Draft Study Design

Instream Flow Study of the Lower Sabine River

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Prepared for

Lower Sabine River Sub-Basin Study Design Workgroup

Prepared by

TEXAS INSTREAM FLOW PROGRAM
AND SABINE RIVER AUTHORITY OF TEXAS

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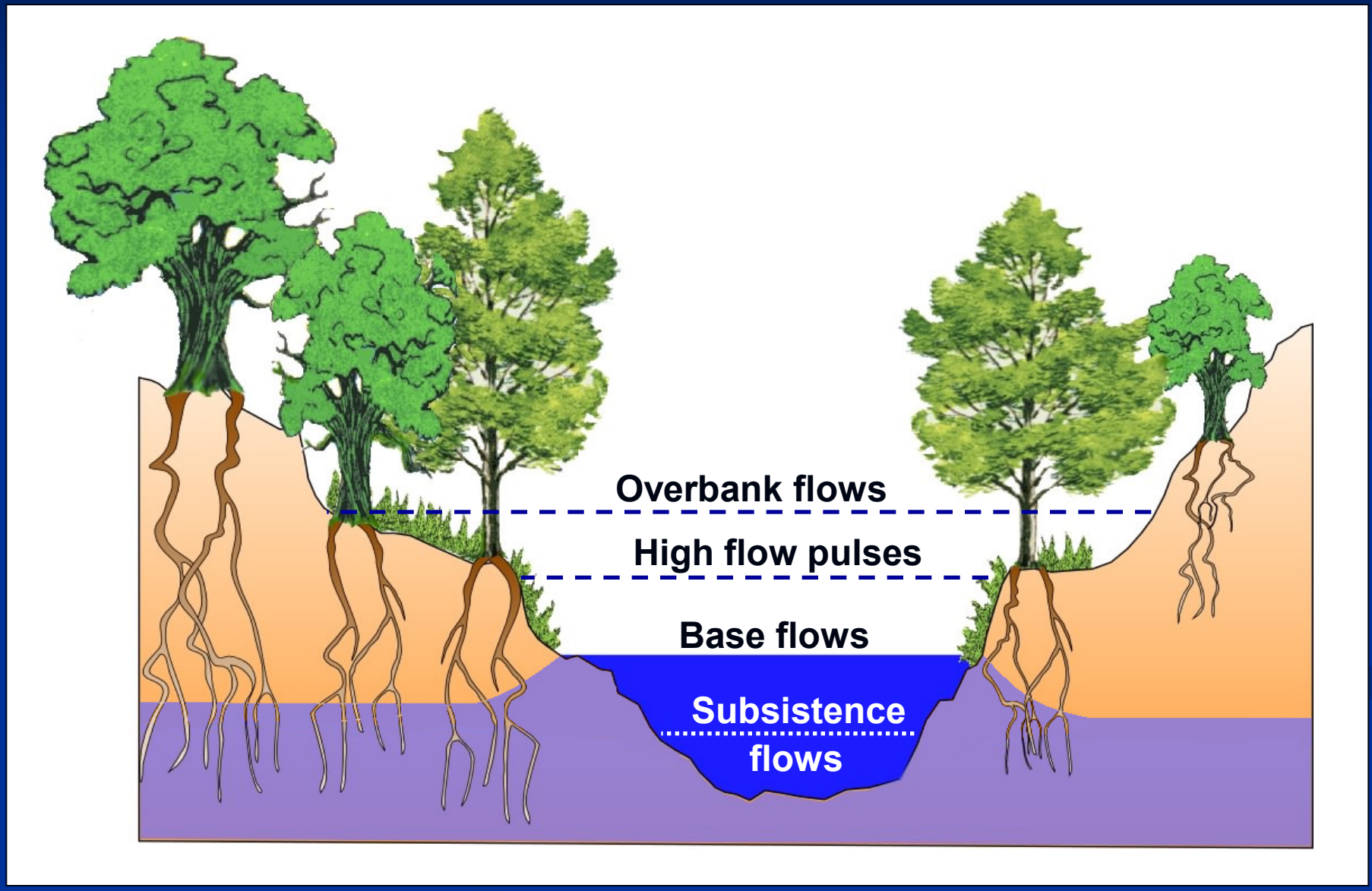
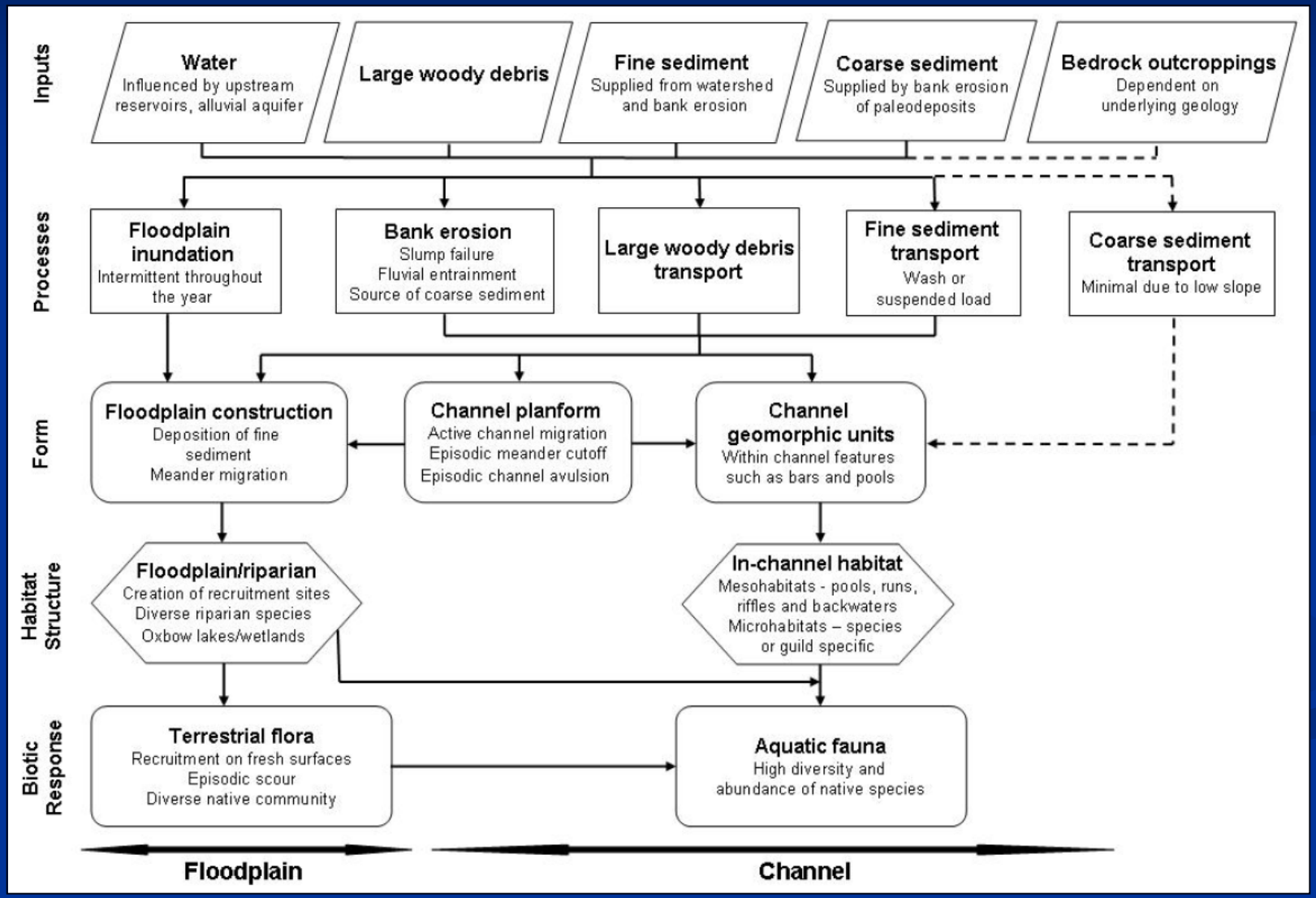
Statewide Conceptual Model



Conceptual Model of lower Sabine River

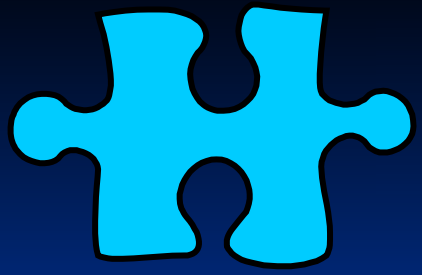


Ecological Processes/Flow Regime of Sabine River

Component	Hydrology	Geomorphology	Biology	Water Quality	Connectivity
Subsistence flows Infrequent, low flows (typically during summer)		Increase deposition of fine and organic particles	Provide limited aquatic habitat Maintain populations of organisms capable of repopulating system when favorable conditions return	Maintain adequate levels of dissolved oxygen, temperature, and constituent concentrations (particularly nutrients)	Provide limited lateral connectivity along the length of the river May be affected by groundwater/ surface water interactions Maintain longitudinal connectivity
Base flows Average flow conditions, including variability.	Influenced by reservoir operation, peaking hydropower, and land use changes Vary by season and year	Maintain soil moisture and groundwater table in riparian areas Maintain a diversity of instream habitats	Provide suitable aquatic habitat for all life stages of native species	Provide suitable in-channel water quality	Provide connectivity along channel corridor May be affected by groundwater / surface water interactions

Eco. Proc./Flow Regime (continued)

Component	Hydrology	Geomorphology	Biology	Water Quality	Connectivity
High flow pulses In-channel, short duration, high flows	Influenced by reservoir operations, peeking hydropower, and land use changes	Maintain channel and substrate characteristics Prevent encroachment of riparian vegetation Play an important role in recovery of channel after flood events	Provide migratory and spawning cues for organisms Transport semi-buoyant fish eggs	Restore in-channel water quality after prolonged low flow periods	Provide connectivity to near-channel water bodies (e.g. oxbows and distributary channels)
Overbank flows Infrequent, high flows that exceed the channel	Influenced by reservoir operation	Provide lateral channel movement, an important source of coarse material for channel Form new habitats Flush organic material/woody debris into channel Transport nutrients and sediment to floodplain	Provide spawning cues for organisms Provide access to floodplain habitats Maintain diversity of riparian vegetation	Restore water quality in floodplain water bodies	Provide connectivity to floodplain Recharge alluvial aquifers Provide large volumes of freshwater to Sabine Lake

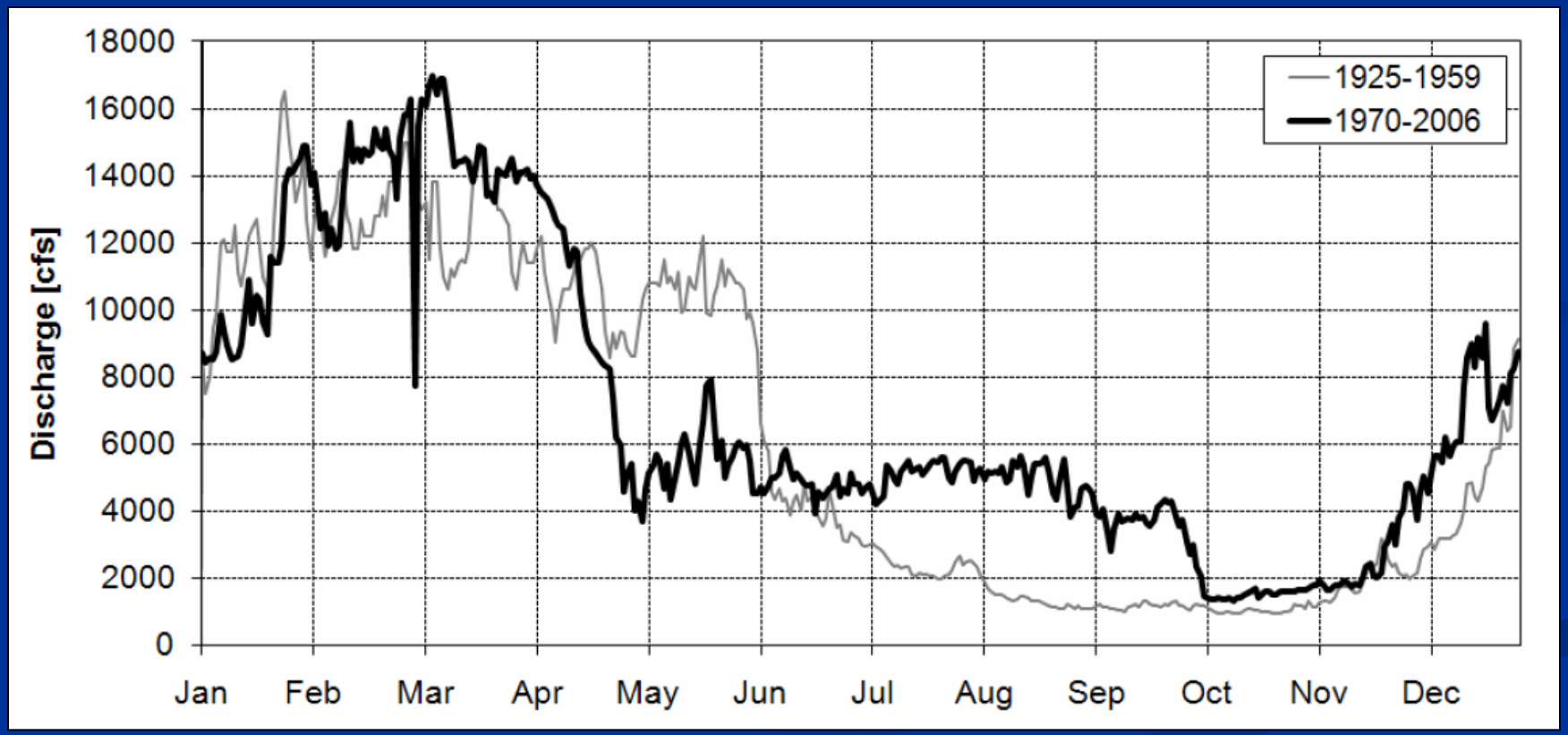


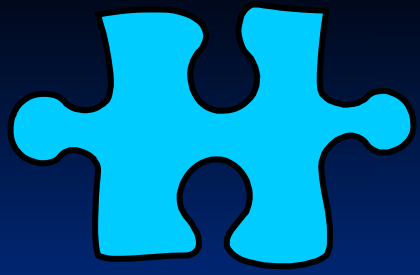
Hydrology and Hydraulics

Indicators	and	Activities
Flow regime components (frequency, timing, duration, rate of change, magnitude)		**Hydrologic evaluation**
Natural variability		**Hydrologic evaluation**

Hydrology and Hydraulics

Hydrologic Evaluation





Hydrology and Hydraulics

Activities to support Other disciplines

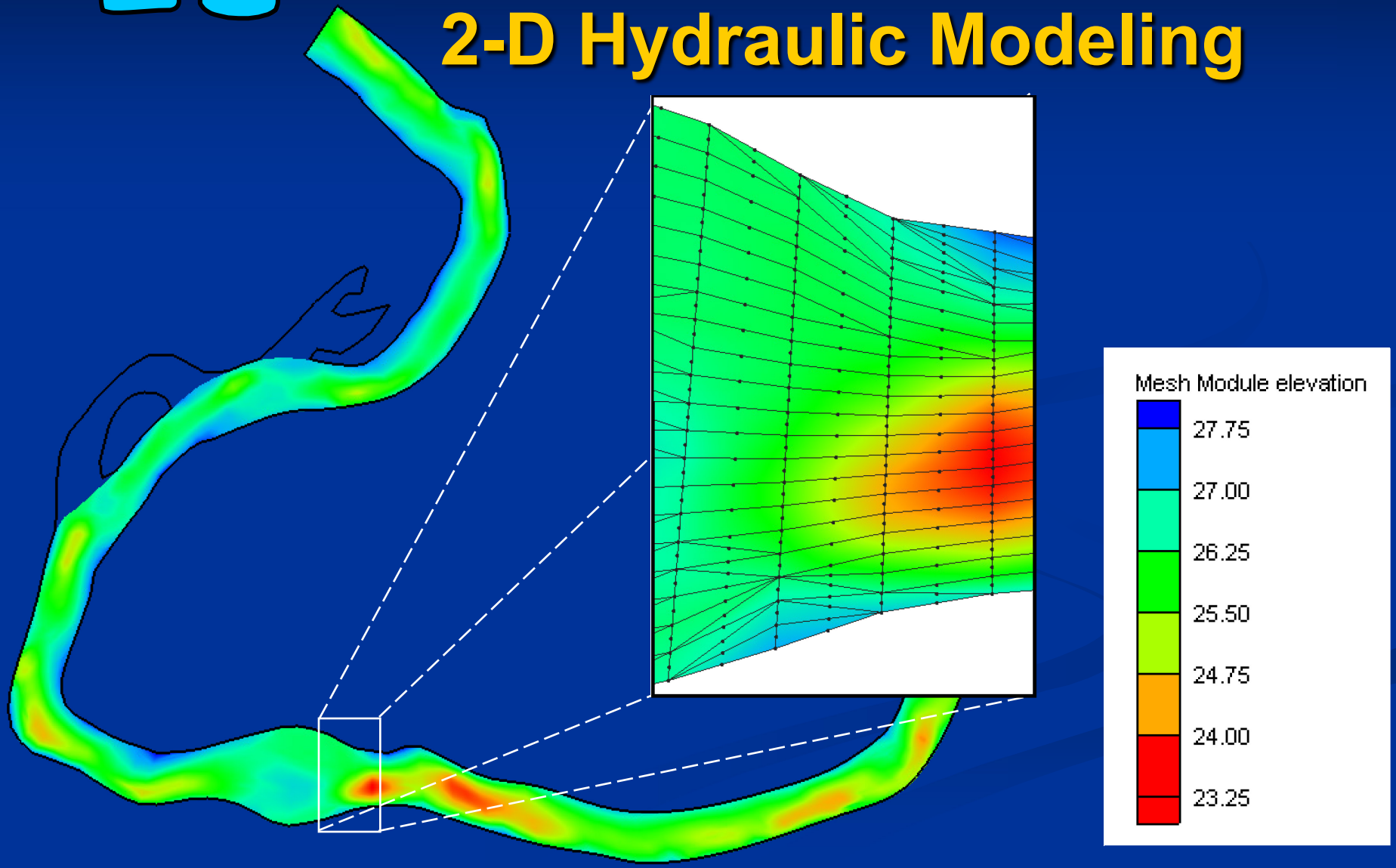
2-d hydraulic modeling

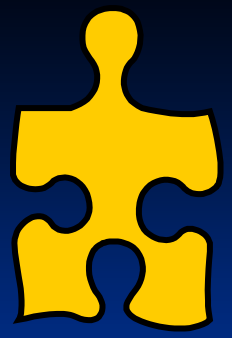
Biology
(habitat modeling)

Physical Processes
(sediment transport)

Hydrology and Hydraulics

2-D Hydraulic Modeling





Physical Processes (Geomorphology)

Indicators	Activities
Bank stability (lateral migration, channel avulsion, bank erosion rates)	**Analysis of aerial photos**
Channel maintenance (in-channel bars, meander pools)	**Sediment budgeting, transport modeling**
Flood impacts	**NWS flood impacts**

Connectivity

Indicators and Activities

Riparian zone
(habitat and total area)

Inundation modeling

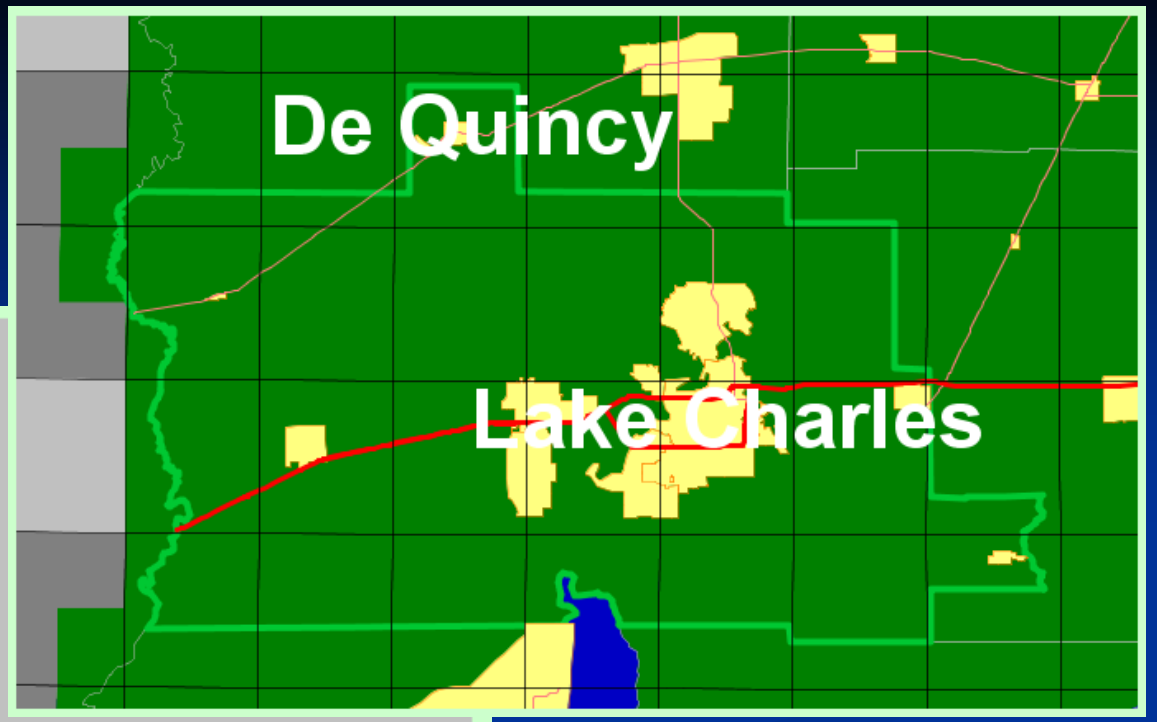
Lateral connectivity
(frequency, duration, timing)

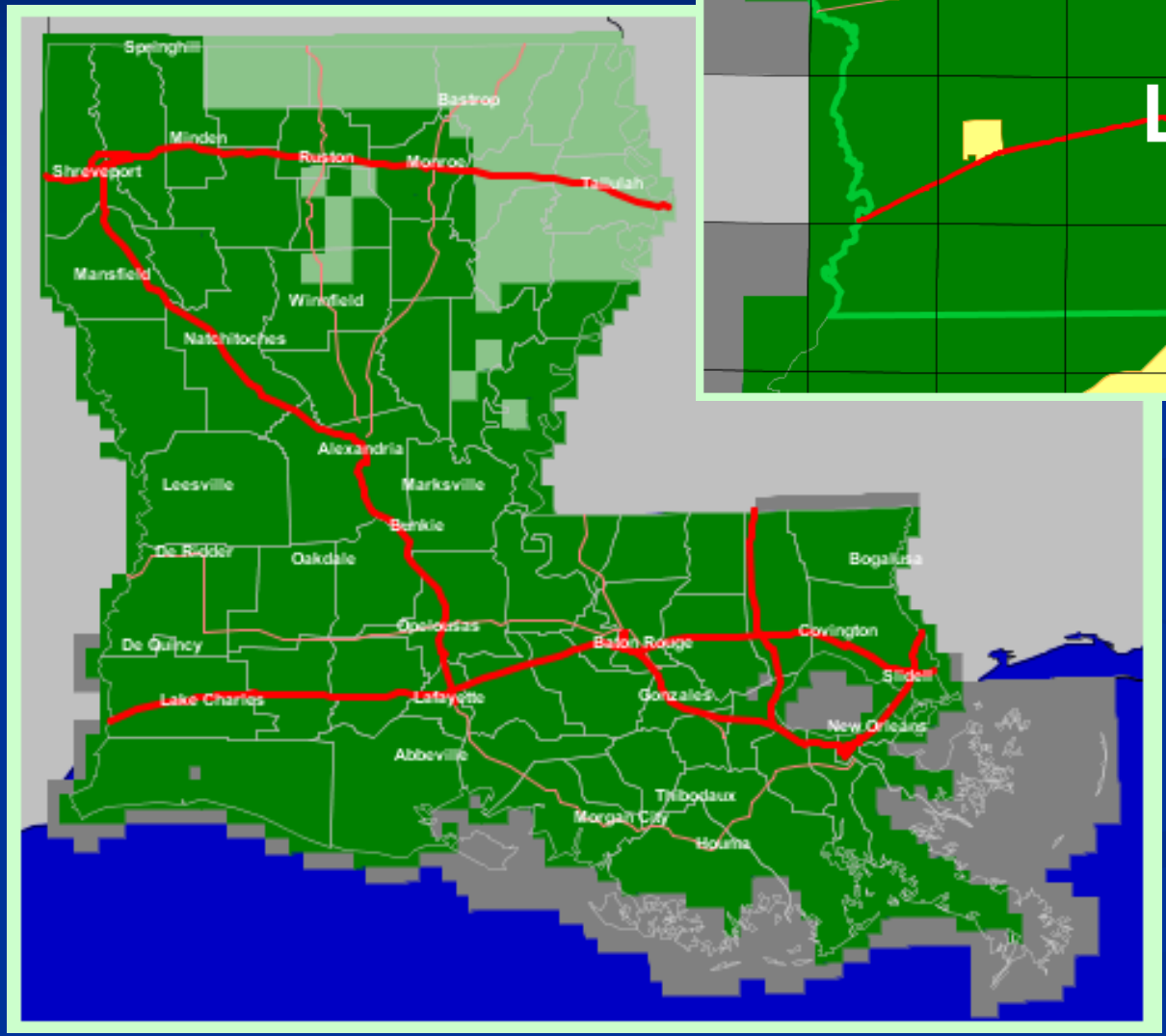
Pressure transducer deployment

Longitudinal connectivity

Non-proposed at this time

Inundation Modeling

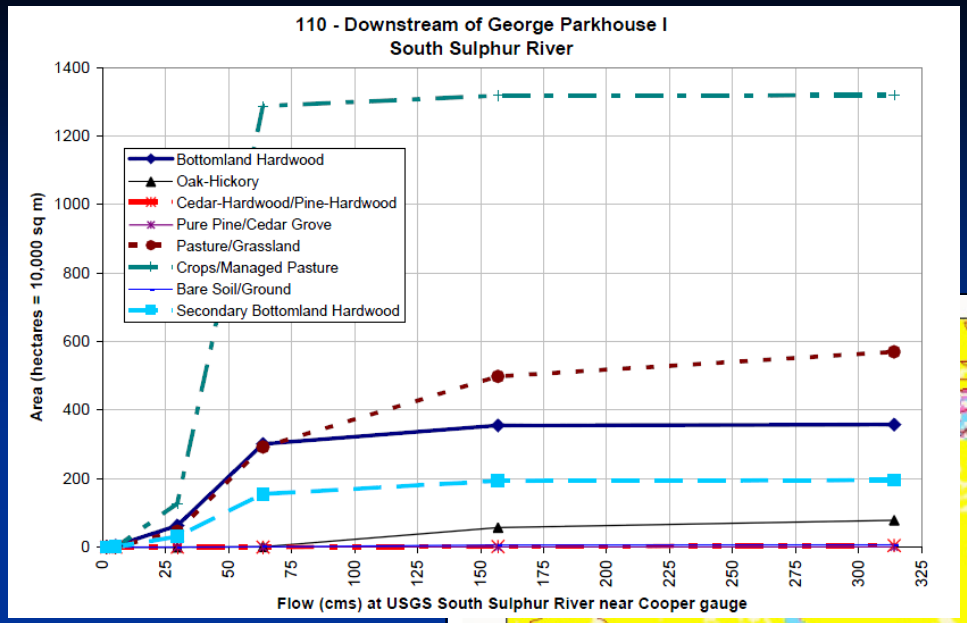


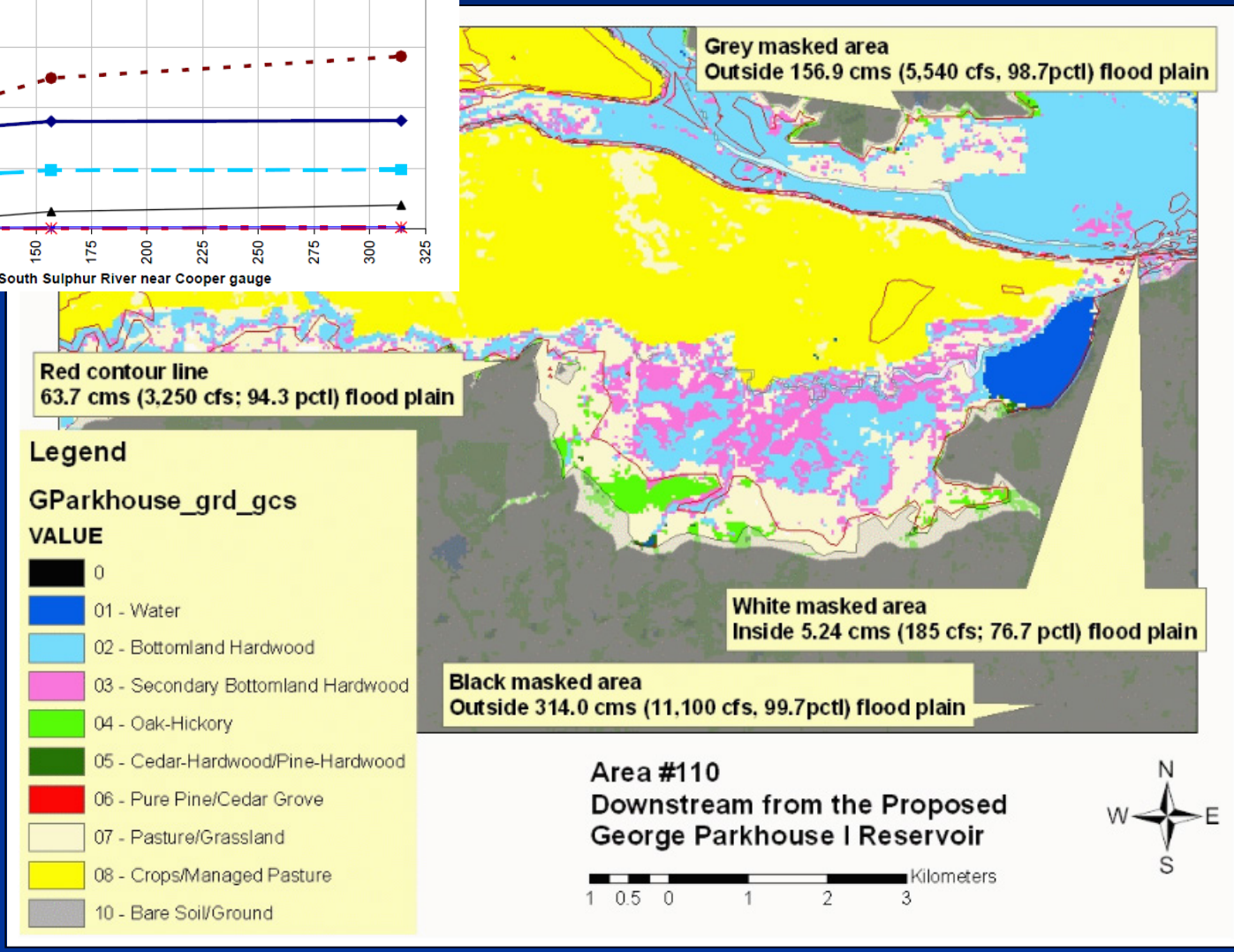


5-m DEM Coverage (based on LiDAR)

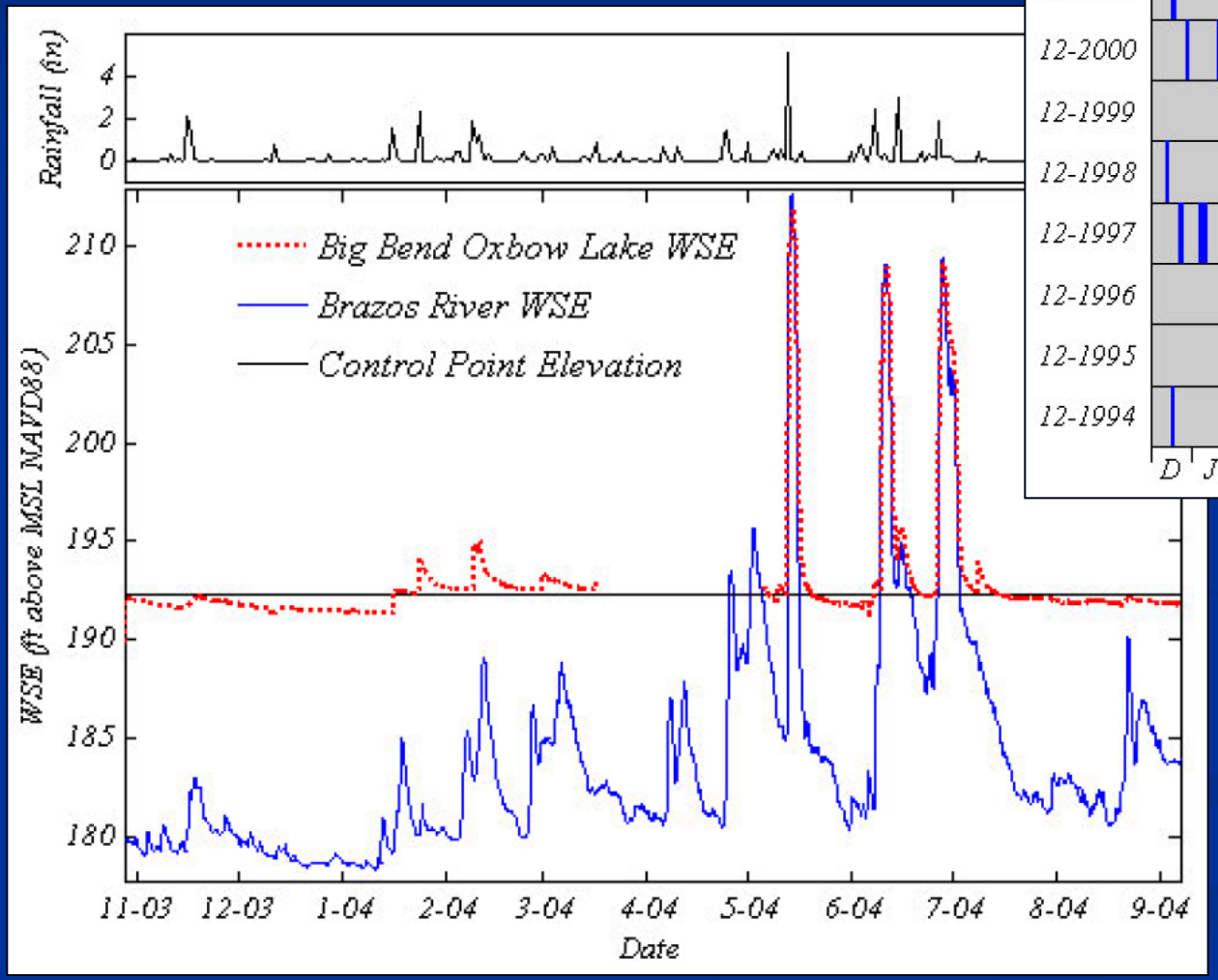
- Panel Available
- Panel Recently Available
- Panel Unavailable
- DOQQ Boundary
- Quad Boundary
- Atla Quad Name
- Surrounding State
- Water Body
- Political Boundary
- Community
- Sun Community Name
- Major Road
- Interstate

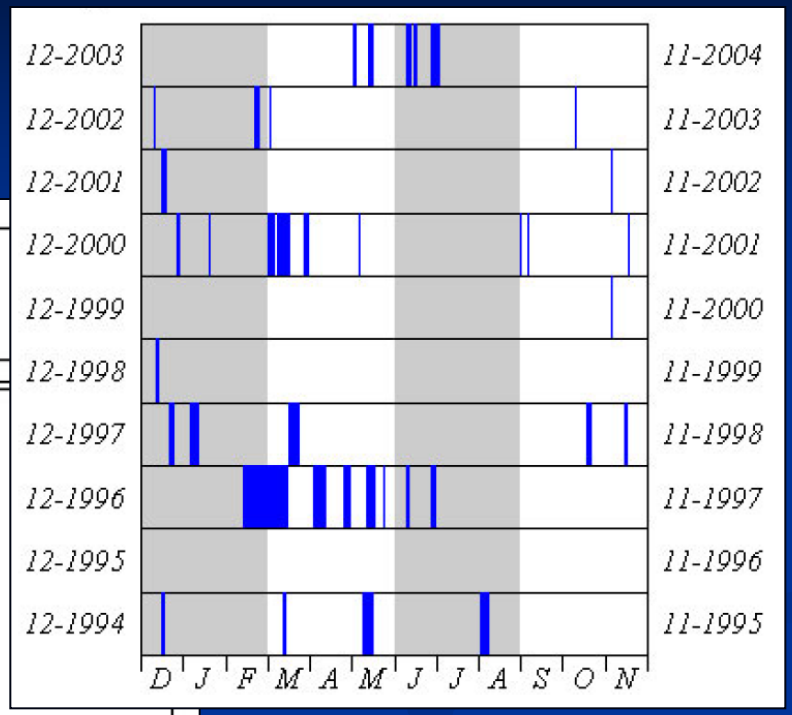
Inundation Modeling



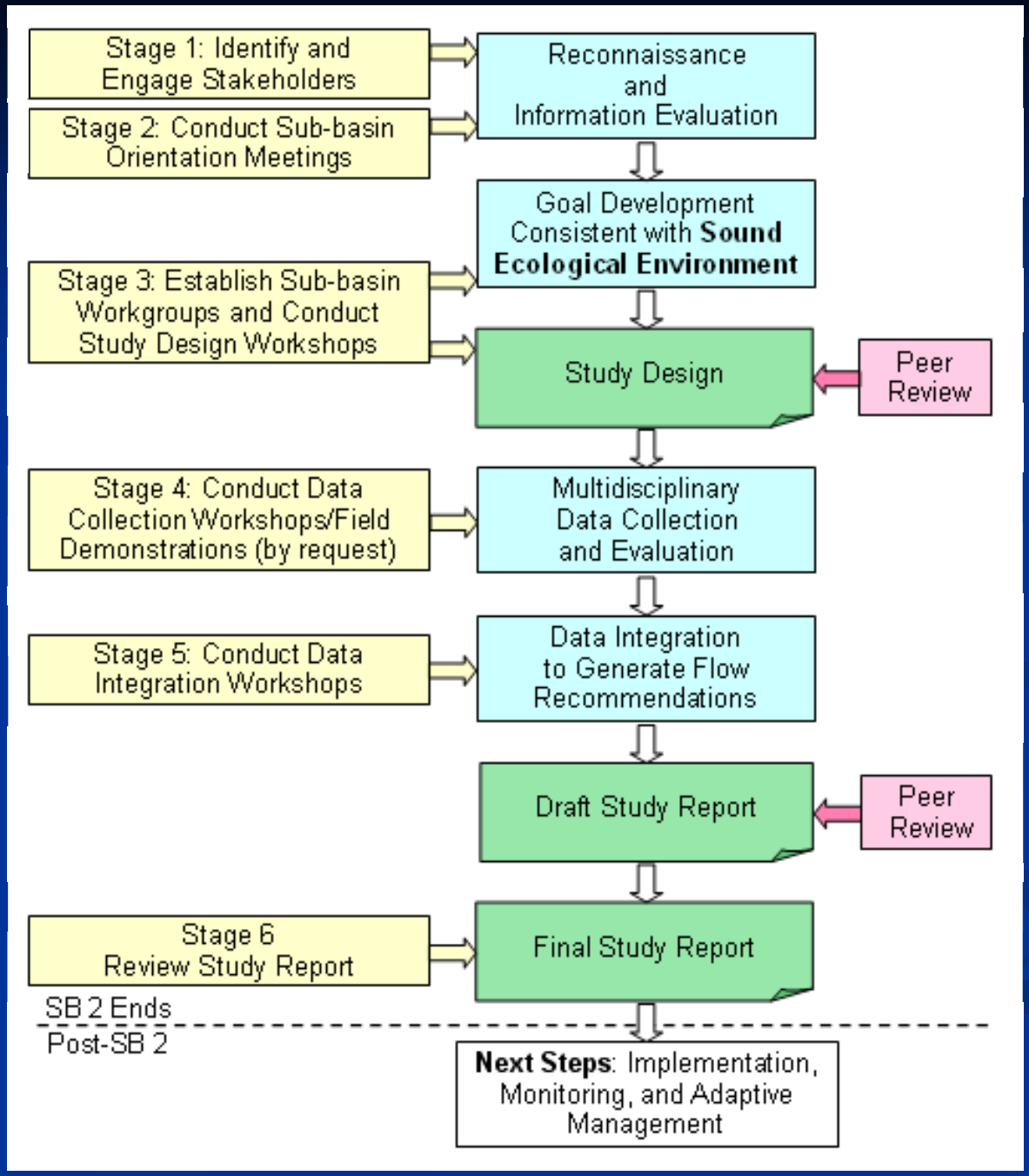


Pressure Transducer Deployment





Next Steps


2005
2008
2008-10
est. 2010 -2012
est. 2012
est. 2013
Stage 1: Identify and Engage Stakeholders
Stage 2: Conduct Sub-basin Orientation Meetings
Reconnaissance and Information Evaluation
Goal Development Consistent with Sound Ecological Environment
Stage 3: Establish Sub-basin Workgroups and Conduct Study Design Workshops
Study Design
Peer Review
Stage 4: Conduct Data Collection Workshops/Field Demonstrations (by request)
Multidisciplinary Data Collection and Evaluation
Stage 5: Conduct Data Integration Workshops
Data Integration to Generate Flow Recommendations
Draft Study Report
Peer Review
Stage 6 Review Study Report
Final Study Report
SB 2 Ends
Post-SB 2
Next Steps: Implementation, Monitoring, and Adaptive Management
2005
2008
2010
est. 2010 -2012
est. 2013
est. 2013

Comments on Draft Study Design

- Today's meeting
- Send comments by Apr. 23, 2010
  - E-mail: tifp@twdb.state.tx.us
  - Mail: Texas Instream Flow Program
    P.O. Box 13231
    Austin, TX 78711-3231

How to stay involved

- Check website for updates
  - www.twdb.state.tx.us/instreamflows/
- Electronic/postal newsletter
- Contact TIFP if interested in seeing study activities in field
- Participate in Data Integration Workshops
- Review Study Report