Mississippi River Dredging and Restoration Efforts

RUDY SIMONEAUX, CPRA CHIEF OF ENGINEERING

COASTAL PROTECTION & RESTORATION AUTHORITY

CPRA SINCE 2007

67,200 ACRES BENEFITED
(105 SQUARE MILES)

214 M YD³
OF SEDIMENT FILLED

383 MILES
OF IMPROVED LEVEE

71.6 MILES
OF BARRIER ISLAND RESTORATION

$21.6 B
FUNDING SECURED

Constructed Hydraulic Dredging Projects:

18 Barrier Island/Headland Projects

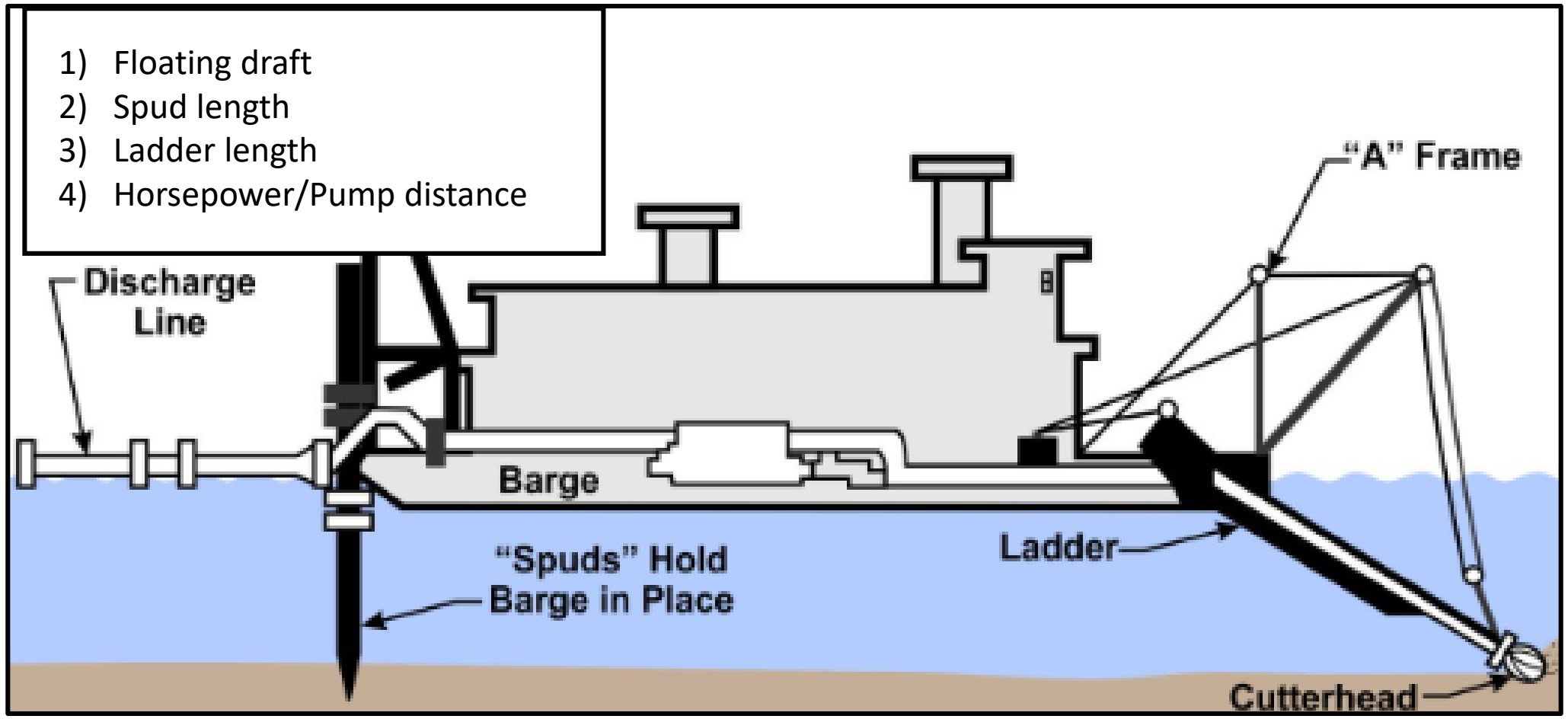
38 Marsh Creation Projects

Nearly 30,000 acres marsh/beach/dune/ridge habitat created

Total Investment = $2.6 Billion

15 Restoration Projects with Mississippi River Dredging

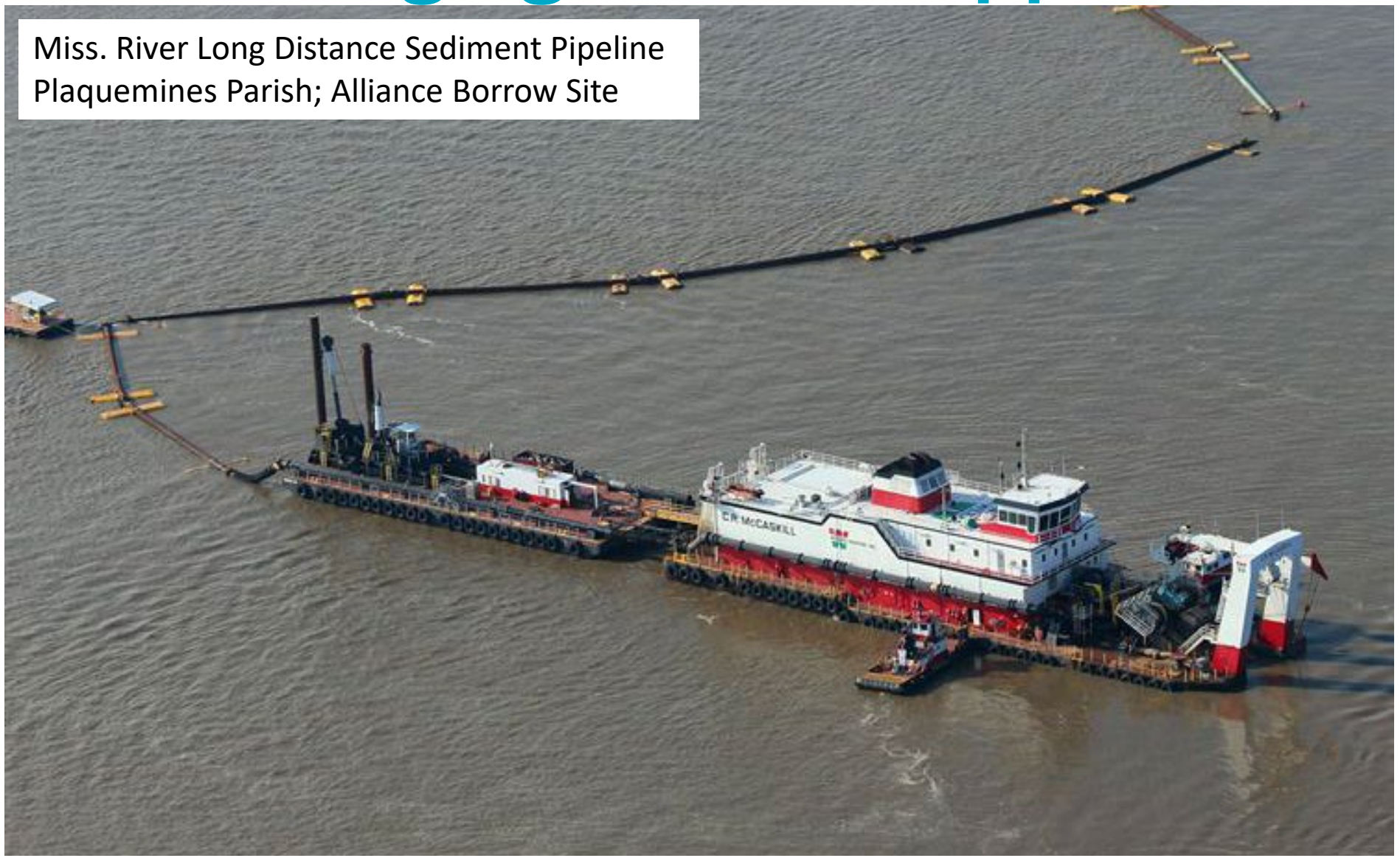
Hydraulic Dredging – Equipment Limitations



CREDIT: FEDERAL REMEDIATION TECHNOLOGIES ROUNDTABLE

Hydraulic Dredging – Shallow Lakes and Bays

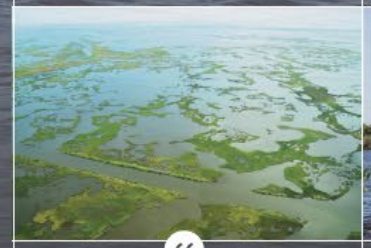
Hydraulic Dredging – Mississippi River



Marsh Creation – Mississippi River Sediment

EXISTING CONDITIONS

More than 1,100 acres of open water and fragmented marsh await restoration.



"Open water represents lost nursery habitat and storm protection."

0 - 6 MONTHS

Marsh buggy excavators and bucket dredges construct 7 miles of earthen containment dikes around the marsh creation areas.

"Containment dikes keep the sediment in place, and they also help track and quantify the contractor's performance."

4 - 6 MONTHS

More than 1,000 segments of 30-inch diameter steel dredge pipeline are welded together to link the Mississippi River borrow sites to marsh creation areas.

"Pipelines are the most cost-effective and efficient method for moving so much sediment over such a large distance."

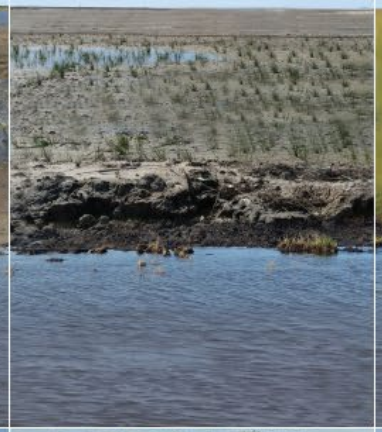
6 - 18 MONTHS

Dredge operations begin in the Mississippi River. Sand is pumped up to 13 miles from the Mississippi River to the marsh creation areas. Vegetation begins to grow within weeks.

"This mimics the natural process that used to occur before the Mississippi River was channelized and leveed."

12 - 18 MONTHS

Marsh plants colonize dredged sand and the marsh creation area becomes vegetated.



"These first plants prevent erosion and provide the foundation for the thriving ecosystem that will develop."

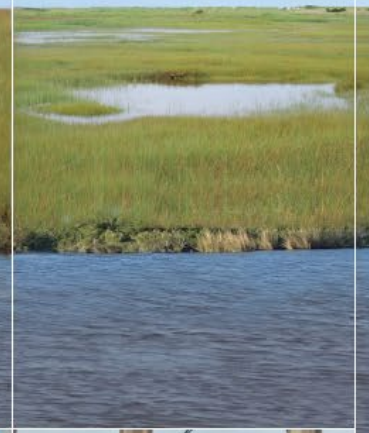
18 - 24 MONTHS

The marsh creation area is fully vegetated, attracting wildlife to the new marsh habitat.

"Specific design elevations were chosen to allow for tidal exchange and compaction of marsh sediments."

AFTER 2 YEARS

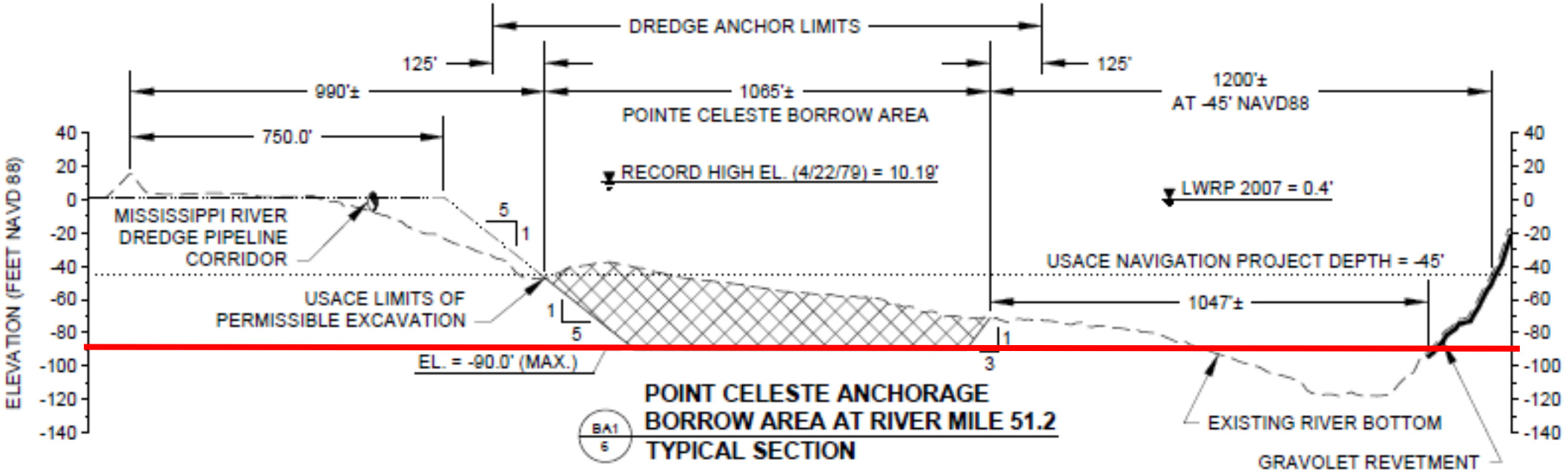
The marsh settles to within an intertidal wetland elevation range and provides intertidal marsh habitat for fish and other wildlife.

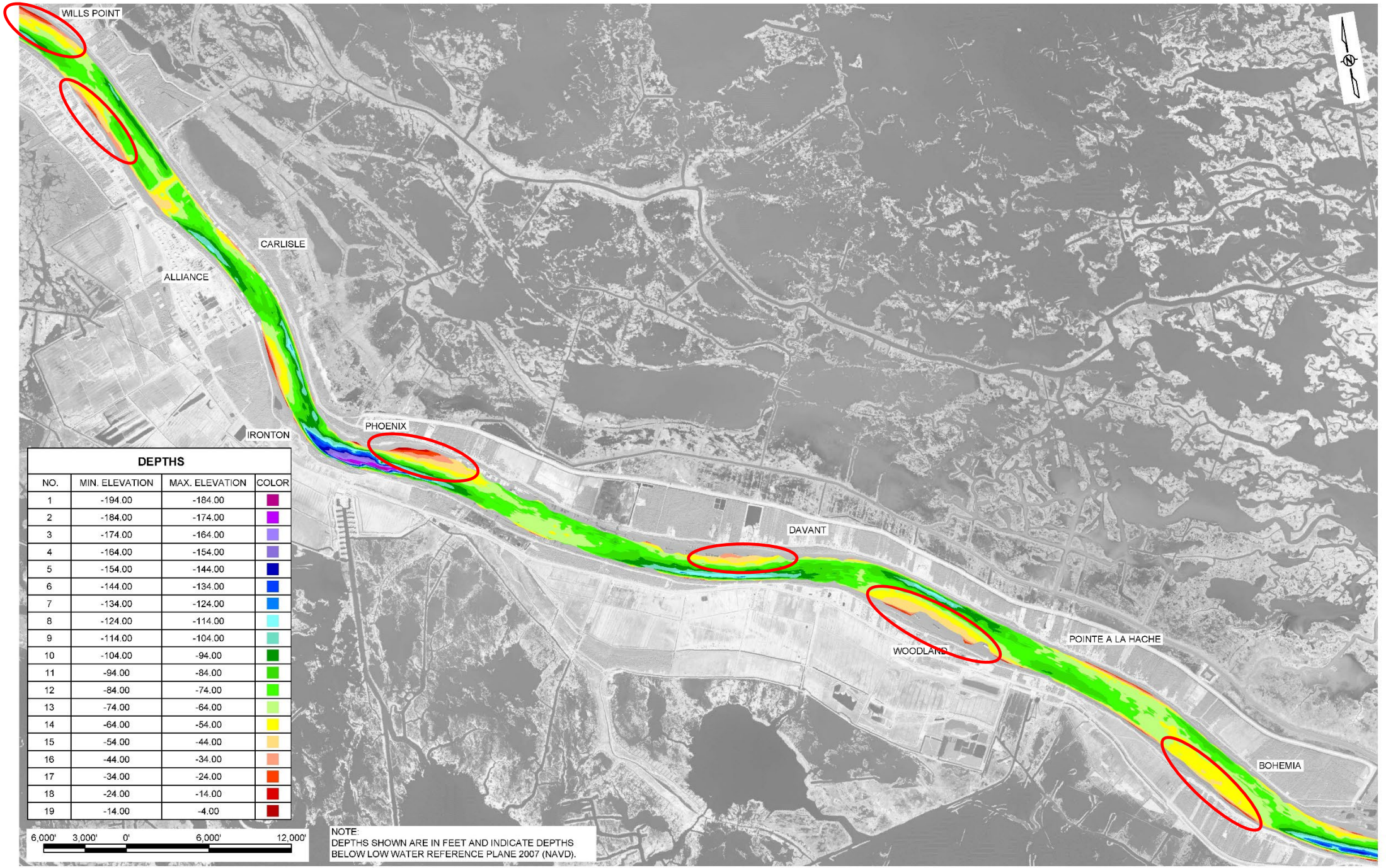


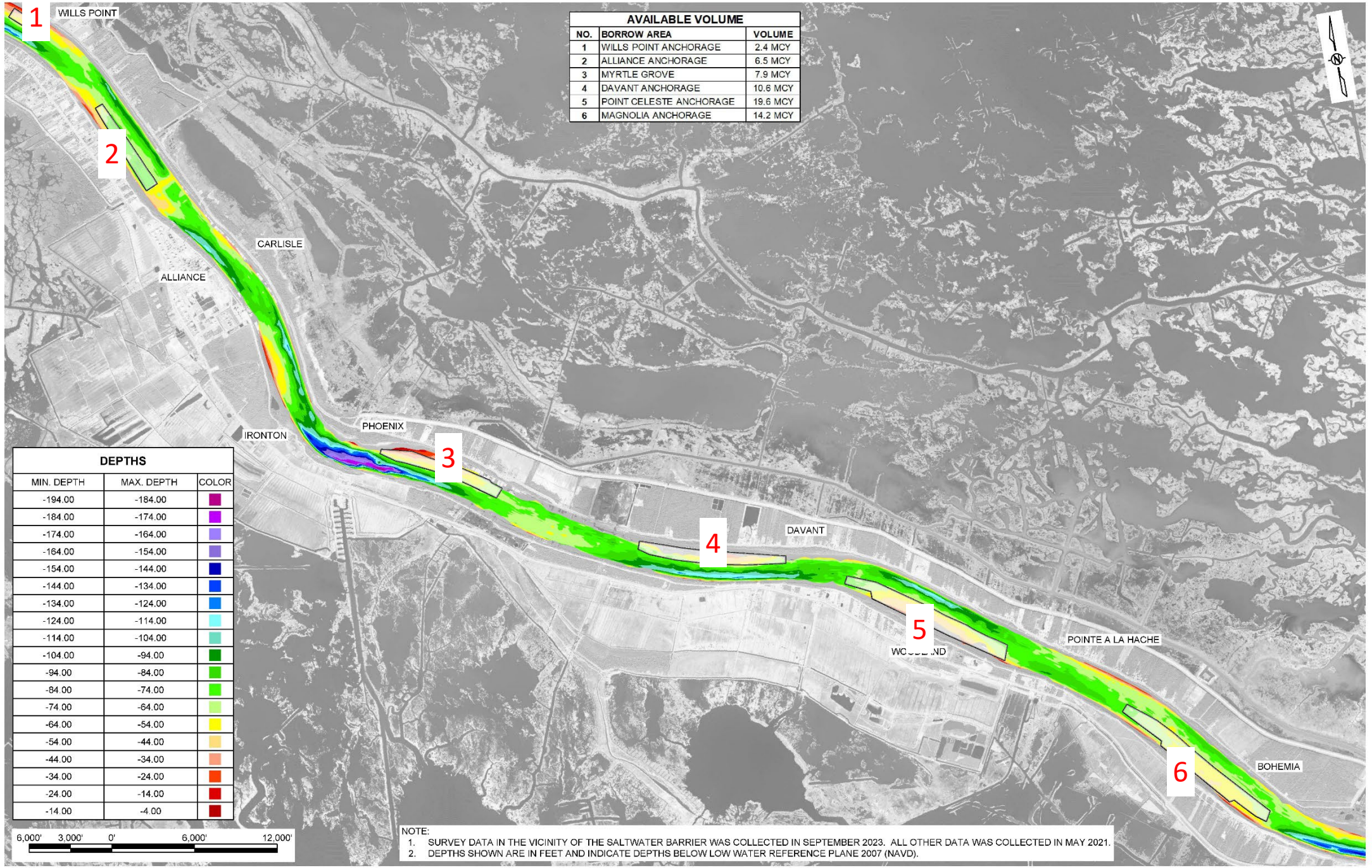
"The restored marsh provides nursery habitat for fish and wildlife while also buffering storm and flooding impacts to local communities."

CREDIT: MOFFATT & NICHOL

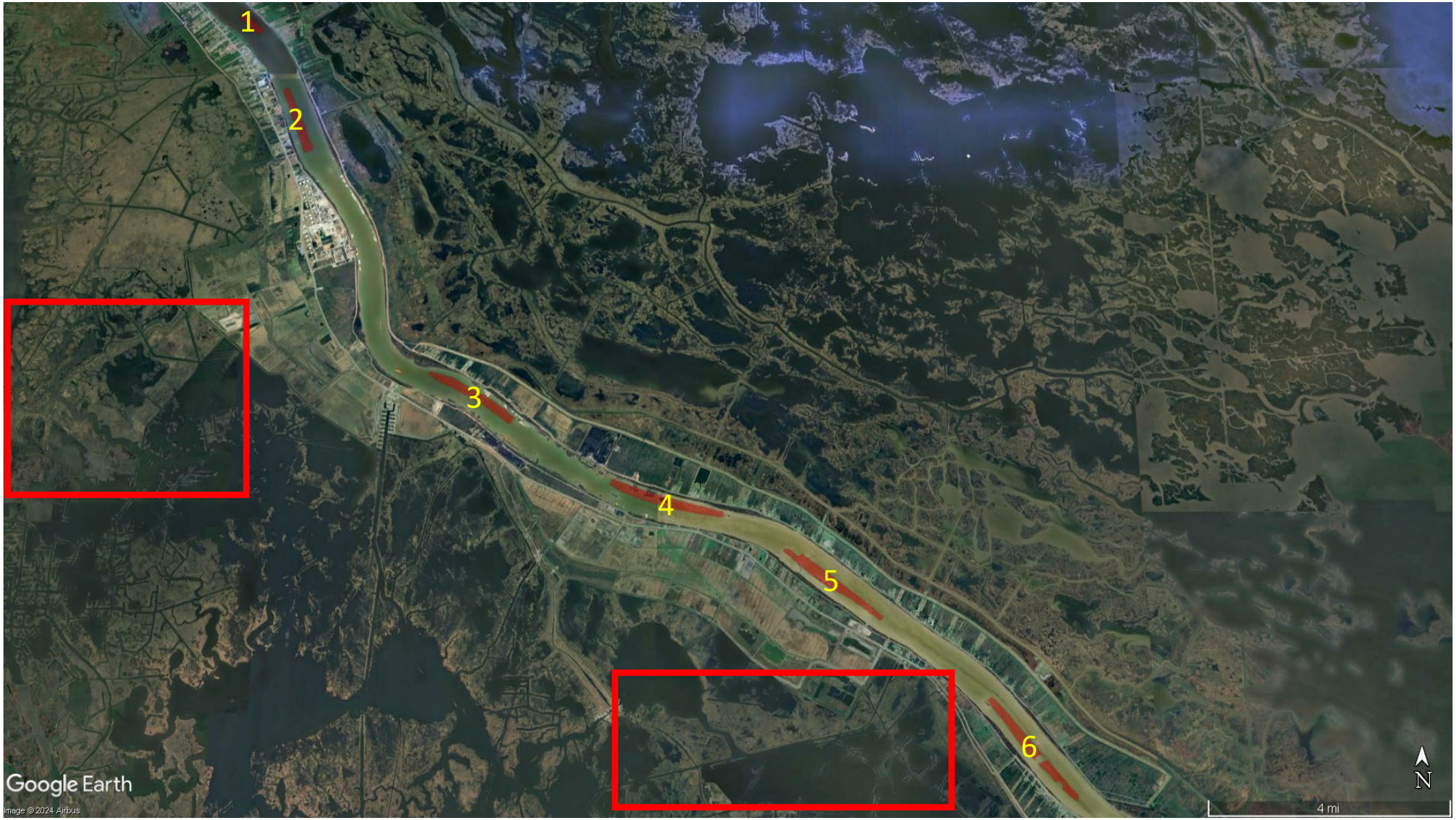
Mississippi River "Dredgeable" Sediment



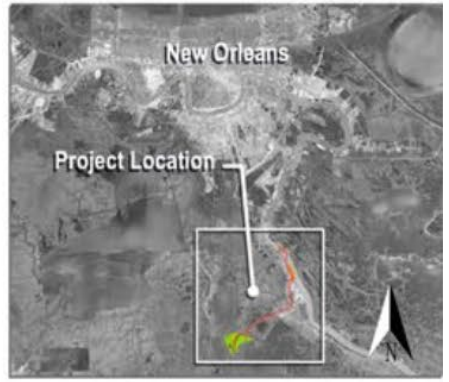

WILLS POINT
CARLISLE
ALLIANCE
IRONTON
PHOENIX
DAVANT
WOODLAND
POINTE A LA HACHE
BOHEMIA
N
DEPTHS
NO. | MIN. ELEVATION | MAX. ELEVATION | COLOR
1 | -194.00 | -184.00
2 | -184.00 | -174.00
3 | -174.00 | -164.00
4 | -164.00 | -154.00
5 | -154.00 | -144.00
6 | -144.00 | -134.00
7 | -134.00 | -124.00
8 | -124.00 | -114.00
9 | -114.00 | -104.00
10 | -104.00 | -94.00
11 | -94.00 | -84.00
12 | -84.00 | -74.00
13 | -74.00 | -64.00
14 | -64.00 | -54.00
15 | -54.00 | -44.00
16 | -44.00 | -34.00
17 | -34.00 | -24.00
18 | -24.00 | -14.00
19 | -14.00 | -4.00
6,000' 3,000' 0' 6,000' 12,000'
NOTE:
DEPTHS SHOWN ARE IN FEET AND INDICATE DEPTHS
BELOW LOW WATER REFERENCE PLANE 2007 (NAVD).


1
WILLS POINT
2
CARLISLE
ALLIANCE
IRONTON
PHOENIX
3
4
DAVANT
5
POINTE A LA HACHE
6
BOHEMIA
AVAILABLE VOLUME
NO. | BORROW AREA | VOLUME
1 | WILLS POINT ANCHORAGE | 2.4 MCY
2 | ALLIANCE ANCHORAGE | 6.5 MCY
3 | MYRTLE GROVE | 7.9 MCY
4 | DAVANT ANCHORAGE | 10.6 MCY
5 | POINT CELESTE ANCHORAGE | 19.6 MCY
6 | MAGNOLIA ANCHORAGE | 14.2 MCY
DEPTHS
MIN. DEPTH | MAX. DEPTH | COLOR
-194.00 | -184.00
-184.00 | -174.00
-174.00 | -164.00
-164.00 | -154.00
-154.00 | -144.00
-144.00 | -134.00
-134.00 | -124.00
-124.00 | -114.00
-114.00 | -104.00
-104.00 | -94.00
-94.00 | -84.00
-84.00 | -74.00
-74.00 | -64.00
-64.00 | -54.00
-54.00 | -44.00
-44.00 | -34.00
-34.00 | -24.00
-24.00 | -14.00
-14.00 | -4.00
6,000' 3,000' 0' 6,000' 12,000'
NOTE:
1. SURVEY DATA IN THE VICINITY OF THE SALTWATER BARRIER WAS COLLECTED IN SEPTEMBER 2023. ALL OTHER DATA WAS COLLECTED IN MAY 2021.
2. DEPTHS SHOWN ARE IN FEET AND INDICATE DEPTHS BELOW LOW WATER REFERENCE PLANE 2007 (NAVD).

Mississippi River Dredging



Mississippi River Long Distance Sediment Pipeline Infrastructure: From Vision to Reality



17,000-hp dredge in Mississippi River

2 x Mississippi River borrow sites @ 8,9-million yd³ combined capacity

Additional 1,200-acre ($105-m)

13.8-mile 30-in ID ¾-in steel pipe

2 x 2000-hp Electric boosters

8,000-yd³ fill/acre

~ 100-acre marsh / month

$112-m Construction Cost

0 Miles
Wills Point Borrow Area
3.6 Miles
Alliance Anchorage Borrow Area
W Ravenna Rd
7.9 Miles
Approximately 22 miles to Downtown New Orleans
10.9 Miles
25 Miles to Gulf of Mexico
Barataria Waterway
13.8 Miles

LEGEND

- Borrow Areas
- Dredge Pipeline Route with Marker Miles Starting at Wills Point Borrow Area
- UBMC Marsh Creation Areas
- Previously Constructed Marsh Creation Areas

CREDIT: MOFFATT & NICHOL

Upper Barataria Marsh Creation (BA-0207)

CREDIT: MOFFATT & NICHOL

Upper Barataria Marsh Creation (BA-0207)

CREDIT: MOFFATT & NICHOL

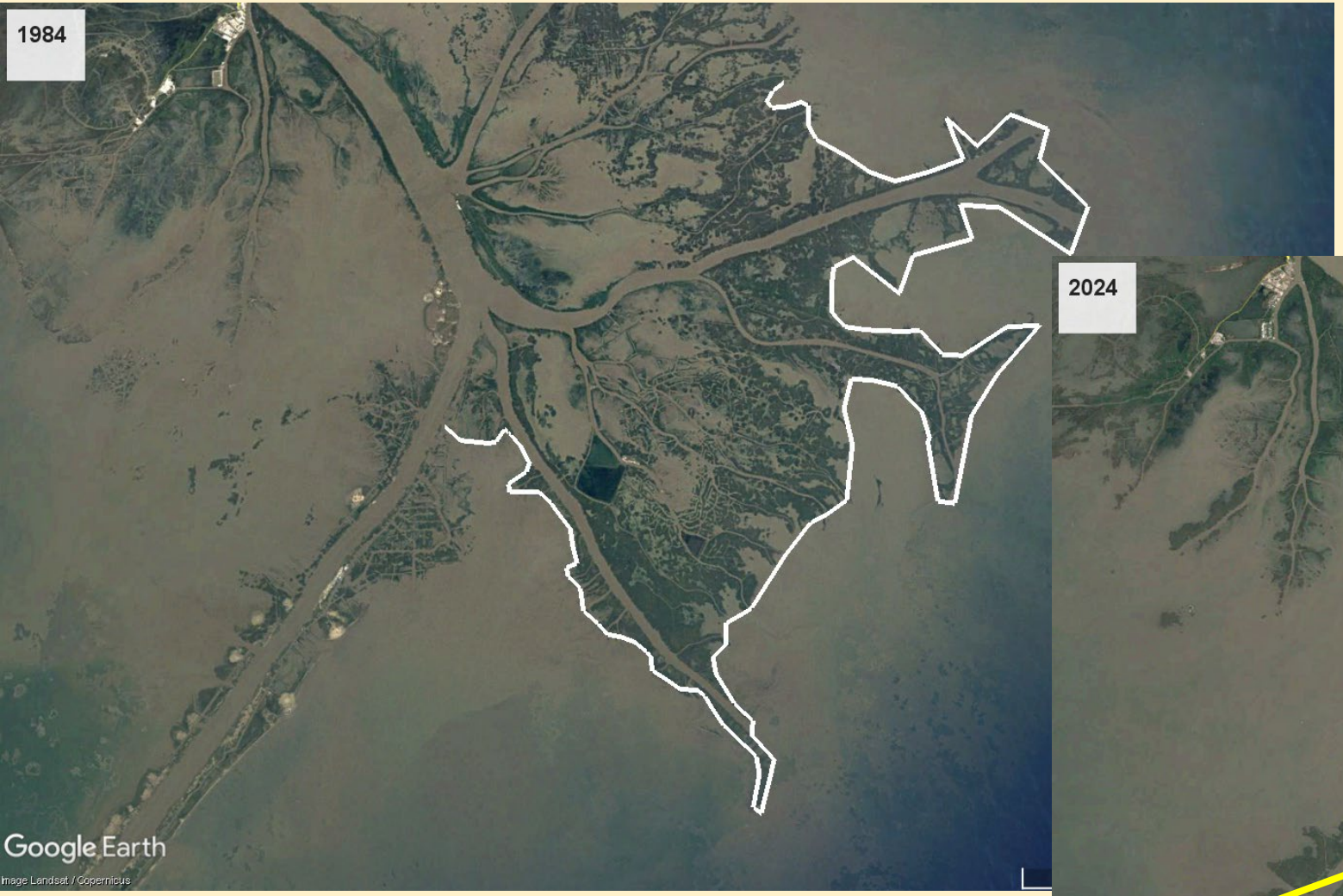
BIRD'S FOOT DETLA HYDROLOGIC RESTORATION PROJECT

Birdfoot Delta Hydrologic Restoration
Project MR-173

Todd Baker, CPRA Project Manager
Bevin Barringer, CPRA Project Engineer

164,000 Acres of Public Lands

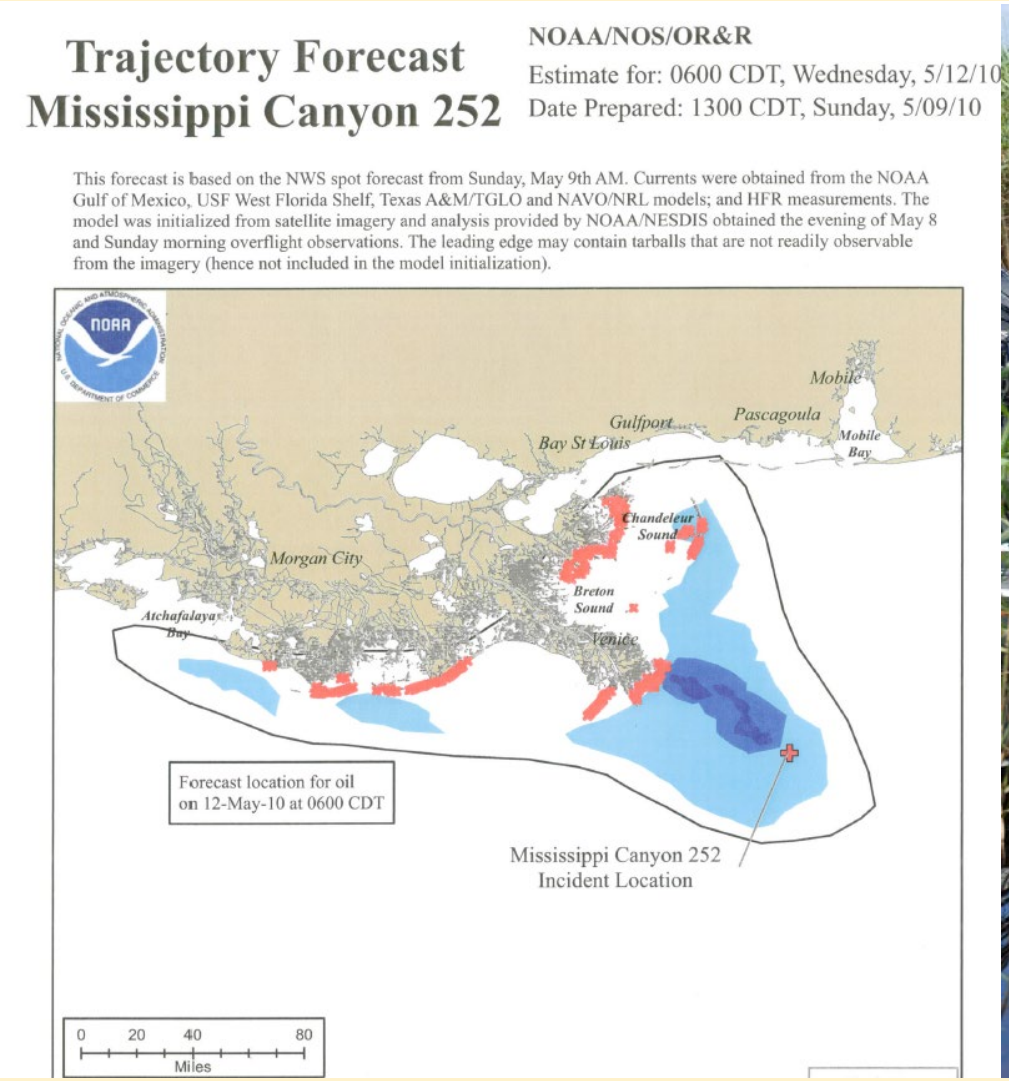
Purpose and Need:



26,500 Acres loss in 40 years

4,500 acre gain in 40 years

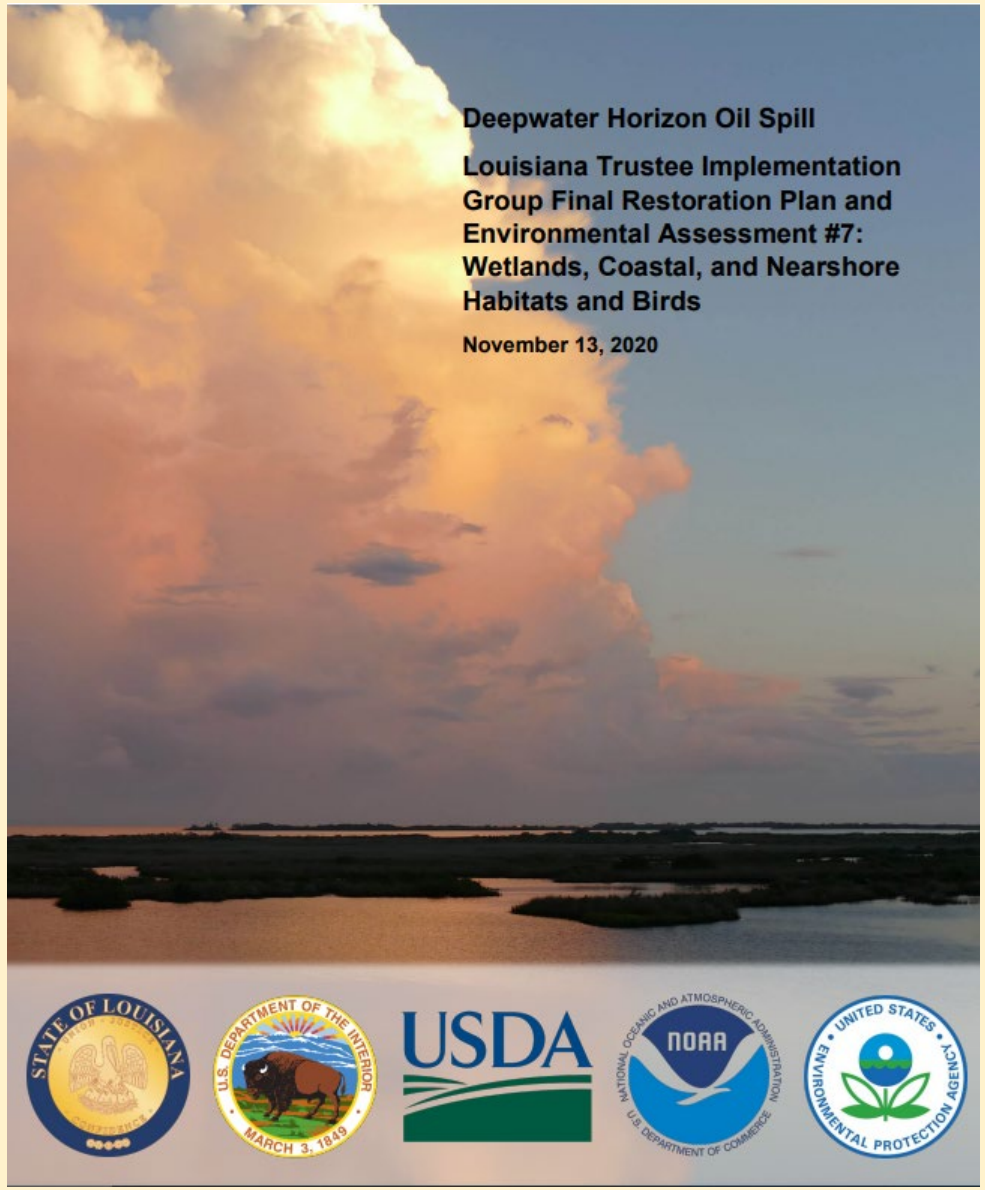
Purpose and Need:

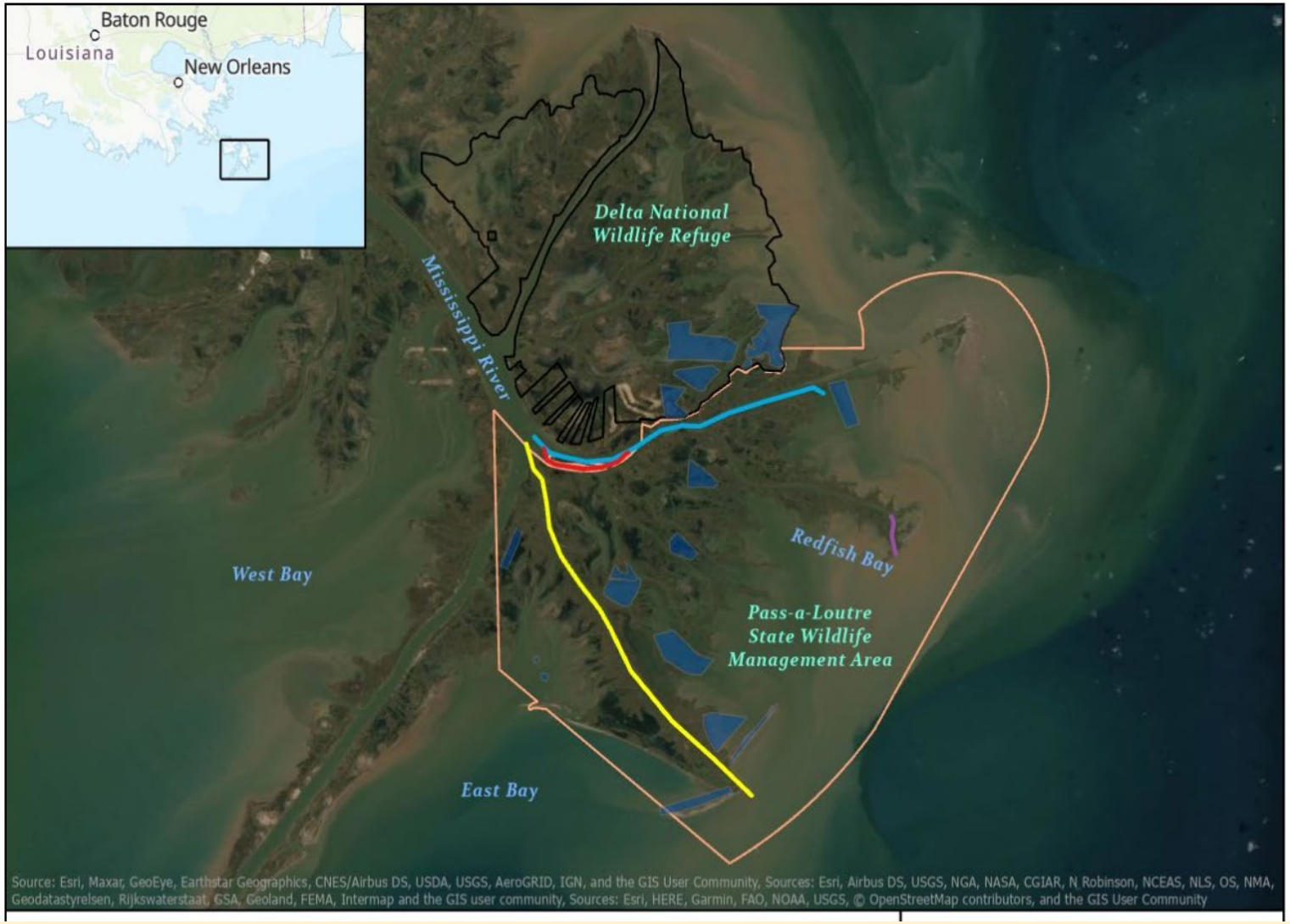


Purpose and Need:

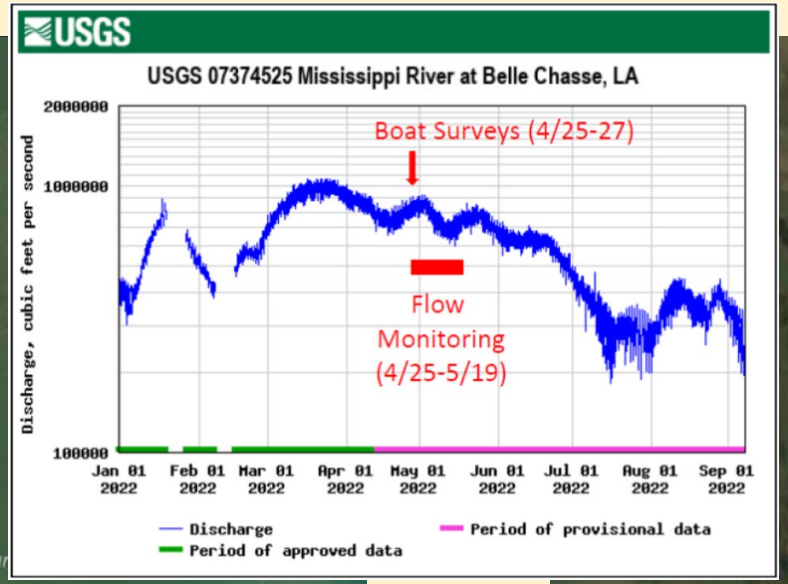
Funding for E&D: LA TIG Restoration Plan #7

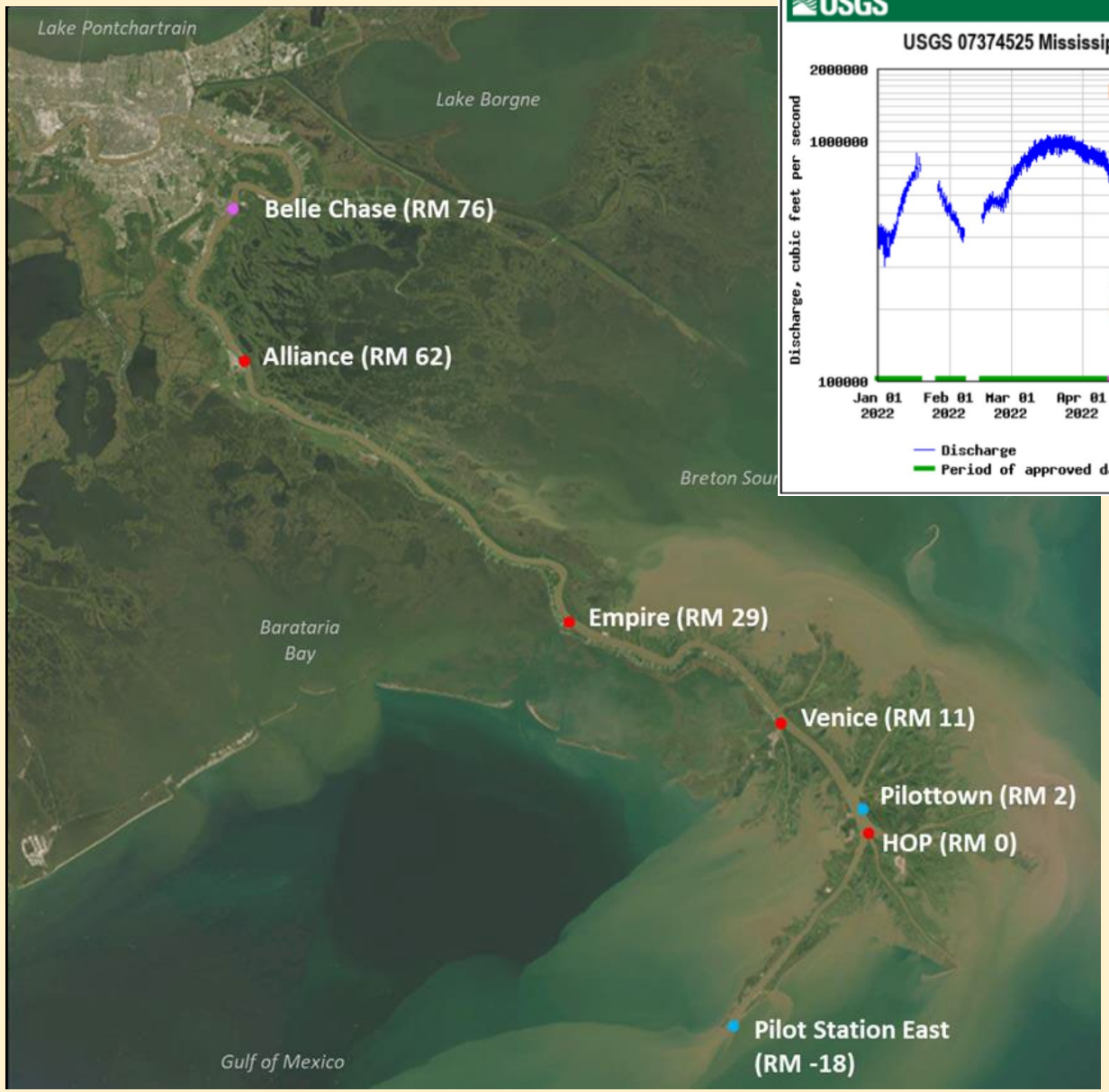
$6,000,000 Engineering and Design

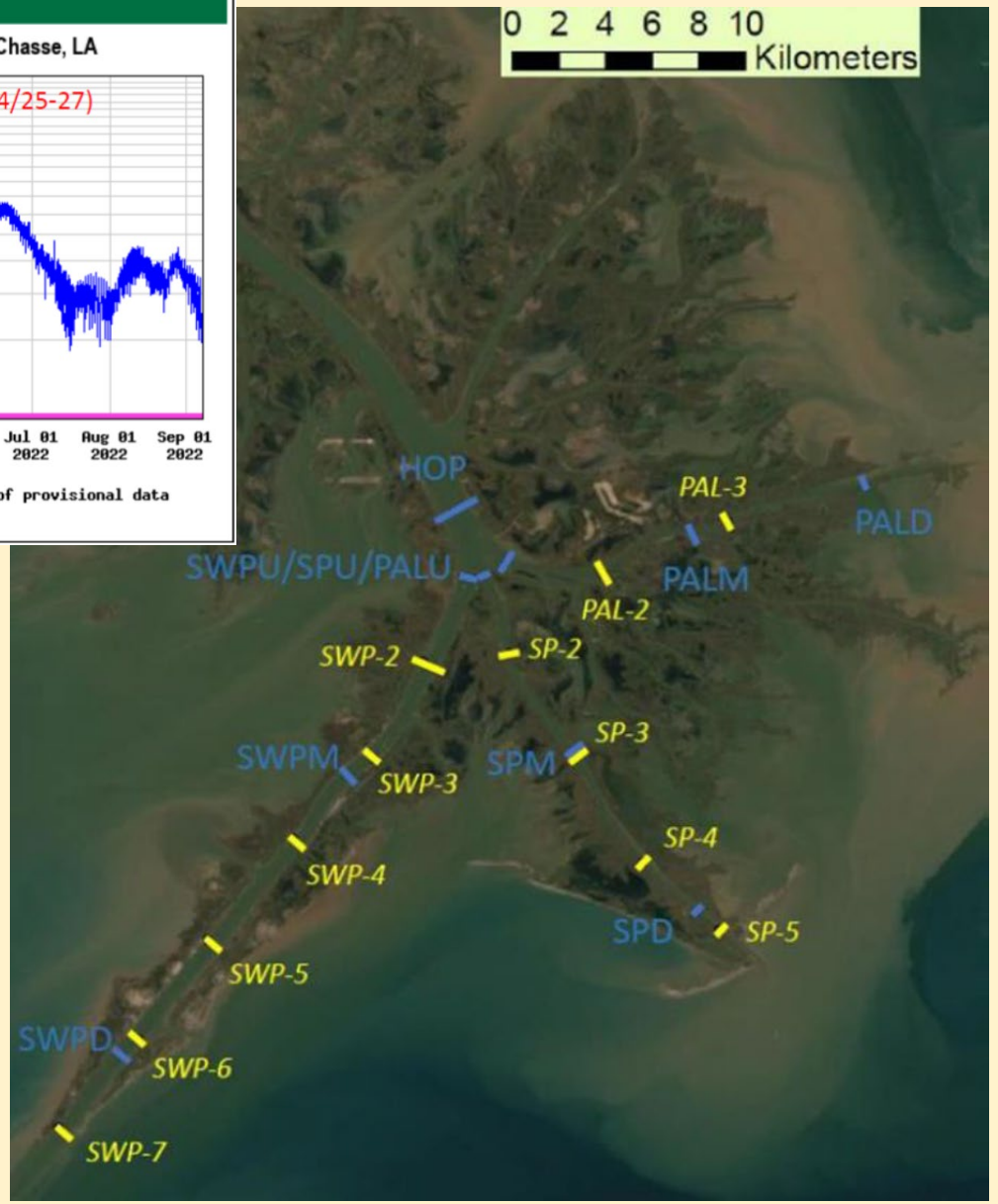




Data Collection and Model Inputs:

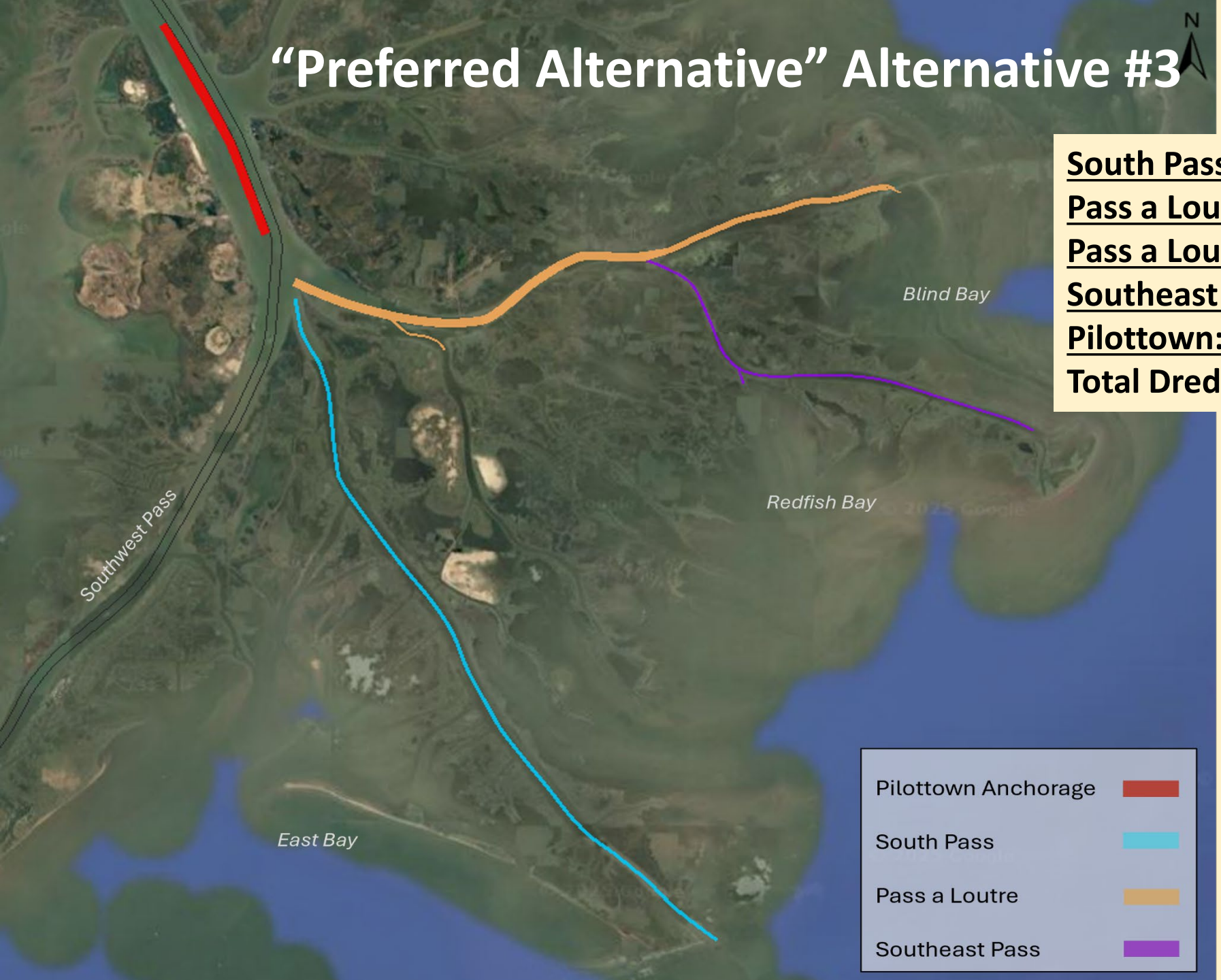






Stakeholder Engagement:

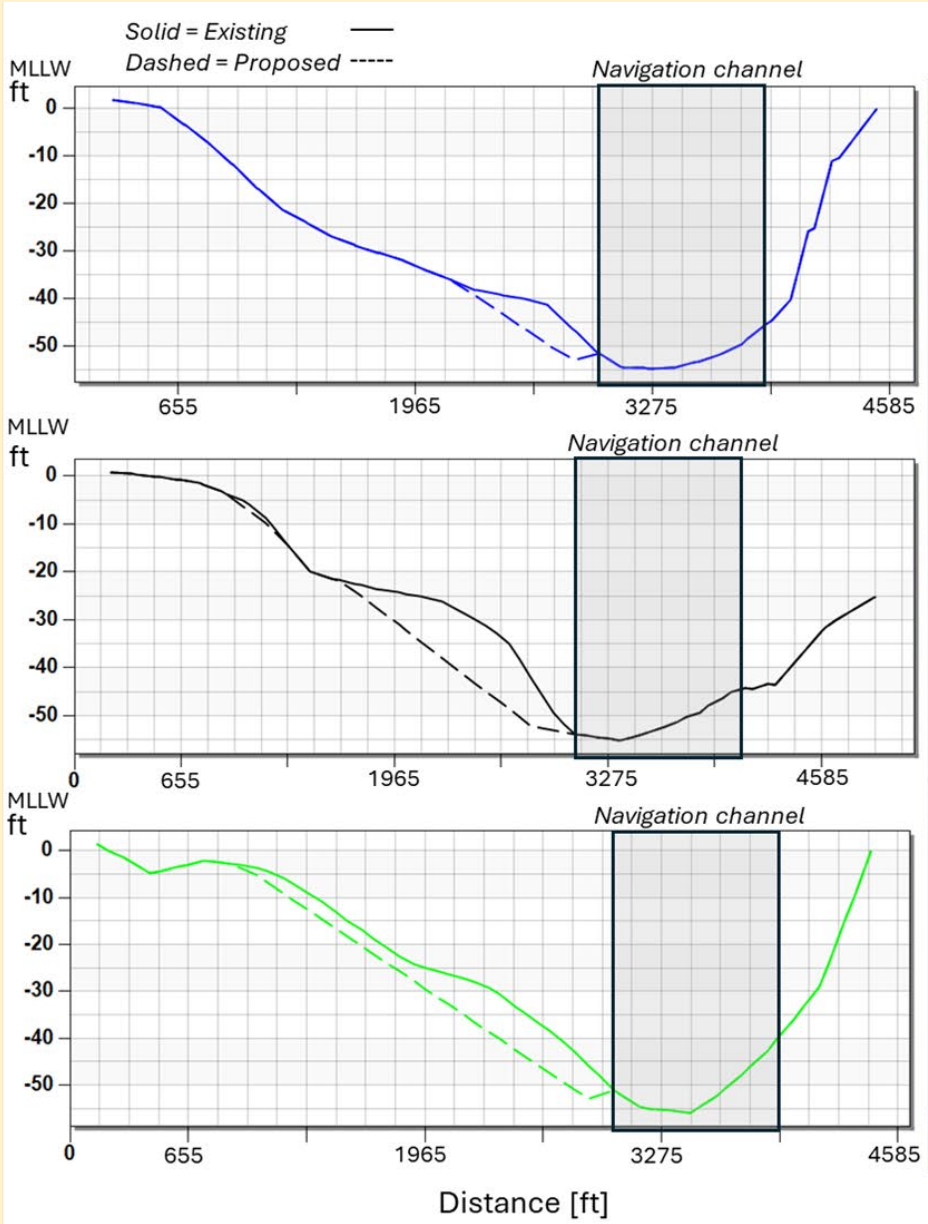
“Preferred Alternative” Alternative #3

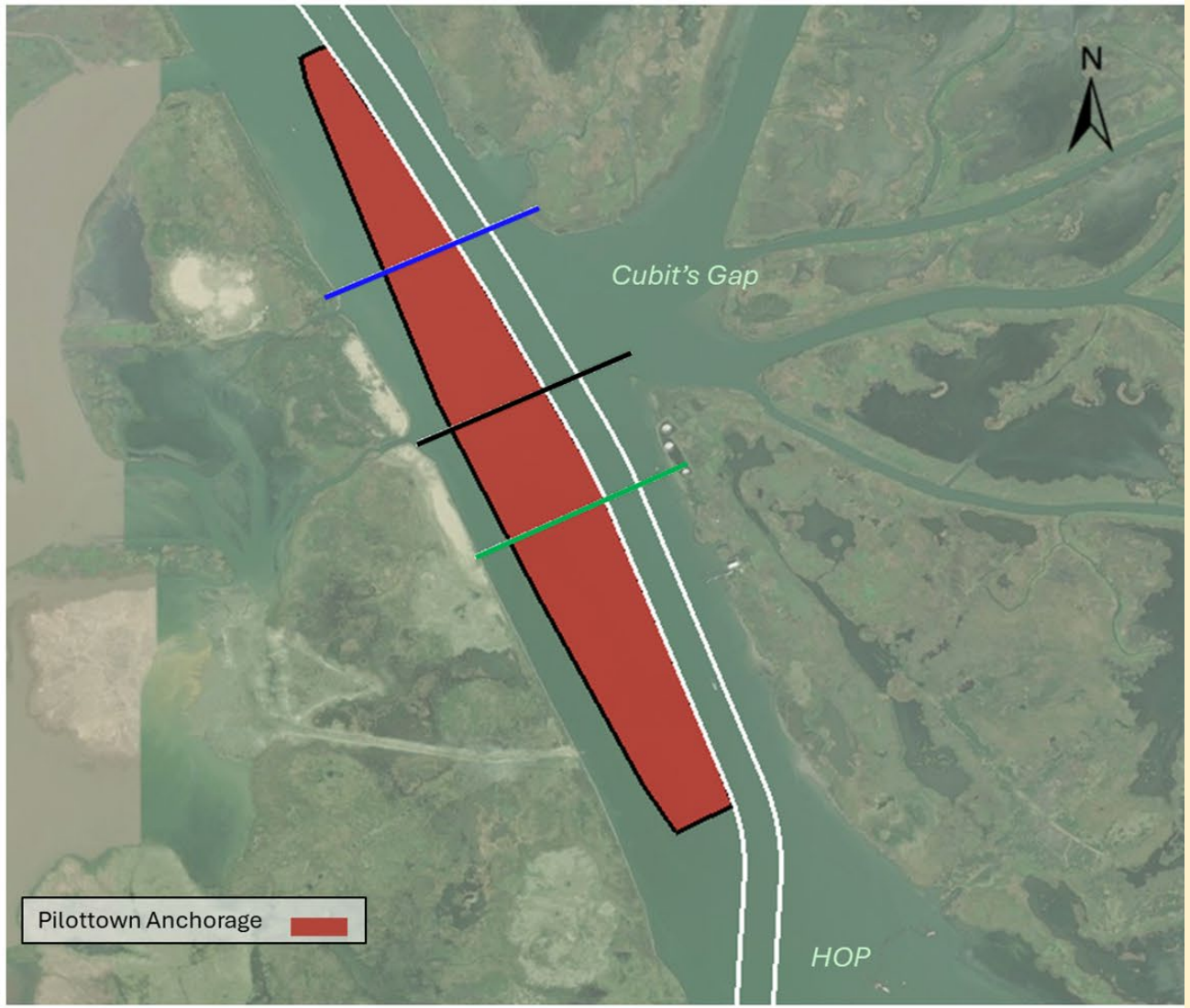


South Pass:	300’x25’ - 3.5 mcy
Pass a Loutre Upper:	750’x25’- 3.45 mcy
Pass a Loutre Lower:	500’x20’- 2.8 mcy
Southeast Pass:	200’x20’- 2.15 mcy
Pilottown:	*Nat. Slope x50’*- 4.5 mcy
Total Dredge Quantity =	16.41 MCY

Estimated Cost:
$144,000,000 - $176,000,000

Pilot Town Anchorage Dredging
** “Modeled Cut” – NOT Construction Cut

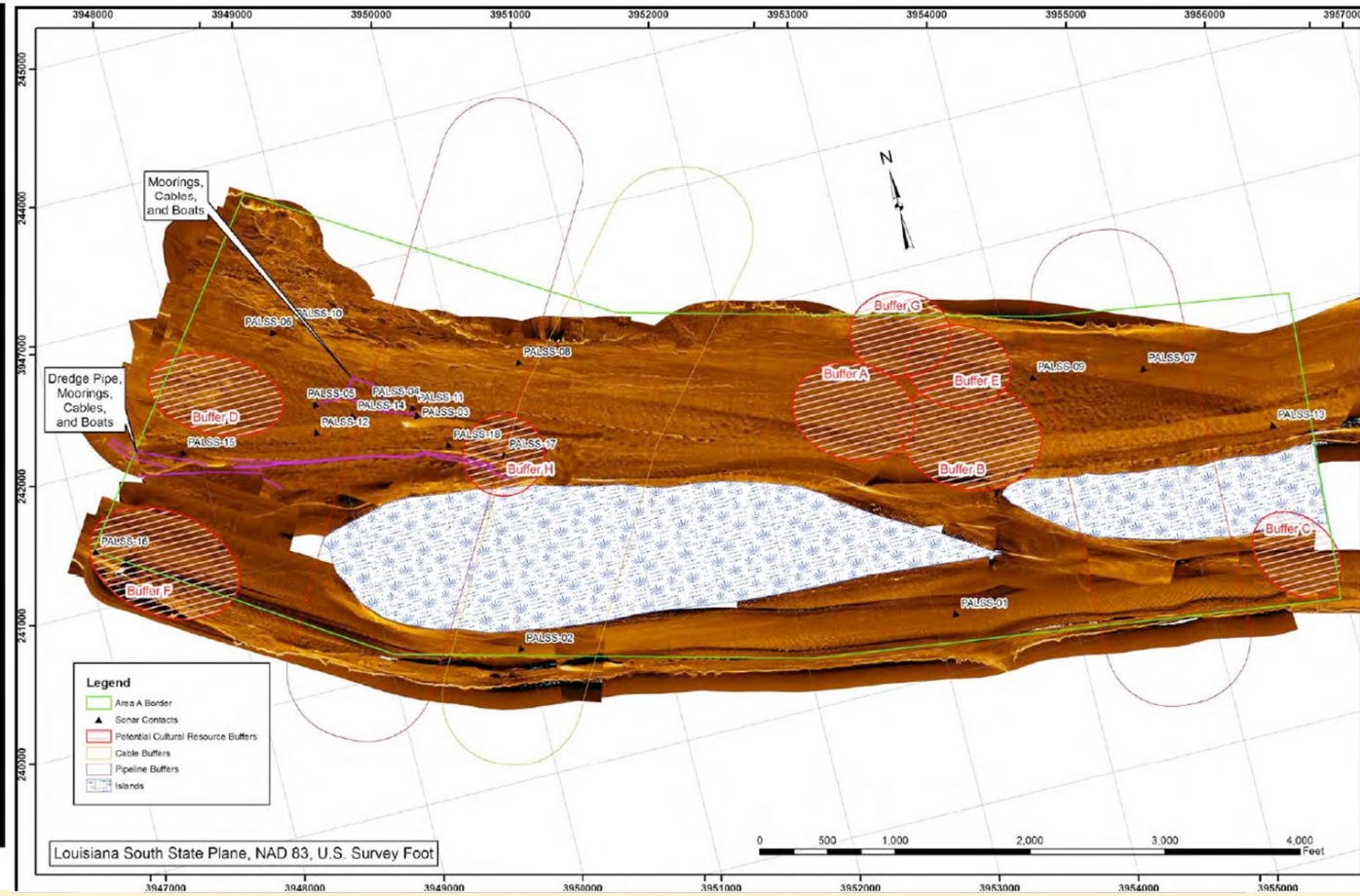




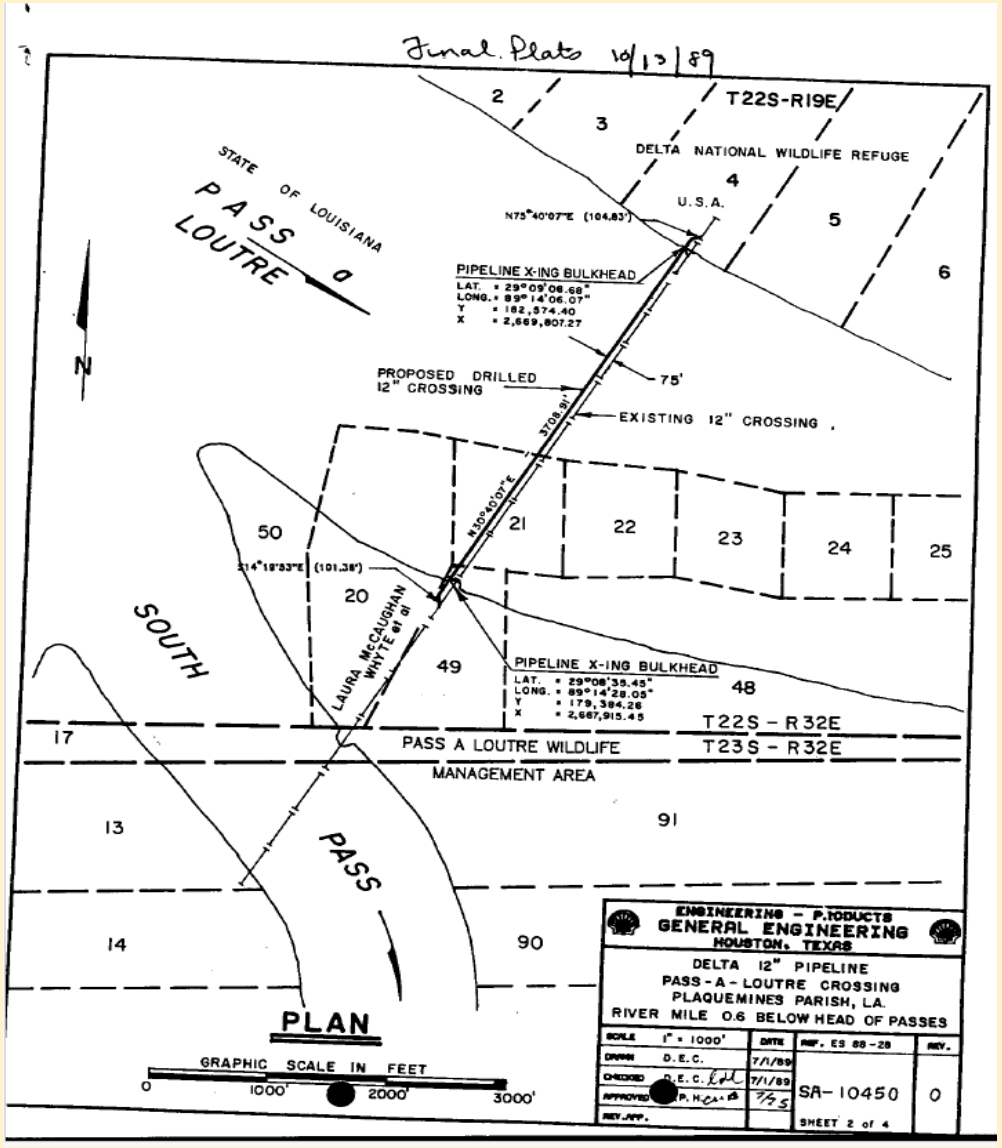
Next Steps: Archeological Surveys

363 miles of survey covering 2,878 acres

(Courtesy I. N. Phelps Stokes Collection, Miriam and Ira D. Wallach Division of Art, Prints and Photographs, The New York Public Library, Astor, Lenox and Tilden Foundations).



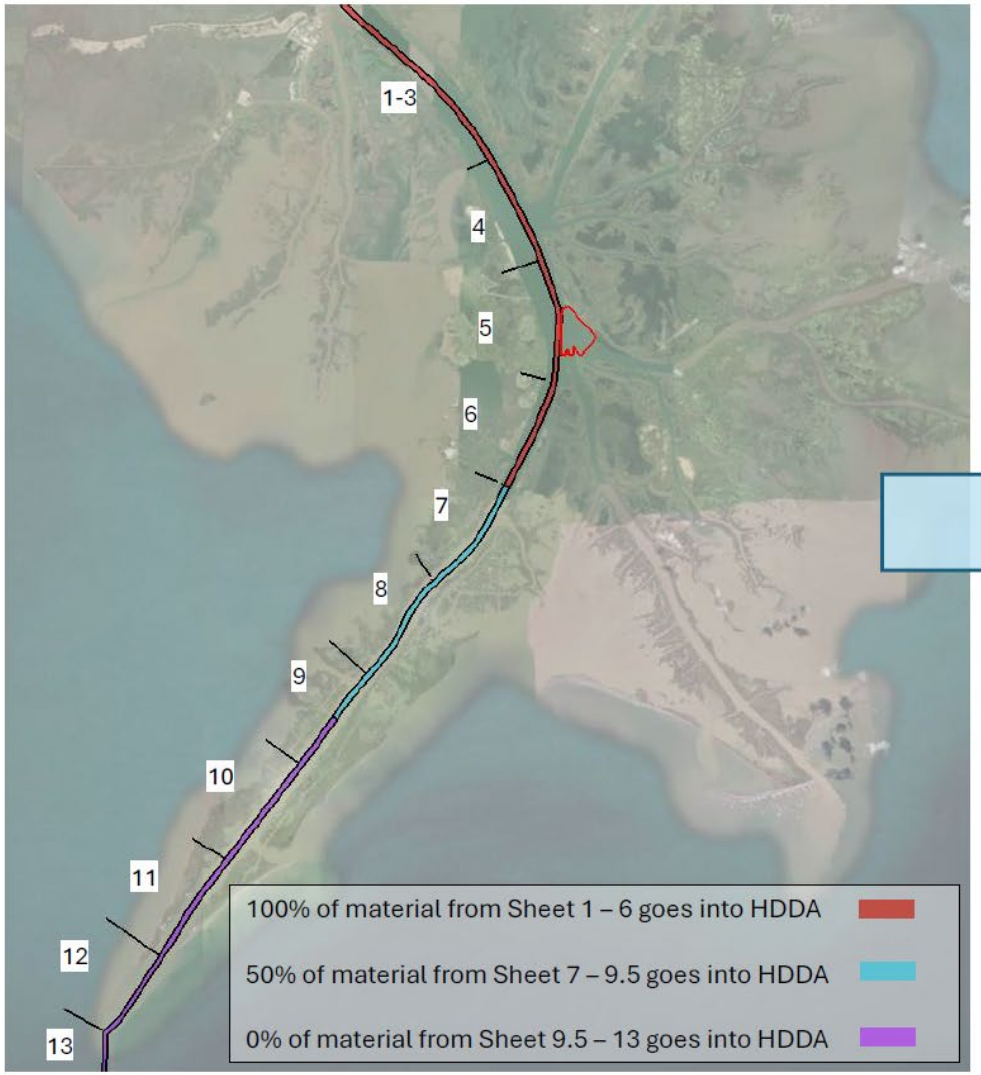
Next Steps: Oil and Gas Infrastructure



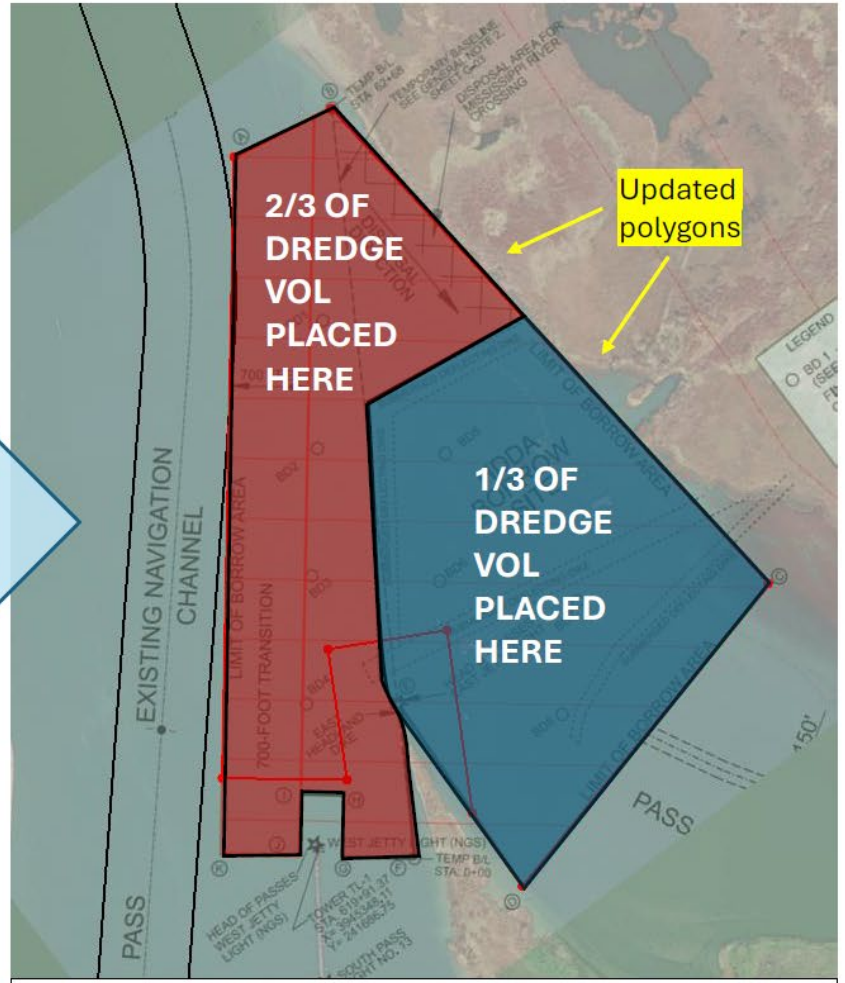
Next Steps: Determine Project Longevity

Every 28 days of model simulation, pause the model to dredge the navigation channel to -52 ft MLLW.

Navigation channel dredging

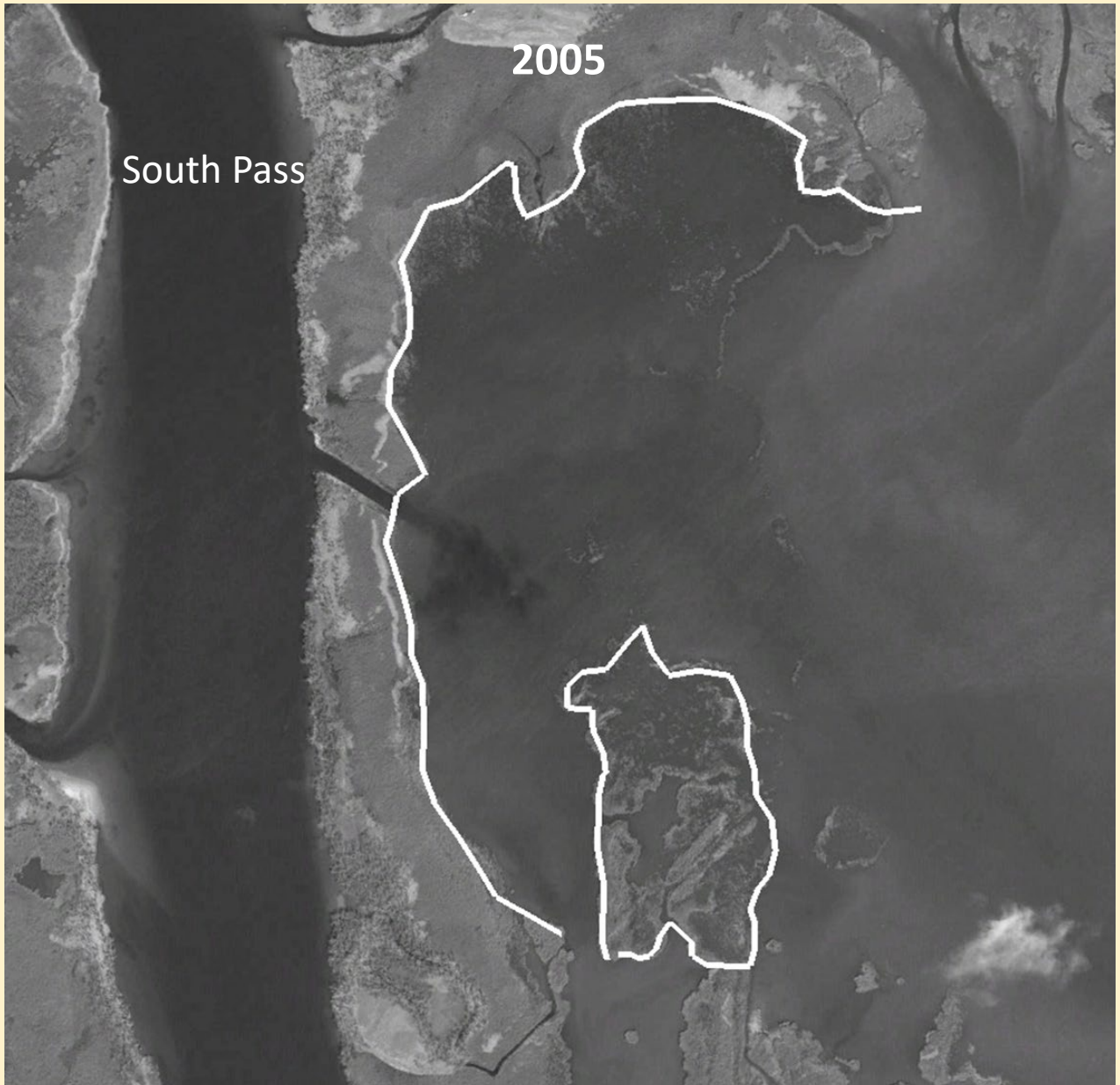


Disposal of dredged material from nav channel



Assumption: Material is distributed evenly within its respective polygon.

Next Steps: Calculate Project Benefits “Acres”



Next Steps: Develop Sediment Disposal Areas

Questions?

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