



Isle of Palms Beach Preservation 2007-2023



Coastal Processes

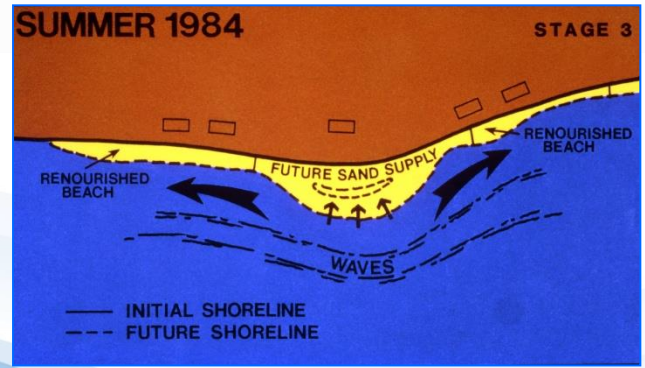
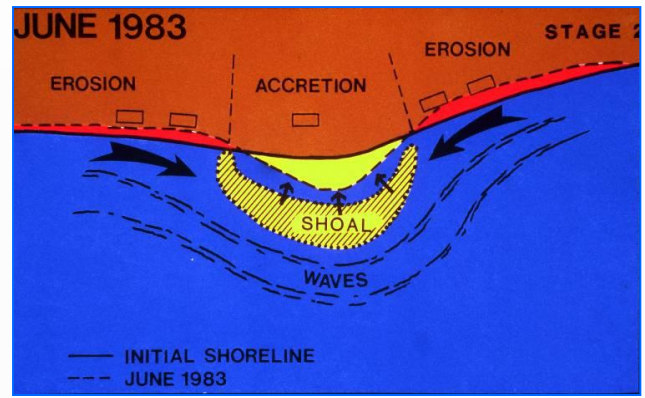
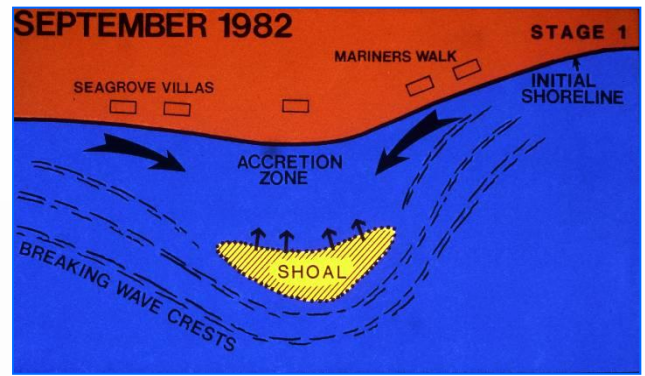
- Inlet-Dominated
- Sand from north end moves south over time
- Sand “packages” as shoals attach or nourishment is added



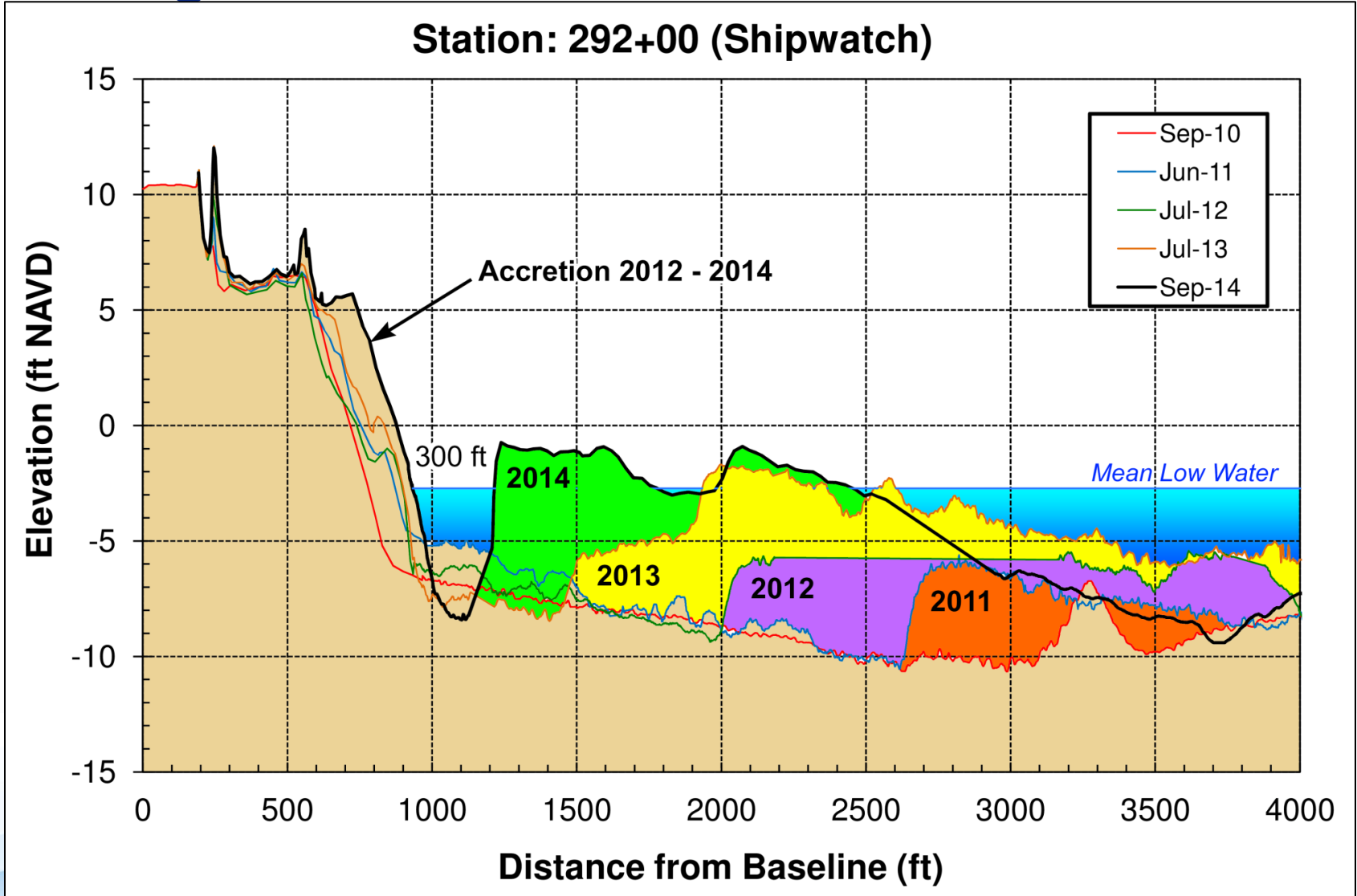
Historical Erosion Rates



This shoal added ~0.5 million cy to Isle of Palms



Shoal Migration



Beach Condition History

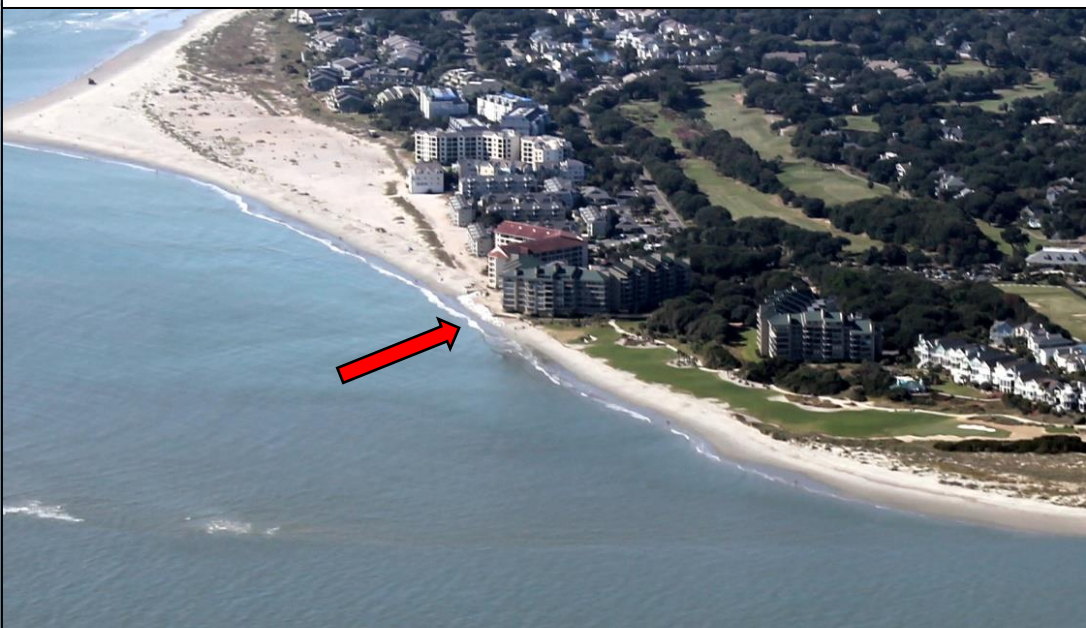
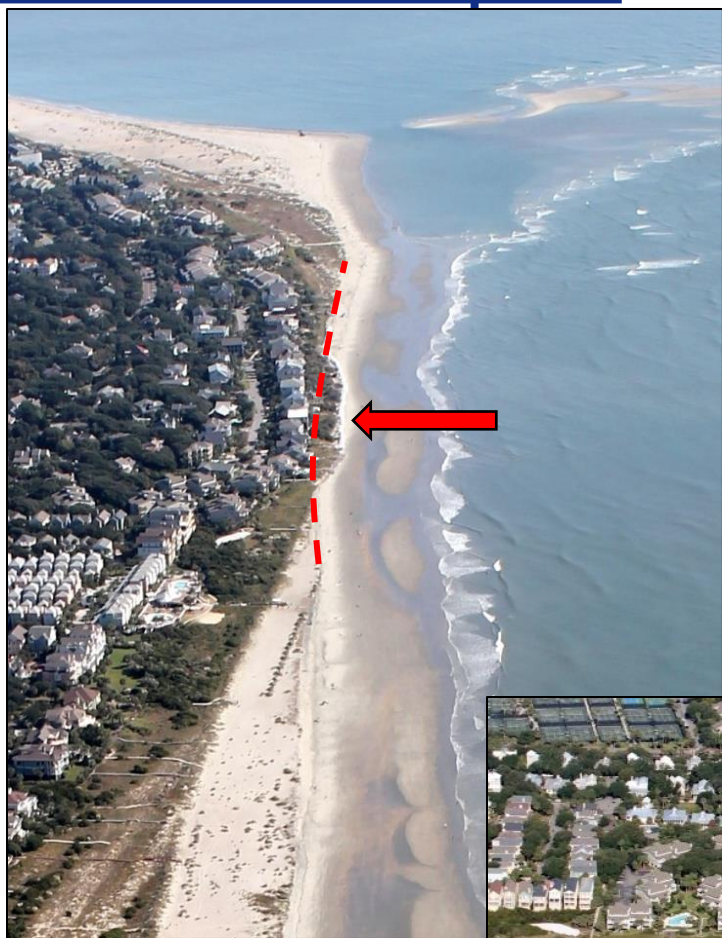


Project History

- 1983 – Nourishment from marina dredging
- 1980's-1990's periodic scraping from shoals
- 2008 – Nourishment ~900,000 cy via offshore dredge (\$10 mil)
- 2012 – 80,000 cy scraping (\$245k)
- 2014-2015 – 240,000 cy scraping (\$800k)
- 2018 -



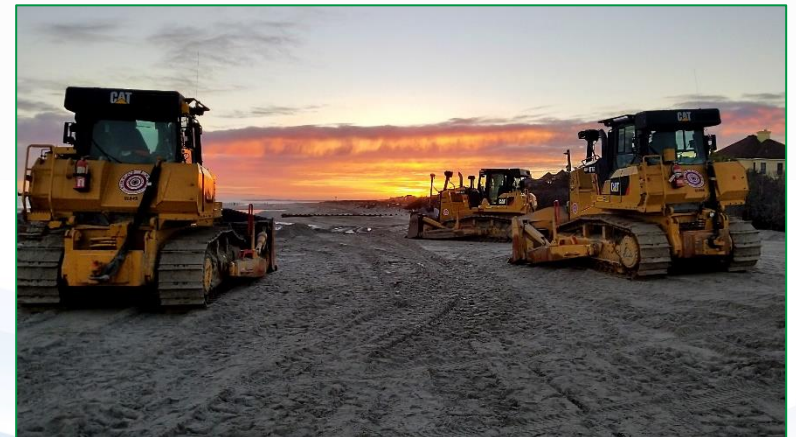
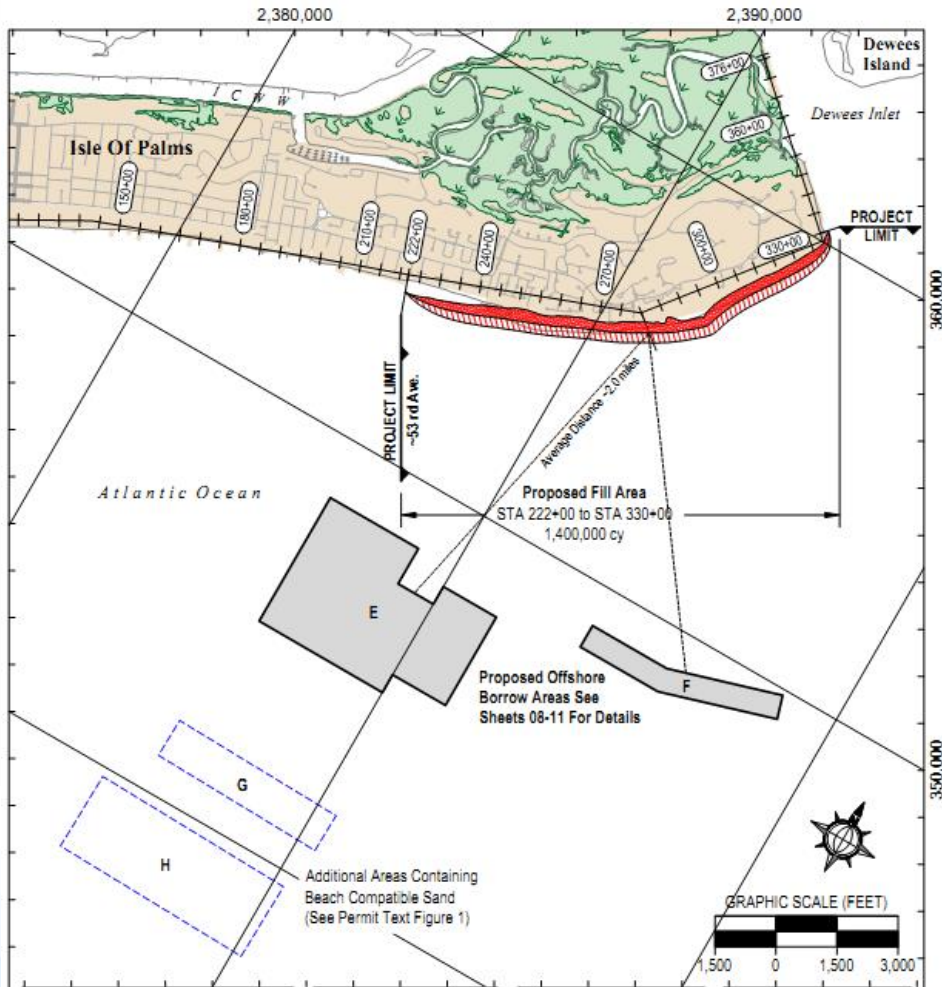
Erosion Hot Spots



SANDBAGS

2018 Project

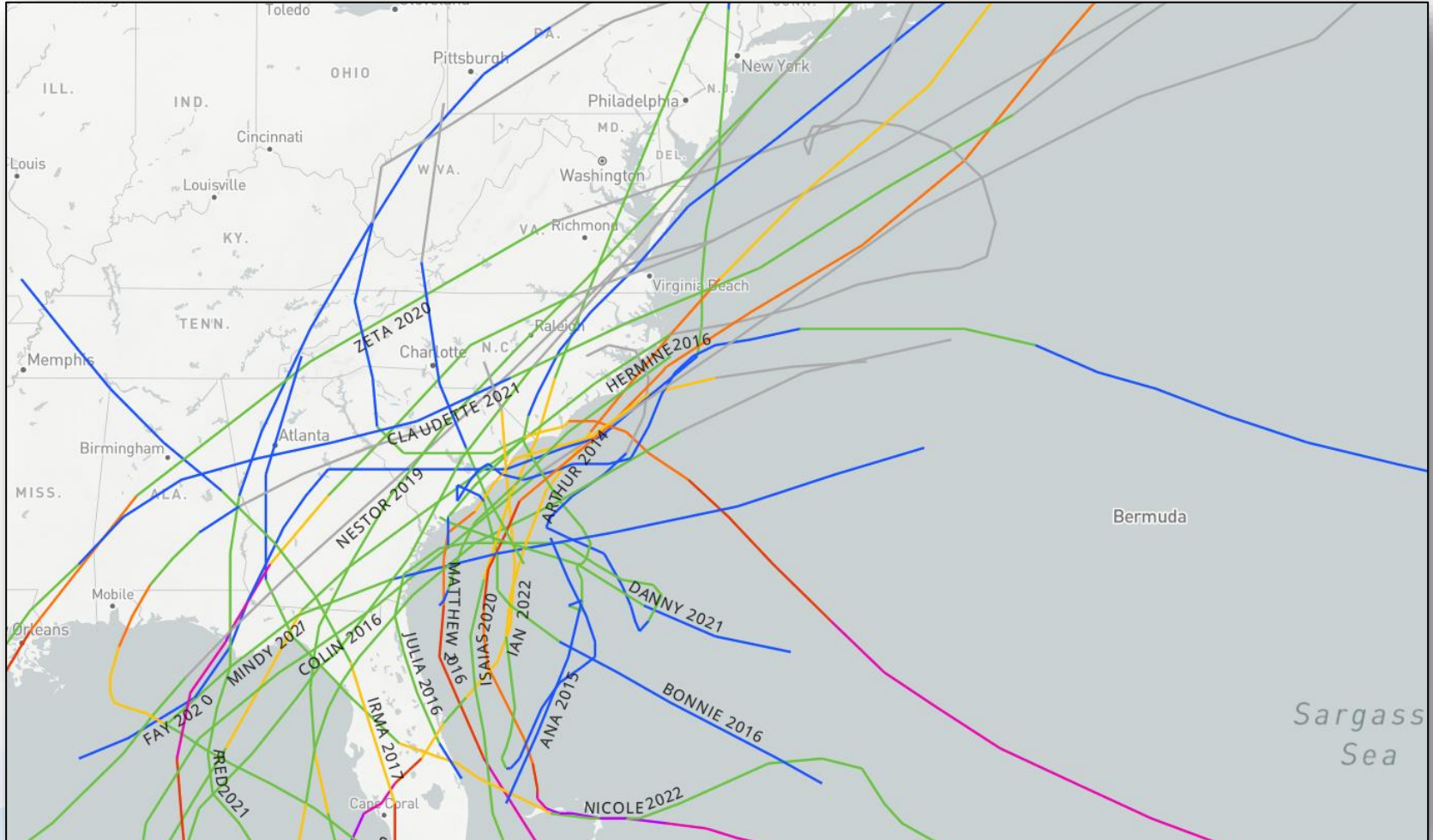
- 1,676,518 cy of sand
- \$13,545,585.70



2018 Project



A Decade of Storms



A Decade of Struggle

- 30 named storms – SCDNR
- 7 FEMA Declared Disasters
 - Joaquin, Matthew, Irma, Florence, Dorian, Ian, Idalia
 - Only 3 from 2000-2012 (all tropical storms in 2004)



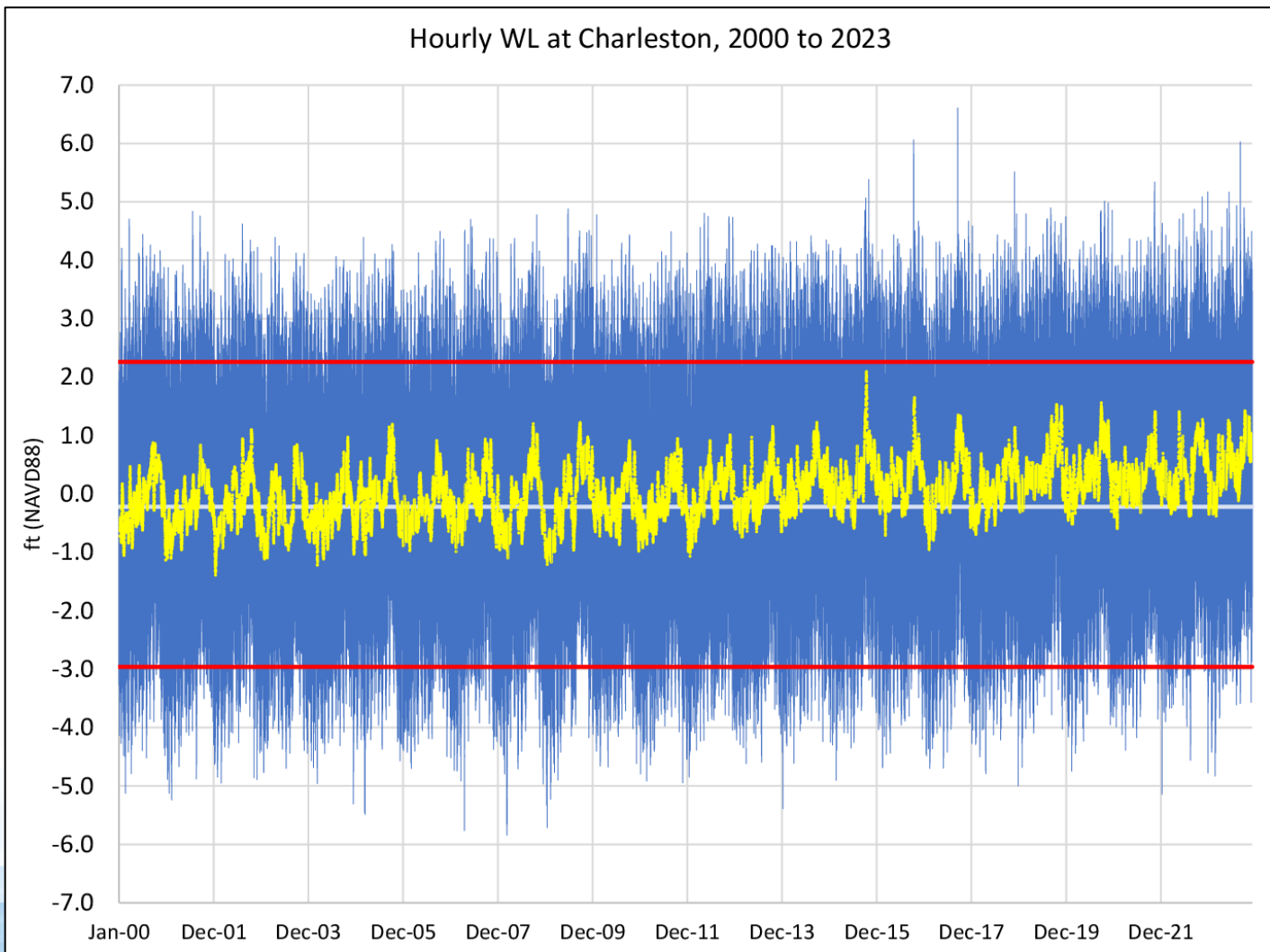
Edisto Beach following Hurricane Matthew 2016

Jante Morgan myhorrynews.com

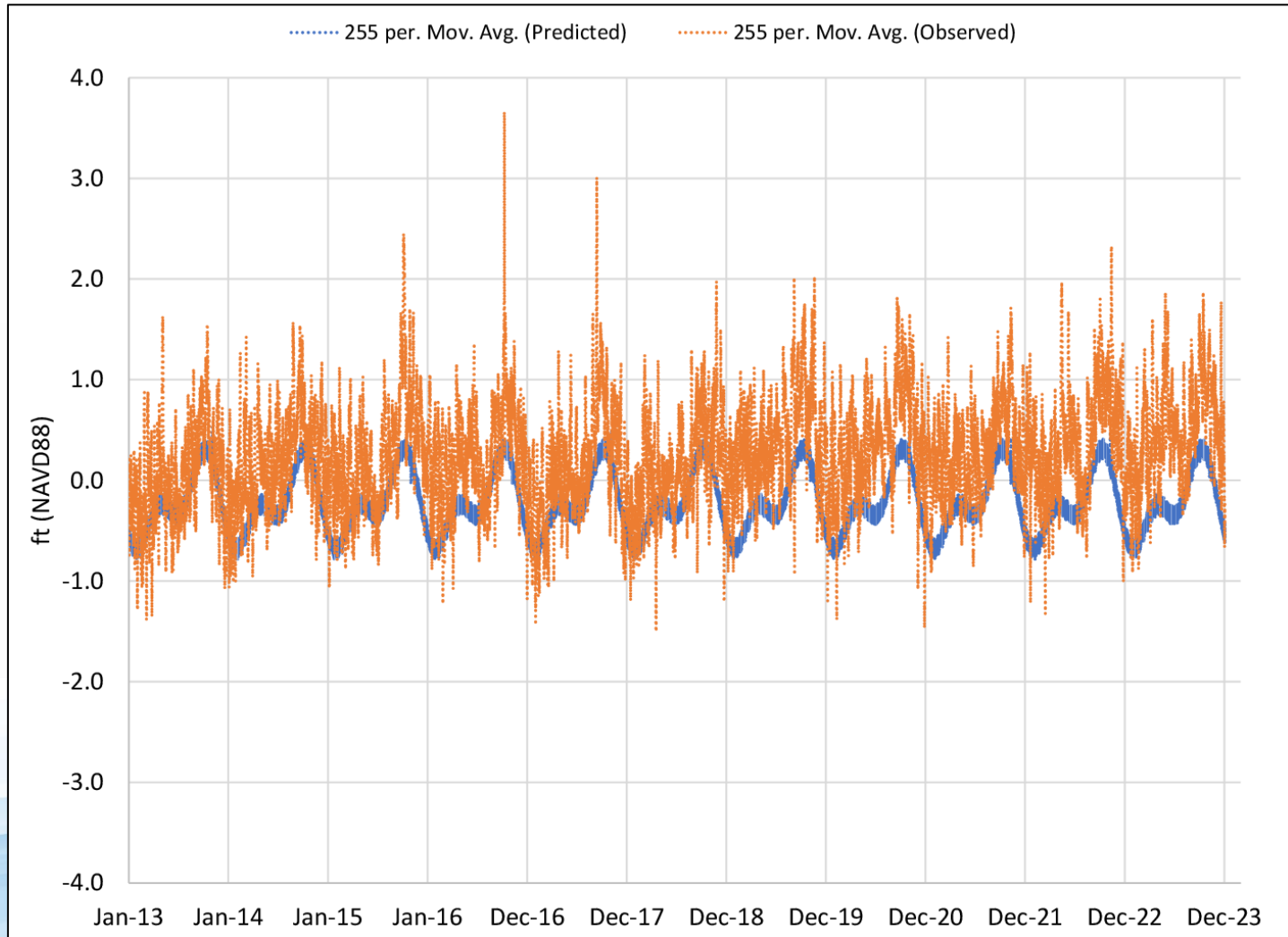


Garden City Beach During Hurricane Ian

A Decade of Sea Level Rise



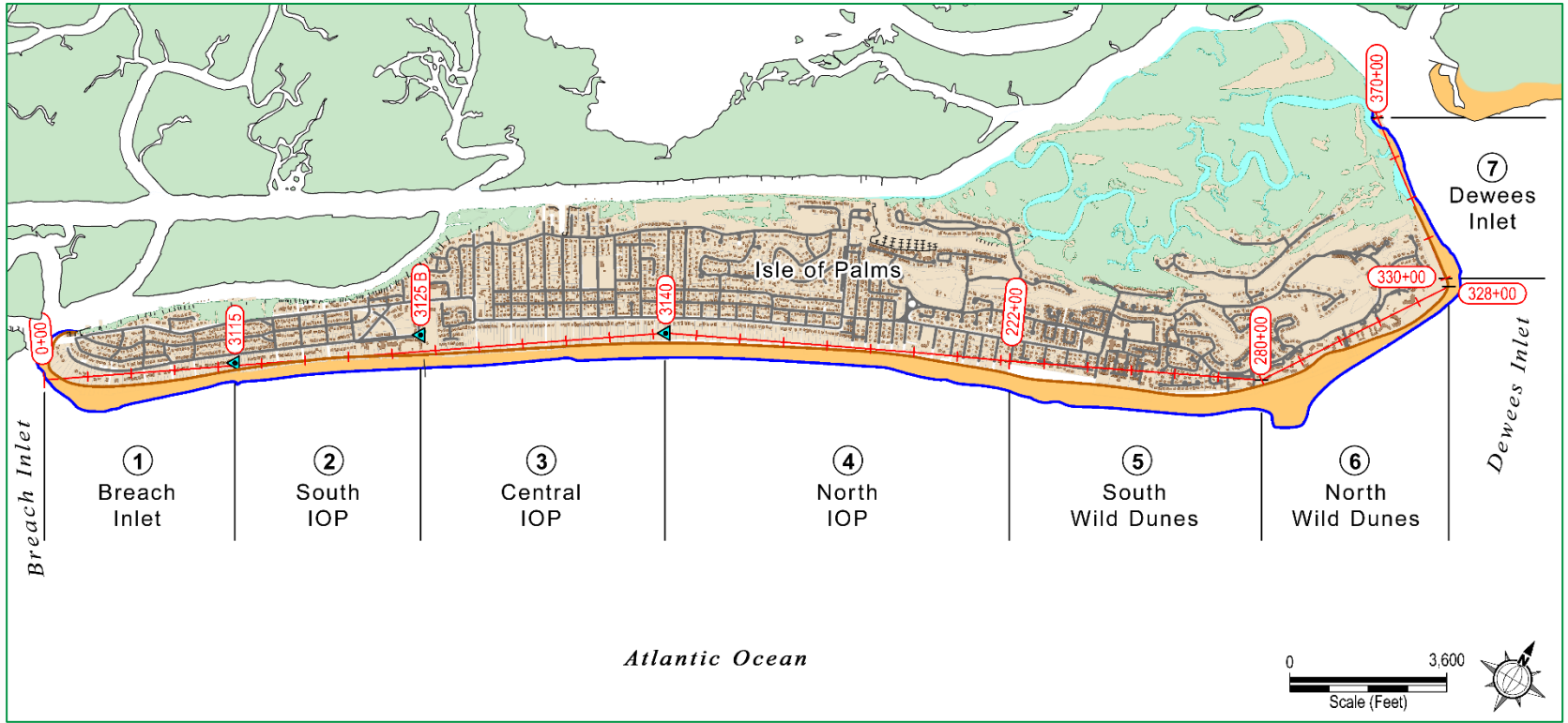
Observations vs Predictions – ‘6-minute’ *Charleston*



Beach Volume Change – Nourishments Removed

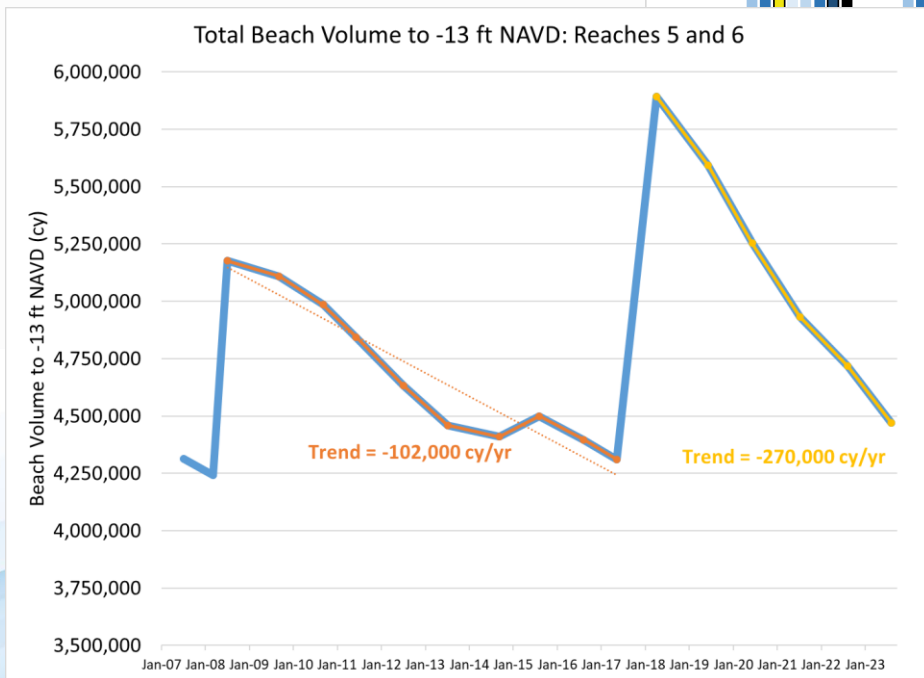
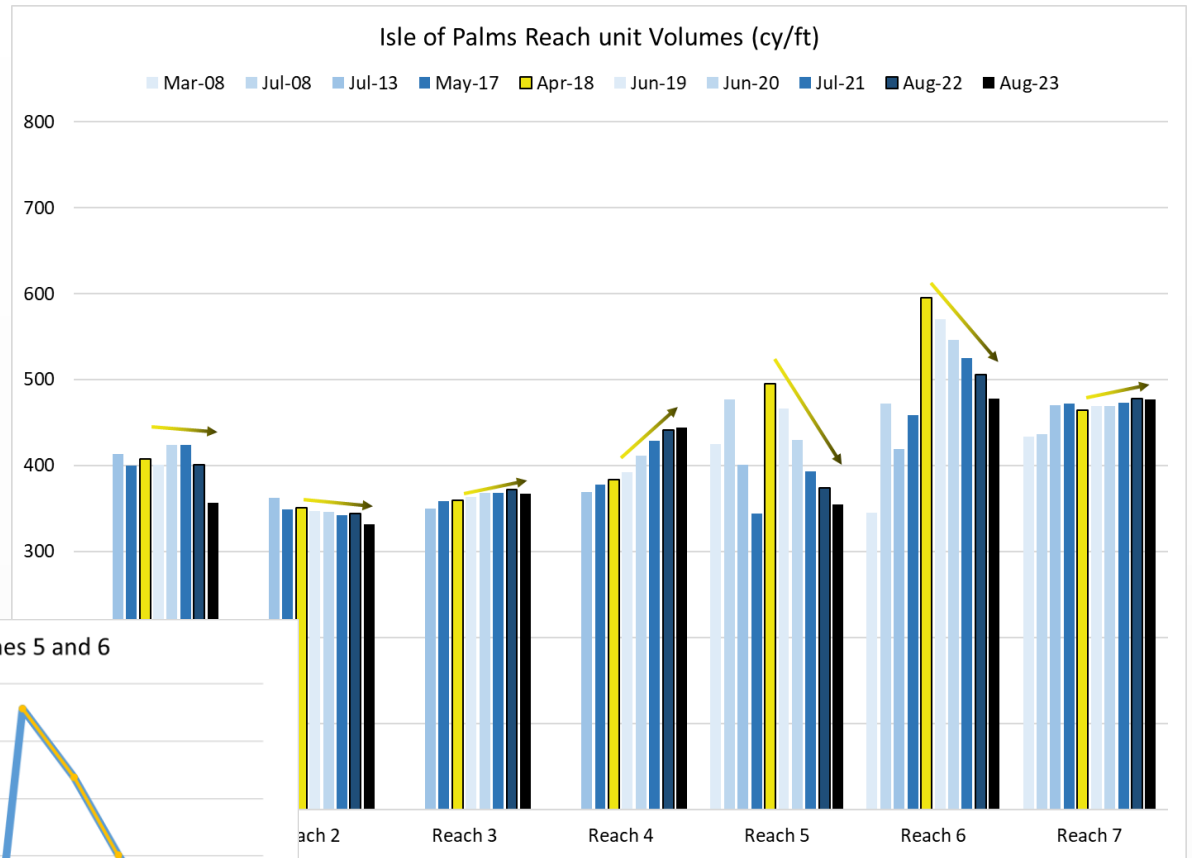
South Carolina Beach Volume Change from Prior Year - Nourishment Removed										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Daufuskie	-73,556	-202,352	-178,168	-148,629	-135,228	-116,667	-30,653	-104,189	-131,567	-1,121,008
Hilton Head	115,122	-778,398	-943,266	601,462	-228,264	163,337	-347,982	-303,272	35,391	-1,685,869
Fripp	252,162	37,056	-81,342	-41,381	366,156	416,855	174,613	-7,410	71,283	1,187,992
Hunting	-47,566	-230,950	-326,823	-442,498	-63,613	-97,223	-205,366	-278,785	-222,812	-1,915,638
Harbor	48,929	56,976	-52,422	-8,744	-55,570	17,036	27,720	-44,511	54,750	44,164
Edisto	-77,130	228,240	10,318	-192,099	-87,103	3,013	-66,612	199,046	20,807	38,480
Seabrook	-118,830	-62,381	-113,901	36,720	-6,094	27,241	-22,550	-69,476	-69,737	-399,008
Kiawah	-51,233	-172,402	-688,518	-68,160	166,786	-382,848	78,733	115,057	205,289	-797,297
Folly Beach	-518,800	-432,273	-469,742	418,065	-195,435	-397,729	-221,476	-240,393	-441,288	-2,499,071
Sullivans	255,121	247,454	600,570	60,654	504,530	626,855	55,415	378,604	211,765	814,160
Isle of Palms	224,918	-20,701	53,241	-240,314	-166,279	36,499	-94,112	-504,805	-450,085	-1,161,637
Dewees	-175,502	-178,219	-352,018	-1,782	-89,011	-110,884	-55,520	-99,785	-229,195	-1,270,922
Debordieu	29,034	-33,297	-412,216	97,802	-157,278	-197,462	-244,810	11,957	218,501	-687,770
Pawleys	21,892	54,939	-228,032	-1,565	42,247	-92,761	-111,164	81,673	-61,546	-294,318
Litchfield	51,349	16,752	-172,599	-97,838	88,814	-187,413	13,049	-101,600	-38,520	-428,005
Garden City	-97,275	23,247	-106,868	215,400	304,113	-76,167	-75,635	56,671	7,283	250,769
Surfside	-734	-200,561	301,157	-335,747	36,148	-69,466	-9,840	-10,204	-69,963	-359,210
Myrtle Beach	-71,034	-137,302	-334,099	117,326	431,471	-139,183	39,082	-304,838	18,211	-380,365
Arcadian	-73,840	-161,523	-64,023	2,001	27,538	74,383	-48,285	-13,697	-51,262	-308,707
NMB	-237,694	-266,853	-311,832	557,537	-108,287	23,432	-137,125	-12,893	-74,948	-568,664
Waties	62,003	181,251	-226,991	337,783	-10,296	-141,583	56,652	139,497	-55,109	343,206
Total	-992,706	-2,526,204	-4,069,168	744,685	-344,313	-620,733	-1,224,174	-1,113,353	-1,052,751	-11,198,717

Monitoring Areas

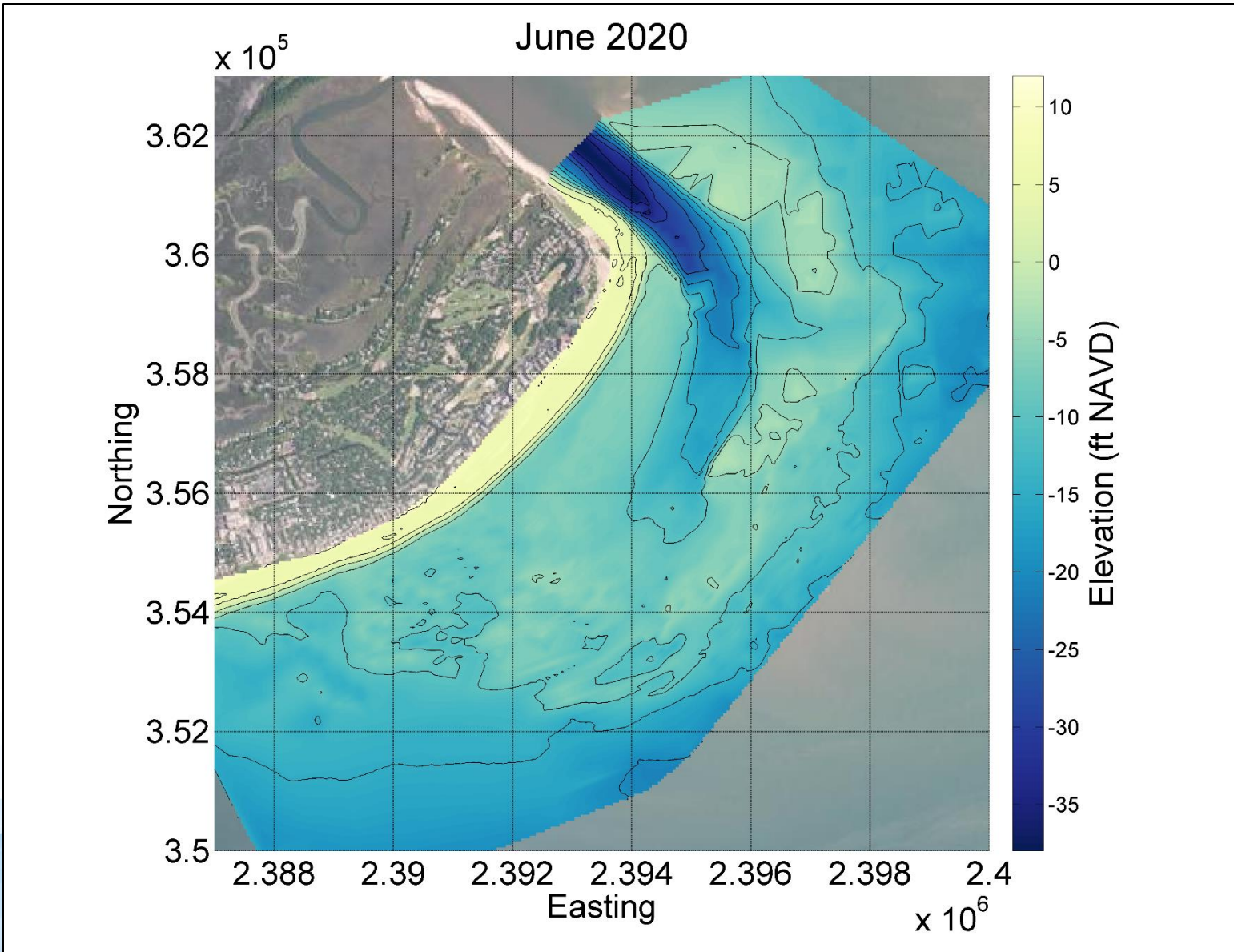


East End Erosion

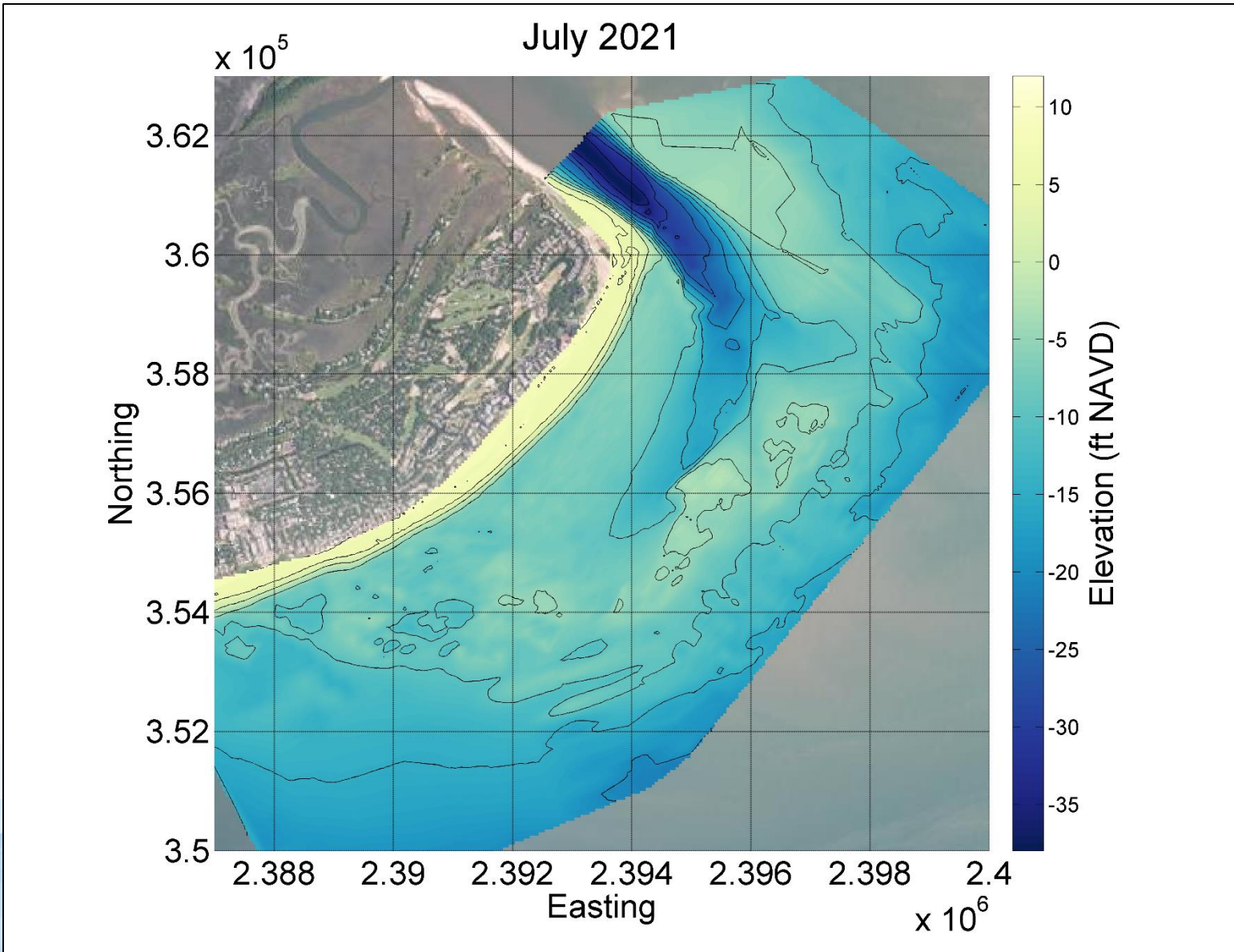
- -254,000 cy last year
- -1,400,000 cy since 2018 (90% of Fill)
- Focused erosion area near Beach Club Villas accounts for much of the loss



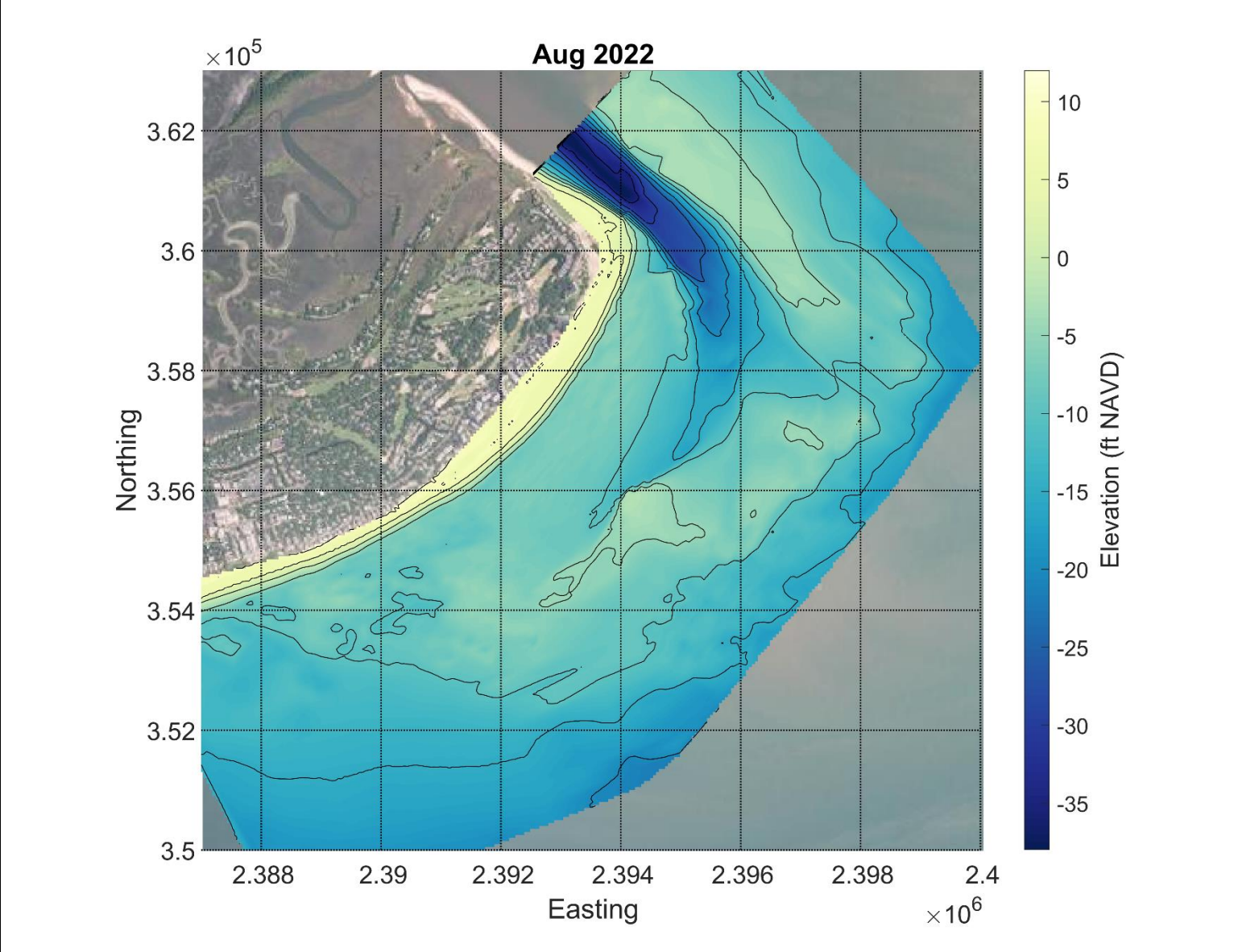
East End Evolution



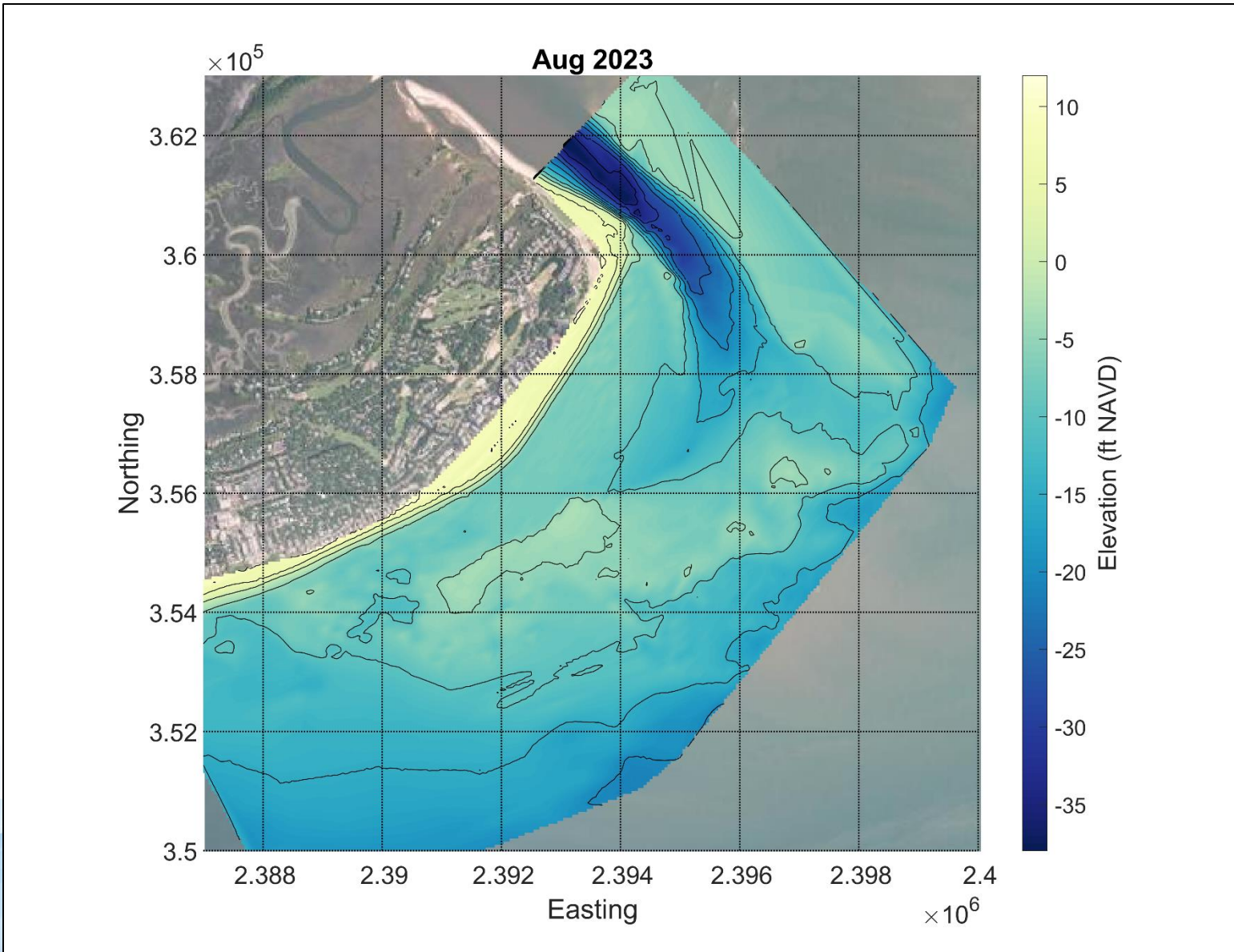
East End Evolution



East End Evolution

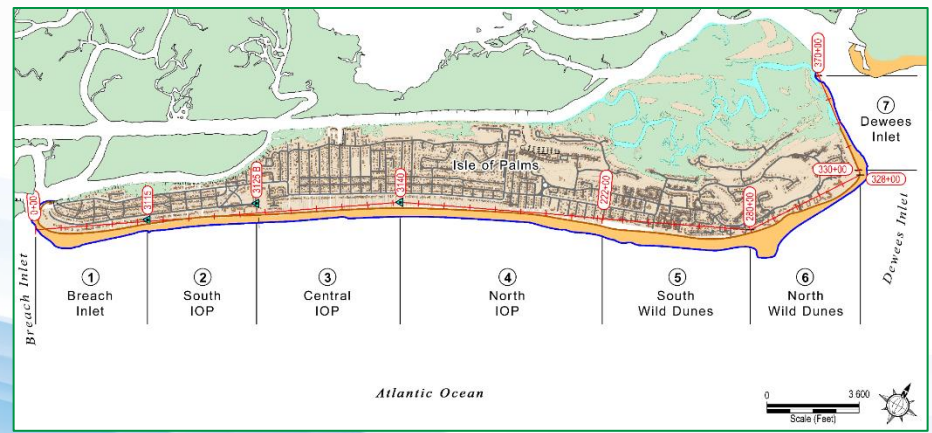
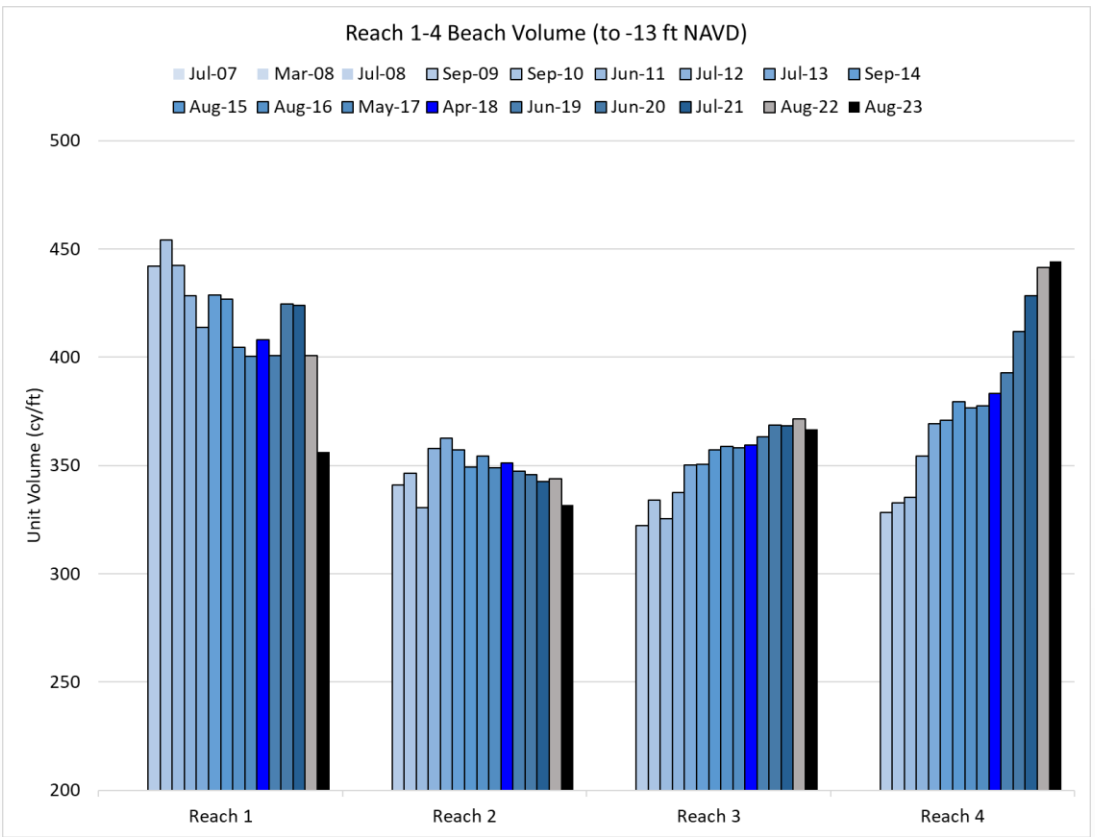


East End Evolution

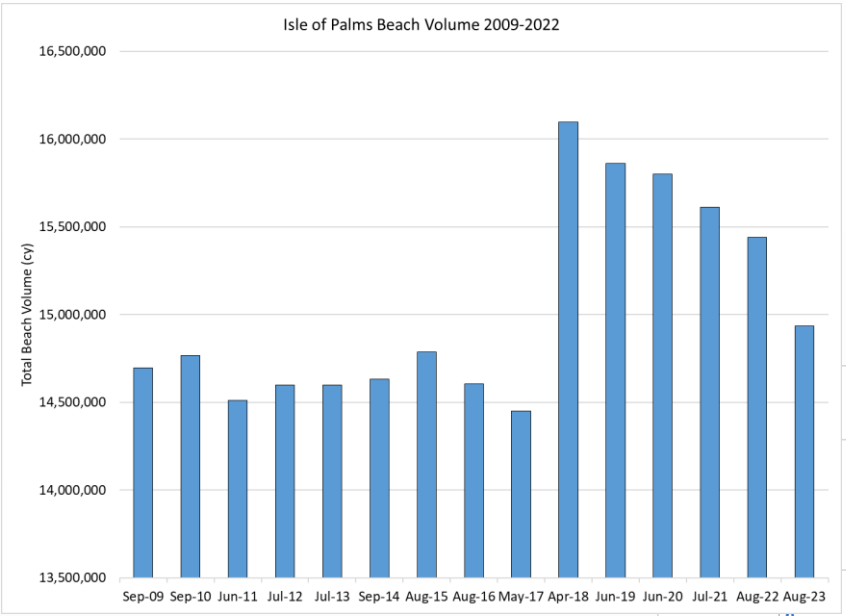


Downcoast Areas

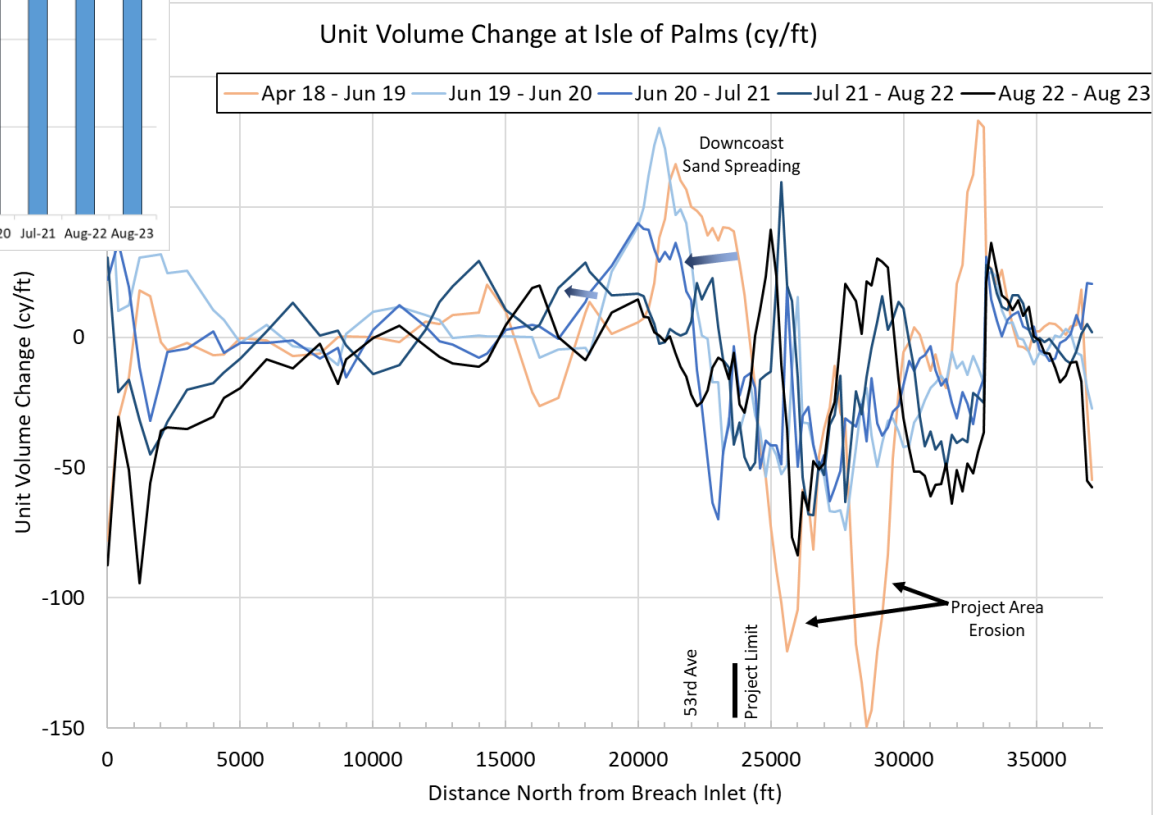
- Downcoast reaches lost ~250,000 cy last year
- Only Reach 4 gained sand
- Most erosional year for reaches 2-3 since 2010-2011



Beach Volume Change



- Total increase of 914,000 cy since 2009
- -506,000 cy (13.6 cy/ft) island wide last year Most of any year by 2x.



Front Beach

- Generally healthy, but lowest dune volume
- Impacted by episodic interruptions of upcoast sand supply
- Protected from modest storm, but not severe
- Persistent arc south of the pier

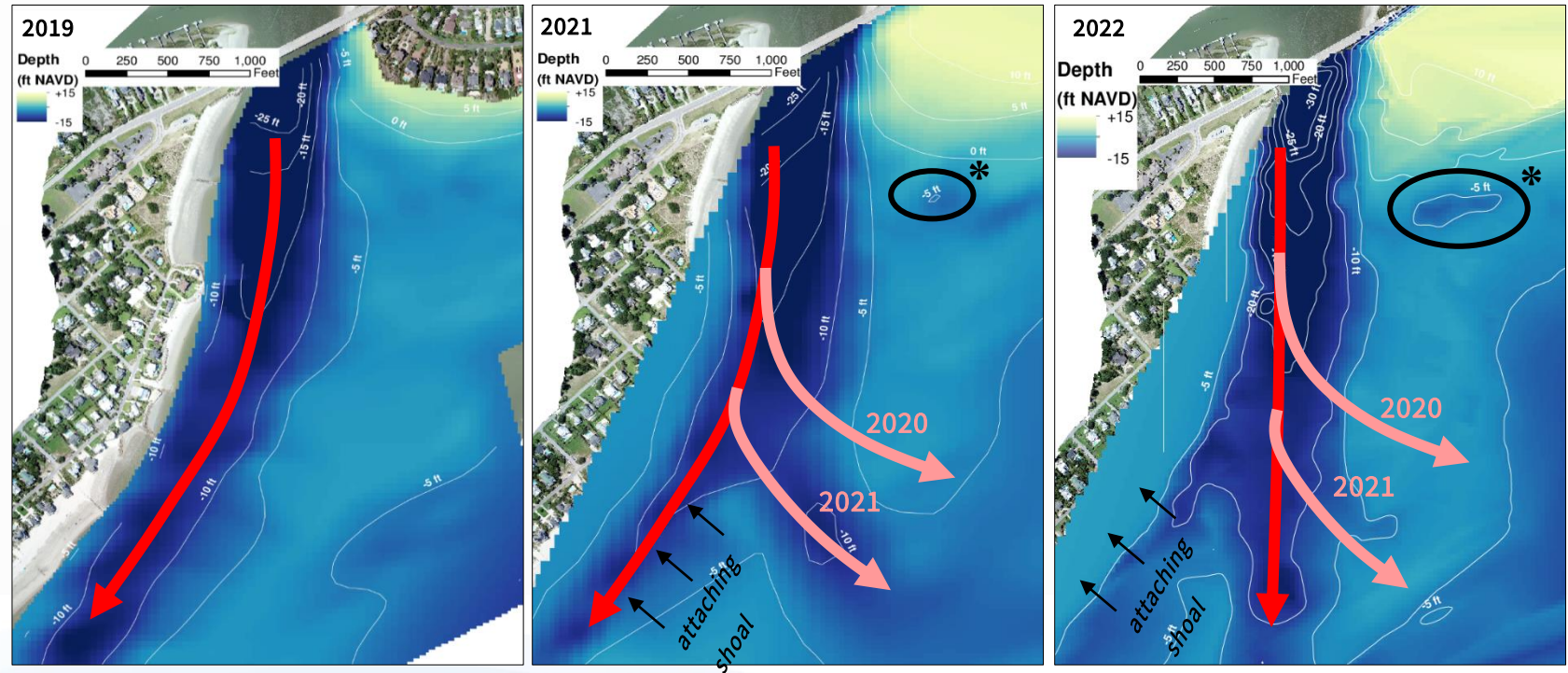


Breach Inlet Conditions June 2023



Breach Inlet

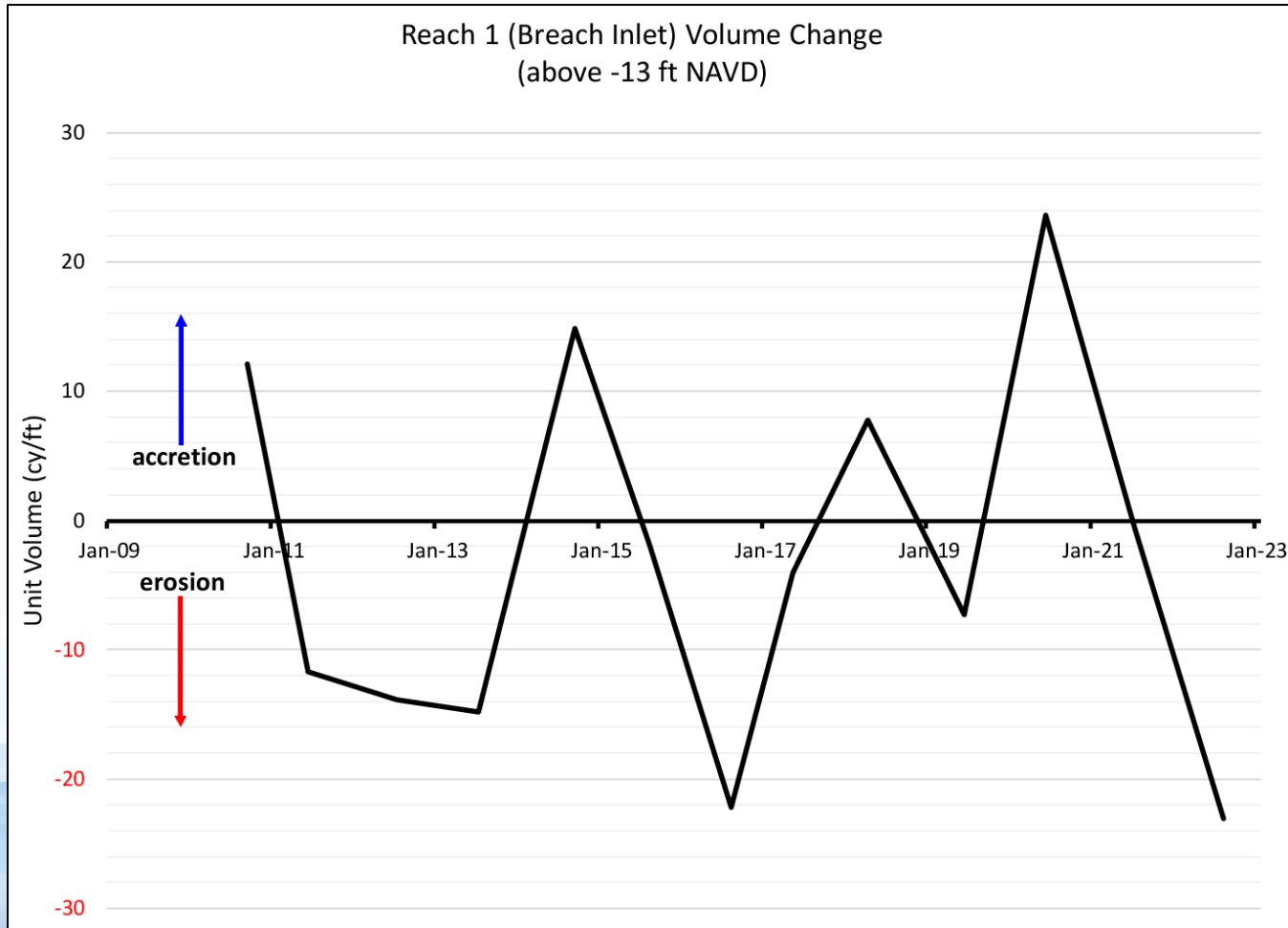
- Episodic erosion caused by:
 - periodic shifts in channels and shoals in inlet
 - Lost ~250,000 cy of sand in past 2 years
 - Lost ~80,000 cy prior 11 years



*deepening and widening channel ~250-500 ft offshore near eroded area

Breach Inlet

- Episodic erosion caused by:
 - *periodic shifts in channels and shoals in inlet*
 - *migration of beach sands from the central and eastern portions of island*
- Results in oscillations between accretion and erosion (typical near inlets):

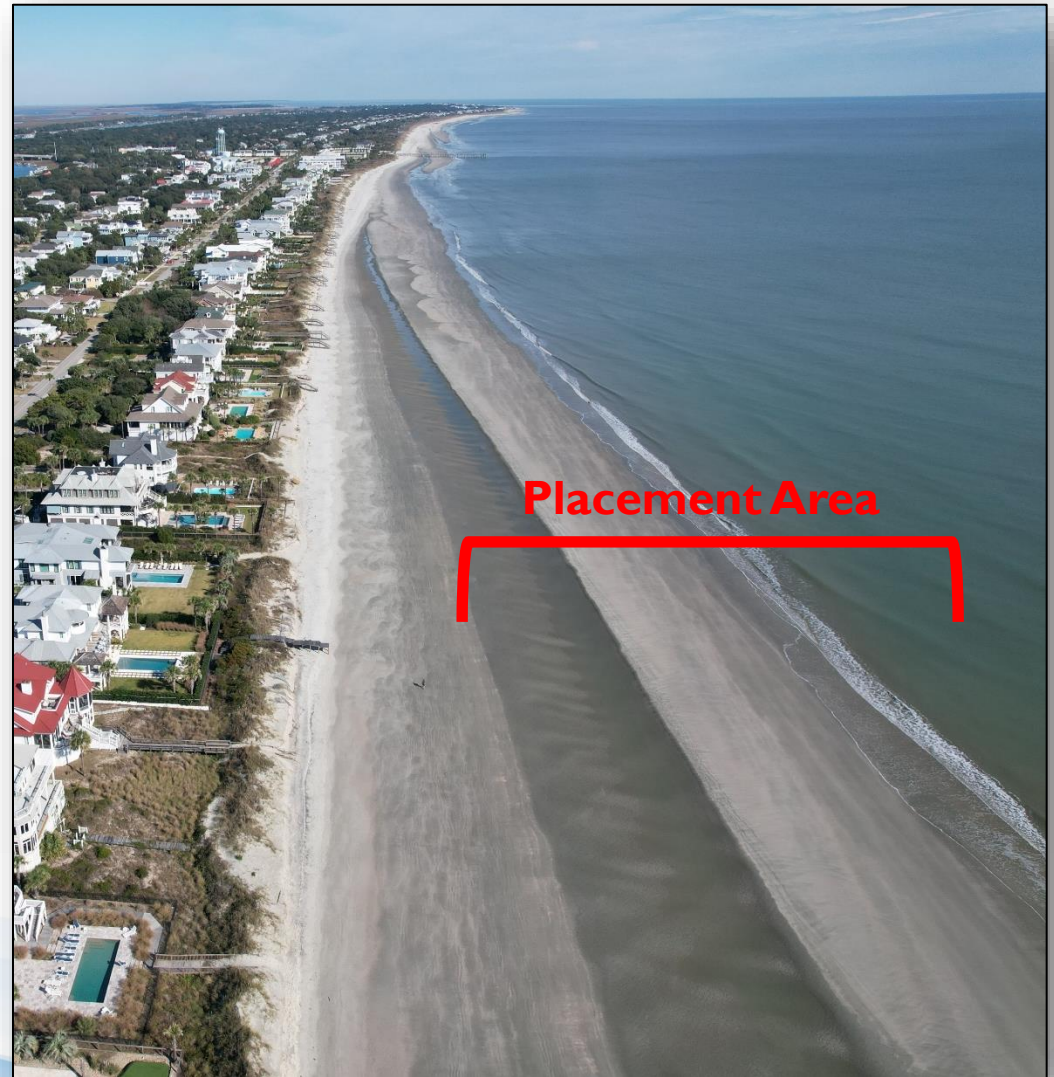


Moving Forward

- **USACE Beneficial Use Project**
 - Expected to be awarded this month.
 - Could start in March, but could be later
 - Would place ~500,000 cy in the system
 - IOP can shift sand to eroded areas, but we expect natural migration as well
- **Shoal Management/Sand Recycling Project**
 - Interim projects to harvest sand from accretional areas and place in eroded areas to combat episodic erosion events
 - Permit submission Feb or early March
- **Large-scale Nourishment**
 - Conducting sand search analysis and coordination with SHPO and BOEM to identify sand sources
 - Would include placement options at both ends of the island

USACE Project Expectations

- Sand will be placed along the intertidal beach via pipes
- Initial placement will widen the intertidal and low tide beach
- Much of the sand will be underwater initially
- Waves will push sand higher in the profile over a period of weeks/months



Considerations

- Presently, the state has nearly exhausted appropriated funds for state match
- Incoming shoal at Wild Dunes will significantly increase beach volume in next 1-2 years.
- Hot-spot erosion may occur/worsen during attachment over next 12 months
- USACE Beneficial use project restores all of sand lost in Reaches 1-2 since 2009