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## Indian River Lagoon Observations

June 12, 2017: Here Comes the Rain – 2017’s First Flush

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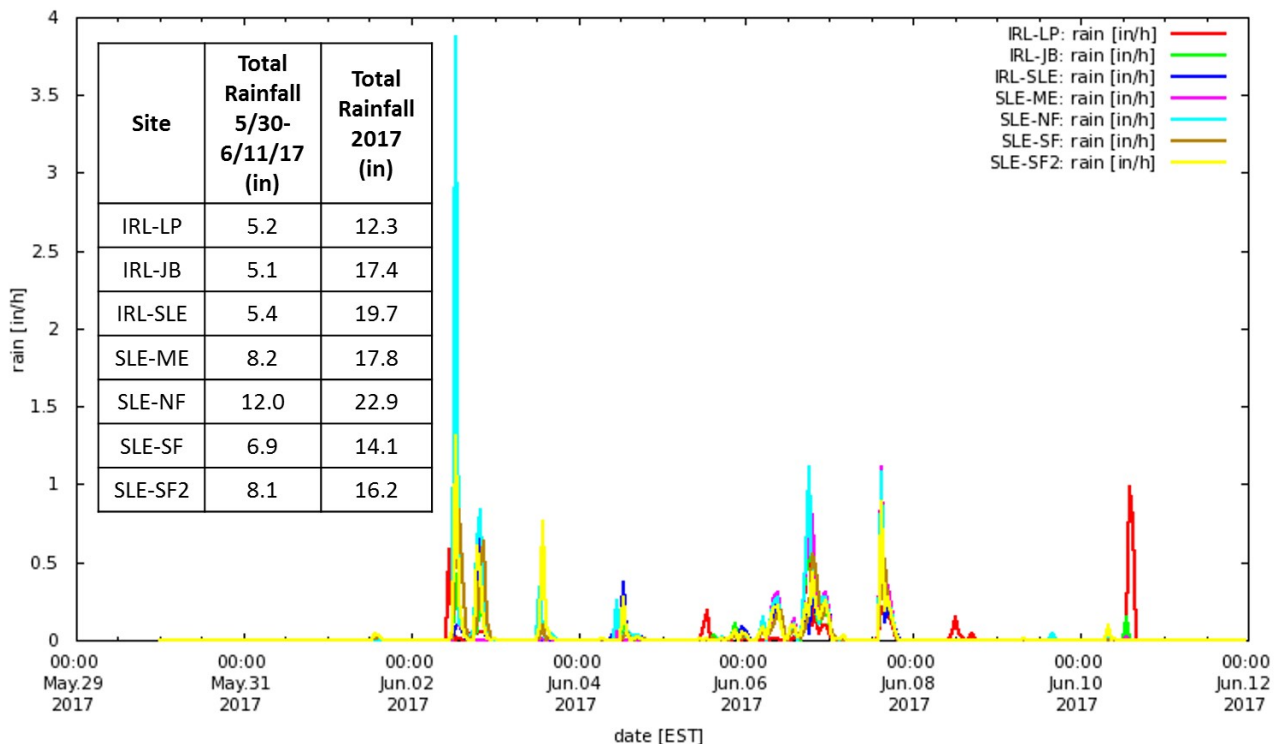


Figure 1. Hourly measurements of rainfall at IRLON sites in the southern network (Screen shot of IRLON Data, May 30-June 11, 2017, <http://fau.loboviz.com/loboviz/> (<http://fau.loboviz.com/loboviz/>)).

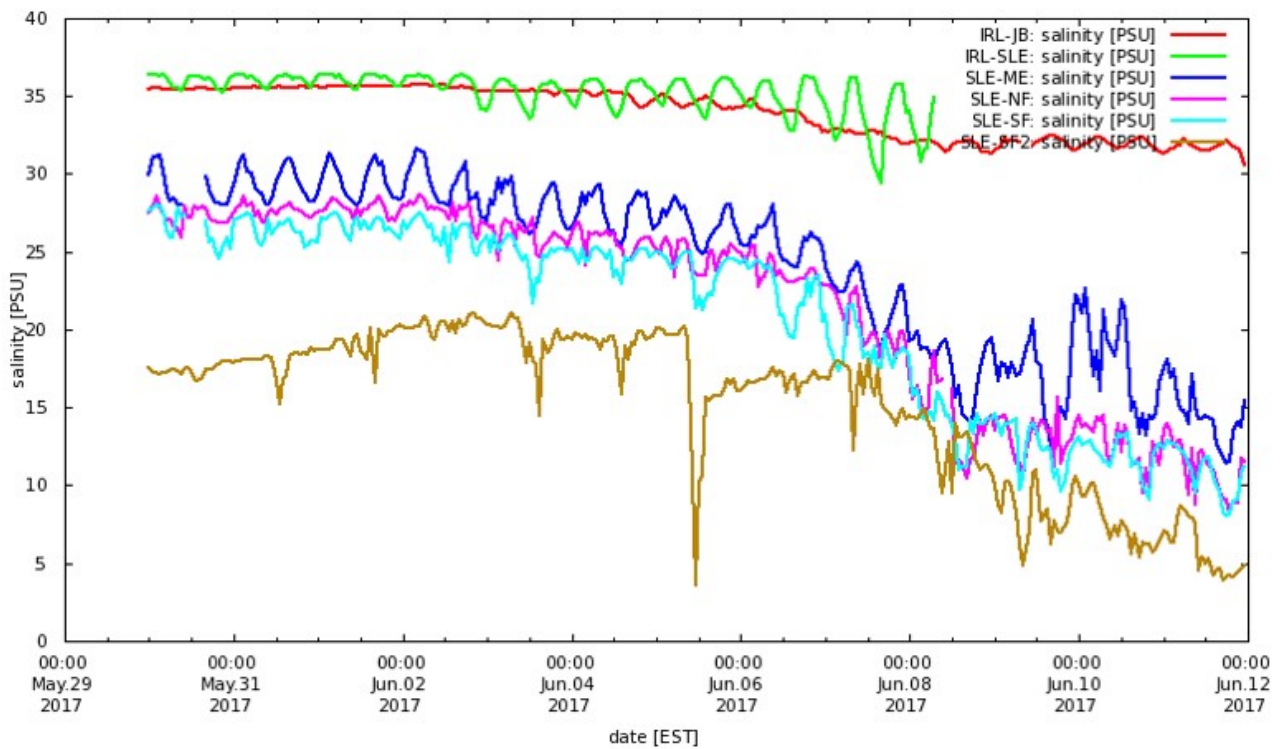


Figure 2. Hourly measurements of salinity at IRLON sites in the southern network from May 30-June 11, 2017 (Screen shot of IRLON Data, May 30-June 11, 2017, <http://fau.loboviz.com/loboviz/> (<http://fau.loboviz.com/loboviz/>)).

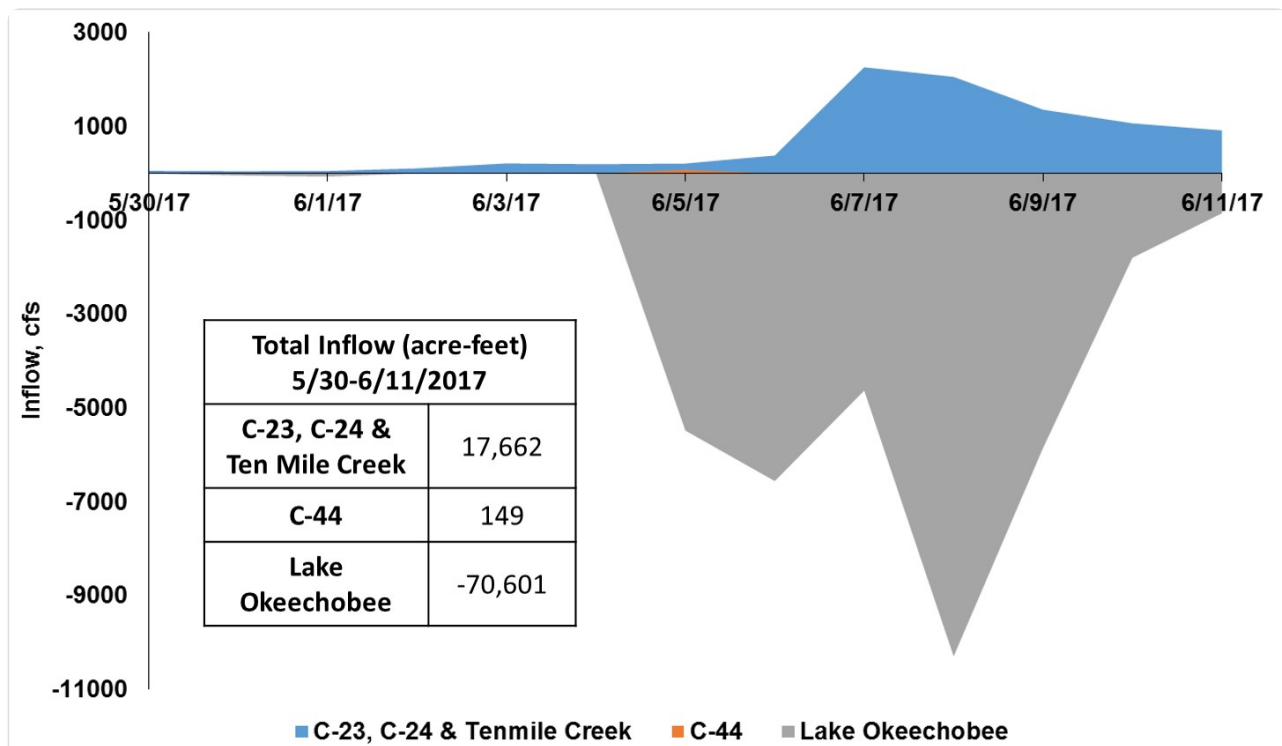


Figure 3. Daily (cubic feet per second) and total (acre-feet) inflows from major canals into the St. Lucie Estuary (Data Source: DBHYDRO, South Florida Water Management District).

After an exceptional dry season fraught with increased wildfires, the wet season began in earnest last week with heavy rainfall driven by the remnants of a tropical depression originating in the Pacific. The rainfall is providing much needed relief to the entire state, which has been in a drought for much of the dry season. What a difference when compared to 2016, at which point discharges from Lake Okeechobee had

already been occurring for 123 days due to above normal rainfall in the dry season. Please see our Indian River Lagoon Observations, March 3, 2017 ([/hboi/irlo/mar03\\_2017.php](/hboi/irlo/mar03_2017.php)) for a comparison on last year's wet year with this year's dry year.

During the dry season, pollutants on land accumulate on roads, parking lots, lawns, etc. so the longer the period without rainfall, the higher the concentration of the pollutants. Once the first rainfall event of the year occurs, which typically coincides with the beginning of the wet season, stormwater flushes the accumulated pollutants into local waterways. This phenomenon is called the "first flush."

Our Indian River Lagoon Observatory Network of Environmental Sensors (IRLON) (</hboi/irlo/irlon.php>) has been recording the response of the St. Lucie Estuary (SLE) and nearby Indian River Lagoon (IRL) to the first rainfall event since the beginning of the wet season. Total rainfall from the May 30 to June 11, 2017 ranged from 5.1 inches at IRL-JB near the coast to 12.0 inches at SLE-NF further upstream in the North Fork of the SLE (see Figure 1) and accounts for approximately 27 to 52% of the total year-to-date rainfall among sites.

The most obvious sign of the "first flush" is reduced salinity. Salinity decreased at all sites with the greatest decrease visible at all four SLE sites. Values, which had remained stable above 20 PSU since the Lake Okeechobee releases ended in November 2016, dropped to approximately 5, 10, and 15 PSU at SLE-SF2, SLE-NF and SLE-SF, and SLE-ME respectively (see Figure 2). Salinity at the sites closer in proximity to the St. Lucie Inlet (IRL-SLE, IRL-JB) showed a minimal decrease in salinity.

Most of the stormwater into the St. Lucie Estuary flowed from the North Fork with a combined total inflow of 17,662 acre-feet from May 30 to June 11, 2017 for Ten Mile Creek, the C-23 and C-24 canals (see Figure 3: Data source: DBHYDRO, SFWMD). Inflow into the South Fork of the SLE was limited to localized watershed runoff, as very minimal inflow was recorded at the St. Lucie Locks and Dam. Negative inflows recorded at the S308 lock and dam structure at Port Mayaca, indicate that runoff from the C-44 watershed is flowing back into Lake Okeechobee instead of moving east into the SLE. Note that more water is flowing back to Lake Okeechobee through these canals than what is flowing into the Estuary. Combined with other inflows, lake levels have increased more than half a foot, from 11.00 feet on May 30 to 11.76 feet NGVD29 (National Geodetic Vertical Datum of 1929, a type of system for elevation comparisons) on June 11.

Reduced salinity is stressful to many plants and animals in estuaries. The severity of low-salinity stress depends primarily on how long the condition lasts. Stay tuned for any further impacts of this "first flush" on the St. Lucie Estuary and nearby Indian River Lagoon by accessing data at our IRLON website (<http://irlon.org>)

## Observations Archive

- April 6, 2016: You can observe a lot by just watching ([/hboi/irlo/april06\\_2016.php](/hboi/irlo/april06_2016.php))
- April 27, 2016: Our Tenth IRLON Site ([/hboi/irlo/april27\\_2016.php](/hboi/irlo/april27_2016.php))
- May 12, 2016: Barnacle Busting ([/hboi/irlo/may12\\_2016.php](/hboi/irlo/may12_2016.php))
- May 26, 2016: Future of Water Quality Research in Florida Workshop ([/hboi/irlo/may26\\_2016.php](/hboi/irlo/may26_2016.php))
- June 29, 2016: St. Lucie Estuary Algal Blooms ([/hboi/irlo/june\\_29\\_2016.php](/hboi/irlo/june_29_2016.php))
- July 08, 2016: Connecting Users to IRL Data ([/hboi/irlo/july08\\_2016.php](/hboi/irlo/july08_2016.php))

- › [October 11, 2016: A Brush with Hurricane Matthew \(/hboi/irlo/oct11\\_2016.php\)](/hboi/irlo/oct11_2016.php)
- › [January 17, 2017: Martin County Youth Leadership Environmental Day \(/hboi/irlo/jan17\\_2017.php\)](/hboi/irlo/jan17_2017.php)
- › [March 3, 2017: St. Lucie Estuary – What A Difference A Year Makes! \(/hboi/irlo/mar03\\_2017.php\)](/hboi/irlo/mar03_2017.php)
- › [June 12, 2017: Here Comes the Rain – 2017’s First Flush \(/hboi/irlo/june12\\_2017.php\)](/hboi/irlo/june12_2017.php)
- › [August 24, 2017: An Estuary at your Fingertips: Connecting the Community to Environmental Data \(/hboi/irlo/aug24\\_2017.php\)](/hboi/irlo/aug24_2017.php)

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