



Kiawah Island 2017 Beach Monitoring

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*High Value Services
Sustainable Solutions*



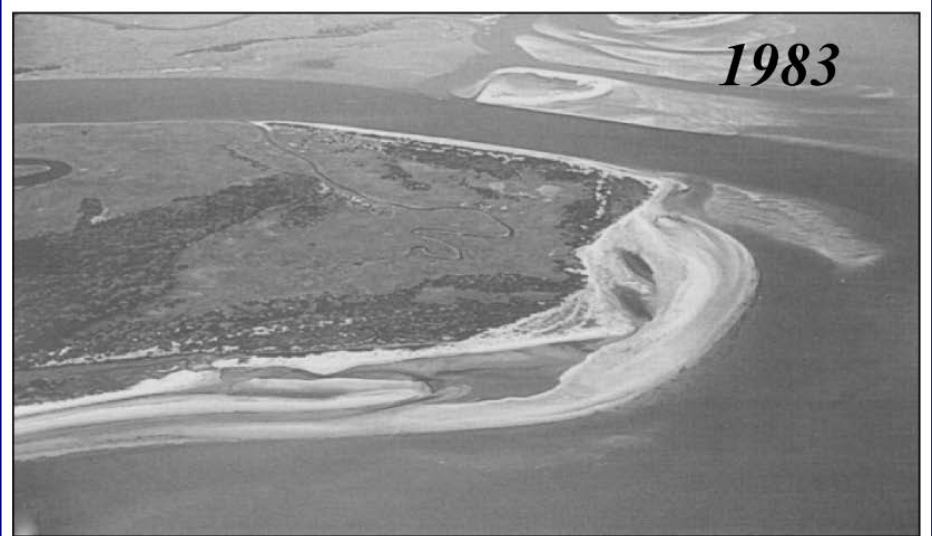
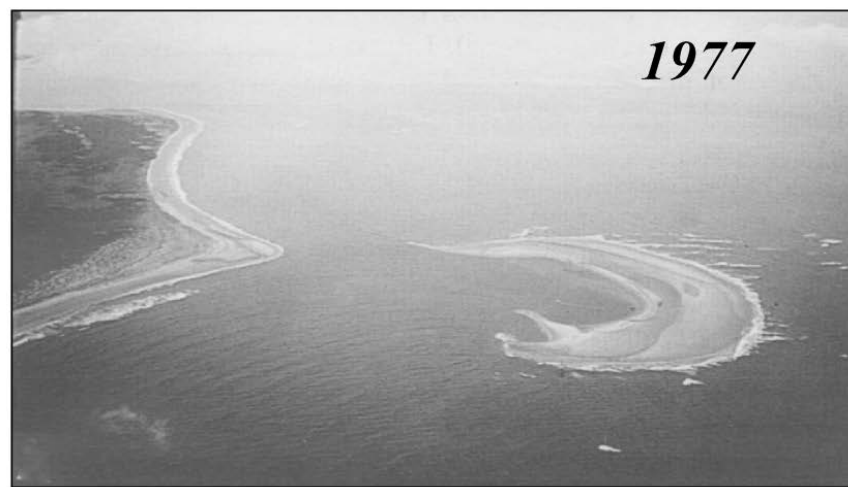
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Kiawah Island

- ~10 miles of beach along a mostly east-west configuration
- Stono Inlet to east, Captain Sams Inlet to west
- Most of the island has accreted over past several decades (1-10 ft/yr)
- Developed after studies of the beach processes completed



Shoal Bypassing at Stono Inlet



Large-scale shoal bypassing

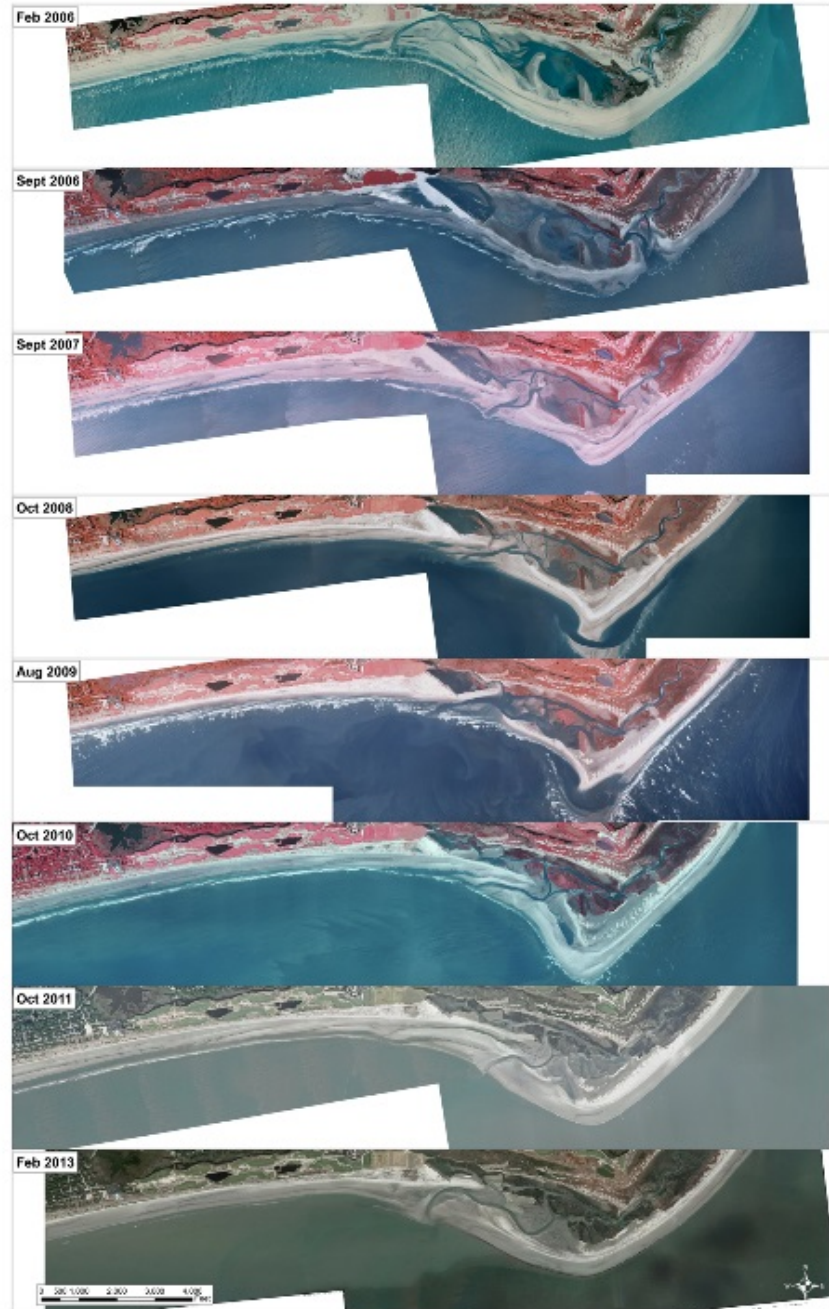
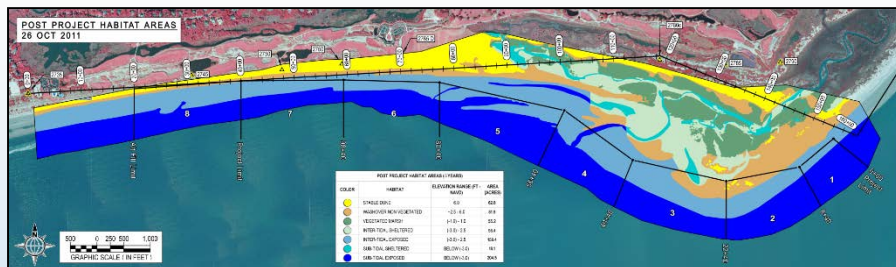
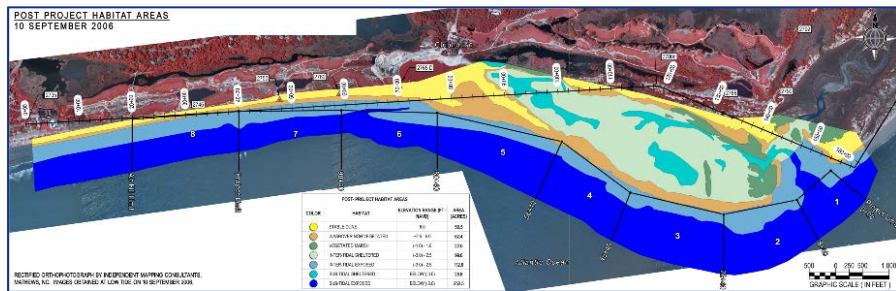
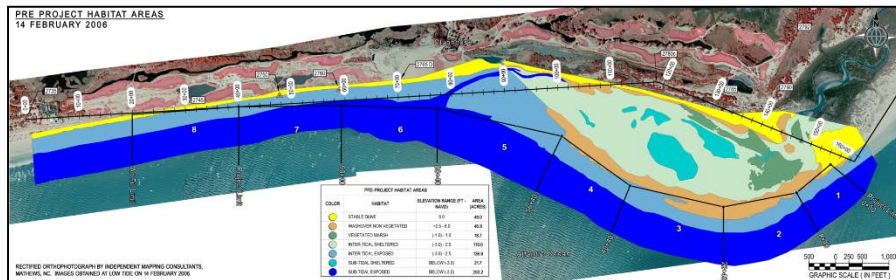


2006 Restoration Project

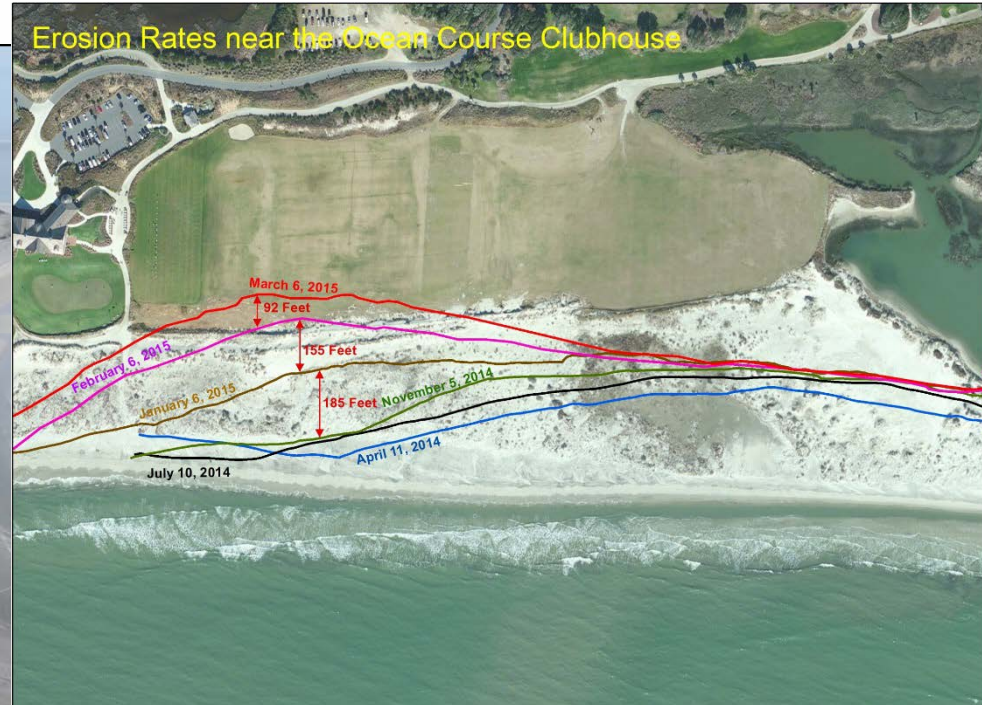
- Moved ~550,000 cy
- Inlet realignment plus beach restoration
- Used land-based equipment



Post-Project Monitoring



2015 Project

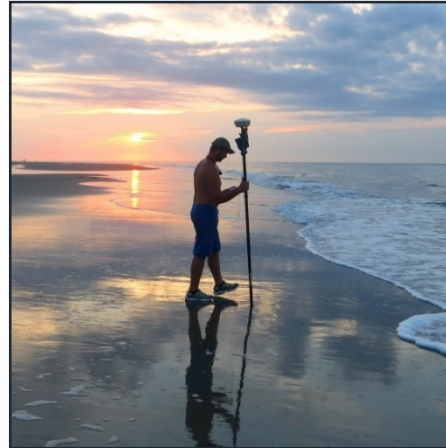
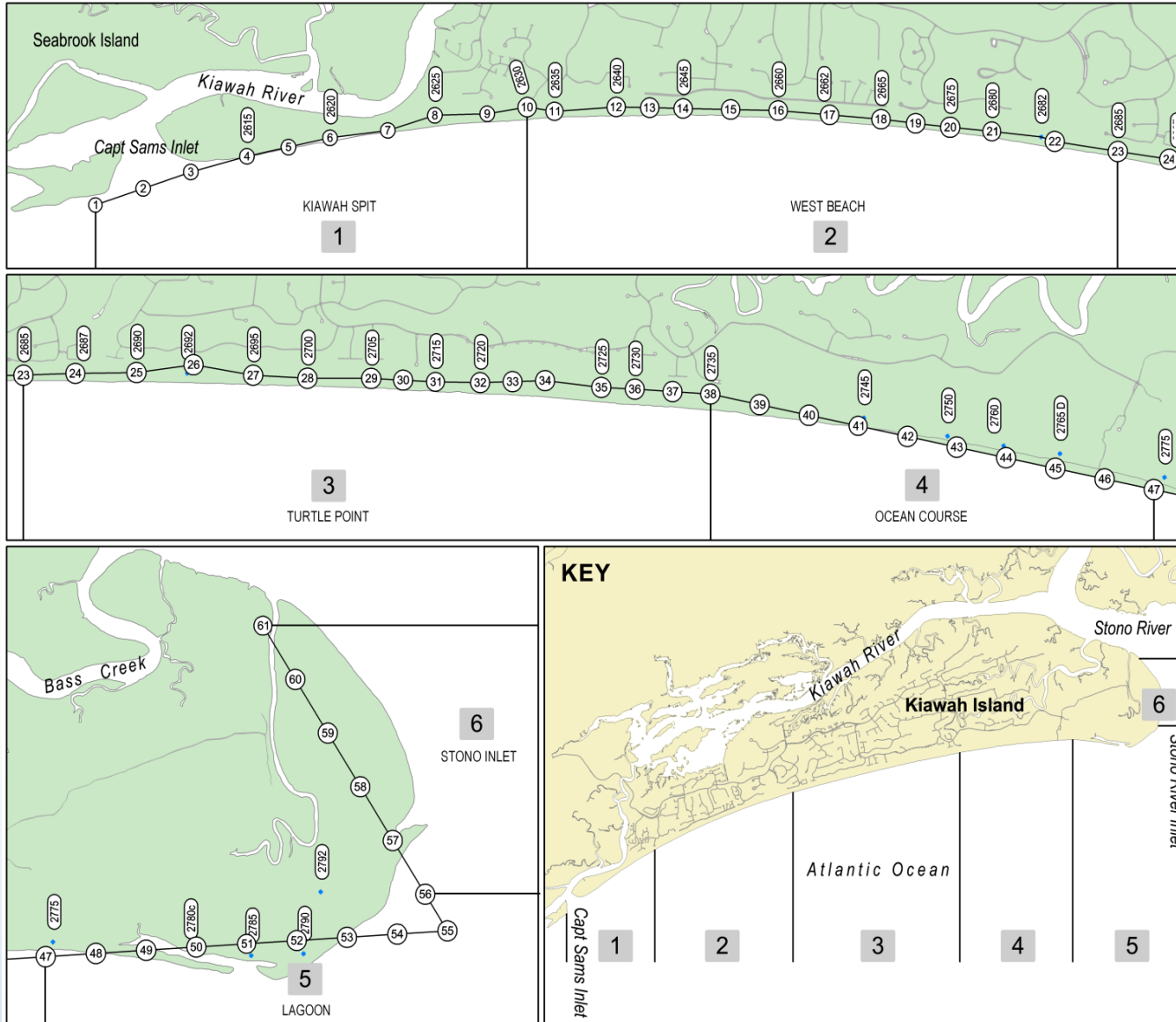


2015 Channel Realignment Project

- Moved 100,000 cy
- Limited beach restoration
- Focus on habitat conservation



Kiawah Island Beach Monitoring Stations



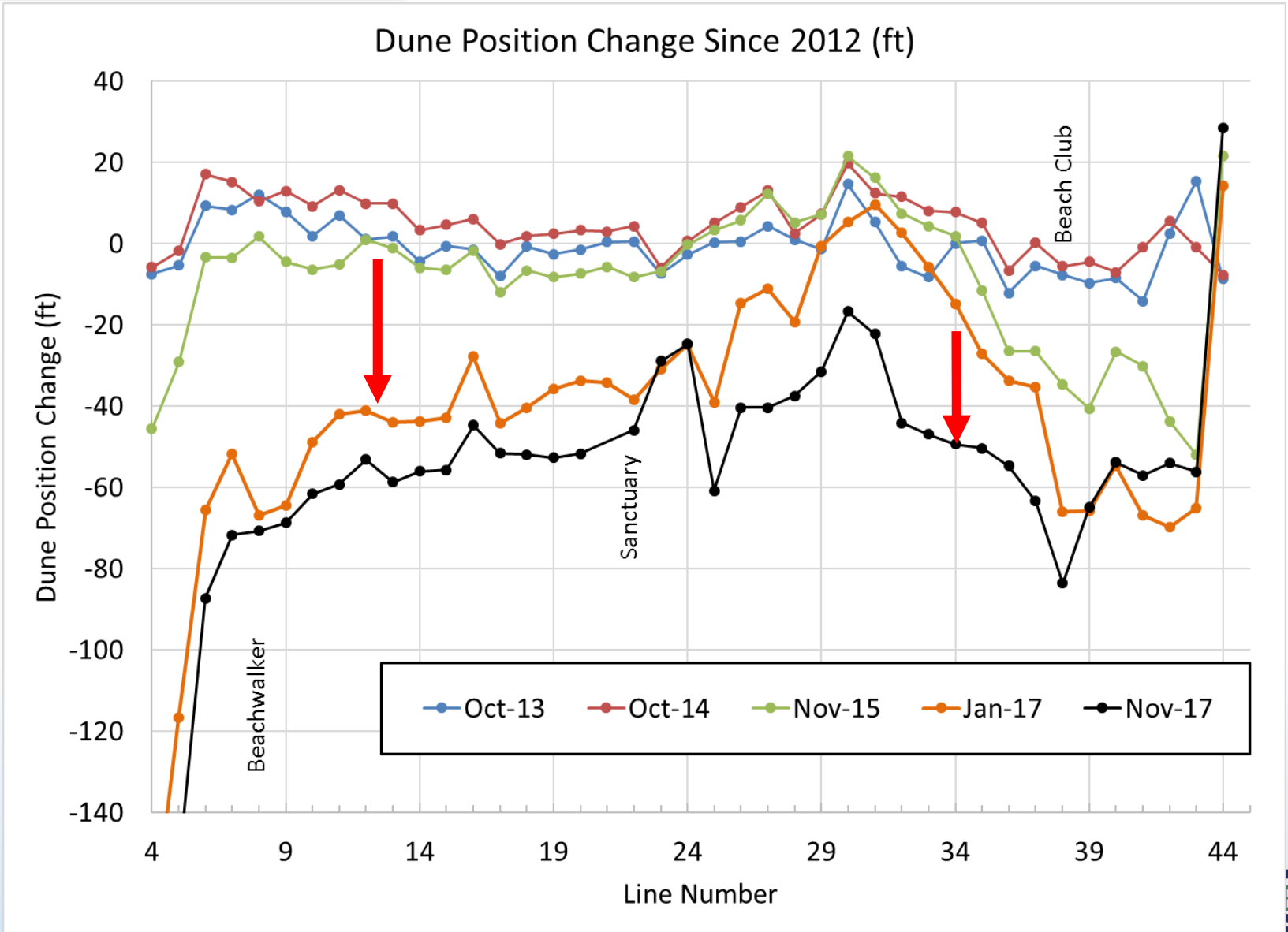
Key Events 2015-2017

- Channel Realignment Projects – Spring 2015
- Hurricane Joaquin – October 2015
- 2015 Survey – November
- Hurricane Matthew – October 2016
- 2016 Survey – Jan 2017 (delayed for environmental monitoring)
- Hurricane Irma – September 2017
- 2017 Survey – November 2017 (expedited to document Irma conditions)

Hurricane Impacts

- Matthew impacted the beach around 8 October 2016 as a weak Category 2 storm. Winds in Charleston ~75 mph.
- Resulted in significant dune recession (20-60 ft typical), damaged walkovers, minor flooding
- Irma passed to the west, however, higher water levels than Matthew.
- Additional 10-30 ft of dune erosion

Dune Erosion



Post-Irma Conditions

West Beach



Sanctuary



Boardwalk 32



Ocean Course



Post-Storm Conditions



Dune Scraping



Dune Scraping



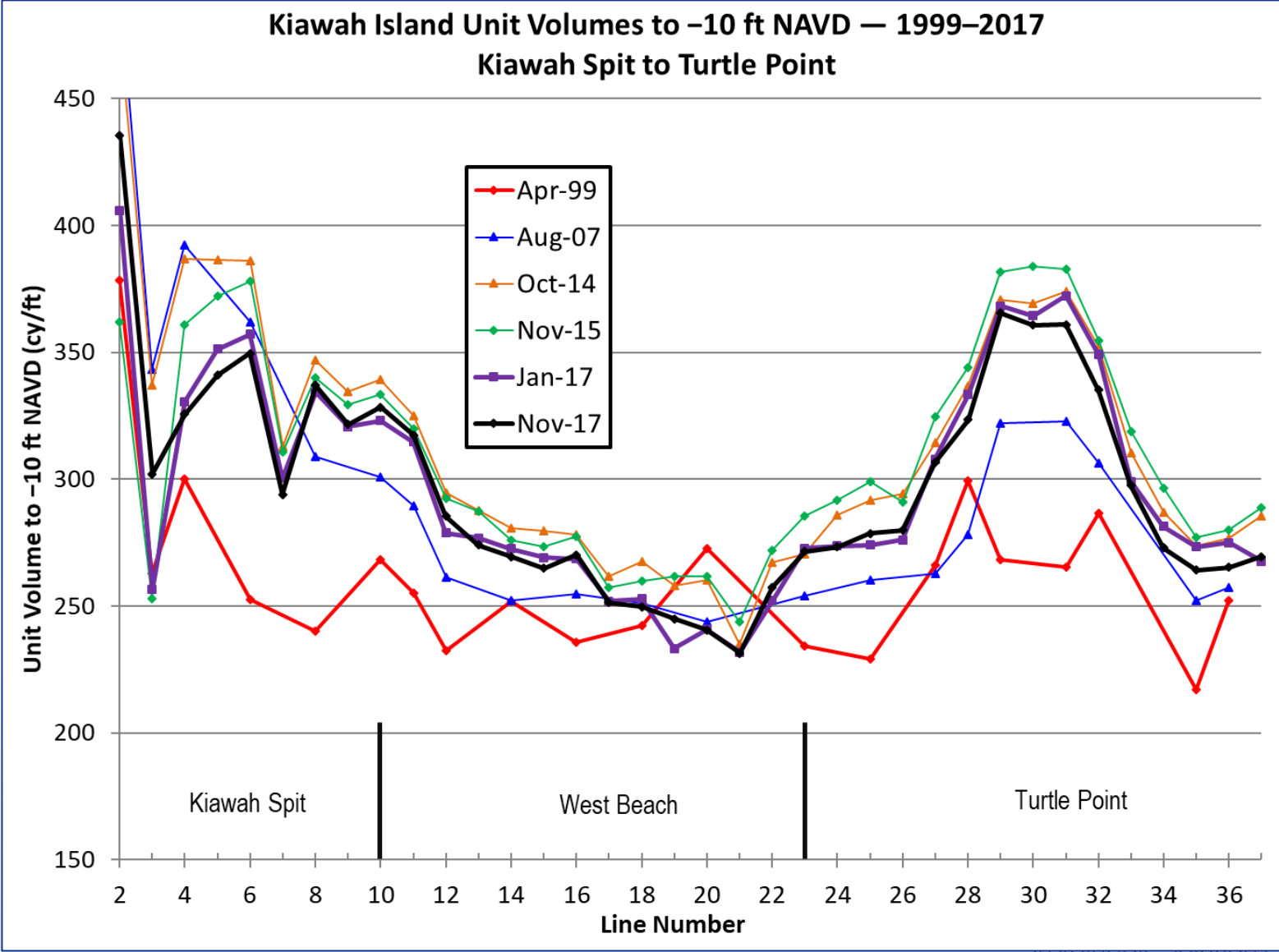
2017 Volume Changes

Reach	Name	Jan-Nov 2017 Unit Volume Change	2015-2017 Total Volume Change	2007-2017 Average
1	Kiawah Spit	18.9	166,319	-8.0
2	West Beach	1.2	13,818	0.9
3	Turtle Point	-3.7	-49,869	2.3
4	Ocean Course	1.6	14,695	6.2
5	Lagoon	-33.7	-269,902	-1.7
6	Stono Inlet	-14.3	-85,861	-8.0
1-6	All	-3.7	-210,800	-0.6

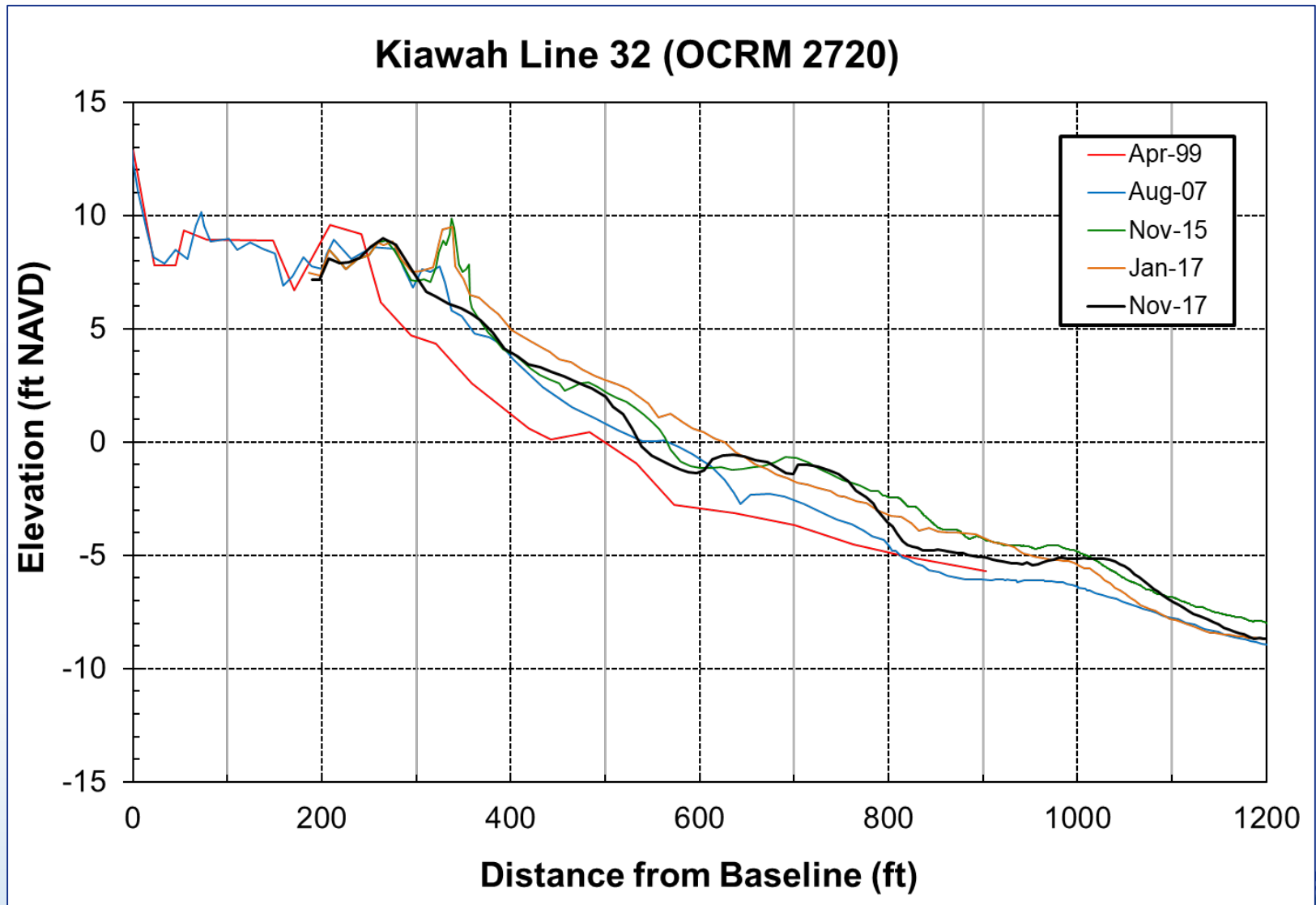
January – November 2017 Volume Changes

- Overall the island lost ~210,800 cy of sand (compared to ~750,000 cy lost previous year)
- Erosion mostly restricted to area east of Ocean Course driving range
- Residential zone lost ~21,000 (compared to ~370,000 cy previous year)
- Erosion most severe along Flyway Dr.

Residential Area Beach Volumes



Beach Profile Changes



Beach Recovery

- Calm weather promotes beach recovery.
- Sand moves from underwater bars to the dry sand berm and dune.
- Sand lost from system needs to be replaced by new sand from upcoast.
- Evidence of recovery in early 2018 and substantial by April 2018.
- Scraped dunes have remained stable, which is a positive sign that additional erosion is minimal.

Post Storm and Recovery Conditions



September 2017



April 2018

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Post Storm and Recovery Conditions



September 2017



April 2018

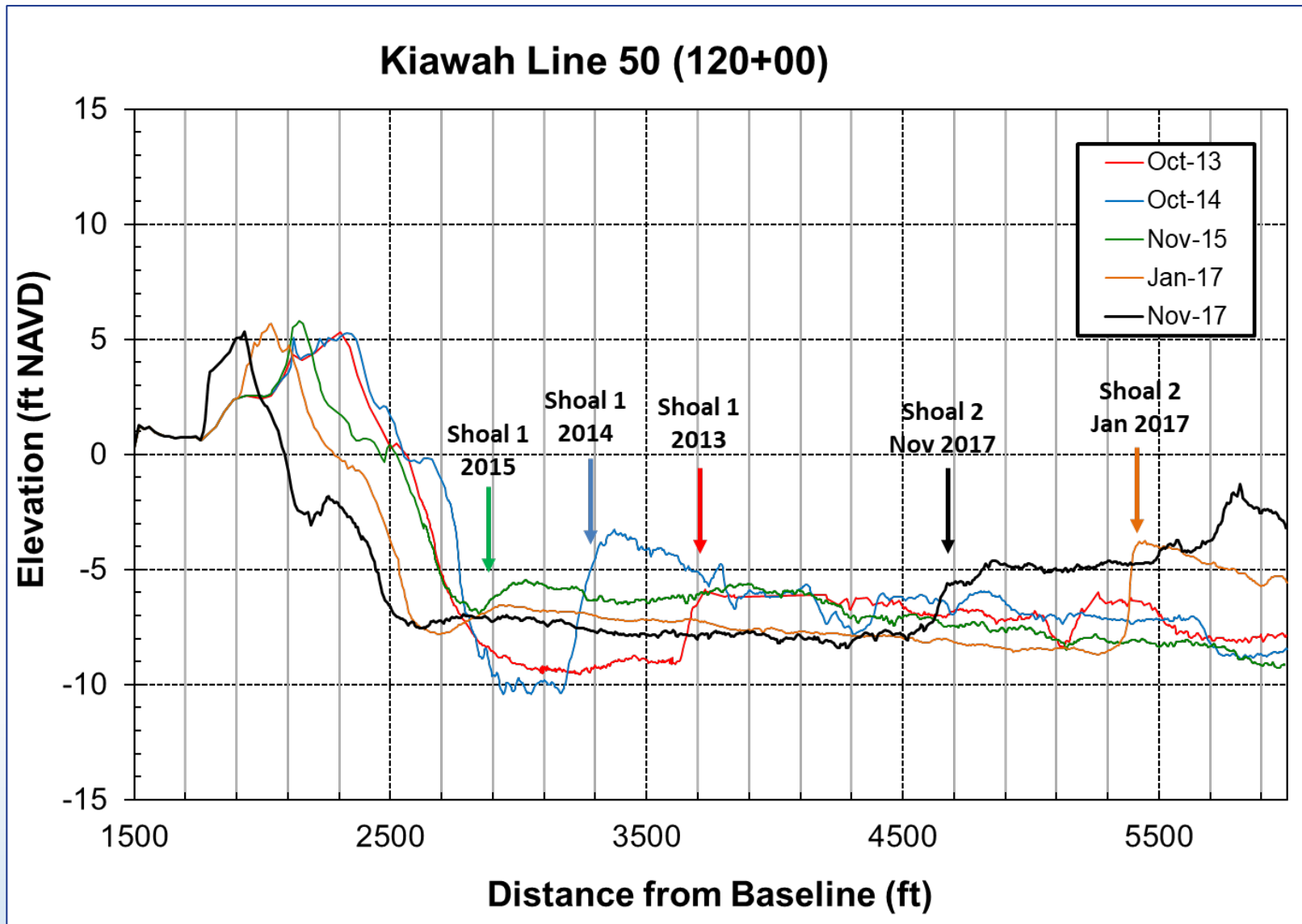
East End



East End

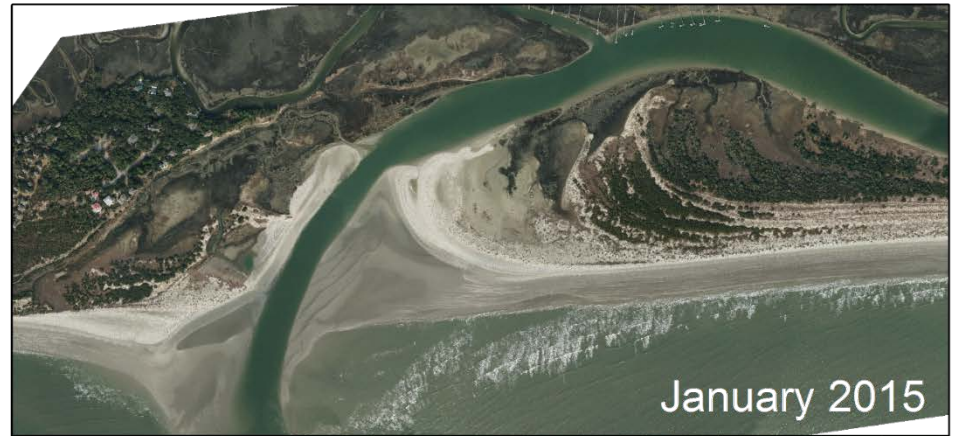


Shoal Attachment



Captain Sams Inlet

- Inlet relocated ~3,000 ft east in 2015
- 140,000 cy removed from new inlet basin
- Migrated ~325 ft from July 2015 to Jan 2017.
- Historical rate 200-300 ft/yr
- End of spit is rebuilding normal shape



Capt Sams



April 2018



Captain Sams Inlet



Summary and Recommendations

- Overall the island lost ~280,000 cy of sand from Jan to Nov 2017, mostly due to Hurricane Irma. Erosion was widespread.
- Dune erosion between 10 and 30 ft along residential area in addition to Matthew losses
- Emergency dune restoration performing well
- Natural dune building ongoing, no additional action needed; however, planting may promote more rapid recovery
- Sand fencing not necessary; but should be as close to the primary dune as possible if installed

Summary and Recommendations

- The east end project area continues to evolve as a washover attaching shoal
- Constructed channel has closed, lessening threat to Ocean Course
- Permit allows for another project to be completed, if necessary, but triggers are not met
- An additional survey can be obtained to document recovery of upper beach profile