# ARE DMMA'S REALLY THE END FOR DREDGED MATERIAL?
## EXAMPLES OF BENEFICIAL USE AT THE JACKSONVILLE DISTRICT

Jennifer Coor, P.G. Ph.D.,
Barbara Nist, P.G.
USACE Jacksonville District
Engineering Division – Geosystems Branch

8 February 2024

# SACS SAND

## DMMA BENEFICIAL USE AND OFFLOADING

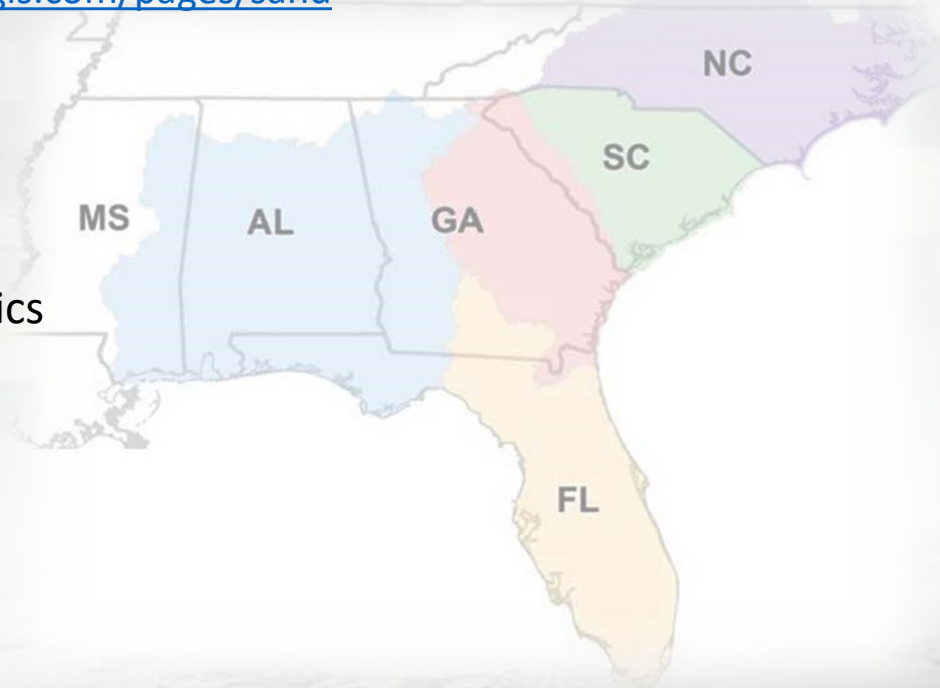

| Site | D/A-2 | Also Known As | DA-2 |
|---|---|---|---|
| DMMA ID | 853 | Basin Area (Acres) | 170 |
| Current Status | Active | Dike/Berm Crest Ht. (ft) | 50 |
| Reach | Kings Bay Sub Base | Vert. Datum Dike/Berm | NGVD29 |
| District | Jacksonville (SAJ) | Natural Grade Elev. (ft) | 5 |
| State | Georgia | Vert. Datum/Natural Gr. | NGVD29 |
| County | Camden | Material Placement Freq. | |
| Design Capacity (cy) | 11,900,000 | Material Placement Vol. | |
| Current Filled Vol. (cy) | | Beach Quality | |
| Remaining Cap. (cy) | | Beneficial Uses/Material | Wetland Habitat Development |
| Year Constructed | | Facility Access | |
| Year Modified | | Deep Draft Access | Yes |
| Sponsor | United States Navy | General Sediment Characteristics | 60% sand / 40% fines |

F-12

DMMA Beneficial Use and Offloading database

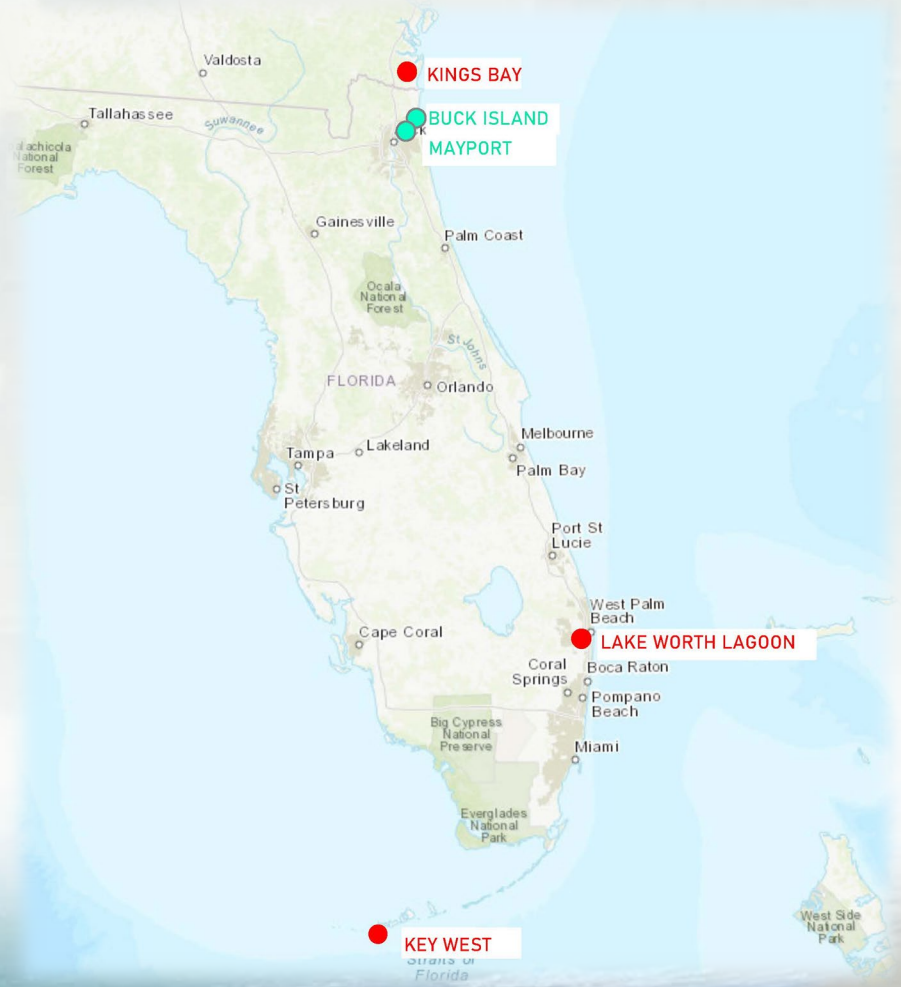
https://data-sacs.opendata.arcgis.com/pages/sand

- ❑ Capacity
- ❑ Facility Access
- ❑ Sediment Characteristics
- ❑ Etc.



# DMMA BENEFICIAL USE EXAMPLES

## JACKSONVILLE DISTRICT




- ❑ Buck Island DMMA
- ❑ Mayport NAS DMMA N

- ❑ Kings Bay Naval Submarine Base DMMA
- ❑ Peanut Island DMMA- Lake Worth Lagoon
- ❑ Key West NAS DMMA

# BUCK ISLAND AND MAYPORT DMMA N

## MATERIAL EVALUATION FOR DUNE RESTORATION


# BUCK ISLAND AND MAYPORT DMMA N

## MATERIAL EVALUATION FOR DUNE RESTORATION


- DMMA N at Mayport Naval Air Station
- Buck Island DMMA on the St Johns River (Jax Harbor Entrance Channel)

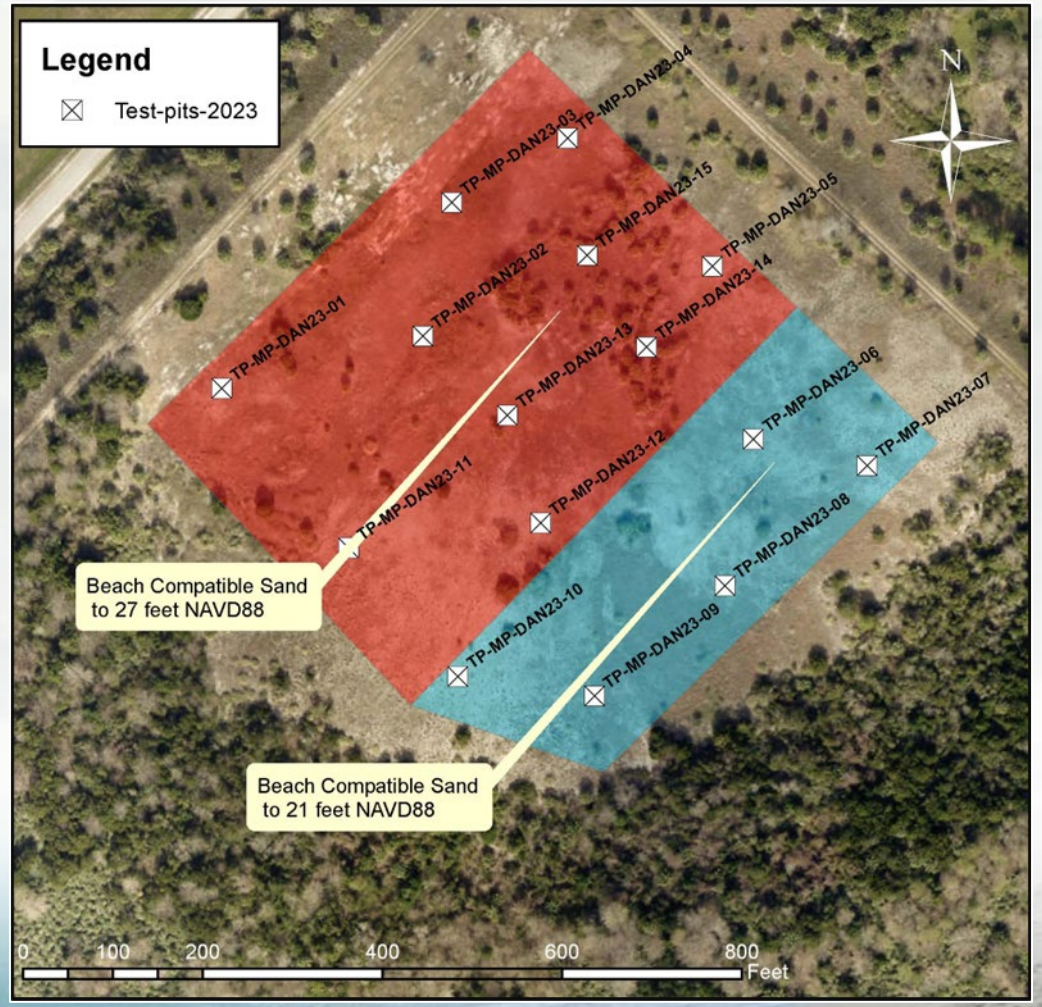
# MAYPORT DMMA N

## MATERIAL EVALUATION FOR DUNE RESTORATION


- ❑ Not used for decades
- ❑ Placed dredge material is mostly fine-grained
- ❑ Coarser material at the in-fall pipe location

# MAYPORT DMMA N

## MATERIAL EVALUATION FOR DUNE RESTORATION




- ❑ 15 Test Pits 12-feet deep
- ❑ Fine to medium grained quartz sand
- ❑ Average grainsize 0.30 mm
- ❑ Fines passing the #230 sieve <1.5%
- ❑ Typical Munsell Color Value 7

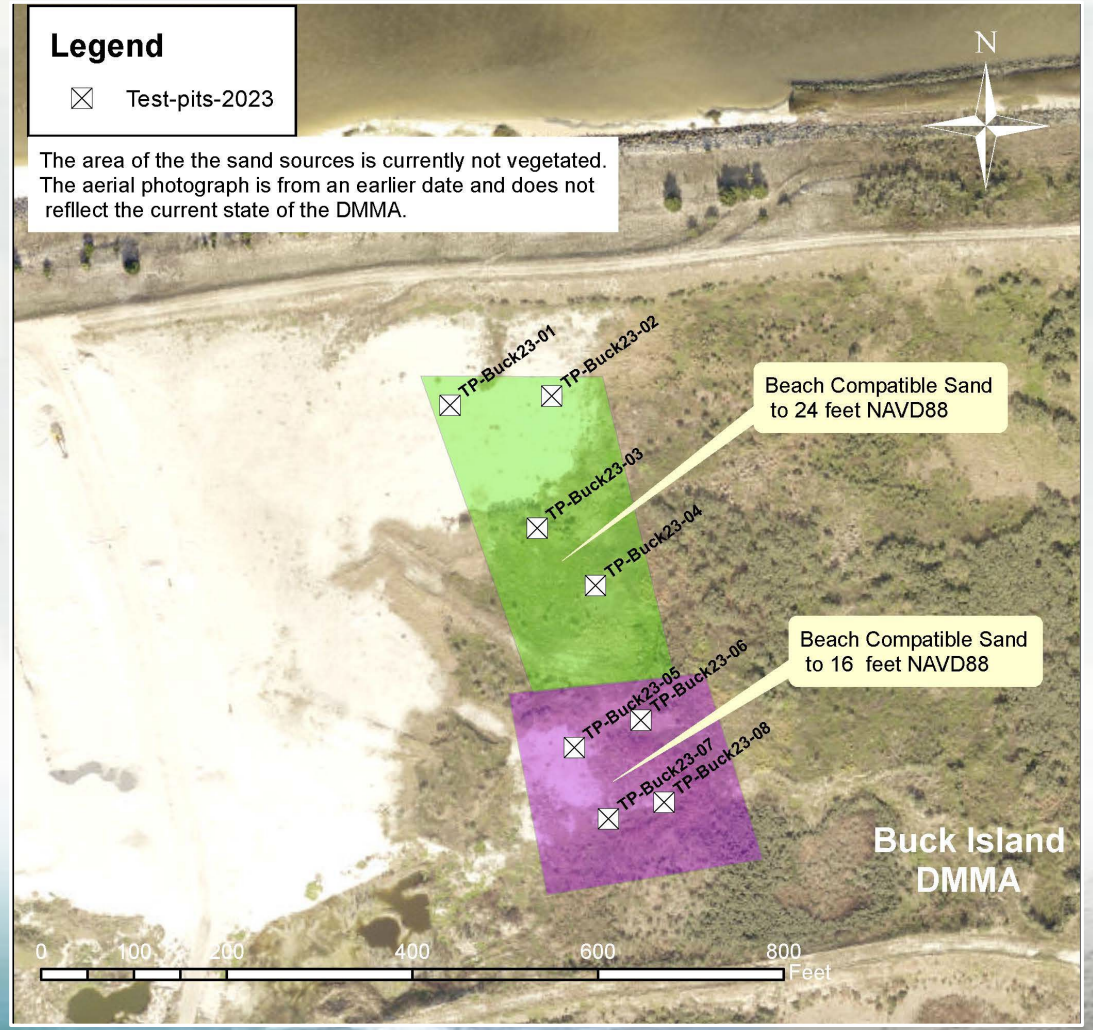
# BUCK ISLAND DMMA

## MATERIAL EVALUATION FOR DUNE RESTAURATION


- ❑ Is actively used
- ❑ Maintenance Material from the Jax Harbor Entrance Channel
- ❑ Dredged Material is mostly sand
- ❑ DMMA is continually off-loaded for road construction

# BUCK ISLAND DMMA

## MATERIAL EVALUATION FOR DUNE RESTORATION




- 8 test Pits, 12-feet deep
- Fine to medium grained quartz sand
- Average grainsize 0.24 mm
- Fines passing the #230 sieve <1%
- Typical Munsell Color Value 7

# BUCK ISLAND AND MAYPORT DMMA N

## MATERIAL EVALUATION FOR DUNE RESTORATION SUMMARY

- ❑ Both DMMAs have beach/dune compatible sand
- ❑ Mayport DMMA N is closer and directly on the Navy Installation
- ❑ Currently in permitting process


# NAVAL SUBMARINE BASE KINGS BAY

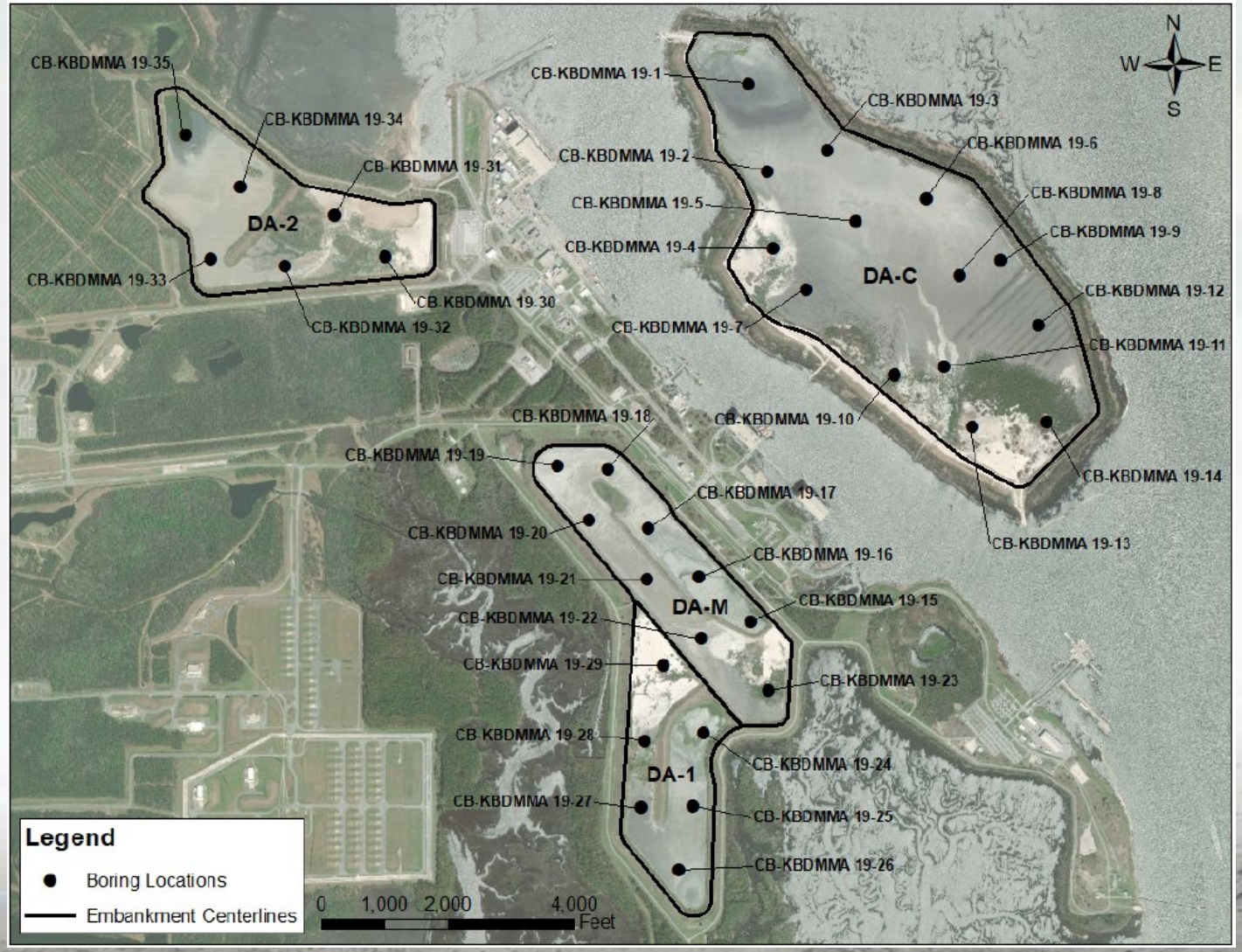
## OVERVIEW

- Kings Bay Entrance Channel
  - Dredged annually
  - Beach compatible material placed on Ft Clinch and Fernandina Beach
  - Near beach compatible material placed in nearshore
  - Non beach compliant material placed in ODMDS
- Kings Bay Submarine Base
  - Dredged annually
  - No beach compatible material
  - Placed in DMMAs adjacent to channel

# NAVAL SUBMARINE BASE KINGS BAY

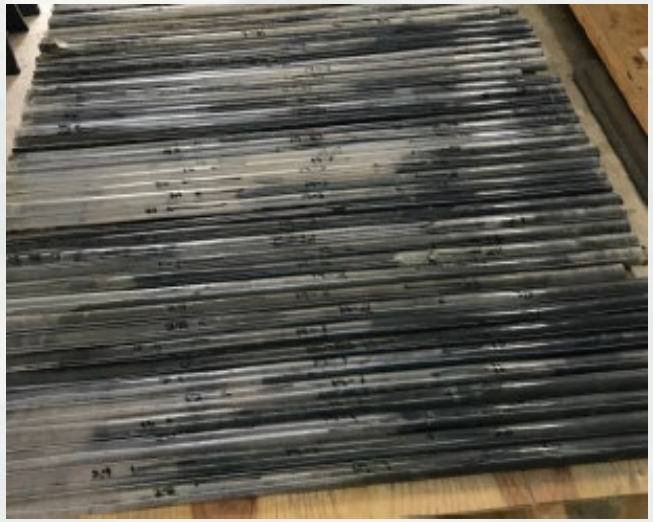
## GEOTECHNICAL INVESTIGATION

- 35 direct push cores using a Geoprobe (1.25” ID)
  - 6 cores in DA-1
  - 6 cores in DA-2
  - 9 cores in DA-M
  - 14 cores in DA-C
- DMMA materials consisted primarily of clay, silt, and fine to medium-grained sand with varying amounts of shell and gravel



# NAVAL SUBMARINE BASE KINGS BAY

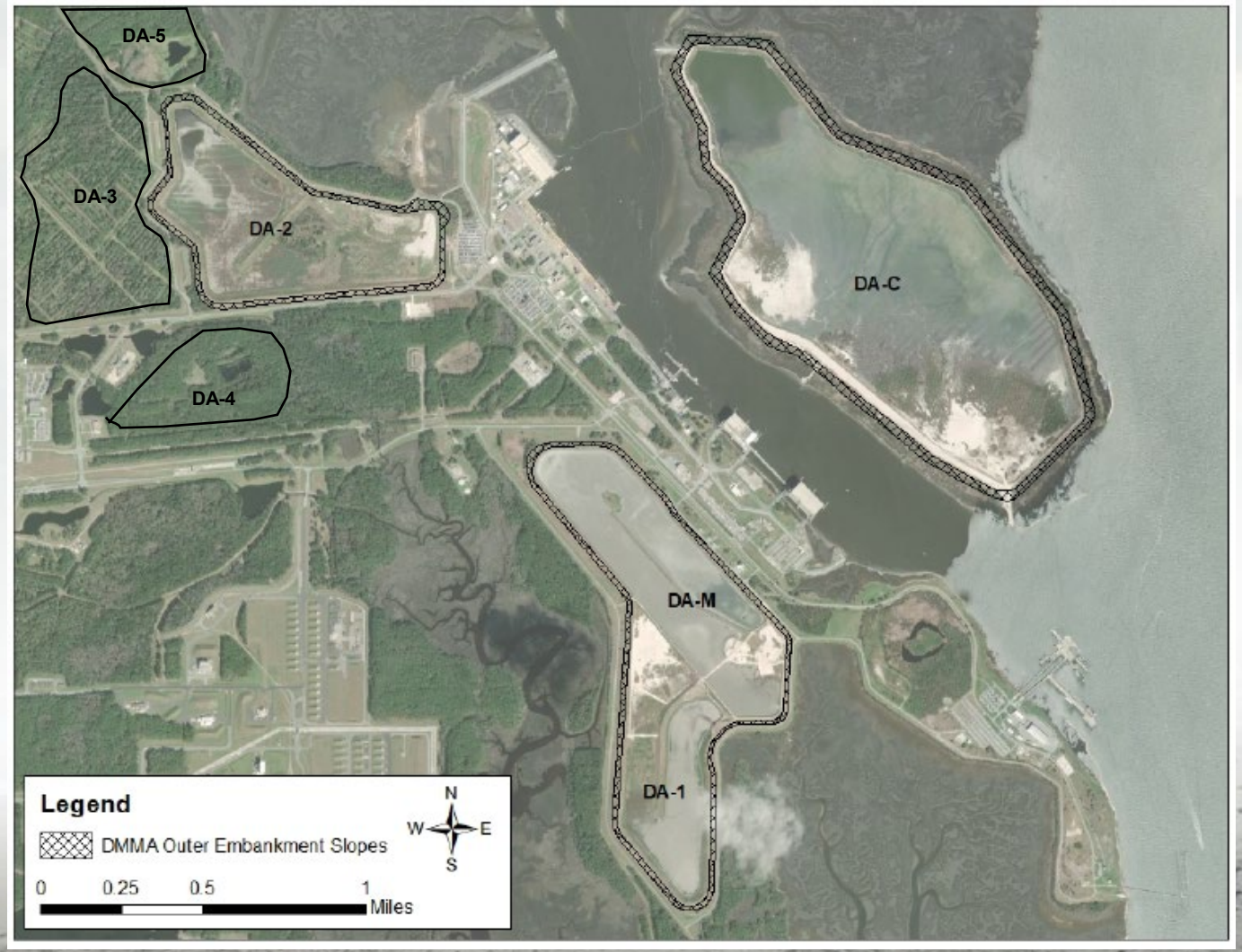
## GEOTECHNICAL INVESTIGATION



# NAVAL SUBMARINE BASE KINGS BAY

## BENEFICIAL USE

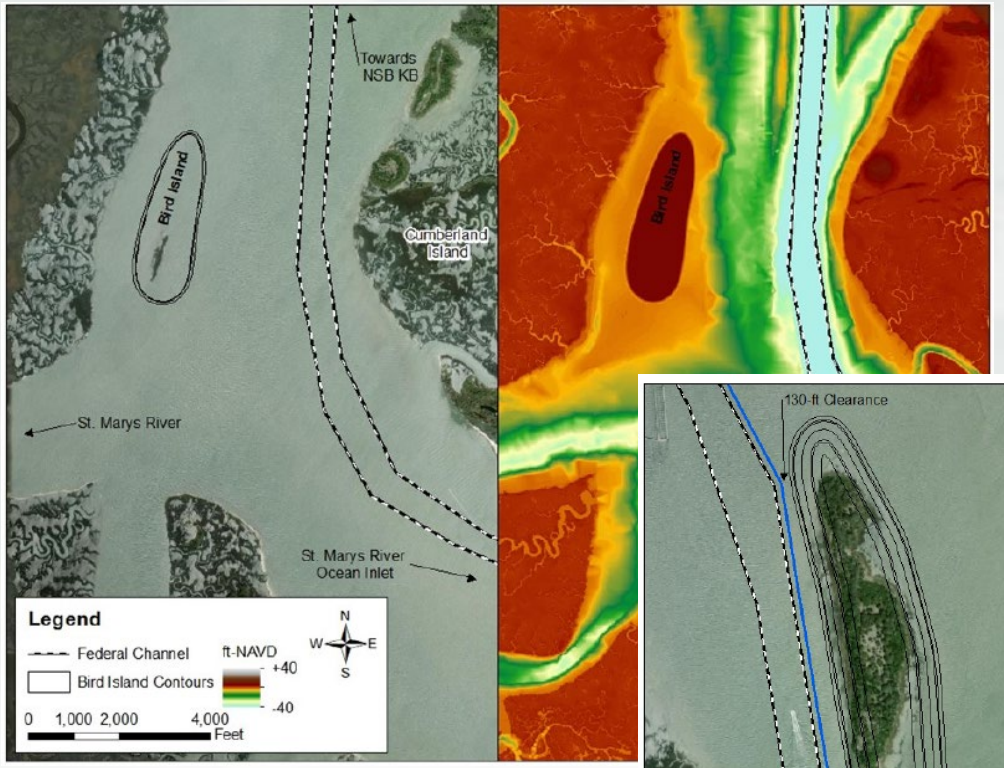
- Currently enough suitable material in landside DMMAs to build the 3 new landside DMMAs
  - DA-3 requires 1.7 MCY
  - DA-4 requires 1.1 MCY
  - DA-5 requires 1.2 MCY
  - Total of 4 MCY needed for landside DMMAs
  - 4.3 MCY suitable material available in DA-1 + DA-2 + DA-M

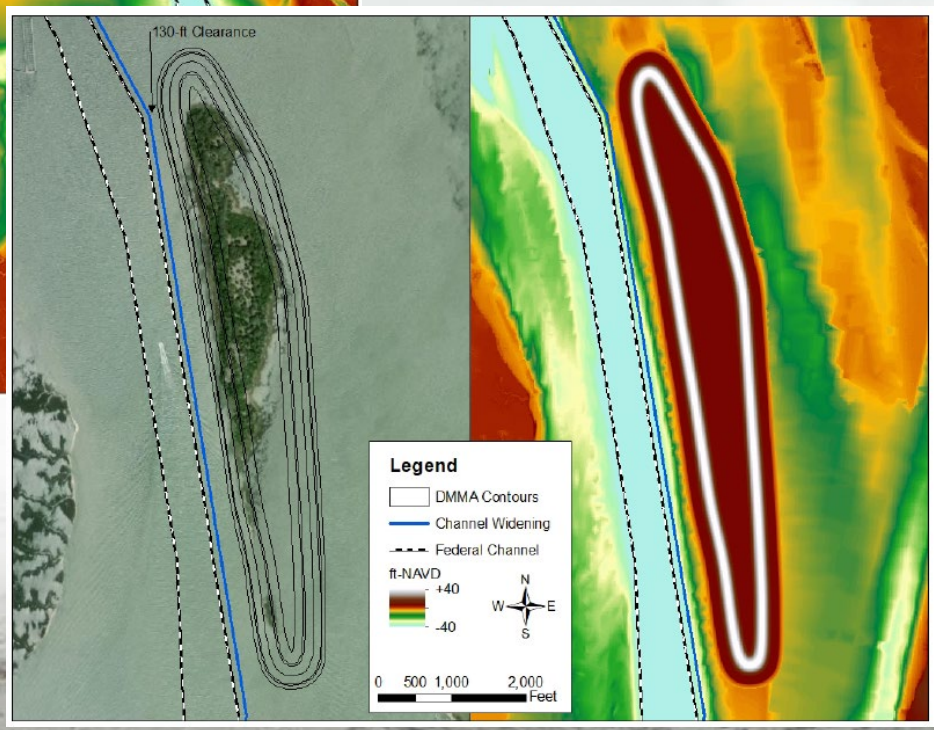


# NAVAL SUBMARINE BASE KINGS BAY

## BENEFICIAL USE

- DA-D (Drum Point Island) and Bird Island
  - Currently enough suitable material in DA-C to build DA-D and a portion of Bird Island
    - DA-D requires 5.5 MCY
    - Bird Island requires 1.2 MCY
    - Total of 6.7 MCY needed
    - 6.1 MCY suitable material available in DA-C
  - To build both in near term, Bird Island would require some (or all) material placement directly from new dredge event



# LAKE WORTH LAGOON CAP 1135

## OVERVIEW

- Ecosystem Restoration Project
  - Using material from Peanut Island DMMAs
  - Creating habitat in nearshore cove
- Previous projects in Lake Worth Lagoon
  - Peanut Island
  - Snook Island
  - Many other completed by Palm Beach County Environmental Resources Management

# LAKE WORTH LAGOON CAP 1135

## SNOOK ISLANDS, MODEL FOR BONEFISH COVE

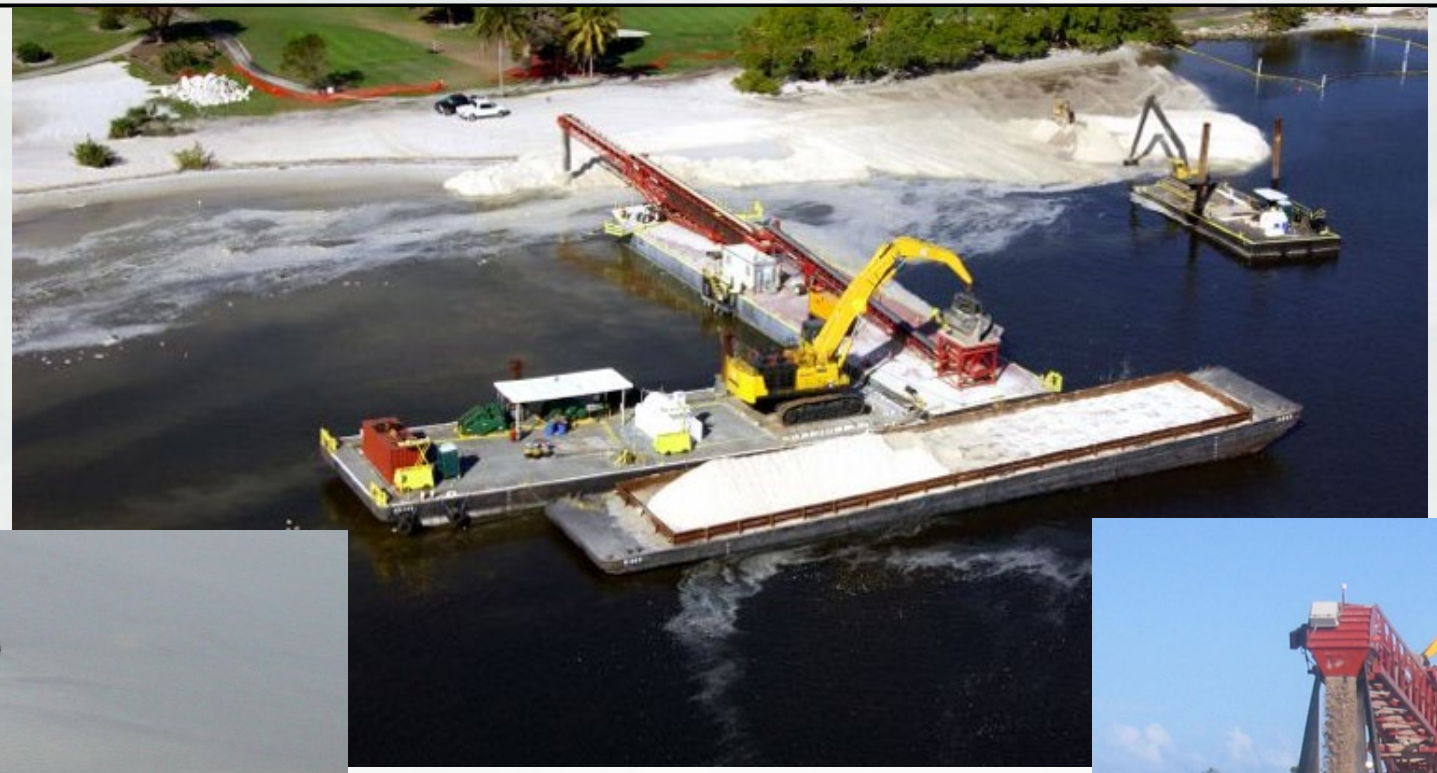
- Construction Completed: 2005
- Eco-Islands Acreage: 100 acres
- Acreage Created/Restored: Four islands (100 acres)
- Habitat Created/Restored: Seagrasses, oysters, and mangroves
- Material from Peanut Island was placed to create Snook Islands

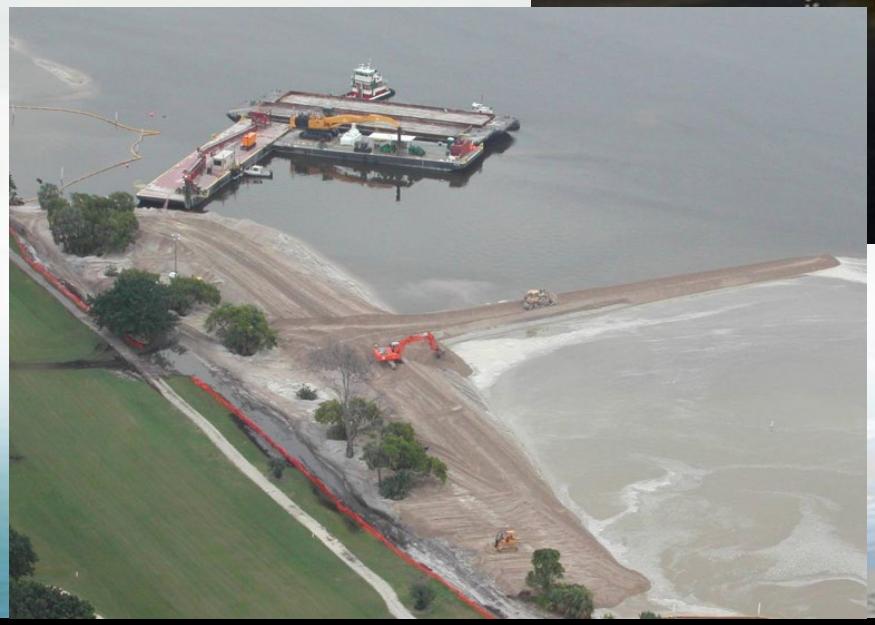
Before

After

# LAKE WORTH LAGOON CAP 1135

## SNOOK ISLANDS, MODEL FOR BONEFISH COVE

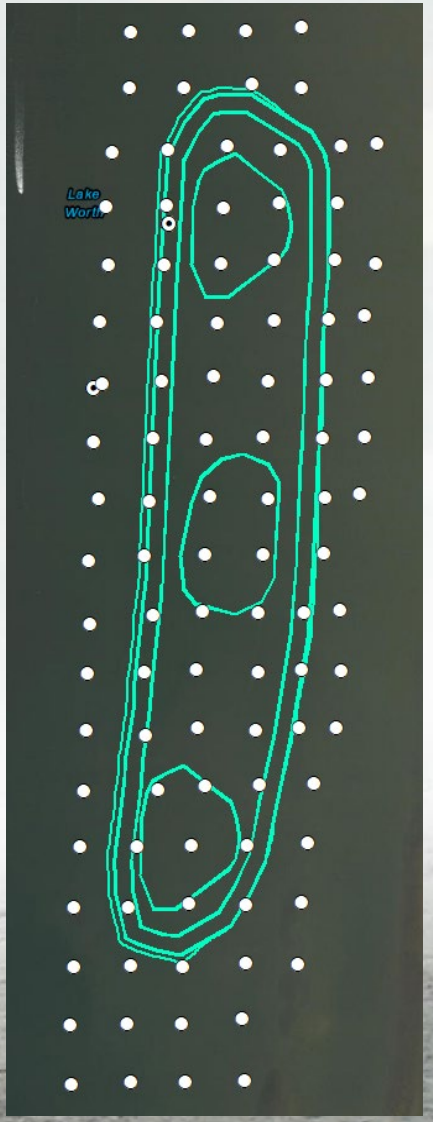




# LAKE WORTH LAGOON CAP 1135

## GEOTECHNICAL INVESTIGATION

- Peanut Island
  - 3 hand augers in FIND DMMA
  - 11 hand augers in Port DMMA
- Bonefish Cove
  - 2 SPT core borings
  - 100 mud probes
- DMMA materials consisted primarily of fine to medium-grained sand with varying amounts of shell, gravel, and debris
- Bonefish Cove contains silt and silty sand overlying limestone

# LAKE WORTH LAGOON CAP 1135

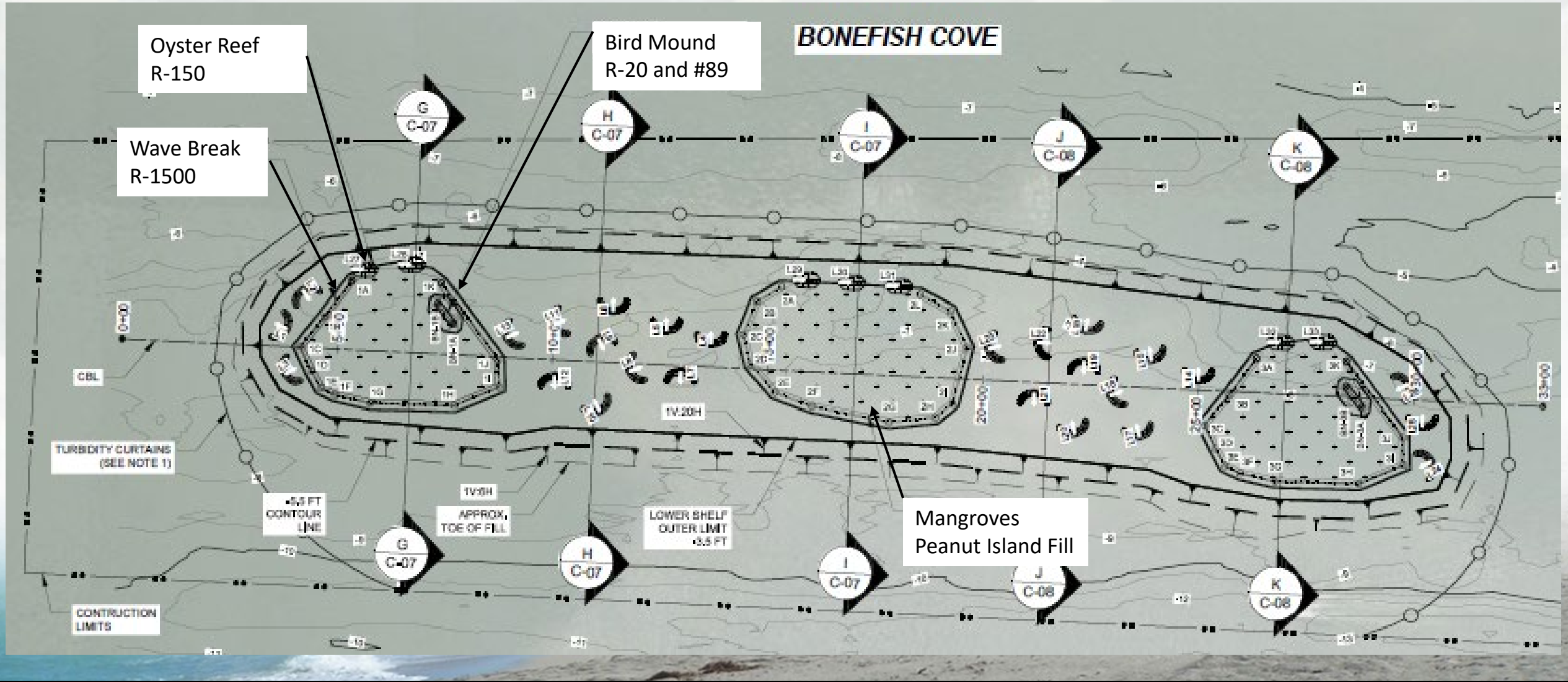
## BENEFICIAL USE – EXCAVATION OF PEANUT ISLAND

- Currently enough suitable material on Peanut Island to construct Bonefish Cove islands



# LAKE WORTH LAGOON CAP 1135

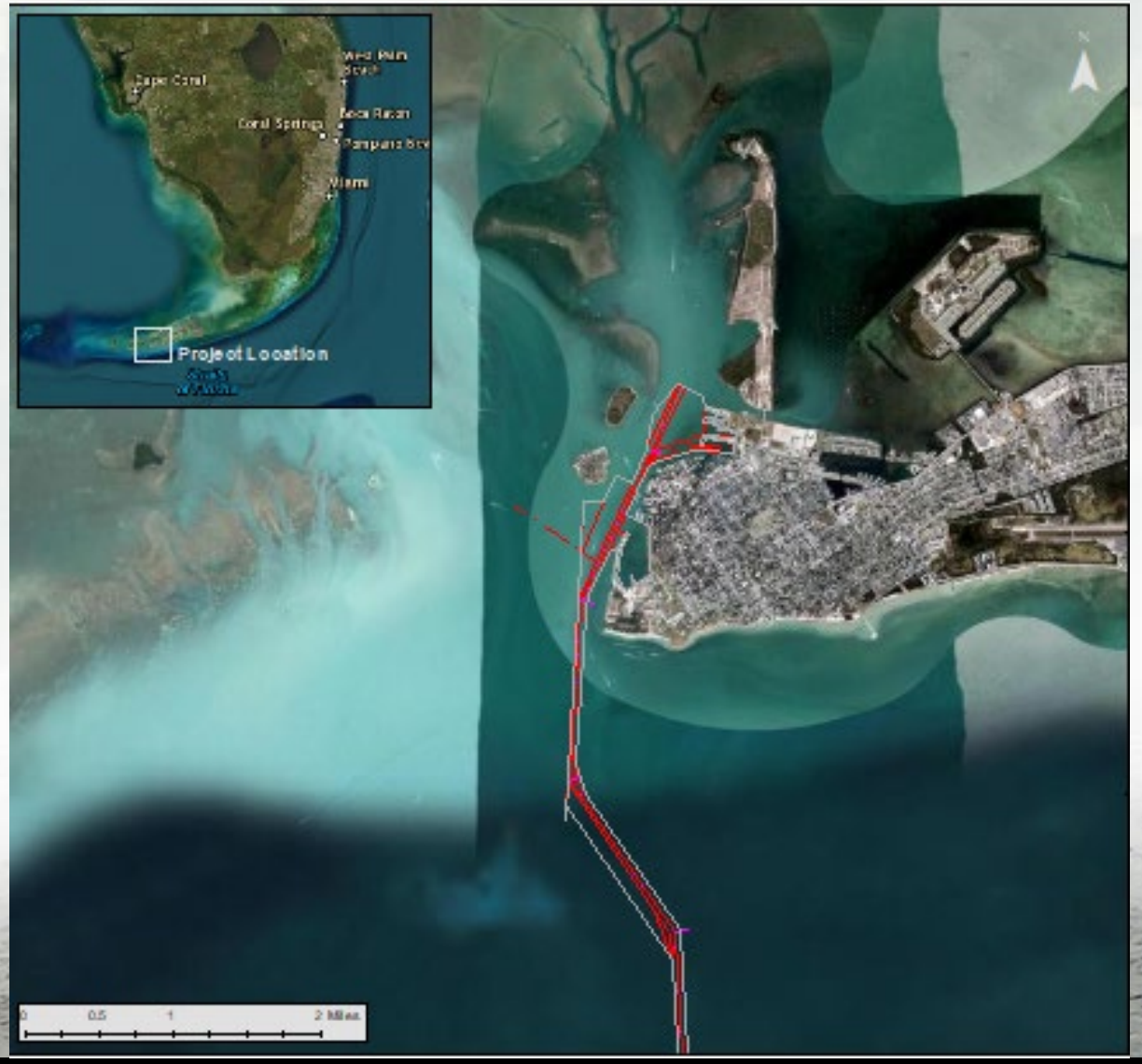
## BENEFICIAL USE – ISLAND CREATION IN BONEFISH COVE



# NAVAL AIR STATION KEY WEST O&M

## OVERVIEW

- Navy Key West Channel (O&M)
  - Historically dredged since late 1800s/early 1900s
  - Constructed depth of -36 ft MLLW (2005)
    - Dredged material placed in Fleming Key DMMA
- Dredge Readiness Plan
  - Site access plan
  - Data collection
  - Beneficial use material placement alternatives
  - Reporting



# NAVAL AIR STATION KEY WEST O&M

## GEOTECHNICAL INVESTIGATION

- Fleming Key
  - 14 test pits
  - DMMA materials consisted primarily of calcareous sand and limestone gravel with few to some fines
- Key West Channel
  - Side scan sonar
    - Completed December 2023
  - 20 vibracores
    - Scheduled for February 2024

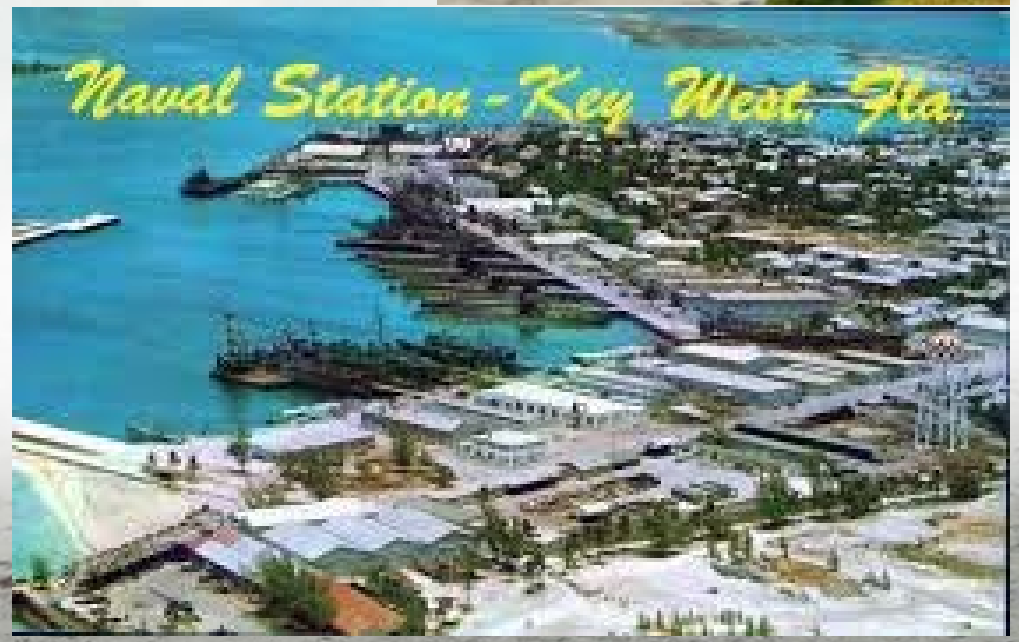

# NAVAL AIR STATION KEY WEST O&M

## GEOTECHNICAL INVESTIGATION


# NAVAL AIR STATION KEY WEST O&M

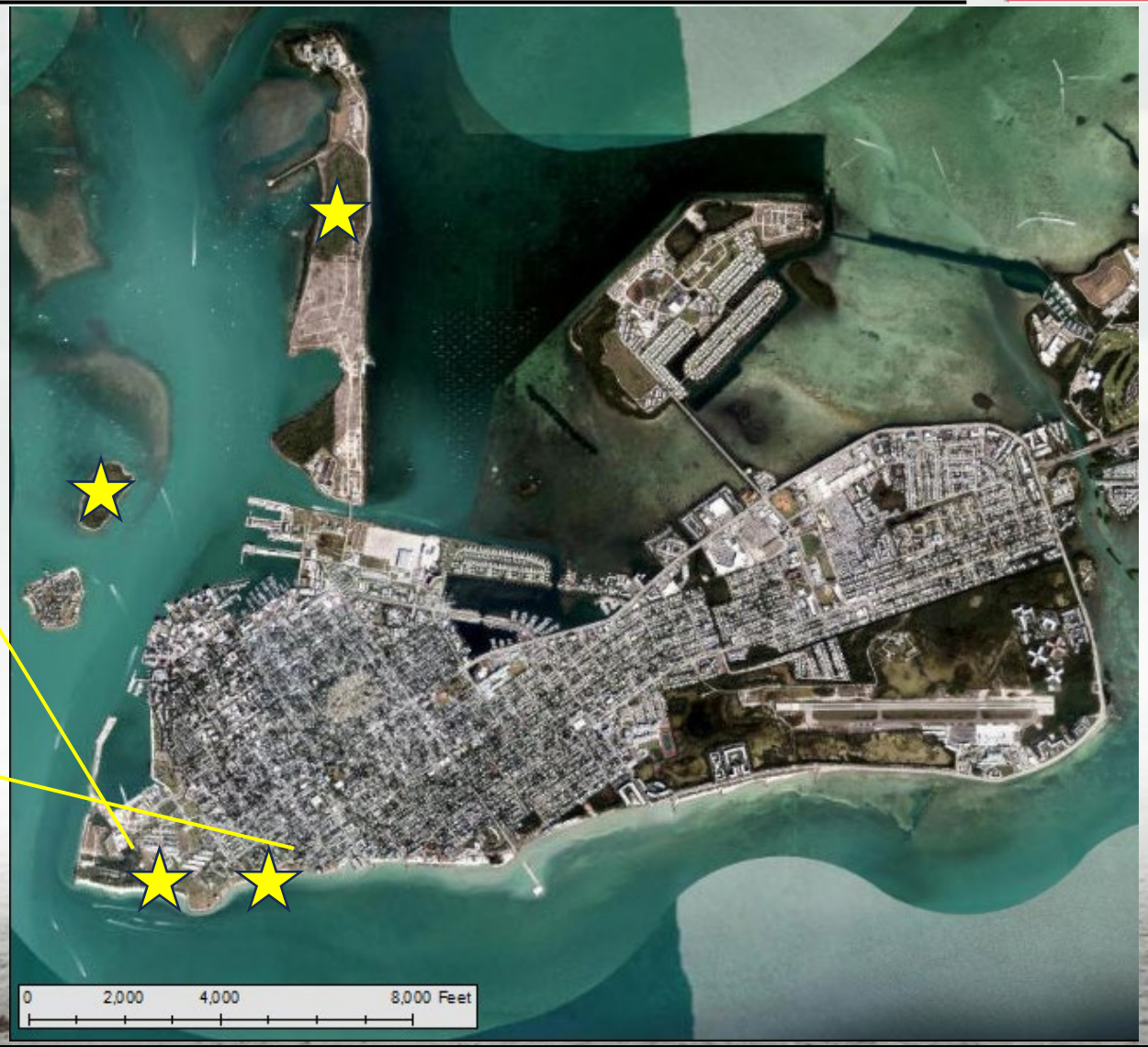
## DREDGE READINESS PLAN

- Draft Project Work Plan
- Geotechnical Analyses
  - Side Scan Sonar Survey
  - Vibracore Sample Collection
  - Historic Shoaling Rate Analysis
  - Fleming Key DMMA Geotechnical Data
  - Turbidity & Water Quality Monitoring Requirements
  - General Hydrodynamic Circulation & Measured Data
- Material Placement Alternatives
  - NAVFAC Sediment Placement Alternatives
  - Virtual Maps on Table
  - 30%, 60%, and 90% Study Review Meetings
- Reporting
  - Selection of Placement Alternatives
  - Draft Report
  - Final Report

# NAVAL AIR STATION KEY WEST O&M

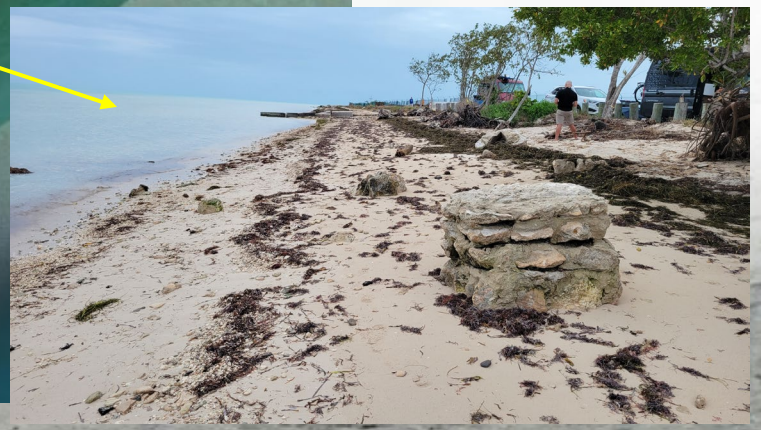
## BENEFICIAL USE ON KEY WEST



# NAVAL AIR STATION KEY WEST O&M

## BENEFICIAL USE ON BOCA CHICA AND GEIGER KEYS





# DMMA MATERIAL - BENEFICIAL USE

# QUESTIONS?