Brazos Valley Groundwater Conservation District

Review of Subsidence Estimates using TWDB Subsidence Tool

May 11, 2023

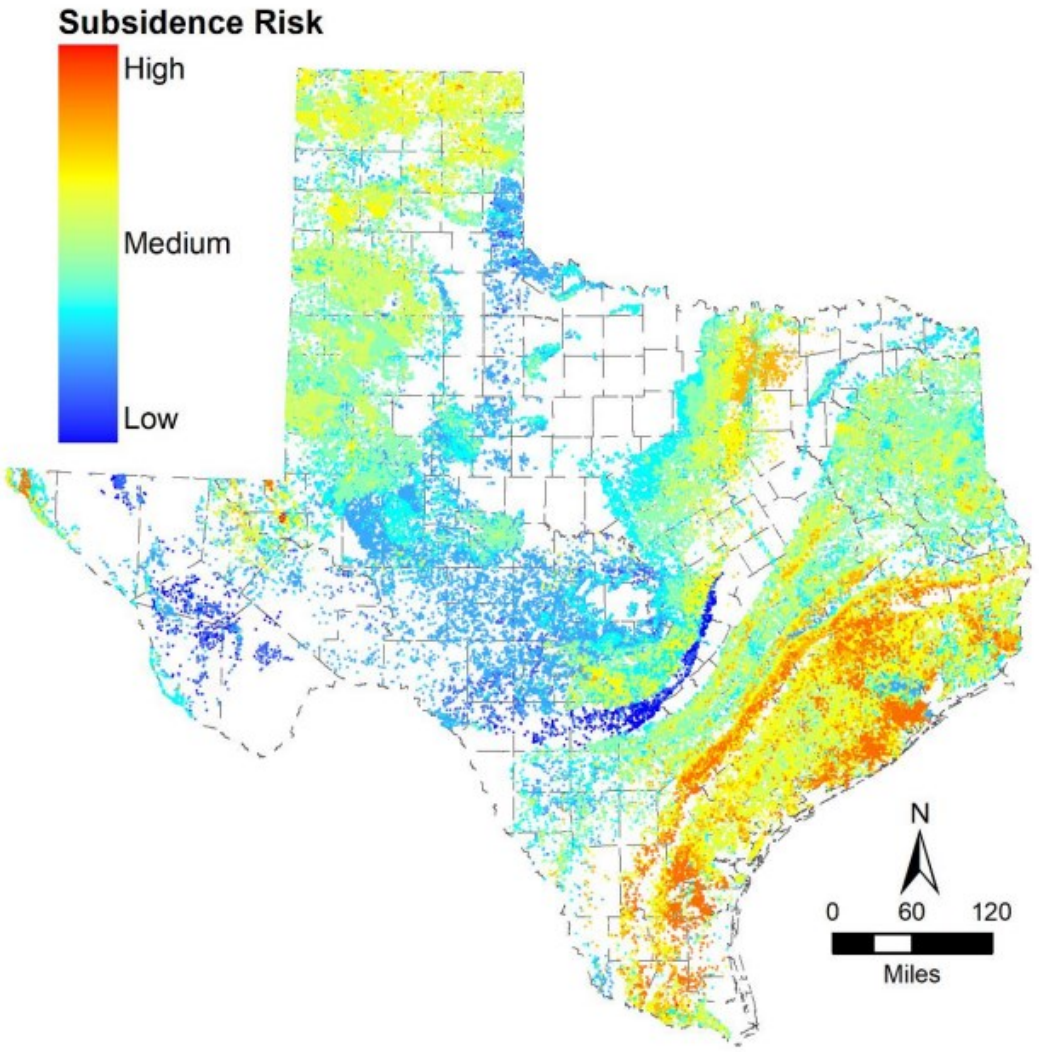
AGS
Advanced Groundwater Solutions, LLC

TWDB Subsidence Study and Tool

Final Report: Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping

TWDB Contract Number 1648302062

March 2017



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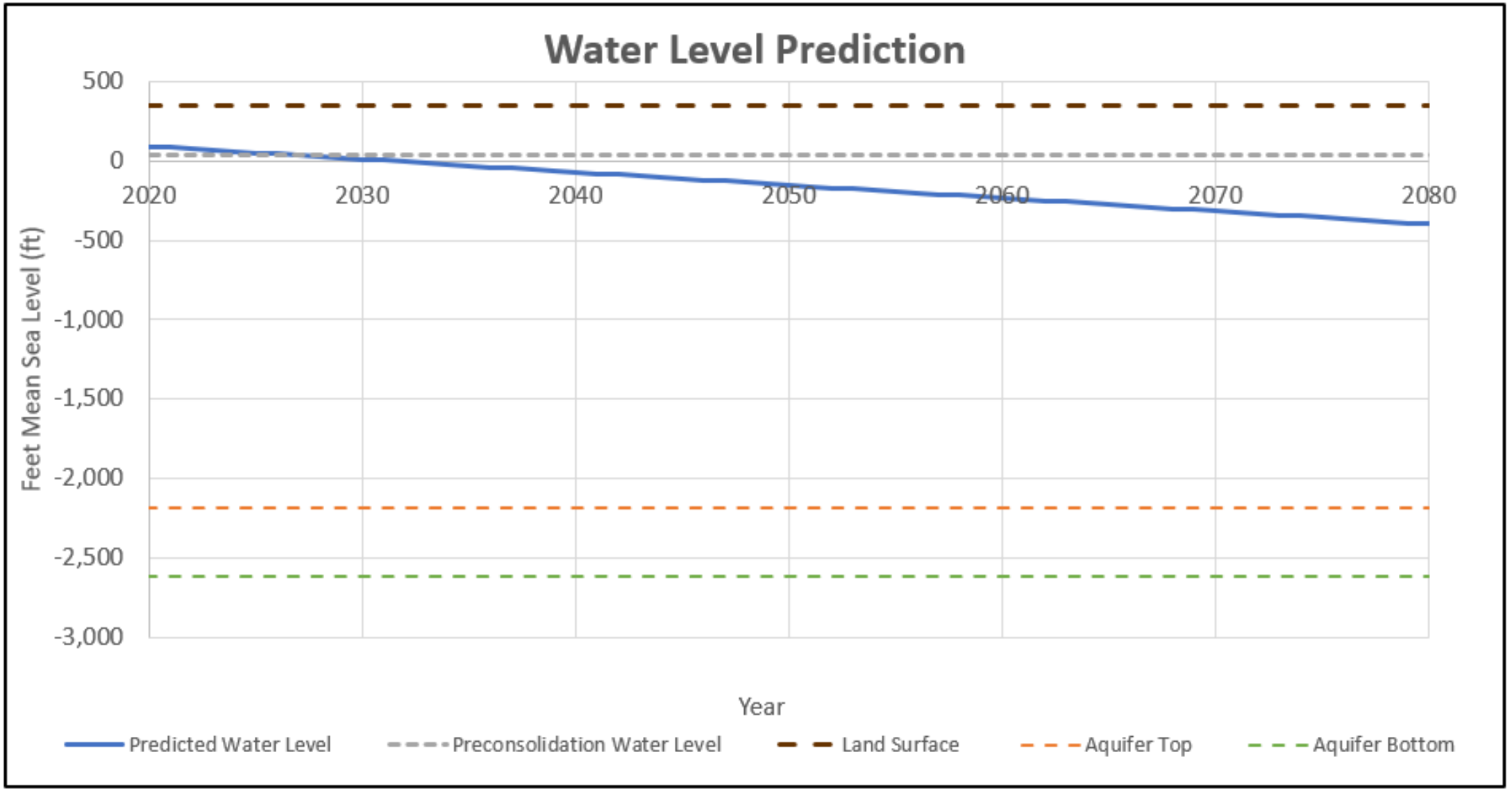
Subsidence Prediction Screening Tool Assumptions and Limitations

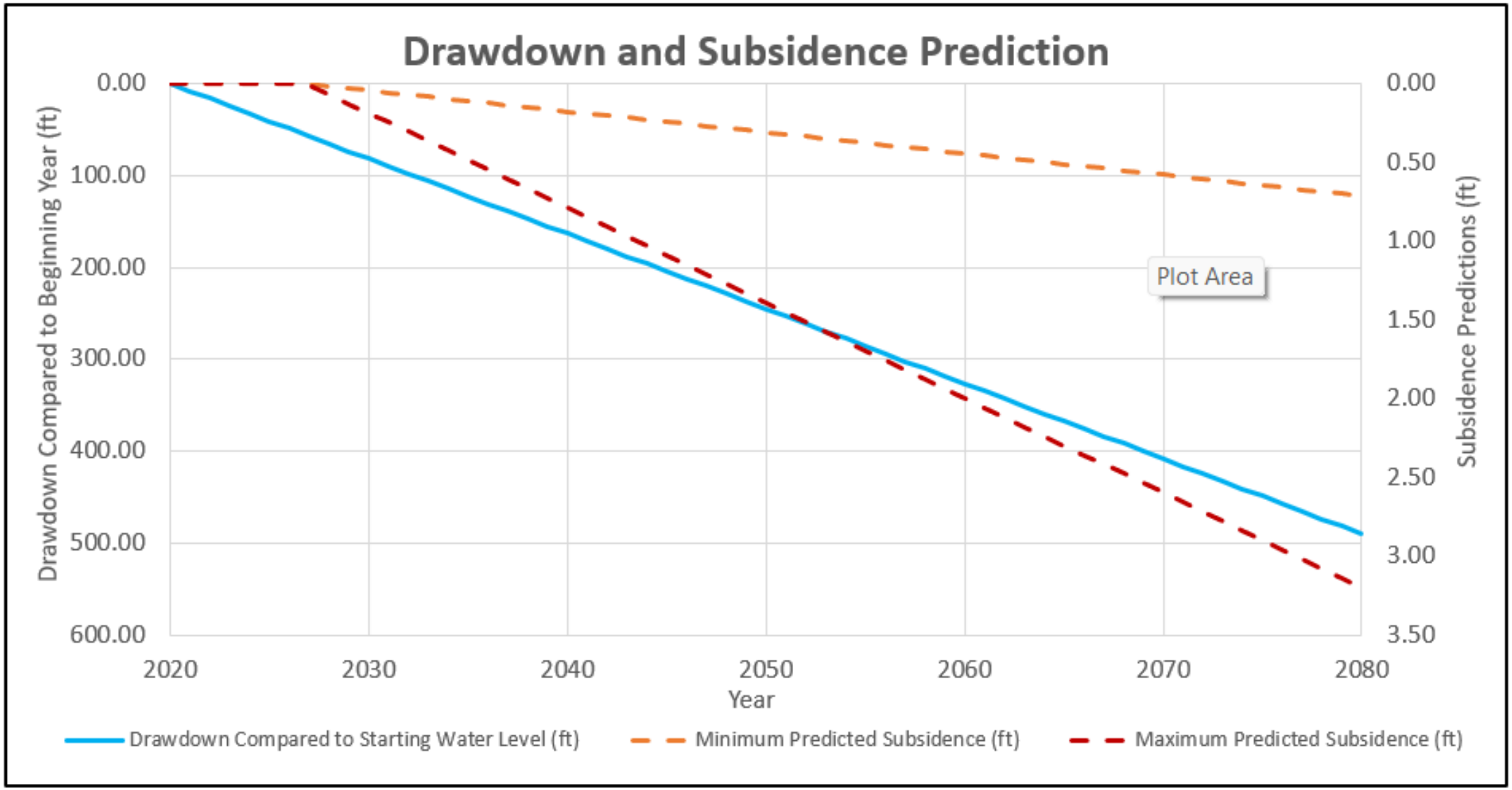
- Compaction properties and subsidence data is sparse
- Generally obtained from core samples and geotechnical lab tests
- Uses generalized compaction parameters and properties by sediment type
- Not considering geology away from well bore or in other aquifers
- No actual compaction properties from the Simsboro

Aquifer	**General Calculation**	☐ Reset Subsidence Prediction Tool on Open
Report Generated by		
Report Date	5/3/2023	
Well Name	CS Well1	
Water Levels to Use for Predictions	Current and Trend	
Location and Water Level Based User Input	**User Input Values**	**Units**
Land Surface (feet MSL)	349	feet
Aquifer Top (feet MSL)	-2,181	feet
Aquifer Thickness	430	feet
Clay Thickness within Aquifer	77	feet
Groundwater Temperature	46	Degrees Celsius
Groundwater Total Dissolved Solids (TDS)	560	mg/l
Predevelopment Water Level (feet MSL)	269	feet
Current Water Level (feet MSL)	93	feet
Unsaturated Thickness	100	feet
Preconsolidation (deepest) Water Level (feet MSL)	36	feet
Base Water Level (feet MSL)	102	feet
Future Water Level (feet MSL)	-388	feet
Beginning Year for Subsidence Evaluation	2020	year
Ending Year for Subsidence Evaluation	2080	year

Aquifer Subsidence Calculations based on overall aquifer information and user supplied input values

		Units
Water Level Trend	-8.17	ft/year; negative for decline
Predominant Aquifer Lithology	Unconsolidated Clastic	Description
Aquifer Storage Coefficient	0.0001	Dimensionless
Aquifer Porosity	25	Percent
Predominant Aquifer Clay Type	Plastic Clay	Type
Aquifer Clay Porosity	50	Percent
Minimum Aquifer Compressibility	4.80E-04	psi^{-1}
Maximum Aquifer Compressibility	9.00E-04	psi^{-1}
Minimum Clay Compressibility	1.79E-03	psi^{-1}
Maximum Clay Compressibility	1.38E-02	psi^{-1}
Minimum Elastic Specific Storage (S_{ske})	6.42E-07	ft^{-1}
Maximum Elastic Specific Storage (S_{ske})	2.88E-06	ft^{-1}
Minimum Inelastic Specific Storage (S_{skv})	6.42E-05	ft^{-1}
Maximum Inelastic Specific Storage (S_{skv})	2.88E-04	ft^{-1}
Total Weighted Risk for Well 0 (low risk) to 10 (high risk)	**6.25**	


Water Level Prediction
500
0
-500
-1,000
-1,500
-2,000
-2,500
-3,000
2020
2030
2040
2050
2060
2070
2080
Feet Mean Sea Level (ft)
Year
Predicted Water Level
Preconsolidation Water Level
Land Surface
Aquifer Top
Aquifer Bottom


Drawdown and Subsidence Prediction
Drawdown Compared to Beginning Year (ft)
0.00
100.00
200.00
300.00
400.00
500.00
600.00
Subsidence Predictions (ft)
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
Plot Area
2020
2030
2040
2050
2060
2070
2080
Year
Drawdown Compared to Starting Water Level (ft)
Minimum Predicted Subsidence (ft)
Maximum Predicted Subsidence (ft)