

Local Storm Surge Considerations: Florida Keys

Examining the role of a complex
coastline in storm surge evolution

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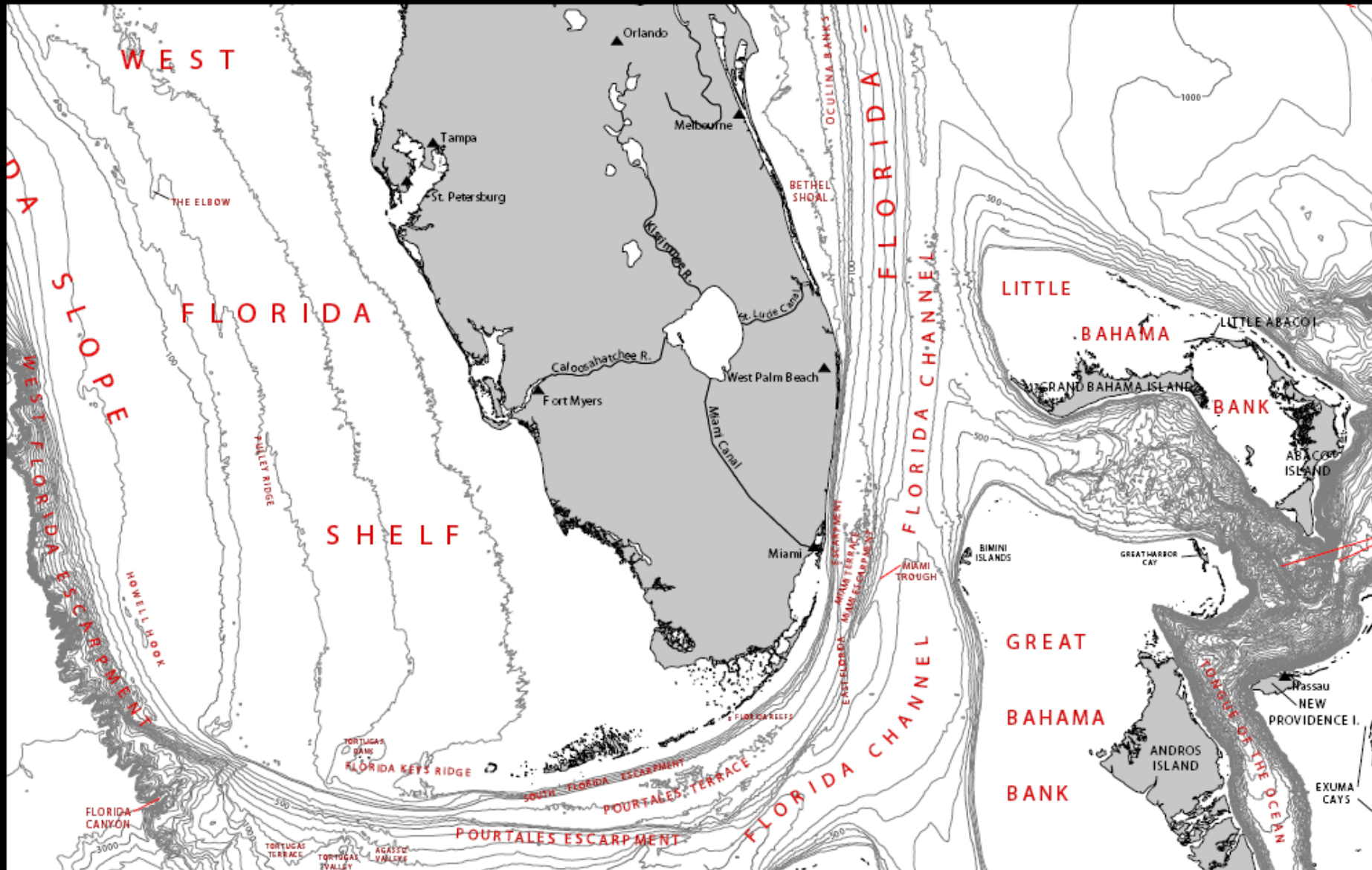
<http://weather.gov>



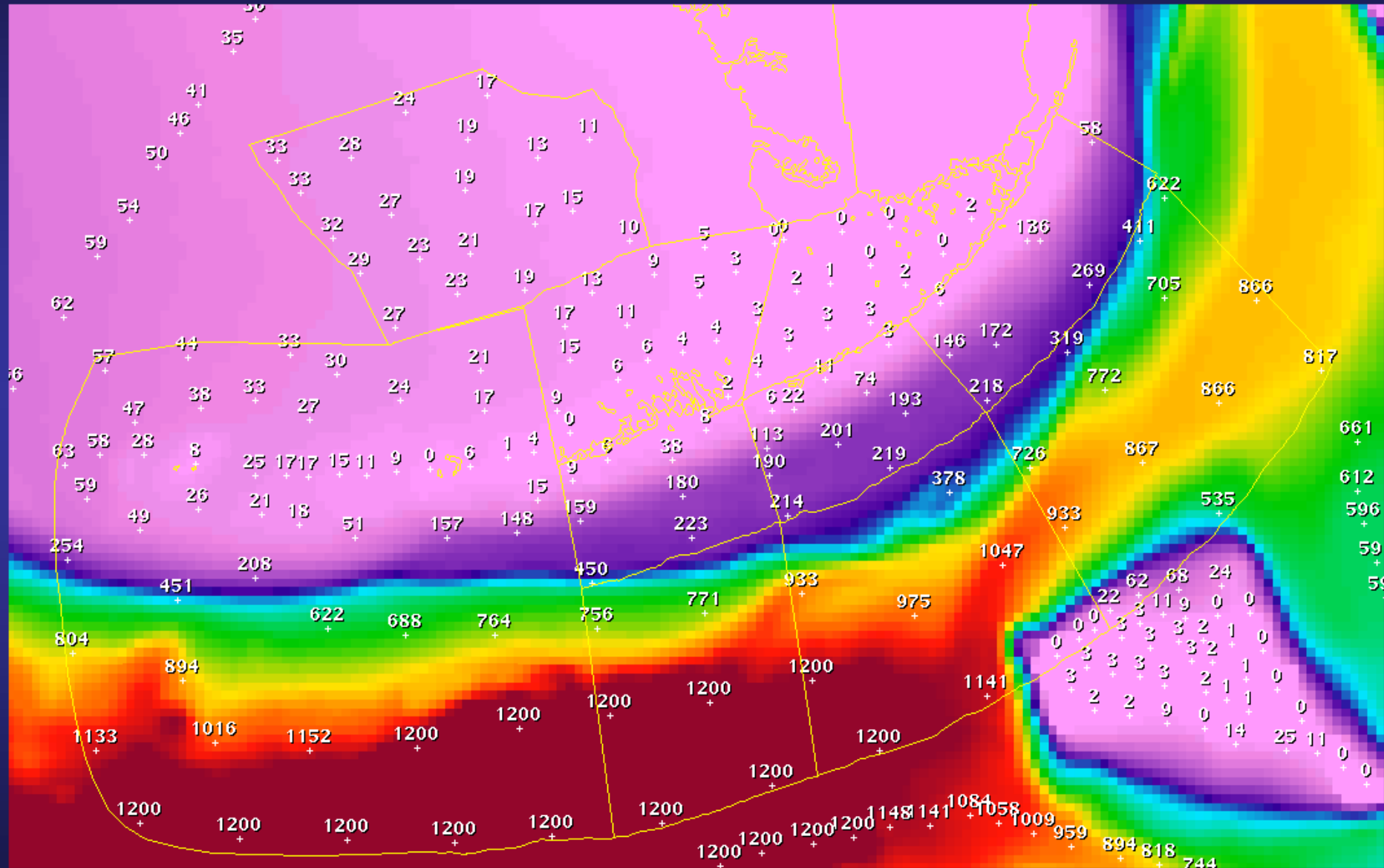
4 Rules Not to Live By...

...in the Florida Keys

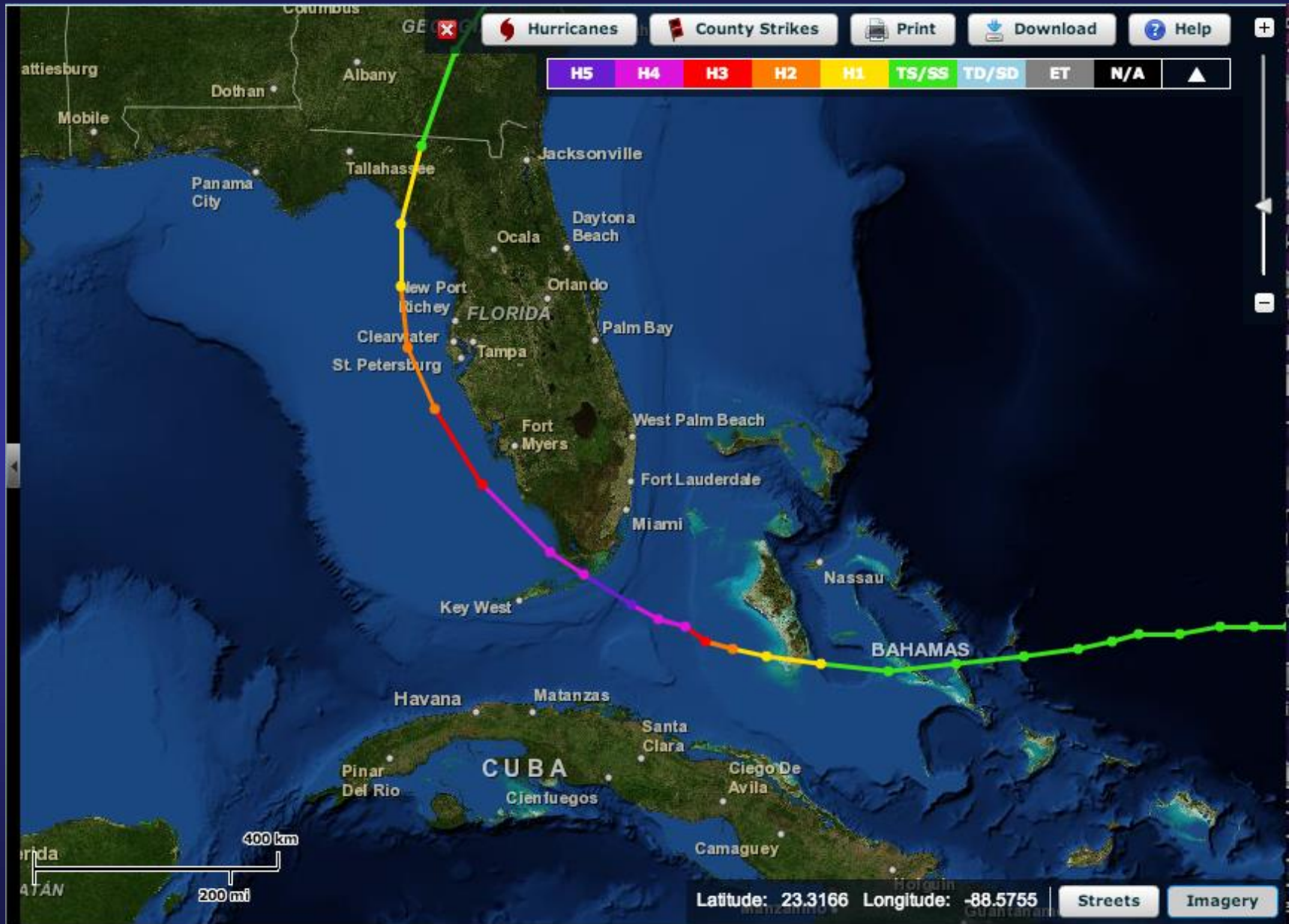
- “The coral reef protects us from damaging storm surge.”
- “The storm surge flooding is worst when the winds and weather are the worst .”
- “Storm surge only comes from the
[ocean / bay] side!”



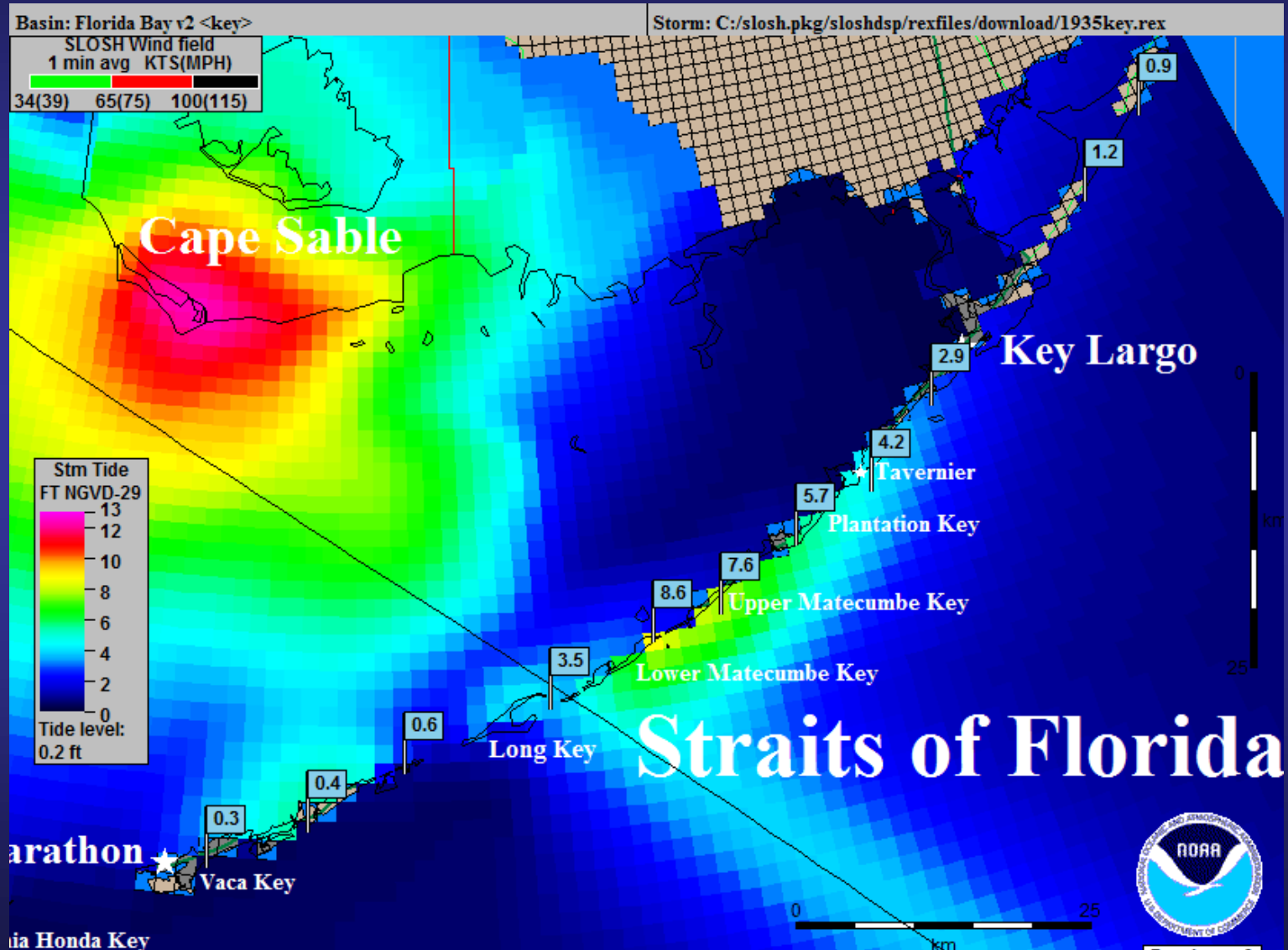
Bathymetry of the Florida Keys Coastal Waters (meters)



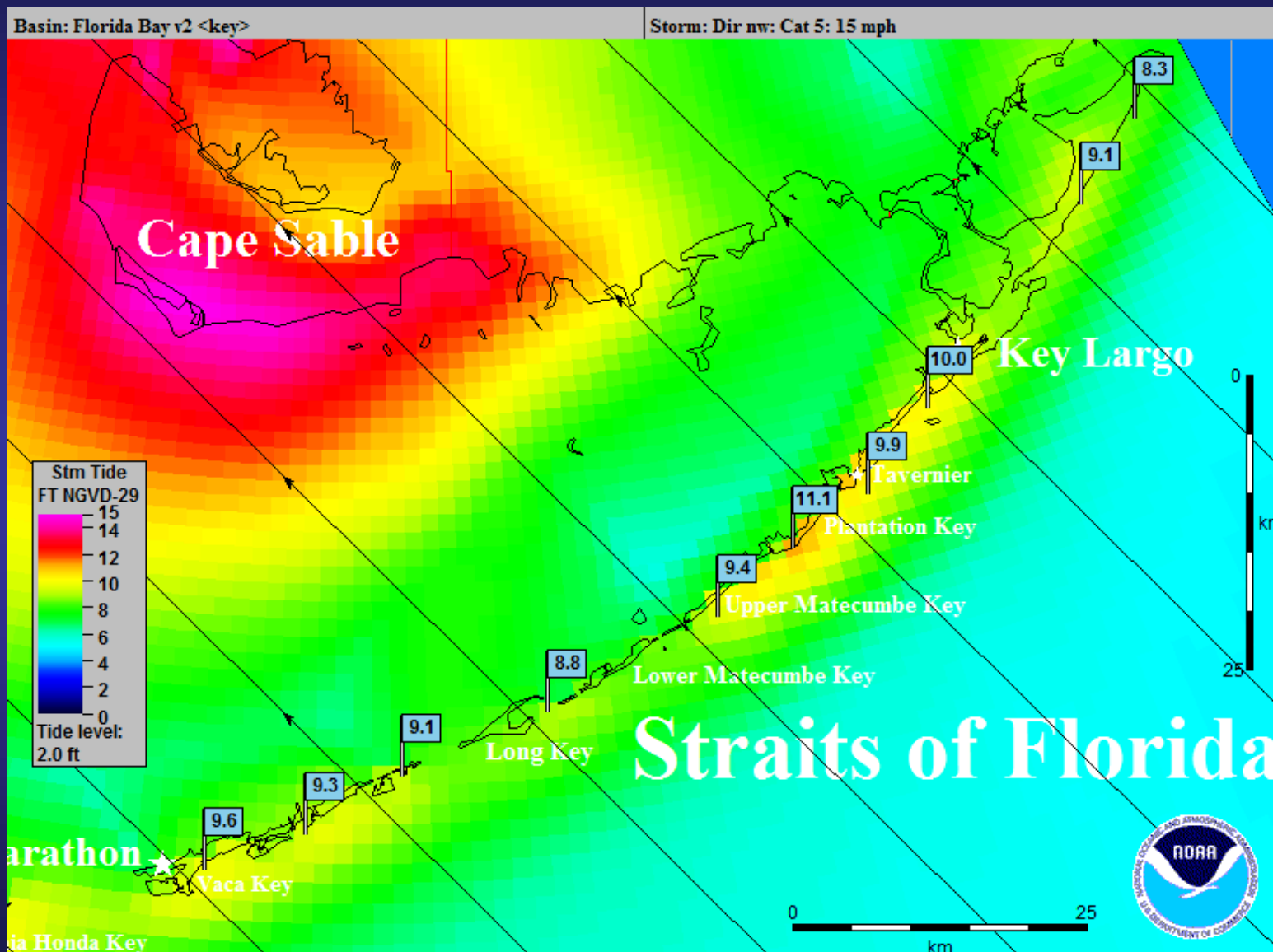
1935 – The Labor Day Hurricane



1935 "Labor Day" Hurricane Max. Envelope of Water



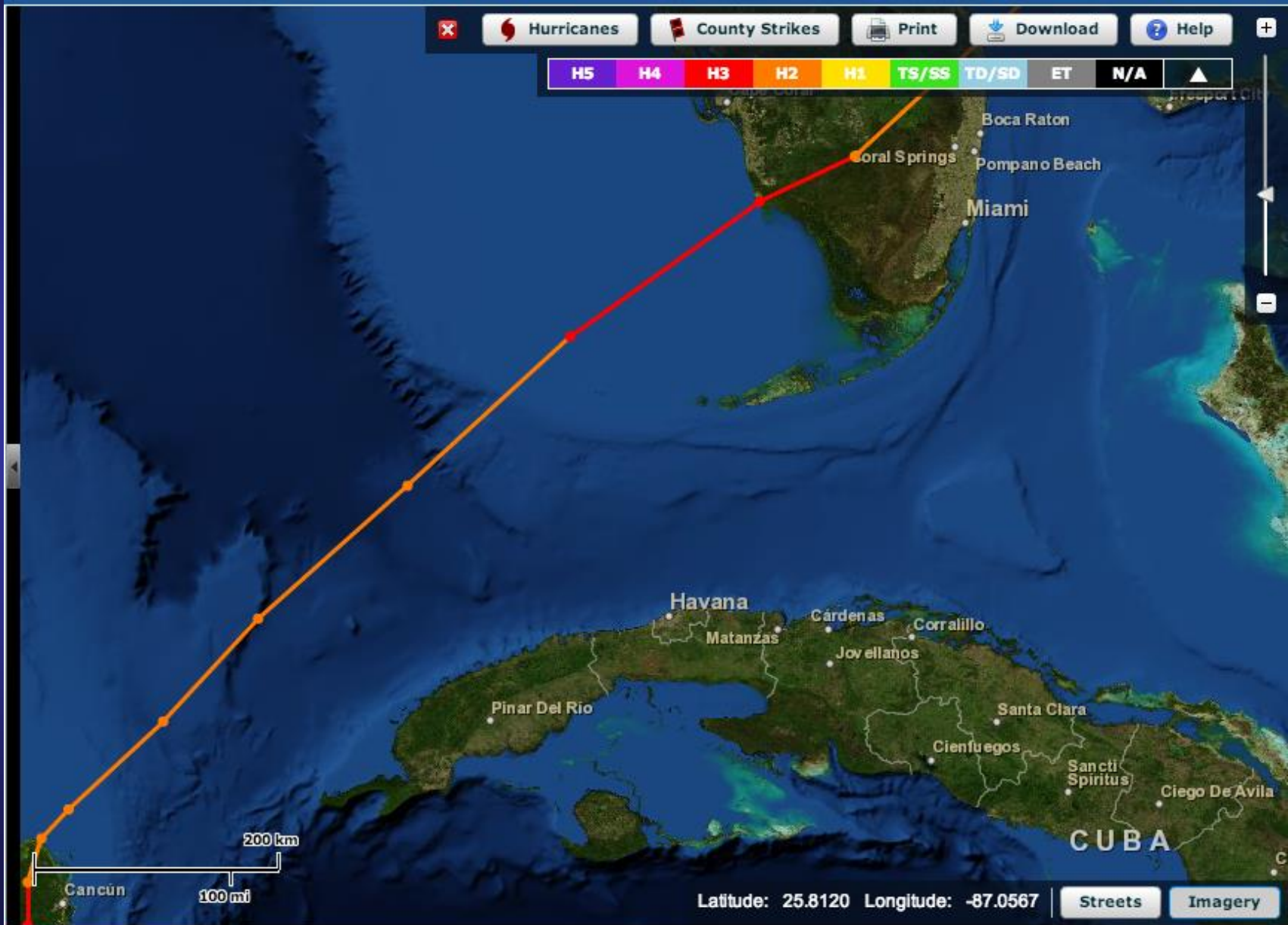
Category 5 – Northwest 15 mph MEOW

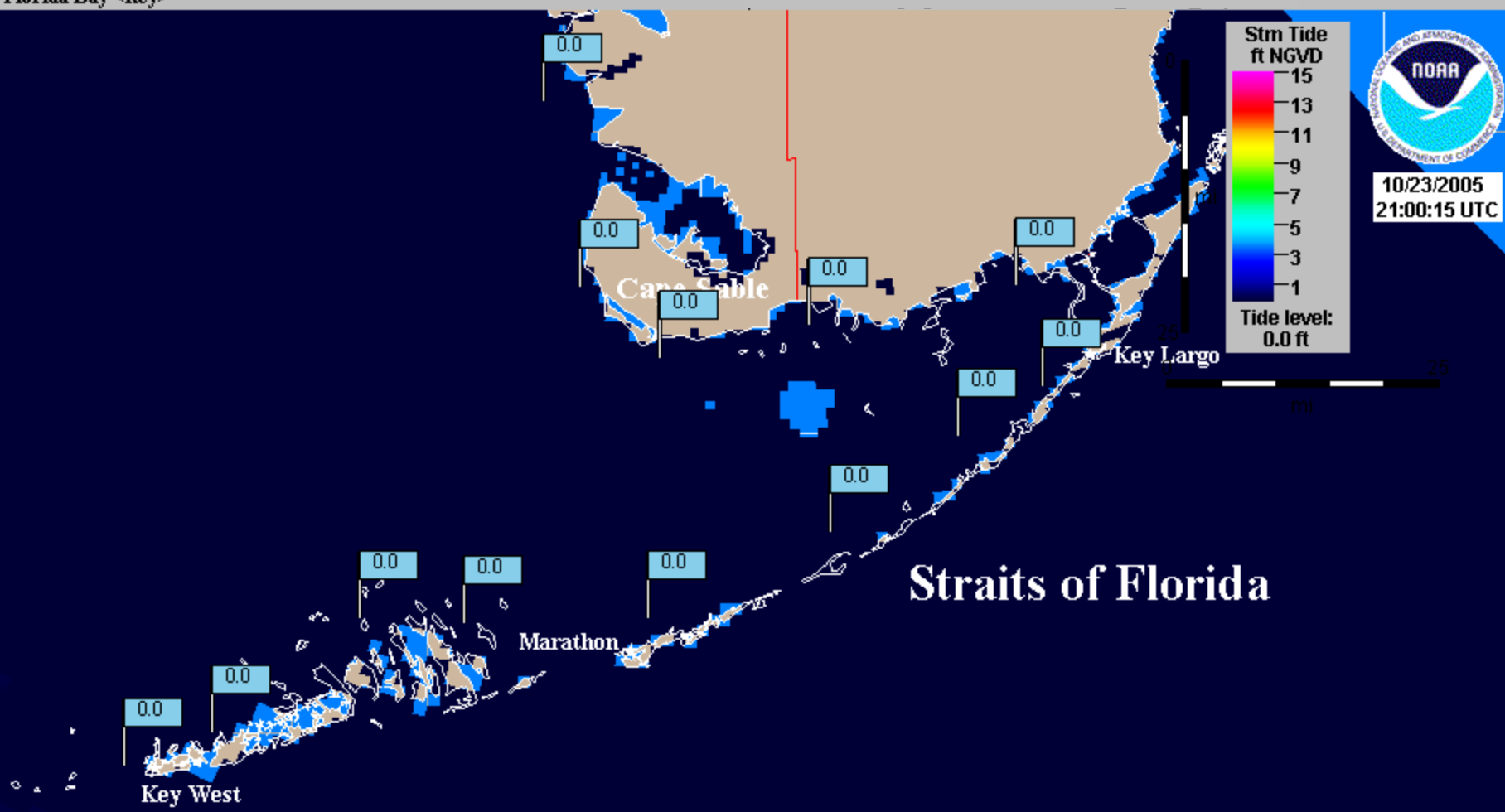


1935 Storm Surge

- Maximum Water Levels 20 to 25 feet
- Calculated Storm Surge plus Wave Set yields 18.7 feet at Lower Matecumbe Key
- Shoreline wave height and wave run-up may be significant in very small, intense hurricanes

Hurricane Wilma - 2005

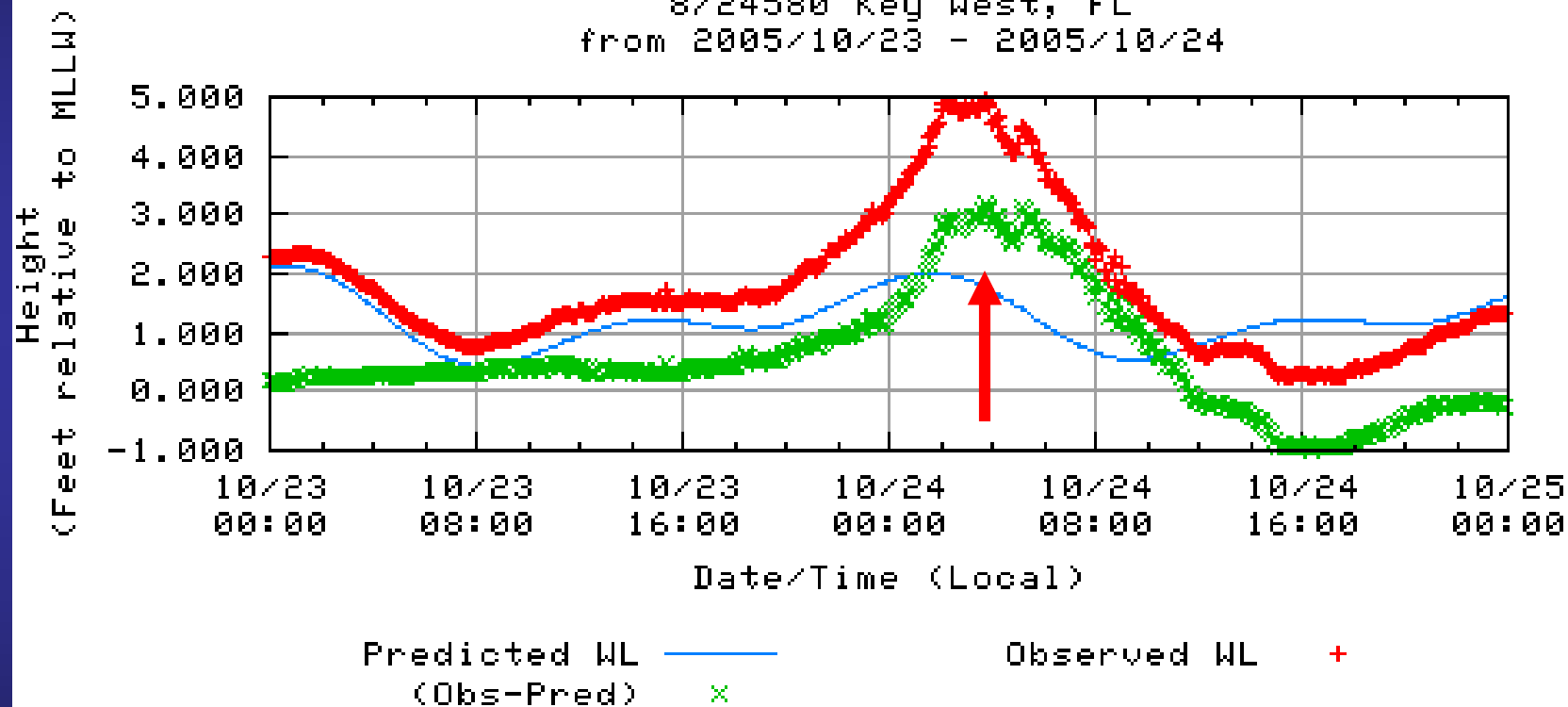




Straits of Florida

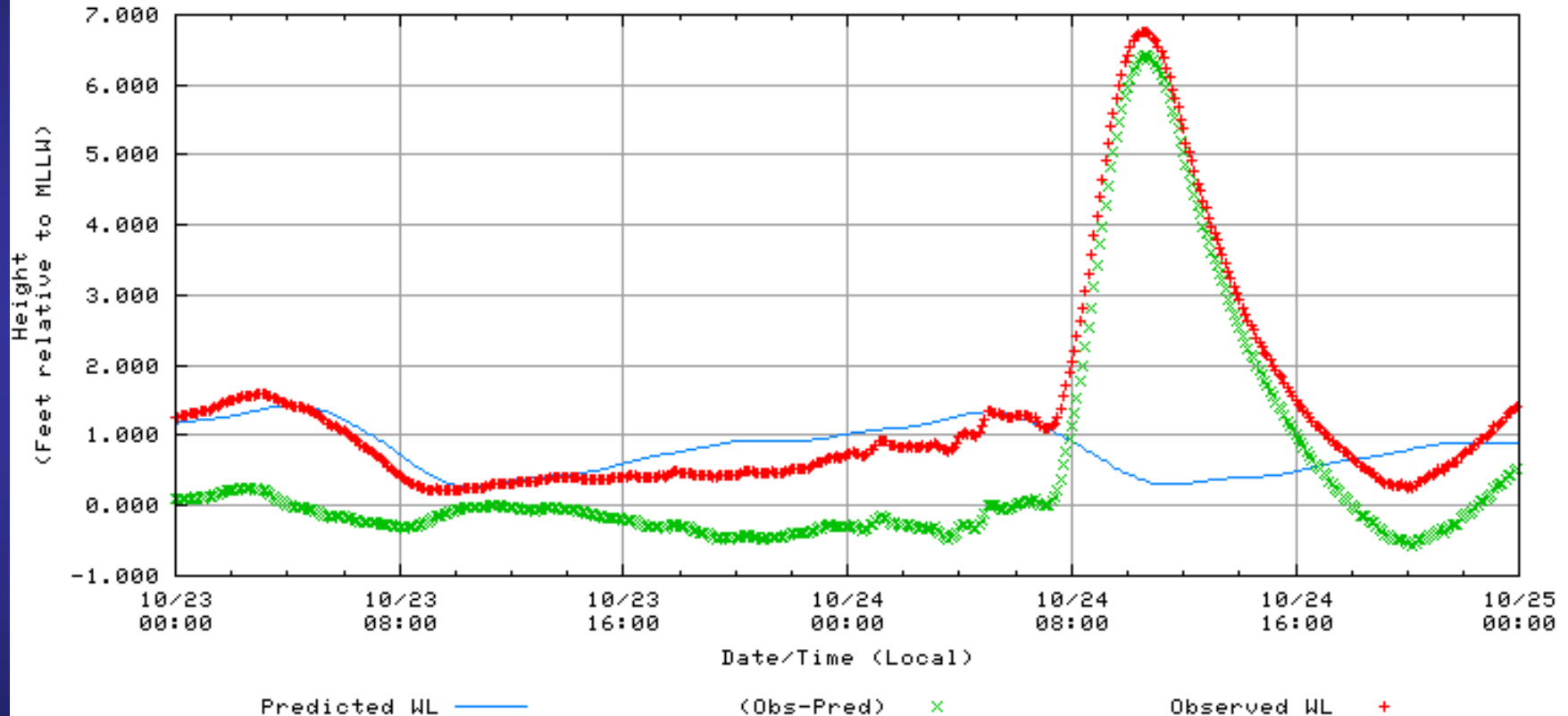
KEY WEST, FLORIDA

NOAA/NOS/CO-OPS
Verified Water Level vs. Predicted Plot
8724580 Key West, FL
from 2005/10/23 - 2005/10/24



VACA KEY (MARATHON, FLORIDA)

NOAA/NOS/CO-OPS
Verified Water Level vs. Predicted Plot
8723970 Vaca Key, FL
from 2005/10/23 - 2005/10/24



Wilma – October 24, 2005

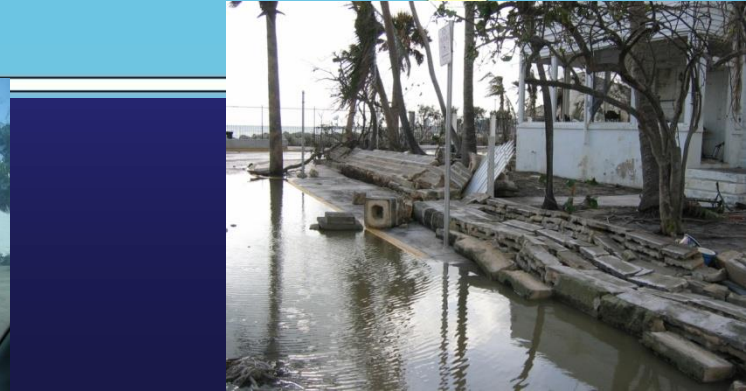
3:00 AM to 5:00 AM EDT

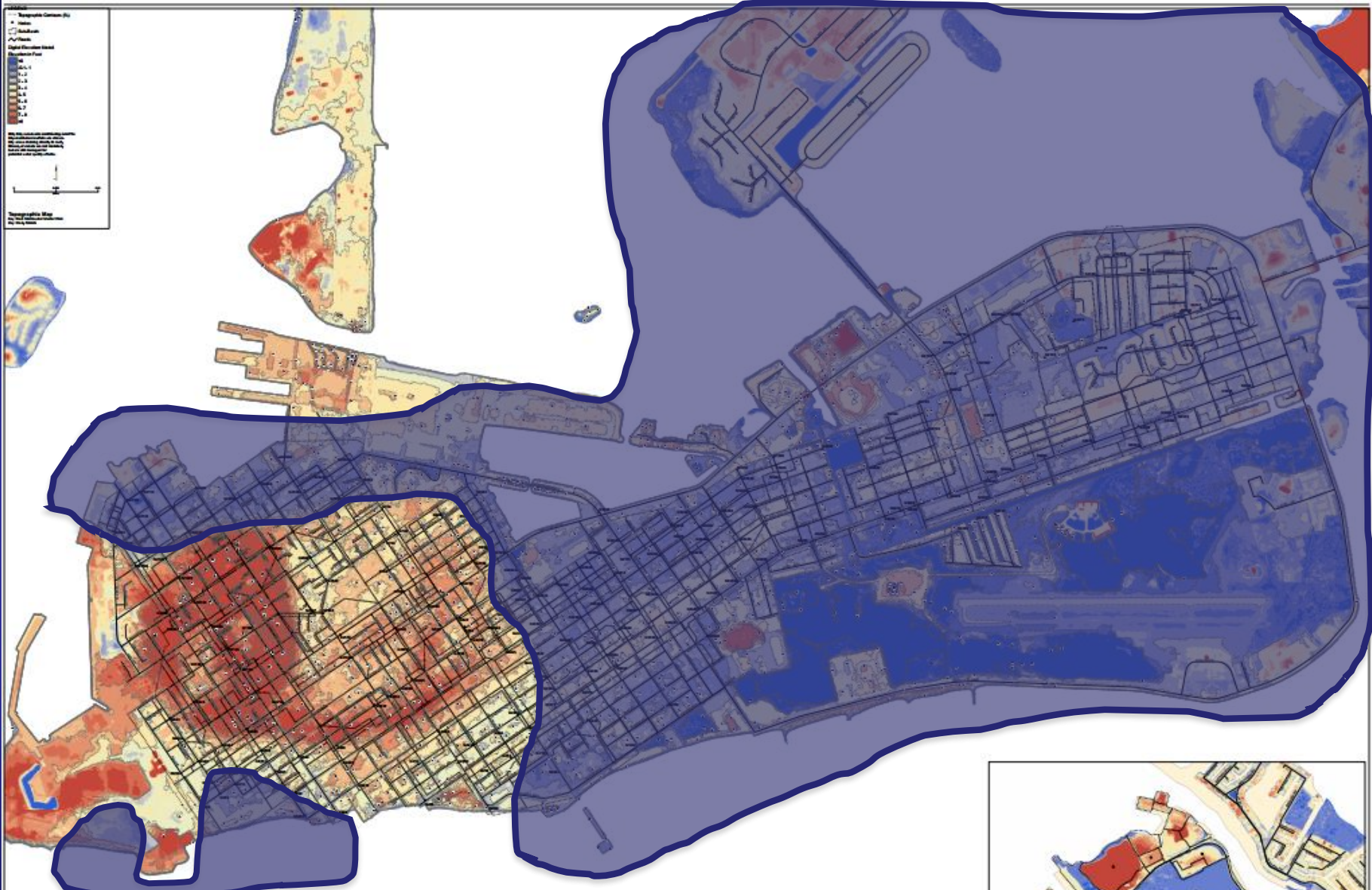
**Category One
Hurricane Force
Winds from Key
West to Marathon**



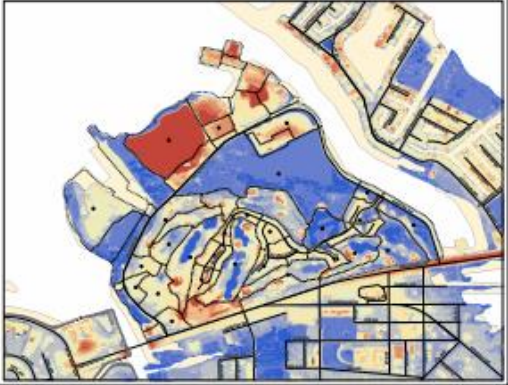
**Key West Airport
Flooded...phone lines
out to weather sensors**

**Storm Tide 4.5 feet
inundates south half of
“New Town” Key West**





**Key West Inundation Estimate
7:00 to 9:00 AM EDT**



Wilma – October 24, 2005

7:00 through 9:00 AM EDT

Rain ends...and winds now below Tropical Storm Force in Key West...
...good weather for photographs?



Wilma – October 24, 2005

1100 AM EDT

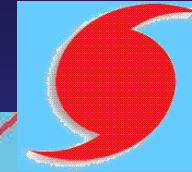
**Waters begin to recede
in Key West...**

**...but severe flooding
from the north shore is
occurring 50 miles up
the road in Marathon**



Wilma – October 24, 2005

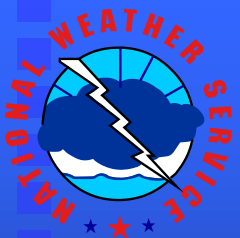
100 PM EDT



Flooding abating in Key West... but U.S. 1 flooded for 21 miles from Marathon to Conch Key

U.S. 1 begins to flood at the “18-Mile Stretch”





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