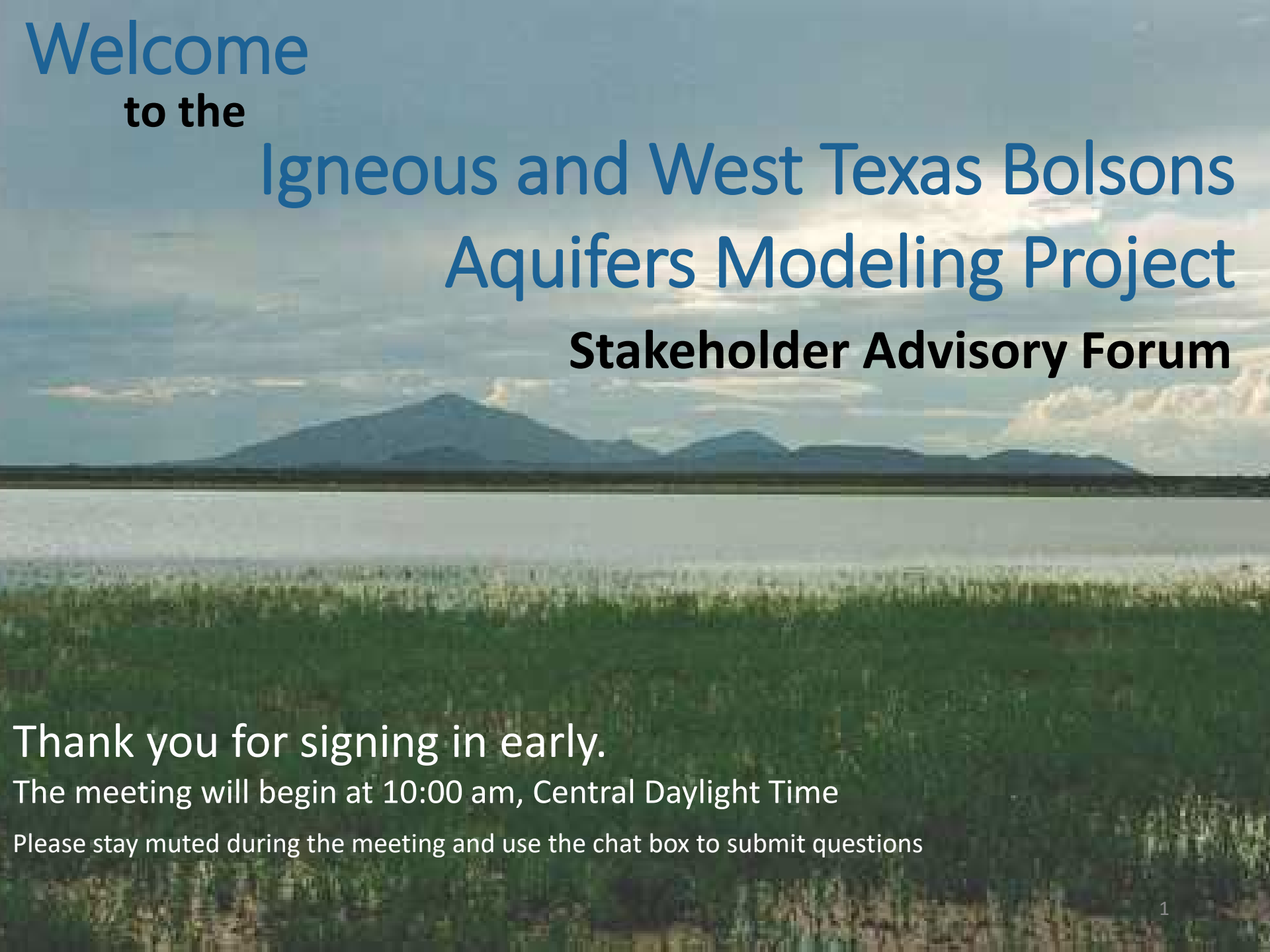
Welcome

to the

Igneous and West Texas Bolsons Aquifers Modeling Project

Stakeholder Advisory Forum



Thank you for signing in early.

The meeting will begin at 10:00 am, Central Daylight Time

Please stay muted during the meeting and use the chat box to submit questions

Meeting information

- Draft model and report out for public comment
  - Due end of day **September 1, 2025**

- An audio and video recording of the meeting, presentation, and the report summarizing the meeting will be made available on the TWDB webpage for this project

- https://www.twdb.texas.gov/groundwater/models/gam/wtbi/wtbi.asp

Why Stakeholder Advisory Forums?

Keep stakeholders updated about progress of the modeling project

Inform how the groundwater model can, should, and should not be used

Provide stakeholders with the opportunity to provide input and data to assist with model development

Contact information

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512-475-0470

Daryn.Hardwick@twdb.texas.gov

Web information:

https://www.twdb.texas.gov/groundwater/models/gam/wtbi/wtbi.asp

Igneous and West Texas Bolsons Aquifers

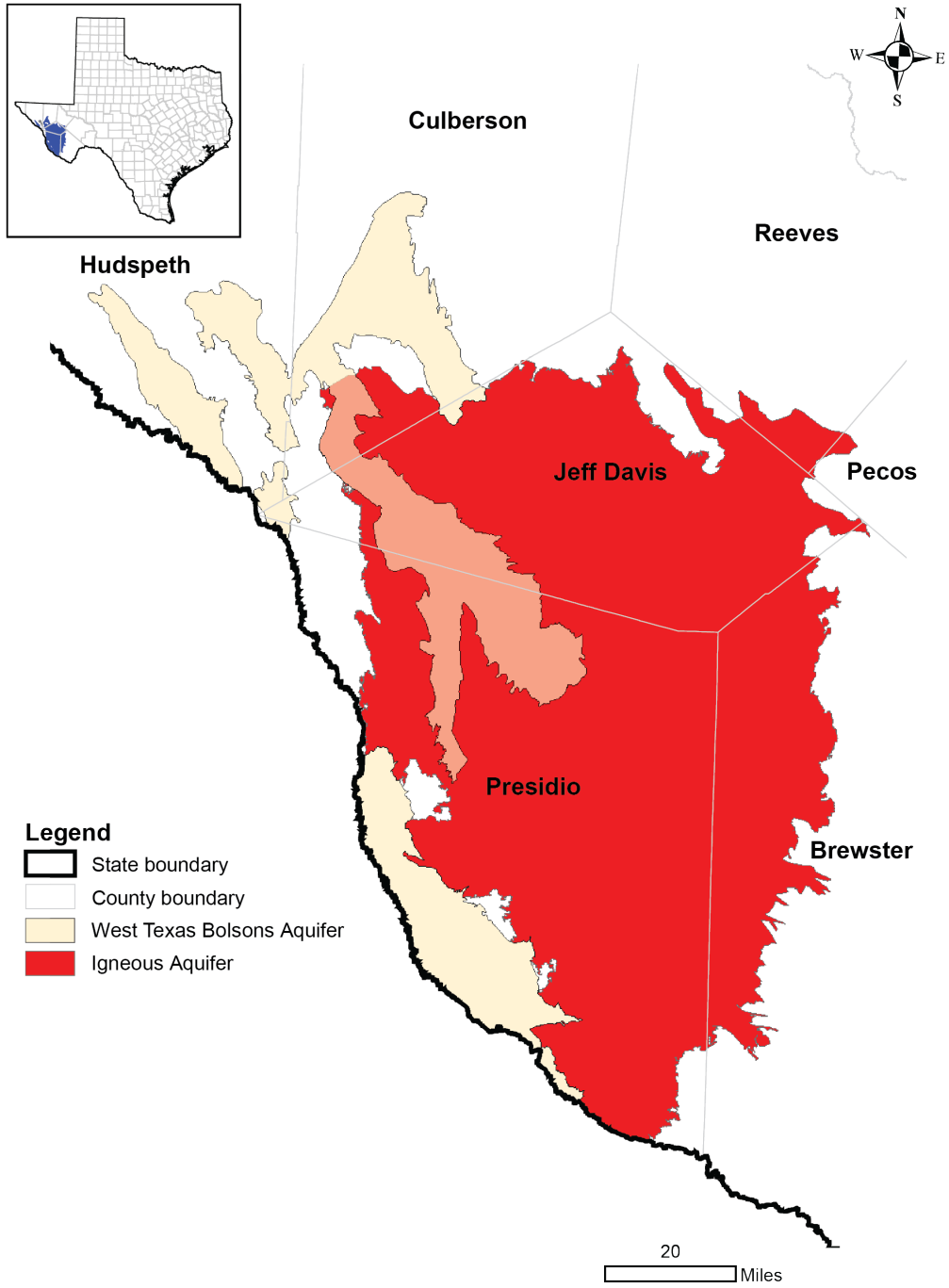
Ian Jones, Ph.D., P.G.

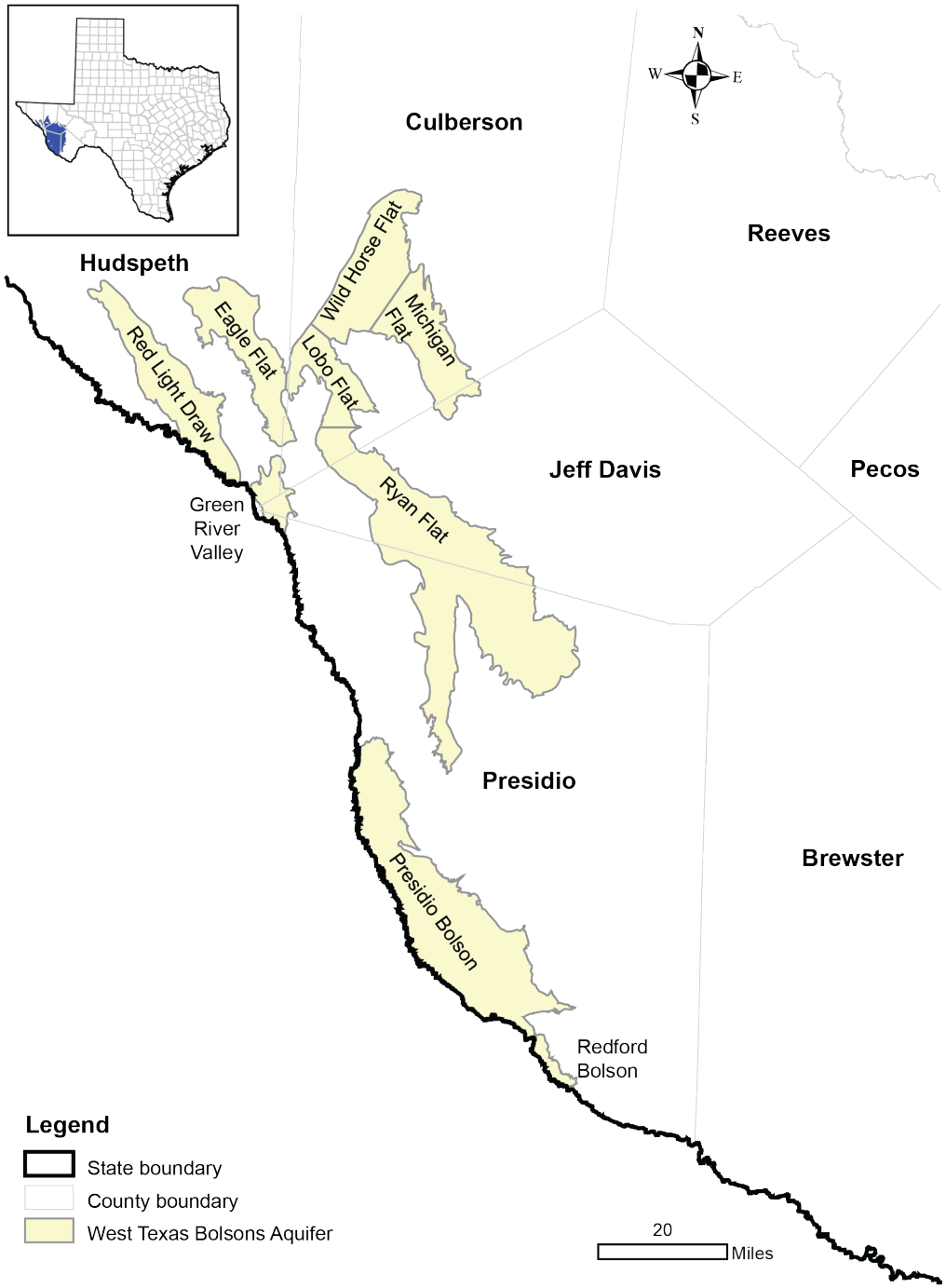
July 29, 2025

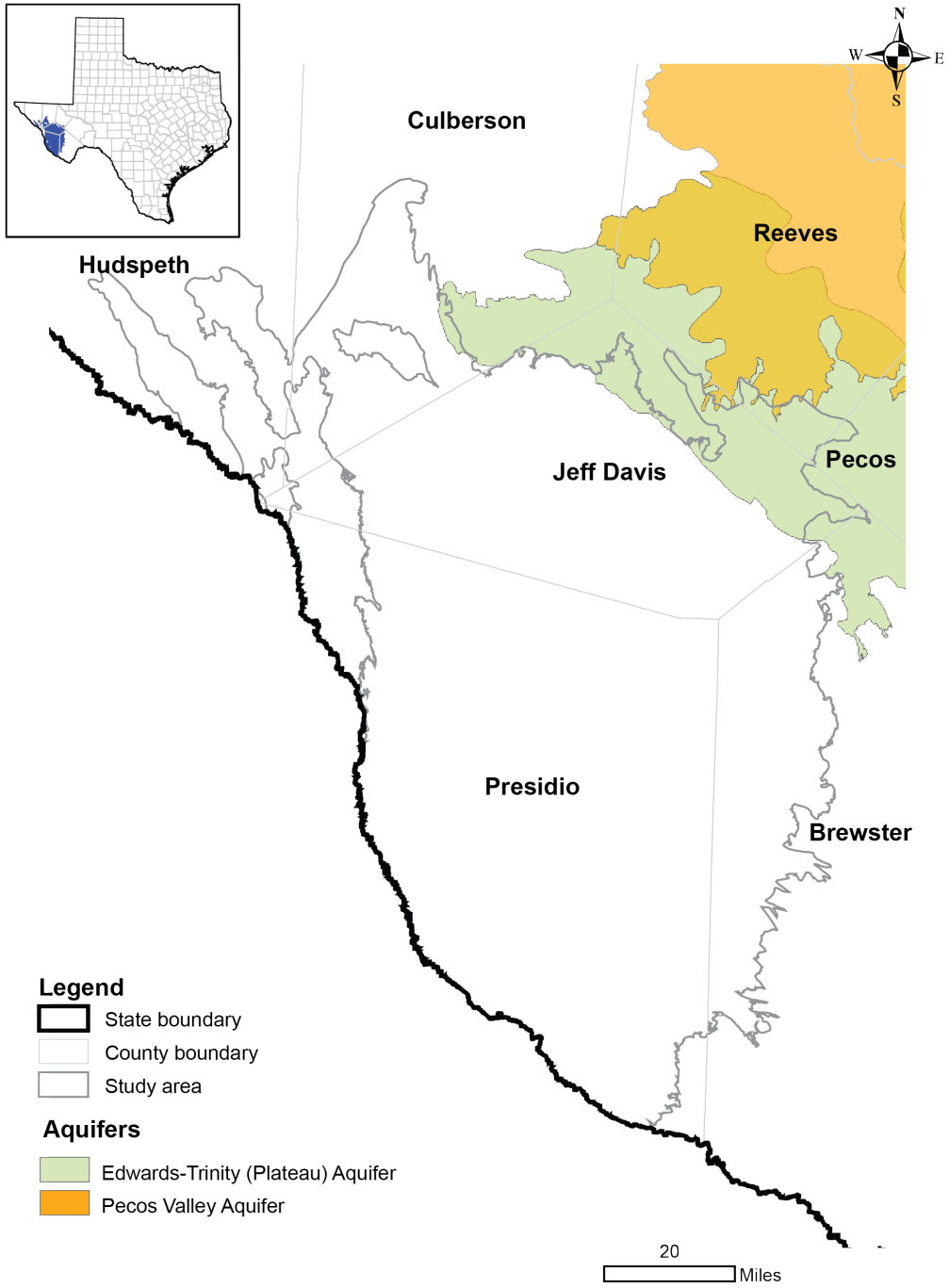
Agenda

1. Model packages
2. Model Calibration
3. Simulated vs. measured water levels
4. Model water budget
5. Model Sensitivity Analysis
6. Model limitations
7. Questions and Answers

INTRODUCTION
Ryan Flat


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
West Texas Bolsons Aquifer
Igneous Aquifer
20
Miles


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
Wild Horse Flat
Michigan Flat
Eagle Flat
Lobo Flat
Red Light Draw
Ryan Flat
Green River Valley
Presidio Bolson
Redford Bolson
N
W
E
S
Legend
State boundary
County boundary
West Texas Bolsons Aquifer
20
Miles


N
W
E
S
Culberson
Reeves
Hudspeth
Pecos
Jeff Davis
Presidio
Brewster
Legend
State boundary
County boundary
Study area
Aquifers
Edwards-Trinity (Plateau) Aquifer
Pecos Valley Aquifer
20
Miles

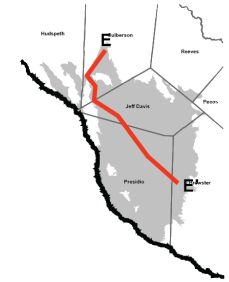
MODEL OVERVIEW AND PACKAGES

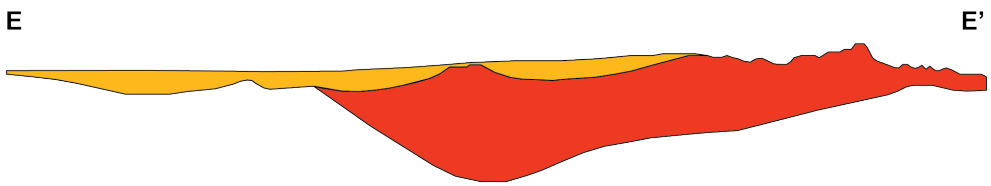
Red Light Draw

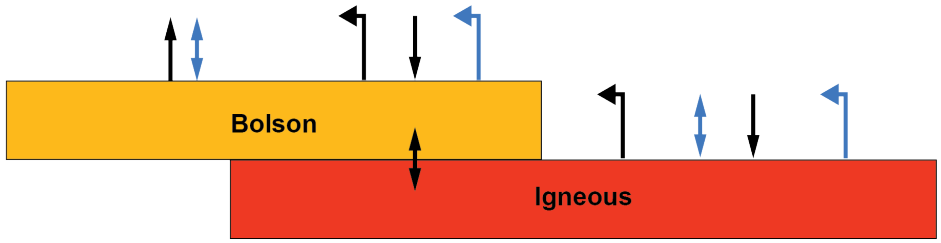
Model Packages

Packages	Input files
Basic (BAS6)	Igbl2Utr2.bas
Name (NAM)	Igbl2Utr2.nam
Discretization (DIS)	Igbl2Utr2.dis
Layer-Property Flow (LPF)	Igbl2Utr2.lpf
Well (WEL)	Igbl2.wel
Drain (DRN)	Igbl2Utr2.drn
River (RIV)	Igbl2Utr2.riv
General-Head Boundary (GHB)	Igbl2Utr2.ghb
Recharge (RCH)	Igbl2Utr2.rch
Output Control (OC)	Igbl2Utr2.oc
Preconditioned Conjugate-Gradient (PCG)	Igbl2Utr2.pcg

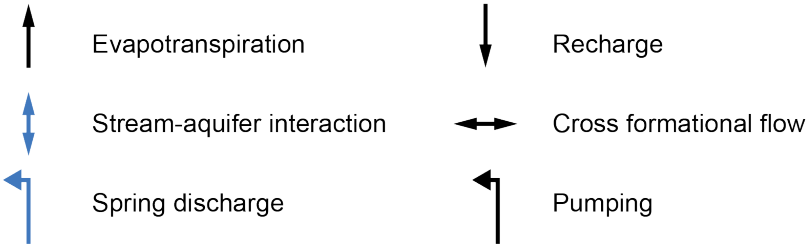
Packages	Output files
List (LST)	Igbl2Utr2.lst
Cell-by-Cell Budgets (CBB)	Igbl2Utr2.cbb
Heads (HDS)	Igbl2Utr2.hds
Drawdown (DDN)	Igbl2Utr2.ddn

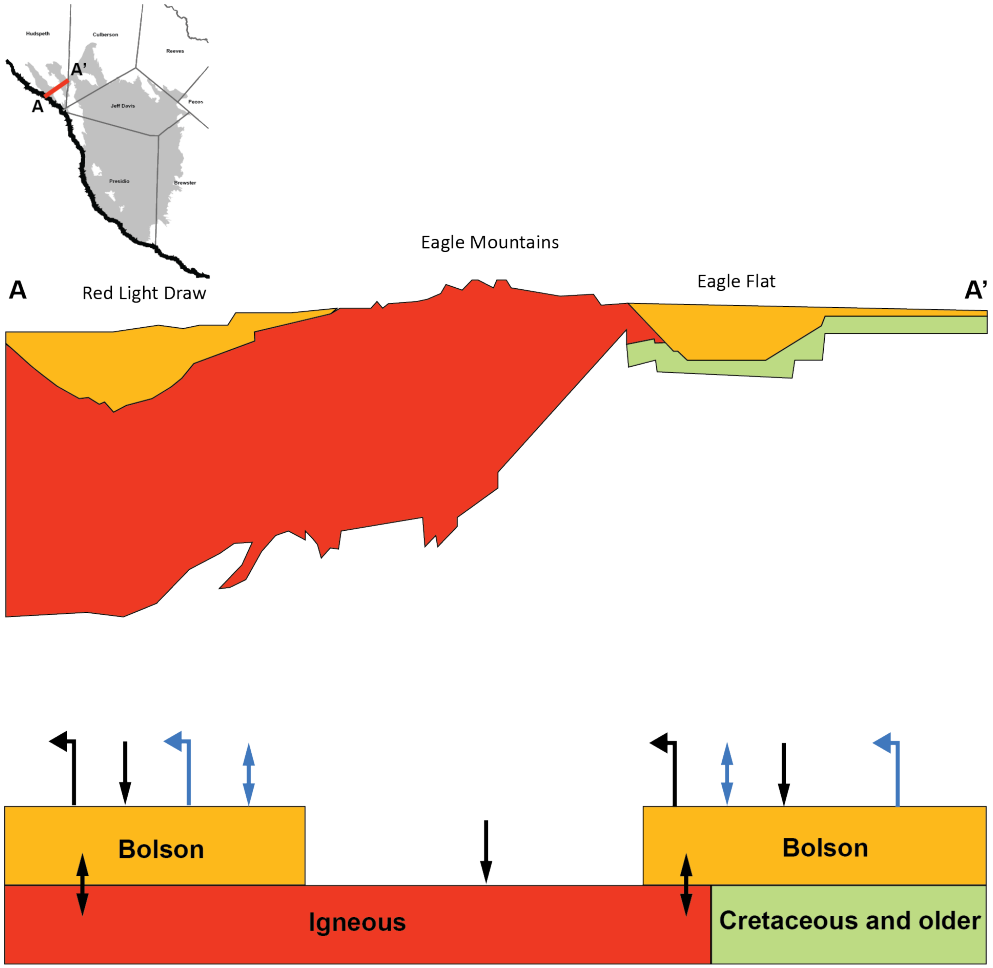


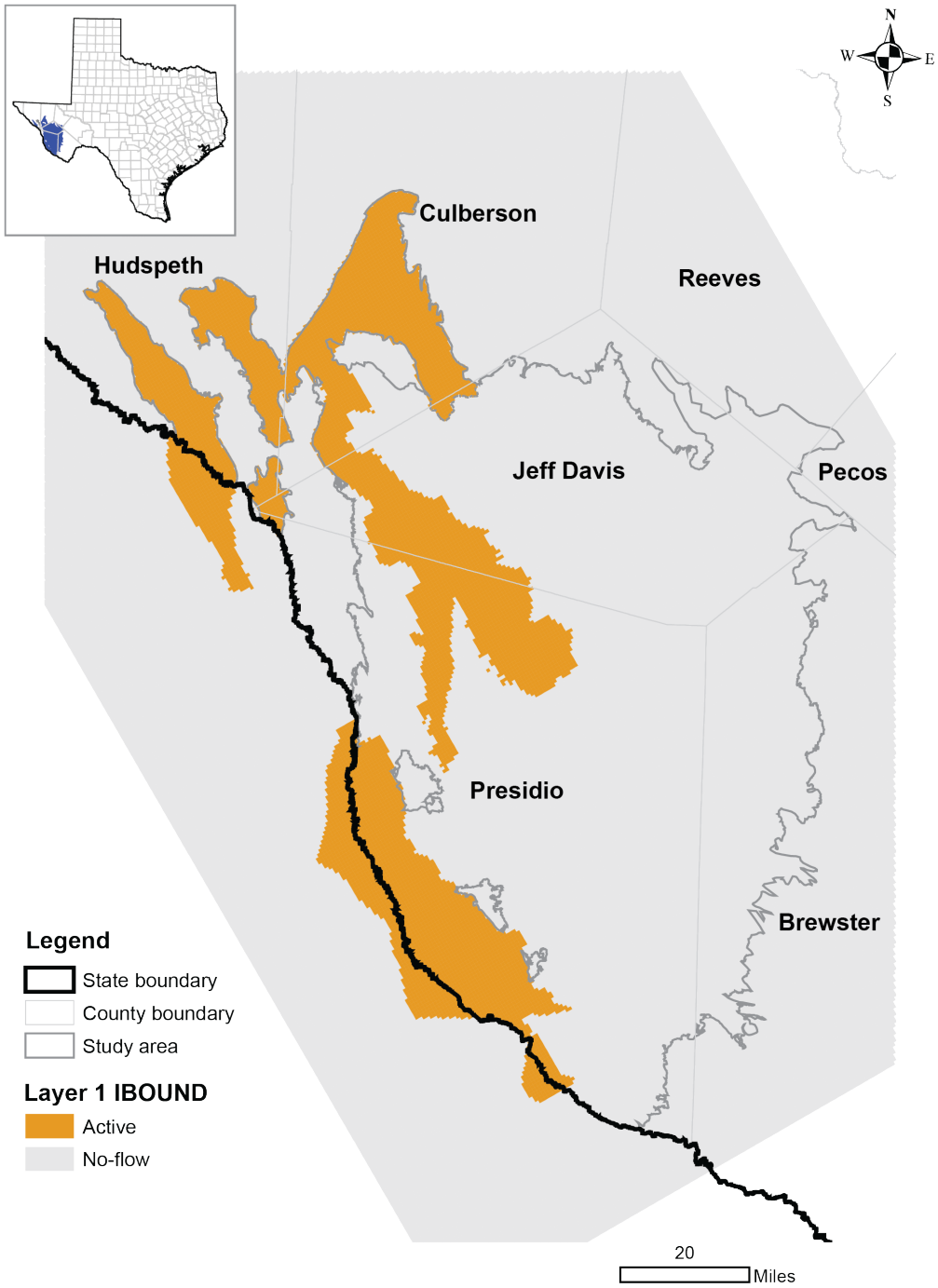


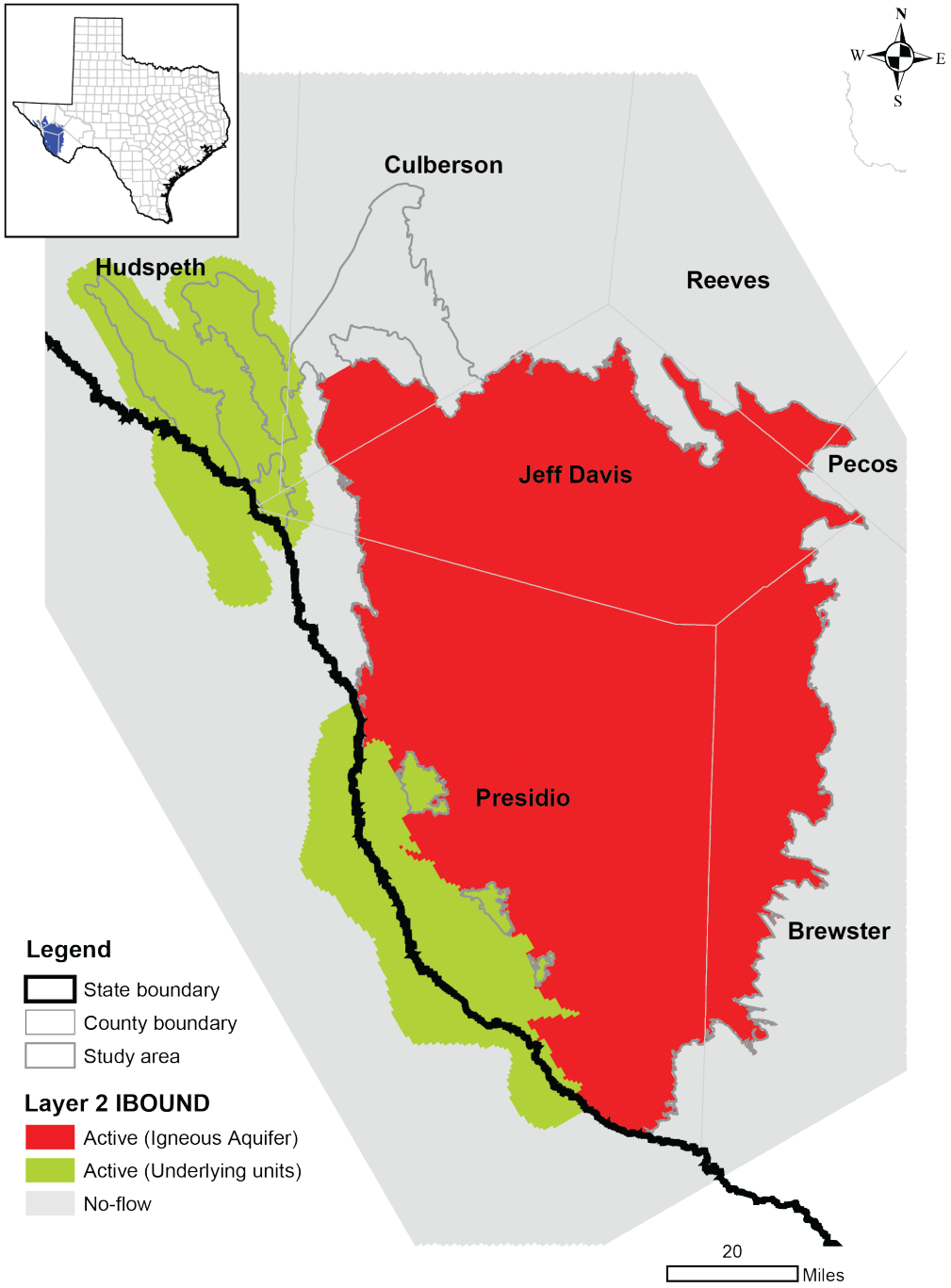


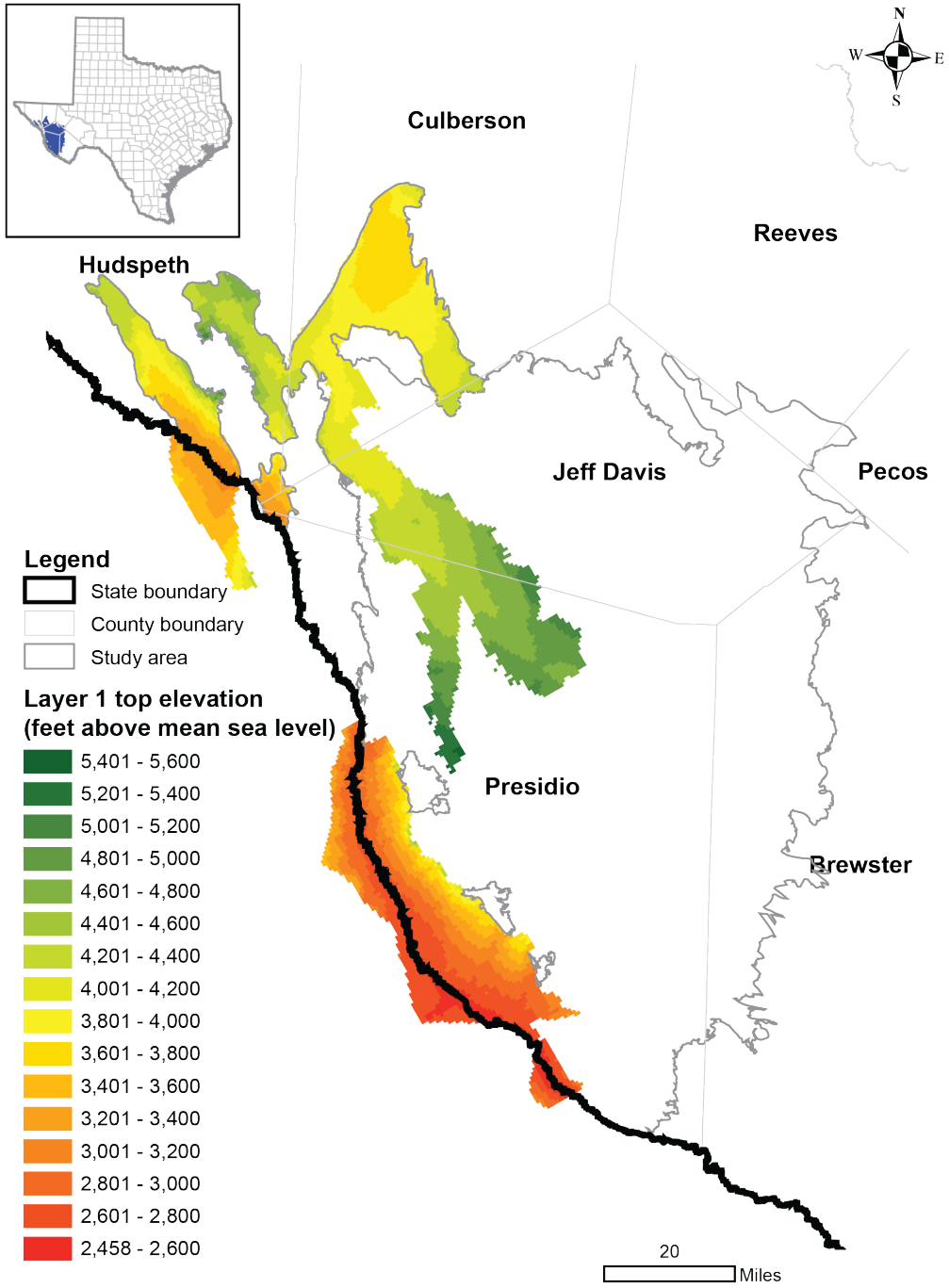
No Flow Boundary

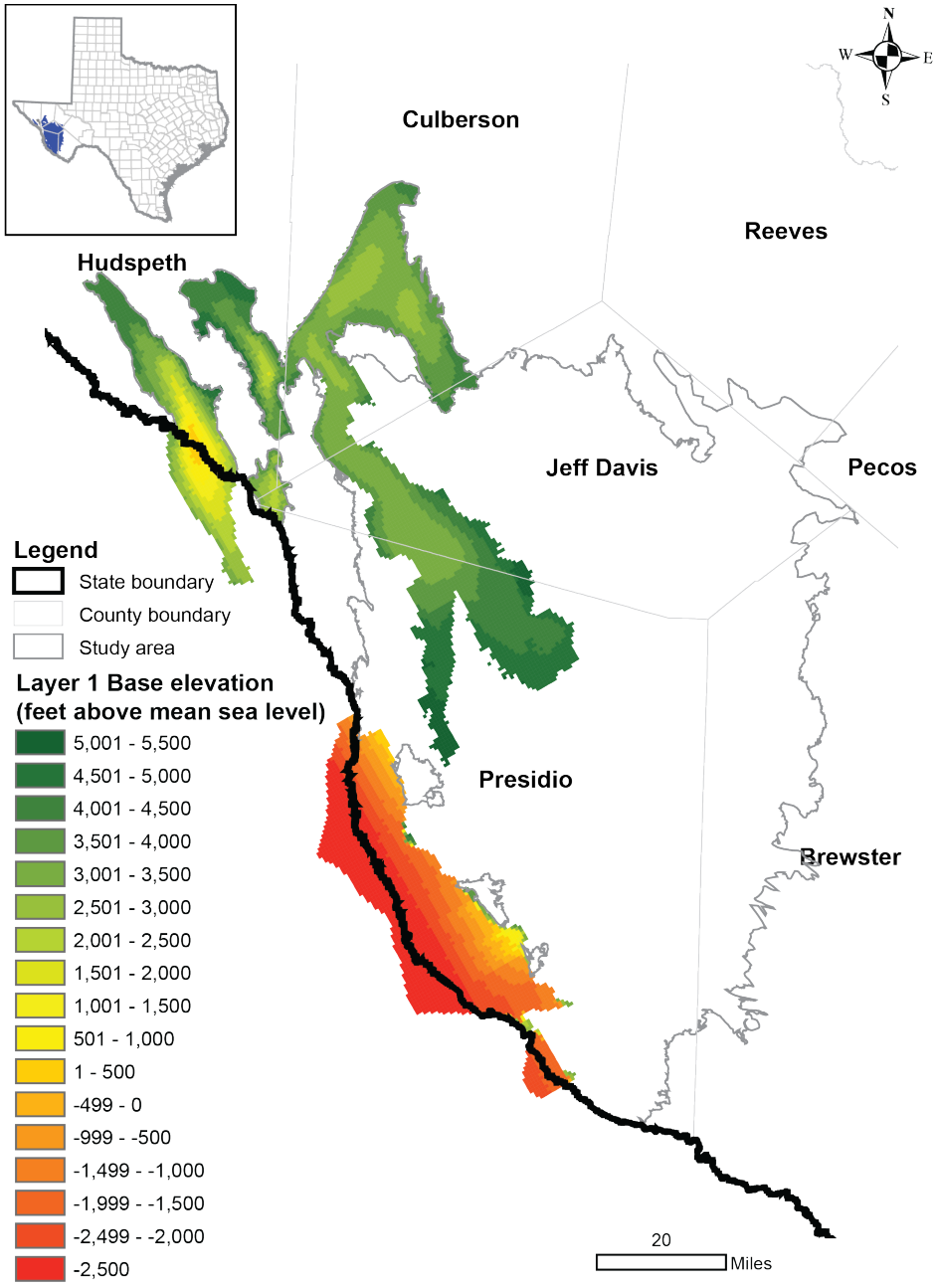


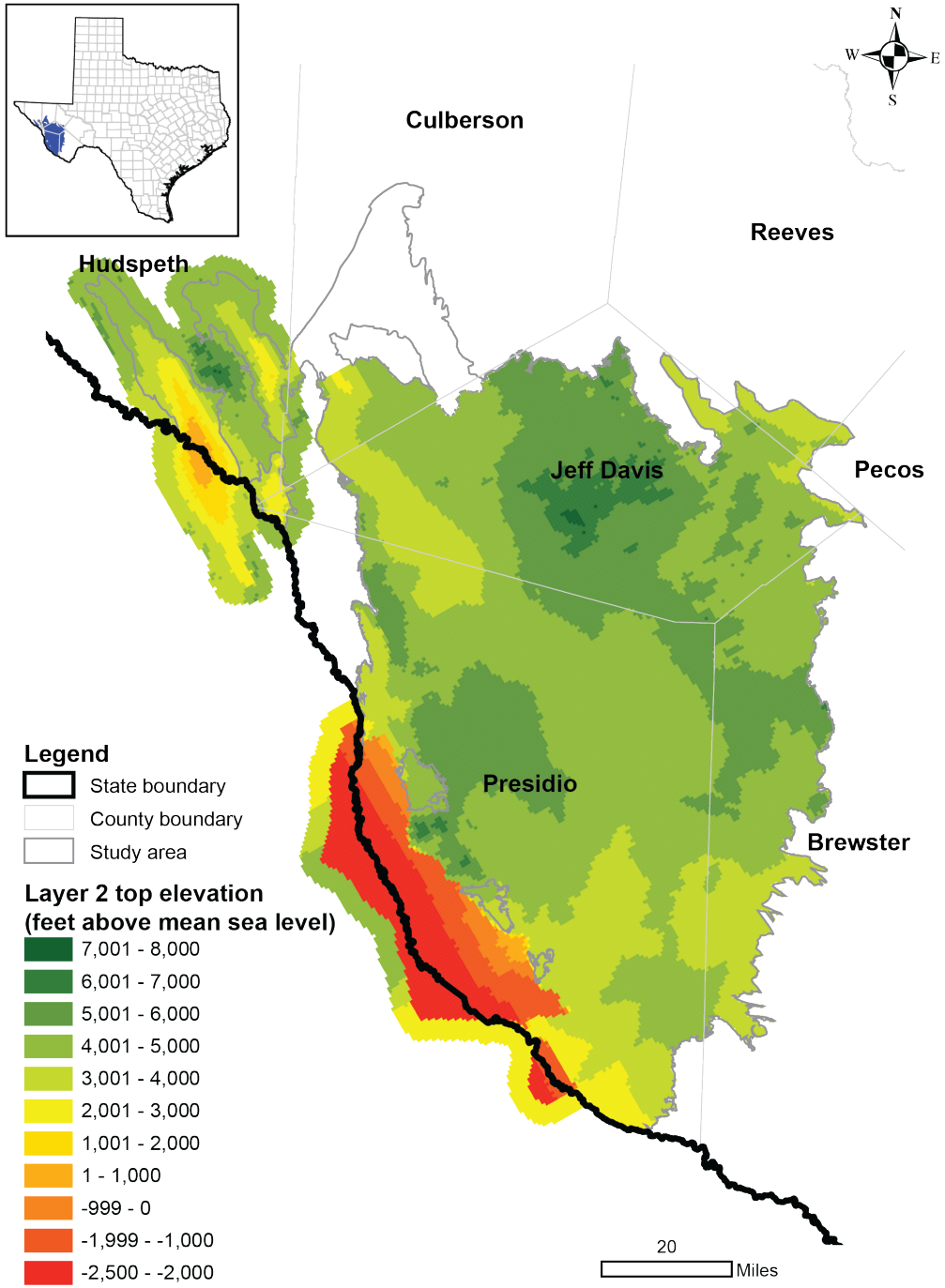

A'
A
Eagle Mountains
A
Red Light Draw
Eagle Flat
A'
Bolson
Bolson
Igneous
Cretaceous and older
No Flow Boundary
Evapotranspiration
Recharge
Stream-aquifer interaction
Cross formational flow
Spring discharge
Pumping

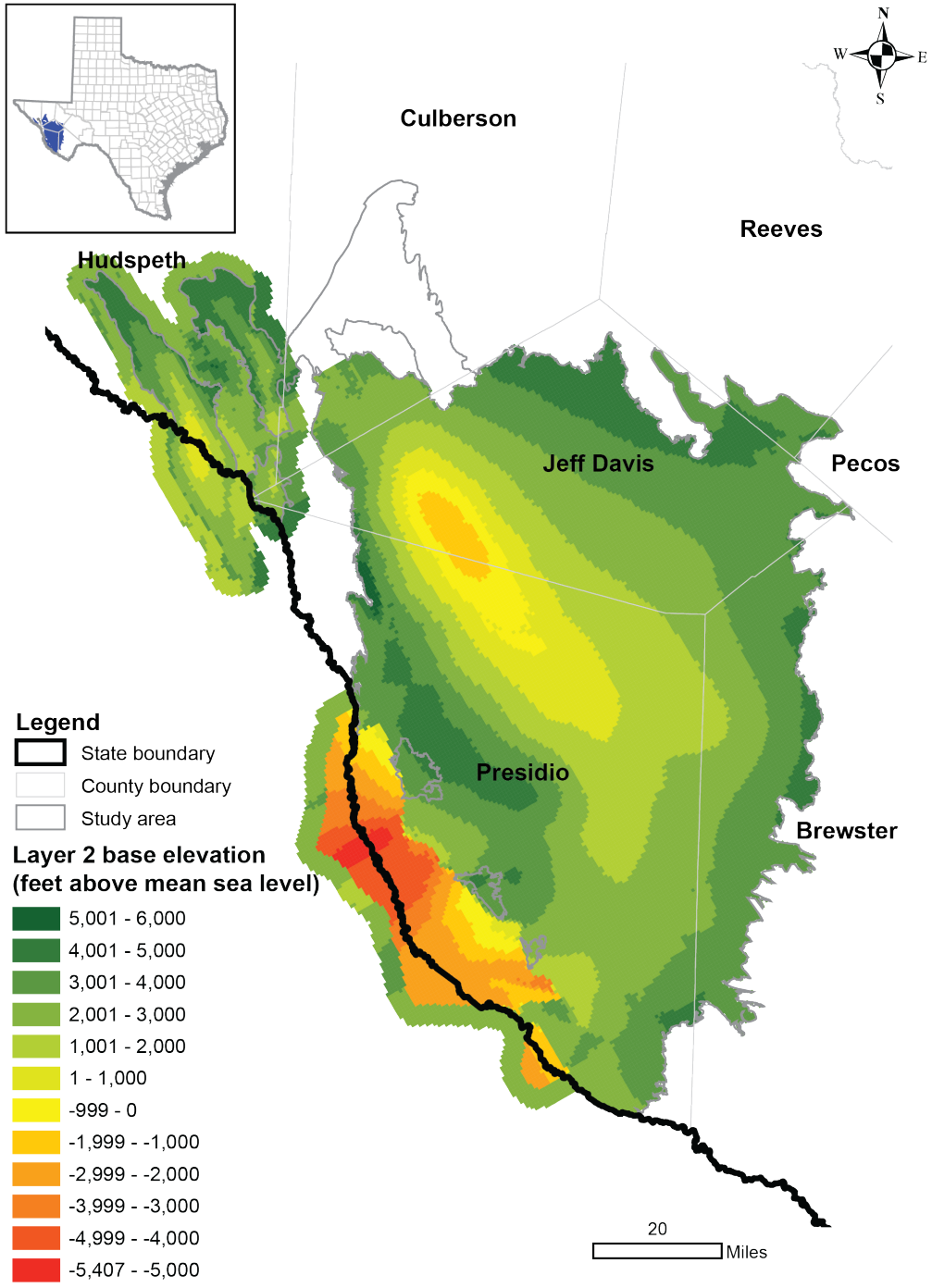

N
W
E
S
Culberson
Hudspeth
Reeves
Jeff Davis
Pecos
Presidio
Brewster
Legend
State boundary
County boundary
Study area
Layer 1 IBOUND
Active
No-flow
20
Miles

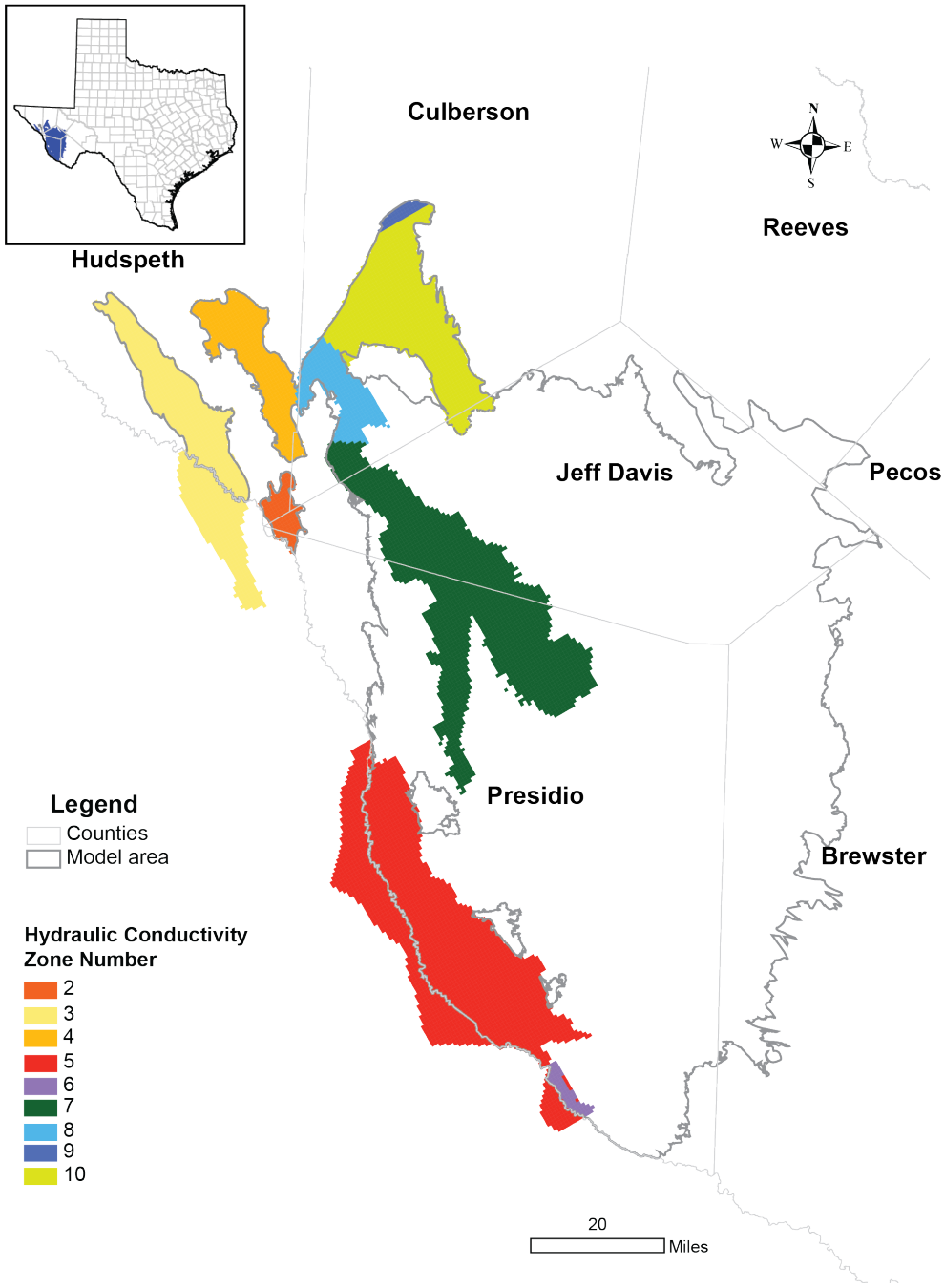

N
W
E
S
Culberson
Hudspeth
Reeves
Jeff Davis
Pecos
Presidio
Brewster
Legend
State boundary
County boundary
Study area
Layer 2 IBOUND
Active (Igneous Aquifer)
Active (Underlying units)
No-flow
20
Miles

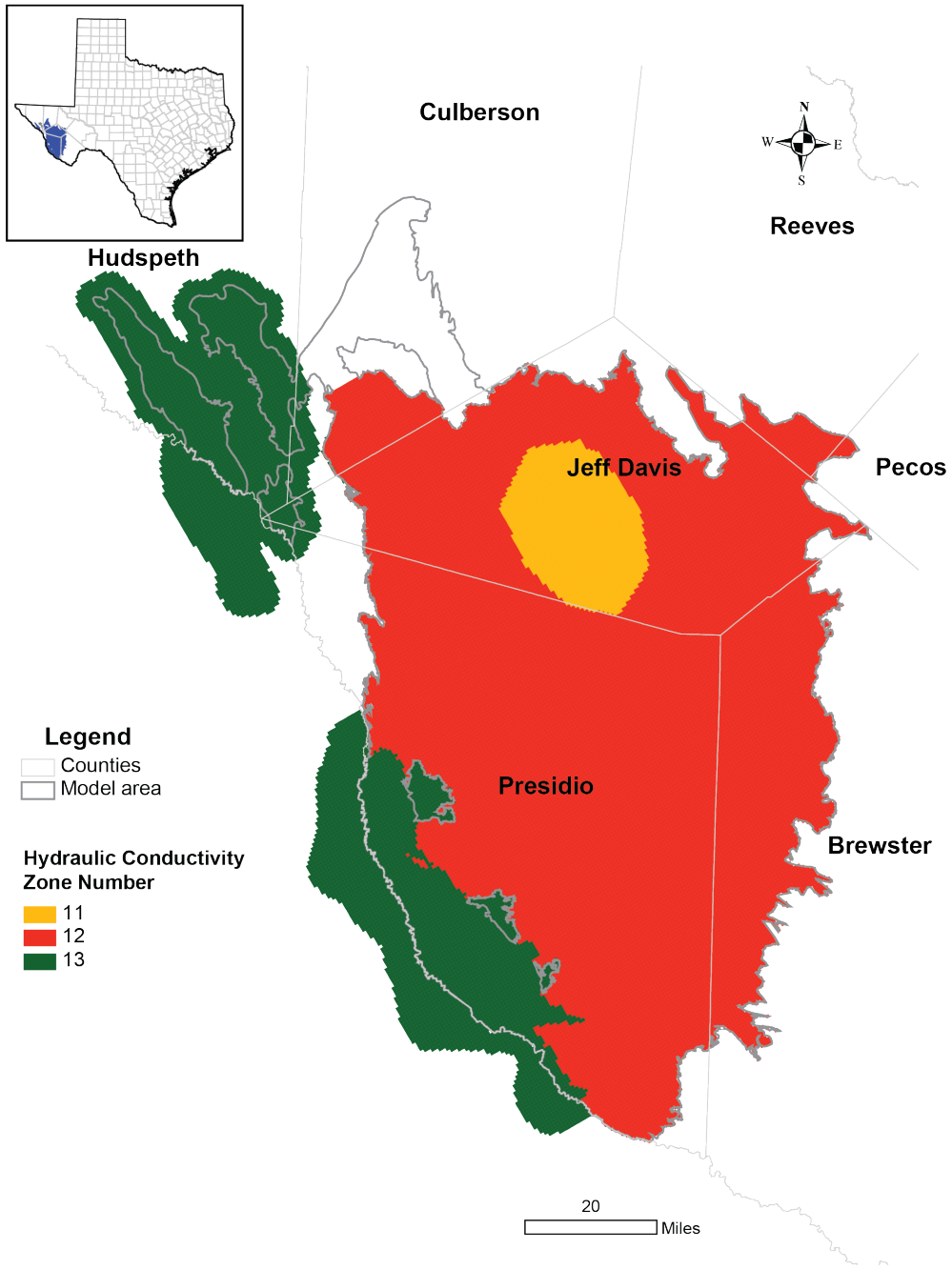

Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
Layer 1 top elevation
(feet above mean sea level)
5,401 - 5,600
5,201 - 5,400
5,001 - 5,200
4,801 - 5,000
4,601 - 4,800
4,401 - 4,600
4,201 - 4,400
4,001 - 4,200
3,801 - 4,000
3,601 - 3,800
3,401 - 3,600
3,201 - 3,400
3,001 - 3,200
2,801 - 3,000
2,601 - 2,800
2,458 - 2,600
20
Miles

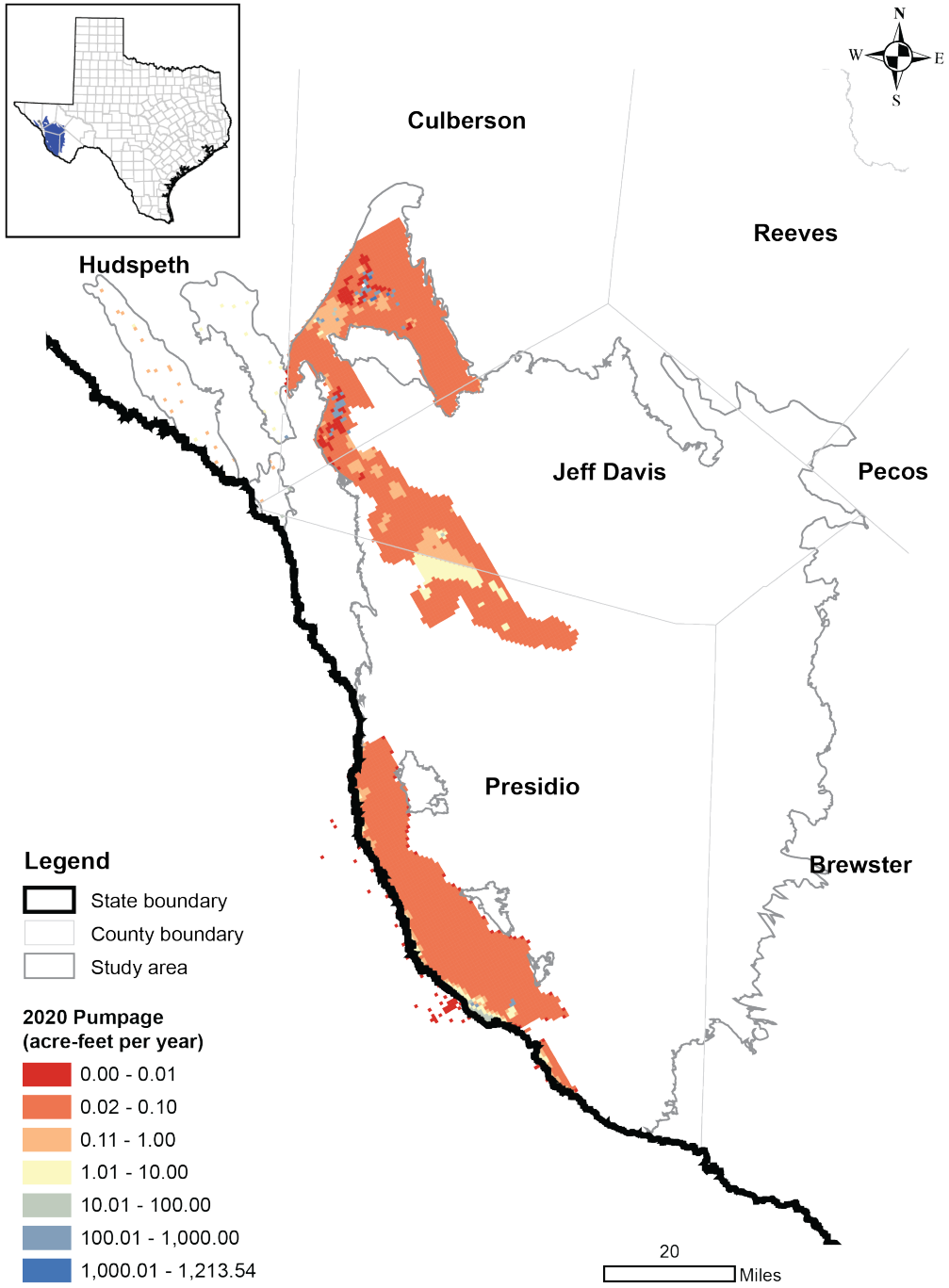

N
W
E
S
Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
Legend
State boundary
County boundary
Study area
Layer 1 Base elevation
(feet above mean sea level)
5,001 - 5,500
4,501 - 5,000
4,001 - 4,500
3,501 - 4,000
3,001 - 3,500
2,501 - 3,000
2,001 - 2,500
1,501 - 2,000
1,001 - 1,500
501 - 1,000
1 - 500
-499 - 0
-999 - -500
-1,499 - -1,000
-1,999 - -1,500
-2,499 - -2,000
-2,500
20
Miles

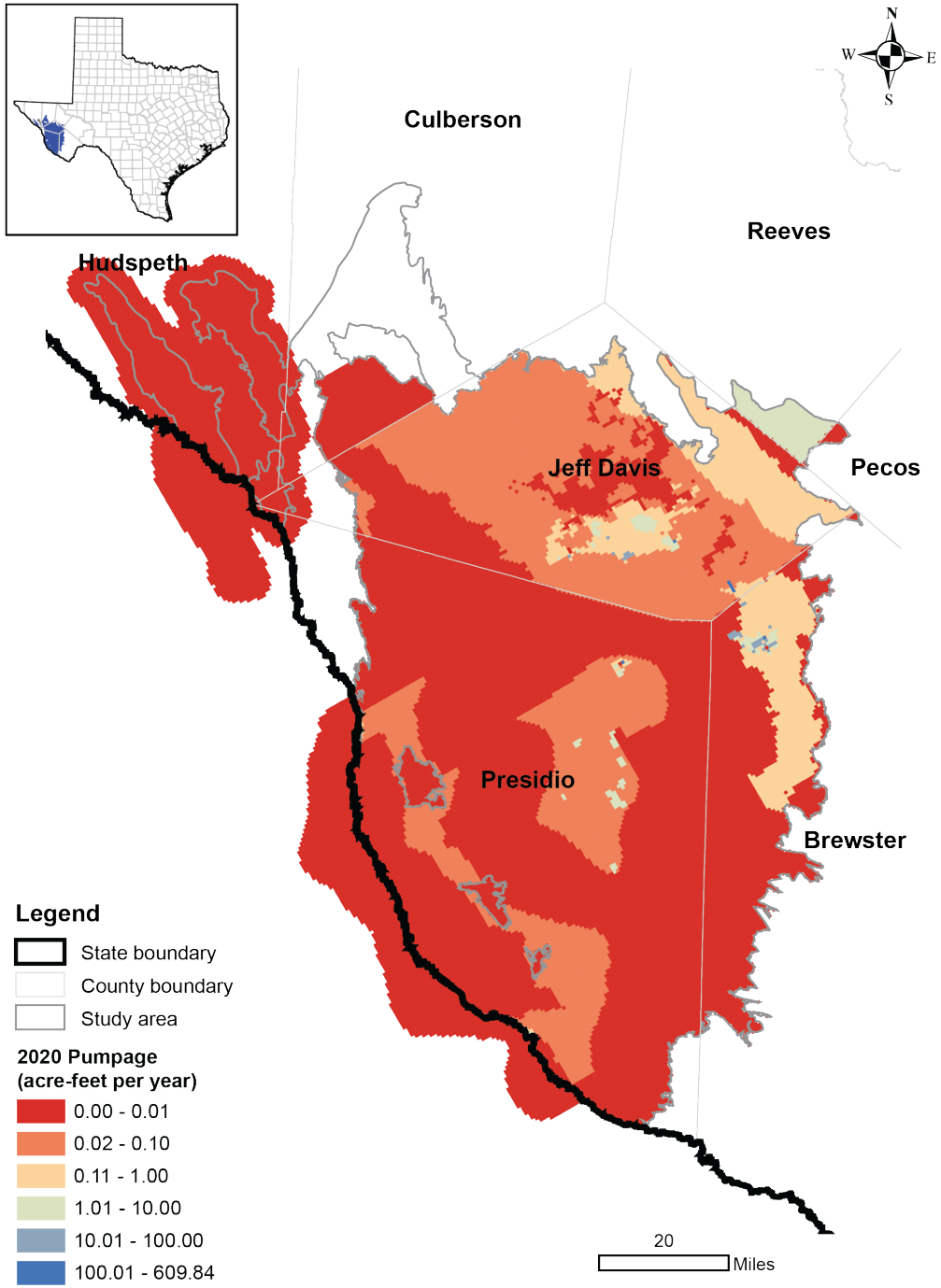

Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
Layer 2 top elevation
(feet above mean sea level)
7,001 - 8,000
6,001 - 7,000
5,001 - 6,000
4,001 - 5,000
3,001 - 4,000
2,001 - 3,000
1,001 - 2,000
1 - 1,000
-999 - 0
-1,999 - -1,000
-2,500 - -2,000
20
Miles

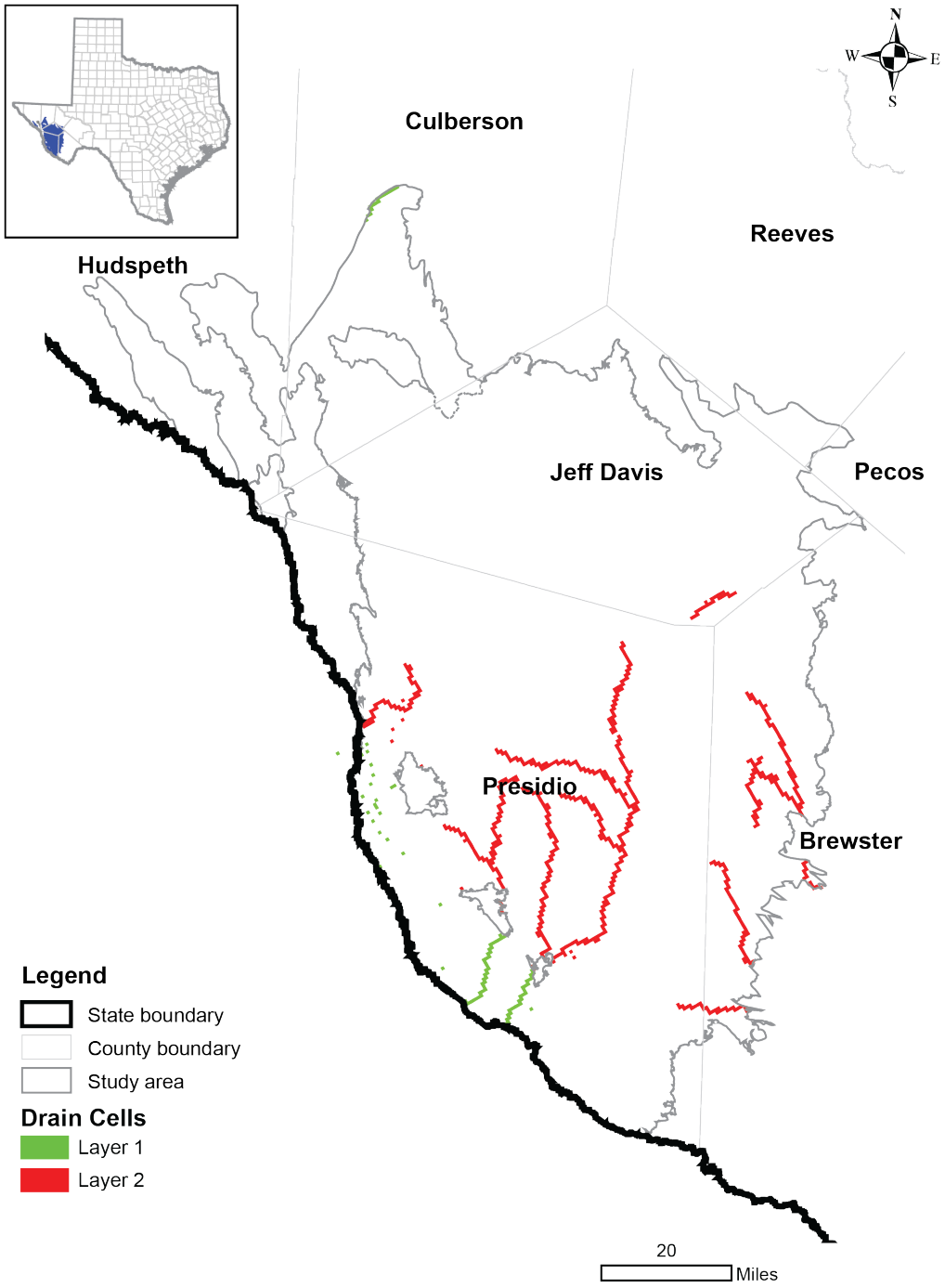

Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
Layer 2 base elevation
(feet above mean sea level)
5,001 - 6,000
4,001 - 5,000
3,001 - 4,000
2,001 - 3,000
1,001 - 2,000
1 - 1,000
-999 - 0
-1,999 - -1,000
-2,999 - -2,000
-3,999 - -3,000
-4,999 - -4,000
-5,407 - -5,000
20
Miles

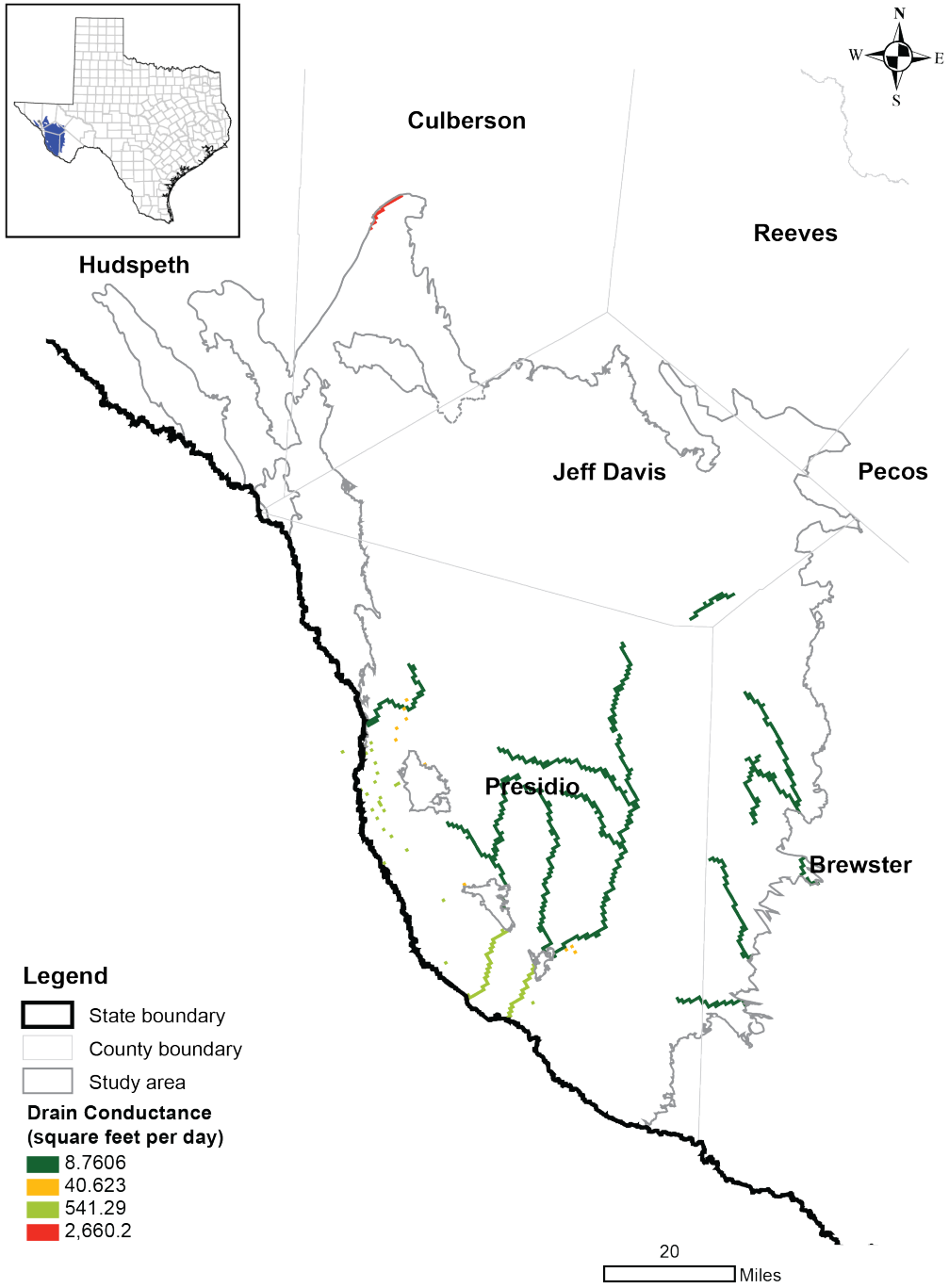

Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
Counties
Model area
Hydraulic Conductivity Zone Number
2
3
4
5
6
7
8
9
10
20
Miles


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
Counties
Model area
Hydraulic Conductivity Zone Number
11
12
13
20
Miles


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
2020 Pumpage
(acre-feet per year)
0.00 - 0.01
0.02 - 0.10
0.11 - 1.00
1.01 - 10.00
10.01 - 100.00
100.01 - 1,000.00
1,000.01 - 1,213.54
20
Miles


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
2020 Pumpage
(acre-feet per year)
0.00 - 0.01
0.02 - 0.10
0.11 - 1.00
1.01 - 10.00
10.01 - 100.00
100.01 - 609.84
20
Miles


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
Drain Cells
Layer 1
Layer 2
20
Miles


N
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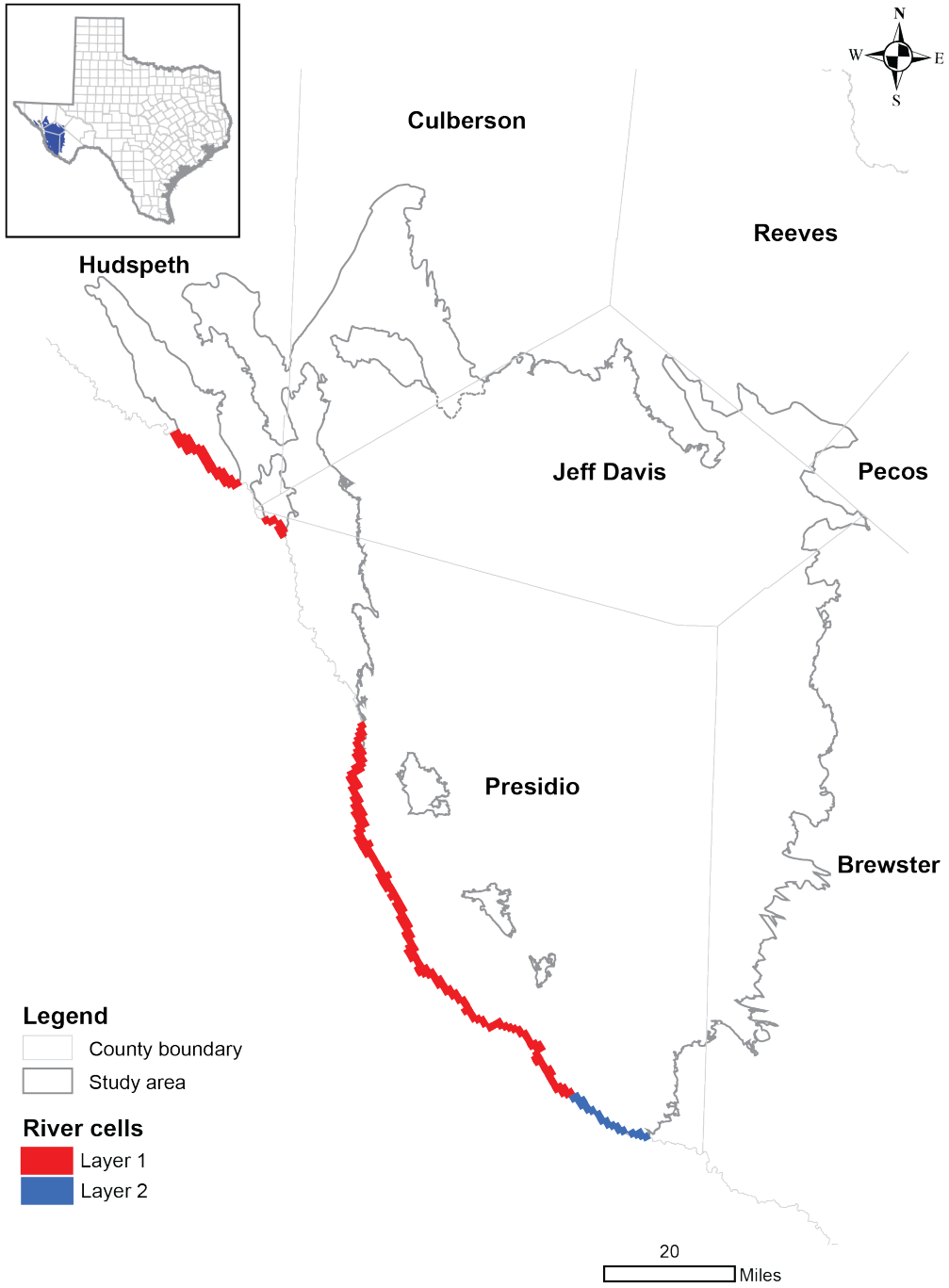
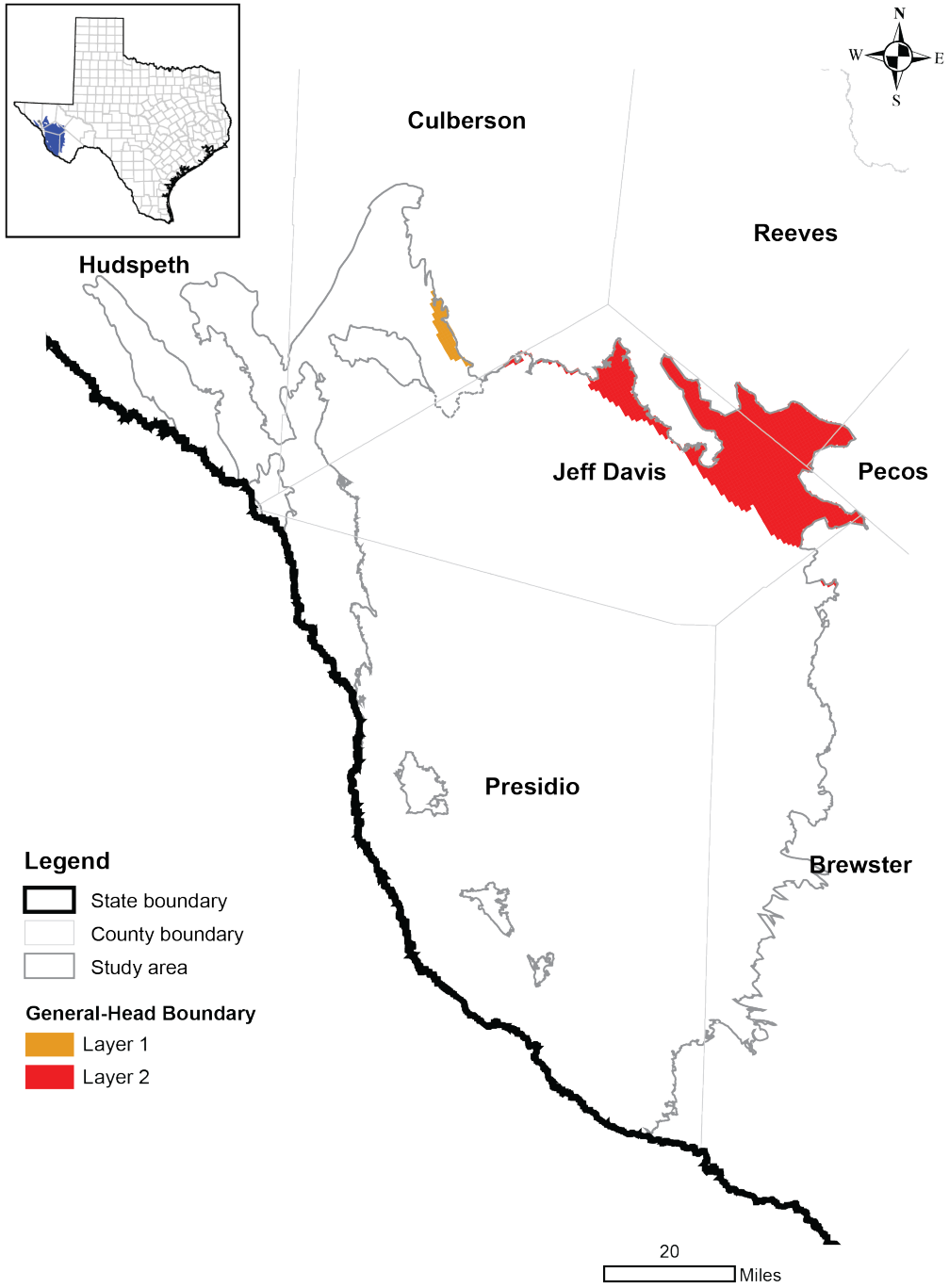
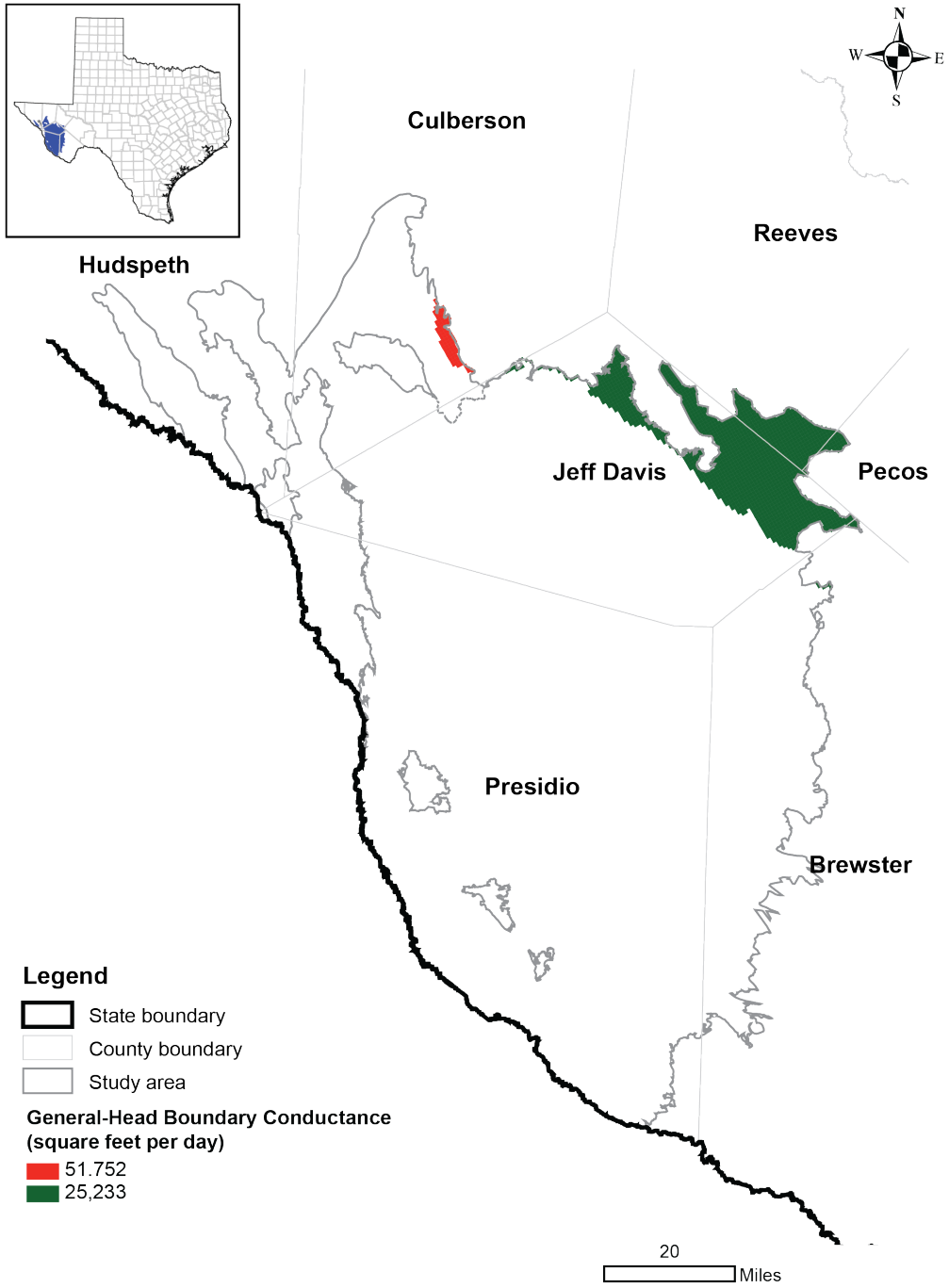
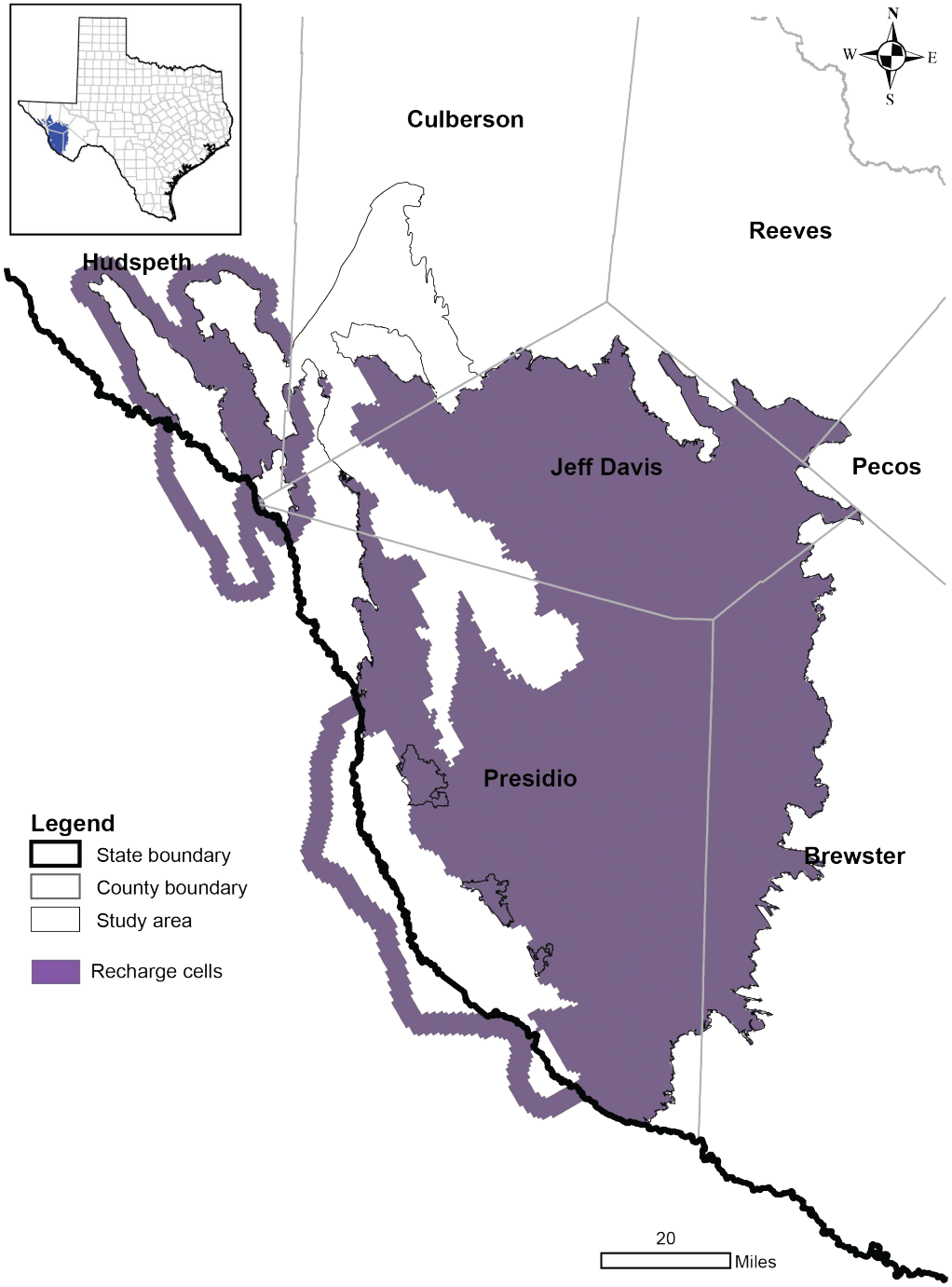
Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
Legend
State boundary
County boundary
Study area
Drain Conductance
(square feet per day)
8.7606
40.623
541.29
2,660.2
20
Miles

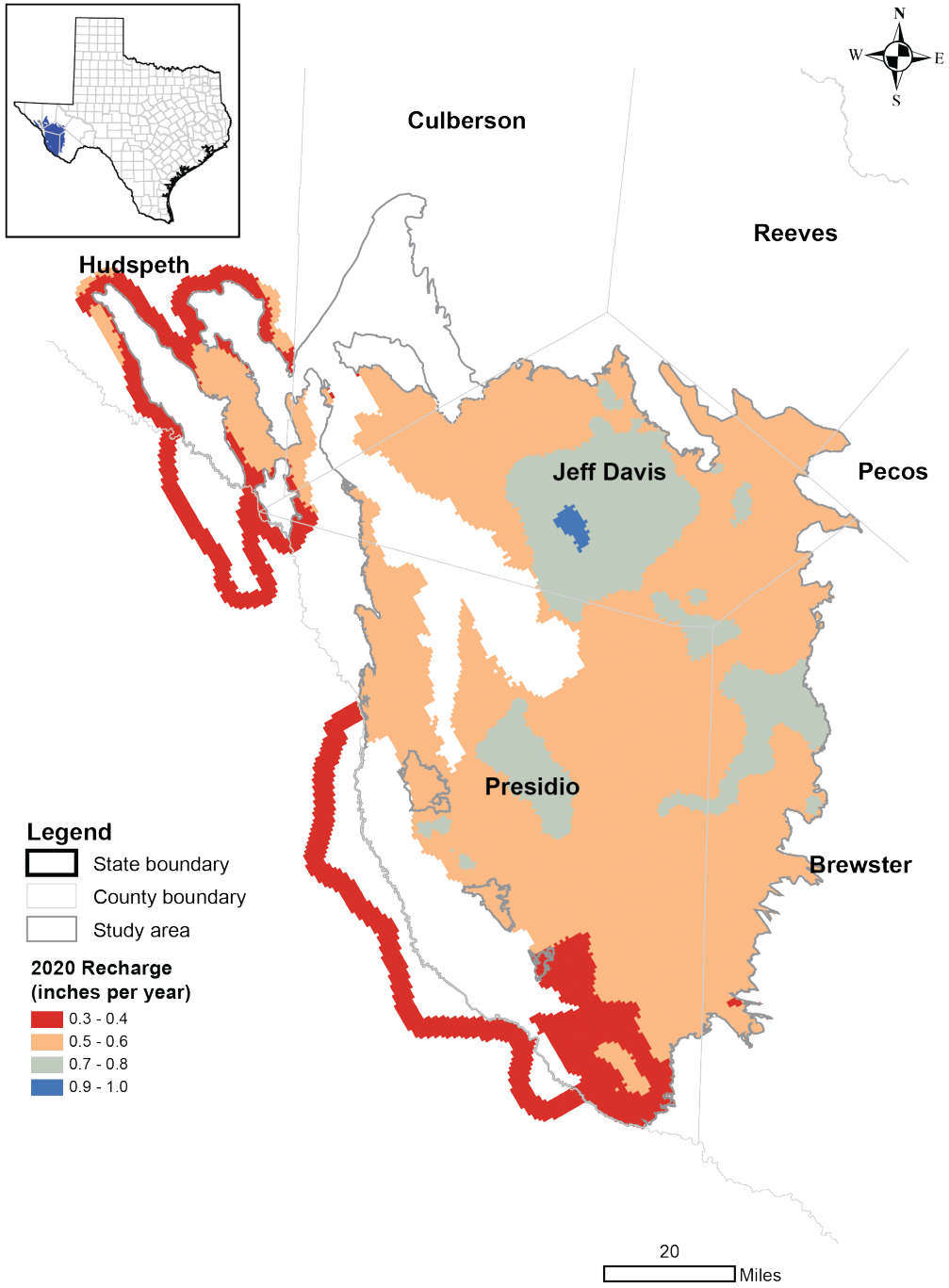

Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
County boundary
Study area
River cells
Layer 1
Layer 2
20
Miles

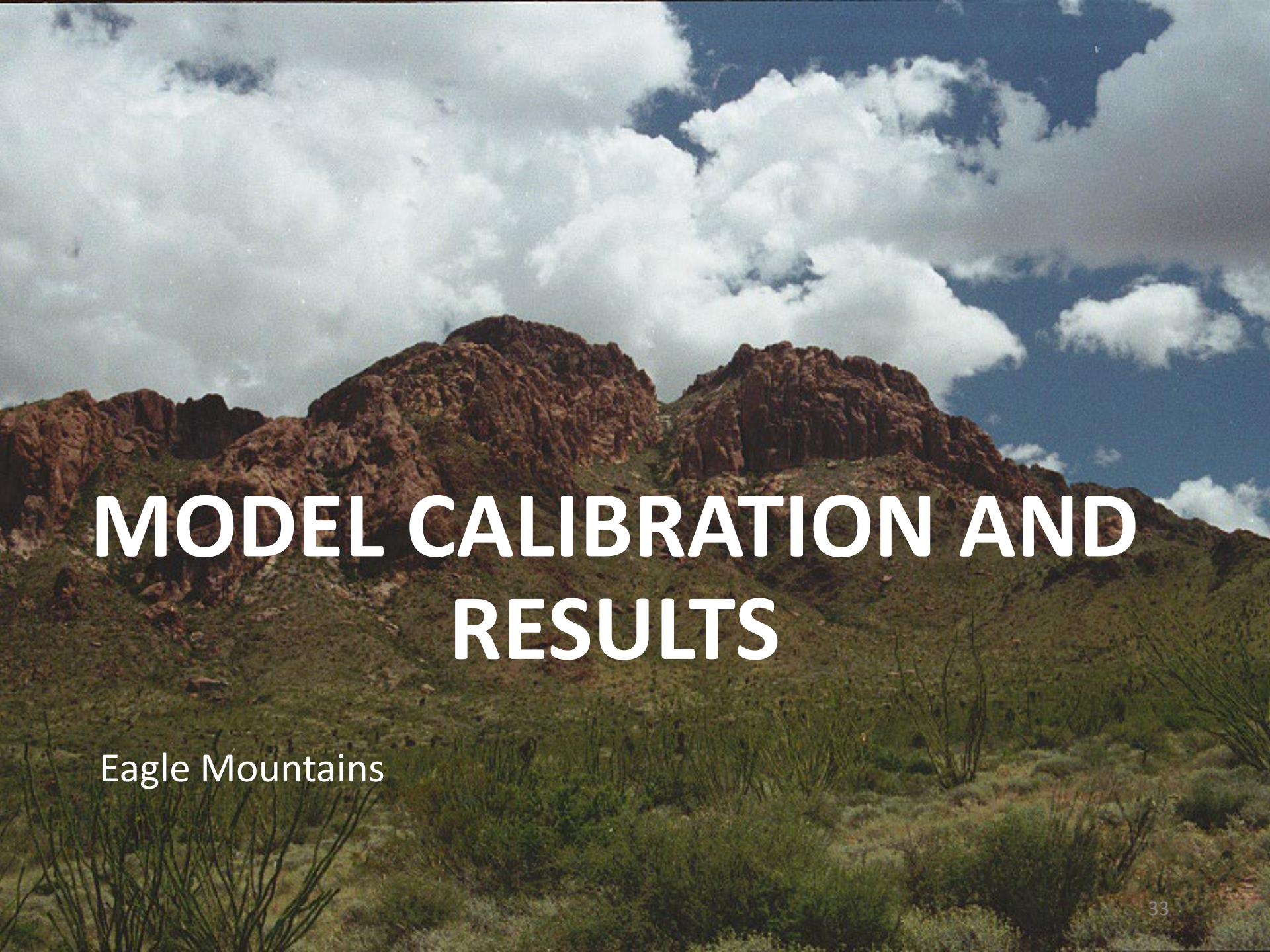

Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
General-Head Boundary
Layer 1
Layer 2
20
Miles


N
W
E
S
Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
Legend
State boundary
County boundary
Study area
General-Head Boundary Conductance
(square feet per day)
51.752
25,233
20
Miles

Year	Total Recharge (acre-feet per year)	Year	Total Recharge (acre-feet per year)
1980	109,469	2001	105,200
1981	145,912	2002	108,444
1982	103,935	2003	106,267
1983	110,977	2004	175,597
1984	172,567	2005	108,134
1985	113,695	2006	98,453
1986	148,699	2007	121,211
1987	117,041	2008	124,923
1988	122,301	2009	129,287
1989	91,758	2010	133,691
1990	151,962	2011	69,209
1991	139,247	2012	108,230
1992	124,761	2013	106,643
1993	88,486	2014	113,250
1994	95,411	2015	151,151
1995	99,435	2016	113,910
1996	108,713	2017	148,330
1997	125,421	2018	113,635
1998	84,009	2019	122,877
1999	107,606	2020	88,452
2000	95,436		


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
Recharge cells
20
Miles


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
State boundary
County boundary
Study area
2020 Recharge
(inches per year)
0.3 - 0.4
0.5 - 0.6
0.7 - 0.8
0.9 - 1.0
20
Miles

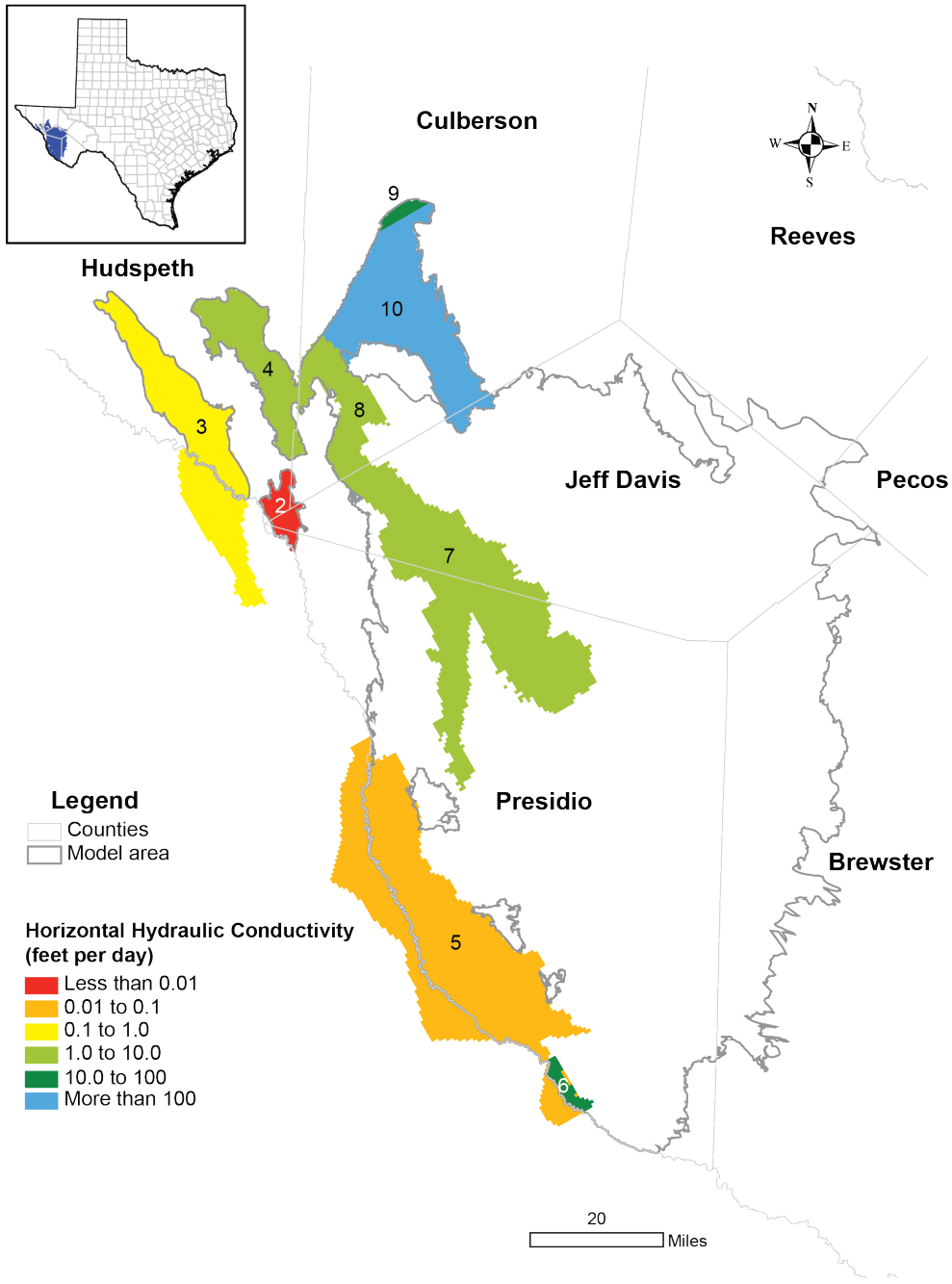


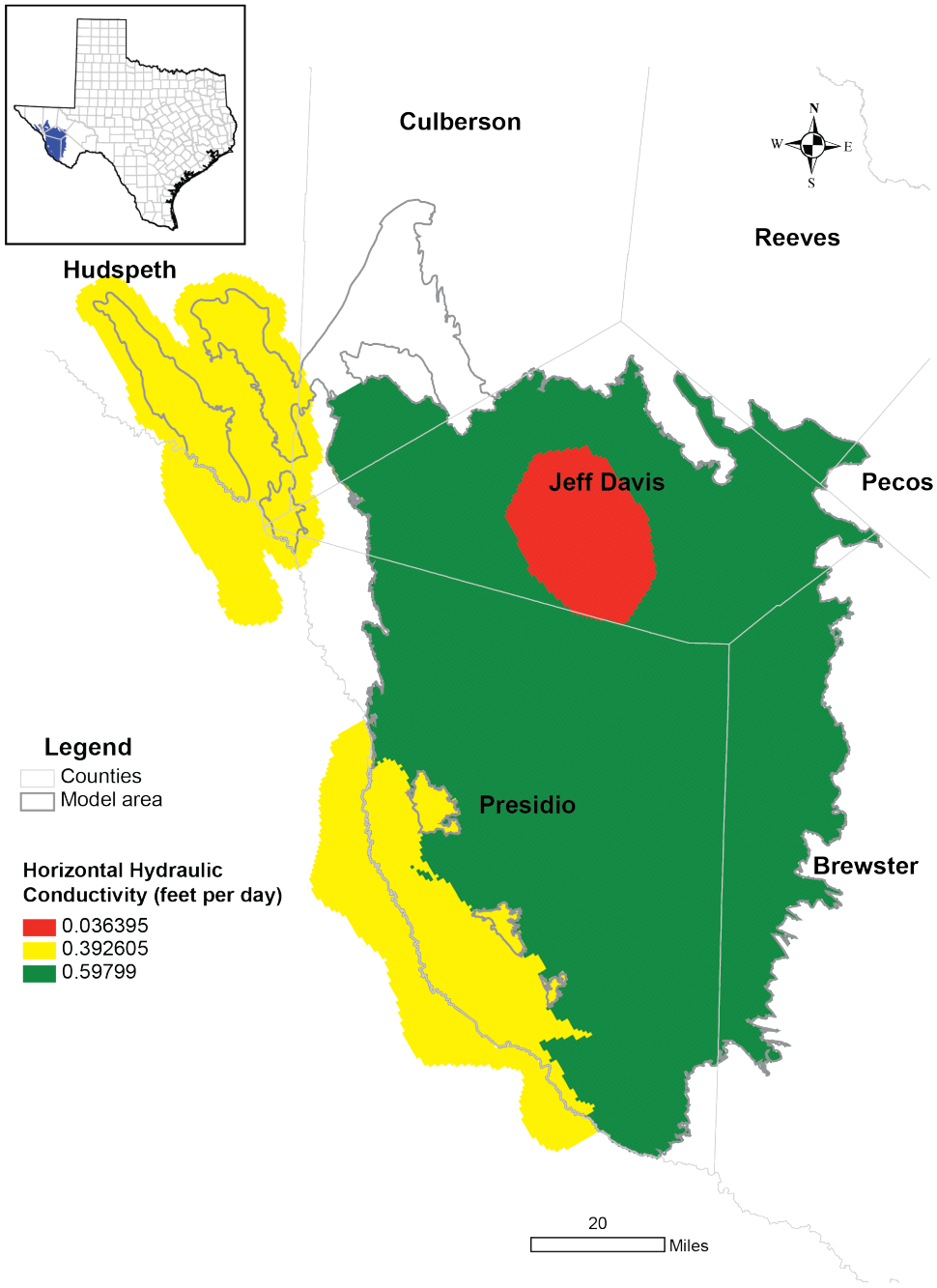
MODEL CALIBRATION AND RESULTS

Eagle Mountains

Parameter	Zone	Aquifer	Initial	Calibrated
Horizontal Hydraulic Conductivity (feet per day)	1	West Texas Bolsons	0.0	0.0
	2	West Texas Bolsons	0.001	0.003
	3	West Texas Bolsons	0.200	1.0
	4	West Texas Bolsons	1.14	6.40
	5	West Texas Bolsons	2.35	0.013
	6	West Texas Bolsons	4.20	17.6
	7	West Texas Bolsons	8.80	4.28
	8	West Texas Bolsons	30.6	1.74
	9	West Texas Bolsons	35.0	35.0
	10	West Texas Bolsons	50.0	1,000
	11	Igneous	0.02	0.04
	12	Igneous	0.10	0.60
	13	Igneous	0.14	0.39
Vertical Hydraulic Conductivity (feet per day)	1	West Texas Bolsons	0.0	0.0
	2	West Texas Bolsons	0.0001	0.0003
	3	West Texas Bolsons	0.02	0.10
	4	West Texas Bolsons	0.114	0.64
	5	West Texas Bolsons	0.235	0.001
	6	West Texas Bolsons	0.42	1.76
	7	West Texas Bolsons	0.88	0.43
	8	West Texas Bolsons	3.06	0.17
	9	West Texas Bolsons	3.50	3.50
	10	West Texas Bolsons	5.00	100
	11	Igneous	0.002	0.004
	12	Igneous	0.01	0.06
	13	Igneous	0.014	0.039
Specific Storage (per foot)	1	West Texas Bolsons	0.00003	0.001
	2	Igneous	0.00001	0.00001
	3	Igneous	0.00003	0.000002
Recharge factor	1		1.00	2.55
General-Head Boundary Conductance (square feet per day)	1	West Texas Bolsons	264	52
	2	Igneous	400	25,233

Parameter	Zone	Aquifer	Initial	Calibrated
River Conductance (square feet per day)	1	West Texas Bolsons/Igneous	3,300	19,891
Drain Conductance (square feet per day)	1	West Texas Bolsons	2,640	2,660
	2	West Texas Bolsons	500	541
	3	Igneous	1,320	8.76
	4	Igneous	50	41


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
9
10
4
8
3
2
7
5
6
N
W
E
S
Legend
Counties
Model area
Horizontal Hydraulic Conductivity
(feet per day)
Less than 0.01
0.01 to 0.1
0.1 to 1.0
1.0 to 10.0
10.0 to 100
More than 100
20
Miles


Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
N
W
E
S
Legend
Counties
Model area
Horizontal Hydraulic Conductivity (feet per day)
0.036395
0.392605
0.59799
20
Miles

MODEL-SIMULATED v. MEASURED WATER LEVELS

Eagle Flat

$$Residual = (h_m - h_s)$$

$$Mean\ error = \frac{1}{n}\sum_{i=1}^{n}(h_m - h_s)_i$$

$$Mean\ absolute\ error = \frac{1}{n}\sum_{i=1}^{n}|(h_m - h_s)_i|$$

$$Root\ mean\ square\ error = \left[\frac{1}{n}\sum_{i=1}^{n}\left|(h_m - h_s)_i^2\right|\right]^{0.5}$$

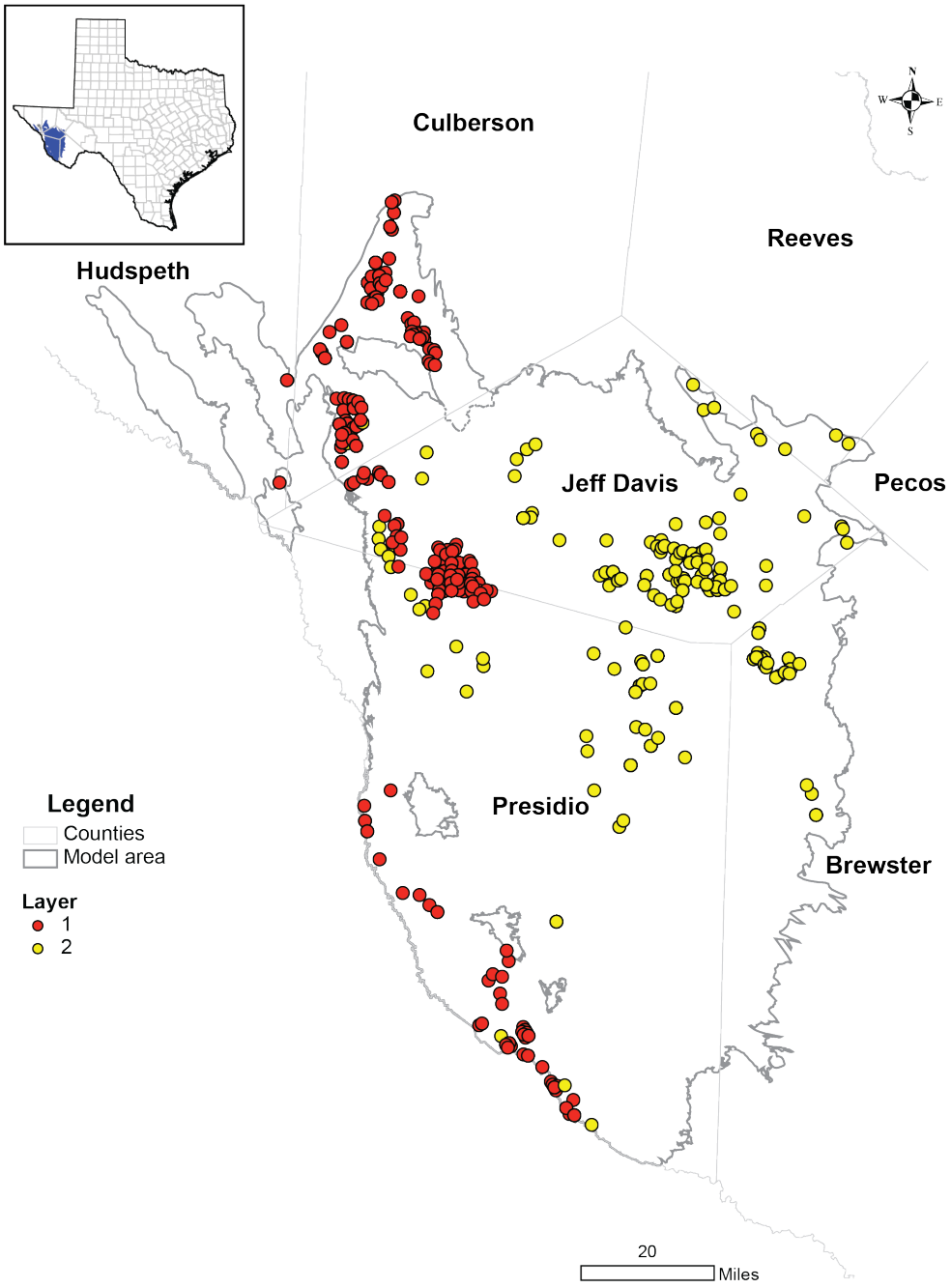
where:

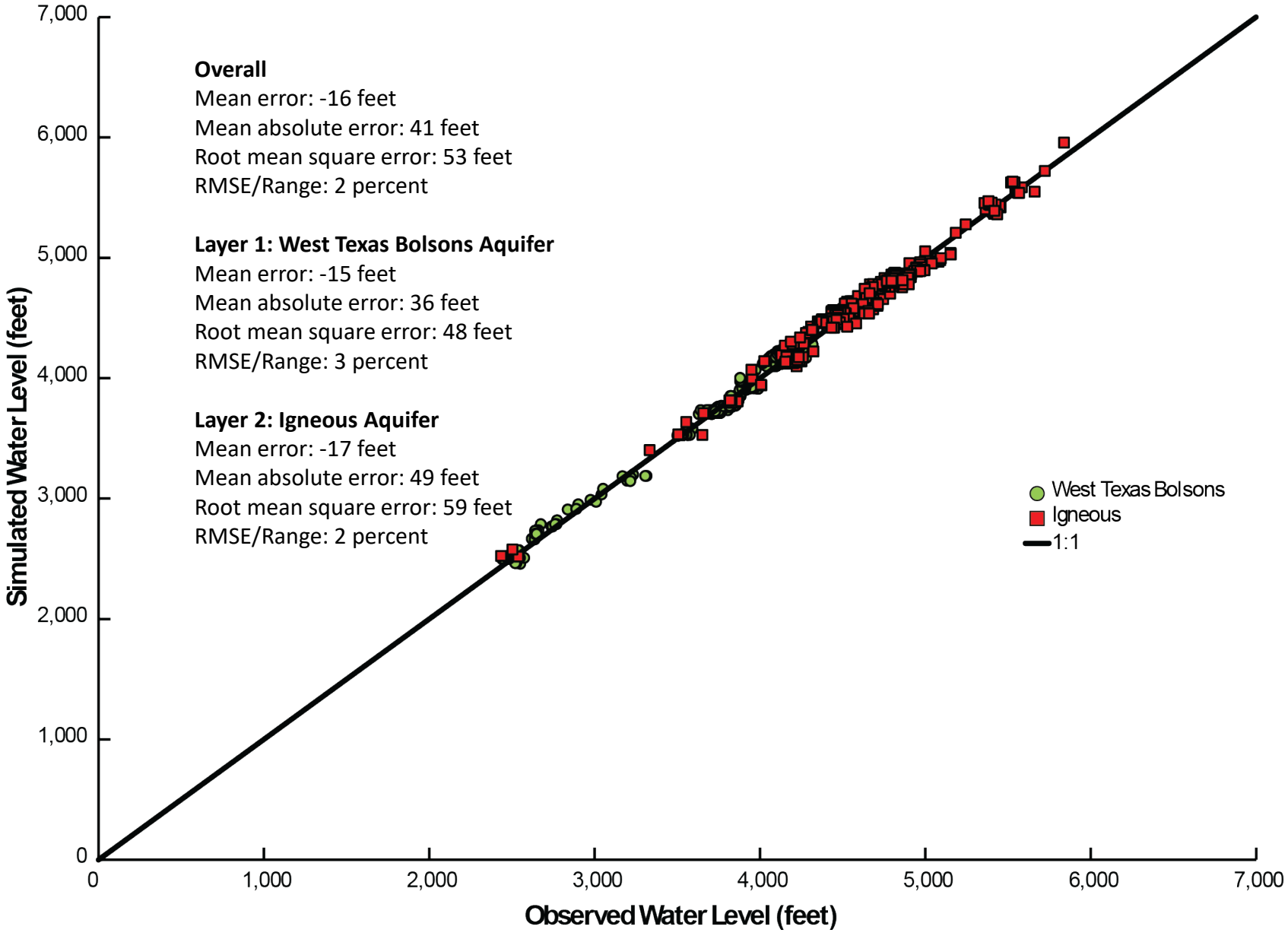
h_m = measured water level (feet above mean sea level)

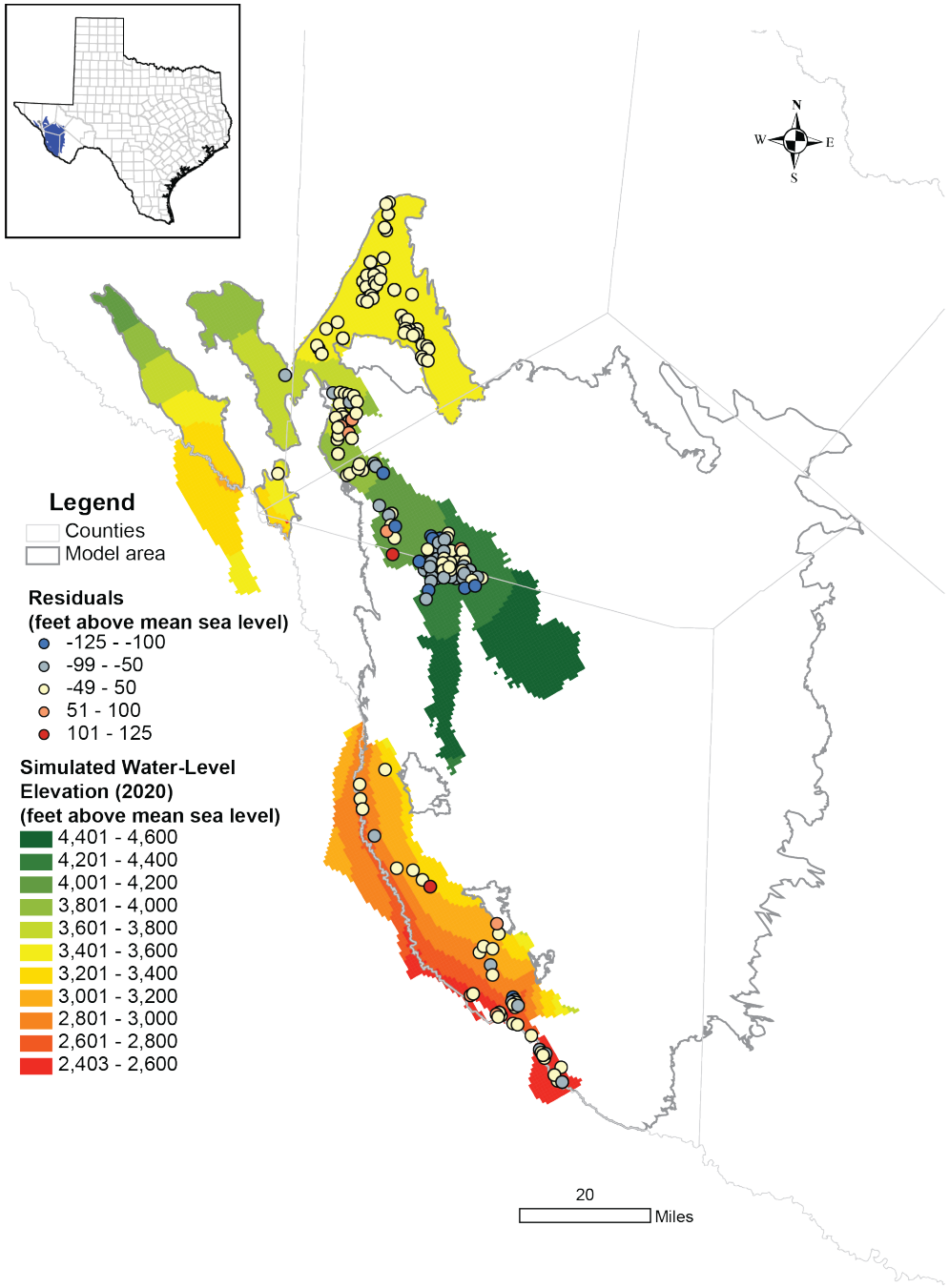
h_s = simulated water level (feet above mean sea level)

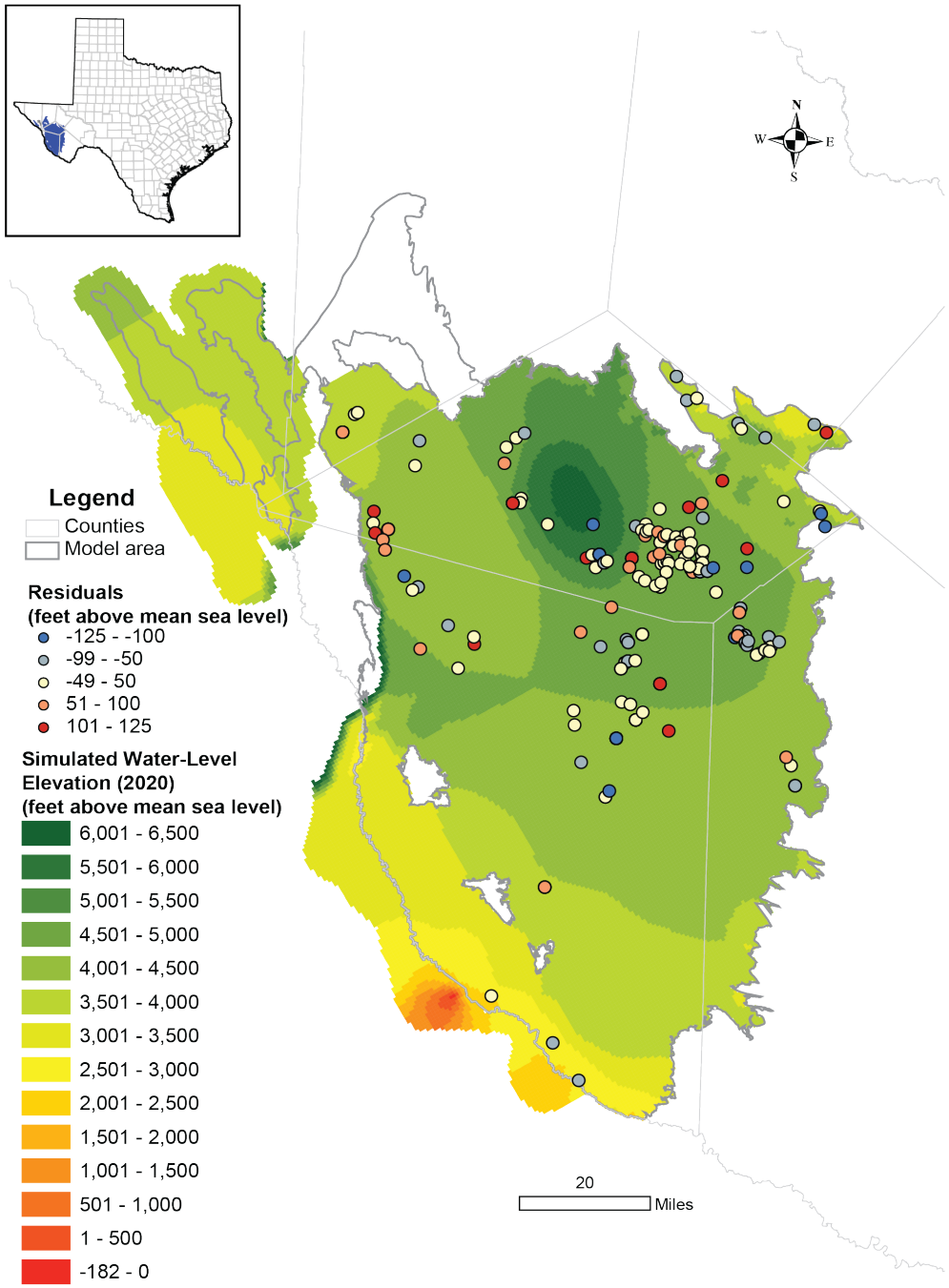
n = number of calibration measurements.

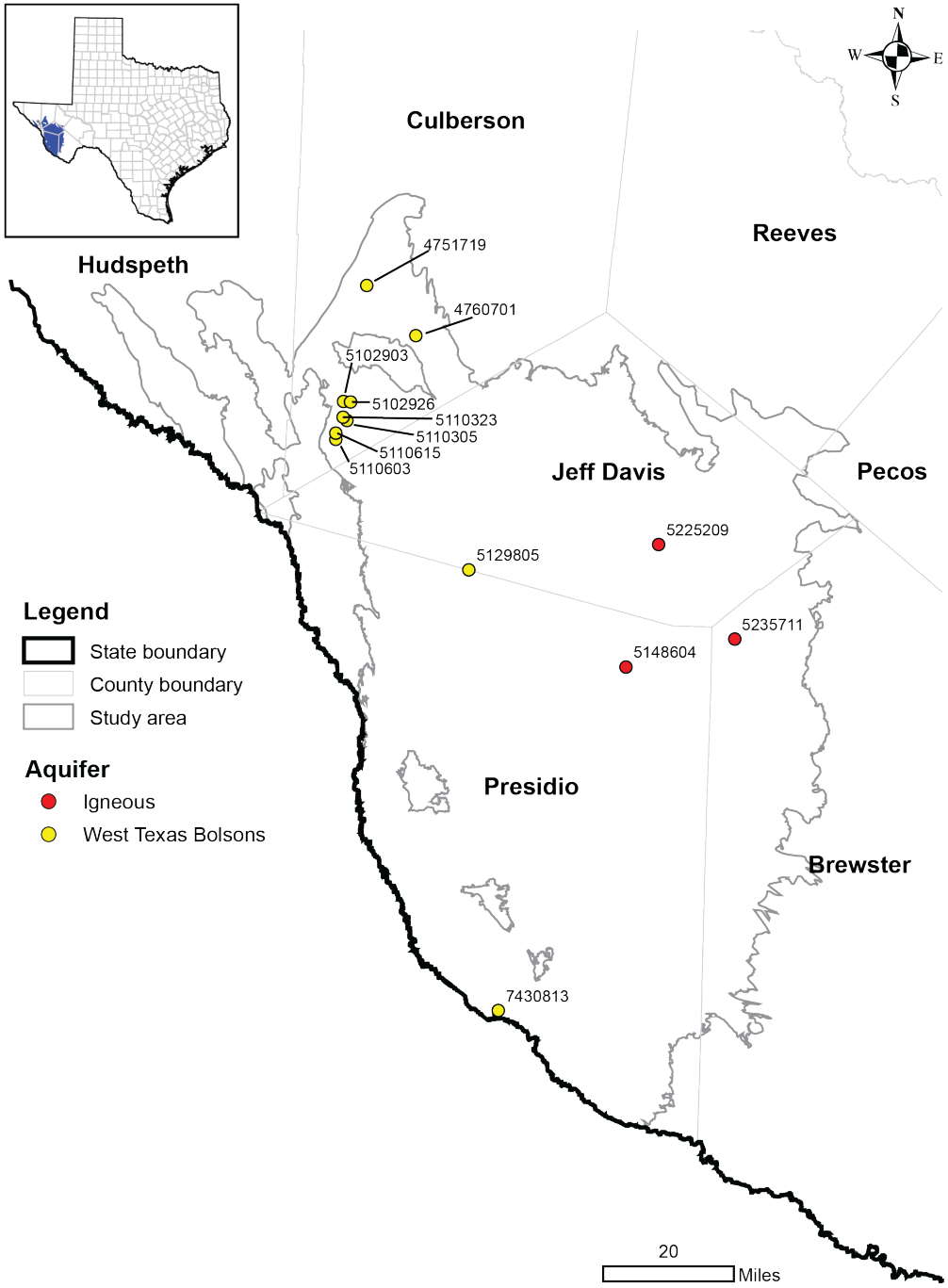
West Texas Bolsons Aquifer	Pest 3
Mean Error (feet)	-15
Mean Absolute Error (feet)	36
Root Mean Square Error (feet)	48
Range of measured water levels (feet)	1,877
Root Mean Square Error/Range (percent)	3
Igneous Aquifer	
Mean Error (feet)	-17
Mean Absolute Error (feet)	49
Root Mean Square Error (feet)	59
Range of measured water levels (feet)	3,404
Root Mean Square Error/Range (percent)	2
Overall	
Mean Error (feet)	-16
Mean Absolute Error (feet)	41
Root Mean Square Error (feet)	53
Range of measured water levels (feet)	3,404
Root Mean Square Error/Range (percent)	2

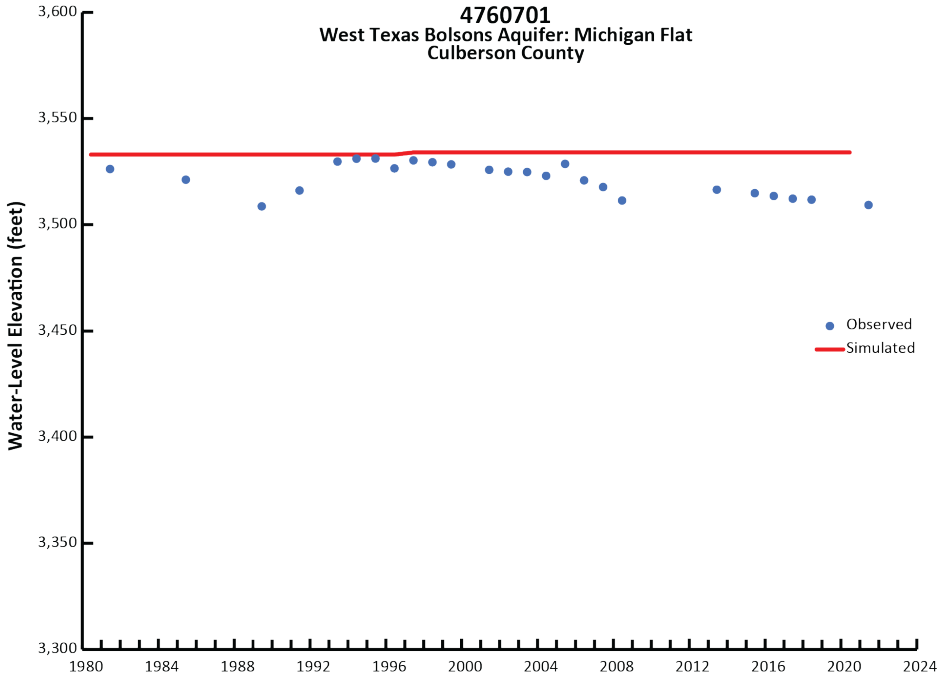

Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
Legend
Counties
Model area
Layer
1
2
20
Miles

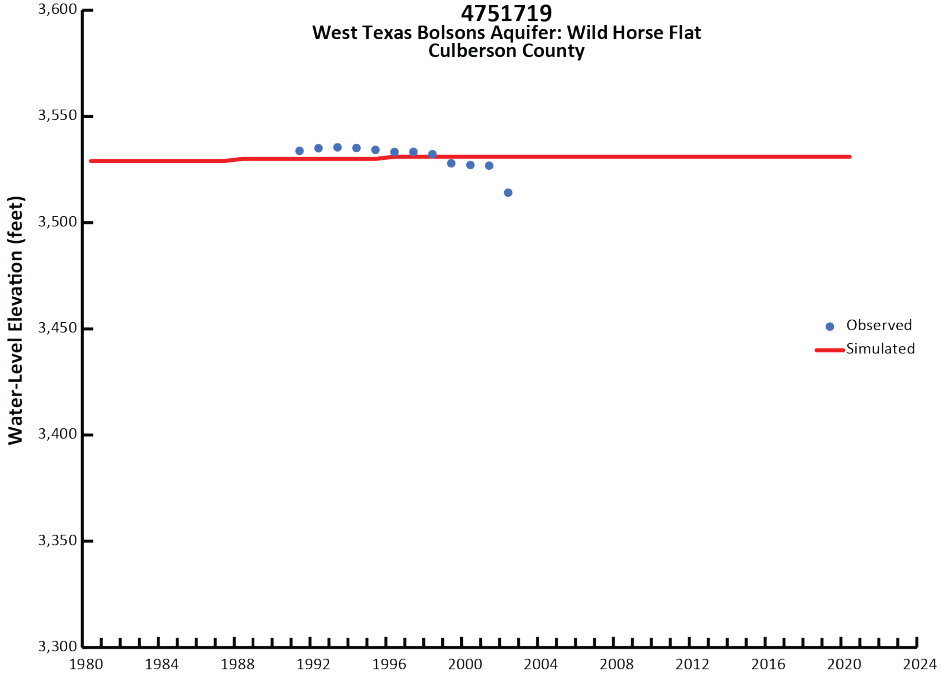

Overall
Mean error: -16 feet
Mean absolute error: 41 feet
Root mean square error: 53 feet
RMSE/Range: 2 percent
Layer 1: West Texas Bolsons Aquifer
Mean error: -15 feet
Mean absolute error: 36 feet
Root mean square error: 48 feet
RMSE/Range: 3 percent
Layer 2: Igneous Aquifer
Mean error: -17 feet
Mean absolute error: 49 feet
Root mean square error: 59 feet
RMSE/Range: 2 percent
West Texas Bolsons
Igneous
1:1
Simulated Water Level (feet)
Observed Water Level (feet)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000

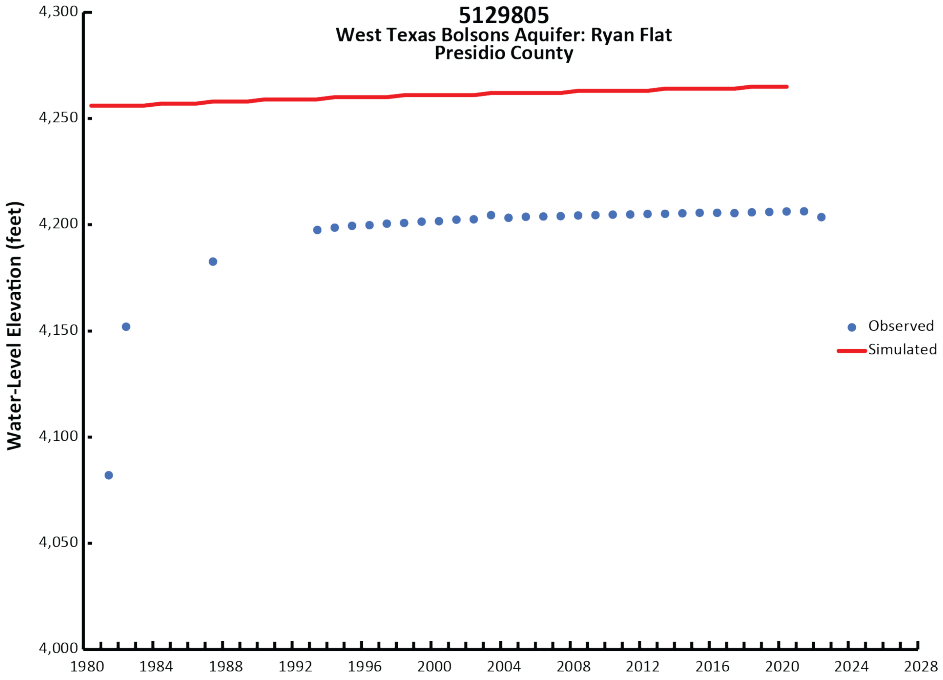

Legend
Counties
Model area
Residuals
(feet above mean sea level)
-125 - -100
-99 - -50
-49 - 50
51 - 100
101 - 125
Simulated Water-Level
Elevation (2020)
(feet above mean sea level)
4,401 - 4,600
4,201 - 4,400
4,001 - 4,200
3,801 - 4,000
3,601 - 3,800
3,401 - 3,600
3,201 - 3,400
3,001 - 3,200
2,801 - 3,000
2,601 - 2,800
2,403 - 2,600
N
W
E
S
20
Miles

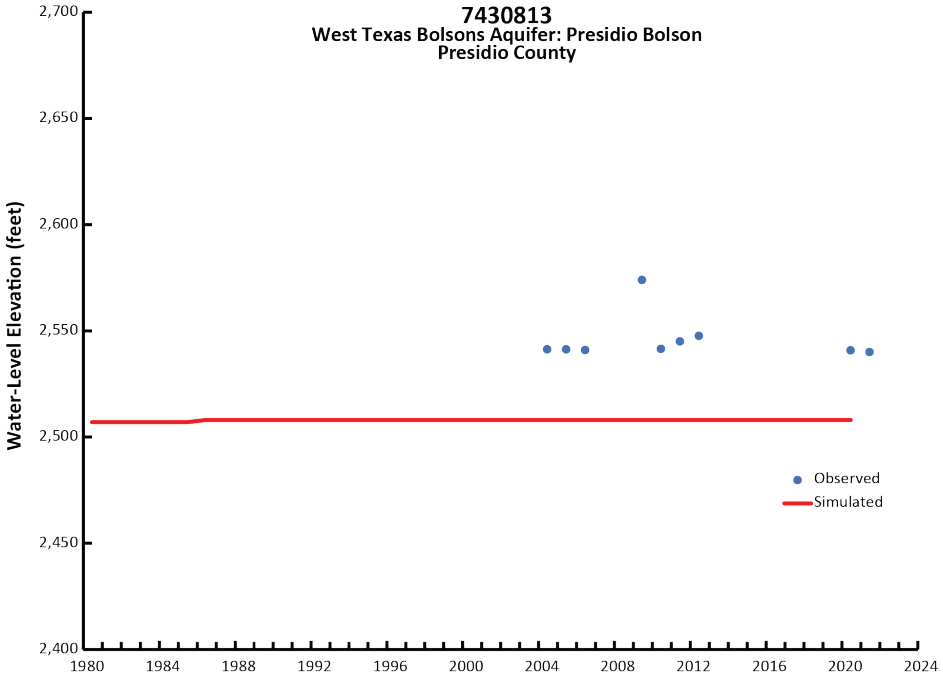

Legend
Counties
Model area
Residuals
(feet above mean sea level)
-125 - -100
-99 - -50
-49 - 50
51 - 100
101 - 125
Simulated Water-Level
Elevation (2020)
(feet above mean sea level)
6,001 - 6,500
5,501 - 6,000
5,001 - 5,500
4,501 - 5,000
4,001 - 4,500
3,501 - 4,000
3,001 - 3,500
2,501 - 3,000
2,001 - 2,500
1,501 - 2,000
1,001 - 1,500
501 - 1,000
1 - 500
-182 - 0
N
W
E
S
20
Miles

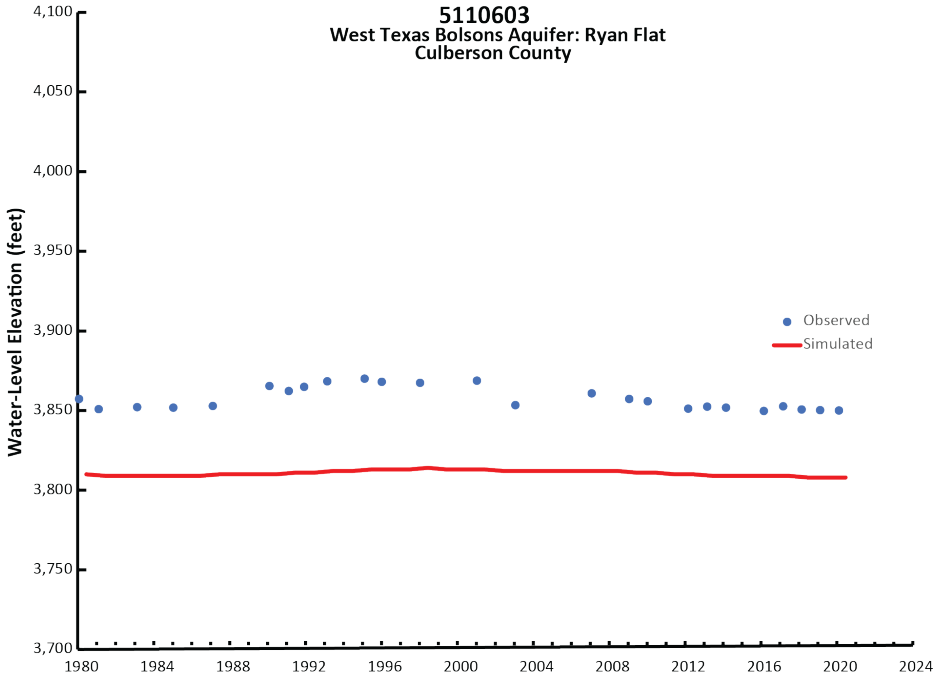

Culberson
Reeves
Hudspeth
Jeff Davis
Pecos
Presidio
Brewster
4751719
4760701
5102903
5102926
5110323
5110305
5110615
5110603
5225209
5129805
5235711
5148604
7430813
N
W
E
S
Legend
State boundary
County boundary
Study area
Aquifer
Igneous
West Texas Bolsons
20
Miles

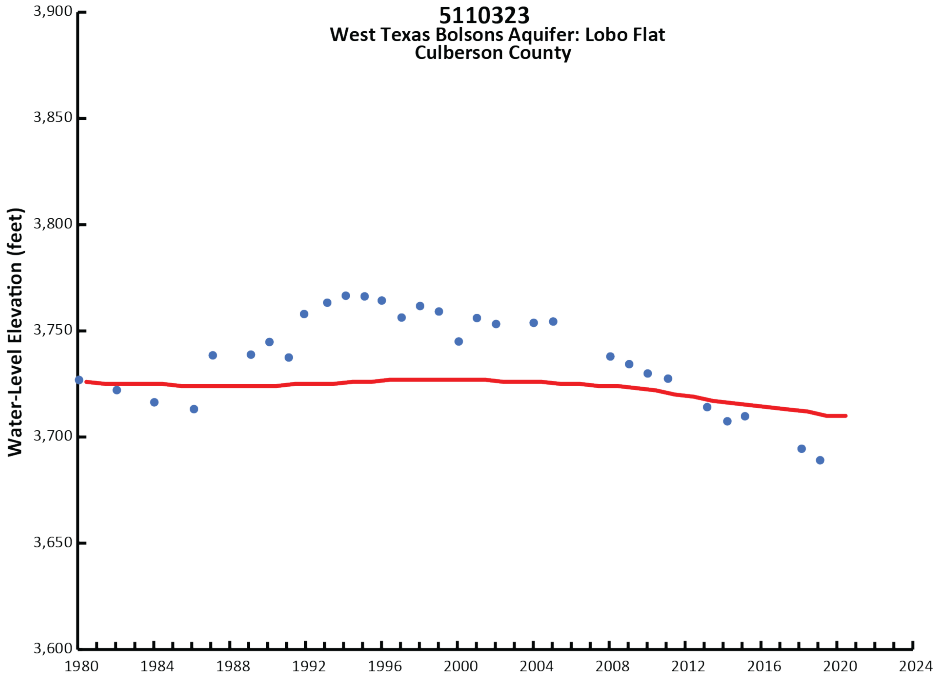

4760701
West Texas Bolsons Aquifer: Michigan Flat
Culberson County
Water-Level Elevation (feet)
3,600
3,550
3,500
3,450
3,400
3,350
3,300
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated

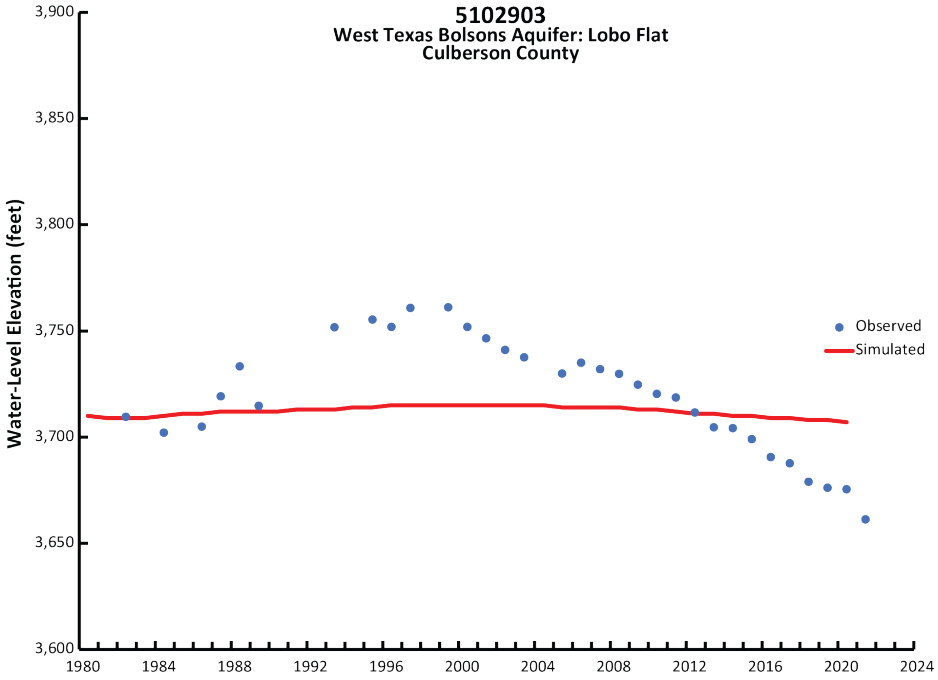

4751719
West Texas Bolsons Aquifer: Wild Horse Flat
Culberson County
Water-Level Elevation (feet)
3,600
3,550
3,500
3,450
3,400
3,350
3,300
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated

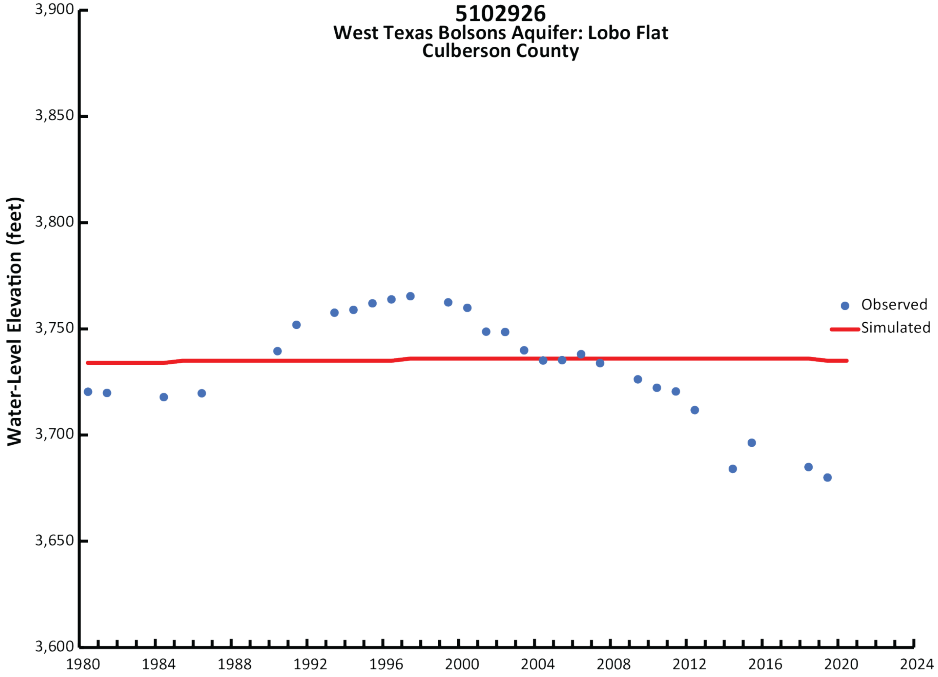

5129805
West Texas Bolsons Aquifer: Ryan Flat
Presidio County
Water-Level Elevation (feet)
4,300
4,250
4,200
4,150
4,100
4,050
4,000
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
2028
Observed
Simulated

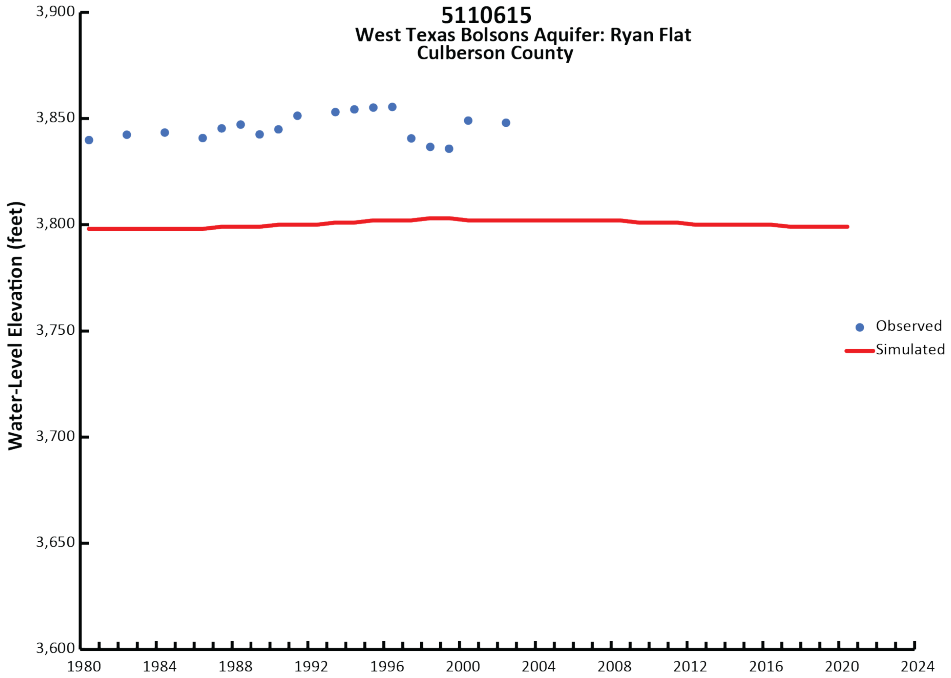

7430813
West Texas Bolsons Aquifer: Presidio Bolson
Presidio County
Water-Level Elevation (feet)
2,700
2,650
2,600
2,550
2,500
2,450
2,400
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated

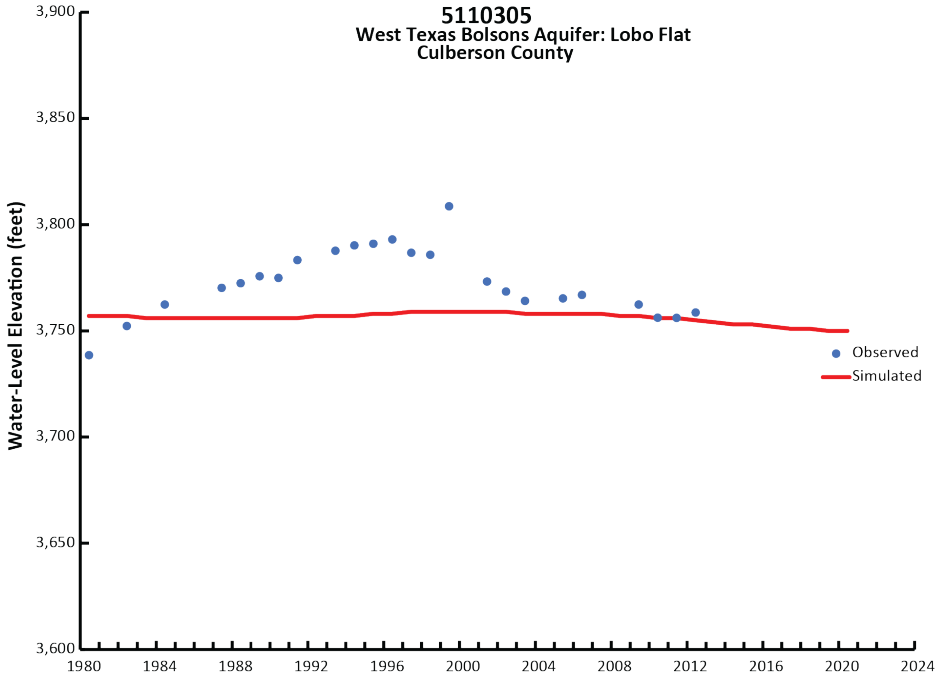

5110603
West Texas Bolsons Aquifer: Ryan Flat
Culberson County
Water-Level Elevation (feet)
4,100
4,050
4,000
3,950
3,900
3,850
3,800
3,750
3,700
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated

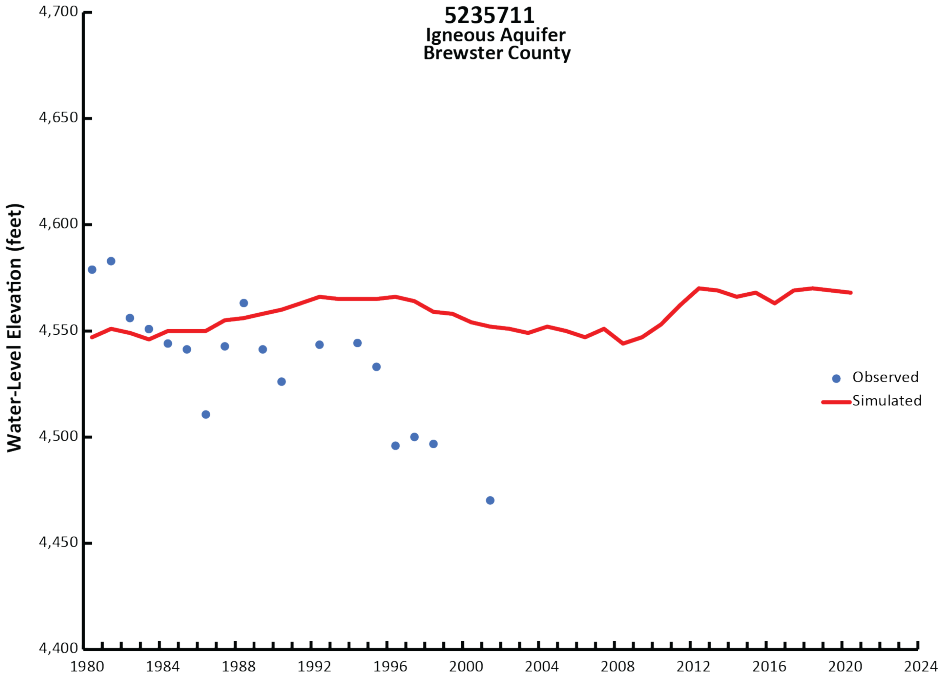

5110323
West Texas Bolsons Aquifer: Lobo Flat
Culberson County
Water-Level Elevation (feet)
3,900
3,850
3,800
3,750
3,700
3,650
3,600
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024

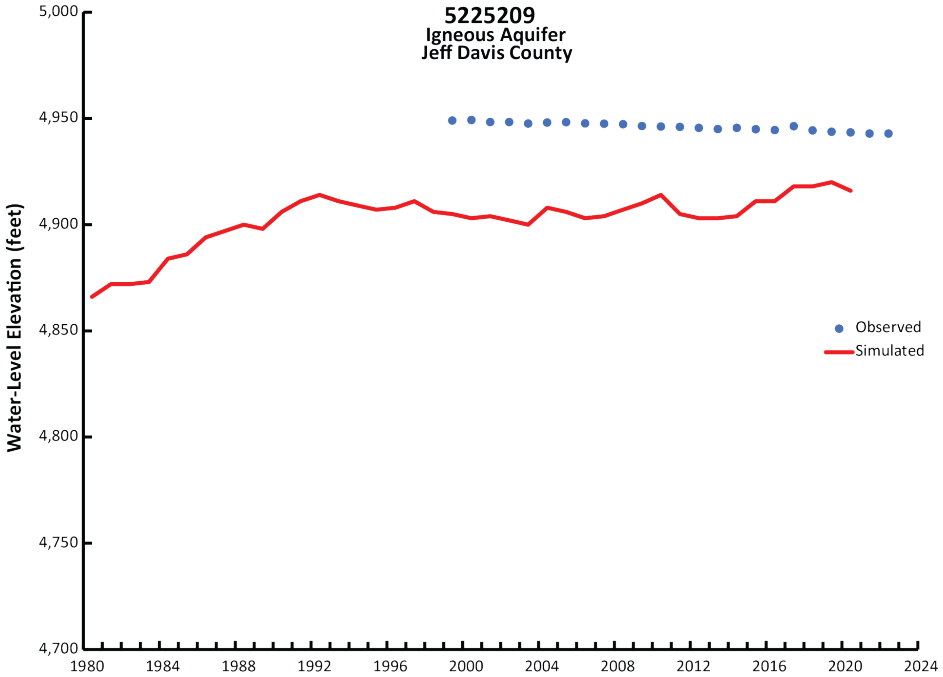

5102903
West Texas Bolsons Aquifer: Lobo Flat
Culberson County
Water-Level Elevation (feet)
3,900
3,850
3,800
3,750
3,700
3,650
3,600
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated

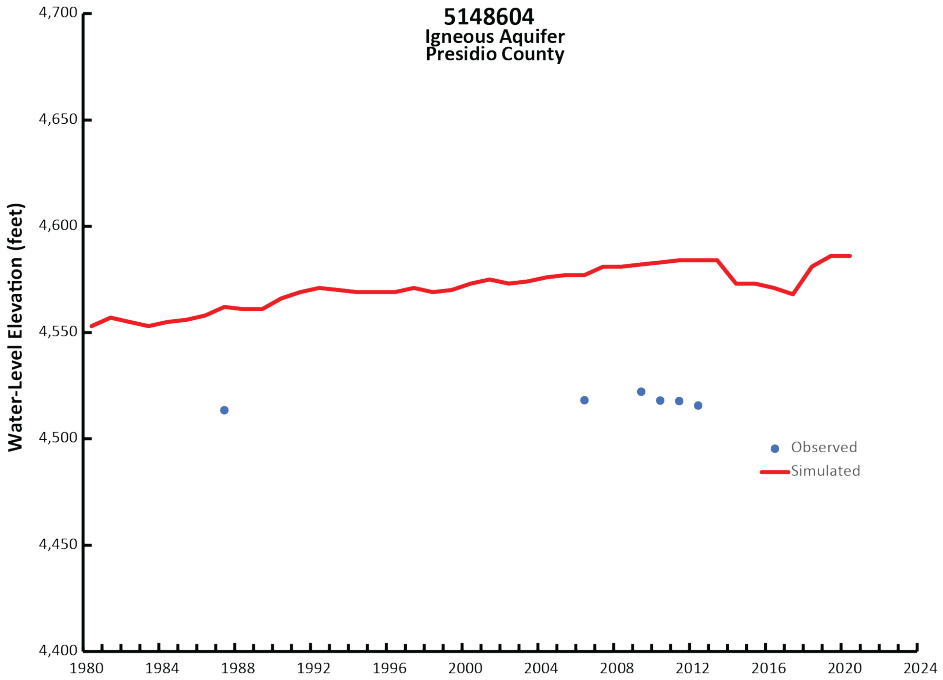

5102926
West Texas Bolsons Aquifer: Lobo Flat
Culberson County
Water-Level Elevation (feet)
3,900
3,850
3,800
3,750
3,700
3,650
3,600
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated


5110615
West Texas Bolsons Aquifer: Ryan Flat
Culberson County
Water-Level Elevation (feet)
3,900
3,850
3,800
3,750
3,700
3,650
3,600
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated


5110305
West Texas Bolsons Aquifer: Lobo Flat
Culberson County
Water-Level Elevation (feet)
3,900
3,850
3,800
3,750
3,700
3,650
3,600
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated

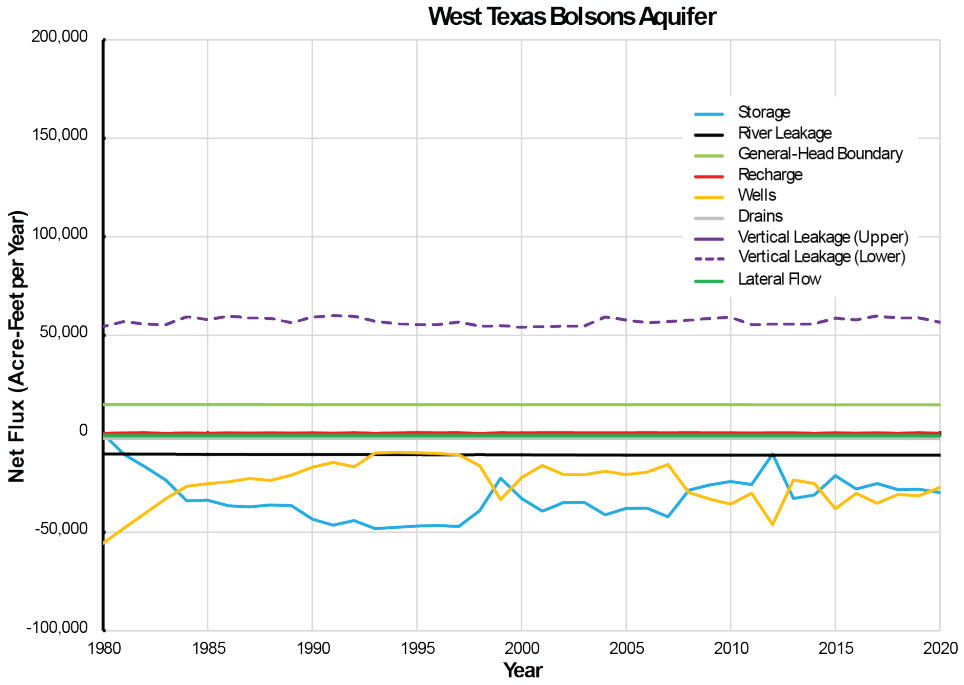

5235711
Igneous Aquifer
Brewster County
Water-Level Elevation (feet)
4,700
4,650
4,600
4,550
4,500
4,450
4,400
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated

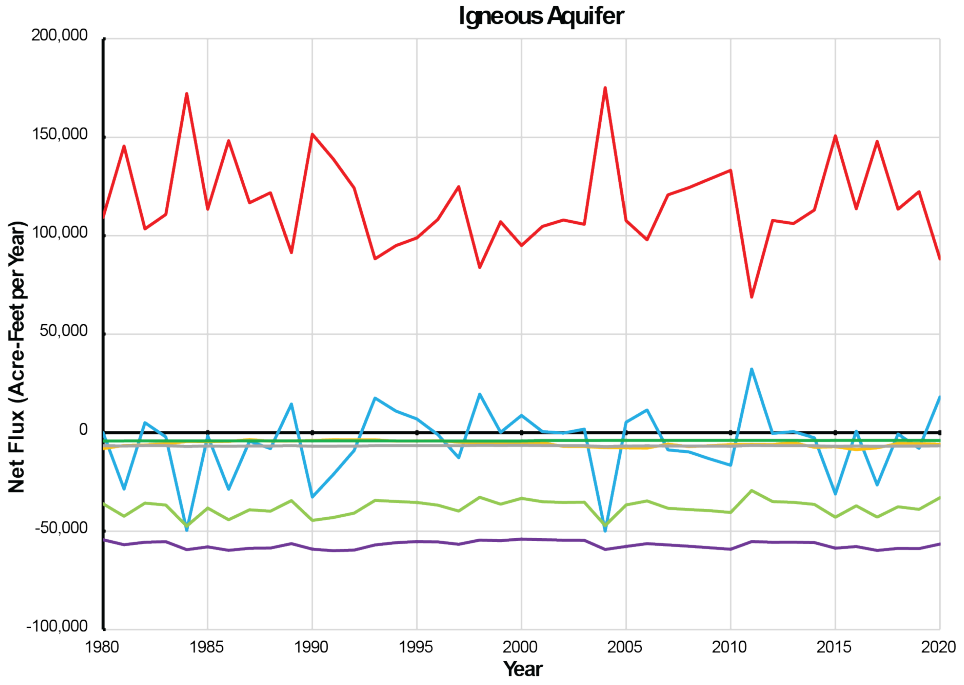

5225209
Igneous Aquifer
Jeff Davis County
Water-Level Elevation (feet)
5,000
4,950
4,900
4,850
4,800
4,750
4,700
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated


5148604
Igneous Aquifer
Presidio County
Water-Level Elevation (feet)
4,700
4,650
4,600
4,550
4,500
4,450
4,400
1980
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
Observed
Simulated

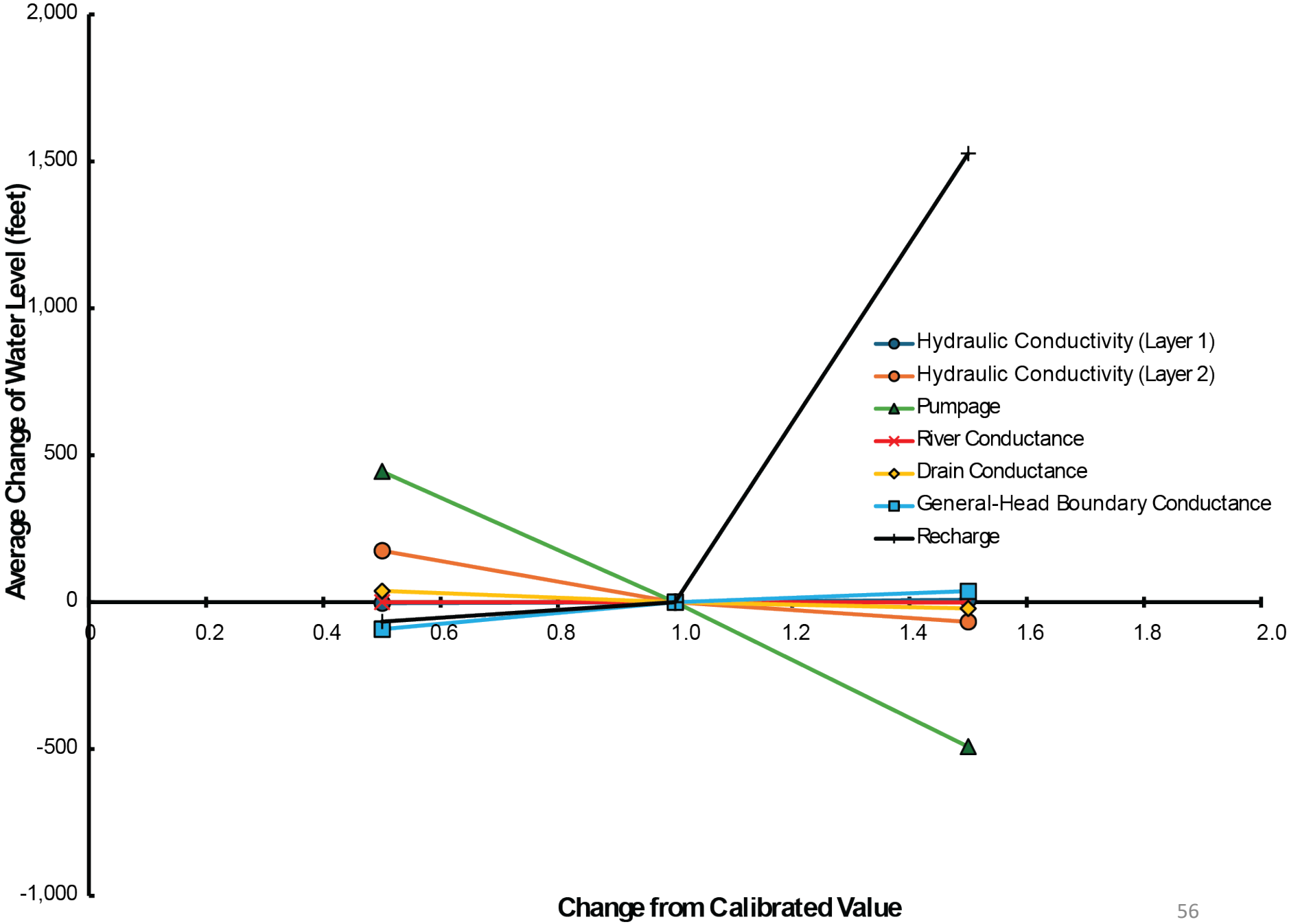
MODEL-SIMULATED WATER BUDGETS

Flux	Layer 1	Layer 2	Overall
Inflow (acre-feet)			
River Leakage	17,411	95	17,506
General-Head Boundary	14,774	182,977	197,751
Recharge	142	109,327	109,469
Vertical Leakage (Upper)	--	2,013	2,013
Vertical Leakage (Lower)	56,374	--	56,374
Lateral Flow	6,434	1,858	8,292
Outflow (acre-feet)			
Wells	55,578	8,082	63,660
Drains	2,400	6,562	8,962
River Leakage	27,687	151	27,838
General-Head Boundary	--	219,044	219,044
Vertical Leakage (Upper)	--	56,374	56,374
Vertical Leakage (Lower)	2,013	--	2,013
Lateral Flow	7,458	6,071	13,529


West Texas Bolsons Aquifer
Net Flux (Acre-Feet per Year)
200,000
150,000
100,000
50,000
0
-50,000
-100,000
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year
Storage
River Leakage
General-Head Boundary
Recharge
Wells
Drains
Vertical Leakage (Upper)
Vertical Leakage (Lower)
Lateral Flow


Igneous Aquifer
Net Flux (Acre-Feet per Year)
200,000
150,000
100,000
50,000
0
-50,000
-100,000
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

SENSITIVITY ANALYSIS


2,000
1,500
1,000
500
0
-500
-1,000
Average Change of Water Level (feet)
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Change from Calibrated Value
Hydraulic Conductivity (Layer 1)
Hydraulic Conductivity (Layer 2)
Pumpage
River Conductance
Drain Conductance
General-Head Boundary Conductance
Recharge

MODEL LIMITATIONS

Supporting data

- Spatially and temporally limited water-level targets
  - westernmost bolsons of the West Texas Bolsons Aquifer (Green River Valley, Eagle Flat, and Red Light Draw)
- Limited applicability of available stream gage and stream gain/loss estimates for the streams in the study area
- Limited hydraulic conductivity data for the aquifers and non-aquifer stratigraphic units in the study area
- Limited data quantifying cross-formational flow between the aquifers
- Uncertain estimates of pumping and recharge in all hydrostratigraphic units

Assumption assessment

- Assumptions about groundwater flow
  - Spatial distribution of parameters
  - Occurrence of flow boundaries
  - Spatial and temporal distribution of pumping
- Distribution simplification
  - Parameters
  - Boundaries
- Recharge assumed only in Igneous Aquifer outcrop

Model application

- Purpose
  - Groundwater management
  - Not applicable for use
    - Non-aquifer parts of model
    - High salinity groundwater
    - Geothermal flow systems
- Scale
  - Regional scale only
  - Not useful for local-scale issues
- Predictive tool
  - Better at predicting changes in water level than absolute water levels at specific locations

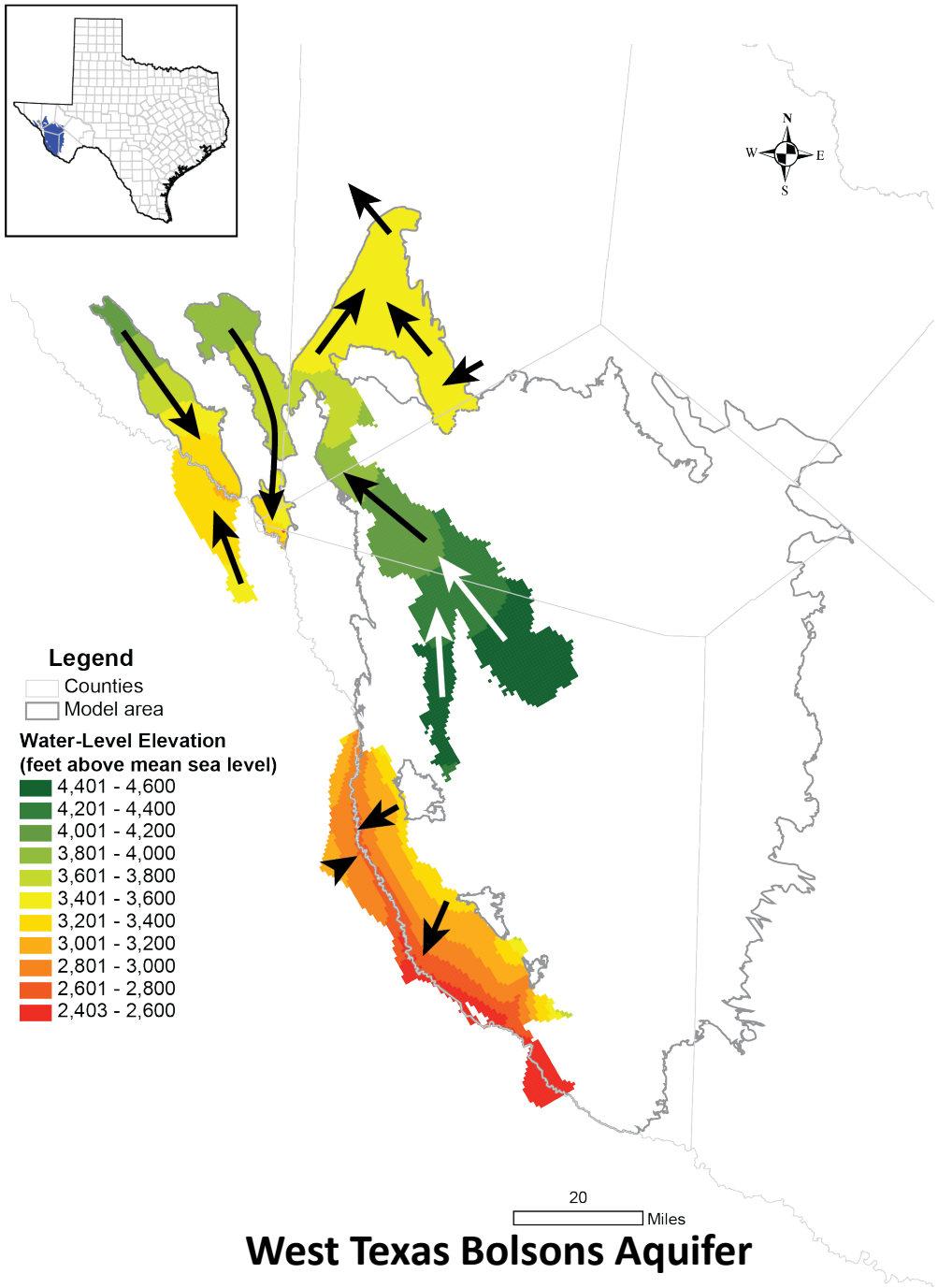
SUMMARY/CONCLUSIONS

Summary

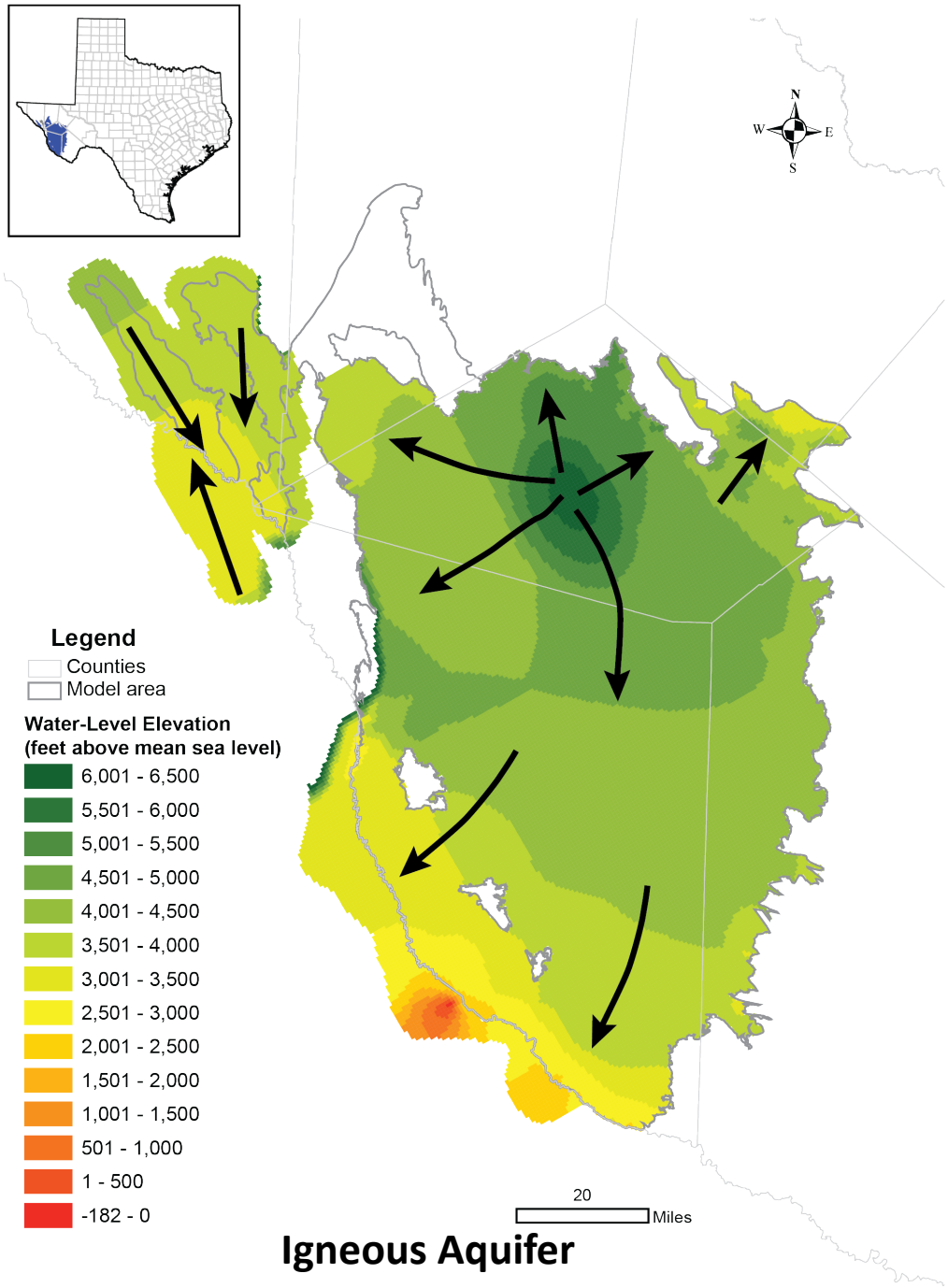
- The groundwater availability model is a groundwater management tool that can be used by stakeholders.
- This regional-scale model
  - Not intended to address issues at local scale resolution, nor is it intended to simulate groundwater flow through the non-aquifer geologic units included in the model.
- Two layers of half-mile grid cells
  - West Texas Bolsons Aquifer (Layer 1) and
  - Igneous Aquifer and non-aquifer stratigraphic units (Layer 2).

Summary

- Model boundaries
  - No-flow along the margins of the model boundaries represent groundwater divides or other barriers to groundwater flow .
  - GHBs simulate groundwater flow between the Igneous and West Texas Bolsons aquifers and adjacent the Edwards-Trinity (Plateau) Aquifer.
  - Recharge to the Igneous Aquifer outcrop through infiltration from intermittent and ephemeral streams associated with rainfall events.
  - Groundwater pumped from the flow system for municipal, domestic, irrigation, and livestock uses.
- The model was calibrated using trial-and-error and parameter estimation software (PEST).
- Sensitivity analysis indicate that the model is most sensitive to recharge and pumpage.



West Texas Bolsons Aquifer



Igneous Aquifer

Additional Information

Web information:

https://www.twdb.texas.gov/groundwater/models/gam/wtbi/wtbi.asp

Deadline for comments: September 1, 2025

Contact Information

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ian.jones@twdb.texas.gov

512-463-6641

Texas Water Development Board

P.O. Box 13231

Austin, Texas 78711-3231

Web information:

https://www.twdb.texas.gov/groundwater/models/gam/wtbi/wtbi.asp

QUESTIONS?
Wild Horse Flat

ATTENDANCE LIST
Ryan Flat

Name	Affiliation
Ian Jones	Texas Water Development Board
Daryn Hardwick	Texas Water Development Board
Avay Risal	Texas Water Development Board
Roberto Anaya	Texas Water Development Board
Shirley Wade	Texas Water Development Board
Natalie Ballew	Texas Water Development Board
William Smith	Consultant
Darrell Peckham	Consultant
Bence Close	Consultant
Saheli Majumdar	Texas Water Development Board
Yasin Abulsayen	Texas Water Development Board
Jean Perez	Texas Water Development Board
Gretchen Miller	Consultant
Cody Bjornson	Texas Water Development Board
Steve Finch	Consultant
Robbyn Hill	Brewster County Groundwater Conservation District
Kevin Urbanczk	Sul Ross State University
Haley Davis	Culberson County Groundwater Conservation District
Randy Barker	Hudspeth County Groundwater Conservation District no. 1
Janet Adams	Jeff Davis County Groundwater Conservation District
Trey Gerfers	Presidio County Groundwater Conservation District