

HARVEY AT GROUND ZERO:

Looking Back—
Looking Forward

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iCyclone

06.01.18





First Off

**I've got
questions.**



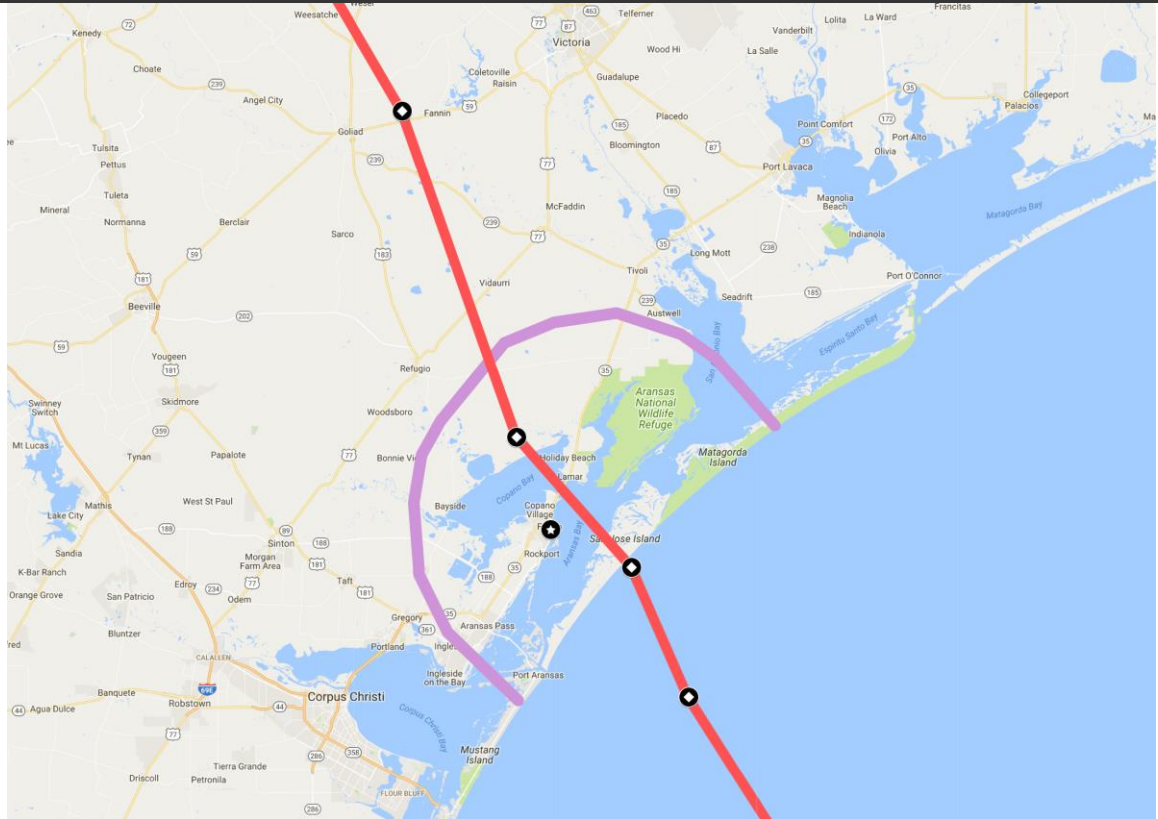
Question No. 1

**Who rode out
Hurricane HARVEY
between
Port Aransas &
Aransas Nat'l
Wildlife Refuge?**

**Port Aransas
Aransas Pass
Rockport
Fulton
Bayside
Copano Village
Lamar
Holiday Beach**



Question No. 1 (cont'd)





Question No. 2

Of the direct-hit folks:

**Who was freaked out
by it?**



Question No. 3

Of the direct-hit folks:

**Who felt really prepared
for it?**



In the next 20 minutes, we'll...

- **Look back at HARVEY.**
- **Get ready for the next one.**

But first...

ME



Because a 60-second video is worth 1,000 words...





In a Nutshell

I'm an extremely prolific **hurricane chaser**.

- Subjects: **hurricanes only**.
- Specialization: **narrow**.
- When: **25+ years**.
- Where: **around the world** (USA, Mexico, Philippines, Japan, Australia, etc.).
- Style: **aggressive**.
- Attitude: **competitive**.

I'm independent—but the past few years I've been collaborating with The Weather Channel and WeatherNation.



First Off

From my perspective:

2017 was a big year.



Chaserdude Scorecard: 2017

It was a record year for me—one of disgusting excess!

- **Hurricanes chased: 8**
- **Hurricane eyewalls penetrated: 8** (1.000 batting average!)
- **Hemispheres: 4** (N, S, E, W)
- **Ocean basins: 3** (NATL, WPAC, SPAC)
- **Continents: 3** (N America, Asia, Australia)
- **Nations: 4** (Australia, Japan, Mexico, USA)
- **Categories:**
 - **Cat 1 – 3**
 - **Cat 2 – 1**
 - **Cat 3 – 2**
 - **Cat 4 – 2**
 - **Cat 5 – 0**



2017: The 8 iCyclone Chases





The star of the year?

The Atlantic Ocean.

**2017
HURRICANE
SEASON**





Big Picture

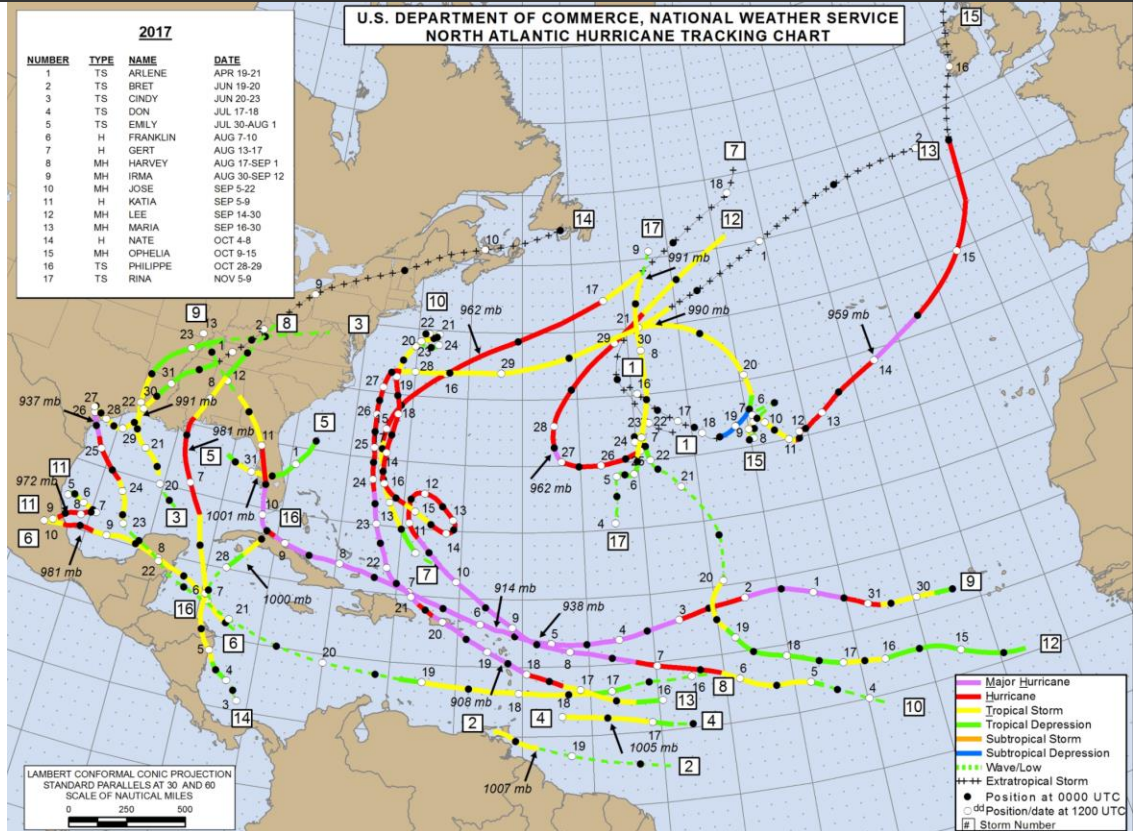
2017 = return of:

- The **Atlantic** hurricane
- The **American** hurricane

**A big surprise, because
I'd given up on both.**



Big Picture (cont'd)





Big Picture (cont'd)

The Atlantic stood out!

- 17 named storms
- 10 hurricanes
- 6 major hurricanes
- 2 Cat 5s!

The USA stood out!

- 4 hurricanes
- 3 Cat 4s!
- Costliest season ever



Unprecedented?

Not really.

Other seasons have had:

- More storms
- More hurricanes
- More Cat 5s

And the season's strongest (IRMA) wasn't as strong as the Atlantic's other top hurricanes.

But, yeah: **it was a big year.**

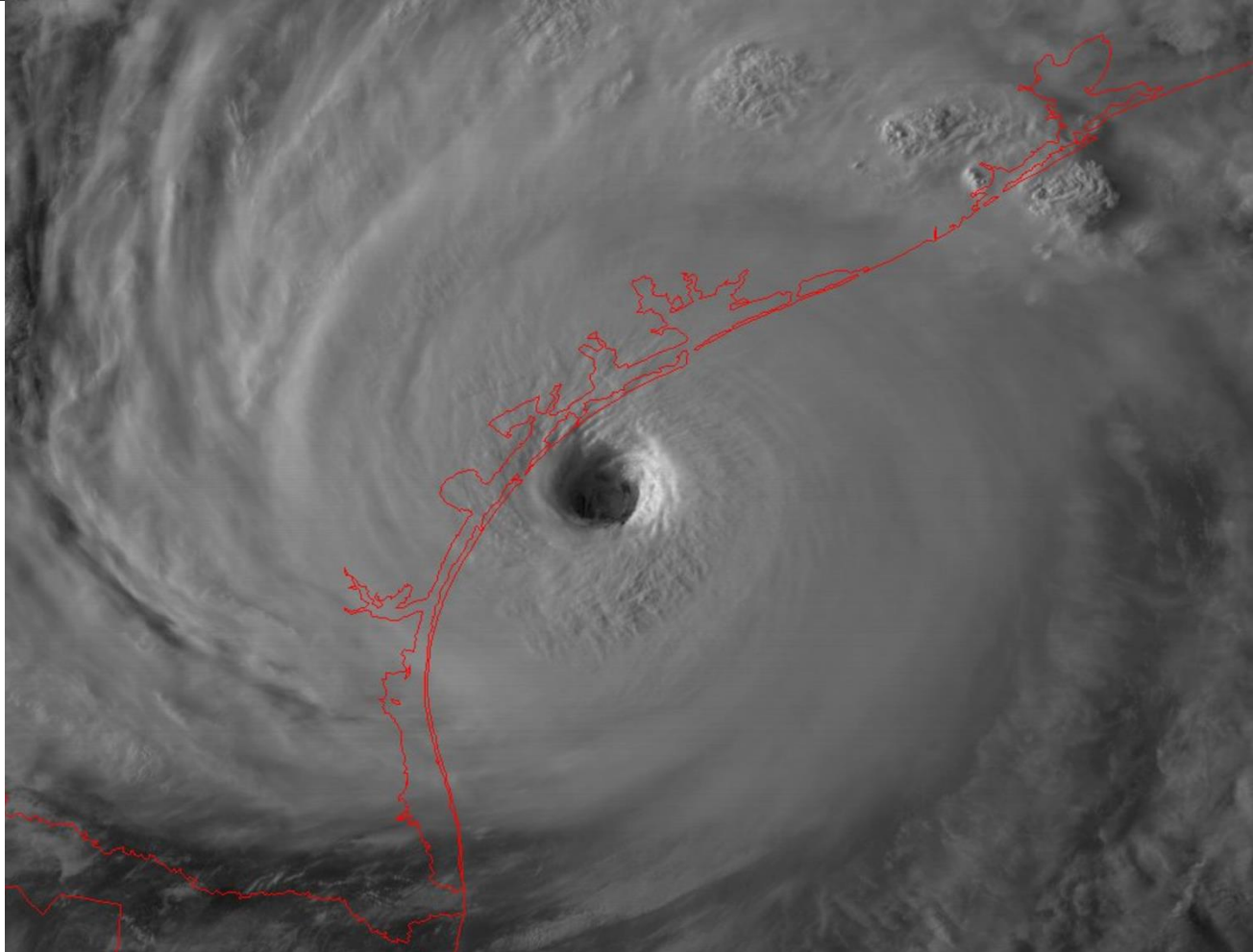


For Texas, it was all about...

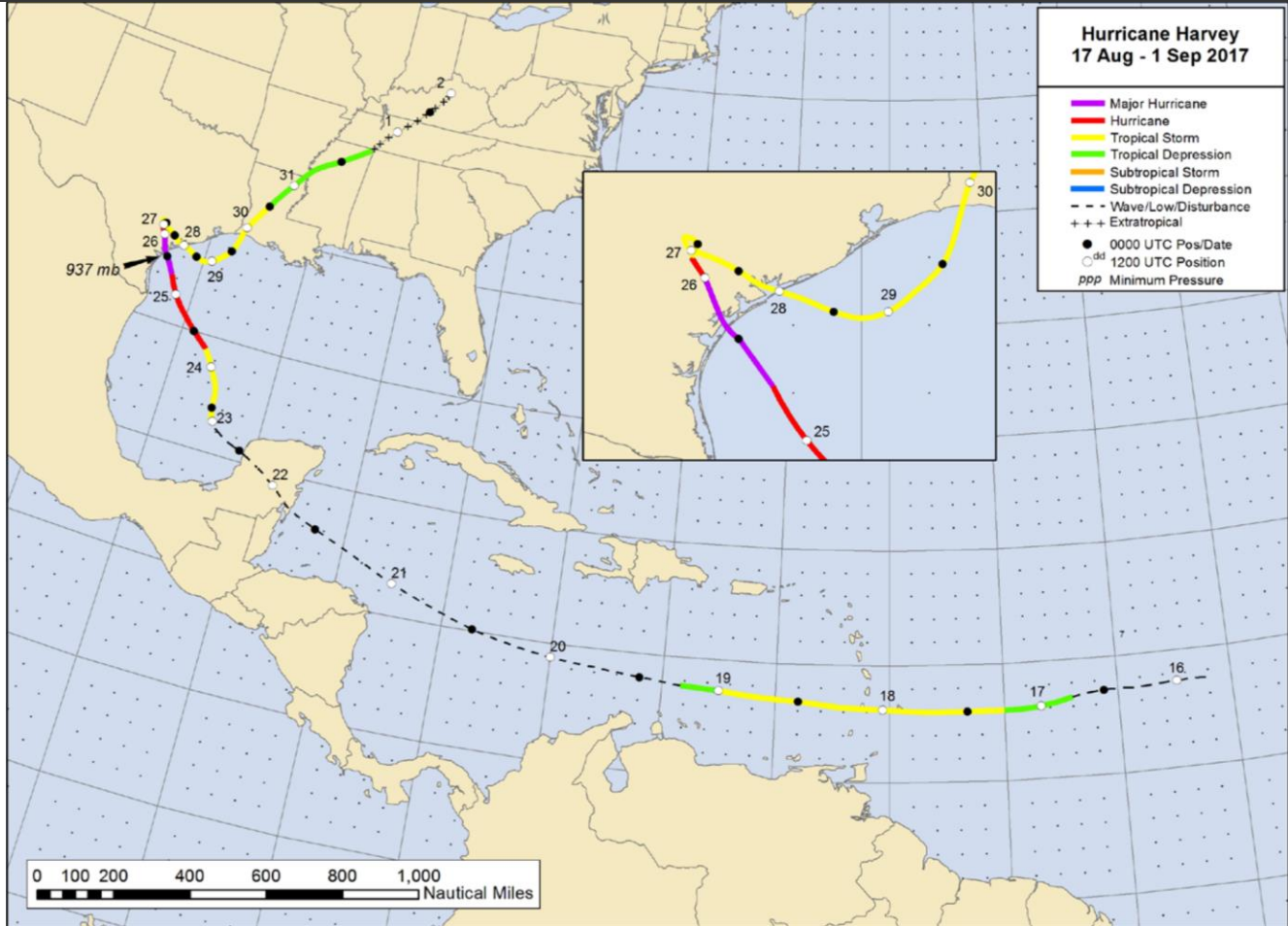
HARVEY: BIG PICTURE



HARVEY!



HARVEY: Track

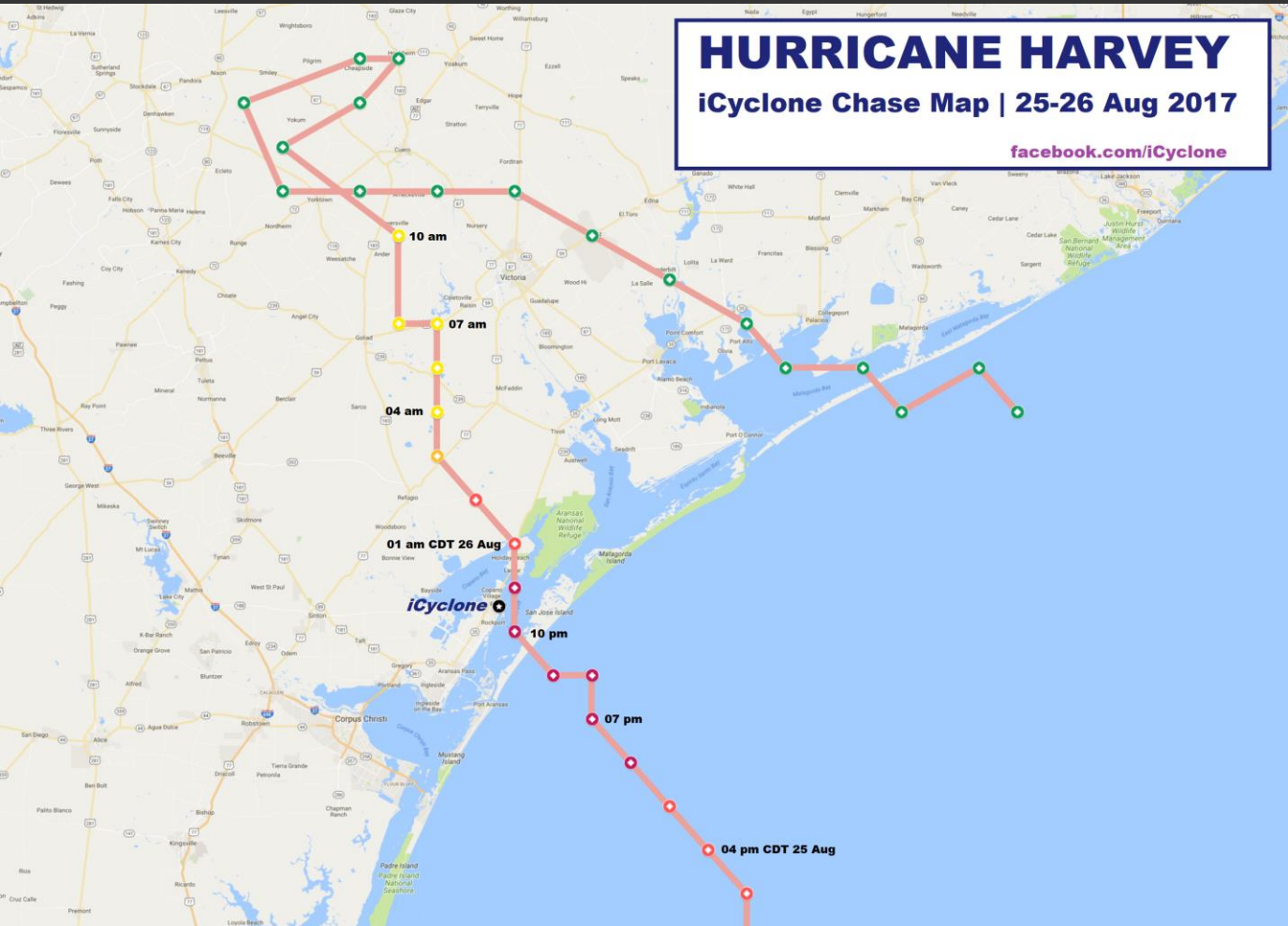


HARVEY: Track over Texas



HURRICANE HARVEY iCyclone Chase Map | 25-26 Aug 2017

[facebook.com/iCyclone](https://www.facebook.com/iCyclone)





HARVEY: Essentials

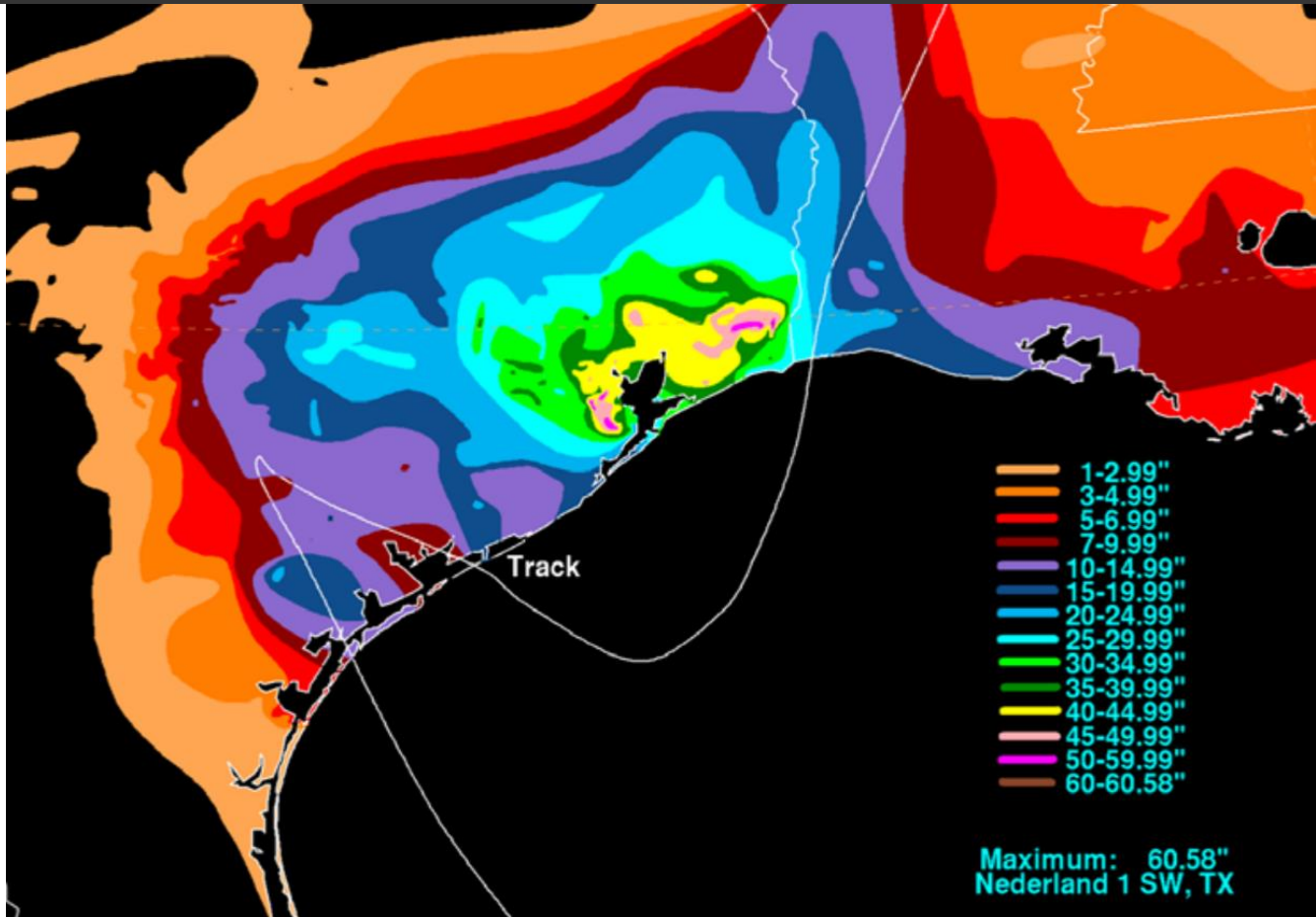
The main facts:

- **Date: 25-26 August**
- **Landfall**
 - **Location: San Jose Island, Texas**
 - **Time: 10 pm CDT 25 Aug**
 - **Intensity: Cat 4: 115 knots (130 mph) / 937 mb**
- **Damage: \$125 billion**
- **Deaths: 68**

Price tag makes HARVEY 2nd-costliest hurricane in U.S. history.

How'd that happen?

HARVEY: Big Villain



Graphic: David Roth, NWS

HARVEY: Big Story



Photo: David J. Phillip, AP



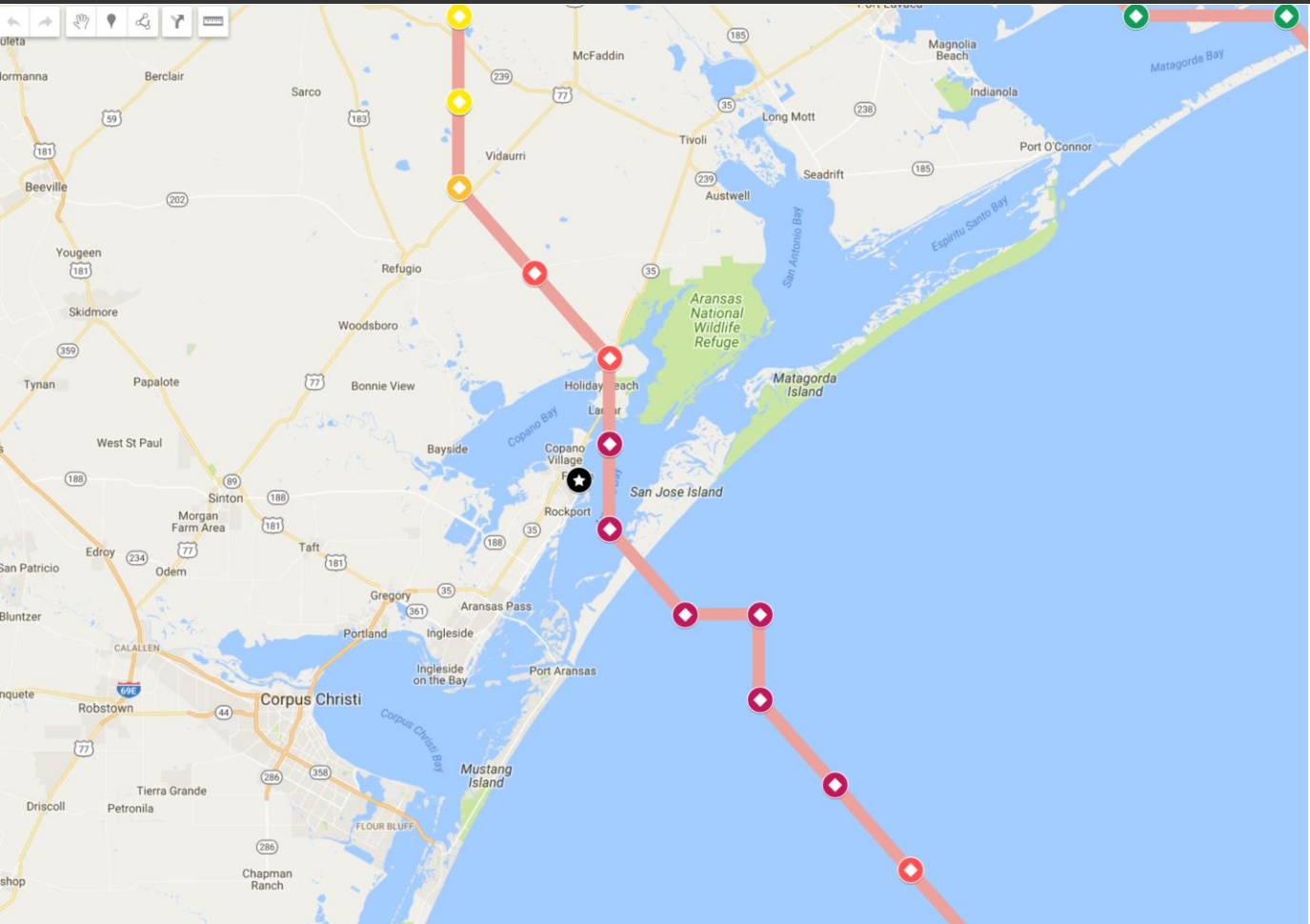
However...

There was another big story.

Before the floods.

**When HARVEY first came roaring
in off the Gulf.**

Landfall Zone



Wind Reports



HURRICANE HARVEY

Measured Winds

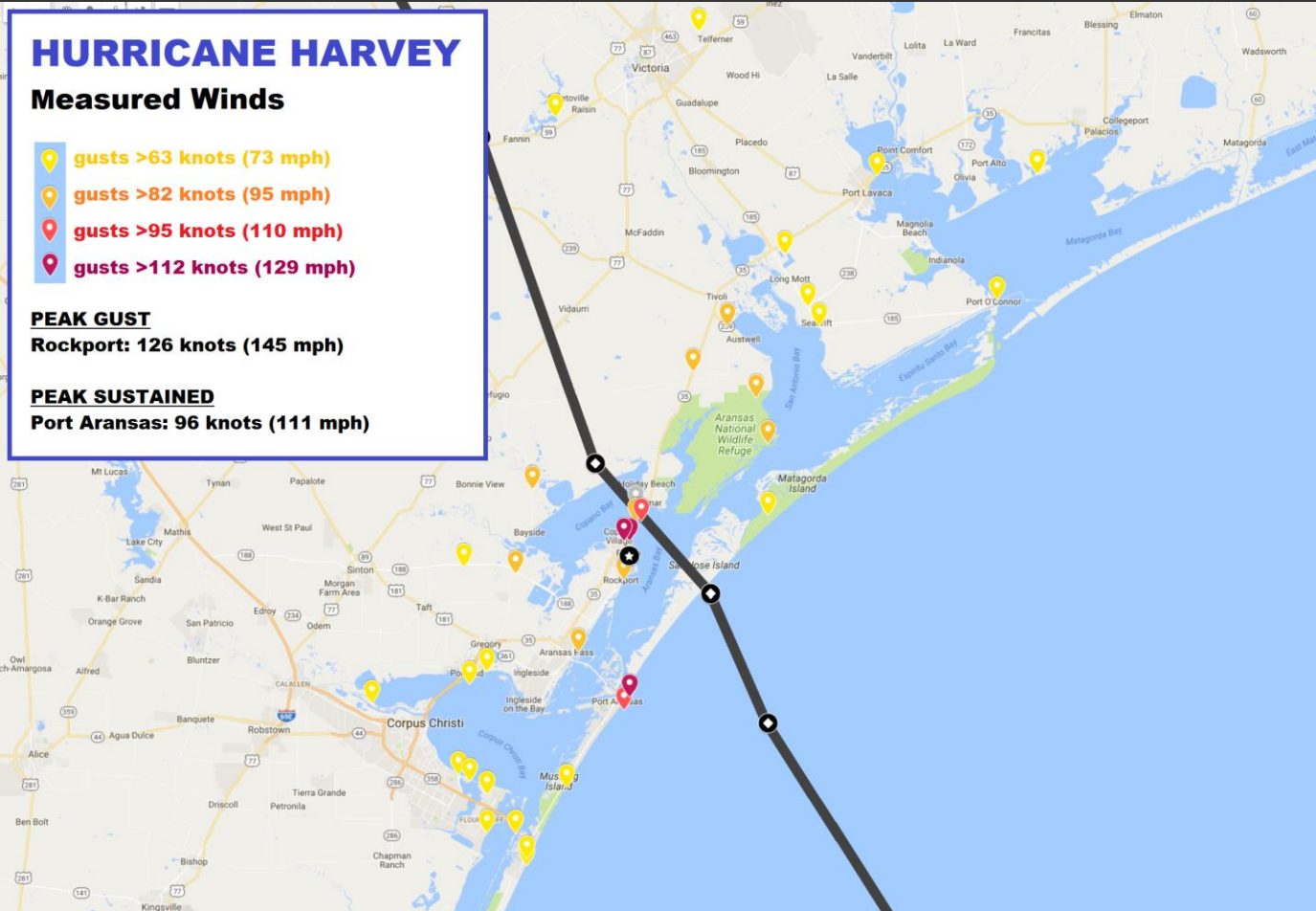
-  gusts >63 knots (73 mph)
-  gusts >82 knots (95 mph)
-  gusts >95 knots (110 mph)
-  gusts >112 knots (129 mph)

PEAK GUST

Rockport: 126 knots (145 mph)

PEAK SUSTAINED

Port Aransas: 96 knots (111 mph)





Compared to Other TX 'Canes

On the list of strongest Texas hurricanes since 1851, **HARVEY** is tied for No. 6:

CAT 5

—

CAT 4

130 knots (150 mph)

1. Indianola 1886
1. Freeport 1932

125 knots (145 mph)

3. CARLA 1961

120 knots (140 mph)

4. Galveston 1900
4. CELIA 1970*

115 knots (130 mph)

6. Galveston 1915
6. Baffin Bay 1916
6. **HARVEY 2017**

CAT 3

110 knots (125 mph)

9. Brownsville 1880
9. Brownsville 1933
9. Bay City 1941

105 knots (120 mph)

12. BEULAH 1967*

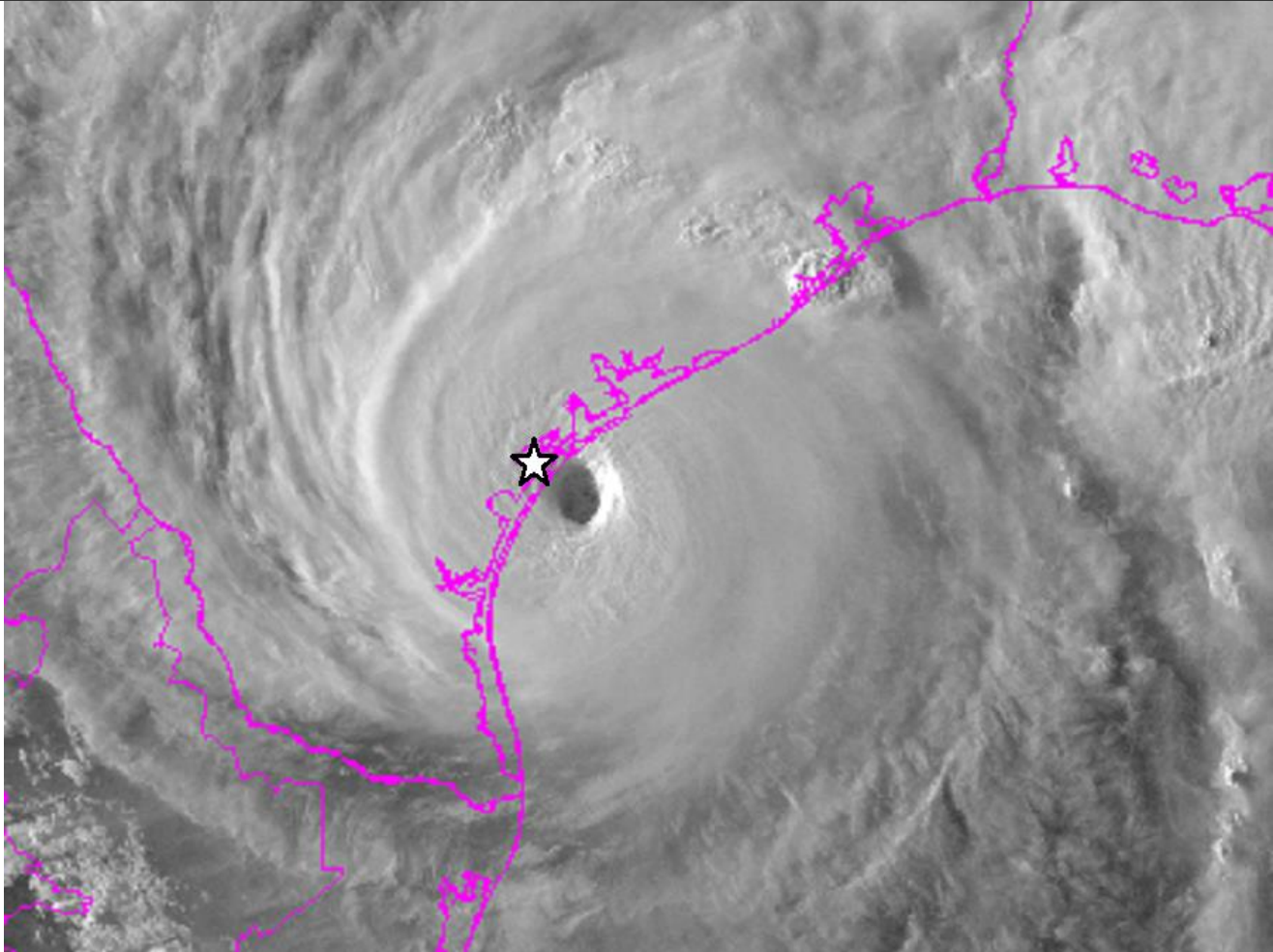
100 knots (115 mph)

13. Indianola 1875
13. Velasco 1909
13. Baffin Bay/Corpus Christi 1919
13. Matagorda 1942
13. Seadrift 1945
13. ALLEN 1980
13. ALICIA 1983
13. BRET 1999

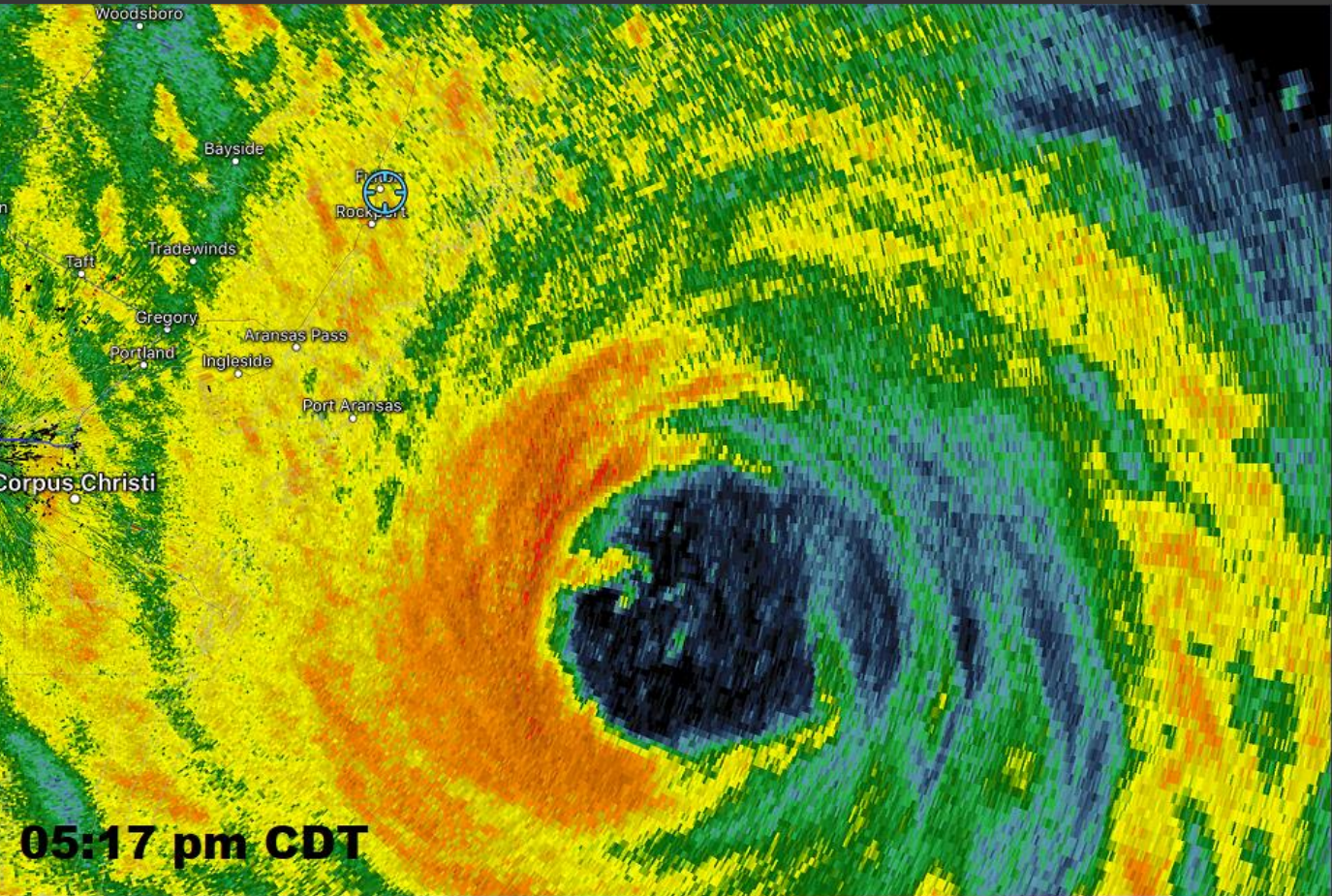
HARVEY: GROUND ZERO



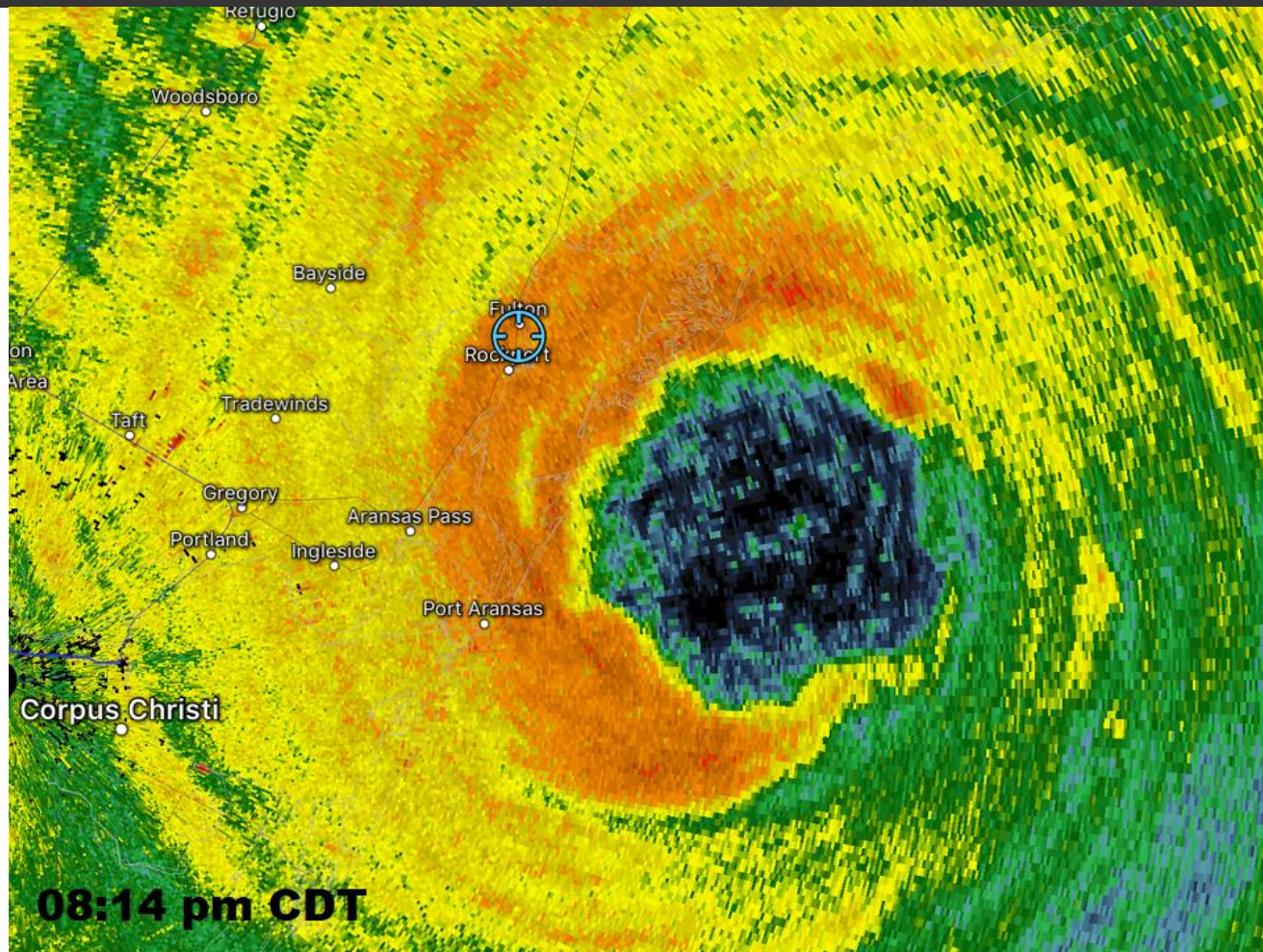
SATELLITE: Late Afternoon



RADAR: Inner Rainbands



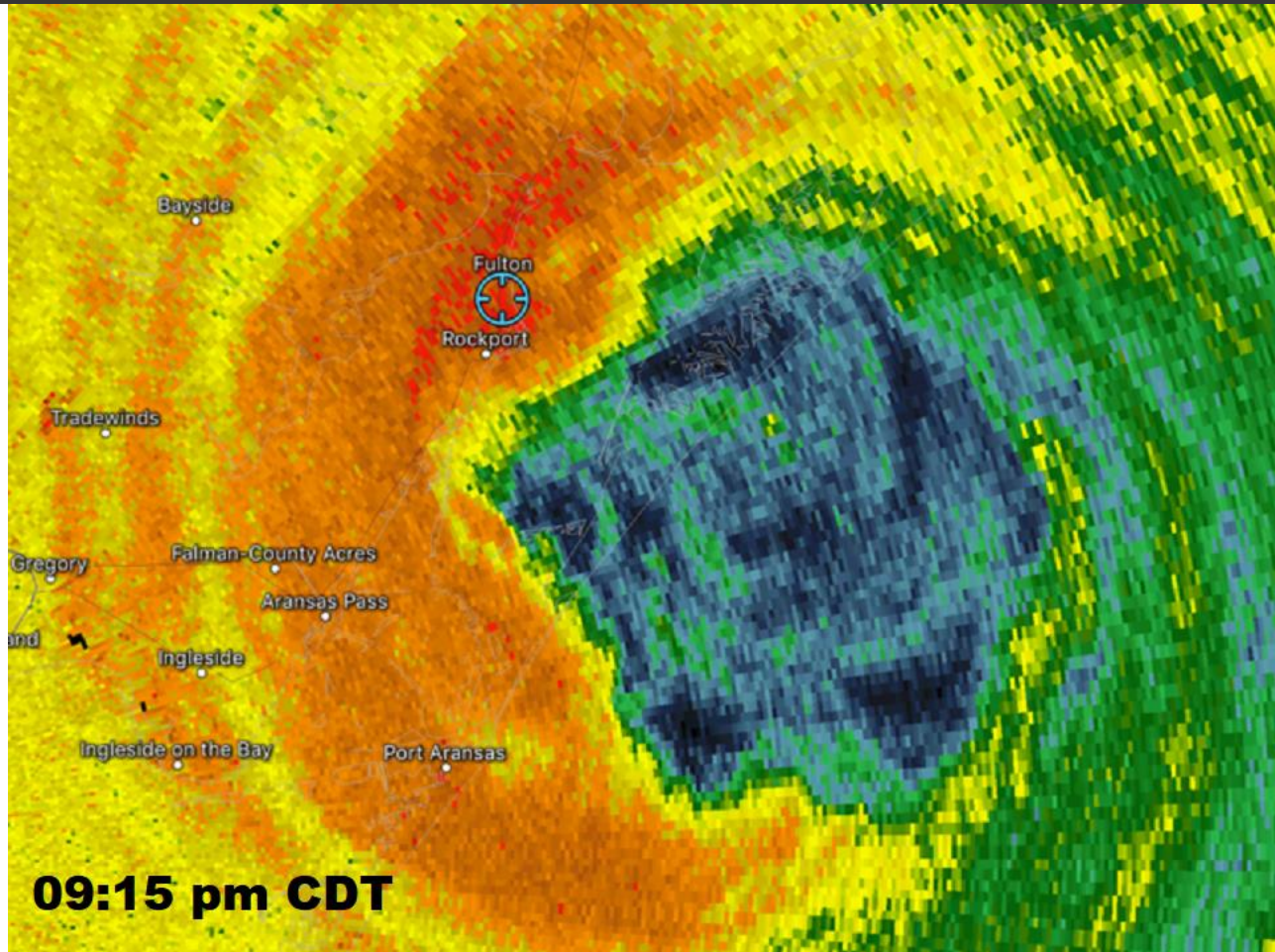
RADAR: Entering Eyewall



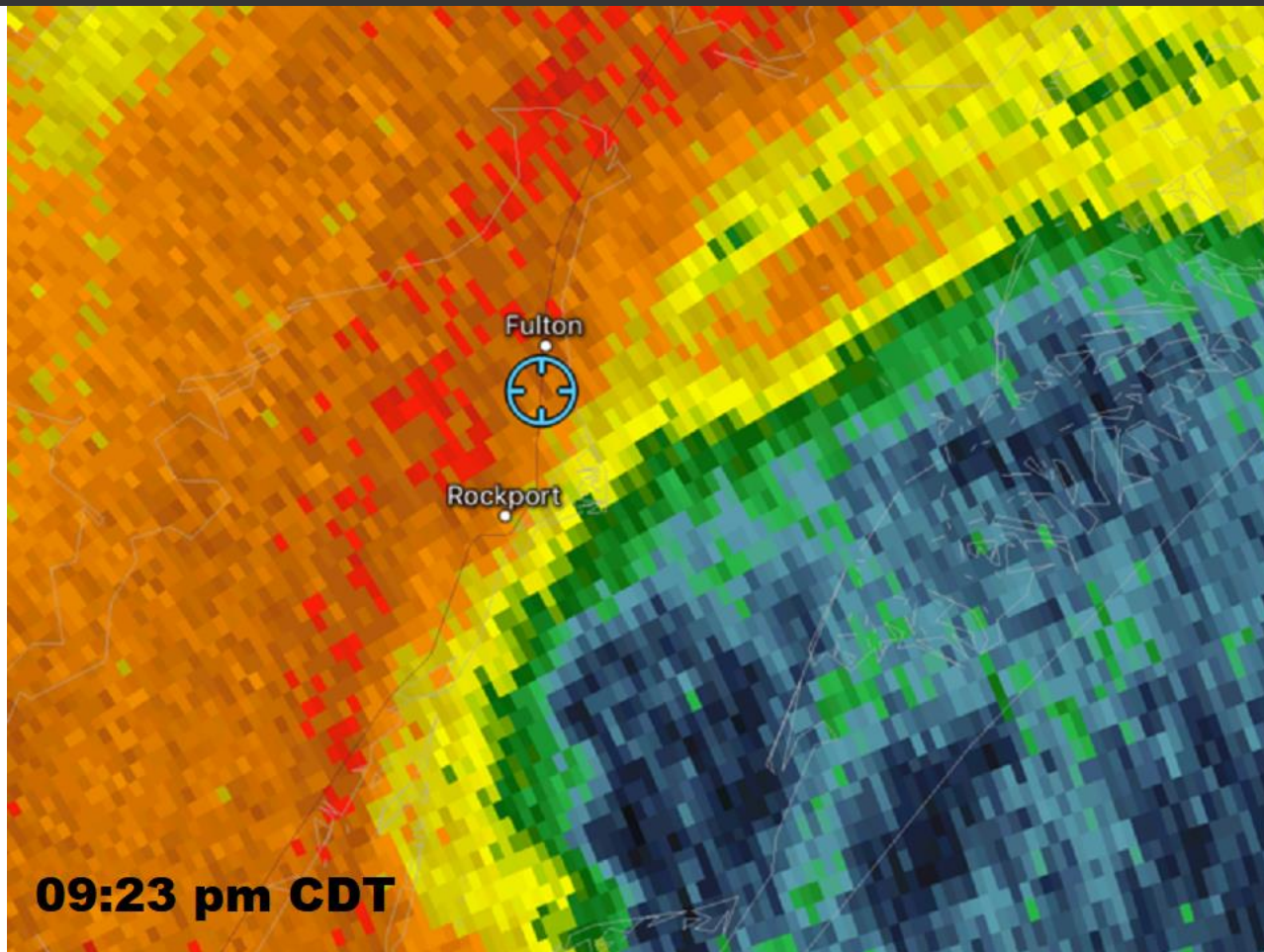
VIDEO: Entering Eyewall



RADAR: Inner Eyewall



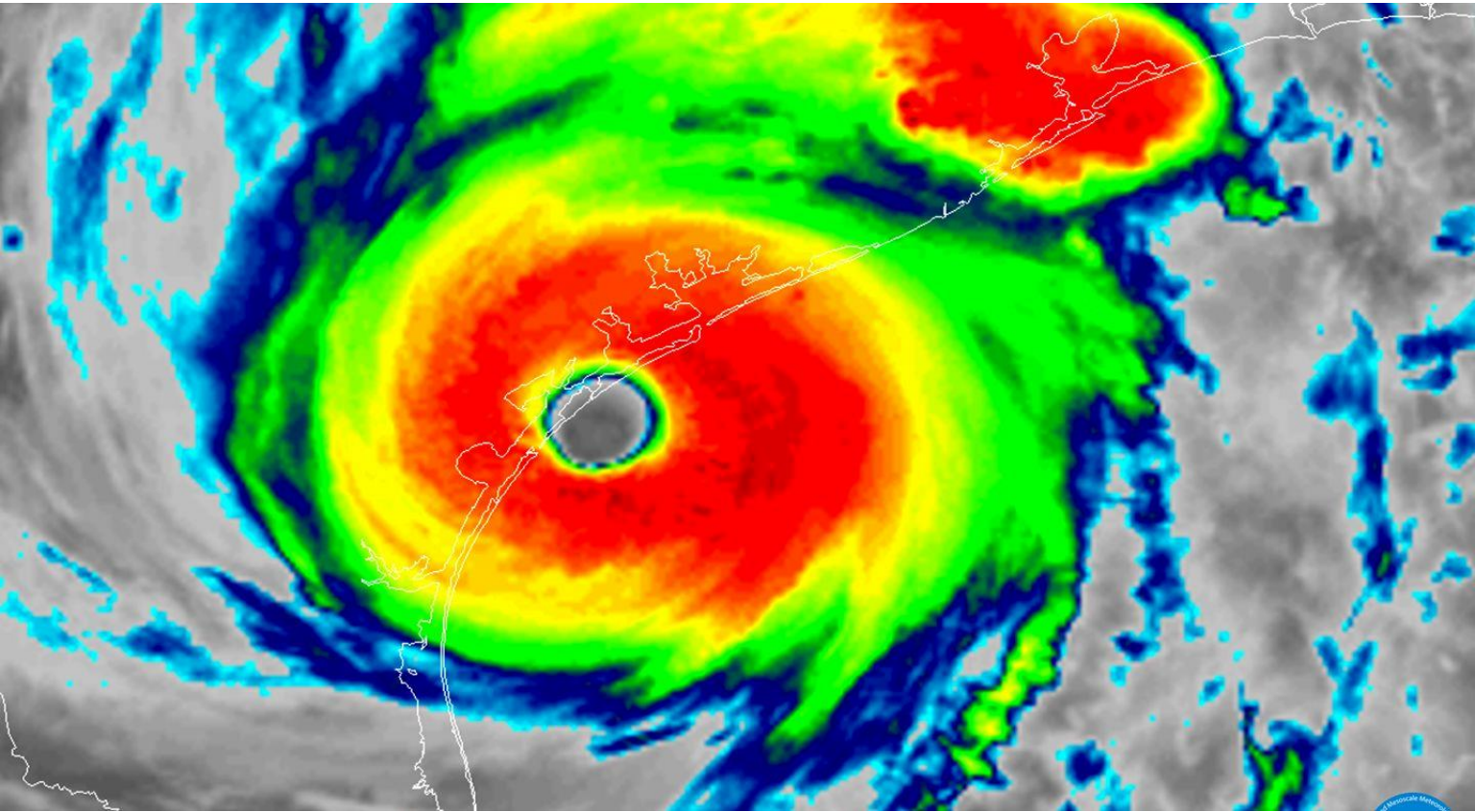
RADAR: Inner Eyewall (Close)



VIDEO: Inner Eyewall



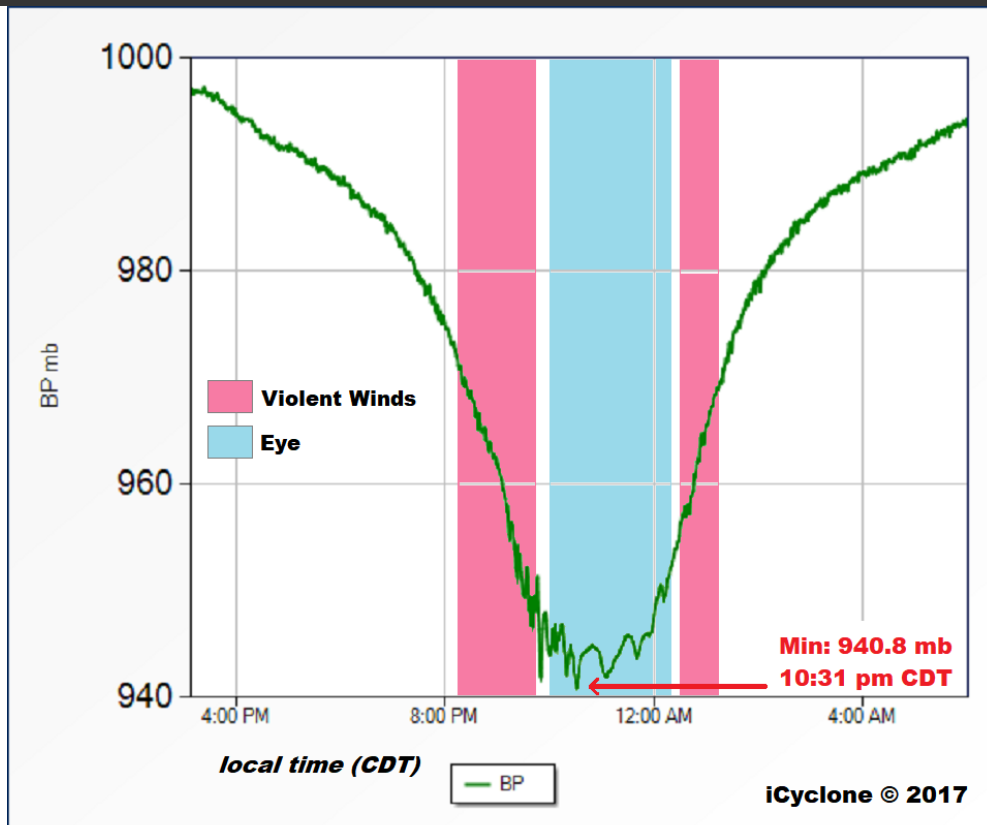
SATELLITE: Eye



VIDEO: Eye



DATA: Air Pressure

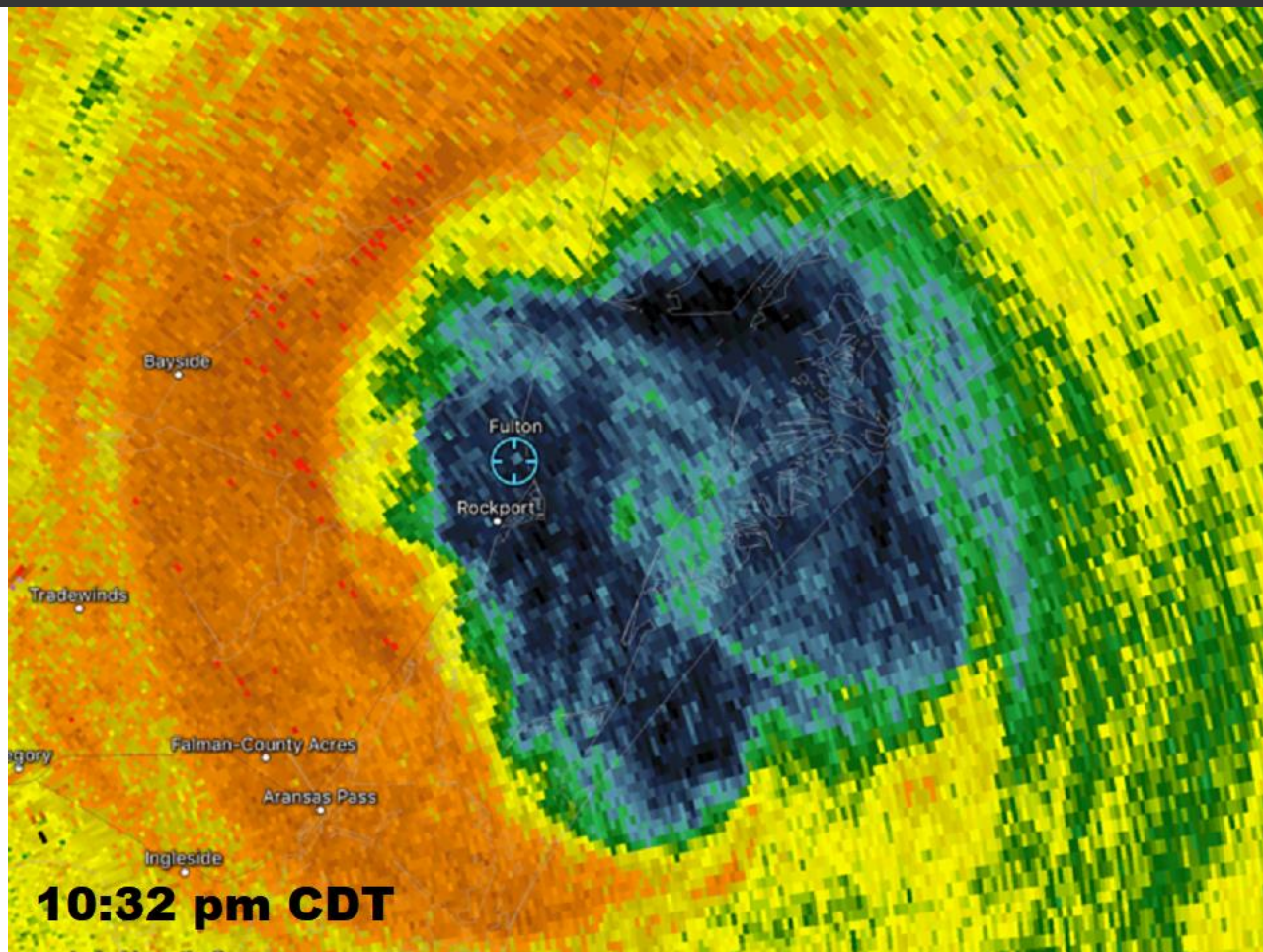


HURRICANE HARVEY: 25-26 Aug 2017

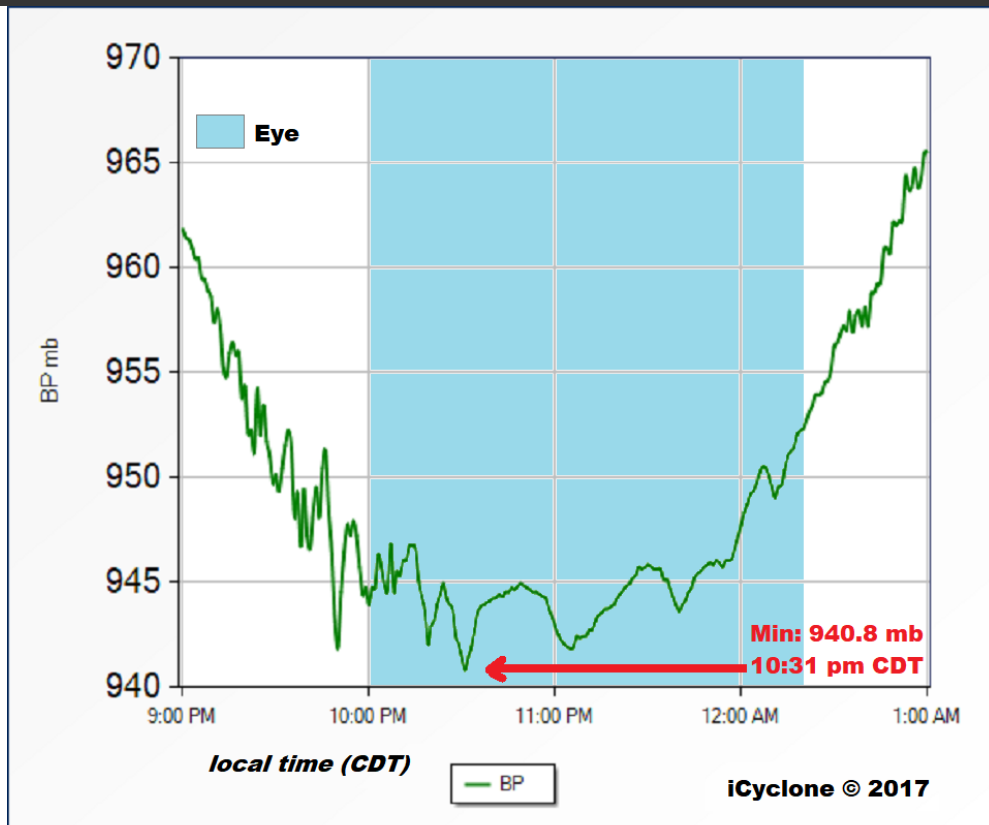
Rockport, Texas, USA

28.05795N 97.04096W – ref el 11 ft

RADAR: Eye



DATA: Air Pressure – Mesovortices



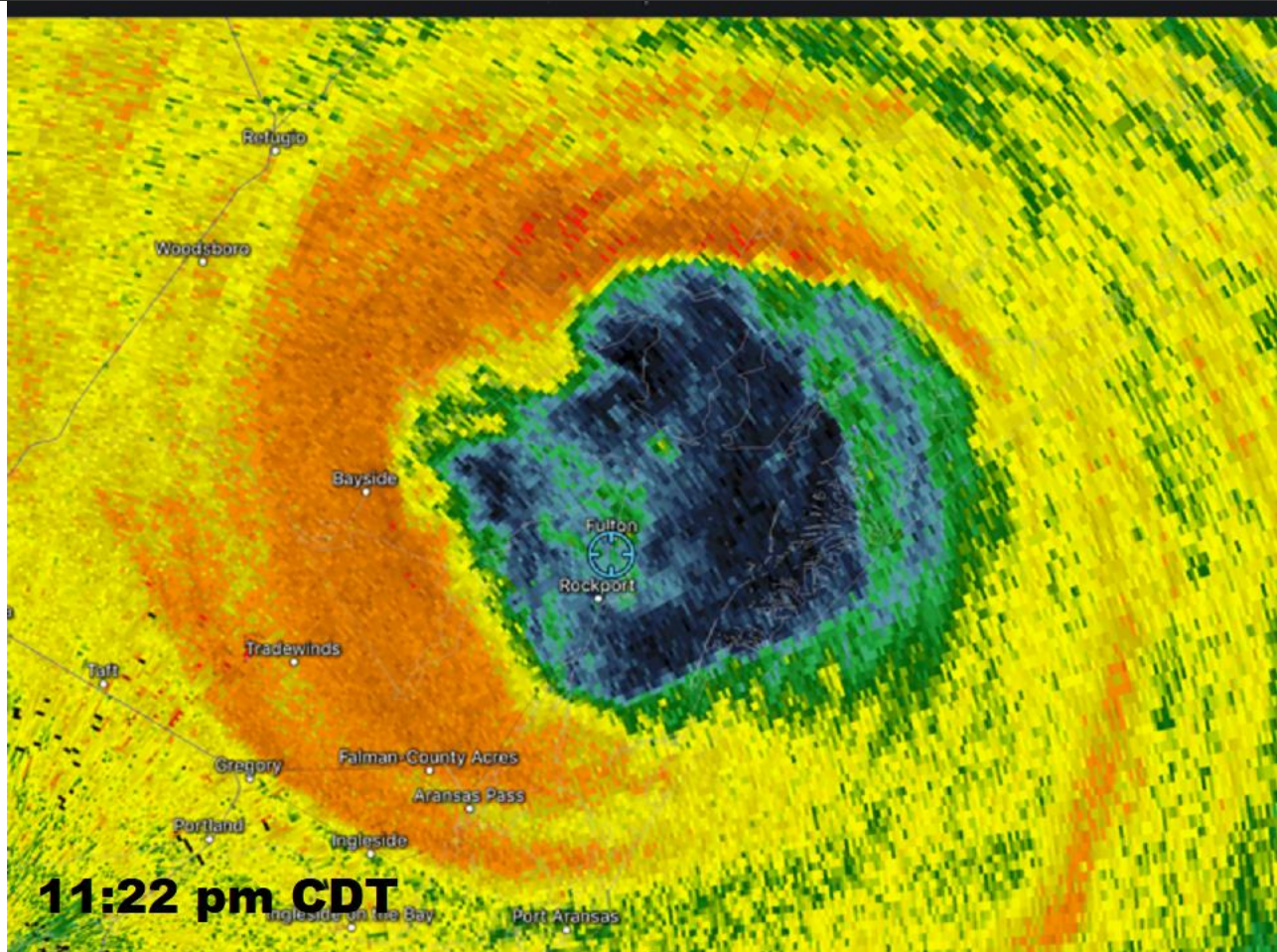
HURRICANE HARVEY: 25-26 Aug 2017

Rockport, Texas, USA

28.05795N 97.04096W – ref el 11 ft

CLOSE VIEW

RADAR: Eye



VIDEO: Backside



HARVEY: AFTERMATH





Numbers from Ground Zero

In the landfall zone, there were:

- **15,000 homes destroyed**
- **25,000 homes damaged**

Wind damage was extreme in Aransas, Nueces, Refugio, & E San Patricio Cos.

Damage from storm surge (up to 10 ft AGL) was more moderate.

PHOTO: Dawn



PHOTO: Hotel



PHOTO: Hotel



PHOTO: Rockport



PHOTO: Rockport



PHOTO: Rockport



PHOTO: Rockport



PHOTO: Rockport



PHOTO: Rockport



PHOTO: Rockport



PHOTO: Rockport



PHOTO: Aransas Pass



PHOTO: Aransas Pass



PHOTO: Aransas Pass



PHOTO: Aransas Pass



HARVEY: THOUGHTS





THOUGHT 1

Corpus Christi got lucky.

HARVEY's core missed CC. Theyd didn't get a Cat 4 or anything close.

Had HARVEY crossed 30 miles further SW, CC would've made Houston look like a vacation.

It's important folks in CC understand this.



THOUGHT 2

Construction matters.

HARVEY was an intense hurricane.

But many of the building failures were older and/or non-reinforced wood-frame buildings.



THOUGHT 3

**Huge storm surge
didn't materialize—
but it may next time.**

You need to feel this threat is real—every time.



THOUGHT 4

**Preparations for
next time should
start now.**

Hurricanes run in clusters.

The lessons are fresh.



**And let's talk specifically
about...**

SURVIVING HURRICANE WINDS





I've been in the cores of many violent hurricanes.

I've seen **crazy** wind.

And I have **3 simple tips** for getting through them.



Tip No. 1

Cover windows.

And I'm not talking tape.



Tip No. 1 (cont'd)

Obvious? Maybe.

But folks don't do it. They should:

- **Windows are the Achilles heel of a structure.**
- **Structural failure often starts with a window.**

Once a window goes, it's downhill from there...

Tip No. 1: VIDEO (Hurricane ODILE)



Tip No. 1: IMAGES



Tip No. 1: IMAGES (cont'd)



Tip No. 1: IMAGES (cont'd)



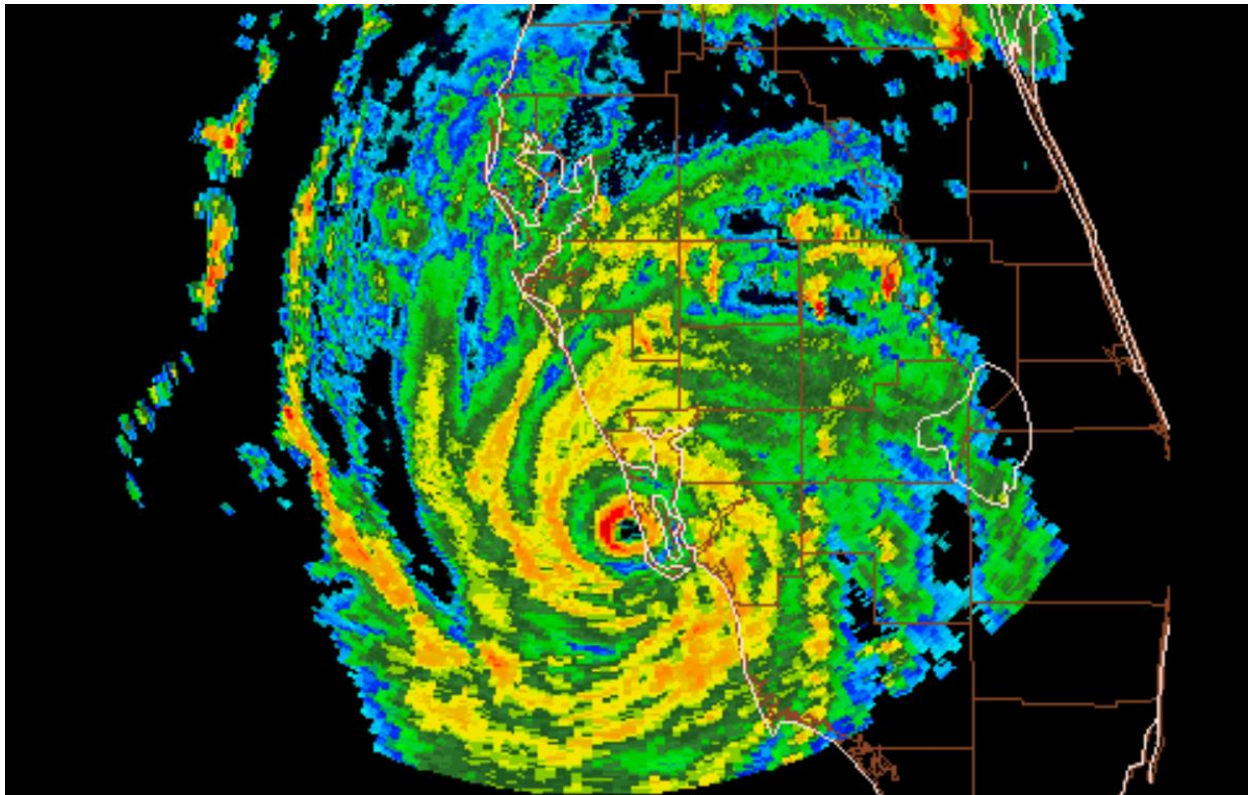


Tip No. 2

Treat the core of a major hurricane like it's a tornado.



Tip No. 2 (cont'd)





Tip No. 2 (cont'd)

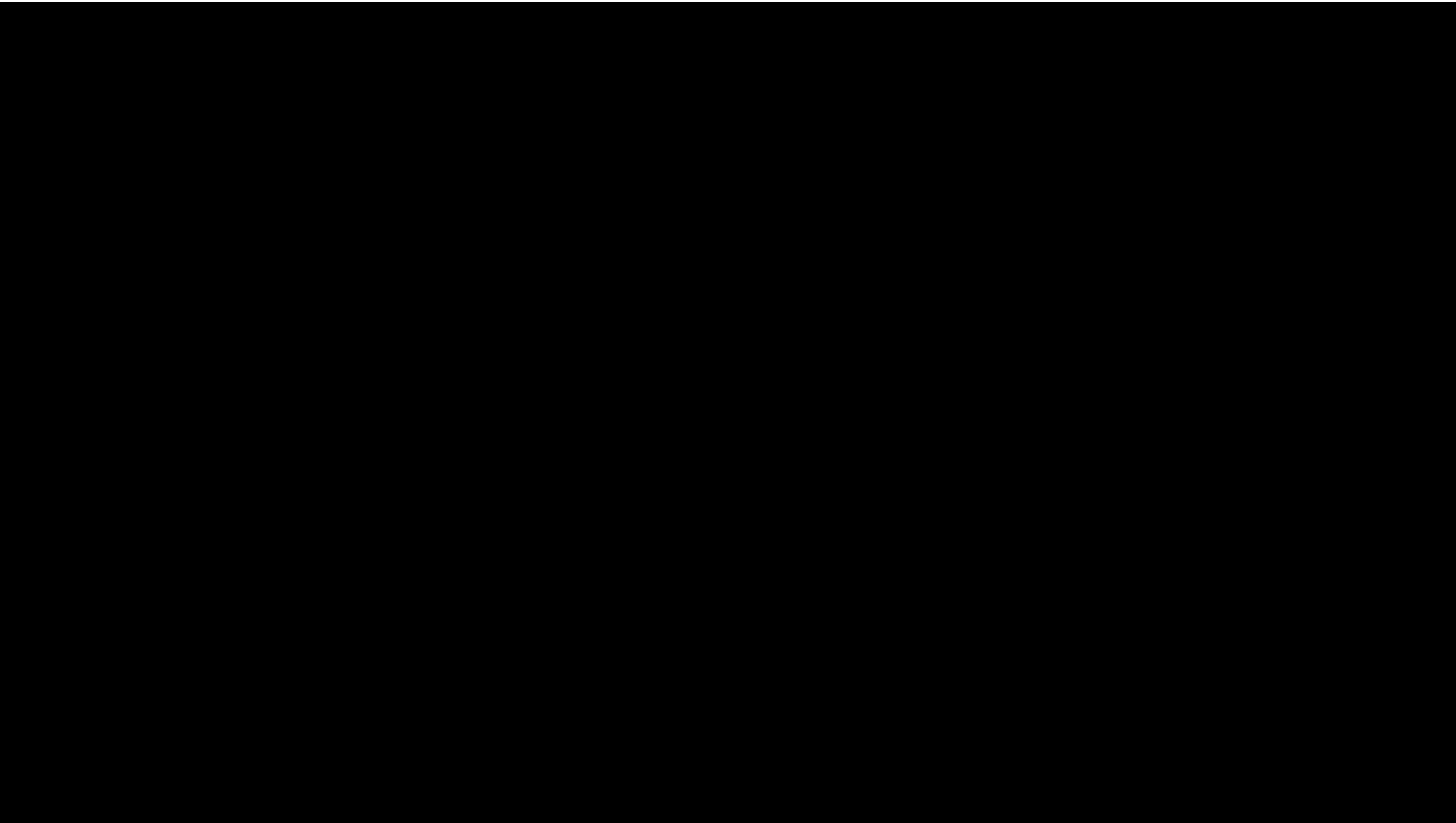
A hurricane is large, but the core (eyewall) is small.

When the core of major (Cat-3+) hurricane reaches you, winds:

- **Increase suddenly.**
- **Become turbulent & very violent.**

And visibility reduces to near zero. Take cover.

Tip No. 2: VIDEO (Hurricane PATRICIA)



Tip No. 2: IMAGES



Tip No. 2: IMAGES (cont'd)



Tip No. 2: IMAGES (cont'd)



Tip No. 2: IMAGES (cont'd)



Tip No. 2: IMAGES (cont'd)



Tip No. 2: IMAGES (cont'd)



Tip No. 2: IMAGES (cont'd)



Tip No. 2: IMAGES (cont'd)





Tip No. 3

**Winds won't always
blow straight—
but may swirl
dangerously.**



Tip No. 3 (cont'd)

Hurricanes produce mostly straight-line winds.

But sometimes they don't:

- **In urban areas:**
 - Buildings & streets produce chaotic flow.
 - Debris flies in every direction.
- **In eyewall mesovortices.**

So, there's not always a safe "downwind" side.

Tip No. 3: VIDEO (Super Typhoon HAIYAN)



Tip No. 3: IMAGES



Tip No. 3: IMAGES (cont'd)



Twitter: @iCyclone

Facebook: /iCyclone



THANKS! Questions?

