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Indian River Lagoon Observations

March 3, 2017: St. Lucie Estuary – What A Difference A Year Makes!

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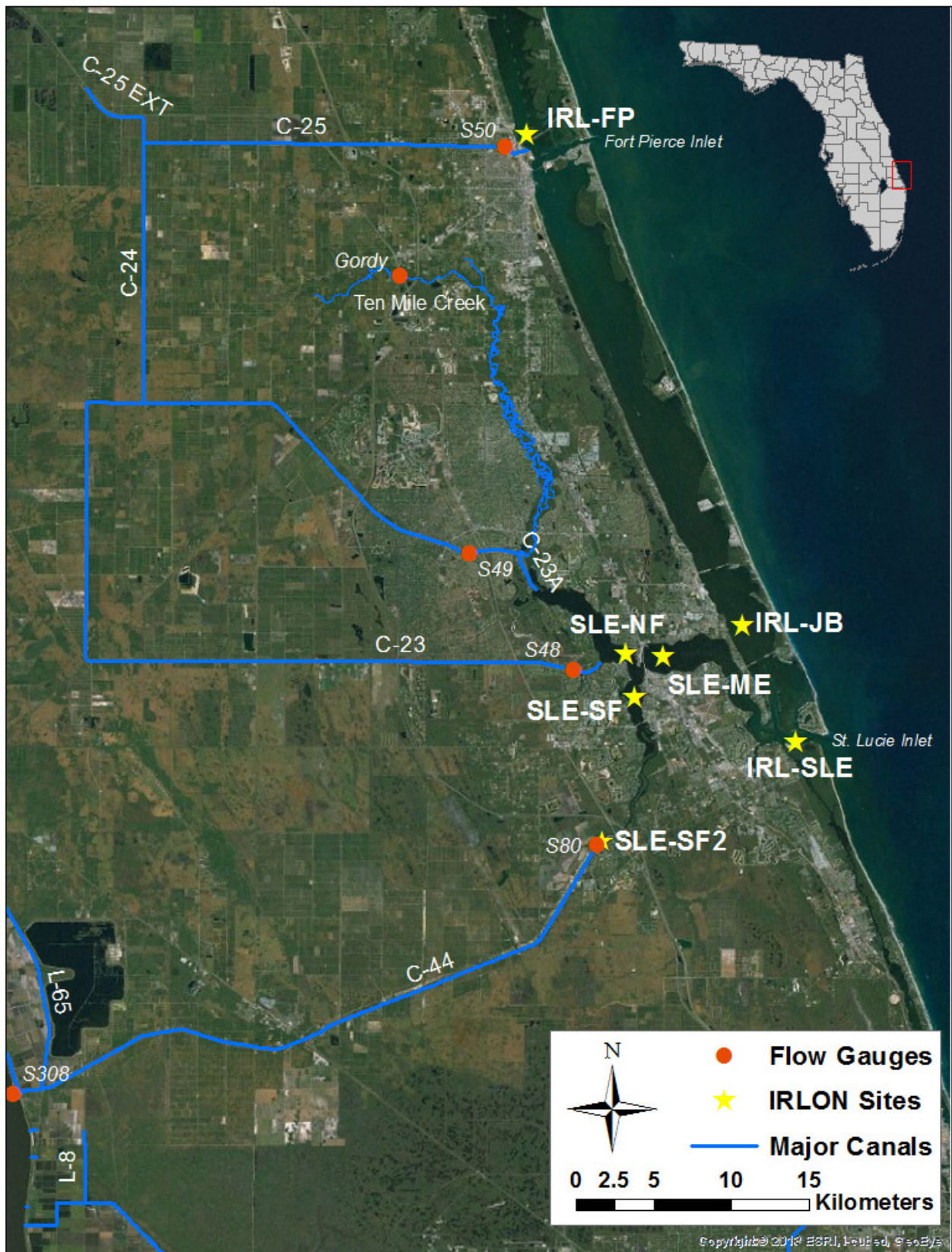
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Anyone who lived along the St. Lucie Estuary in 2016 will recall the large discharges of freshwater from Lake Okeechobee which essentially converted the estuary into a freshwater system. Impacts included large blooms of cyanobacteria (/hboi/irlo/june_29_2016.php) (blue-green algae) that led Governor Rick Scott to declare a state of emergency in St. Lucie and Martin Counties. The large amount of freshwater discharges was due to an abnormally high rainfall throughout the center of the state during last year's dry season. The resulting runoff flowed down the center of the state via the Kissimmee River and then into Lake O. When water levels in the lake exceed a certain level, the U.S. Army Corps of Engineers releases freshwater into estuaries on both coasts of Florida, including the South Fork of the St. Lucie Estuary via the C-44 Canal.

In 2016, the freshwater discharges started on January 29, and persisted, at various rates, for 9 months. In contrast, this year we are having a more typical dry season and there have been no freshwater releases from the lake (see discharge data in the table below). Our Indian River Lagoon Observatory Network of Environmental Sensors (IRLON) (</hboi/irlo/irlon.php>) is strategically located to address the impact of releases from Lake Okeechobee on the estuary (see map).

Figure 1 (a) shows salinities at three of our sites a year ago. IRL-SLE, located near the inlet, had the highest salinity, with strong tidal influences, ranging from oceanic salinity of 35, but much lower (sometime less than 15) at low tide. Meanwhile, upstream at SLE-SF, near the base of the South Fork, salinities were essentially zero, due to the freshwater flows from the lake. At times a completely freshwater environment extended all the way down to SLE-ME, our mid-estuary site near the Roosevelt



Location of IRLON stations, major canal, and sites of flow gauges in the St. Lucie Estuary and nearby Indian River Lagoon.

Bridge in downtown Stuart; even when some salt water was present, salinity was seldom above 5. These extended periods of reduced salinity would

Monthly inflow (acre-feet) from major canals and discharge stations into the St. Lucie Estuary (Data Source: DBHYDRO, South Florida Water Management District). See locations in the map above.

have been detrimental to plants and animals in the estuary that do not move, such as seagrasses and oysters, which are important resources.

Figure 1 (b) shows salinities this past month.

Notice that salinities at IRL-SLE, near the inlet, were higher overall, with much less variability during the tidal cycle than in 2016, resulting in a much more stable environment for more oceanic species that live near the inlet. Salinities at both SLE-SF and SLE-ME were much higher than in 2016, being in the 20's the entire month, with tidal patterns more obvious than last year. This is quite a favorable salinity range for estuarine species compared to the freshwater environment present in 2016. Another station, SLE-SF2, came on line in April 2016 near the C-44 lock and dam which is the entry point for the freshwater releases from Lake O into the estuary. Salinities at that station were about half that of full-strength seawater, showing the degree that salt water can extend to the upper reaches of the South Fork. These data demonstrate that species such as seagrasses and oysters have a much more favorable environment this year than last.

Source	Discharge Site	February 2016	February 2017
Lake Okeechobee	S308	217,576	0
C-44 Canal	S80	227,922	0
C23	S48	19,753	13
C24	S49	23,650	0
Ten Mile Creek	Gordy	10,322	2,970

This quick comparison of salinity, the most important factor in looking at the interaction of saltwater and freshwater in estuaries, readily reveals the magnitude (both absolute decline of salinity and spatial extent) of impacts from last year's discharges in the St. Lucie Estuary. All of our data are readily available to anyone who wishes to access it at our I (<http://fau.loboviz.com/>)RLON data website (<http://www.irlon.org/>).

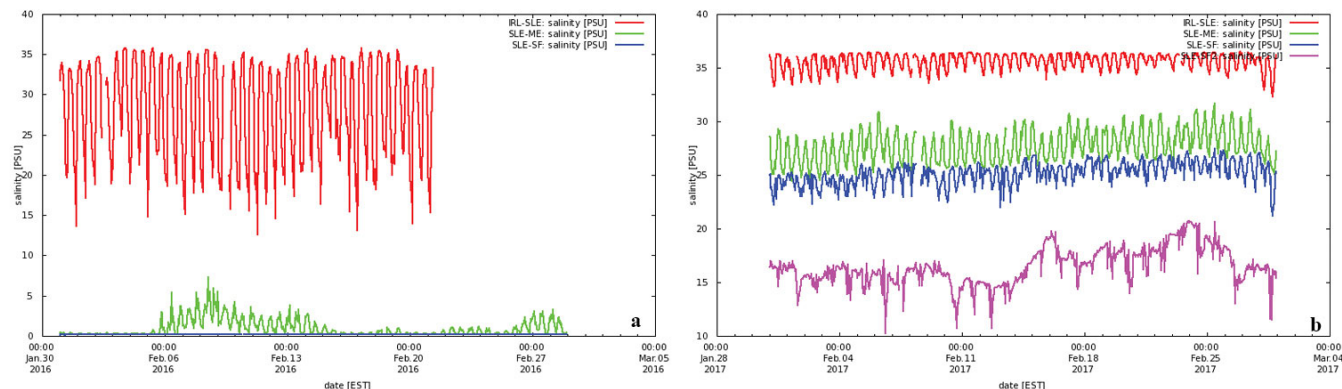


Figure 1. (a) Hourly measurements of salinity at the IRL-SLE, SLE-ME, and SLE-SF stations (Screen shot of IRLON Data, February 2016), and (b) at the IRL-SLE, SLE-ME, SLE-SF, and SLE-SF2 stations (Screen shot of IRLON Data, February 2017) (<http://www.irlon.org/>) (<http://www.irlon.org/>) (<http://www.irlon.org/>) (<http://www.irlon.org/>).

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)
- July 08, 2016: Connecting Users to IRL Data (/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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