

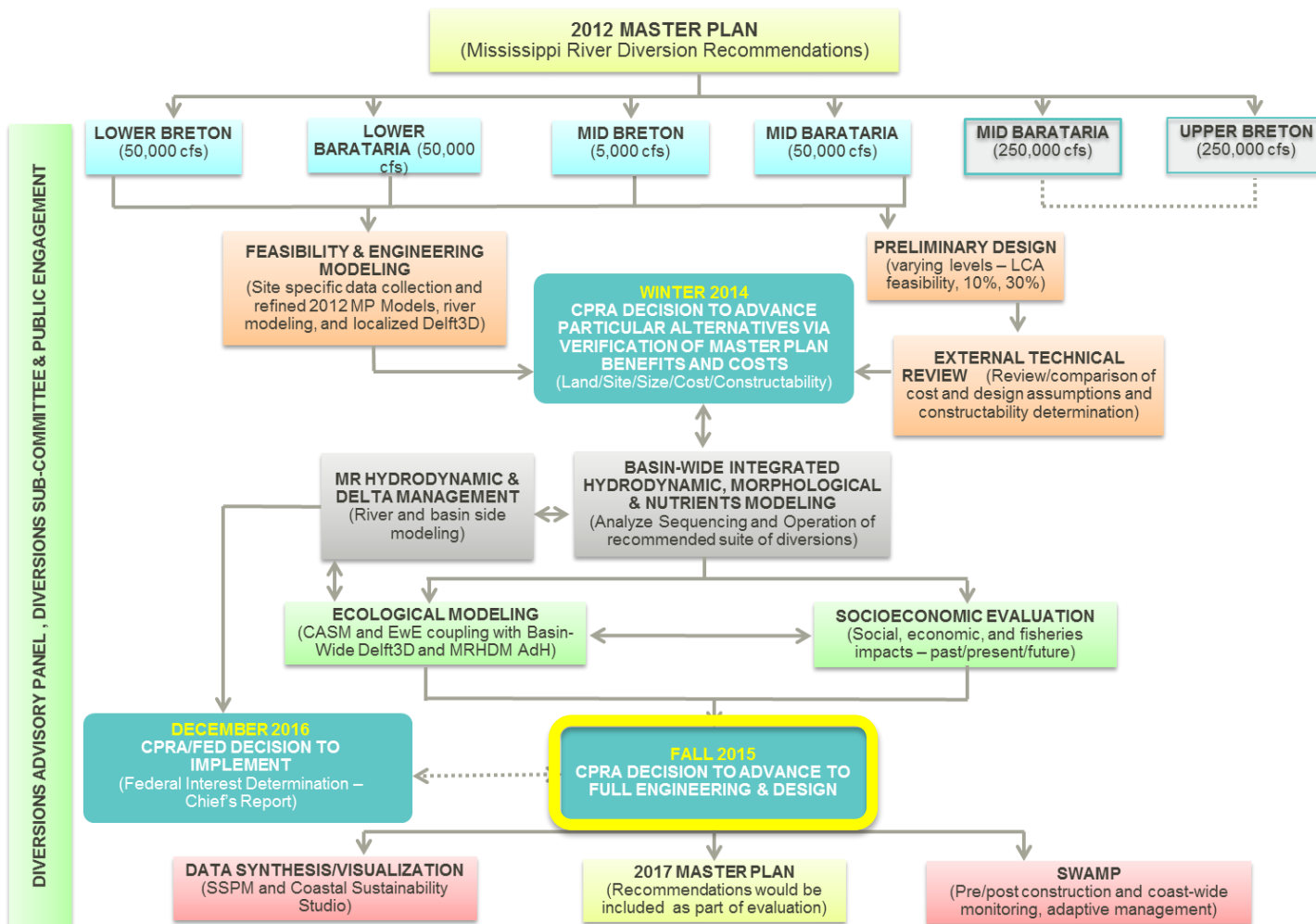


EXPERT PANEL ON DIVERSION PLANNING AND IMPLEMENTATION

SEDIMENT DIVERSIONS UPDATE

August 31, 2016

MISSISSIPPI RIVER SEDIMENT DIVERSIONS: PROCESS





RECOMMENDATIONS FROM LAST MEETING: BEYOND THE FALL 2015 DECISION POINT

- Explore through model interactions between diversions and other potential restoration tools (e.g., outflow management, dredge spoil, terracing, and channel realignment) ways to more aggressively enhance sediment retention and maximize the process of land building.



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- Reconcile inconsistencies in fisheries modeling through rigorous assessment of model performance following a process similar to that used for the land-building models, ensuring that model formulations are parallel and that model differences are understood and explained.

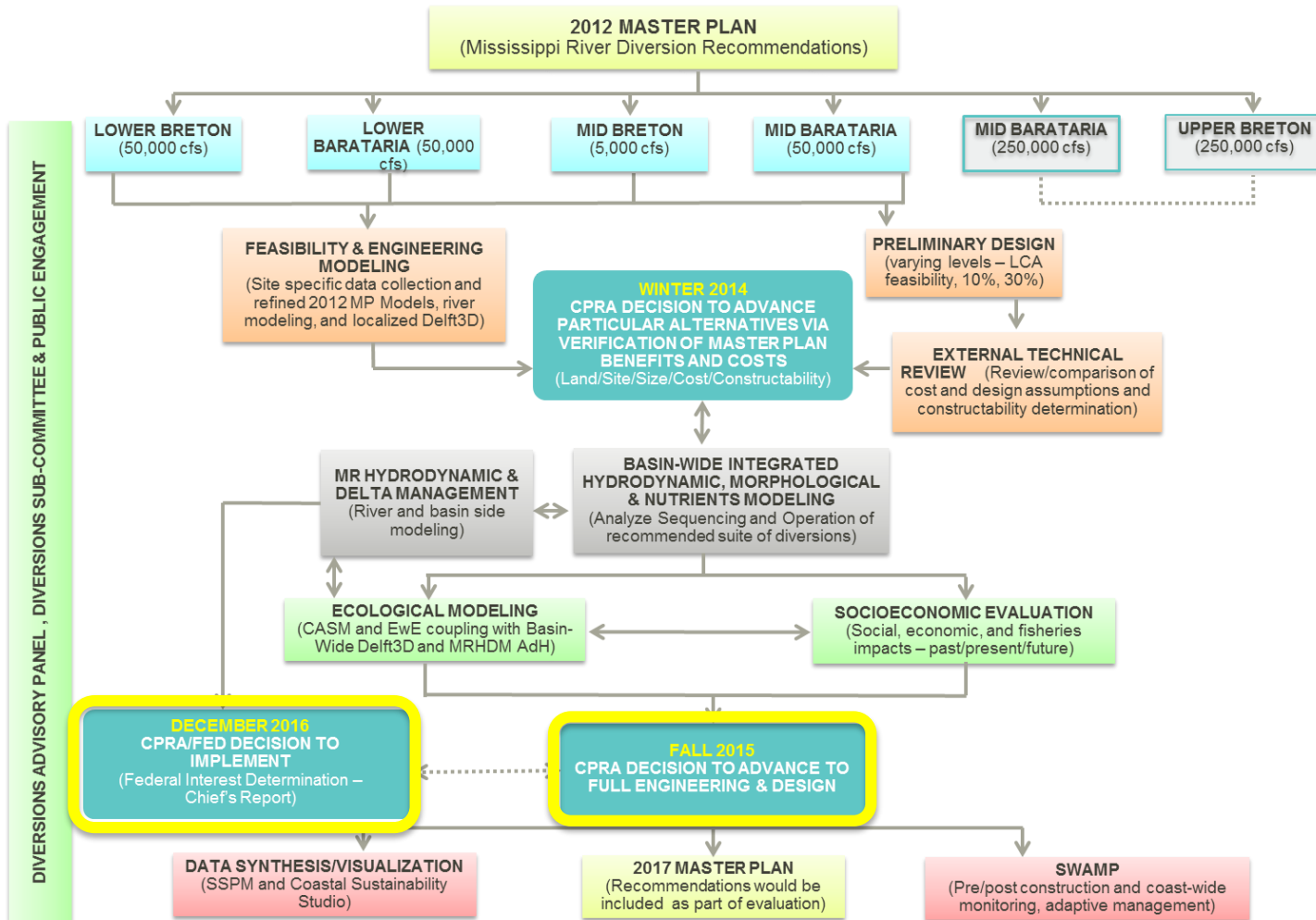
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- Express socio-economic outcomes as changes relative to FWOP (in addition to changes relative to initial condition), and depict outcomes for all available time steps as opposed to outcomes in year 50 only.

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- Express socio-economic outcomes as changes relative to FWOP (in addition to changes relative to initial condition), and depict outcomes for all available time steps as opposed to outcomes in year 50 only.
- Ensure that assumptions used in socio-economic analyses are fully stated and that inconsistencies between biomass and socio-economic results are reconciled using outputs from both EwE and CASM models.

MISSISSIPPI RIVER SEDIMENT DIVERSIONS: PROCESS





THE PATH FORWARD



BRAD BARTH



PRESENTATION OVERVIEW

- Program Overview
- Funding Update
- Permitting and Construction Approvals
- Project Costs
- Project Status and Program Update
- Schedule

CREATING A TEAM-BASED, PROGRAMMATIC APPROACH



ANTICIPATED FUNDING

- Engineering, Design and Permitting
 - Programmatic
 - Mid-Barataria
 - Mid-Breton

- Construction
 - Mid-Barataria (NDRA)



- Mid-Breton



PERMITTING & CONSTRUCTION APPROVALS

Permitting

Coastal Use (LDNR), Navigation, and Wetlands

- Section 10 (USACE Navigation)/404 (USACE Wetlands) and Coastal Use Permit (LDNR CUP)
- Permit Public Notice and Comment
- Coastal Use Permit
- Coastal Use Permit Public Notice and Comment
- Coastal Use Permit Approval
- Section 10/404 Approval
- Project Implementation and Monitoring

NEPA Compliance

National Environmental Policy Act

- **Solicitation of Views (2013)**
- Notice of Intent for EIS
- Start EIS
- **Public Scoping Meeting**
- Draft EIS
- USACE (HQ/MVD) Approves Draft EIS for Release
- **Public Comment on Draft EIS**
- Final EIS
- **Public Review of Final EIS**
- Complete EIS (Record of Decision)

408 Approval (USACE)

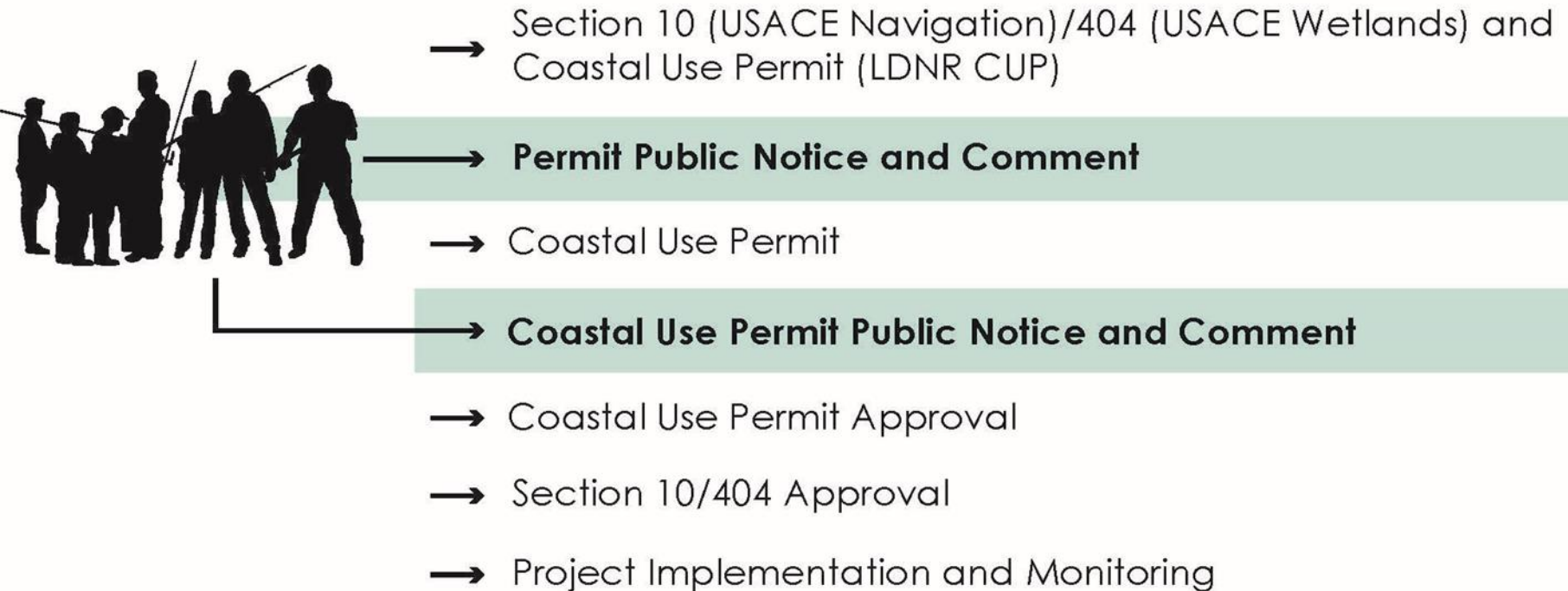
Request to alter a Federal Project or project with Federal interest; no direct public involvement.

- 408 Request
- 60% Plans and specifications review
 - District - PDT
 - Agency Technical Review (ATR)
 - IEPR-SAR Review
- USACE (HQ/MVD) Preliminary 408 Approval
- Record of Decision (408)
- 408 Approval
- 408 Construction Oversight



PERMITTING & CONSTRUCTION APPROVALS

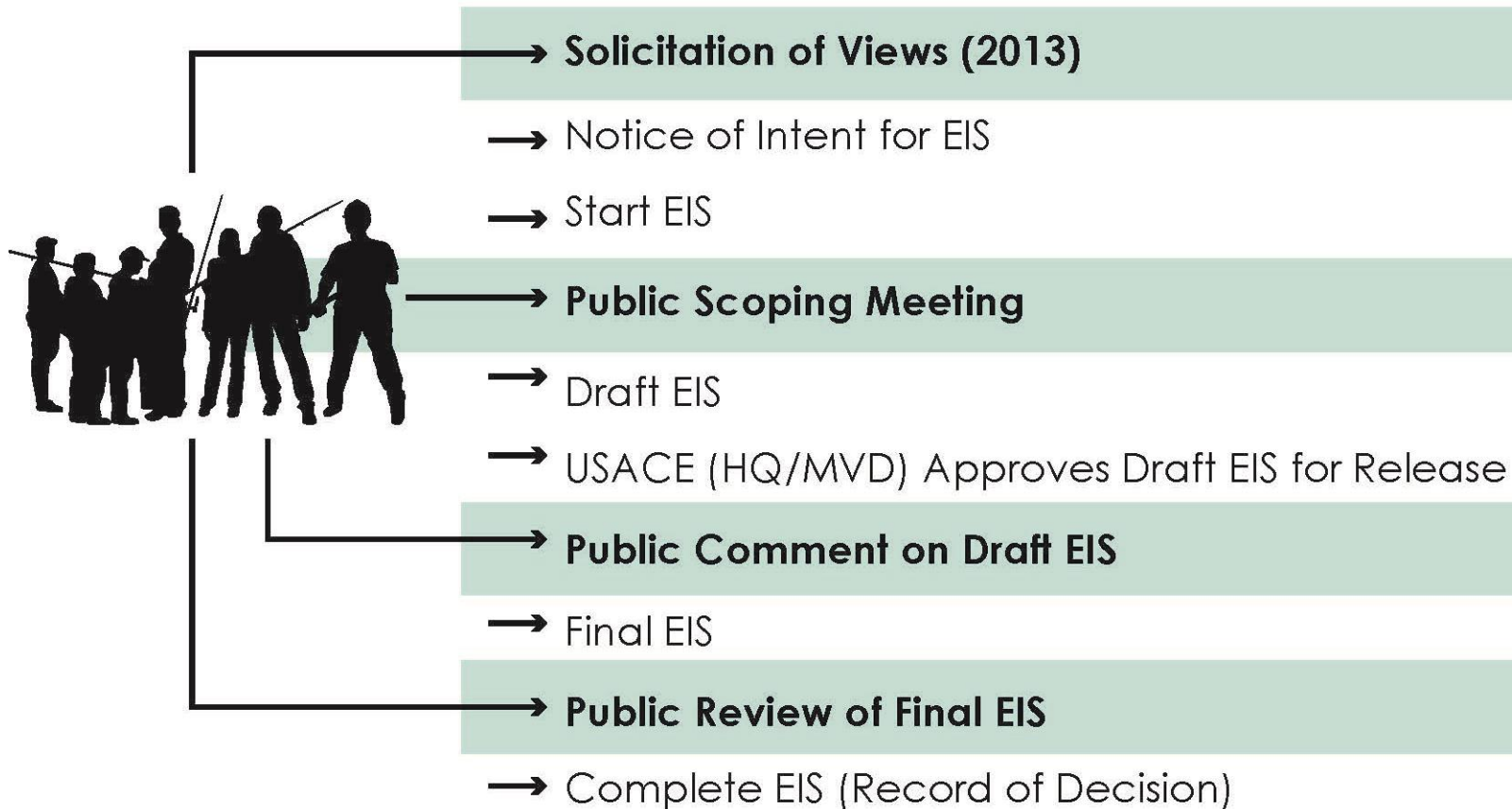
COASTAL USE (LDNR), NAVIGATION, & WETLANDS



PERMITTING & CONSTRUCTION APPROVALS

NEPA COMPLIANCE

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PERMITTING & CONSTRUCTION APPROVALS

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OTHER PERMITS/CONSULTATIONS

PERMIT/LAW	RESPONSIBLE AGENCY	RESOURCE ISSUE FOR PERMIT
Section 404	USACE	Dredging and/or filling in waters of the US
Section 10	USACE	Construction of structures in navigable waters of the US
Marine Mammal Protection Act (MMPA)	National Marine Fisheries Service (NMFS)	Projects that may affect marine mammals
Essential Fish Habitat (EFH)	National Marine Fisheries Service	Projects that may affect habitat designated as “Essential Fish Habitat”
Endangered Species Act, Section 7 Consultation	National Marine Fisheries Service	Impacts to marine species designated as “Endangered”
Section 106 Consultation	State Historic Preservation Office (SHPO)	Cultural resources, including historic resources and Native American traditional places
Section 401, Clean Water Act	Department of Environmental Quality/Environmental Protection Agency	Project activities that could affect quality of water
Coastal Use Permit (CUP)	Louisiana Department of Natural Resources	Project activities within the coastal zone: dredging, filling, construction, etc.



LAND RIGHTS

Tax Assessment Records

Abstracting

Title Opinions and Reviews

Appraisals

Acquisition Maps and Letters



ENGINEERING AND DESIGN

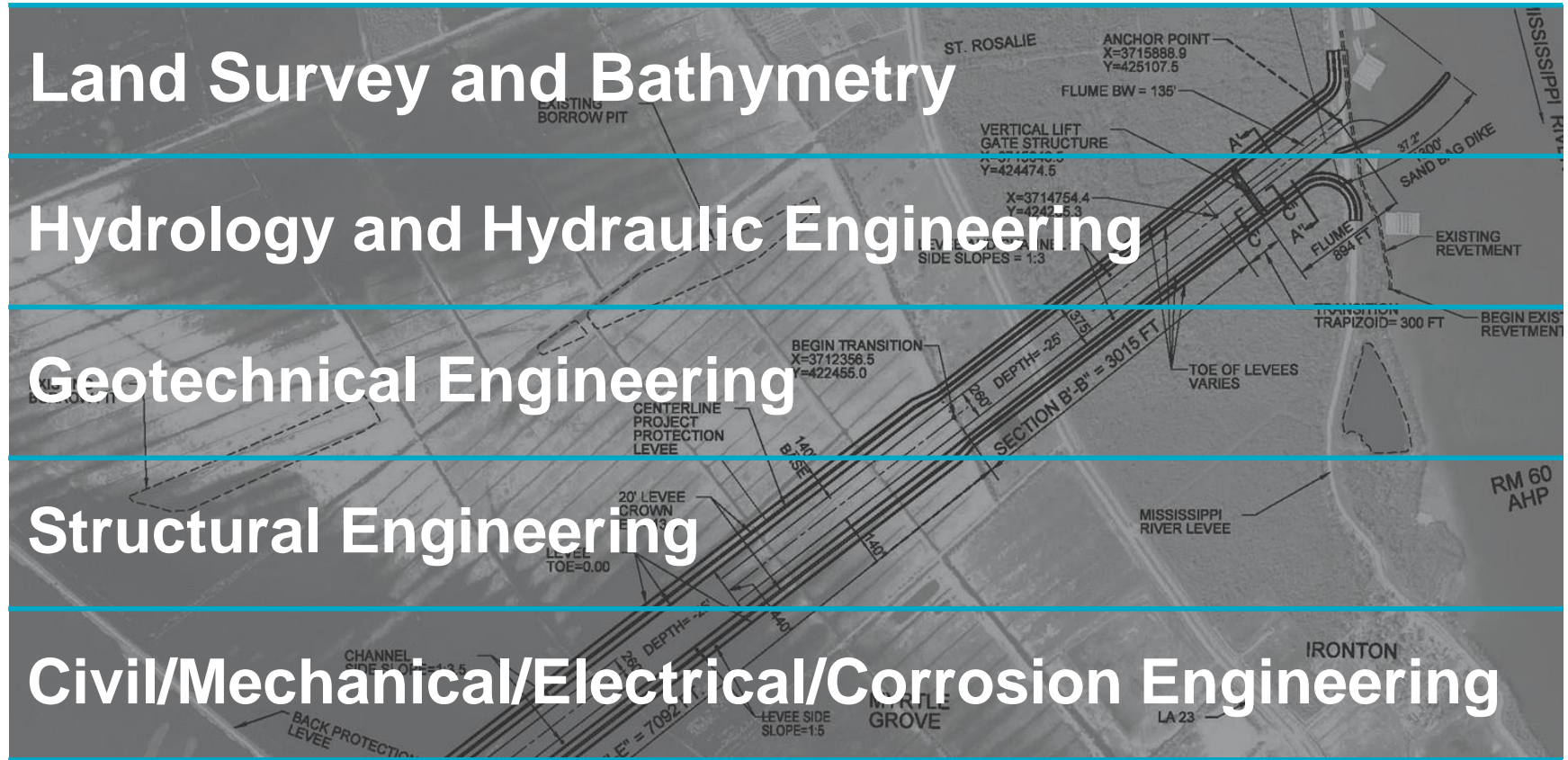
Land Survey and Bathymetry

Hydrology and Hydraulic Engineering

Geotechnical Engineering

Structural Engineering

Civil/Mechanical/Electrical/Corrosion Engineering



OPERATIONS

The background of the slide is a photograph of a large concrete dam with multiple spillways. The water is turbulent and white with foam as it flows through the spillways. On top of the dam, there are several pieces of construction equipment, including a large red crane and other machinery. Workers in safety gear are visible on the dam's surface. The sky is overcast with grey clouds.

Operation Plan

**Operation, Maintenance, Repair, Rehabilitation,
and Replacement (OMRRR) Manual**

Monitoring Plan

Adaptive Management

MID-BARATARIA SEDIMENT DIVERSION PROJECT HISTORY

PROJECT CONCEPT

CWPPRA



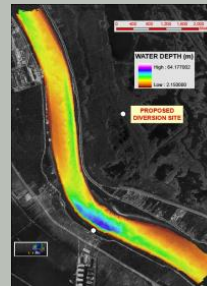
PLANNING

CPRA MASTER PLAN



PRELIMINARY E&D

STATE/NGO EFFORT



FEASIBILITY

LCA MYRTLE GROVE



DETAILED E&D

CPRA MID- BARATARIA



**This Project Has Been Planned,
Evaluated and Discussed with
Stakeholders For 10+ Years**

MID-BARATARIA SEDIMENT DIVERSION BASIS FOR DESIGN

#1 Capacity

- 75,000 cfs – Dr. Ehab Meselhe’s results (sediment/water ratios)

#2 Alignment

- Based on an intensive Mississippi River data collection and modeling effort, the location of the intake channel and the outfall channel alignment has been carefully selected at river mile 60.7 above Head of Passes to optimize the capture of sediment from the river.

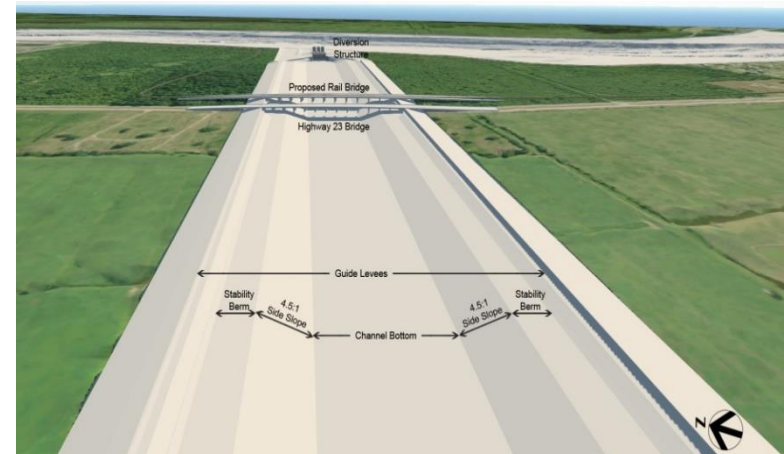
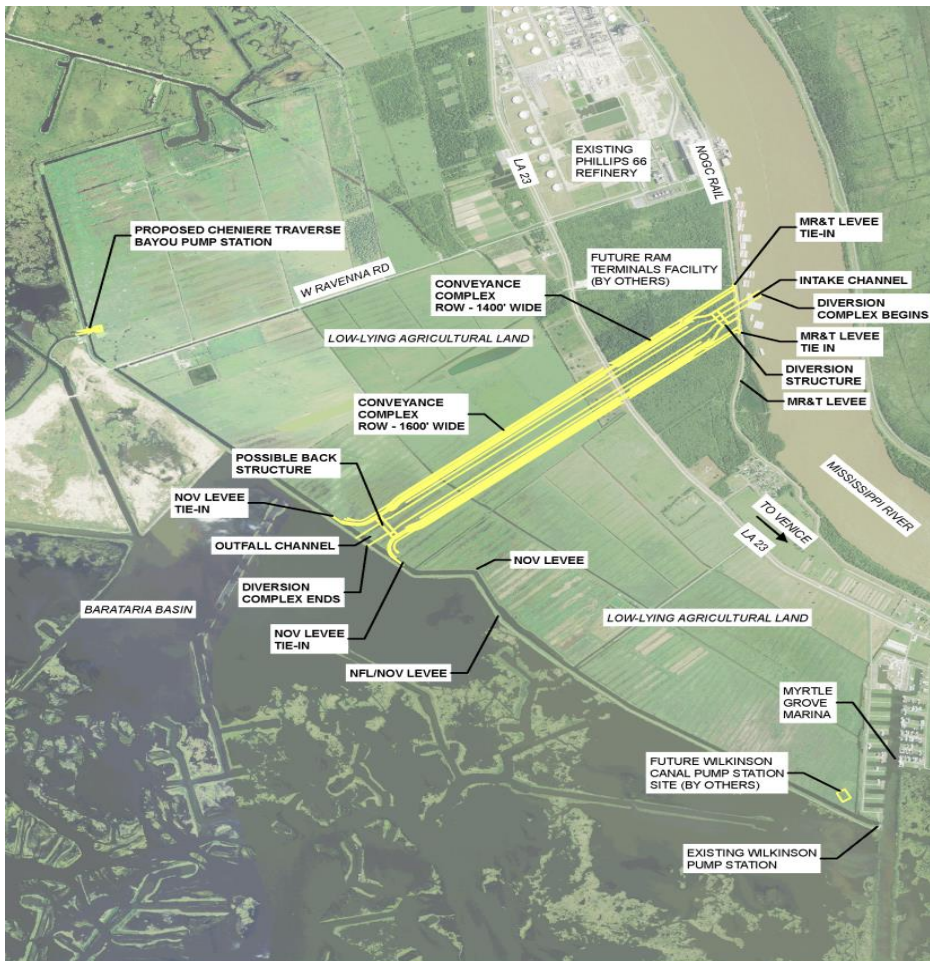
	Mississippi River (Main Stem)	Diversion Channel OA- RM60.2-15K	Diversion Channel ND- RM60.7-15K	Diversion Channel MA- RM60.7-45K	Diversion Channel ND- RM60.7-45K	Diversion Channel ND- RM60.7-75K
Water Discharge (m3/s)	19,821	322	361	955	937	1,725
Water Discharge (CFS)	700,000	11,369	12,733	33,735	33,075	60,918
Sediment Load (metric tons/d) - 32 Micron	233,539	2,786	4,189	15,306	13,819	24,789
Sediment Load (metric tons/d) - 63 Micron	10,839	104	188	663	619	1,156
Sediment Load (metric tons/d) - 96 Micron	21,816	144	335	1,230	1,150	2,357
Sediment Load (metric tons/d) - 125 Micron	34,437	133	420	1,637	1,675	3,726
Sediment Load (metric tons/d) - 250 Micron	23,460	2	44	218	528	1,607
Total 63 - 250 Micron Load (metric tond/d)	90,554	383	987	3,748	3,972	8,847
Sediment/Water Ration (SWR)		0.26	0.60	0.85	0.93	1.12



MID-BARATARIA SEDIMENT DIVERSION

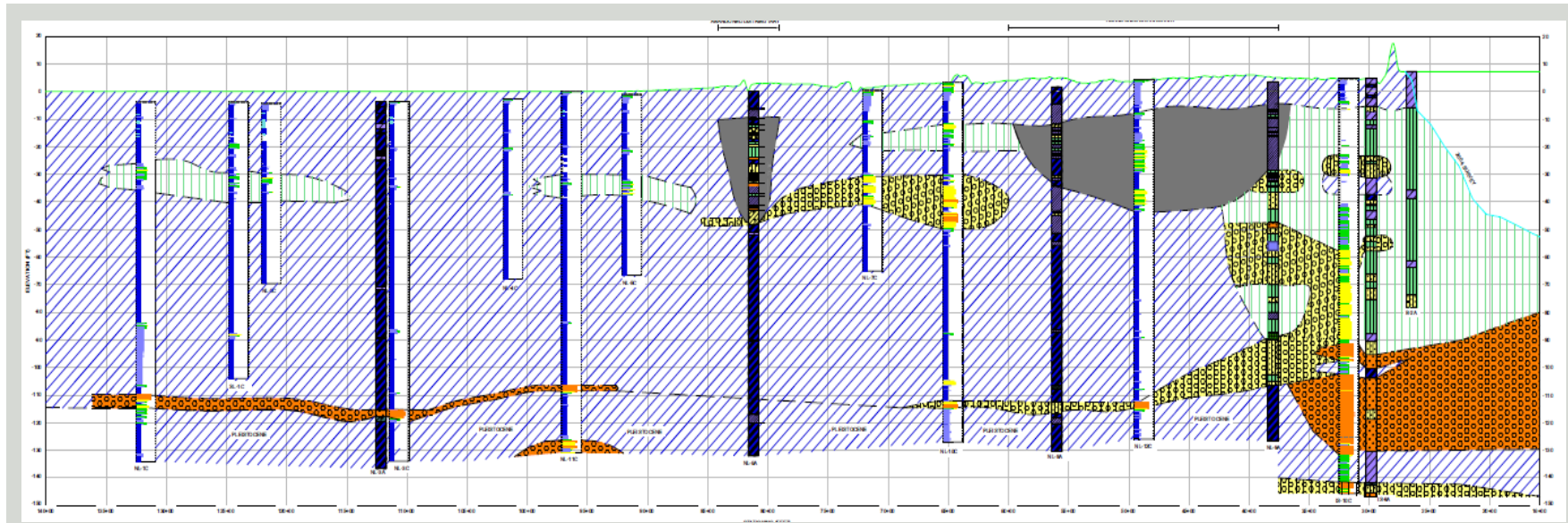
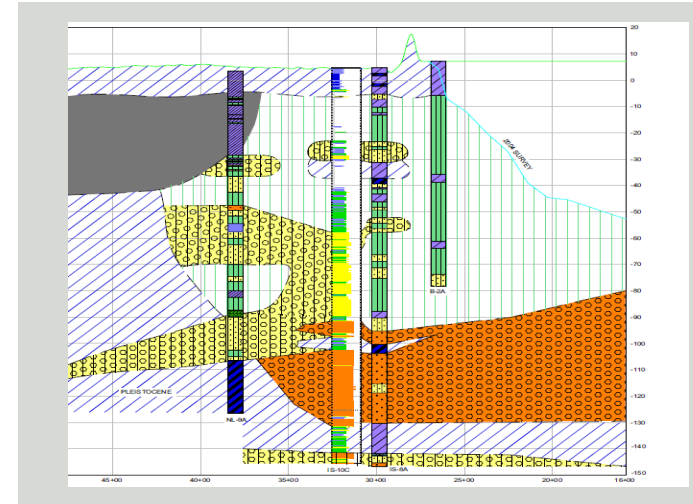
- 75,000 peak flow
- Location: Myrtle Grove
- Tasks:
 - Funding E&D, Construction
 - Permitting and Construction Approvals
 - Environmental (EIS)
 - Land Rights
 - Engineering and Design
 - Operations
- Project Features:
 - Inlet, Conveyance Structure, Outlet
 - Interior Drainage Pump Station
 - Highway Modifications
 - Rail Road Modifications

MID-BARATARIA SEDIMENT DIVERSION PROJECT SCHEMATICS



MID-BARATARIA SEDIMENT DIVERSION GEOTECHNICAL ANALYSIS

- Complex Point Bar Deposit
- Extremely Soft Soils West of Highway





MID-BRETON SEDIMENT DIVERSION PROJECT HISTORY

- USACE (2010) Integrated Feasibility Study and Supplementary EIS Recommendations:
 - Study authorized under 2007 WRDA Section 7006(e)(3)(B)
 - 35,000 cfs peak flow
 - Location: East Bank RM59
- Feasibility report completed 2010
 - Recommended plan included a 35,000 cfs diversion structure just north of Phoenix, consisting of ten 15-ft x 15-ft box culverts
 - Total project cost of \$387,620,000*
 - Operated March and April at capacity with 1,000 cfs maintenance flow the rest of the year
 - *Due to project cost, reauthorization is necessary (original maximum cost of ~\$127M*)



MID-BRETON SEDIMENT DIVERSION PROJECT HISTORY

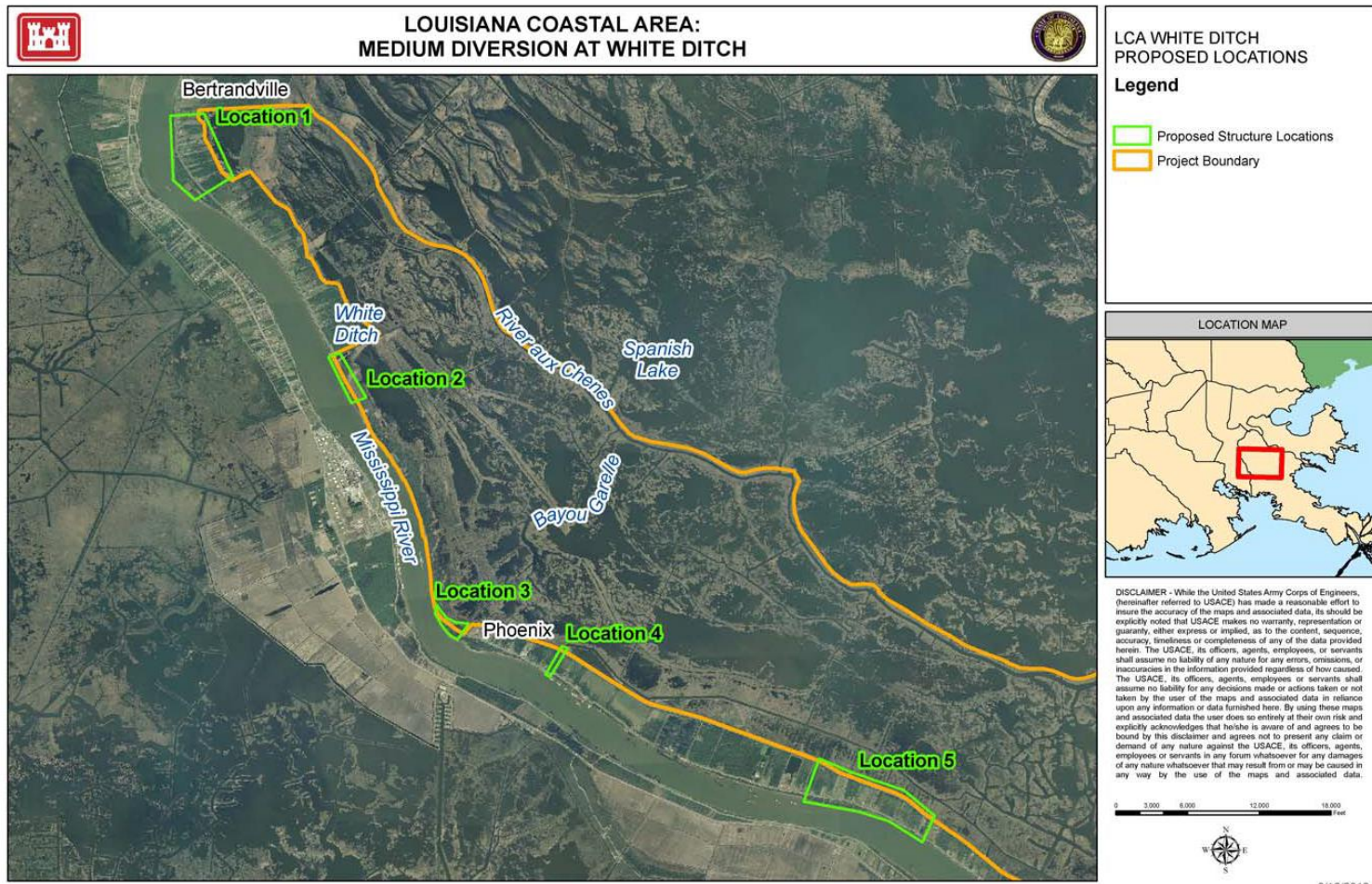
- Initiated December 2011
- Concerns over location of recommended intake resulted in additional locational analysis (in-river data collection and FLOW-3D modeling)
 - Intake location moved to Location 1
 - Will's Point (River Mile 68.6)
 - Preliminary design also resulted in design modification from 15-ft x 15-ft culverts to 2 tainter gates.
- 2013 Report – Hydrodynamic and Sediment Transport Modeling using Flow 3-D for Siting and Optimization of the LCA Medium Diversion at White Ditch
 - RECOMMENDATIONS:
 - 35,000 cfs peak flow
 - Location: East Bank near Bertrandville (RM68); modified based on river hydraulics and sediment supply



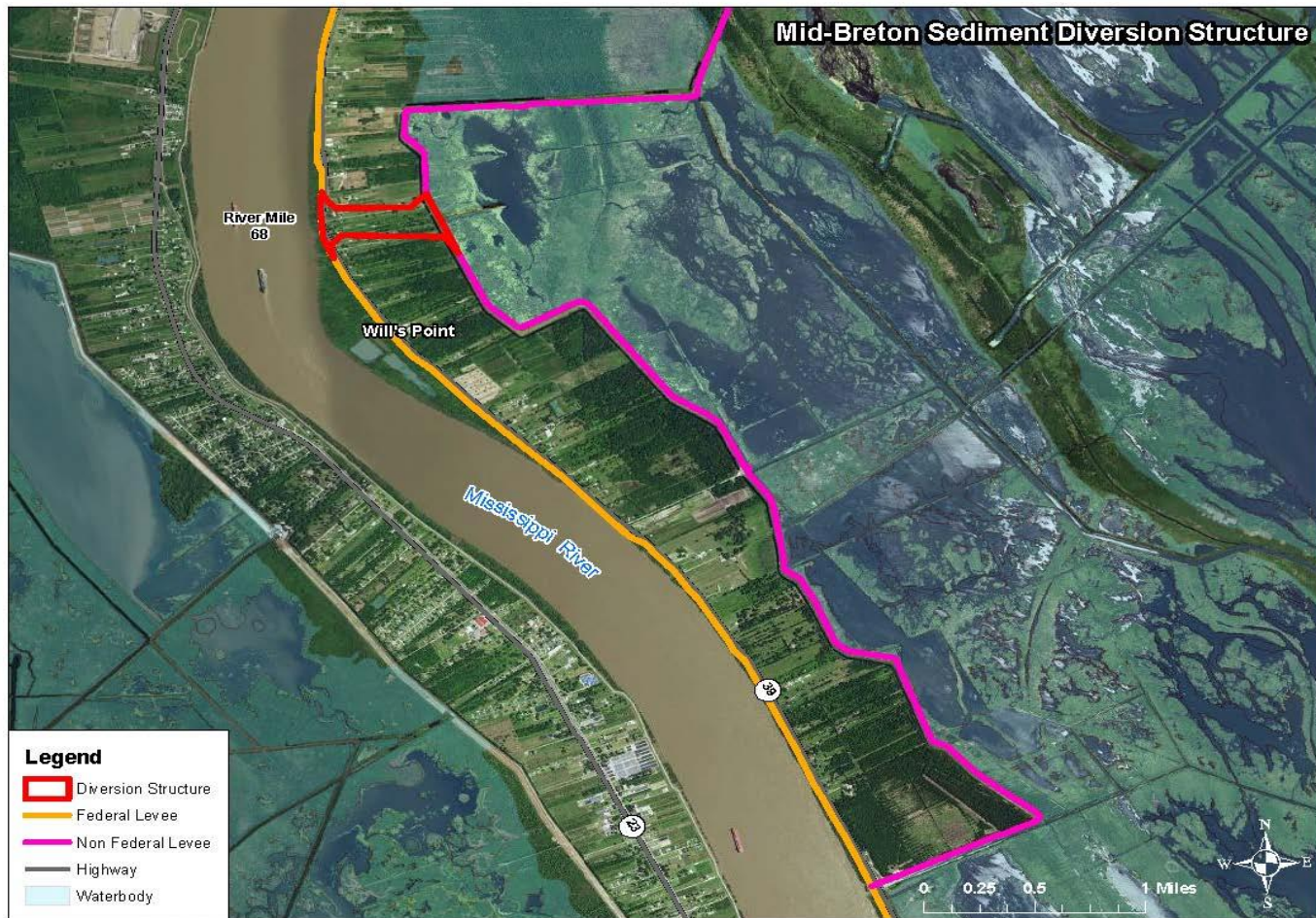
MID-BRETON SEDIMENT DIVERSION

- 35,000 peak flow
- Location: Bertrandville
- Tasks:
 - Funding E&D, Construction
 - Permitting and Construction Approvals
 - Environmental (EIS)
 - Land Rights
 - Engineering and Design
 - Operations
- Project Features:
 - Inlet, Conveyance Structure, Outlet
 - Interior Drainage Pump Station
 - Highway Modifications

MID-BRETON SEDIMENT DIVERSION CURRENT PROJECT STATUS



MID-BRETON SEDIMENT DIVERSION PROJECT SCHEMATIC





MID-BRETON SEDIMENT DIVERSION

MAJOR PROJECT FEATURES

- The major elements of the Mid-Breton Sediment Diversion:
 - 35,000 cfs controlled gravity flow reintroduction structure, installed through the Mississippi River and Tributaries Levee
 - A new conveyance channel would be constructed across fastlands with levees to reconnect the Mississippi River to the Breton Sound Basin
 - Replacement of Highway 39 with a new fixed span bridge over the conveyance channel
 - Forced drainage system for the northern area that will be isolated by the new conveyance channel
 - A gated structure on the downstream end of the conveyance channel
 - Utility relocations and pipeline protection



OPINION OF PROBABLE CONSTRUCTION COSTS

TYPES OF COST ESTIMATES

ESTIMATE TYPE	PURPOSE	DESIGN LEVEL
Order of Magnitude	Study / Conceptual	0%
Schematic / Conceptual	Feasibility	<15%
Design	Budget / Authorization	<35%
Design / Construction	Control	<65%
Construction / Bid	Bid / GMP / Final	<100%

CONTINGENCY



BASE CONSTRUCTION COSTS

- Mid-Basin Sediment Diversion Estimate Validation Report (May 2016):
 - Comprehensive analysis and validation of all existing sediment diversion cost data
 - Produced programmatic recommendations on contingency and uncertainty
 - Base (2016) Costs for MBSD and MBrSD
- Base Construction Costs (2016):
 - Mid-Barataria = \$835,000,000
 - Mid-Breton = \$400,000,000



OPINION OF PROBABLE CONSTRUCTION COSTS

	MID-BARATARIA	MID-BRETON
Base Cost	\$835M	\$400M
Contingency	19%	30%
Escalation	27%	27%
SDC	\$57M	\$36M
Total	\$1.3B	\$696M



OTHER PROGRAM UPDATES

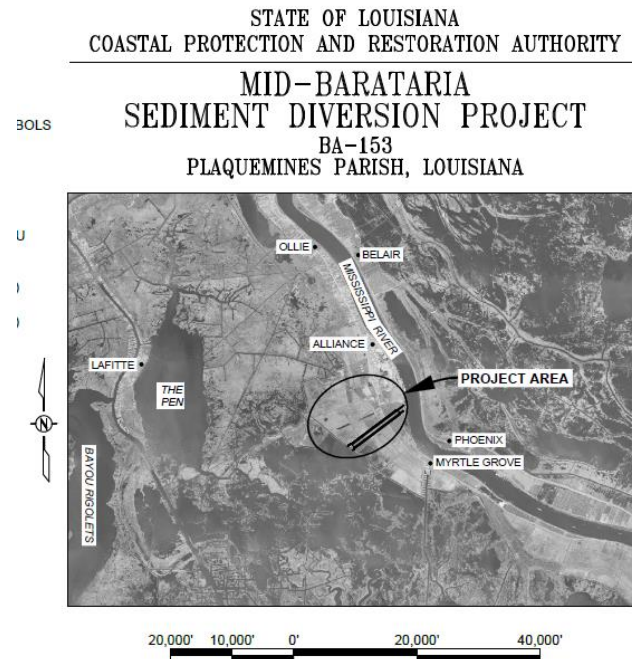


CPRA/USACE 214 AGREEMENTS

- Mid-Barataria executed April 19, 2016
- USACE completed Public Notice and MFR to allow USACE to enter into agreement with CPRA for Mid-Breton on June 16, 2016

MID-BARATARIA SECTION 10/404 PERMIT

- Joint Application Submitted on June 22, 2016
- USACE has begun work on permit application and is actively coordinating with CPRA
- CUPs permit placed “On hold” during EIS/NEPA process





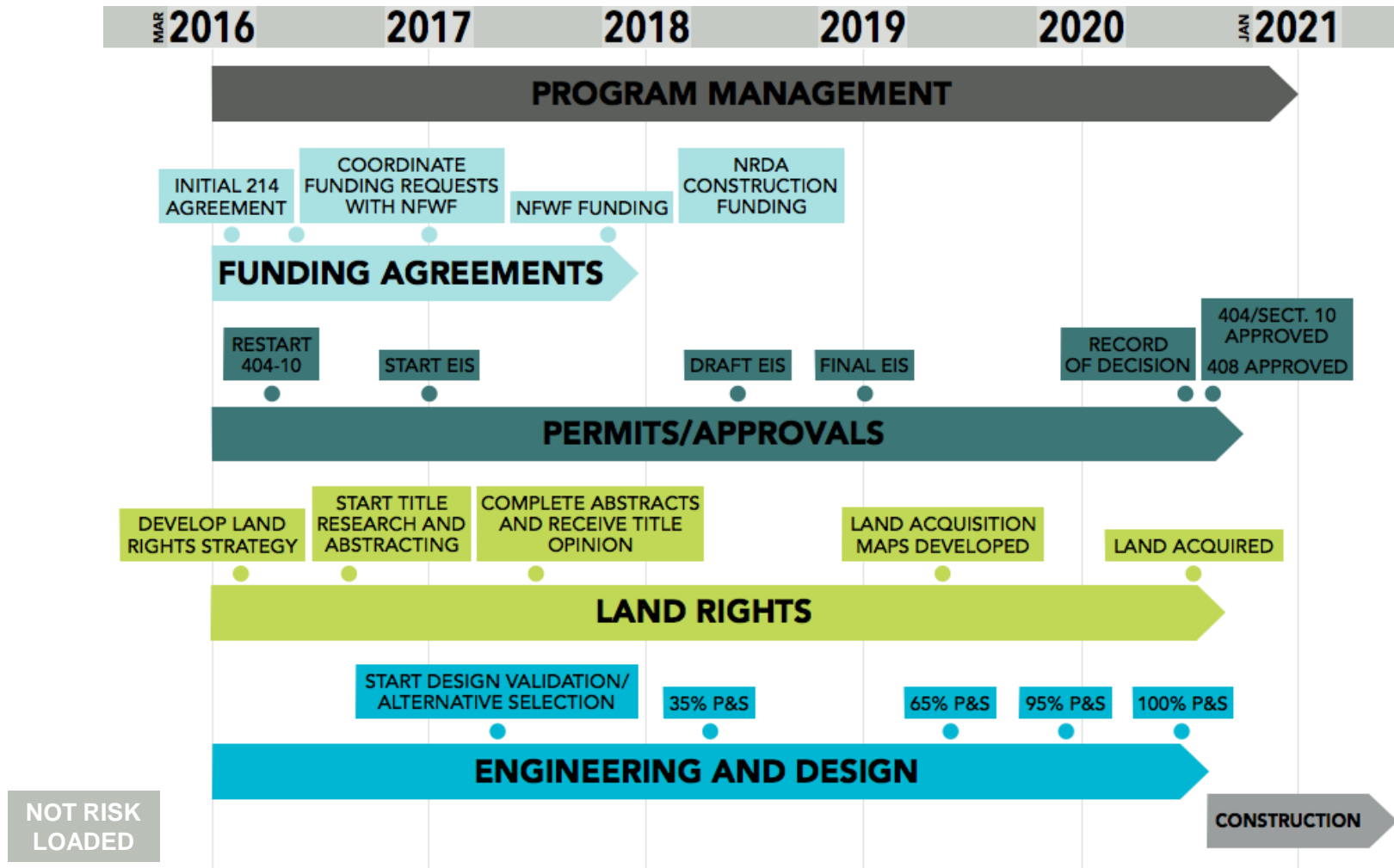
MID-BARATARIA EIS 3RD PARTY CONTRACTOR

- SOW substantially complete
- RFP Package undergoing final review by Office of State Purchasing (OSP)
- Advertisement likely 3rd Quarter 2016
- Notice To Proceed (NTP) anticipated 1st Quarter 2017



MILESTONE SUMMARY SCHEDULE

MID-BARATARIA





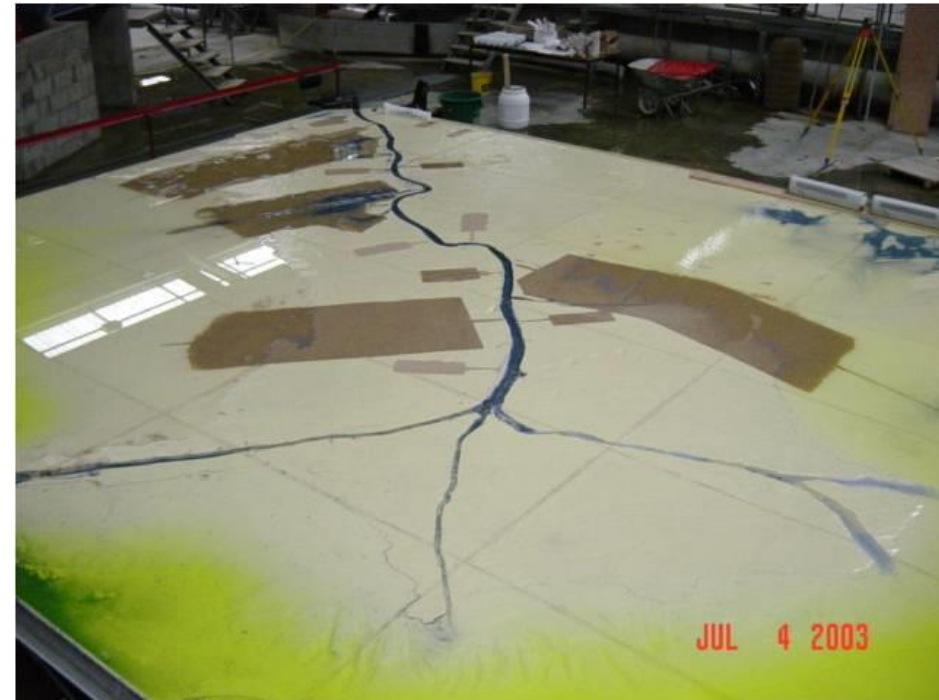
CENTER FOR RIVER STUDIES



BREN HAASE

SSPM Background and History

2002-2003: Construction and Initial Calibration (France) cont'd





SSPM Background and History

Results and Conclusions

Large
Diversion # 2

Center for River Studies

Interior Rendering – Model Area



Center for River Studies

Coastal Exhibit Area



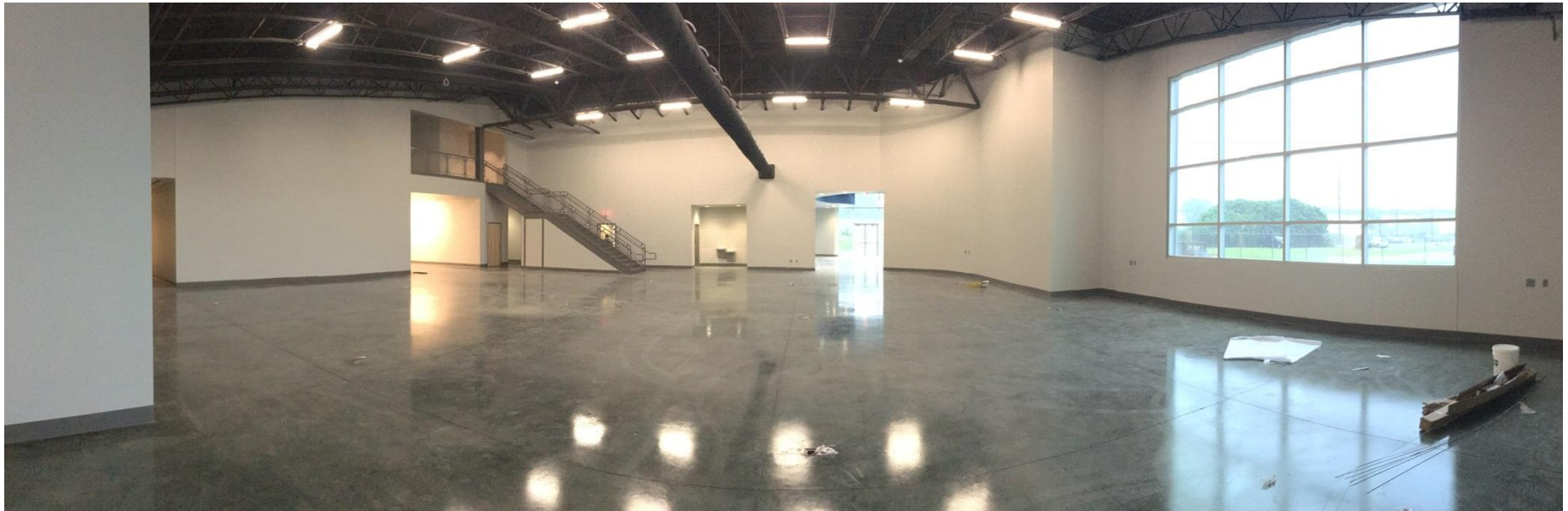
Center for River Studies

Model Area Complete



Center for River Studies

Exhibit Area Progress



Center for River Studies

Exterior Progress



The Water Campus



Model Expansion

Panel Routing



Model Expansion

Routed Panel Storage



Model Expansion

“Guinea Pig” Model

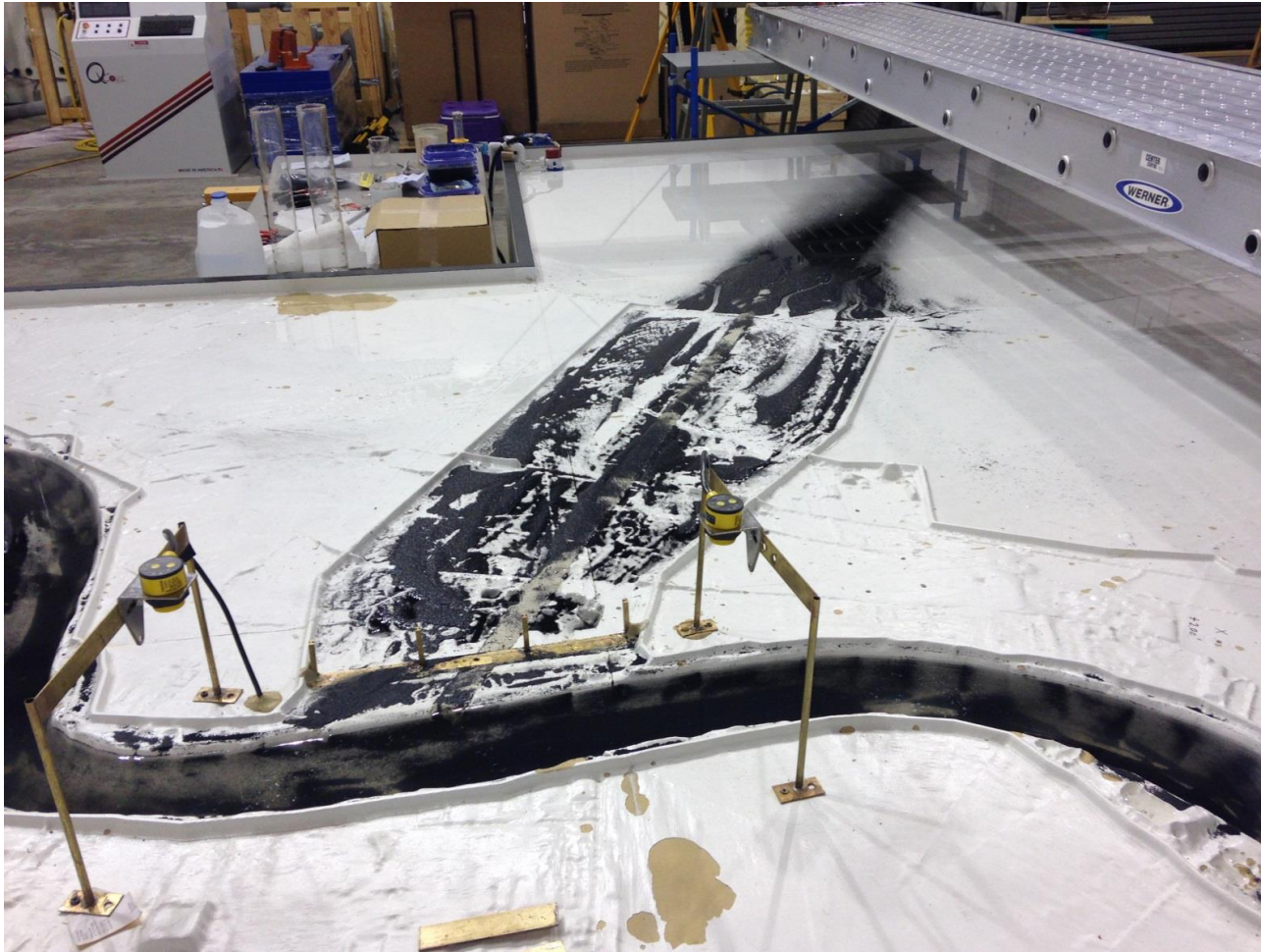


“Guinea Pig” Model Assembly 2014



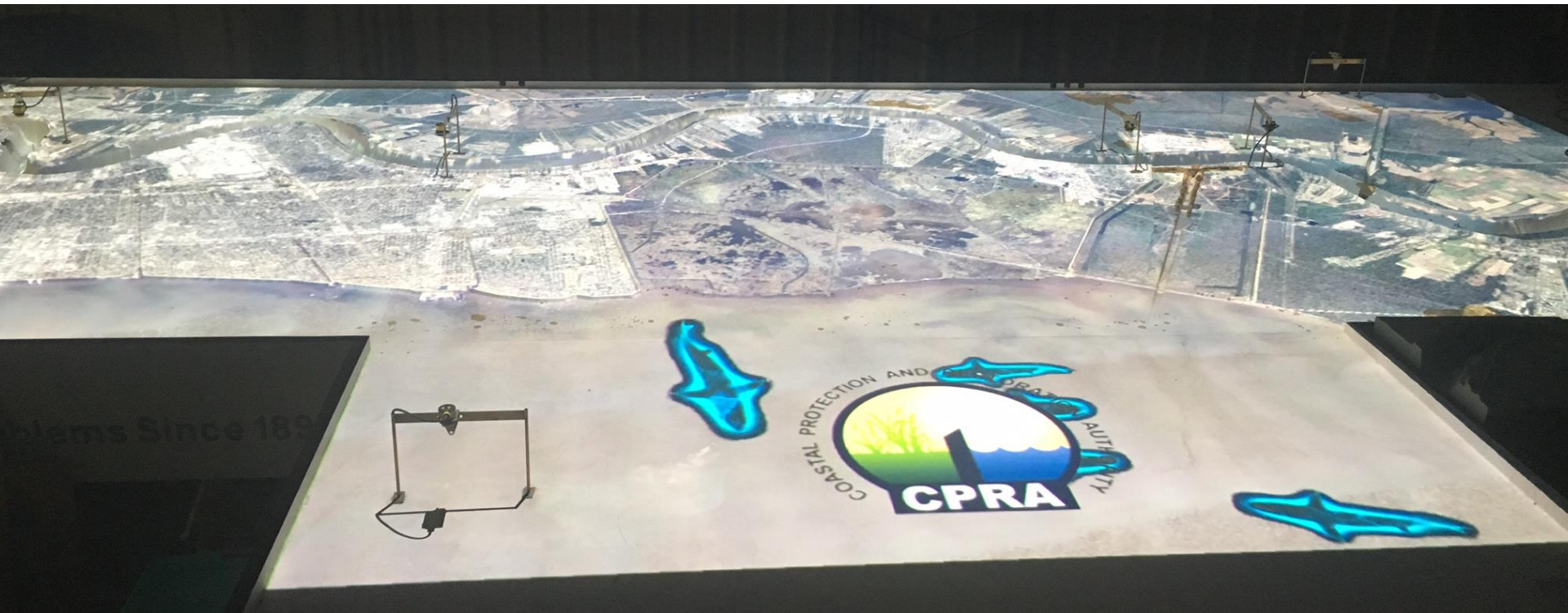
Model Expansion

“Guinea Pig” Model



Model Surface Digital Projection

Digital Projection Test January 2016



Status & Path Forward

- **Model Panel Routing**
 - 100+/216 Panels Routed
 - Routed Panels in storage at LSU; currently being transported to CRS
 - Routing currently underway

- **Center for River Studies**
 - Construction 99% complete
 - Punch list repairs underway

- **Model Assembly**
 - Will begin immediately after Facility is complete (Fall 2016)
 - Model should be operational by late 2016/early 2017



A1	B1	C1	D1	E1	F1	G1	H1	I1	J1	K1	L1
A2	B2	C2	D2	E2	F2	G2	H2	I2	J2	K2	L2
A3	B3 OR#5 6	C3 OR#5 5	D3 OR#5 5	E3	F3	G3	H3	I3	J3	K3	L3
A4	B4 OR#5 6	C4 OR#5 6	D4 OR#2 5	E4	F4	G4 OR#4 6	H4	I4	J4	K4	L4
A5 OR#6 11	B5 OR#6 9	C5 OR#2 10	D5 OR#2 7	E5 OR#2 11	F5 OR#6 11	G5 OR#5 6	H5 OR#4 5	I5	J5	K5	L5
A6 OR#6 10	B6 OR#6 11	C6 OR#2 10	D6 OR#2 10	E6 OR#6 11	F6 OR#6 11	G6 OR#5 6	H6	I6	J6	K6	L6
A7	B7	C7	D7	E7	F7	G7	H7	I7	J7	K7	L7
A8	B8	C8	D8	E8	F8	G8	H8	I8	J8	K8	L8
A9	B9	C9	D9	E9	F9	G9	H9	I9	J9	K9	L9
A10	B10	C10	D10	E10	F10	G10	H10	I10	J10	K10	L10
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A17	B17	C17	D17	E17	F17	G17	H17	I17	J17	K17	L17
A18	B18	C18	D18	E18	F18	G18	H18	I18	J18	K18	L18



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