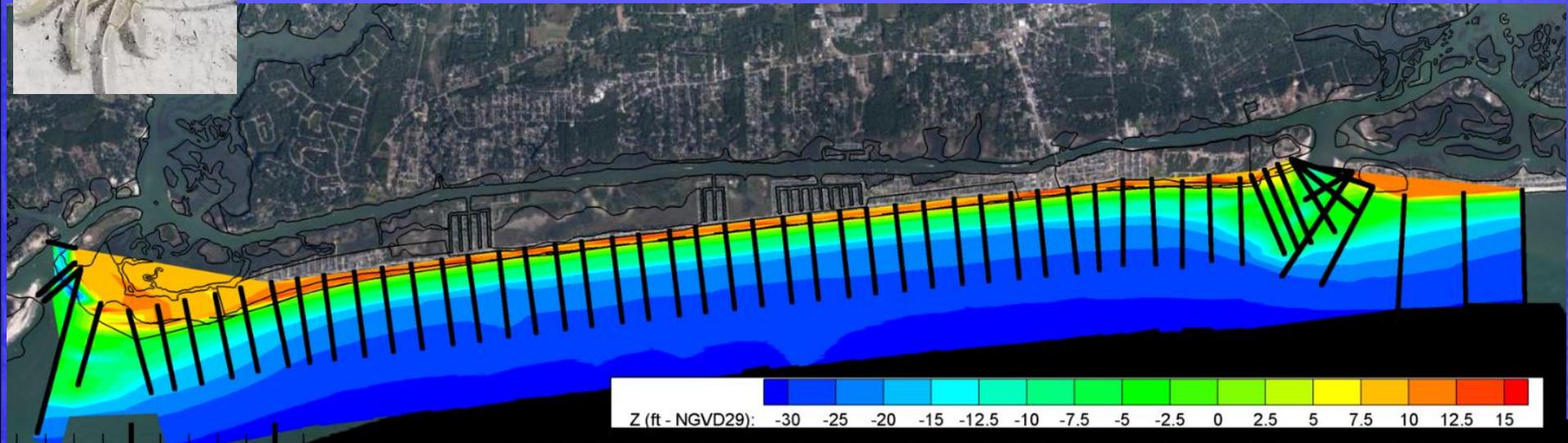


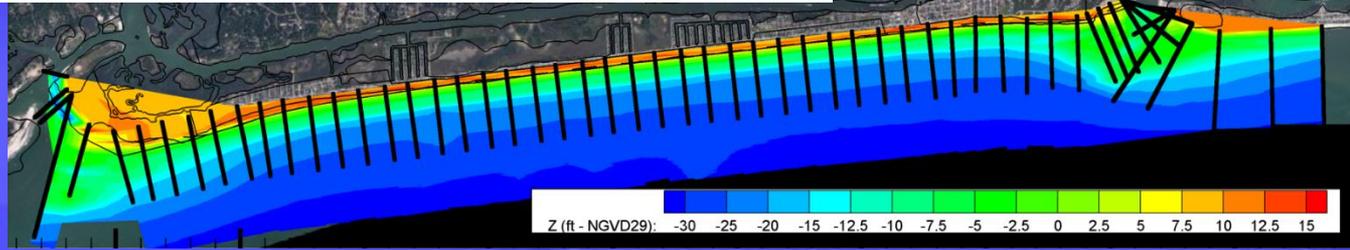
# HOLDEN BEACH ANNUAL MONITORING

*November 15, 2022*



*Marina, Coastal, Environmental  
& Water Resources Engineers*

# Annual Monitoring Analysis



- Volume Change
- Shoreline Change
- Has occurred annually since 2001
- Nourishment Planning & FEMA Eligibility

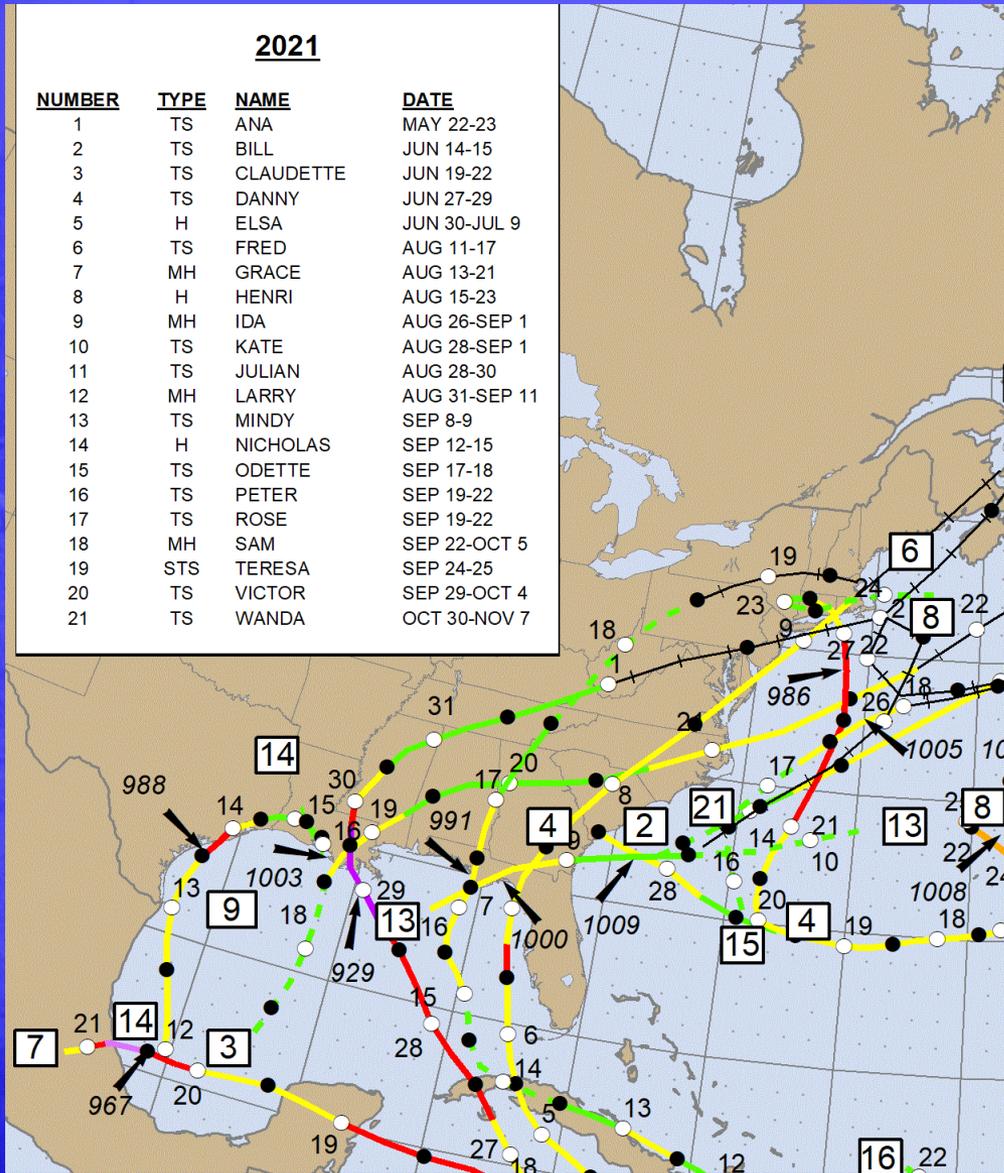


**Figure 39.** Photographs of the eastern portion of Holden Beach. A. West view (3/86) of eroding shoreline and houses stranded on recreational beach. Note bulkheads, timber groins and vestiges of seawalls that litter the beach. The eastern portion of Holden Beach shoreline near the inlet has been a chronic erosion zone since the late 1970s. B. West view (11/7/97) of same area in "A" retreat of the shoreline, removal of all but one home and a refurbished dune/dike composed of truck hauled sand. C. Aerial photograph of house on beach and peat exposure. Insert depict dike along road. D. Aerial photograph depicting shoreline and chronic erosion zone. Note the homes fronted by bulkheads and remnants of those destroyed.

# 2021/2022 Hurricane Seasons

## 2021

NUMBER	TYPE	NAME	DATE
1	TS	ANA	MAY 22-23
2	TS	BILL	JUN 14-15
3	TS	CLAUDETTE	JUN 19-22
4	TS	DANNY	JUN 27-29
5	H	ELSA	JUN 30-JUL 9
6	TS	FRED	AUG 11-17
7	MH	GRACE	AUG 13-21
8	H	HENRI	AUG 15-23
9	MH	IDA	AUG 26-SEP 1
10	TS	KATE	AUG 28-SEP 1
11	TS	JULIAN	AUG 28-30
12	MH	LARRY	AUG 31-SEP 11
13	TS	MINDY	SEP 8-9
14	H	NICHOLAS	SEP 12-15
15	TS	ODETTE	SEP 17-18
16	TS	PETER	SEP 19-22
17	TS	ROSE	SEP 19-22
18	MH	SAM	SEP 22-OCT 5
19	STS	TERESA	SEP 24-25
20	TS	VICTOR	SEP 29-OCT 4
21	TS	WANDA	OCT 30-NOV 7

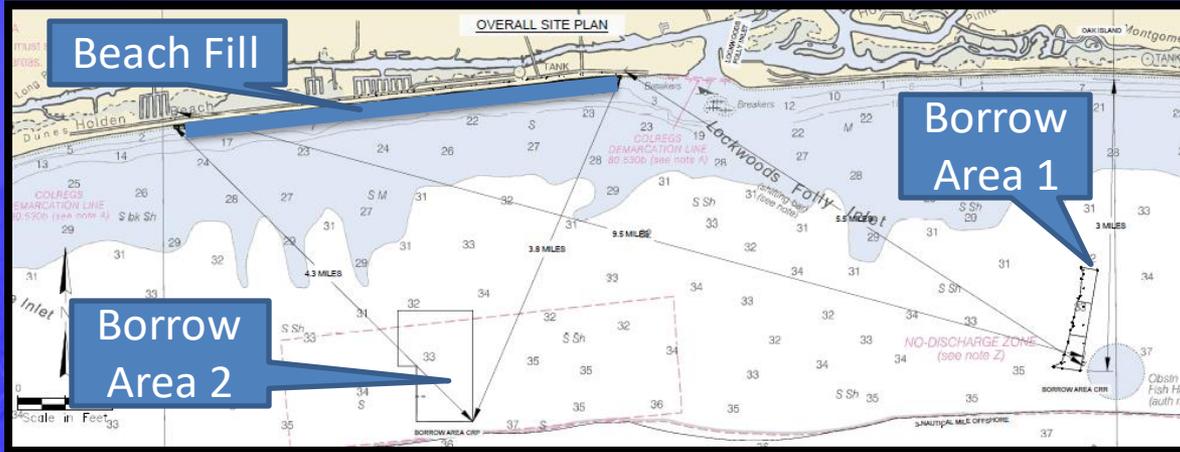


2021: Minor

2022: Ian, Nicole



# 2022 Nourishment (Jan 7 to April 12)



R.N. Weeks

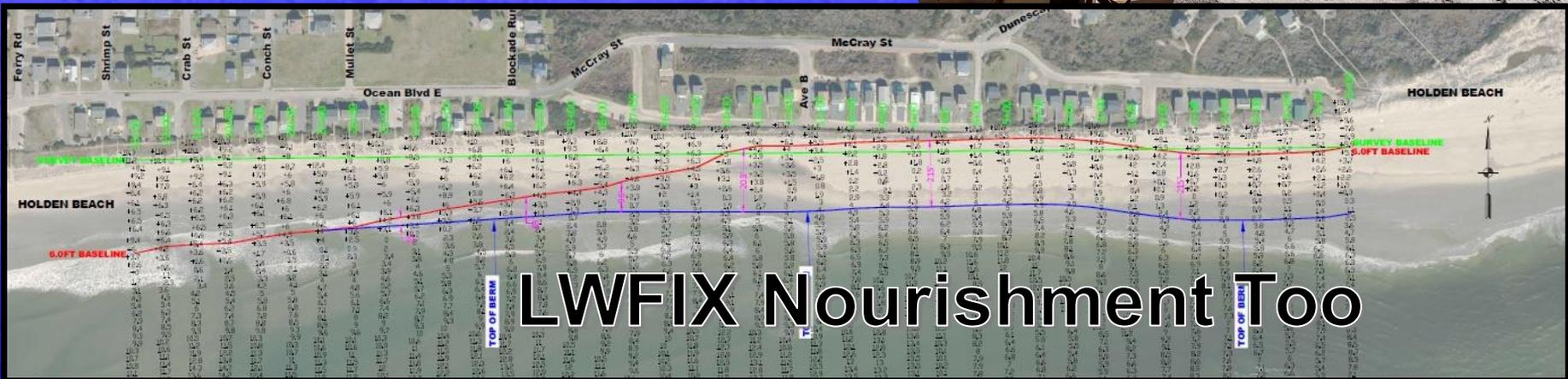


B.E. Lindholm

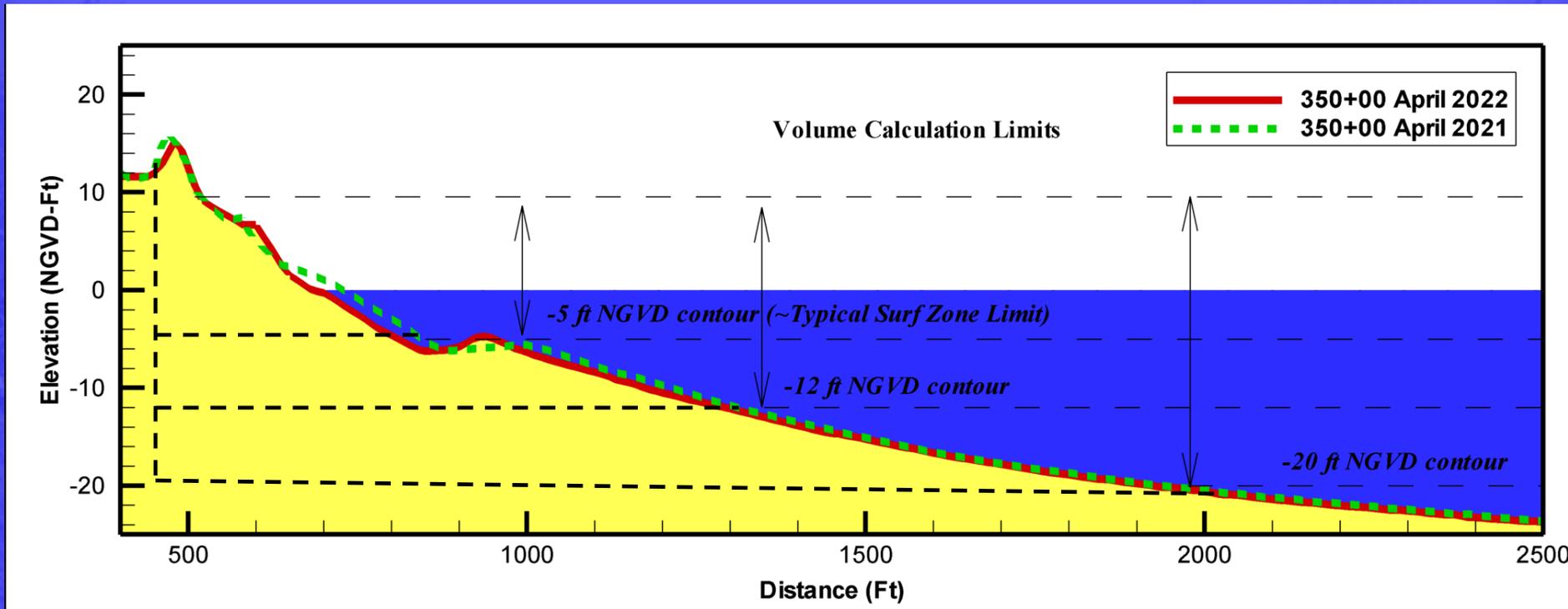


Secondary Berm

Primary Berm

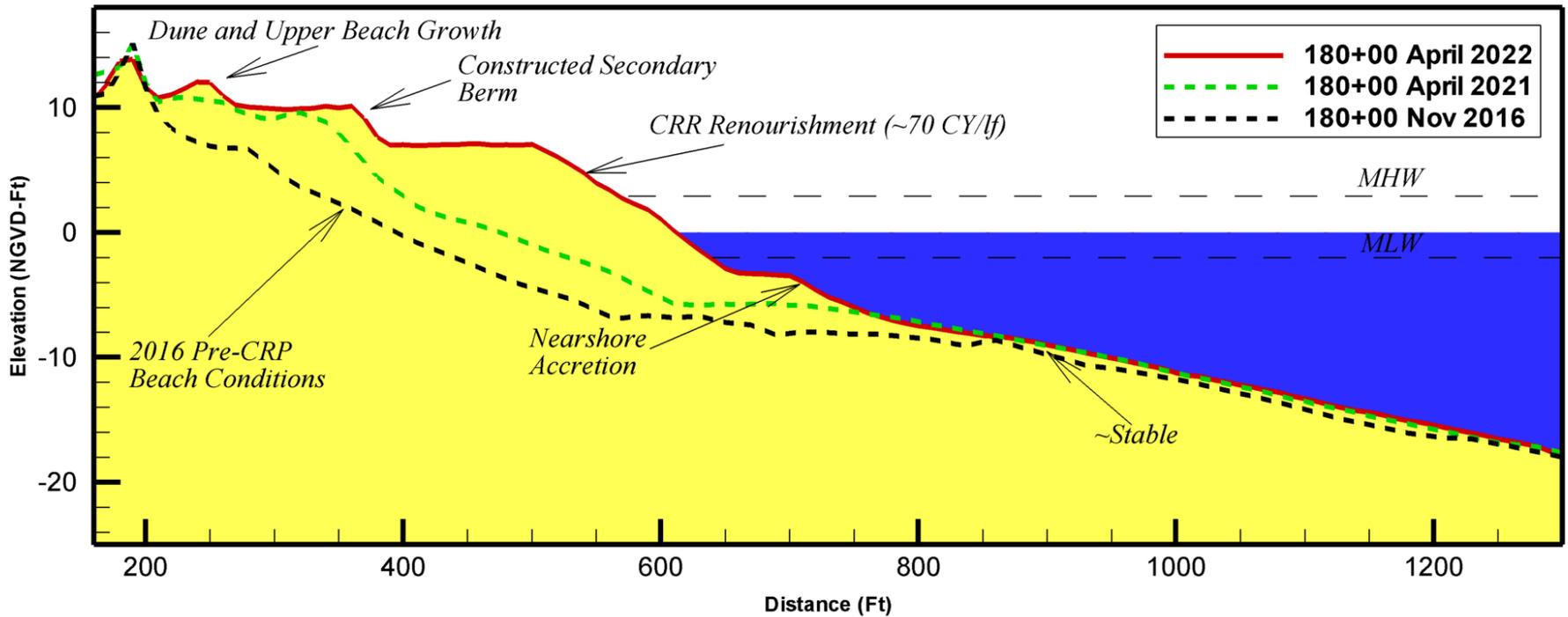


# Volume Analysis



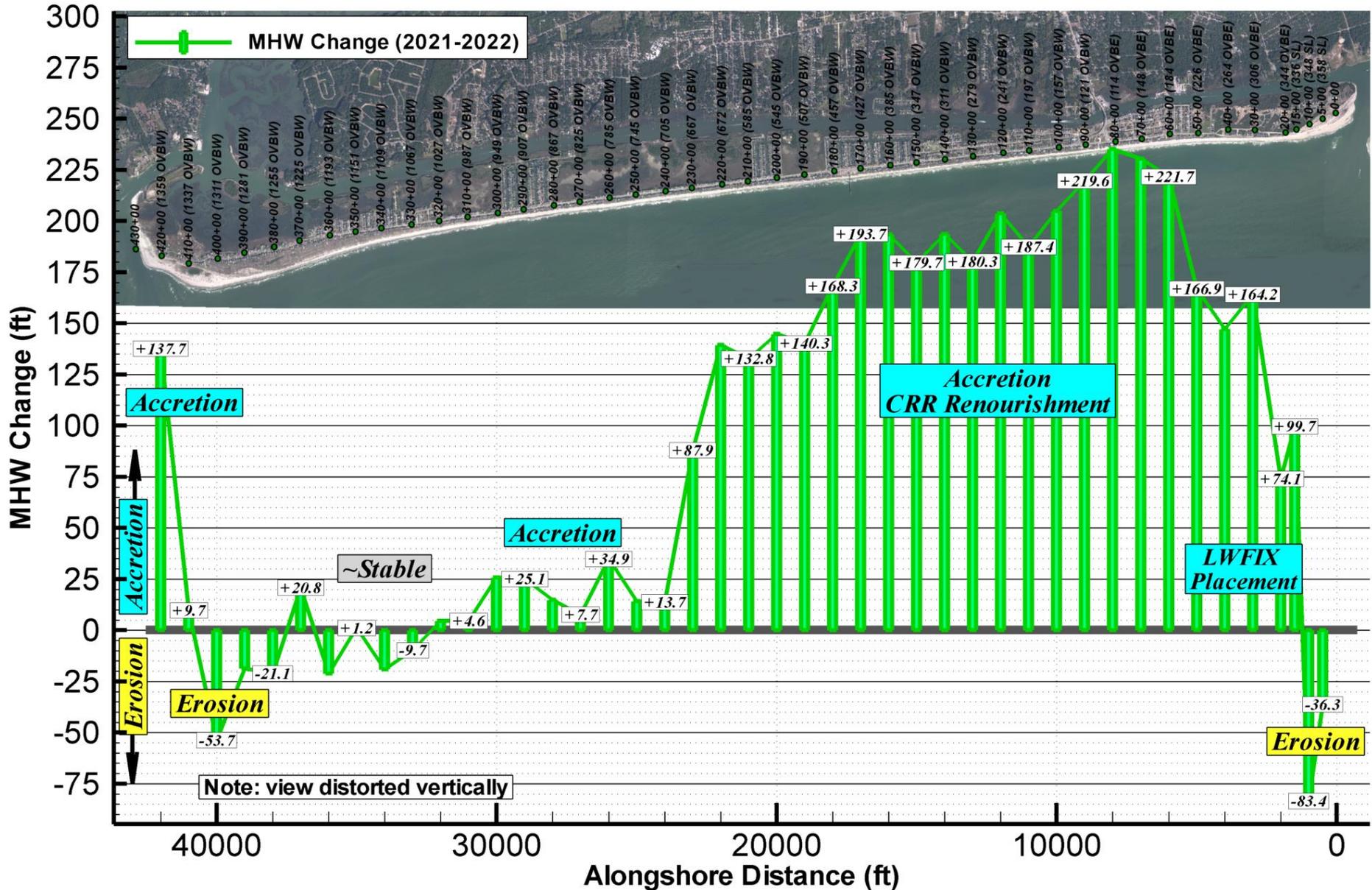
Three Volume Calcs. From Dune to  
-5 ft, -12 ft and -20 ft

# Cumulative Effect of 2017 and 2022 Nourishments





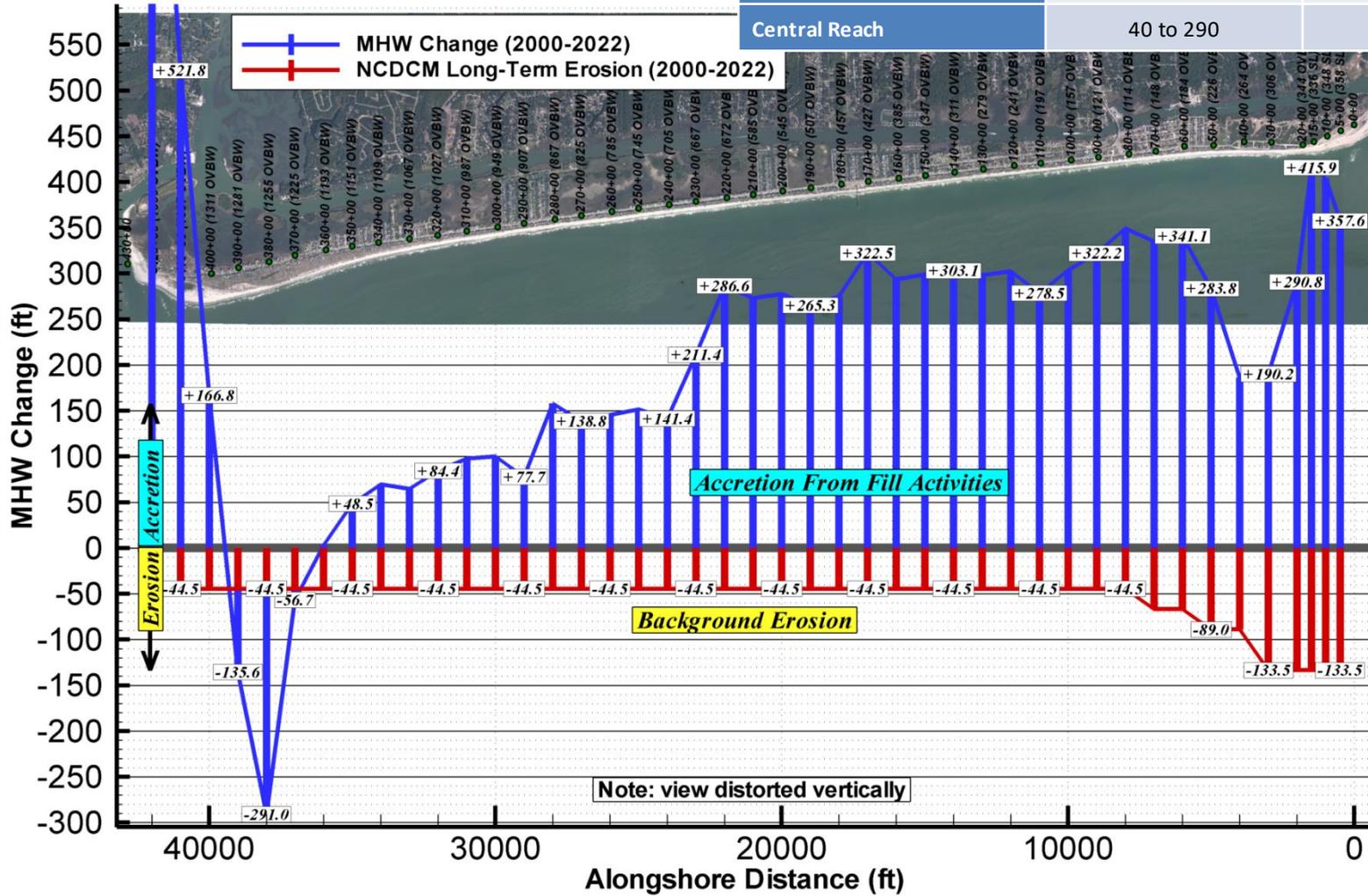
# Mean High Water (MHW) Shoreline Change



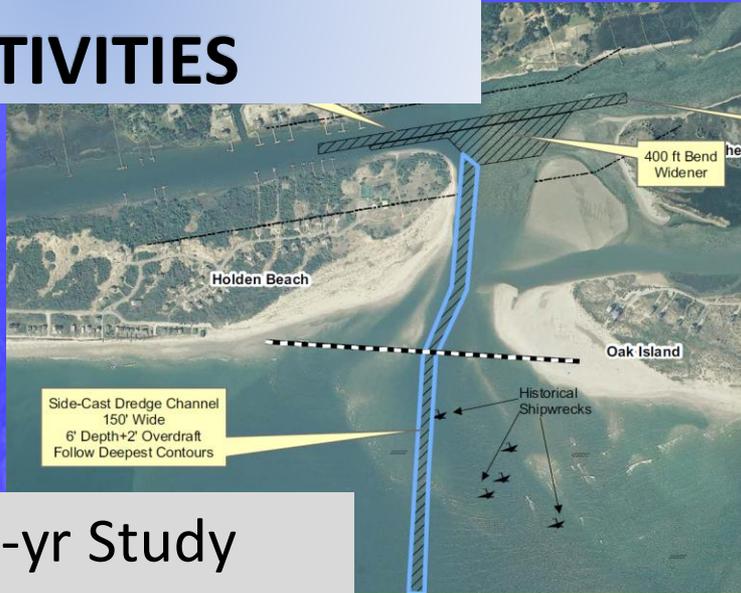
# 2000 to 2022

## Beach much healthier now

Table 3-4. Historical MHW Shoreline Change by Reach (2000 to 2021)		
Reach Averages	Stations Included	Historical MHW Change (2000 to 2022) (ft)
LWF Inlet	5 to 15	+392.7
USACE East	15 to 40	+222.4
Town East	40 to 150	+300.3
Pier	150 to 190	+291.1
Town West	190 to 290	+193.4
West Area	290 to 380	+19.8
Shallotte Inlet	380 to 420	+65.5
Central Reach	40 to 290	+254.7



# ONGOING HB BEACH MANAGEMENT ACTIVITIES



- Corps 50-yr Study
- FEMA Coordination
- LWFIX & Bend-Widener
- LWF Outer Channel Dredging/Navigation
- West End Analysis

