

SUCCESSFUL INLET MANAGEMENT AT SOUTH LAKE WORTH INLET

By

Douglas W. Mann, P.E., D.CE.

Aptim Environmental & Infrastructure, LLC

LOCATION



HISTORY

Constructed in 1925-1927.

Original cut was 130 wide by 8 feet deep.

Includes sheetpile walls and a rock bottom.

Designed for water circulation, but used by recreational boaters.



Mechanical bypassing began in 1937.

Inlet was modified with longer jetties in 1967.

Flood shoal dredging.

Fixed bypassing plant last improved in 2011.

Photo by Mann (Nov 2019)



HISTORICAL DOWNDRIFT IMPACTS



Photo by Mann (1987)



HISTORY OF INLET MANAGEMENT PLANNING

Historical inlet studies include Watt,(1953), UF (1960's), Strock/Coastal Planning & Engineering (1984), Olsen Associates (1990), USACE (1984, 1993),.....)

An inlet management study was completed in 1998 (Coastal Planning & Engineering, Inc.)

FDEP adopted a plan in March 1999.



EXCERPTS OF THE 1999 ADOPTED PLAN

1) Continue to bypass suitable sediment to the downdrift beaches.

....meet average annual placement objectives ...

The sediment budget ... shall be verified by December 31 2001.

2) Implement the sand transfer plant protocols subject to verification by the findings of the monitoring program.

Average annual bypassing of a minimum of 60,000 cubic yards ...

to achieve a portion of the mechanical bypassing objective

to maintain a portion of the beach restoration project.

3) Construct the expansion of the Interior Deposition Basin to facilitate bypassing objectives as stated above.

4) Implement a comprehensive beach and offshore monitoring program subject to the approval of the Department.



OCEAN RIDGE SHORE PROTECTION PROJECT

Beach nourishment of 784,000cy
along 1.4 miles of shoreline
8 T-head groins in the northern
1000 feet of beach.

Project is part of a federal
authorized shore protection
project.

Construction in 1998, 2005,
2014, planned 2020.

Sand is dredged from an
offshore borrow area.

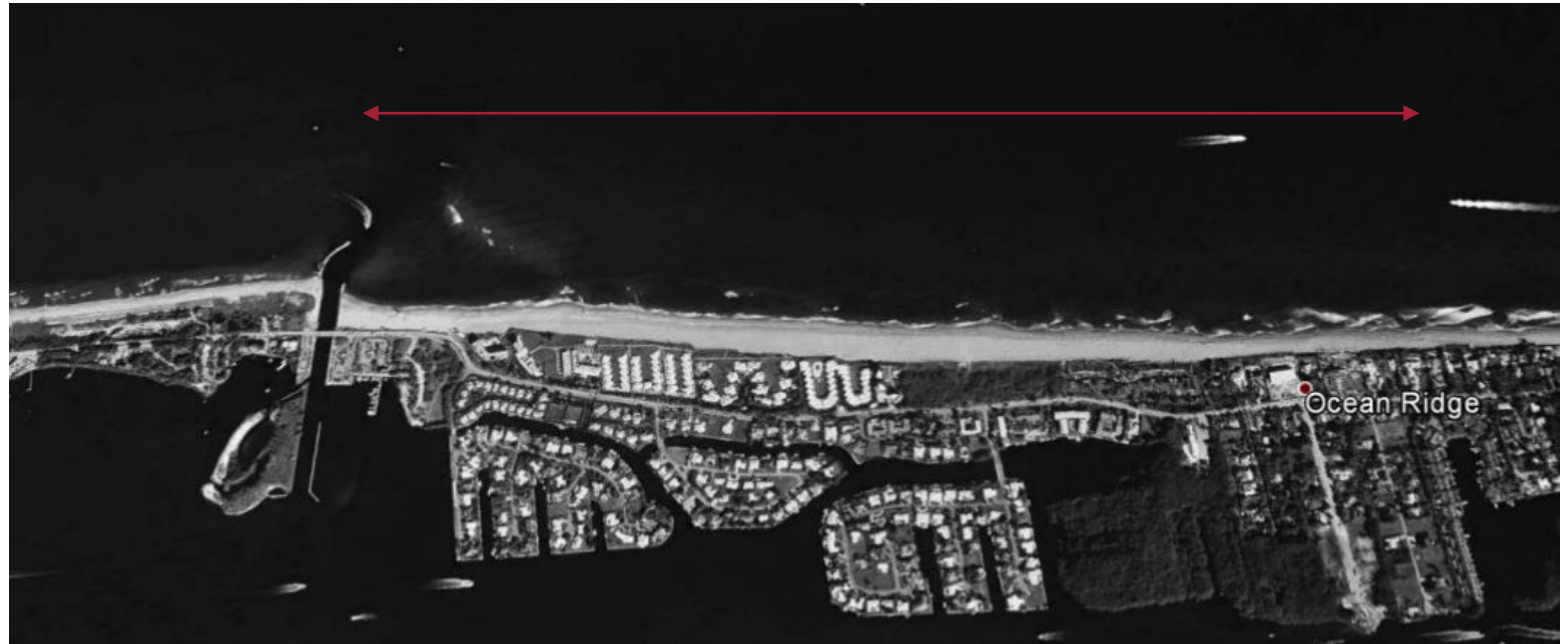


Photo by Google Earth 1999



MOTIVATIONS FOR PRESENT STUDY

- › Sediment budgets have not been updated since 2004.
- › Document compliance with State's inlet management plan.
- › Recommendations (if any) on sand bypassing (mechanical, offshore dredging, flood shoal).
- › Improved understanding of inlet system.



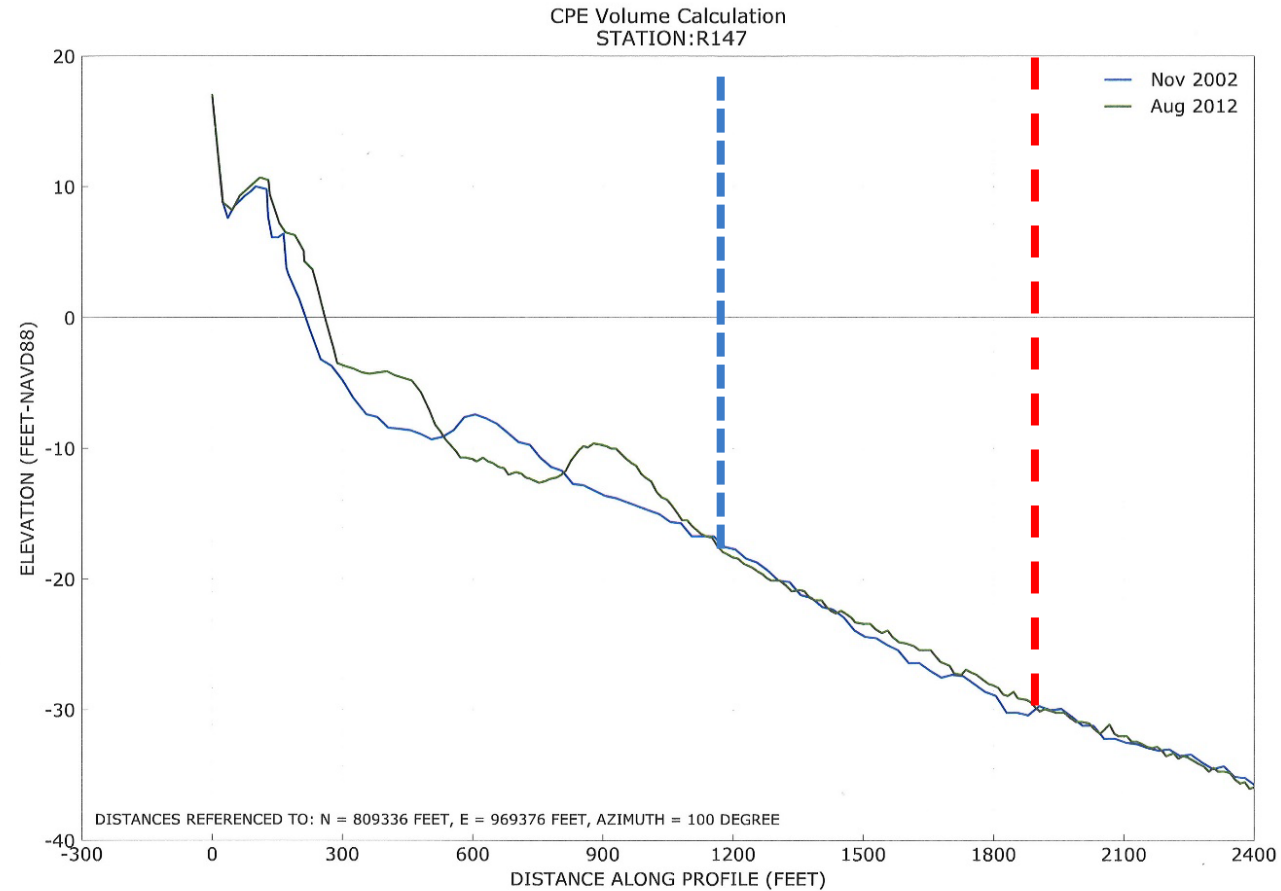
REGIONAL NET SEDIMENT TRANSPORT

- › In Coastal Planning & Engineering, Inc. (1998, 2004) a net transport of 200,000 cy/yr was assumed.
- › This included an evaluation of hindcasted wave data and a calibrated sediment transport coefficient.
- › APTIM re-calibrated the wave induced sediment transports for the previous time period (to 200,000 cy/yr) using sea and swell wave components separately, then computed the net transports for:
 - 2002-2012-----251,000 cy/yr
 - 2012-2018 -----242,000 cy/yr

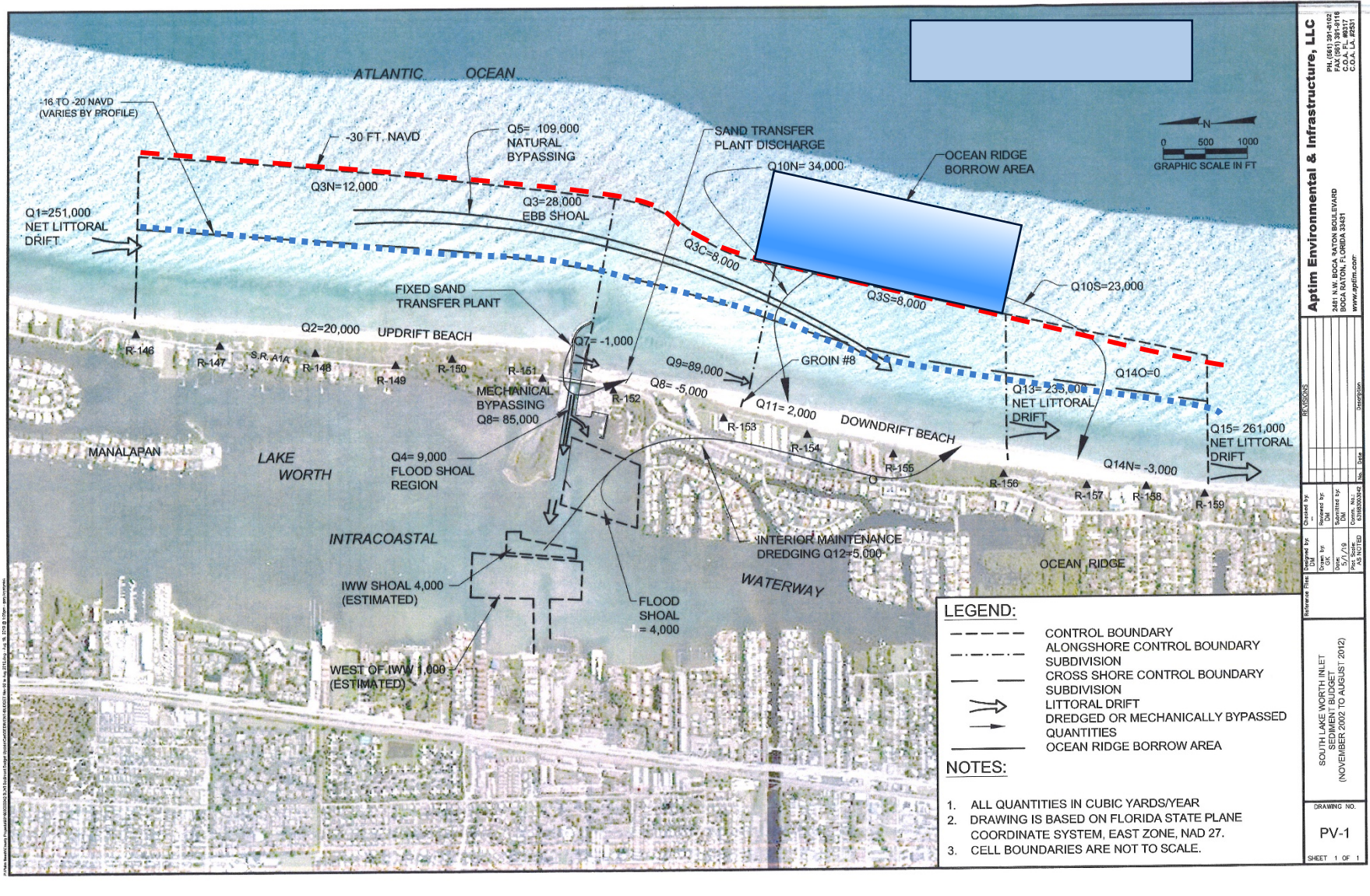


CROSS SHORE PROCESSES

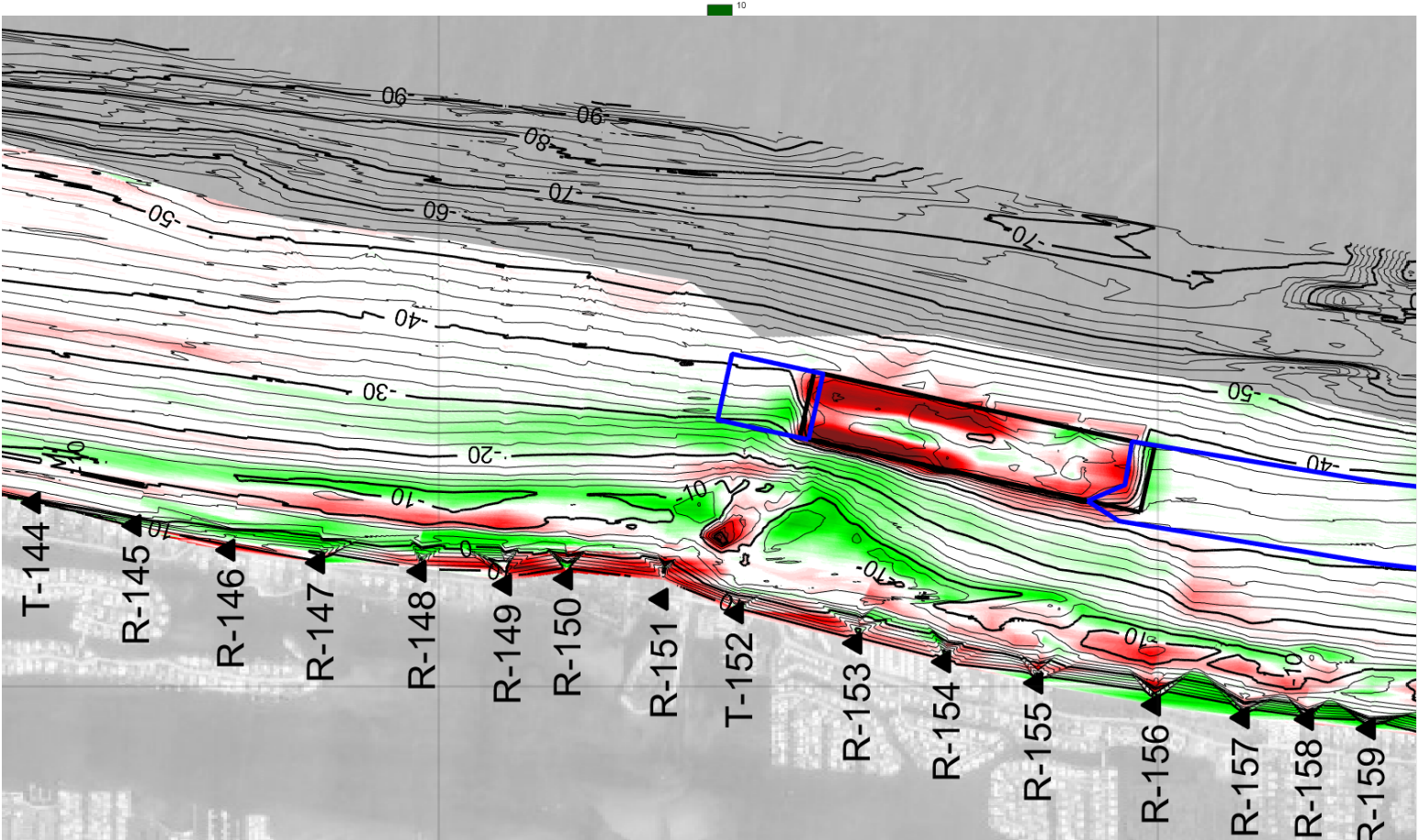
- ▶ Depth of Closure = -30 feet NAVD. Deeper than previous studies.
- ▶ Noted general consistent trend of offshore accretion between 2002- 2018. This depth is variable by profile line, but is generally -16 to -20 feet.



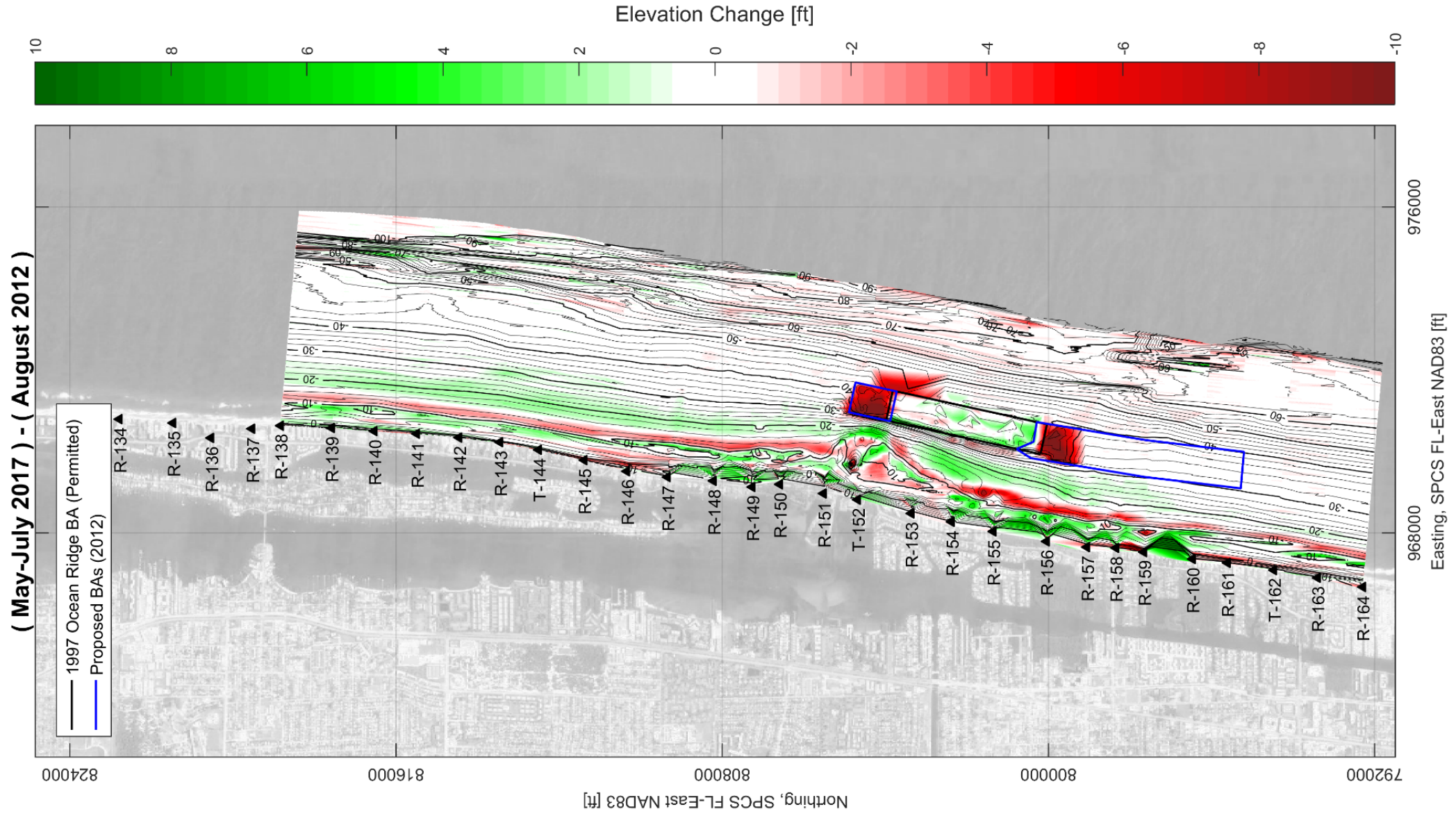
STUDY LIMITS-OFFSHORE BORROW AREA



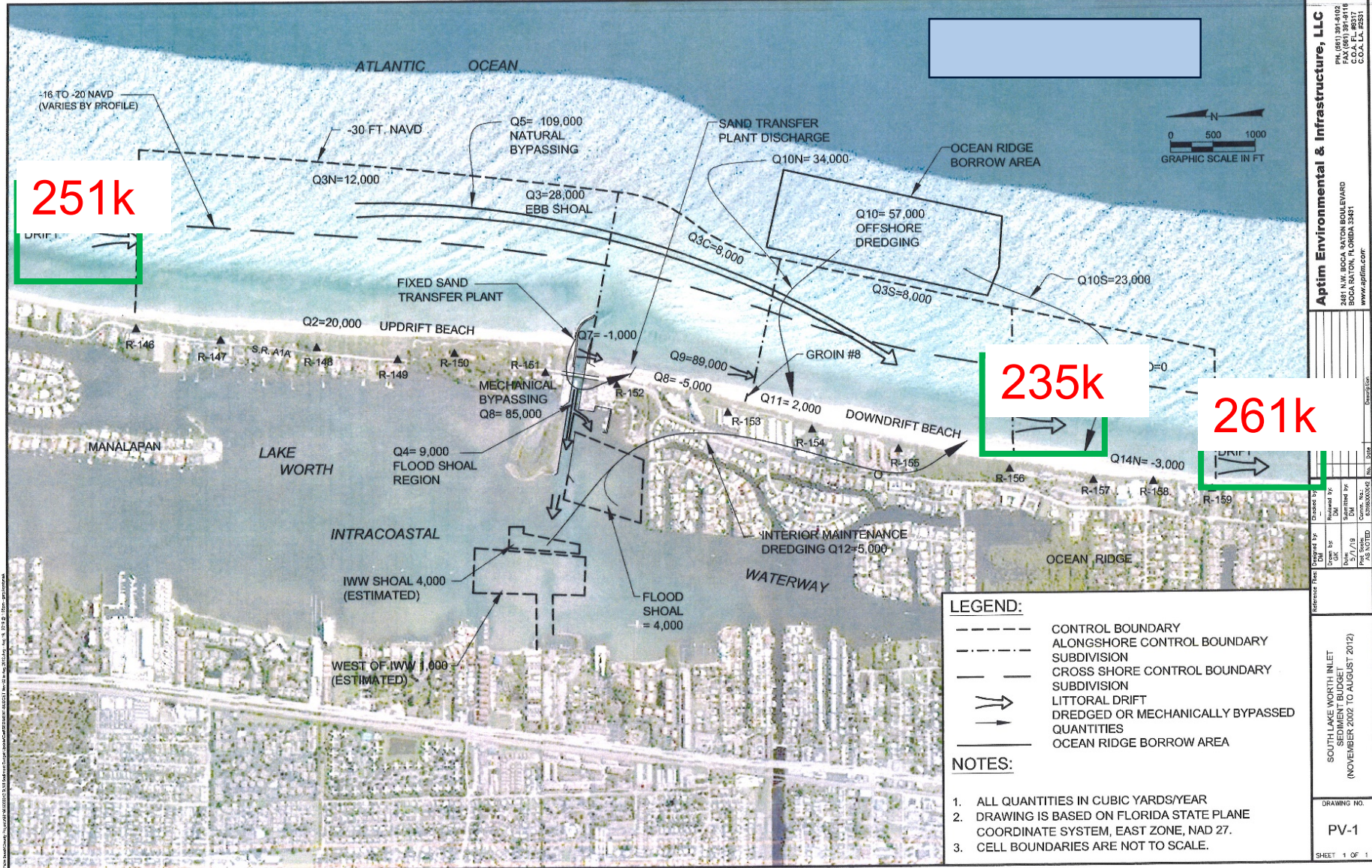
EBB SHOAL 2002-2012



EBB SHOAL 2012-2017



2002-2012 AVERAGE ANNUAL NET SEDIMENT BUDGET



Aptim Environmental & Infrastructure, LLC
 2881 N.W. BOCA RATON BOULEVARD
 BOCA RATON, FLORIDA 33461
 PH: (561) 381-4102
 FAX: (561) 381-4118
 C.O. L. #2321
 www.aptim.com

Drawn by	Checked by	Revised by
Issue	Date	Issue
AS NOTED	AS NOTED	AS NOTED

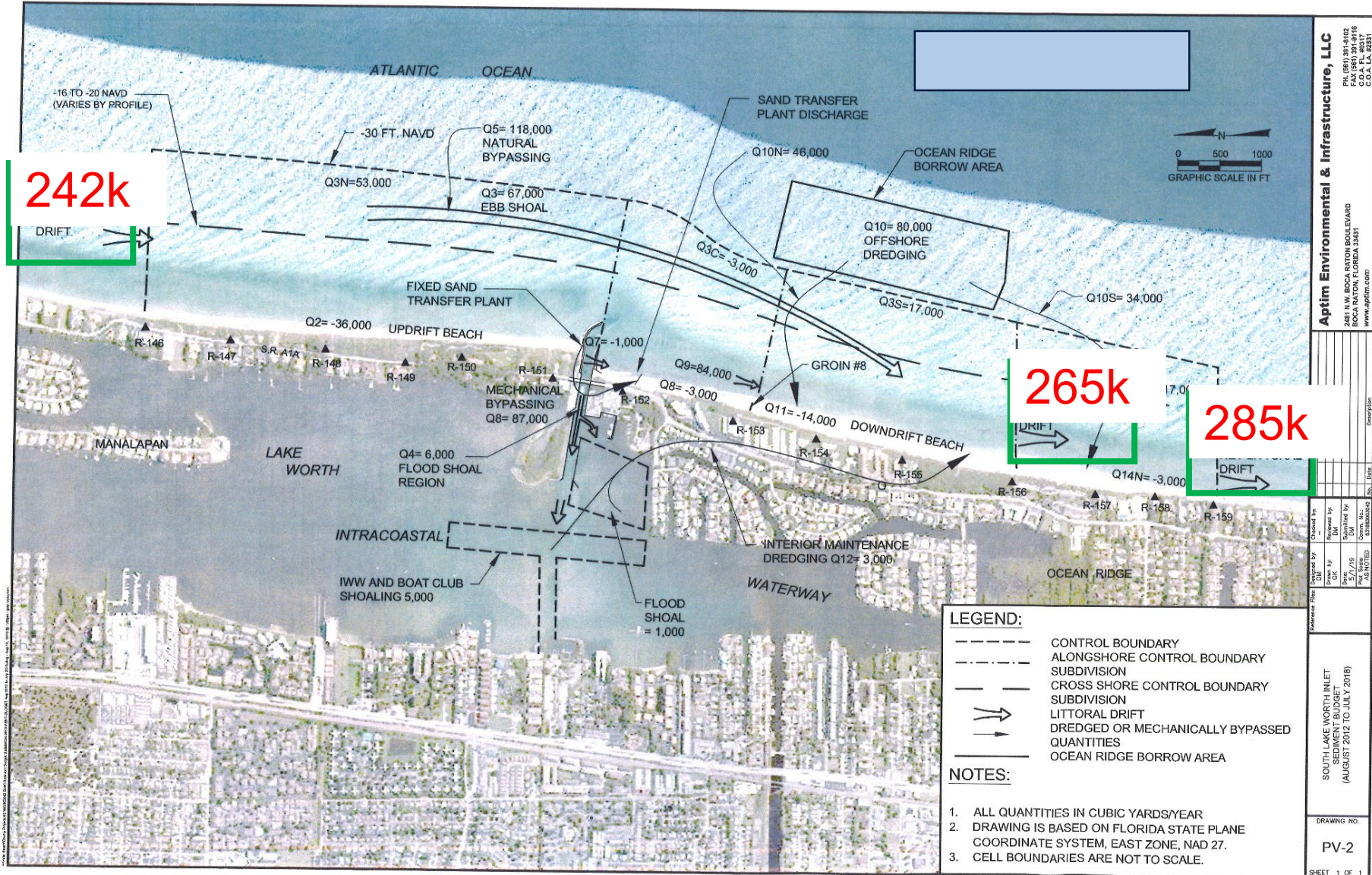
SOUTH LAKE WORTH INLET
 LITTORAL DRIFT BUDGET
 (NOVEMBER 2002 TO AUGUST 2012)

DRAWING NO.
PV-1

SHEET 1 OF 1



2012-2018 AVERAGE ANNUAL SEDIMENT BUDGET



FINDINGS

- › Mechanical bypassing was at or above the State's published goal for both time frames.
- › Natural bypassing continues across the ebb shoal with attachment near Ocean Hammock Park.
- › Ebb shoal growth continues across a broad area.
- › Episodic storms have impacted the beach and ebb shoal morphologies.
- › Flood shoal regional dredging continues to maintain interior elevations and return beach sands to the beach.
- › Offshore dredging continues to mitigate for any remainder of the inlet sedimentary impacts.



RECENT REGIONAL IMPACTS



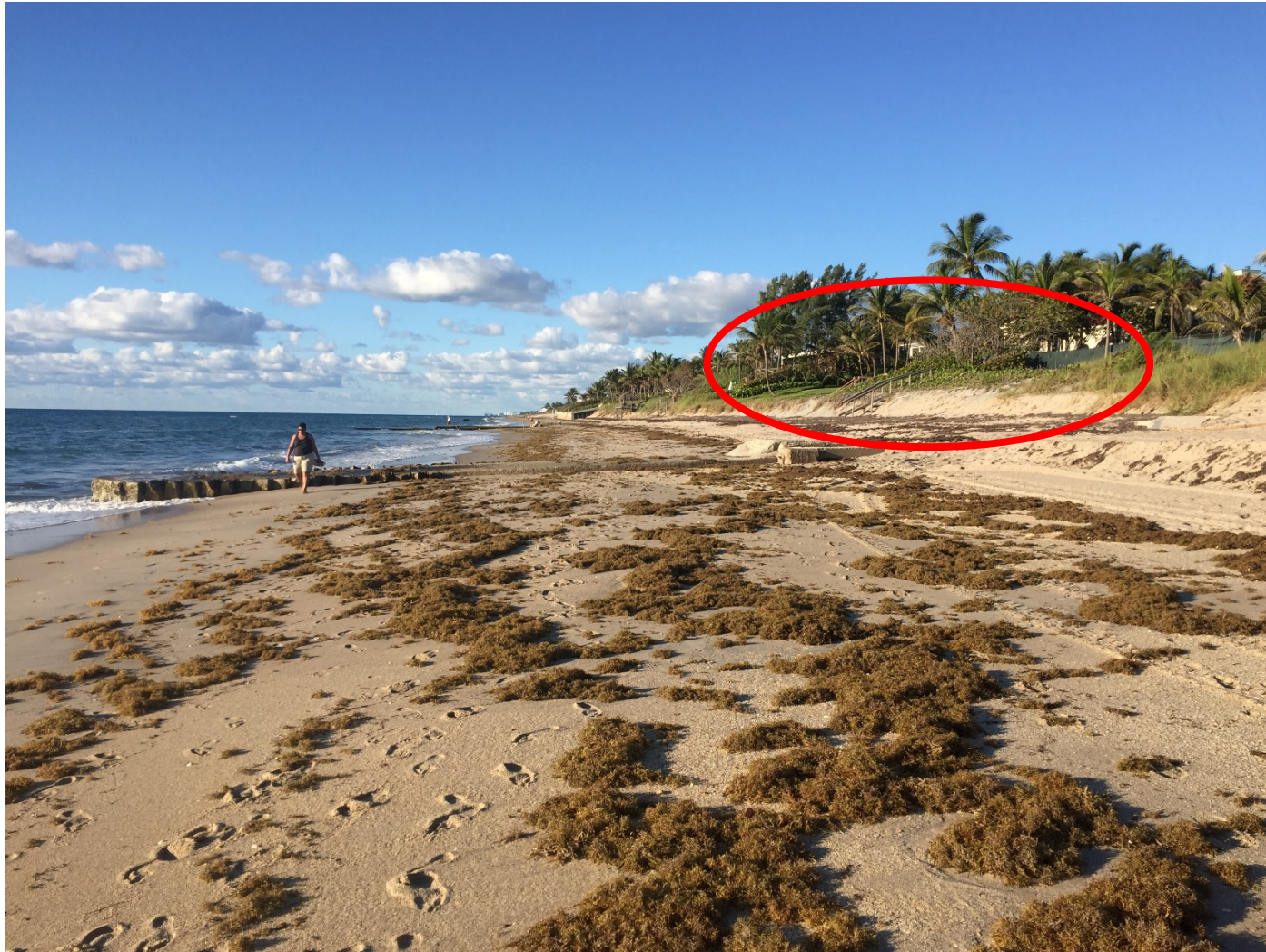
MANALAPAN APRIL 2019



MANALAPAN NOV. 27 2019



OCEAN RIDGE APRIL 2019



NEW RECOMMENDATIONS- INLET MANAGEMENT



SUMMARY OF SLWI SUCCESS

- › Maintain mechanical bypassing of sand from the plant
- › Dredge flood shoal and bypass the sand back to the beach
- › Mitigate for remaining impacts through their beach nourishment program.
- › Maintain long term monitoring plan to document the success.



Photo by Mann (2020)



QUESTIONS



Douglas W. Mann, P.E., D.CE

Douglas.Mann@aptim.com

561 361 3148

