Indian River Lagoon Observations

October 11, 2016: A Brush with Hurricane Matthew

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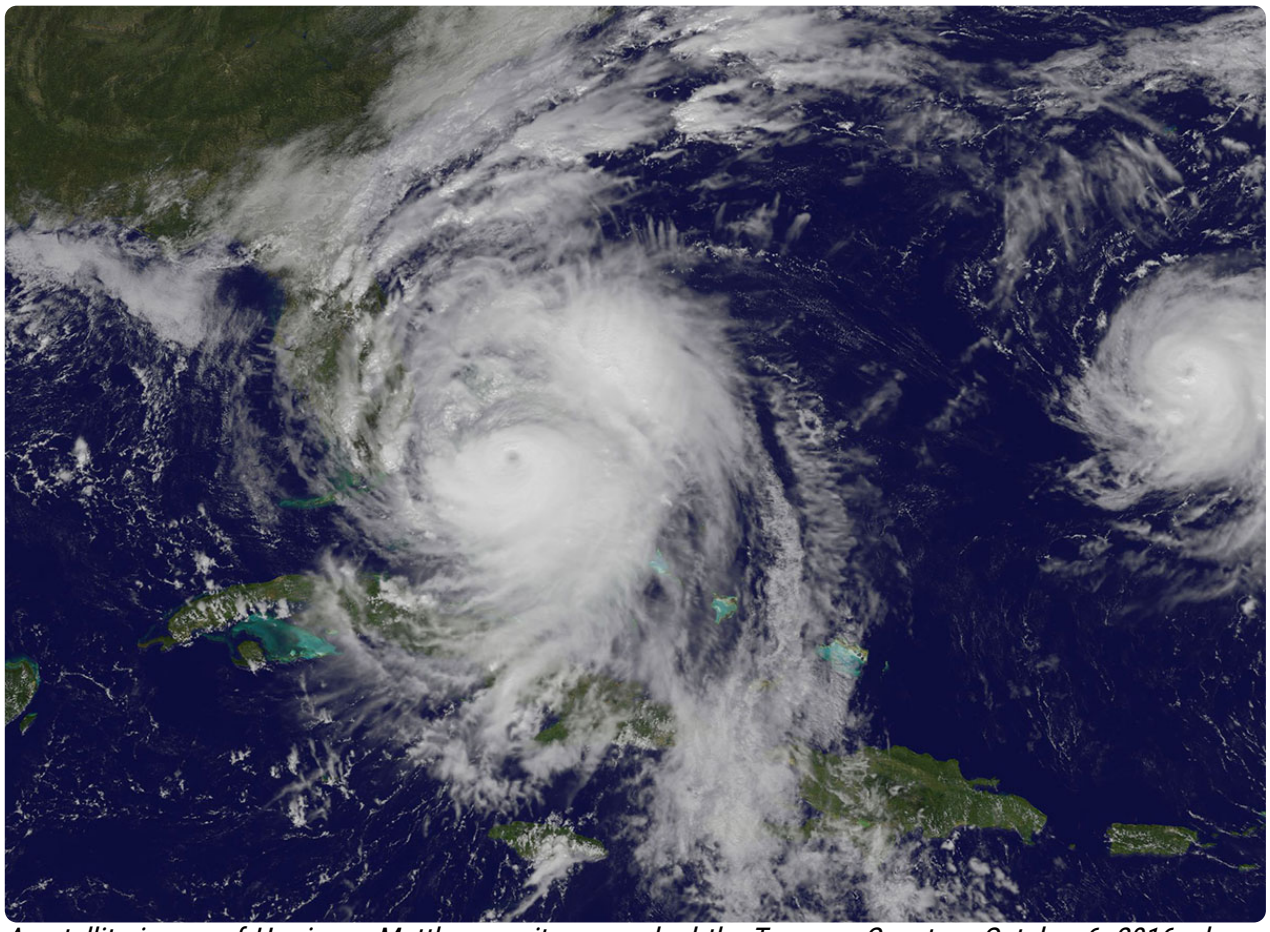
Hurricane Matthew made a historical visit to the southeastern United States this past week. Matthew was briefly a Category 5 hurricane, the first one in the Atlantic since 2007. For about two days, it appeared that it would hit our part of the east Florida coast as a Category 4 hurricane that would have resulted in catastrophic damage and significant loss of life. But a last-minute small turn or “wobble” as it approached the coast resulted in our Treasure Coast receiving only moderate tropical storm conditions. Matthew continued north, making landfall in South Carolina as a Category 1 hurricane with historically high storm surges that caused extensive flooding in the Carolinas.

Here on the Treasure Coast the Indian River Lagoon Observatory Network of Environmental Sensors (http://fau.loboviz.com/) (IRLON) captured the strong winds and heavy rain from Matthew as it moved northward from Stuart to Sebastian on October 6 and 7. Sustained winds increased from approximately 20 mph on October 6 before increasing up to 50 mph at the peak of the storm in the early hours of October 7 (Figure 1 a). Maximal sustained winds were highest at IRLON sites closer to the coast with 51.8, 46.4 and 49.0 mph recorded at IRL-LP, IRL-SLE and IRL-JB respectively. SLE-ME, SLE-NF and SLE-SF in the St. Lucie Estuary measured maximal sustained winds ranging from 37.9, 42.1 and 39.6 mph respectively. During that time, maximal wind gusts ranged from 58.0 at SLE-ME to 73.4 mph at IRL-LP (Figure 1 b).

We did not receive as much rainfall as had been predicted and it varied considerably among our sites, with total rain ranging from 2.0 inches at SLE-SF to 4.3 inches at IRL-SLE (Figure 2 a). To put that in perspective, we recorded much more rainfall in an event in September 2015 with a maximal one-day rainfall of 9.6 inches (see Indian River Lagoon Observations, May 26, 2016) (/hboi/irlo/may26_2016.php).



A satellite image of Hurricane Matthew, as it approached the Treasure Coast on October 6, 2016, shows the massive size of this storm (Image credit: NASA)

There was much concern in advance of the storm of potential storm surge along our coast. Fortunately, Matthew stayed offshore and moved quickly away. Storm surge in the IRL and SLE was minor (Figure 2 b), and only observable (about 1-1.5 foot) at sites near two of the inlets: St. Lucie Inlet (IRL-SLE) and Sebastian Inlet (IRL-SB). Storm surge was probably higher at our local beaches, as the lagoon is protected by the barrier island. But residents along our estuaries did not experience any surge, unlike the 2004 twin hurricanes where many shoreline residents experienced substantial flooding.

In terms of water quality, we did see all of the expected short-term impacts, such as reduced salinity (due to the rainfall and runoff) and high turbidity (due to the winds stirring up the sediments and some erosion). The greatest impact is likely to be felt in the St. Lucie Estuary (SLE), as rainfall from Matthew all the way up to Orlando is draining down the Kissimmee Basin into Lake Okeechobee. Discharges from the lake into SLE that started in January have now exceeded 200 billion gallons and may very well continue for the rest of this year, as will the impacts on our local estuaries.

Observations Archive

April 6, 2016:You can observe a lot by just watching (/hboi/irlo/april06_2016.php)

April 27, 2016: Our Tenth IRLON Site (/hboi/irlo/april27_2016.php)

May 12, 2016: Barnacle Busting (/hboi/irlo/may12_2016.php)

May 26, 2016: Future of Water Quality Research in Florida Workshop (/hboi/irlo/may26_2016.php)

June 29, 2016: St. Lucie Estuary Algal Blooms (/hboi/irlo/june_29_2016.php)

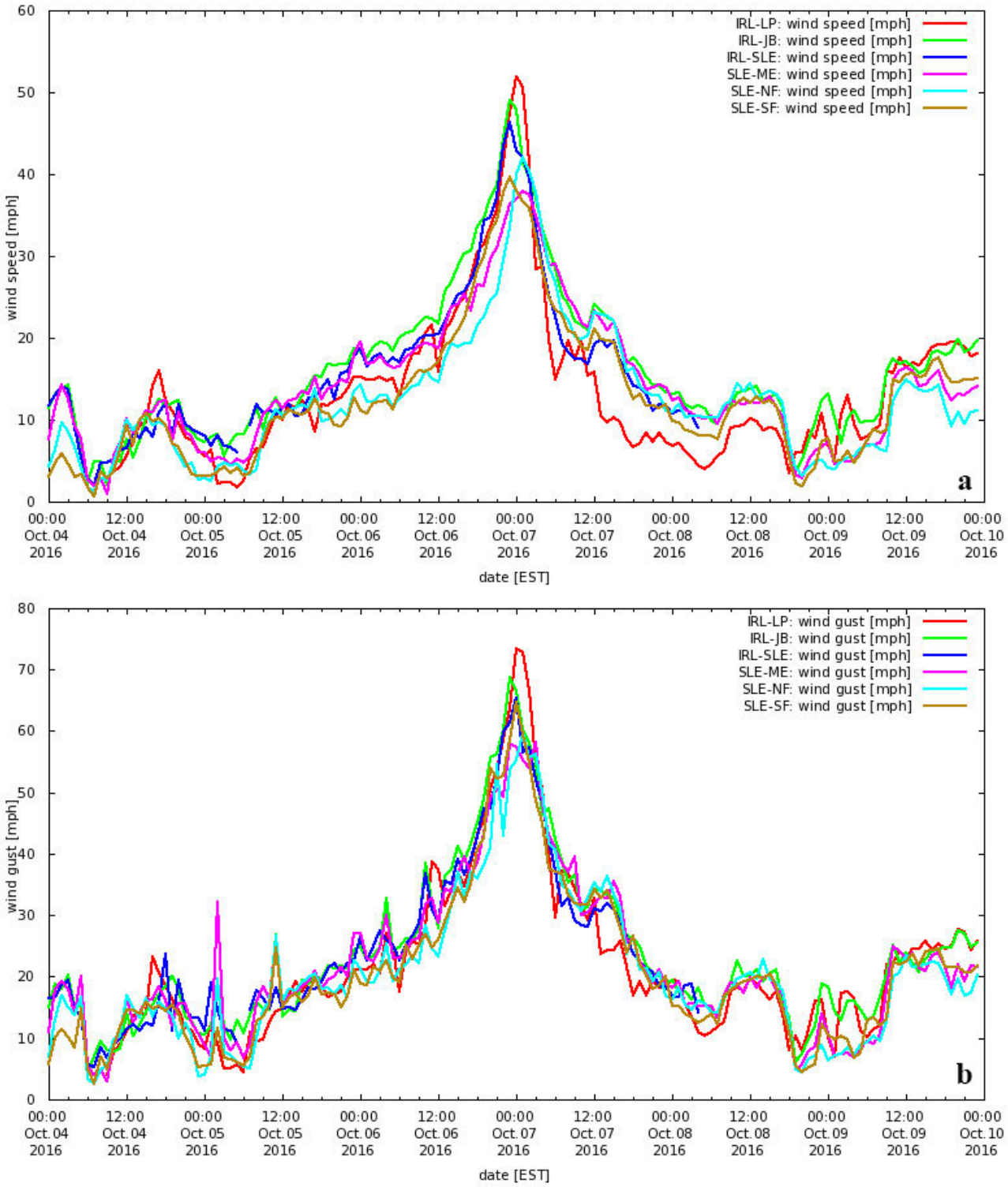


Figure 1. (a) Mean and (b) maximal hourly wind speed (mph)at IRLON sites before, during, and after Hurricane Matthew (Screen shot of IRLON Data, October 4-9, 2016, http://fau.loboviz.com/loboviz/ (http://fau.loboviz.com/loboviz/))

2016: Connecting Users to IRL Data (/hboi/irlo/july08_2016.php)

October 11, 2016: A Brush with Hurricane Matthew (/hboi/irlo/oct11_2016.php)

January 17, 2017: Martin County Youth Leadership Environmental Day (/hboi/irlo/jan17_2017.php)

March 3, 2017: St. Lucie Estuary – What A Difference A Year Makes! (/hboi/irlo/mar03_2017.php)

June 12, 2017: Here Comes the Rain – 2017's First Flush (/hboi/irlo/june12_2017.php)

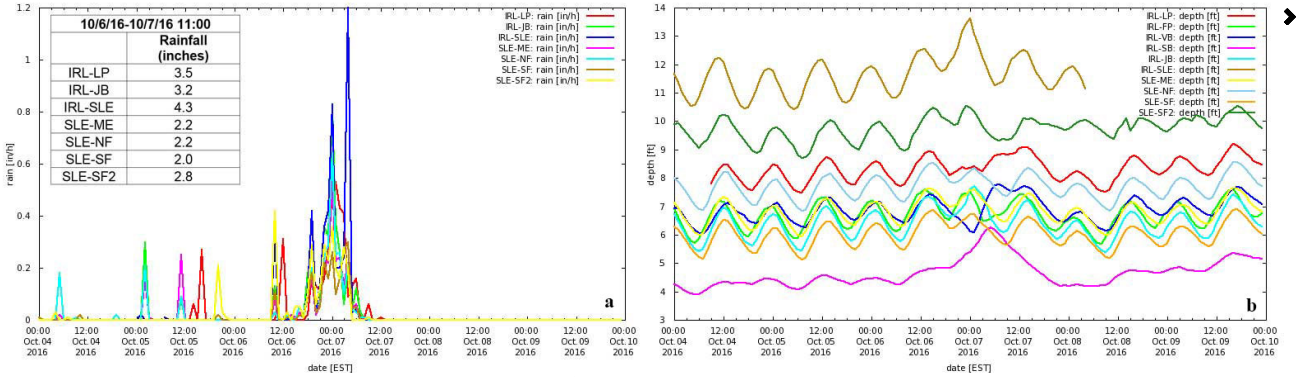


Figure 2. (a) Hourly rainfall (inches/hour) and (b) water depth feet)at IRLON sites before, during, and after Hurricane Matthew. (Screen shot of IRLON Data, October 4-9, 2016, http://fau.loboviz.com/loboviz/ (http://fau.loboviz.com/loboviz/))

August 24, 2017: An Estuary at your Fingertips: Connecting the Community to Environmental Data (/hboi/irlo/aug24_2017.php)

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