Lake Conroe
Lake Houston
Joint Reservoir Operations Study

Lake Conroe – Lake Houston Joint Reservoir Operations Study

Public Meeting #2 – Study Updates & Pre-Release Evaluation

November 5, 2026

SJRA
SAN JACINTO RIVER AUTHORITY

BLACK & VEATCH

Study Partners

SJRA SAN JACINTO RIVER AUTHORITY

Funding / Project Management

- Texas Water Development Board: $500k Grant Funds
- City of Houston: $450k Local Match
- City of Humble: $50k Local Match
- SJRA: Project Management & In-Kind Services

Study Objectives

1. Evaluate benefits and impacts of Lake Conroe and Lake Houston pre-releases.
2. Evaluate effective and safe pre-releases at Lake Conroe and Lake Houston.
3. Develop a Lake Houston Forecasting Tool and support gate operations policy for future additional spillway gates at Lake Houston.



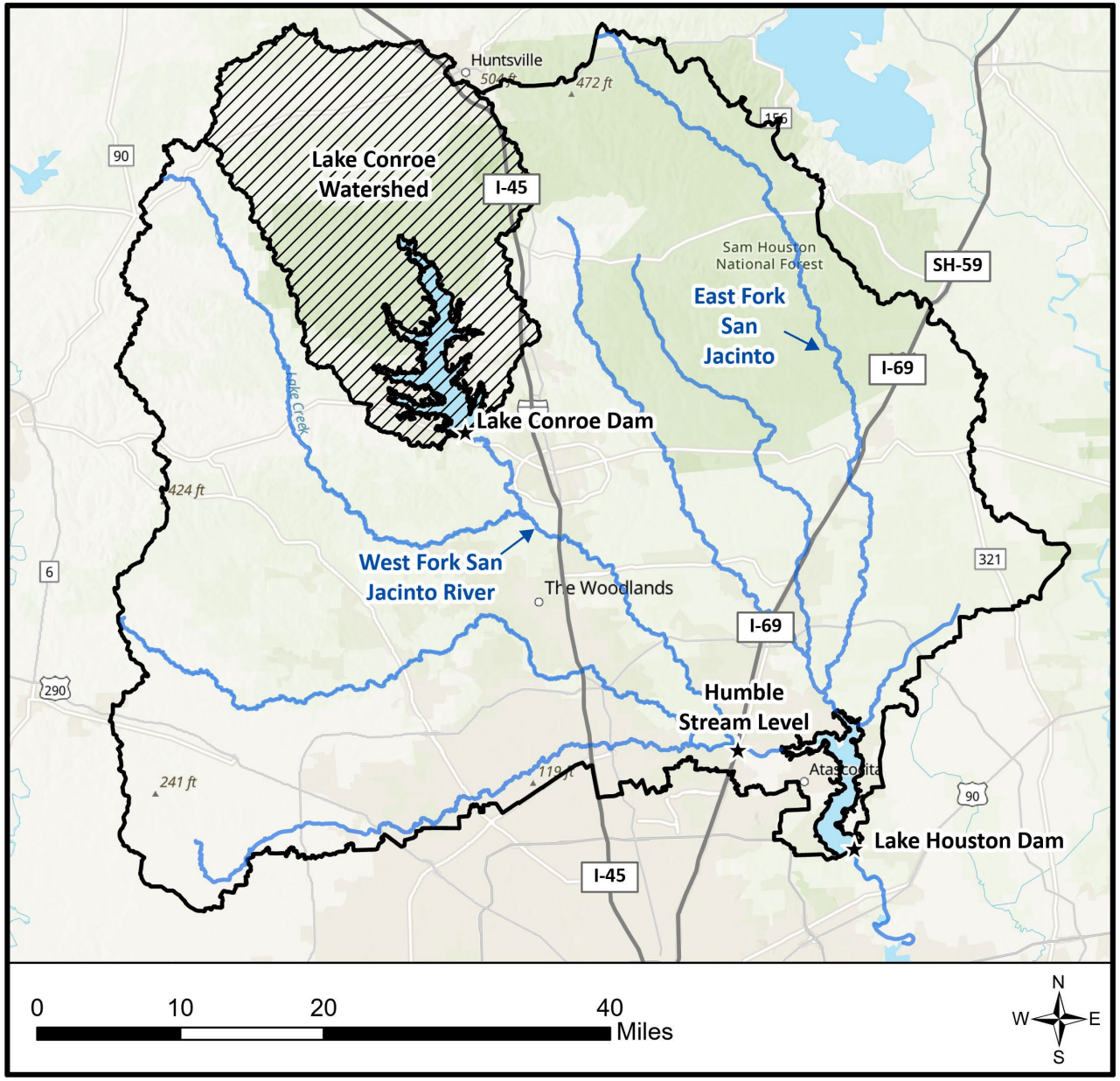


Pre-Release Results Summary

Lake Conroe pre-releases provided some measurable flood risk reduction in the scenarios evaluated.

Lake Houston pre-releases did not provide measurable flood risk reduction in the scenarios evaluated.

Study Area



Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

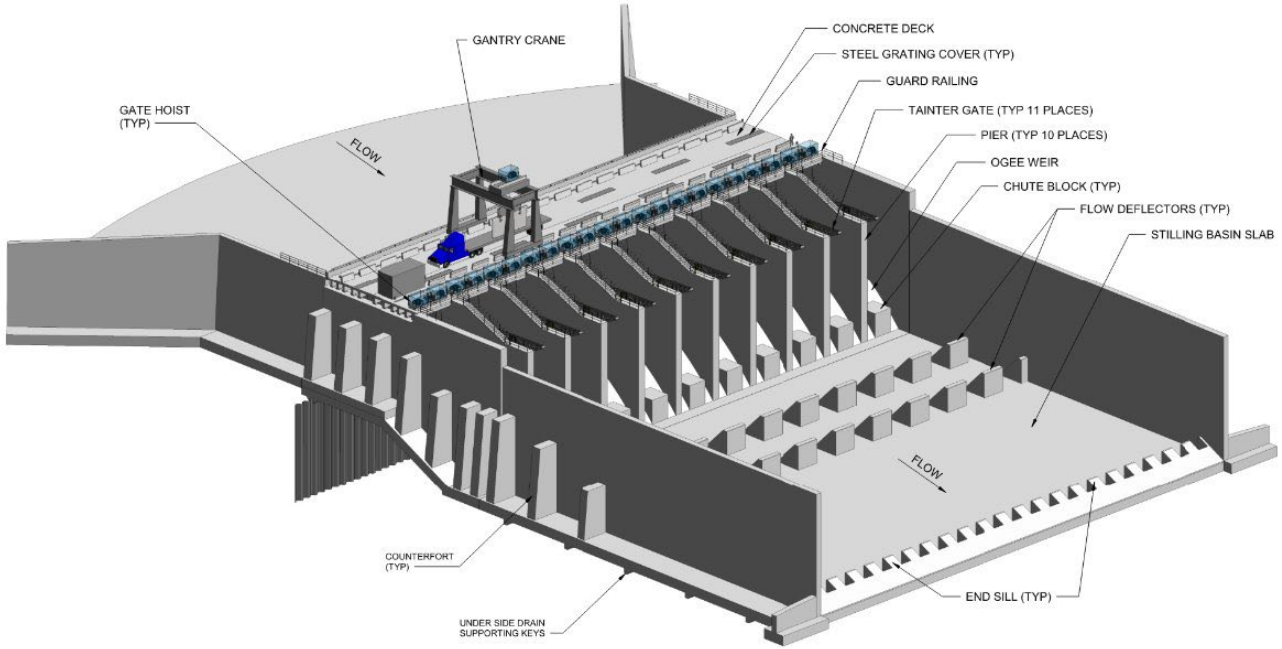
- Lake Houston Watershed ~2,800 square miles
- ~ 45 miles along the West Fork of the San Jacinto River
- Includes Lake Houston Reservoir and Lake Conroe Reservoir Footprints
- **<u>Lake Conroe watershed is ~16% of total Lake Houston watershed</u>**

Scope of Pre-Release Evaluation

1) Evaluate benefits and impacts of Lake Conroe and Lake Houston pre-releases.
2) Evaluate 20 pre-release scenarios using synthetic and historical storm events.
3) Assess pre-release impacts on water supply at both reservoirs.
4) Future additional Lake Houston spillway gates are incorporated into the modeling.

Future Additional Lake Houston Spillway Gates

- 11 new 20’x 20’ radial gates
- Additional 84,000 cfs controlled discharge capacity during 100-year storm
- Reduced upstream flooding
- Benefits future dam rehabilitation or replacement project
- Project Status: Detailed Design (90%)



PERSPECTIVE VIEW SPILLWAY

What are Pre-Releases?

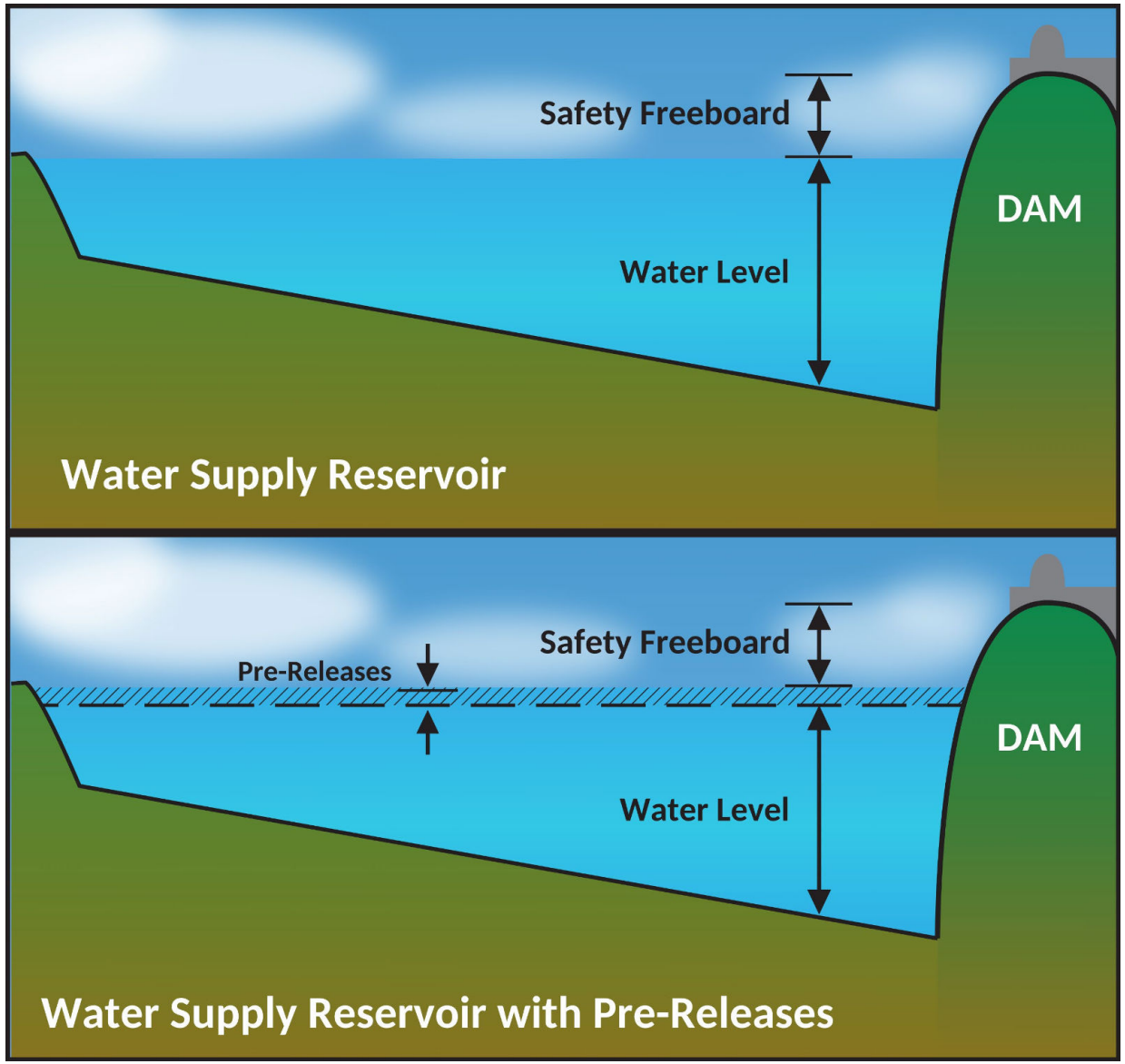


Image is not to scale

Pre-releases are water supply discharges released prior to an incoming rain event to provide temporary stormwater storage

Operation Conditions Evaluated

1. Practical Pre-Releases
2. High Risk Pre-Releases
3. Drought Conditions
4. Isolated Pre-Releases
5. Extended Drawdowns

Please note that pre-release scenarios are constrained by dam safety, legal and regulatory, and water supply limitations. Some evaluated scenarios are not practical based on these constraints.

Existing Pre-Release Operations



No formal program



Up to 1.5-ft

Pre-Release Constraints



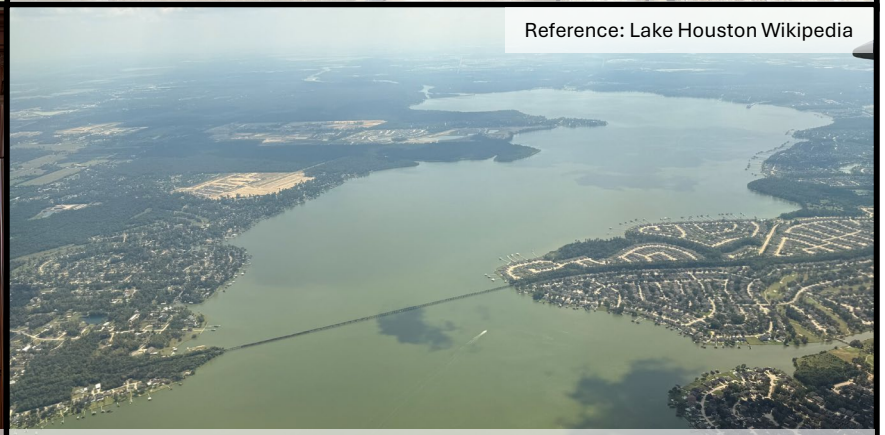
Limit Rapid Drawdowns to Prevent Embankment Failure



Manage Releases to Protect the Public



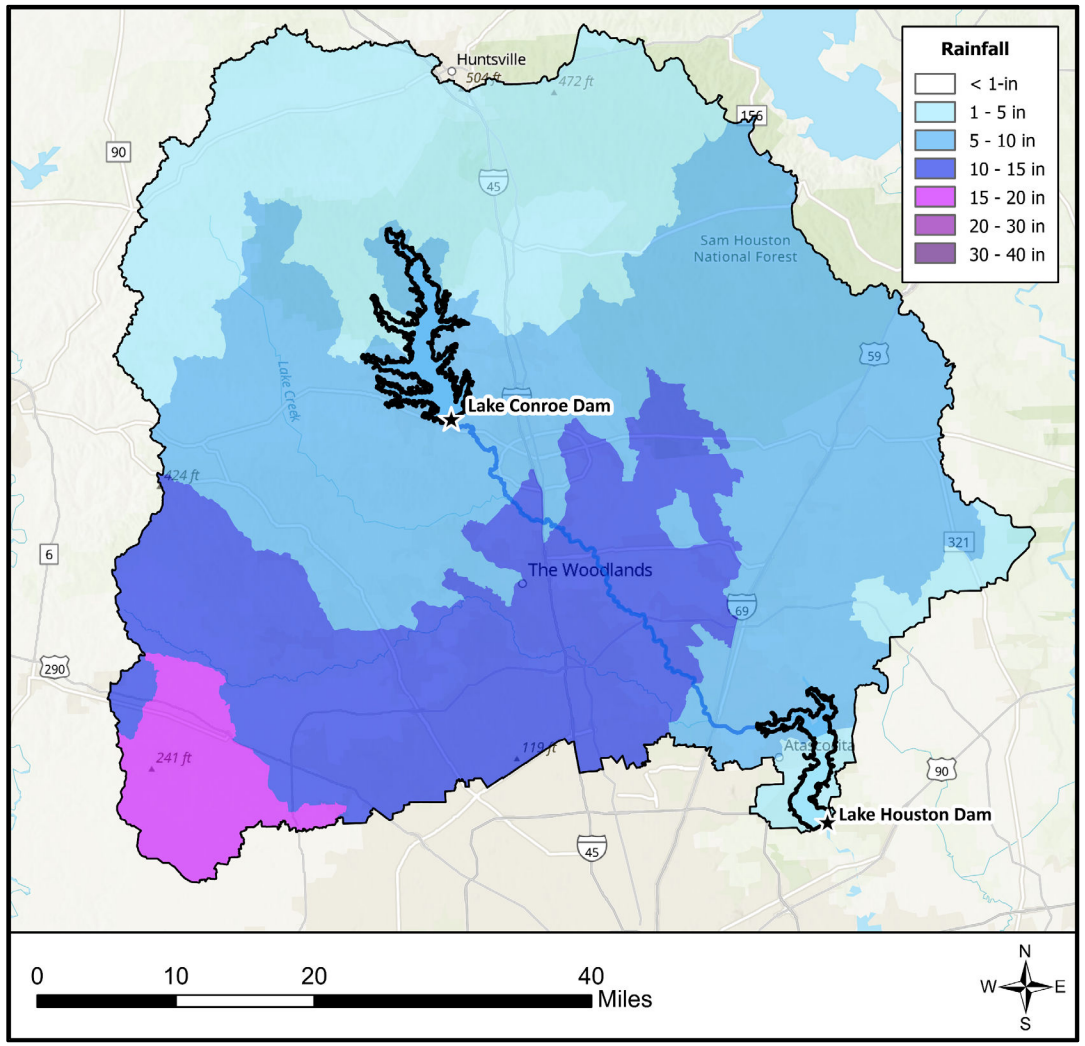
Maintain Legal & Regulatory Requirements



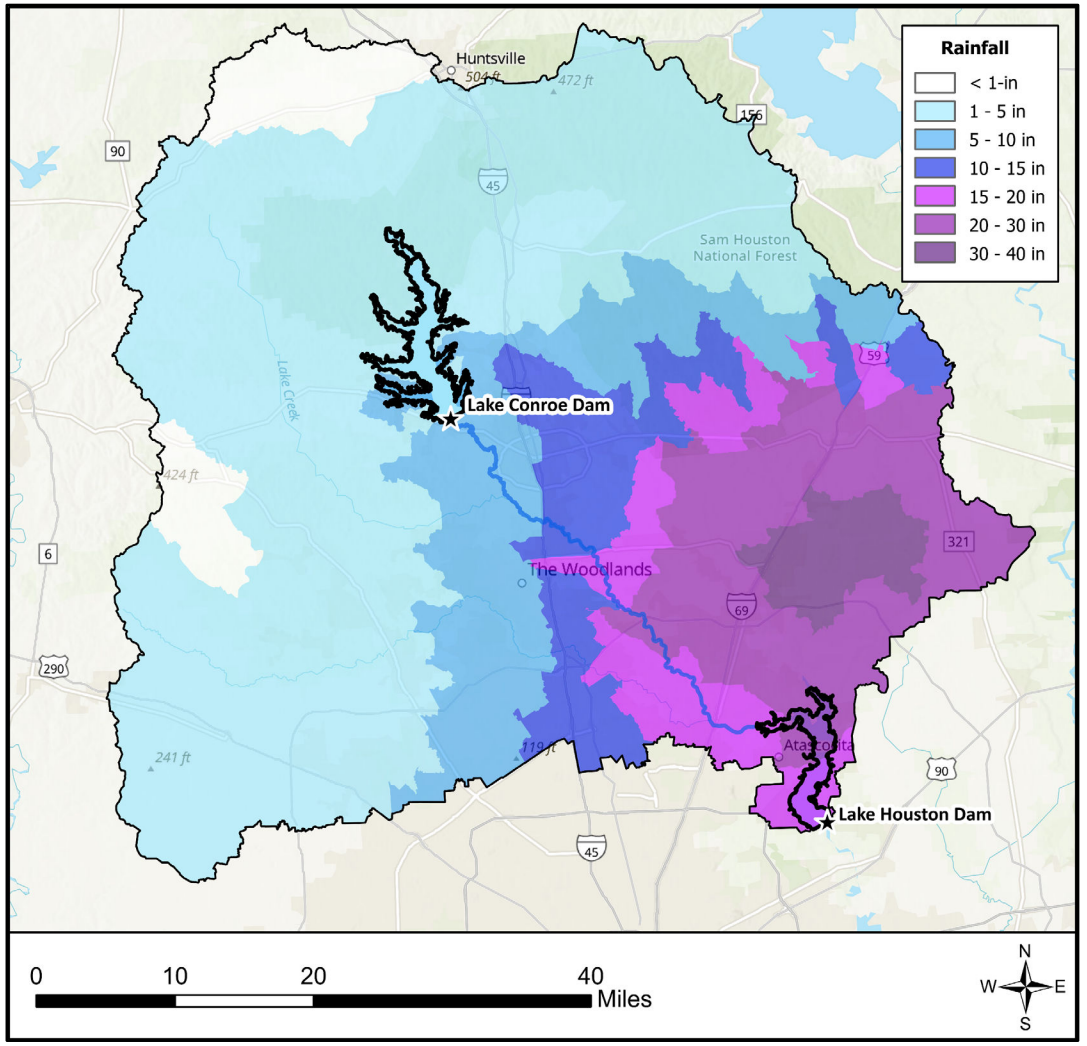
Reference: Lake Houston Wikipedia

Preserve & Protect Water Supply

Storm Variability



Tax Day 2016
Averaged 8.2-inches



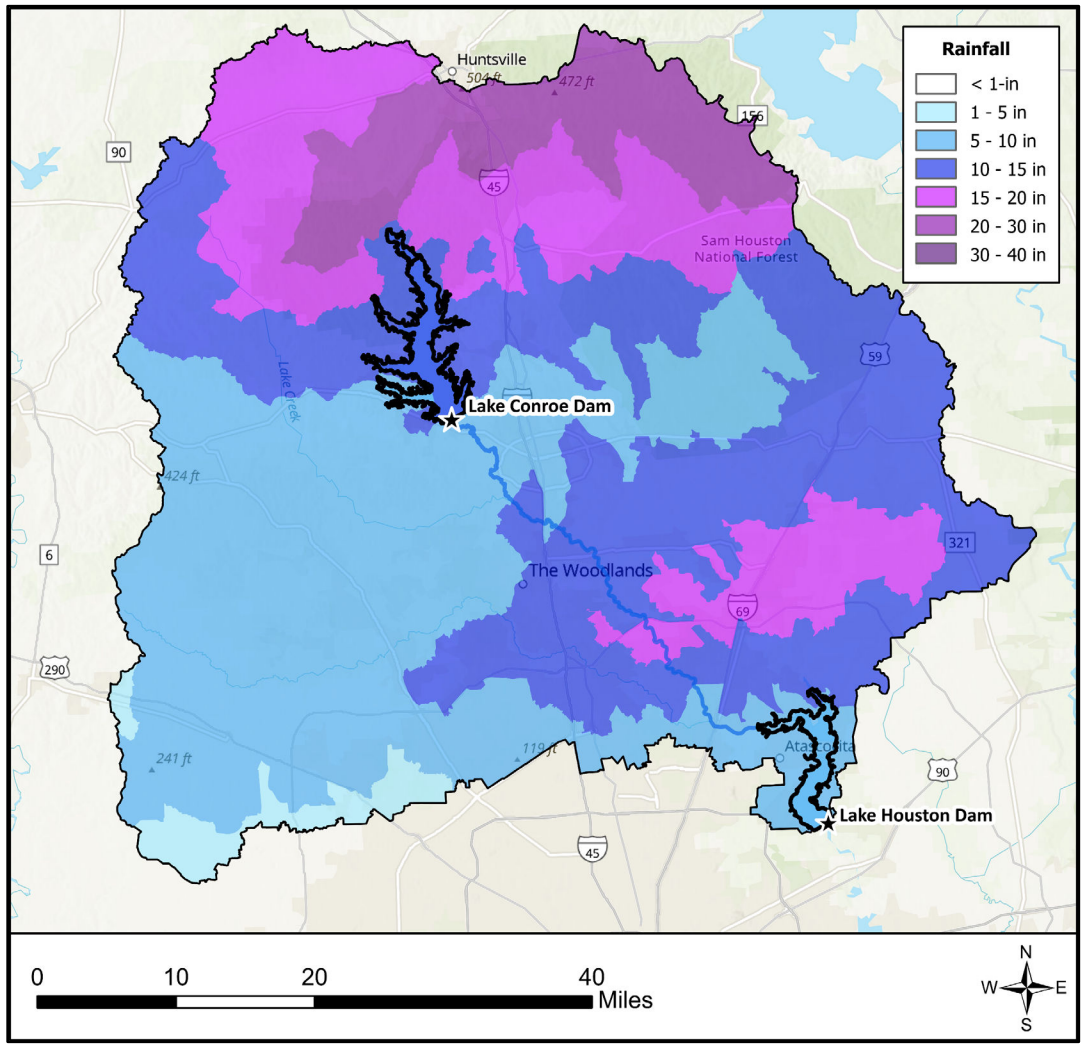
Imelda 2019
Averaged 8.4-inches

Storm Variability

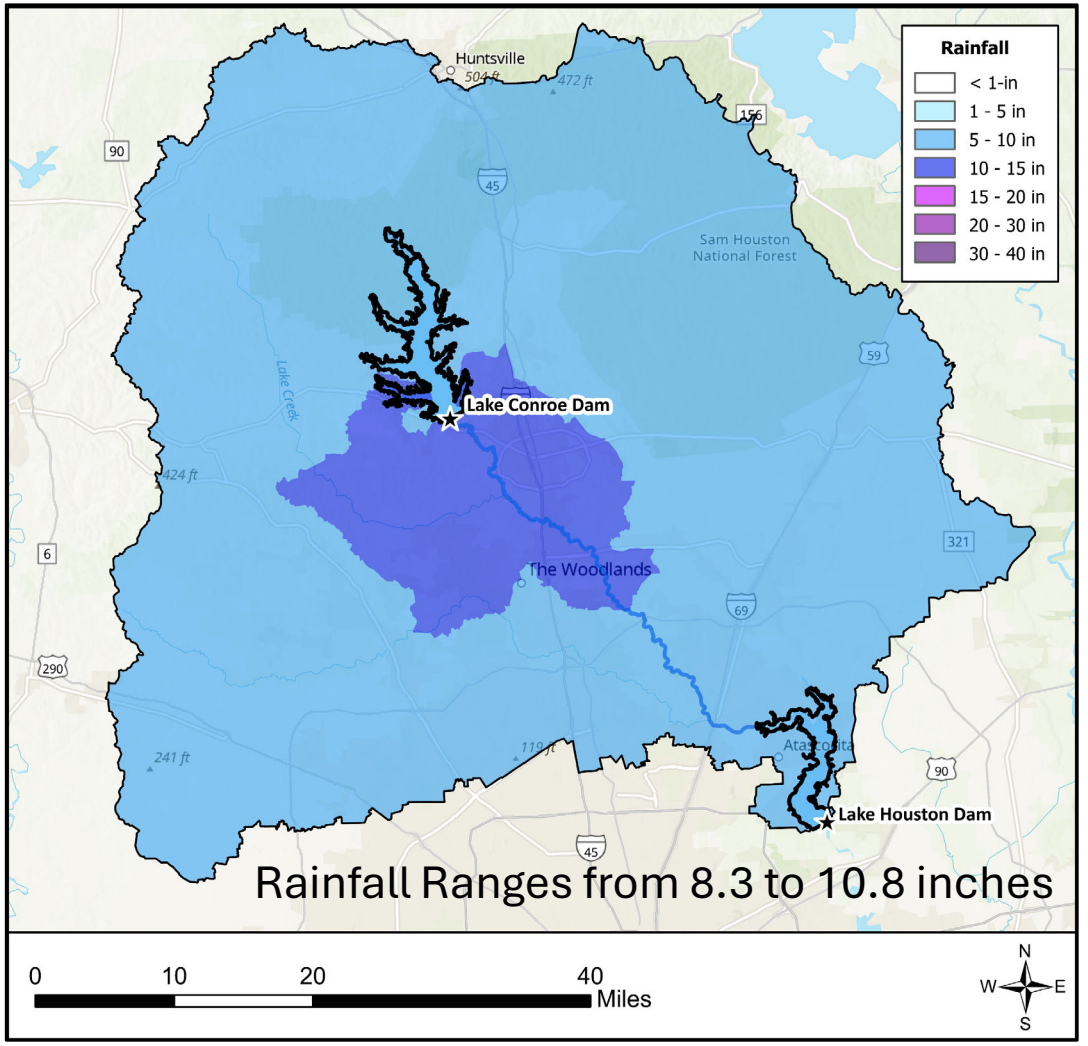
Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026



May 2024
Averaged 12.0-inches



25-year Synthetic Storm
Averaged 9.2-inches

Practical Pre-Release Approach

Based on existing operation constraints, a practical pre-release approach is **0.5-ft at Lake Conroe** and **1.5-ft at Lake Houston**.

Practical Pre-Release Scenarios

Scenarios 1-7

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Pre-Releases

Simulated pre-releases that are low risk to water supply, dam failure and public safety.

Objective

Determine potential flood reduction benefits of practical pre-releases across a range of storm events

Scenarios	Rain Event (Inches of Rain)	Pre-Release (% of Annual Permitted Water Supply)	
		Lake Conroe	Lake Houston
1	2-year (3.9-in)	0.5-ft (~10%)	1.5-ft (~9%)
2	5-year (5.4-in)		
3	10-year (6.8-in)		
4	Tax Day (8.2-in)		
5	25-year (9.2-in)		
6	May 2024 (12.0-in)		
7	Imelda (8.4-in)		

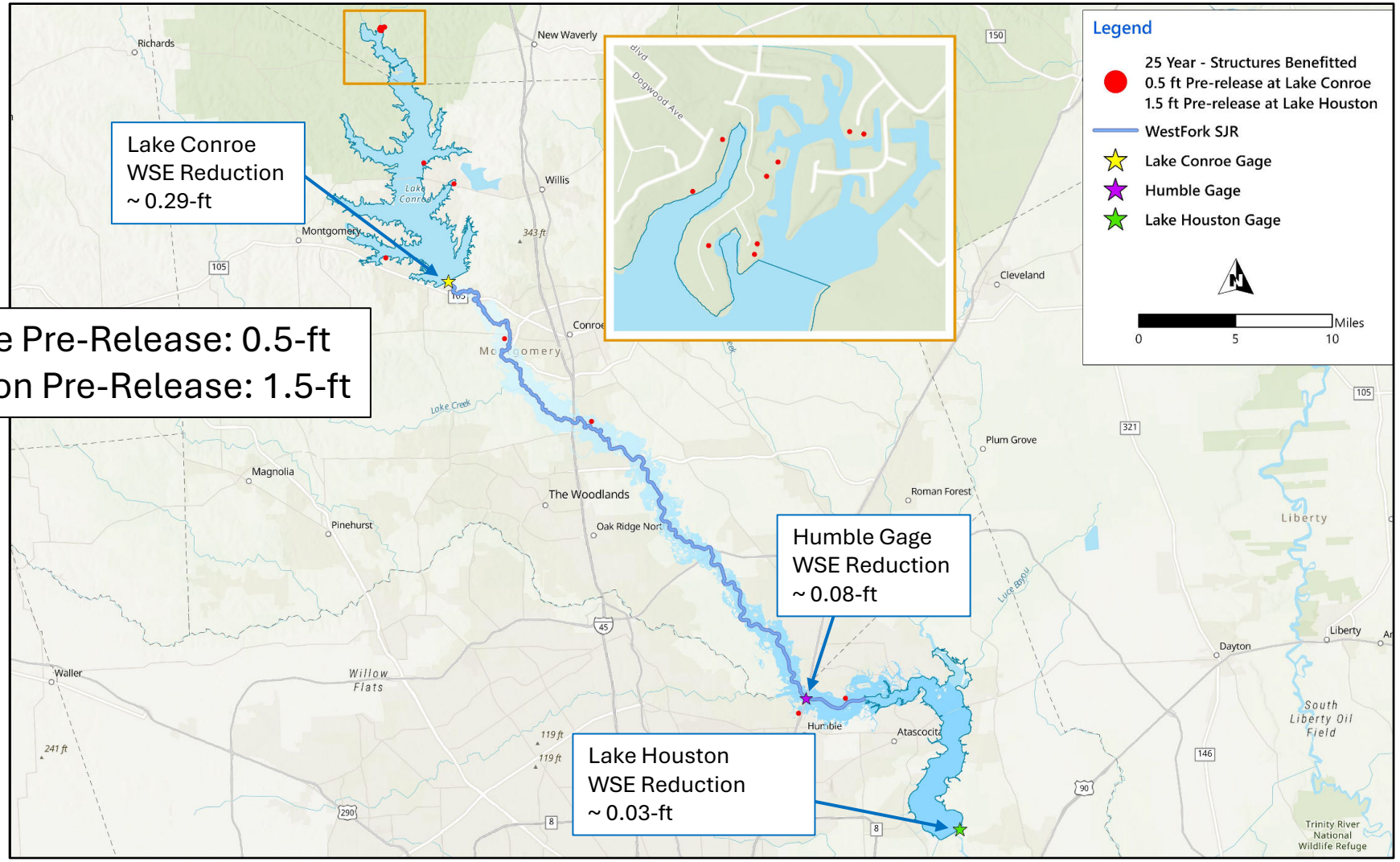
Practical Pre-Release Results

25-yr Synthetic Storm (Scenario 5)

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026



Lake Conroe Pre-Release: 0.5-ft
Lake Houston Pre-Release: 1.5-ft

16 modeled structures removed from flooding out of total 515 flooded structures (~3%)

Practical Pre-Release Results

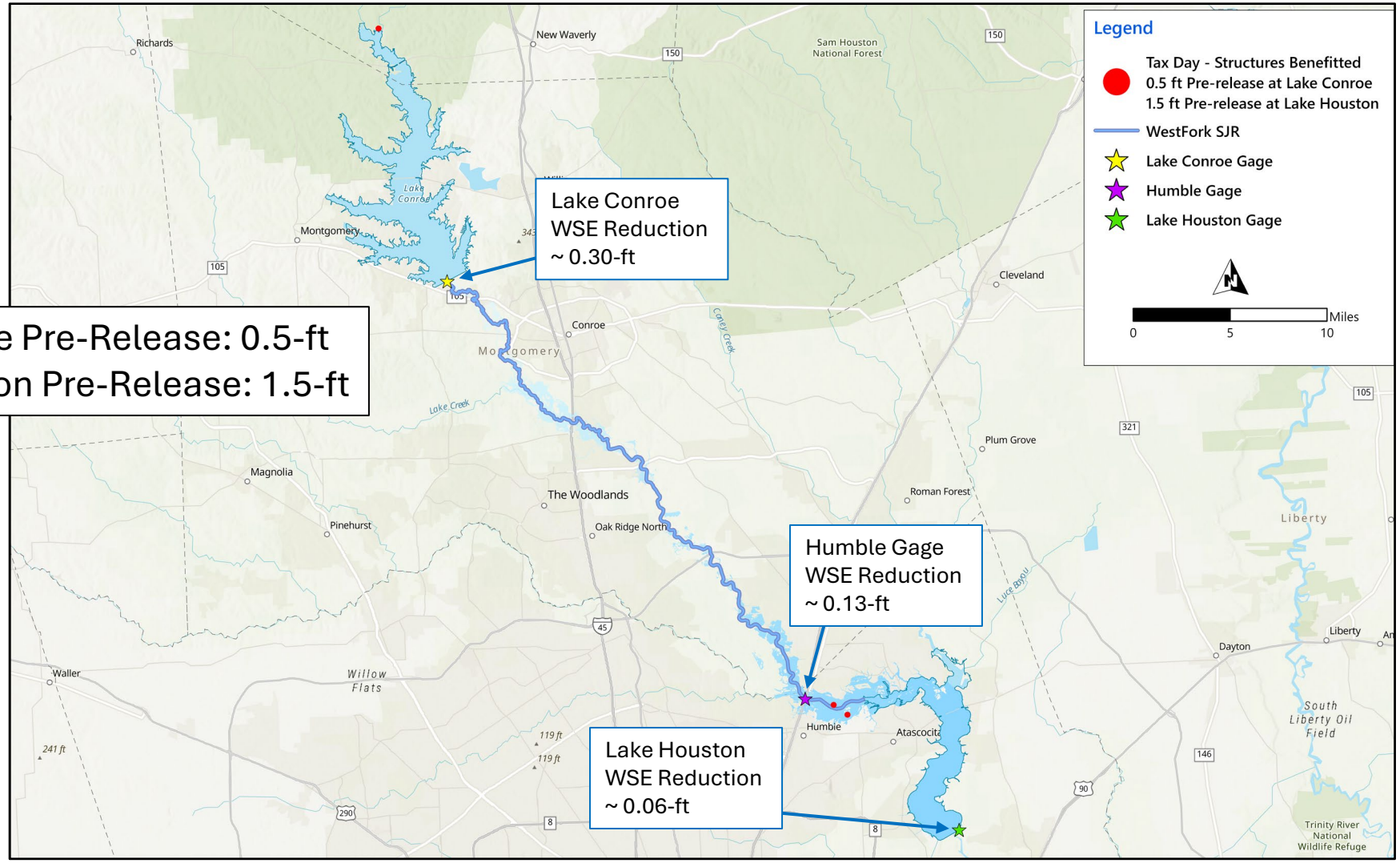
Tax Day 2016 (Scenario 4)

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Lake Conroe Pre-Release: 0.5-ft
Lake Houston Pre-Release: 1.5-ft



3 modeled structures removed from flooding out of total 207 flooded structures (~1%)

Practical Pre-Release Results

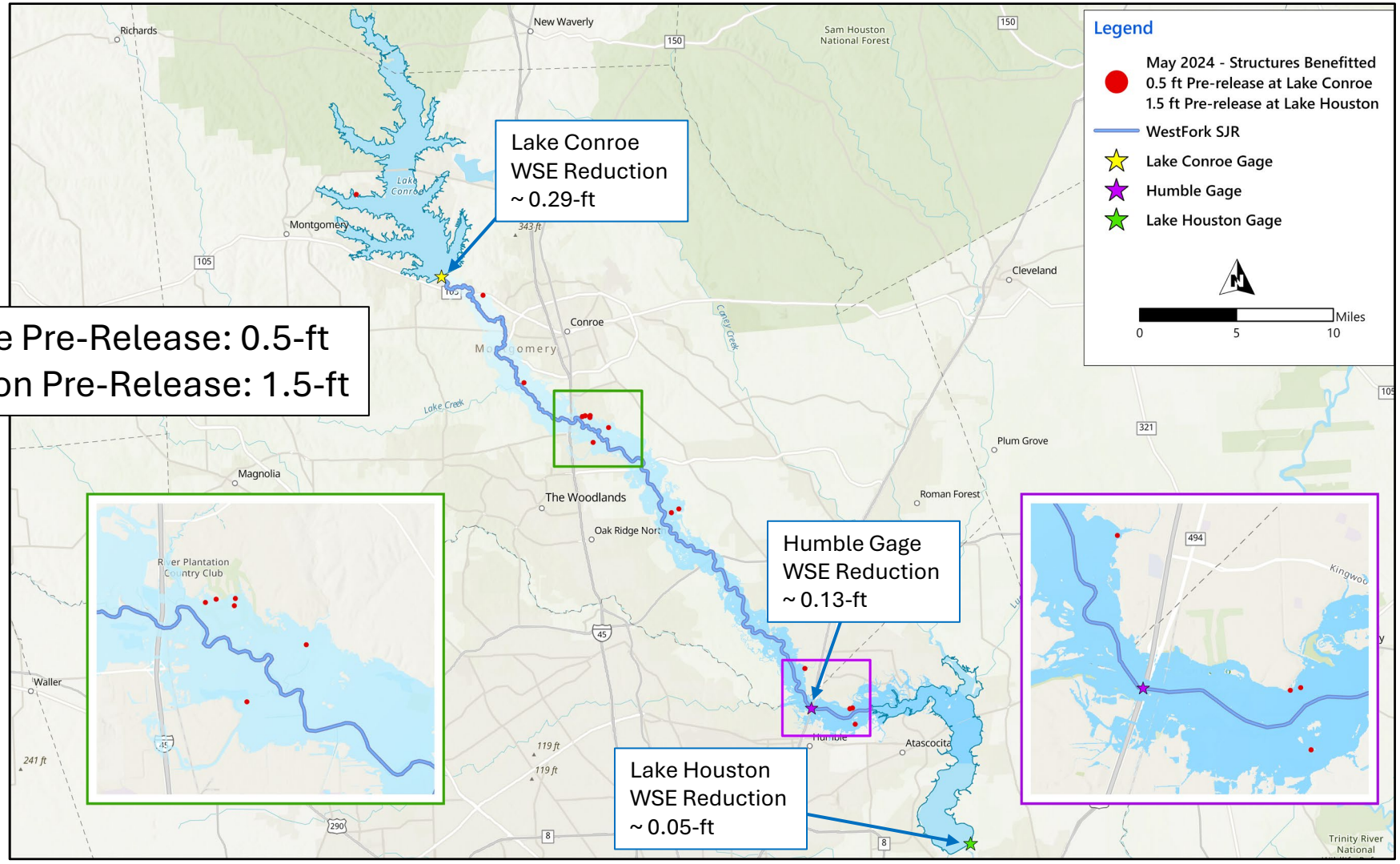
May 2024 (Scenario 6)

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Lake Conroe Pre-Release: 0.5-ft
Lake Houston Pre-Release: 1.5-ft



15 modeled structures removed from flooding out of total 784 flooded structures (~2%)

Practical Pre-Release Results

Scenarios 1-7

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Scenario	Operation Condition	Flood Event (Inches of Rain)	Pre-Release Amounts (ft)		Lake Conroe	Lake Houston	Humble Gage	Total Modeled Structures Flooded	Modeled Structures Removed from Flooding	% of Total Modeled Structures Removed	Lake Conroe Discharge Contributions (%) of Lake Houston Inflows
			Lake Conroe	Lake Houston	Lake Level Reductions (ft)	Lake Level Reductions (ft)	Stream Level Reductions (ft)				
1	Practical	2-year (3.9-in)	0.5	1.5	0.38	0.06	0.15	14	1	7%	15%
2	Practical	5-year (5.4-in)	0.5	1.5	0.42	0.02	0.07	59	1	2%	16%
3	Practical	10-year (6.8-in)	0.5	1.5	0.32	0.08	0.06	195	5	3%	17%
4	Practical	Tax Day (8.2-in)	0.5	1.5	0.30	0.06	0.13	207	3	1%	8%
5	Practical	25-year (9.2-in)	0.5	1.5	0.29	0.03	0.08	515	16	3%	17%
6	Practical	May 2024 (12.0-in)	0.5	1.5	0.29	0.05	0.13	784	15	2%	24%
7	Practical	Imelda (8.4-in)	0.5	1.5	0.31	0.01	0.04	223	1	<1%	1%

Key Finding

A practical pre-release approach has limited flood reduction benefits.

High-Risk Pre-Release Scenarios

Scenarios 8-9

Pre-Releases

Simulated pre-releases with high-risk dam operation conditions as sensitivity analysis.

Objective

Determine potential flood reduction benefits of large pre-releases that are outside of practical operating protocol.

Scenarios	Rain Event (Inches of Rain)	Pre-Release (% of Annual Permitted Water Supply)	
		Lake Conroe	Lake Houston
8*	25-year (9.2-in)	1.5-ft (~30%)	5.0-ft (~26%)
9*	May 2024 (12.0-in)	1.5-ft (~30%)	1.5-ft (~9%)

Please note that these pre-release scenarios are constrained by dam safety, legal and regulatory, and water supply limitations. Some evaluated scenarios are not practical based on these constraints (*).

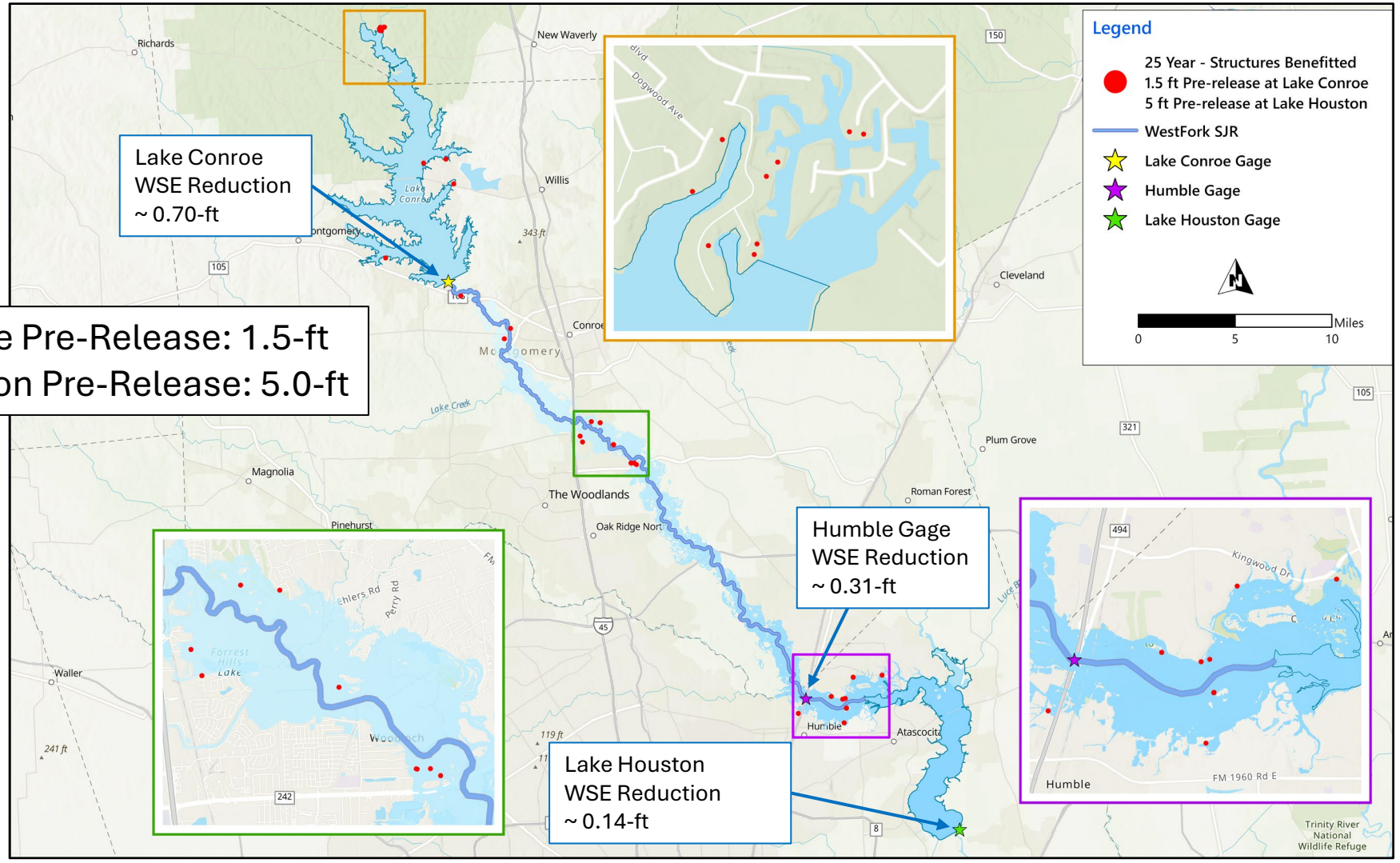
High-Risk Pre-Release Results

25-yr Synthetic Storm (Scenario 8)

Lake Conroe Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026



Lake Conroe Pre-Release: 1.5-ft
Lake Houston Pre-Release: 5.0-ft

35 modeled structures removed from flooding out of total 515 flooded structures (~7%)

High-Risk Pre-Release Scenarios

Scenarios 8-9

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Scenario	Operation Condition	Flood Event (Inches of Rain)	Pre-Release Amounts (ft)		Lake Conroe	Lake Houston	Humble Gage	Total Modeled Structures Flooded	Modeled Structures Removed from Flooding	% of Total Modeled Structures Removed	Lake Conroe Discharge Contributions (%) of Lake Houston Inflows
			Lake Conroe	Lake Houston	Lake Level Reductions (ft)	Lake Level Reductions (ft)	Stream Level Reductions (ft)				
8*	High-Risk	25-year (9.2-in)	1.5	5.0	0.70	0.14	0.31	515	35	7%	17%
9*	High-Risk	May 2024 (12.0-in)	1.5	1.5	0.33	0.07	0.18	784	23	3%	24%

Key Finding

High-Risk pre-releases provided additional measurable flood risk reduction in the scenarios evaluated. Nonetheless, there would still have been substantial flooding.

Please note that these pre-release scenarios are constrained by dam safety, legal and regulatory, and water supply limitations. Some evaluated scenarios are not practical based on these constraints (*).

Drought Drawdown Scenarios

Scenarios 10-11

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Reservoir Drawdowns

Simulated 2011 drought reservoir water elevations with Hurricane Harvey rainfall conditions.

Objective

Determine flood risk benefits of the lowest reservoir elevations on record.

Storm Events

- Hurricane Harvey with drought infiltration parameters.
- Hurricane Harvey with typical (non-drought) infiltration parameters.

Scenarios	Rain Event (Inches of Rain)	Lake Conroe Drawdown (% of Annual Permitted Water Supply)	Lake Houston Drawdown (% of Annual Permitted Water Supply)	Infiltration Conditions
10*	Hurricane Harvey (24.8-in)	~9-ft (~180%)	~6-ft (~31%)	Drought
11*	Hurricane Harvey (24.8-in)	~9-ft (~180%)	~6-ft (~31%)	Non-Drought

*Drought drawdown conditions unrealistic for actual pre-release implementation.

Drought Drawdown Results

Scenarios 10-11

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Scenario	Operation Condition	Flood Event (Inches of Rain)	Drawdown Amounts (ft)		Lake Conroe		Lake Houston		Humble Gage		Total Modeled Structures Flooded	Lake Conroe Discharge Contributions (%) of Lake Houston Inflows
			Lake Conroe	Lake Houston	Modeled Peak Level	Actual 2017 Peak Level	Modeled Peak Level	Actual 2017 Peak Level	Modeled Peak Level	Actual 2017 Peak Level		
10*	Drought	Harvey with 2011 Drought, High Infiltration (24.8-in)	N/A, ~9-ft low due to 2011 Drought	N/A, ~6-ft low due to 2011 Drought	202.84	206.23	48.45	53.12	64.31	69.60*	1,157	12%
11*	Drought	Harvey with 2011 Drought, Typical Infiltration (24.8-in)	N/A, ~9-ft low due to 2011 Drought	N/A, ~6-ft low due to 2011 Drought	204.02	206.23	50.20	53.12	67.80	69.60*	3,595	14%

**Highest reported level – the subject gage has some missing ordinates on August 29, 2017*

Key Findings

If Hurricane Harvey occurred when Lake Conroe and Lake Houston were ~9-ft and ~6-ft below normal water elevations, there would still have been substantial flooding.

Please note that these pre-release scenarios are constrained by dam safety, legal and regulatory, and water supply limitations. Some evaluated scenarios are not practical based on these constraints (*).

Isolated Reservoir Pre-Releases

Scenarios 12-14

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Pre-Releases

Perform pre-releases at one reservoir during storm event.

Objective

Evaluate how each reservoir impacts the potential flood reduction during a specific rain event.

Scenarios	Rain Event (Inches of Rain)	Pre-Release (% of Annual Permitted Water Supply)	
		Lake Conroe	Lake Houston
12*	25-year (9.2-in)	0-ft (0%)	5.0-ft (~26%)
13*	25-year (9.2-in)	1.5-ft (~30%)	0.0-ft (0%)
14	25-year (9.2-in)	0.5-ft (~10%)	0.0-ft (0%)

Please note that these pre-release scenarios are constrained by dam safety, legal and regulatory, and water supply limitations. Some evaluated scenarios are not practical based on these constraints (*).

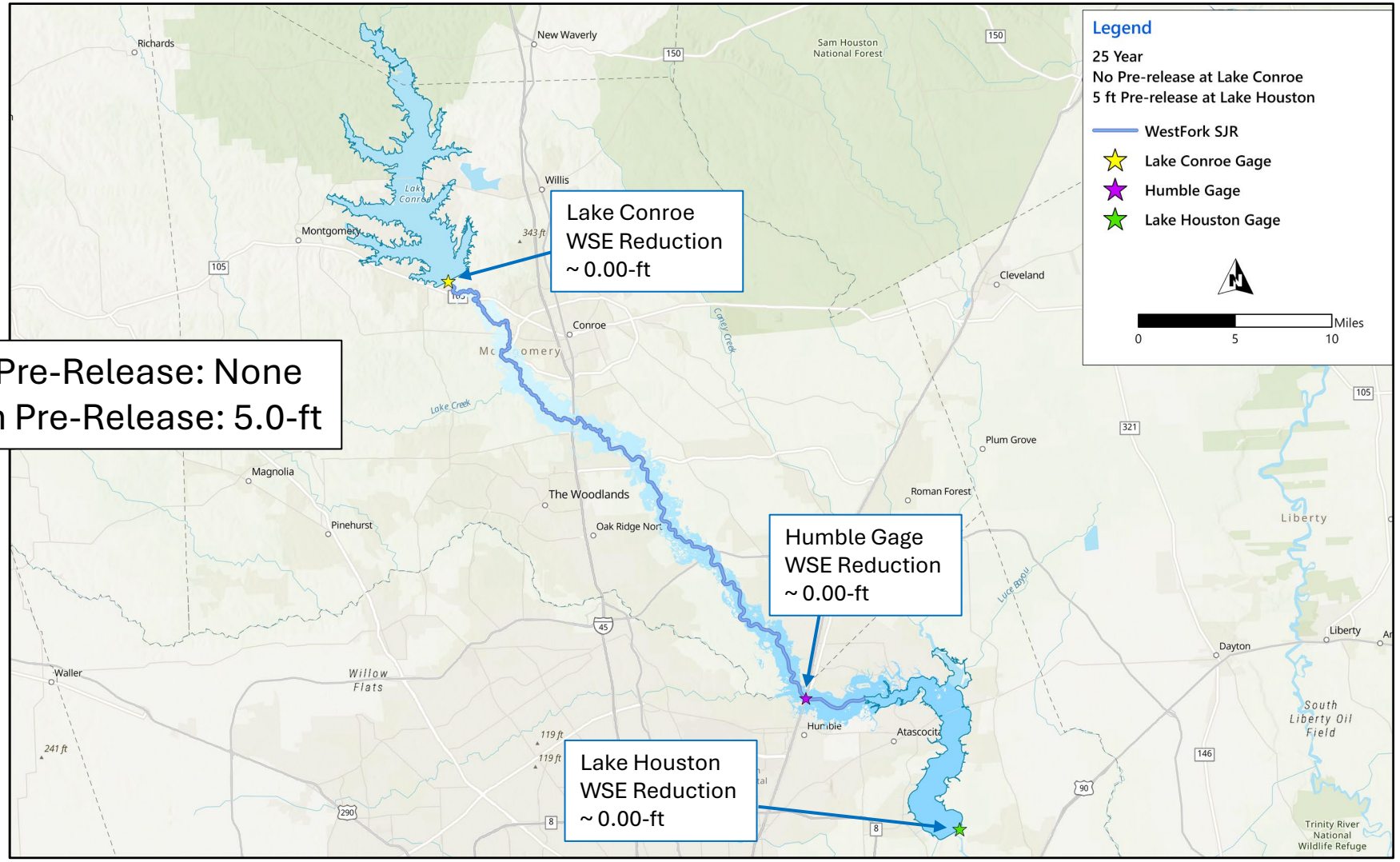
Isolated Pre-Release Results

25-yr Synthetic Storm (Scenario 12)

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026



Lake Conroe Pre-Release: None
Lake Houston Pre-Release: 5.0-ft

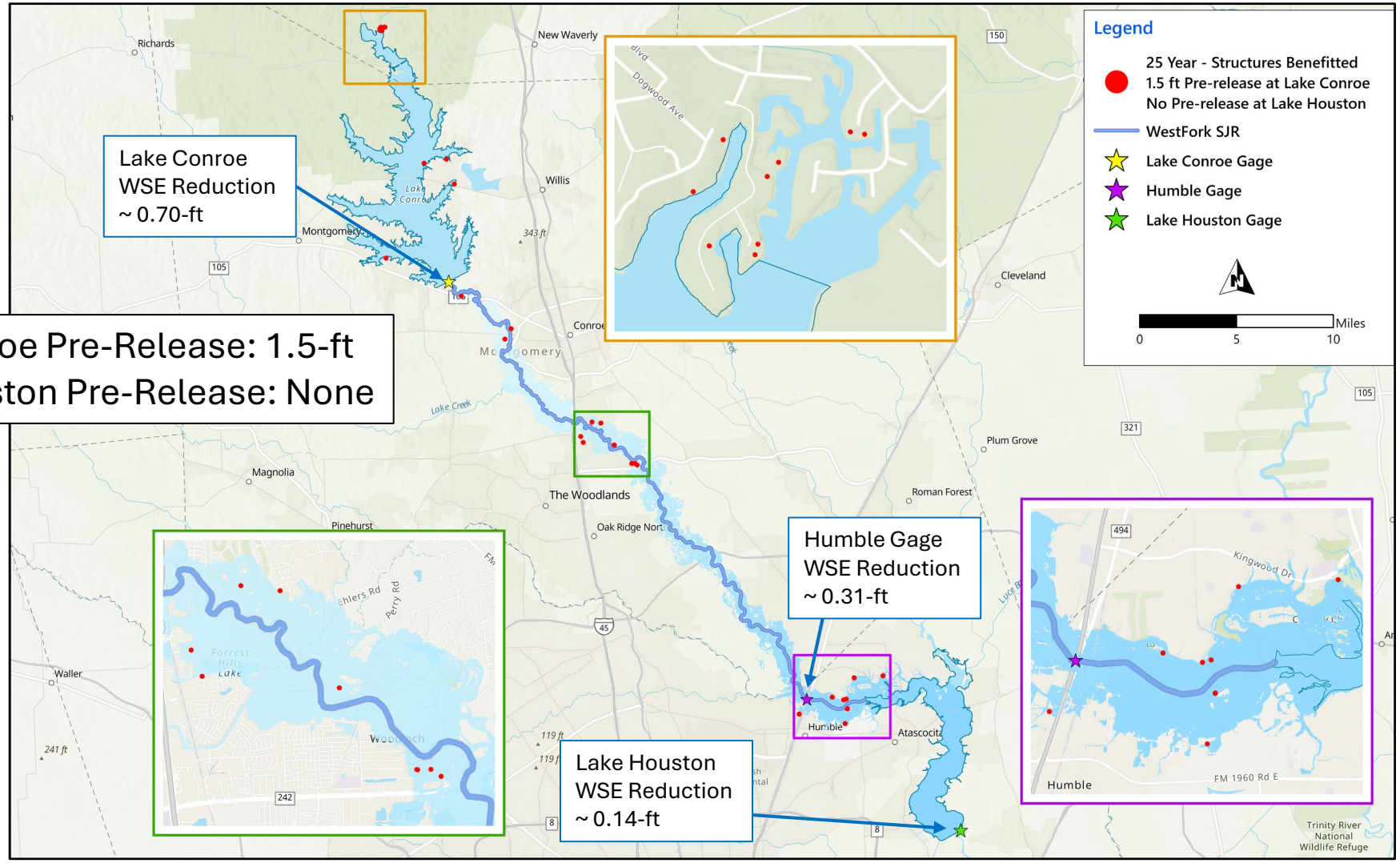
0 modeled structures removed from flooding out of total 515 flooded structures (0%)

Isolated Pre-Release Results

25-yr Synthetic Storm (Scenario 13)

Lake Conroe Joint Reservoir Operations Study | SJRA San Jacinto River Authority

Public Meeting #2 - November 5, 2026



Lake Conroe Pre-Release: 1.5-ft
Lake Houston Pre-Release: None

35 modeled structures removed from flooding out of total 515 flooded structures (~7%)

Isolated Pre-Release Results

Scenarios 12-14

Public Meeting #2 - November 5, 2026

Scenario	Operation Condition	Flood Event (Inches of Rain)	Pre-Release Amounts (ft)		Lake Conroe	Lake Houston	Humble Gage	Total Modeled Structures Flooded	Modeled Structures Removed from Flooding	% of Total Modeled Structures Removed	Lake Conroe Discharge Contributions (%) of Lake Houston Inflows
			Lake Conroe	Lake Houston	Lake Level Reductions (ft)	Lake Level Reductions (ft)	Stream Level Reductions (ft)				
12*	Isolated	25-year (9.2-in)	0	5.0	~0.00	~0.00	~0.00	515	0	0%	17%
13*	Isolated	25-year (9.2-in)	1.5	0	0.70	0.14	0.31	515	35	7%	17%
14	Isolated	25-year (9.2-in)	0.5	0	0.29	0.03	0.08	515	16	3%	17%

Key Findings

- Lake Conroe pre-releases provided some measurable flood risk reduction in the scenarios evaluated.
- Lake Houston pre-releases did not provide measurable flood risk reduction in the scenarios evaluated.

Please note that these pre-release scenarios are constrained by dam safety, legal and regulatory, and water supply limitations. Some evaluated scenarios are not practical based on these constraints (*).

Extended Reservoir Drawdowns

Scenarios 15-17

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Reservoir Drawdowns

Lower reservoirs over an extended duration.

Objective

Safely drawdown reservoirs to provide additional temporary stormwater capacity.

Scenarios	Rain Event (Inches of Rain)	Pre-Release (% of Annual Permitted Water Supply)	
		Lake Conroe	Lake Houston
15*	25-year (9.2-in)	2.0-ft (~40%)	0.0-ft (0%)
16*	Tax Day (8.2-in)	2.0-ft (~40%)	0.0-ft (0%)
17*	100-year (13.8-in)	2.0-ft (~40%)	1.5-ft (~9%)

Please note that these pre-release scenarios are constrained by dam safety, legal and regulatory, and water supply limitations. Some evaluated scenarios are not practical based on these constraints (*).

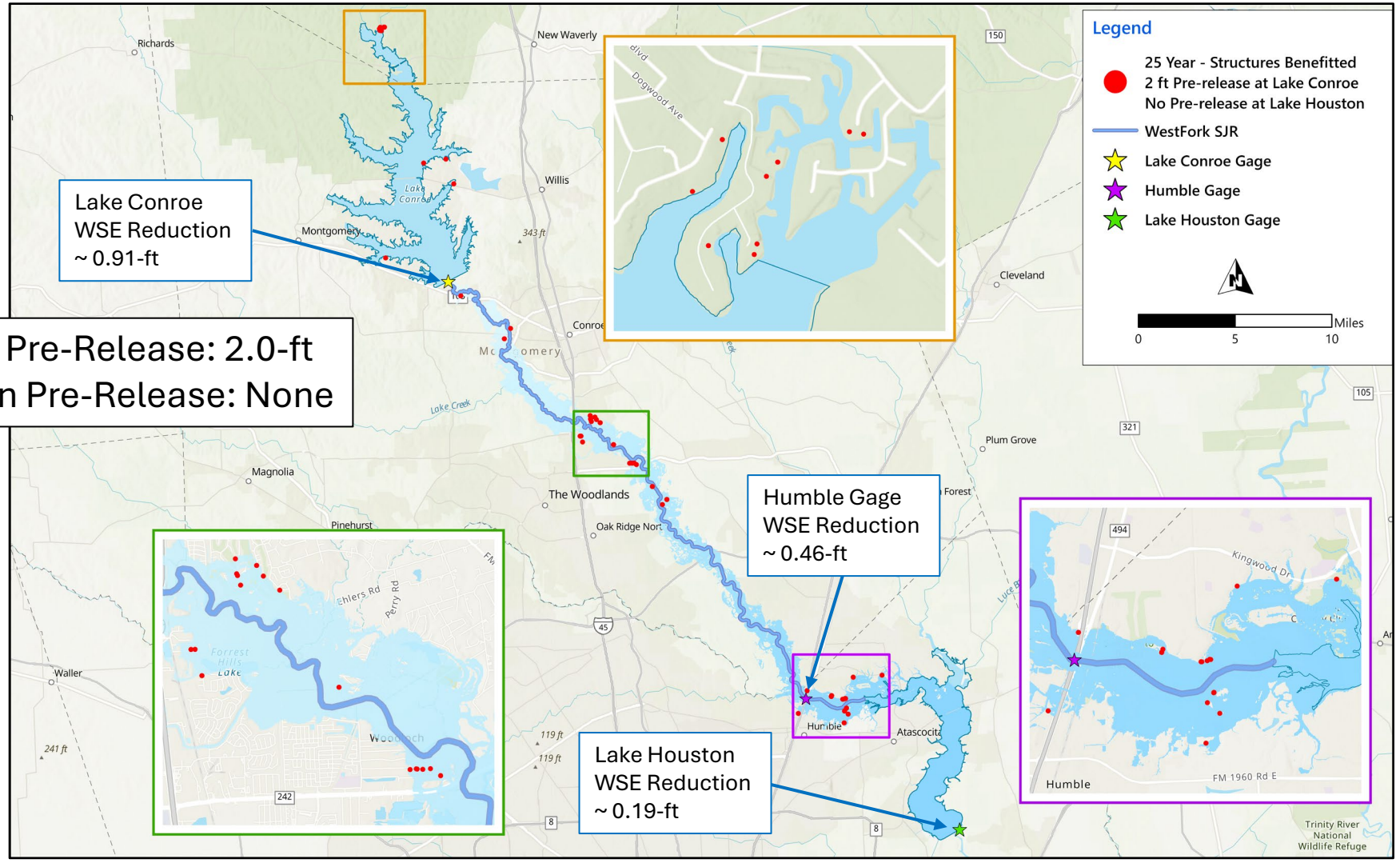
Extended Drawdown Results

25-yr Synthetic Storm (Scenario 15)

Lake Conroe Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026



Lake Conroe Pre-Release: 2.0-ft
Lake Houston Pre-Release: None

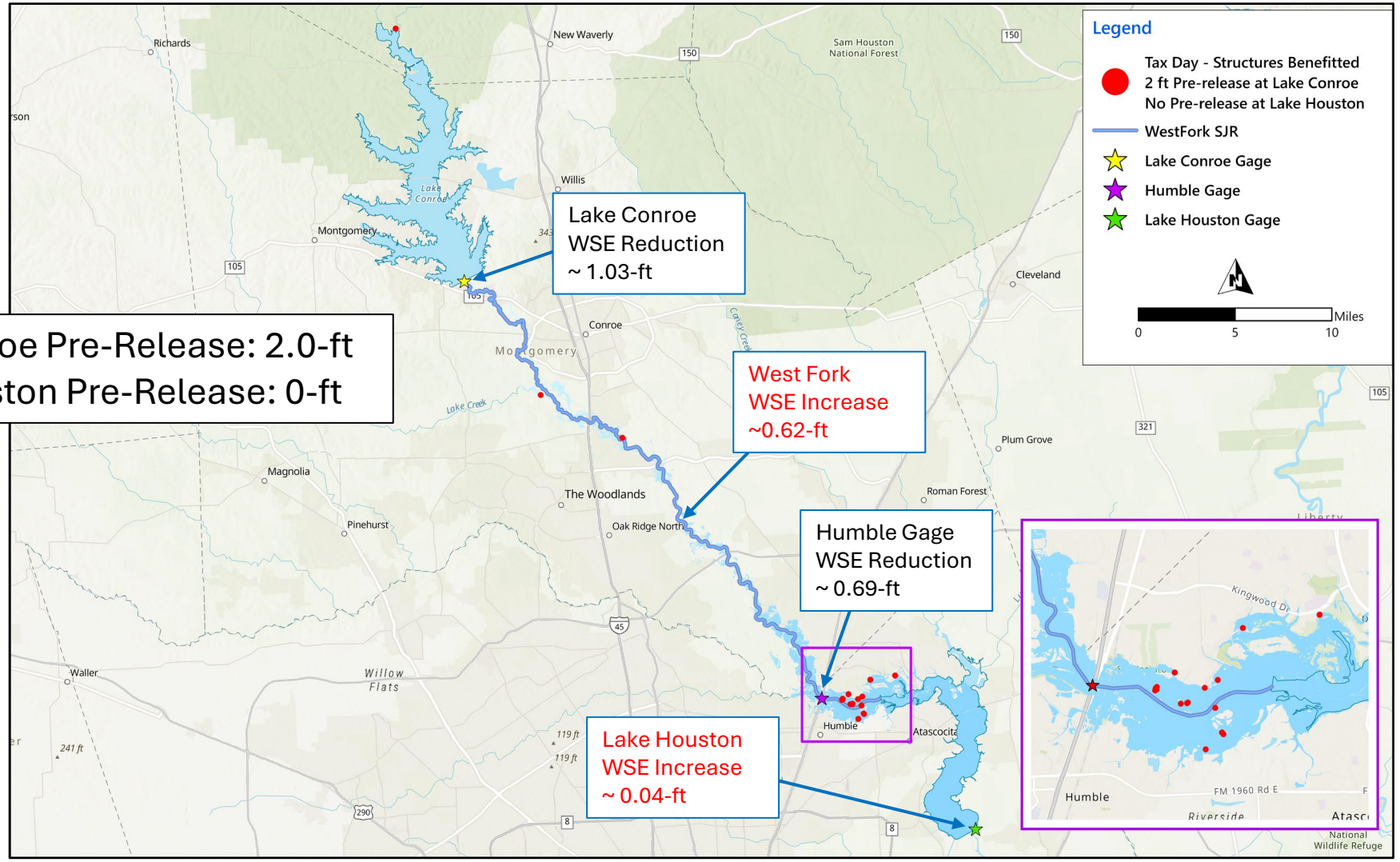
53 modeled structures removed from flooding out of total 515 flooded structures (~10%)

Extended Drawdown Results

Tax Day 2016 (Scenario 16)

Public Meeting #2 - November 5, 2026

Lake Conroe Pre-Release: 2.0-ft
Lake Houston Pre-Release: 0-ft



26 modeled structures removed from flooding out of total 207 flooded structures (~13%).
One additional modeled structure flooded.

Extended Drawdown Results

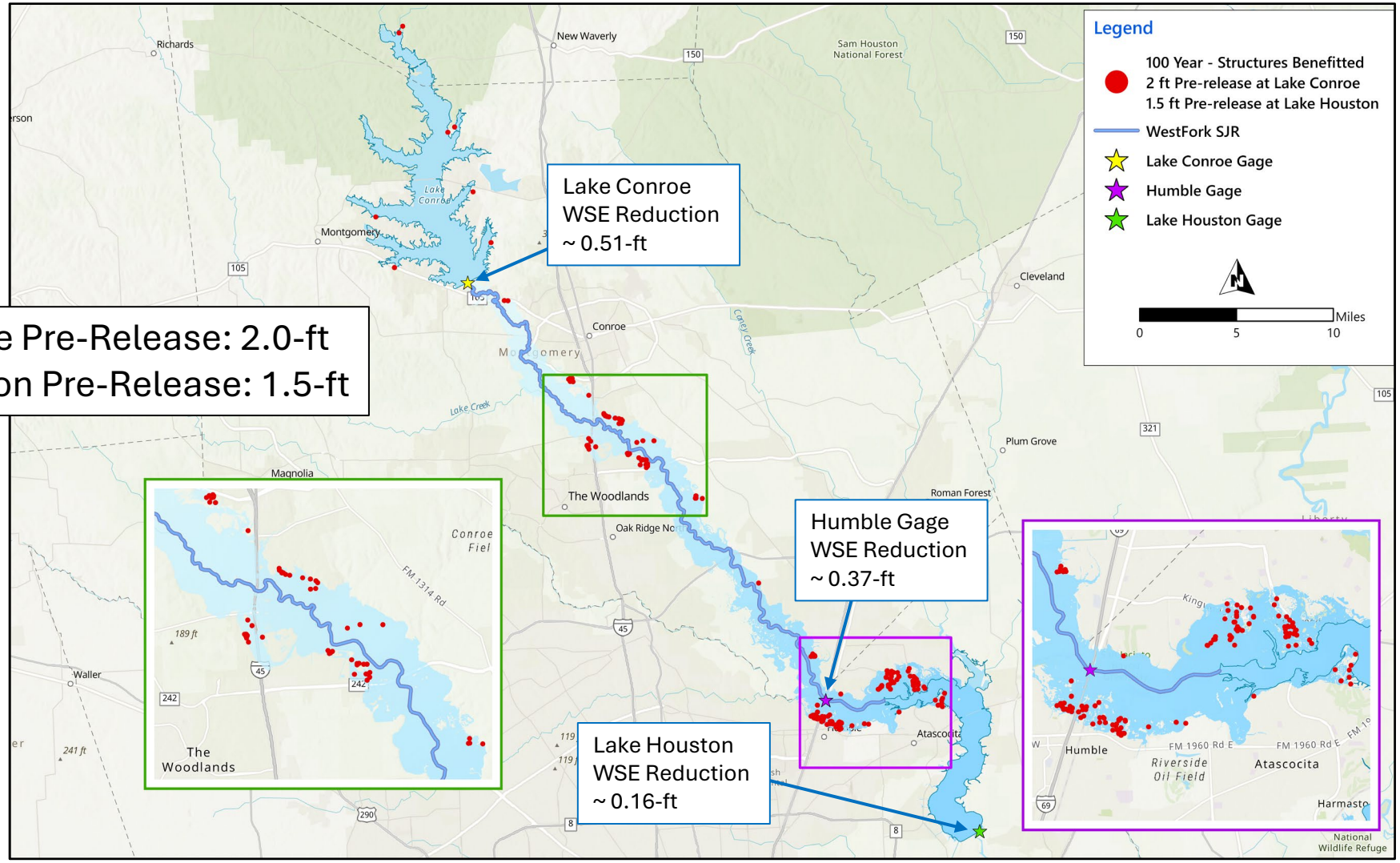
100-yr Synthetic Storm (Scenario 17)

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Lake Conroe Pre-Release: 2.0-ft
Lake Houston Pre-Release: 1.5-ft



217 modeled structures removed from flooding out of total 2477 flooded structures (~9%)

Extended Drawdown Results

Scenarios 15-17

Lake Conroe Lake Houston Joint Reservoir Operations Study

SJRA SAN JACINTO RIVER AUTHORITY

Public Meeting #2 - November 5, 2026

Scenario	Operation Condition	Flood Event (Inches of Rain)	Pre-Release Amounts (ft)		Lake Conroe	Lake Houston	Humble Gage	Total Modeled Structures Flooded	Modeled Structures Removed from Flooding	% of Total Modeled Structures Removed	Lake Conroe Discharge Contributions (%) of Lake Houston Inflows
			Lake Conroe	Lake Houston	Lake Level Reductions (ft)	Lake Level Reductions (ft)	Stream Level Reductions (ft)				
15*	Extended Drawdown	25-year (9.2-in)	2.0	0	0.91	0.19	0.46	515	53	10%	17%
16*	Extended Drawdown	Tax Day (8.2-in)	2.0	0	1.03	-0.04 (increase)	0.69	207	26	13%	8%
17*	Extended Drawdown	100-year (13.8-in)	2.0	1.5	0.51	0.16	0.37	2477	217	9%	16%

Key Findings

Extended drawdowns at Lake Conroe provide additional measurable flood risk reduction.

Please note that these pre-release scenarios are constrained by dam safety, legal and regulatory, and water supply limitations. Some evaluated scenarios are not practical based on these constraints (*).

Pre-Release Results Summary

Lake Conroe pre-releases provided some measurable flood risk reduction in the scenarios evaluated.

Lake Houston pre-releases did not provide measurable flood risk reduction in the scenarios evaluated.

Next Steps

- Finalize Pre-Release Evaluation
- Complete Lake Houston Flow Forecasting Tool
- Conduct forecast tool workshops with CWA and City of Houston
- Prepare Study Report

Community Engagement / Estimated Schedule

Kickoff – September 2025

Public Meetings

- #1 – March 2026: Study Background, Scope, and Goals (Humble)
- #2 – November 2026: Pre-Release Results (Conroe)
- #3 – Spring 2027: Study Results (TBD)

Website: LCLHJointOps.com

Public comments welcome on the study, flood risk locations, and flood impacts

Public Comments

(3 minutes per speaker)