



2017 Atlantic Hurricane Season

Major Hurricanes Irma, Jose and Maria

Content

1

Season
summary

2

Relative to
Antigua &
Barbuda

3

- Irma
- Maria
- Jose

4

TCs &
climate
change

5

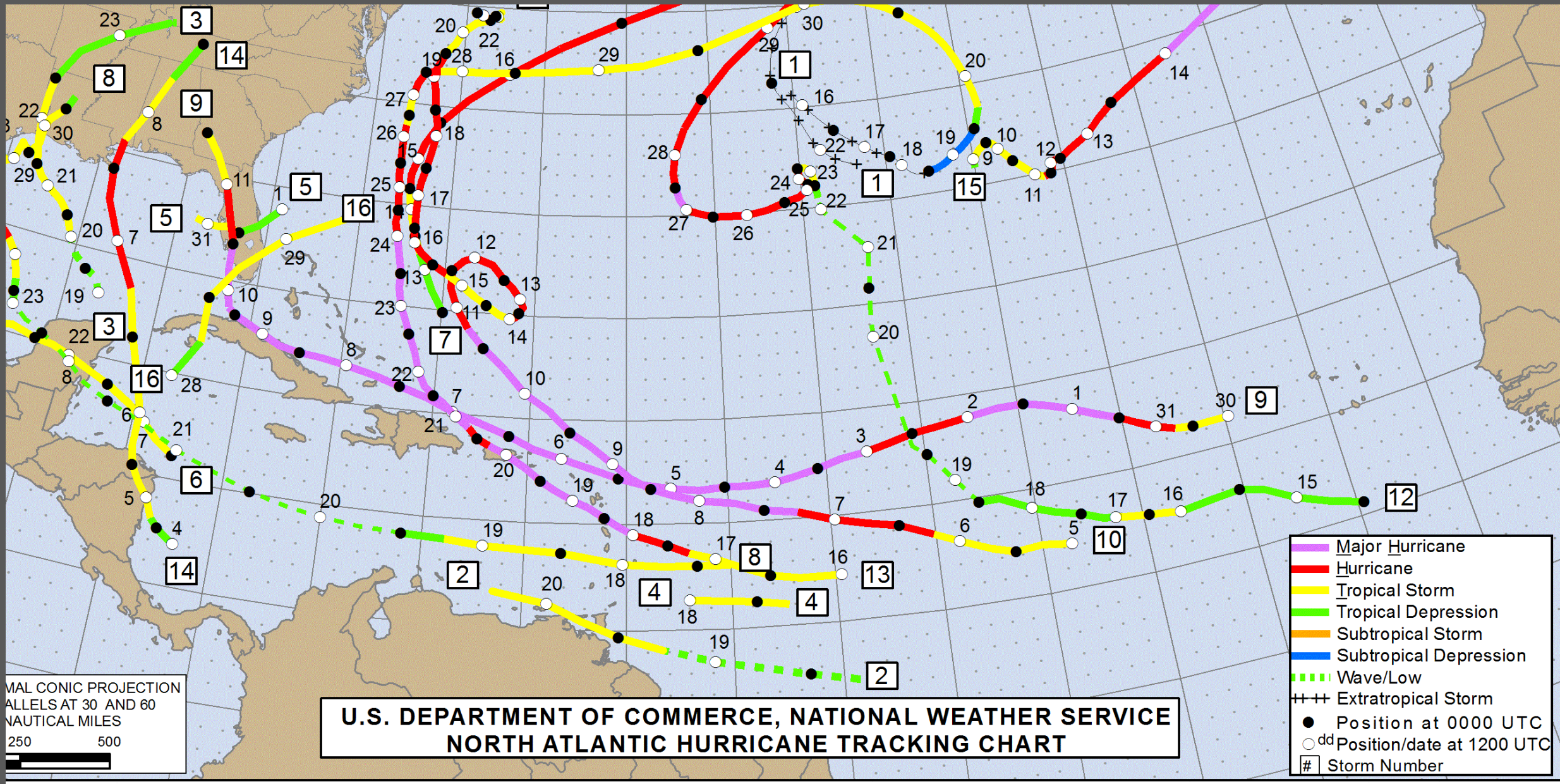
Lessons
learnt

2017 Hurricane Season to Date

	2017	2016	Avg
Named Storms	17	15	12
Hurricanes	10	7	6
Category 3 or Higher	6	4	3
ACE	223	141	106

2017 Hurricane Season to Date

	2017	Rank	Record
Named Storms	17	9 th	28
Hurricanes	10	8 th	15
Category 3 or Higher	6	3 rd	7
ACE	223	7 th	250



MAPAL CONIC PROJECTION
 PARALLELS AT 30 AND 60
 NAUTICAL MILES
 250 500

- Major Hurricane
- Hurricane
- Tropical Storm
- Tropical Depression
- Subtropical Storm
- Subtropical Depression
- - - Wave/Low
- ++ Extratropical Storm
- Position at 0000 UTC
- _{dd} Position/date at 1200 UTC
- # Storm Number

2017 Hurricane Season to Date for Antigua

	2017	2016	Avg	Avg
Named Storms	3	0	0.5	1 every other yr
Hurricanes	3	0	0.33	1 every 3 yrs
Category 3 or Higher	3	0	0.15	1 every 7 yrs

Based on 1981-2010 data

Years With Three Hurricanes

2017

1899

Category

TS

TD

ET

N/A

H1

H2

H3

H4

H5

17.08, -61.80

Busy Hurricane Seasons for Antigua

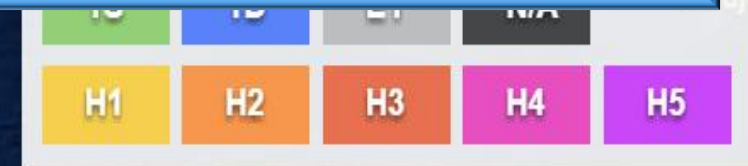
1995 Iris, Luis, Marilyn, Sebastian*

1933 4 Tropical Storms

2017 Irma, Jose, Maria

2011*, 2000, 1979, 1955, 1916, 1908, 1899, 1898

Depression



17.08, -61.80

Super-Category 5 H. Irma: 5-6 Sep 2017

Barbuda

Antigua

Track

Over

30 mi N

Winds

185 Gusting 225 mph?

52 Gusting 62 mph

24-hr Rainfall

≥150 mm

150 mm

Pressure

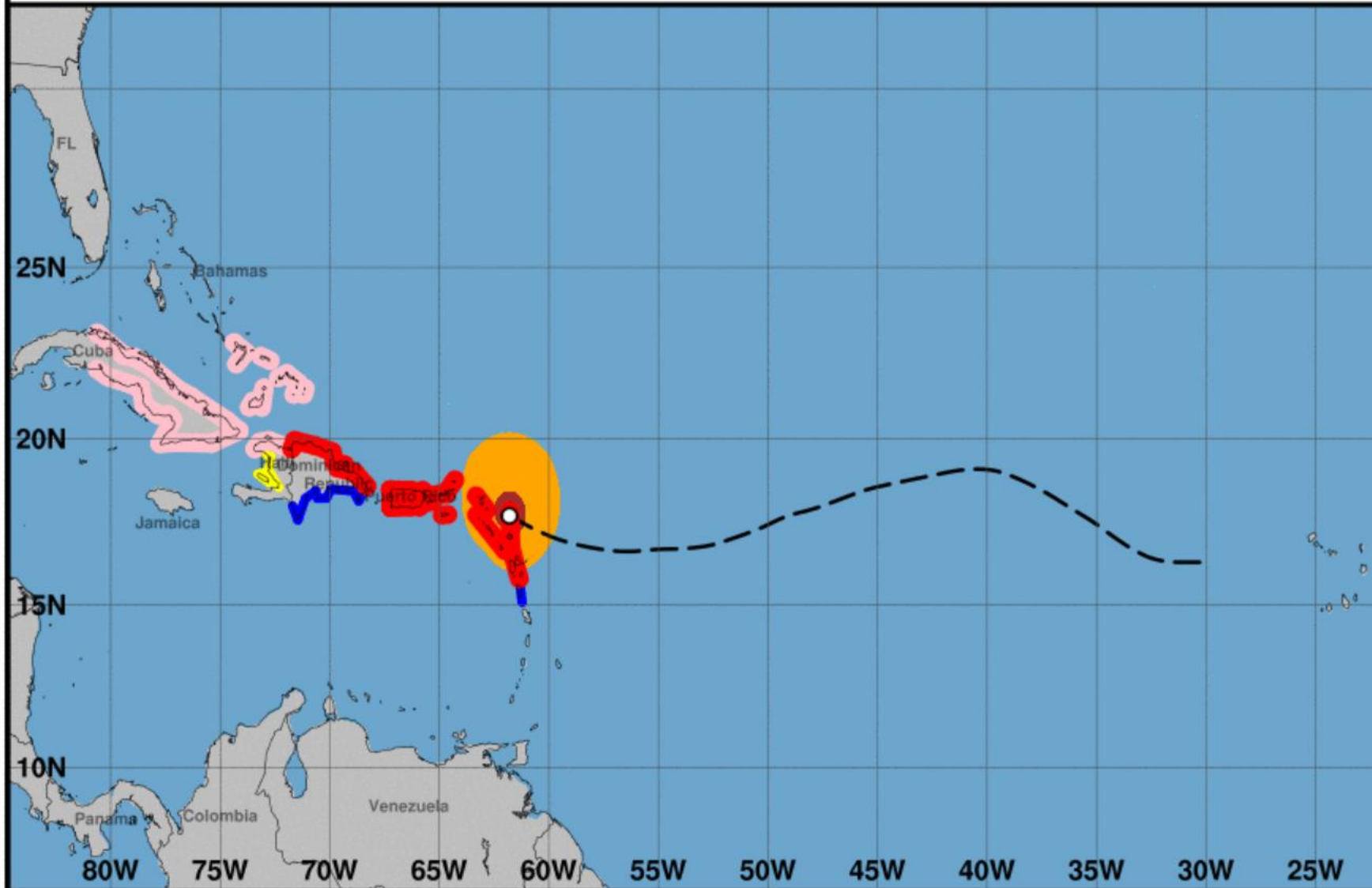
920.0 mb

988.3 mb – VCB



Surface Wind Field of Hurricane Irma

Sustained Winds as of 200 AM AST Wed Sep 06, 2017 Advisory Number 28A



Watches:

- Hurricane Watch
- Tropical Storm Watch

Warnings:

- Hurricane Warning
- Tropical Storm Warning

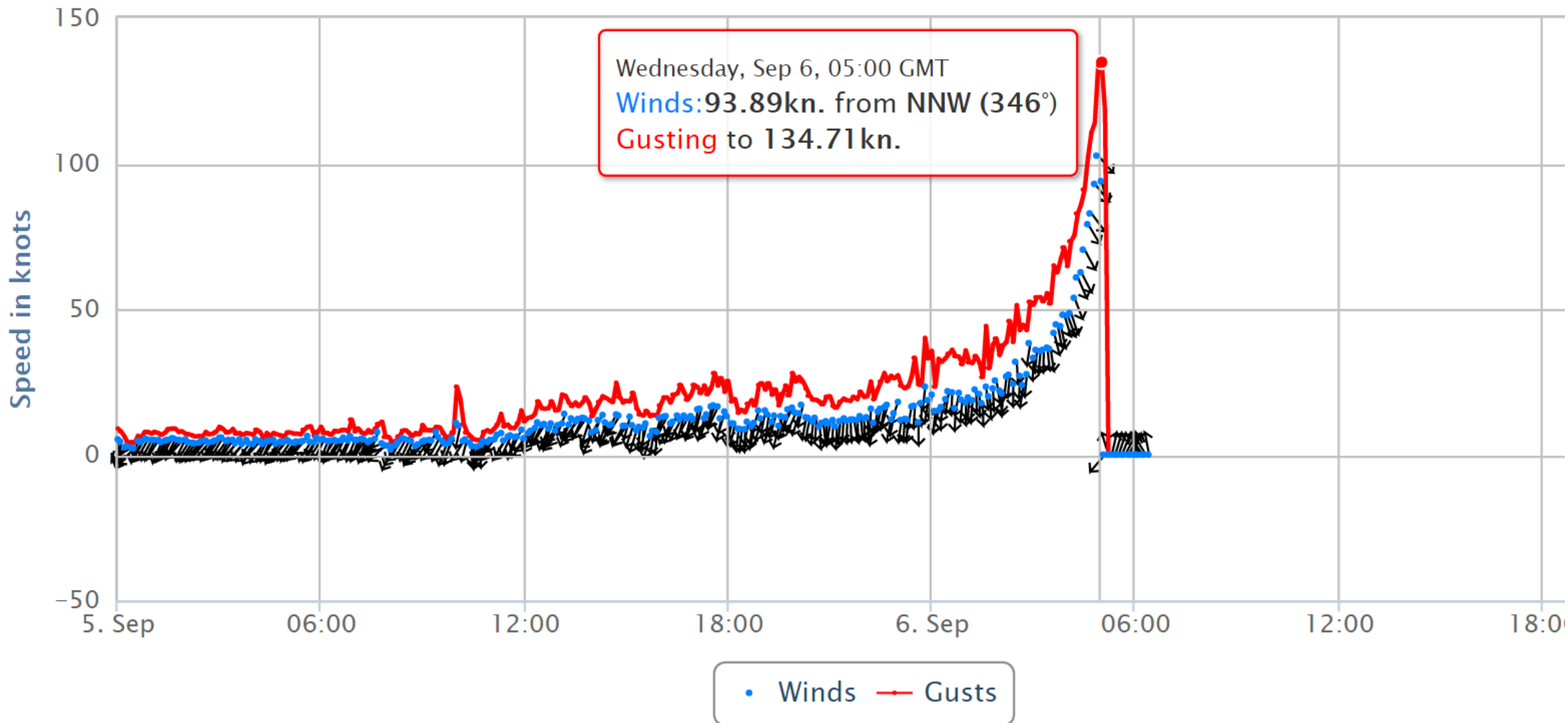
Sustained Winds:

- Hurricane Force
- Tropical Storm Force

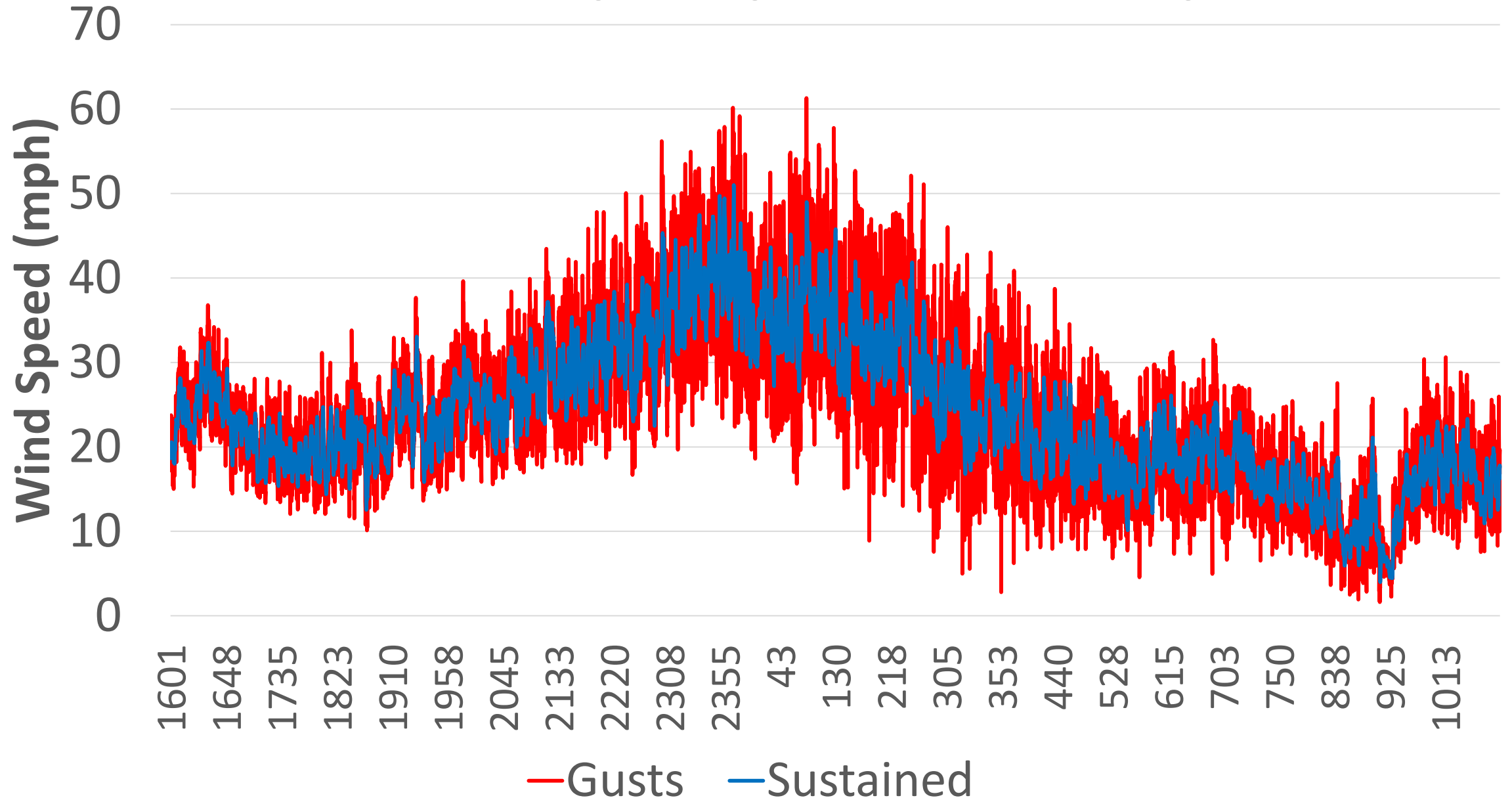
Position:

- Center as of 200 AM AST
- Past Track

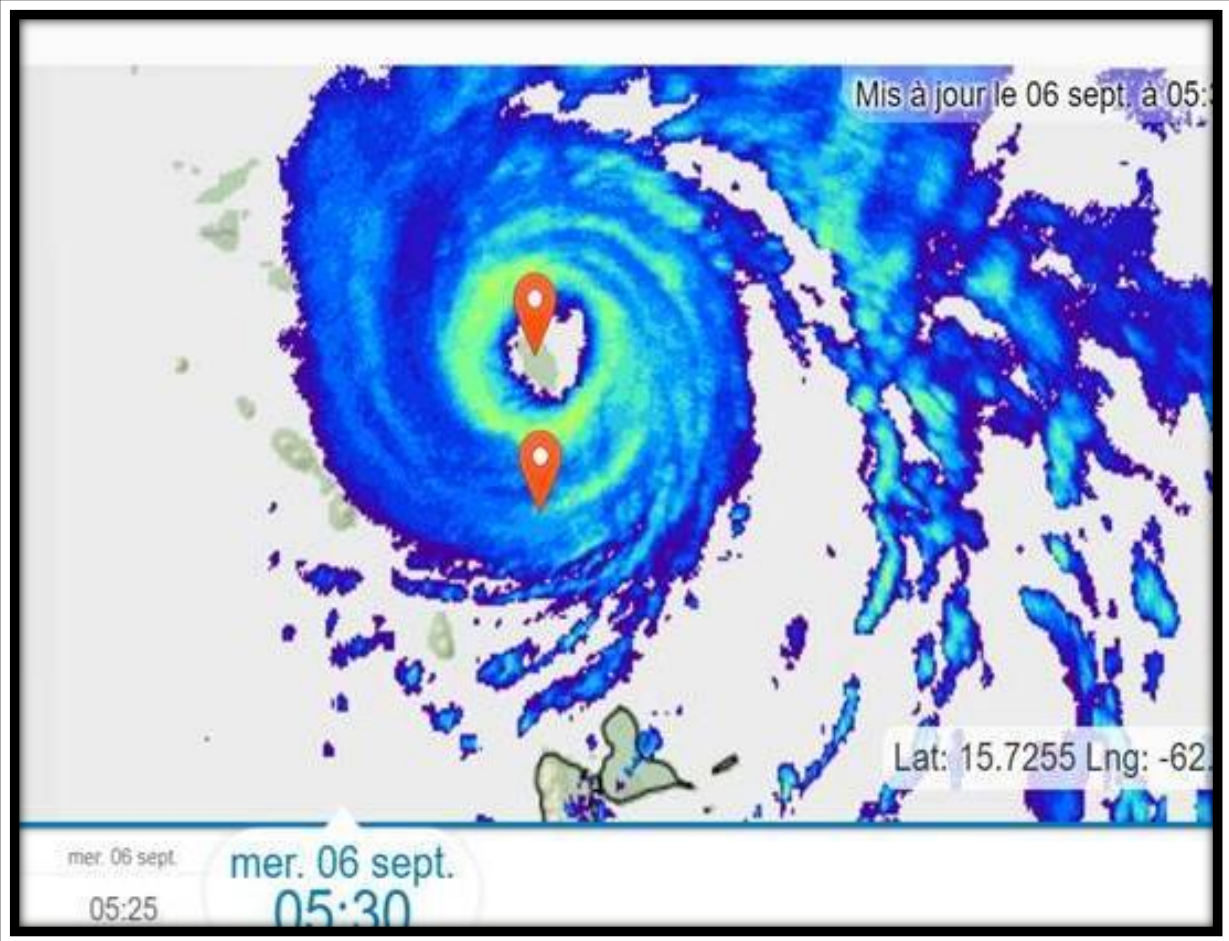
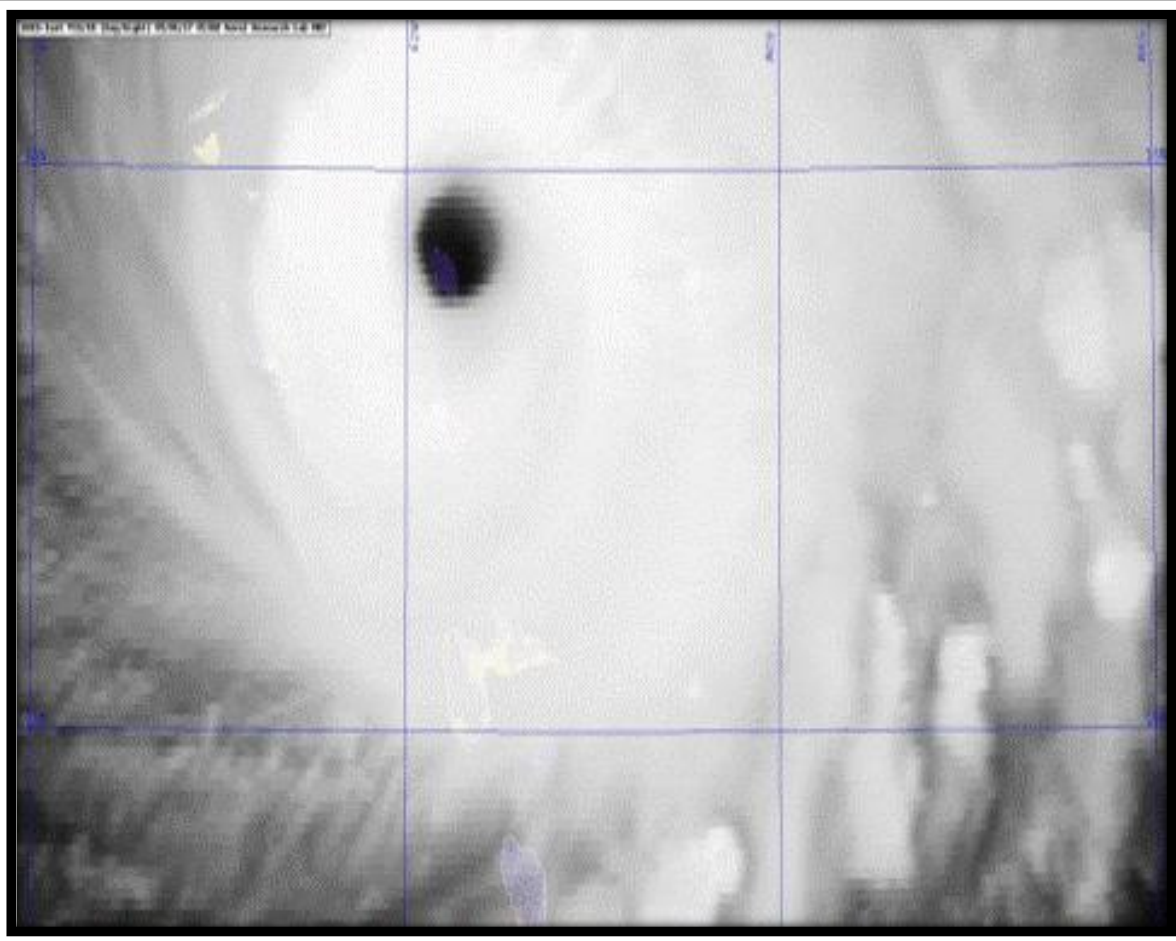
NOAA/NOS/CO-OPS
Winds at 9761115, Barbuda
From 2017/09/05 00:00 GMT to 2017/09/06 23:59 GMT

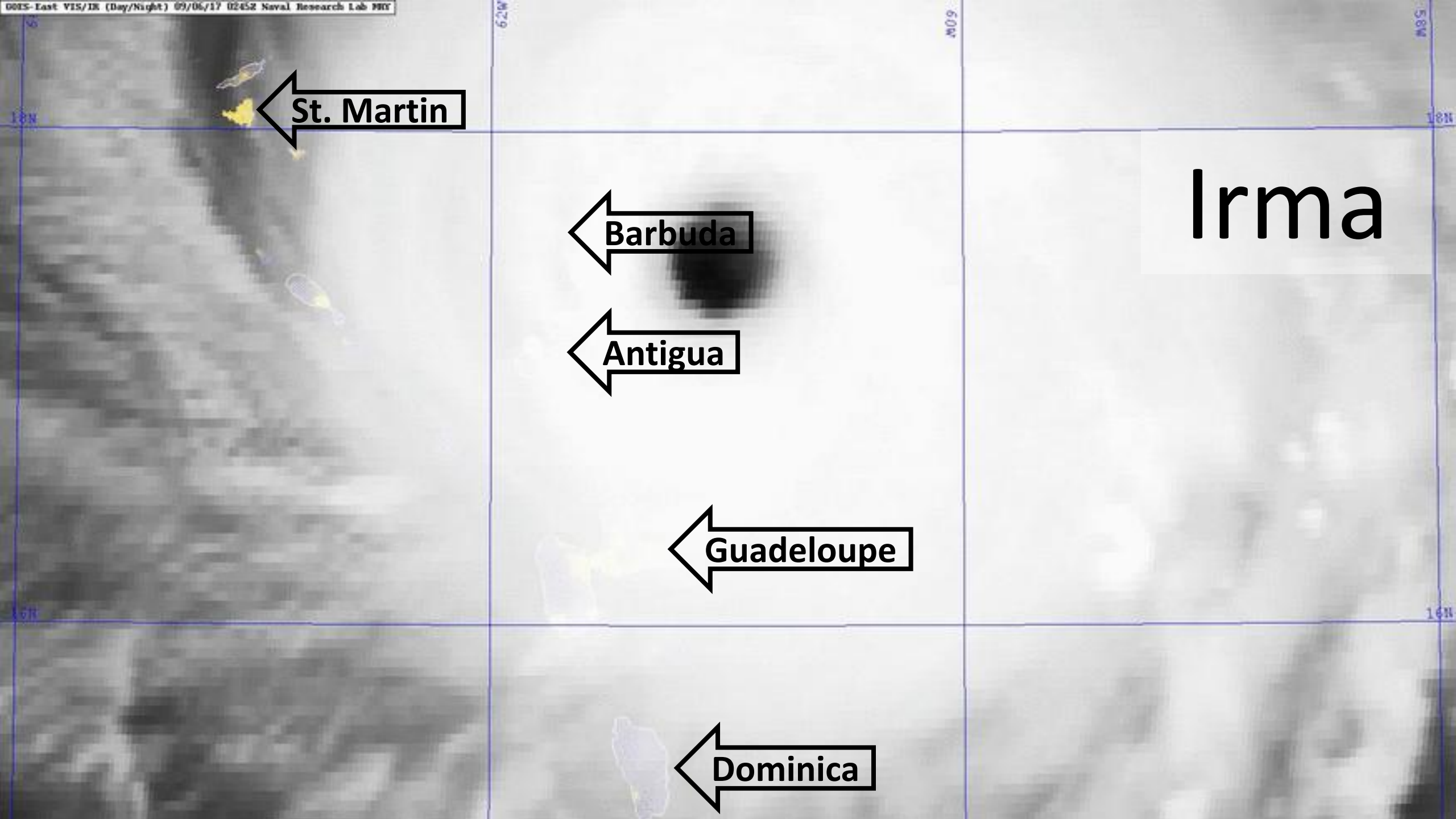


Irma's Wind - 4pm Sep 5 - 11:00 am Sep 6, 2017



Irma at 1:30 am, 6 Sep, 2017 – Satellite & Radar





← St. Martin

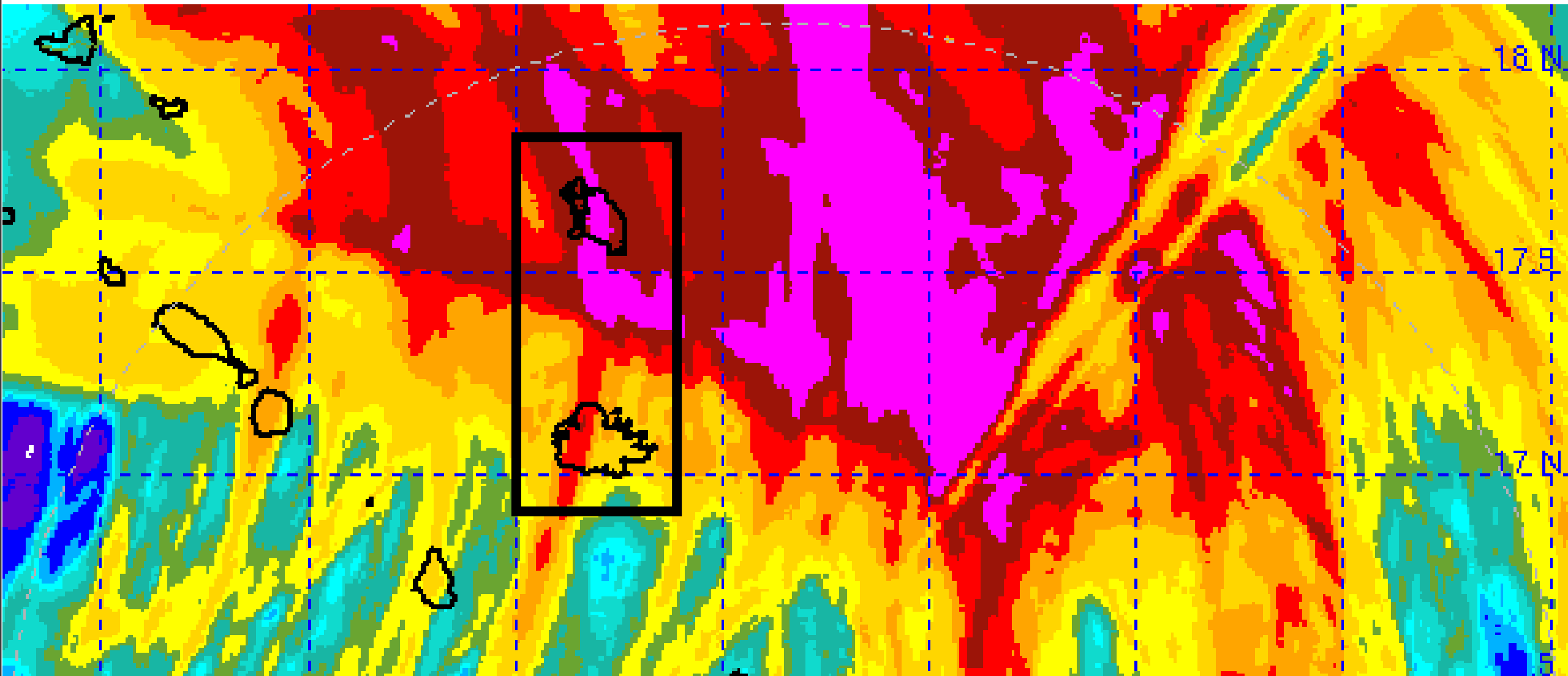
← Barbuda

← Antigua

← Guadeloupe

← Dominica

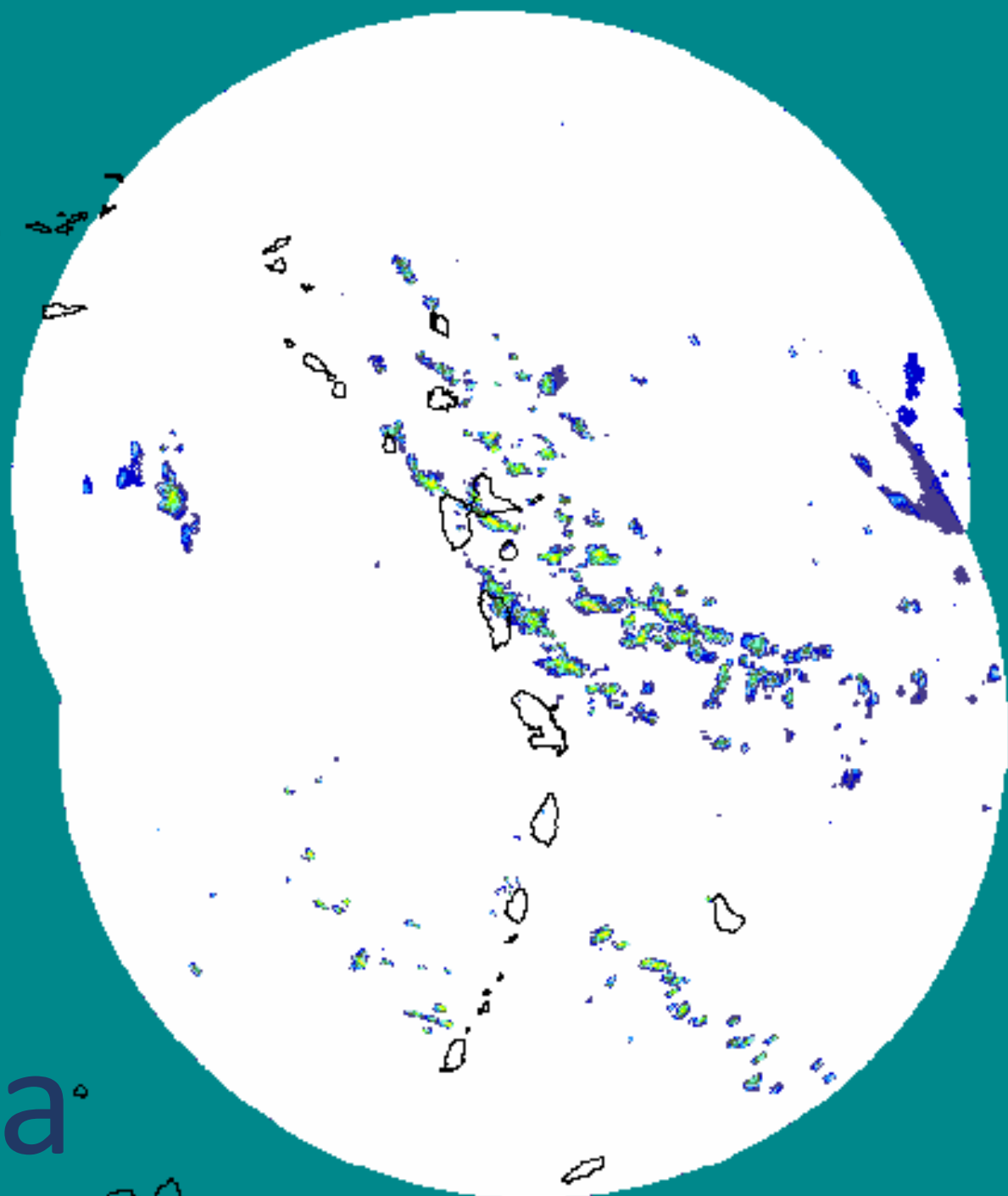
Irma



Mosaïque radar

Guadeloupe / Martinique

05 / 09 / 2017
09H00 UTC



REFLECTIVITY

62.0- 66.0+>
58.5- 62.0
55.0- 58.5
51.5- 55.0
48.0- 51.5
44.5- 48.0
41.0- 44.5
37.5- 41.0
34.0- 37.5
30.5- 34.0
27.0- 30.5
23.5- 27.0
20.0- 23.5
16.5- 20.0
13.0- 16.5

dBZ

RANGE : 400 km

Irma



METEO FRANCE

Toujours un temps d'avance















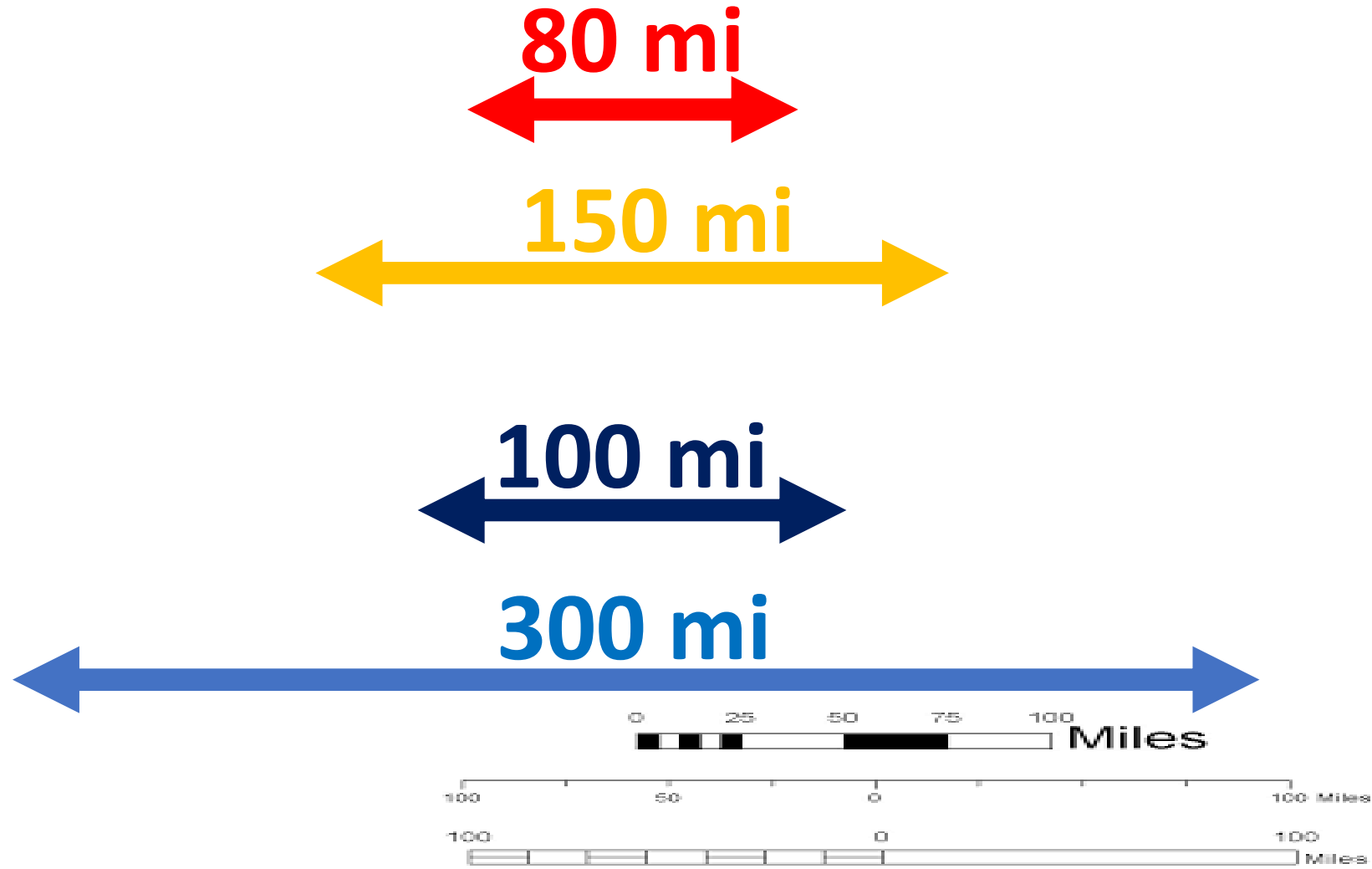
H. Hunter
5pm Sep 5



Irma
5 pm Sep 5



Was Irma a **Monster** Hurricane?



Category 5 Hurricane Maria – 19 Sep 2017

Barbuda

Antigua

Track

112 mi SSW

76 mi SSW

Winds

NA

44 Gusting 65 mph

24-hr Rainfall

50 mm

70 mm

Pressure

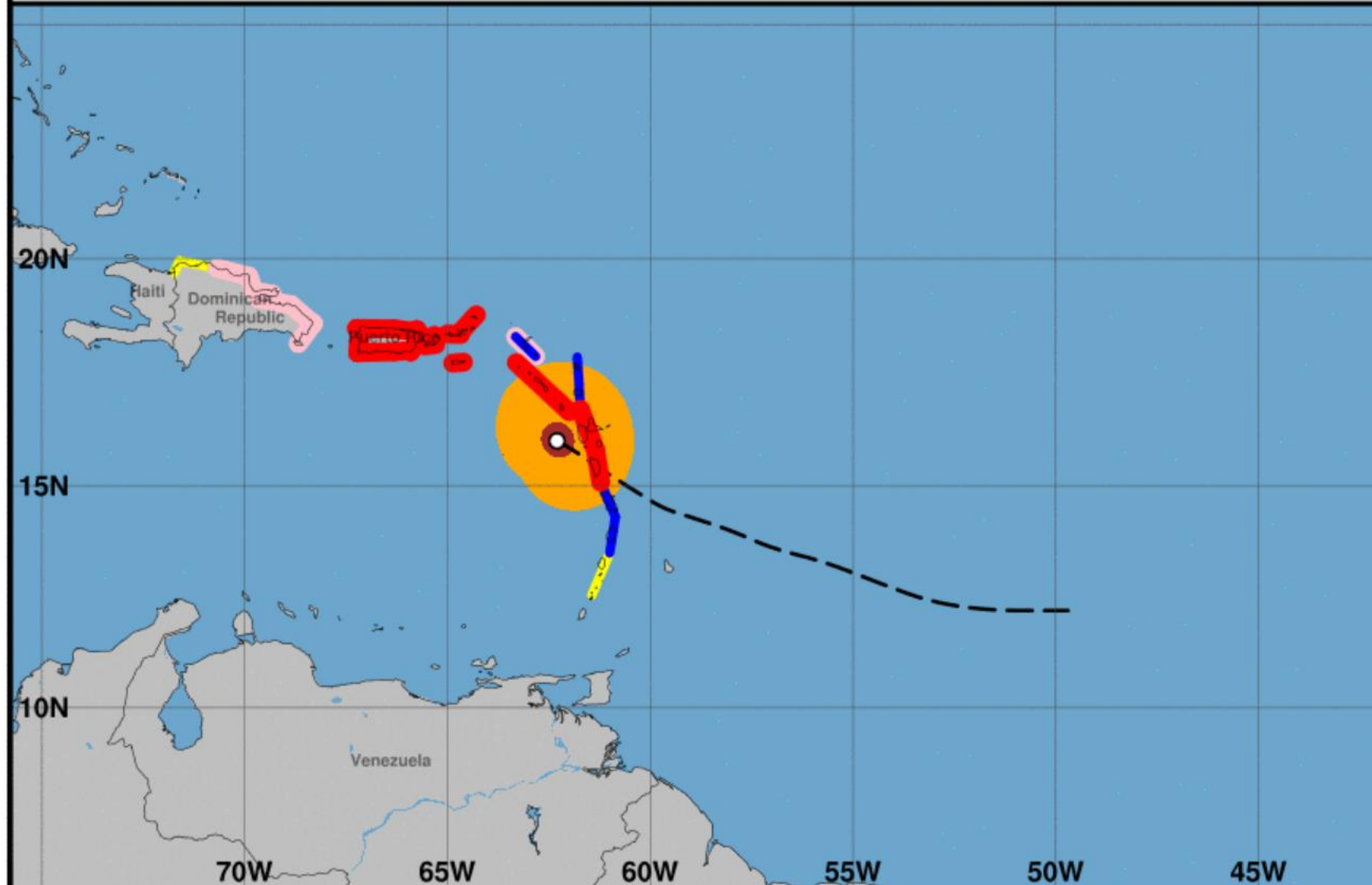
NA

1005.2 mb – VCB



Surface Wind Field of Hurricane Maria

Sustained Winds as of 500 AM AST Tue Sep 19, 2017 Advisory Number 13



Watches:

- Hurricane Watch
- Tropical Storm Watch

Warnings:

- Hurricane Warning
- Tropical Storm Warning

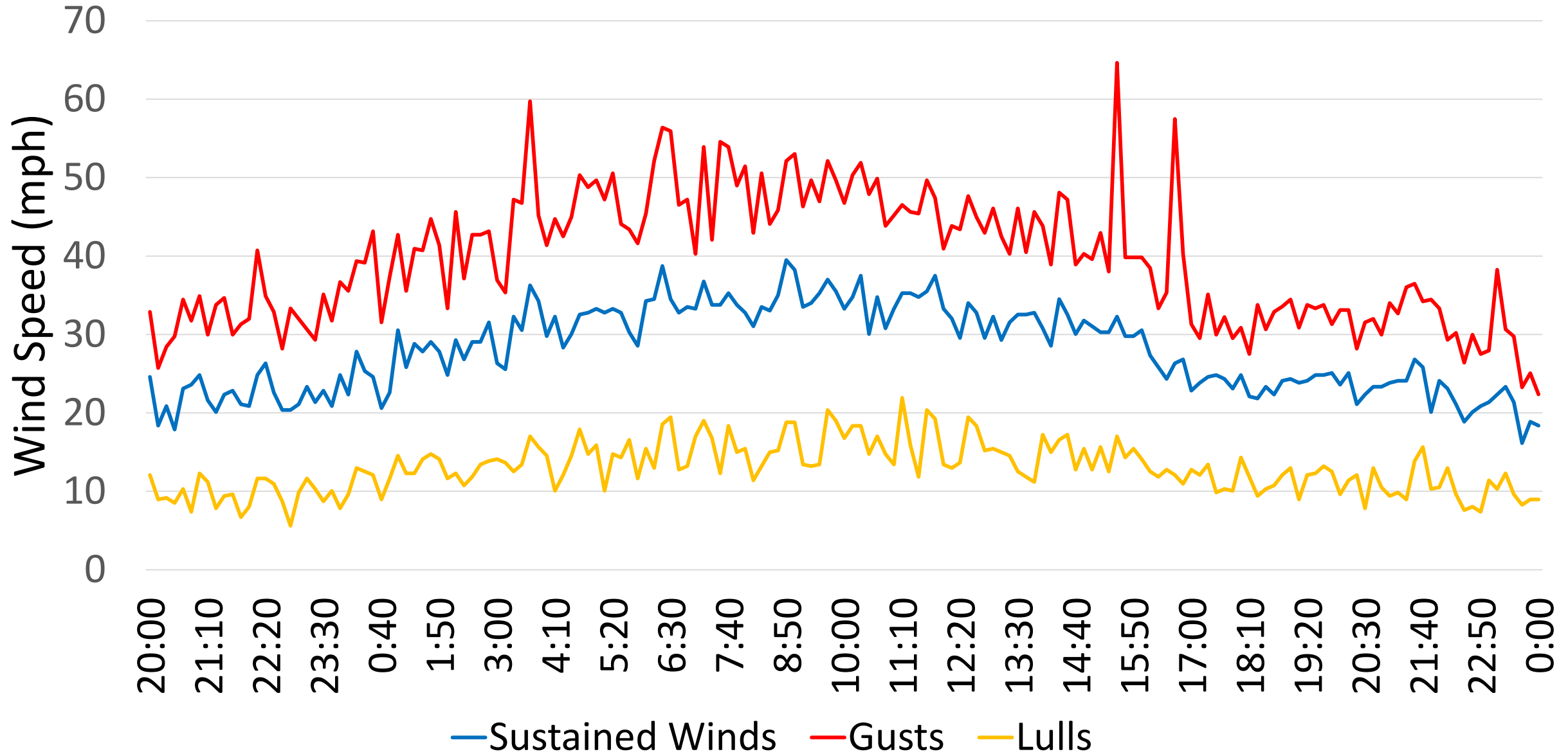
Sustained Winds:

- Hurricane Force
- Tropical Storm Force

Position:

- Center as of 500 AM AST
- Past Track

Maria's Winds - 8 pm Sep 18 to 12 mn Sep 19



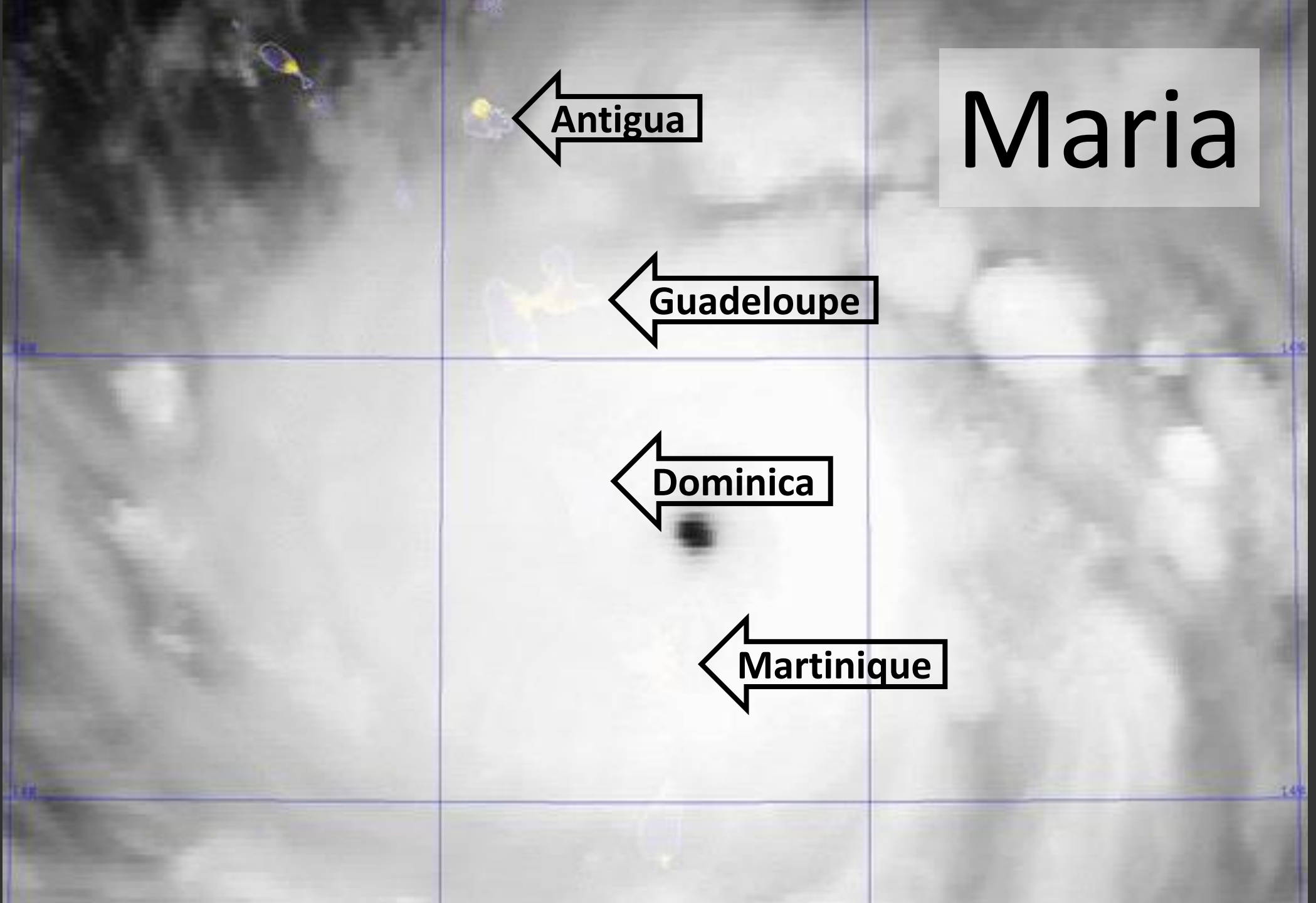
María

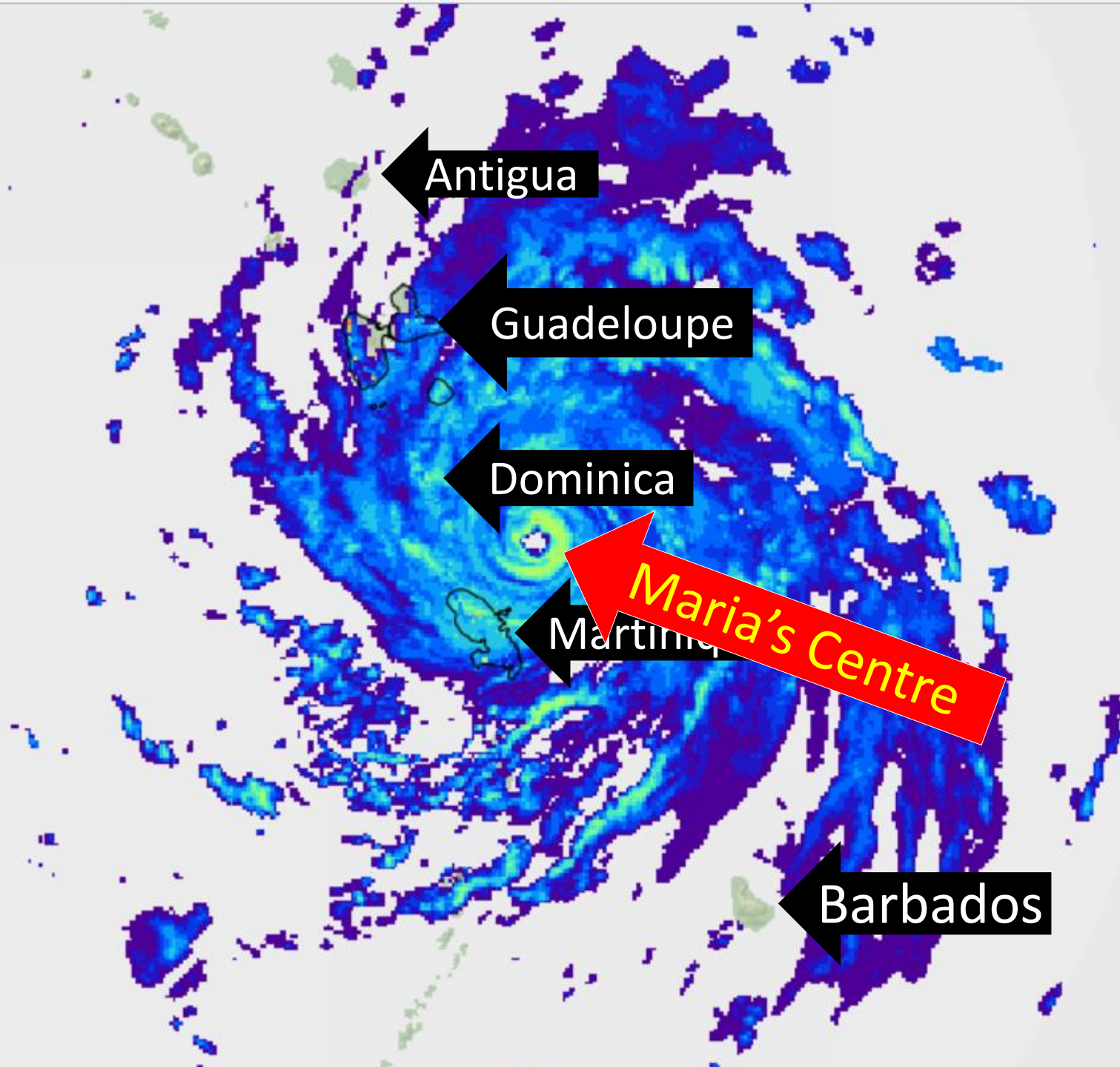
← Antigua

← Guadeloupe

← Dominica

← Martinique





Antigua

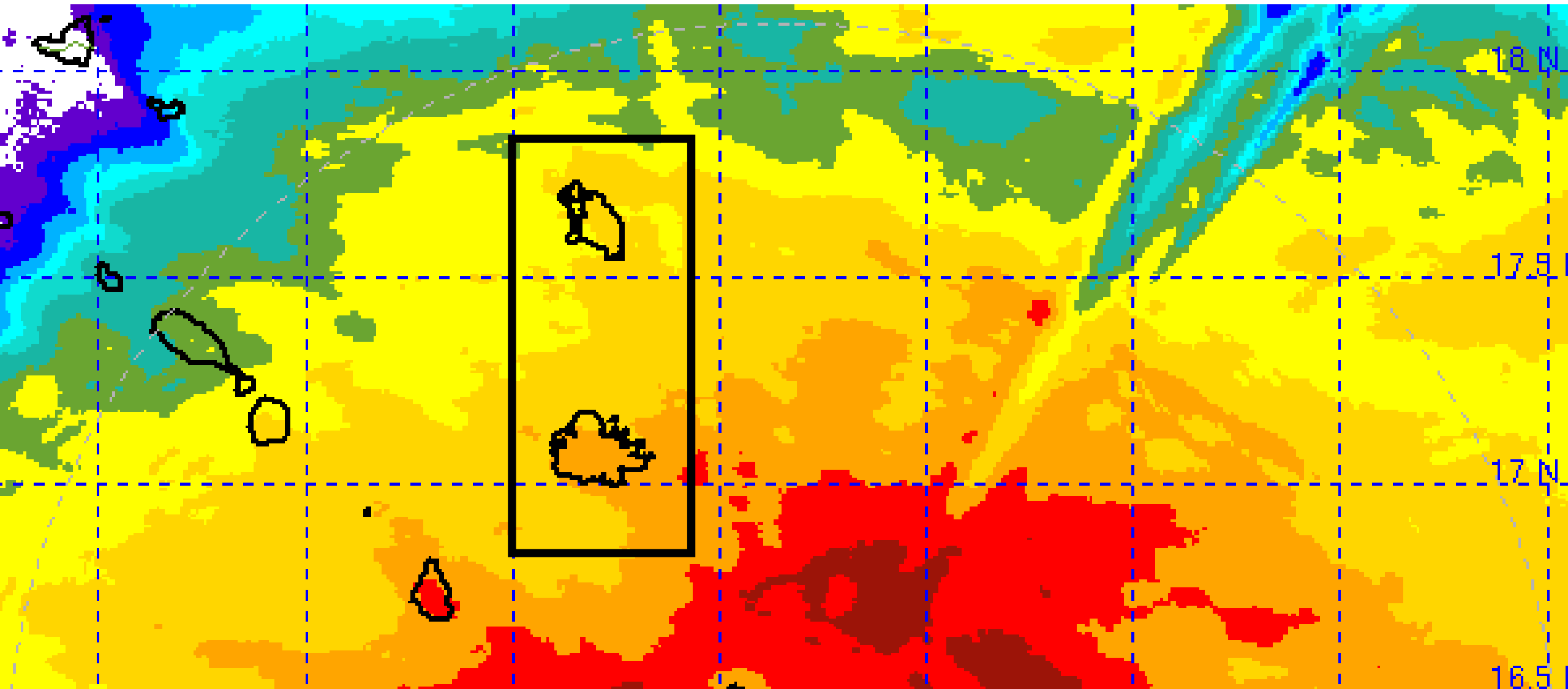
Guadeloupe

Dominica

Martinique

Maria's Centre

Barbados



Category 4 Hurricane Jose – 9 Sep 2017

Barbuda

Antigua

Track

55 mi NE

83 mi NE

Winds

NA

<20 mph

24-hr Rainfall

70 mm

30 mm

Pressure

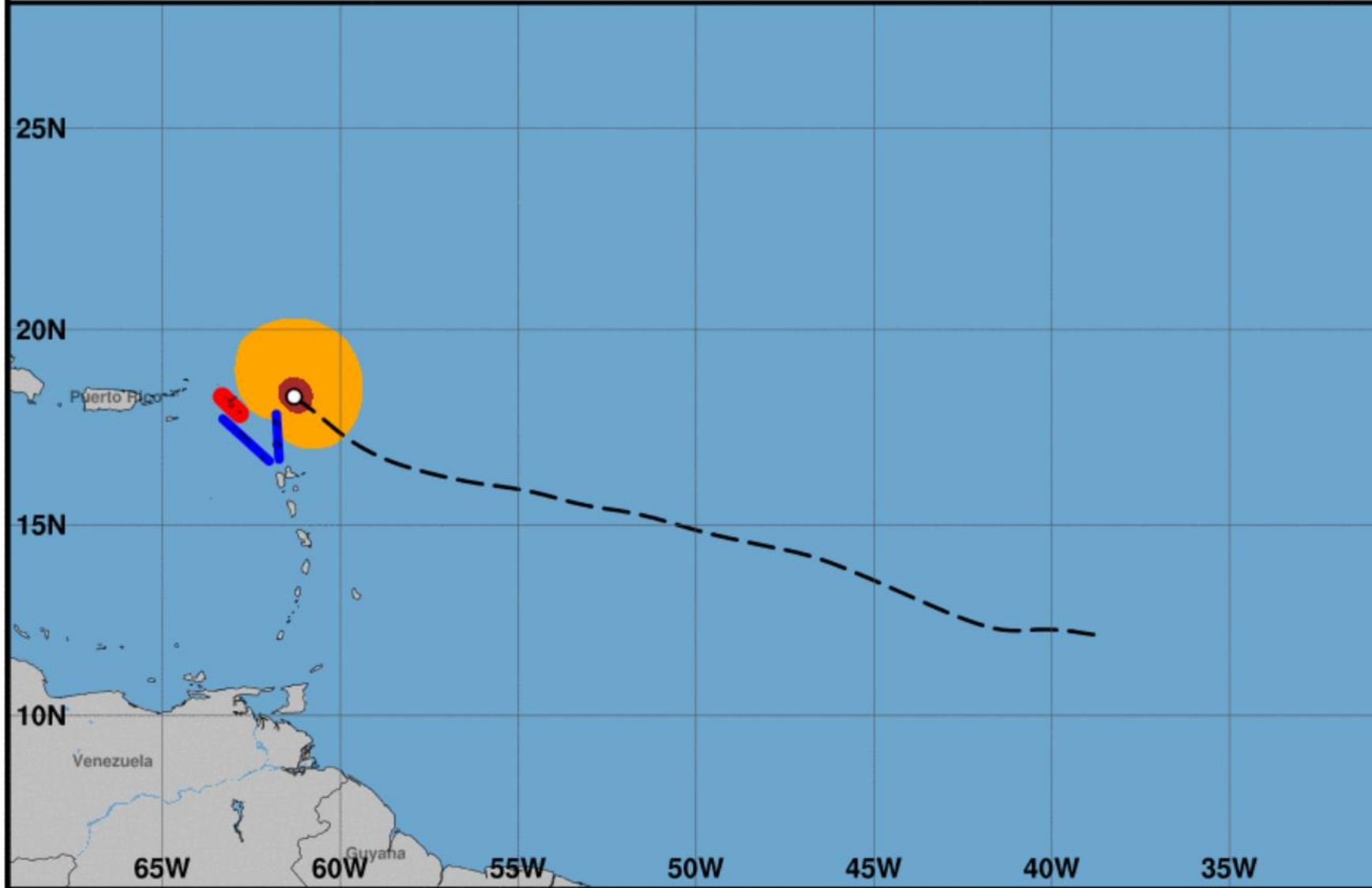
NA

1008.5 mb – VCB



Surface Wind Field of Hurricane Jose

Sustained Winds as of 1100 AM AST Sat Sep 09, 2017 Advisory Number 17



Watches:

- Hurricane Watch
- Tropical Storm Watch

Warnings:

- Hurricane Warning
- Tropical Storm Warning

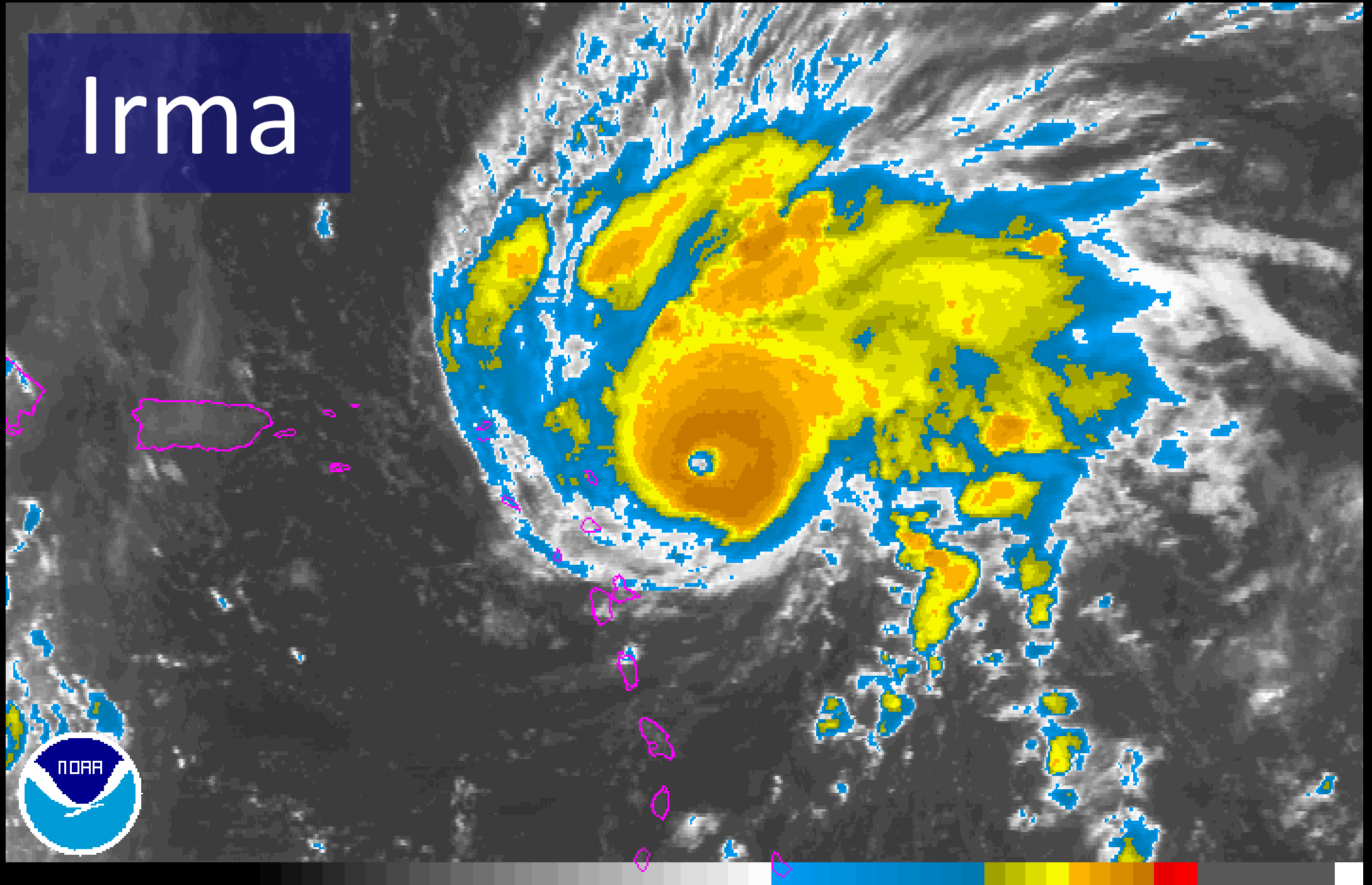
Sustained Winds:

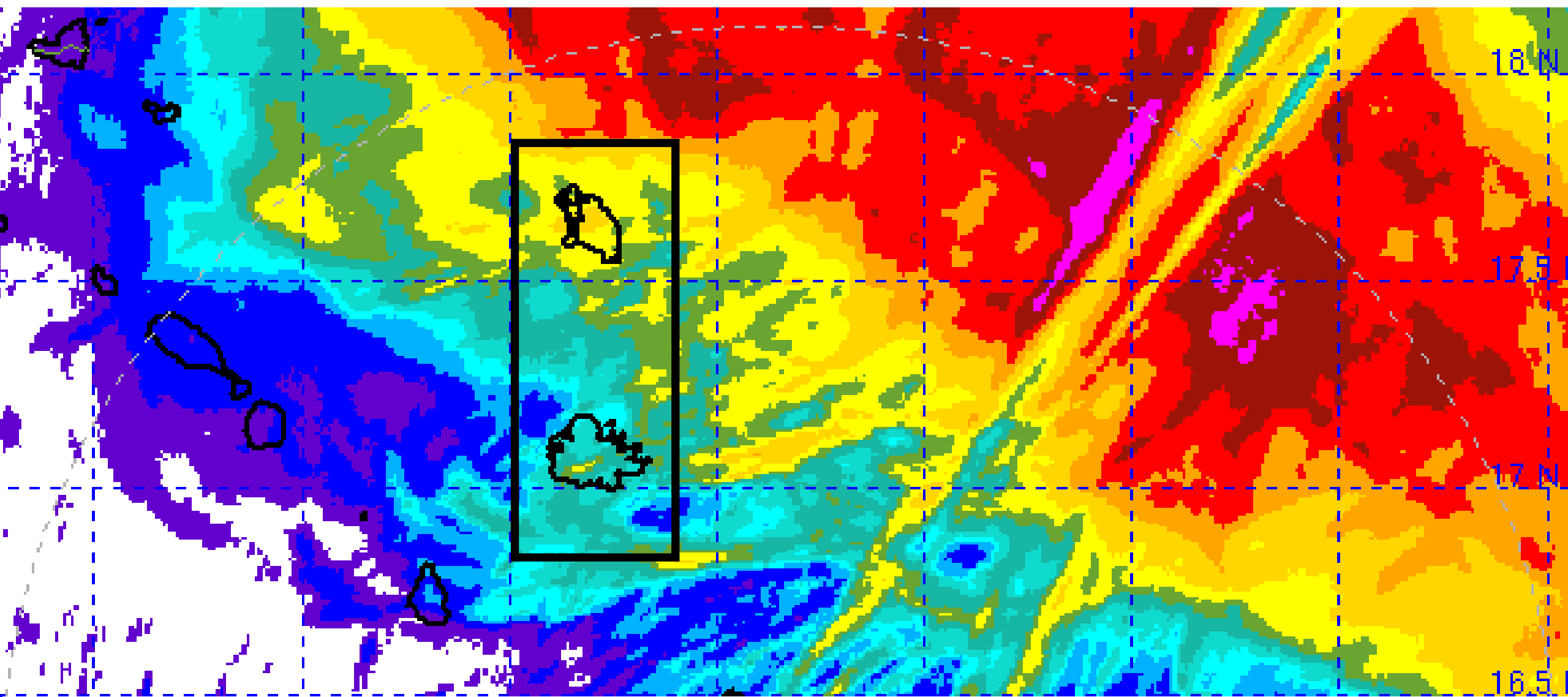
- Hurricane Force
- Tropical Storm Force

Position:

- Center as of 1100 AM AST
- Past Track

Irma









FUERZA AEREA VENEZOLANA

3134

TCs and Climate Change

What is possible? What does the science say?

TCs and Climate Change

PM Gaston Browne: ***“Hurricanes are stronger and bigger because they are absorbing moisture from increasingly warmer seas, caused by global warming.”***

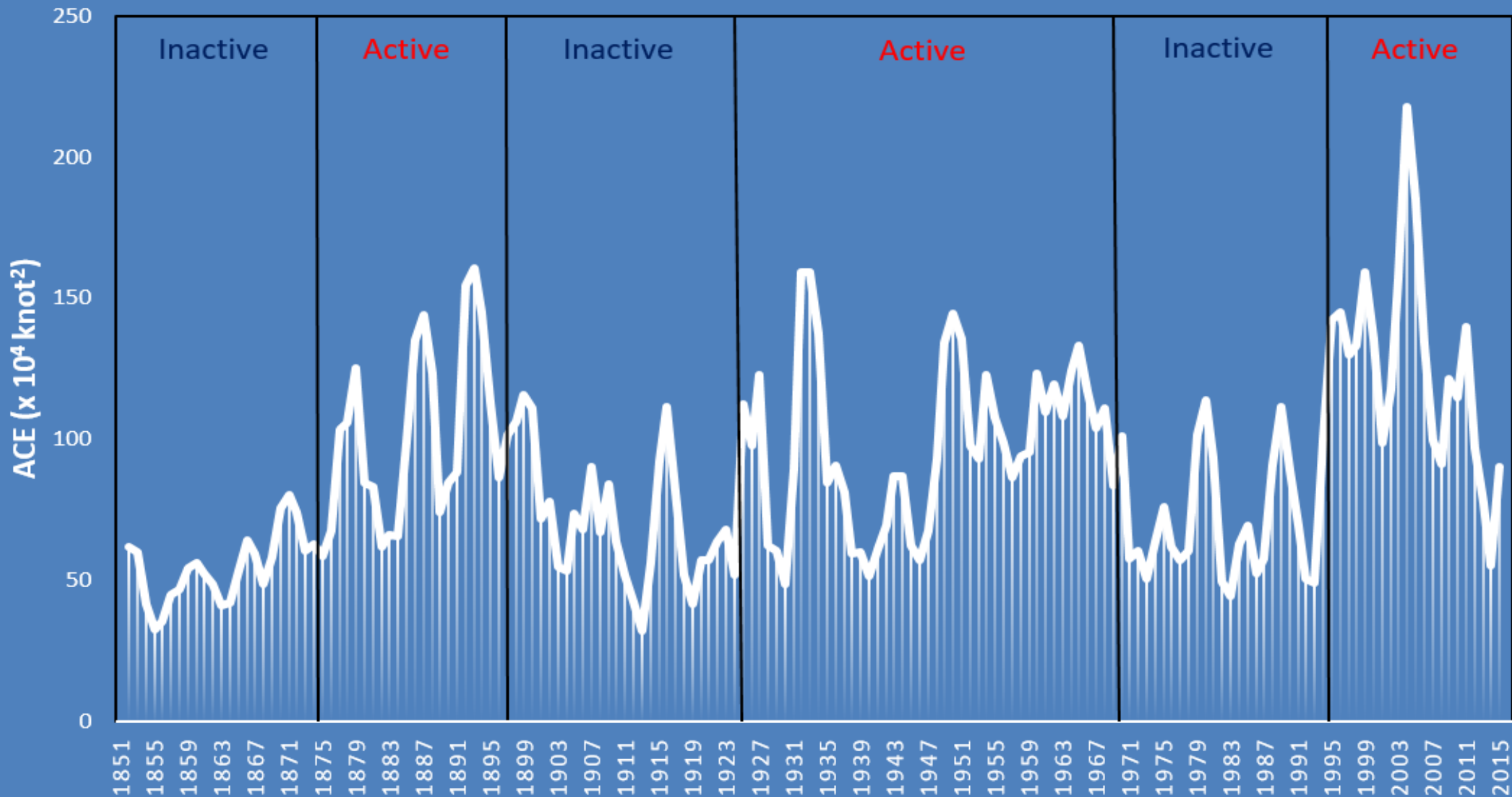
TCs and Climate Change

PM Roosevelt Skeritt: ***“Mr. President to deny climate change is to procrastinate while the earth sinks; it is to deny a truth we have just lived!”***

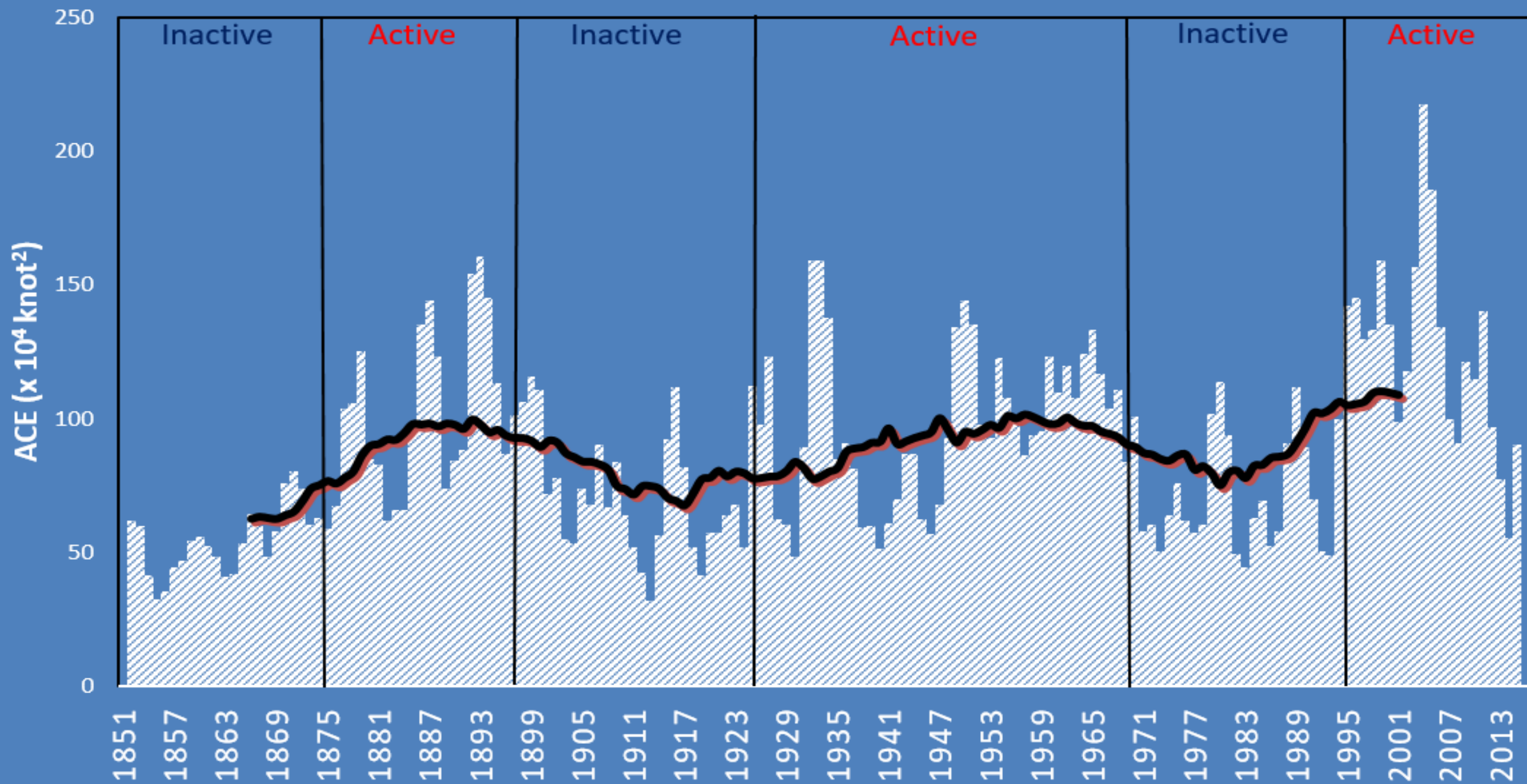
TC Intensity and Climate Change

Hurricane Category	Period	
	1924 to 1969	1970 to 2016
Cat 1-5	259 (5.6)	287 (6.1)
Cat 3, 4, 5	109 (2.4)	115 (2.4)
Cat 4	48 (1.0)	49 (1.0)
Cat 5	14 (0.3)	17 (0.4)

THREE-YEAR-AVERAGED ACE - 1951 TO 2015



3 AND 30-YEAR-AVERAGED ACE - 1951 TO 2015



TC Intensity and Climate Change

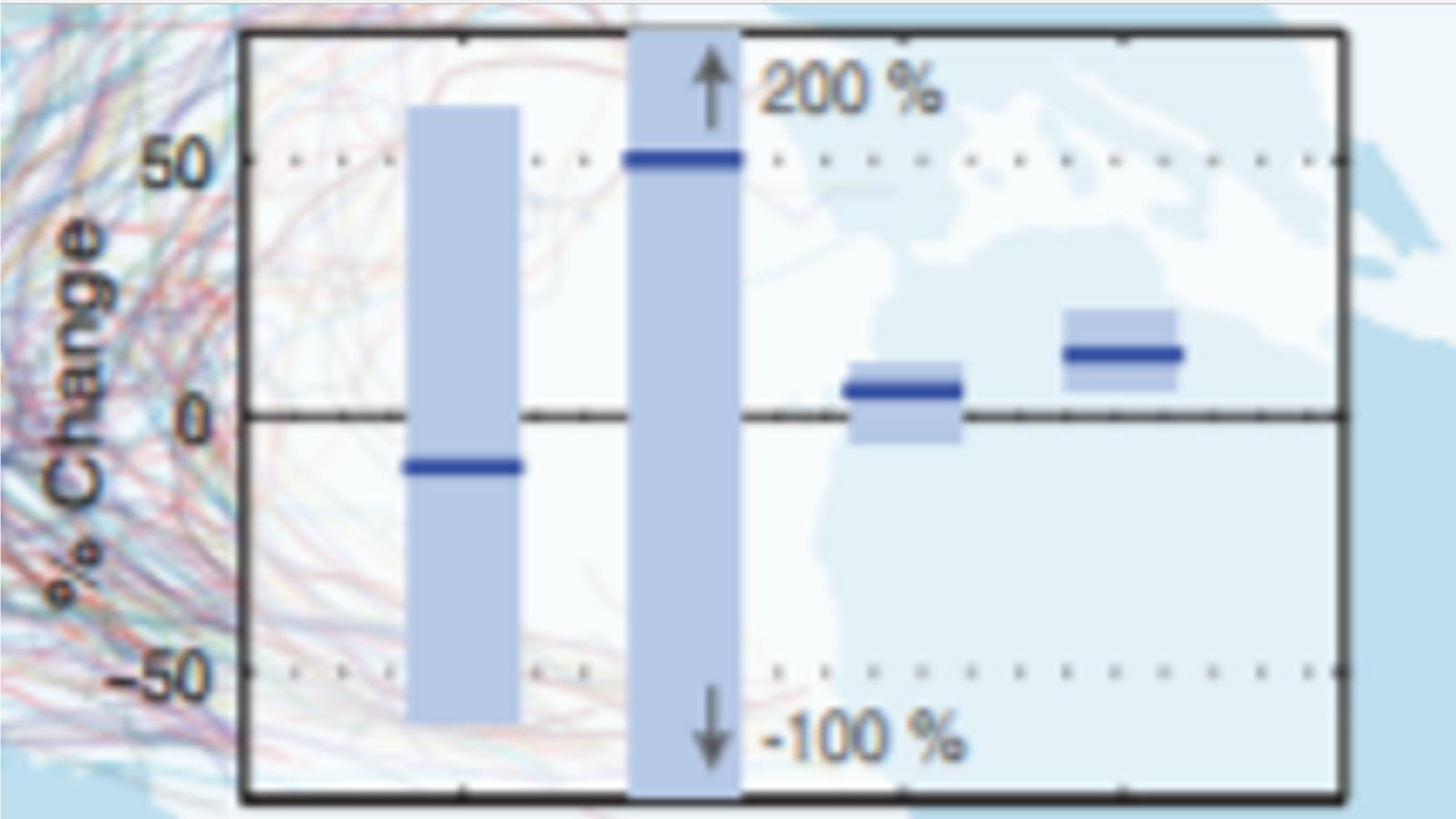
*“...it is **unlikely** that annual numbers of tropical storms, hurricanes and major hurricanes counts have increased over the past 100 years in the North Atlantic basin...”*

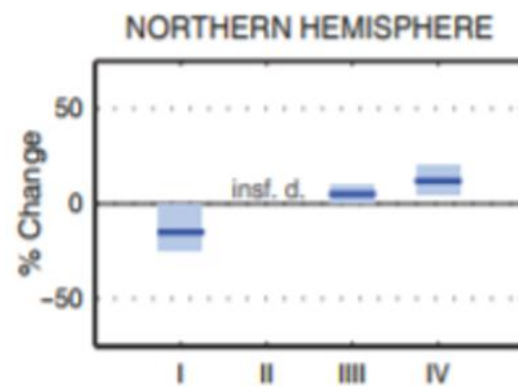
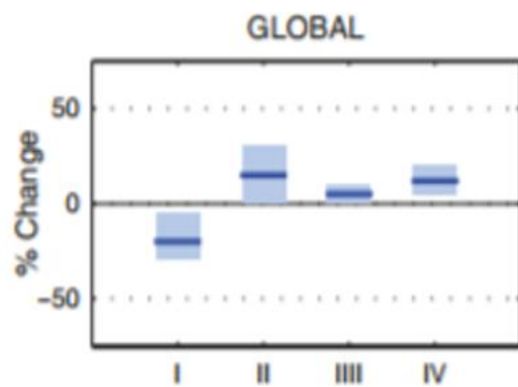
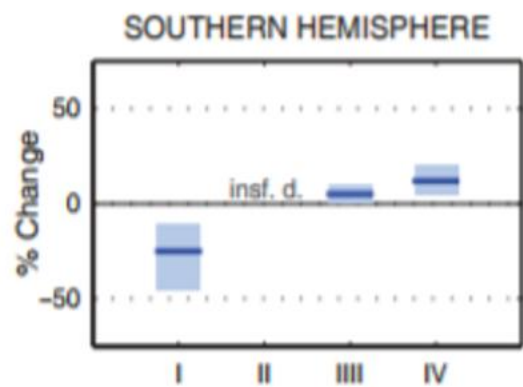
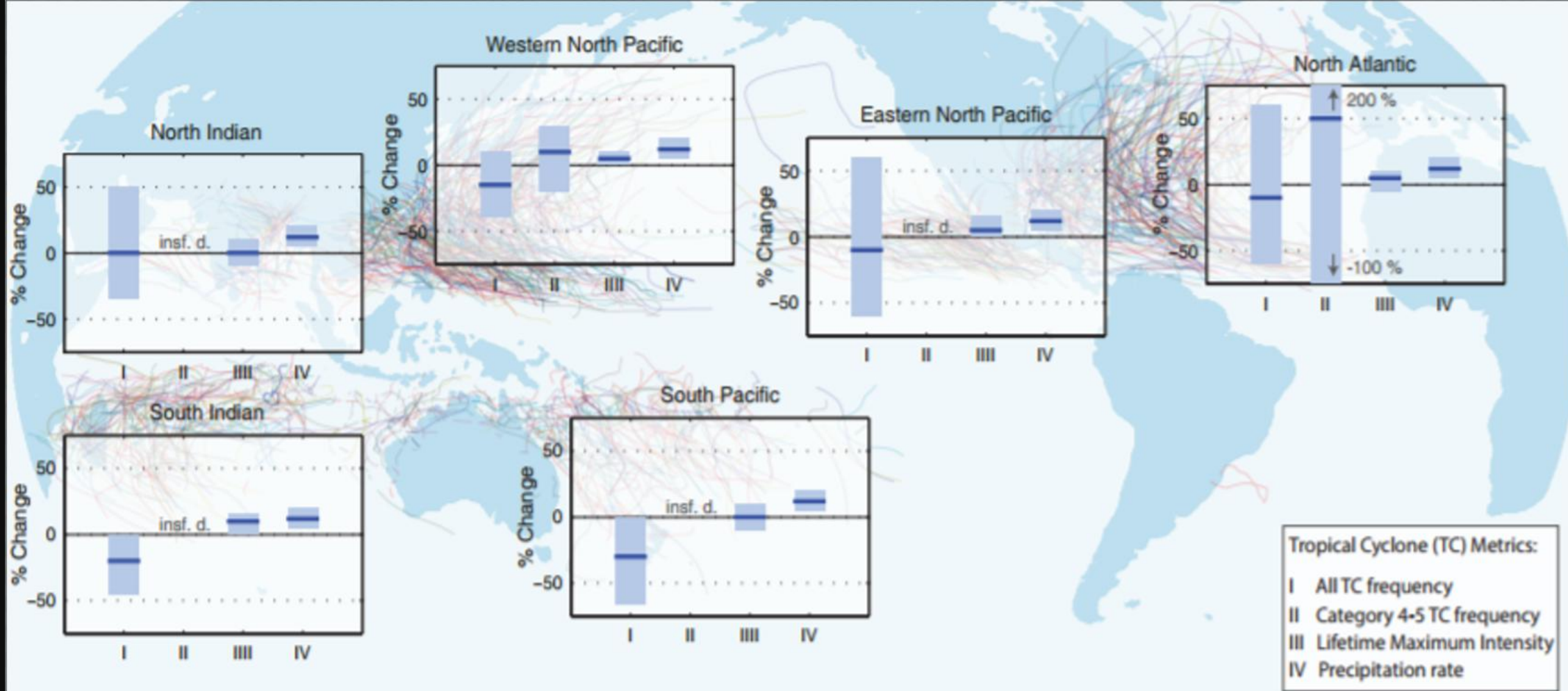
TC Intensity and Climate Change

Going forward, IPCC AR5 says that climate change will “*more likely than not*” cause changes in TC intensities late in this current century – near year 2100.

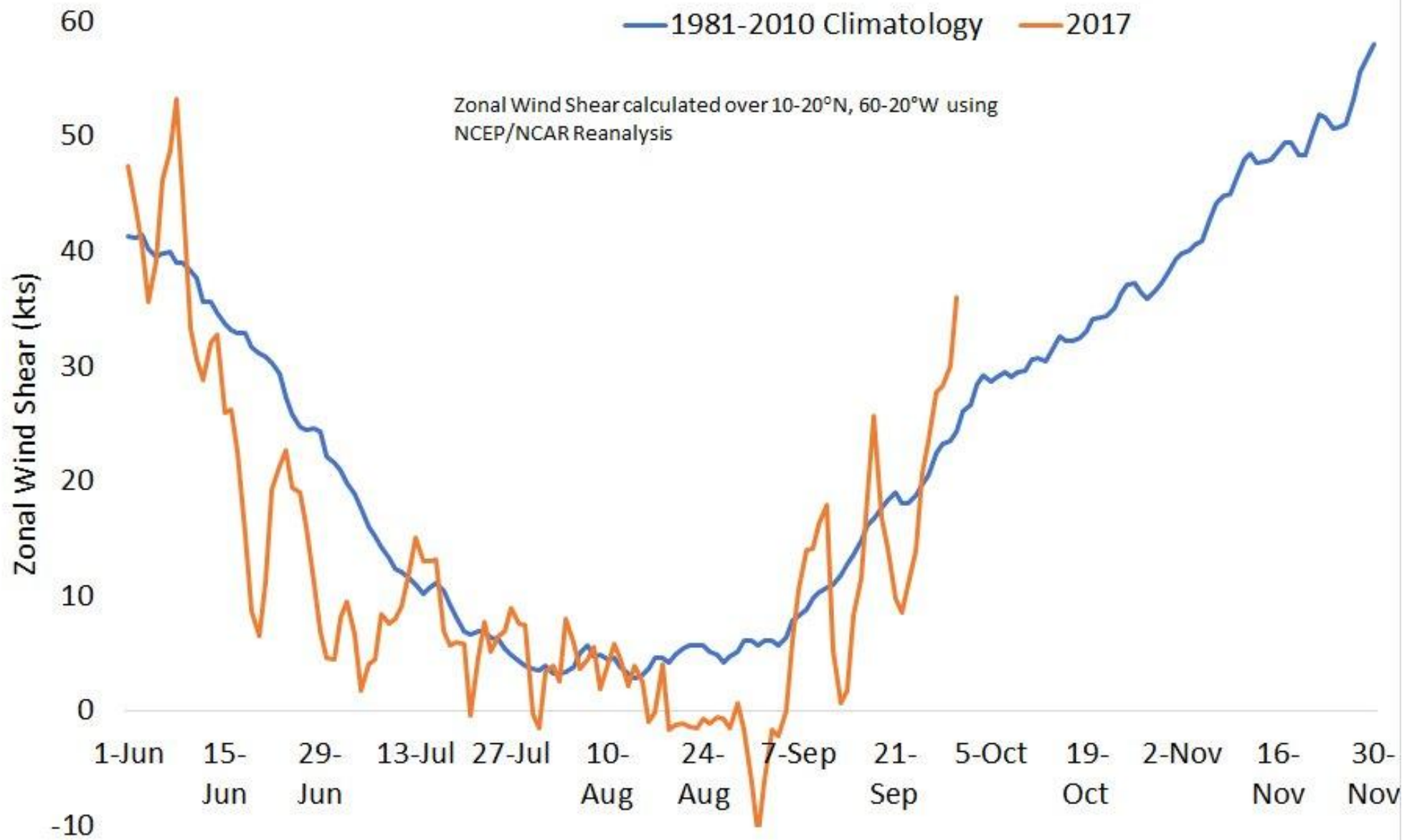
TC Intensity and Climate Change

UN SG António Guterres: ***“But scientists are clear that such extreme weather is precisely what their models predict, and they predict it will be the new normal of a warming world... Scientific models have long predicted an increase in the number of Category 4 and 5 hurricanes. This is precisely what is happening – and even sooner than expected.”***.





Tropical Atlantic 200 minus 850 mb Daily Zonal Wind Shear in 2017 versus 1981-2010 Climatology



It is Only a Matter Of Time

I believe it is only a matter of time before we all get flattened by a major hurricane – perhaps Cat 5. So, we need to help each other in the aftermath of such cyclones.

Thank You!