A Dual-phase Ensemble Framework for Enhancing Reservoir Inflow Forecasting

Supplementary Information

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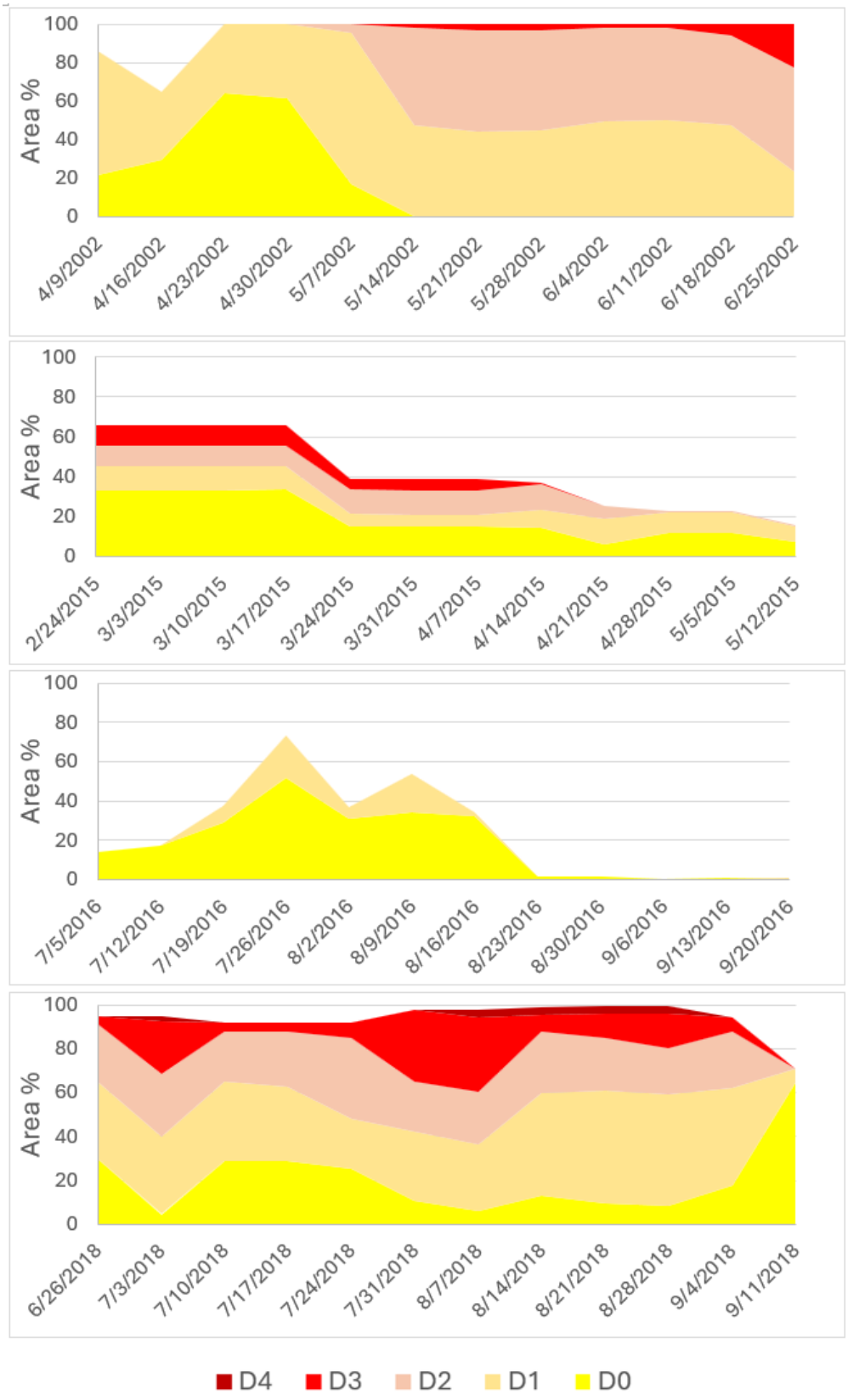
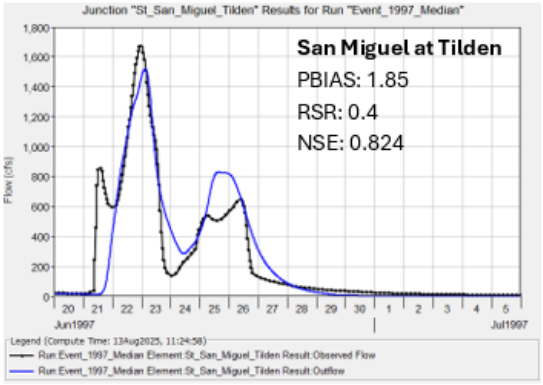
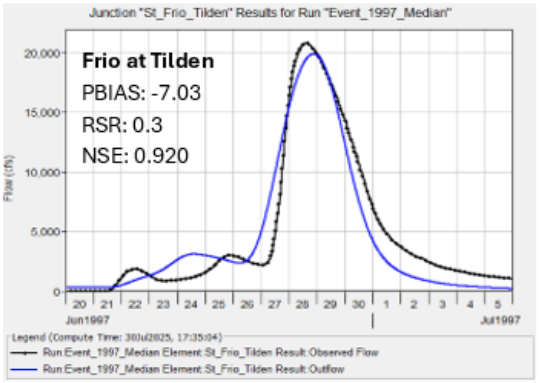


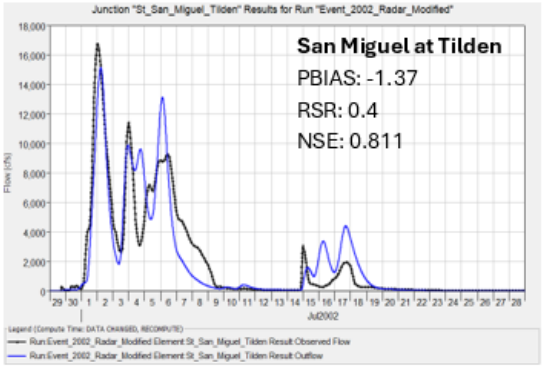
Figure S1: Selected rainfall events 12 weeks drought category pattern

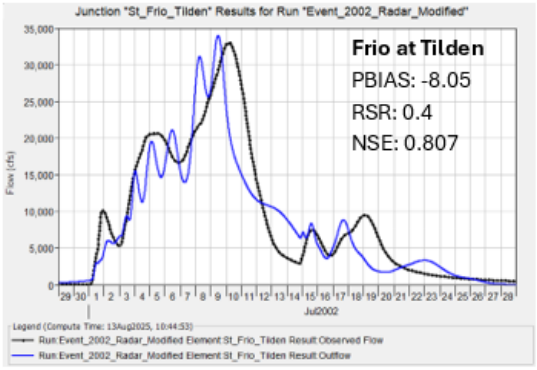
1997 Calibration



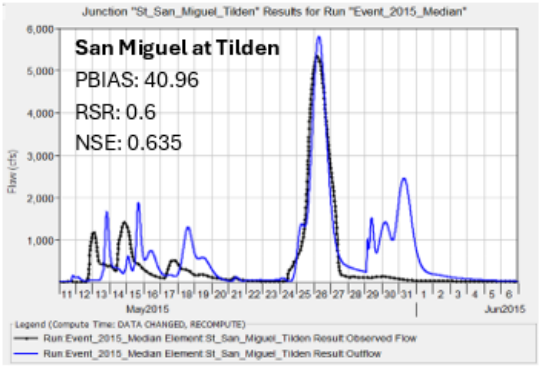


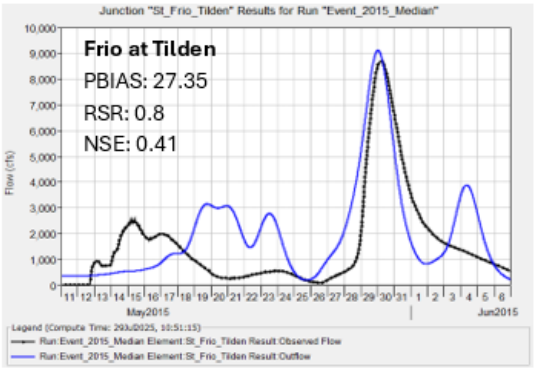
2002 Calibration



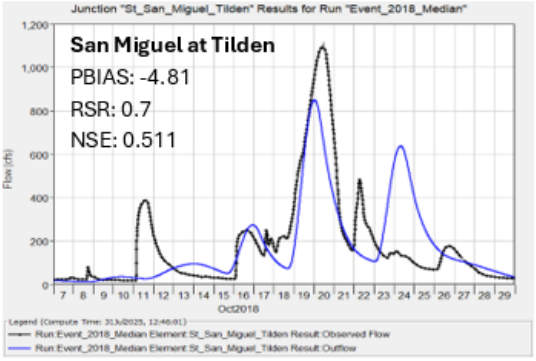


2015 Calibration





2018 Calibration



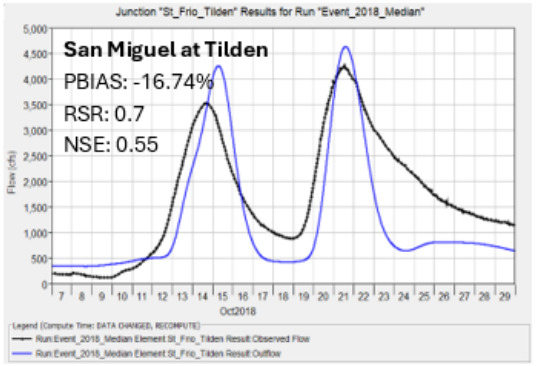
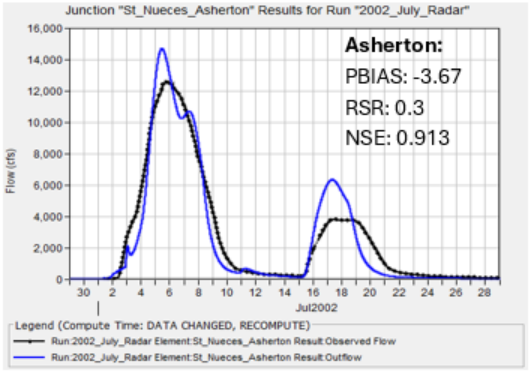
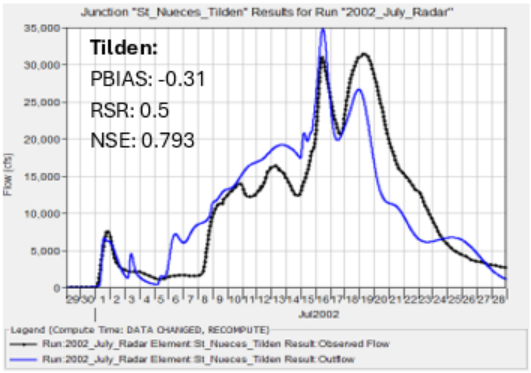


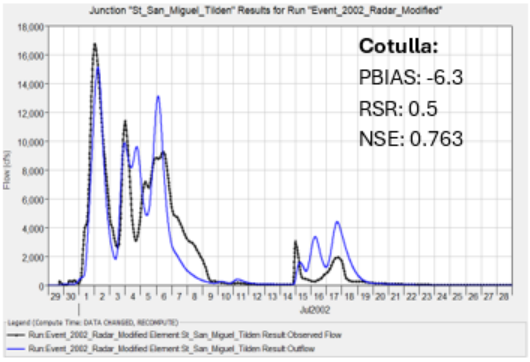
Figure S2: Flow hydrograph for calibration at Choke Canyon Reservoir inflow stations

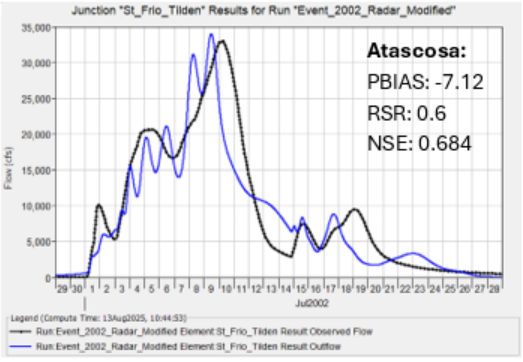
2002 Calibration



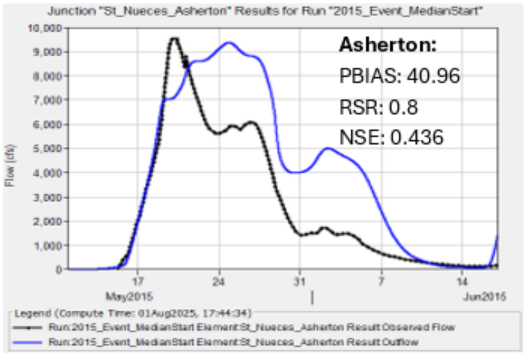


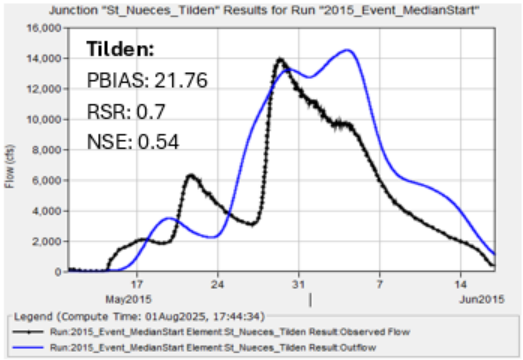
2002 Calibration





2015 Calibration





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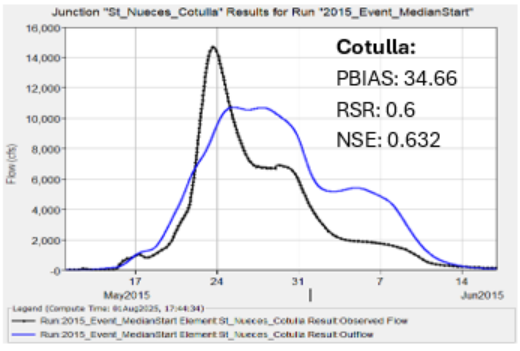


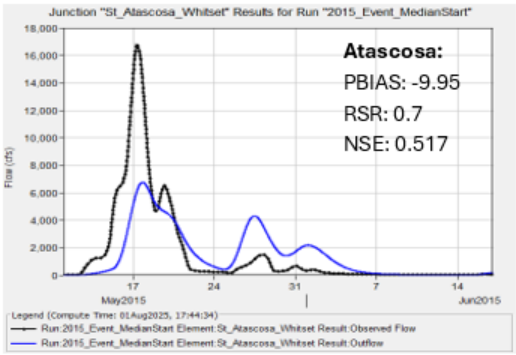
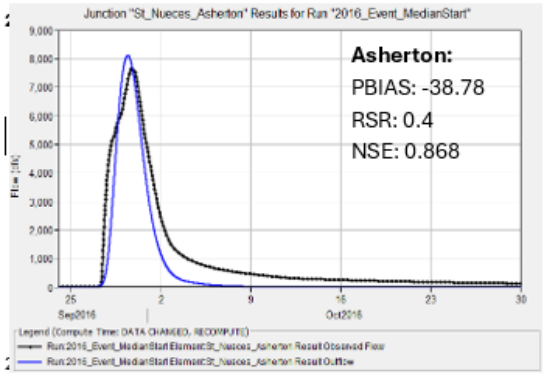
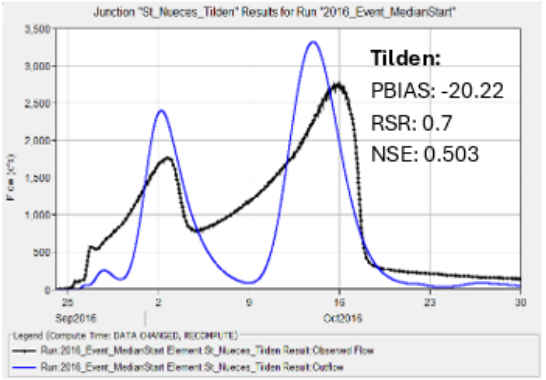


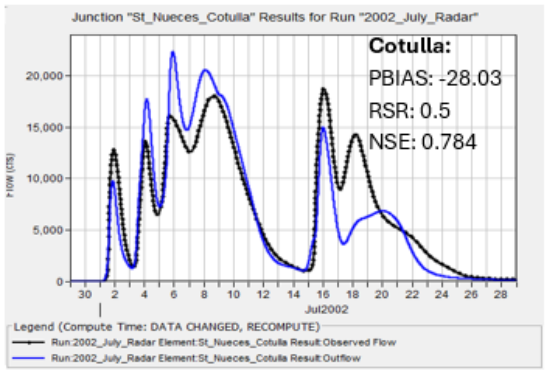
Figure S3a: Flow hydrograph for calibration at Lake Corpus Christi stations (2002 & 2015)

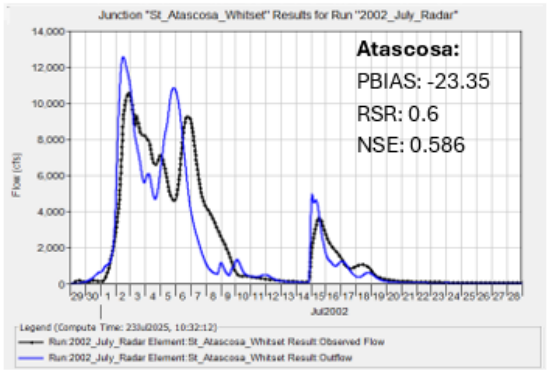
2016 Calibration



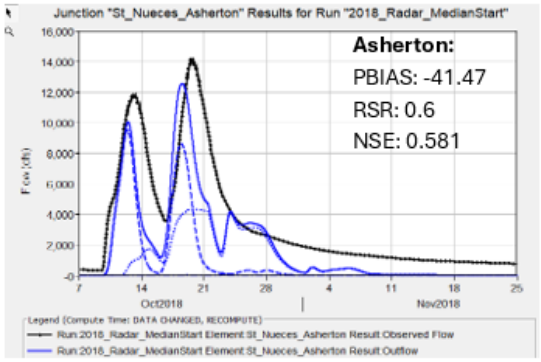


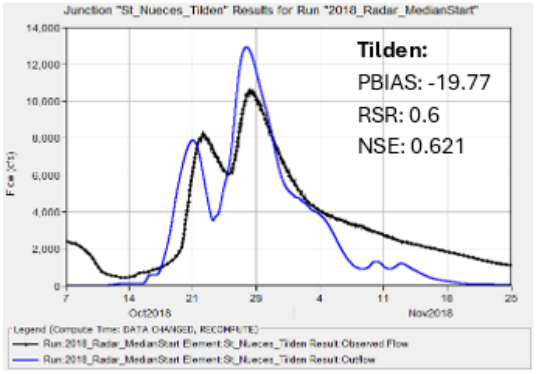
2016 Calibration



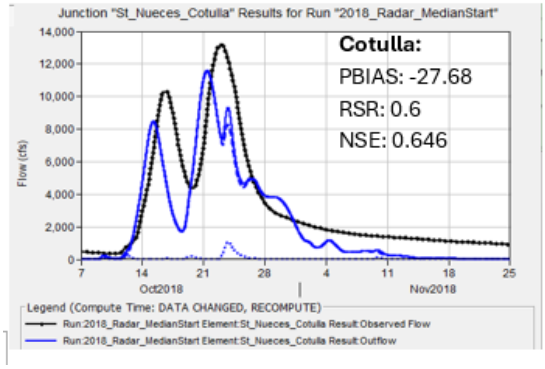


2018 Calibration





2018 Calibration



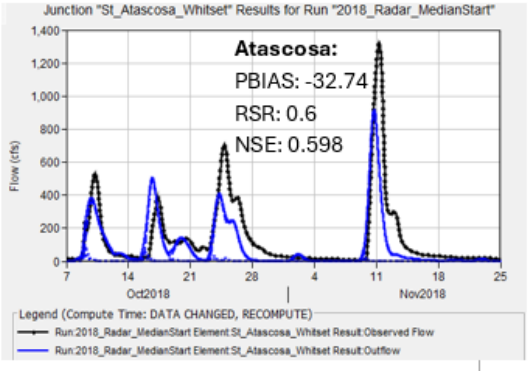


Figure S3b: Flow hydrographs for calibration at Lake Corpus Christi stations (2016 and 2018)

Table S1: Characterstics of and initial condition calibrated and derived ensemble for Choke Canyon Reservoir model

Choke canyon Reservoir model ensemble members		
Event Year	Ensemble member	Description
1997	1997-Cali	This original model has been prepared by calibrating on the 1997 summer event (20-Jun to 6-July).
	1997-Wet	The wet scenario is developed from the original considering highly saturated initial soil moisture condition with no initial loss.
	1997-Dry	The dry scenario represents a probable dry initial condition created with 2 times the observed initial loss from the calibrated model
2002	2002-Cali	This original model has been prepared by calibrating on the 2002 summer (29-Jun to 29-July).
	2002-Wet	The wet scenario is developed from the original considering highly saturated initial soil moisture condition with no initial loss.
	2002-Dry	The dry scenario represents a probable dry initial condition created with 2 times the observed initial loss from the calibrated model
2015	2015-Cali	This original model has been prepared by calibrating on the 2015 (11-May to 7-Jun).
	2015-Wet	The wet scenario is developed from the original considering highly saturated initial soil moisture condition with no initial loss.
	2015-Dry	The dry scenario represents a probable dry initial condition created with 2 times the observed initial loss from the calibrated model
2018	2018-Cali	This original model has been prepared by calibrating on the 2018 (07-Oct to 30-Oct).
	2018-Wet	The wet scenario is developed from the original considering highly saturated initial soil moisture condition with no initial loss.
	2018-Dry	The dry scenario represents a probable dry initial condition created with 2 times the observed initial loss from the calibrated model

Table S2: Characterstics of and initial condition calibrated and derived ensemble for Lake Corpus Christi model

Lake Corpus Christi inflow model Ensemble members		
Event Year	Ensemble member	Description
2002	2002-Cali	This original model has been prepared by calibrating on the 2002 event (29-Jun to 29-July).
	2002-Wet	The wet scenario is developed from the original considering highly saturated initial soil moisture condition with no initial loss.
	2002-Dry	The dry scenario represents a probable dry initial condition created with 2 times the observed initial loss from the calibrated model
2015	2015-Cali	This original model has been prepared by calibrating on the 2015 summer (07-May to 20-Jun).
	2015-Wet	The wet scenario is developed from the original considering highly saturated initial soil moisture condition with no initial loss.
	2015-Dry	The dry scenario represents a probable dry initial condition created with 2 times the observed initial loss from the calibrated model
2016	2016-Cali	This scenario has been prepared calibrating on the 2016 summer (24-Sep to 30-Oct).
	2016-Wet	The wet scenario is developed from the original considering highly saturated initial soil moisture condition with no initial loss.
	2016-Dry	The dry scenario represents a probable dry initial condition created with 2 times the observed initial loss from the calibrated model
2018	2018-Cali	This scenario has been prepared calibrating on the 2018 summer (07-Oct to 25-Nov).
	2018-Wet	The wet scenario is developed from the original considering highly saturated initial soil moisture condition with no initial loss.
	2018-Dry	The dry scenario represents a probable dry initial condition created with 2 times the observed initial loss from the calibrated model

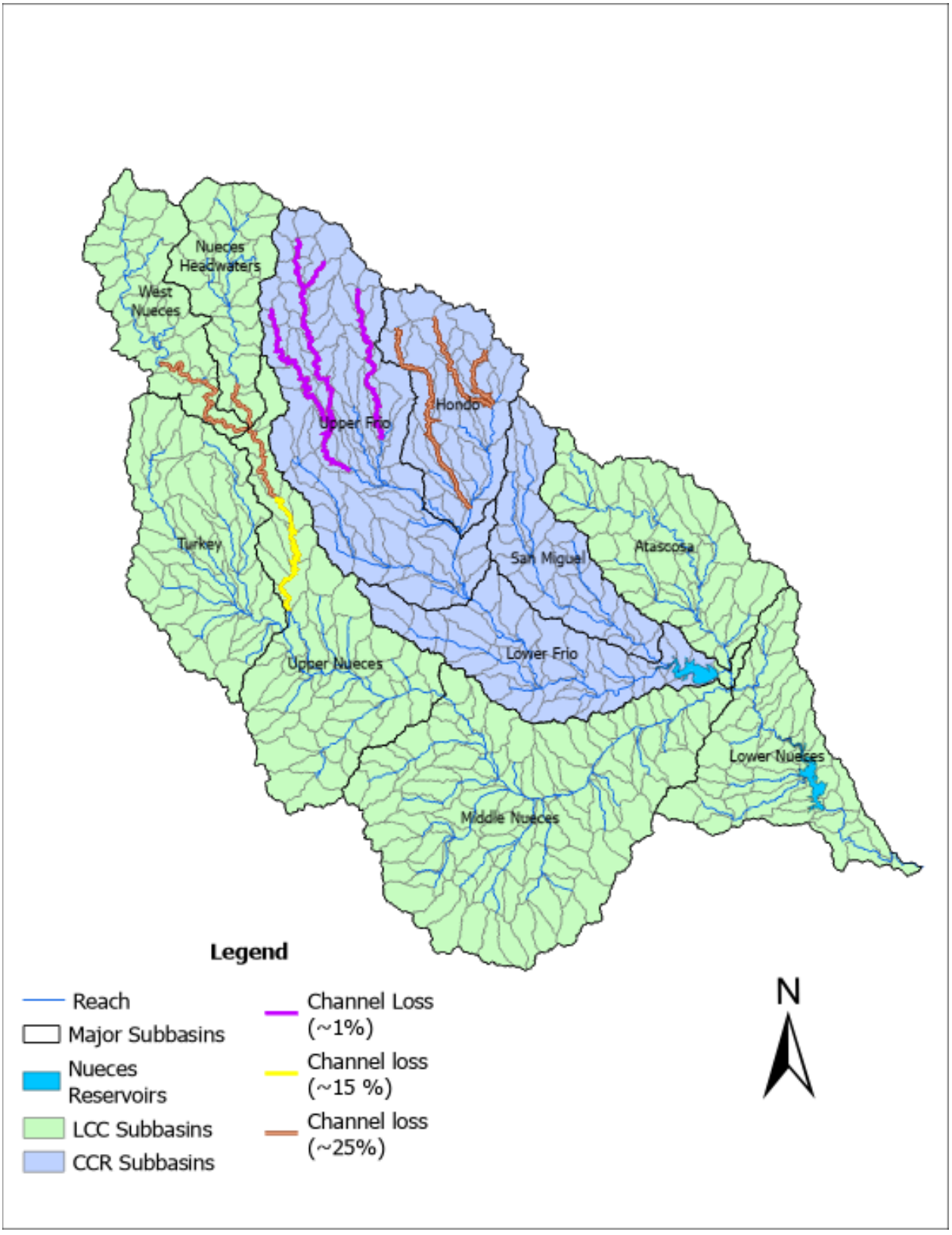


Figure S4a: Nueces River Basin channel loss reaches on HEC-HMS

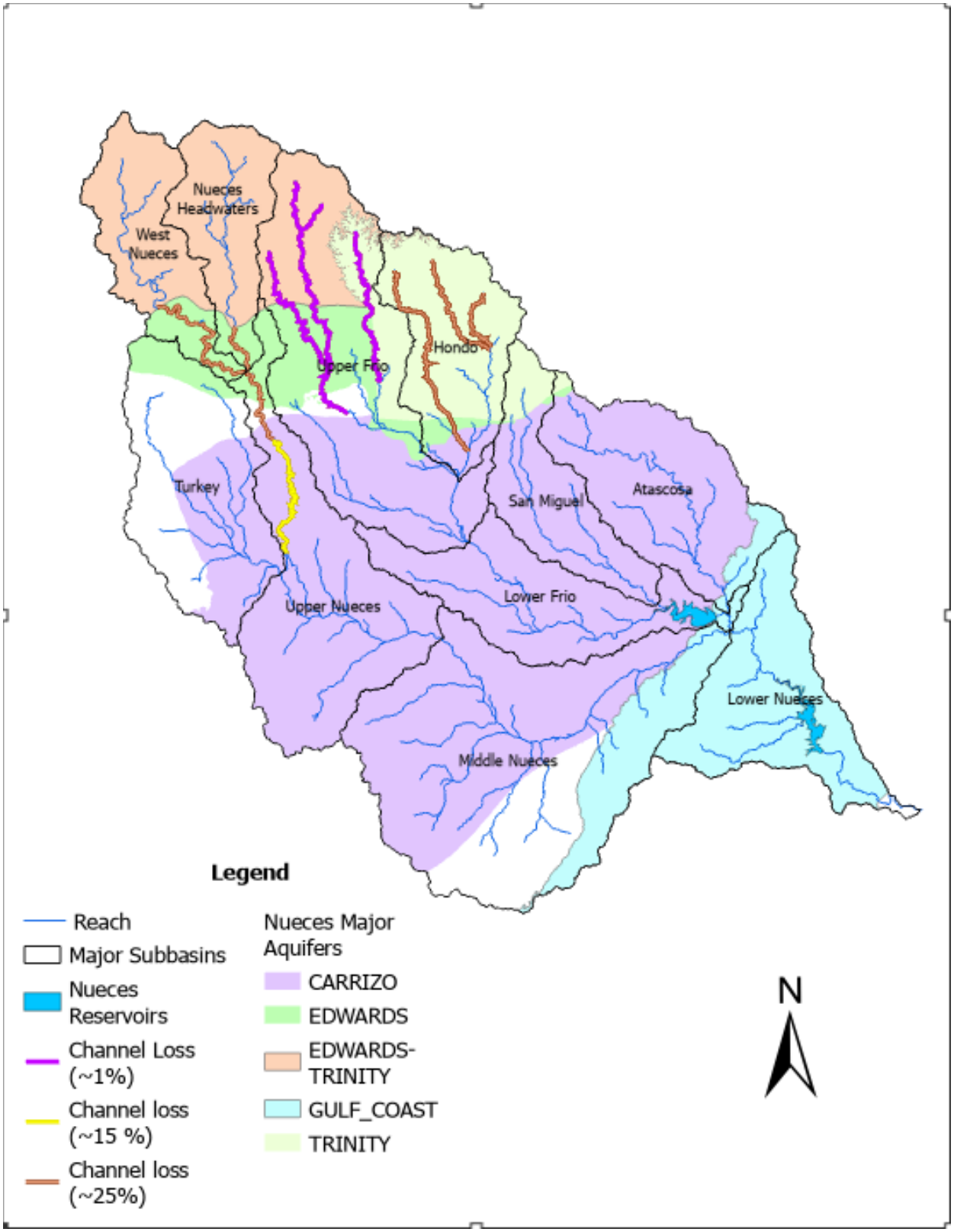


Figure S4b: Nueces Basin River channel loss reaches with ground water aquifer layers