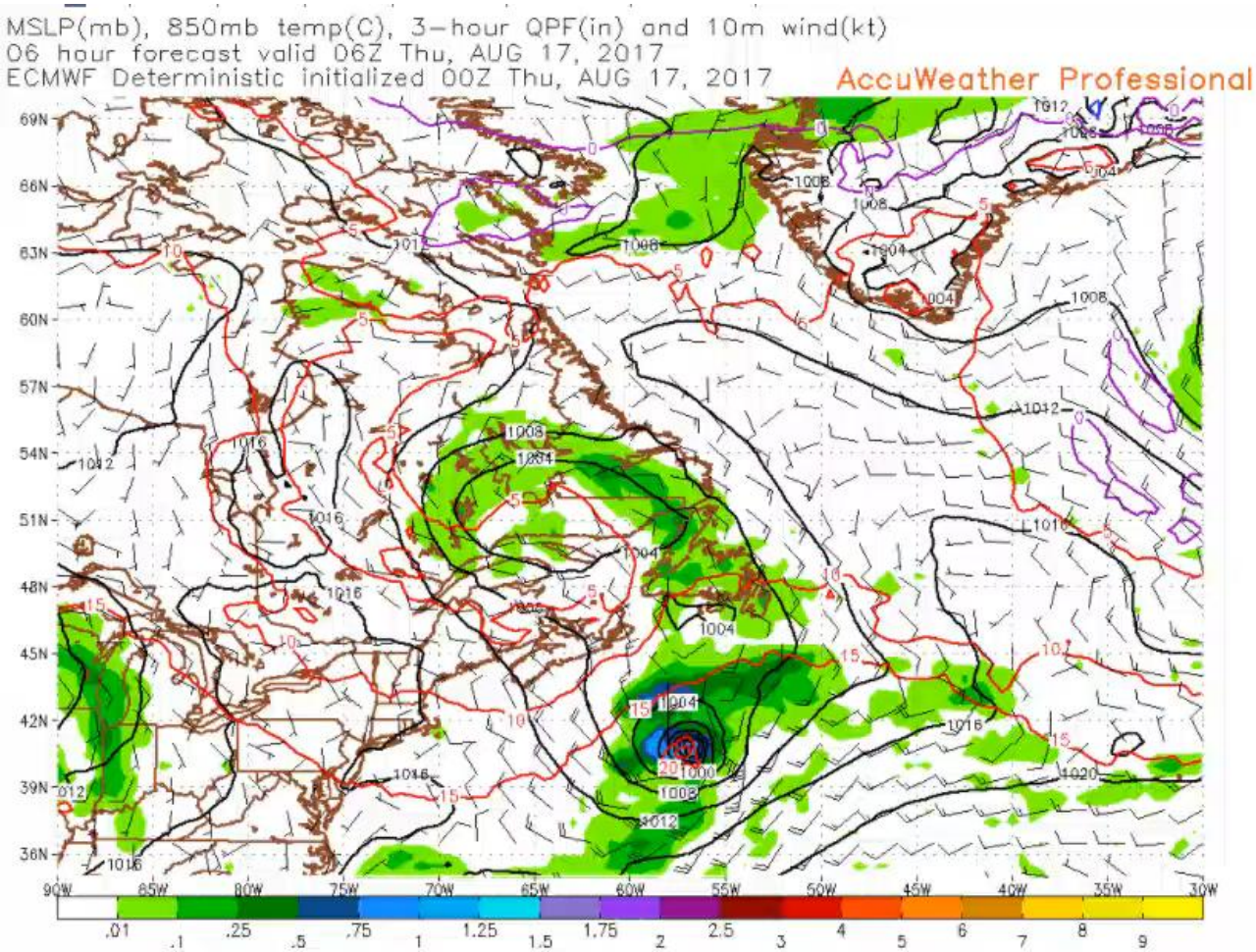


Total Clouds

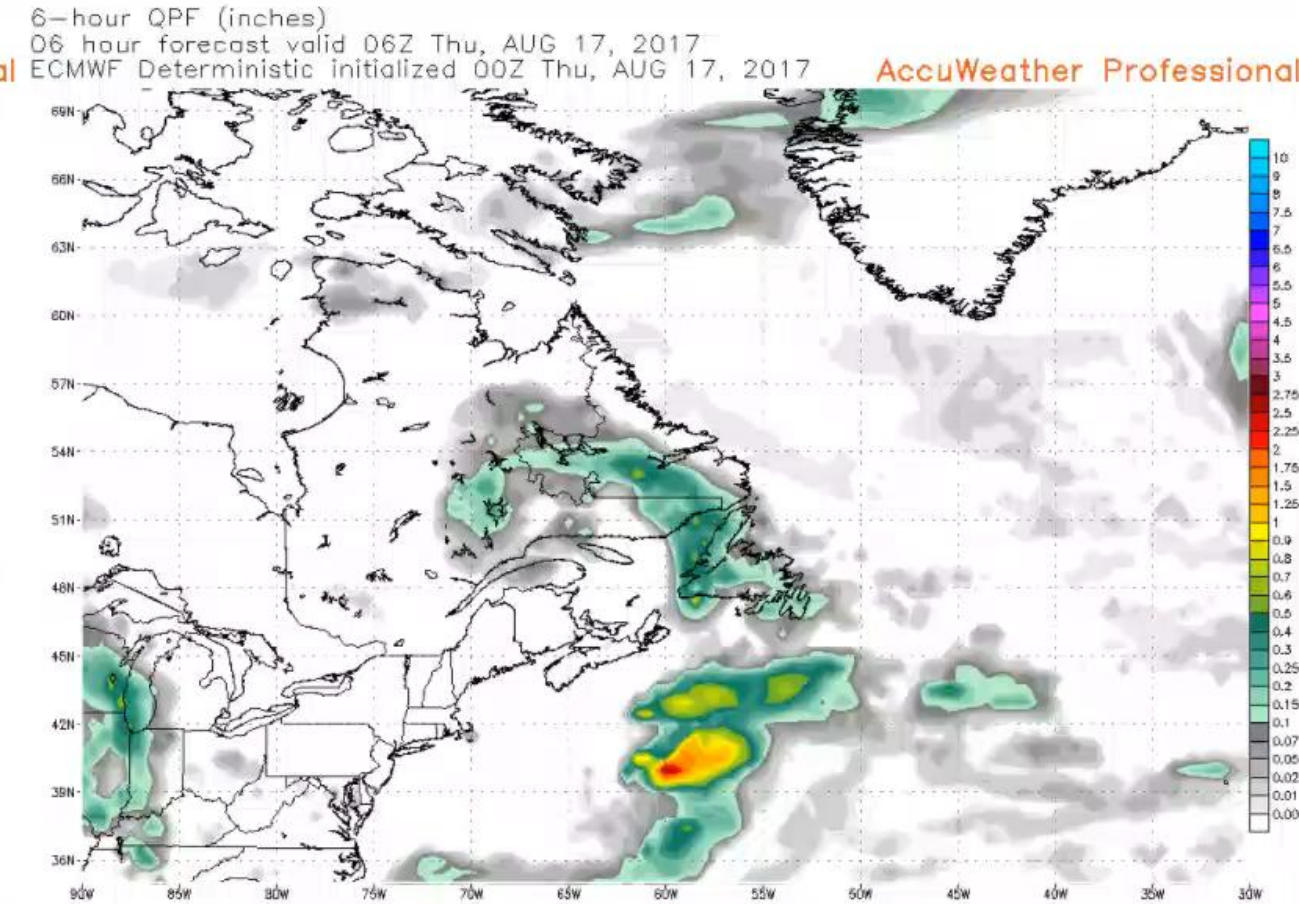


100
90
80
70
60
50
40
30
20
10
0

MSLP, 850 mb temp, 6 hour QPF, 10 m wind



6 hour QPF (inches)

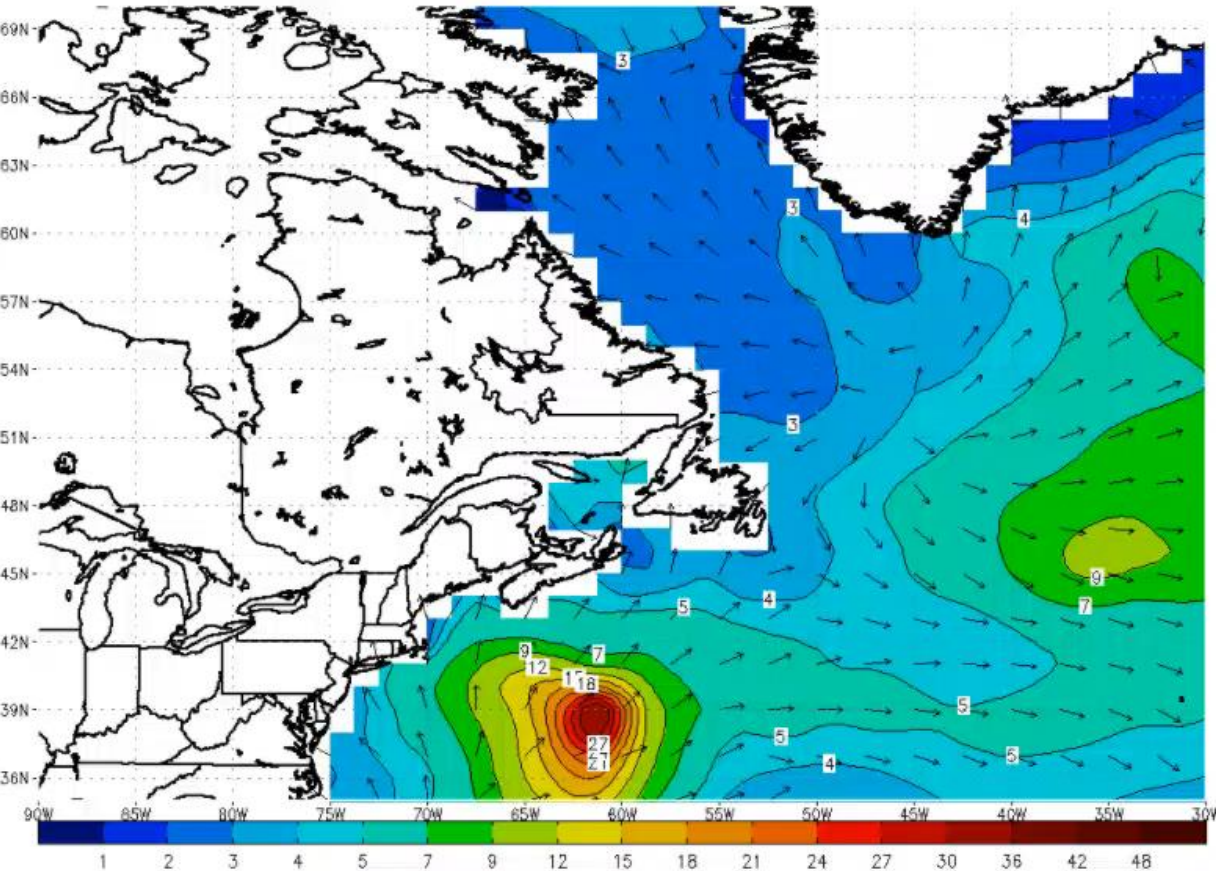


Wave height (ft)

Winds (knots)

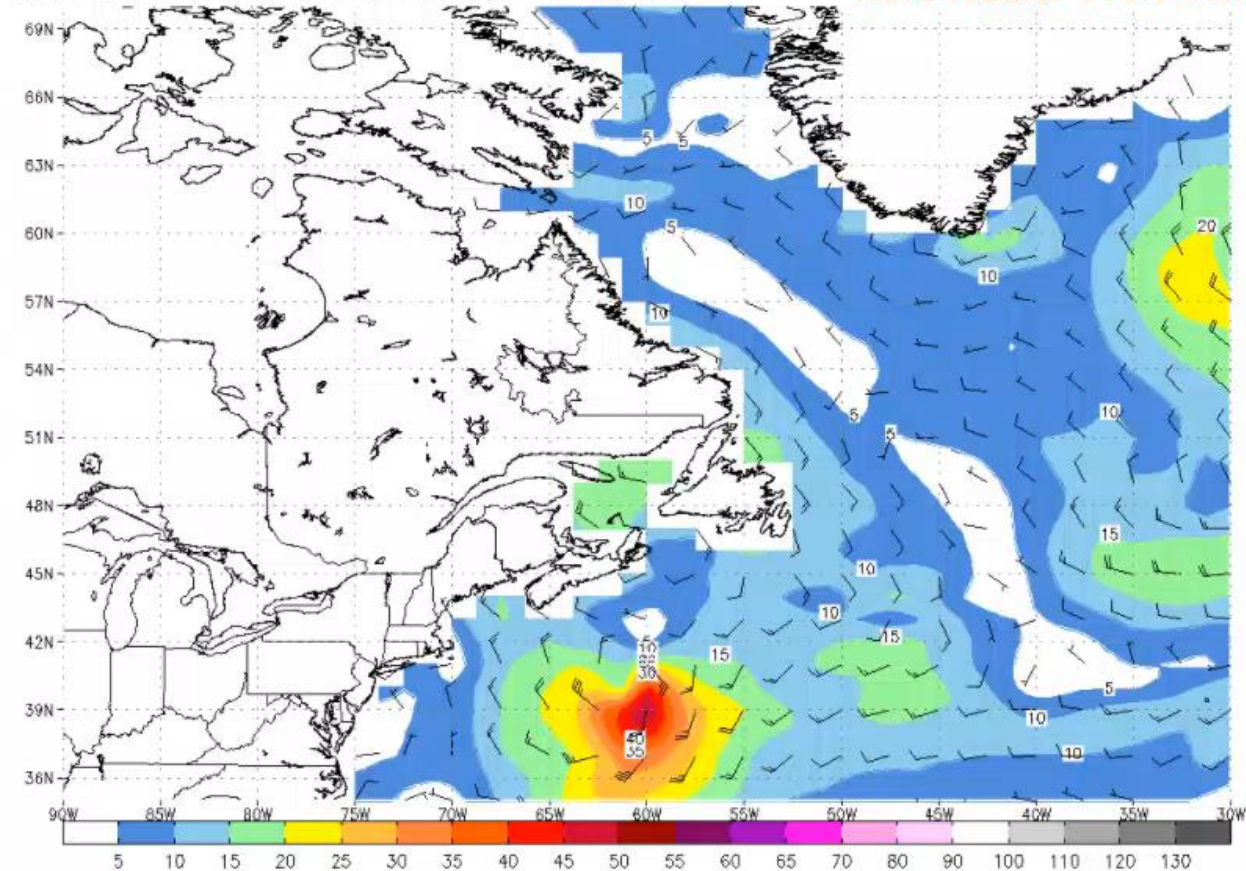
Significant Height of Waves and Swell (ft) and Direction
00 hour forecast valid 00Z Thu 17 AUG 2017
Wave Watch III initialized 00Z Thu 17 AUG 2017

Pro.AccuWeather.com



Surface Wind Speed (kts) and Wind Barbs
00 hour forecast valid 00Z Thu, AUG 17, 2017
Wave Watch III initialized 00Z Thu, AUG 17, 2017

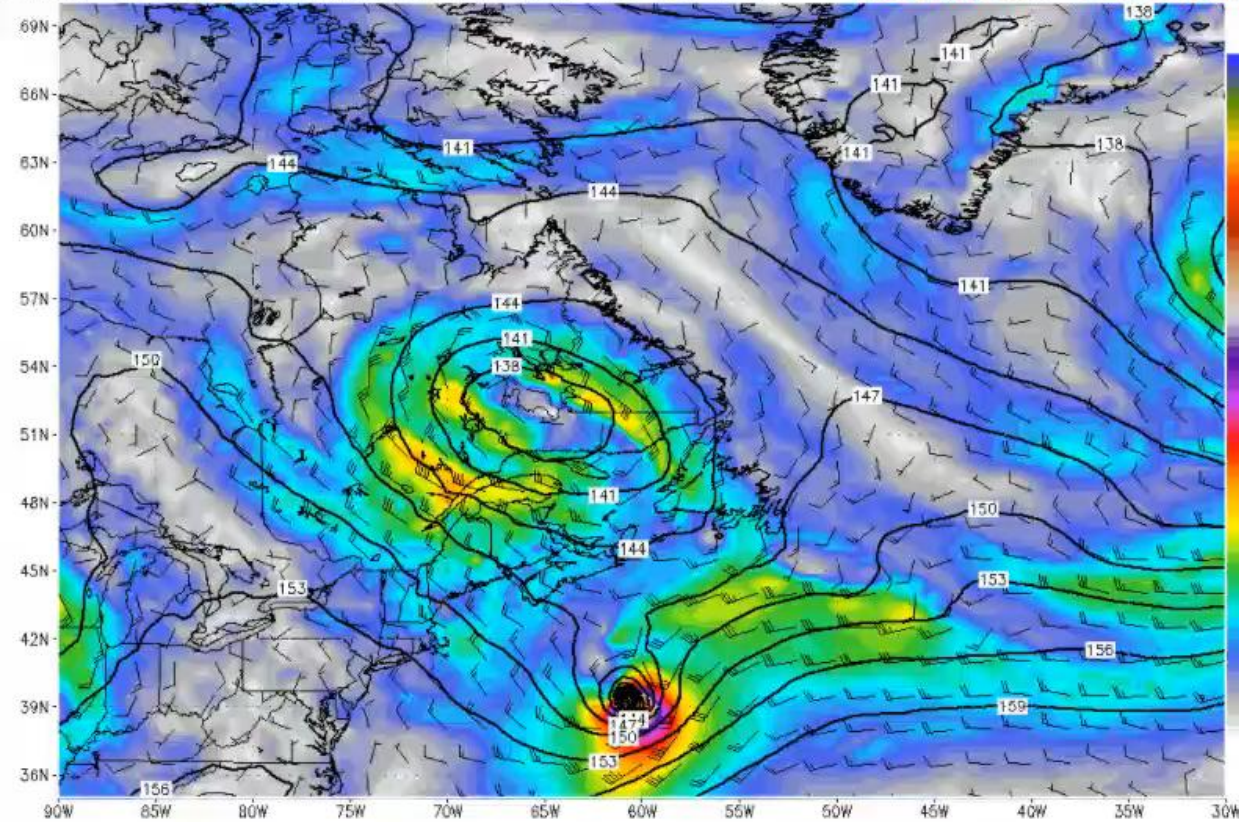
AccuWeather Professional



850 mb Height and Winds ~ 1.5 km or 5000 ft AMSL

850 MB Height and Winds (knots)
00 hour forecast valid 00Z Thu, AUG 17, 2017
ECMWF Deterministic initialized 00Z Thu, AUG 17, 2017

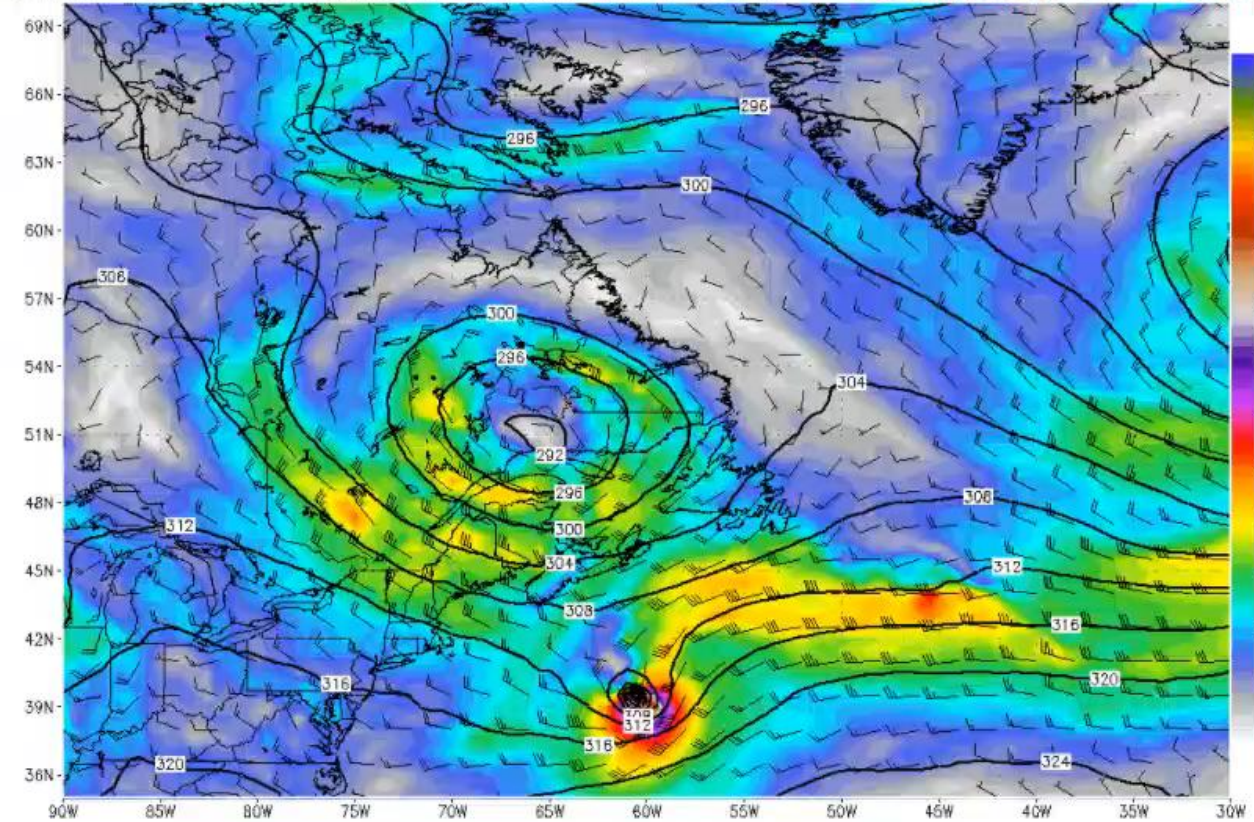
AccuWeather Professional



700 mb Height and Winds ~ 3 km or 10,000 ft AMSL

700 MB Height and Winds (knots)
00 hour forecast valid 00Z Thu, AUG 17, 2017
ECMWF Deterministic initialized 00Z Thu, AUG 17, 2017

AccuWeather Professional



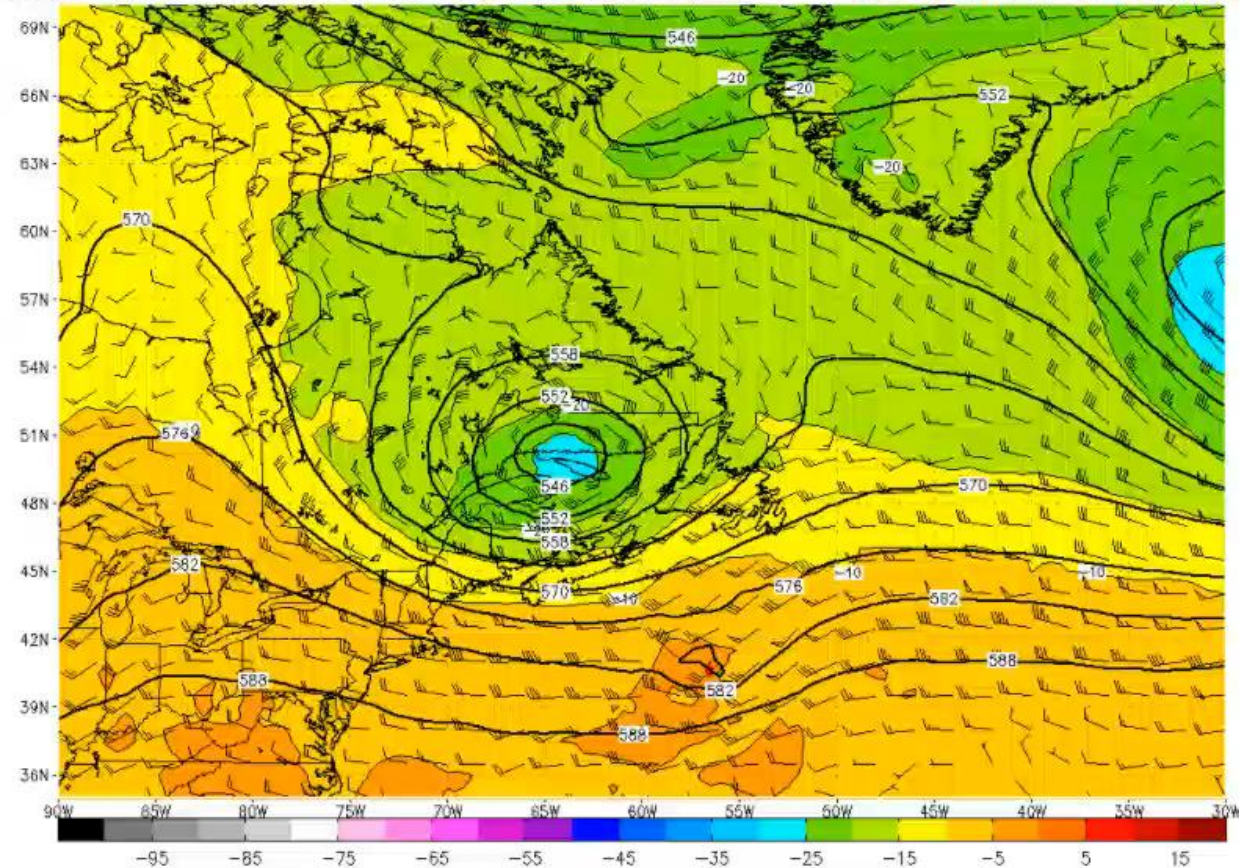
ECMWF 500 mb HGT/Temp/Winds ~ 5.5 km or 18,000 ft AMSL

500 MB Height, Temperature, and Winds (knots)

06 hour forecast valid 06Z Thu, AUG 17, 2017

ECMWF Deterministic initialized 00Z Thu, AUG 17, 2017

AccuWeather Professional



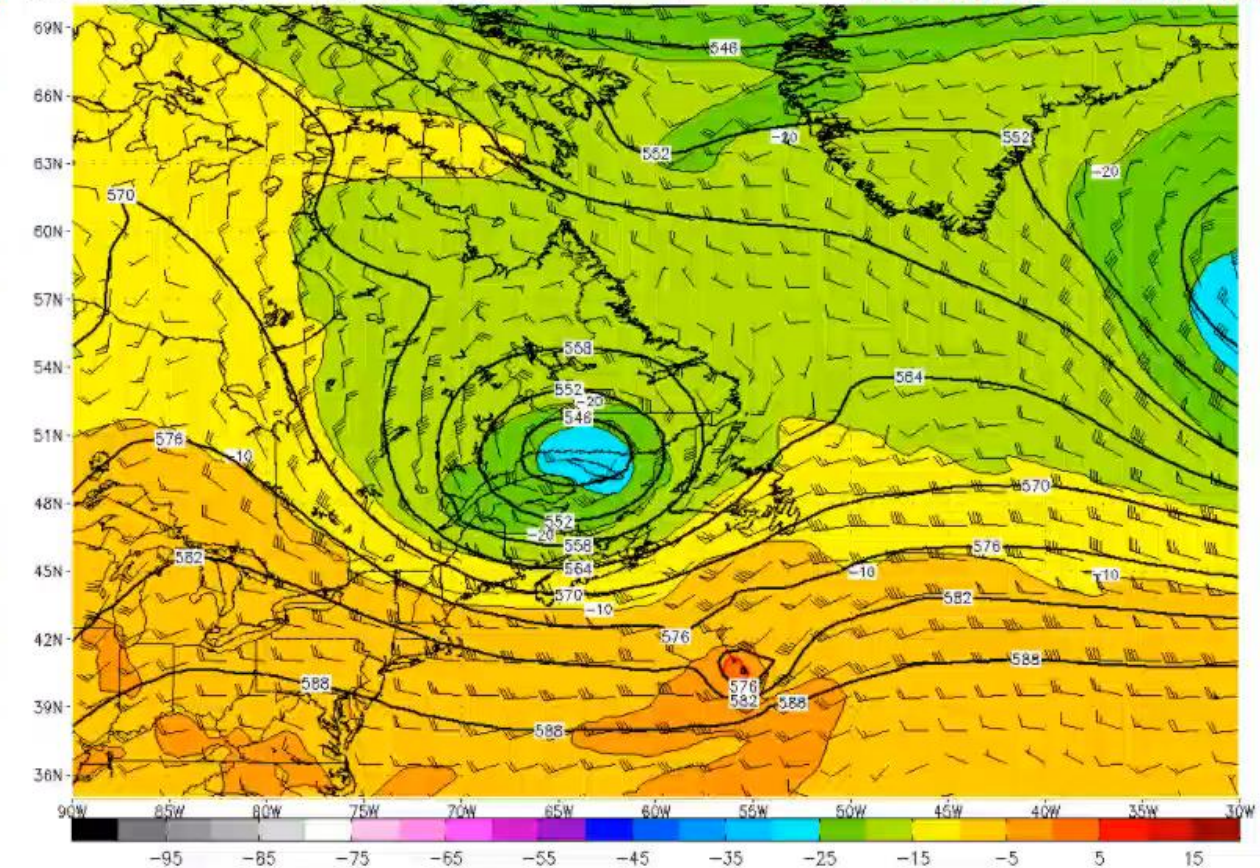
GFS 500 mb HGT/Temp/Winds ~ 5.5 km or 18,000 ft AMSL

500 MB Height, Temperature, and Winds (knots)

00 hour forecast valid 06Z Thu, AUG 17, 2017

GFS initialized 06Z Thu, AUG 17, 2017

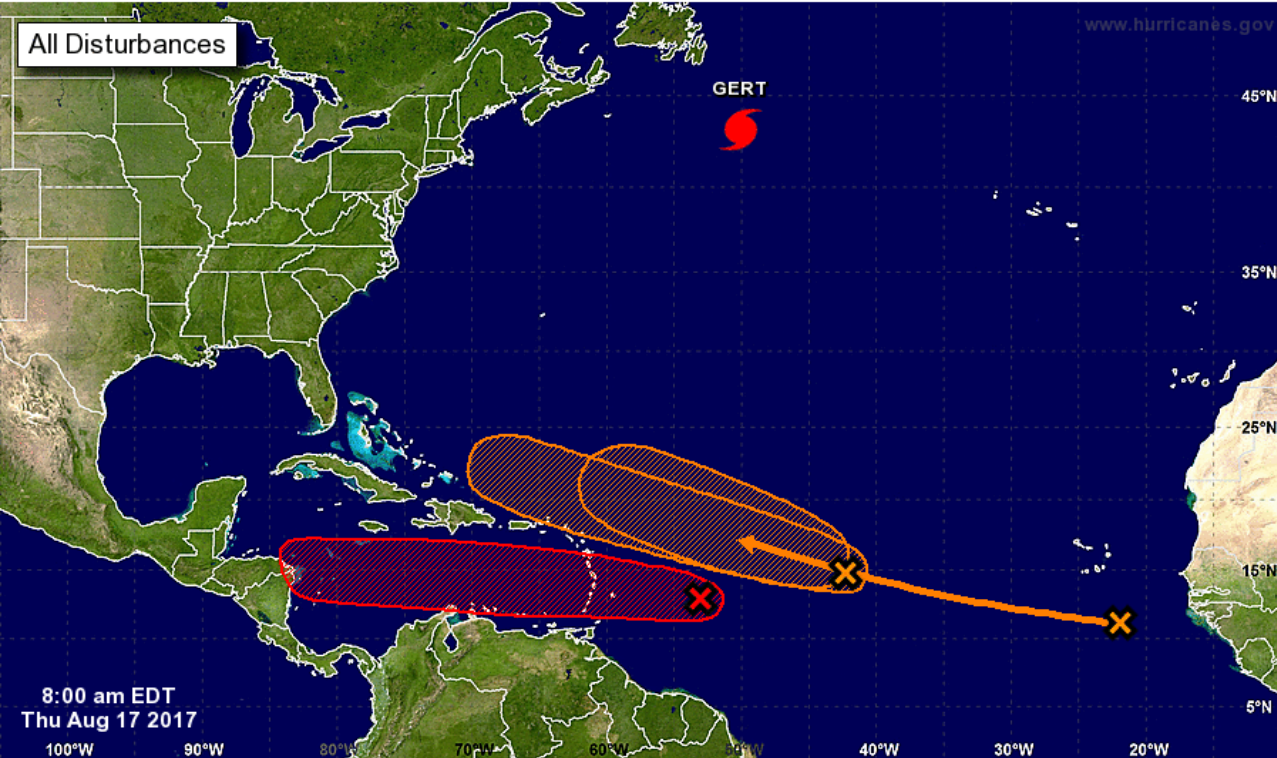
AccuWeather Professional



Eye on the Tropics



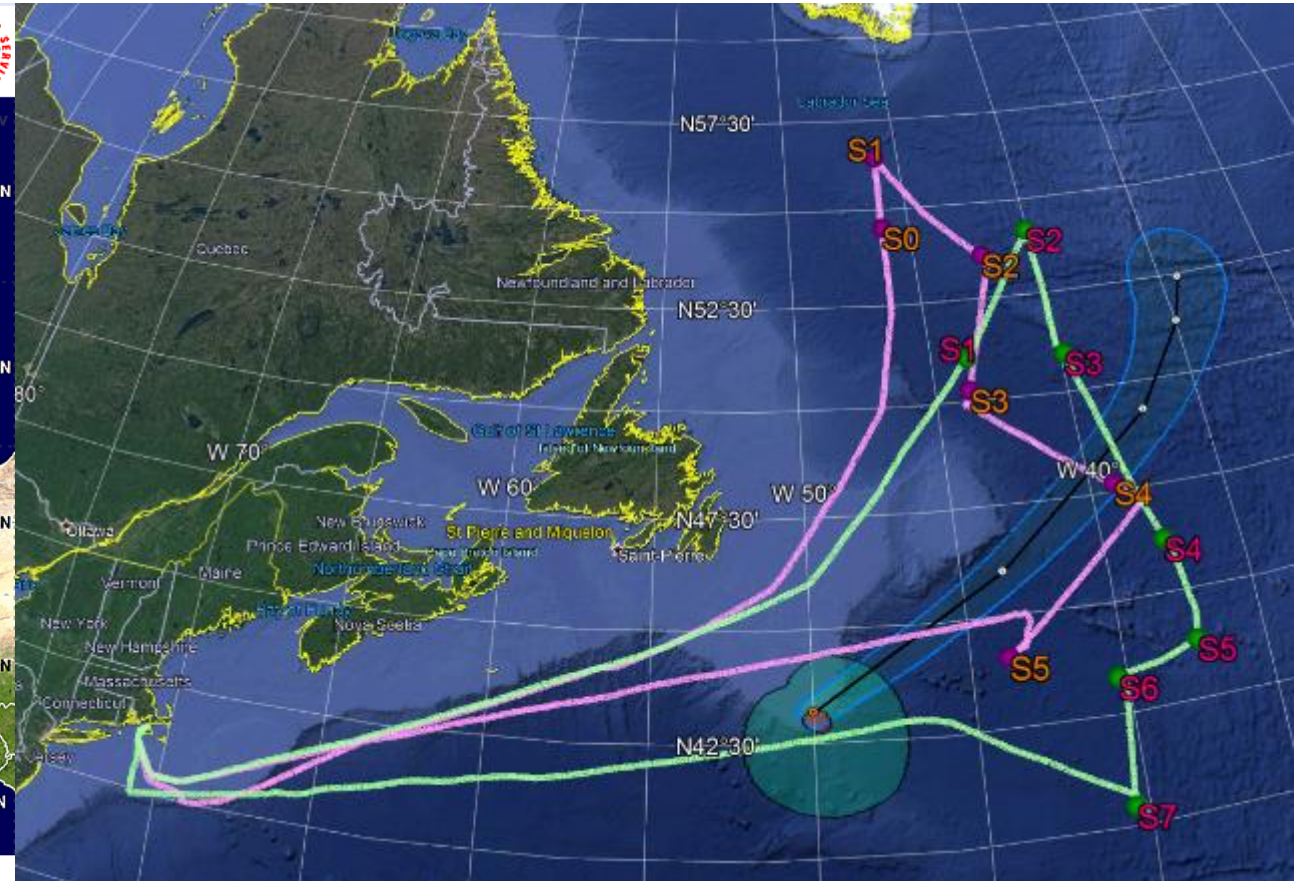
Five-Day Graphical Tropical Weather Outlook National Hurricane Center Miami, Florida



Current Disturbances and Five-Day Cyclone Formation Chance: < 40% 40-60% > 60%

Tropical or Sub-Tropical Cyclone: Depression Storm Hurricane

Post-Tropical Cyclone Remnants

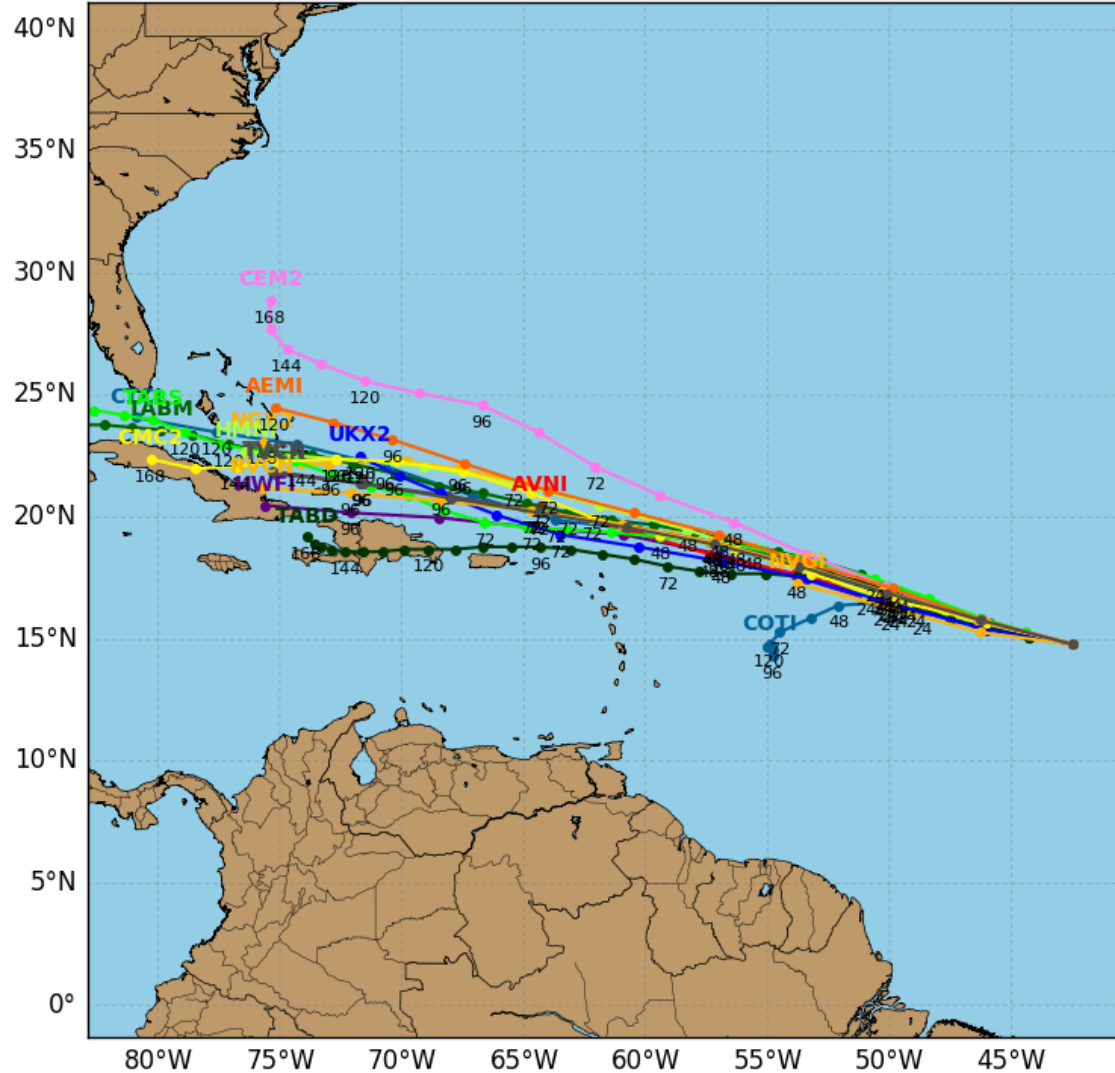


Eye on the Tropics - Forecast

Invest 92L Model Track Guidance

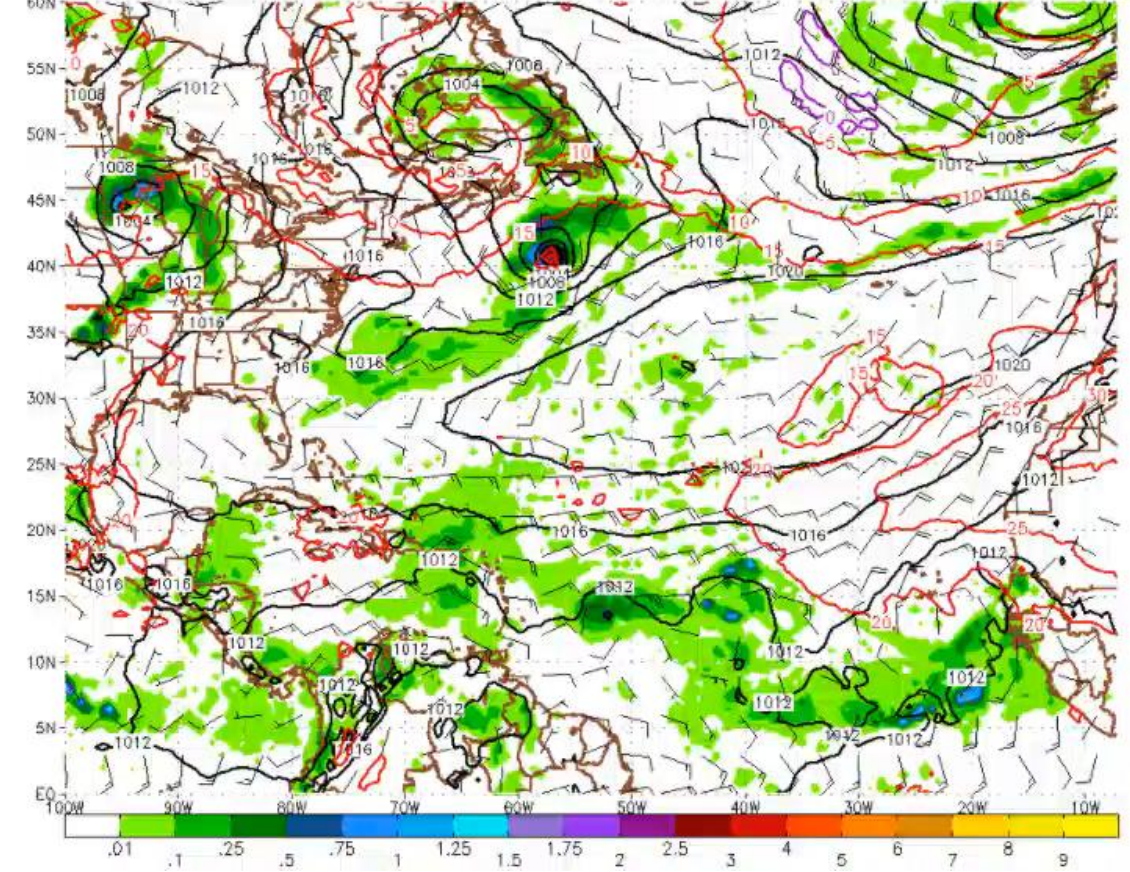
Initialized at 12z Aug 17 2017

Levi Cowan - tropicaltidbits.com

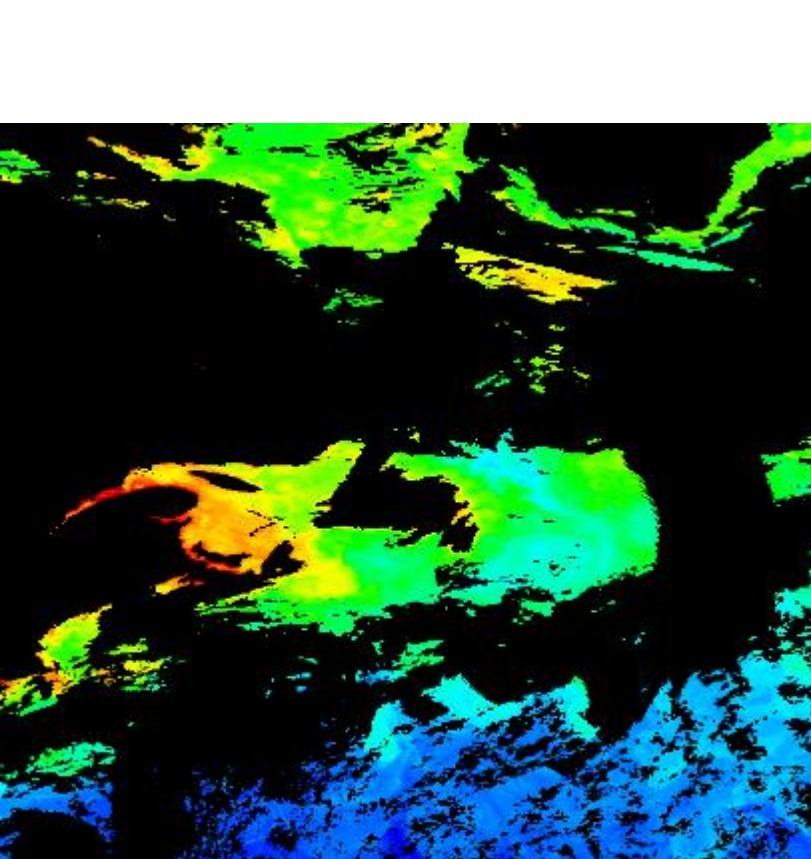


MSLP(mb), 850mb temp(C), 3-hour QPF(in) and 10m wind(kt)
06 hour forecast valid 06Z Thu, AUG 17, 2017
ECMWF Deterministic initialized 00Z Thu, AUG 17, 2017

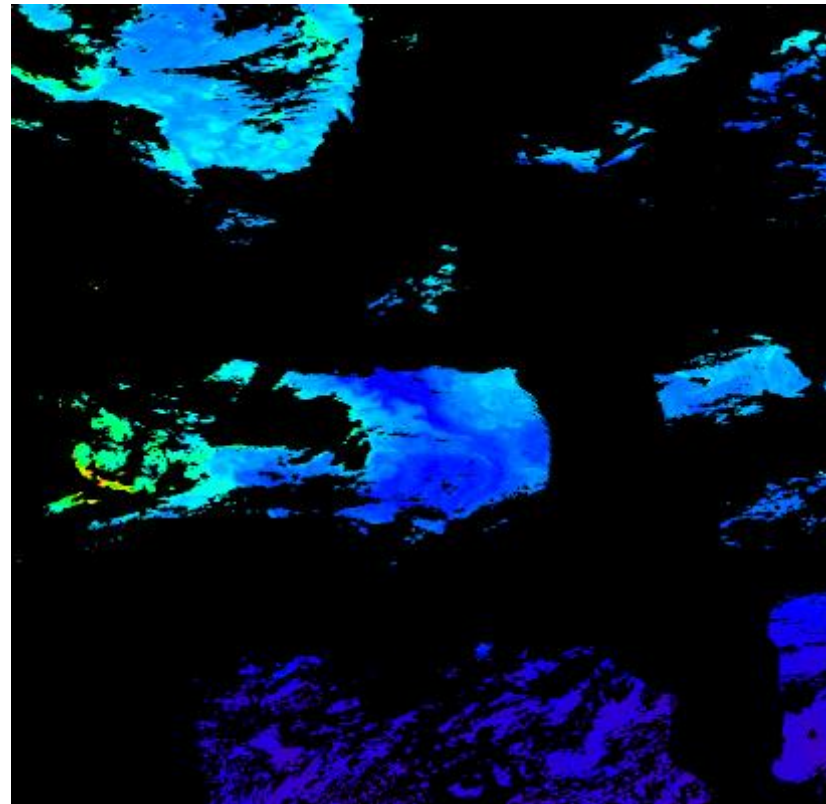
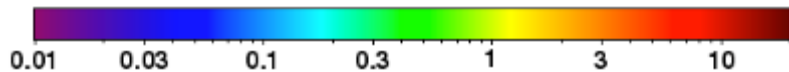
AccuWeather Professional



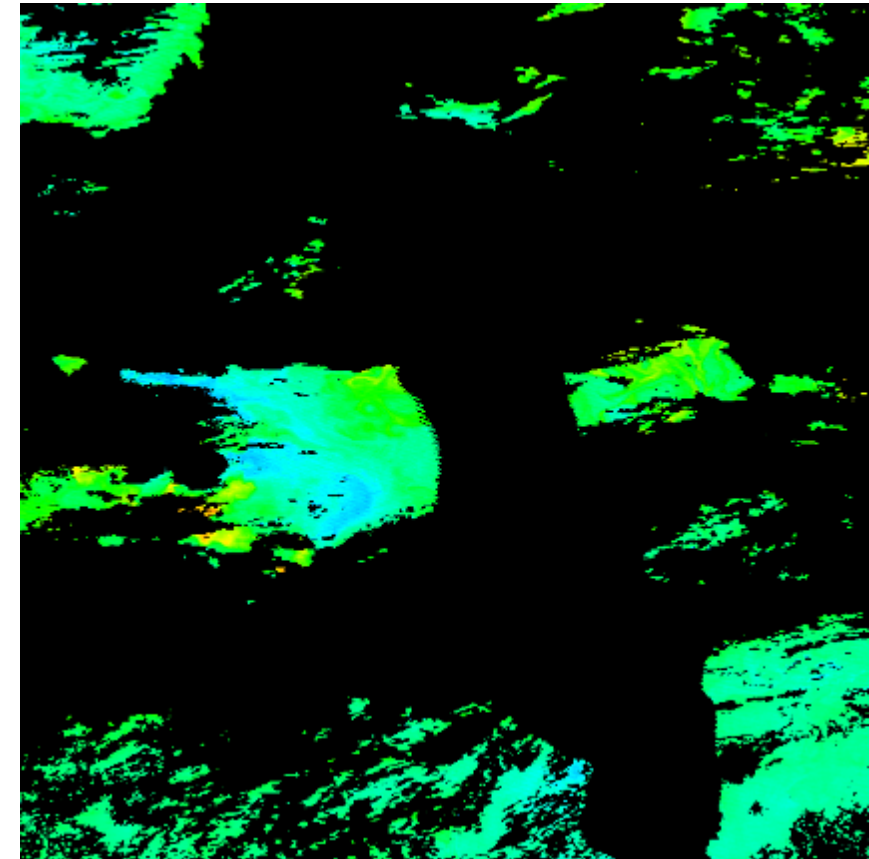
Aqua VIIRS Ocean Color – August 13-15th



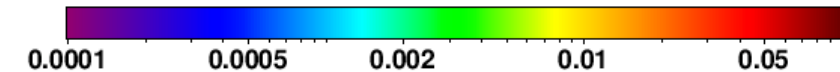
Chlorophyll a concentration (mg / m³)



Diffuse attenuation coefficient at 490 nm (m⁻¹)

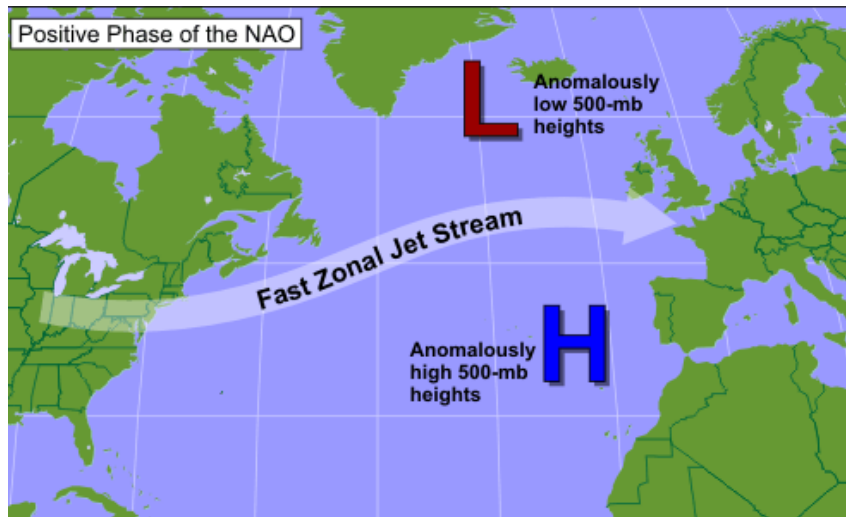


Particle backscatter at 443 nm (m⁻¹)



North Atlantic Oscillation

The North Atlantic Oscillation (NAO) is a weather phenomenon in the North Atlantic Ocean of fluctuations in the difference of atmospheric pressure at sea level between the Icelandic low and the Azores high. Through fluctuations in the strength of the Icelandic low and the Azores high, it controls the strength and direction of westerly winds and storm tracks across the North Atlantic, which is important for our mission domain.

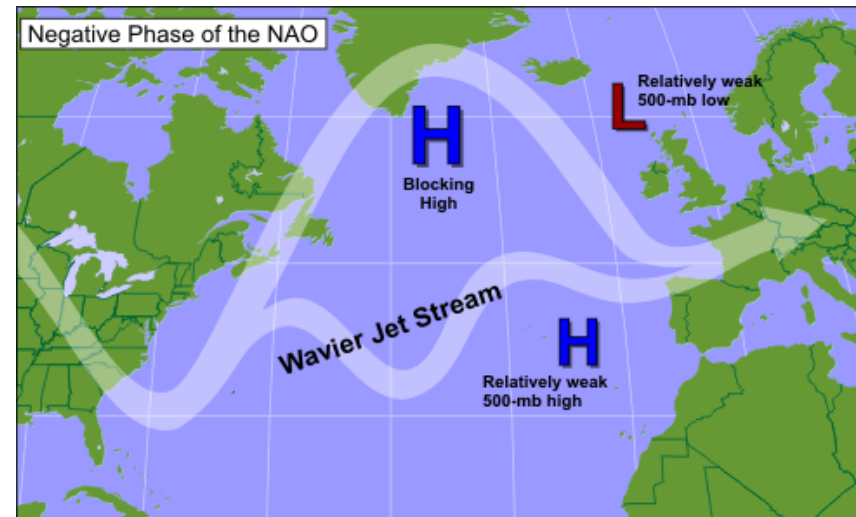


The positive phase of the NAO is marked by low 500-mb heights near Iceland and high 500-mb heights near the Azores Islands.

November Average: 0.07479

November 2015: 1.7438

Forecasters track the NAO by comparing the 500-mb heights over the far North Atlantic (near Iceland) with those several thousand miles to the south near the Azores Islands.



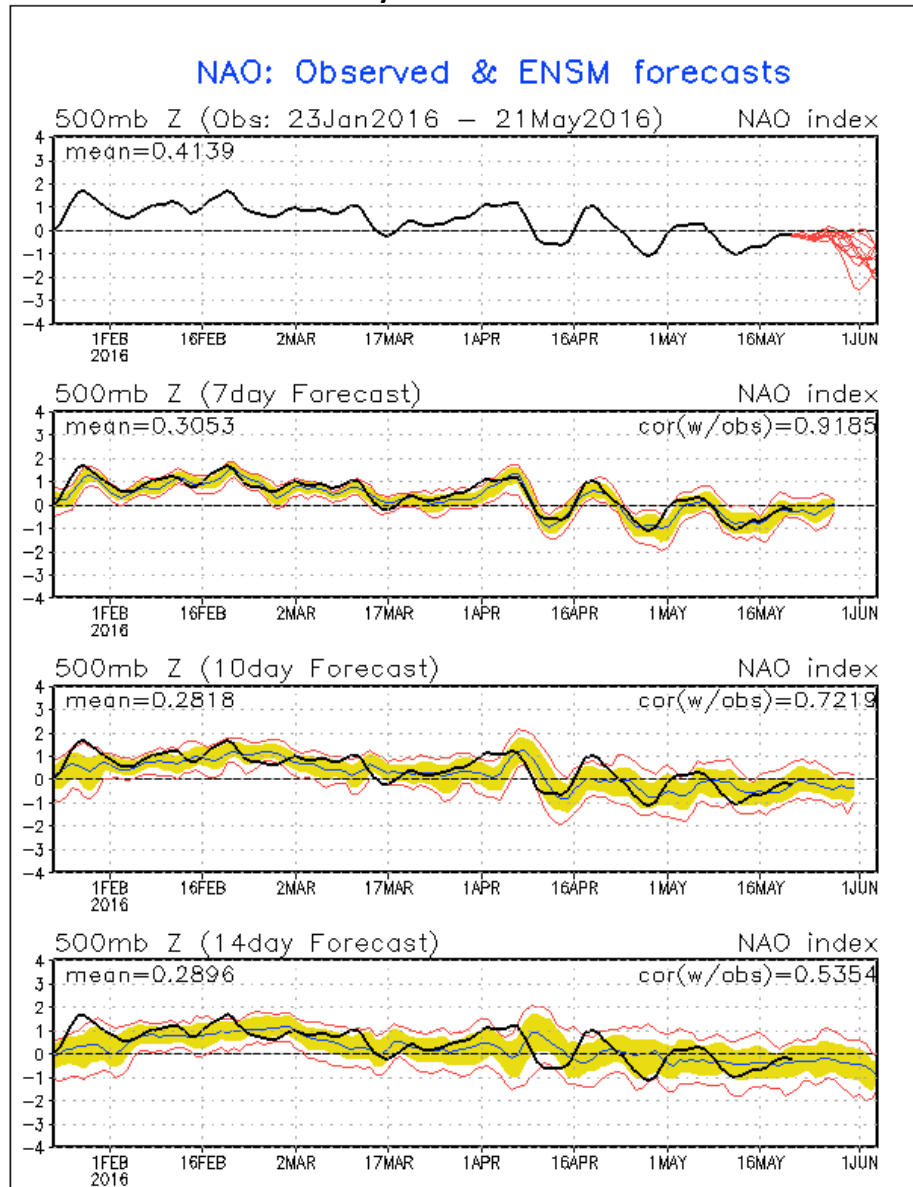
The negative phase of the NAO is marked by unusually high 500-mb heights near Iceland, a pattern that typically develops with a blocking ridge or blocking high.

May Average: -0.079 May 2016: -0.77358

Credit: <https://www.e-education.psu.edu/worldofweather/s15.html>

North Atlantic Oscillation

May 2016

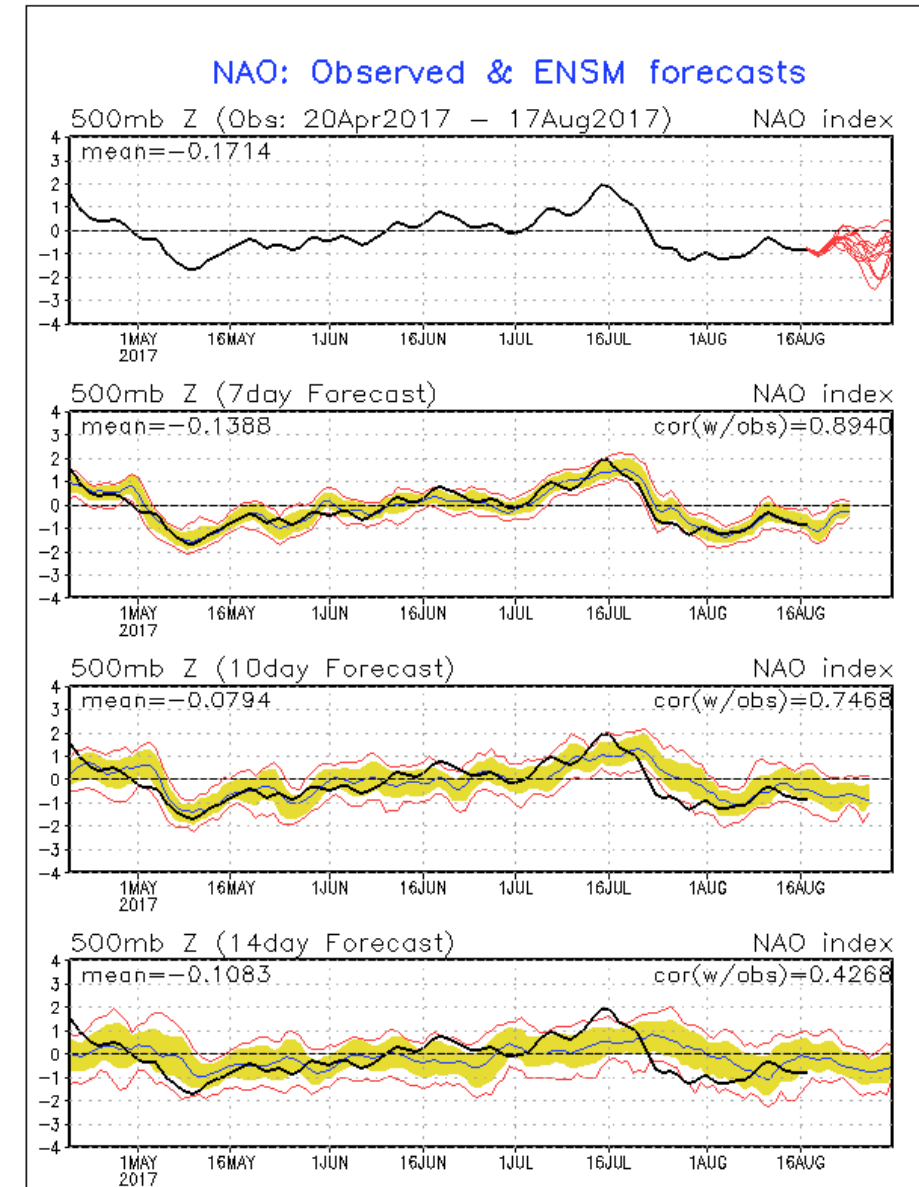


In 2016, May through August was negative, with September being positive.

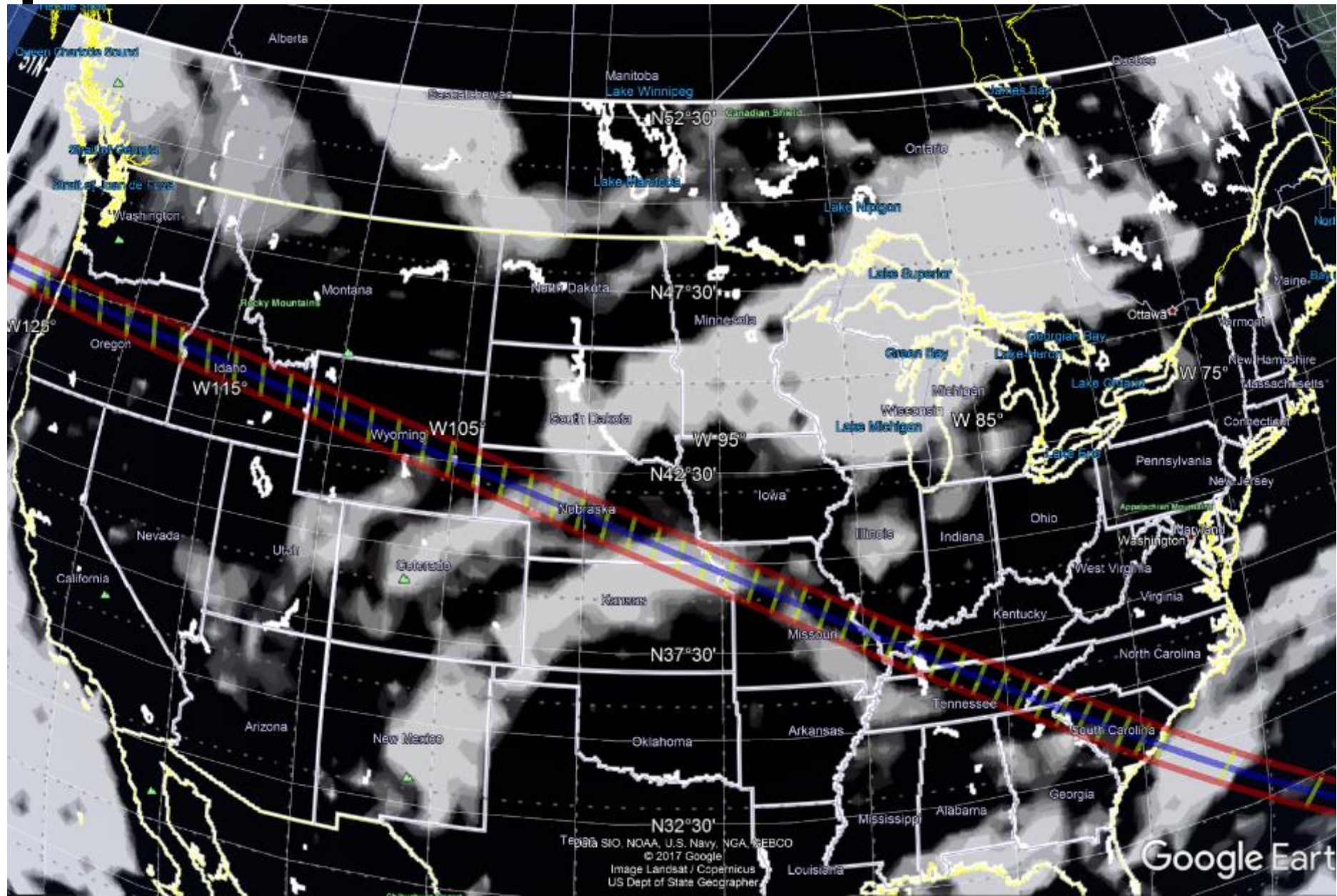
So far this year, May and part of June were negative. Late June through July were positive and then went negative until now. There are some forecasts bringing NAO index closer to 0. Will track over the next week or so to see if trending positive.

Past Septembers
2015 – negative
2014 – positive

Current



Eclipse Forecast



BEAUFORT WIND SCALE WITH CORRESPONDING SEA STATE CODES					
Beaufort Number	Wind Velocity (Knots)	Wind Description	Sea State Description	Sea State	
				Term and Height of Waves (Feet)	Condition Number
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, glassy 0	0
1	1-3	Light Air	Scaly ripples, no foam crests		
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Calm, rippled 0 – 0.3	1
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Smooth, wavelets 0.3-1	2
4	11-16	Moderate Breeze	Small waves, becoming longer, numerous whitecaps	Slight 1-4	3
5	17-21	Fresh Breeze	Moderate waves, taking longer form, many whitecaps, some spray	Moderate 4-8	4
6	22-27	Strong Breeze	Larger waves, whitecaps common, more spray	Rough 8-13	5
7	28-33	Near Gale	Sea heaps up, white foam streaks off breakers	Very rough 13-20	6
8	34-40	Gale	Moderately high, waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks		
9	41-47	Strong Gale	High waves, sea begins to roll, dense streaks of foam, spray may reduce visibility		
10	48-55	Storm	Very high waves, with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	High 20-30	7
11	56-63	Violent Storm	Exceptionally high waves, foam patches cover sea, visibility more reduced	Very high 30-45	8
12	64 and over	Hurricane	Air filled with foam, sea completely white with driving spray, visibility greatly reduced	Phenomenal 45 and over	9

Figure 8-1. Beaufort wind scale.

MANDATORY PRESSURE LEVELS

<u>Level</u>	<u>Remarks</u>	Temp. Range	Critical Thickness For Snow	Standard Height Above Sea level	
1000 mb				0 meters	0 feet
925 mb				750 to 800 meters	2460 to 2624 ft
850 mb	Besides the surface, 850mb is used to calculate temperature advection. Also used in weather forecasting to determine high temperature on sunny, warm days and also used to determine maximum wind gust on sunny, well-mixed days.	0 to + 40 in summer -40 to +20 in winter	1000 to 850 = 1300 meters 850 to 700 = 1540 meters	1500 meters	4921 ft
700 mb	The "free atmosphere" begins here. This pressure level skims the tops of the Rockies, so, for practical purposes, there is little ground about this level. The last mandatory level in the lower troposphere	-15 to +15 in summer -40 to +5 in winter	1000 to 700 = 2840 meters	3000 meters	9842 ft
500 mb	This pressure marks the approximate level where half the weight of the local air column is below and half the weight is above. Thus, 500mb is considered to represent the middle troposphere	-25 to 0 in summer -45 to -10 in winter	1000 to 500 meters = 5400 meters	5500 meters	18044 ft
400 mb	The approximate level where winds steer well-developed hurricanes. The first mandatory level in the upper troposphere			7000 meters	22965 ft
300 mb	The pressure level near the cruising altitude of most commercial aircraft. The approximate pressure at the summit of Mount Everest.	-55 to -35 (marginal seasonal changes)		9000 meters	29527 ft
250 mb	The typical pressure level of the jet stream over the middle latitudes.			10500 meters	34448 ft
200 mb	The typical pressure level of the tropopause over the middle latitudes.	-60 to -45 (marginal seasonal changes)		12000 meters	39370 ft
150 mb				13500 meters	44291 ft