ATCHAFALAYA MASTER PLAN UPDATE

MAY 7, 2025

PAIGE GREEN

AGENDA

- Welcome
- Background
  - Highlights
  - Importance
  - History
- Atchafalaya Master Plan Development
  - Team Members
  - Plan Development Process
  - Engagement
  - Schedule

BACKGROUND

ATCHAFALAYA RIVER SYSTEM HIGHLIGHTS

- Home to the nation's largest river swamp
- Contains the largest contiguous bottomland hardwood forest in North America
- Atchafalaya River and Wax Lake deltas have exhibited increases in wetland area since 1974
- Atchafalaya River conveys about 30% of the combined flow of the Mississippi and Red Rivers to Atchafalaya Bay
- Home to the largest nesting concentration of bald eagles in the south-central United States
- Estimated average annual commercial harvest of nearly 22 million pounds of crawfish






IMPORTANCE


HISTORY OF PLANNING

The Atchafalaya River System is managed by USACE to support flood risk management. In recent decades, state and federal interest has expanded to include restoration and navigation.

- Atchafalaya Basin Floodway System, Louisiana Feasibility Study (USACE, 1982)
- Atchafalaya Basin Floodway System Louisiana Project State Master Plan (LDNR, 1998)
- Atchafalaya Basin Program Annual Plans (LDNR, 2010-2019; CPRA, 2020-present)
  - In 2018, the Louisiana Legislature (Act 570) transferred the responsibilities of the Atchafalaya Basin Program from LDNR to CPRA.
- Atchafalaya River Basin Restoration and Enhancement (ARBRE) Task Force Findings and Recommendations to the Louisiana Coastal Protection and Restoration Authority Board (GOCA, 2021)

ARBRE TASK FORCE

- The Atchafalaya River Basin Restoration and Enhancement (ARBRE) Task Force was charged with:
  - Elevating critical issues facing the Atchafalaya Basin
  - Identifying and building support for new and recurring sources of funding
  - Identifying shared goals and values for the restoration and enhancement of the Basin
  - Building consensus and advising the Atchafalaya Basin Program on matters relating to implementing the Atchafalaya Basin Floodway System Louisiana Project.
- A key recommendation of the Task Force was to update the *1998 State Master Plan*
- Funding for the Atchafalaya Master Plan was made available via Capital Outlay

ATCHAFALAYA MASTER PLAN DEVELOPMENT

TEAM MEMBERS

emergent method

Denise Reed LLC

Jenneke Visser

PLAN DEVELOPMENT PROCESS

1. Developing Goals and Objectives

2. Identifying Candidate Projects for WPUs

Finalizing WPU objectives and metrics to evaluate projects

3. Evaluating Projects

4. Prioritizing Projects

5. Developing Master Plan

1. DEVELOPING GOALS AND OBJECTIVES

ALIGNED WITH THE COASTAL MASTER PLAN

GOAL

- Manage the use of Atchafalaya River System sediments and water to maximize ecosystem functions and support continued human uses

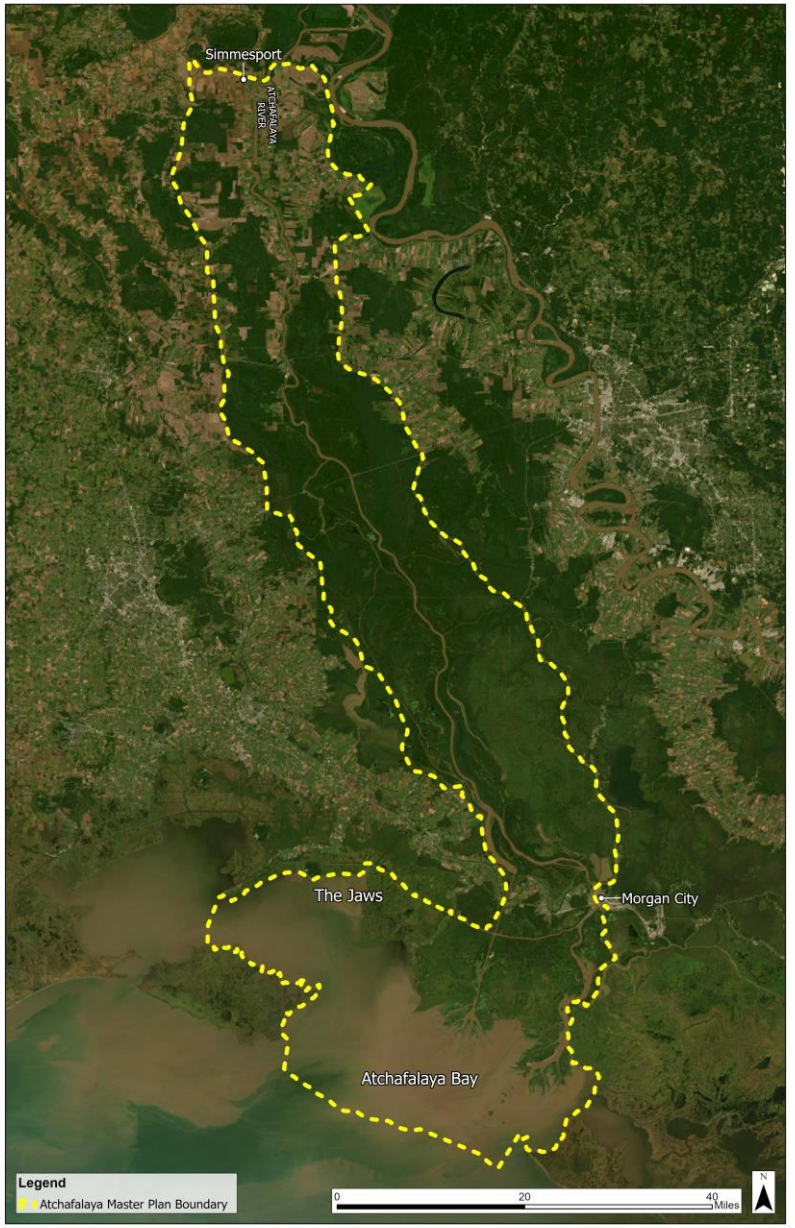
OBJECTIVES

- **NATURAL PROCESSES**: Promote a sustainable ecosystem by harnessing the natural processes of the Atchafalaya River System.
- **HABITATS**: Provide habitats suitable to support conservation and an array of commercial and recreational activities in the Atchafalaya River System.
- **CULTURAL HERITAGE**: Sustain the unique cultural heritage of the Atchafalaya River System by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment.
- **WORKING RIVER SYSTEM**: Promote a viable working Atchafalaya River System to support regionally and nationally important business and industry.

*Note that this plan is focused on restoration and conservation actions, not on addressing flood risk.

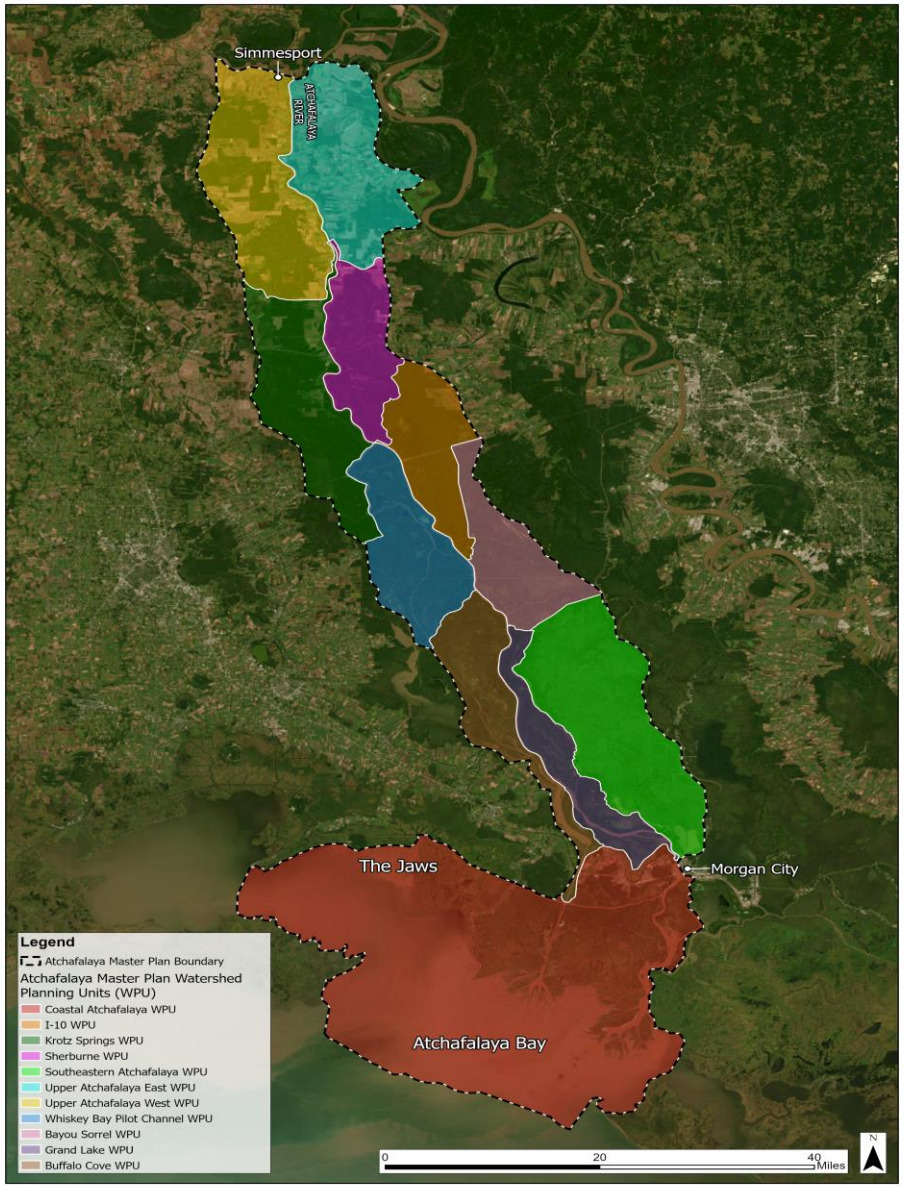
ATCHAFALAYA MASTER PLAN BOUNDARY

- Total area: ~1.5M acres
- Boundary
  - North: Simmesport
  - South: Gulf of America
  - East and West (above Morgan City): Atchafalaya Basin Protection Levees
  - West (below Morgan City): West Cote Blanche Bay
  - East (below Morgan City): Atchafalaya Bay



WATERSHED PLANNING UNITS

- Eleven WPUs were developed using HUC10 boundaries modified using intuitive dividers such as levees or rivers
- WPUs range from ~56,000 to ~568,000 acres
- Land cover types include
  - Upland and Cultivated Crops
  - Bottomland Hardwood and Swamp Forest
  - Fresh, Intermediate, Brackish, and Saline Marsh
- Identify objectives and targets for each WPU



2. IDENTIFYING CANDIDATE PROJECTS FOR WPUS

CANDIDATE PROJECTS WERE IDENTIFIED FROM A VARIETY OF SOURCES:

- Previous plans
- Public project solicitation process
- Experts with local knowledge
- Plan Development Team based on predicted future conditions
- USACE Lower Mississippi River Comprehensive Study

ADDITIONAL CANDIDATE PROJECT DEVELOPMENT

- Public project solicitation
- Examination of modeling outputs
- Input from interested parties and experts

3. EVALUATING PROJECTS

CANDIDATE PROJECT EVALUATION

- Model project effects
- Assess project performance
  - How well do projects meet WPU objectives?
- Refine projects as needed
- Identify ineffective projects

4. PRIORITIZING PROJECTS

PROJECT EVALUATION

- Consider project costs and budget constraints
- Score and rank projects
- Use basin-scale modeling to evaluate cumulative effects

5. DEVELOPING MASTER PLAN

DRAFT ATCHAFALAYA MASTER PLAN

- Finalize higher priority projects
- Incorporate programmatic projects

WPU OBJECTIVES AND METRICS

OBJECTIVES AND METRICS

1. Goals, Objectives, etc.

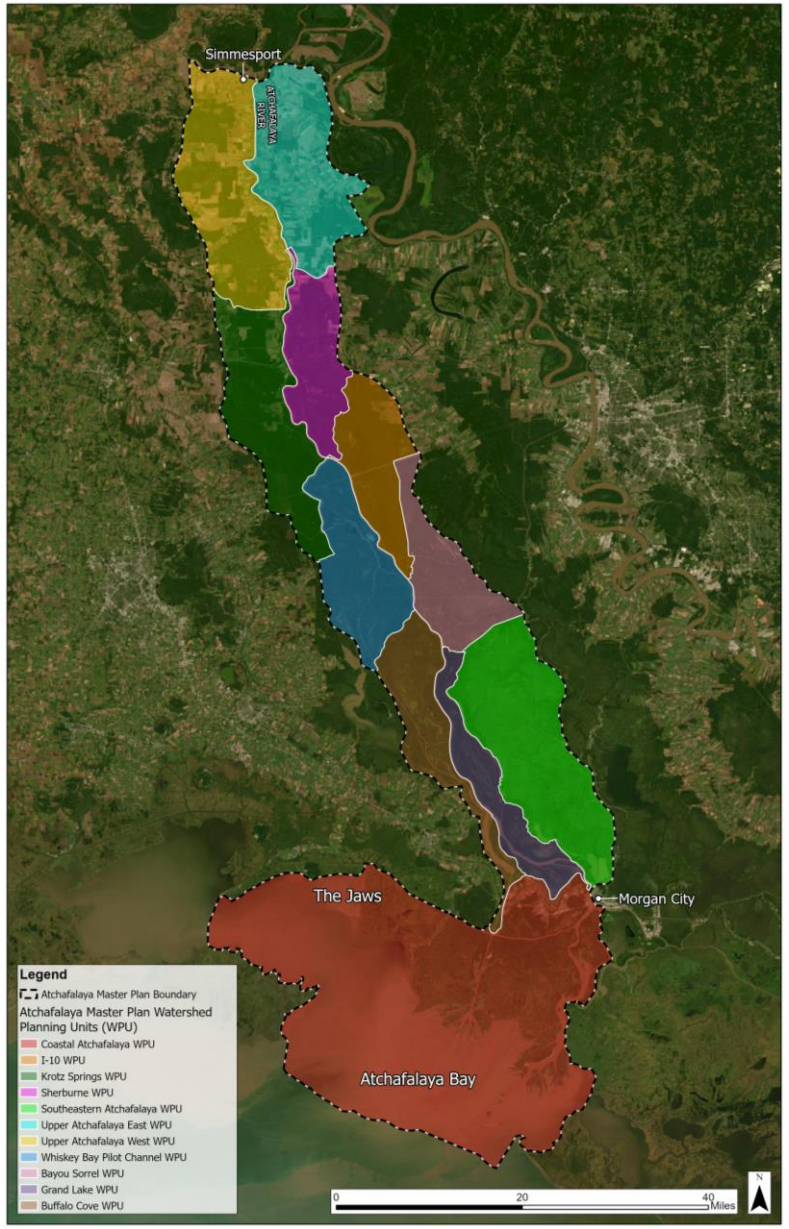
Basin Scale Goals, Objectives, Principles and Strategies

↓

Watershed Planning Units

↓

Objectives, Strategies, Metrics, Targets for WPUs



Candidate projects to be evaluated based on objectives and metrics of WPUs

NATURAL PROCESSES

PROMOTE A SUSTAINABLE ECOSYSTEM BY HARNESSING THE NATURAL PROCESSES OF THE ATCHAFALAYA RIVER SYSTEM.

Basin Scale Issues:

- Stagnant waters, potential for hypoxia, impacts to aquatic habitats
- Hydrologic exchanges needed to promote healthy forested wetlands are impaired
- Excessive sedimentation
- Flood pulse concept to support fisheries

HABITATS

PROVIDE HABITATS SUITABLE TO SUPPORT CONSERVATION AND AN ARRAY OF COMMERCIAL AND RECREATIONAL ACTIVITIES IN THE ATCHAFALAYA RIVER SYSTEM.

- High quality habitat for harvest
- Sustain habitats for conservation
  - American alligator
  - Bald eagle
  - Black bear
  - Blue crab
  - Channel catfish
  - Crawfish
  - Gizzard shad
  - Largemouth bass
  - Black crappie
  - Bottomland hardwood
  - Swamp

CULTURAL HERITAGE

SUSTAIN THE UNIQUE CULTURAL HERITAGE OF THE ATCHAFALAYA RIVER SYSTEM BY PROTECTING HISTORIC PROPERTIES AND TRADITIONAL LIVING CULTURES AND THEIR TIES AND RELATIONSHIPS TO THE NATURAL ENVIRONMENT.

Basin Scale Issues:

- Opportunities for recreation (e.g., hunting, fishing, hiking, birdwatching), including opportunities that do not require boat or ATV
- Sustaining cultural and traditional use of the natural resources
- Educational resources for residents and visitors

WORKING RIVER

PROMOTE A VIABLE WORKING ATCHAFALAYA RIVER SYSTEM TO SUPPORT REGIONALLY AND NATIONALLY IMPORTANT BUSINESS AND INDUSTRY.

Basin Scale Issues:

- Maintaining navigational access to channels and ports
- Access to key areas for harvest

OBJECTIVES AND METRICS OVERVIEW

Drivers	River Flow Conditions			
	Sea Level Rise			
	Projects (Dozens)			
Sub-Objectives	Natural Processes	Habitat	Cultural Heritage	Working River
	-Improve water quality -Support forested wetlands -Promote hydrologic exchange	-Provide wetland/open water habitat for conservation and recreation -Sustain forested wetland ecosystems	-Support increased access to recreational opportunities -Provide educational materials at population centers	-Maintain access to habitat for commercial harvest -Maintain dynamic equilibrium in channels -Maintain access ports
Metrics	-Extent of open water with potential hypoxia - BLH and swamp WVA -Sediment flux	-Extent/quality of habitat based on HIS values -Extent of BLH and swamp by zone -BLH and swamp WVA habitat units	-Habitat for culturally important species -Change in net sediment flux for specified reaches	-Extent of habitat with HSI > 0.7 for key species -Change in net sediment flux for specified reaches

CANDIDATE PROJECTS

PROJECT TYPES

CANDIDATE PROJECT TYPES:

Hydrologic Restoration

- Channel Floodplain Exchange
- Channel Filling
- Channel Plug
- Channel Plug Removal
- Water Control Structures (passive and active)

Sediment Trapping

Freshwater Diversion

Sediment Diversion

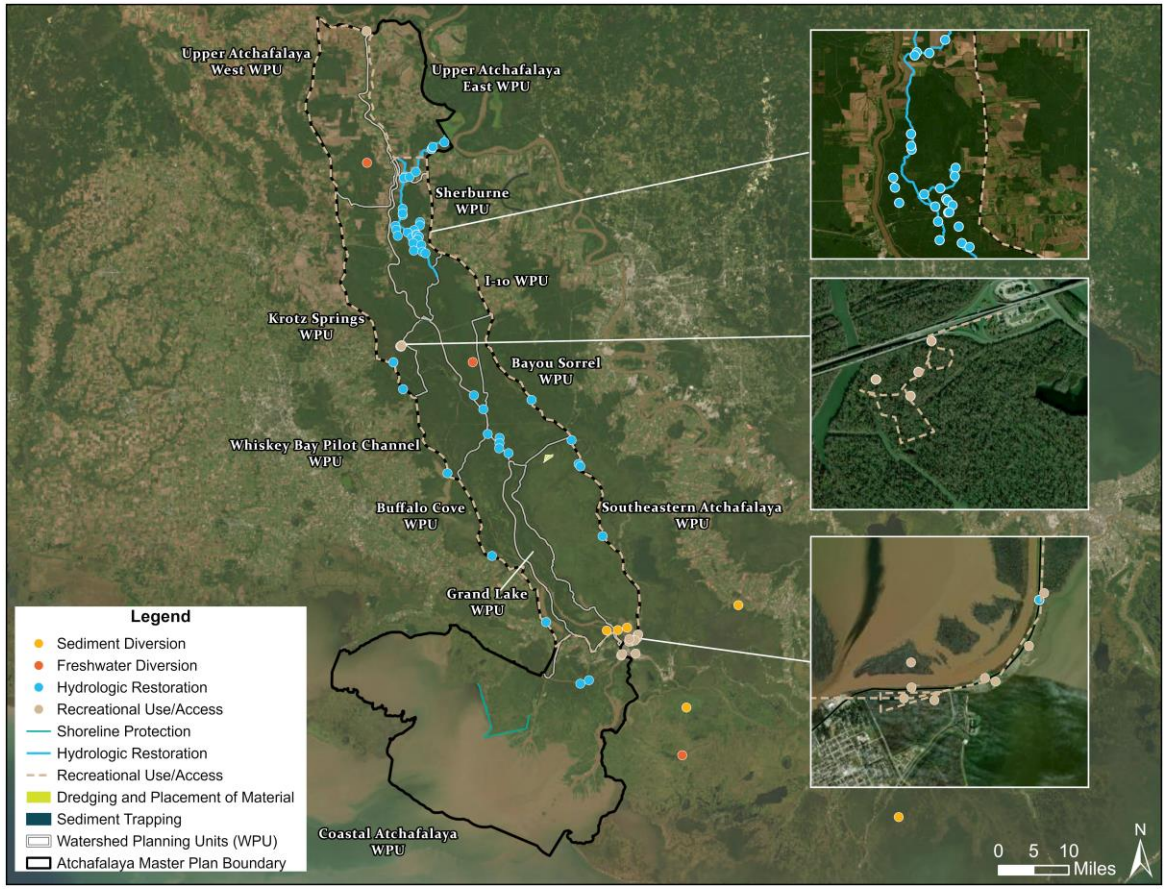
Dredging and Placement of Material

Integrated

PROGRAMMATIC PROJECT CATEGORIES:

- Recreational Use, Access, Education
- Shoreline Protection
- Beneficial Use
- Habitat Conservation
- Invasive Species Management
- Reforestation and Plantings
- Studies and Monitoring Programs

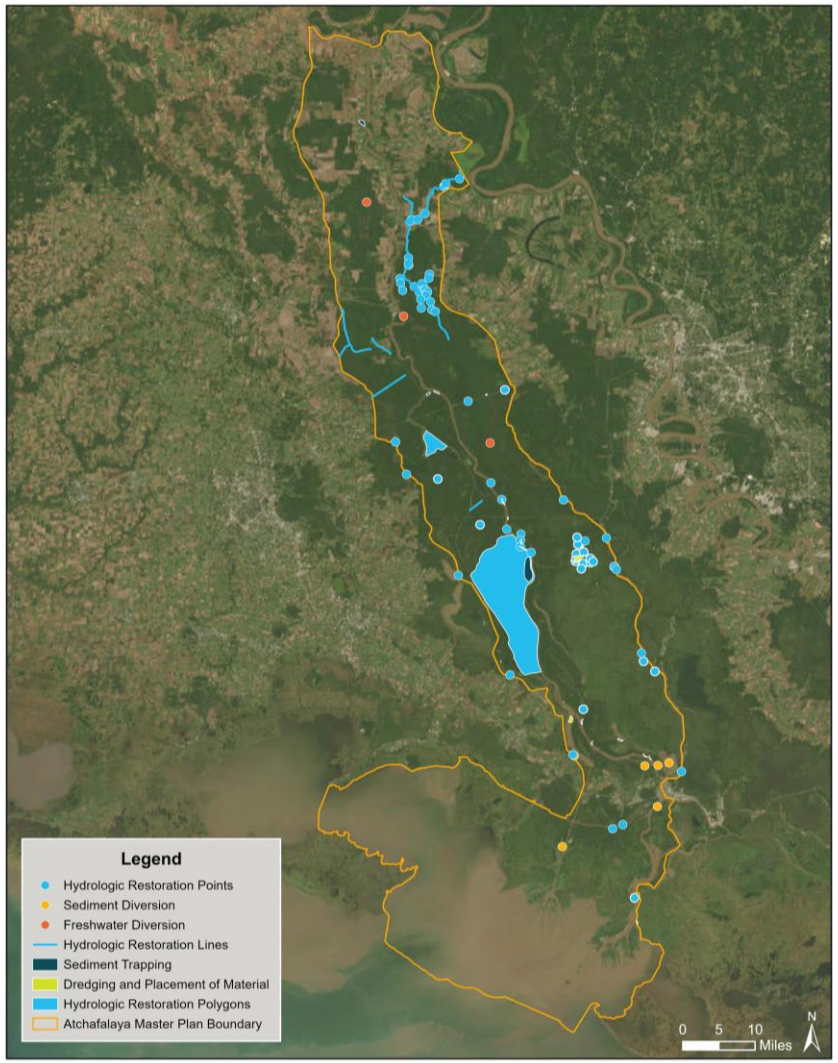
PROJECT SOLICITATION SURVEY



PROJECTS SUBMITTED

- 23 projects submitted
  - Hydrologic Restoration – 10
  - Recreational Use/Access – 5
  - Freshwater Diversion – 2
  - Sediment Diversion – 2
  - Shoreline Protection – 2
  - Sediment Trapping – 1
  - Dredging/Placement of Material – 1

POTENTIAL CANDIDATE PROJECTS



Projects Identified From

- Previous plans
- Experts with local knowledge
- Plan Development Team based on predicted future conditions
- USACE Lower Mississippi River Comprehensive Study

MODELING AND SCENARIOS OVERVIEW

TOOL DEVELOPMENT AND APPLICATION

Models

- Uses tools that already exist and can be readily updated
- Models to simulate water flow, sediment flux, and distribution of water in both the backwater swamps and the main channels
- Habitat models for bottomland hardwood, swamp, and fish and wildlife species that are of importance in the system for their conservation, recreation, and commercial value
  - Habitat Suitability Index models developed for the 2017 and 2023 Coastal Master Plan are leveraged for this effort

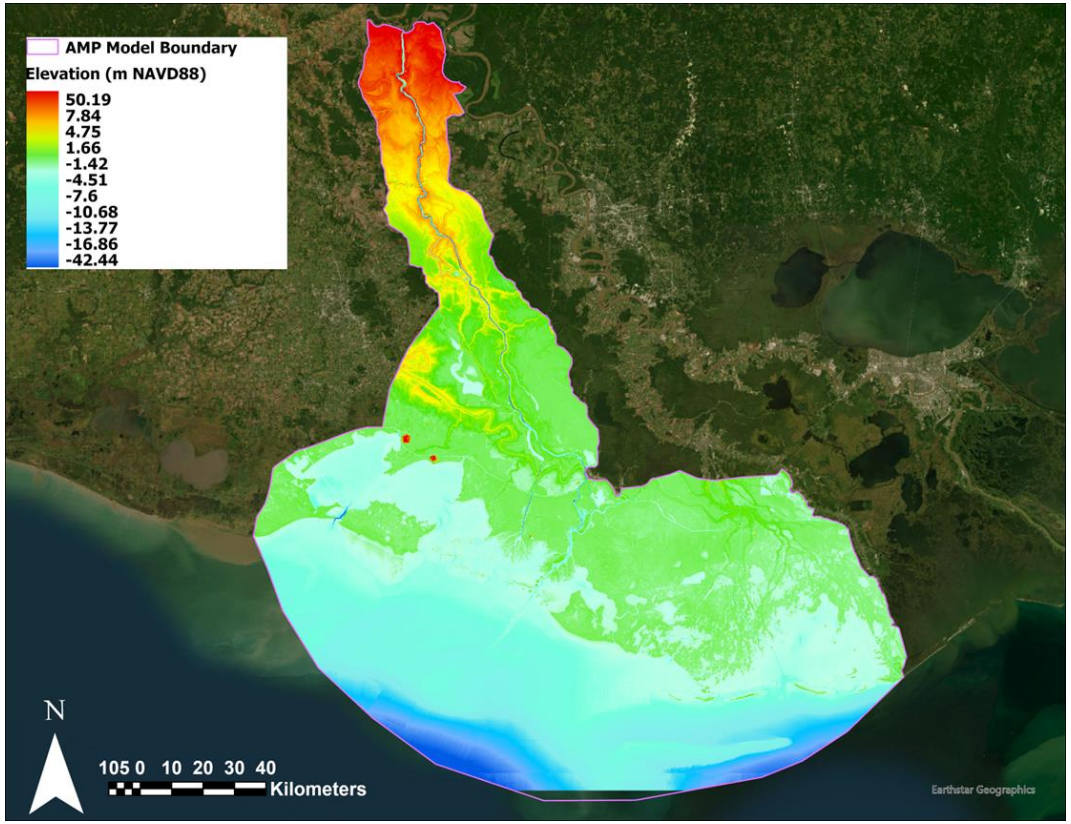
Decision Support Tool

- Assess how each project performs relative to a target for the relevant WPU
  - Does the project improve habitat suitability for largemouth bass relative to the current condition, etc.
- Rank projects based on their performance
- Select projects that are highly ranked

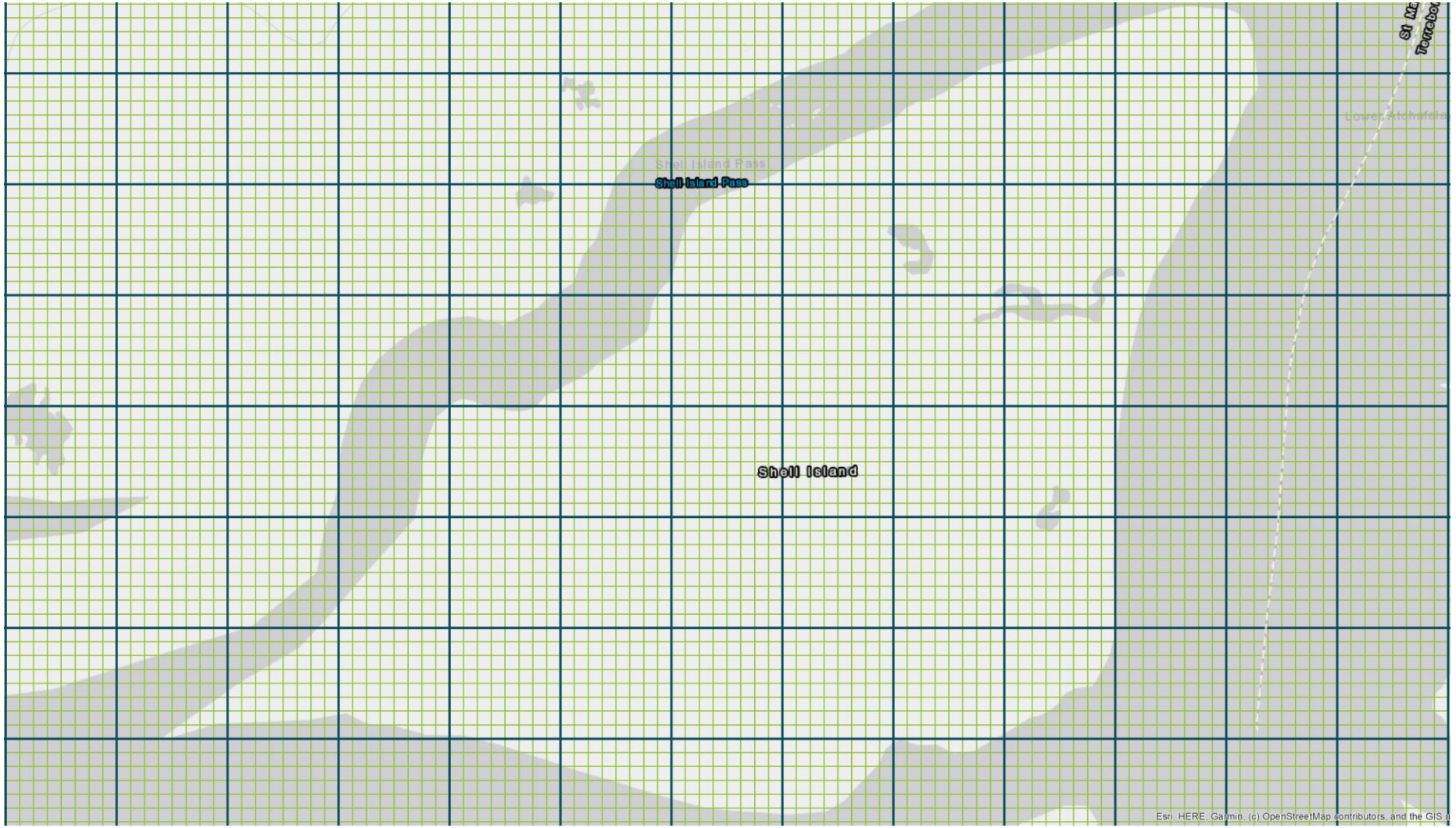
FWOA AND PROJECT EVALUATION

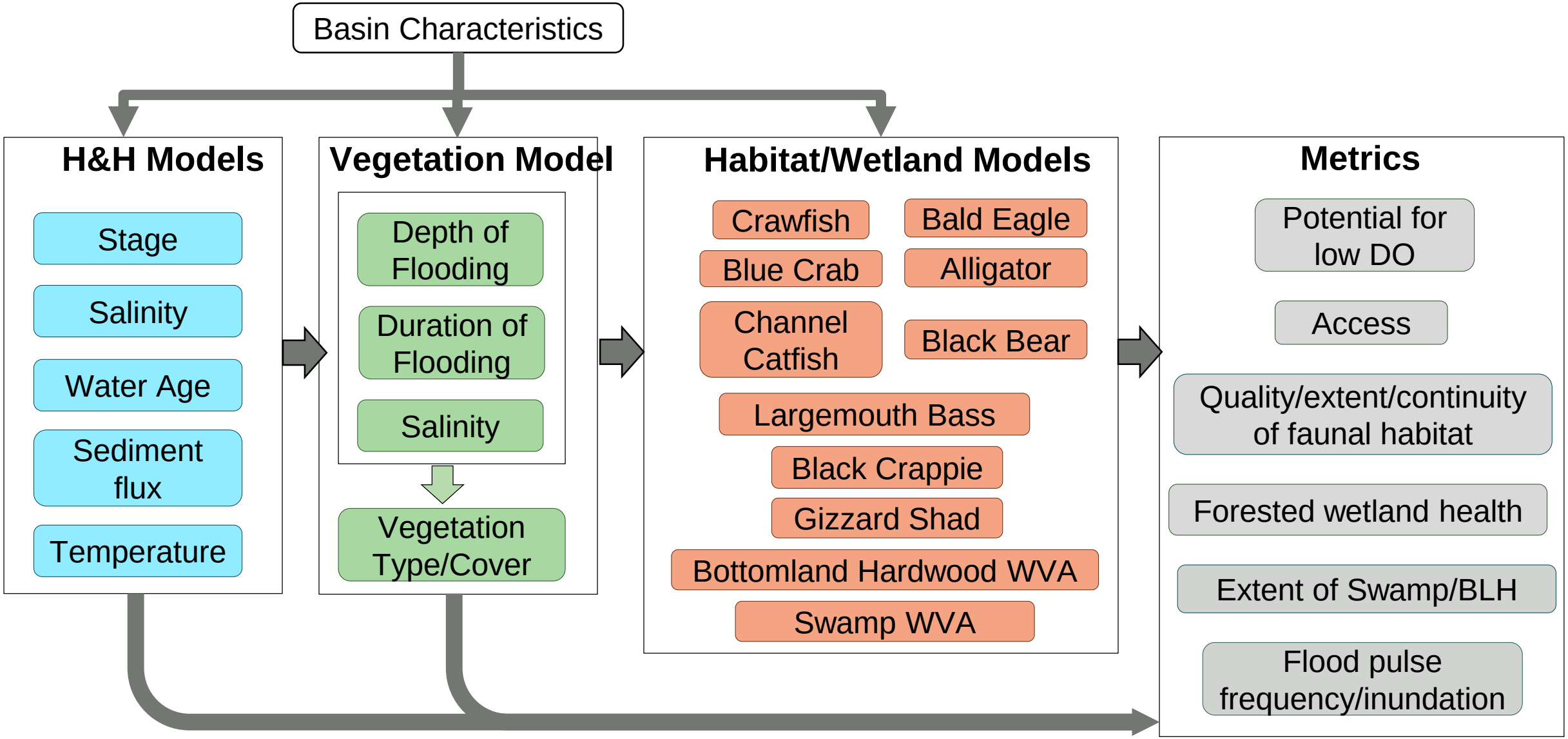
SCALE OF ANALYSIS

- H&H: Spatial resolution/time step are variable
  - Output to 60m grid to generate monthly means
- Vegetation:
  - Transitions based on 60m grid
  - Annual time step using seasonal data compiled from monthly hydro as needed
- Habitat:
  - 480m grid (compatible with Coastal Master Plan)
  - Annual time step using seasonal data compiled from monthly hydro as needed



MODEL GRIDS


Shell Island Pass
Shell Island Pass
Shell Island
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS u


Basin Characteristics
H&H Models
Stage
Salinity
Water Age
Sediment flux
Temperature
Vegetation Model
Depth of Flooding
Duration of Flooding
Salinity
Vegetation Type/Cover
Habitat/Wetland Models
Crawfish
Bald Eagle
Blue Crab
Alligator
Channel Catfish
Black Bear
Largemouth Bass
Black Crappie
Gizzard Shad
Bottomland Hardwood WVA
Swamp WVA
Metrics
Potential for low DO
Access
Quality/extent/continuity of faunal habitat
Forested wetland health
Extent of Swamp/BLH
Flood pulse frequency/inundation

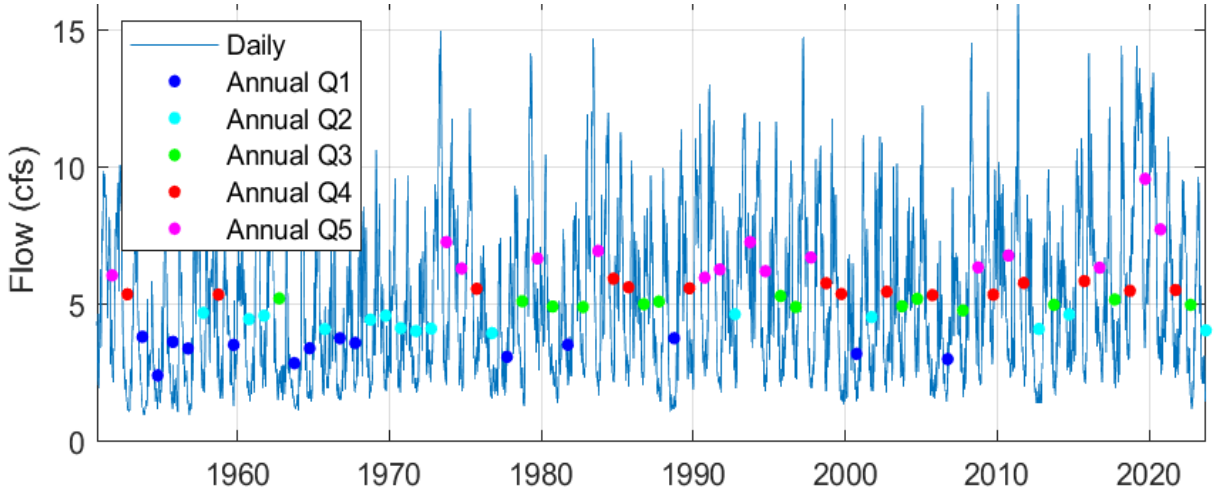
VARIABILITY IN FLOWS

- The Tarbert Landing flows show drier and wetter periods
- Water year discharges* divided into quintiles
- Years selected to represent those quintiles based on USACE LMRComp study and recent record:
  - Q1 – 2006
  - Q2 – 2023
  - Q3 – 2022
  - Q4 – 2021
  - Q5 – 2019
- + 2011 (Q4) with peak flow that triggers Morganza

Tarbert Landing record used to identify 3 sequences years that reflect:

- Lowest quintile of average annual flows
- Median of average annual flows
- Highest quintile of average annual flows

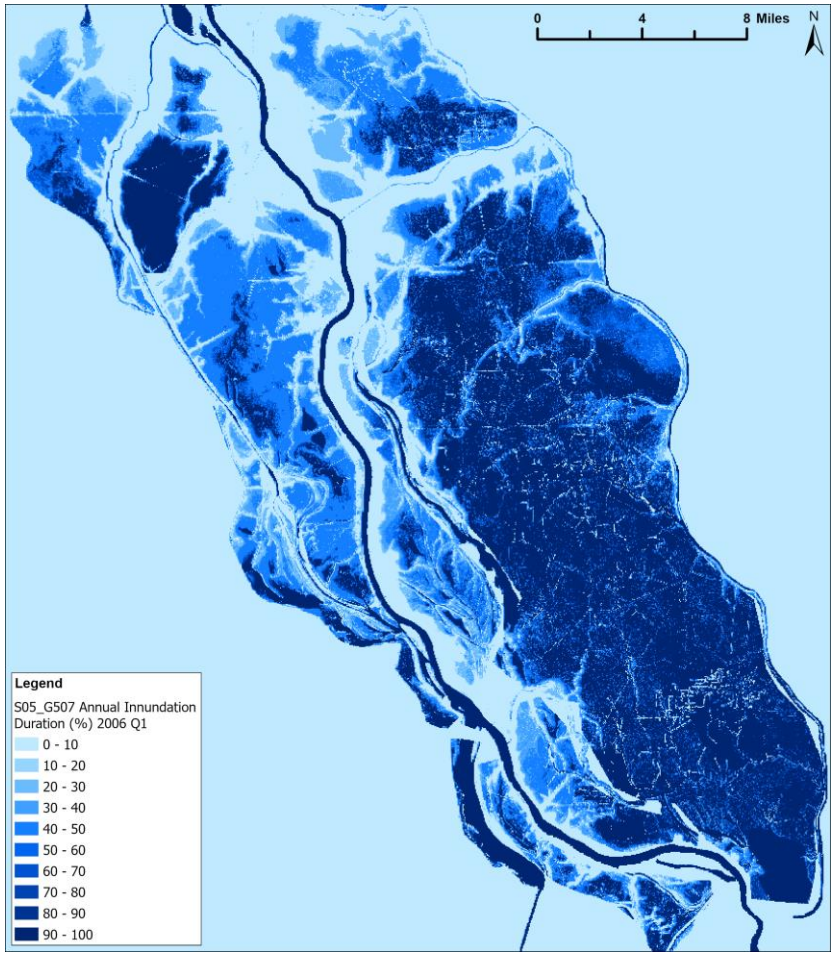
Mississippi River Hydrograph with Water Year Means: Oct 1950-Sep 2023



HYDROLOGY EXAMPLE OUTPUTS

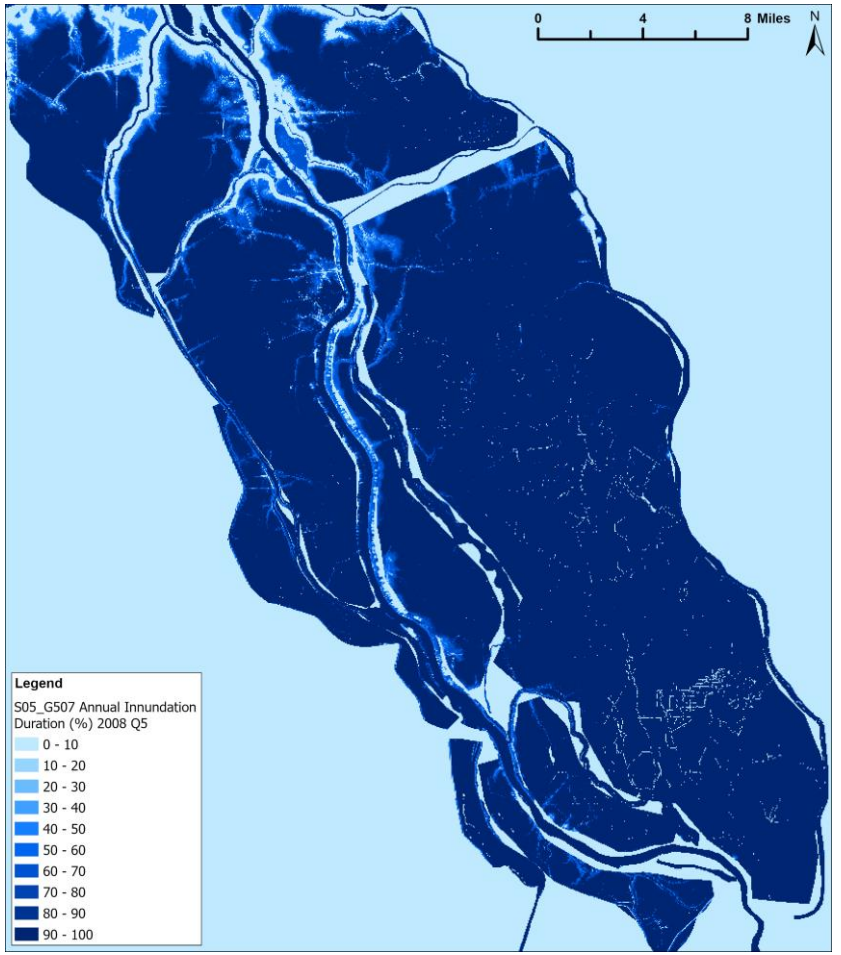
DRY, BASE

ANNUAL INUNDATION DURATION 2006 Q1



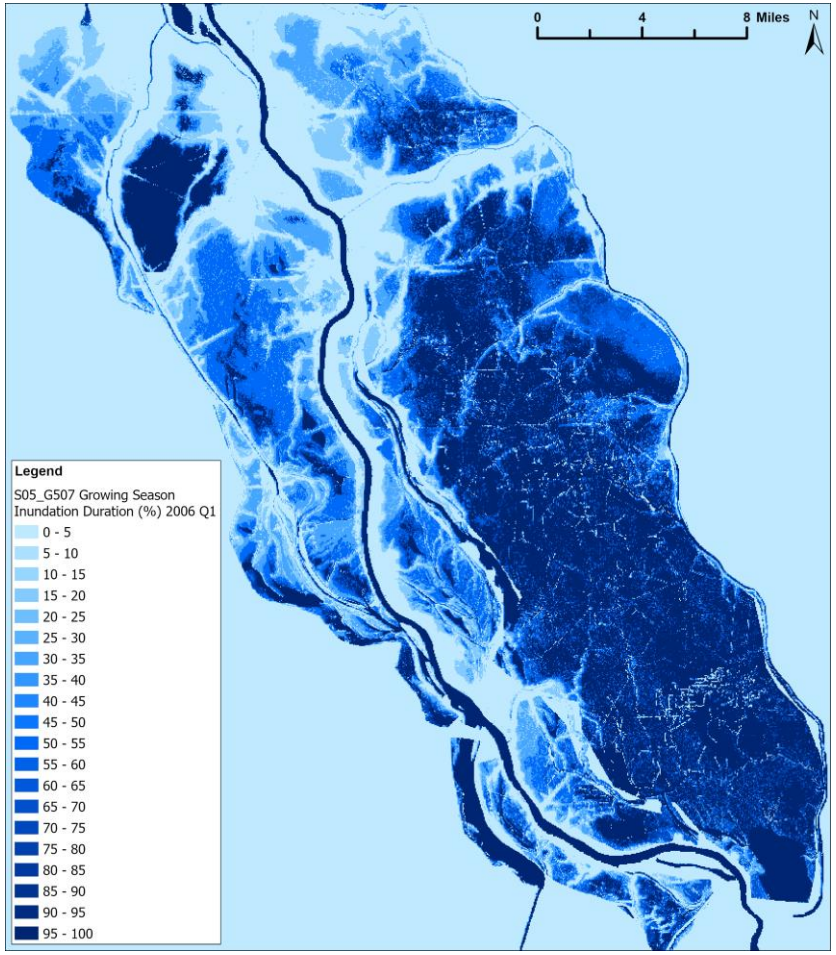
WET, BASE

ANNUAL INUNDATION DURATION 2008 Q5



DRY, BASE

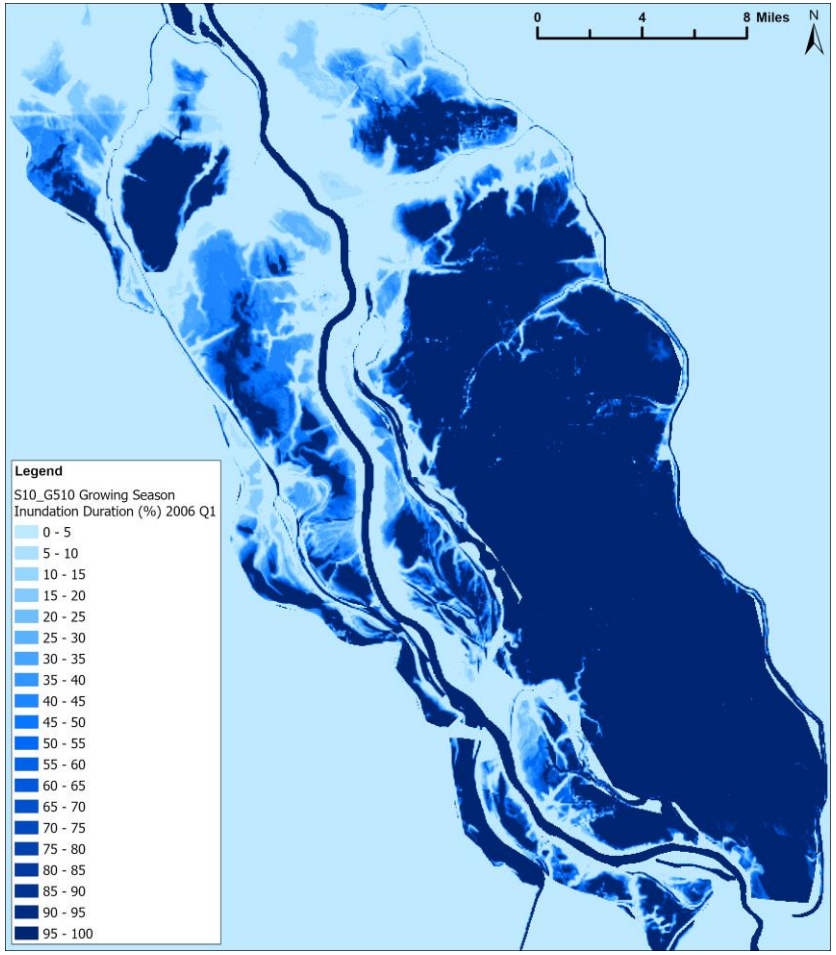
GS INUNDATION DURATION 2006 Q1



EFFECT OF A RISE IN SEA LEVEL

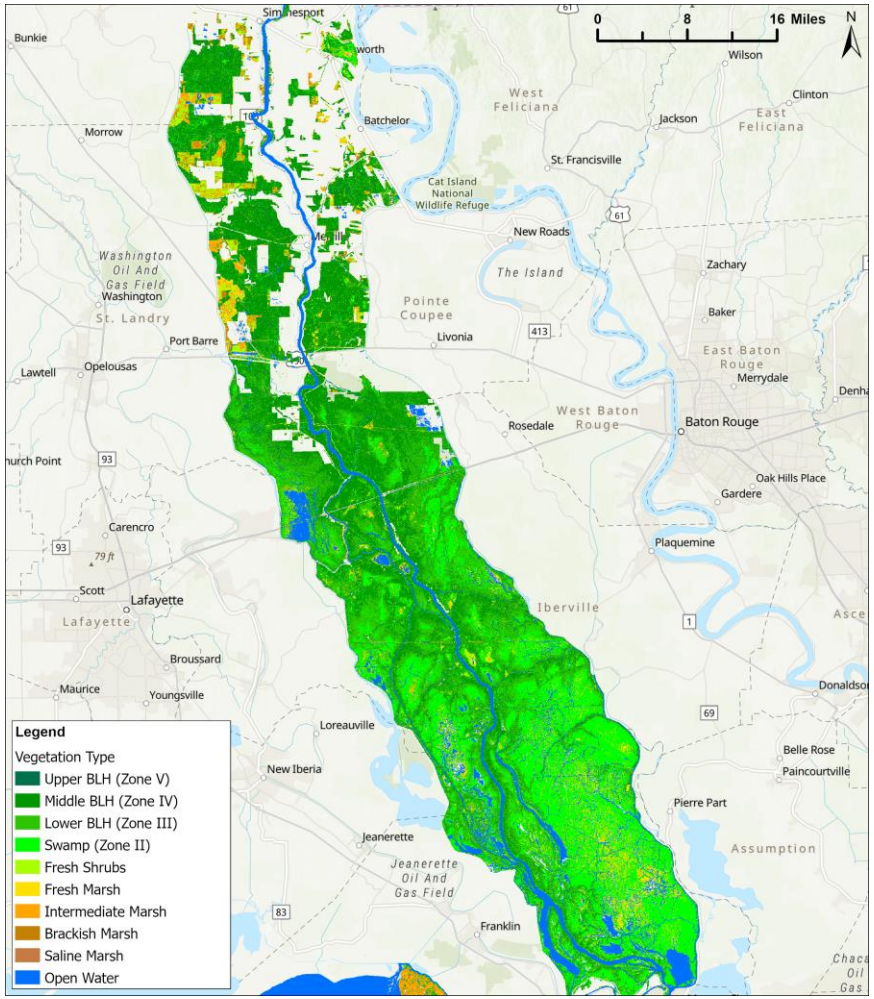
DRY, +0.328M SLR

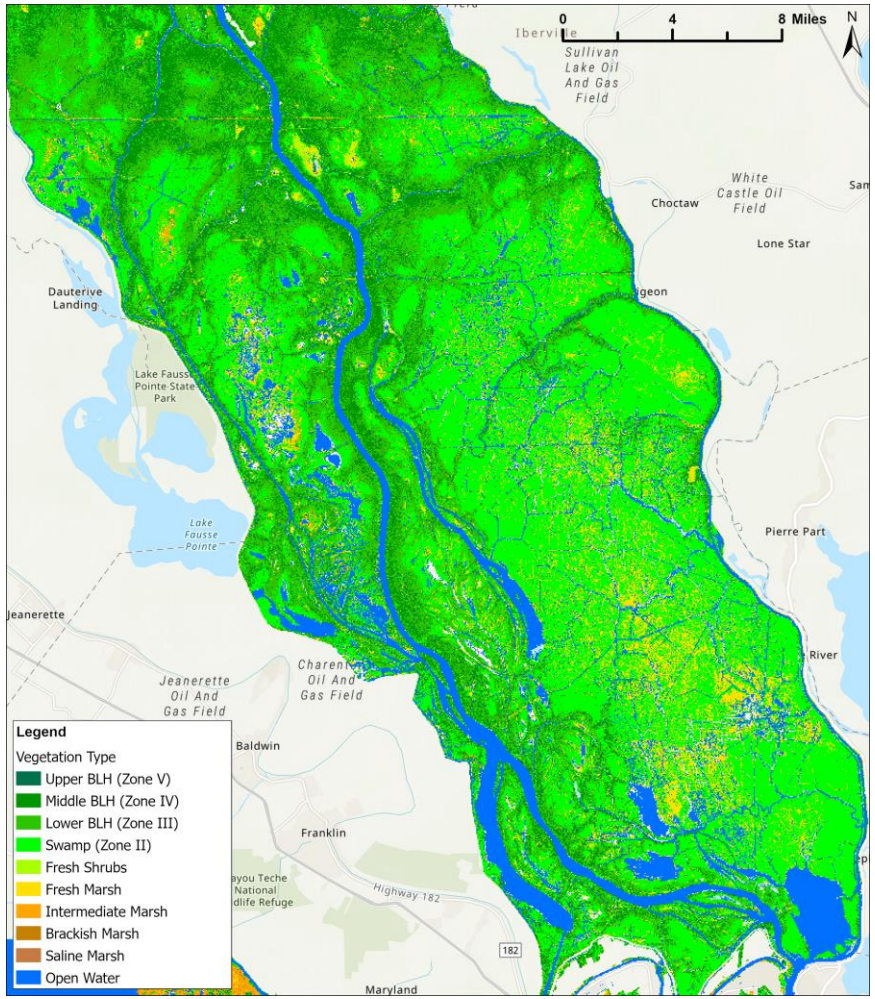
GS INUNDATION DURATION 2006 Q1



VEGETATION TRANSITION EXAMPLE OUTPUTS

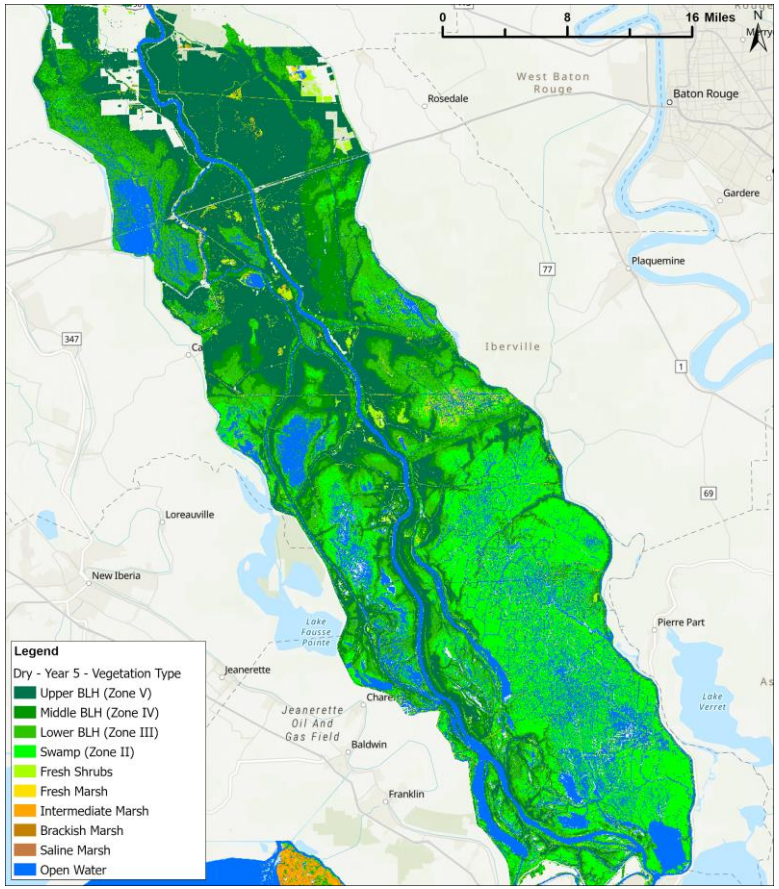
INITIAL CONDITIONS FOR ALL RUNS



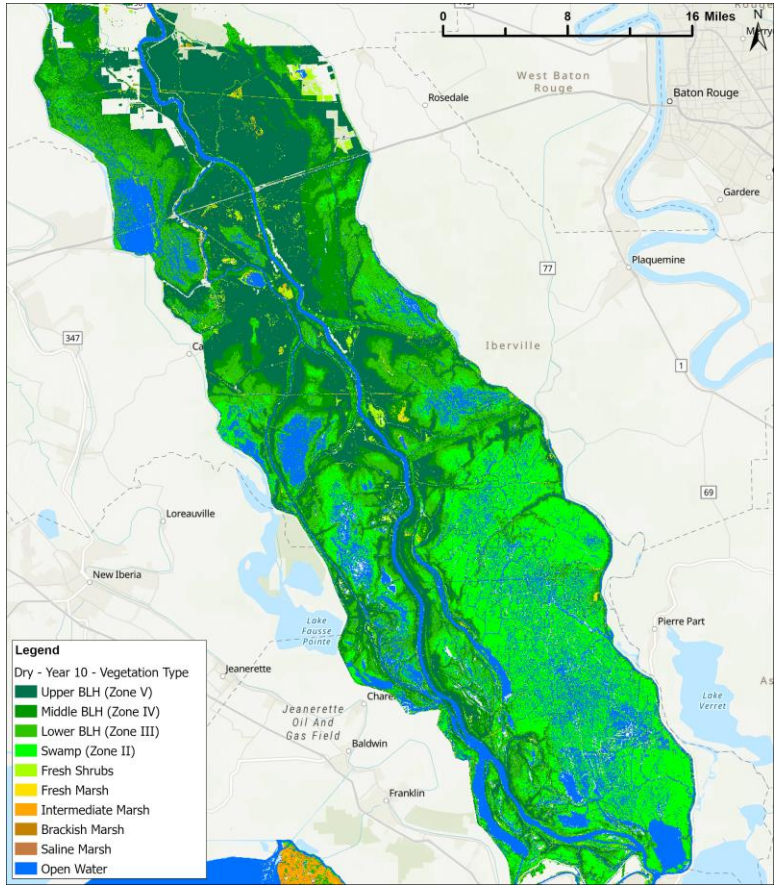


BASIN WIDE DRY FLOW SCENARIO

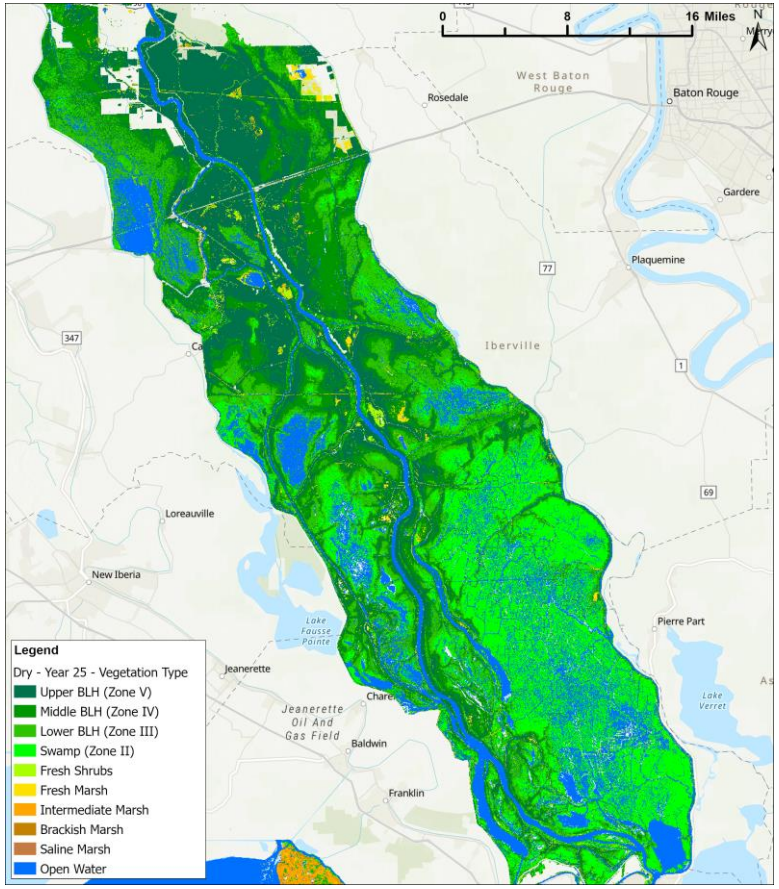
YEAR 5



YEAR 10



YEAR 25

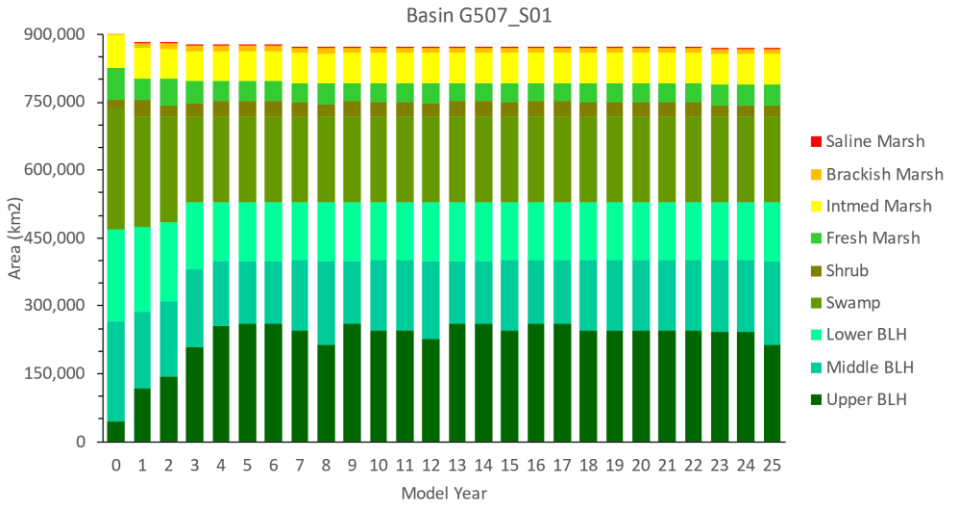


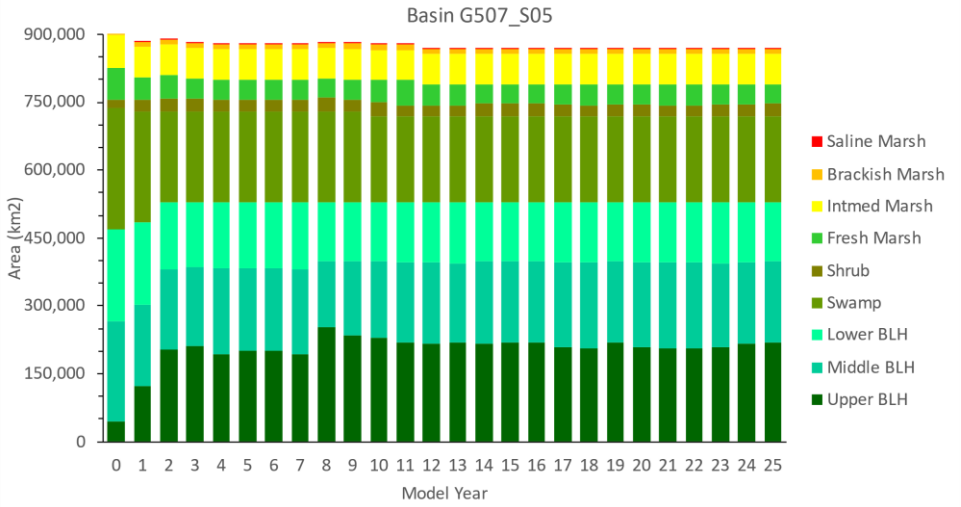
EFFECT OF FLOW SCENARIOS BASIN WIDE

DRY

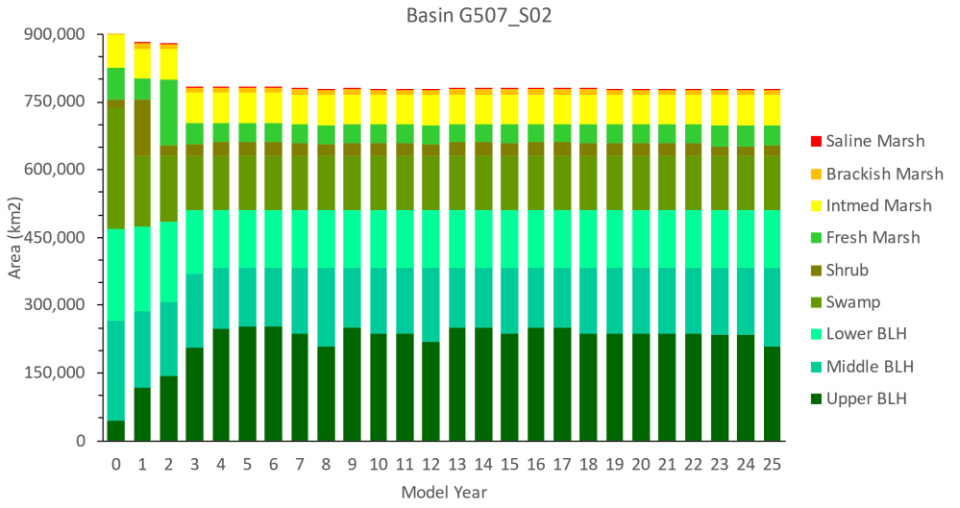
WET

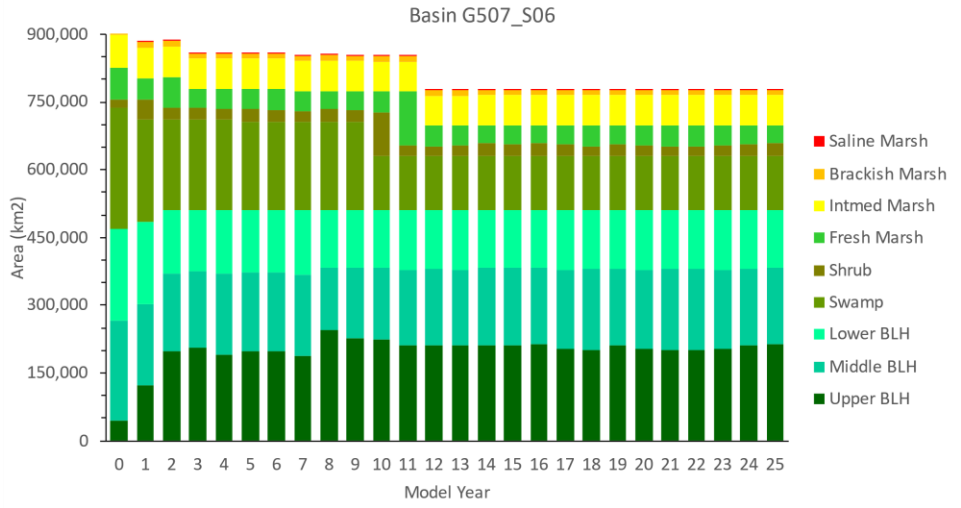
0 FT SLR





+1.08 FT SLR





OUTREACH & ENGAGEMENT

ENGAGEMENT

PUBLIC

- Introductory webinar
- Project solicitation
- Ongoing engagement at key Plan development milestones

STEERING COMMITTEE

- Engagement of local, tribal, state, and federal agency personnel who are engaged in system activities

WORKING GROUP

- Engagement of subject matter experts to provide technical input and feedback on key elements of the Atchafalaya Master Plan

COLLABORATIVE ENGAGEMENT GROUP

- Engagement with community members who represent conservation organizations; environmental, recreational, and cultural interests; navigation, ports, and industry; academia; landowners; recreational fisheries; and commercial fisheries to gather their input on key issues within each sector and how potential management approaches or project concepts may affect key sectors

CPRA BOARD

GOVERNOR'S ADVISORY COMMISSION

RESOURCES AVAILABLE

COASTAL.LA.GOV/OUR-PLAN/ATCHAFALAYA-MASTER-PLAN/

PROJECT INFORMATION & OVERVIEW

PROCESS & TIMELINE

RECORDED PUBLIC WEBINAR (10/1)

FREQUENTLY ASKED QUESTIONS

WRAP UP AND NEXT STEPS

SCHEDULE

Year 1

- Model development, calibration, validation
- FWOA project list
- Candidate projects
- Environmental scenarios
- DST development

Year 2

- FWOA modeling
- Candidate projects
- Project attributes
- Project modeling
- Metric and target iteration
- Funding scenarios
- DST incorporation of project, modeling data

Year 3

- DST analysis of projects
- Project interactions modeling
- DST analysis of system effects
- Final plan modeling

Year 4

- Final DST analysis
- Technical reports
- Draft plan
- Final plan

FWOA = Future Without Action
DST = Decision Support Tool

CONNECT WITH US

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