Kennedy Space Center Dune Restoration

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2022 National Conference on Beach Preservation Technology

St. Augustine Beach, FL

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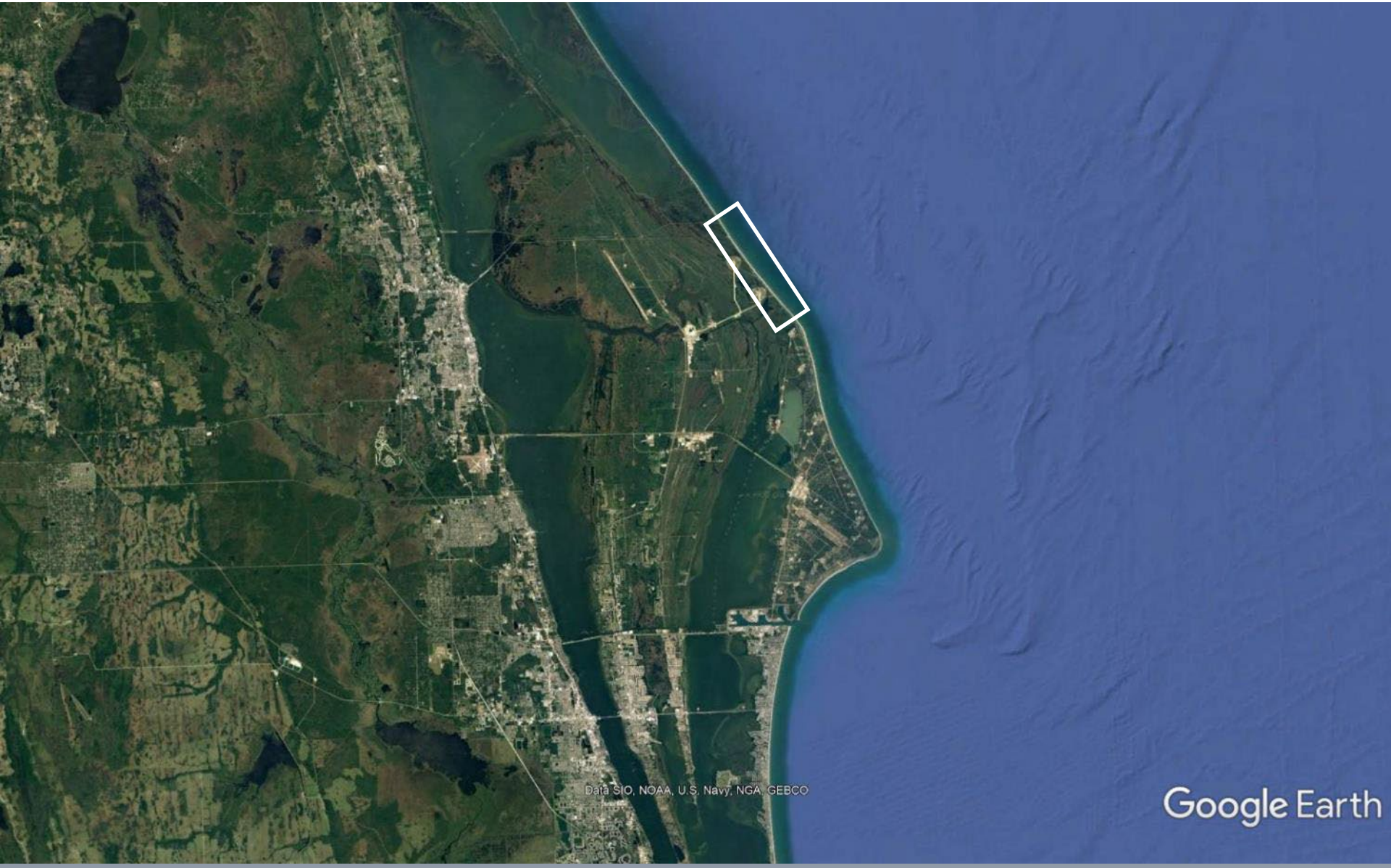
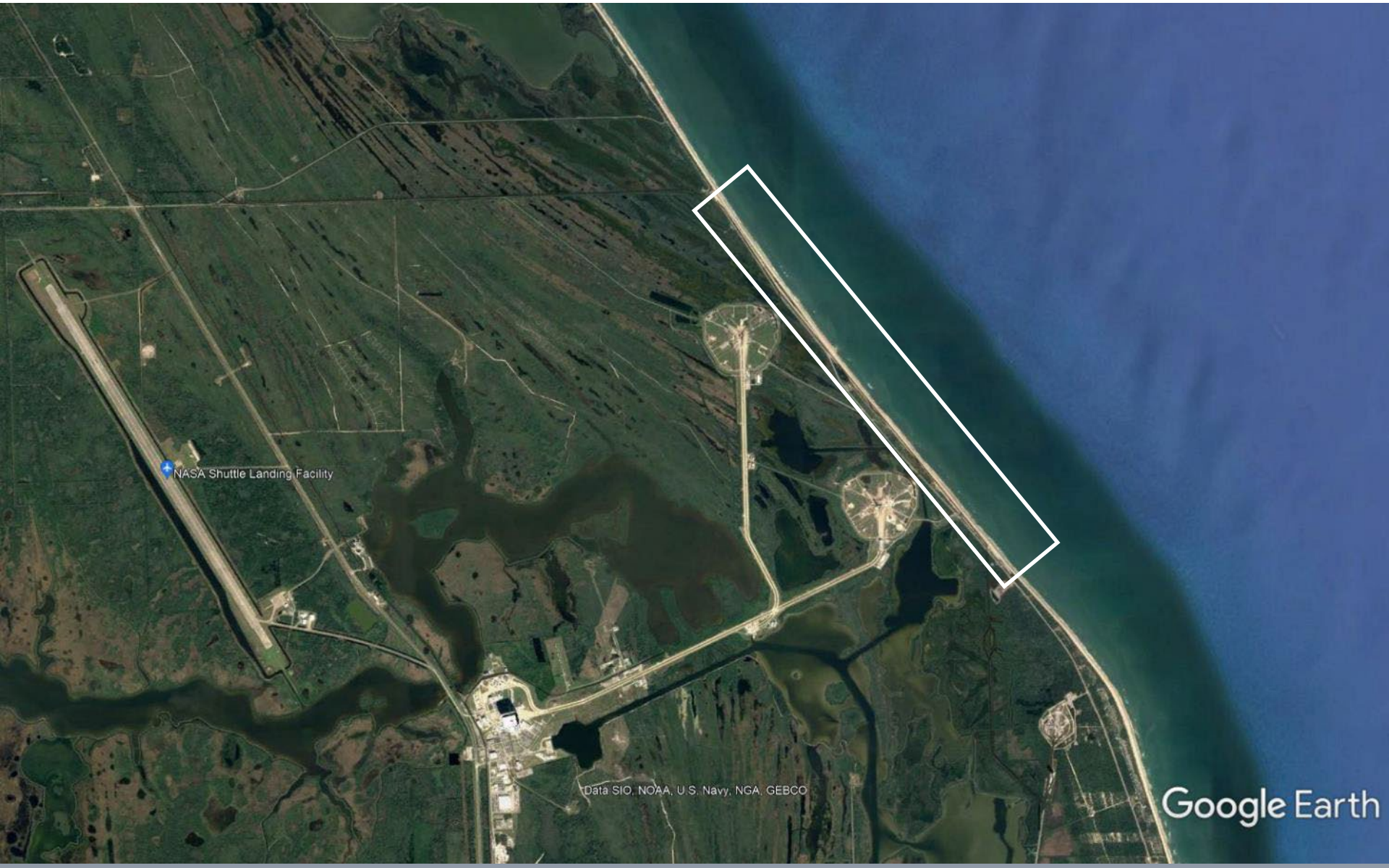
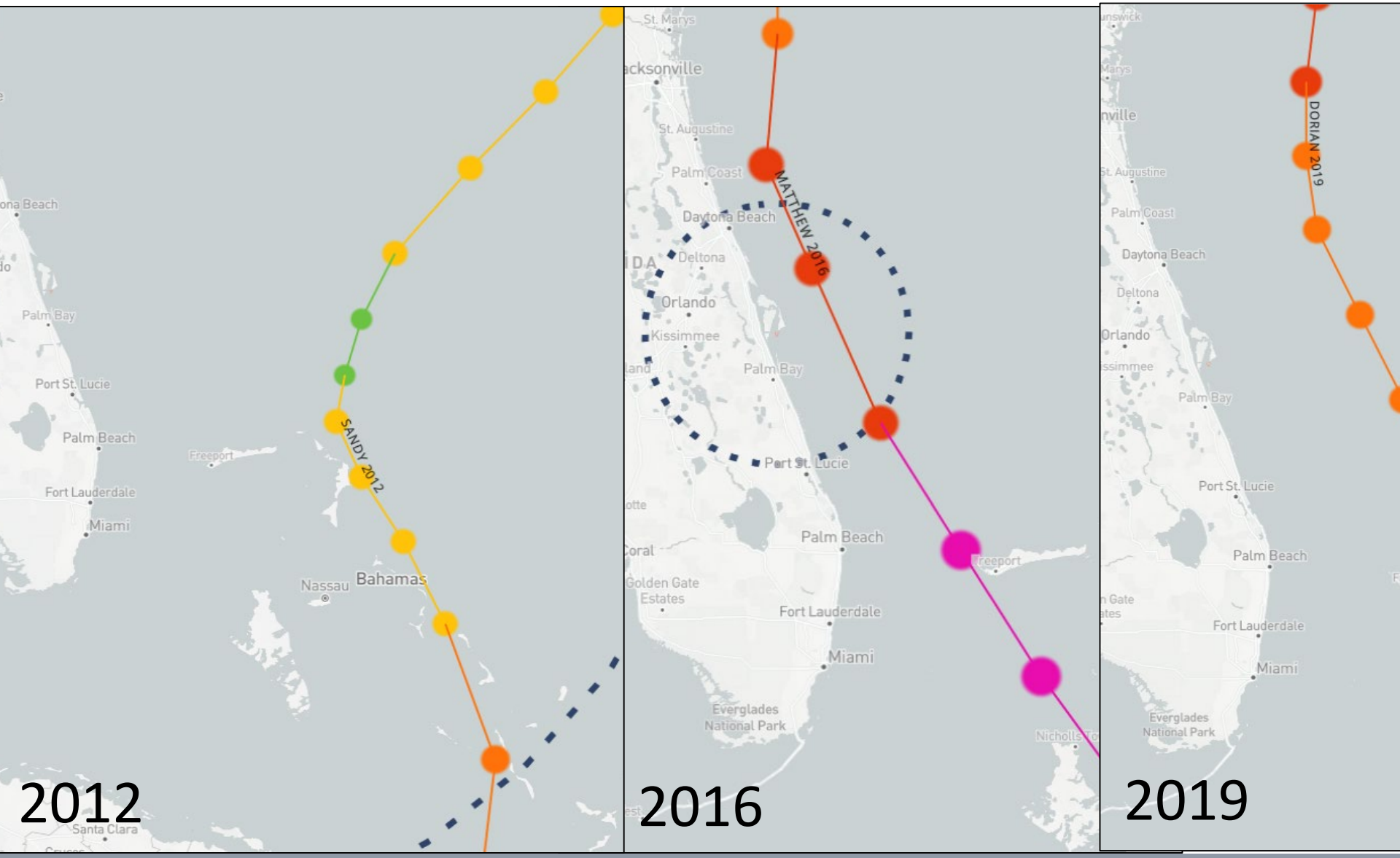
The Project Site



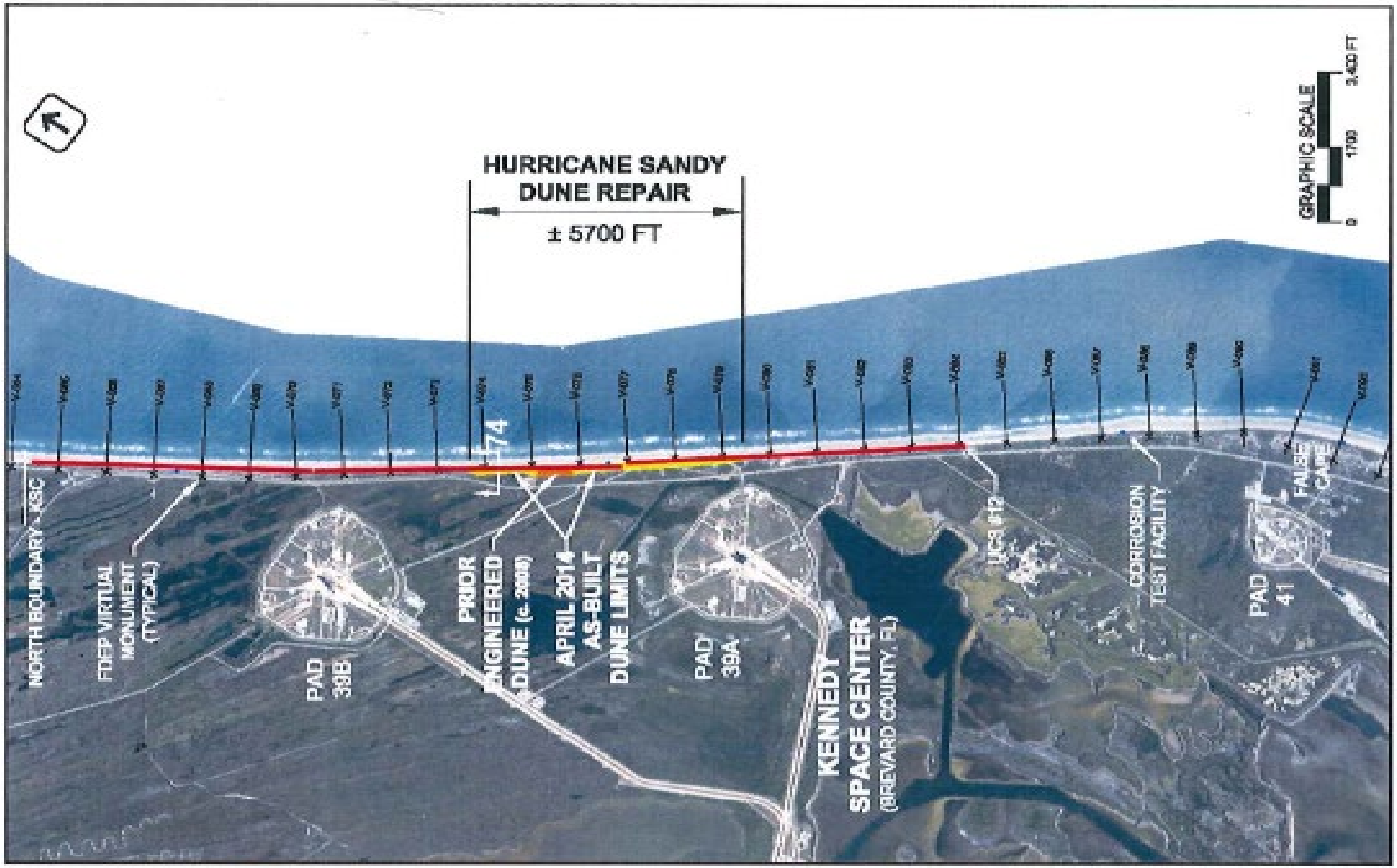
The Project Site



Sandy, Mathew and Dorian



Post Sandy Dune Restoration

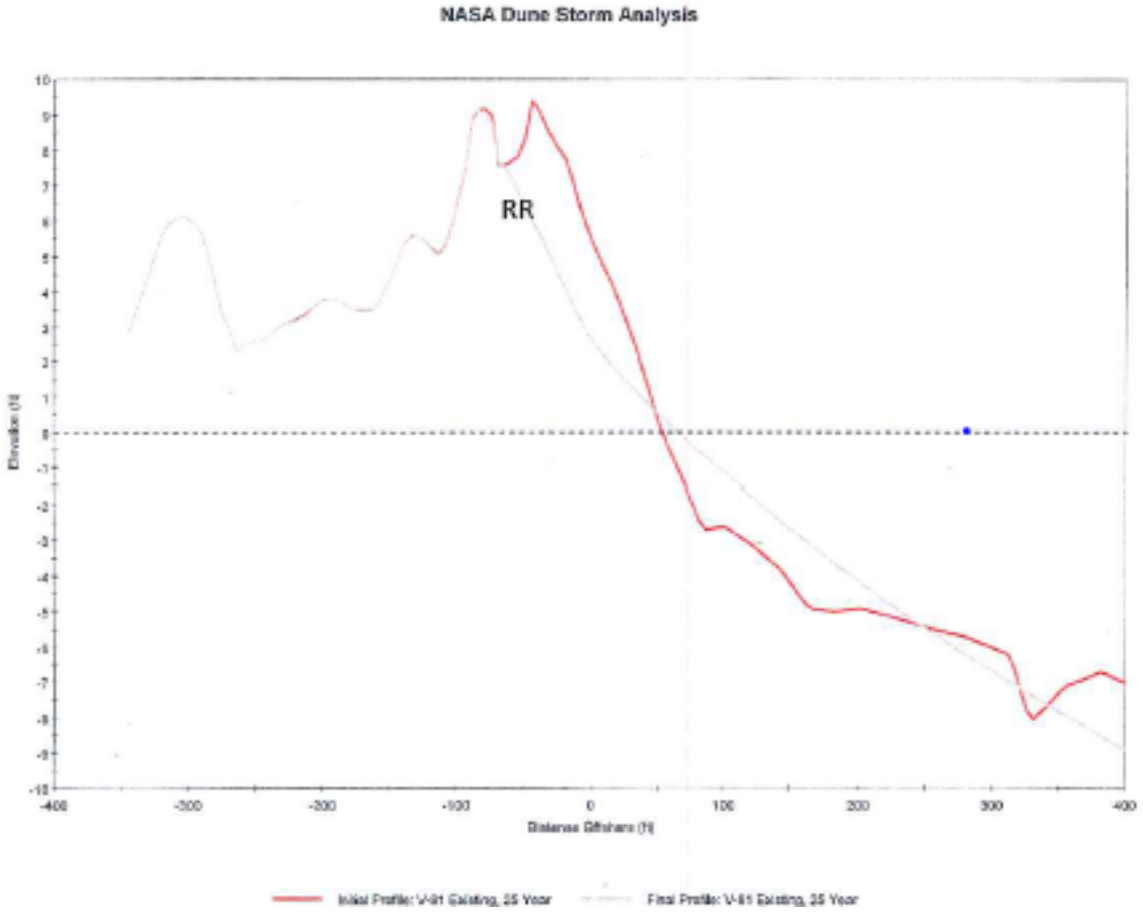


Dune Breach – Hurricane Mathew

Site Constraints

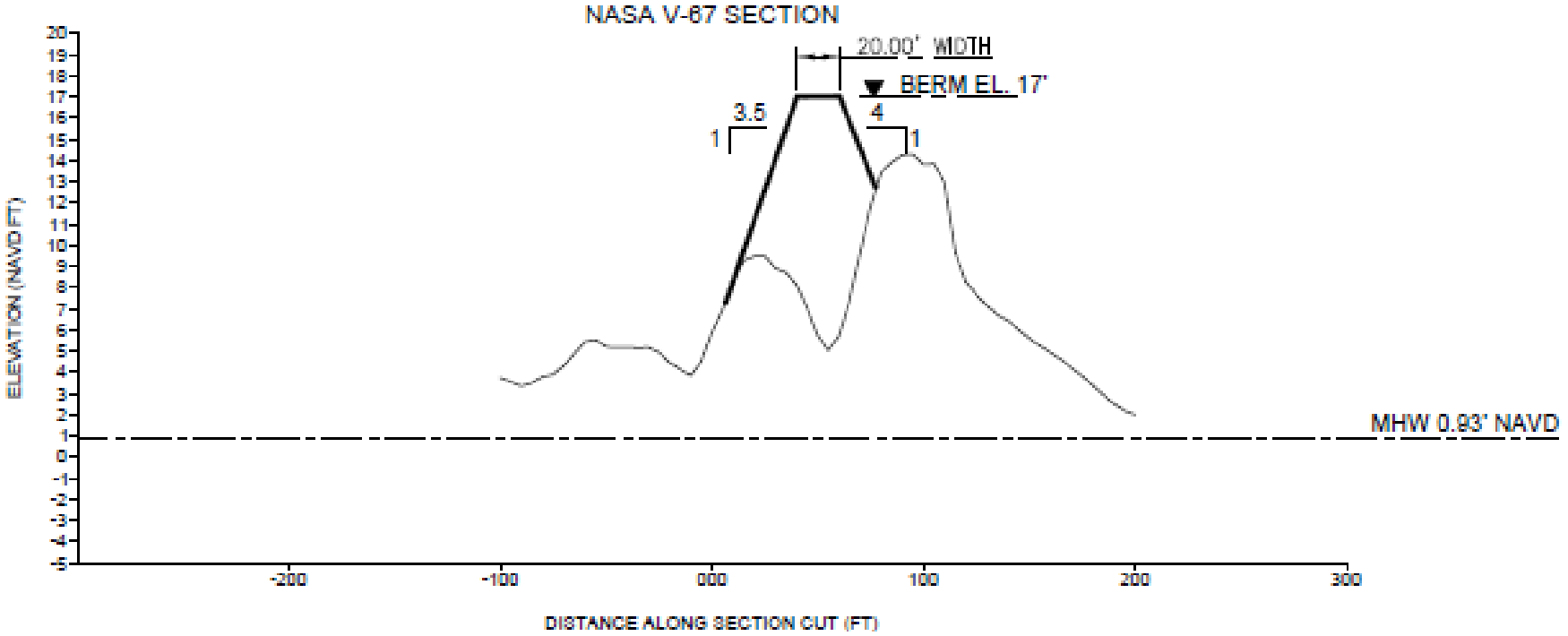
- Receding Headland - Shoreline Retreat
- Upland Infrastructure
- Coastal Wetlands
- Critical Habitat
- Operational Space Port (NASA - KSC)

SBEACH Modeling



- SBEACH analysis showing the effects of 25 year storm on V-81.
- 7.8 CY/lf loss.
- SBEACH inputs based on FDEP published settings for 15 and 25 Year storm simulation for Volusia County, FL.

Typical Dune Cross Section



Sand Sources

- Sand source specifications - Grain Size, Munsell Color and Chroma (Florida Rule 62B-41.007)
- Standard Practice for Dune Placement
- Grain Size, General Color, Silt Fraction, Gravel Fraction and Debris
- QA and QC Procedures
- Monitoring and Testing

Sand Sources

LEGEND:

RECOMMENDED SOIL TESTING LOCATIONS

NASA ENVIRONMENTAL ADDITIONAL LOCATIONS

-N-

GRAPHIC SCALE

0 2000 4000 8000

4/20/2017

Sand Sources

- On-Center:
  - KSC Beach line Samples (baseline) - passed
  - All KSC Locations (3) – failed (samples finer characteristics, darker color)
  - CCAFS samples (Titan and DMMA) – passed
- Off-center:
  - (Cemex Davenport and Central Sand Tico) – passed
  - other sources (6) – failed specifications or inadequate quantity

Project Construction

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Completed Project

Construction Summary

Phase 1 and 1A (Completed Spring 2019)

- **Phase 1:** 340,000cy over 14,700ft (23.1 cy/lft)
- **Phase 1A:** additional 110,000cy over 5,000 ft (22 cy/lft) (back side of dune)

Phase 2 and Dorian-Post

- **Phase 2:** 70,000 cy over 4,500 ft (15.6 cy/lft)
- **Dorian-Post:** 35,000cy over 2,000 ft (back side of dune) (17.5 cy/lft)

Total: 555,000 CY over 3.6 Miles (avg. density 29.2 CY/lft)

Lessons Learned

- Complexities of dune construction on a receding shoreline
- Vulnerability of transition zones and project limits
- Bad things come in 3’s (Sandy, Mathew and Dorian)

Upcoming Launches

February – Falcon 9 (Starlink)

March 1 – Atlas 5 (Geos T)

Early 2022 – Falcon Heavy (US Space Force)

March 20 – Artemis-SLS (Heavy lift)

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