City of Folly Beach: Evolution and Rehabilitation of Folly Beach's Groin System

NCBIWA, October 22, 2026

CITY OF FOLLY BEACH SOUTH CAROLINA

Geosyntec consultants

Geosyntec Consultants of NC, P.C.

ATM

A Geosyntec Company of NC, P.C.

ELKO COASTAL CONSULTING INC.

S.C. Beachfront Management Act



- Regulation 30-15: Activities Allowed Seaward of Baseline
- Existing **groins** may be reconstructed, repaired, and maintained. New groins may be allowed only on beaches that have high erosion rates with erosion threatening existing development or public parks. In addition to these requirements, new groins may be constructed, and existing groins may be reconstructed, only in furtherance of an ongoing beach renourishment effort…

S.C. Beachfront Management Act

- “The use of armoring …such as seawalls, bulkheads, and rip-rap to protect erosion-threatened structures adjacent to the beach has not proven effective. These armoring devices have given a false sense of security to beachfront property owners…have increased the vulnerability of beachfront property to damage from wind and waves while contributing to the deterioration and loss of the dry sand beach…”
- No new seawalls
- Existing seawalls can be rebuilt if damaged <50%.



Project Setting





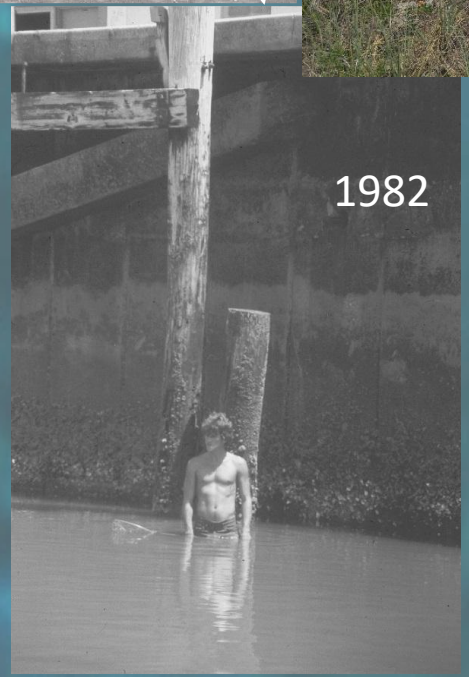


Folly Beach, SC

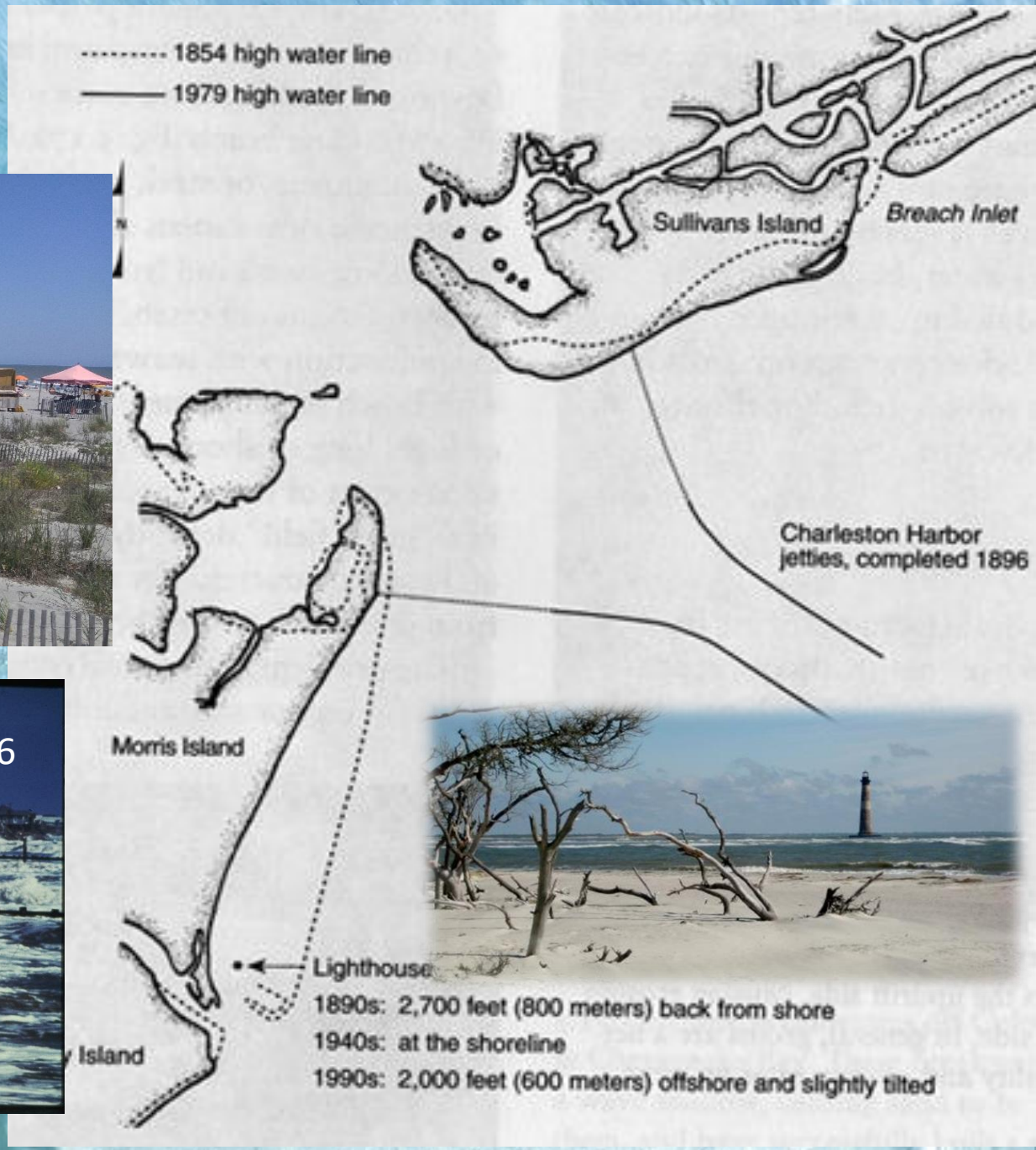


2017















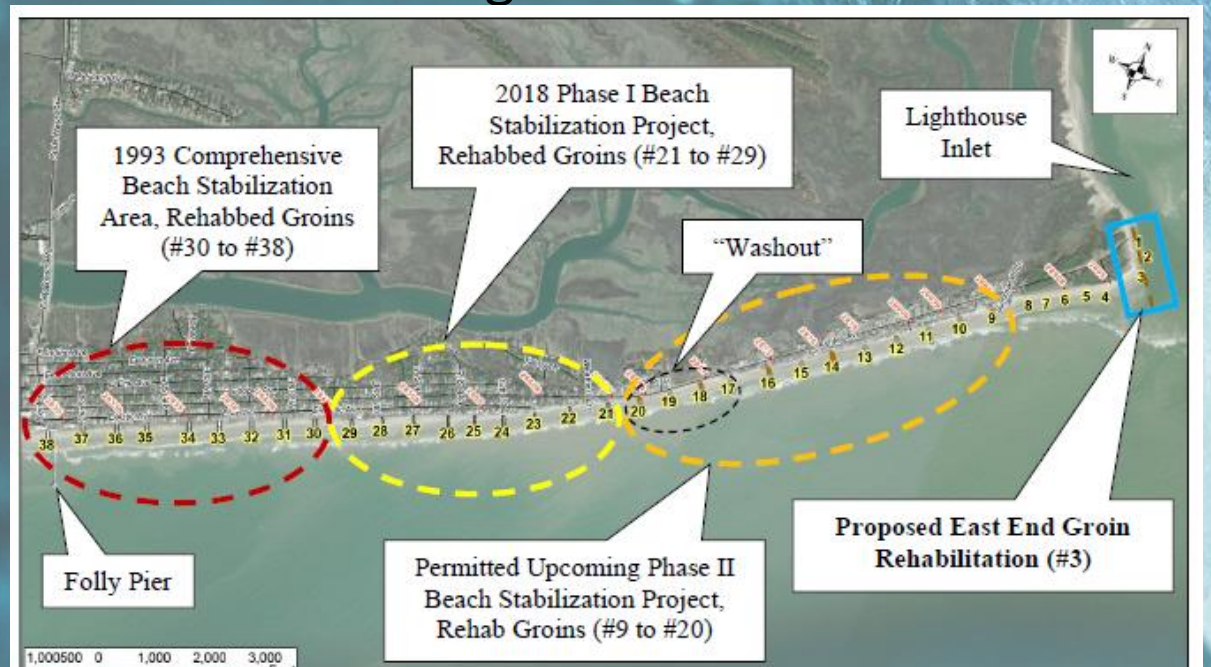
Status in 2017

1990 exemption from S.C. Beachfront Management Act did not save Folly Beach

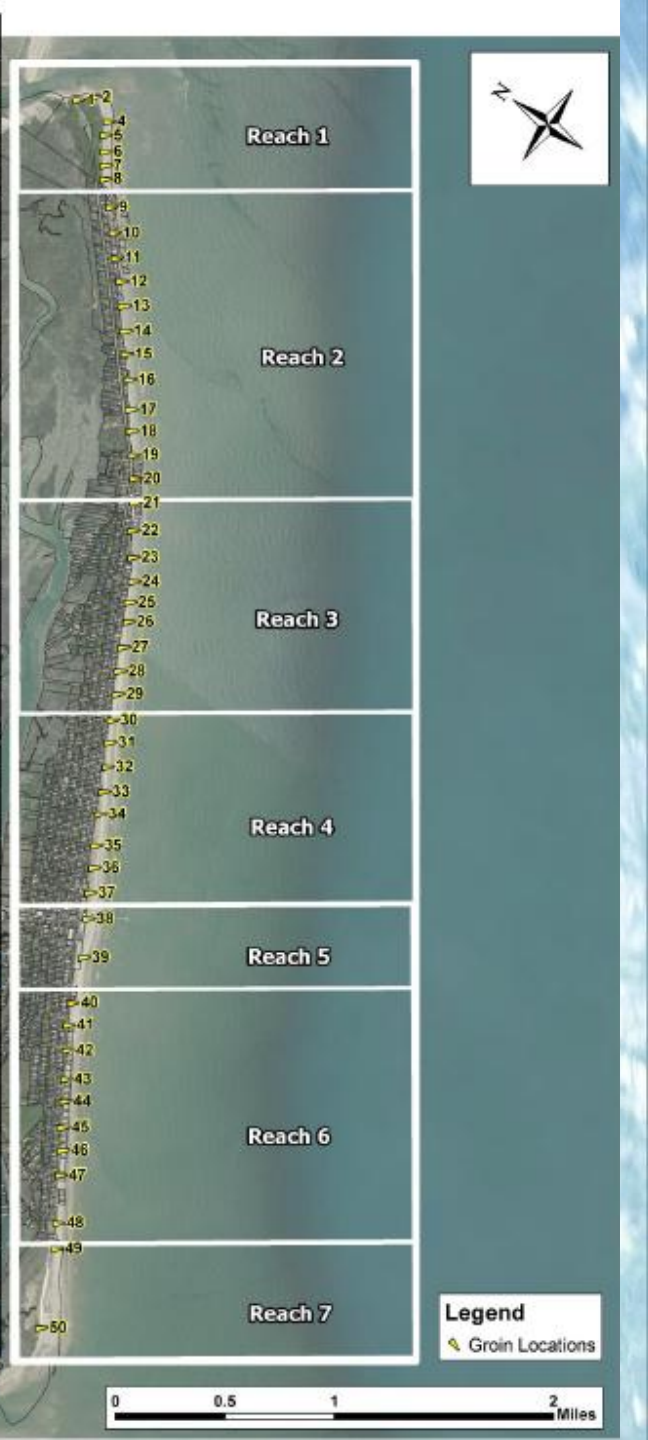
Master Planning (2017 to 2022)
Groin Condition Assessment
Costing Analysis
Major Focus on Rebuilding/Enhancing Dune System

Groin Rehabilitation Phases

Phase 1 -Groins 30-38 (1993)
Phase 2 –Groins 21-29 (2018)
Phase 3 –Groins 9-20 (Next Fill Event)
-now includes Lighthouse Inlet Groin



Groin ID	Functionality	Vegetated Dune Width (ft)
1	Marginal	50
2	Marginal	50
3	Marginal	50
4	Marginal	60
5	Poor	60
6	Poor	50
7	Poor	50
8	Poor	70
9	Poor	15
10	Marginal	20
11	Marginal	25
12	Marginal	50
13	Marginal	40
14	Marginal	20
15	Marginal	30
16	Poor	15
17	Poor	20
18	Poor	50
19	Poor	35
20	Poor	40
21	Good	90
22	Good	50
23	Good	25
24	Good	60
25	Good	60
26	Good	55
27	Good	75
28	Good	80
29	Good	70
30	Good	85
31	Good	115
32	Good	120
33	Good	125
34	Good	150
35	Good	190
36	Good	185
37	Good	140
38	Good	0
39	Poor	25
40	Poor	140
41	Poor	150
42	Poor	150
43	Poor	120
44	Poor	110
45	Poor	100
46	Poor	100
47	Poor	65
48	Poor	50
49	Poor	65
50	Good	200



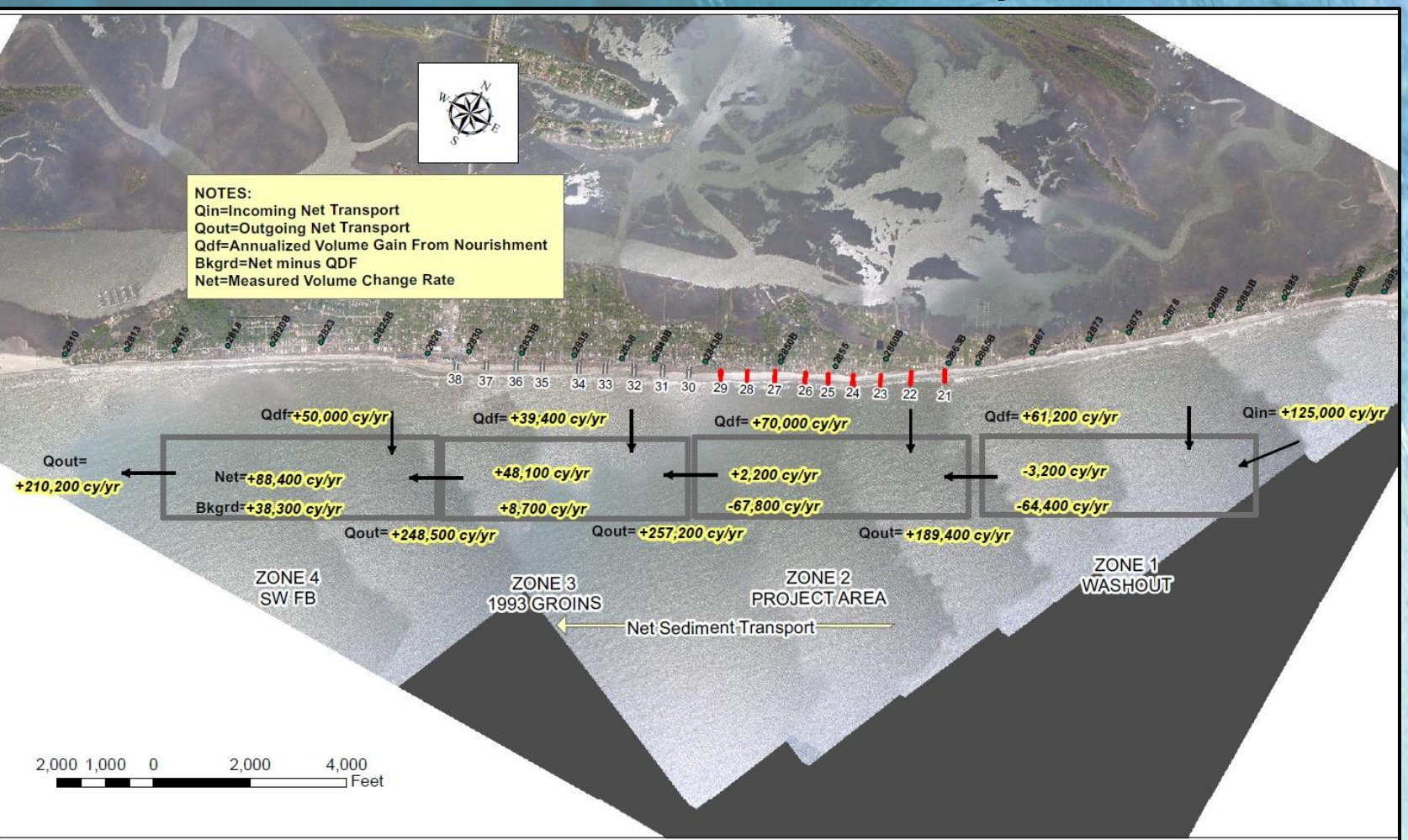
Groin Rehabilitation must coordinate with a Nourishment Project

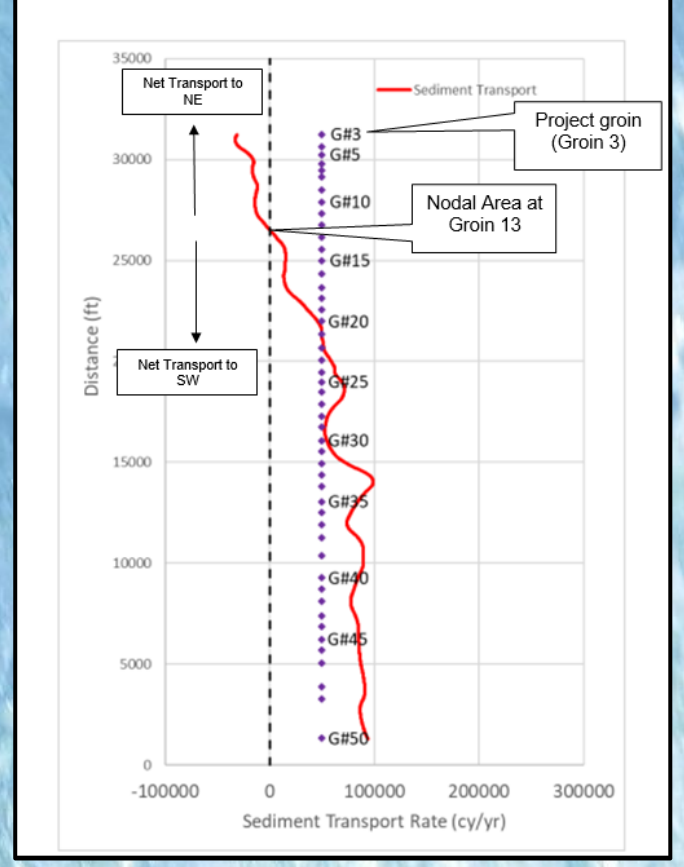
Nourishments since USACE began its 50-year Folly Beach nourishment program.					
Year	**Volume Placed (cy)**	**Borrow Area**	**Fill Length (ft)**	**Length (miles)**	**Average Placement (cy/ft)**
1993	2,695,900	Folly River	28,200	5.34	95.6
2005	2,338,000	Offshore (Area A)	28,200	5.34	81.0
2007	486,000	Offshore	10,138	1.92	47.9
2014	1,419,385	Offshore (A, B, C, D)	28,800	5.45	49.1
2018	1,200,000	Folly River	26,030	4.93	46.1
2024	1,300,000	Folly River	28,200	5.34	46.1
2029?*	2,169,000	Offshore (E,F)	30,890	5.85	70.2

* dependent on storm activity, USACE funding, beach conditions, etc.

Permitting & Monitoring

- Sediment Budget Analysis
- Erosion Rates, Fill Activities
- Beach Fill Diffusion
- Downdrift Analysis





Post-Project Monitoring:

1. Beach Profile Surveys
2. Beach Sediment Samples
3. Aerial Photographs
4. Compaction
5. Escarpment Formation during turtle nesting season.

Phase 2 – Groins 21-29
Timber Elements Removal





Geotextile Mattresses





Phase 2 – Groins 21-29
Stone, Grouting, Ramps

















From this…



to this…







2018 Folly Groin Rehabilitation: Impermeable Low-Profile Groins

Phase 3 –Groin 3 and Groins 9-20

Groins 9-20 (including “Washout”)





Groin 19 (part of “Washout”)

Groin 3 along Lighthouse Inlet



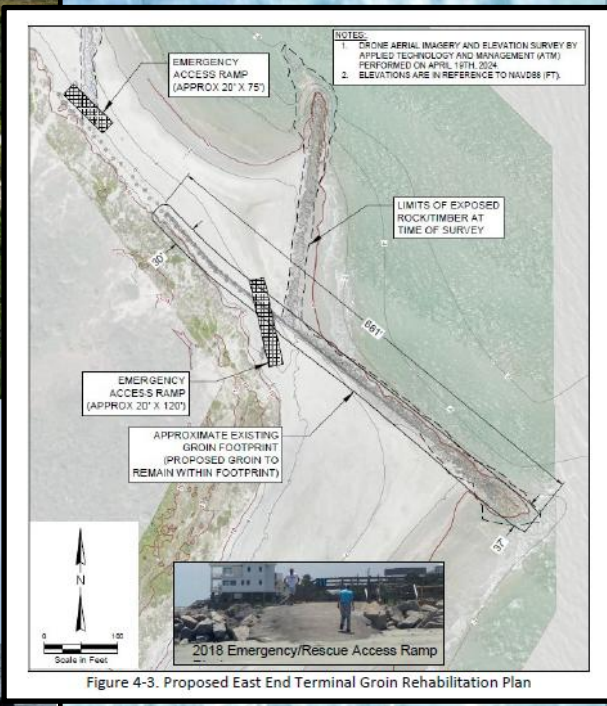


Figure 4-3. Proposed East End Terminal Groin Rehabilitation Plan

2019

2024







2017: Seawalls constructed
2018: 5th USACE renourishment, groin rehabilitation, dune fending and grassing
2024: 6th USACE renourishment, dune fending and grassing
2026: See photos

2017



2026



1990 exemption from S.C. Beachfront Management Act did not save Folly Beach

2017



2026



City of Folly Beach:
Evolution and Rehabilitation of Folly Beach's Groin System

Nicole Elko, Ph.D.
President
Elko Coastal Consulting, Inc.
nelko@elkocoastal.com
(843) 371-7082

https://elkocoastal.com/

Fran Way, P.E., C.F.M
Senior Coastal Engineer
Geosyntec Consultants of NC, P.C.
Francis.way@geosyntec.com
(843) 414-1050

www.geosyntec.com



NCBIWA, October 22, 2026



CITY OF FOLLY BEACH SOUTH CAROLINA

Geosyntec consultants
Geosyntec Consultants of NC, P.C.

ATM
A Geosyntec Company of NC, P.C.

ELKO COASTAL CONSULTING INC.