Appendix A-3

Tule Subbasin Coordination Agreement
Attachment 3: Technical Memorandum Re: Update to the Groundwater Flow Model of the Tule Subbasin

Technical Memorandum

To:	Mr. David De Groot Tule Subbasin Technical Advisory Committee
From:	Thomas Harder, P.G., CH.G. Thomas Harder & Co.
Date:	30-Jun-21
Re:	Update to the Groundwater Flow Model of the Tule Subbasin

1. Introduction

This Technical Memorandum (TM) summarizes the 2020 update to the Tule Subbasin groundwater flow model. The Tule Subbasin groundwater flow model was originally developed in 2018 and 2019 to inform preparation of the Groundwater Sustainability Plans (GSPs) for each of the six Groundwater Sustainability Agencies (GSAs) in the Tule Subbasin (the original version of the Tule Subbasin groundwater model is referred to herein as the "2019 Model"). The 2019 Model was calibrated to measured data from October 1986 through September 2017. At the request of the Tule Subbasin Technical Advisory Committee (TAC), Thomas Harder & Co. (TH&Co) updated the 2019 Model with groundwater pumping and recharge data through September 2019. During the course of the update, TH&Co incorporated new data and made changes to certain aspects of the 2019 Model. The updated model is referred to herein as the "2020 Model."

It is anticipated that the updated model will be used to:

1. develop estimates of subbasin-wide change in groundwater storage,
2. analyze land subsidence, including assistance in identifying specific land subsidence managed areas,
3. evaluate additional projects and management actions, as needed and directed by the TAC, and
4. evaluate the impacts of individual projects and/or management actions on the Sustainable Yield of the subbasin.

Many aspects of the 2019 Model were not changed for the 2020 Model update. The basic hydrogeological conceptual model did not change significantly, as reported in TH&Co 2020a[1] and TH&Co 2020b).[2] The model domain and layering remain the same (see Figure 1). The grid size and spacing are also the same and the 2020 Model transient calibration utilizes monthly stress periods, as did the 2019 Model. TH&Co also utilized the same suite of model codes (MODFLOW) and associated packages for the updated 2020 Model as were used in the 2019 Model.

2. Updates to the Groundwater Flow Model

2.1. Updated Model Calibration Period

The 2019 Model was updated with groundwater pumping and recharge data through September 2019. The previous historical period of the model was October 1986 through September 2017. Model input files were appended to extend the model calibration period from October 2017 through September 2019. Consistent with the 2019 Model, the updated 2020 Model uses monthly stress periods; therefore, twenty-four stress periods were appended to the model to extend the calibration through September 2019.

2.2. Types and Sources of Data for Updating the Model

The types and sources of data used to update the model included:

Groundwater Recharge

- Precipitation recharge based on precipitation records from the Mapping of EvapoTranspiration with Internal Calibration (METRIC) satellite data and with the assumptions for the portion of precipitation that becomes recharged described in TH&Co (2020a).
- Tule River infiltration based on Tule River Association (TRA) annual reports.
- Deer Creek infiltration based on stream gage records at the United States Geological Survey (USGS) stream gage at Fountain Springs and the assumptions described in TH&Co (2020a).
- White River infiltration based on the assumptions described in TH&Co (2020a).
- Unlined canal losses based on data provided by Lower Tule River Irrigation District (LTRID) and Pixley Irrigation District (Pixley ID).
- Recharge in basins based on data from the LTRID, Pixley ID, Deer Creek Tule River Association, City of Porterville, and Delano-Earlimart Irrigation District.

[1] Tule Subbasin Coordination Agreement, 2020. Attachment 2. Tule Subbasin Setting. January 2020.
[2] TH&Co, 2020. Groundwater Flow Model of the Tule Subbasin. January 2020.

- Deep infiltration of applied water (i.e. "return flow"), which is a function of consumptive use demand and assumed irrigation efficiency.
- Mountain-block recharge, which was estimated through the model calibration process.

Groundwater Discharge

- Municipal groundwater production (including the cities of Porterville, Tipton, Pixley, Terra Bella, Tulare, Corcoran, Delano, Teviston, and Allensworth).
- Agricultural groundwater production based on monthly consumptive use estimates across the subbasin from METRIC satellite data, assumed irrigation efficiency, and surface water deliveries.

Surface Water Supplies

- Imported water deliveries based on United States Bureau of Reclamation (USBR) records.
- Tule River diversions based on TRA reports.
- Deer Creek diversions based the State Water Resources Control Board's (SWCRB) Electronic Water Rights Information Management System (eWRIMS), Pixley ID, and Terra Bella Irrigation District.
- Revised historical Deer Creek Flows from the United States Geological Survey (USGS).

In addition to updating model input files, TH&Co updated the hydrographs used for boundary conditions and calibration targets with groundwater level data measured through September 2019 (see Attachment A).

2.3. Updated Model Calibration Targets

2.3.1. Groundwater Level Targets

In addition to appending the previous model calibration target wells with updated data, TH&Co added 20 new groundwater level calibration target wells (see Figure 2). New calibration targets were primarily wells identified in the Tule Subbasin Monitoring Plan that were not used in the previous model (Attachment 1 to the Tule Subbasin Coordination Agreement). Some calibration targets are Representative Monitoring Sites (RMS) from the Monitoring Plan and included in each Tule Subbasin Groundwater Sustainability Agency's (GSA's) Groundwater Sustainability Plan (GSP). These RMS sites were not included in the previous model because their data record is limited. However, they are included in the model update as they are a basis for groundwater management decisions.

2.3.2. Land Subsidence Targets

Multiple new land subsidence calibration targets were included in the 2020 Model including:

- The USGS extensometer located along the Friant-Kern Canal approximately one mile north of Deer Creek (see Figure 3).
- Friant Water Authority benchmarks located along the Friant-Kern Canal, and
- Additional InSAR land subsidence calibration targets.

For the two global positioning system (GPS) targets that were used in the previous model, TH&Co extended the data through September 2019. Likewise, InSAR land subsidence rates were adjusted to reflect data collected through 2019.

2.4. Refined Model Water Budget Areas

The number of Water Budget Areas (WBAs) was increased in the 2020 Model to better account for the spatial distribution of water demand and return flow in individual areas (see Figure 4). The WBAs account for the application, consumption and movement of water at the land surface in irrigated agricultural areas. The surface water budget is coupled with the groundwater flow system in the sense that the applied water demand of any given agricultural area that is not met by surface water supplies (i.e., imported water, diverted streamflow, or precipitation) is assumed to be supplied by pumped groundwater. In addition, agricultural areas can be subdivided to account for differences in crop type, irrigation efficiency, and available surface water supply, among others. The previous groundwater flow model had 33 WBAs across the model domain. Many of these existing WBAs were subdivided in the 2020 Model, which now incorporates 56 WBAs.

The specific changes to WBAs and the reasons for the changes are as follows:

- The previous City of Porterville / Pioneer Water Company WBA (No. 2) was divided into two separate WBAs to distinguish the agricultural water uses and deliveries of the Pioneer Water Company from the municipal water uses of the city.
- The portion of Pioneer Water Company that extends into the Kaweah Subbasin was separated from the old WBA 21 to create a new WBA (No. 42) with surface deliveries applied to these two WBAs based on an area-weighted method.
- The Porterville Irrigation District (PID) / City of Porterville WBA boundary was modified to more accurately reflect the actual PID legal boundary.
- The previous Southern Porterville WBA (No. 4) was subdivided into five WBAs to better account for surface water deliveries specific to the Campbell-Moreland Ditch Company, Vandalia Water District, and Tea Pot Dome Water District.

- The Eastern Tule GSA White Areas (previous WBAs 5 and 8) were subdivided into eight WBAs to enable more detailed spatial representation of consumptive use and groundwater pumping in these areas.
- The Kern-Tulare Water District WBAs (WBAs 9 and 33) were subdivided to distinguish this agency from neighboring White Areas.
- The previous Lower Tule River Irrigation District WBA (WBA 10) was subdivided into four WBAs to better account for the spatial distribution of surface water deliveries and differences in agricultural water demand across the district.
- The previous Pixley Irrigation District WBA (WBA 11) was subdivided into three WBAs to better account for the spatial distribution of surface water deliveries and differences in agricultural water demand across the district.
- The previous Delano-Earlimart Irrigation District (DEID) WBA (No. 12) included a small portion of White Area (also referred to as the annex area) which is now included in the DEID White Area WBA (No. 35).
- The Tri-County Water Authority (TCWA) GSA Southeastern Management Area was previously covered by three WBAs (WBAs 15, 16, and 17) were merged into one WBA (No. 37) to better reflect the GSA's management of the Management Area.

2.5. Revised Agricultural Groundwater Production Based on Consumptive Use Estimates from METRIC

Agricultural groundwater pumping in both the 2019 and 2020 Models is a function of estimates of crop consumptive use, surface water supplies and assumptions regarding irrigation efficiency. In the 2019 Model, consumptive use estimates were applied to crops in the Tule Subbasin based on crop coefficients specific to the Tule Subbasin as published by the Irrigation Training and Research Center (ITRC) of California Polytechnic State University, San Luis Obispo.[3] Information on the types and areas of crops for the LTRID, Pixley Irrigation District, Porterville Irrigation District, and Saucelito Irrigation District were obtained from annual crop surveys from each respective district. The types and areas of crops in other parts of the Tule Subbasin were estimated from land use maps and associated data published by the California Department of Water Resources (CDWR) for 1993, 1999, 2007 and 2014.

In the 2020 Model update, TH&Co replaced the previous consumptive use estimates with crop consumptive use based on the METRIC data. Monthly consumptive use based on the METRIC data and precipitation estimates for the period from January 1991 through September 2019 were

[3] ITRC, 2003. California Crop and Soil Evapotranspiration for Water Balances and Irrigation Scheduling/Design. ITRC No. 03-001, dated January 2003.

provided by ITRC. The METRIC data provided more refined temporal resolution of consumptive use (monthly estimates versus annual or longer period resolution) and a more complete spatial coverage of consumptive use than was available from the estimates used in the 2019 Model. The spatial resolution of the METRIC dataset is 30 meters.

The consumptive use estimates from METRIC resulted in different agricultural groundwater pumping in the 2020 Model relative to the 2019 Model. For the subbasin as a whole, groundwater pumping in the 2020 Model is generally lower than pumping in the 2019 Model (see Figure 5). The differences in groundwater pumping between the models is greater in some GSAs relative to others. Groundwater pumping in the Tri-County Water Authority GSA and Eastern Tule GSA was significantly less than the pumping simulated for the 2019 Model (see Figures 6 and 7). For the other GSAs, the differences in consumptive use were not as pronounced (see Figures 8 through 11).

It is noted that five of the six Tule Subbasin GSAs have decided to rely on satellite consumptive use data from Land IQ for consumptive use estimates going forward. Tri-County Water Authority GSA intends to track their groundwater pumping using in-line flow meters installed at the pumping wells. However, groundwater pumping in all six of the GSAs in the 2020 Model is based on consumptive use estimates from ITRC (METRIC).

2.6. Refined the Number and Depth of Wells for Agricultural Pumping

Given the large number of agricultural wells in the Tule Subbasin, it is not currently practical to incorporate all of them explicitly into the model. The CDWR driller's log databases suggests that there are more than 9,000 wells in the model area. Aerial photo surveys of the eastern portion of the Tule Subbasin, as an example, suggest that there are even more agricultural wells than indicated from the driller's logs. Except for wells in the Angiola Water District and Corcoran Irrigation District with known location and construction, and wells along the Friant-Kern Canal, agricultural groundwater pumping in the 2019 Model was simulated using representative wells with a spacing of one per square mile throughout the agricultural areas. To provide more resolution in the lateral distribution of agricultural pumping, the density of agricultural wells in the 2020 Model was increased to four wells per square mile (see Figure 12). The total number of agricultural wells was increased from 1,406 to 5,372.

In addition to the increase in well density, the perforation intervals of the representative agricultural wells were further refined to reflect the vertical distribution of pumping. Changes in well perforation intervals were based on well construction information reported in CDWR drillers logs. The process for assigning representative perforation intervals to agricultural wells in the model was as follows:

- TH&Co compiled a list of wells that were documented or inferred to be agricultural wells, based on the CDWR driller's log database.

- TH&Co compiled the documented perforation intervals for each WBA of the model, based on the CDWR driller's log database.
- For each WBA, TH&Co determined the overall perforation interval range from the list of wells.
- The overall perforation interval range for each WBA was subdivided into quartiles (i.e. four representative perforation intervals; see Figure 13).
- A quartile perforation interval was assigned to each of the four representative agricultural wells in each mile-square section of each WBA.

2.7. Updates to Municipal Pumping

Groundwater pumping for municipal supply was updated in the 2020 Model based on data provided by the City of Porterville, assumptions for water demand, and data published in GSPs. All municipal groundwater pumping was updated through September 2019. City of Porterville pumping was updated based on monthly individual well production data provided by the City. Municipal pumping for other small cities utilized the same per capita water use assumptions used for the 2019 Model and updated to account for growth. In addition, pumping for the City of Allensworth was incorporated into the 2020 Model. This pumping had not previously been included in the 2019 Model. The Allensworth groundwater pumping rate was based on an assumed water demand of 100 acre-ft per year, per the TCWA GSP.

2.8. Refined City of Porterville Water Budget

Various aspects of the City of Porterville's water budget were refined including recycled water use and recharged water. These changes included refining recycled water application assumptions (e.g., distribution of recharge in basins and application to agricultural fields), adding historical City of Porterville recharge of Tule River water in basins along the Porter Slough, and changing the septic return flow assumptions in the area of the Porter Vista Public Utilities District sewer service area.

2.9. Incorporated Bedrock Outcrops East of Porterville

Based on a review of aerial photographs and the geologic map prepared by Matthews and Burnett (1965),[4] there are small bedrock outcrops in and around the City of Porterville that are within the mapped boundaries of the alluvial Subbasin (see Figure 14). The 2020 Model incorporates these areas as no-flow cells (areas where no groundwater flow is simulated).

[4] Geologic Atlas of California Map No. 005, 1:250,000 scale, Compiled by: R.A. Matthews and J.L. Burnett, 1965.

2.10. Refined Deer Creek Surface Water Diversions

Historical diversions from Deer Creek by Terra Bella Irrigation District (TBID) and Laux Land Company Hill Ranch (Laux Land) were incorporated into the model based on diversion records from the California State Water Resources Control Board (SWCRB) electronic Water Rights Information Management System (eWRIMS). TBID diversion data was available from 1986 through 2019 and averaged 2,044 acre-ft/yr from 1990/91 through 2009/10. Deer Creek water diverted by TBID is recharged in the basin shown on Figure 15. Laux Land diversion data was available from 2011 through 2018 and averaged approximately 300 acre-ft/yr. The Laux Land diversions are riparian claims where several wells act as the diversion works and the Deer Creek water is applied to agricultural lands adjacent to Deer Creek. In the 2020 Model, this water is treated as a surface diversion and applied to WBA 10.

2.11. Incorporated Additional Recharge Basins

Additional recharge basins were incorporated in PID, LTRID, and TBID (see Figure 16). Deliveries to PID basins were provided by PID. Deliveries to the additional LTRID basin were area-weighted, consistent with all the basins in LTRID. Deliveries to the TBID basin were based on records from the SWCRB eWRIMS and TBID.

2.12. Revised Future Projections Input Files

The 2019 Model was used to evaluate a future basin management scenario that incorporated each of the six GSAs' proposed projects and management actions, including transitional pumping. The purpose of the projection was to assess the impact of basin management on future groundwater level trends. The same projects and management actions that were analyzed using the 2019 Model were analyzed using the 2020 Model. However, because the previous future projection scenario was specific to the previous WBAs and their consumptive use estimates, the future projection input files for the 2020 Model were revised to accommodate the new refined WBAs from Section 2.4 of this TM and the METRIC consumptive use estimates that were used as a baseline (see Section 4 for more detail).

2.13. Changes in Aquifer Parameters from Recalibration of the Updated Model

Given the changes in pumping stresses in the updated 2020 Model relative to the 2019 Model, it was necessary to recalibrate the 2020 Model to provide an optimum match of measured and model-generated groundwater levels (see Section 3 herein). As aquifer parameters were adjusted during this process, the recalibration effort resulted in changes to parameter arrays in the model (see Attachment B). In general, changes to horizontal hydraulic conductivity, vertical hydraulic conductivity, and specific yield were minor between the 2019 and 2020 models (see Attachment B-1 to B-13) and remain consistent with pumping test data, as reported in TH&Co (2020)[5]. The

[5] TH&Co, 2020. Groundwater Flow Model of the Tule Subbasin. January 2020.

greatest changes were to elastic and inelastic storage properties across all layers (see Attachment B-14 to B-23), primarily to calibrate historical land subsidence across the model. Critical head values were also changed to better calibrate historical land subsidence.

3. Model Calibration

The revisions to the model changed the pumping and recharge stresses that affect model calibration, so the model was recalibrated to reflect the new data. This involved a two-step process:

1. Manually modifying aquifer property values to optimize the fit between measured groundwater levels and modeled groundwater levels as well as measured land surface subsidence and modeled subsidence, and
2. Conducting an automated parameter estimation process (PEST) to further refine the calibration.

For a more detailed description of the calibration process, see Section 3.8.3 of TH&Co 2020 Groundwater Flow Model of the Tule Subbasin.

3.1. Calibration Results

3.1.1. Groundwater Levels

Calibration hydrographs showing both measured and model-generated groundwater elevations are provided in Attachment C, with additional model-generated groundwater levels for RMS wells provided in Attachment D. The simulated groundwater elevations reasonably match the measured elevations at most of the target wells in the model. A scatter plot of simulated versus measured groundwater elevations for the 2,122 groundwater level observations in the calibration is shown on Figure 17. The correlation coefficient between the simulated and measured values is 0.90, which meets the benchmark value of 0.90 noted in CDWR (2016) and Hill and Tiedemann (2007). Values of 0.90 and above indicate a strong positive correlation between the measured and model-generated groundwater levels (i.e., as one value increases, so does the other and vice versa). On an individual layer basis, scatter plots of simulated versus measured groundwater levels specific to Layers 1 and 3 are shown on Figures 18 and 19.[6] The correlation coefficients for the data specific to these model layers are 97% and 63%, respectively. While the Layer 1 value approaches the theoretically perfect correlation value of 1.0 as shown by the tight clustering of the blue datapoints about the solid black line on the figure, the Layer 3 value indicates that the measured and model-generated groundwater levels are only moderately correlated as shown by the greater scatter of the datapoints to either side of the solid black line on the figure.

[6] Statistical plots of model Layers 2, 4 and 5 were not produced due to a lack of groundwater level data specific to those layers.

Another measure of groundwater level "goodness of fit" is the normalized root-mean square error (NRMSE) where the error is the difference between the measured and model-generated groundwater level. The NRMSE is expressed as a percent with results less than 10 percent generally considered to be acceptable. The NRMSE for the 2020 Model with respect to groundwater elevations is 7.7 percent (see Figure 17). For model Layers 1 and 3, the NRMSE is 4.9 and 17percent, respectively.

Layer-specific statistics were not calculated for the 2019 Model. The table below summarizes the 'model-wide' calibration statistics for the 2019 and 2020 Models (i.e., statistics for measured and model-generated groundwater levels for all model layers).

Statistic (all layers)	2019 Model	2020 Model
Correlation coefficient	0.95	0.90
NRMSE	6.6%	7.7%

While the calibration statistics are acceptable for the 2020 Model on a model-wide basis, the modifications associated with the 2020 Model as documented herein did not improve upon the 2019 Model and actually diminished the calibration. The layer-specific calibration statistics indicate that, while the Layer 1 calibration is considered good, the Layer 3 calibration is not. Improving upon the Layer 3 calibration will likely require better estimates of production well parameters such as pumping times, pumping rates, and perforated intervals for wells within this layer, as well as layer-specific groundwater level data.

3.1.2. Land Subsidence

Calibration graphs showing both measured and simulated subsidence are provided in Attachment E. Model-generated land subsidence was calibrated to both InSAR satellite data and measured land subsidence at the Porterville and Delano GPS stations. While the model reasonably matches the measured land subsidence rates throughout most of the subbasin for periods when InSAR data are available, it underestimates land subsidence rates relative to InSAR rates in certain areas, including the northwest part of the subbasin and in the eastern Pixley GSA area just west of the Friant-Kern Canal, particularly for the period from 2015 to 2019. In these areas, calibrated model-generated groundwater levels were relatively stable over the last four years of the transient calibration, a condition that does not elicit land subsidence in the model. The land subsidence that is being observed in satellite data may be residual from lowered groundwater levels in previous years, a condition the model cannot replicate.

Given the nature of the subsidence data to which the 2020 Model is calibrated, simulated land subsidence by the model is acceptably calibrated to enable projections of relative change in land

surface elevation in the future. It is not recommended to use the model to determine absolute values of projected land surface elevation.

3.1.3. Calibration Summary

The groundwater level calibration in the 2020 Model shows a slight improvement relative to the 2019 Model. The NRMSE is lower in the 2020 Model relative to the 2019 Model and the correlation coefficient is approximately the same between the two.

The land subsidence calibration in the 2020 Model did not improve relative to the 2019 Model. The 2020 Model appears to underestimate land subsidence in certain areas between 2015 and 2019, relative to data from InSAR. There are a couple of potential reasons for this:

1. Groundwater levels for many of the calibration targets in the areas where land subsidence is underestimated were not available for the period between 2015 and 2019. Absent the data, the model tends to automatically stabilizes groundwater levels at these wells during those periods. Without dropping groundwater levels, the model will not simulate land subsidence.
2. Some of the observed land subsidence between 2015 and 2019 could be continuing residual land subsidence from groundwater level declines that occurred in prior years. The land subsidence package in MODFLOW does not simulate this residual land subsidence.

As additional groundwater level data are collected, the model can be refined to better simulate subsidence.

The surface and groundwater budgets produced by the updated calibrated model are presented in Tables 1a, 1b, and 2.

4. Future Subbasin Management Scenario for Analysis with the Updated Model

In the 2019 Model, TH&Co simulated a future Tule Subbasin projects and management scenario using the model. The scenario incorporated projects and management actions identified by the GSAs and described in the Tule Subbasin Setting document.[7] The future scenario began in October 2017 (the end of the 2019 Model calibration period) and extended through September 2070 and utilized annual (i.e., water year) stress periods. Baseline stream flow hydrology for the Tule River, Deer Creek and White River was based on the 20-yr average of historical stream flows measured or estimated between water years 1990/91 and 2009/10. This base period approximates the 115-year average surface water flow within the Tule River between 1903/04 and 2016/17.[8] Baseline

[7] Tule Subbasin Coordination Agreement, 2020. Attachment 2. Tule Subbasin Setting. January 2020.
[8] Tule River Association 2016/17 Annual Report. Appendix.

surface water deliveries to agencies with diversion rights were also based on the 20-yr average of deliveries for the period 1990/91 to 2009/10. Future hydrology and diversions were adjusted into the future to account for climate change, as described in TH&Co (2020).[9]

For the 2020 Model, TH&Co used almost all the same scenario assumptions as used in the 2019 Model. The same projects and management actions and the same hydrological assumptions were incorporated into the projection scenario for the 2020 Model as was used in the 2019 Model. The only difference was the starting consumptive use estimate for the future projection.

The 2019 Model used the 2014 land use condition, which was used through 2016/17 of the calibration period, as the starting condition for the future projection. The 2020 Model uses the average consumptive use from 1990/91 through 2009/10 as the starting condition for the projection which starts in 2019/20. This period was chosen because more recent consumptive use (i.e. 2013/14 through 2018/19) was significantly lower than the long-term average resulting in an unrealistic starting consumptive use for the forward projection.

5. Summary of Updated Model Findings

TH&Co used the updated and recalibrated 2020 Model to assess projected future water budgets, groundwater levels, and land subsidence within the Tule Subbasin.

5.1. Historical Surface Water Budget

The surface water budget for the historical model is detailed in Tables 1a and 1b. All of the elements of the historical surface water budget remained the same in the updated model except precipitation (Column A), agricultural groundwater pumping (Column S in Table 1a and Column R in Table 1b) and agricultural consumptive use (Columns U, W, Z and AA). Consumptive use, which determines the estimate of groundwater pumping, was adjusted in the 2020 Model using METRIC data, as described in Section 2.5 herein. The difference between the cumulative surface water inflow and surface water outflow for the 1986/87 to 2018/19 period is 3,000 acre-ft or a relative percent difference of 0.2 percent, indicating the surface water inflow and outflow terms of the budget are closely reconciled.

5.2. Historical Groundwater Water Budget

The groundwater budget for the historical model is shown in Table 2. Comparison of the groundwater inflow elements of the water budget with the outflow elements shows a cumulative change in groundwater storage over the period between 1986/87 to 2018/19 of approximately -2,656,000 acre-ft. The average annual change in storage resulting from the groundwater budget is approximately -74,000 acre-ft/yr. This cumulative change in storage, which reflects changes in elastic storage, is less than that reported for the 2019 Model (-4,948,000 acre-ft). Inelastic storage

[9] TH&Co, 2020. Groundwater Flow Model of the Tule Subbasin. January 2020.

change, which is associated with releases of water from compression of aquitards (Column T in Table 2), was on average 123,000 acre-ft/yr over the 1986/87 to 2018/19 period of the 2020 Model, compared with 77,000 acre-ft/yr for the 2019 Model.

The reduced cumulative storage change in the 2020 Model, relative to the 2019 Model, is, in part, due to lower consumptive use demand in the updated model resulting from the use of METRIC data. The reduced consumptive use demand resulted in lower groundwater extraction rates and reduced rates of groundwater level decline, particularly after 2008/09. This, combined with a lack of measured groundwater level data after 2015 at many calibration targets, resulted in relatively stable model-generated groundwater levels after 2015. As land subsidence was observed to continue throughout much of the model area between 2015 and 2019, it was necessary to change inelastic storage values in the 2020 Model, relative to the 2019 Model, to match observed rates of subsidence (see also Sections 2.13 and 3.1.3 of this TM). This resulted in increased inelastic storage change in the 2020 Model relative to the 2019 Model.

Using the updated 2020 Model, TH&Co estimated the change in groundwater storage between October 2018 and September 2019 (see Figure 20). Based on the model, the change in groundwater storage for this water year was positive 403,000 acre-ft. Most of the increases in groundwater storage occur in the LTRID, Pixley and northern ETGSA areas.

5.3. Projected Water Budgets

The projected surface water budget shown in Tables 3a and 3b reflect the assumptions described in Section 4 herein.

The projected groundwater budget based on the 2020 Model and the assumptions described in Section 4 herein shows that annual change in groundwater storage into the future is projected to decrease from -163,000 acre-ft in 2019/20 to -16,000 acre-ft in 2039/40 (see Table 4). The resulting changes in groundwater level in the Upper and Lower aquifers between 2019/20 and 2039/40 are shown on Figures 21 and 22, respectively. As shown, the greatest groundwater level declines in the Upper Aquifer are projected to occur in the northern LTRID GSA, DEID GSA annex area, and west of Angiola Water District in the Tri-County Water Authority GSA (see Figure 21). Upper Aquifer groundwater levels across much of the Tule Subbasin are projected to drop between 10 and 50 feet over the 20-year transitional pumping period. In the Lower Aquifer, the greatest groundwater level declines are projected to occur along the boundaries and outside the subbasin (see Figure 22). These changes are largely due to assumptions in boundary condition groundwater levels. Lower Aquifer groundwater levels in the Alpaugh ID GSA, much of the central and eastern Pixley GSA, and central and southern ETGSA are projected to rise between 2019/20 and 2039/40.

For the projected period from 2040 to 2050, some additional groundwater level decline is predicted with an average annual storage change of approximately -20,000 acre-ft/yr (see Table 4). In the Upper Aquifer, groundwater is projected to drop less than 10 feet throughout much of the LTRID

GSA, western Pixley GSA, Tri-County Water Authority GSA, Alpaugh ID GSA, and DEID GSA (see Figure 23). Upper Aquifer groundwater level declines greater than 10 ft are predicted for the northwest portion of the LTRID GSA, the southwest portion of the Tri-County Water Authority GSA, and the DEID GSA annex area. Upper Aquifer groundwater levels are projected to rise in the northern portion of the ETGSA. Lower Aquifer groundwater levels are projected to decline less than 10 ft throughout most of the LTRID GSA, Pixley GSA, Tri-County Water Authority GSA, Alpaugh GSA, DEID GSA and northwest ETGSA (see Figure 24). Lower Aquifer groundwater levels are projected to rise throughout most of the ETGSA, westernmost portion of the Pixley GSA, and northeast portion of the DEID GSA.

5.4. Groundwater Flow

Groundwater contour maps showing groundwater flow directions in Spring and Fall of 2019 for both the Upper and Lower Aquifers are shown on Figures 25 through 28. In the Upper Aquifer, groundwater flows toward a persistent pumping depression located in the southern LTRID GSA and eastern Pixley GSA area (see Figures 25 and 27). Apparent shifts in this pumping depression may be associated with differences in the available data for generating the contour maps between the two time periods. In contrast to groundwater levels in the Upper Aquifer, groundwater levels in the Lower Aquifer indicated a relative high area in eastern Pixley GSA in both the Fall and Spring 2019 maps (see Figures 26 and 28). Groundwater flows from this high area to the west.

5.5. Projected Groundwater Levels

Projected changes in groundwater levels for the 2020 Model are shown in Attachment F. At most calibration target wells, groundwater levels are projected to be higher in the 2020 Model relative to the 2019 Model. For the period from 2020 to 2040 (transitional pumping period), groundwater levels stabilize or recover slightly in many of the wells. Notable exceptions to this include groundwater levels in the Upper Aquifer in the western part of the subbasin (for examples see Attachment F Angiola G1, 21S/23E-32K01, and 22S/24E-09A01) and in the south-central subbasin area (see Attachment E 23S/25E-30B01, 24S/26E-04P01 and DEID M19). Groundwater levels in the Lower Aquifer generally stabilize through the subbasin by 2040.

At RMS wells (see Attachment G), groundwater levels are projected to drop below the minimum thresholds in the following wells during the 50-year planning horizon (2020 – 2070):

- 25S/26E-9 Lower Aquifer DEID GSA 2042
- 21S/23E-32K01 Upper Aquifer LTRID GSA 2054
- 23S/24E-28J02 Upper Aquifer Pixley GSA 2023
- 24S/24E-04R01 Lower Aquifer TCWA GSA 2025

It is noted that the model simulated hydrograph for 24S/24E-25J01 (Upper Aquifer) is below the minimum threshold throughout most of the historical period and all of the planning horizon.

Model simulated groundwater levels at this location are significantly below the measured data and the model results should not be used to assess the timing of when groundwater levels may drop below the minimum threshold. However, the overall trend is more reliable and indicates continued declines into the future. Based on model generated groundwater level trends at this location (in TCWA GSA), it is reasonable to expect that groundwater levels will drop below the minimum threshold at some point in the future without a change in groundwater pumping or recharge.

5.6. Land Subsidence

Projected groundwater level trends at calibration target wells within the Tule Subbasin are provided in Attachment H. As land subsidence is correlated with groundwater level decline, continued land subsidence is expected during the transitional pumping period from 2020 to 2040 as groundwater levels continue to drop throughout much of the Subbasin (see Figure 29). As much as eight to ten feet of additional land subsidence is predicted in the TCWA GSA, western Pixley GSA, and northern LTRID GSA. Up to 1.5 feet of land subsidence is also predicted at various locations along the Friant-Kern Canal between Tule River and White River. Between 2040 and 2050, the rate of land subsidence decreases as groundwater levels stabilize throughout most of the Subbasin (see Figure 30). Up to five feet of land subsidence is still predicted to occur in isolated areas of the northern TCWA GSA and as much as three feet is predicted in the southern TCWA GSA area. Less than 0.5 feet (average of 0.05 ft/yr) of land subsidence is predicted in the vicinity of the Friant-Kern Canal during this time period. Land subsidence between 2050 and 2070 is predicted to continue in the western part of the Tule Subbasin as a result of declining groundwater levels in Layer 1 in this area (see Figure 31). Up to eight feet of land subsidence is predicted during this time period for the northern TCWA GSA at the western boundary of the Subbasin and up to four feet of additional land subsidence is predicted for the southern TCWA GSA and Alpaugh Irrigation District GSA areas. The increased groundwater level declines and increased rate of subsidence during this time period is due to a higher level of projected evapotranspiration due to projections of climate change.

As much as approximately 1.5 feet of additional land subsidence is projected to occur beneath the Friant-Kern Canal during the transitional pumping period from 2020 to 2040 (see Figure 32). The greatest land subsidence is projected to occur in the area of the canal between the Tule River and White River. Localized variations in model projected land subsidence along this area of the canal are related to differences in available surface water supplies and associated reduced groundwater pumping demand within the various WBA areas along the canal. Certain WBAs, which represent local irrigation districts, have access to surface water and are less dependent on groundwater pumping than other WBA areas along the canal, which rely more on groundwater pumping for irrigation supply. Those WBAs more dependent on groundwater pumping will result in greater groundwater level drawdown and land subsidence. In reality, the magnitude of projected land subsidence between the Tule and White Rivers would be expected to be more uniform.

Tule Subbasin Historical Surface Water Budget - Inflow

	Surface Water Inflow (acre-ft)																		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	
Water Year	Precipitation	Stream Inflow			Imported Water													Discharge from Wells		Total In
		Tule River	Deer Creek	White River	Saucelito ID	Terra Bella ID	Kern-Tulare WD	Porterville ID	Tea Pot Dome WD	City of Porterville	Hope WD	Ducor ID	LTRID	Pixley ID	Delano-Earlimart ID	Angiola WD	Alpaugh ID	Agriculture Pumping	Municipal Pumping	
1986/87	369,000	70,029	8,386	2,496	23,879	13,136	10,899	15,337	5,490	0	0	0	89,541	9,356	114,782	7,278	1,901	595,000	13,600	1,350,000
1987/88	318,000	39,842	6,090	1,420	19,666	21,961	12,210	13,067	5,493	0	0	0	64,654	0	110,345	3,530	0	671,000	15,200	1,302,000
1988/89	263,000	49,667	7,791	1,942	22,426	22,561	11,991	13,106	6,226	0	0	0	63,922	5,289	105,980	6,026	0	688,000	15,800	1,284,000
1989/90	309,000	29,342	4,706	778	16,166	23,159	11,371	11,520	6,193	0	0	0	24,325	0	83,837	3,847	0	716,000	16,400	1,257,000
1990/91	410,000	51,275	7,250	1,362	19,848	18,725	9,762	11,322	5,636	0	0	0	71,430	0	106,877	925	0	500,000	16,800	1,231,000
1991/92	317,000	34,325	4,082	739	21,566	20,743	11,700	15,569	6,607	0	0	0	51,949	0	92,567	1,611	0	747,000	17,100	1,343,000
1992/93	472,000	115,640	15,132	3,623	41,261	18,180	13,205	12,310	6,968	0	0	0	321,973	96,890	133,359	3,420	18,642	550,000	17,300	1,840,000
1993/94	319,000	61,313	6,821	1,148	22,064	18,740	14,334	12,895	6,526	0	0	0	71,784	7,793	92,394	3,640	5,604	858,000	17,700	1,520,000
1994/95	609,000	218,479	32,235	10,596	37,477	16,186	14,023	9,455	6,562	0	0	0	229,683	55,365	124,388	8,918	13,658	606,000	17,700	2,010,000
1995/96	309,000	174,473	23,264	5,957	48,924	21,617	14,755	13,808	7,993	0	0	0	236,845	60,931	144,069	12,551	16,397	810,000	17,900	1,918,000
1996/97	437,000	353,968	58,823	12,920	40,908	20,158	16,496	13,379	7,298	0	0	0	192,934	37,048	153,967	12,383	0	687,000	18,800	2,063,000
1997/98	761,000	439,125	88,359	36,764	28,221	13,165	13,536	10,159	4,913	0	0	0	101,180	41,823	119,815	7,460	0	541,000	18,000	2,225,000
1998/99	338,000	108,466	18,410	7,469	37,062	17,567	15,571	16,107	9,218	0	0	0	183,971	34,736	124,051	9,778	0	734,000	18,100	1,673,000
1999/00	341,000	102,354	15,230	4,878	39,734	19,200	17,601	15,545	7,191	0	0	0	177,192	40,076	134,272	8,118	253	704,000	19,000	1,646,000
2000/01	311,000	55,249	7,015	4,695	25,252	19,194	18,880	15,436	6,456	0	0	0	83,405	9,098	117,746	3,824	0	753,000	19,200	1,449,000
2001/02	263,000	73,206	10,369	6,176	26,131	20,234	16,481	13,628	6,388	0	0	0	78,511	13,588	126,747	2,932	0	851,000	21,000	1,529,000
2002/03	318,000	125,004	15,690	5,875	33,692	18,356	15,750	14,646	5,844	0	0	0	131,470	32,195	121,277	4,728	104	666,000	20,700	1,529,000
2003/04	257,000	51,738	6,883	2,350	26,988	20,352	16,689	14,698	6,913	0	0	0	71,472	9,839	127,364	3,434	0	935,000	21,800	1,573,000
2004/05	513,000	172,558	22,743	6,502	42,840	15,266	14,013	14,748	5,217	0	0	0	247,595	59,211	119,847	11,741	14,490	525,000	20,700	1,805,000
2005/06	478,000	195,667	23,876	7,588	45,106	21,763	15,210	13,251	6,436	0	0	0	194,019	60,634	121,005	10,909	16,112	396,000	21,700	1,627,000
2006/07	188,000	38,587	6,908	1,815	16,280	20,797	15,862	9,775	5,489	0	0	0	33,174	7,200	79,111	6,641	0	954,000	22,800	1,406,000
2007/08	253,000	74,030	8,395	2,355	24,083	18,192	18,335	12,988	6,894	0	0	0	71,872	12,243	106,470	2,165	0	805,000	23,100	1,439,000
2008/09	215,000	54,737	6,618	1,751	31,282	19,701	16,324	18,000	6,165	0	0	0	113,189	23,620	111,556	191	2,131	626,000	22,600	1,269,000
2009/10	394,000	144,778	16,480	5,080	42,855	17,574	14,688	14,335	5,845	0	0	0	200,064	32,972	118,671	3,243	2,671	405,000	21,900	1,440,000
2010/11	597,000	266,473	44,873	14,997	46,733	16,381	14,303	9,387	6,105	0	0	0	229,763	48,391	127,447	6,476	10,951	295,000	21,900	1,756,000
2011/12	423,000	87,532	11,311	3,334	19,189	19,757	15,538	9,318	4,680	0	0	0	67,684	5,914	114,108	3,156	943	453,000	22,600	1,261,000
2012/13	166,000	30,284	4,777	1,145	14,102	20,628	16,232	10,298	4,354	0	0	0	37,073	5,012	87,302	1,492	0	746,000	22,800	1,167,000
2013/14	147,000	13,171	2,957	535	5,724	12,390	11,290	178	1,030	0	0	0	0	0	38,106	1,048	0	869,000	22,000	1,124,000
2014/15	238,000	8,820	1,994	253	1,503	12,012	6,209	114	260	0	0	0	0	0	18,591	575	0	770,000	19,800	1,078,000
2015/16	369,000	74,330	14,559	4,547	20,049	14,357	12,118	13,271	4,627	0	0	0	73,382	3,442	93,806	587	0	514,000	19,800	1,232,000
2016/17	499,000	356,920	64,976	22,113	51,137	16,089	13,944	21,651	6,694	0	0	0	273,151	82,363	137,773	12,146	2,368	499,000	20,200	2,080,000
2017/18	218,000	66,673	9,047	2,545	28,219	17,800	15,042	12,706	6,858	0	0	0	121,447	19,070	124,484	625	0	620,000	21,100	1,284,000
2018/19	496,000	223,636	32,582	10,667	55,019	15,825	14,051	60,853	6,524	0	0	0	216,118	70,457	133,860	4,289	3,100	385,000	20,800	1,749,000
86/87-18/19 Avg	361,000	120,100	18,400	6,000	29,600	18,200	14,200	14,000	5,900	0	0	0	125,000	26,800	111,100	5,100	3,300	651,000	19,600	1,529,000

Tule Subbasin Historical Surface Water Budget

	Surface Water Outflow (acre-ft)																	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
		Streambed Infiltration					Canal Loss			Recharge in Basins				Deep Percolation of Applied Water					
Water Year	Areal Recharge of Precipitation	Tule River		Native Deer Creek		White River	Tule River	Deer Creek	Imported Water	Tule River	Deer Creek	Imported Water	Recycled Water	Tule River	Deer Creek	Imported Water	Recycled Water	Agricultural Pumping	Municipal Pumping
		Success to Oettle Bridge	Oettle Bridge to Turnbull Weir	Before Trenton Weir	Trenton Weir to Homeland Canal														
1986/87	24,000	11,600	1,100	7,300	0	2,400	20,700	0	52,400	26,100	800	0	100	13,000	0	81,300	1,100	148,900	5,305
1987/88	12,000	8,000	900	5,300	0	1,300	8,800	0	32,700	13,800	500	0	100	10,500	0	70,000	1,000	170,600	5,605
1988/89	4,000	8,700	0	7,500	0	1,800	7,400	0	20,500	13,600	0	0	800	7,100	0	64,300	1,300	171,000	5,705
1989/90	12,000	5,000	0	4,400	0	700	2,900	0	7,400	6,600	0	0	1,200	4,200	0	50,900	1,300	180,900	5,705
1990/91	34,000	6,400	300	6,900	0	1,300	6,800	0	24,300	12,000	0	0	1,500	8,100	0	88,700	1,600	129,100	5,905
1991/92	3,000	4,300	0	2,700	0	700	3,100	0	16,100	6,800	1,100	0	800	4,400	0	49,700	1,900	186,900	6,005
1992/93	56,000	18,500	3,000	10,800	0	3,500	27,800	0	184,400	36,000	4,000	5,600	1,300	25,200	0	192,100	2,200	129,800	6,005
1993/94	0	6,100	200	3,900	0	1,100	14,200	0	35,600	19,200	2,600	700	1,400	10,200	0	53,800	2,000	207,400	6,105
1994/95	145,000	36,400	10,400	18,100	1,000	10,500	39,500	3,800	128,500	47,300	5,200	10,400	1,700	54,900	2,000	137,300	2,000	141,300	6,205
1995/96	1,000	20,700	4,000	11,300	700	5,900	26,200	2,800	87,700	34,000	3,300	39,600	2,100	47,100	3,700	138,500	1,400	192,100	6,205
1996/97	34,000	34,600	9,700	43,800	1,800	12,800	47,300	6,900	64,100	52,700	3,300	14,200	2,400	49,800	2,500	154,500	1,700	162,800	6,405
1997/98	245,000	41,100	9,000	12,900	12,700	36,600	79,100	48,800	54,100	83,200	2,900	16,100	3,500	69,400	7,000	112,400	600	125,000	6,405
1998/99	4,000	14,300	2,800	9,000	600	7,300	19,500	2,500	58,100	25,700	4,600	19,700	1,900	21,100	1,000	132,300	600	174,900	6,405
1999/00	8,000	16,900	2,900	9,400	600	4,700	11,100	2,400	64,300	16,600	1,200	13,100	3,500	20,300	1,200	135,600	600	168,500	6,505
2000/01	5,000	12,300	0	5,100	0	4,600	7,000	0	28,500	11,800	1,600	2,700	3,700	8,600	0	85,000	700	185,700	6,605
2001/02	0	14,800	700	7,700	0	6,100	13,400	0	24,800	19,200	2,400	0	3,600	12,700	0	72,900	600	209,700	7,015
2002/03	3,000	19,700	3,700	12,600	100	5,700	22,800	400	53,600	29,100	1,300	5,000	3,300	13,100	200	85,000	1,800	141,800	6,915
2003/04	0	9,900	300	4,900	0	2,300	7,700	0	19,600	11,600	1,700	0	1,900	6,400	0	61,700	2,400	196,400	7,125
2004/05	85,000	24,200	4,700	13,800	400	6,400	22,900	1,500	91,100	30,100	3,500	32,000	1,000	28,100	1,600	153,200	3,100	106,000	7,125
2005/06	60,000	28,100	7,200	13,400	900	7,500	40,500	3,400	77,900	47,300	4,100	26,700	800	50,900	1,100	170,000	3,500	83,800	7,335
2006/07	0	6,200	1,500	6,500	0	1,700	5,100	0	15,500	10,100	100	100	1,100	4,600	0	39,400	2,400	199,000	7,535
2007/08	0	11,700	1,100	7,600	0	2,300	15,900	0	22,000	22,500	500	1,600	1,500	13,500	0	56,600	1,700	170,800	7,645
2008/09	1,000	9,500	1,400	3,100	0	1,600	7,100	0	43,800	12,900	7,000	8,100	1,600	8,000	0	67,000	2,000	134,300	7,645
2009/10	17,000	25,600	4,500	13,100	0	5,000	34,600	0	72,600	51,600	3,200	29,900	1,700	33,800	0	129,100	2,100	86,400	7,655
2010/11	143,000	37,100	7,500	24,200	1,300	14,800	82,400	5,000	89,500	93,000	9,700	45,600	1,900	68,300	6,200	173,000	2,600	63,500	7,555
2011/12	32,000	13,600	300	6,700	0	3,200	17,800	0	23,000	24,800	4,500	7,100	1,300	14,900	100	98,200	2,800	99,600	7,765
2012/13	3,000	4,900	0	3,100	0	1,000	4,400	0	13,100	9,800	1,300	100	1,100	4,000	100	36,000	1,600	159,200	7,765
2013/14	5,000	2,300	0	2,500	0	400	0	0	0	4,100	0	0	1,800	2,000	200	16,300	1,500	180,100	7,875
2014/15	3,000	1,000	0	1,600	0	200	0	0	0	4,600	0	0	1,800	1,400	200	10,200	1,200	161,200	7,675
2015/16	16,000	16,000	5,500	14,000	0	4,400	11,400	0	28,600	18,300	100	3,700	2,000	9,200	200	65,400	1,600	110,900	7,685
2016/17	76,000	42,100	15,900	50,600	800	22,000	82,600	3,100	133,700	98,300	3,700	75,500	2,100	65,300	6,000	158,500	1,600	101,200	7,785
2017/18	9,000	9,600	0	8,400	0	2,400	13,000	0	62,000	22,300	0	15,500	1,800	7,200	300	89,500	2,100	128,600	7,895
2018/19	80,000	30,200	500	28,500	200	10,500	65,400	900	112,900	81,500	600	106,300	2,300	36,400	1,800	174,200	1,400	79,000	7,895
86/87-18/19 Avg	34,000	16,700	3,000	11,500	600	5,800	23,300	2,500	52,800	30,200	2,300	14,500	1,800	22,200	1,100	97,000	1,700	148,100	6,900

Groundwater Inflows to be Included in Sustainable Yield Estimates
Groundwater Inflows to be Excluded from the Sustainable Yield Estimates
Surface Water or ET Outflows Not Included in Groundwater Recharge or Sustainable Yield Estimates

Tule Subbasin Historical Surface Water Budget - Outflow

	Surface Water Outflow (acre-ft)												
	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	
	Evapotranspiration										Surface Outflow		
Water Year	Precipitation Crops/Native	Tule River		Deer Creek		White River	Imported Water	Ag. Cons. Use from Pumping	Recycled Water	Municipal (Landscape ET)	Tule River	Deer Creek	Total Out
		Agricultural Cons. Use	Stream Channel	Agricultural Cons. Use	Stream Channel	Stream Channel	Agricultural Cons. Use		Agricultural Cons. Use				
1986/87	334,000	18,200	400	0	300	100	155,300	449,000	1,000	4,715	0	0	1,359,000
1987/88	301,000	7,000	300	0	300	100	146,500	507,000	1,000	5,315	0	0	1,310,000
1988/89	260,000	14,700	300	0	300	100	170,900	522,000	1,200	5,615	0	0	1,289,000
1989/90	297,000	5,200	400	0	300	100	120,300	544,000	1,200	5,715	0	0	1,257,000
1990/91	352,000	12,800	300	0	300	100	129,800	378,000	700	6,015	0	0	1,207,000
1991/92	310,000	7,900	400	0	300	100	154,800	568,000	1,300	6,015	0	0	1,336,000
1992/93	389,000	24,600	400	0	400	100	277,600	422,000	1,200	6,115	0	0	1,828,000
1993/94	307,000	17,700	300	0	300	100	162,500	655,000	1,700	6,215	0	0	1,515,000
1994/95	432,000	49,600	400	2,000	400	100	234,000	466,000	1,300	6,315	25,000	0	2,019,000
1995/96	315,000	45,400	400	1,100	400	100	306,500	618,000	1,300	6,415	7,000	0	1,930,000
1996/97	379,000	36,800	400	200	400	100	260,000	524,000	1,300	6,715	121,000	0	2,035,000
1997/98	475,000	68,300	400	5,300	400	200	156,000	416,000	900	6,415	95,000	0	2,190,000
1998/99	319,000	29,100	400	300	400	200	236,300	558,000	700	6,415	0	0	1,657,000
1999/00	324,000	32,200	400	100	400	100	243,600	536,000	600	6,715	5,000	0	1,637,000
2000/01	296,000	19,300	300	0	300	100	181,500	572,000	600	6,815	0	0	1,446,000
2001/02	265,000	17,200	400	0	300	100	205,100	648,000	700	7,415	0	0	1,540,000
2002/03	302,000	34,300	400	700	400	100	232,700	528,000	1,100	7,315	5,000	0	1,521,000
2003/04	252,000	16,200	400	0	300	100	214,700	744,000	1,700	7,725	1,000	0	1,572,000
2004/05	390,000	29,700	400	1,500	400	100	256,300	420,000	1,100	7,325	22,000	0	1,745,000
2005/06	376,000	35,800	400	600	400	100	227,200	313,000	800	7,725	11,000	0	1,607,000
2006/07	186,000	12,800	300	0	300	100	137,500	763,000	1,400	8,025	0	0	1,410,000
2007/08	246,000	17,200	300	0	300	100	190,900	642,000	1,400	8,135	1,000	0	1,444,000
2008/09	209,000	20,300	400	0	300	100	222,100	501,000	1,300	7,935	0	0	1,278,000
2009/10	344,000	29,500	400	0	400	100	222,700	324,000	1,000	7,635	0	0	1,448,000
2010/11	408,000	26,100	400	100	400	200	205,900	233,000	900	7,735	8,000	0	1,767,000
2011/12	354,000	29,400	400	100	300	100	130,200	363,000	1,100	7,945	0	0	1,244,000
2012/13	164,000	8,500	400	100	300	100	145,400	595,000	1,500	8,045	0	0	1,174,000
2013/14	150,000	400	300	200	300	100	51,500	696,000	1,600	7,745	0	0	1,132,000
2014/15	225,000	1,000	300	100	200	100	27,900	616,000	1,500	7,055	0	0	1,073,000
2015/16	333,000	14,800	300	200	300	100	137,000	410,000	900	6,955	0	0	1,219,000
2016/17	394,000	32,600	400	500	400	200	259,500	396,000	900	7,155	71,000	0	2,109,000
2017/18	207,000	13,500	400	100	300	100	179,000	489,000	1,300	7,455	1,000	0	1,279,000
2018/19	386,000	35,500	400	100	400	200	195,800	303,000	900	7,365	12,000	0	1,762,000
86/87-18/19 Avg	312,000	23,100	400	400	300	100	187,200	506,600	1,100	6,900	12,000	0	1,526,000

Groundwater Inflows to be Included in Sustainable Yield Estimates
Groundwater Inflows to be Excluded from the Sustainable Yield Estimates
Surface Water or ET Outflows Not Included in Groundwater Recharge or Sustainable Yield Estimates

Tule Subbasin Historical Groundwater Budget

	Groundwater Inflows (acre-ft)																					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	
Water Year	Areal Recharge from Precipitation	Tule River Infiltration					Deer Creek Infiltration					White River Infiltration	Imported Water Deliveries			Agricultural Pumping Return Flow	Municipal Pumping			Release of Water from Compression of Aquitards	Sub-surface Inflow	Mountain-Block Recharge	Total In
		Success to Oettle Bridge Infiltration	Oettle Bridge to Turnbull Weir Infiltration	Canal Loss	Recharge in Basins	Return Flow	Before Trenton Weir Infiltration	Trenton Weir to Homeland Canal Infiltration	Canal Loss	Recharge in Basins	Return Flow		Canal Loss	Recharge in Basins	Return Flow		Return Flow	Recycled Water					
																		Agricultural Return Flow	Artificial Recharge				
1986/87	24,000	11,600	1,100	20,700	26,100	13,000	7,300	0	0	800	0	2,400	52,400	0	81,300	148,900	5,305	1,100	100	79,078	71,306	32,404	579,000
1987/88	12,000	8,000	900	8,800	13,800	10,500	5,300	0	0	500	0	1,300	32,700	0	70,000	170,600	5,605	1,000	100	105,401	79,572	33,068	559,000
1988/89	4,000	8,700	0	7,400	13,600	7,100	7,500	0	0	0	0	1,800	20,500	0	64,300	171,000	5,705	1,300	800	116,068	82,414	33,707	546,000
1989/90	12,000	5,000	0	2,900	6,600	4,200	4,400	0	0	0	0	700	7,400	0	50,900	180,900	5,705	1,300	1,200	151,736	78,000	33,252	546,000
1990/91	34,000	6,400	300	6,800	12,000	8,100	6,900	0	0	0	0	1,300	24,300	0	88,700	129,100	5,905	1,600	1,500	72,608	75,861	33,251	509,000
1991/92	3,000	4,300	0	3,100	6,800	4,400	2,700	0	0	1,100	0	700	16,100	0	49,700	186,900	6,005	1,900	800	188,054	83,457	33,123	592,000
1992/93	56,000	18,500	3,000	27,800	36,000	25,200	10,800	0	0	4,000	0	3,500	184,400	5,600	192,100	129,800	6,005	2,200	1,300	62,900	75,769	33,196	878,000
1993/94	0	6,100	200	14,200	19,200	10,200	3,900	0	0	2,600	0	1,100	35,600	700	53,800	207,400	6,105	2,000	1,400	173,608	77,553	33,756	649,000
1994/95	145,000	36,400	10,400	39,500	47,300	54,900	18,100	1,000	3,800	5,200	2,000	10,500	128,500	10,400	137,300	141,300	6,205	2,000	1,700	64,826	73,475	33,306	973,000
1995/96	1,000	20,700	4,000	26,200	34,000	47,100	11,300	700	2,800	3,300	3,700	5,900	87,700	39,600	138,500	192,100	6,205	1,400	2,100	119,800	77,303	31,804	857,000
1996/97	34,000	34,600	9,700	47,300	52,700	49,800	43,800	1,800	6,900	3,300	2,500	12,800	64,100	14,200	154,500	162,800	6,405	1,700	2,400	66,838	82,606	31,878	887,000
1997/98	245,000	41,100	9,000	79,100	83,200	69,400	12,900	12,700	48,800	2,900	7,000	36,600	54,100	16,100	112,400	125,000	6,405	600	3,500	18,940	74,767	32,578	1,092,000
1998/99	4,000	14,300	2,800	19,500	25,700	21,100	9,000	600	2,500	4,600	1,000	7,300	58,100	19,700	132,300	174,900	6,405	600	1,900	57,596	88,336	33,653	686,000
1999/00	8,000	16,900	2,900	11,100	16,600	20,300	9,400	600	2,400	1,200	1,200	4,700	64,300	13,100	135,600	168,500	6,505	600	3,500	30,291	89,536	33,983	641,000
2000/01	5,000	12,300	0	7,000	11,800	8,600	5,100	0	0	1,600	0	4,600	28,500	2,700	85,000	185,700	6,605	700	3,700	123,874	82,850	33,990	610,000
2001/02	0	14,800	700	13,400	19,200	12,700	7,700	0	0	2,400	0	6,100	24,800	0	72,900	209,700	7,015	600	3,600	171,188	85,633	34,033	686,000
2002/03	3,000	19,700	3,700	22,800	29,100	13,100	12,600	100	400	1,300	200	5,700	53,600	5,000	85,000	141,800	6,915	1,800	3,300	92,463	83,067	33,405	618,000
2003/04	0	9,900	300	7,700	11,600	6,400	4,900	0	0	1,700	0	2,300	19,600	0	61,700	196,400	7,125	2,400	1,900	276,867	87,931	34,059	733,000
2004/05	85,000	24,200	4,700	22,900	30,100	28,100	13,800	400	1,500	3,500	1,600	6,400	91,100	32,000	153,200	106,000	7,125	3,100	1,000	39,712	79,309	33,257	768,000
2005/06	60,000	28,100	7,200	40,500	47,300	50,900	13,400	900	3,400	4,100	1,100	7,500	77,900	26,700	170,000	83,800	7,335	3,500	800	-26,779	75,951	32,712	716,000
2006/07	0	6,200	1,500	5,100	10,100	4,600	6,500	0	0	100	0	1,700	15,500	100	39,400	199,000	7,535	2,400	1,100	223,337	84,684	33,683	643,000
2007/08	0	11,700	1,100	15,900	22,500	13,500	7,600	0	0	500	0	2,300	22,000	1,600	56,600	170,800	7,645	1,700	1,500	245,013	79,028	34,402	695,000
2008/09	1,000	9,500	1,400	7,100	12,900	8,000	3,100	0	0	7,000	0	1,600	43,800	8,100	67,000	134,300	7,645	2,000	1,600	186,626	72,708	34,440	610,000
2009/10	17,000	25,600	4,500	34,600	51,600	33,800	13,100	0	0	3,200	0	5,000	72,600	29,900	129,100	86,400	7,655	2,100	1,700	62,701	58,661	33,381	673,000
2010/11	143,000	37,100	7,500	82,400	93,000	68,300	24,200	1,300	5,000	9,700	6,200	14,800	89,500	45,600	173,000	63,500	7,555	2,600	1,900	-27,145	59,467	32,031	941,000
2011/12	32,000	13,600	300	17,800	24,800	14,900	6,700	0	0	4,500	100	3,200	23,000	7,100	98,200	99,600	7,765	2,800	1,300	66,110	60,453	32,521	517,000
2012/13	3,000	4,900	0	4,400	9,800	4,000	3,100	0	0	1,300	100	1,000	13,100	100	36,000	159,200	7,765	1,600	1,100	206,627	71,965	33,222	562,000
2013/14	5,000	2,300	0	0	4,100	2,000	2,500	0	0	0	200	400	0	0	16,300	180,100	7,875	1,500	1,800	366,026	73,258	33,731	697,000
2014/15	3,000	1,000	0	0	4,600	1,400	1,600	0	0	0	200	200	0	0	10,200	161,200	7,675	1,200	1,800	349,002	66,798	33,991	644,000
2015/16	16,000	16,000	5,500	11,400	18,300	9,200	14,000	0	0	100	200	4,400	28,600	3,700	65,400	110,900	7,685	1,600	2,000	197,575	63,875	33,412	610,000
2016/17	76,000	42,100	15,900	82,600	98,300	65,300	50,600	800	3,100	3,700	6,000	22,000	133,700	75,500	158,500	101,200	7,785	1,600	2,100	61,845	62,152	31,636	1,102,000
2017/18	9,000	9,600	0	13,000	22,300	7,200	8,400	0	0	0	300	2,400	62,000	15,500	89,500	128,600	7,895	2,100	1,800	112,712	61,395	32,569	586,000
2018/19	80,000	30,200	500	65,400	81,500	36,400	28,500	200	900	600	1,800	10,500	112,900	106,300	174,200	79,000	7,895	1,400	2,300	16,657	54,971	31,577	924,000
36/87-18/19 Avg	34,000	16,700	3,000	23,300	30,200	22,200	11,500	600	2,500	2,300	1,100	5,800	52,800	14,500	97,000	148,100	6,900	1,700	1,800	123,000	75,000	33,000	707,000

Groundwater Inflows to be Included in Sustainable Yield Estimates
Groundwater Inflows to be Excluded from the Sustainable Yield Estimates
Surface Water or ET Outflows Not Included in Groundwater Recharge or Sustainable Yield Estimates

Tule Subbasin Groundwater Budget

Water Year	Groundwater Outflows (acre-ft)						Change in Storage (acre-ft)
	W	X	Y	Z	AA		
	Groundwater Pumping						
	Municipal	Irrigated Agriculture	Exports	Groundwater Banking Extraction	Sub-surface Outflow	Total Out	
1986/87	13,600	595,000	6,600	0	71,632	687,000	-108,000
1987/88	15,200	671,000	34,200	0	69,790	790,000	-231,000
1988/89	15,800	688,000	38,300	0	73,816	816,000	-270,000
1989/90	16,400	716,000	50,400	0	77,957	861,000	-315,000
1990/91	16,800	500,000	46,300	0	82,651	646,000	-137,000
1991/92	17,100	747,000	41,300	0	74,320	880,000	-288,000
1992/93	17,300	550,000	14,600	0	82,099	664,000	214,000
1993/94	17,700	858,000	11,200	0	70,609	958,000	-309,000
1994/95	17,700	606,000	10,700	0	67,306	702,000	271,000
1995/96	17,900	810,000	0	0	62,805	891,000	-34,000
1996/97	18,800	687,000	0	0	63,663	769,000	118,000
1997/98	18,000	541,000	0	0	62,951	622,000	470,000
1998/99	18,100	734,000	0	0	65,665	818,000	-132,000
1999/00	19,000	704,000	7,700	0	60,918	792,000	-151,000
2000/01	19,200	753,000	30,600	0	72,815	876,000	-266,000
2001/02	21,000	851,000	44,500	0	70,235	987,000	-301,000
2002/03	20,700	666,000	25,400	0	58,587	771,000	-153,000
2003/04	21,800	935,000	37,600	0	61,541	1,056,000	-323,000
2004/05	20,700	525,000	12,400	0	61,073	619,000	149,000
2005/06	21,700	396,000	100	0	55,591	473,000	243,000
2006/07	22,800	954,000	37,900	0	57,146	1,072,000	-429,000
2007/08	23,100	805,000	56,300	0	81,140	966,000	-271,000
2008/09	22,600	626,000	52,100	550	96,336	798,000	-188,000
2009/10	21,900	405,000	30,500	68	103,242	561,000	112,000
2010/11	21,900	295,000	8,200	0	92,672	418,000	523,000
2011/12	22,600	453,000	43,600	3,859	94,974	618,000	-101,000
2012/13	22,800	746,000	63,600	5,990	118,435	957,000	-395,000
2013/14	22,000	869,000	58,000	5,586	132,032	1,087,000	-390,000
2014/15	19,800	770,000	53,300	1,153	128,111	972,000	-328,000
2015/16	19,800	514,000	50,000	68	132,642	717,000	-107,000
2016/17	20,200	499,000	12,100	0	99,607	631,000	471,000
2017/18	21,100	620,000	33,600	0	102,150	777,000	-191,000
2018/19	20,800	385,000	11,600	0	103,691	521,000	403,000
86/87-18/19 Avg	19,600	651,000	28,000	500	82,000	781,000	-74,000
					Cummulative Change in Storage		-2,656,000

Groundwater Inflows to be Included in Sustainable Yield Estimates
Groundwater Inflows to be Excluded from the Sustainable Yield Estimates
Surface Water or ET Outflows Not Included in Groundwater Recharge or Sustainable Yield Estimates

Projected Future Tule Subbasin Surface Water Budget

	Surface Water Inflow (acre-ft)																				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
Water Year	Precipitation	Stream Inflow			Imported Water														Discharge from Wells			Total In
		Tule River	Deer Creek	White River	Saucelito ID	Terra Bella ID	Kern-Tulare WD	Porterville ID	Tea Pot Dome WD	City of Porterville	Hope WD	Ducor ID	LTRID	Pixley ID	Delano-Earlimart ID	Angiola WD	Alpaugh ID	Private	Agriculture Pumping	Municipal Pumping	Water Bank	
2019 - 2020	369,000	132,249	19,729	6,347	27,567	18,786	16,145	13,603	6,528	0	0	0	143,186	31,763	118,778	7,554	3,680	0	655,000	32,300	3,000	1,605,000
2020 - 2021	369,000	132,249	19,729	6,347	28,667	18,786	18,745	13,603	6,528	1,100	0	0	143,186	31,763	118,778	8,555	3,680	0	650,000	32,700	3,000	1,606,000
2021 - 2022	369,000	132,249	19,729	6,347	28,667	18,786	18,745	13,603	6,528	1,100	0	0	143,186	31,763	118,778	9,557	3,680	0	645,000	33,000	3,000	1,603,000
2022 - 2023	369,000	132,249	19,729	6,347	28,667	18,786	18,745	13,603	6,528	1,100	1,667	0	143,186	31,763	118,778	10,559	3,680	0	640,000	33,400	3,000	1,601,000
2023 - 2024	369,000	132,249	19,729	6,347	28,667	18,786	18,745	13,603	6,528	1,100	1,667	4,000	143,186	31,763	118,778	10,559	3,680	0	634,000	33,800	3,000	1,599,000
2024 - 2025	369,000	135,249	19,729	6,347	29,543	20,304	18,904	14,839	6,594	1,100	1,667	4,000	135,513	31,763	119,224	10,559	3,680	1,500	623,000	34,200	3,000	1,590,000
2025 - 2026	369,000	135,249	19,729	6,347	30,418	21,823	18,384	16,075	6,661	1,100	1,667	4,000	127,841	31,763	119,671	10,559	4,813	1,500	614,000	34,700	3,000	1,578,000
2026 - 2027	369,000	135,249	19,729	6,347	31,293	23,341	17,863	17,312	6,727	1,100	1,667	4,000	120,168	31,763	120,117	10,559	4,751	1,500	610,000	35,100	3,000	1,571,000
2027 - 2028	369,000	135,249	19,729	6,347	32,168	24,860	17,342	18,548	6,793	1,100	1,667	4,000	112,496	31,763	120,564	10,559	4,689	1,500	605,000	35,500	3,000	1,562,000
2028 - 2029	369,000	135,249	19,729	6,347	33,044	26,378	16,822	19,785	6,860	1,100	1,667	4,000	104,823	31,763	121,010	10,559	4,627	1,500	601,000	36,000	3,000	1,554,000
2029 - 2030	369,000	134,235	19,729	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	4,565	1,500	553,000	36,500	3,000	1,503,000
2030 - 2031	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	5,737	1,500	528,000	36,900	3,000	1,479,000
2031 - 2032	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	5,737	1,500	506,000	37,400	3,000	1,458,000
2032 - 2033	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	5,737	1,500	482,000	37,900	3,000	1,434,000
2033 - 2034	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	5,737	1,500	459,000	38,400	3,000	1,412,000
2034 - 2035	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	5,737	1,500	426,000	39,000	3,000	1,379,000
2035 - 2036	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	6,970	1,500	412,000	39,500	3,000	1,367,000
2036 - 2037	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	6,970	1,500	400,000	40,100	3,000	1,356,000
2037 - 2038	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	6,970	1,500	387,000	40,600	3,000	1,343,000
2038 - 2039	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	6,970	1,500	373,000	41,200	3,000	1,330,000
2039 - 2040	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	6,970	1,500	357,000	41,800	3,000	1,314,000
2040 - 2041	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	357,000	41,800	3,000	1,315,000
2041 - 2042	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	357,000	41,800	3,000	1,315,000
2042 - 2043	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	358,000	41,800	3,000	1,316,000
2043 - 2044	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	358,000	41,800	3,000	1,316,000
2044 - 2045	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	358,000	41,800	3,000	1,316,000
2045 - 2046	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	358,000	41,800	3,000	1,316,000
2046 - 2047	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	358,000	41,800	3,000	1,316,000
2047 - 2048	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	358,000	41,800	3,000	1,316,000
2048 - 2049	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	358,000	41,800	3,000	1,316,000
2049 - 2050	369,000	134,235	19,411	6,347	33,919	27,897	18,039	21,021	6,926	1,100	1,667	4,000	97,151	31,763	121,457	10,264	7,793	1,500	359,000	41,800	3,000	1,317,000
2050 - 2051	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	371,000	41,800	3,000	1,297,000
2051 - 2052	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	372,000	41,800	3,000	1,298,000
2052 - 2053	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	373,000	41,800	3,000	1,299,000
2053 - 2054	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	373,000	41,800	3,000	1,299,000
2054 - 2055	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	374,000	41,800	3,000	1,300,000
2055 - 2056	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	374,000	41,800	3,000	1,300,000
2056 - 2057	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2057 - 2058	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2058 - 2059	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2059 - 2060	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2060 - 2061	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2061 - 2062	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2062 - 2063	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2063 - 2064	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2064 - 2065	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2065 - 2066	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2066 - 2067	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2067 - 2068	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2068 - 2069	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
2069 - 2070	369,000	130,581	18,944	6,143	32,278	26,278	18,039	18,941	6,524	1,100	1,667	4,000	84,084	31,763	112,046	10,043	7,793	1,500	375,000	41,800	3,000	1,301,000
19/20-69/70 Avg	369,000	132,700	19,300	6,300	32,500	25,900	18,000	19,100	6,700	1,100	1,600	3,700	98,800	31,800	117,400	10,100	6,700	1,400	436,000	39,700		1,378,000

Projected Future Tule Subbasin Surface Water Budget

	Surface Water Outflow (acre-ft)																	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
		Streambed Infiltration					Canal Loss			Recharge in Basins				Deep Percolation of Applied Water					
Water Year	Areal Recharge of Precipitation	Tule River		Native Deer Creek		White River	Tule River	Deer Creek	Imported Water	Tule River	Deer Creek	Imported Water	Recycled Water	Tule River	Deer Creek	Imported Water	Recycled Water	Agricultural Pumping	Municipal Pumping
		Success to Oettle Bridge	Oettle Bridge to Turnbull Weir	Before Trenton Weir	Trenton Weir to Homeland Canal														
2019 - 2020	38,000	18,100	4,000	10,200	600	6,200	17,000	2,200	65,100	23,700	2,500	19,800	3,000	17,000	1,050	92,200	1,200	168,700	8,500
2020 - 2021	38,000	18,100	4,000	10,200	600	6,200	17,000	2,200	65,100	23,700	2,500	19,800	3,100	17,000	1,050	93,100	1,200	167,400	8,500
2021 - 2022	38,000	18,100	4,000	10,200	600	6,200	17,000	2,200	65,100	23,700	2,500	19,800	3,100	17,000	1,050	93,100	1,300	166,200	8,500
2022 - 2023	38,000	18,100	4,000	10,200	600	6,200	17,000	2,200	65,100	23,700	2,500	19,800	3,200	17,000	1,050	93,200	1,400	164,900	8,600
2023 - 2024	38,000	18,100	4,000	10,200	600	6,200	17,000	2,200	65,100	23,700	2,500	19,800	3,300	17,000	1,050	93,200	1,400	163,800	8,600
2024 - 2025	38,000	18,100	4,000	10,200	600	6,200	18,100	2,200	62,300	25,200	2,500	20,700	3,400	17,300	1,050	92,700	1,500	161,400	8,700
2025 - 2026	38,000	18,100	4,000	10,200	600	6,200	18,400	2,200	59,500	25,500	2,500	20,100	3,500	17,200	1,250	92,600	1,600	160,000	8,700
2026 - 2027	38,000	18,100	4,000	10,200	600	6,200	18,700	2,200	56,700	25,800	2,500	19,500	3,600	17,100	1,250	92,000	1,700	159,200	8,800
2027 - 2028	38,000	18,100	4,000	10,200	600	6,200	19,000	2,200	53,900	26,100	2,500	18,800	3,600	17,000	1,250	91,300	1,700	158,200	8,800
2028 - 2029	38,000	18,100	4,000	10,200	600	6,200	19,200	2,200	51,100	26,300	2,500	18,200	3,700	16,900	1,250	90,800	1,800	157,300	8,900
2029 - 2030	38,000	17,900	4,000	10,200	600	6,200	19,400	2,200	48,300	26,500	2,500	17,600	3,800	16,500	1,250	90,600	1,900	148,900	8,900
2030 - 2031	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	3,900	16,600	1,250	90,900	2,000	143,100	9,000
2031 - 2032	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,000	16,600	1,250	91,100	2,000	137,700	9,100
2032 - 2033	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,100	16,700	1,250	91,200	2,100	132,000	9,100
2033 - 2034	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,200	16,800	1,250	91,400	2,200	126,500	9,200
2034 - 2035	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,300	16,800	1,250	91,700	2,300	120,400	9,200
2035 - 2036	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,400	16,800	1,250	92,000	2,400	117,100	9,300
2036 - 2037	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,500	16,900	1,250	92,200	2,500	114,100	9,400
2037 - 2038	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,700	16,900	1,350	92,200	2,600	111,000	9,400
2038 - 2039	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,800	17,000	1,350	92,400	2,700	107,500	9,500
2039 - 2040	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,100	1,350	92,600	2,800	104,100	9,600
2040 - 2041	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,100	1,350	92,800	2,800	104,200	9,600
2041 - 2042	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,100	1,350	92,800	2,800	104,200	9,600
2042 - 2043	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,100	1,350	92,800	2,800	104,300	9,600
2043 - 2044	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,000	1,350	92,800	2,800	104,300	9,600
2044 - 2045	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,000	1,350	92,800	2,800	104,400	9,600
2045 - 2046	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,000	1,350	92,800	2,800	104,400	9,600
2046 - 2047	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,000	1,350	92,800	2,800	104,400	9,600
2047 - 2048	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,000	1,350	92,800	2,800	104,500	9,600
2048 - 2049	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,000	1,350	92,800	2,800	104,500	9,600
2049 - 2050	38,000	17,900	4,000	10,100	600	6,200	19,400	2,100	48,300	26,500	2,500	17,600	4,900	17,000	1,350	92,700	2,800	104,700	9,600
2050 - 2051	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	107,600	9,600
2051 - 2052	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	107,800	9,600
2052 - 2053	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,000	9,600
2053 - 2054	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,200	9,600
2054 - 2055	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,300	9,600
2055 - 2056	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,400	9,600
2056 - 2057	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,600	9,600
2057 - 2058	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,700	9,600
2058 - 2059	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2059 - 2060	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2060 - 2061	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2061 - 2062	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2062 - 2063	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2063 - 2064	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2064 - 2065	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2065 - 2066	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2066 - 2067	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2067 - 2068	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2068 - 2069	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
2069 - 2070	38,000	17,400	3,800	9,800	500	6,100	19,200	2,100	43,500	25,700	2,500	16,600	4,900	16,900	1,340	87,300	2,800	108,800	9,600
19/20-69/70 Avg	38,000	17,700	3,900	10,000	600	6,200	19,000	2,100	48,900	25,800	2,500	17,600	4,500	16,900	1,300	90,300	2,400	121,700	9,300

Projected Future Tule Subbasin Surface Water Budget

	Surface Water Outflow (acre-ft)												
	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	
	Evapotranspiration										Surface Outflow		
Water Year	Precipitation Crops/Native	Tule River		Deer Creek		White River	Imported Water	Ag. Cons. Use from Pumping	Recycled Water	Municipal (Landscape ET)	Tule River	Deer Creek	Total Out
		Agricultural Cons. Use	Stream Channel	Agricultural Cons. Use	Stream Channel	Stream Channel	Agricultural Cons. Use		Agricultural Cons. Use				
2019 - 2020	332,000	38,100	400	3,000	300	100	208,100	508,000	1,300	11,200	15,000	0	1,617,000
2020 - 2021	332,000	38,100	400	3,000	300	100	209,800	505,000	1,300	11,400	8,000	0	1,608,000
2021 - 2022	332,000	38,100	400	3,000	300	100	209,800	501,000	1,300	11,600	8,000	0	1,603,000
2022 - 2023	332,000	38,100	400	3,000	300	100	209,800	497,000	1,300	11,800	8,000	0	1,599,000
2023 - 2024	332,000	38,100	400	3,000	300	100	209,800	493,000	1,300	12,000	8,000	0	1,594,000
2024 - 2025	332,000	38,800	400	3,000	300	100	208,800	481,000	1,300	12,300	8,000	0	1,580,000
2025 - 2026	332,000	38,600	400	3,000	300	100	209,000	476,000	1,300	12,500	8,000	0	1,571,000
2026 - 2027	332,000	38,300	400	3,000	300	100	207,300	472,000	1,300	12,700	8,000	0	1,562,000
2027 - 2028	332,000	38,000	400	3,000	300	100	205,800	468,000	1,300	12,900	7,000	0	1,550,000
2028 - 2029	332,000	37,700	400	3,000	300	100	204,100	463,000	1,300	13,200	7,000	0	1,539,000
2029 - 2030	332,000	36,500	400	3,000	300	100	203,600	425,000	1,300	13,400	7,000	0	1,488,000
2030 - 2031	332,000	36,500	400	2,900	300	100	204,400	405,000	1,300	13,600	7,000	0	1,463,000
2031 - 2032	332,000	36,500	400	2,900	300	100	204,300	388,000	1,300	13,900	7,000	0	1,442,000
2032 - 2033	332,000	36,500	400	2,900	300	100	204,300	370,000	1,300	14,100	7,000	0	1,419,000
2033 - 2034	332,000	36,500	400	2,900	300	100	204,100	353,000	1,300	14,400	7,000	0	1,397,000
2034 - 2035	332,000	36,500	400	2,900	300	100	204,000	325,000	1,300	14,700	7,000	0	1,363,000
2035 - 2036	332,000	36,500	400	2,900	300	100	204,800	315,000	1,300	15,000	7,000	0	1,352,000
2036 - 2037	332,000	36,500	400	2,900	300	100	204,700	306,000	1,300	15,200	7,000	0	1,340,000
2037 - 2038	332,000	36,500	400	2,900	300	100	204,700	295,000	1,300	15,500	7,000	0	1,327,000
2038 - 2039	332,000	36,500	400	2,800	300	100	204,600	284,000	1,300	15,800	7,000	0	1,313,000
2039 - 2040	332,000	36,500	400	2,800	300	100	204,500	271,000	1,300	16,100	7,000	0	1,298,000
2040 - 2041	332,000	36,500	400	2,800	300	100	205,200	271,000	1,300	16,100	7,000	0	1,299,000
2041 - 2042	332,000	36,500	400	2,800	300	100	205,200	271,000	1,300	16,100	7,000	0	1,299,000
2042 - 2043	332,000	36,500	400	2,800	300	100	205,200	271,000	1,300	16,100	7,000	0	1,299,000
2043 - 2044	332,000	36,500	400	2,800	300	100	205,200	272,000	1,300	16,100	7,000	0	1,300,000
2044 - 2045	332,000	36,500	400	2,800	300	100	205,200	272,000	1,300	16,100	7,000	0	1,300,000
2045 - 2046	332,000	36,500	400	2,800	300	100	205,200	272,000	1,300	16,100	7,000	0	1,300,000
2046 - 2047	332,000	36,500	400	2,800	300	100	205,200	272,000	1,300	16,100	7,000	0	1,300,000
2047 - 2048	332,000	36,500	400	2,800	300	100	205,200	272,000	1,300	16,100	7,000	0	1,300,000
2048 - 2049	332,000	36,500	400	2,800	300	100	205,200	272,000	1,300	16,100	7,000	0	1,300,000
2049 - 2050	332,000	36,500	400	2,800	300	100	205,200	273,000	1,300	16,100	7,000	0	1,301,000
2050 - 2051	332,000	35,600	400	2,800	300	100	188,300	284,000	1,300	16,100	6,000	0	1,283,000
2051 - 2052	332,000	35,600	400	2,800	300	100	188,300	285,000	1,300	16,100	6,000	0	1,284,000
2052 - 2053	332,000	35,600	400	2,800	300	100	188,300	285,000	1,300	16,100	6,000	0	1,284,000
2053 - 2054	332,000	35,600	400	2,800	300	100	188,300	286,000	1,300	16,100	6,000	0	1,285,000
2054 - 2055	332,000	35,600	400	2,800	300	100	188,300	286,000	1,300	16,100	6,000	0	1,285,000
2055 - 2056	332,000	35,600	400	2,800	300	100	188,300	286,000	1,300	16,100	6,000	0	1,285,000
2056 - 2057	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2057 - 2058	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2058 - 2059	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2059 - 2060	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2060 - 2061	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2061 - 2062	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2062 - 2063	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2063 - 2064	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2064 - 2065	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2065 - 2066	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2066 - 2067	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2067 - 2068	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2068 - 2069	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
2069 - 2070	332,000	35,600	400	2,800	300	100	188,300	287,000	1,300	16,100	6,000	0	1,287,000
86/87-16/17 Avg	332,000	36,500	400	2,900	300	100	199,000	334,300	1,300	15,000	7,000	0	1,368,000

Projected Future Tule Subbasin Groundwater Budget

	Groundwater Inflows (acre-ft)																					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	
Water Year	Areal Recharge from Precipitation	Tule River Infiltration					Deer Creek Infiltration					White River Infiltration	Imported Water Deliveries			Agricultural Pumping Return Flow	Municipal Pumping			Release of Water from Compression of Aquitards	Sub-surface Inflow	Mountain-Block Recharge	Total In
		Success to Oettle Bridge Infiltration	Oettle Bridge to Turnbull Weir Infiltration	Canal Loss	Recharge in Basins	Return Flow	Before Trenton Weir Infiltration	Trenton Weir to Homeland Canal Infiltration	Canal Loss	Recharge in Basins	Return Flow		Canal Loss	Recharge in Basins	Return Flow		Return Flow	Recycled Water					
																		Agricultural Return Flow	Artificial Recharge				
2019 - 2020	38,000	18,100	4,000	17,000	23,700	17,000	10,200	600	2,200	2,500	1,050	6,200	65,100	19,800	92,200	168,700	8,500	1,200	3,000	53,175	53,082	31,855	637,000
2020 - 2021	38,000	18,100	4,000	17,000	23,700	17,000	10,200	600	2,200	2,500	1,050	6,200	65,100	19,800	93,100	167,400	8,500	1,200	3,100	70,510	50,875	31,980	652,000
2021 - 2022	38,000	18,100	4,000	17,000	23,700	17,000	10,200	600	2,200	2,500	1,050	6,200	65,100	19,800	93,100	166,200	8,500	1,300	3,100	78,917	49,370	32,118	658,000
2022 - 2023	38,000	18,100	4,000	17,000	23,700	17,000	10,200	600	2,200	2,500	1,050	6,200	65,100	19,800	93,200	164,900	8,600	1,400	3,200	85,158	47,436	32,226	662,000
2023 - 2024	38,000	18,100	4,000	17,000	23,700	17,000	10,200	600	2,200	2,500	1,050	6,200	65,100	19,800	93,200	163,800	8,600	1,400	3,300	89,972	46,283	32,405	664,000
2024 - 2025	38,000	18,100	4,000	18,100	25,200	17,300	10,200	600	2,200	2,500	1,050	6,200	62,300	20,700	92,700	161,400	8,700	1,500	3,400	91,017	44,828	32,312	662,000
2025 - 2026	38,000	18,100	4,000	18,400	25,500	17,200	10,200	600	2,200	2,500	1,250	6,200	59,500	20,100	92,600	160,000	8,700	1,600	3,500	92,396	44,095	32,347	659,000
2026 - 2027	38,000	18,100	4,000	18,700	25,800	17,100	10,200	600	2,200	2,500	1,250	6,200	56,700	19,500	92,000	159,200	8,800	1,700	3,600	95,111	43,481	32,389	657,000
2027 - 2028	38,000	18,100	4,000	19,000	26,100	17,000	10,200	600	2,200	2,500	1,250	6,200	53,900	18,800	91,300	158,200	8,800	1,700	3,600	97,451	42,996	32,521	654,000
2028 - 2029	38,000	18,100	4,000	19,200	26,300	16,900	10,200	600	2,200	2,500	1,250	6,200	51,100	18,200	90,800	157,300	8,900	1,800	3,700	100,272	42,522	31,753	652,000
2029 - 2030	38,000	17,900	4,000	19,400	26,500	16,500	10,200	600	2,200	2,500	1,250	6,200	48,300	17,600	90,600	148,900	8,900	1,900	3,800	90,704	41,012	31,431	628,000
2030 - 2031	38,000	17,900	4,000	19,400	26,500	16,600	10,100	600	2,100	2,500	1,250	6,200	48,300	17,600	90,900	143,100	9,000	2,000	3,900	82,408	39,932	31,333	614,000
2031 - 2032	38,000	17,900	4,000	19,400	26,500	16,600	10,100	600	2,100	2,500	1,250	6,200	48,300	17,600	91,100	137,700	9,100	2,000	4,000	74,511	39,123	31,386	600,000
2032 - 2033	38,000	17,900	4,000	19,400	26,500	16,700	10,100	600	2,100	2,500	1,250	6,200	48,300	17,600	91,200	132,000	9,100	2,100	4,100	66,954	38,268	31,284	586,000
2033 - 2034	38,000	17,900	4,000	19,400	26,500	16,800	10,100	600	2,100	2,500	1,250	6,200	48,300	17,600	91,400	126,500	9,200	2,200	4,200	59,158	37,509	31,277	573,000
2034 - 2035	38,000	17,900	4,000	19,400	26,500	16,800	10,100	600	2,100	2,500	1,250	6,200	48,300	17,600	91,700	120,400	9,200	2,300	4,300	51,975	36,509	31,040	559,000
2035 - 2036	38,000	17,900	4,000	19,400	26,500	16,800	10,100	600	2,100	2,500	1,250	6,200	48,300	17,600	92,000	117,100	9,300	2,400	4,400	49,228	35,935	31,039	553,000
2036 - 2037	38,000	17,900	4,000	19,400	26,500	16,900	10,100	600	2,100	2,500	1,250	6,200	48,300	17,600	92,200	114,100	9,400	2,500	4,500	46,843	35,260	30,906	547,000
2037 - 2038	38,000	17,900	4,000	19,400	26,500	16,900	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,200	111,000	9,400	2,600	4,700	44,333	34,630	30,875	541,000
2038 - 2039	38,000	17,900	4,000	19,400	26,500	17,000	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,400	107,500	9,500	2,700	4,800	39,702	34,226	30,851	533,000
2039 - 2040	38,000	17,900	4,000	19,400	26,500	17,100	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,600	104,100	9,600	2,800	4,900	34,836	34,266	30,902	526,000
2040 - 2041	38,000	17,900	4,000	19,400	26,500	17,100	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,200	9,600	2,800	4,900	34,231	33,991	30,776	525,000
2041 - 2042	38,000	17,900	4,000	19,400	26,500	17,100	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,200	9,600	2,800	4,900	33,284	33,930	30,734	524,000
2042 - 2043	38,000	17,900	4,000	19,400	26,500	17,100	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,300	9,600	2,800	4,900	32,434	33,822	30,697	523,000
2043 - 2044	38,000	17,900	4,000	19,400	26,500	17,000	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,300	9,600	2,800	4,900	31,964	33,781	30,748	522,000
2044 - 2045	38,000	17,900	4,000	19,400	26,500	17,000	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,400	9,600	2,800	4,900	31,485	33,594	30,628	522,000
2045 - 2046	38,000	17,900	4,000	19,400	26,500	17,000	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,400	9,600	2,800	4,900	31,153	33,496	30,596	521,000
2046 - 2047	38,000	17,900	4,000	19,400	26,500	17,000	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,400	9,600	2,800	4,900	30,854	33,459	30,566	521,000
2047 - 2048	38,000	17,900	4,000	19,400	26,500	17,000	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,500	9,600	2,800	4,900	30,265	33,416	30,625	520,000
2048 - 2049	38,000	17,900	4,000	19,400	26,500	17,000	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,800	104,500	9,600	2,800	4,900	30,331	33,338	30,513	520,000
2049 - 2050	38,000	17,900	4,000	19,400	26,500	17,000	10,100	600	2,100	2,500	1,350	6,200	48,300	17,600	92,700	104,700	9,600	2,800	4,900	29,962	33,242	30,487	520,000
2050 - 2051	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	107,600	9,600	2,800	4,900	37,613	33,804	30,509	518,000
2051 - 2052	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	107,800	9,600	2,800	4,900	36,741	33,996	30,602	517,000
2052 - 2053	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,000	9,600	2,800	4,900	36,651	34,074	30,518	517,000
2053 - 2054	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,200	9,600	2,800	4,900	36,494	34,169	30,519	517,000
2054 - 2055	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,300	9,600	2,800	4,900	36,249	34,264	30,518	517,000
2055 - 2056	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,400	9,600	2,800	4,900	36,059	34,424	30,603	518,000
2056 - 2057	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,600	9,600	2,800	4,900	36,009	34,426	30,516	518,000
2057 - 2058	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,700	9,600	2,800	4,900	35,932	34,514	30,514	518,000
2058 - 2059	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	35,834	34,612	30,512	518,000
2059 - 2060	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	35,338	34,768	30,597	518,000
2060 - 2061	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	35,240	34,767	30,509	517,000
2061 - 2062	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	34,995	34,850	30,507	517,000
2062 - 2063	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	34,719	34,931	30,506	517,000
2063 - 2064	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	34,244	35,086	30,591	517,000
2064 - 2065	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	34,206	35,101	30,504	517,000
2065 - 2066	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	33,932	35,187	30,502	516,000
2066 - 2067	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	33,677	35,272	30,501	516,000
2067 - 2068	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	33,317	35,429	30,587	516,000
2068 - 2069	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	33,221	35,431	30,501	516,000
2069 - 2070	38,000	17,400	3,800	19,200	25,700	16,900	9,800	500	2,100	2,500	1,340	6,100	43,500	16,600	87,300	108,800	9,600	2,800	4,900	32,938	35,512	30,500	516,000
19/20-69/70 Avg	38,000	17,700	3,900	19,000	25,800	16,900	10,000	600	2,100	2,500	1,300	6,200	48,900	17,600	90,300	121,700	9,300	2,400	4,500	49,000	37,000	31,000	556,000

Projected Future Tule Subbasin Groundwater Budget

	Groundwater Outflows (acre-ft)						
	W	X	Y	Z	AA		
	Groundwater Pumping						
Water Year	Municipal	Irrigated Agriculture	Exports	Groundwater Banking Extraction	Sub-surface Outflow	Total Out	Change in Storage (acre-ft)
2019 - 2020	32,300	655,000	22,916	3,000	86,651	800,000	-163,000
2020 - 2021	32,700	650,000	22,916	3,000	86,920	796,000	-144,000
2021 - 2022	33,000	645,000	22,916	3,000	87,101	791,000	-133,000
2022 - 2023	33,400	640,000	22,916	3,000	87,722	787,000	-125,000
2023 - 2024	33,800	634,000	22,916	3,000	89,223	783,000	-119,000
2024 - 2025	34,200	623,000	22,916	3,000	89,968	773,000	-111,000
2025 - 2026	34,700	614,000	20,006	3,000	91,283	763,000	-104,000
2026 - 2027	35,100	610,000	20,006	3,000	92,422	761,000	-104,000
2027 - 2028	35,500	605,000	20,006	3,000	93,833	757,000	-103,000
2028 - 2029	36,000	601,000	20,006	3,000	94,814	755,000	-103,000
2029 - 2030	36,500	553,000	20,006	3,000	96,411	709,000	-81,000
2030 - 2031	36,900	528,000	17,096	3,000	98,943	684,000	-70,000
2031 - 2032	37,400	506,000	17,096	3,000	102,261	666,000	-66,000
2032 - 2033	37,900	482,000	17,096	3,000	105,333	645,000	-59,000
2033 - 2034	38,400	459,000	17,096	3,000	109,431	627,000	-54,000
2034 - 2035	39,000	426,000	17,096	3,000	112,594	598,000	-39,000
2035 - 2036	39,500	412,000	14,185	3,000	117,017	586,000	-33,000
2036 - 2037	40,100	400,000	14,185	3,000	120,330	578,000	-31,000
2037 - 2038	40,600	387,000	14,185	3,000	124,416	569,000	-28,000
2038 - 2039	41,200	373,000	14,185	3,000	127,167	559,000	-26,000
2039 - 2040	41,800	357,000	11,275	3,000	129,380	542,000	-16,000
2040 - 2041	41,800	357,000	11,275	3,000	129,073	542,000	-17,000
2041 - 2042	41,800	357,000	11,275	3,000	128,706	542,000	-18,000
2042 - 2043	41,800	358,000	11,275	3,000	128,454	543,000	-20,000
2043 - 2044	41,800	358,000	11,275	3,000	128,326	542,000	-20,000
2044 - 2045	41,800	358,000	11,275	3,000	127,736	542,000	-20,000
2045 - 2046	41,800	358,000	11,275	3,000	127,346	541,000	-20,000
2046 - 2047	41,800	358,000	11,275	3,000	126,804	541,000	-20,000
2047 - 2048	41,800	358,000	11,275	3,000	126,988	541,000	-21,000
2048 - 2049	41,800	358,000	11,275	3,000	126,042	540,000	-20,000
2049 - 2050	41,800	359,000	11,275	3,000	125,806	541,000	-21,000
2050 - 2051	41,800	371,000	11,275	3,000	123,993	551,000	-33,000
2051 - 2052	41,800	372,000	11,275	3,000	123,630	552,000	-35,000
2052 - 2053	41,800	373,000	11,275	3,000	122,362	551,000	-34,000
2053 - 2054	41,800	373,000	11,275	3,000	121,593	551,000	-34,000
2054 - 2055	41,800	374,000	11,275	3,000	120,852	551,000	-34,000
2055 - 2056	41,800	374,000	11,275	3,000	120,507	551,000	-33,000
2056 - 2057	41,800	375,000	11,275	3,000	119,515	551,000	-33,000
2057 - 2058	41,800	375,000	11,275	3,000	118,827	550,000	-32,000
2058 - 2059	41,800	375,000	11,275	3,000	118,157	549,000	-31,000
2059 - 2060	41,800	375,000	11,275	3,000	117,879	549,000	-31,000
2060 - 2061	41,800	375,000	11,275	3,000	116,968	548,000	-31,000
2061 - 2062	41,800	375,000	11,275	3,000	116,354	547,000	-30,000
2062 - 2063	41,800	375,000	11,275	3,000	115,782	547,000	-30,000
2063 - 2064	41,800	375,000	11,275	3,000	115,557	547,000	-30,000
2064 - 2065	41,800	375,000	11,275	3,000	114,725	546,000	-29,000
2065 - 2066	41,800	375,000	11,275	3,000	114,212	545,000	-29,000
2066 - 2067	41,800	375,000	11,275	3,000	113,697	545,000	-29,000
2067 - 2068	41,800	375,000	11,275	3,000	113,512	545,000	-29,000
2068 - 2069	41,800	375,000	11,275	3,000	112,736	544,000	-28,000
2069 - 2070	41,800	375,000	11,275	3,000	112,259	543,000	-27,000
17/18-69/70 Avg	39,700	436,000	14,300	3,000	113,000	606,000	-50,000

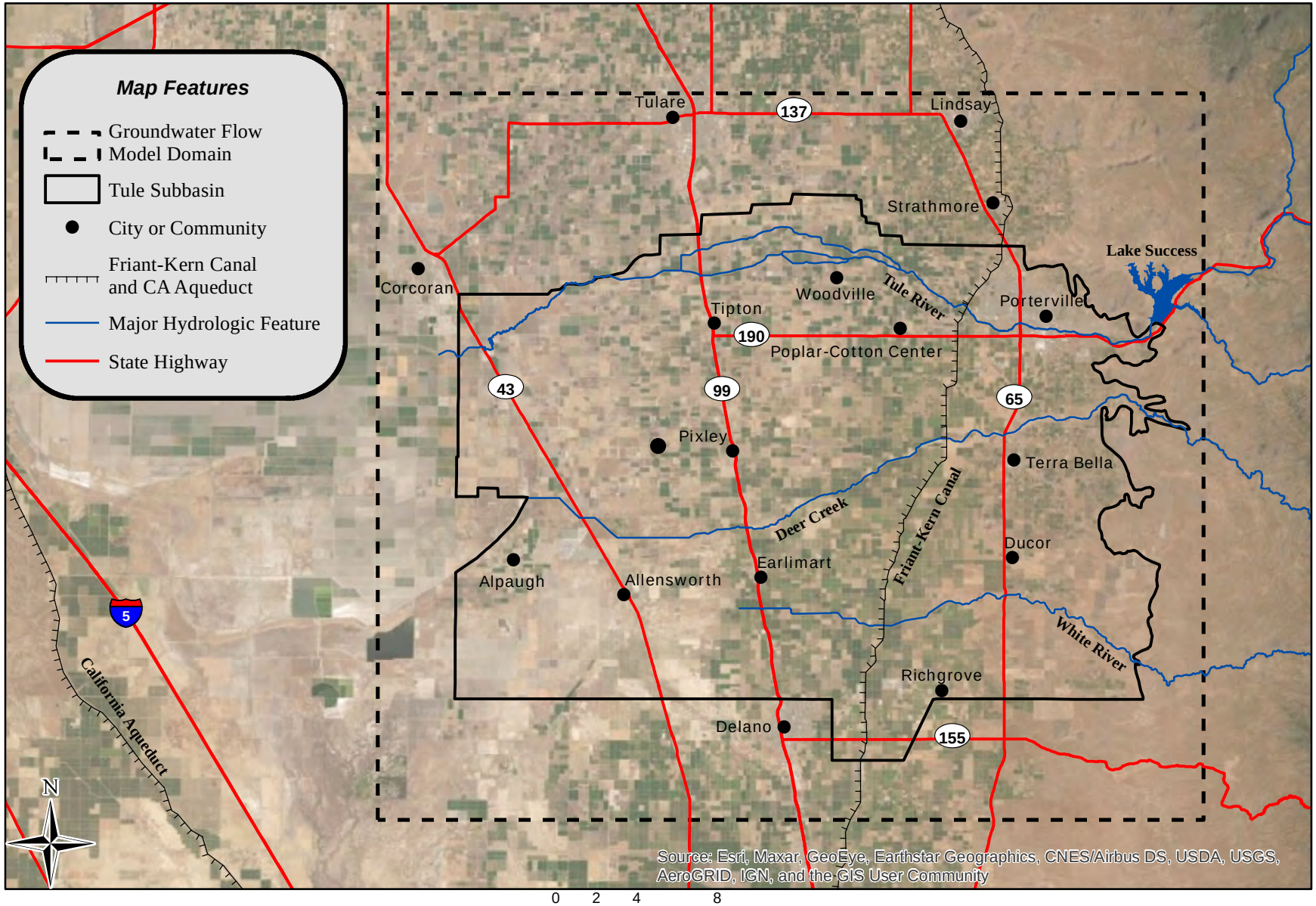
Projected Future Tule Subbasin Sustainable Yield

Water Year	Groundwater Inflows (acre-ft)										Groundwater Outflow (acre-ft)	Sustainable Yield
	A	B	C	D	E	F	G	H	I	J	K	
	Areal Recharge from Precipitation	Streambed Infiltration					Return Flow		Sub-surface Inflow	Mountain-Block Recharge	Sub-surface Outflow	
		Tule River		Deer Creek		White River	Irrigated Agriculture	Municipal				
		Success to Oettle Bridge	Oettle Bridge to Turnbull Weir	Before Trenton Weir Infiltration	Trenton Weir to Homeland Canal Infiltration							
2040 - 2041	38,000	17,900	4,000	10,100	600	6,200	104,200	9,600	33,991	30,776	129,073	126,300
2041 - 2042	38,000	17,900	4,000	10,100	600	6,200	104,200	9,600	33,930	30,734	128,706	126,600
2042 - 2043	38,000	17,900	4,000	10,100	600	6,200	104,300	9,600	33,822	30,697	128,454	126,800
2043 - 2044	38,000	17,900	4,000	10,100	600	6,200	104,300	9,600	33,781	30,748	128,326	126,900
2044 - 2045	38,000	17,900	4,000	10,100	600	6,200	104,400	9,600	33,594	30,628	127,736	127,300
2045 - 2046	38,000	17,900	4,000	10,100	600	6,200	104,400	9,600	33,496	30,596	127,346	127,500
2046 - 2047	38,000	17,900	4,000	10,100	600	6,200	104,400	9,600	33,459	30,566	126,804	128,000
2047 - 2048	38,000	17,900	4,000	10,100	600	6,200	104,500	9,600	33,416	30,625	126,988	128,000
2048 - 2049	38,000	17,900	4,000	10,100	600	6,200	104,500	9,600	33,338	30,513	126,042	128,700
2049 - 2050	38,000	17,900	4,000	10,100	600	6,200	104,700	9,600	33,242	30,487	125,806	129,000
40/41-49/50 Avg	38,000	17,900	4,000	10,100	600	6,200	104,400	9,600	34,000	31,000	128,000	127,800

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021



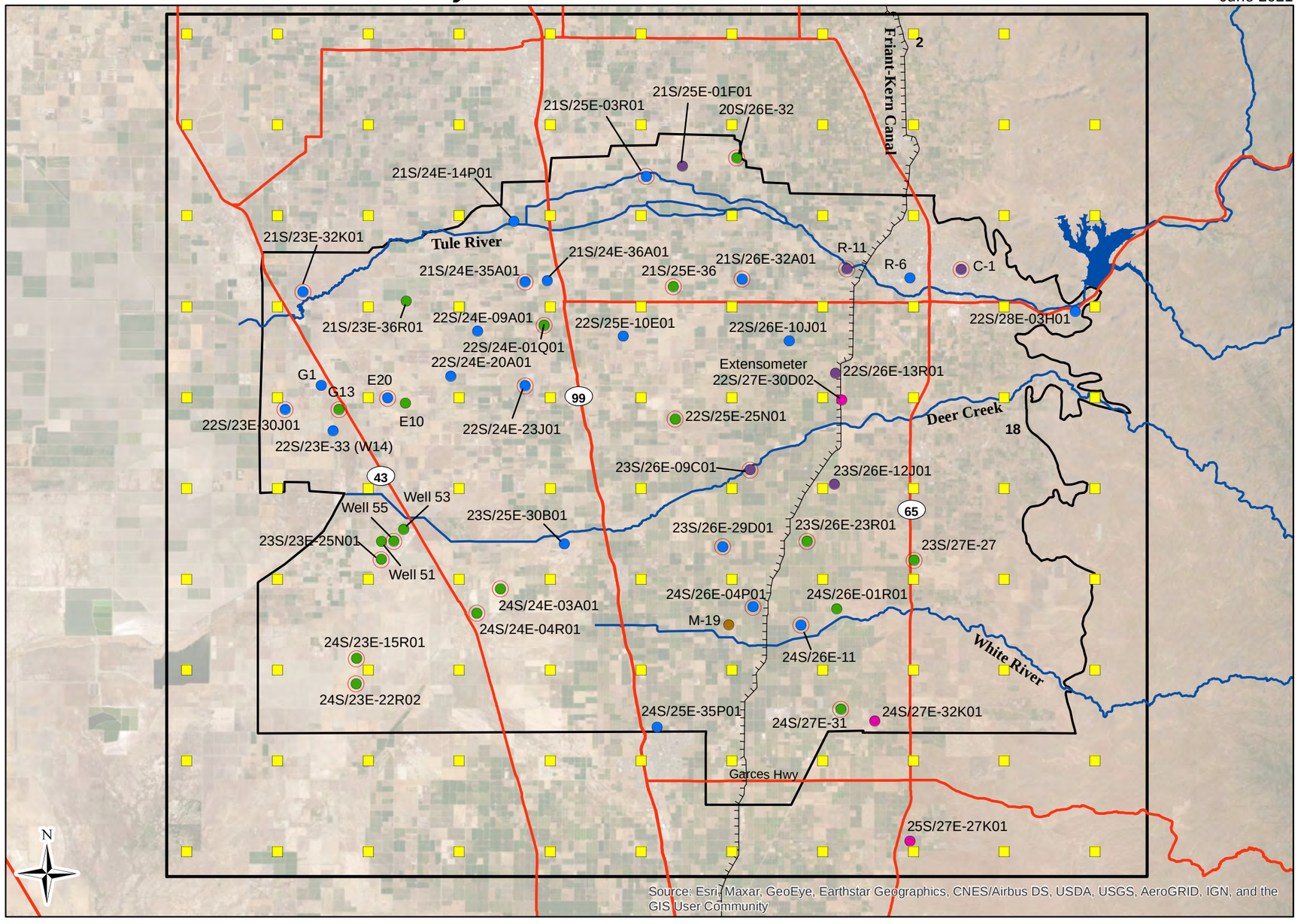
Thomas Harder & Co.
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Tule Subbasin Model Area

Figure 1

Tule Subbasin Technical Advisory Committee

June 2021



0 2 4 8 Miles

NAD 83 State Plane Zone 4

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Groundwater Consulting

Update to the Groundwater Flow Model of the Tule Subbasin

Map Features

- Pilot Points Layers 1 to 4

Calibration Well

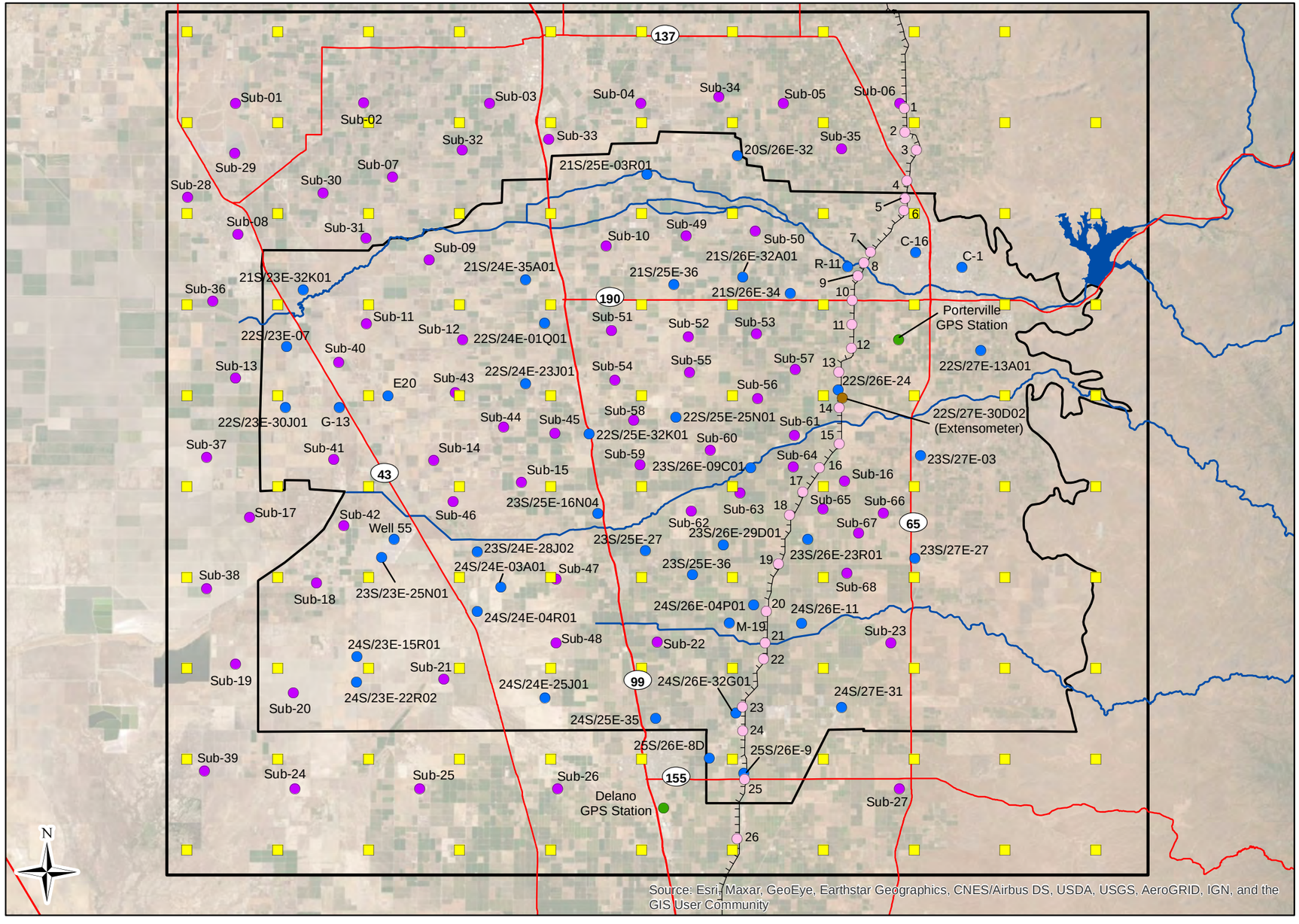
- DEID RMS M-19 Nested L1 and L3
- Layer 1 - Shallow Well
- RMS Layer 1 - Shallow Well
- Layer 2 - Shallow Well
- RMS Layer 2 - Shallow Well
- Layer 3 - Deep Well
- RMS Layer 3 - Deep Well
- Layer 4 - Deep Well
- Model Domain
- Tule Subbasin
- Friant-Kern Canal
- Major Hydrologic Feature
- State Highway/Major Road

Groundwater Level Calibration Target Wells

Figure 2

Tule Subbasin Technical Advisory Committee

June 2021



Update to the Groundwater Flow Model of the Tule Subbasin

Map Features

- Pilot Points Layers 1 to 4

Subsidence Calibration Target

- Groundwater RMS
- USGS Extensometer 22S/27E-30D02
- GPS Station
- Additional Point
- Friant-Kern Canal Survey Point
- Model Domain
- Tule Subbasin
- Friant-Kern Canal
- Major Hydrologic Feature
- Major Road

Thomas Harder & Co.
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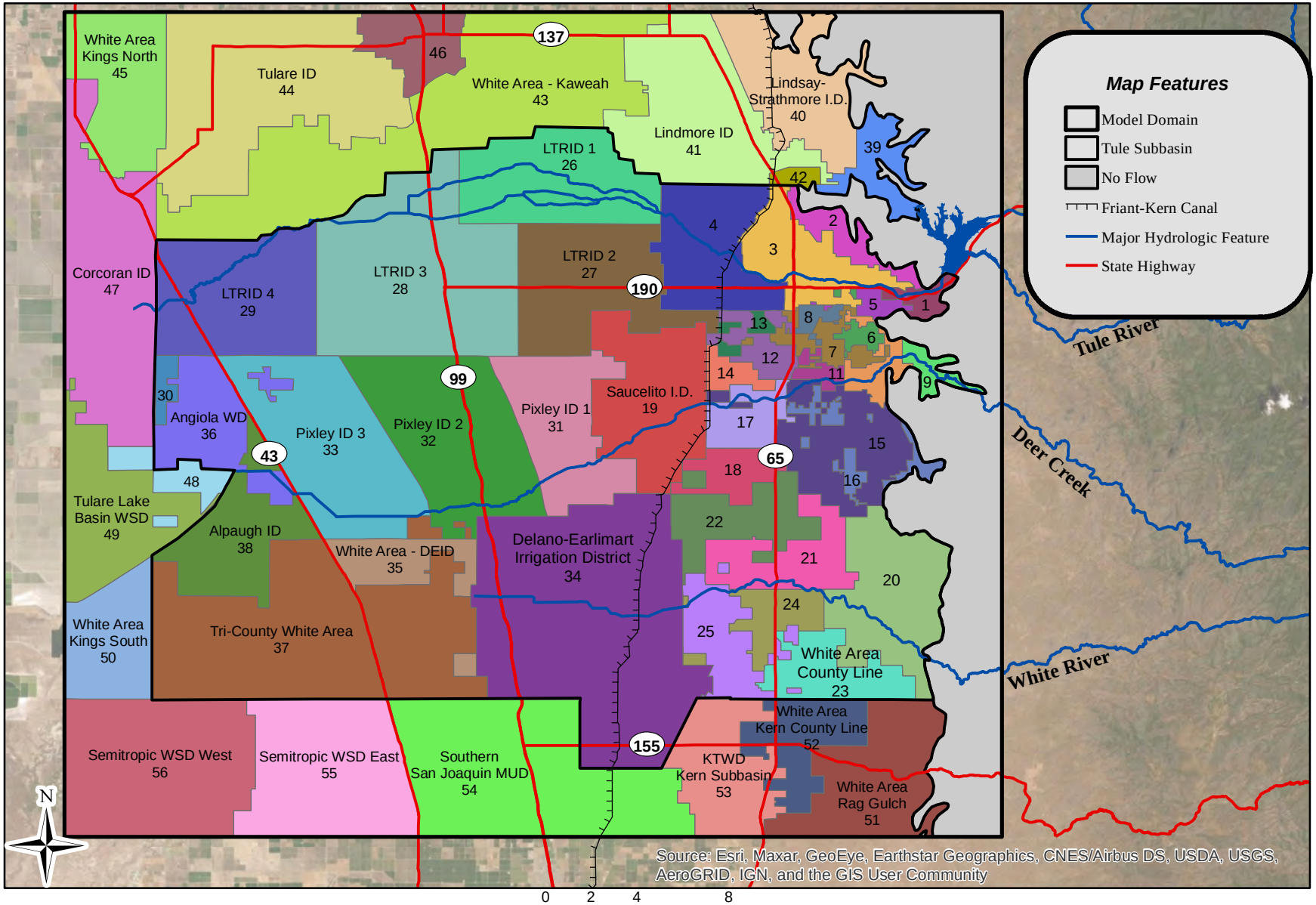
Land Subsidence Calibration Targets

Figure 3

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021



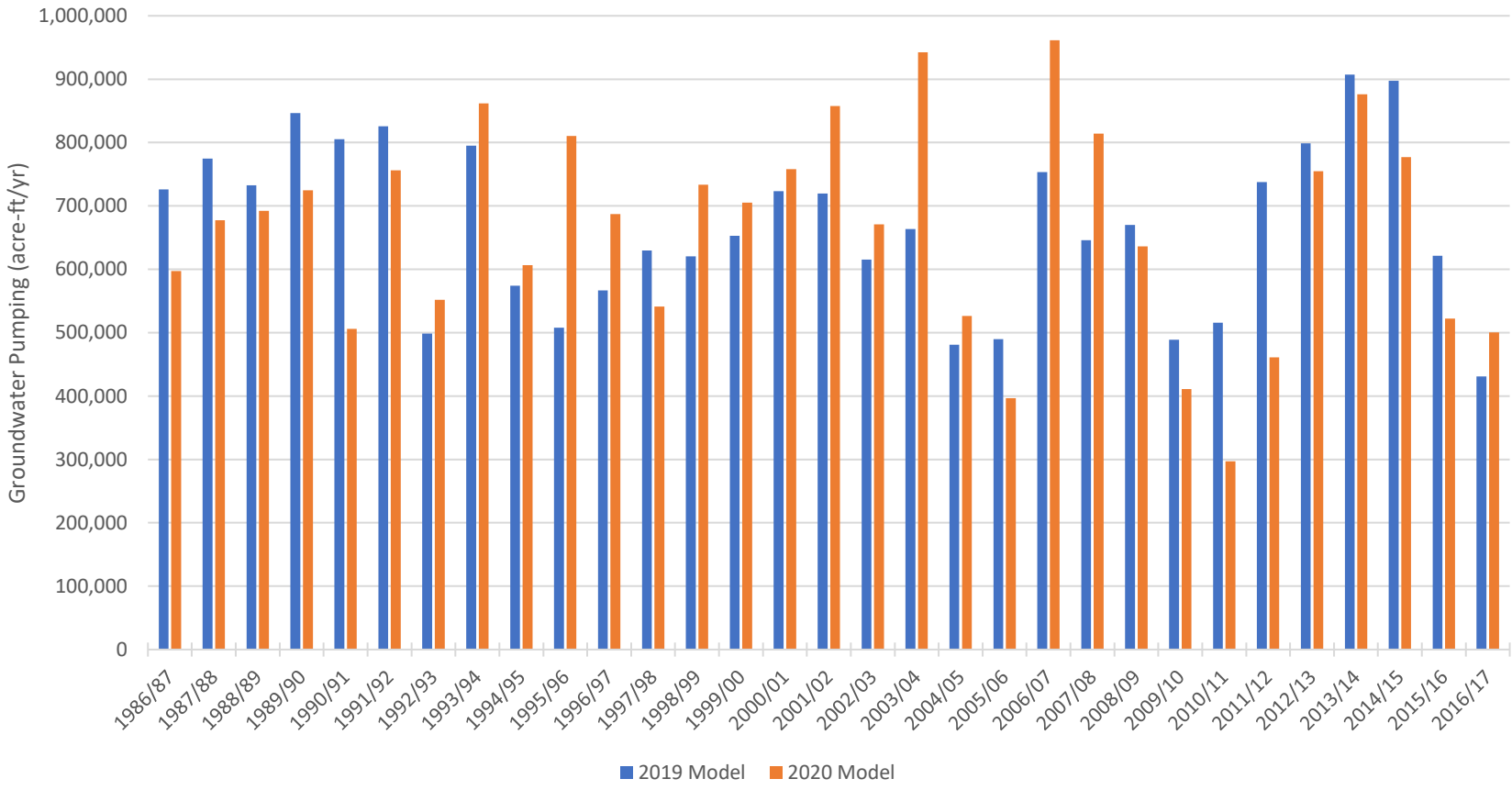
NAD 83 State Plane Zone 4

Thomas Harder & Co.
Groundwater Consulting

Revised Water Budget Areas

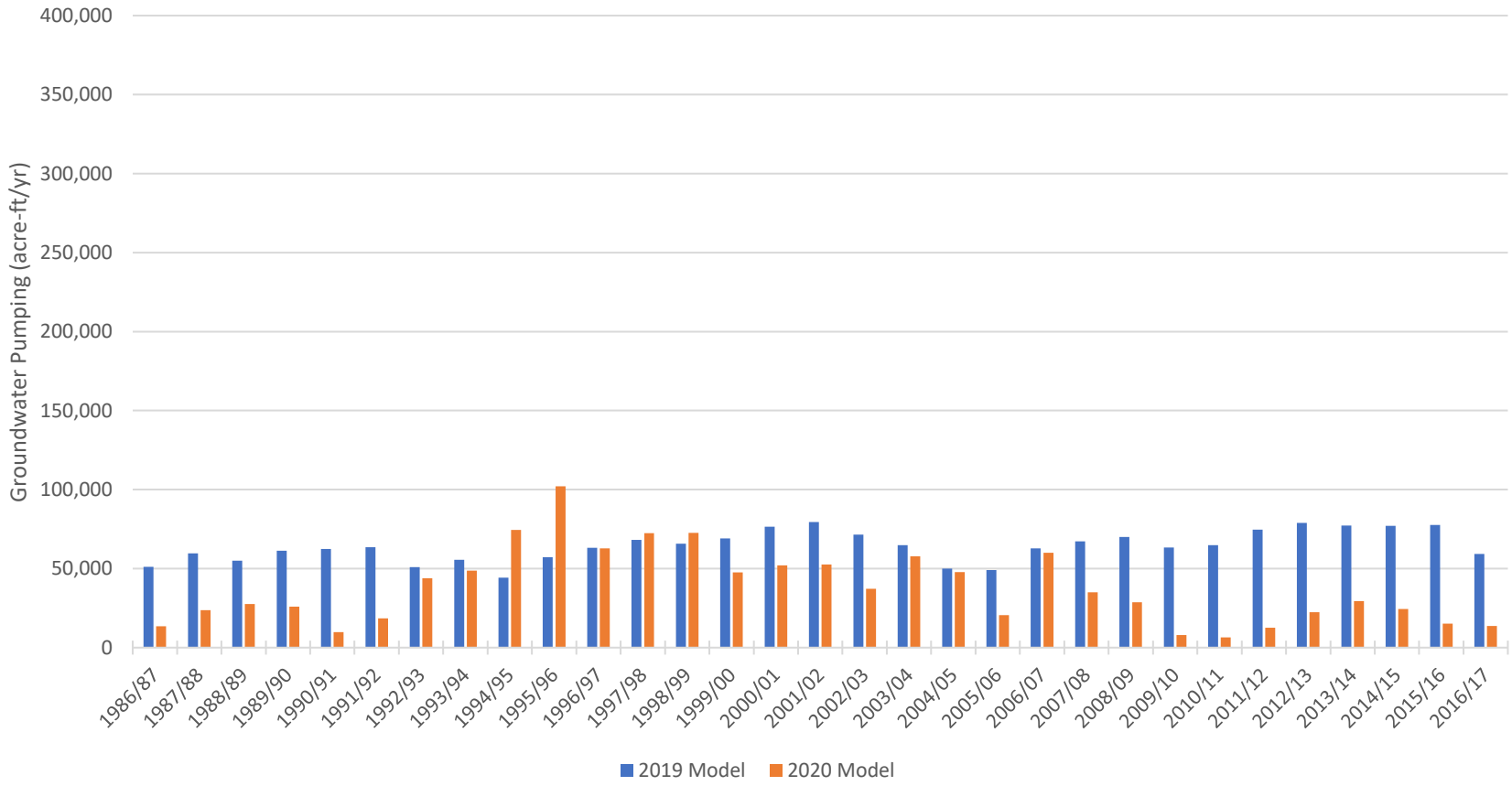
Figure 4

Agricultural Groundwater Pumping
Tule Subbasin



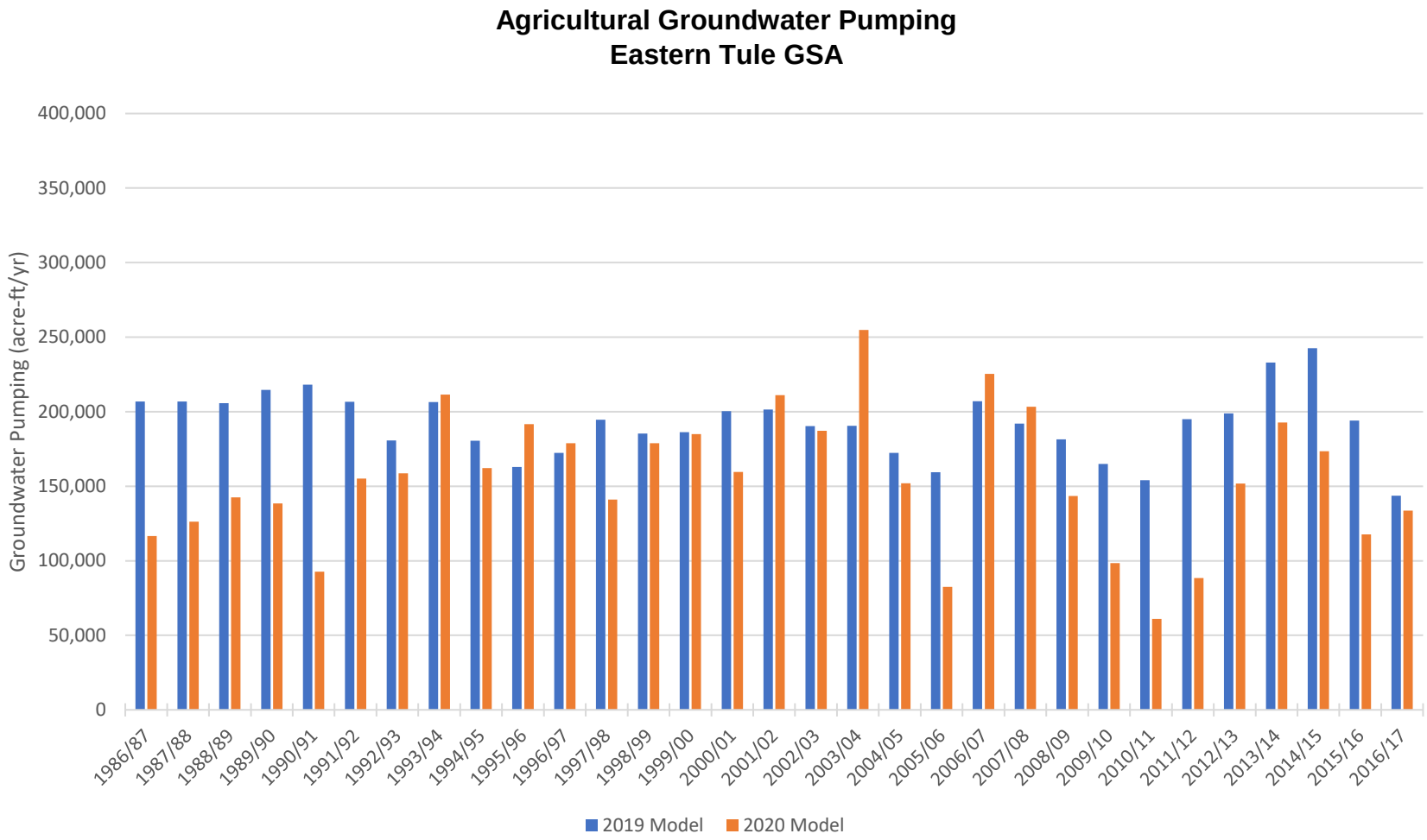
Notes: Does not include groundwater exports.
Pumping data for 2017/18 and 2018/19 not shown as those years were part of the projection in the 2019 model.

Agricultural Groundwater Pumping
Tri-County Water Authority GSA



Notes: Does not include groundwater exports
Pumping data for 2017/18 and 2018/19 not shown as those years were part of the projection in the 2019 model.

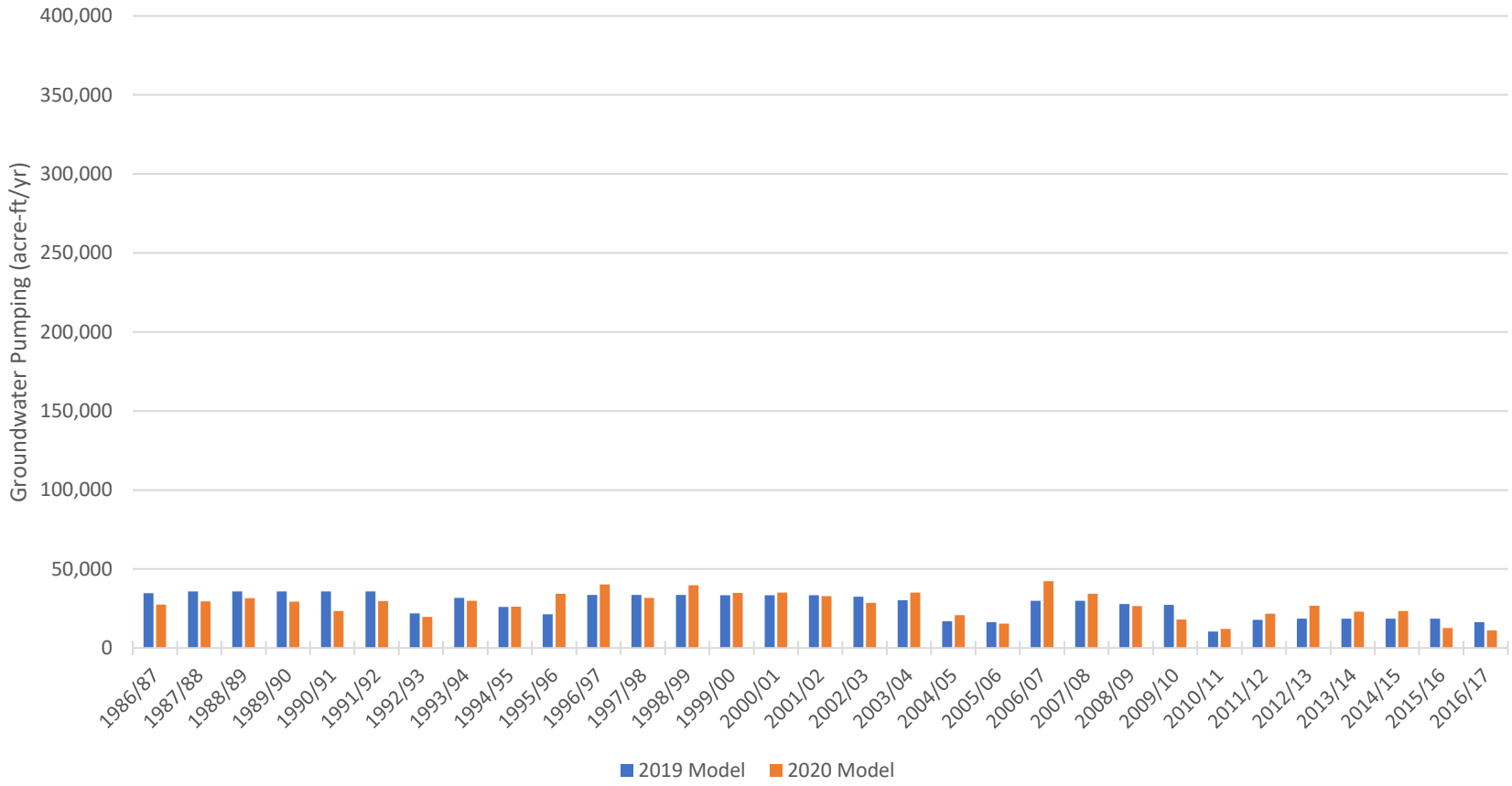
Figure 7



Note: Pumping data for 2017/18 and 2018/19 not shown as those years were part of the projection in the 2019 model.

Figure 8

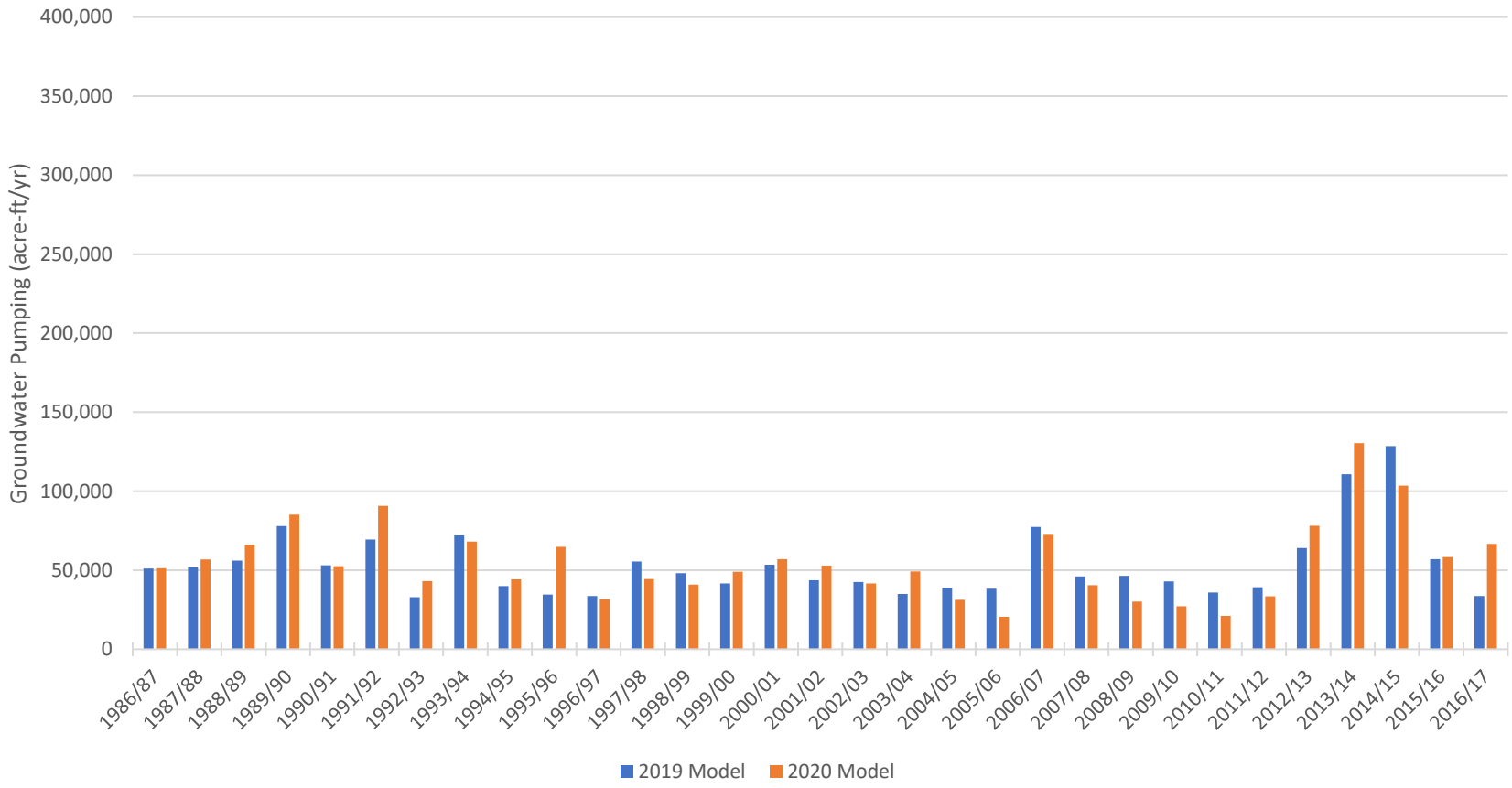
Agricultural Groundwater Pumping
Alpaugh Irrigation District GSA



Note: Pumping data for 2017/18 and 2018/19 not shown as those years were part of the projection in the 2019 model.

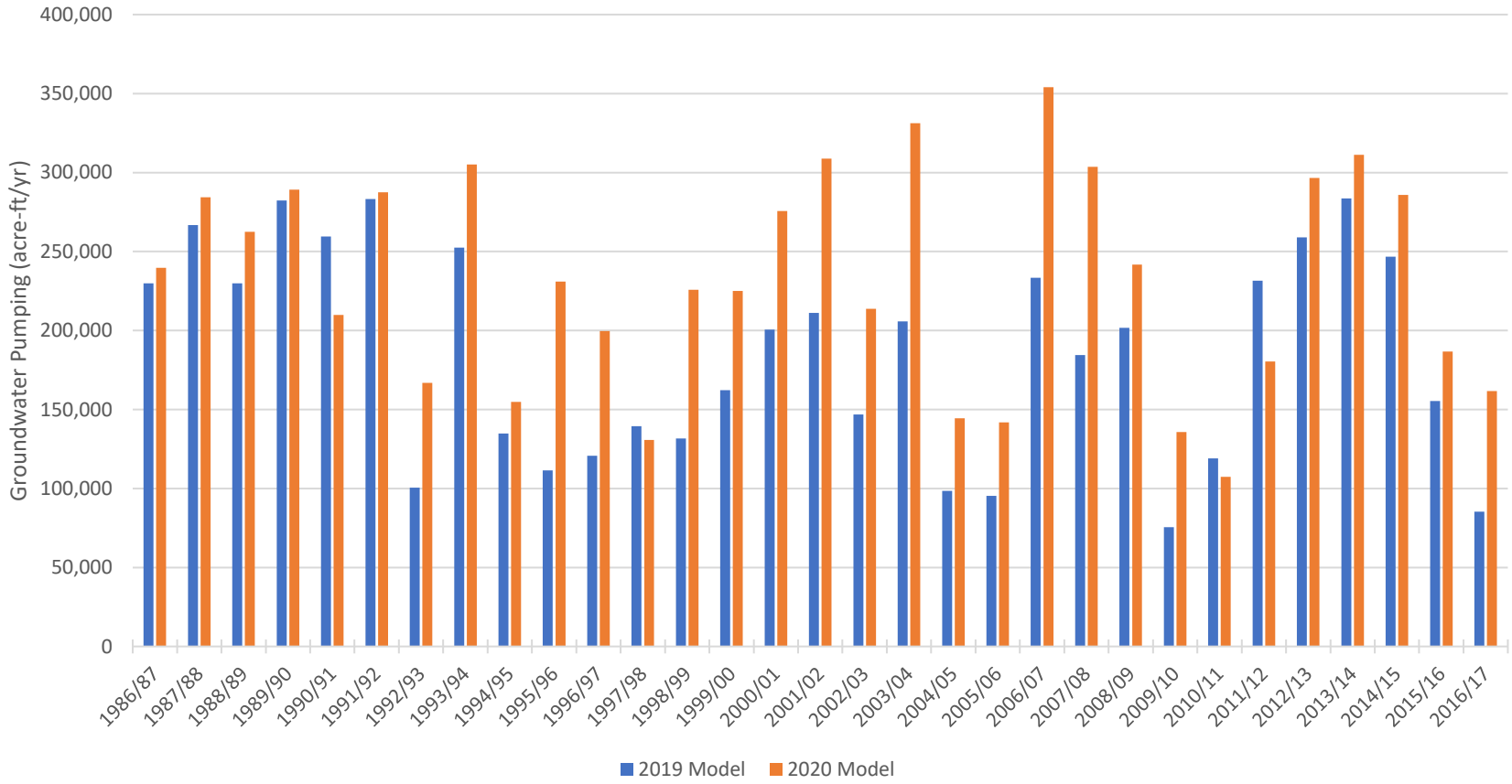
Figure 9

Agricultural Groundwater Pumping
Delano-Earlimart Irrigation District GSA



Note: Pumping data for 2017/18 and 2018/19 not shown as those years were part of the projection in the 2019 model.

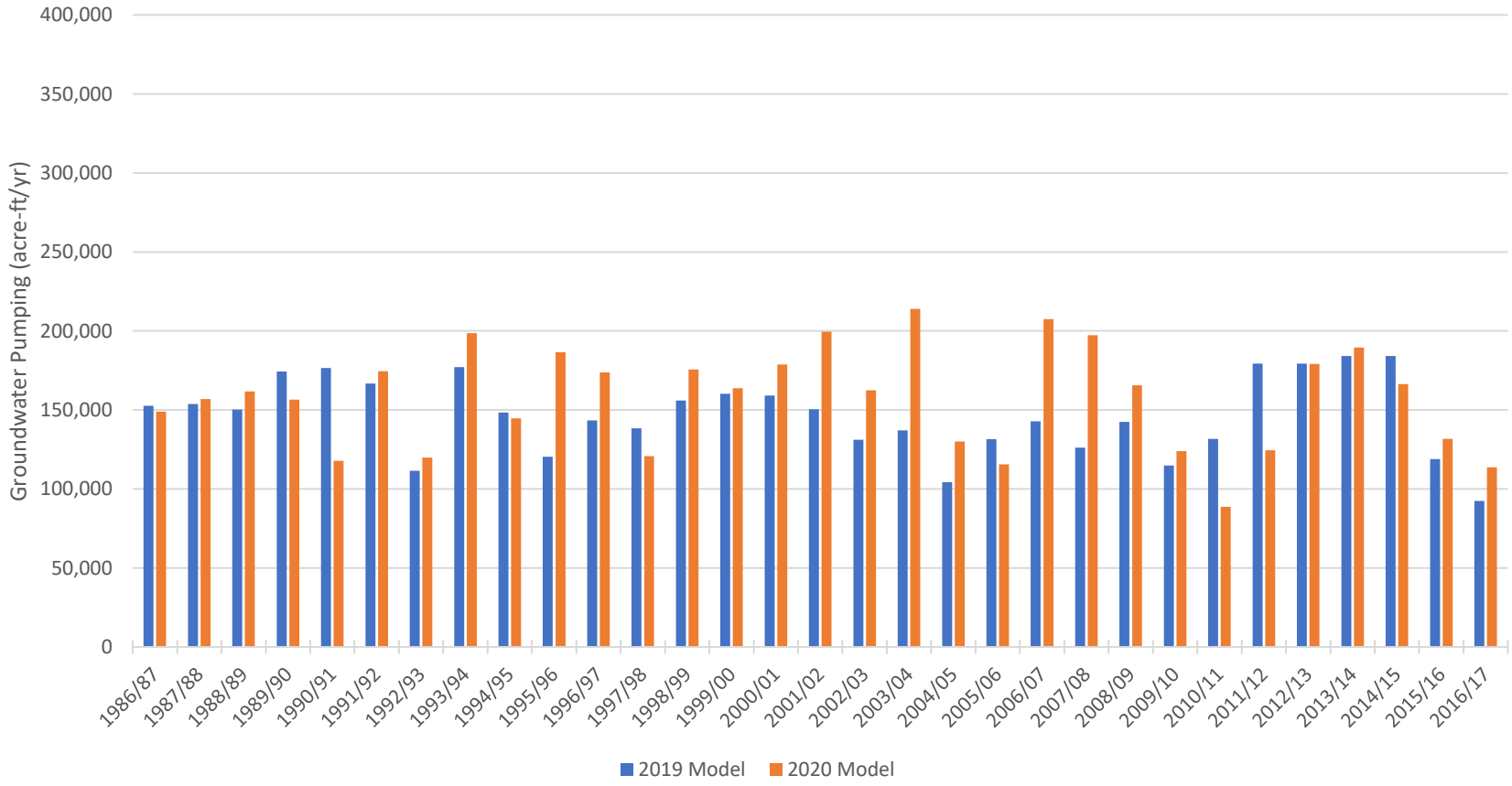
Agricultural Groundwater Pumping
Lower Tule River Irrigation District GSA



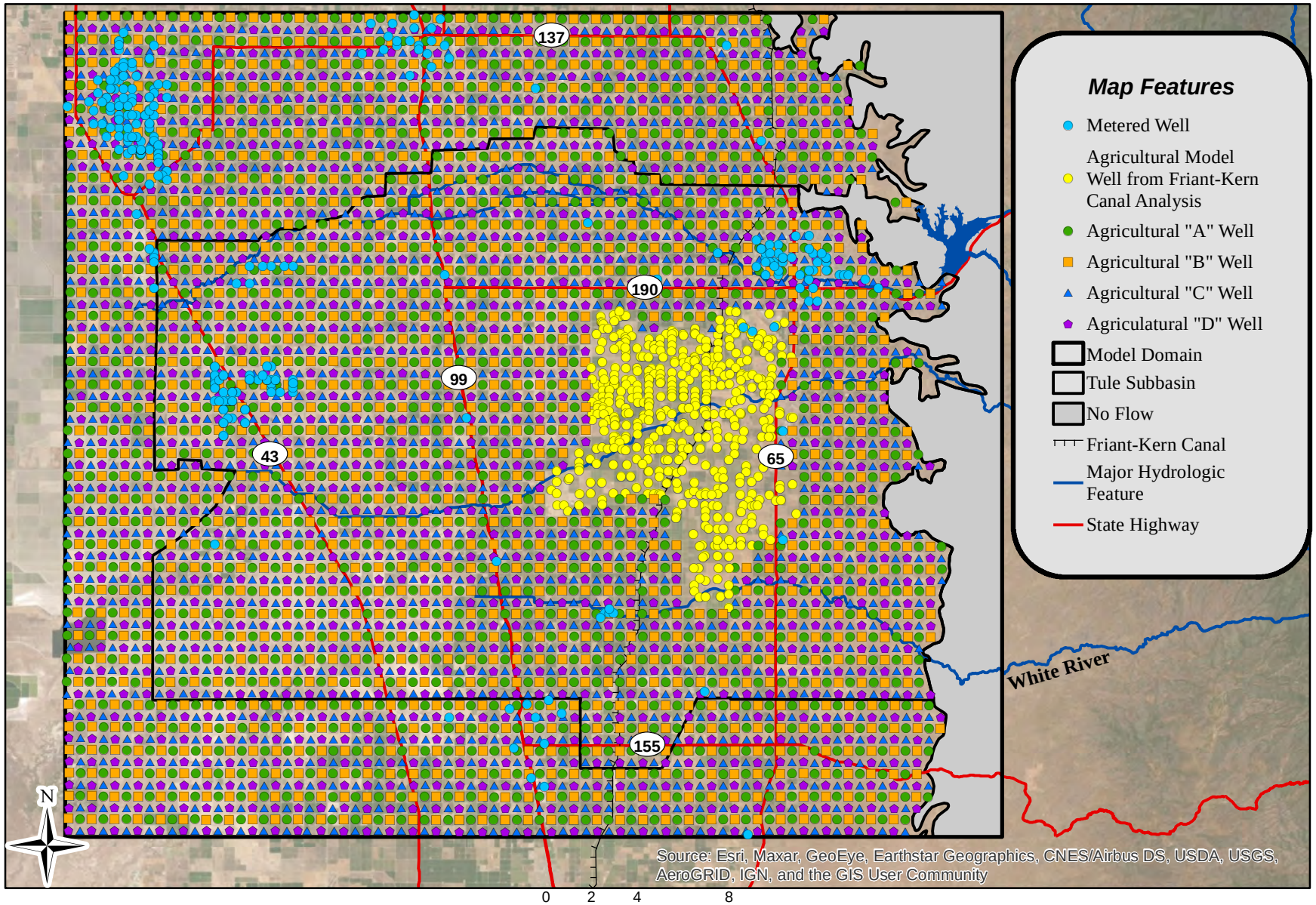
Notes: Does not include groundwater exports
Pumping data for 2017/18 and 2018/19 not shown as those years were part of the projection in the 2019 model.

Figure 11

Agricultural Groundwater Pumping
Pixley Irrigation District GSA



Note: Pumping data for 2017/18 and 2018/19 not shown as those years were part of the projection in the 2019 model.



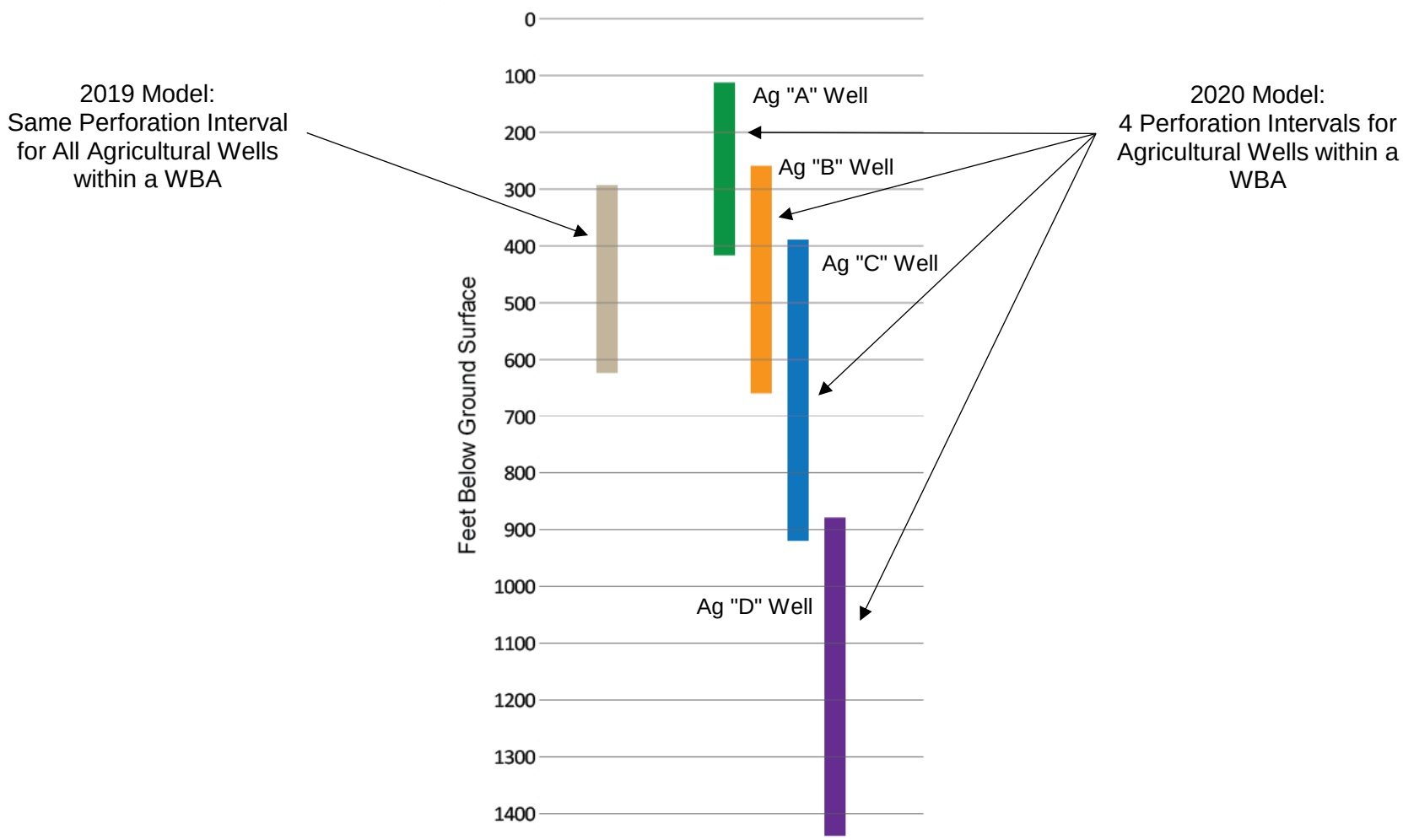
Thomas Harder & Co.
Groundwater Consulting

Updated Wells in the Groundwater Flow Model

Figure 12

Figure 13

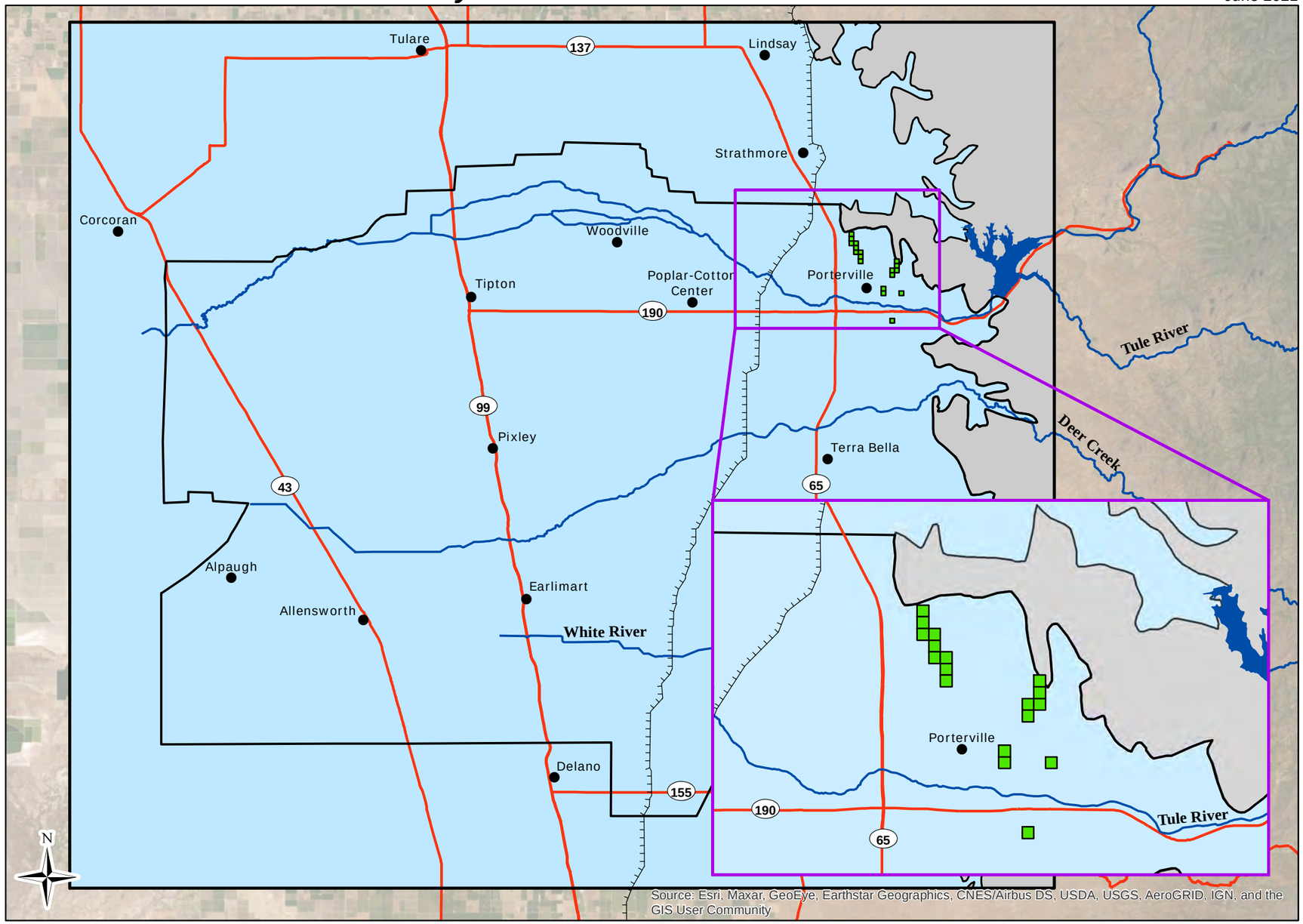
Refined Model Agricultural Well Perforations Example



Tule Subbasin Technical Advisory Committee

June 2021

Update to the Groundwater Flow Model of the Tule Subbasin



Map Features

- City or Community
- New No Flow Cell
- Flow
- No Flow
- Model Domain
- Tule Subbasin
- Friant-Kern Canal
- Major Hydrologic Feature
- State Highway/Major Road

0 2 4 8 Miles

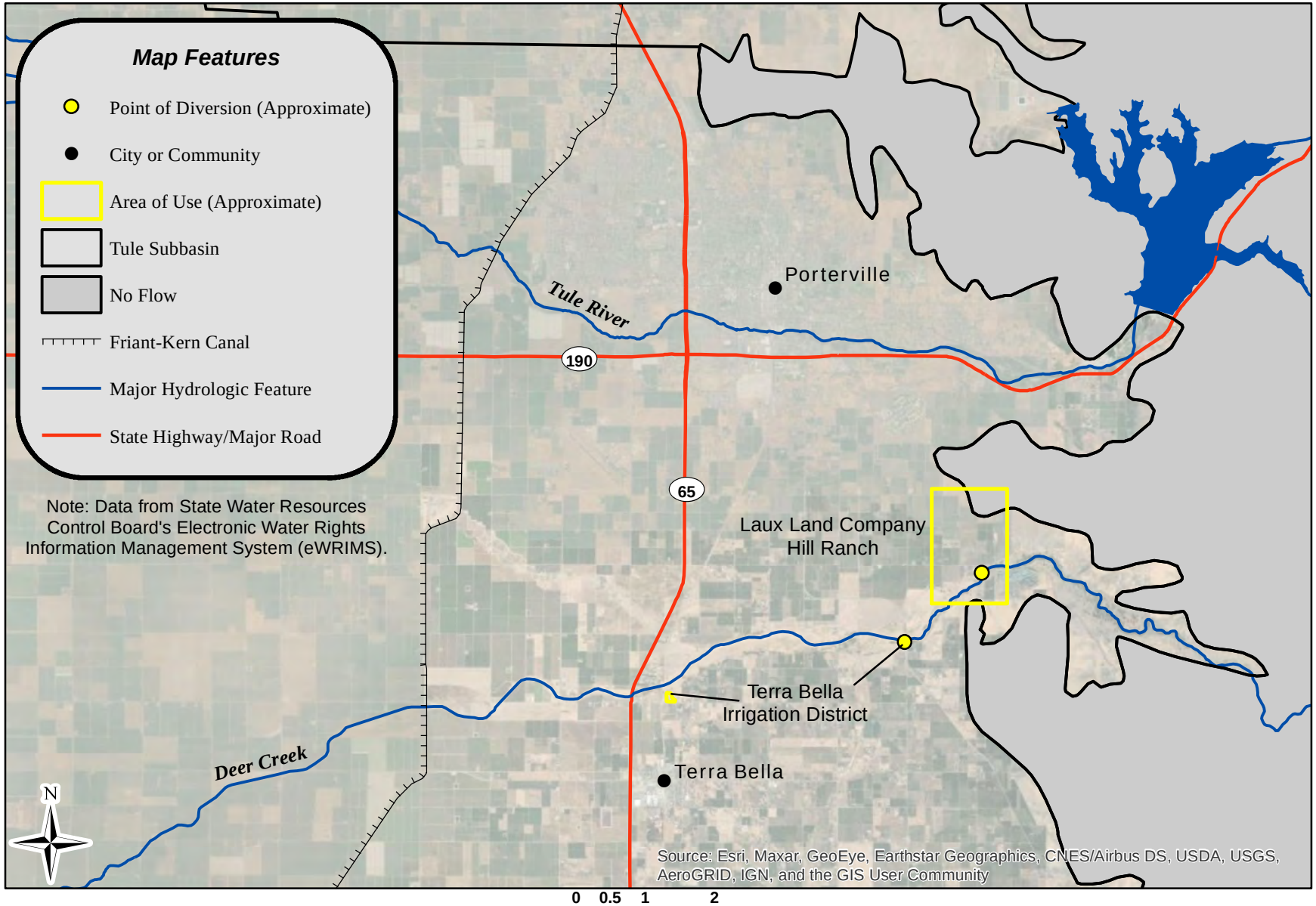
NAD 83 State Plane Zone 4

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Groundwater Consulting

Revised Bedrock Boundaries East of Porterville

Figure 14

Tule Subbasin Technical Advisory Committee



Thomas Harder & Co.
Groundwater Consulting

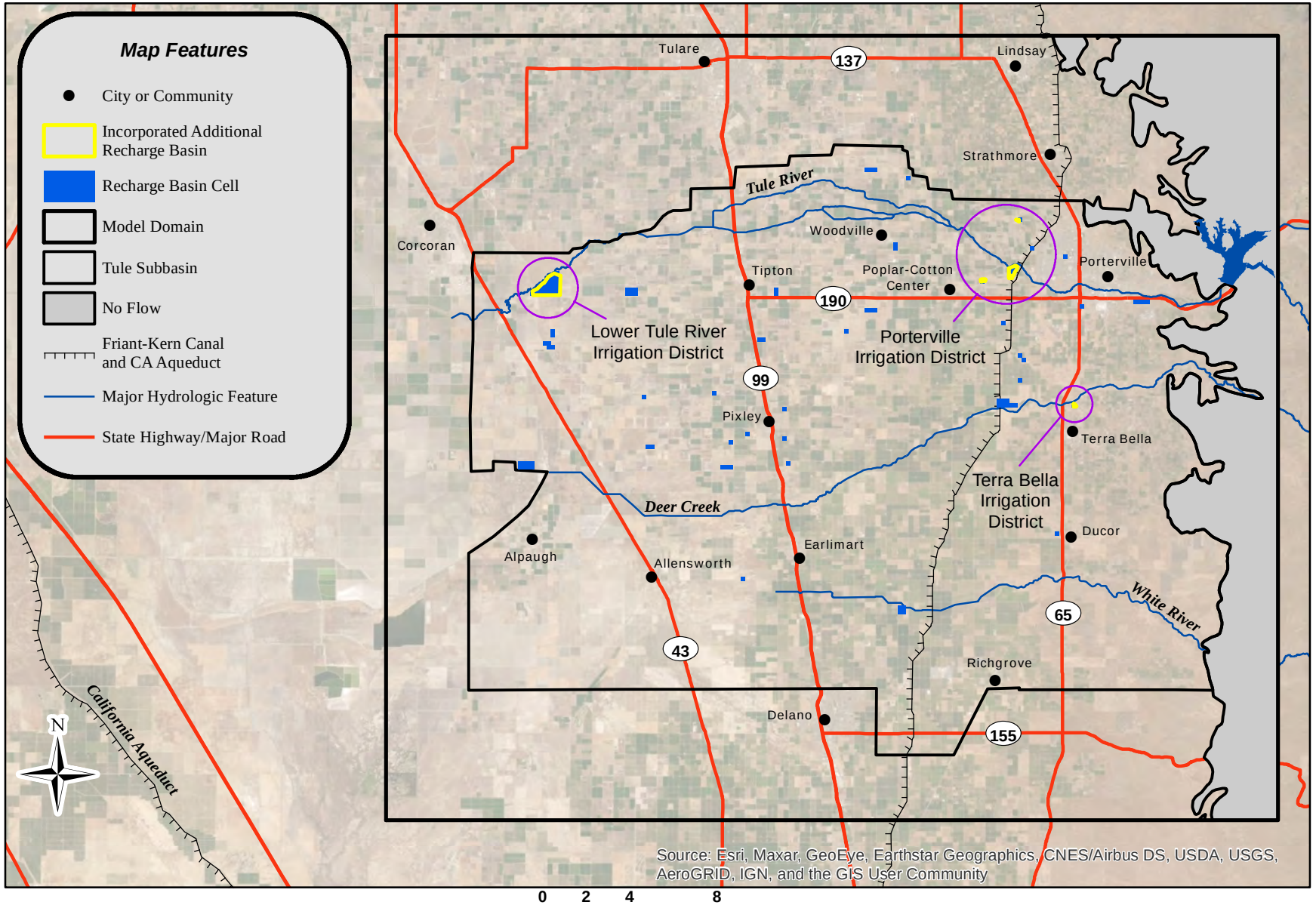
Updated Deer Creek Diversion Locations

Figure 15

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021



NAD 83 State Plane Zone 4

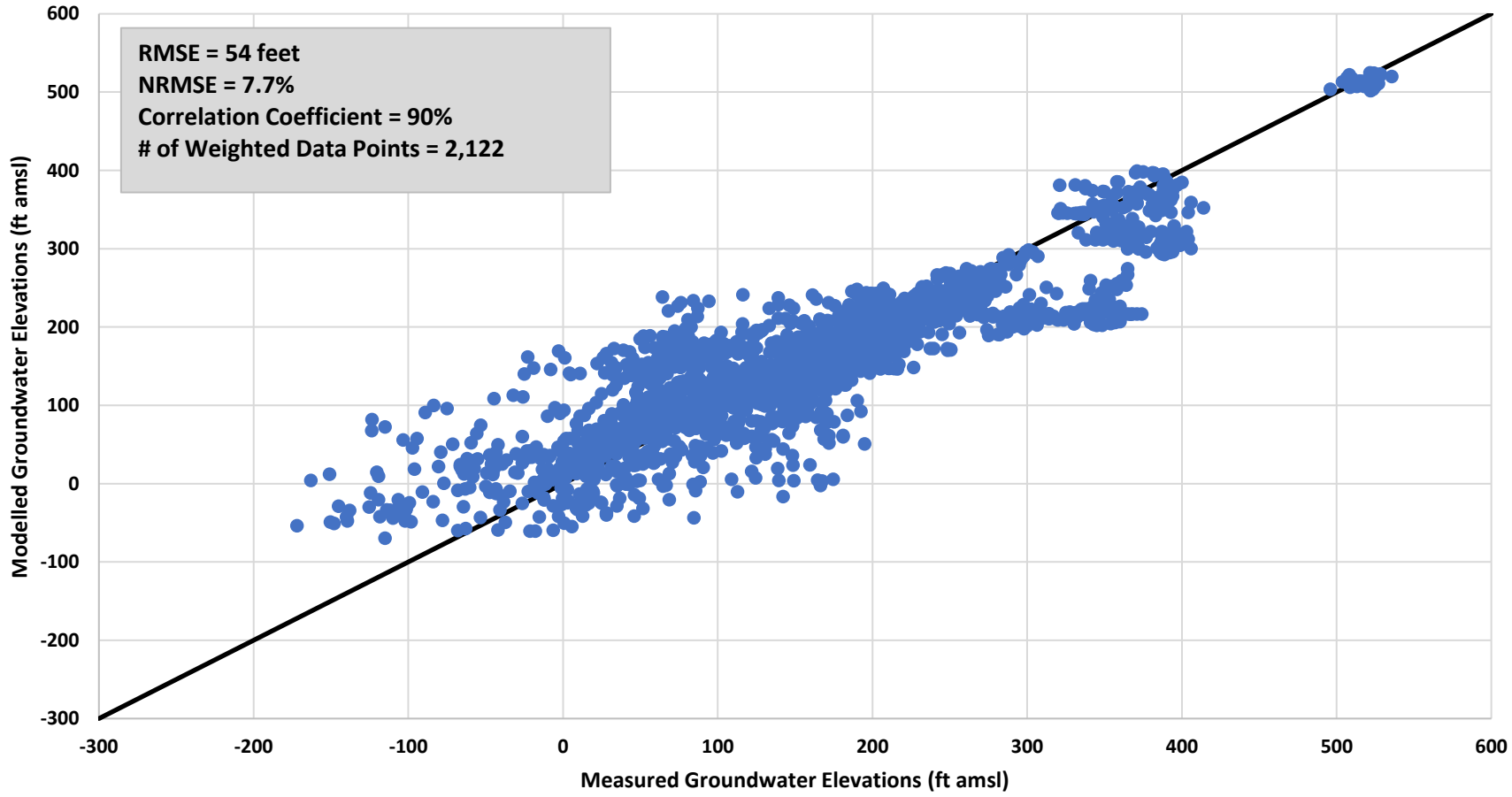
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Updated Recharge Basin Locations

Figure 16

Figure 17

Modeled vs. Measured Groundwater Elevations
All Model Layers



Thomas Harder & Co.
Groundwater Consulting

Figure 18

Modeled vs. Measured Groundwater Elevations
Model Layer 1

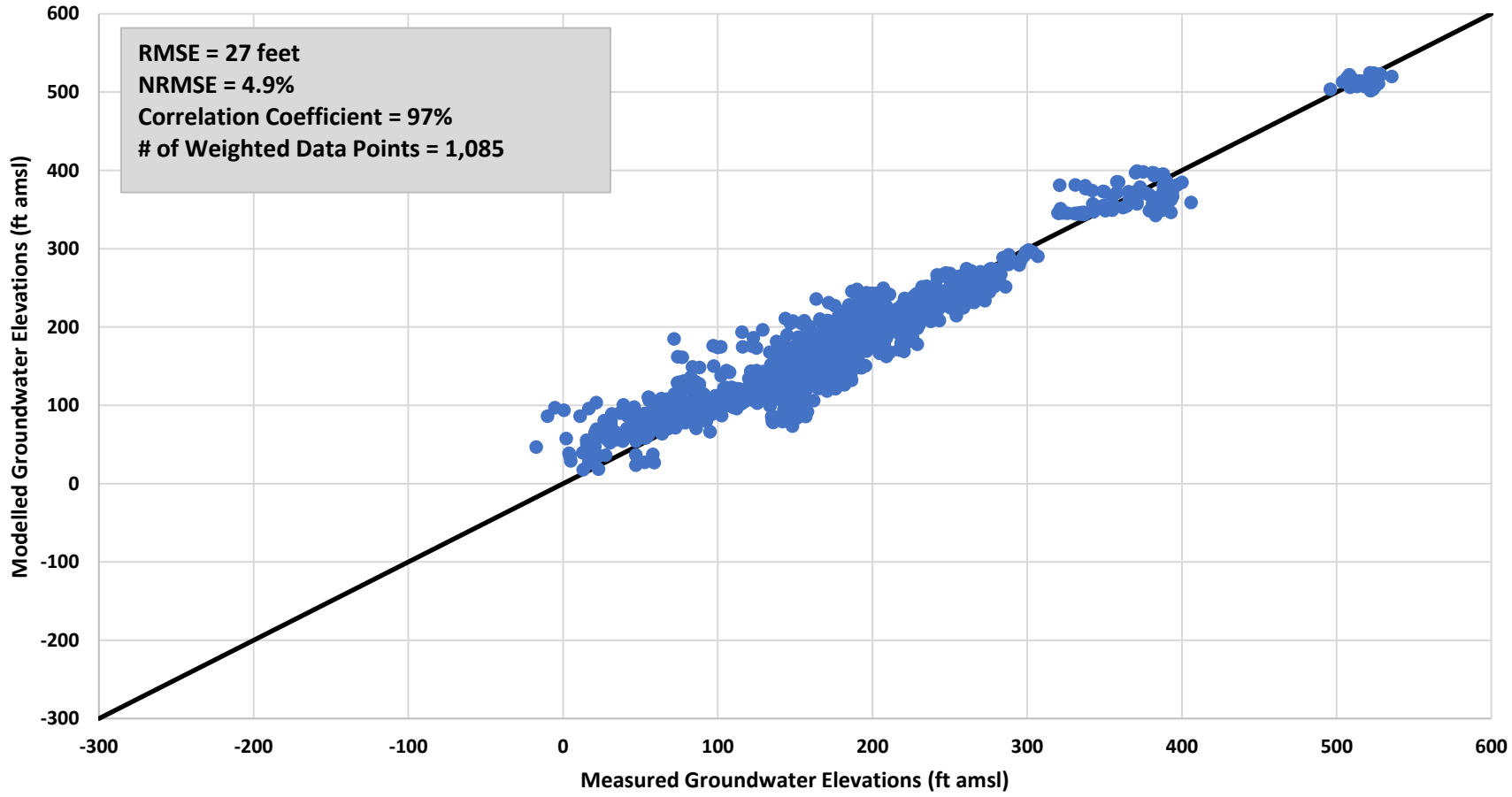
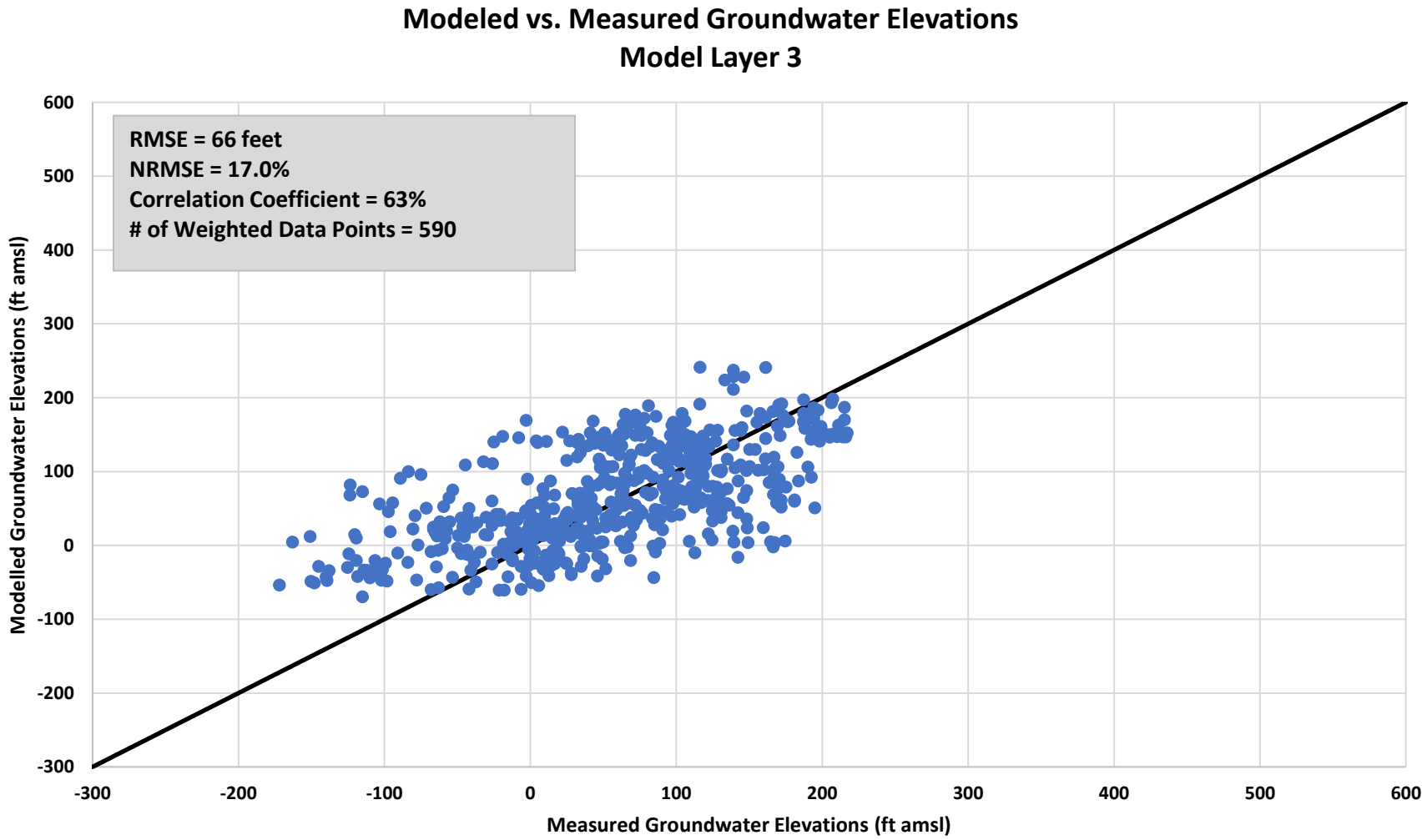
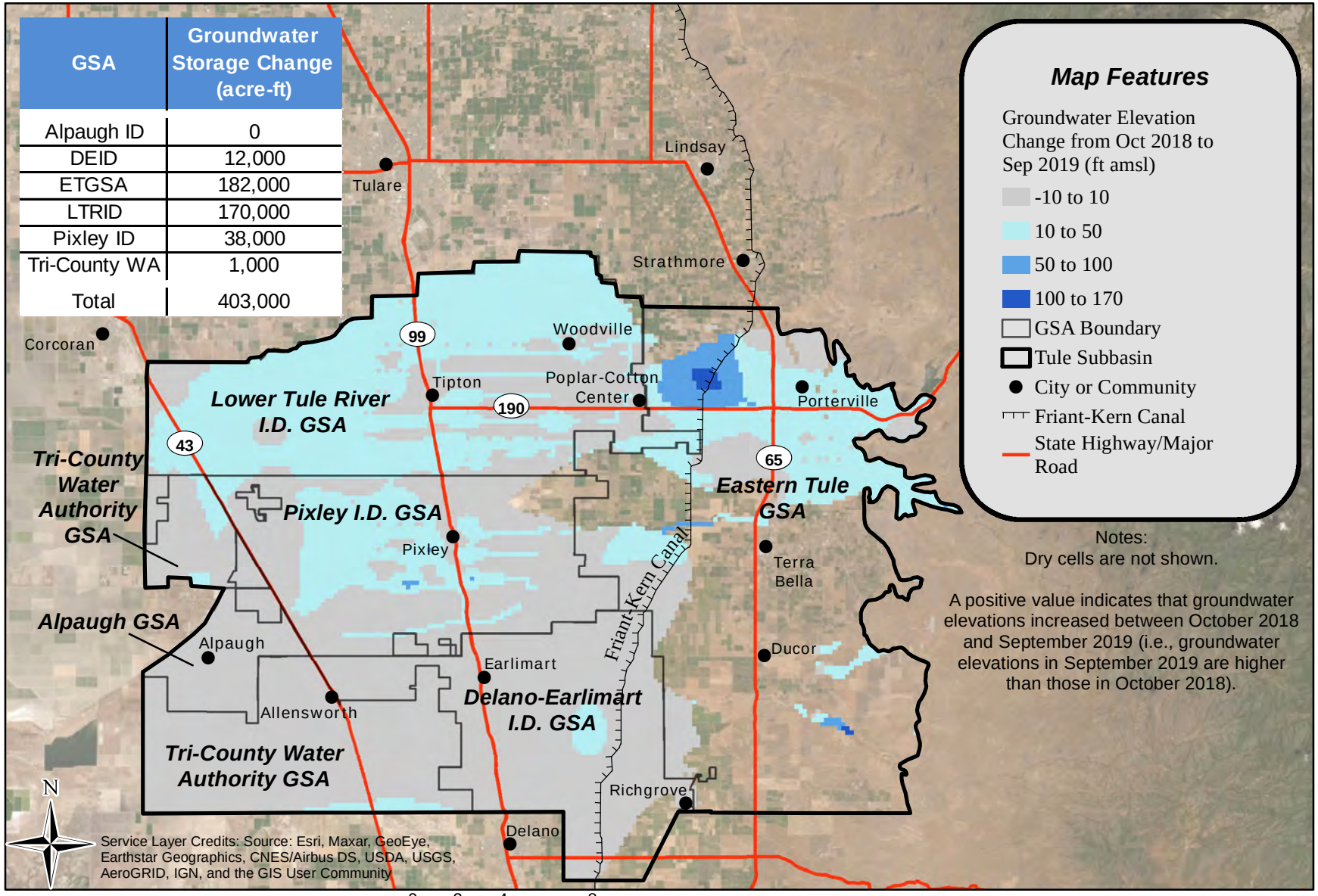


Figure 19


Modeled vs. Measured Groundwater Elevations
Model Layer 3
RMSE = 66 feet
NRMSE = 17.0%
Correlation Coefficient = 63%
of Weighted Data Points = 590
Modelled Groundwater Elevations (ft amsl)
Measured Groundwater Elevations (ft amsl)
600
500
400
300
200
100
0
-100
-200
-300
-300
-200
-100
0
100
200
300
400
500
600

Tule Subbasin Technical Advisory Committee

GSA	Groundwater Storage Change (acre-ft)
Alpaugh ID	0
DEID	12,000
ETGSA	182,000
LTRID	170,000
Pixley ID	38,000
Tri-County WA	1,000
Total	403,000

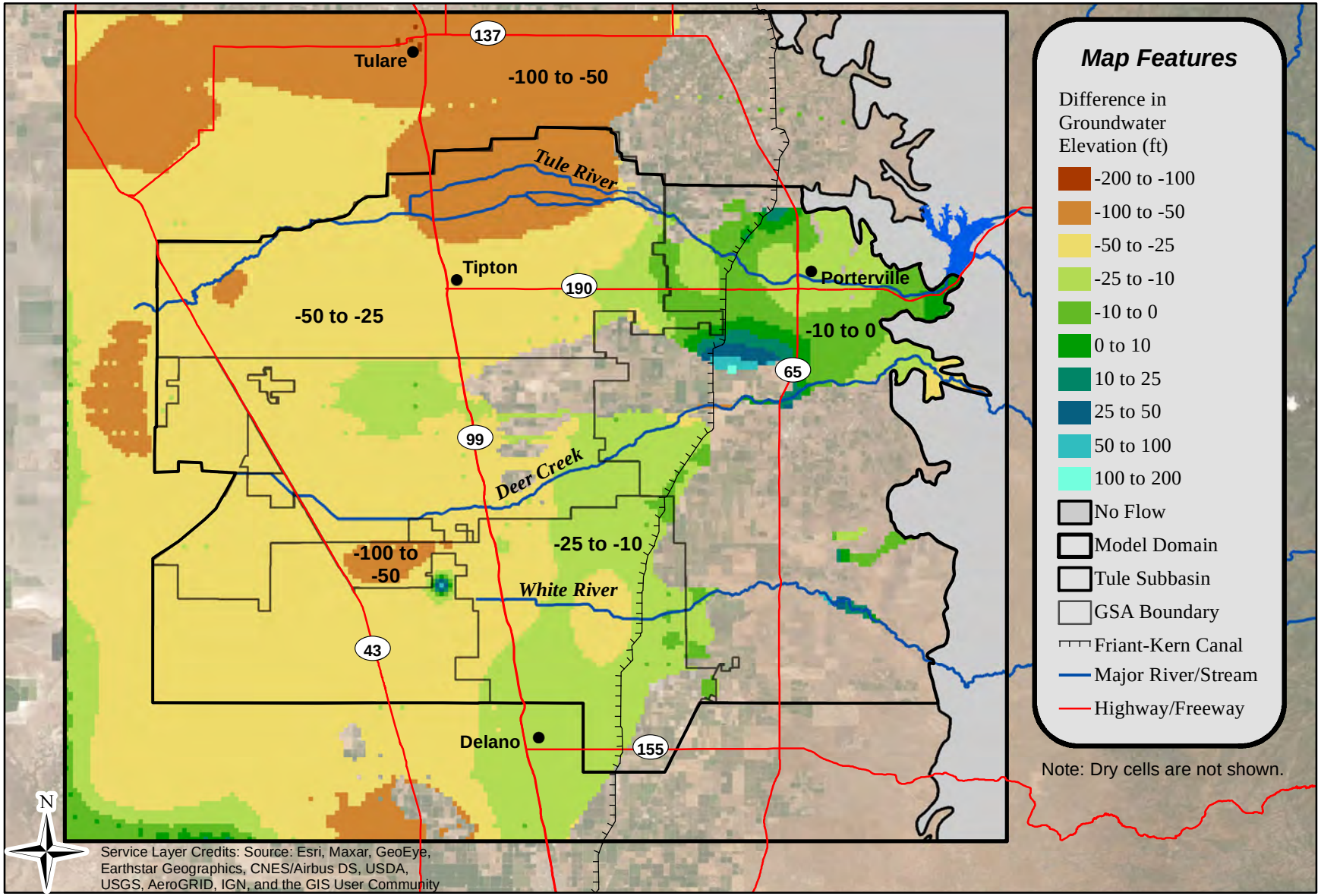


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Model-Predicted Layer 1 Change in Groundwater Elevation from October 2018 to September 2019

Figure 20

Tule Subbasin Technical Advisory Committee



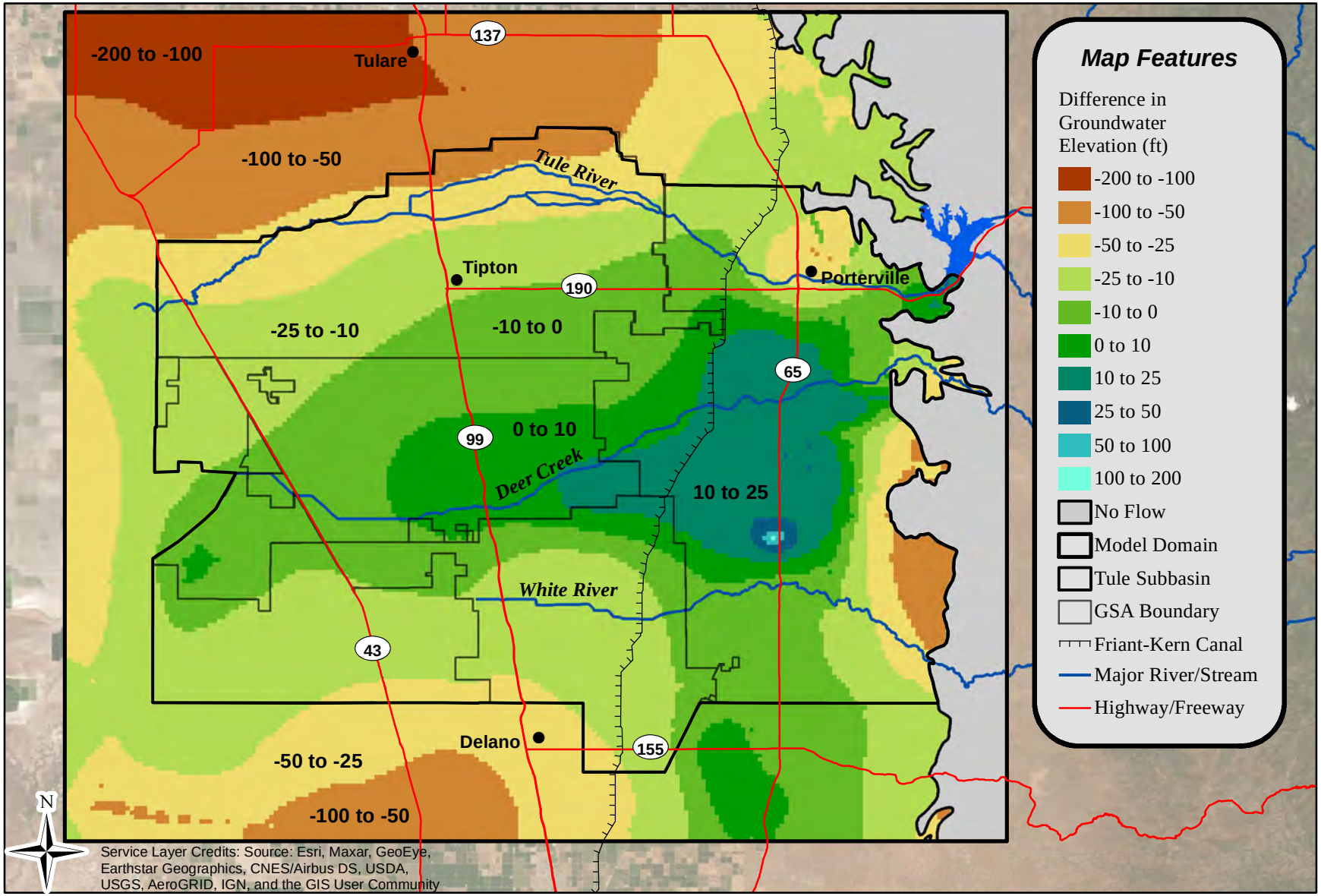
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Model-Predicted Groundwater Elevation Layer 1 - 2020 to 2040

Note: This map shows the model predicted difference in layer 1 groundwater elevation from October 1, 2020 to October 1, 2040.

Figure 21

Tule Subbasin Technical Advisory Committee



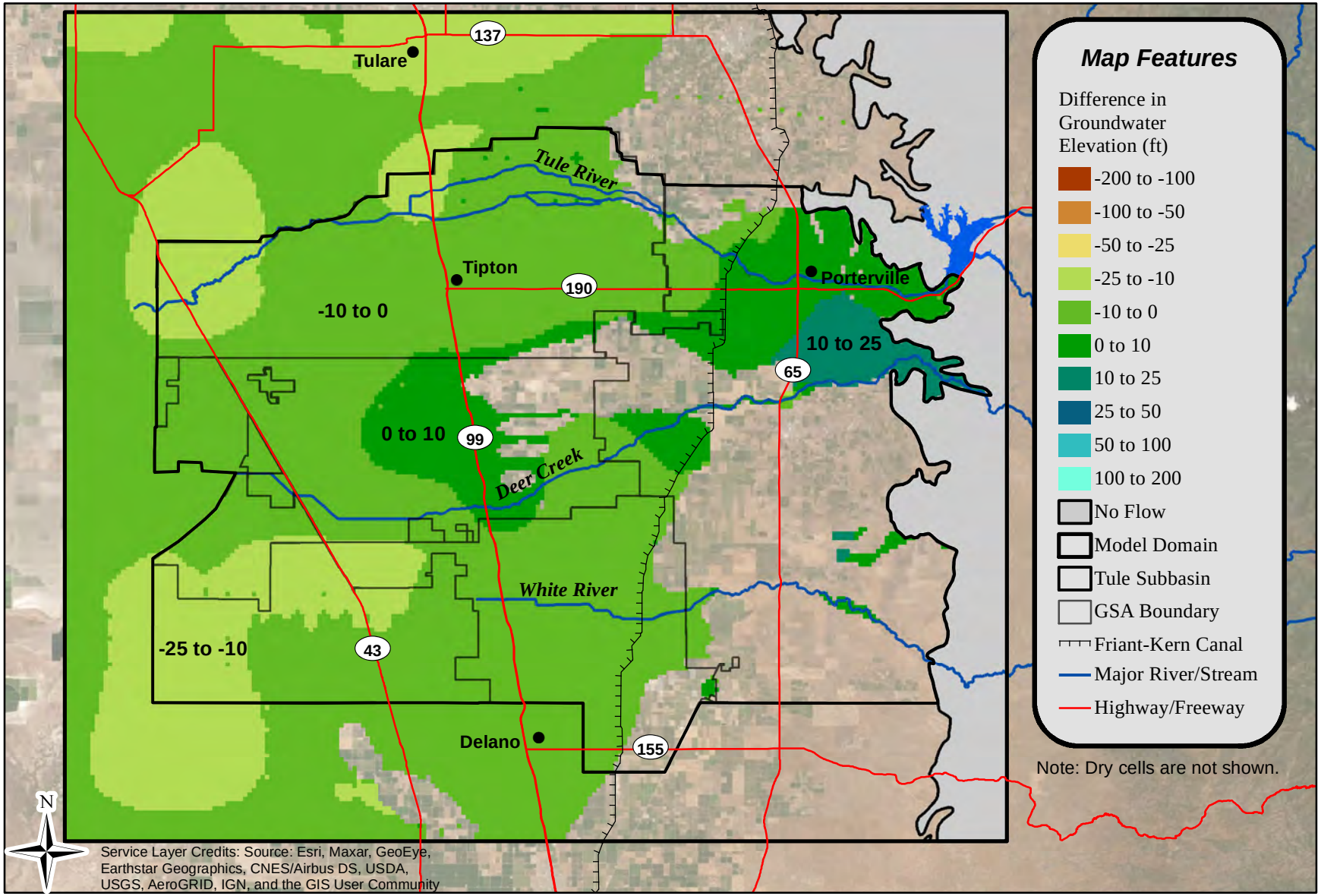
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Model-Predicted Groundwater Elevation Layer 3 - 2020 to 2040

Note: This map shows the model predicted difference in layer 3 groundwater elevation from October 1, 2020 to October 1, 2040.

Figure 22

Tule Subbasin Technical Advisory Committee



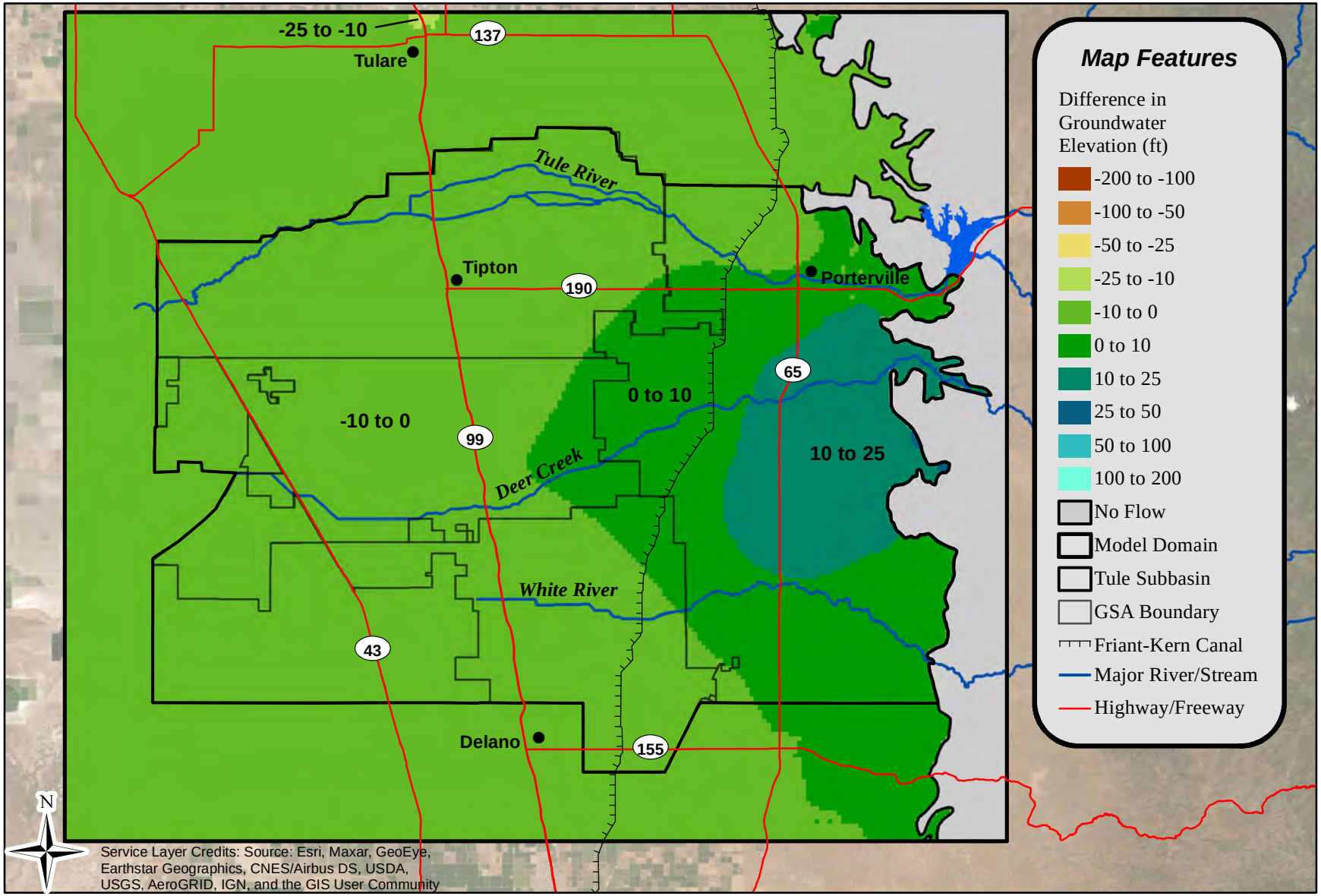
Thomas Harder & Co.
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Model-Predicted Groundwater Elevation Layer 1 - 2040 to 2050

Note: This map shows the model predicted difference in layer 1 groundwater elevation from October 1, 2040 to October 1, 2050.

Figure 23

Tule Subbasin Technical Advisory Committee



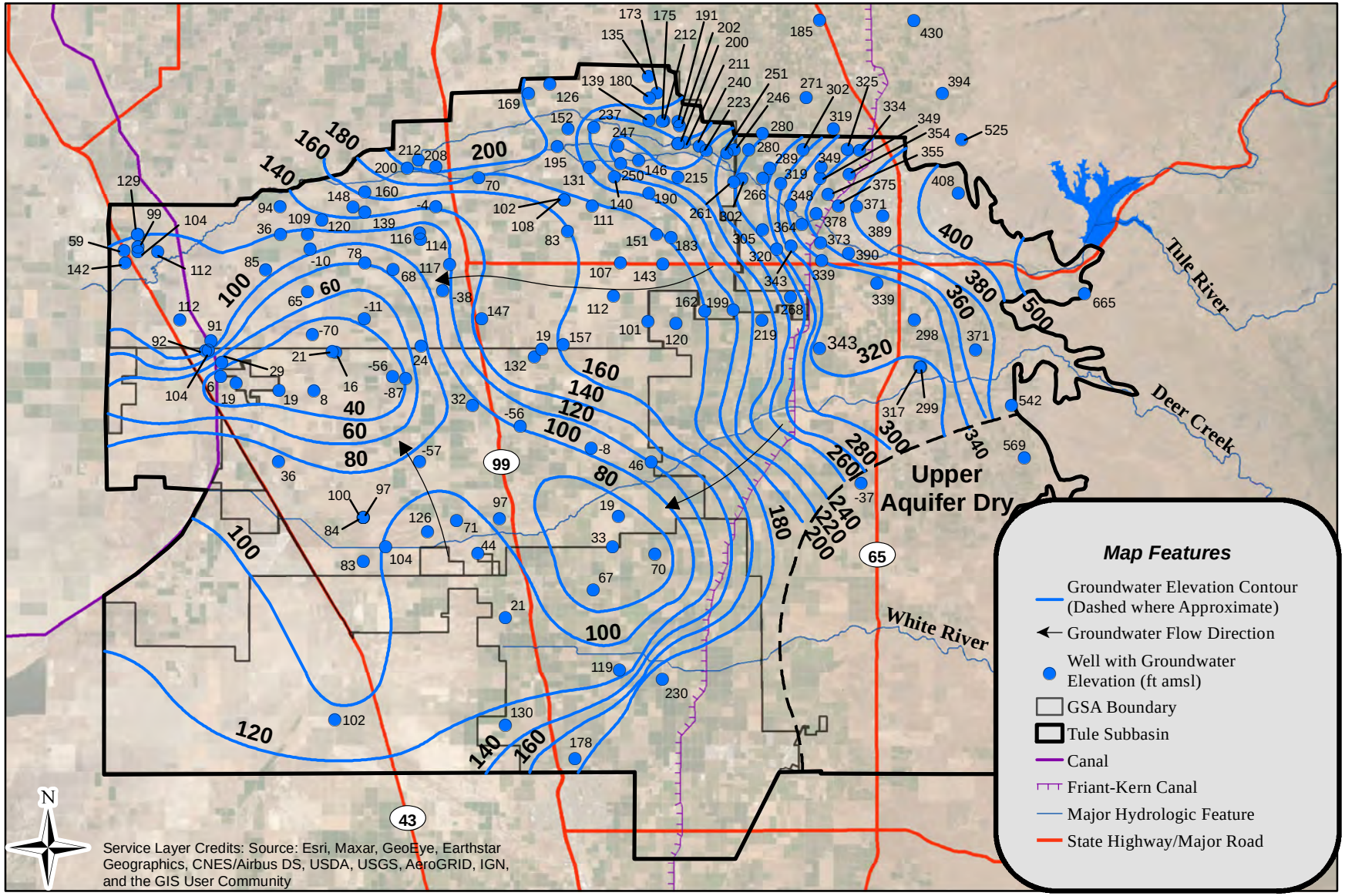
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Model-Predicted Groundwater Elevation Layer 3 - 2040 to 2050

Note: This map shows the model predicted difference in layer 3 groundwater elevation from October 1, 2040 to October 1, 2050.

Figure 24

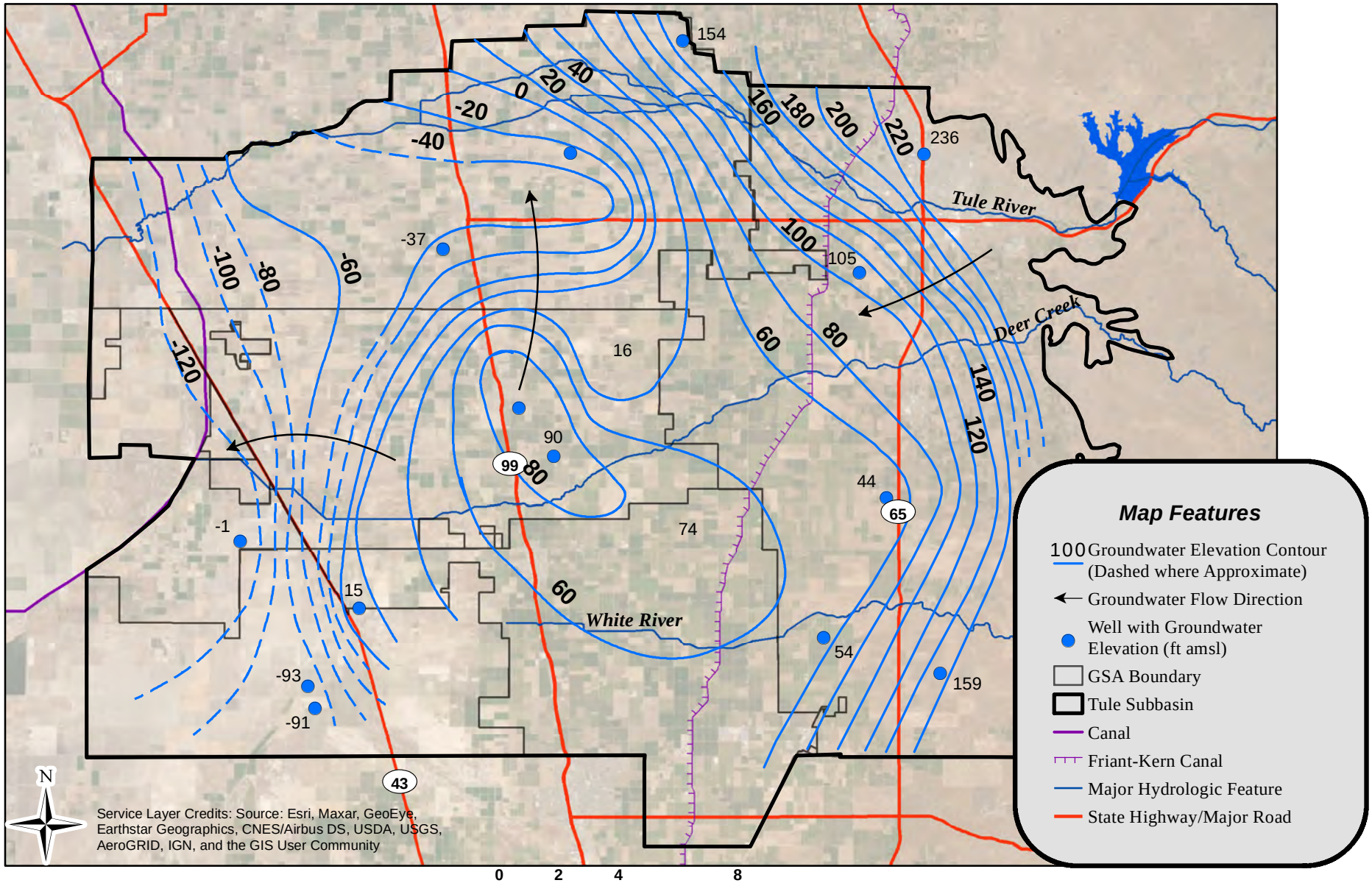
Tule Subbasin Technical Advisory Committee



Thomas Harder & Co.
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Fall 2019 Upper Aquifer Groundwater Elevation Contours

Figure 25



Thomas Harder & Co.
Groundwater Consulting

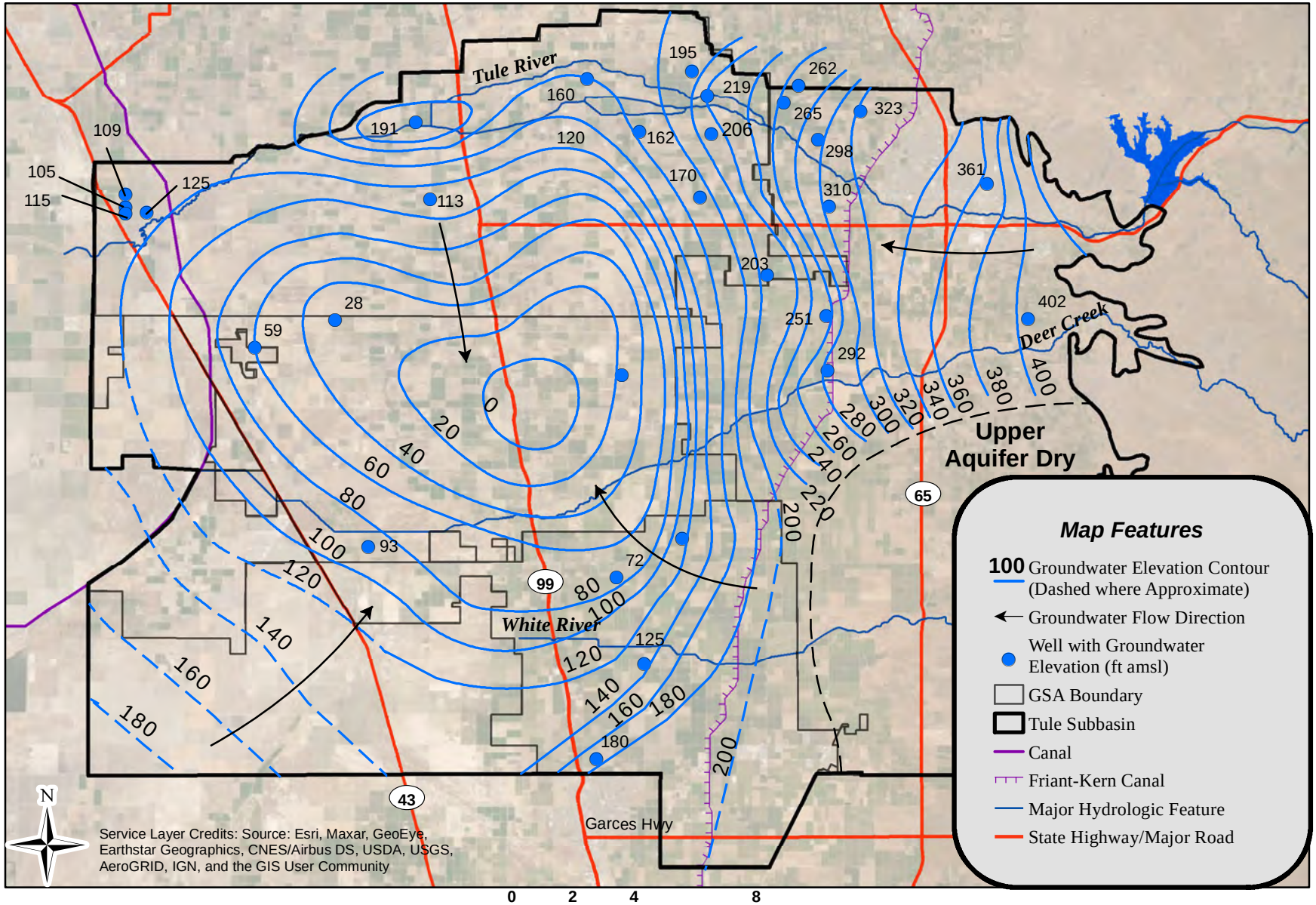
Fall 2019 Lower Aquifer Groundwater Elevation Contours

Figure 26

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021

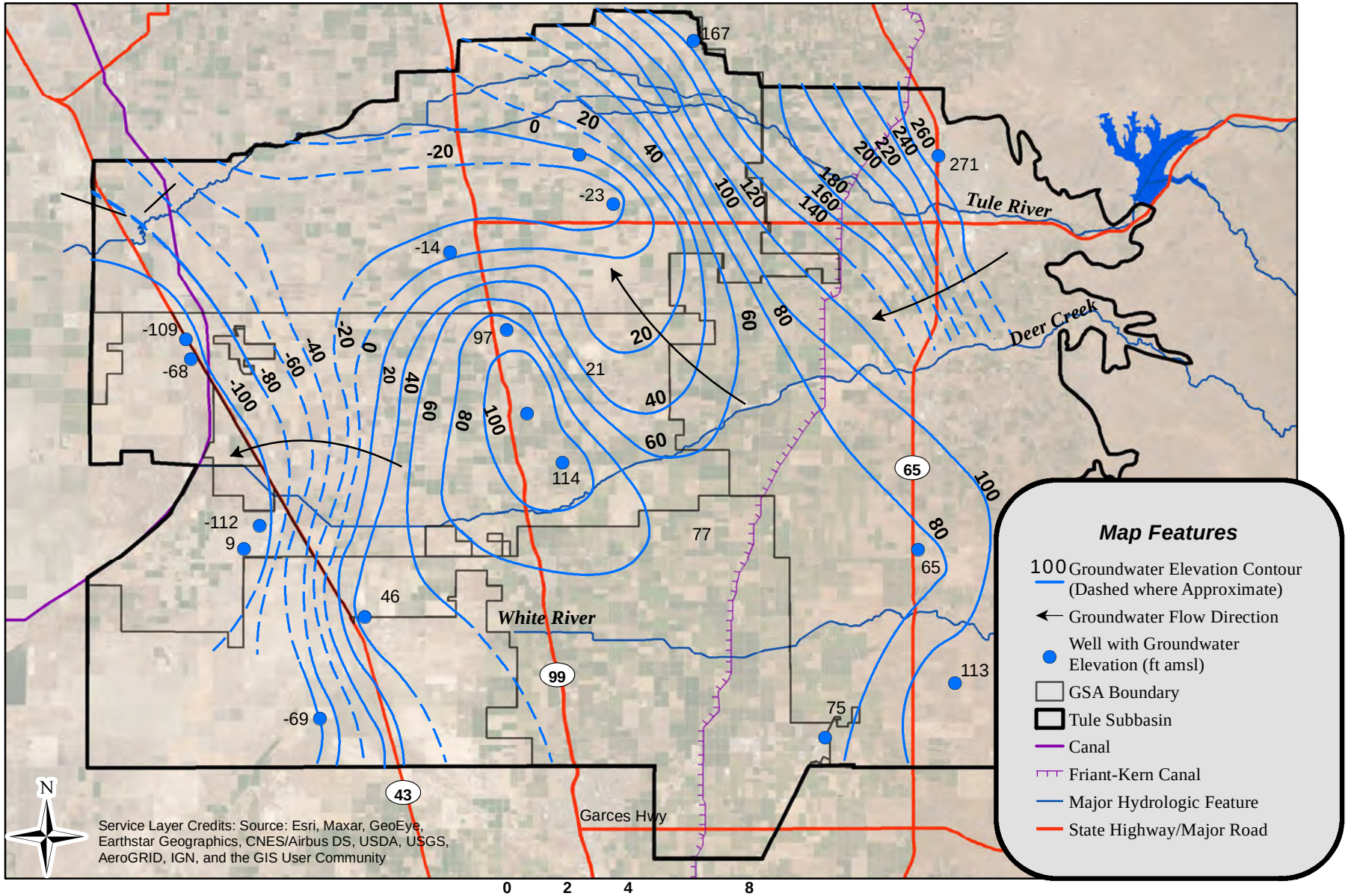


Thomas Harder & Co.
Groundwater Consulting

Spring 2019 Upper Aquifer Groundwater Elevation Contours

Figure 27

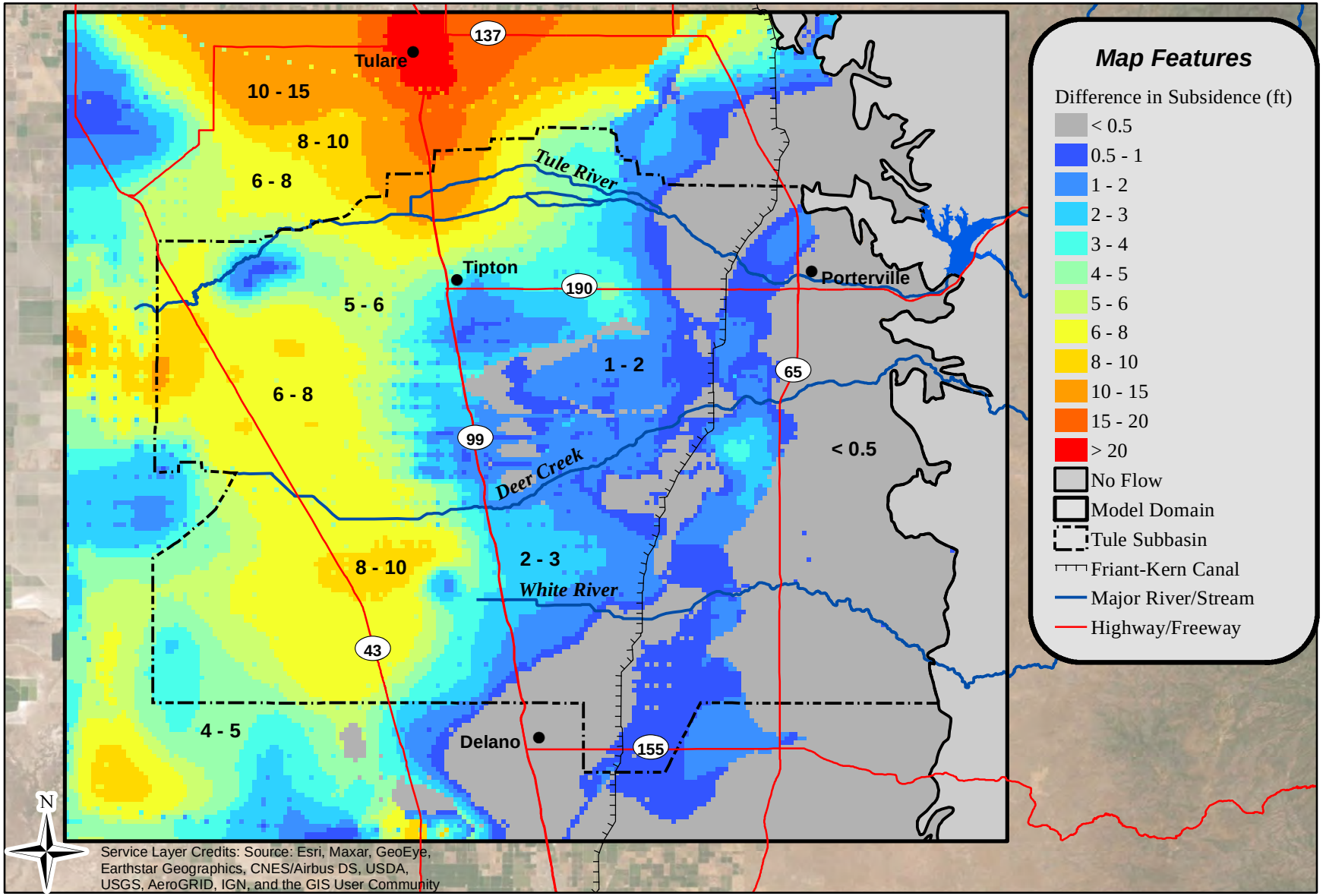
Tule Subbasin Technical Advisory Committee



Thomas Harder & Co.
Groundwater Consulting

Spring 2019 Lower Aquifer Groundwater Elevation Contours

Figure 28

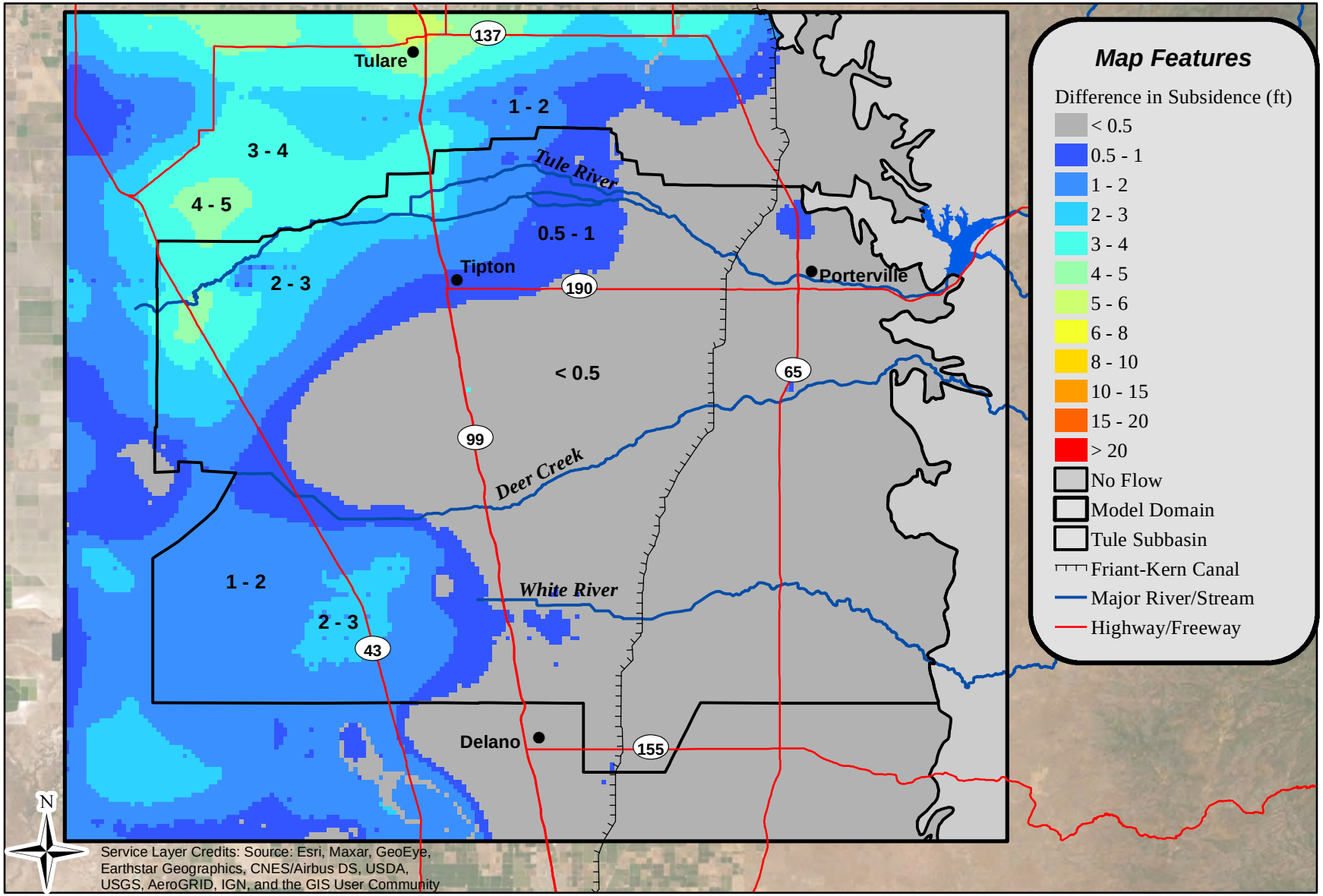


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Model-Predicted Subsidence 2020 to 2040

Note: This map shows the model predicted difference in subsidence from October 1, 2020 to October 1, 2040.

Figure 29

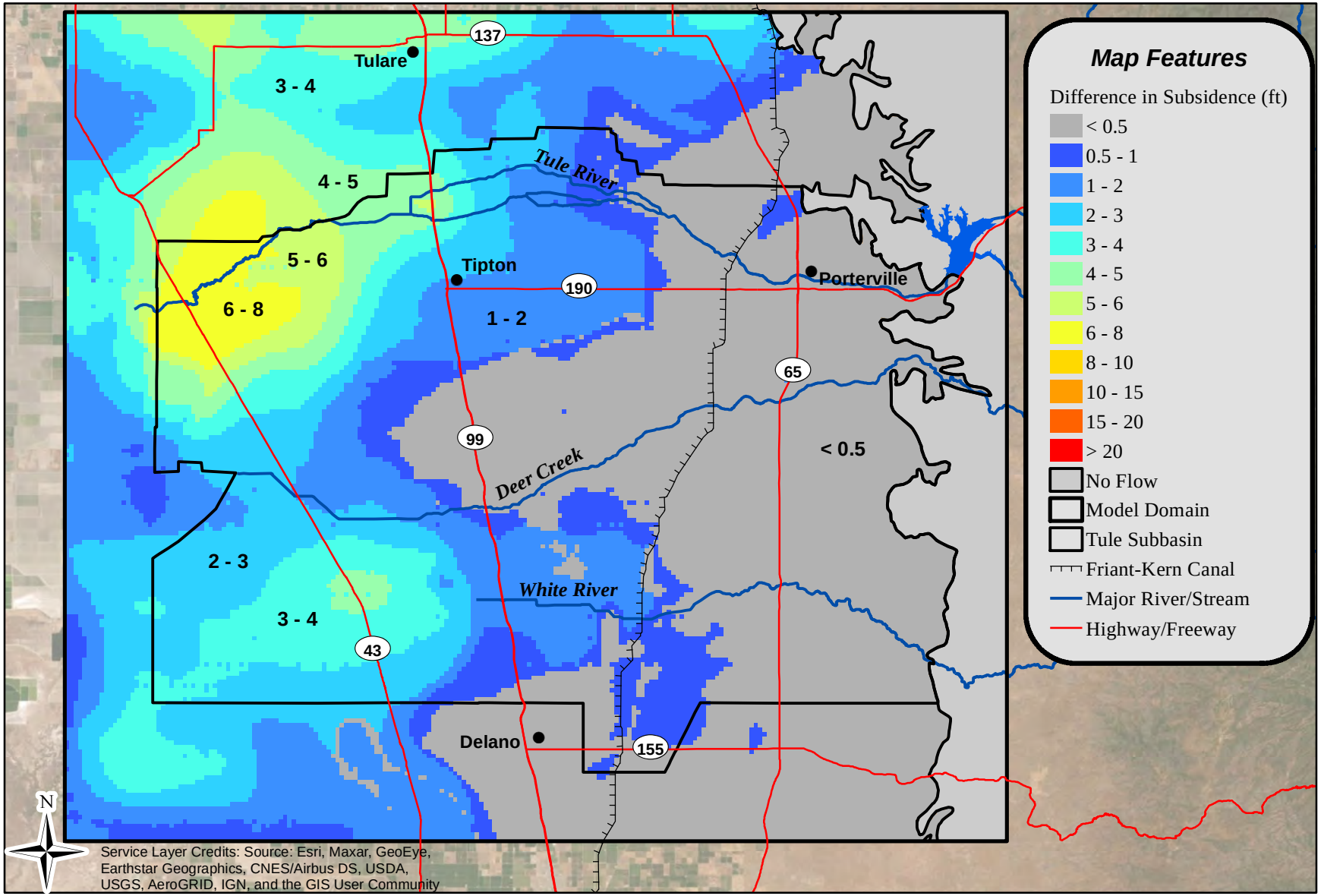


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Model-Predicted Subsidence 2040 to 2050

Figure 30

Note: This map shows the difference in subsidence from October 1, 2040 to October 1, 2050.



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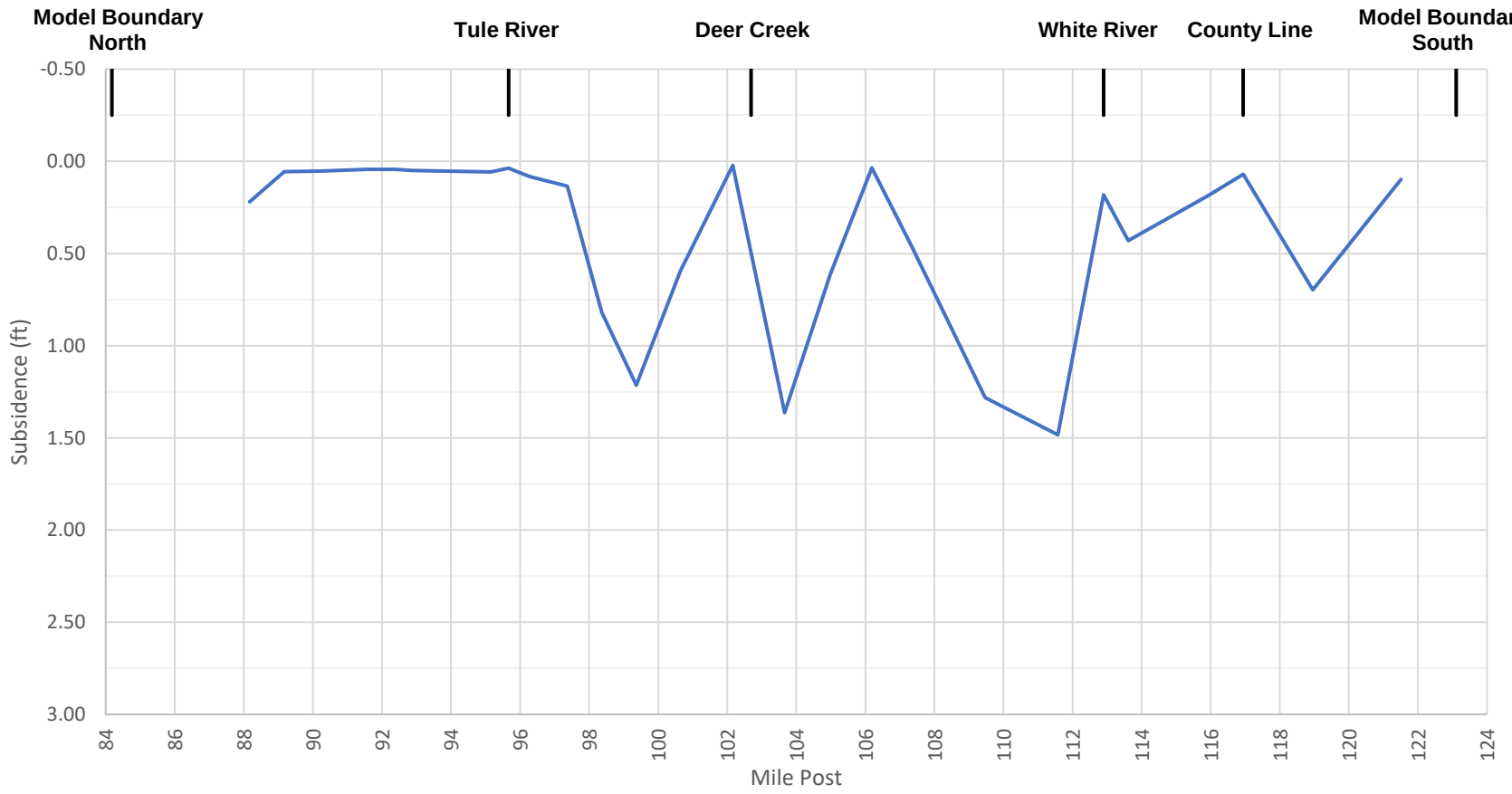
Model-Predicted Subsidence 2050 to 2070

Figure 31

Note: This map shows the difference in subsidence from October 1, 2050 to October 1, 2070.

Figure 32

Subsidence Along the Friant-Kern Canal
2020 to 2040



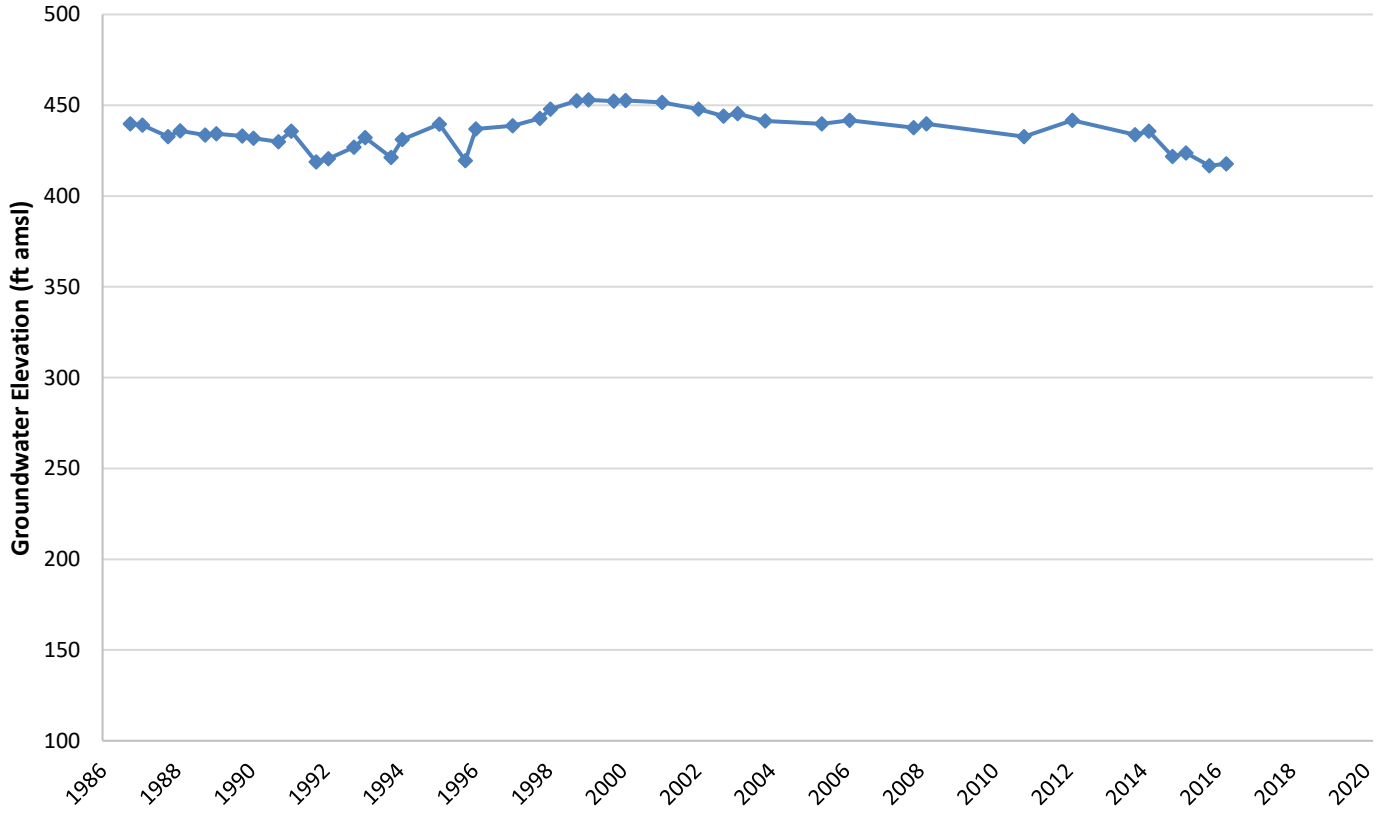
Notes: Based on the future projection with average hydrology. See Section 4 of the Tehnical Memorandum.
Time period October 1, 2020 to October 1, 2040

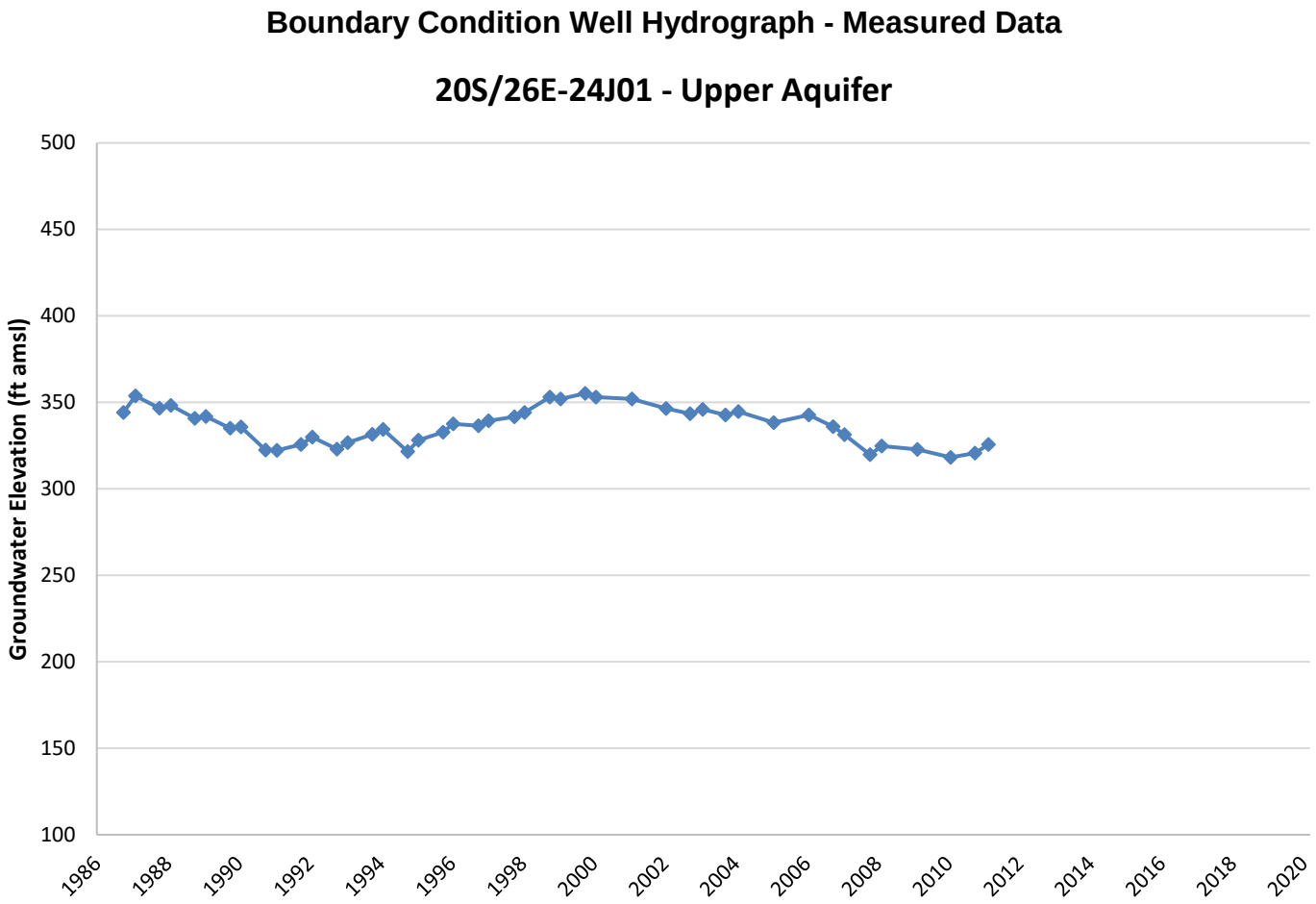
Attachment A

Boundary Condition Well Hydrographs

Boundary Condition Well Hydrograph - Measured Data

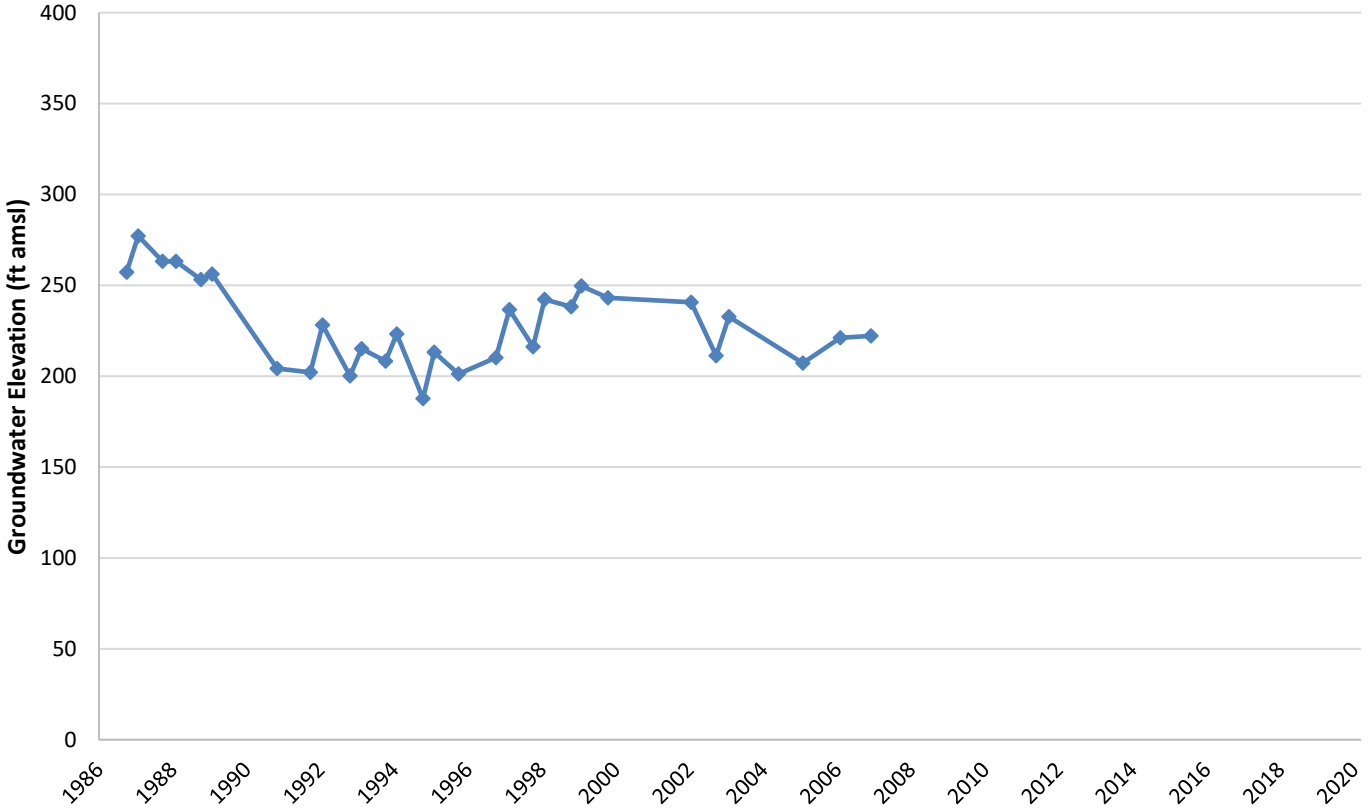
20S/27E-25N01 - Upper Aquifer




Boundary Condition Well Hydrograph - Measured Data
20S/26E-24J01 - Upper Aquifer
Groundwater Elevation (ft amsl)
500
450
400
350
300
250
200
150
100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020

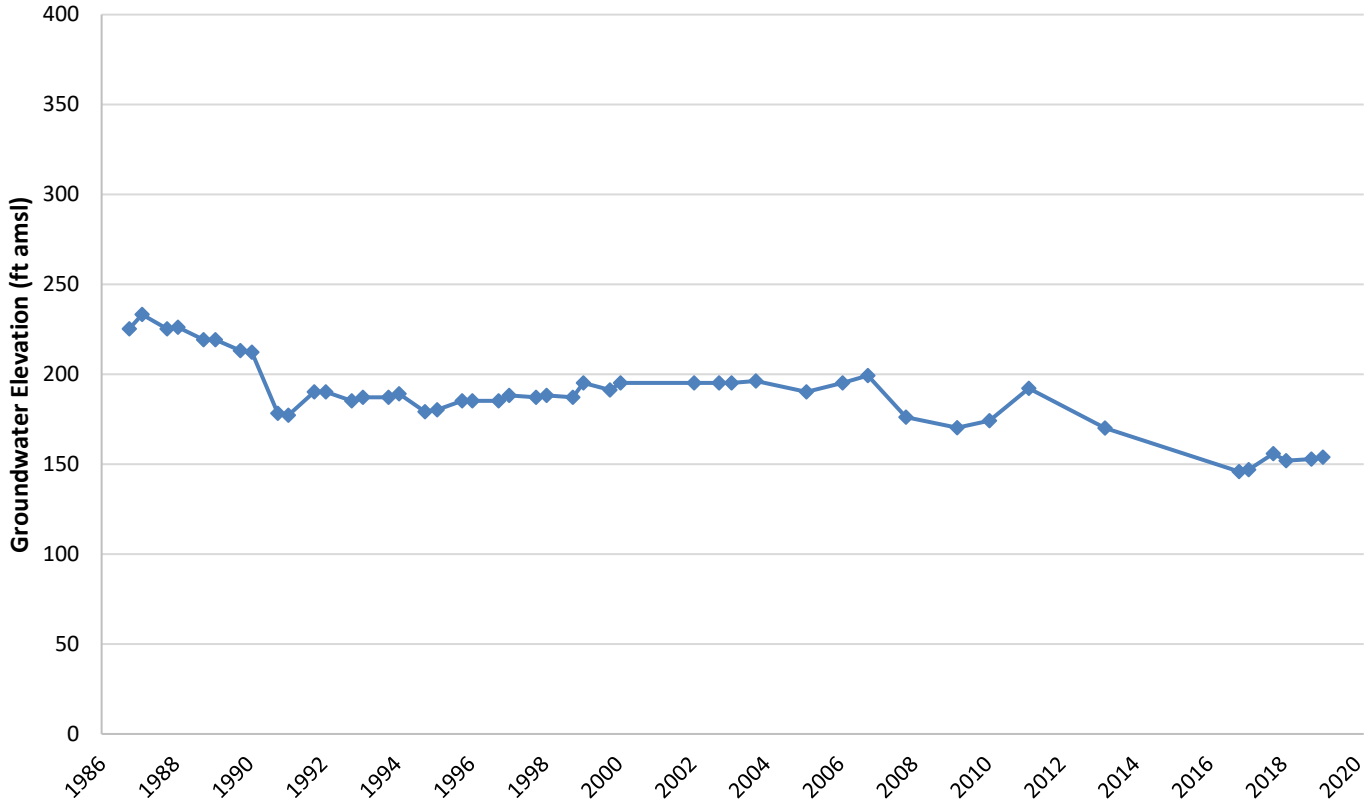
Boundary Condition Well Hydrograph - Measured Data

20S/25E-23H01 - Upper Aquifer



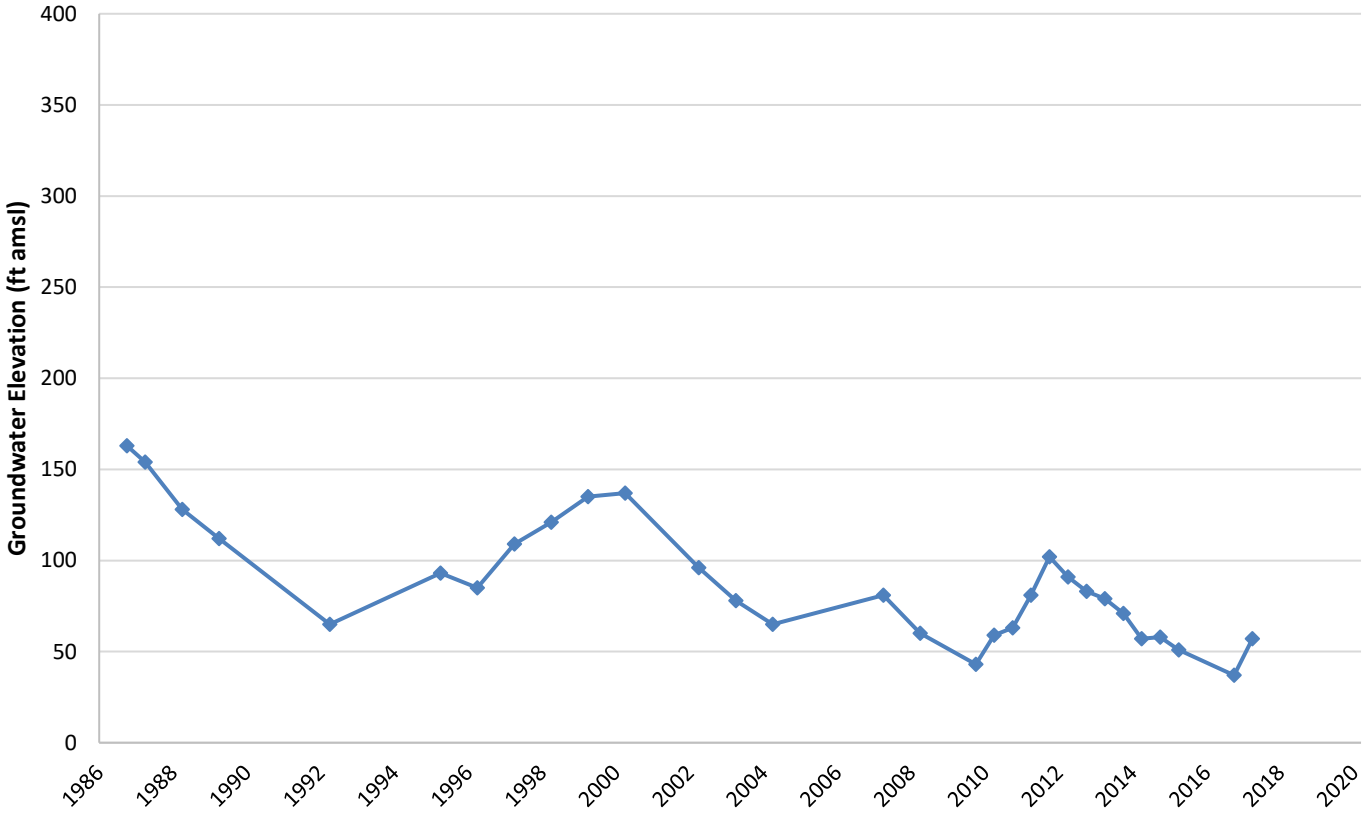
Boundary Condition Well Hydrograph - Measured Data

20S/24E-28L01 - Upper Aquifer



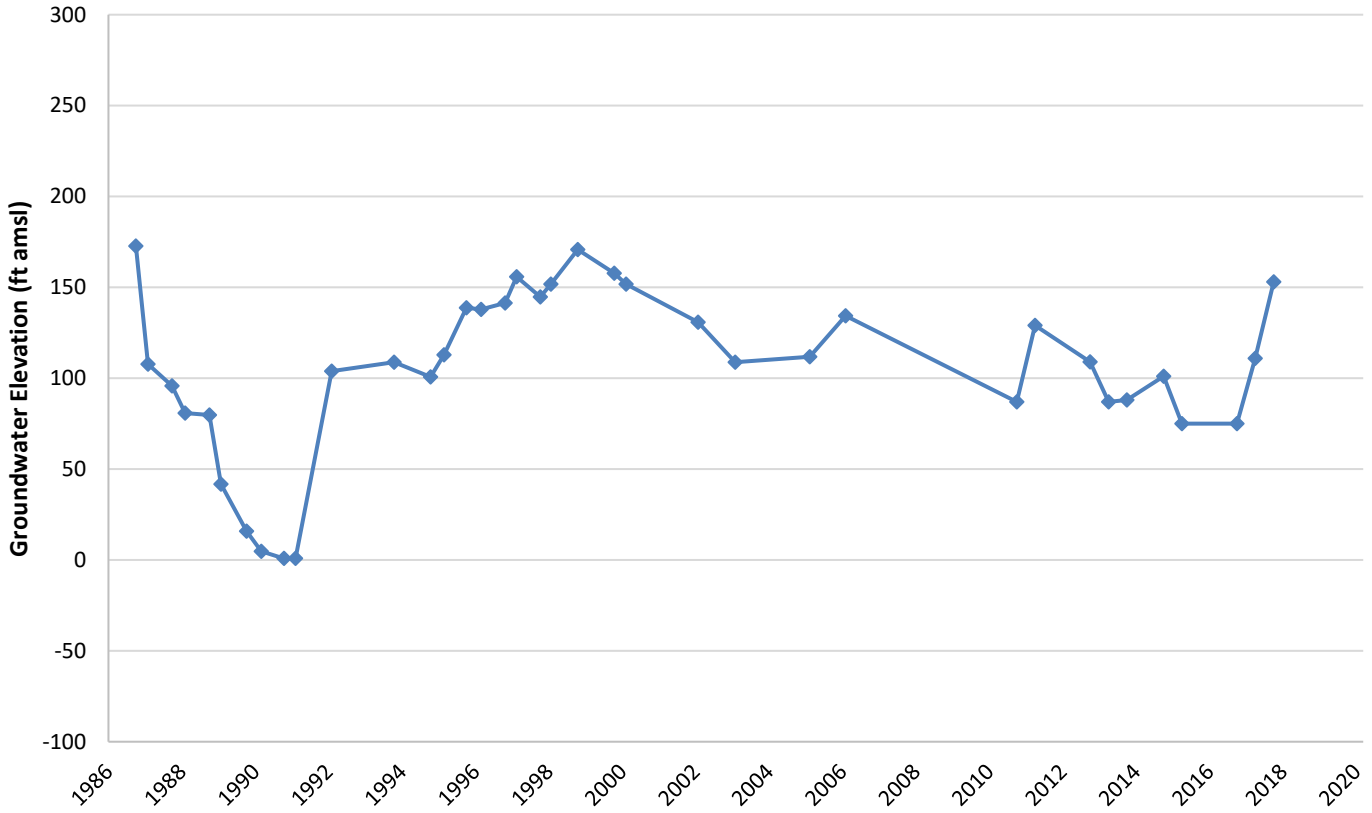
Boundary Condition Well Hydrograph - Measured Data

Well 17 - Upper Aquifer



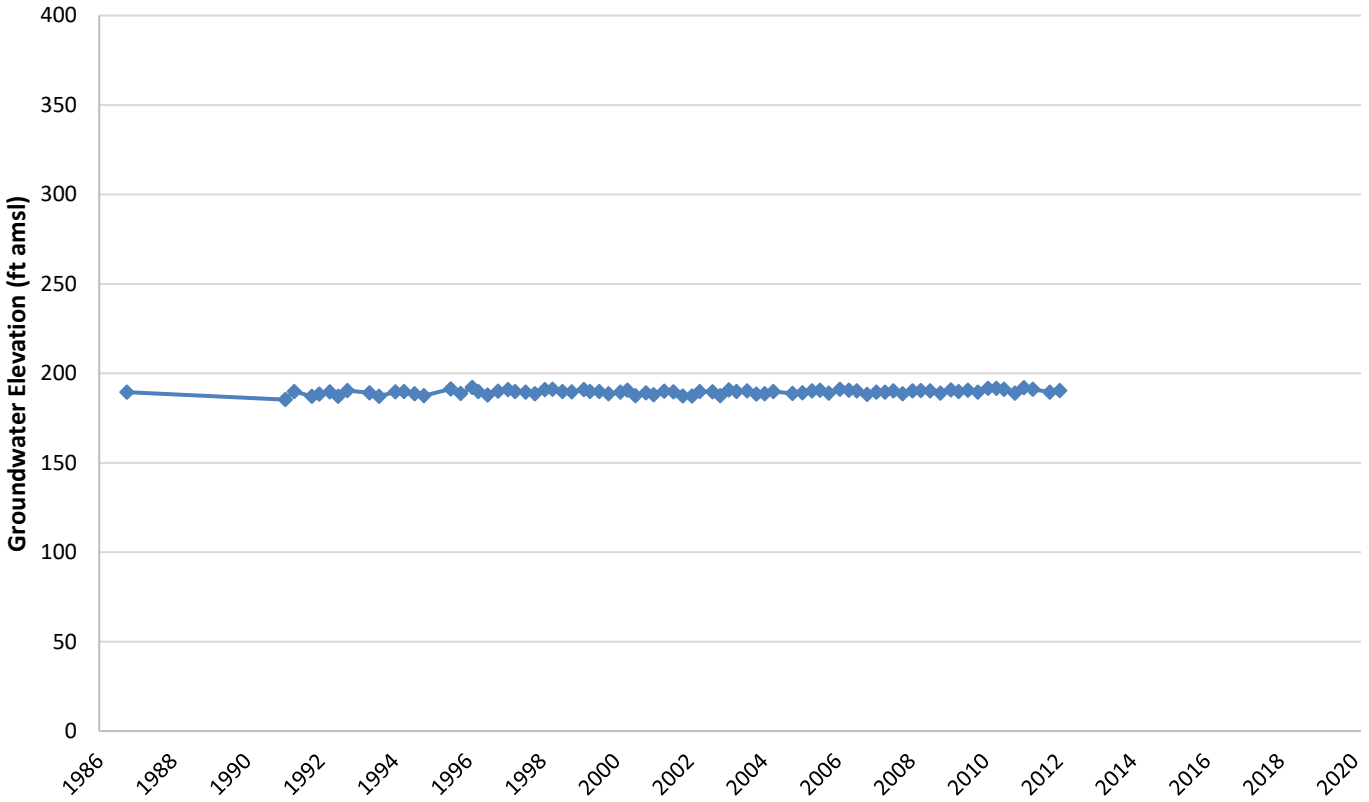
Boundary Condition Well Hydrograph - Measured Data

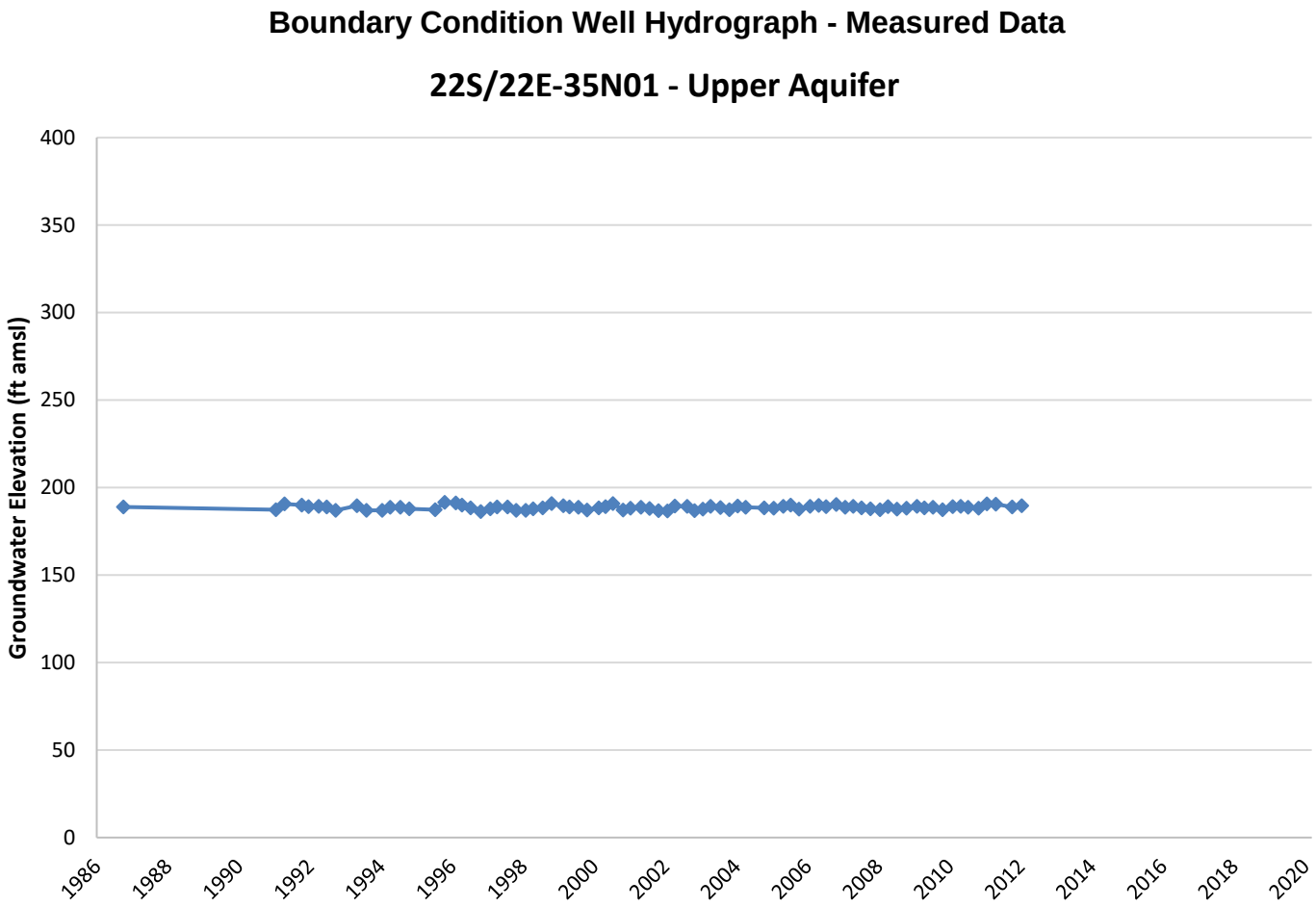
20S/22E-33F01 - Upper Aquifer



Boundary Condition Well Hydrograph - Measured Data

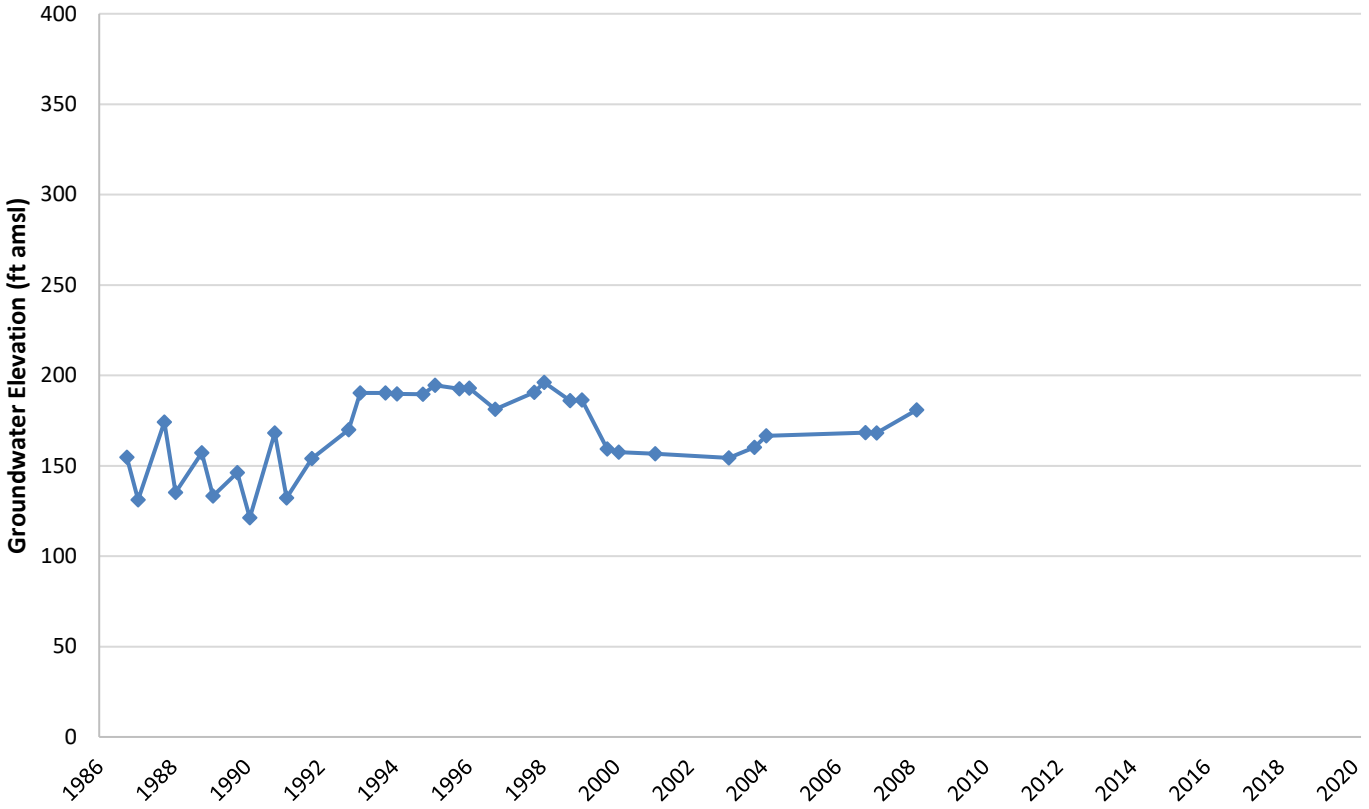
22S/22E-22R01 - Upper Aquifer




Boundary Condition Well Hydrograph - Measured Data
22S/22E-35N01 - Upper Aquifer
Groundwater Elevation (ft amsl)
400
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020

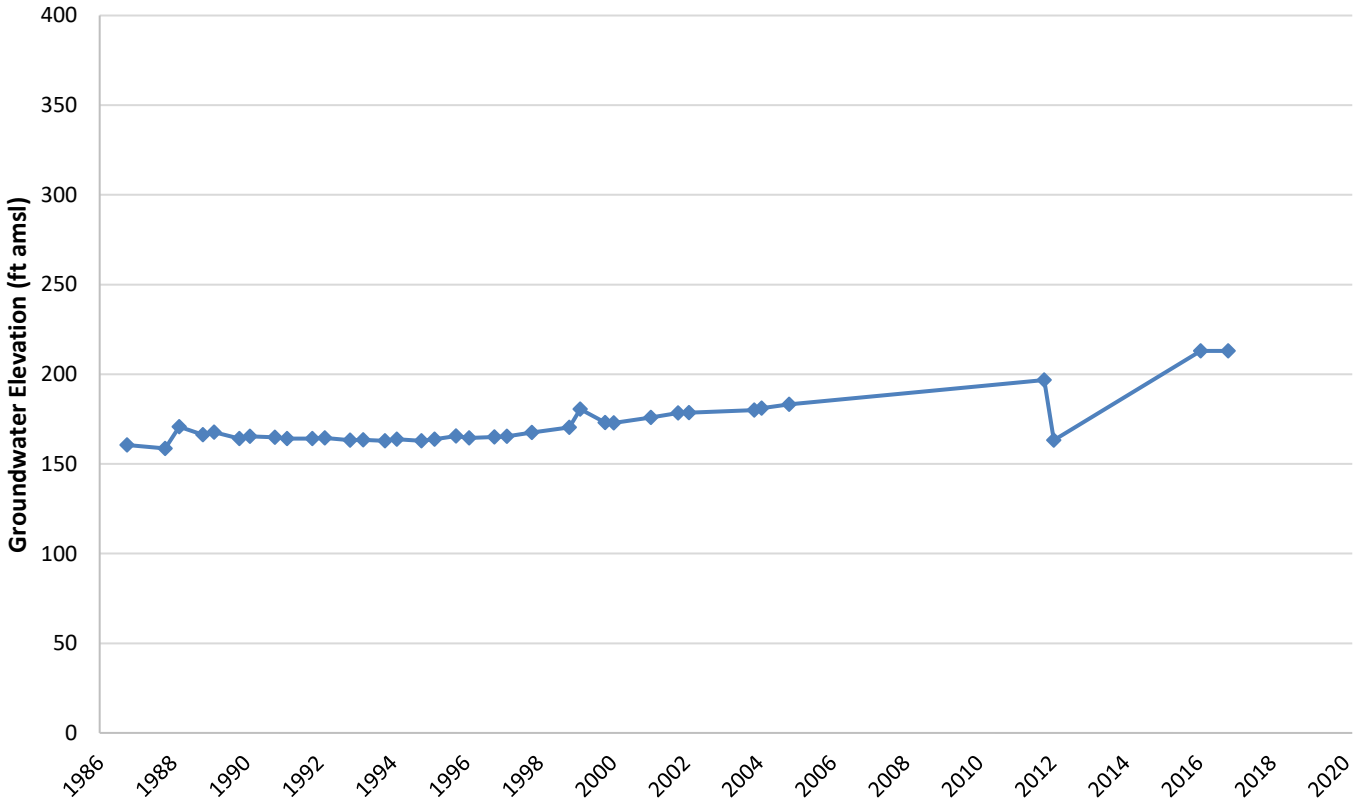
Boundary Condition Well Hydrograph - Measured Data

23S/23E-33A02 - Upper Aquifer



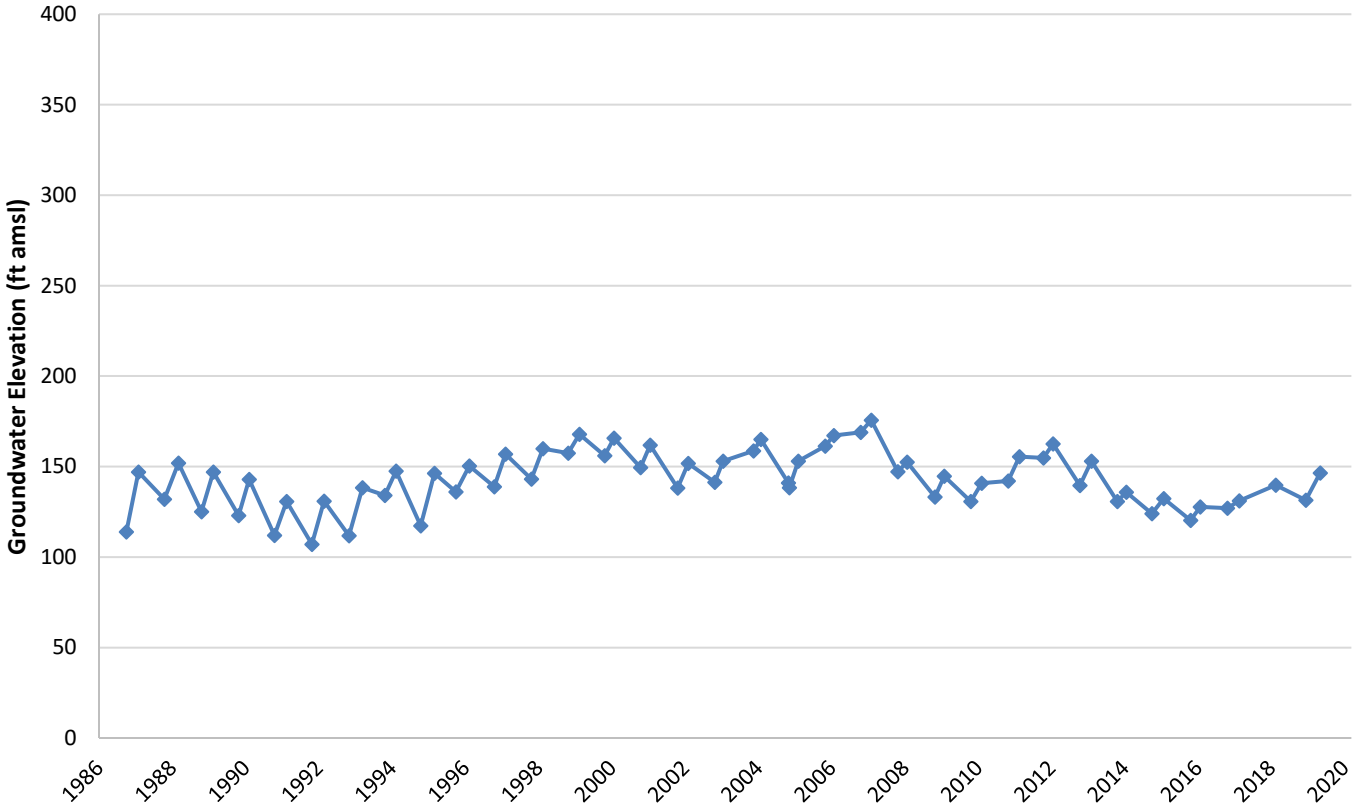
Boundary Condition Well Hydrograph - Measured Data

25S/22E-02R01 - Upper Aquifer



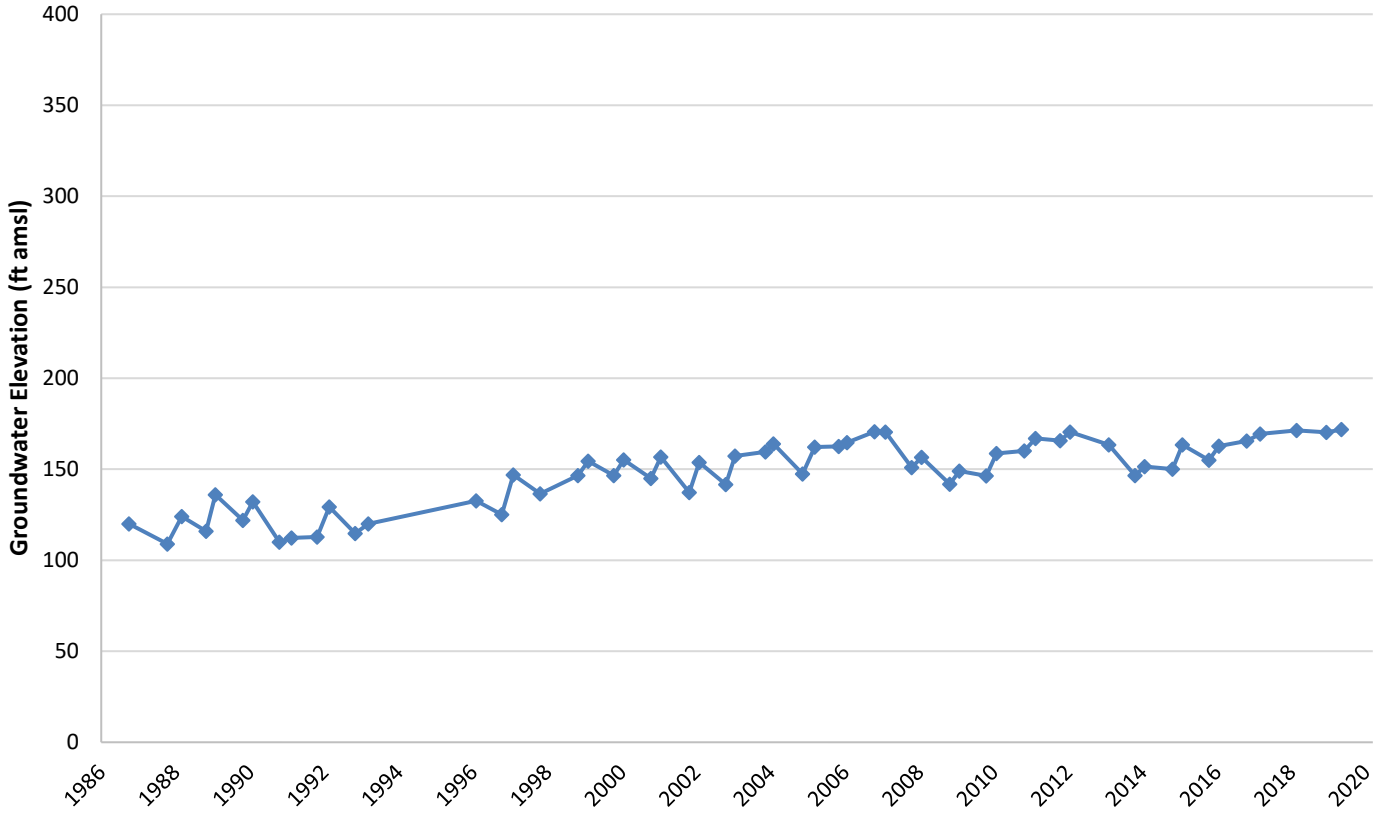
Boundary Condition Well Hydrograph - Measured Data

25S/22E-28R01 - Upper Aquifer



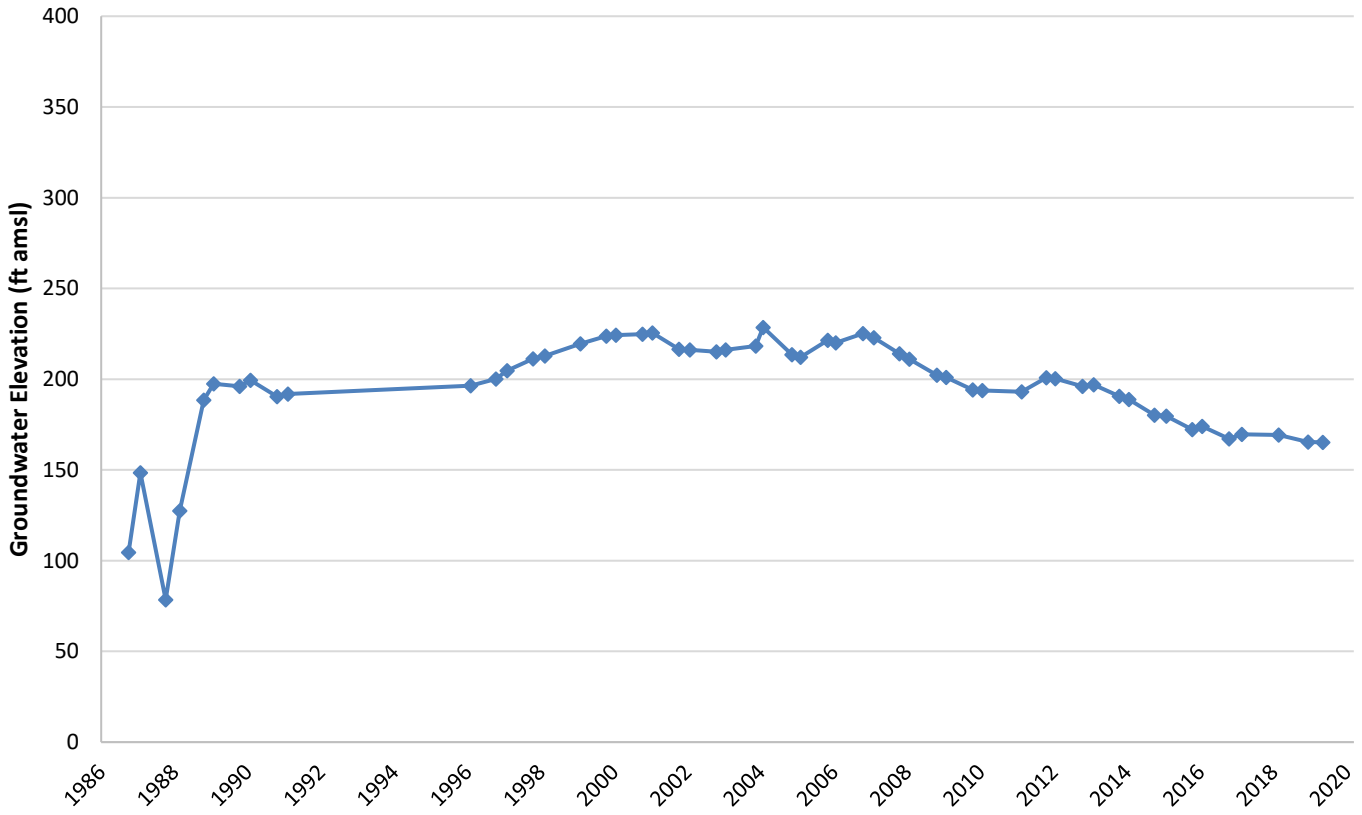
Boundary Condition Well Hydrograph - Measured Data

25S/23E-27H01 - Upper Aquifer



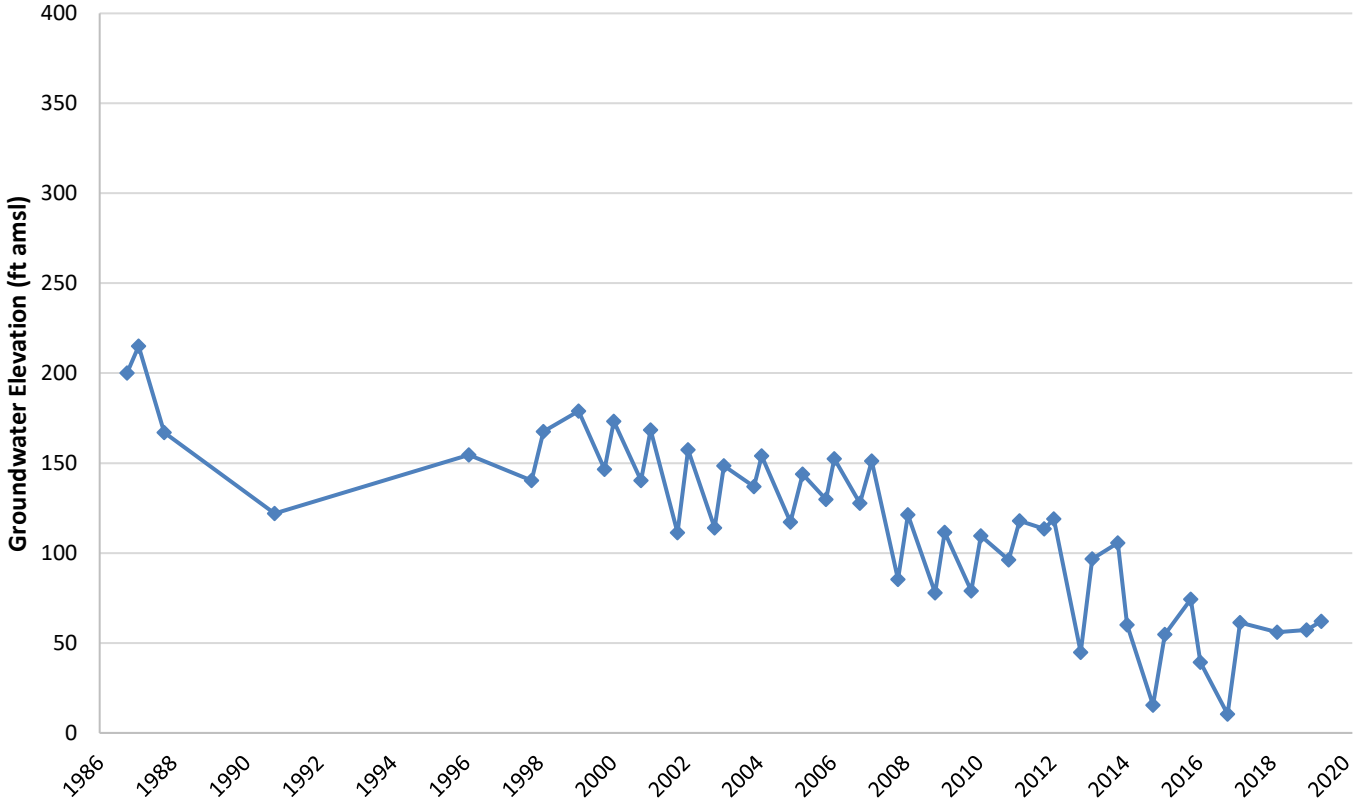
Boundary Condition Well Hydrograph - Measured Data

25S/24E-35E02 - Upper Aquifer



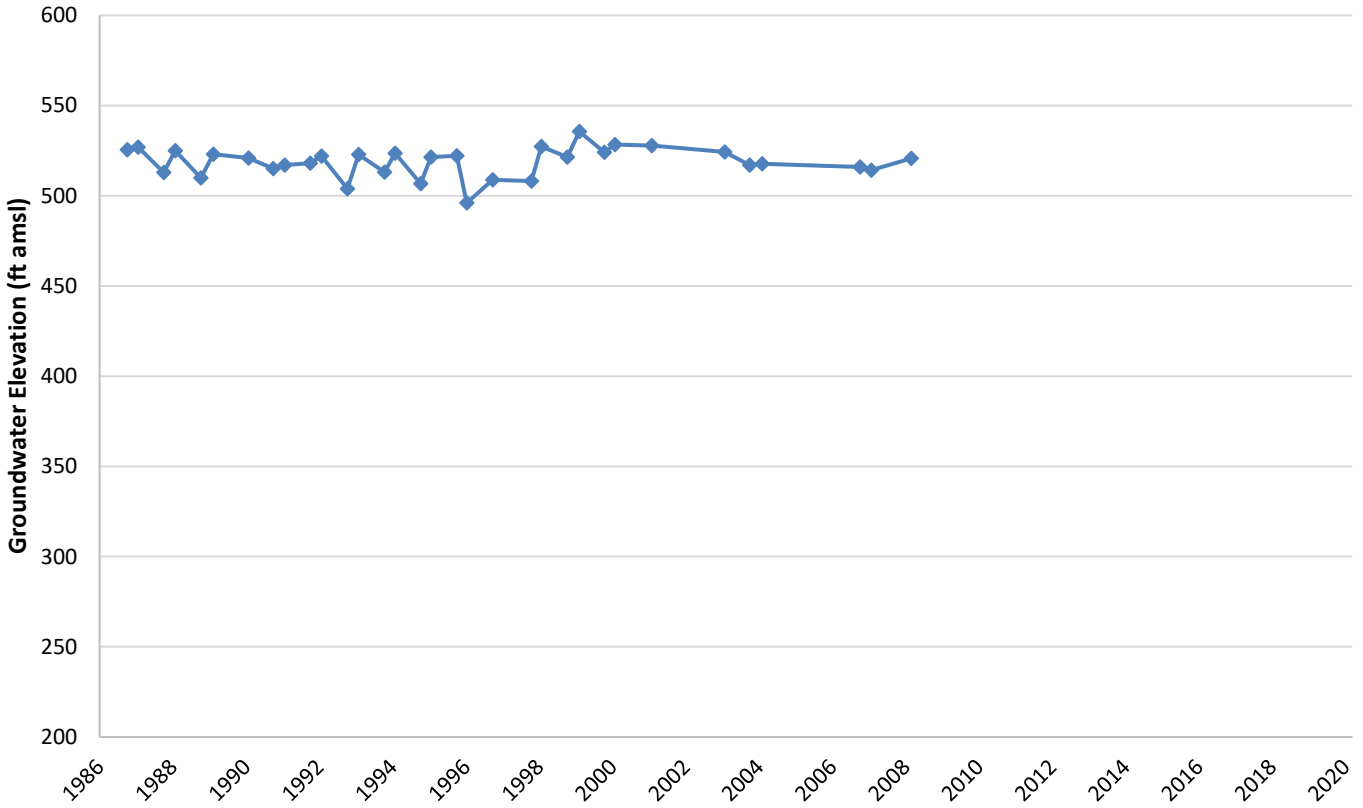
Boundary Condition Well Hydrograph - Measured Data

25S/25E-36C02 - Upper Aquifer



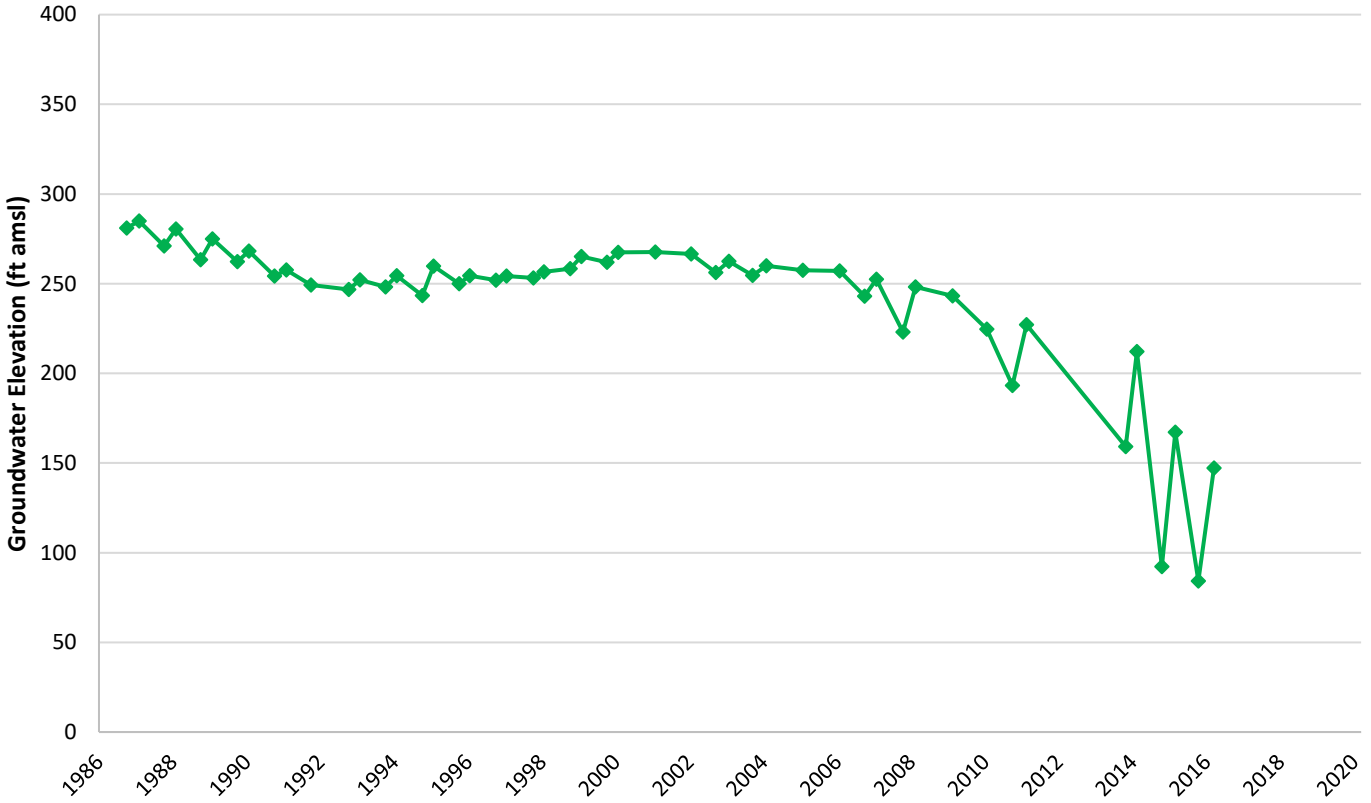
Boundary Condition Well Hydrograph - Measured Data

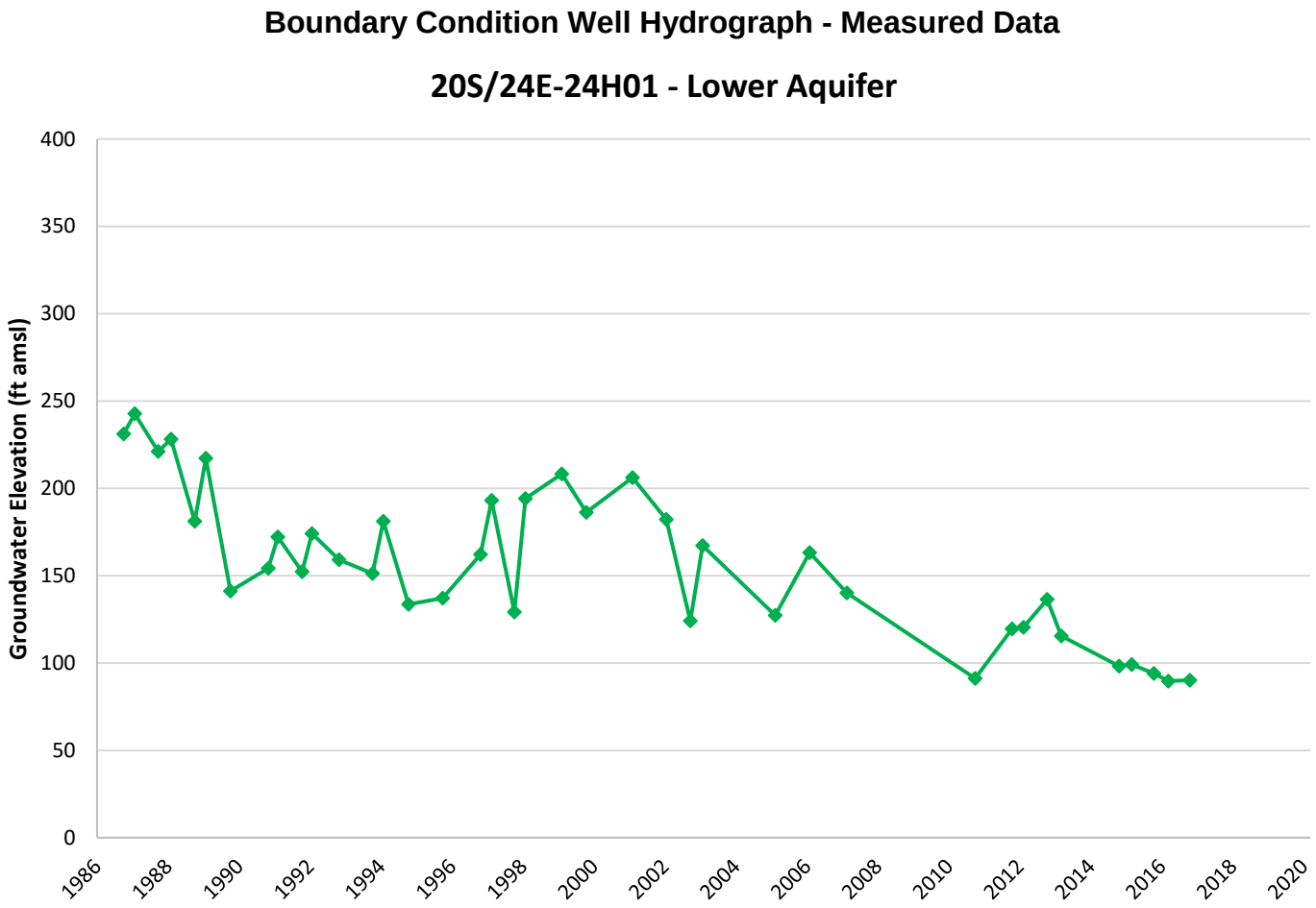
22S/28E-03H01 - Upper Aquifer



Boundary Condition Well Hydrograph - Measured Data

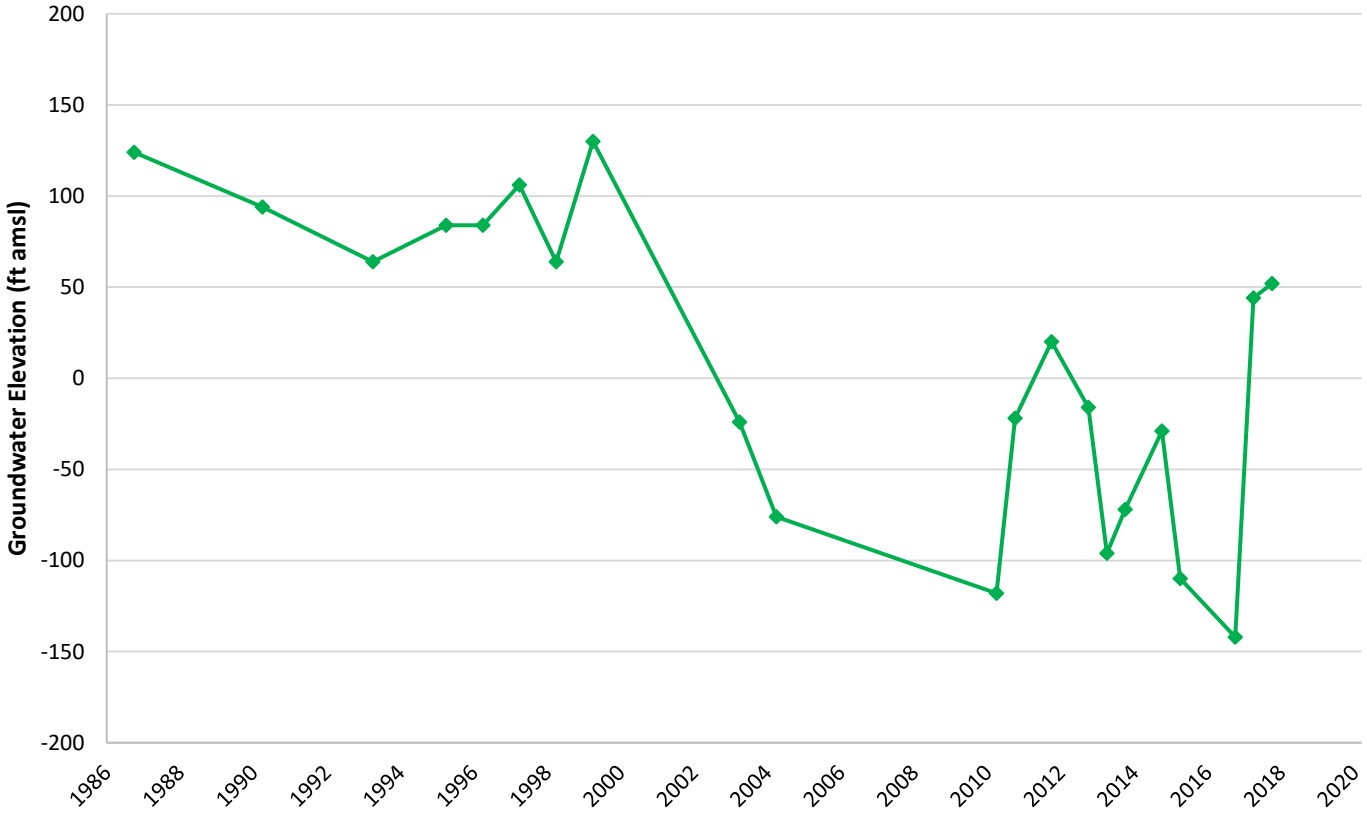
20S/26E-16R01 - Upper Aquifer




Boundary Condition Well Hydrograph - Measured Data
20S/24E-24H01 - Lower Aquifer
Groundwater Elevation (ft amsl)
400
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020

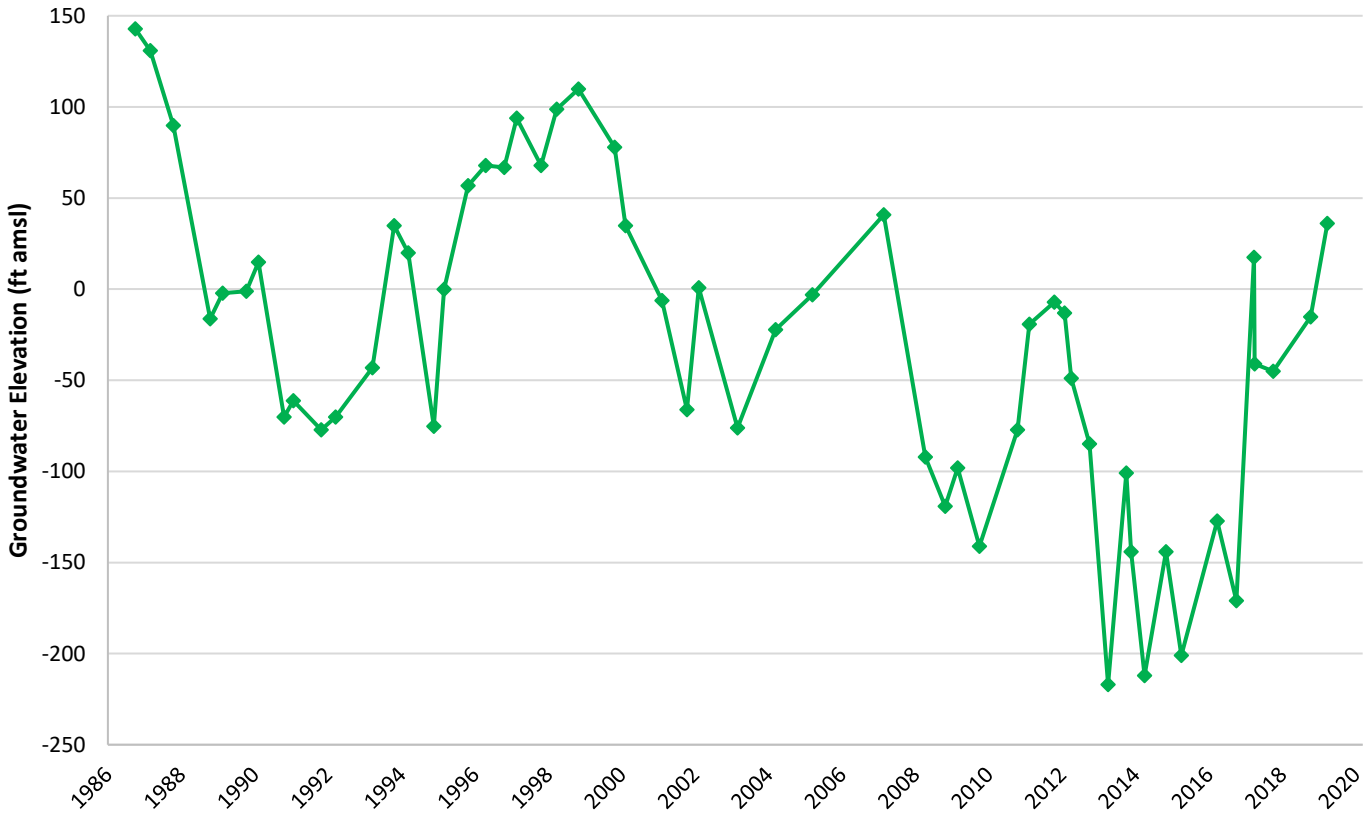
Boundary Condition Well Hydrograph - Measured Data

Well 1 - Lower Aquifer



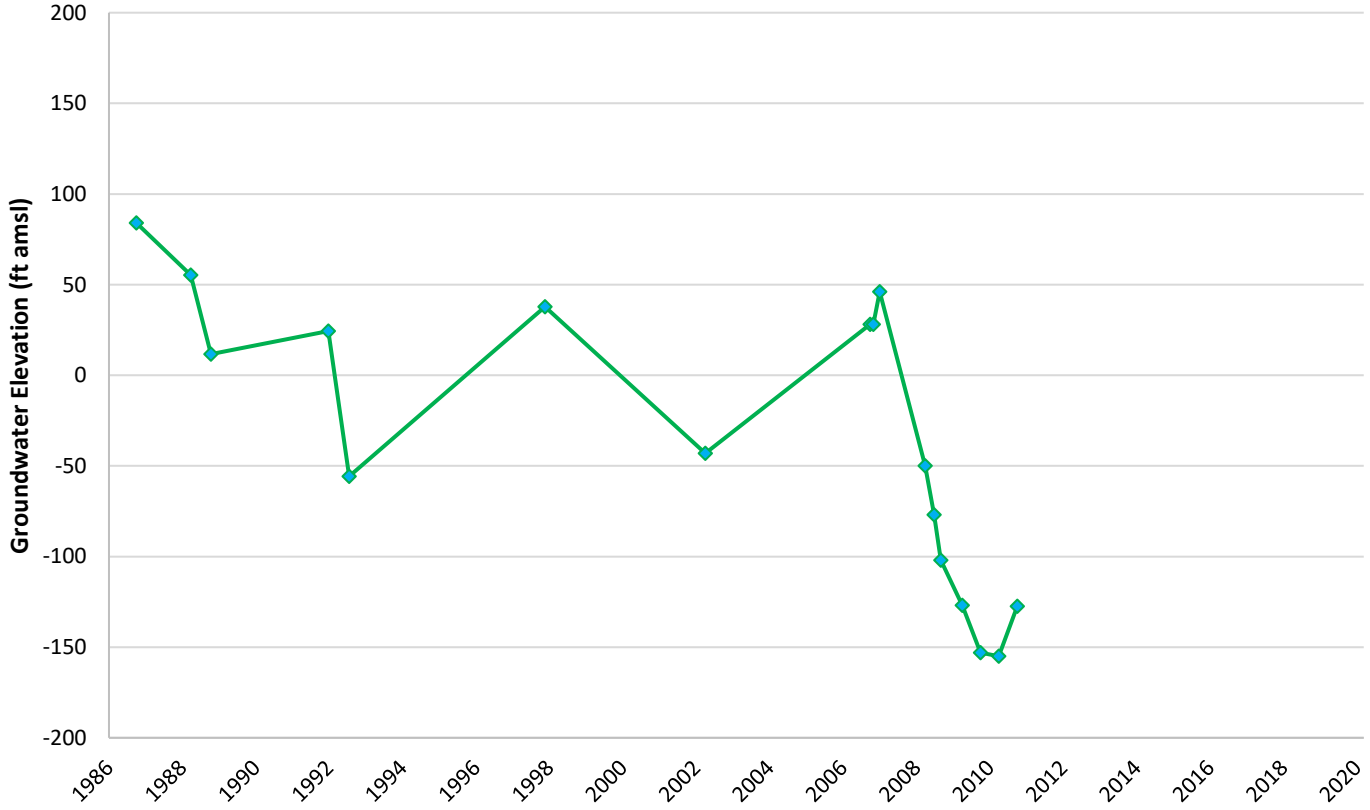
Boundary Condition Well Hydrograph - Measured Data

20S/22E-19N01 - Lower Aquifer



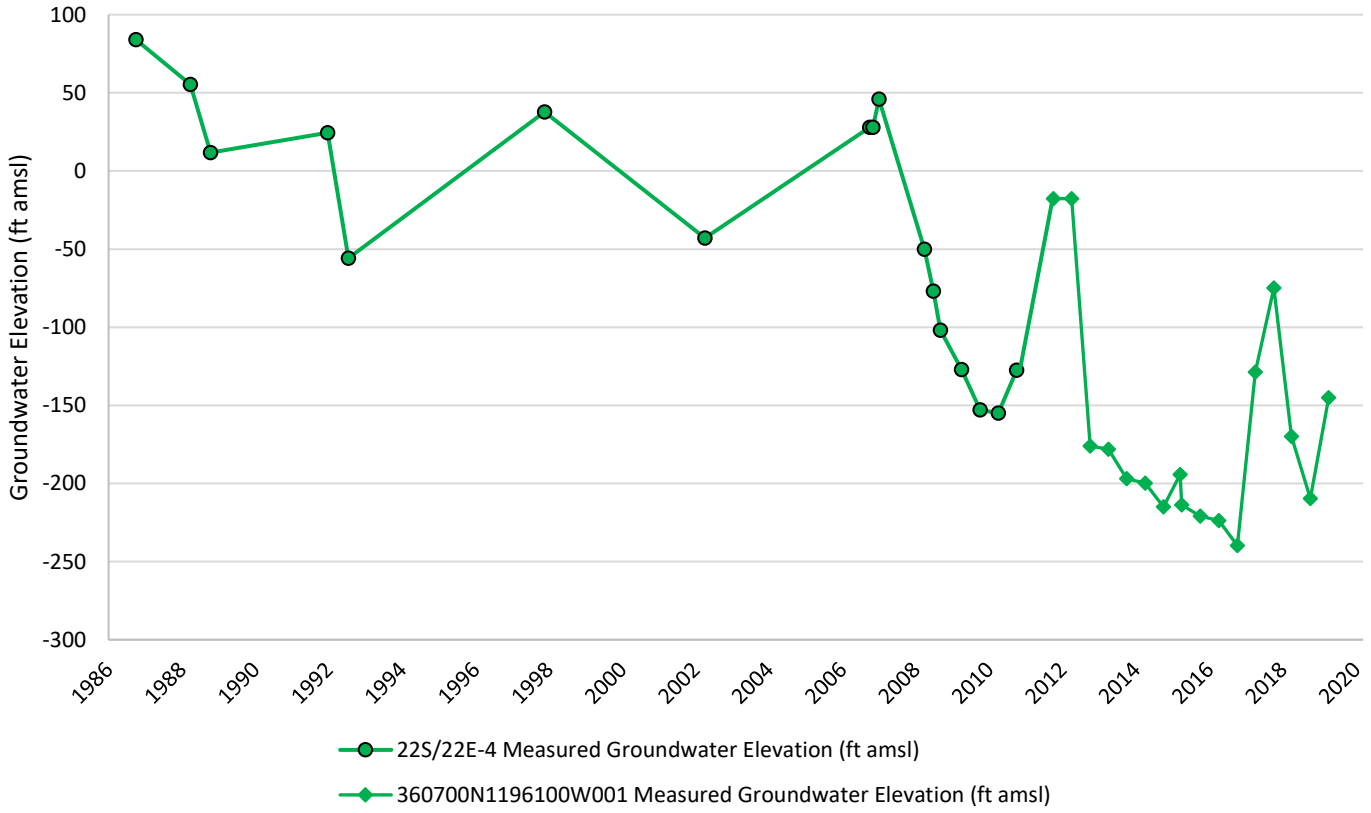
Boundary Condition Well Hydrograph - Measured Data

22S/22E-4 - Lower Aquifer



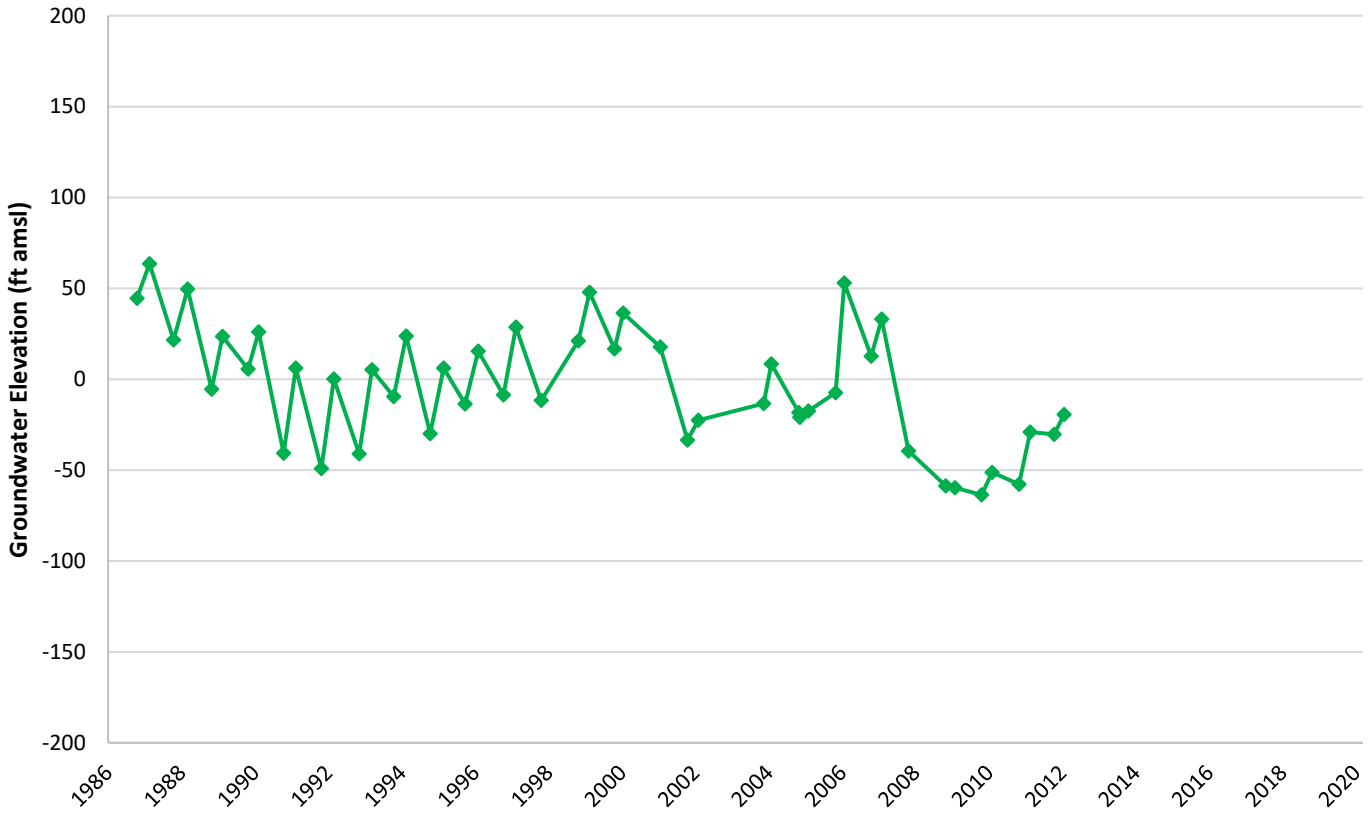
Boundary Condition Well Hydrograph - Measured Data

360700N1196100W001 - Lower Aquifer



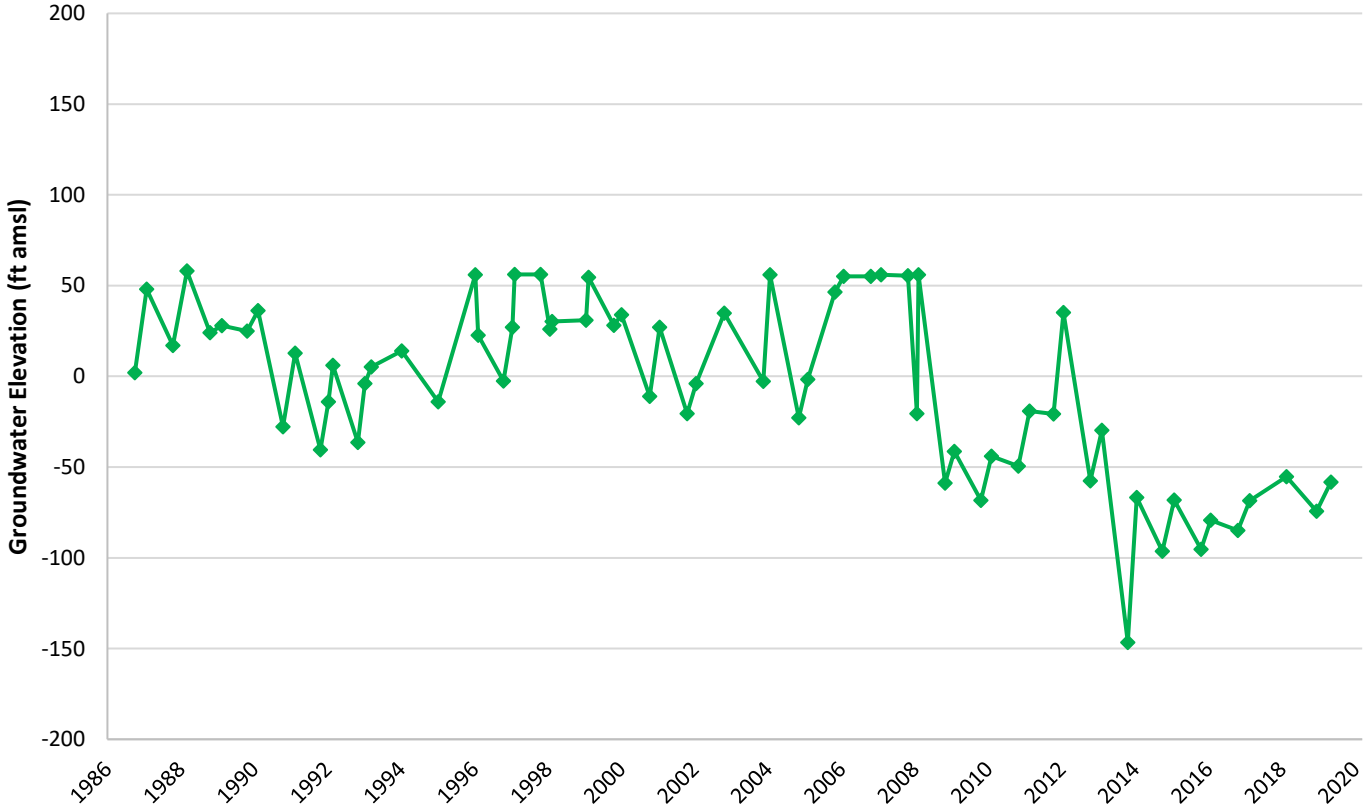
Boundary Condition Well Hydrograph - Measured Data

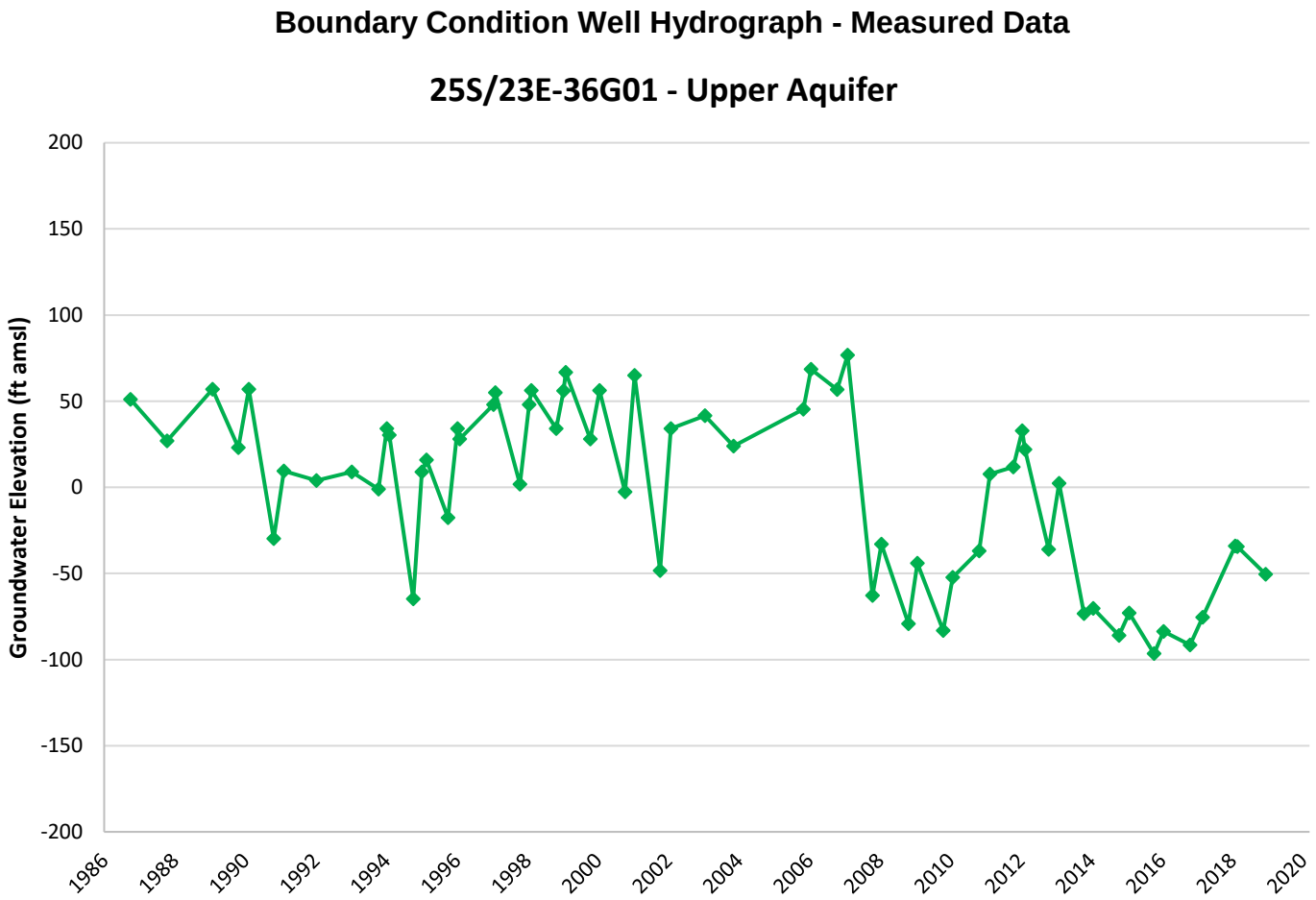
25S/22E-02F01 - Lower Aquifer



Boundary Condition Well Hydrograph - Measured Data

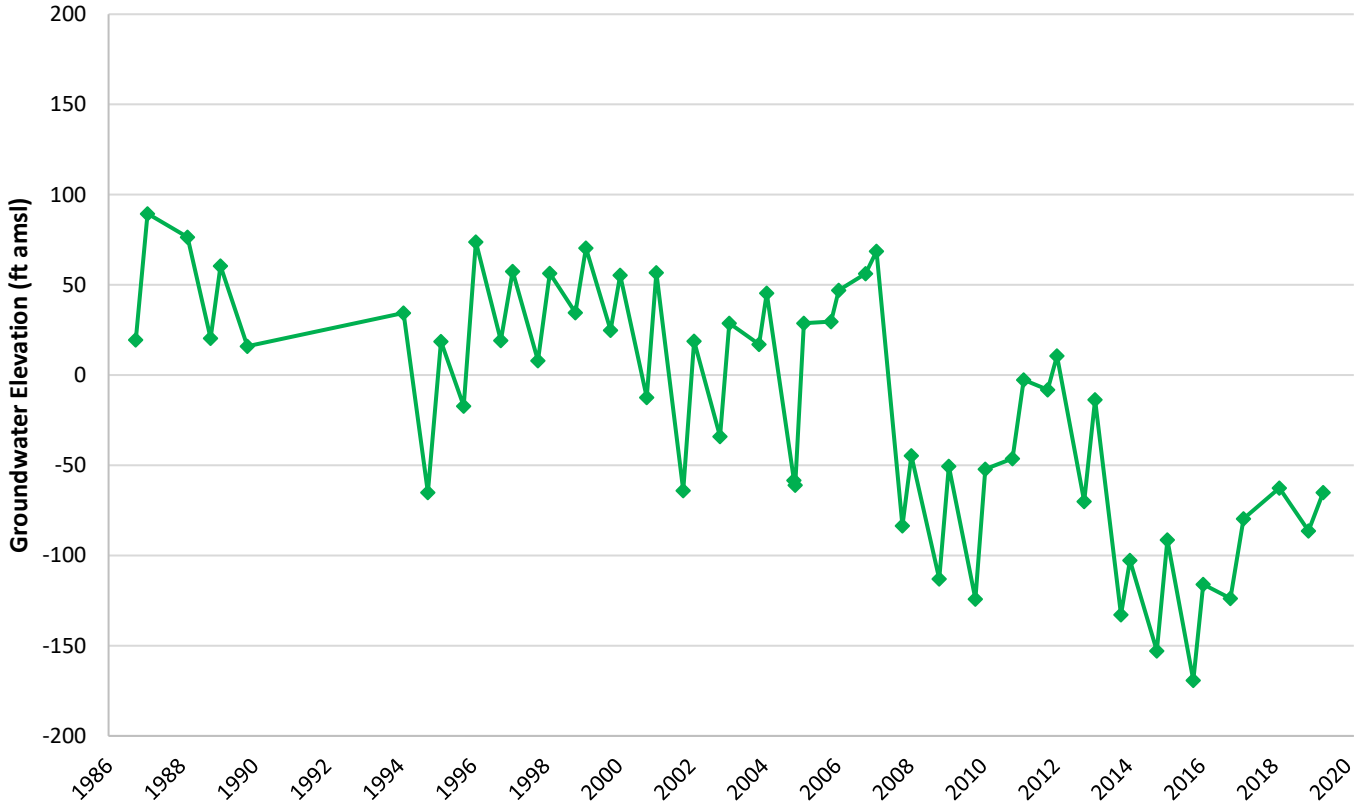
25S/22E-27J01 - Lower Aquifer




Boundary Condition Well Hydrograph - Measured Data
25S/23E-36G01 - Upper Aquifer
Groundwater Elevation (ft amsl)
200
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020

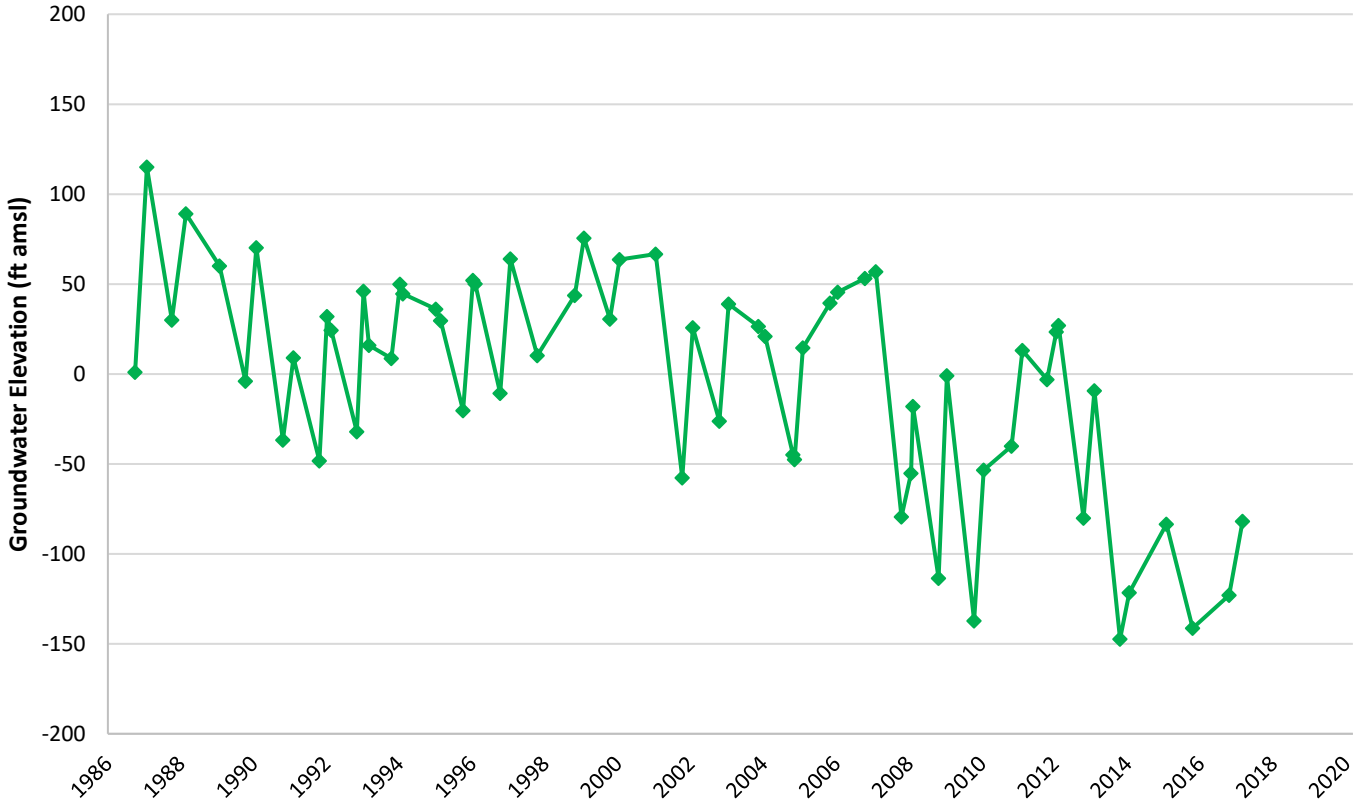
Boundary Condition Well Hydrograph - Measured Data

25S/23E-36R03 - Lower Aquifer



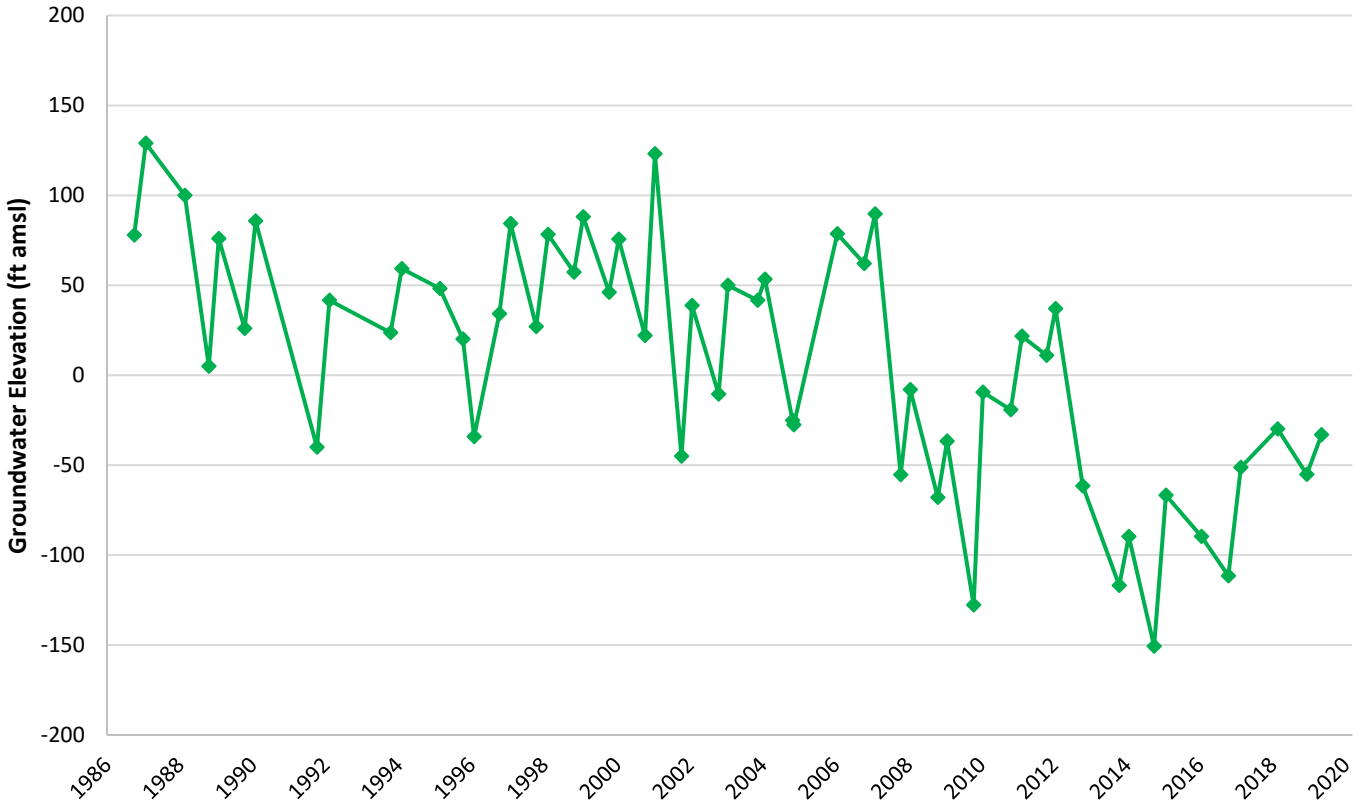
Boundary Condition Well Hydrograph - Measured Data

25S/24E-21P01 - Lower Aquifer



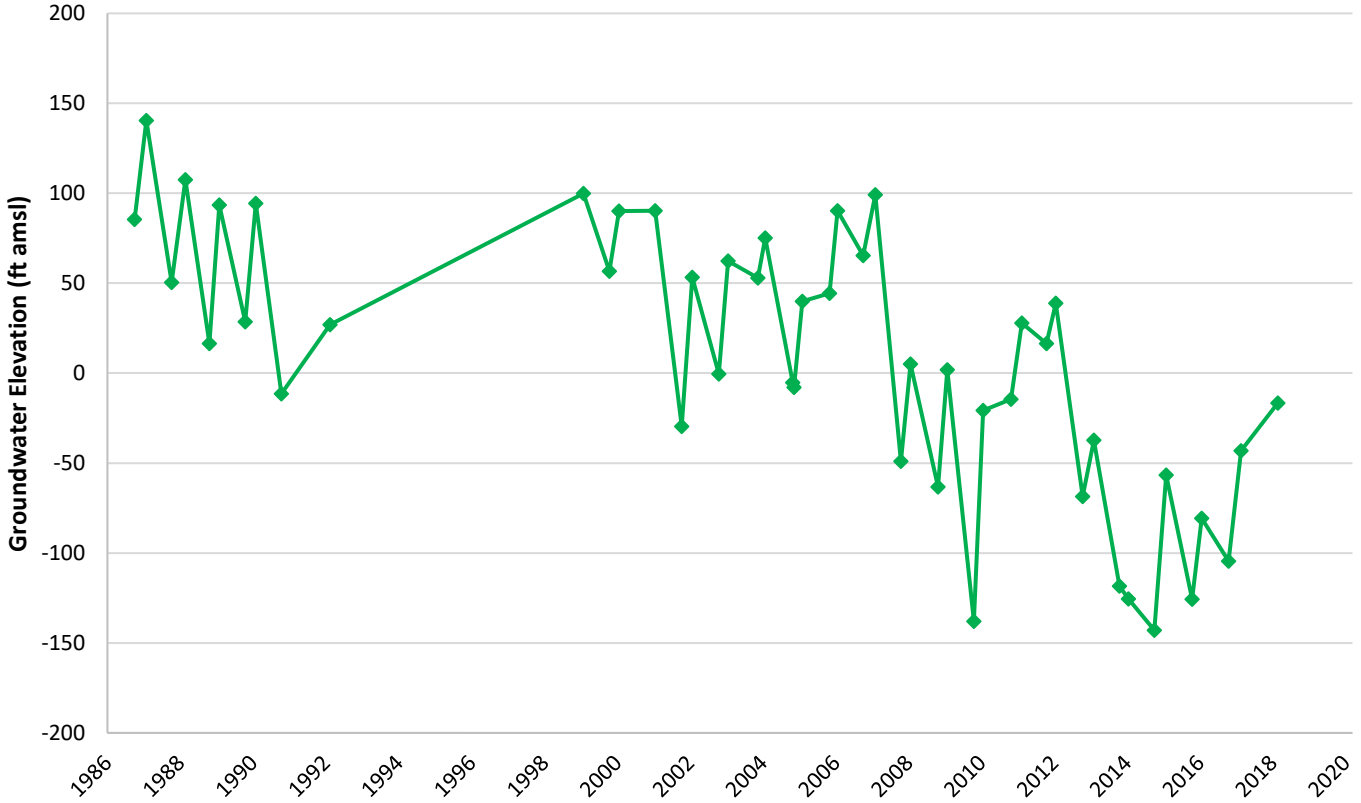
Boundary Condition Well Hydrograph - Measured Data

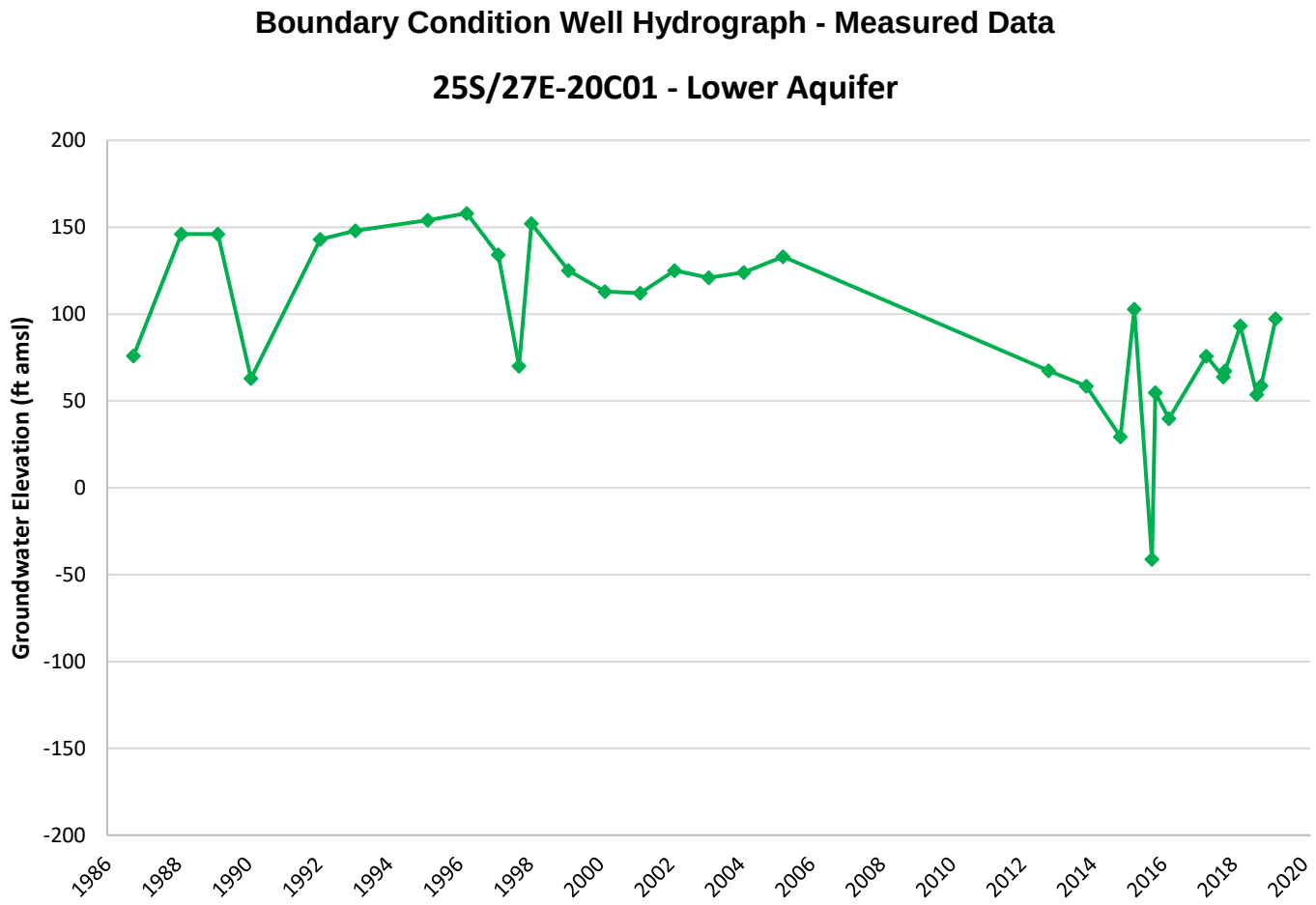
25S/24E-26F01 - Lower Aquifer



Boundary Condition Well Hydrograph - Measured Data

25S/24E-25F02 - Lower Aquifer




Boundary Condition Well Hydrograph - Measured Data
25S/27E-20C01 - Lower Aquifer
Groundwater Elevation (ft amsl)
200
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020

Attachment B

Model Parameters

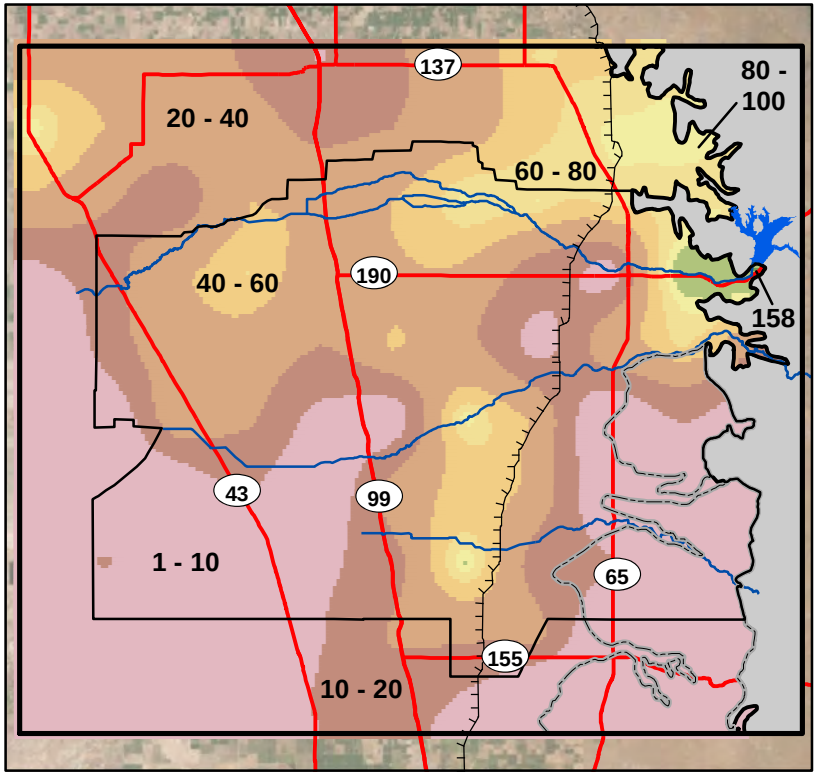
Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021

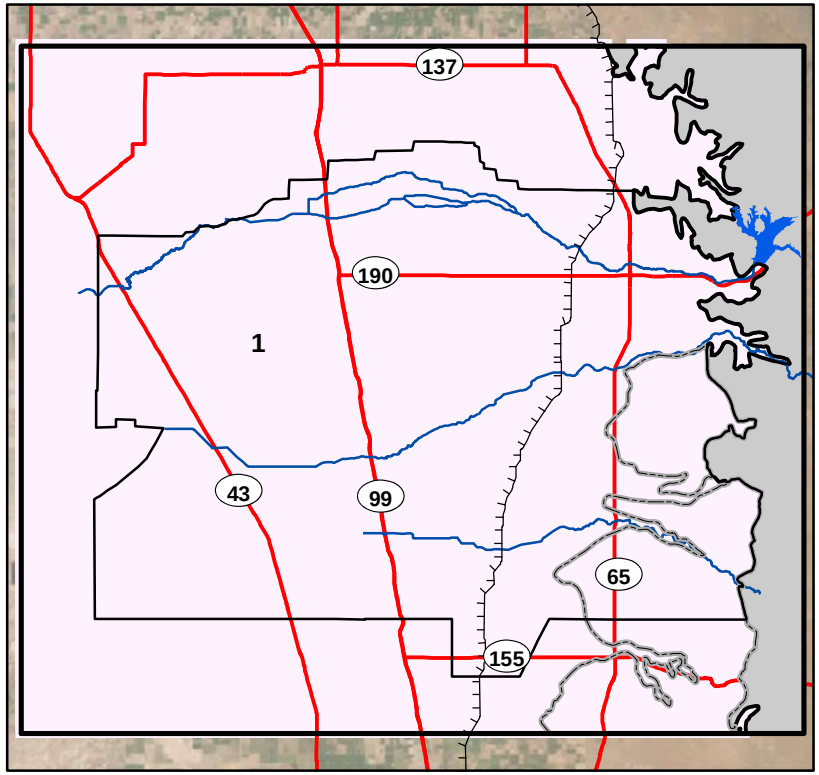
2020 Model

Min: 1
Max: 158



2020 Model to 2019 Model Ratio

Min: 1
Max: 1



Map Features

Model Calibrated Horizontal Hydraulic Conductivity (ft/day)

- 0.001 - 1
- 1 - 10
- 10 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80 - 100
- 100 - 150
- 150 - 200

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 1 Horizontal Hydraulic Conductivity

Attachment B-1

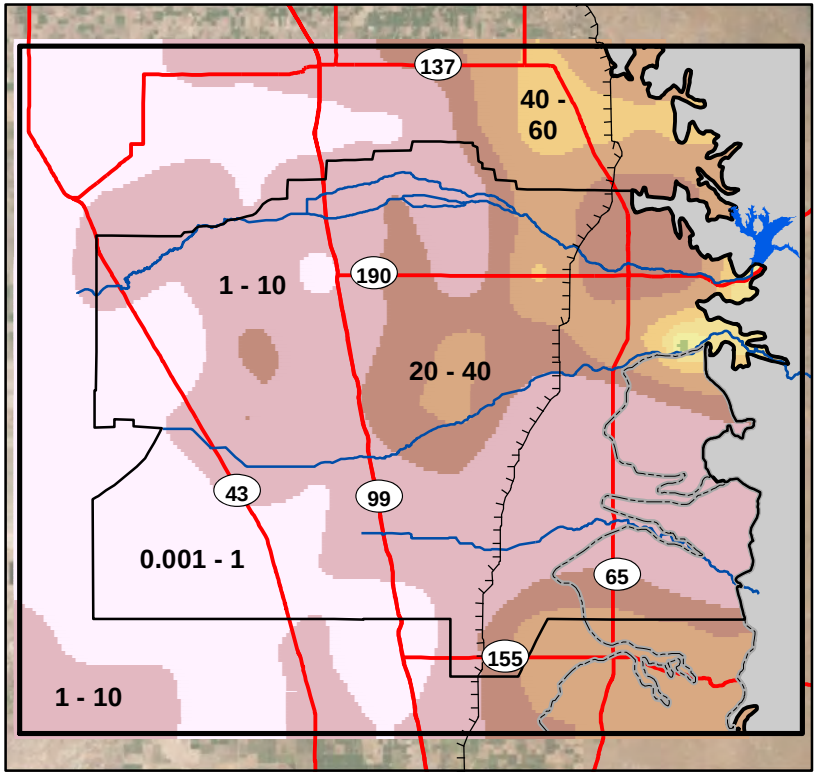
Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021

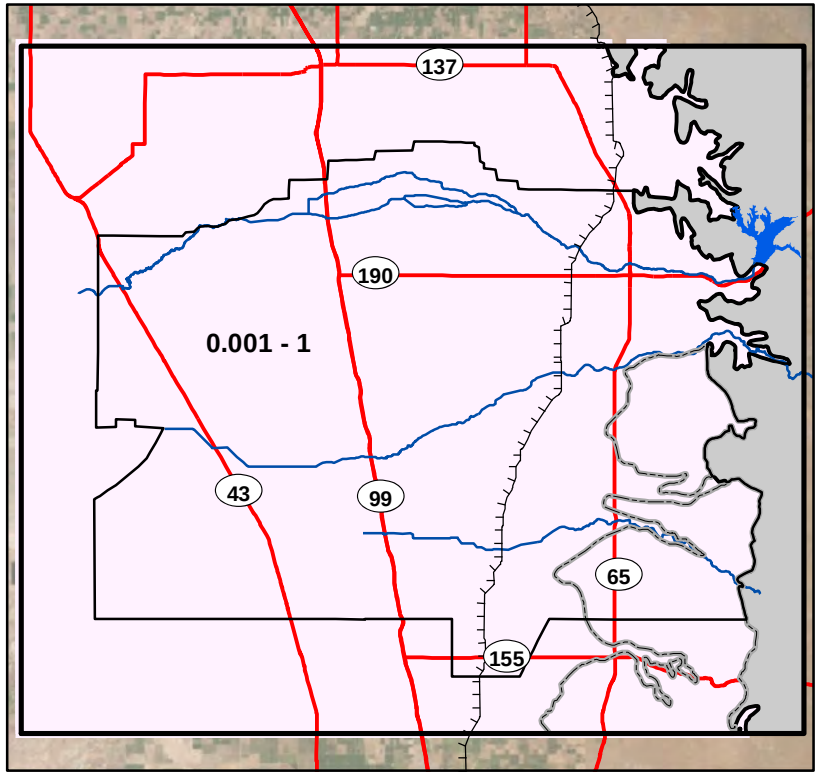
2020 Model

Min: 0.001
Max: 120



2020 Model to 2019 Model Ratio

Min: 0.001
Max: 1



Map Features

Model Calibrated Horizontal Hydraulic Conductivity (ft/day)

- 0.001 - 1
- 1 - 10
- 10 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80 - 100
- 100 - 150
- 150 - 200

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 2 Horizontal Hydraulic Conductivity

Attachment B-2

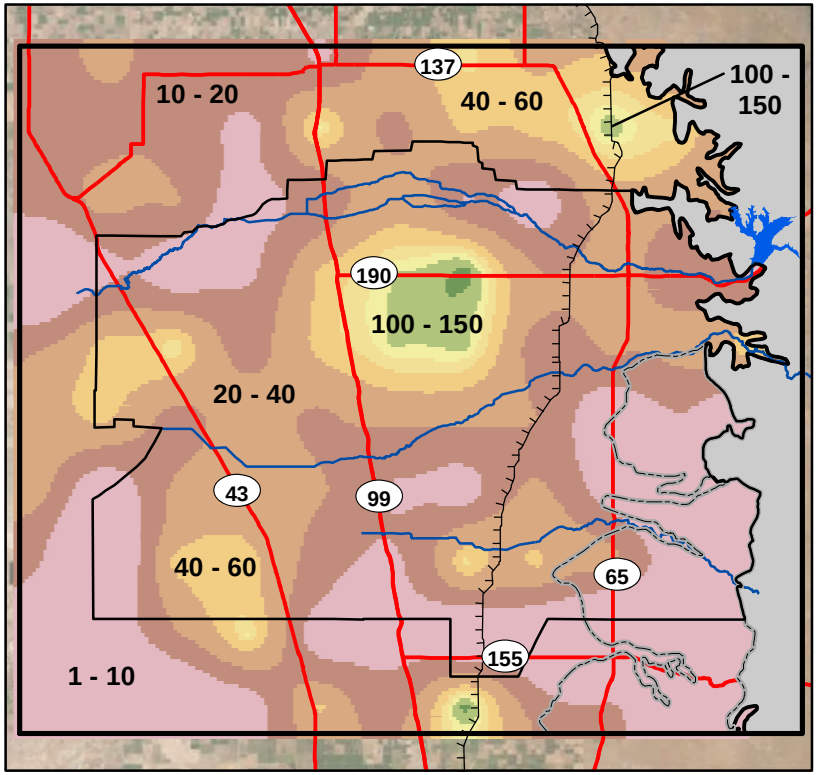
Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021

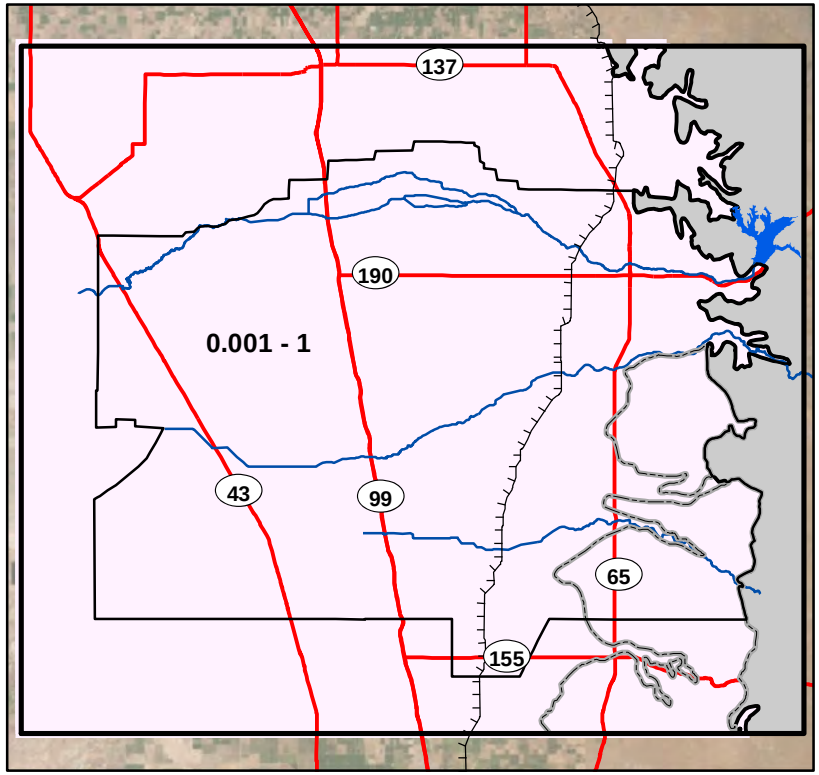
2020 Model

Min: 0.001
Max: 200



2020 Model to 2019 Model Ratio

Min: 0.001
Max: 1



Map Features

Model Calibrated Horizontal Hydraulic Conductivity (ft/day)

- 0.001 - 1
- 1 - 10
- 10 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80 - 100
- 100 - 150
- 150 - 200

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

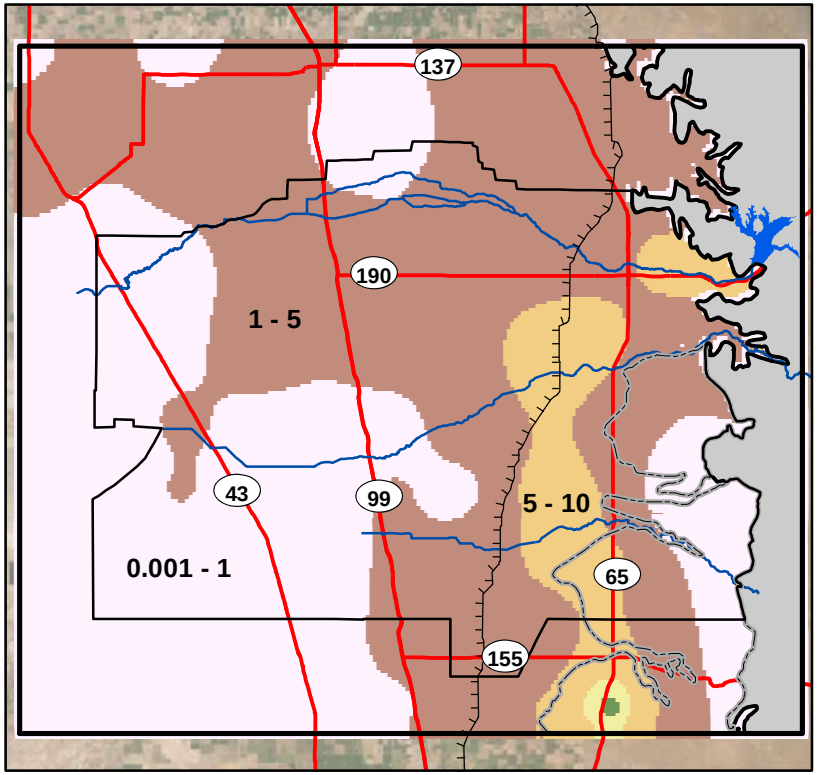
Layer 3 Horizontal Hydraulic Conductivity

Attachment B-3

Tule Subbasin Technical Advisory Committee

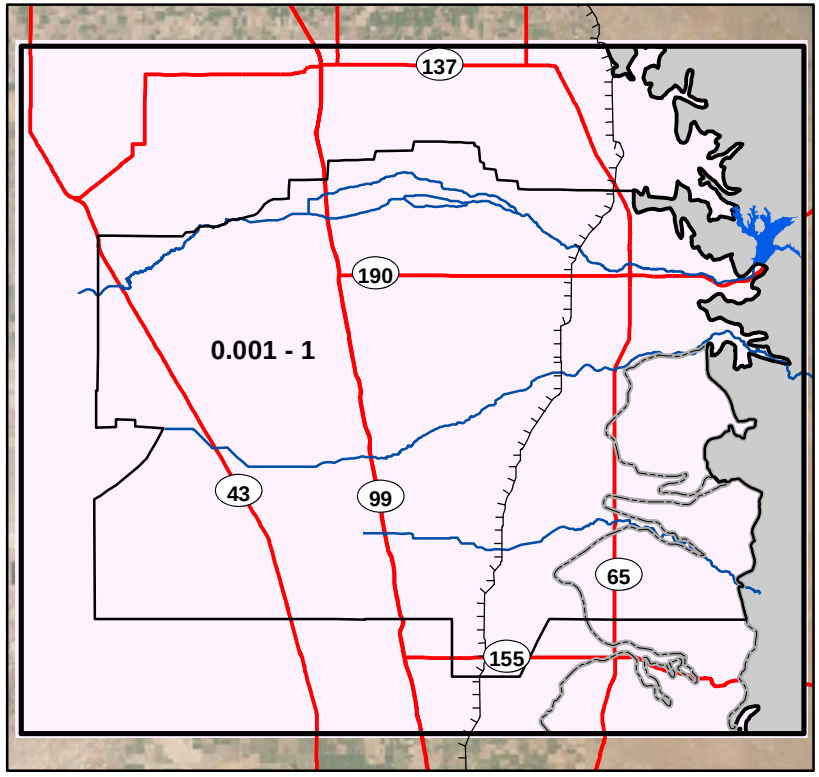
2020 Model

Min: 0.001
Max: 20



2020 Model to 2019 Model Ratio

Min: 0.001
Max: 1



Map Features

Model Calibrated Horizontal Hydraulic Conductivity (ft/day)
- 0.001 - 1
- 1 - 5
- 5 - 10
- 10 - 15
- 15 - 20

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

Layer 4 Horizontal Hydraulic Conductivity

Attachment B-4

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

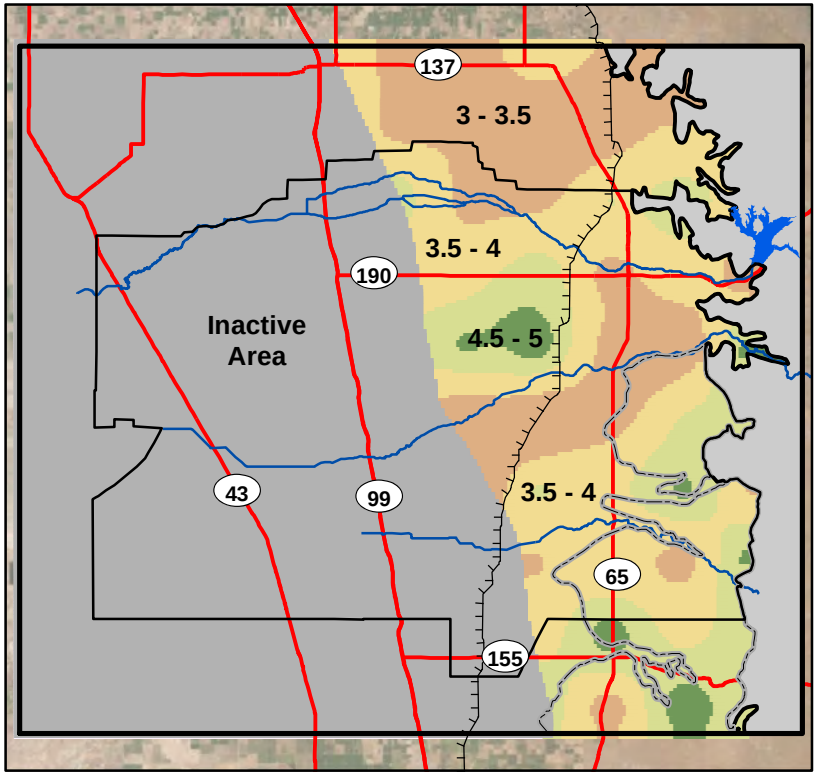
June 2021

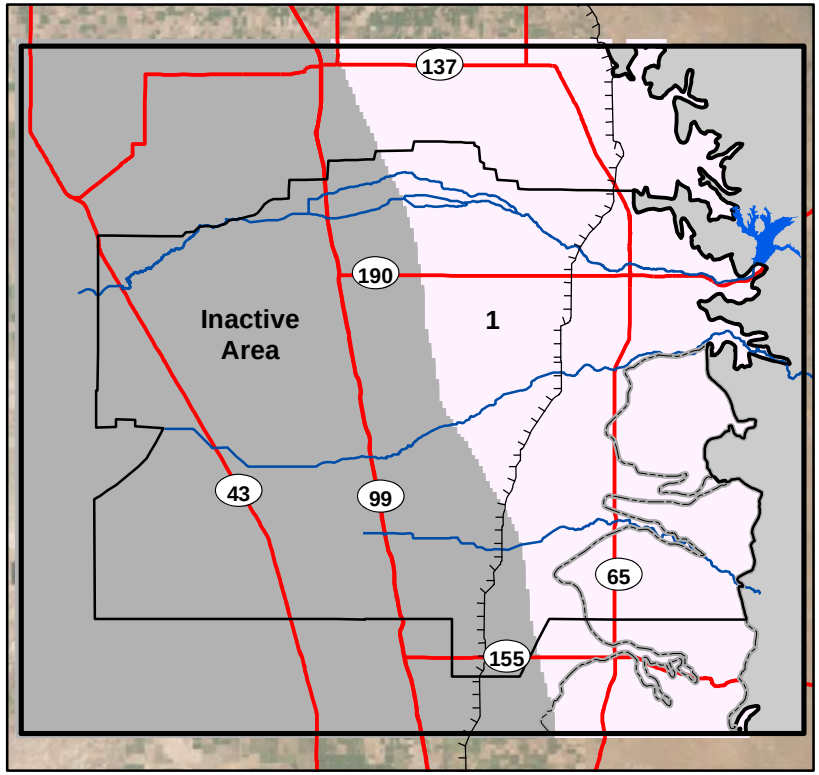
2020 Model

Min: 3
Max: 5

2020 Model to 2019 Model Ratio

Min: 1
Max: 1





Map Features

Model Calibrated Horizontal Hydraulic Conductivity (ft/day)

- 0.001 - 1
- 1 - 3
- 3 - 3.5
- 3.5 - 4
- 4 - 4.5
- 4.5 - 5
- Inactive Area

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

DRAFT

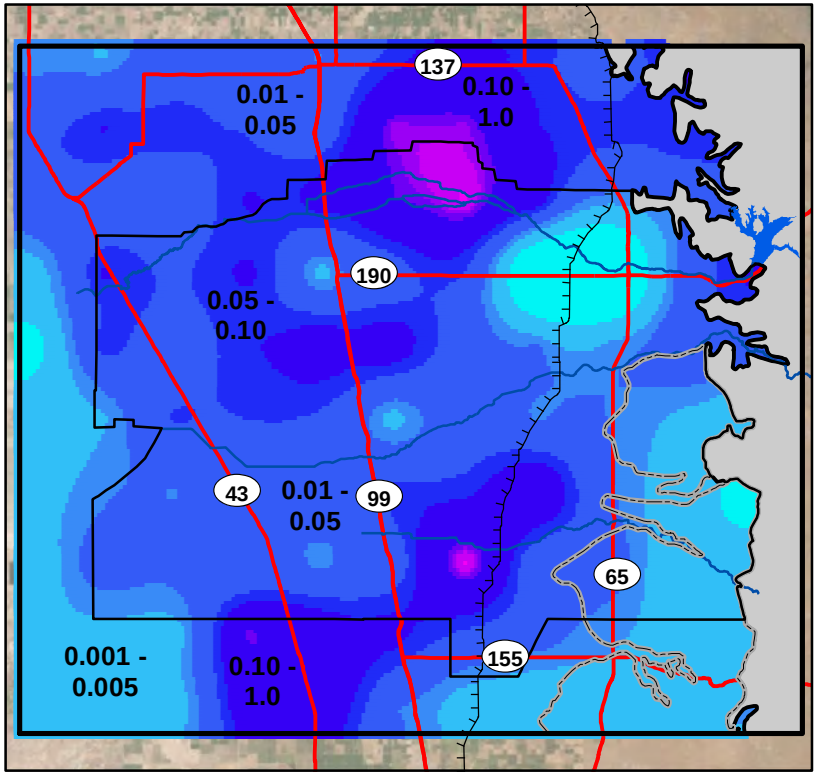
Layer 5 Horizontal Hydraulic Conductivity

Attachment B-5

Tule Subbasin Technical Advisory Committee

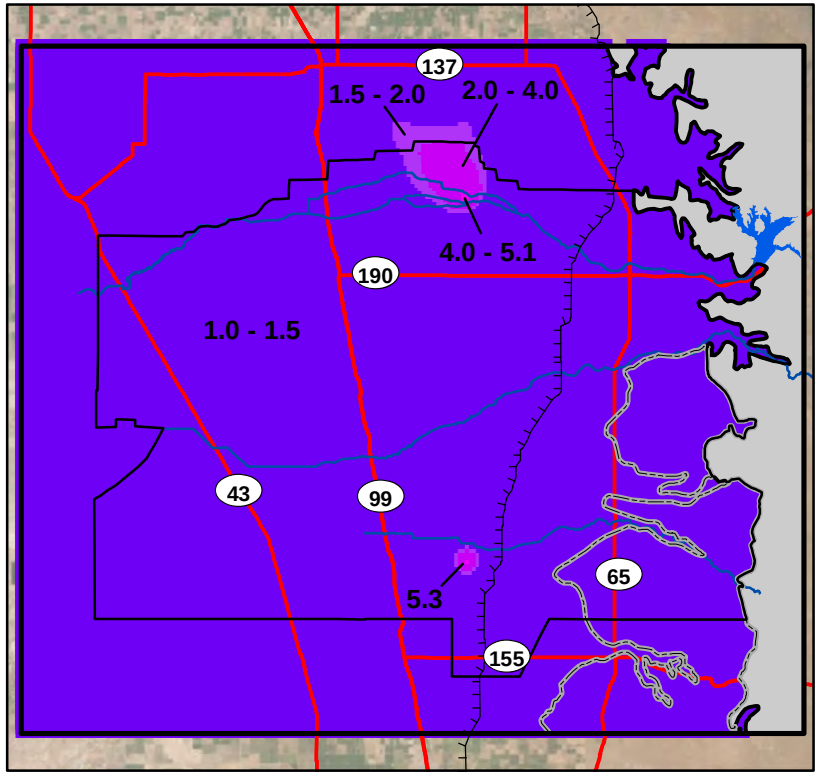
2020 Model

Min: 0.00001
Max: 5.3



2020 Model to 2019 Model Ratio

Min: 1.0
Max: 5.3



Map Features

Model Calibrated Vertical Hydraulic Conductivity (ft/day)

- 0.000001 - 0.001
- 0.001 - 0.005
- 0.005 - 0.01
- 0.01 - 0.05
- 0.05 - 0.10
- 0.10 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 4.0
- 4.0 - 6.0

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 1 Vertical Hydraulic Conductivity

Attachment B-6

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

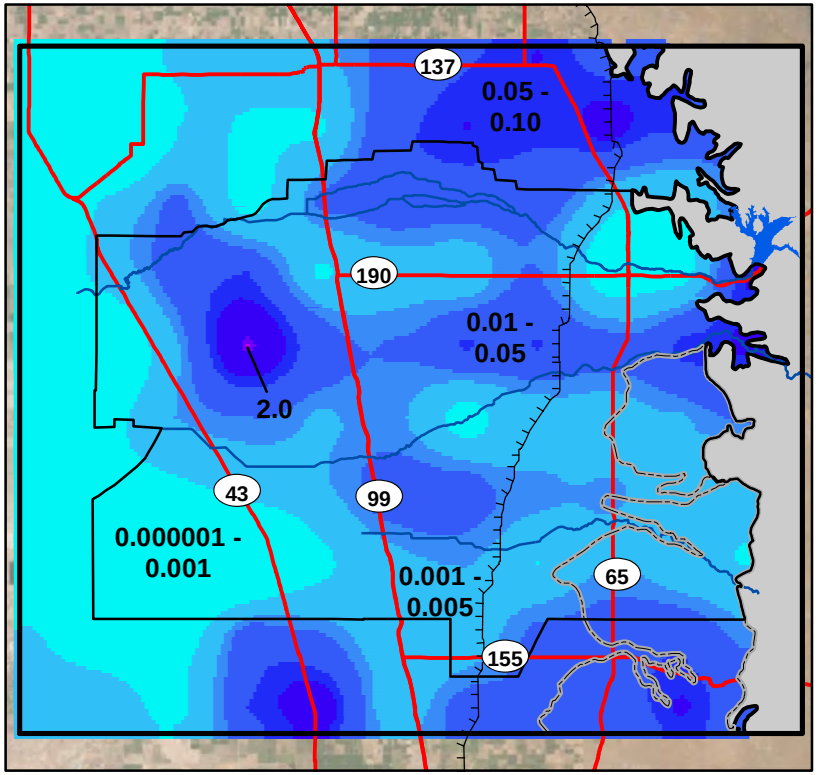
June 2021

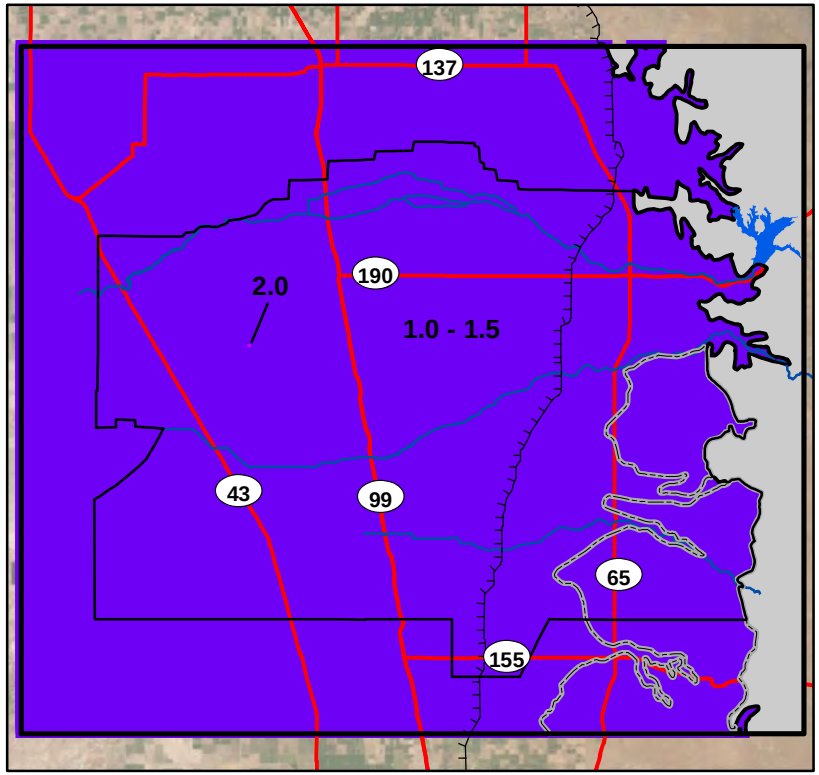
2020 Model

Min: 0.000001
Max: 2.0

2020 Model to 2019 Model Ratio

Min: 1.0
Max: 2.0





Map Features

Model Calibrated Vertical Hydraulic Conductivity (ft/day)

- 0.000001 - 0.001
- 0.001 - 0.005
- 0.005 - 0.01
- 0.01 - 0.05
- 0.05 - 0.10
- 0.10 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 4.0
- 4.0 - 6.0

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

Layer 2 Vertical Hydraulic Conductivity

Attachment B-7

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

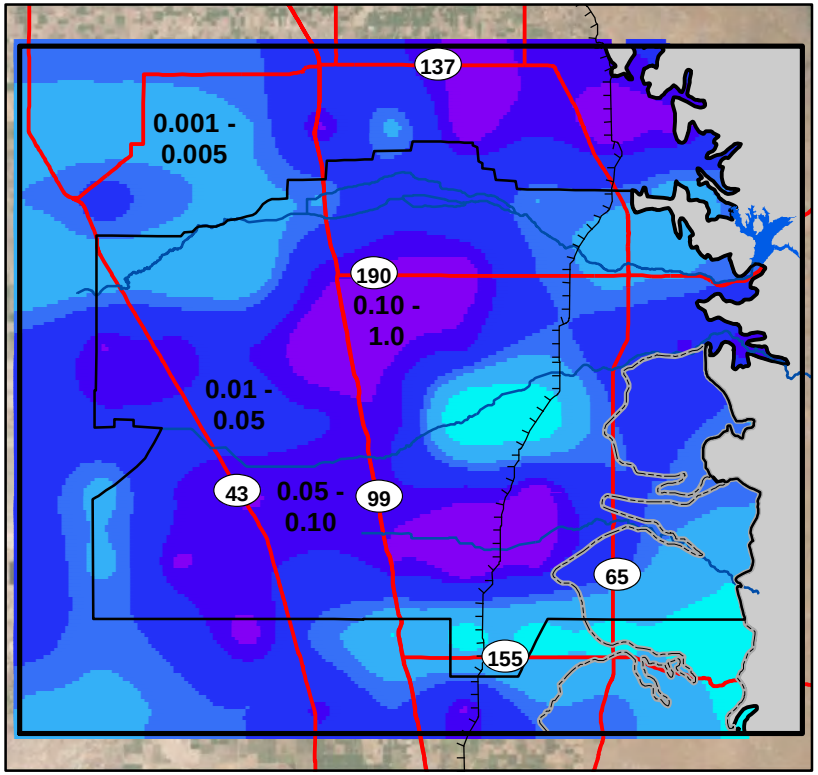
June 2021

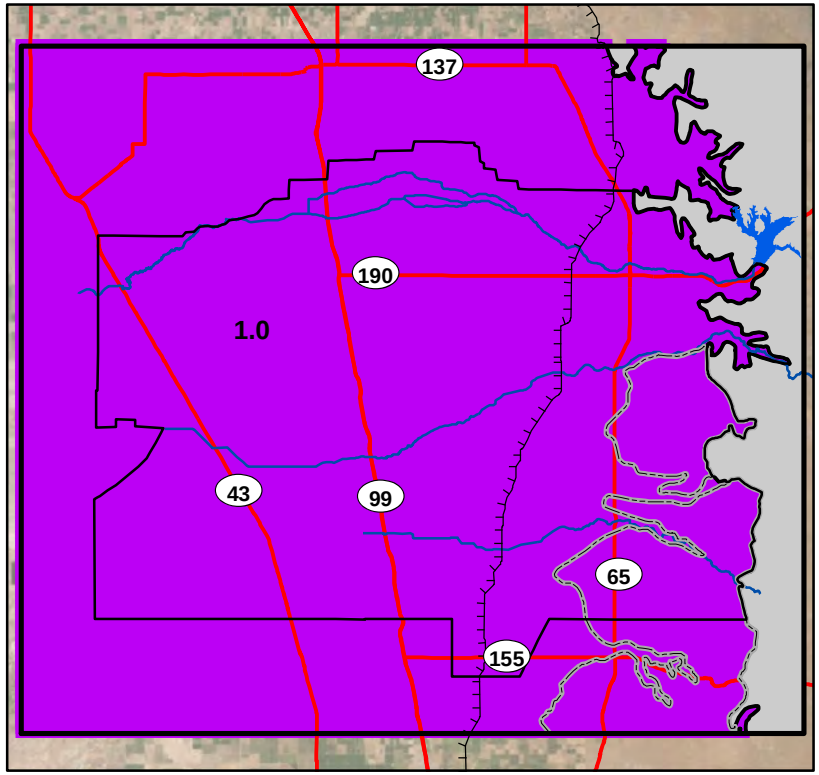
2020 Model

Min: 0.00004
Max: 0.5

2020 Model to 2019 Model Ratio

Min: 1.0
Max: 1.0





Map Features

Model Calibrated Vertical Hydraulic Conductivity (ft/day)

- 0.00004 - 0.001
- 0.001 - 0.005
- 0.005 - 0.01
- 0.01 - 0.05
- 0.05 - 0.10
- 0.10 - 1.0
- 1.0 - 3.0
- 3.0 - 6.0

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 3 Vertical Hydraulic Conductivity

Attachment B-8

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

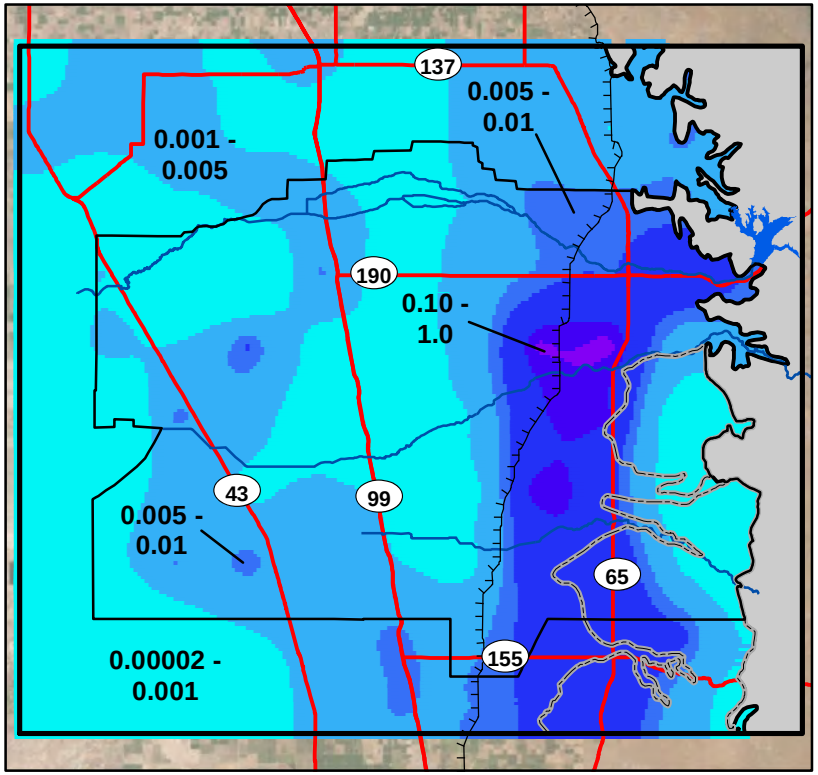
June 2021

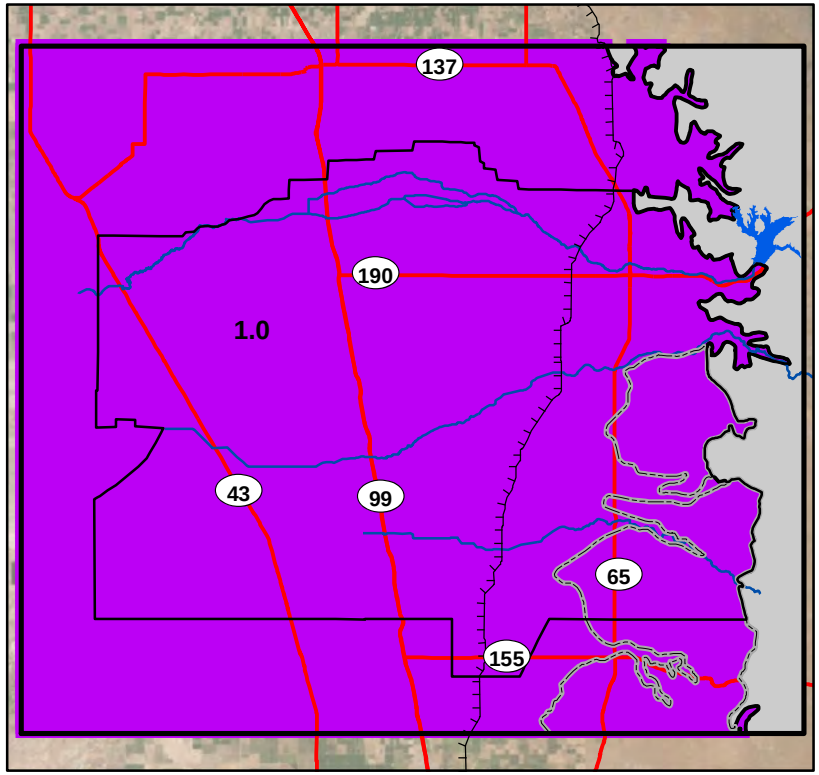
2020 Model

Min: 0.00002
Max: 0.1

2020 Model to 2019 Model Ratio

Min: 1.0
Max: 1.0





Map Features

Model Calibrated Vertical Hydraulic Conductivity (ft/day)

- 0.00002 - 0.001
- 0.001 - 0.005
- 0.005 - 0.01
- 0.01 - 0.05
- 0.05 - 0.10
- 0.10 - 1.0
- 1.0 - 3.0
- 3.0 - 6.0

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

Layer 4 Vertical Hydraulic Conductivity

Attachment B-9

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

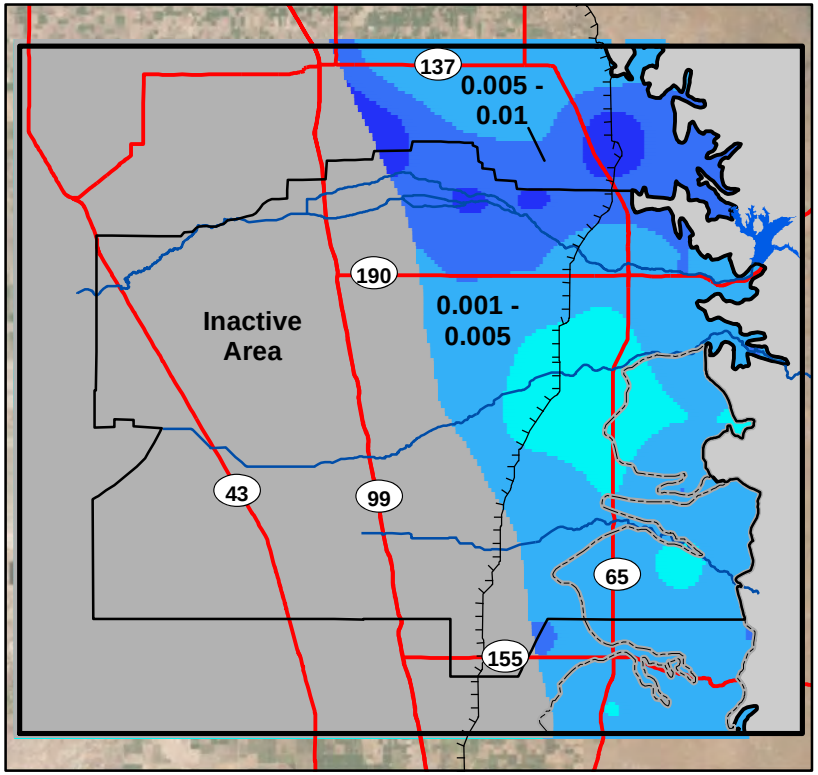
June 2021

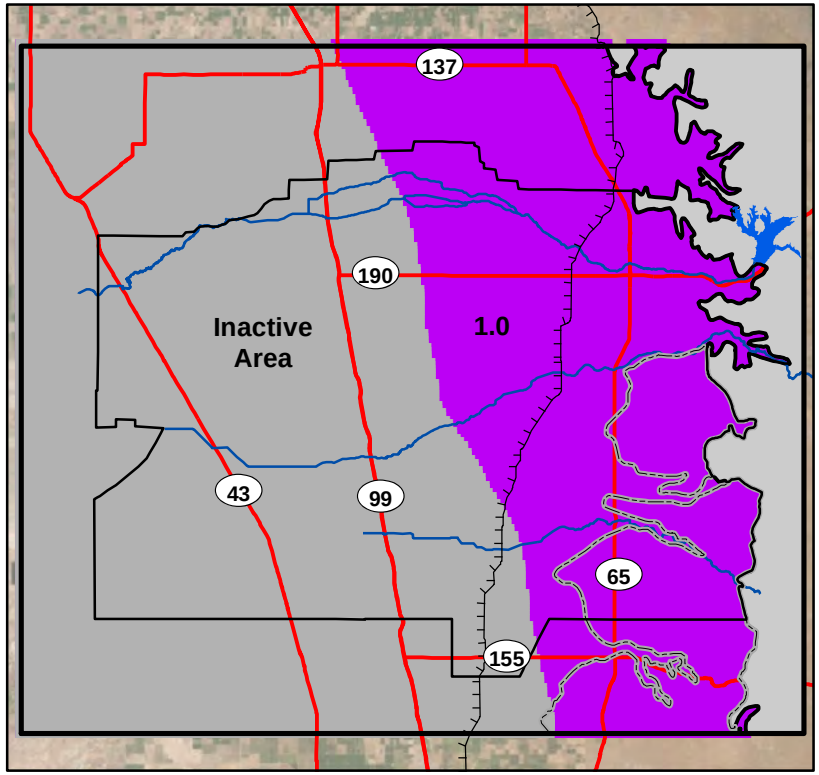
2020 Model

Min: 0.0004
Max: 0.02

2020 Model to 2019 Model Ratio

Min: 1.0
Max: 1.0





Map Features

Model Calibrated Vertical Hydraulic Conductivity (ft/day)

- 0.0004 - 0.001
- 0.001 - 0.005
- 0.005 - 0.01
- 0.01 - 0.05
- 0.05 - 0.10
- 0.10 - 1.0
- 1.0 - 3.0
- 3.0 - 6.0
- Inactive Area
- Tertiary Loosely Consolidated Deposits
- Tule Subbasin
- Model Domain
- No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 5 Vertical Hydraulic Conductivity

Attachment B-10

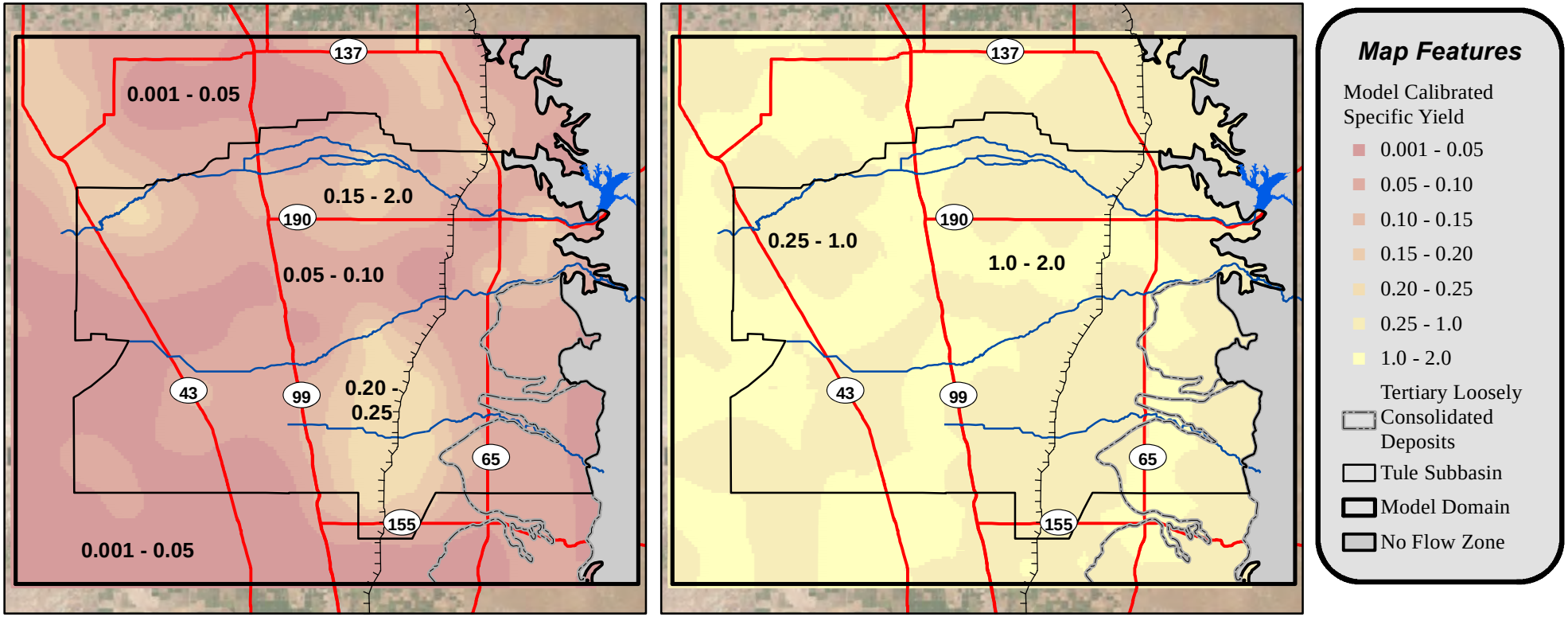
Tule Subbasin Technical Advisory Committee

2020 Model

Min: 0.001
Max: 0.25

2020 Model to 2019 Model Ratio

Min: 0.18
Max: 1.0



N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

Layer 1 Specific Yield

Attachment B-11

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

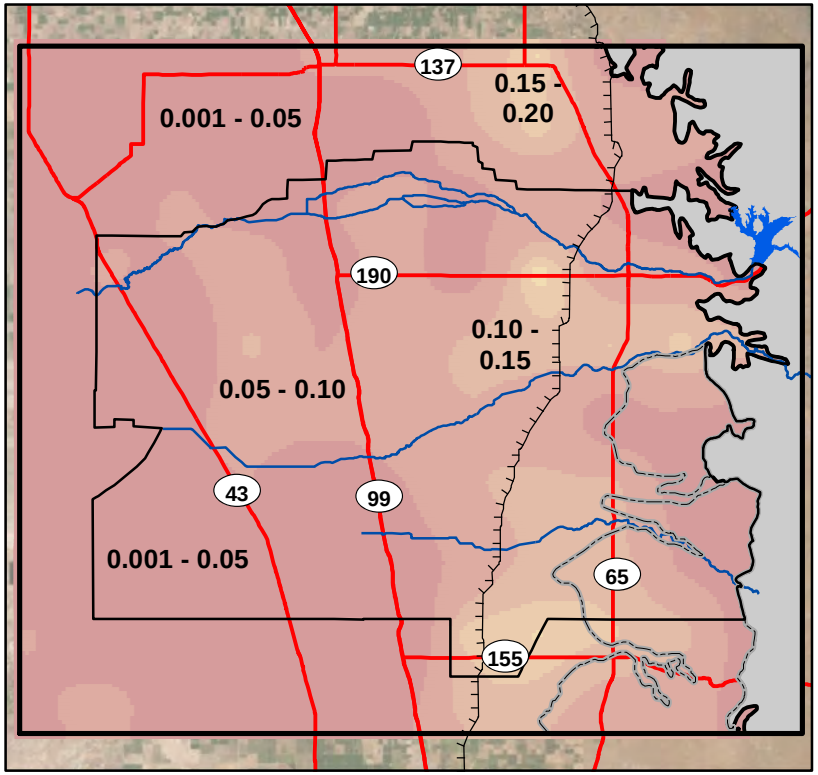
June 2021

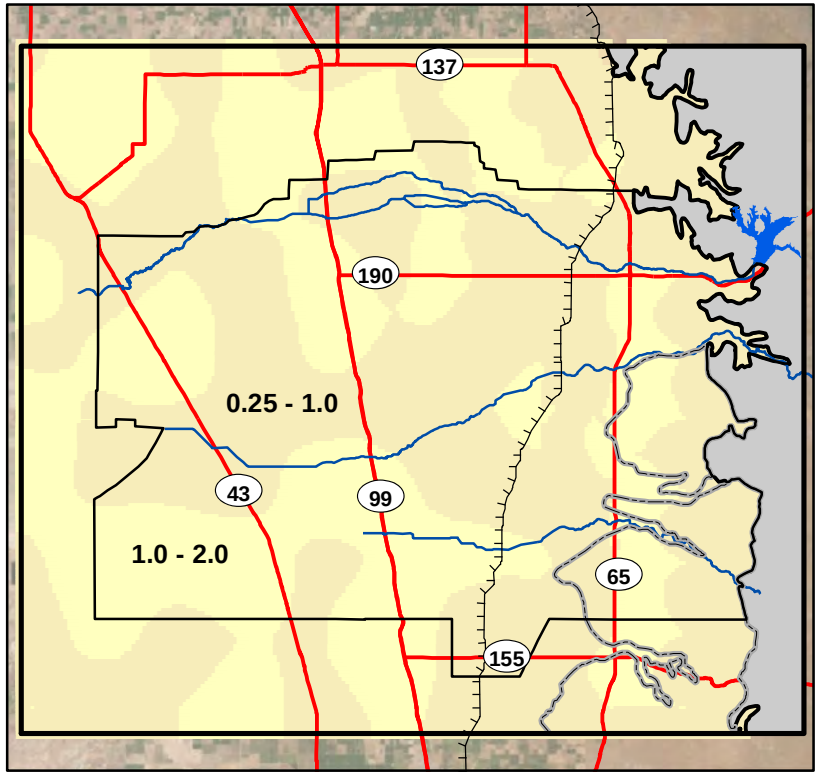
2020 Model

Min: 0.001
Max: 0.25

2020 Model to 2019 Model Ratio

Min: 0.03
Max: 1.0





Map Features

Model Calibrated Specific Yield
- 0.001 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.25
- 0.25 - 1.0
- 1.0 - 2.0

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 2 Specific Yield

Attachment B-12

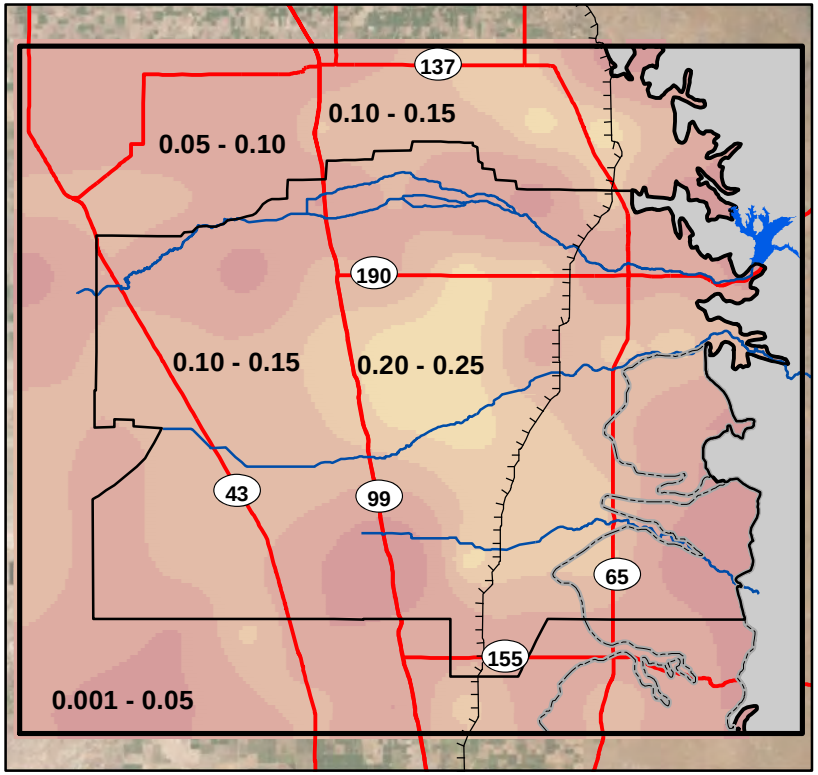
Tule Subbasin Technical Advisory Committee

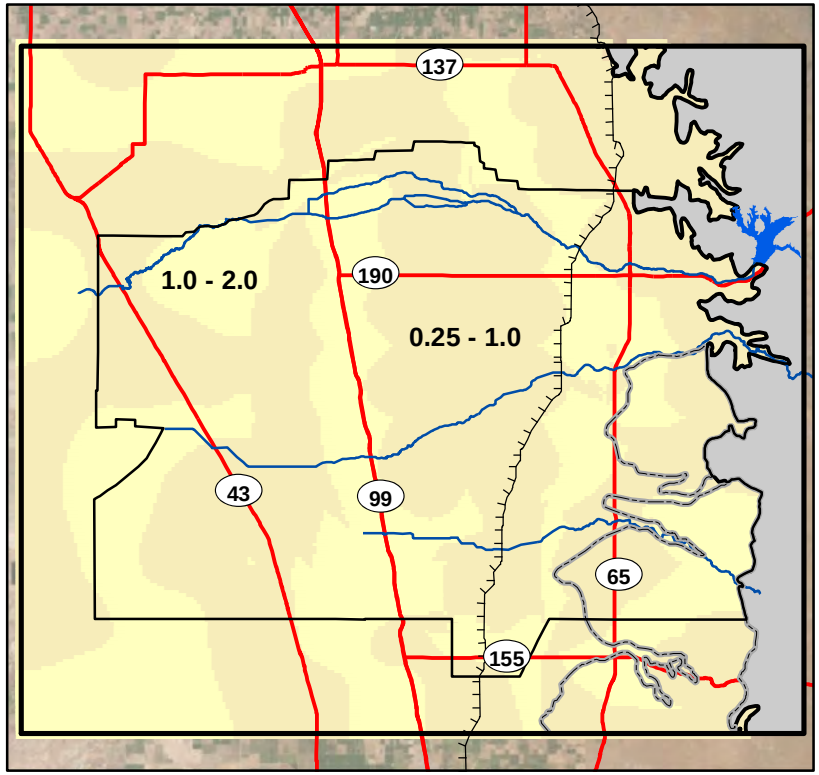
2020 Model

Min: 0.001
Max: 0.25

2020 Model to 2019 Model Ratio

Min: 0.03
Max: 1.6





Map Features

Model Calibrated Specific Yield
- 0.001 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.25
- 0.25 - 1.0
- 1.0 - 2.0

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

Layer 3 Specific Yield

Attachment B-13

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

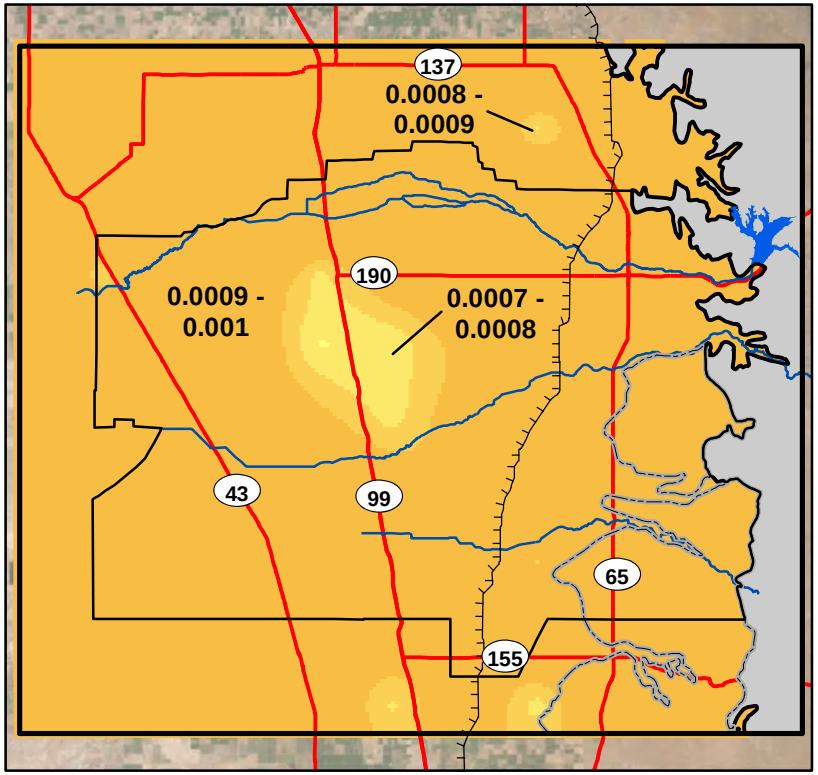
June 2021

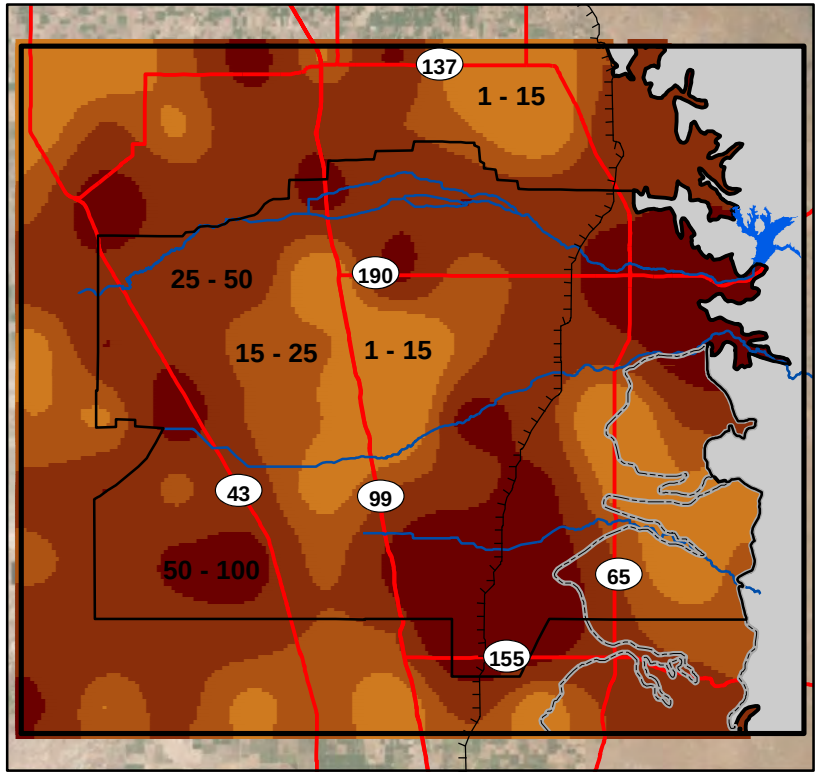
2020 Model

Min: 0.0007
Max: 0.001

2020 Model to 2019 Model Ratio

Min: 4
Max: 100





Map Features

Model Calibrated Elastic Storage
- 0.0006 - 0.0007
- 0.0007 - 0.0008
- 0.0008 - 0.0009
- 0.0009 - 0.001
- 0.001 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 1 Elastic Storage

Attachment B-14

Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

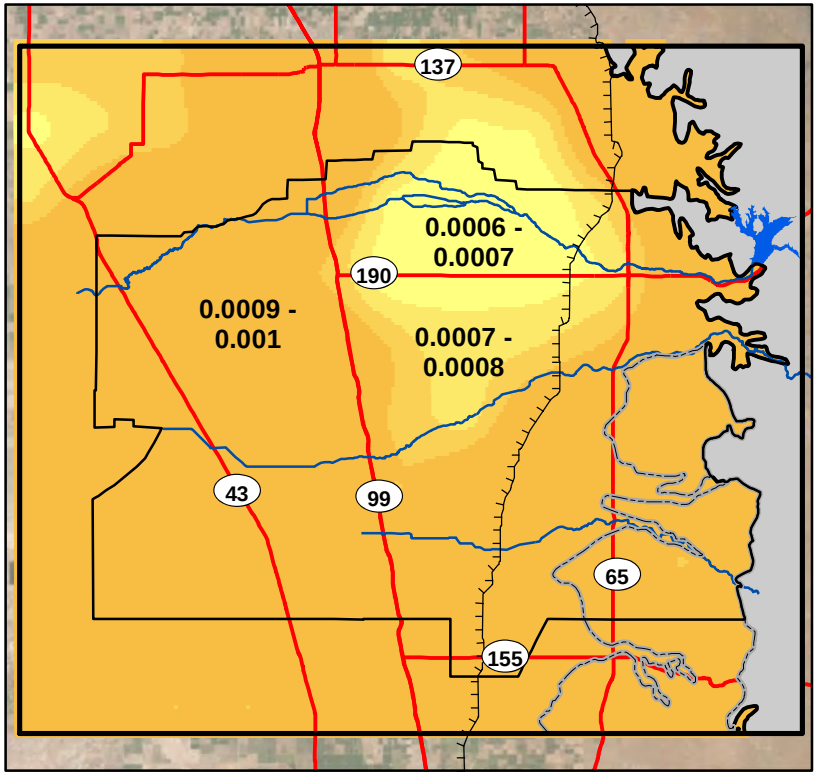
June 2021

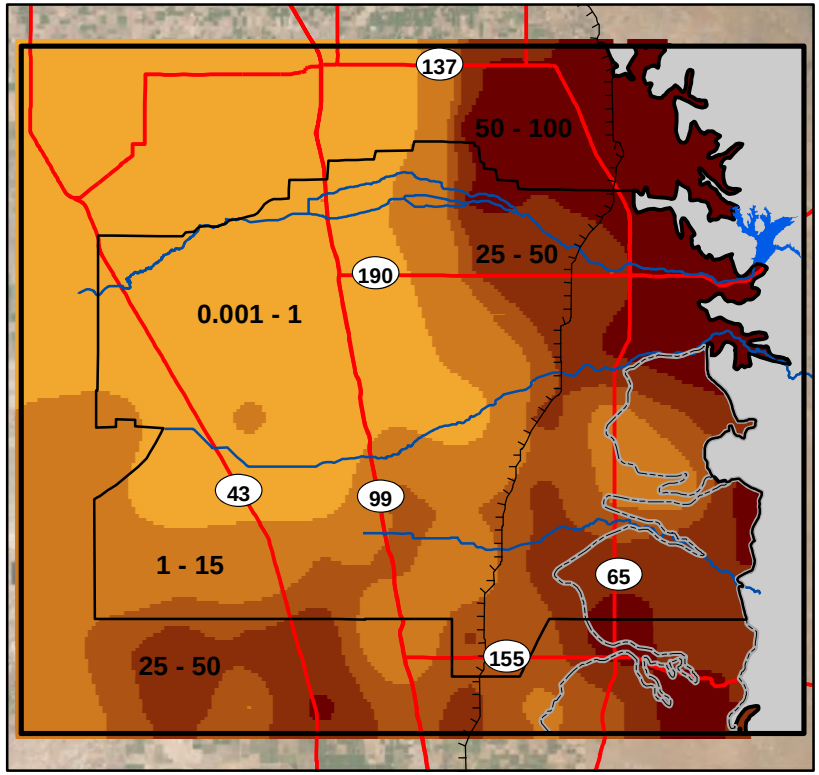
2020 Model

Min: 0.0006
Max: 0.001

2020 Model to 2019 Model Ratio

Min: 0.6
Max: 100





Map Features

Model Calibrated Elastic Storage

- 0.0006 - 0.0007
- 0.0007 - 0.0008
- 0.0008 - 0.0009
- 0.0009 - 0.001
- 0.001 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 2 Elastic Storage

Attachment B-15

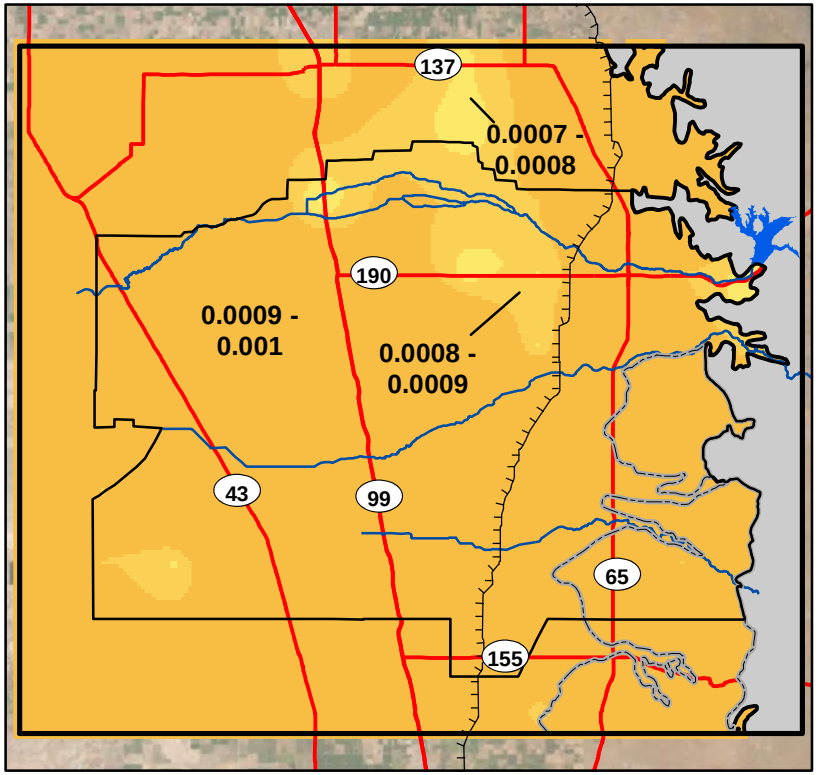
Tule Subbasin Technical Advisory Committee

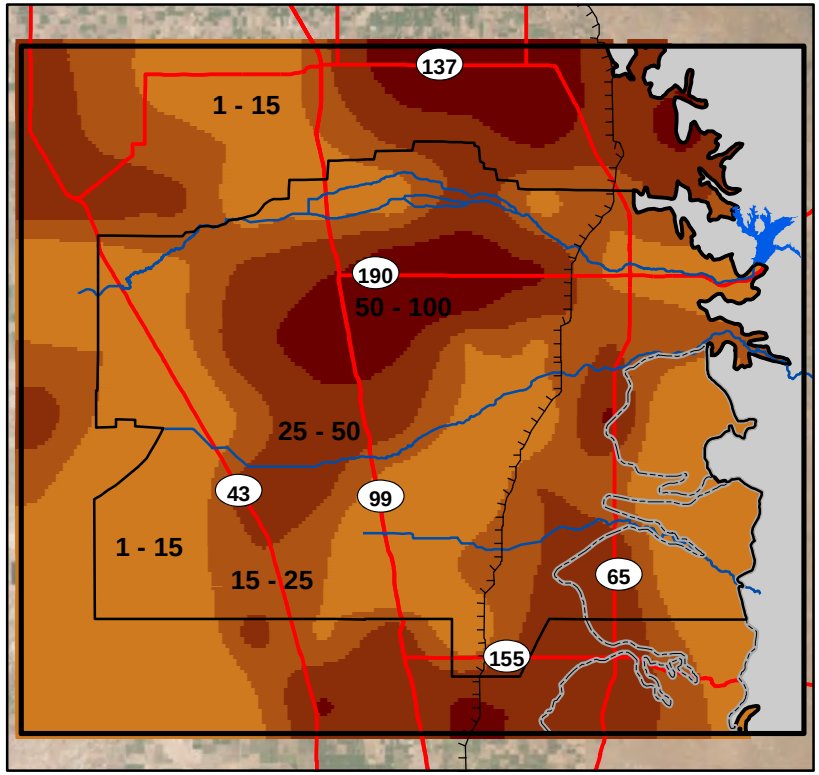
2020 Model

Min: 0.0007
Max: 0.001

2020 Model to 2019 Model Ratio

Min: 1
Max: 100





Map Features

Model Calibrated Elastic Storage
- 0.0006 - 0.0007
- 0.0007 - 0.0008
- 0.0008 - 0.0009
- 0.0009 - 0.001
- 0.001 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

Layer 3 Elastic Storage

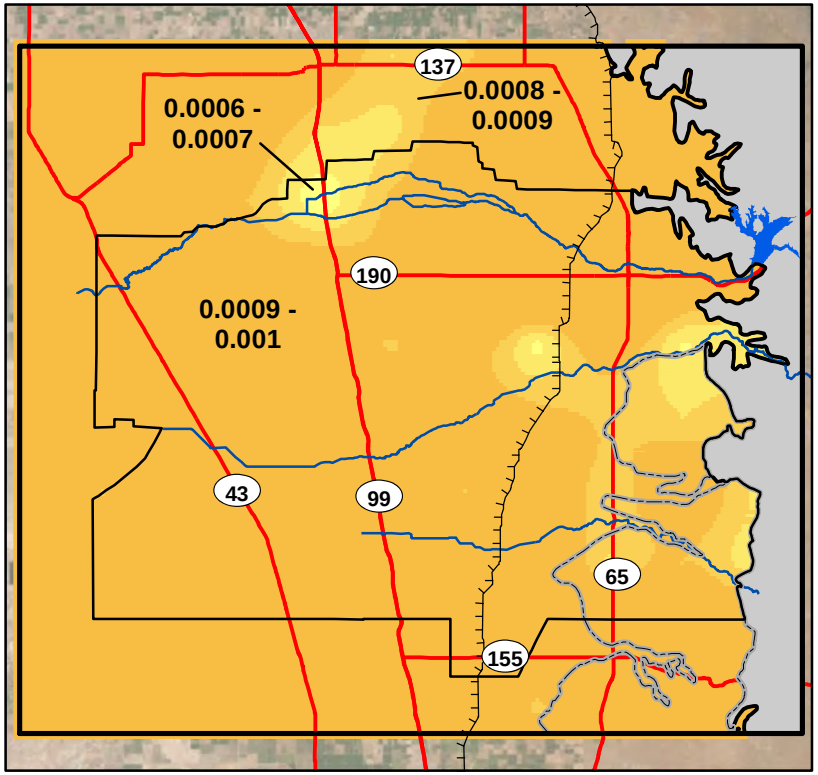
Tule Subbasin Technical Advisory Committee

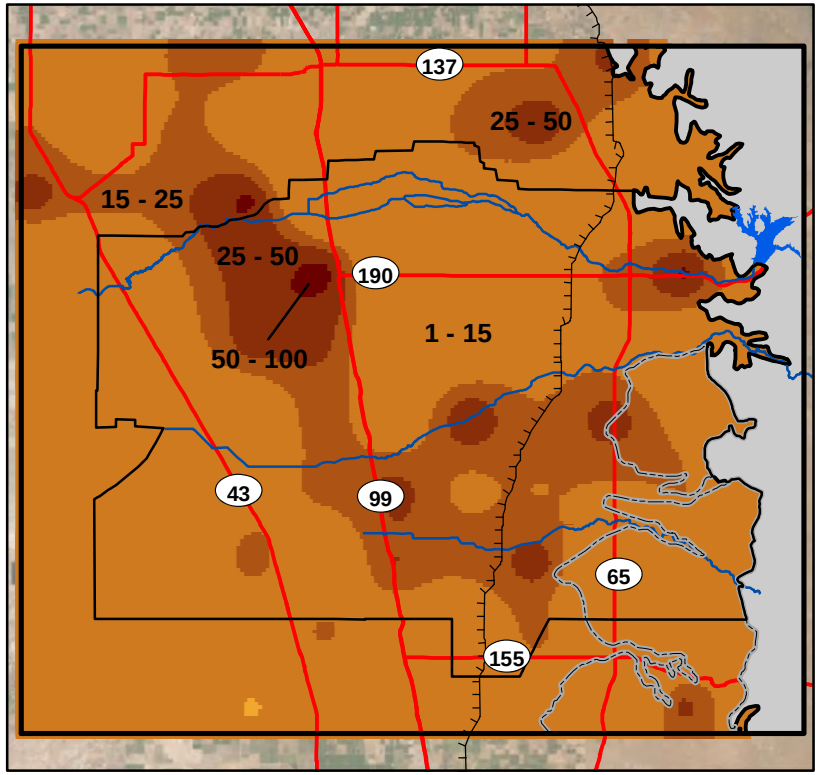
2020 Model

Min: 0.0006
Max: 0.001

2020 Model to 2019 Model Ratio

Min: 1
Max: 79





Map Features

Model Calibrated Elastic Storage
- 0.0006 - 0.0007
- 0.0007 - 0.0008
- 0.0008 - 0.0009
- 0.0009 - 0.001
- 0.001 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

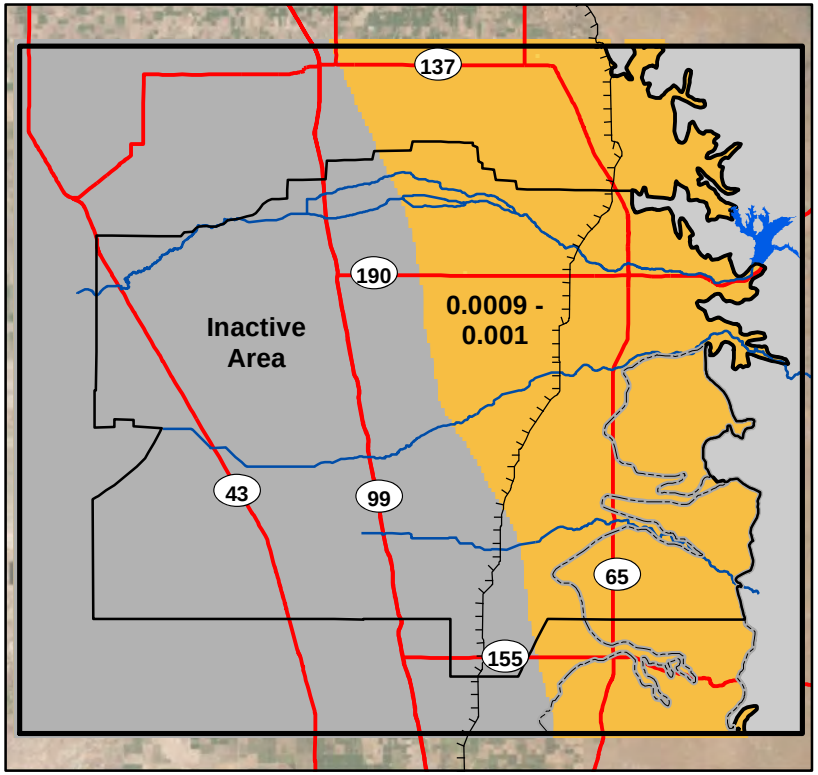
Layer 4 Elastic Storage

Attachment B-17

Tule Subbasin Technical Advisory Committee

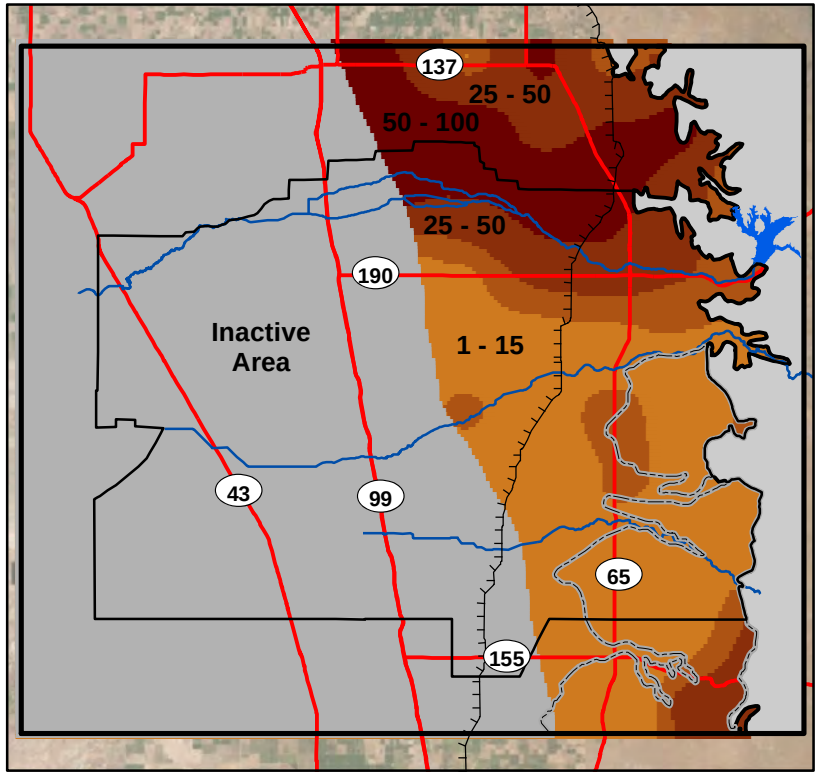
2020 Model

Min: 0.0009
Max: 0.001



2020 Model to 2019 Model Ratio

Min: 3
Max: 83



Map Features

Model Calibrated Elastic Storage
- 0.0006 - 0.0007
- 0.0007 - 0.0008
- 0.0008 - 0.0009
- 0.0009 - 0.001
- 0.001 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100
- Inactive Area

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

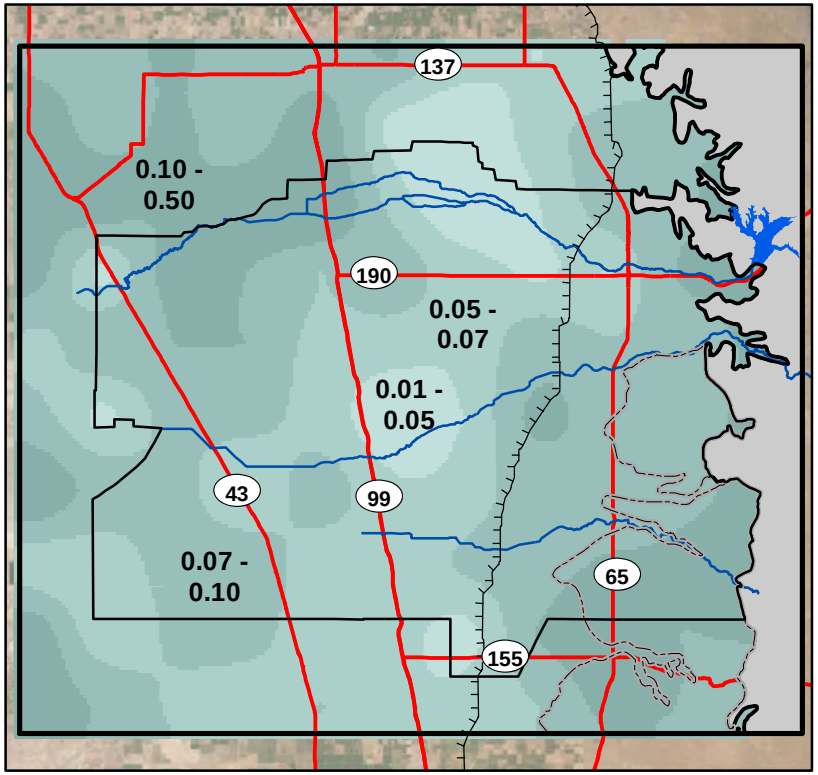
Layer 5 Elastic Storage

Attachment B-18

Tule Subbasin Technical Advisory Committee

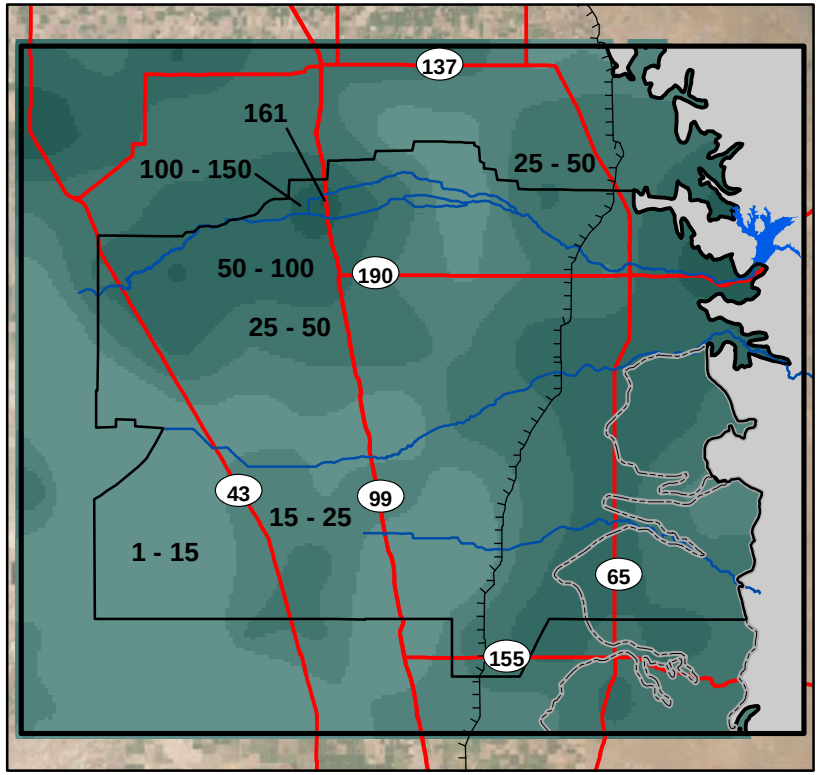
2020 Model

Min: 0.03
Max: 0.18



2020 Model to 2019 Model Ratio

Min: 1
Max: 161



Map Features

Model Calibrated Inelastic Storage
- 0.001 - 0.01
- 0.01 - 0.05
- 0.05 - 0.07
- 0.07 - 0.10
- 0.10 - 0.50
- 0.50 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 180

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

Layer 1 Inelastic Storage

Attachment B-19

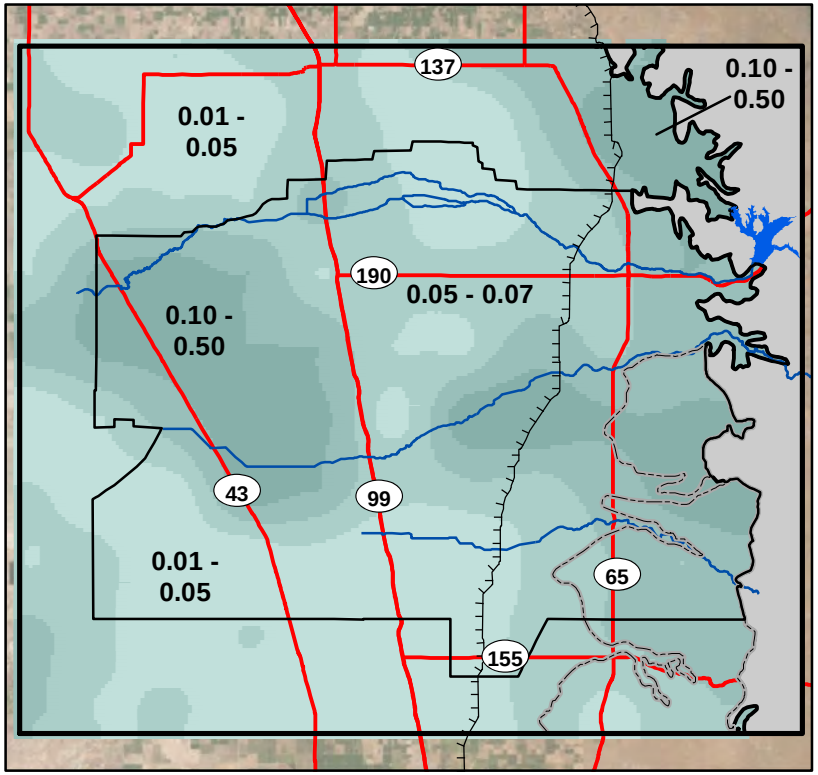
Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021

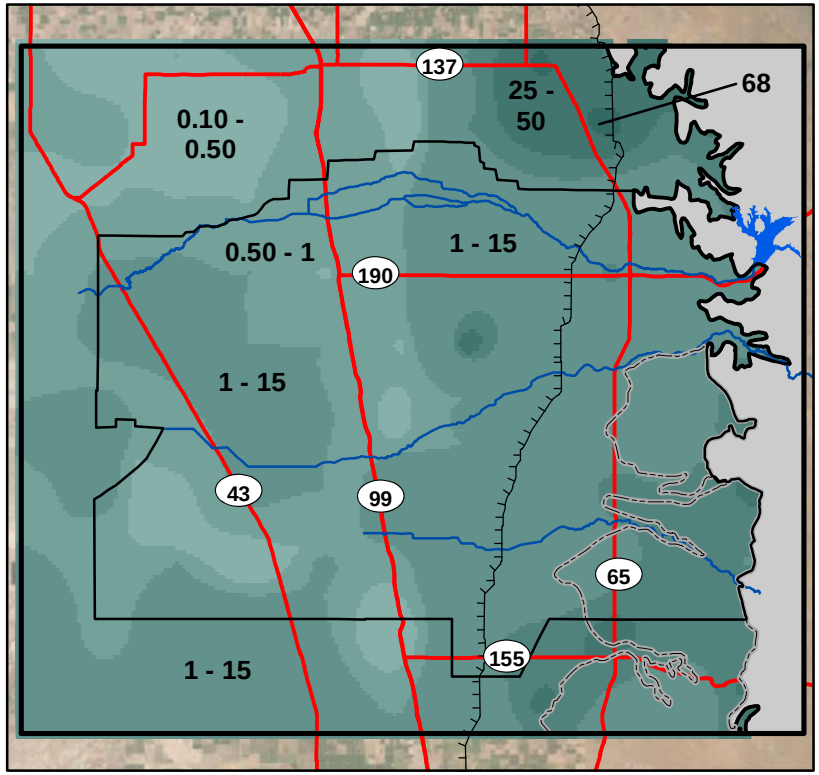
2020 Model

Min: 0.02
Max: 0.17



2020 Model to 2019 Model Ratio

Min: 0.10
Max: 68



Map Features

Model Calibrated Inelastic Storage

- 0.001 - 0.01
- 0.01 - 0.05
- 0.05 - 0.07
- 0.07 - 0.10
- 0.10 - 0.50
- 0.50 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 180

Tertiary Loosely Consolidated Deposits

Tule Subbasin

Model Domain

No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

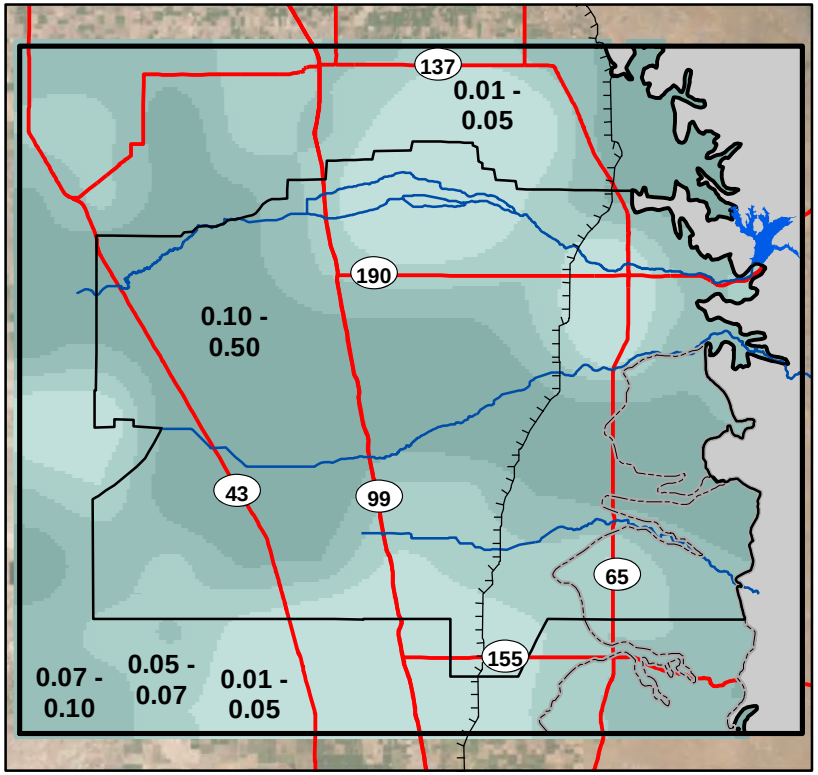
Layer 2 Inelastic Storage

Attachment B-20

Tule Subbasin Technical Advisory Committee

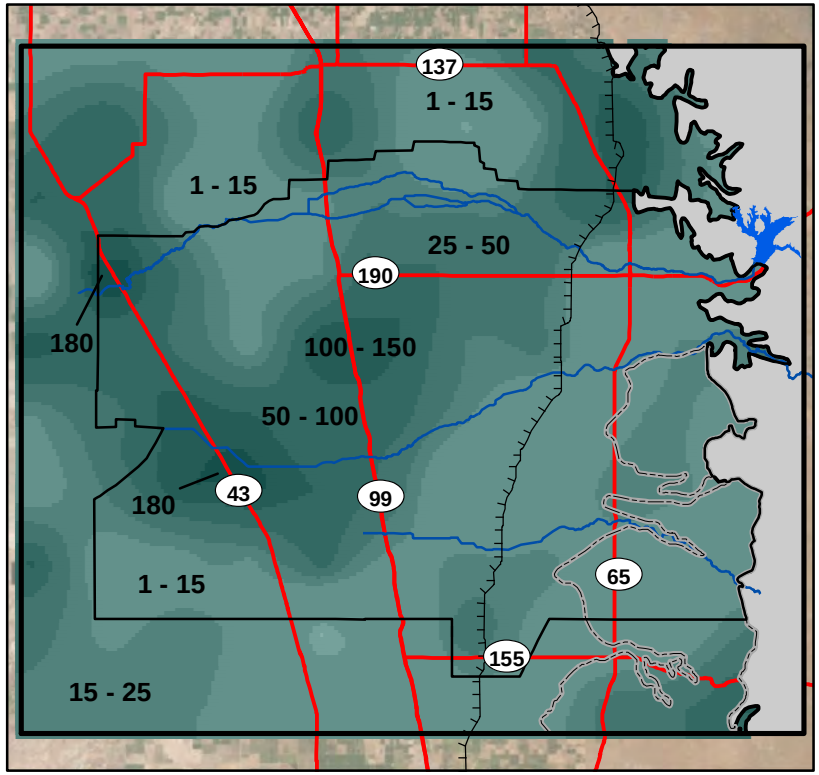
2020 Model

Min: 0.01
Max: 0.20



2020 Model to 2019 Model Ratio

Min: 0.44
Max: 180



Map Features

Model Calibrated Inelastic Storage
- 0.001 - 0.01
- 0.01 - 0.05
- 0.05 - 0.07
- 0.07 - 0.10
- 0.10 - 0.50
- 0.50 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 180

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

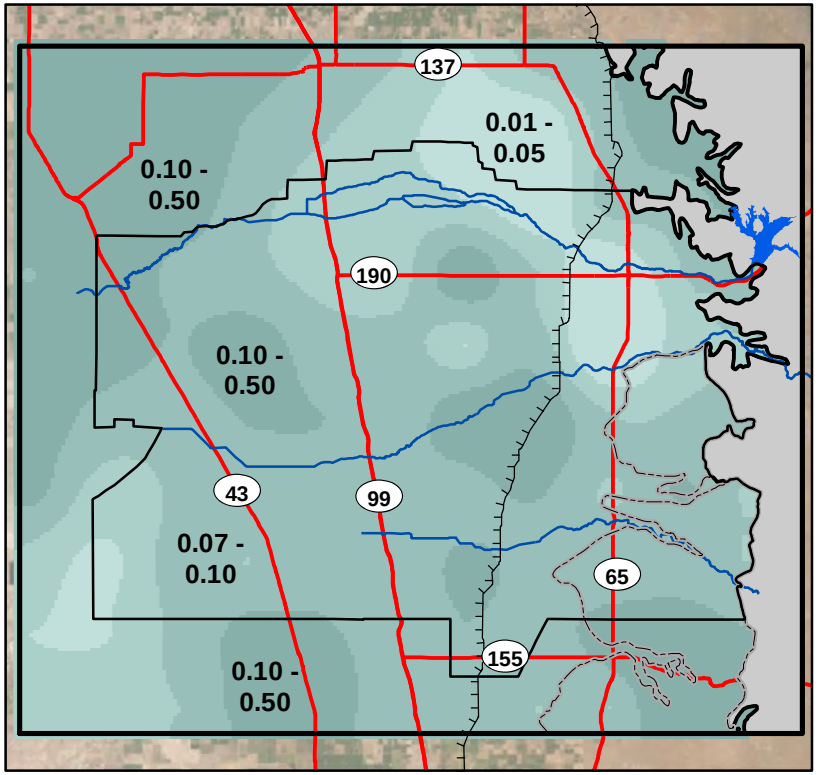
Layer 3 Inelastic Storage

Attachment B-21

Tule Subbasin Technical Advisory Committee

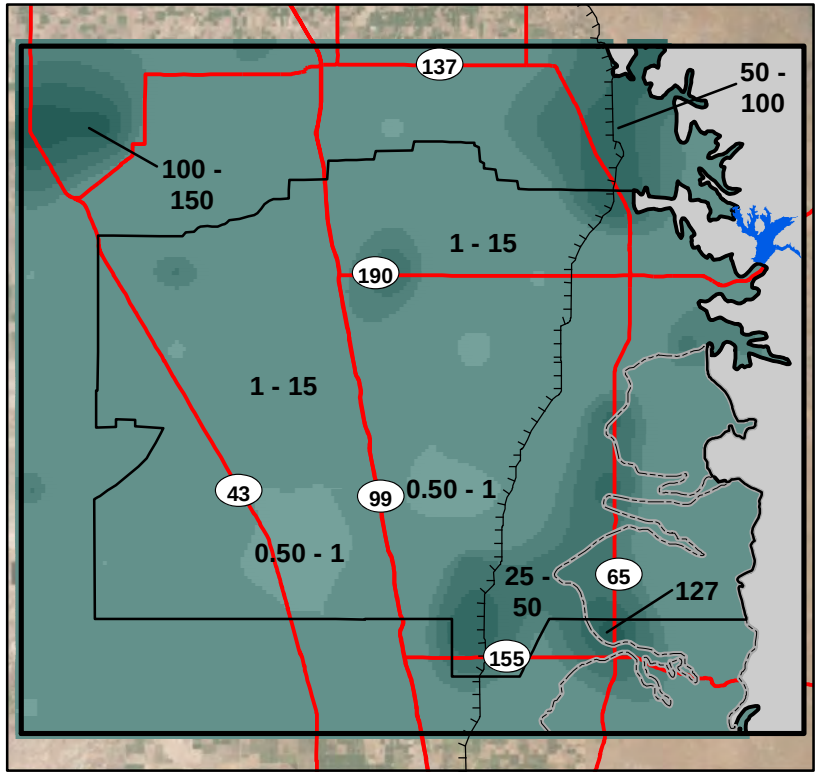
2020 Model

Min: 0.02
Max: 0.18



2020 Model to 2019 Model Ratio

Min: 0.61
Max: 127



Map Features

Model Calibrated Inelastic Storage
- 0.001 - 0.01
- 0.01 - 0.05
- 0.05 - 0.07
- 0.07 - 0.10
- 0.10 - 0.50
- 0.50 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 180

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

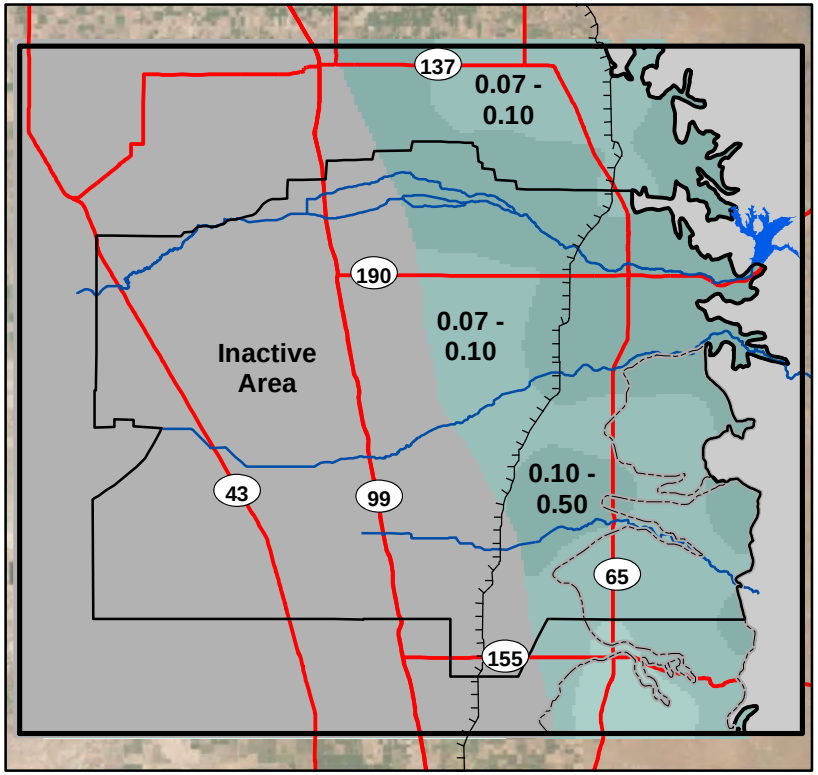
Layer 4 Inelastic Storage

Attachment B-22

Tule Subbasin Technical Advisory Committee

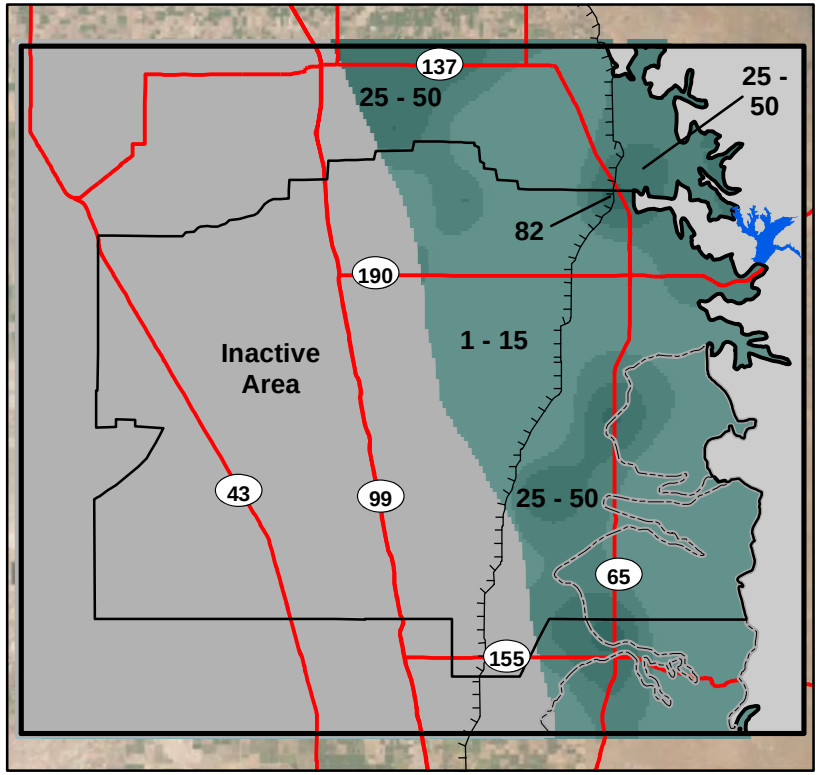
2020 Model

Min: 0.06
Max: 0.17



2020 Model to 2019 Model Ratio

Min: 1.9
Max: 82



Map Features

Model Calibrated Inelastic Storage
- 0.001 - 0.01
- 0.01 - 0.05
- 0.05 - 0.07
- 0.07 - 0.10
- 0.10 - 0.50
- 0.50 - 1
- 1 - 15
- 15 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 180
- Inactive Area

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

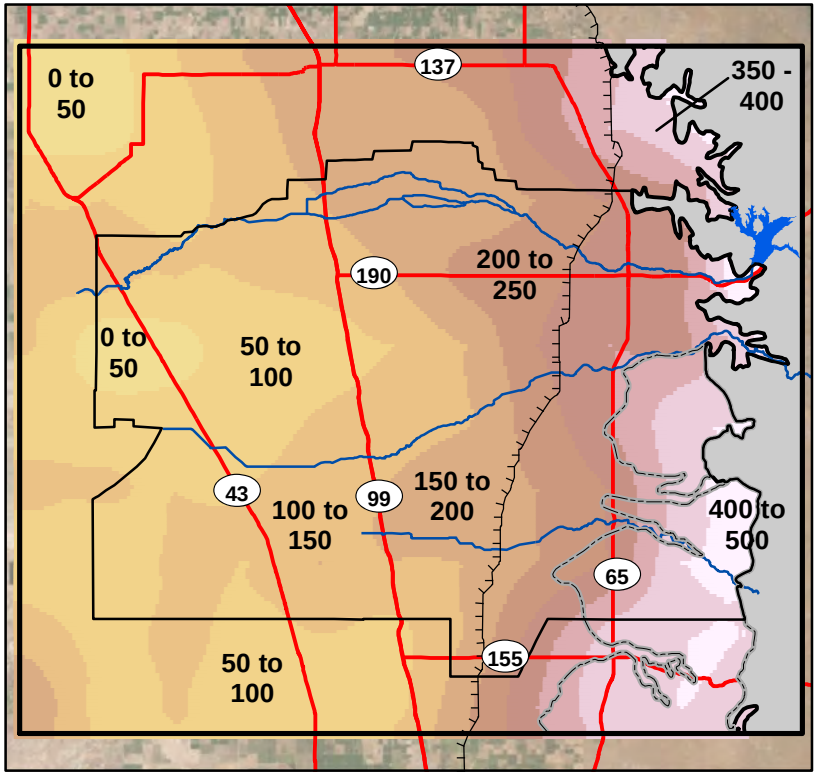
Layer 5 Inelastic Storage

Attachment B-23

Tule Subbasin Technical Advisory Committee

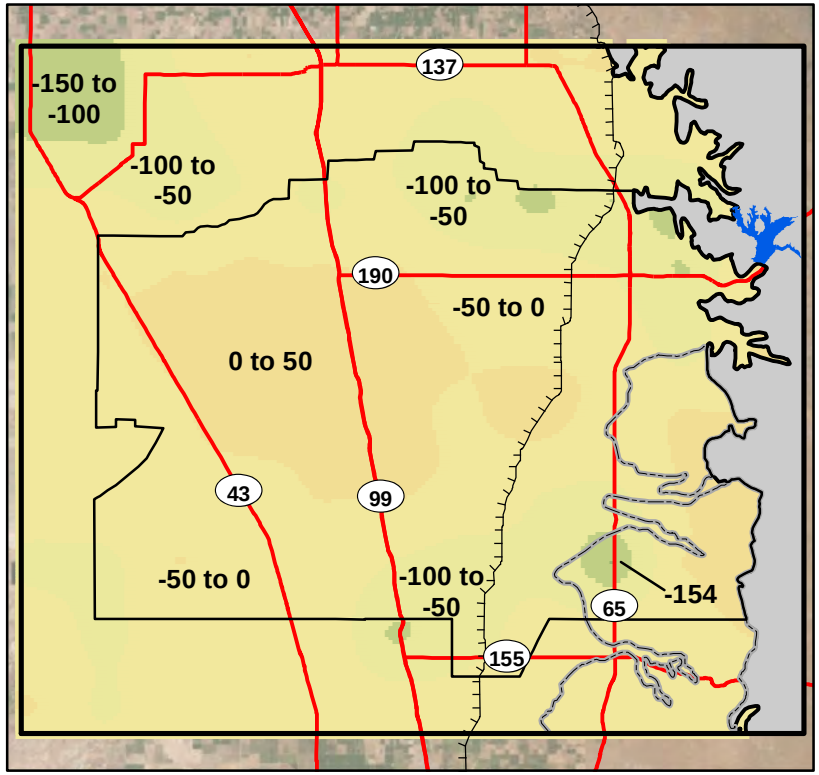
2020 Model

Min: -2
Max: 491



2020 Model and 2019 Model Difference

Min: -154
Max: 23



Map Features

Model Calibrated Critical Head (ft amsl)

- < - 200
- -200 to -150
- -150 to -100
- -100 to -50
- -50 to 0
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 200
- 200 to 250
- 250 to 300
- 300 to 350
- 350 to 400
- 400 to 500

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16 Miles
NAD 83 State Plane Zone 4

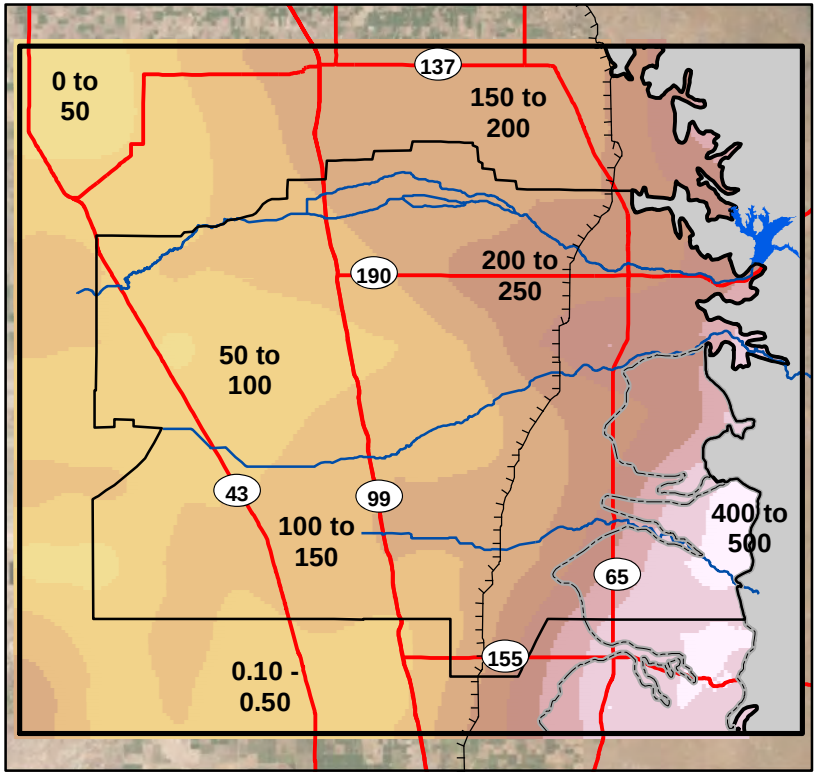
Layer 1 Critical Head

Attachment B-24

Tule Subbasin Technical Advisory Committee

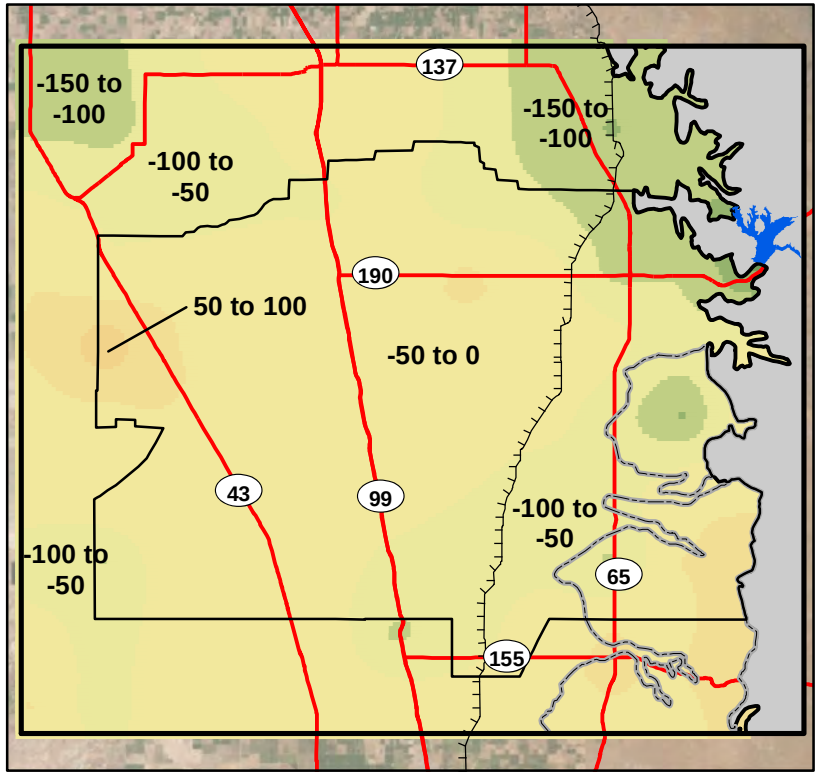
2020 Model

Min: 19
Max: 445



2020 Model and 2019 Model Difference

Min: -216
Max: 95



Map Features

Model Calibrated Critical Head (ft amsl)

- < -200
- -200 to -150
- -150 to -100
- -100 to -50
- -50 to 0
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 200
- 200 to 250
- 250 to 300
- 300 to 350
- 350 to 400
- 400 to 500

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

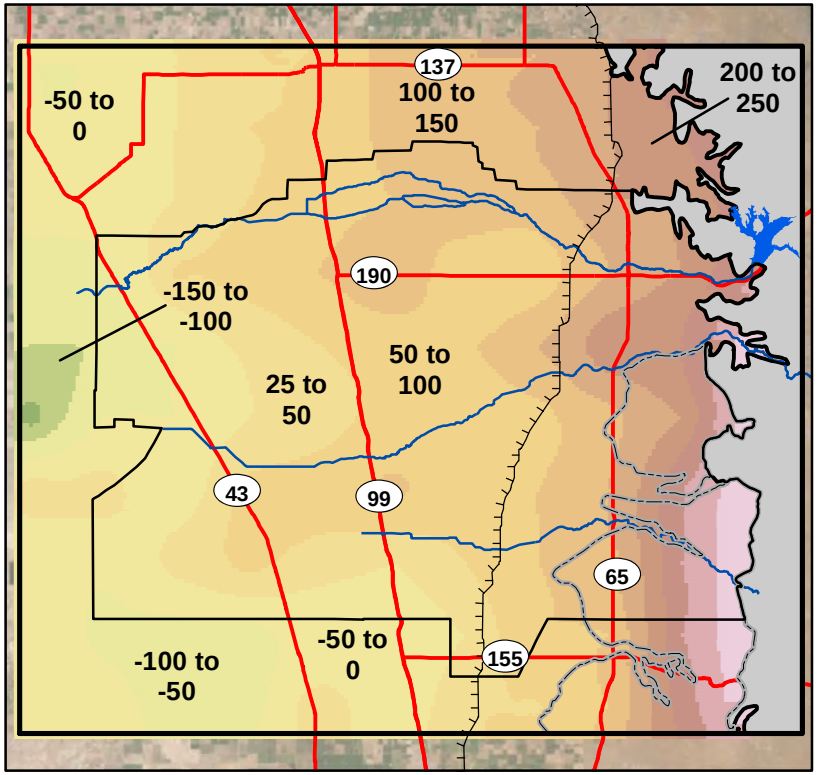
Layer 2 Critical Head

Attachment B-25

Tule Subbasin Technical Advisory Committee

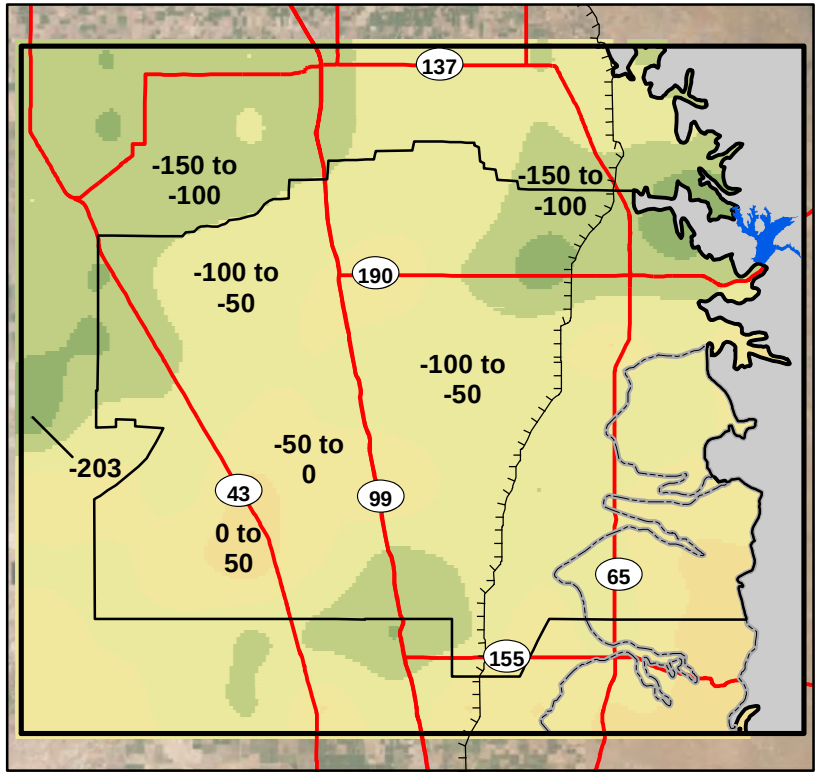
2020 Model

Min: -175
Max: 400



2020 Model and 2019 Mode Difference

Min: -203
Max: 41



Map Features

Model Calibrated Critical Head (ft amsl)

- < -200
- -200 to -150
- -150 to -100
- -100 to -50
- -50 to 0
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 200
- 200 to 250
- 250 to 300
- 300 to 350
- 350 to 400
- 400 to 500

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

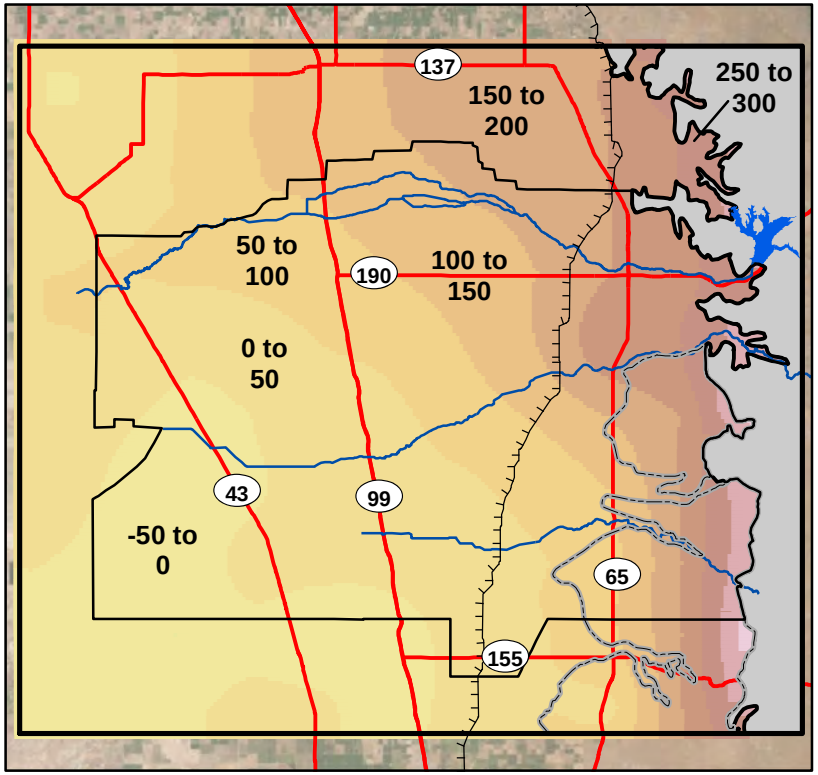
Layer 3 Critical Head

Attachment B-26

Tule Subbasin Technical Advisory Committee

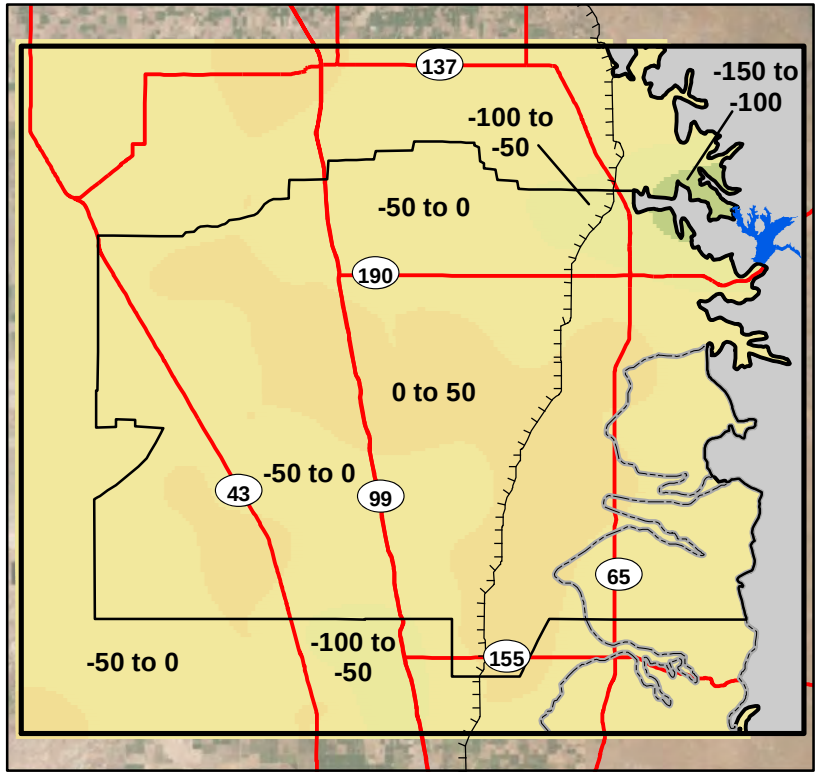
2020 Model

Min: -51
Max: 379



2020 Model and 2019 Model Difference

Min: -144
Max: 32



Map Features

Model Calibrated Critical Head (ft amsl)

- < - 200
- -200 to -150
- -150 to -100
- -100 to -50
- -50 to 0
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 200
- 200 to 250
- 250 to 300
- 300 to 350
- 350 to 400
- 400 to 500

Tertiary Loosely Consolidated Deposits
Tule Subbasin
Model Domain
No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

0 4 8 16
Miles
NAD 83 State Plane Zone 4

Layer 4 Critical Head

Attachment B-27

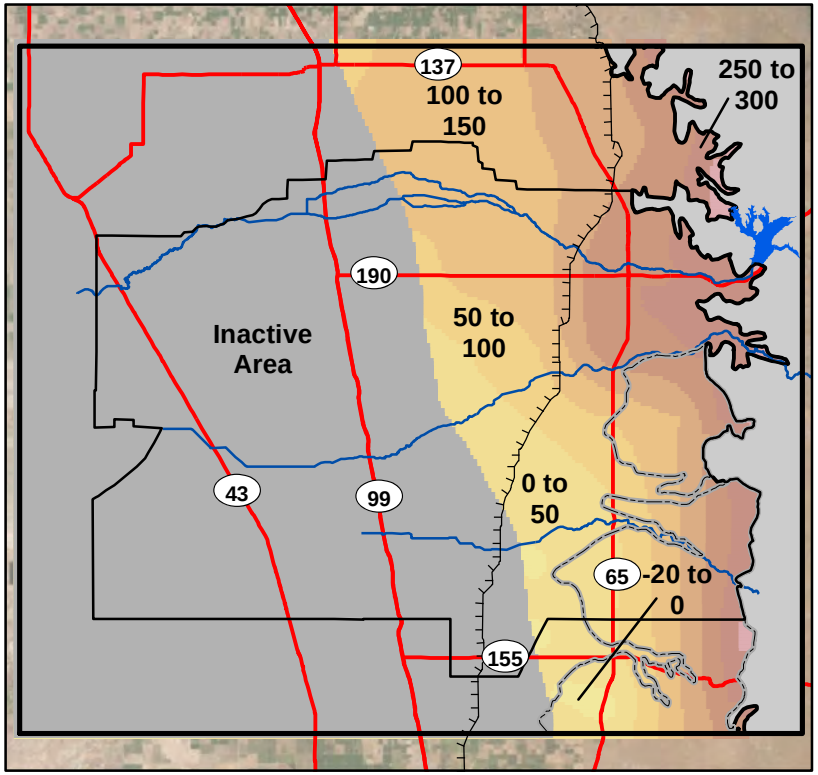
Tule Subbasin Technical Advisory Committee

Update to the Groundwater Flow Model of the Tule Subbasin

June 2021

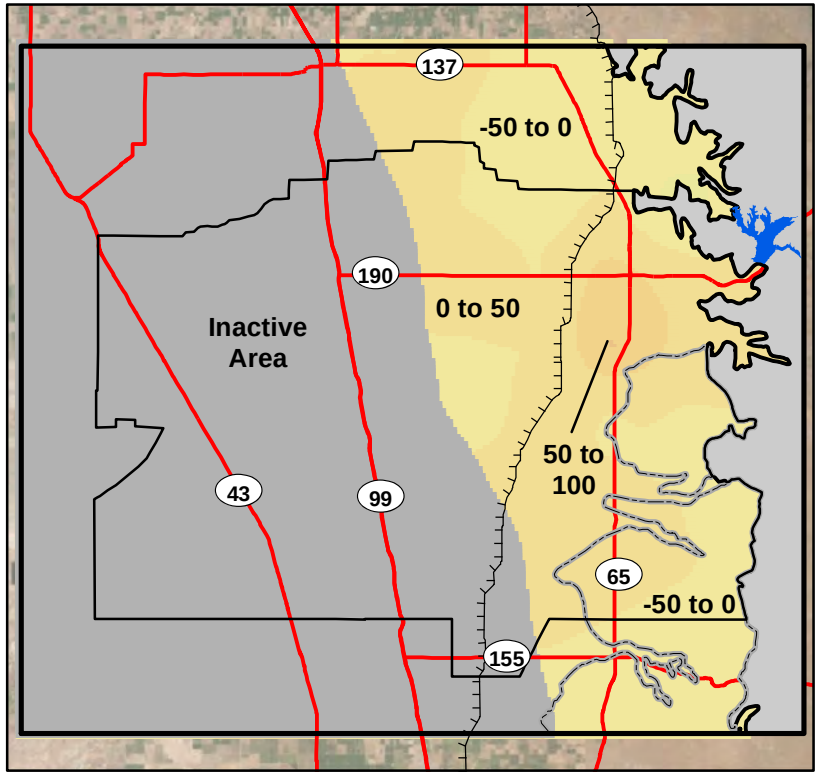
2020 Model

Min: -20
Max: 348



2020 Model and 2019 Model Difference

Min: -79
Max: 101



Map Features

Model Calibrated Critical Head (ft amsl)

- < -200
- -200 to -150
- -150 to -100
- -100 to -50
- -50 to 0
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 200
- 200 to 250
- 250 to 300
- 300 to 350
- 350 to 400
- 400 to 500
- Inactive Area
- Tertiary Loosely Consolidated Deposits
- Tule Subbasin
- Model Domain
- No Flow Zone

N

Thomas Harder & Co.
Groundwater Consulting

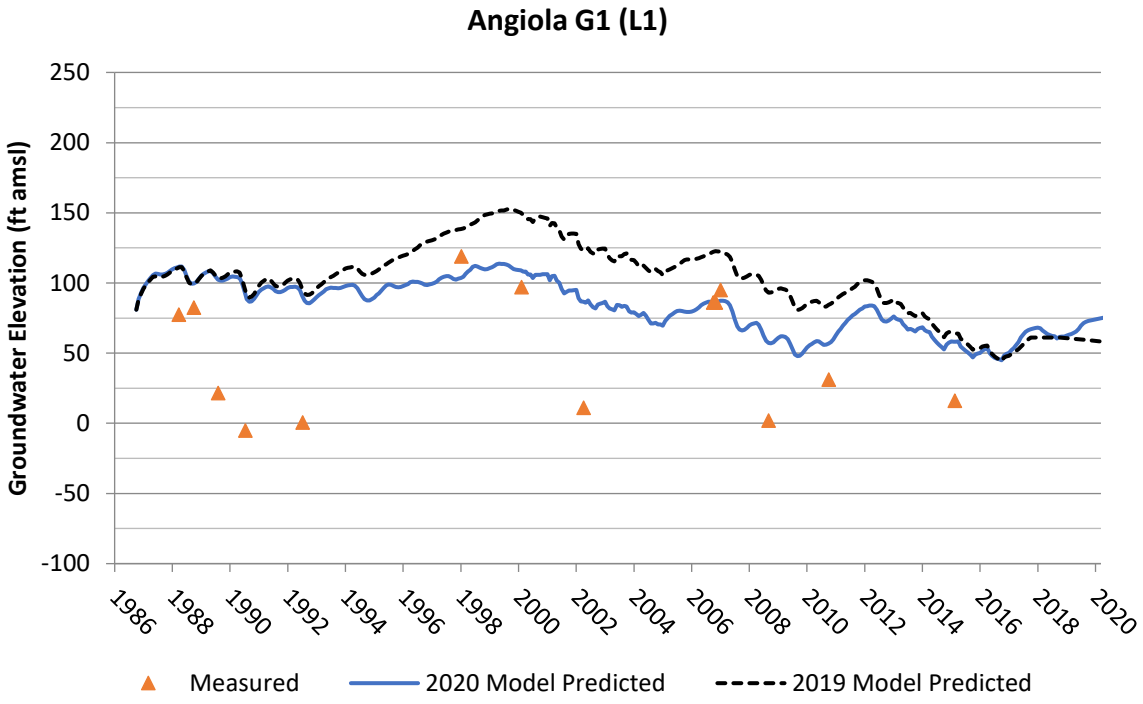
0 4 8 16 Miles
NAD 83 State Plane Zone 4

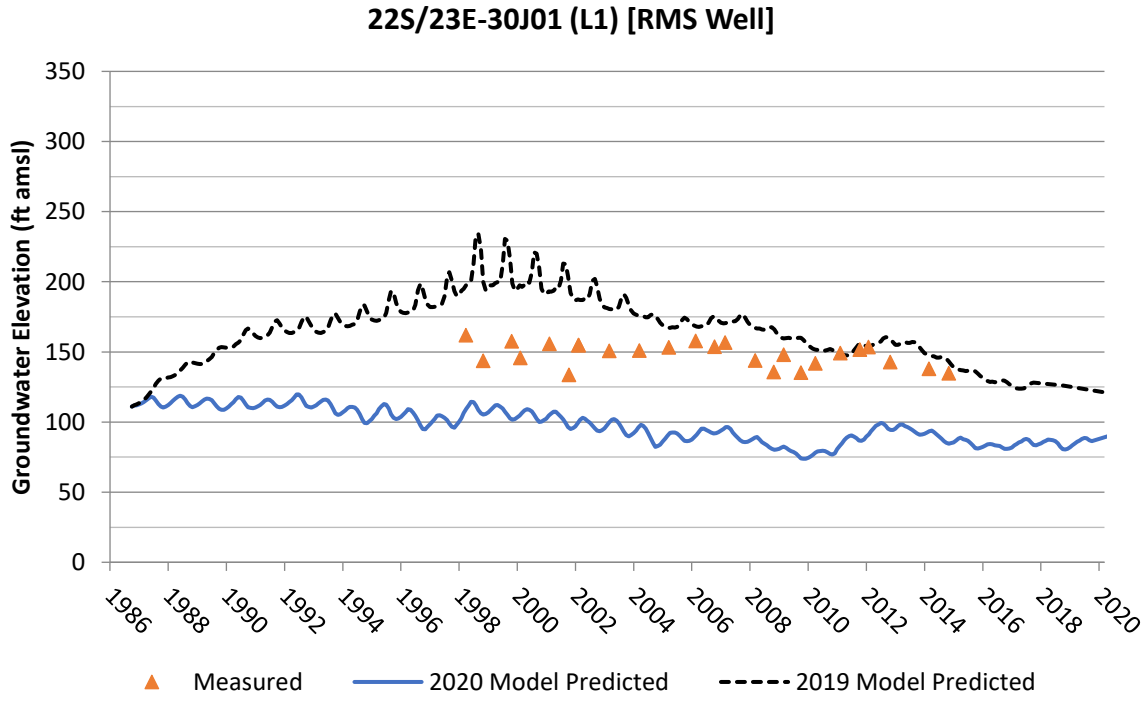
Layer 5 Critical Head

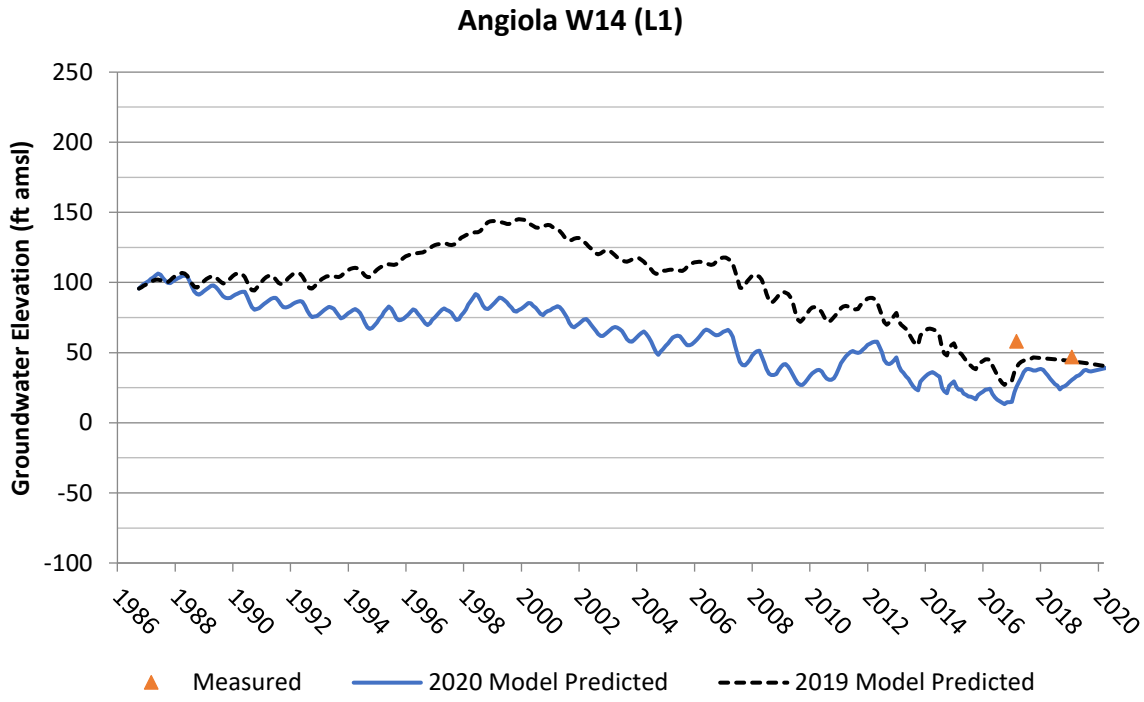
Attachment B-28

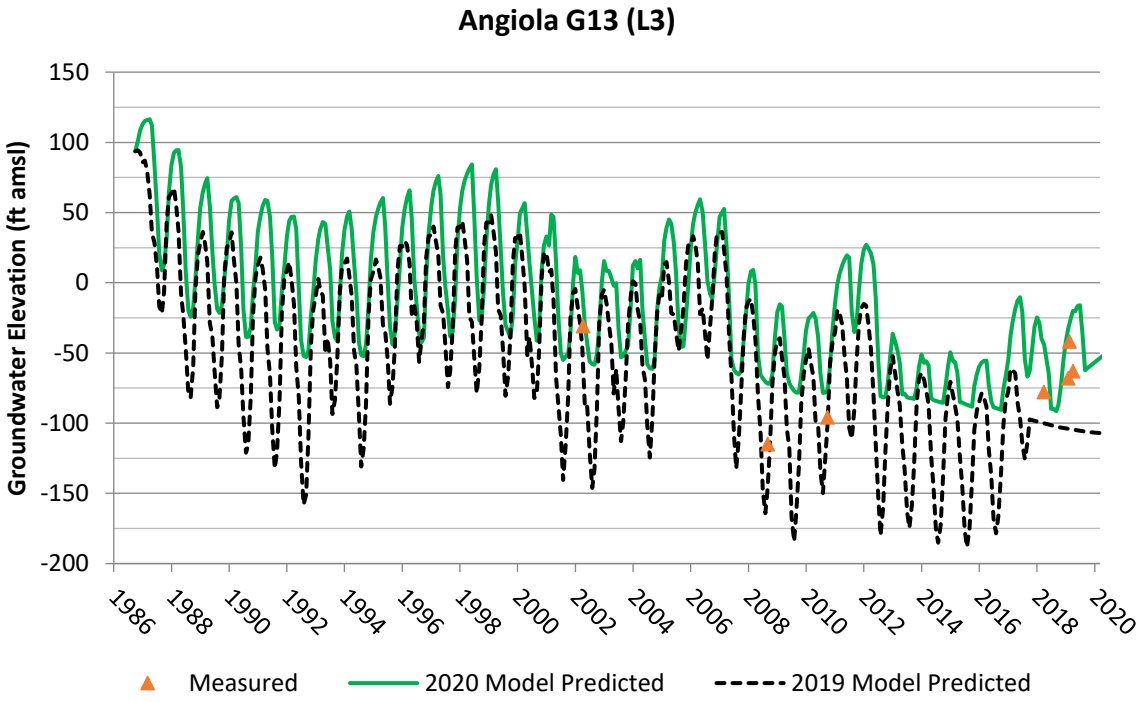
Attachment C

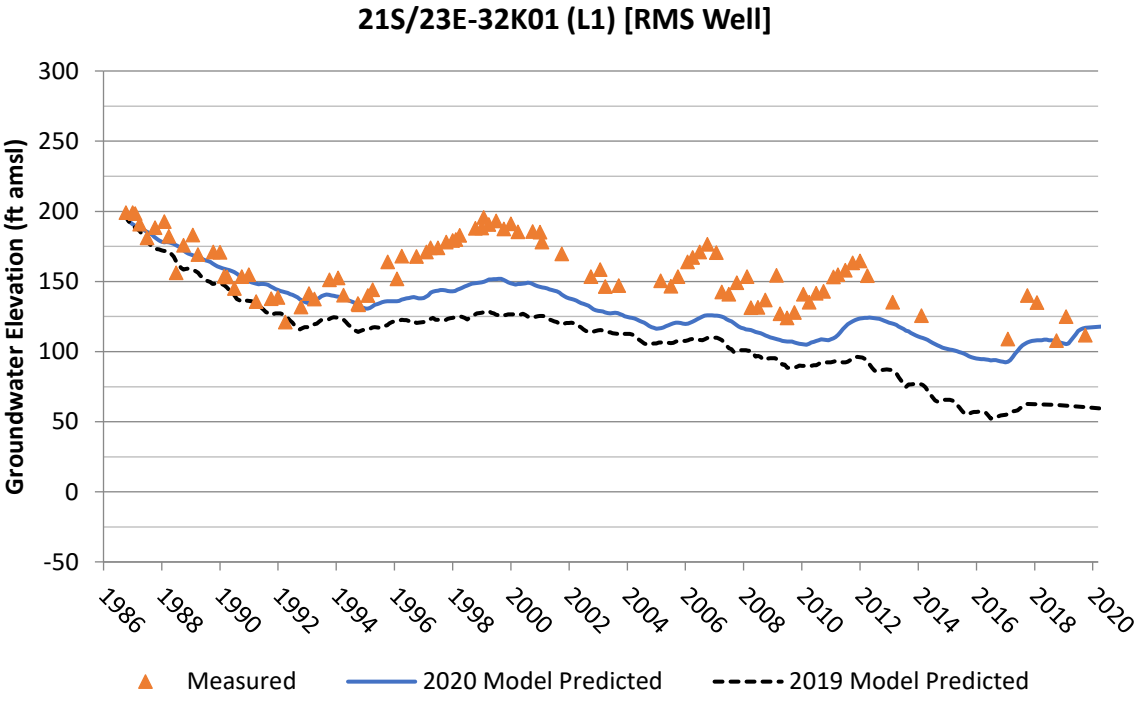
Calibration Hydrographs at Calibration Targets

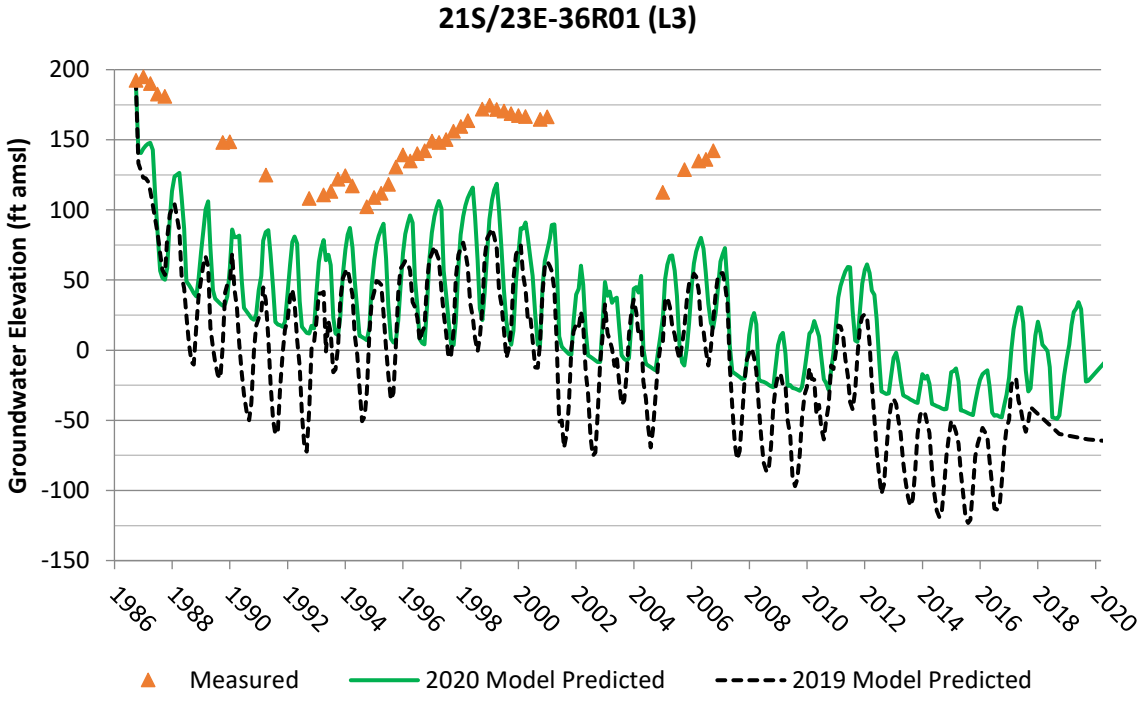

Angiola G1 (L1)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

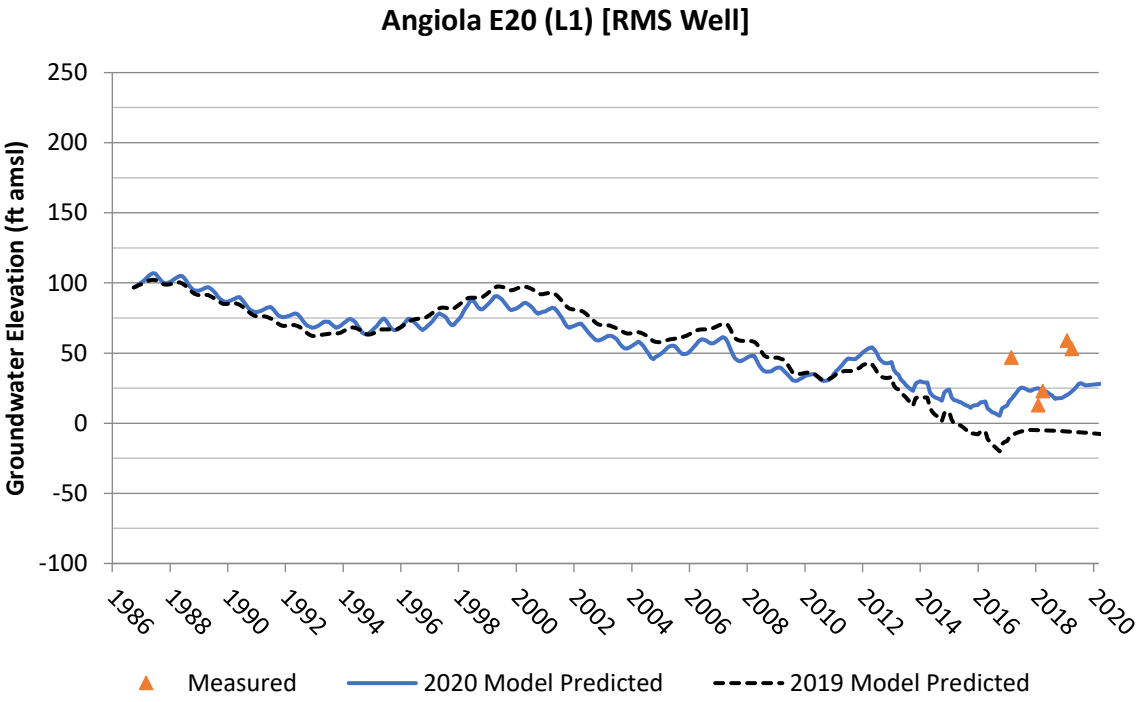

22S/23E-30J01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

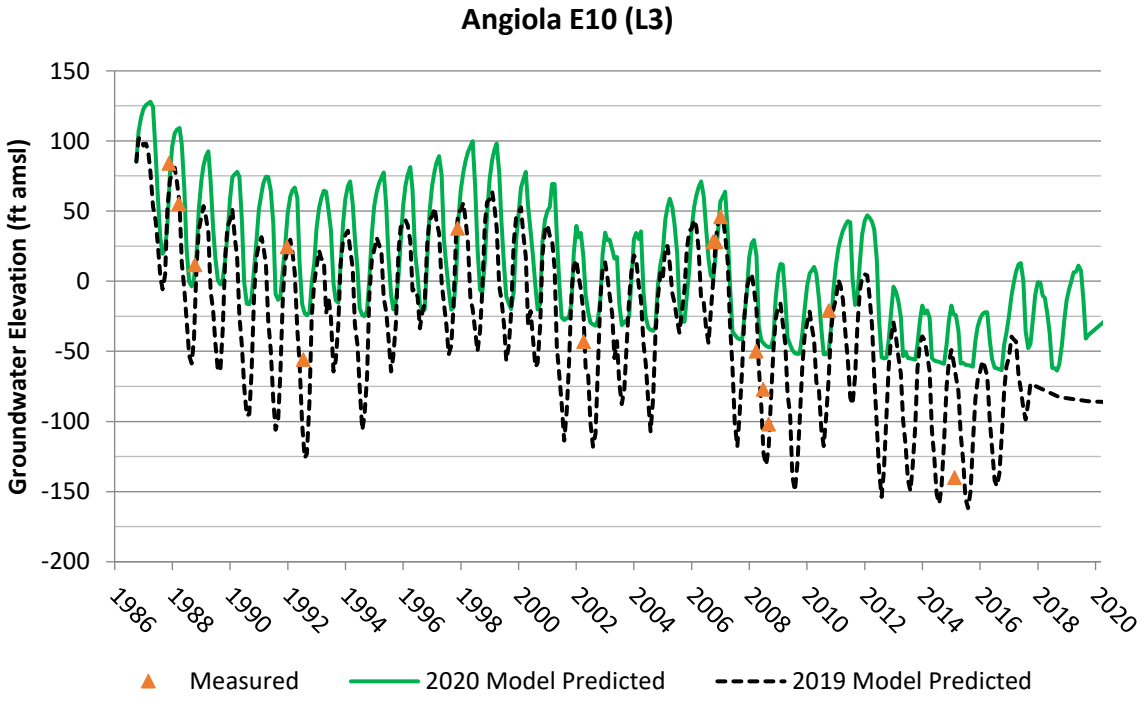

Angiola W14 (L1)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

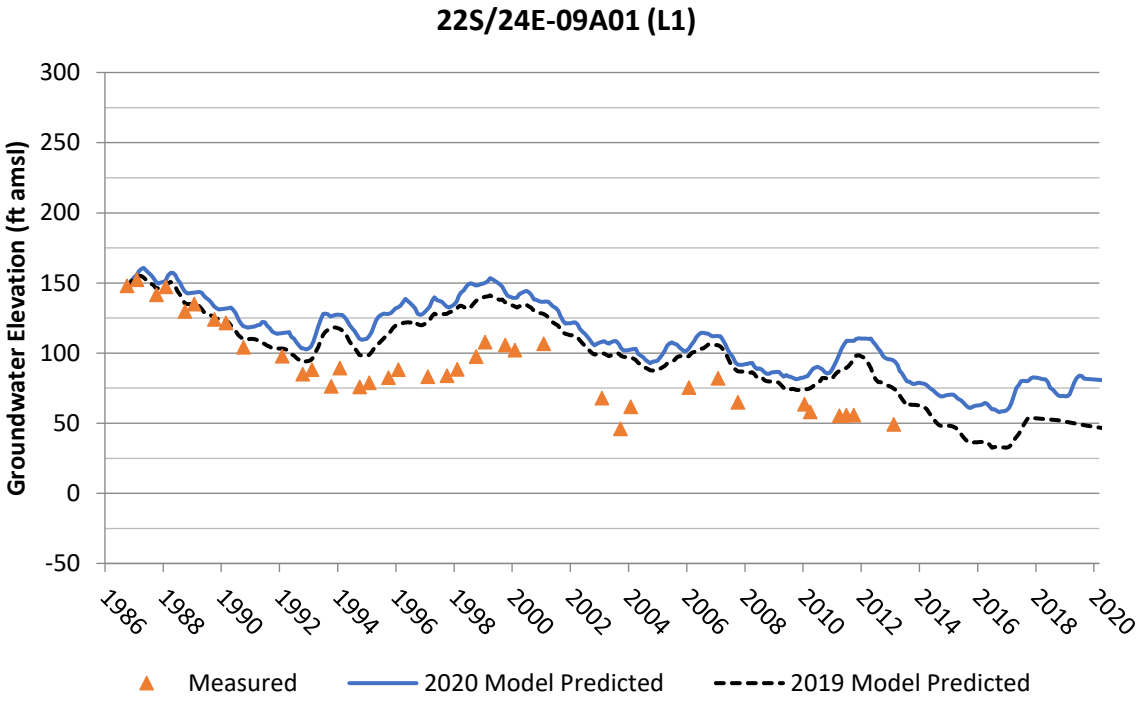

Angiola G13 (L3)
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

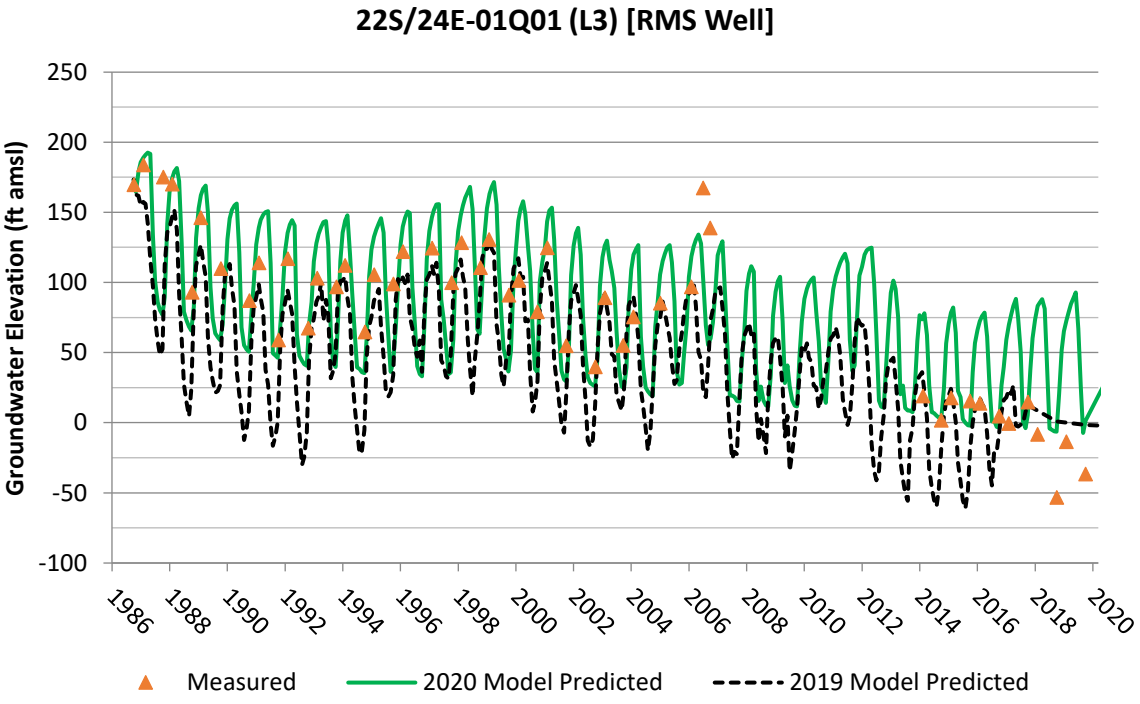

21S/23E-32K01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
300
250
200
150
100
50
0
-50
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

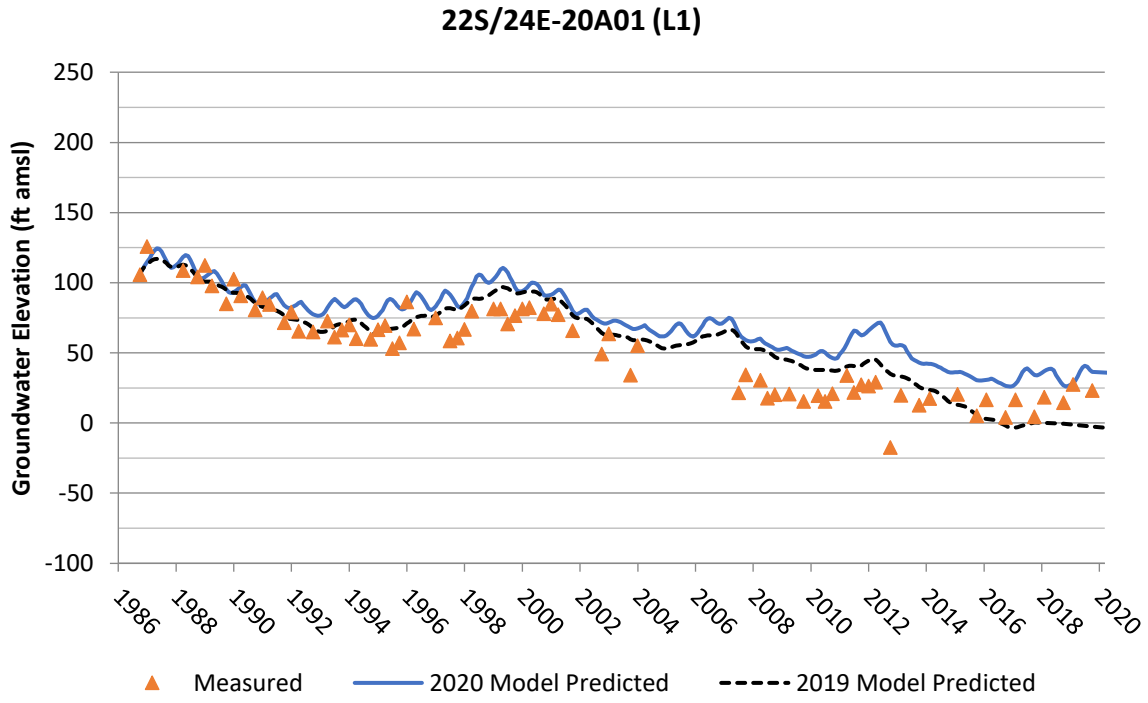

21S/23E-36R01 (L3)
Groundwater Elevation (ft amsl)
200
150
100
50
0
-50
-100
-150
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

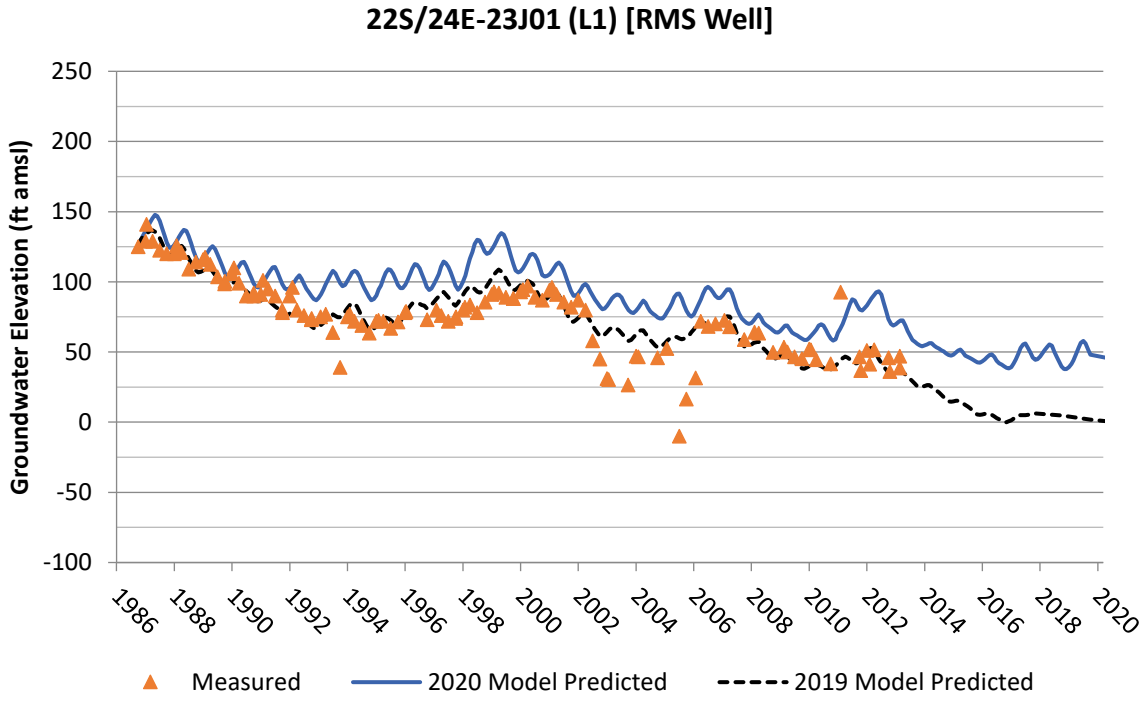

Angiola E20 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

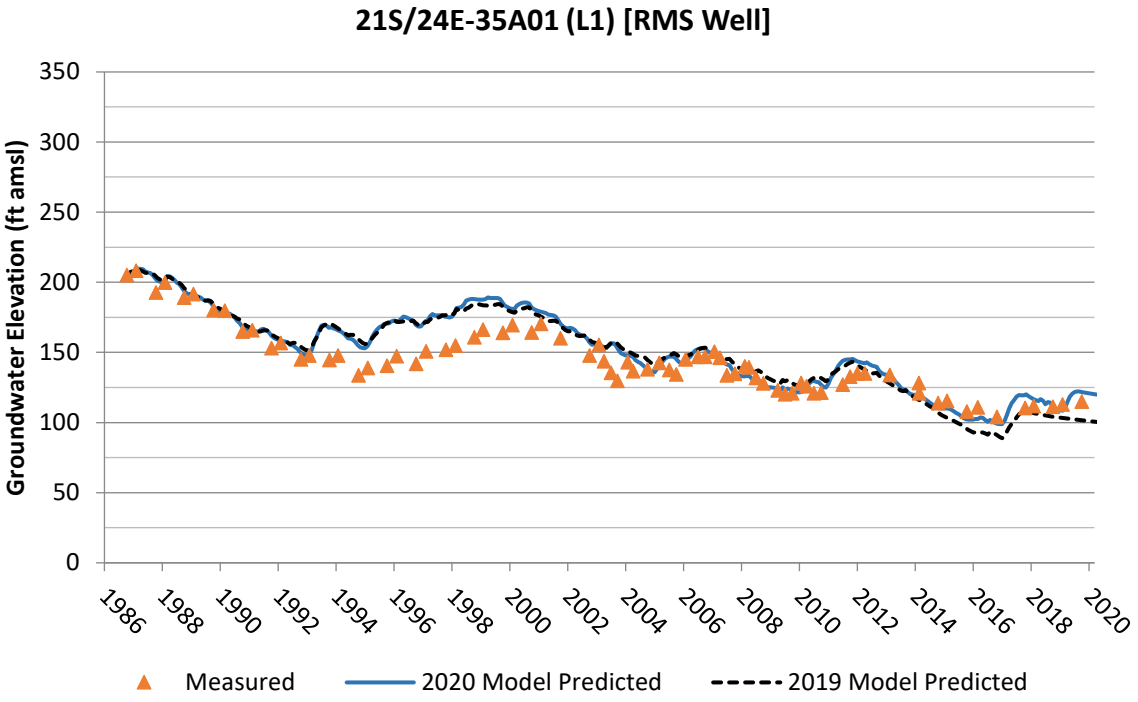

Angiola E10 (L3)
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

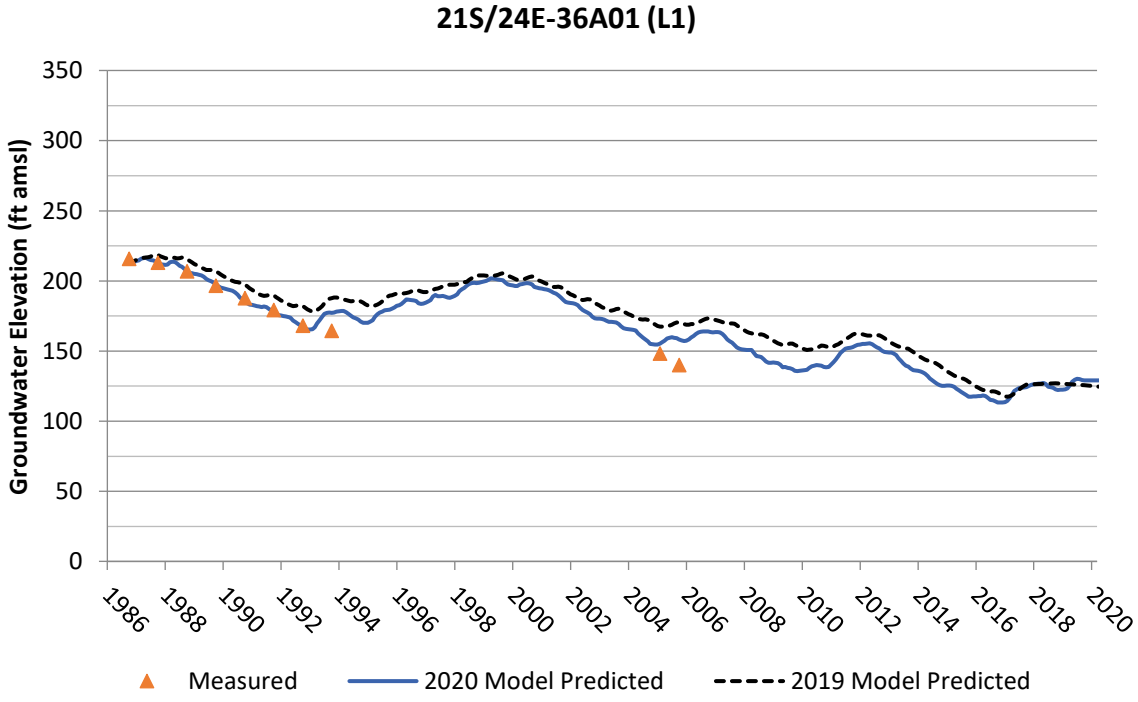

22S/24E-09A01 (L1)
Groundwater Elevation (ft amsl)
300
250
200
150
100
50
0
-50
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

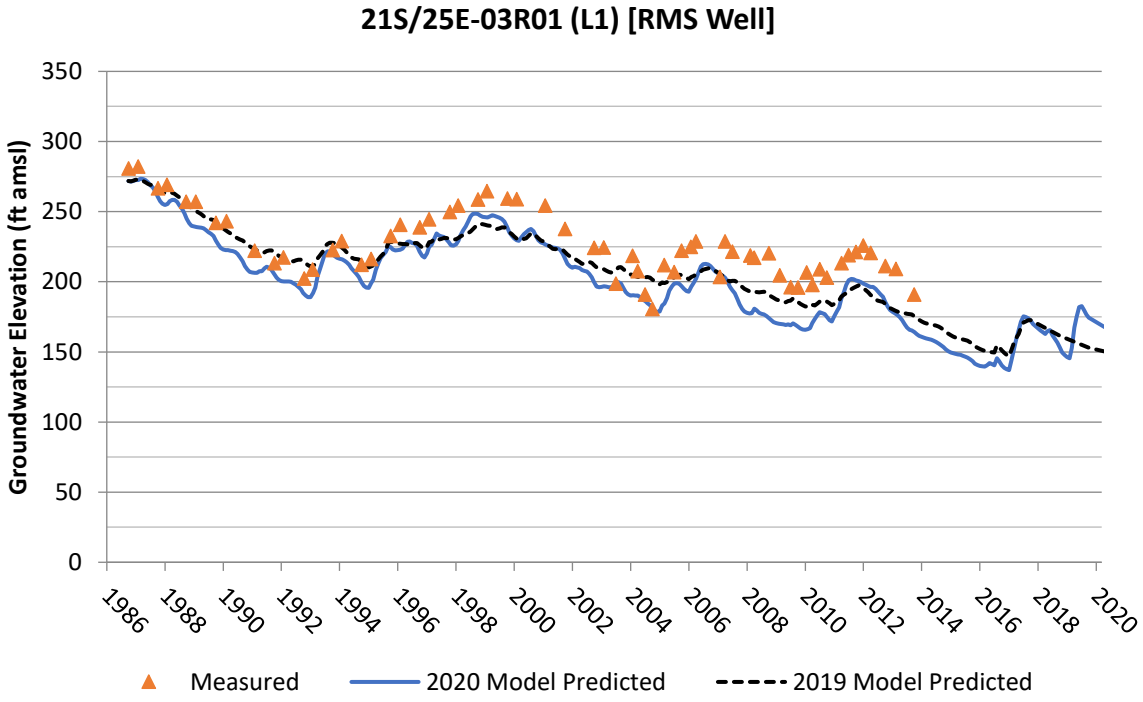

22S/24E-01Q01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

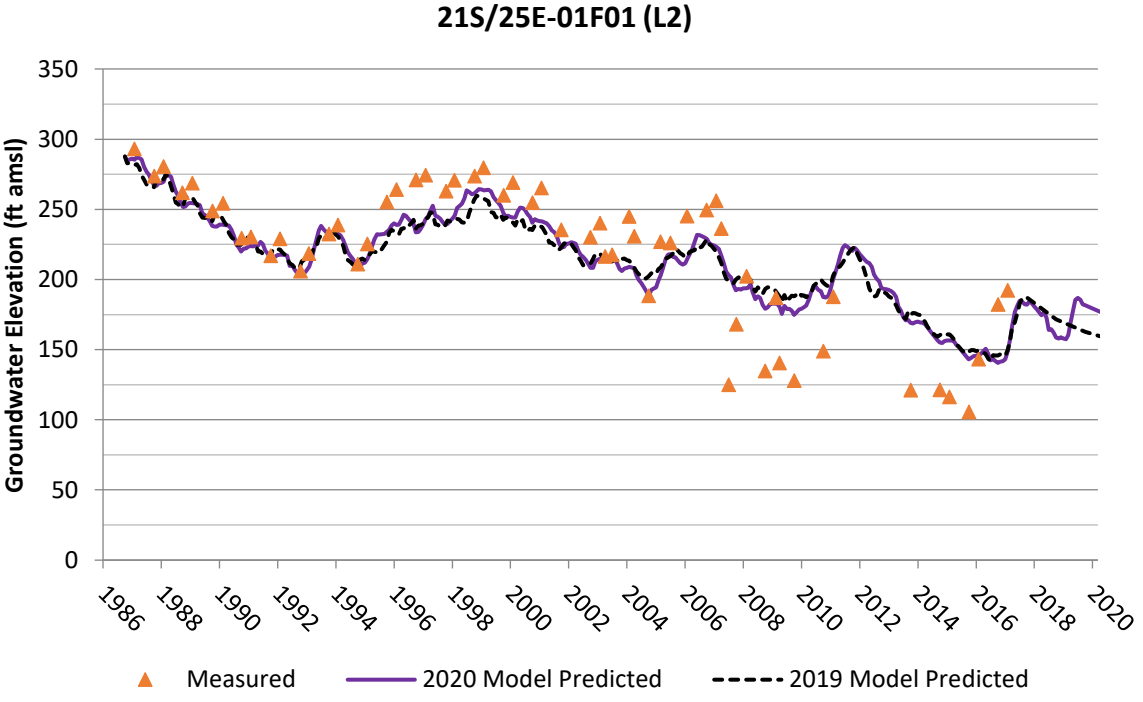

22S/24E-20A01 (L1)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

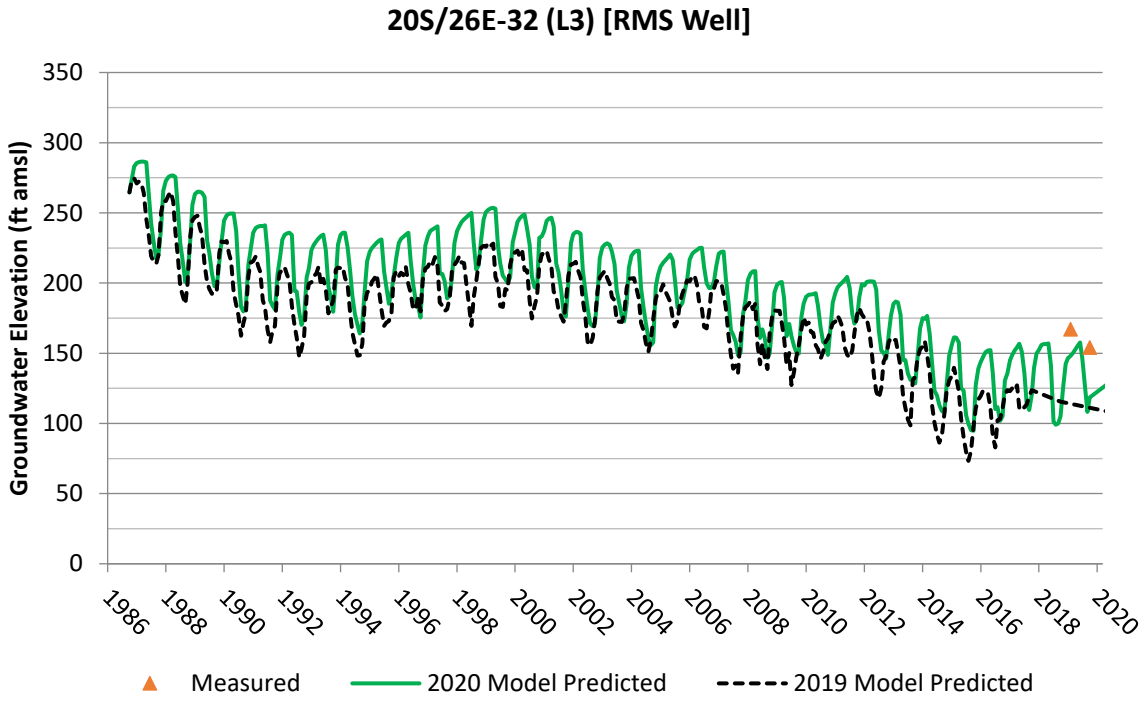

22S/24E-23J01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

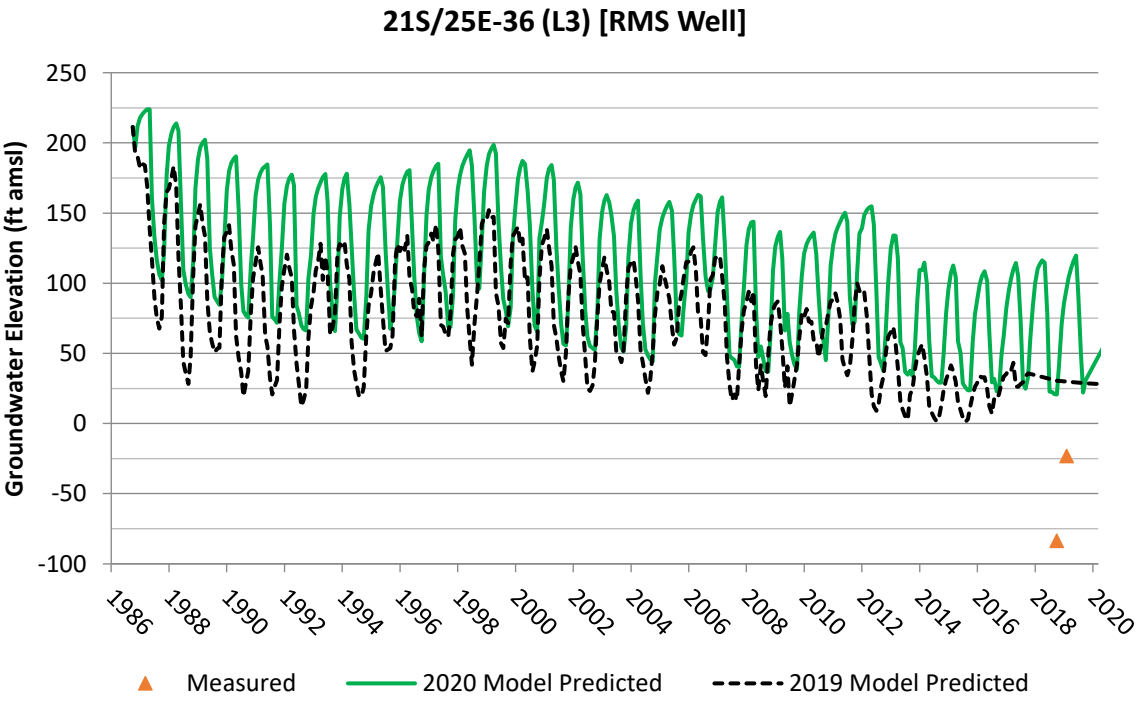

21S/24E-35A01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

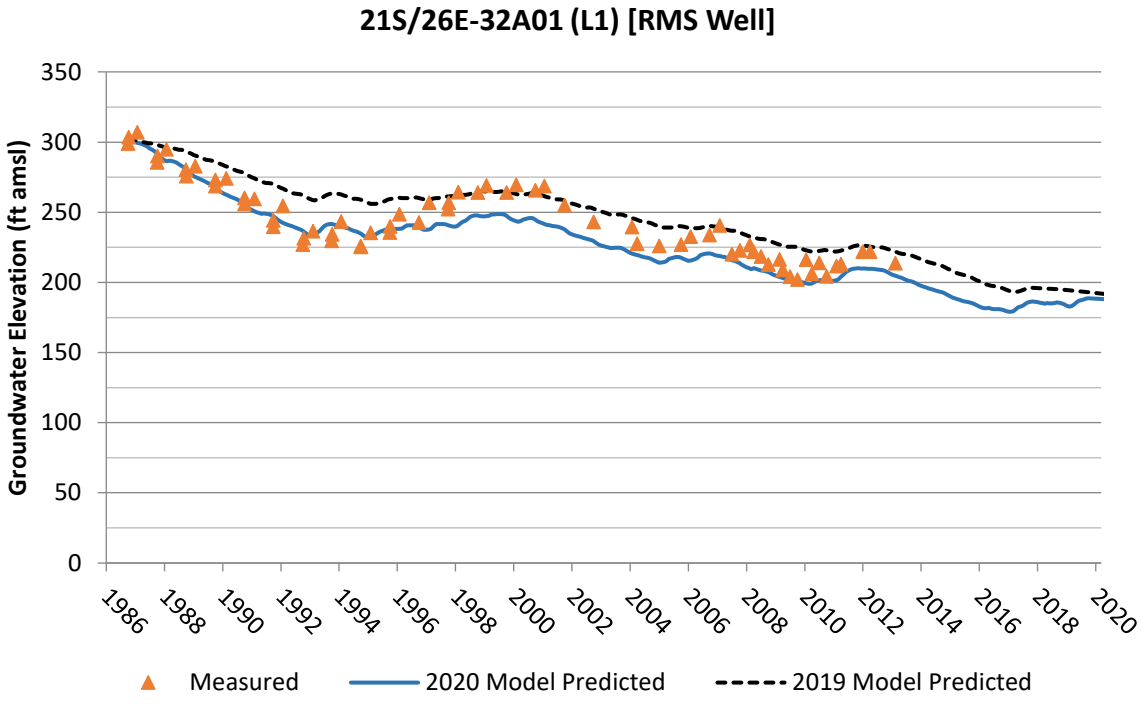

21S/24E-36A01 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

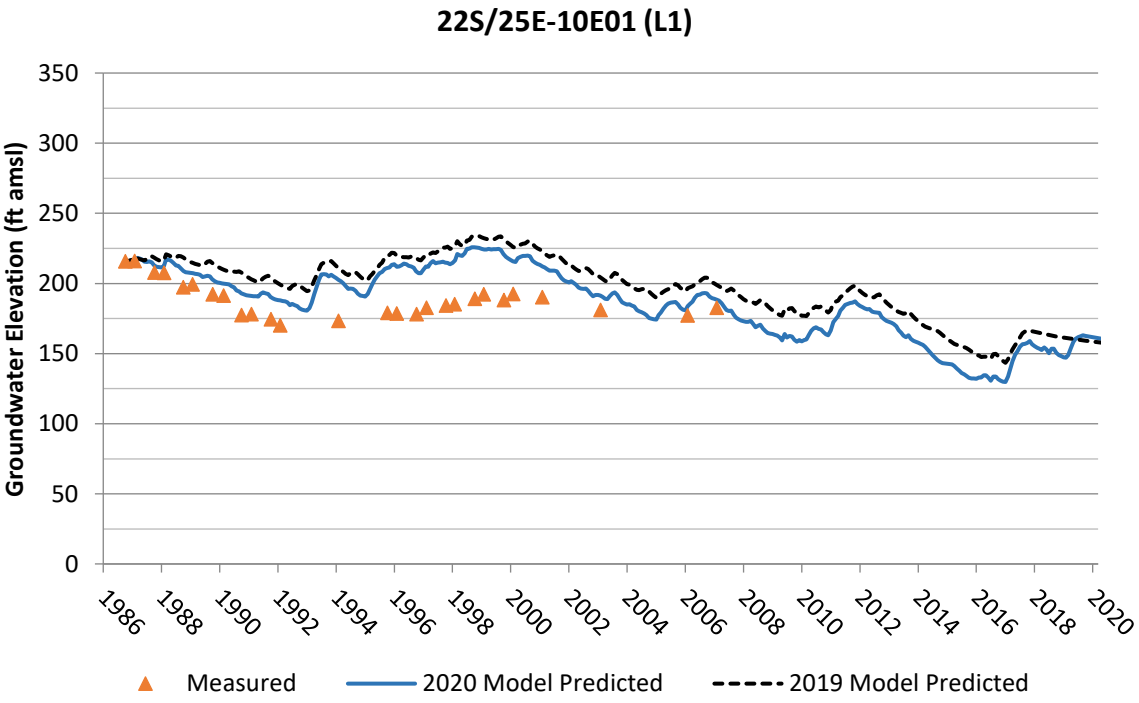

21S/25E-03R01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

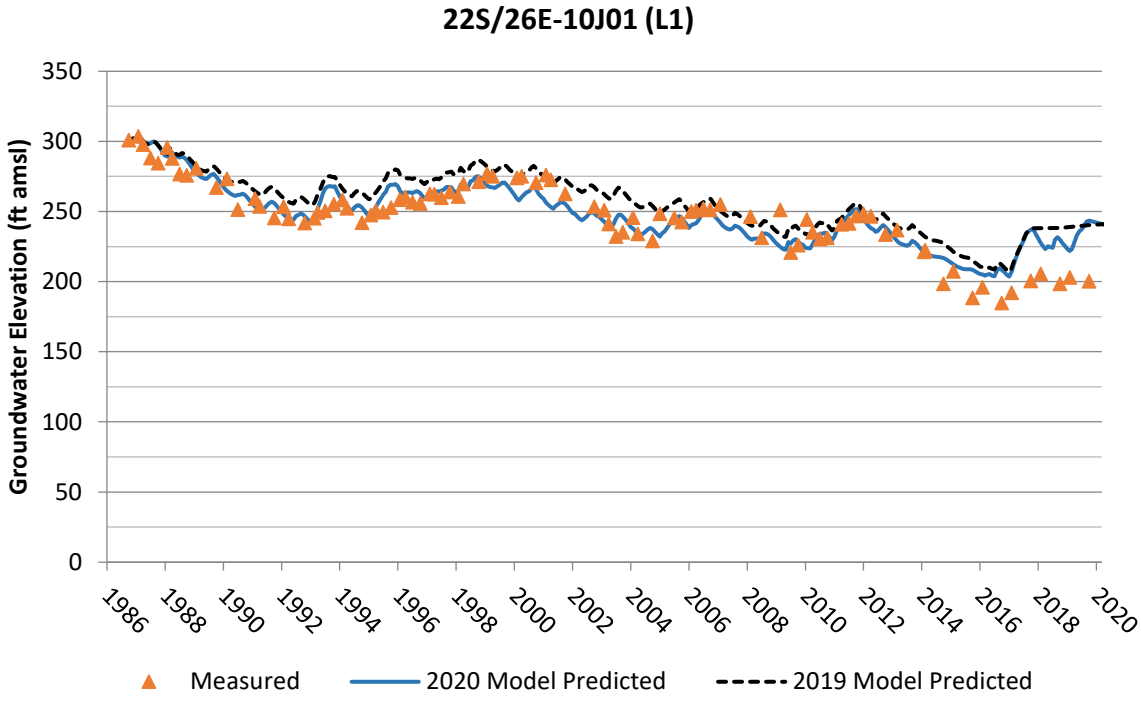

21S/25E-01F01 (L2)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

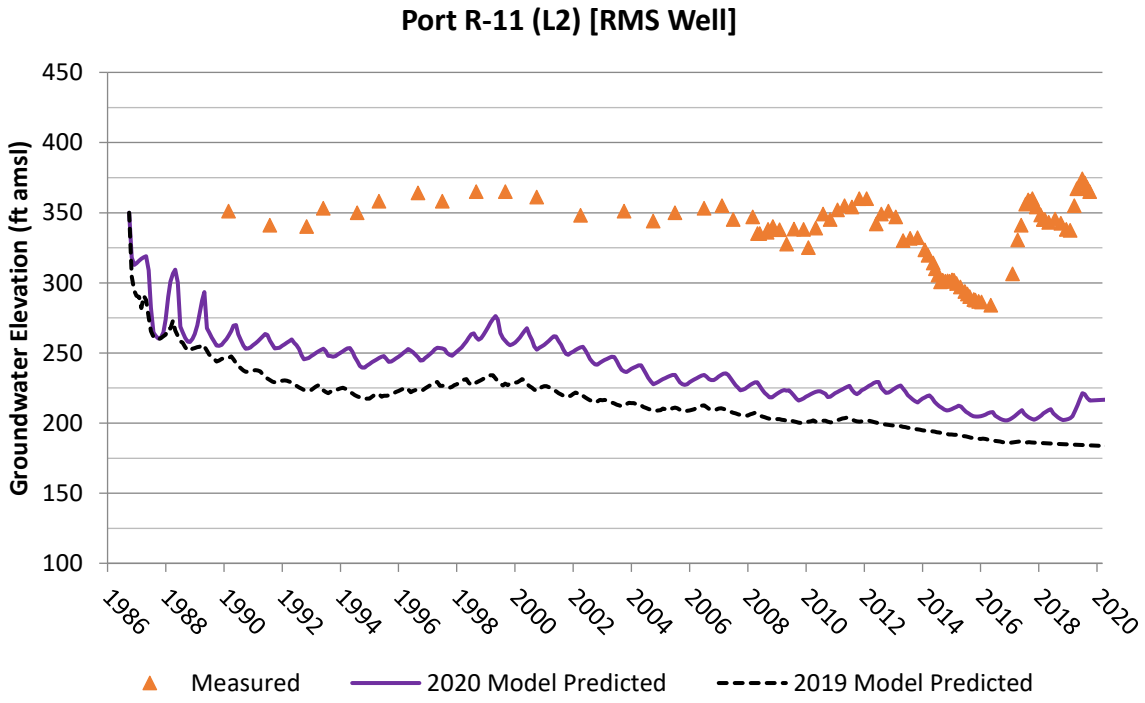

20S/26E-32 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

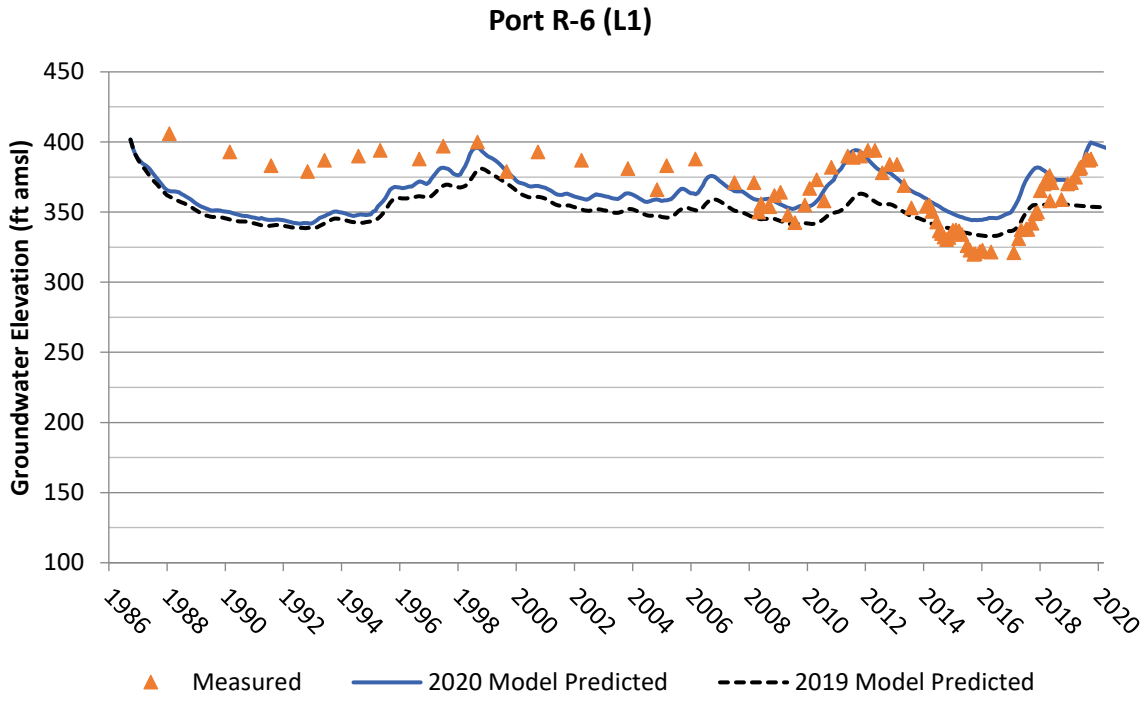

21S/25E-36 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

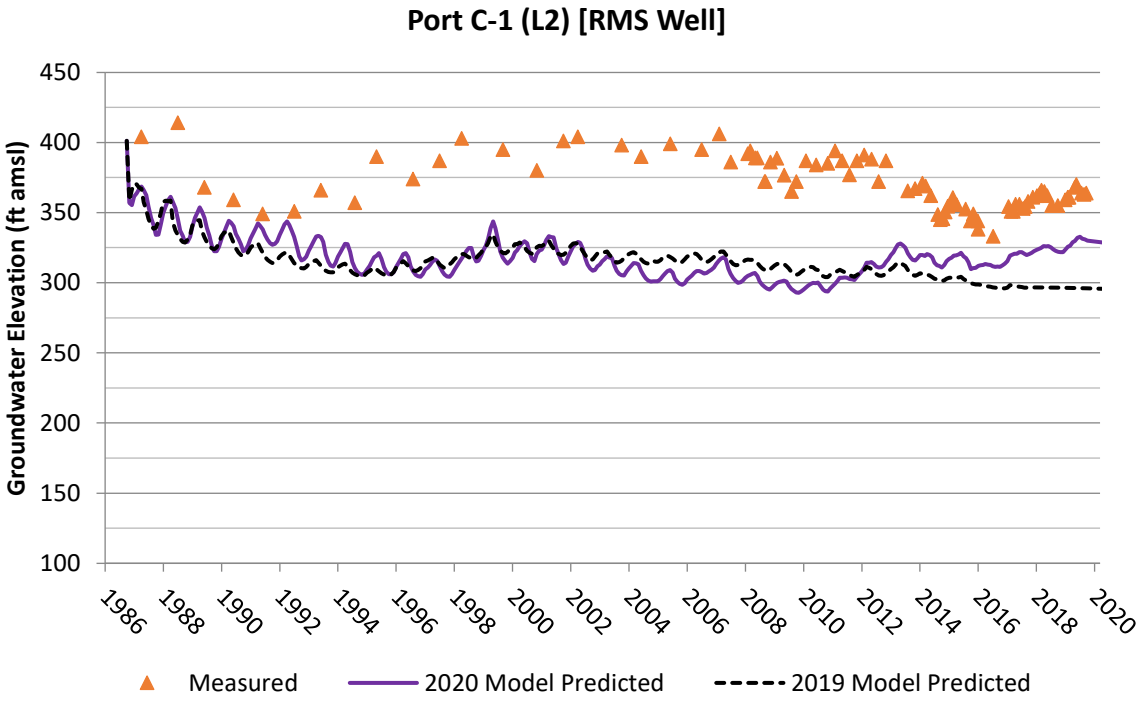

21S/26E-32A01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

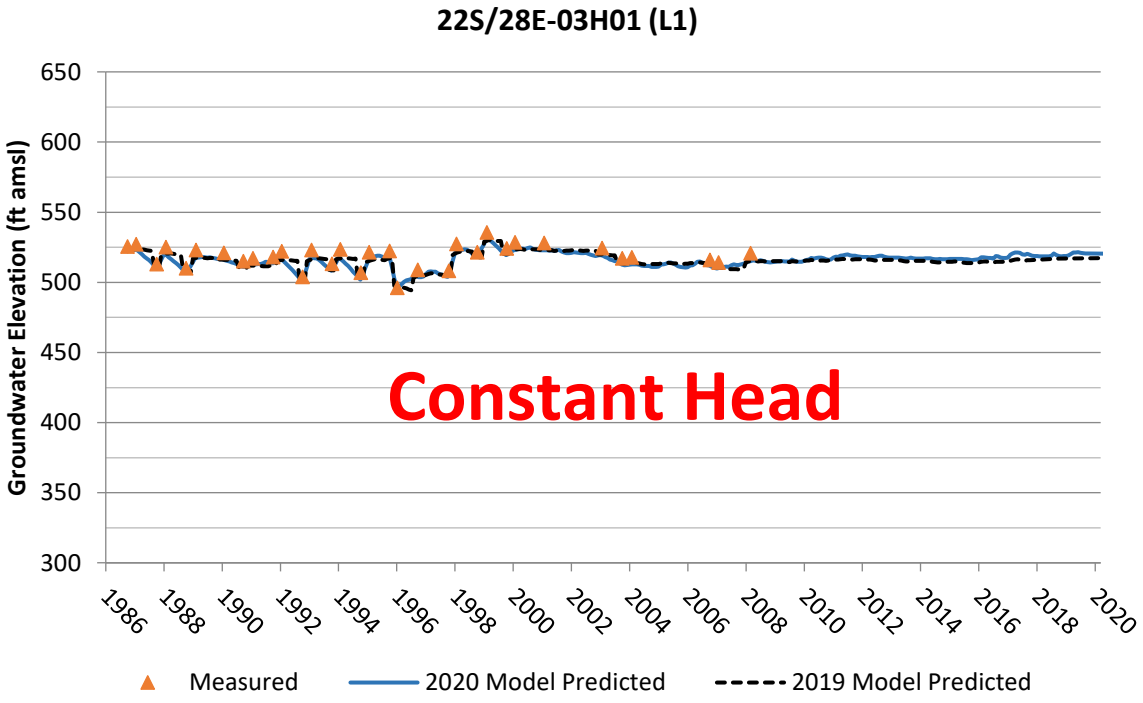

22S/25E-10E01 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

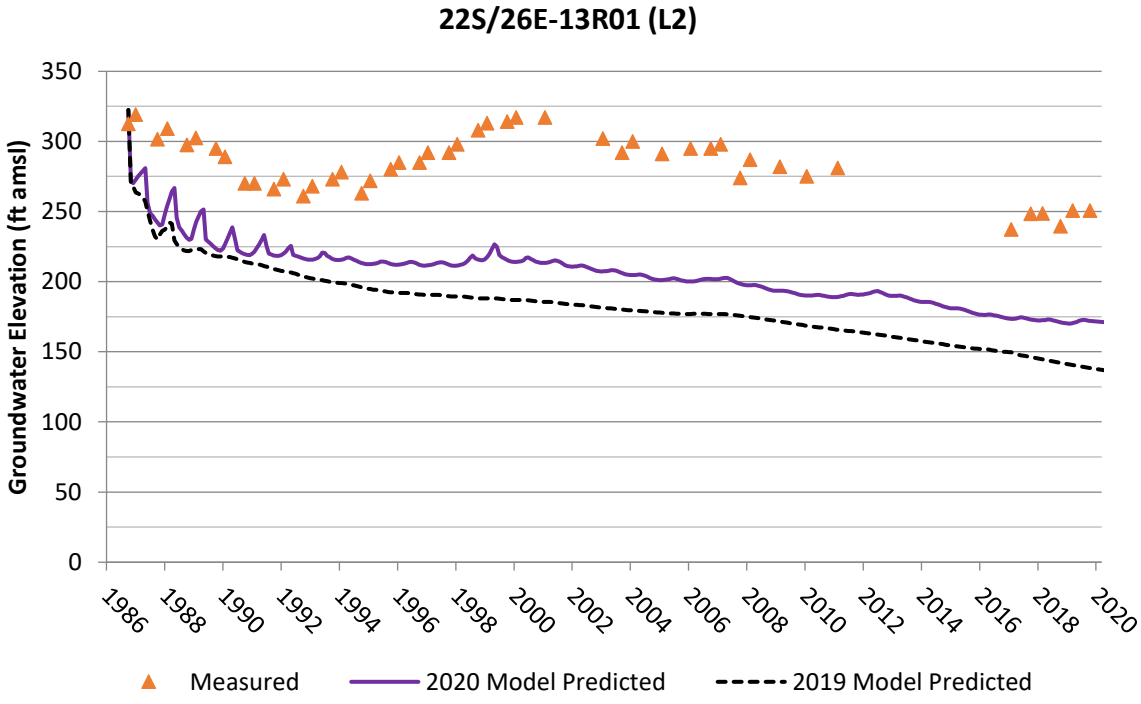

22S/26E-10J01 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

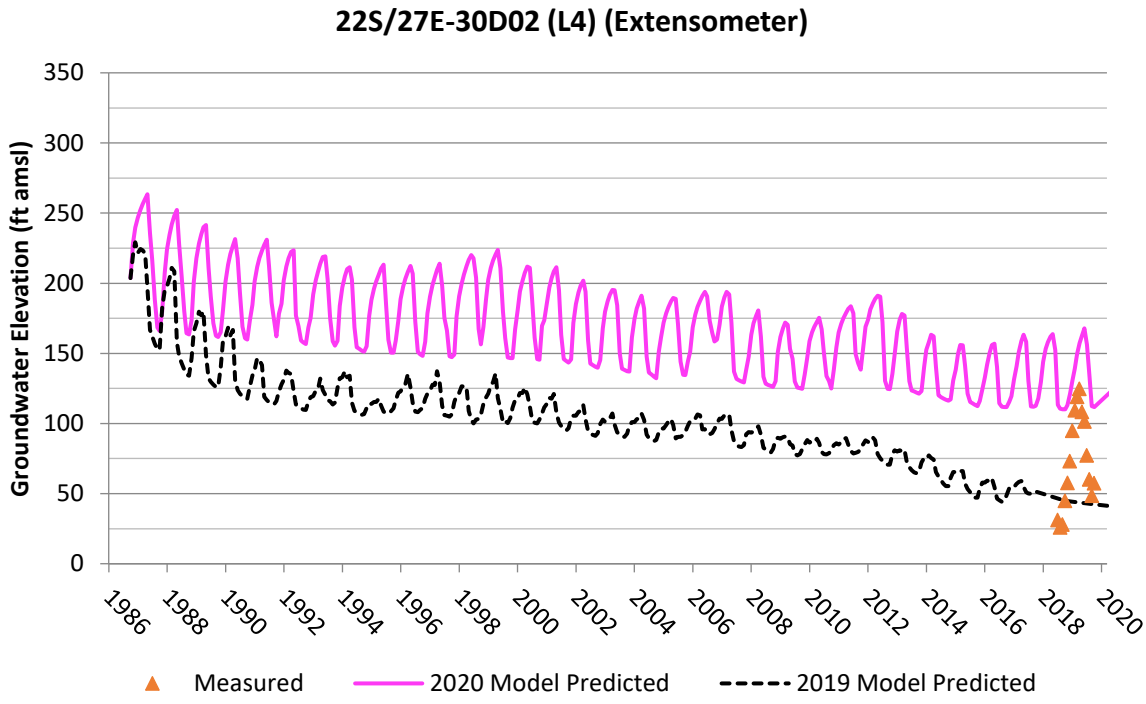

Port R-11 (L2) [RMS Well]
Groundwater Elevation (ft amsl)
450
400
350
300
250
200
150
100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

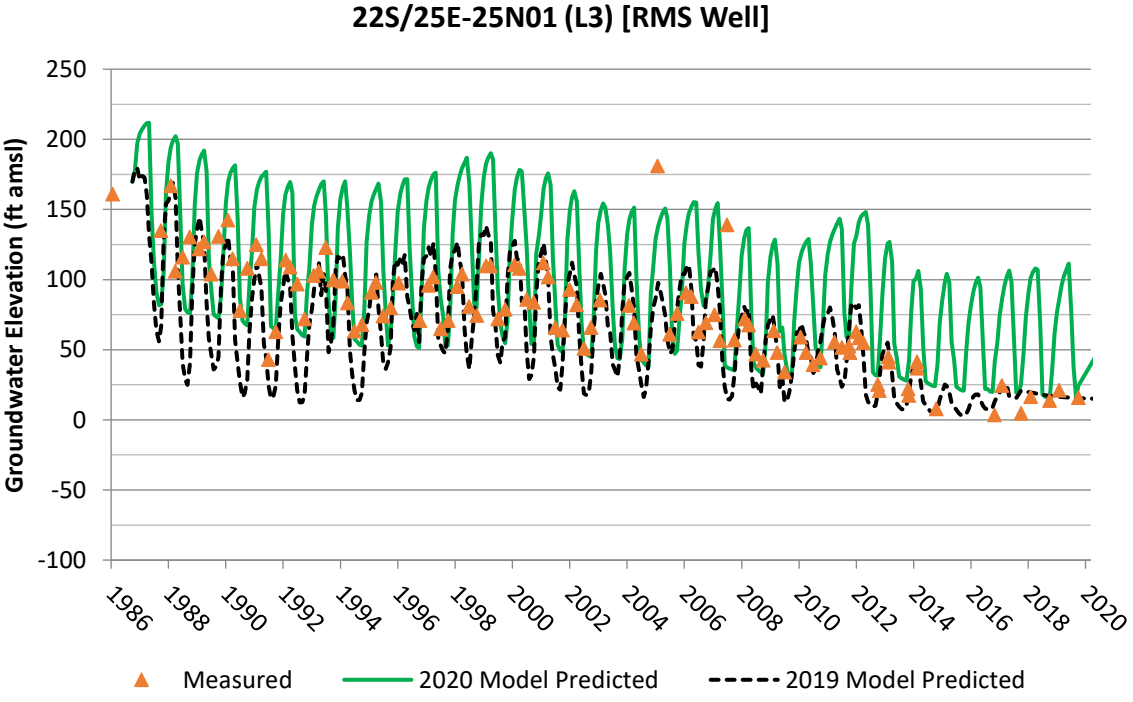

Port R-6 (L1)
Groundwater Elevation (ft amsl)
450
400
350
300
250
200
150
100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

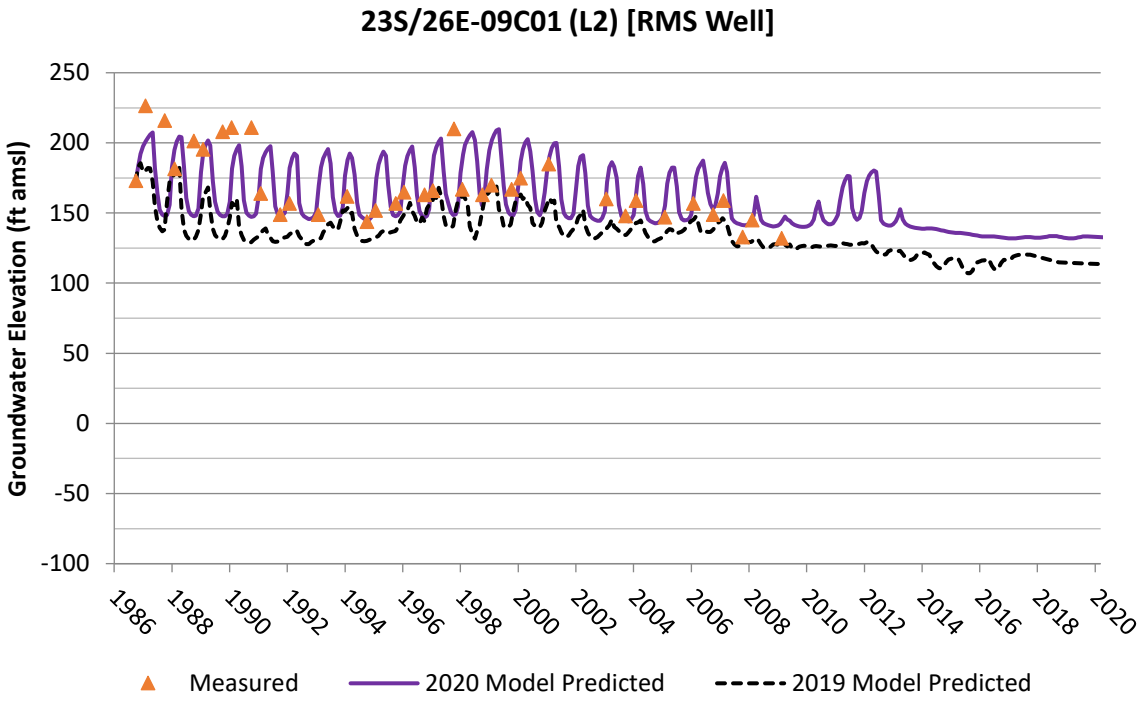

Port C-1 (L2) [RMS Well]
Groundwater Elevation (ft amsl)
450
400
350
300
250
200
150
100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

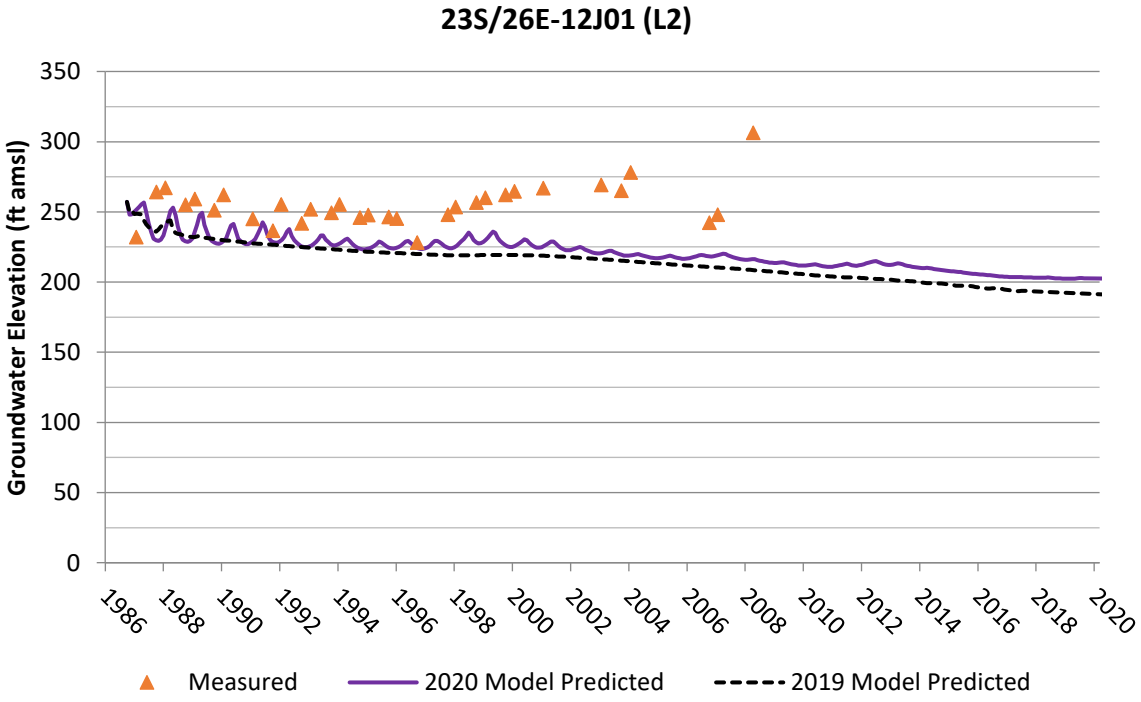

22S/28E-03H01 (L1)
Groundwater Elevation (ft amsl)
650
600
550
500
450
400
350
300
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Constant Head
Measured
2020 Model Predicted
2019 Model Predicted

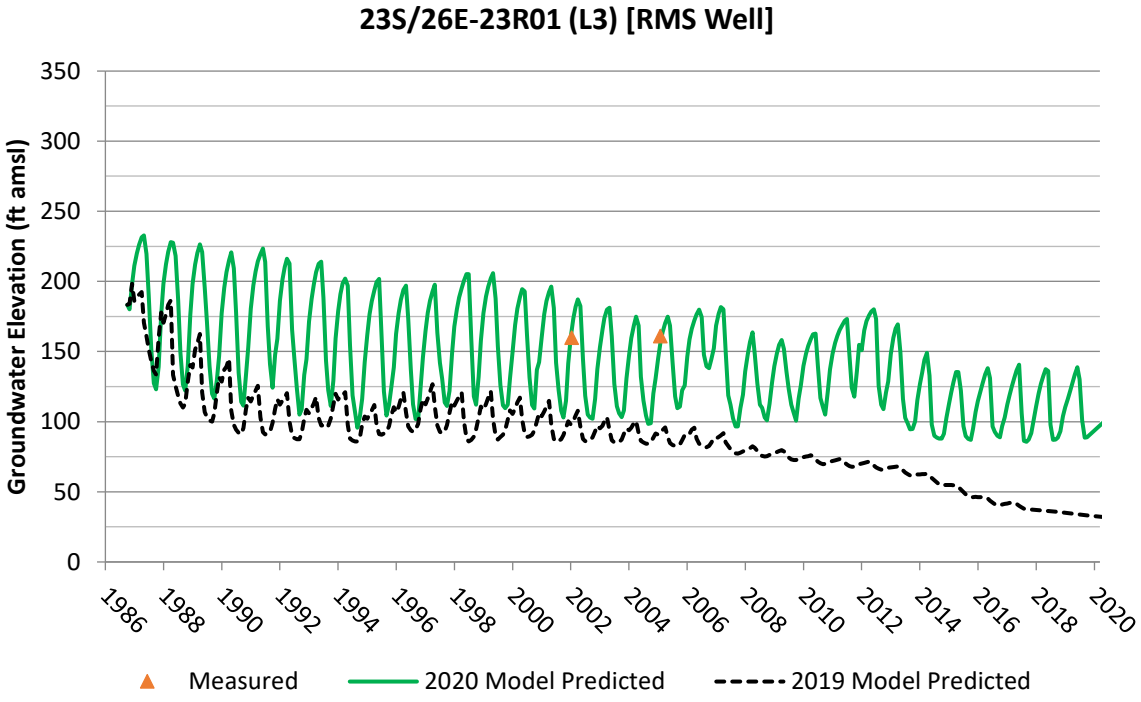

22S/26E-13R01 (L2)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

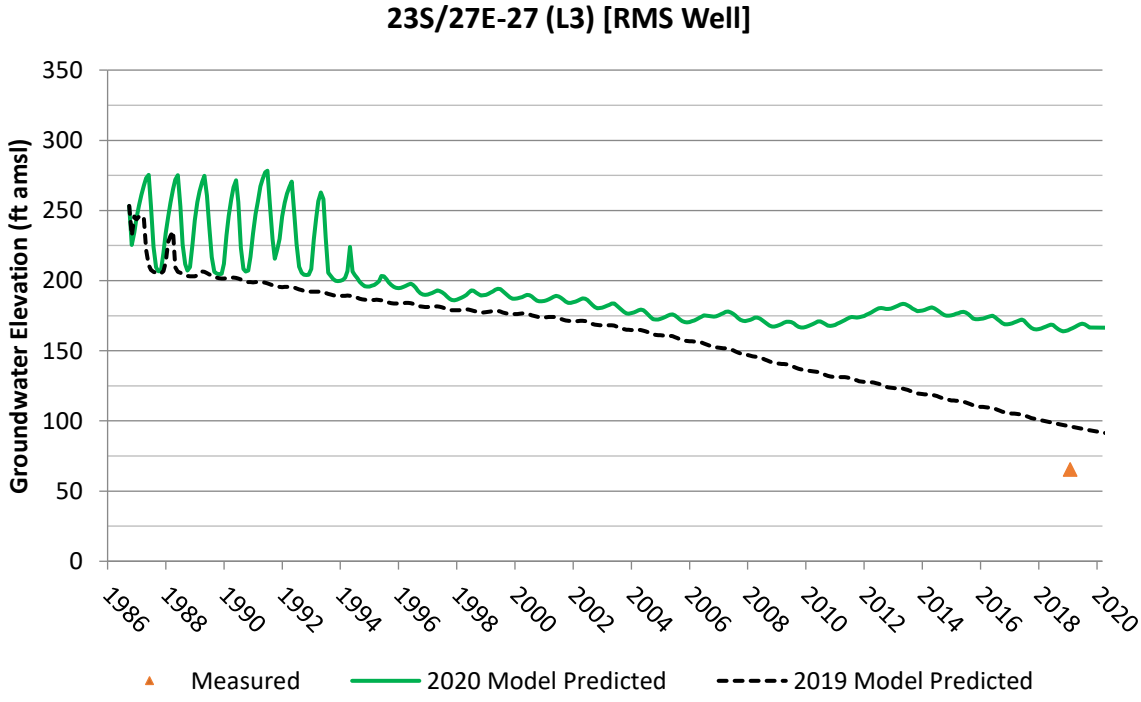

22S/27E-30D02 (L4) (Extensometer)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

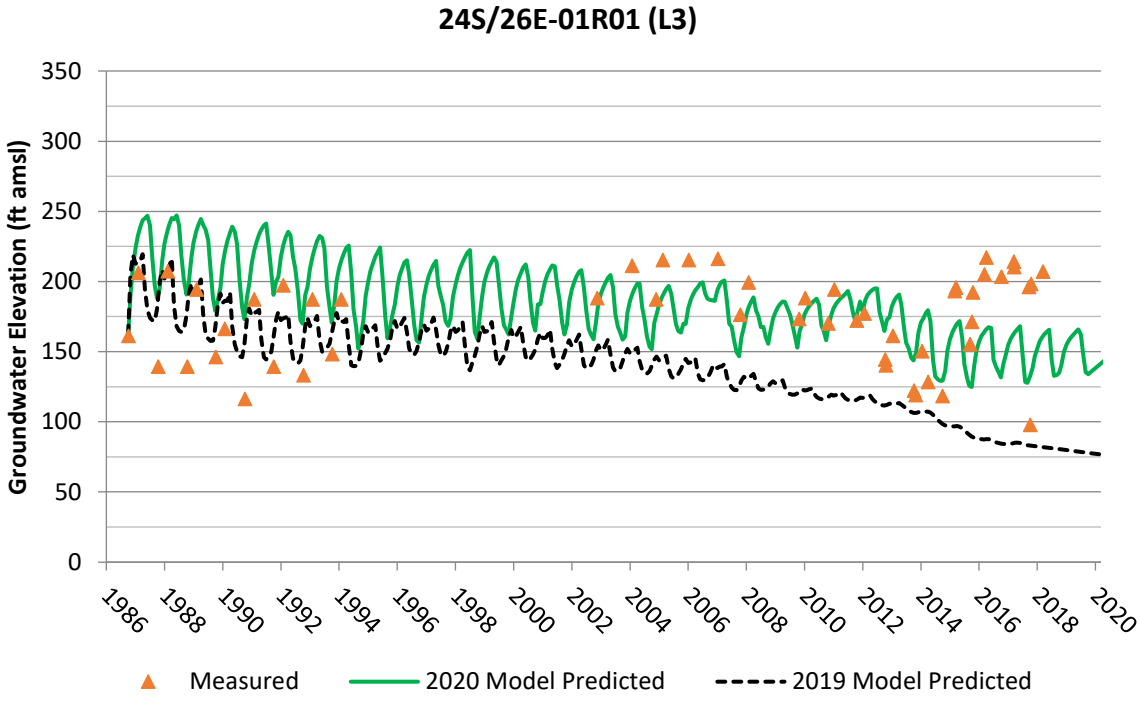

22S/25E-25N01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

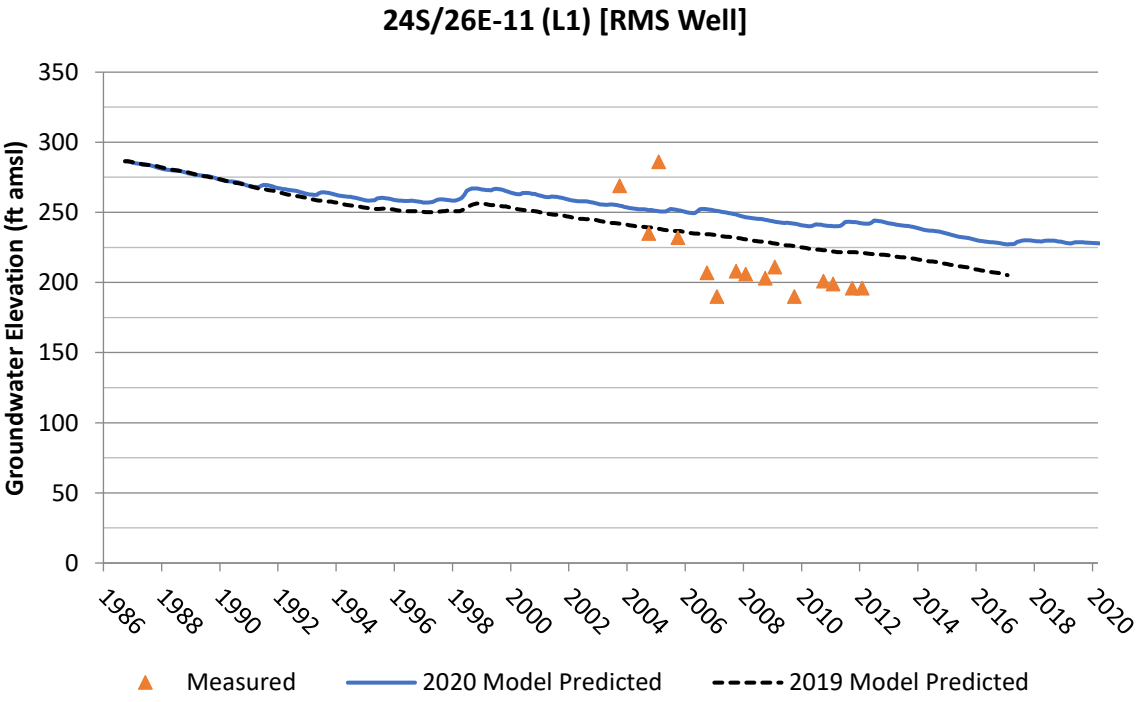

23S/26E-09C01 (L2) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

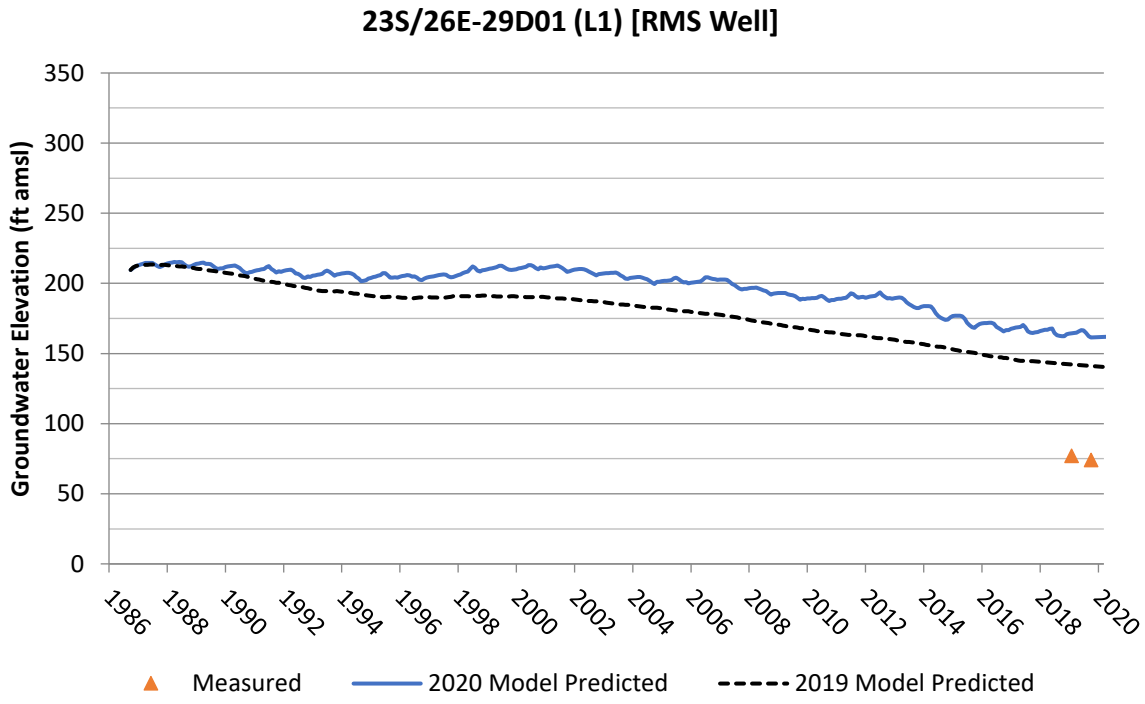

23S/26E-12J01 (L2)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

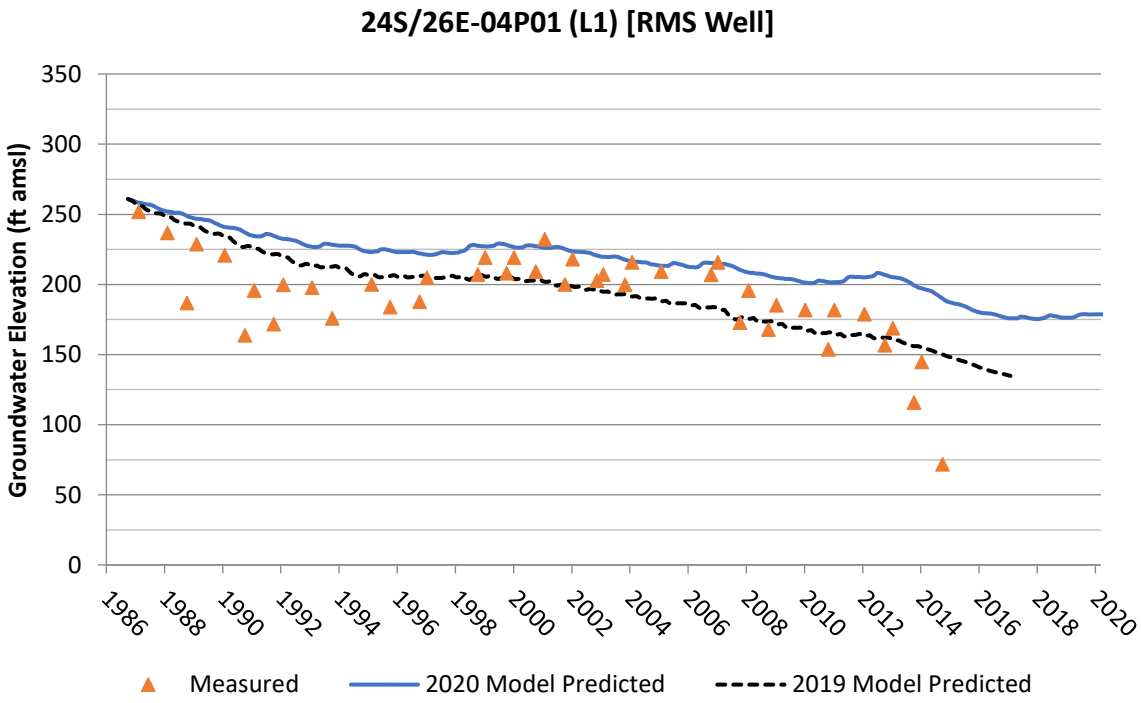

23S/26E-23R01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

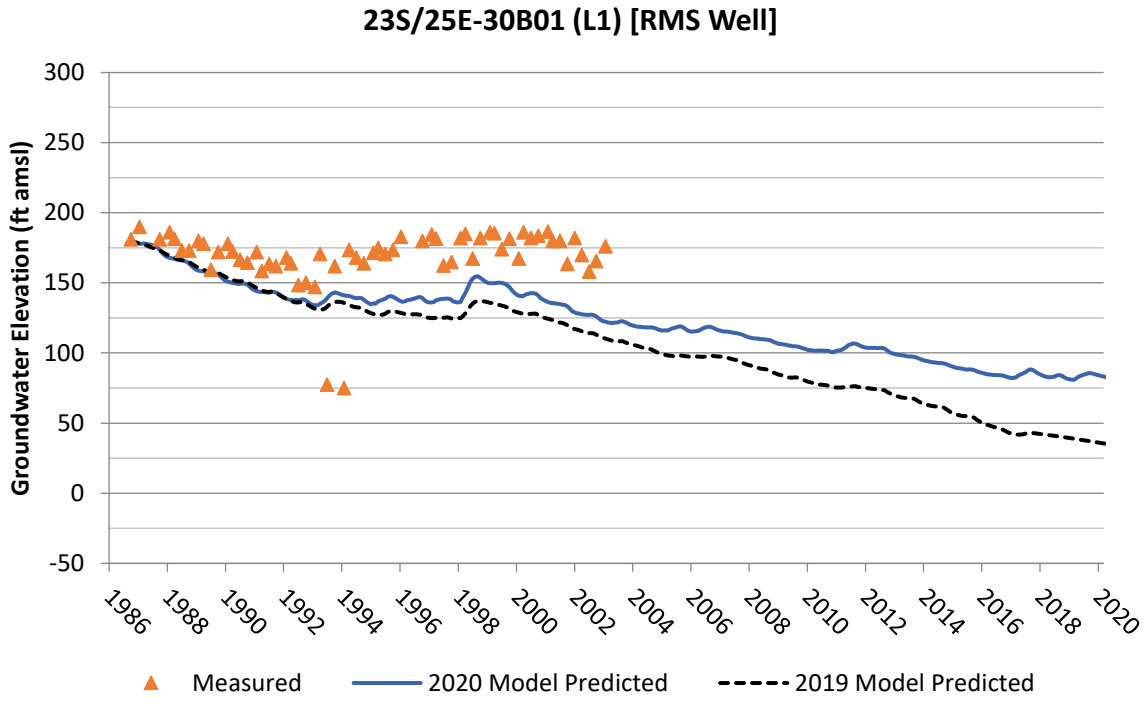

23S/27E-27 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

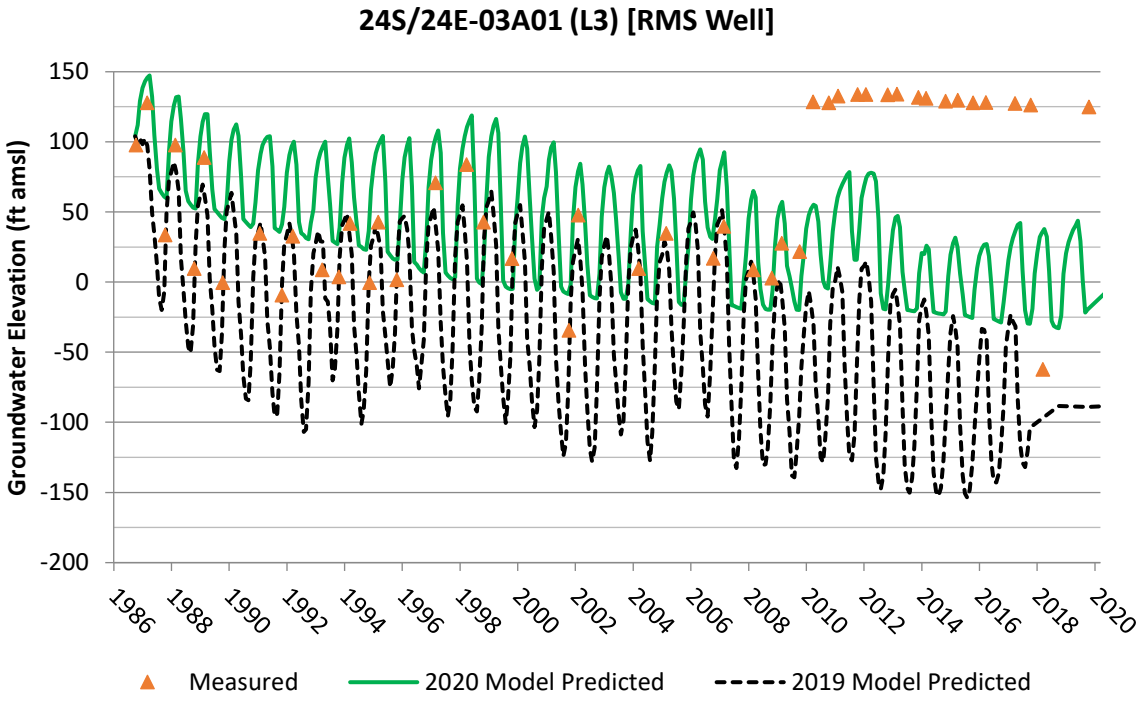

24S/26E-01R01 (L3)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

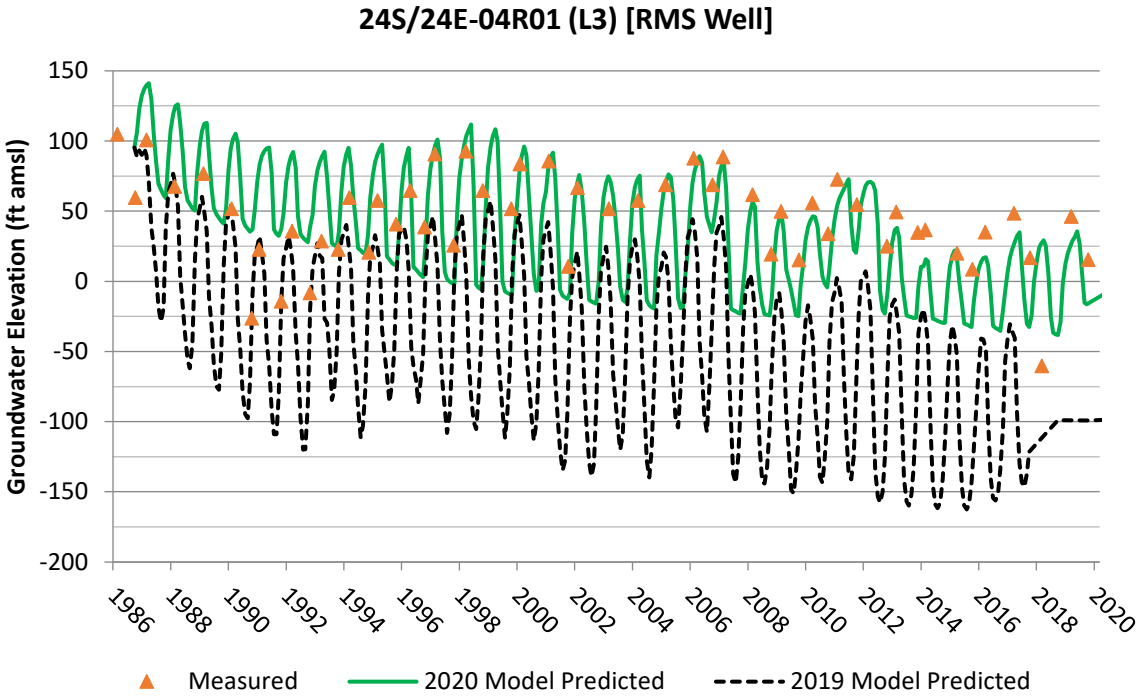

24S/26E-11 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

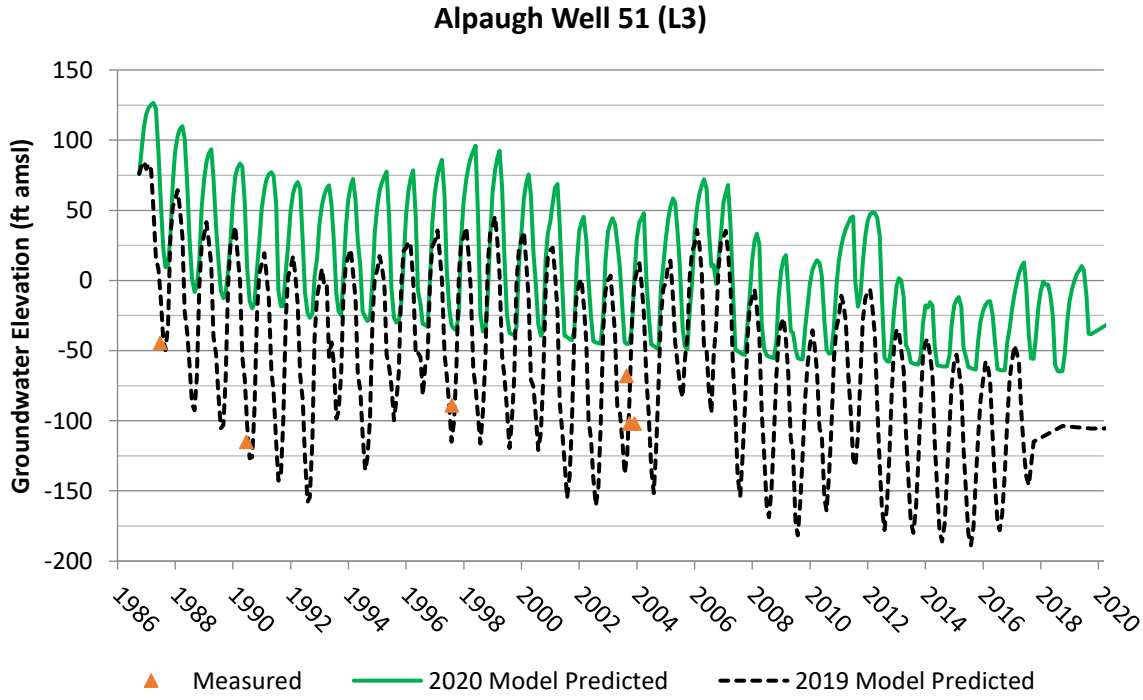

23S/26E-29D01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

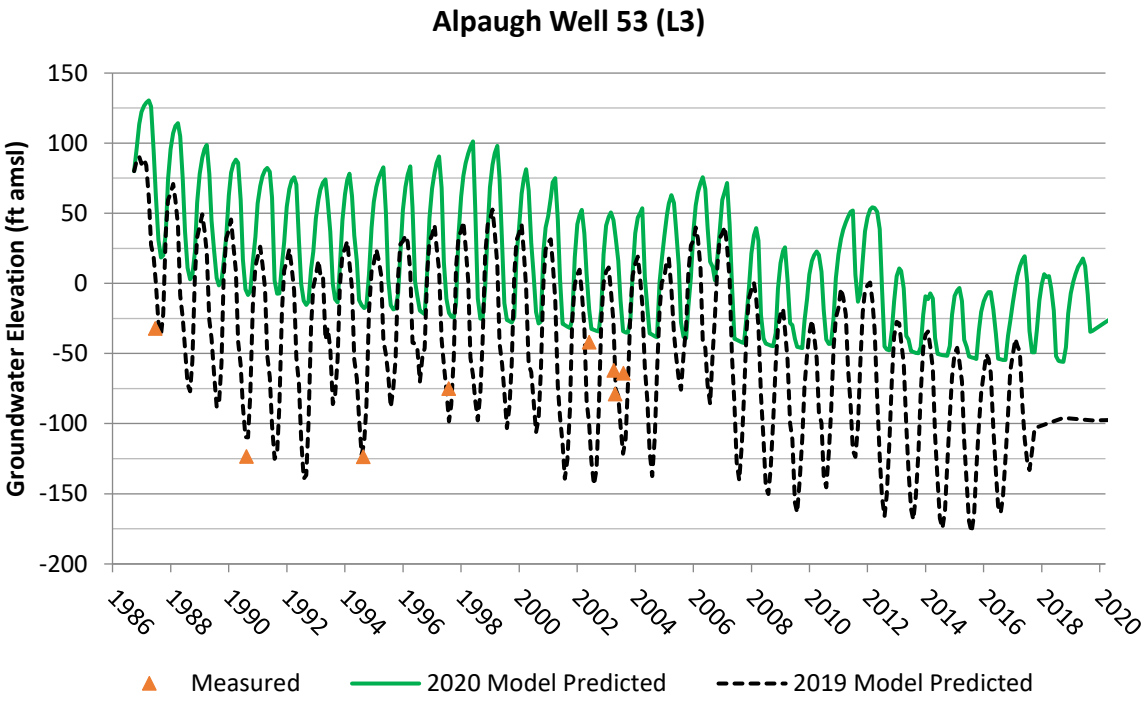

24S/26E-04P01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

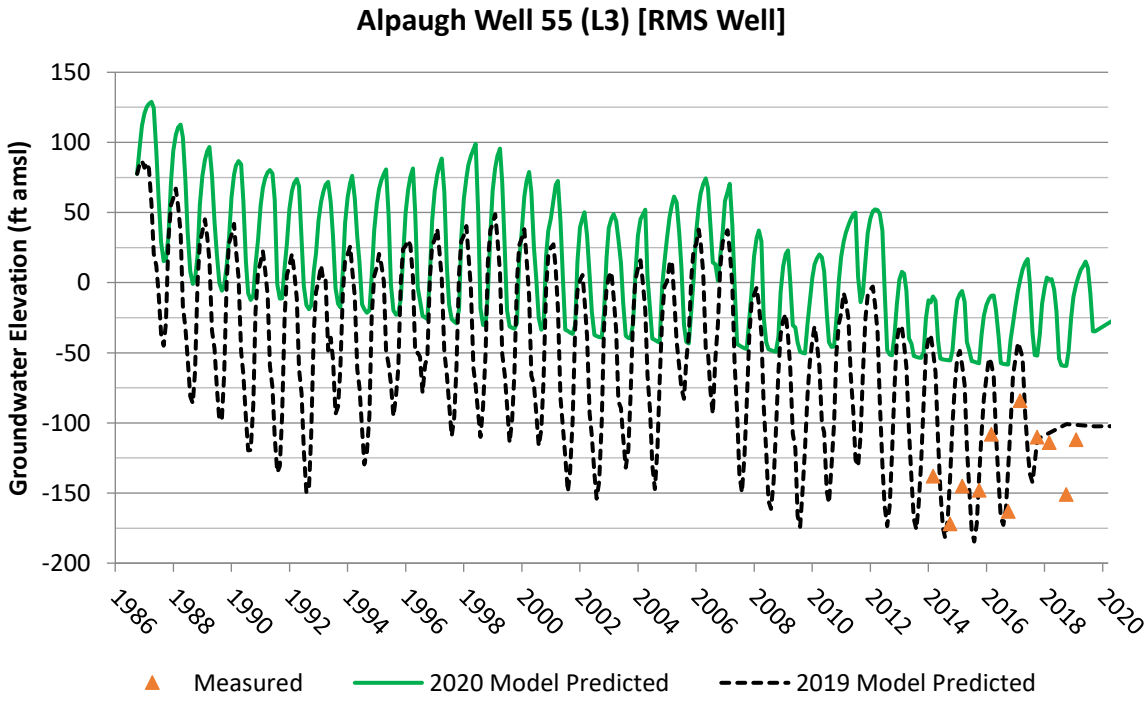

23S/25E-30B01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
300
250
200
150
100
50
0
-50
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

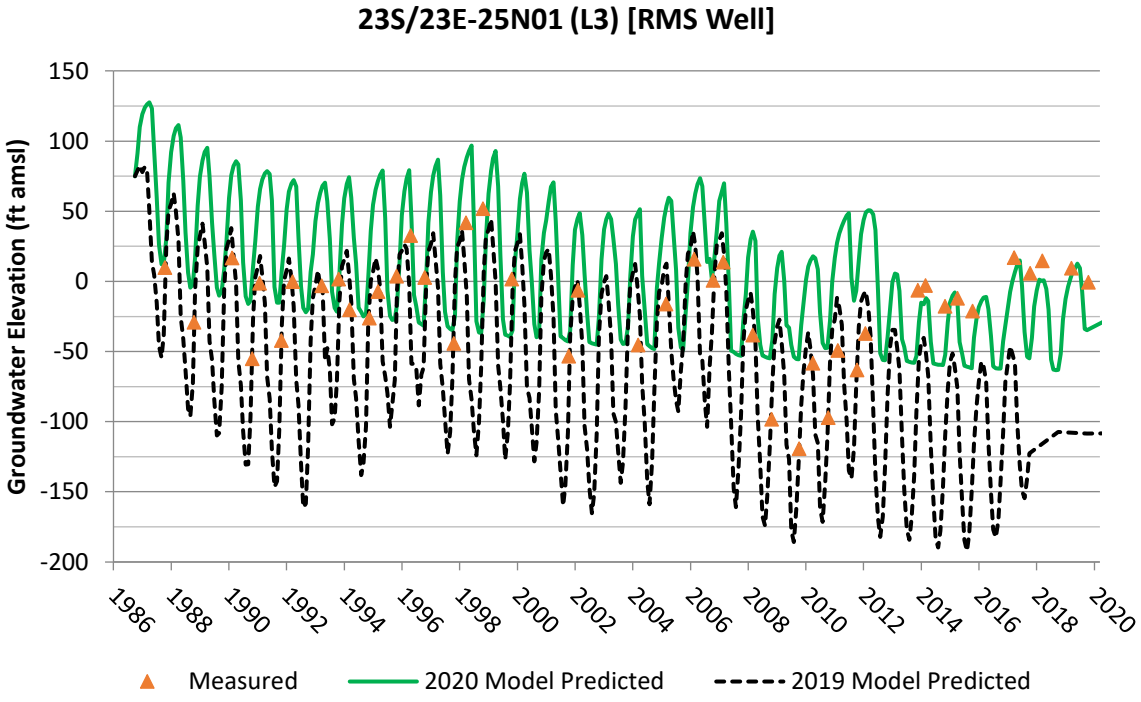

24S/24E-03A01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

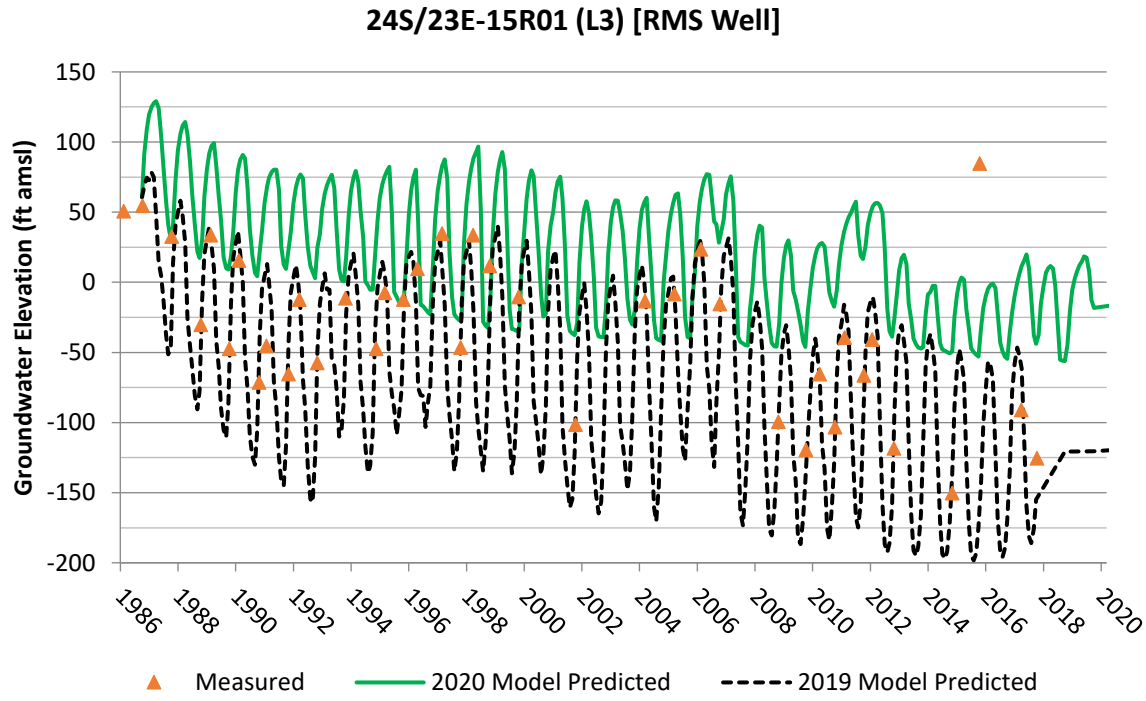

24S/24E-04R01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

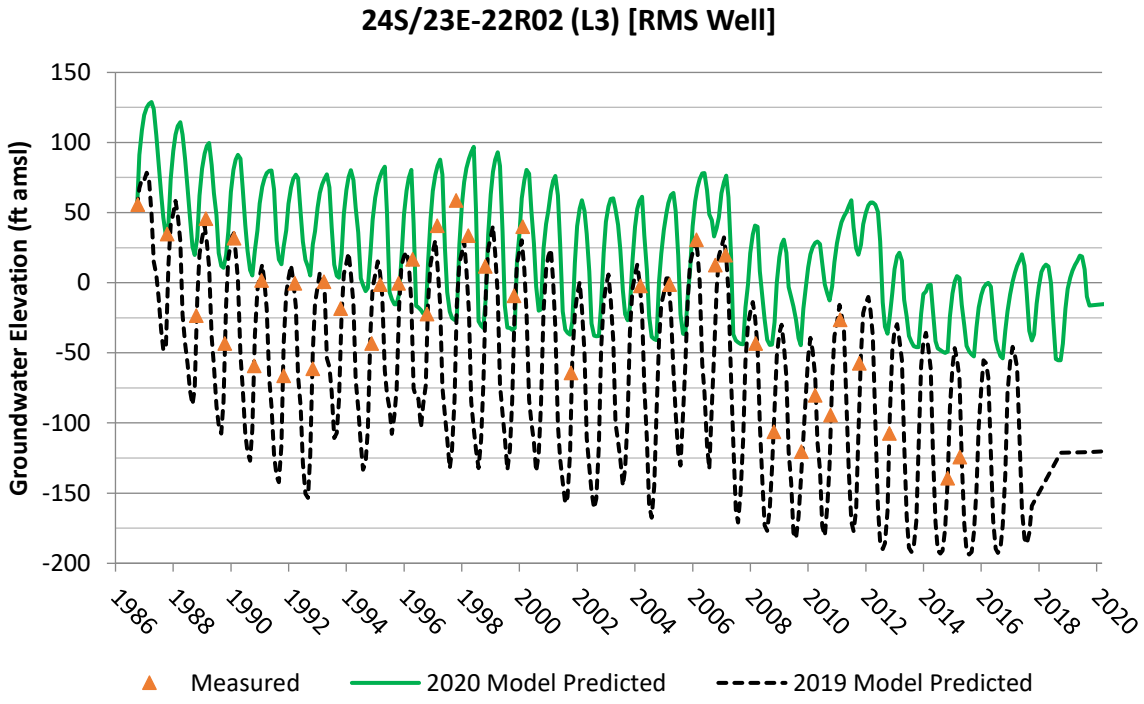

Alpaugh Well 51 (L3)
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

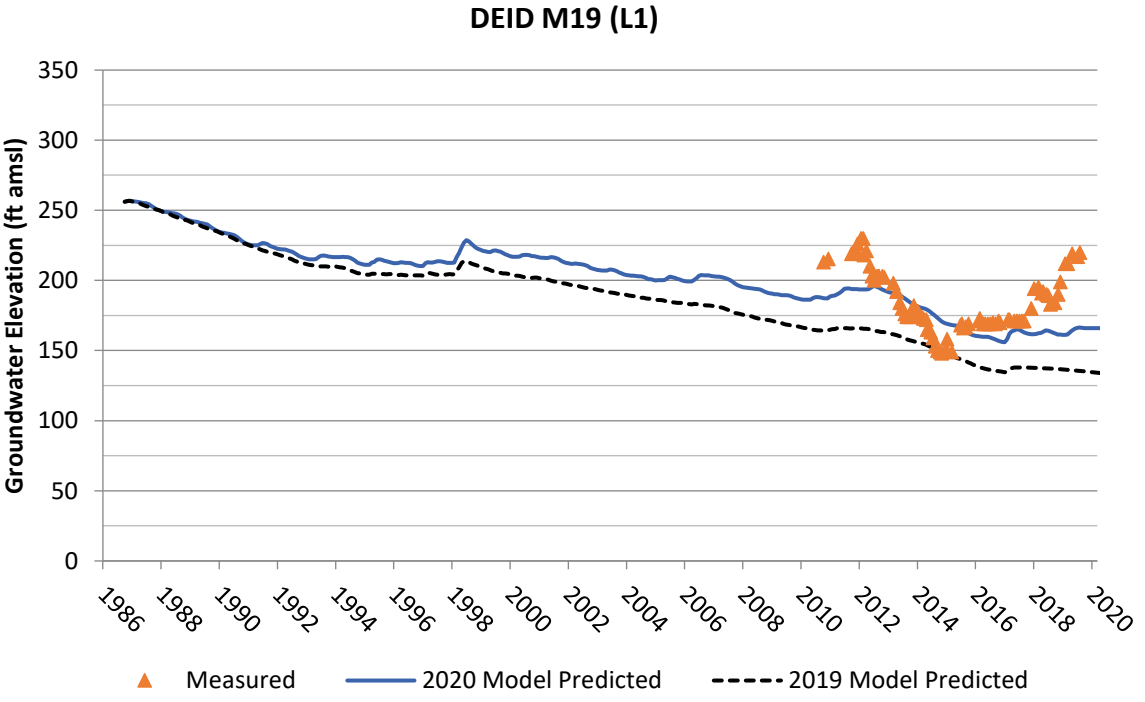

Alpaugh Well 53 (L3)
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

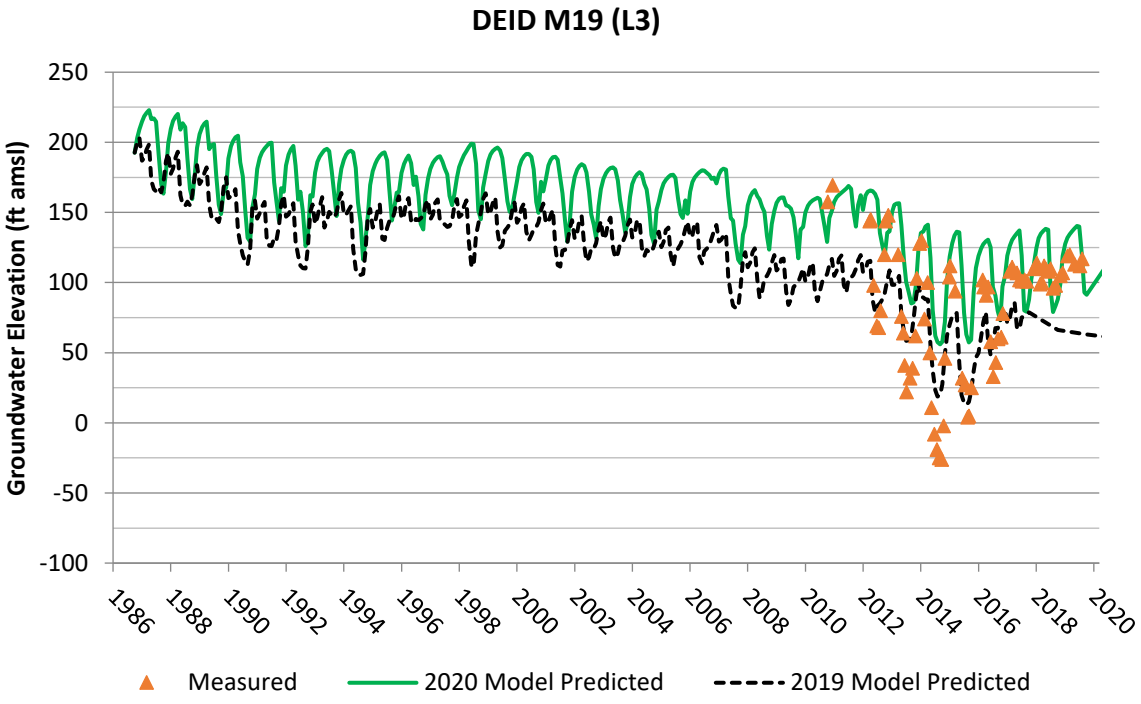

Alpaugh Well 55 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

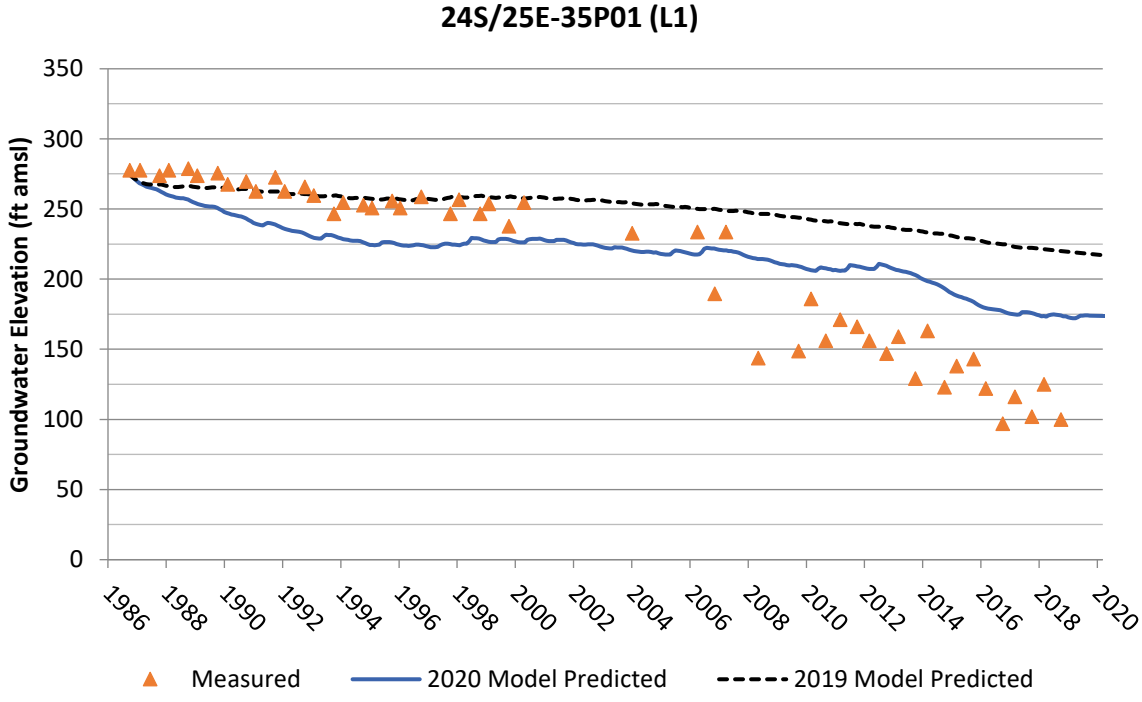

23S/23E-25N01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

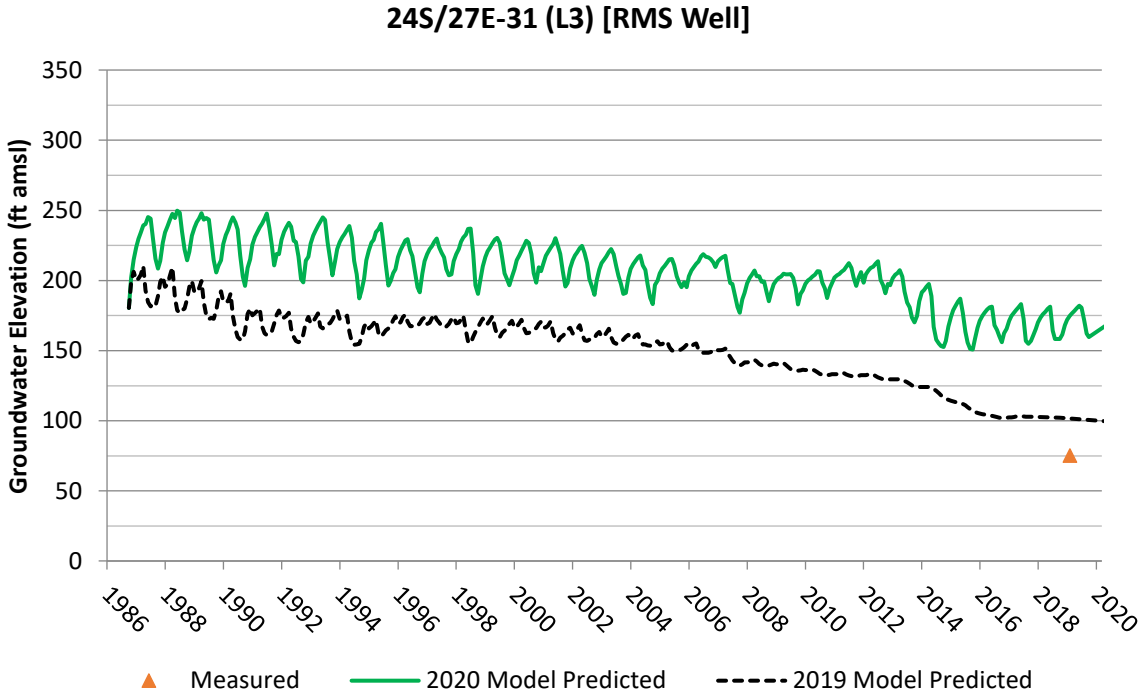

24S/23E-15R01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

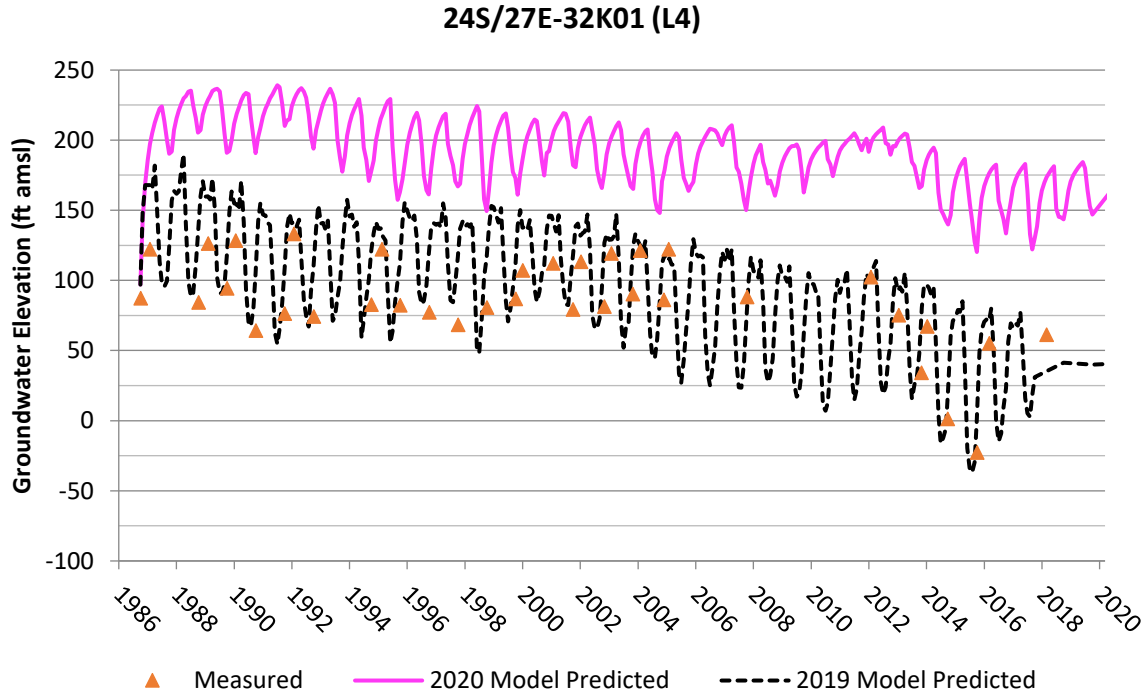

24S/23E-22R02 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

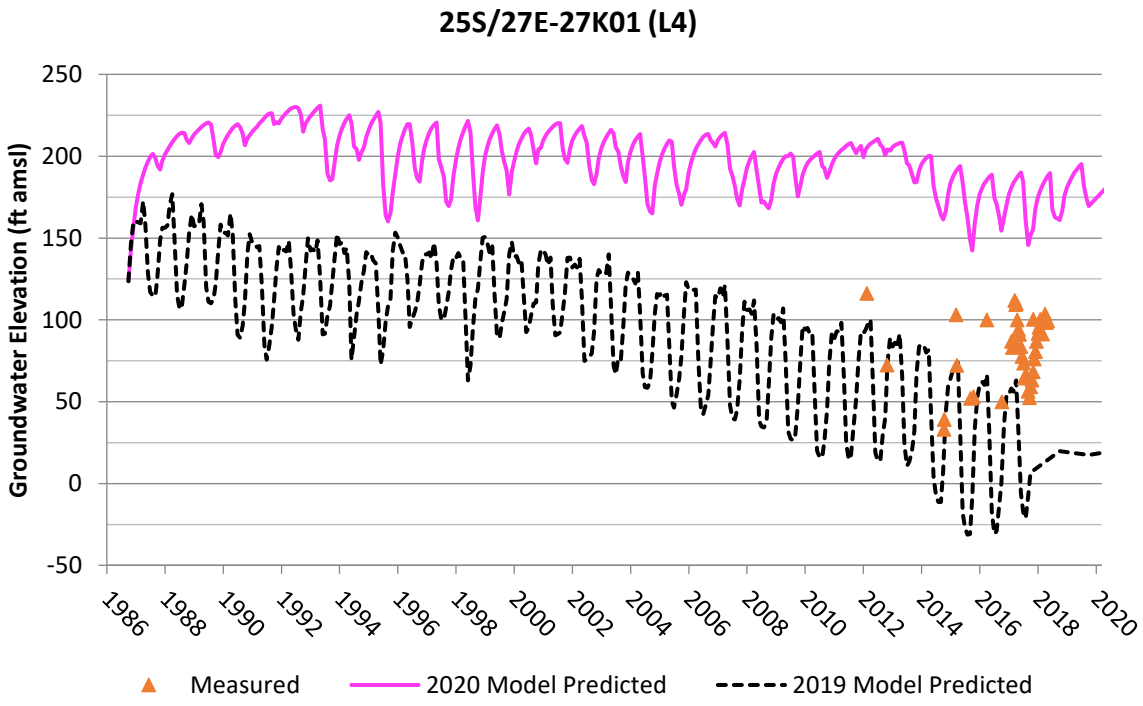

DEID M19 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted


DEID M19 (L3)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted


24S/25E-35P01 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted


24S/27E-31 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

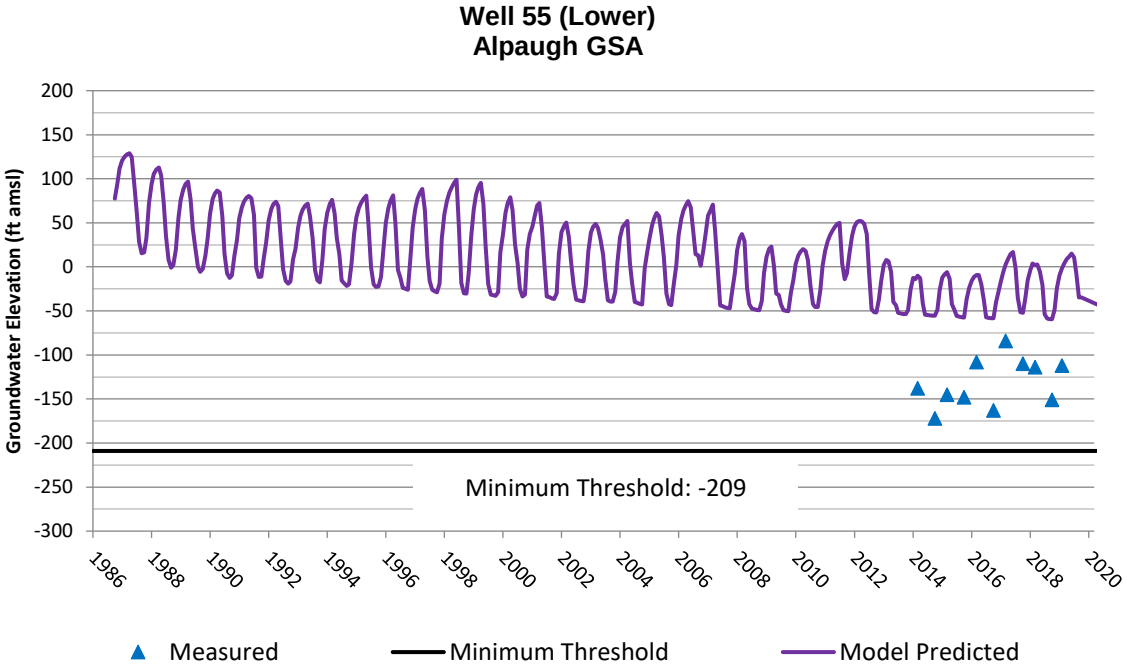

24S/27E-32K01 (L4)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted


25S/27E-27K01 (L4)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured
2020 Model Predicted
2019 Model Predicted

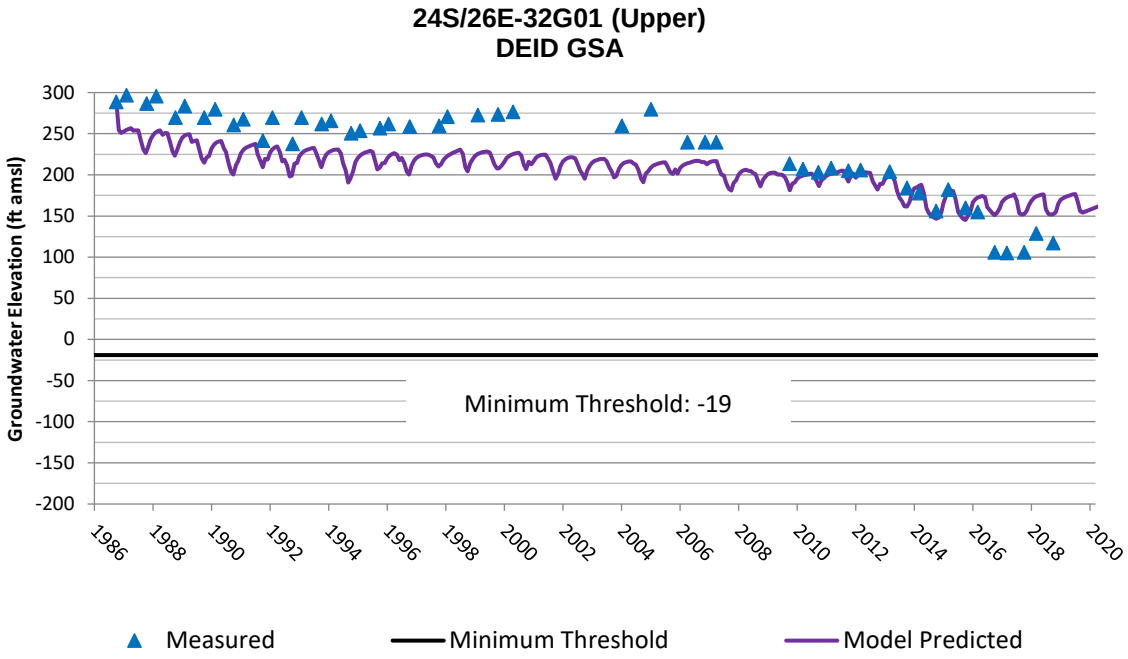
Attachment D

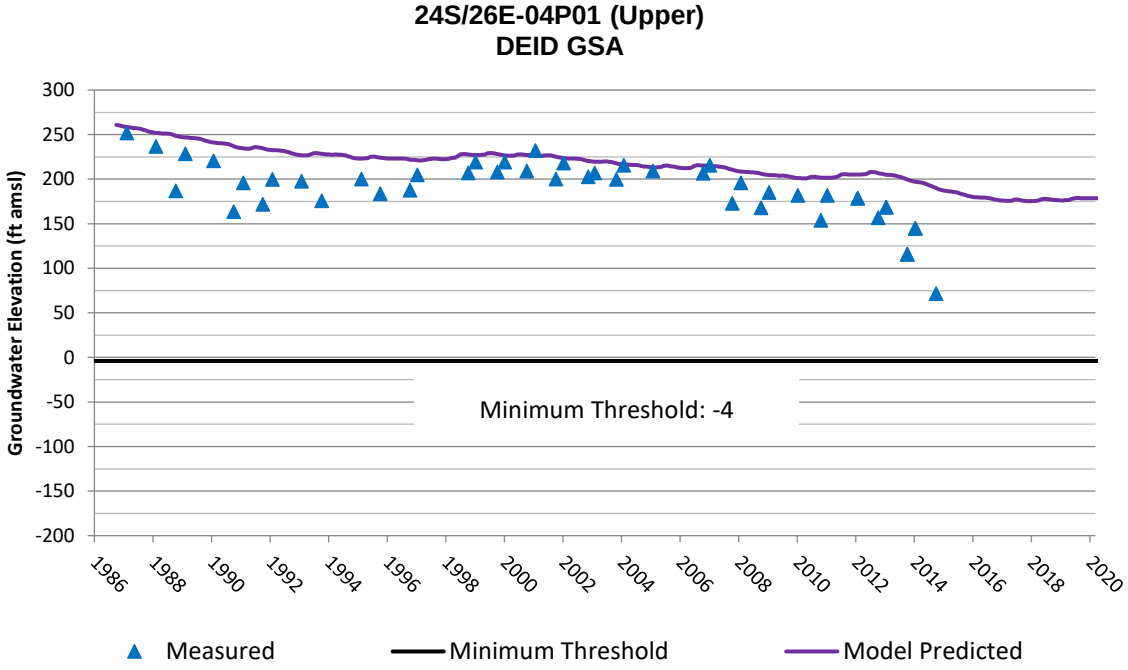
Calibration Hydrographs at RMS

Alpaugh Irrigation District GSA
RMS Groundwater Elevation Hydrographs

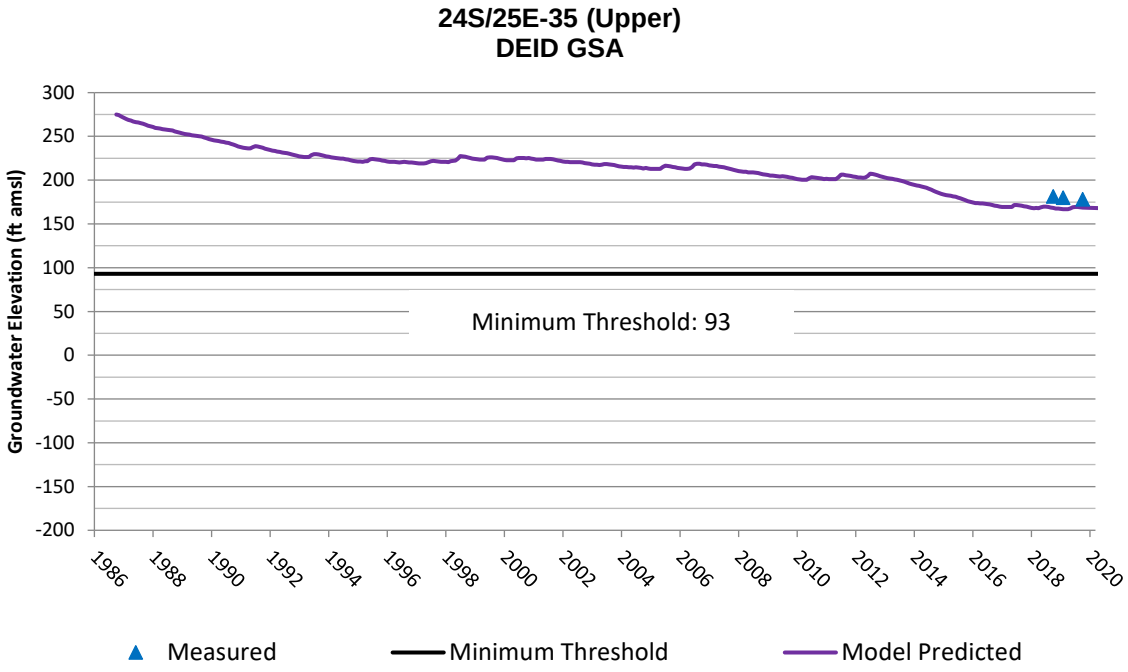


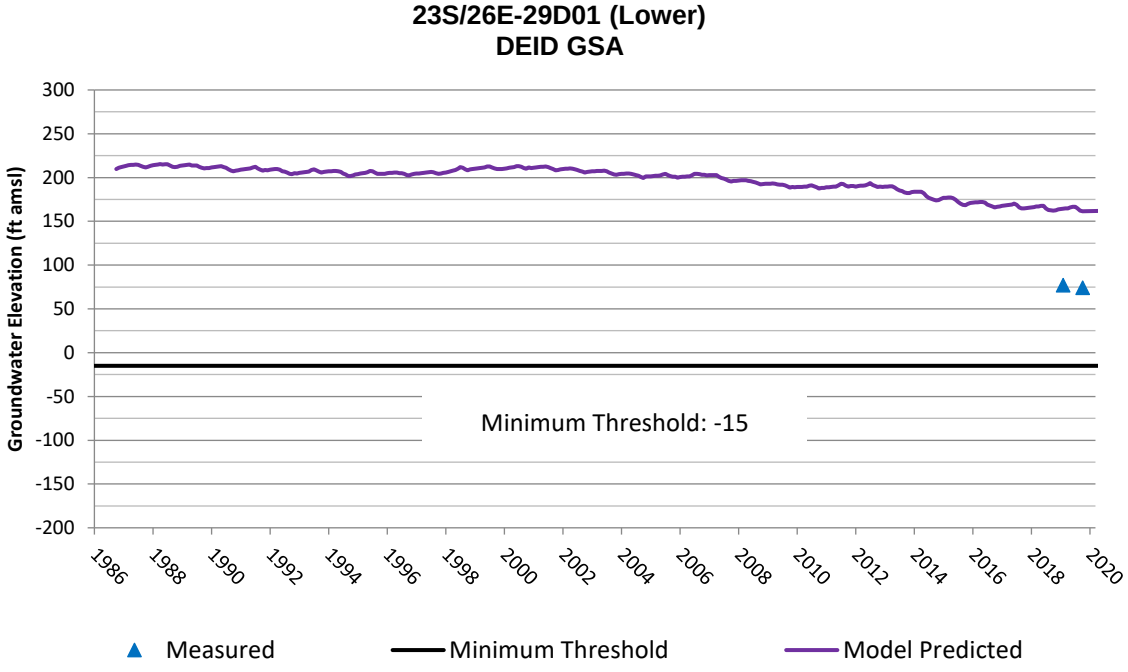
Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs



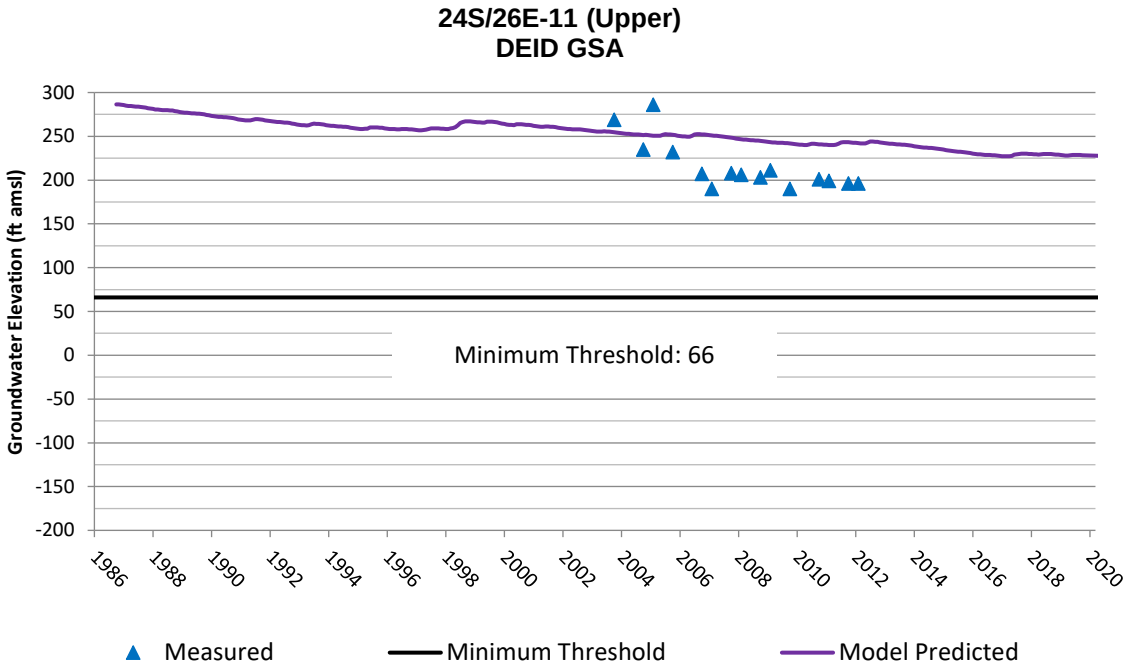


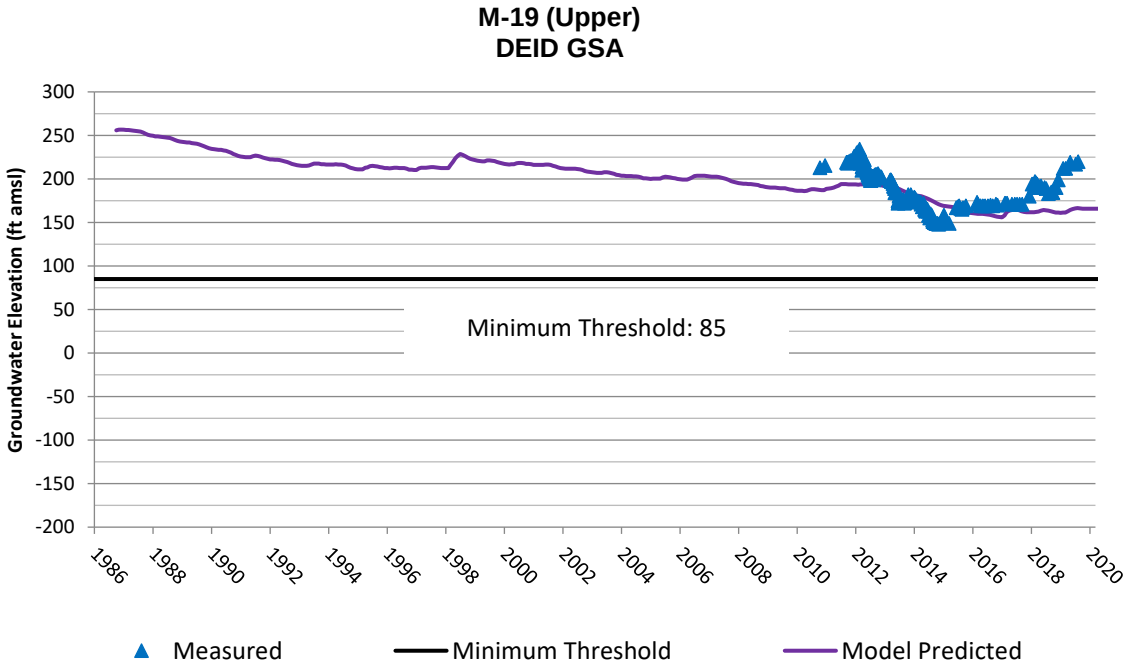
Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs





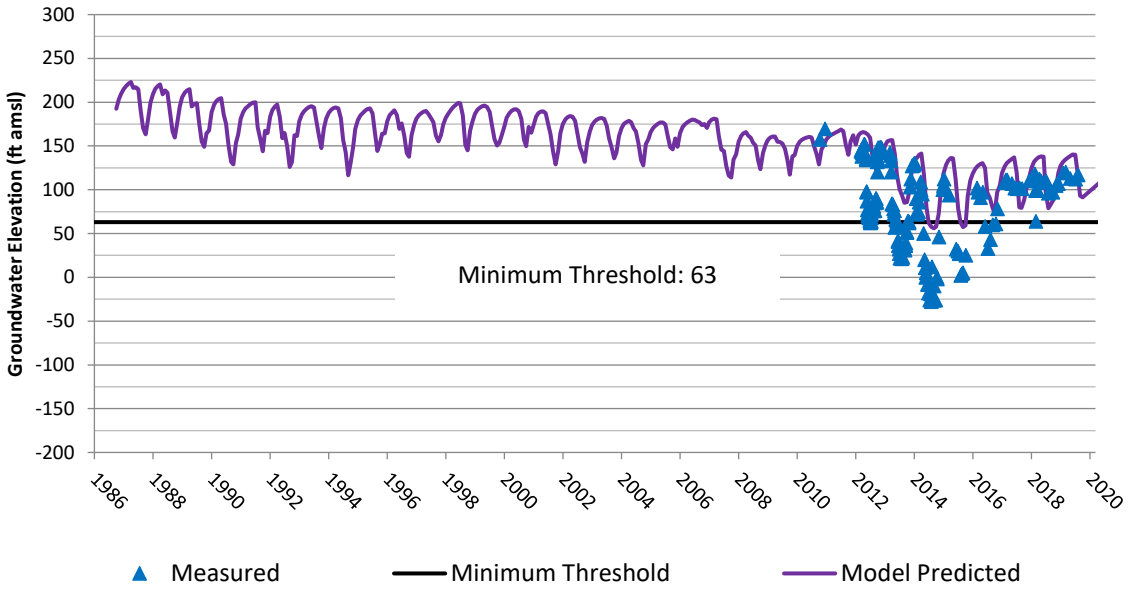
Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs



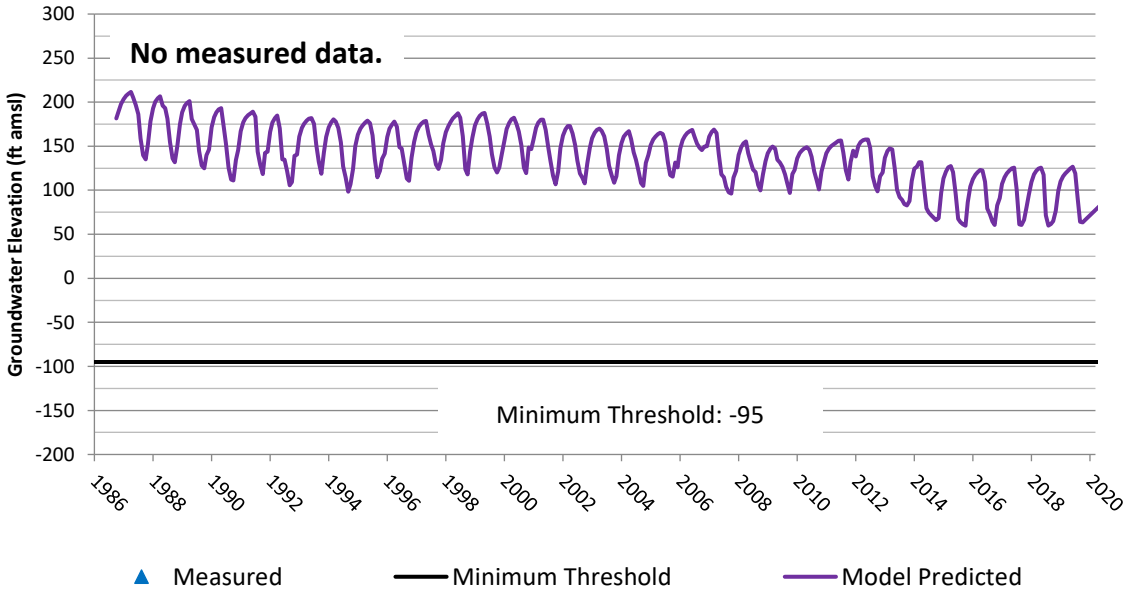


Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs

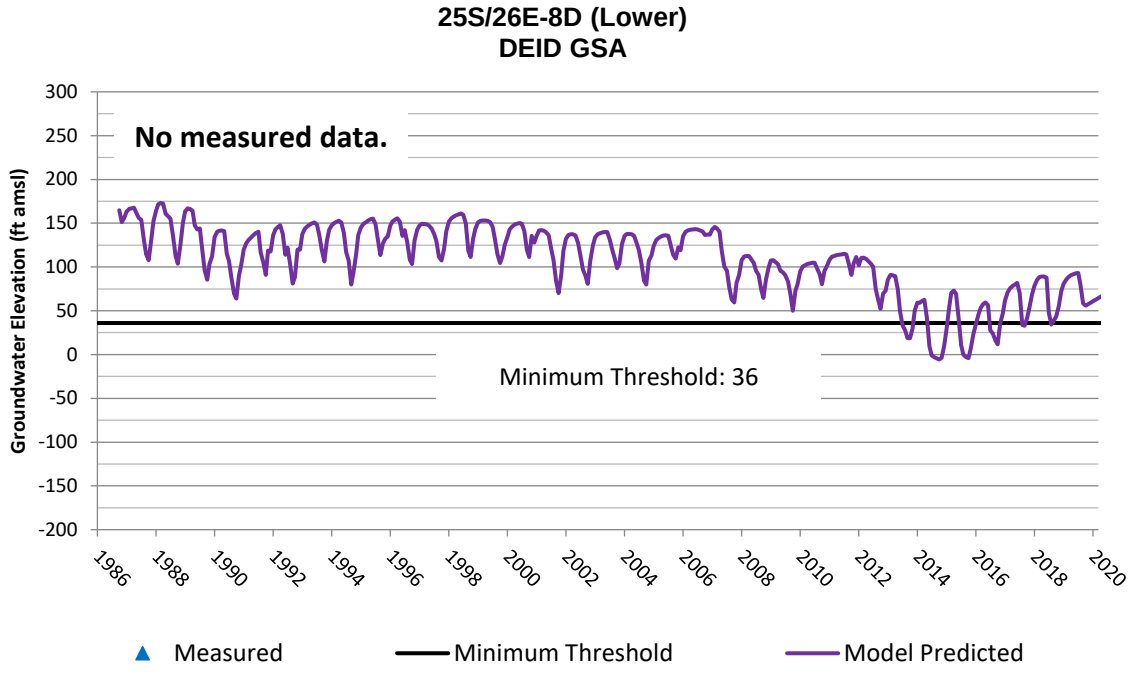
M-19 (Lower)
DEID GSA

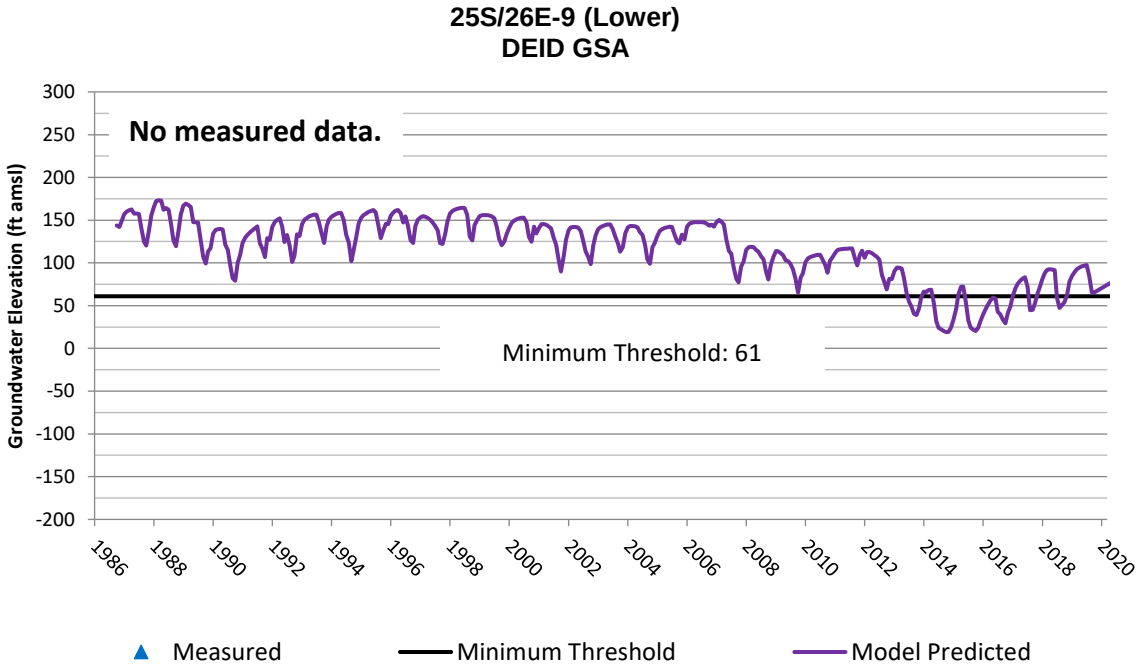


23S/25E-36 (Lower)
DEID GSA

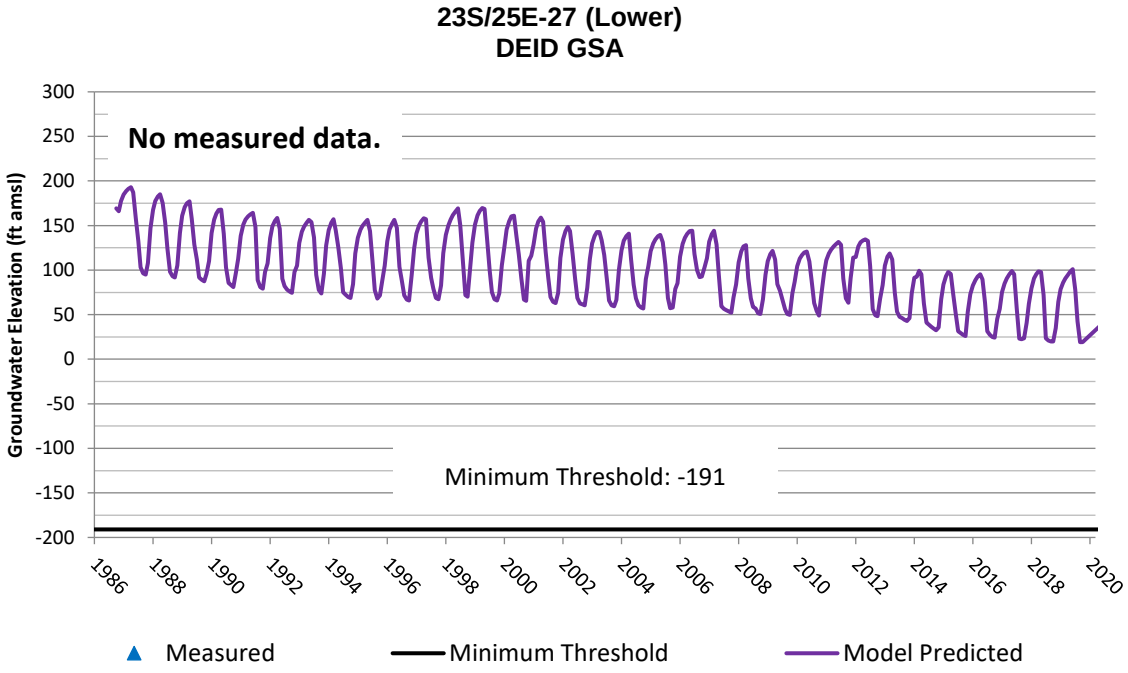


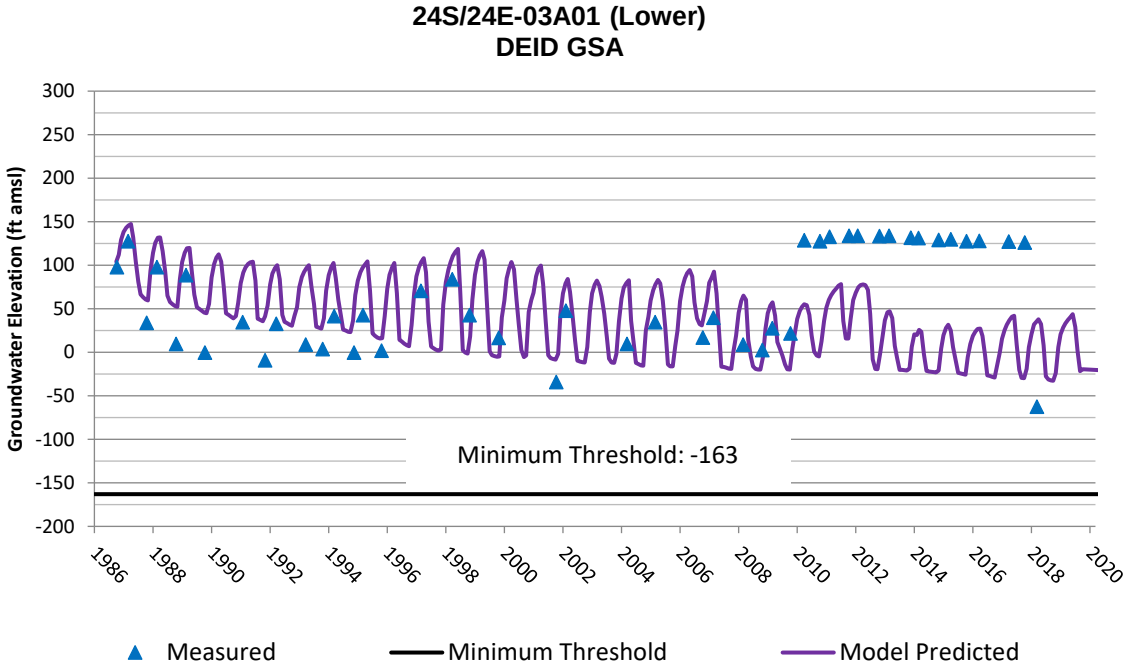
Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs



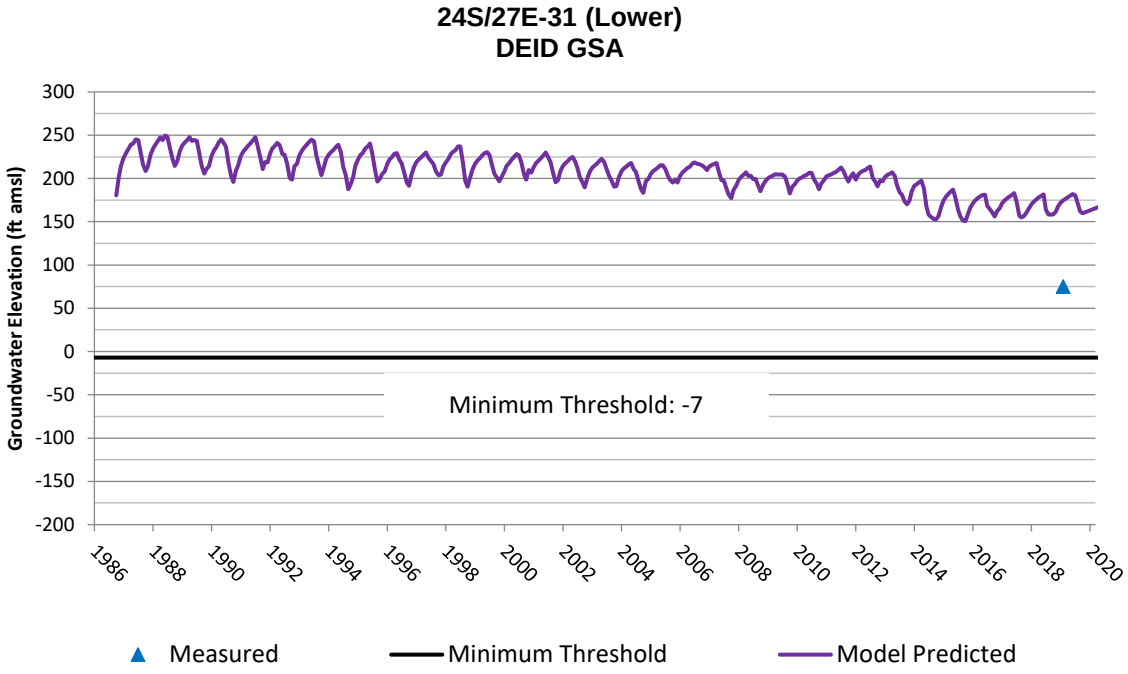


Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs

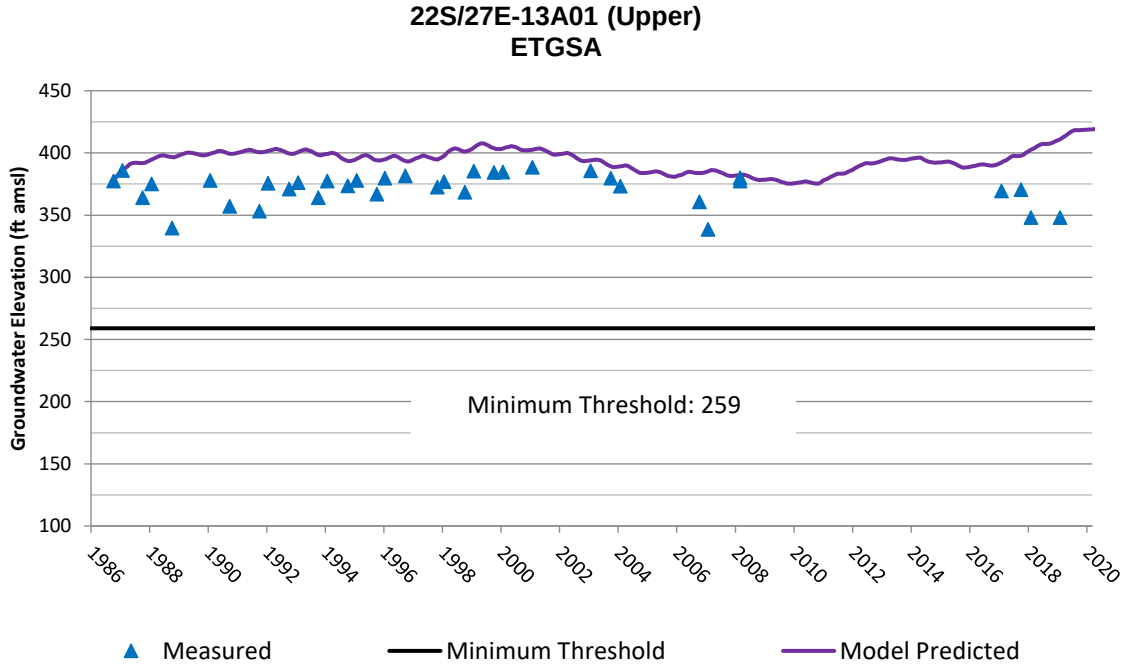


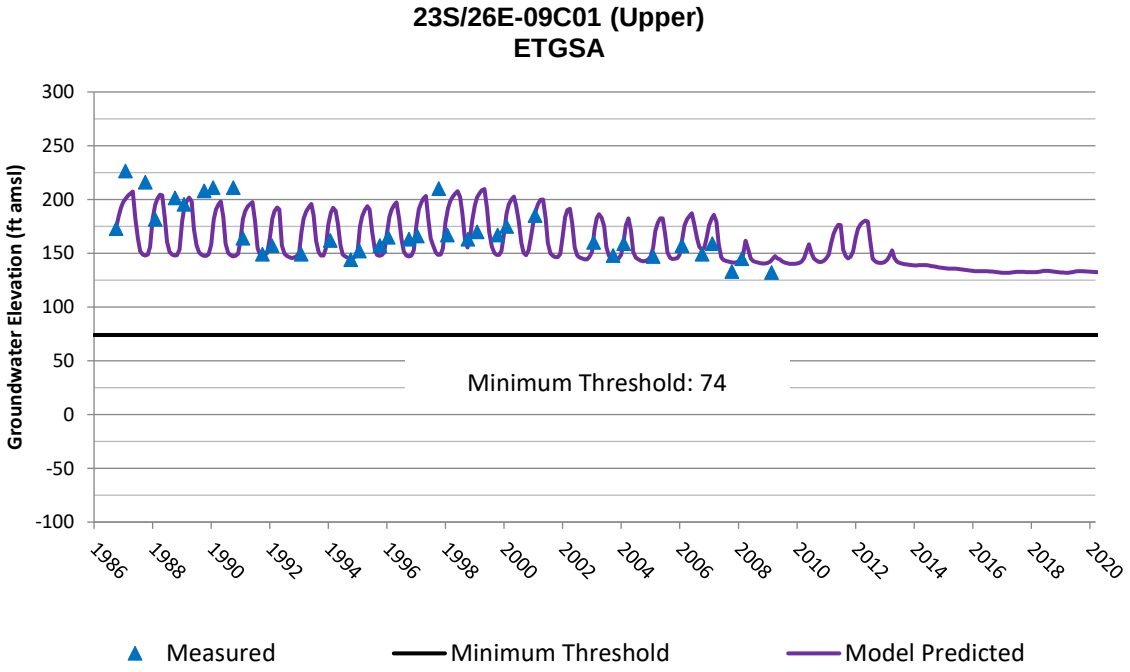


Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs

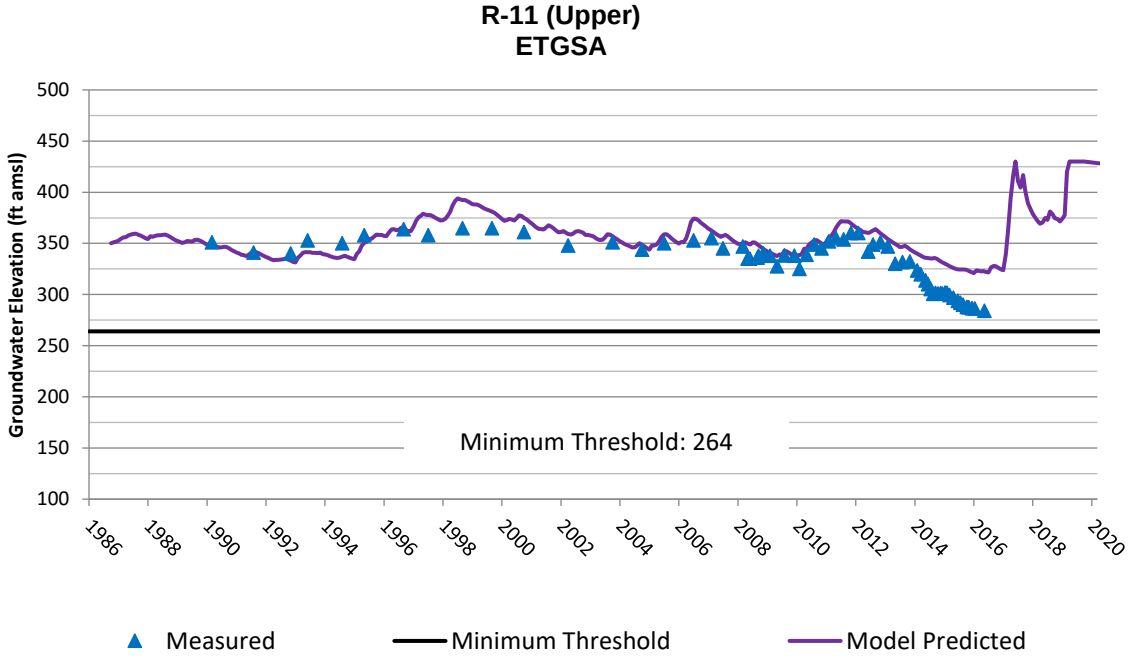


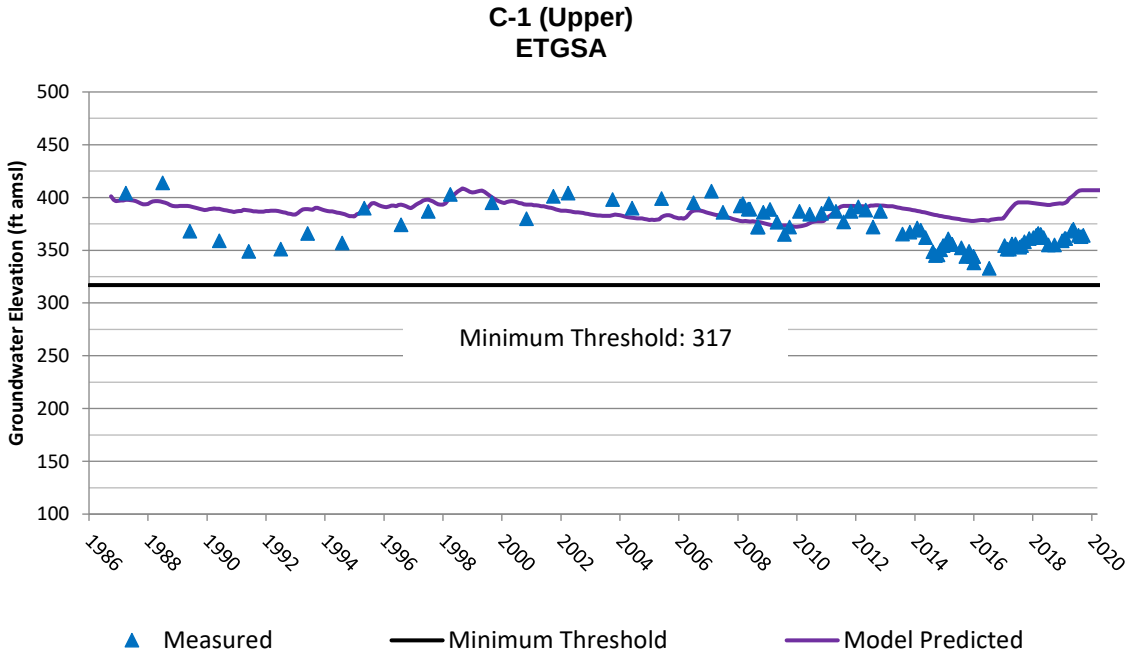
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs



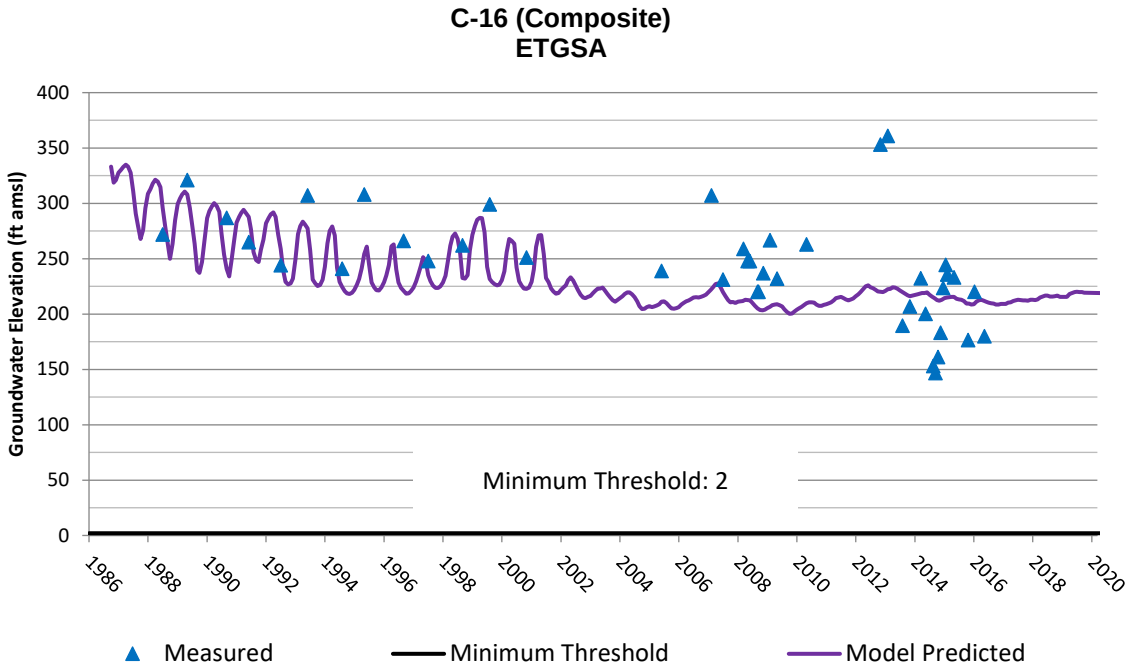


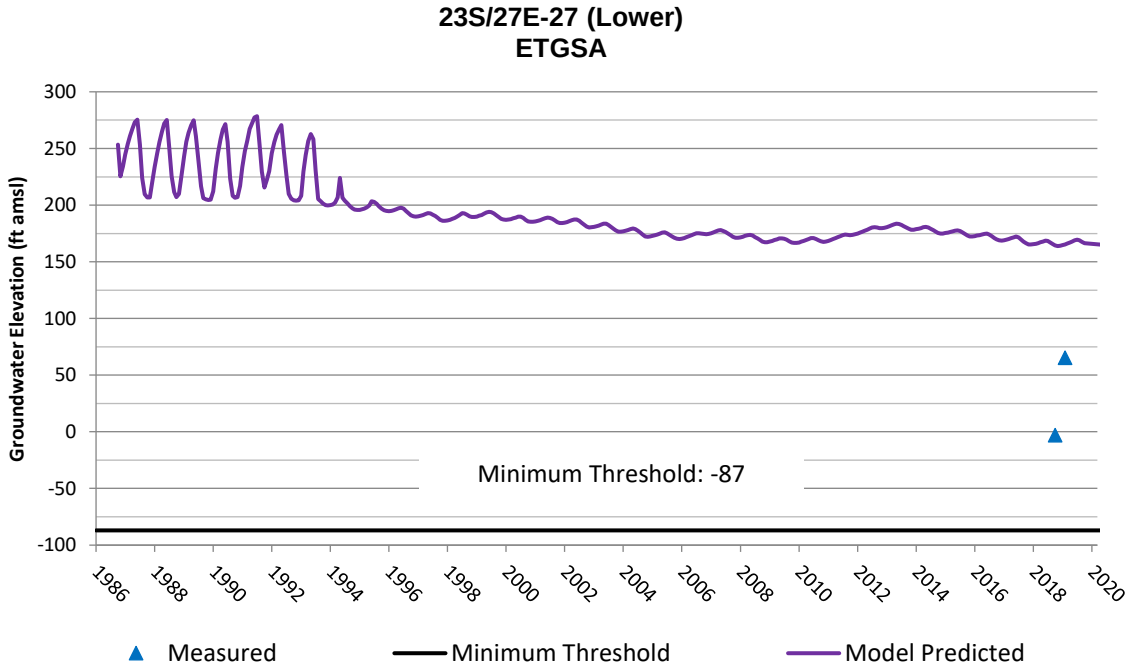
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs



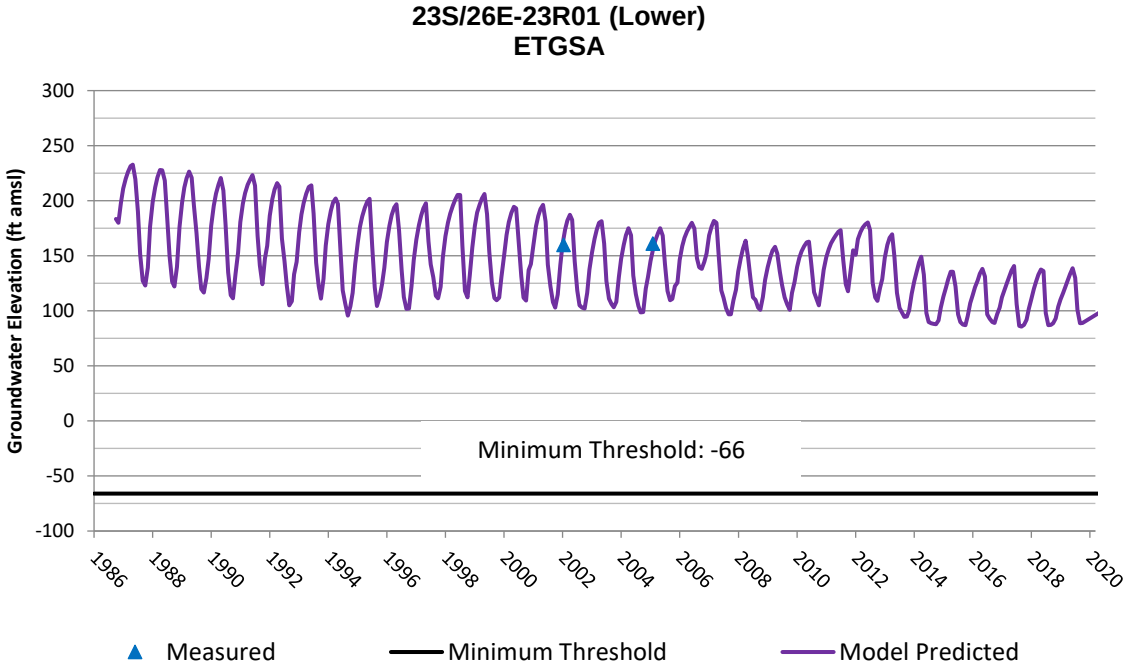


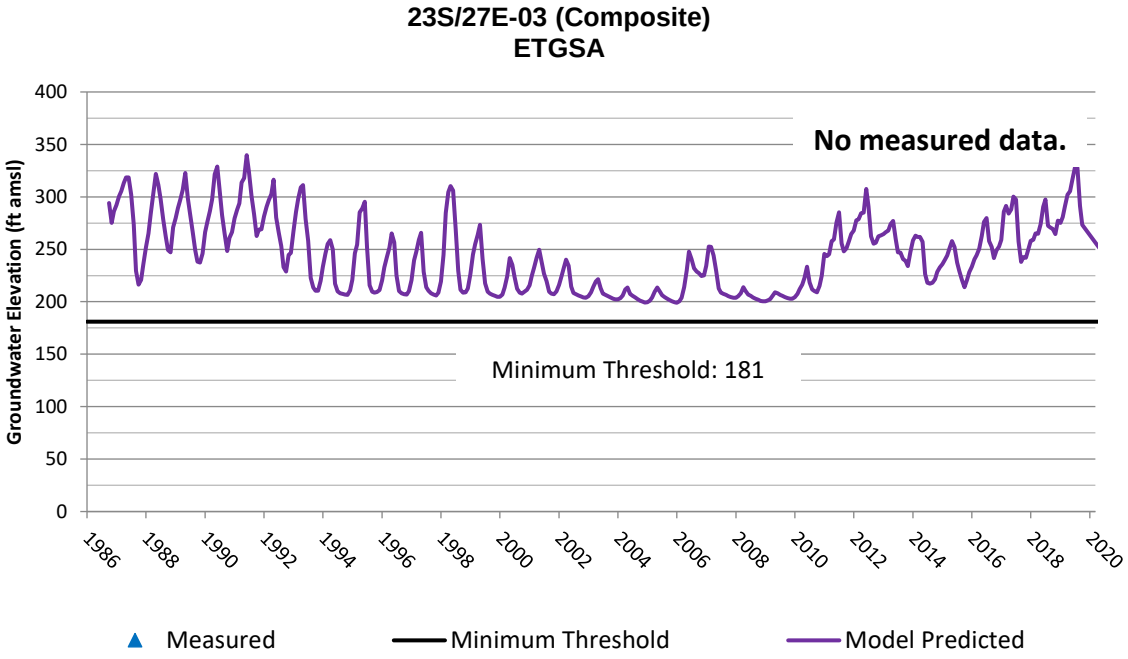
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs



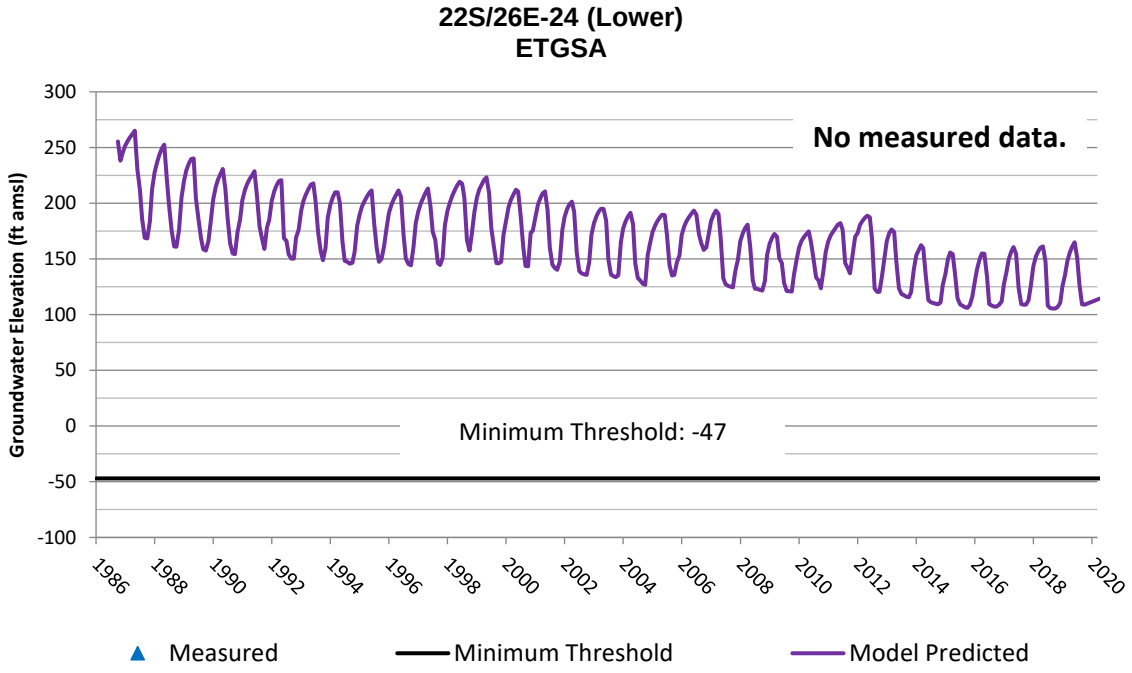


Eastern Tule GSA
RMS Groundwater Elevation Hydrographs

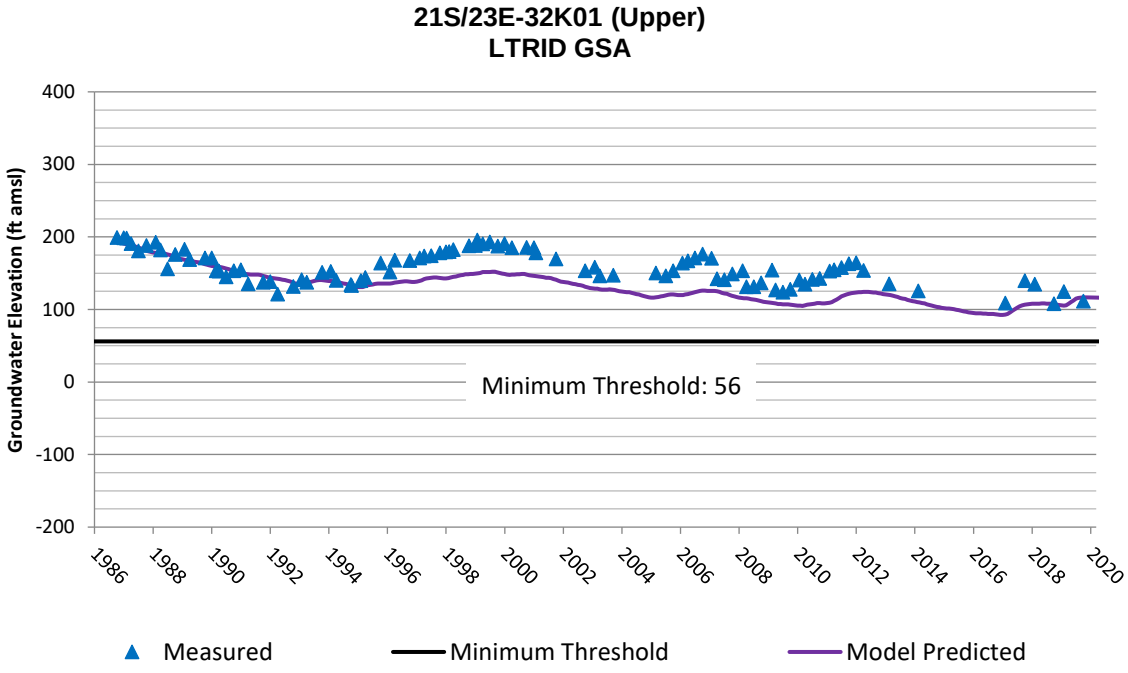


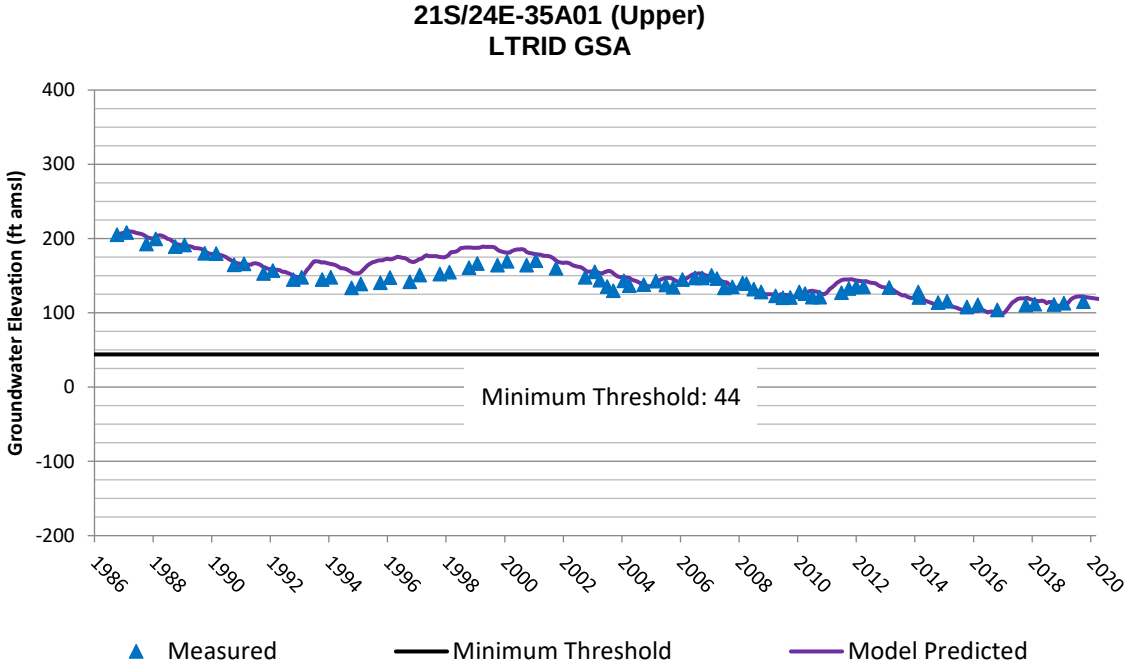


Eastern Tule GSA
RMS Groundwater Elevation Hydrographs

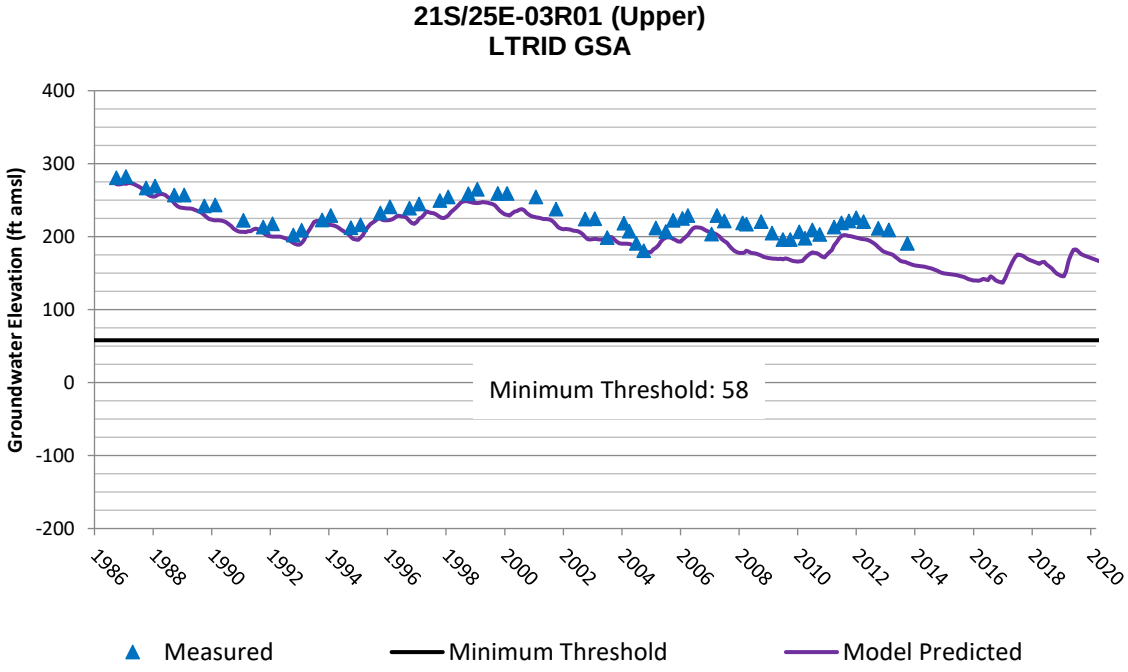


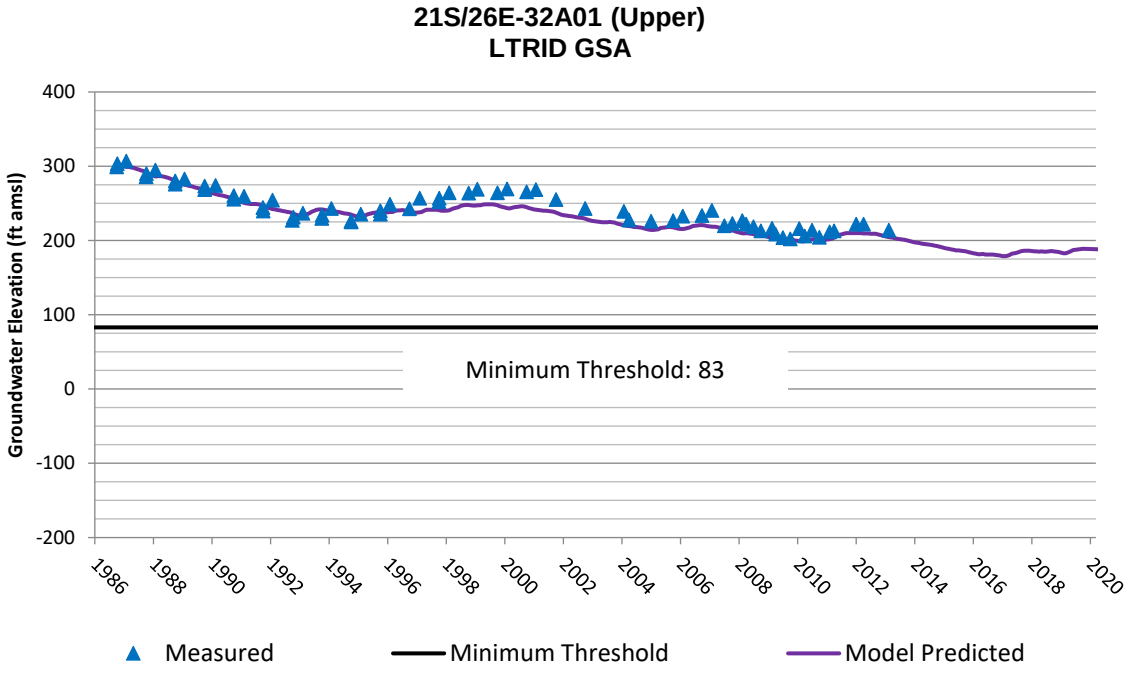
Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs



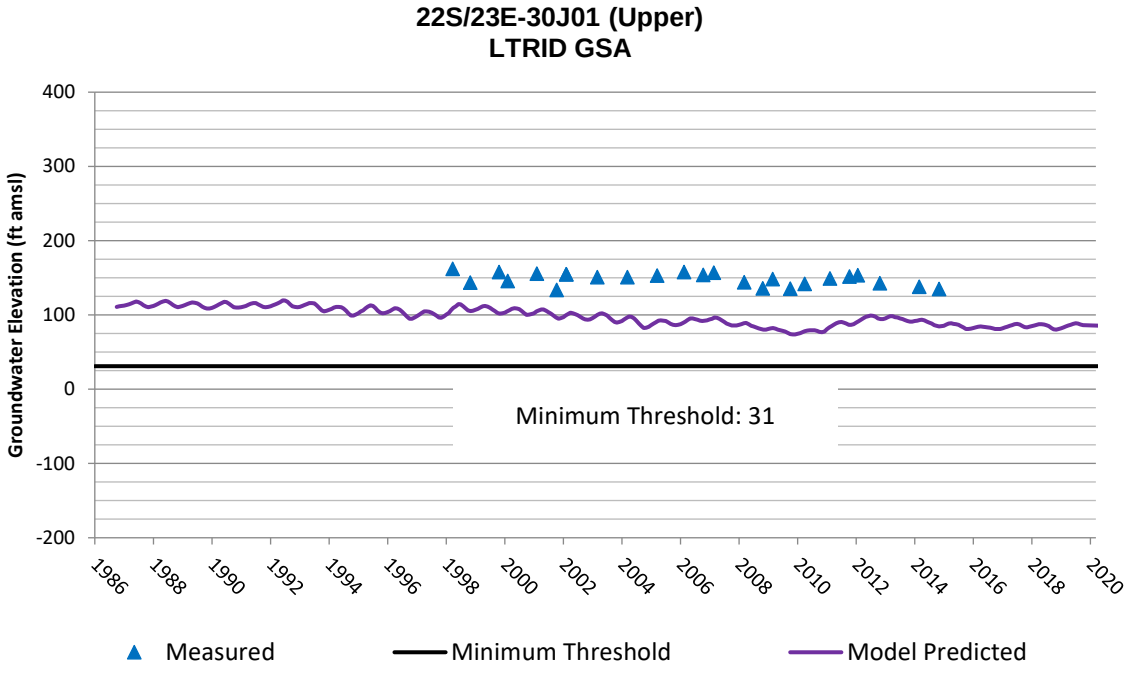


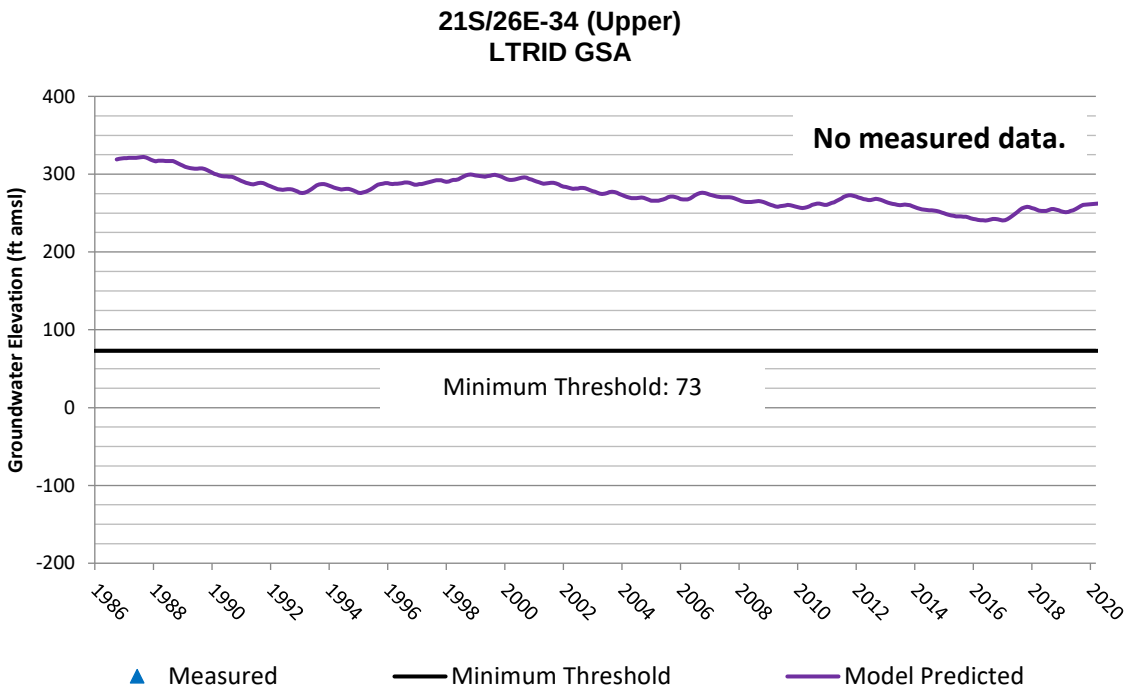
Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs





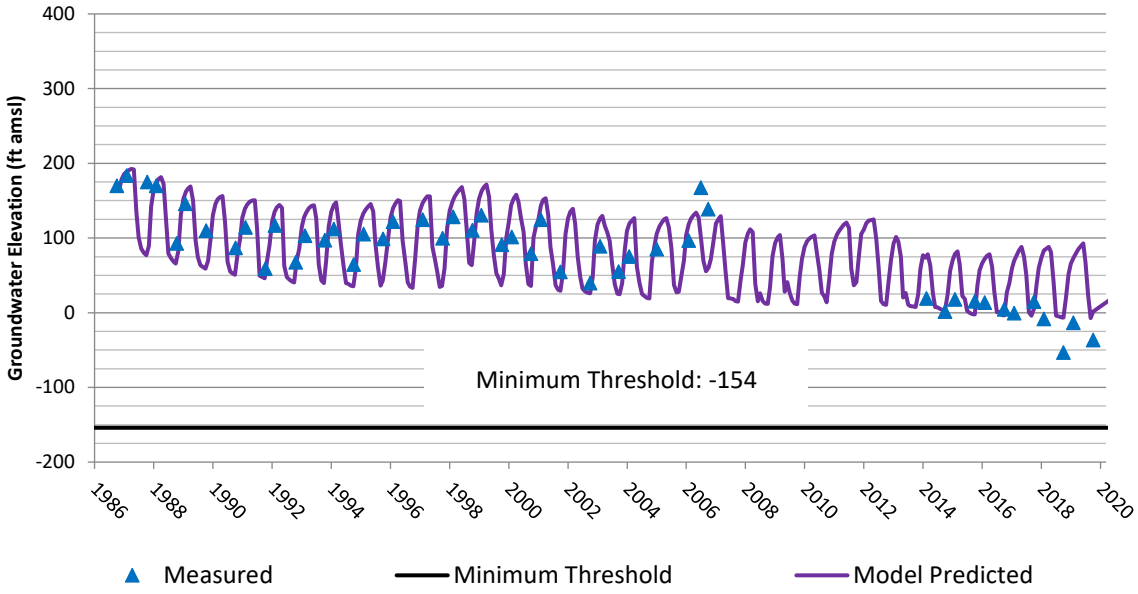
Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs



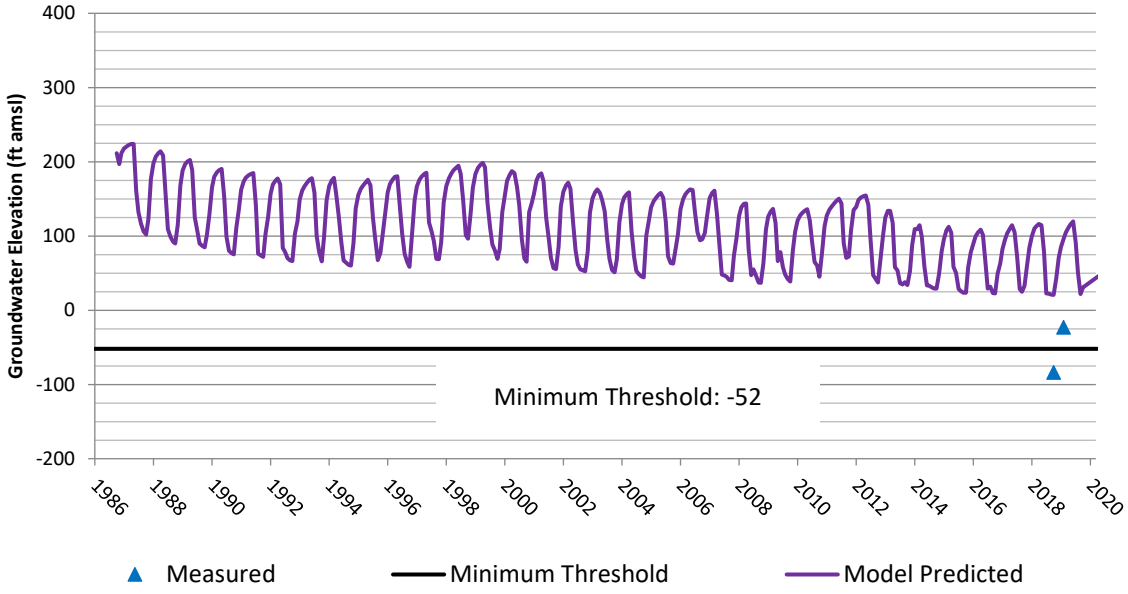


Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs

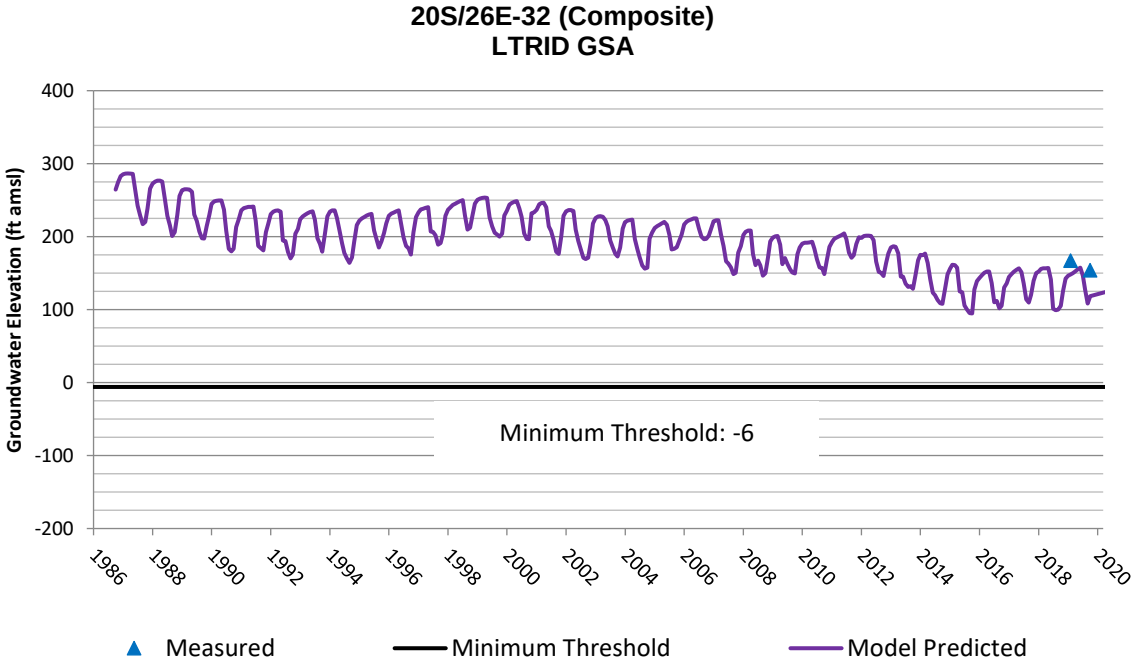
22S/24E-01Q01 (Lower)
LTRID GSA

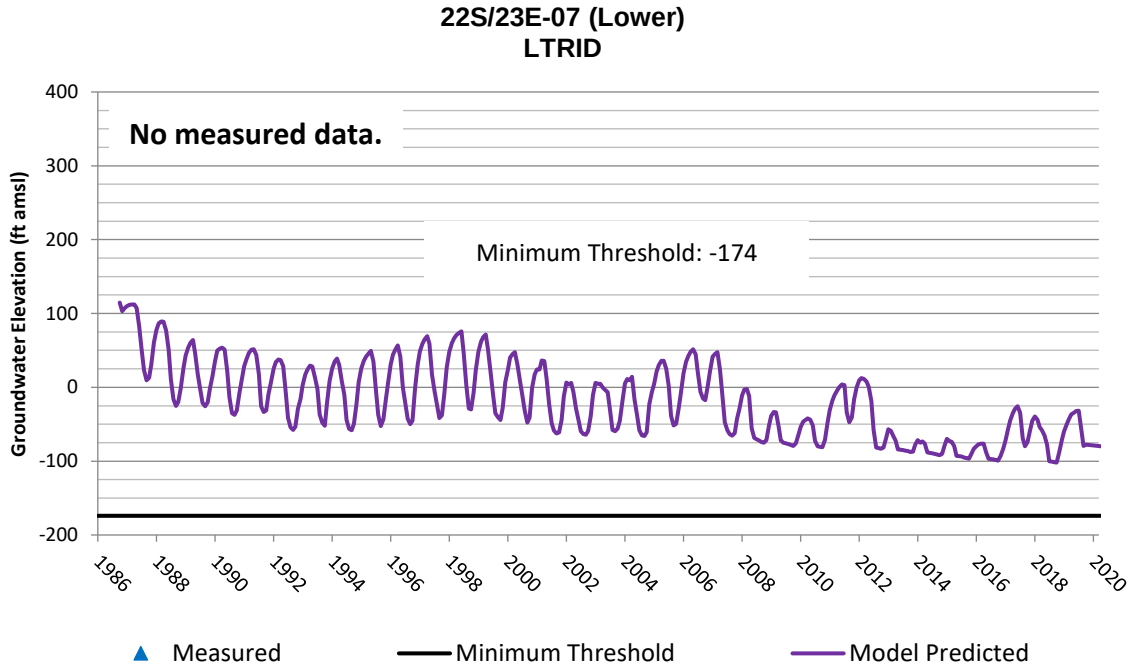


21S/25E-36 (Lower)
LTRID GSA



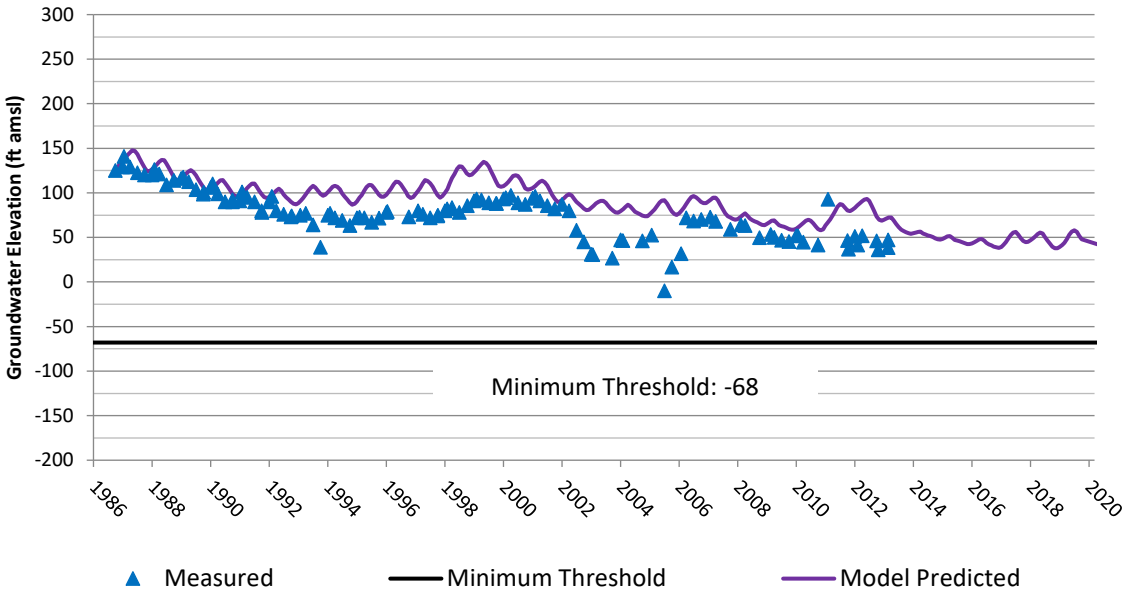
Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs



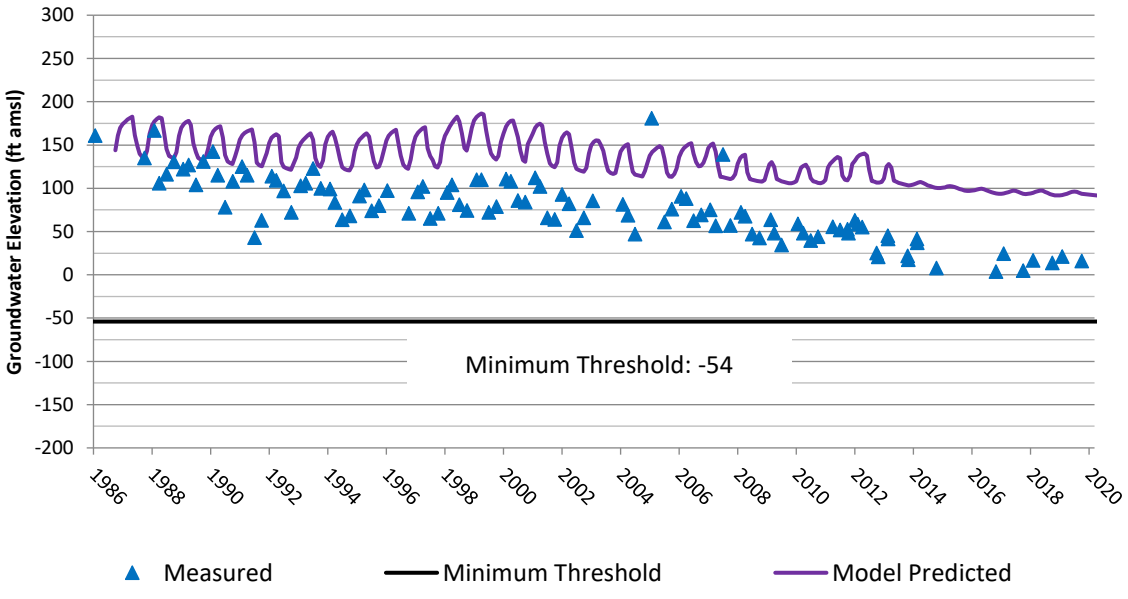


Pixley Irrigation District GSA
RMS Groundwater Elevation Hydrographs

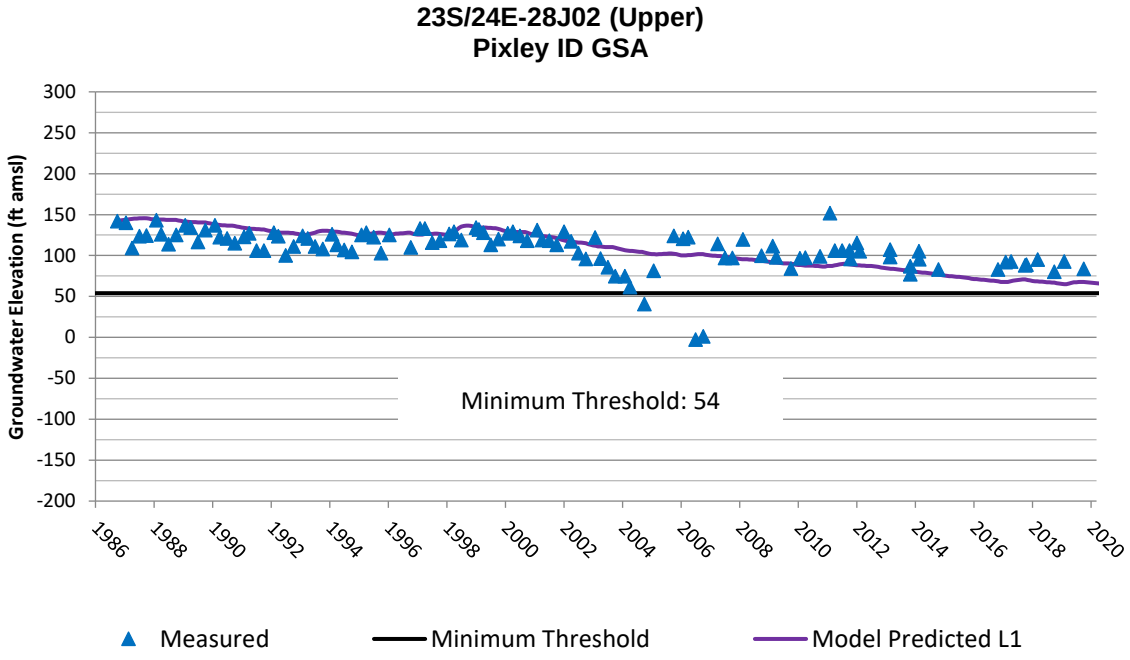
22S/24E-23J01 (Upper)
Pixley ID GSA

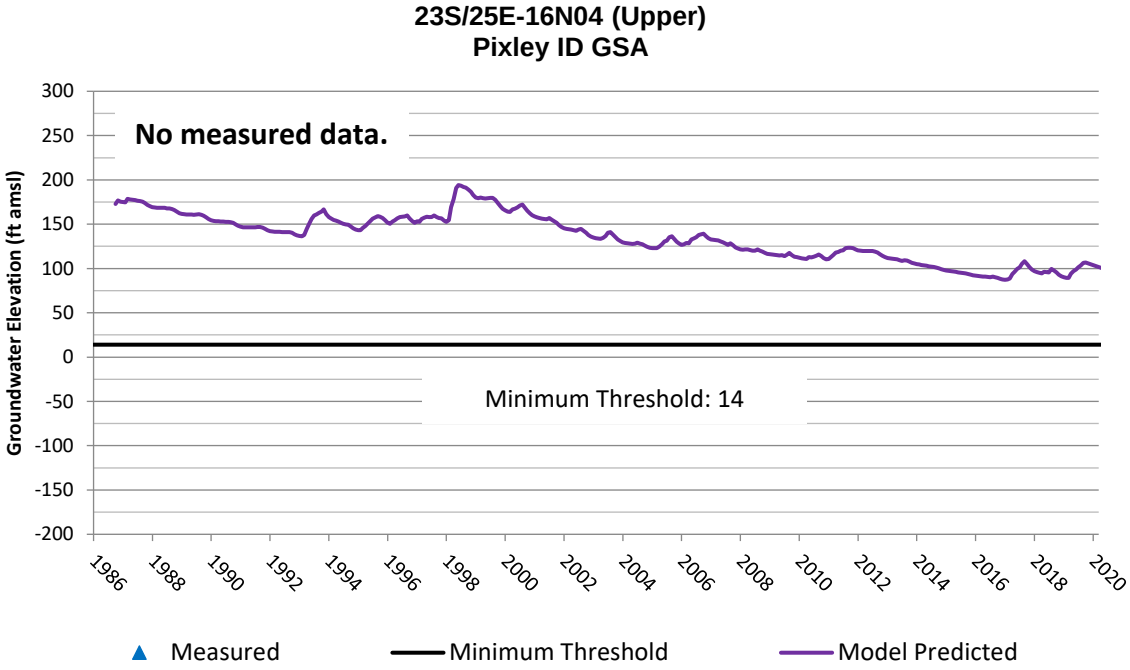


22S/25E-25N01 (Upper)
Pixley ID GSA

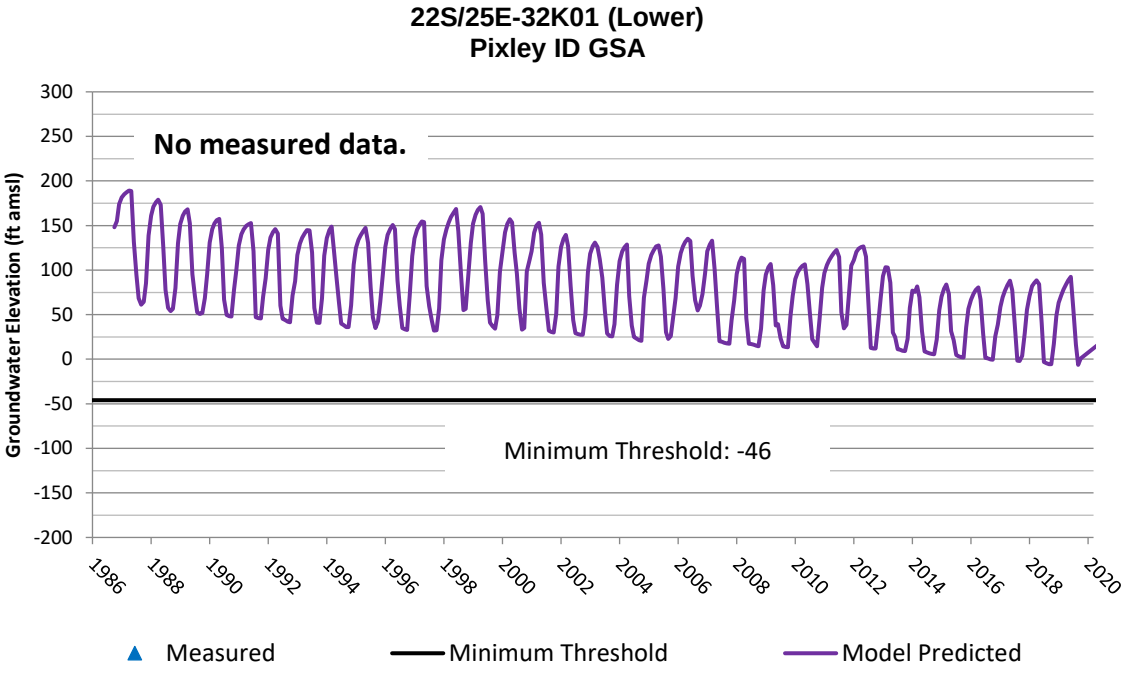


Pixley Irrigation District GSA
RMS Groundwater Elevation Hydrographs

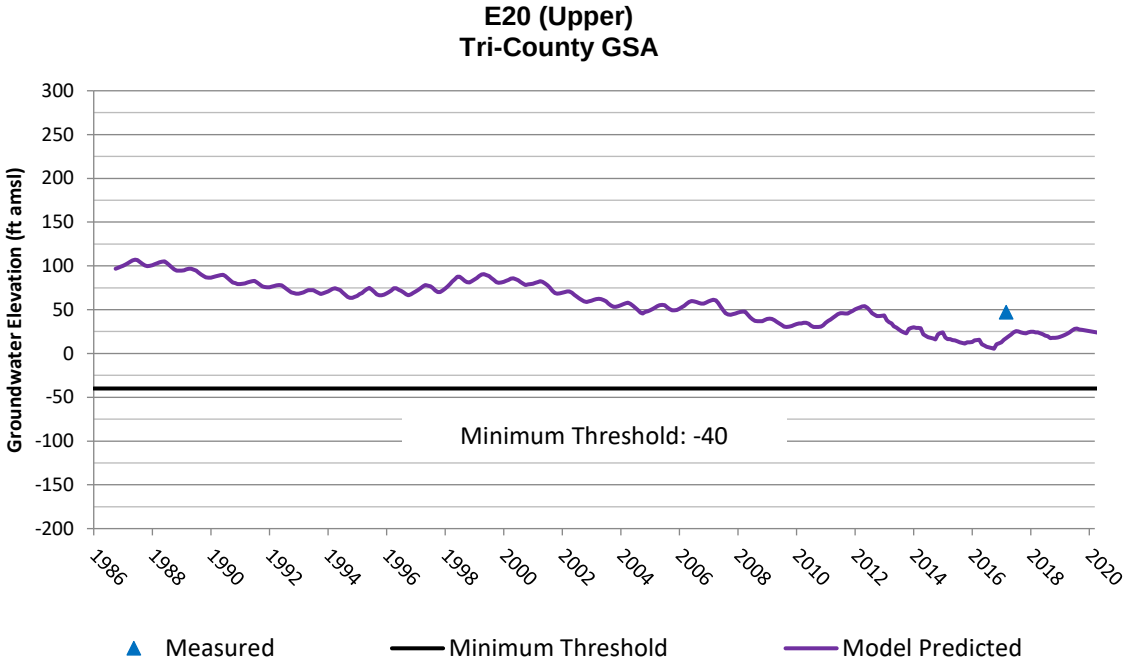


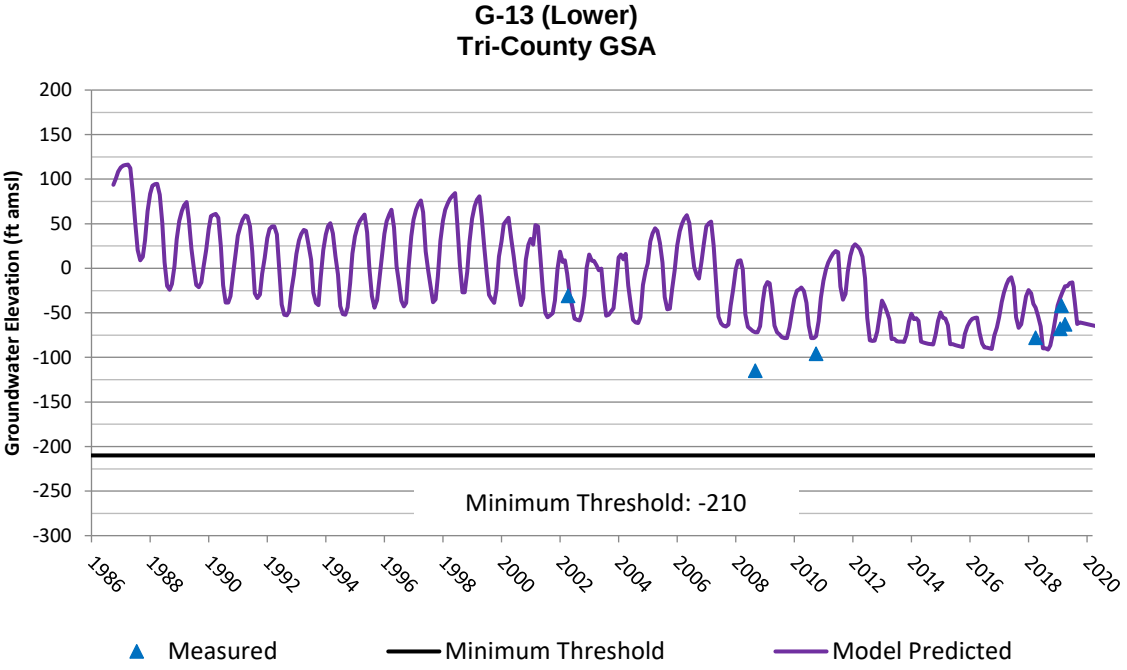


Pixley Irrigation District GSA
RMS Groundwater Elevation Hydrographs



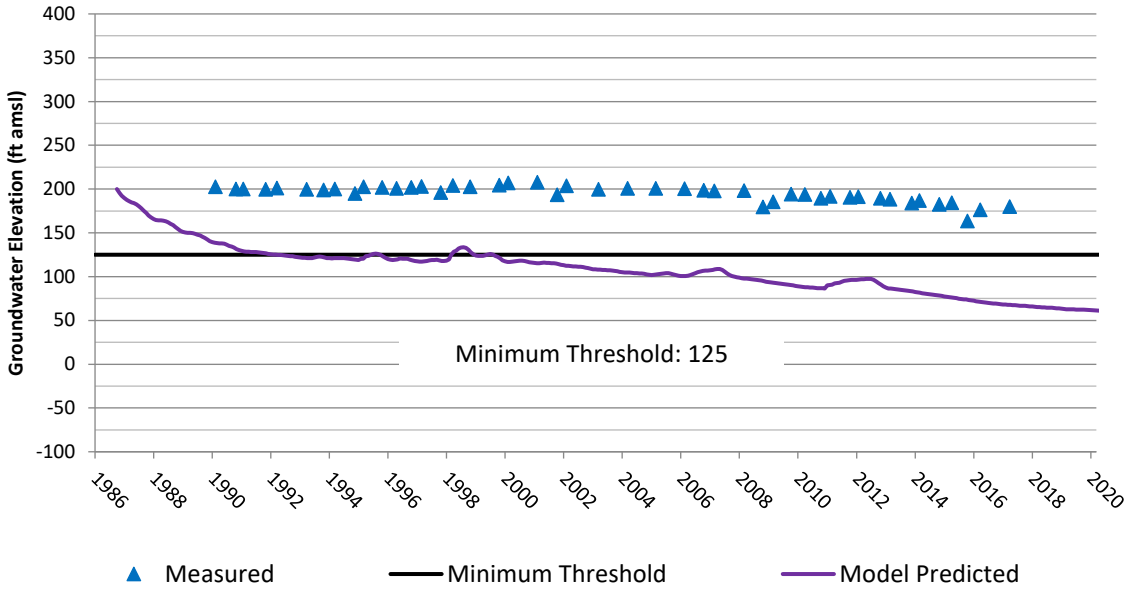
Tri-County Water Authority GSA
RMS Groundwater Elevation Hydrographs



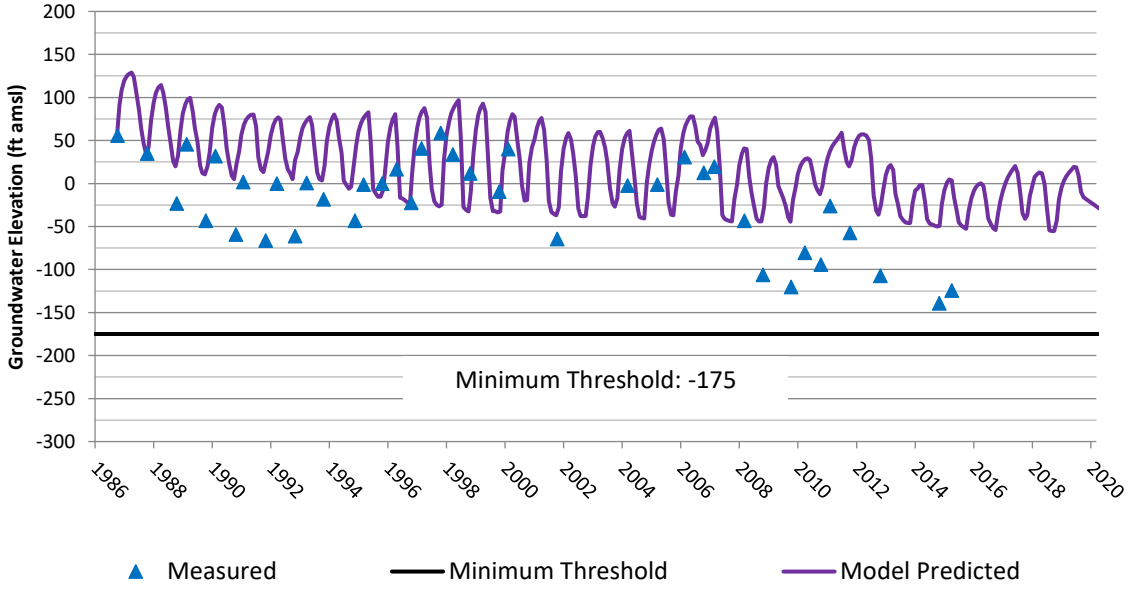


Tri-County Water Authority GSA
RMS Groundwater Elevation Hydrographs

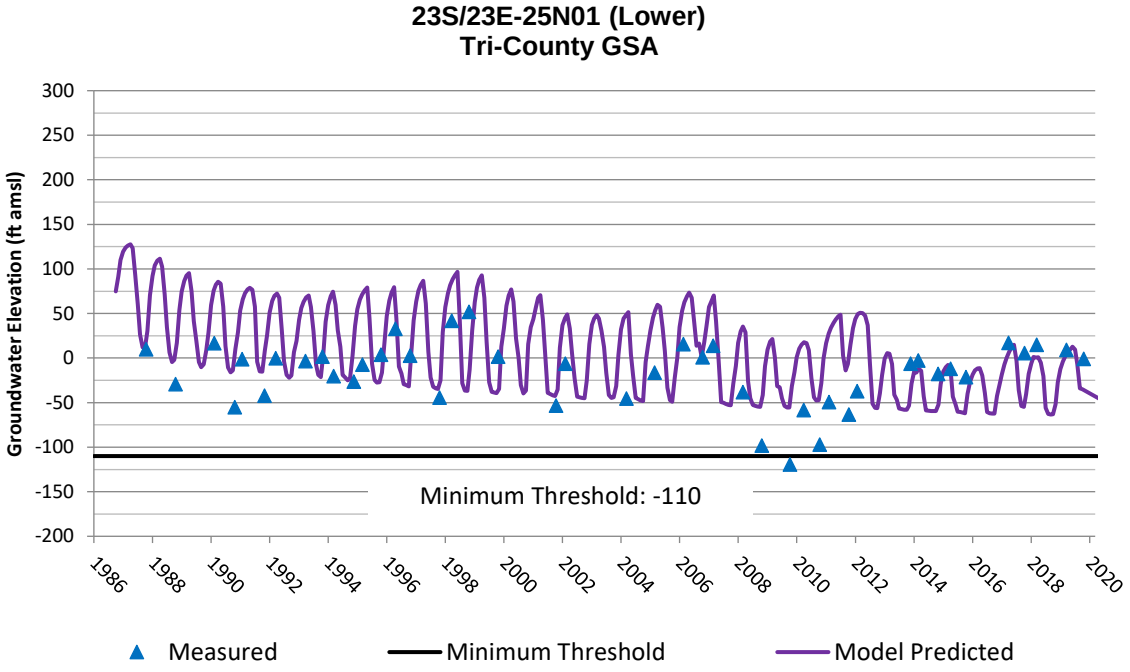
24S/24E-25J01 (Upper)
Tri-County GSA

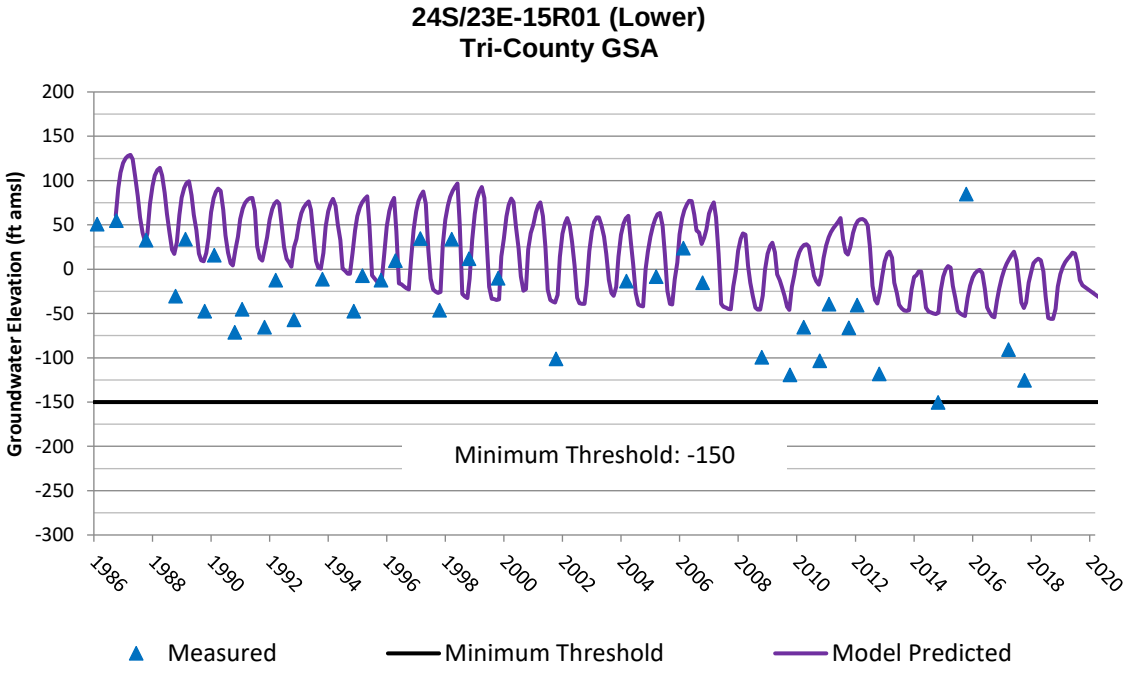


24S/23E-22R02 (Lower)
Tri-County GSA

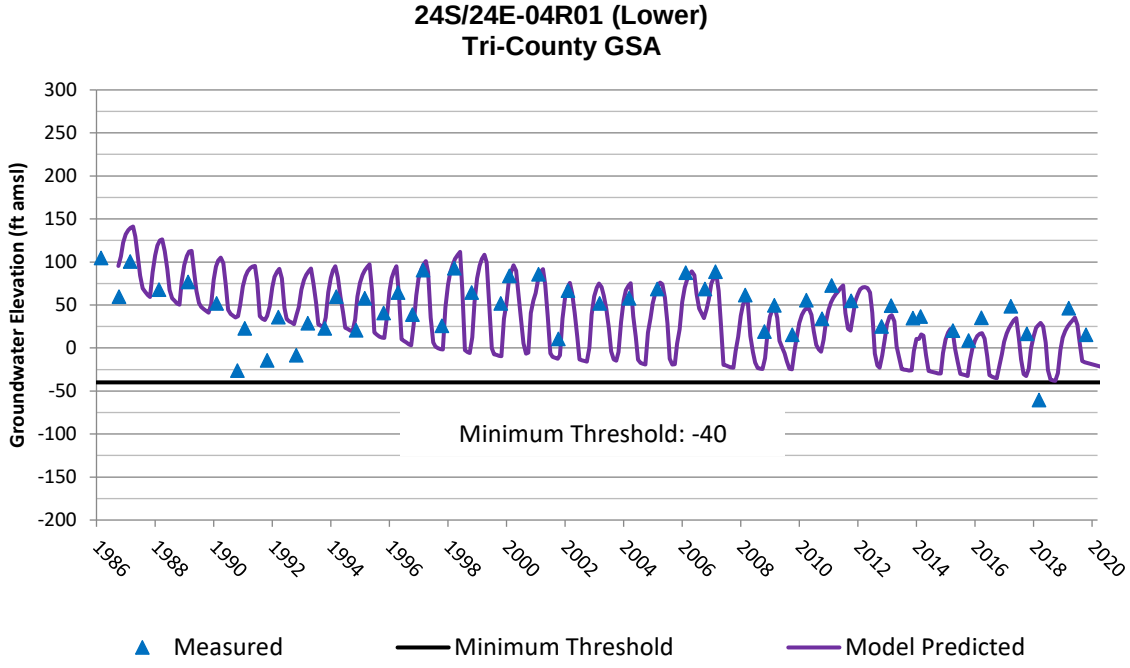


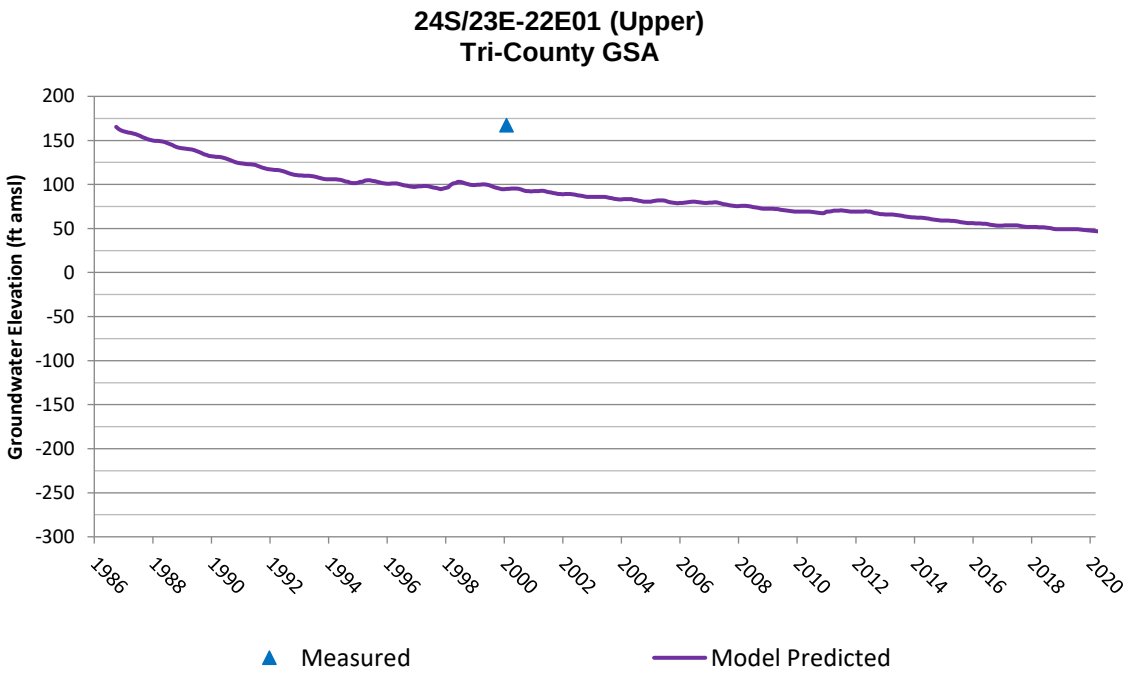
Tri-County Water Authority GSA
RMS Groundwater Elevation Hydrographs





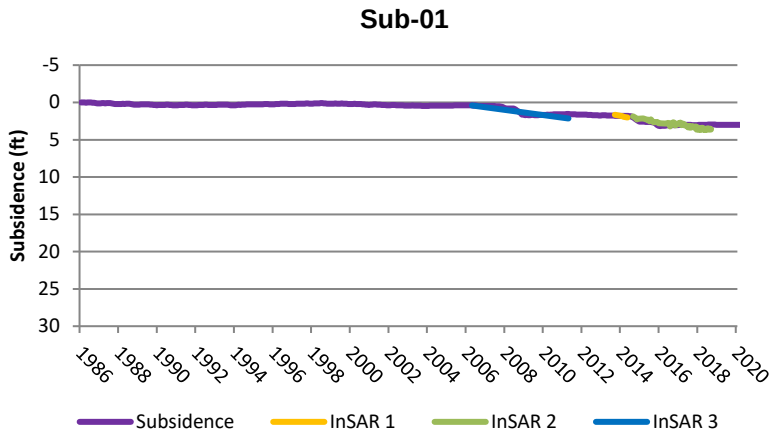
Tri-County Water Authority GSA
RMS Groundwater Elevation Hydrographs

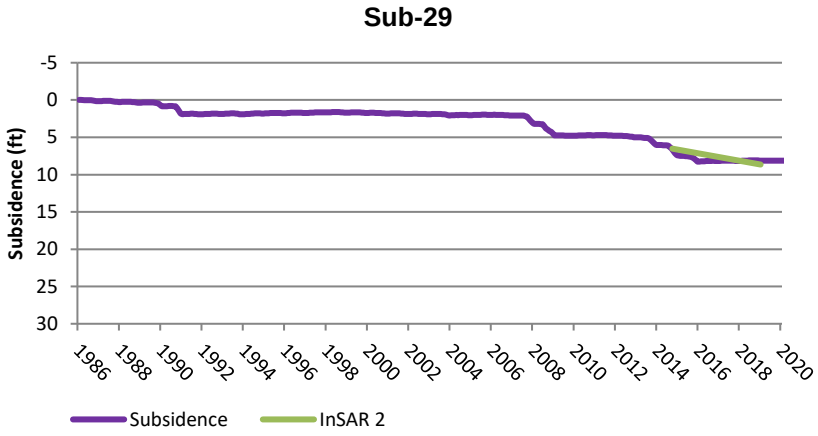


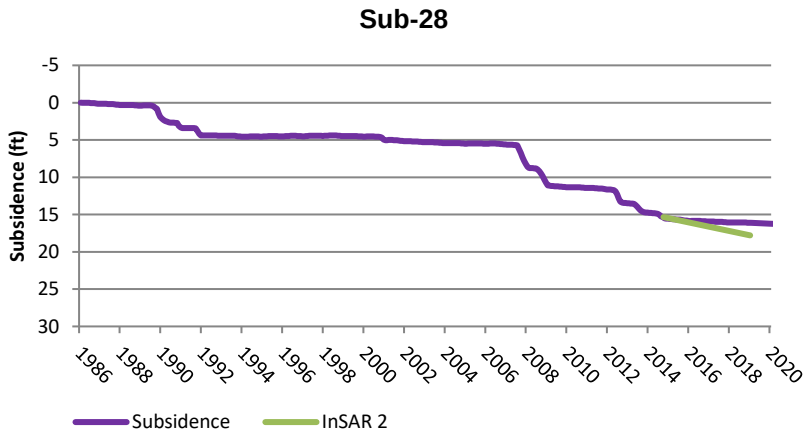


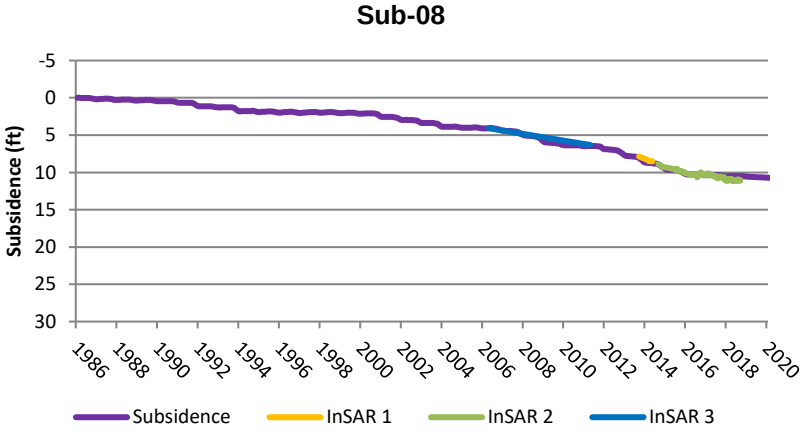
Attachment E

Calibration Subsidence Graphs at Calibration Targets and RMS

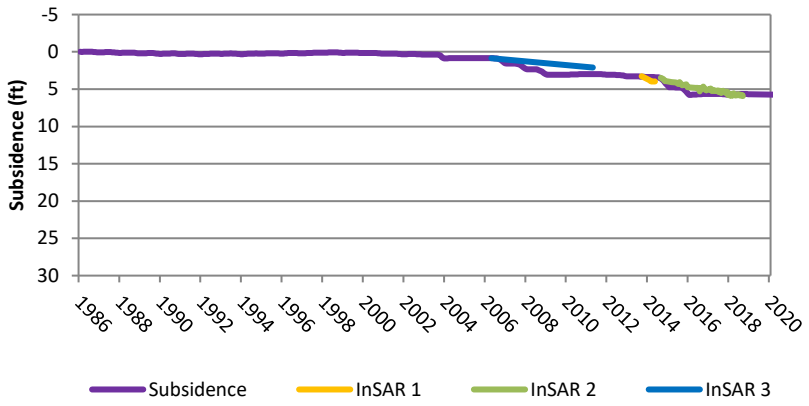

Sub-01
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2
InSAR 3


Sub-29
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

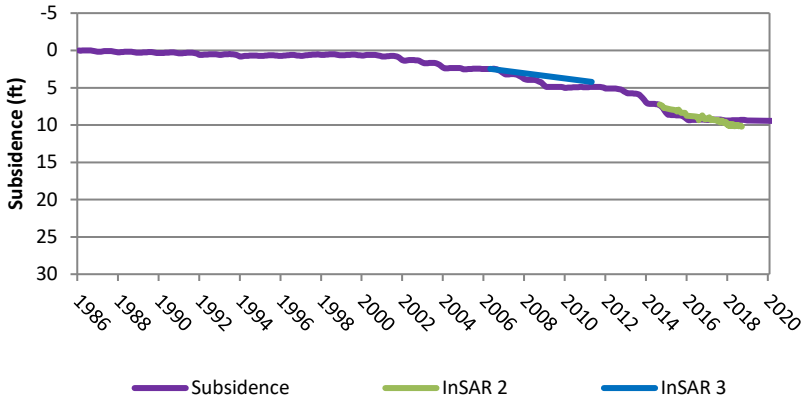

Sub-28
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2


Sub-08
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2
InSAR 3

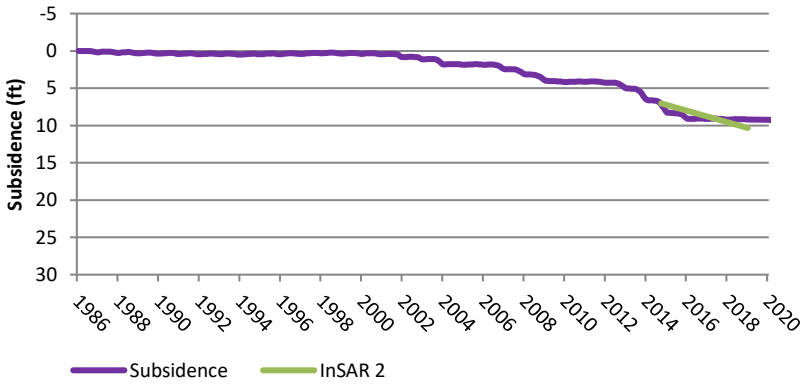
Sub-02



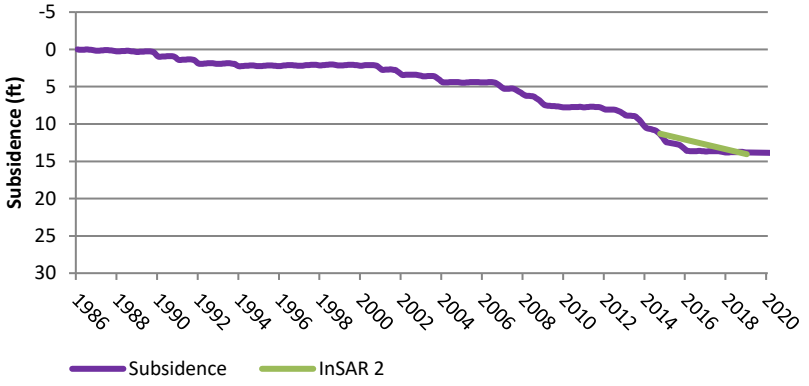
Sub-07

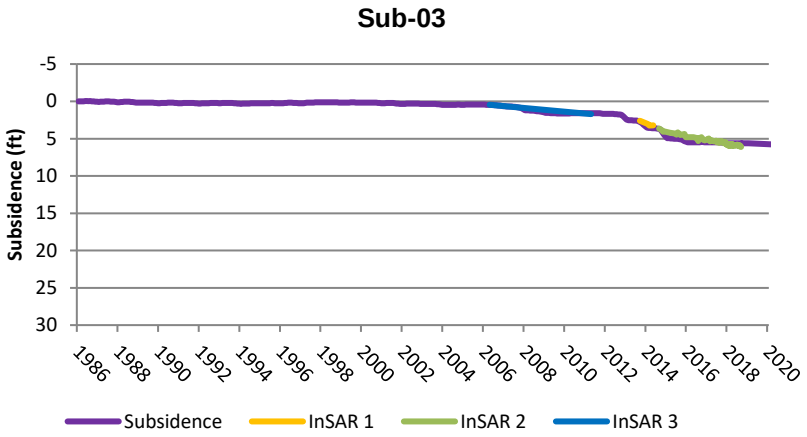


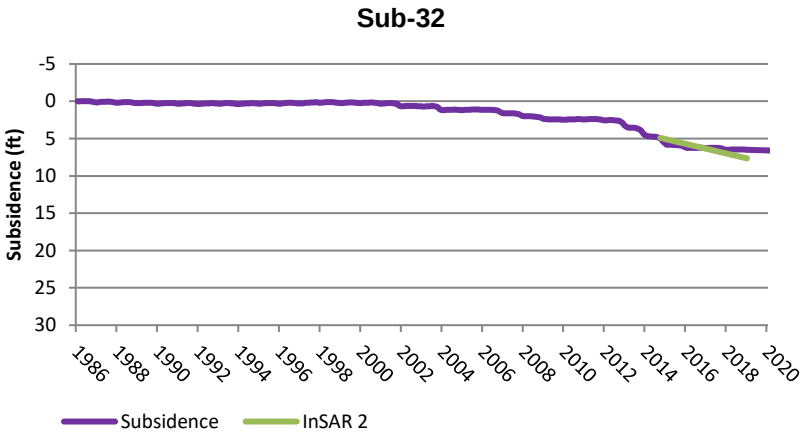
Sub-30

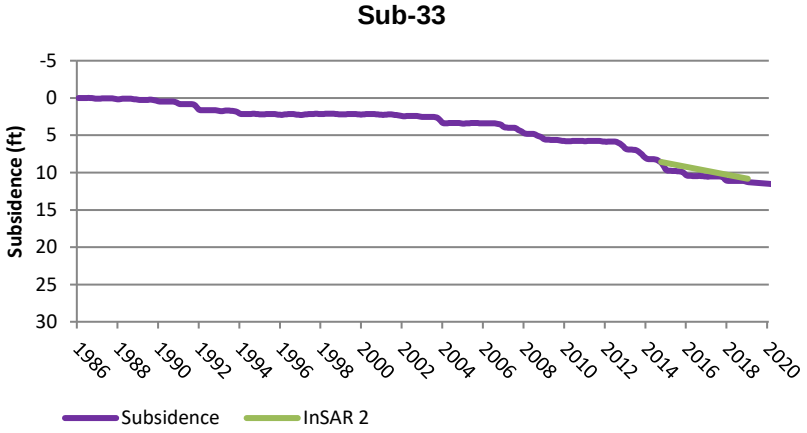


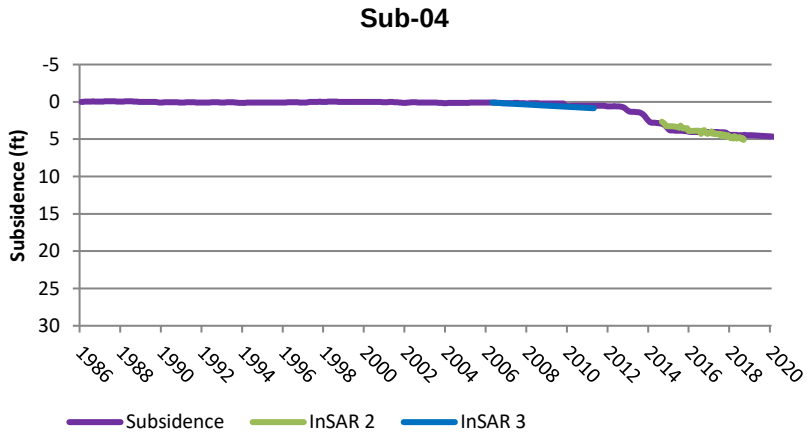
Sub-31

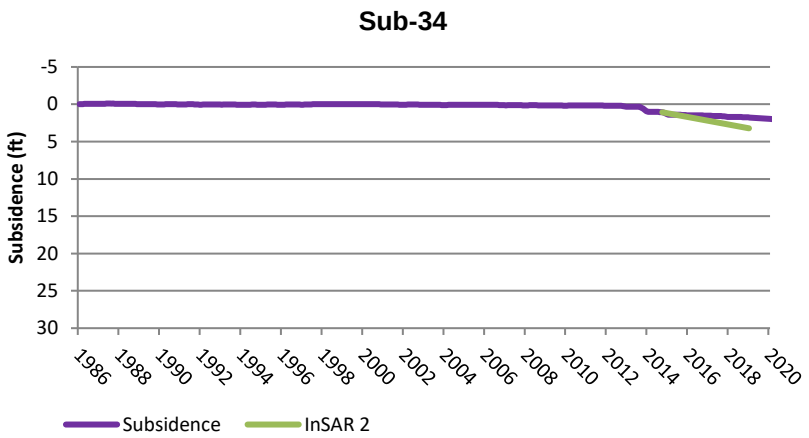


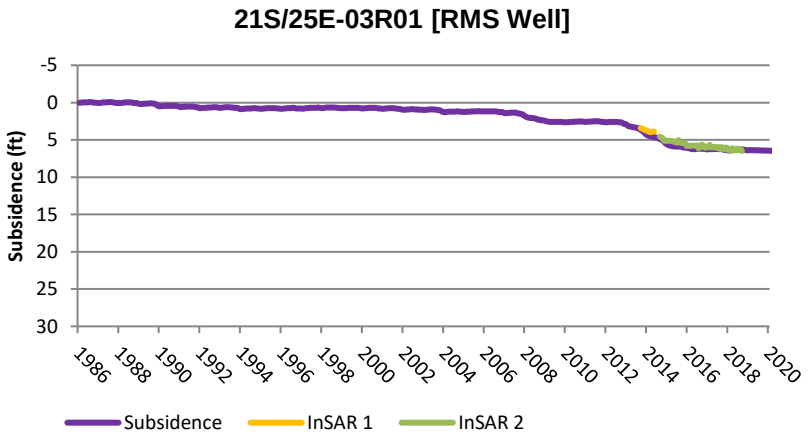

Sub-03
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2
InSAR 3

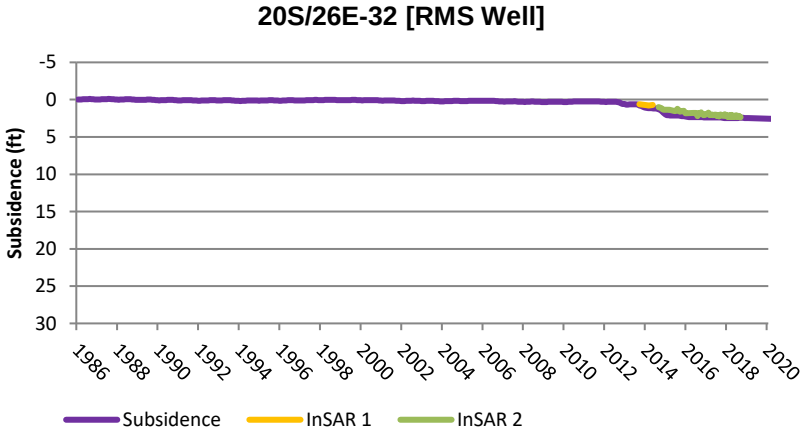

Sub-32
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

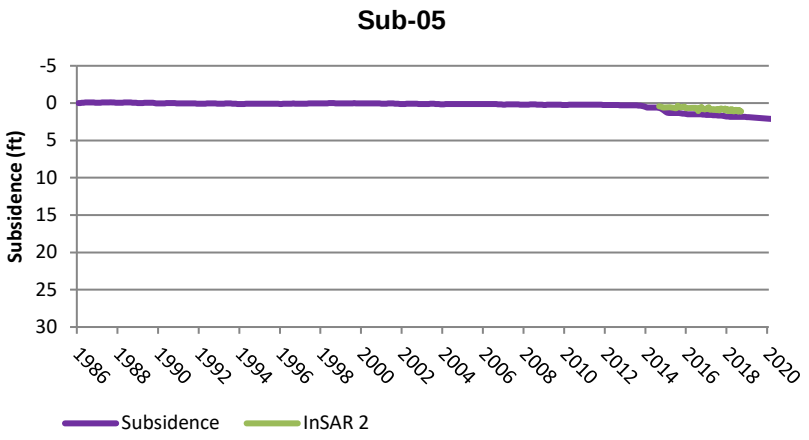

Sub-33
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

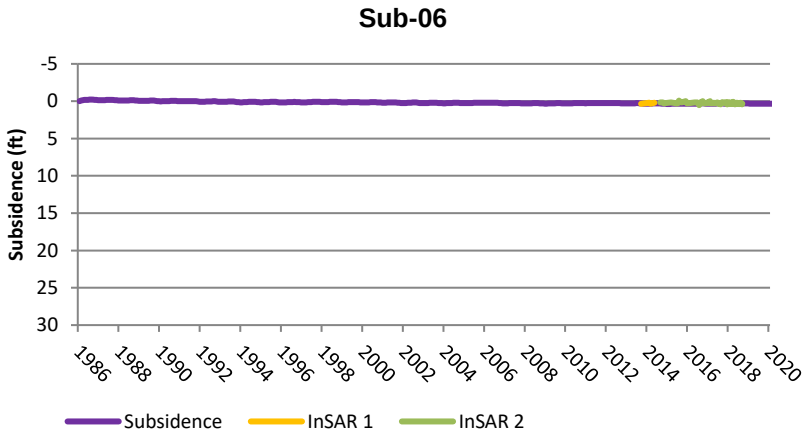

Sub-04
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2
InSAR 3

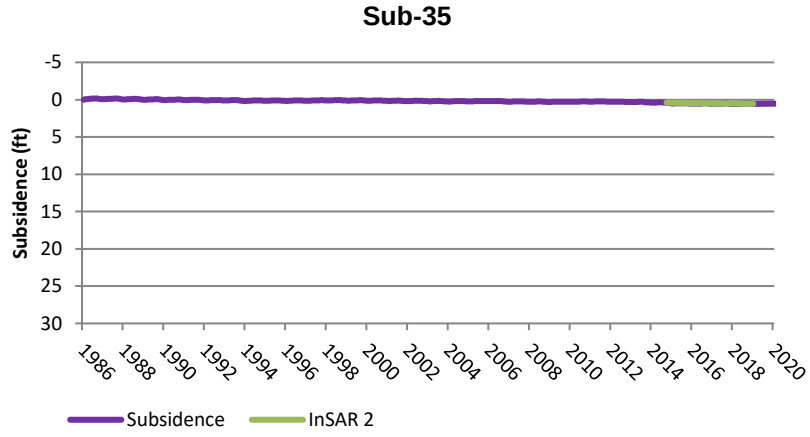

Sub-34
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

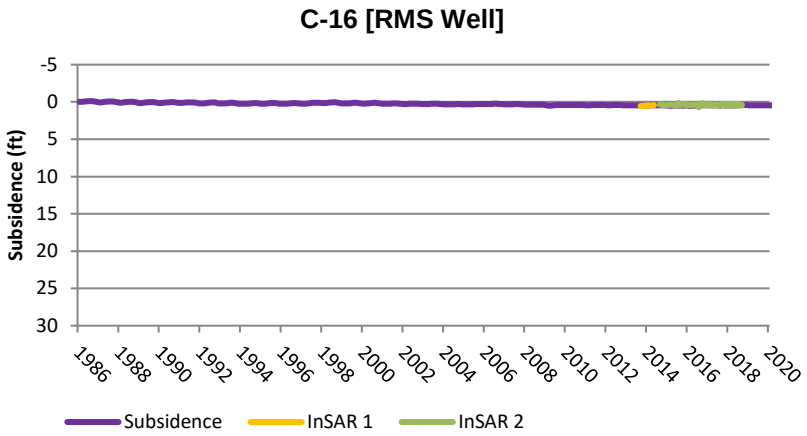

21S/25E-03R01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 1
InSAR 2

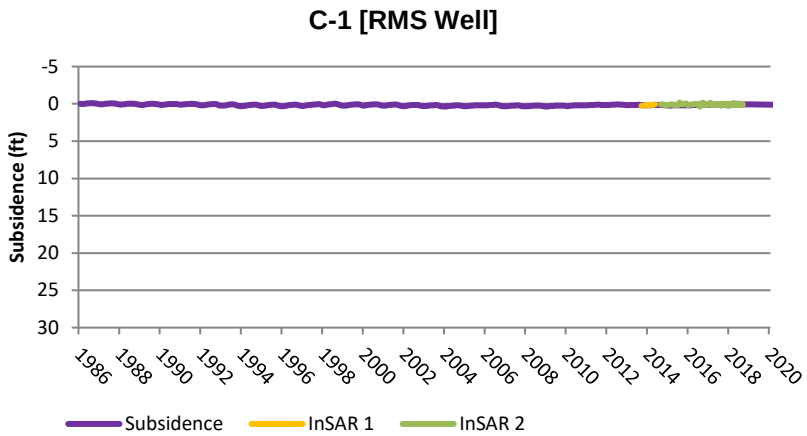

20S/26E-32 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 1
InSAR 2

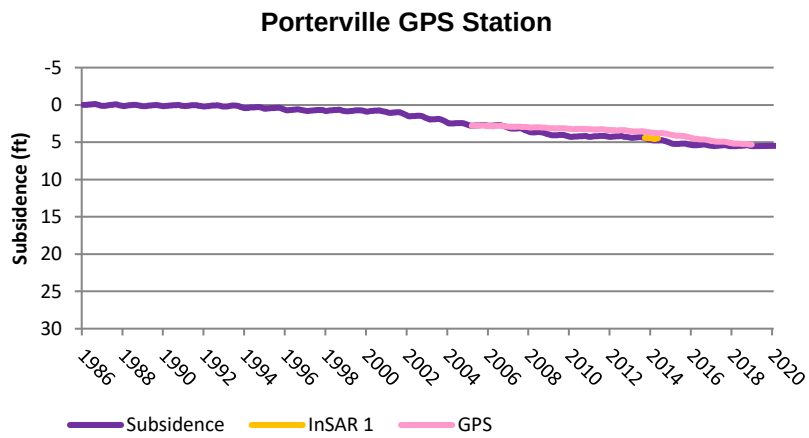

Sub-05
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

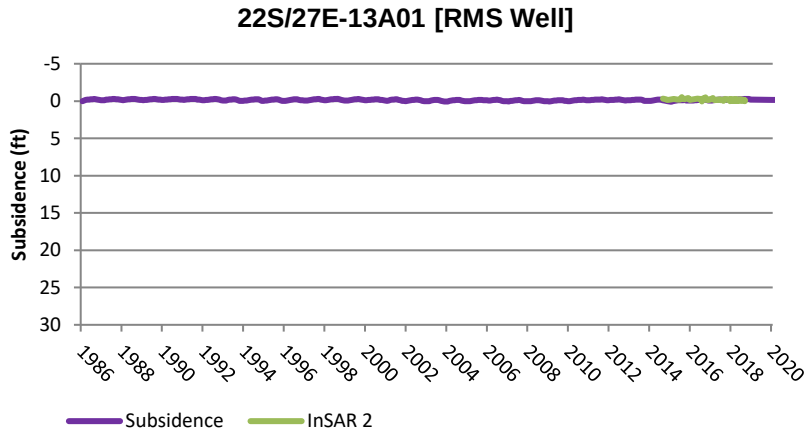

Sub-06
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

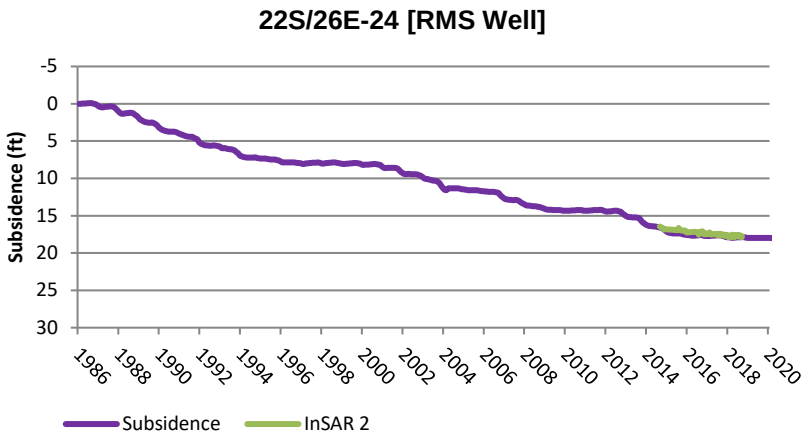

Sub-35
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

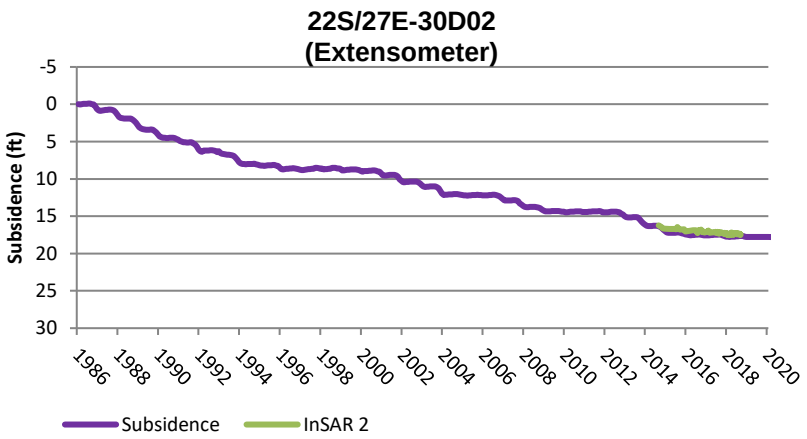

C-16 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

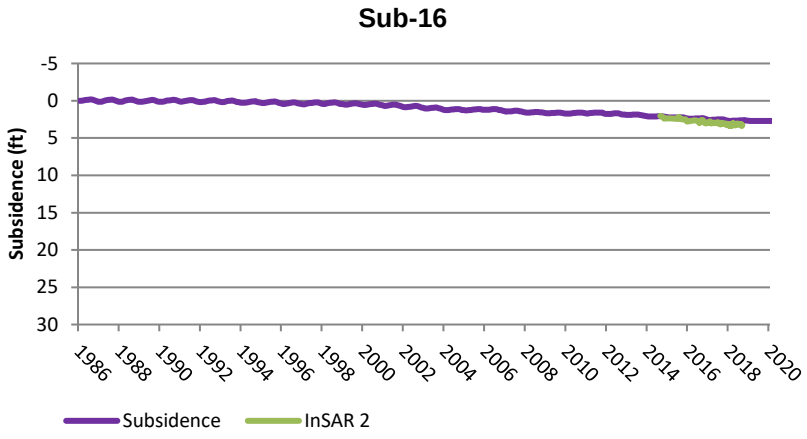

C-1 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

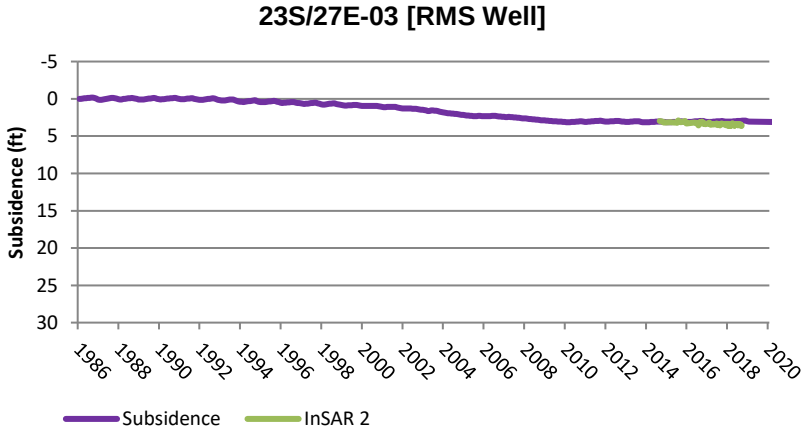

Porterville GPS Station
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
GPS

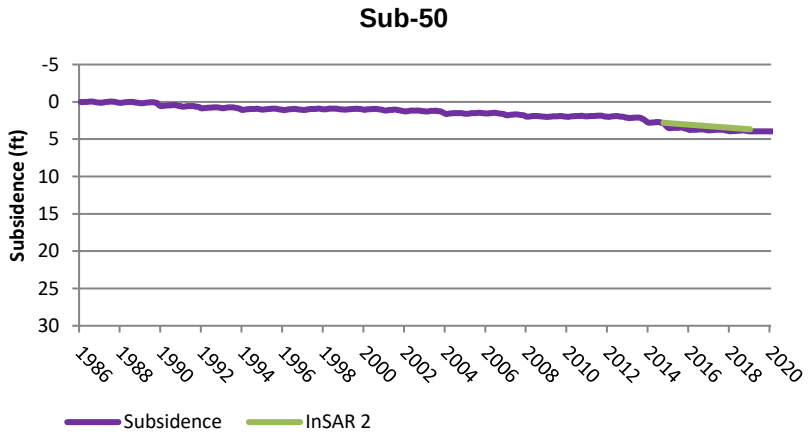

22S/27E-13A01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

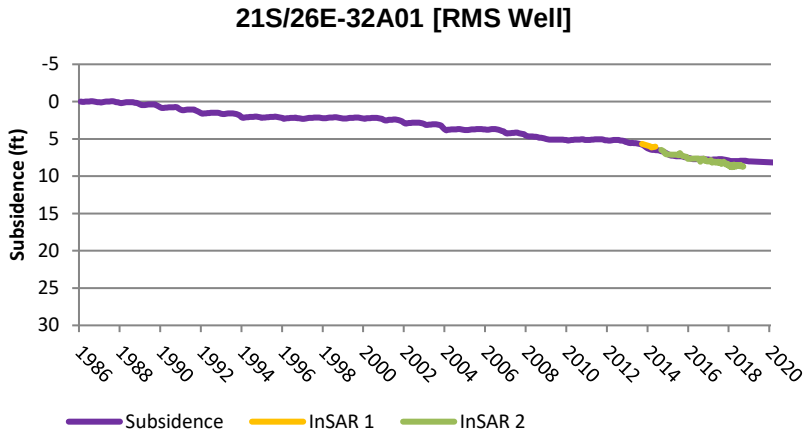

22S/26E-24 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

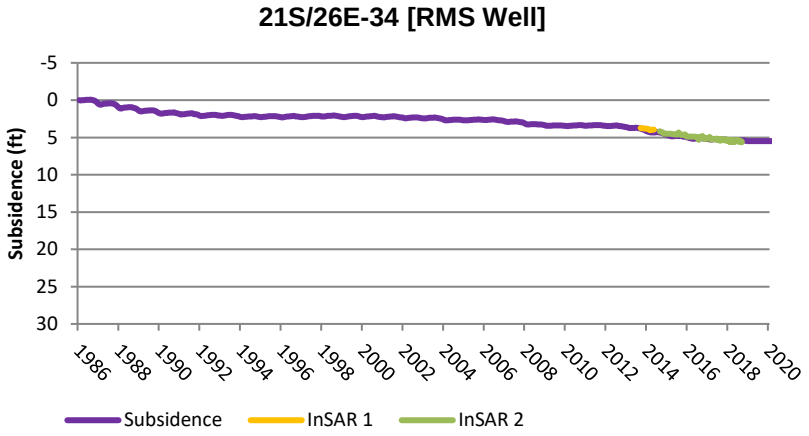

22S/27E-30D02
(Extensometer)
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

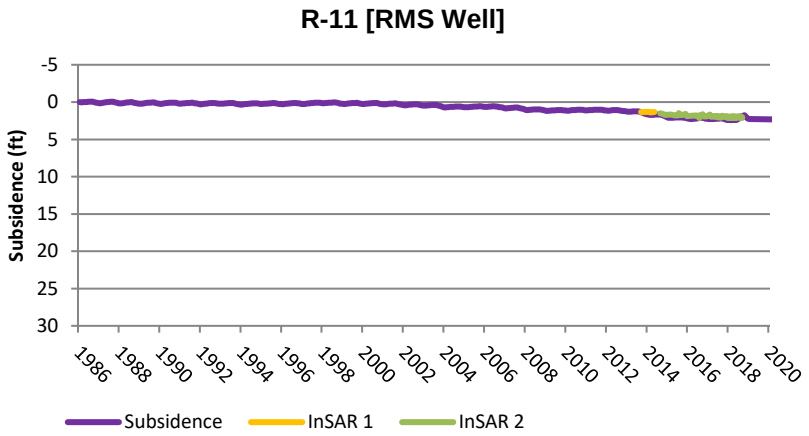

Sub-16
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

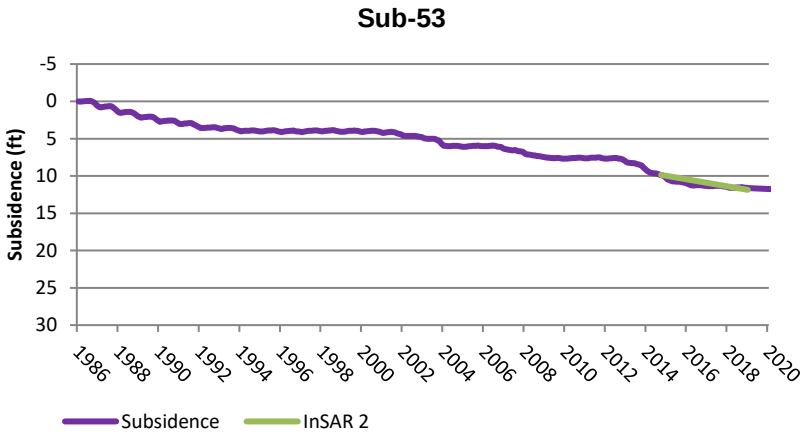

23S/27E-03 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

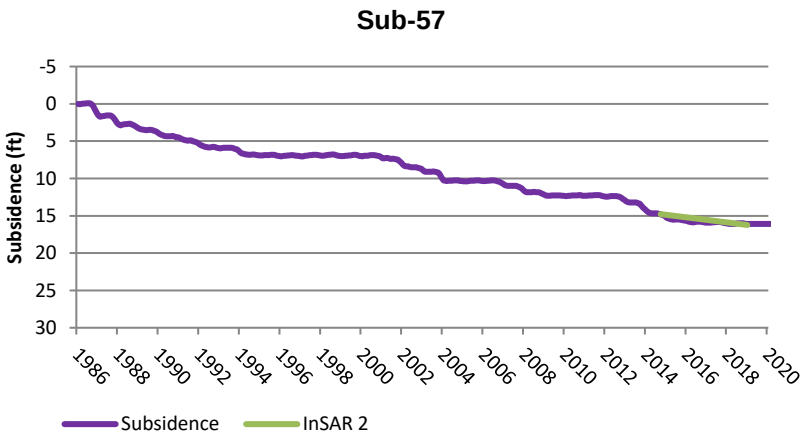

Sub-50
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

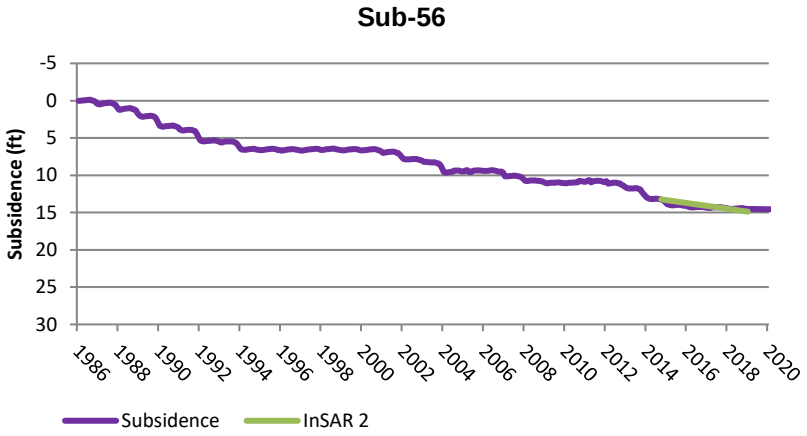

21S/26E-32A01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

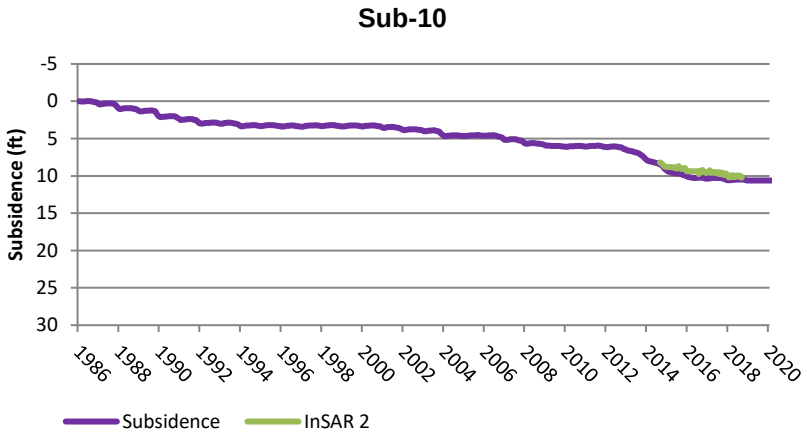

21S/26E-34 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

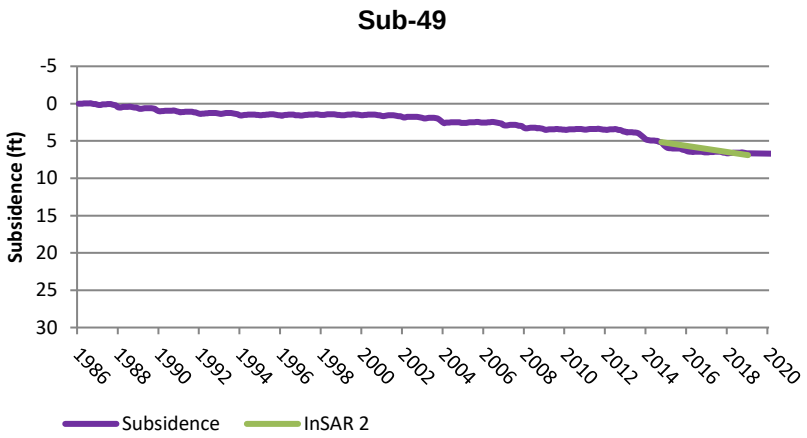

R-11 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

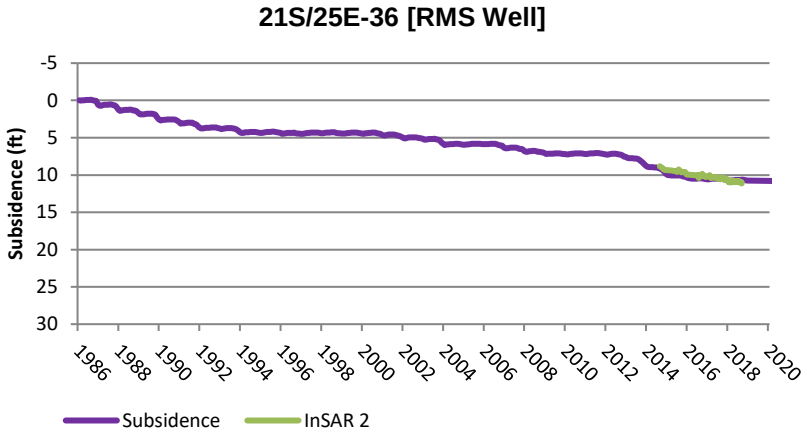

Sub-53
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

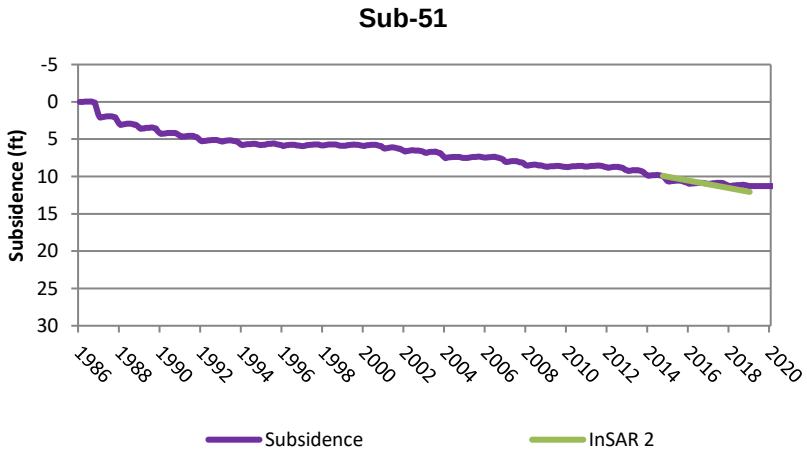

Sub-57
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

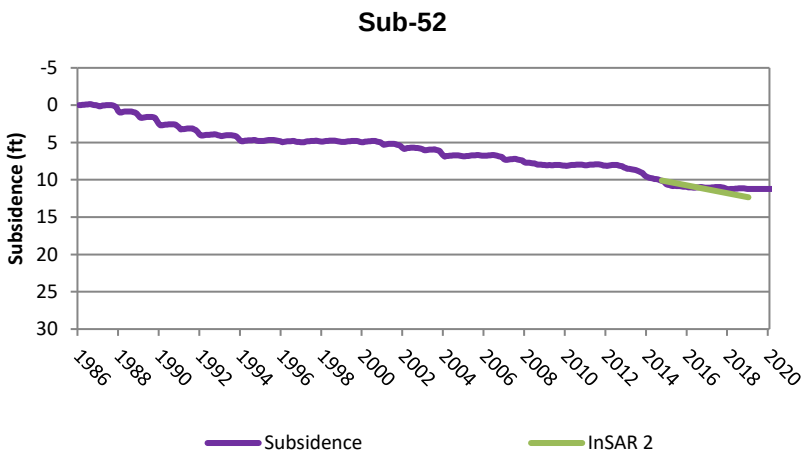

Sub-56
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

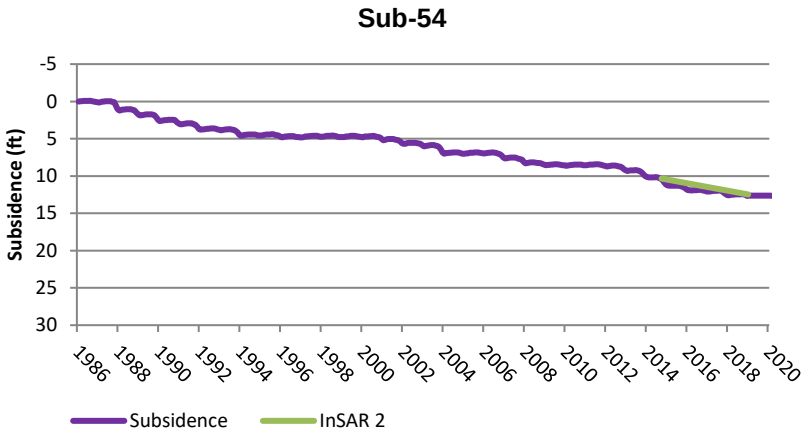

Sub-10
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

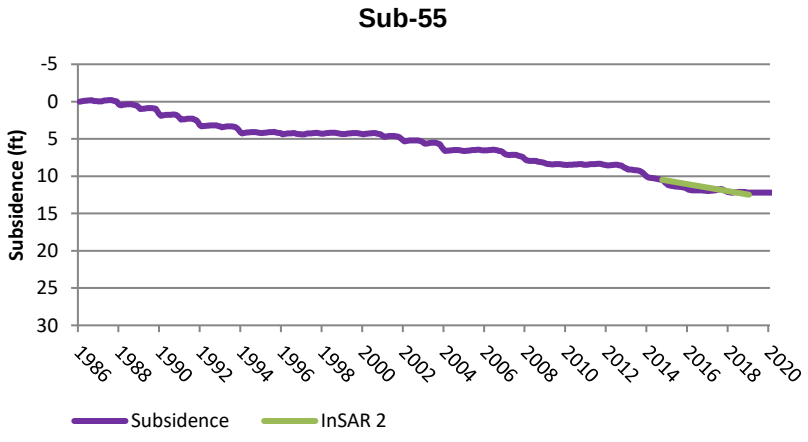

Sub-49
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2


21S/25E-36 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

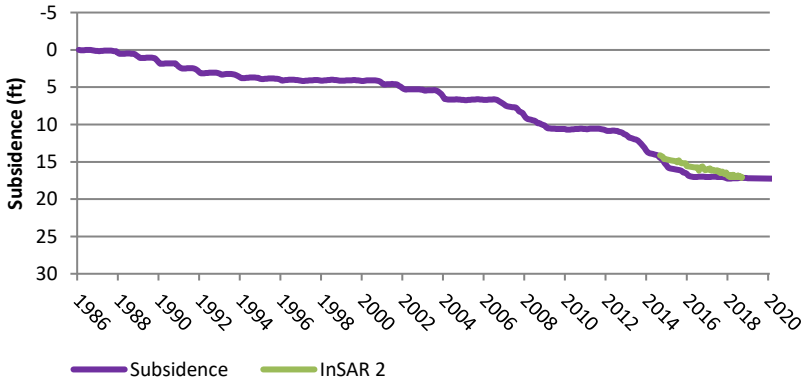

Sub-51
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2


Sub-52
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

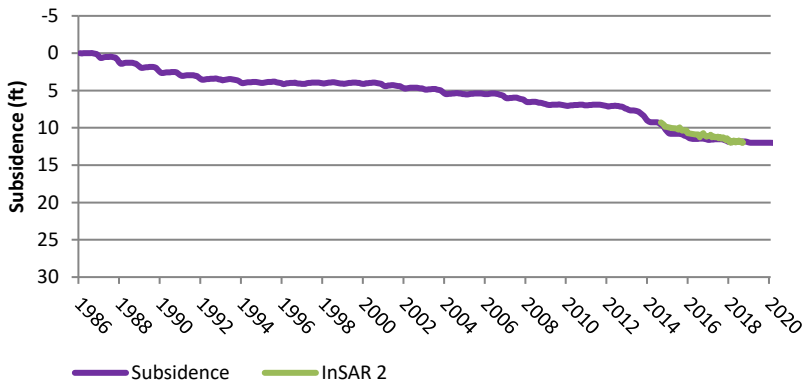

Sub-54
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2


Sub-55
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

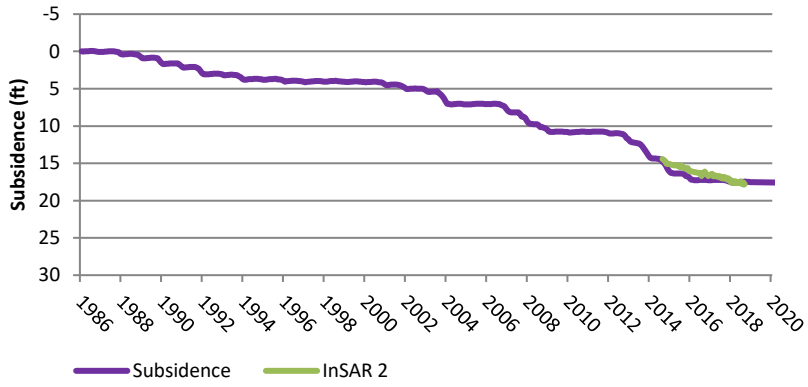
Sub-09



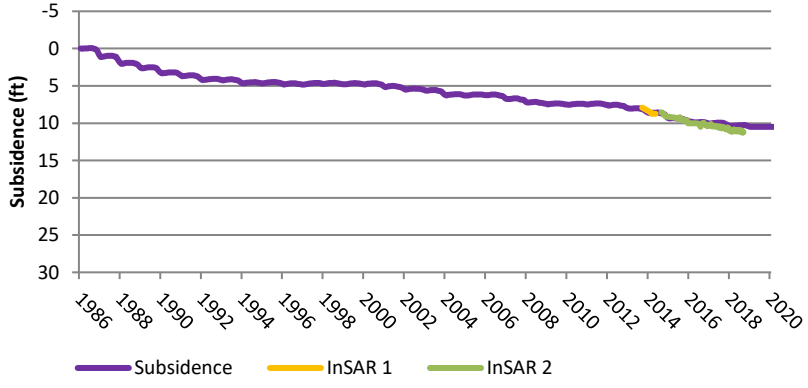
21S/24E-35A01 [RMS Well]

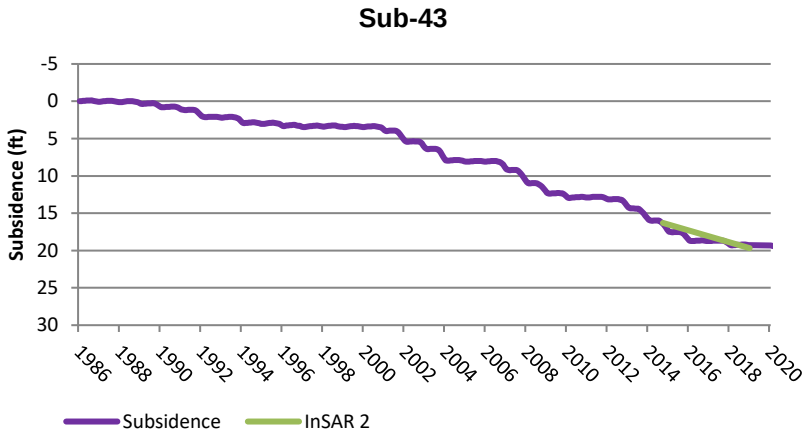


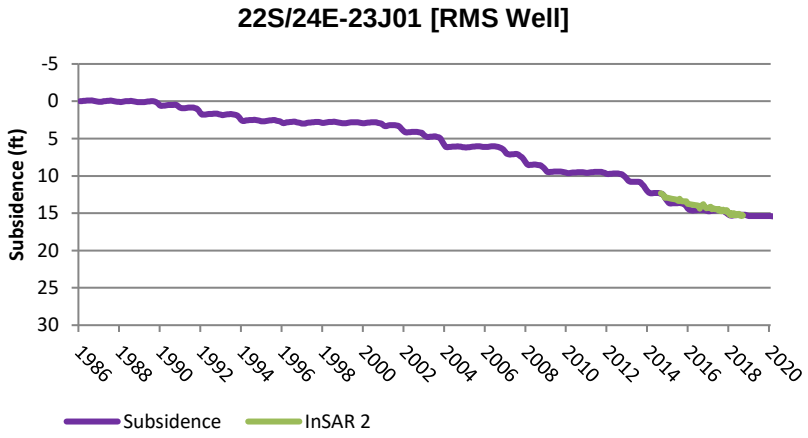
Sub-12

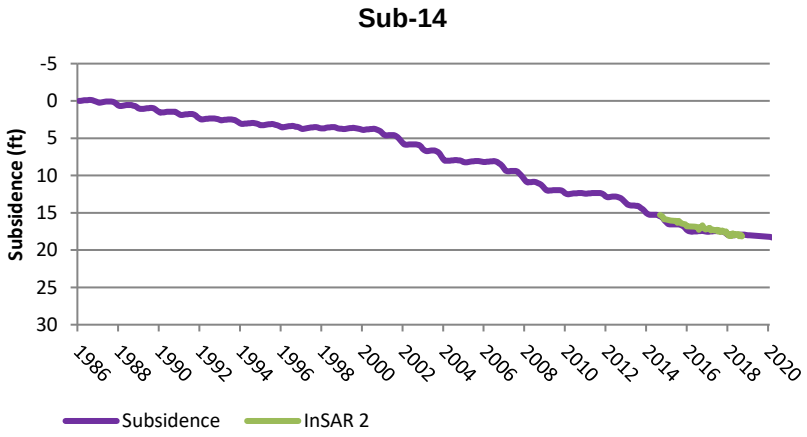


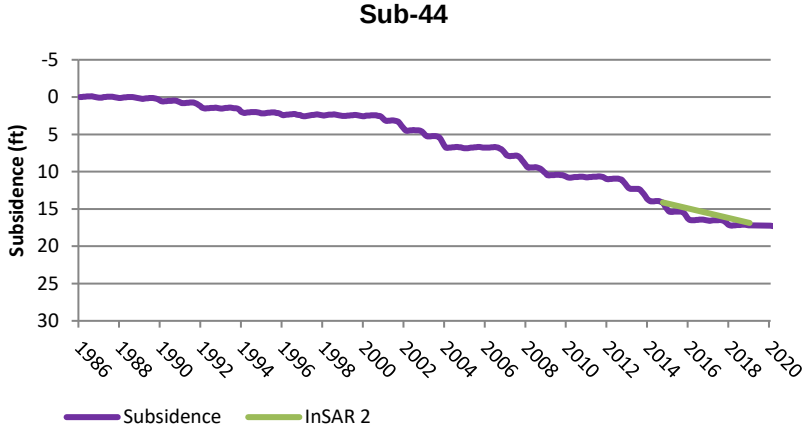
22S/24E-01Q01 [RMS Well]

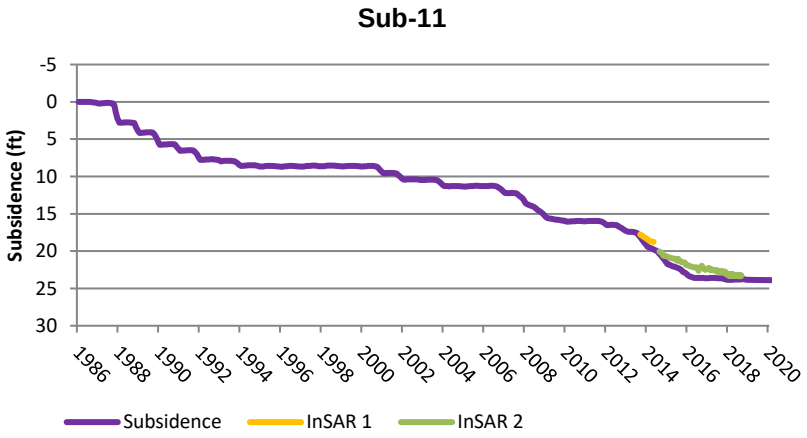


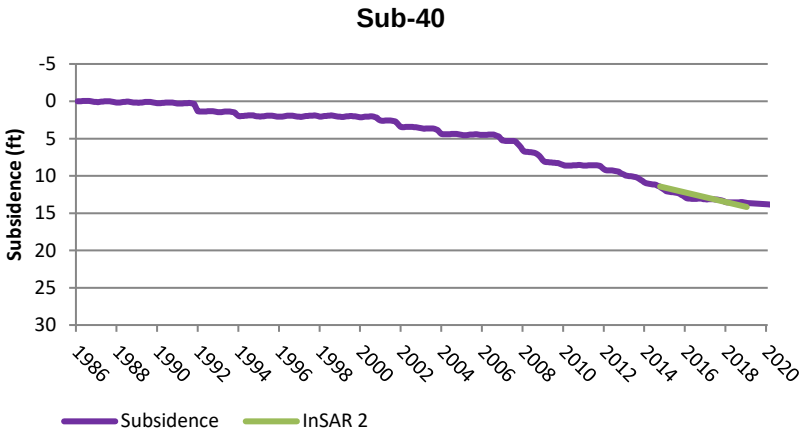

Sub-43
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

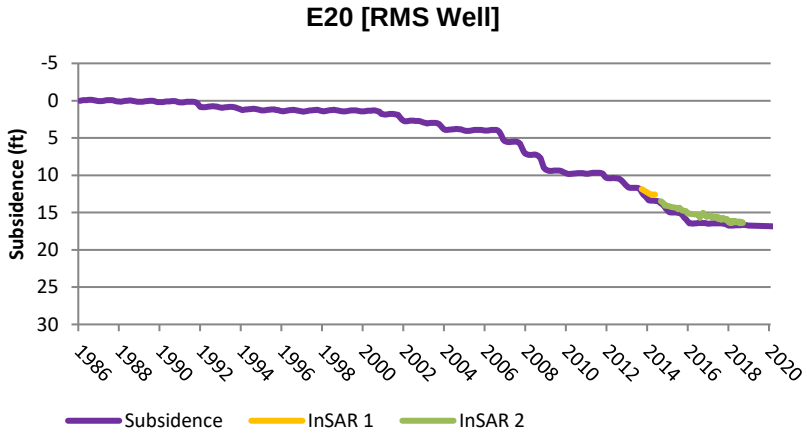

22S/24E-23J01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

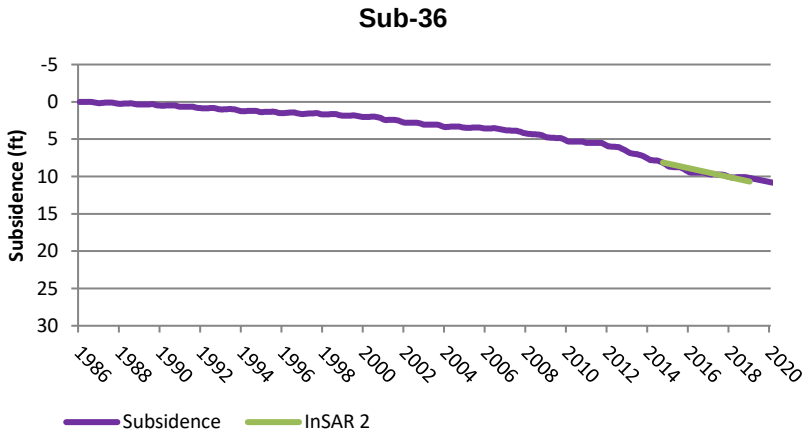

Sub-14
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

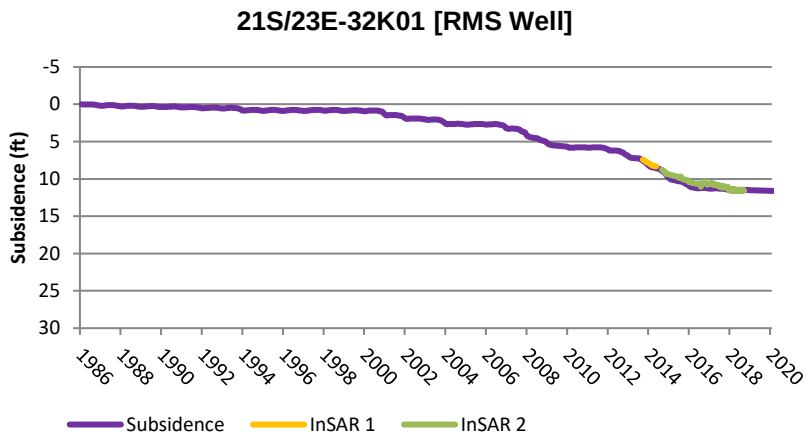

Sub-44
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

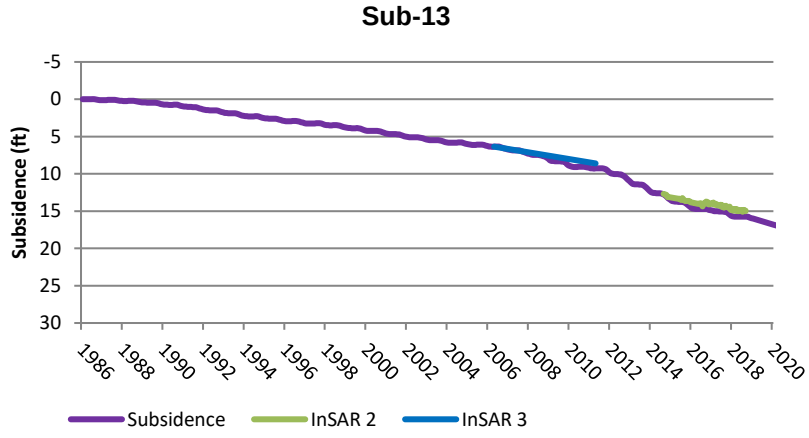

Sub-11
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

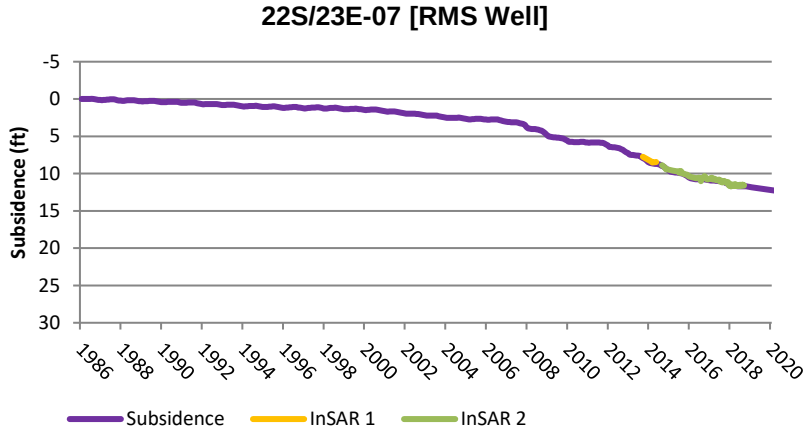

Sub-40
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

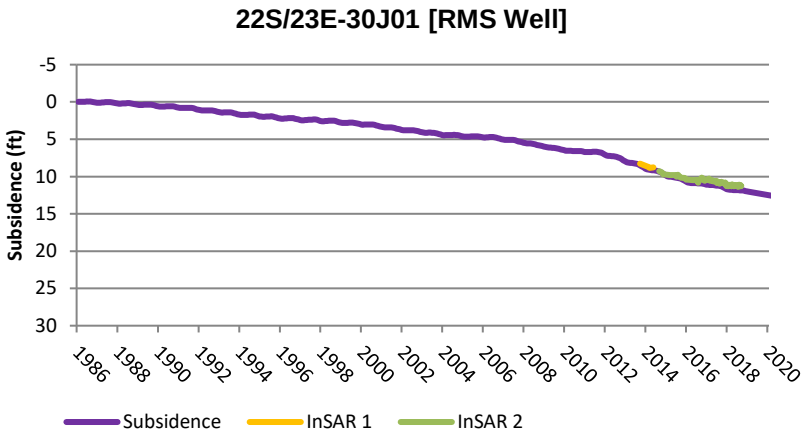

E20 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

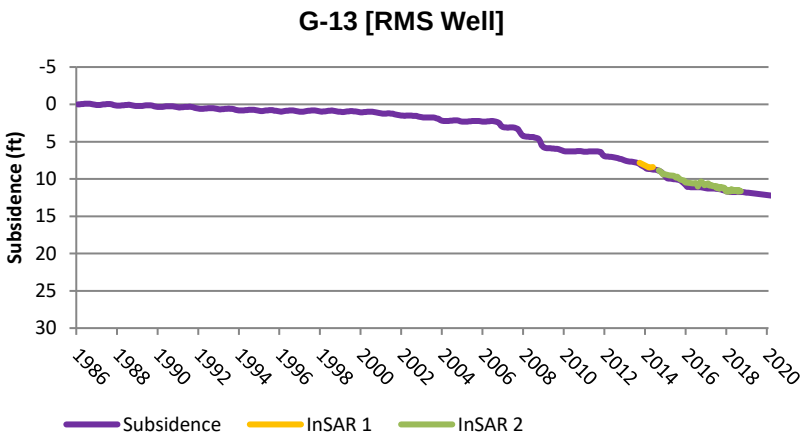

Sub-36
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

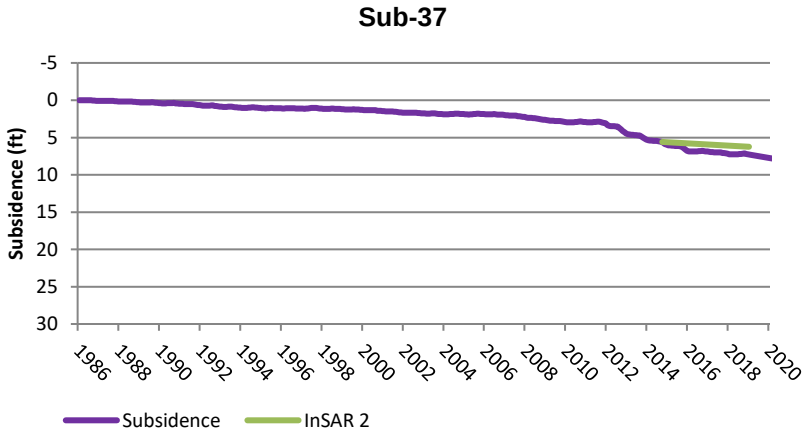

21S/23E-32K01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 1
InSAR 2

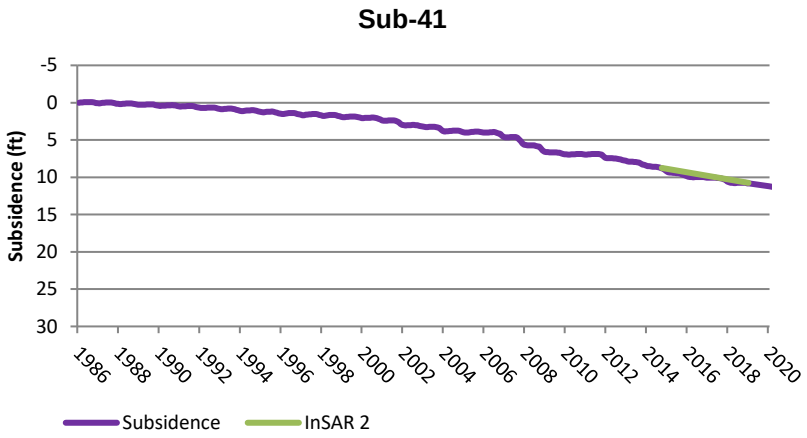

Sub-13
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2
InSAR 3

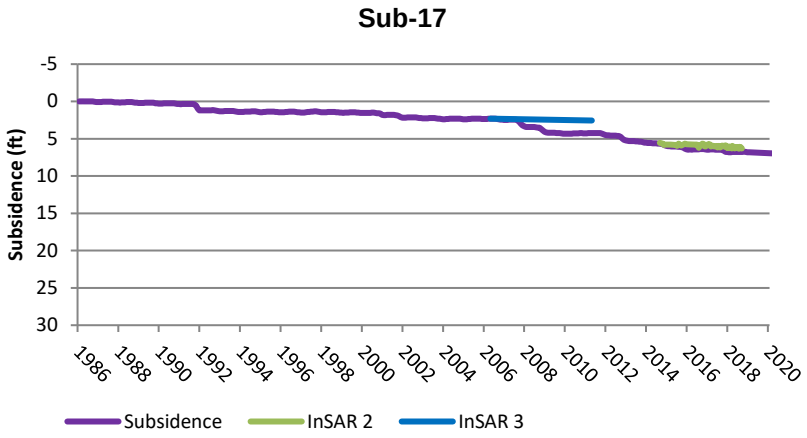

22S/23E-07 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 1
InSAR 2

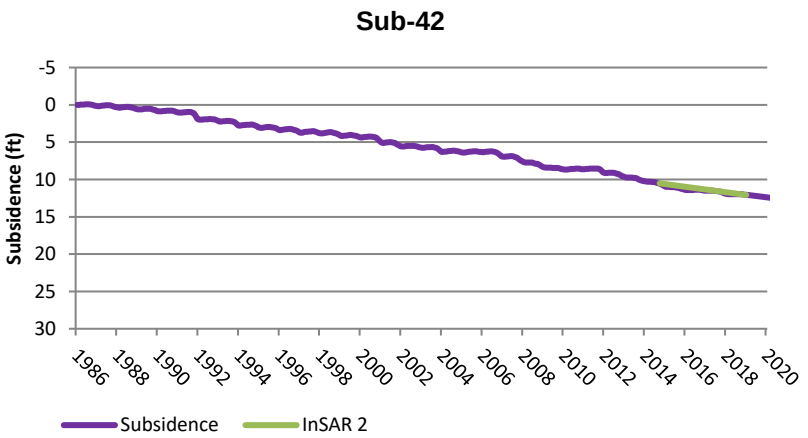

22S/23E-30J01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

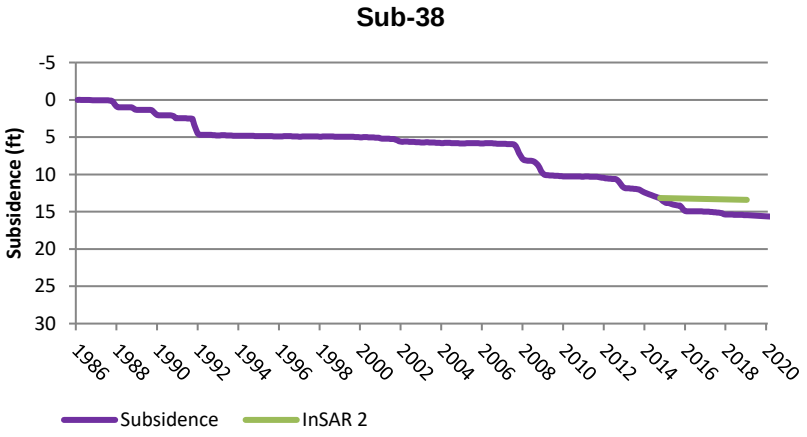

G-13 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 1
InSAR 2

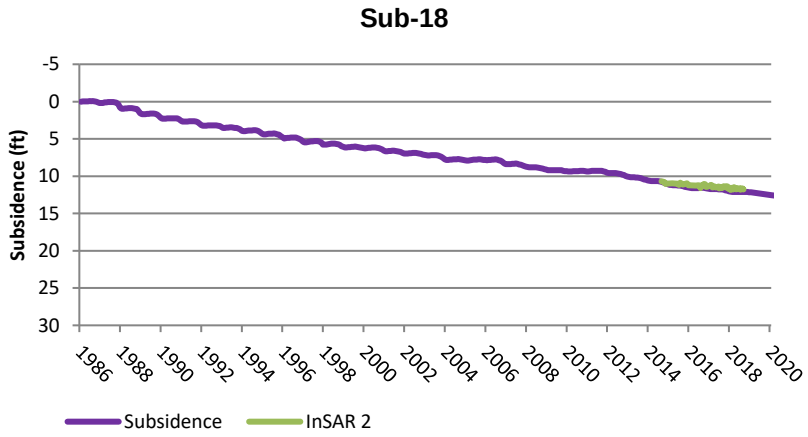

Sub-37
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

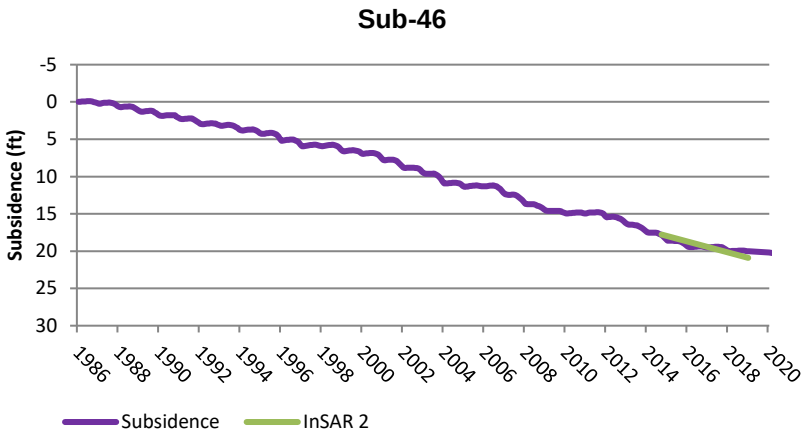

Sub-41
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

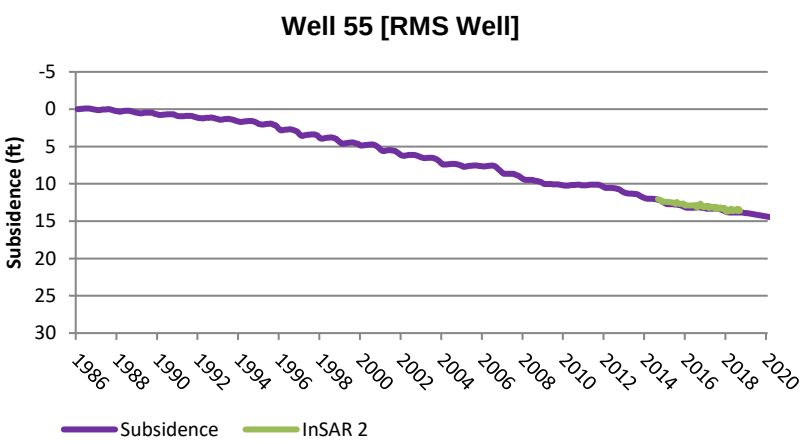

Sub-17
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2
InSAR 3

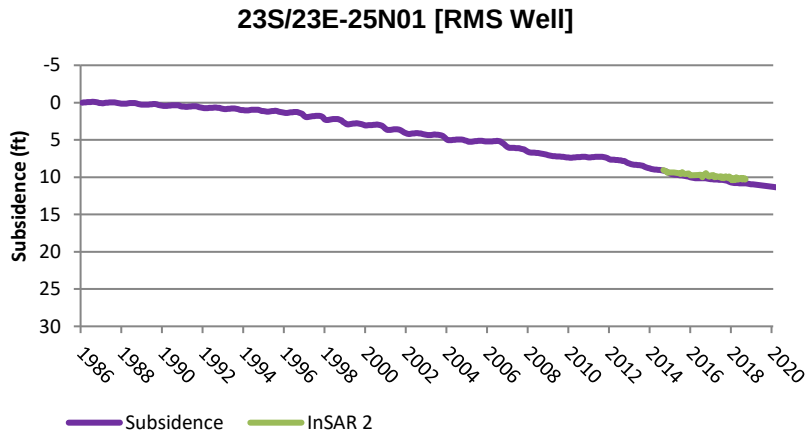

Sub-42
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

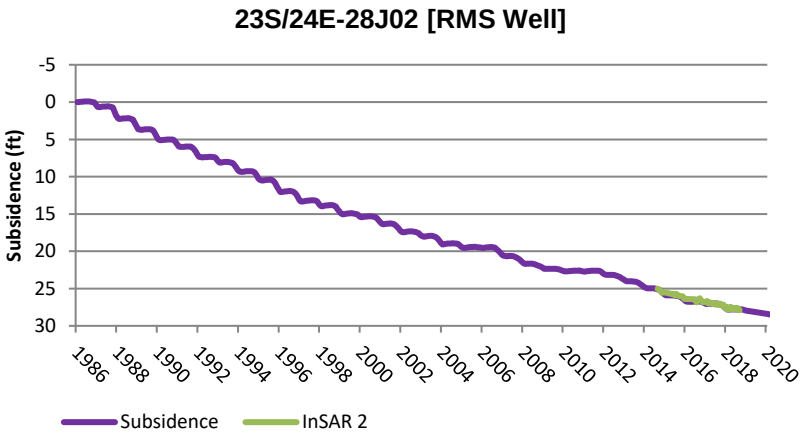

Sub-38
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

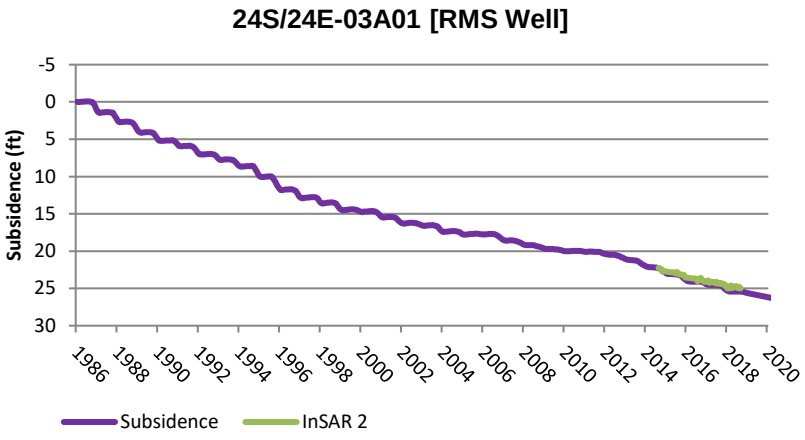

Sub-18
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

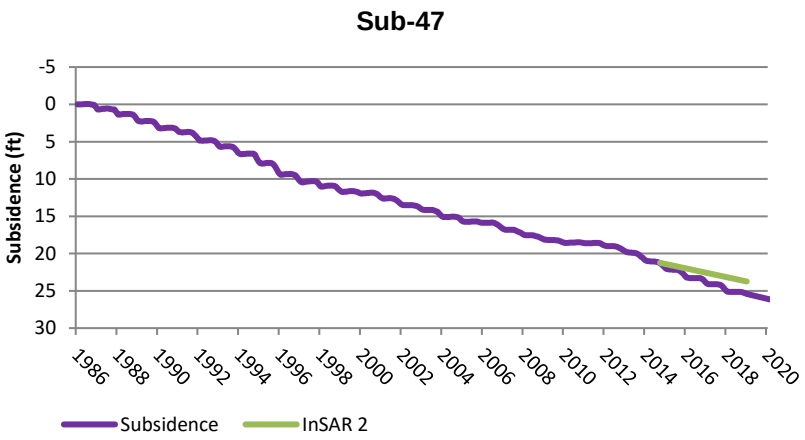

Sub-46
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

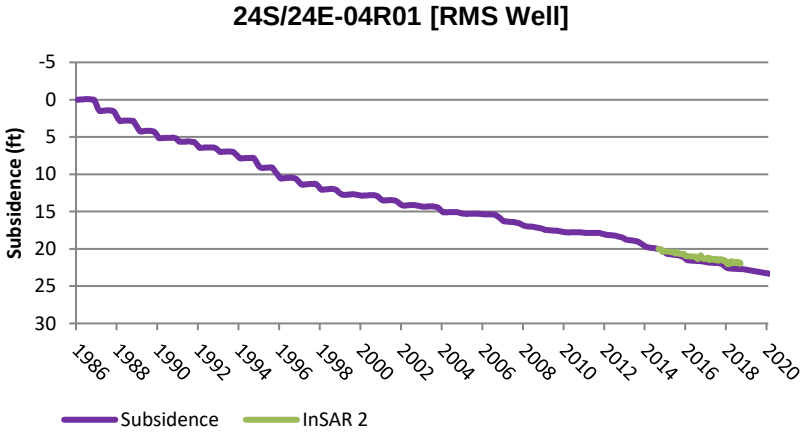

Well 55 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

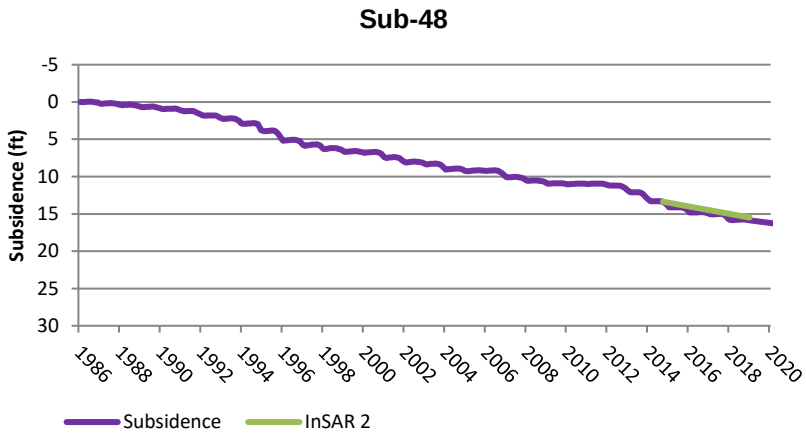

23S/23E-25N01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

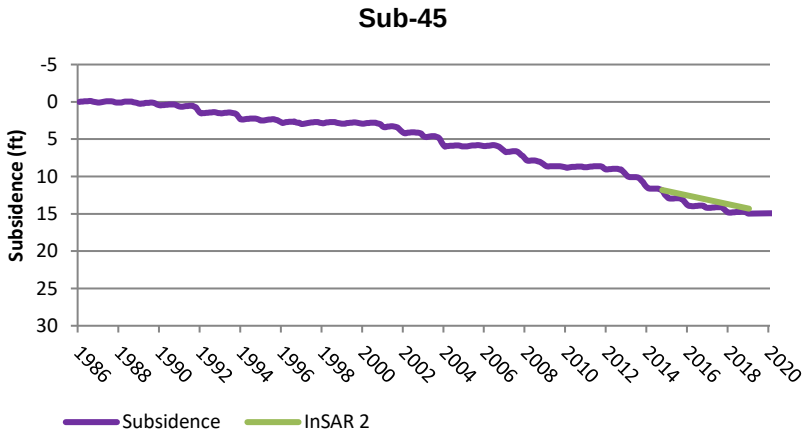

23S/24E-28J02 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

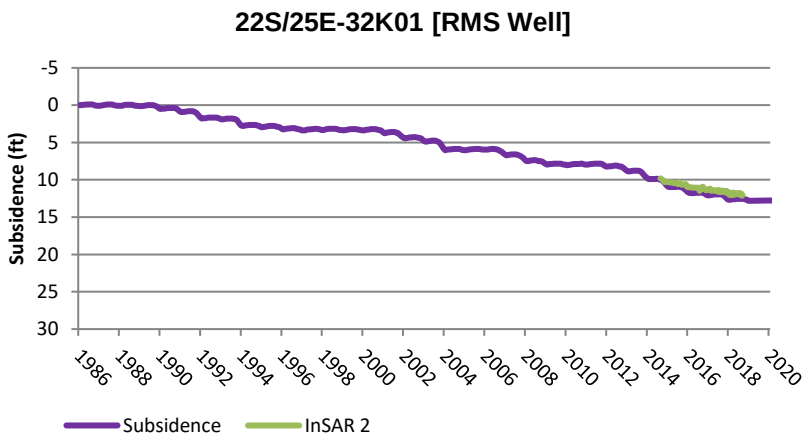

24S/24E-03A01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

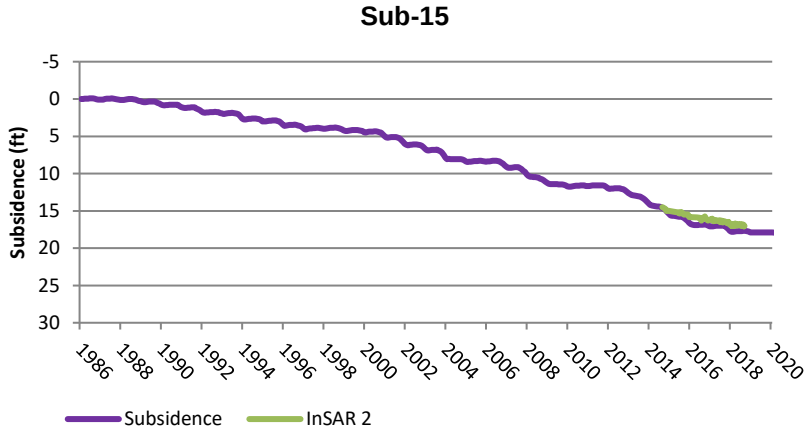

Sub-47
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

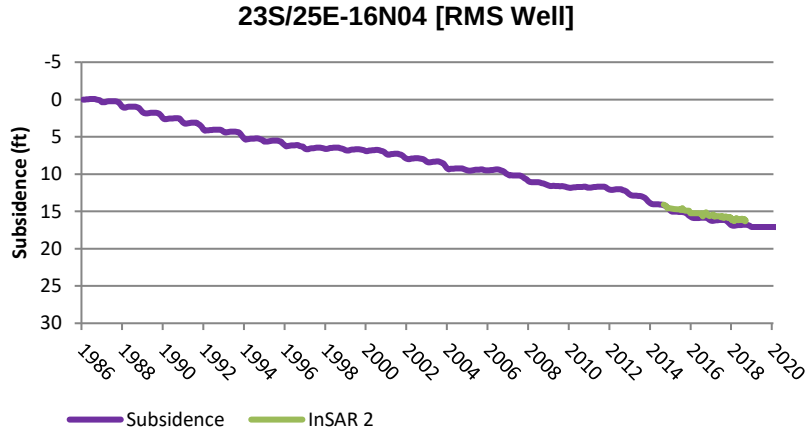

24S/24E-04R01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2


Sub-48
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

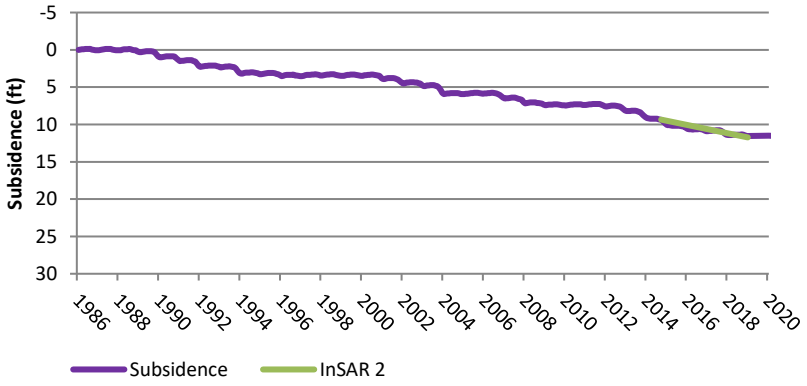

Sub-45
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2


22S/25E-32K01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

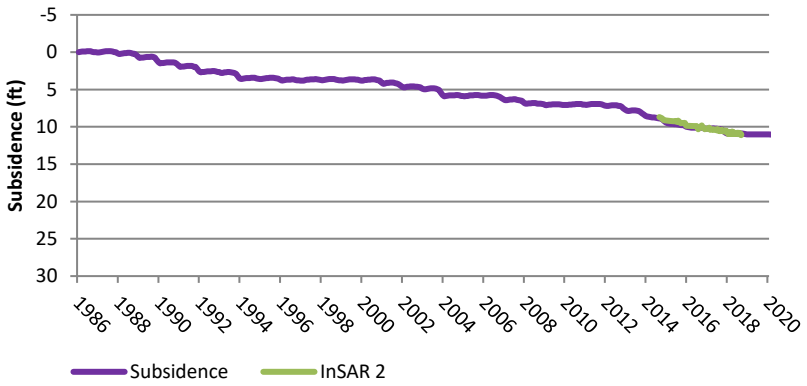

Sub-15
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2


23S/25E-16N04 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

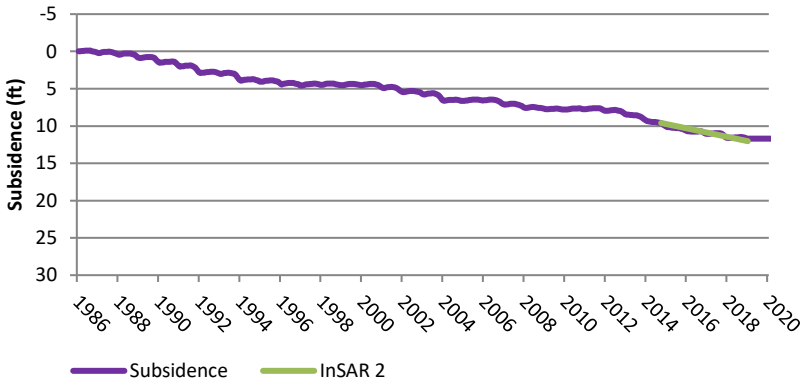
Sub-58



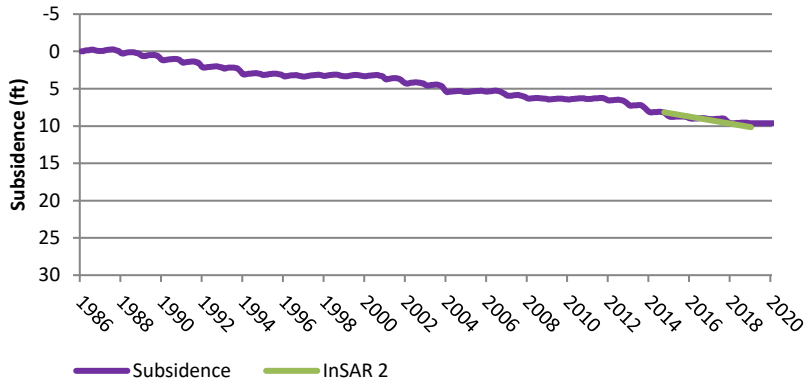
22S/25E-25N01 [RMS Well]

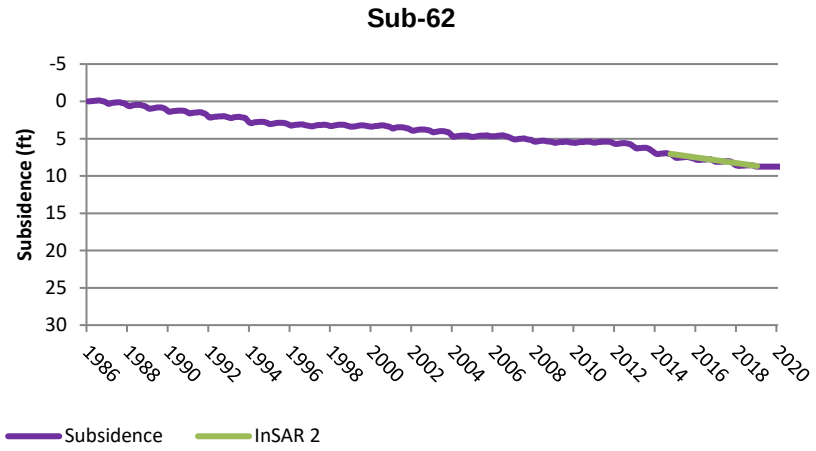


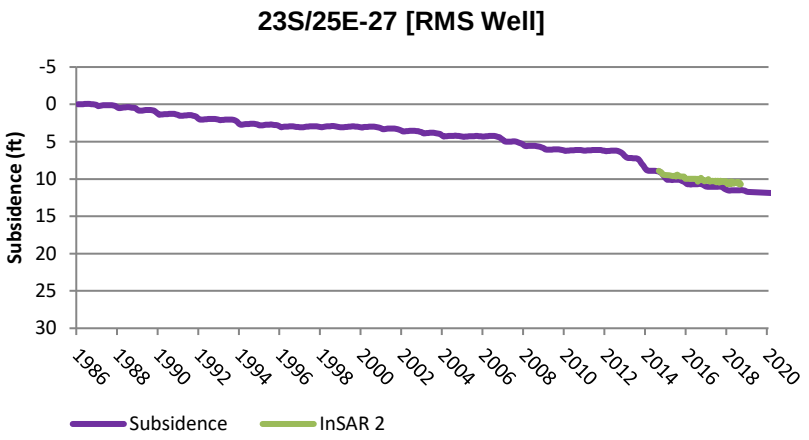
Sub-59

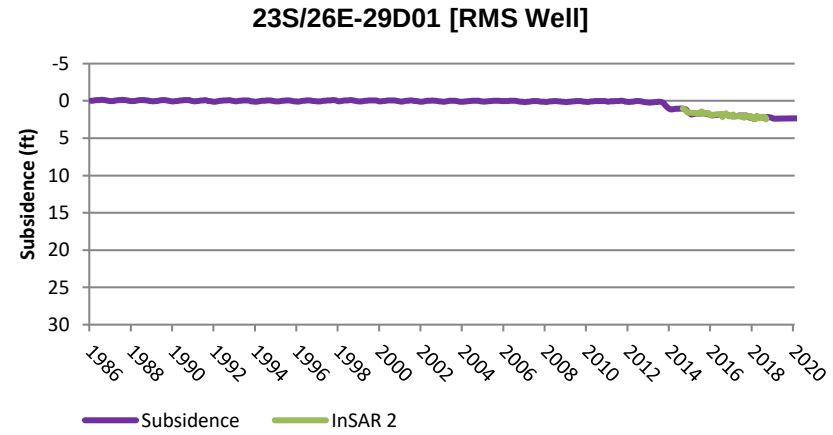


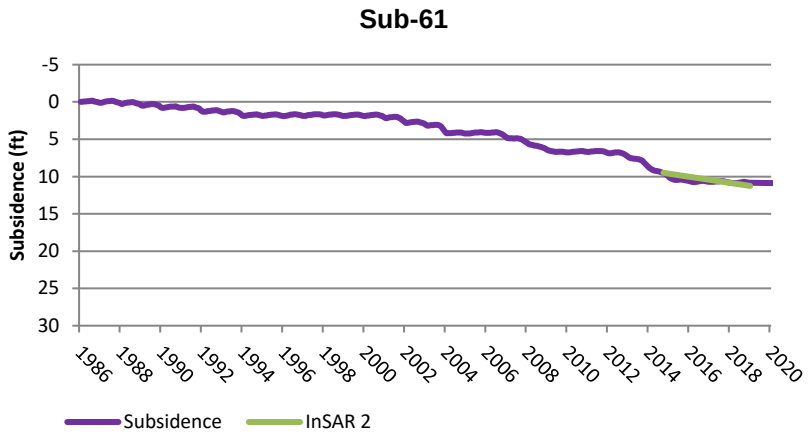
Sub-60

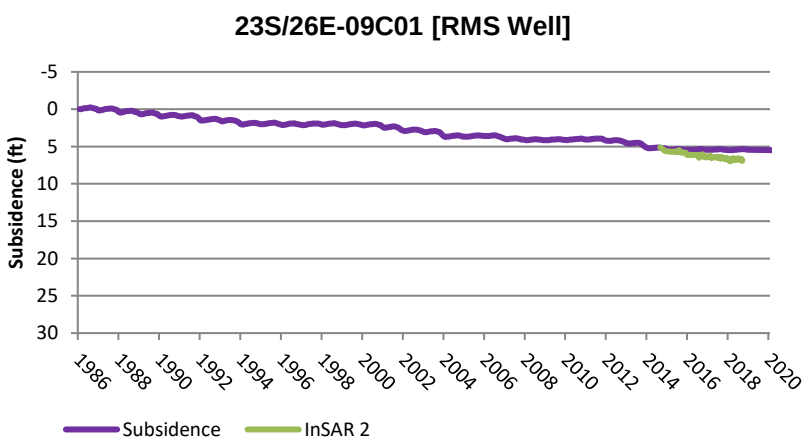


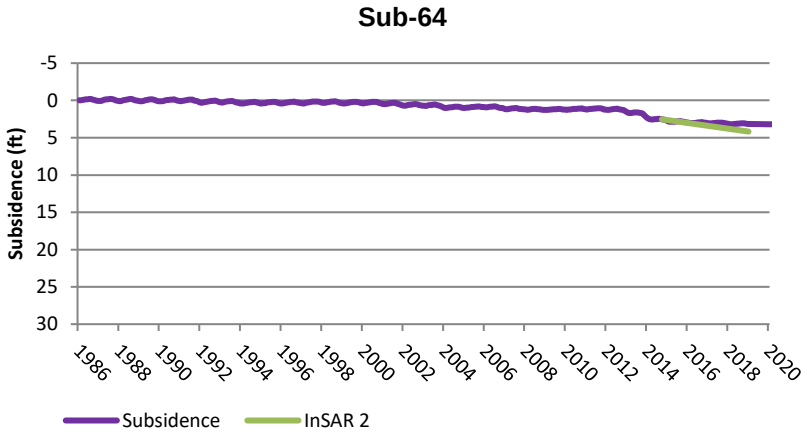

Sub-62
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

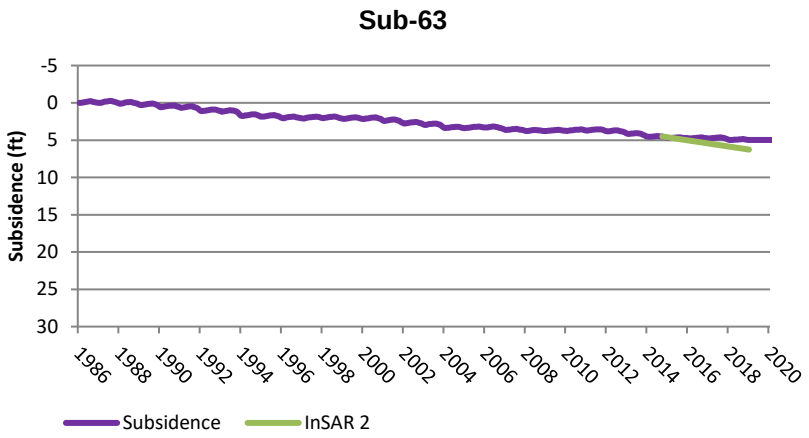

23S/25E-27 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

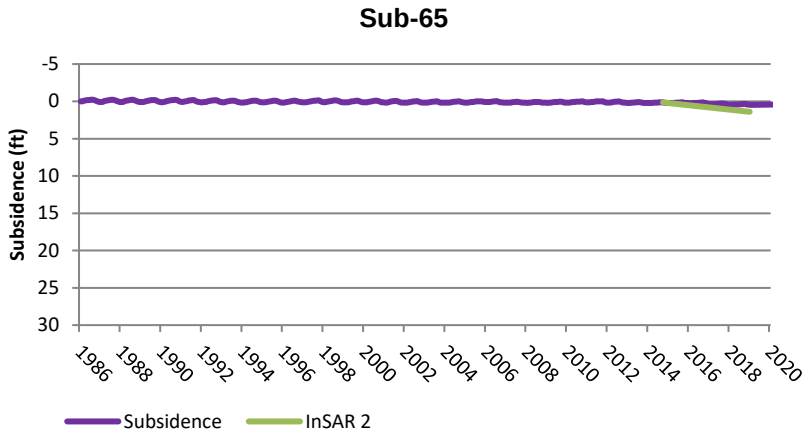

23S/26E-29D01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

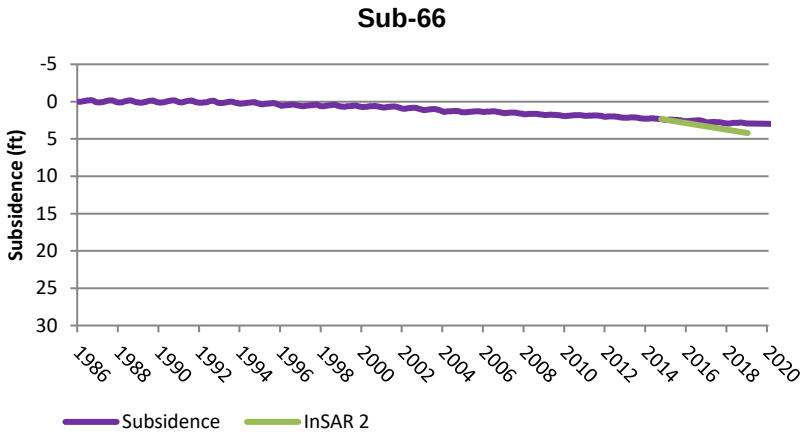

Sub-61
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

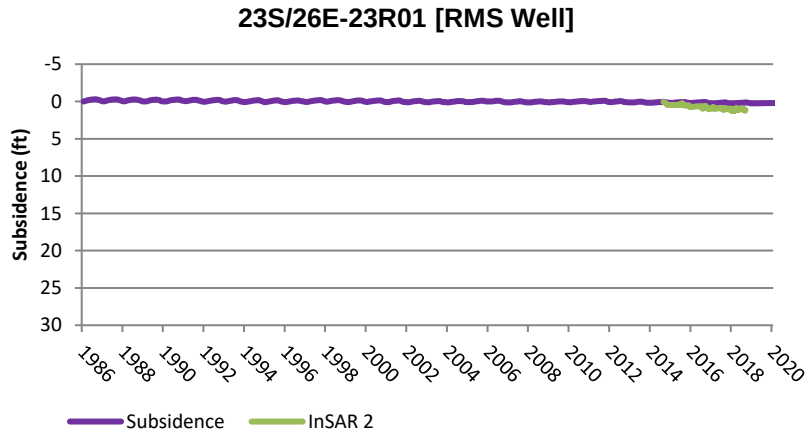

23S/26E-09C01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

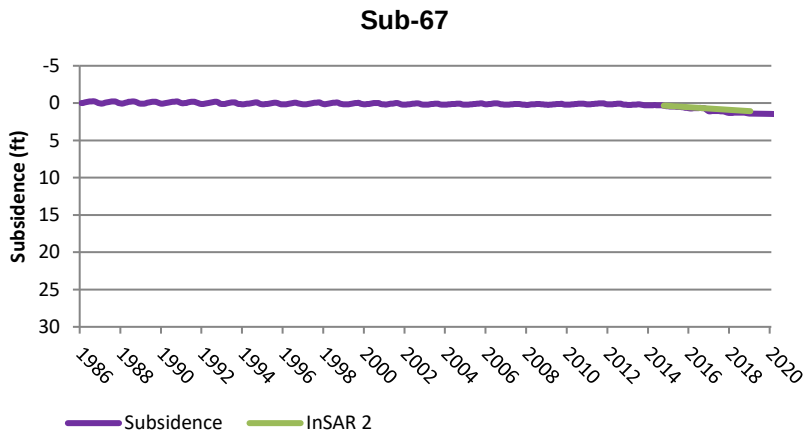

Sub-64
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

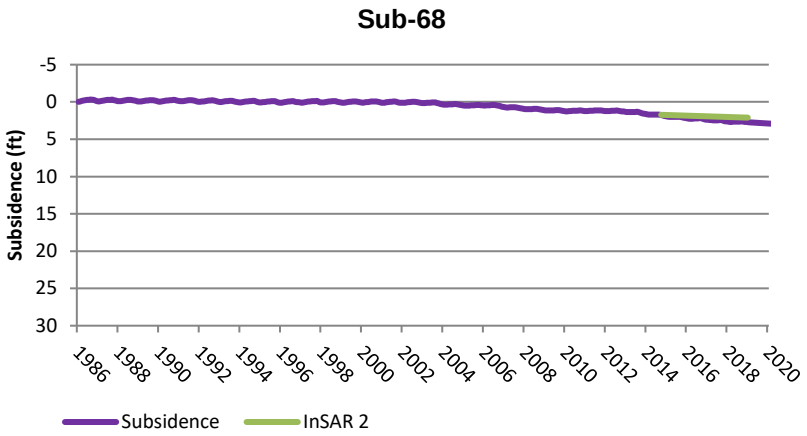

Sub-63
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

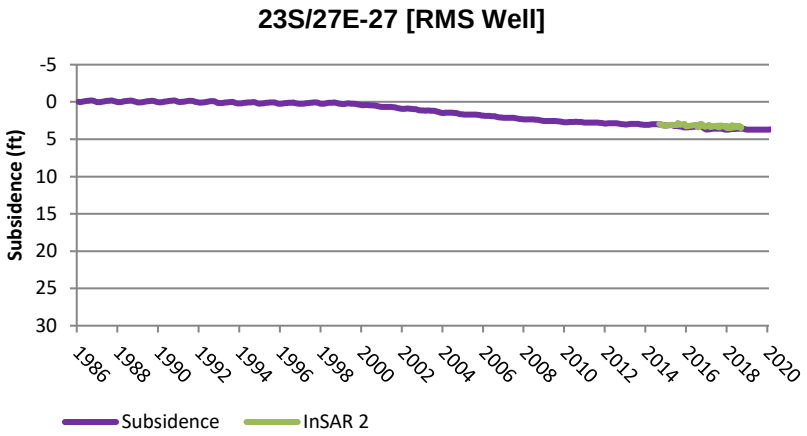

Sub-65
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

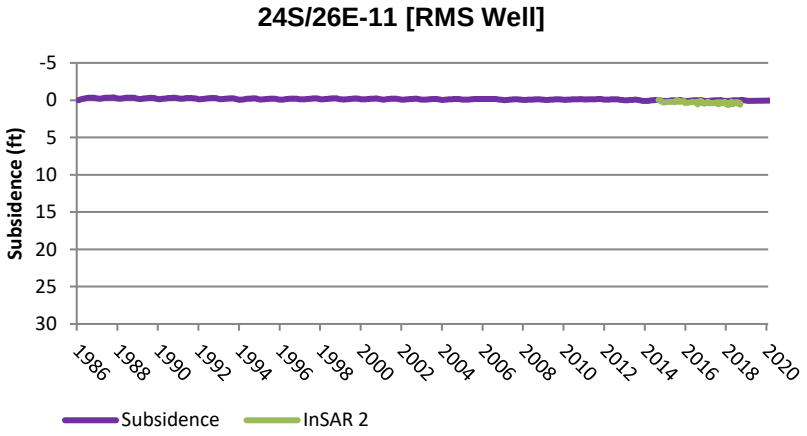

Sub-66
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

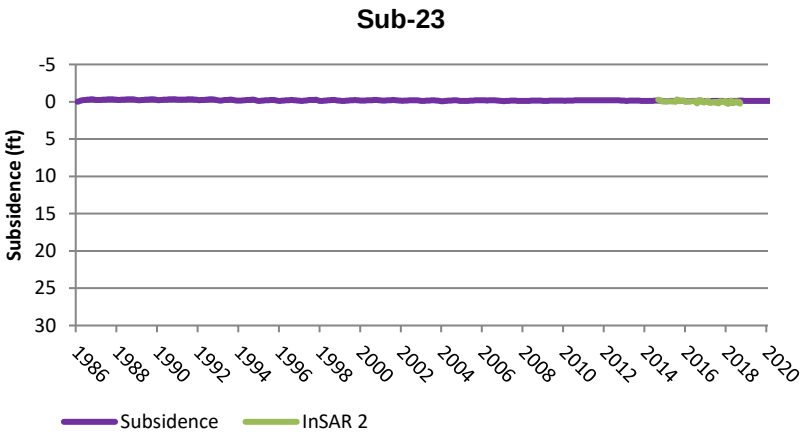

23S/26E-23R01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2


Sub-67
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

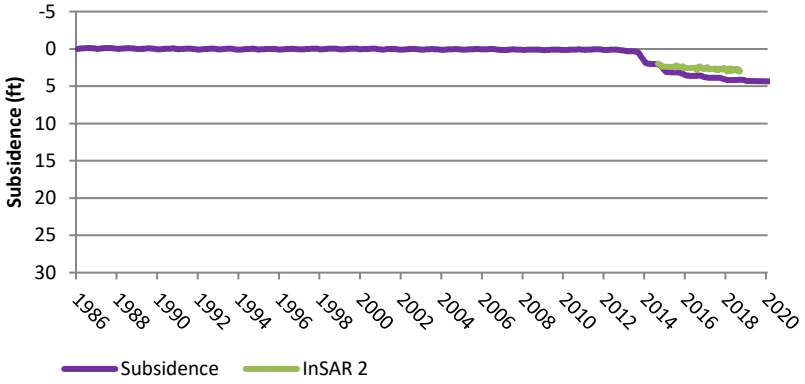

Sub-68
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2


23S/27E-27 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

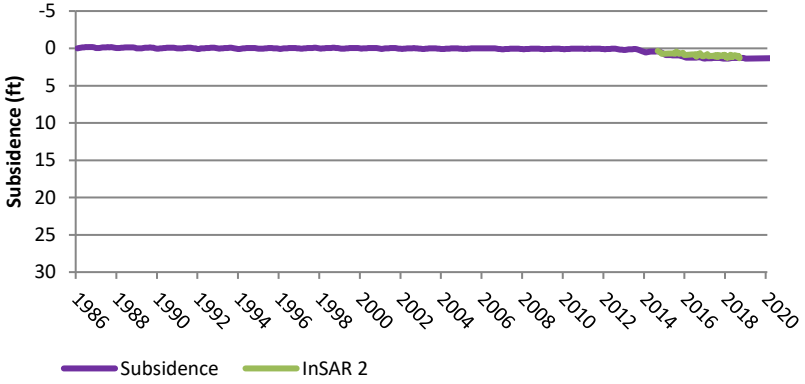

24S/26E-11 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2


Sub-23
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

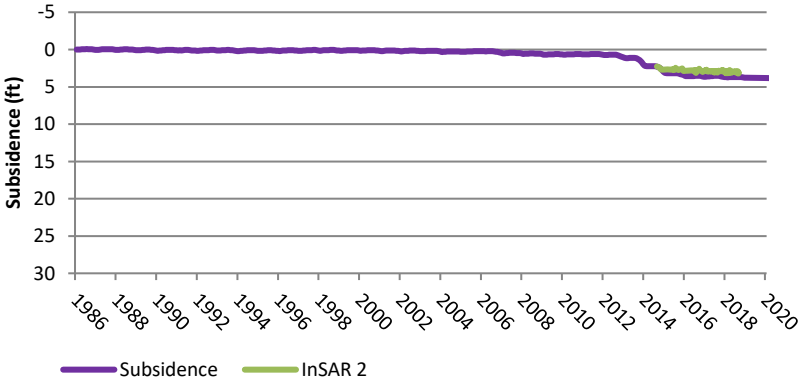
23S/25E-36 [RMS Well]



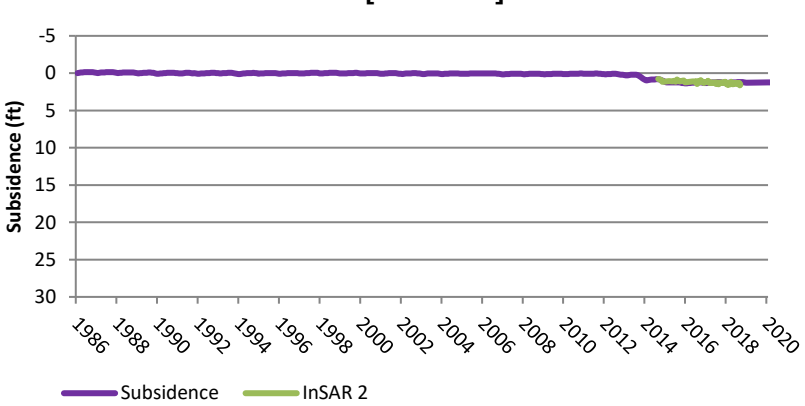
24S/26E-04P01 [RMS Well]

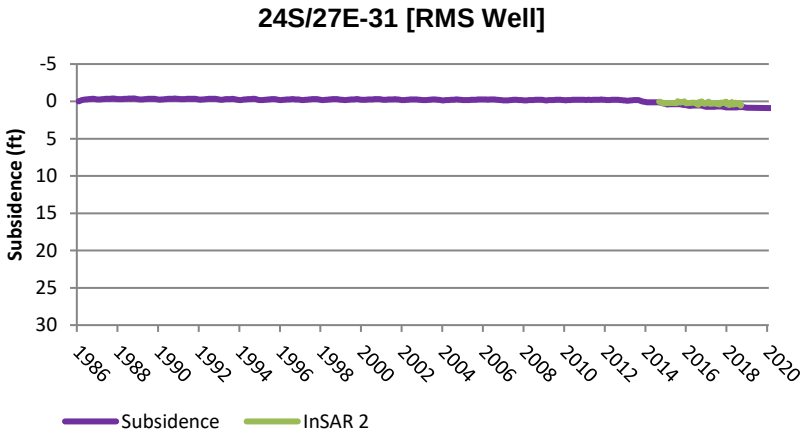


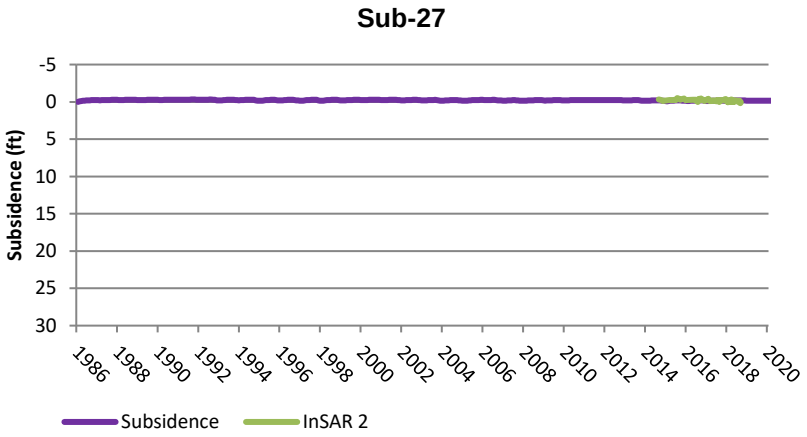
Sub-22

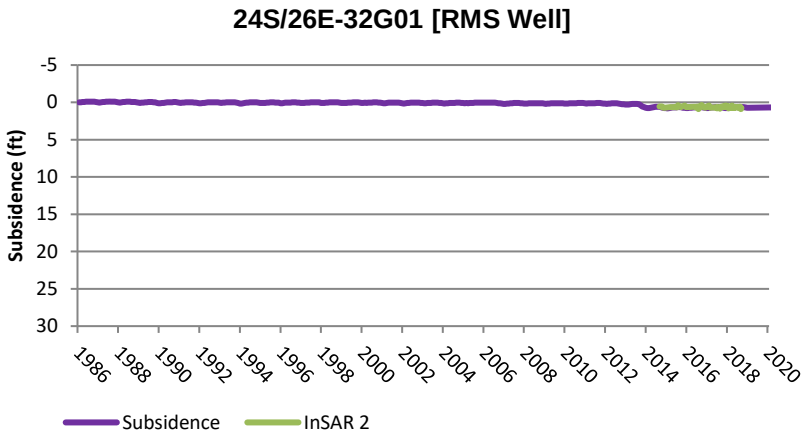


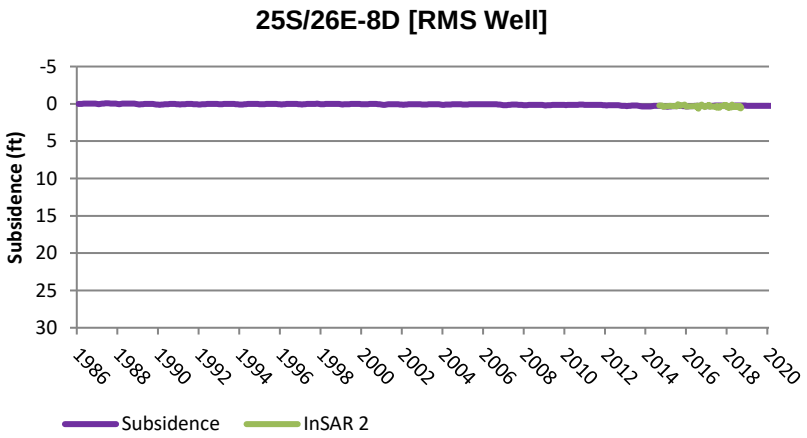
M-19 [RMS Well]

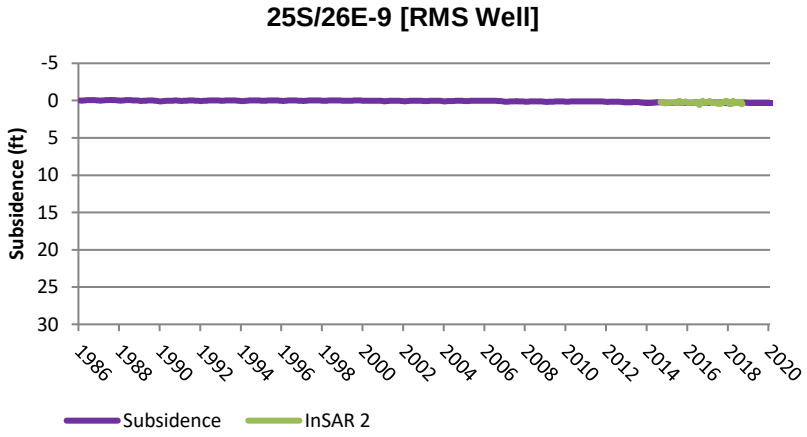


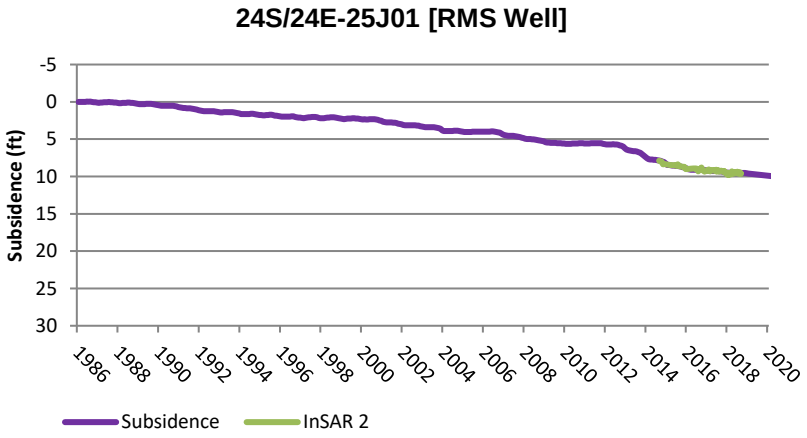

24S/27E-31 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

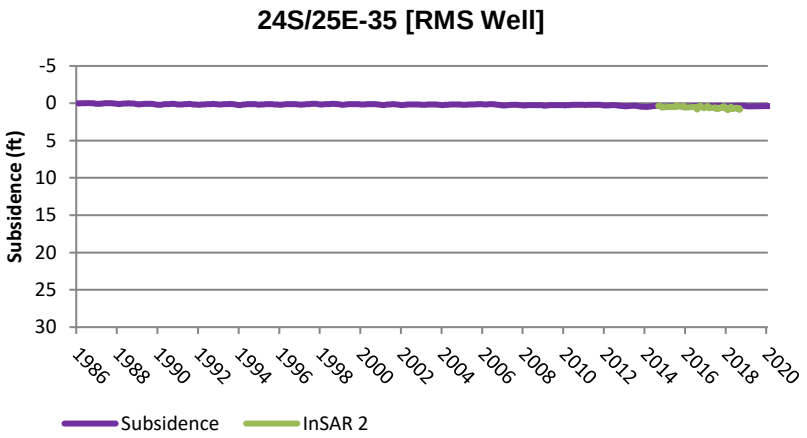

Sub-27
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

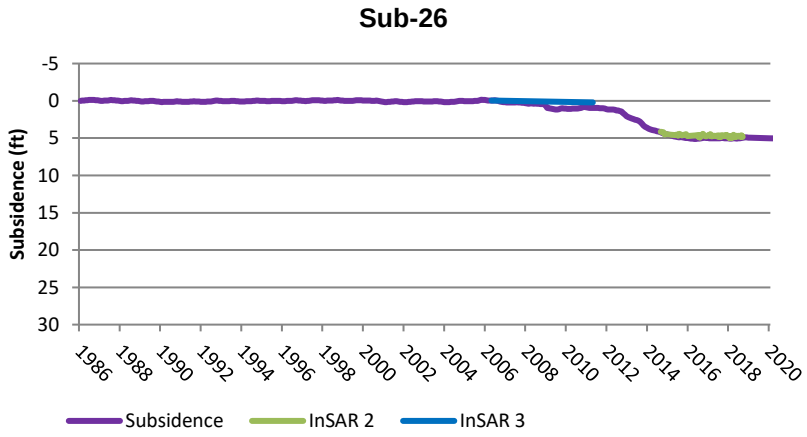

24S/26E-32G01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

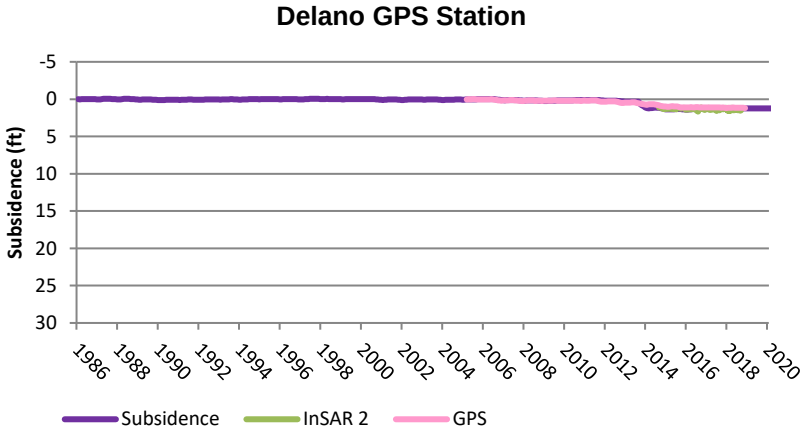

25S/26E-8D [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

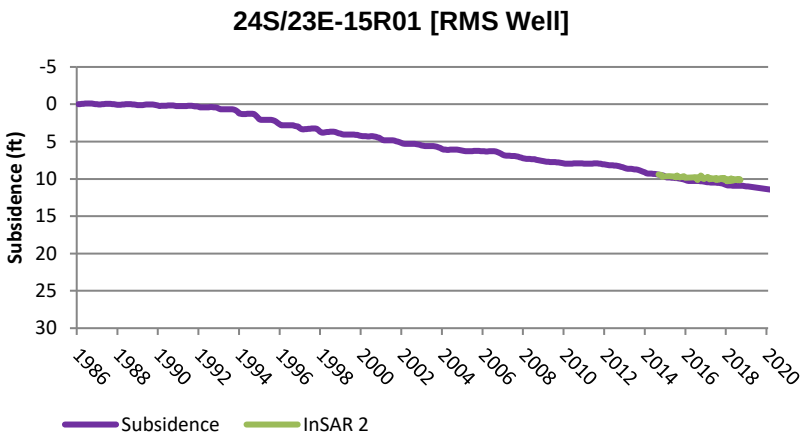

25S/26E-9 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence
InSAR 2

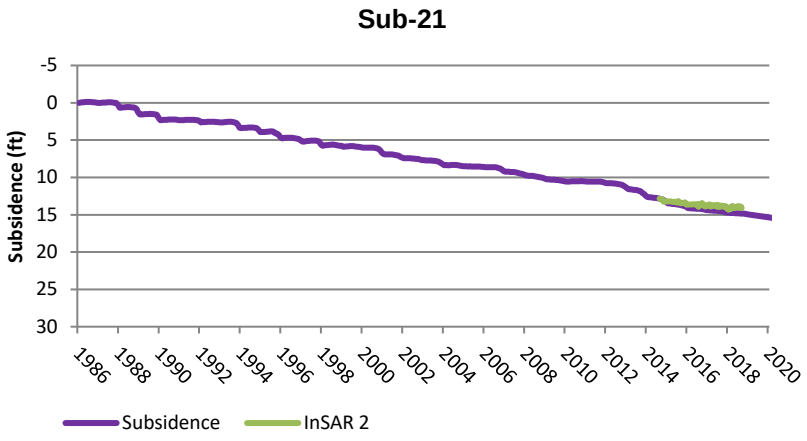

24S/24E-25J01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

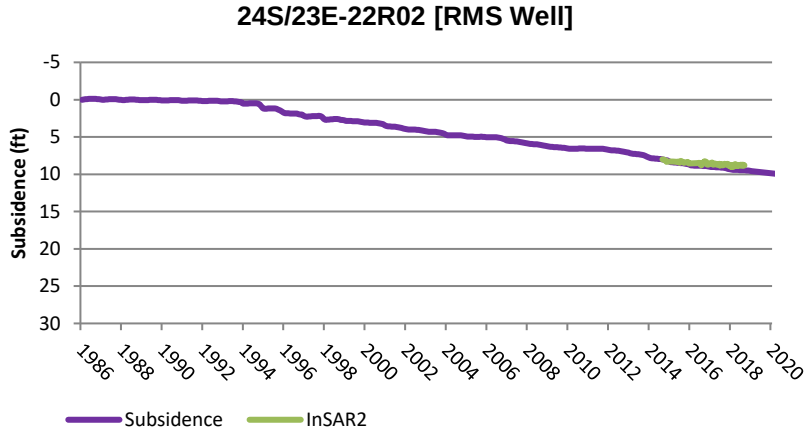

24S/25E-35 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

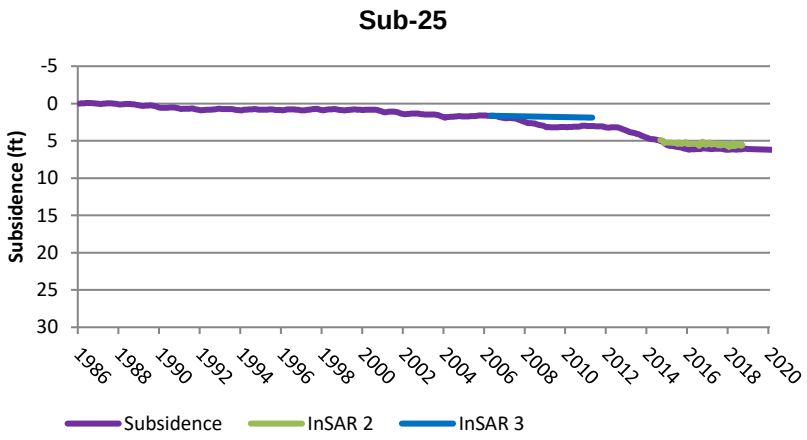

Sub-26
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2
InSAR 3

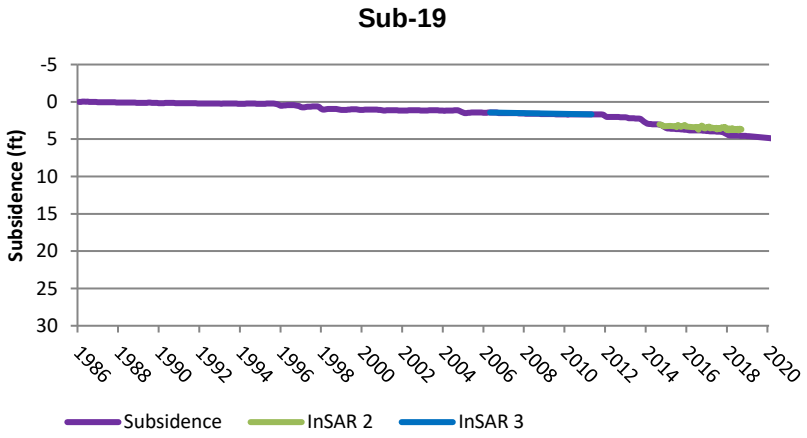

Delano GPS Station
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2
GPS

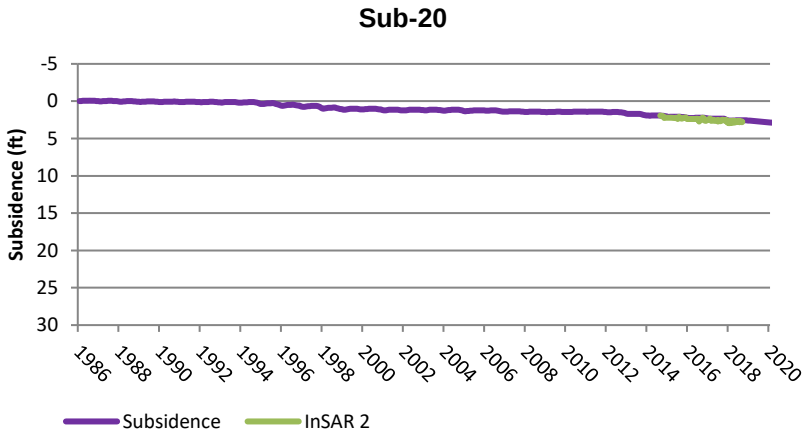

24S/23E-15R01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

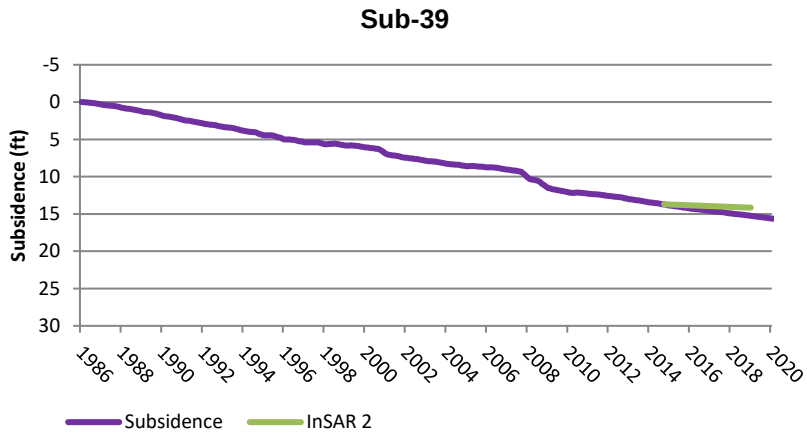

Sub-21
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

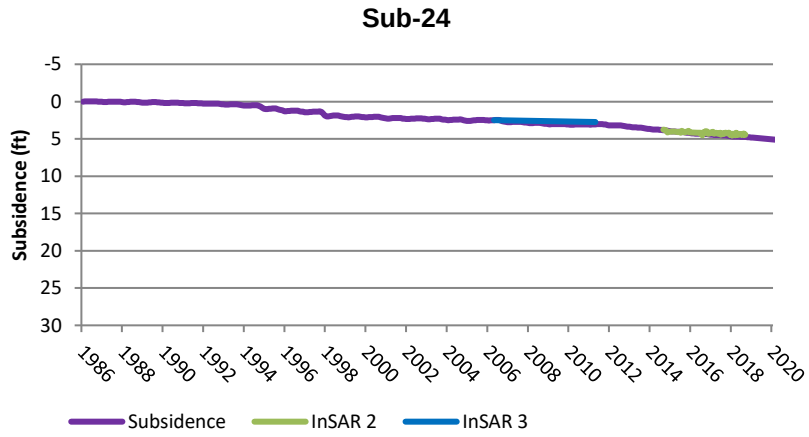

24S/23E-22R02 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR2

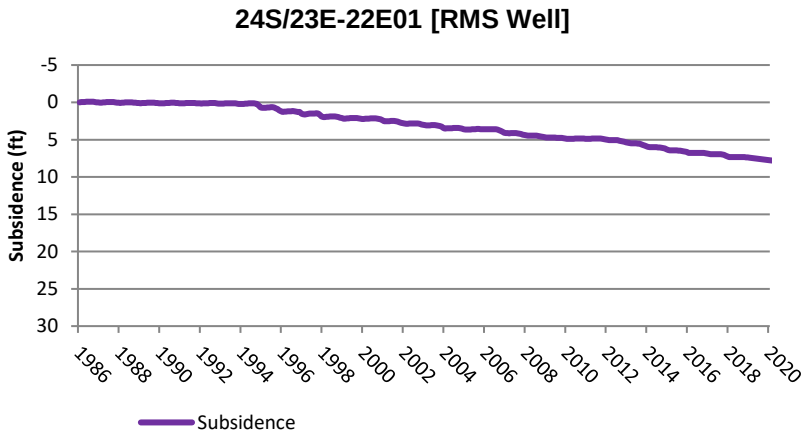

Sub-25
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2
InSAR 3


Sub-19
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2
InSAR 3


Sub-20
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

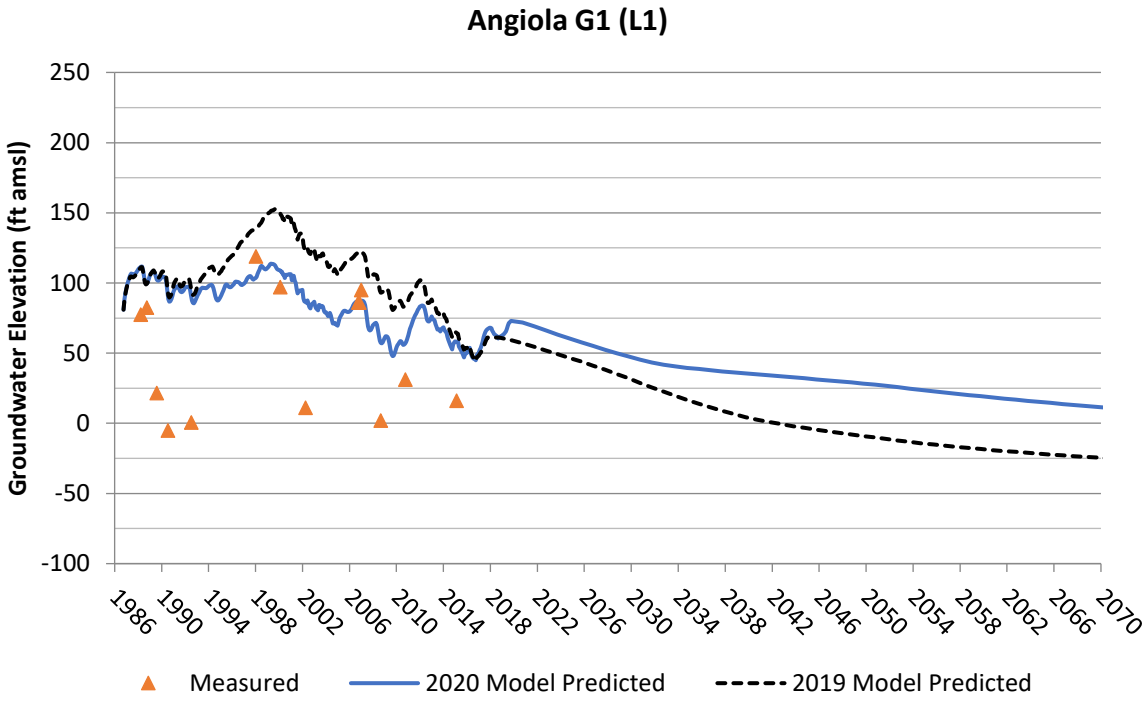

Sub-39
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2

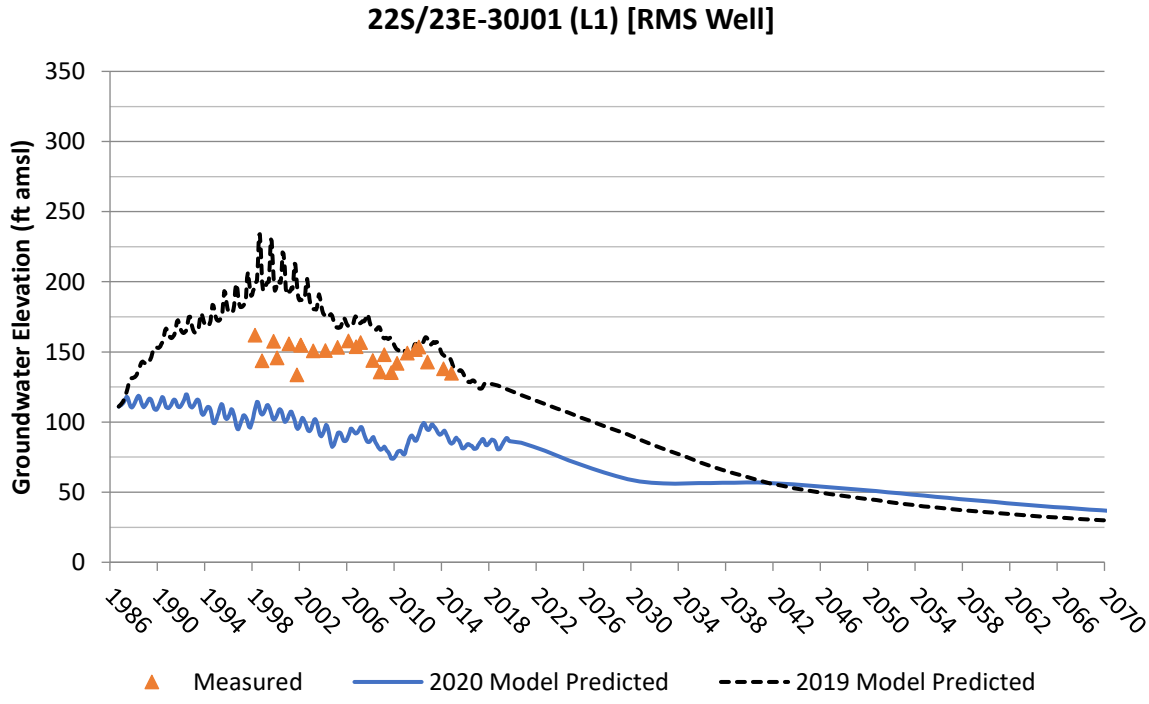

Sub-24
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Subsidence
InSAR 2
InSAR 3

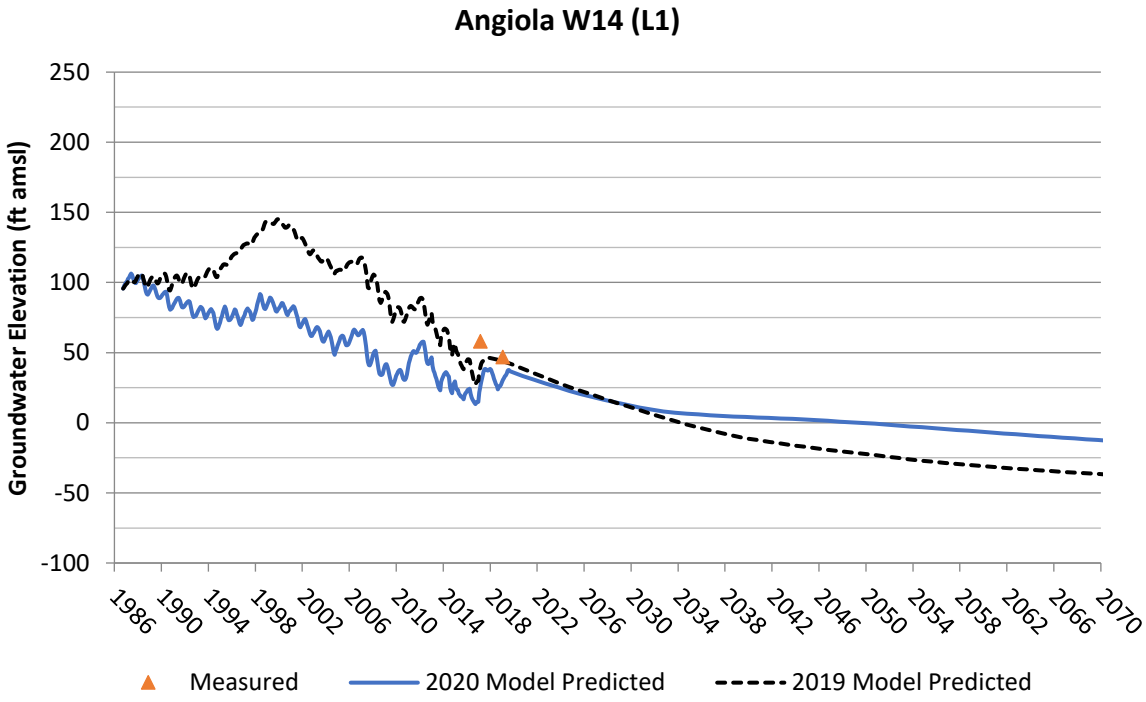

24S/23E-22E01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Subsidence

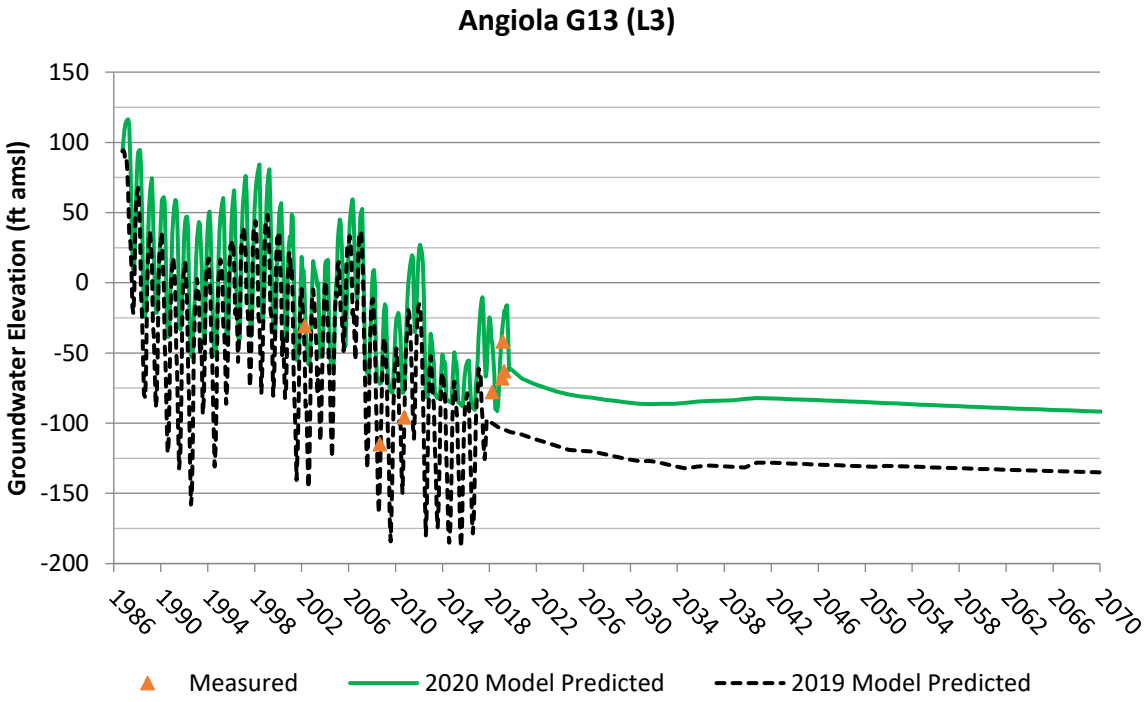
Attachment F

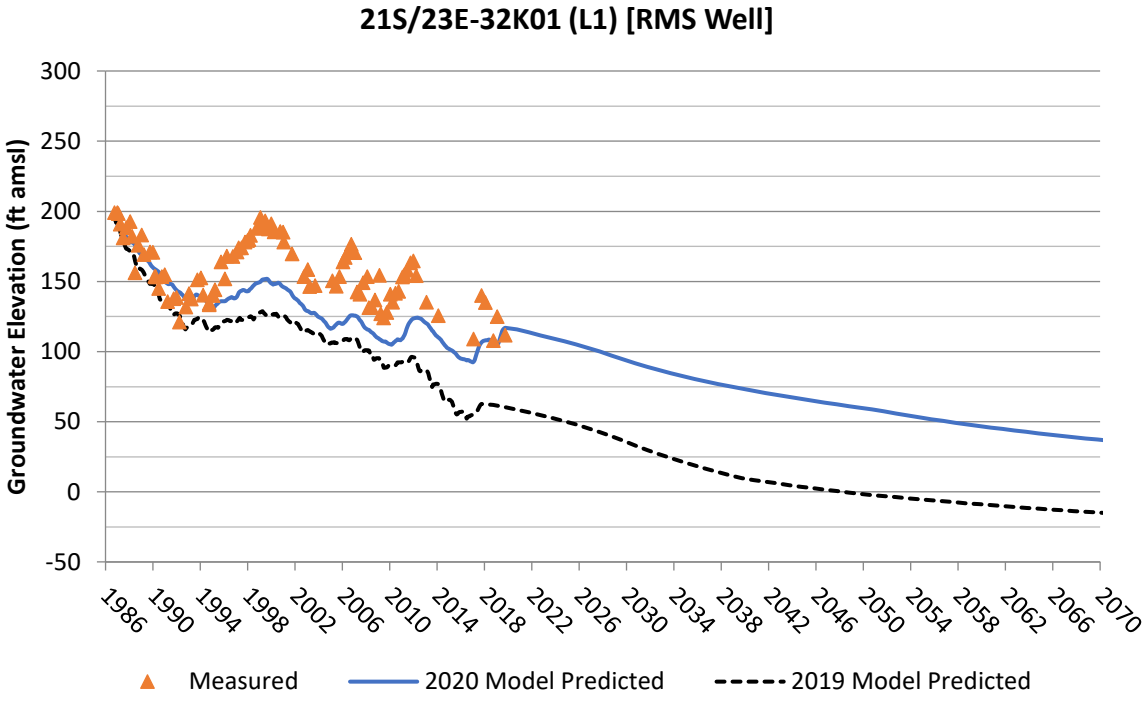
Projection Hydrographs at Calibration Targets

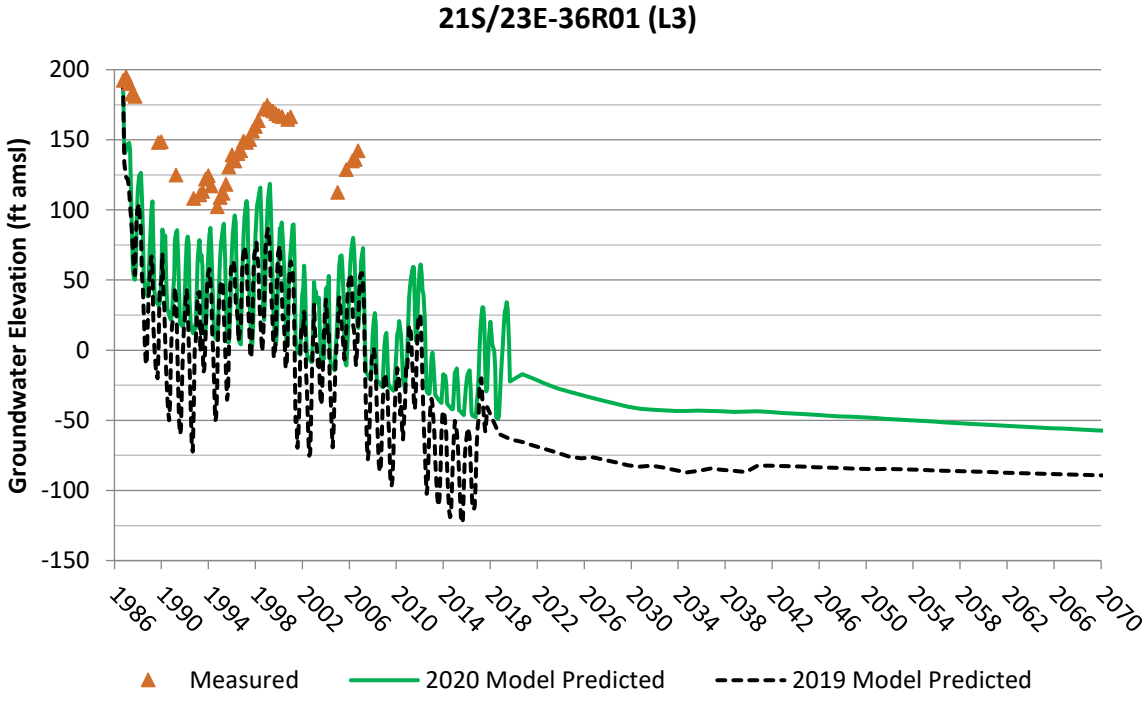

Angiola G1 (L1)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

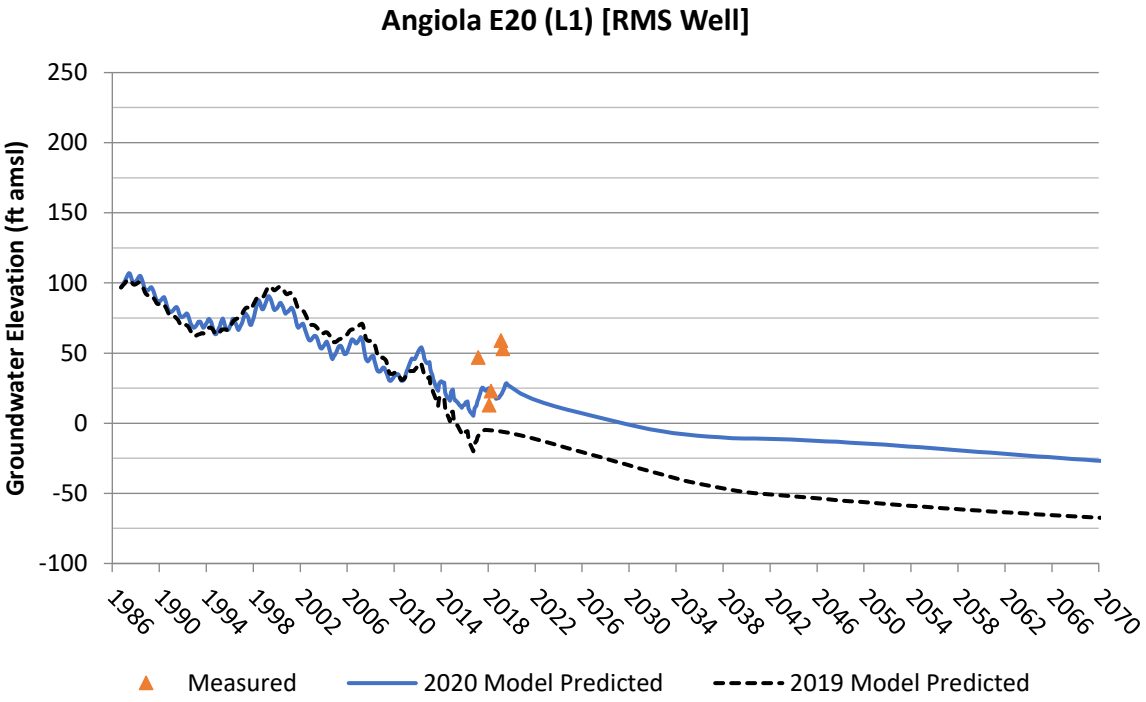

22S/23E-30J01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

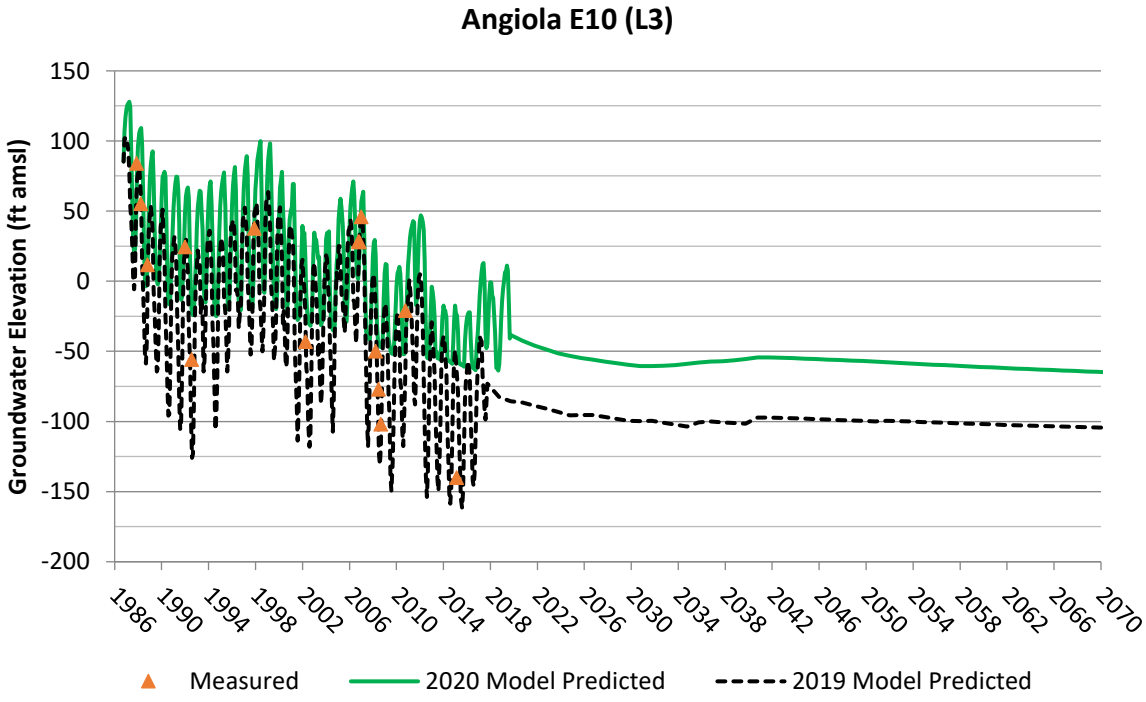

Angiola W14 (L1)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

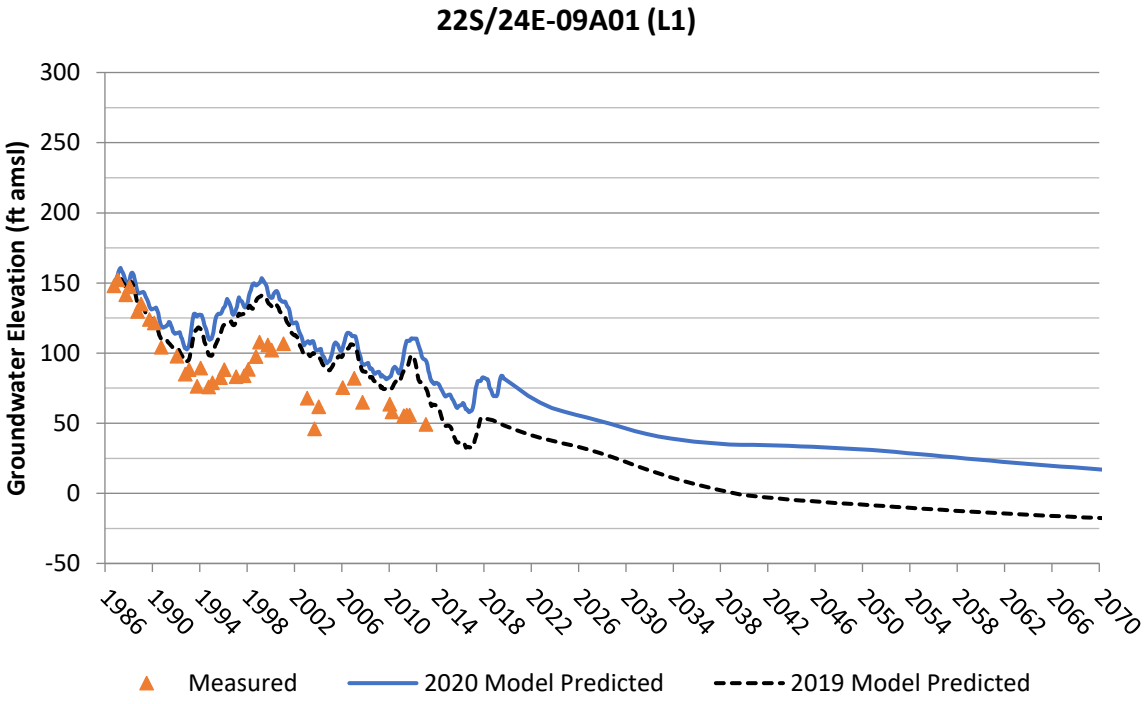

Angiola G13 (L3)
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

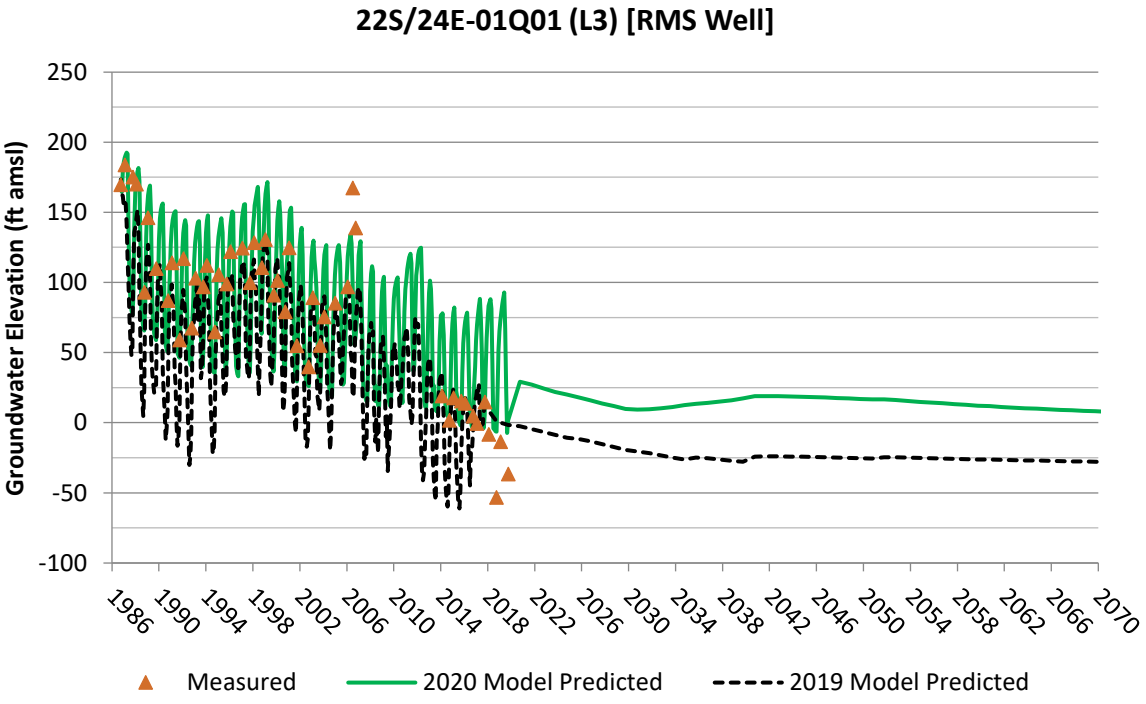

21S/23E-32K01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
300
250
200
150
100
50
0
-50
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

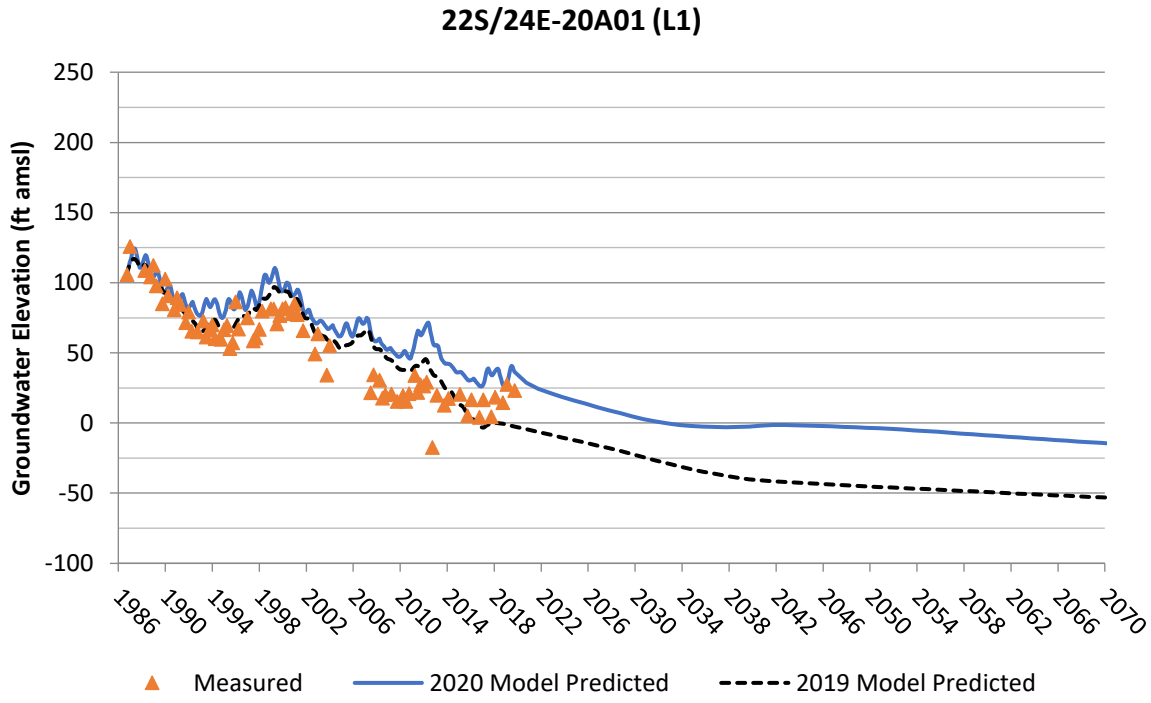

21S/23E-36R01 (L3)
Groundwater Elevation (ft amsl)
200
150
100
50
0
-50
-100
-150
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

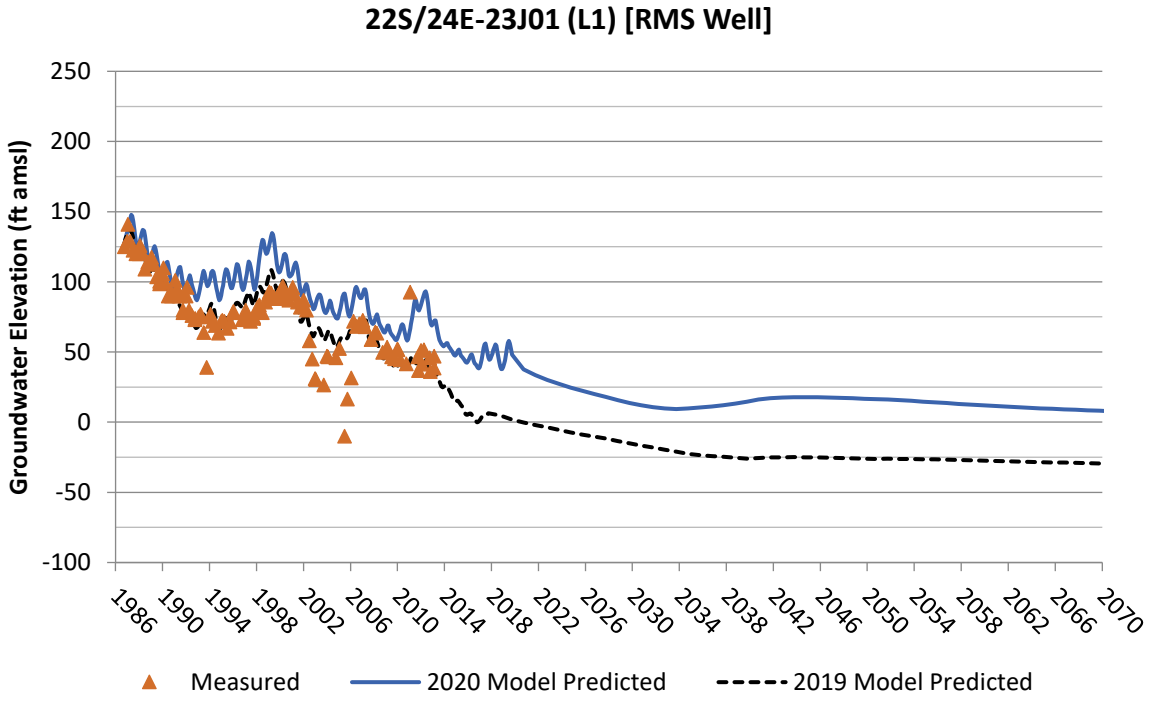

Angiola E20 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

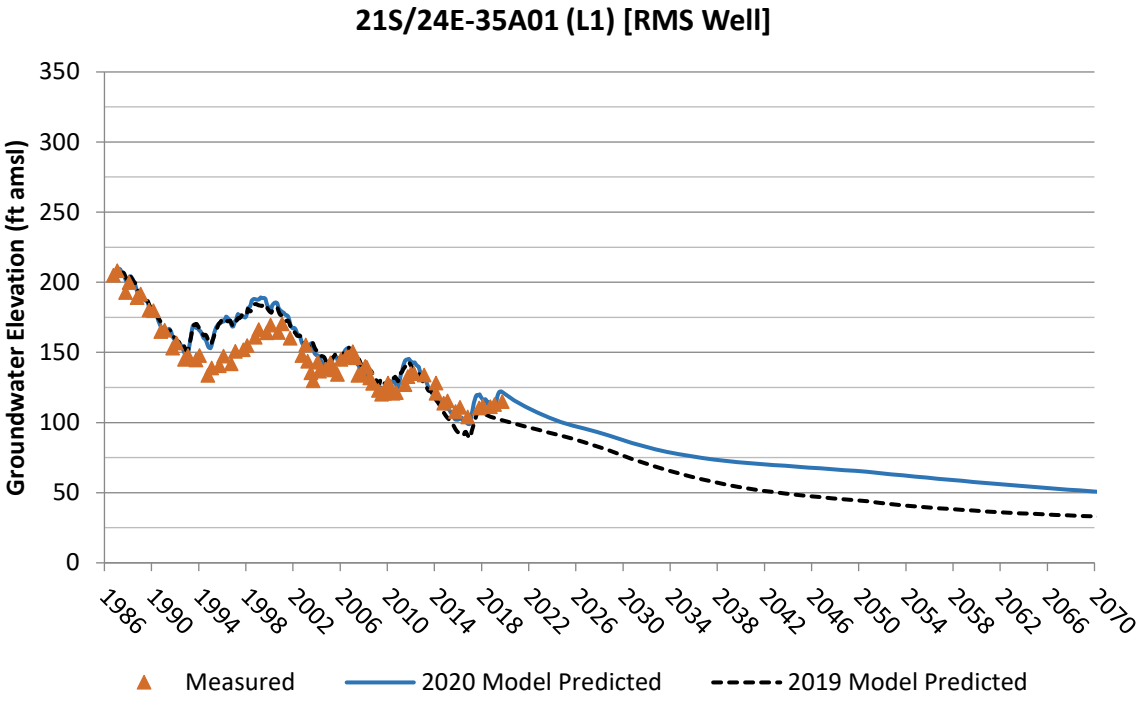

Angiola E10 (L3)
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

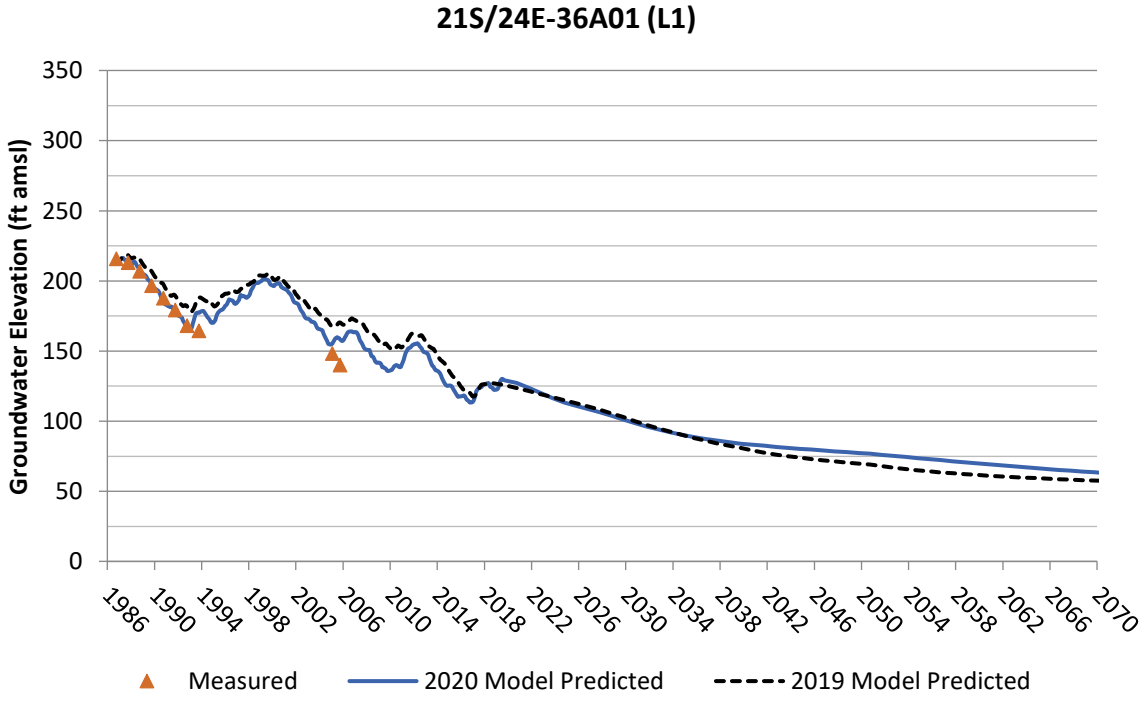

22S/24E-09A01 (L1)
Groundwater Elevation (ft amsl)
300
250
200
150
100
50
0
-50
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

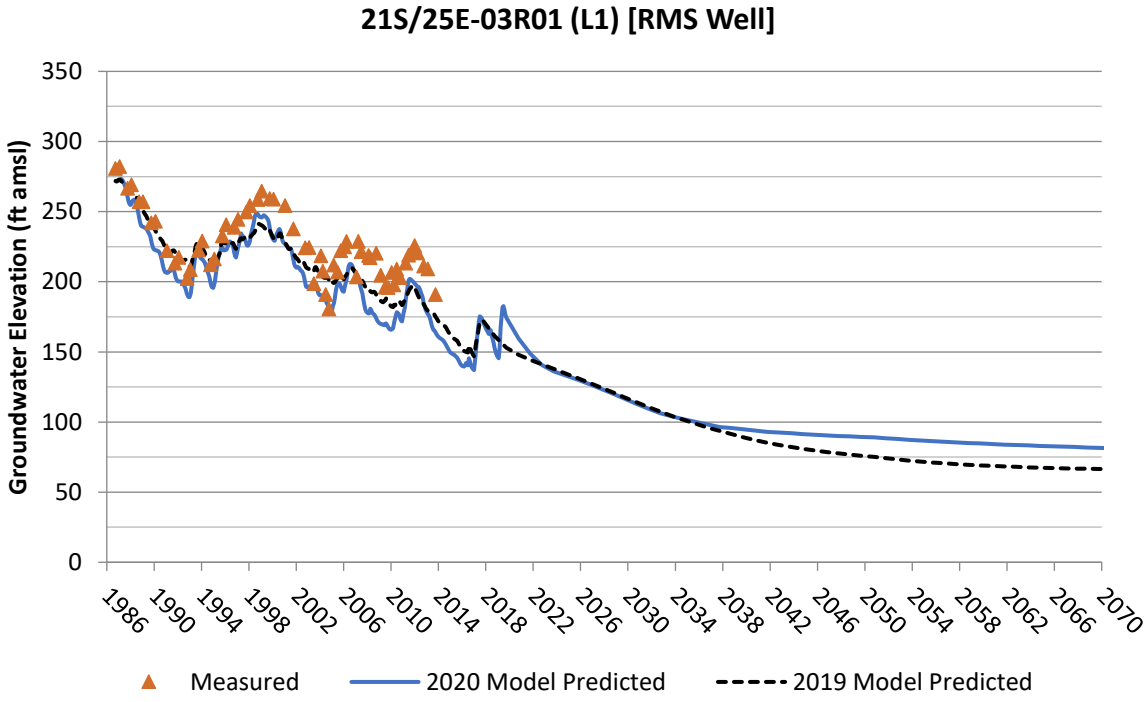

22S/24E-01Q01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

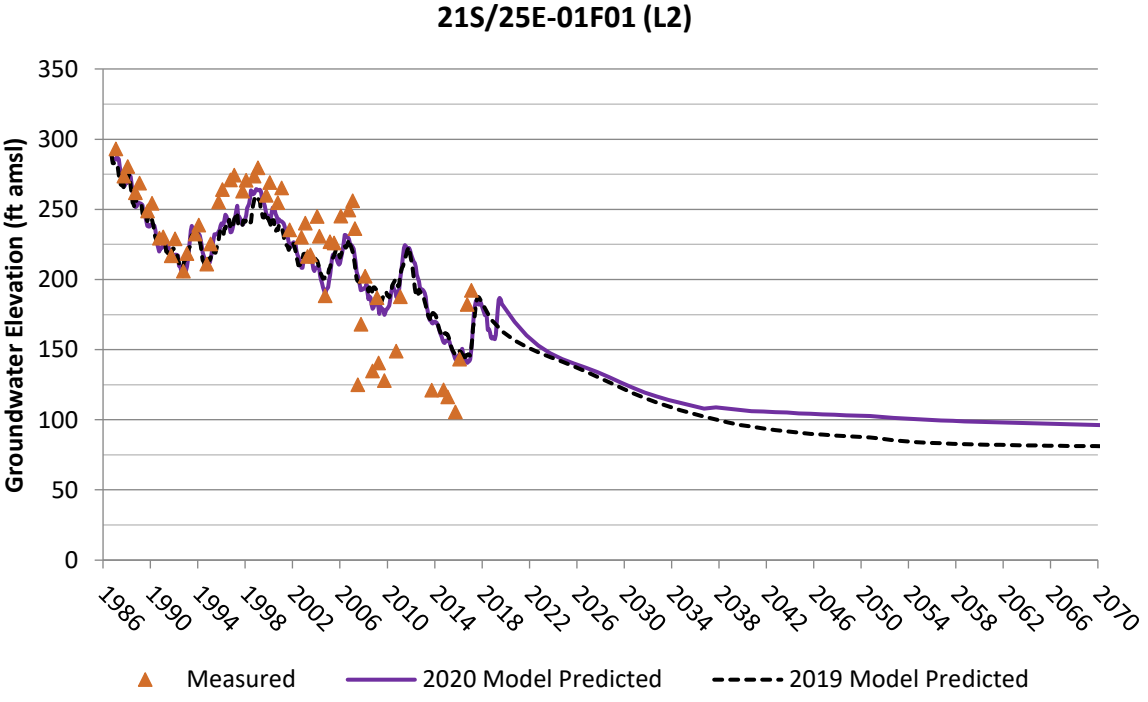

22S/24E-20A01 (L1)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

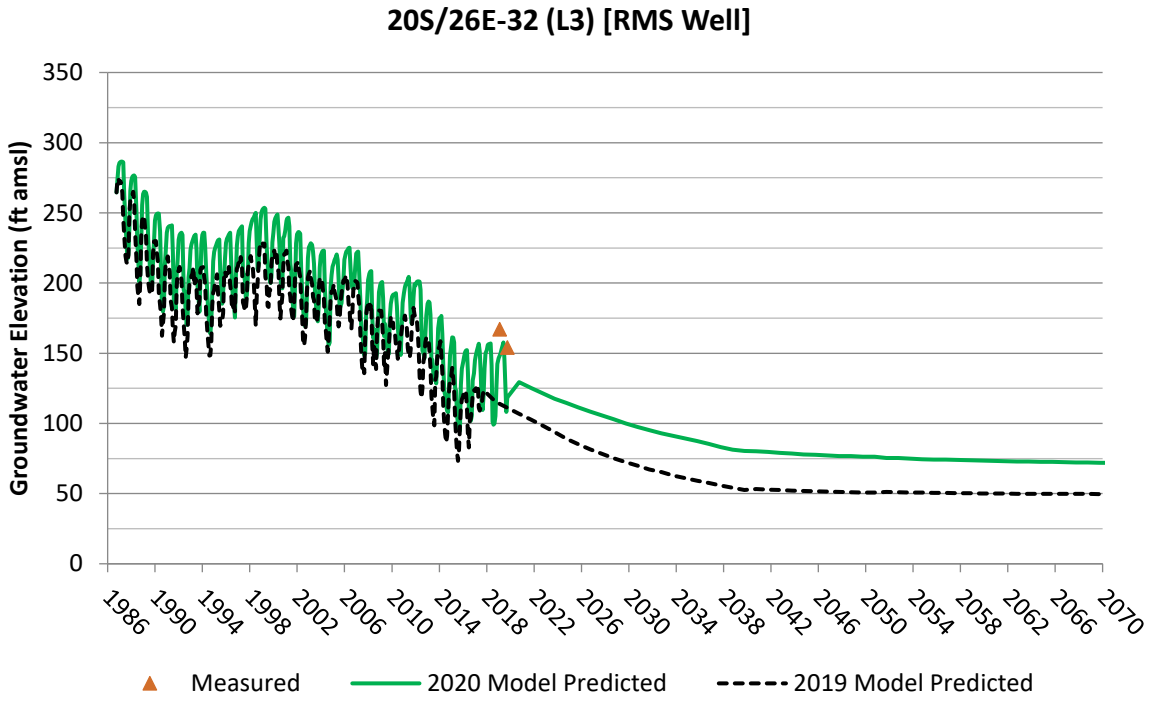

22S/24E-23J01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

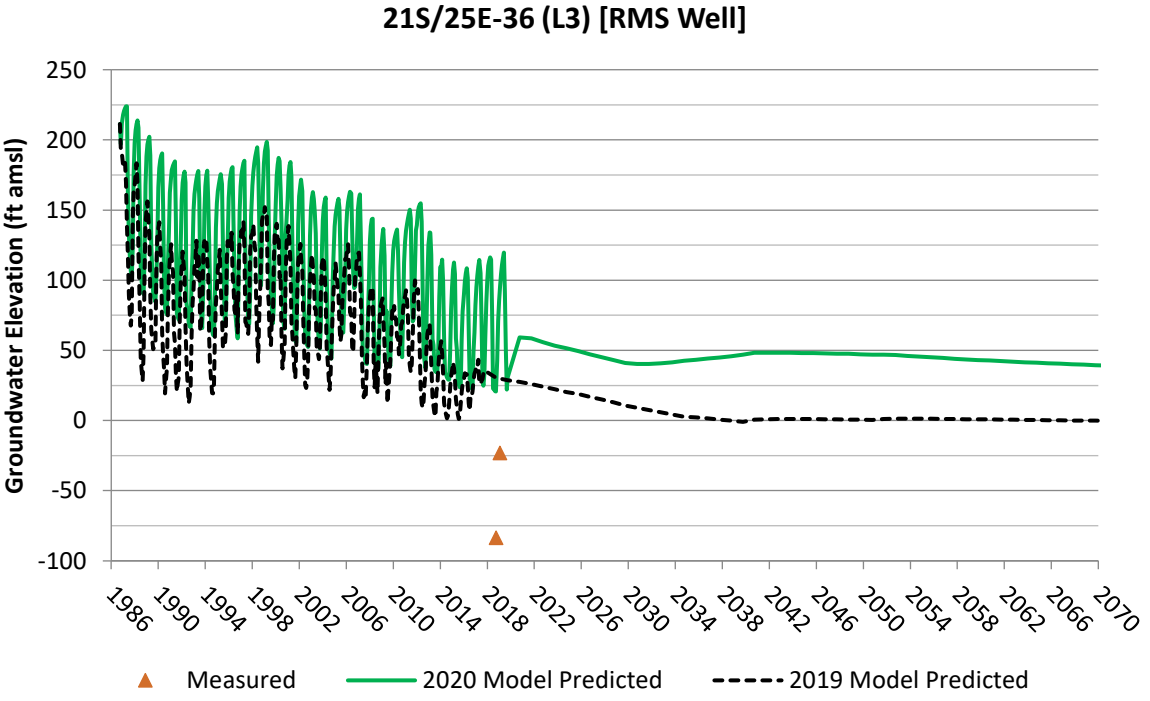

21S/24E-35A01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

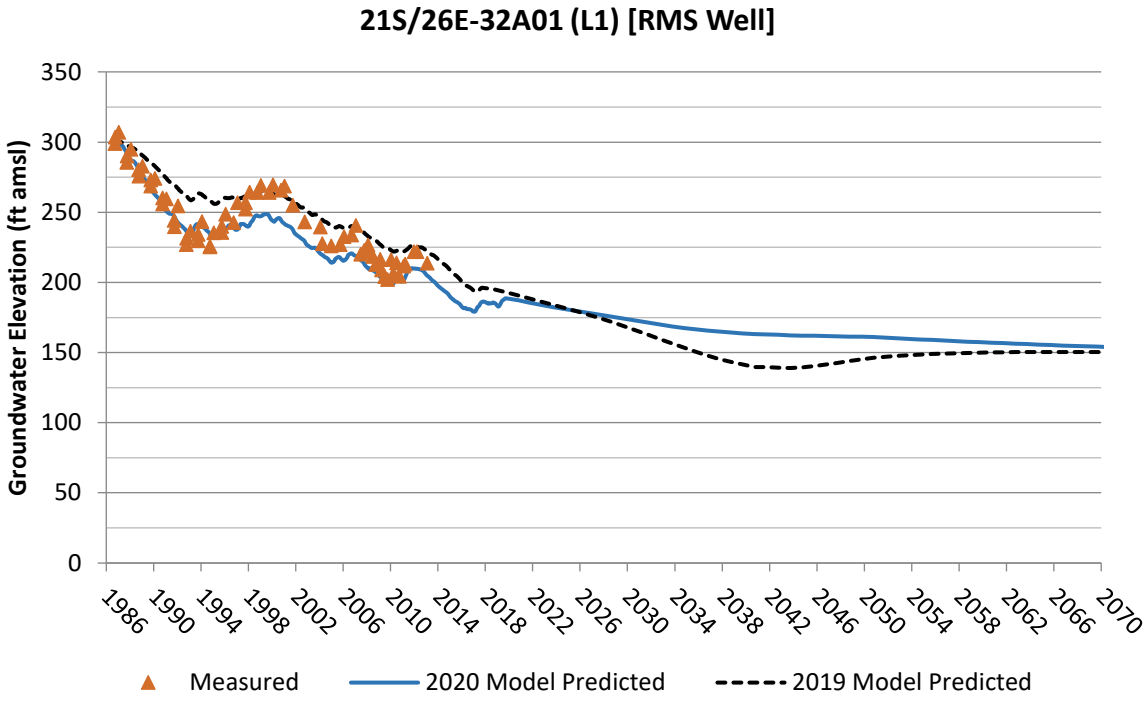

21S/24E-36A01 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

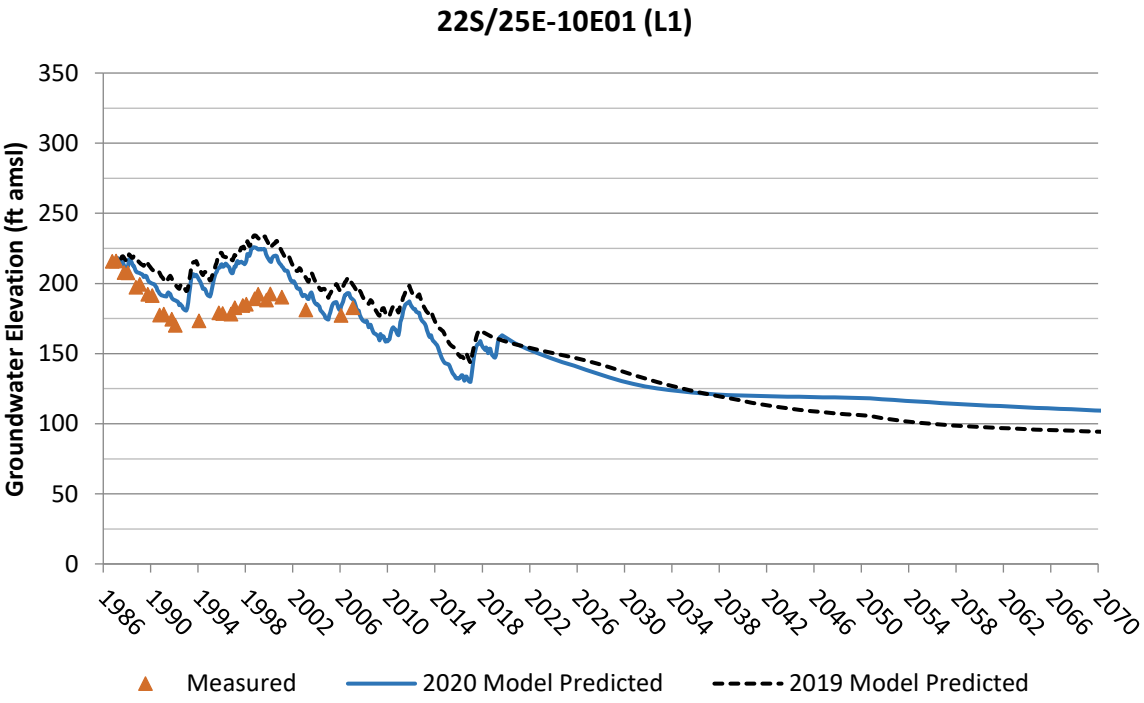

21S/25E-03R01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

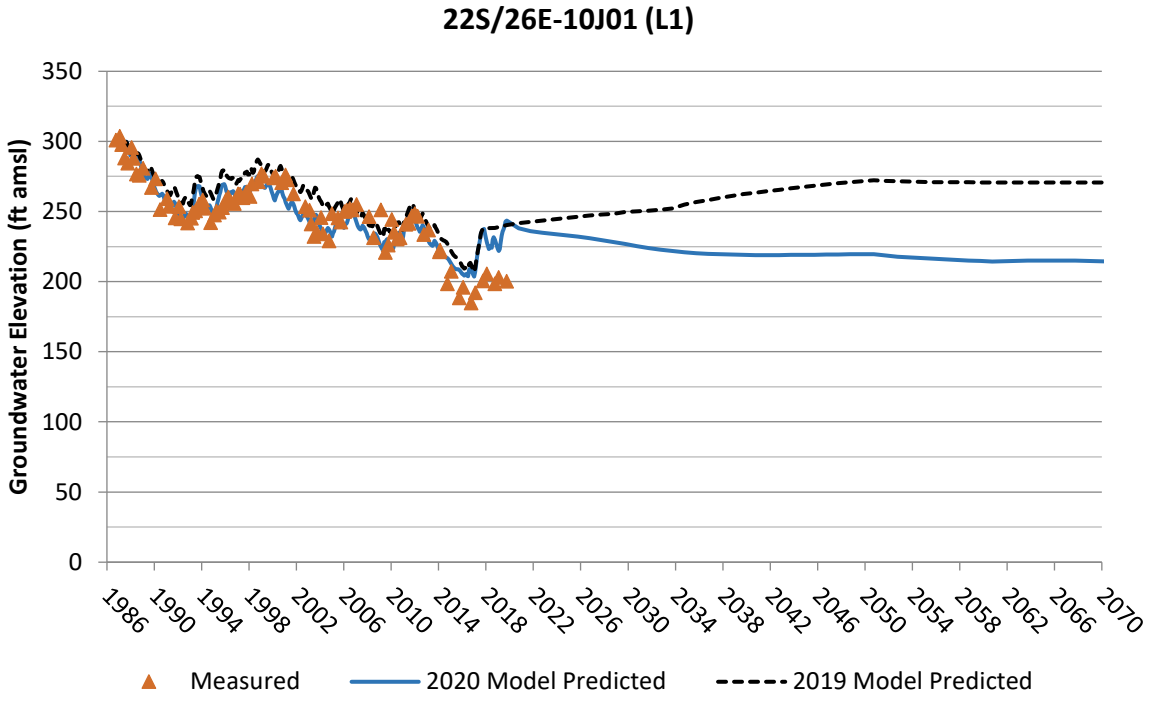

21S/25E-01F01 (L2)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

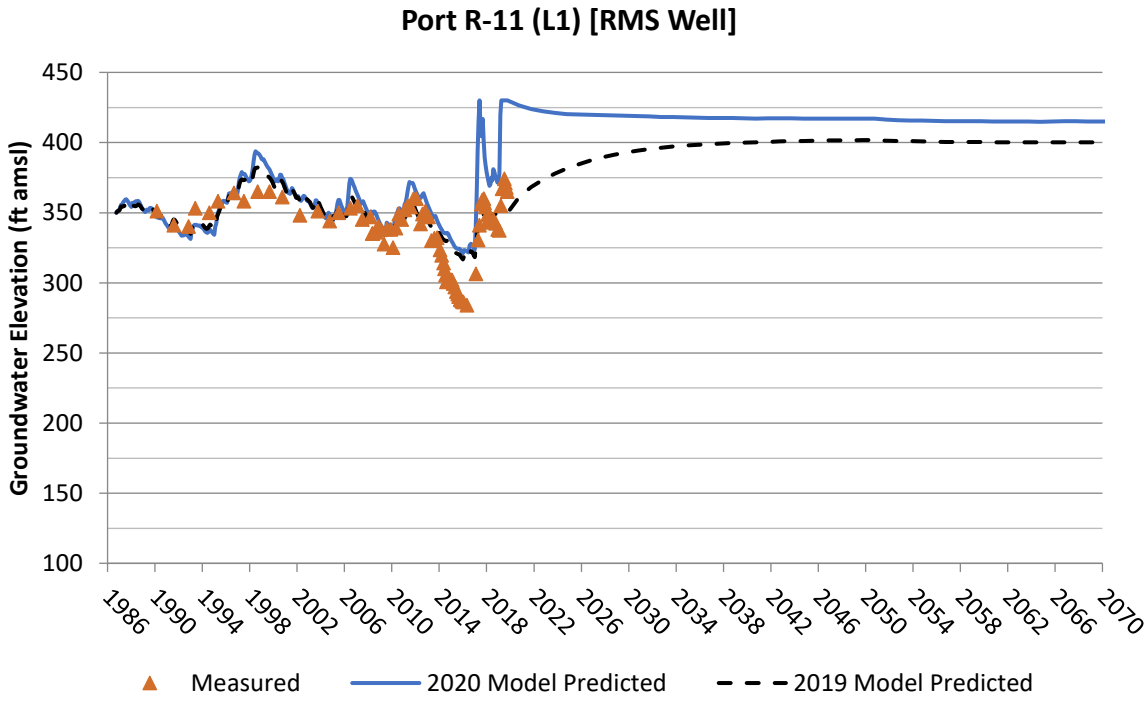

20S/26E-32 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

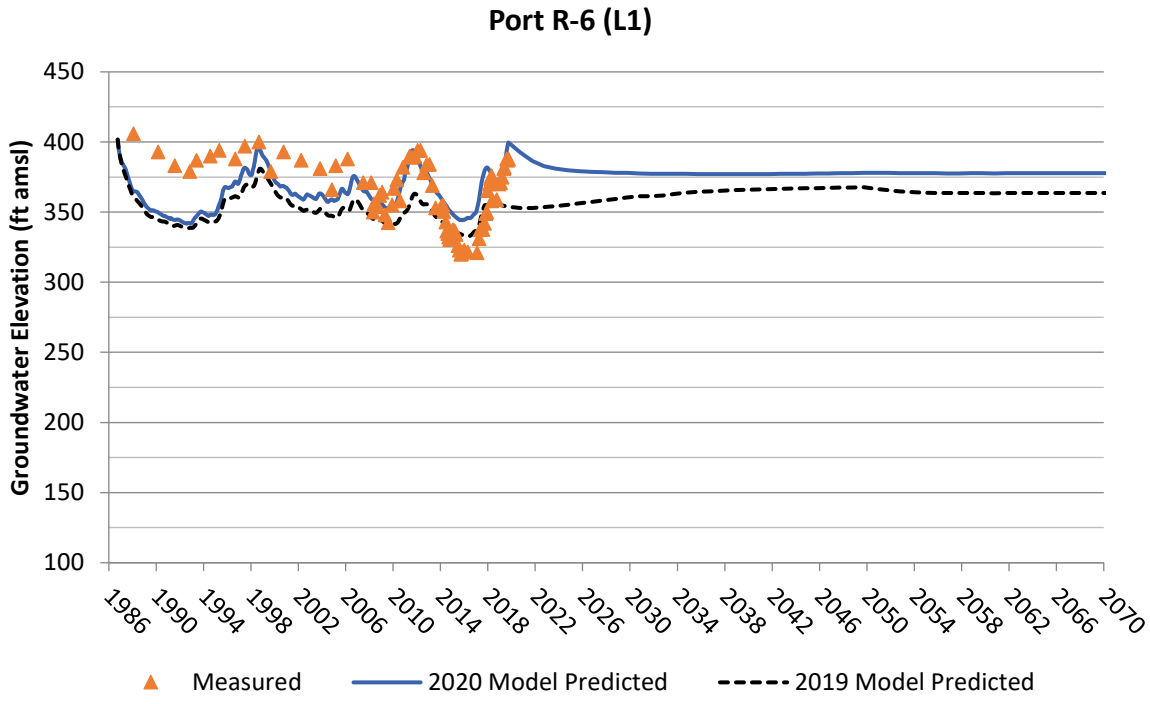

21S/25E-36 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

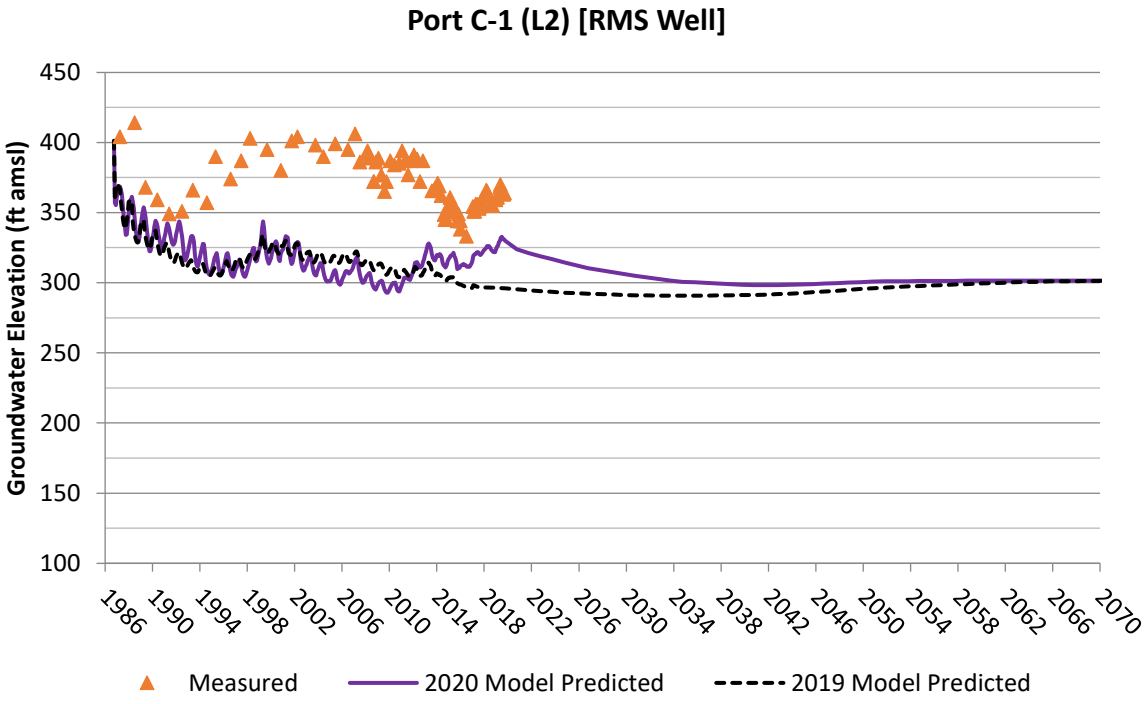

21S/26E-32A01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

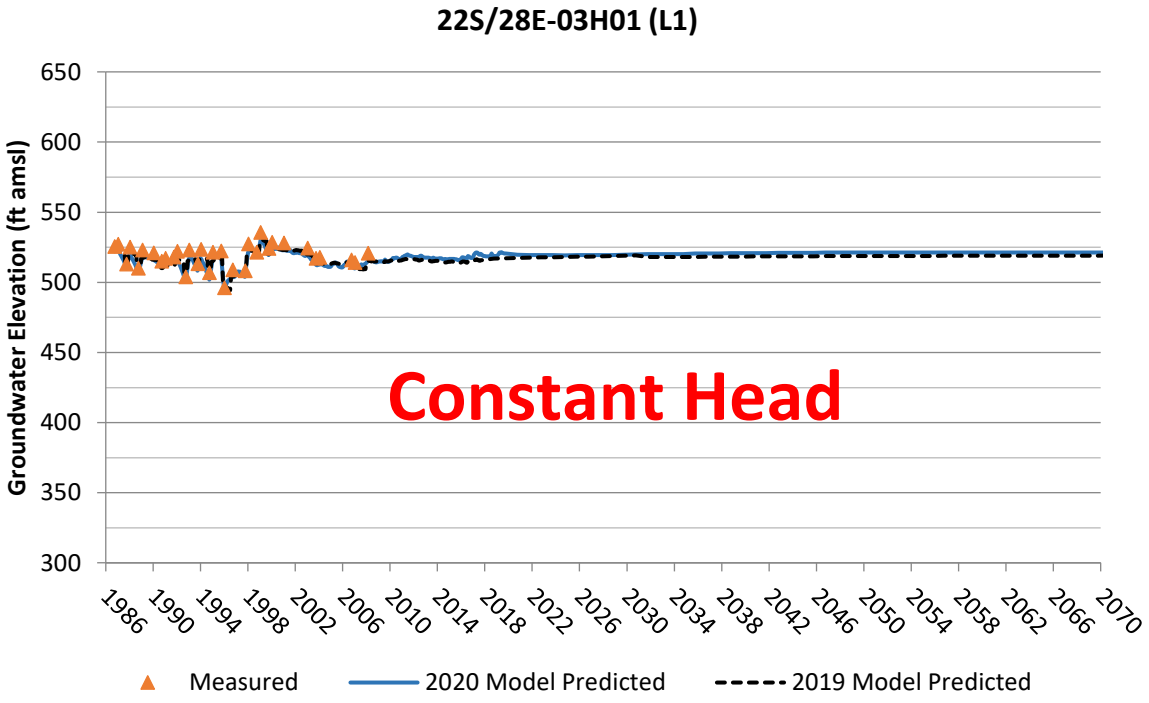

22S/25E-10E01 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

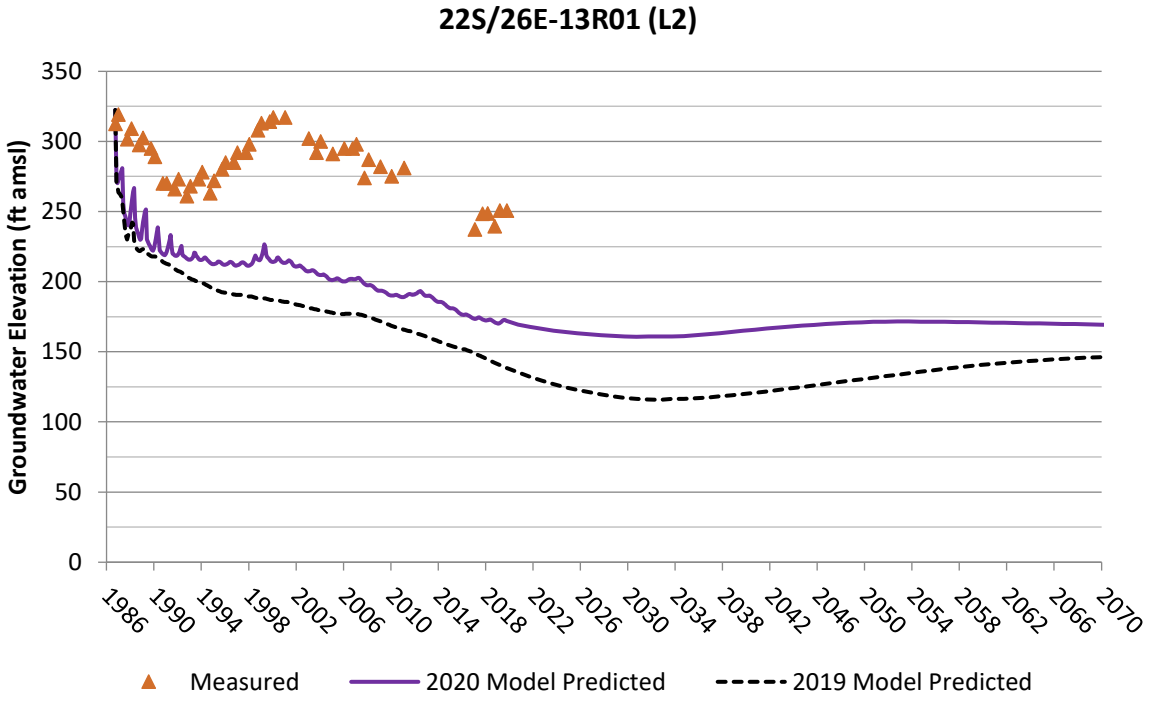

22S/26E-10J01 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

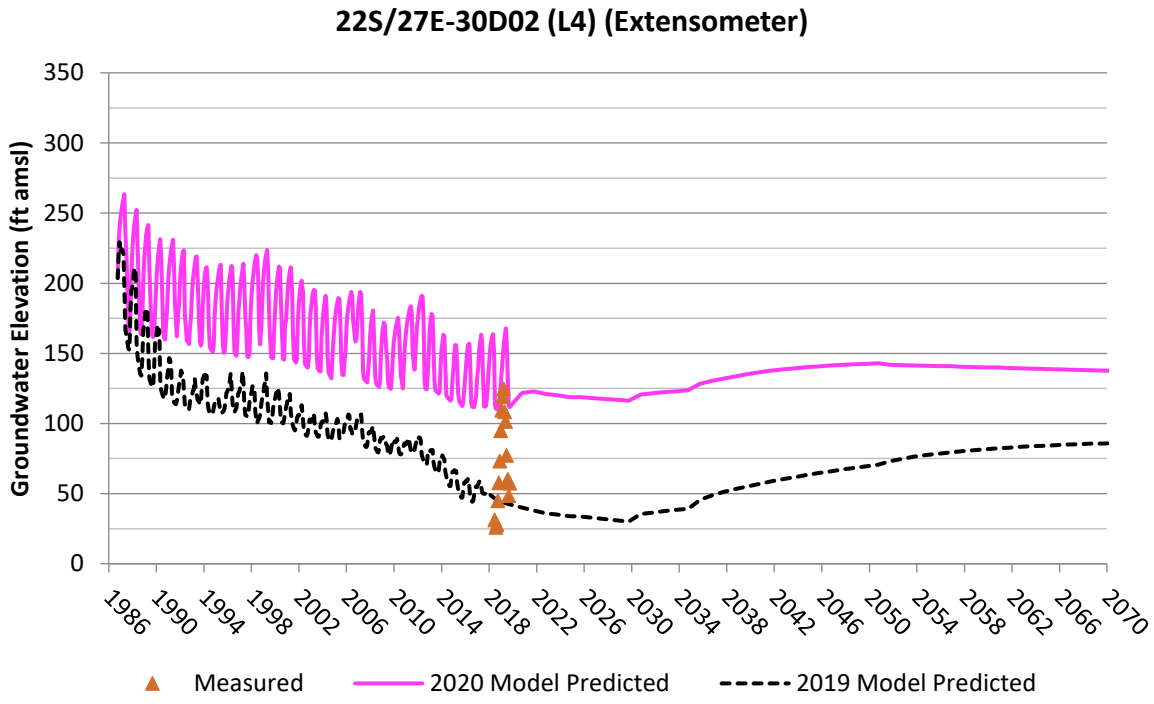

Port R-11 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
450
400
350
300
250
200
150
100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

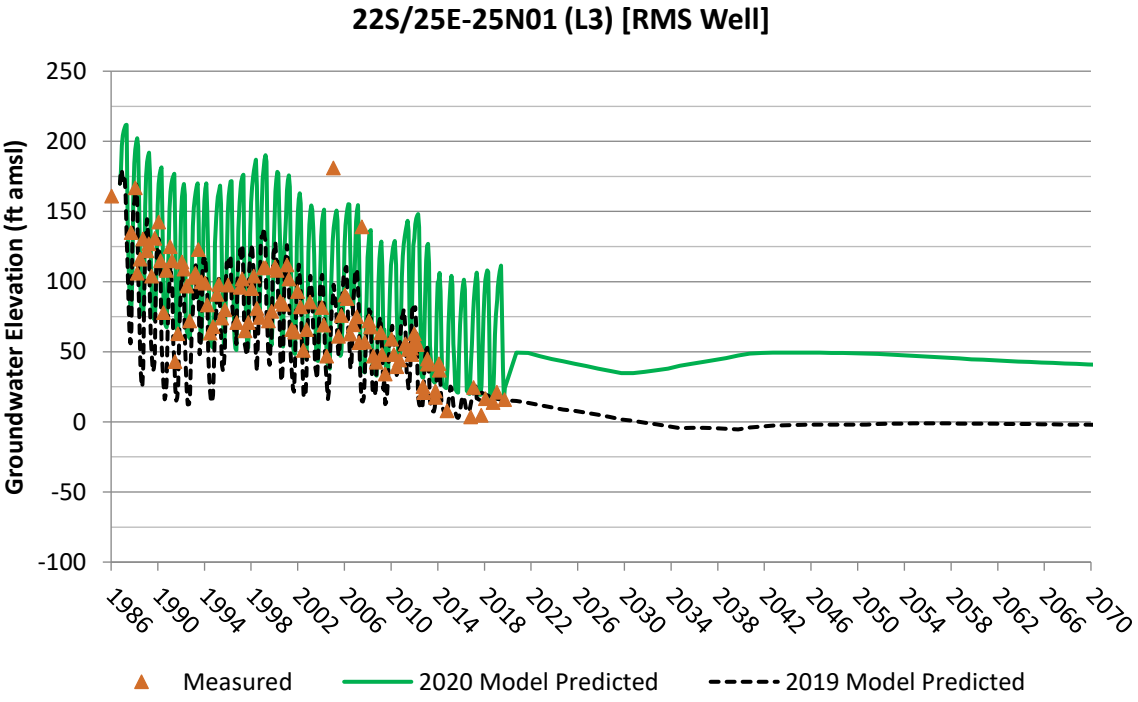

Port R-6 (L1)
Groundwater Elevation (ft amsl)
450
400
350
300
250
200
150
100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

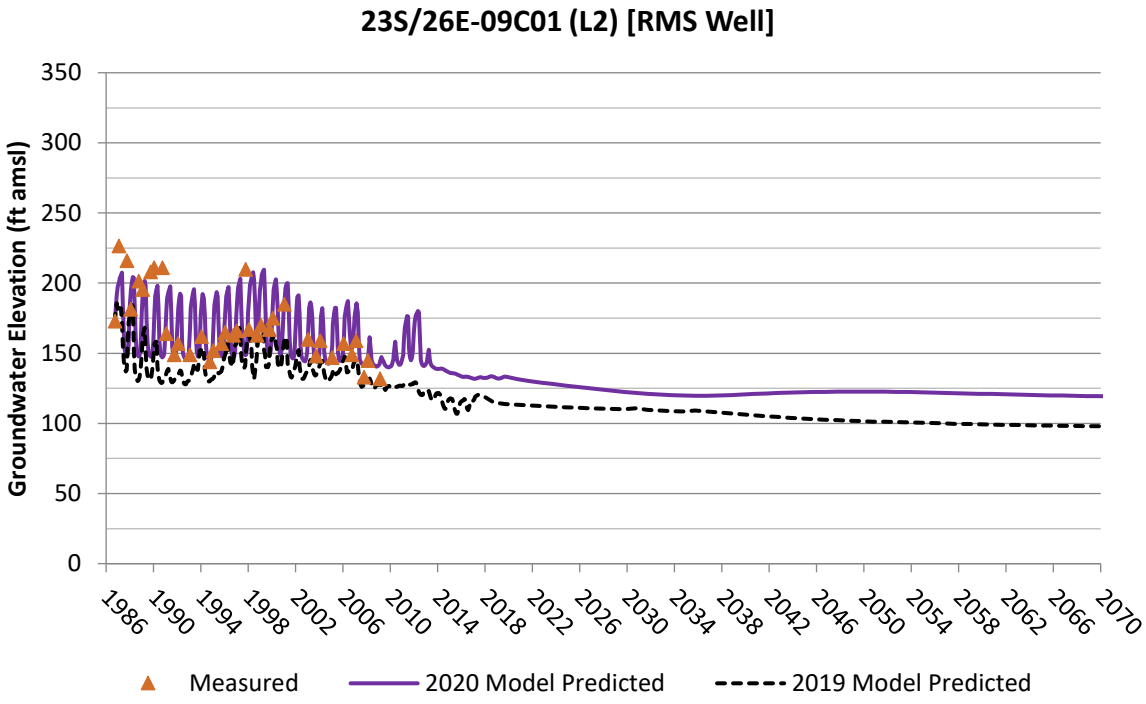

Port C-1 (L2) [RMS Well]
Groundwater Elevation (ft amsl)
450
400
350
300
250
200
150
100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

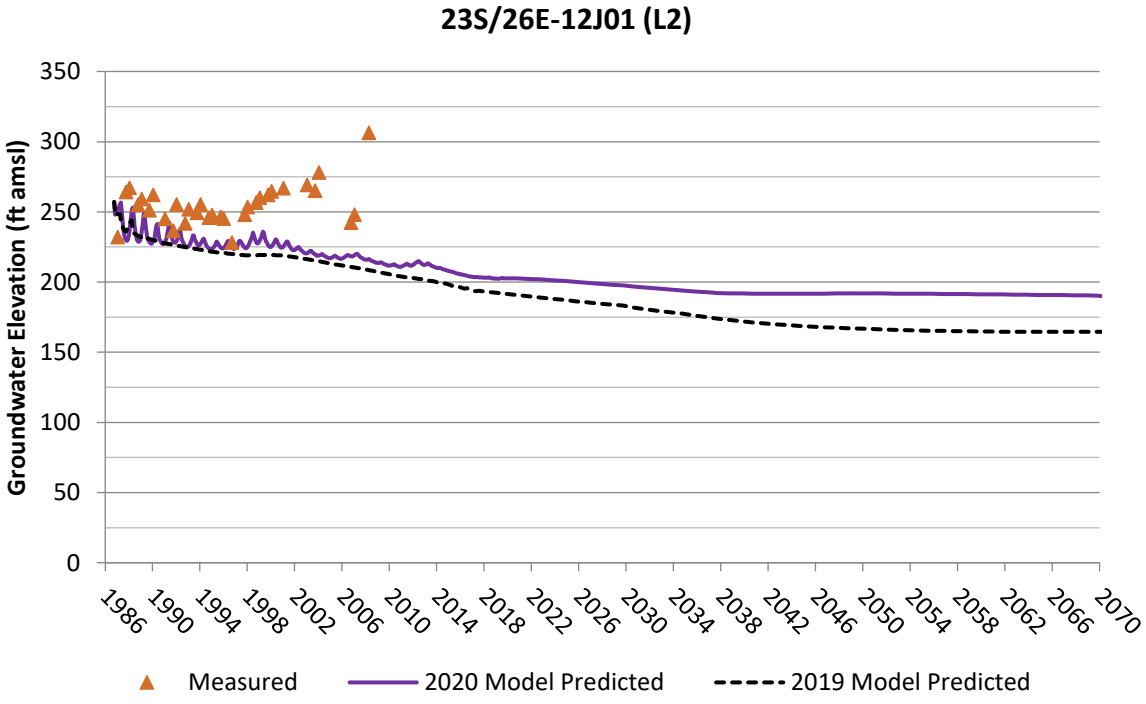

22S/28E-03H01 (L1)
Groundwater Elevation (ft amsl)
650
600
550
500
450
400
350
300
Constant Head
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

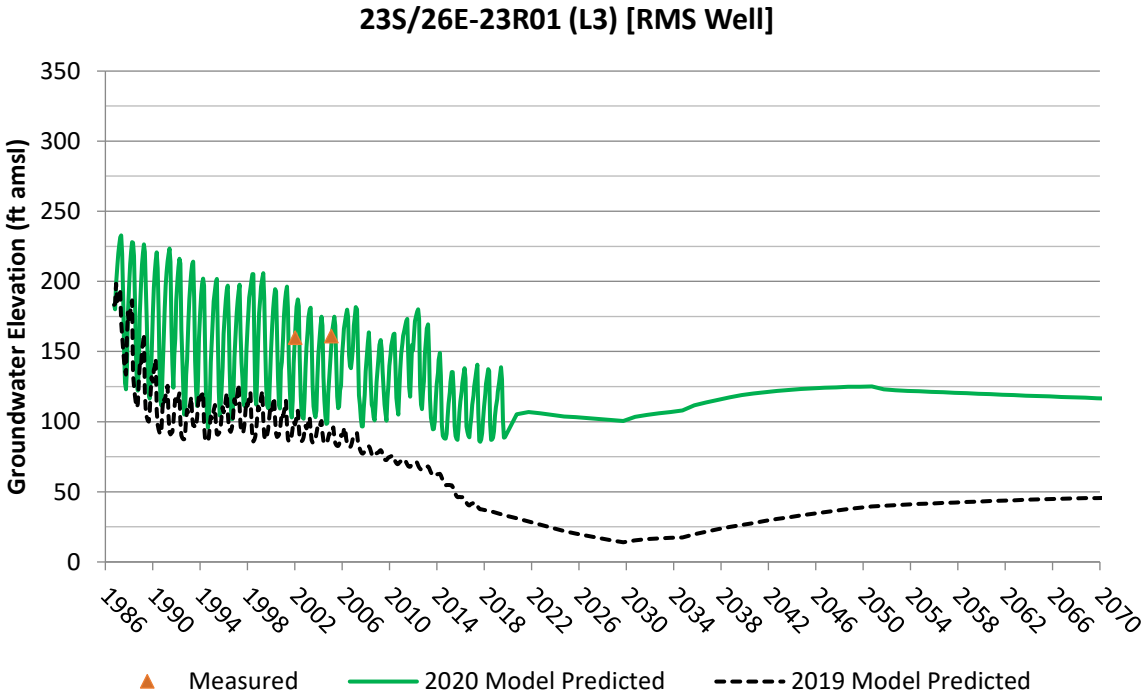

22S/26E-13R01 (L2)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

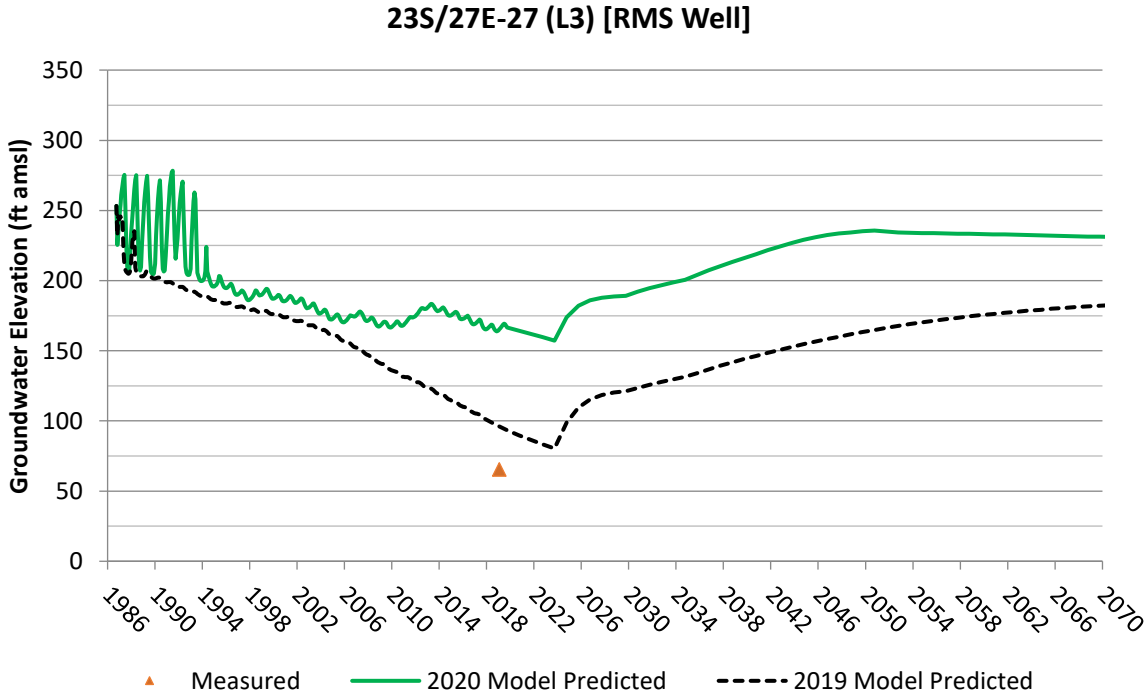

22S/27E-30D02 (L4) (Extensometer)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

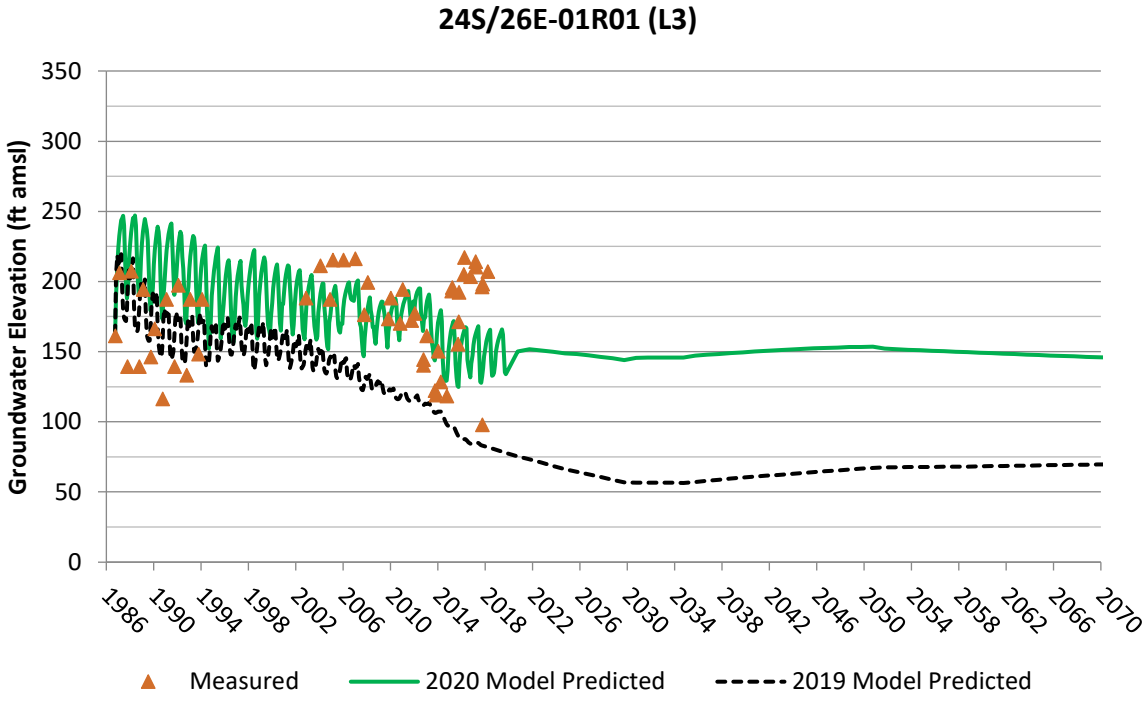

22S/25E-25N01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

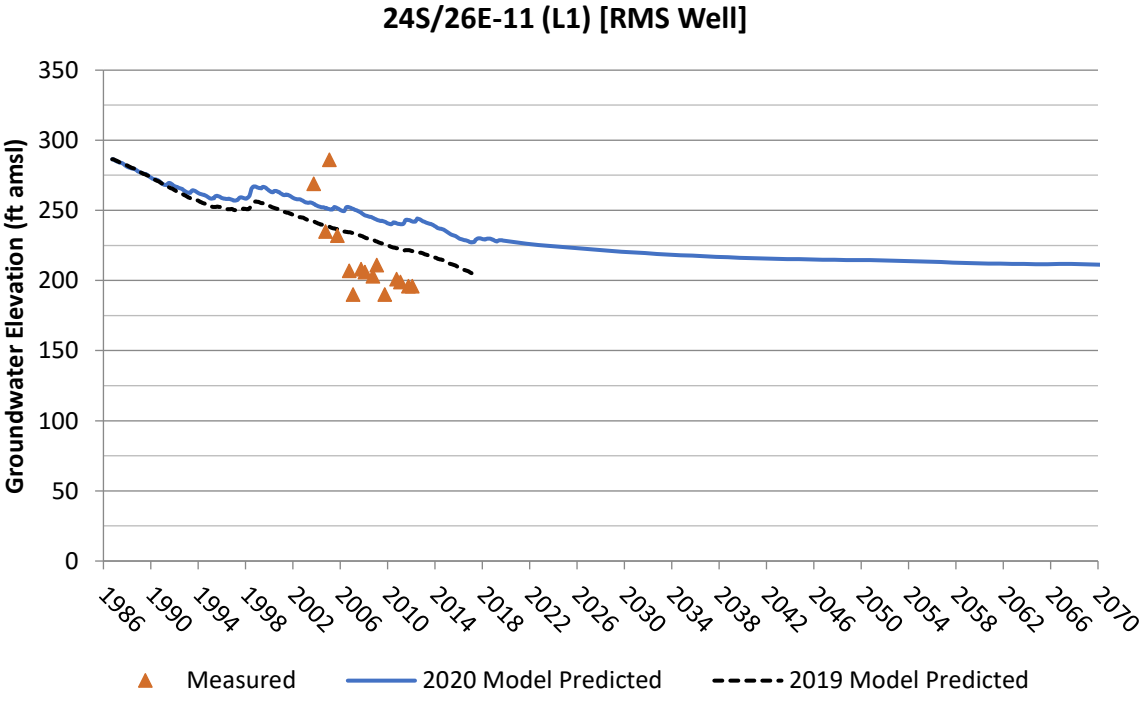

23S/26E-09C01 (L2) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

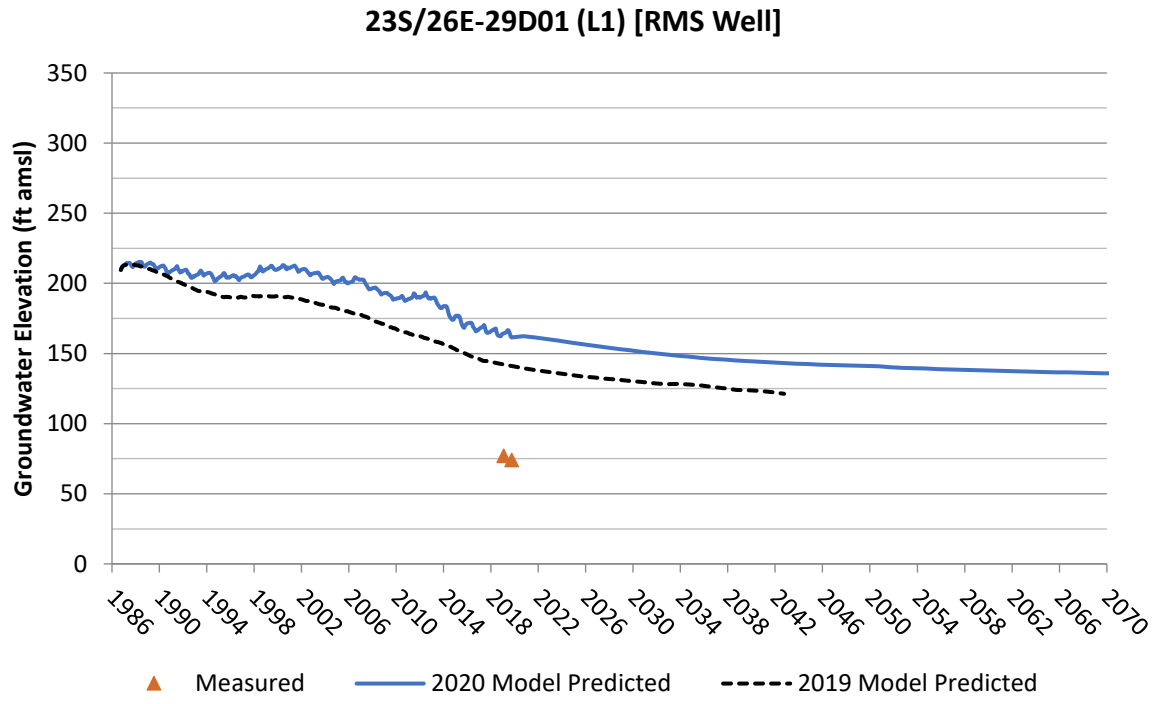

23S/26E-12J01 (L2)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

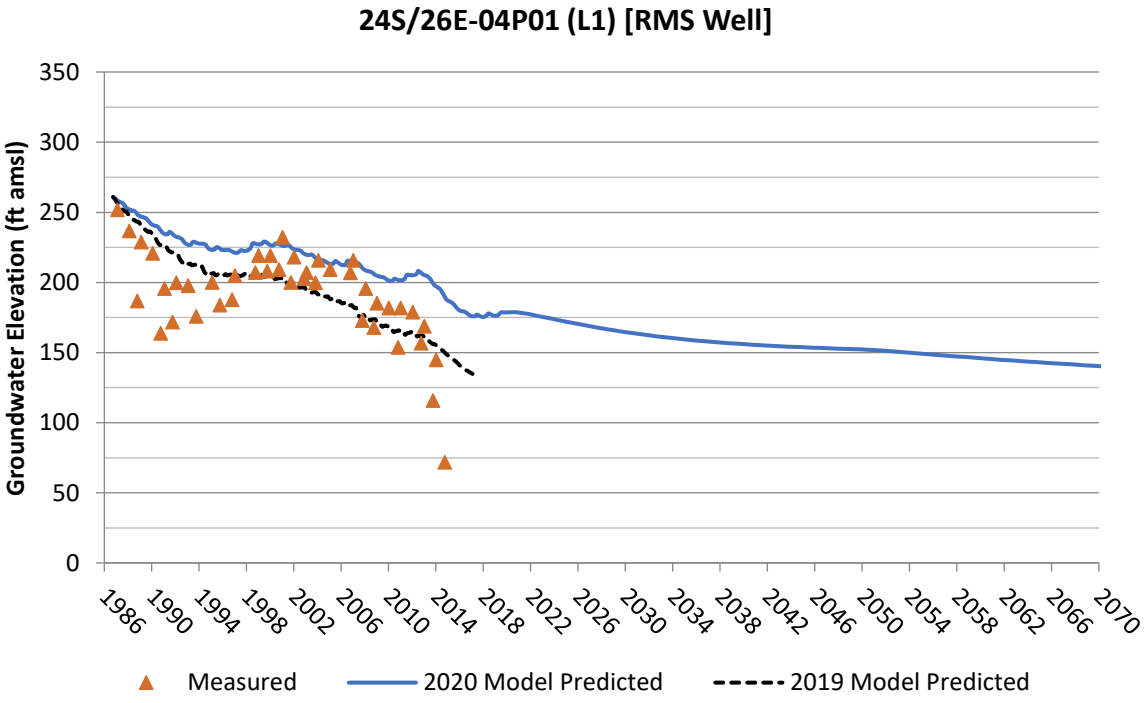

23S/26E-23R01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

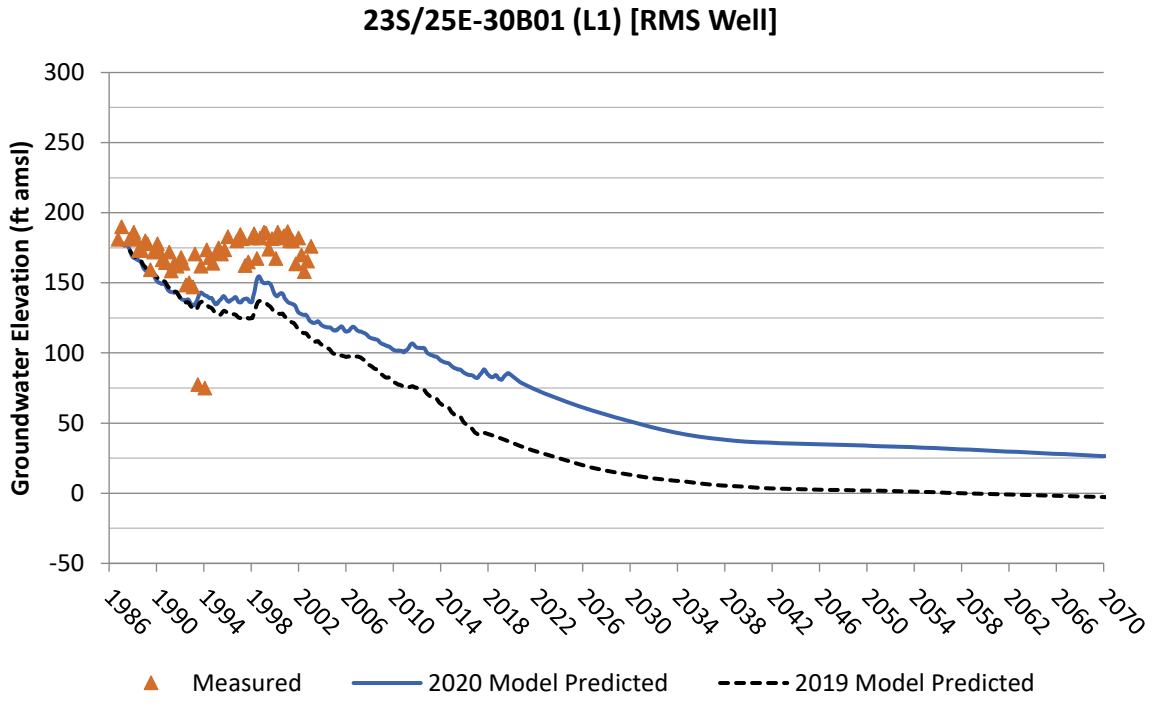

23S/27E-27 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

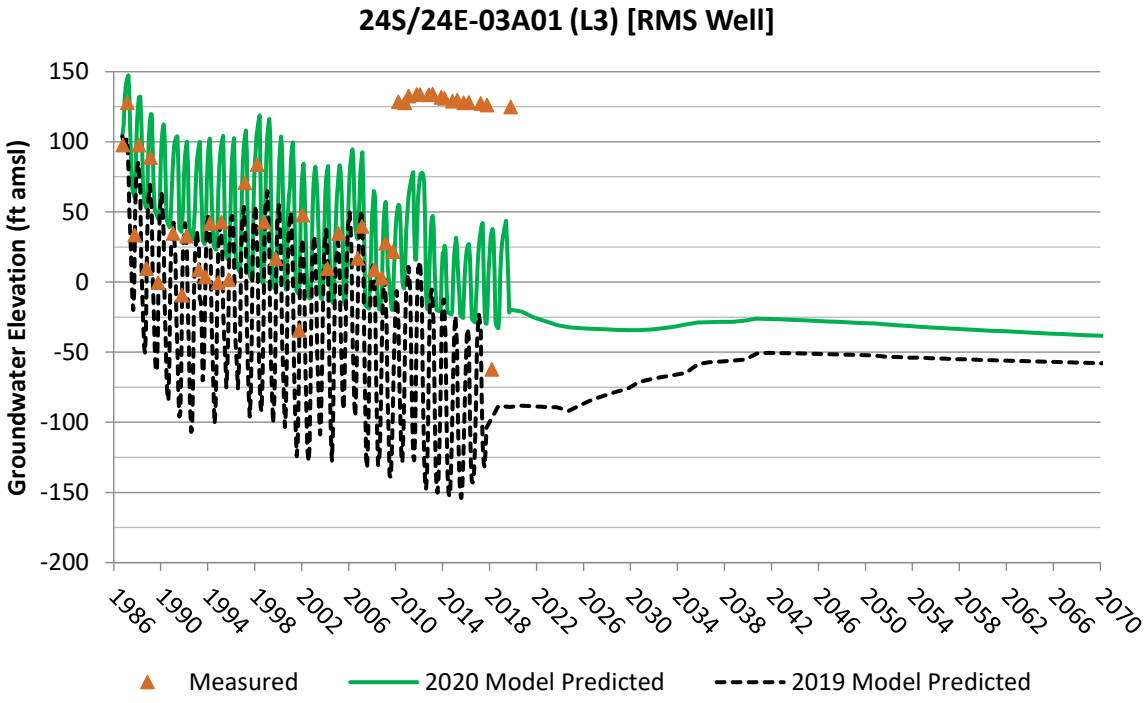

24S/26E-01R01 (L3)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

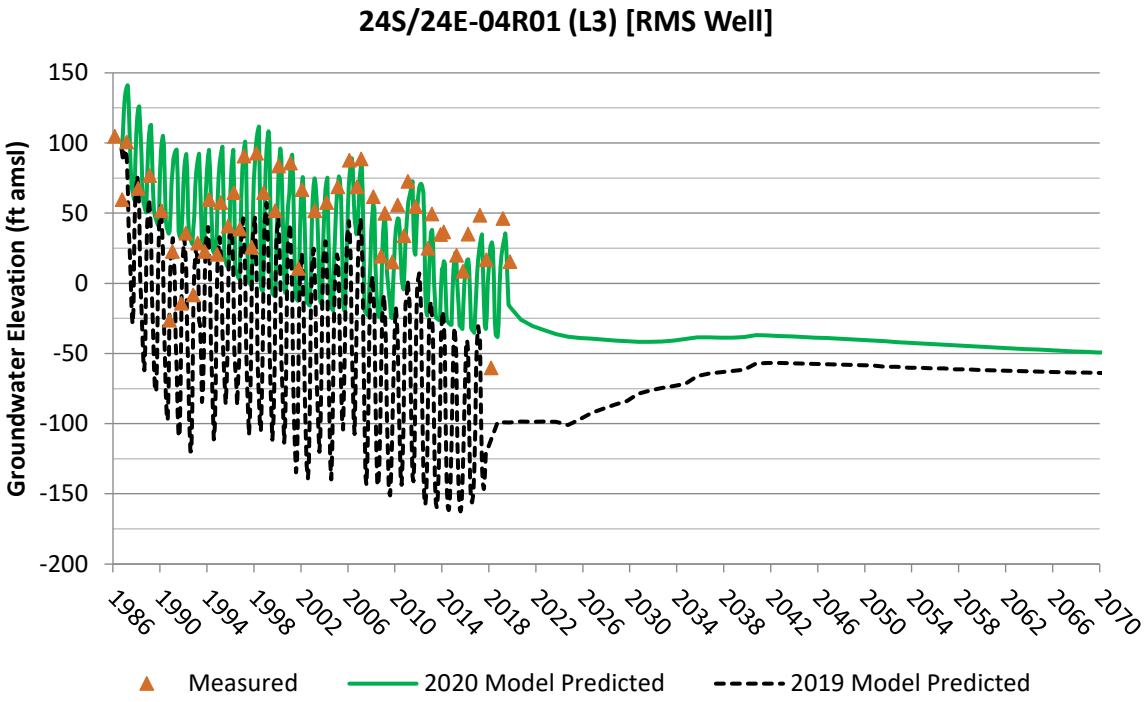

24S/26E-11 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

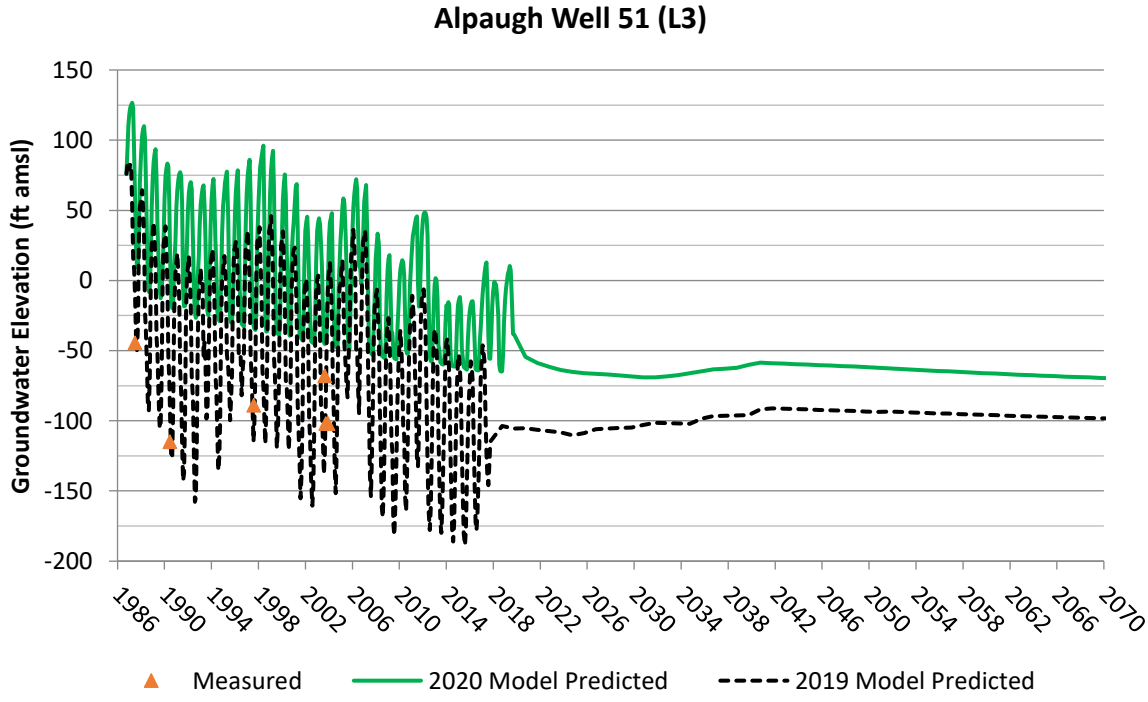

23S/26E-29D01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

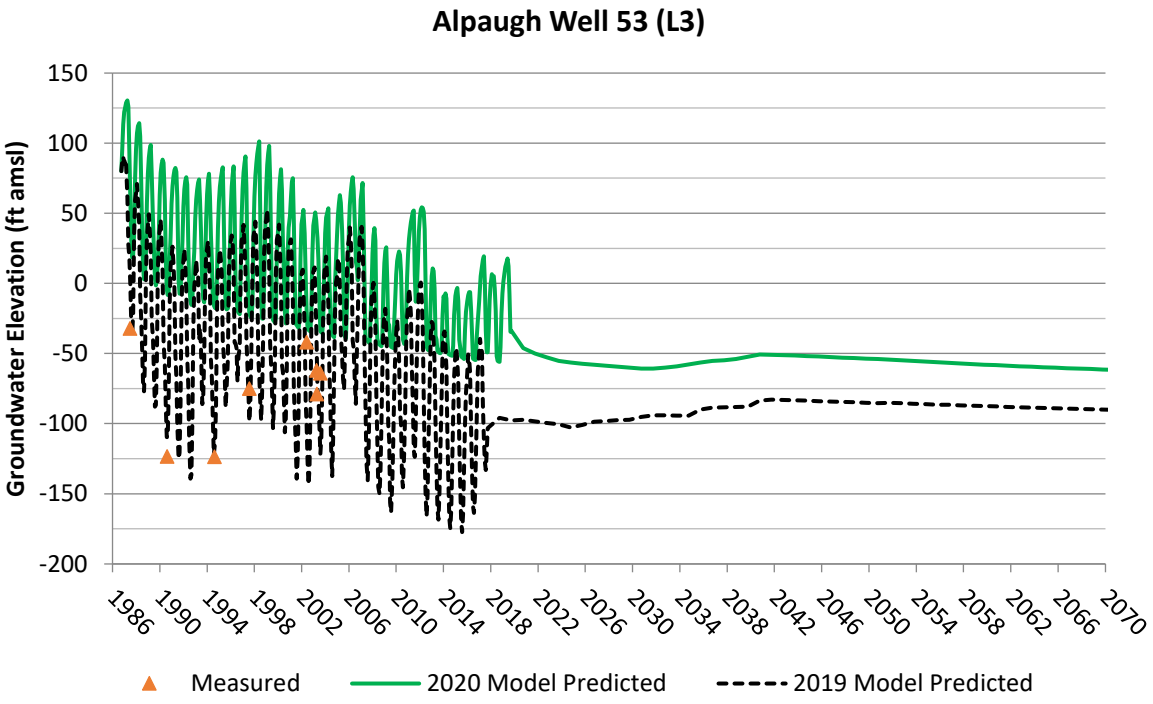

24S/26E-04P01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

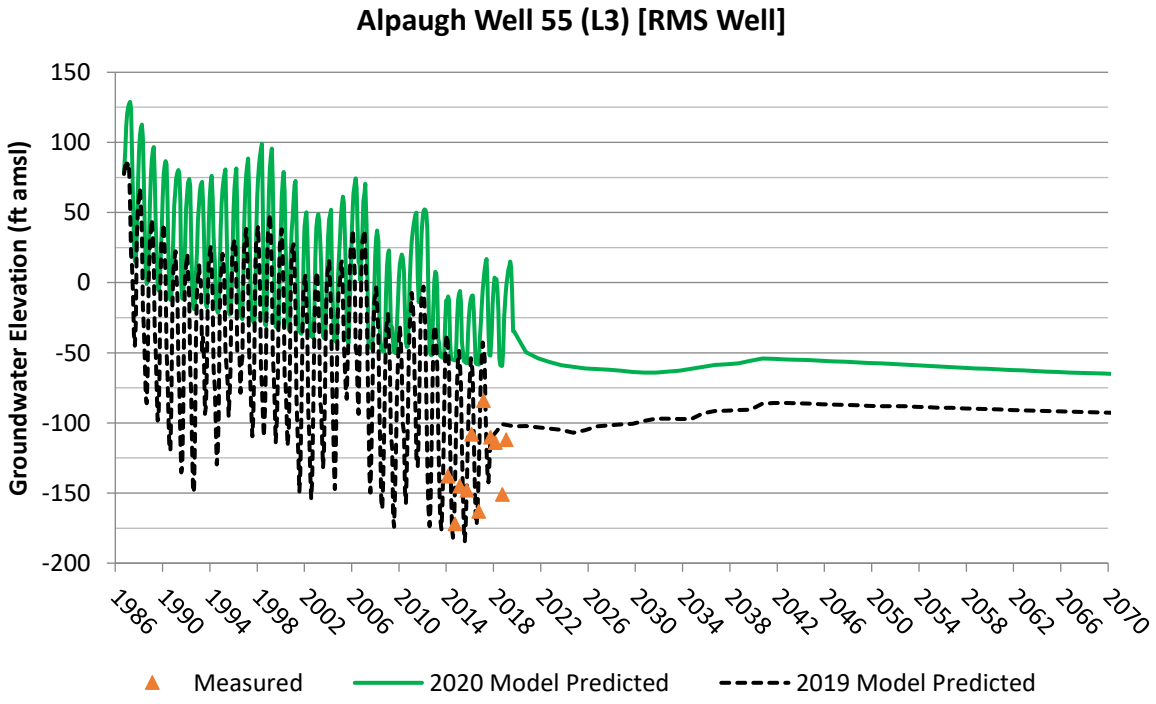

23S/25E-30B01 (L1) [RMS Well]
Groundwater Elevation (ft amsl)
300
250
200
150
100
50
0
-50
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

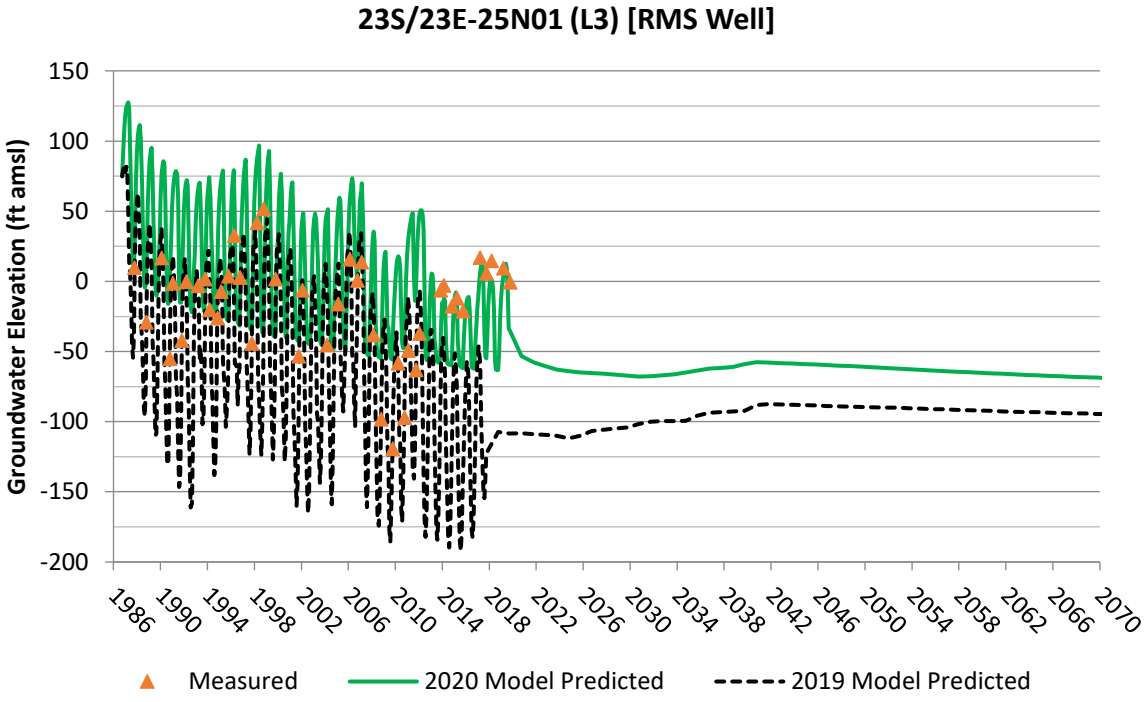

24S/24E-03A01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

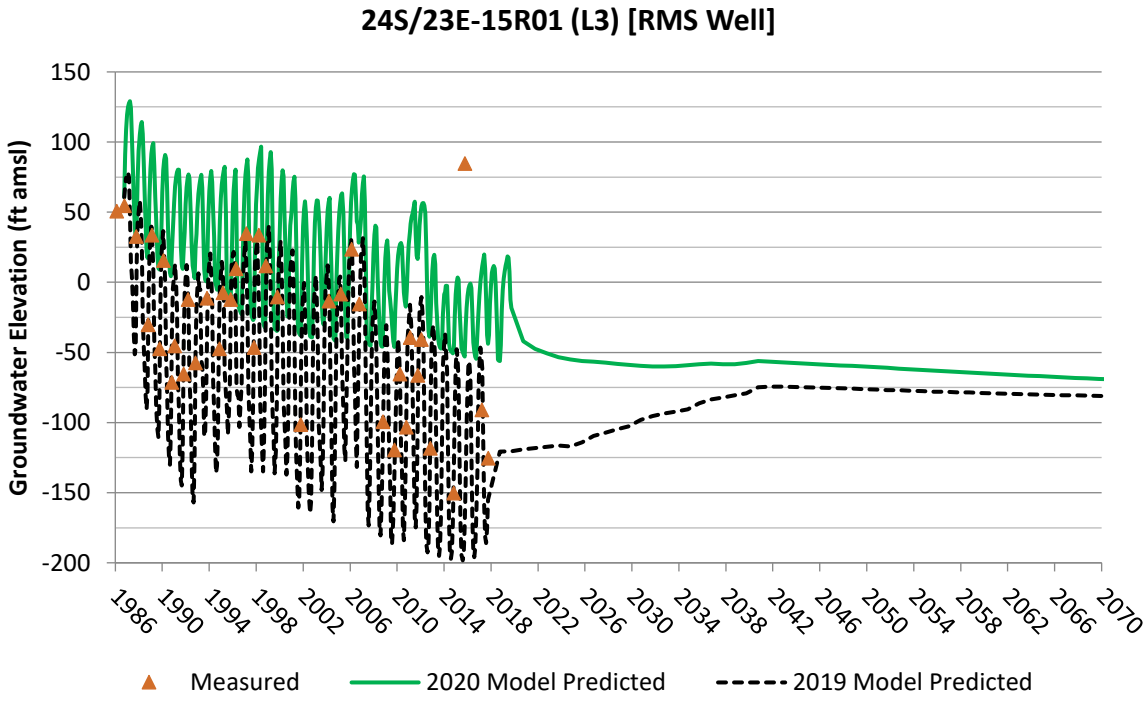

24S/24E-04R01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

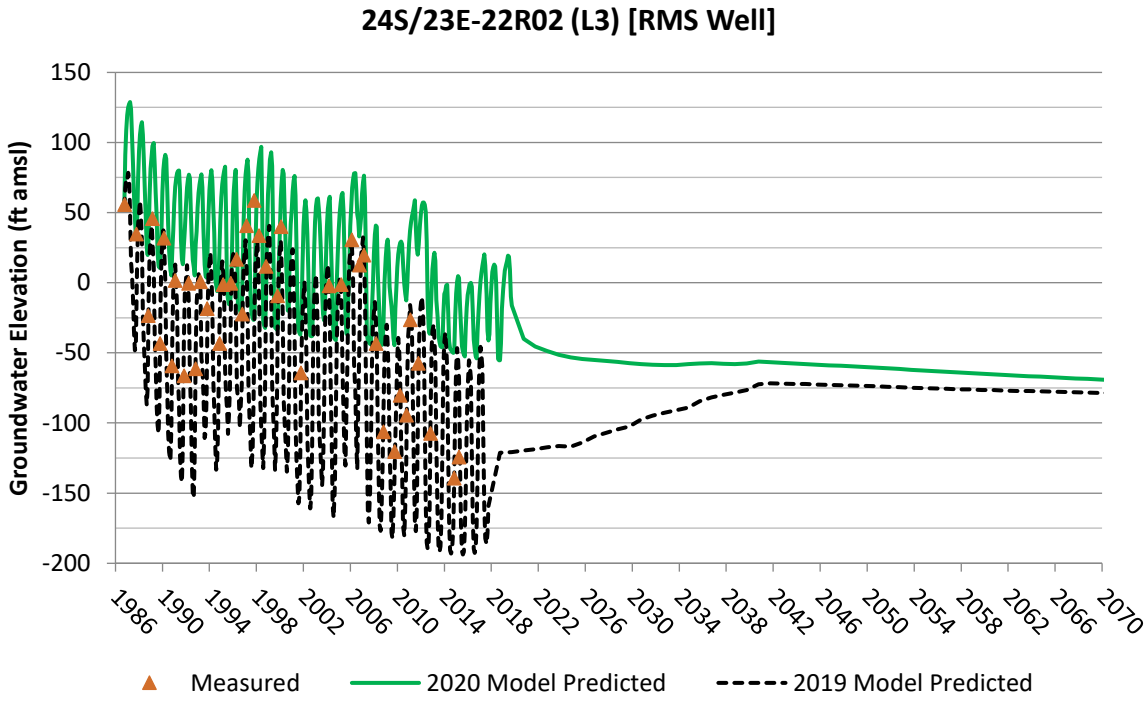

Alpaugh Well 51 (L3)
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

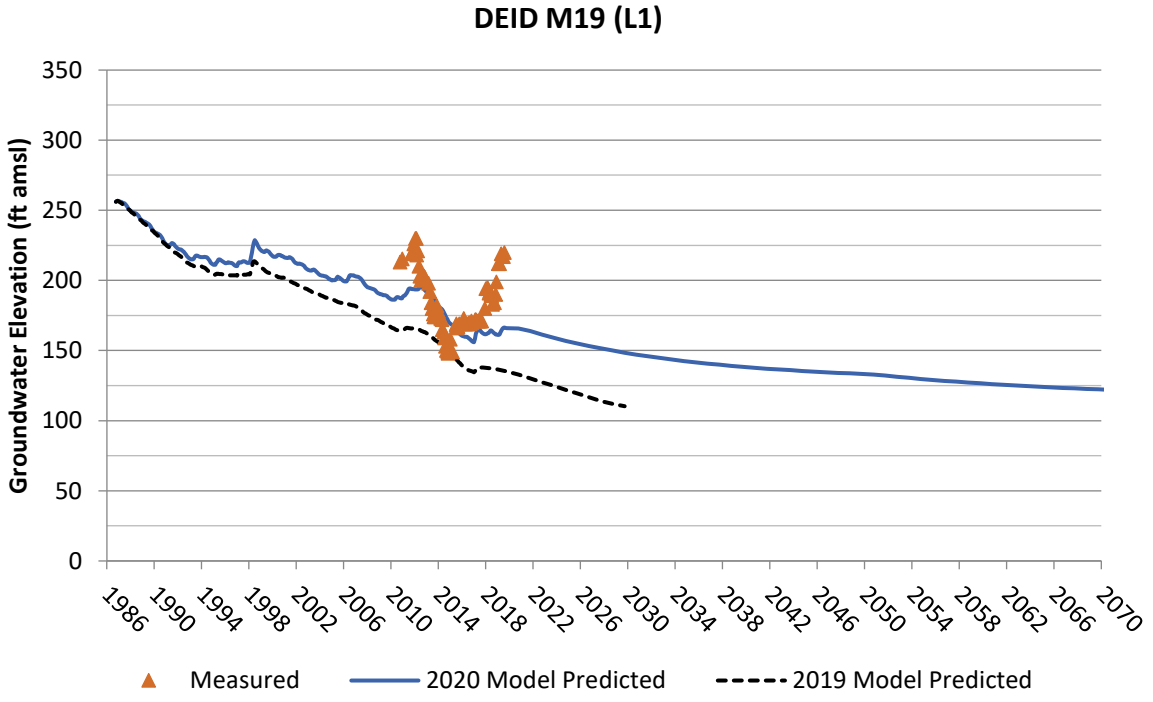

Alpaugh Well 53 (L3)
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

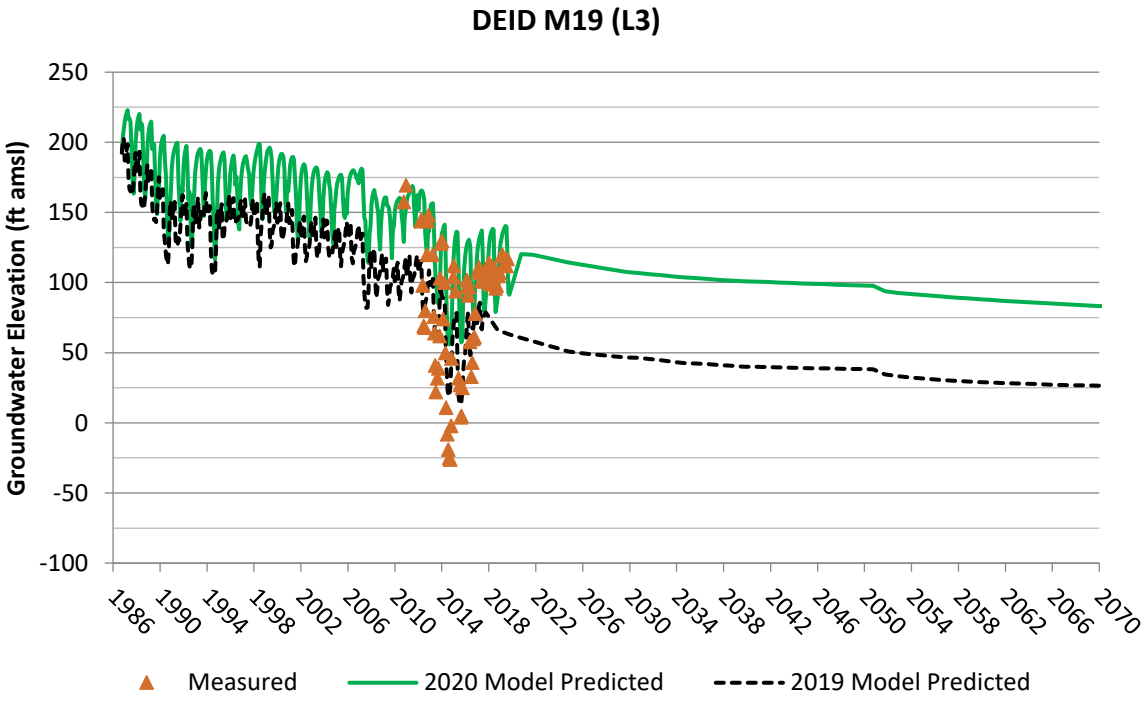

Alpaugh Well 55 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

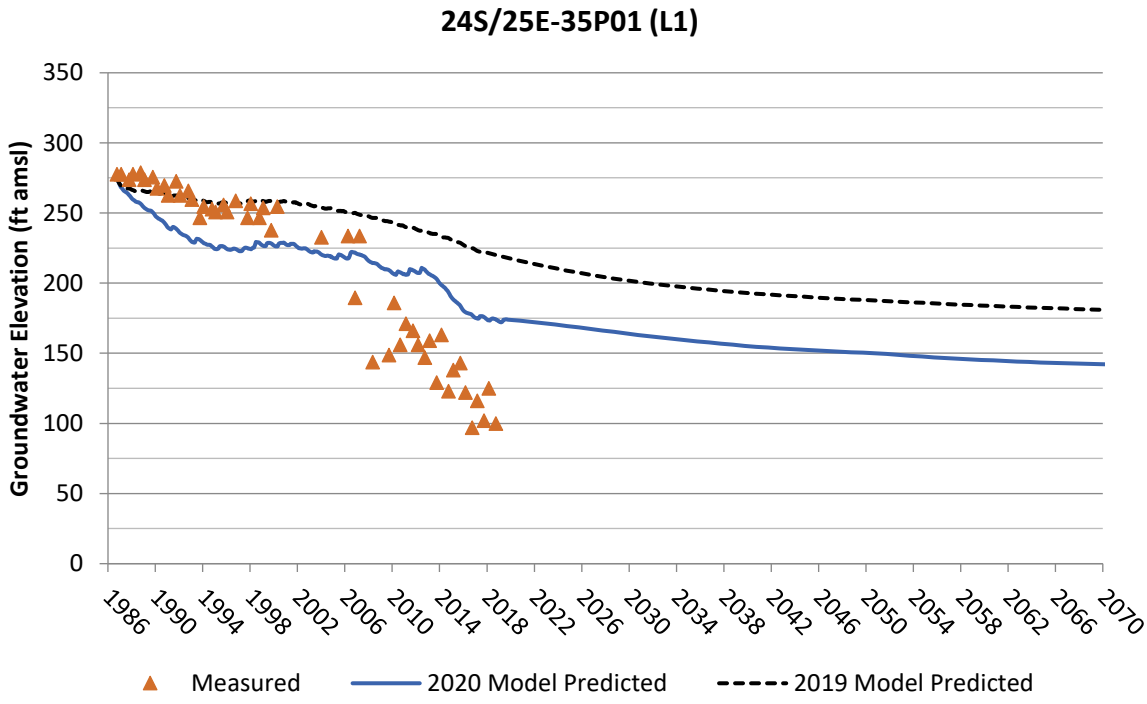

23S/23E-25N01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

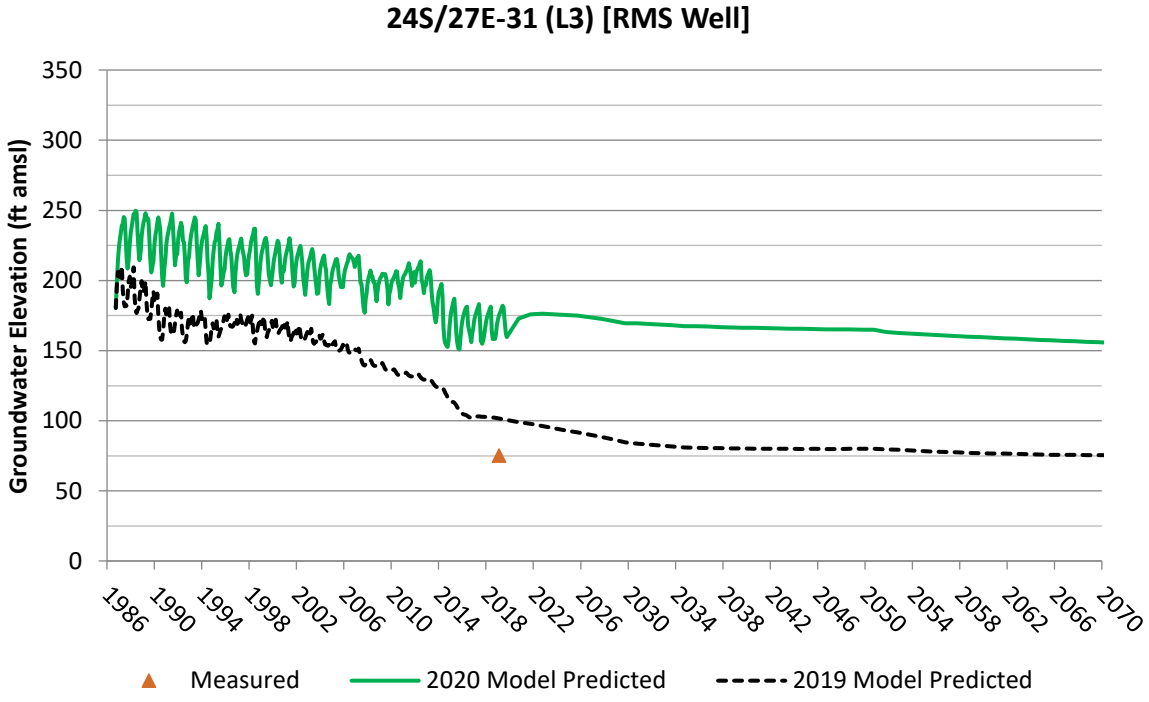

24S/23E-15R01 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

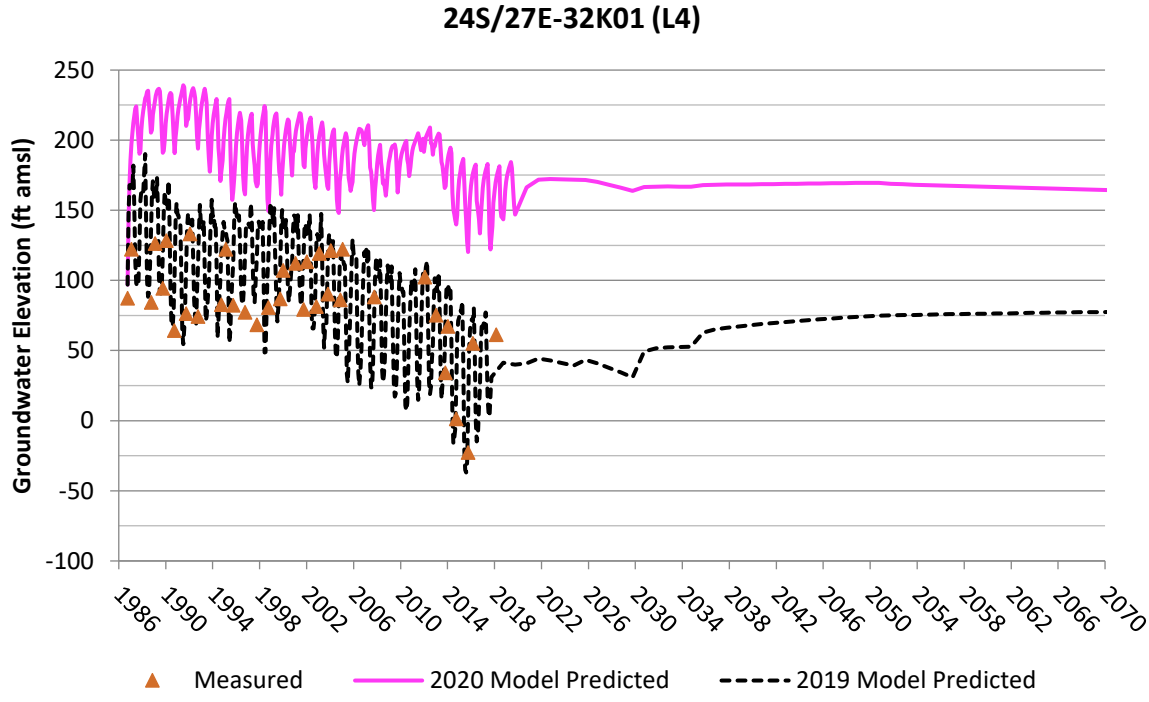

24S/23E-22R02 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
150
100
50
0
-50
-100
-150
-200
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

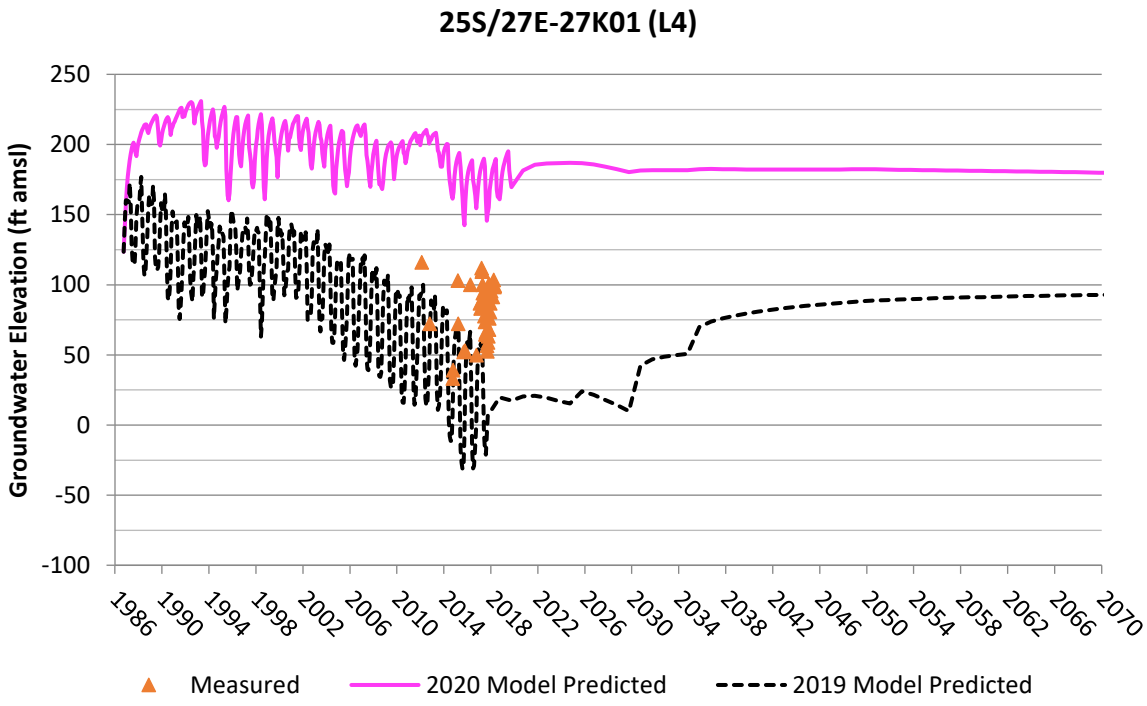

DEID M19 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted


DEID M19 (L3)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted


24S/25E-35P01 (L1)
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted


24S/27E-31 (L3) [RMS Well]
Groundwater Elevation (ft amsl)
350
300
250
200
150
100
50
0
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

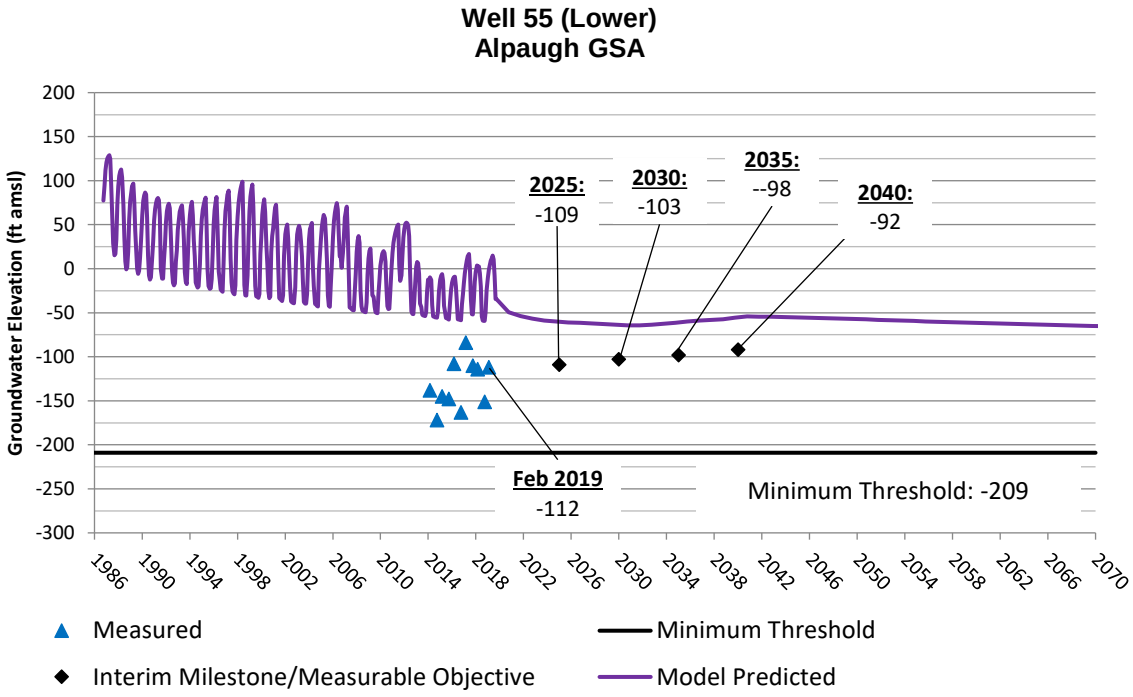

24S/27E-32K01 (L4)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted


25S/27E-27K01 (L4)
Groundwater Elevation (ft amsl)
250
200
150
100
50
0
-50
-100
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Measured
2020 Model Predicted
2019 Model Predicted

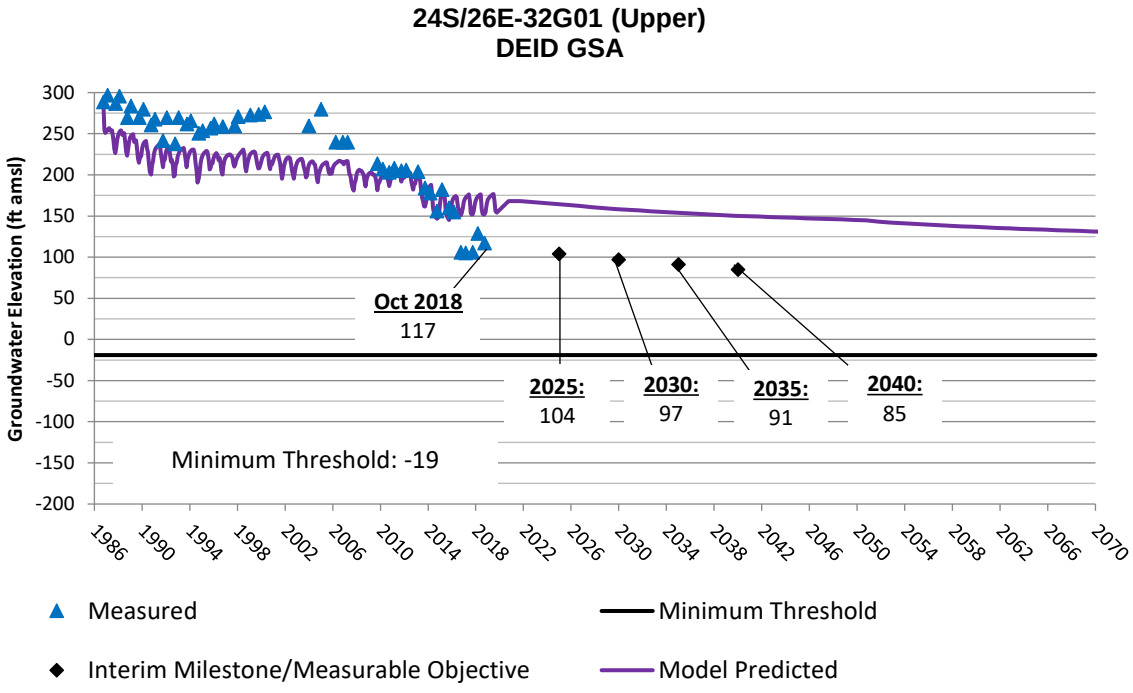
Attachment G

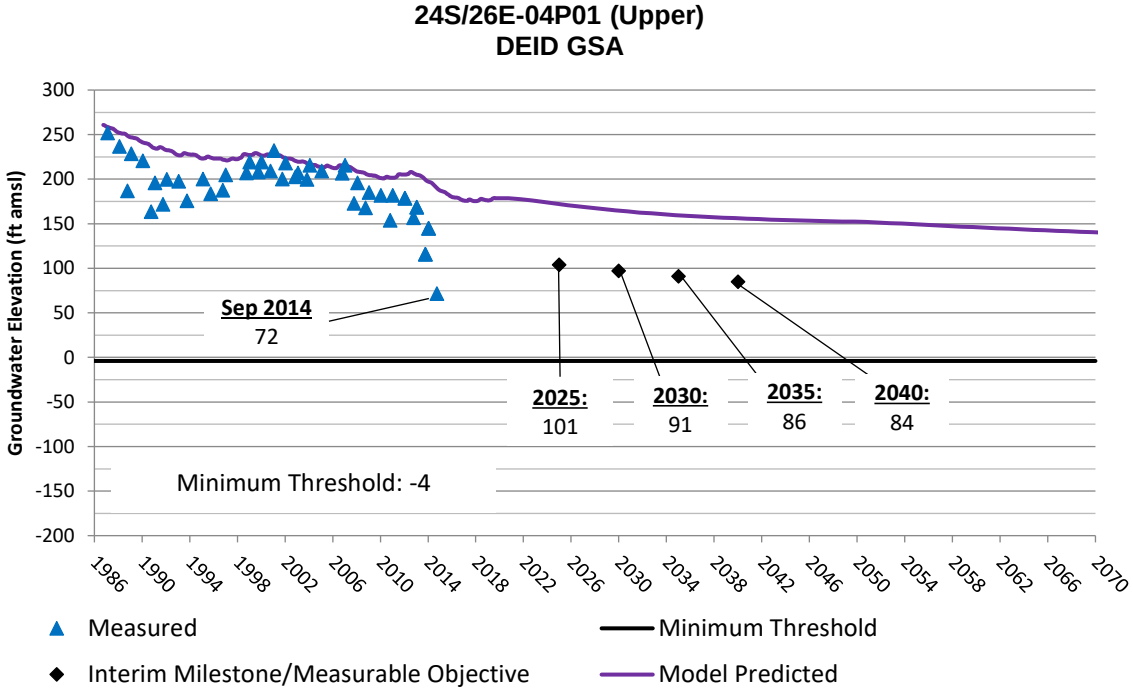
Projection Hydrographs at RMS

Alpaugh Irrigation District GSA
RMS Groundwater Elevation Hydrographs

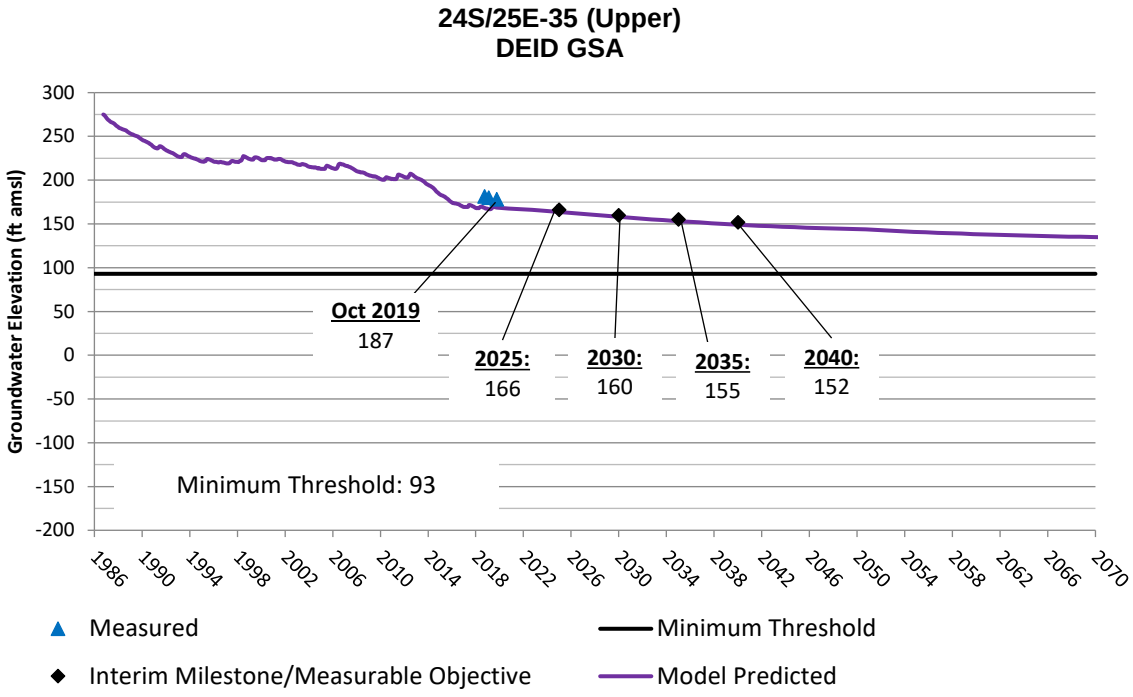


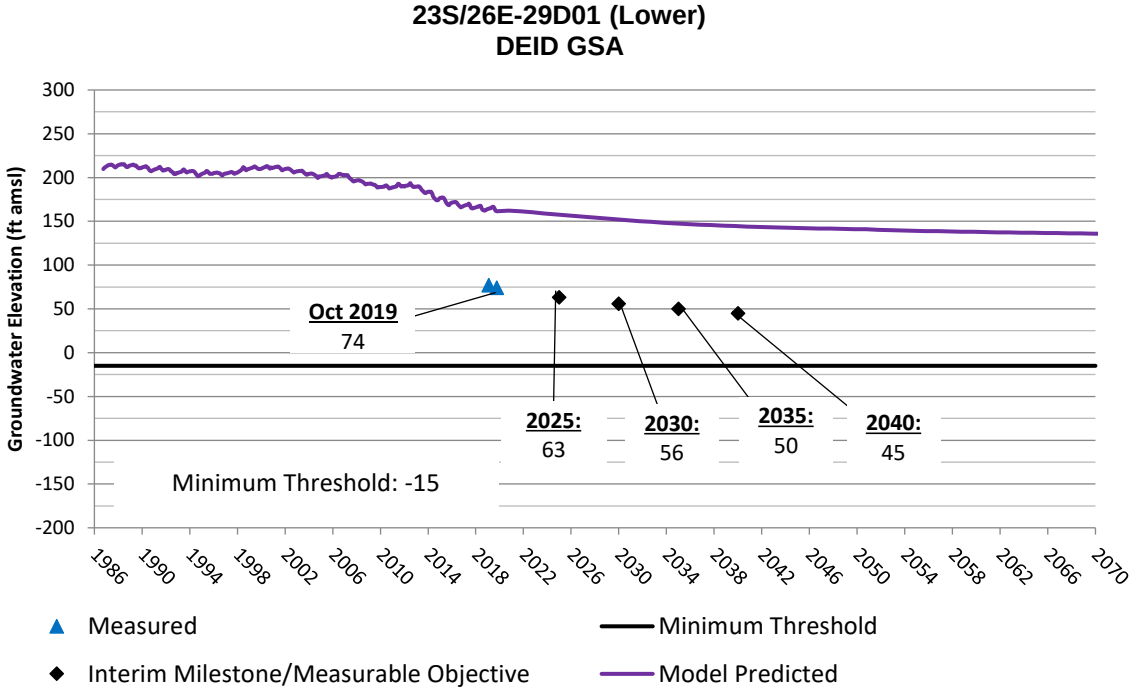
Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs



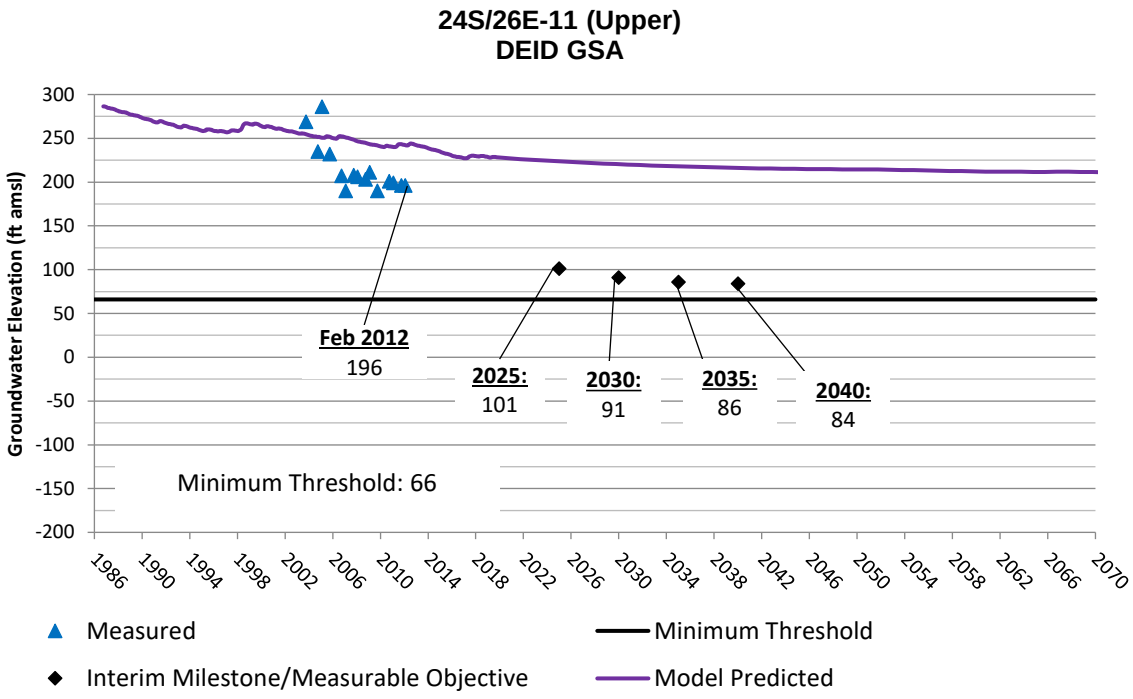


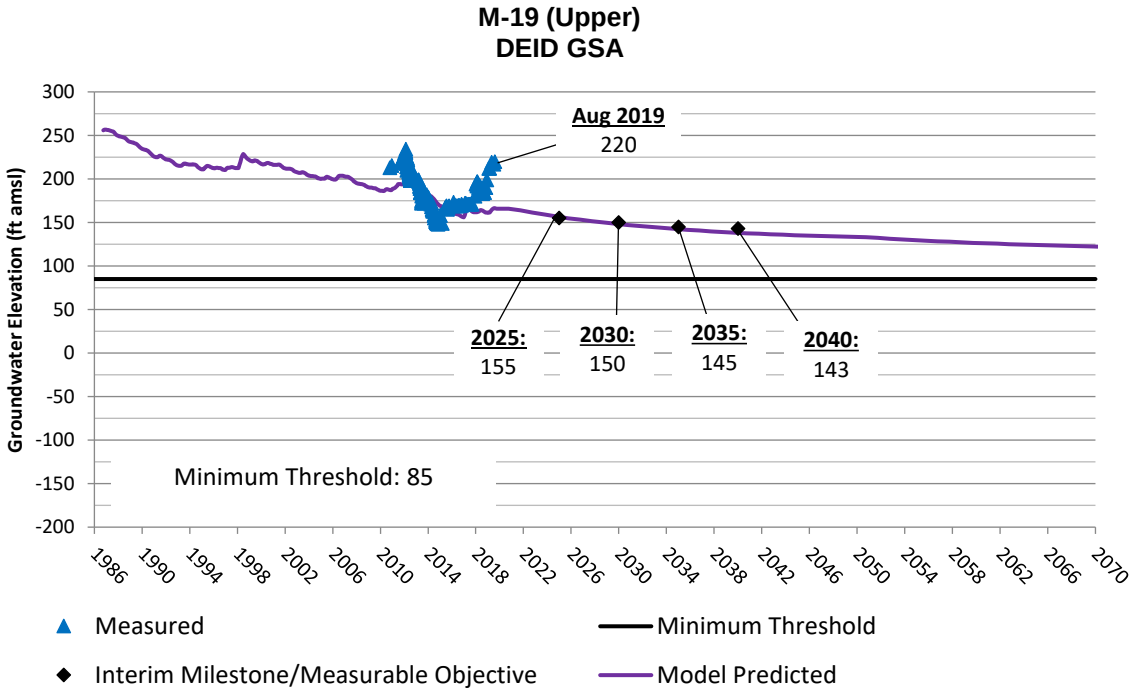
Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs





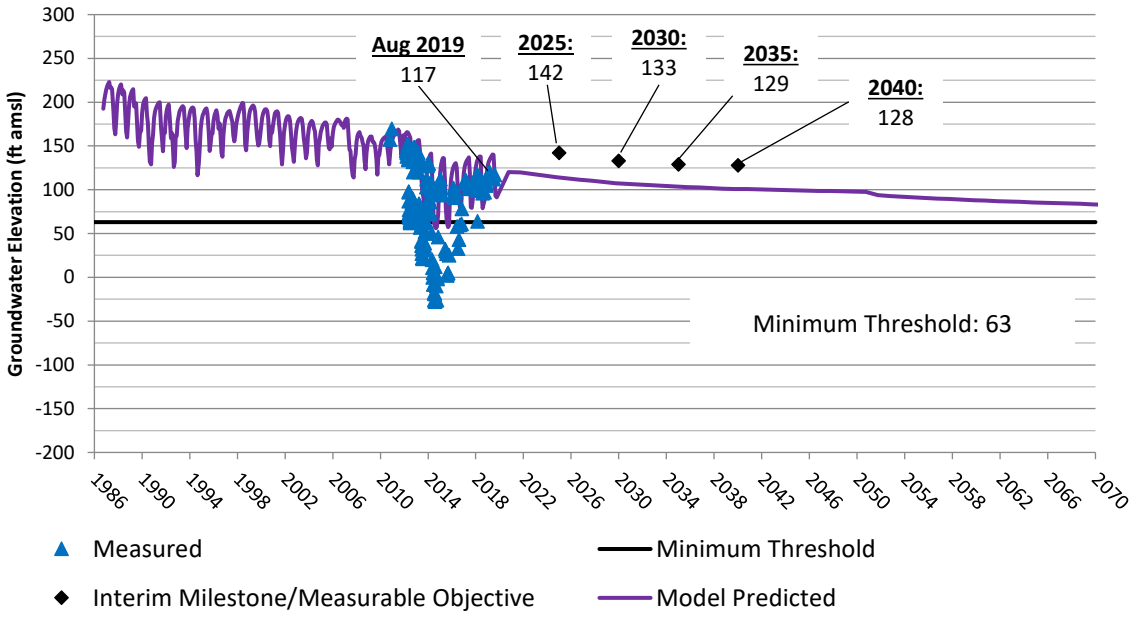
Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs



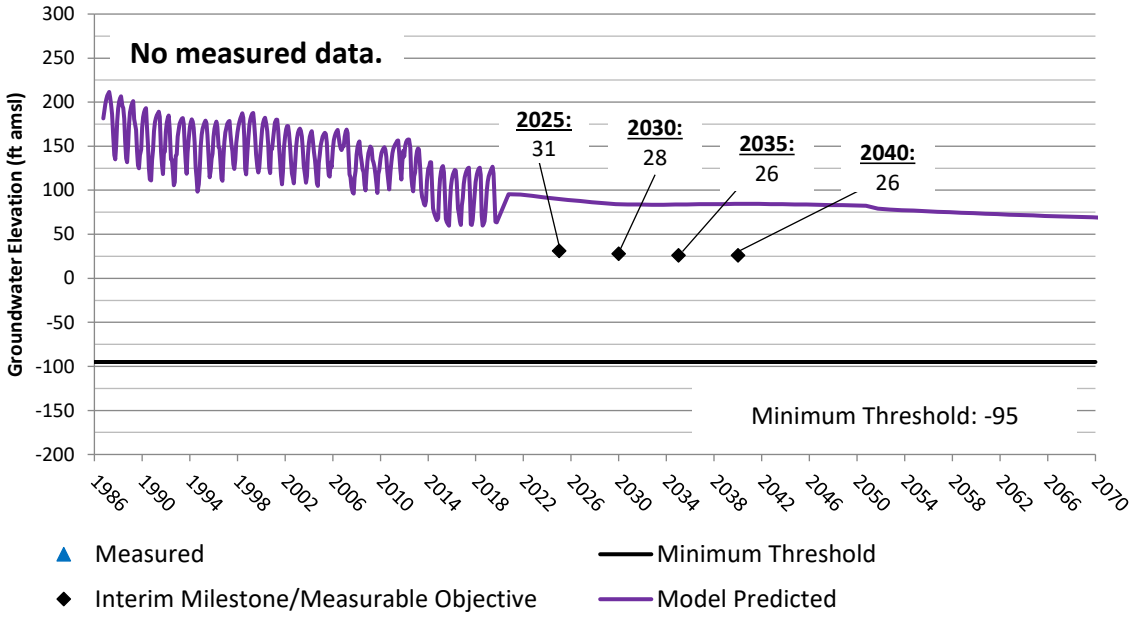


Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs

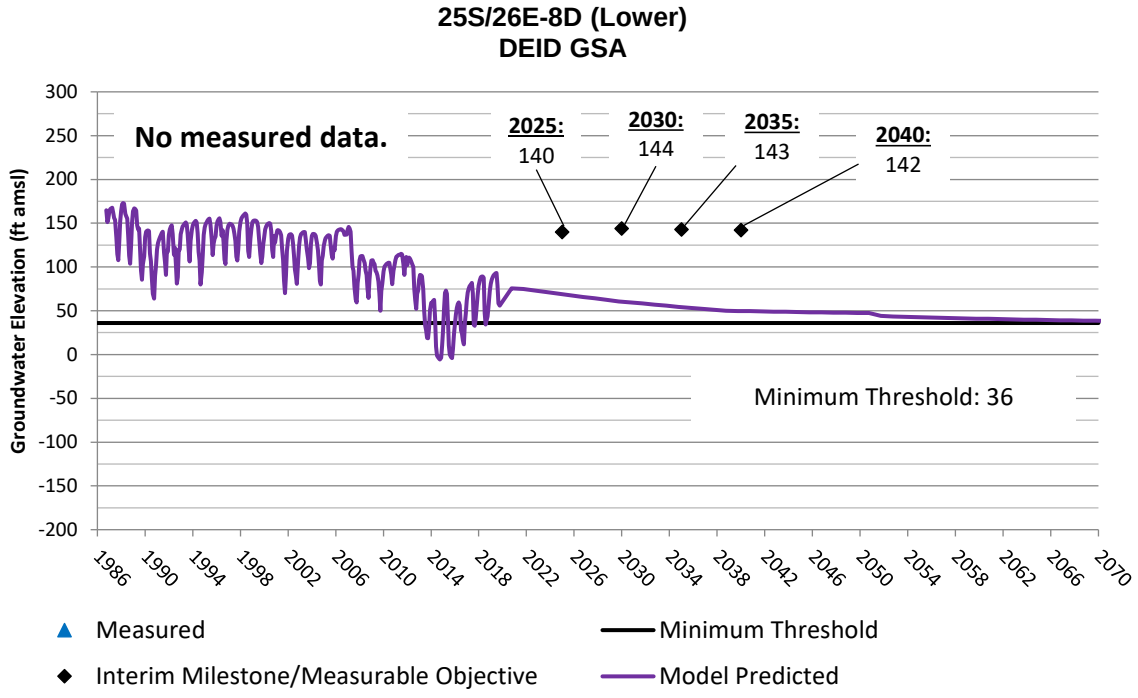
M-19 (Lower)
DEID GSA

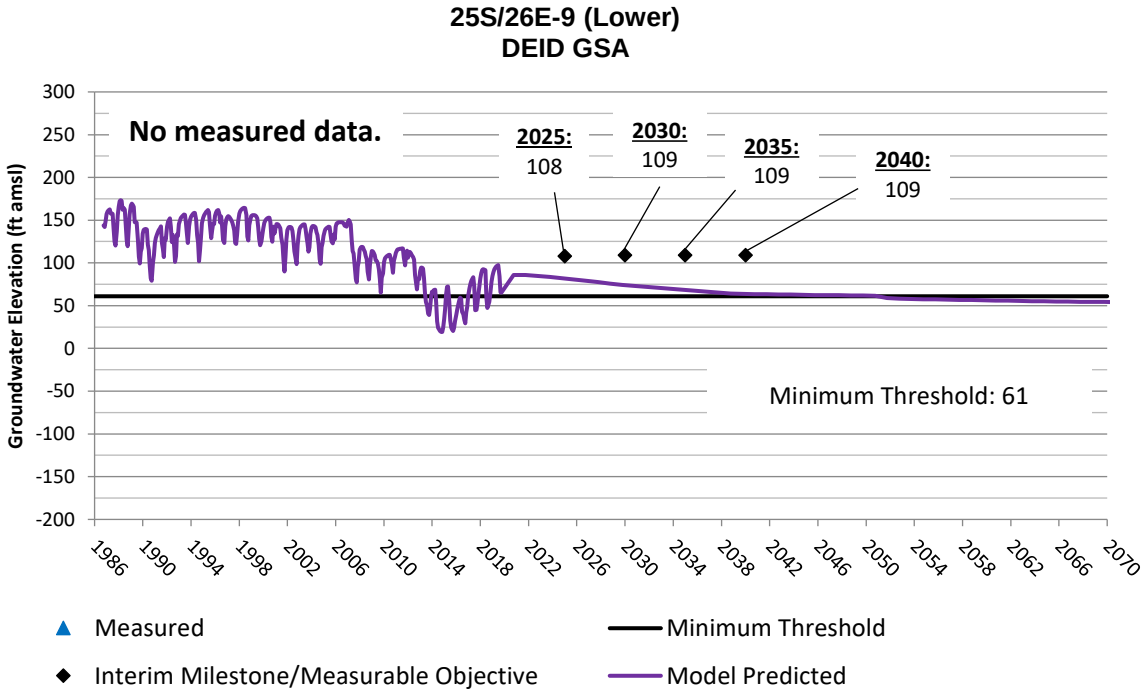


23S/25E-36 (Lower)
DEID GSA



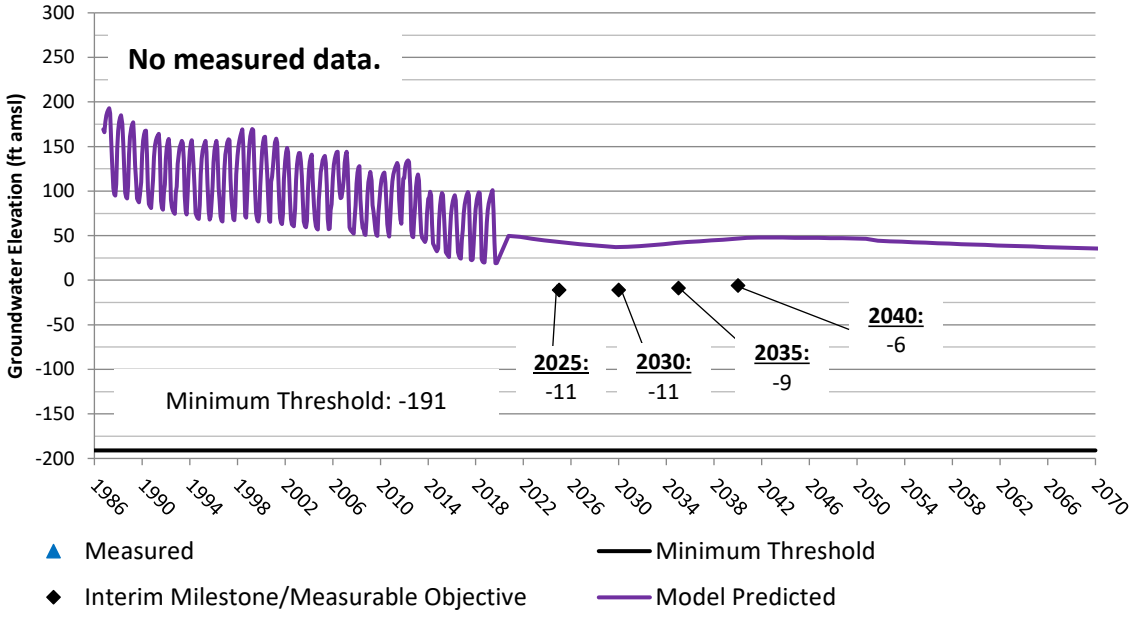
Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs



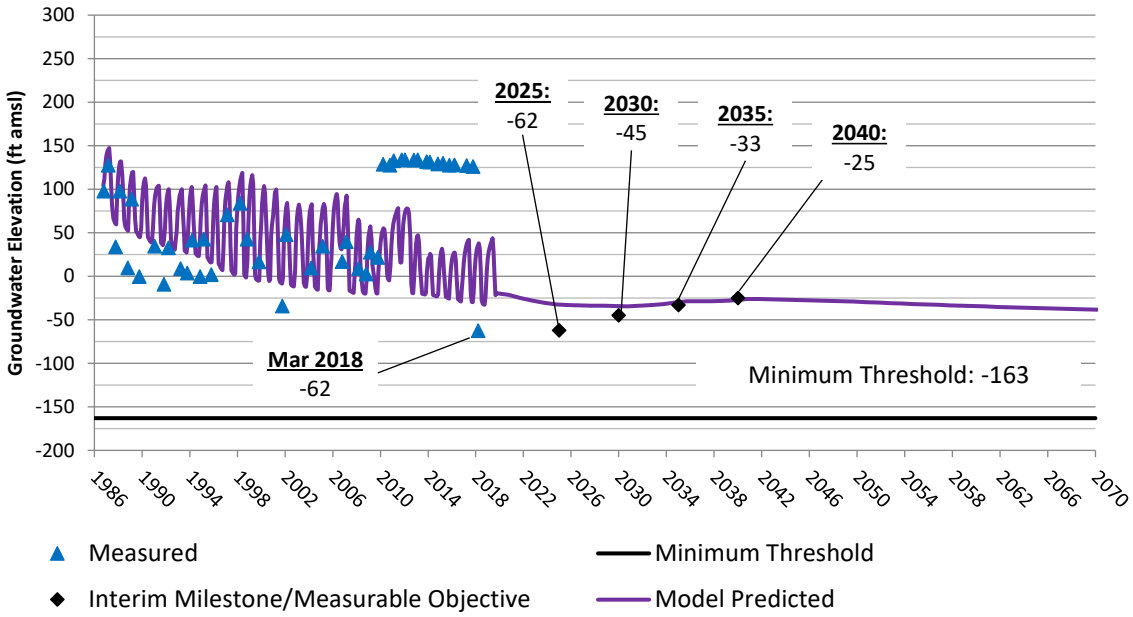


Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs

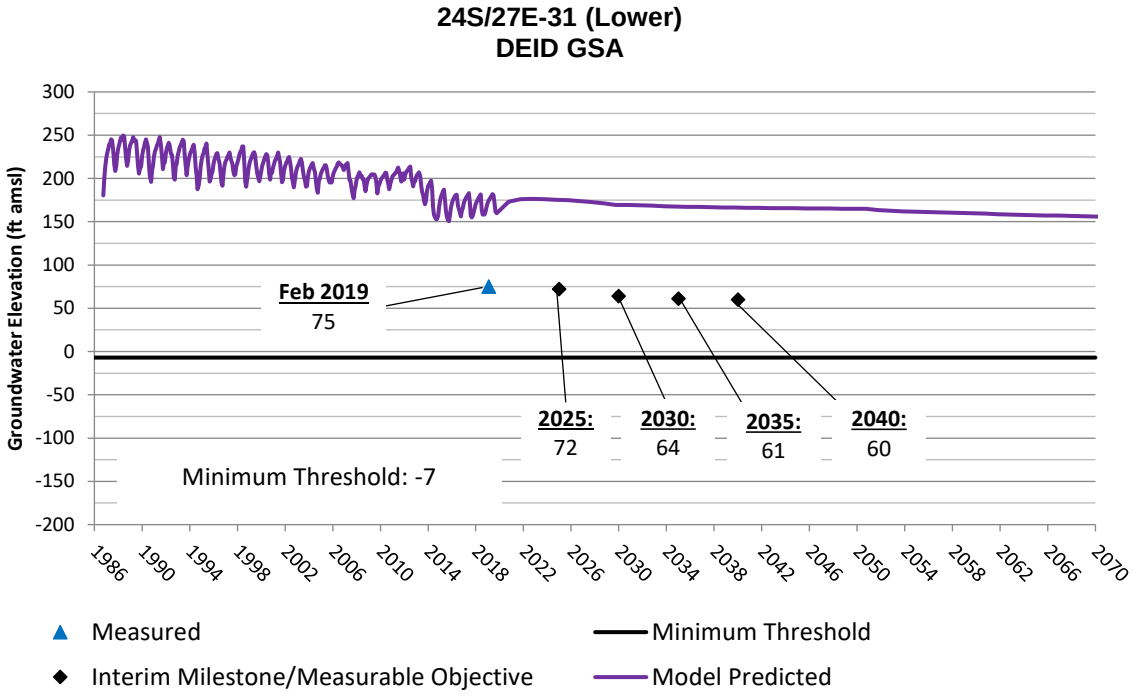
23S/25E-27 (Lower)
DEID GSA



24S/24E-03A01 (Lower)
DEID GSA

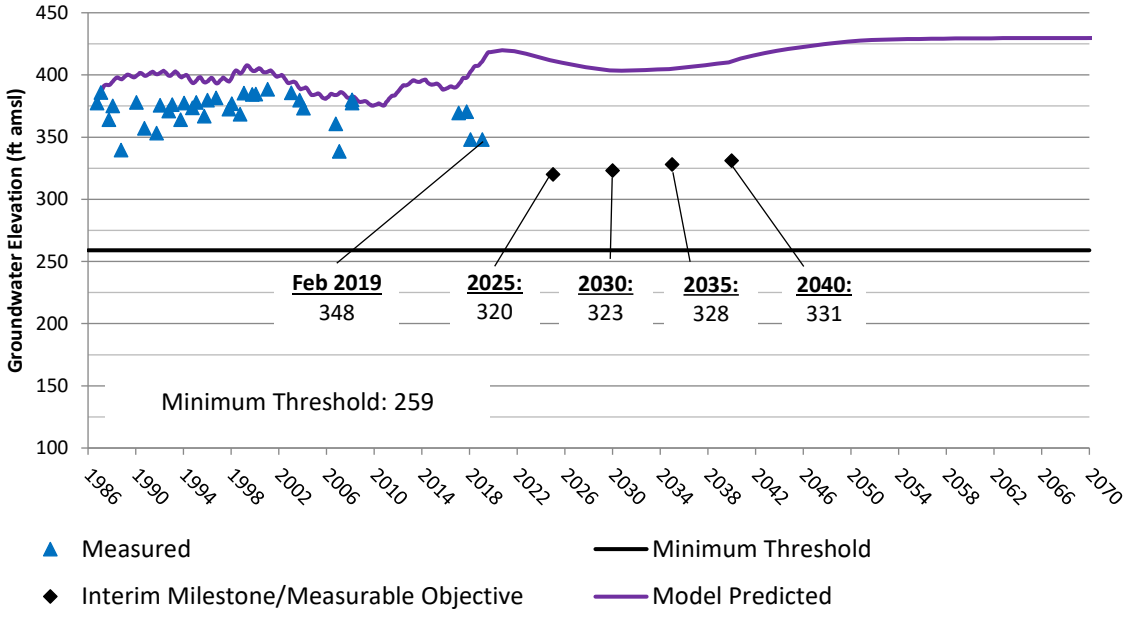


Delano-Earlimart Irrigation District GSA
RMS Groundwater Elevation Hydrographs

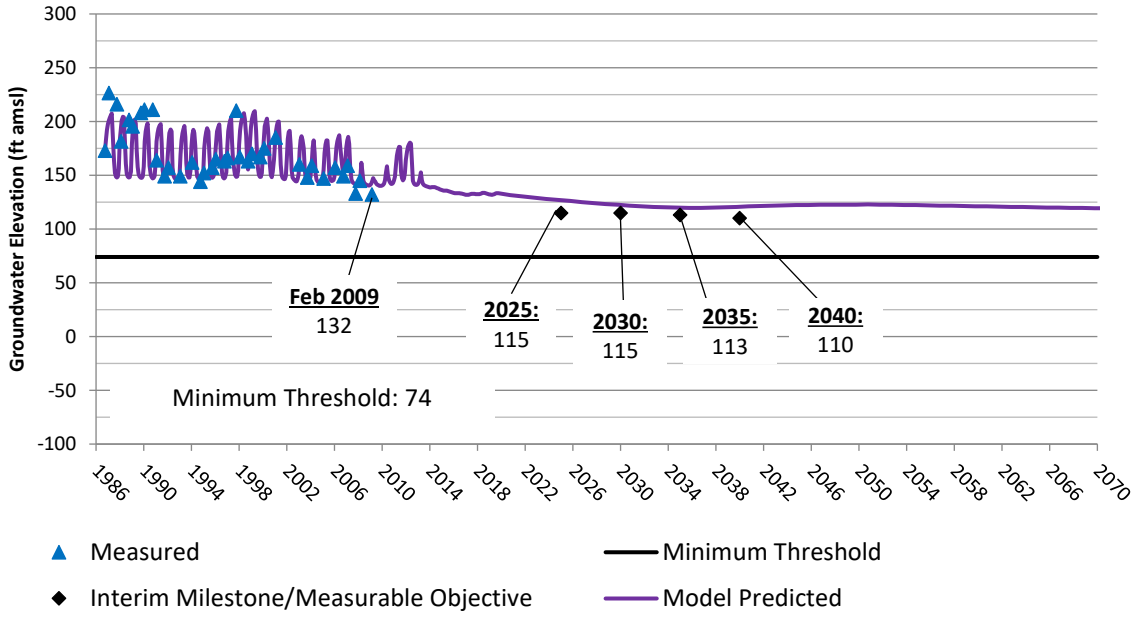


Eastern Tule GSA
RMS Groundwater Elevation Hydrographs

22S/27E-13A01 (Upper)
ETGSA

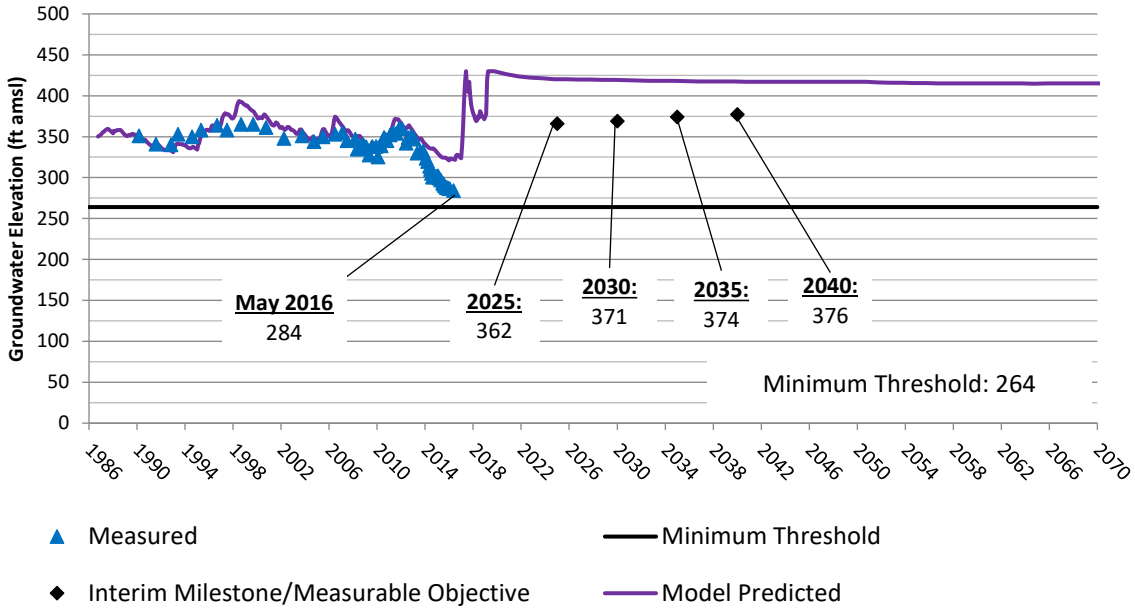


23S/26E-09C01 (Upper)
ETGSA

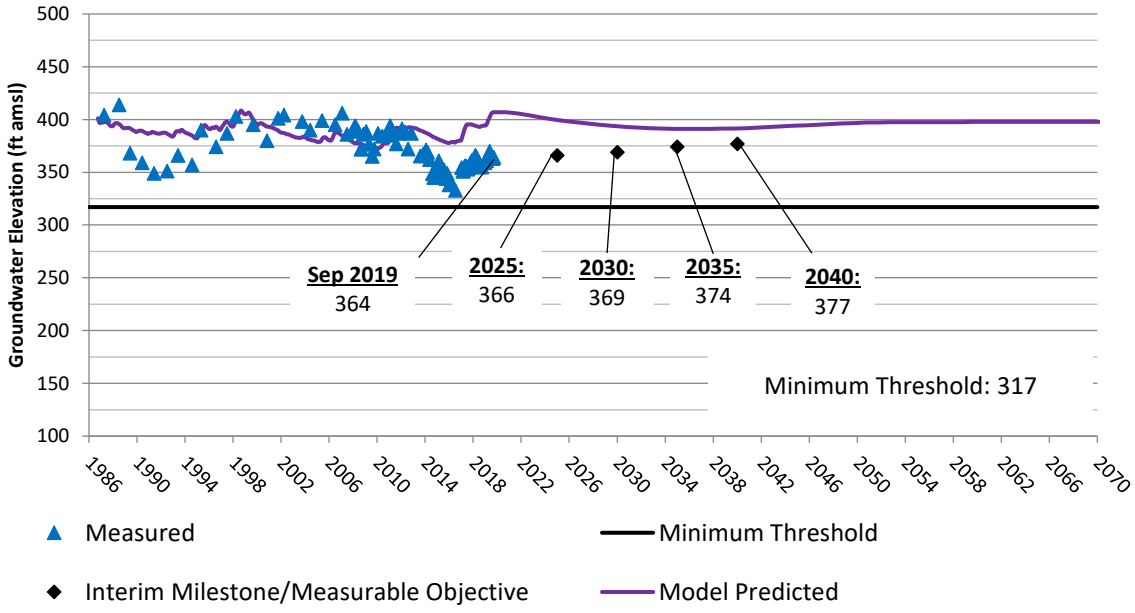


Eastern Tule GSA
RMS Groundwater Elevation Hydrographs

R-11 (Upper)
ETGSA

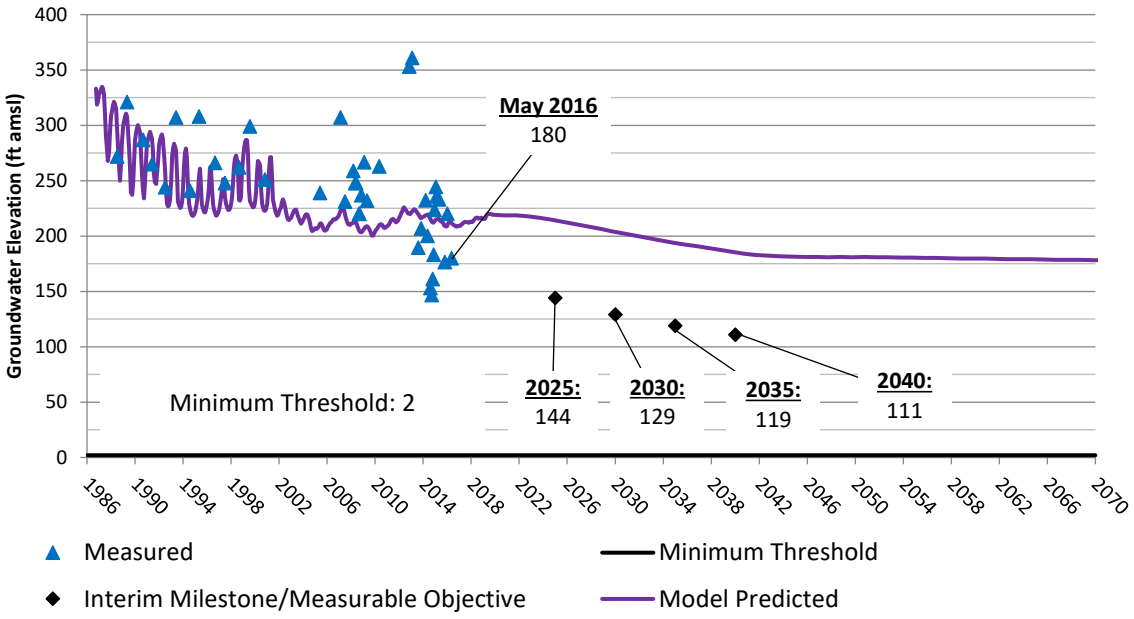


C-1 (Upper)
ETGSA

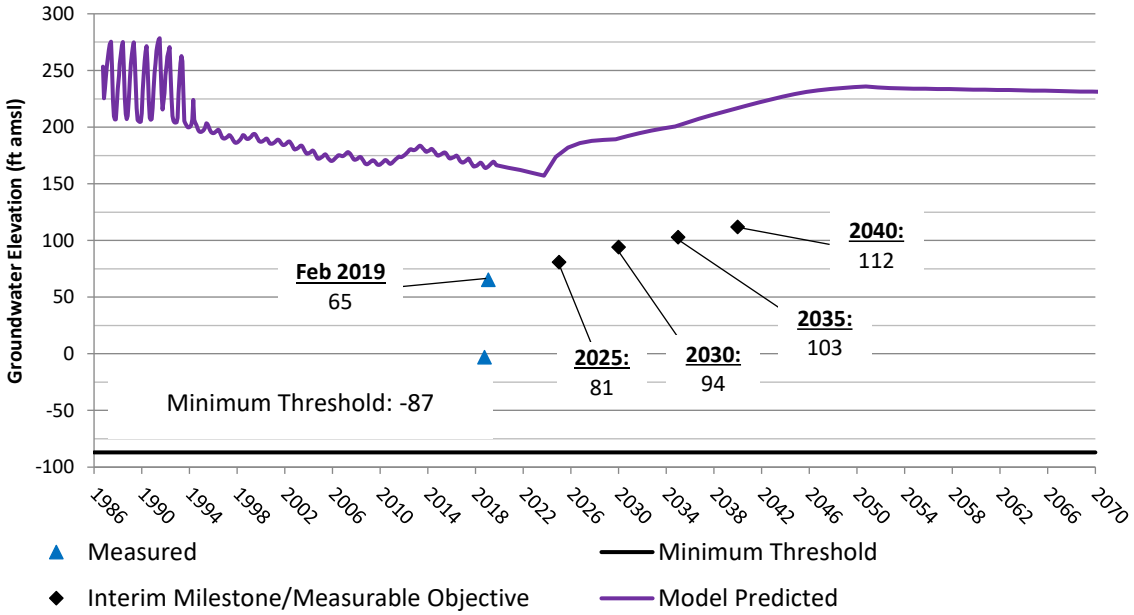


Eastern Tule GSA
RMS Groundwater Elevation Hydrographs

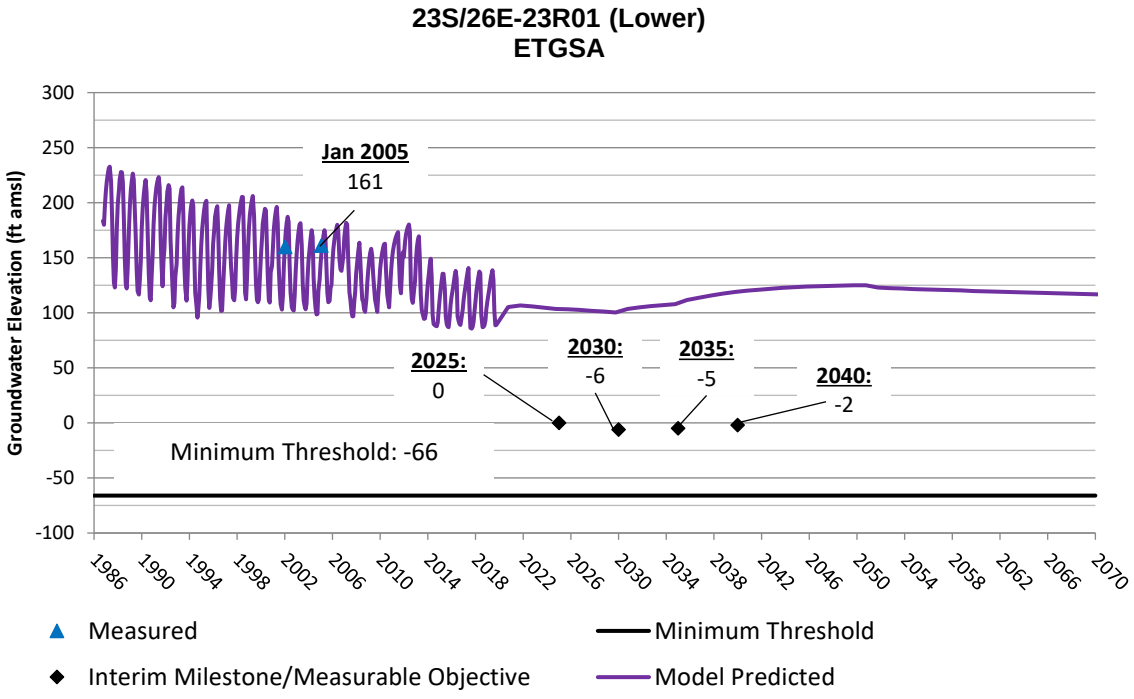
C-16 (Composite)
ETGSA

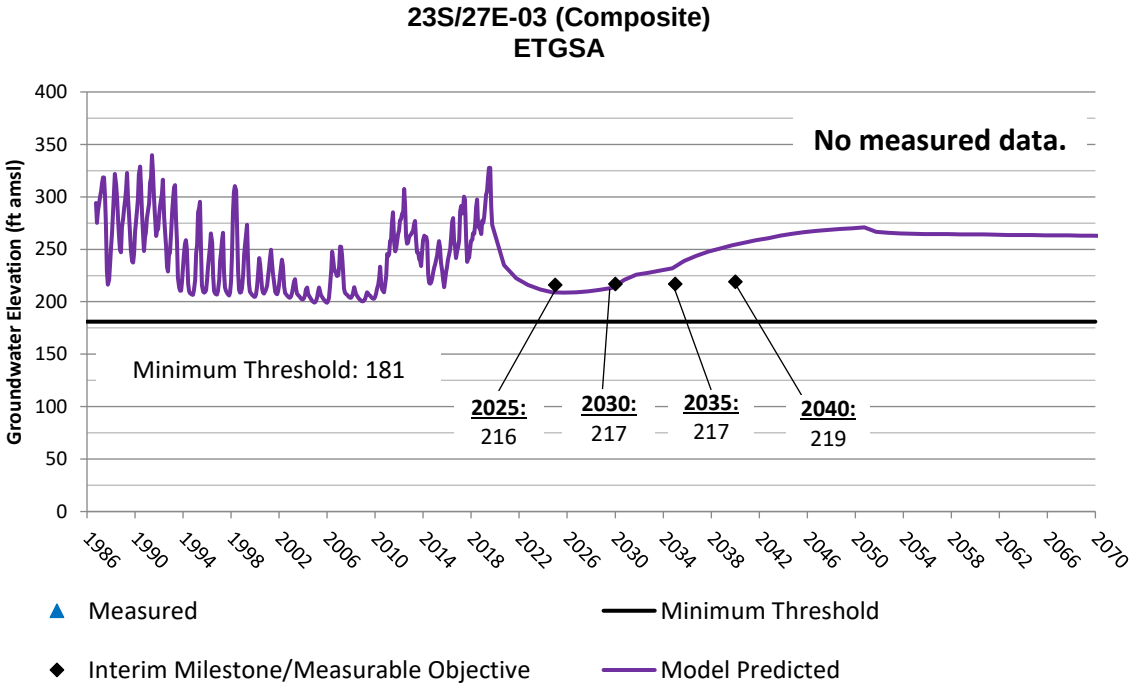


23S/27E-27 (Lower)
ETGSA

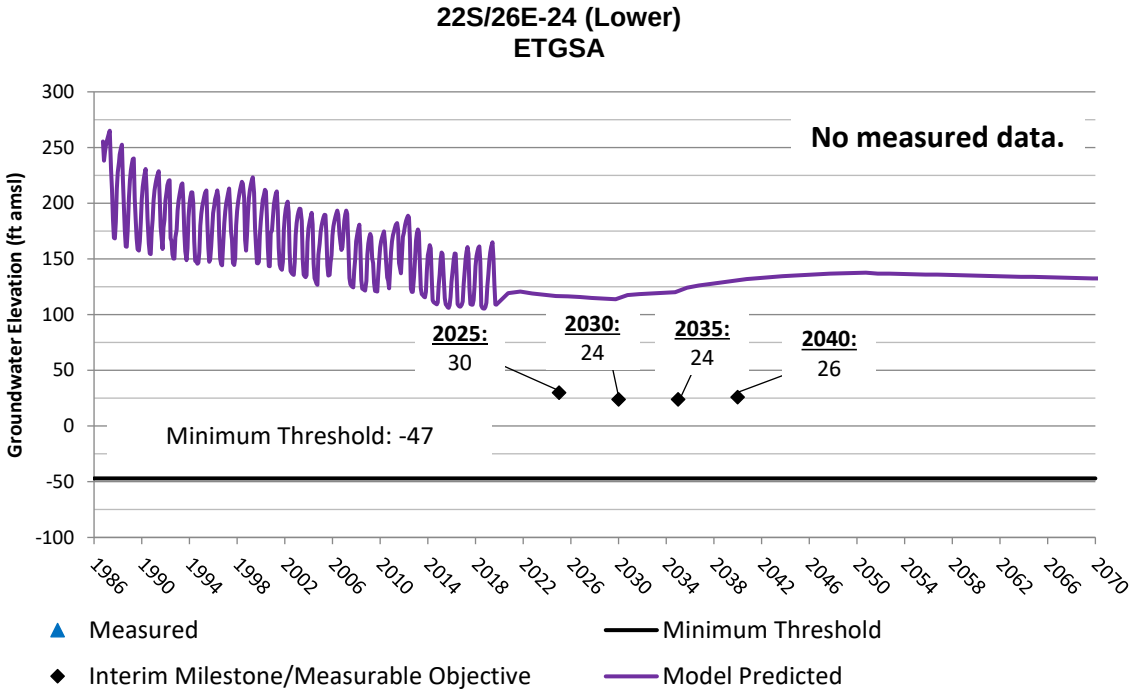


Eastern Tule GSA
RMS Groundwater Elevation Hydrographs

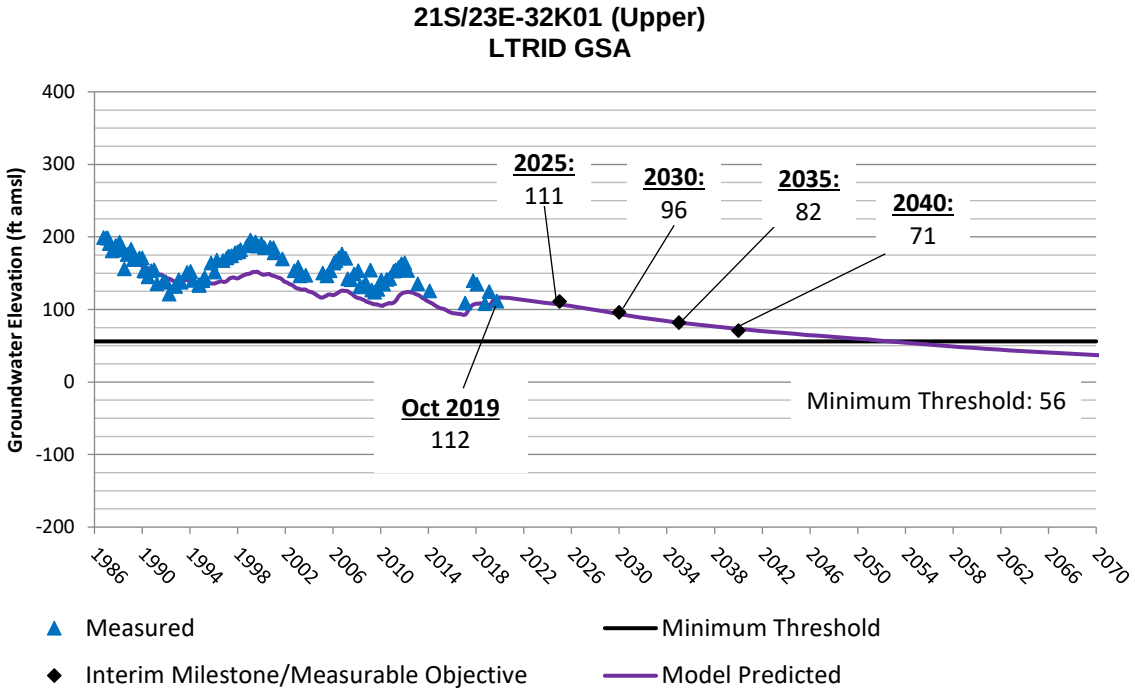


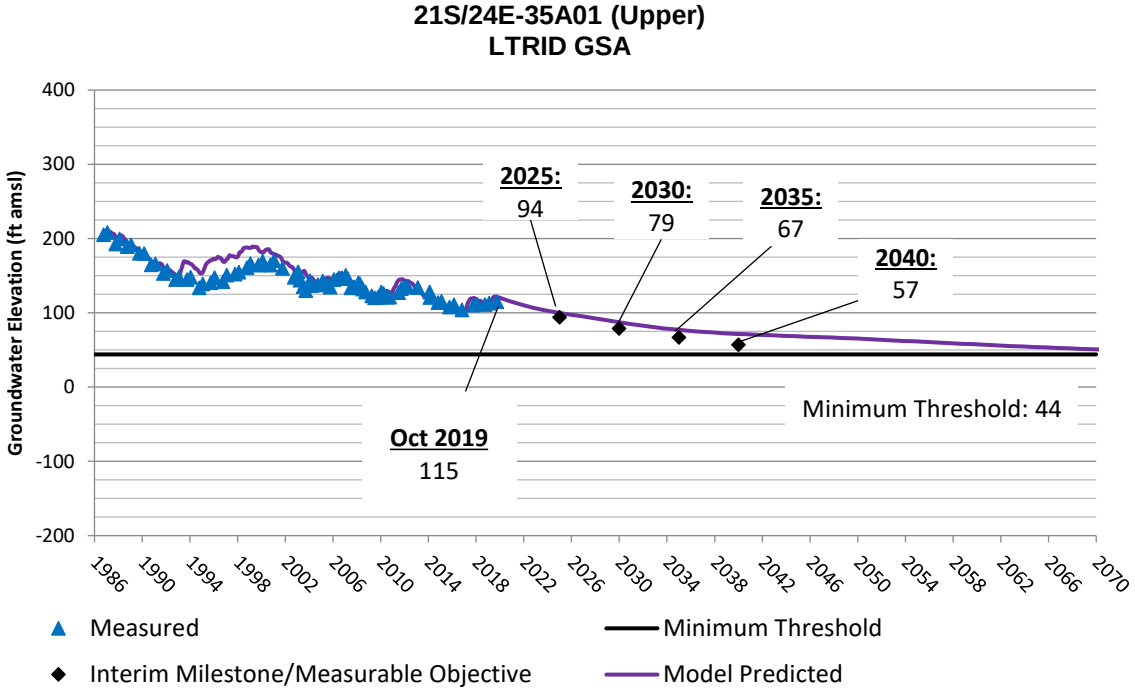


Eastern Tule GSA
RMS Groundwater Elevation Hydrographs

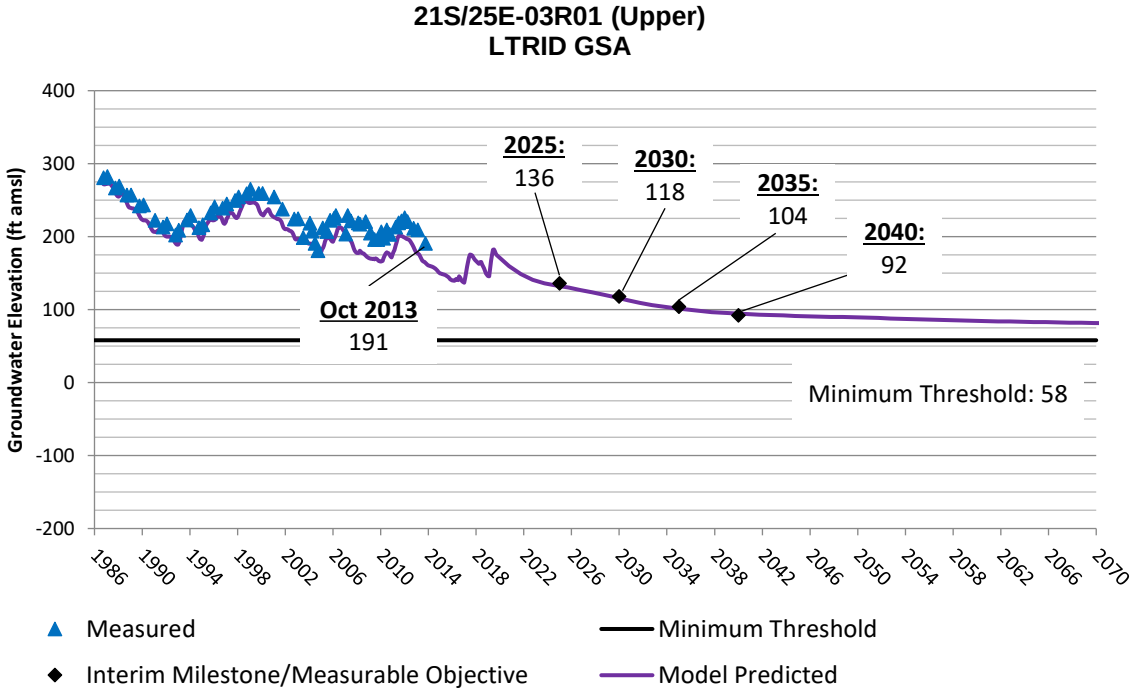


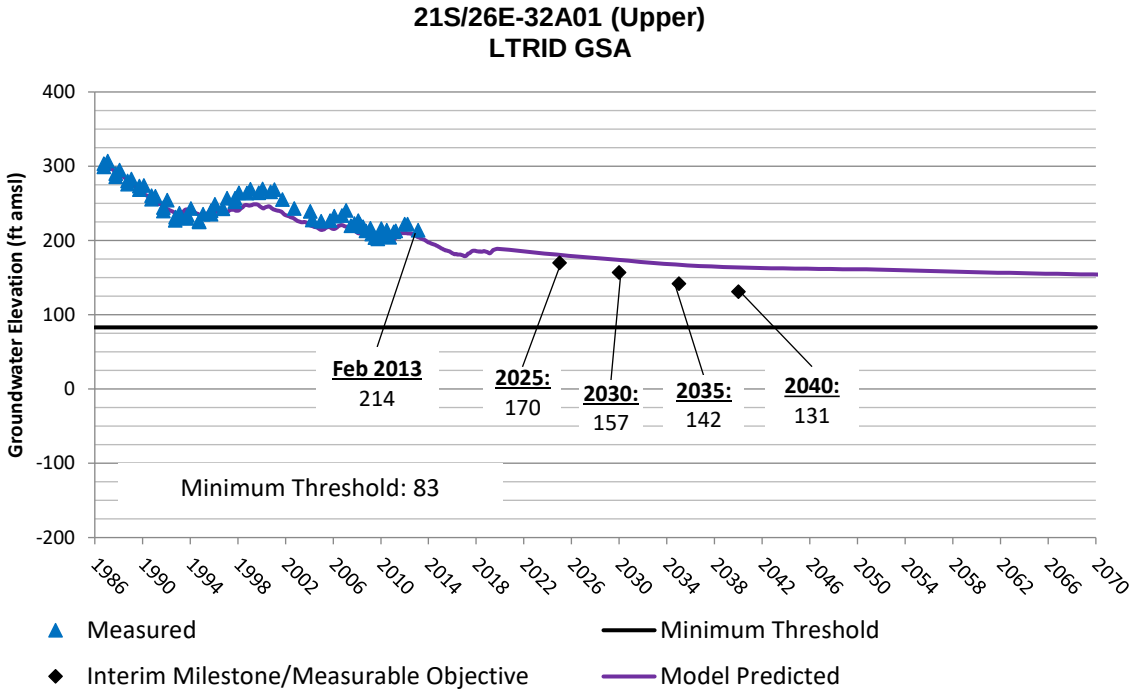
Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs





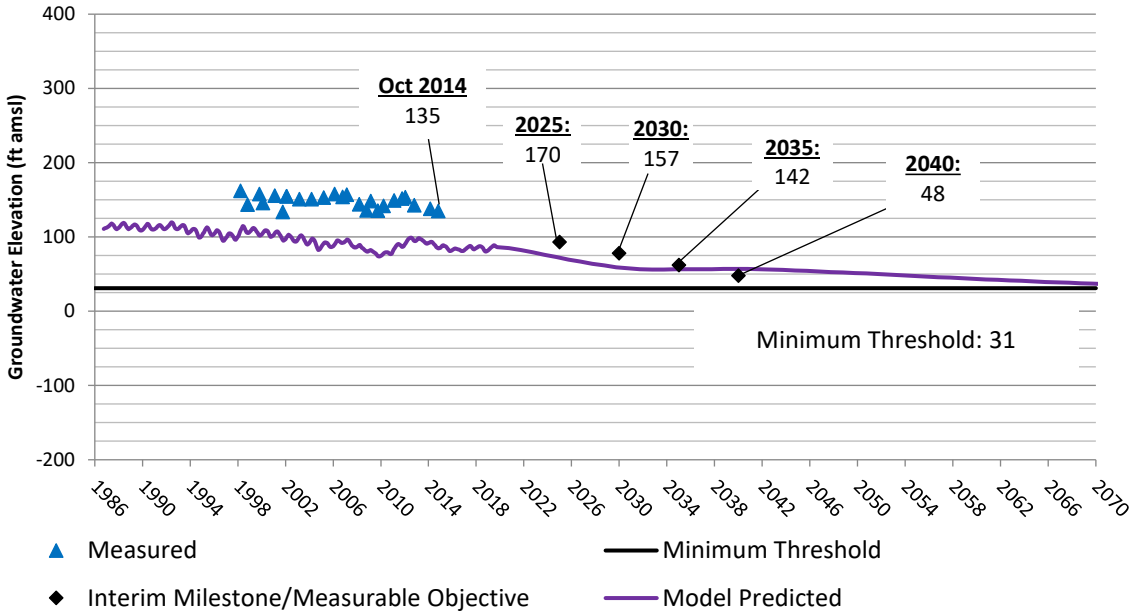
Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs



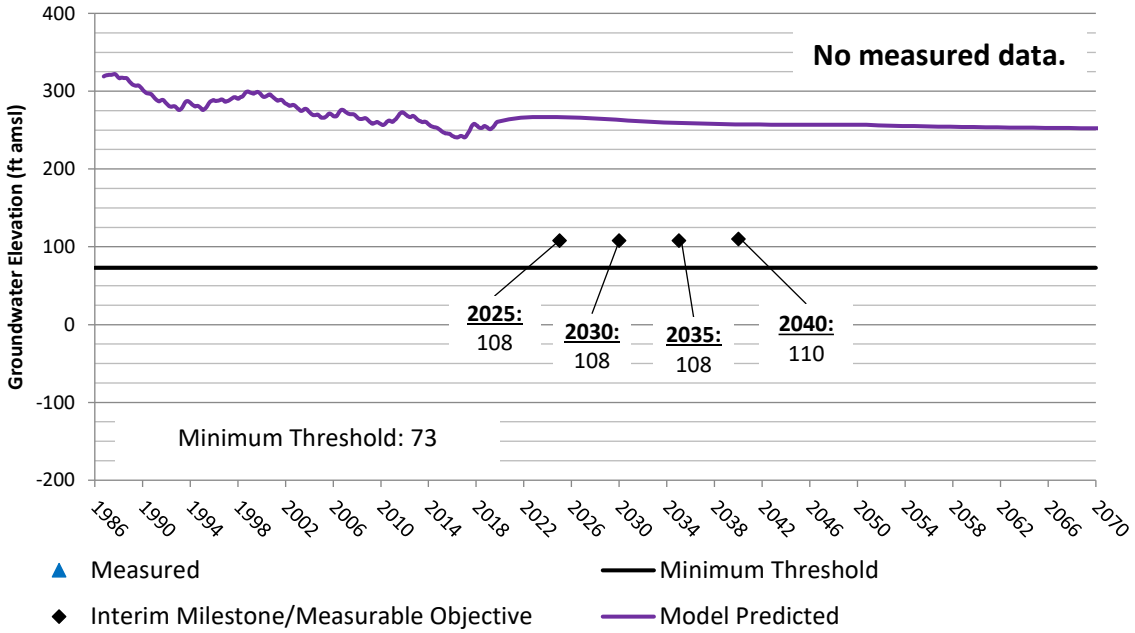


Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs

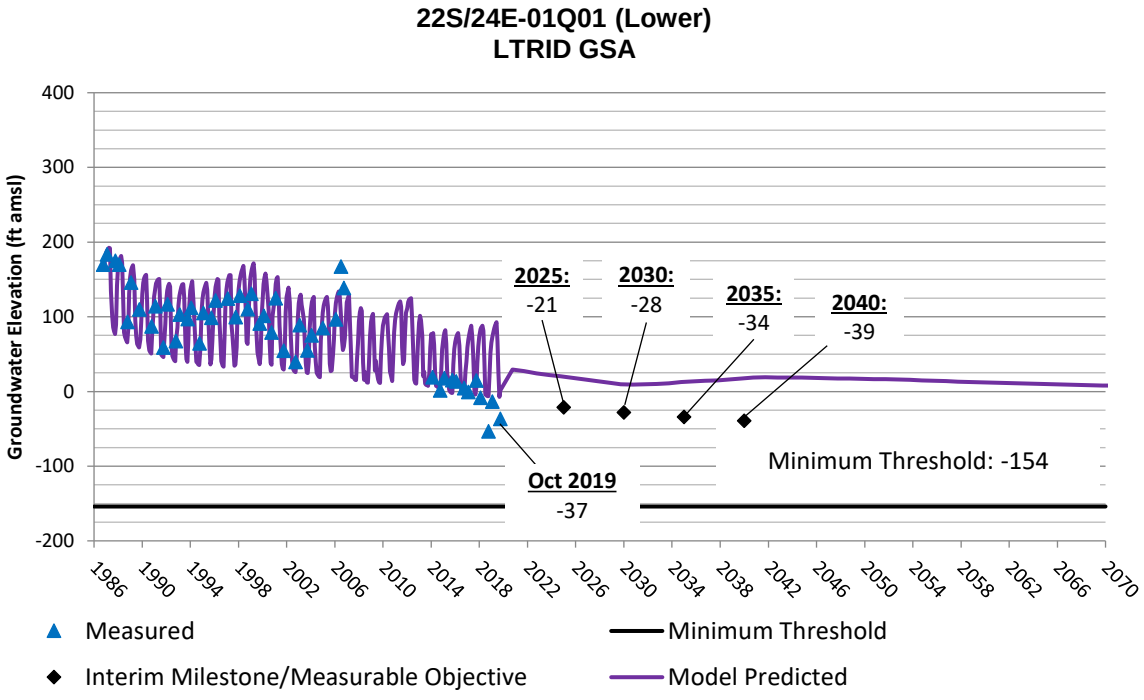
22S/23E-30J01 (Upper)
LTRID GSA

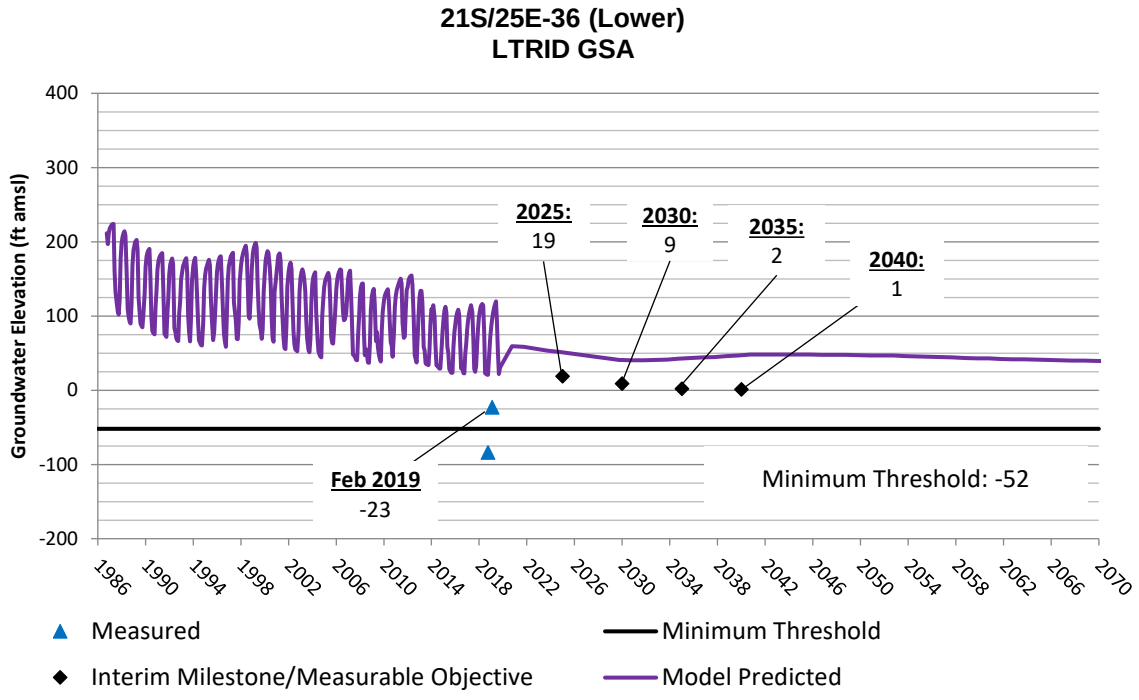


21S/26E-34 (Upper)
LTRID GSA

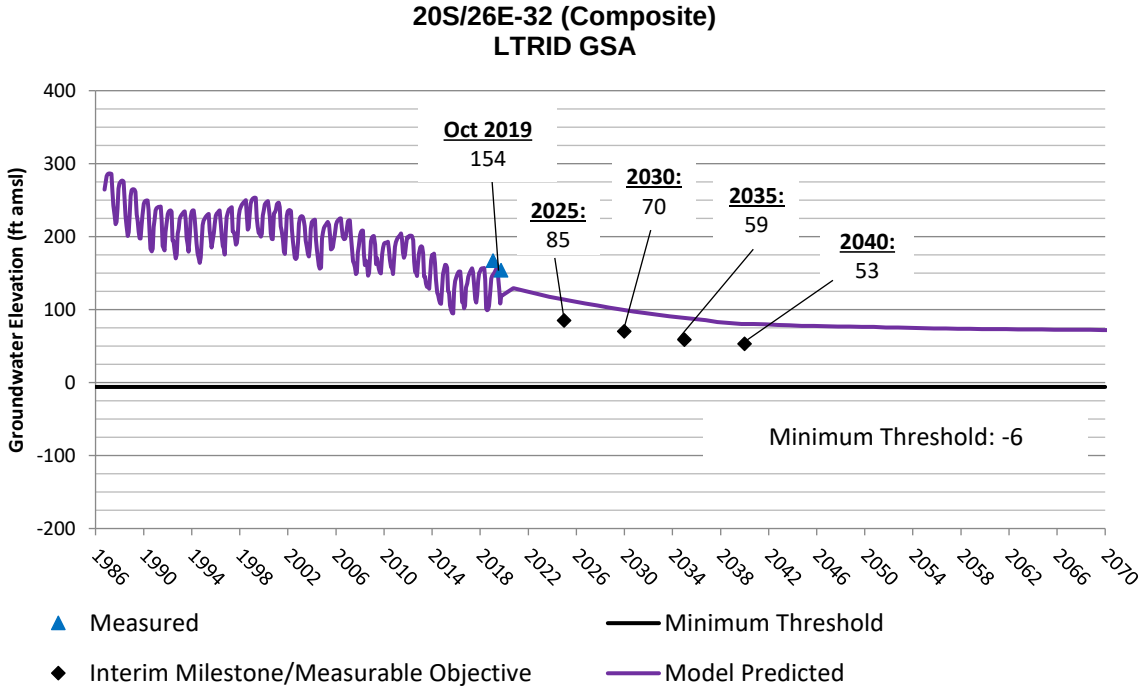


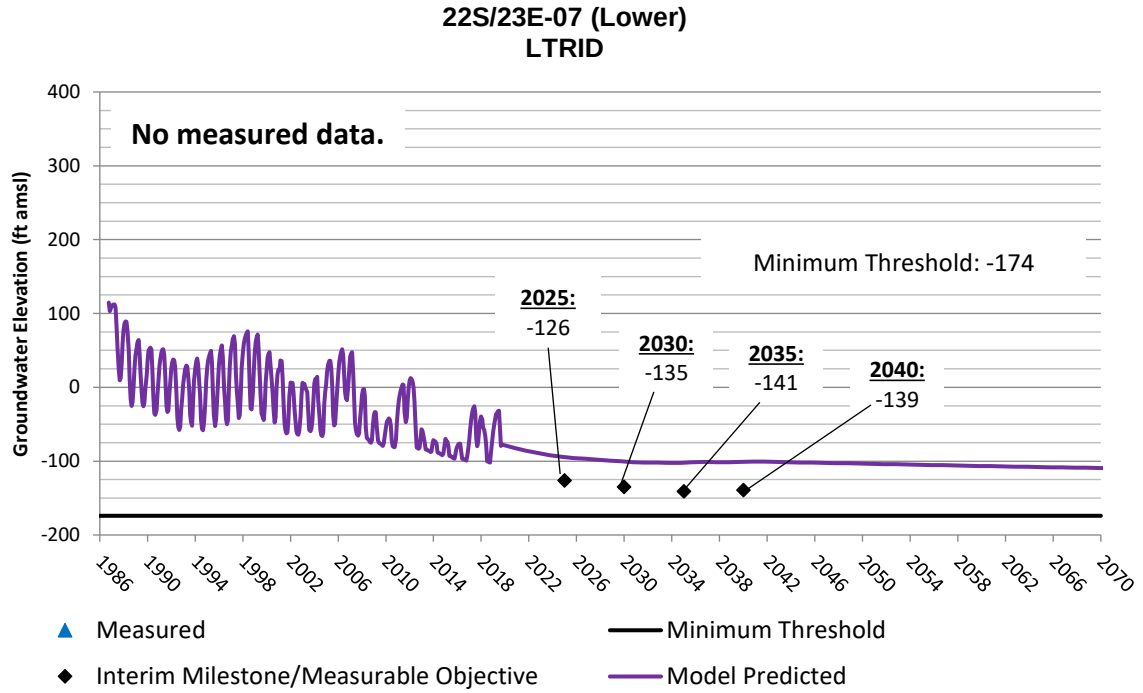
Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs



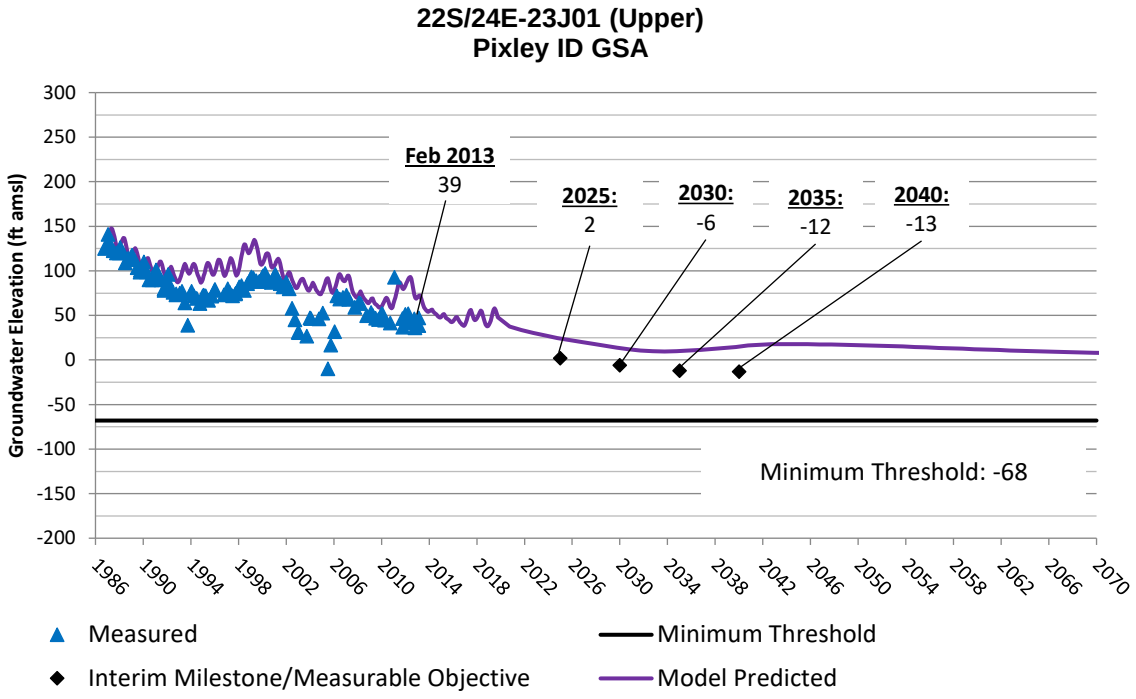


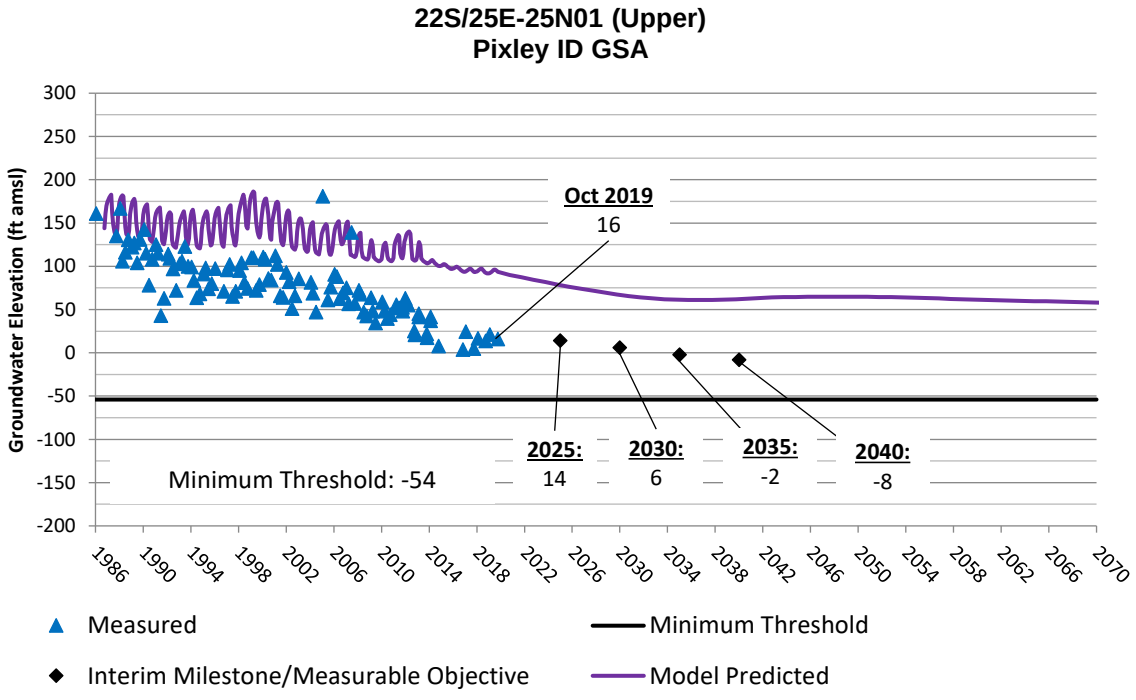
Lower Tule River Irrigation District GSA
RMS Groundwater Elevation Hydrographs





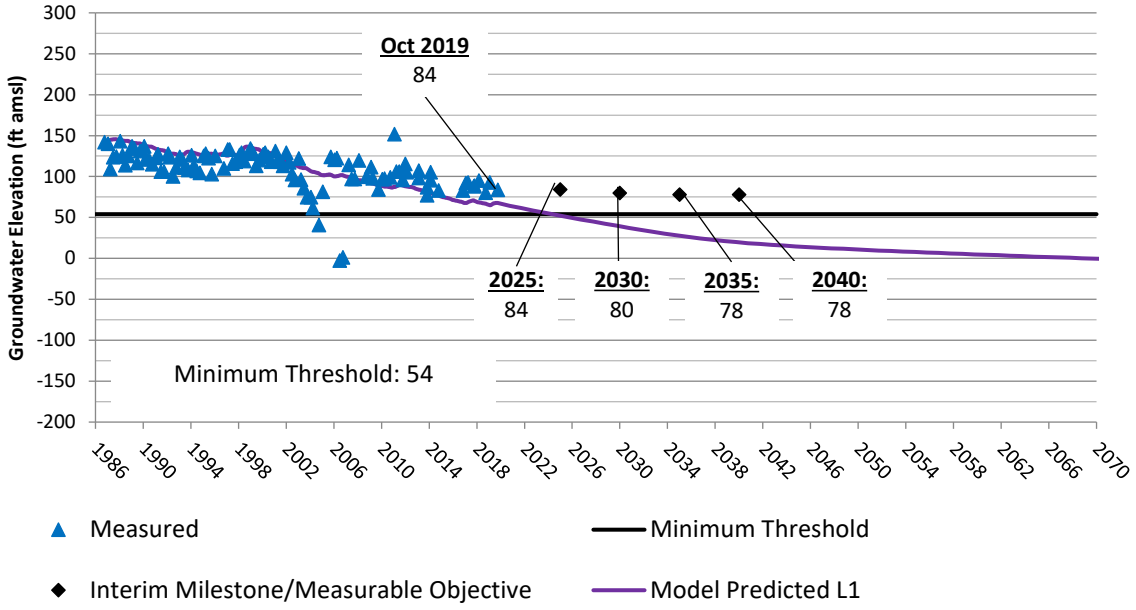
Pixley Irrigation District GSA
RMS Groundwater Elevation Hydrographs



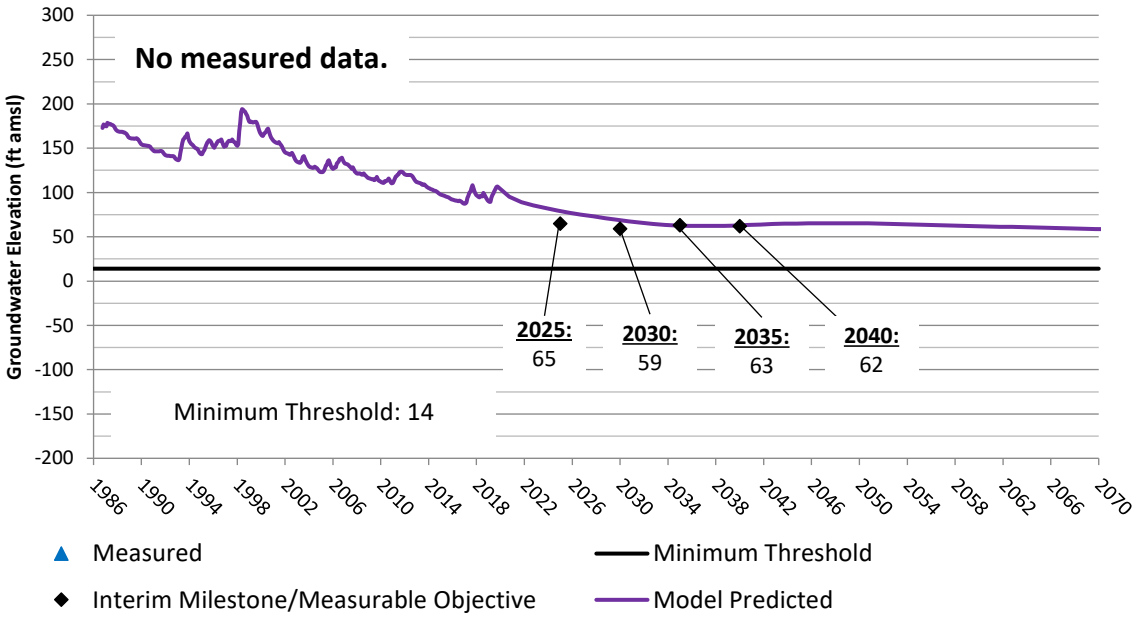


Pixley Irrigation District GSA
RMS Groundwater Elevation Hydrographs

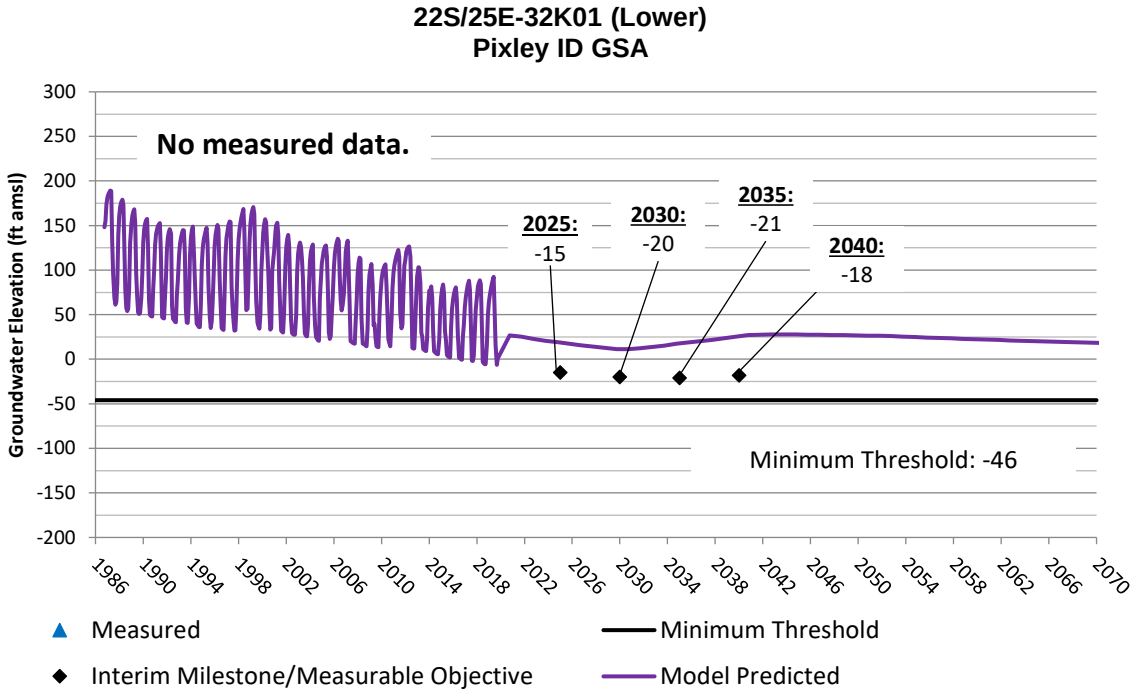
23S/24E-28J02 (Upper)
Pixley ID GSA



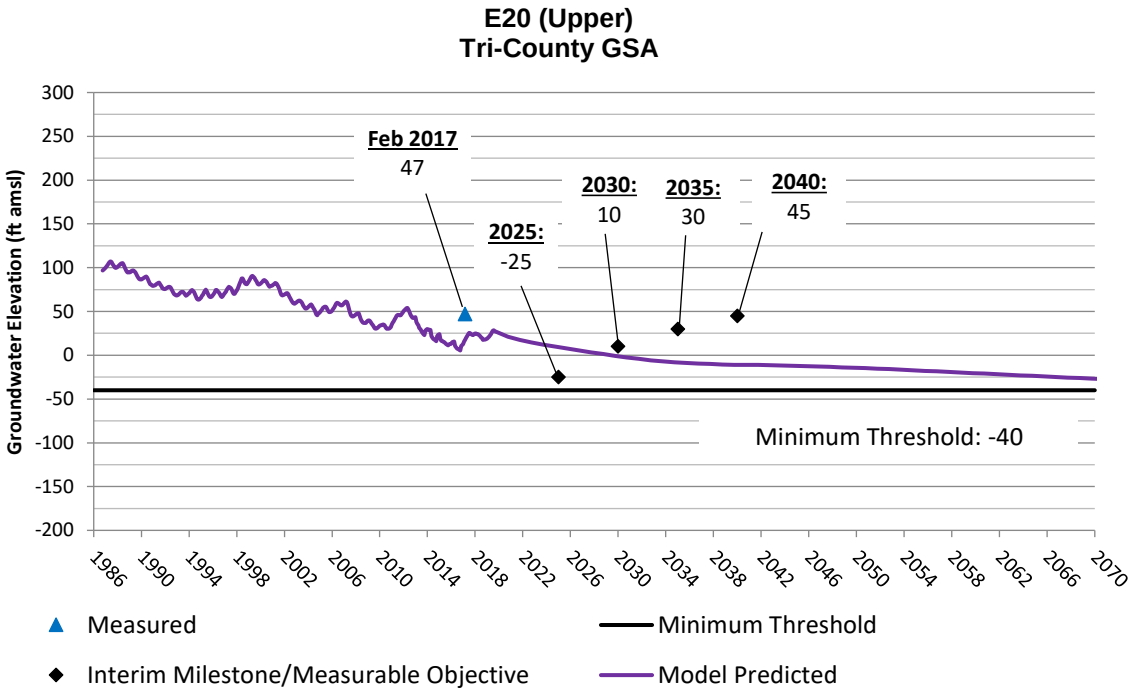
23S/25E-16N04 (Upper)
Pixley ID GSA

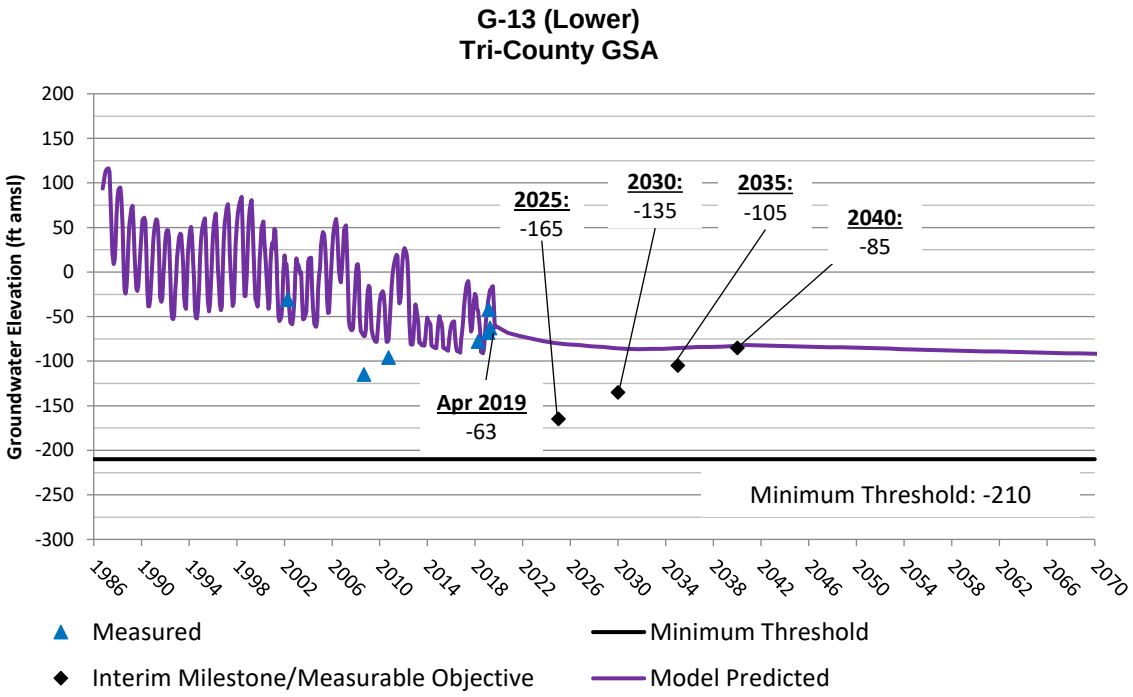


Pixley Irrigation District GSA
RMS Groundwater Elevation Hydrographs

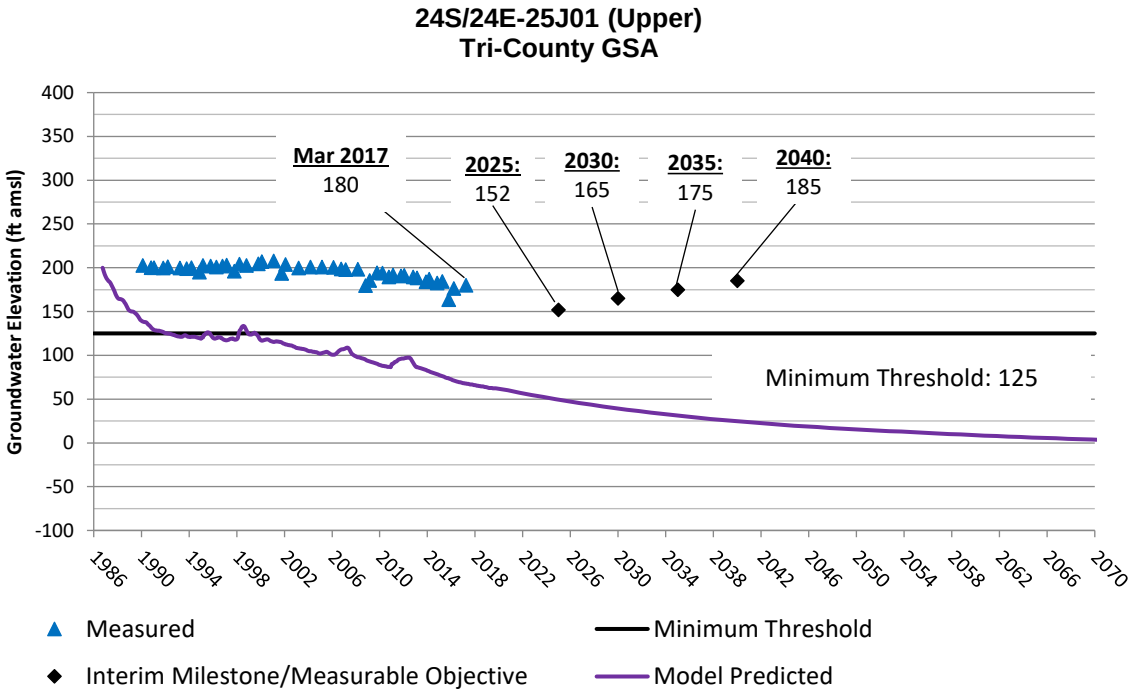


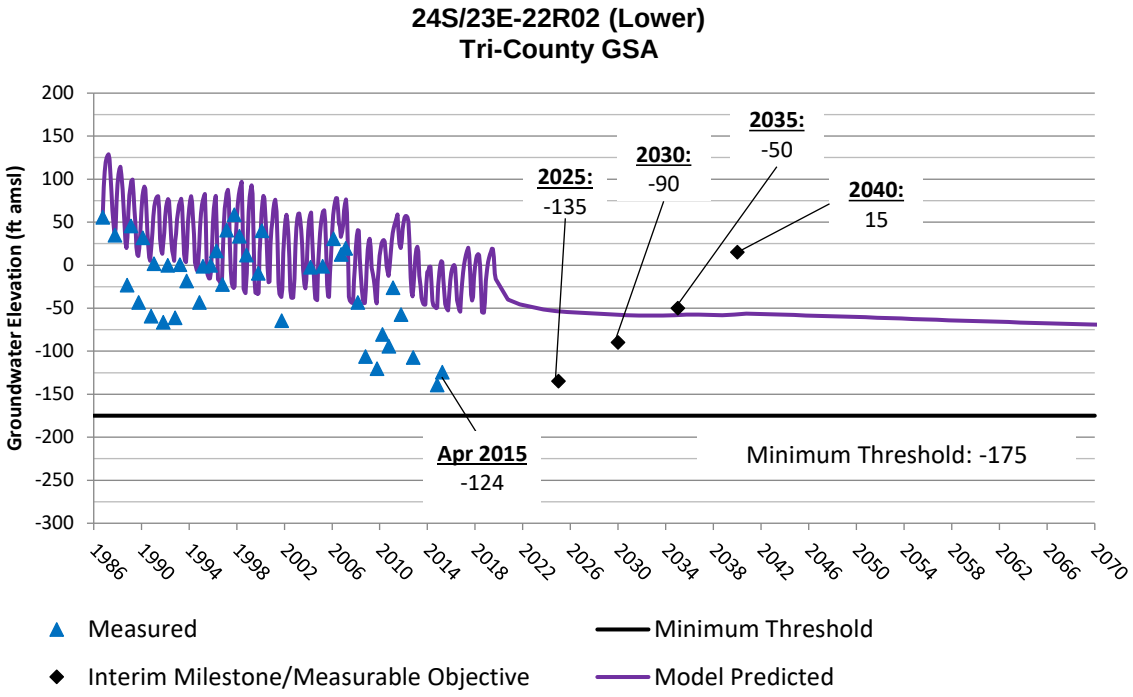
Tri-County Water Authority GSA
RMS Groundwater Elevation Hydrographs



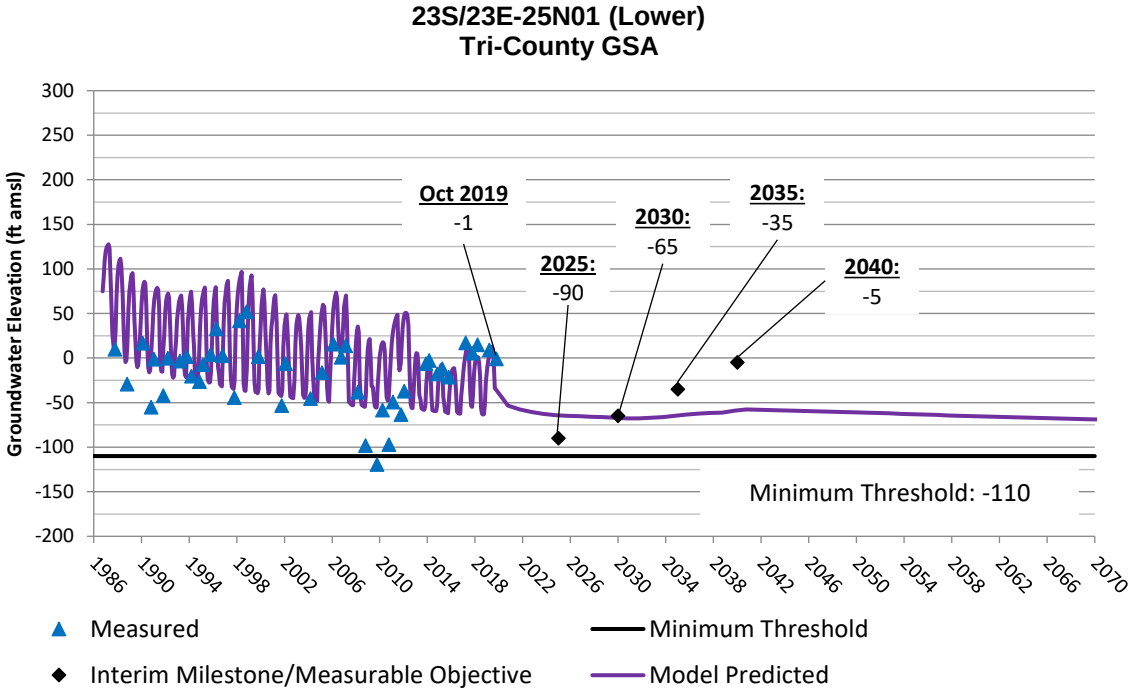


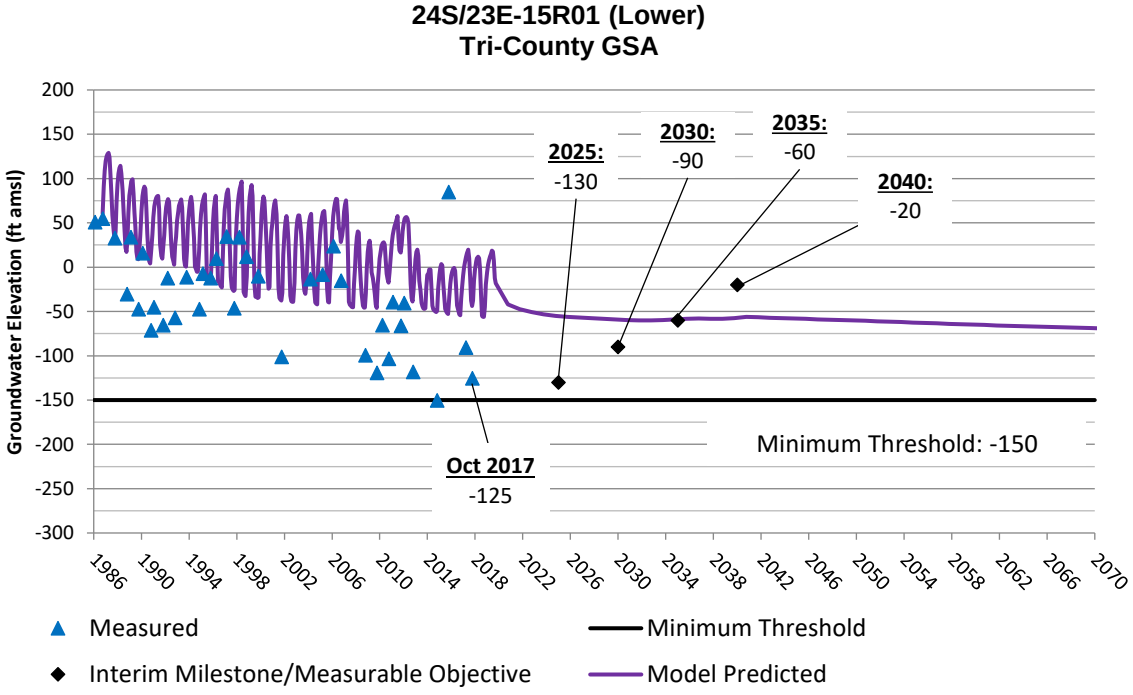
Tri-County Water Authority GSA
RMS Groundwater Elevation Hydrographs





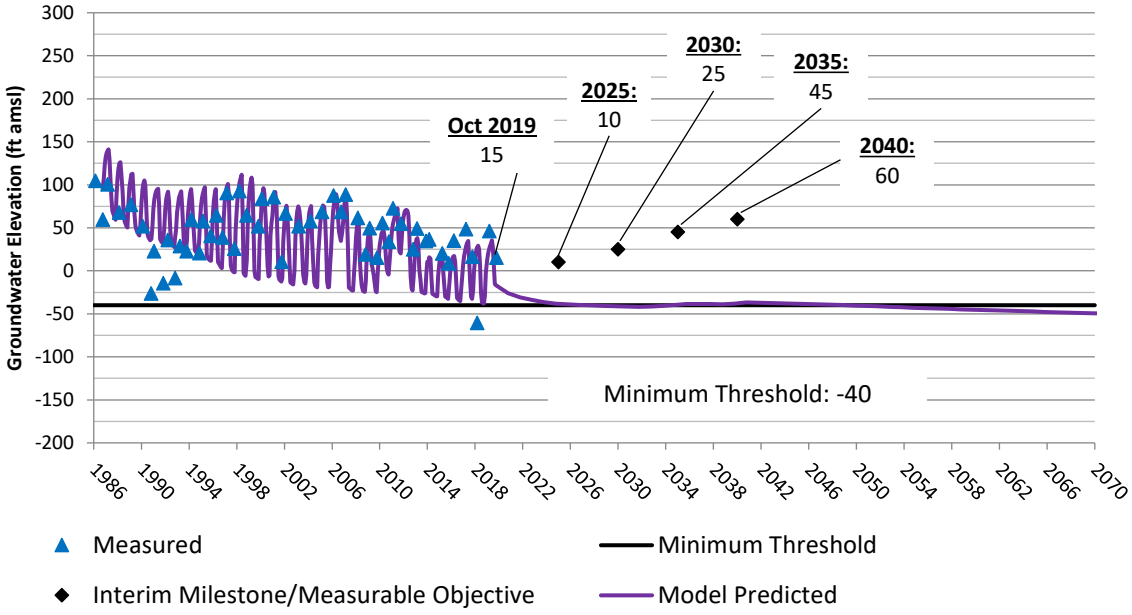
Tri-County Water Authority GSA
RMS Groundwater Elevation Hydrographs



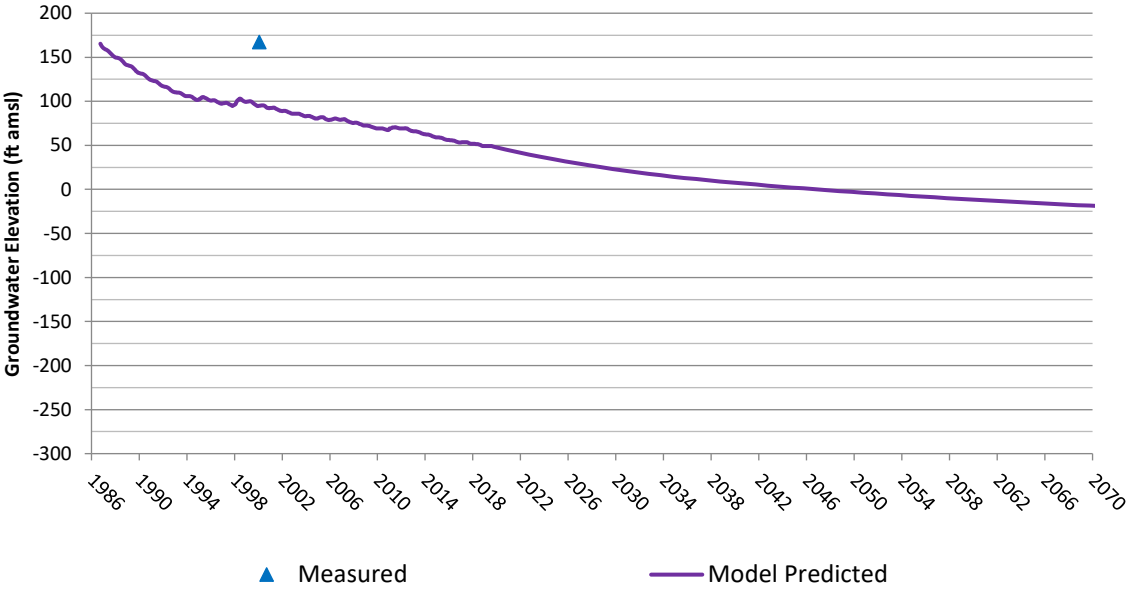


Tri-County Water Authority GSA
RMS Groundwater Elevation Hydrographs

24S/24E-04R01 (Lower)
Tri-County GSA

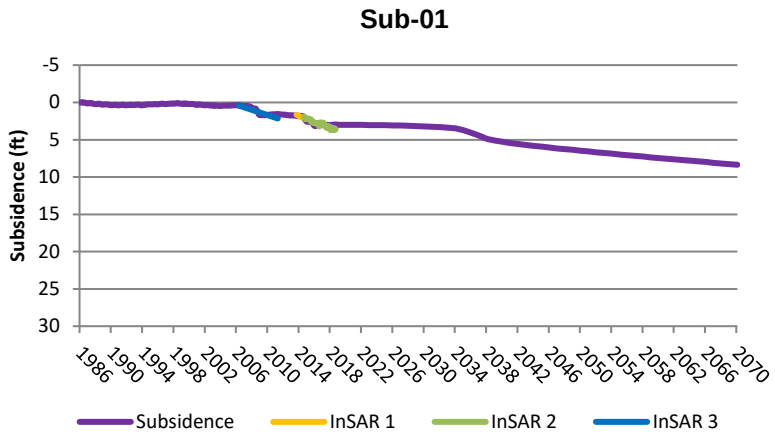


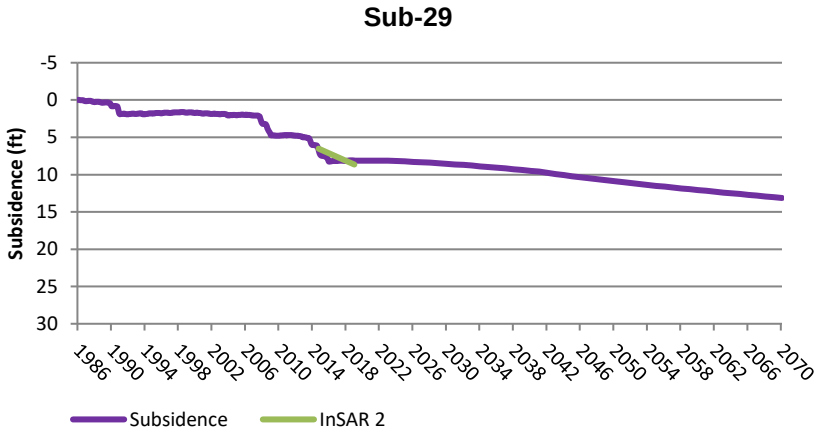
24S/23E-22E01 (Upper)
Tri-County GSA

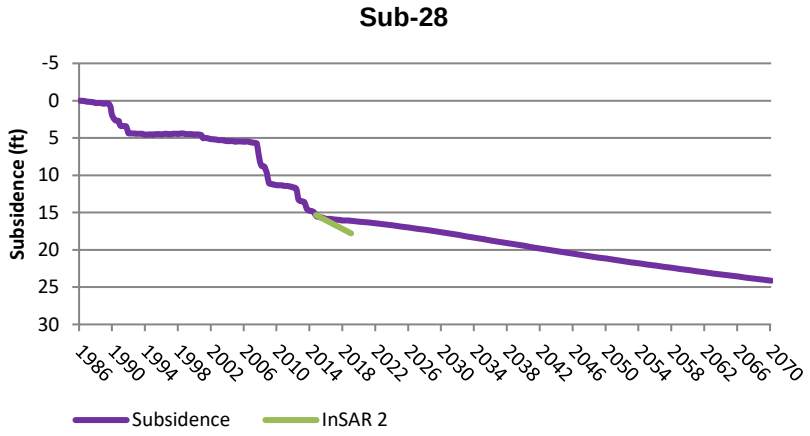


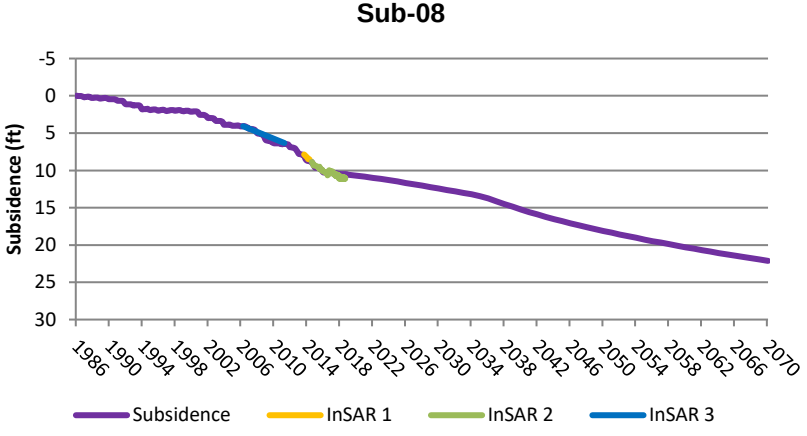
Attachment H

Projection Subsidence Graphs at Calibration Targets and RMS

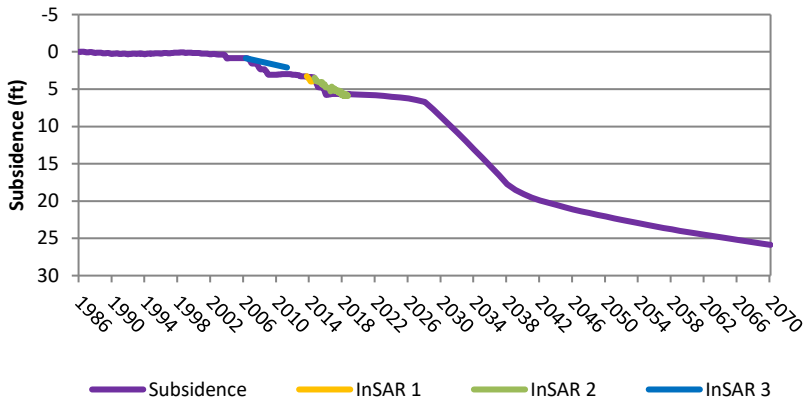

Sub-01
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2
InSAR 3


Sub-29
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

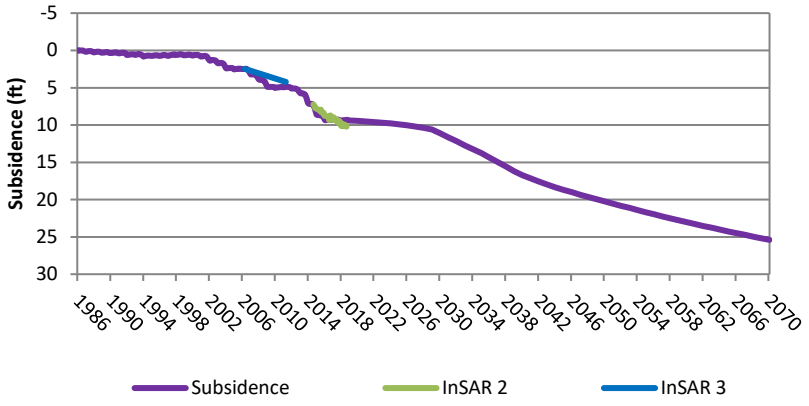

Sub-28
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


Sub-08
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2
InSAR 3

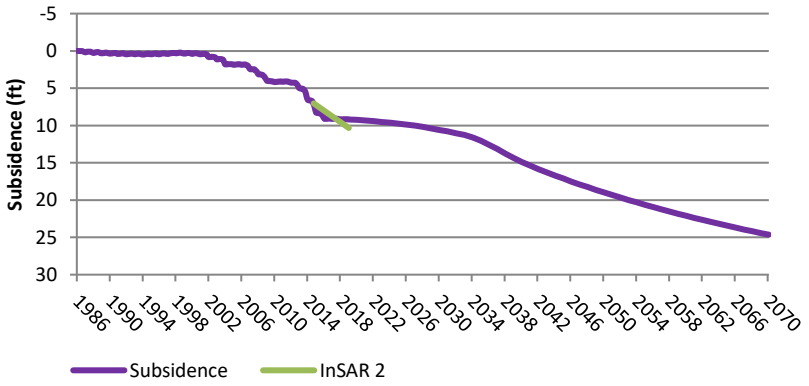
Sub-02



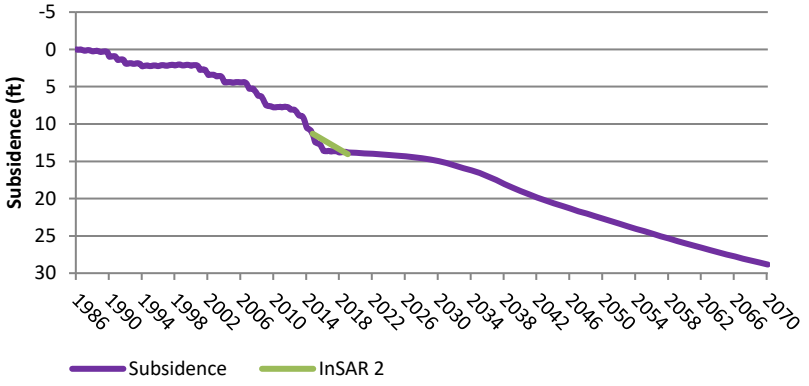
Sub-07

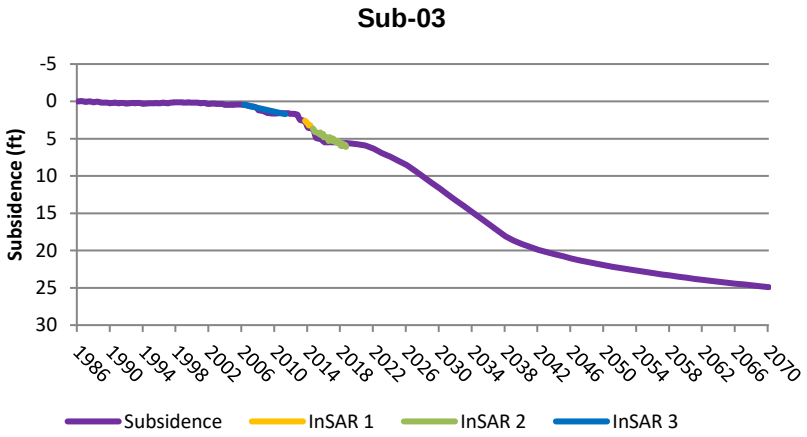


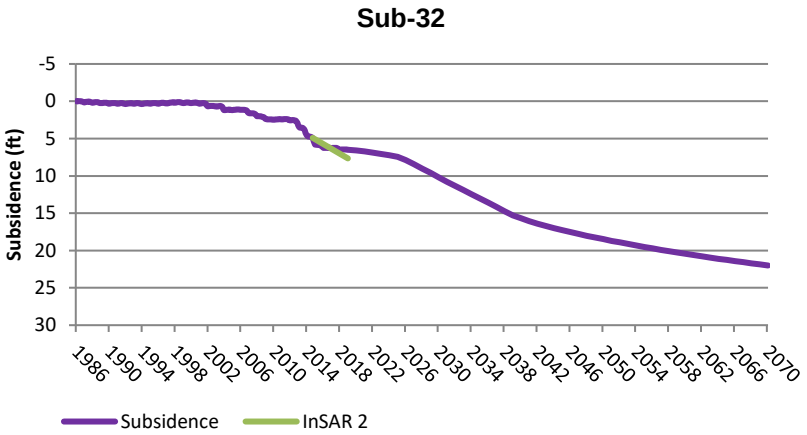
Sub-30

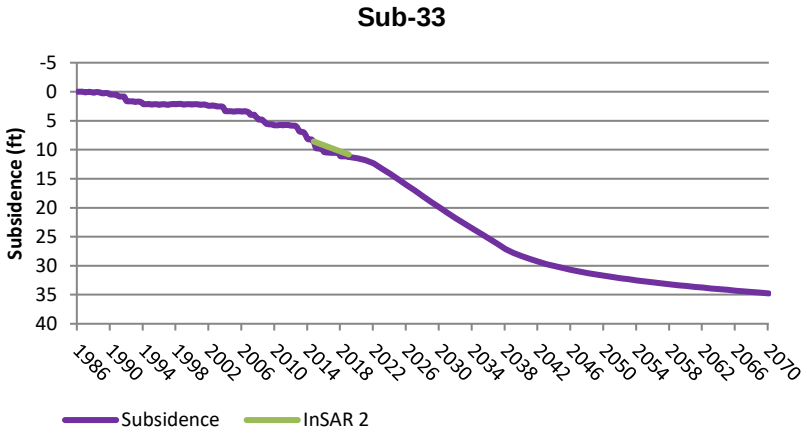


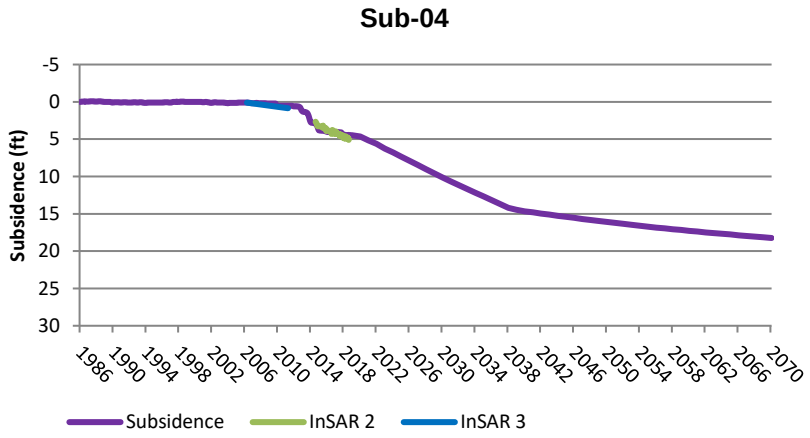
Sub-31

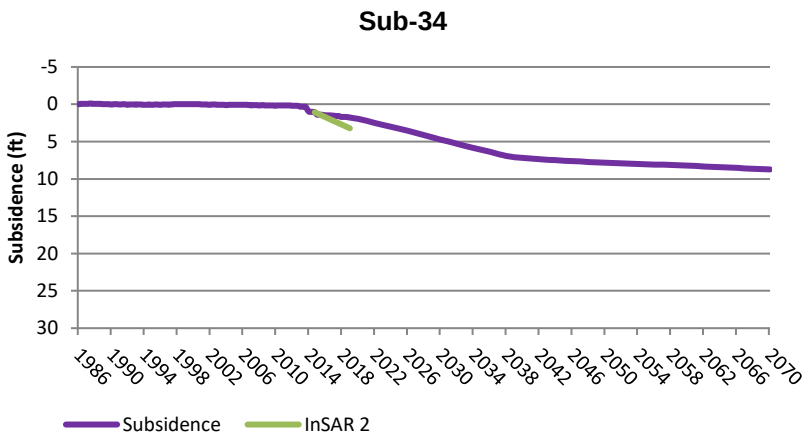


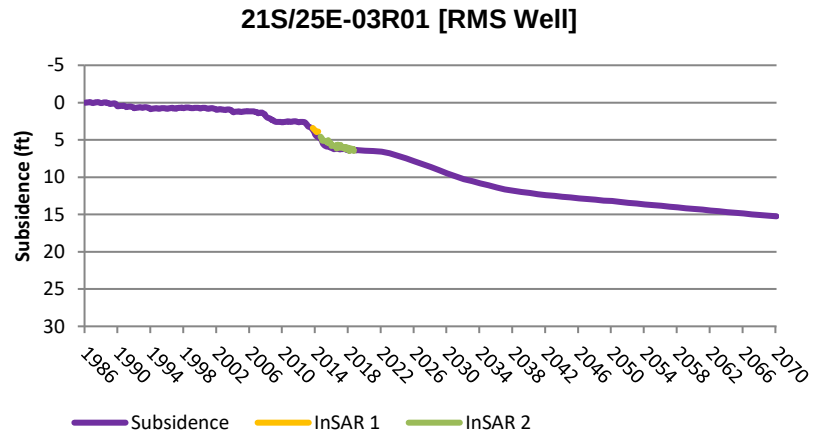

Sub-03
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2
InSAR 3

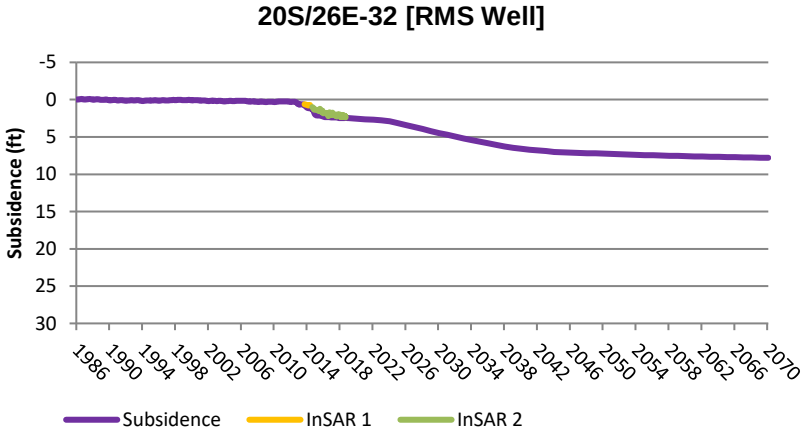

Sub-32
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


Sub-33
Subsidence (ft)
-5
0
5
10
15
20
25
30
35
40
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

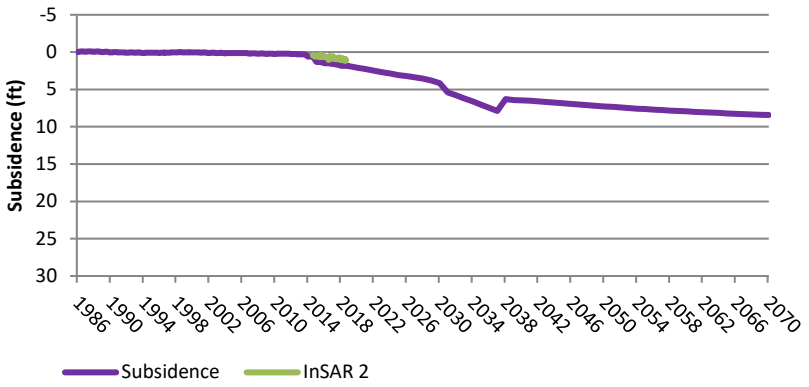

Sub-04
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2
InSAR 3


Sub-34
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

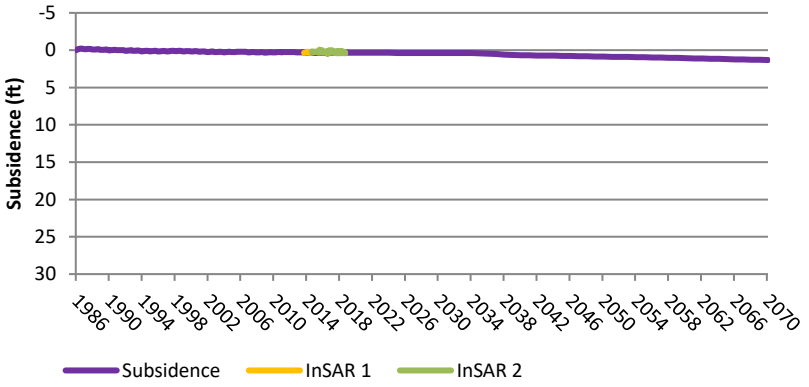

21S/25E-03R01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2


20S/26E-32 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2

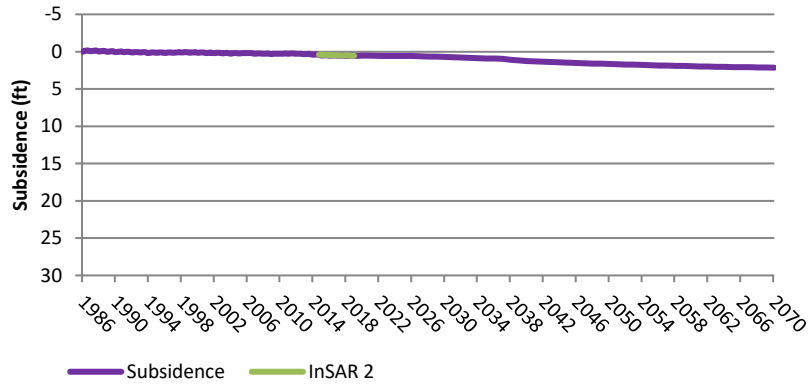
Sub-05

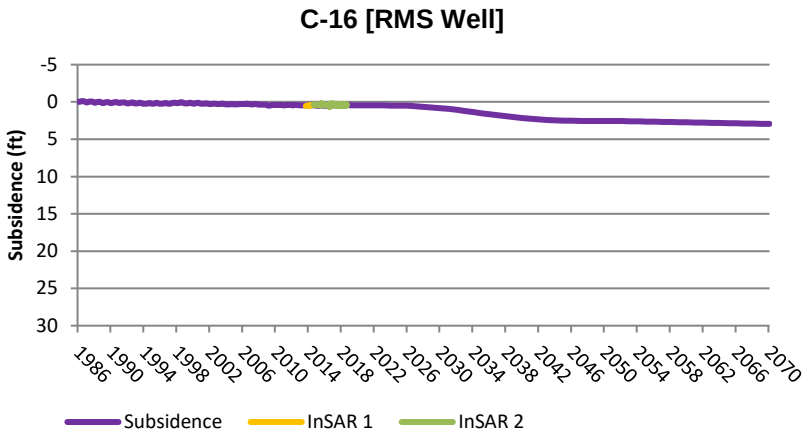


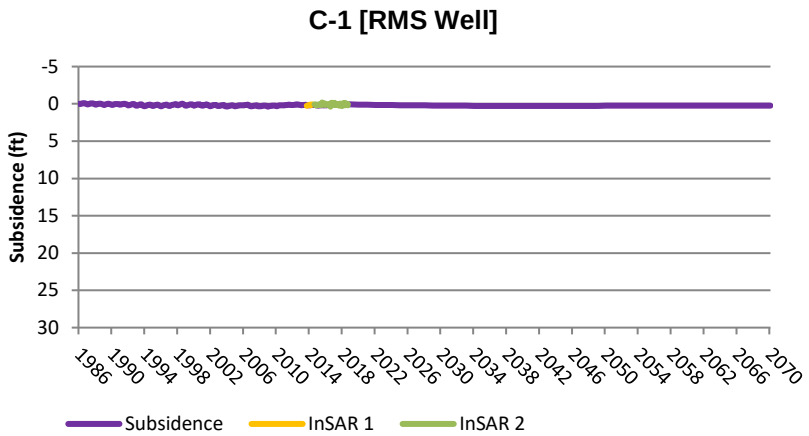
Sub-06

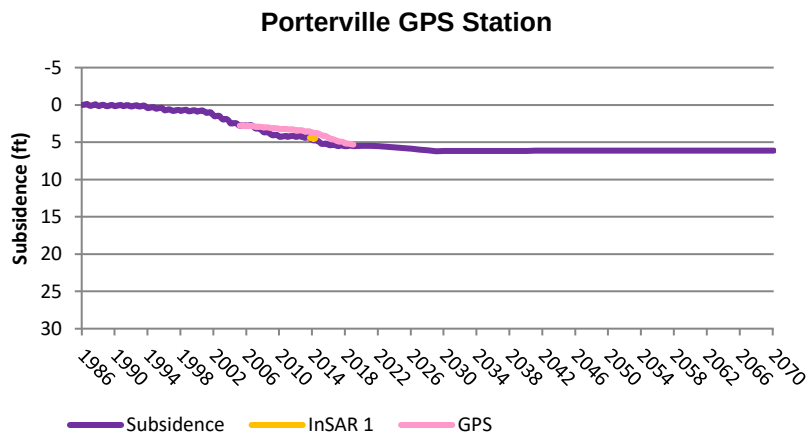


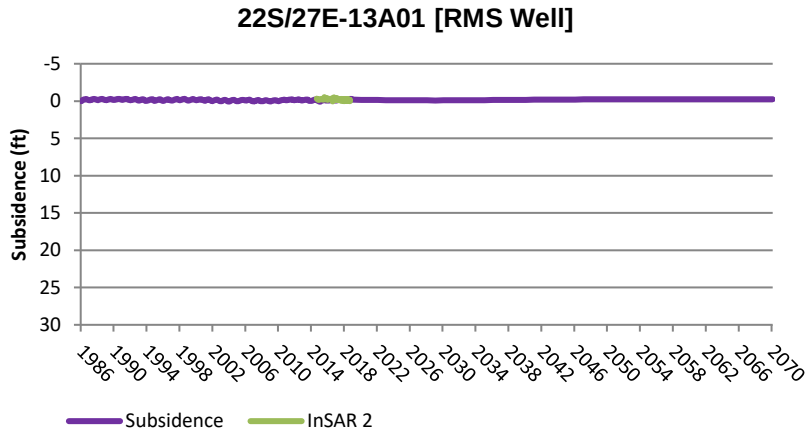
Sub-35

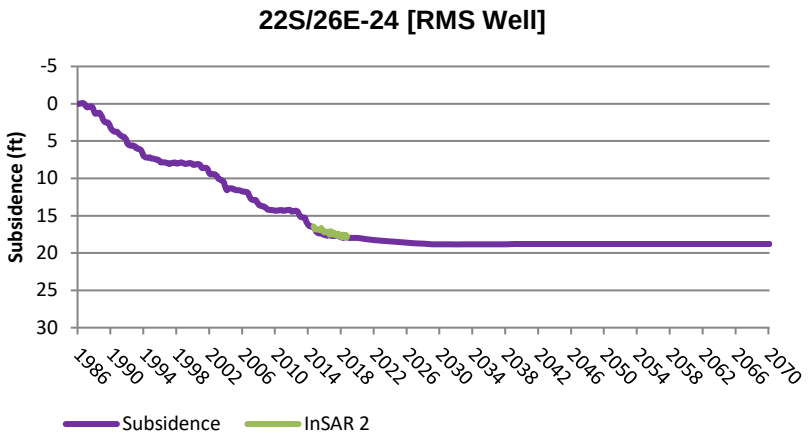


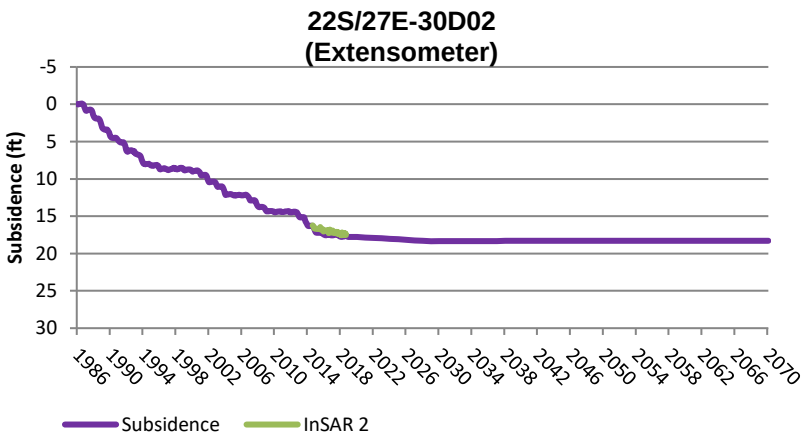

C-16 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2

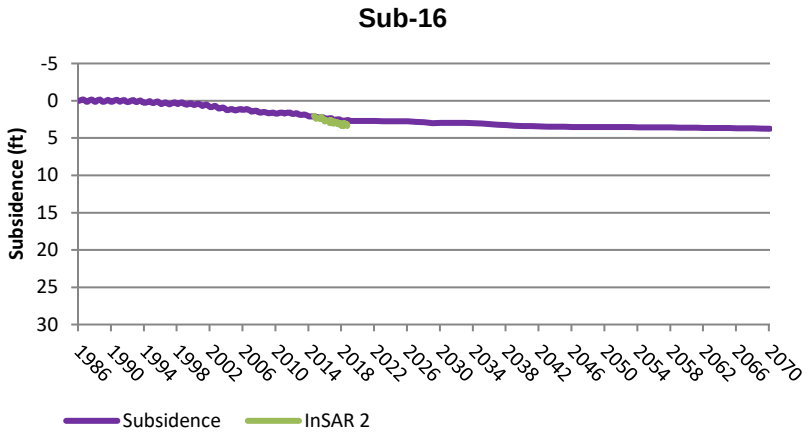

C-1 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2

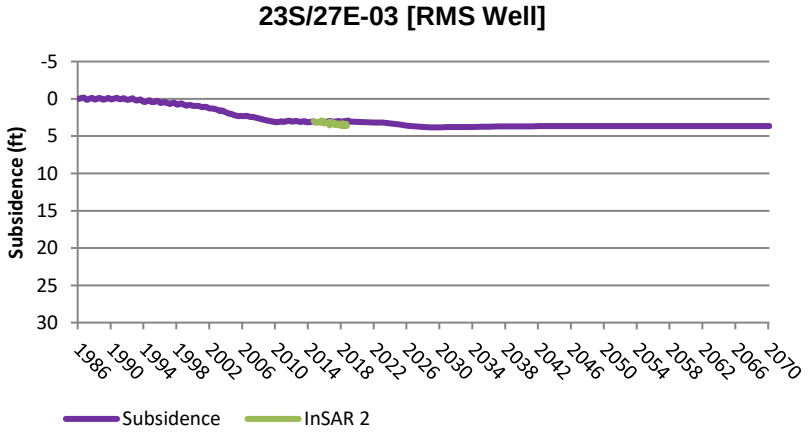

Porterville GPS Station
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
GPS

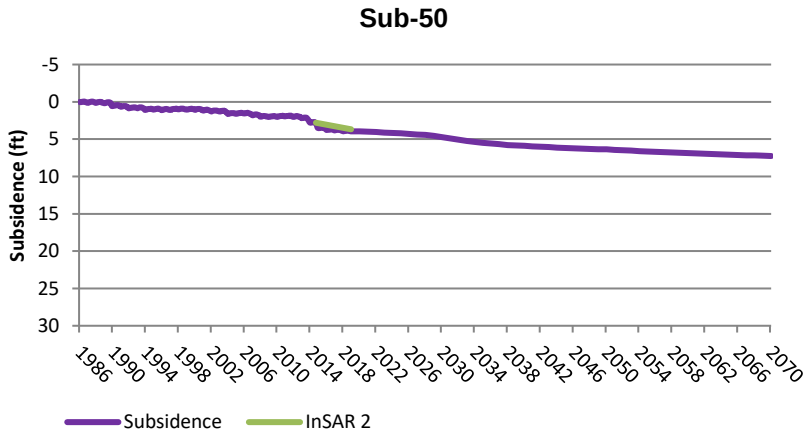

22S/27E-13A01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

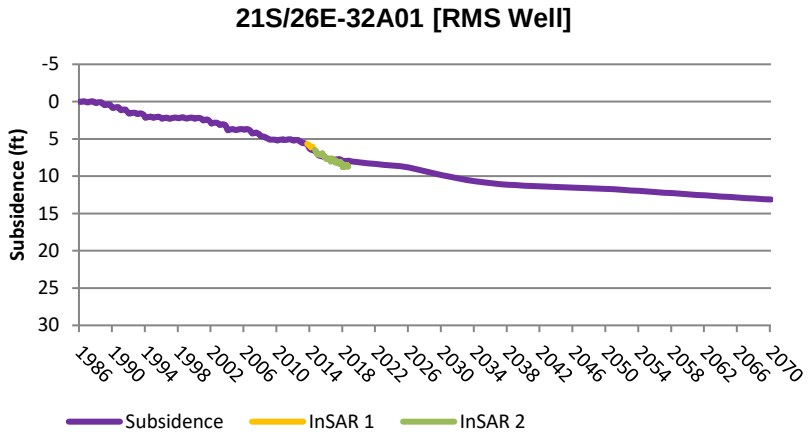

22S/26E-24 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

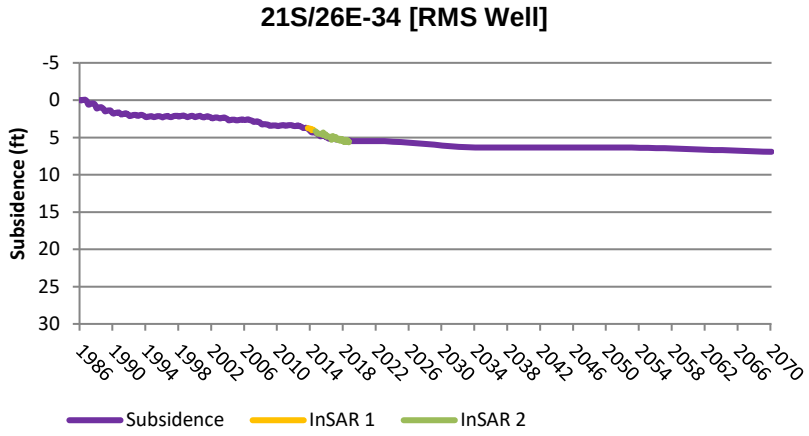

22S/27E-30D02
(Extensometer)
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

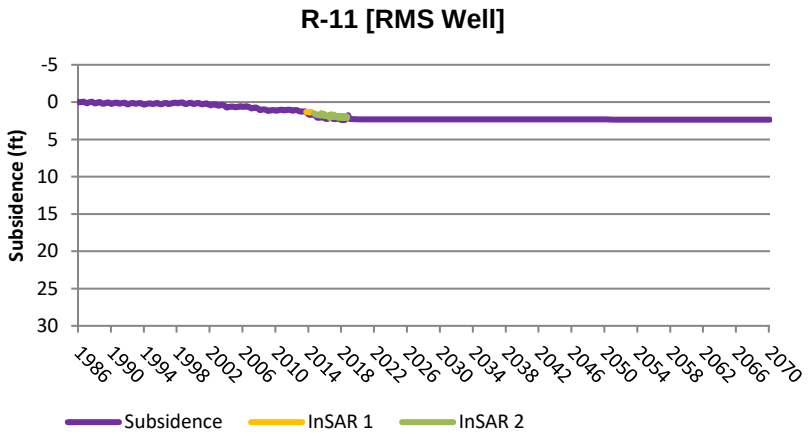

Sub-16
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

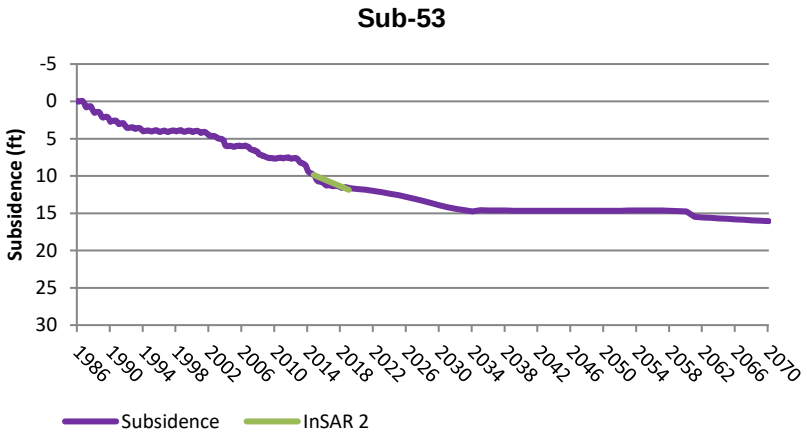

23S/27E-03 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

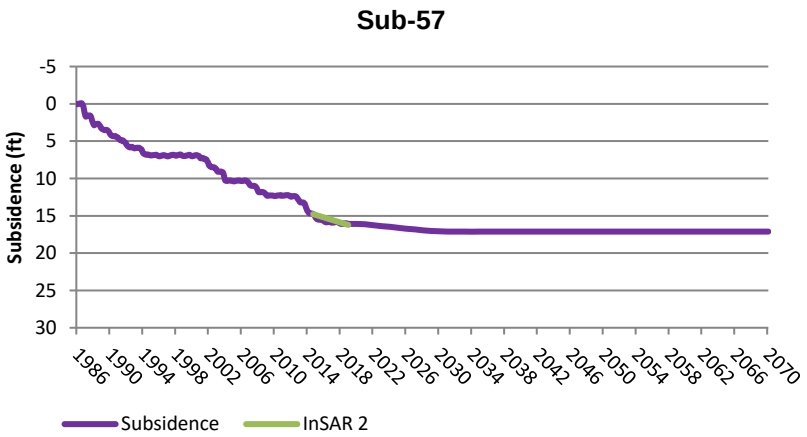

Sub-50
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

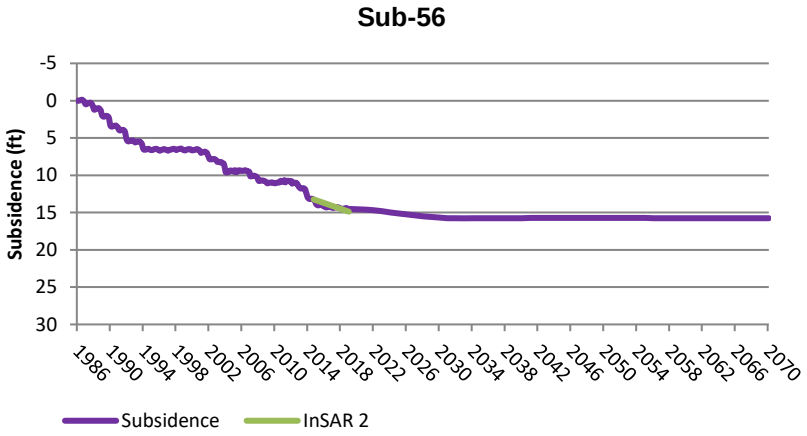

21S/26E-32A01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2


21S/26E-34 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2

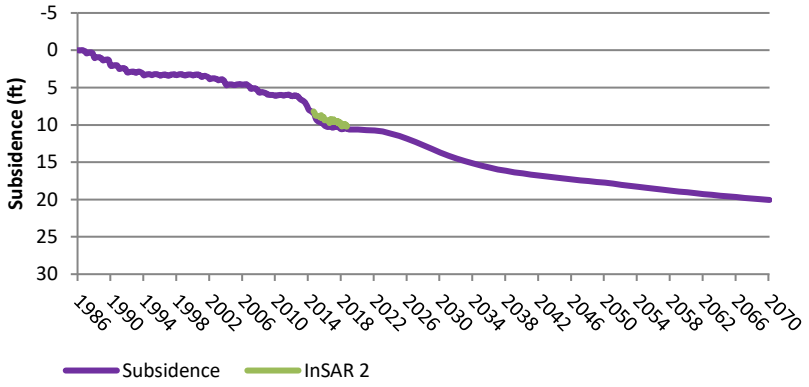

R-11 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2


Sub-53
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

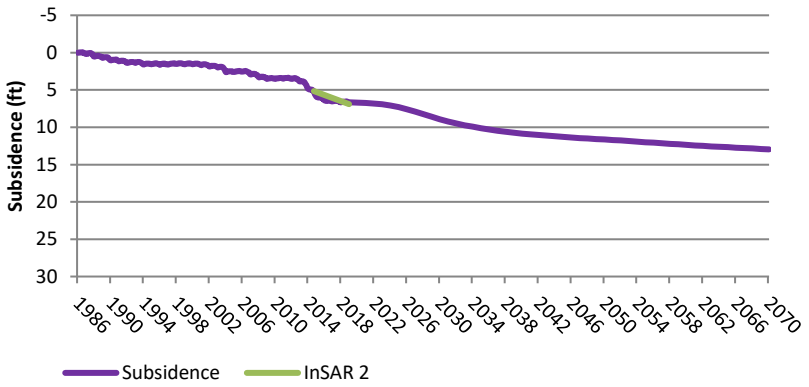

Sub-57
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


Sub-56
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

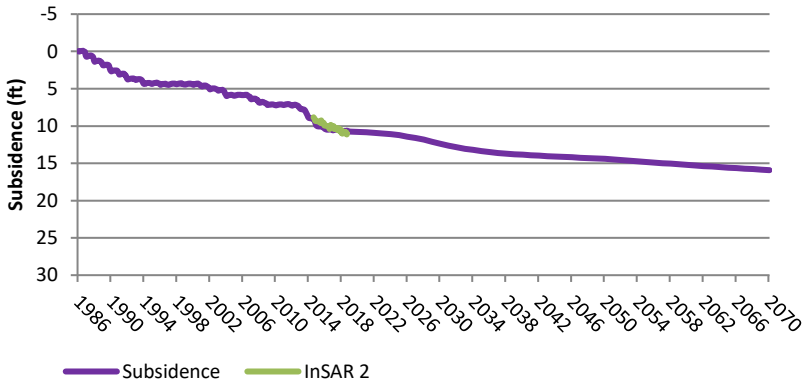
Sub-10

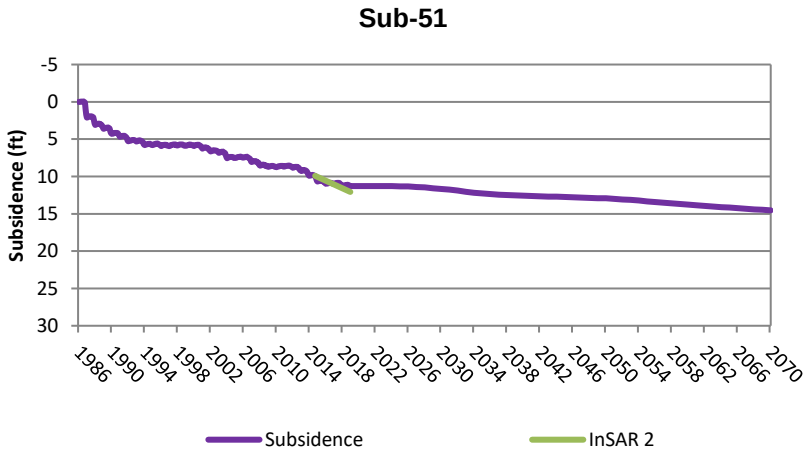


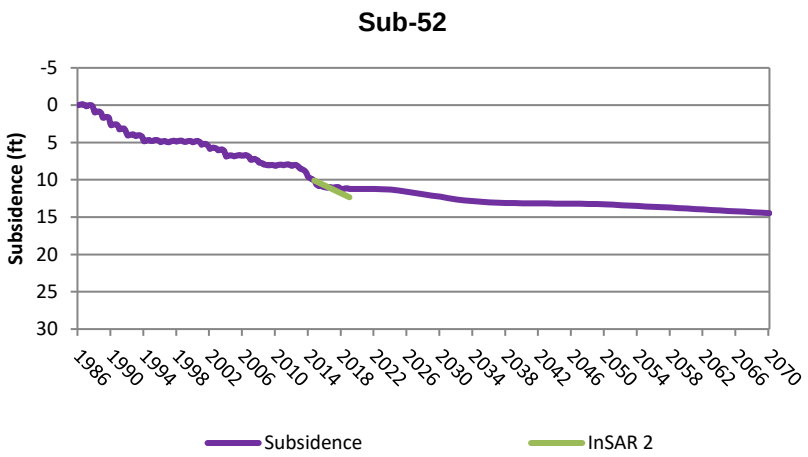
Sub-49

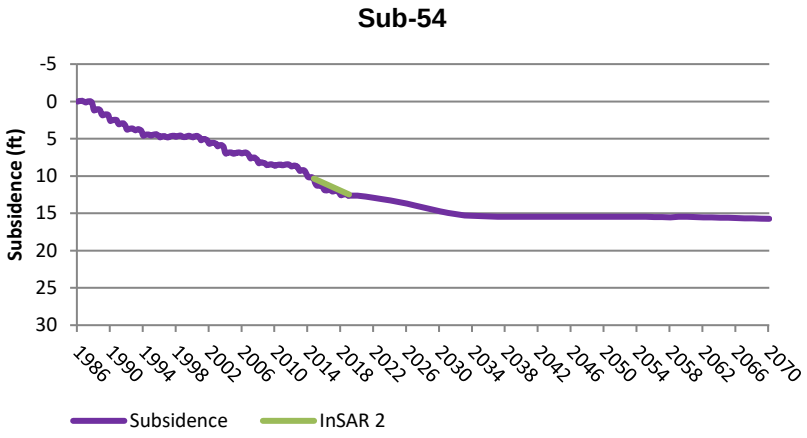


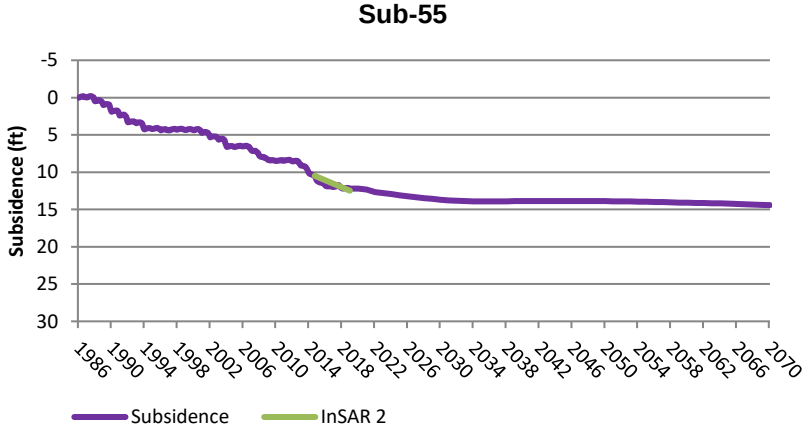
21S/25E-36 [RMS Well]

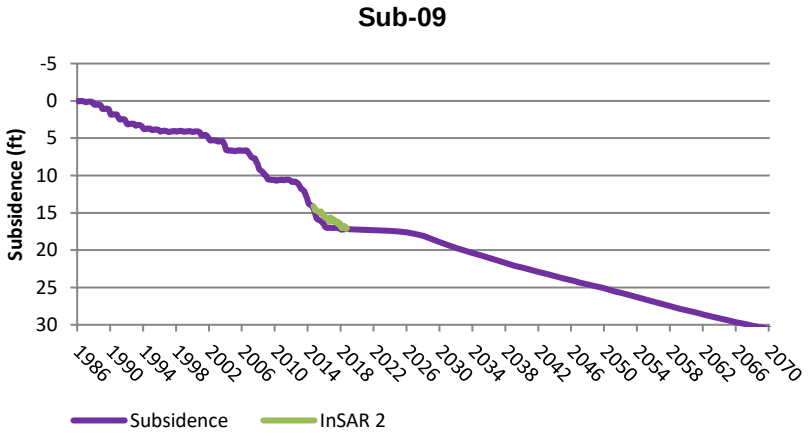


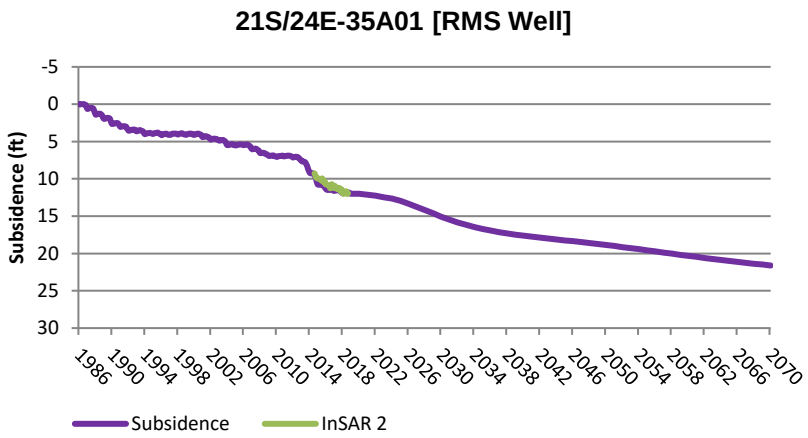

Sub-51
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

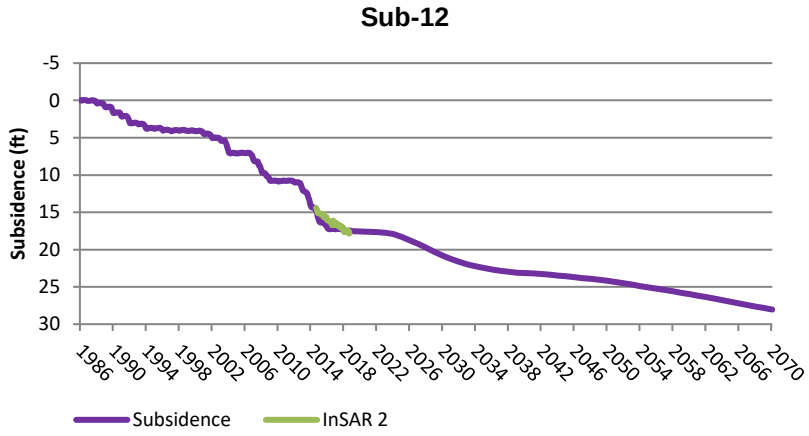

Sub-52
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

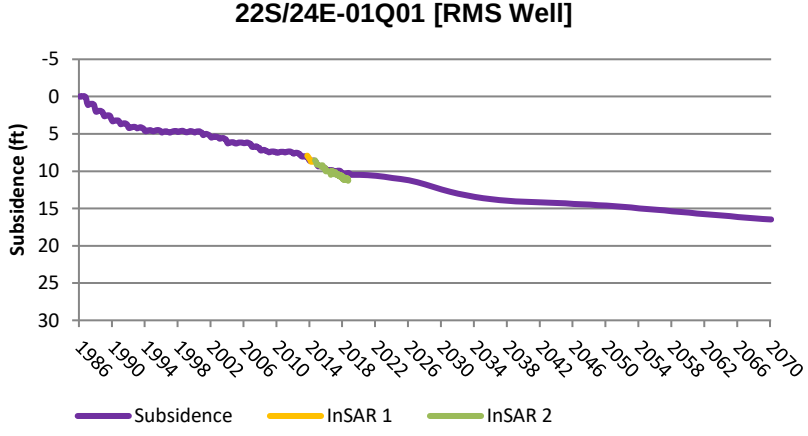

Sub-54
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


Sub-55
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

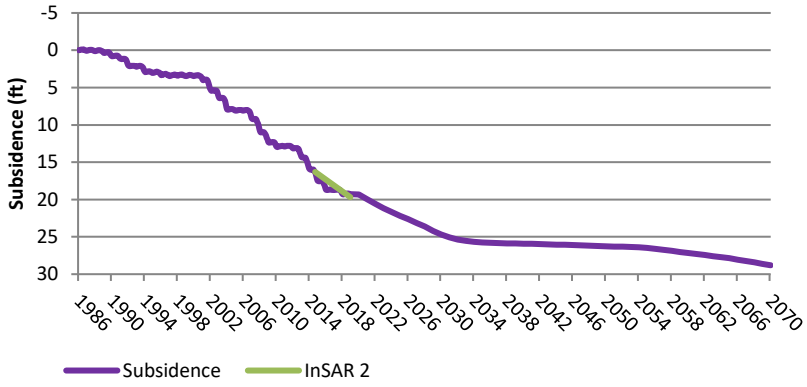

Sub-09
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


21S/24E-35A01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

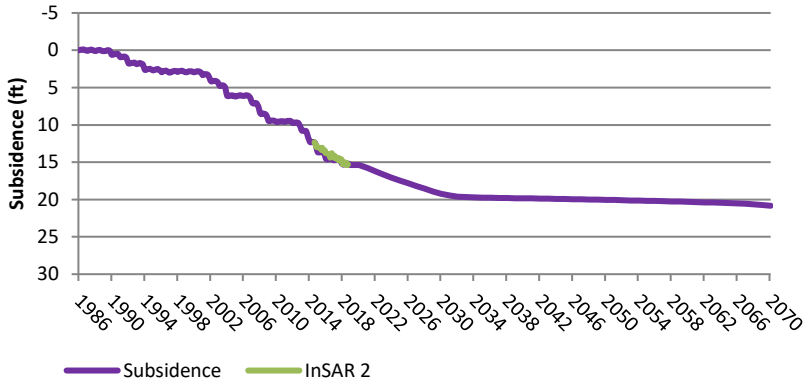

Sub-12
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


22S/24E-01Q01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2

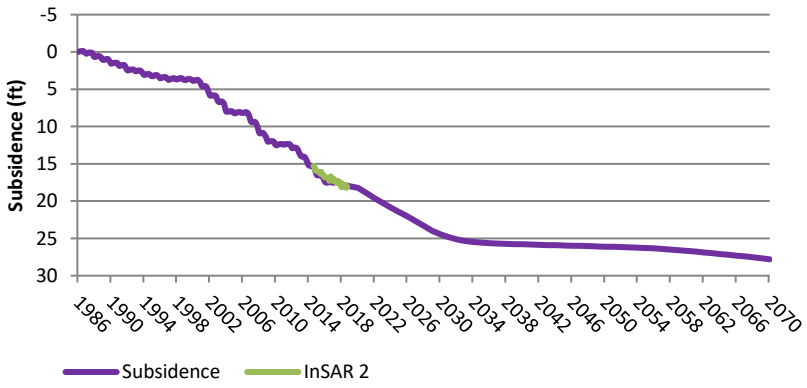
Sub-43



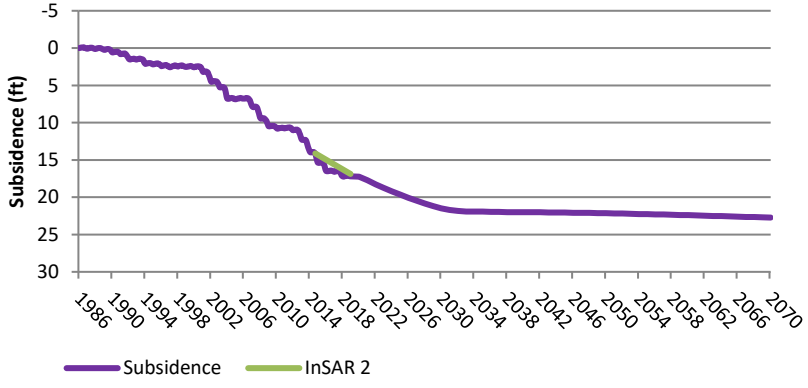
22S/24E-23J01 [RMS Well]

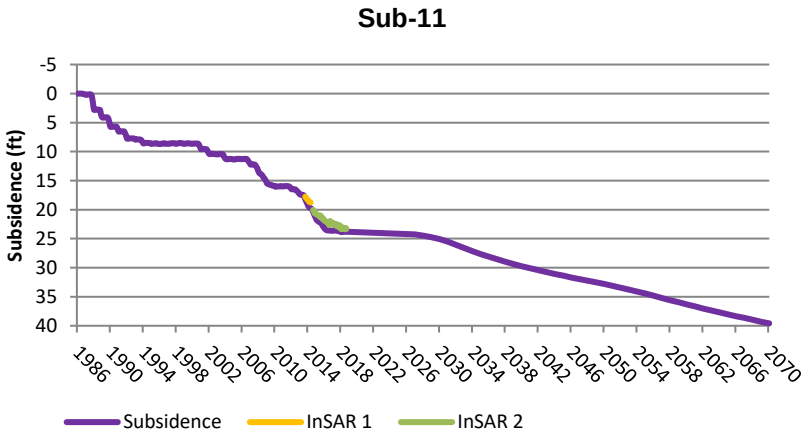


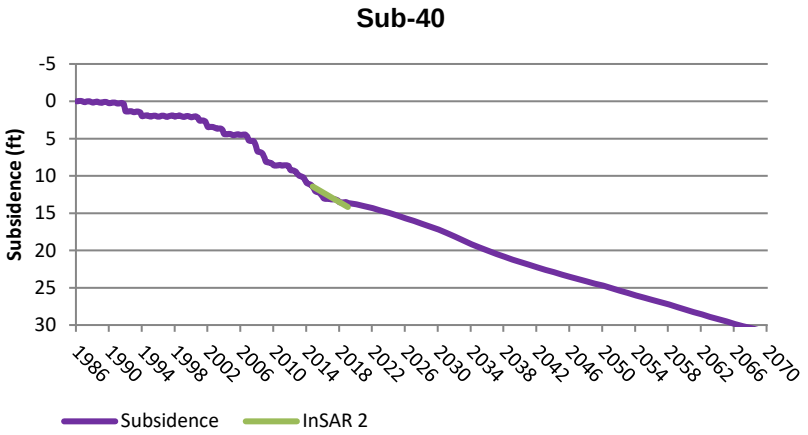
Sub-14

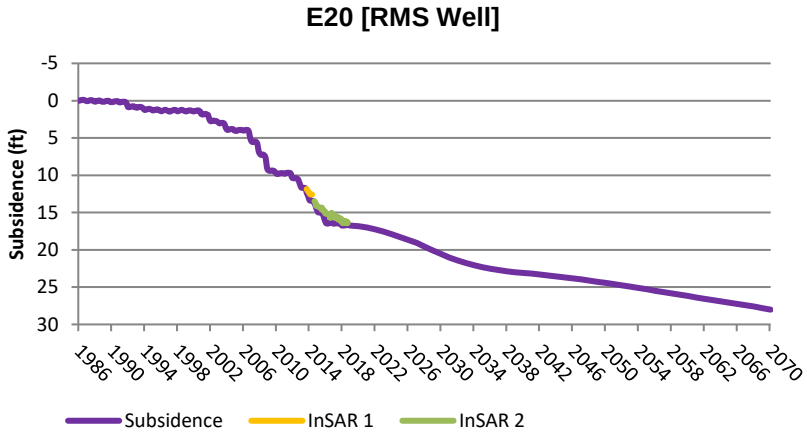


Sub-44

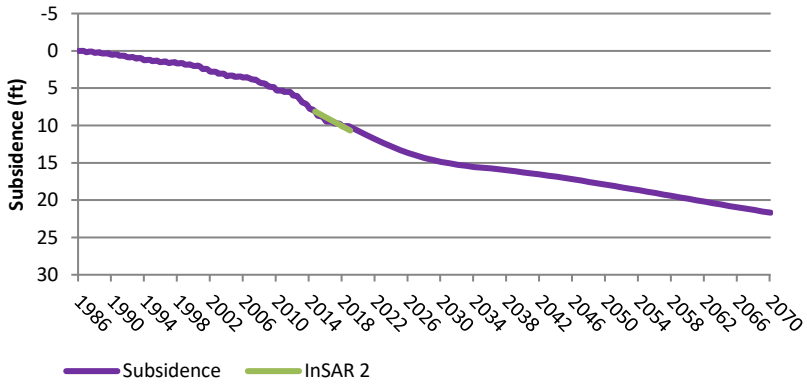



Sub-11
Subsidence (ft)
-5
0
5
10
15
20
25
30
35
40
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 1
InSAR 2

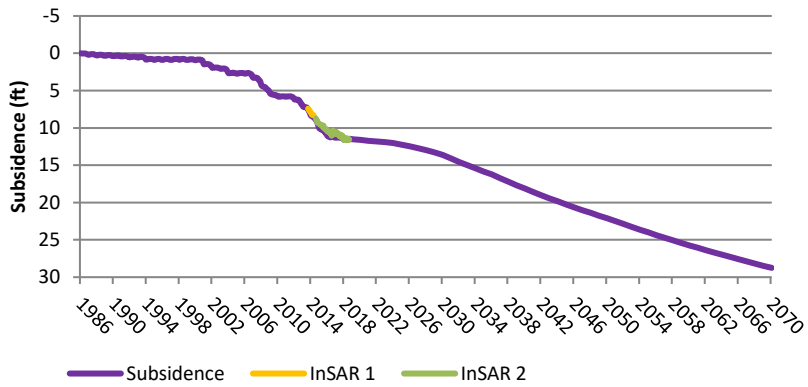

Sub-40
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 2


E20 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 1
InSAR 2

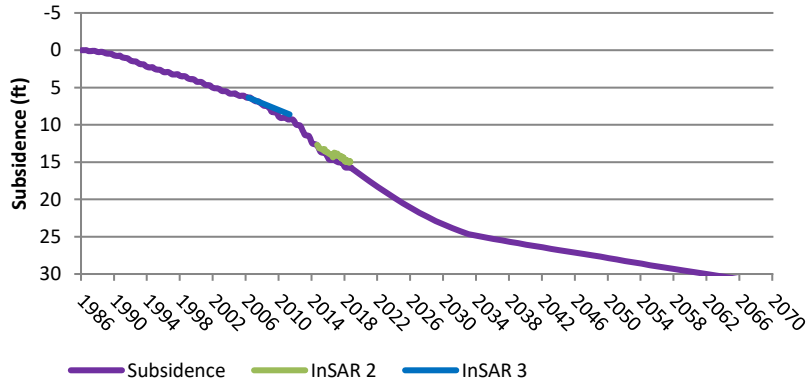
Sub-36



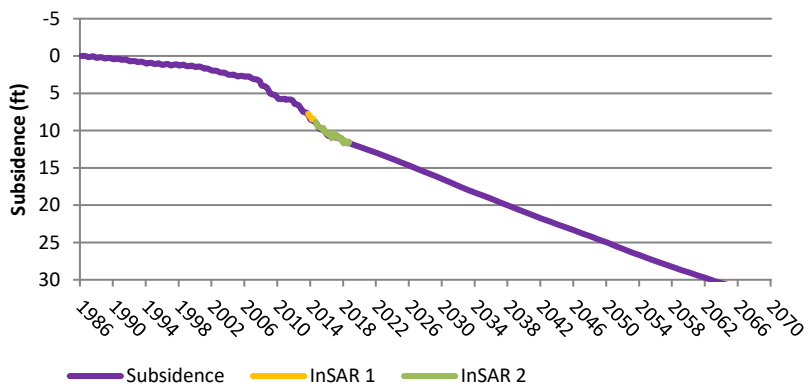
21S/23E-32K01 [RMS Well]

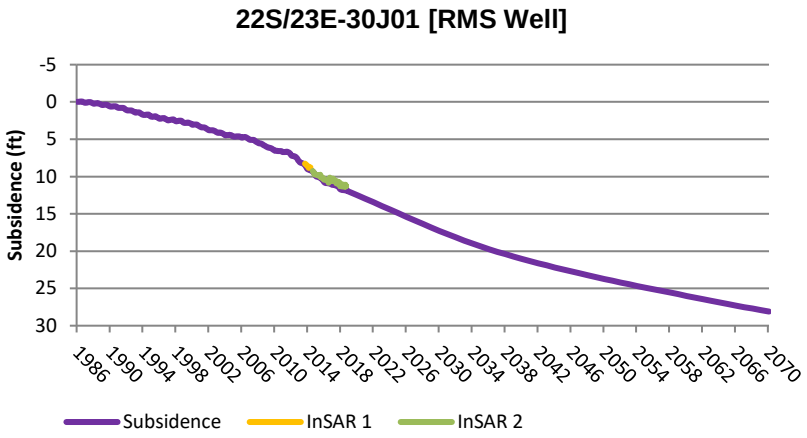


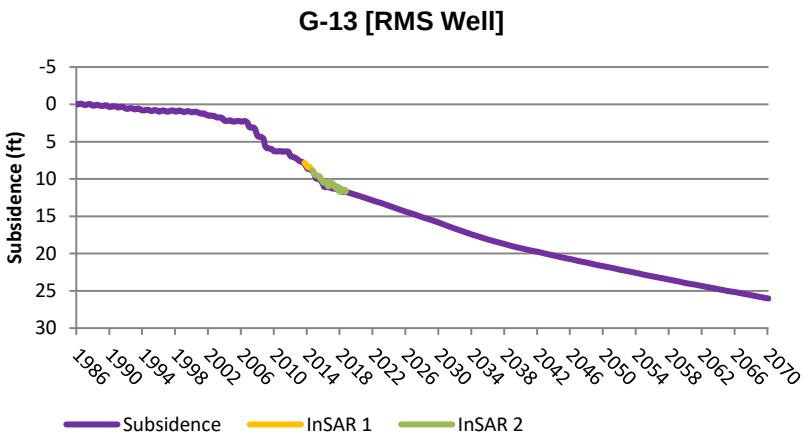
Sub-13

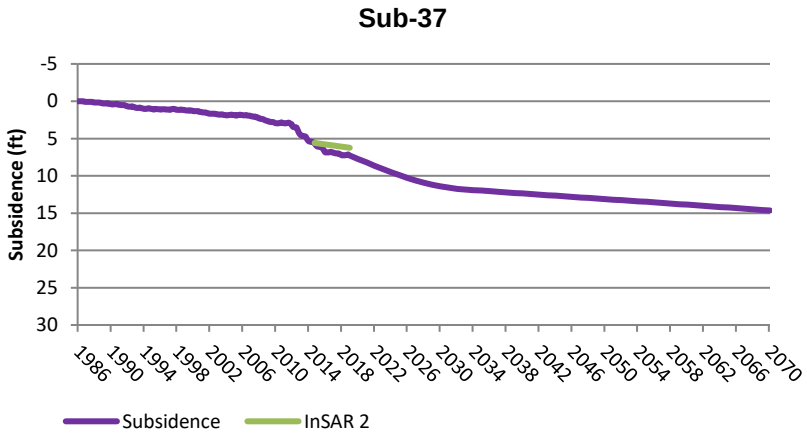


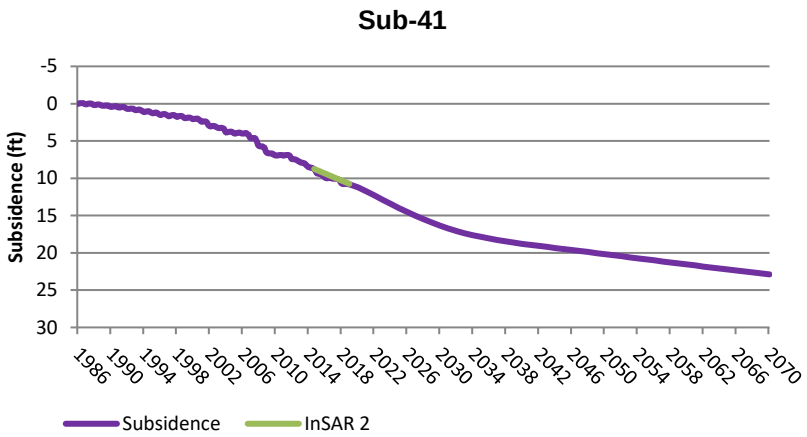
22S/23E-07 [RMS Well]

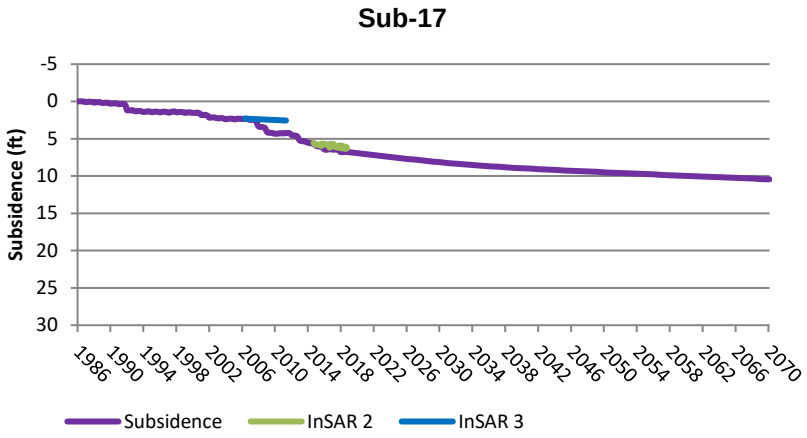


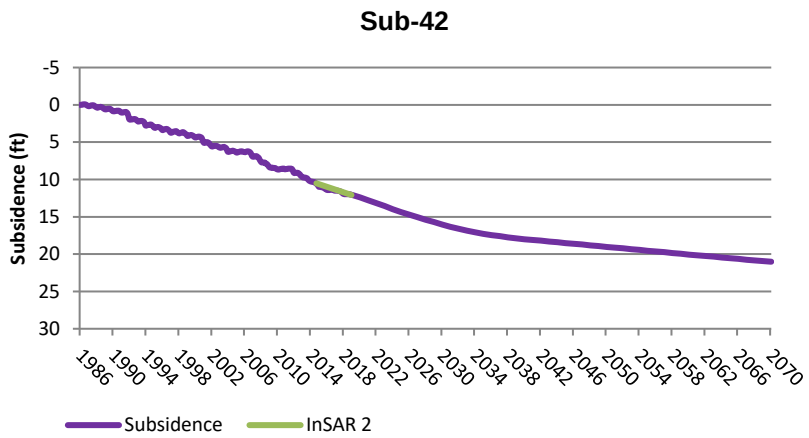

22S/23E-30J01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2

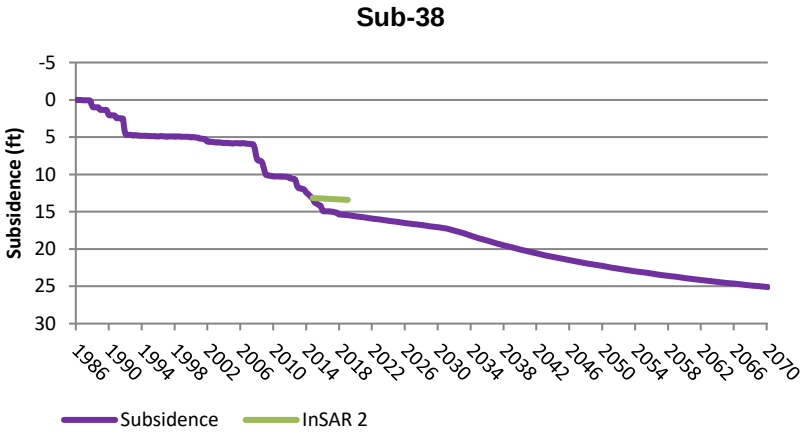

G-13 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 1
InSAR 2

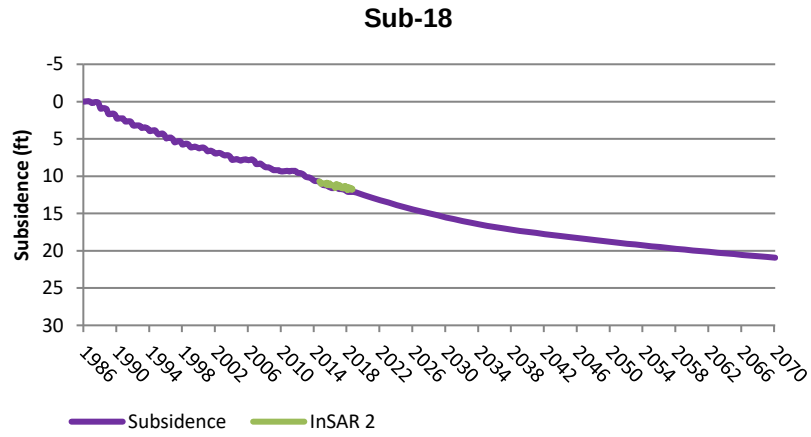

Sub-37
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

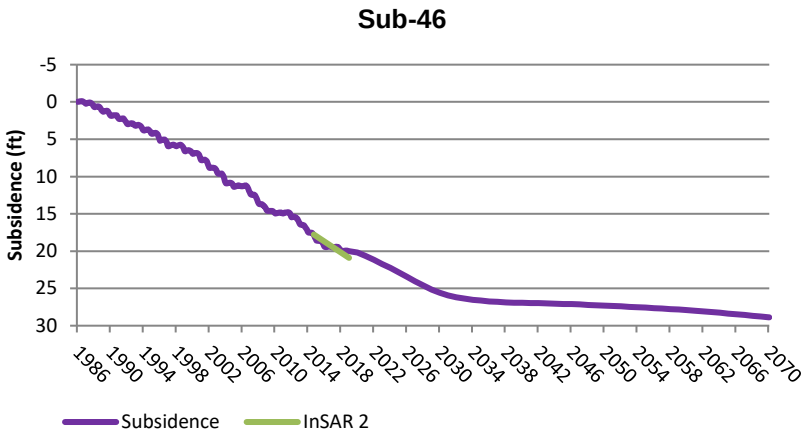

Sub-41
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

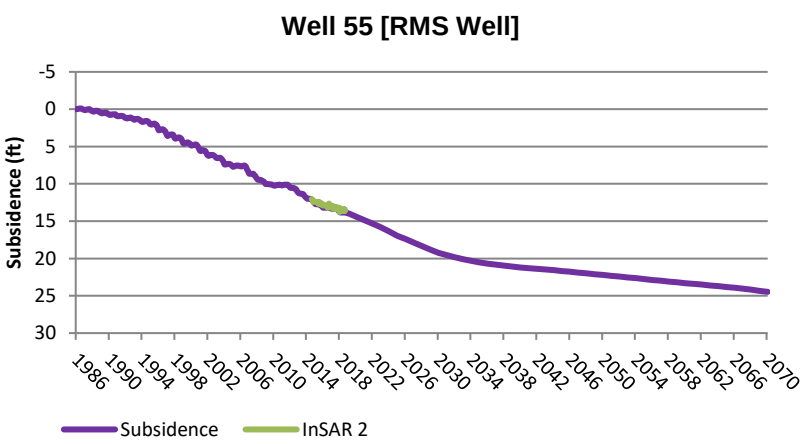

Sub-17
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2
InSAR 3

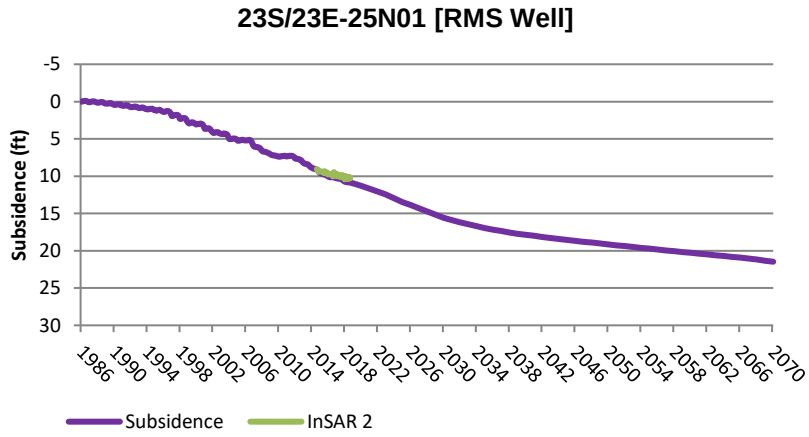

Sub-42
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

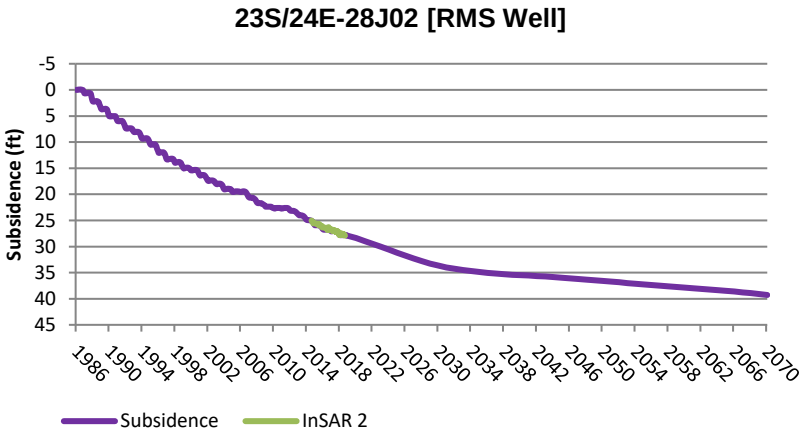

Sub-38
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

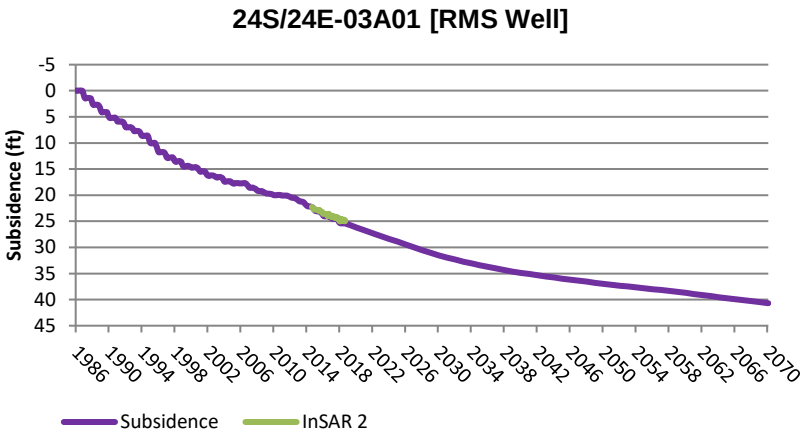

Sub-18
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

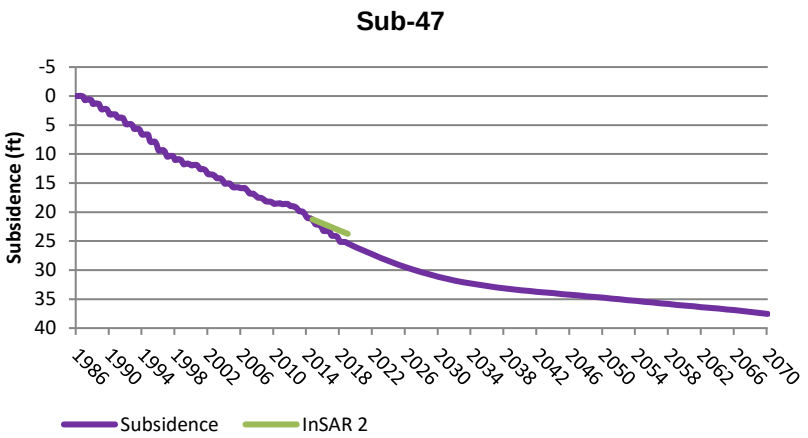

Sub-46
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

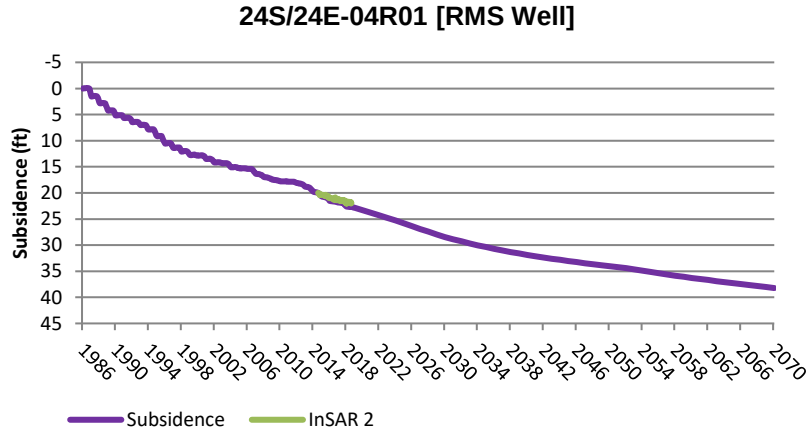

Well 55 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

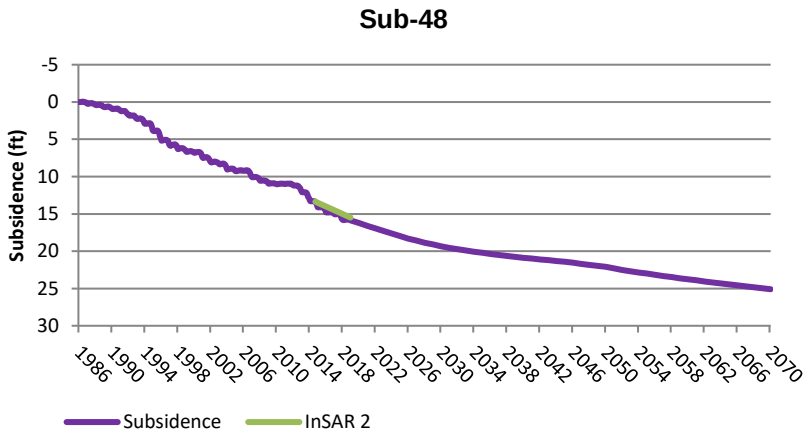

23S/23E-25N01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


23S/24E-28J02 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
35
40
45
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

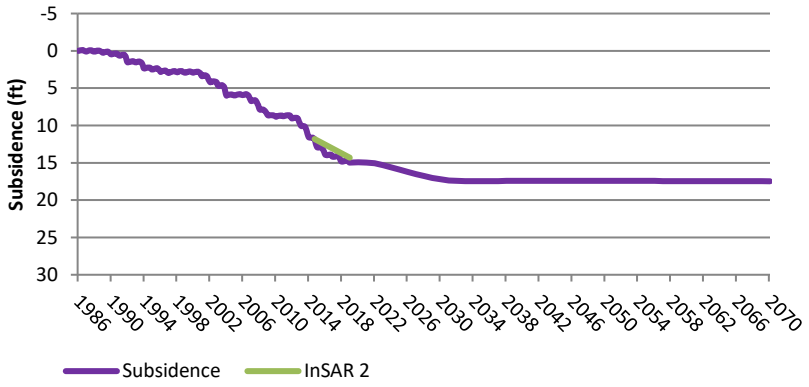

24S/24E-03A01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
35
40
45
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 2


Sub-47
Subsidence (ft)
-5
0
5
10
15
20
25
30
35
40
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 2

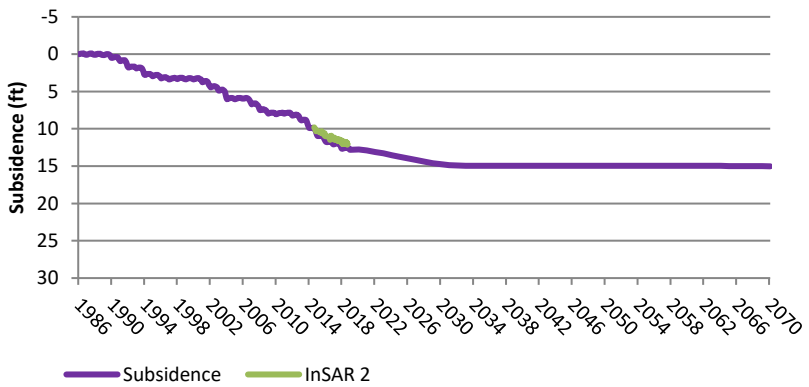

24S/24E-04R01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
35
40
45
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 2


Sub-48
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 2

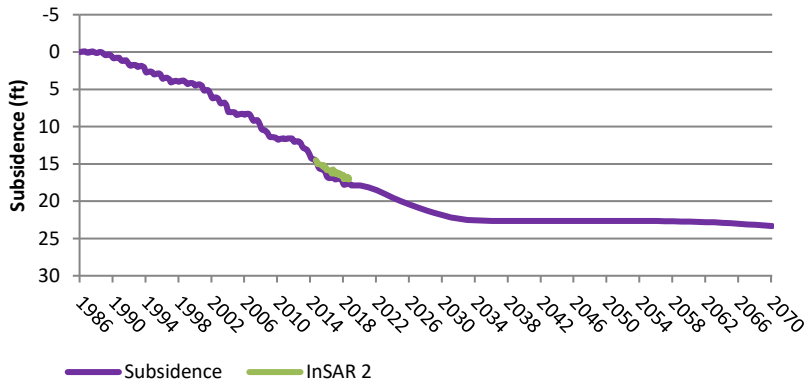
Sub-45



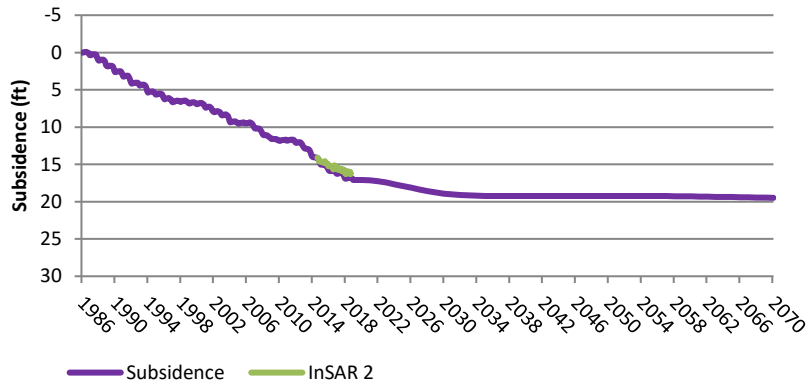
22S/25E-32K01 [RMS Well]

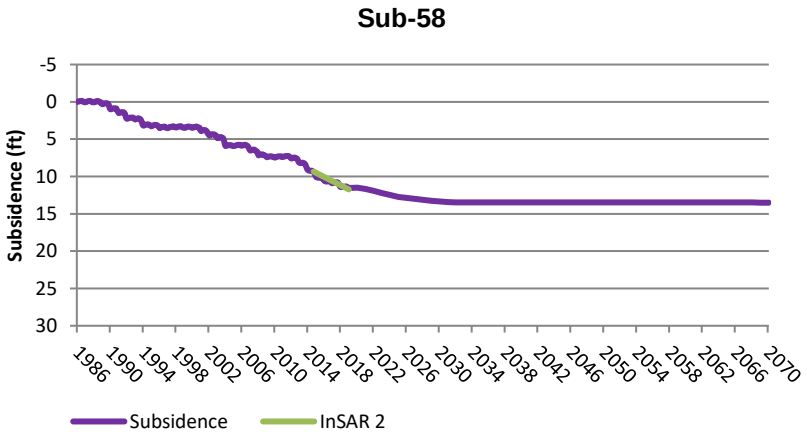


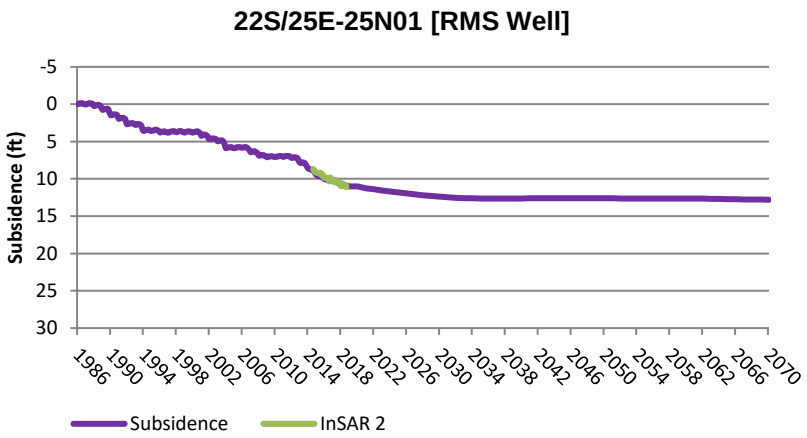
Sub-15

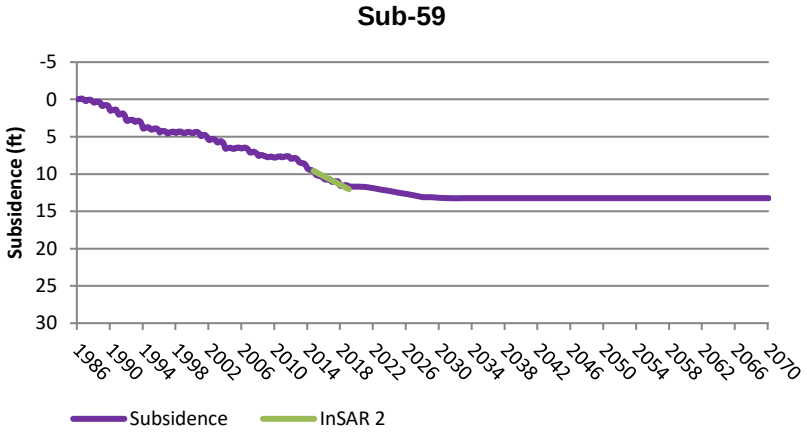


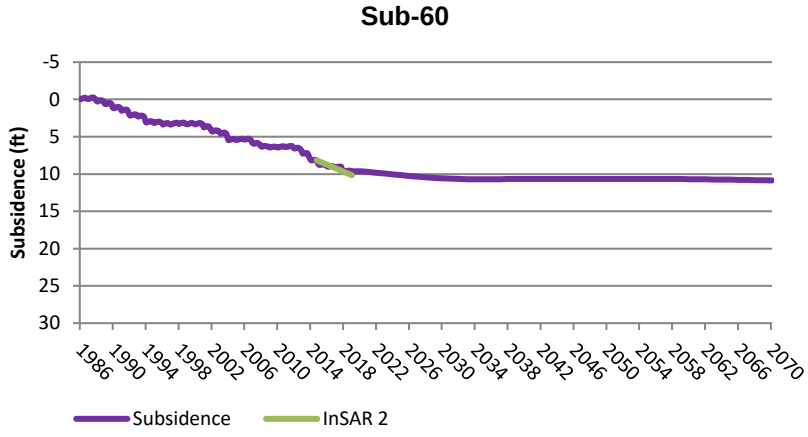
23S/25E-16N04 [RMS Well]

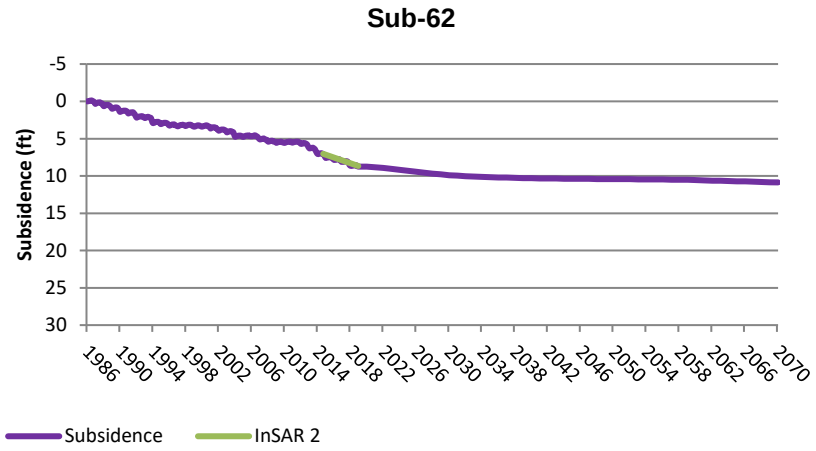


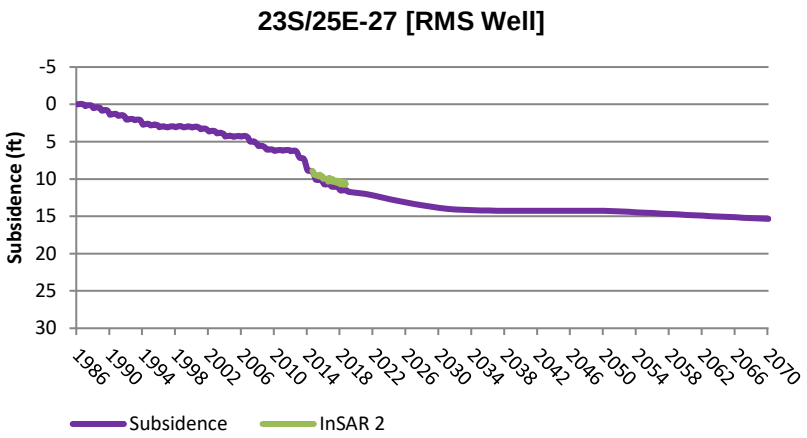

Sub-58
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

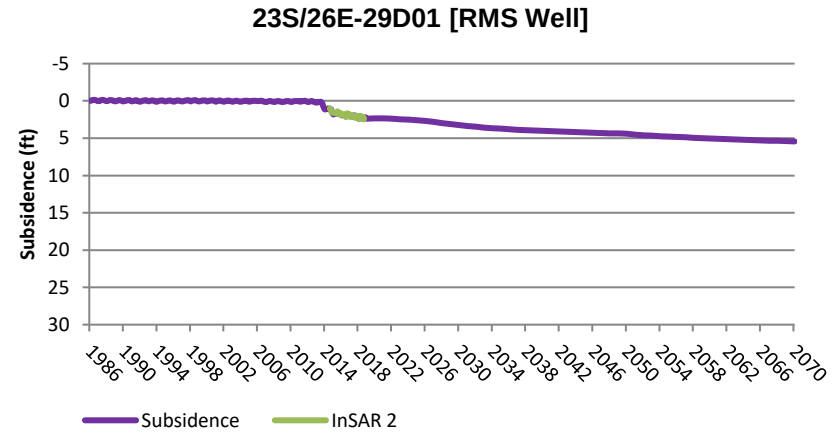

22S/25E-25N01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

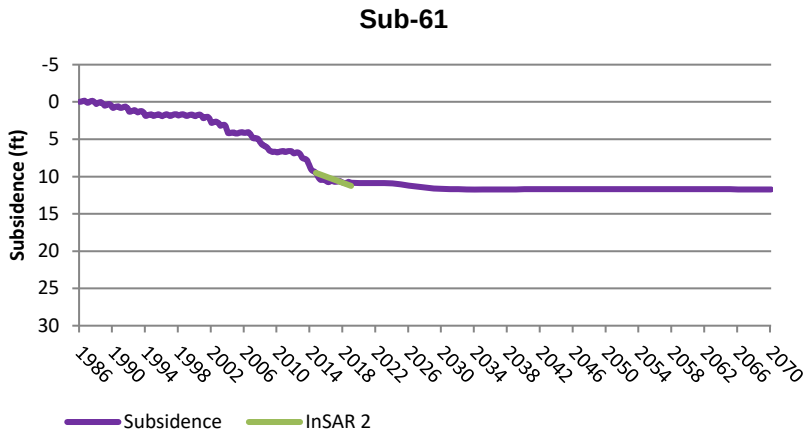

Sub-59
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

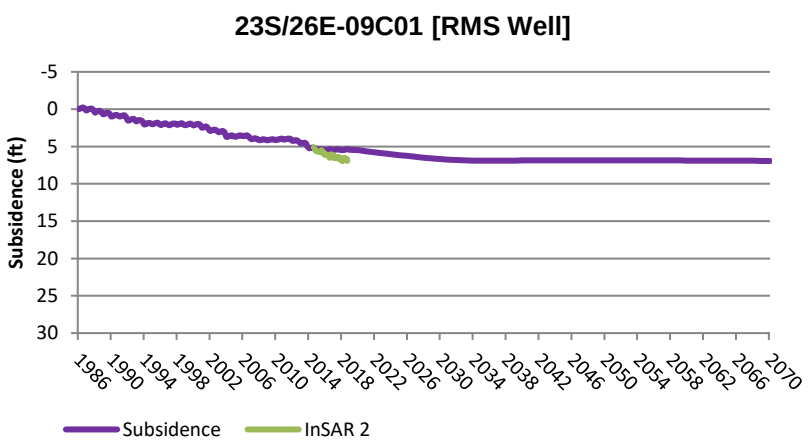

Sub-60
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

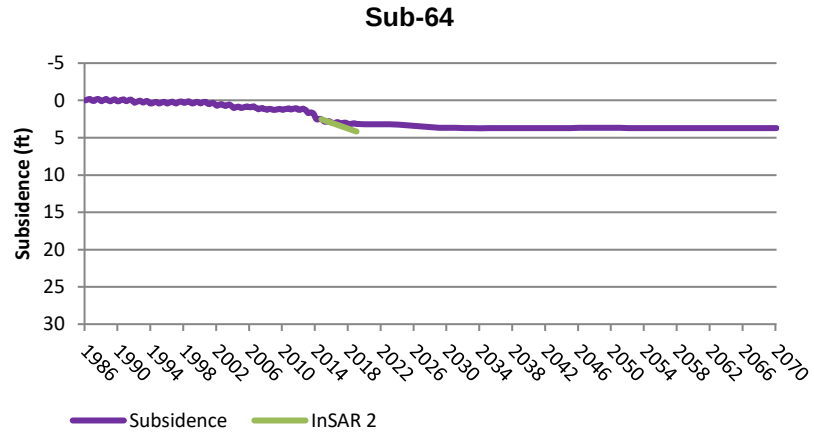

Sub-62
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

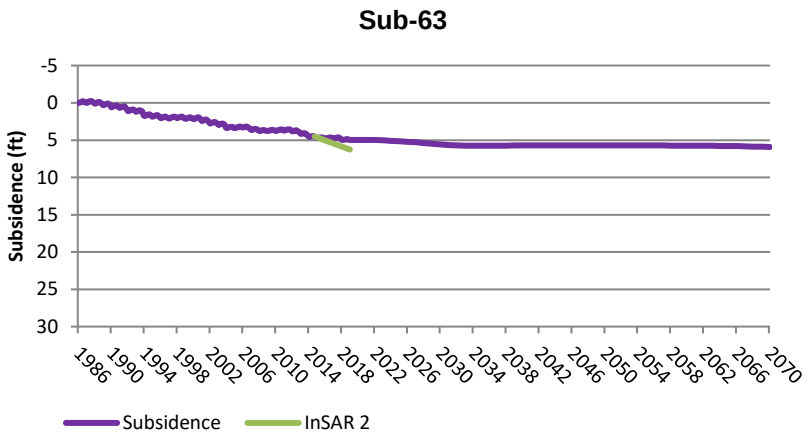

23S/25E-27 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

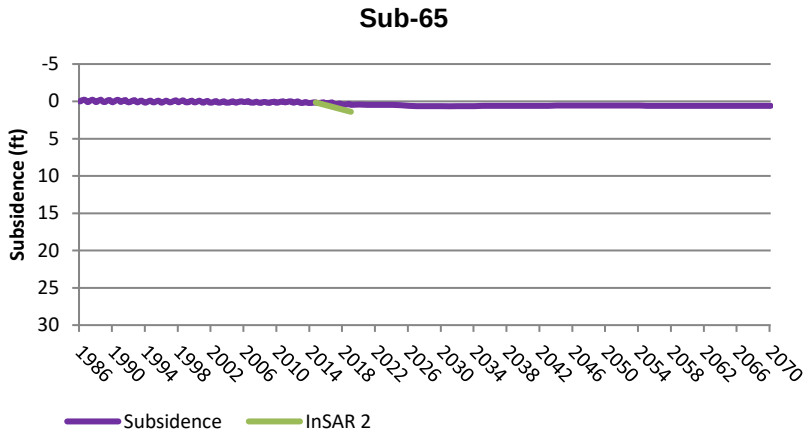

23S/26E-29D01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

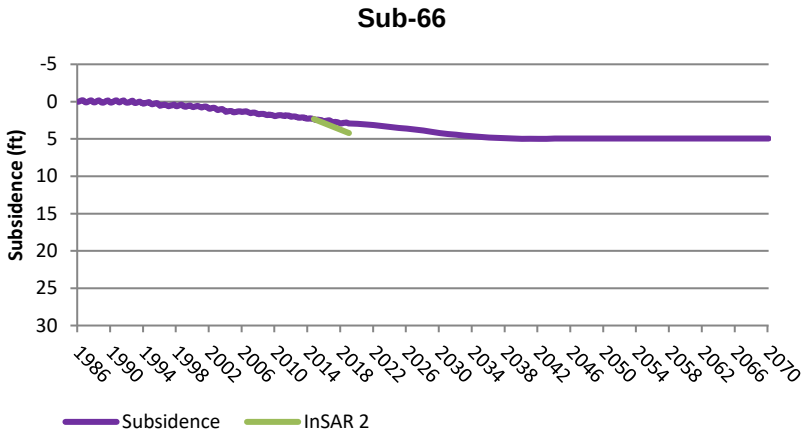

Sub-61
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

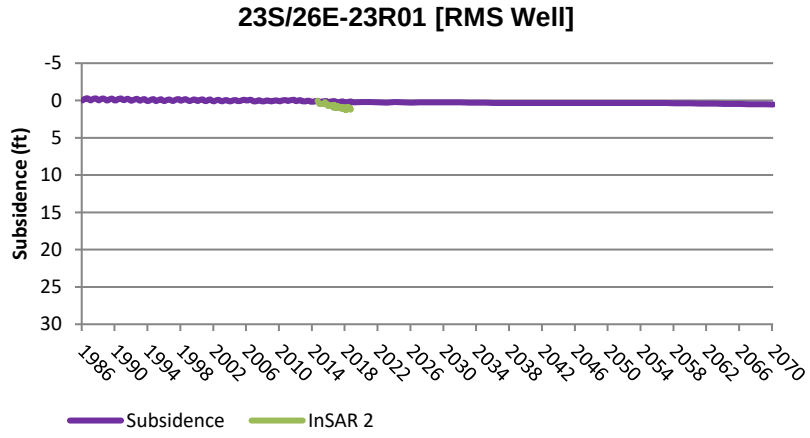

23S/26E-09C01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

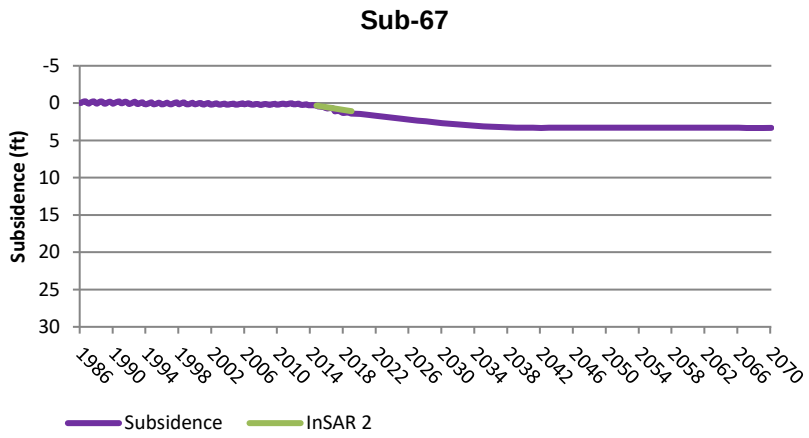

Sub-64
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

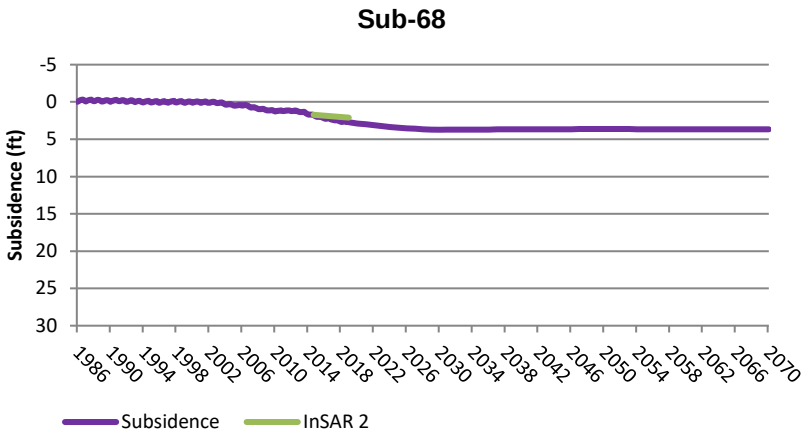

Sub-63
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

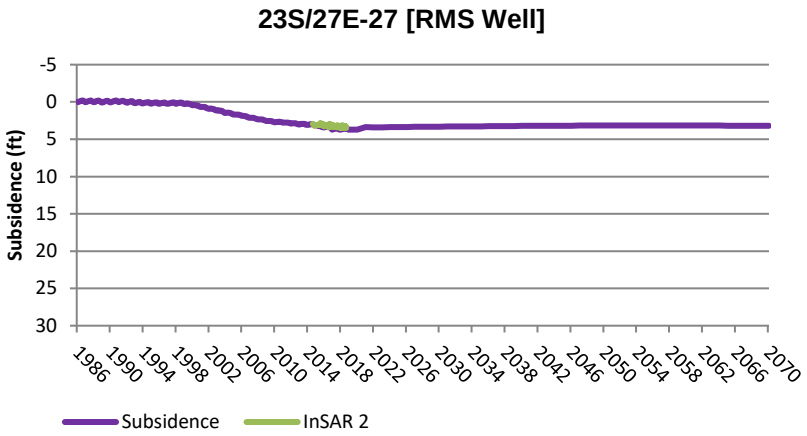

Sub-65
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

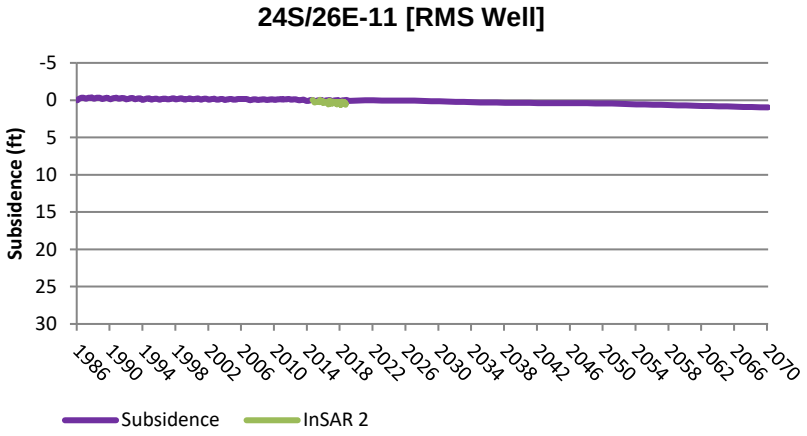

Sub-66
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

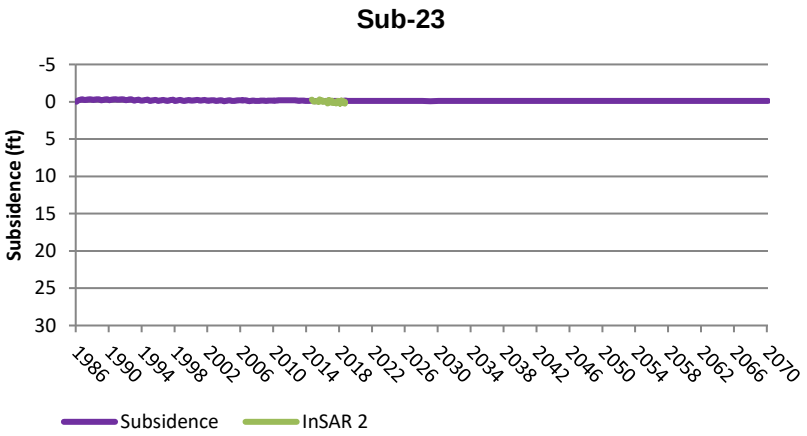

23S/26E-23R01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

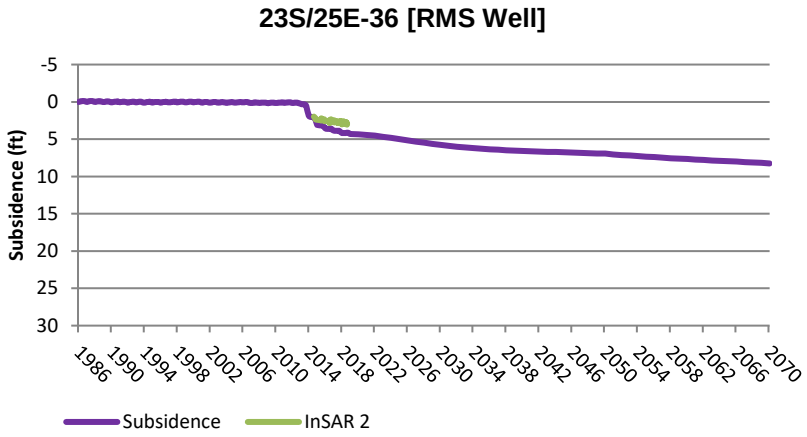

Sub-67
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

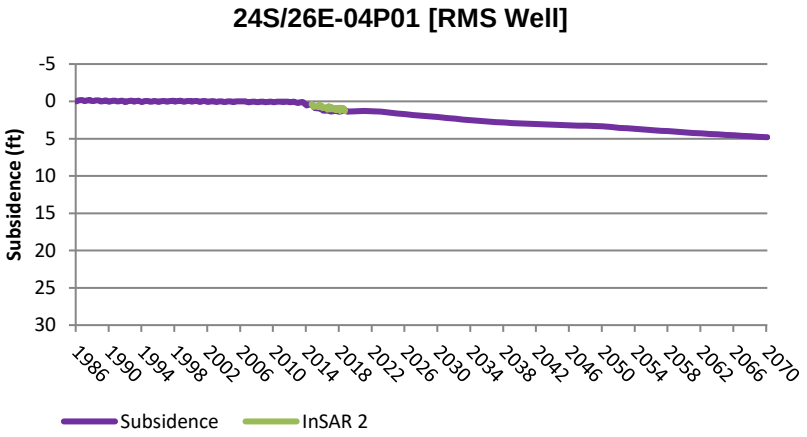

Sub-68
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

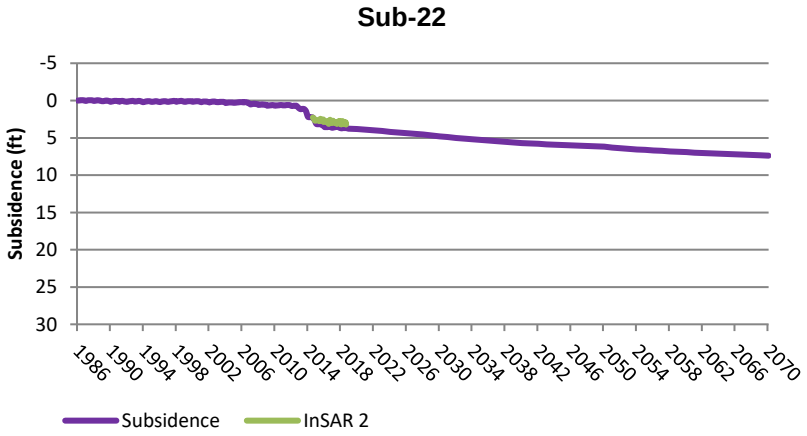

23S/27E-27 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

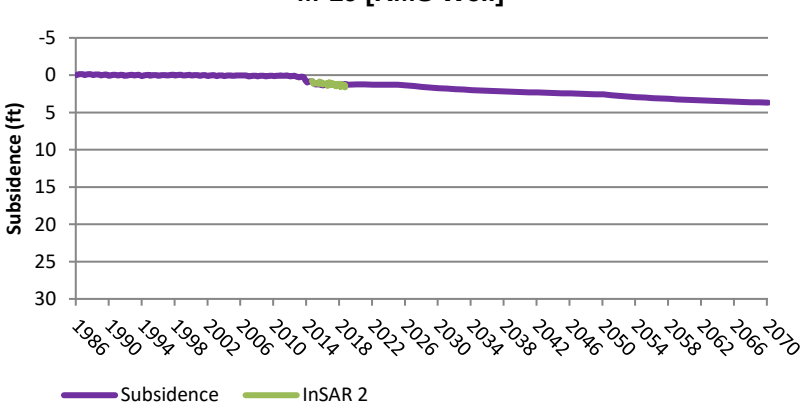

24S/26E-11 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

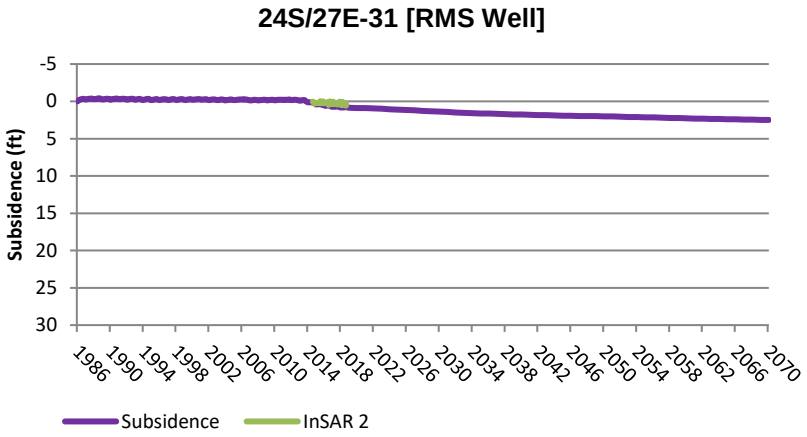

Sub-23
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

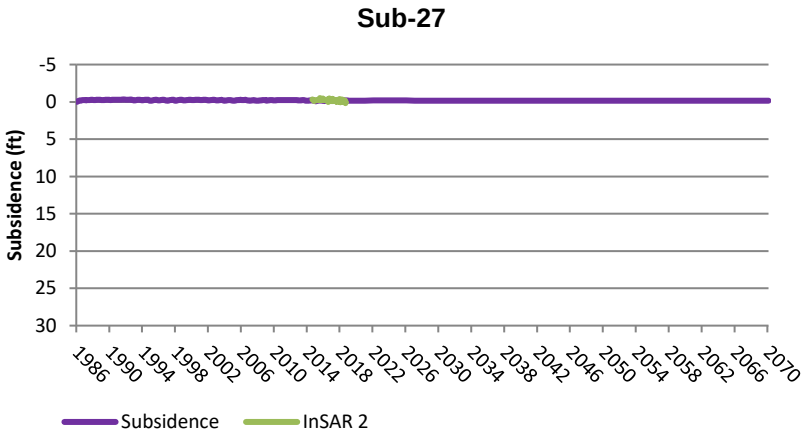

23S/25E-36 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

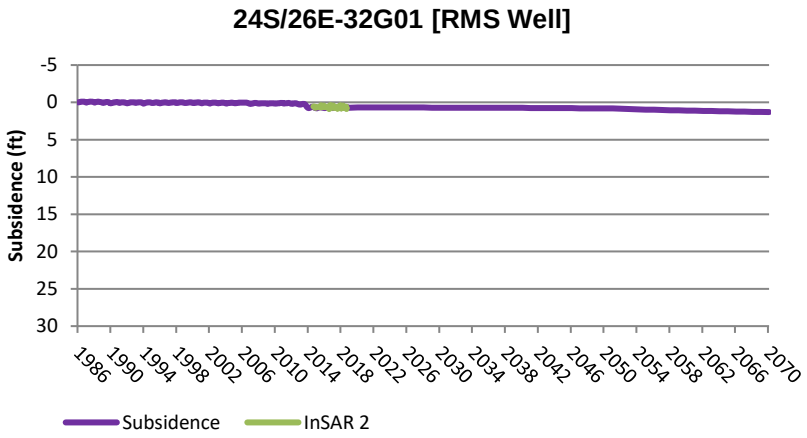

24S/26E-04P01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

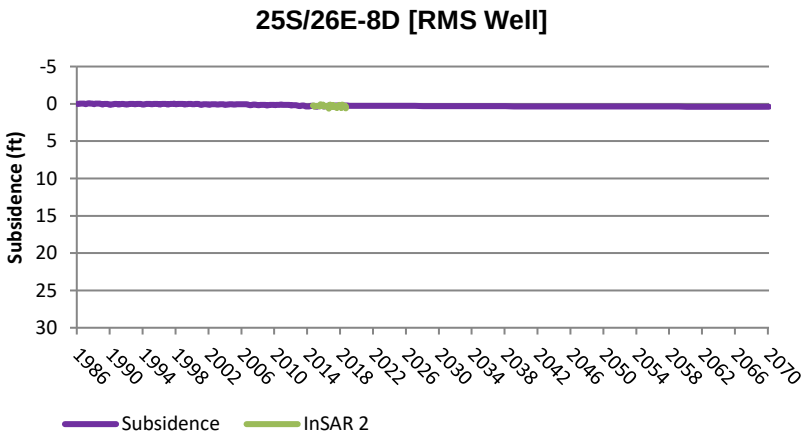

Sub-22
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

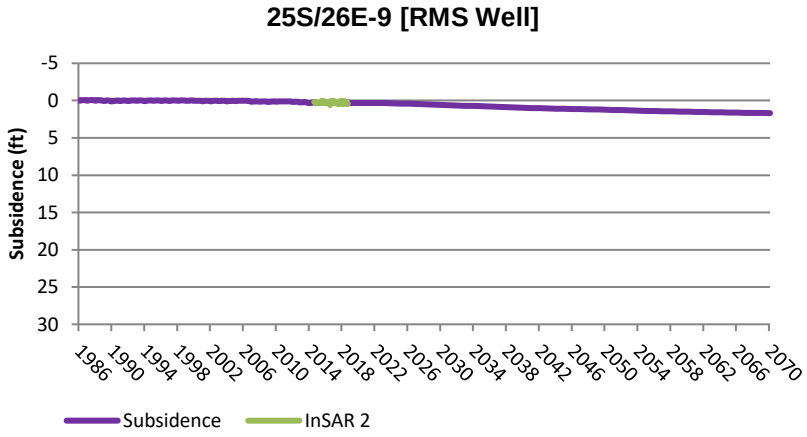

M-19 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

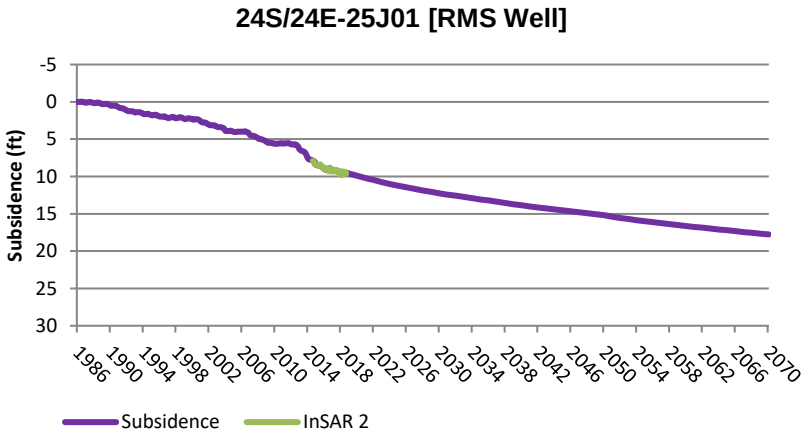

24S/27E-31 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 2

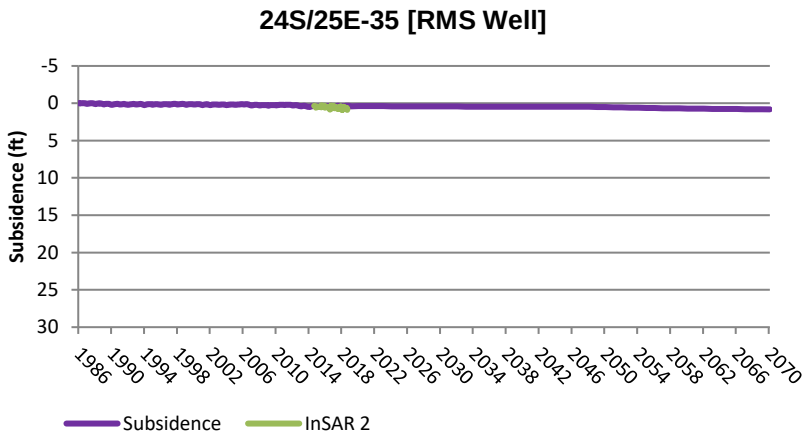

Sub-27
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence
InSAR 2

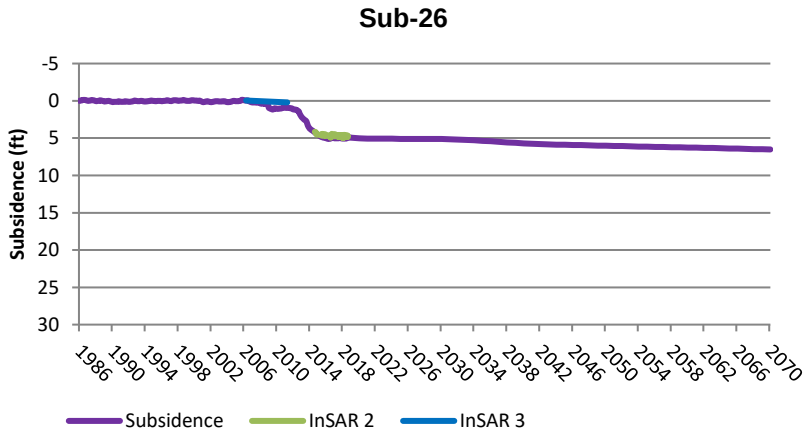

24S/26E-32G01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

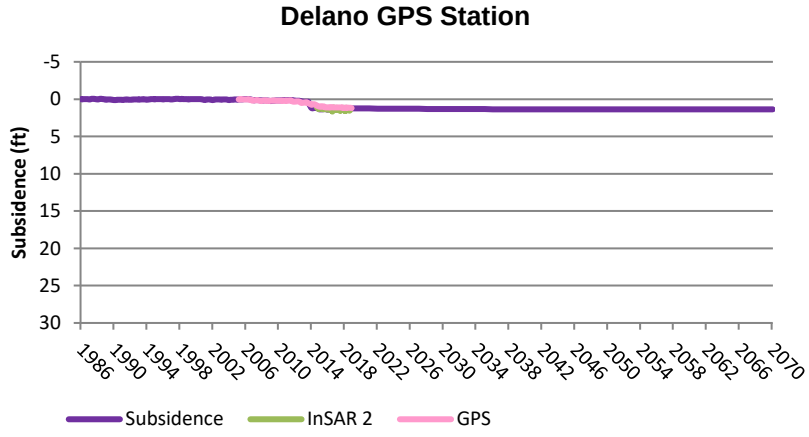

25S/26E-8D [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

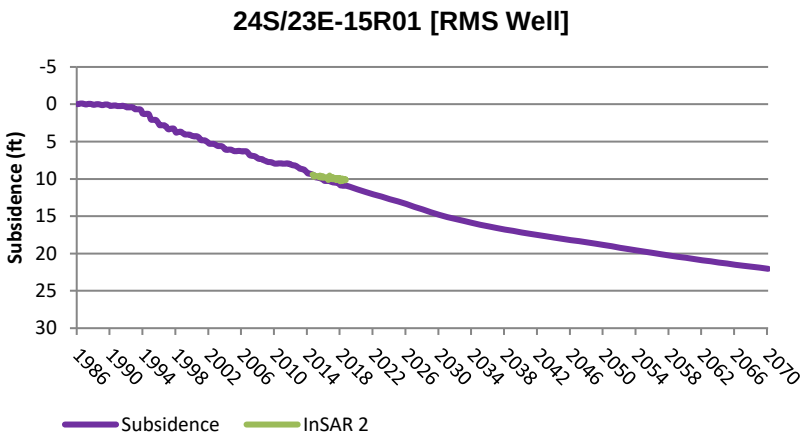

25S/26E-9 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

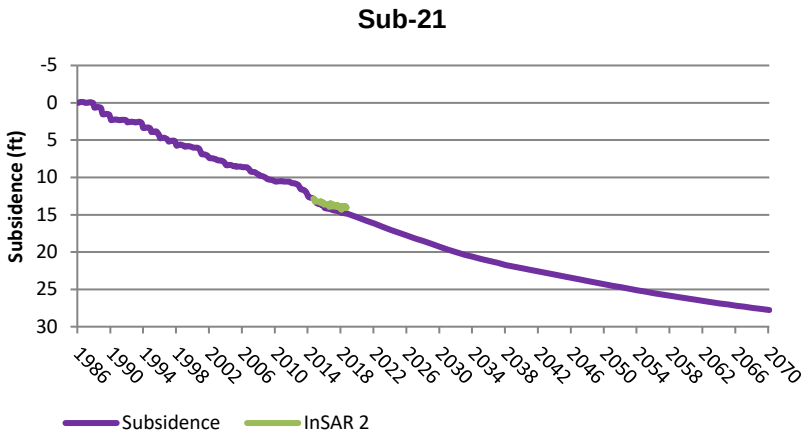

24S/24E-25J01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

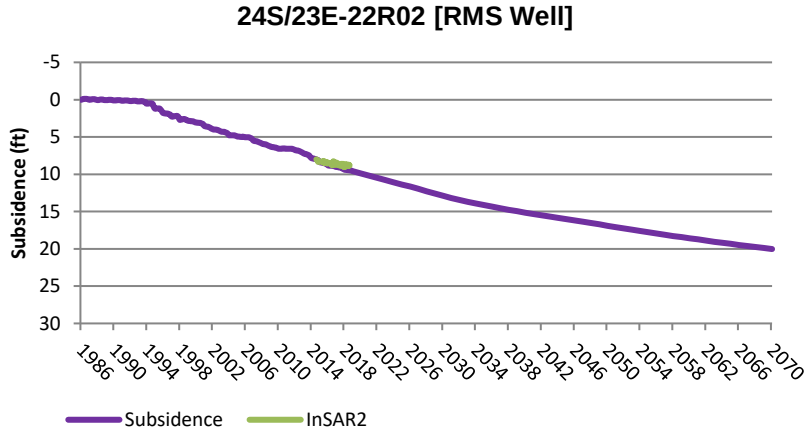

24S/25E-35 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

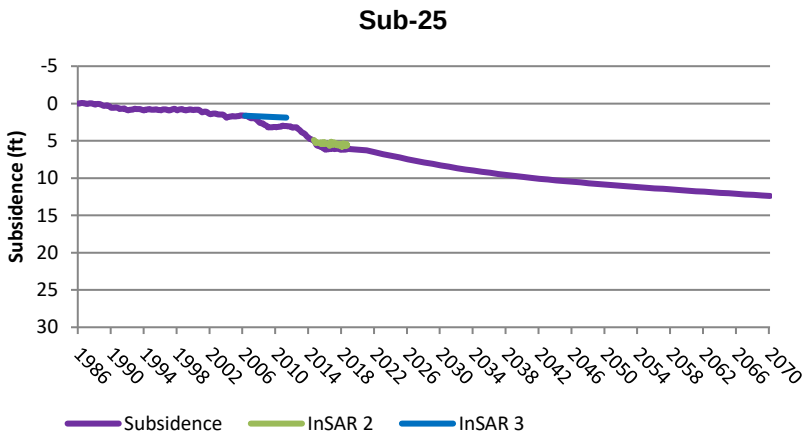

Sub-26
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2
InSAR 3

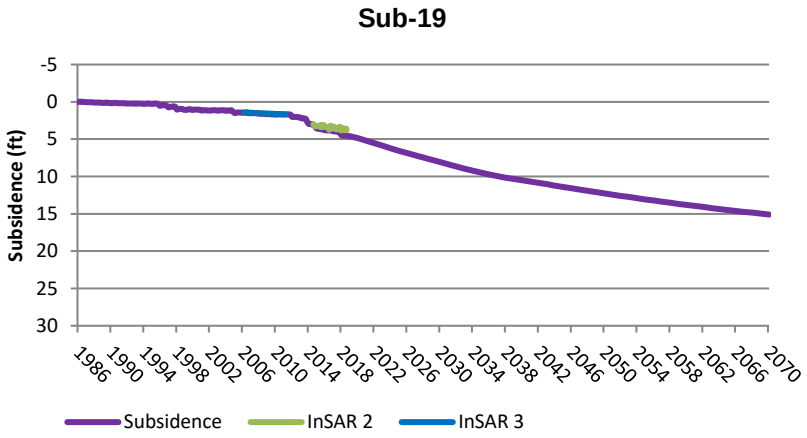

Delano GPS Station
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2
GPS

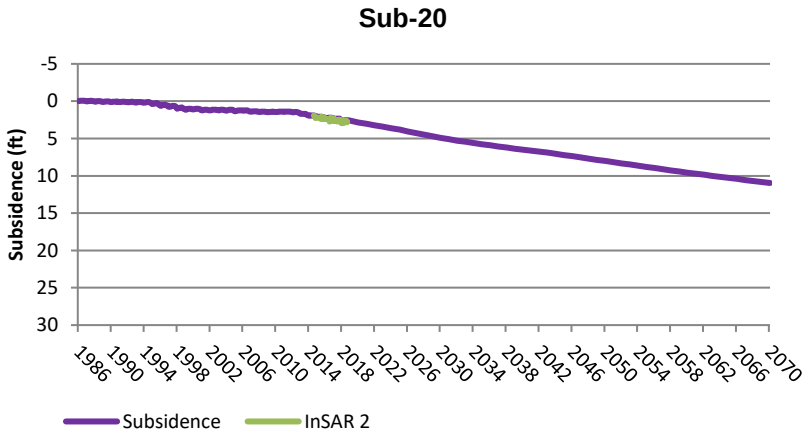

24S/23E-15R01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

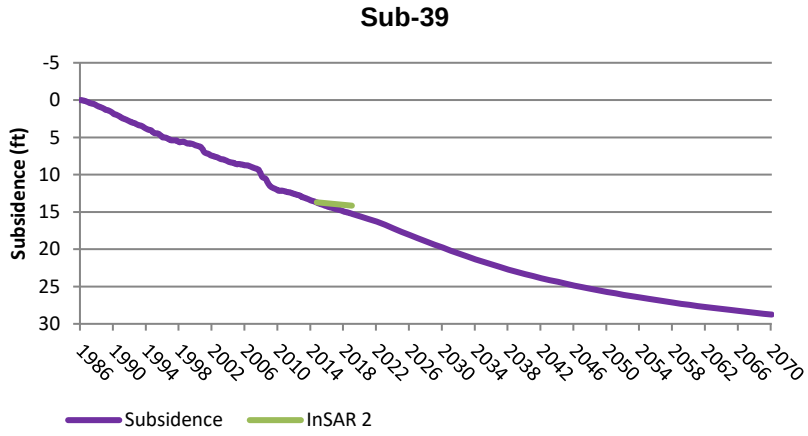

Sub-21
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2

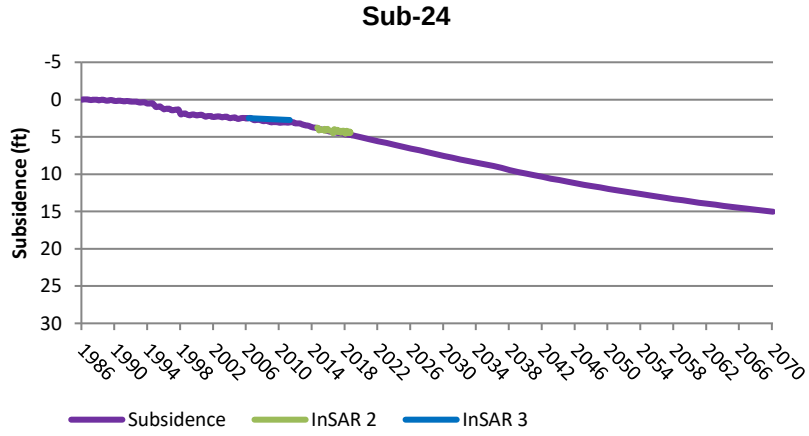

24S/23E-22R02 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR2

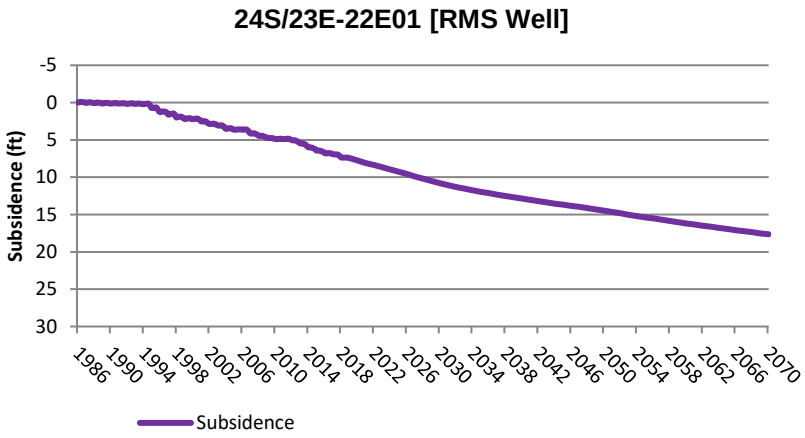

Sub-25
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2
InSAR 3


Sub-19
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2
InSAR 3


Sub-20
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


Sub-39
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2


Sub-24
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986 1990 1994 1998 2002 2006 2010 2014 2018 2022 2026 2030 2034 2038 2042 2046 2050 2054 2058 2062 2066 2070
Subsidence
InSAR 2
InSAR 3


24S/23E-22E01 [RMS Well]
Subsidence (ft)
-5
0
5
10
15
20
25
30
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
Subsidence