VENTURA REGIONAL GROUNDWATER FLOW MODEL 2016-2019 UPDATE FOR THE PIRU, FILLMORE, SANTA PAULA, MOUND, OXNARD, PLEASANT VALLEY, AND WEST LAS POSAS VALLEY GROUNDWATER BASINS

United Water Conservation District

Open-File Report 2021-02

September 2021

WATER RESOURCES DEPARTMENT
UNITED WATER CONSERVATION DISTRICT

THIS REPORT IS PRELIMINARY AND SUBJECT TO MODIFICATION BASED UPON FUTURE ANALYSIS AND EVALUATIONS

VENTURA REGIONAL GROUNDWATER FLOW MODEL 2016-2019 UPDATE FOR THE PIRU, FILLMORE, SANTA PAULA, MOUND, OXNARD, PLEASANT VALLEY, AND WEST LAS POSAS GROUNDWATER BASINS

United Water Conservation District
Open-File Report 2021-02
September 2021

PREPARED BY

WATER RESOURCES DEPARTMENT

SEPTEMBER 2021

THIS REPORT IS PRELIMINARY AND SUBJECT TO MODIFICATION BASED UPON FUTURE ANALYSIS AND EVALUATIONS

Preferred Citation: United Water Conservation District, 2021, *Ventura Regional Groundwater Flow Model 2016-2019 Update for the Piru, Fillmore, Santa Paula, Mound, Oxnard, Pleasant Valley, and West Las Posas Valley Groundwater Basins*, United Water Conservation District Open-File Report 2021-02.

Principal Authors: Dr. Jason Sun, PE, Dr. Bram Sercu, Dr. Zachary Hanson, and
Dan Detmer, PG, CHG

EXECUTIVE SUMMARY

A regional groundwater flow model (Regional Model) was built and calibrated by United Water Conservation District (UWCD or United) in 2020 (UWCD, 2021a). The Regional Model covers the seven groundwater basins within United's District boundaries, and areas of the Pleasant Valley and West Las Posas Valley basins that are outside District boundaries. The simulation and calibration period for the Regional Model was for the years 1985 through 2015, using a daily time step to capture surface water dynamics along the Santa Clara River and United's water diversions. The 2020 Regional Model was an expansion of United's 2018 groundwater flow model, which simulated the Oxnard, Pleasant Valley, Mound and West Las Posas Valley basins and used a monthly time step. The expanded Regional Model was reviewed by an expert panel comprised of three nationally recognized experts on groundwater flow models: Dr. Sorab Panday, Mr. Jim Rumbaugh, and Mr. John Porcello. The expert panel concluded that "The model calibration to both heads and streamflows is very good" (GSI Water Solutions and others, 2021).

As hydrologic data from years 2016 through 2019 became available, United was able to extend the simulation period of the Regional Model through the end of the year 2019. The model update through 2019 is presented in this report. Updating the model included the following steps:

- Collection of precipitation and areal recharge data, streamflow measurements, data related to United's conservation releases from Lake Piru, streamflow diversion records, groundwater extraction records, and groundwater elevation measurements, from 2016 to 2019
- Pre-processing the 2016-2019 data into the model input files
- Model simulation for the years 2016-2019
- Post-processing the model output to generate simulated groundwater elevations, streamflow rates, gaining and losing stream reaches, and water budget components for the years 2016-2019
- Comparison of simulated groundwater elevations and modeled streamflow with measured values to evaluate the model calibration with the 2016-2019 record set that is independent of the original model calibration record set (years 1985-2015).

United staff started the data collection in early 2020 and completed the model update in fall 2020. In this Model Update Report, it is shown that the Regional Model's simulation of the 2016-2019 groundwater elevations closely approximates the measured 2016-2019 groundwater elevations. Streamflow and surface water-groundwater interaction along the Santa Clara River is also well simulated. The uniform numerical model grid size of 2000 feet by 2000 feet implies that the Regional Model may be used to support basin-scale groundwater analysis but one should be cautious when using the model to interpret smaller/local scale projects or conditions.

TABLE OF CONTENTS

LIST OF TABLES

(Tables are located following the “References” section of the document)

LIST OF FIGURES

(Figures are located following the “Tables” section of the document)

LIST OF APPENDICES

(Appendices are located following the “Figures” section of the document)

1 INTRODUCTION

United Water Conservation District (United or UWCD) is a California special district (i.e., a public agency) with a service area of approximately 335 square miles (214,000 acres) in southern Ventura County. United's service area includes the Ventura County portion of the Santa Clara River Valley and much of the Oxnard coastal plain, including the lower part of the Calleguas Creek watershed, as shown on Figure 1-1. United serves as a steward for managing the surface water and groundwater resources within all or part of seven groundwater basins. It is governed by a seven-person board of directors elected by region, and receives revenue from property taxes, pump charges, recreation fees, and water delivery charges. United is authorized under the California Water Code to conduct water resource investigations, acquire water rights, build facilities to store and recharge water, construct wells and pipelines for water deliveries, commence actions involving water rights and water use, prevent interference with or diminution of stream/river flows and their associated natural subterranean supply of water, and to acquire and operate recreational facilities (California Water Code, section 74500 et al).

This report documents the update of the Regional Model for the years 2016-2019, covering the groundwater basins of the coastal plain and the Santa Clara River (SCR) valley within Ventura County, California. The groundwater conditions on the coastal plain, which includes the Oxnard, Pleasant Valley, Mound, and West Las Posas Valley basins are distinctly different from the basin setting and groundwater conditions in the basins of the SCR Valley subbasins, which include the Piru, Fillmore and Santa Paula basins (Figure 1-2). For example, the SCR basins are largely unconfined, and seasonally recharged by SCR streamflow and conservation releases conducted by UWCD, resulting in rapid groundwater elevation rebound in the SCR basins in wet years. The largely confined basins of the Oxnard coastal plain basins are predominantly influenced by the availability of surface water for artificial recharge in the Oxnard Forebay area and direct water deliveries to offset pumping in the more central and coastal portions of these basins.

As a note related to basin naming terminology, for the sake of brevity, groundwater subbasins are commonly referred to as "basins" throughout this report. Additionally, the Forebay portion of the Oxnard basin and the western portion of Las Posas Valley basin (West Las Posas Valley) are not recognized basins or subbasins by California Department of Water Resource (DWR), but are locally-recognized and established management areas. As such, these management areas are referenced for analysis during this report due to their relevance to local understanding and consistency with previous reporting and analysis.

Since the 1990s, United's Board of Directors has endeavored to have a regional groundwater flow model covering all the above-mentioned basins, for water resources planning and management purposes (USGS, 2003; FCGMA and others, 2007; UWCD, 2018a; UWCD, 2021a). In 2020 United staff completed construction and calibration of a regional model covering its service area and some adjacent areas outside its jurisdiction (in the West Las Posas Valley basin and the northern Pleasant Valley basin) (UWCD, 2021a). The simulation period for the expanded Regional Model is from 1985 to 2015 with a daily time step, specifically for surface water inputs. The Regional Model was reviewed by an expert panel comprised of three nationally recognized experts in groundwater modeling: Dr. Sorab Panday, Mr. Jim Rumbaugh, and Mr. John Porcello. The expert panel concluded that "The model calibration to both heads and streamflows is very good" (UWCD, 2021a).

When hydrologic data for 2016 to 2019 period became available, the simulation period of the Regional Model was extended through 2019. This report documents the first update of the Regional Model, which was completed in the fall of 2020. Model input data for 2016-2019 (the "Update Period") were implemented with the same methodologies as the 1985-2015 "Calibration Period" data, except for a single streamflow and single subsurface underflow component (see Section 2.2; Conejo Creek and Arroyo Las Posas subsurface underflow) which no longer had the same data available for the Update Period. Overall, the model and the processes for data acquisition and implementation were not revised, and this report documents the update for the 2016-2019 time period.

Generally, when a groundwater flow model is constructed, a historical data set is used to calibrate the model. Over time, as recent data sets become available, the newly available data sets can be used to extend the simulation period of the model. The new data sets can also be used to evaluate model calibration and help assess whether further model calibration is necessary. United's Regional Model (UWCD, 2021a) was calibrated with data available from calendar years 1985 through 2015. As data became available in ensuing years, the new data were gathered and evaluated as described in Section 2, and then was used to evaluate the calibration of the Regional Model and extend the simulation period with calendar years 2016 through 2019. Simulated groundwater elevations, streamflow and surface flow pattern results for the Update Period were processed and compared with observed groundwater elevation data and measured streamflows and surface water flow patterns for the same period. In this report, it is shown that the Regional Model simulates groundwater elevations for the Update Period with sufficient accuracy. Streamflow rates and surface water-groundwater interactions along the Santa Clara River are also reasonably simulated on a monthly basis during the Update Period. In general, model performance during the 2016-2019 Update Period is considered good and in line with model performance from the 1985-2015 Calibration Period.

2 UPDATED MODEL INPUTS AND DATA SETS FOR 2016-2019 PERIOD

With the inclusion of data from 2016 through 2019, the simulation period of the Regional Model is extended through December 2019. The various data sets necessary for the model update and comparison process included: (1) precipitation for implementation into the areal recharge component of the numerical model, (2) streamflow records and subsurface underflow estimates for implementation into the streamflow and related underflow components, (3) streamflow diversions for implementation into the streamflow components, (4) groundwater extraction records for implementation into the well pumping component of the numerical model (5) areal recharge from agricultural and municipal and industrial return flows for implementation into the areal recharge component of the numerical model, (6) wastewater treatment plant discharges for implementation into the areal recharge component of the numerical model, and (7) groundwater elevation records for comparison. This section will describe the data sets gathered, and the methodology used to acquire and process the data sets for implementation in the numerical model.

2.1 PRECIPITATION DATA

Precipitation records were updated in order to estimate monthly total precipitation across the entire domain of the Regional Model. Daily precipitation data were collected for 110 rainfall gage stations located within and near Ventura County that have data available during the 2016-2019 Update Period (Table 2-1 and Figure 2-1). The daily precipitation records were downloaded from the Ventura County Watershed Protection District (VCWPD; http://www.vcwatershed.net/hydrodata/). Previously, Ventura County had 180 gages active during the 1985-2015 Calibration Period. The same procedures were used in the Update Period as were performed in the Calibration Period: daily data were aggregated to monthly data and Kriging was used to generate monthly precipitation distributions across Ventura County. The monthly precipitation distributions were then mapped to the numerical grid of the Regional Model for use as an input when calculating areal recharge.

Precipitation records from VCWPD Gage 245A over the modeling period (1985-2019) is representative of precipitation over the model area for both periods (Figure 2-2). Gage 245A was discontinued by VCWPD after water Year 2010, and the VCWPD Gage record was continued using nearby VCWPD Gage 245B (Figure 2-1). However, United continued to record precipitation data through year 2019 at Gage 245A. Figure 2-2 shows that the average calendar year rainfall at VCWPD Gage 245A was very similar between the Calibration Period (17.13 inches) and the Update Period (17.37 inches). Also, the Calibration Period contained some very wet years (e.g. 1998 and 2005) as well as significant drought conditions (2011-2015), leading to basin conditions being severely depleted at the beginning of the Update Period. When comparing 2011-2015 rainfall to the 2016-2019 Update Period, there is a significant increase in recorded precipitation, with average annual rainfall nearly doubling from 8.89 inches from 2011-2015 to 17.37 inches per year for the 2016-2019 Update Period.

2.2 STREAMFLOW AND SUBSURFACE UNDERFLOW

Streamflow was updated for the 2016-2019 Update Period with data acquired from the USGS and VCWPD. The methods used for estimating streamflow and subsurface underflow for Arroyo Las Posas, and streamflow for Conejo Creek, which no longer had data available for the Update Period, are described below in this Section. For the SCR and tributaries, streamflow data was available through the USGS, VCWPD, and United's records at Freeman Diversion (Table 2-2 and Figure 2-3).

Annual average streamflow along the SCR near Piru (USGS gage 11109000) was higher in 2017 and 2019 due to significant releases from Castaic Lake (15,200 AF in 2017, 19,000 AF in 2019). Note that the 2017 Castaic Lake release included 10,000 AF of imported State Water Project (Article 21 water purchase). Field monitoring by United staff indicated that most (75-95%) of the released water percolated to Piru basin, while the remainder percolated in the Castaic Creek streambed upstream. Groundwater underflow into Piru basin along the SCR near County Line remained the same as during the Regional Model Calibration Period (5000 AFY; UWCD, 2021a). Although average annual precipitation is similar for the Update and Calibration Periods (Figure 2-2), streamflow gages in the SCR basins indicate decreased annual average streamflow during the Update Period compared to the Calibration Period. The decrease in streamflow is due to dry antecedent conditions in all watersheds following the drought conditions from fall 2011 through 2015, as mentioned above. Measurements of rising groundwater at the Piru-Fillmore and Fillmore-Santa Paula basin boundaries were performed by United staff and are available for the 2016-2019 Update Period. Measurements were obtained by manually measuring streamflow in the Santa Clara River upstream and downstream of the rising groundwater reach, which varies spatially, and subtracting upstream flows from downstream flows. Streamflow measurements are generally within 5-10% accuracy. Rising groundwater measurements are generally available for dry months only, as it is difficult to accurately measure rising groundwater when streamflow is high and dynamic. Rising groundwater measurements were not used as an input to the Regional Model, but are used in evaluation of the streamflow as detailed in Section 3.3.4. Similarly, measurements of percolation of streamflow to the groundwater basins are made by United staff, and that data is described briefly in Section 2.3, below, as well as Section 3.3.2.

In the Pleasant Valley basin, data was not available for the surface water flows into the model domain at the Arroyo Las Posas and Conejo Creek locations (Figure 2-3). Arroyo Las Posas streamflow was estimated based on a relationship developed between observed monthly precipitation (VCWPD site 190) and monthly simulated streamflow that was provided by Calleguas Municipal Water District's Las Posas Valley Model (CMWD, 2018) that was previously used in the Coastal Plain model (UWCD, 2018a) from 1985 – 2015 (coefficient of determination, R^2 = 0.74). As the 1985-2015 period contained both wet and dry conditions, the relationship is assumed to hold reasonably well for the 2016-2019 period. Conejo Creek streamflow data was unavailable from Ventura County Watershed Protection District, and therefore, streamflow entering the model domain was estimated over 2016-2019 based on dry weather (June – August) streamflow measurements provided by The City of Thousand Oak's Hill Canyon Treatment Plant and applied equally across the year of measurement. Although this data does not capture wet season storms, Conejo Creek flows are dominated by discharge from the treatment plant, which serve as a reasonable estimate of total flow in Conejo Creek. Low percolation rates are also expected to be associated with the Conejo Creek flows. Estimates of annual average streamflow discharge for Arroyo Las Posas and Conejo Creek are shown in Table 2-3. Subsurface underflow along Arroyo Las Posas for the 2016-2019 Update Period was unavailable from the Calleguas Las Posas Valley Model (CMWD, 2018). United estimated the subsurface underflow from the East Las Posas basin into the Pleasant Valley basin along Arroyo Las Posas for the 2016-2019 time period based on a relationship developed between monthly simulated underflow available from then Calleguas Las Posas Valley Model (CMWD, 2018) for 2014-2015 and available groundwater elevation records from well 02N20W17J06S (R^2 = 0.70), which was determined to be the well with best available data for an estimation of the Arroyo Las Posas underflow into the Regional Model domain (Table 2-4).

2.3 LAKE PIRU CONSERVATION RELEASES

Lake Piru stores natural runoff from the Piru Creek watershed and State Water purchases that are released from Lake Pyramid, located on Piru Creek upstream of Lake Piru. Conservation releases from Lake Piru are conducted to provide direct groundwater recharge to the Piru, Fillmore, Santa Paula and Oxnard basins at times when natural runoff in the SCR watershed is limited. Daily release volumes from Lake Piru are measured below Santa Felicia Dam at USGS gage 11109800. Conservation releases provide recharge to the basins and help to sustain rising groundwater at the Piru/Fillmore and Fillmore/Santa Paula basin boundaries. Released water that does not percolate into the Piru and Fillmore basins flows downstream to the Santa Paula basin, and is diverted at the Freeman Diversion for subsequent surface water deliveries and managed aquifer recharge operations in the Oxnard and Pleasant Valley basins. Groundwater underflow also exists between these groundwater basins. United's conservation releases typically last from over a month to several months, and are scheduled in order to optimize the distribution of the recharge occurring in downstream basins and to optimize the distribution of diverted surface water in the coastal basins.

Streamflow percolation to the groundwater basins is estimated using manual measurements of streamflow made at the basin boundaries. Measurements by United staff were available for conservation releases during the 2016-2019 Update Period (Table 2-5). Table 2-5 shows the measured distribution of released water to each basin over the 2016-2019 Update Period and compares these with the averages over the 1985-2015 Calibration Period (note that measurements of the distribution of released water are only available from 1999 onwards). Annual average conservation release volumes during the Update Period (14,204 AFY) were a little more than half of those during the Calibration Period (25,184 AFY), due to continued drought conditions that reduce inflows into the Lake Piru, and thus limit the volume of stored runoff available for release. This illustrates the severity of the recent drought conditions and the impacts it had on watershed drainage for local replenishment. The 2019 release volume form Lake Piru included 15,000 AF of imported State Water Project (Article 21). Without this imported water, the total and average release volume over the Update Period would have been substantially lower.

United is also required to release water continuously from Lake Piru to maintain fish habitat in lower Piru Creek. Current habitat water release requirements range between 7 and 20 cfs, depending on cumulative annual rainfall at the Piru-Temescal Guard Station rain gage at Lake Piru (VCWPD Gage 160; see Figure 2-1) (UWCD, 2012). Much of the water released for habitat requirements flows down Piru Creek and provides recharge to the Piru basin. Piru Mutual Water Company and Rancho Temescal operate permitted diversions on lower Piru Creek, diverting a portion of the creek flow for agricultural uses, as discussed in detail in Section 2.3.8 of the Regional Model Expansion Report (UWCD, 2021a) and briefly in the next section. Additional information related to Lake Piru conservation releases can be found in Section 2.3.2.1 of the Regional Model Expansion Report (UWCD, 2021a).

2.4 DIVERSIONS

The Regional Model 2016-2019 Update Period adopts the same methodologies utilized in the Regional Model Expansion Report (UWCD, 2021a), relying largely on reported data to the State. The Update Period includes the same 15 diversions in addition to United's Freeman Diversion as the model for the Calibration Period (Figure 2-4):

- Camulos Ranch (Santa Clara River, Piru basin)
- Isola (Santa Clara River, Piru basin)
- Rancho Temescal 1 (Piru Creek, Piru basin),
- Rancho Temescal 2 (Piru Creek, Piru basin),
- Piru Mutual (Piru Creek, Piru basin),
- United's Piru Diversion (Piru Creek, Piru basin)
- Fillmore Irrigation Company (Sespe Creek, Fillmore basin)
- Limoneira (minor; Boulder Creek, Filmore basin)
- Beans Ranch (Boulder Creek, Fillmore basin)
- Canyon and Farmer's Irrigation Companies (Santa Paula Creek, Santa Paula basin)
- Zaragosa (minor; Santa Clara River, Santa Paula basin)

- Diversions related to Hyde Ditch (Santa Clara River, Santa Paula basin)
- Southfork Ranch (Santa Clara River, Santa Paula basin)
- UWCD Freeman Diversion (Santa Clara River, Santa Paula basin)
- Camrosa Water District Diversion (Conejo Creek, Pleasant Valley basin).

During the 2016-2019 Update Period, several active diversions from the Calibration Period remained unused, including Isola (inactive after 2005), UWCD's Piru Diversion (diversion and spreading grounds inactive after 2008), Fillmore Irrigation Company (inactive after 2008), and Limoneira (no 2016-2019 use). Diversion data was obtained from monthly data reported to the California State Water Resources Control Board's Water Rights Information Management System, which are available to the public (https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWMenuPublic.jsp). Where necessary, data gaps were filled in a manner similar to that used during the model expansion effort (see Piru Mutual; Section 2.3.8.1 in UWCD, 2021a). Monthly records were acquired or estimated for diversions within the model domain and reported monthly diversion totals were distributed equally across the days of each month in the model. Reported and estimated annual average diversion rates over the 2016-2019 Update Period are shown in Table 2-6.

Surface water diversions were implemented with the stream (STR) package in MODFLOW-NWT (Niswonger and others, 2011) for the reported diversion locations and rates detailed here, except for Freeman Diversion. As detailed in the Regional Model Expansion report (UWCD, 2021a) and the Technical Memorandum on Model Inputs for Simulations in Support of GSPs (UWCD, 2021b), United used separate surface water models to estimate daily streamflow (Upper Basins Surface Water Model) as well as diversions at the Freeman Diversion (Hydrological Operations Simulation System, HOSS). The use of these surface water models provides more accurate estimates of diversions and downstream flows compared to relying solely on MODFLOW-NWT. Additionally, an operational model (Surface Water Distribution Model) was used to calculate the portion of the diverted water that was delivered to United's recharge facilities and to surface water deliveries via the Pumping Trough Pipeline (PTP) and Pleasant Valley Pipeline (PVP) systems. Both the application of surface water to the spreading basins for recharge and streamflow downstream of Freeman were implemented into the Regional Model using the same methods that areal spreading and streamflow were implemented upstream of Freeman (see Sections 3.5.2.1 and 3.5.2.3 in [UWCD, 2021a]).

Annual average diversions decreased significantly from 63,133 AFY during the Calibration Period to 14,596 AFY during the Update Period. This decrease is in part due to reduced streamflow in the SCR basins due to drought conditions (Tables 2-2 and 2-3), but is also attributed to reductions in allowable diversion due to increased environmental regulatory requirements. The reduction in allowed surface water diversions at Freeman Diversion reduces both artificial recharge activities in the Oxnard Forebay area and surface water deliveries to the PTP and PVP for agriculture use.

Additional information regarding diversions and the application of diverted water can be found in previous modeling reports (UWCD, 2018a; UWCD, 2021a).

2.5 PUMPING FROM WATER-SUPPLY WELLS

Since 1980 and 1985, respectively, United and the Fox Canyon Groundwater Management Agency (FCGMA) have required semi-annual reporting of groundwater extractions by well owners and operators within their service areas, greatly improving the understanding and accuracy of groundwater pumping in the study area. Further details related to pumping operations within the Regional Model domain are available in previous reports (UWCD, 2018a; UWCD, 2021a). Reported locations and the relative magnitude of groundwater pumping from active wells for the Update Period in the Regional Model domain are shown in Figures 2-5 through and 2-8. For wells located in both the United and FCGMA boundaries (FCGMA boundaries include the Oxnard, Pleasant Valley, and Las Posas Valley basins), United staff worked with FCGMA staff to reconcile any large discrepancies between production records reported to the two agencies and to reconcile any omissions in extraction reporting between the two agencies. Many of the water-supply wells that exist in the study area are screened across multiple aquifers to maximize water production rates.

The FCGMA Board adopted Emergency Ordinance E in 2014 in response to the severely depleted groundwater conditions in the coastal basins following the onset of drought conditions in fall 2011. Temporary extraction allocations were applied to wells within the FCGMA, adding additional pumping restrictions. In February 2015, the County of Ventura passed a well ordinance prohibiting the construction of new wells in High and Medium Priority basins, as designated by CA DWR, which includes all basins within the model domain. Construction of replacement wells is allowed, as the ordinance was intended to prevent increased groundwater use rather than to limit existing use. Pumping extractions in nearly all the groundwater basins located within the Regional Model was reduced during the Update Period compared to the Calibration Period, and few new wells were constructed. The exception is West Las Posas Valley basin, which saw a slight increase in reported production.

2.6 RECHARGE

The Regional Model implements areal recharge as a combination of recharge derived from precipitation and recharge derived from agricultural and municipal and industrial return flows. Other areal recharge sources included in the Regional Model are United's artificial recharge activities, and the percolation ponds at wastewater treatment plants. The Regional Model adopts the same methodologies used in the Update Period that were used in the Calibration Period (UWCD, 2021a). There are nine wastewater treatment plants located within the expanded study area that are considered for both their discharges and distribution of recycled water; their locations are shown on Figure 2-9 and the annual discharges to percolation or application are shown in

Table 2-7. Treated wastewater from plants in the SCR basins is discharged to percolation basins (Fillmore also distributes water for landscape irrigation). Downstream, Ventura's Wastewater Reclamation Facility distributes water to nearby golf courses, and Oxnard's Advanced Water Purification Facility began supplying recycled water to several agriculture users in the southern Oxnard basin beginning in 2016 (it was not active during the calibration period of 1985-2015). Camarillo's Wastewater Treatment Plant and Camrosa's Water Reclamation Facility have supplied Pleasant Valley County Water District (PVCWD) with treated water for agricultural uses.

In addition to areal recharge, the Regional Model adopts the same assumptions and methodologies for the Update Period as were used for the Calibration Period (UWCD, 2021a) for streamflow percolation, which recharges the underlying groundwater aquifers from surface water sources, as well as mountain front recharge, which is directly related to the observed precipitation (Figure 2-1) that falls on the various areas in the Regional Model domain. Section 3.3 of this report describes the analysis of the modeling results related to the interaction between the groundwater and surface water components along the Santa Clara River within the Piru, Fillmore, and Santa Paula basins. The percolation and rising groundwater that recharges to, and discharges from the groundwater aquifer below the river is often an important component of the groundwater budget within these basins, especially in the Piru and Fillmore basins.

2.7 RIPARIAN VEGETATION

Riparian evapotranspiration (ET) was implemented in the same way as described in in the extended Regional Model calibration (see Section 3.5.2.6 in UWCD, 2021a). Within the coastal basins, the maximum ET flux is 0.01 feet per day over the area of stream channel and wetland. The ET surface elevation is assumed at 3 feet below ground surface, and the ET extinction depth is set at 5 feet. In the Piru, Fillmore, and Santa Paula basins, the maximum ET flux was increased to 0.014 feet per day (5.2 feet per year) in order to account for higher estimated water use with the presence of Arundo donax within the SCR corridor along with other vegetation species. To account for seasonal variation in ET, the maximum ET rates were adjusted according to percentages for each month.

2.8 GROUNDWATER ELEVATION RECORDS

As described in the Regional Model Expansion report (UWCD, 2021a), United's groundwater elevation database includes historical groundwater elevation data for 1,369 wells within the Regional Model domain (as of May 2020). The groundwater elevation database is a compilation of information provided by several cooperating entities, with data collection protocols among the agencies in the area being fairly consistent. In this report, the term "groundwater elevations" is used to describe the measured or simulated elevation of the water column in a well, and refers to both unconfined water table elevations and potentiometric surface elevations in confined aquifers. Groundwater elevations are normally measured in wells that are not pumping; these measurements are referred to as “static.” When evaluating trends in long-term groundwater elevations, static groundwater elevation measurements are preferred. However, the groundwater elevation in a non-pumping well may remain depressed for some time due to residual drawdown in the well being monitored, or because of pumping interference from a nearby well. Although it is not possible to eliminate all effects of pumping when manually measuring groundwater elevations in a developed groundwater basin, UWCD and other parties take care to measure wells when residual drawdown is not expected, and nearby wells are not known to be pumping. When groundwater elevations are measured during the low-irrigation season (winter and early spring), potential pumping effects on the measurements are typically reduced. Some area wells are equipped with pressure transducers that collect frequent measurements and seasonal high and low groundwater elevations can be assessed with greater confidence. United’s groundwater elevation database records are updated on a continuous basis, and all available groundwater elevation records were utilized for the 2016-2019 period for update purposes, as described in Section 3 of this report. Additional background and details regarding the database can be found in Section 2.7 of the Regional Model Expansion Report (UWCD, 2021a). Time series plots of measured groundwater elevations and simulated groundwater elevations in area wells were used in evaluating model calibration.

All available groundwater elevation measurements were also paired with the simulated groundwater elevations in scatter plots. As detailed in Section 4.1.1 in the Regional Model Expansion Report (UWCD, 2021), the simulated groundwater elevations from wells with screen interval spanning multiple aquifers is plotted as the maximum of the simulated groundwater elevation in the individual model layers.

2.9 SUMMARY OF UPDATE PERIOD CONDITIONS

From the hydrologic input datasets described previously in this section, this 2016-2019 Update Period can be characterized as an atypical period. While the precipitation during the entire Update Period is about average, with two very dry years and two wet years, due to the 2011-2015 drought conditions, the watersheds did not yield much water. This is evident from (1) the reduced observed streamflow entering the Regional Model domain (see Table 2-2), (2) the below-average volume of conservation releases and (3) measured surface water inputs that were lower than would be expected under the actual rainfall amounts that occurred in the area. The reduced surface water flows resulted in reductions in diversions in the SCR basins, including at the Freeman Diversion (Table 2-6), and those reductions in diversions had impacts on the amount of water available for recharging and replenishing the coastal basins following the 2011-2015 drought conditions. Although the drought conditions and reduced streamflow into the Regional Model domain persisted for much of the Update Period, supplemental State Water imports of Article 21 water allowed for increased water releases from Castaic Lake (in 2017) and Lake Piru (in 2019). These releases benefited the groundwater basins of the Santa Clara River Valley as well as the coastal groundwater basins. Overall, the Update Period is considered to be a period with significant hydrologic stress and fluctuation within the 35-year modeling period.

3 NUMERICAL MODEL RESULTS COMPARISON

The comparison for groundwater elevations was performed by evaluating the residual statistics, scatter plots, hydrographs, and flow budget. Residual statistics are the statistical values for an overall evaluation of model calibration. Scatter plots combine all groundwater elevation measurements paired with simulated groundwater elevations in one figure for visual inspection of model calibration. Hydrographs provide an evaluation for individual wells. Groundwater budgets provide an evaluation of inflow and outflow for the major components of groundwater flow. The comparisons for streamflow also relied on scatter plots to compare simulated and observed data, but also used heat maps to evaluate spatial and temporal trends of simulated and observed flows. The simulation results from 2016 to 2019 were paired with the calibration results from 1985 to 2015 (reported in the Regional Model Expansion Report [UWCD, 2021a]) to evaluate any significant difference. It is noted that years 2016 and 2017 combine the last year of a record drought and the following wet year with significant rebound of groundwater elevation and streamflow conditions, which posed challenges for the Regional Model in some cases. The following sections provide background on the model setup, and then detail the comparison of the model's ability to simulate groundwater and surface water conditions during the 2016-2019 Update Period.

3.1 MODEL SETUP

Updates to the model input conditions for the model simulation from 2016 to 2019 include updates to the areal recharge components, streamflow components, and pumping components as discussed previously in Section 2 of this report. The input conditions were implemented in the same way as the period from 1985 to 2015, and the uniform numerical model grid size of 2000 feet by 2000 feet remained the same between the Calibration Period and the Update Period. The model input implementation is detailed in the Regional Model Expansion Report (UWCD, 2021a) and the Coastal Plain Model Report (UWCD, 2018a). The initial head used in the 2016-2019 simulation is from the simulated head on December 31, 2015. The aquifer systems and layering within the Regional Model are identical between the Calibration Period and the Update Period, as detailed in the Regional Model Expansion Report (see Sections 2 and 3, and Figure 2-23 in UWCD, 2021a).

3.2 GROUNDWATER RESULTS COMPARISON

The groundwater results comparison was performed based on all basins combined, and also for each basin individually. Note that the individual basins referred to here include the basins as defined by Department of Water Resources (DWR, 2019). However, the unconfined Forebay area of the Oxnard basin is separated from the confined majority portion of the basin for characterization.

3.2.1 RESIDUAL STATISTICS

As detailed in Section 4.1.1 in the Regional Model Expansion Report (UWCD, 2021a), residual mean (RM), absolute residual mean (ARM), root mean square (RMS), and standard deviation (Std Dev) were calculated for all the basins together and for each individual basin to evaluate model calibration for the Update Period. The ARM, RMS, and Std Dev should be less than 10% of the range of groundwater elevation measurement for a well-calibrated model, and RM should be close to zero. Residual statistics were prepared for all groundwater elevation measurements, and for a data set excluding several outlier wells and wells with less than 10 groundwater elevation measurements. The residual statistics based on the groundwater elevation measurements excluding the outlier wells and wells with less than 10 measurements are used for groundwater results comparison. The residuals statistics based on all groundwater elevation data is included for information purposes.

Tables 3-1 to 3-3 show the residual statistics from 2016 to 2019 for all basins combined and for each basin separately. For comparison, the residual statistics from 1985 to 2015 are listed in Tables 3-4 and 3-5. By comparing the residual statistics between the two periods, 1985 to 2015 and 2016 to 2019, it is noted that:

- For all the basins together, the residual statistics meets the criteria of a well-calibrated model. The ARM, RMS, and Std Dev were less than 3% of the range of groundwater elevation data.
- For the Piru, Fillmore, Santa Paula, Oxnard Forebay area, and Oxnard Plain basins, the residual statistics meets the criteria of a well-calibrated model. The ARM, RMS, and Std Dev were less than 10% of the range of groundwater elevation data.
- The RM for Santa Paula basin is about -10 feet for both periods: 1985-2015 and 2016-2019, indicating a consistent overestimation of groundwater elevations. The ARMS, RMS and Std Dev percentages are slightly higher for the Update Period compared to the Calibration Period.
- For Pleasant Valley basin, the residual statistics increase from the 1985-2015 period to the 2016-2019 period. The ARM percentage remains less than 10% while the percentages of RMS and Std Dev increase to more than 11%. The increase in ARM, RMS, and Std Dev suggest that the Regional Model is less calibrated from 2016-2019.
- For Mound basin, the initial ARM, RMS, and Std Dev percentages were significantly higher in the 2016-2019 period than the 1985-2015 period. After further examination, it was noted that the range of the 2016-2019 groundwater elevations, 78.1 ft, was much smaller than the range of the 1985-2015 groundwater elevations, 132 ft. By using the 1985 to 2015 groundwater elevation range to calculate the percentages of ARM, RMS, and Std Dev, the adjusted statistics are shown in Table 3-3. The adjusted percentage of ARM, RMS, and Std Dev are less than 10%, and less than or about equal to the percentages for the Calibration Period.
- For West Las Posas basin, the initial ARM, RMS, and Std Dev percentages were significantly higher in the 2016-2019 period than the 1985-2015 period. After further examination, it was noted that the range of the 2016-2019 groundwater elevations, 303.1

ft, was much smaller than the range of the 1985-2015 groundwater elevations, 651.3 ft. By using the 1985 to 2015 groundwater elevation ranges to calculate the percentages of ARM, RMS, and Std Dev, the adjusted statistics are shown in Table 3-3. The adjusted percentage of ARM is 7.96%. The percentage of RMS, and Std Dev are 11.09% and 10.74%, very similar to those of the Calibration Period.

3.2.2 SCATTER PLOTS

A scatter plot uses measured groundwater elevation as the X-axis and simulated groundwater elevation as the Y-axis. By plotting the simulated groundwater elevation corresponding to the groundwater elevation measurements on a scatter plot, the correlation between simulated groundwater elevation and measured groundwater elevation may be evaluated. Scatter plots for the 2016-2019 and 1985-2015 periods were also compared. Scatter plots for all the basins, with all groundwater elevation data from all wells with measured data, and for individual basins are shown on Figures 3-1 to 3-9. Note that most, but not all, scatter plot points are represented on hydrographs available in Section 3.2.3 and Appendix A.

- All the basins: Figure 3-1 shows that there is no significant difference between the 1985-2015 period and the 2016-2019 period.
- Piru basin: Figures 3-2a and 3-2b show there is no significant difference between the 1985-2015 period and the 2016-2019 period. Piru basin calibrates well during both periods, except data points from a few wells screened in both Aquifer Systems B and C where the simulated groundwater elevation is higher than the measured data, and data points in Aquifer System A underpredicting heads during the Update Period.
- Fillmore basin: Figures 3-3a and 3-3b show there is no significant change between the 1985-2015 period and 2016-2019 period, except for a few wells screened in Aquifer System C, where simulated groundwater elevations are higher than the measured data for the Update Period.
- Santa Paula basin: Figures 3-4a and 3-4c show there is no significant change between the 1985-2015 period and 2016-2019 period. The wells with unknown screen depths were assigned an assumed screen interval based on their groundwater elevation measurements. Simulated groundwater elevations from Aquifer System B and unknown screen interval are closer to the measurements.
- Mound basin: Figures 3-5a and 3-5d show there is no significant change between the 1985-2015 period and 2016-2019 period.
- Oxnard Forebay area: Figures 3-6a and 3-6b show there is a noticeable change between the 1985-2015 period and 2016-2019 period. The 2016-2019 simulated groundwater elevations tend to be lower than the measured groundwater elevations in both the Upper Aquifer System (UAS) and the Lower Aquifer System (LAS).
- Oxnard basin: Figures 3-7a and 3-7b show there is no significant change between the 1985-2015 period and 2016-2019 period.
- Pleasant Valley basin: Figures 3-8a and 3-8b show there is no significant change between the 1985-2015 period and 2016-2019 period.

- West Las Posas basin: Figures 3-9a to 3-9c show there is no significant change between the 1985-2015 period and 2016-2019 period.

3.2.3 HYDROGRAPHS

The simulated hydrographs in select wells for each basin are compared to observed groundwater elevations for the Calibration Period (1985-2015, shown in blue) and the Update Period (2016-2019, shown in red) in Figures 3-13 through 3-23. Additionally, Figures 3-24 through 3-36 show locations of all wells that have hydrographs available in Appendix A (not all wells with data, as shown in the scatter plots, have hydrographs available, but this report does include a substantial number of hydrographs between those presented in this section and in Appendix A). Comparing the Calibration Period and the Update Period, the following observations are noted:

- Piru basin: The hydrographs from 1985 to 2019 for wells in Piru basin are shown in Figure 3-10 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-24 and 3-25). From all the hydrographs, it is noted that the simulated 2016-2019 groundwater elevations are close to the observed groundwater elevations for most wells, and the recovery from drought conditions is generally captured well. However for a number of wells on the western side of the basin (e.g. 04N19W34K01S and 04N18W31D04S in Figure 3-10), the observed groundwater elevation increases following the 2016 drought period are somewhat underestimated. The underestimation of recovery of groundwater elevations following drought conditions is generally apparent for both the Update Period and the Calibration Period (following the 1987-1991 drought, when data is available).
- Fillmore basin: The hydrographs from 1985 to 2019 for wells in Fillmore basin are shown in Figure 3-11 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-26 and 3-27). From all the hydrographs, it is noted that the simulated 2016-2019 groundwater elevations are generally close to the observed groundwater elevations for most wells, though not quite as well as in Piru basin. For several wells, simulated groundwater elevations during the drought in 2016 (and during the preceding drought years of 1987-1991) were higher than the measured groundwater elevations (e.g., 03N20W08A01S in Figure 3-11). Where observed, overestimation of low groundwater elevations during drought conditions was apparent in both the Update Period and Calibration Period. Overall, the model performs consistently in both the Calibration Period and the Update Period.
- Santa Paula basin: The hydrographs from 1985 to 2019 for wells in Santa Paula basin are shown in Figure 3-12 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-28 and 3-29). From all the hydrographs, it is noted that the Regional Model performs similarly in the Update Period and the Calibration Period. For the wells with simulated groundwater elevations higher than measured in the Calibration Period, the simulated groundwater elevations are also higher than the measurements in the Update Period. Similarly, for the wells with simulated groundwater elevations lower than measured in the Calibration Period, the simulated groundwater elevations are also lower than the measurements in the Update Period. For several wells, simulated groundwater elevations during the 2012-2016 drought period were higher than measured groundwater elevations (e.g., 03N21W31L01S, 03N21W09R04S), indicating that in some wells the model underpredicts the rate of decline during droughts and the

subsequent rate of recovery. Note that groundwater elevation declines during drought conditions are much less in Santa Paula basin compared to the Fillmore and Piru basins. Overall, the model performs consistently in both the Calibration Period and the Update Period.

- Mound basin (additional well locations with hydrographs in Appendix A are also shown on Figure 3-30): The hydrographs from 1985 to 2019 for wells in Mound basin are shown in Figure 3-13. From all the hydrographs, it is noted that the simulated 2016-2019 groundwater elevations are close to the observed groundwater elevations for many wells. It should be noted that there are a few wells with outlier groundwater elevation measurements, potentially influenced by very local geology (faults) which the groundwater model cannot simulate. For most wells, the groundwater model performs consistently in both the Calibration Period and the Update Period. Several wells screened in LAS are identified as outliers. These outlier wells (02N22W09K05S, 02N22W09L03S, and 02N22W09L04S) have groundwater elevation measurements higher than groundwater elevation measurements from a nearby well (02N22W09K04S) where heads are simulated well by the model.
- Oxnard Forebay area: The hydrographs from 1985 to 2019 for wells in Forebay area are shown in Figures 3-14 and 3-15 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-31 and 3-32). From all the hydrographs, it is noted that the simulated 2016-2019 groundwater elevations are close to the observed groundwater elevations for most wells. Several wells screened across both the UAS and the LAS (e.g., 02N22W02R05S) did not capture the groundwater elevation rebound during the Update Period, while many wells screened only in the UAS (e.g., wells 02N21W07L06S and02N22W23B08S) or only in the LAS (e.g. 02N22W23B04S) did capture the groundwater elevation rebound recorded during in the Update Period. Several wells screened only in the UAS (e.g., 02N22W15R02S and 02N22W23B02S) and only in the LAS (e.g., 02N22W23B06S) underpredict the rate of decline of groundwater elevations during most recent drought conditions, resulting in overestimated groundwater elevations during the end of the Calibration Period and portions of the Update Period for these well locations within the Oxnard Forebay area.
- Oxnard basin: The hydrographs from 1985 to 2019 for wells in Oxnard basin are shown in Figures 3-16 to 3-20 (additional well locations with hydrographs in Appendix A are also shown on Figures 3-33 and 3-35). From all the hydrographs, it is noted that the simulated 1985-2015 and 2016-2019 groundwater elevations are close to the observed groundwater elevations for most wells. The groundwater model performs consistently in both the Calibration Period and the Update Period.
- Pleasant Valley basin: The hydrographs from 1985 to 2019 for wells in Pleasant Valley basin are shown in Figure 3-20 and 3-21 (additional well locations with hydrographs in Appendix A are also shown on Figure 3-36). From all the hydrographs, it is noted that the simulated 1985-2015 and 2016-2019 groundwater elevations are close to the observed groundwater elevations for most wells. The groundwater model performs consistently in both the Calibration Period and the Update Period.
- West Las Posas basin: The hydrographs from 1985 to 2019 for wells in West Las Posas basin are shown in Figures 3-22 and 3-23 (additional well locations with hydrographs in Appendix A are also shown on Figure 3-37). From all the hydrographs, it is noted that the model calibration in West Las Posas basin is generally not as good as the above-mentioned basins. For wells with good calibration in the Calibration Period, the simulated groundwater elevation in the Update Period is reasonably close to the groundwater

elevation measurements (e.g., 02N20W06R01S and 02N21W18H03S). The complex hydrogeology in the shallow layer (hundreds of feet thick) between ground surface and the groundwater table, and the known geologic faults along the base of South Mountain poses a challenge in the model calibration for West Las Posas basin in both the Calibration Period and the Update Period (e.g., 02N21W01L01S and 02N21W11J06S).

3.2.4 SIMULATED GROUNDWATER ELEVATION CONTOURS

Simulated groundwater elevations, also known as potentiometric heads, or heads, were also contoured for each of the model layers in the Regional Model for December 2017 and December 2019. These dates include the central time of the Update Period, which corresponds with dry-to-normal conditions, as well as the end of the Update Period, which saw slightly wetter conditions. These groundwater-elevation contours are shown on Figures 3-37 through 3-62 (layers 11 through 13 are not present in the Piru, Fillmore and Santa Paula basins). The Regional Model Expansion Report (UWCD, 2021a) included simulated groundwater elevation contours for December 2015, which is representative of the most-recent major drought conditions. The simulated groundwater elevation contours are not presented for direct comparison to measured groundwater elevations, but rather are provided as a supplemental visualization of the simulated groundwater elevations from the Update Period, as discussed in the above sections.

Inspection of these figures shows that simulated groundwater elevations in all applicable layers (1 through 10) of the Piru, Fillmore, and Santa Paula basins reasonably simulates the observed westerly groundwater flow down the SCR Valley, generally following the elevation changes along the valley floor, as well as the steeper gradients down the hillslopes and tributaries discharging into SCR Valley from the north. The model does capture the variation in groundwater elevations between the dry and wet periods, most notably along the valley floor and areas near the basin boundaries, where rising water typically occurs (e.g., for Model Layer 3, compare Figures 3-39 and 3-52). Simulated groundwater elevations in all applicable layers (1 through 13) of the coastal plain basins capture the significant areas of depressed groundwater elevations associated with high groundwater extraction rates. The model also simulates onshore gradients in coastal areas during the drought conditions, and increasing heads during the wetter conditions towards the end of the Update Period (e.g., for Model Layer 7, compare the steep depression in the southern portion of the model domain on Figure 3-43 [December 2017] with the shallower depression shown on Figure 3-56 [December 2019]).

3.2.5 GROUNDWATER BUDGETS

In this section, the annual average groundwater flow budgets for the Regional Model groundwater basins during the 2016-2019 Update Period are compared with the annual averages from the 1985-2015 Calibration Period.

For context, readers are directed to the annual groundwater budget components for the SCR basins (presented as separately for Piru, Fillmore, and Santa Paula) as historically estimated by other investigations (see Tables 2-15 and 2-16 in [UWCD, 2021a]) as well as annual groundwater budgets components for the Coastal Plain Model basins (presented as combined for Mound, Oxnard, Pleasant Valley, and West Las Posas) as estimated by other investigations (see Table 2-2 in [UWCD, 2018a]). Comparison and discussion of simulated groundwater flow budgets for the Calibration Period and the estimated groundwater budgets are presented in previous reports (UWCD, 2018 and 2021a). The flow budgets from United's Regional Model are within the range of the flow budget estimated by other investigators (UWCD, 2018a and 2021a).

Monthly groundwater flow budgets based on the Update Period model outputs are provided in Appendix B. These monthly groundwater budgets show the variability in a basin's groundwater flow budgets from wet to dry periods. Tables 3-6 to 3-12 show the annual average groundwater flow budgets during the Update Period for the seven DWR basins as well as by aquifer zone. As described previously in this report, the Update Period followed substantial drought conditions at the end of the Calibration Period, resulting in declined groundwater elevations in most of the Regional Model domain at the beginning of the Update Period.

The water budgets calculated from the Regional Model represent volumetric budgets that are based on volumes of water and volumetric flow rates. Continuity of flow must be satisfied numerically, meaning that the total change of storage should equal the difference between the inflows and the outflows over a given amount of time. Following this convention, wet years and drought years are reflected in the change-in-storage component in the flow budget in the following way:

- negative change-in-storage volumes represent accumulation in storage, which is the excess of net groundwater flow, and stores that volume in the aquifer. Total groundwater recharge (inflows) exceeds total groundwater discharge and extraction (outflows), resulting in an increase in the volume of water stored as groundwater and an increase in groundwater elevations;
- positive change-in-storage volumes represent storage release, which compensates for the deficit of net groundwater flow. Total groundwater recharge (inflows) is less than total groundwater discharge and extraction (outflows), resulting in a decrease in the volume of water stored as groundwater and a decrease in groundwater elevations.

The Piru, Fillmore, and Santa Paula basin experienced a rebound from the 2013-2016 drought years during the wetter period from 2017 to 2019, as reflected in the change-in-storage component. The 2016-2019 average annual change-in-storage volumes for Piru, Fillmore and Santa Paula basins are -12,090, -5,720, and -1,978 acre-ft, respectively, representing an increase in the volume of stored groundwater (Tables 3-6 to 3-8). Groundwater elevations generally declined over the 1985-2015 Calibration Period, largely due to the severe drought at the end of the period. This is reflected by the positive annual change-in-storage volumes for the 1985-2015 period for Piru, Fillmore and Santa Paula basins (2,119, 4,334, and 3,487 acre-ft, respectively).

Although there was a rebound in storage and groundwater elevations within the SCR basins, simulated riparian evapotranspiration (ET) within all SCR basins (Piru, Fillmore, and Santa Paula) as well as other basins with simulated riparian ET (Mound, Oxnard, Pleasant Valley) was lower during 2016-2019 compared with 1985-2015. This occurred as a result of the lowering of groundwater elevations during the 2012-2016 drought period and therefore reduced connection with riparian vegetation, even was groundwater elevations generally rose during the Update Period. When groundwater elevations are low, there is a reduction in simulated ET as rates drop to zero if the water table drops below the extinction depth of 5 feet below ground surface elevation.

Also related to reduced simulated groundwater elevations during the Update Period as a result of dry antecedent conditions, all SCR stream percolation and rising groundwater volumes were reduced compared to the Calibration Period. Similarly, net percolation for Arroyo Las Posas were also reduced during the Update Period in Pleasant Valley basin.

As discussed in Section 2.4 above, significant decreases in diversion volumes from the SCR at Freeman Diversion resulted in a significant reduction (approximately 50%) of United's artificial recharge in the Forebay area of the Oxnard basin. The reduction in recharge to the Oxnard basin and continued groundwater extraction in excess of recharge to the basin resulted in lower groundwater elevations. Simulated groundwater inflow from adjacent basins that witnessed less groundwater elevation decline (Santa Paula, Mound, Pleasant Valley, and West Las Posas) increased. Similarly, the reduction in groundwater elevations due to reduced recharge and changes in inter-basin flows resulted in increased coastal flux from areas offshore of the Mound and Oxnard basins. With the exception of West Las Posas, all basins reported a reduction in pumping during the Update Period.

3.2.6 GROUNDWATER MODEL UPDATE PERIOD SUMMARY

The following model evaluation and comparison for the Update Period is summarized for all basins combined, as well as for each basin individually, as follows:

- All the basins: From the residual statistics, and the scatter plots described in Sections 3.2.1 and 3.2.2, the model performs consistently in both the Calibration Period and the Update Period.
- Piru basin: From the residual statistics, scatter plots, and hydrographs for Piru basin detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period. For some wells, simulated groundwater elevations were lower than measured values during recovery from severe droughts.
- Fillmore basin: From the residual statistics, scatter plots, and hydrographs for Fillmore basin detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period. Simulated groundwater elevations in drought years are higher than measured values in several wells, but consistently in both the Calibration Period and the Update Period.
- Santa Paula basin: From the residual statistics, scatter plots, and hydrographs for Santa Paula basin detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period, and it is noted that

the modeling simulates an overestimation of groundwater elevations in some wells during both the Calibration Period and the Update Period.

- Mound basin: From the residual statistics, scatter plots, and hydrographs for Mound basin detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period.
- Oxnard Forebay area: From the residual statistics, scatter plots, and hydrographs for Oxnard Forebay detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period except several wells that are screened across both the UAS and LAS, capture some but not the full rebounds in the groundwater elevations from recharge activities in the area. Several wells underpredict the rate of decline of groundwater elevations during most recent drought conditions, resulting in overestimated groundwater elevations during the end of the Calibration Period and portions of the Update Period.
- Oxnard basin: From the residual statistics, scatter plots, and hydrographs for Oxnard Plain detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period.
- Pleasant Valley basin: From the residual statistics, scatter plots, and hydrographs for Pleasant Valley detailed in Sections 3.2.1, 3.2.2, and 3.2.3, the Regional Model performs equally well between the Calibration Period and the Update Period.
- West Las Posas basin: From the residual statistics, scatter plots, and hydrographs for West Las Posas detailed in Sections 3.2.1, 3.2.2, and 3.2.3, wells screened in the thick shallow layer and along the edge of South Mountain do not perform as well compared to elsewhere within the basin, and this was consistent between both the Calibration and Update Periods.

3.3 STREAMFLOW RESULTS COMPARISON

Significant effort was expended during development of the Regional Model to simulate the complex surface water flow patterns in the Santa Clara River, characterized by highly variable and intermittent flows, and the frequent occurrence of alternating wet and dry reaches in dry seasons and years (UWCD, 2021a). The analyses that were performed to assess streamflow calibration for the 1985-2015 Calibration Period were repeated for the 2016-2019 Update Period, and included a detailed assessment of how well historic spatial and temporal patterns of streamflow, stream channel recharge (percolation) and rising groundwater were simulated. Three criteria were used to evaluate streamflow simulations by the Regional Model during the Update Period: stream channel recharge (Sections 3.3.1 and 3.3.2), rising groundwater (Section 3.3.4), and streamflow patterns and magnitude (Sections 3.3.2, 3.3.3, and 3.3.5). These were the same criteria as used to evaluate model calibration for the 1985-2015 period.

For most analyses presented here, results are described for the model Update Period, and compared to results for the Calibration Period that were described in the Regional Model Expansion Report (UWCD, 2021a). For Piru and Fillmore basins the focus was on simulation of recharge (percolation) and surface flow, as these basins are where the most natural recharge percolates into the groundwater basins of the Regional Model. In Santa Paula basin the focus was on streamflow at the Freeman Diversion facility, as less direct streamflow percolation occurs in this basin and accurate percolation measurements are not available. While model runs were performed using daily time steps, results were generally shown using averaged (monthly or seasonal) data. The analysis was largely based on assessing the correlation between simulated and observed data, but also by visualization of flow patterns using "heat maps" and comparing to known spatiotemporal flow trends.

3.3.1 BASIN RESPONSE DUE TO RECHARGE DURING RAINY SEASON

Direct measurements of stream channel recharge during the rainy season are very limited due to (1) the difficulty of accurately and safely performing manual discharge measurements during high flows for calculating recharge rates, and (2) a lack of appropriate locations for automated gaging stations at the downstream end of Piru and Fillmore basins (because of the high degree and variability of sediment scour and deposition in the sandy river channel associated with large storm events). Therefore, evaluation of stream channel recharge during the rainy season in these two basins consisted of evaluating simulated versus measured groundwater basin responses, which are largely driven by stream channel recharge during the rainy season. More specifically, this was done by comparing simulated and observed groundwater elevation increases between January 1 and May 1 for key wells in the Piru and Fillmore basins (wells with a long historical record that are used by United to represent basin conditions and calculate available storage). Changes in groundwater elevations were calculated by subtracting January 1 elevations from May 1 elevations, resulting in one data point for each year at each well for comparing the observed and simulated increases in groundwater elevation.

For the model Update Period for Piru basin, simulated basin responses correlated well with observed basin responses, as was also achieved for the model Calibration Period (Figure 3-63). Note that observed groundwater elevation changes were not available for the years 2016 and 2017 as the key well for the Piru basin went dry due to ongoing drought conditions. For Fillmore basin, simulated basin responses for the model Update Period were under-predicted for three out of the four years, when observed groundwater elevation changes between January 1 and May 1 were 8 ft or more (Figure 3-64). Two of the observed groundwater elevation changes for the model Update Period were well outside the range observed for the model Calibration Period and were significantly under predicted by the Regional Model. A hydrograph for the key well in the Fillmore basin (well 03N20W02A01S; see Figure 3-72B) confirms that the simulations during the model Update Period do not completely capture the groundwater elevation declines during drought years and the subsequent recovery in groundwater elevations during the winter period of years with normal or above-normal rainfall, which explains the reduced performance in predicting groundwater elevation changes as identified in the previous discussions in Section 3.2.3 regarding the groundwater analysis during the Update Period. Similar observations were made for some of the other wells located in Fillmore basin (see Figure 3-11), where simulated groundwater elevation increases during winter were much smaller than observed groundwater elevation increases during winter for the model Update Period (e.g., 03N21W01P02S and 04N20W26C02S in Figure 3-11). Overall, results suggest that stream channel recharge during the rainy season is well-predicted for Piru basin, but under-predicted for Fillmore basin following dry periods when stream channel recharge is high. Stream channel recharge to Fillmore basin originates from the mainstem SCR as well as from Sespe Creek upstream of the confluence with the SCR and is more complex than in Piru basin.

3.3.2 SURFACE FLOWS AND BASIN RESPONSE DURING CONSERVATION RELEASES

United monitors streamflow at multiple locations in the watershed during conservation releases, in order to monitor the progress of the release and allow calculation of recharge benefits to each of the groundwater basins upstream of the Freeman Diversion Facility. Two significant conservation releases from Lake Piru occurred during the model Update Period, in 2017 (3 weeks in late spring,) and 2019 (8 weeks in late spring and early summer) (Table 2-5).

3.3.2.1 PIRU BASIN

Simulated and observed monthly streamflow at the downstream end of Piru basin (upstream of the rising groundwater) correlate well during the model Update Period, similarly as for the Calibration Period (Figure 3-65). Recharge to Piru basin was also reasonably well-predicted for both years with conservation releases, with a similar accuracy as for the Calibration Period (Figure 3-66). Figure 3-67 displays the hydrograph for simulated daily streamflow at the downstream end of Piru basin. Streamflow measurements were performed during releases and occasionally during periods with low flows during the period 2000-2019, and match the simulated streamflows closely in most cases, during both the Calibration Period and the Update Period. The response of Piru basin to recharge during the conservation releases was assessed by comparing simulated and observed groundwater elevation changes in the Piru basin key well. Groundwater elevation increases were calculated by subtracting elevations just before release from elevations just after release, resulting in one data point each for observed and simulated groundwater elevation increases during release years. The increase in groundwater elevations in the Piru basin key well (04N18W29M02S) due to conservation releases during the model Update Period was well simulated by the Regional Model (Figure 3-68 A). Groundwater elevation changes were slightly underestimated, but within the range observed during the Calibration Period. It should be noted that the hydrograph for this key well (04N18W29M02S) generally shows a very good calibration during the model Update Period (Figure 3-68 B). The hydrograph also shows that increases in groundwater elevations during the winter season were greater than increases during conservation releases, which occurred shortly after the end of the rainy season. In 2017, releases from Castaic

Lake resulted in additional groundwater elevation increases after the end of the conservation release from Lake Piru.

3.3.2.2 FILLMORE BASIN

Monthly simulated and observed streamflow at the downstream end of Fillmore basin (upstream of the rising groundwater) generally correlated well during the model Update Period, similarly as for the Calibration Period (Figure 3-69). Simulated flows for one month during the 2019 release were somewhat under predicted. Recharge to Fillmore basin was better predicted for 2017 than for 2019, but generally within the accuracy observed for the Calibration Period (Fig 3-70). The under-prediction of recharge for the 2019 release was related at least in part to the under-prediction of surface flow at the basin boundary (Figure 3-65). Figure 3-71 displays the hydrograph for simulated daily streamflow at the downstream end of Fillmore basin. Streamflow measurements were performed during the releases and occasionally during periods of low flow during the period 2000-2019, and these measurements match the simulated streamflows closely in most cases, during both the Calibration Period and the Update Period.

Fillmore basin response to recharge during the conservation releases was assessed by comparing simulated and observed groundwater elevation changes in the Fillmore basin key well. Groundwater elevation increases were calculated by subtracting groundwater elevations just before the release from elevations just after release, resulting in one data point for observed and simulated groundwater elevation increases during release years. The increase in groundwater elevations in the Fillmore basin key well 03N20W02A01S resulting from conservation releases during the model Update Period was well-simulated by the Regional Model (Figure 3-72 A). As observed during the Calibration Period, groundwater elevations changed little in response to conservation releases. Note that the hydrograph for key well 03N20W02A01S shows relatively poor-calibration during the model Update Period, especially during the 2015 and 2016 drought years (Figure 3-72 B). However, calibration was better during years with conservation releases. Similarly, as observed in Piru basin, groundwater elevation increases in the Fillmore key well occurred predominantly during the rainy season (with recharge from SCR mainstem and Sespe Creek), but smaller or no increases we simulated during the conservation releases.

3.3.3 SURFACE FLOW PATTERNS

3.3.3.1 PIRU BASIN

A heat map for flows in Piru basin shows spatial and temporal trends in simulated monthly flows, compared to observed losing and gaining reaches (Figure 3-73). The heat map rows represent monthly time steps, from the oldest on top to the most recent at the bottom (in this case October 2017 to December 2019). The heat map columns represent location along the SCR stream channel (each column is one model grid cell along the stream channel, or “stream cell”), in this case from Ventura/Los Angeles County line to near the Fillmore Fish Hatchery. Flow direction is from left-to-right, corresponding to the general flow direction from east-to-west. The value in each cell is the simulated monthly streamflow (cfs). Each row essentially provides a monthly snapshot of the streamflow from upstream (left) to downstream (right), with changes in streamflow driven by surface water-groundwater interactions. Blue colors indicate high flows, yellow colors intermediate flows, and red colors low flows. Watershed features are listed for reference in the top row above the heat map, and colors in the top row indicate known losing reaches (red), gaining reaches (green) or stable reaches (yellow).

The Piru losing reach (also known as the “dry gap”) starts downstream of USGS gage 11109000. Simulated streamflows rapidly decreases to zero in this area, except during the wettest months when surface flows persisted across the basin (as shown inside the “A” box on Figure 3-73). During a conservation release, simulated flow inputs from Piru Creek decreased due to channel percolation, but surface flows persisted across the basin, matching field observations, as shown for the 2019 release (inside the “B” box on Figure 3-73).

Simulated flows in the area of rising groundwater near the western basin boundary accurately reflect the mostly dry conditions prior to 2019 (as shown inside the upper half of the “C” box on Figure 3-73). However, the Regional Model does not capture the return of the wetted stream channel due to rising groundwater in Piru basin following the 2019 rainy season and the late spring/early summer conservation release in 2019 (as shown inside the lower half of the “C” box on Figure 3-73). Under-prediction of Piru basin rising groundwater flows is also observed for the Calibration Period. In general, simulated flow patterns in Piru basin for the model Update Period are similar to those for the Calibration Period.

3.3.3.2 FILLMORE BASIN

A heat map for flows in Fillmore basin shows spatial and temporal trends in the simulated monthly flows, compared to observed losing and gaining reaches for the period January 2017 to August 2019 (Figure 3-74). The Fillmore basin losing reach starts downstream of the Fillmore Fish Hatchery (top row colored red). During conservation releases, simulated flows decrease in this reach, as they should based on field measurements (as shown inside the “A” box on Figure 3-74). During drier periods with lower flows, simulated surface flows persist across the basin (as shown inside the “B” box on Figure 3-74), which does not quite match field observations. Field observations have shown that low flows from Piru basin (or rising groundwater from Piru-Fillmore basin boundary) generally percolate completely to groundwater in Fillmore basin. Recharge of these low flows in Fillmore basin are a small part of the basin water balance, and simulated groundwater elevations are therefore not very sensitive to this component.

Simulated flows in the area of rising groundwater at the western end of the basin during the model Update Period did not reflect the observed rising groundwater there. Instead, simulated flows were constant (less than 1 cfs difference entering and exiting the rising groundwater reach) or indicated a consistently dry reach (as shown inside the “C” box on Figure 3-74). In contrast, field measurements documented 4 to 10 cfs of rising groundwater in the area in 2017 and 2018 (after the 2017 winter season), resulting in a wetted stream channel at the western end of Fillmore basin. Under-prediction of Fillmore basin rising groundwater flows was also observed for the Calibration Period. In general, simulated flow patterns in Fillmore basin for the model Update Period were similar as those for the Calibration Period.

3.3.4 RISING GROUNDWATER IN PIRU AND FILLMORE BASINS

Measurements of rising groundwater at the Piru-Fillmore and Fillmore-Santa Paula basin boundaries are available for the period 2011-2019, which includes periods with both high and low groundwater elevations. Observations are available for dry months only, as it is difficult to measure rising groundwater when streamflow is high and dynamic. For both basins, observed rising groundwater correlates well with groundwater elevations at selected wells (non-linear correlation, see observed data in Figure 3-75 A and Figure 3-76 A).

Simulated rising groundwater during dry months in western Piru basin was zero during the entire model Update Period. The relationship between simulated rising groundwater and groundwater elevations was very similar to the one observed for the Calibration Period, with both periods significantly under-predicted rates of rising groundwater as a function of groundwater elevation (Figure 3-75 A). In addition, the under-prediction of rising groundwater in Piru basin was also due to the slight under-prediction of groundwater elevations during the 2017-2019 period when water levels generally rose in the basin (Figure 3-75 B).

In the Fillmore basin, simulated rising groundwater during dry periods varied between 0 and 1 cfs for the model Update Period. The relationship between simulated rising groundwater and groundwater elevations was very similar to the one observed for the Calibration Period, with both periods showing significantly (up to tenfold) under-predicted rates of rising groundwater (Figure 3-76 A). For Fillmore basin, under prediction of rising groundwater was not associated with under-prediction of groundwater elevations, as groundwater elevations were generally over-predicted (except during most of 2019, see Figure 3-76 B). Due to the importance of Fillmore rising groundwater for dry season diversions at the Freeman Diversion, improving rising groundwater simulations there will be considered in future model updates.

3.3.5 STREAMFLOW AND DIVERSION AT FREEMAN DIVERSION FACILITY

In the Santa Paula basin, simulated and observed daily streamflow just upstream of the Freeman Diversion correlated well for the Update Period, as they did during the Calibration Period (Figure 3-77). Simulated streamflow just upstream of the Freeman Diversion was generally lower during the Update Period than during the Calibration Period. As observed during calibration, there was significant scatter in the low to moderate flow ranges, which are most relevant to operations of the Freeman Diversion (up to about 3,000 cfs) (Figure 3-78). Figure 3-79 compares hydrographs for simulated and observed daily streamflow at the Freeman Diversion, for the Calibration Period and the Update Period. Simulated streamflow generally captures the magnitude and seasonal variability of observed streamflow well. Streamflow simulations are slightly better during the Update Period, as in some cases flows less than approximately 20 cfs were overestimated during the Calibration Period.

To better understand the impact of streamflow simulation discrepancy on simulated diversions, the Hydrological Operations Simulation System (HOSS) model was used to calculate simulated diversion volumes at Freeman Diversion, once based on observed streamflows, and once based on simulated streamflows upstream of the diversion. This was conducted for the Update Period, as was previously done for the Calibration Period. For the purpose of this comparison, the HOSS model calculated diversion volumes based on the bypass flow operations proposed in United's Freeman Diversion Multiple Species Habitat Conservation Plan, without any infrastructure improvements. A more detailed description of the HOSS and modeling scenarios for future simulations is available in the Regional Model documentation report (UWCD, 2021b). Simulated annual diversions based on observed and simulated streamflow correlate well for the Update Period, as they did for the Calibration Period (Figure 3-80). Note that calculated diversions for the Calibration Period are consistently lower when based on simulated streamflow compared to when based on observed streamflow. This was not apparent for the Update Period, likely because of the limited number of observations (four years with comparatively low annual diversions volumes).

As explained in more detail in the Regional Model expansion report (UWCD, 2021a) and United's Technical Memorandum on model inputs for simulations in support of GSPs (UWCD, 2021b), United opted to use its Surface Water Hydrology Model for the upper basins to simulate streamflow at the Freeman Diversion, instead of the Regional Model. Simulated streamflow and diversions based on the Surface Water Hydrology Model matched the observations better than those based on the Regional Model.

3.3.6 STREAMFLOW UPDATE PERIOD SUMMARY

Three criteria were used to evaluate streamflow simulations by the Regional Model during the 2016-2019 Update Period: stream channel recharge, rising groundwater, and streamflow. These were the same criteria as used to evaluate model calibration of the 1985-2015 period. In general, the results of the surface water flow comparisons for the Update Period are very much in line with results of model Calibration Period. The conclusions regarding streamflow calibration that were made in the Regional Model expansion report (UWCD, 2021a) therefore remain valid:

- Recharge from stream channels: The simulated recharge to groundwater from streams in the Piru and Fillmore basins during conservation releases is well-predicted by the Regional Model. The location and seasonal occurrence of the dry gap in Piru basin was also accurately simulated. Outside the conservation release periods, recharge of natural baseflows to the groundwater system in Fillmore basin was slightly under-estimated (during the rainy season as well as the dry season), however the calibration of groundwater elevations in the basin was not affected. Recharge from stream channels was not assessed for Santa Paula basin as recharge is relatively low there.

- Rising groundwater: The locations of simulated rising groundwater is generally in agreement with observed locations, i.e. at Piru-Filmore and Fillmore-Santa Paula basin boundaries. The volume of rising groundwater is under-estimated by the model, especially in the Fillmore basin. The simulated groundwater elevations in the areas of rising groundwater are generally well-calibrated, but tend to be under-predicted in Fillmore basin, which may cause the under-estimation of rising groundwater. Because the simulated rising groundwater is sensitive to groundwater elevation changes of less than one foot to a few feet, it may be too sensitive for the numerical model to simulate the rising groundwater adequately. Rather than simulating the flow downstream as surface flow stemming from the rising groundwater, the model may simulate that flow as shallow underflow. In this case groundwater elevation calibrations are not affected as the volumetric flow rate downstream would be comparable to one another, although not in the same component (groundwater flow versus surface water flow).
- Streamflow: The streamflow patterns and magnitudes across the Piru and Fillmore basins were generally well simulated during conservation releases and outside the winter season. Streamflow calibration within those basins could not directly be assessed for flows exceeding approximately 350 cfs due to the lack of manual observations in that flow range. Streamflow in the Santa Paula basin at the Freeman Diversion Facility, was consistently under-predicted, resulting in a significant under prediction of annual average diversions there. Therefore, United opted to use an alternative surface water spreadsheet model to simulate streamflow at the Freeman Diversion. The numerical groundwater model has limited surface water routing capabilities, and was not expected to fully capture the highly flashy streamflow conditions in the SCR on a daily basis across the entire flow range.

Based on the above summary, the Regional Model is well-calibrated for simulating basin recharge from streamflow, which was one of the main goals of the groundwater model. Daily streamflow patterns and magnitudes were adequately captured, but as expected the numerical groundwater flow model alone was inherently limited for the purpose of daily streamflow simulations.

4 CONCLUSIONS

The Regional Model update with the 2016-2019 data sets provides an opportunity to evaluate the calibration quality of the Regional Model and helped identify a few areas for model improvement. When evaluating the Regional Model as a whole, local imperfections in model calibration in certain areas is generally not affecting the model calibration on the regional scale. The uniform numerical model grid size of 2000 feet by 2000 feet implies that the Regional Model may be used to support basin-scale groundwater analysis, but caution should be taken when using the model to interpret smaller/local scale projects or conditions. From the discussion included in Section 3, it is concluded that the Regional Model is well-calibrated with the 2016-2019 data when all basins are evaluated overall.

When evaluating the basins individually, local model imperfections suggest areas for further model improvement. The Regional Model performs equally well in both the Calibration Period (1985-2015) and the Update Period (2016-2019) in the Oxnard, Pleasant Valley and Mound basins. The areas for potential future model improvement are summarized in the following:

- Piru basin: Groundwater elevations are well-calibrated. The simulation of rising groundwater may be further improved near the Fish Hatchery at the downstream basin boundary.
- Fillmore basin: Groundwater elevations along SCR between the Fillmore Fish Hatchery and the City of Fillmore may be improved, as simulated groundwater elevations in a few wells along the SCR are noticeable underestimated. The rising groundwater near the basin boundary with Santa Paula may be further improved
- Santa Paula basin: Simulated groundwater elevations trend slightly higher than the observed groundwater elevations. Further investigation of the SCR stream interaction and the complex geologic transition from the river basins to coastal plain basins might improve model calibration.
- Oxnard Forebay area: The simulated groundwater elevation rebound in the 2016-2019 Update Period was less than the measured groundwater elevation recovery in several wells, and may be further calibrated.
- West Las Posas basin: Groundwater elevations in wells located along South Mountain are influenced by local faults, and wells that are screened in the shallow aquifer pose a challenge to the Regional Model. Additional calibration efforts related to model parameterization, such as aquifer layering, aquifer parameters and revising the fault lines, can be expected to improve calibration this area of the Regional Model.

REFERENCES

Calleguas Municipal Water District (CMWD), 2018. Groundwater Flow Model of the East and South Las Posas Sub-Basins Preliminary Draft. January.

DWR (California Department of Water Resources) 2019. Bulletin 118 update, https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118

FCGMA and others, 2007. 2007 Update to the Fox Canyon Groundwater Management Agency Groundwater Management Plan. Prepared by Fox Canyon Groundwater Management Agency, United Water Conservation District, and Callegaus Municipal Water District. May.

GSI Water Solutions, Environmental Simulations, and GSI Environmental (GSI Water Solutions and others), 2021, Expert Review Panel Review of the Expansion and Update to the Ventura Regional Groundwater (Ventura County, California). Memorandum to Jason Sun and Dan Detmer, United Water Conservation District. Prepared by John Porcello/GSI Water Solutions, Jim Rumbaugh/ Environmental Simulations, and Sorab Panday/ GSI Environmental. August 19, 2021.

Niswonger, R.G., Panday, S., and Ibarki, M., 2011, MODFLOW-NWT, A Newton formulation for MODFLOW-2005: U.S. Geological Survey Techniques and Methods 6-A37, 44 p.

UWCD (United Water Conservation District), 2012. Santa Felicia Water Release Plan, Santa Felicia Project, FERC License No. 2153, June.

UWCD (United Water Conservation District), 2018a. Ventura Regional Groundwater Flow Model and Updated Hydrogeologic Conceptual Model: Oxnard Plain, Oxnard Forebay, Pleasant Valley, West Las Posas, and Mound Groundwater Basins. Open-File Report 2018-02. July.

UWCD (United Water Conservation District), 2018b. 2016 Recycled Water Management Impact Analysis Annual Report. March.

UWCD (United Water Conservation District), 2018c. 2017 Recycled Water Management Impact Analysis Annual Report. March.

UWCD (United Water Conservation District), 2019. 2018 Recycled Water Management Impact Analysis Annual Report. March.

UWCD (United Water Conservation District), 2020. 2019 Recycled Water Management Impact Analysis Annual Report. May.

UWCD (United Water Conservation District), 2021a. Ventura Regional Groundwater Flow Model Expansion and Updated Hydrogeologic Conceptual Model for the Piru, Fillmore and Santa Paula Groundwater Basins, United Water Conservation District Open-File Report 2021-01. June.

UWCD (United Water Conservation District), 2021b. Technical Memorandum. Implementation of Groundwater Model Inputs for Simulations in Support of Groundwater Sustainability Plan Development by the Mound, Fillmore, and Piru Groundwater Sustainability Agencies, dated June 2021.

Ventura Water, 2016, 2015 Urban Water Management Plan for City of Ventura. June.

TABLES

This page intentionally blank.

Table 2-1.
Precipitation Stations Used for Input to Regional Model over 2016-2019 Update Period

VCWPD Site ID	Site Description	Elevation (ft amsl)	Easting	Northing
004A	Casitas Dam	360	6,160,010.91	1,958,955.34
017C	Port Hueneme - Oxnard Sewer Plant	10	6,202,612.24	1,876,061.34
020B	Ventura River County Water District	570	6,170,758.70	1,981,130.10
25	Piru-Newhall Ranch	825	6,343,123.88	1,969,310.51
030D	Ojai-County Fire Station	760	6,190,467.13	1,987,706.04
032A	Oxnard Civic Center	53	6,204,789.76	1,897,291.08
036A	Piru-County Fire Station	700	6,321,351.01	1,973,815.88
59	Ojai-Thacher School	1,440	6,205,907.61	1,994,283.67
064B	Upper Ojai-Happy Valley	1,320	6,202,885.48	1,983,618.91
065A	Upper Ojai Summit-County Fire Station	1,550	6,219,449.62	1,983,278.49
066E	Ventura-Downtown (City Hall-Historic Courthouse)	120	6,171,185.26	1,927,708.89
85	Canada Larga	760	6,190,598.14	1,963,078.28
101A	Piru-Camulos Ranch	725	6,333,332.60	1,971,015.62
106A	Piru RAWS	614	6,317,366.66	1,970,481.35
121C	Lake Sherwood-County Fire Station	975	6,296,513.06	1,874,846.97
122	Ventura-Kingston Reservoir	205	6,170,807.24	1,949,698.08
126A	Moorpark - Ventura County Yard	725	6,296,498.89	1,931,079.69
128C	Thousand Oaks APCD APCD	795	6,298,492.31	1,899,996.39
130B	Chuchupate Ranger Station	5,277	6,257,382.24	2,117,386.68
134B	Matilija Dam	1,060	6,168,203.04	2,000,997.89
140	Oak View-County Fire Station	520	6,169,171.47	1,968,715.20
152	Piedra Blanca Guard Station	3,065	6,210,318.65	2,028,386.86
153A	Ojai-Bower Tree Farm	780	6,193,259.19	1,985,249.48
160	Piru-Temescal Guard Station	1,105	6,332,314.04	1,995,886.74
163C	Sulphur Mountain	2,450	6,207,309.68	1,973,378.94
165	Ojai-Stewart Canyon	970	6,185,297.19	1,992,310.81
167	Ventura-Hall Canyon	180	6,181,192.34	1,926,836.47
168	Oxnard Airport	34	6,196,509.92	1,897,957.19
169A	Thousand Oaks - Civic Center	850	6,304,980.44	1,887,209.50
171	Fillmore-Fish Hatchery	465	6,294,702.26	1,966,783.81
172	Piru Canyon	1,160	6,333,401.68	2,010,027.87
173A	Santa Paula Canyon-Ferndale Ranch	1,010	6,233,981.10	1,979,605.84
175A	Saticoy-County Yard	150	6,216,995.42	1,926,675.70
177A	Camarillo-Pacific Sod	24	6,237,051.88	1,880,691.87
180A	Ortega Hill (Type C)	5,215	6,169,656.59	2,032,959.70
188A	Newbury Park-County Fire Station #35	645	6,280,378.29	1,891,465.74
189	Somis-Deboni	520	6,237,481.43	1,927,918.91
190	Somis-Bard	460	6,257,126.22	1,926,683.02
193A	Santa Susana	960	6,347,291.26	1,920,641.77
194A	Camarillo-Adohr (Sanitation Plant)	110	6,258,557.72	1,895,499.74
196C	Tapo Canyon - County Park	1,380	6,347,001.76	1,940,710.05

Table 2-1.
Precipitation Stations Used for Input to Regional Model over 2016-2019 Update Period

VCWPD Site ID	Site Description	Elevation (ft amsl)	Easting	Northing
197A	Topa Topa	2,500	6,255,748.03	2,032,448.62
199A	Fillmore Sanitation	390	6,278,113.78	1,965,774.18
206B	Somis-Fuller	733	6,265,744.08	1,936,974.70
207C	Matilija Canyon	1,400	6,153,846.48	2,007,743.73
209A	Lockwood Valley-County Yard	5,163	6,230,083.75	2,091,074.52
211A	Alamo Mountain	6,705	6,266,686.74	2,067,523.99
215	Channel Islands Harbor	5	6,191,789.69	1,883,600.23
215A	Channel Is Harbor - Kiddie Beach	15	6,191,890.63	1,882,471.50
216C	Ventura Harbor	12	6,179,264.01	1,916,713.49
218	Meiners Oaks-County Fire Station	730	6,174,196.93	1,986,656.64
219A	Camarillo-Hauser	192	6,251,232.81	1,910,261.08
219B	Camarillo - CHD	167	6,246,294.05	1,909,285.64
221B	Sea Cliff - County Fire Station	10	6,133,025.30	1,951,120.06
222A	Ventura-County Government Center	280	6,195,762.90	1,921,839.48
224A	Sespe-Westates	2,870	6,295,734.01	1,997,948.69
225	Wheeler Canyon	900	6,215,927.31	1,966,562.48
227	Lake Bard	1,030	6,311,199.14	1,911,833.57
230A	Ventura-Sexton Canyon	880	6,191,509.93	1,938,304.60
232	Santa Monica Mts-Deals Flat	1,475	6,268,508.25	1,856,193.20
234B	Las Llajas Canyon	1,160	6,353,216.94	1,933,069.75
235A	Piru-L.A./Ventura County Line	800	6,349,004.67	1,968,584.50
237	San Guillermo	5,125	6,209,751.14	2,063,561.73
238	South Mountain-Shell Oil	1,624	6,257,058.81	1,944,644.71
239	El Rio-UWCD Spreading Grounds	105	6,213,198.85	1,911,502.97
242	Tripas Canyon	2,500	6,330,865.14	1,956,896.70
244	Cuddy Valley-Cuddy Ranch	5,500	6,243,779.26	2,129,751.59
245B	Santa Paula - Wilson Ranch	405	6,243,086.17	1,959,223.84
246A	Simi Sanitation Plant	660	6,316,423.15	1,926,755.02
250	Moorpark-Happy Camp Canyon	1,410	6,304,945.44	1,949,562.15
254	Casitas Station - Station Canyon	630	6,148,134.04	1,973,671.64
259	Camarillo-PVWD	90	6,238,341.98	1,901,620.25
264	Wheeler Gorge	1,900	6,179,131.33	2,012,365.69
268	Last Chance (Type C)	4,510	6,245,359.76	2,003,549.85
272	Sage Ranch	2,045	6,357,157.87	1,910,272.42
273A	Oxnard NWS	63	6,217,788.37	1,899,732.49
279	Borracho Saddle (Type C)	4,350	6,287,889.19	2,043,867.99
280	Circle X Ranch (Type B)	1,700	6,278,074.76	1,863,577.77
281	Oak Park Fire Station	1,096	6,331,412.60	1,889,247.99
300	Senior Gridley Canyon (Type B)	2,514	6,197,406.84	1,999,945.09
301	Old Man Mountain (Type C)	4,370	6,127,959.25	2,009,046.46
302	Canada Larga-Verde Canyon (Type B)	1,590	6,195,219.04	1,953,482.70
303	Nordhoff Ridge (Type C)	4,112	6,190,904.54	2,010,205.12

Table 2-1.
Precipitation Stations Used for Input to Regional Model over 2016-2019 Update Period

VCWPD Site ID	Site Description	Elevation (ft amsl)	Easting	Northing
304	Matilija Hot Springs at No Fork (Type B)	1,142	6,168,013.37	2,004,259.19
305	La Granada Mountain (Type B)	2,230	6,132,137.17	1,977,451.39
306	White Ledge Peak (Type C)	4,405	6,142,028.70	1,997,262.35
307	Upper Matilija Canyon (Type C)	4,440	6,148,481.82	2,022,194.58
308	Red Mountain (Type B)	2,075	6,157,218.33	1,952,181.82
309	La Conchita - Schaefer Ranch	734	6,126,614.29	1,958,994.90
400	Fillmore-Grand Ave (Type B)	580	6,282,064.84	1,984,441.53
401	Sycamore Canyon (Type C)	4,811	6,237,367.55	2,036,357.76
402	Tommys Creek (Type C)	5,287	6,193,989.88	2,044,352.38
403	Silverstrand Alert (Type B)	18	6,192,883.46	1,880,190.61
404	Sisar North ALERT (Type C)	5,170	6,219,025.53	2,008,956.33
405	Choro Grande (Type C)	4,594	6,159,597.90	2,046,385.27
406	Fagan Canyon West (Type B)	700	6,233,836.94	1,961,275.67
408	Rose Valley Alert (Type C)	3,331	6,204,812.73	2,022,246.68
409	Hopper Mountain (Type C)	4,200	6,300,989.02	1,998,286.59
410	Pyramid Lake Visitors Center (Type B)	2,680	6,331,873.34	2,063,588.68
500A	Camrosa Water District	200	6,269,287.47	1,910,664.24
501	Rocky Peak (Type B)	2,430	6,367,258.62	1,929,842.08
502	Santa Rosa Valley - Basin 2	410	6,294,226.70	1,912,082.33
505	Camarillo - CSUCI (Type B)	58	6,247,267.45	1,889,157.81
506	Wood Ranch - Sycamore Canyon Dam (Type B)	810	6,320,088.63	1,915,931.84
507	South Mountain East (Type B)	965	6,246,056.69	1,933,756.38
508	Moorpark - Home Acres ALERT (Type B)	400	6,282,260.64	1,922,392.56
509	Spanish Hills - Las Posas Res (Type B)	300	6,233,302.06	1,906,536.16
510	Lang Ranch (Type B)	1,600	6,314,046.86	1,898,453.98
512	Camarillo - Upland (Type B)	207	6,257,148.69	1,911,053.90
513	Rancho Sierra Vista - Big Sycamore Canyon (Type B)	885	6,269,566.68	1,877,111.49

Table 2-2: Santa Clara River Basins Annual Average Streamflow (CFS)

Santa Clara River basins Streamgage Flows (CFS) Annual Average

Calendar Year	Santa Clara River LA County Line (USGS 11108500) Near Piru, CA (USGS 11109000)	Piru Creek* (USGS 11109800)	Hopper Creek (USGS 11110500)	Pole Creek (VCWPD 713)	Sespe Creek (USGS 11113000)	Santa Paula Creek (USGS 11113500)	UWCD Freeman
2016	25.32	9.13	1.80	0.12	9.76	2.13	10.32
2017	80.00	37.47	13.44	3.71	129.66	21.18	134.93
2018	31.68	8.93	0.62	0.35	27.31	6.23	15.56
2019	87.34	68.90	8.50	2.55	204.20	32.80	296.74
2016 - 2019 Average	**56.08**	**31.11**	**6.09**	**1.68**	**92.73**	**15.59**	**114.39**
1985 - 2015 Average	77.83	62.22	8.68	3.00	144.06	27.46	272.45

Data from USGS and VCWPD; and United Units: CFS;

**Value includes Santa Felicia Dam releases and spills*

Table 2-3: Coastal Basins Annual Average Streamflow (CFS)

Location	Arroyo Las Posas	Conejo Creek
2016	6.25	16.32 (89%)
2017	10.83	19.78 (78%)
2018	6.48	19.09 (79%)
2019	14.40	21.82 (73%)
2016 - 2019 Average	**9.49**	**19.24 (79%)**
1985 - 2015 Average	2.27	30.26

Note: Percentage of Thousand Oaks Hill Canyon Treatment Plant annual average effluent discharge to total dry season Conejo Creek measured discharge is provided in parenthesis. Conejo Creek data from 1985-2015 represents data from VCWPD Gage 800 and 800A. Data for these gages were not available for the 2016-2019 Update Period.

Table 2-4: Arroyo Las Posas Subsurface Underflow Entering Regional Model Domain (AFY)

Streamgage	Arroyo Las Posas Subsurface Underflow (AFY)
2016	1301.65
2017	1361.64
2018	1141.67
2019	1379.54
2016 - 2019 Average	**1296.13**
1985 - 2015 Average	1646.39

Arroyo Las Posas underflow: United estimation based on relationship developed between available observed (02N20W17J06S) WLE records and monthly Intera Model GW output from 2014 – 2015 (R^2 = 0.70).

Table 2-5. Benefits of the Santa Felicia Dam (SFD) Conservation Releases, 2016-2019

Year	Start Date	End Date	Total conservation release from SFD	Direct deliveries (AF) of SFD Release to:					
				Recharge Piru Basin	Recharge Fillmore Basin	Recharge + Diversions Santa Paula Basin	Diversions at Freeman	Recharge	Surface water
			(AF)					(Saticoy and El Rio)	(Deliveries PTP & PV)
2016	12/7/2016	12/15/2016	970	970	0	0	0	*0*	0
2017	5/29/2017	6/19/2017	15,300	11,700	2,000	700	800	800	0
2018	6/8/2018	7/11/2018	1,103	1,103	0	0	0	0	0
2019	6/3/2019	7/28/2019	39,444	11,776	5,800	3,600	17,100	16,000	970
Total			56,817	25,549	7,800	4,300	17,900	16,800	970
2016-2019 Average			**14,204**	**6,387**	**1,950**	**1,075**	**4,475**	**4,200**	**243**
1999-2015 Average			25,184	9,597	3,453	n/a	4,718*	10,177*	1,957

*Includes recharge to Santa Paula basin (benefits to Santa Paula basin were not measured separately prior to 2016)

Table 2-6: Average Annual Streamflow Diversions in Regional Model Domain (AFY)

Diversion	**Isola**	**Camulos**	**Rancho Temescal 1**	**Rancho Temescal 2**	**Piru Mutual**	**Fillmore Irr. Co.**	**Beans Ranch**	**Limoneira**	**Canyon Irr. Co.**	**Farmers Irr. Co.**	**Zaragosa**	**Hyde-Turner Ditch**	**South Fork**	**United -Piru**	**United - Freeman**	**Camrosa***
Approximate Area (ac)	210	770	242	314	546	1,105	82	126	784	3,178	2	346	159	47	416	11,984
								Total Diversions (AFY)								
Year																
2016	0	2,000	1,130	278	1,261	0	85	0	119	0	0.4	377	390	0	2,927	7,469
2017	0	1,800	1,052	166	1,350	0	59	0	522	123	0.4	326	301	0	10,261	9,326
2018	0	1,756	1,011	181	1,300	0	62	0	432	128	0.3	329	298	0	3,741	8,858
2019	0	1,118	655	152	1,343	0	79	0	1,062	588	0.4	415	570	0	41,455	9,190
2016 - 2019 Average	**0**	**1,669**	**962**	**194**	**1,314**	**0**	**71**	**0**	**534**	**210**	**0.4**	**362**	**390**	**0**	**14,596**	**8,711**
1985-2015 Average	318	1,438	385	53	1,456	1,670	66	13	551	56	0.1	493	378	2,792	63,113	9,021

*Area of application within Model domain is Pleasant Valley only; Camrosa utilizes diverted water outside of model domain and with other sources

Table 2-7: Annual Average Wastewater Discharge in Regional Model Domain (AFY)

Wastewater Plant	Piru WWTP[1]	Fillmore WWTP[1]	Santa Paula WRF[1]	Todd Rd. Co. Jail WWTP[1]	Jose Flores (Saticoy)[1]	Ventura WWTP (Recycled Water)[2]	Oxnard AWPF (Recycled Water)[3]	Camrosa WWTP (Recycled Water)[4]	Camarillo WWTP (Discharge to Conejo Creek)[5]	Camarillo WWTP (Recycled Water)[5]
2016	135	959	2,025	41	86	700	1,024	1,250	1,771	2,102
2017	134	951	2,296	46	107	700	1,568	1,250	1,792	2,097
2018	139	949	2,077	48	87	700	2,770	1,250	2,138	1,797
2019	142	966	2,198	48	105	700	685	1,250	1,995	1,946
2016 - 2019 Average	137	956	2,149	46	96	700	1,512	1,250	1,924	1,985
1985 - 2015 Average	172	1,288	2,279	29	71	534	0	1,250	3,073	1,392

Units: AFY; [1]Data from data submitted to State Water Resources Control Board; [2]Data from Ventura Water's 2015 Urban Water Management Plan projections (Ventura Water, 2016); [3]Data from 2016 – 2019 Recycled Water Management Impact Analysis Reports (UWCD, 2016; 2017, 2018, 2019); [5]Data from correspondence with Camrosa Staff; [5]Data from correspondence with Camarillo Sanitary District Staff; WWTP – Wastewater Treatment Plant; WWRP – Wastewater Recycling Plant; WRF – Water Reclamation Facility; WWRF – Wastewater Reclamation Facility; AWPF – Advanced Water Purification Facility

Table 3-1: 2016-2019 Residual Statistics with All Groundwater Elevation Data Included

Basin	Data No.	RM	ARM	ARM %	RMS	RMS %	Std Dev	Std Dev %	WL Range	WL Min	WL Max
All Basins	18,376	-2.15	19.0	1.48%	30.6	2.40%	30.5	2.39%	1,278.0	-265.9	1,012.1
Piru	1,137	6.25	17.1	6.97%	21.7	8.85%	20.8	8.48%	245.0	427.4	672.4
Fillmore	992	5.07	17.3	3.93%	28.3	6.44%	27.9	6.34%	439.4	243.9	683.2
Santa Paula	2,630	-10.88	14.5	6.27%	22.2	9.57%	19.3	8.35%	231.8	41.0	272.8
Mound	843	20.40	25.5	12.16%	35.0	16.65%	28.4	13.53%	210.1	-65.0	145.1
Forebay	3,470	8.98	20.9	6.95%	26.6	8.83%	25.0	8.31%	301.2	-182.3	118.9
Oxnard Plain	7,068	-5.95	12.0	3.77%	17.4	5.47%	16.4	5.15%	318.0	-265.9	52.1
Pleasant Valley	1,518	-4.80	26.4	8.95%	34.5	11.70%	34.2	11.59%	294.6	-220.1	74.5
West Las Posas	623	-34.75	85.2	18.55%	106.8	23.26%	101.1	22.01%	459.3	-213.1	246.2

Note 1: Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font and highlighted in Yellow if the percentage >10%

Table 3-2: 2016-2019 Residual Statistics Excluding Outlier Wells and Wells with less than 10 Groundwater Elevation Records

Basin	Data No.	RM	ARM	ARM %	RMS	RMS %	Std Dev	Std Dev %	WL Range	WL Min	WL Max
All Basins	17,224	-2.57	16.8	1.77%	25.1	2.65%	25.0	2.63%	949.1	-265.9	683.2
Piru	1,111	6.27	16.9	6.91%	21.4	8.75%	20.5	8.38%	245.0	427.4	672.4
Fillmore	938	5.04	17.0	3.87%	28.4	6.45%	27.9	6.36%	439.4	243.9	683.2
Santa Paula	2,604	-10.67	14.4	6.20%	21.9	9.47%	19.2	8.27%	231.8	41.0	272.8
Mound	544	3.31	11.3	14.44%	13.5	17.25%	13.1	16.74%	78.1	-65.0	13.1
Forebay	3,379	9.10	21.0	6.98%	26.7	8.86%	25.1	8.33%	301.2	-182.3	118.9
Oxnard Plain	6,667	-6.92	11.7	3.69%	17.4	5.47%	16.0	5.02%	318.0	-265.9	52.1
Pleasant Valley	1,503	-4.78	26.1	8.87%	34.2	11.59%	33.8	11.48%	294.6	-220.1	74.5
West Las Posas	391	-18.32	51.9	17.12%	72.2	23.84%	70.0	23.09%	303.1	-198.3	104.8

Note 1: Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font and highlighted in Yellow if the percentage >10%

Note 3: The WL range for Mound and West Las Posas highlighted in yellow are much less than the WL range in the Calibration Period (1985-2015)

Table 3-3: 2016-2019 Adjusted Residual Statistics Excluding Outlier Wells and Wells with less than 10 Groundwater Elevation Records

Basin	Data No.	RM	ARM	Adjusted ARM %	RMS	Adjusted RMS %	Std Dev	Adjusted Std Dev %	1985-2015 WL Range	1985-2015 WL Min	1985-2015 WL Max
Mound	544	3.31	11.3	8.54%	13.5	10.20%	13.1	9.90%	132.0	-55.4	76.6
West Las Posas	391	-18.32	51.9	7.96%	72.2	11.09%	70.0	10.74%	651.3	-367.5	283.8

Note 1: Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font and highlighted in Yellow if the percentage >10%

Note 3: The WL range for Mound and West Las Posas highlighted in yellow

Table 3-4: 1985-2015 Residual Statistics with All Groundwater Elevation Data Included

Basin	Data No.	RM	ARM	ARM %	RMS	RMS %	Std Dev	Std Dev %	WL Range	WL Min	WL Max
All Basins	90,502	0.61	13.4	1.11%	22.3	1.85%	22.3	1.85%	1203.5	-367.5	836.0
Piru	5,481	-3.10	9.7	3.88%	12.6	5.03%	12.2	4.88%	249.5	449.4	698.9
Fillmore	4,827	2.48	11.6	2.47%	16.3	3.47%	16.1	3.43%	470.8	220.7	691.5
Santa Paula	16,684	-10.04	12.1	4.71%	18.4	7.13%	15.4	5.97%	258.0	28.0	286.0
Mound	4,035	9.06	16.4	7.96%	25.7	12.53%	24.1	11.73%	205.5	-55.4	150.1
Forebay	18,428	4.01	9.8	3.06%	15.2	4.74%	14.7	4.57%	321.6	-183.1	138.5
Oxnard Plain	29,656	2.51	11.0	2.51%	16.3	3.72%	16.1	3.67%	438.4	-324.5	113.9
Pleasant Valley	7,355	-0.46	19.6	5.67%	25.8	7.48%	25.8	7.48%	344.9	-200.8	144.1
West Las Posas	3,315	16.84	48.6	7.46%	69.2	10.63%	67.2	10.31%	651.3	-367.5	283.8

Note 1: Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font

Table 3-5: 1985-2015 Residual Statistics Excluding Outlier Wells and Wells with less than 10 Groundwater Elevation Records

Basin	Data No.	RM	ARM	ARM %	RMS	RMS %	Std Dev	Std Dev %	WL Range	WL Min	WL Max
All Basins	88,754	-0.30	12.4	1.16%	19.1	1.79%	19.1	1.79%	1063.4	-367.5	695.9
Piru	5,451	-3.09	9.6	3.90%	12.4	5.03%	12.0	4.87%	246.5	449.4	695.9
Fillmore	4,737	2.57	11.5	4.69%	15.8	6.46%	15.6	6.38%	244.2	220.7	464.9
Santa Paula	16,622	-9.99	12.1	5.01%	18.2	7.54%	15.3	6.31%	241.8	44.2	286.0
Mound	3,322	0.17	9.0	6.80%	11.7	8.90%	11.7	8.90%	132.0	-55.4	76.6
Forebay	18,345	3.95	9.8	3.05%	15.2	4.71%	14.6	4.55%	321.6	-183.1	138.5
Oxnard Plain	29,483	2.52	11.0	2.91%	16.0	4.26%	15.8	4.21%	376.5	-262.6	113.9
Pleasant Valley	7,326	-0.31	19.5	5.65%	25.6	7.43%	25.6	7.43%	344.9	-200.8	144.1
West Las Posas	2,781	2.15	34.6	5.31%	48.4	7.43%	48.3	7.42%	651.3	-367.5	283.8

Note 1: Data No. = Number of data points; RM = Residual Mean (feet); ARM = Absolute Residual Mean (feet); ARM % = Absolute Residual Mean percentage of the range of measurements; RMS = Root Mean Square (feet); RMS % = Root Mean Square percentage of the range of measurements; Std Dev = Standard Deviation (feet); Std Dev % = Standard Deviation percentage of the range of measurements; WL Range = range of (water level) measurements (feet); WL Min = Minimum value of (water level) measurements (feet); WL Max = Maximum value of (water level) measurements (feet);

Note 2: The ARM%, RMS%, and Std Dev% are in RED font

Table 3-6. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Piru Basin

Aquifer System A	Change in Storage	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Outside of Basin, within Model Domain	Underflow from Eastern Basin (LA County)	Internal Flow from Aquifer Above	Internal Flow to Aquifer Below (B)	Underflow to Fillmore Basin (A)	Stream Percolation	Rising Groundwater	Net Stream Percolation	Total Inflows	Total Outflows
	-6,102	968	-2,239	7,970	-1,334	15	5,000	--	-39,960	-6,226	65,064	-23,152	41,912	79,017	-79,012
Aquifer System B	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Eastern Basin (LA County)**	**Internal Flow from Aquifer Above (A)**	**Internal Flow to Aquifer Below (C)**	**Underflow to Fillmore Basin (B)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-5,660	4,772	--	--	-10,351	--	--	39,960	-6,184	-22,536	--	--	--	44,732	-44,732
Aquifer System C	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Eastern Basin (LA County)**	**Internal Flow from Aquifer Above (B)**	**Internal Flow to Aquifer Below**	**Underflow to Fillmore Basin (C)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-329	--	--	--	86	--	--	6,184	--	-5,942	--	--	--	6,270	-6,270
Sum (2016-2019 Average)	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Eastern Basin (LA County)**	**Internal Flow from Aquifer Above**	**Internal Flow to Aquifer Below**	**Underflow to Fillmore Basin**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-12,090	**5,740**	**-2,239**	**7,970**	**-11,599**	**15**	**5,000**	**46,144**	**-46,144**	**-34,704**	**65,064**	**-23,152**	**41,912**	**129,933**	**-129,928**
1985-2015 Average	2,119	5,473	-3,802	10,358	-12,630	14	5,000	47,241	-47,241	-47,124	72,991	-32,394	40,598	143,196	-143,191

Notes: Units are in acre-feet per year (AFY); Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;

ET = Evapotranspiration

Positive pumping from wells results from internal flows in wells screened across multiple model layers

Table 3-7. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Fillmore Basin

Aquifer System A	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Piru Basin (A)**	**--**	**Internal Flow to Aquifer Below (B)**	**Underflow to Santa Paula Basin (A)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-3,715	1,131	-2,215	17,783	-4,732	-156	6,226	--	-18,768	-2,683	12,726	-5,599	7,127	37,866	-37,866
Aquifer System B	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Piru Basin (B)**	**Internal Flow from Aquifer Above (A)**	**Internal Flow to Aquifer Below (C)**	**Underflow to Santa Paula Basin (B)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-1,112	3,495	--	854	-33,146	395	22,536	18,768	-1,083	-9,928	0	-780	-780	46,049	-46,049
Aquifer System C	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Piru Basin (C)**	**Internal Flow from Aquifer Above (B)**	**--**	**Underflow to Santa Paula Basin (C)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-893	2,392	--	91	-4,585	901	5,942	1,083	--	-4,594	105	-442	-337	10,514	-10,514
Sum (2016-2019 Average)	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Piru Basin**	**Internal Flow from Aquifer Above**	**Internal Flow to Aquifer Below**	**Underflow to Santa Paula Basin**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-5,720	**7,018**	**-2,215**	**18,728**	**-42,462**	**1,141**	**34,704**	**19,852**	**-19,852**	**-17,205**	**12,831**	**-6,820**	**6,010**	**94,274**	**-94,274**
1985-2015 Average	4,334	6,723	-4,406	20,796	-47,028	1,858	47,124	9,026	-9,026	-17,965	13,740	-25,178	-11,438	103,601	-103,603

Notes: Units are in acre-feet per year (AFY); Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;
ET = Evapotranspiration

Table 3-8. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Santa Paula Basin

Aquifer System A	Change in Storage	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Outside of Basin, within Model Domain	Underflow from Fillmore Basin (A)	--	Internal Flow to Aquifer Below (B)	Underflow to Mound Basin (Shallow)	Underflow to Mound Basin (UAS)	Underflow to Mound Basin (LAS)	Underflow to Oxnard Basin (UAS)	Underflow to Oxnard Basin (LAS)	Stream Percolation	Rising Groundwater	Net Stream Percolation	Total Inflows	Total Outflows
	-1,357	--	-712	12,322	-1,189	-230	2,683	--	-7,244	0	0	--	-4,009	--	1,319	-1,584	-264	16,324	-16,324
Aquifer System B	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Fillmore Basin (B)**	**Internal Flow to Aquifer Above (A)**	**Internal Flow to Aquifer Below (C)**	**Underflow to Mound Basin (Shallow)**	**Underflow to Mound Basin (UAS)**	**Underflow to Mound Basin (LAS)**	**Underflow to Oxnard Basin (UAS)**	**Underflow to Oxnard Basin (LAS)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-308	1,392	--	3,055	-19,343	792	9,928	7,244	322	--	-348	-2,644	-2	-9	144	-224	-79	22,877	-22,877
Aquifer System C	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Fillmore Basin (C)**	**Internal Flow to Aquifer Above (B)**	**--**	**Underflow to Mound Basin (Shallow)**	**Underflow to Mound Basin (UAS)**	**Underflow to Mound Basin (LAS)**	**Underflow to Oxnard Basin (UAS)**	**Underflow to Oxnard Basin (LAS)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-313	6	--	431	-1,041	-61	4,594	-322	--	--	--	-3,148	--	-21	3	-155	-153	5,034	-5,060
Sum (2016-2019 Average)	**Change in Storage**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Outside of Basin, within Model Domain**	**Underflow from Fillmore Basin**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below**	**Underflow to Mound Basin (Shallow)**	**Underflow to Mound Basin (UAS)**	**Underflow to Mound Basin (LAS)**	**Underflow to Oxnard Basin (UAS)**	**Underflow to Oxnard Basin (LAS)**	**Stream Percolation**	**Rising Groundwater**	**Net Stream Percolation**	**Total Inflows**	**Total Outflows**
	-1,978	**1,398**	**-712**	**15,808**	**-21,573**	**502**	**17,205**	**6,923**	**-6,923**	**0**	**-348**	**-5,792**	**-4,011**	**-30**	**1,466**	**-1,963**	**-496**	**43,302**	**-43,328**
1985-2015 Average	3,487	1,394	-2,291	15,796	-24,561	750	17,965	3,628	-3,628	1	-387	-5,621	-2,278	-22	2,165	-6,399	-4,233	45,186	-45,187

Notes: Units are in acre-feet per year (AFY); Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;
ET = Evapotranspiration

Table 3-9. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Mound Basin

Shallow Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow from Santa Paula Basin (A)**	**Underflow from Santa Paula Basin (B)**	**Underflow from Santa Paula Basin (C)**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below (UAS)**	**Underflow with Oxnard Basin (Shallow)**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Total Inflows**	**Total Outflows**
	-105	-5	--	-226	2,692	--	0	--	--	--	-1,585	362	-257	-863	3,054	-3,040
Upper Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow from Santa Paula Basin (A)**	**Underflow from Santa Paula Basin (B)**	**Underflow from Santa Paula Basin (C)**	**Internal Flow to Aquifer Above (Shallow)**	**Internal Flow to Aquifer Below (LAS)**	**Underflow with Oxnard Basin (UAS)**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Total Inflows**	**Total Outflows**
	796	--	--	--	161	-2,007	0	348	--	1,585	-395	-2,230	1,729	--	4,619	-4,632
Lower Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow from Santa Paula Basin (A)**	**Underflow from Santa Paula Basin (B)**	**Underflow from Santa Paula Basin (C)**	**Internal Flow to Aquifer Above (UAS)**	**Internal Flow to Aquifer Below**	**Underflow with Oxnard Basin (LAS)**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Total Inflows**	**Total Outflows**
	-283	--	2,585	--	546	-4,437	--	2,644	3,148	395	--	-5,333	735	--	10,053	-10,053
Sum (2016-2019 Average)	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow from Santa Paula Basin (A)**	**Underflow from Santa Paula Basin (B)**	**Underflow from Santa Paula Basin (C)**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below**	**Underflow with Oxnard Basin**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Total Inflows**	**Total Outflows**
	407	**-5**	**2,585**	**-226**	**3,399**	**-6,444**	**0**	**2,992**	**3,148**	**1,979**	**-1,979**	**-7,202**	**2,207**	**-863**	**16,718**	**-16,718**
1985-2015 Average	1,092	-129	2,485	-665	3,719	-7,371	27	2,869	3,112	2,166	-2,166	-3,236	-371	-1,541	15,469	-15,479

Notes: Units are in acre-feet per year; Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;
ET = Evapotranspiration; UAS = Upper Aquifer System; LAS = Lower Aquifer System
Net Streamflow percolation in shallow aquifer represents all aquifer systems;
Totals represent net streamflow percolation and not total inflow or outflow

Table 3-10. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Oxnard Basin

Semi-Perched Aquifer System	Change in Storage	Tile Drains	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Underflow with Santa Paula Basin	Underflow with Mound Basin	Underflow with Pleasant Valley Basin	Underflow with Las Posas Basin (West)	Internal Flow to Aquifer Above	Internal Flow to Aquifer Below (UAS)	Coastal Flux	Net Stream Percolation (SCR)	Net Stream Percolation (Calleguas Creek)	Total Inflows	Total Outflows
	2,798	-4,204	--	-6,246	21,008	-44	--	-362	2,301	0	--	-19,193	152	372	3,418	30,048	-30,048
Upper Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge (Volcanic Outcrop)**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Santa Paula Basin**	**Underflow with Mound Basin**	**Underflow with Pleasant Valley Basin**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above (Semi-Perched)**	**Internal Flow to Aquifer Below (LAS)**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	1,194	0	12	0	16,546	-39,023	4,011	2,230	4,053	-1,259	19,193	-21,190	12,620	1,562	--	61,421	-61,472
Lower Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Santa Paula Basin**	**Underflow with Mound Basin**	**Underflow with Pleasant Valley Basin**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above (UAS)**	**Internal Flow to Aquifer Below**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	-1,047	--	--	--	29	-37,773	30	5,333	1,576	1,720	21,190	--	8,913	--	--	38,791	-38,820
Sum (2016-2019 Average)	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Santa Paula Basin**	**Underflow with Mound Basin**	**Underflow with Pleasant Valley Basin**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below**	**Coastal Flux**	**Net Stream Percolation (SCR)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	2,944	**-4,204**	**12**	**-6,246**	**37,583**	**-76,841**	**4,040**	**7,202**	**7,930**	**461**	**40,383**	**-40,383**	**21,685**	**1,934**	**3,418**	**127,592**	**-127,673**
1985-2015 Average	4,417	-10,225	11	-8,797	74,334	-84,324	2,300	3,236	5,105	-1,222	30,239	-30,239	9,001	3,104	3,046	134,794	-134,806

Notes:

Units are in acre-feet per year; Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;

ET = Evapotranspiration; SCR = Santa Clara River; UAS = Upper Aquifer System; LAS = Lower Aquifer System;

Totals represent net streamflow percolation and not total inflow or outflow

Oxnard Basin includes the Forebay that has major United spreading activities that add to the areal recharge.

Table 3-11. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in Pleasant Valley Basin

Semi-Perched Aquifer System	Change in Storage	Tile Drains	Mountain Front Recharge	ET	Areal Recharge	Pumping from Wells	Underflow to Oxnard Basin	Underflow from Las Posas Basin (East)	Underflow with Las Posas Basin (West)	Internal Flow to Aquifer Above	Internal Flow to Aquifer Below (UAS)	Net Stream Percolation (Arroyo Las Posas)	Net Stream Percolation (Conejo Creek)	Net Stream Percolation (Calleguas Creek)	Total Inflows	Total Outflows
	-65	-288	--	-2	4,433	-275	-2,301	--	--	--	-11,941	847	5,026	4,566	14,872	-14,872
Upper Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow to Oxnard Basin**	**Underflow from Las Posas Basin (East)**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above (Semi-Perched)**	**Internal Flow to Aquifer Below (LAS)**	**Net Stream Percolation (Arroyo Las Posas)**	**Net Stream Percolation (Conejo Creek)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	720	--	1,625	-1,658	661	-6,327	-4,053	1,296	-319	11,941	-9,233	2,843	2,504	--	21,590	-21,590
Lower Aquifer System	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow to Oxnard Basin**	**Underflow from Las Posas Basin (East)**	**Underflow with Las Posas Basin (West)**	**Internal Flow to Aquifer Above (UAS)**	**Internal Flow to Aquifer Below**	**Net Stream Percolation (Arroyo Las Posas)**	**Net Stream Percolation (Conejo Creek)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	-307	--	--	--	266	-6,899	-1,576	--	-723	9,233	--	--	--	--	9,499	-9,504
Sum (2016-2019 Average)	**Change in Storage**	**Tile Drains**	**Mountain Front Recharge**	**ET**	**Areal Recharge**	**Pumping from Wells**	**Underflow to Oxnard Basin**	**Underflow from Las Posas Basin (East)**	**Underflow with Las Posas Basin (West)**	**Internal Flow with Aquifer Above**	**Internal Flow with Aquifer Below**	**Net Stream Percolation (Arroyo Las Posas)**	**Net Stream Percolation (Conejo Creek)**	**Net Stream Percolation (Calleguas Creek)**	**Total Inflows**	**Total Outflows**
	349	**-288**	**1,625**	**-1,660**	**5,360**	**-13,501**	**-7,930**	**1,296**	**-1,042**	**21,175**	**-21,175**	**3,689**	**7,530**	**4,566**	**45,590**	**-45,595**
1985-2015 Average	-1,513	-894	1,421	-1,865	6,653	-15,671	-5,105	1,646	-795	19,664	-19,664	4,260	7,300	4,561	45,505	-45,506

Notes:

Units are in acre-feet per year; Positive values indicate inflows, negative values indicate outflows; Rounded to nearest whole number;

ET = Evapotranspiration; SCR = Santa Clara River; UAS = Upper Aquifer System; LAS = Lower Aquifer System;

Totals represent net streamflow percolation and not total inflow or outflow

Table 3-12. Summary of Simulated Annual-Average (AFY) Groundwater Budgets in West Las Posas Valley Basin

Semi-Perched and UAS	Change in Storage	Mountain Front Recharge	Areal Recharge	Pumping from Wells	Underflow with Oxnard Basin	Underflow with Pleasant Valley Basin	Internal Flow to Aquifer Above	Internal Flow to Aquifer Below (LAS)	Outside of Basin, within Model Domain	Total Inflows	Total Outflows
	62	--	5,559	-461	1,259	319	--	-6,738	--	7,199	-7,199
Lower Aquifer System	**Change in Storage**	**Mountain Front Recharge**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Oxnard Basin**	**Underflow with Pleasant Valley Basin**	**Internal Flow to Aquifer Above (UAS)**	**Internal Flow to Aquifer Below**	**Outside of Basin, within Model Domain**	**Total Inflows**	**Total Outflows**
	3,542	1,621	2,272	-13,295	-1,720	723	6,738	--	119	15,015	-15,015
Sum (2016-2019 Average)	**Change in Storage**	**Mountain Front Recharge**	**Areal Recharge**	**Pumping from Wells**	**Underflow with Oxnard Basin**	**Underflow with Pleasant Valley Basin**	**Internal Flow to Aquifer Above**	**Internal Flow to Aquifer Below**	**Outside of Basin, within Model Domain**	**Total Inflows**	**Total Outflows**
	3,604	1,621	7,831	-13,755	-461	1,042	6,738	-6,738	119	20,954	-20,954
1985-2015 Average	2,115	1,710	7,377	-13,367	1,222	795	7,487	-7,487	149	20,854	-20,854

Notes:

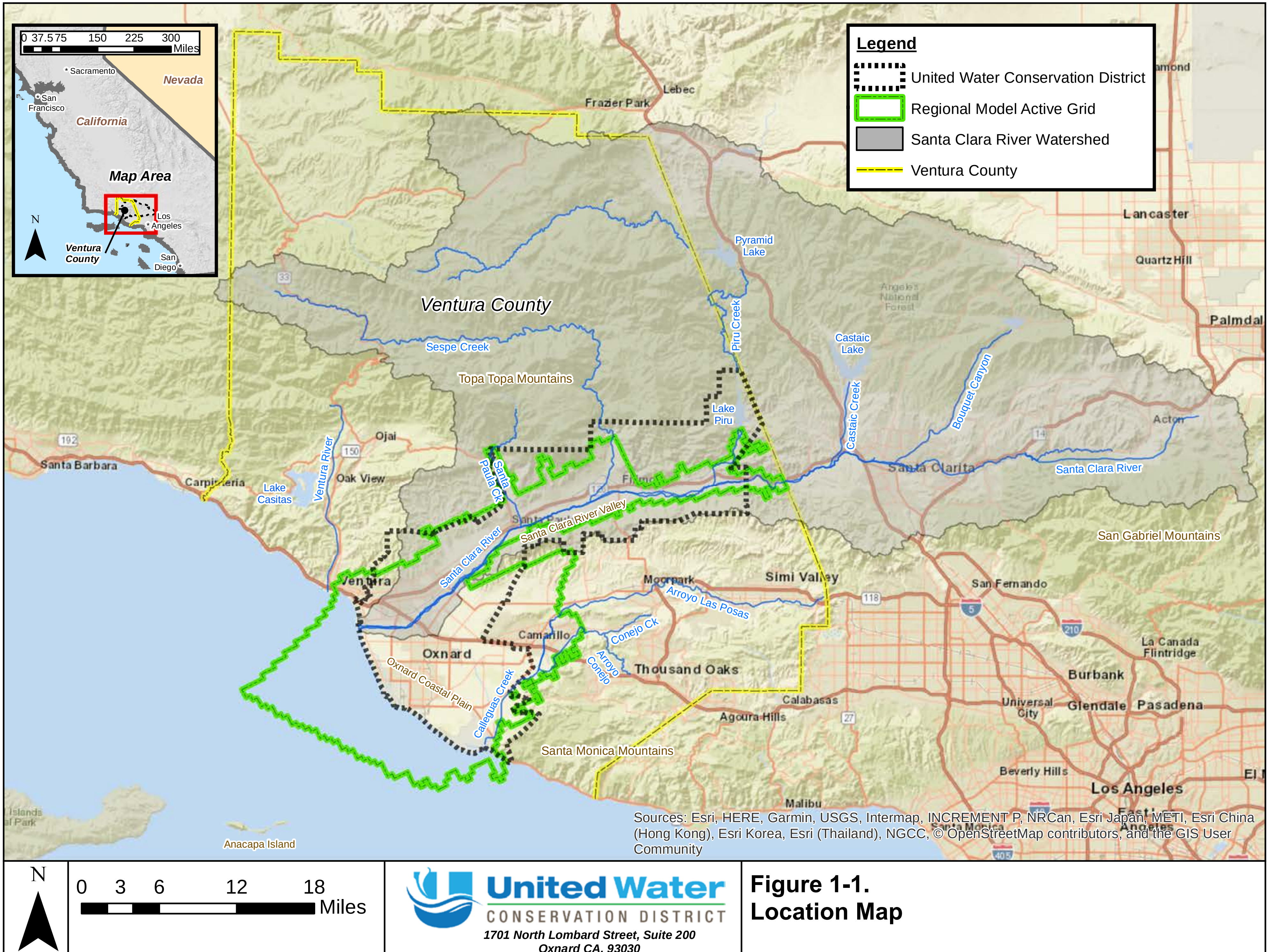
Units are in acre-feet per year; Positive values indicate inflows, negative values indicate outflows;

Rounded to nearest whole number;

ET = Evapotranspiration; SCR = Santa Clara River; UAS = Upper Aquifer System; LAS = Lower Aquifer System;

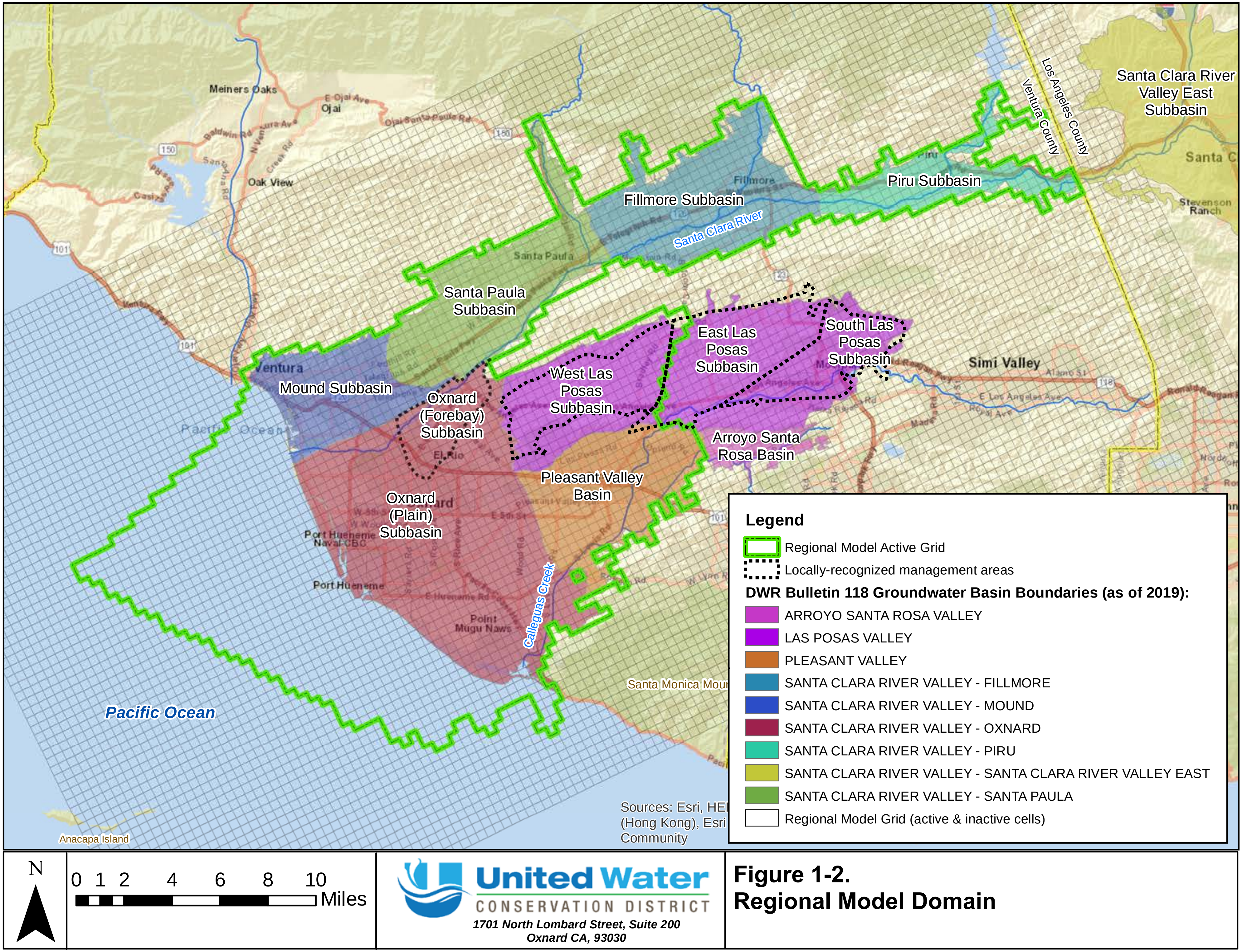
FIGURES

This page intentionally blank.



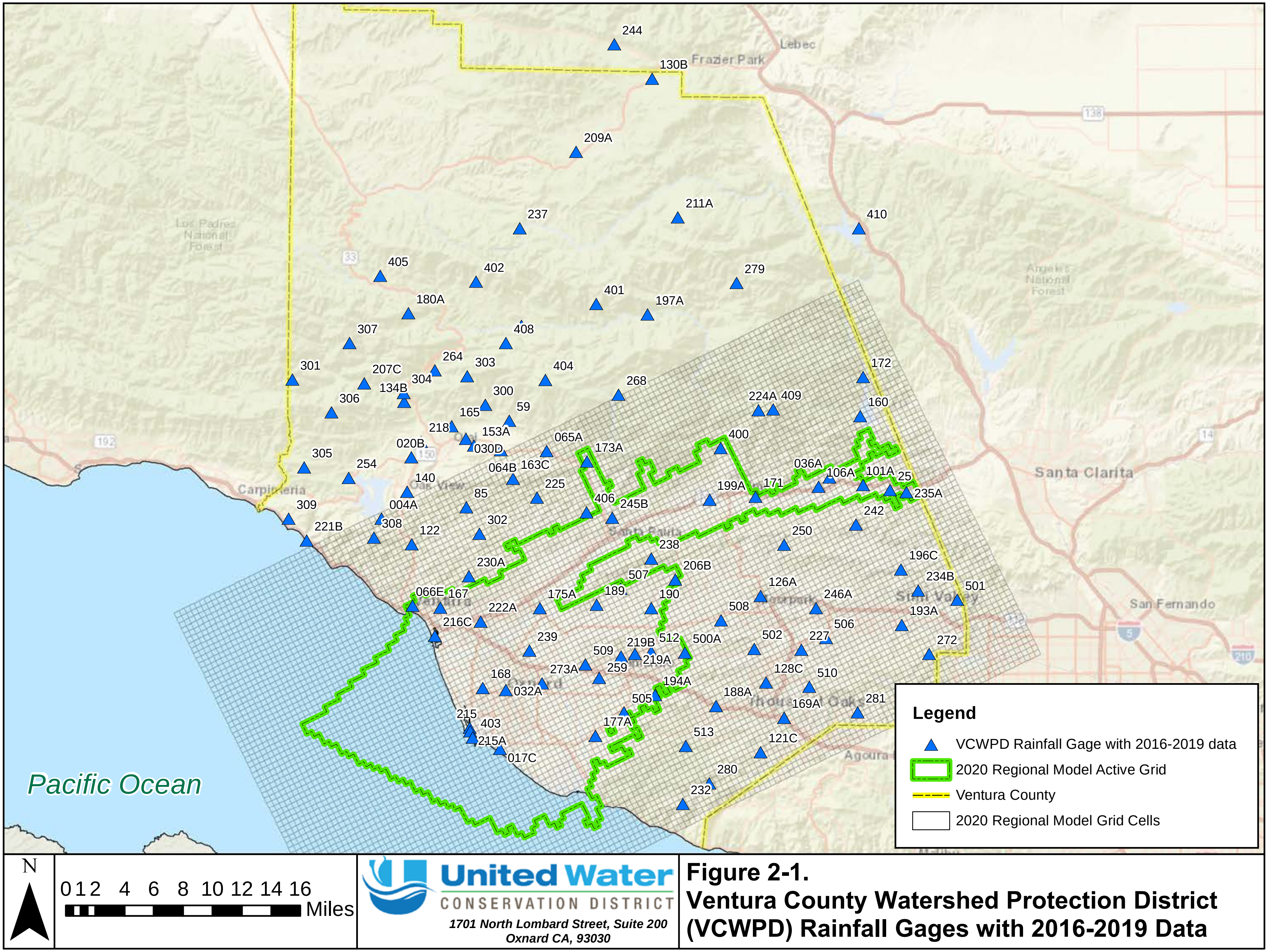
United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 1-1. Location Map



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 1-2.
Regional Model Domain



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 2-1.
Ventura County Watershed Protection District (VCWPD) Rainfall Gages with 2016-2019 Data

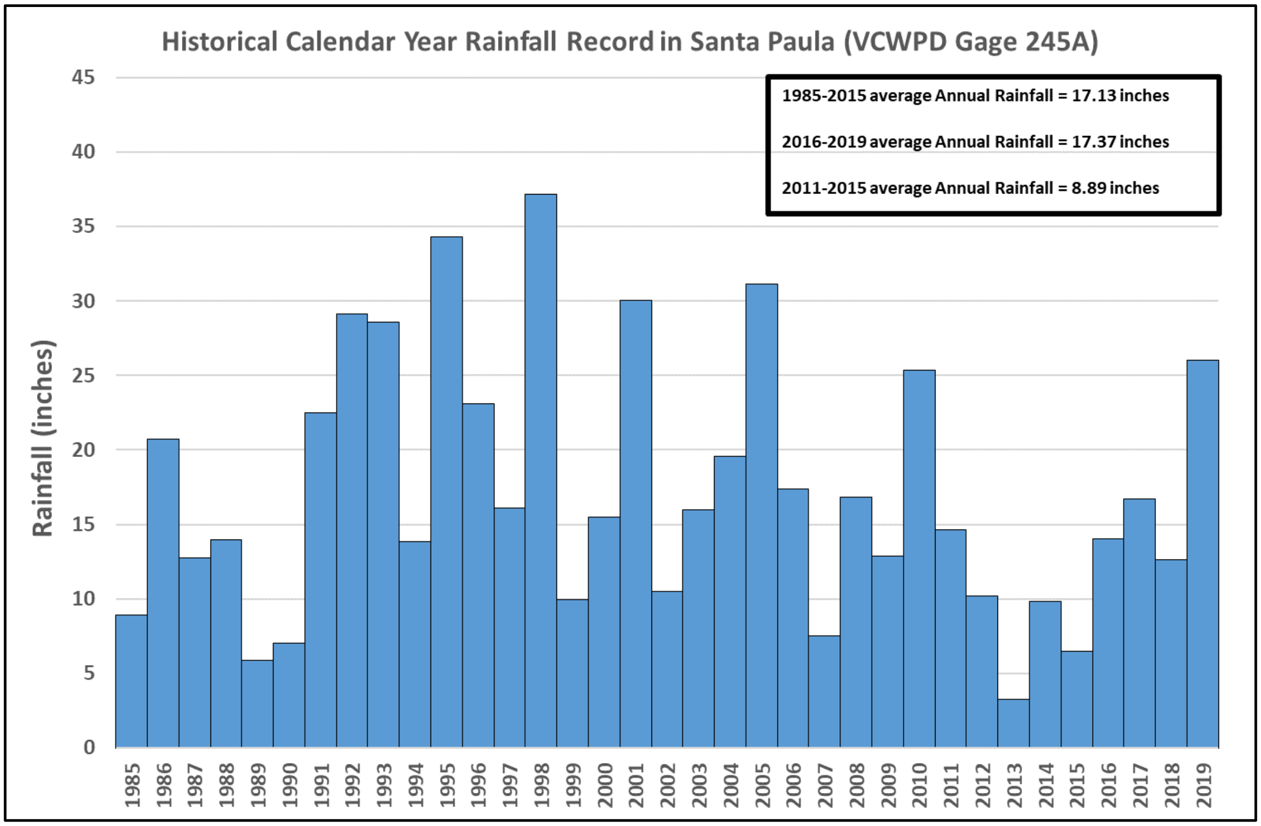
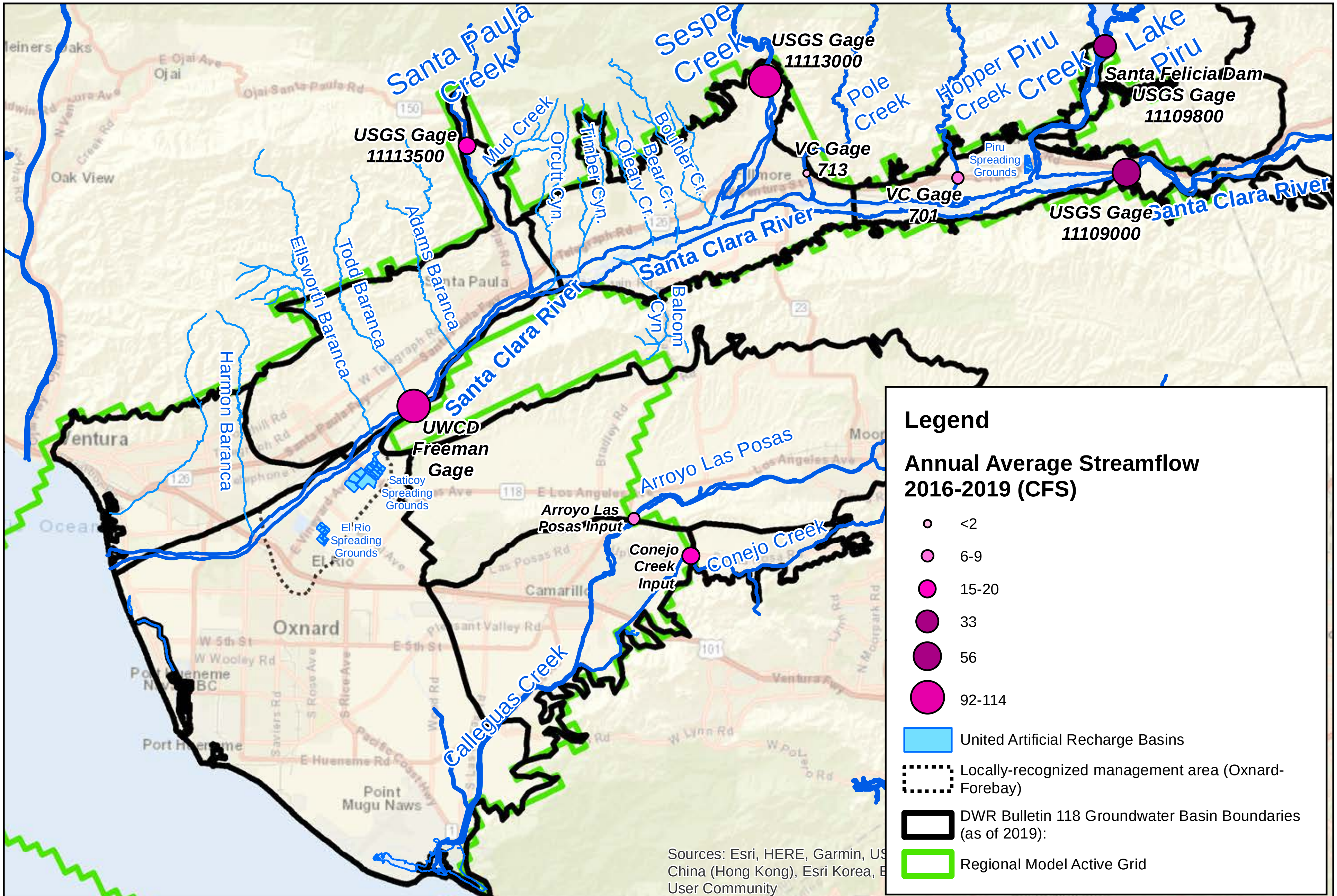


Figure 2-2. Calendar Year Precipitation Records for Regional Model Representative Location in Santa Paula Basin

Note: Santa Paula Station Ventura County Watershed Protection District (VCWPD) Gage 245A was discontinued by VCWPD after water Year 2010 and VCWPD records continued Gage 245 records nearby at Gage 245B. However, United continued maintaining and recording precipitation data through the year 2019 at Gage 245A. Gage 245A is used for this presentation.



Legend

Annual Average Streamflow 2016-2019 (CFS)

- <2
- 6-9
- 15-20
- 33
- 56
- 92-114

- United Artificial Recharge Basins
- Locally-recognized management area (Oxnard-Forebay)
- DWR Bulletin 118 Groundwater Basin Boundaries (as of 2019):
- Regional Model Active Grid

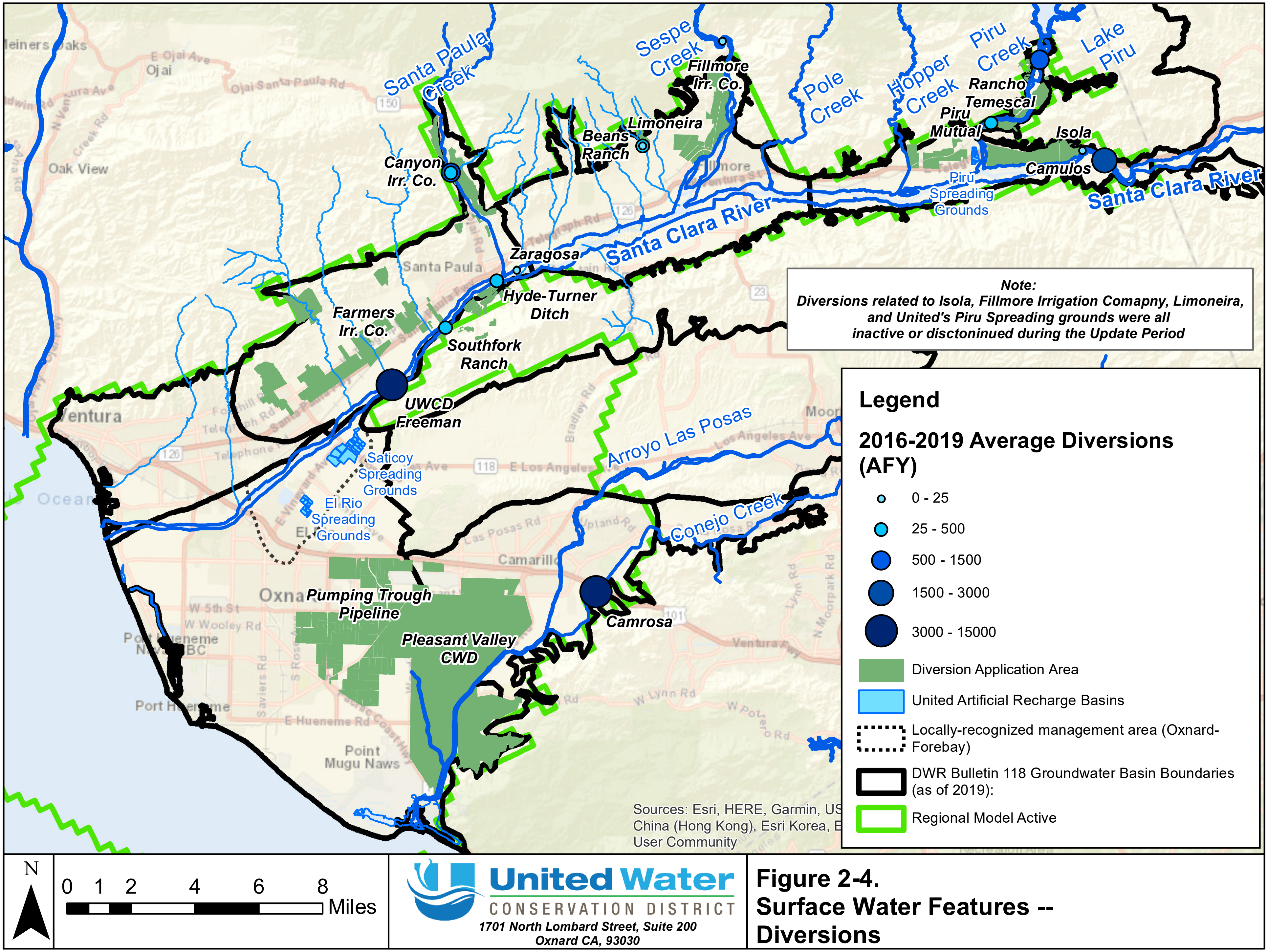
N

0 1 2 4 6 8 Miles

United Water CONSERVATION DISTRICT

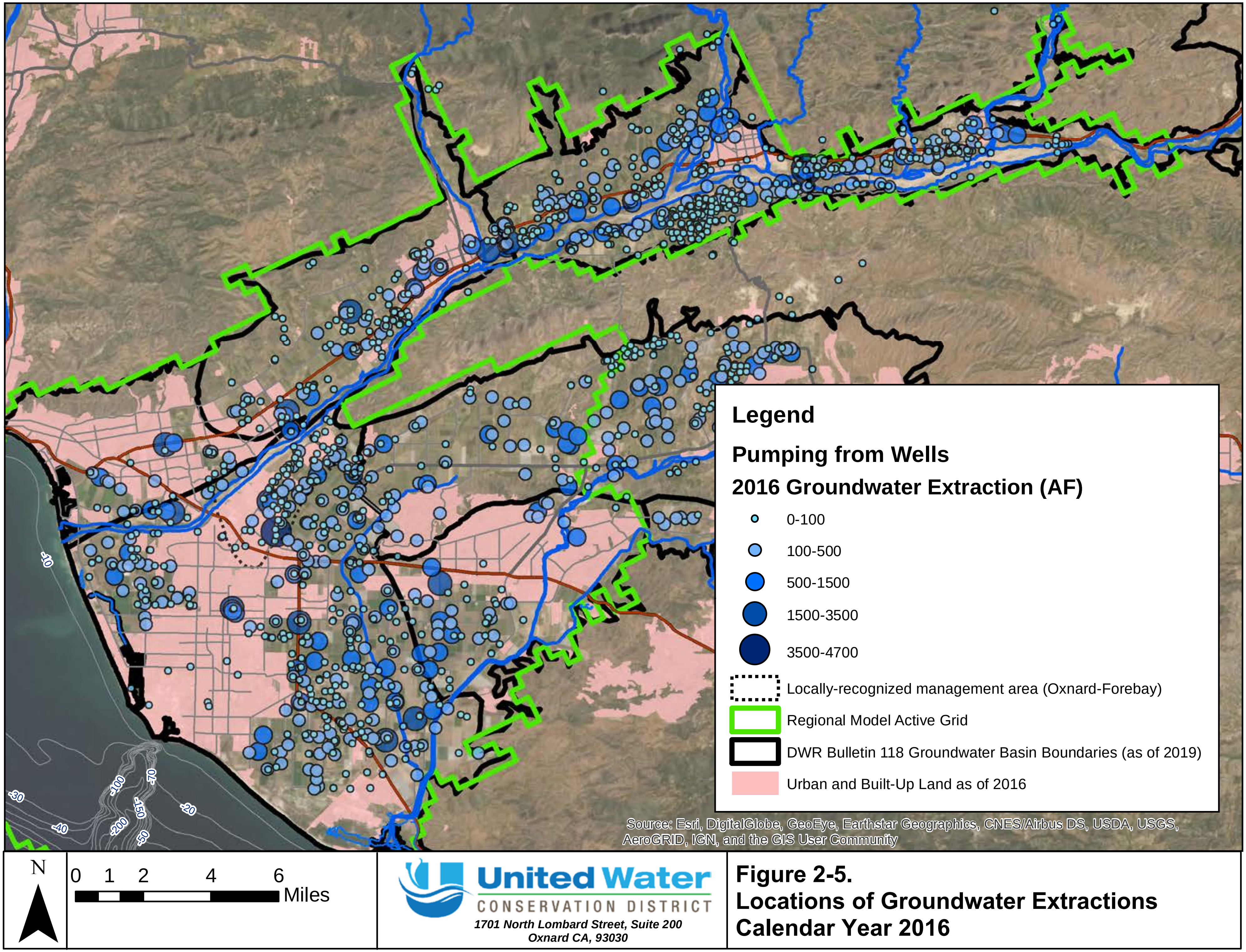
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 2-3.
Surface Water Features -- Streamflow



United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

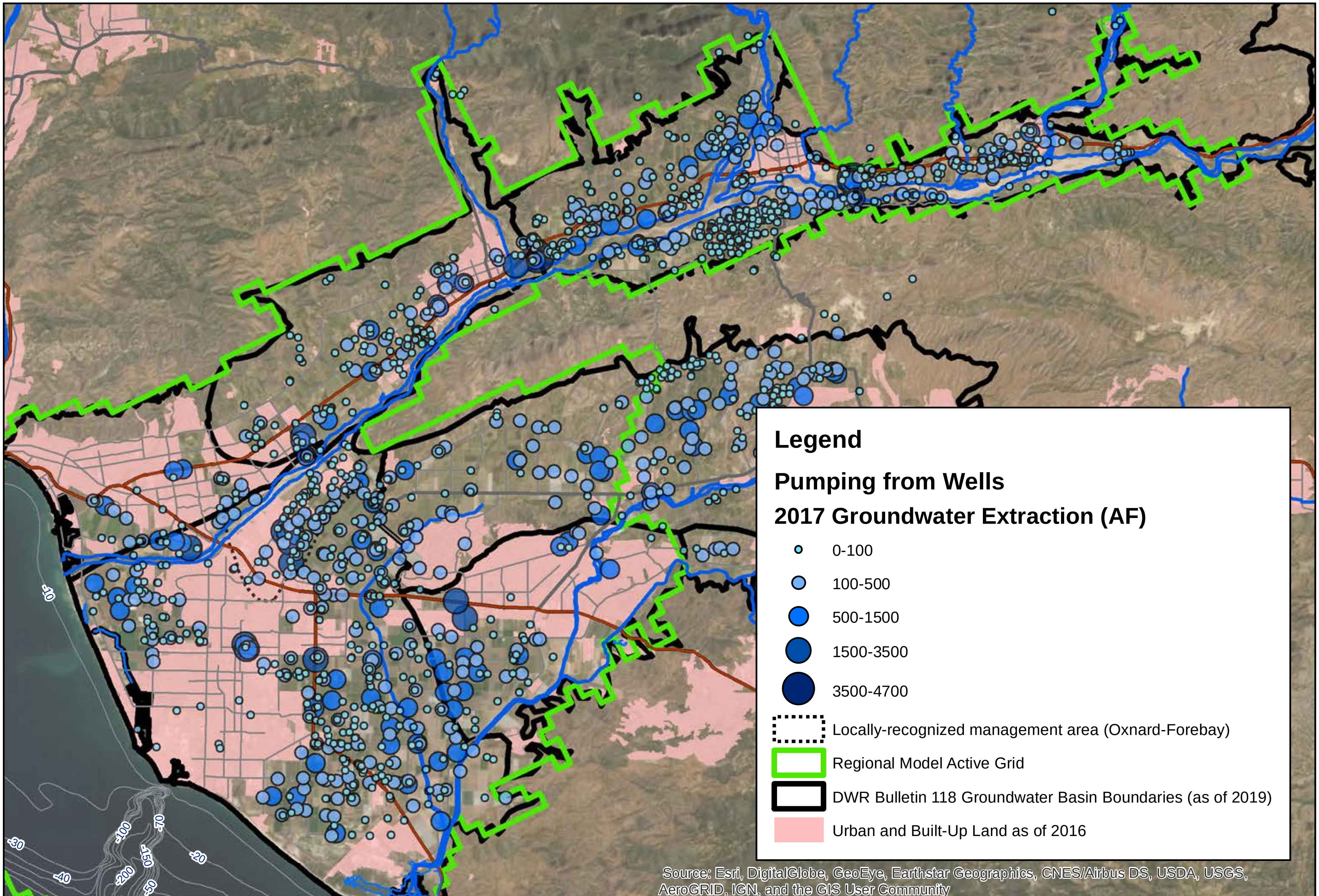
Figure 2-4. Surface Water Features -- Diversions



United Water Conservation District

1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 2-5.
Locations of Groundwater Extractions Calendar Year 2016

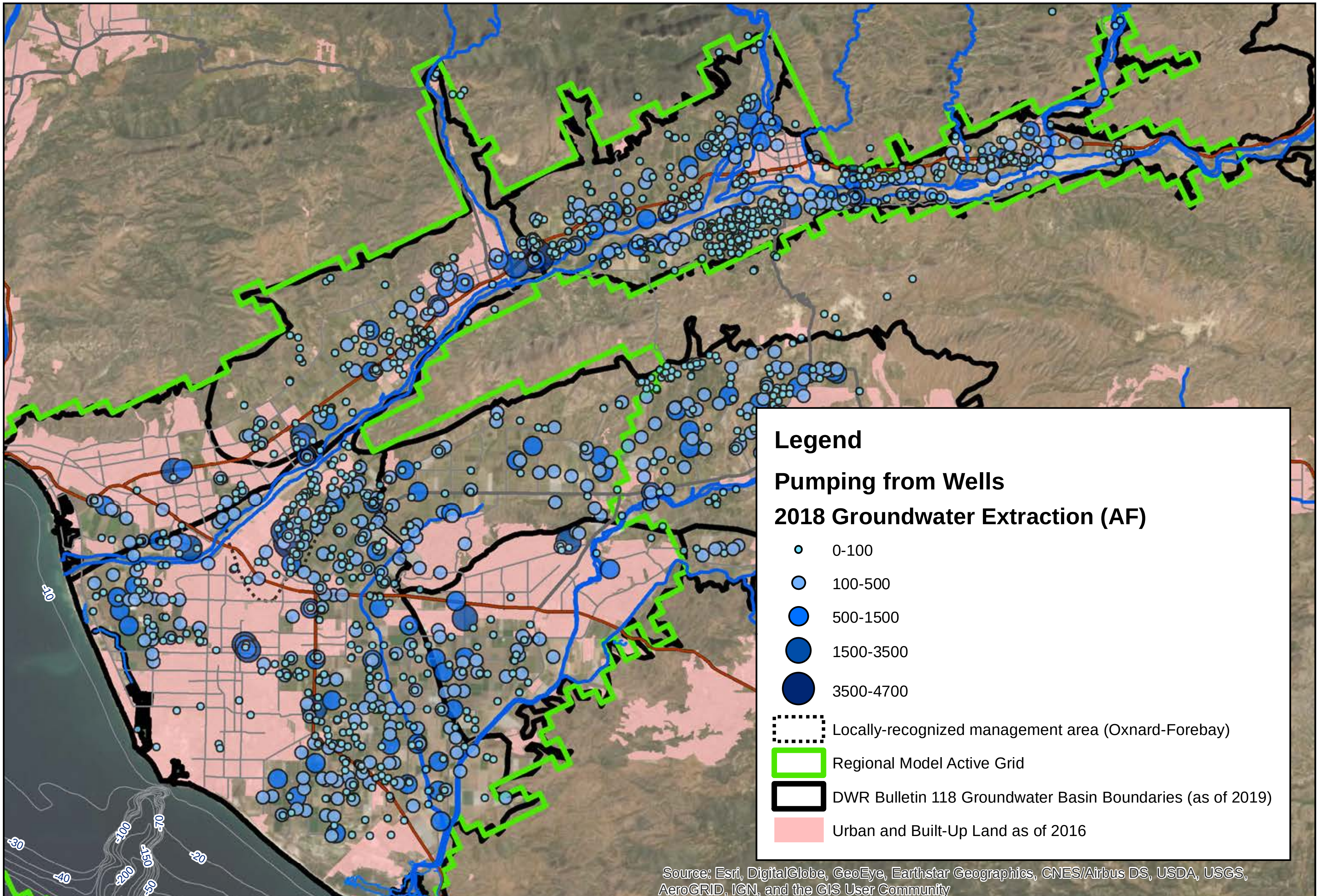


N

0 1 2 4 6
Miles

United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 2-6.
Locations of Groundwater Extractions Calendar Year 2017

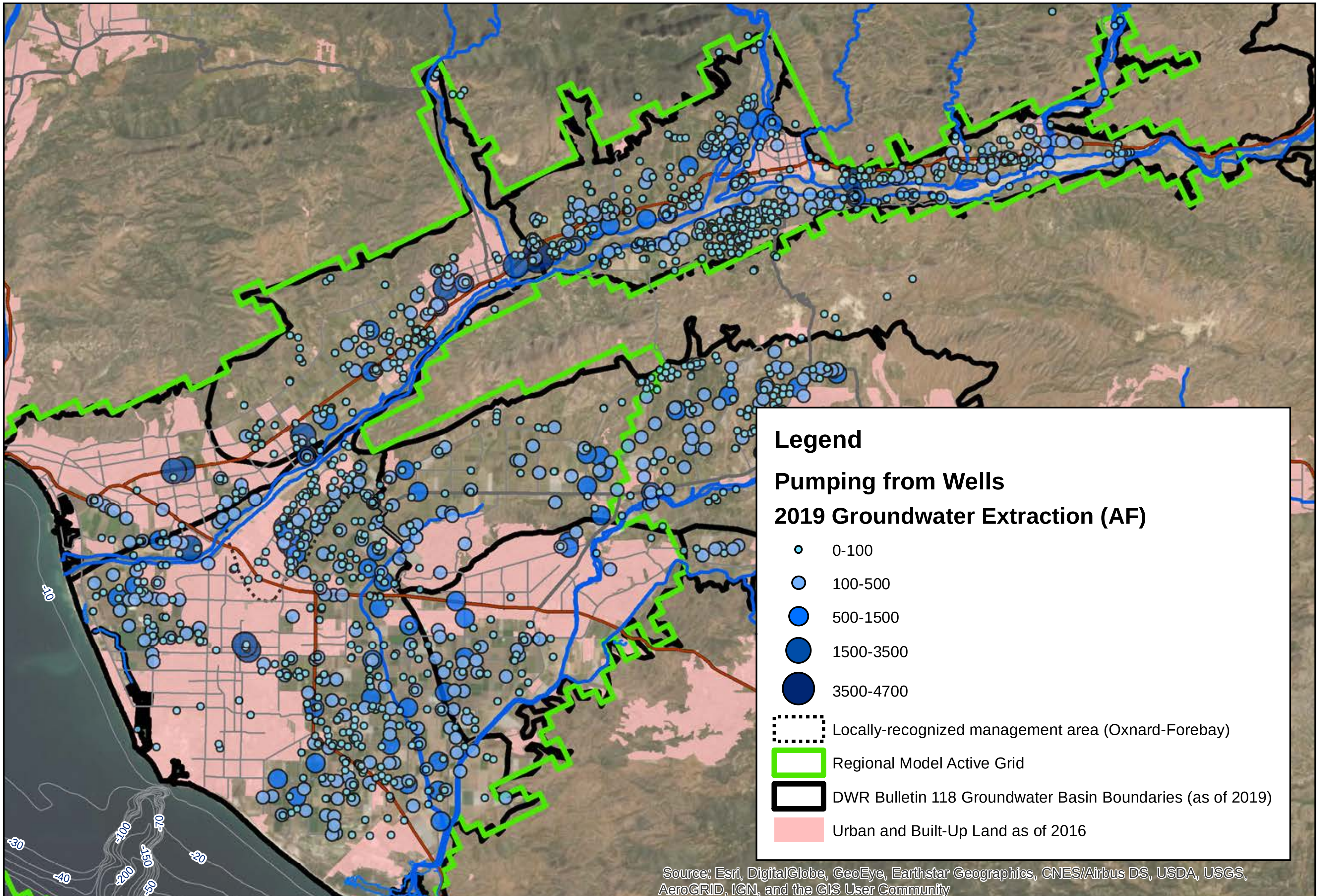


N

0 1 2 4 6 Miles

United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

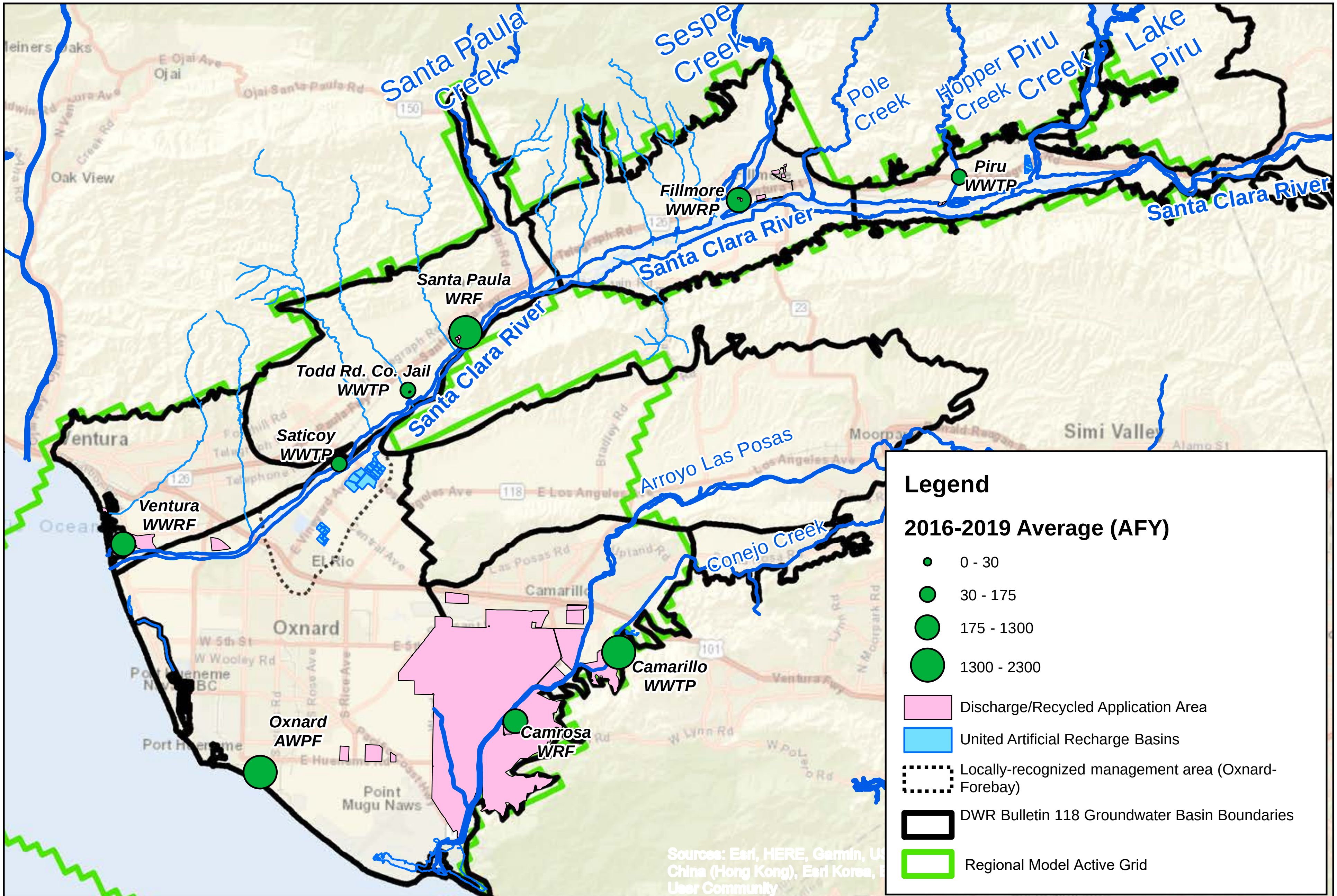
Figure 2-7.
Locations of Groundwater Extractions
Calendar Year 2018



United Water Conservation District

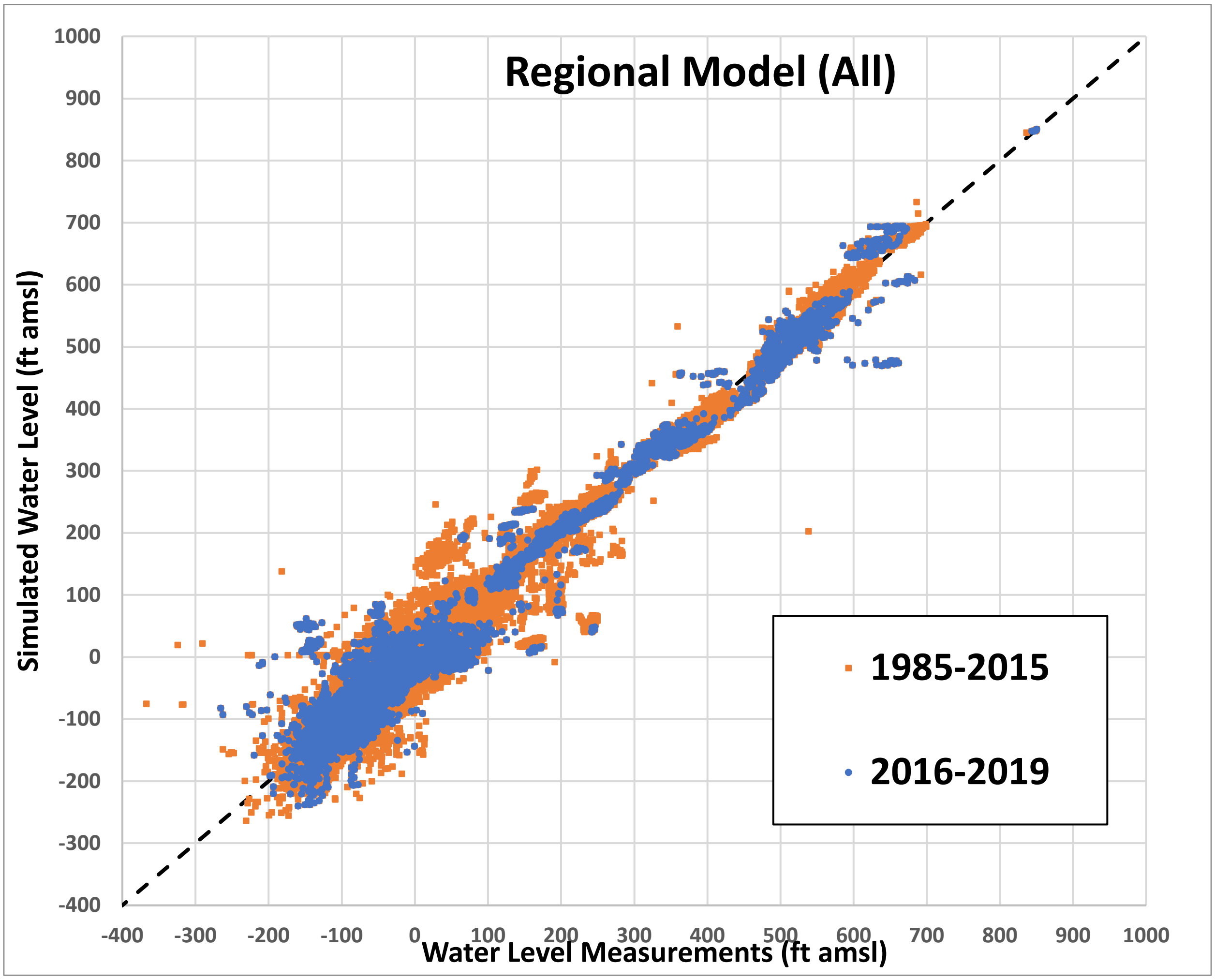
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 2-8.
Locations of Groundwater Extractions Calendar Year 2019



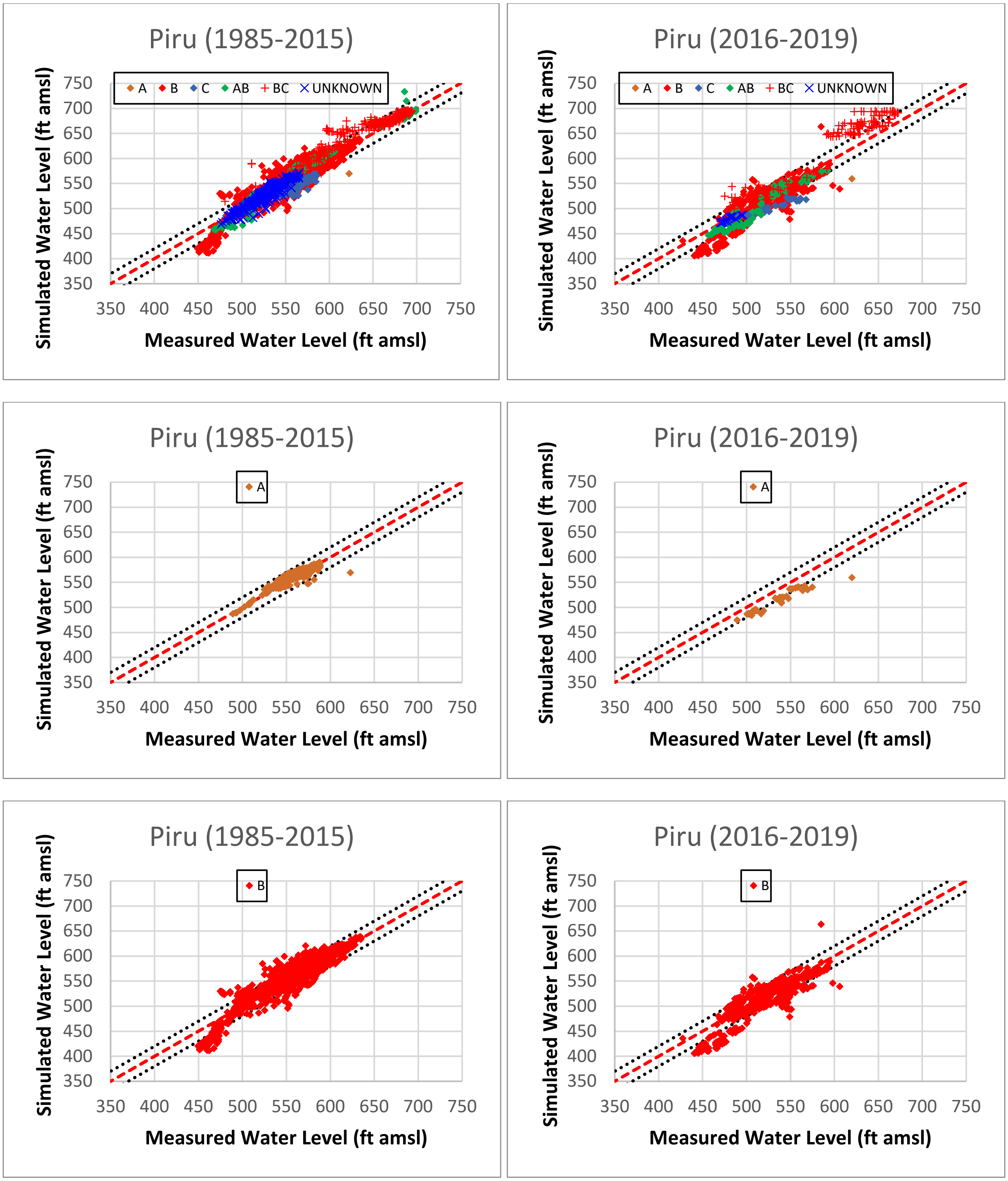
United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 2-9. Surface Water Features -- Wastewater/Recycled Application



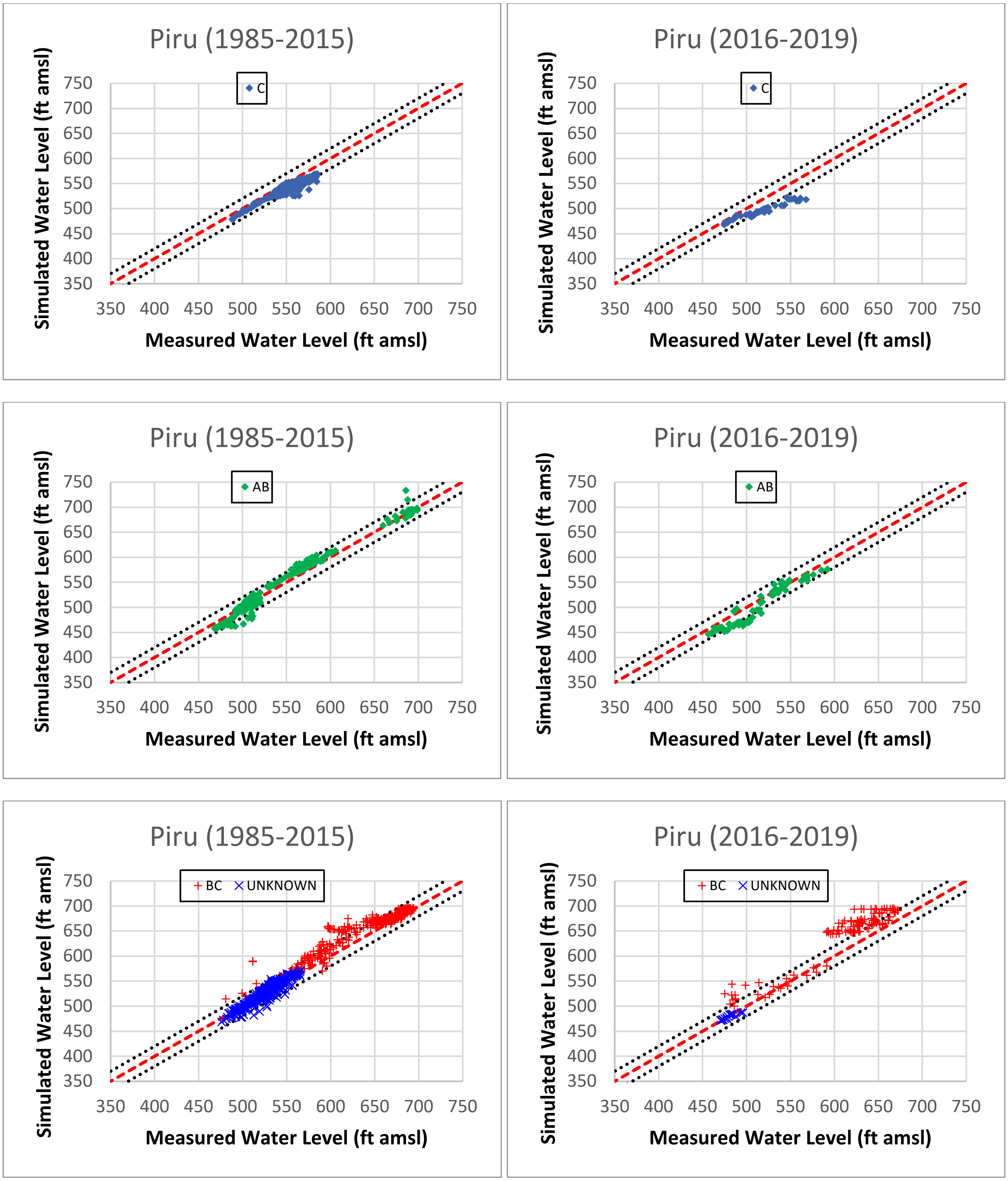
Note: Dashed black line represents a 1 : 1 relationship between measured and simulated groundwater elevations. Orange dots represent 1985-2015 Calibration Period. Blue dots represent 2016-2019 Update Period

Figure 3-1: Scatterplots of Simulated versus Measured Groundwater Elevations in the Regional Model Domain in both the 1985-2015 Calibration Period and the 2016-2019 Update Period.



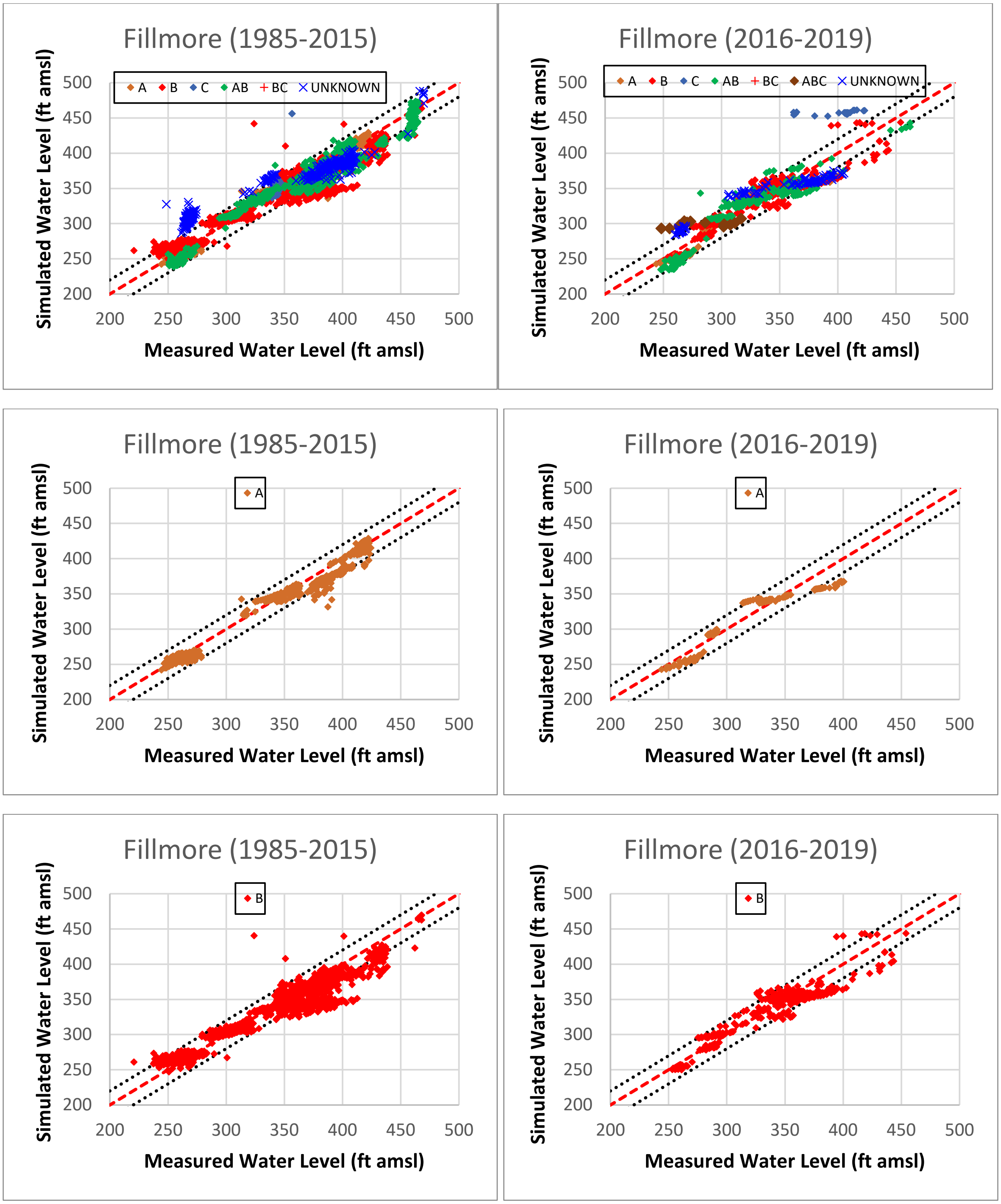
Note: Dashed red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 : 1 (dashed red) line.

Figure 3-2a-: Scatterplots of Simulated versus Measured Groundwater Elevations in the Piru Basin



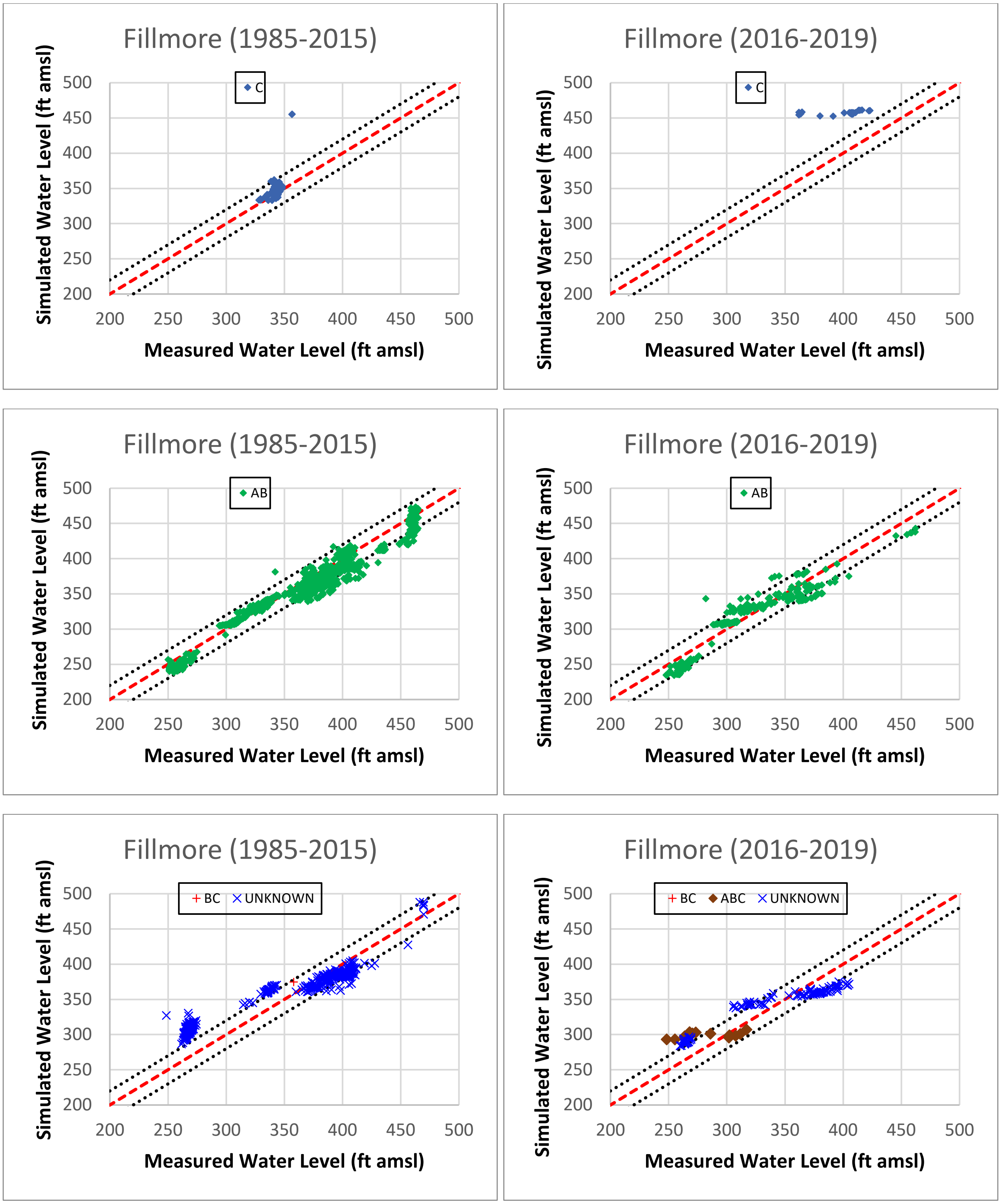
Note: Dashed red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 : 1 (dashed red) line.

Figure 3-2b-: Scatterplots of Simulated versus Measured Groundwater Elevations in the Piru Basin



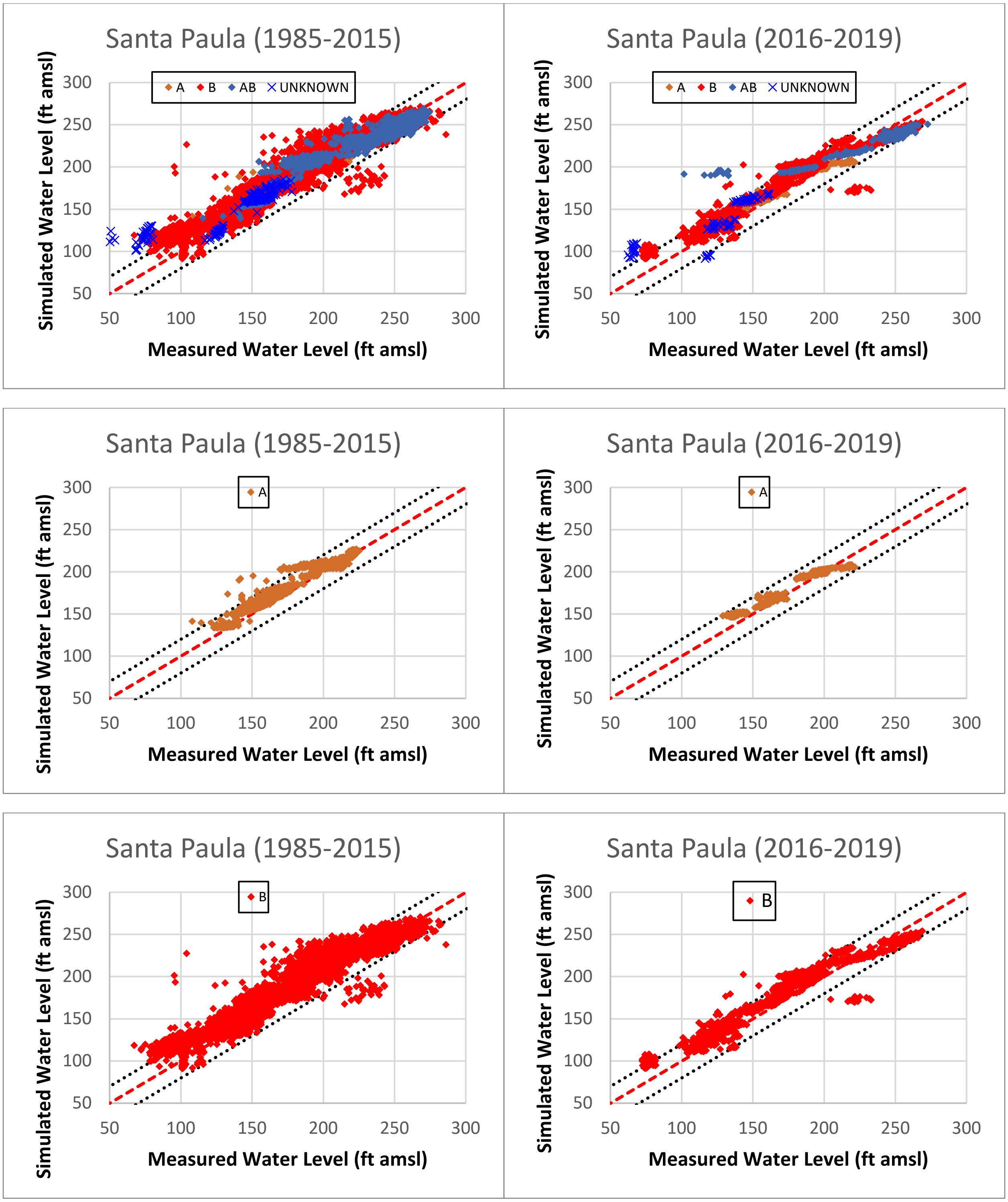
Note: Dashed red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 : 1 (dashed red) line.

Figure 3-3a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Fillmore Basin



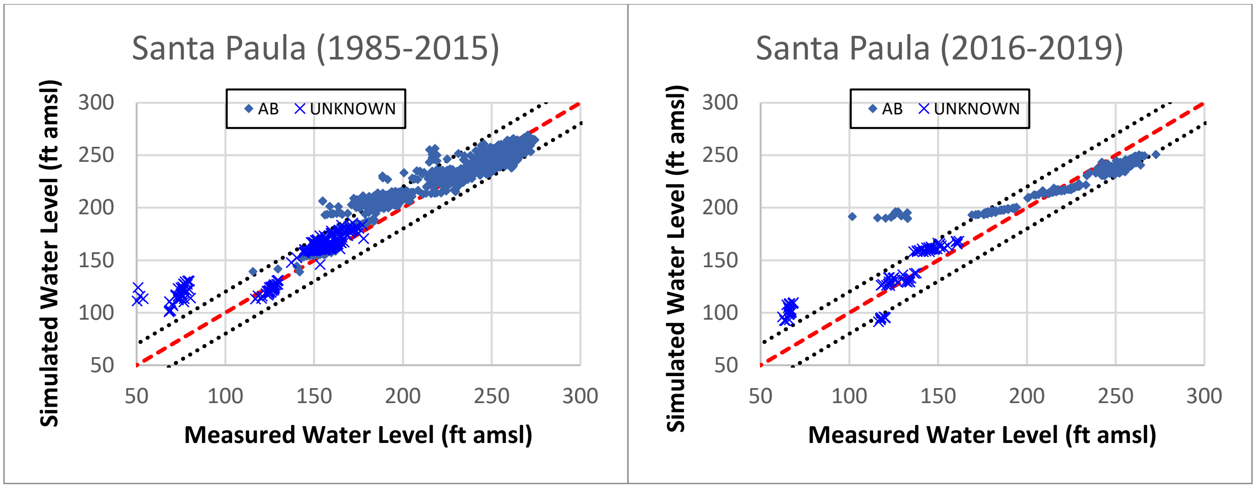
Note: Dashed red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 : 1 (dashed red) line.

Figure 3-3b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Fillmore Basin



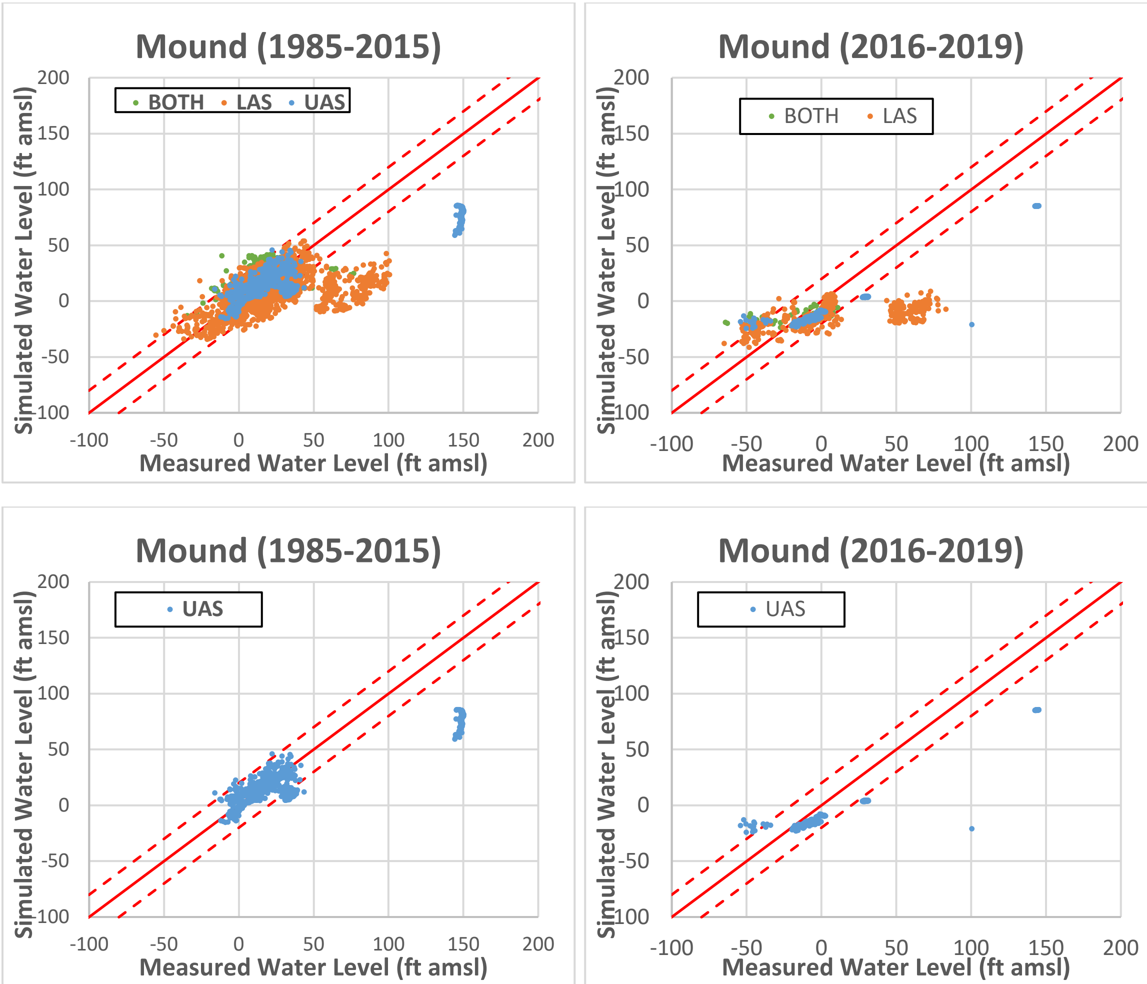
Note: Dashed red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 : 1 (dashed red) line.

Figure 3-4a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Santa Paula Basin



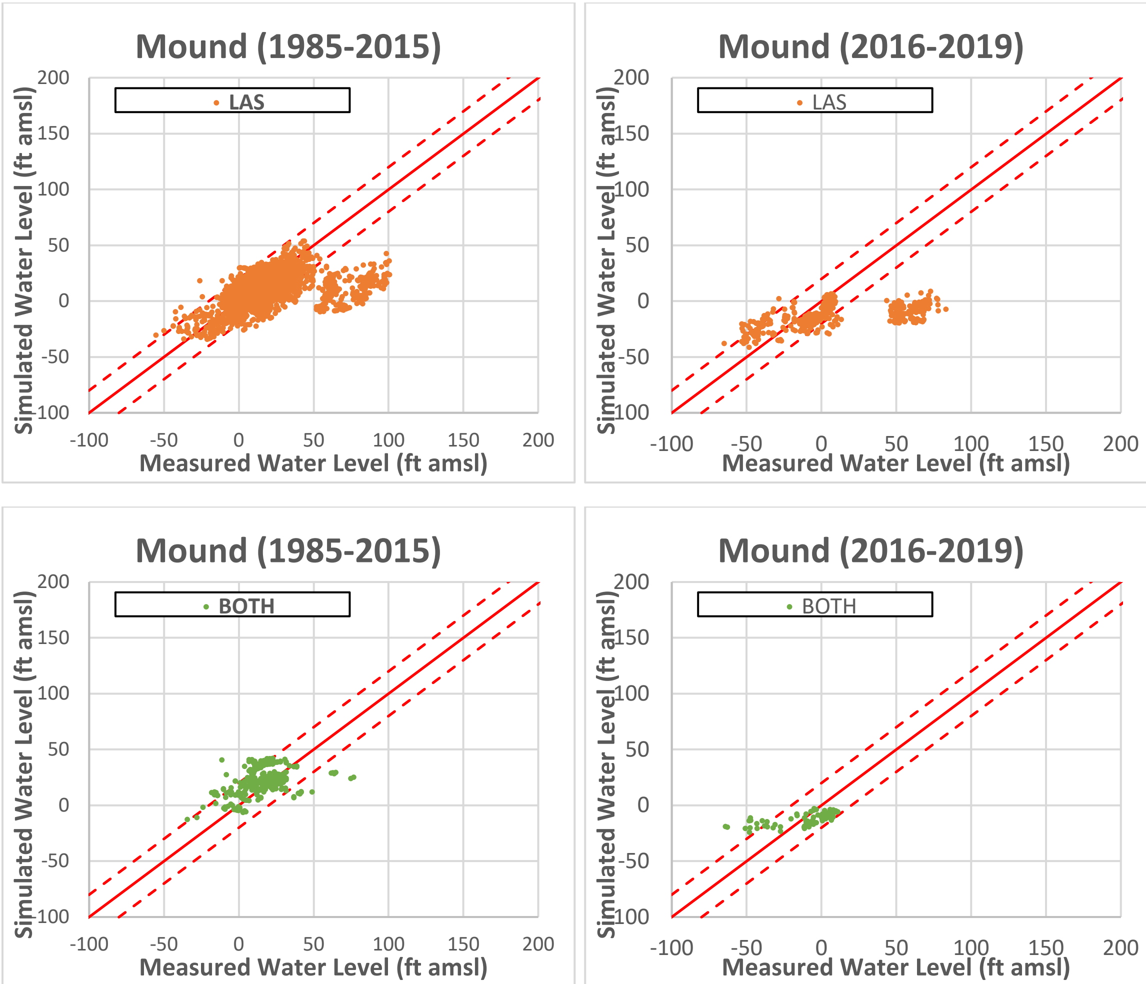
Note: Dashed red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dotted black lines are offset 20 feet above and below the 1 : 1 (dashed red) line.

Figure 3-4b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Santa Paula Basin



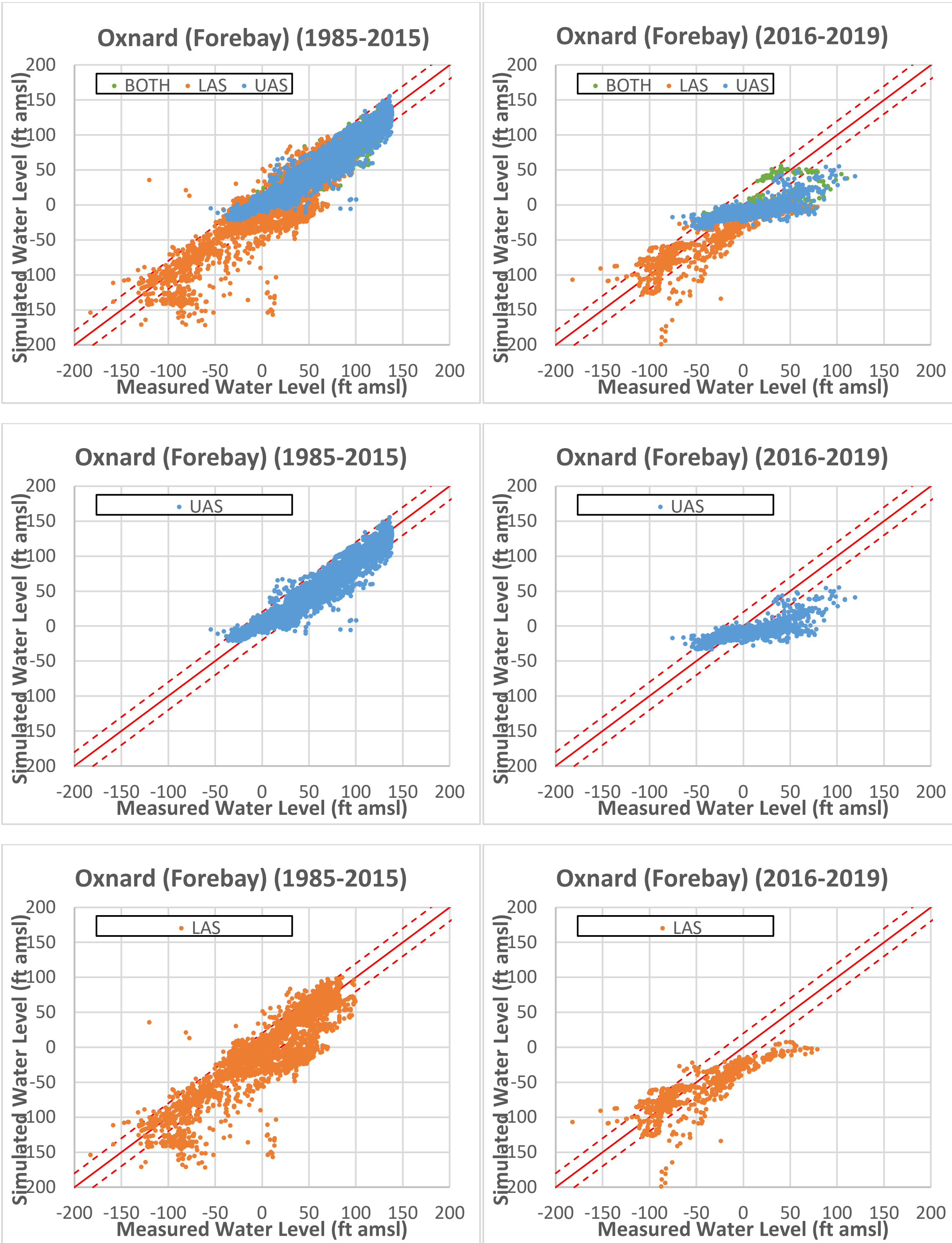
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

Figure 3-5a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Mound Basin



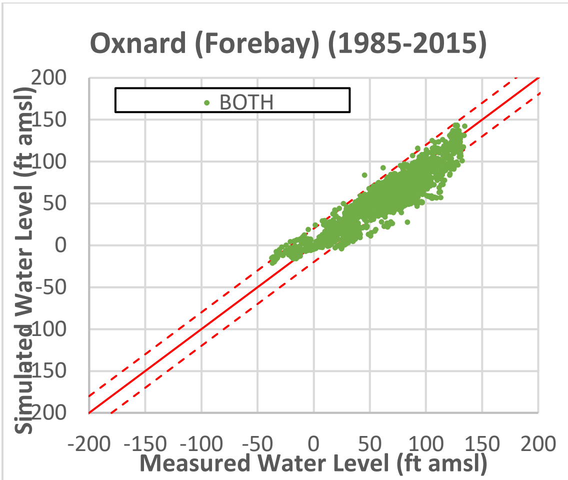
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

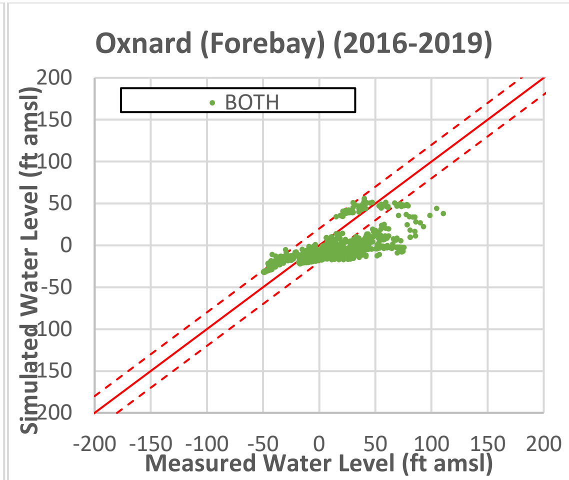
Figure 3-5b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Mound Basin



Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

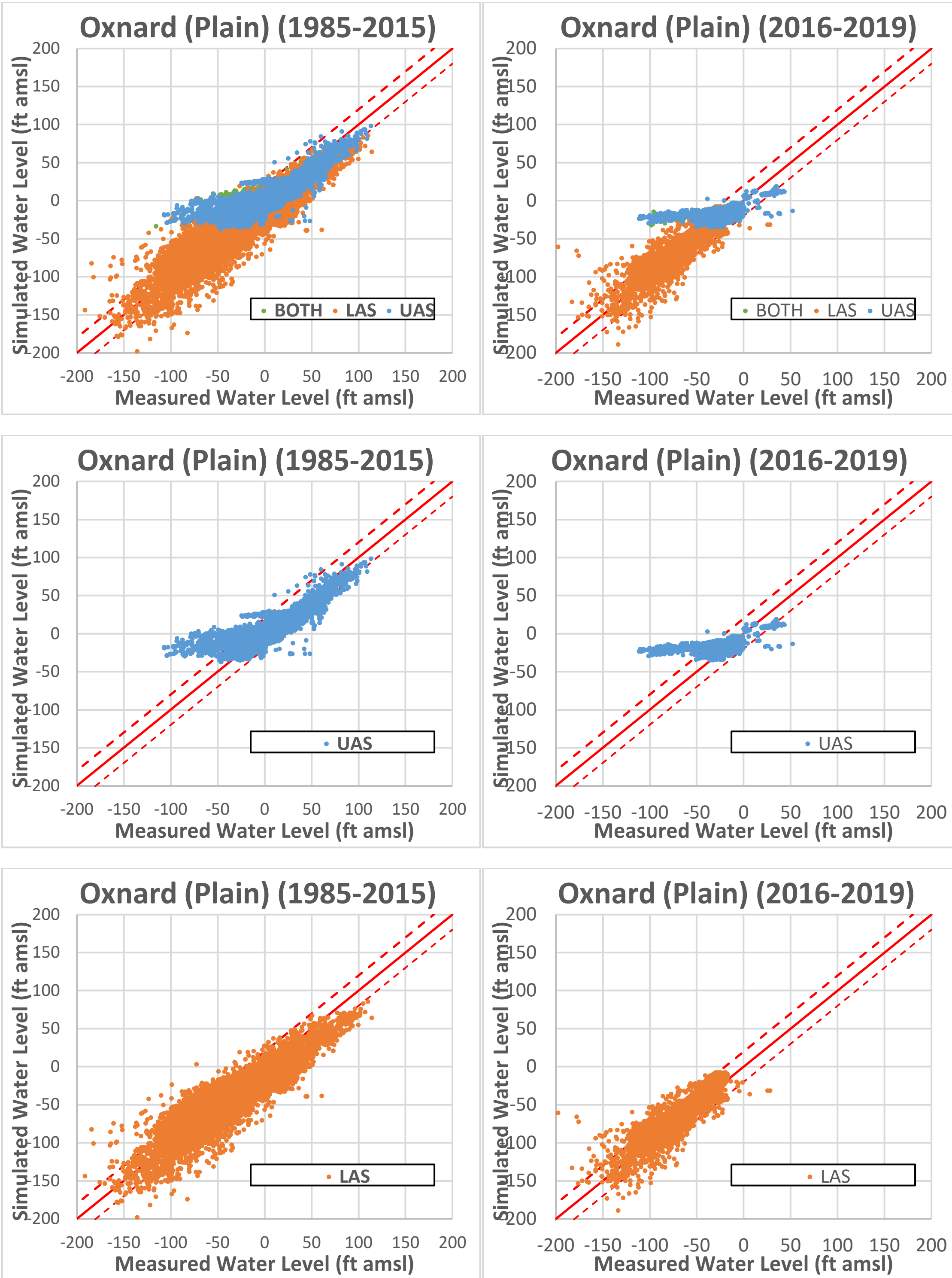
Figure 3-6a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Oxnard (Forebay) Basin





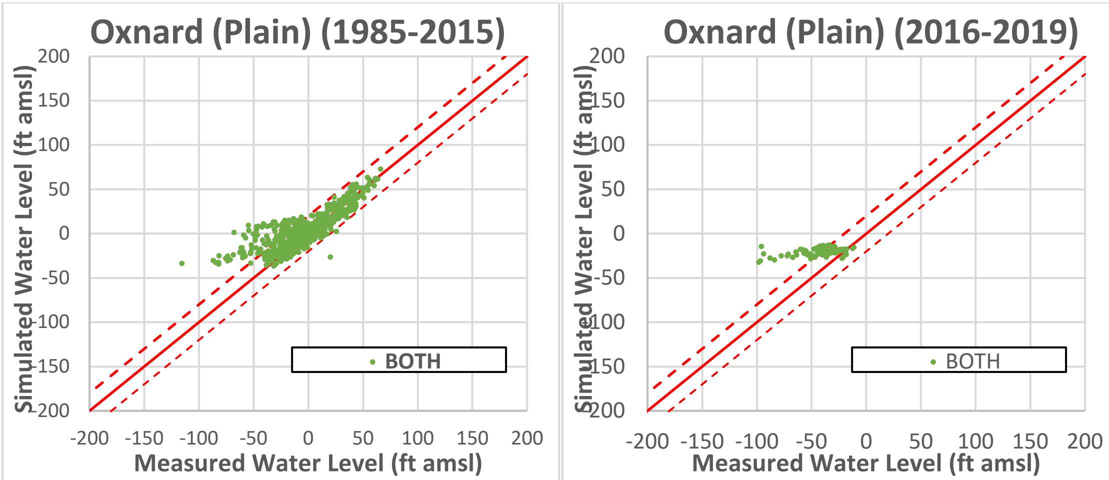
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

Figure 3-6b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Oxnard (Forebay) Basin



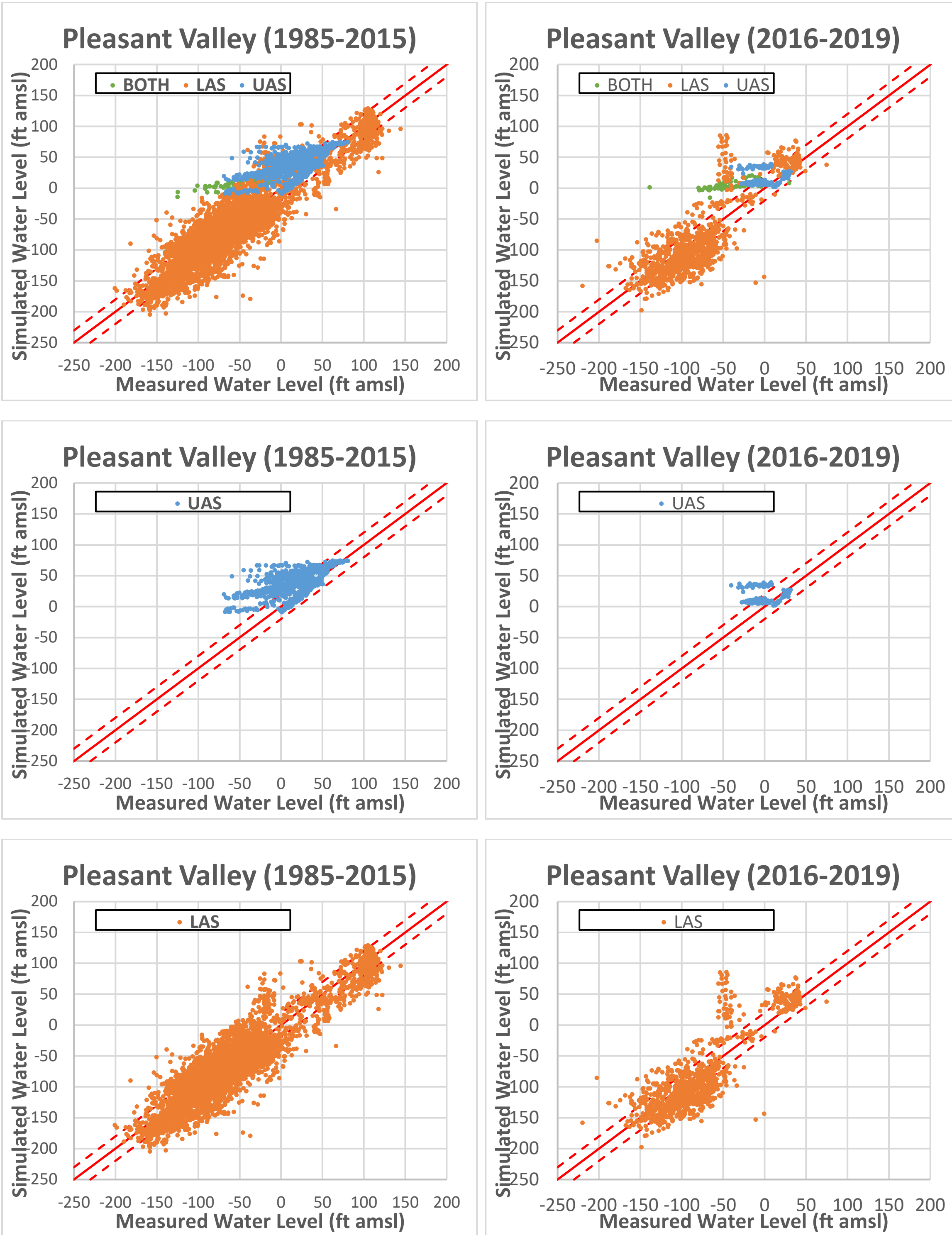
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

Figure 3-7a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Oxnard Basin (area not including Forebay)



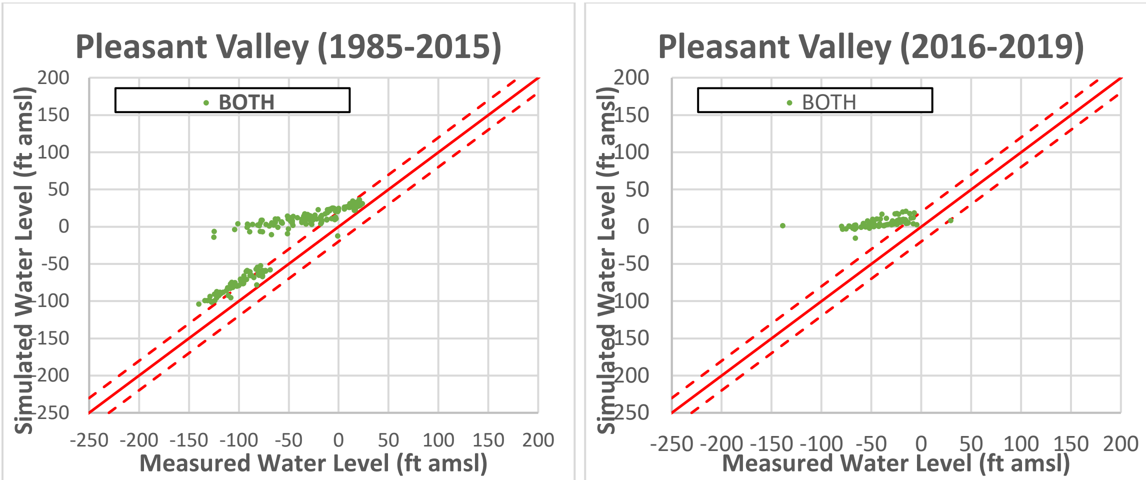
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

Figure 3-7b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Oxnard Basin (area not including Forebay)



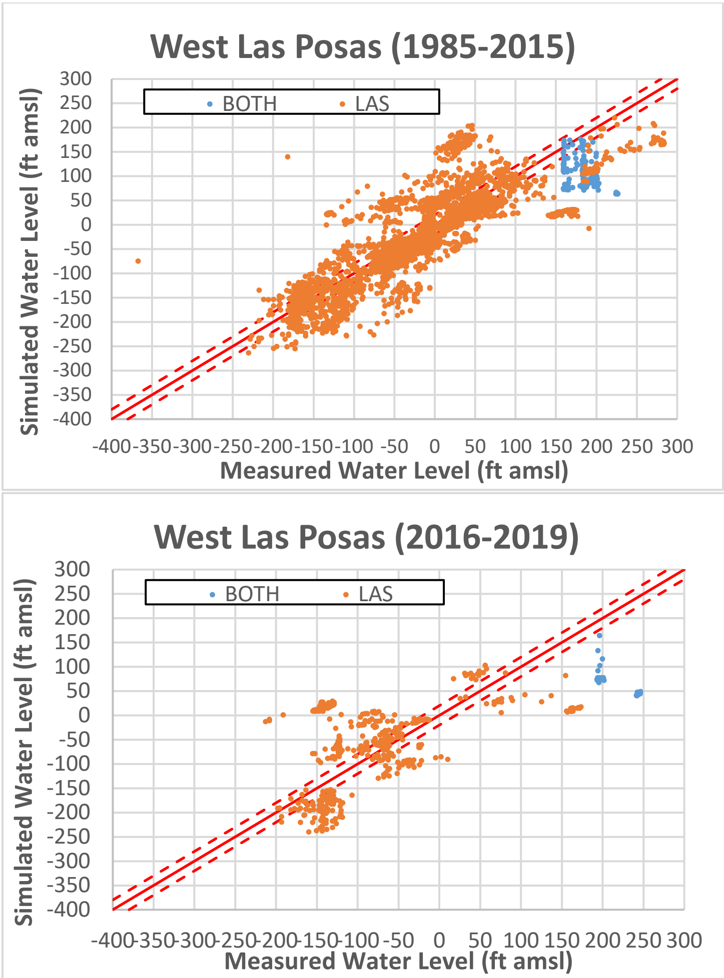
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

Figure 3-8a: Scatterplots of Simulated versus Measured Groundwater Elevations in the Pleasant Valley Basin



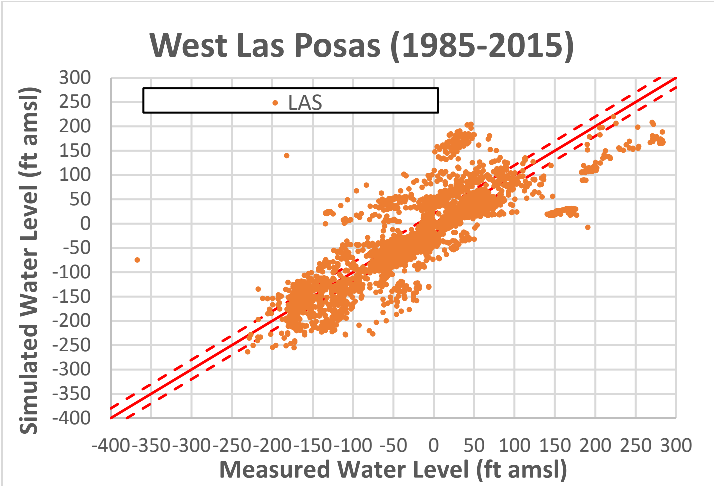
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

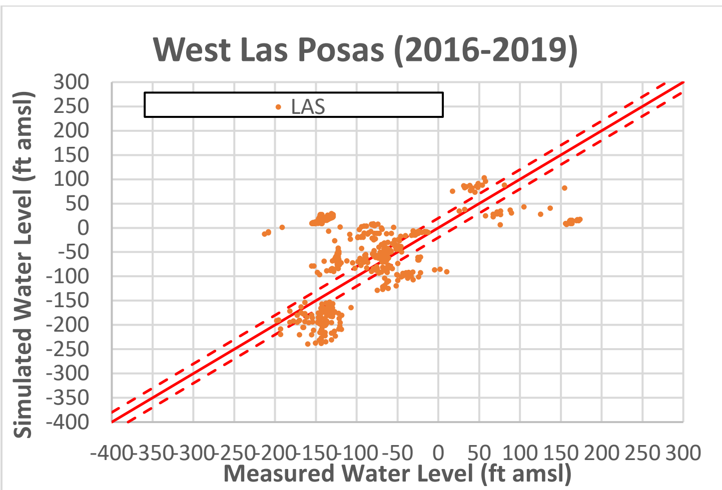
Figure 3-8b: Scatterplots of Simulated versus Measured Groundwater Elevations in the Pleasant Valley Basin



Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

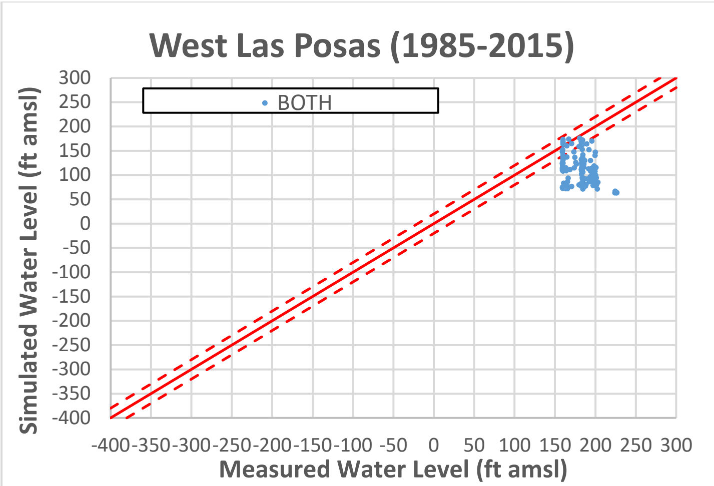
Figure 3-9a: Scatterplots of Simulated versus Measured Groundwater Elevations in the West Las Posas Valley Basin

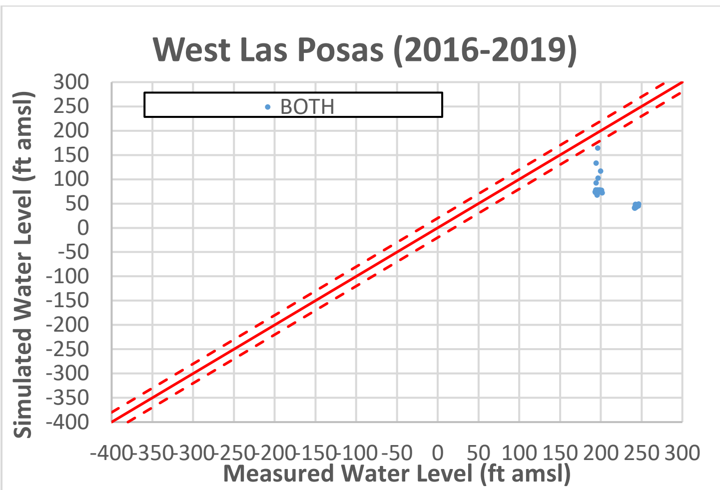




Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

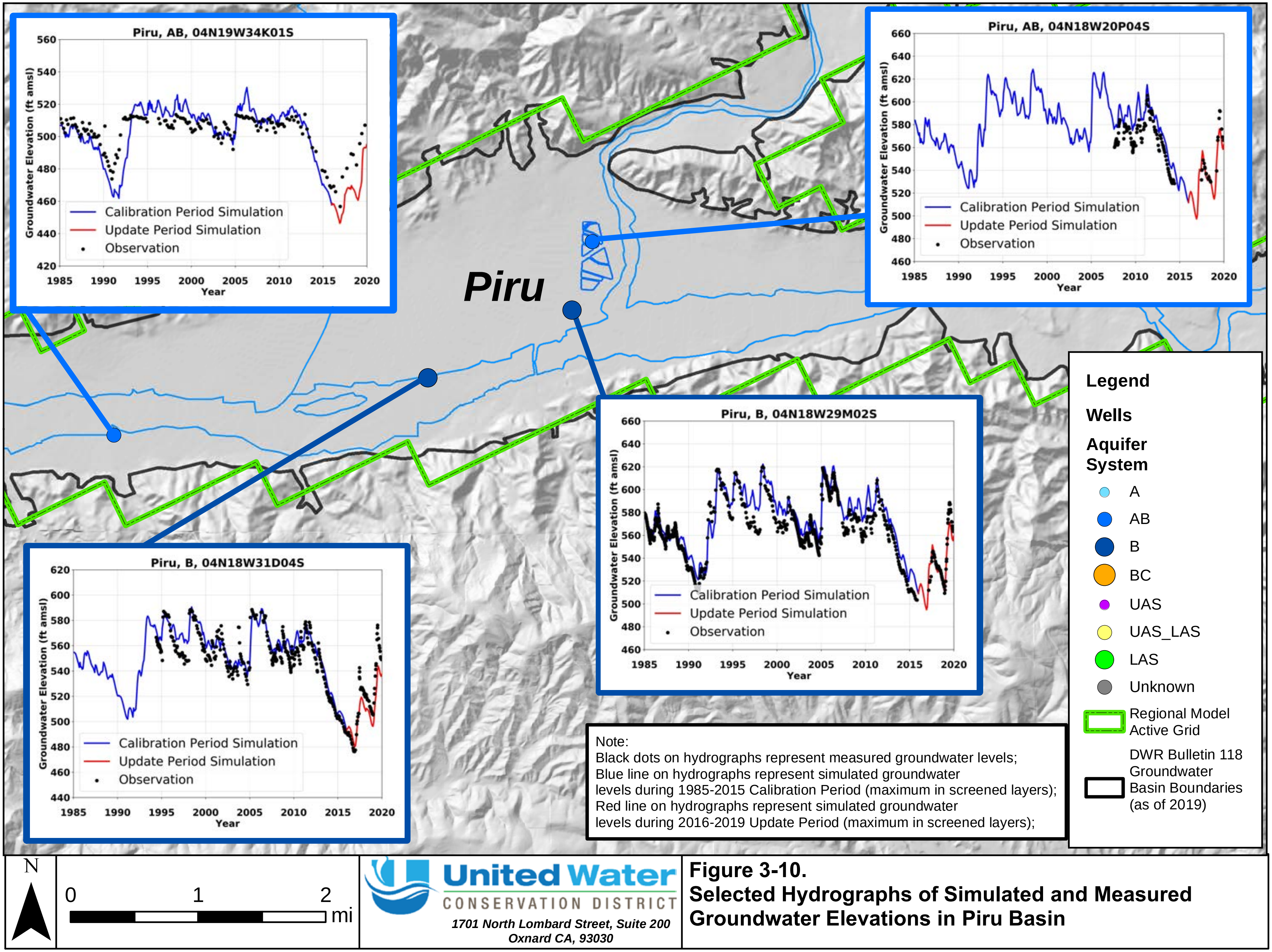
Figure 3-9b: Scatterplots of Simulated versus Measured Groundwater Elevations in the West Las Posas Valley Basin





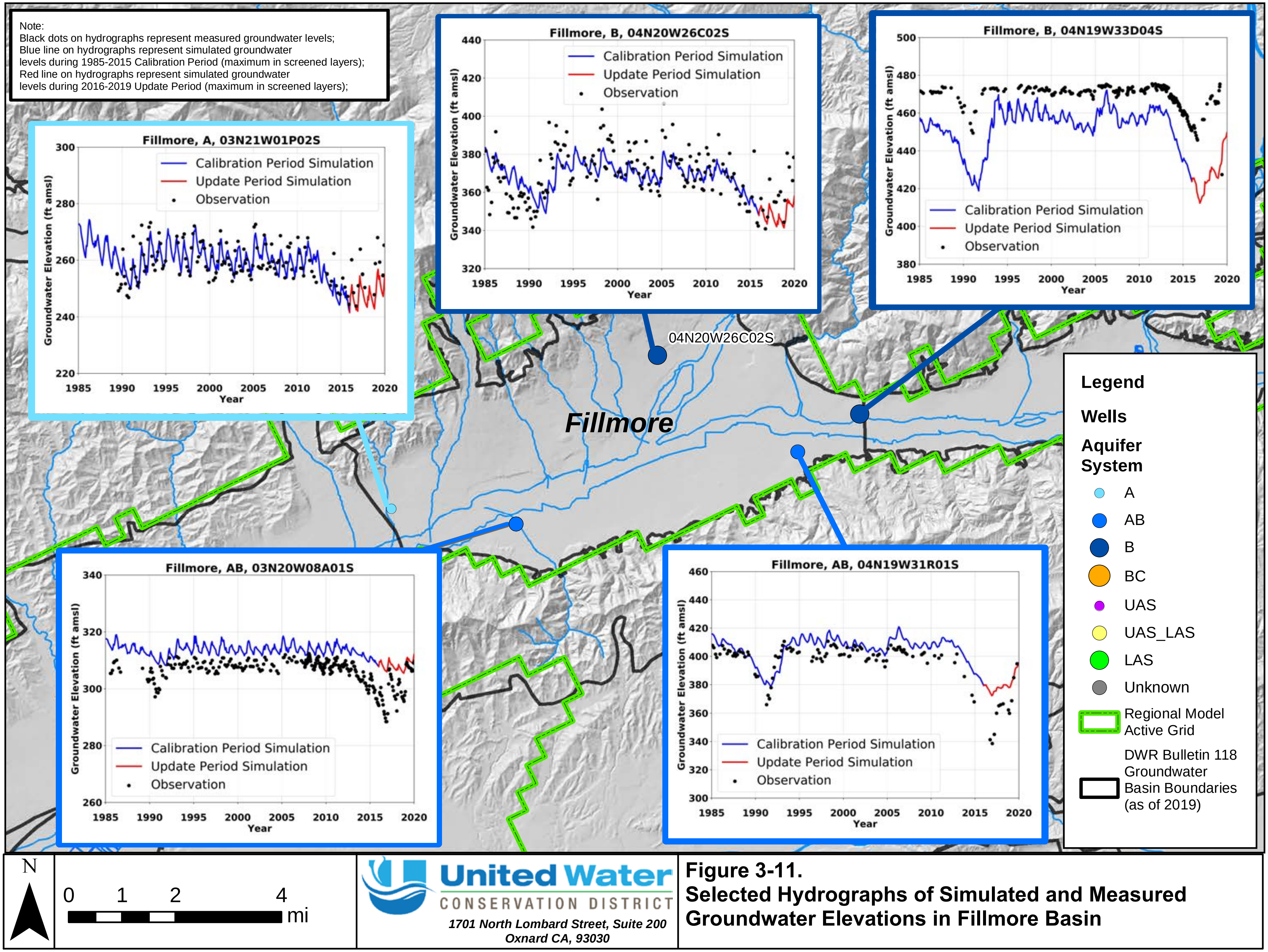
Note: Solid red line in each graph represents a 1 : 1 relationship between measured and simulated groundwater elevations. Dashed red lines are offset 20 feet above and below the 1 : 1 (solid) line.

Figure 3-9c: Scatterplots of Simulated versus Measured Groundwater Elevations in the West Las Posas Valley Basin



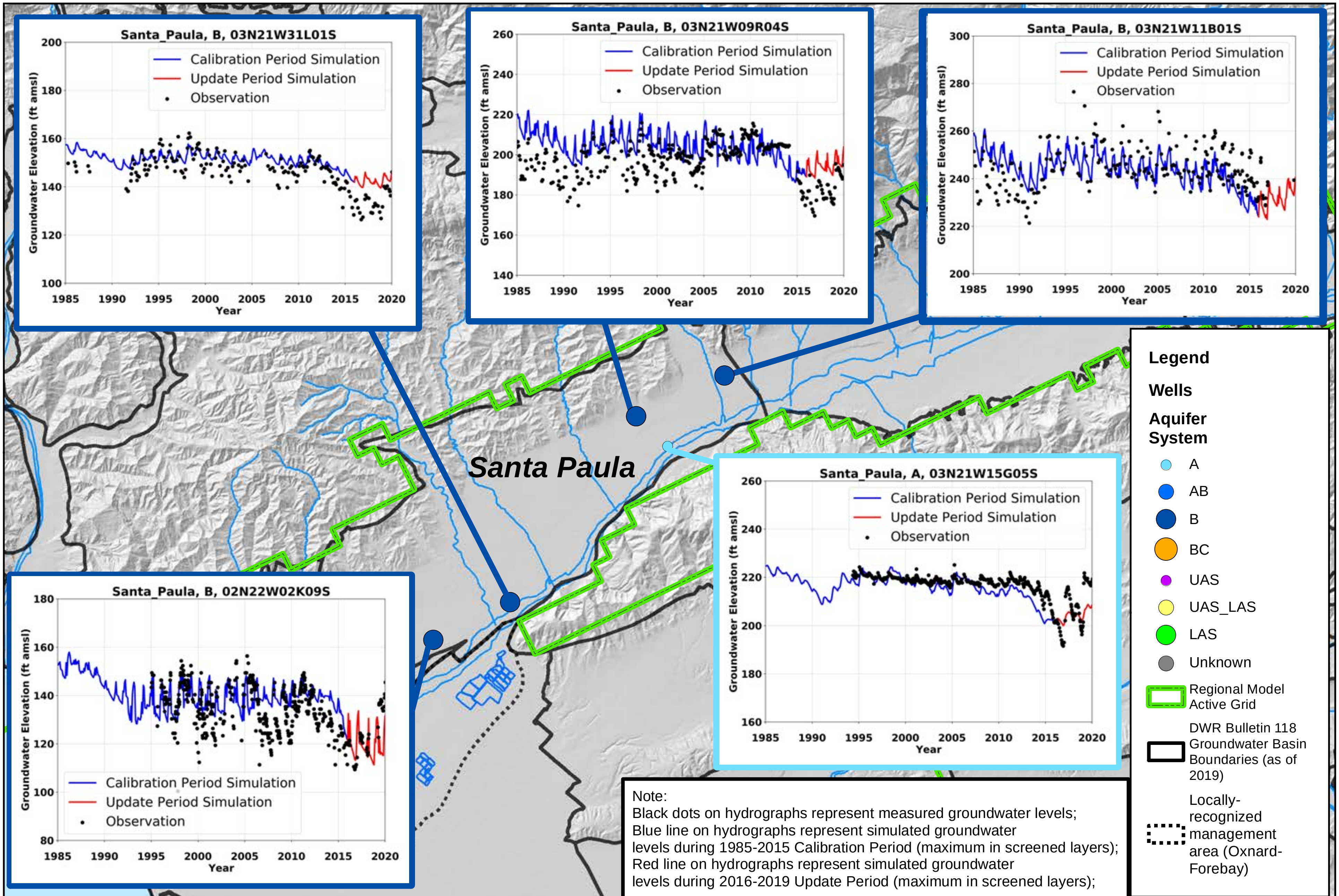
United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-10.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Piru Basin



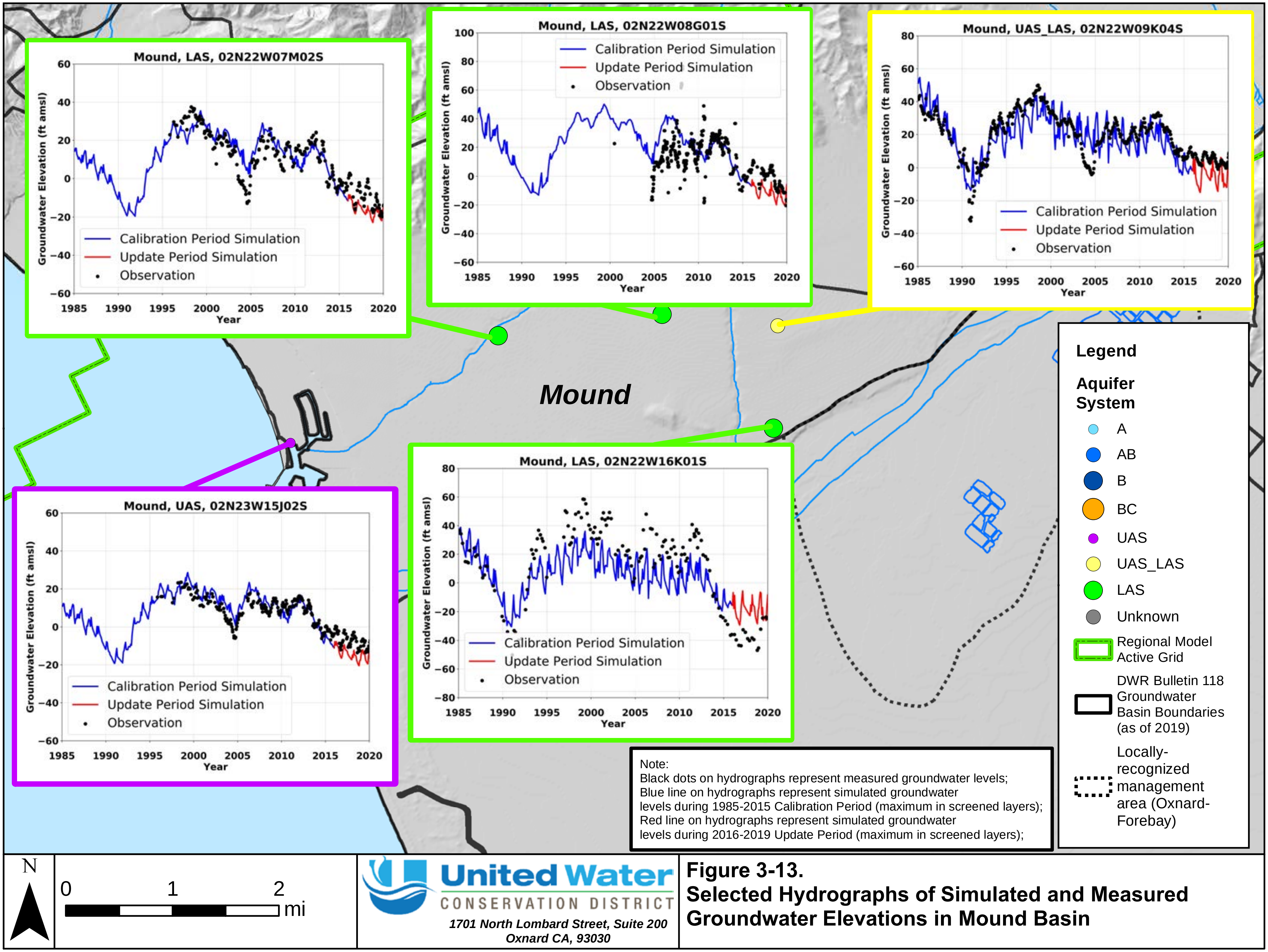
United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-11.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Fillmore Basin



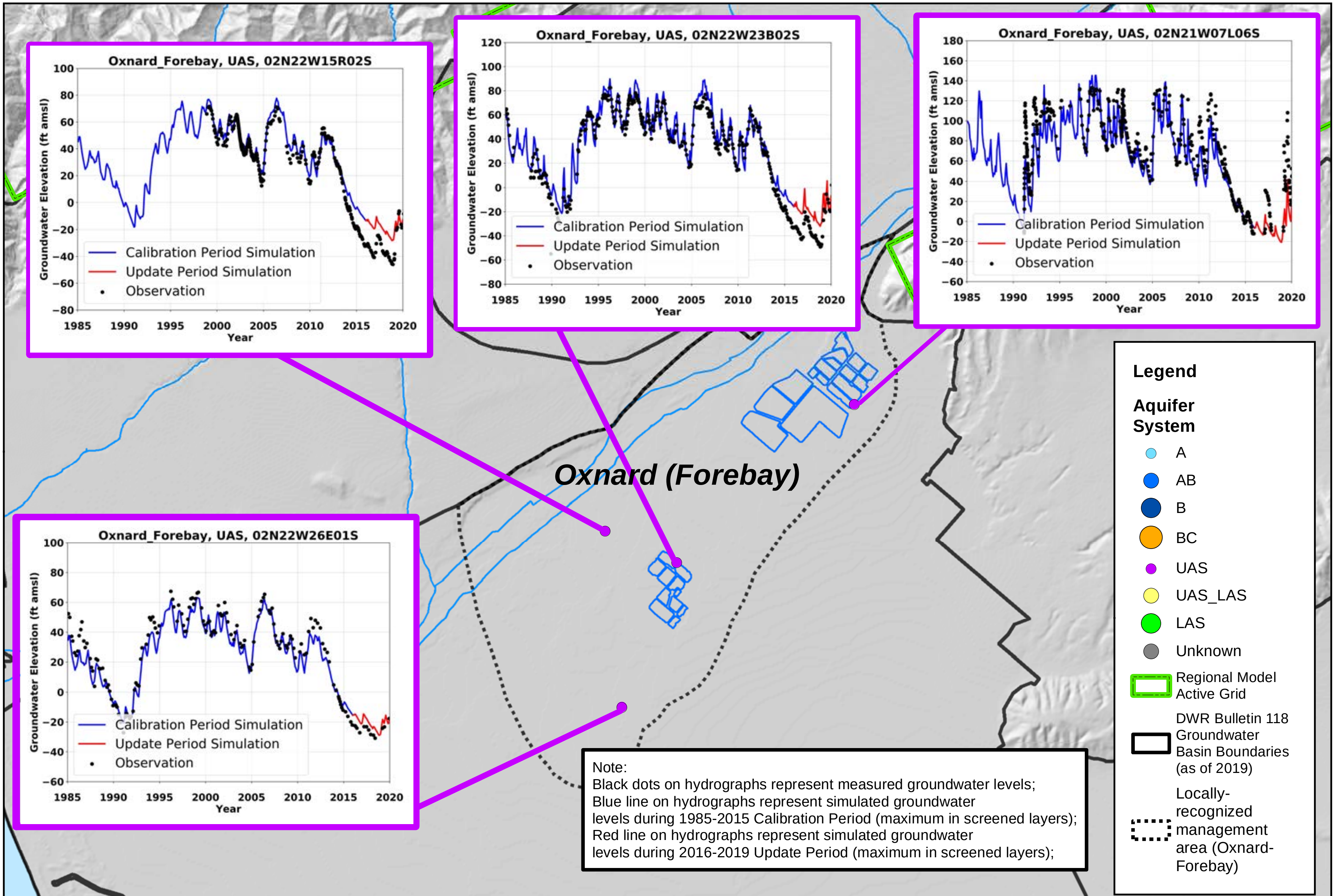
United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-12.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Santa Paula Basin



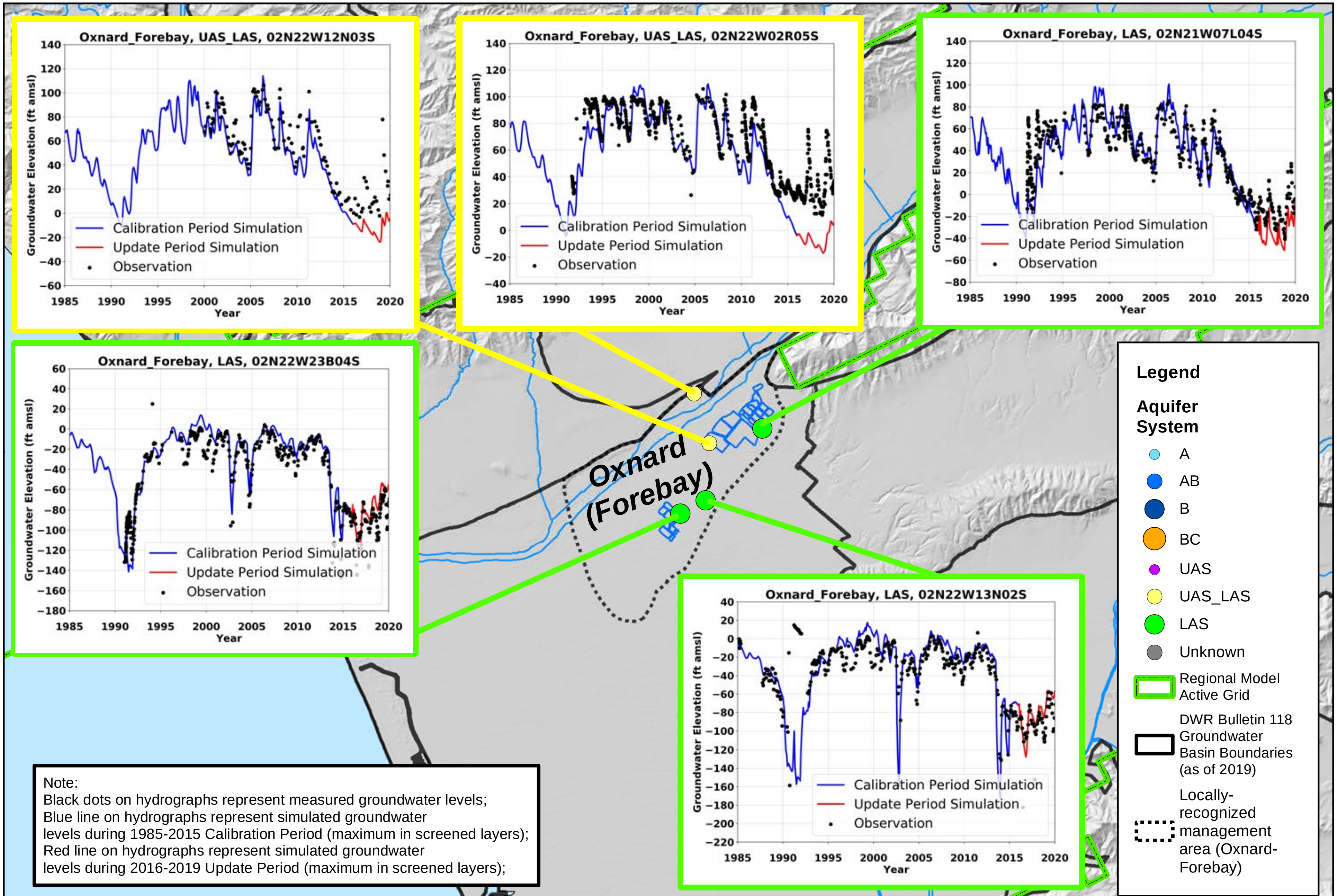
United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-13.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Mound Basin



United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-14.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Oxnard (Forebay) Basin Upper Aquifer System



N

0 0.5 1 2 3 4 mi

United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-15.
Selected Hydrographs of Simulated Groundwater Elevations in Oxnard (Forebay) Basin Upper and Lower Aquifer Systems

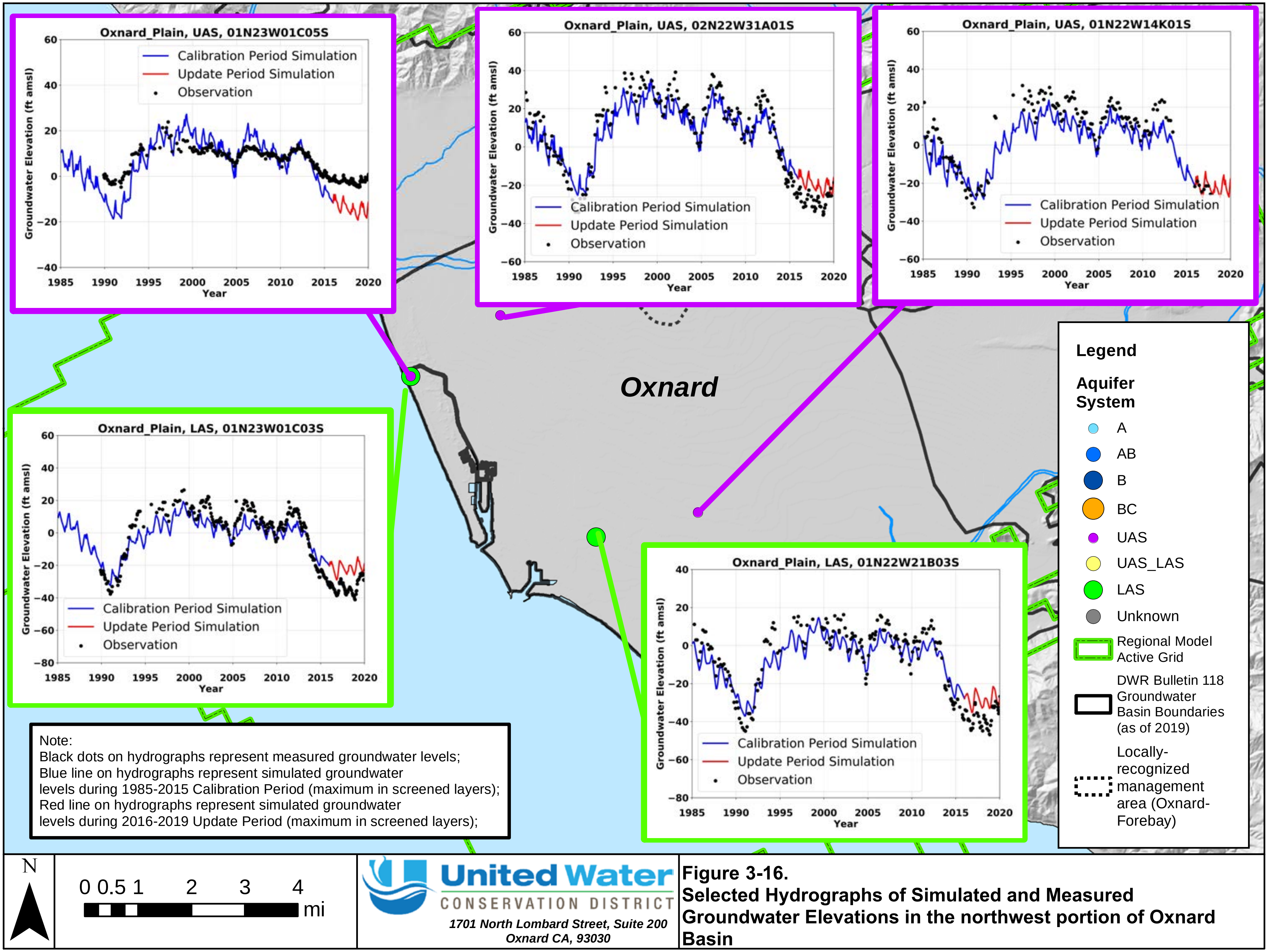
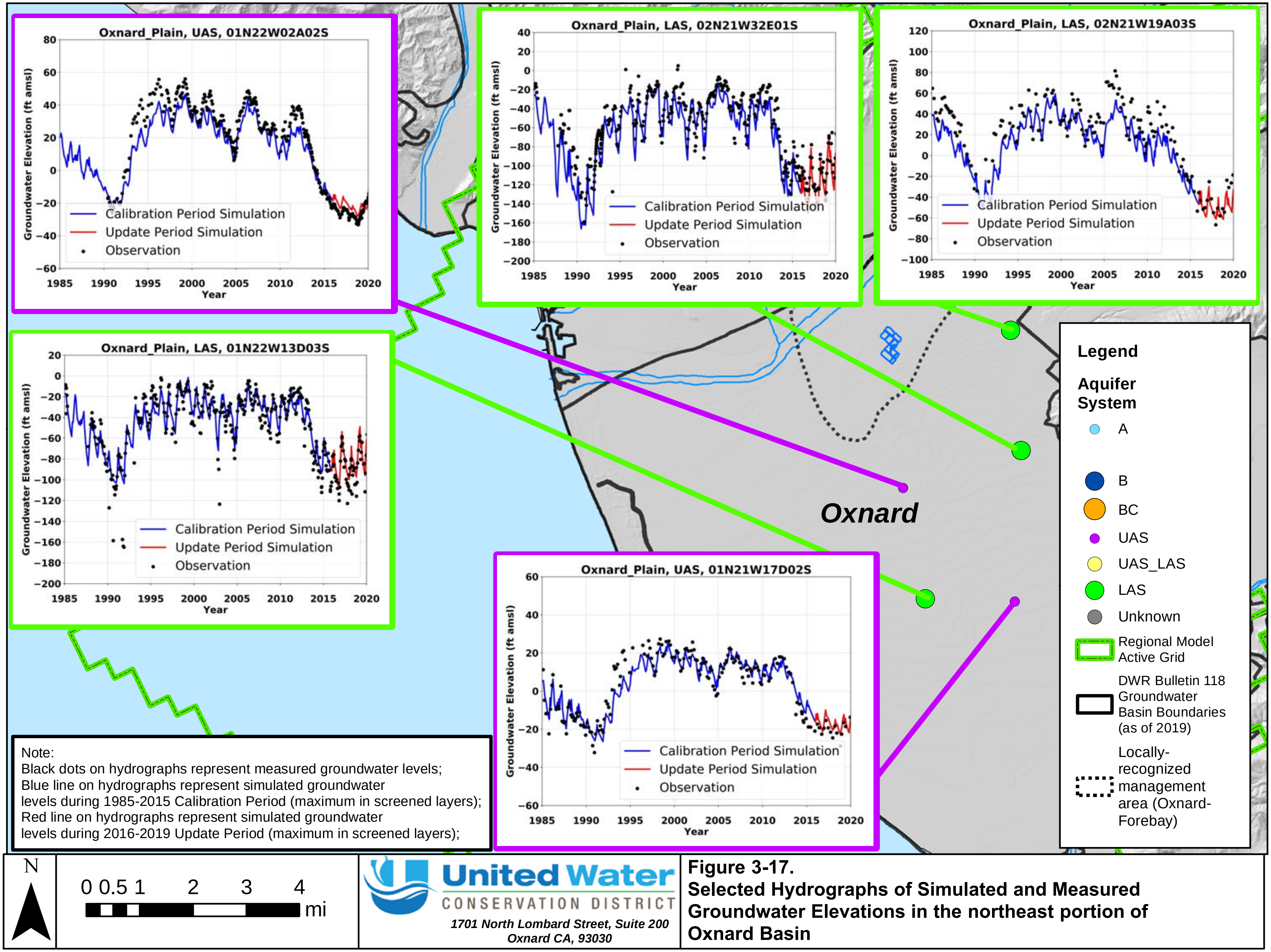
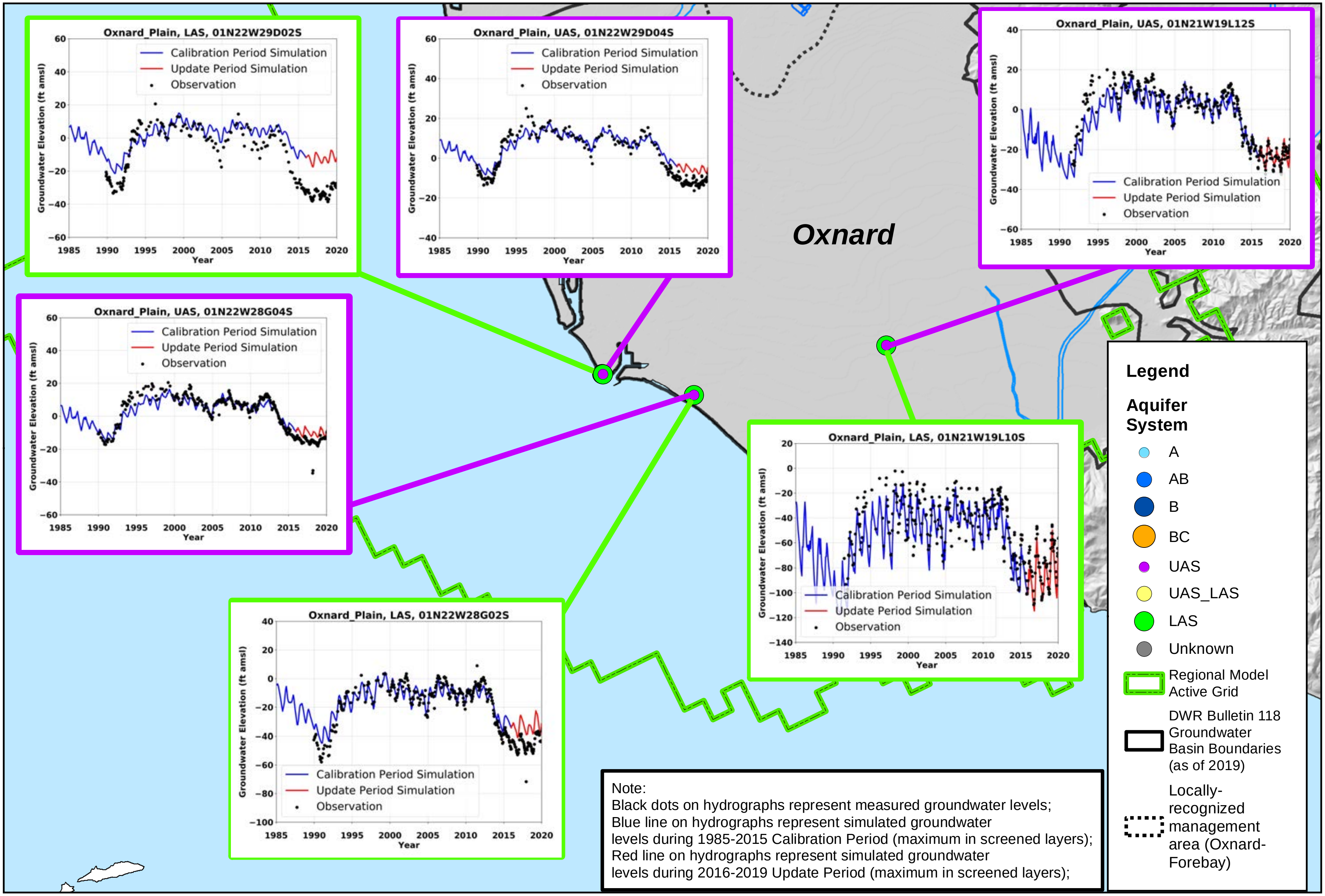


Figure 3-16.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the northwest portion of Oxnard Basin



United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-17.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the northeast portion of Oxnard Basin



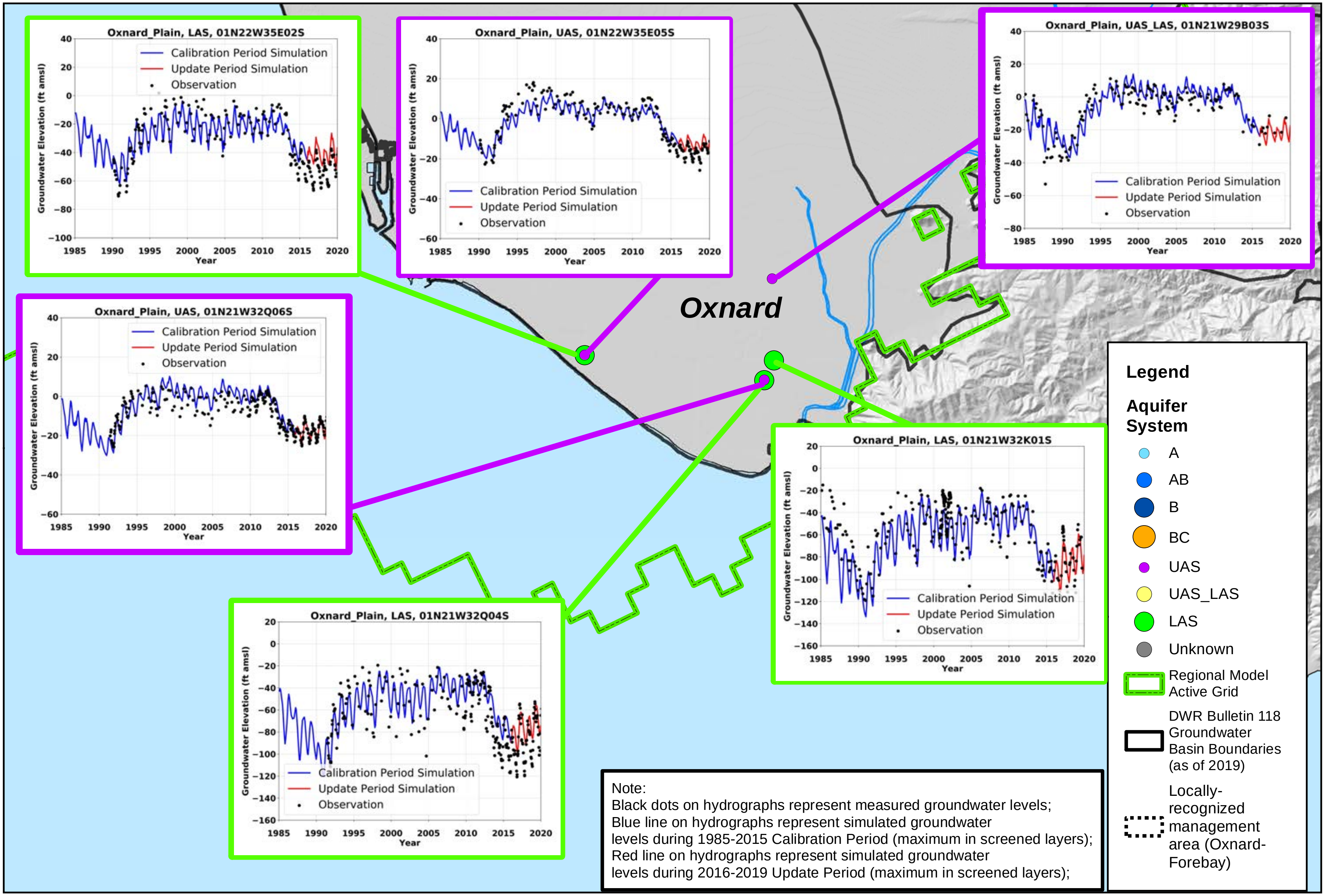
Note:
Black dots on hydrographs represent measured groundwater levels;
Blue line on hydrographs represent simulated groundwater levels during 1985-2015 Calibration Period (maximum in screened layers);
Red line on hydrographs represent simulated groundwater levels during 2016-2019 Update Period (maximum in screened layers);

N

0 0.5 1 2 3 4 mi

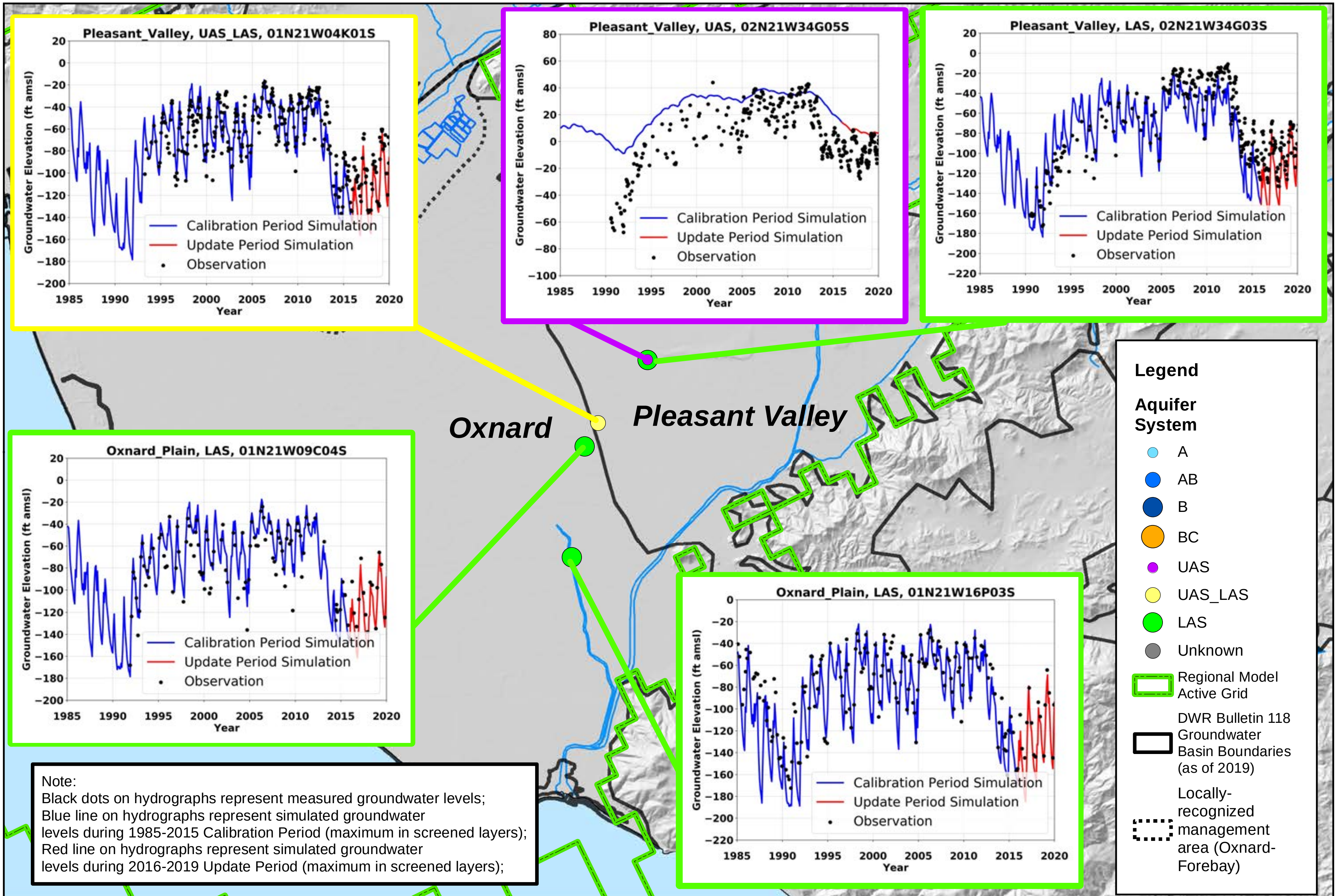
United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-18.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the central portion of Oxnard Basin



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-19.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the in the southern portion of Oxnard Basin

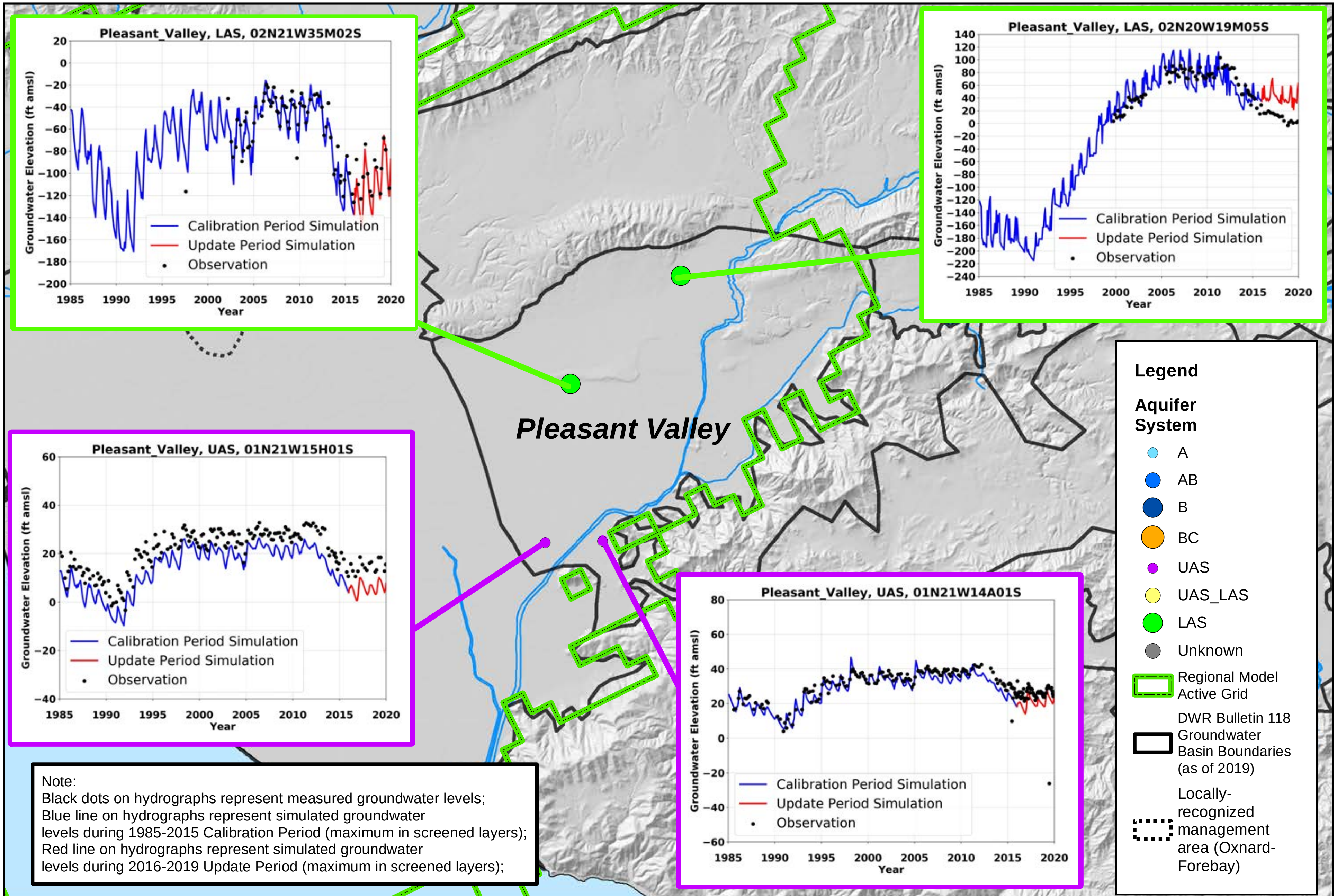


N

0 0.5 1 2 3 4 mi

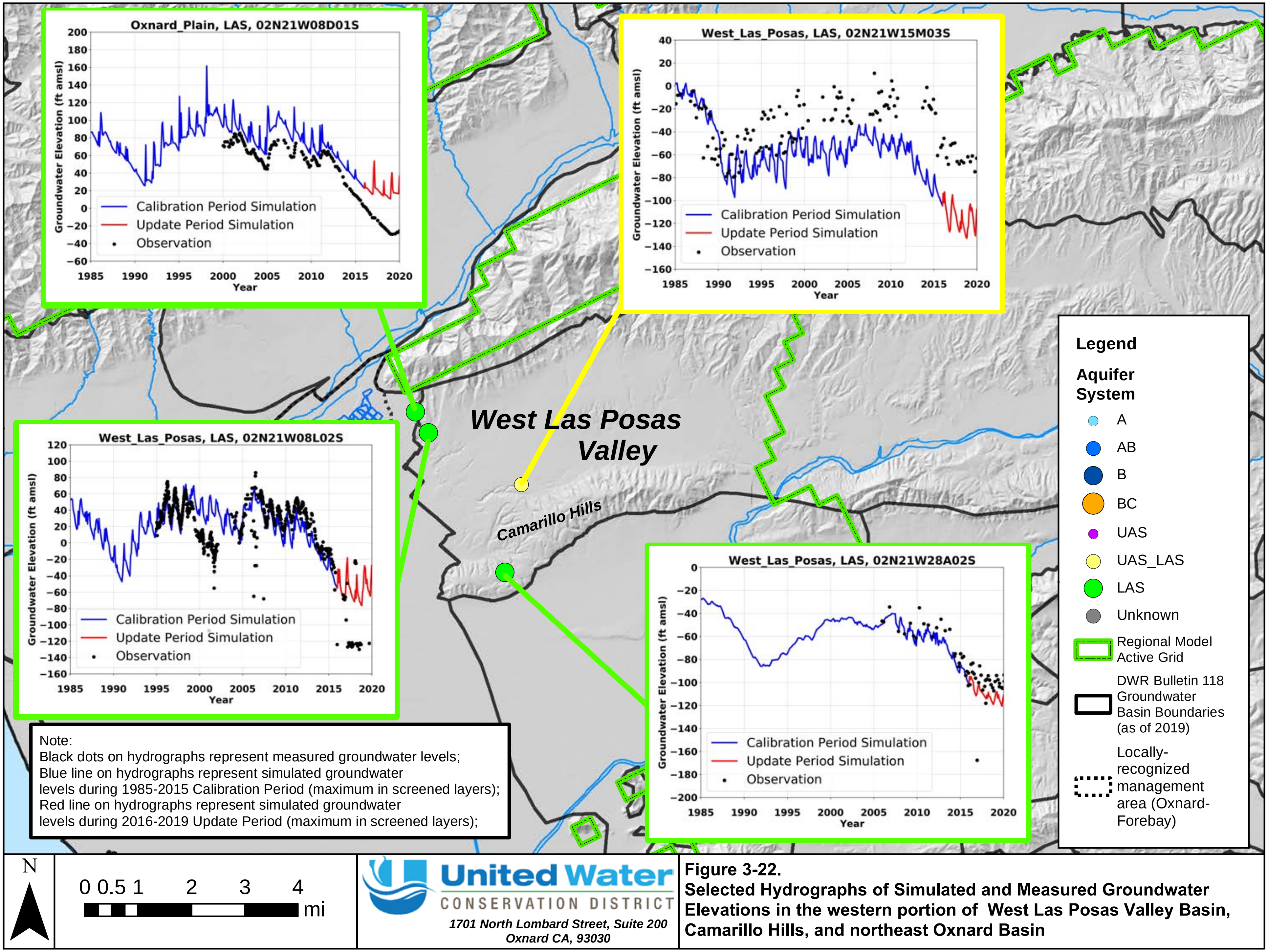
United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-20.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the western portion of Pleasant Valley Basin and eastern portion of Oxnard Basin



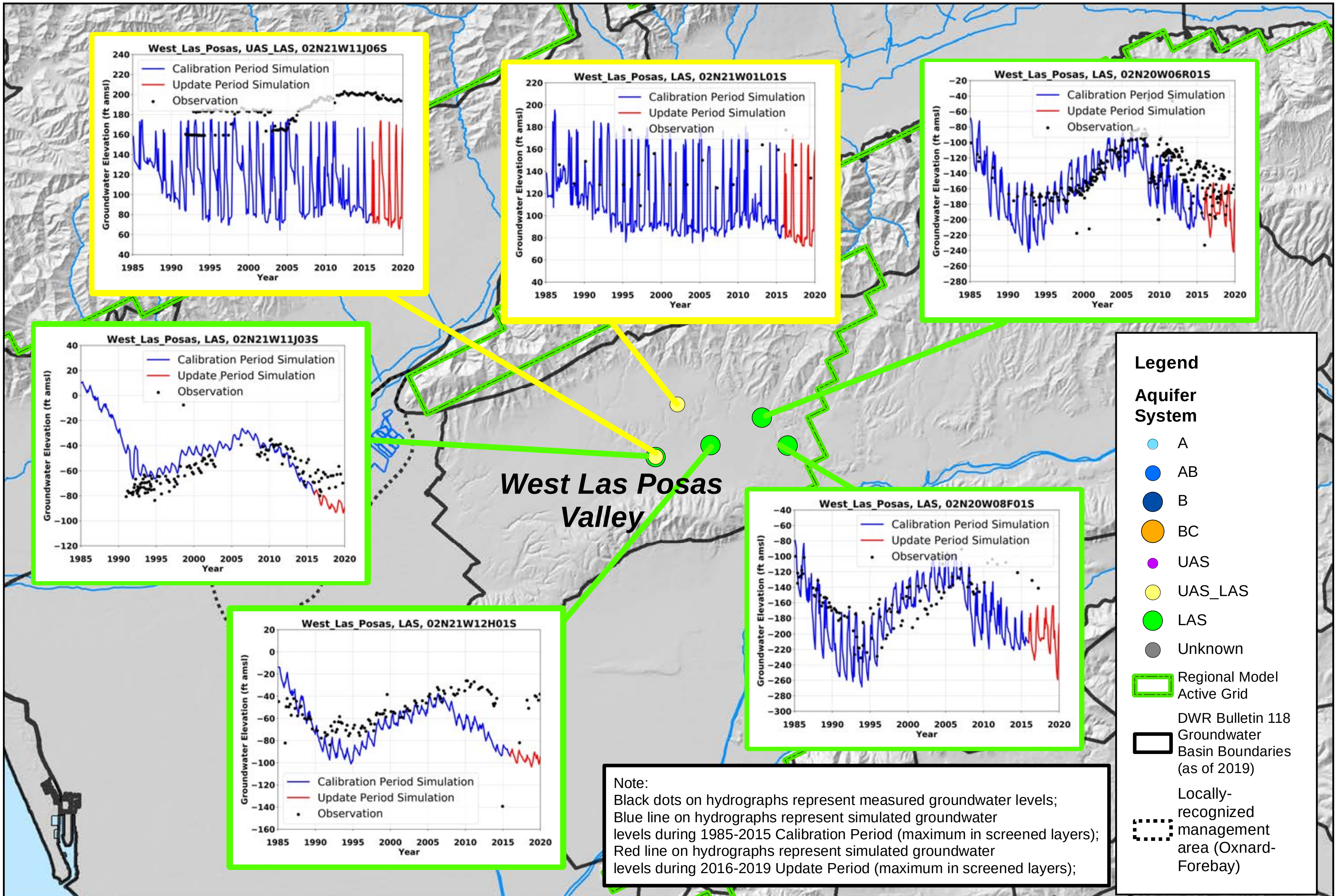
United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-21.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in Pleasant Valley Basin



United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-22.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the western portion of West Las Posas Valley Basin, Camarillo Hills, and northeast Oxnard Basin

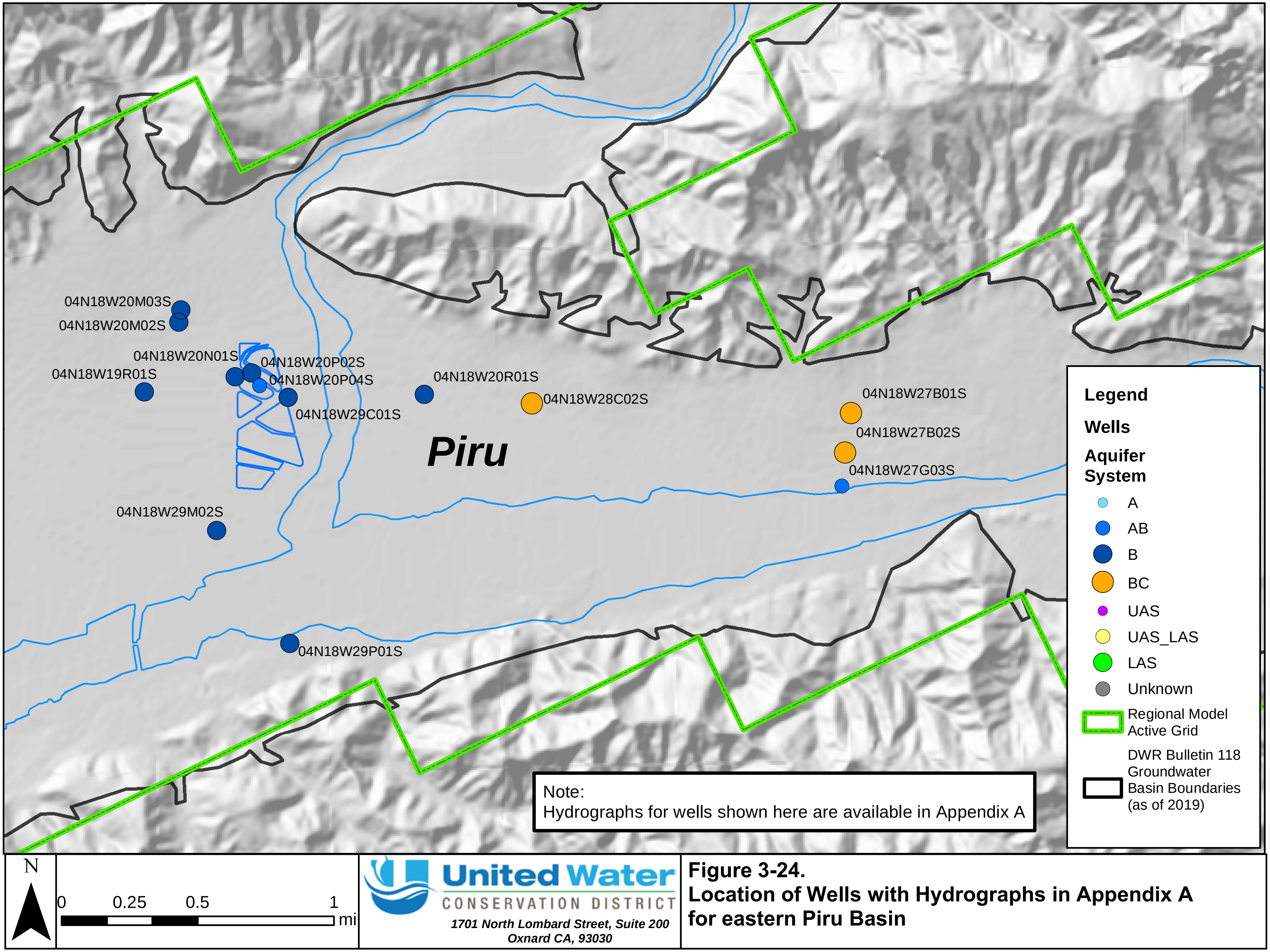


N

0 0.5 1 2 3 4 mi

United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-23.
Selected Hydrographs of Simulated and Measured Groundwater Elevations in the eastern portion of West Las Posas Valley Basin



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-24.
Location of Wells with Hydrographs in Appendix A for eastern Piru Basin

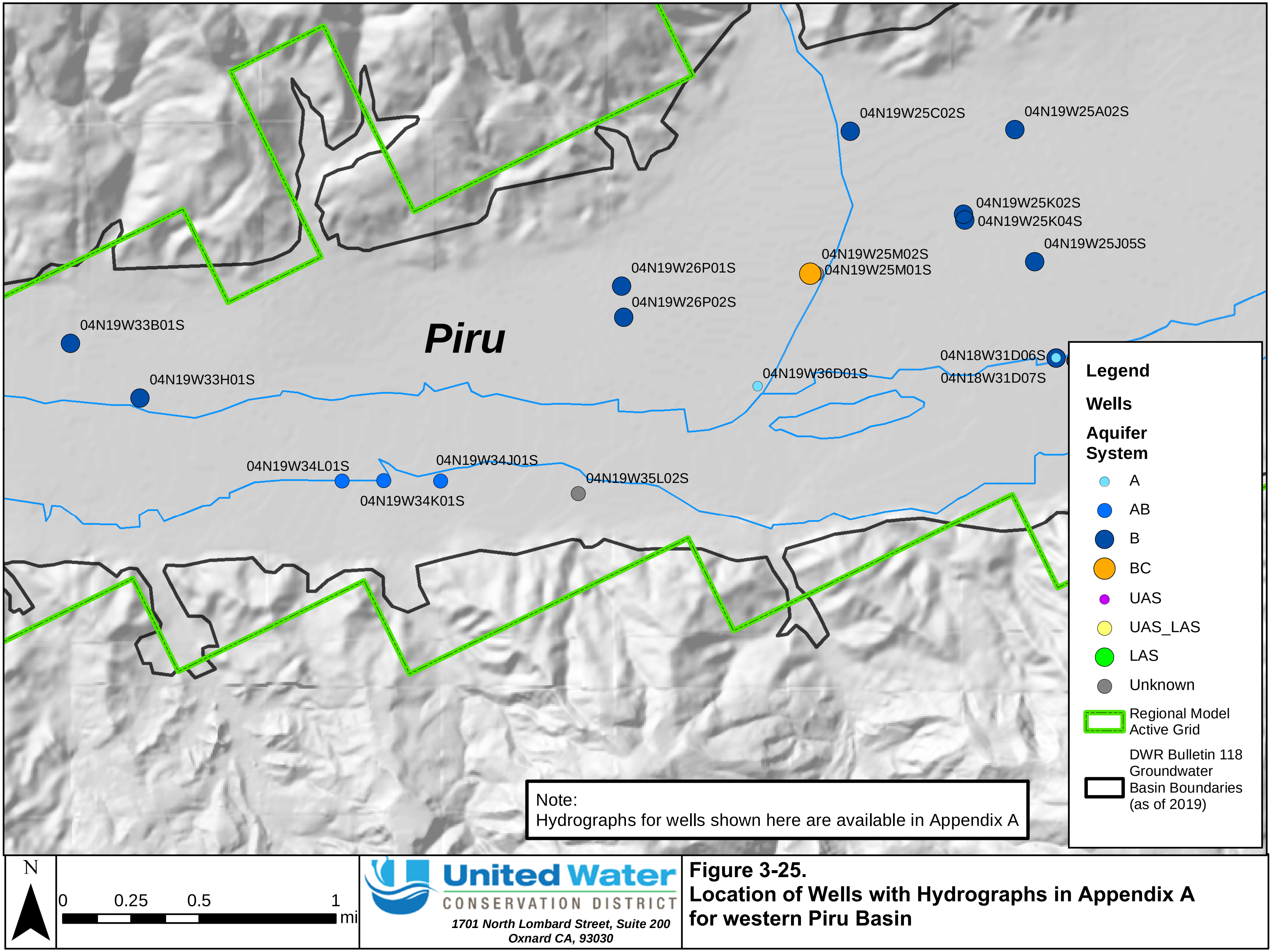


Figure 3-25.
Location of Wells with Hydrographs in Appendix A for western Piru Basin

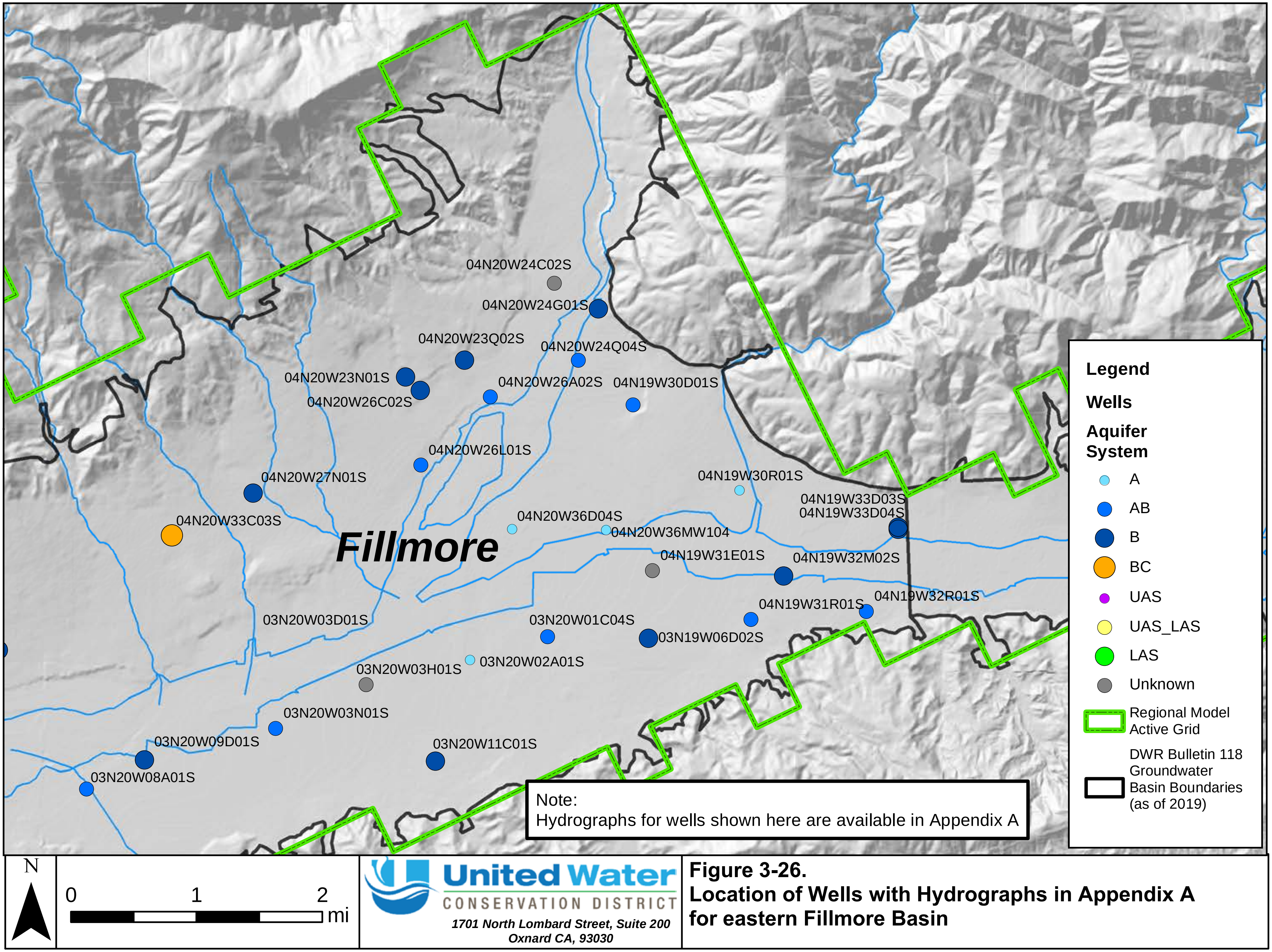


Figure 3-26.
Location of Wells with Hydrographs in Appendix A for eastern Fillmore Basin

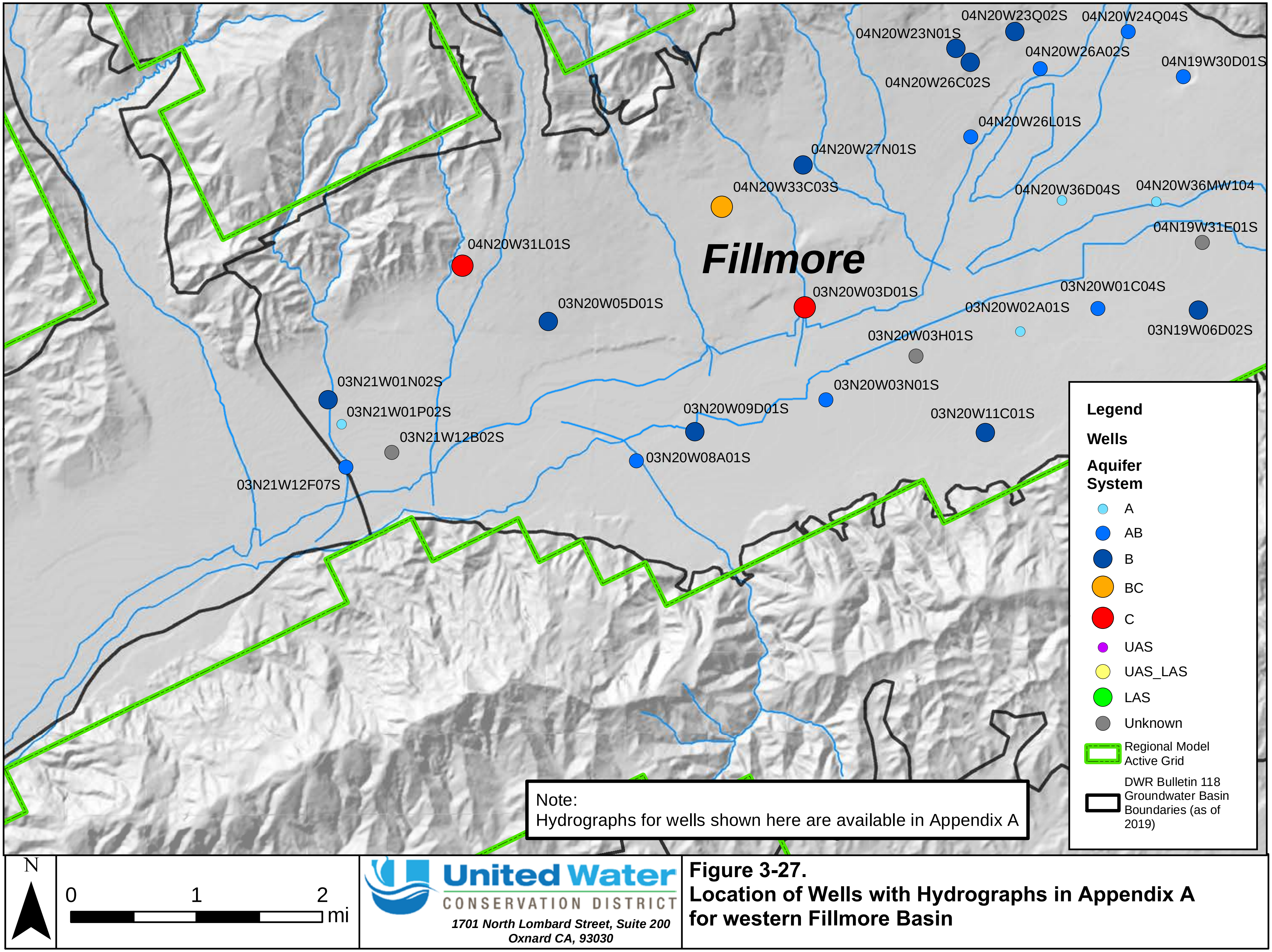


Figure 3-27.
Location of Wells with Hydrographs in Appendix A for western Fillmore Basin

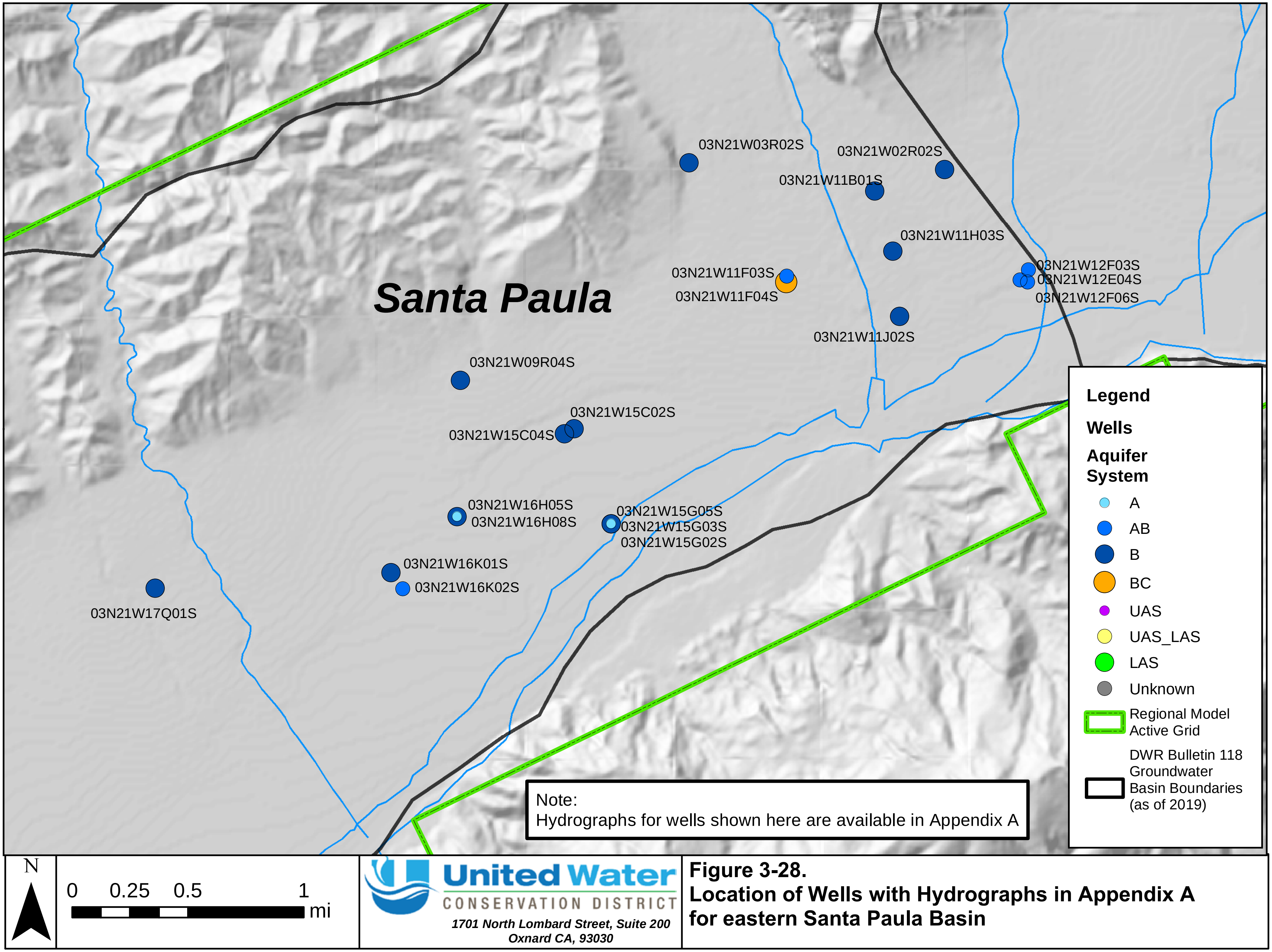


Figure 3-28.
Location of Wells with Hydrographs in Appendix A for eastern Santa Paula Basin

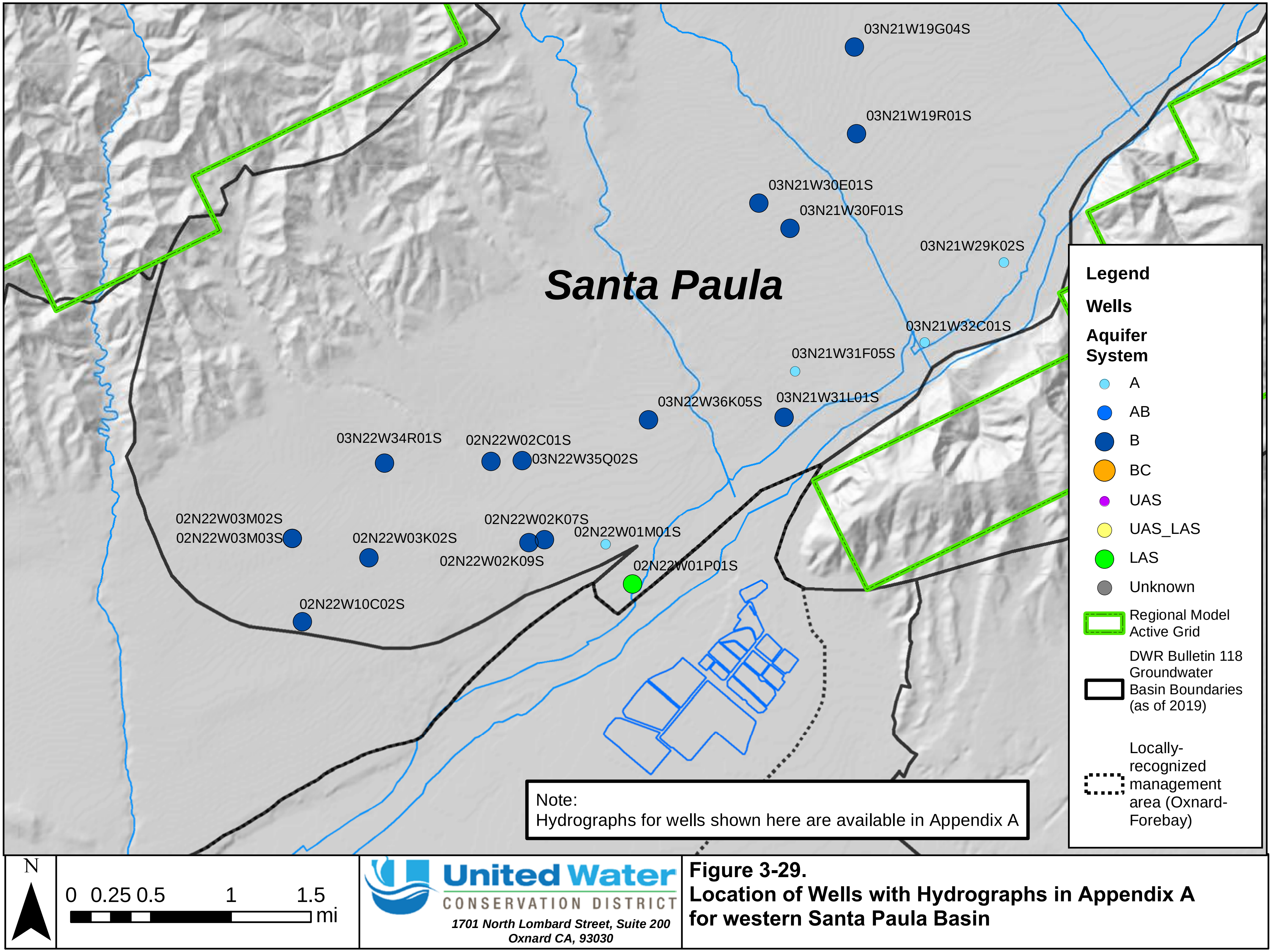


Figure 3-29.
Location of Wells with Hydrographs in Appendix A for western Santa Paula Basin

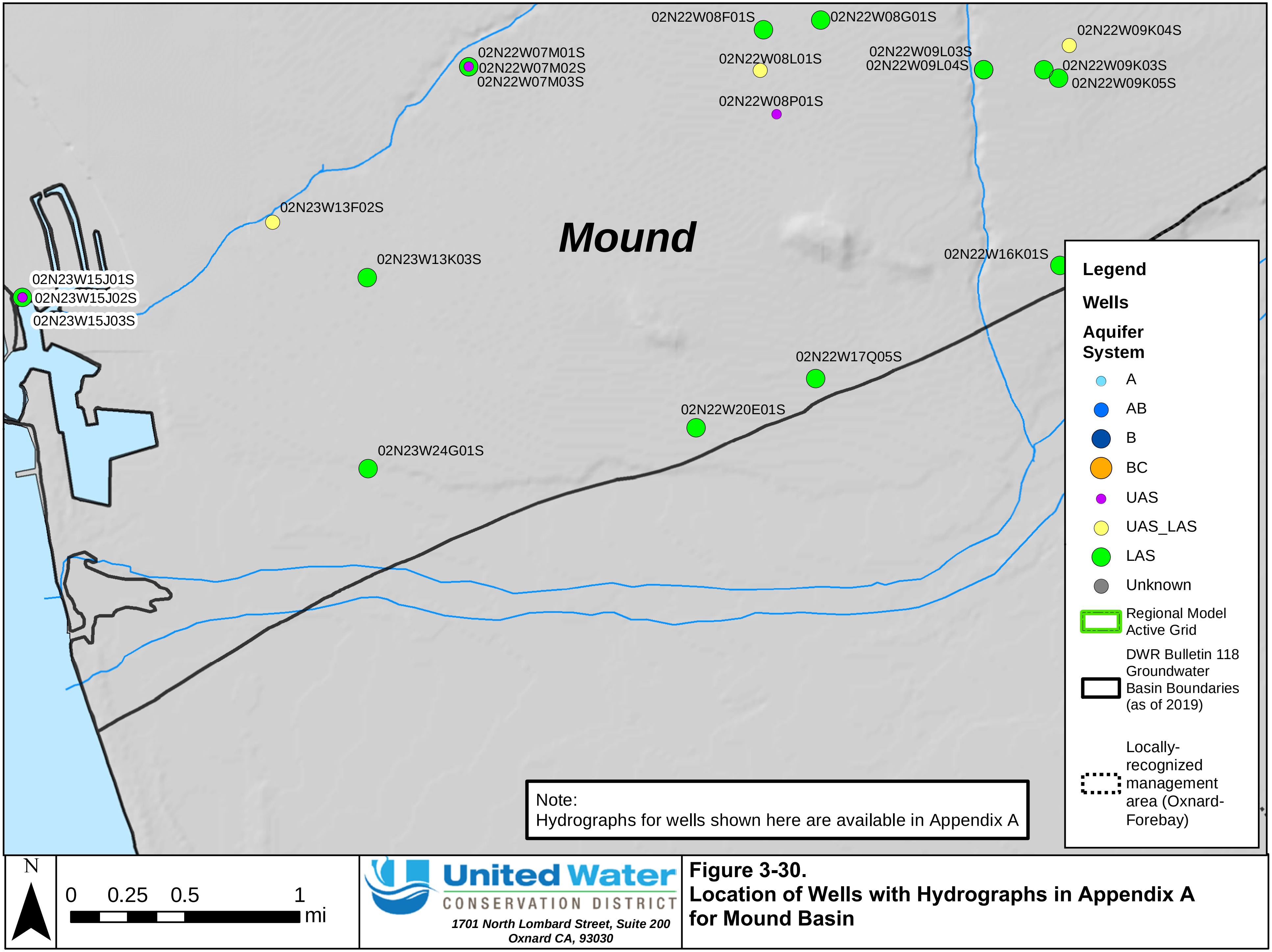


Figure 3-30.
Location of Wells with Hydrographs in Appendix A for Mound Basin

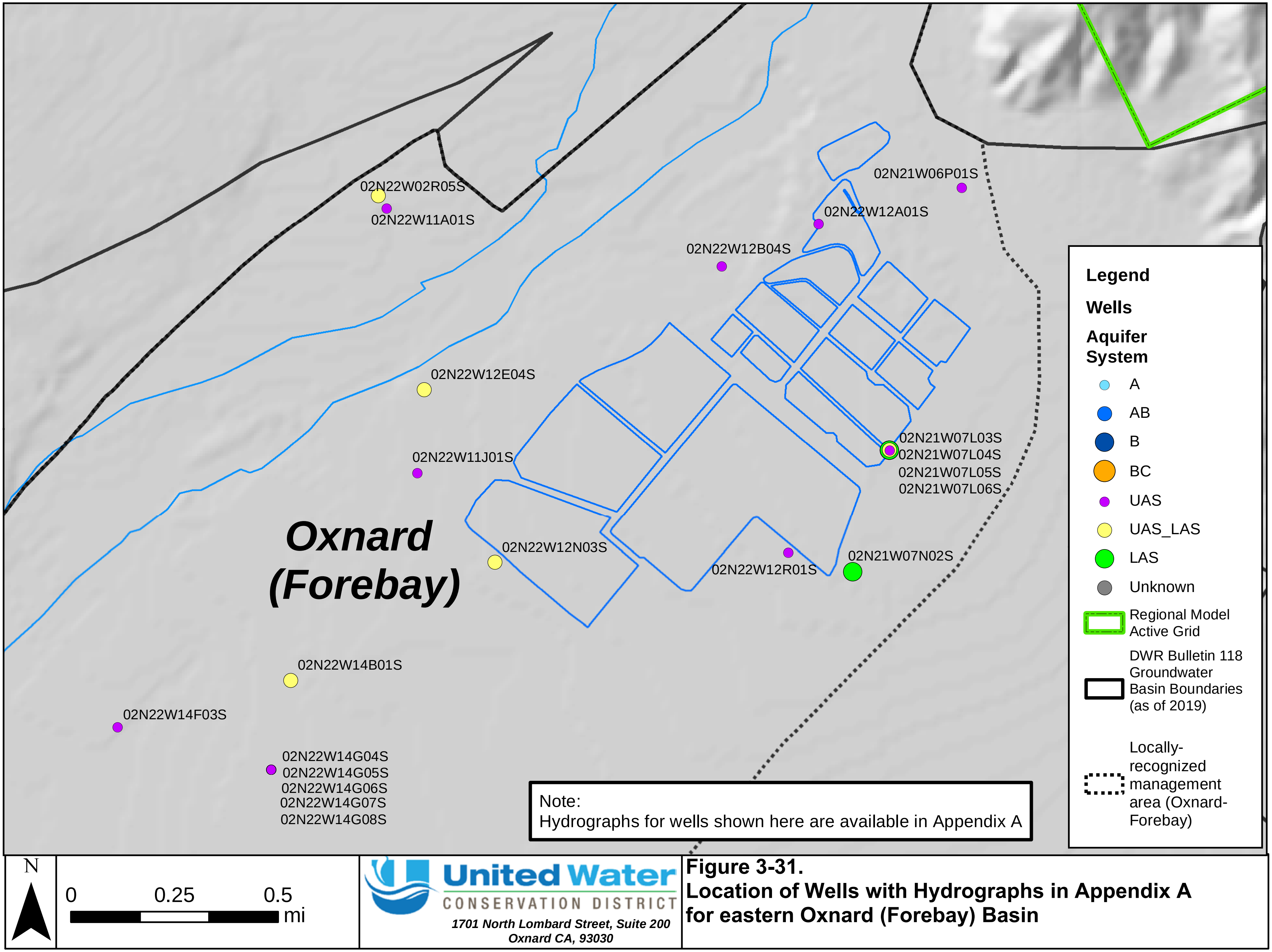
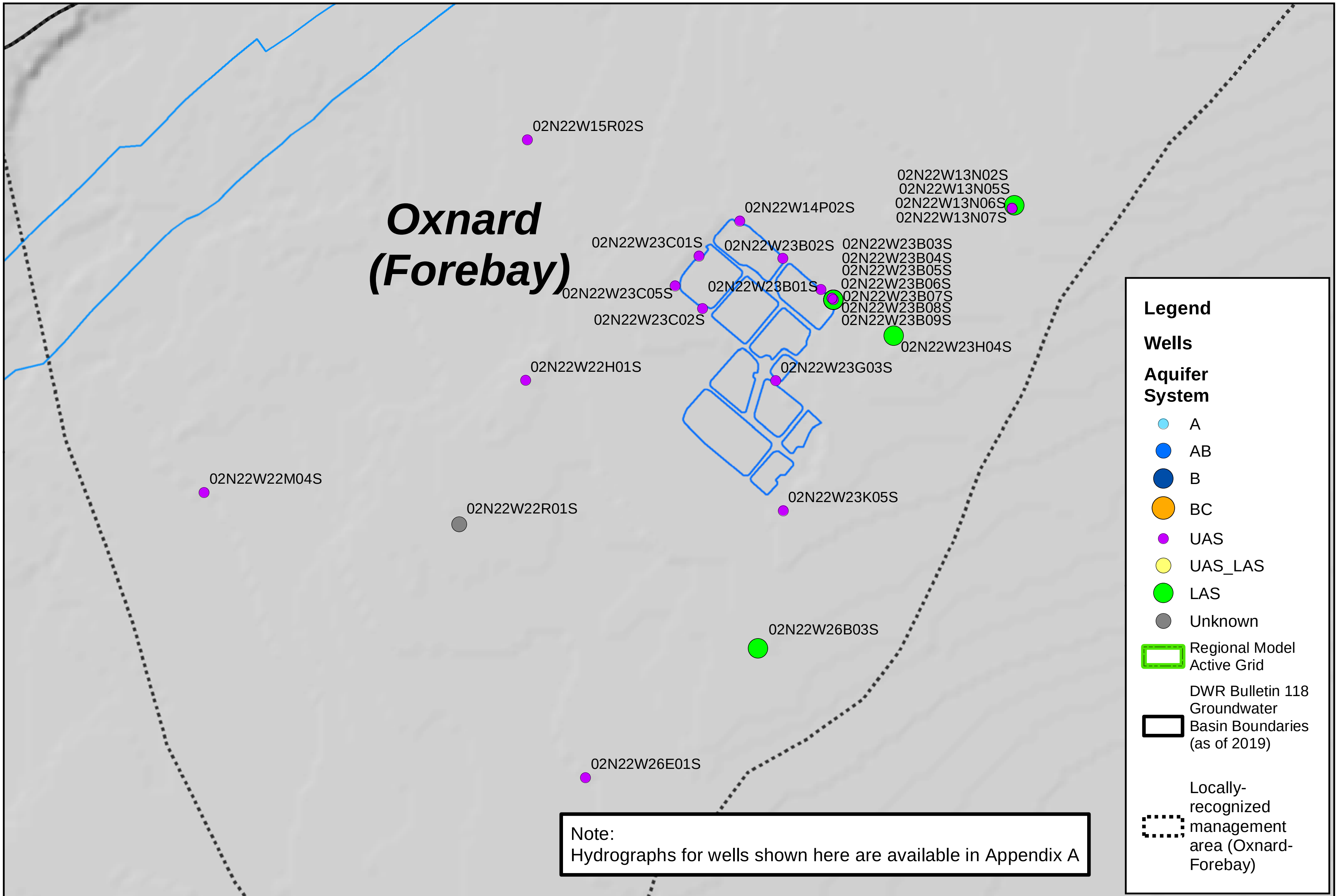
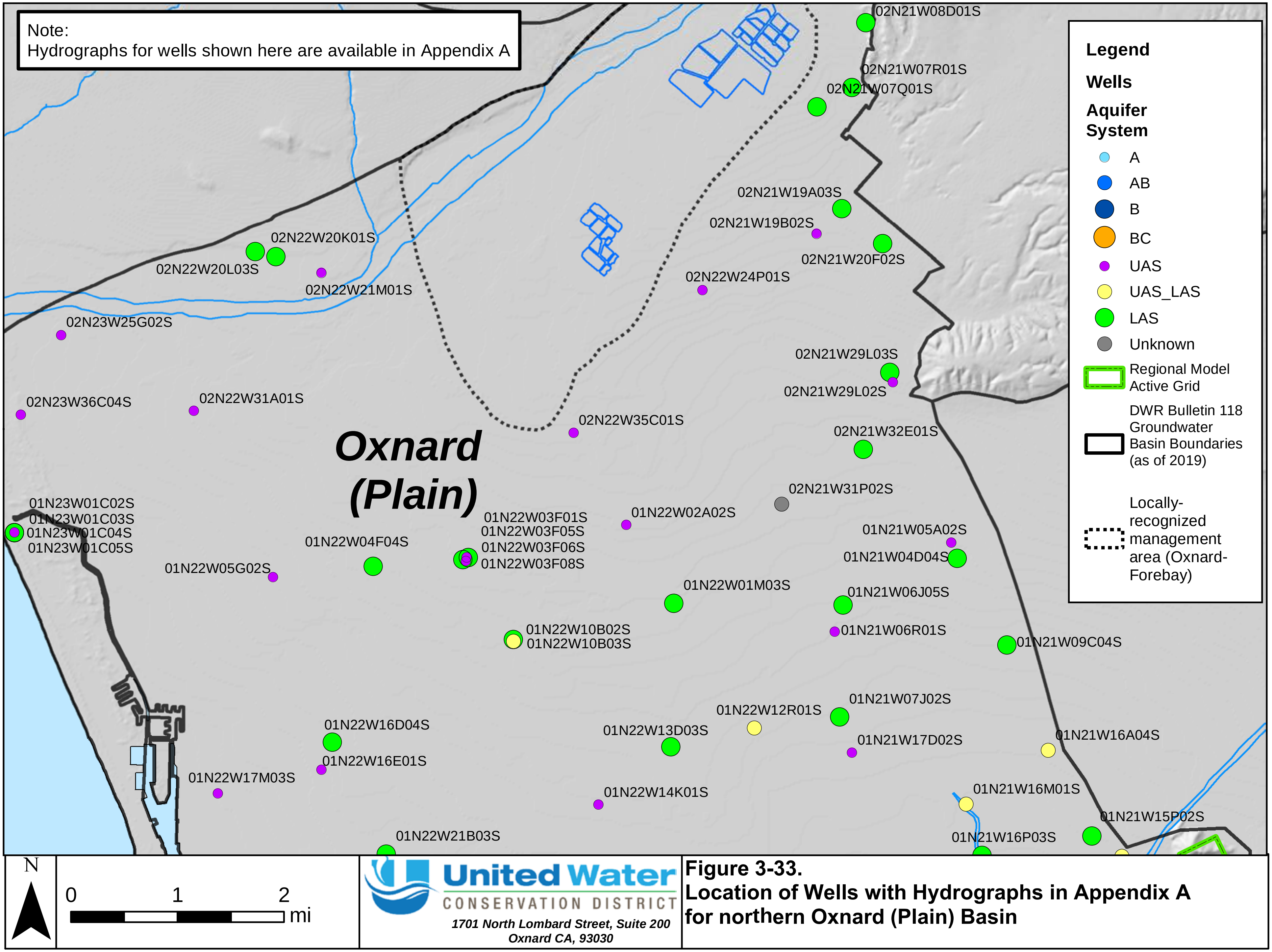


Figure 3-31.
Location of Wells with Hydrographs in Appendix A for eastern Oxnard (Forebay) Basin



United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-32.
Location of Wells with Hydrographs in Appendix A for western Oxnard (Forebay) Basin



United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-33.
Location of Wells with Hydrographs in Appendix A for northern Oxnard (Plain) Basin

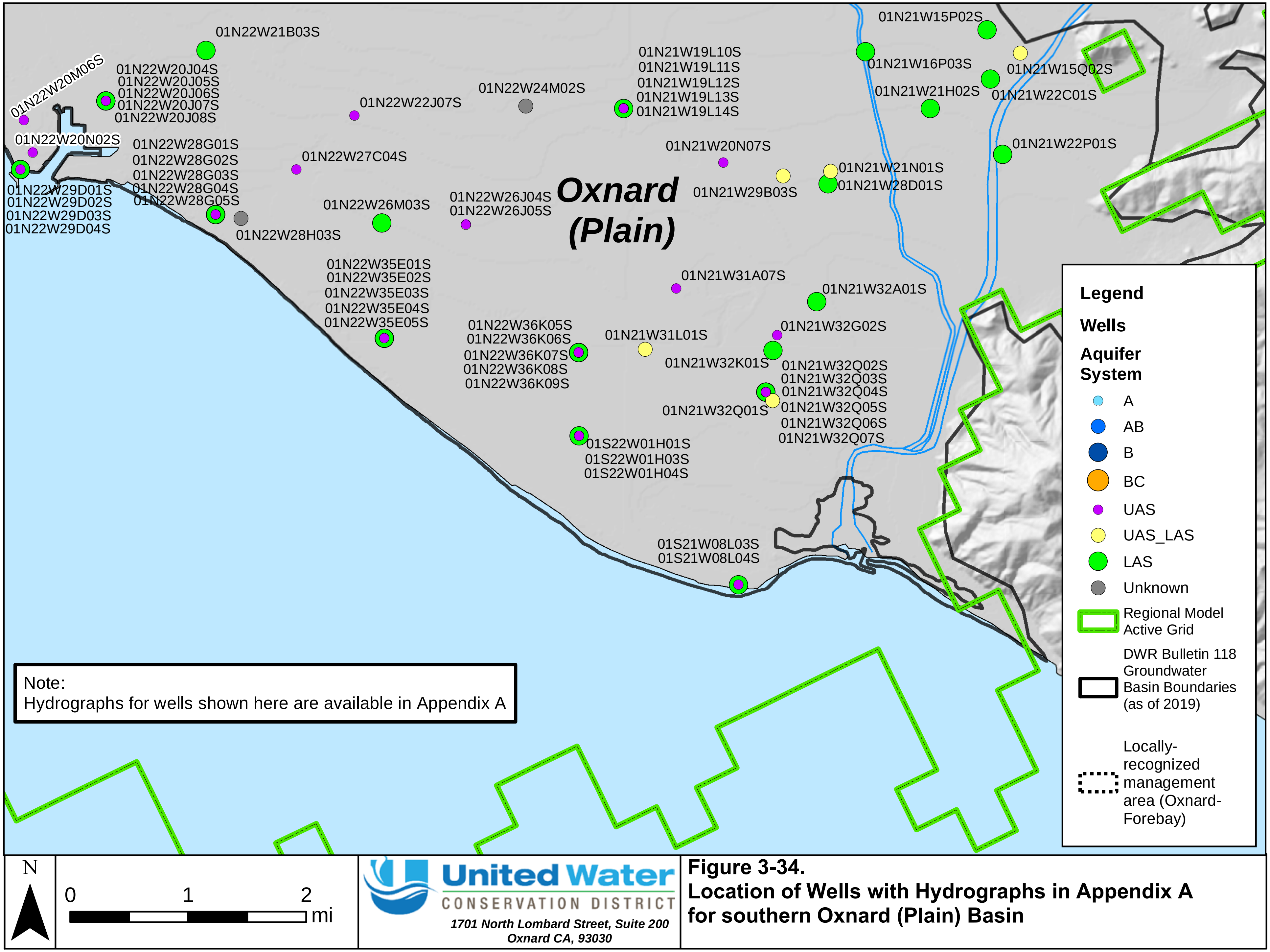
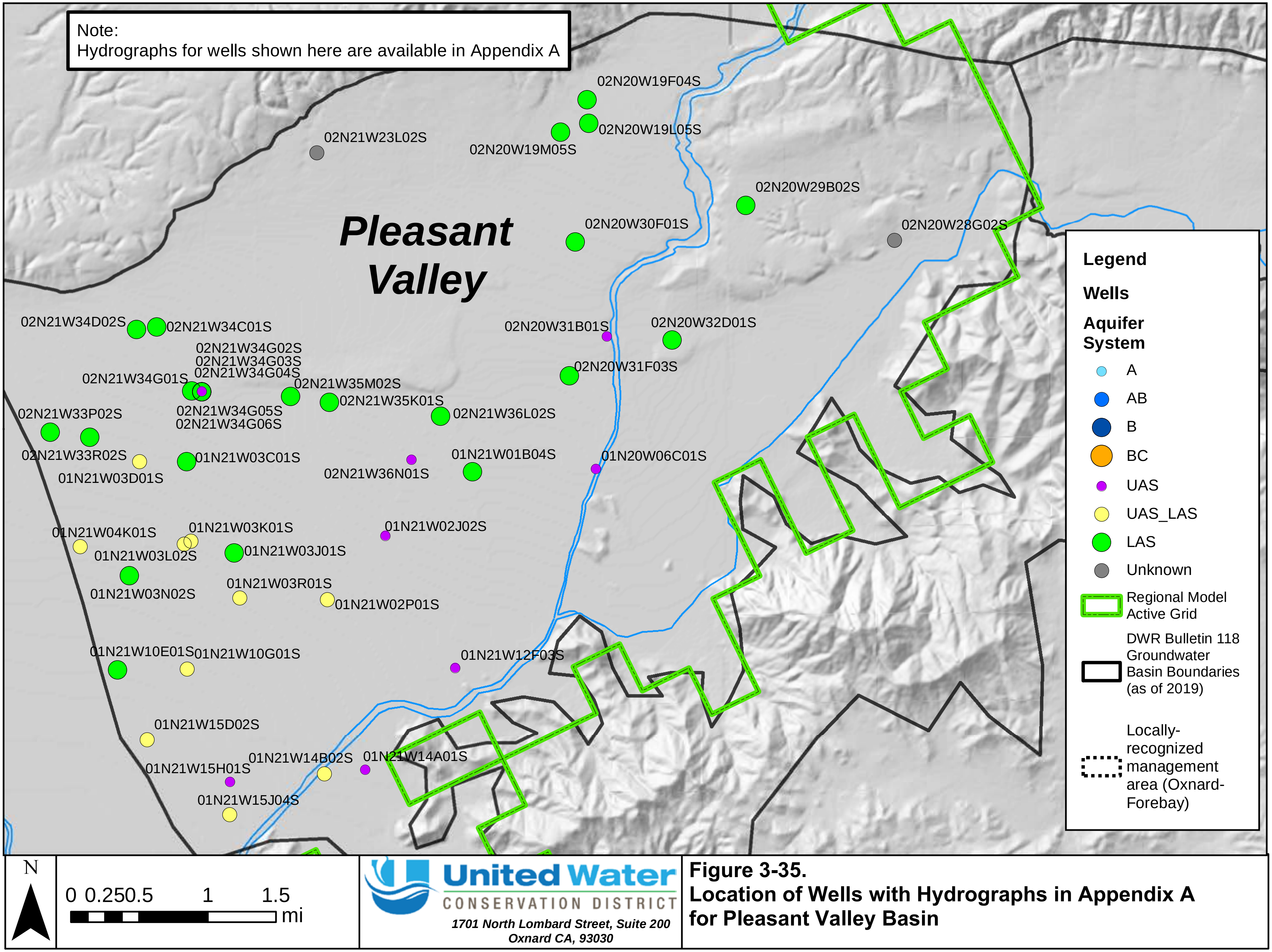
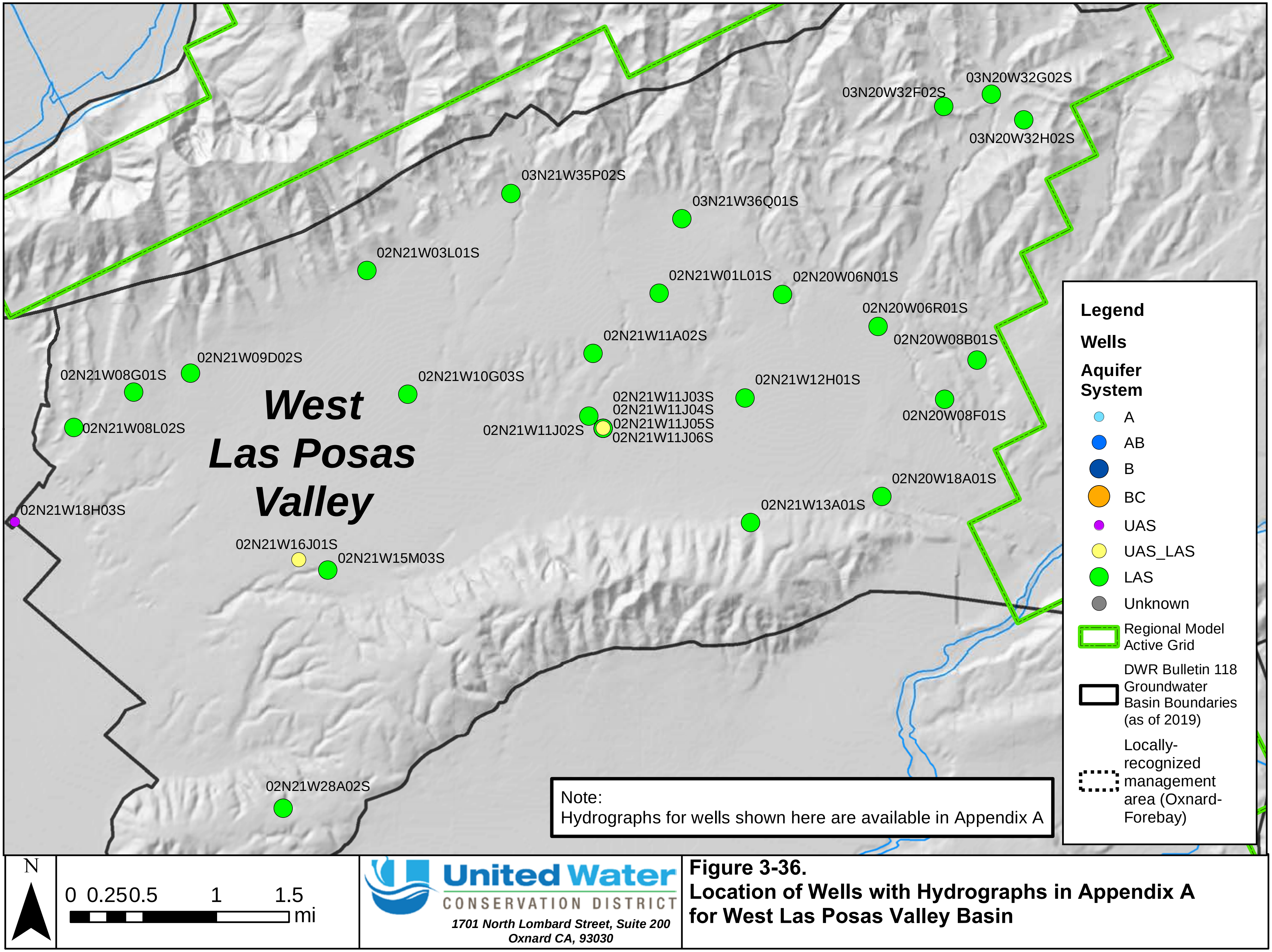


Figure 3-34.
Location of Wells with Hydrographs in Appendix A for southern Oxnard (Plain) Basin



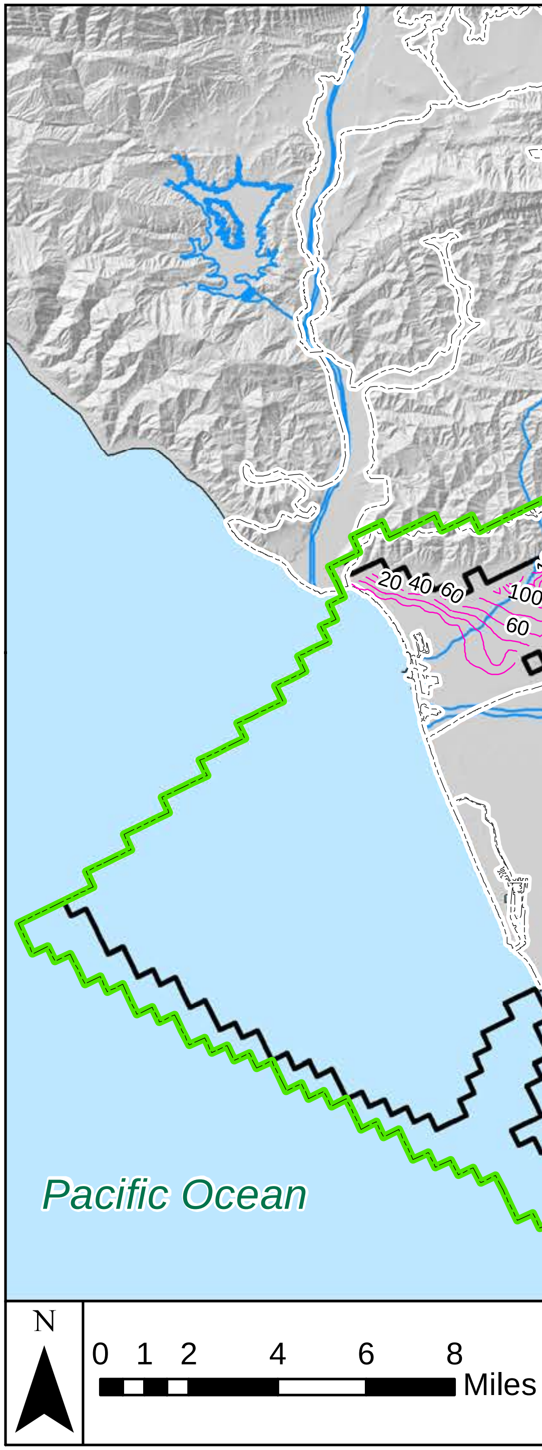
United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-35.
Location of Wells with Hydrographs in Appendix A for Pleasant Valley Basin



United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

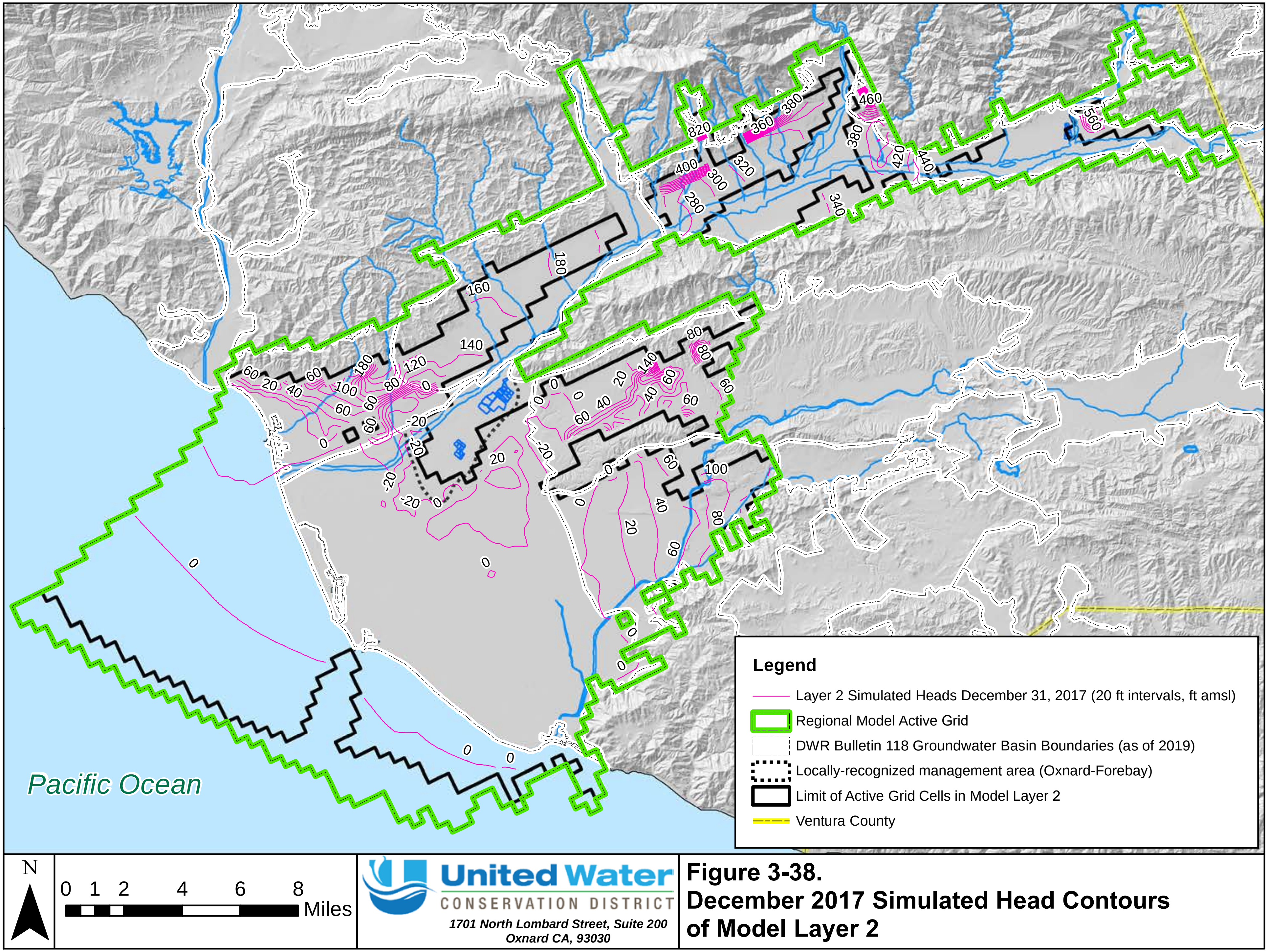
Figure 3-36.
Location of Wells with Hydrographs in Appendix A for West Las Posas Valley Basin



United Water Conservation District

1701 North Lombard Street, Suite 200
Oxnard CA, 93030

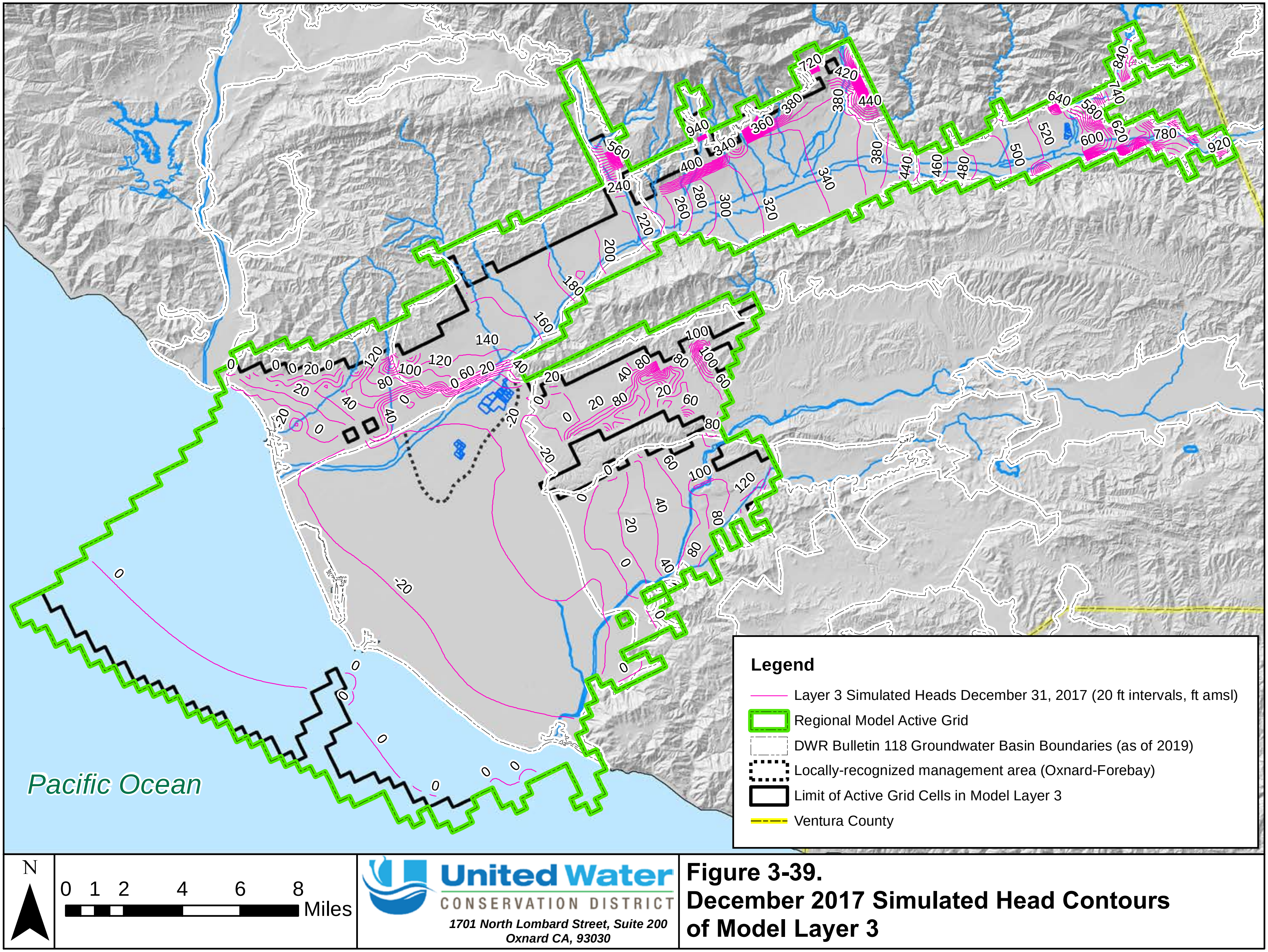
Figure 3-37.
December 2017 Simulated Head Contours of Model Layer 1



United Water Conservation District

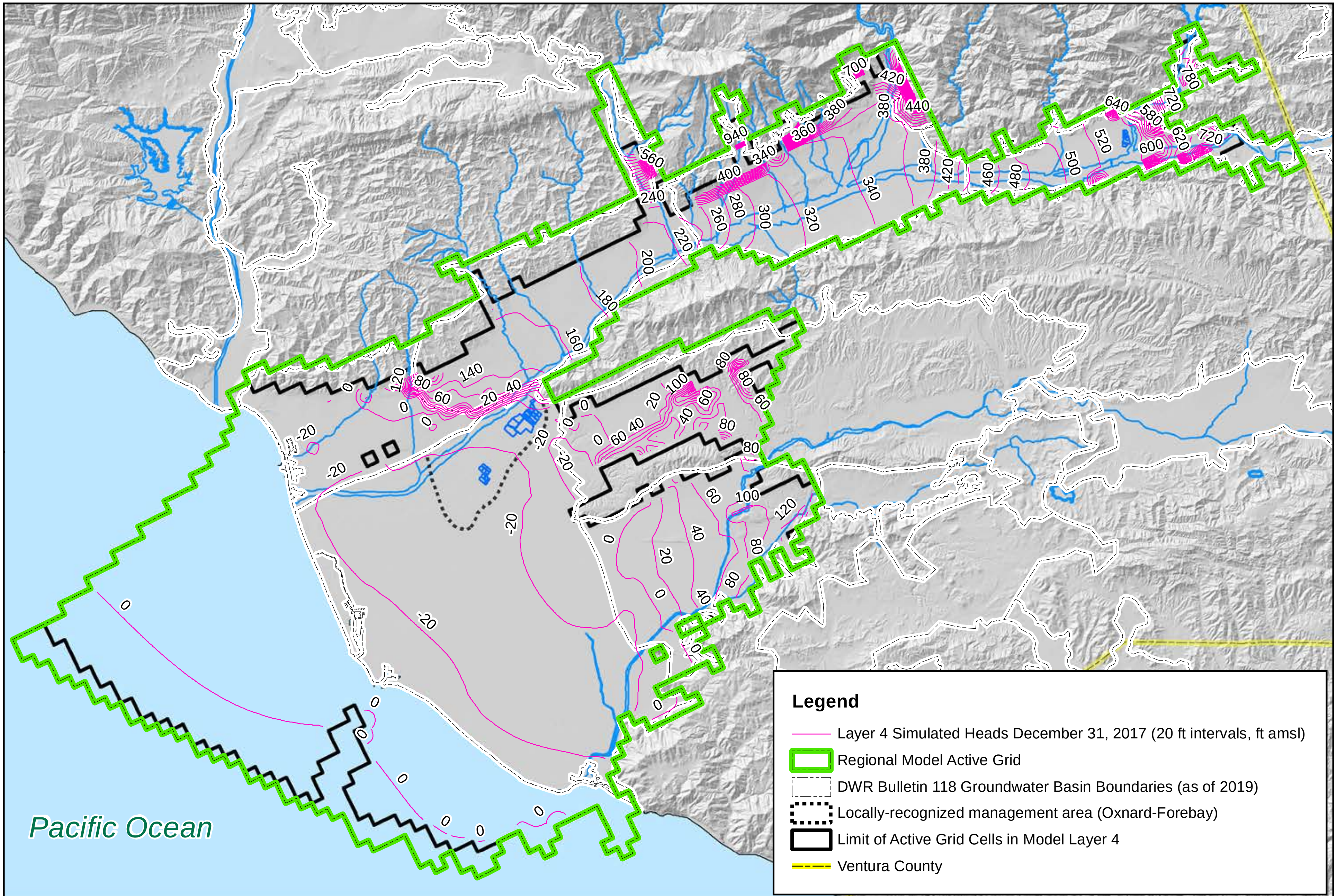
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-38. December 2017 Simulated Head Contours of Model Layer 2



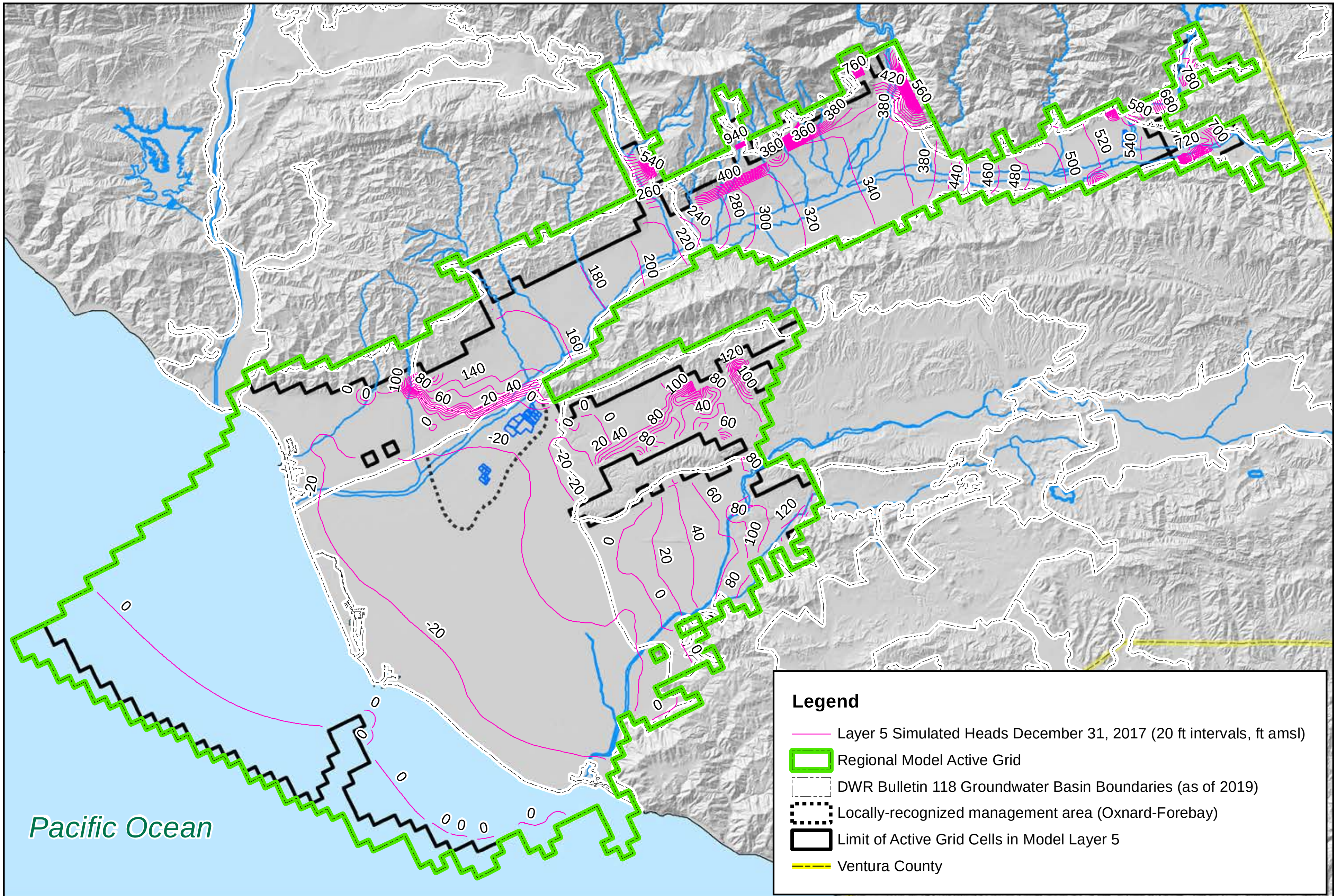
United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-39. December 2017 Simulated Head Contours of Model Layer 3



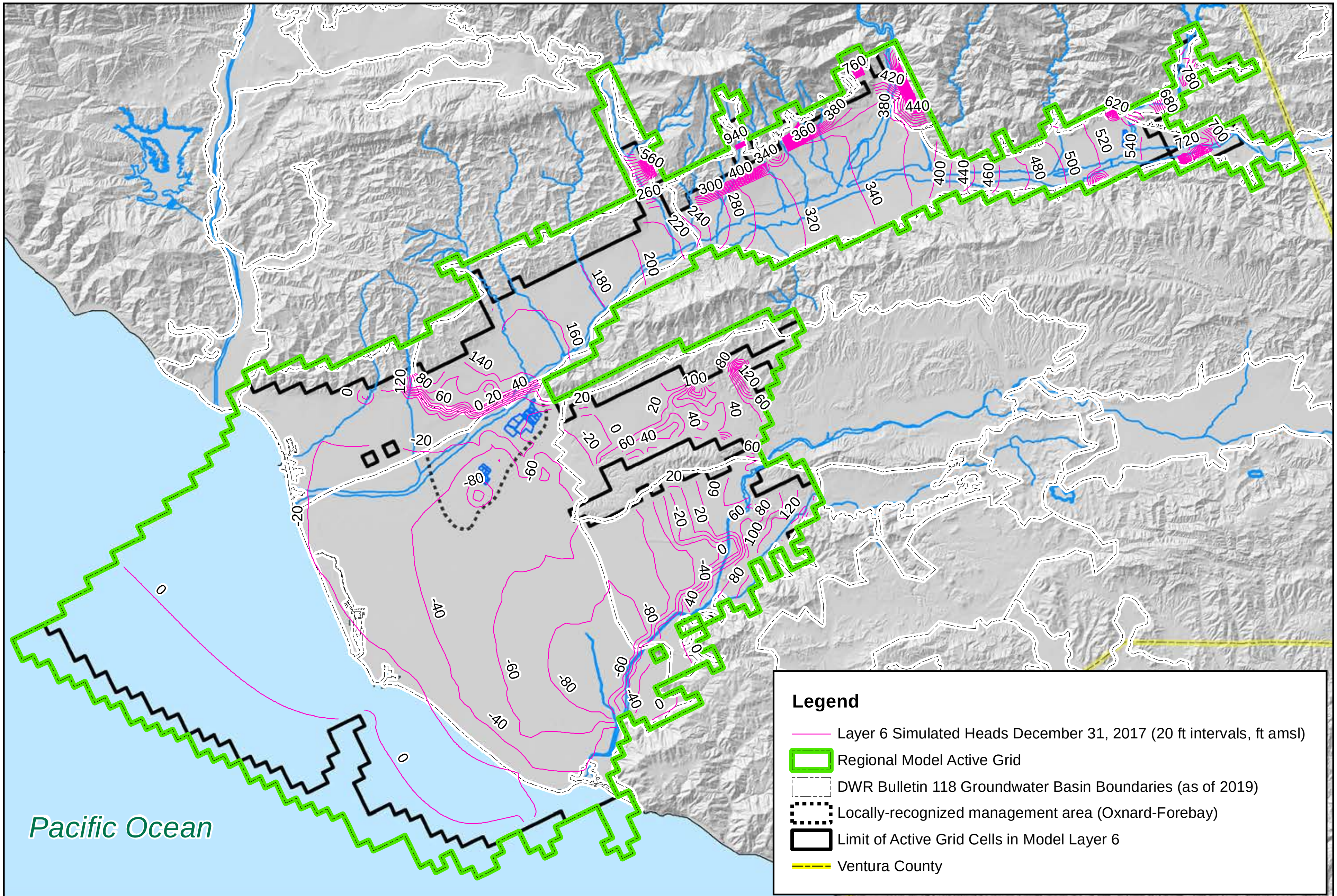
United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-40.
December 2017 Simulated Head Contours of Model Layer 4



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-41.
December 2017 Simulated Head Contours of Model Layer 5

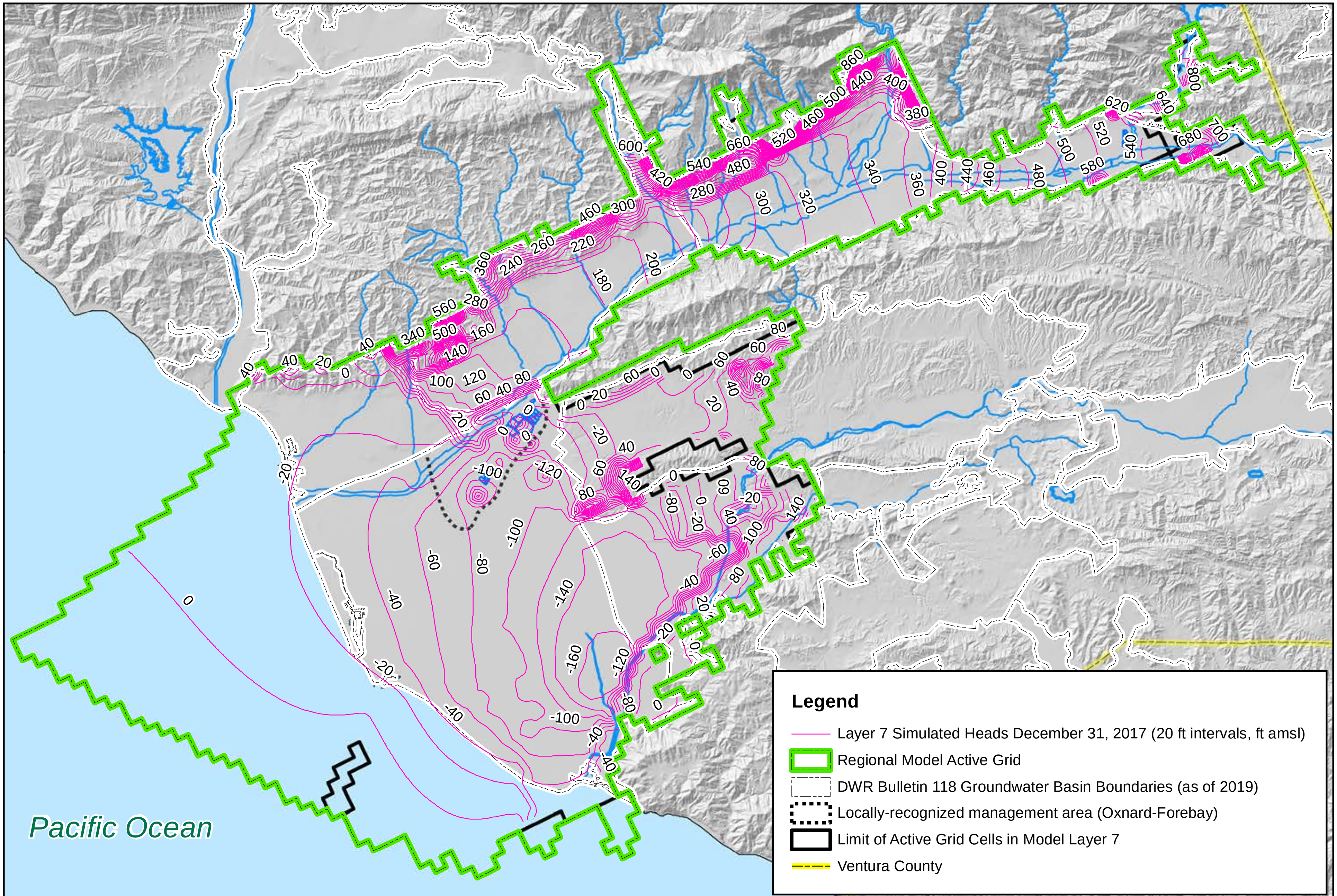


N

0 1 2 4 6 8 Miles

United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-42.
December 2017 Simulated Head Contours of Model Layer 6

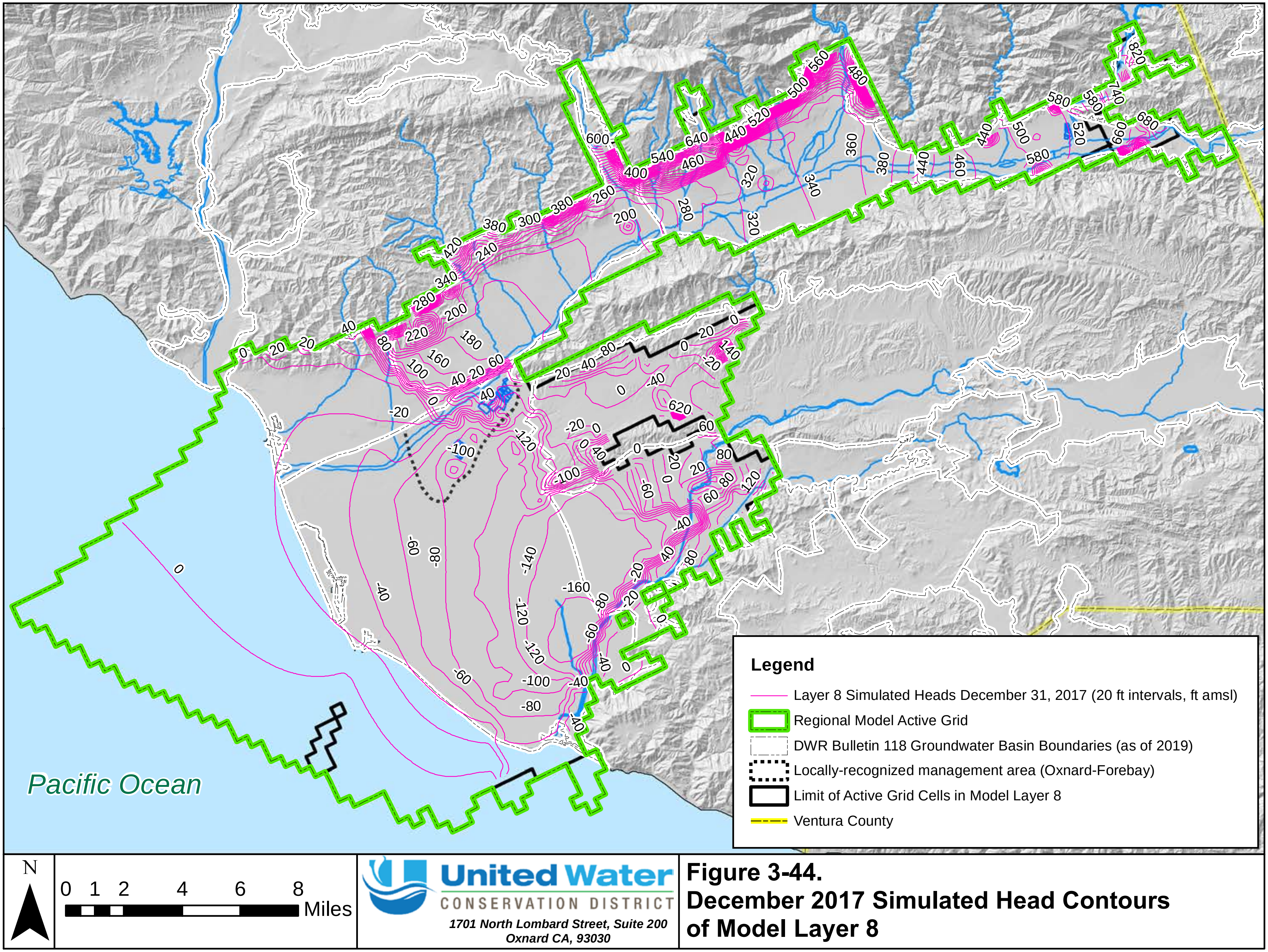


N

0 1 2 4 6 8 Miles

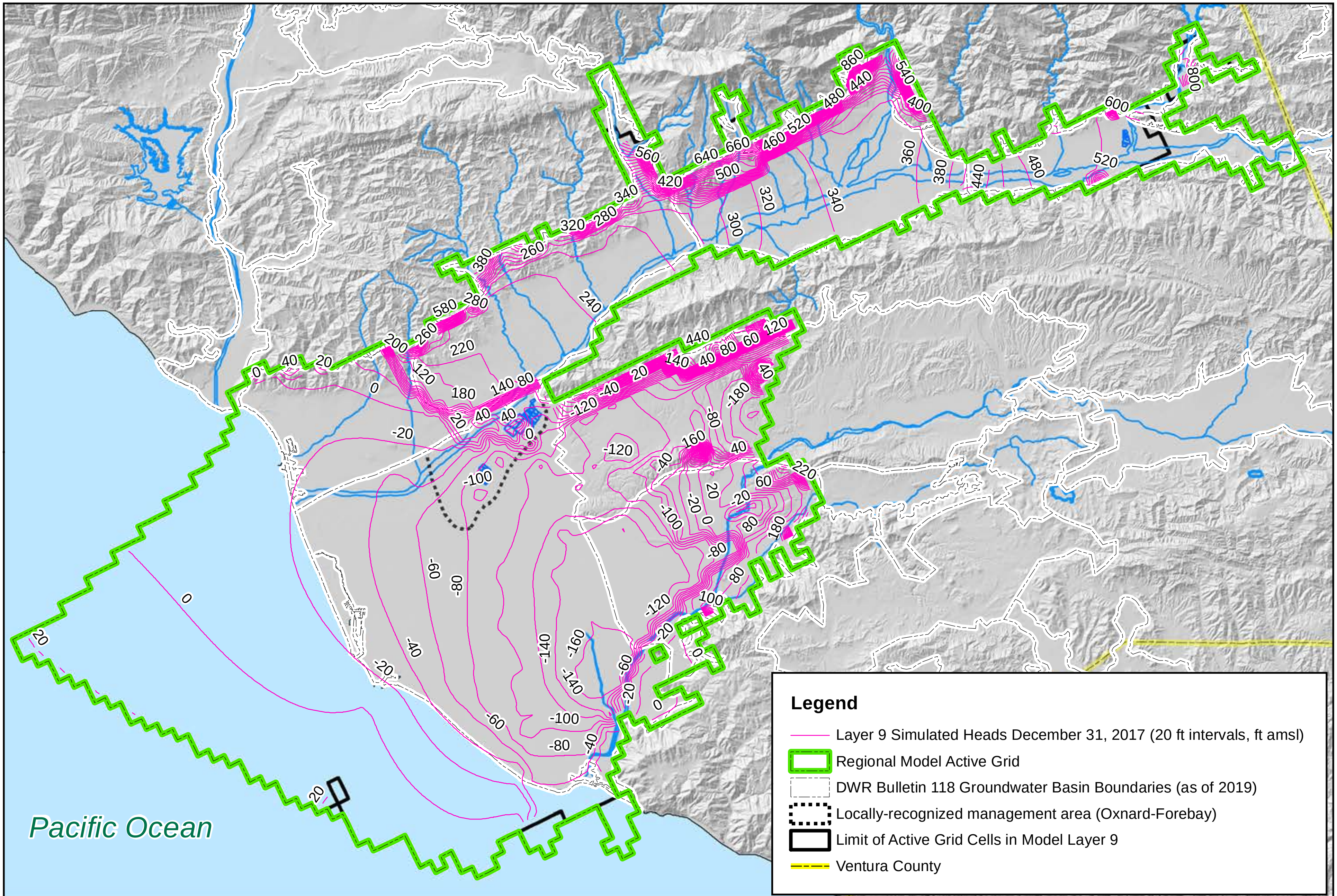
United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-43.
December 2017 Simulated Head Contours of Model Layer 7



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

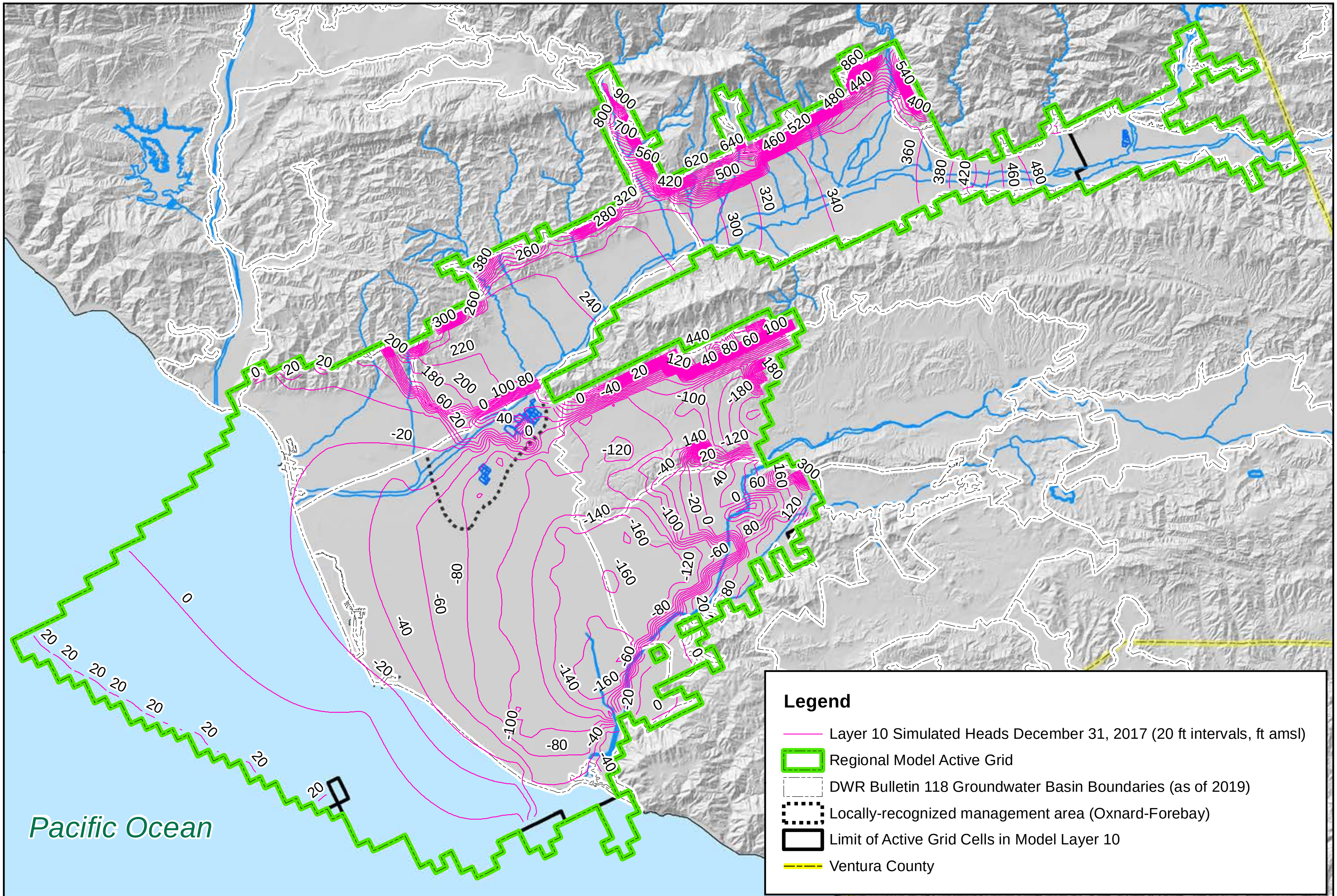
Figure 3-44. December 2017 Simulated Head Contours of Model Layer 8



N
0 1 2 4 6 8 Miles

United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-45.
December 2017 Simulated Head Contours of Model Layer 9

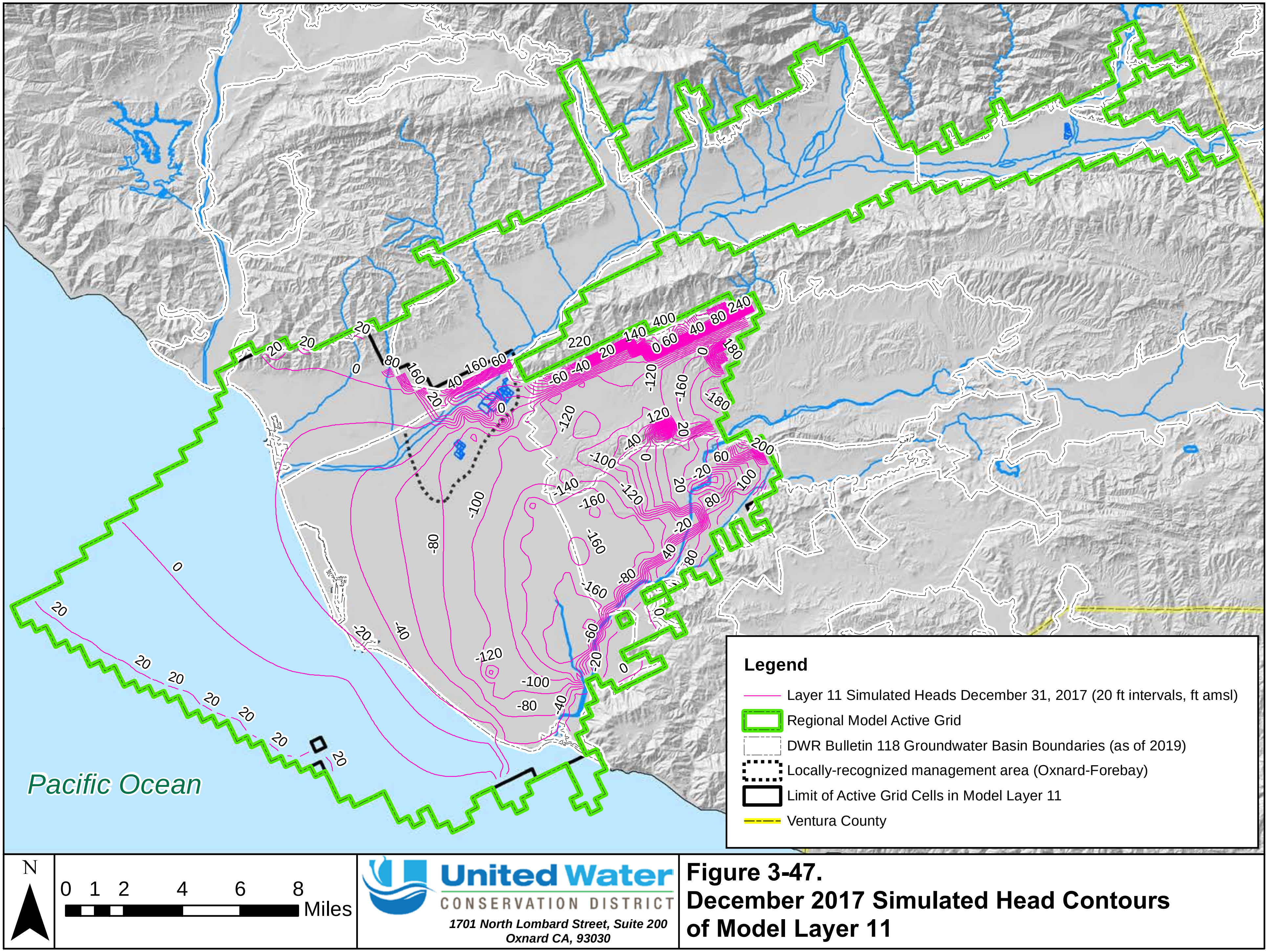


N

0 1 2 4 6 8 Miles

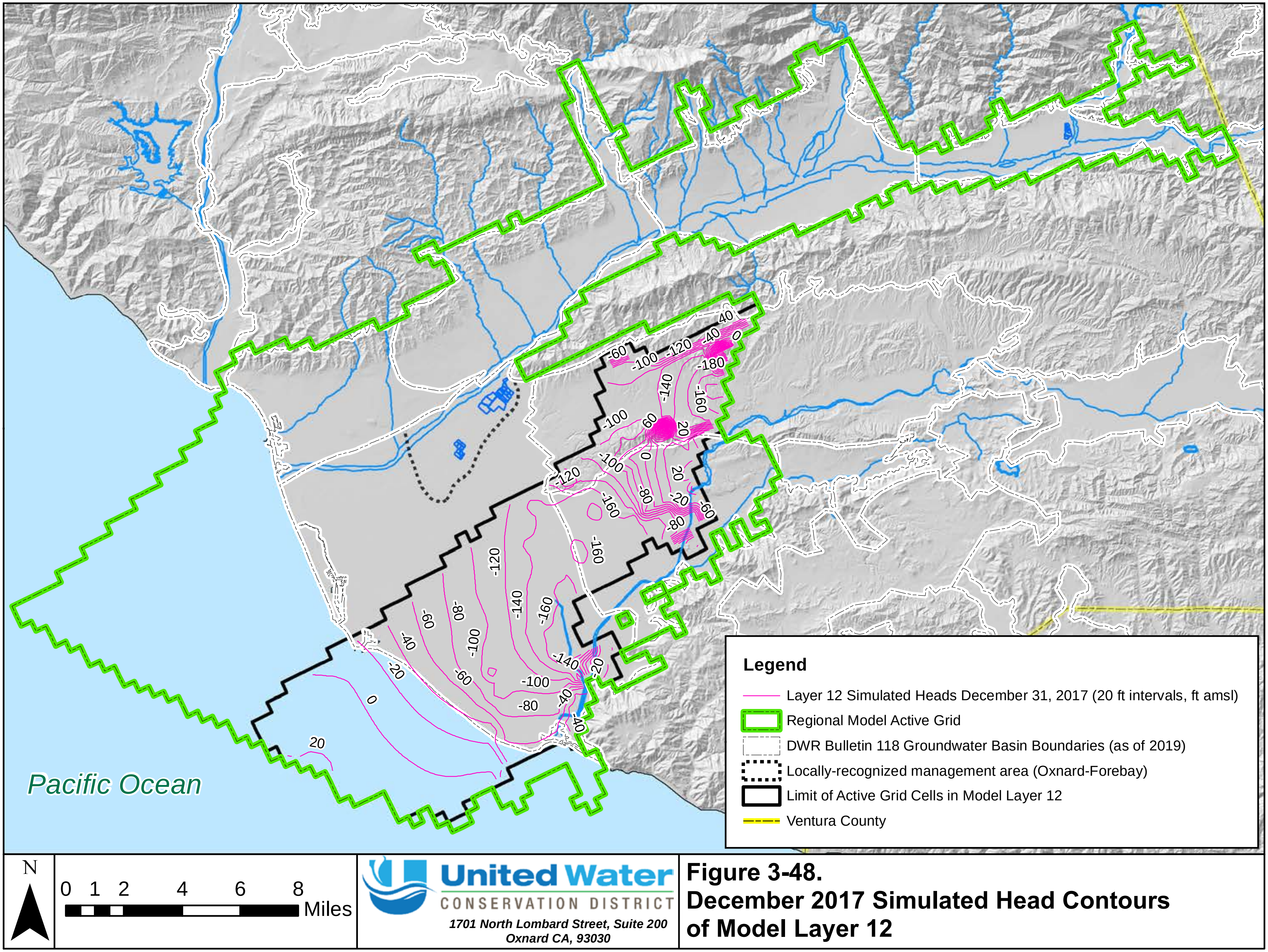
United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-46.
December 2017 Simulated Head Contours of Model Layer 10



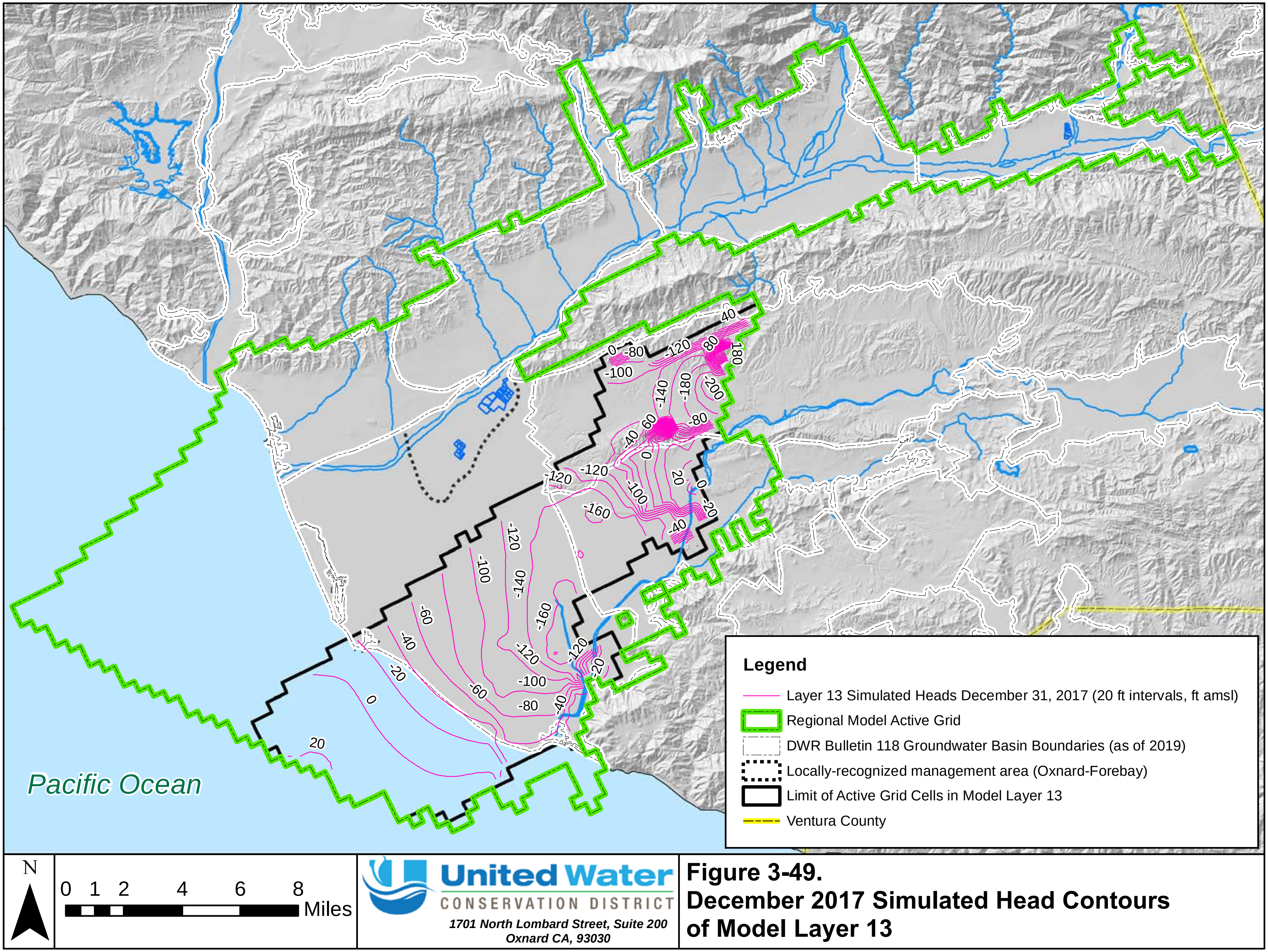
United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-47.
December 2017 Simulated Head Contours of Model Layer 11



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

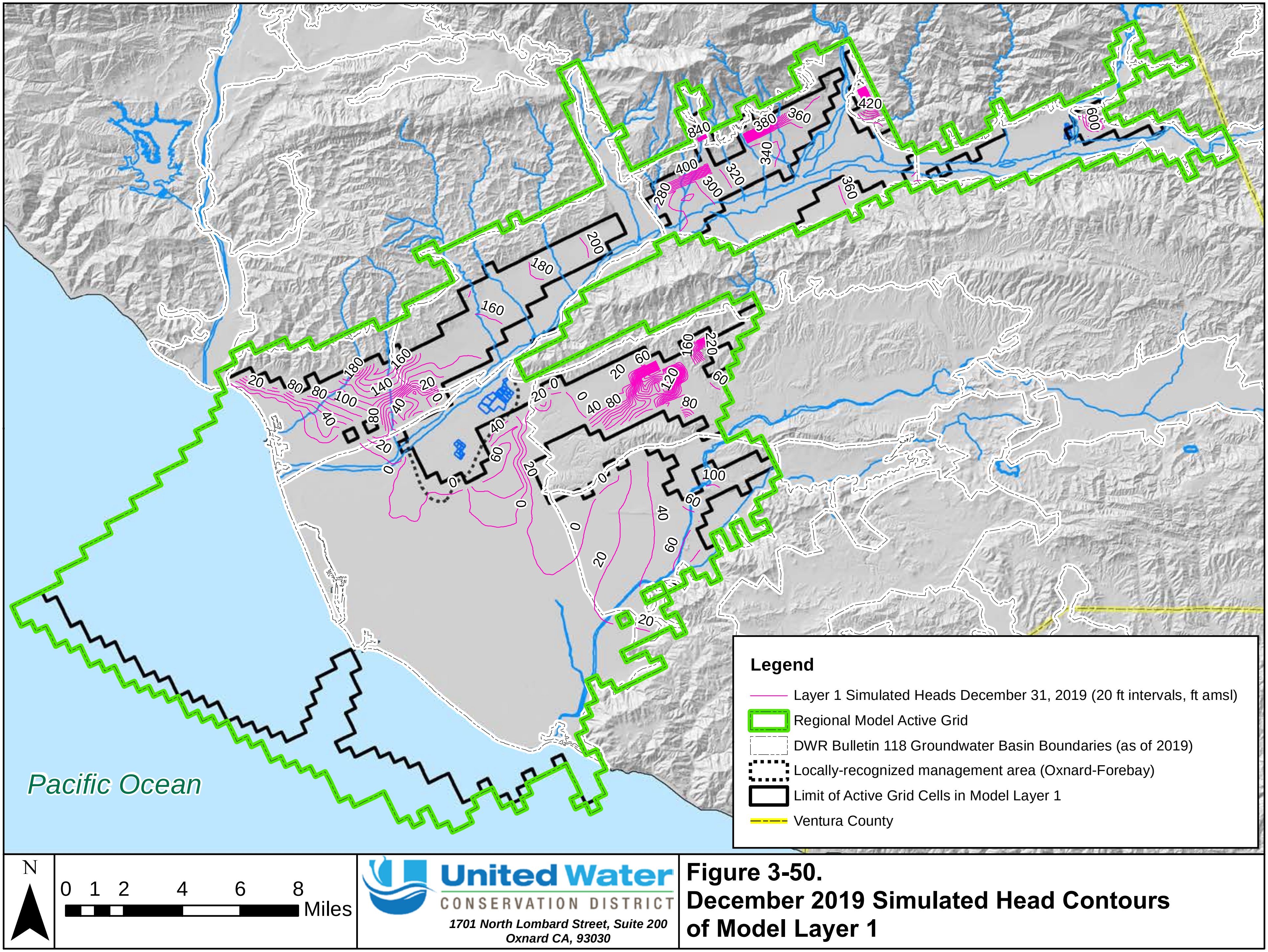
Figure 3-48.
December 2017 Simulated Head Contours of Model Layer 12



United Water CONSERVATION DISTRICT

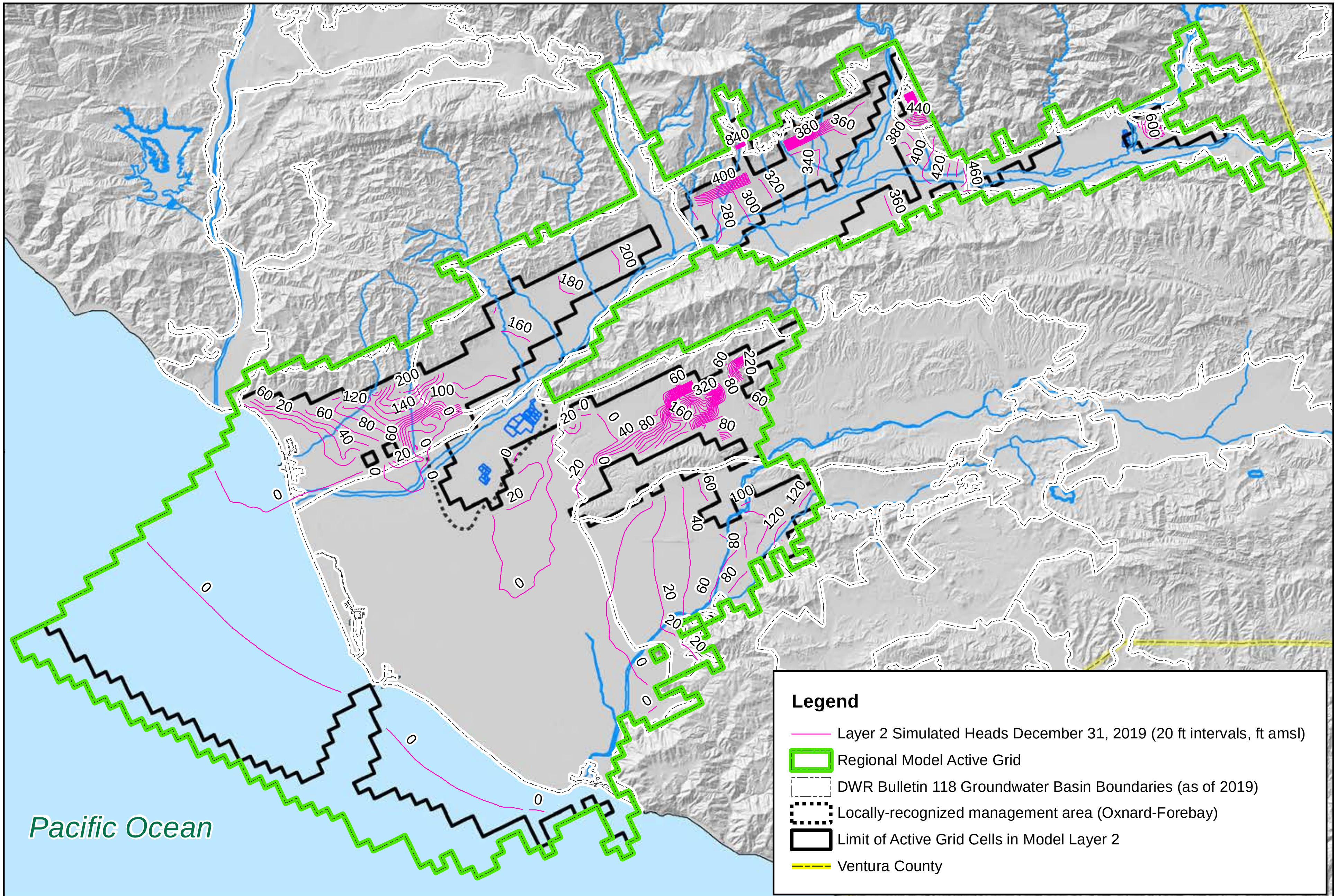
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-49.
December 2017 Simulated Head Contours of Model Layer 13



United Water CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-50. December 2019 Simulated Head Contours of Model Layer 1

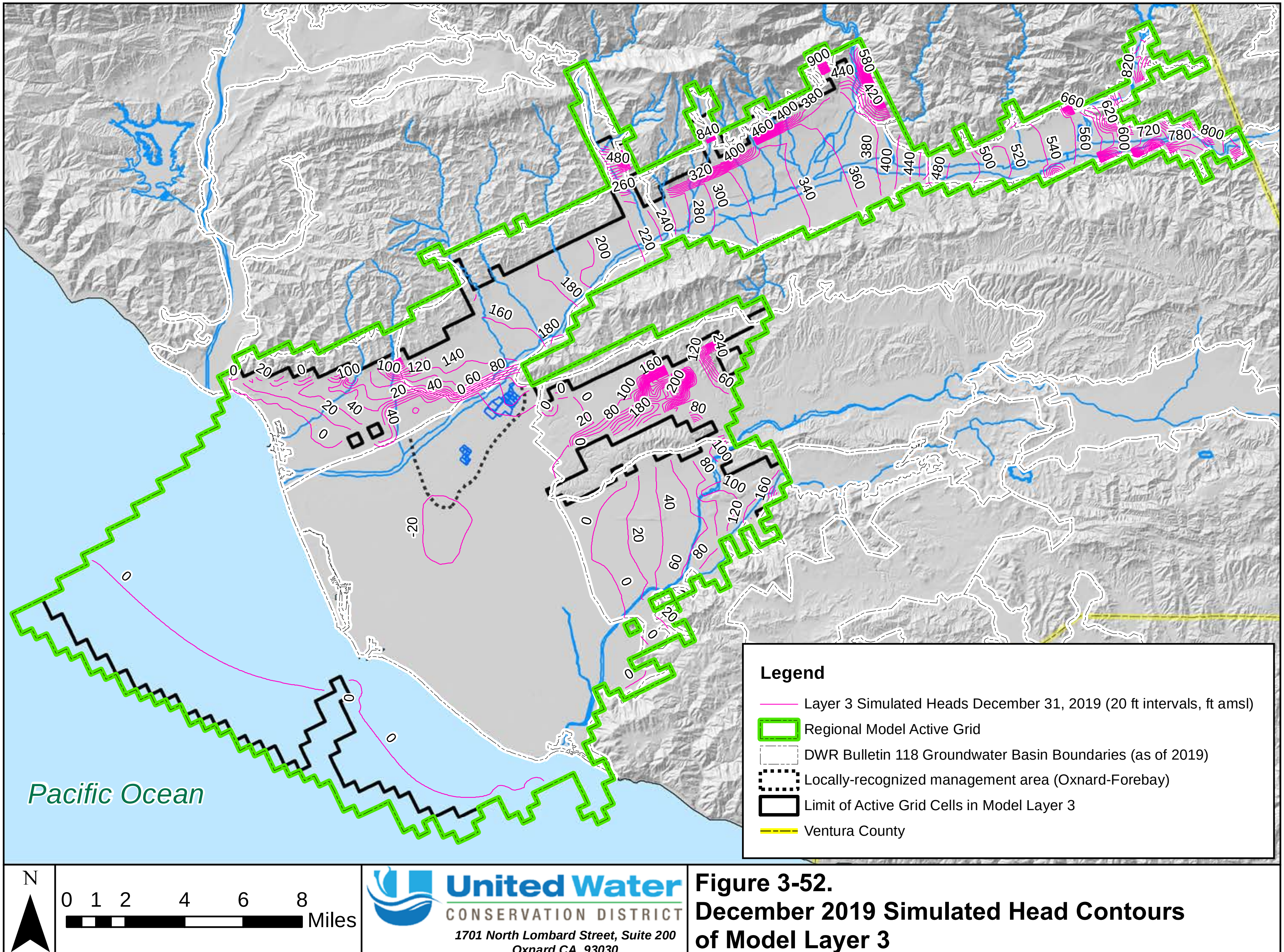


N

0 1 2 4 6 8 Miles

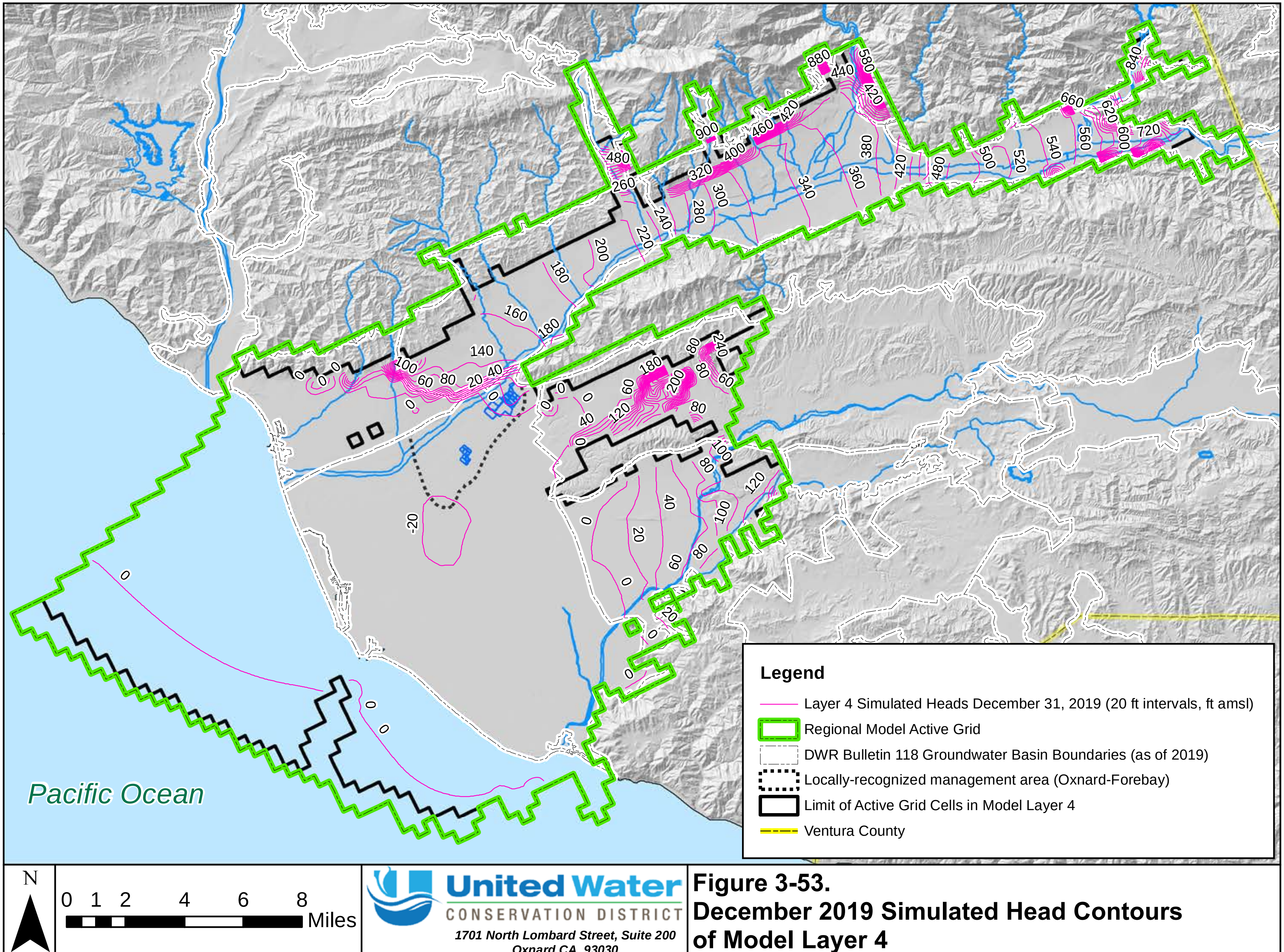
United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-51.
December 2019 Simulated Head Contours of Model Layer 2



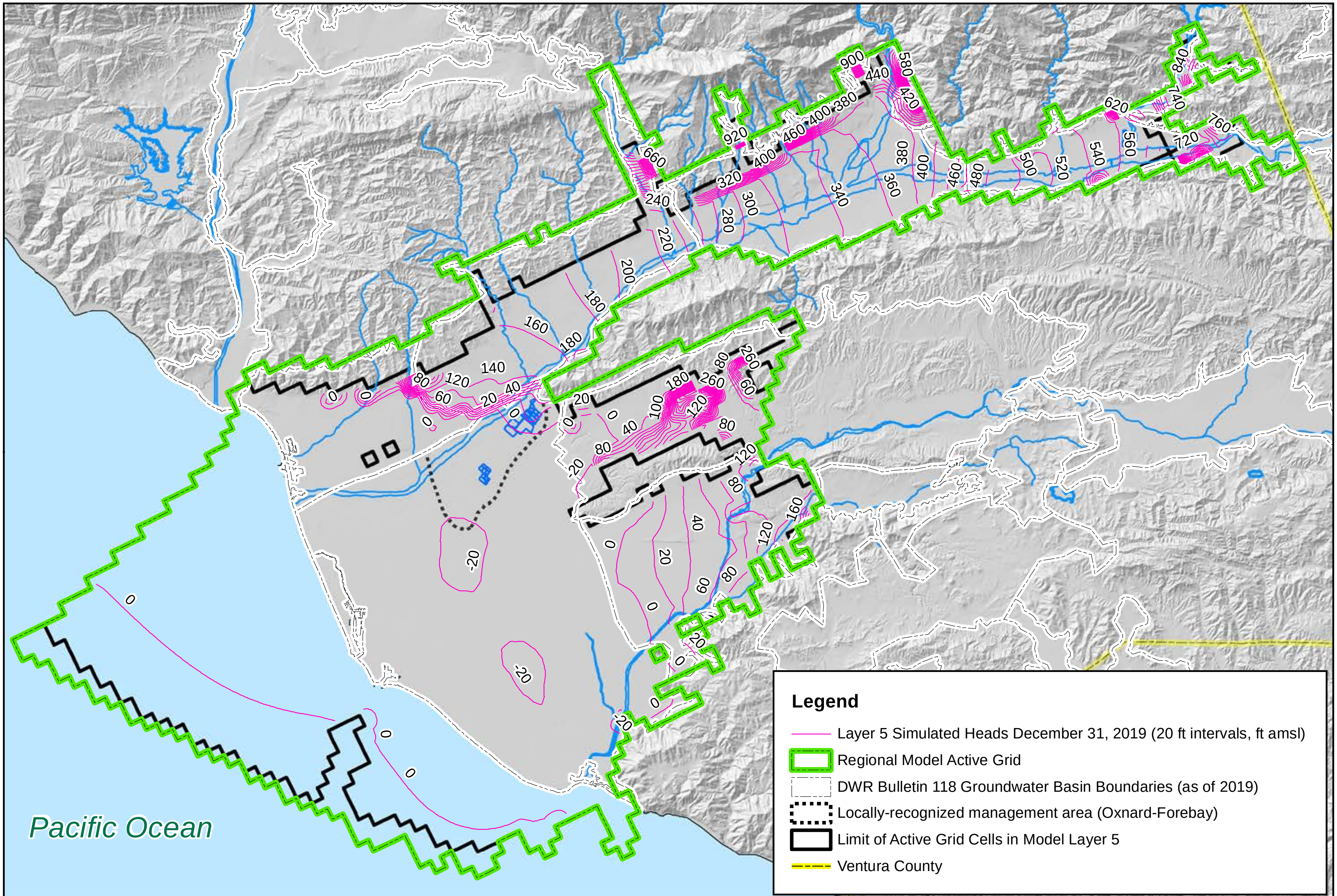
United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-52.
December 2019 Simulated Head Contours of Model Layer 3



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-53. December 2019 Simulated Head Contours of Model Layer 4



N

0 1 2 4 6 8 Miles

United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-54.
December 2019 Simulated Head Contours of Model Layer 5

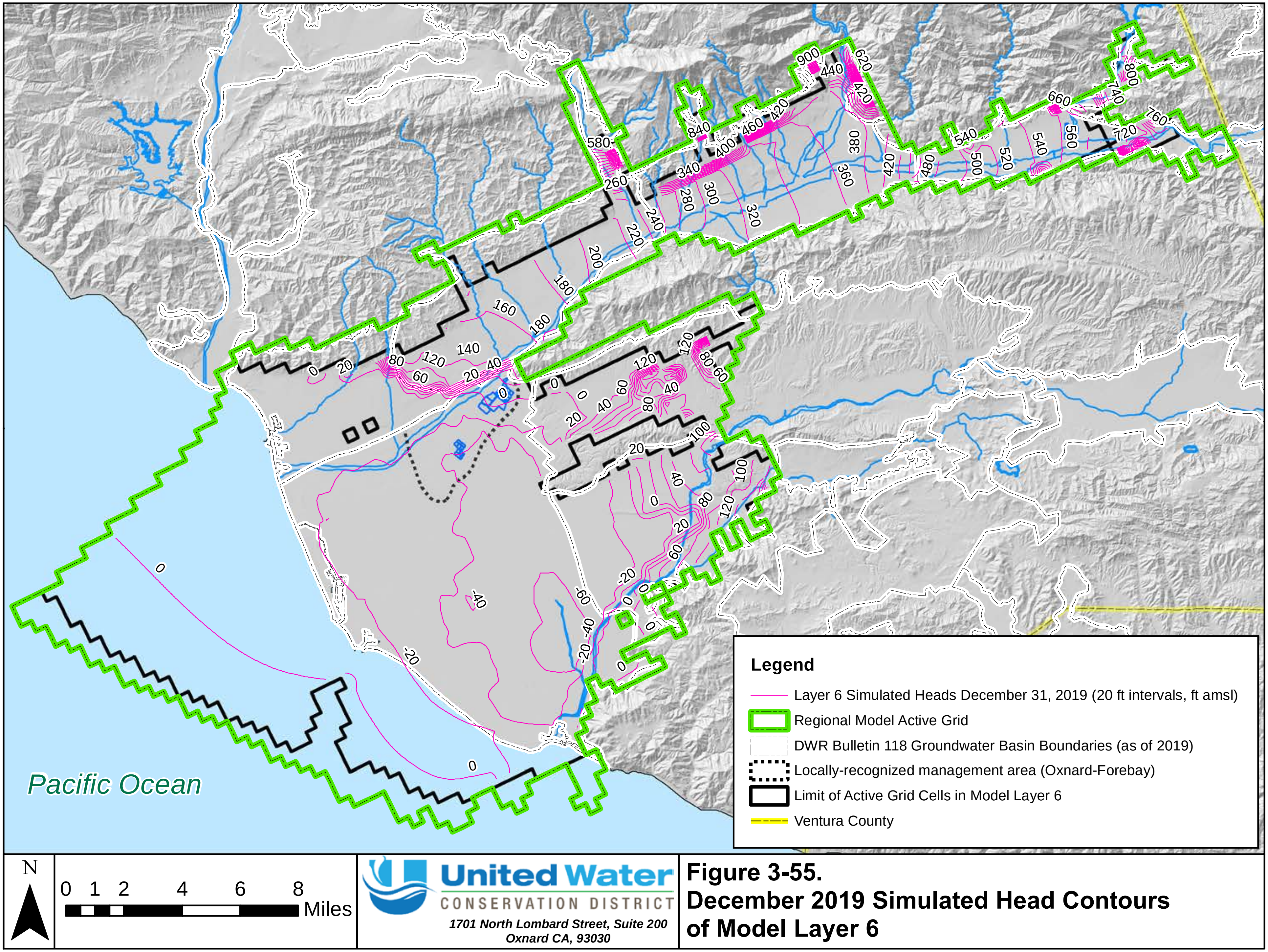
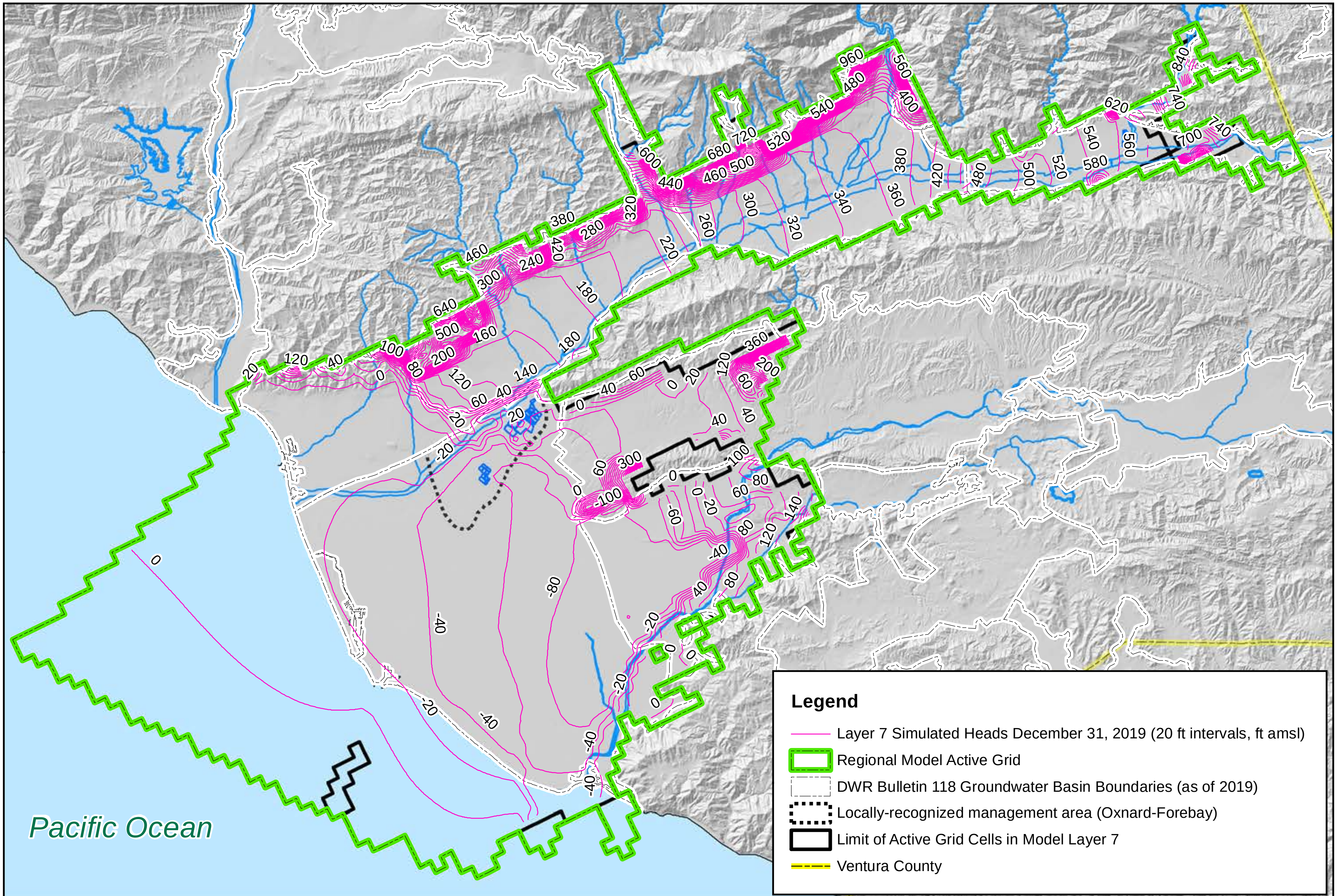


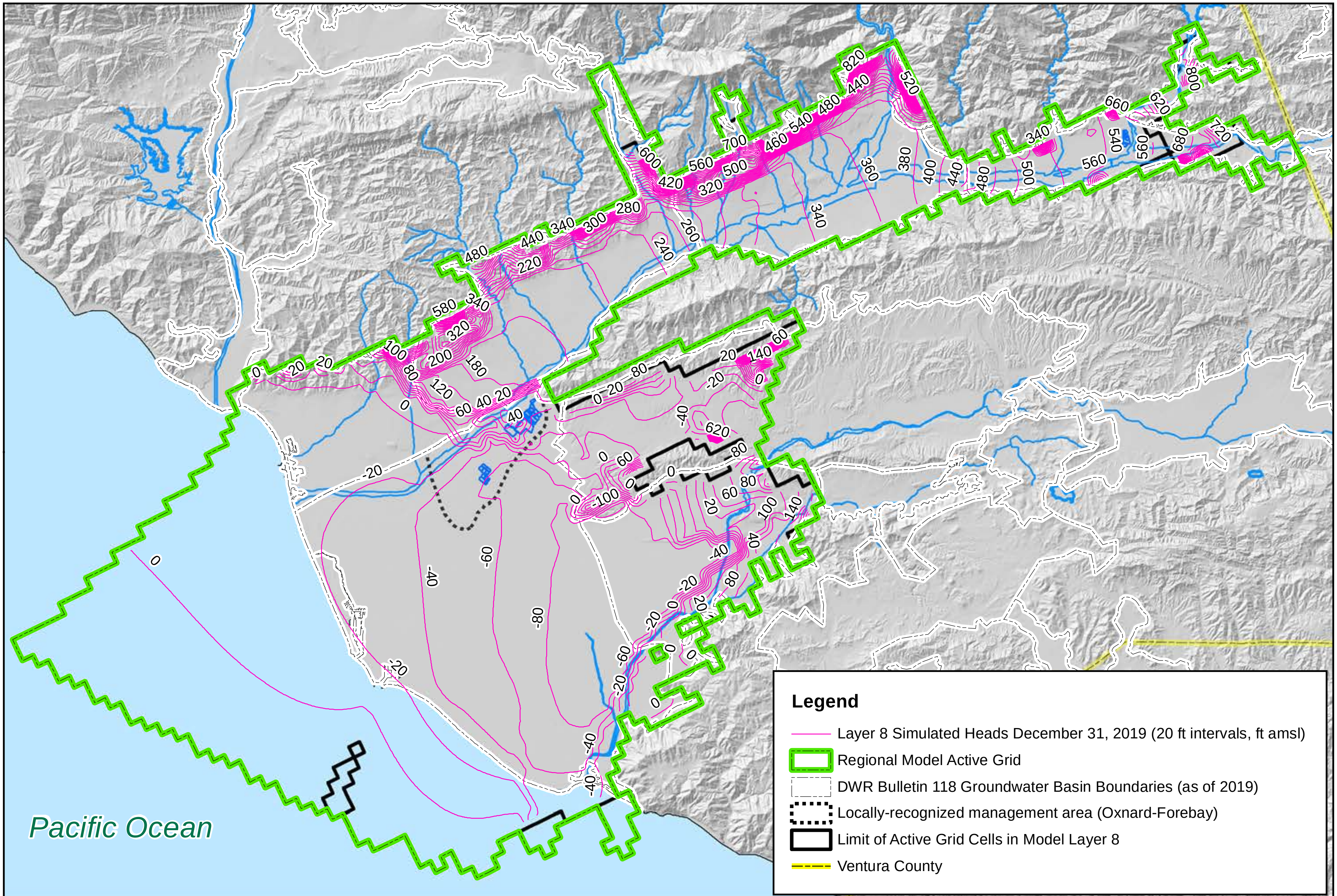
**Figure 3-55.
December 2019 Simulated Head Contours
of Model Layer 6**



N
0 1 2 4 6 8 Miles

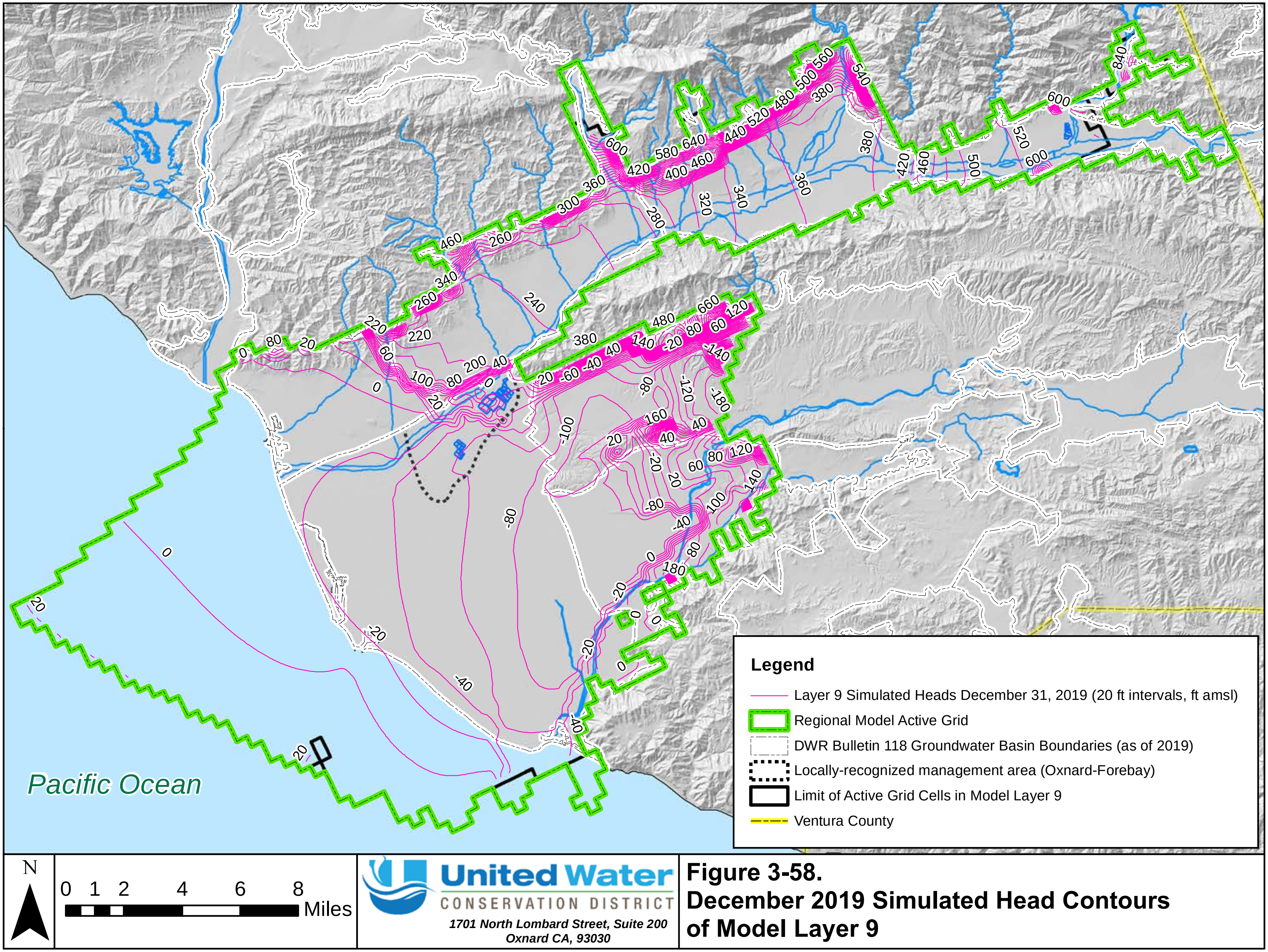
United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-56.
December 2019 Simulated Head Contours of Model Layer 7



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-57.
December 2019 Simulated Head Contours of Model Layer 8



United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-58.
December 2019 Simulated Head Contours of Model Layer 9

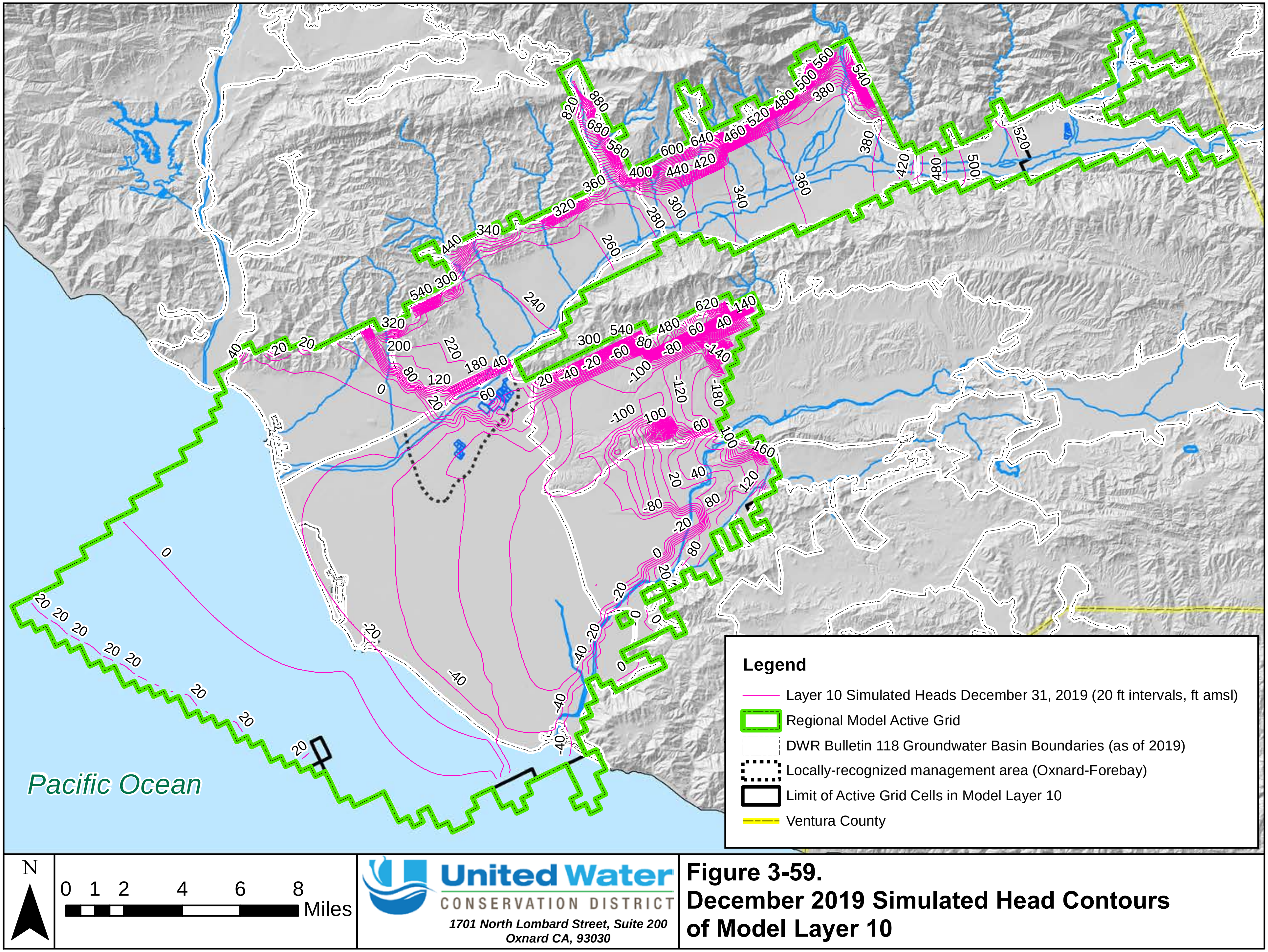
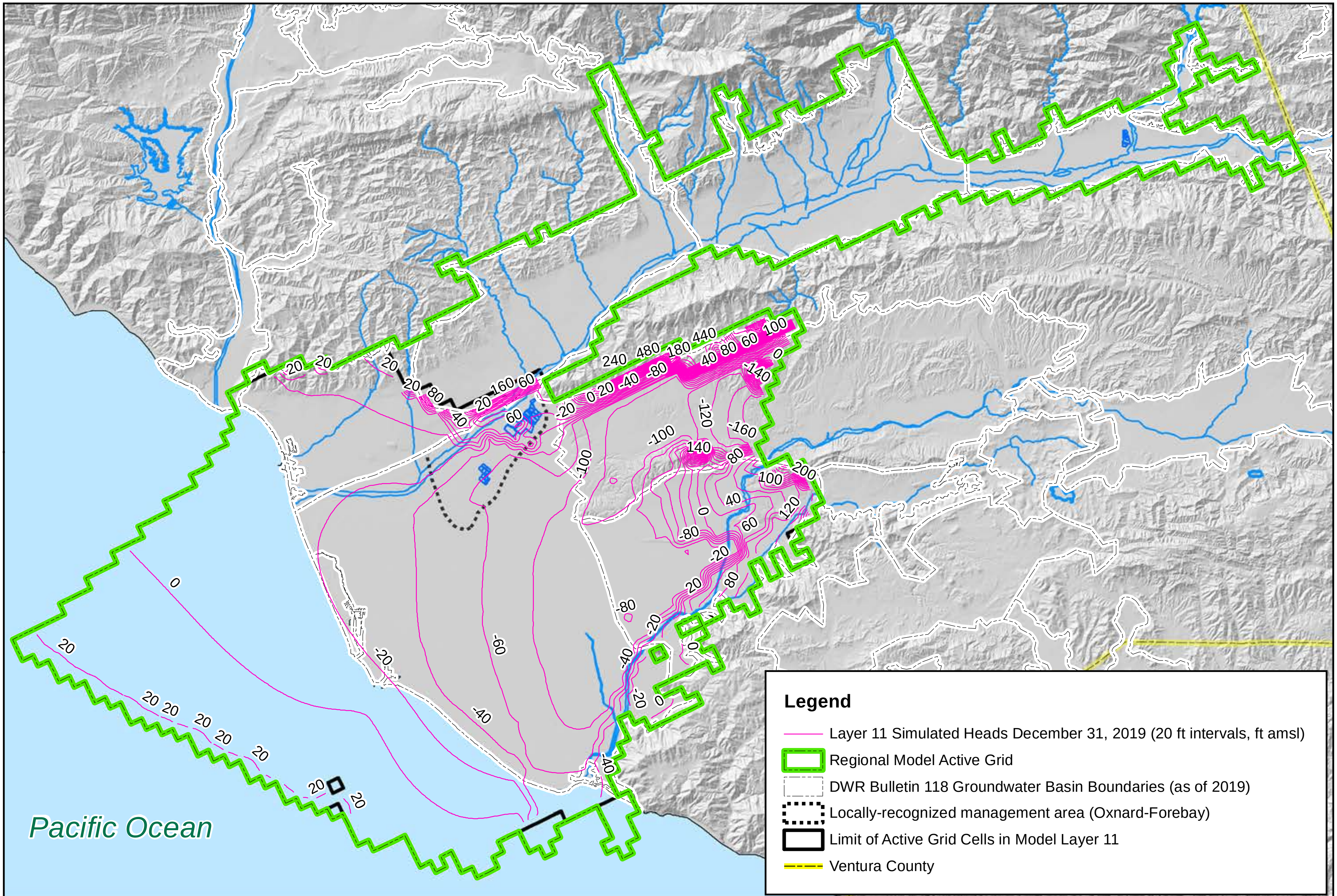


Figure 3-59.
December 2019 Simulated Head Contours of Model Layer 10

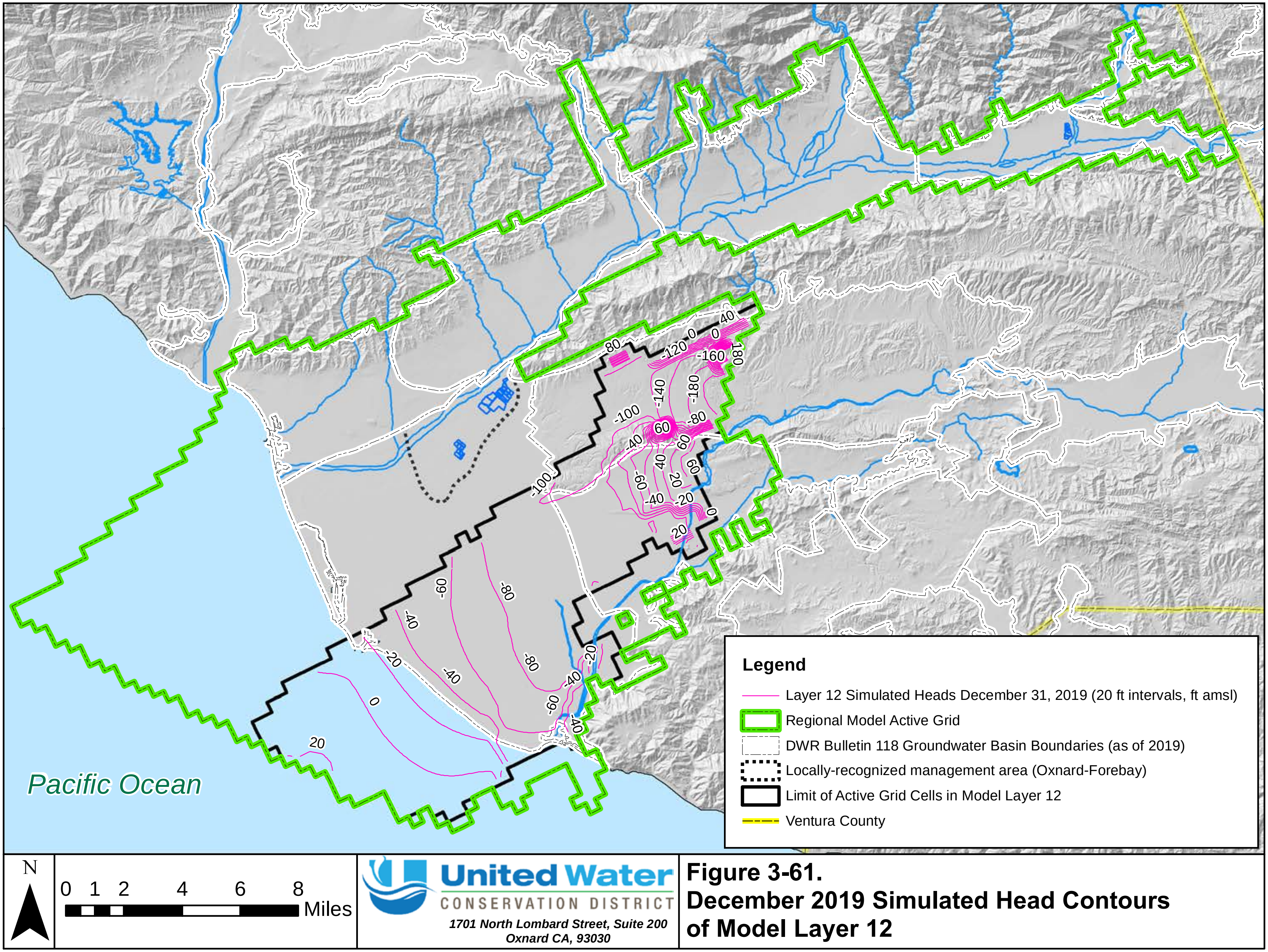


N

0 1 2 4 6 8 Miles

United Water
CONSERVATION DISTRICT
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-60.
December 2019 Simulated Head Contours of Model Layer 11



United Water Conservation District
1701 North Lombard Street, Suite 200
Oxnard CA, 93030

Figure 3-61. December 2019 Simulated Head Contours of Model Layer 12

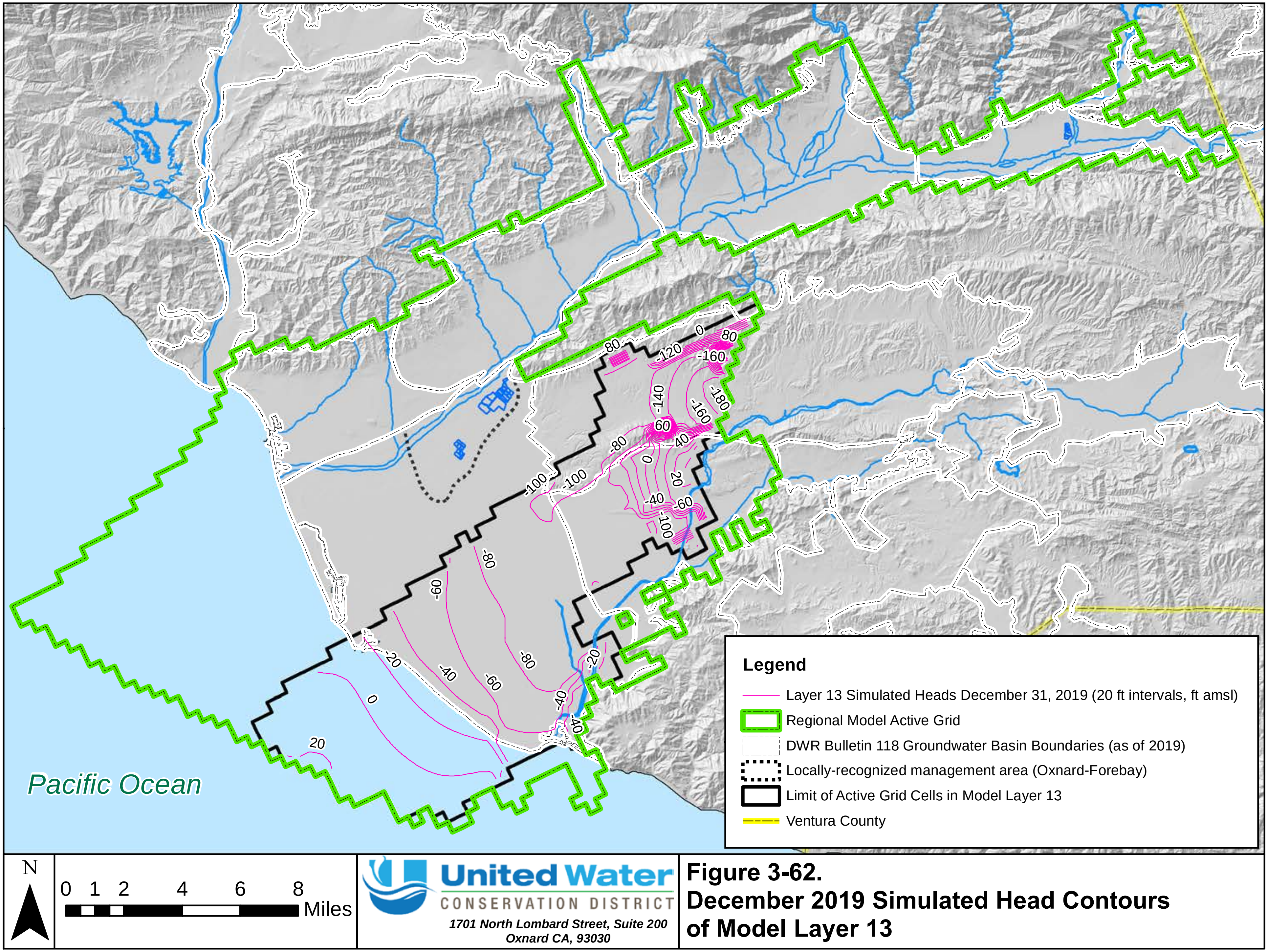


Figure 3-62. December 2019 Simulated Head Contours of Model Layer 13

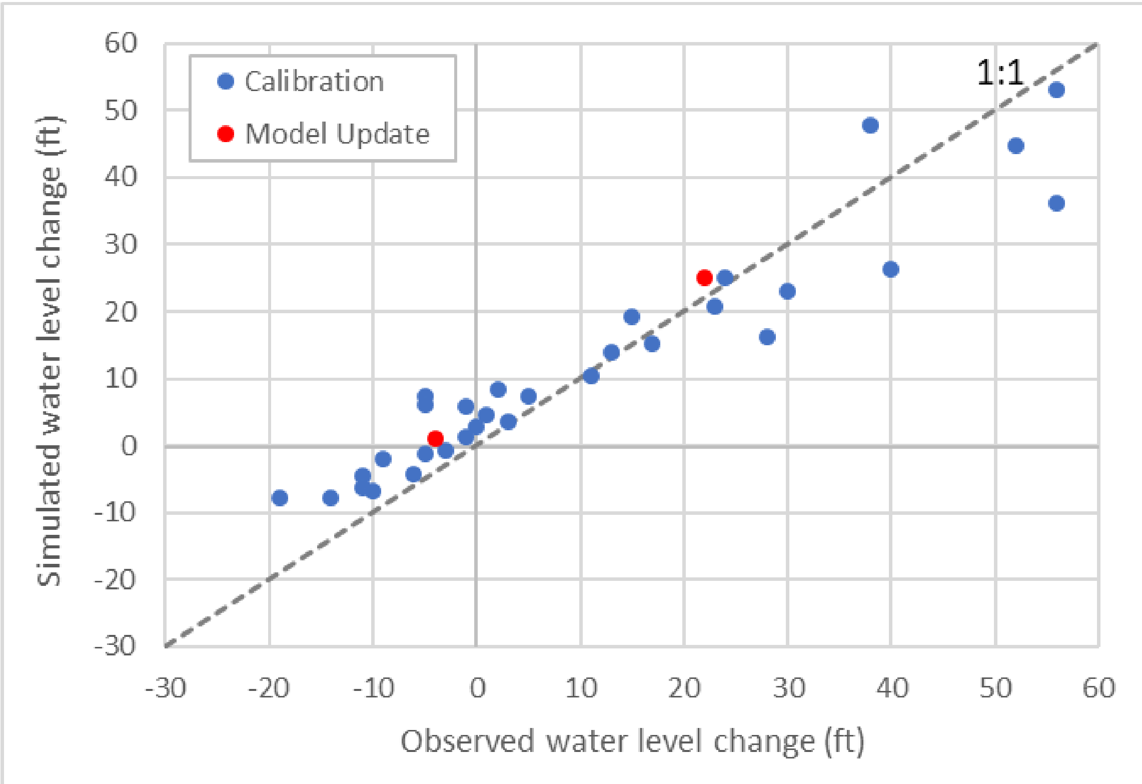


Figure 3-63. Simulated and Observed Change in Groundwater Elevation in Piru Basin (04N18W29M2) During the Wet Season (January 1 to May 1)). Groundwater elevation increases were calculated by subtracting January 1 elevations from May 1 elevations, resulting in one data point annually. Positive changes indicate an increase in groundwater elevation. Years 2016 and 2017 were not included because well 04N18W29M2 went dry.

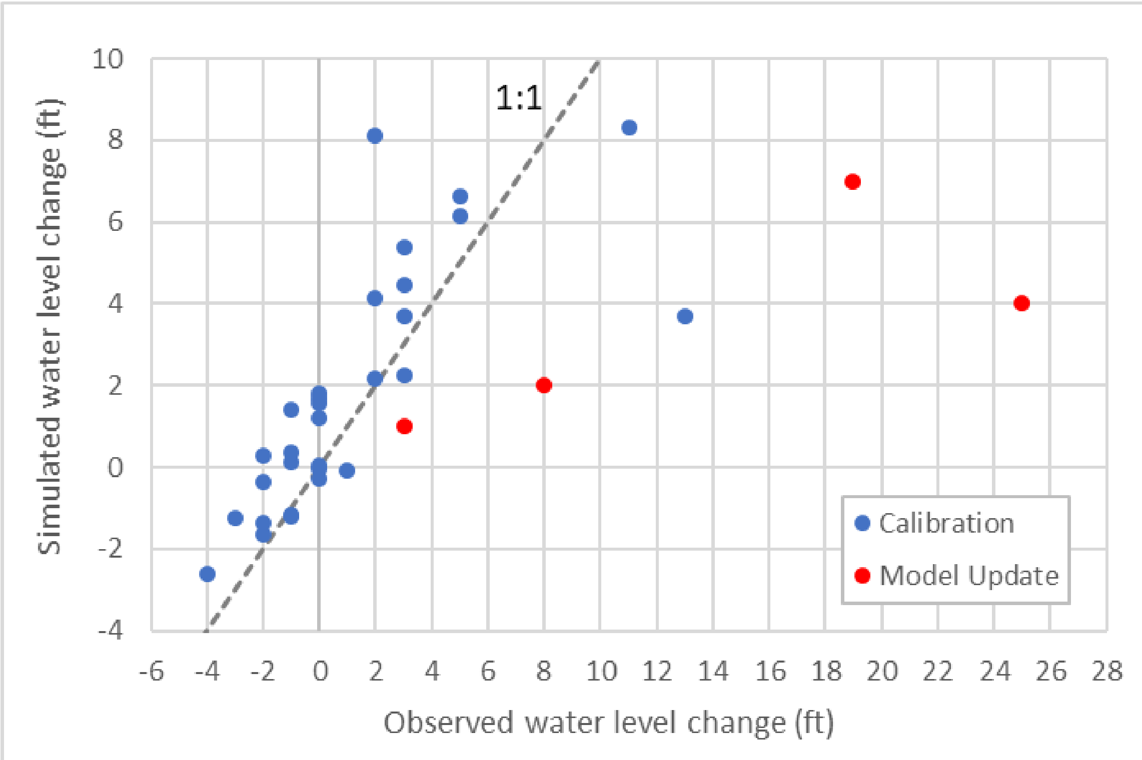


Figure 3-64. Simulated and Observed Change in Groundwater Elevation in Fillmore Basin (03N20W02A01) During the Wet Season (January 1 to May 1). Groundwater elevation increases were calculated by subtracting January 1 elevations from May 1 elevations, resulting in one data point annually. Positive changes indicate an increase in groundwater elevation.

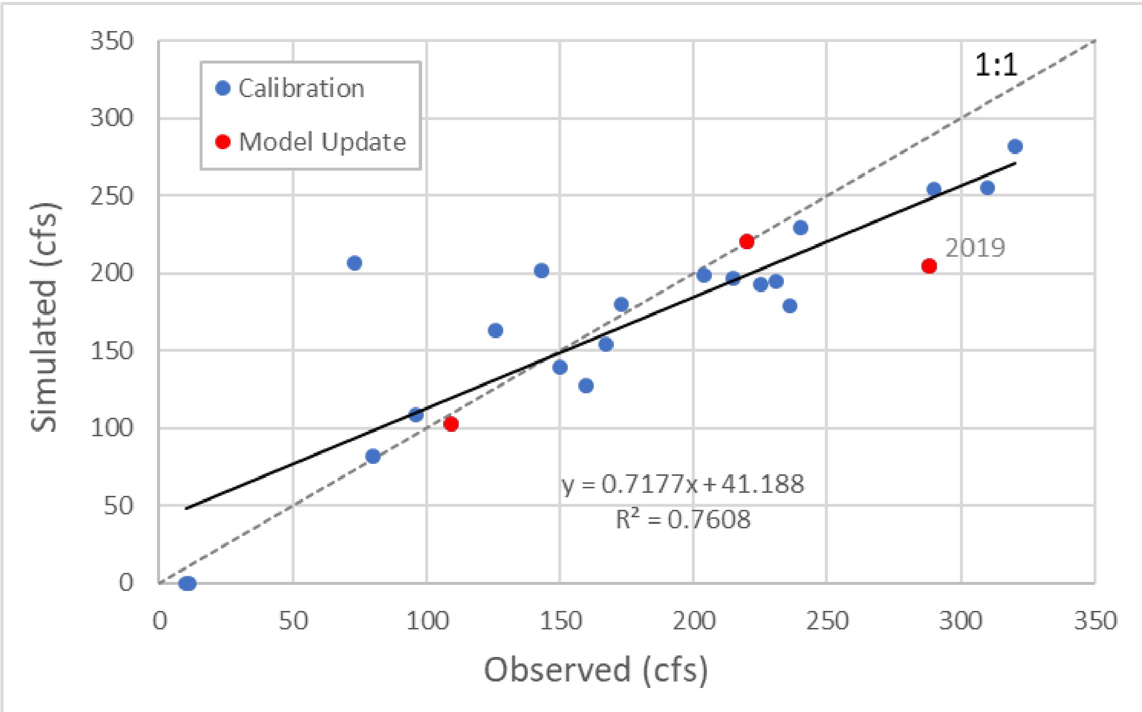


Figure 3-65. Simulated and Observed Monthly Average Streamflow Near the Downstream End of Piru Basin (Cavin Rd.) During Conservation Releases (2000-2019). Observed monthly average streamflows were calculated as the mean of observed flows when multiple flow measurements were performed during one month.

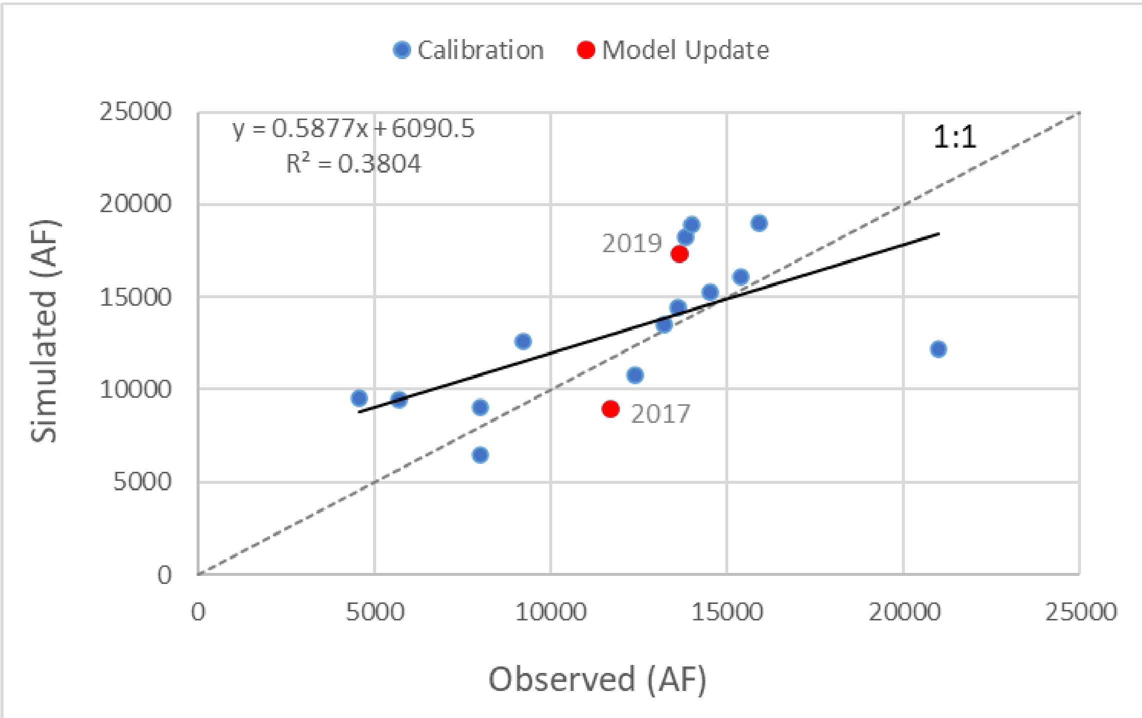


Figure 3-66. Simulated and Observed Total Percolation Volume to Piru Basin (acre-feet) During Conservation Releases (1999-2019).

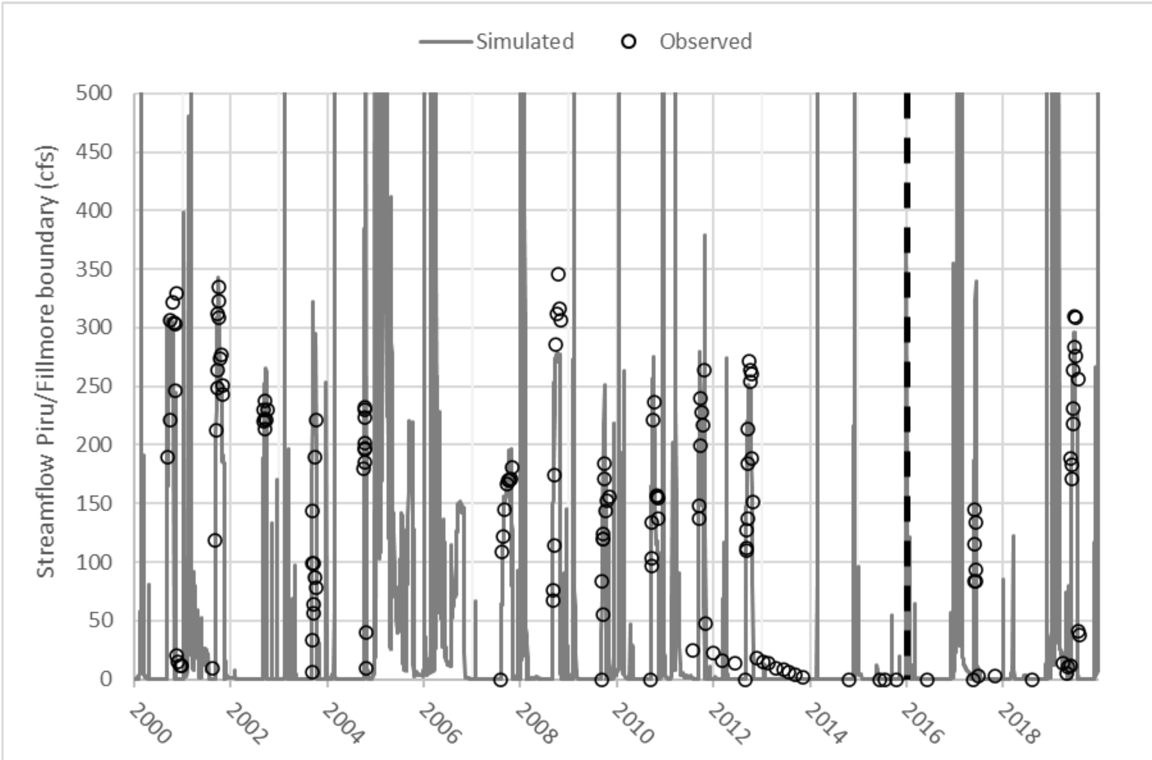
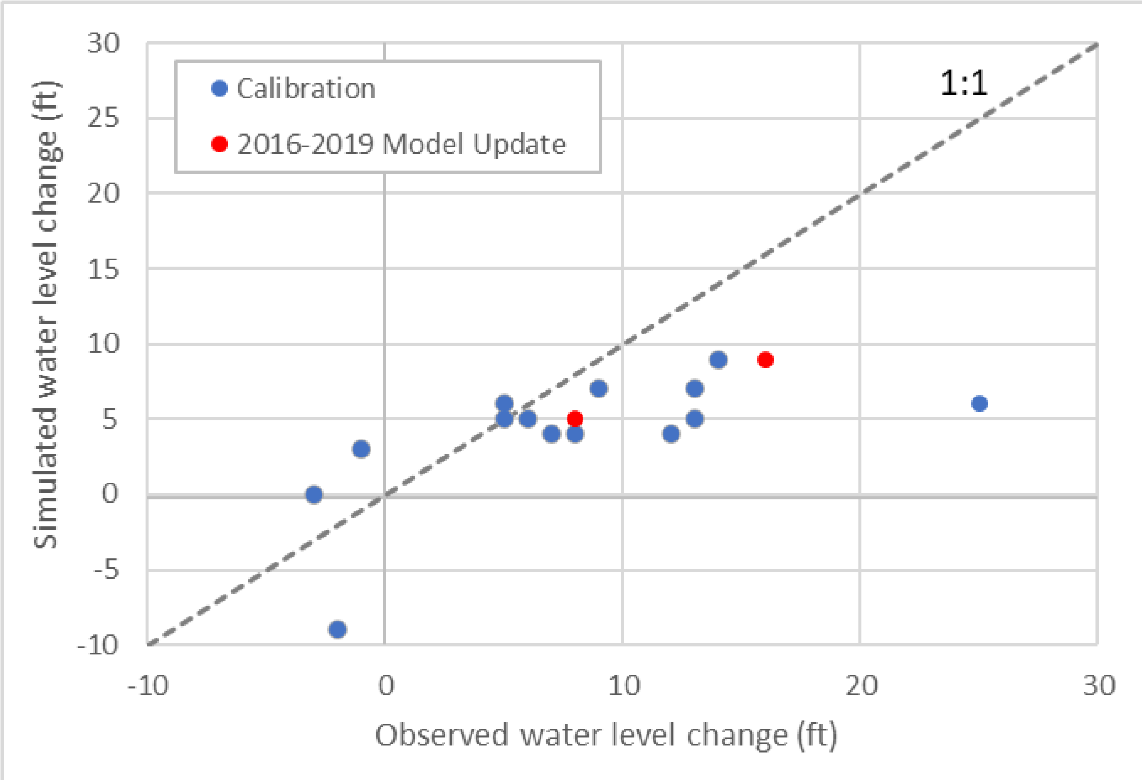


Figure 3-67. Simulated and Observed Streamflow Near the Downstream End of Piru Basin (Cavin Rd.). The hydrograph shows daily simulated streamflow, observations are discrete manual measurements (available for the period 2000-2019). The dashed black line marks the start of the Update Period.

(A)



(B)

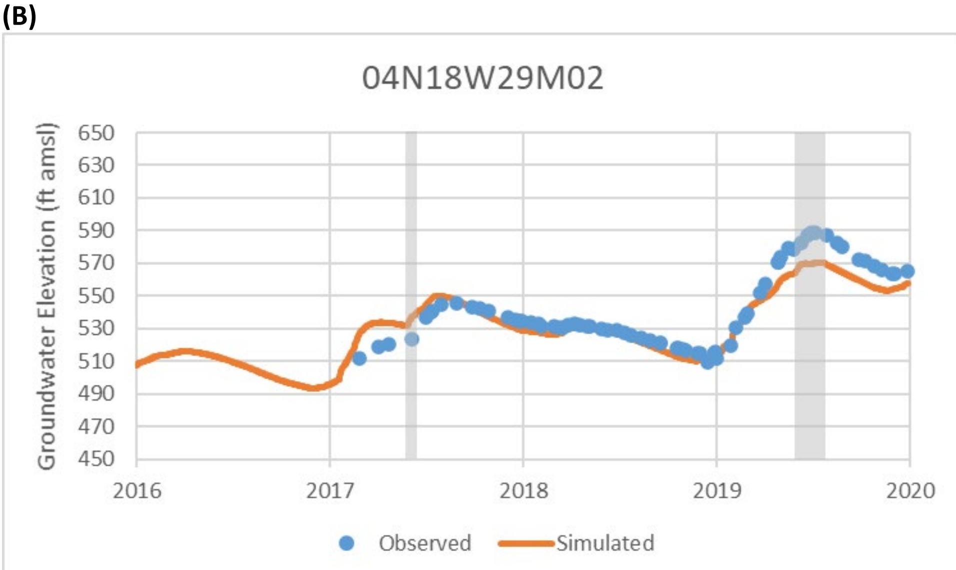


Figure 3-68. (A) Simulated and Observed Change in Groundwater Elevation in Piru Basin (well 04N18W29M2) Due to Conservation Releases. Changes in groundwater elevations were calculated as elevations just after minus elevations just before conservations releases. Positive changes indicate an increase in groundwater elevation following a release. (B) Simulated (orange line) and observed (blue dots) groundwater elevations in well 04N18W29M2. The shaded grey areas represent the periods when conservation releases were occurring.

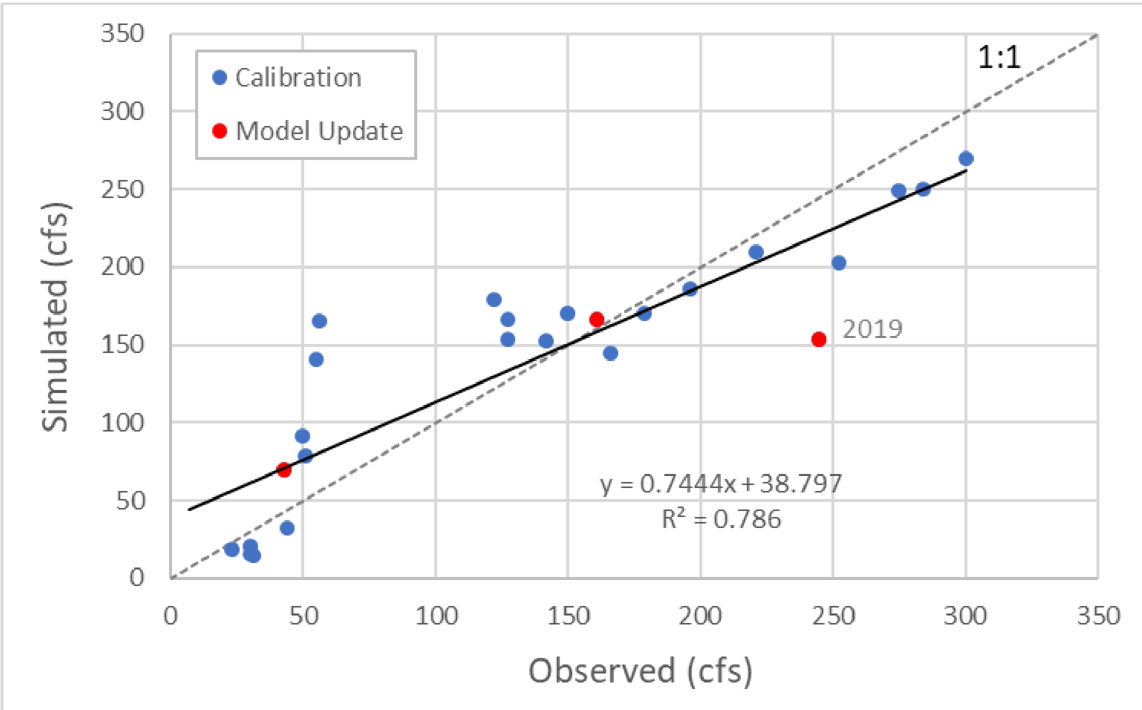


Figure 3-69. Simulated and Observed Monthly Average Streamflow Near the Downstream End of Fillmore Basin (Willard Rd.) During Conservation Releases (2000-2019). Observed monthly average streamflows were calculated as the mean of observed flows when multiple flow measurements were performed during one month.

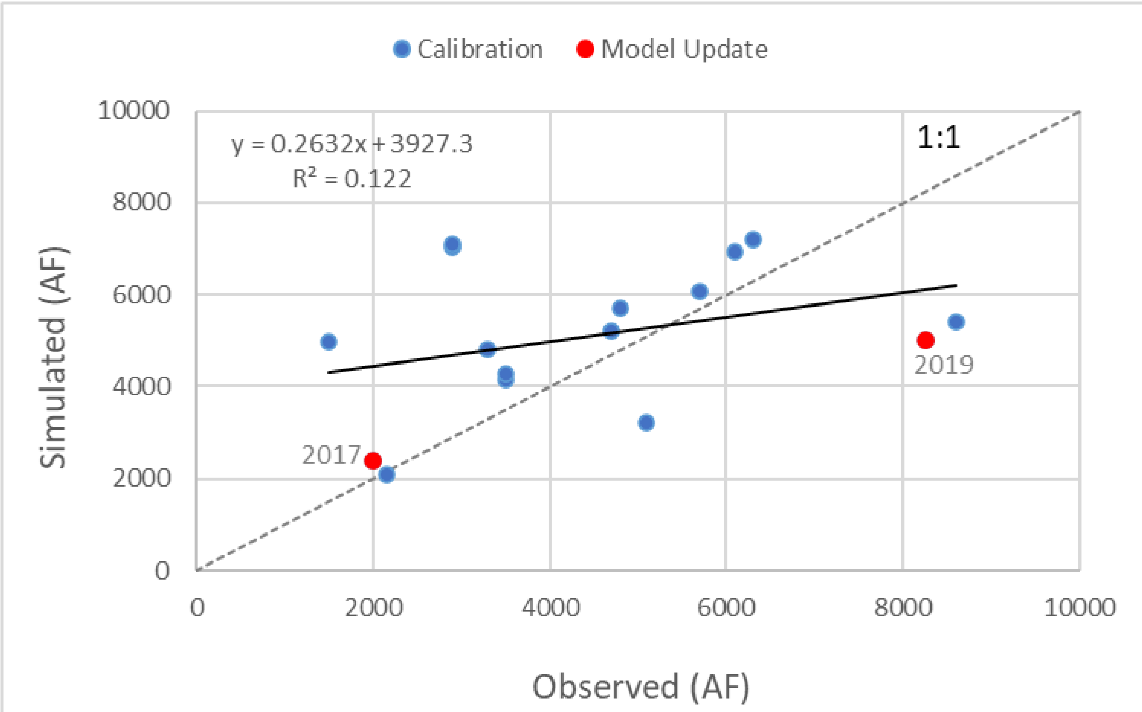


Figure 3-70. Simulated and Observed Total Percolation Volume in Fillmore Basin (acre-feet) During Conservation Releases (1999-2019).

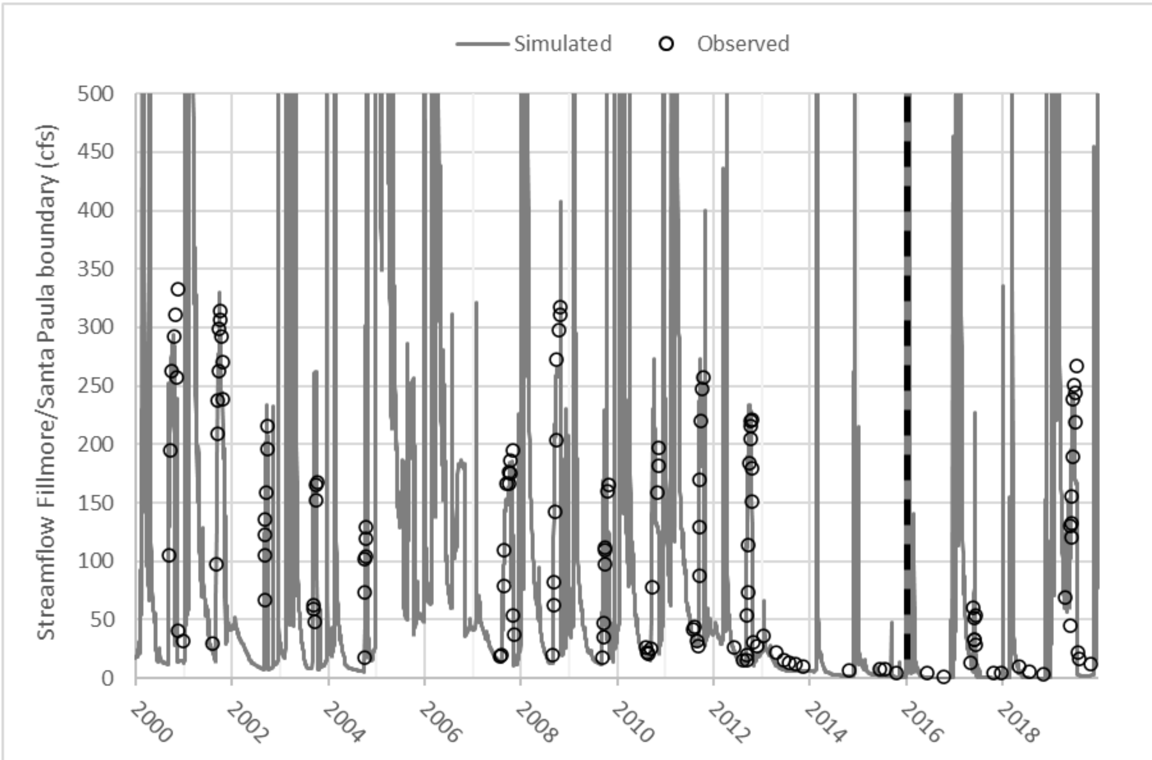
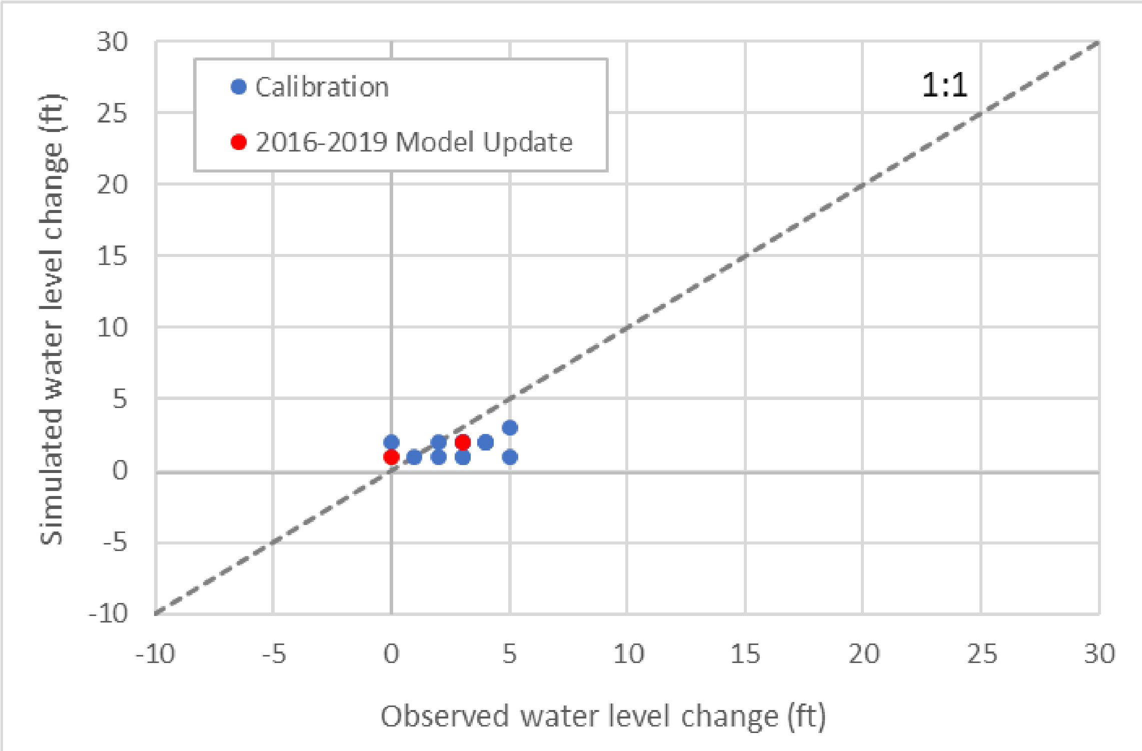


Figure 3-71. Simulated and Observed Streamflow Near the Downstream End of Fillmore Basin (Willard). The hydrograph shows daily simulated streamflow, observations are discrete manual measurements (available for the period 2000-2019). The dashed black line marks the start of the Update Period.

(A)



(B)

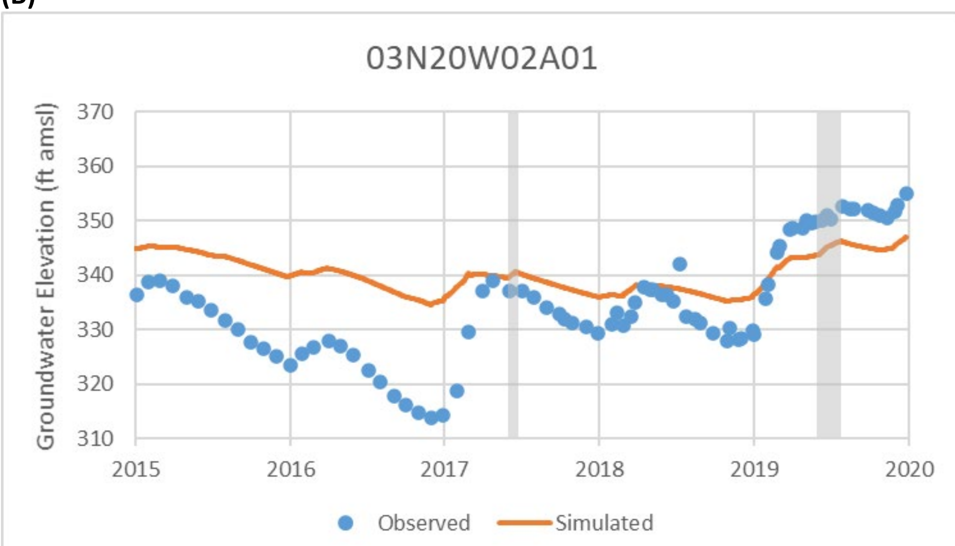


Figure 3-72. (A) Simulated and Observed Change in Groundwater Elevation in Fillmore Basin (03N20W02A01) Due to Conservation Releases. Changes in groundwater elevations were calculated as elevations just after minus elevations just before conservations releases. Positive changes indicate an increase in groundwater elevation. (B) Simulated (orange line) and observed (blue dots) groundwater elevations in well 03N20W02A01. The shaded grey areas represent the periods when conservation releases were occurring.

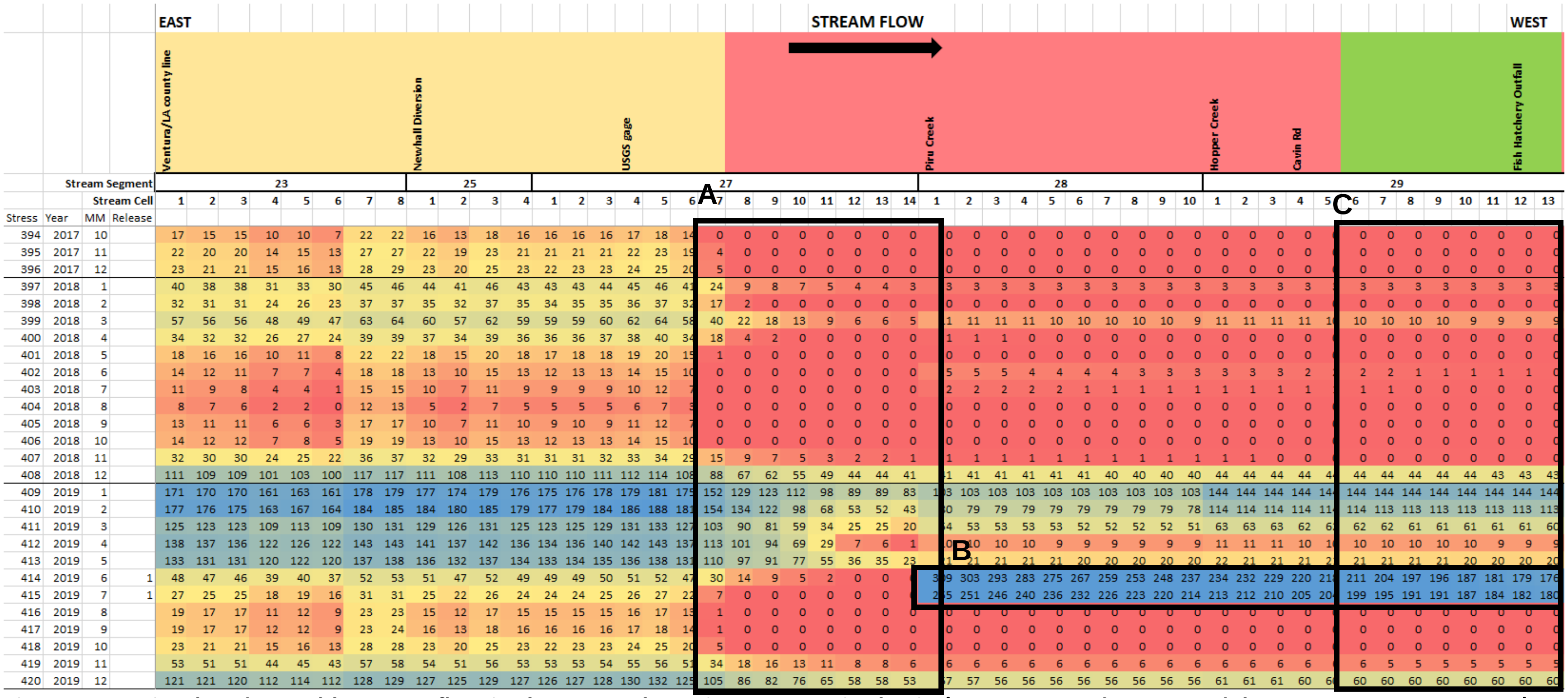


Figure 3-73. Simulated Monthly Streamflow in the Santa Clara River across Piru basin (UWCD groundwater model stream segments 23 –29). Monthly streamflow is derived from daily model outputs. Columns indicate one model cell, rows indicate months, flow direction is from left to right. Watershed features are indicated at the top for reference, including known losing (red), gaining (green), and stable (yellow) reaches. In the heatmap with monthly flows, flow magnitudes are colored from low (red) to high (blue). A. Upstream portion of dry gap in Piru basin, B. Stream channel percolation during the 2019 conservation release, C. Piru-Fillmore basin boundary area of rising groundwater.

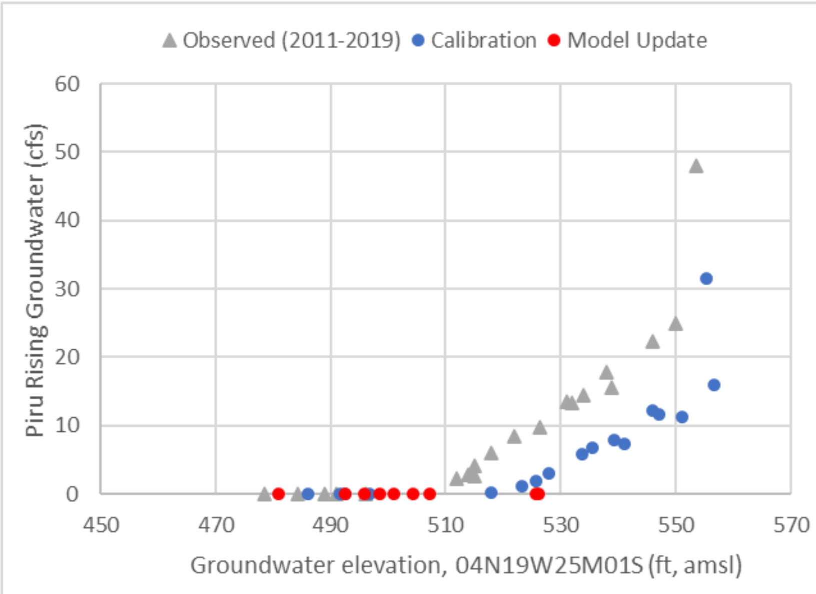
EAST | STREAM FLOW → | WEST

Fish Hatchery Outfall | A St bridge | Sespe Creek | Start Rising GW | Willard | SP Creek

			Stream Segment					30											31										32				33				
			Stream Cell	11	12	13	14	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	10	1	2	3	4	1	2	3	4	5
Stress	Year	MM	Release																																		
385	2017	1		166	166	166	166	172	172	172	172	172	172	172	172	172	172	172	472	472	472	472	472	472	472	472	472	472	473	473	473	473	473	473	473	473	473
386	2017	2		303	303	303	303	323	323	323	323	323	323	323	323	322	322	322	1315	1315	1315	1315	1314	1314	1314	1314	1314	1314	1317	1317	1317	1317	1317	1317	1317	1317	1316
387	2017	3	B	14	14	13	13	13	13	13	13	12	12	12	12	12	12	12	120	120	120	120	119	119	119	119	119	119	122	122	123	123	123	123	123	122	122
388	2017	4		5	5	5	5	4	4	4	4	4	4	4	3	3	3	3	27	27	27	27	26	26	26	26	26	26	28	28	29	29	29	29	28	28	28
389	2017	5		7	7	7	7	6	6	6	6	6	5	5	5	5	5	4	16	15	15	15	14	14	13	13	13	14	15	15	16	15	15	15	15	15	15
390	2017	6		104	102	100	99	95	95	94	93	91	89	87	85	85	83	80	81	79	77	75	73	71	69	69	69	69	70	69 C	70	70	69	69	69	68	68
391	2017	7		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	5	5	5	5	5	5	5
392	2017	8		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
393	2017	9		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
394	2017	10		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
395	2017	11		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
396	2017	12		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
397	2018	1		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	22	22	22	22	22	22	21	21	22	22	22	21	22	21	21	21	21	21	21
398	2018	2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
399	2018	3		9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	185	185	185	184	184	184	184	184	184	184	185	184	185	184	184	184	184	184	184
400	2018	4		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	19	19	19	19	19	19	19	20	20	20	20	20	20	20	20	20
401	2018	5		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
402	2018	6		1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
403	2018	7		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
404	2018	8		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
405	2018	9		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
406	2018	10		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407	2018	11		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
408	2018	12		43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
409	2019	1		144	144	144	144	151	151	151	151	151	151	151	151	151	151	150	523	523	523	523	523	523	523	523	523	523	524	524	524	524	524	524	524	524	524
410	2019	2		113	113	113	113	116	116	116	116	116	116	116	116	116	116	116	1209	1209	1209	1209	1209	1208	1208	1208	1208	1208	1211	1211	1211	1211	1211	1211	1211	1210	1210
411	2019	3		61	61	60	60	60	60	60	60	60	60	60	60	59	59	59	585	584	584	584	584	583	583	583	583	583	587	587	587	587	587	587	587	587	587
412	2019	4		9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	77	77	77	77	77	77	77	77	77	77	80	80	80	80	80	80	80	80	80
413	2019	5		20	20	20	20	20	20	20	20	20	20	20	20	20	19	19	90	90	89	89	89	89	89	89	89	89	92	92	92	92	92	92	92	92	92
414	2019	6	A	181	179	176	174	169	168	167	165	162	159	156	153	153	151	146	182	179	176	173	169	166	162	162	163	163	165	165	167	166	166	166	165	164	164
415	2019	7		184	182	180	179	176	176	175	174	172	170	168	166	165	164	161	163	161	159	157	155	153	150	150	151	151	153	153	154	154	153	153	153	152	152
416	2019	8		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2

Figure 3-74. Simulated Monthly Streamflow in the Santa Clara River across Fillmore Basin (UWCD groundwater model stream segments 30 – 32). Monthly streamflow is derived from daily model outputs. Columns indicate one model cell, rows indicate months, flow direction is from left to right. Watershed features are indicated at the top for reference, including known losing (red), gaining (green), and stable (yellow) reaches. In the heatmap with monthly flows, flow magnitudes are colored from low (red) to high (blue). A. Stream channel percolation during conservation release, B. Stream channel percolation during dry winter period with low flows, C. Fillmore – Santa Paula basin boundary with rising groundwater.

(A)



(B)

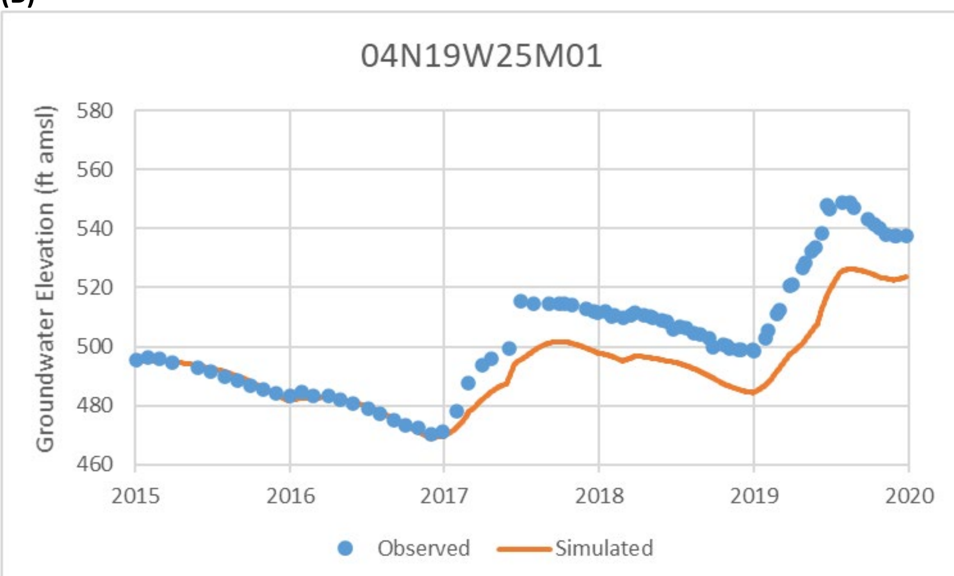
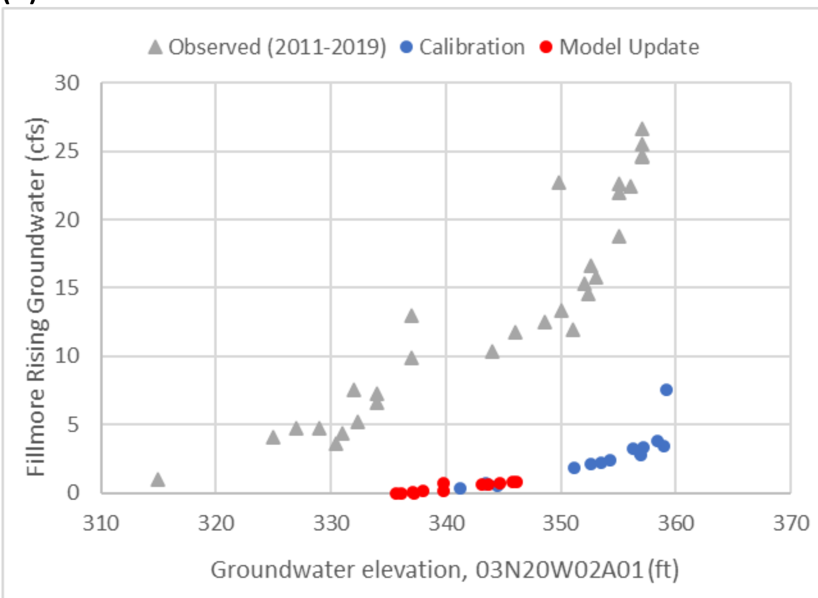


Figure 3-75. (A) Simulated and Observed Relationship Between Rising Groundwater at the Piru-Fillmore Basin Boundary and Groundwater Elevation in Piru Basin Well 04N19W25M01. (B) Simulated (orange line) and observed (blue dots) groundwater elevations in Piru basin well 04N19W25M01.

(A)



(B)

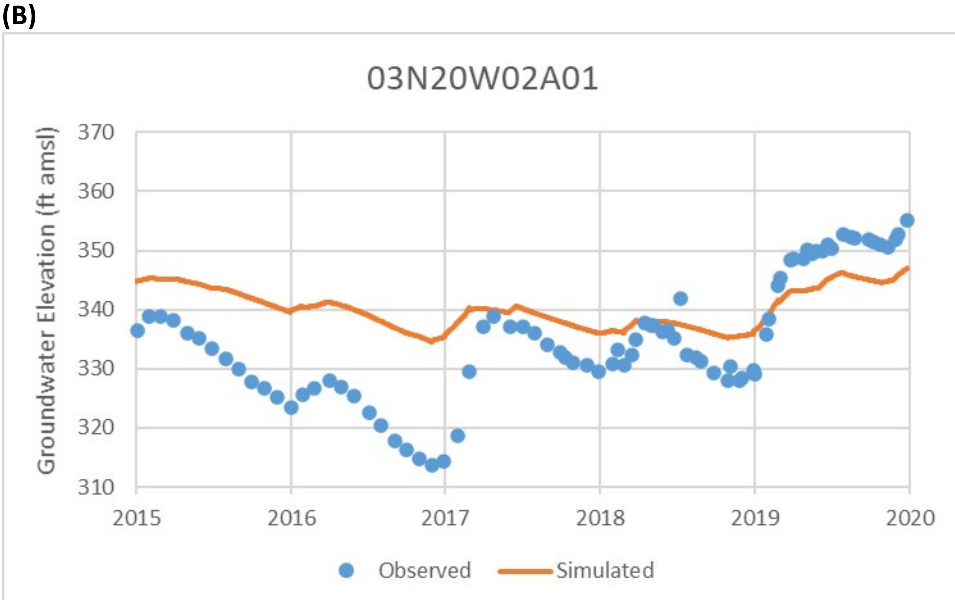


Figure 3-76. (A) Simulated and Observed Relationship Between Rising Groundwater at the Fillmore-Santa Paula Basin Boundary and Groundwater Elevation in Fillmore Basin Well 03N20W02A01. (B) Simulated (orange line) and observed (blue dots) groundwater elevations in Fillmore basin well 03N20W02A01.

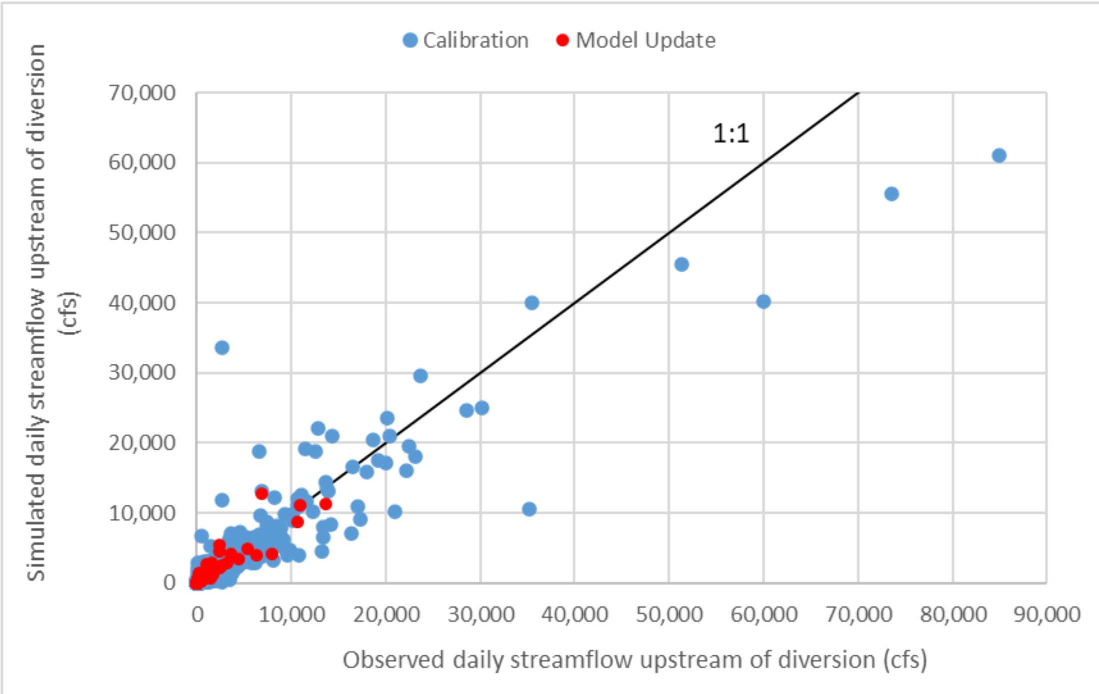


Figure 3-77. Simulated and Observed Daily Streamflow Upstream of the Freeman Diversion.

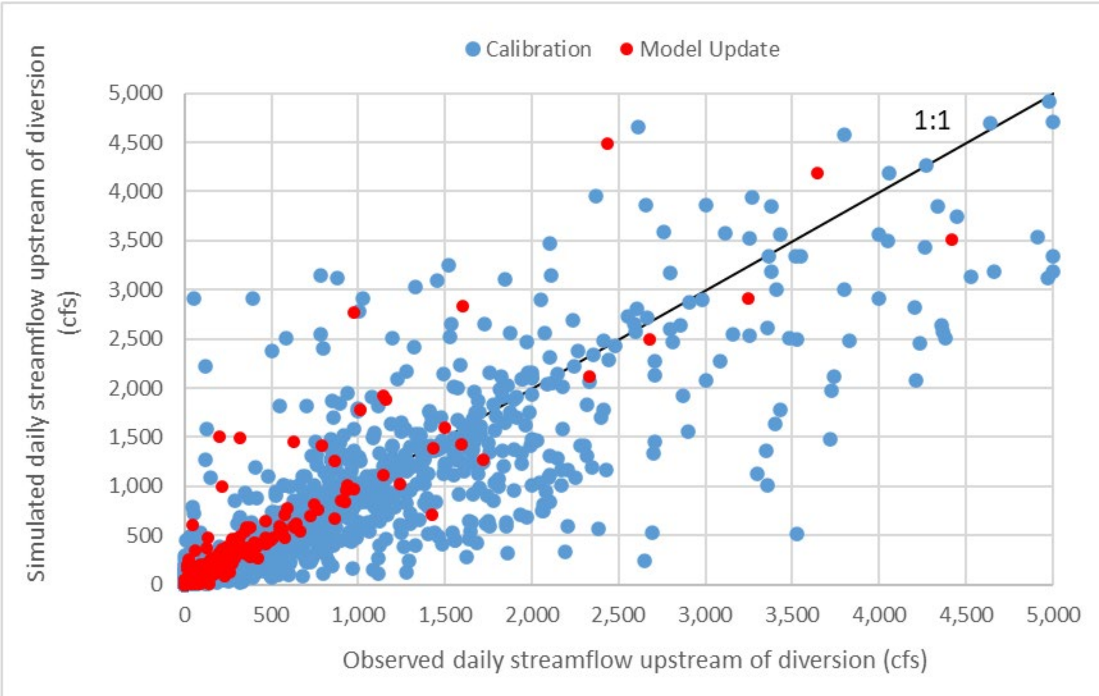


Figure 3-78. Simulated and Observed Daily Streamflow (Low Ranges) Upstream of the Freeman Diversion.

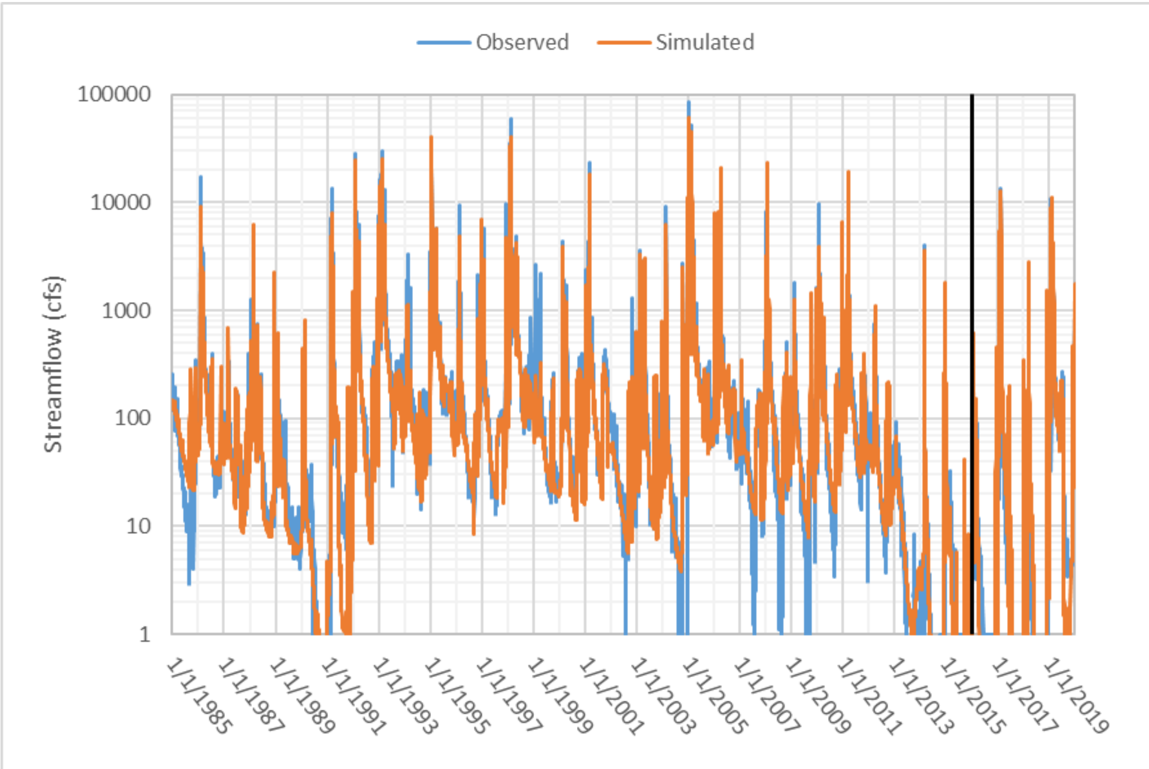


Figure 3-79. Observed and simulated daily streamflow in the SCR just upstream of the Freeman Diversion. The black vertical line indicates the start of the Update Period.

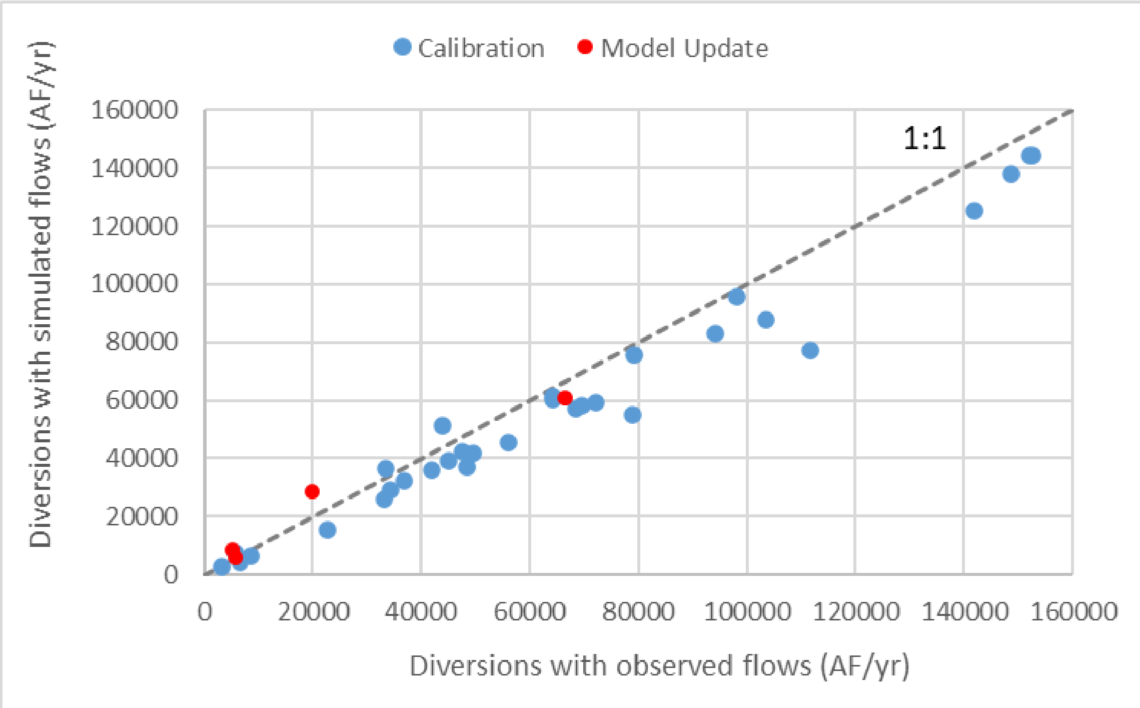
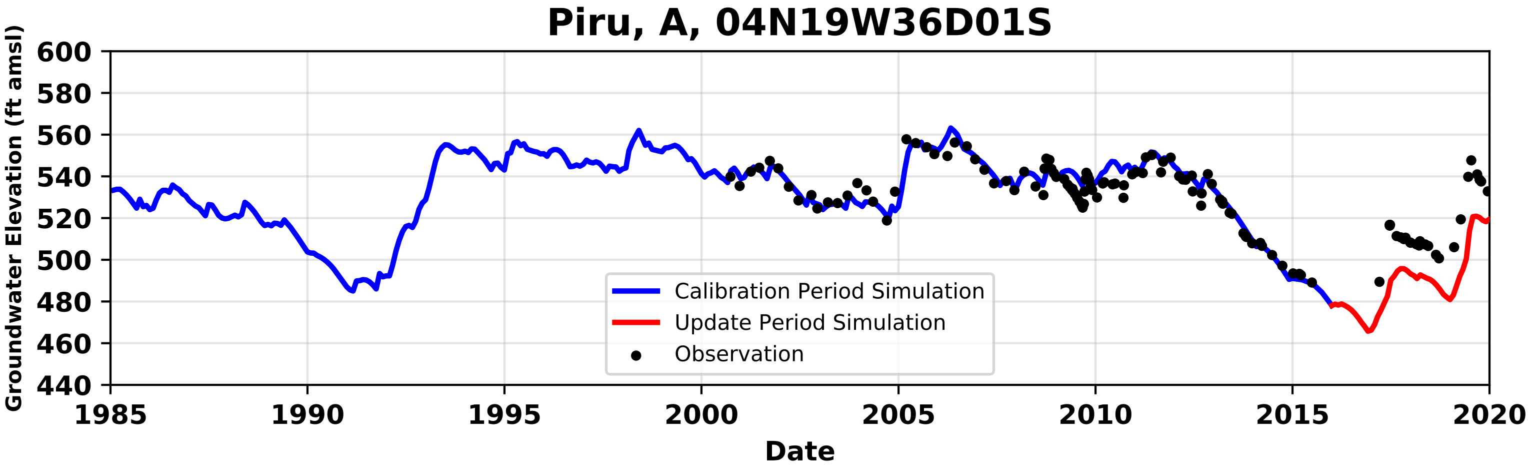


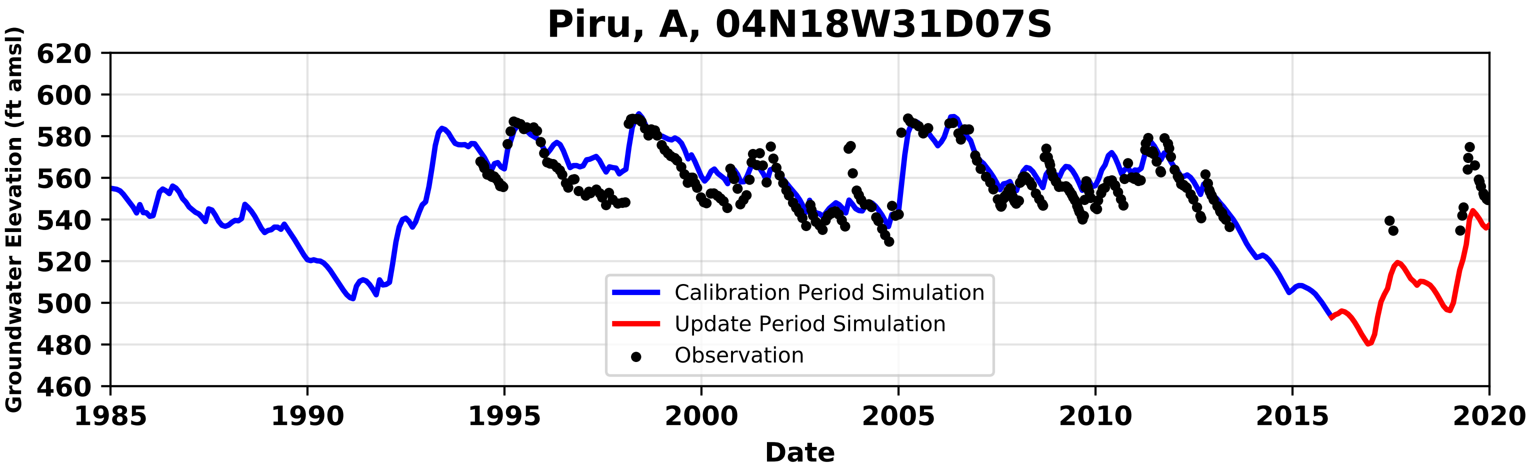
Figure 3-80. Correlation between simulated annual diversions based on observed streamflow and simulated annual diversions based on streamflow from Regional Model. Simulated annual diversions were calculated using the Hydrological Operations Simulation System (HOSS) model, assuming bypass flow operations proposed in United's Freeman Diversion Multiple Species Habitat Conservation Plan, without any infrastructure improvements. The grey line represents the 1:1 line.

Appendix A –Additional Hydrographs

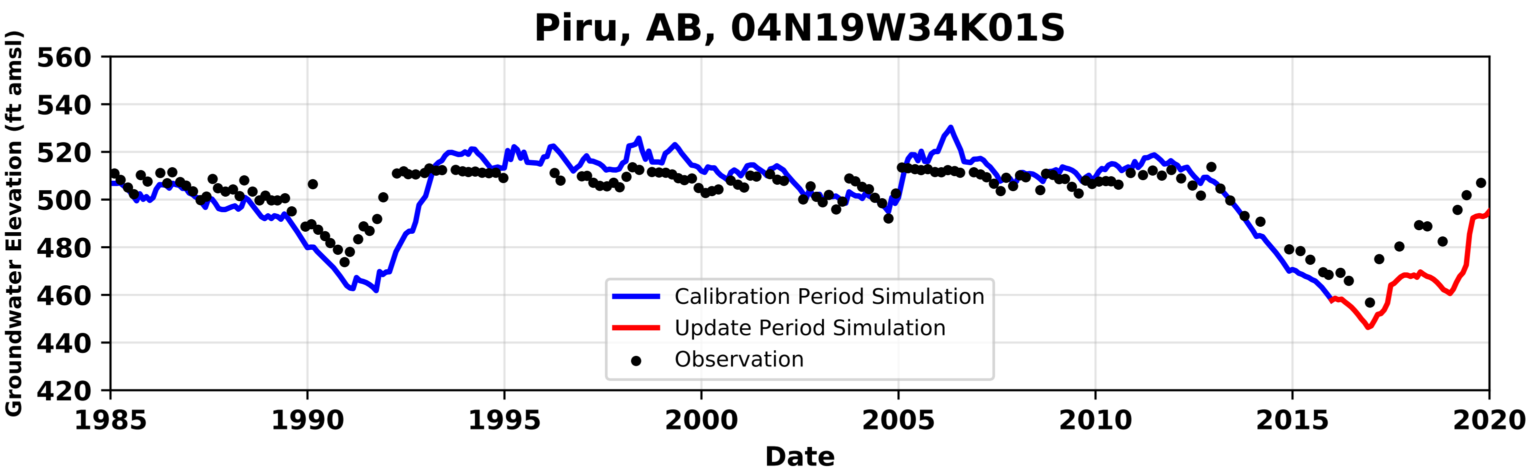
This page intentionally blank.



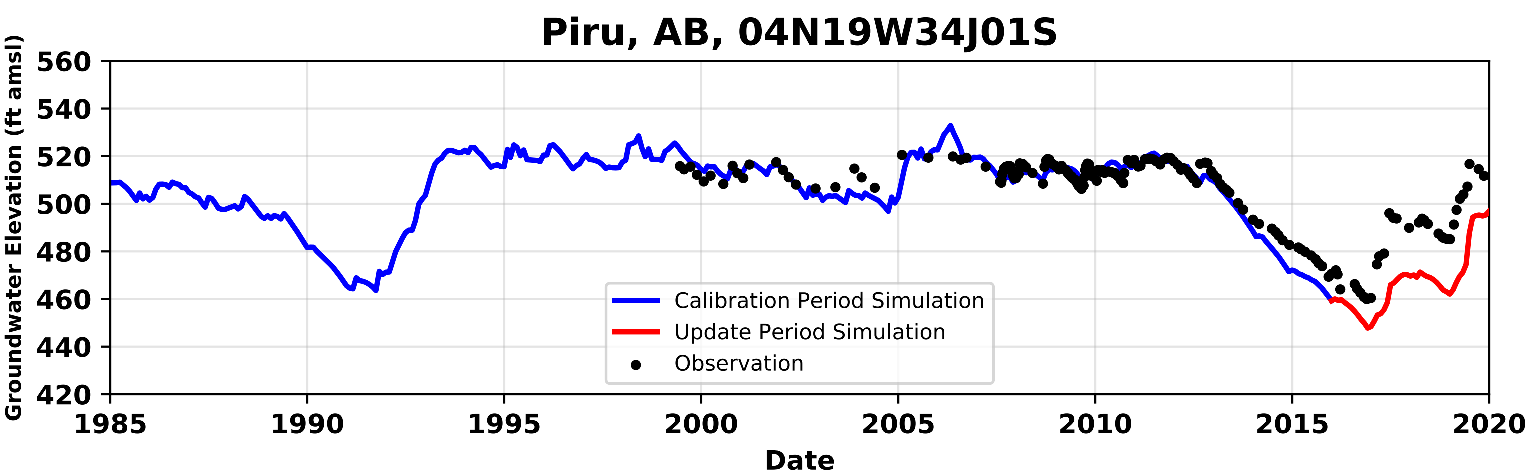
Piru, A, 04N19W36D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



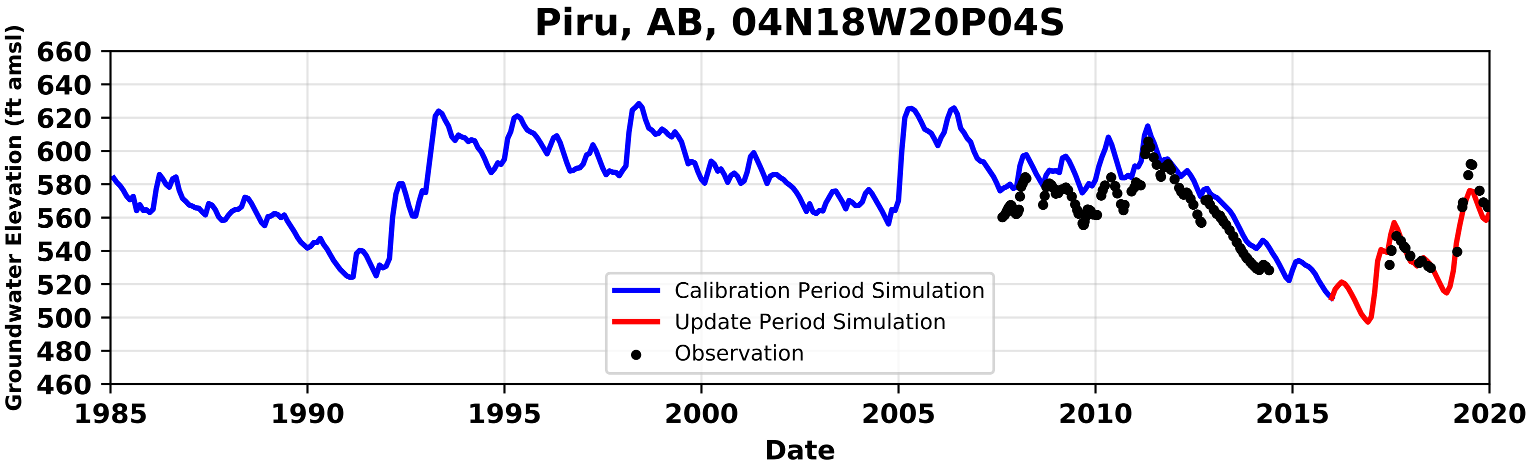
Piru, A, 04N18W31D07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

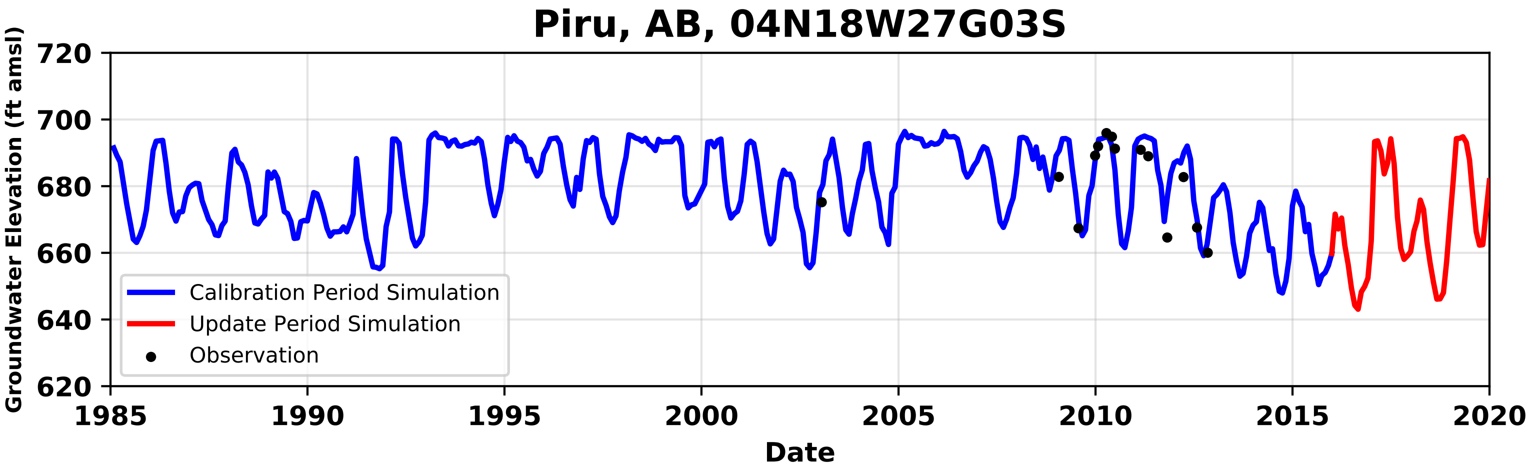


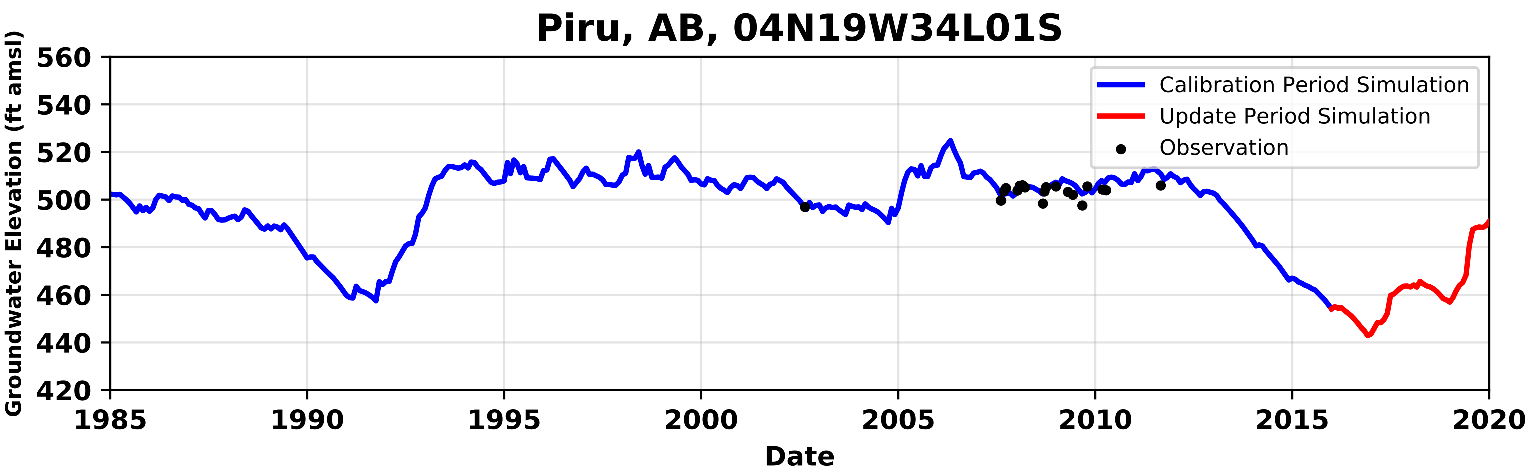
Piru, AB, 04N19W34K01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

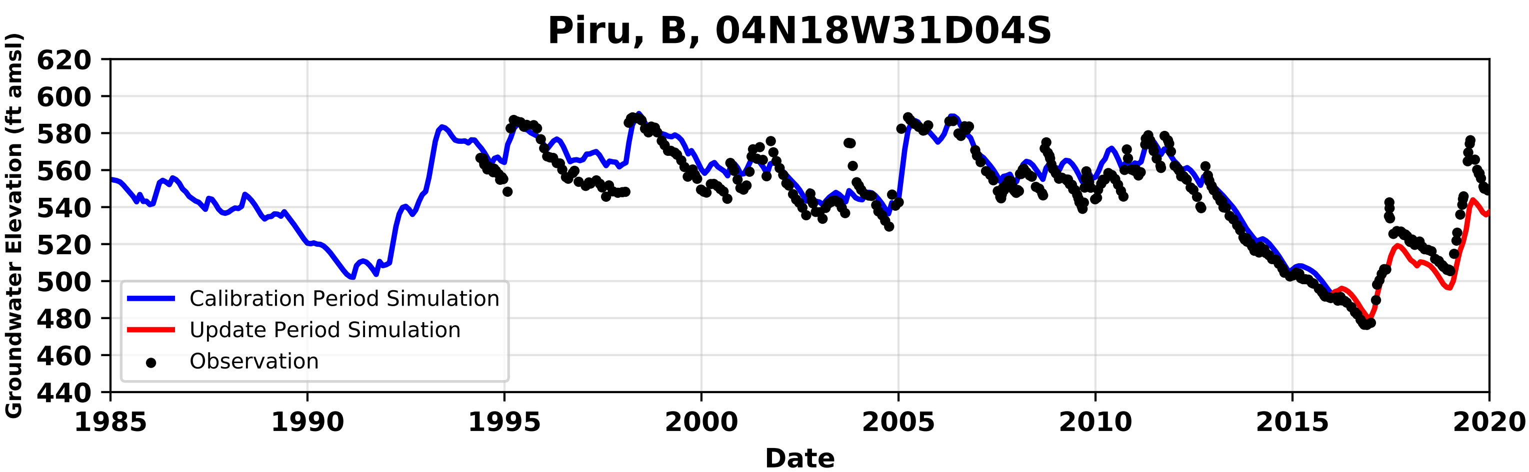


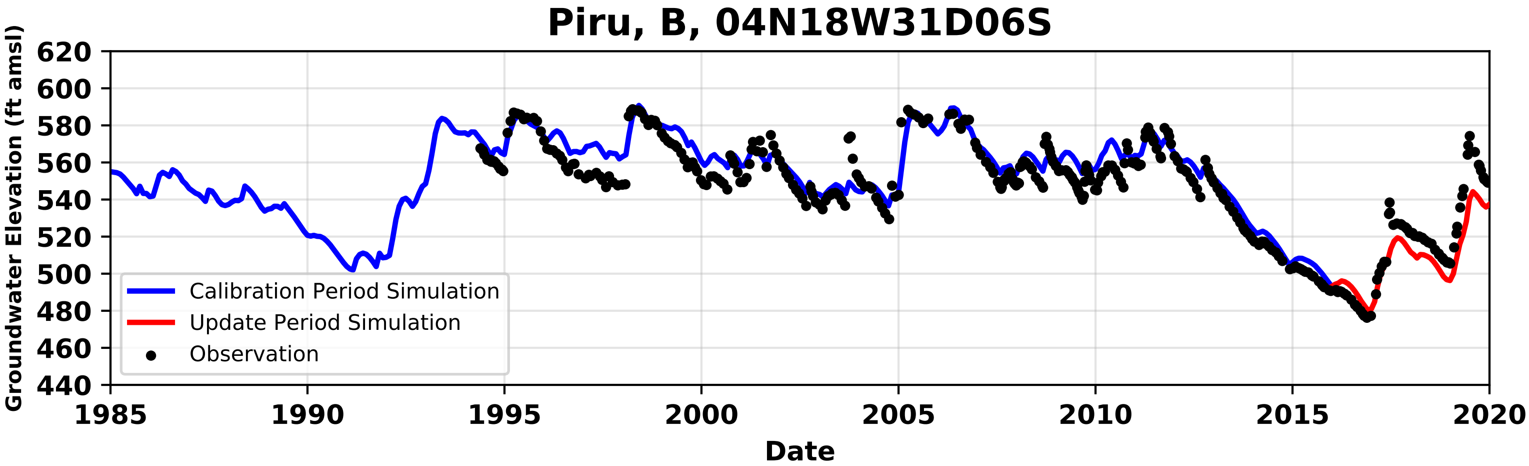
Piru, AB, 04N19W34J01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, AB, 04N18W20P04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

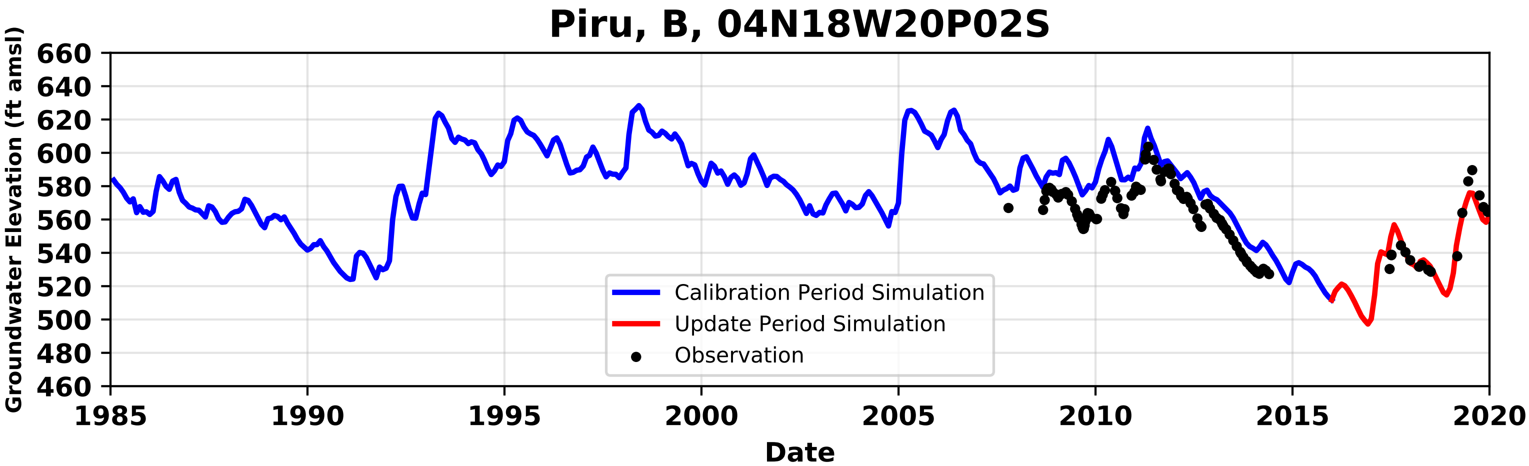

Piru, AB, 04N18W27G03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, AB, 04N19W34L01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

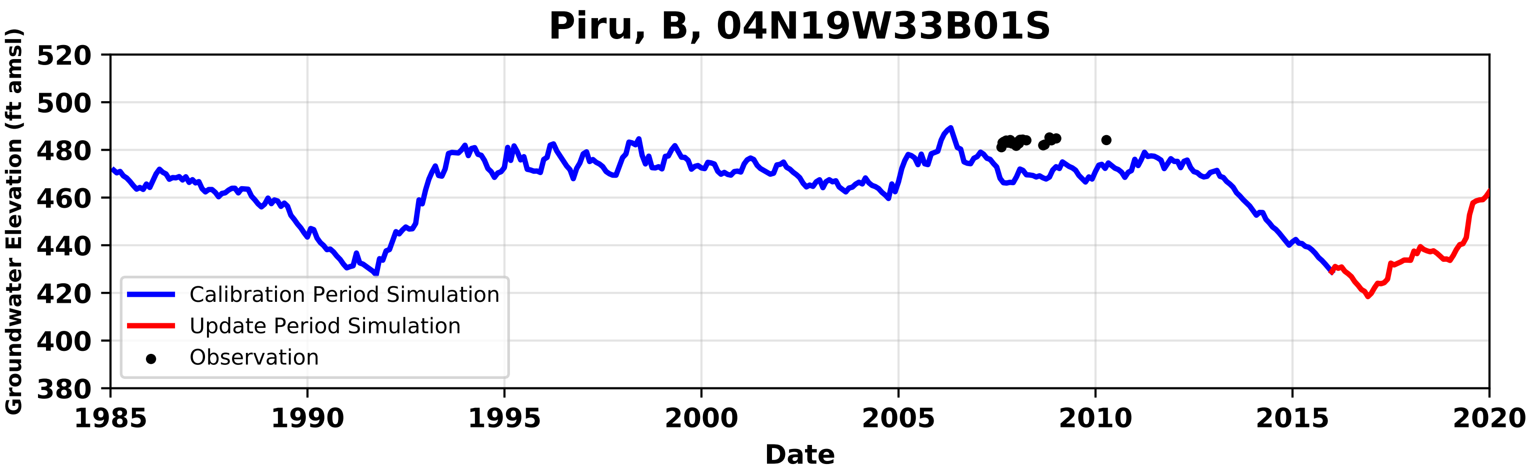

Piru, B, 04N18W31D04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



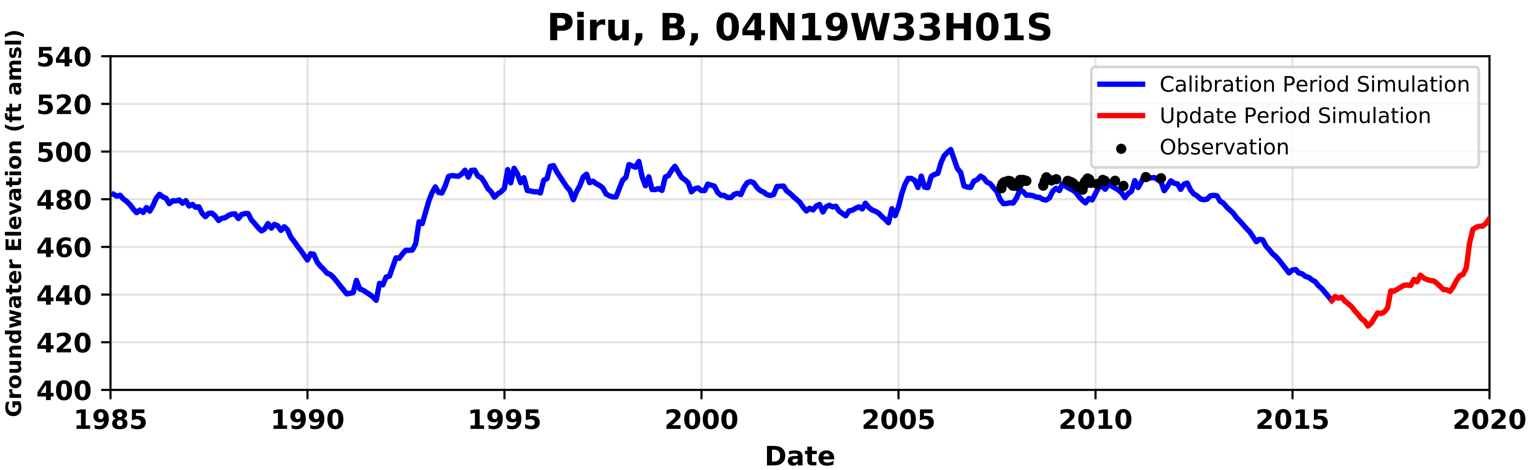
Piru, B, 04N18W31D06S
Groundwater Elevation (ft amsl)
620
600
580
560
540
520
500
480
460
440
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



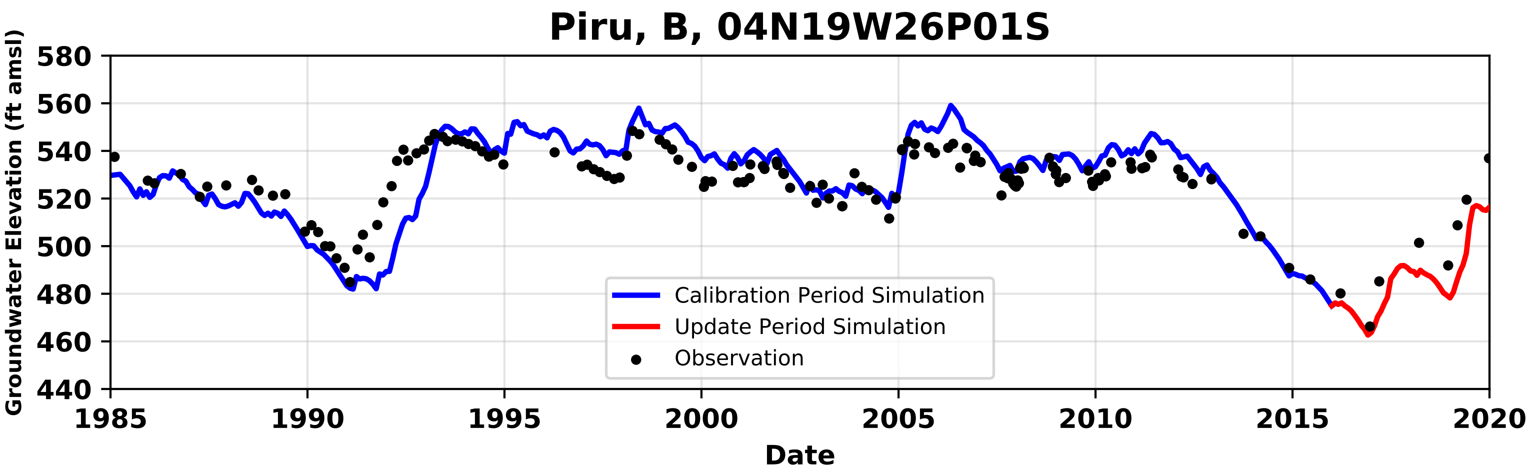
Piru, B, 04N18W20P02S
Groundwater Elevation (ft amsl)
660
640
620
600
580
560
540
520
500
480
460
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



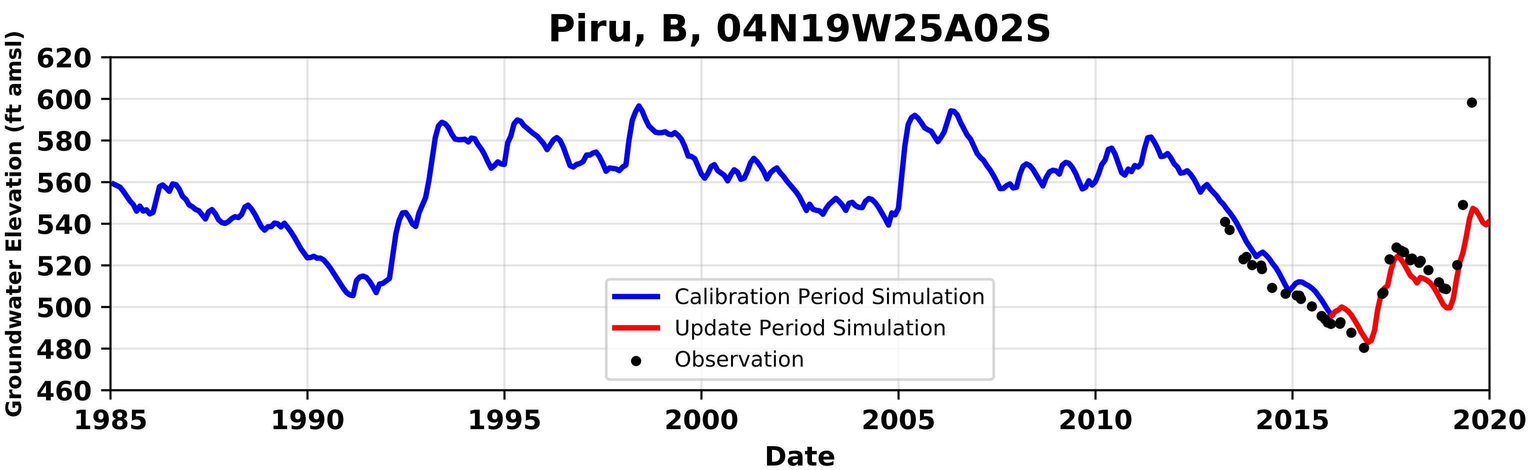
Piru, B, 04N19W33B01S
Groundwater Elevation (ft amsl)
520
500
480
460
440
420
400
380
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



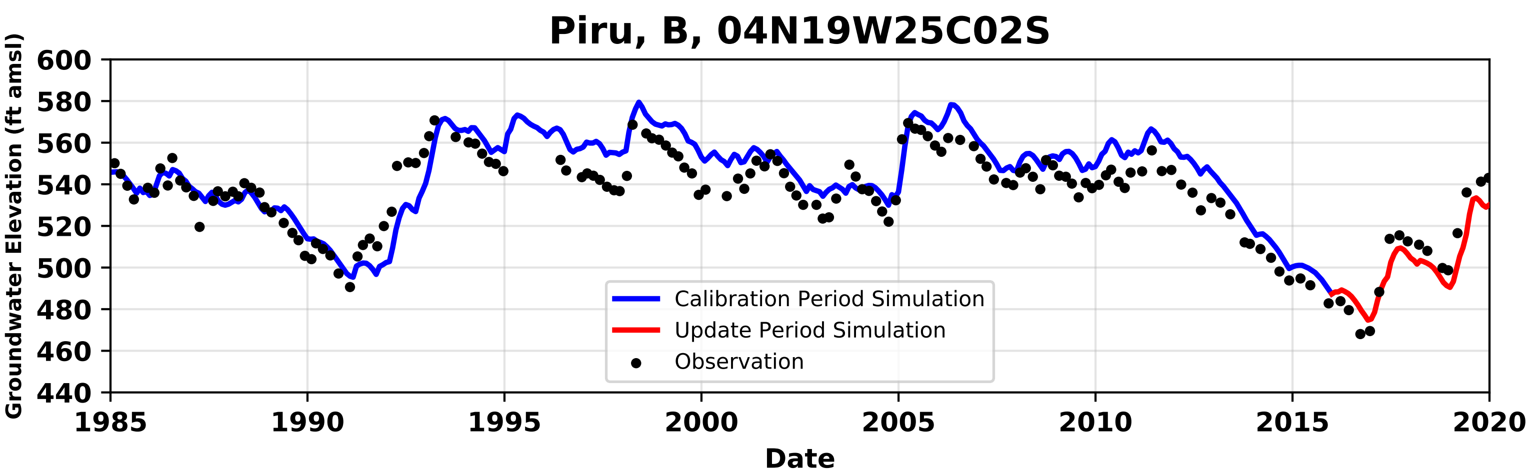
Piru, B, 04N19W33H01S
Groundwater Elevation (ft amsl)
540
520
500
480
460
440
420
400
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



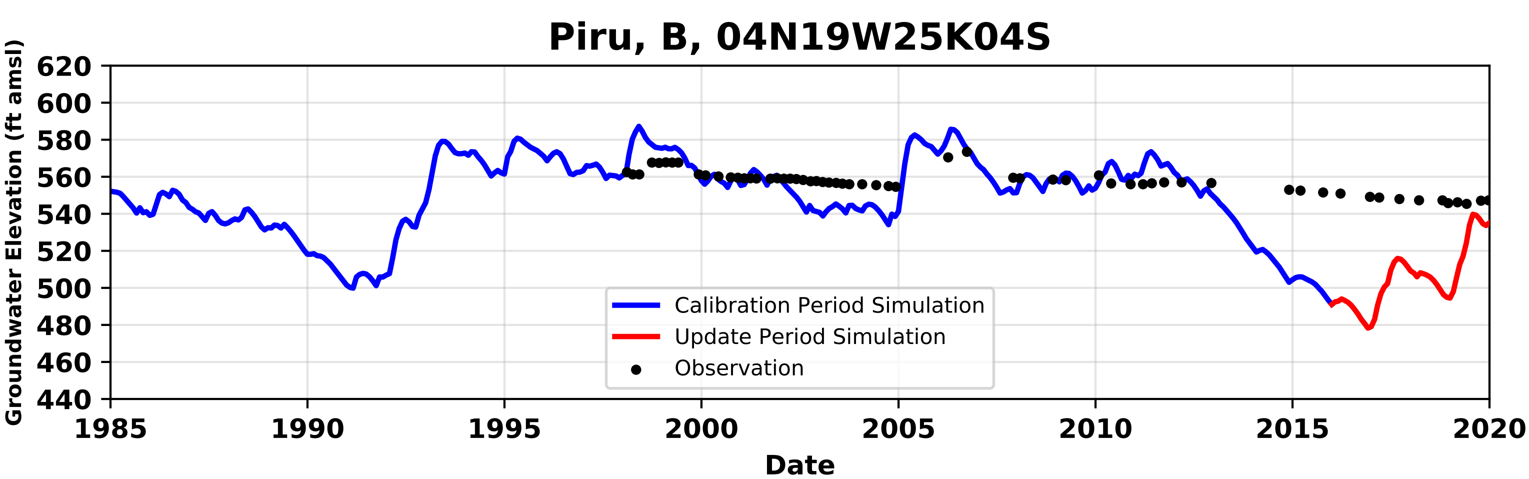
Piru, B, 04N19W26P01S
Groundwater Elevation (ft amsl)
580
560
540
520
500
480
460
440
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



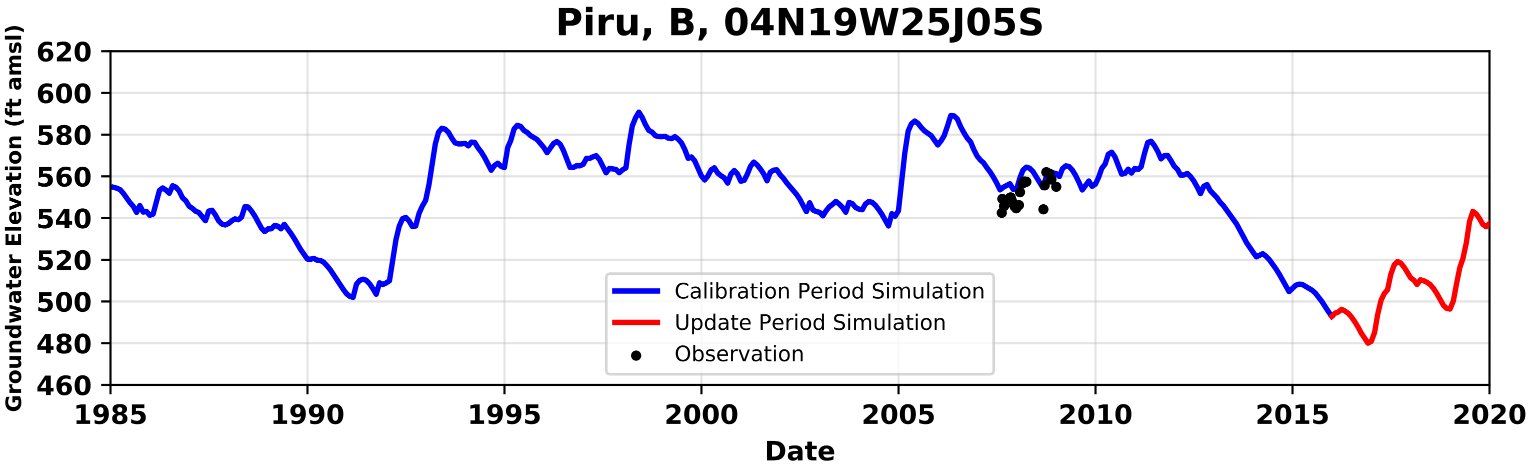
Piru, B, 04N19W25A02S
Groundwater Elevation (ft amsl)
620
600
580
560
540
520
500
480
460
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

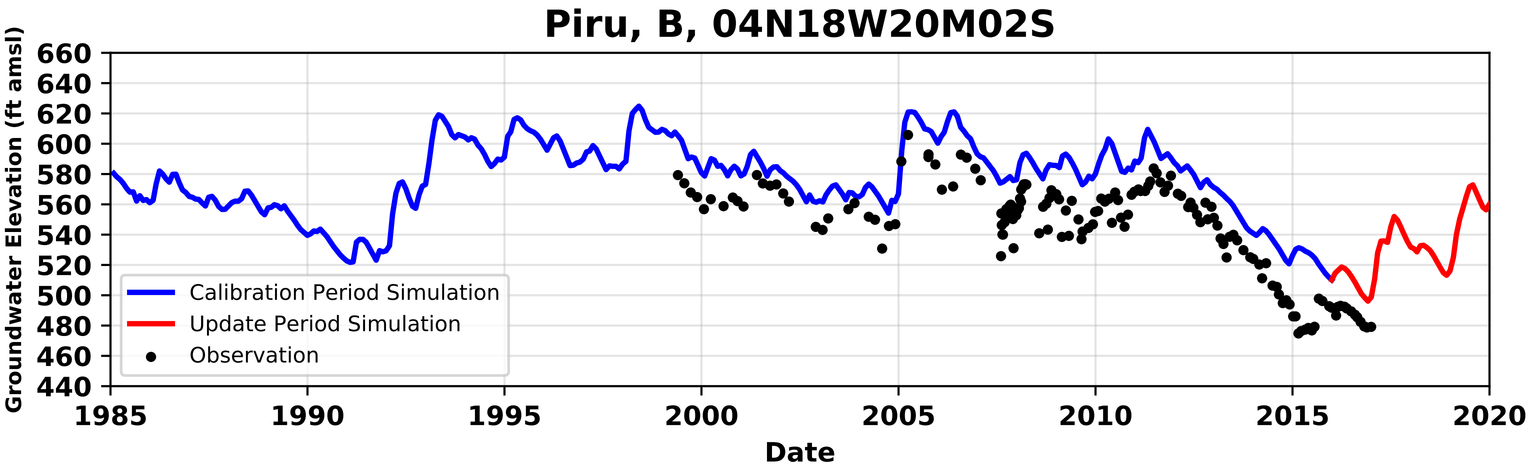


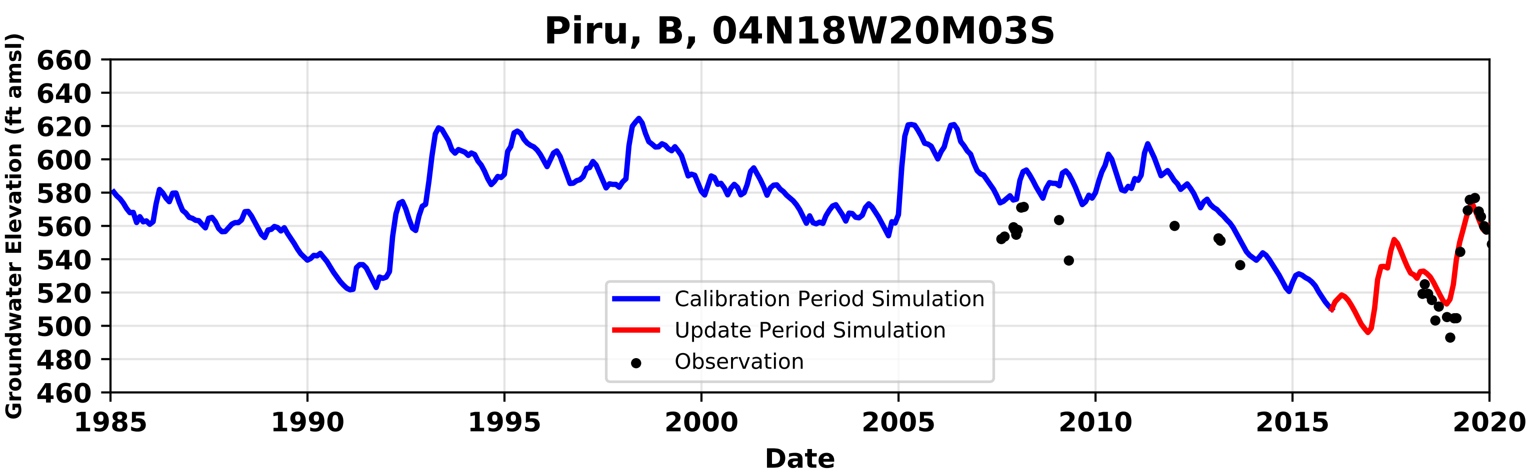
Piru, B, 04N19W25C02S
Groundwater Elevation (ft amsl)
600
580
560
540
520
500
480
460
440
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

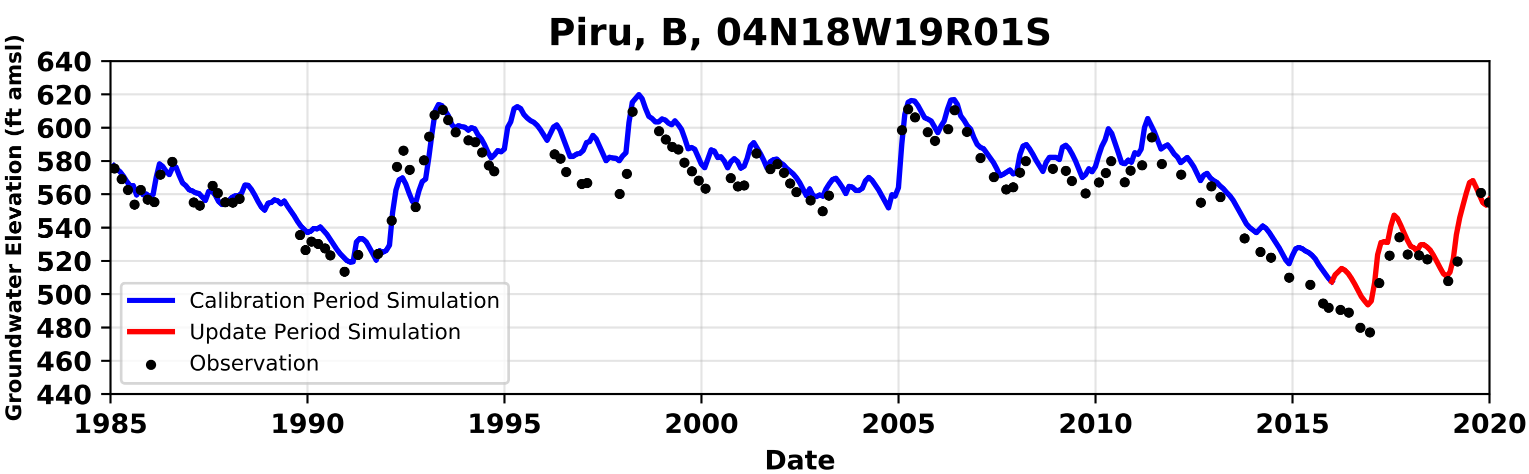


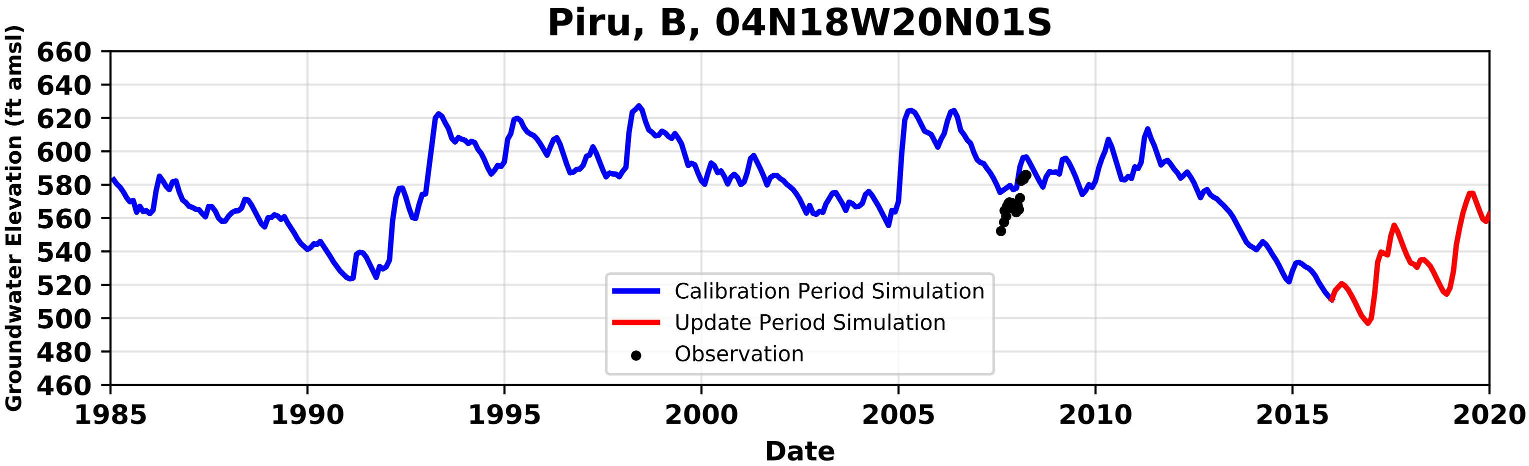
Piru, B, 04N19W25K04S
Groundwater Elevation (ft amsl)
620
600
580
560
540
520
500
480
460
440
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, B, 04N19W25J05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

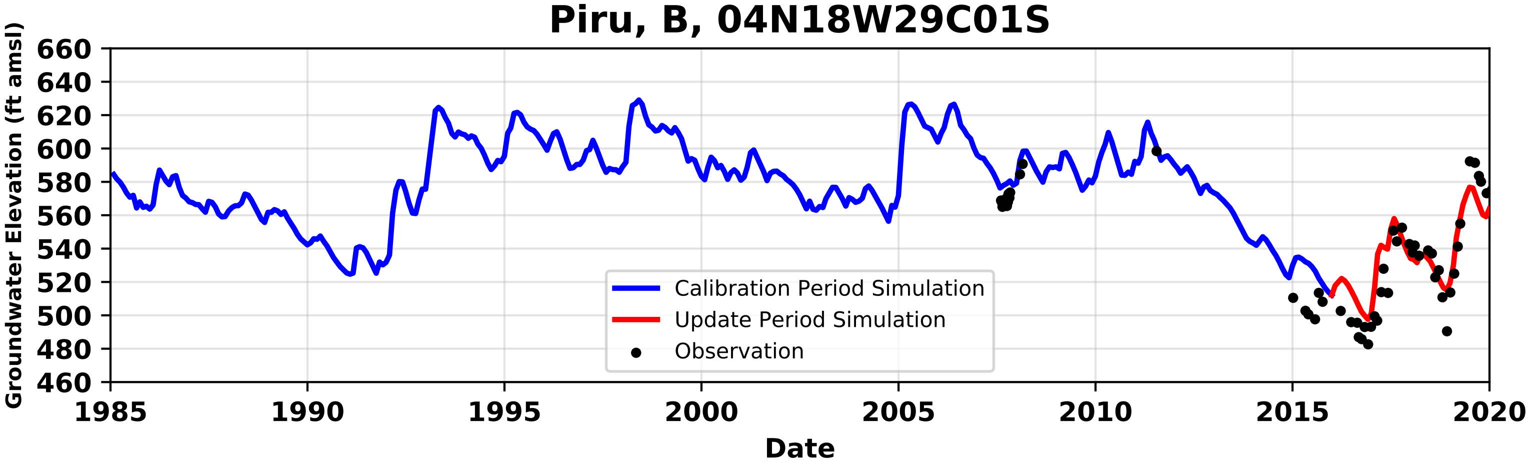

Piru, B, 04N18W20M02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, B, 04N18W20M03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

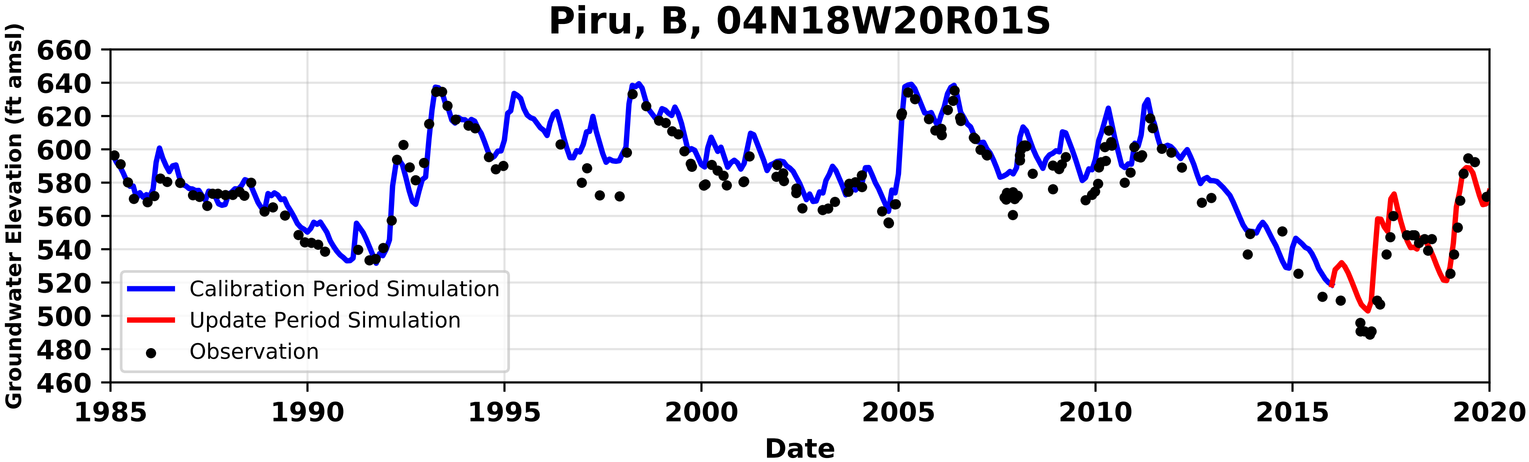

Piru, B, 04N18W19R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



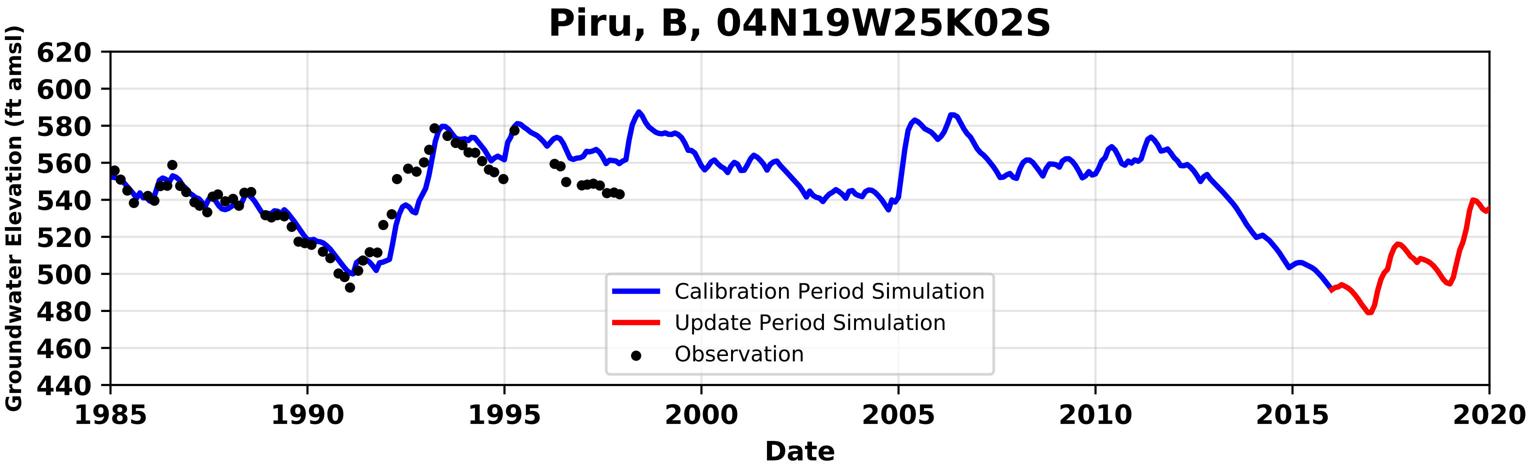
Piru, B, 04N18W20N01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



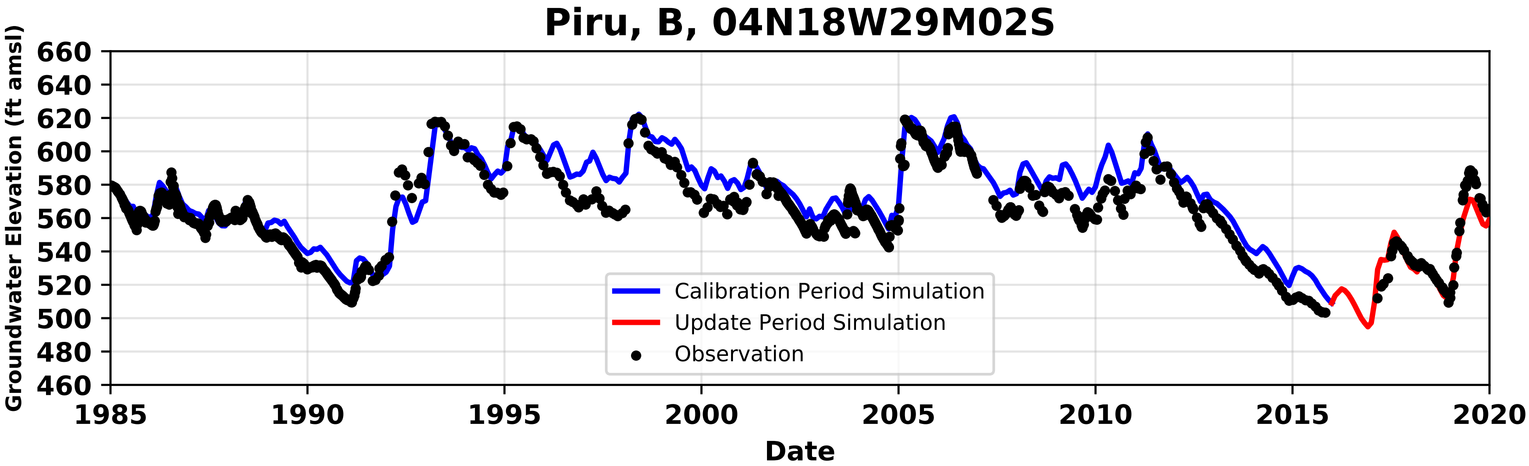
Piru, B, 04N18W29C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

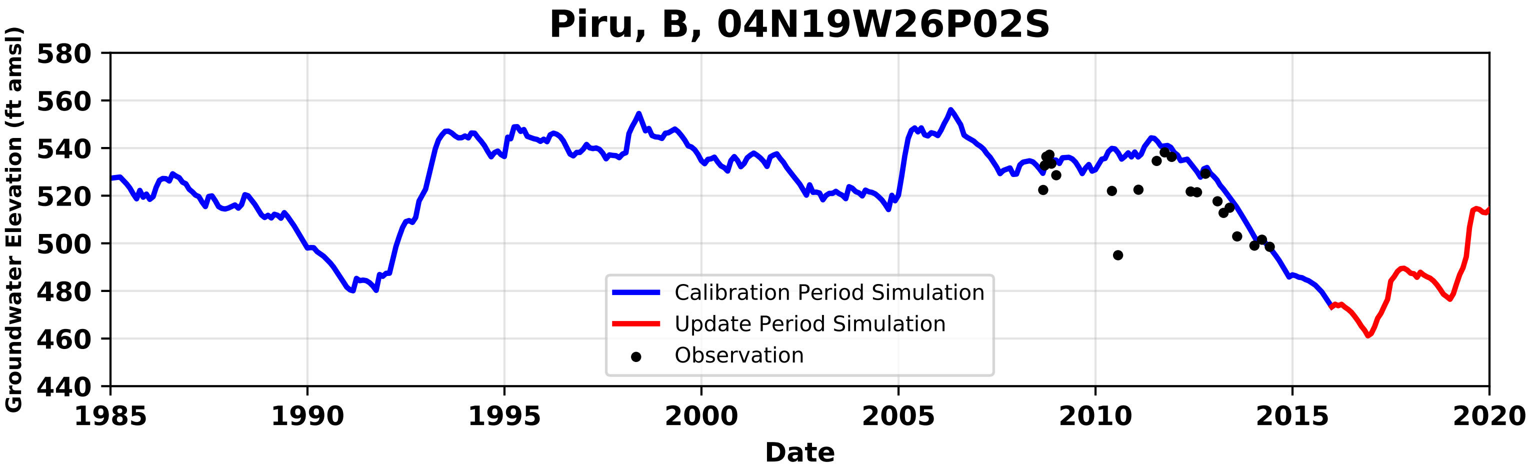


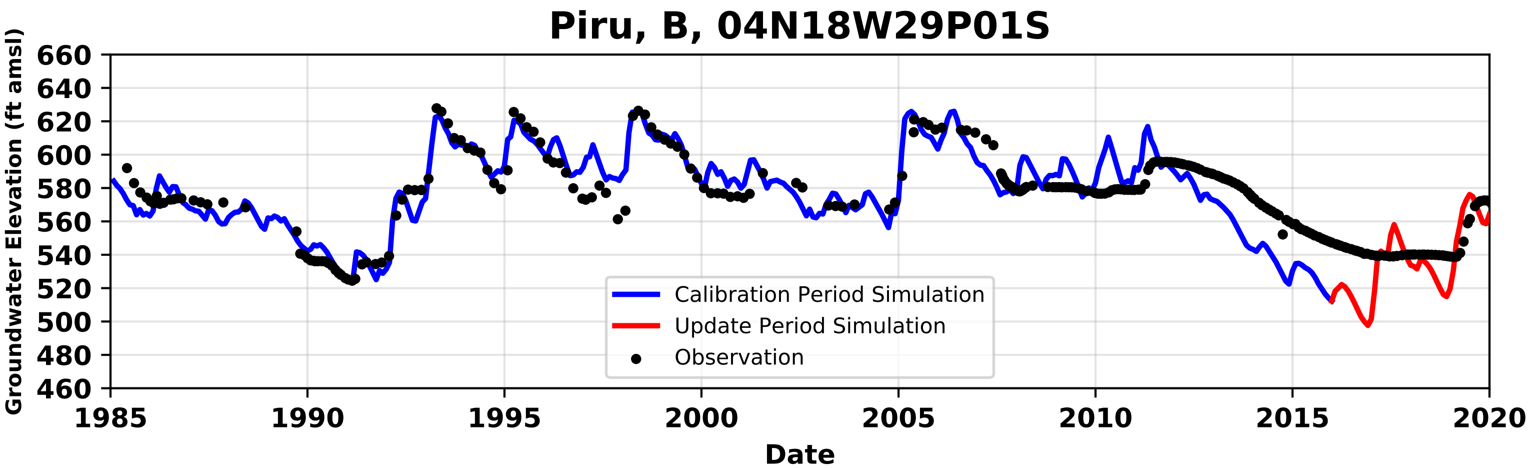
Piru, B, 04N18W20R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

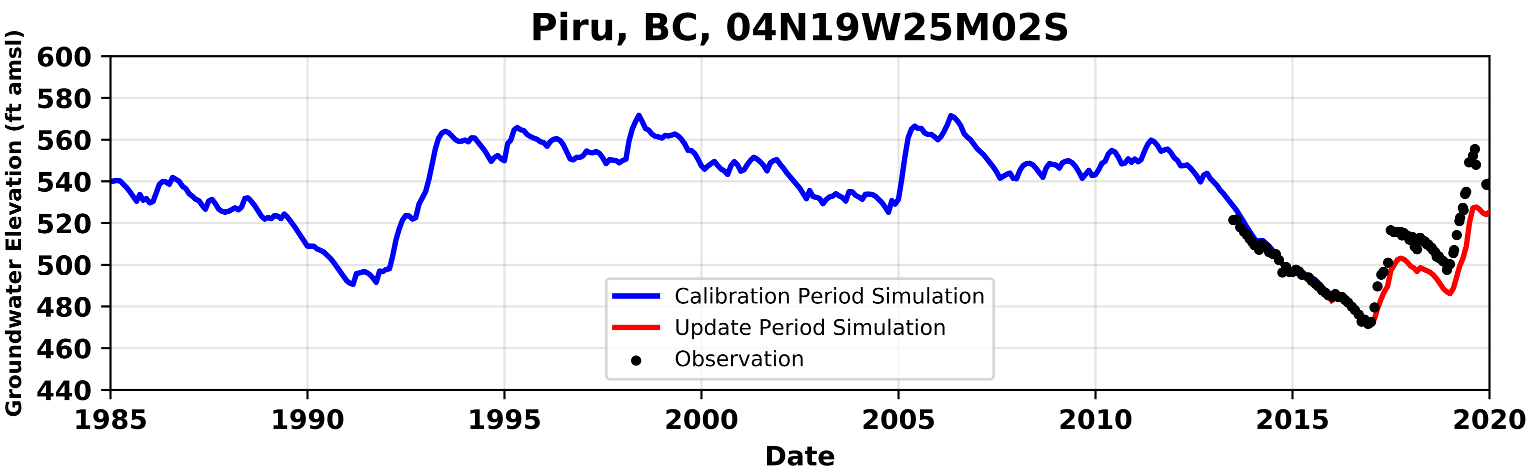


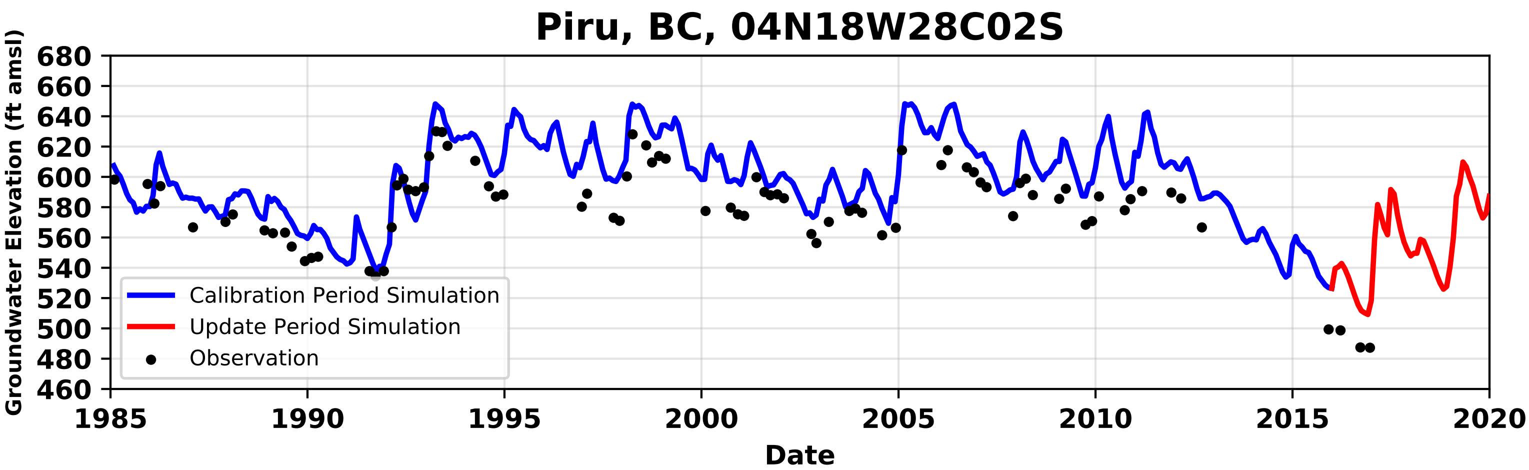
Piru, B, 04N19W25K02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

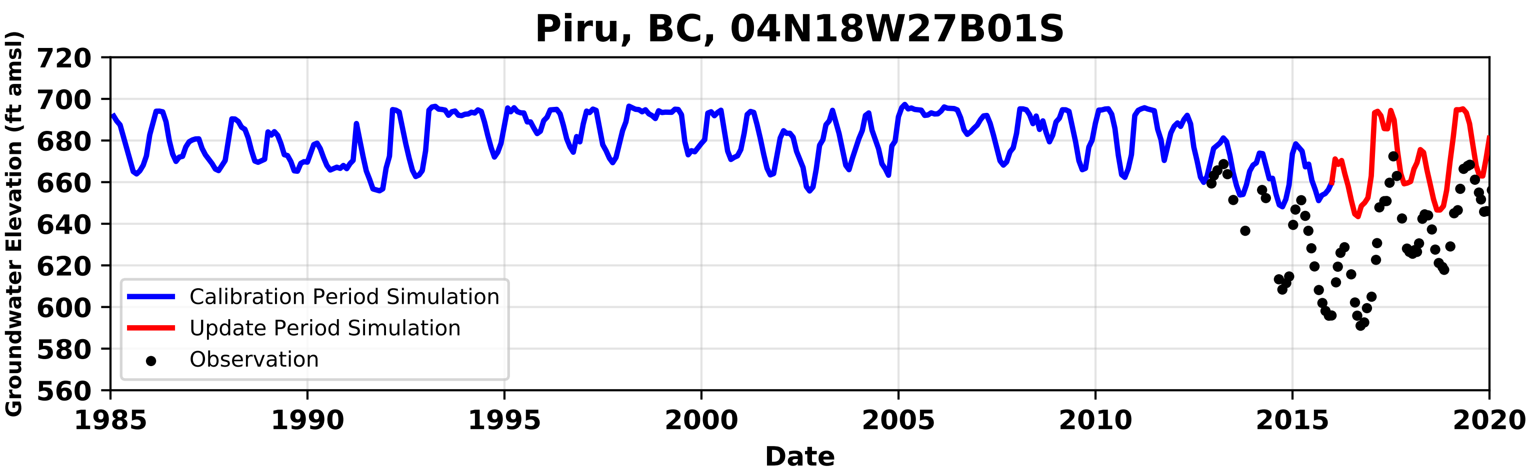

Piru, B, 04N18W29M02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

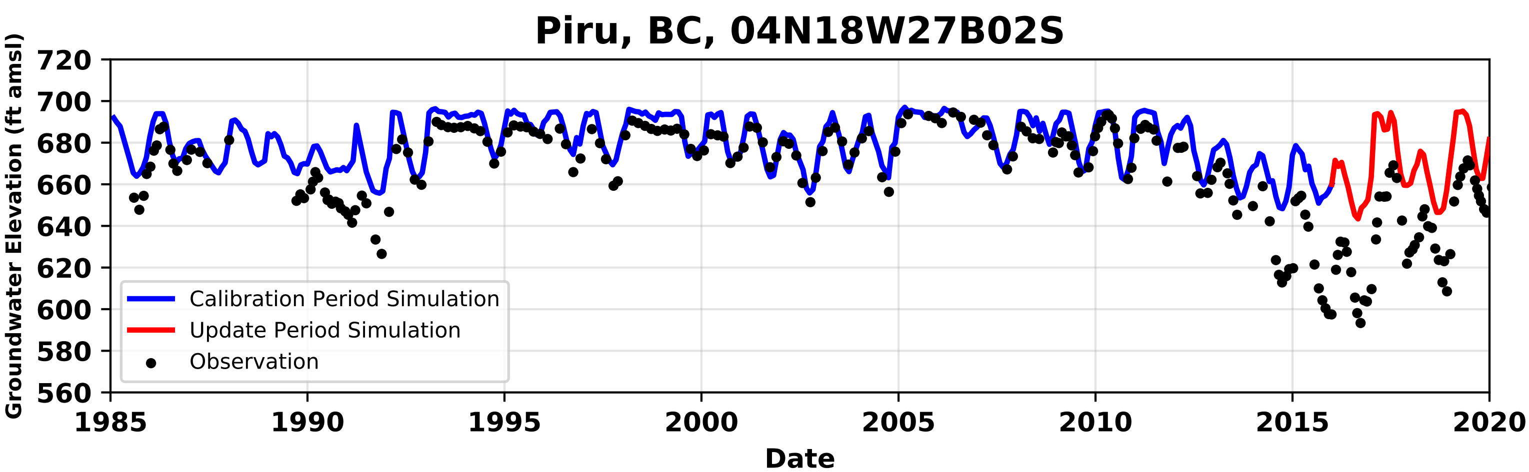

Piru, B, 04N19W26P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

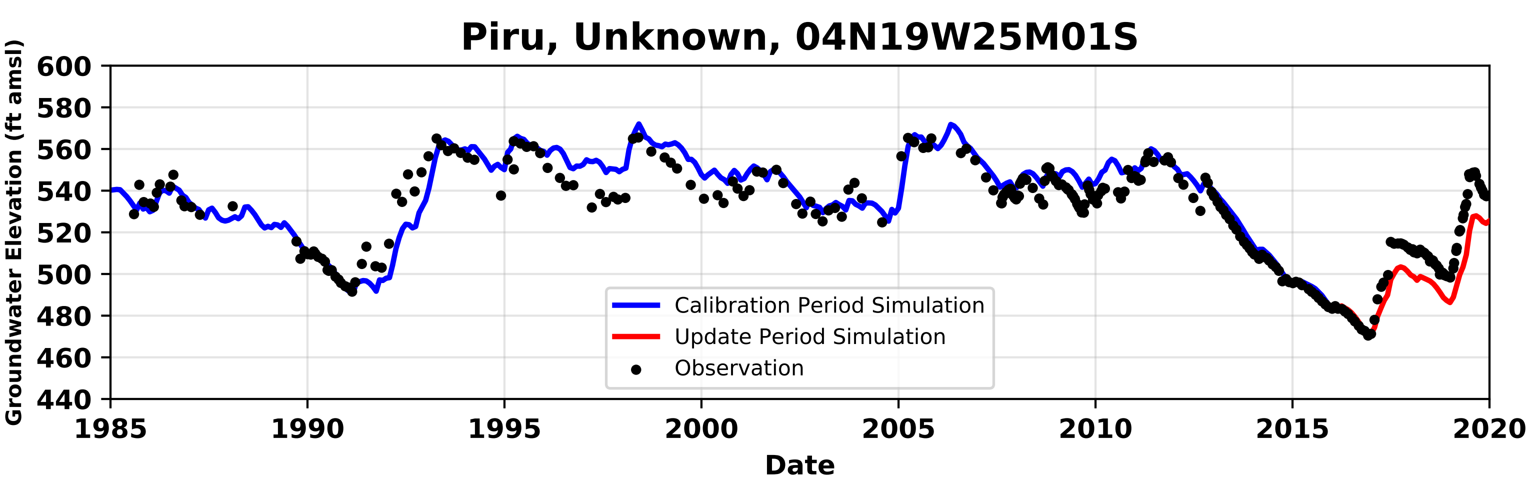

Piru, B, 04N18W29P01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

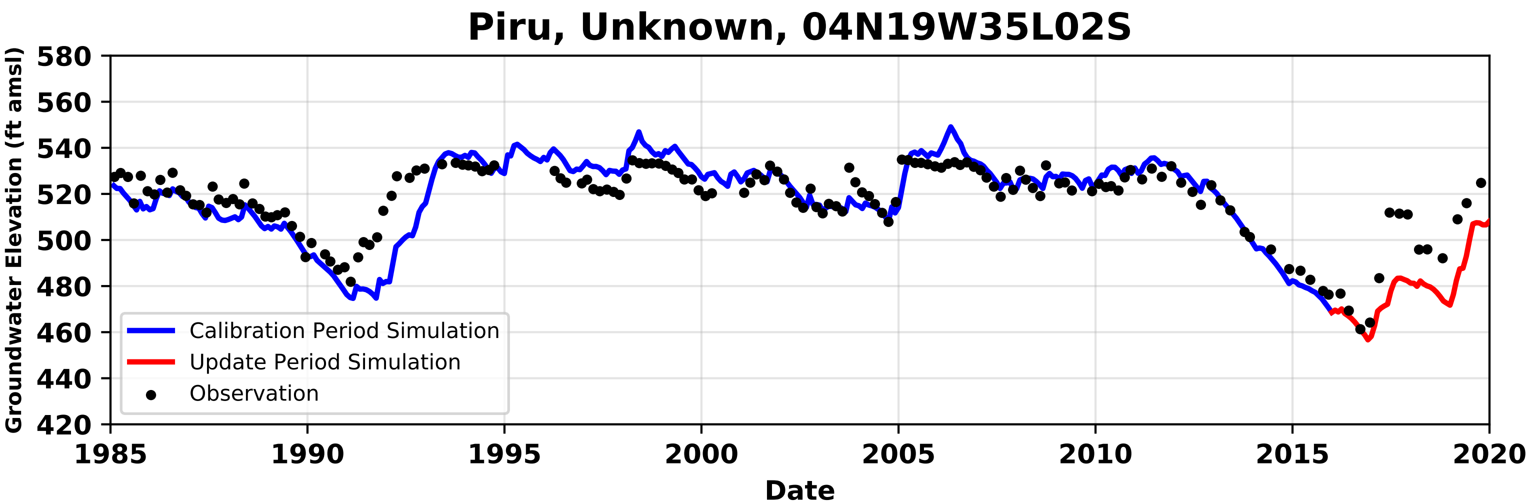

Piru, BC, 04N19W25M02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, BC, 04N18W28C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

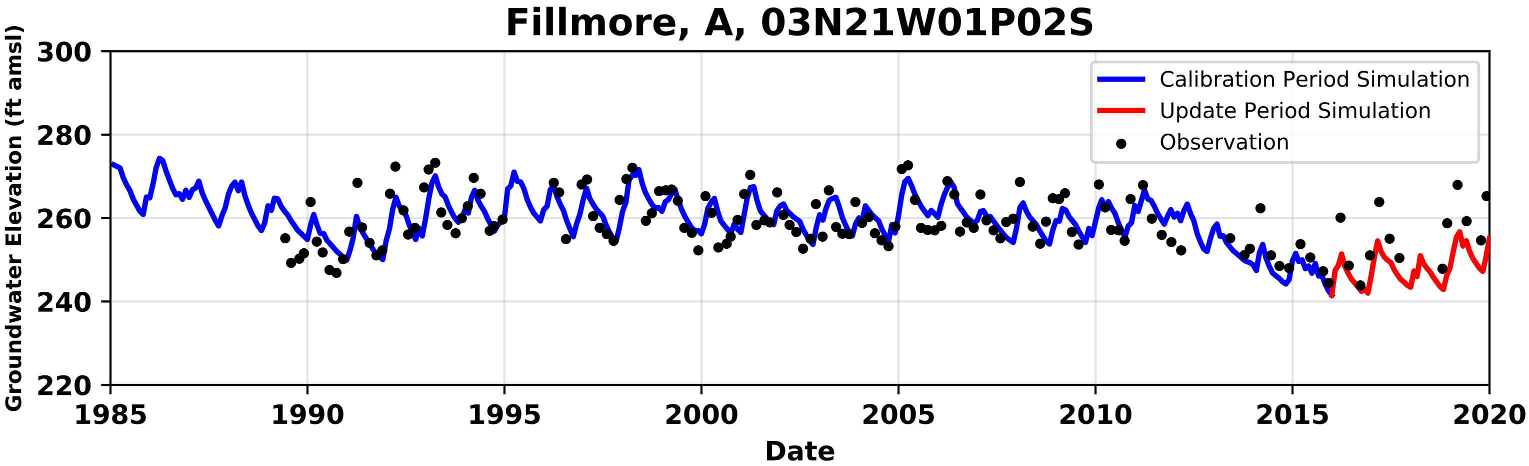

Piru, BC, 04N18W27B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

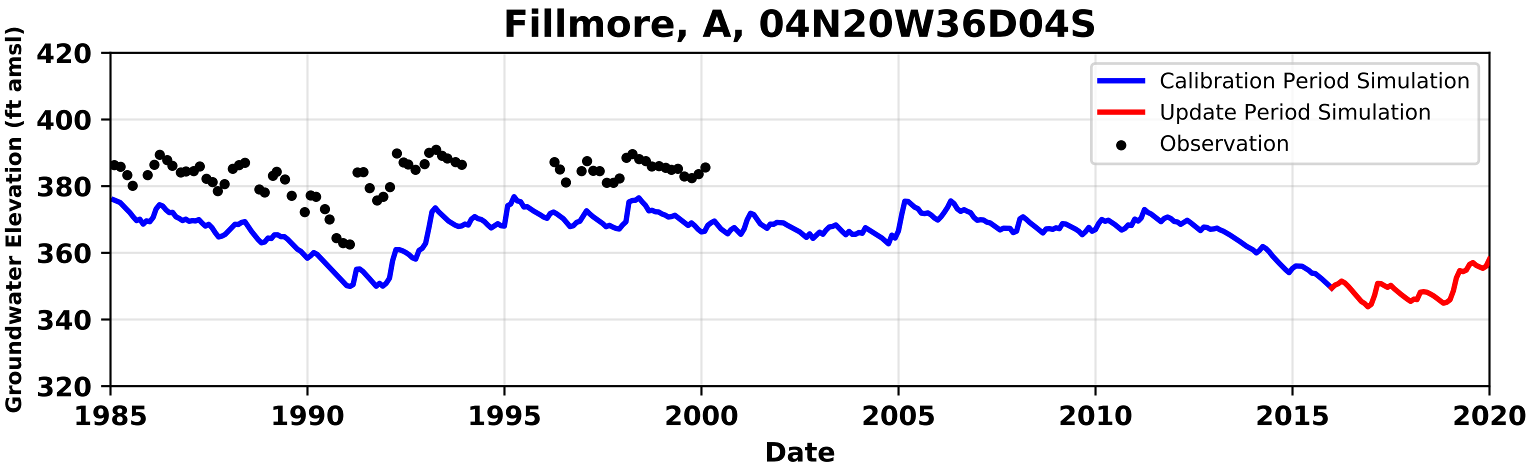

Piru, BC, 04N18W27B02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

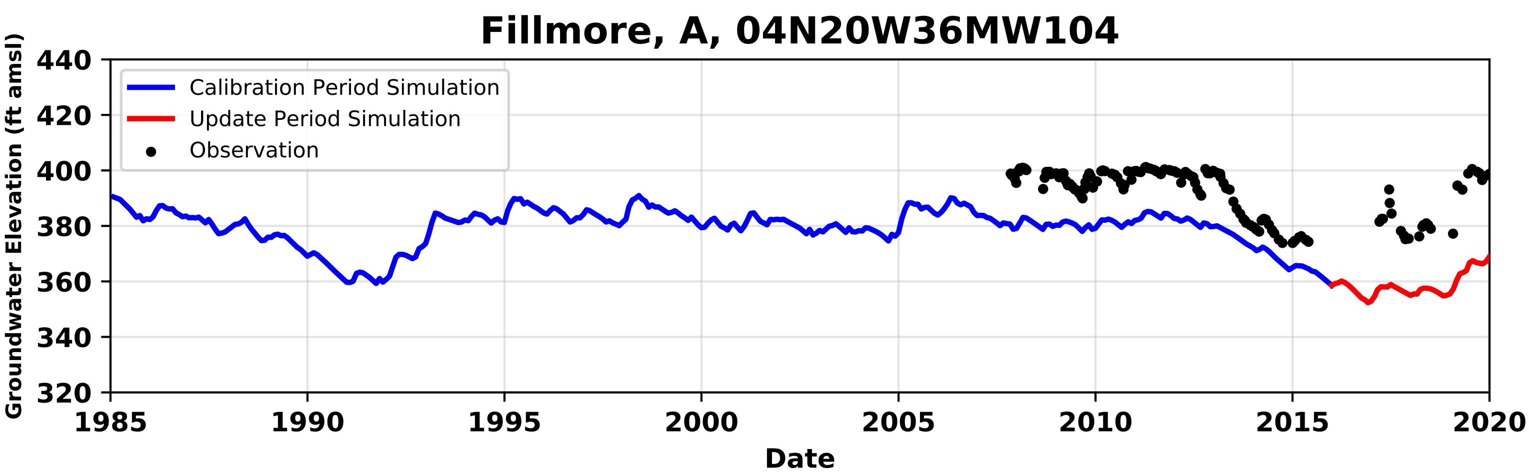

Piru, Unknown, 04N19W25M01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

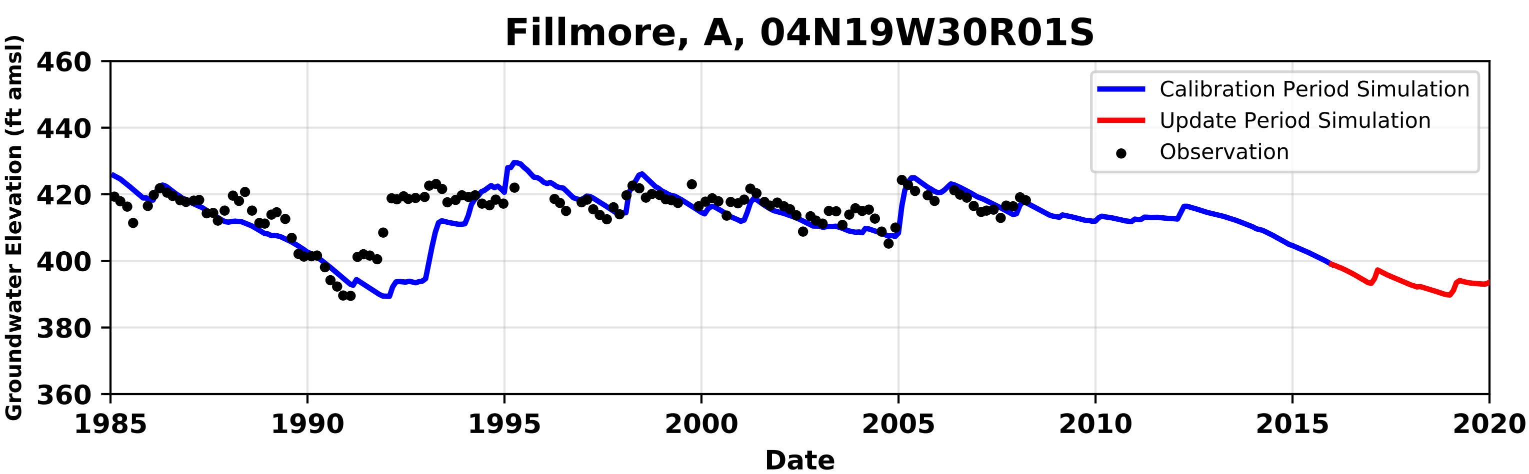


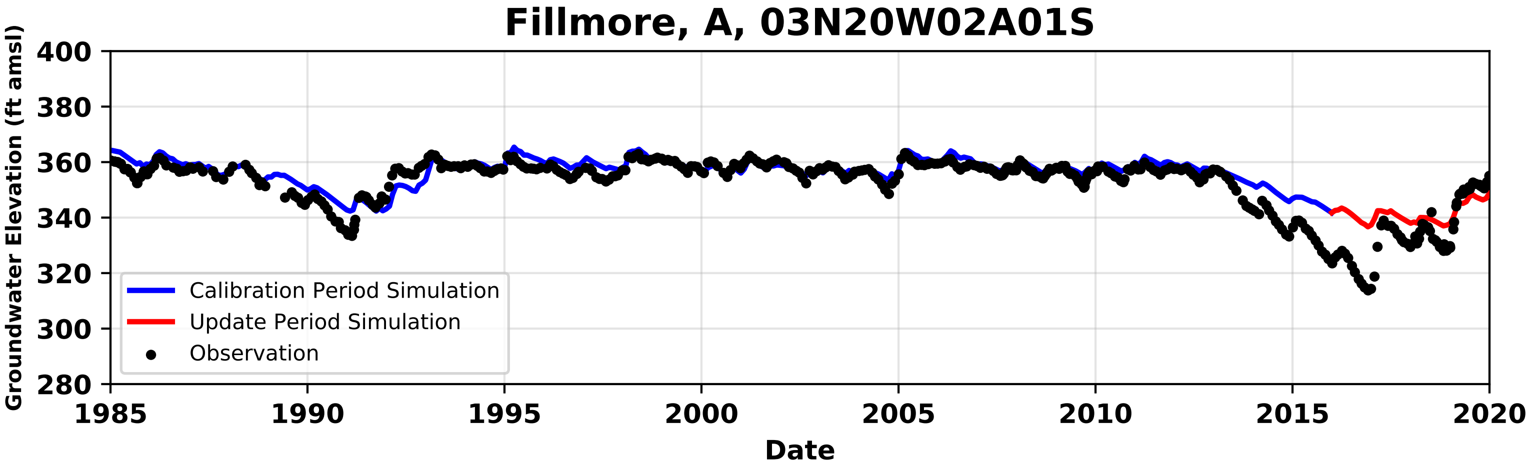
Piru, Unknown, 04N19W35L02S
Groundwater Elevation (ft amsl)
580
560
540
520
500
480
460
440
420
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, A, 03N21W01P02S
Groundwater Elevation (ft amsl)
300
280
260
240
220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

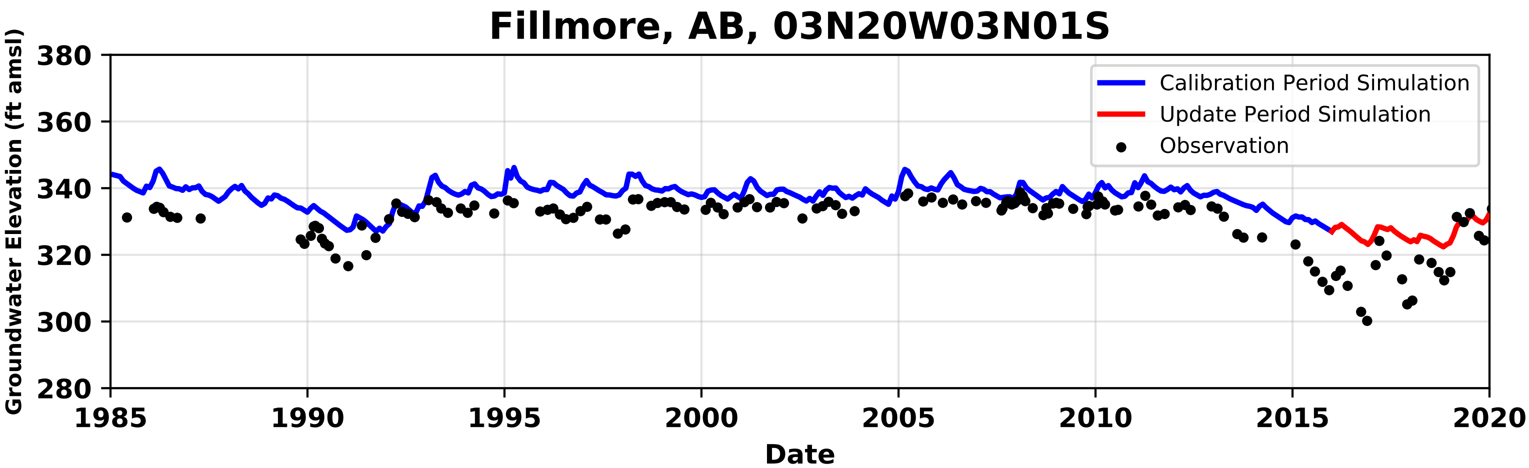

Fillmore, A, 04N20W36D04S
Groundwater Elevation (ft amsl)
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, A, 04N20W36MW104
Groundwater Elevation (ft amsl)
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

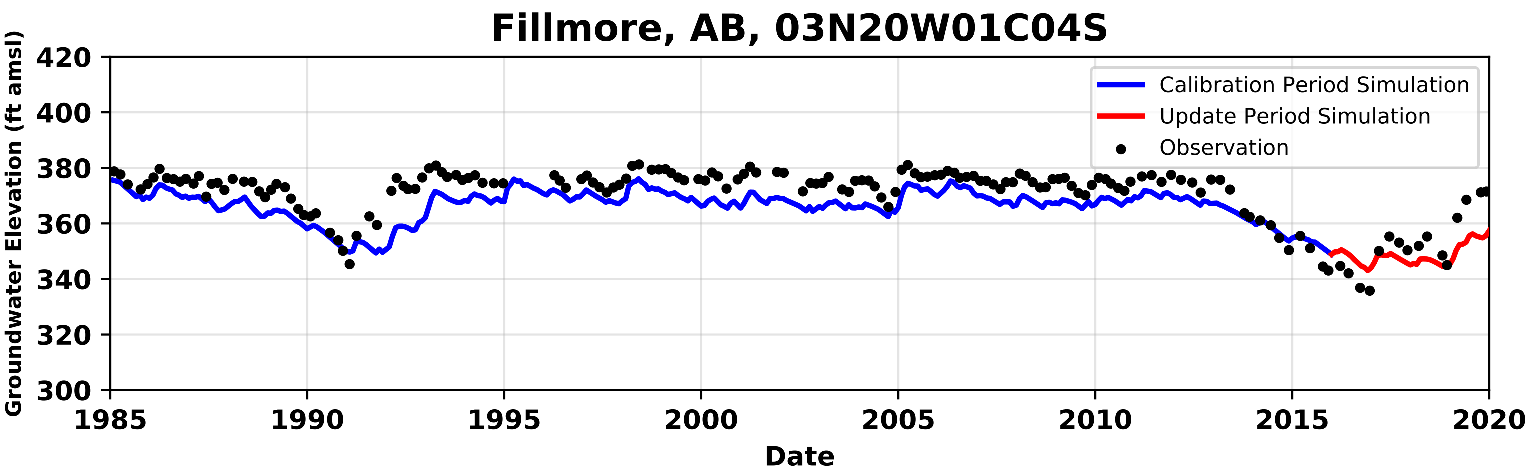

Fillmore, A, 04N19W30R01S
Groundwater Elevation (ft amsl)
460
440
420
400
380
360
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



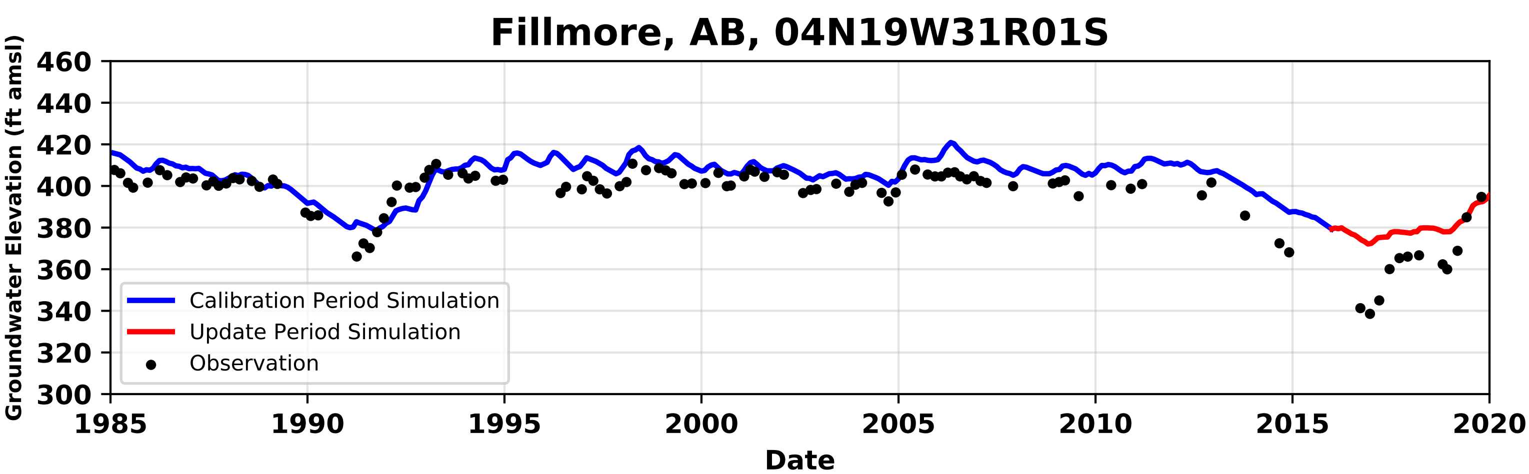
Fillmore, A, 03N20W02A01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



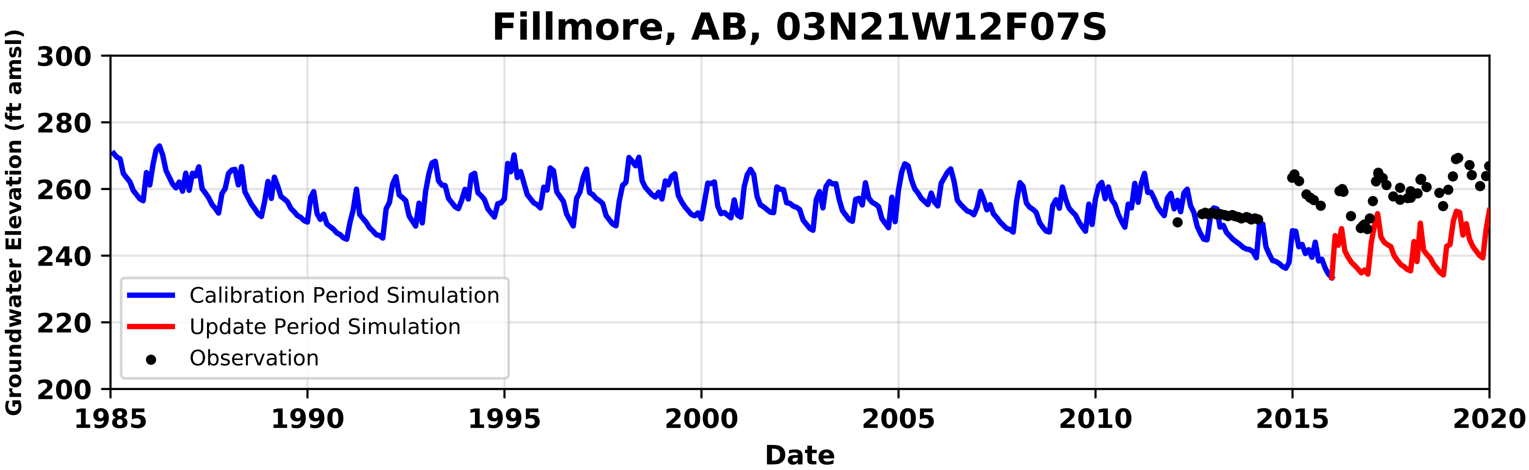
Fillmore, AB, 03N20W03N01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

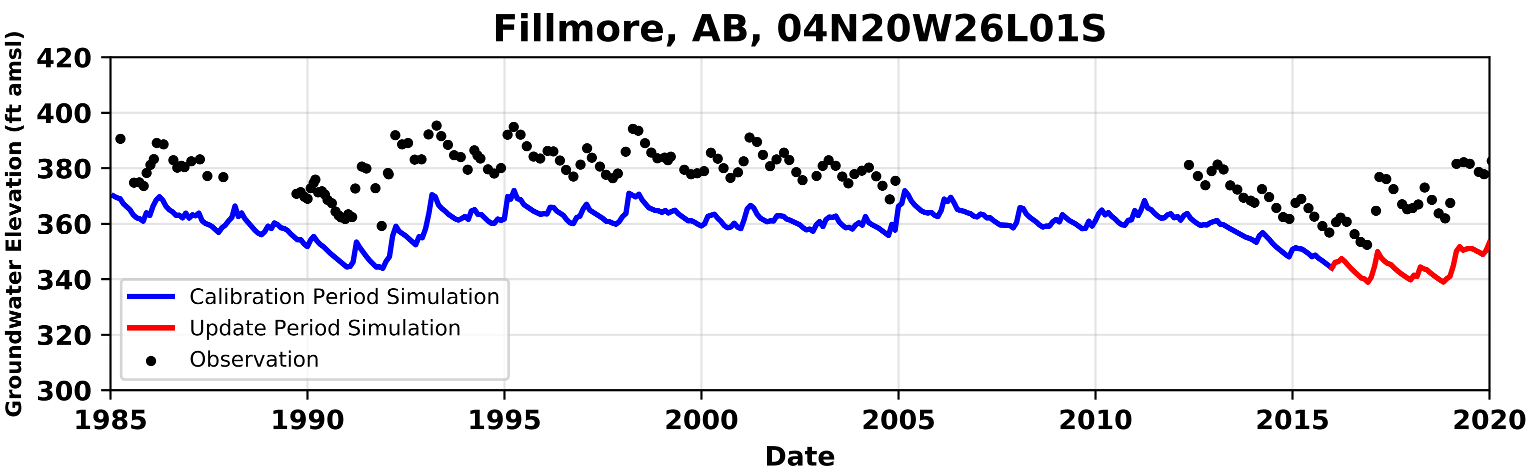


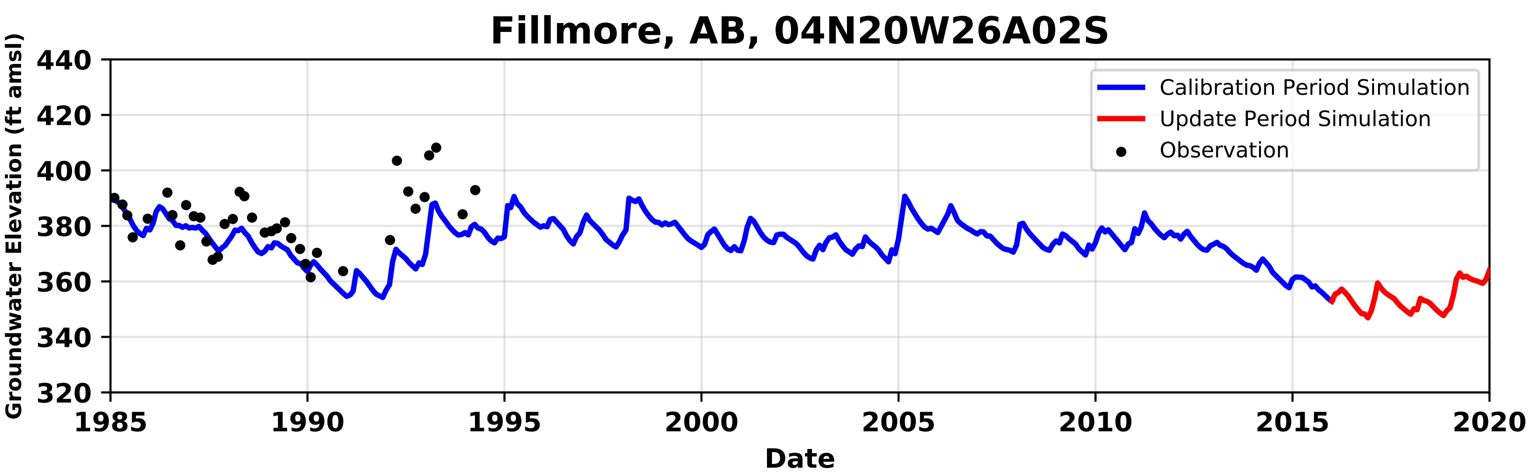
Fillmore, AB, 03N20W01C04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

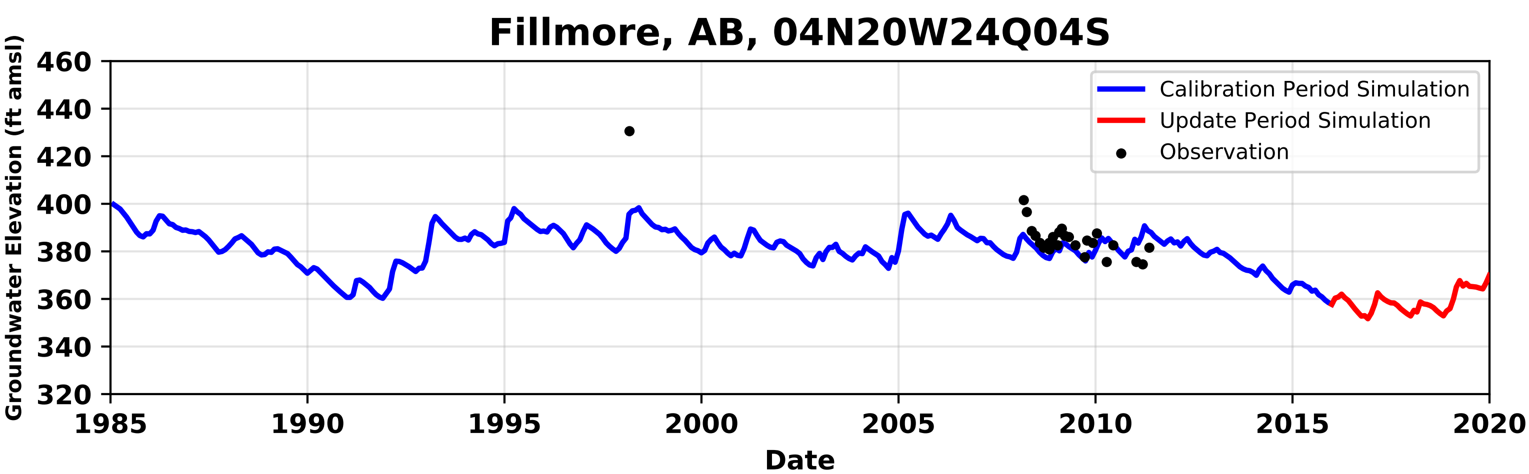


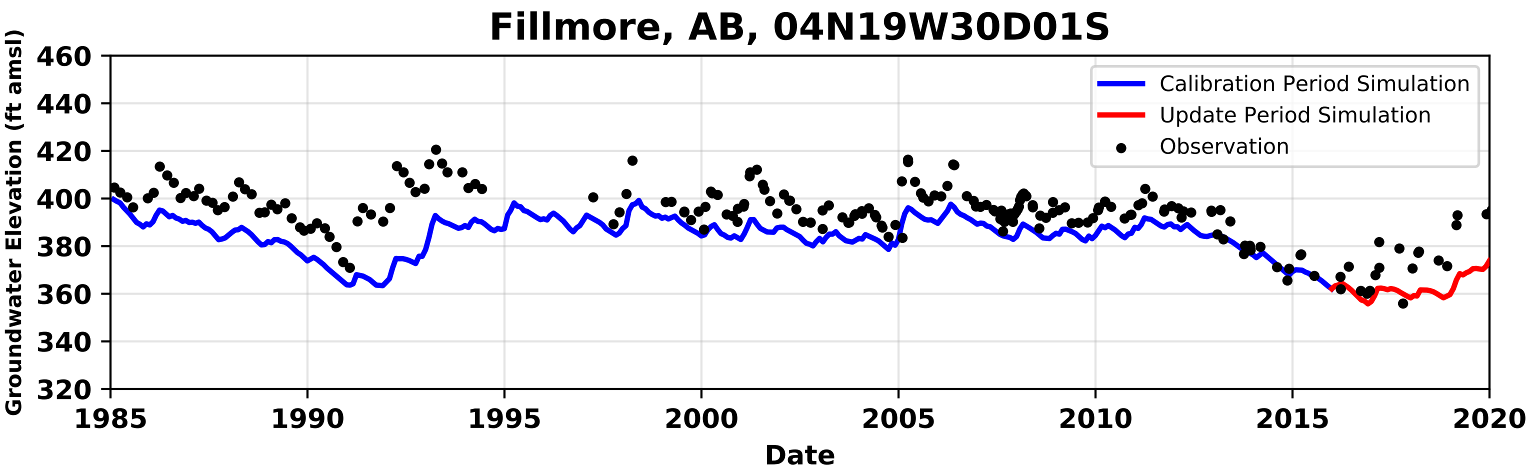
Fillmore, AB, 04N19W31R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, AB, 03N21W12F07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
300
280
260
240
220
200
1985
1990
1995
2000
2005
2010
2015
2020

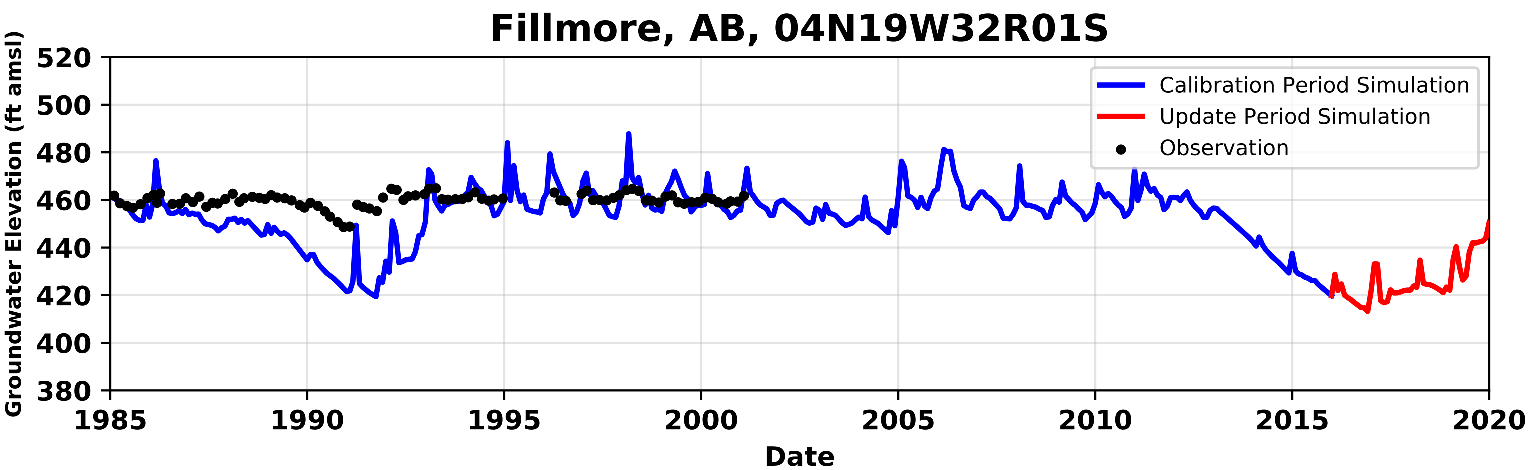

Fillmore, AB, 04N20W26L01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
420
400
380
360
340
320
300
1985
1990
1995
2000
2005
2010
2015
2020


Fillmore, AB, 04N20W26A02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020

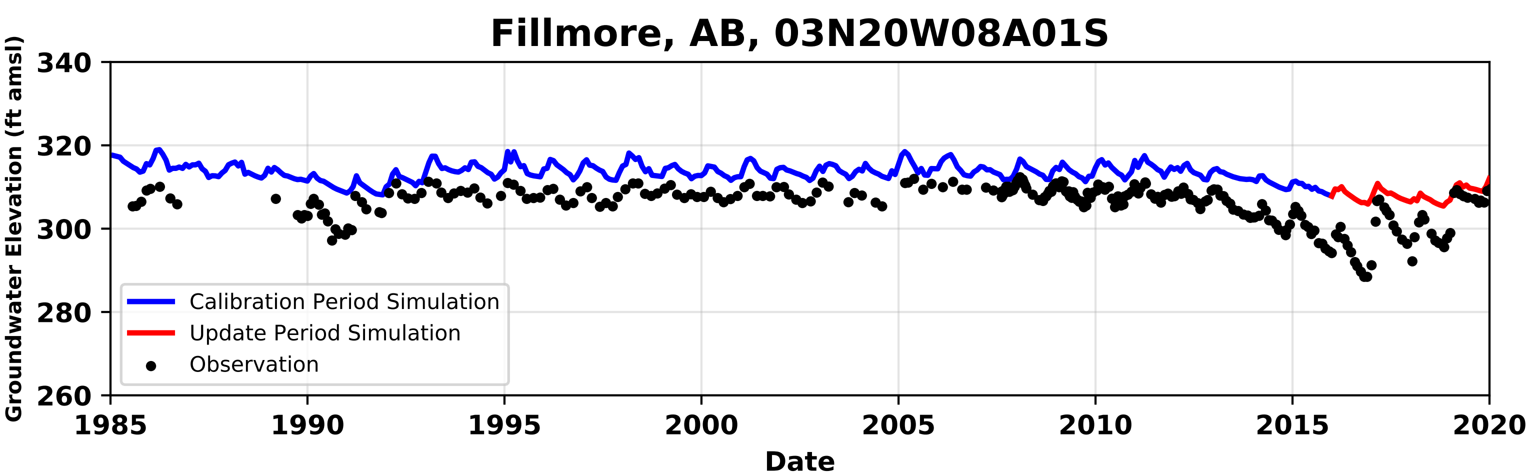

Fillmore, AB, 04N20W24Q04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
460
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020



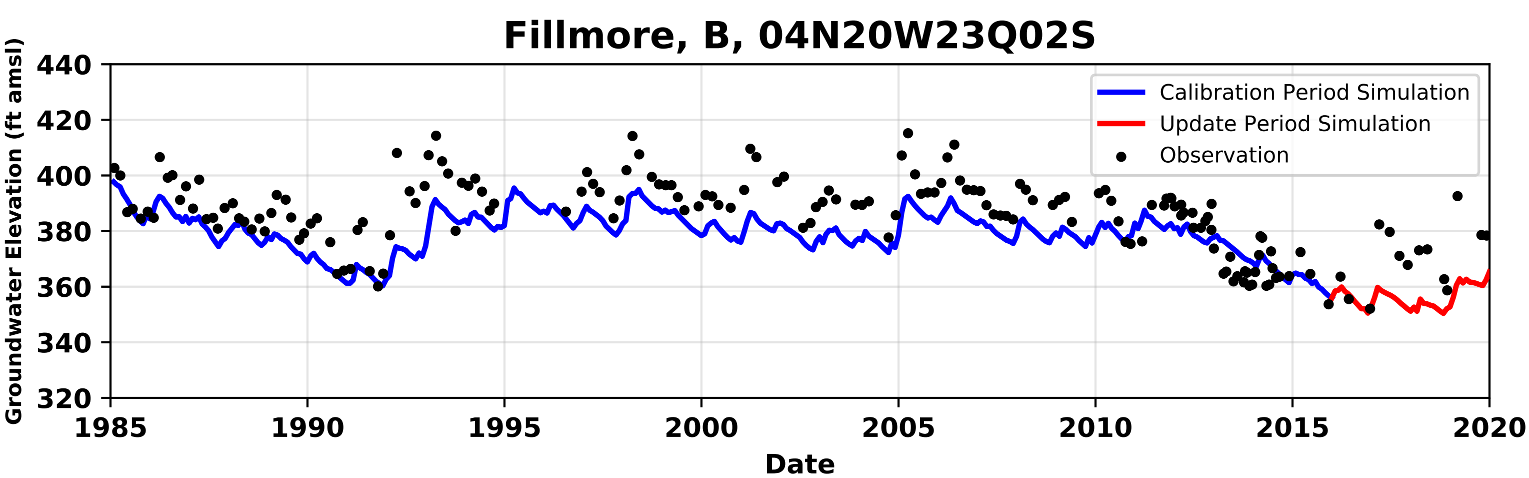
Fillmore, AB, 04N19W30D01S
Groundwater Elevation (ft amsl)
460
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



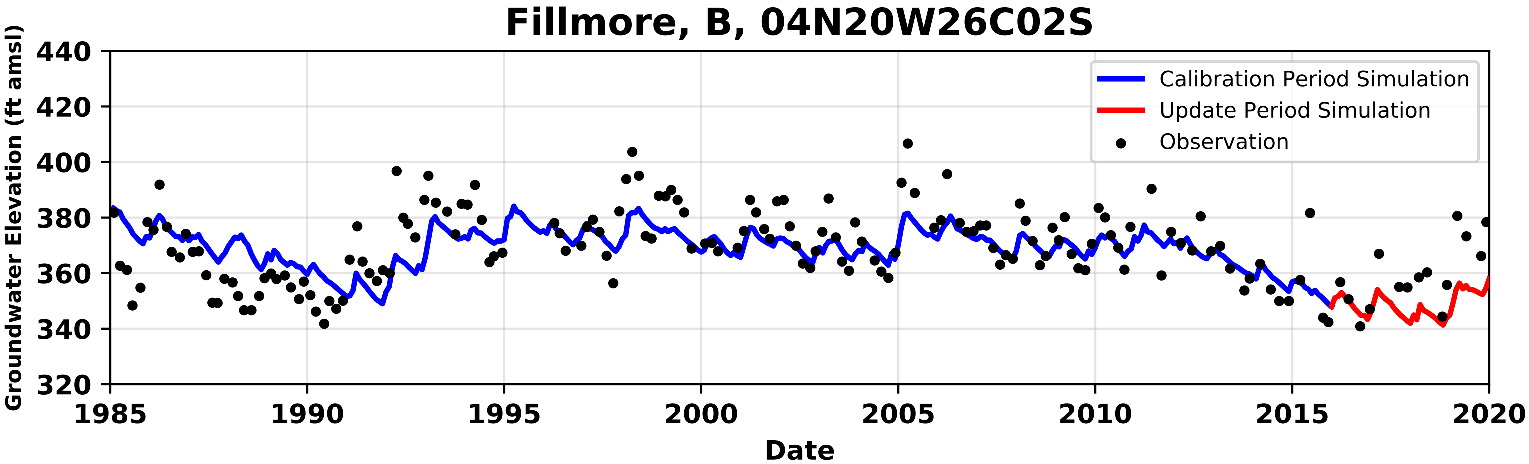
Fillmore, AB, 04N19W32R01S
Groundwater Elevation (ft amsl)
520
500
480
460
440
420
400
380
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

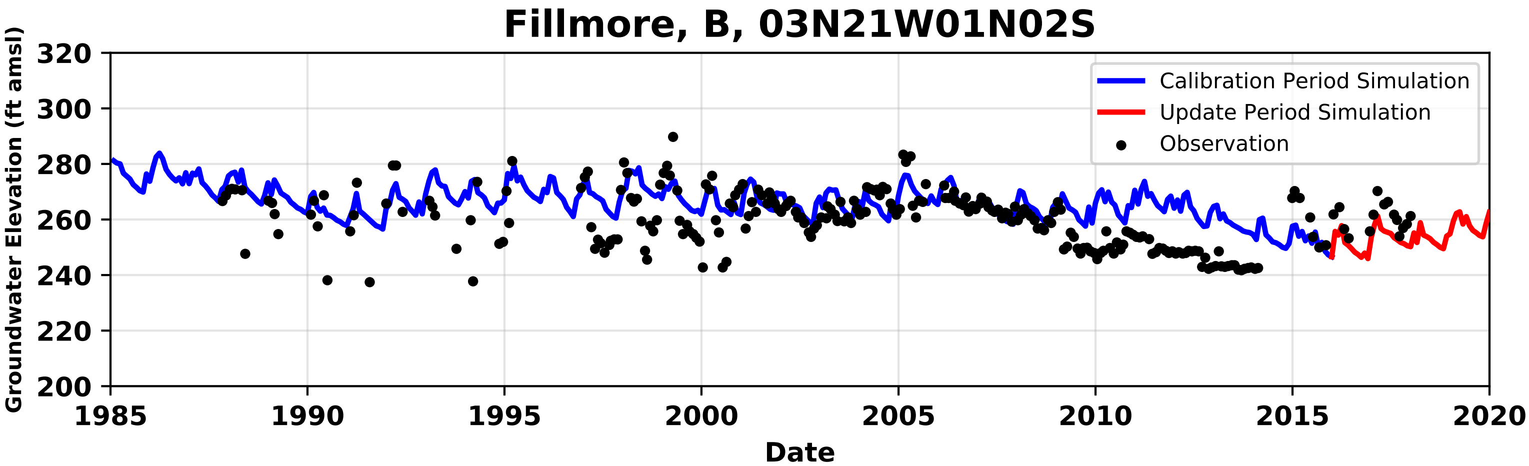


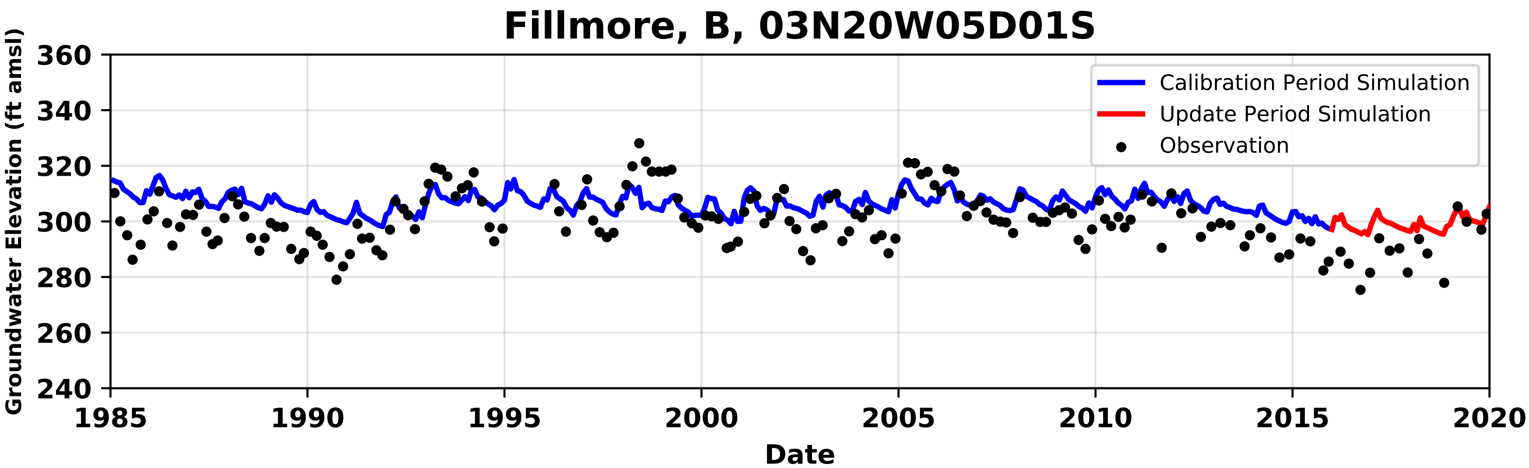
Fillmore, AB, 03N20W08A01S
Groundwater Elevation (ft amsl)
340
320
300
280
260
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

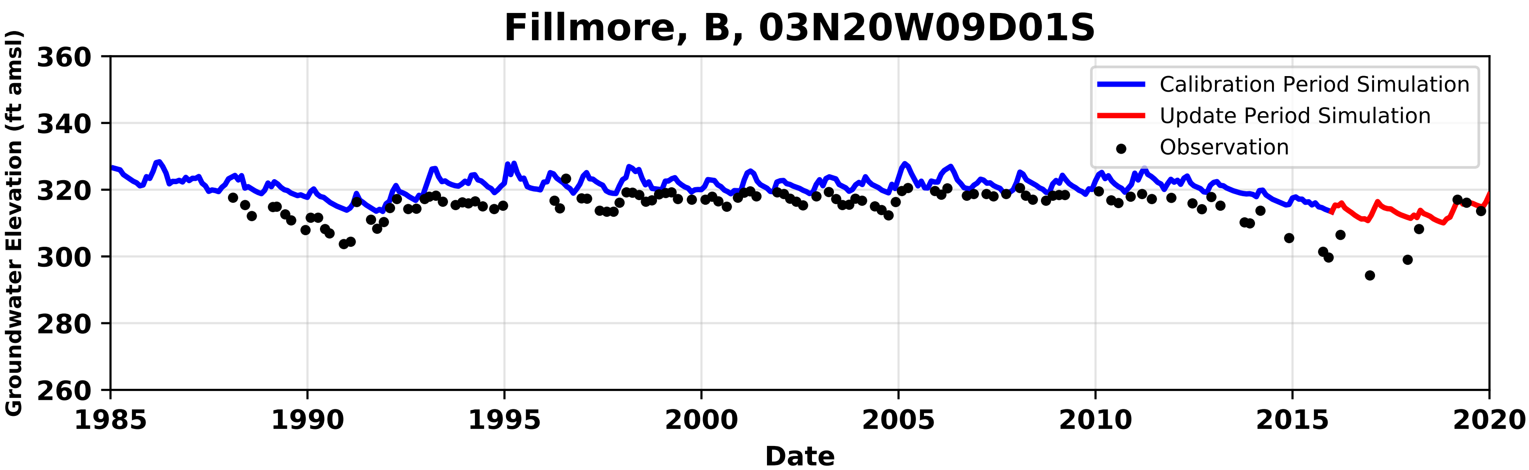


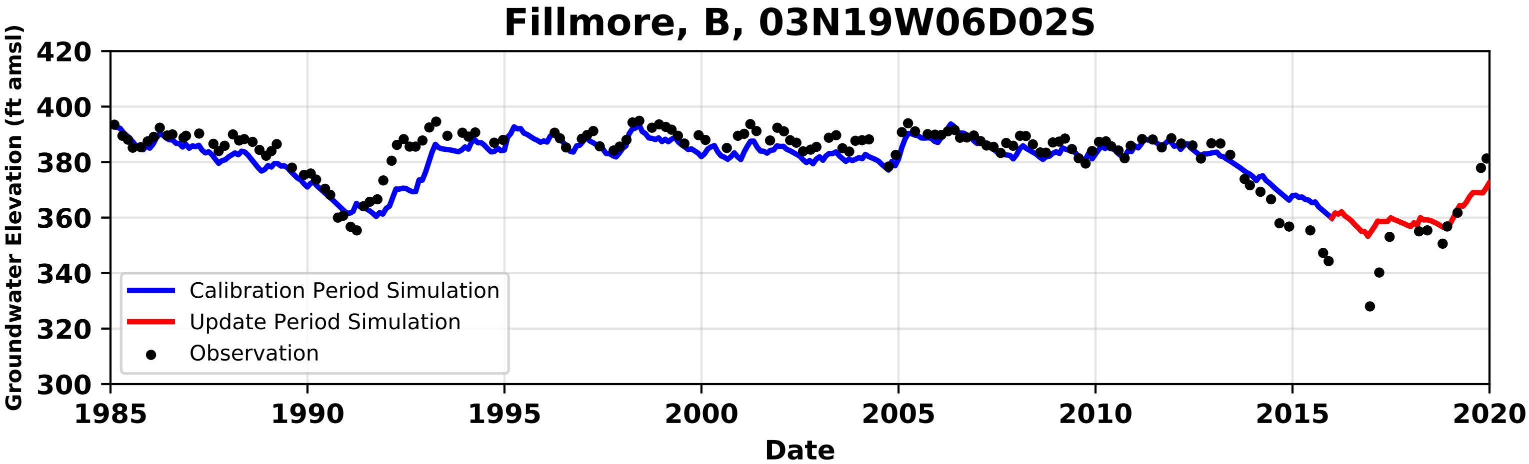
Fillmore, B, 04N20W23Q02S
Groundwater Elevation (ft amsl)
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

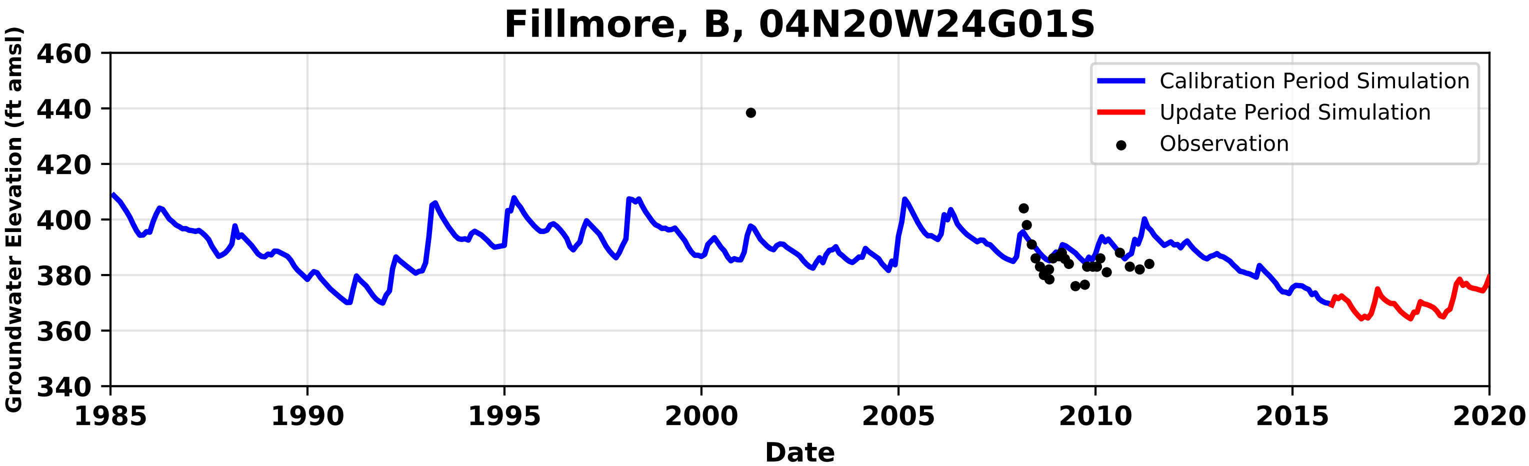

Fillmore, B, 04N20W26C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

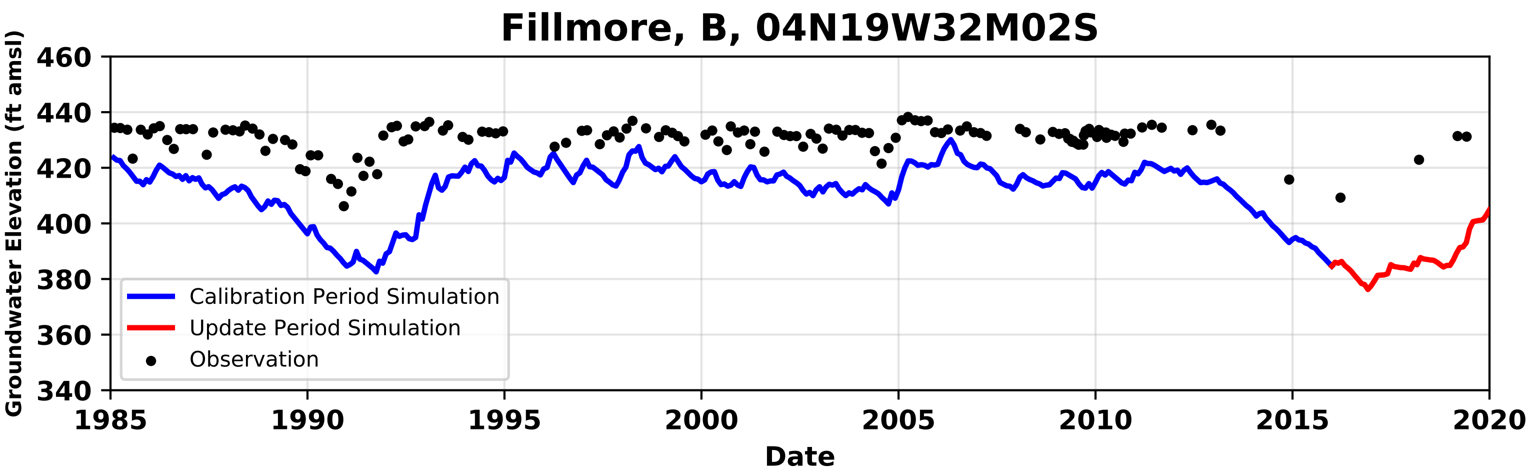

Fillmore, B, 03N21W01N02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

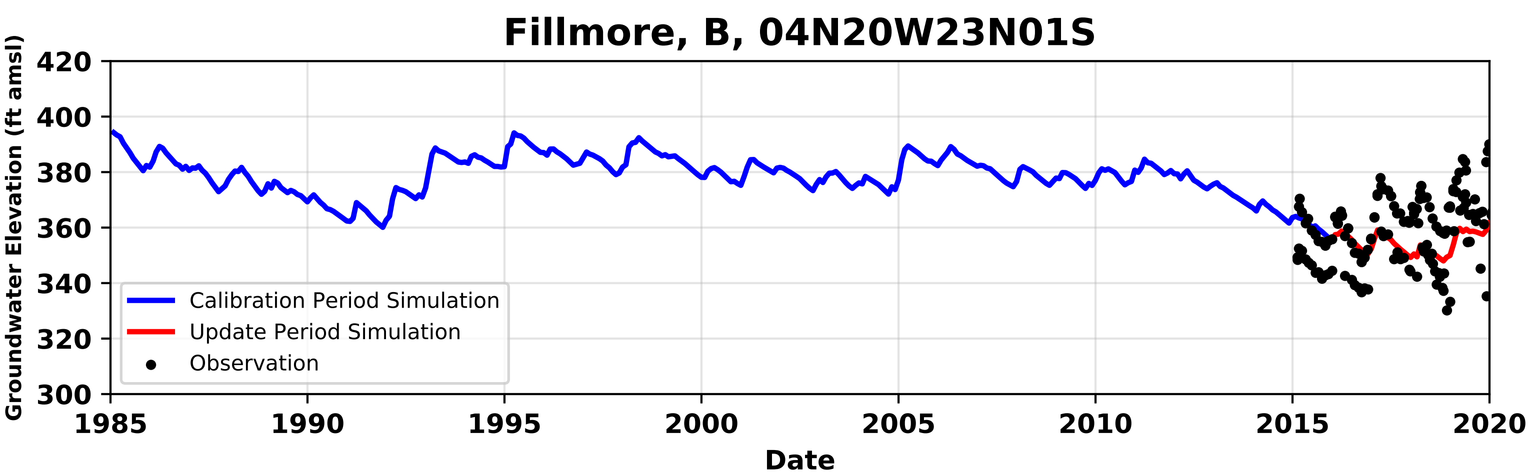

Fillmore, B, 03N20W05D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

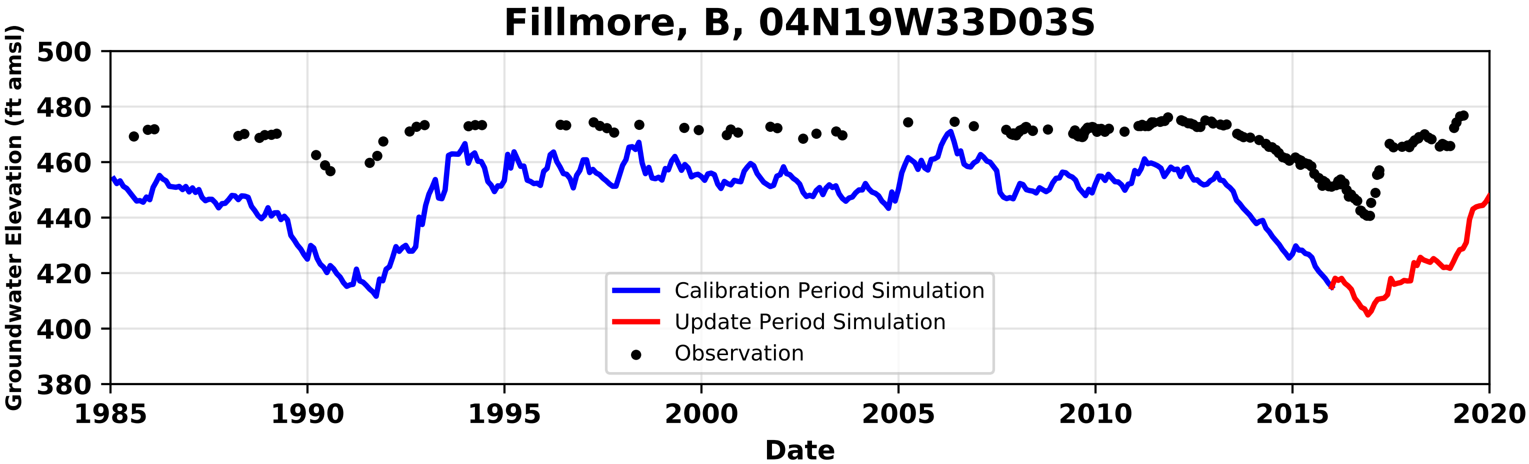

Fillmore, B, 03N20W09D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

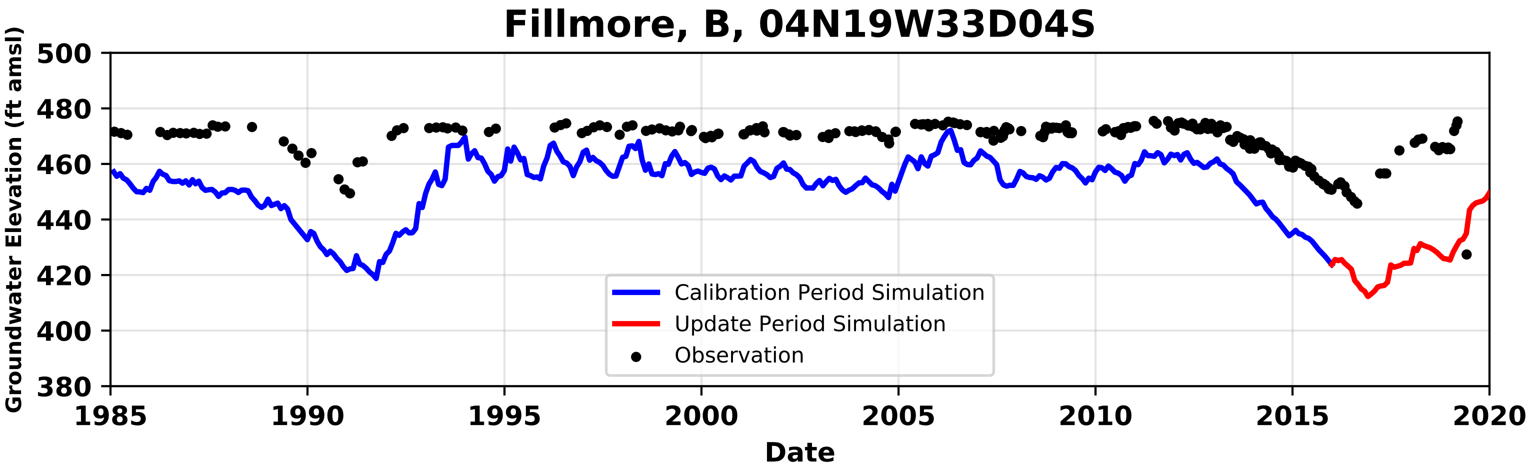

Fillmore, B, 03N19W06D02S
Groundwater Elevation (ft amsl)
420
400
380
360
340
320
300
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

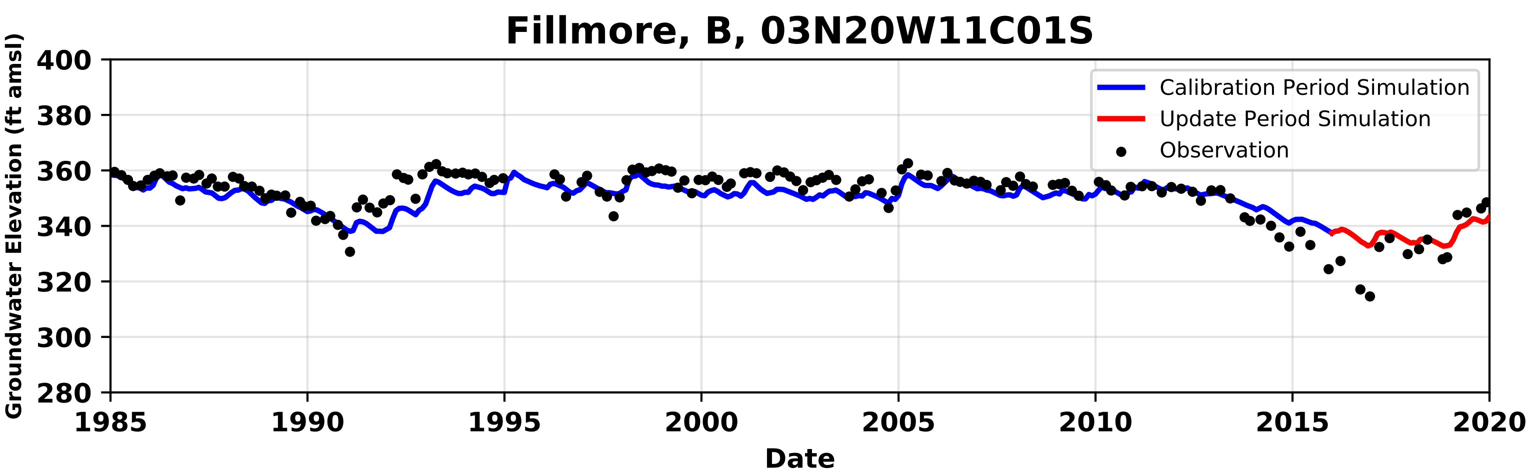

Fillmore, B, 04N20W24G01S
Groundwater Elevation (ft amsl)
460
440
420
400
380
360
340
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

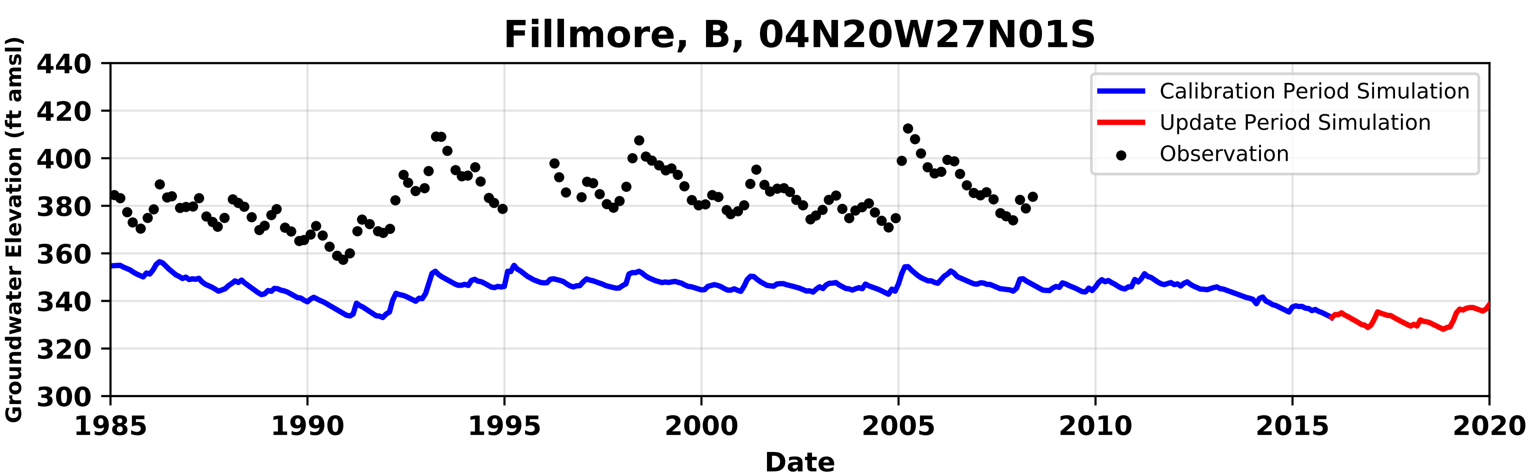

Fillmore, B, 04N19W32M02S
Groundwater Elevation (ft amsl)
460
440
420
400
380
360
340
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, B, 04N20W23N01S
Groundwater Elevation (ft amsl)
420
400
380
360
340
320
300
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

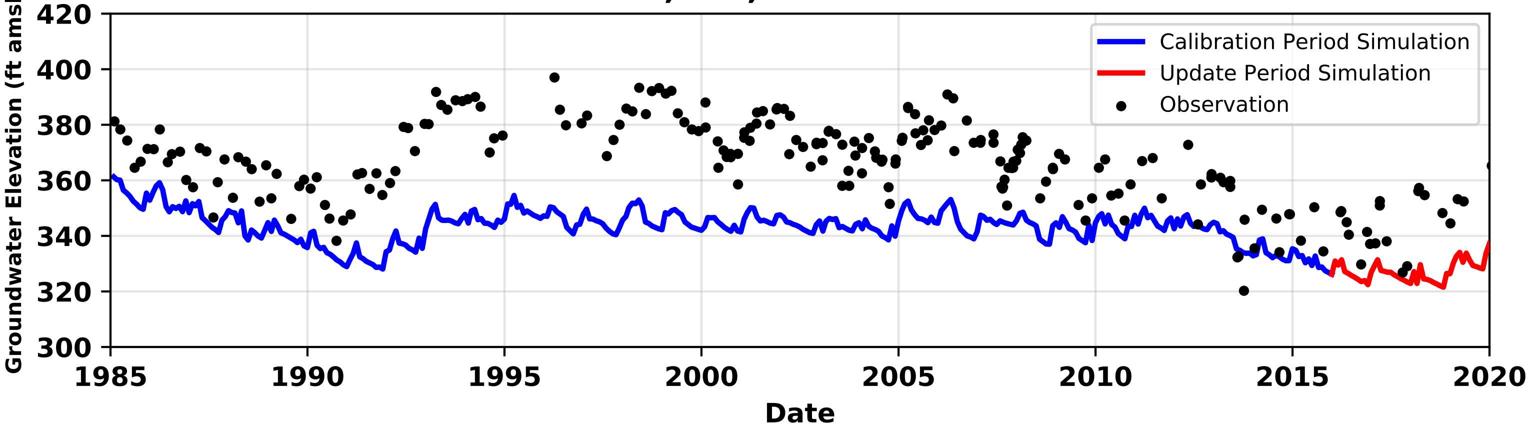

Fillmore, B, 04N19W33D03S
Groundwater Elevation (ft amsl)
500
480
460
440
420
400
380
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, B, 04N19W33D04S
Groundwater Elevation (ft amsl)
500
480
460
440
420
400
380
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

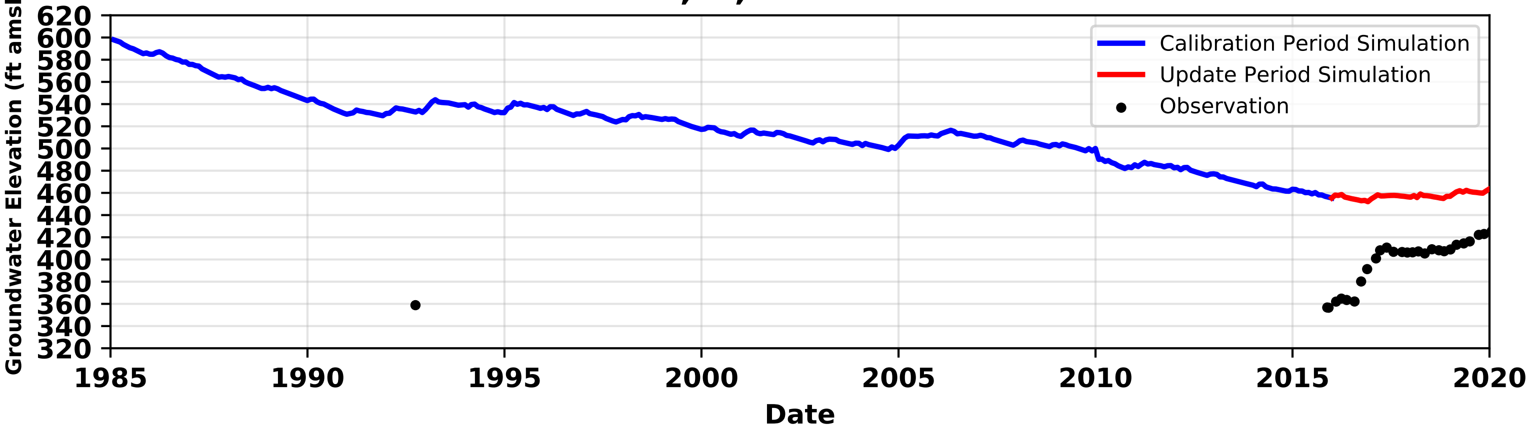

Fillmore, B, 03N20W11C01S
Groundwater Elevation (ft amsl)
400
380
360
340
320
300
280
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, B, 04N20W27N01S
Groundwater Elevation (ft amsl)
440
420
400
380
360
340
320
300
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

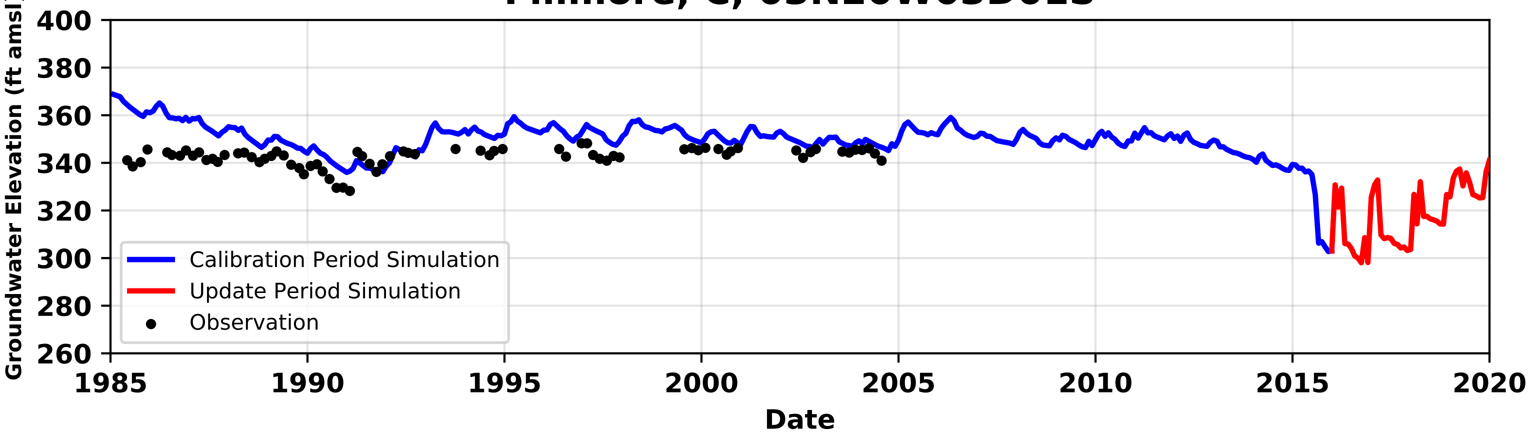
Fillmore, BC, 04N20W33C03S



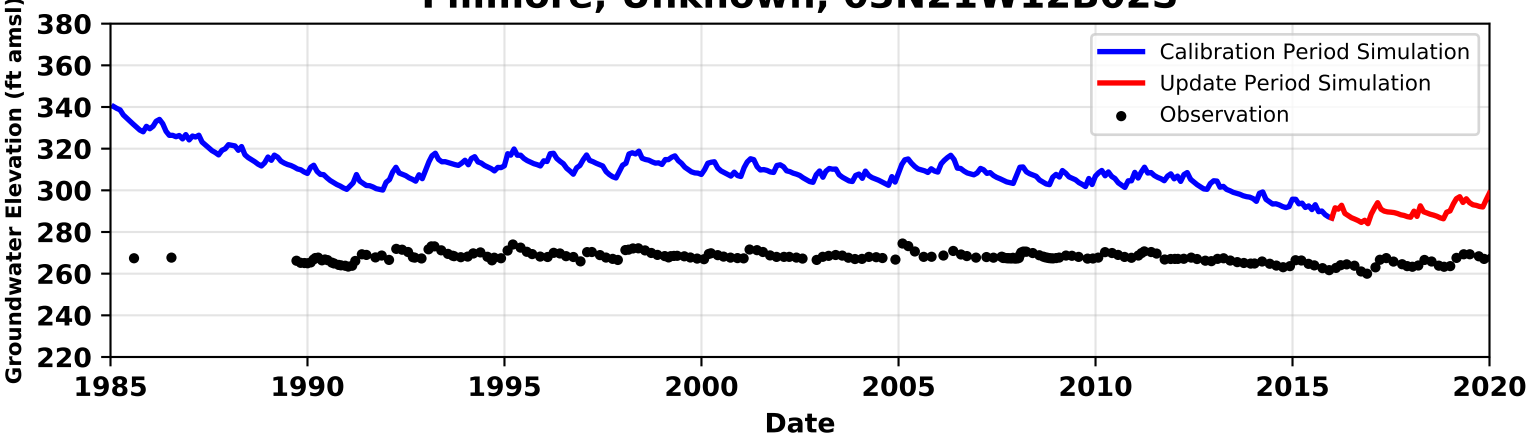
Fillmore, C, 04N20W31L01S

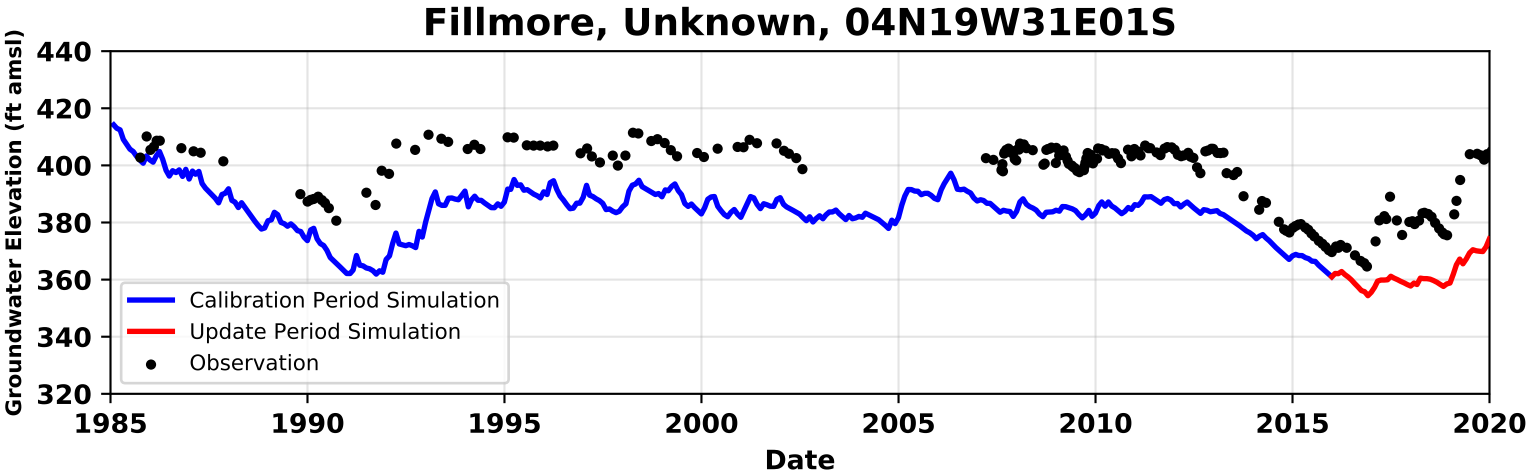


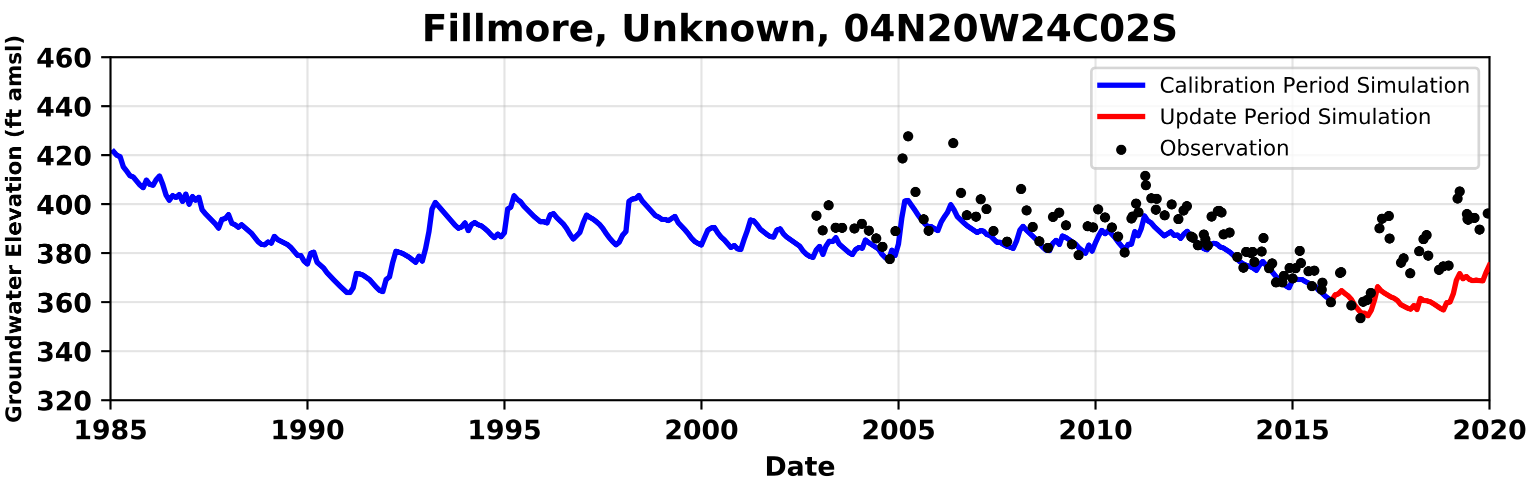
Fillmore, C, 03N20W03D01S

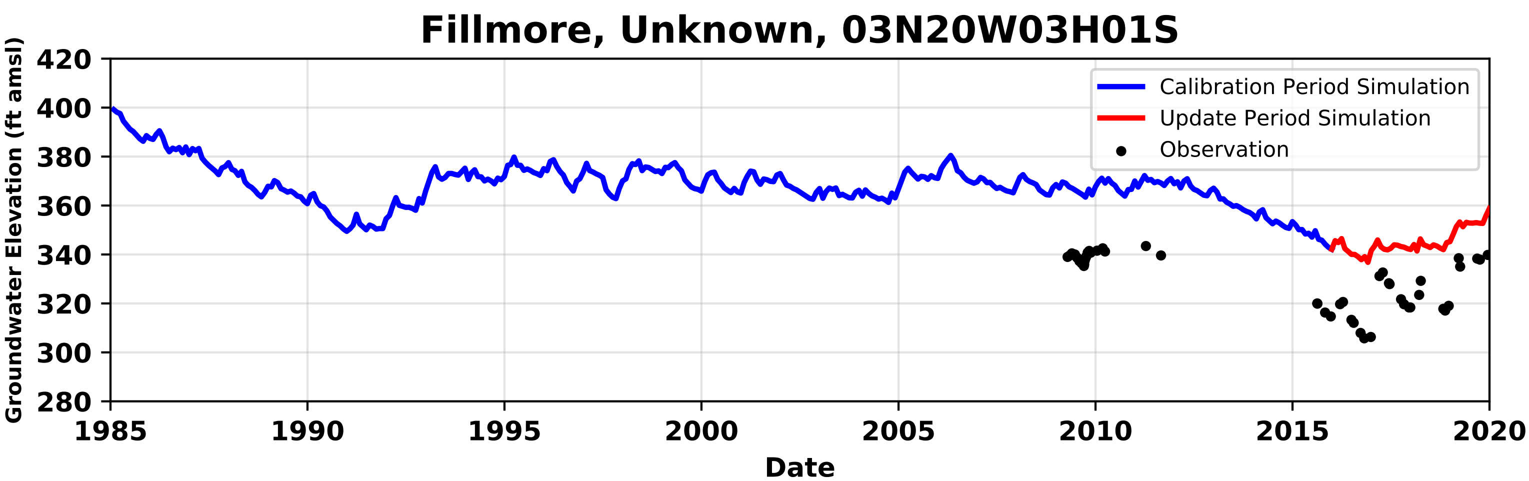


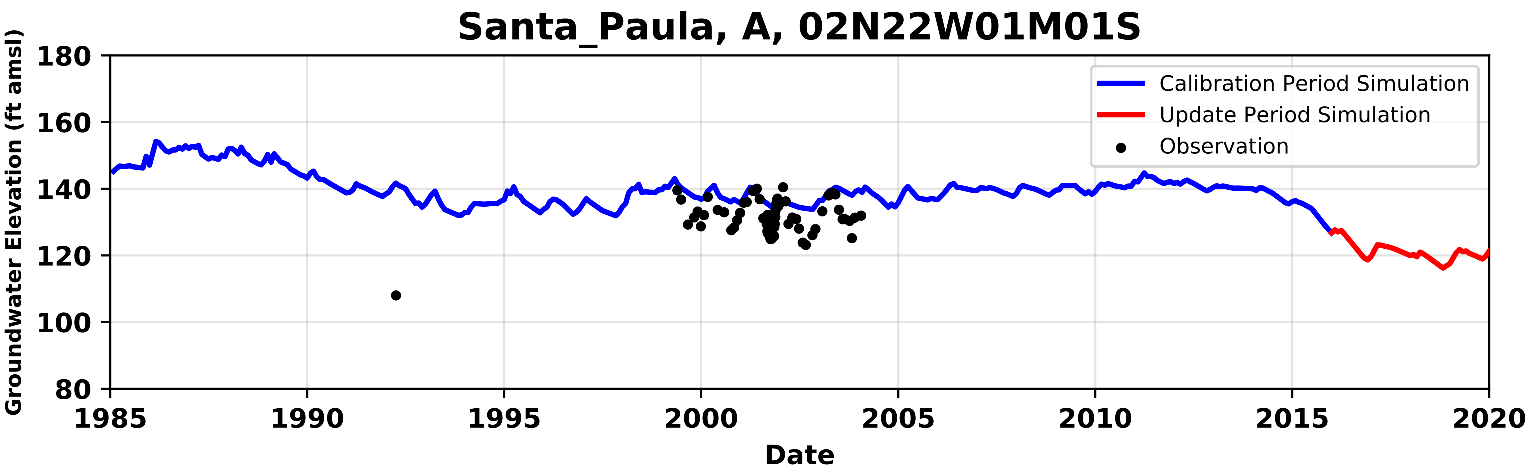
Fillmore, Unknown, 03N21W12B02S

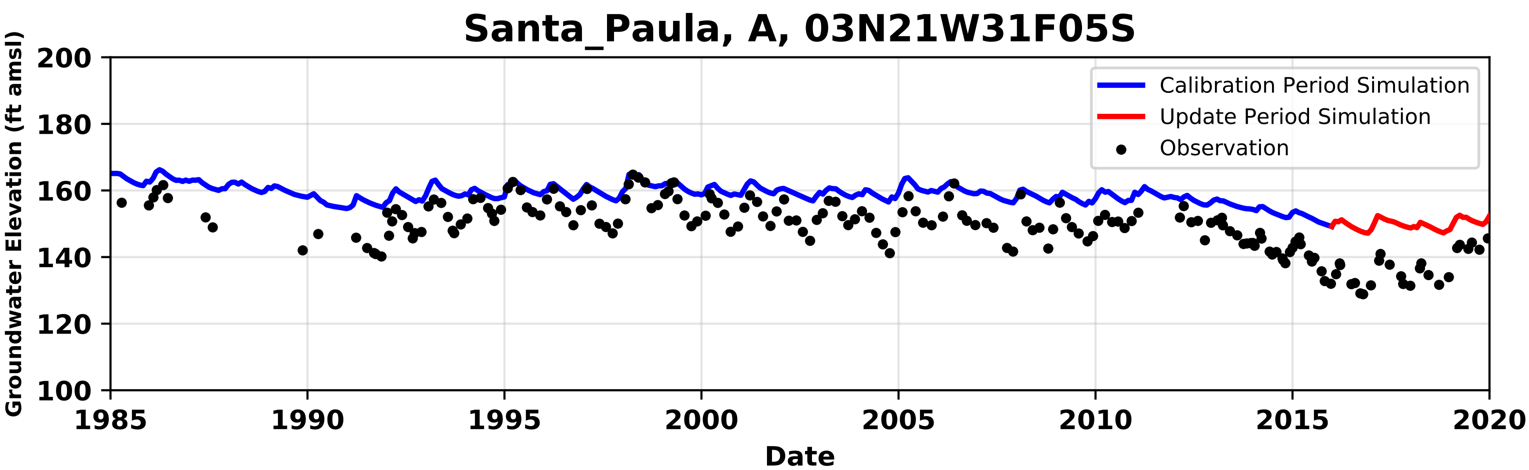


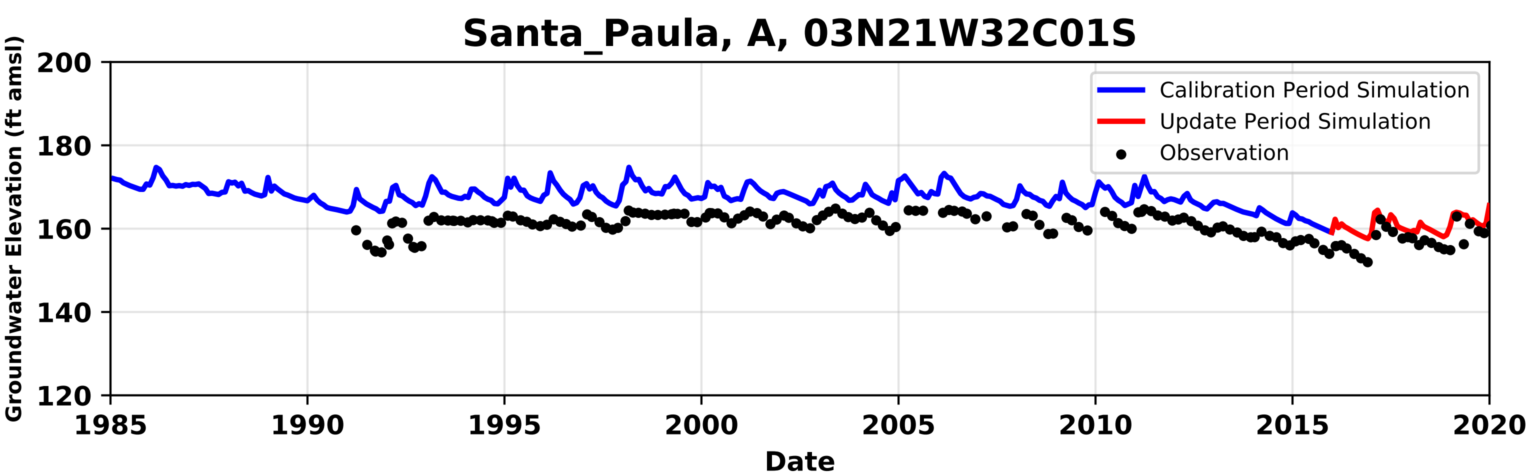

Fillmore, Unknown, 04N19W31E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020

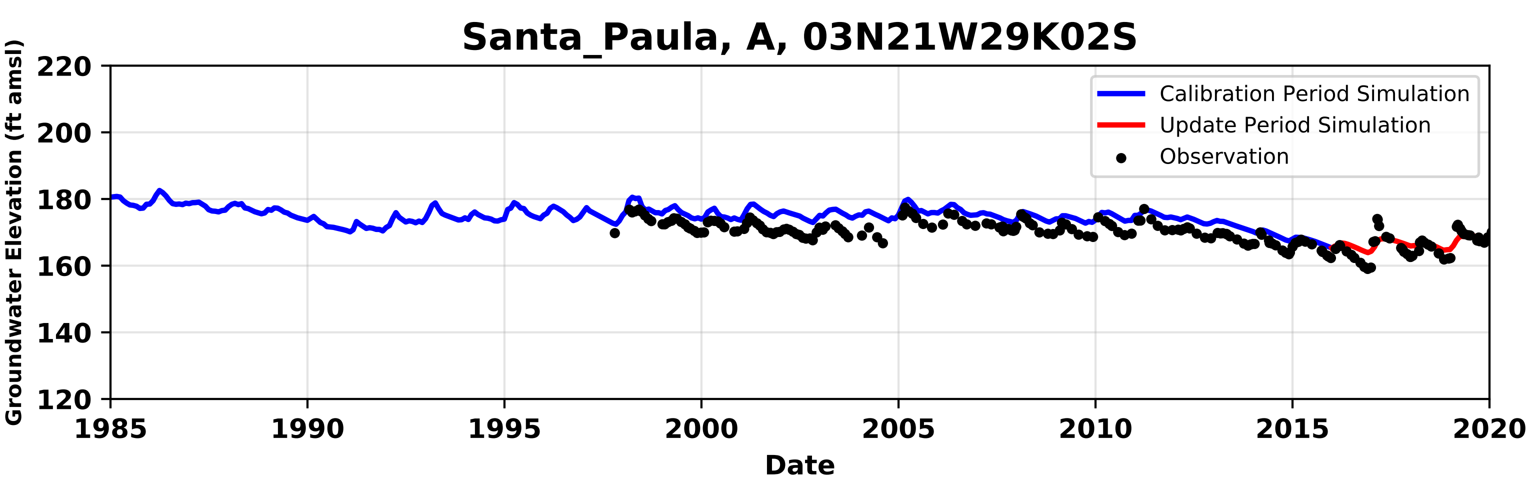

Fillmore, Unknown, 04N20W24C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
460
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020

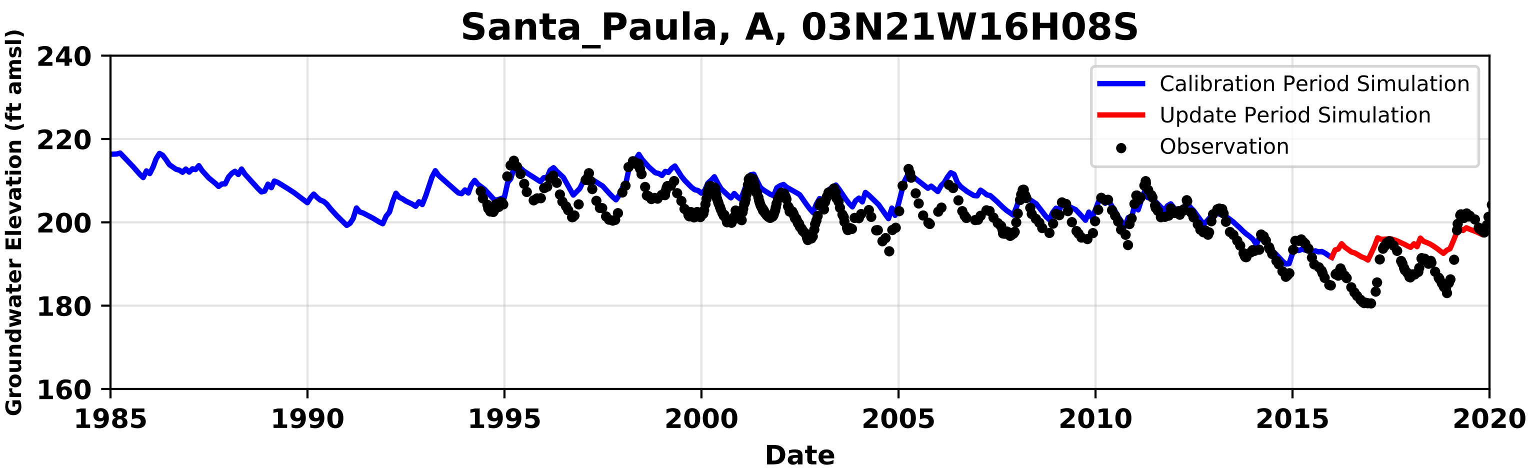

Fillmore, Unknown, 03N20W03H01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
420
400
380
360
340
320
300
280
1985
1990
1995
2000
2005
2010
2015
2020

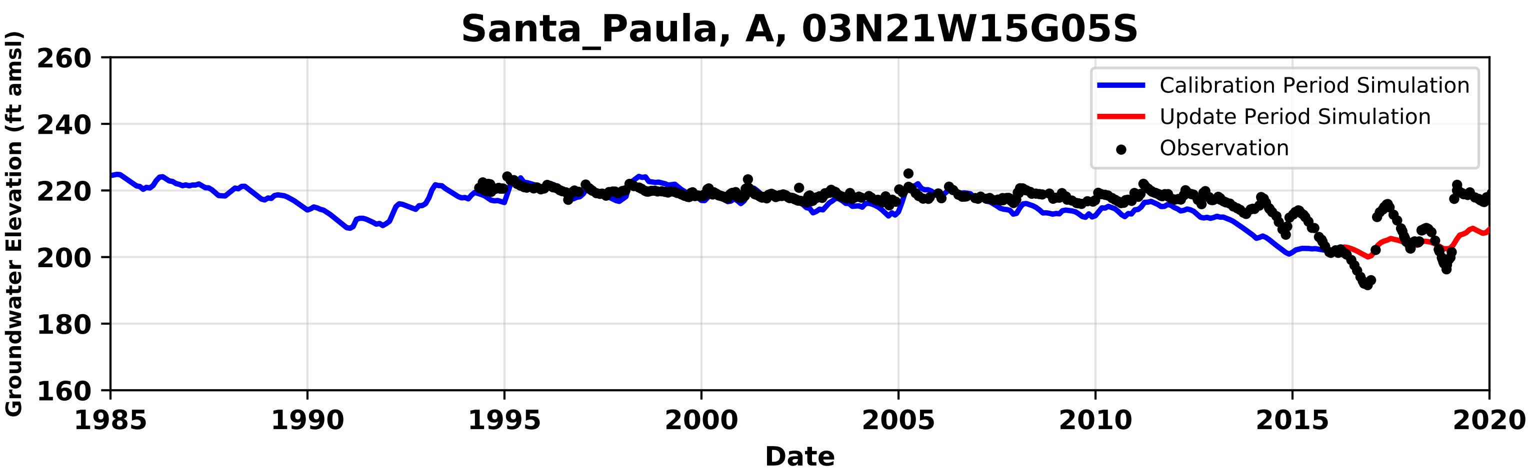

Santa_Paula, A, 02N22W01M01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
180
160
140
120
100
80
1985
1990
1995
2000
2005
2010
2015
2020

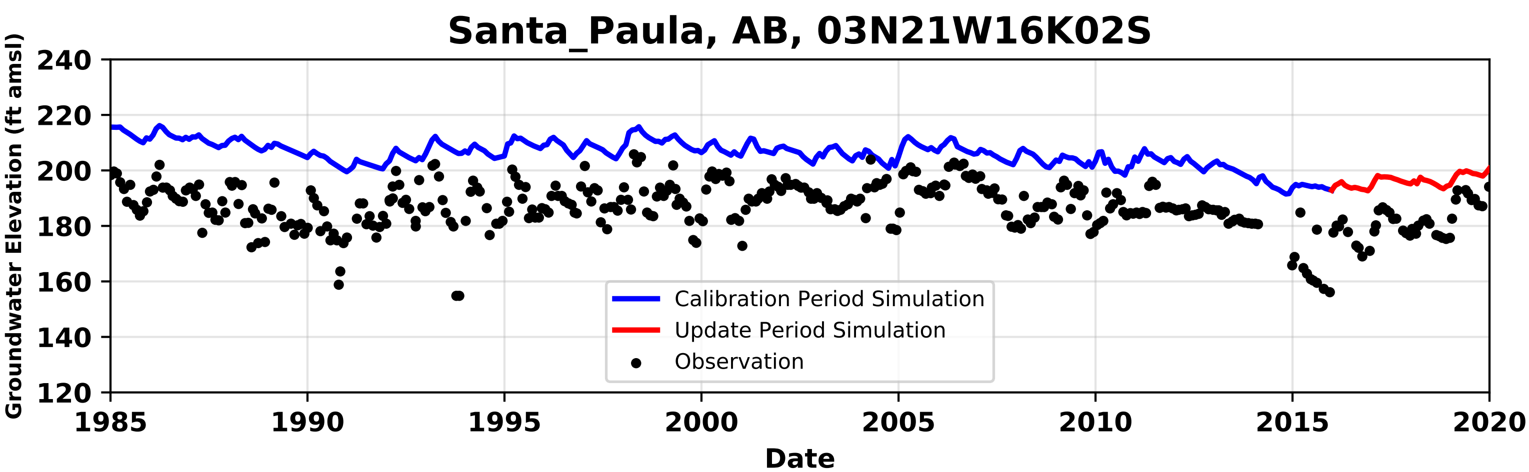

Santa_Paula, A, 03N21W31F05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
200
180
160
140
120
100
1985
1990
1995
2000
2005
2010
2015
2020

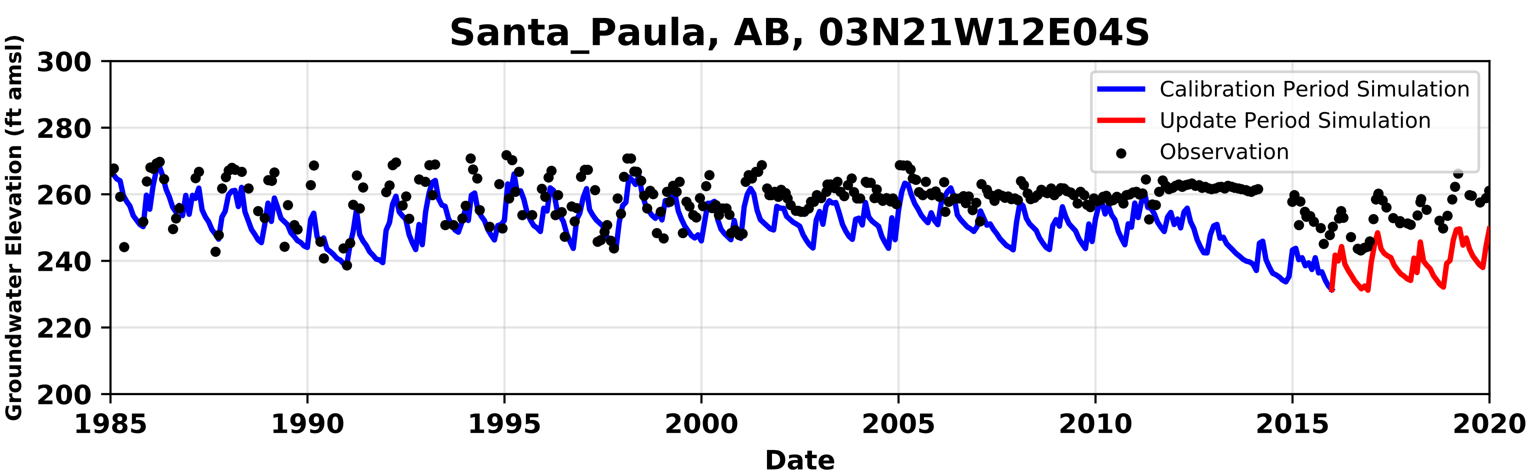

Santa_Paula, A, 03N21W32C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
200
180
160
140
120
1985
1990
1995
2000
2005
2010
2015
2020

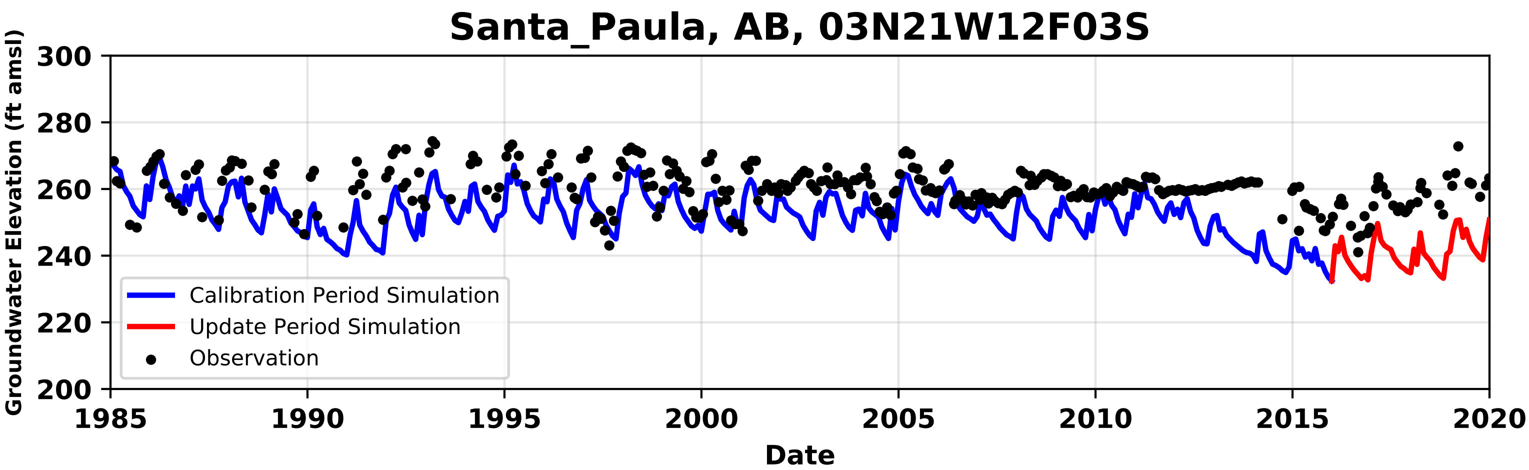

Santa_Paula, A, 03N21W29K02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
220
200
180
160
140
120
1985
1990
1995
2000
2005
2010
2015
2020

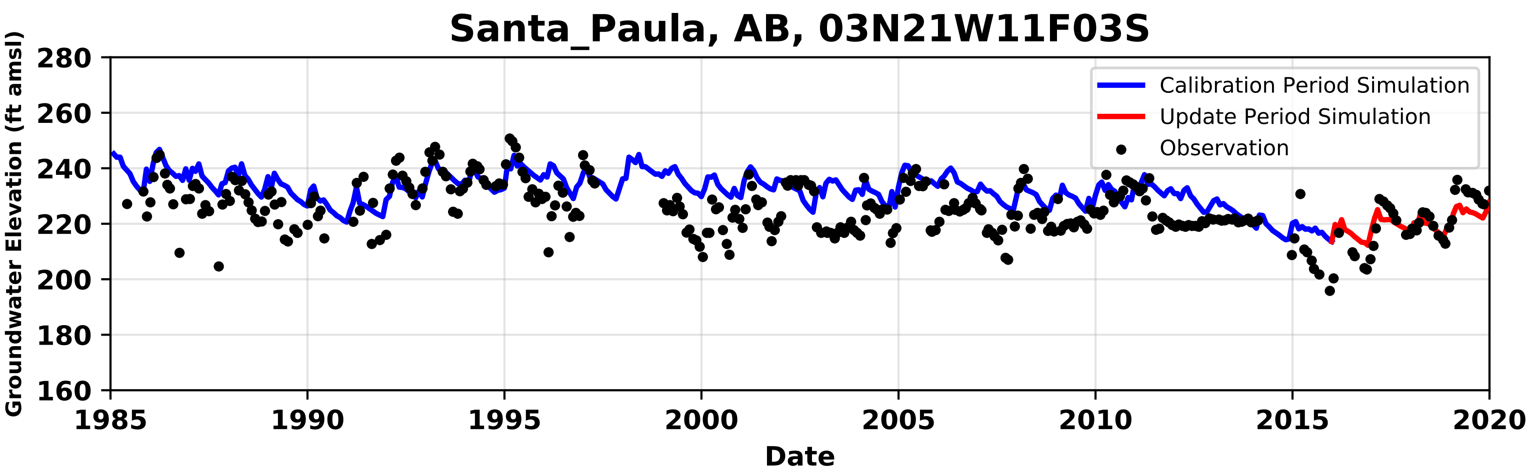

Santa_Paula, A, 03N21W16H08S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

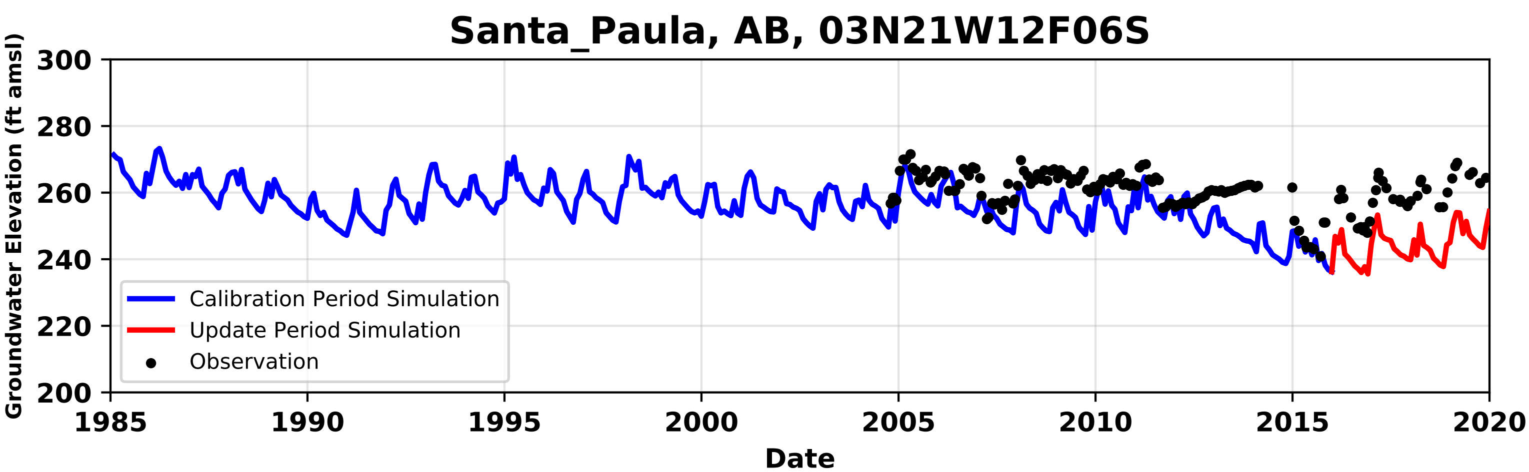

Santa_Paula, A, 03N21W15G05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

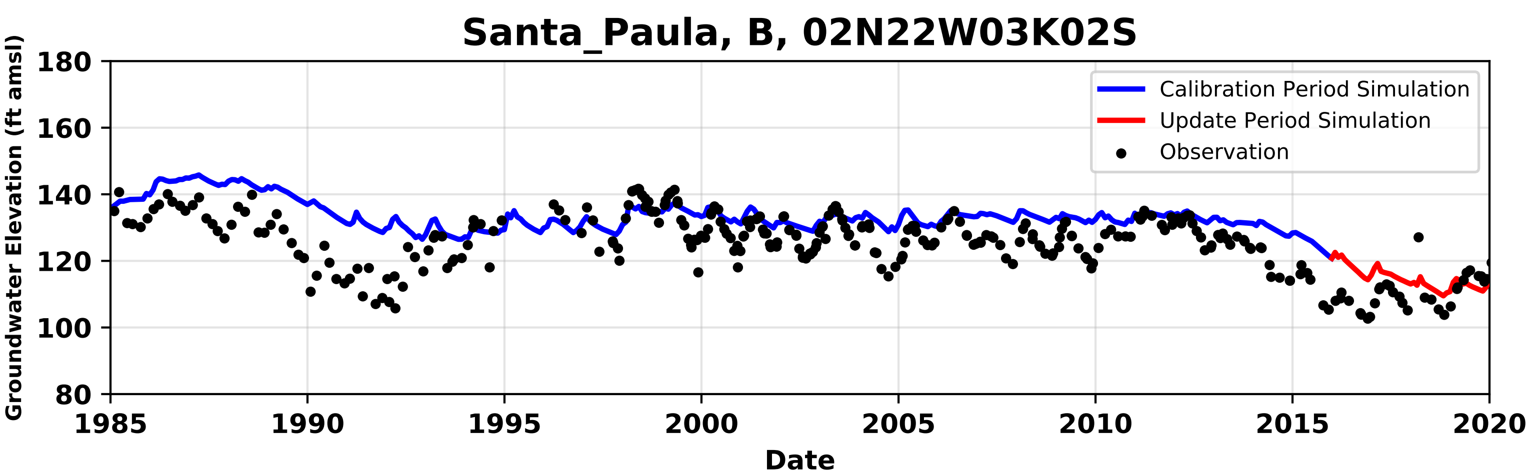

Santa_Paula, AB, 03N21W16K02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

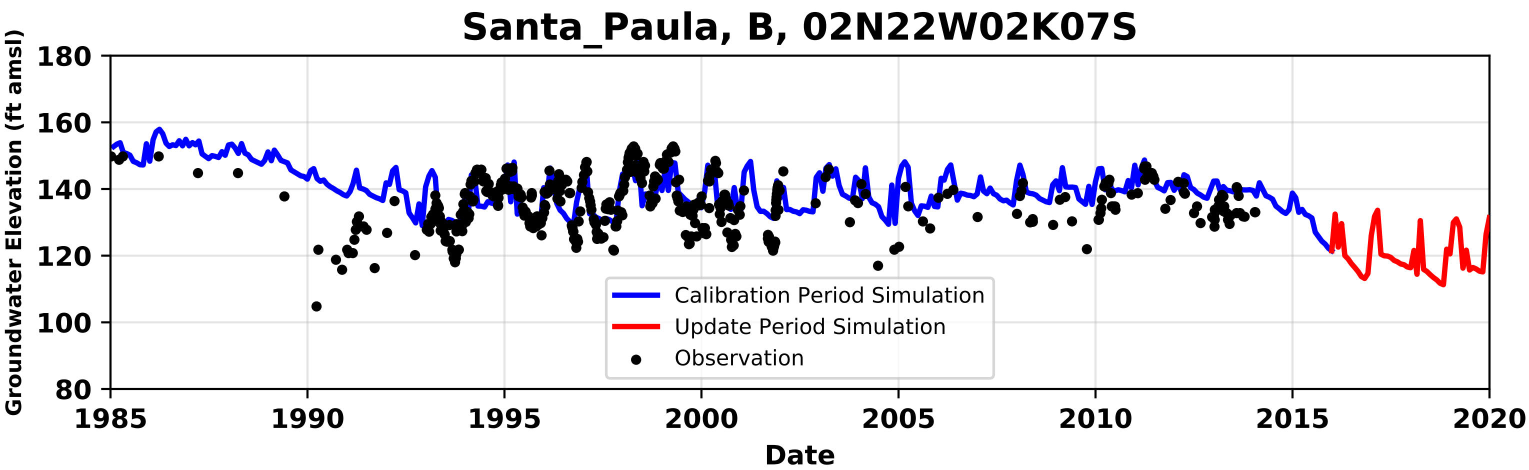

Santa_Paula, AB, 03N21W12E04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

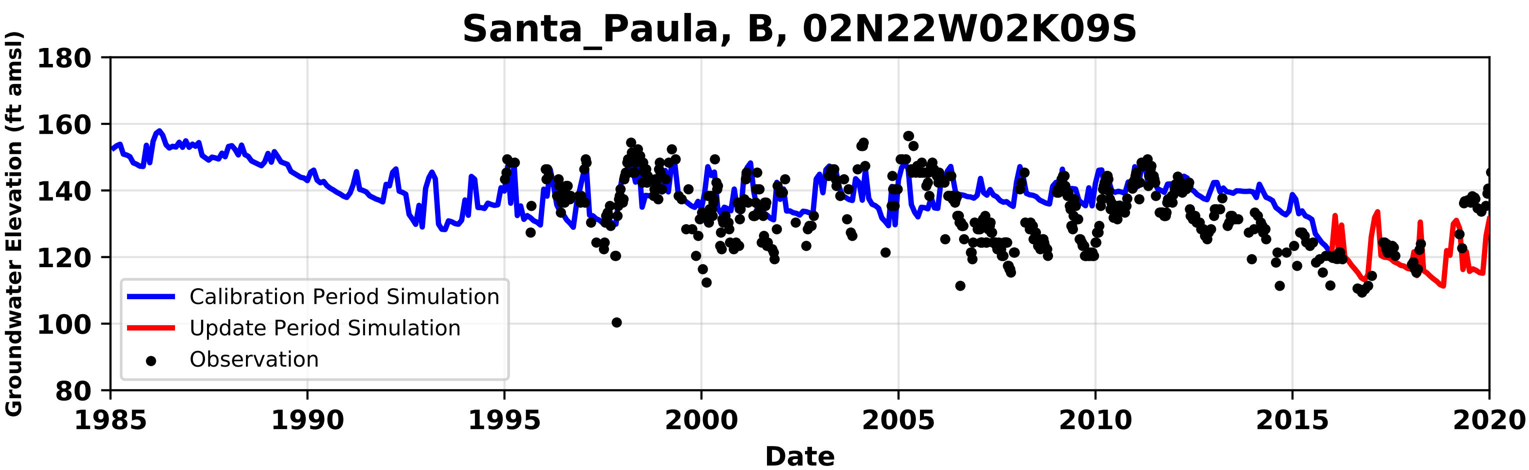

Santa_Paula, AB, 03N21W12F03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

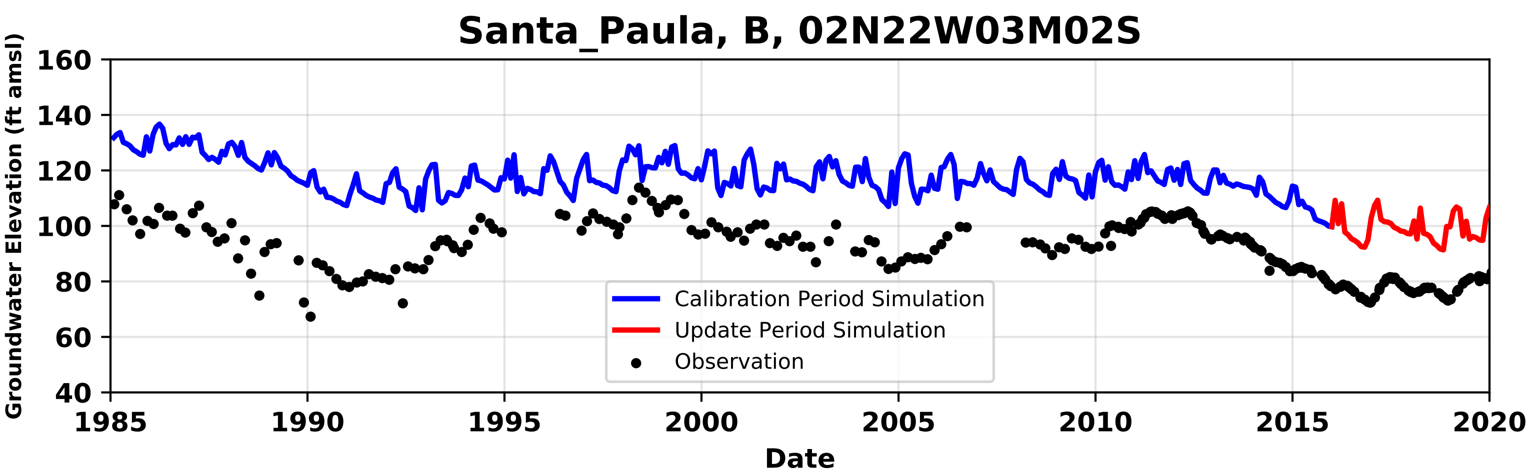

Santa_Paula, AB, 03N21W11F03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

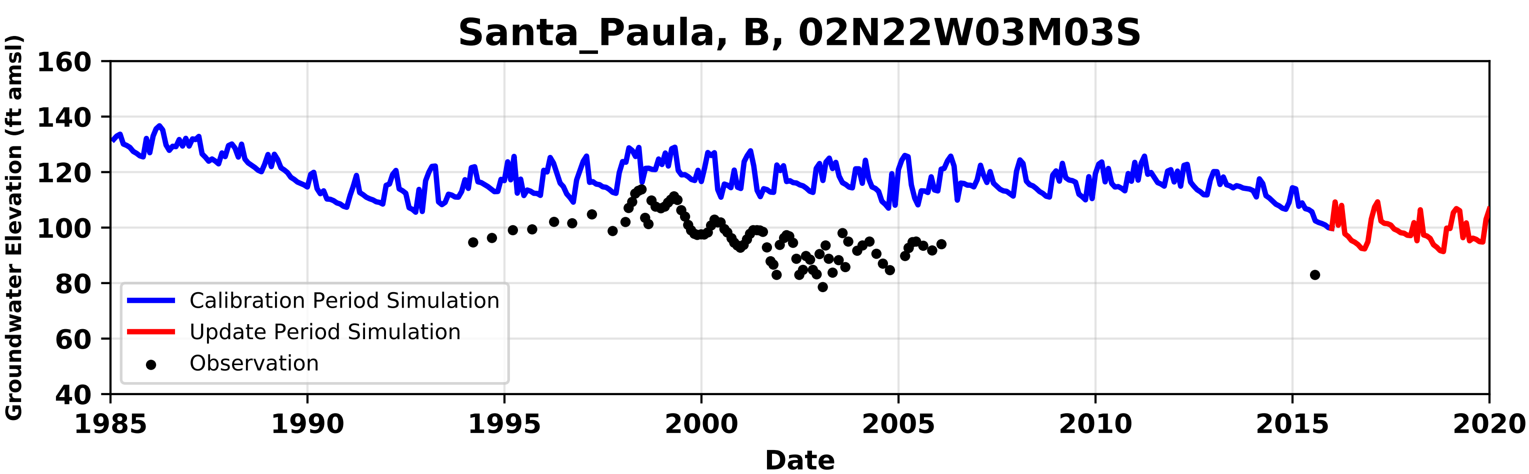

Santa_Paula, AB, 03N21W12F06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

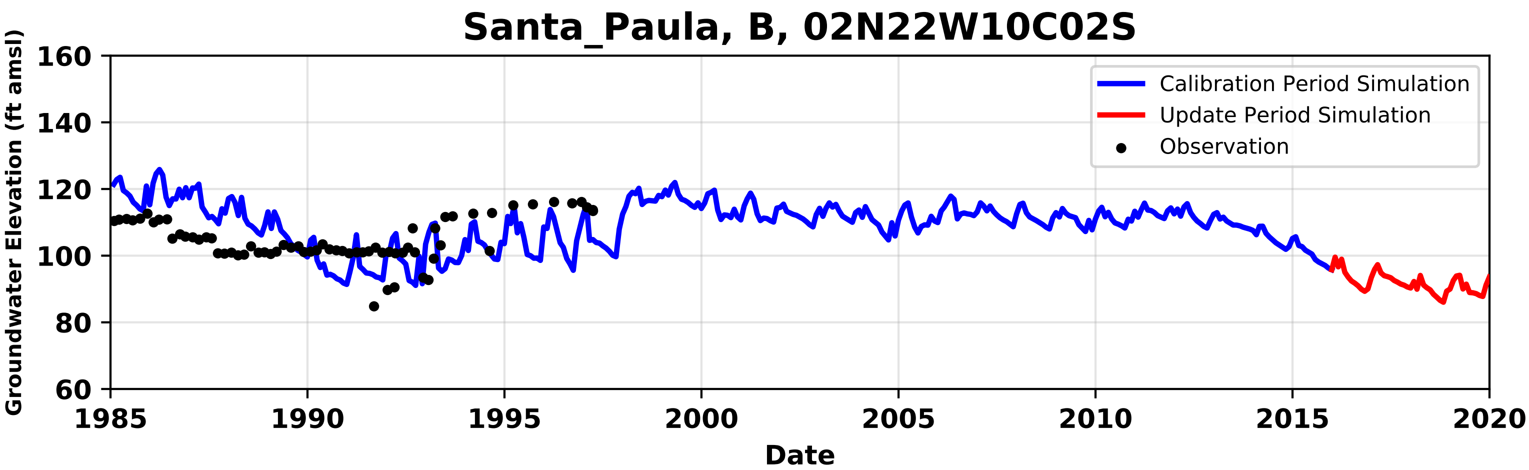

Santa_Paula, B, 02N22W03K02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

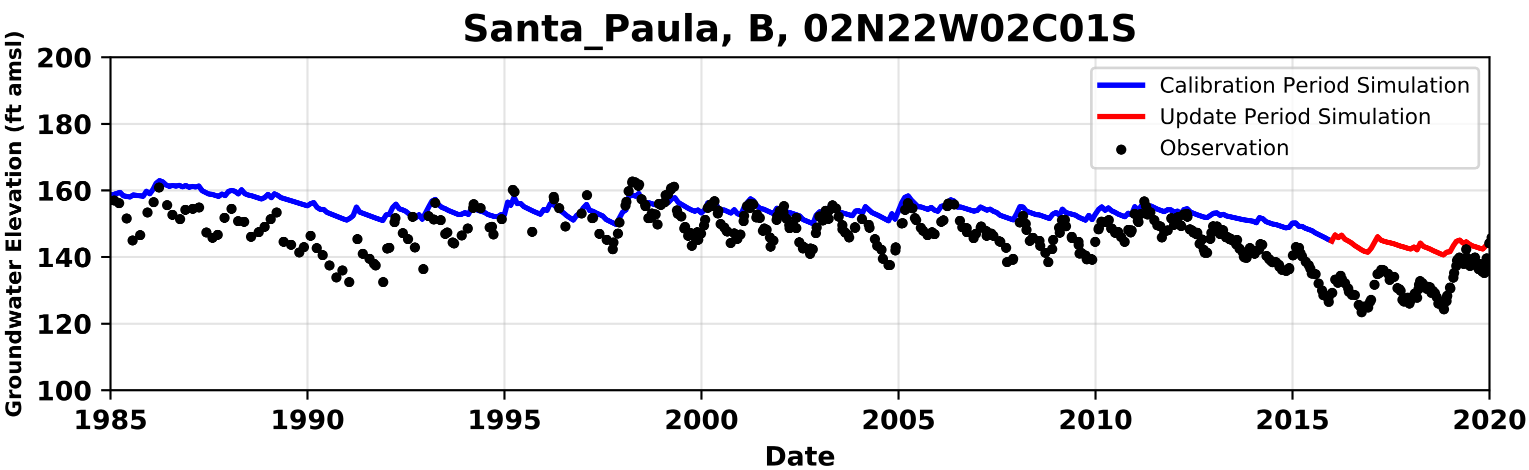

Santa_Paula, B, 02N22W02K07S
Groundwater Elevation (ft amsl)
180
160
140
120
100
80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

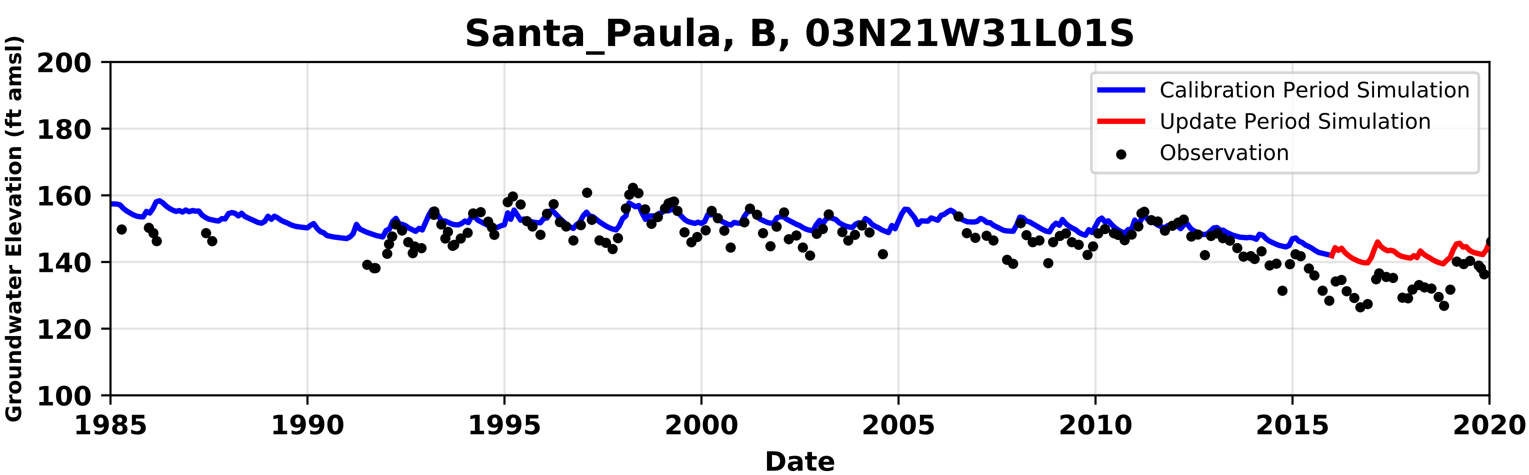

Santa_Paula, B, 02N22W02K09S
Groundwater Elevation (ft amsl)
180
160
140
120
100
80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

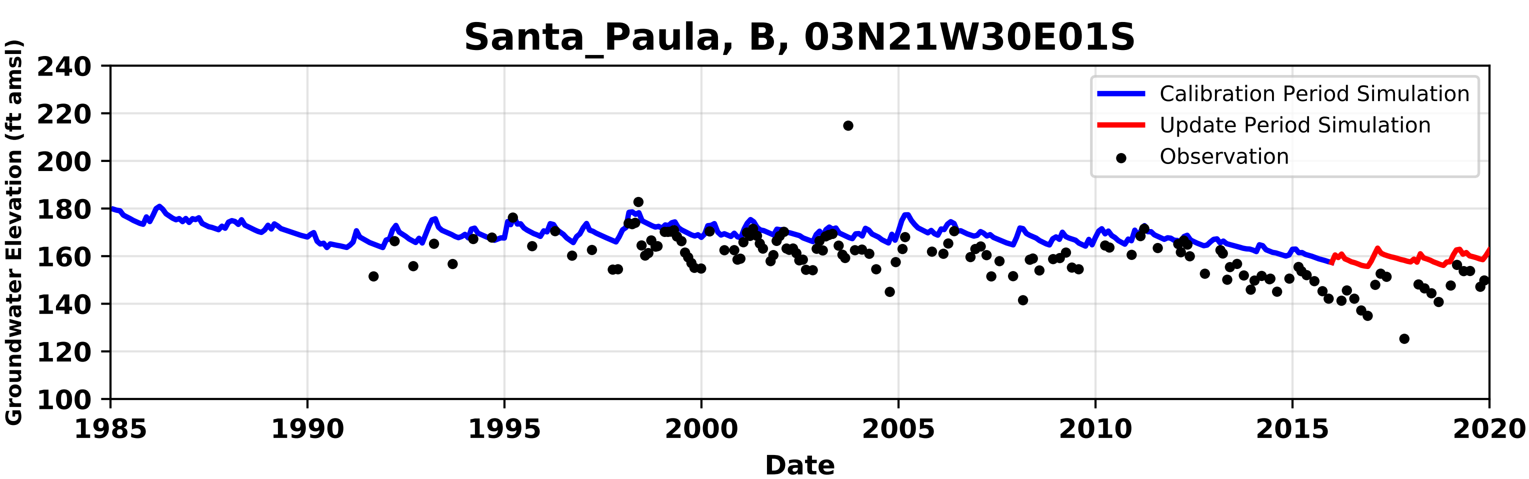

Santa_Paula, B, 02N22W03M02S
Groundwater Elevation (ft amsl)
160
140
120
100
80
60
40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

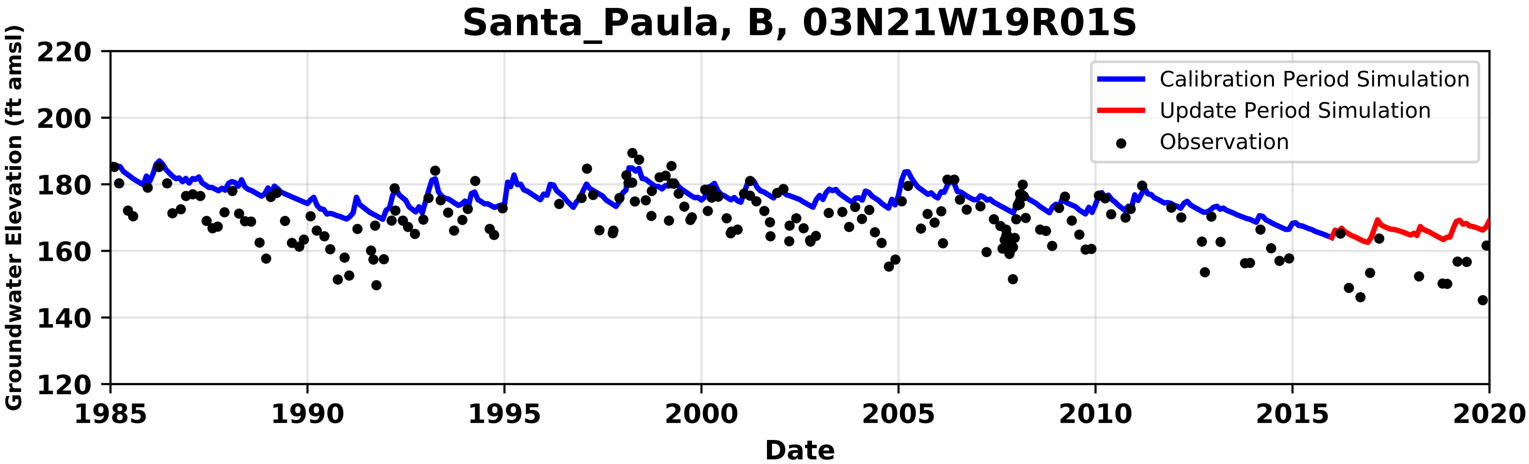

Santa_Paula, B, 02N22W03M03S
Groundwater Elevation (ft amsl)
160
140
120
100
80
60
40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

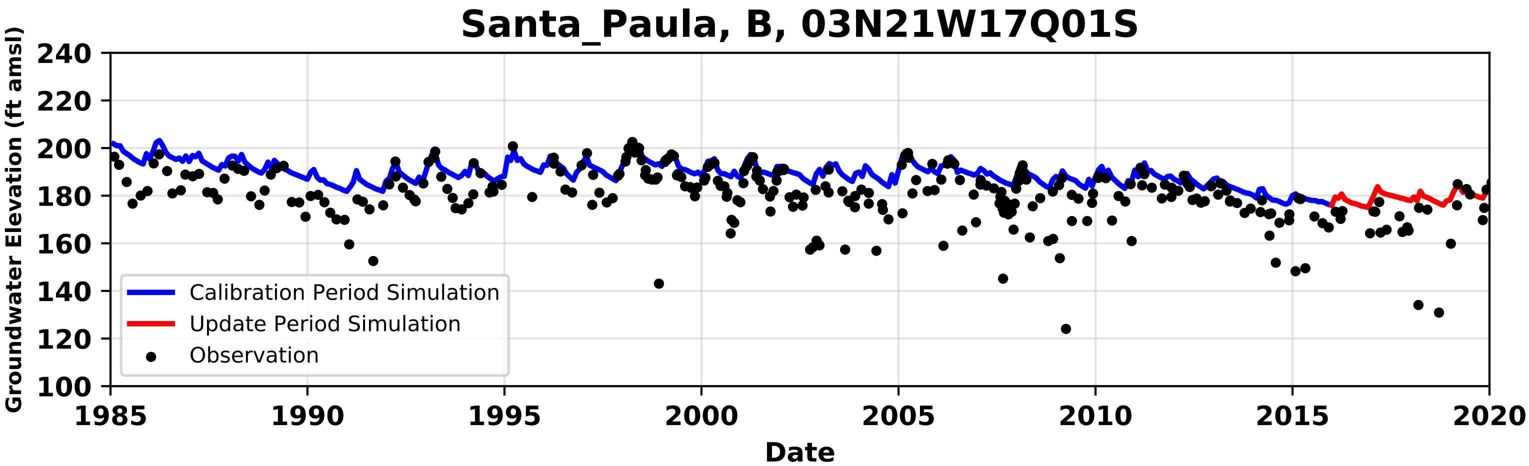

Santa_Paula, B, 02N22W10C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

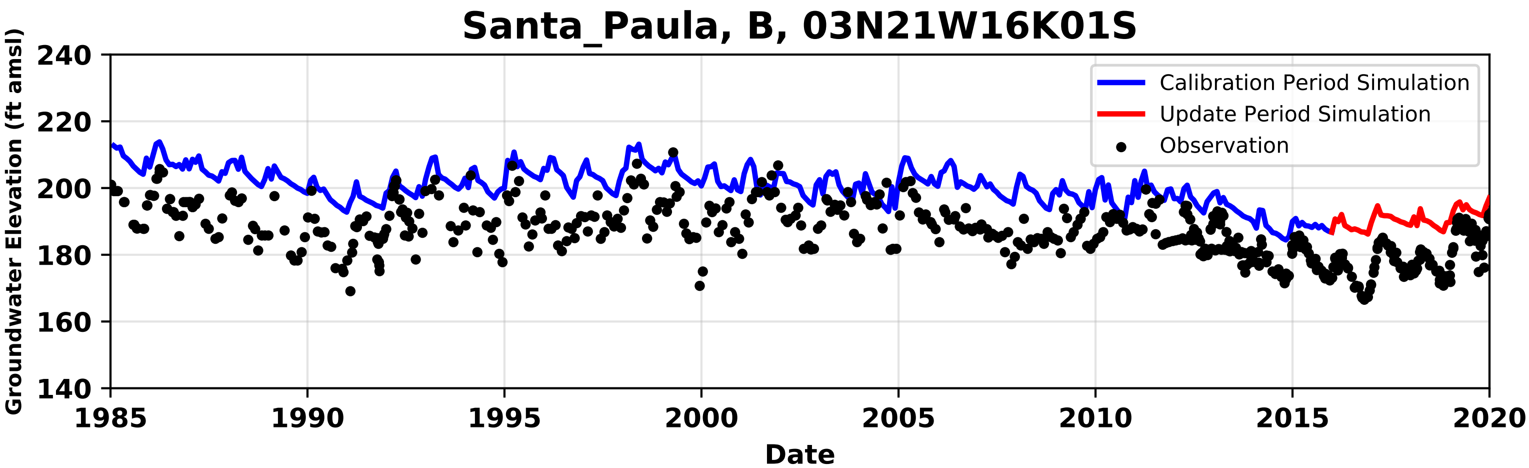

Santa_Paula, B, 02N22W02C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

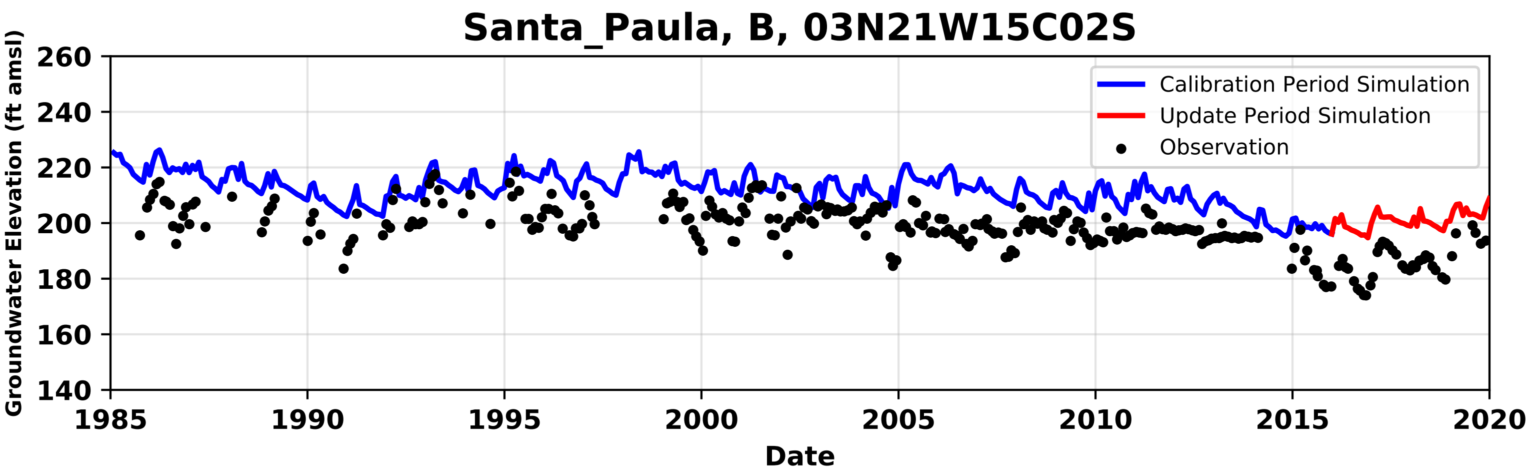

Santa_Paula, B, 03N21W31L01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

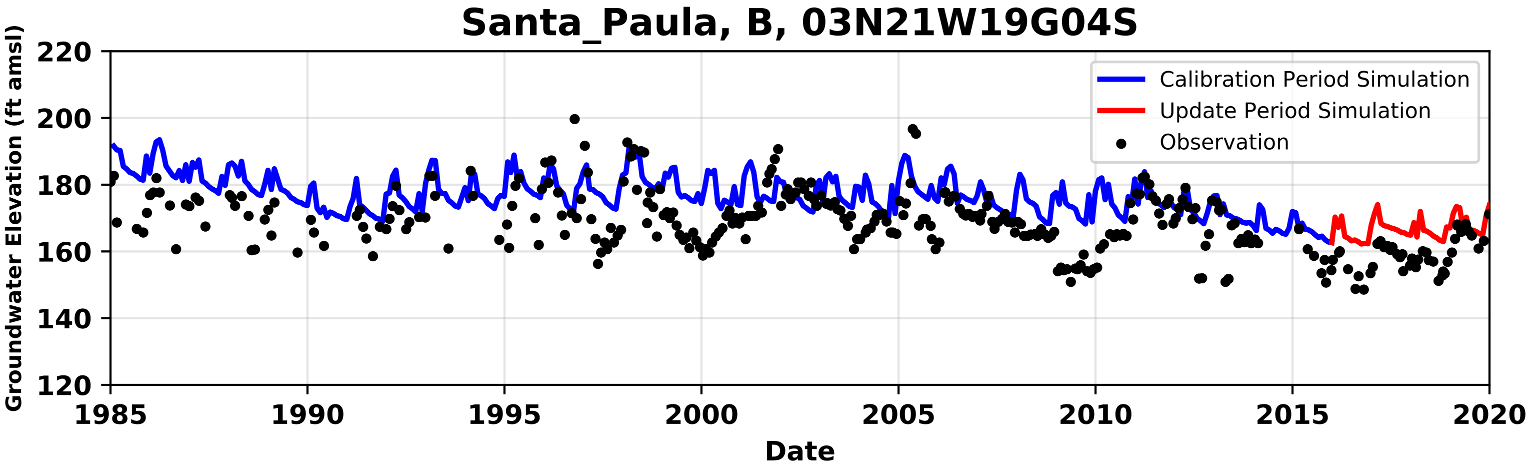

Santa_Paula, B, 03N21W30E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

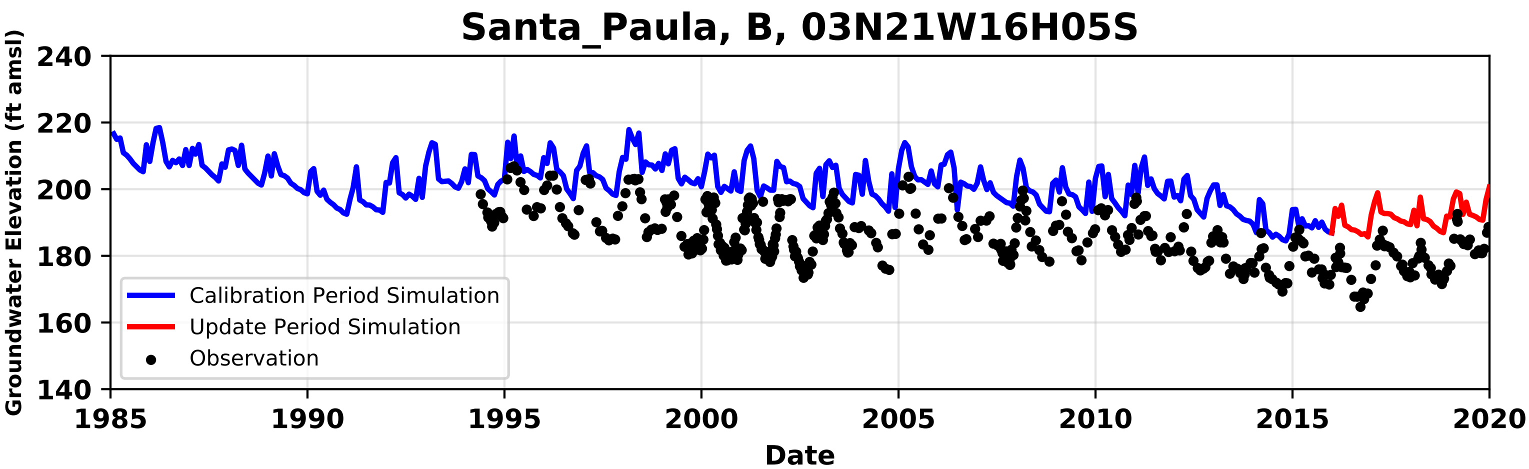

Santa_Paula, B, 03N21W19R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

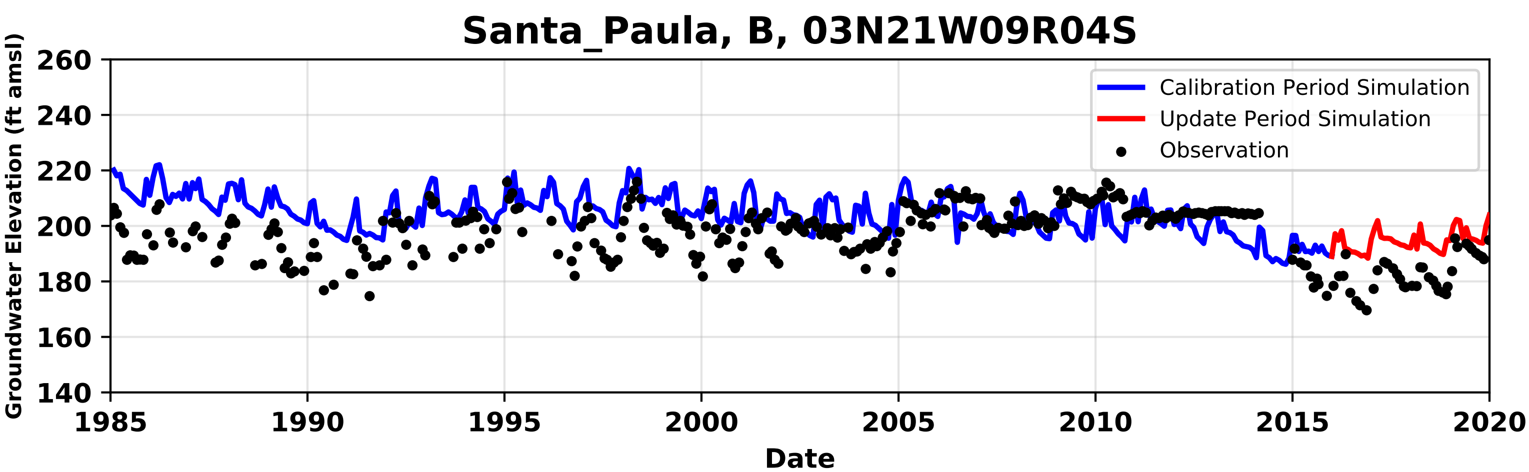

Santa_Paula, B, 03N21W17Q01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

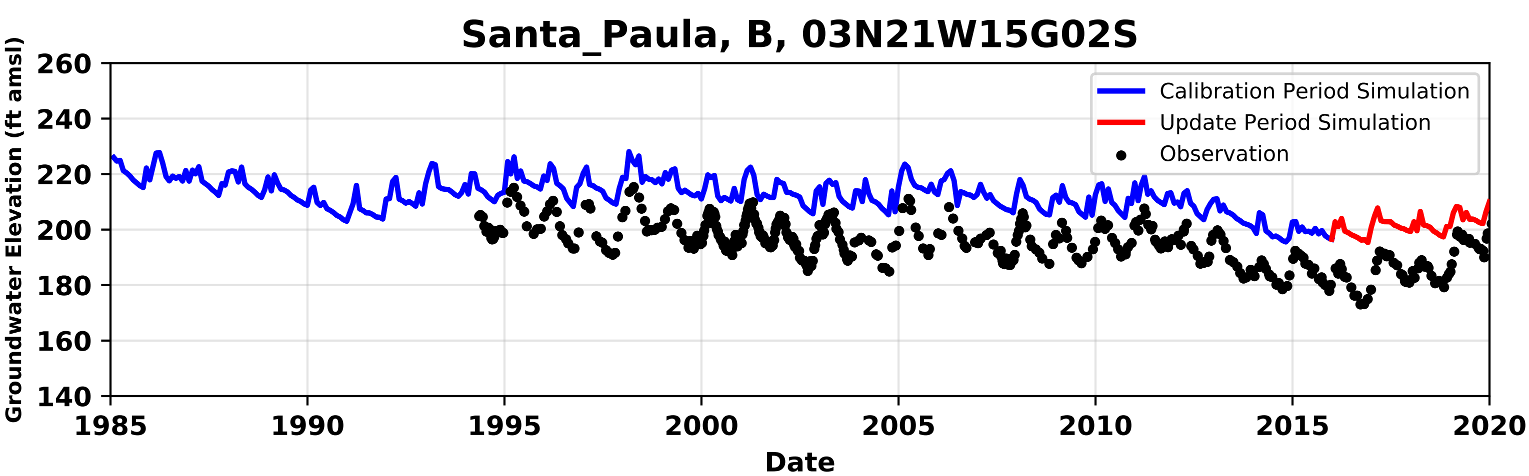

Santa_Paula, B, 03N21W16K01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

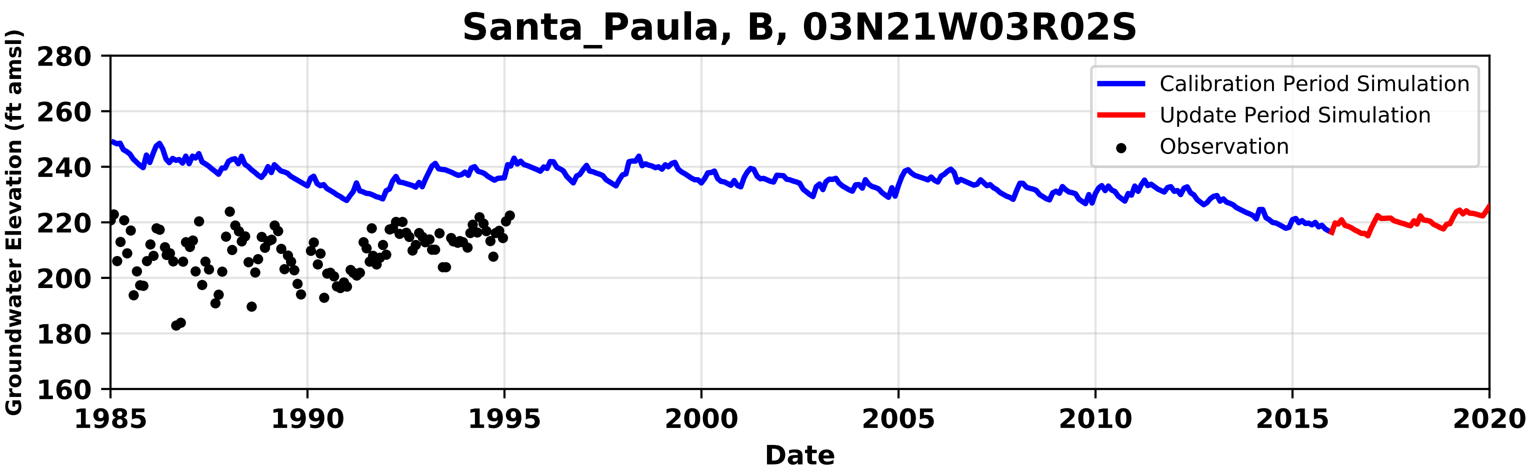

Santa_Paula, B, 03N21W15C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

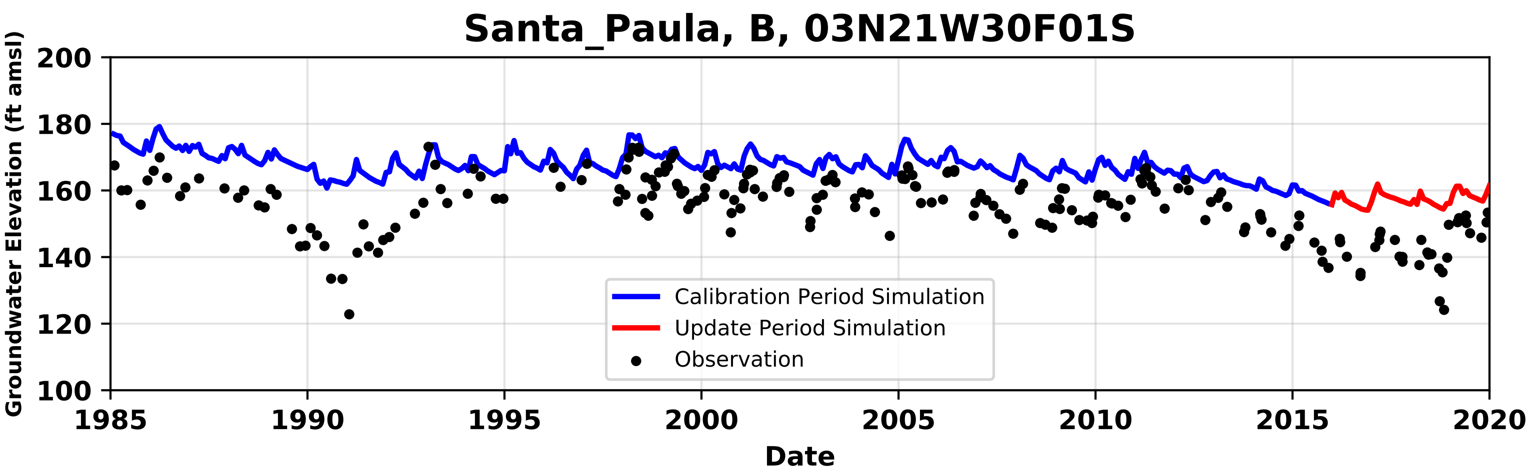

Santa_Paula, B, 03N21W19G04S
Groundwater Elevation (ft amsl)
220
200
180
160
140
120
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

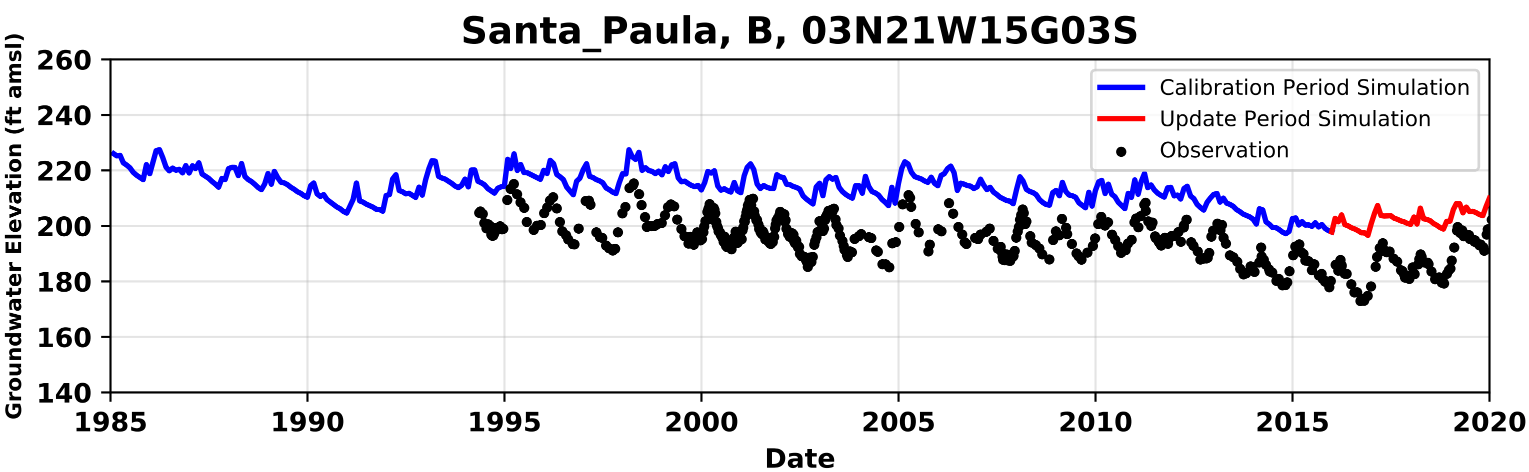

Santa_Paula, B, 03N21W16H05S
Groundwater Elevation (ft amsl)
240
220
200
180
160
140
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

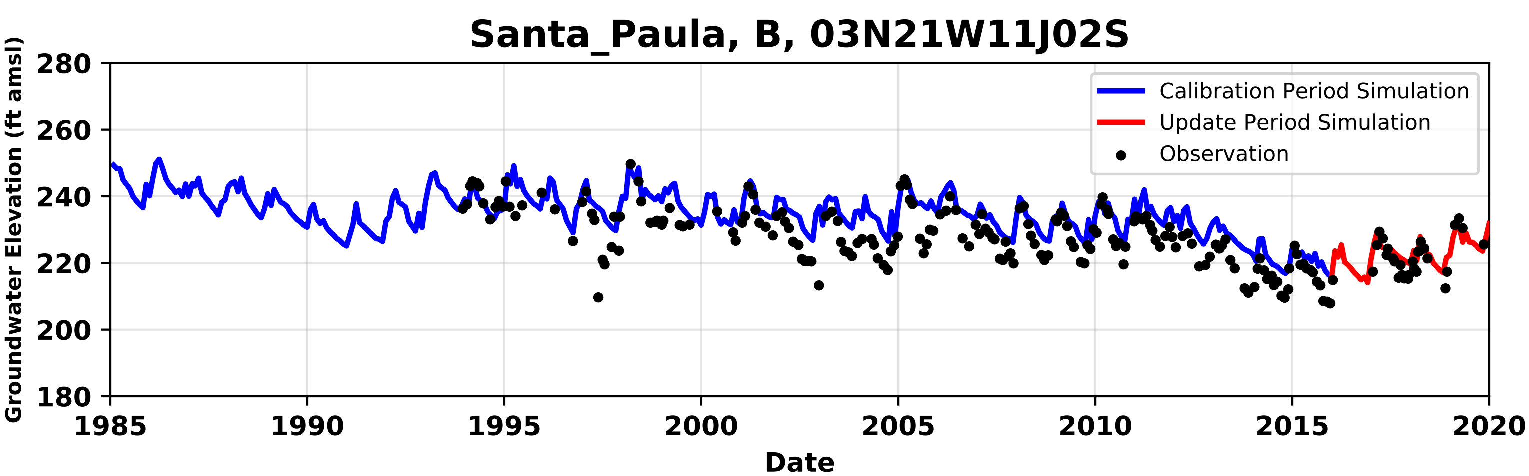

Santa_Paula, B, 03N21W09R04S
Groundwater Elevation (ft amsl)
260
240
220
200
180
160
140
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

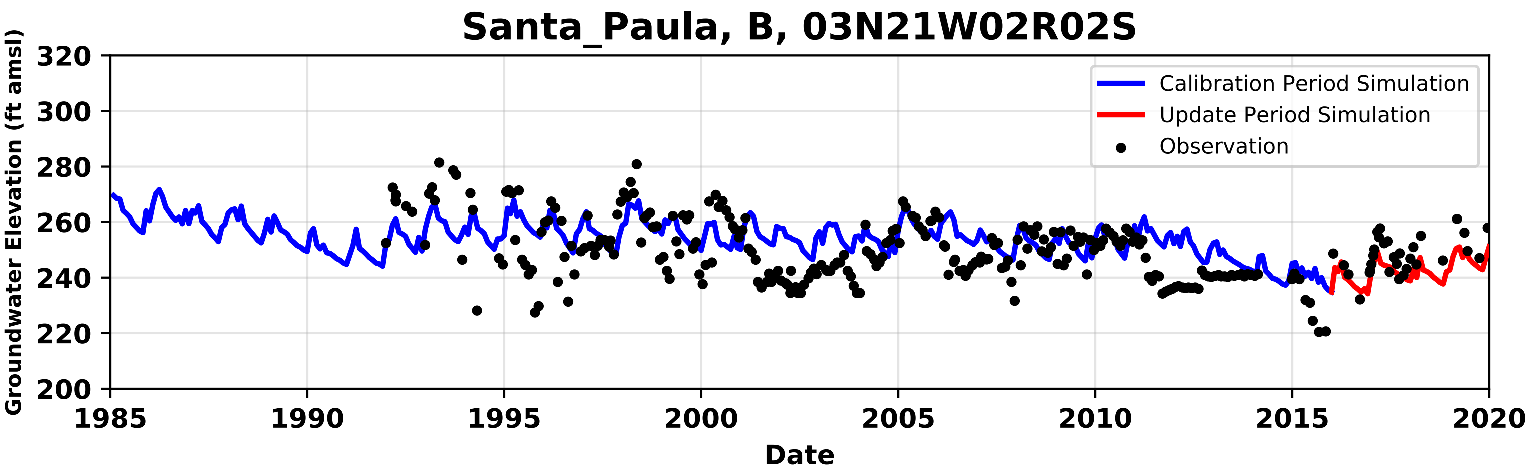

Santa_Paula, B, 03N21W15G02S
Groundwater Elevation (ft amsl)
260
240
220
200
180
160
140
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Santa_Paula, B, 03N21W03R02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

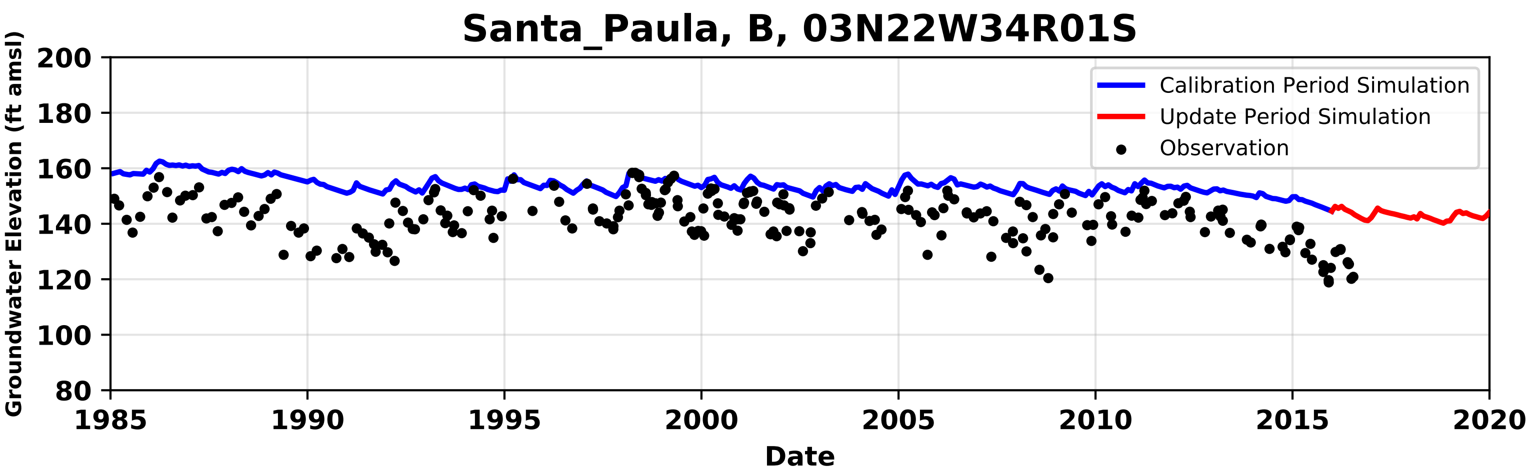

Santa_Paula, B, 03N21W30F01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Santa_Paula, B, 03N21W15G03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

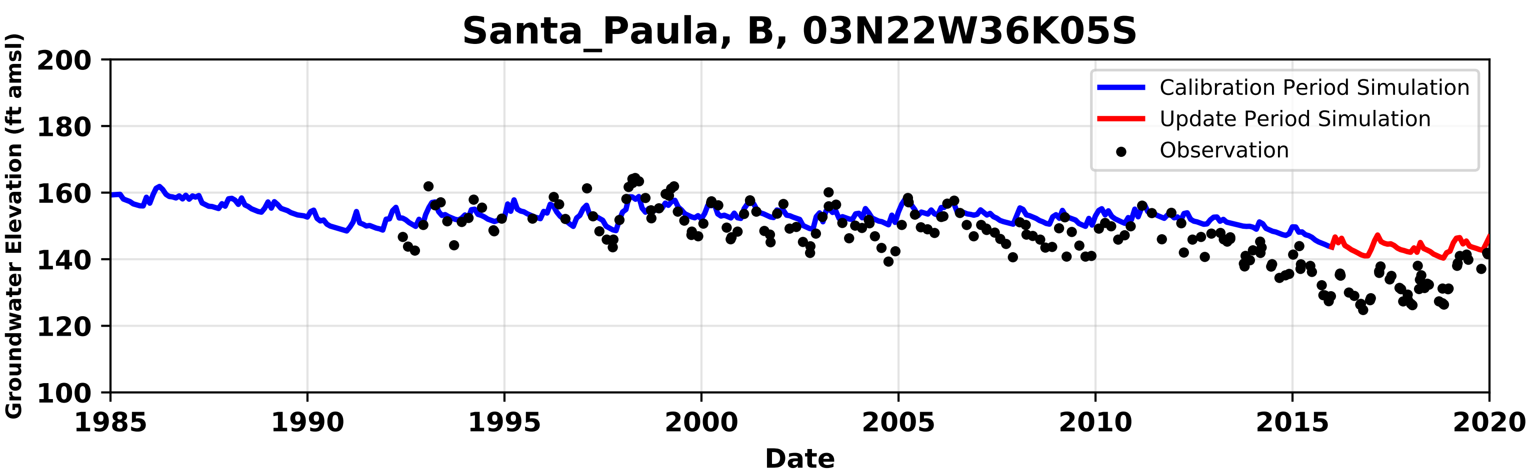

Santa_Paula, B, 03N21W11J02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



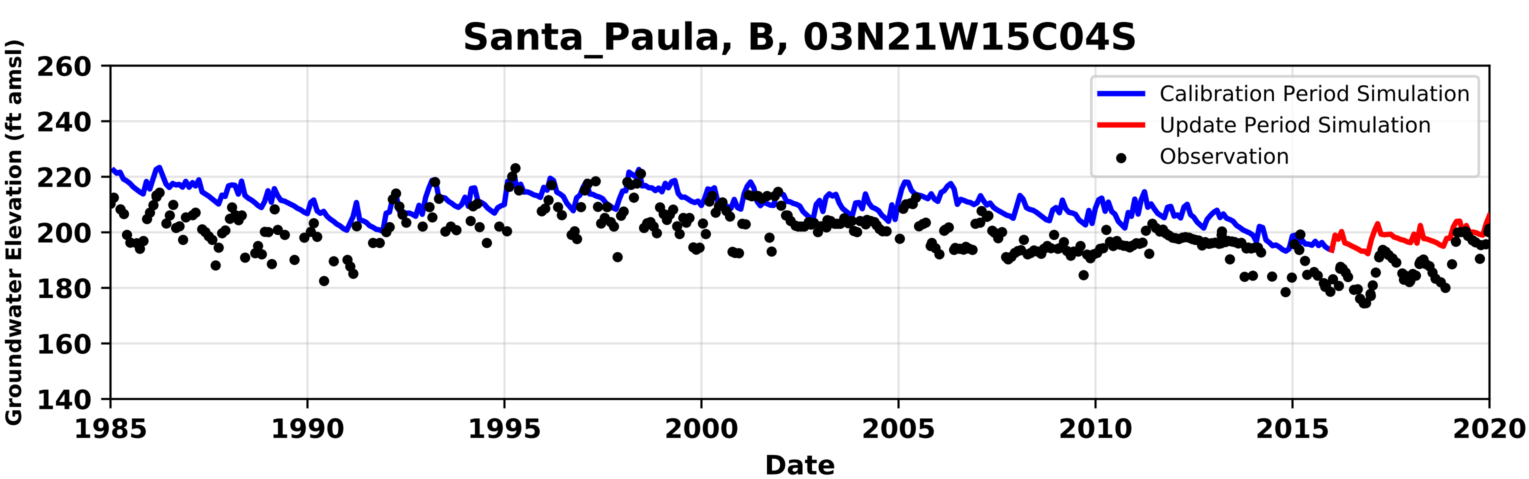
Santa_Paula, B, 03N21W02R02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



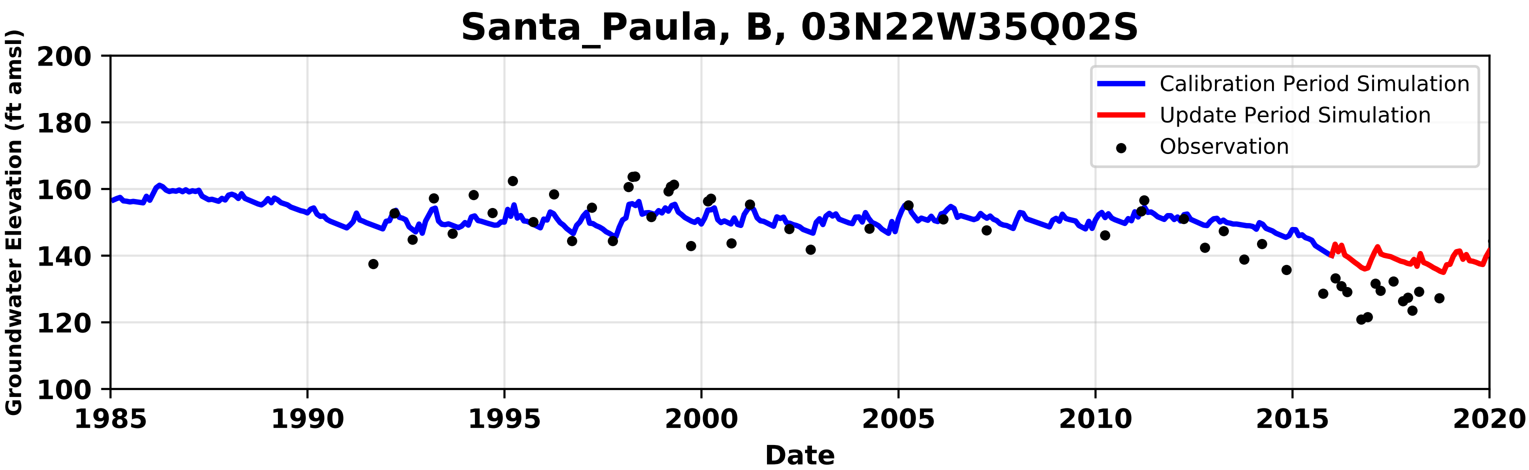
Santa_Paula, B, 03N22W34R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

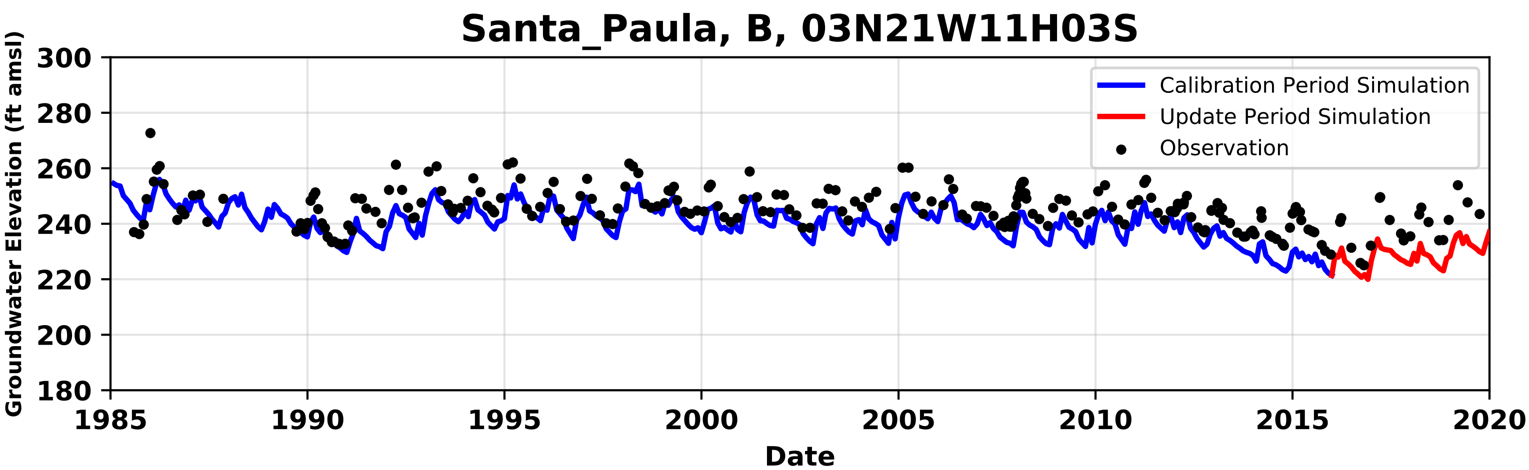


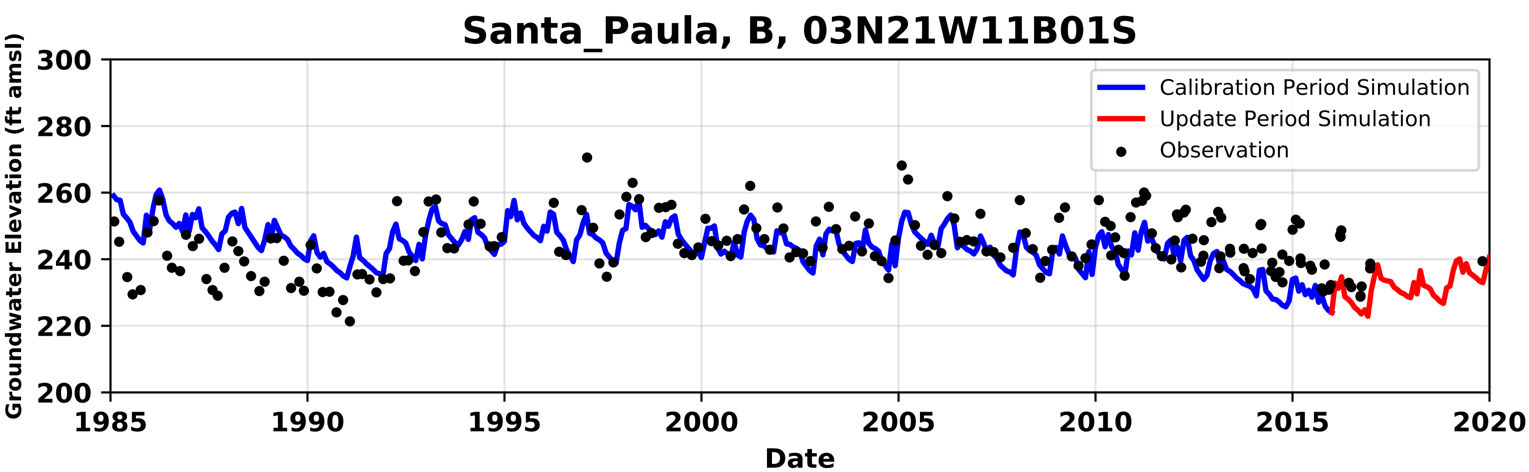
Santa_Paula, B, 03N22W36K05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

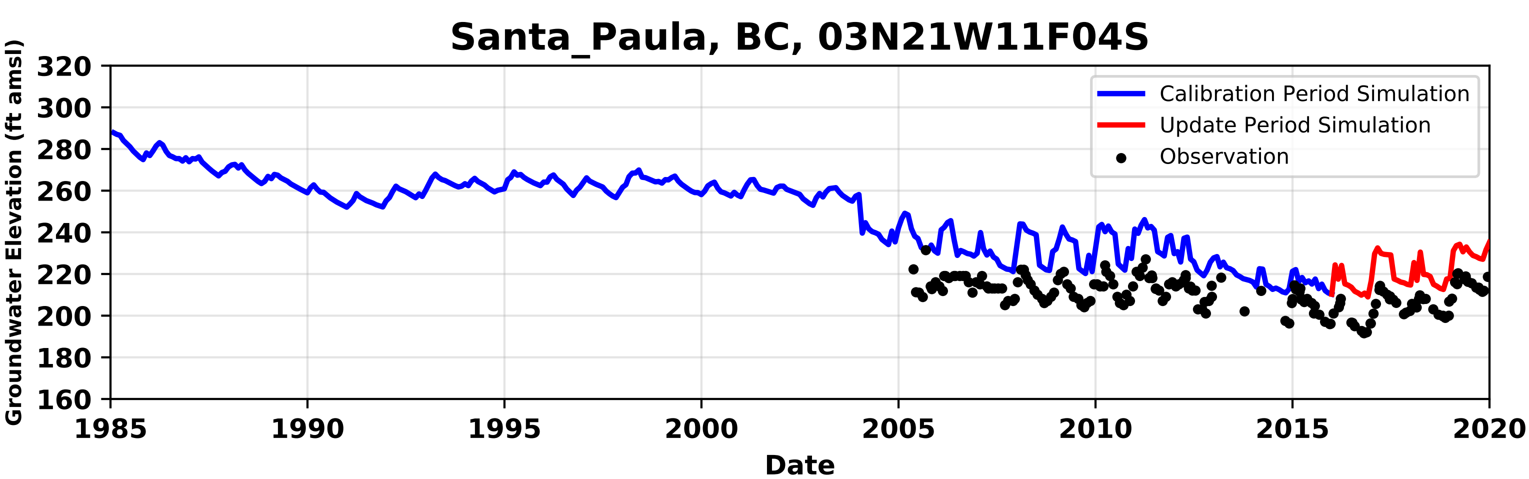


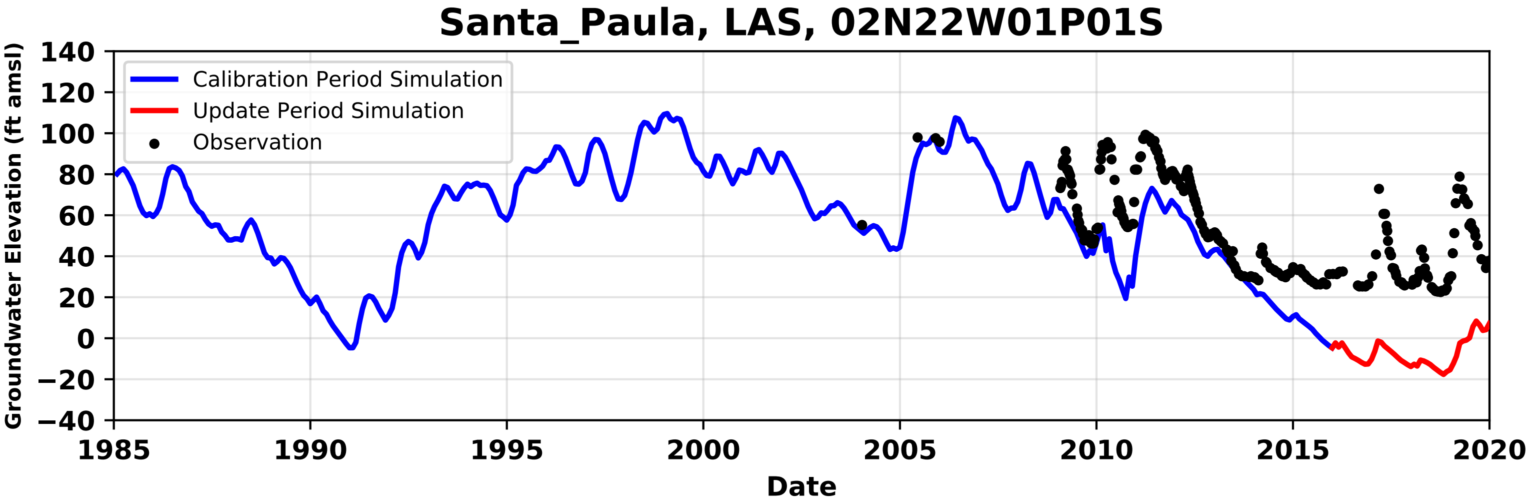
Santa_Paula, B, 03N21W15C04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

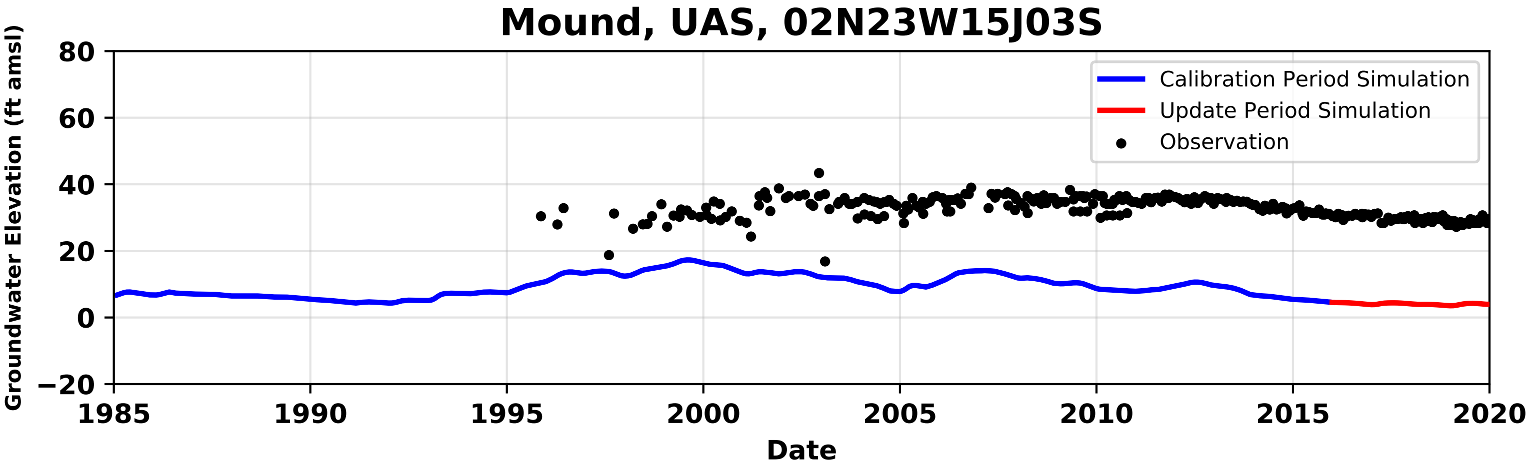

Santa_Paula, B, 03N22W35Q02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Santa_Paula, B, 03N21W11H03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

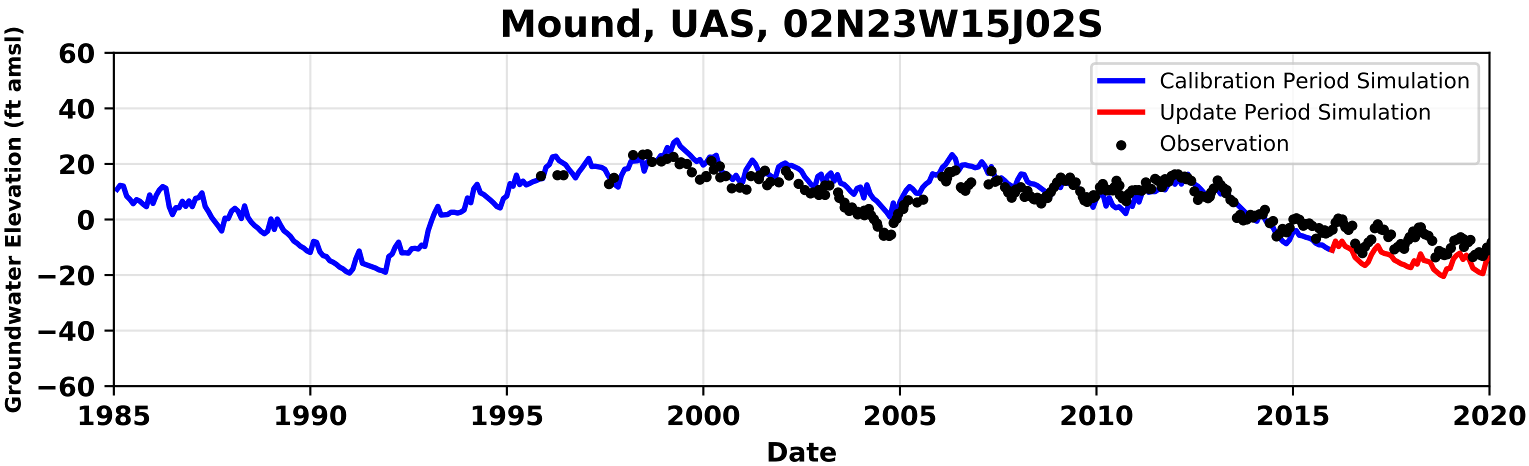

Santa_Paula, B, 03N21W11B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Santa_Paula, BC, 03N21W11F04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

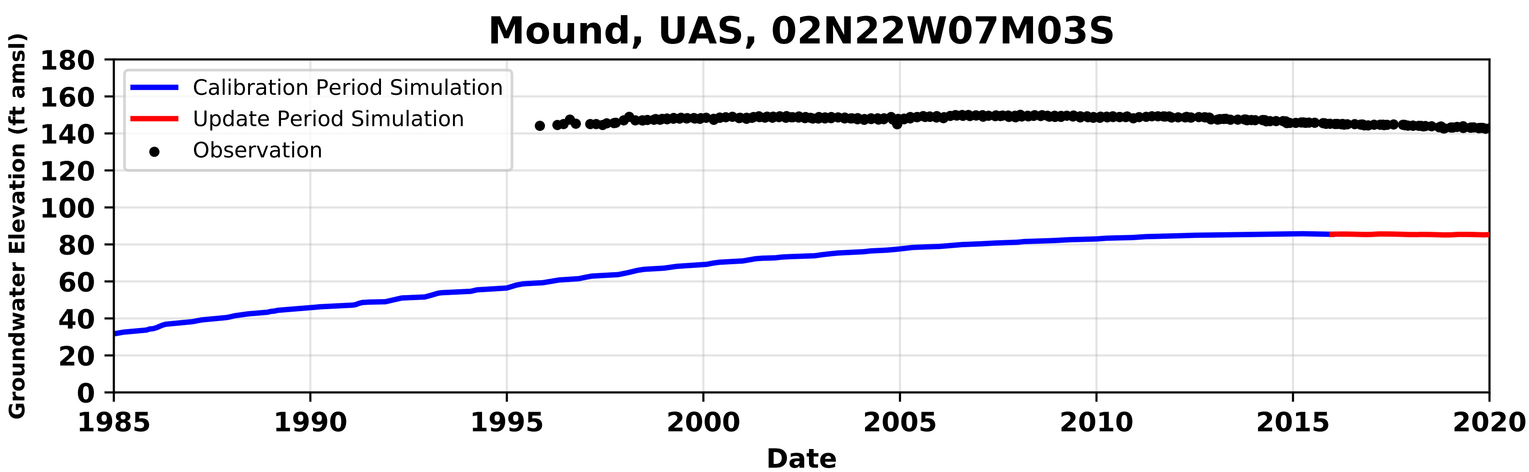

Santa_Paula, LAS, 02N22W01P01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
140
120
100
80
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020
Date



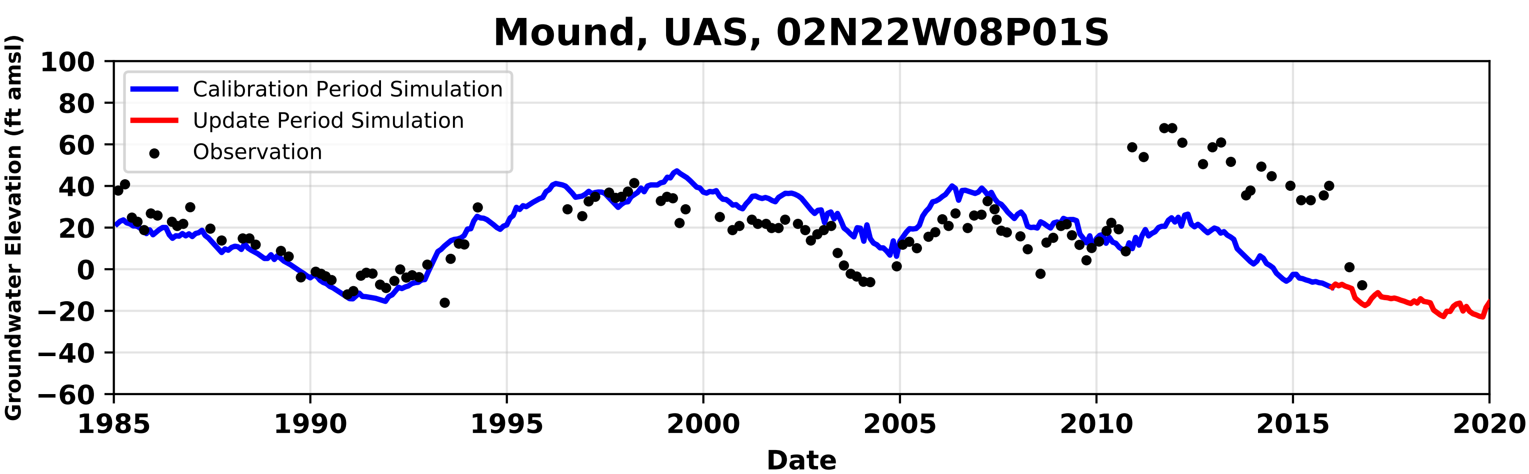
Mound, UAS, 02N23W15J03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
80
60
40
20
0
−20
1985
1990
1995
2000
2005
2010
2015
2020



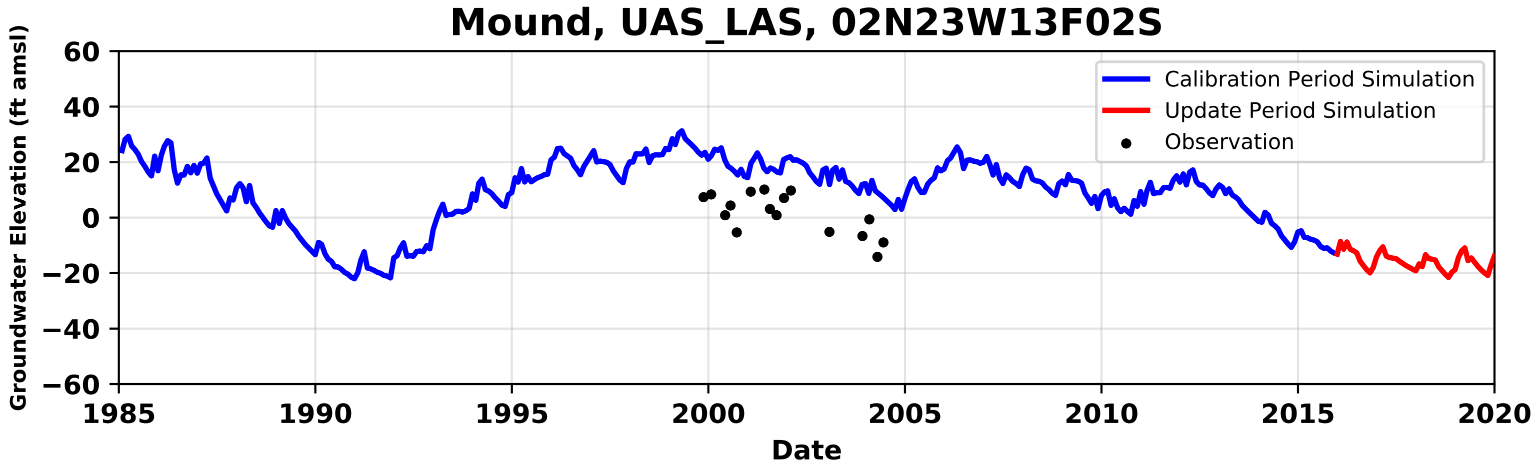
Mound, UAS, 02N23W15J02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020



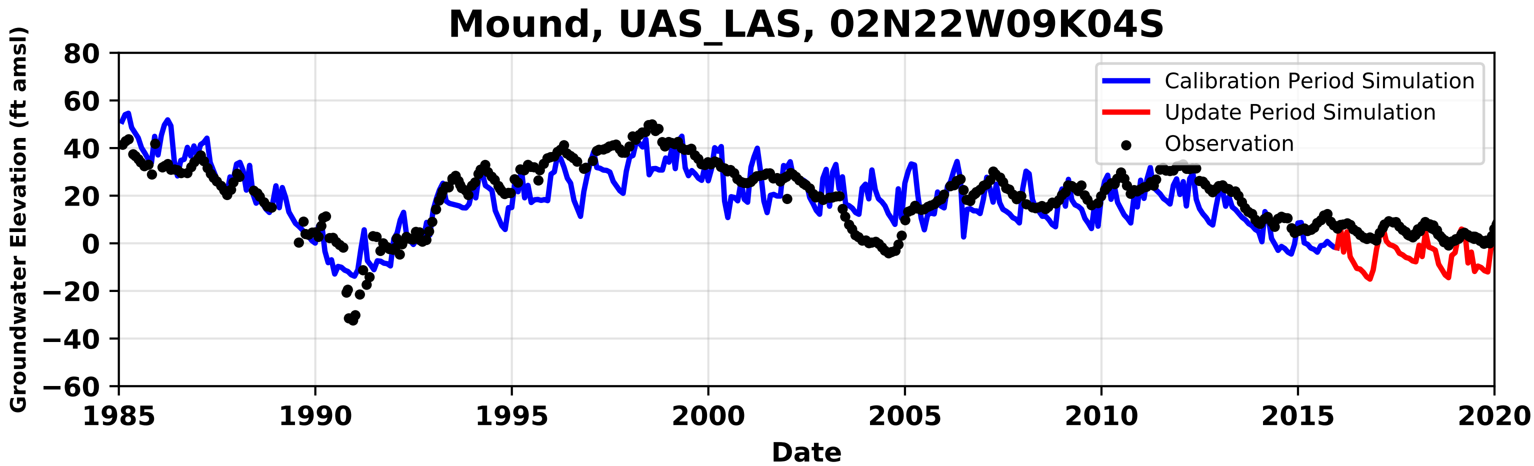
Mound, UAS, 02N22W07M03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
180
160
140
120
100
80
60
40
20
0
1985
1990
1995
2000
2005
2010
2015
2020



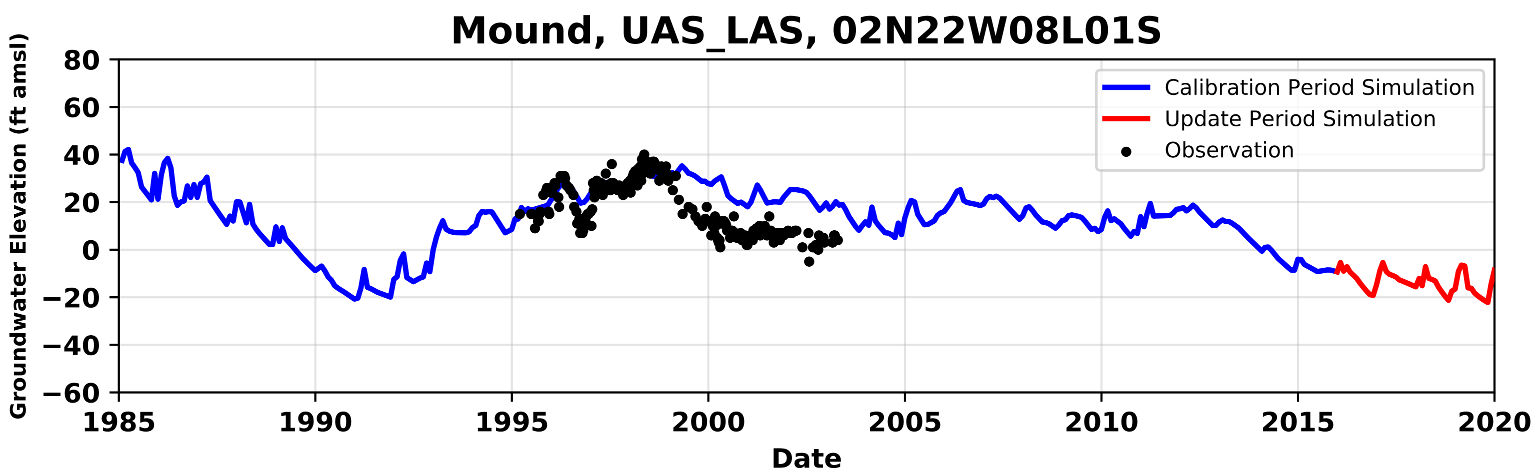
Mound, UAS, 02N22W08P01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020



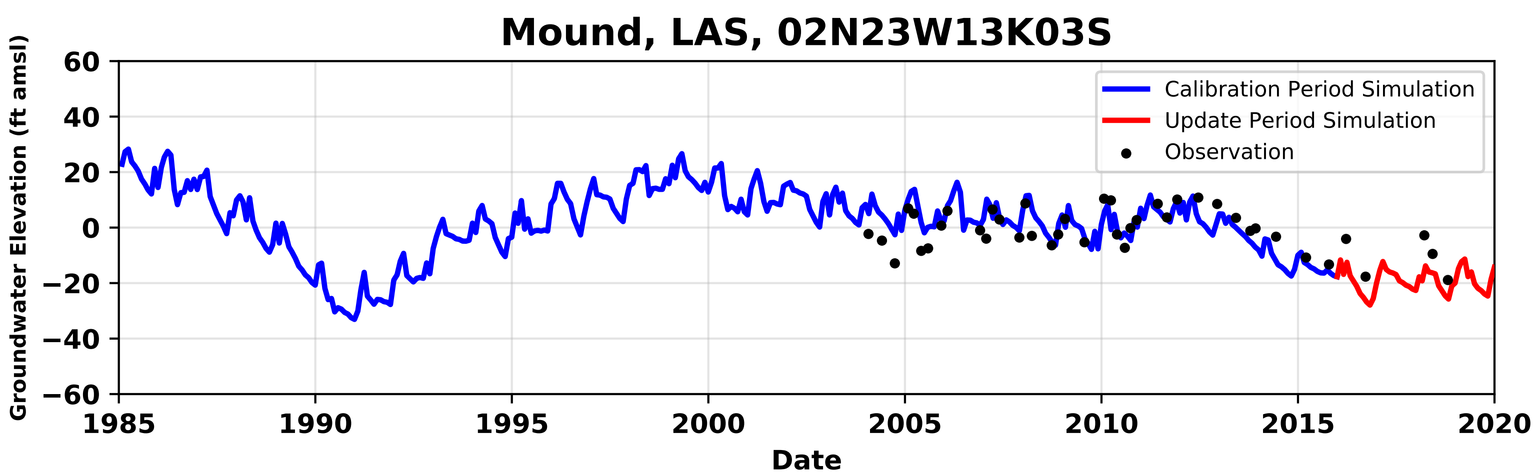
Mound, UAS_LAS, 02N23W13F02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



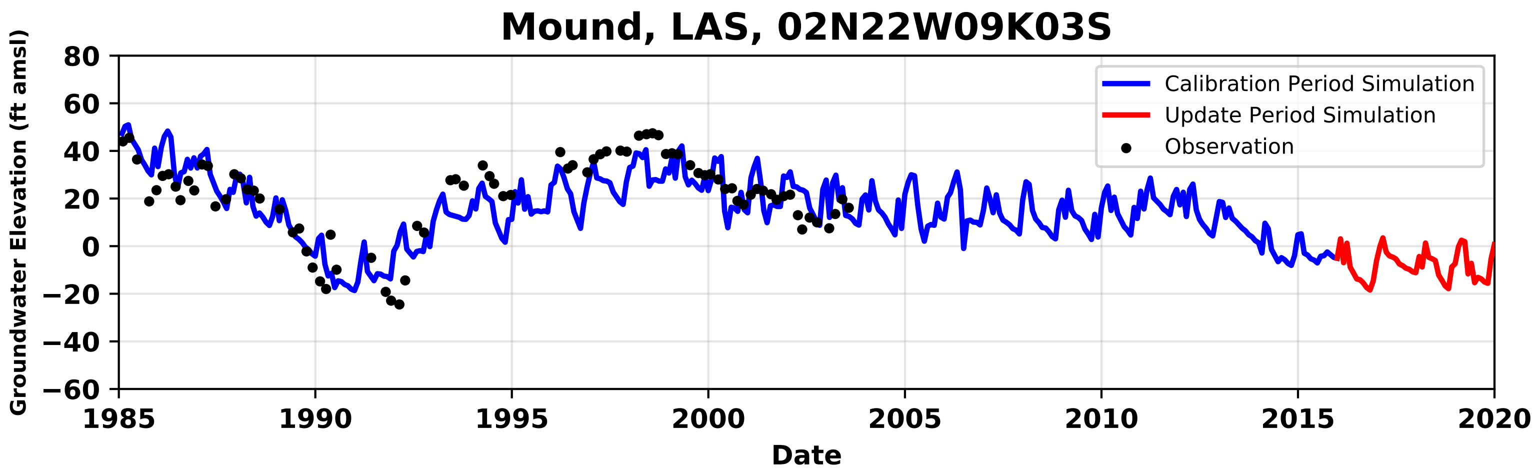
Mound, UAS_LAS, 02N22W09K04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

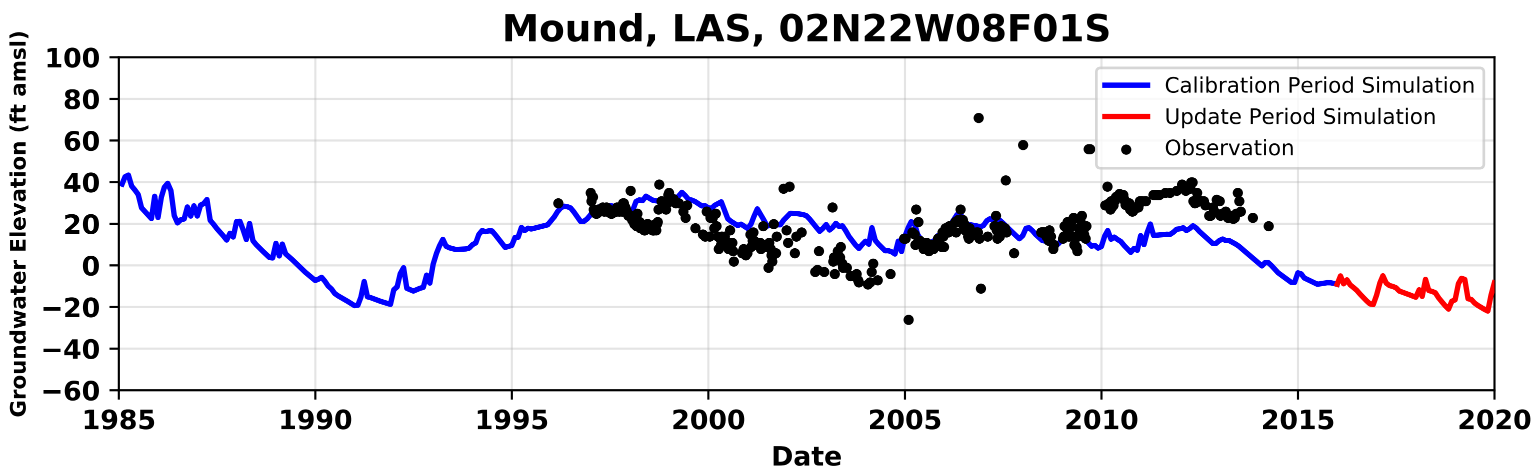


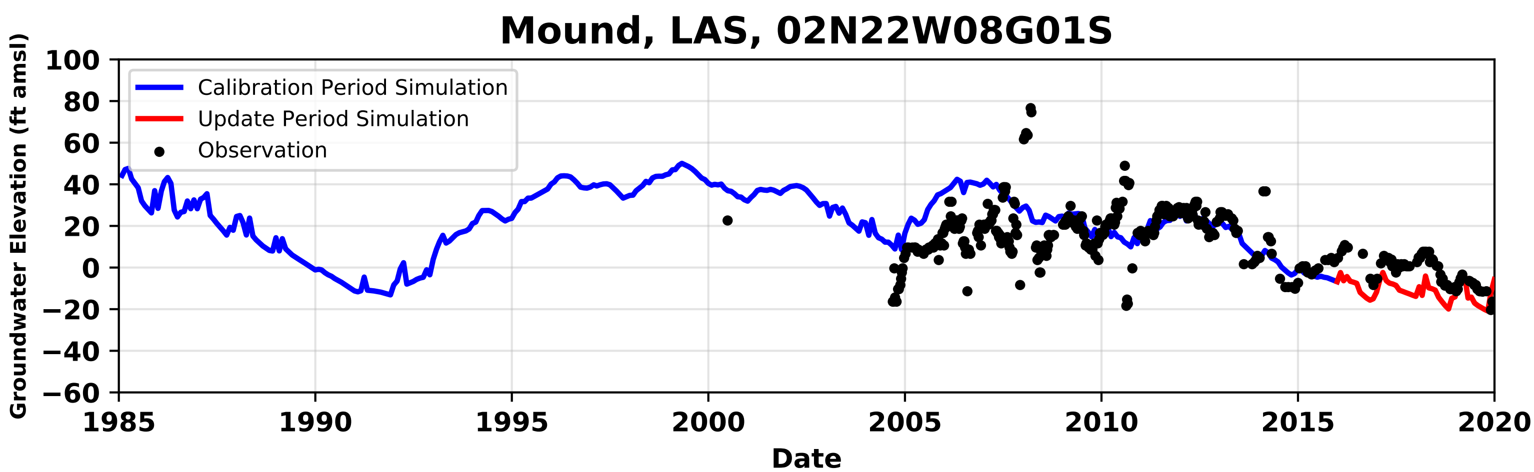
Mound, UAS_LAS, 02N22W08L01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

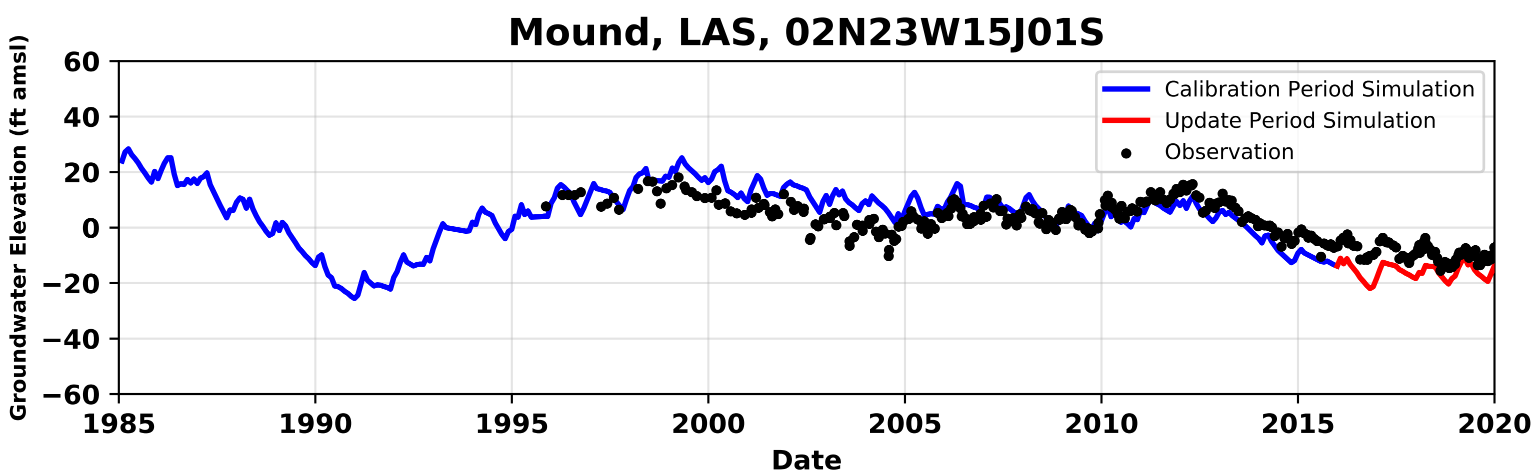


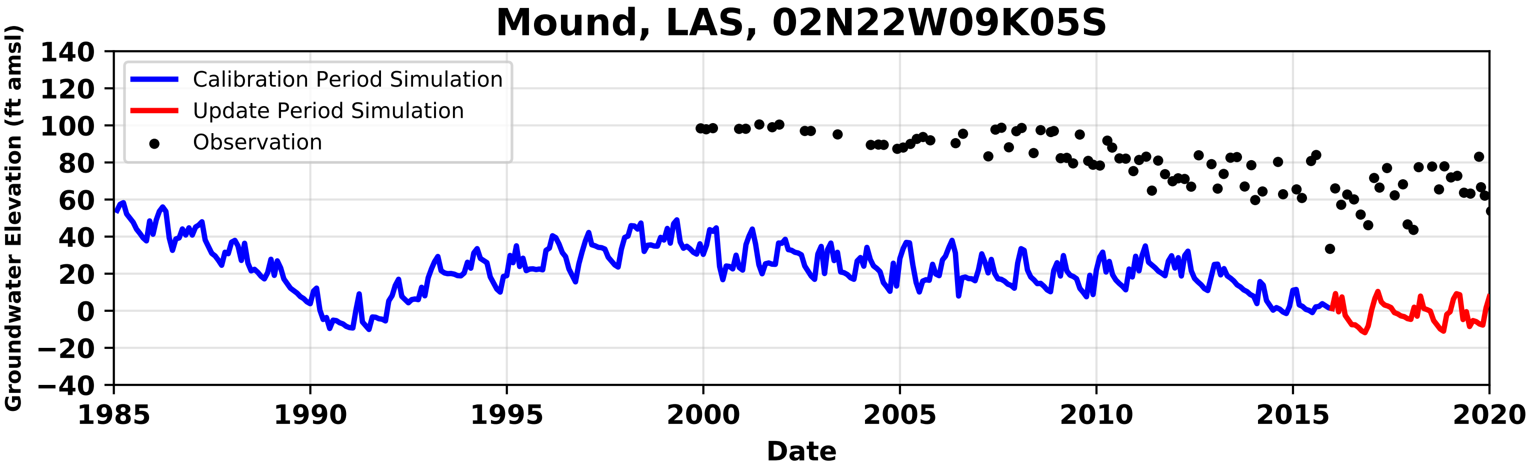
Mound, LAS, 02N23W13K03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

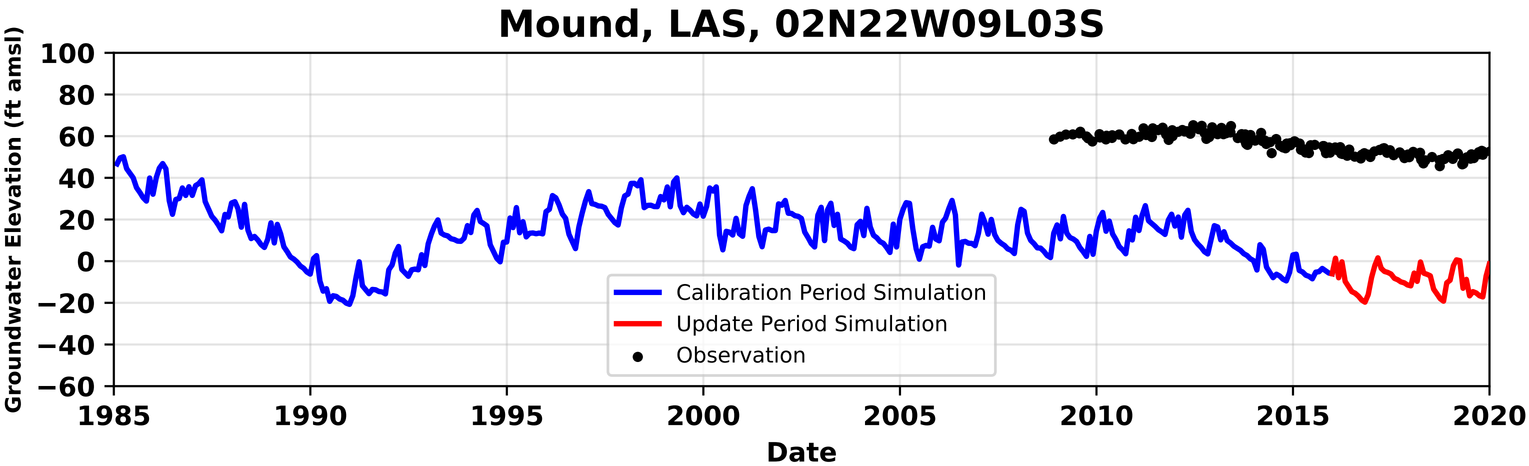

Mound, LAS, 02N22W09K03S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

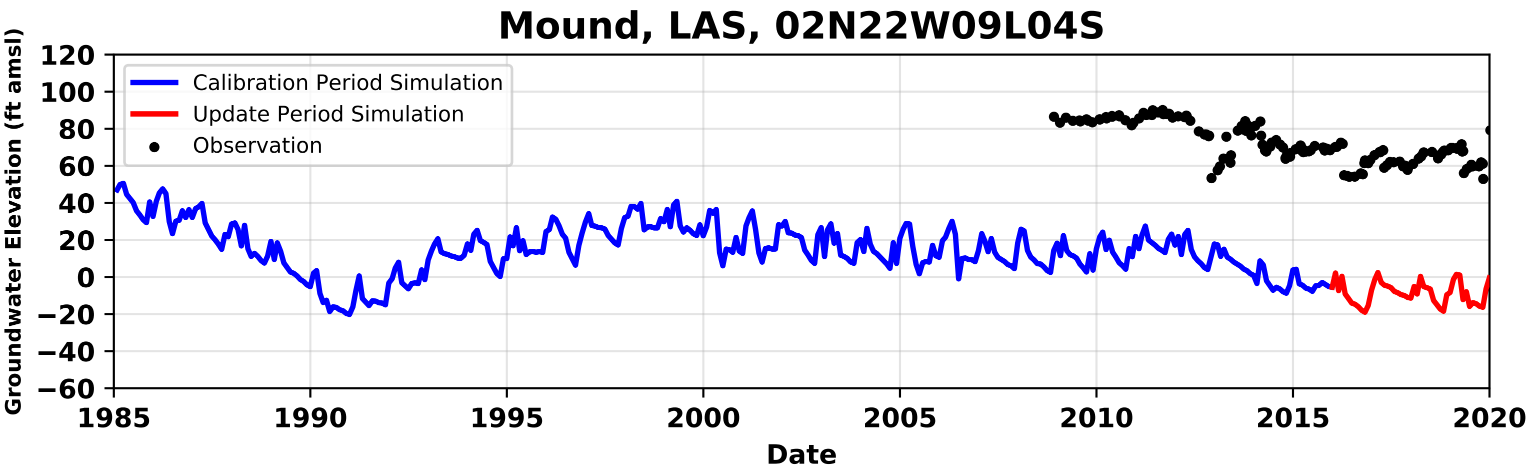

Mound, LAS, 02N22W08F01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

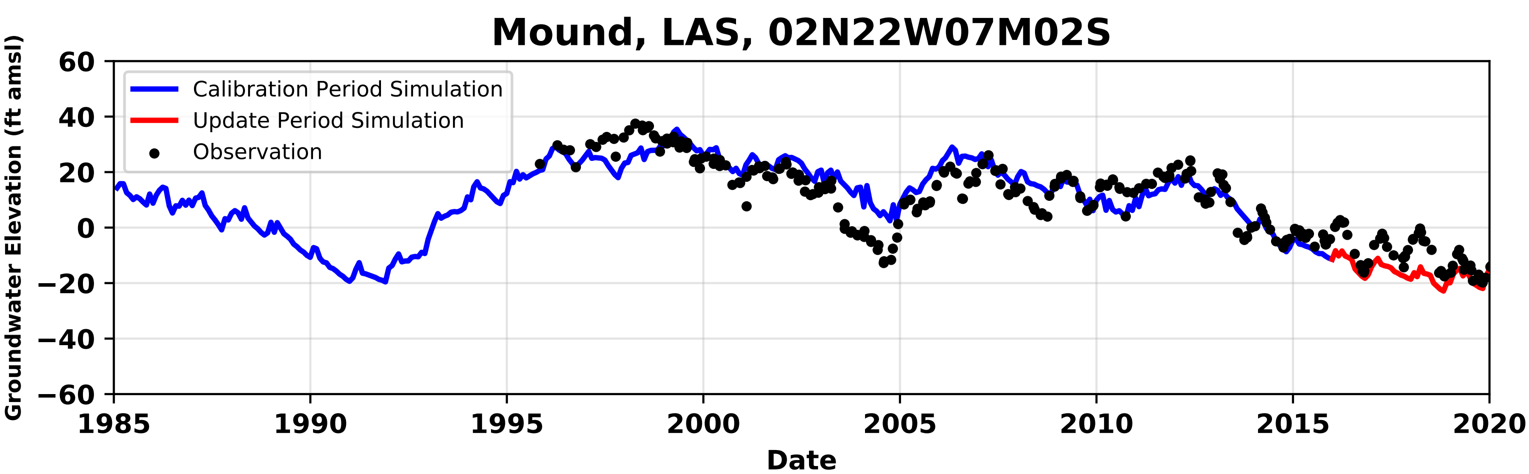

Mound, LAS, 02N22W08G01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

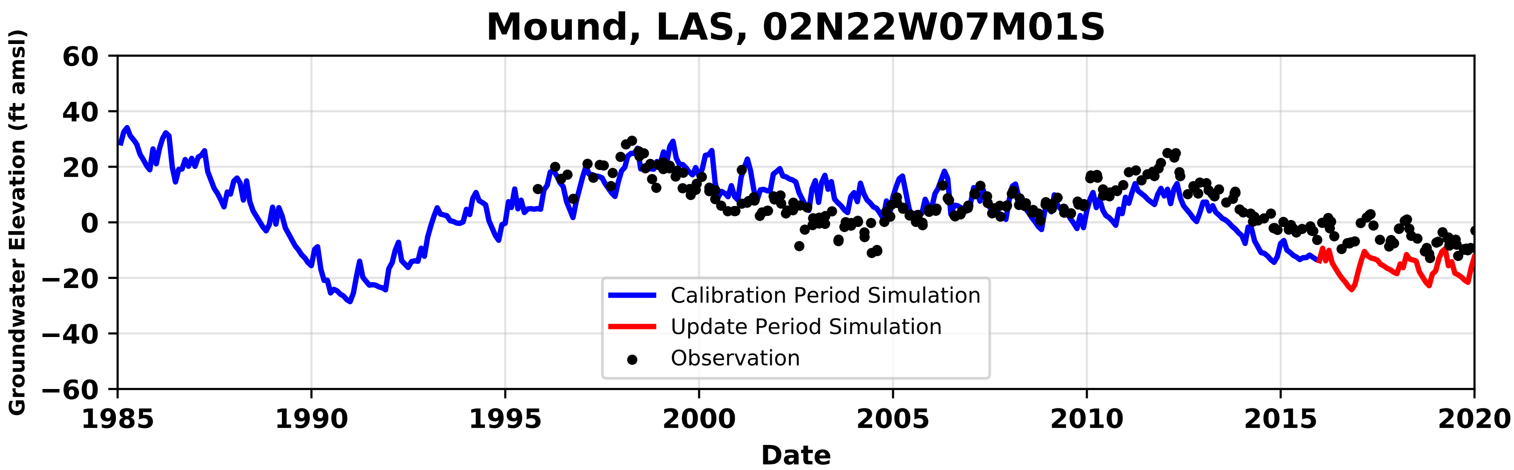

Mound, LAS, 02N23W15J01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

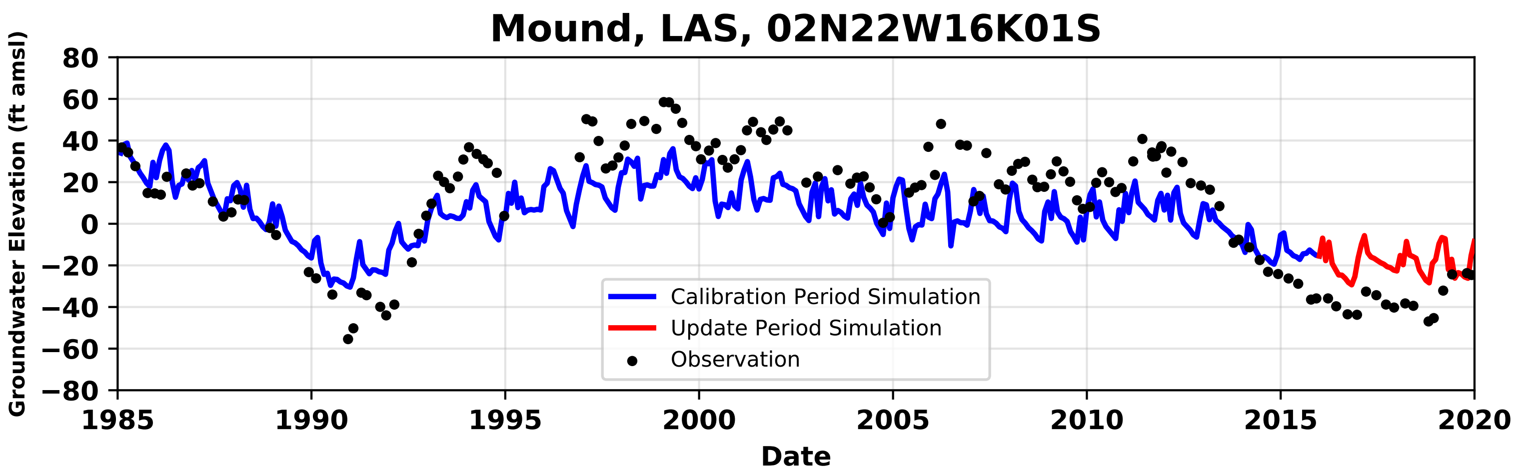

Mound, LAS, 02N22W09K05S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
140
120
100
80
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020

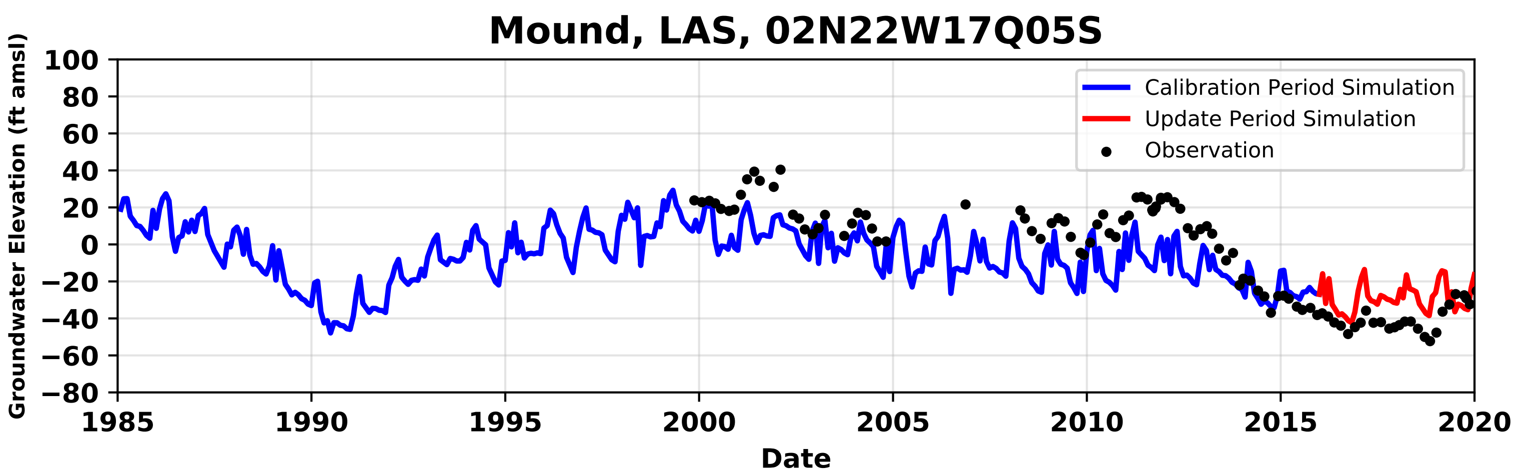

Mound, LAS, 02N22W09L03S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

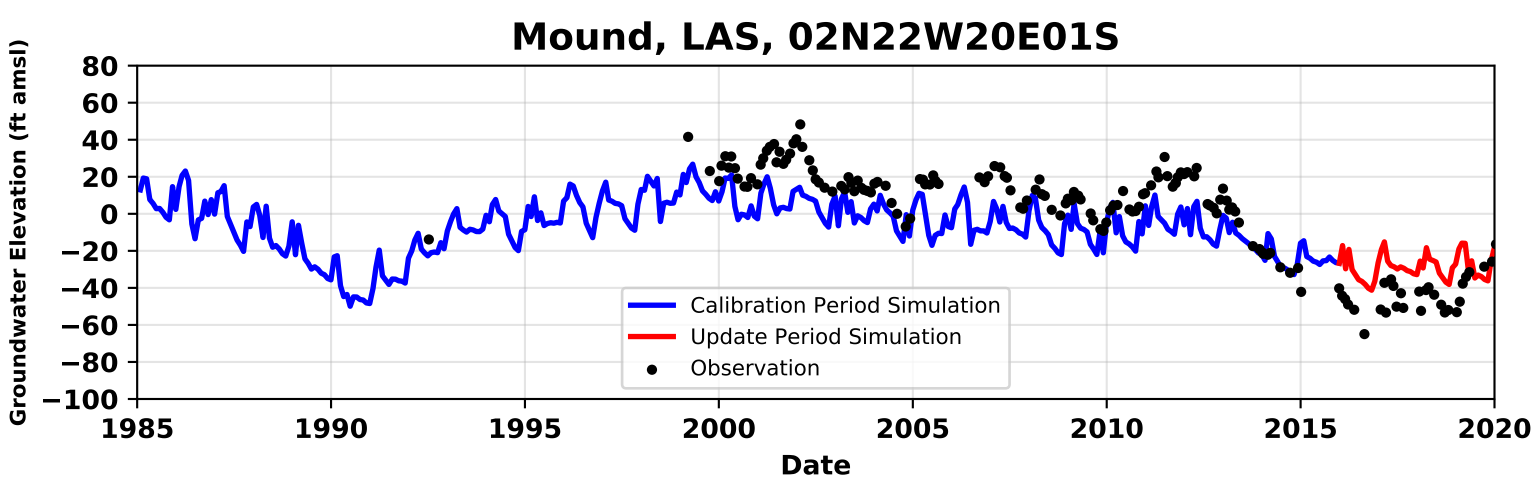

Mound, LAS, 02N22W09L04S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
120
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

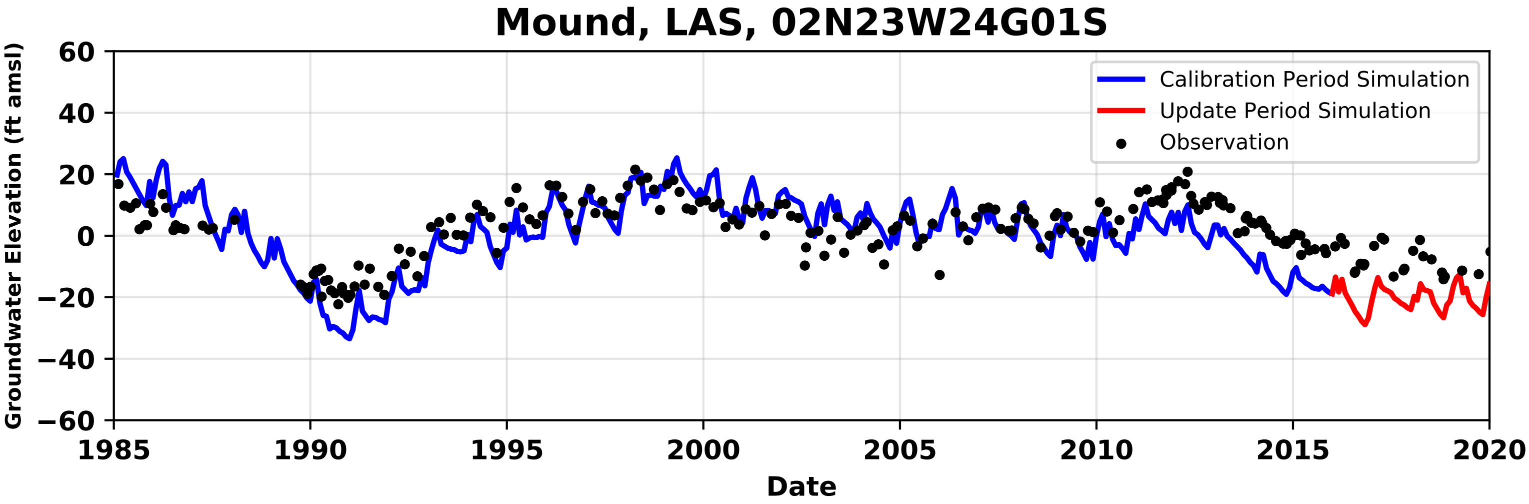

Mound, LAS, 02N22W07M02S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

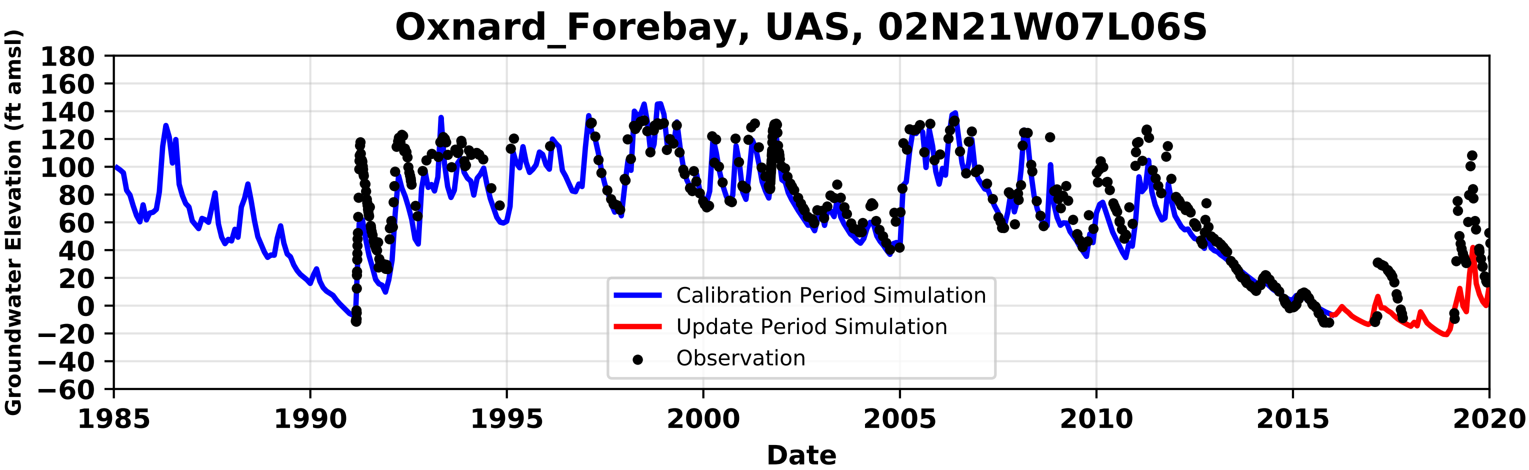

Mound, LAS, 02N22W07M01S
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Mound, LAS, 02N22W16K01S
Groundwater Elevation (ft amsl)
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

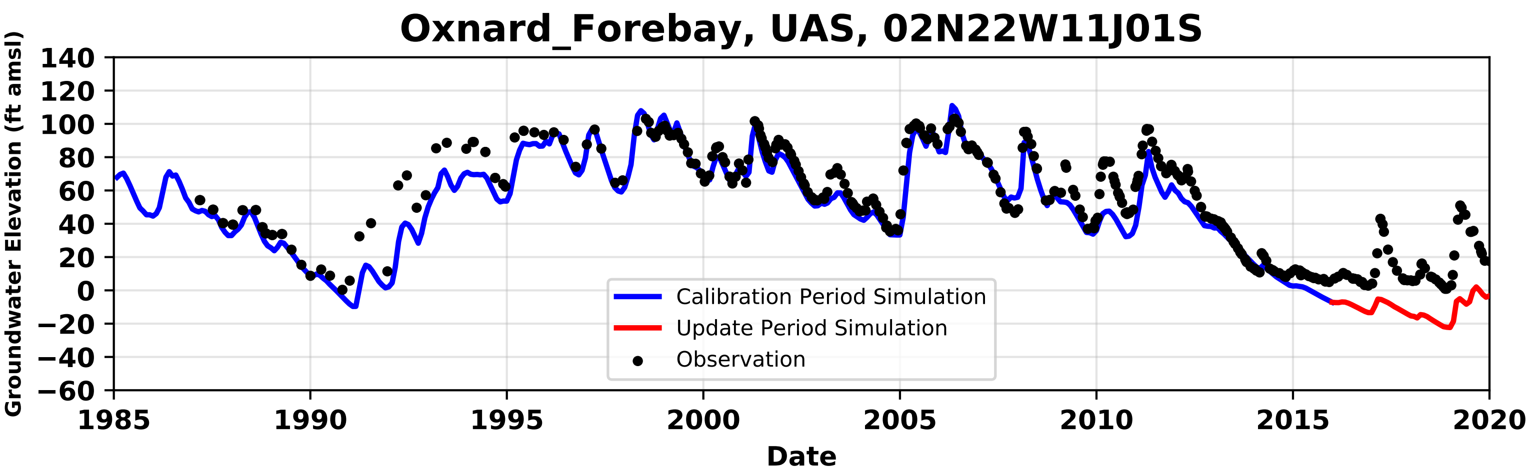

Mound, LAS, 02N22W17Q05S
Groundwater Elevation (ft amsl)
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Mound, LAS, 02N22W20E01S
Groundwater Elevation (ft amsl)
80
60
40
20
0
−20
−40
−60
−80
−100
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

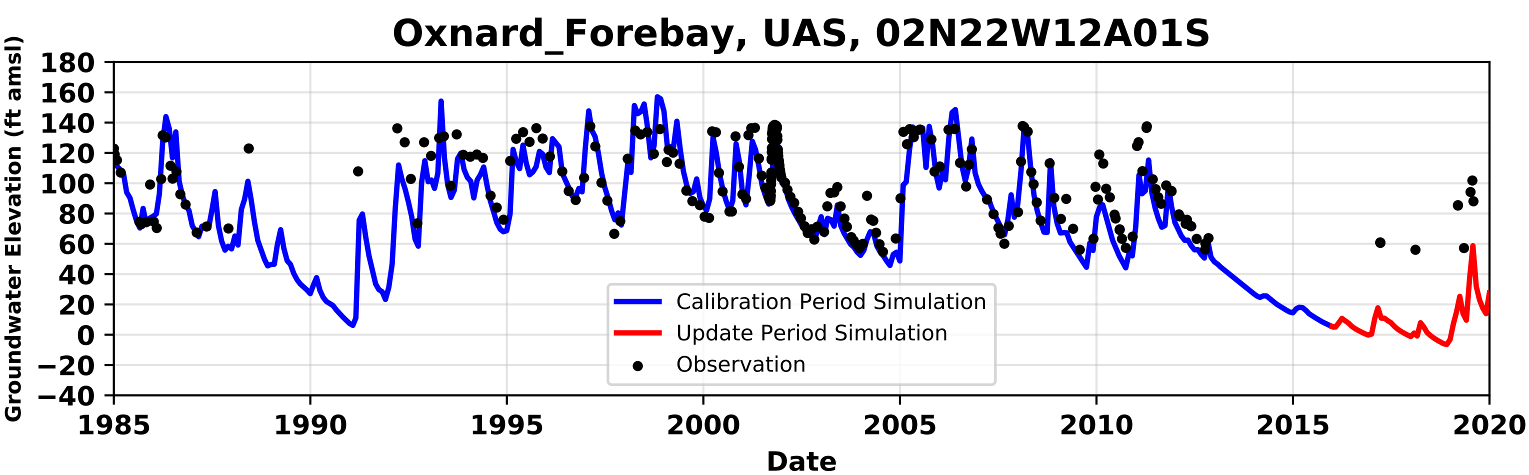

Mound, LAS, 02N23W24G01S
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



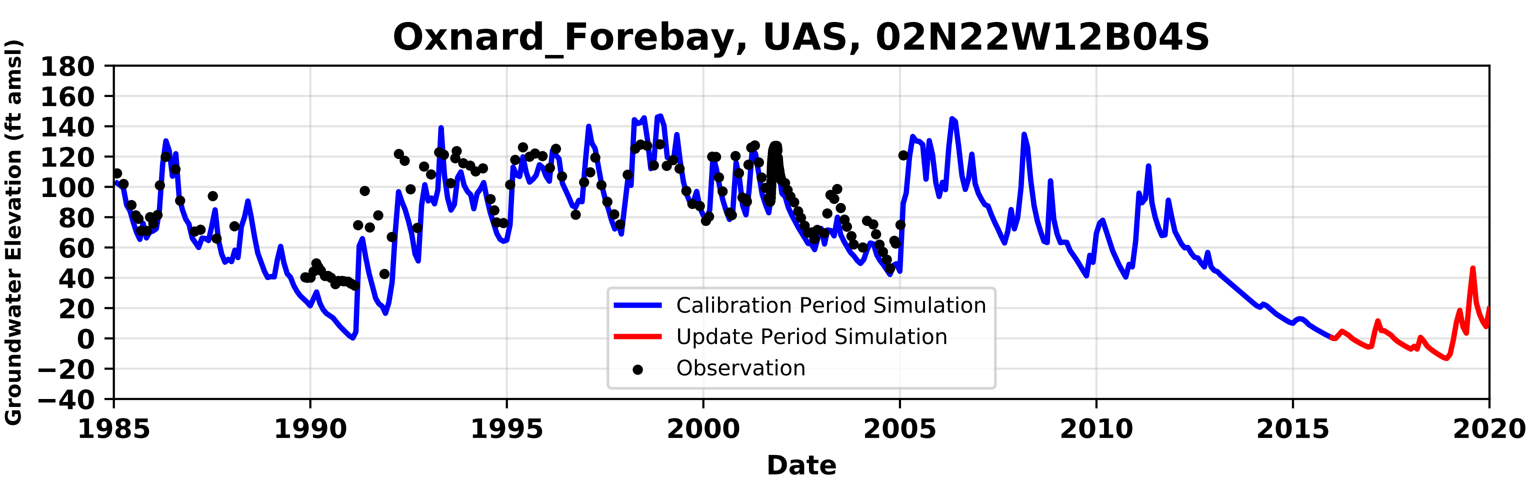
Oxnard_Forebay, UAS, 02N21W07L06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



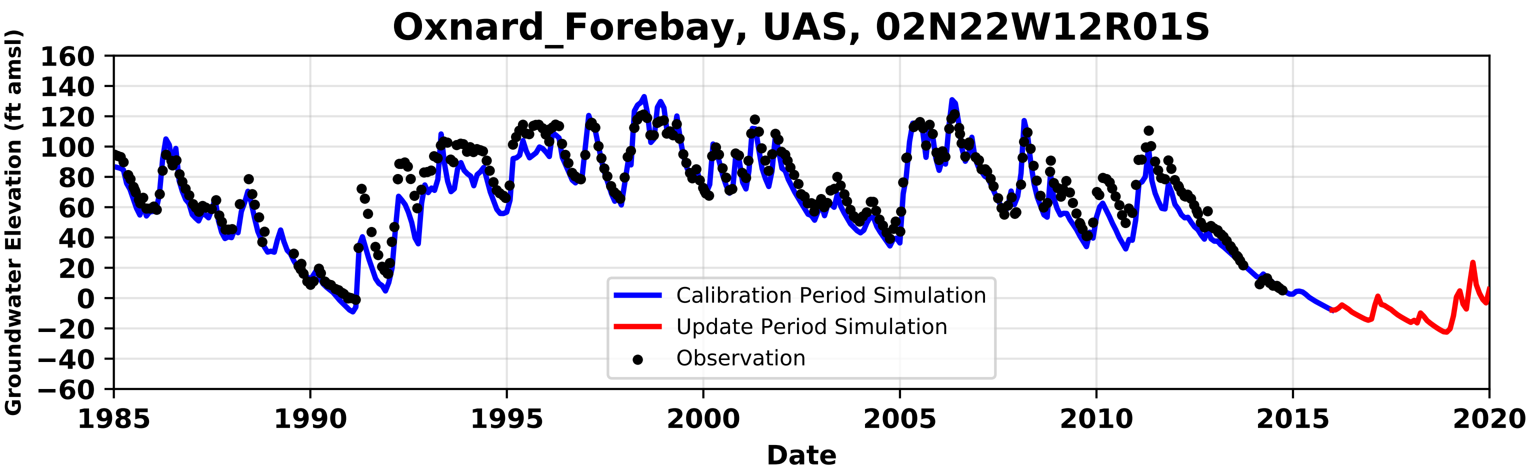
Oxnard_Forebay, UAS, 02N22W11J01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

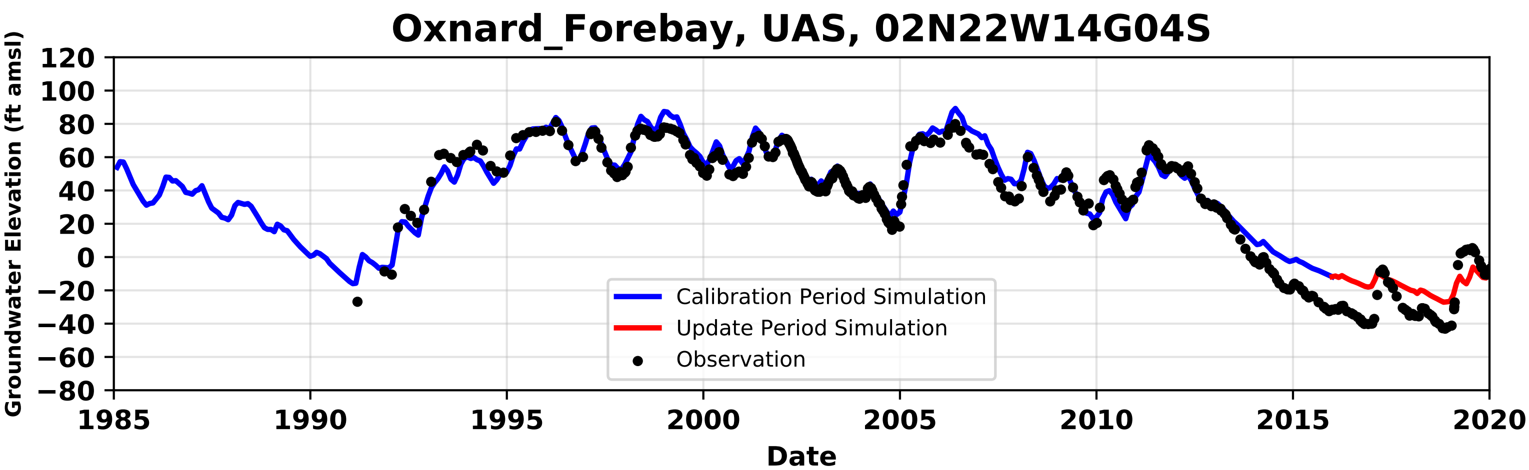


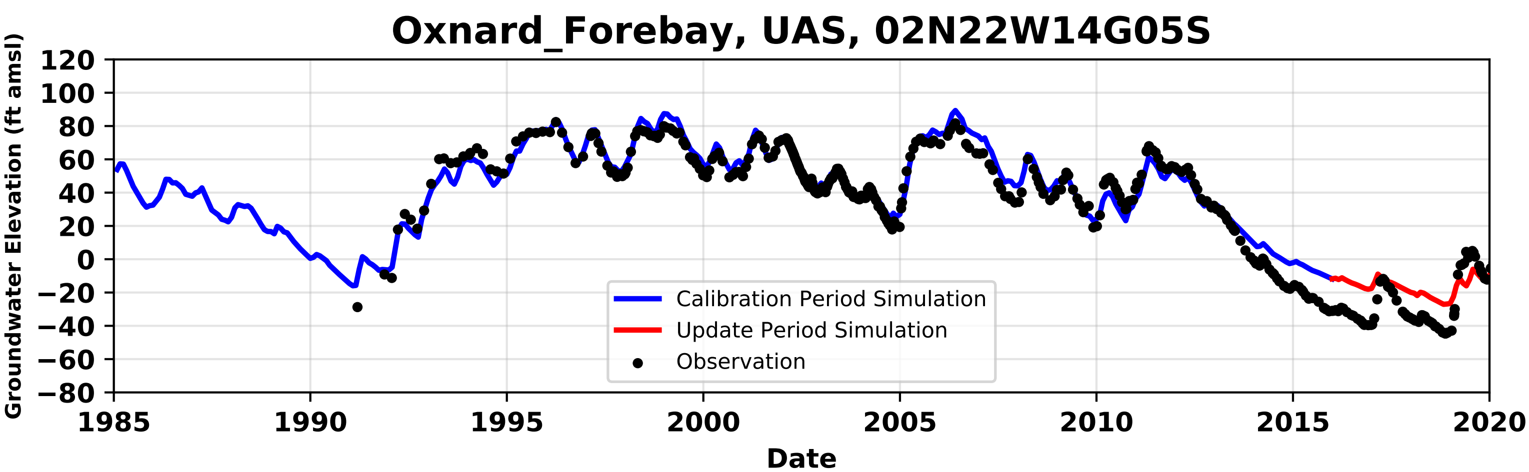
Oxnard_Forebay, UAS, 02N22W12A01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

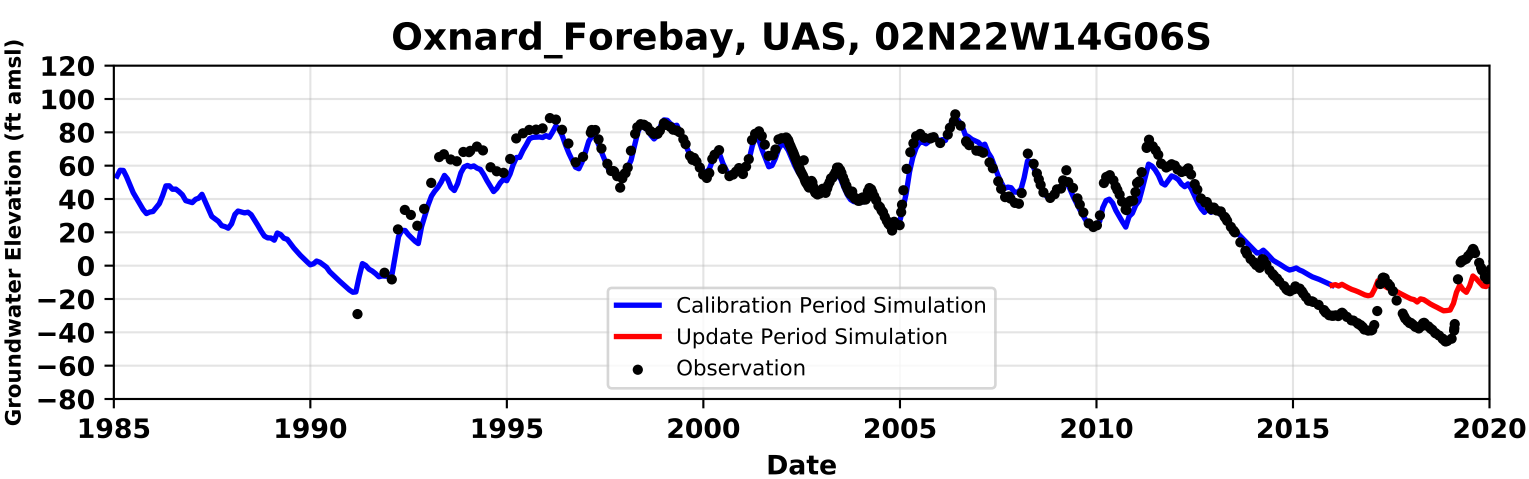


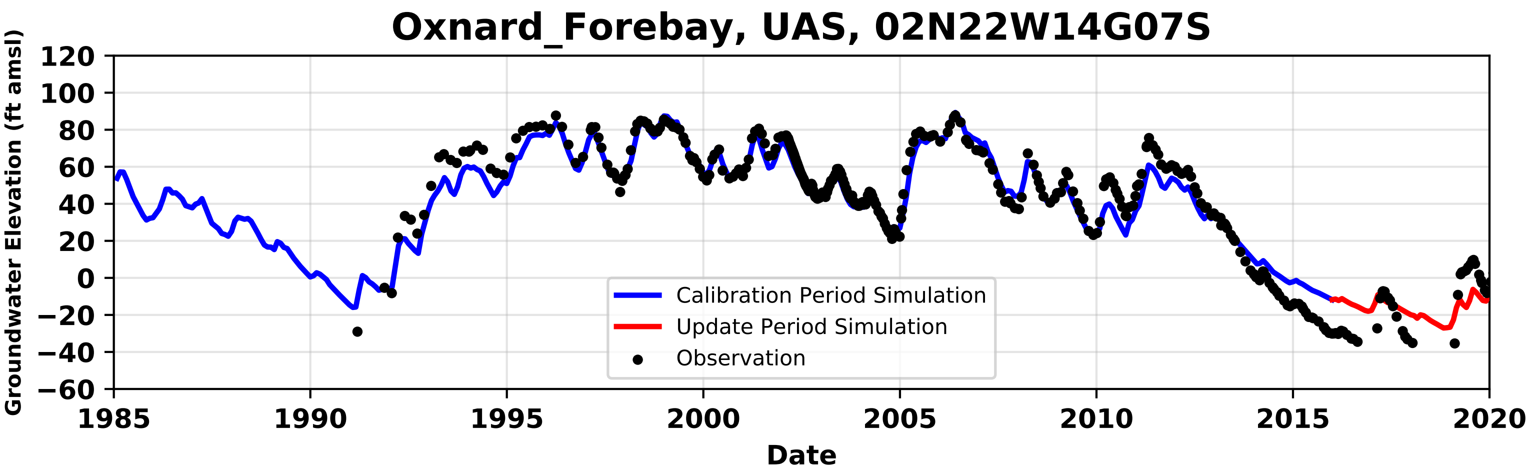
Oxnard_Forebay, UAS, 02N22W12B04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

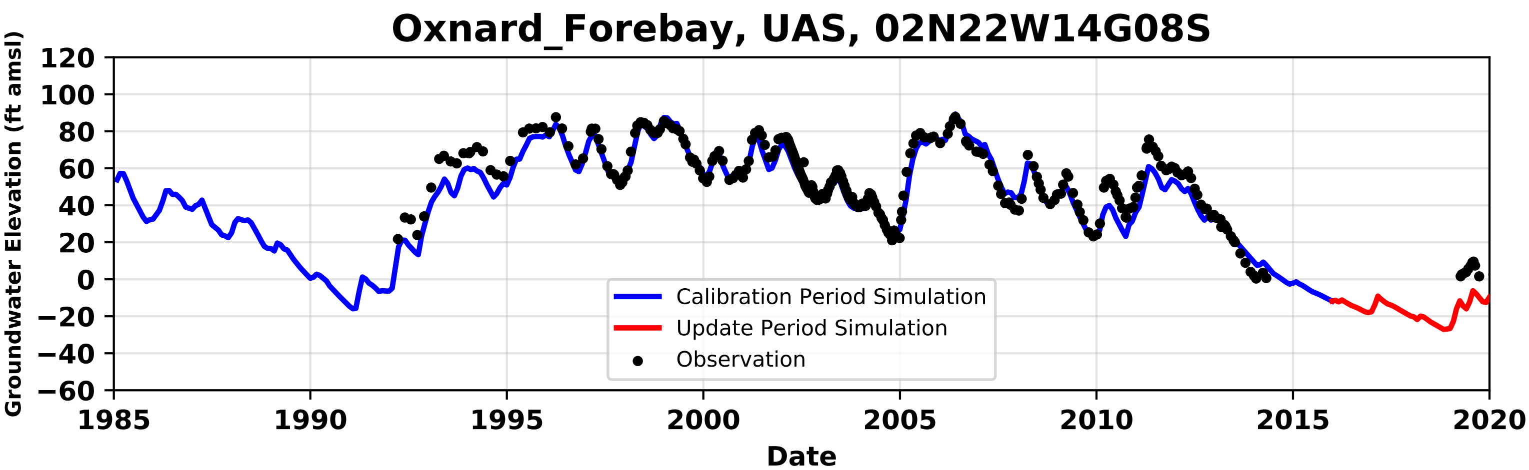

Oxnard_Forebay, UAS, 02N22W12R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

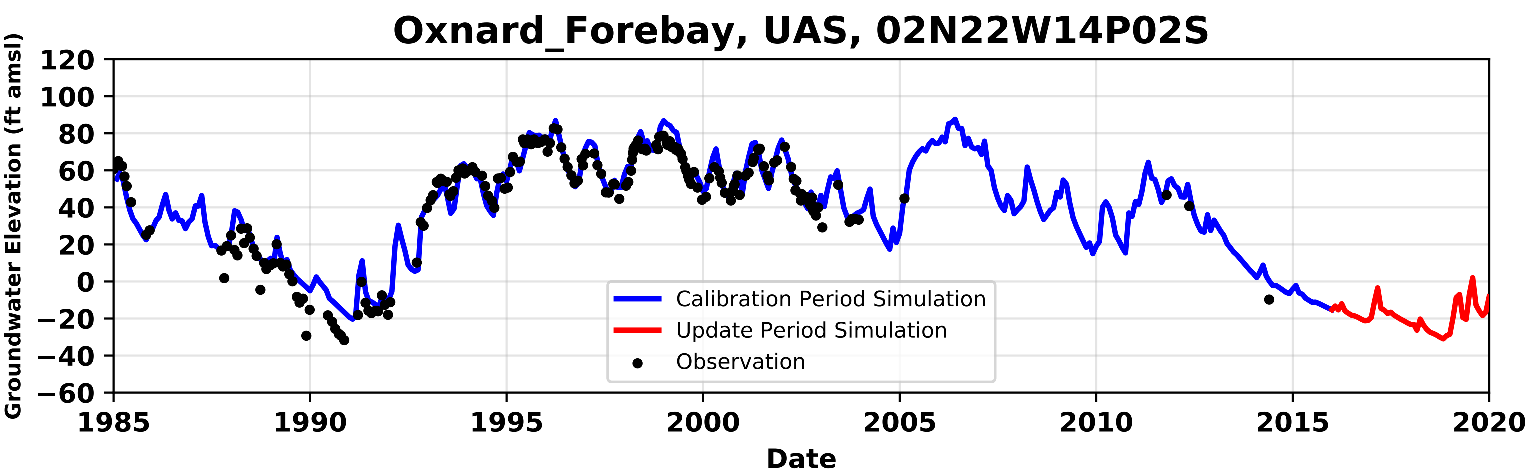

Oxnard_Forebay, UAS, 02N22W14G04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

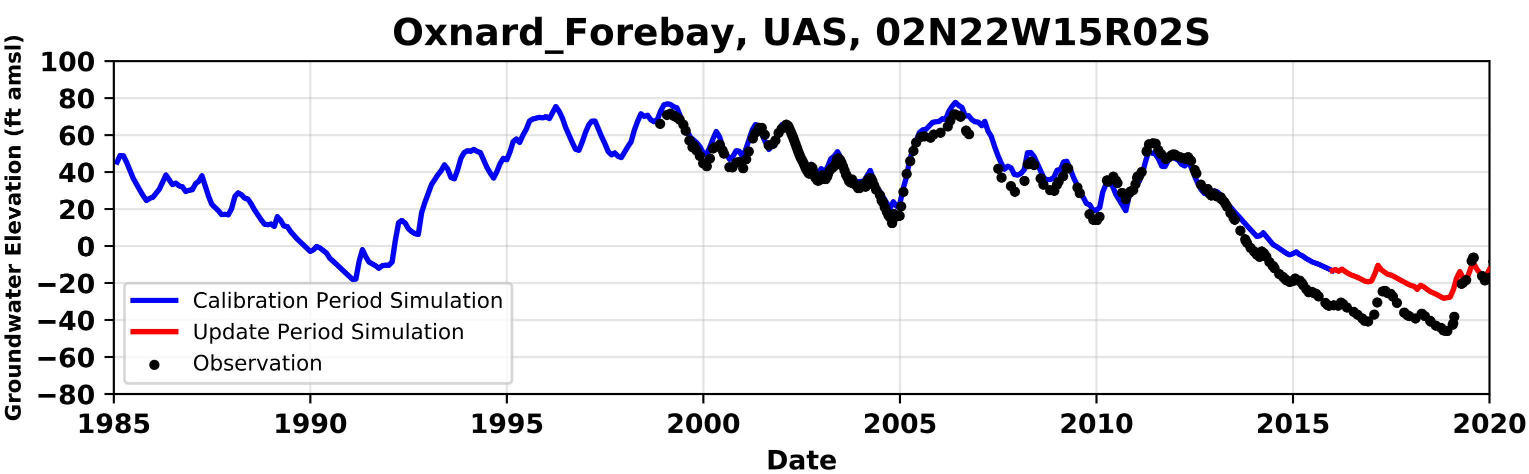

Oxnard_Forebay, UAS, 02N22W14G05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

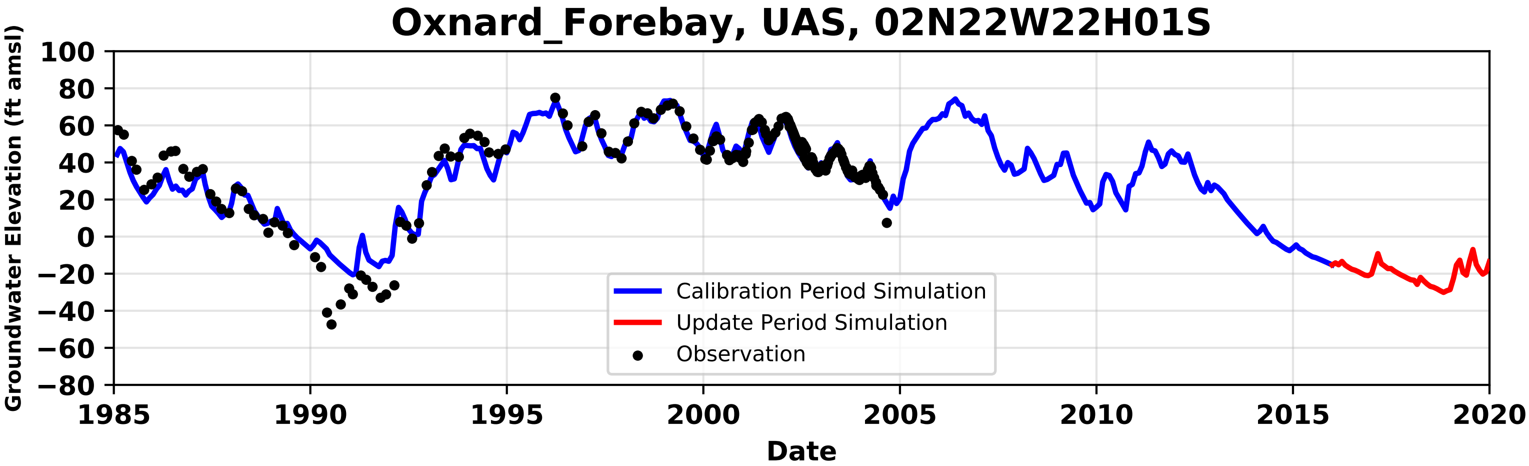

Oxnard_Forebay, UAS, 02N22W14G06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

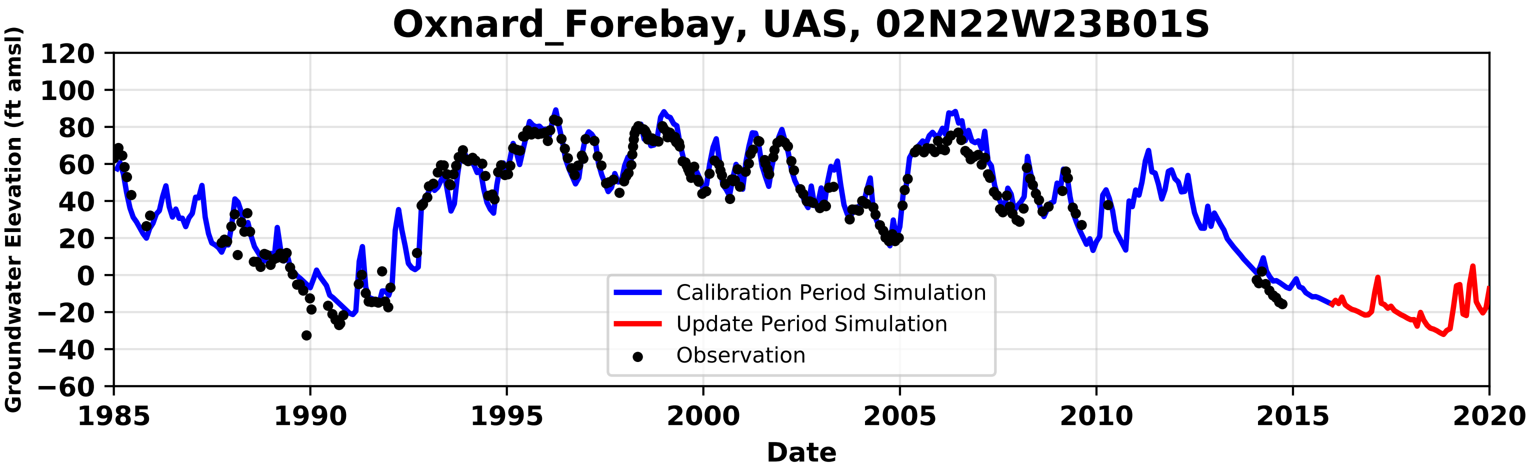

Oxnard_Forebay, UAS, 02N22W14G07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

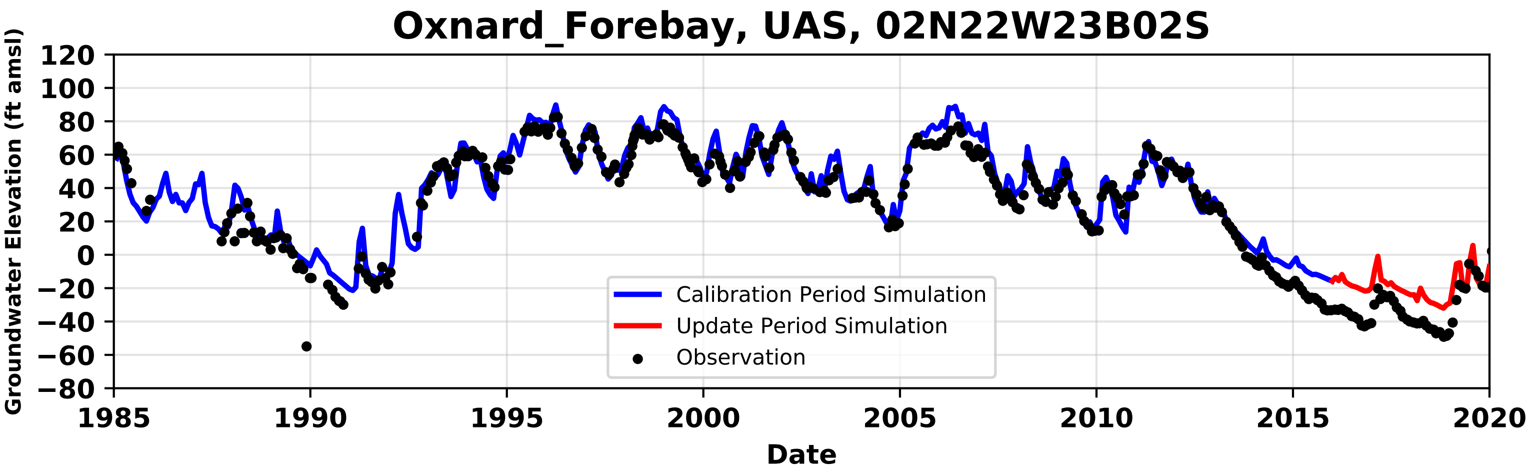

Oxnard_Forebay, UAS, 02N22W14G08S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

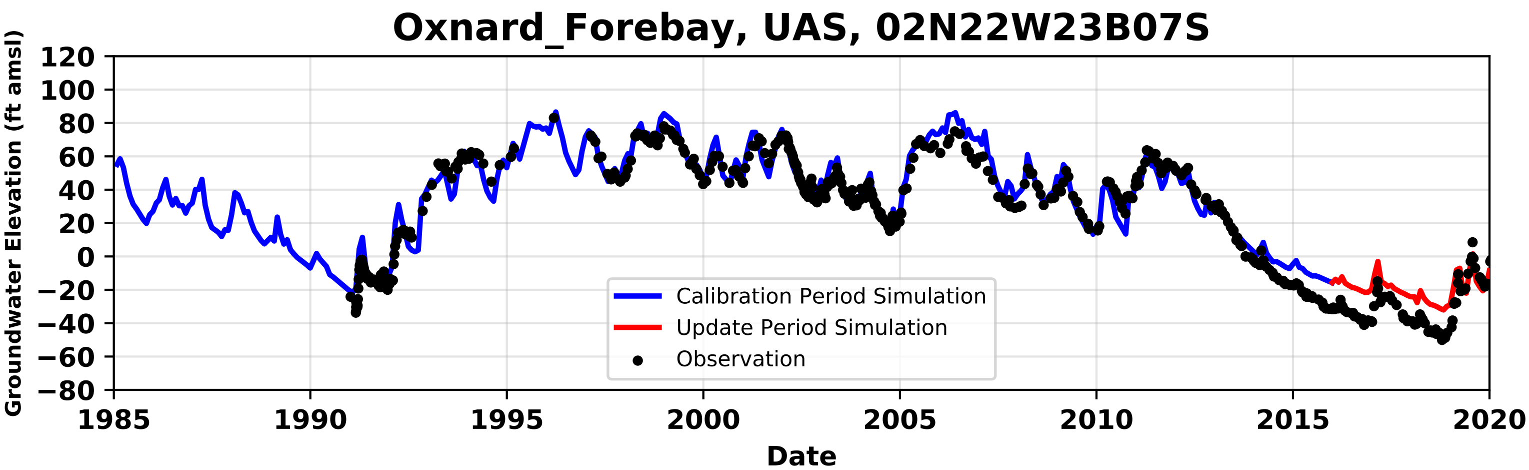

Oxnard_Forebay, UAS, 02N22W14P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

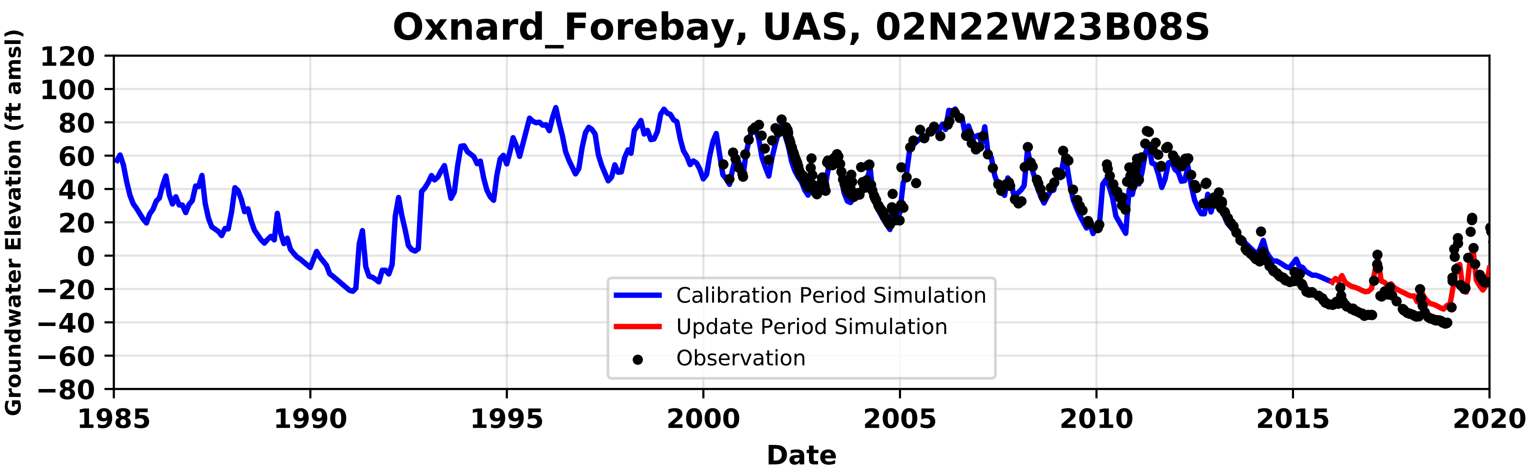

Oxnard_Forebay, UAS, 02N22W15R02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

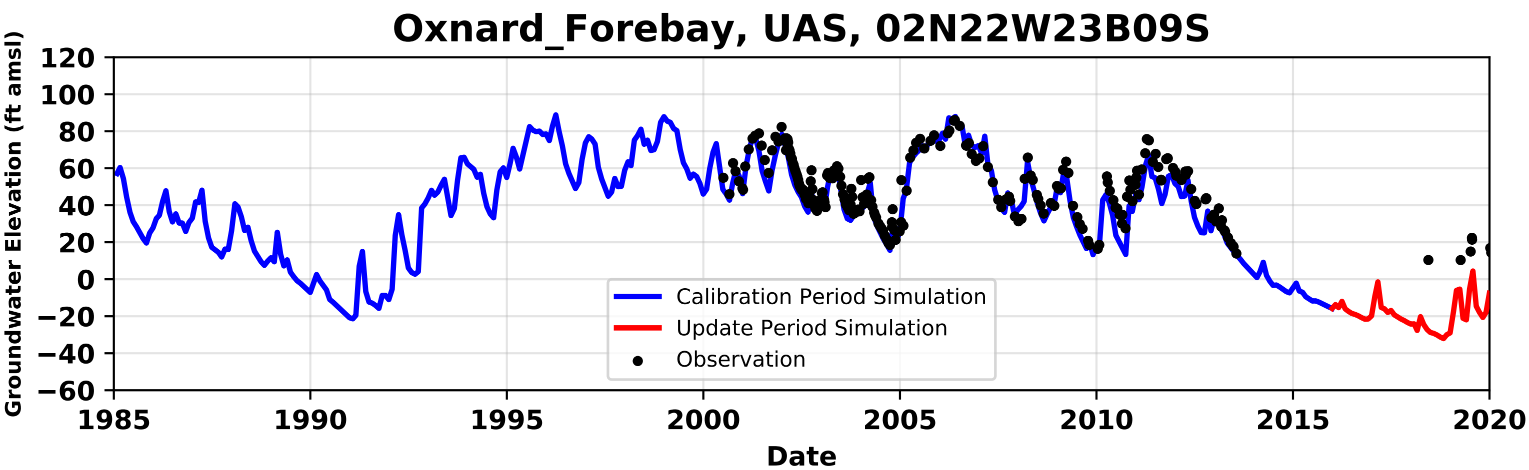

Oxnard_Forebay, UAS, 02N22W22H01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020

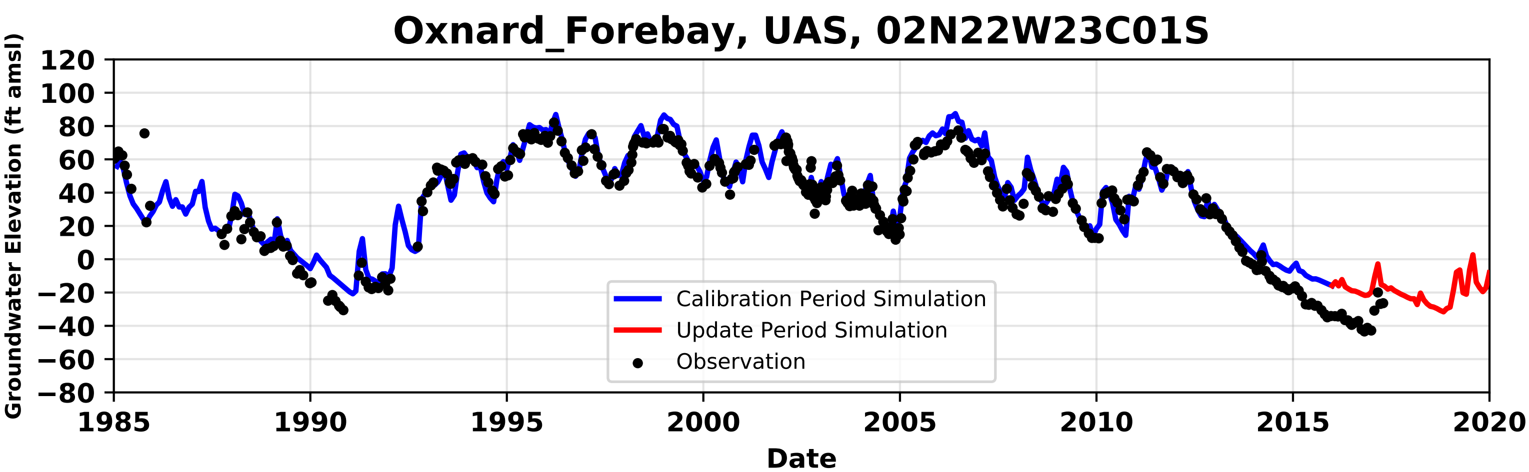

Oxnard_Forebay, UAS, 02N22W23B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
120
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

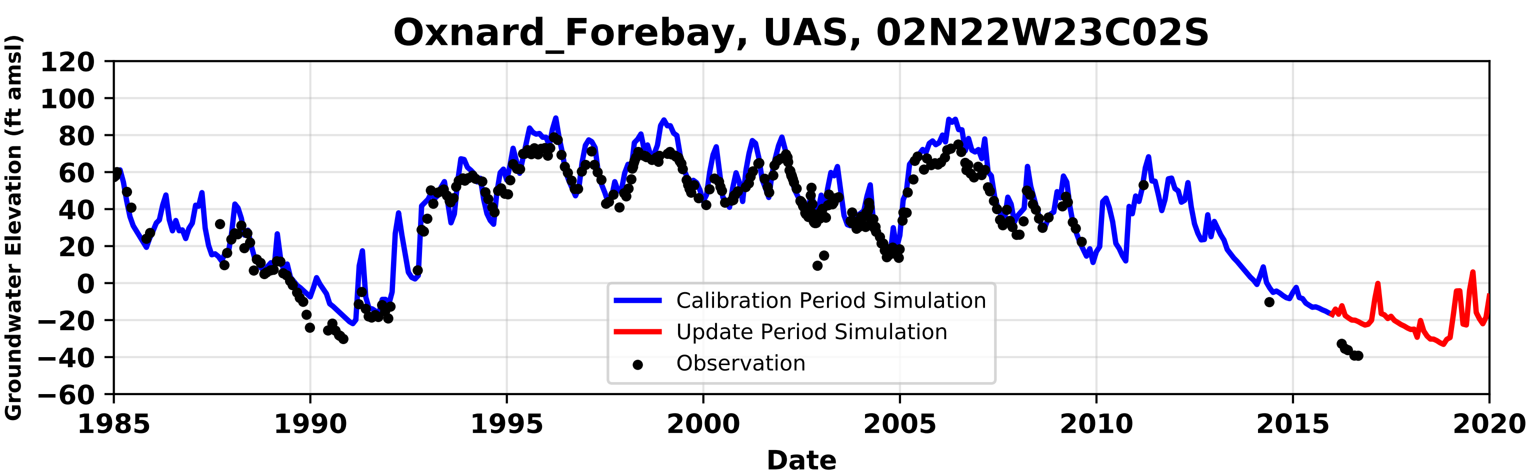

Oxnard_Forebay, UAS, 02N22W23B02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
120
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020

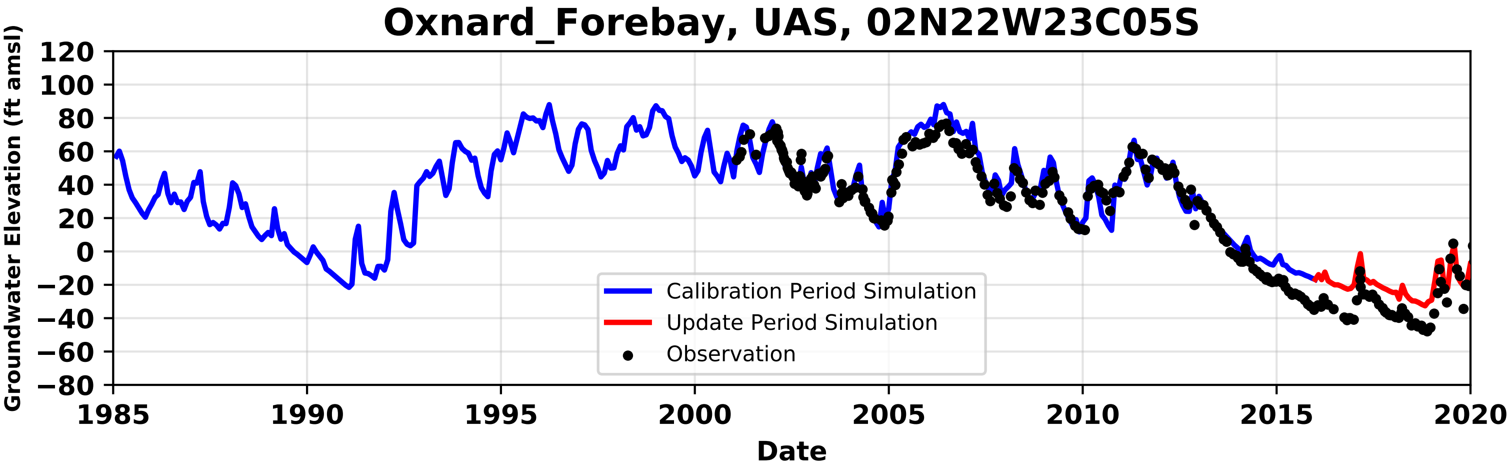

Oxnard_Forebay, UAS, 02N22W23B07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
120
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020

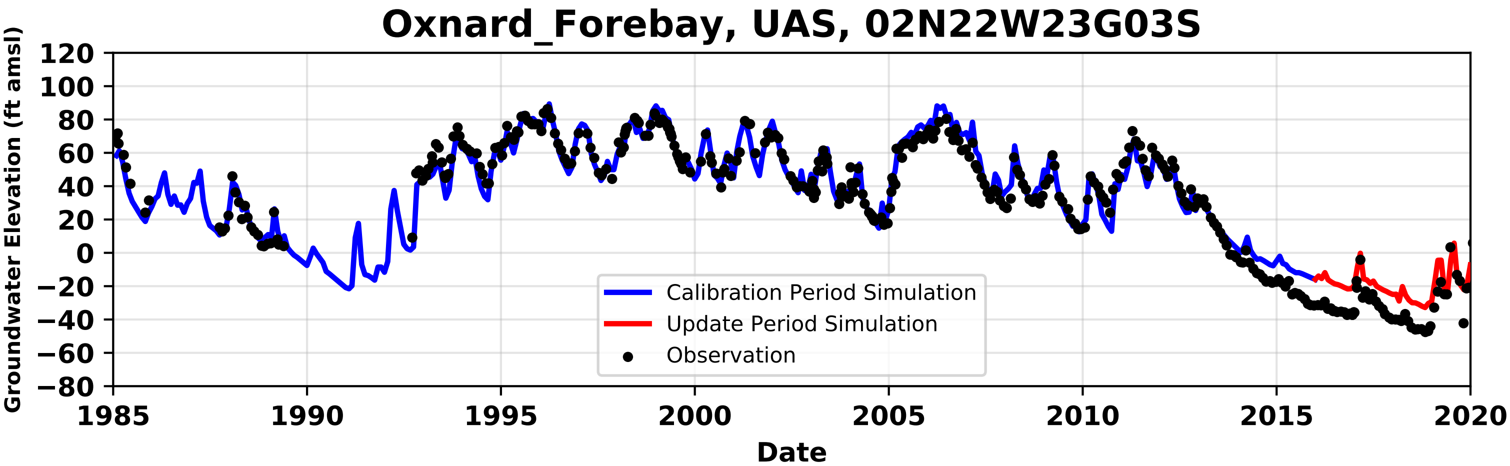

Oxnard_Forebay, UAS, 02N22W23B08S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

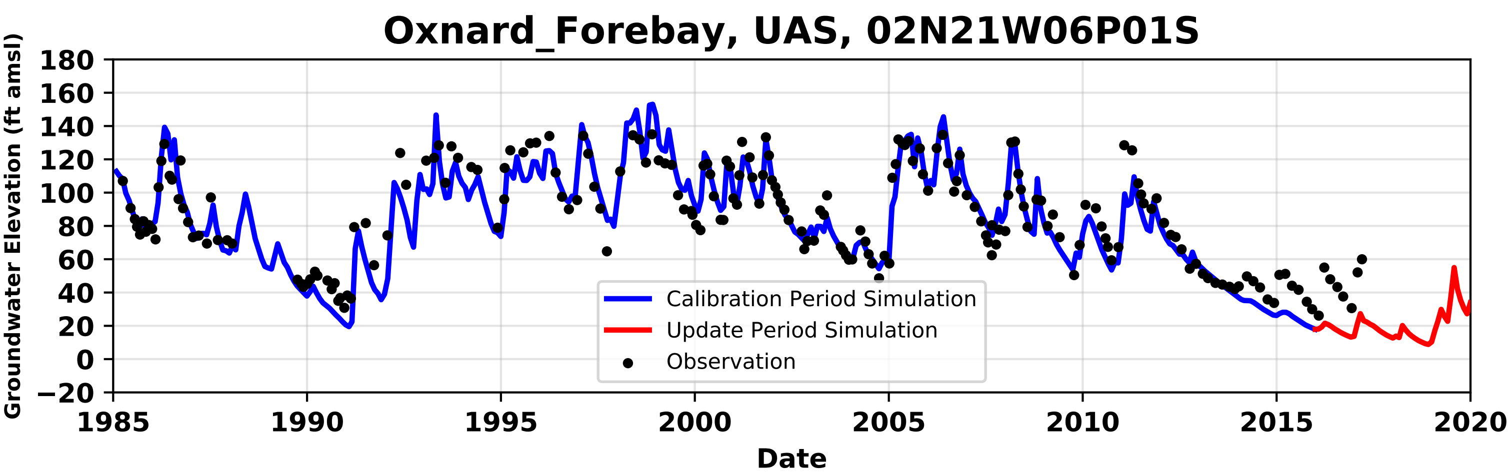

Oxnard_Forebay, UAS, 02N22W23B09S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

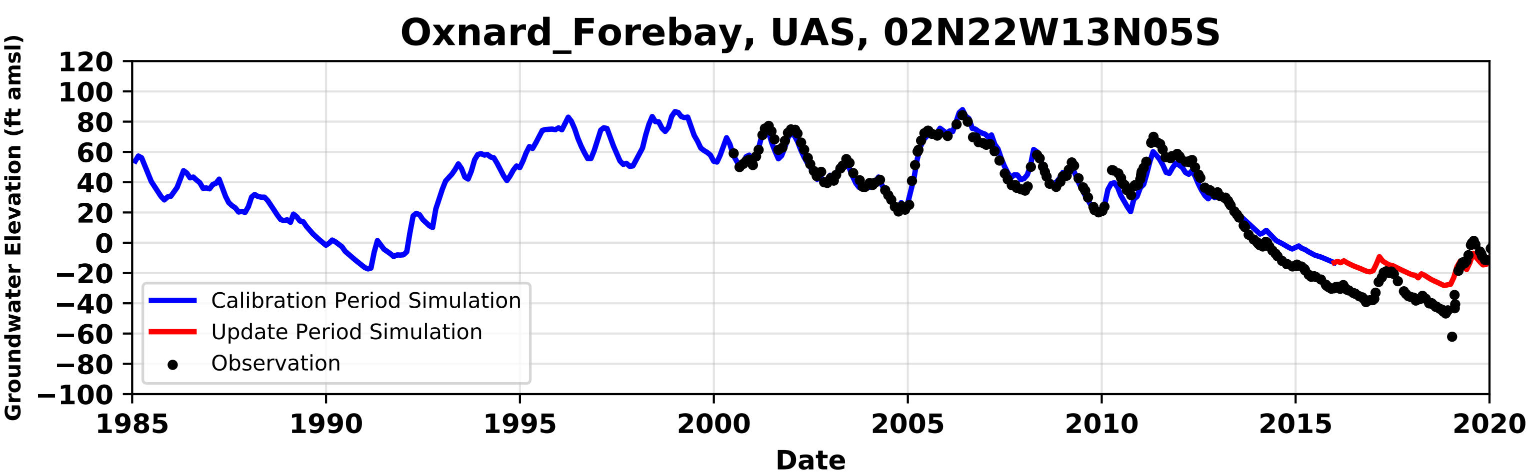

Oxnard_Forebay, UAS, 02N22W23C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

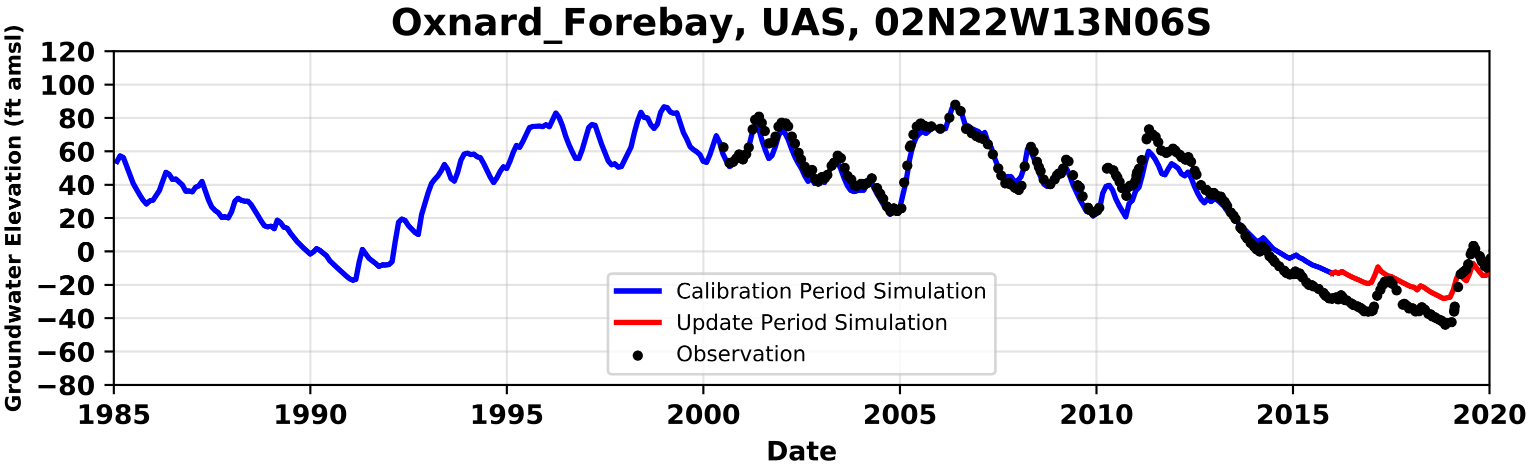

Oxnard_Forebay, UAS, 02N22W23C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

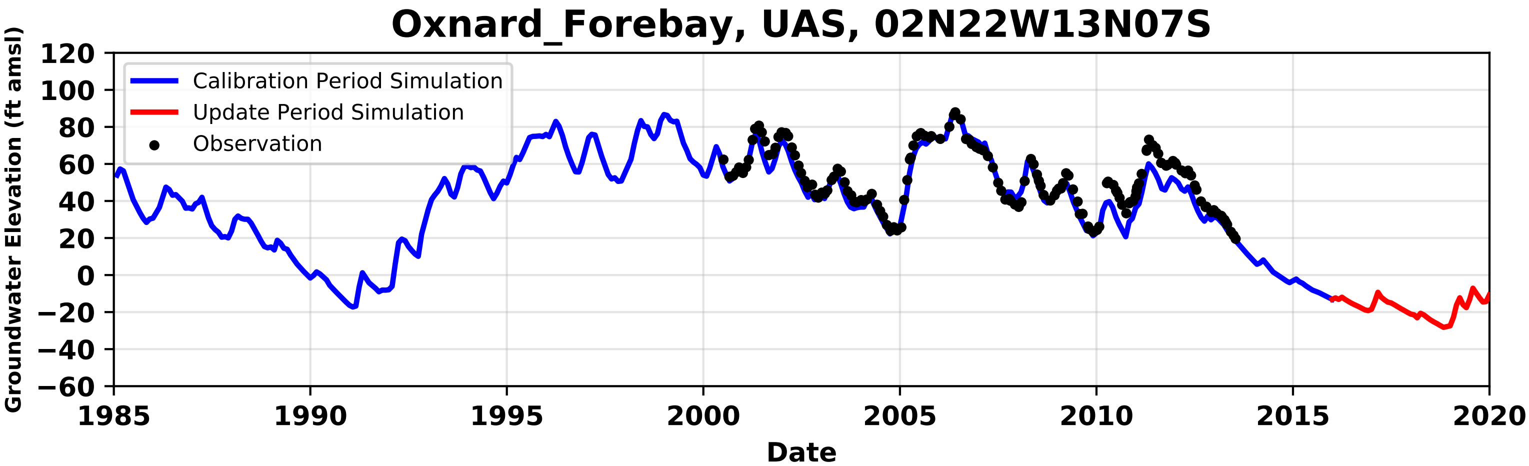

Oxnard_Forebay, UAS, 02N22W23C05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

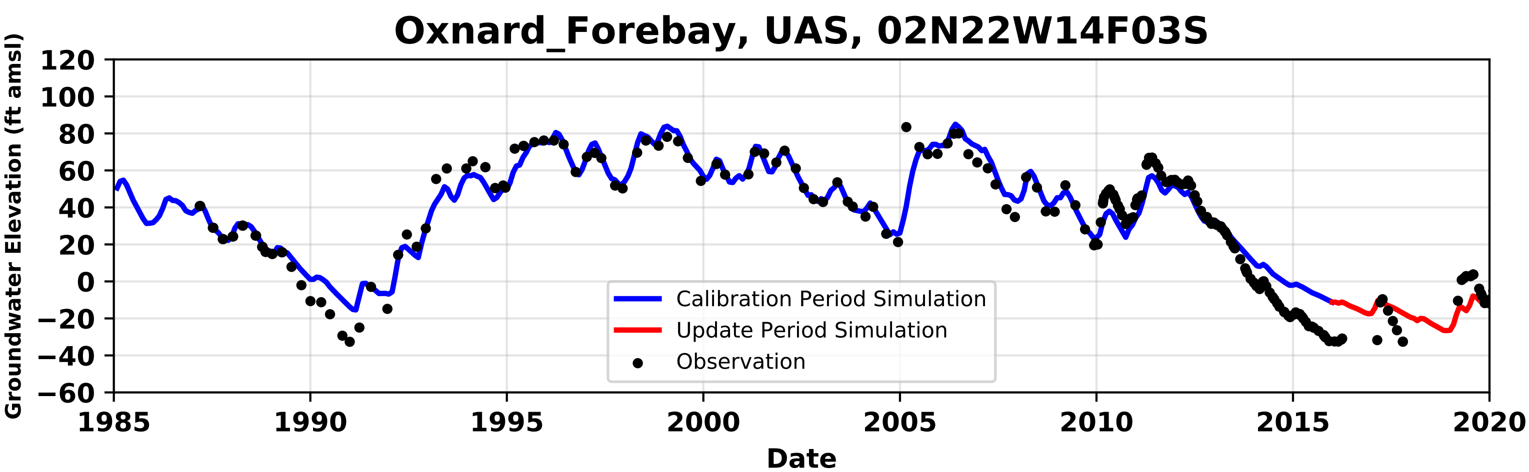

Oxnard_Forebay, UAS, 02N22W23G03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

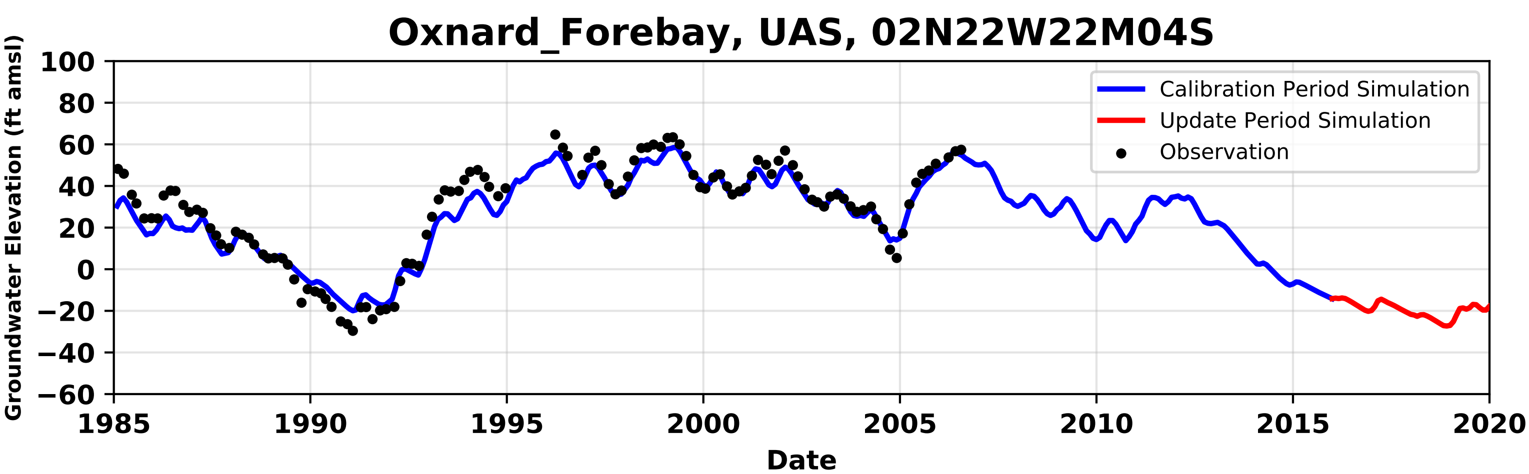

Oxnard_Forebay, UAS, 02N21W06P01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

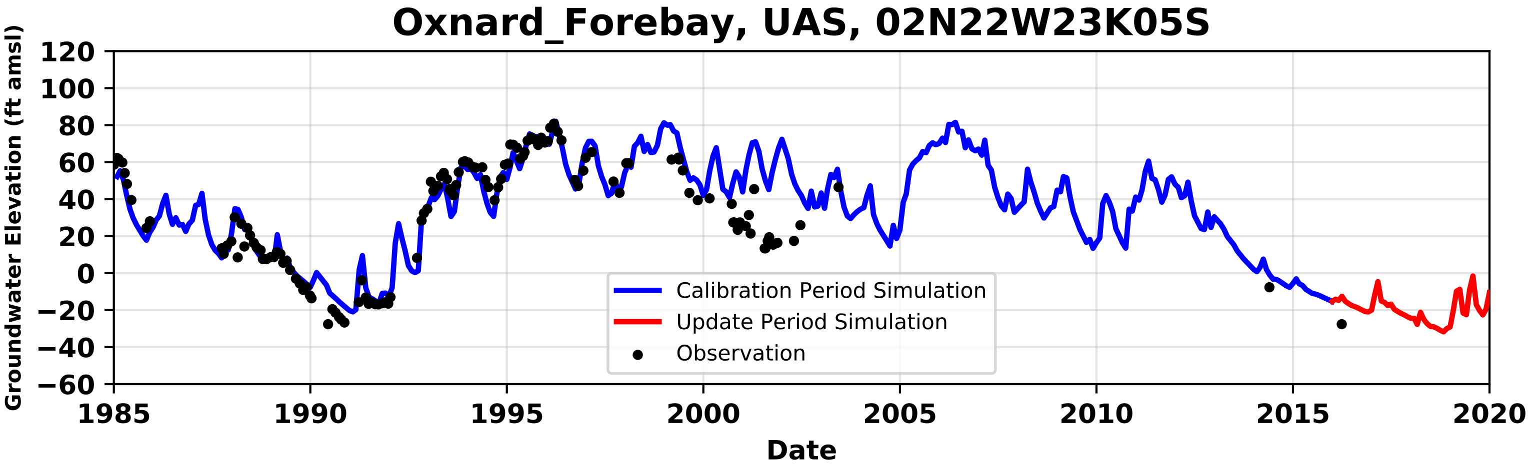

Oxnard_Forebay, UAS, 02N22W13N05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

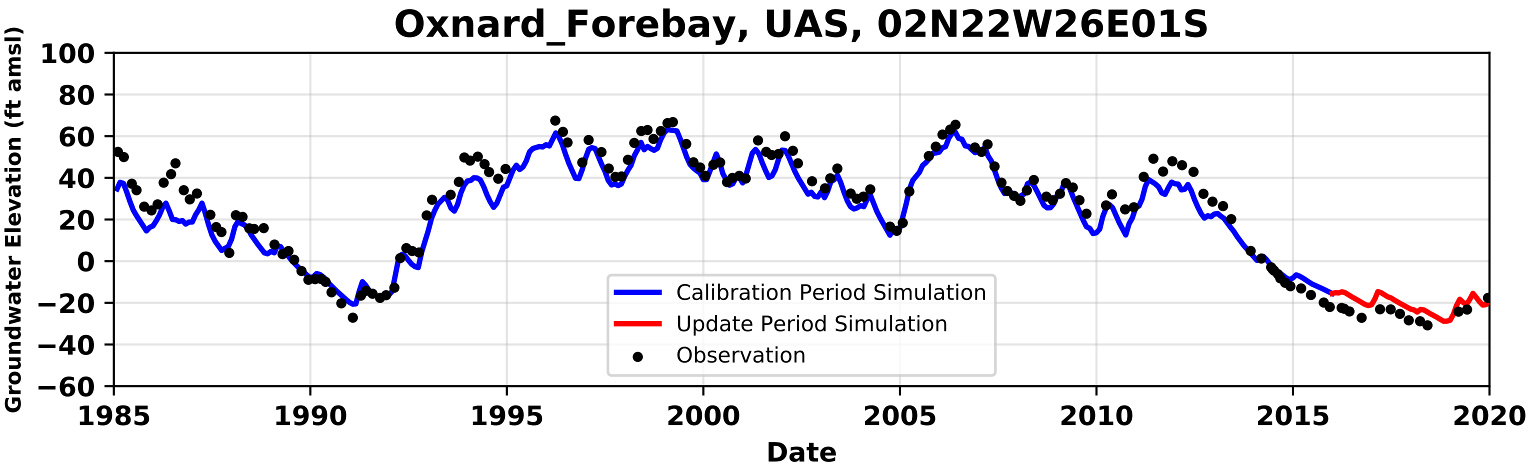

Oxnard_Forebay, UAS, 02N22W13N06S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

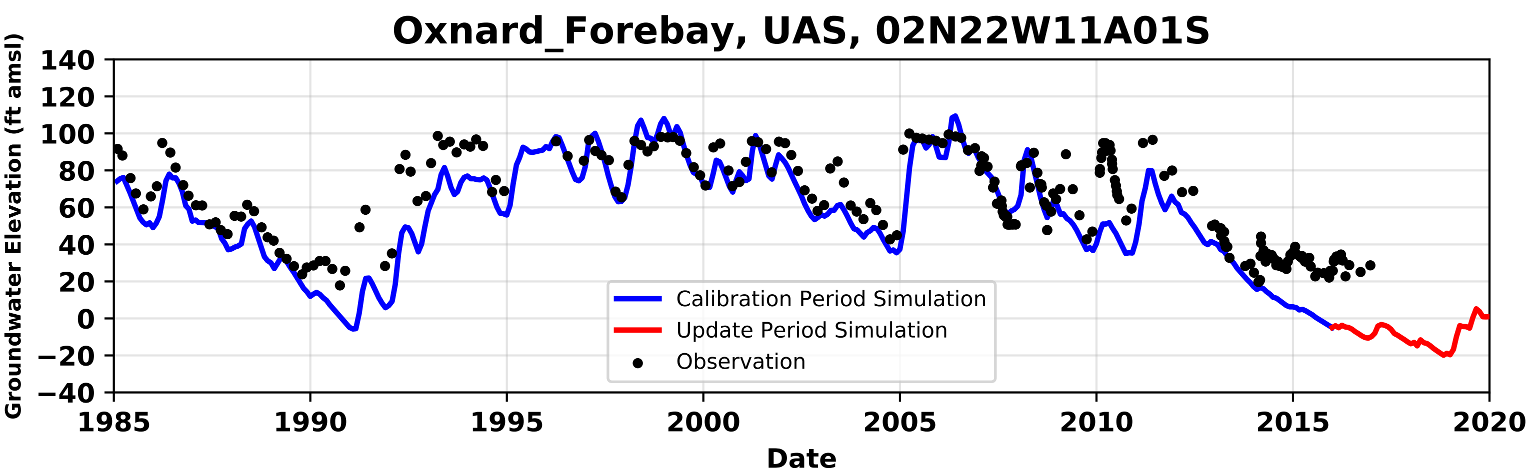

Oxnard_Forebay, UAS, 02N22W13N07S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

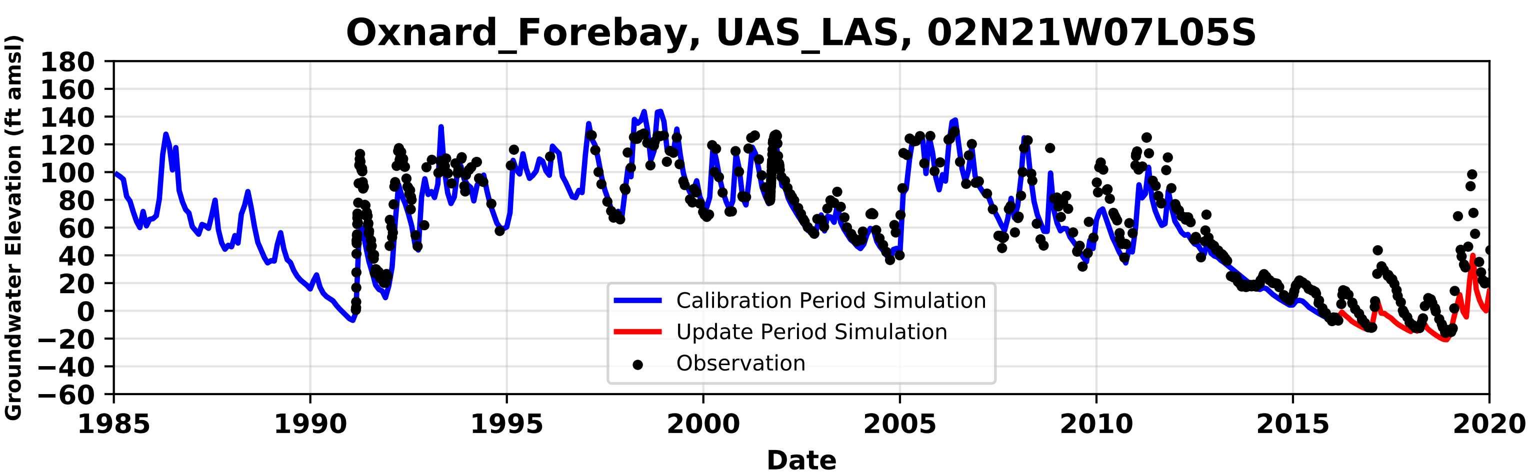

Oxnard_Forebay, UAS, 02N22W14F03S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

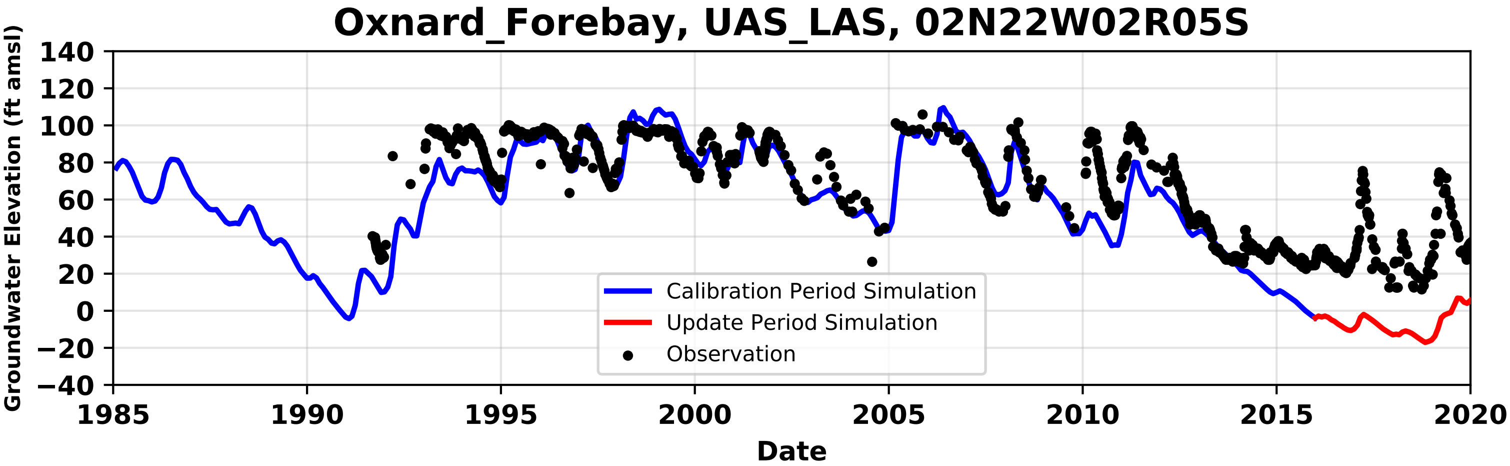

Oxnard_Forebay, UAS, 02N22W22M04S
Groundwater Elevation (ft amsl)
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

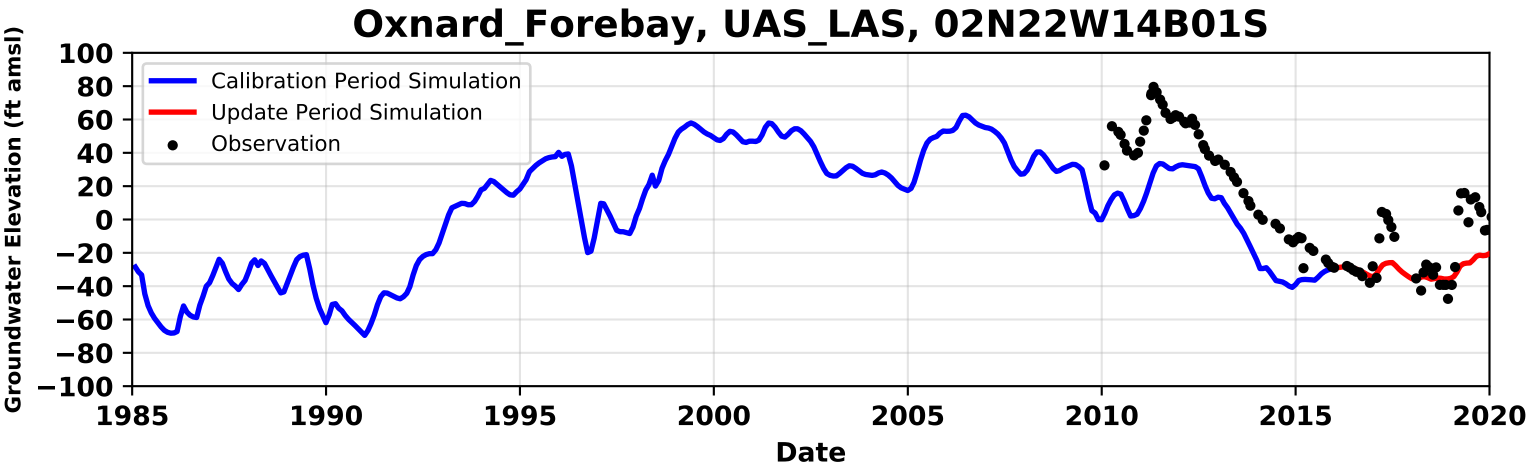

Oxnard_Forebay, UAS, 02N22W23K05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

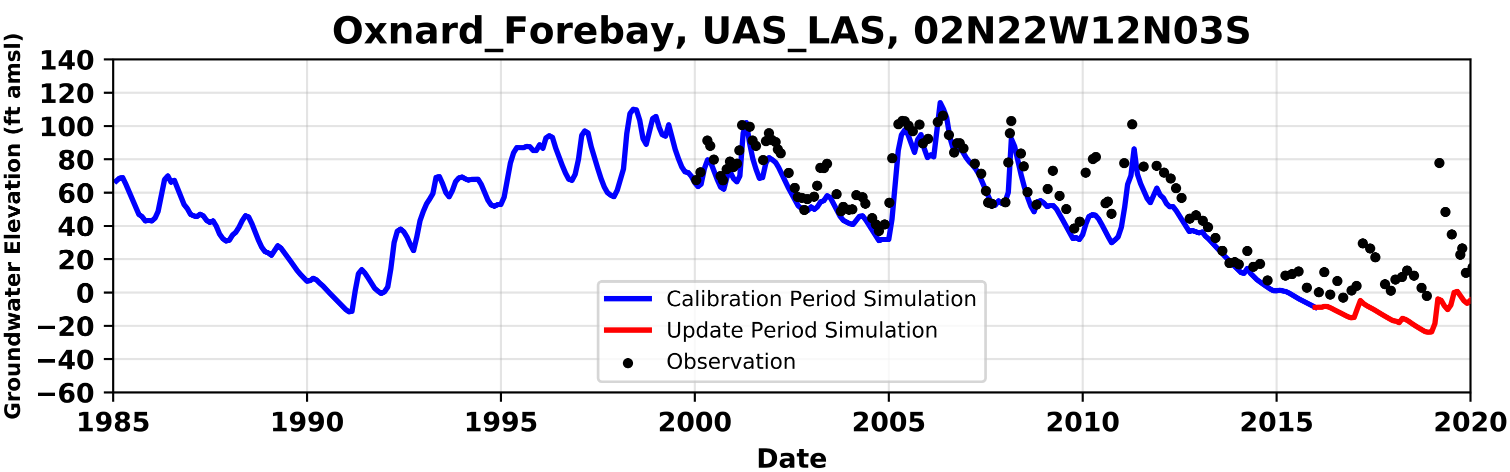

Oxnard_Forebay, UAS, 02N22W26E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

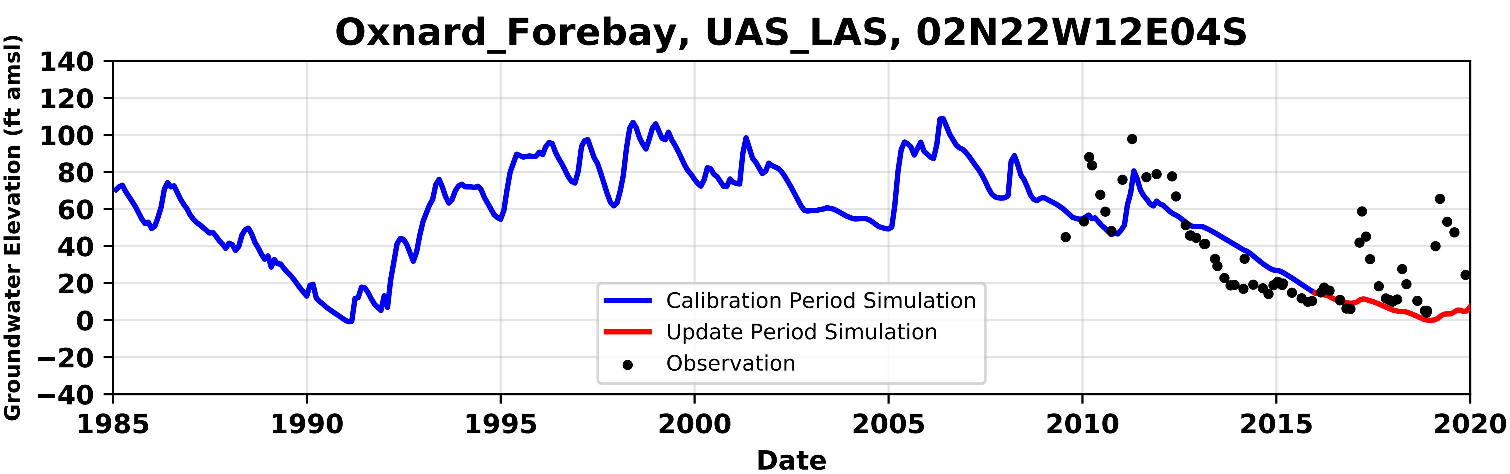

Oxnard_Forebay, UAS, 02N22W11A01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

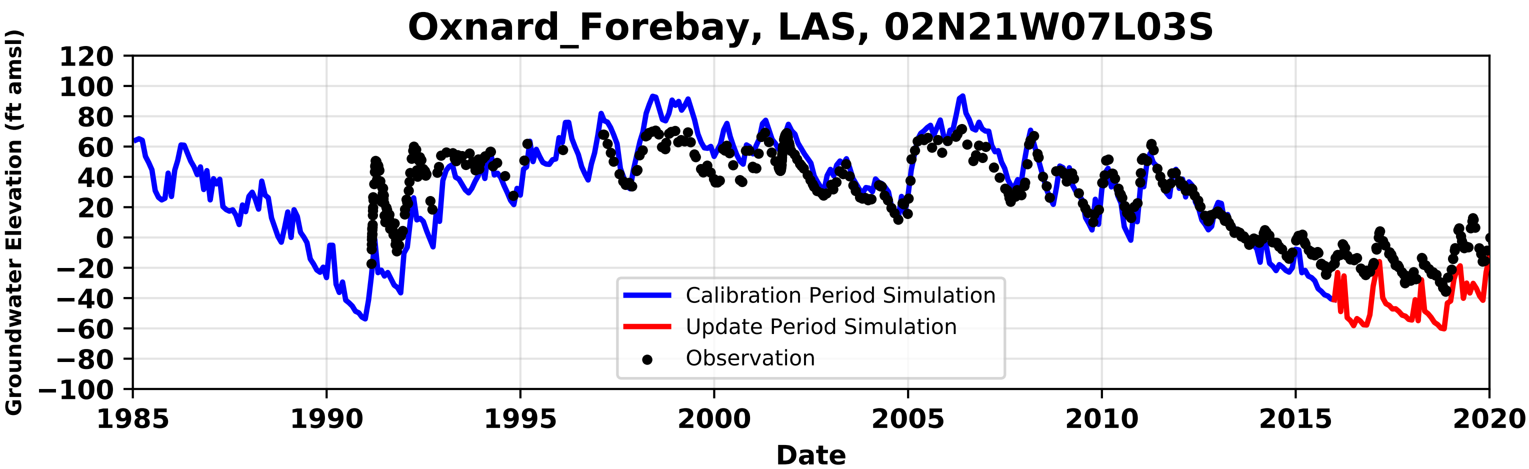

Oxnard_Forebay, UAS_LAS, 02N21W07L05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

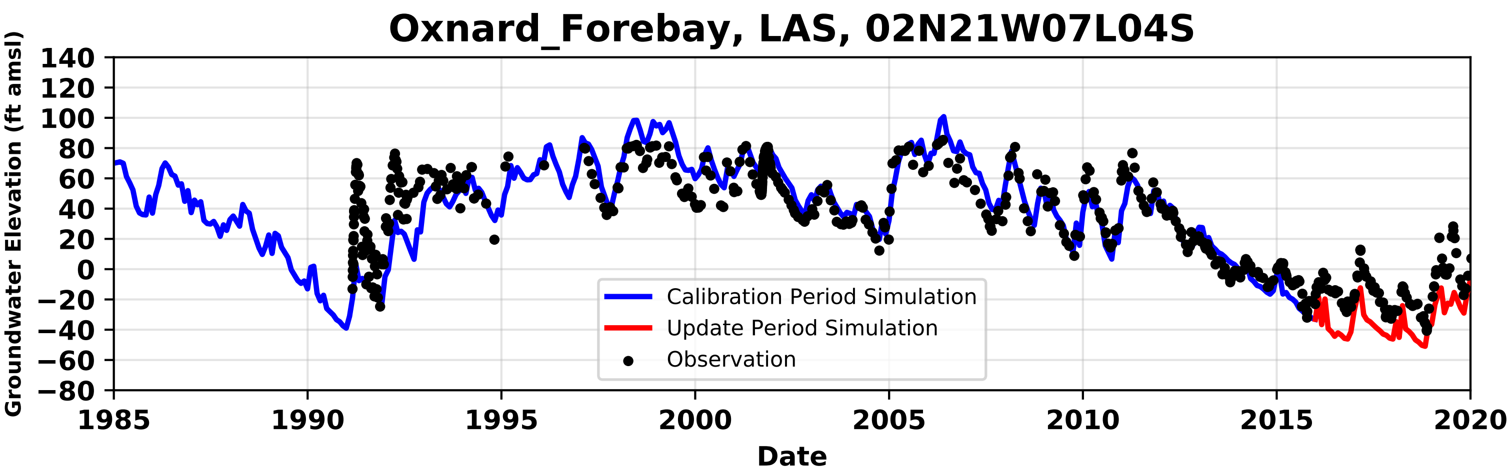

Oxnard_Forebay, UAS_LAS, 02N22W02R05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

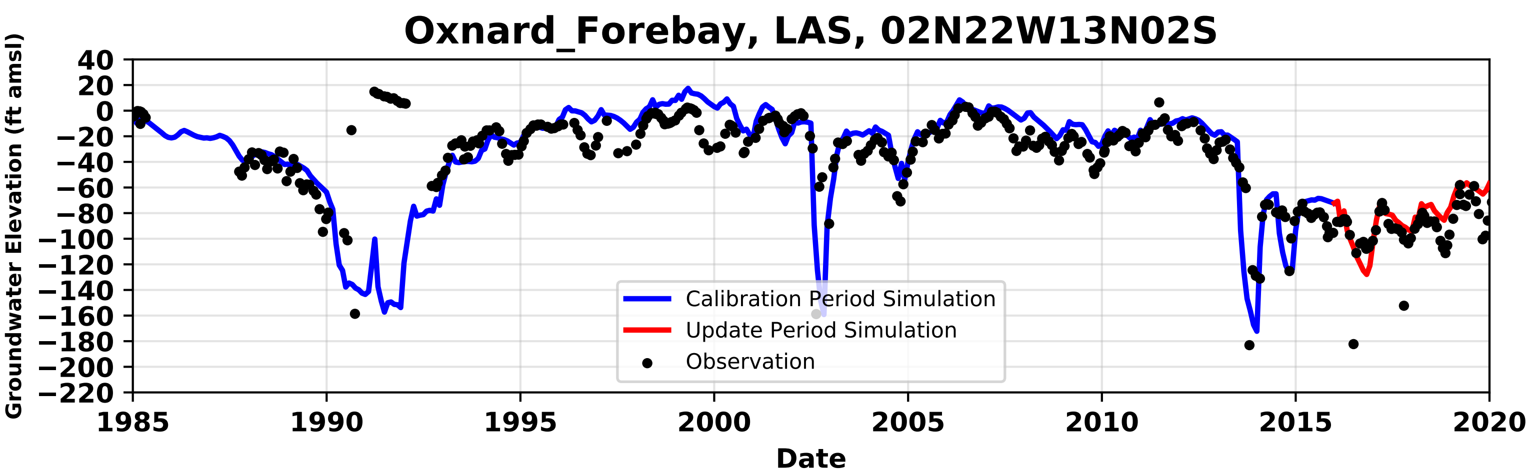

Oxnard_Forebay, UAS_LAS, 02N22W14B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

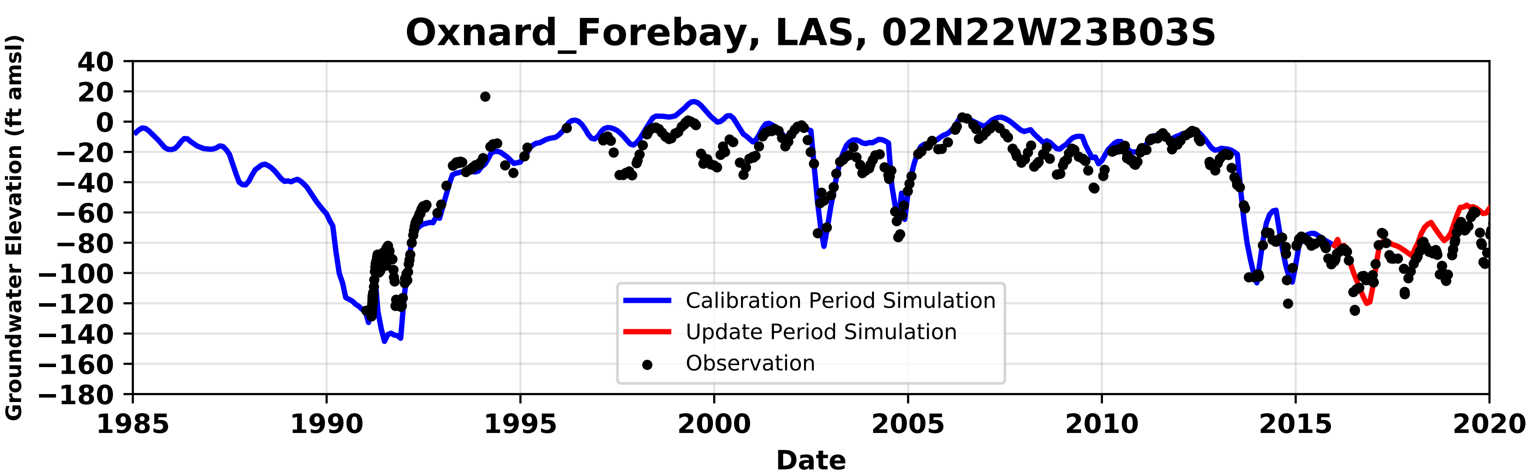

Oxnard_Forebay, UAS_LAS, 02N22W12N03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

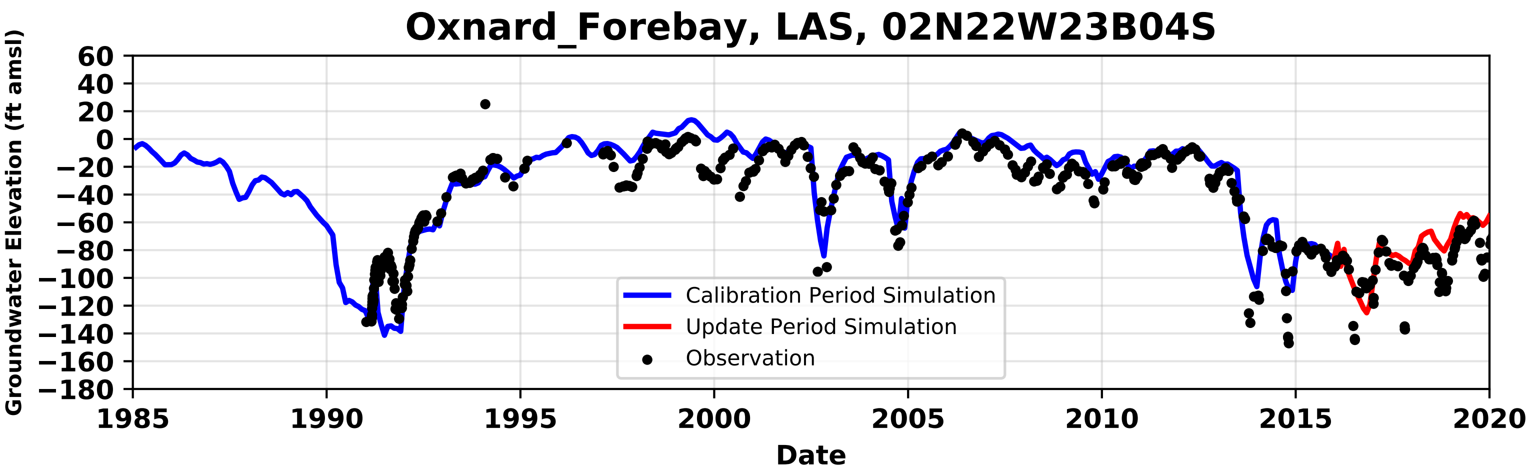

Oxnard_Forebay, UAS_LAS, 02N22W12E04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

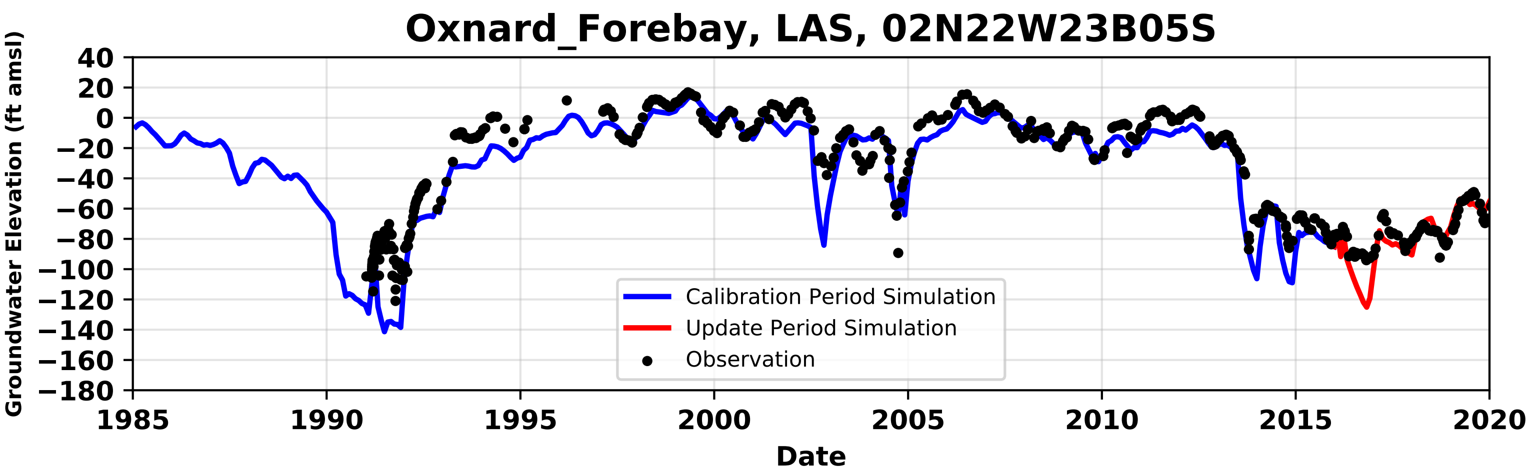

Oxnard_Forebay, LAS, 02N21W07L03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

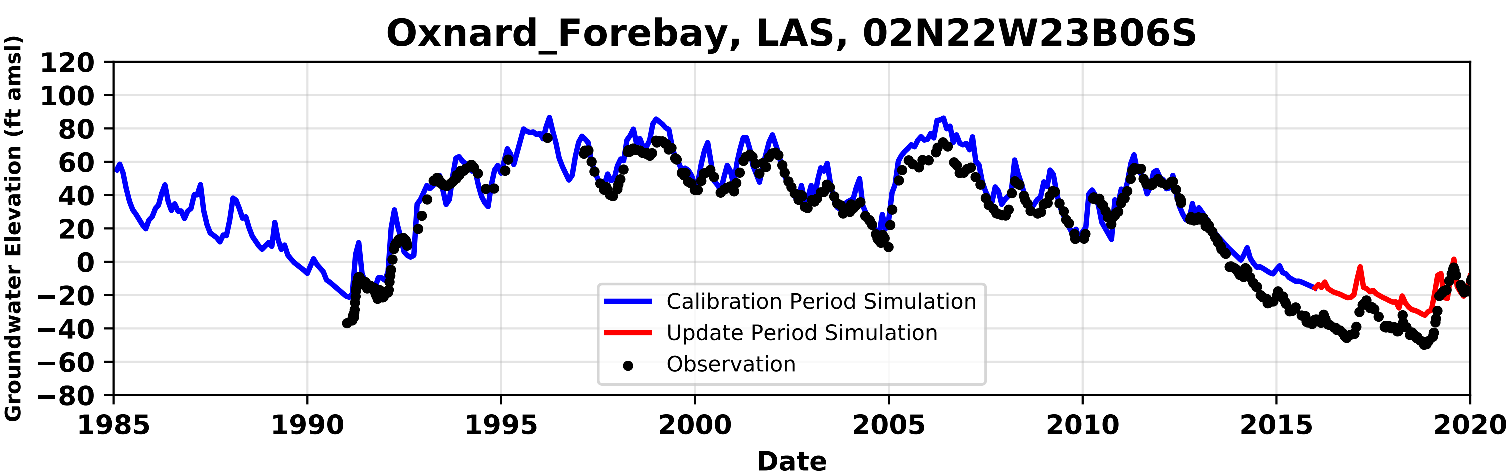

Oxnard_Forebay, LAS, 02N21W07L04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

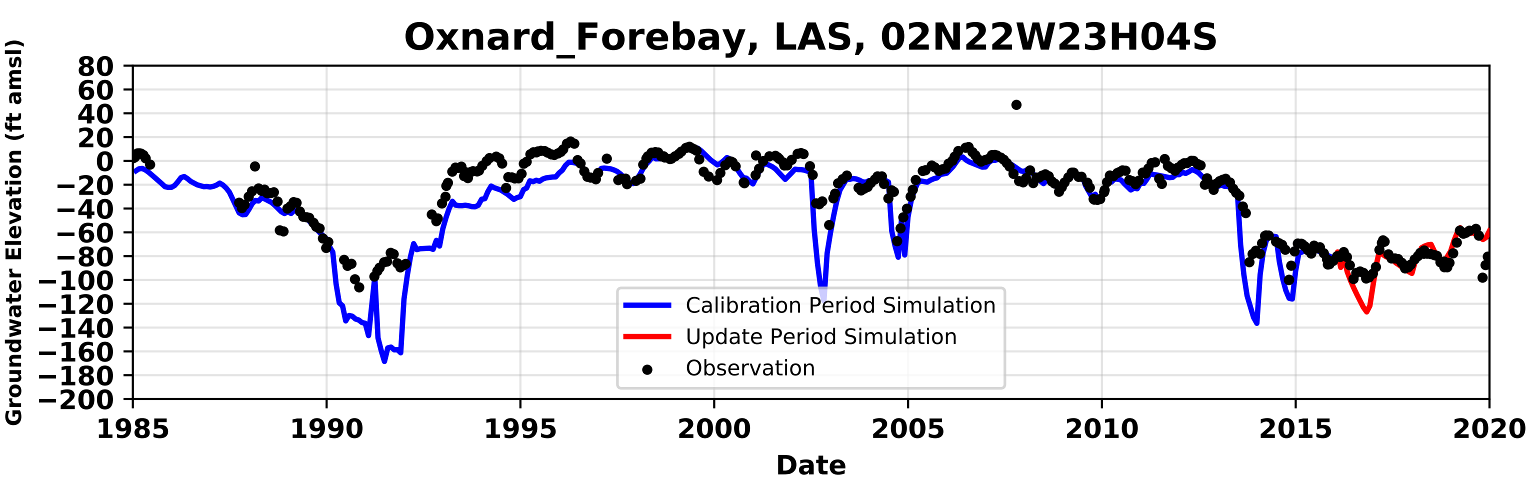

Oxnard_Forebay, LAS, 02N22W13N02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

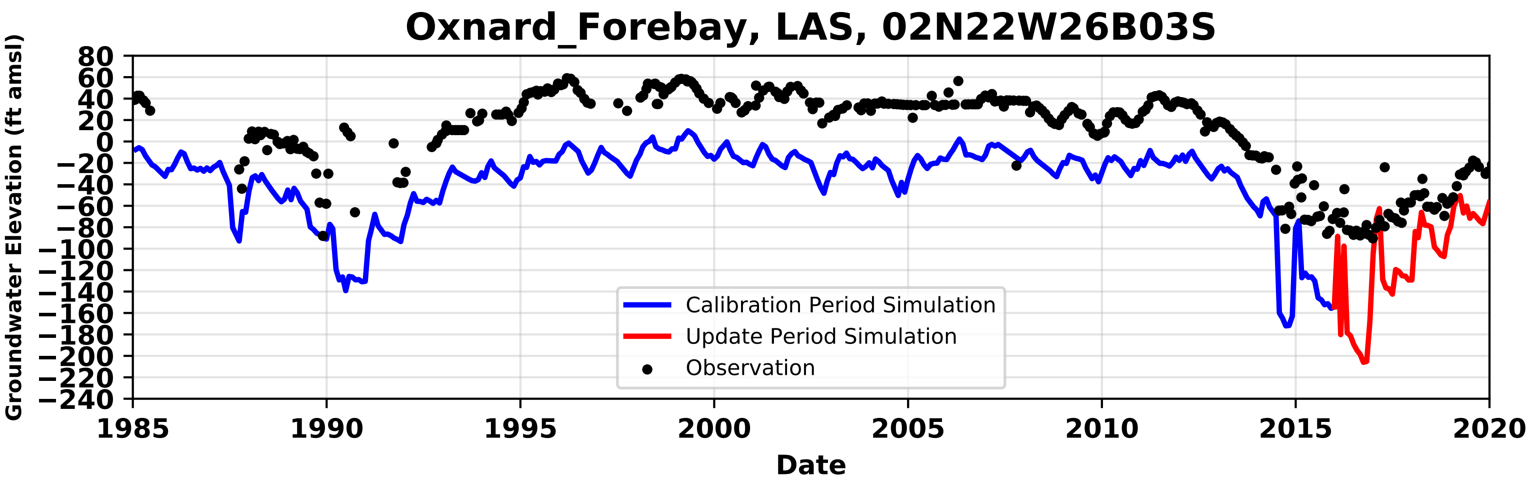

Oxnard_Forebay, LAS, 02N22W23B03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

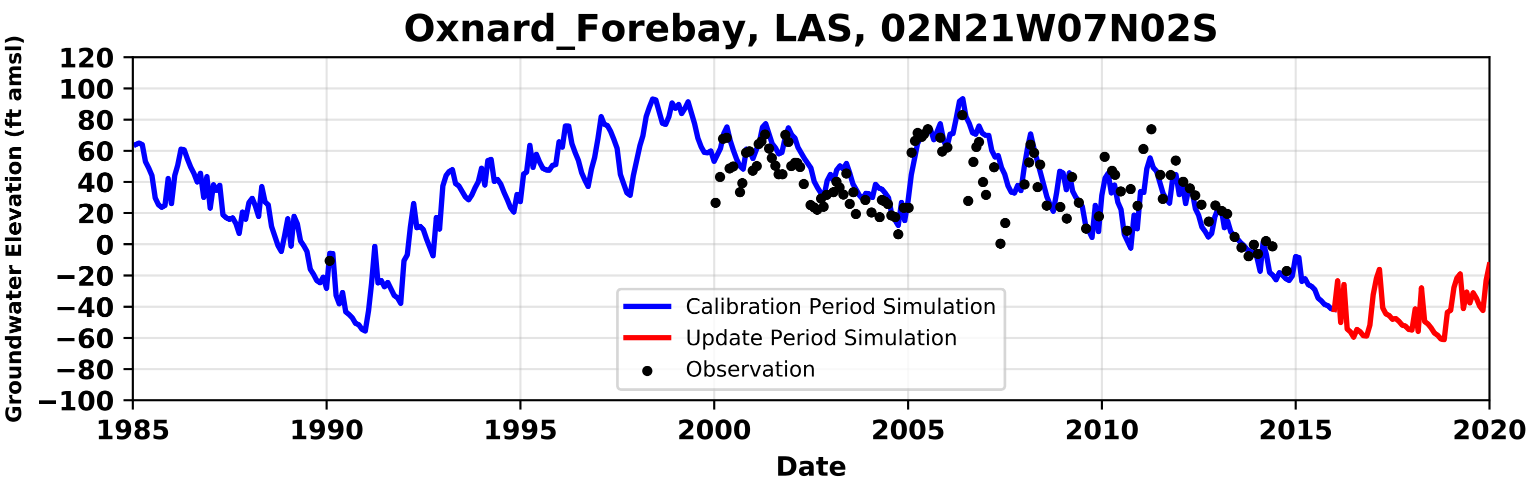

Oxnard_Forebay, LAS, 02N22W23B04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

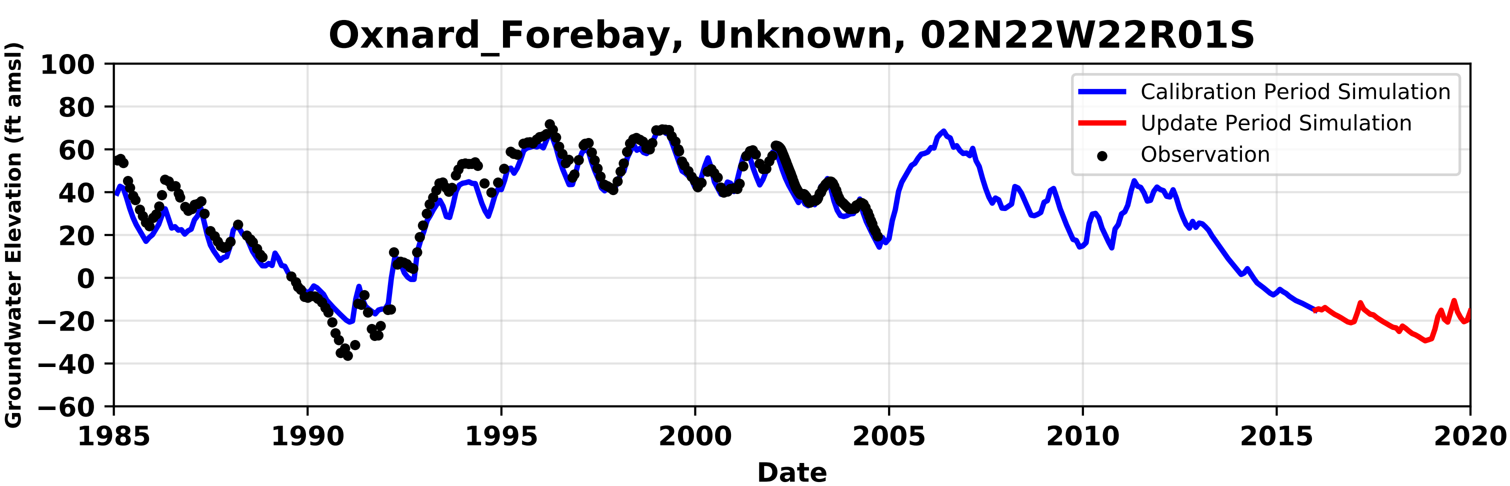

Oxnard_Forebay, LAS, 02N22W23B05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

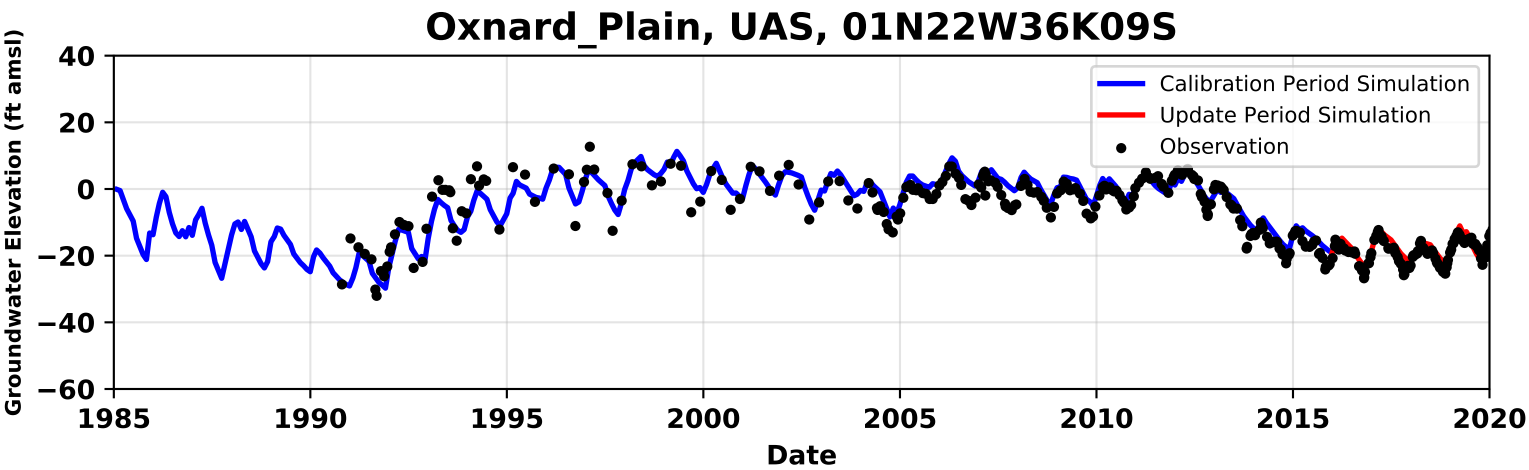

Oxnard_Forebay, LAS, 02N22W23B06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

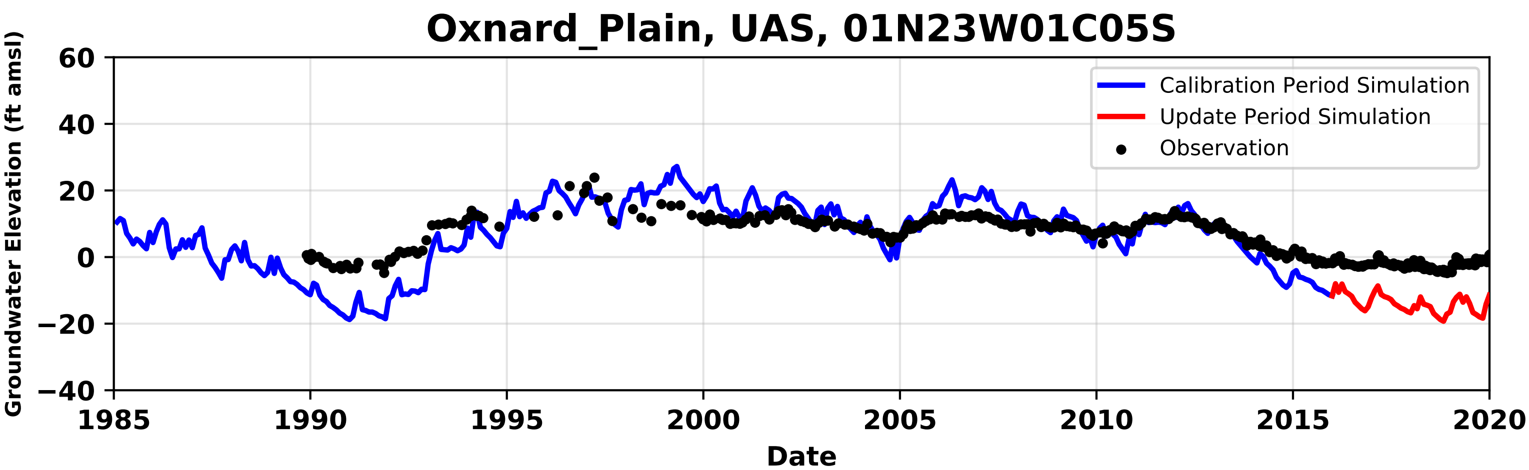

Oxnard_Forebay, LAS, 02N22W23H04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

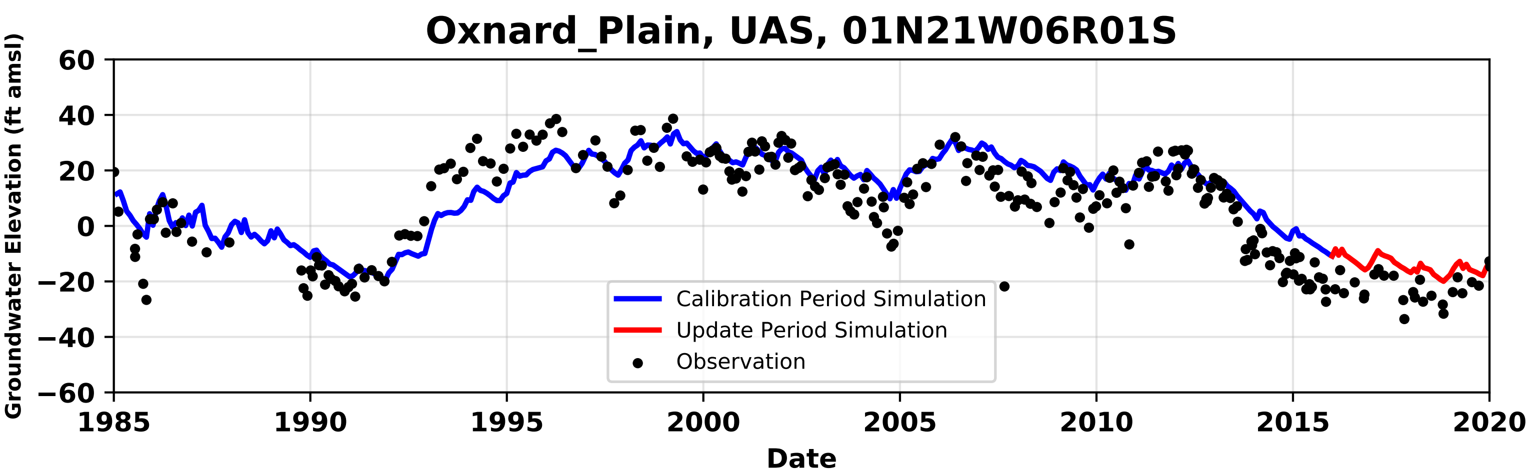

Oxnard_Forebay, LAS, 02N22W26B03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
1985
1990
1995
2000
2005
2010
2015
2020

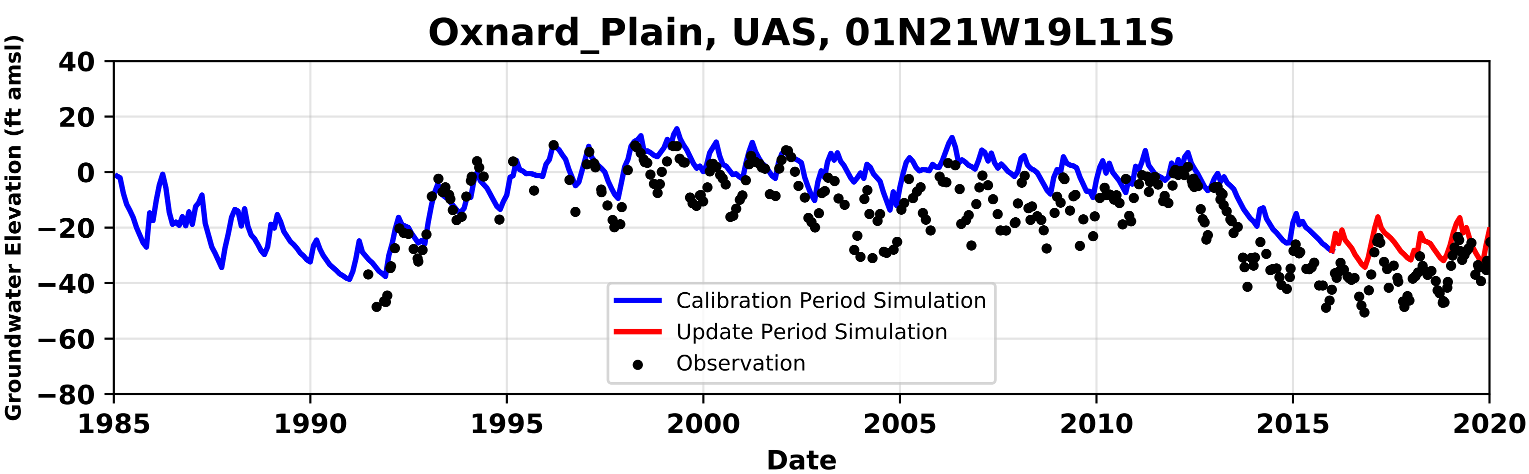

Oxnard_Forebay, LAS, 02N21W07N02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
1985
1990
1995
2000
2005
2010
2015
2020

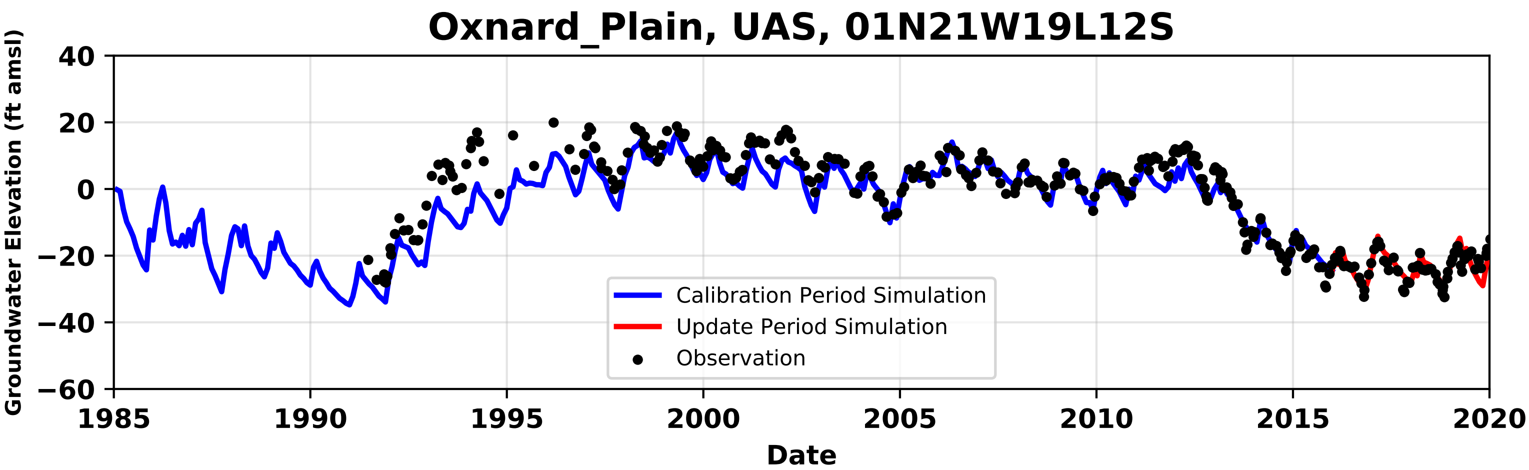

Oxnard_Forebay, Unknown, 02N22W22R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
1985
1990
1995
2000
2005
2010
2015
2020

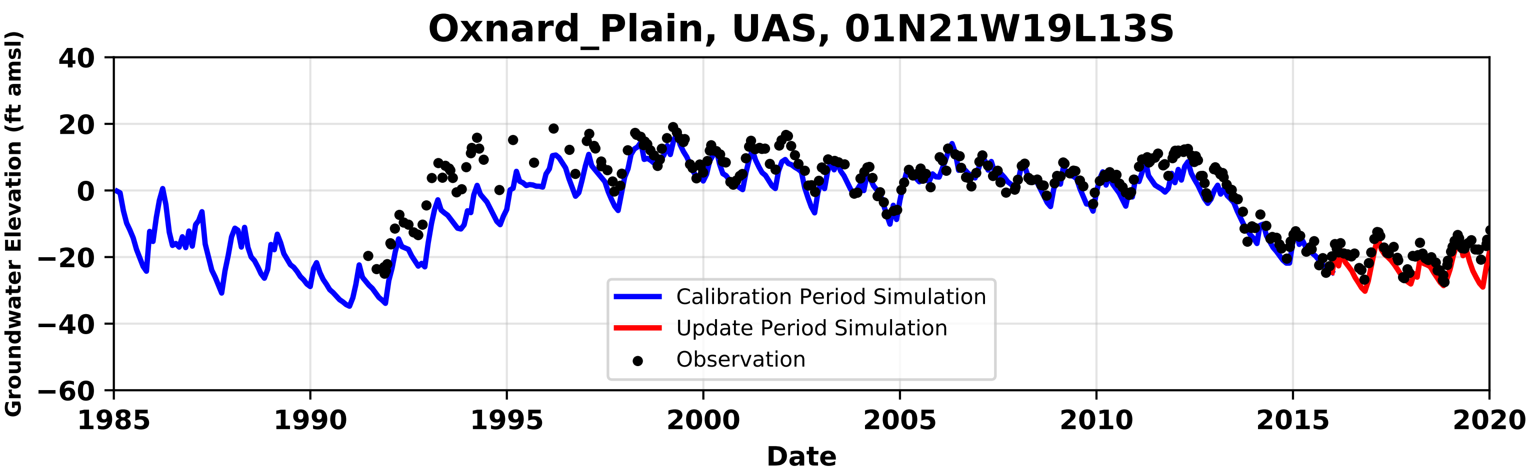

Oxnard_Plain, UAS, 01N22W36K09S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

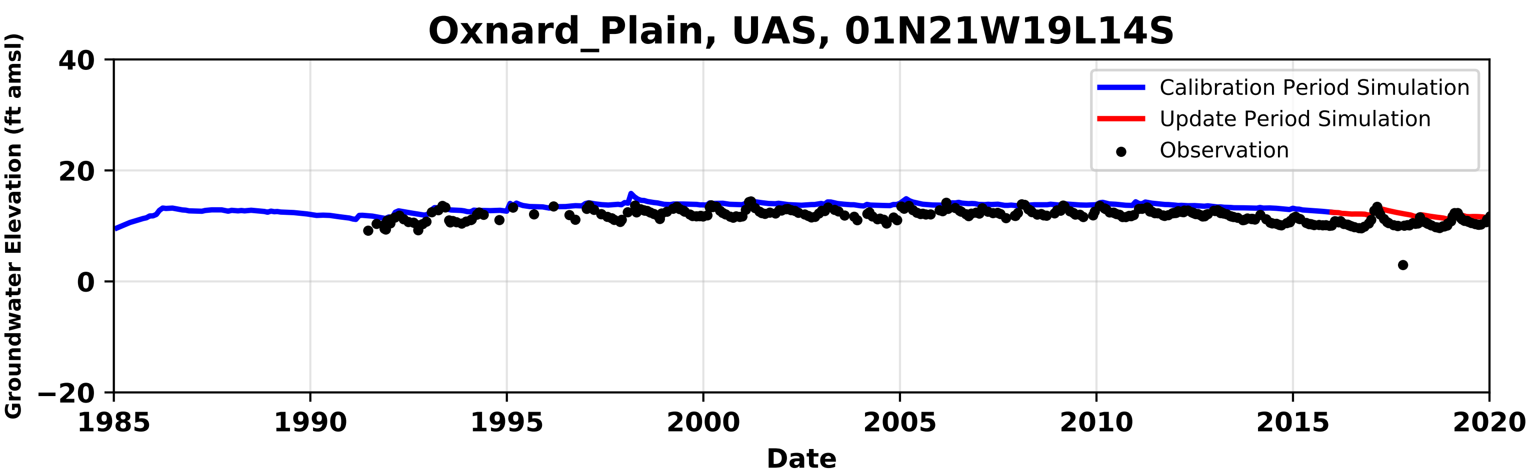

Oxnard_Plain, UAS, 01N23W01C05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

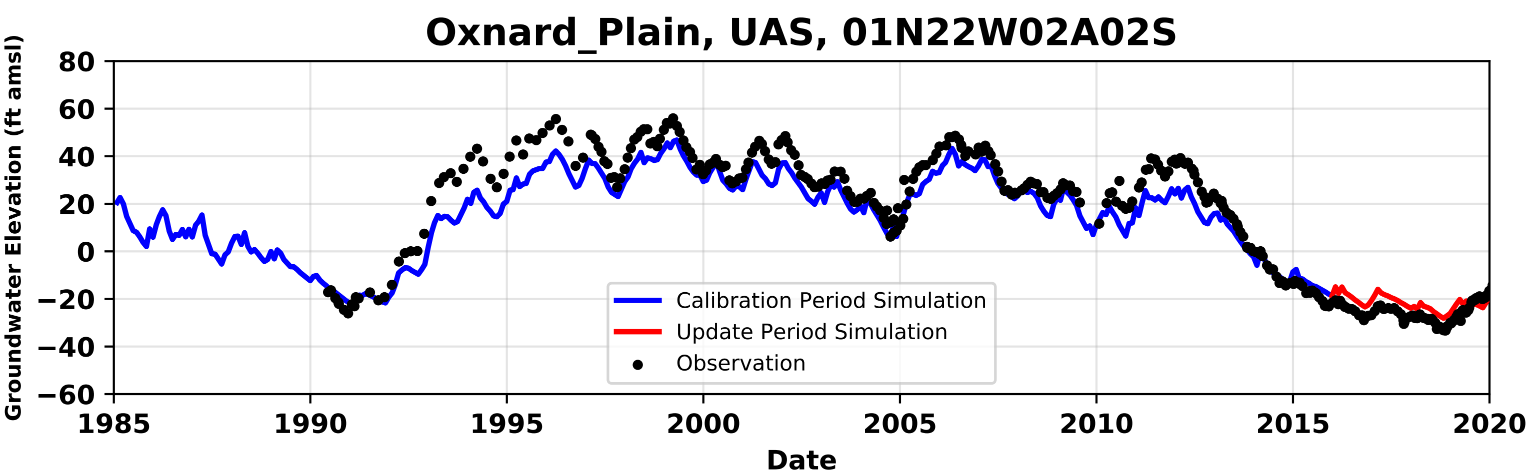

Oxnard_Plain, UAS, 01N21W06R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

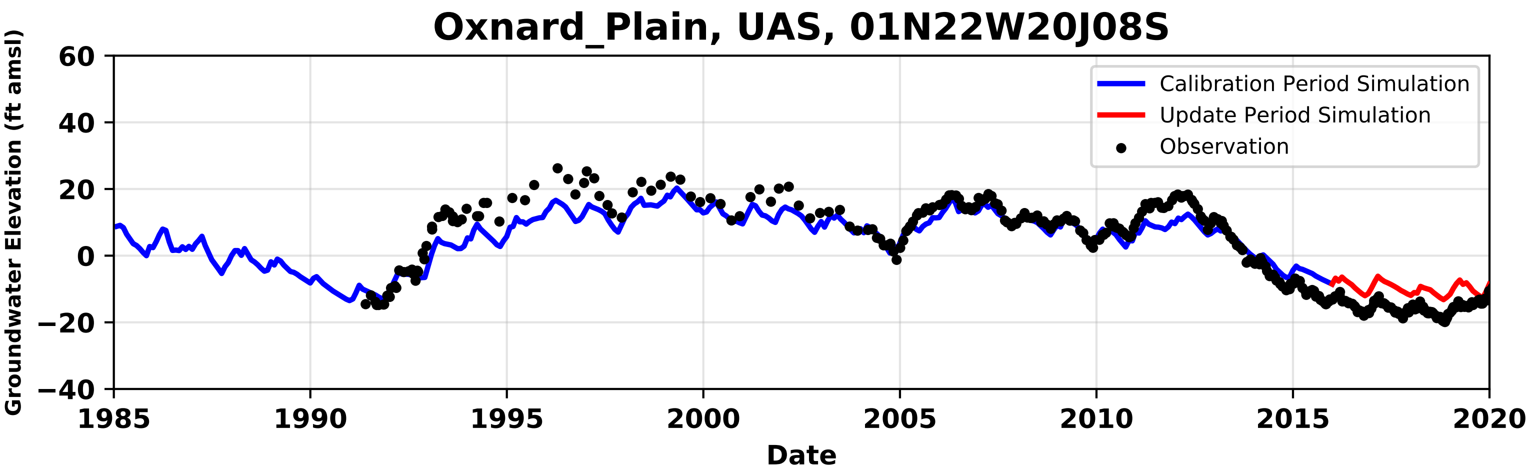

Oxnard_Plain, UAS, 01N21W19L11S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N21W19L12S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

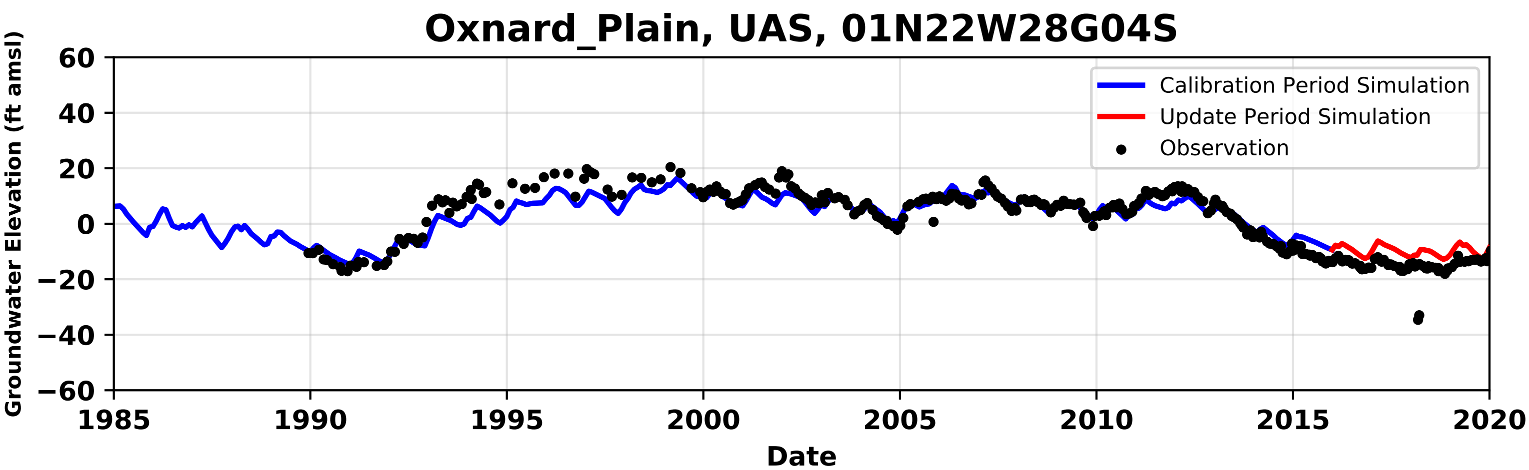

Oxnard_Plain, UAS, 01N21W19L13S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N21W19L14S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

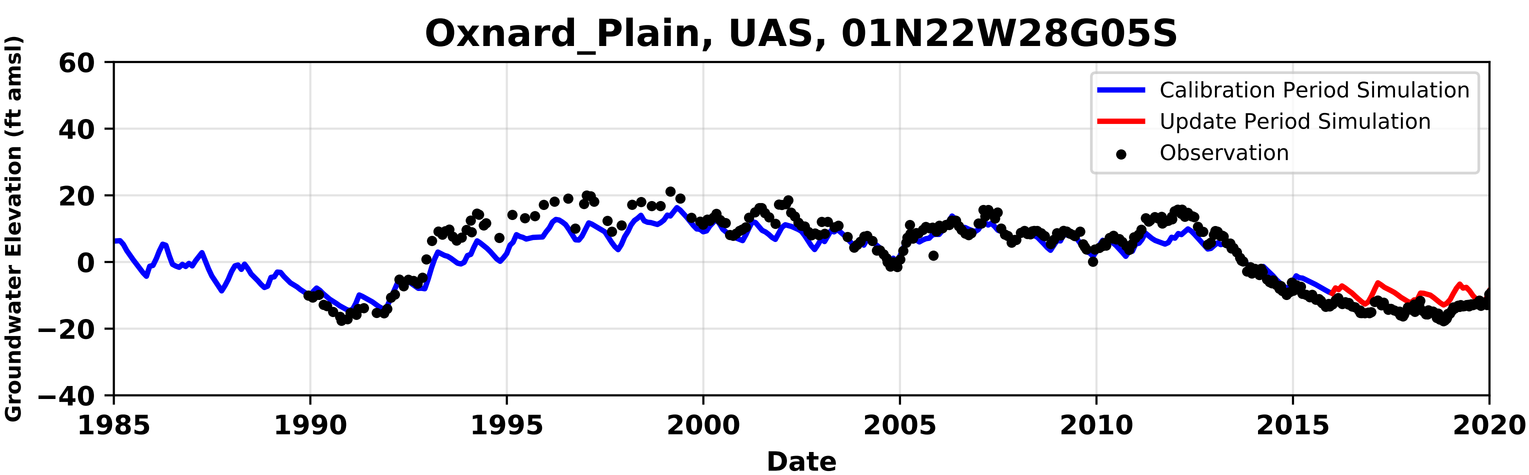

Oxnard_Plain, UAS, 01N22W02A02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



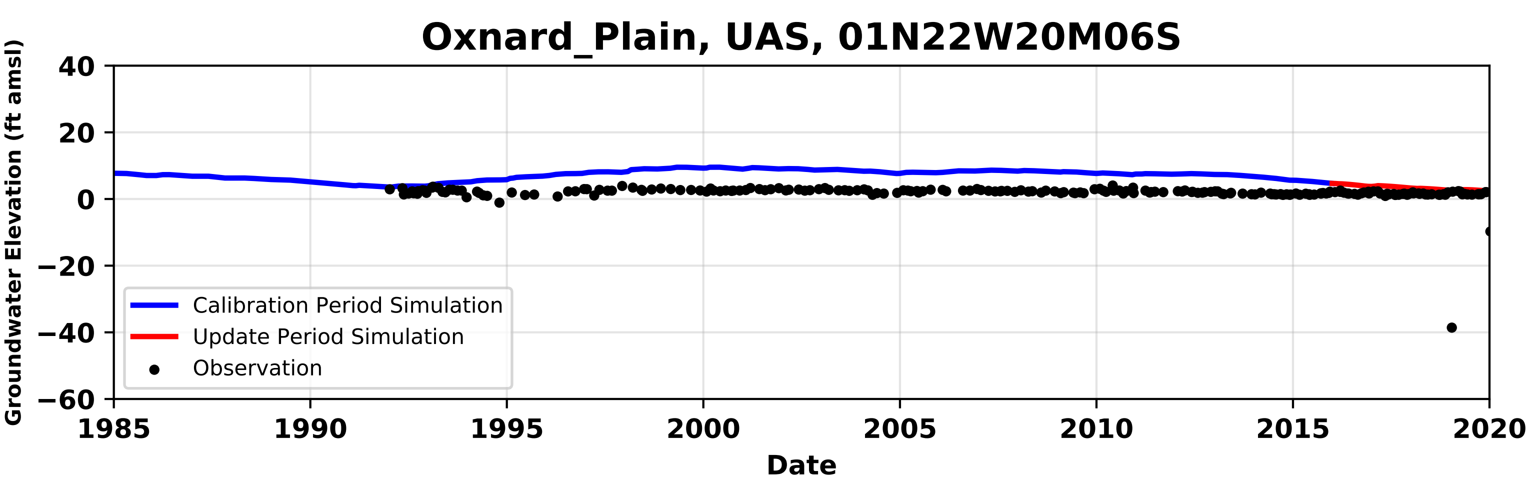
Oxnard_Plain, UAS, 01N22W20J08S
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



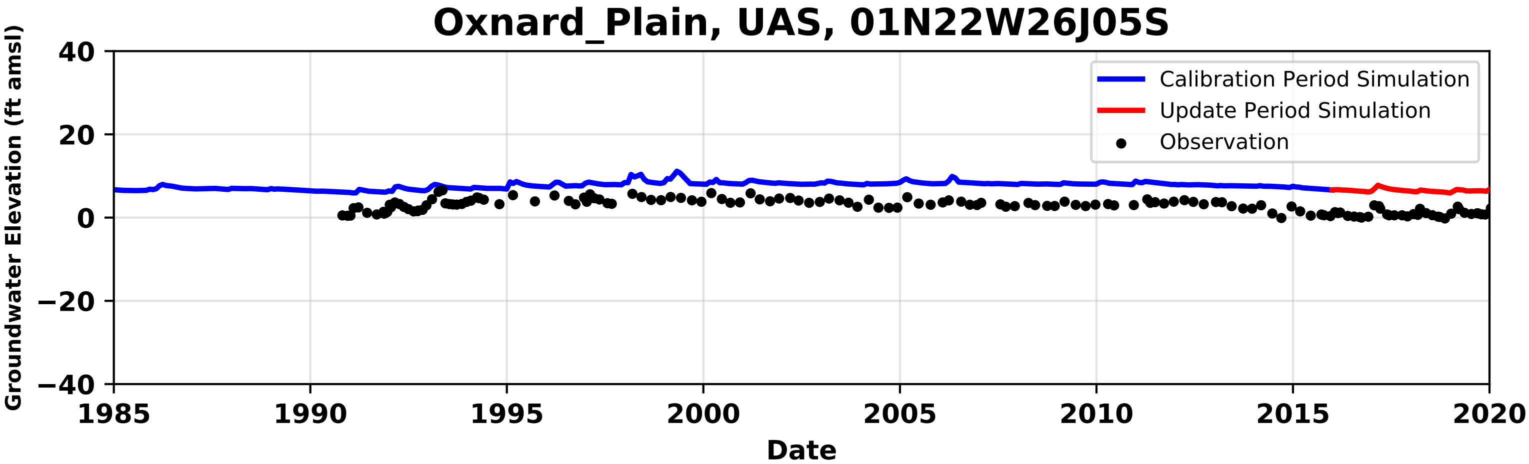
Oxnard_Plain, UAS, 01N22W28G04S
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

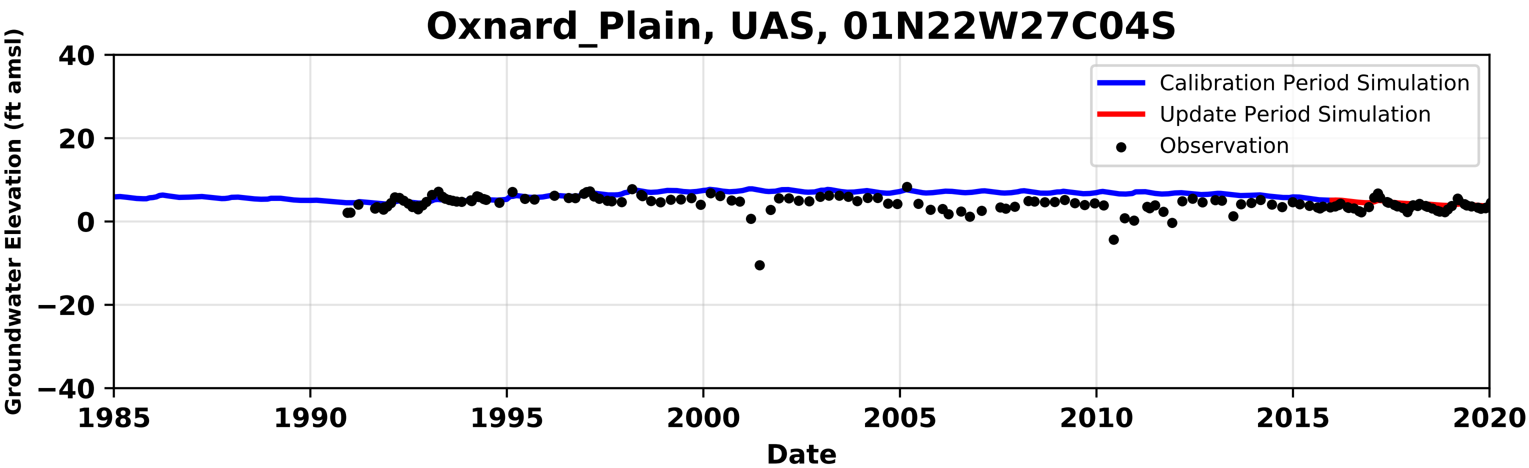


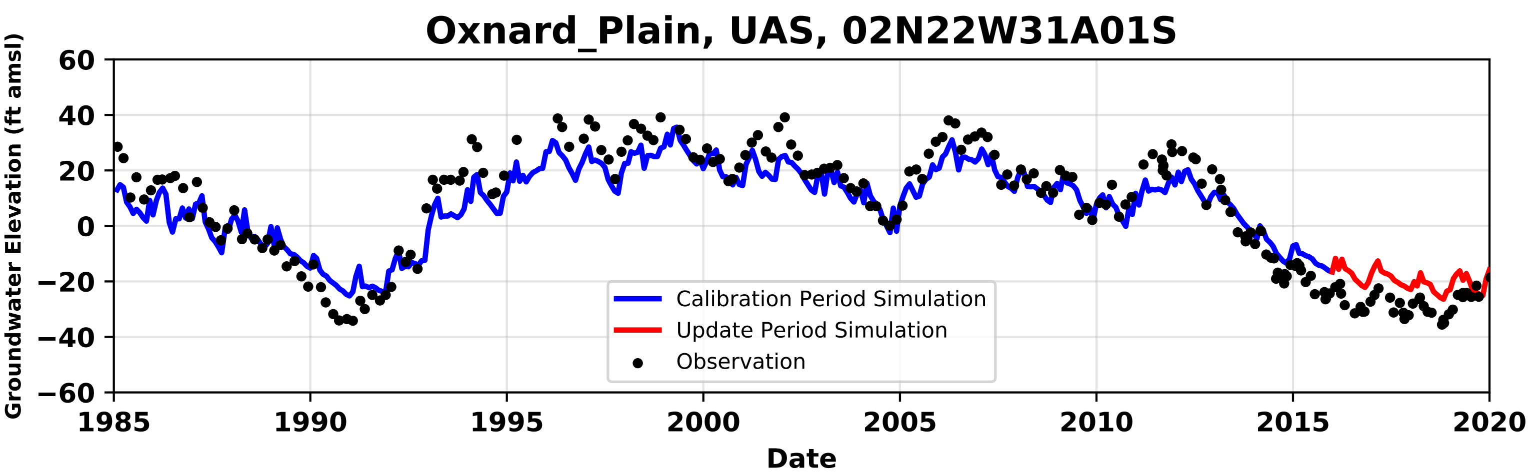
Oxnard_Plain, UAS, 01N22W28G05S
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

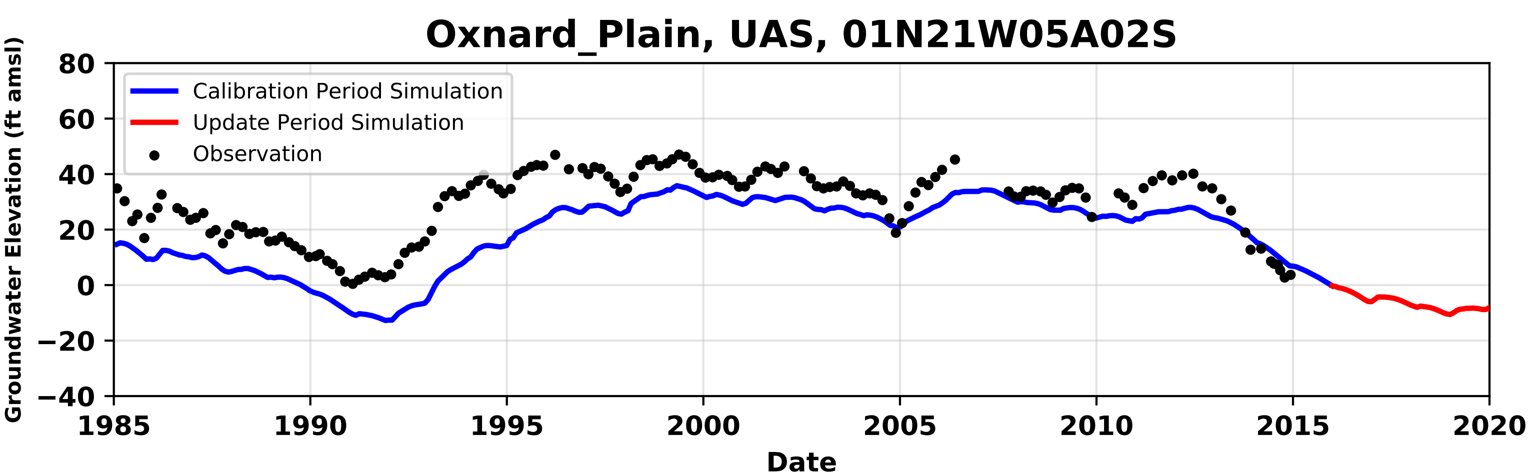


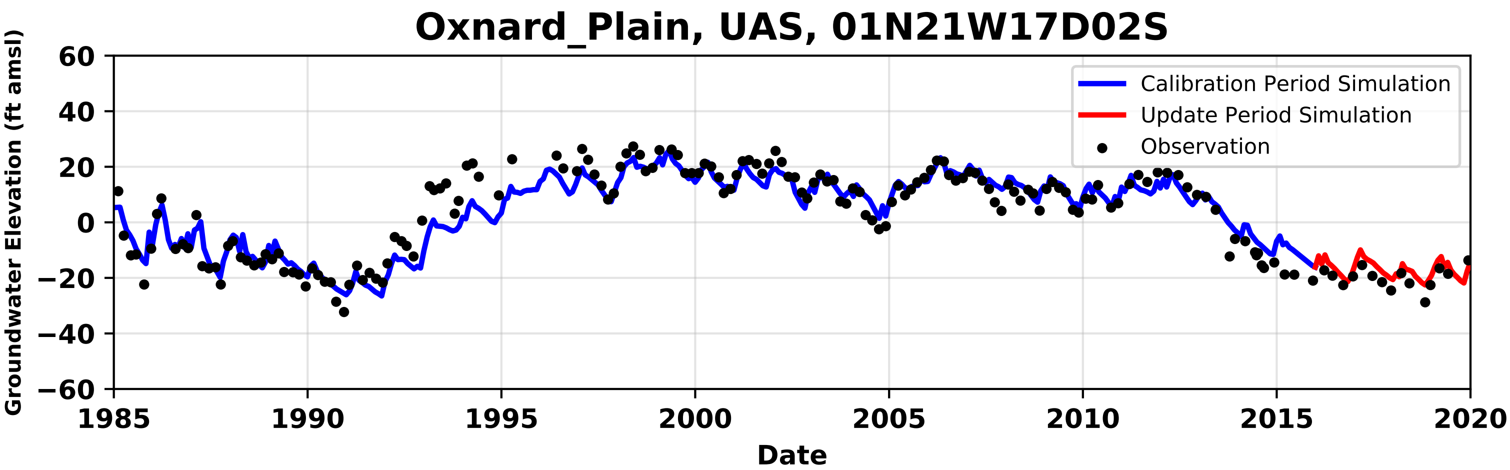
Oxnard_Plain, UAS, 01N22W20M06S
Groundwater Elevation (ft amsl)
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

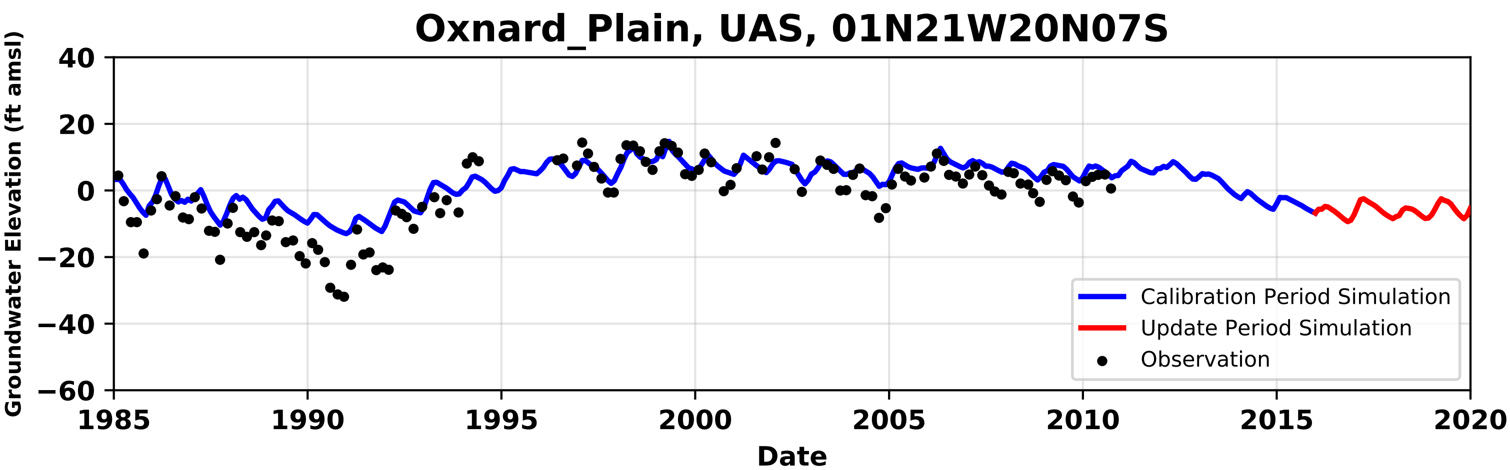

Oxnard_Plain, UAS, 01N22W26J05S
Groundwater Elevation (ft amsl)
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

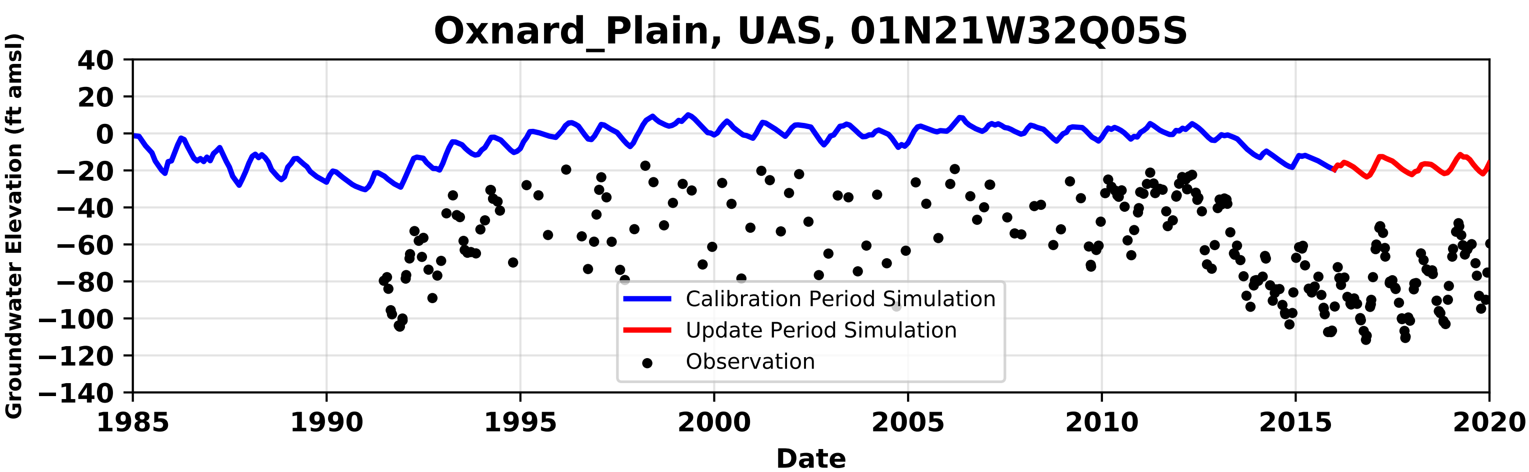

Oxnard_Plain, UAS, 01N22W27C04S
Groundwater Elevation (ft amsl)
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

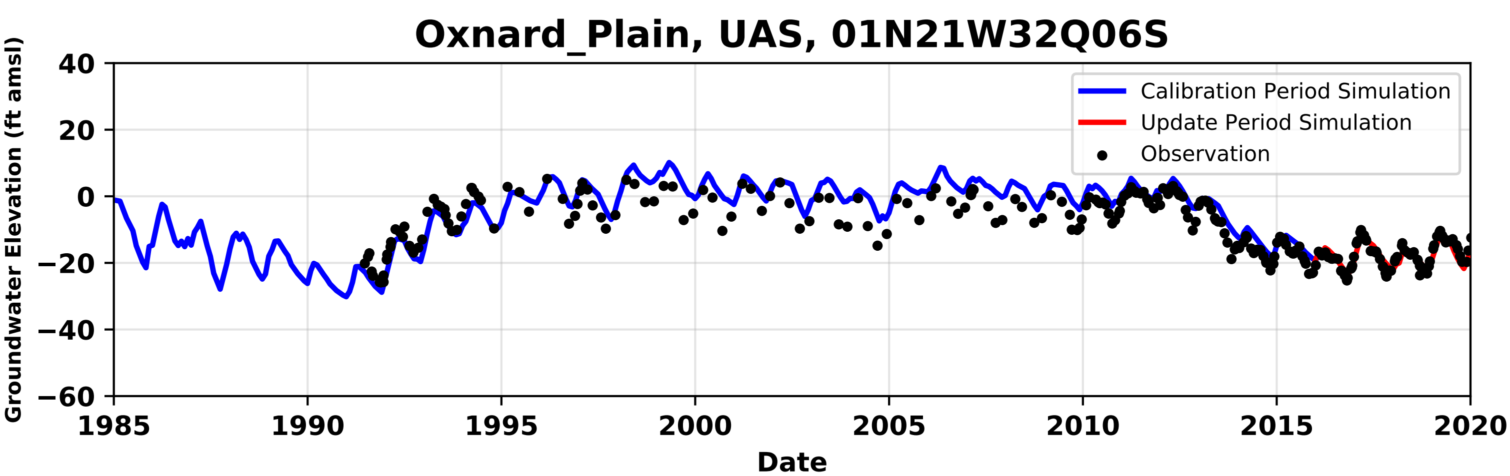

Oxnard_Plain, UAS, 02N22W31A01S
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

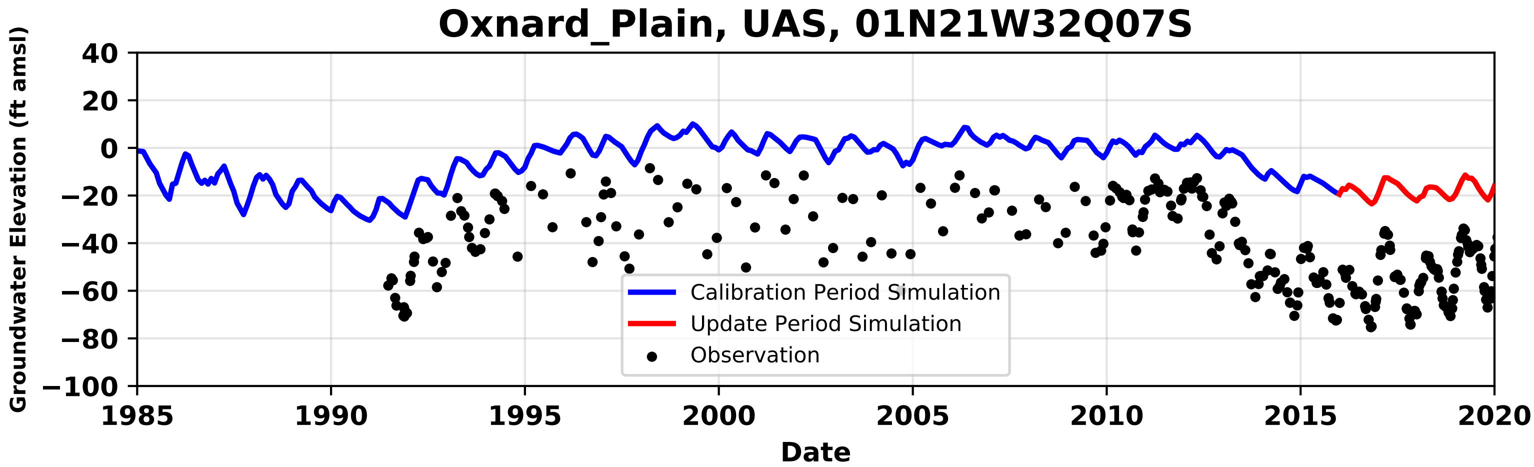

Oxnard_Plain, UAS, 01N21W05A02S
Groundwater Elevation (ft amsl)
80
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

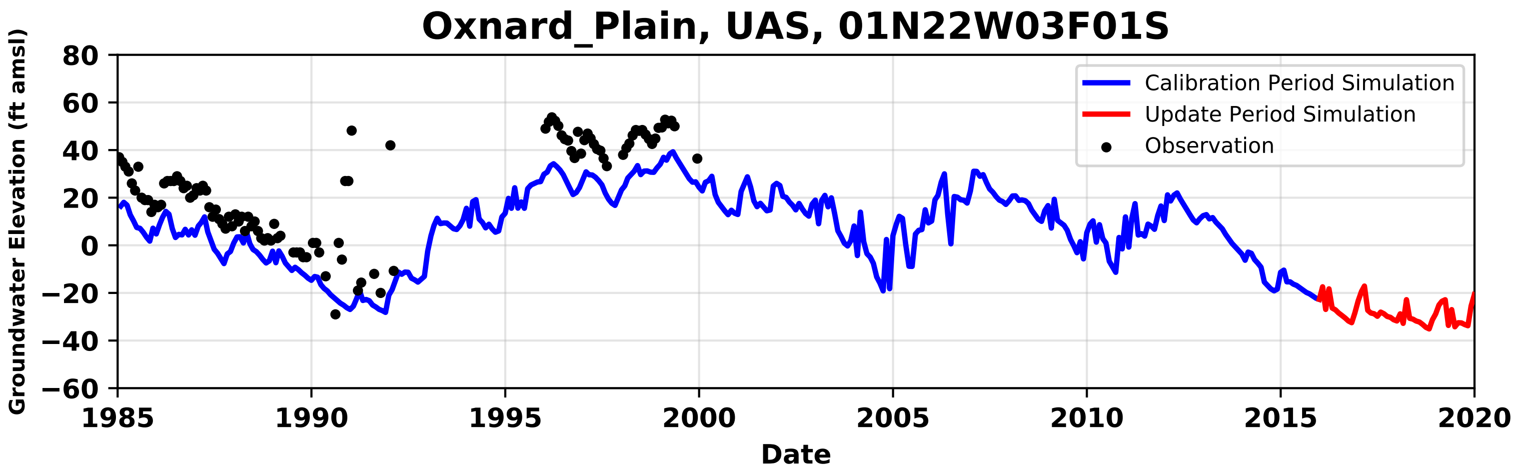

Oxnard_Plain, UAS, 01N21W17D02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

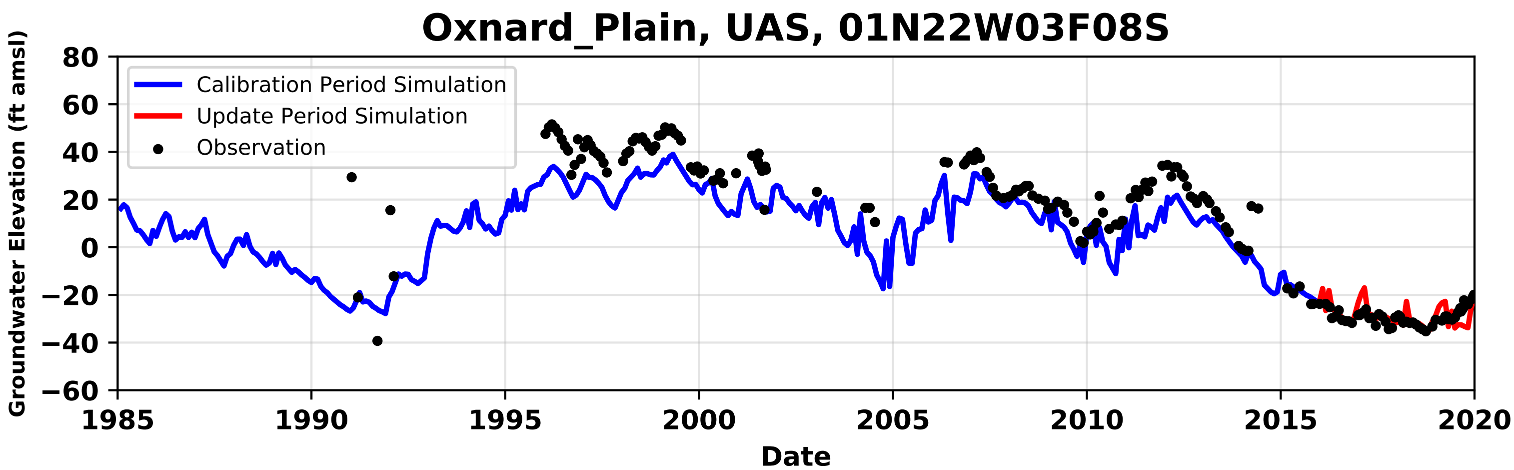

Oxnard_Plain, UAS, 01N21W20N07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

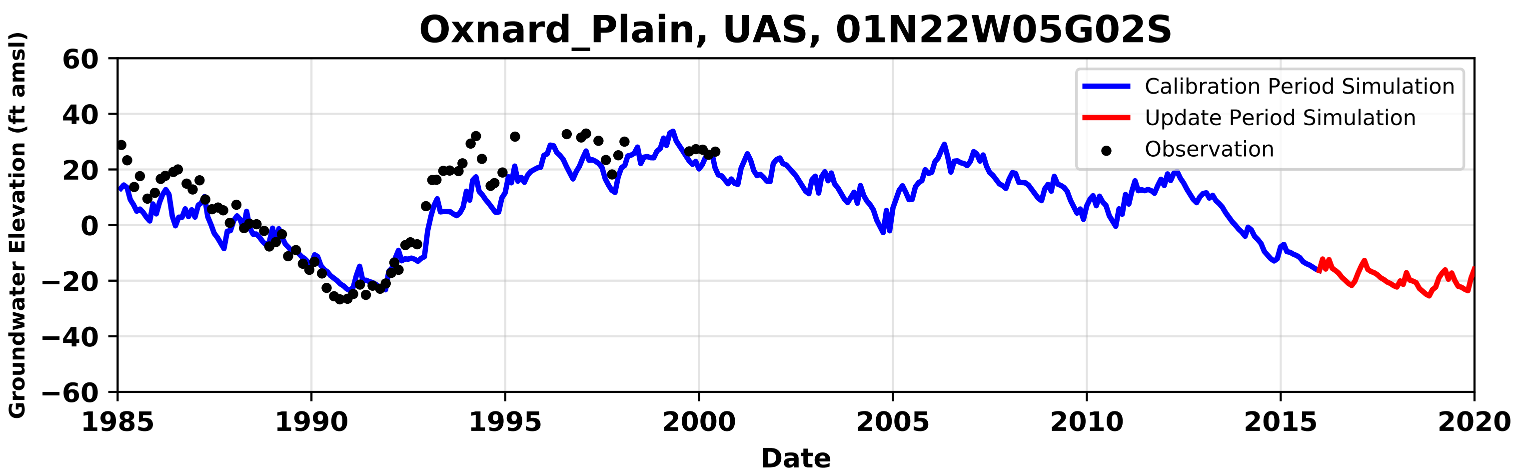

Oxnard_Plain, UAS, 01N21W32Q05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

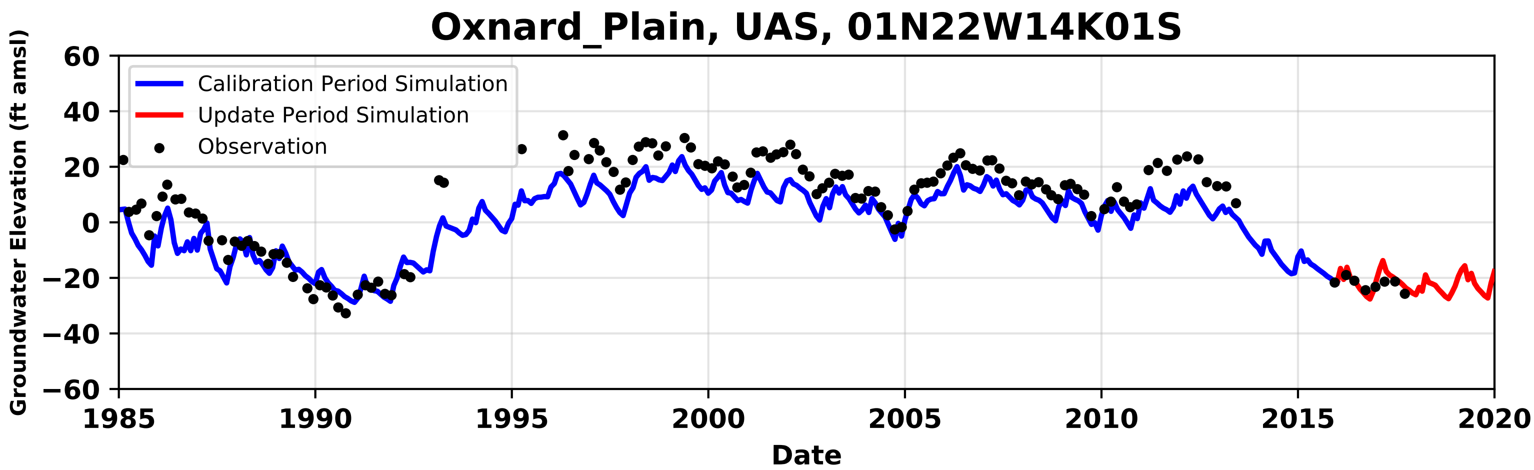

Oxnard_Plain, UAS, 01N21W32Q06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N21W32Q07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

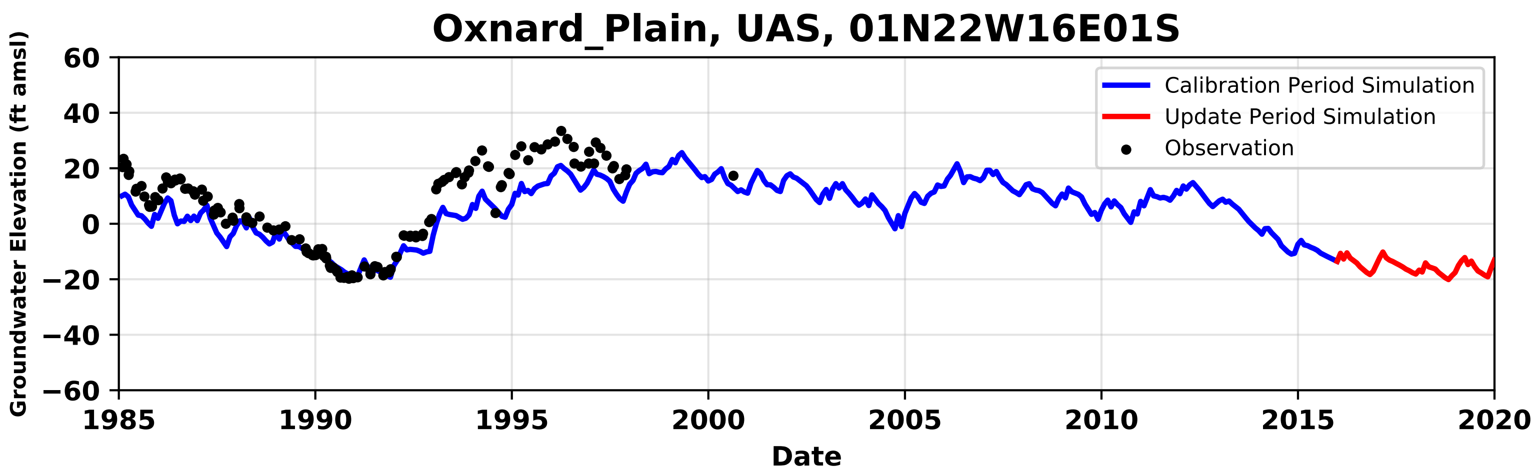

Oxnard_Plain, UAS, 01N22W03F01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N22W03F08S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

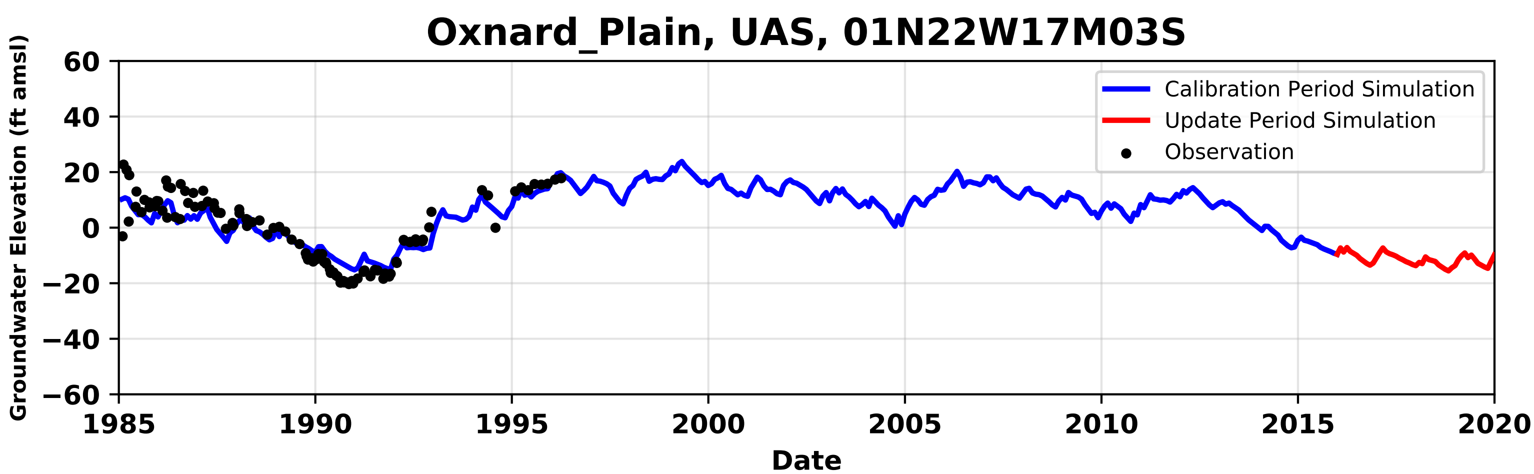

Oxnard_Plain, UAS, 01N22W05G02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



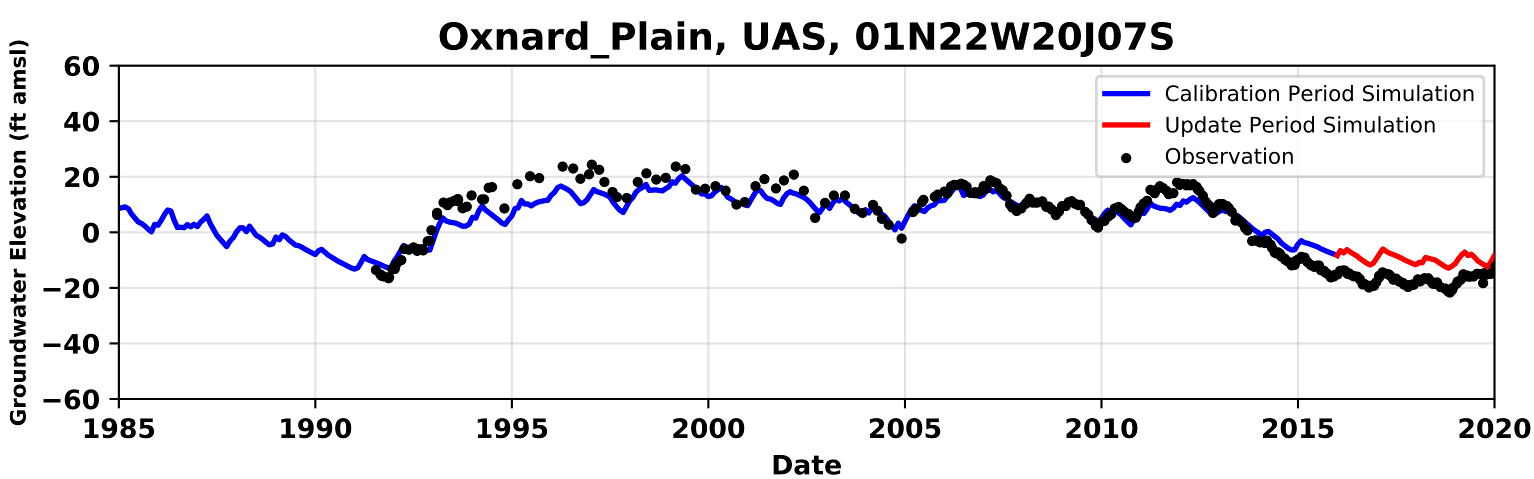
Oxnard_Plain, UAS, 01N22W14K01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date



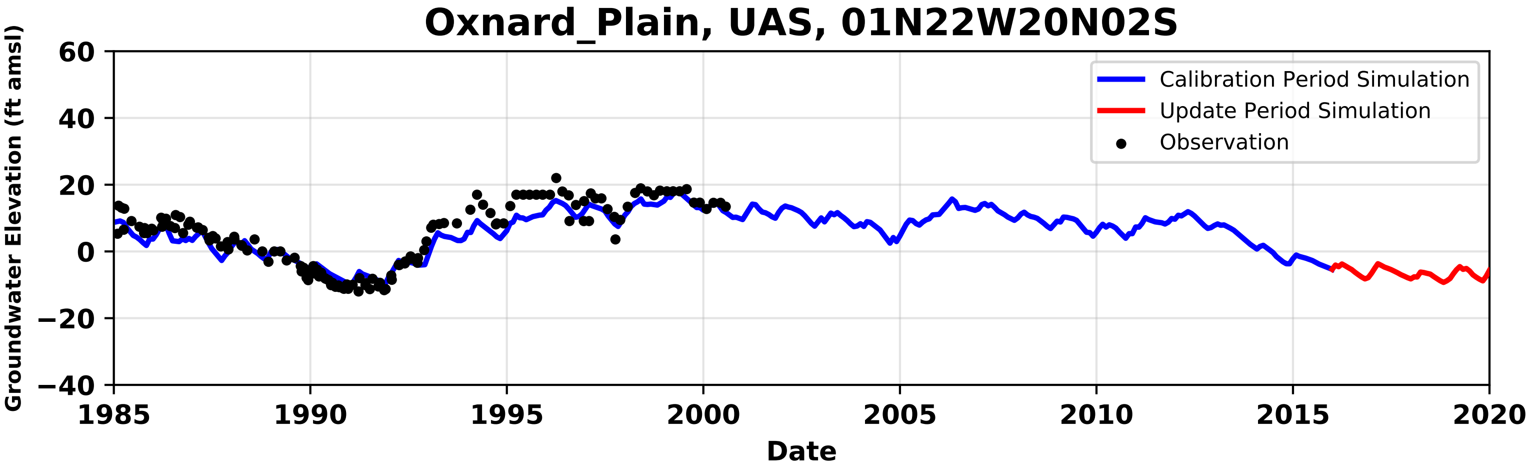
Oxnard_Plain, UAS, 01N22W16E01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

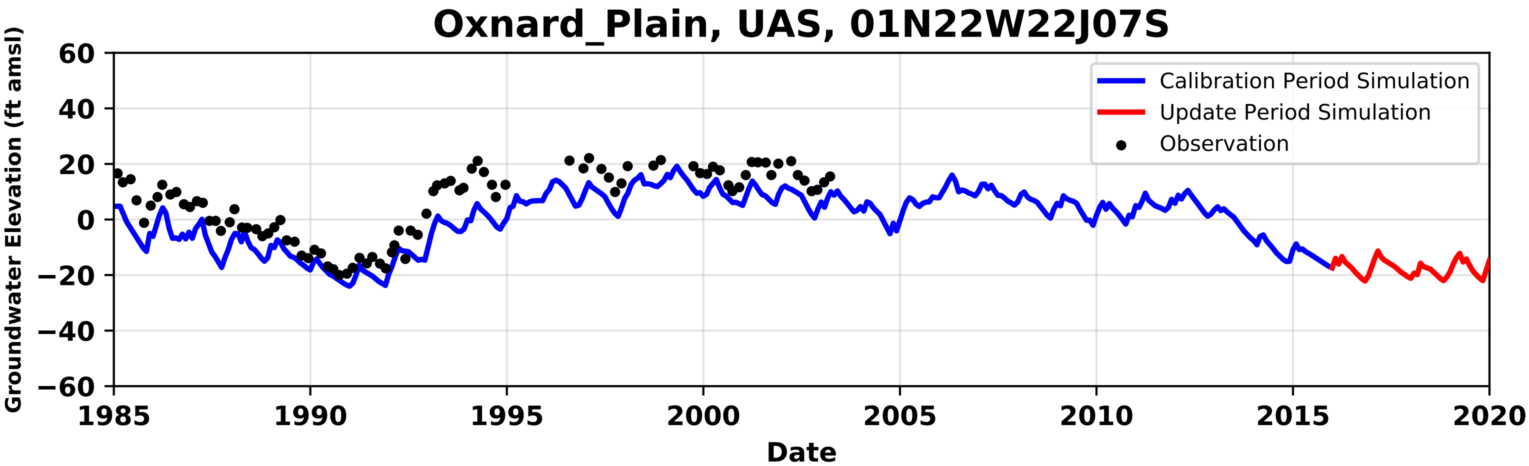


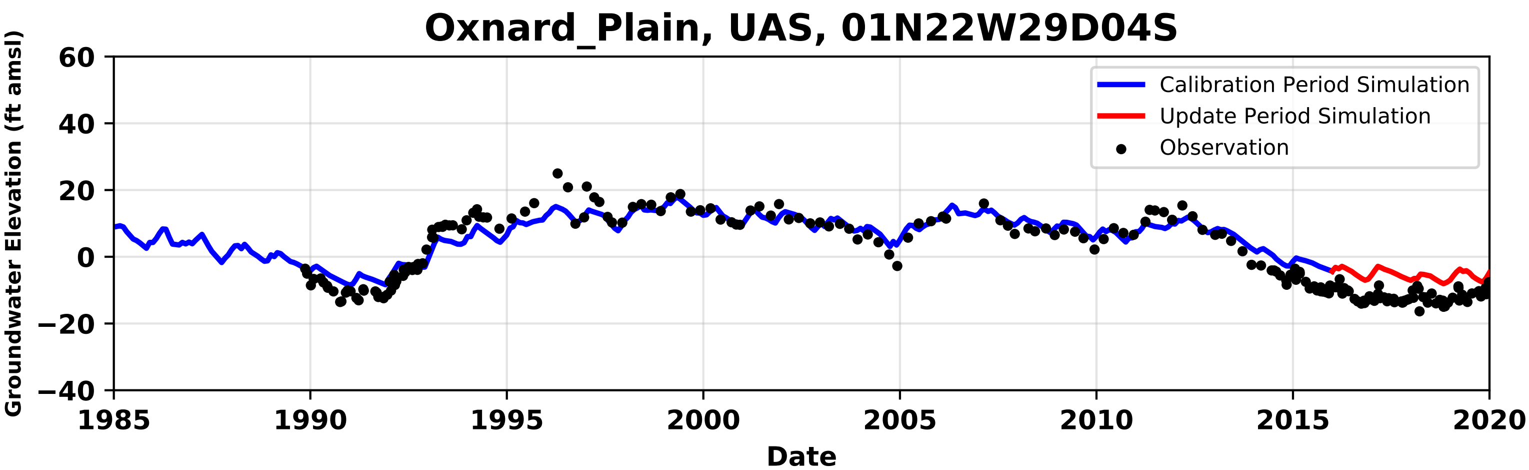
Oxnard_Plain, UAS, 01N22W17M03S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

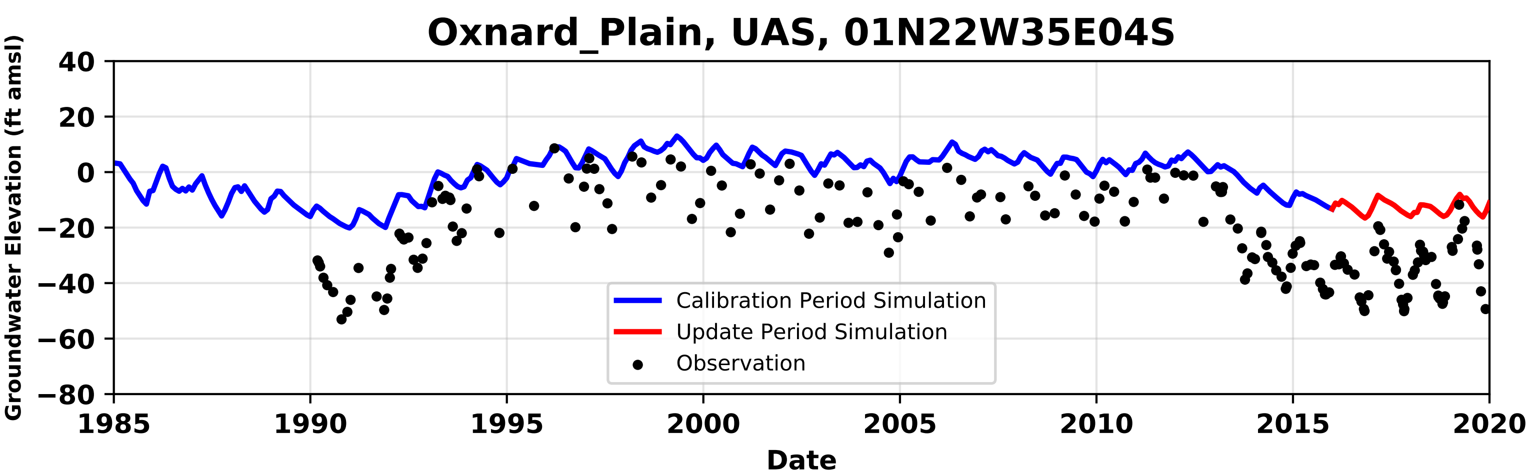


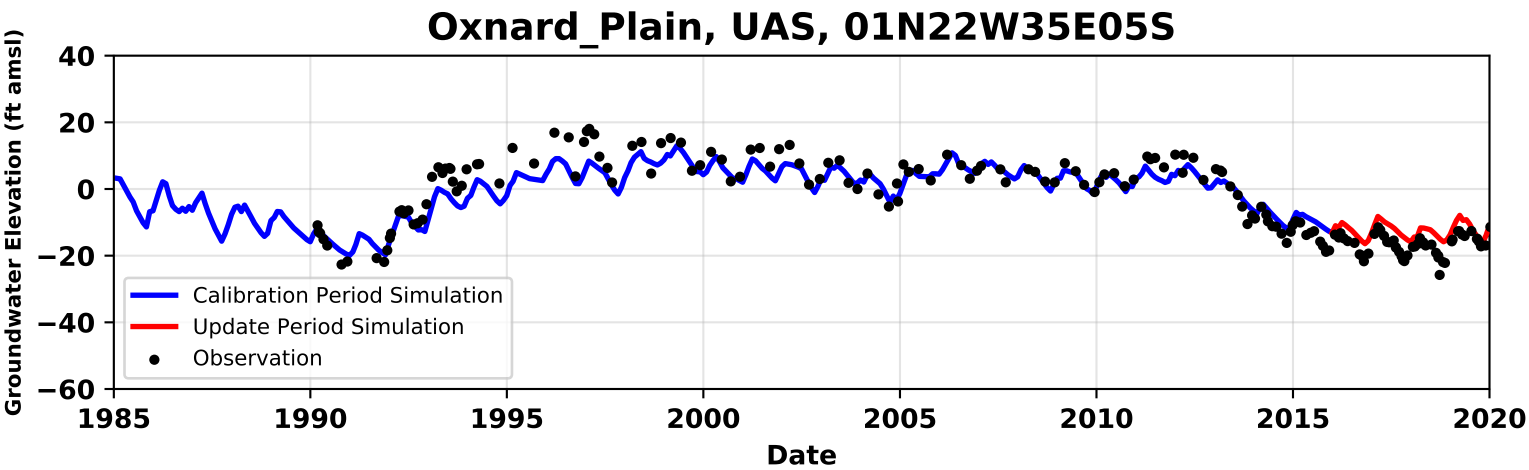
Oxnard_Plain, UAS, 01N22W20J07S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

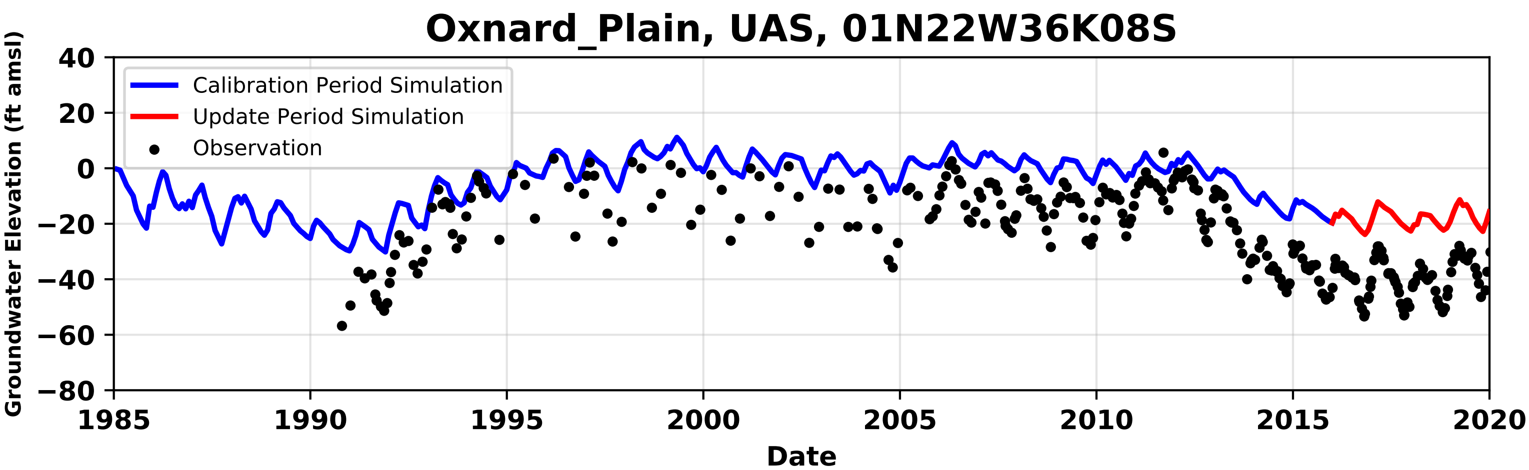

Oxnard_Plain, UAS, 01N22W20N02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020

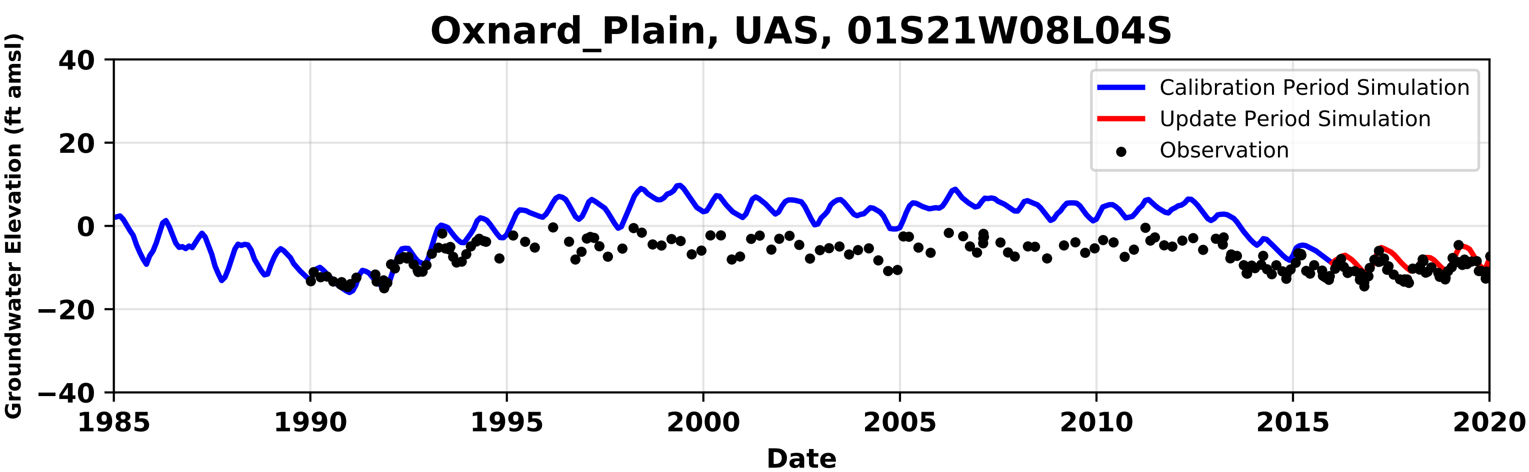

Oxnard_Plain, UAS, 01N22W22J07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

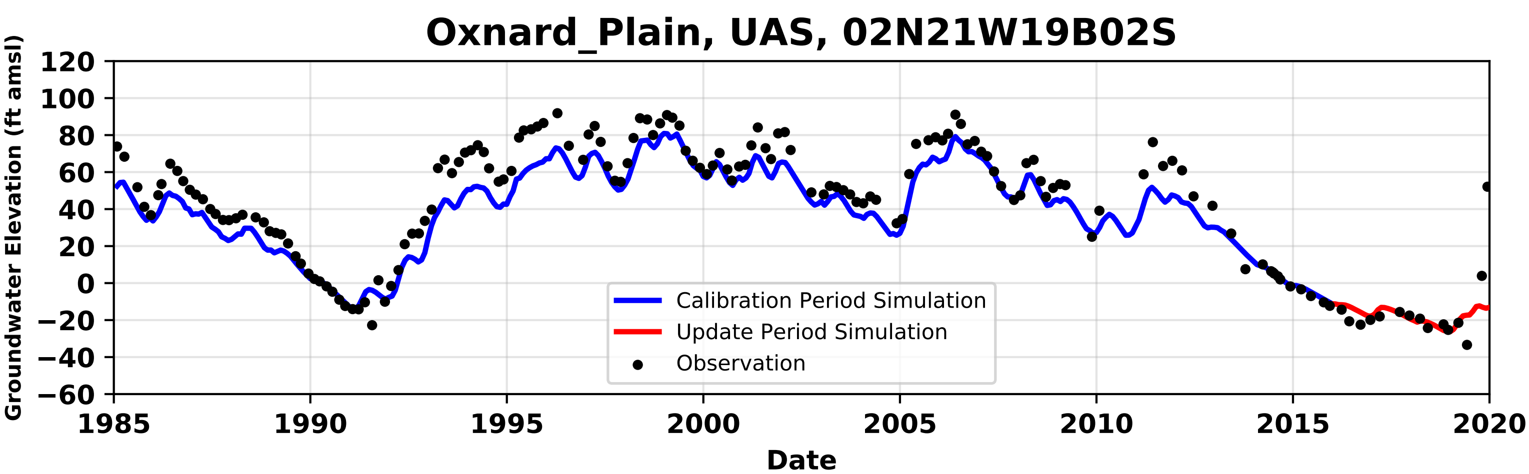

Oxnard_Plain, UAS, 01N22W29D04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020

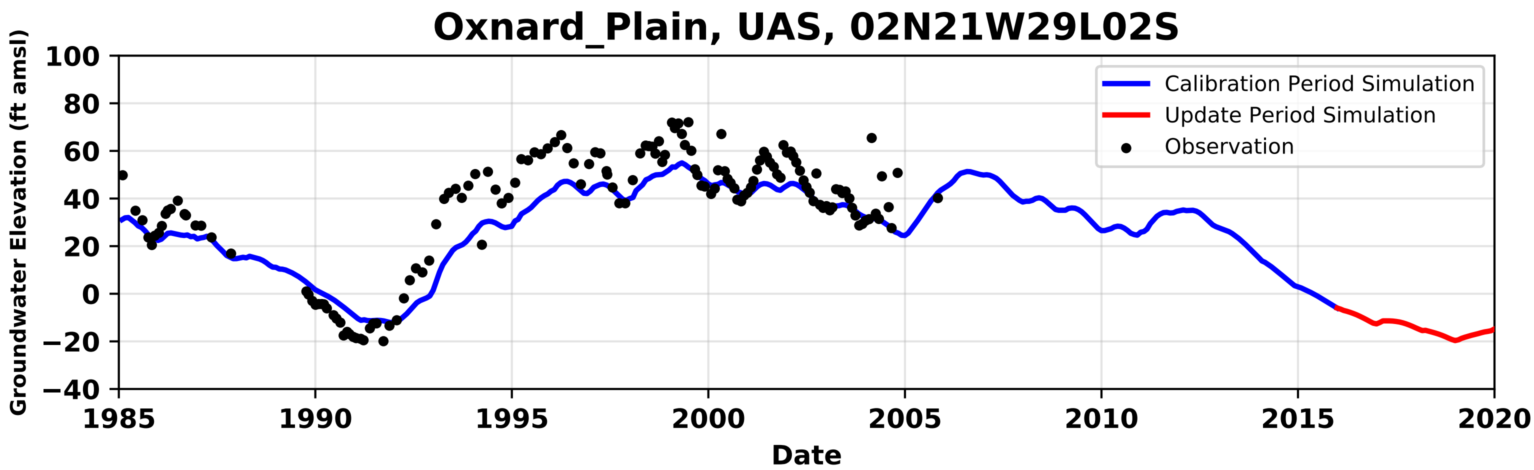

Oxnard_Plain, UAS, 01N22W35E04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020

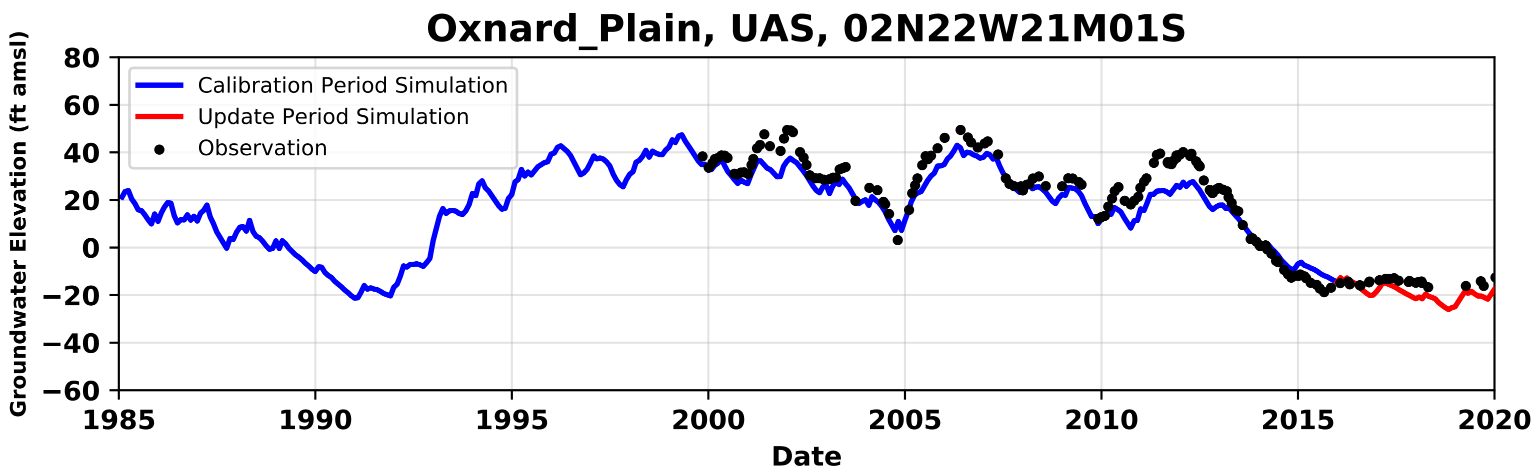

Oxnard_Plain, UAS, 01N22W35E05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

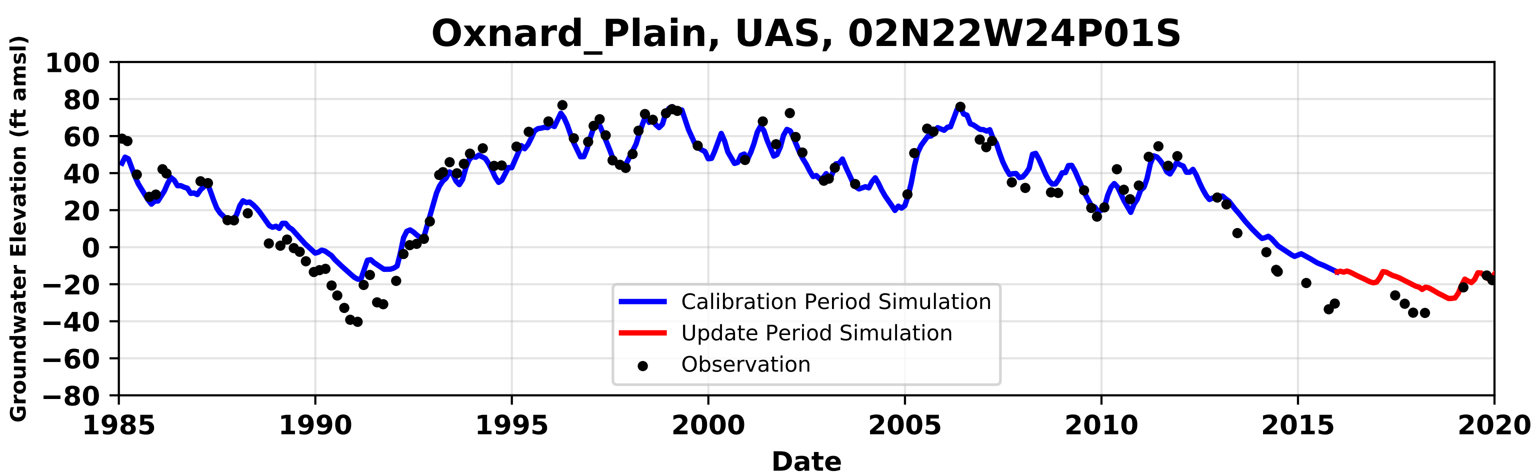

Oxnard_Plain, UAS, 01N22W36K08S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

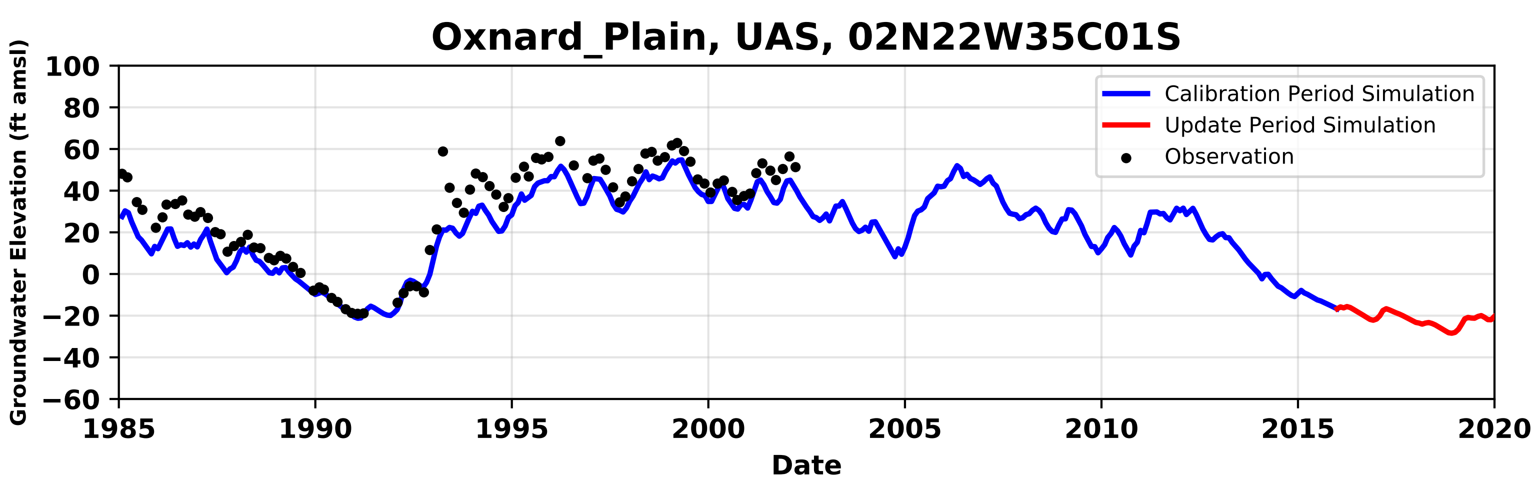

Oxnard_Plain, UAS, 01S21W08L04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

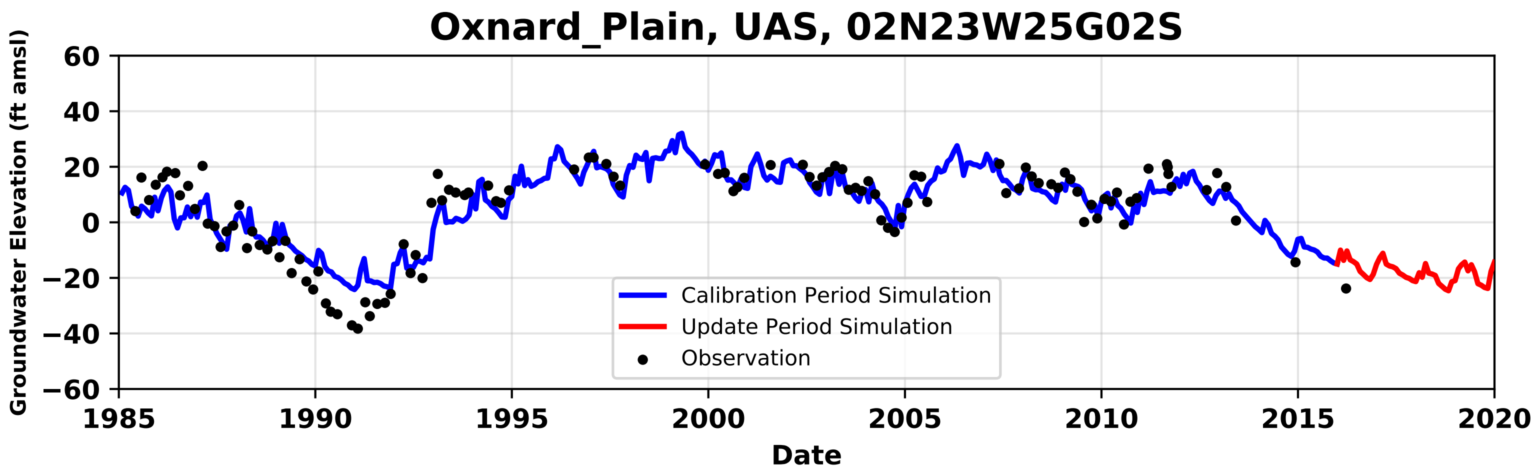

Oxnard_Plain, UAS, 02N21W19B02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

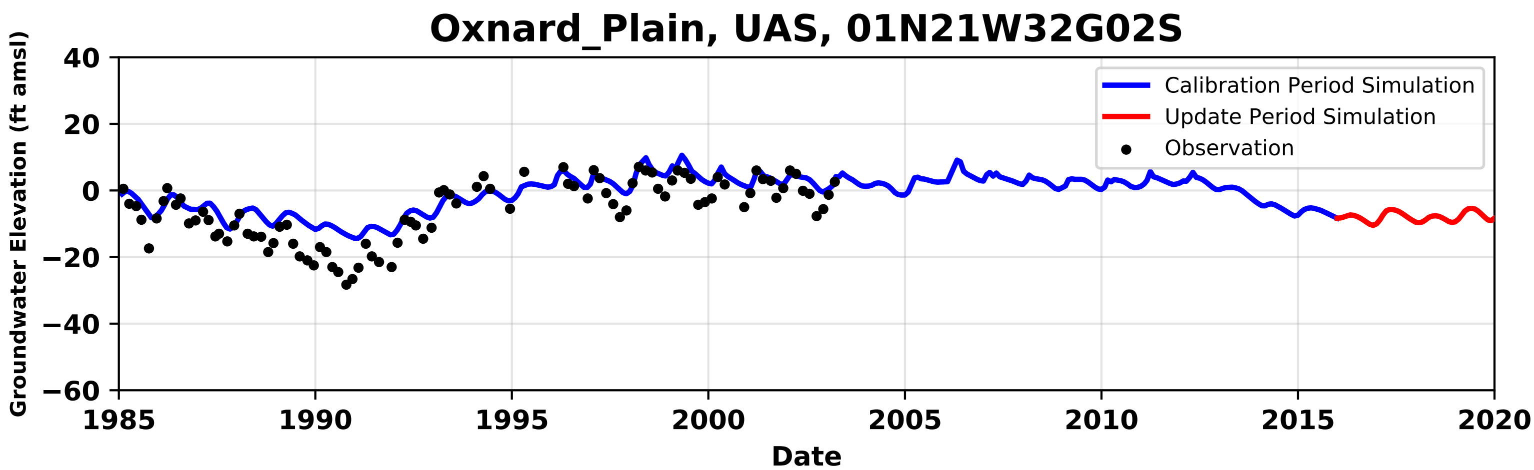

Oxnard_Plain, UAS, 02N21W29L02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
100
80
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020

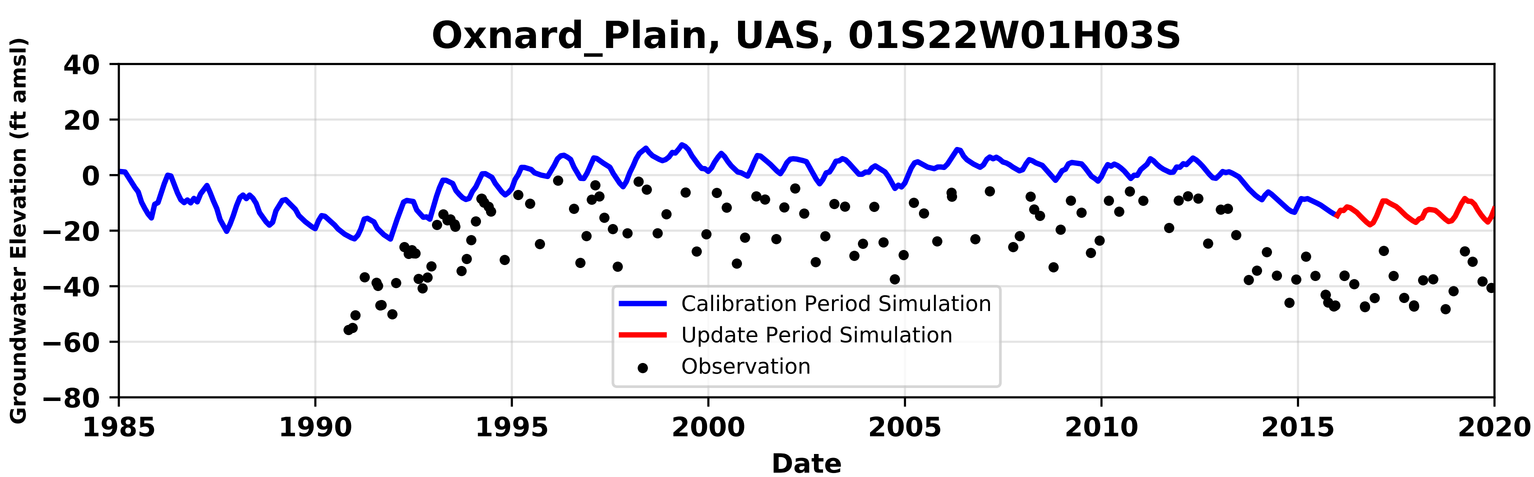

Oxnard_Plain, UAS, 02N22W21M01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

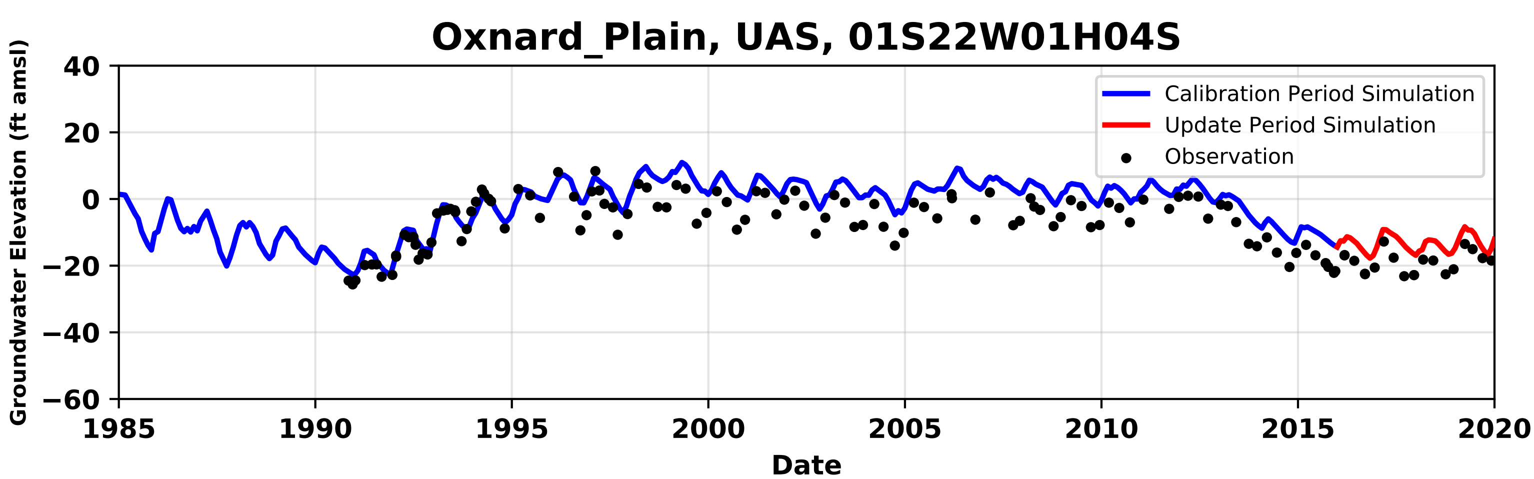

Oxnard_Plain, UAS, 02N22W24P01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020

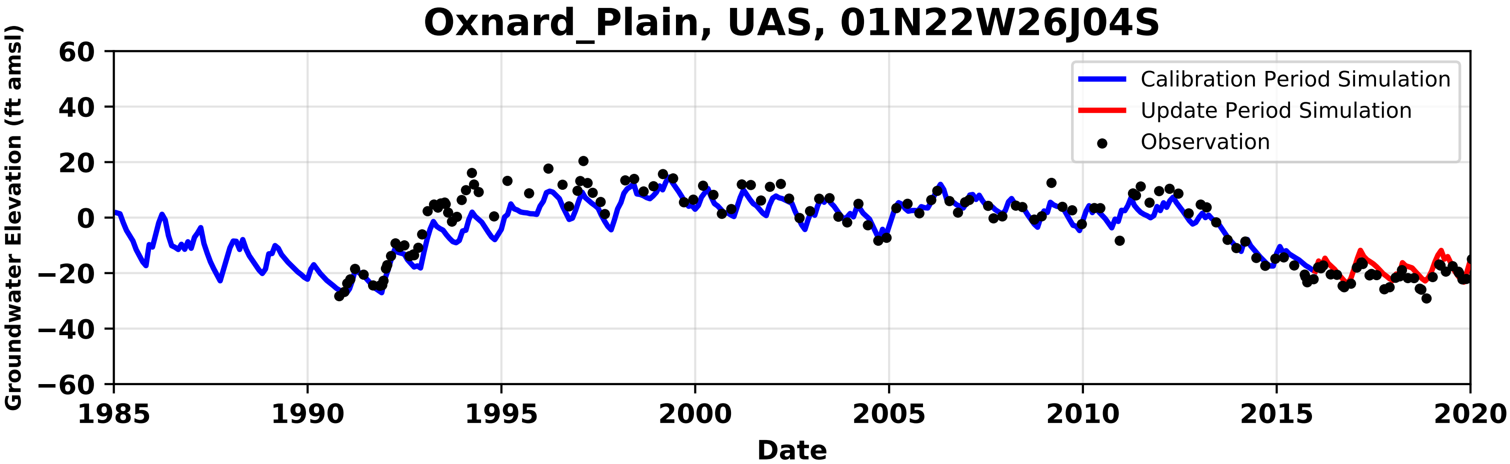

Oxnard_Plain, UAS, 02N22W35C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020


Oxnard_Plain, UAS, 02N23W25G02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

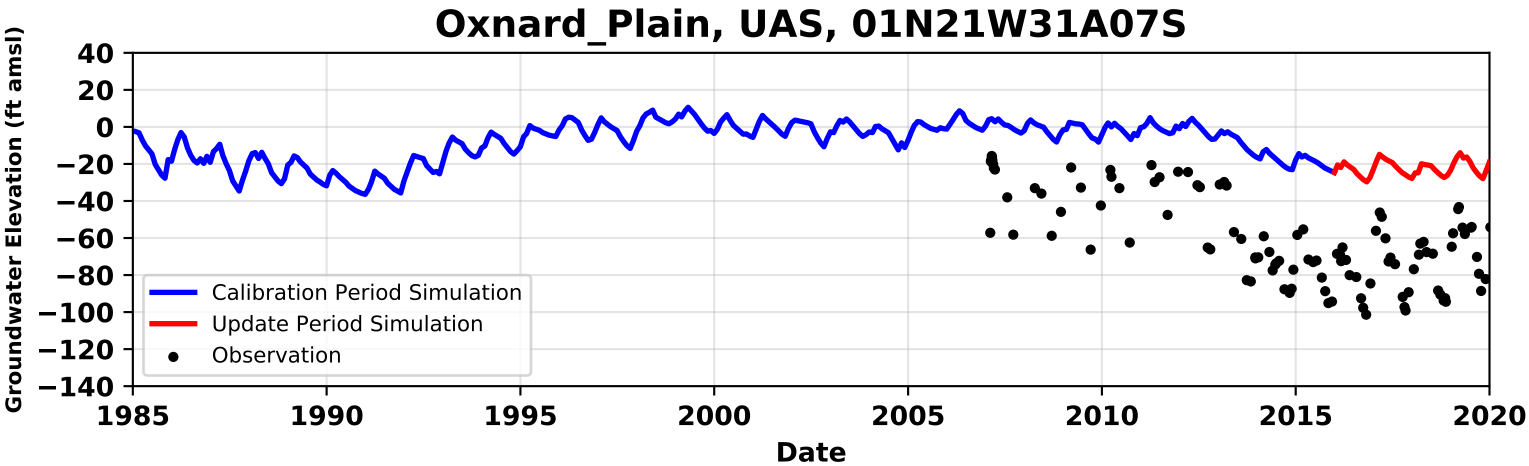

Oxnard_Plain, UAS, 01N21W32G02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01S22W01H03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

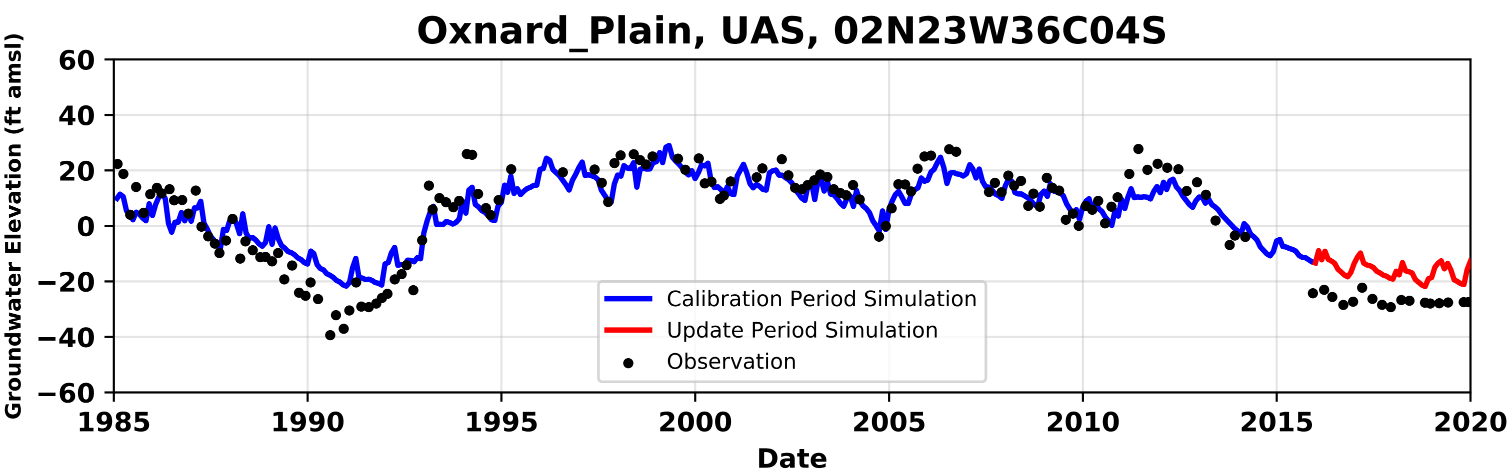

Oxnard_Plain, UAS, 01S22W01H04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



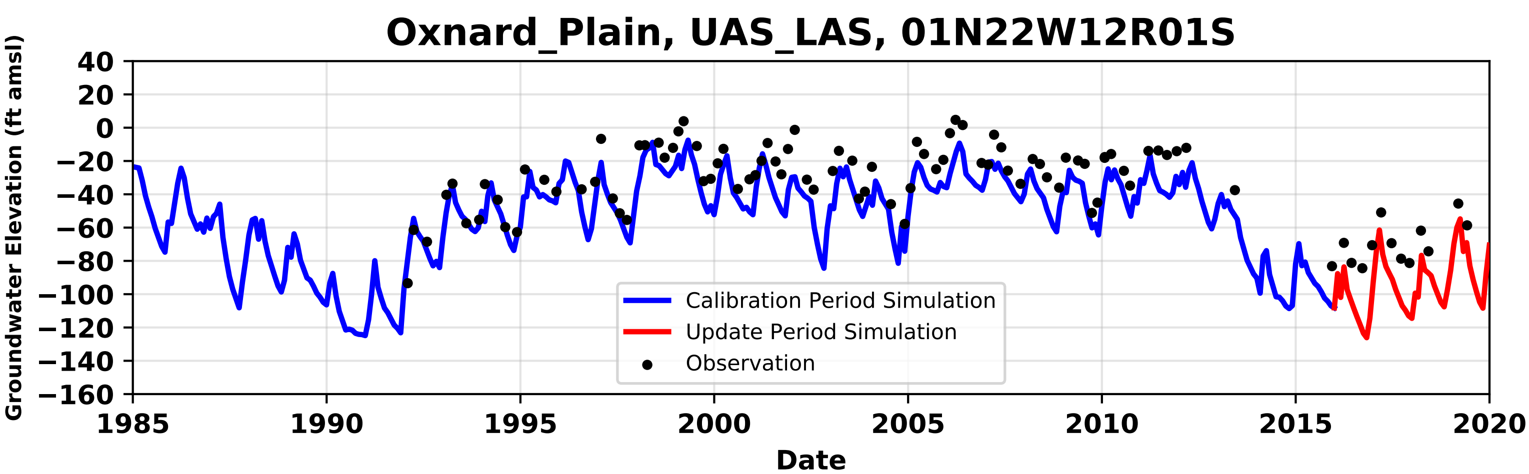
Oxnard_Plain, UAS, 01N22W26J04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



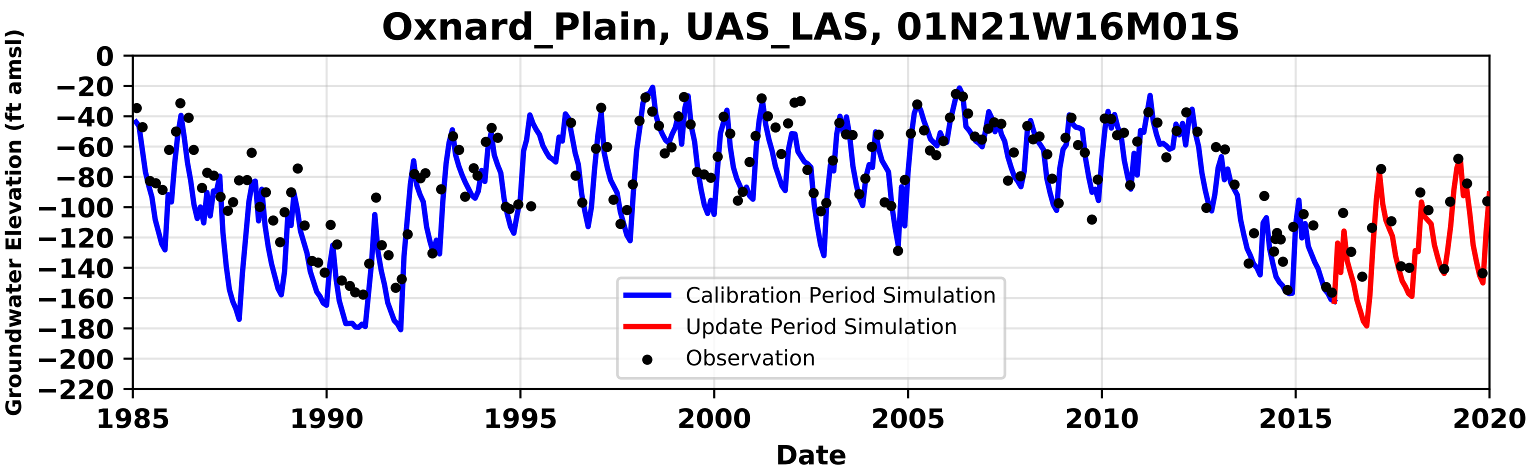
Oxnard_Plain, UAS, 01N21W31A07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

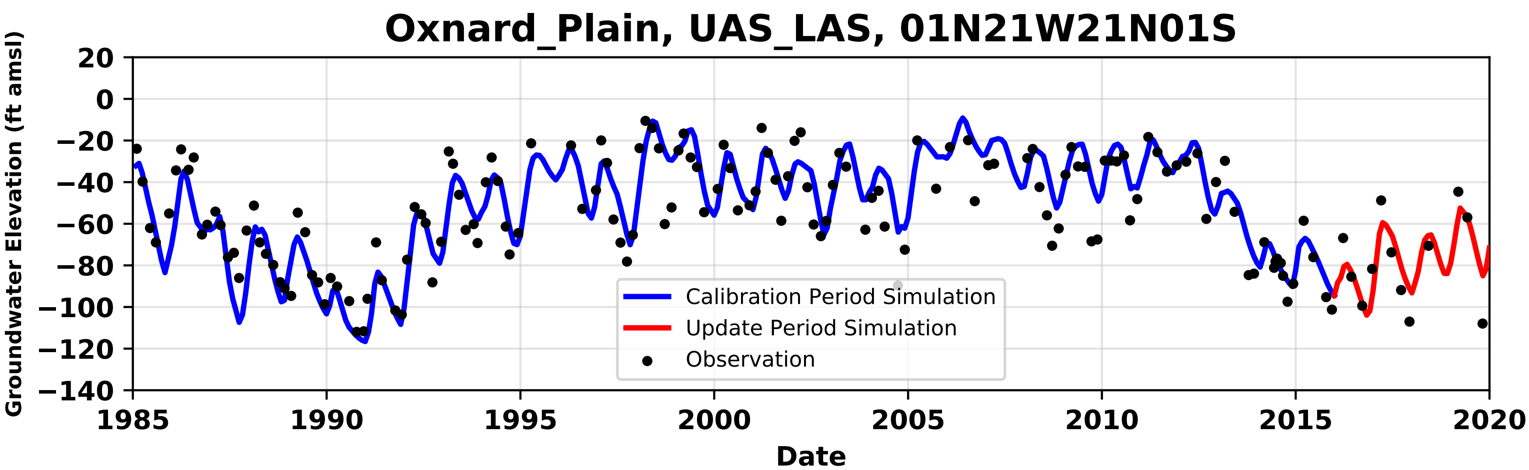


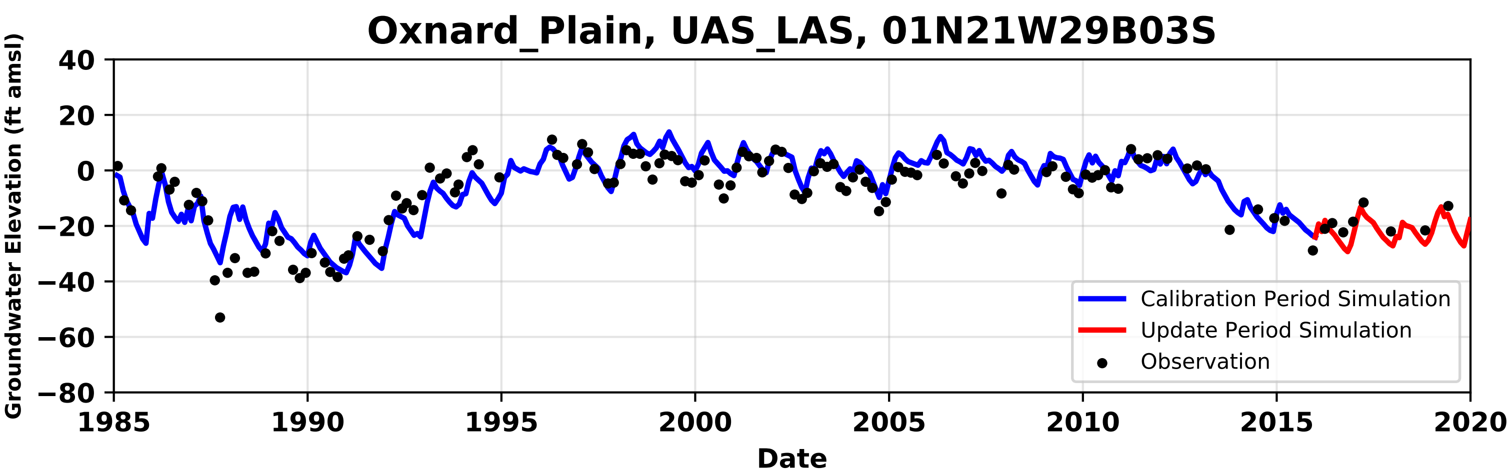
Oxnard_Plain, UAS, 02N23W36C04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

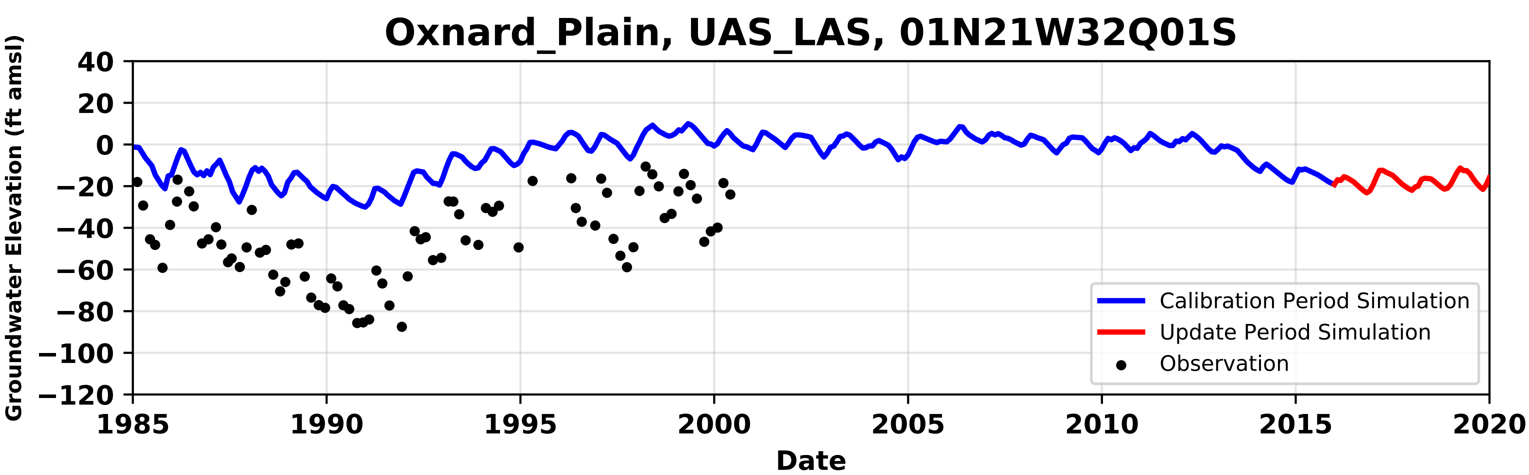


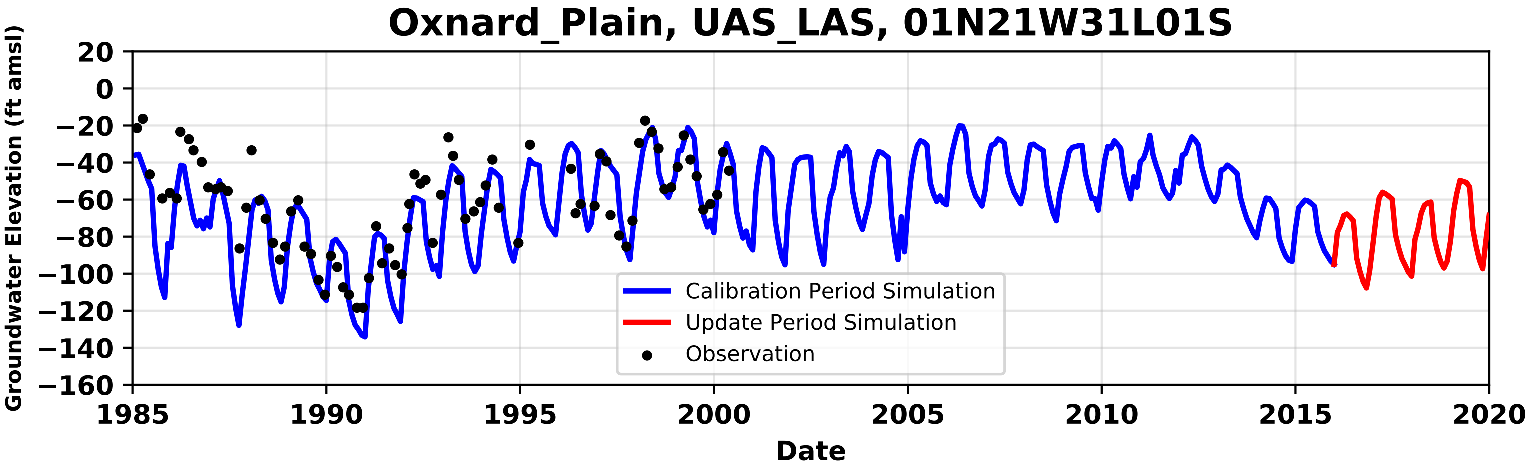
Oxnard_Plain, UAS_LAS, 01N22W12R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS_LAS, 01N21W16M01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

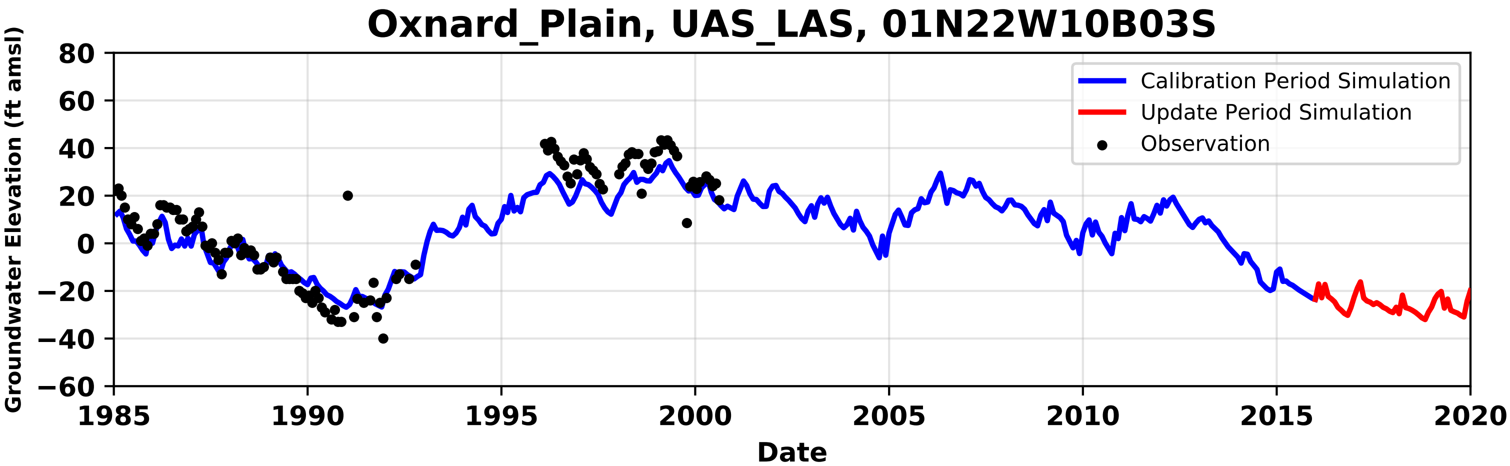

Oxnard_Plain, UAS_LAS, 01N21W21N01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS_LAS, 01N21W29B03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

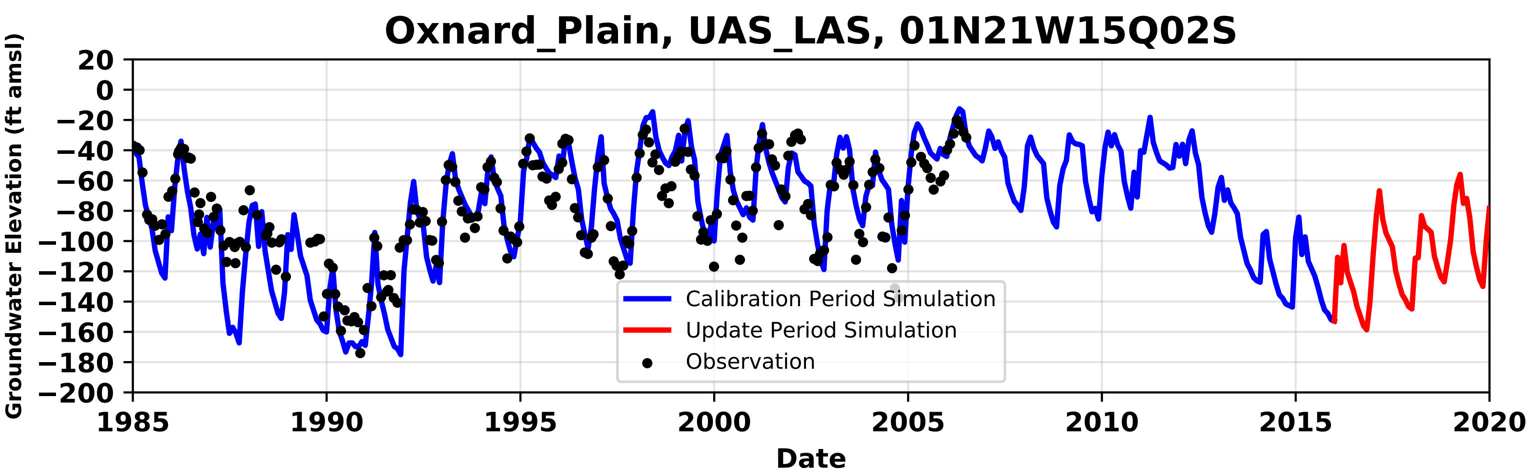

Oxnard_Plain, UAS_LAS, 01N21W32Q01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



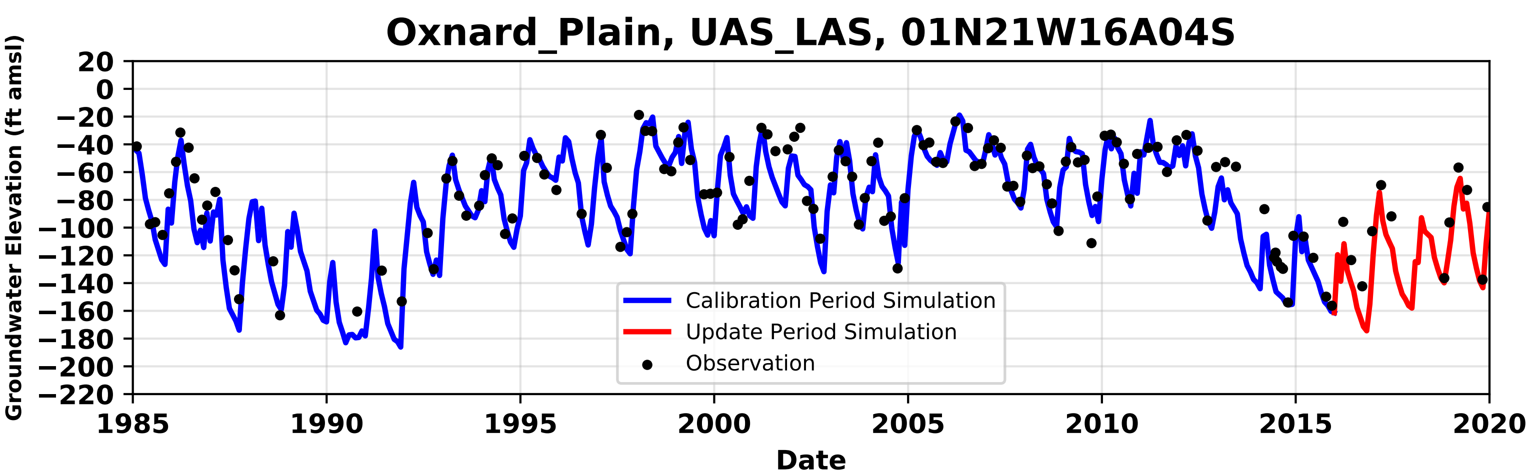
Oxnard_Plain, UAS_LAS, 01N21W31L01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



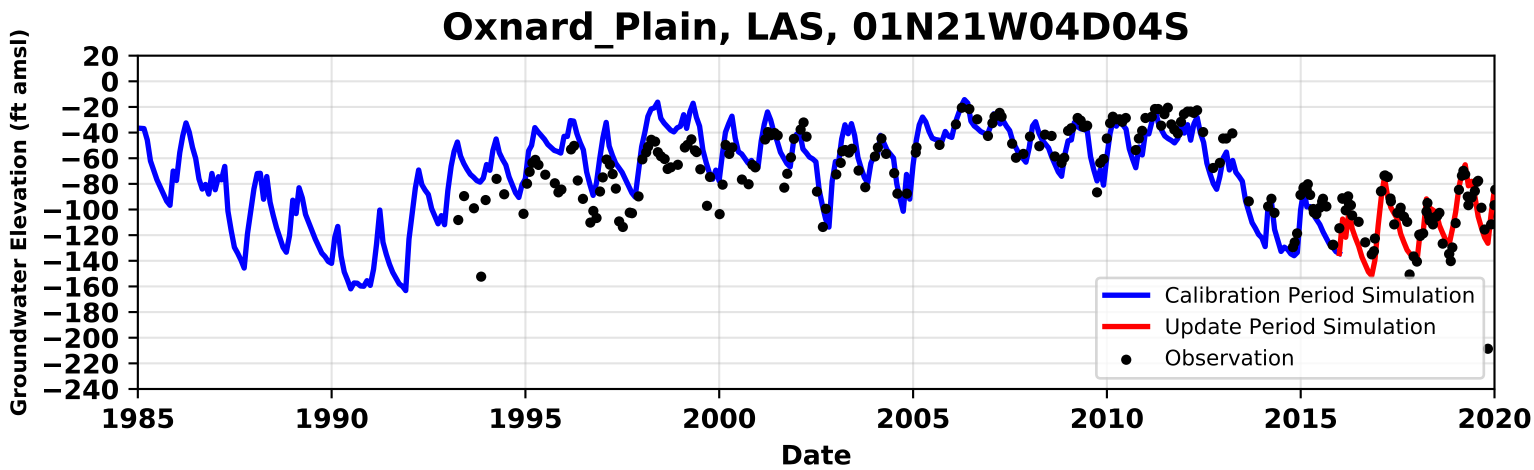
Oxnard_Plain, UAS_LAS, 01N22W10B03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

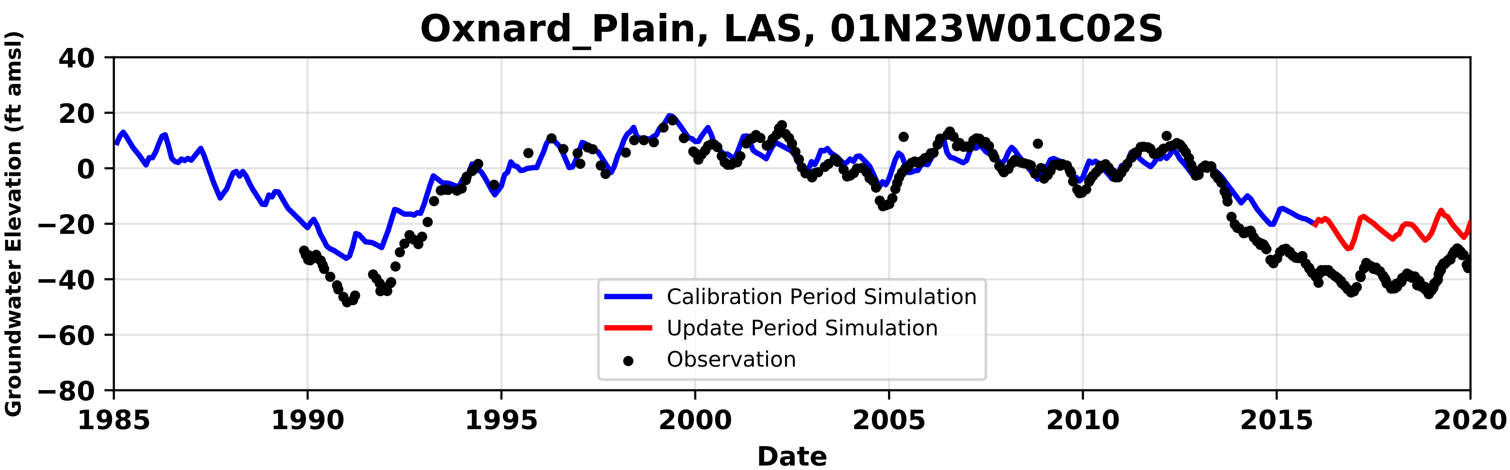


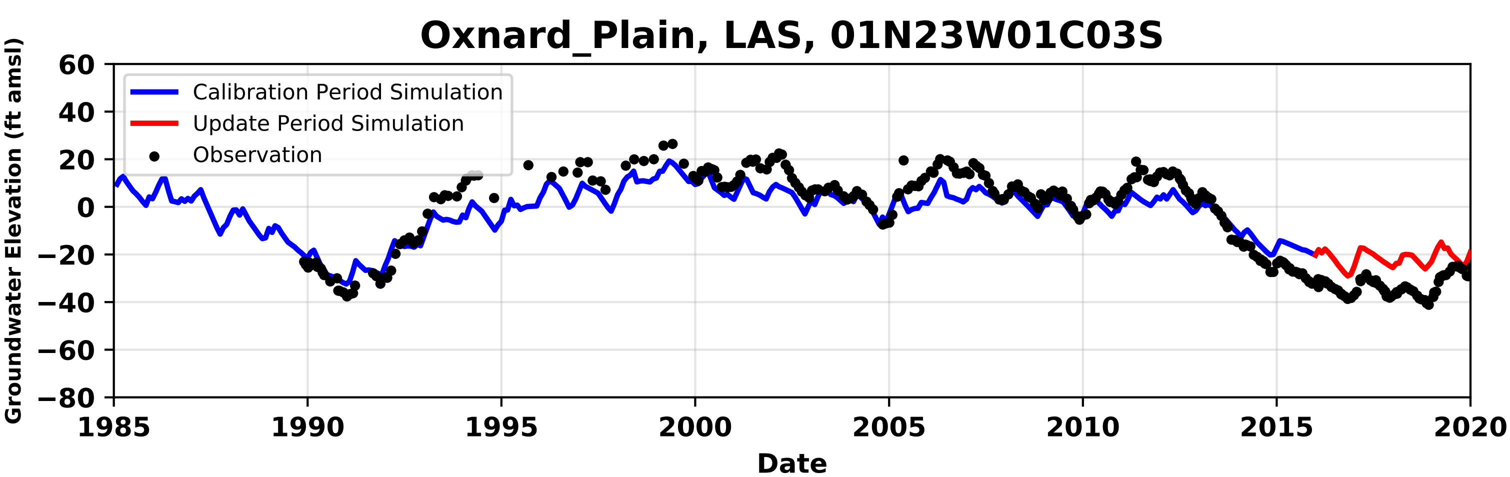
Oxnard_Plain, UAS_LAS, 01N21W15Q02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

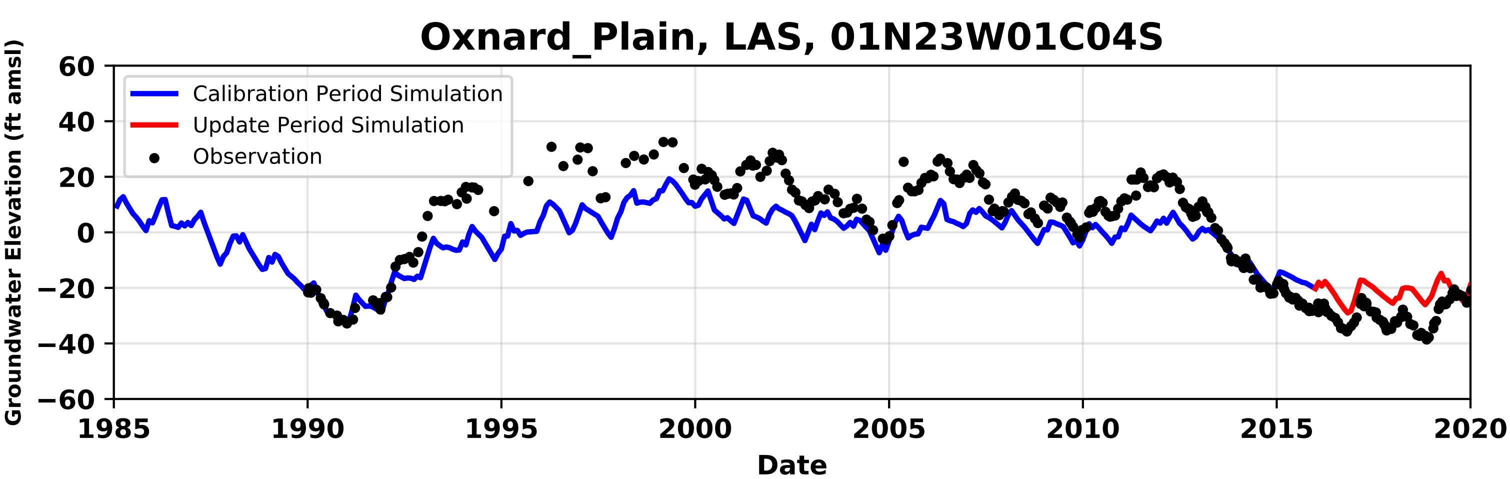


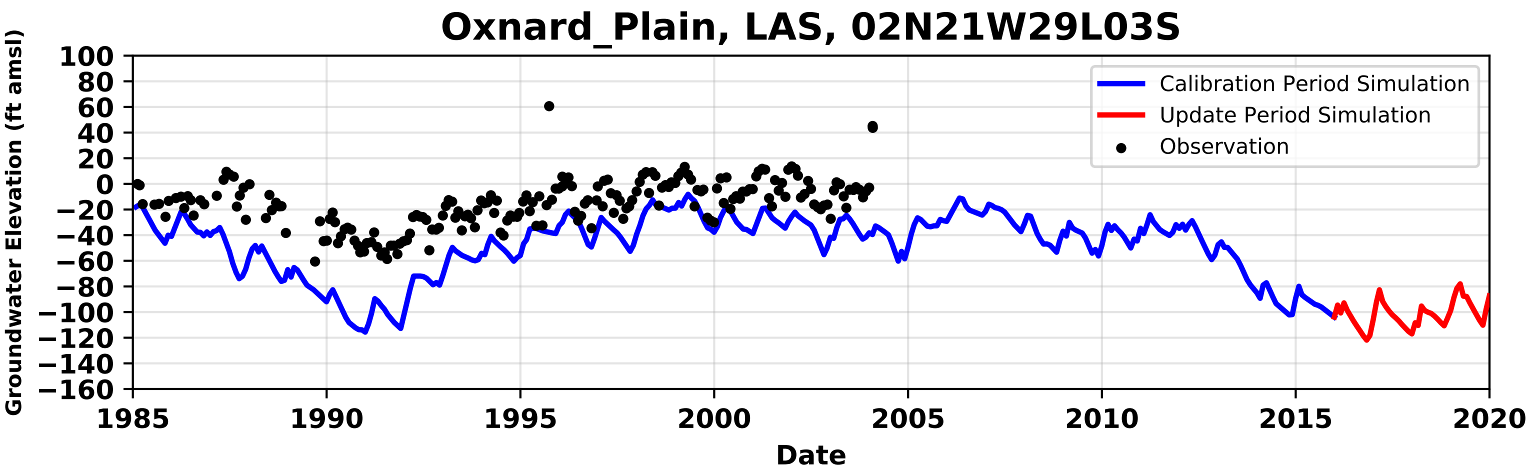
Oxnard_Plain, UAS_LAS, 01N21W16A04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

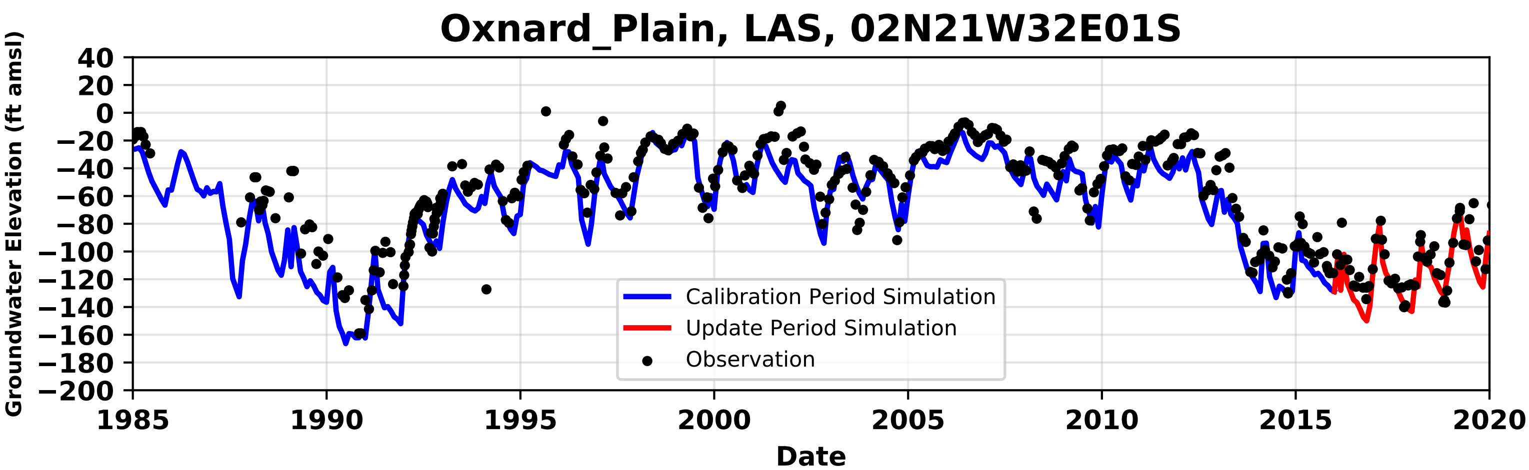

Oxnard_Plain, LAS, 01N21W04D04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

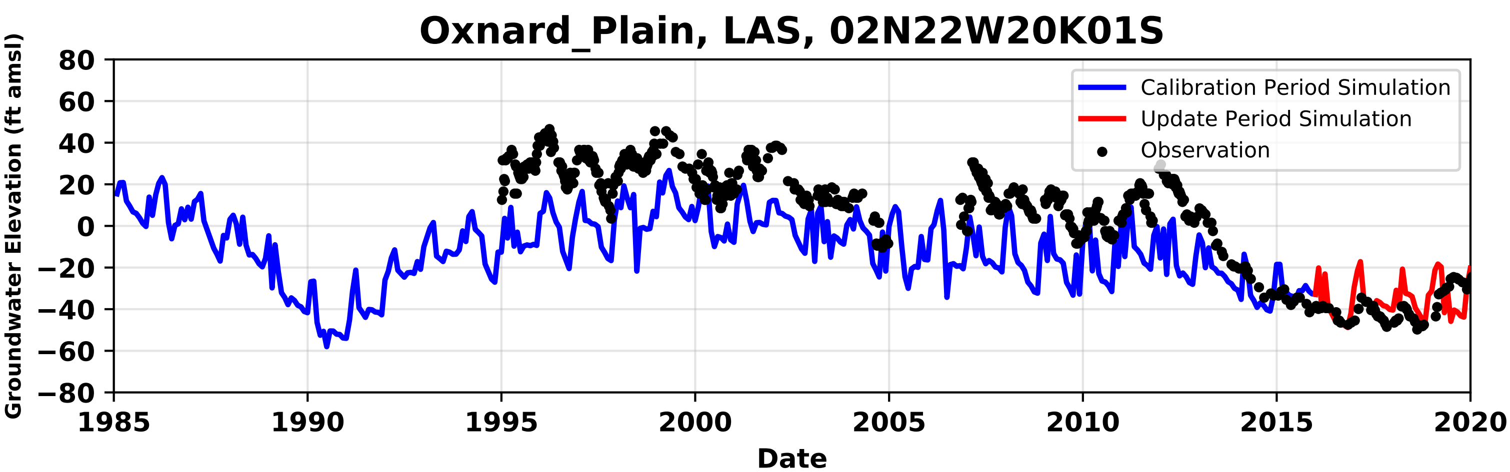

Oxnard_Plain, LAS, 01N23W01C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

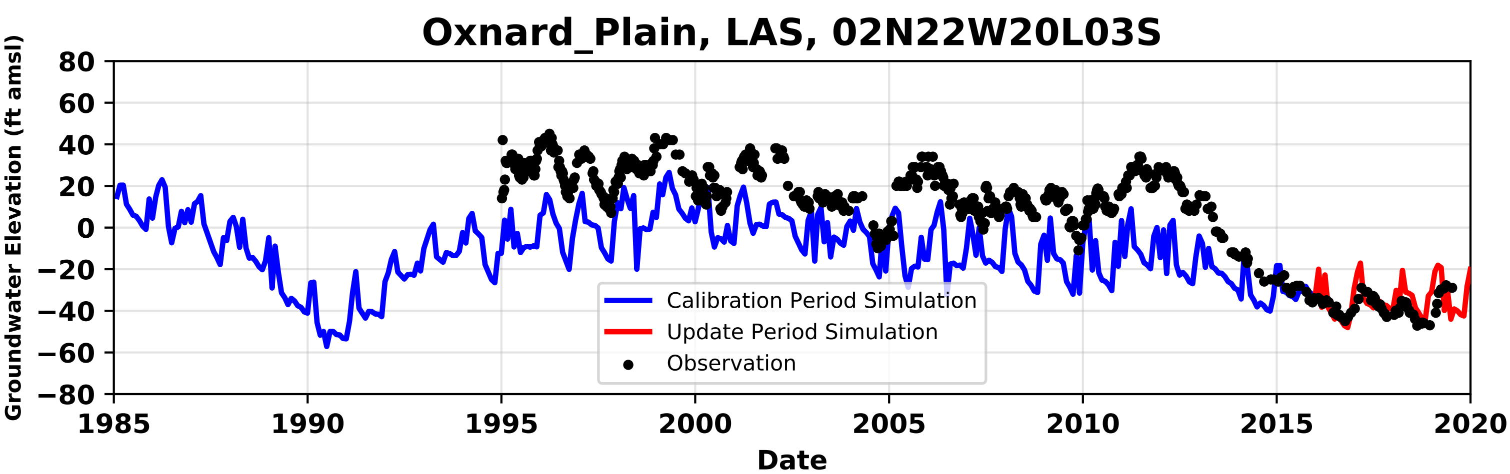

Oxnard_Plain, LAS, 01N23W01C03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

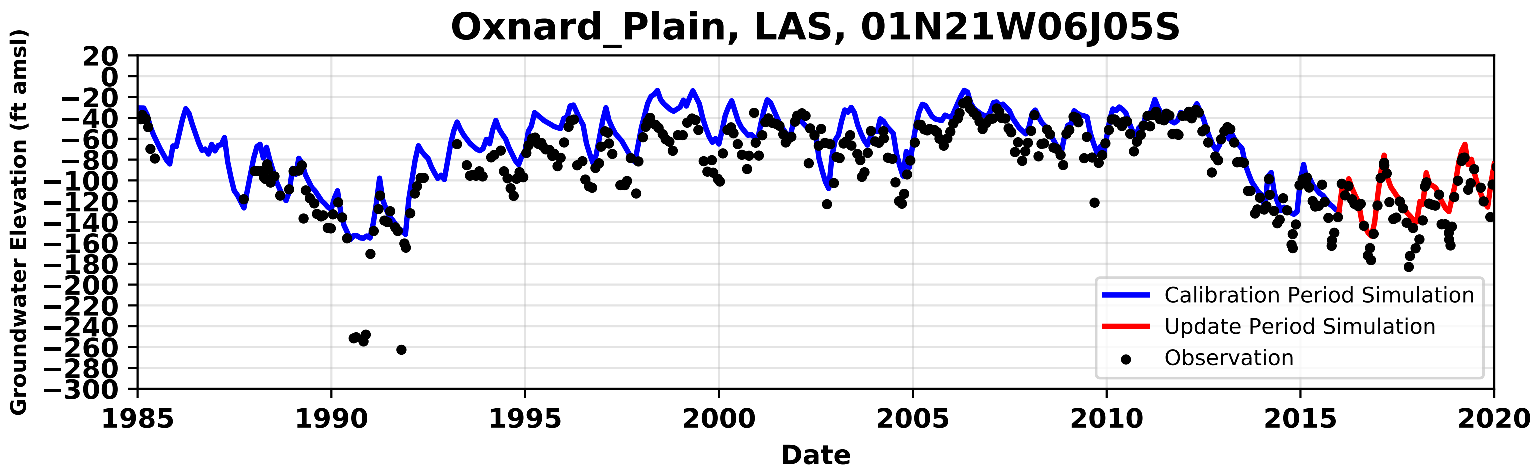

Oxnard_Plain, LAS, 01N23W01C04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

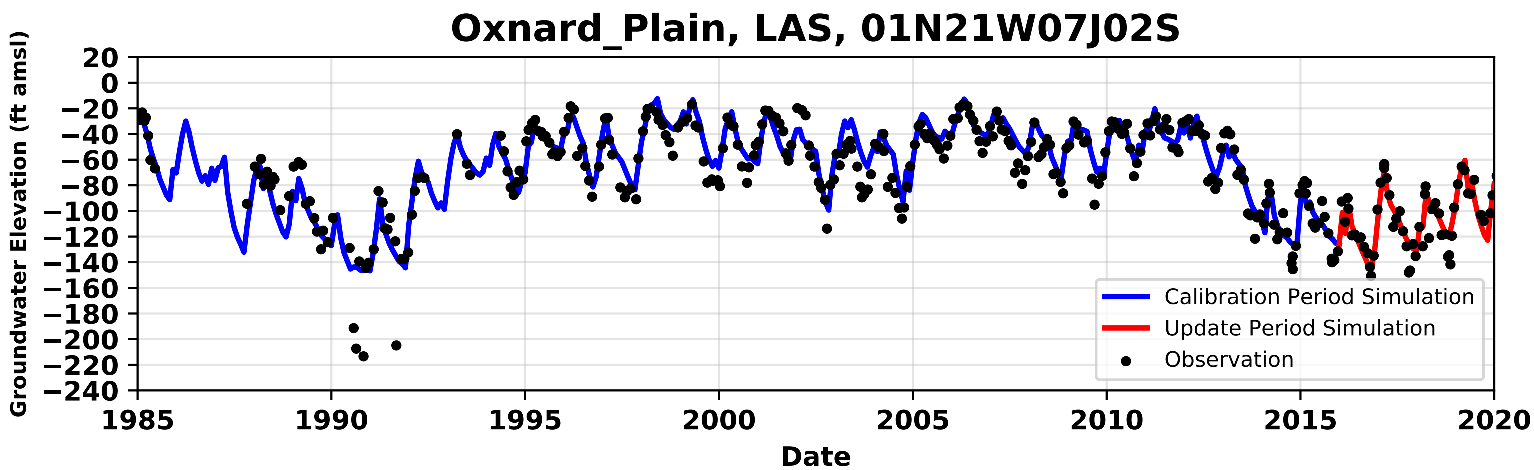

Oxnard_Plain, LAS, 02N21W29L03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

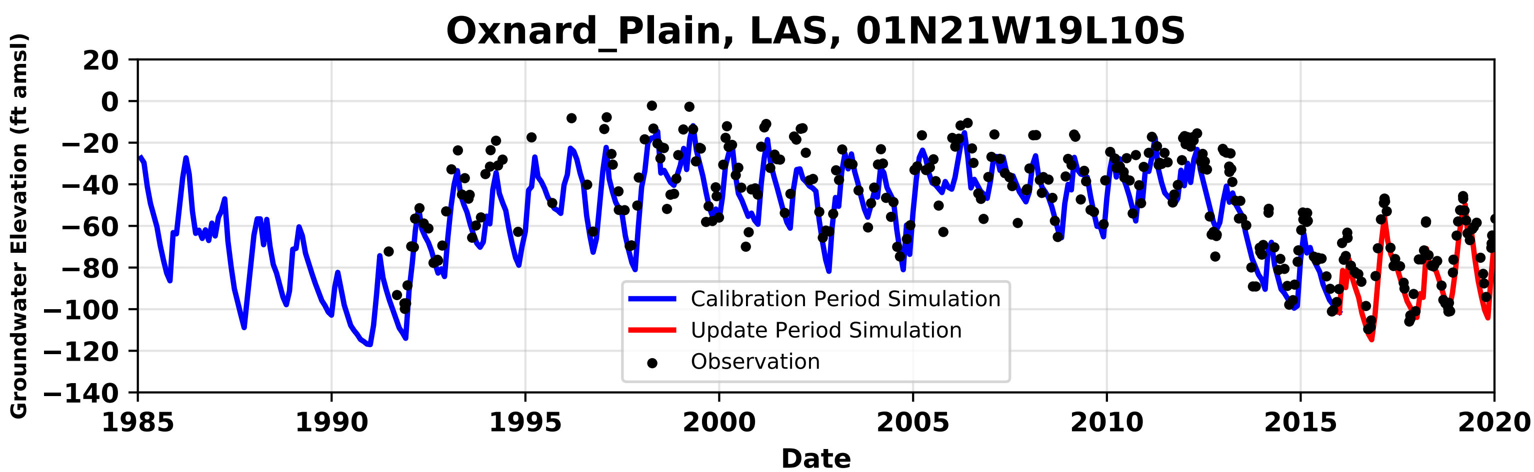

Oxnard_Plain, LAS, 02N21W32E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

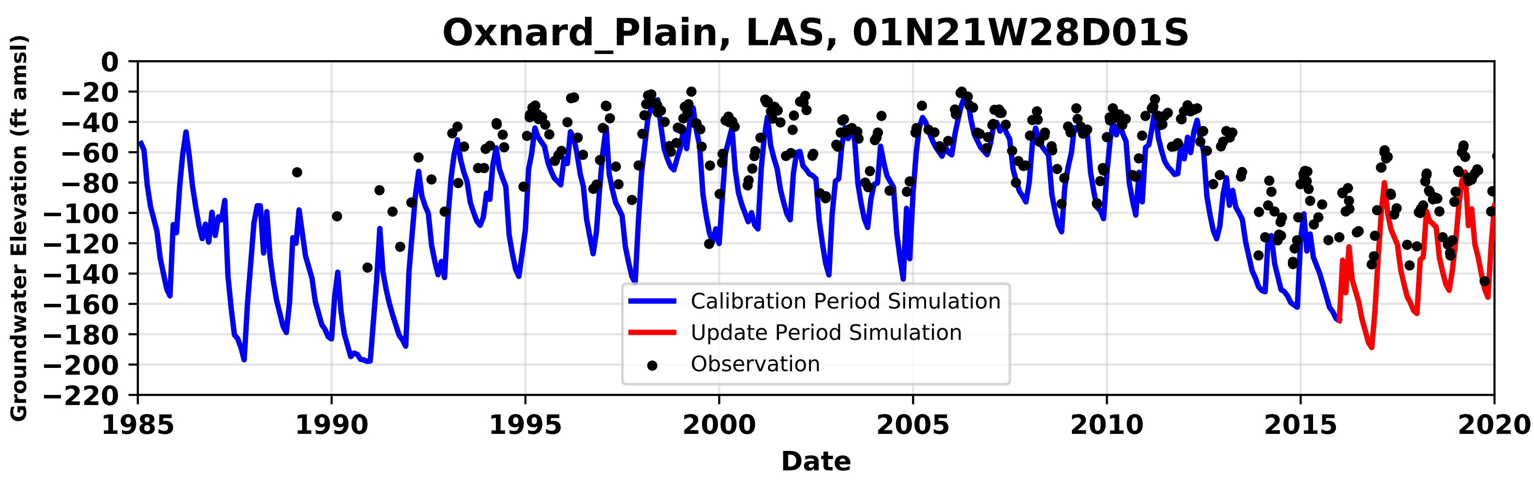

Oxnard_Plain, LAS, 02N22W20K01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

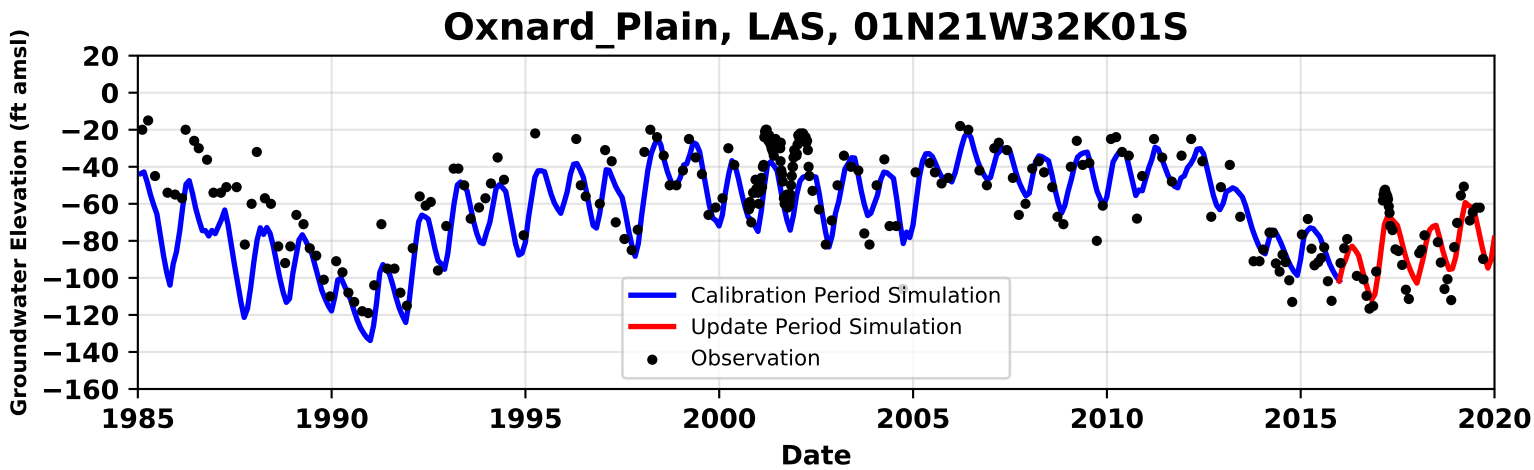

Oxnard_Plain, LAS, 02N22W20L03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, LAS, 01N21W06J05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

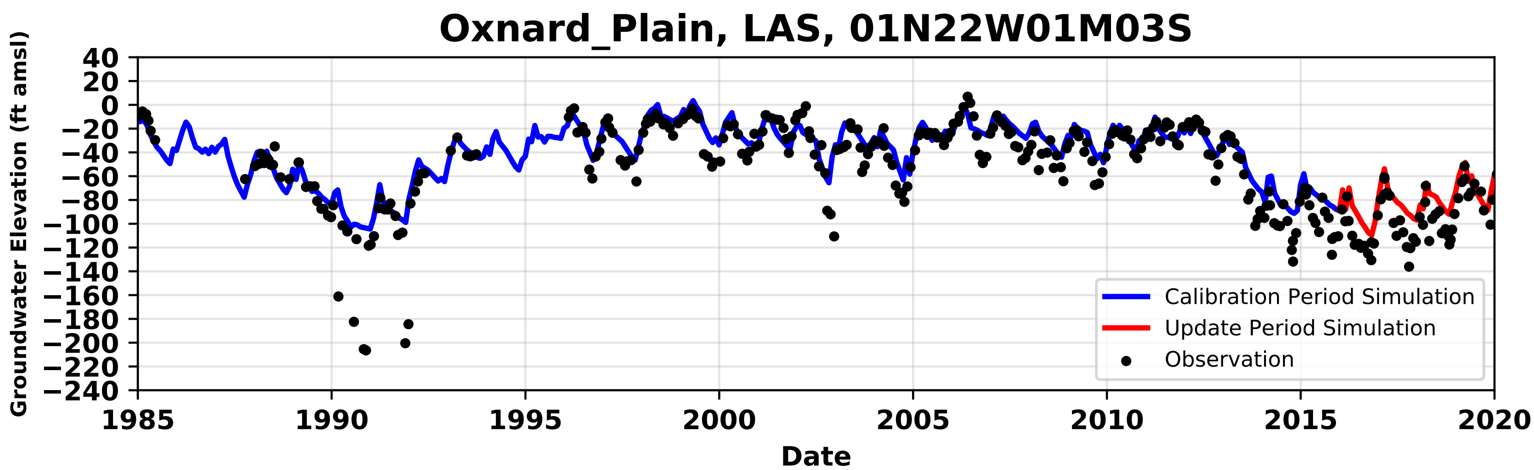

Oxnard_Plain, LAS, 01N21W07J02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, LAS, 01N21W19L10S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

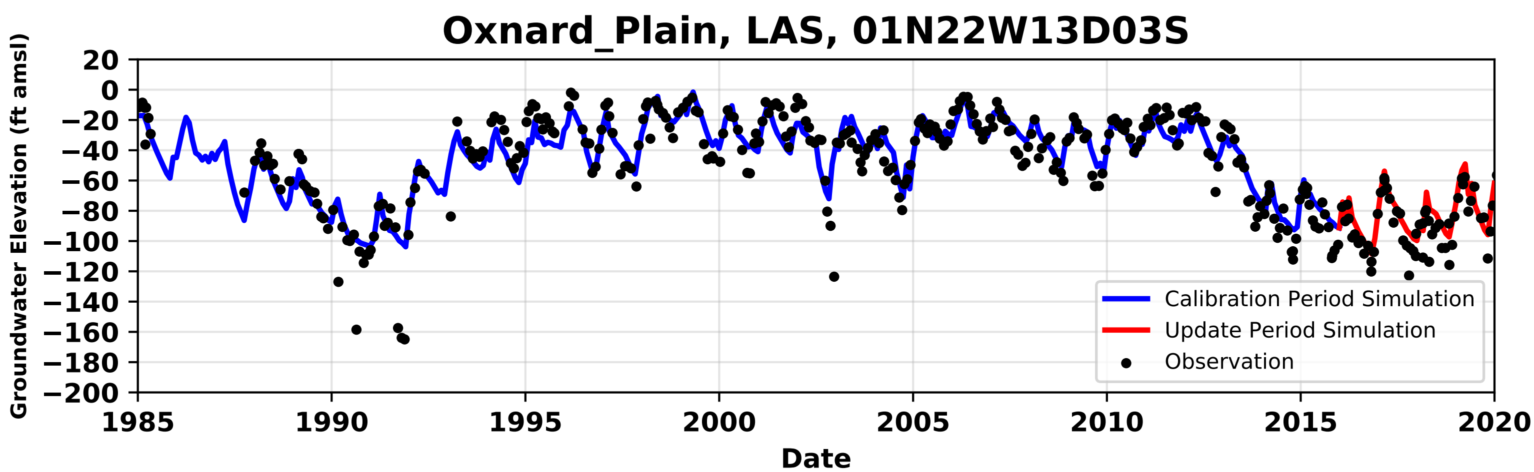

Oxnard_Plain, LAS, 01N21W28D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



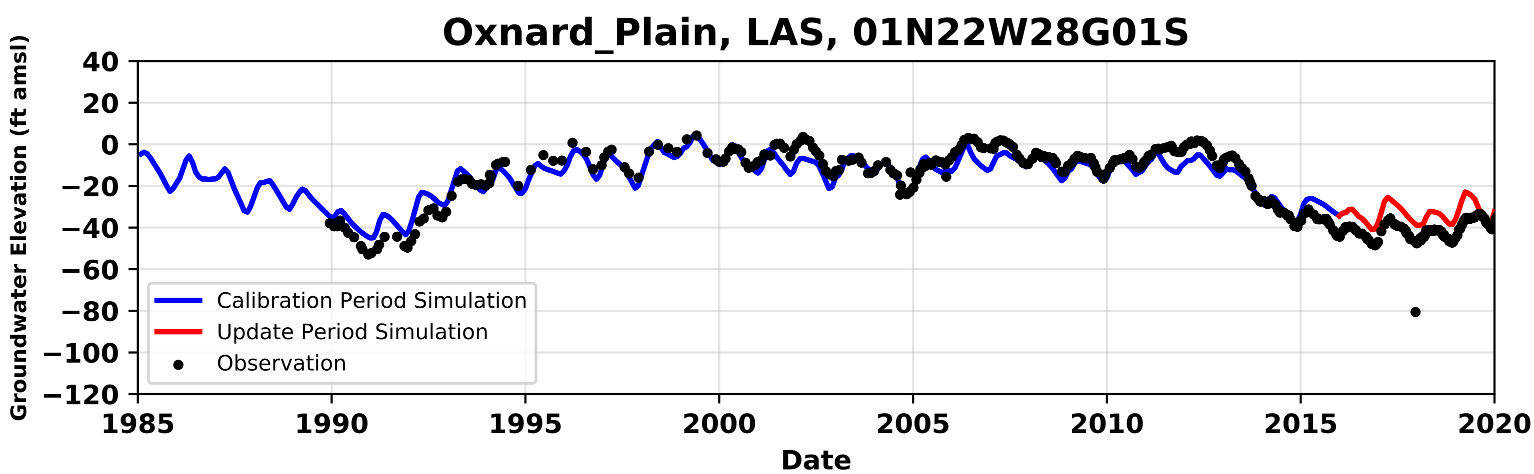
Oxnard_Plain, LAS, 01N21W32K01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



Oxnard_Plain, LAS, 01N22W01M03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

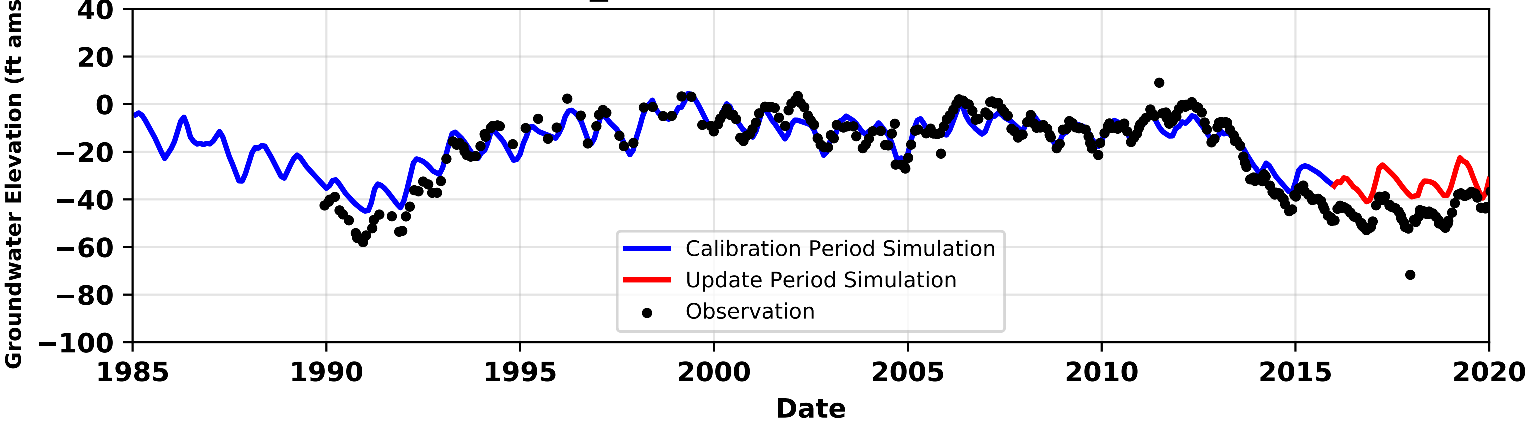


Oxnard_Plain, LAS, 01N22W13D03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

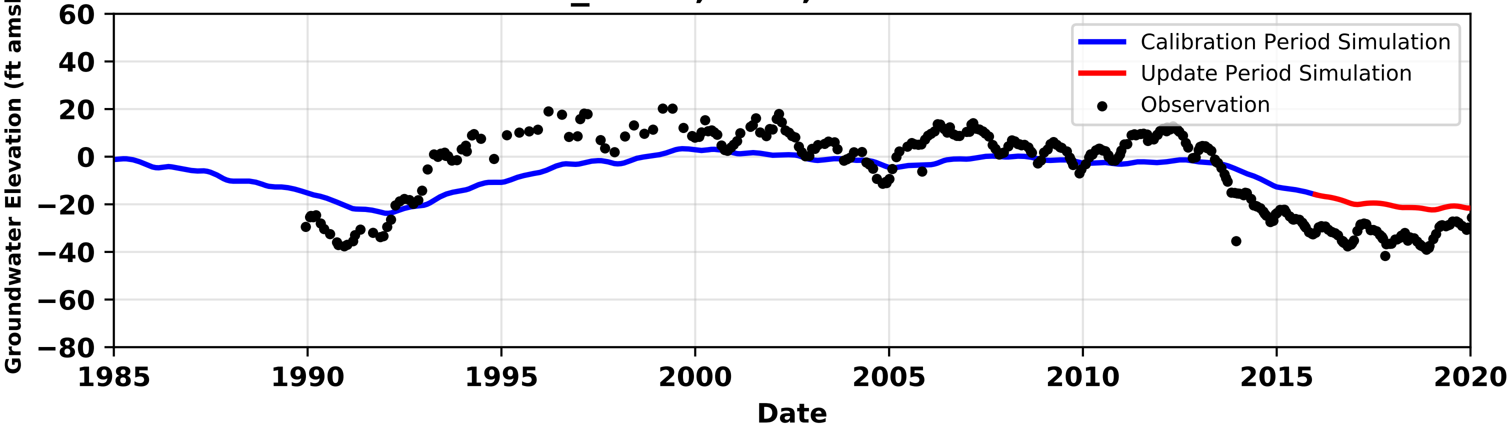


Oxnard_Plain, LAS, 01N22W28G01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

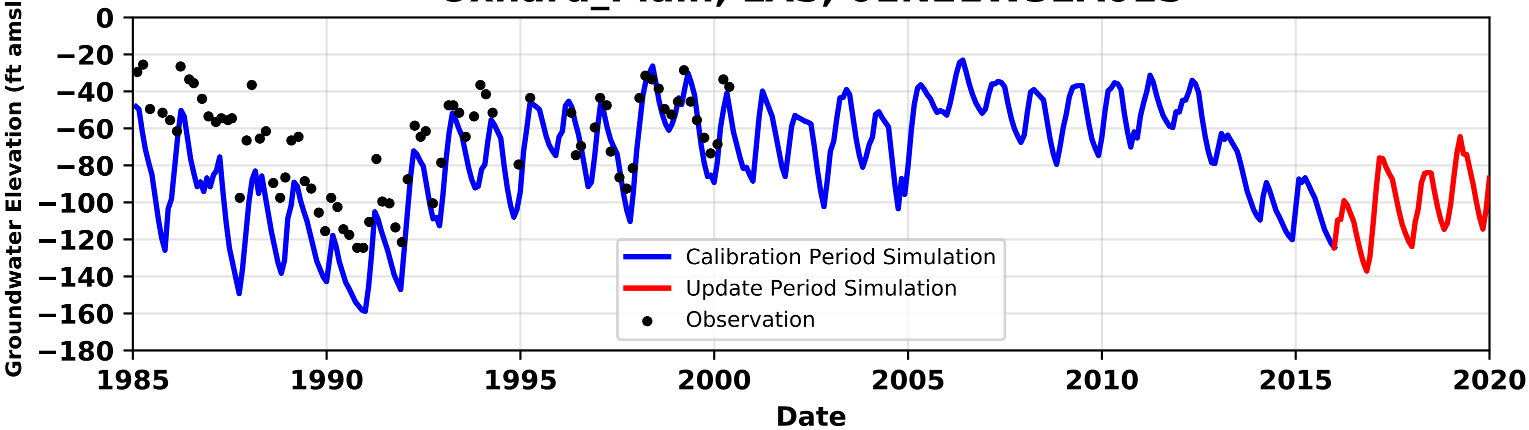
Oxnard_Plain, LAS, 01N22W28G02S



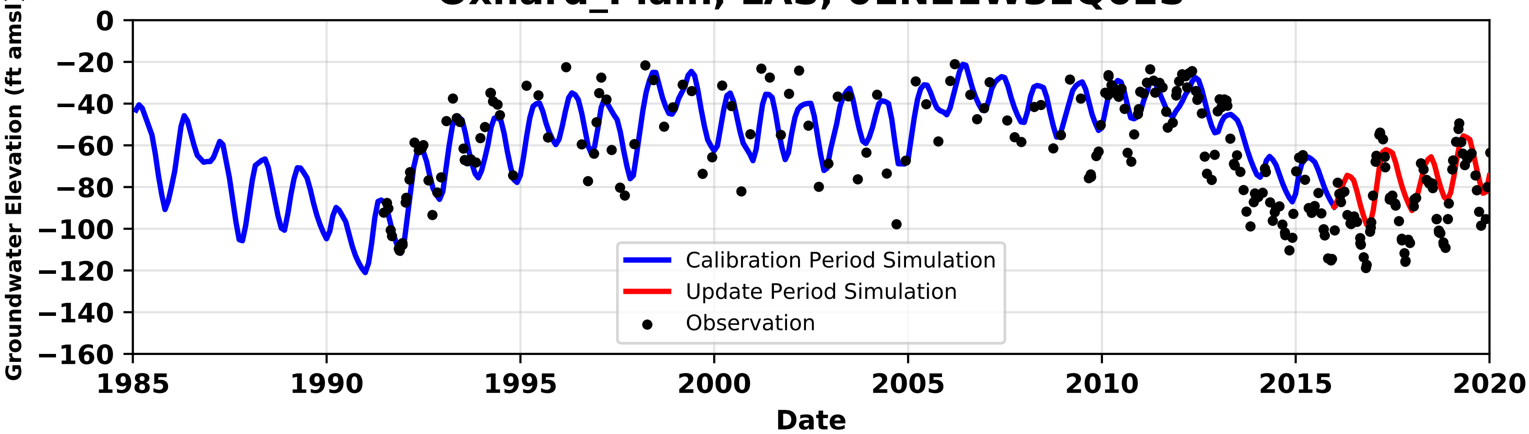
Oxnard_Plain, LAS, 01N22W28G03S

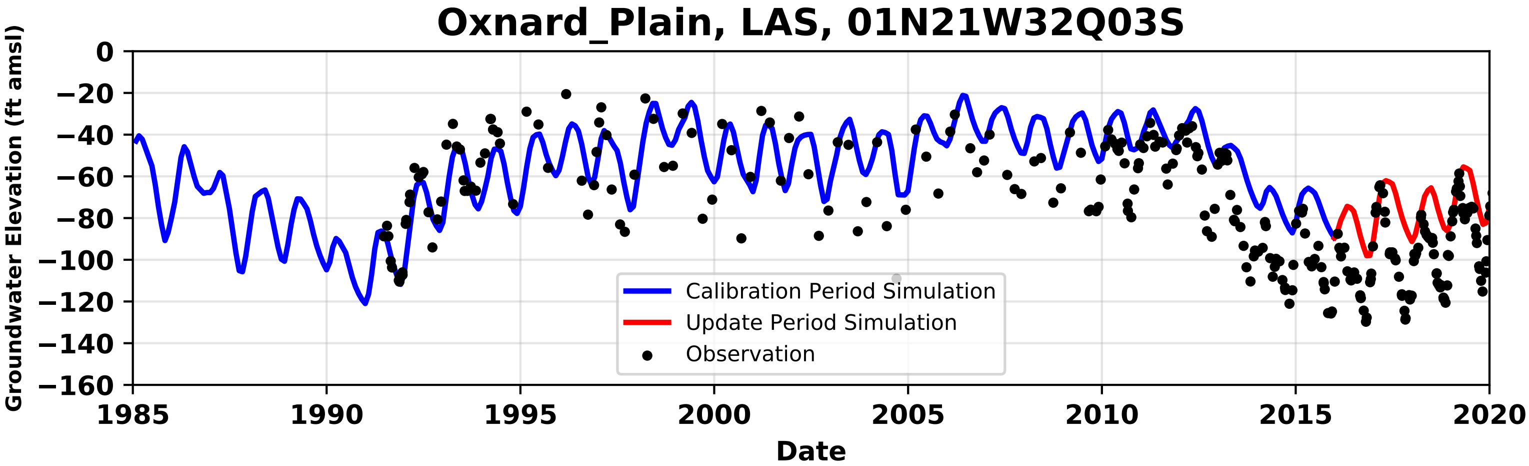


Oxnard_Plain, LAS, 01N21W32A01S

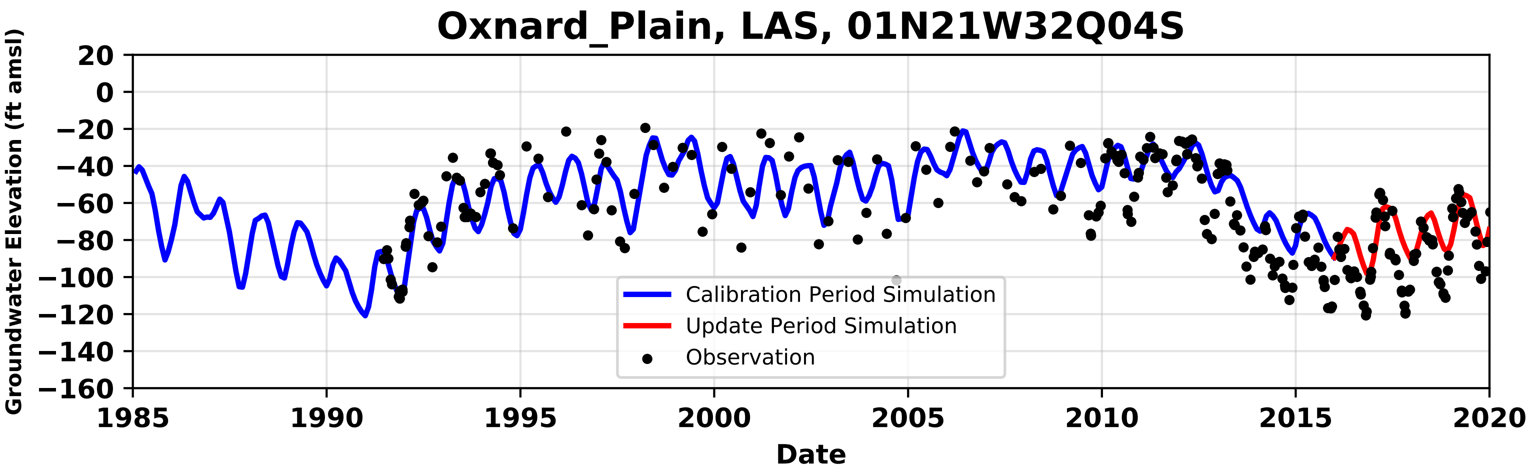


Oxnard_Plain, LAS, 01N21W32Q02S

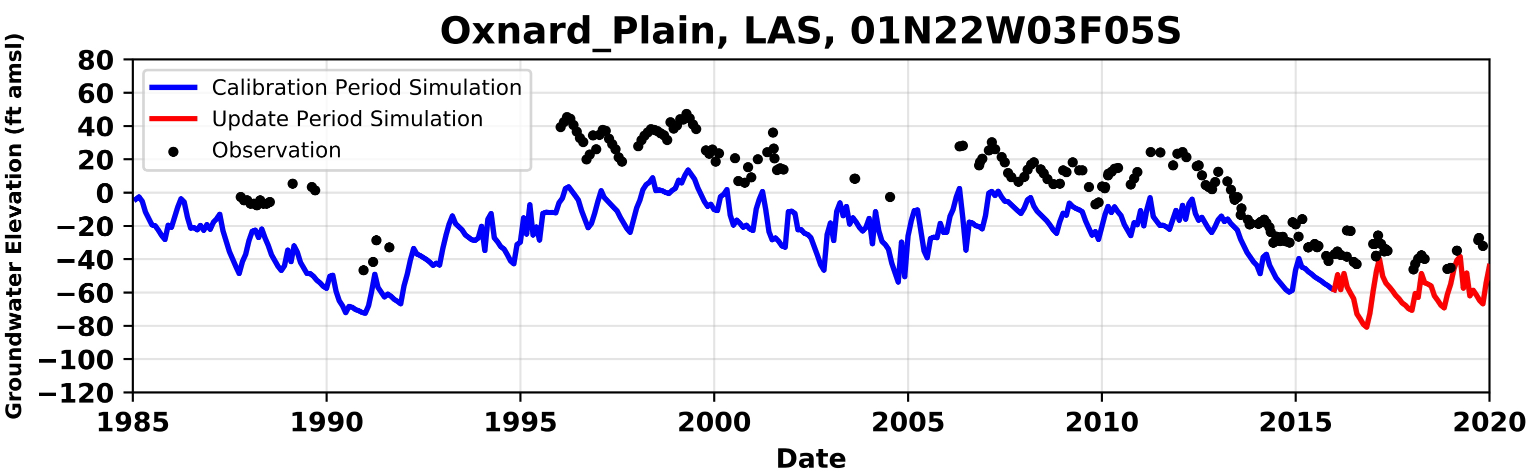




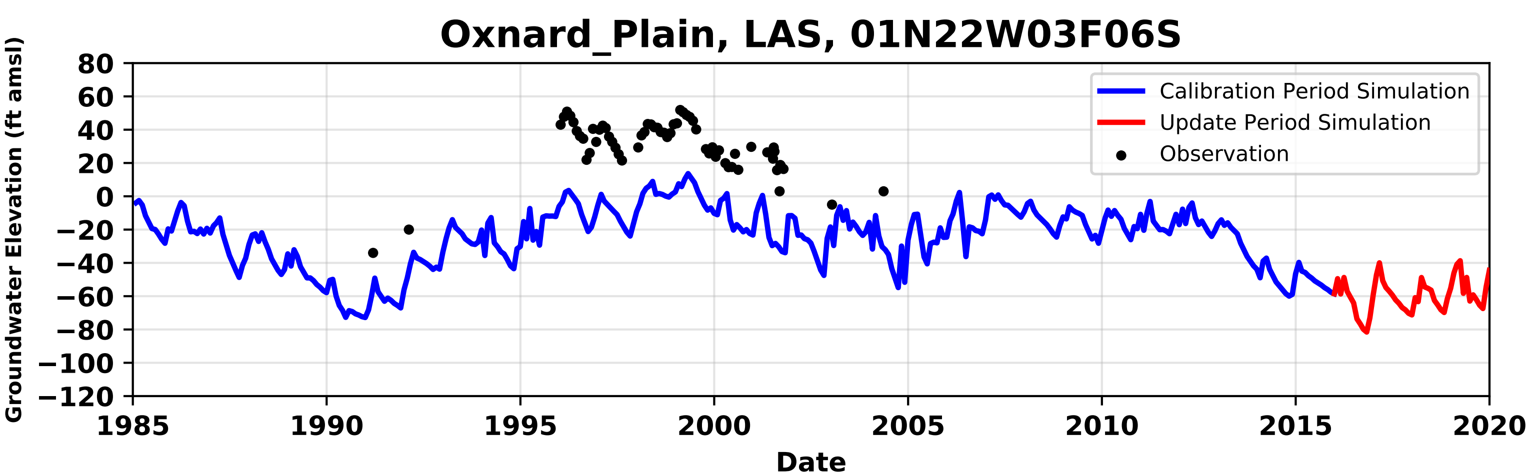
Oxnard_Plain, LAS, 01N21W32Q03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



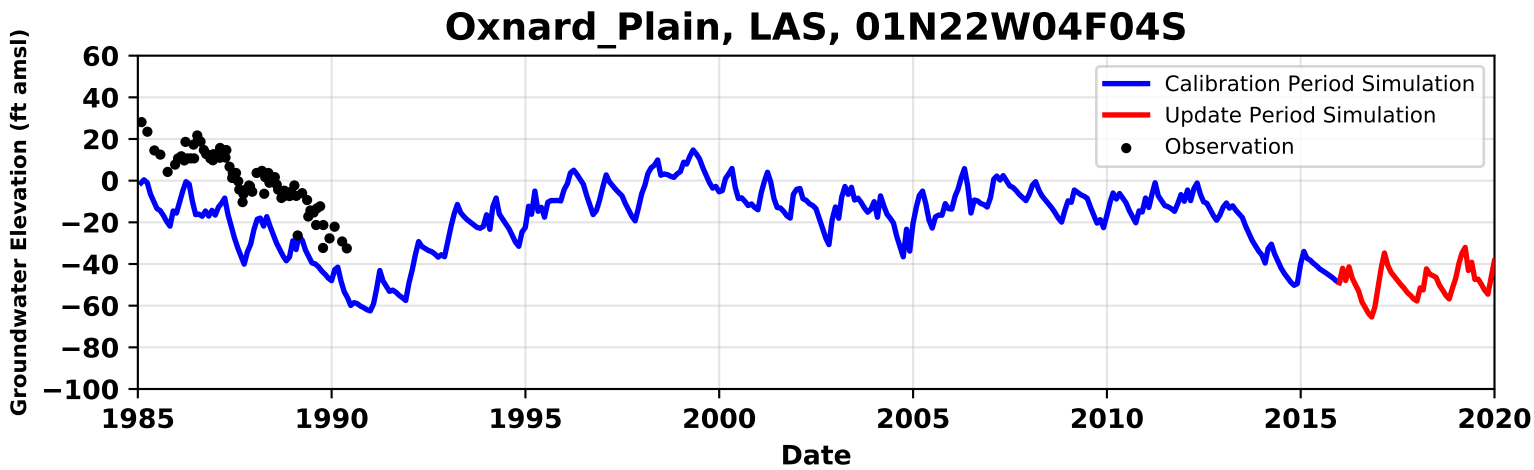
Oxnard_Plain, LAS, 01N21W32Q04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

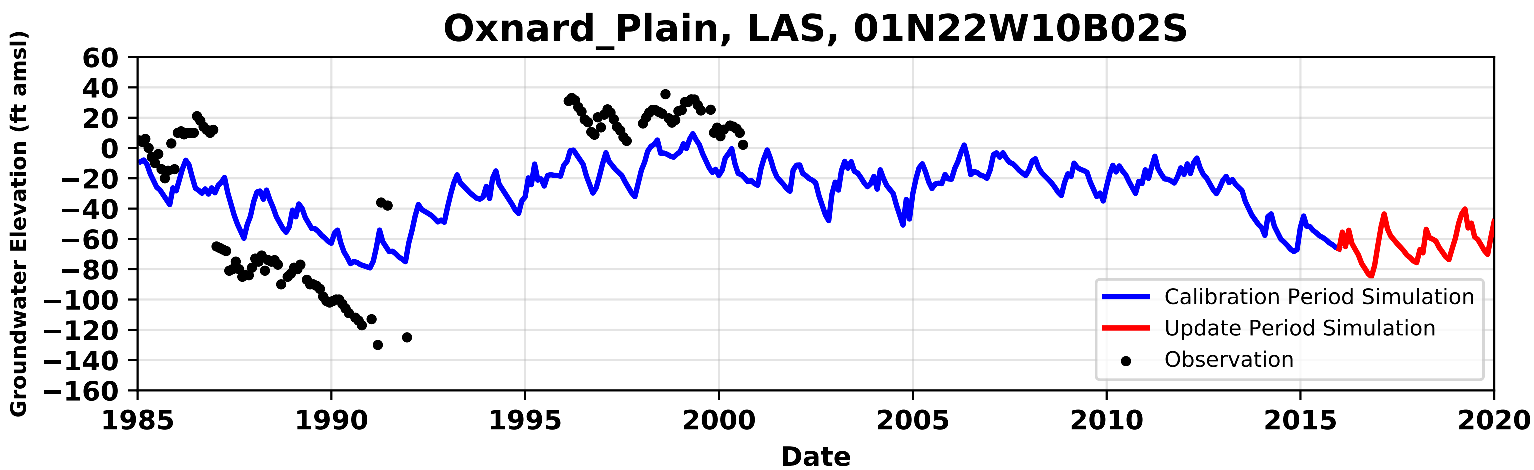


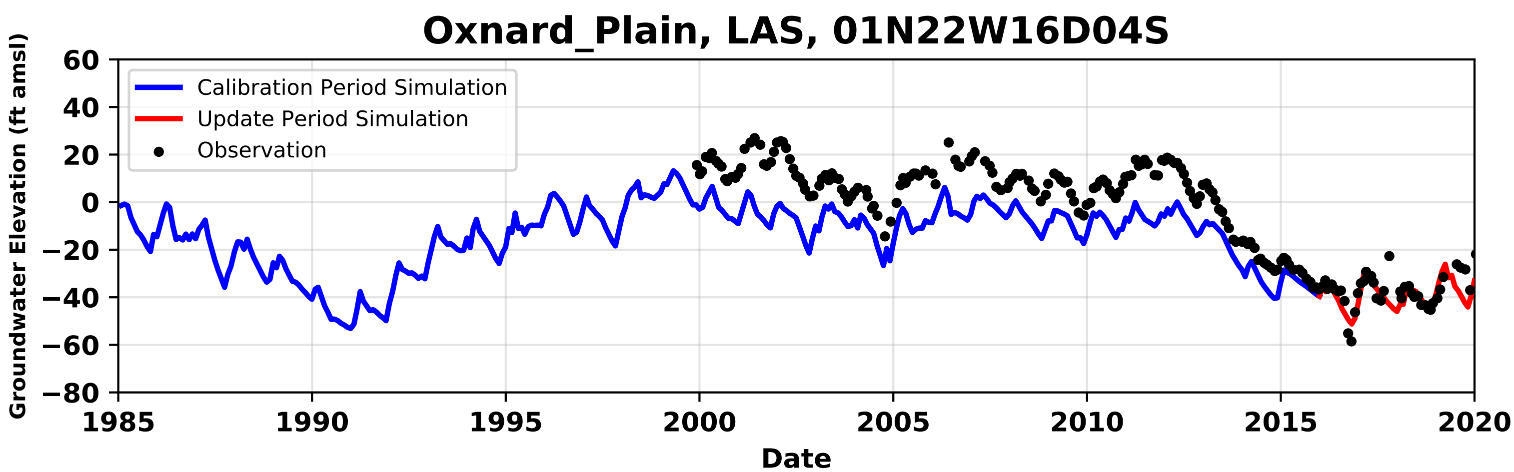
Oxnard_Plain, LAS, 01N22W03F05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

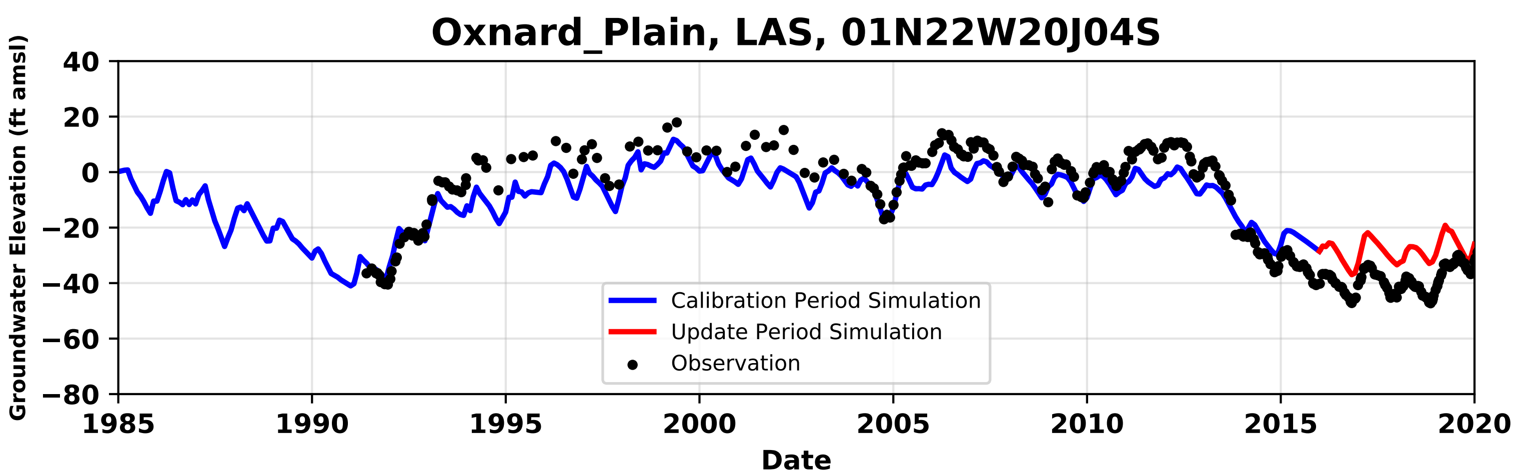


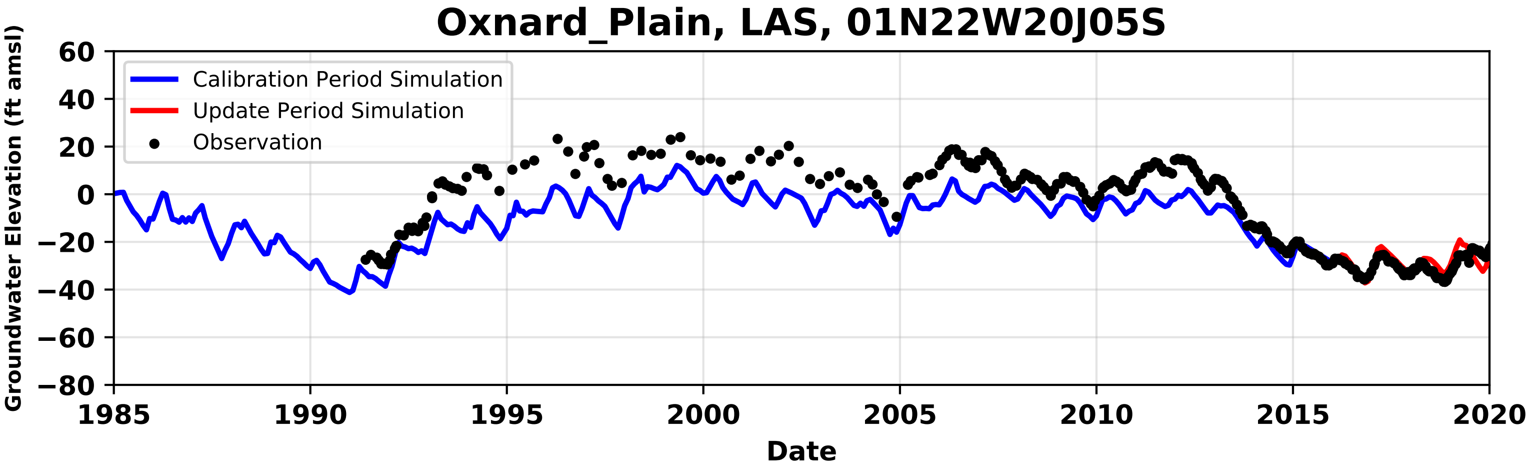
Oxnard_Plain, LAS, 01N22W03F06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

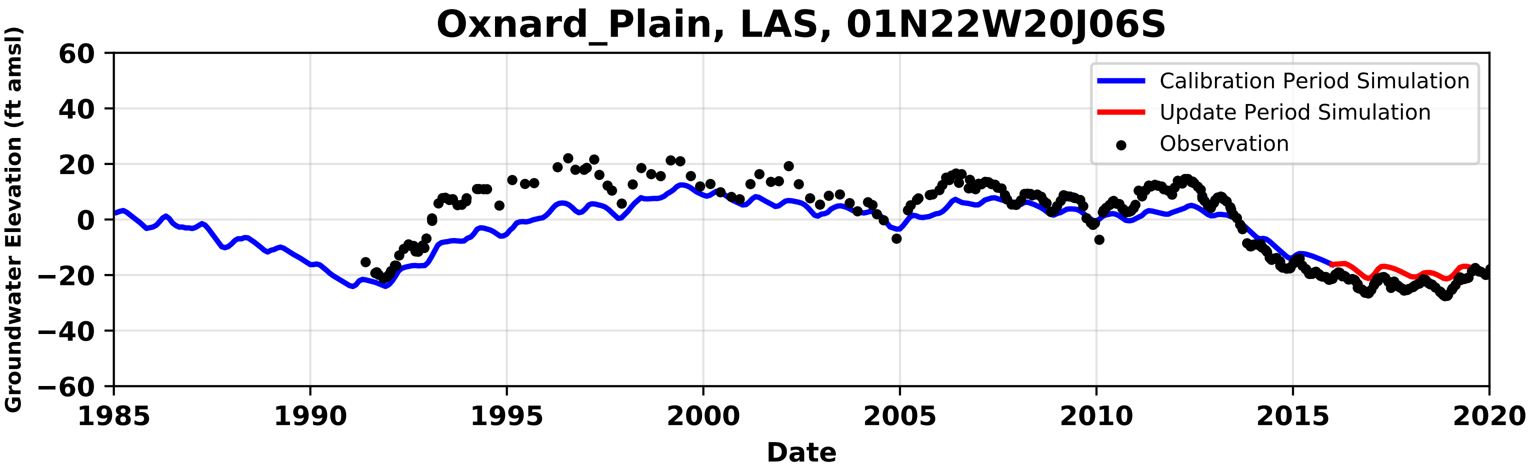

Oxnard_Plain, LAS, 01N22W04F04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

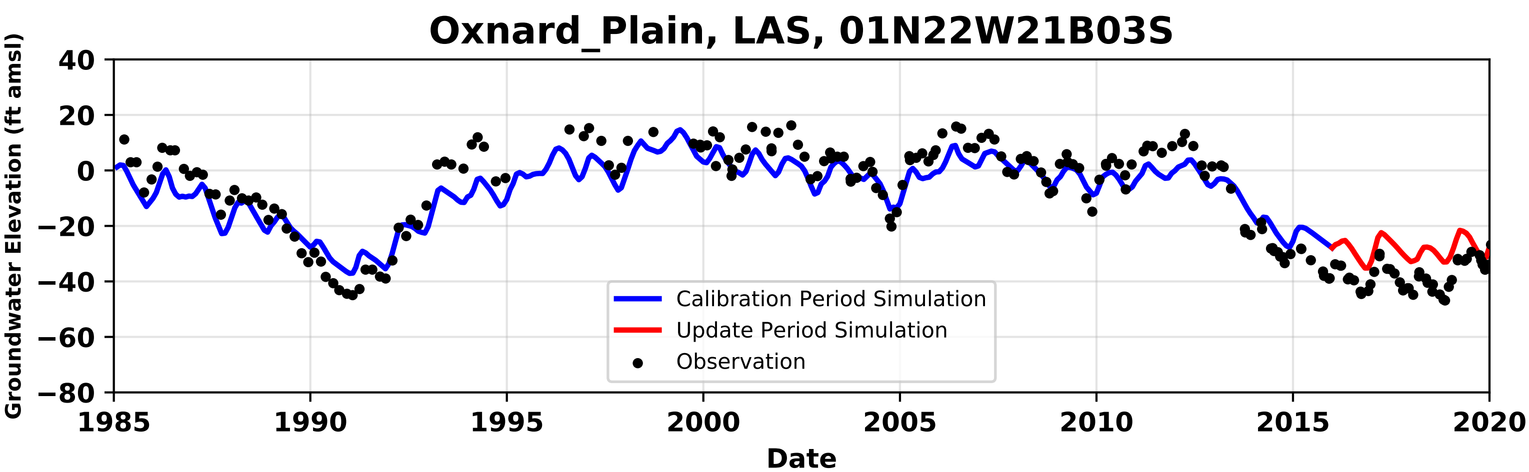

Oxnard_Plain, LAS, 01N22W10B02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

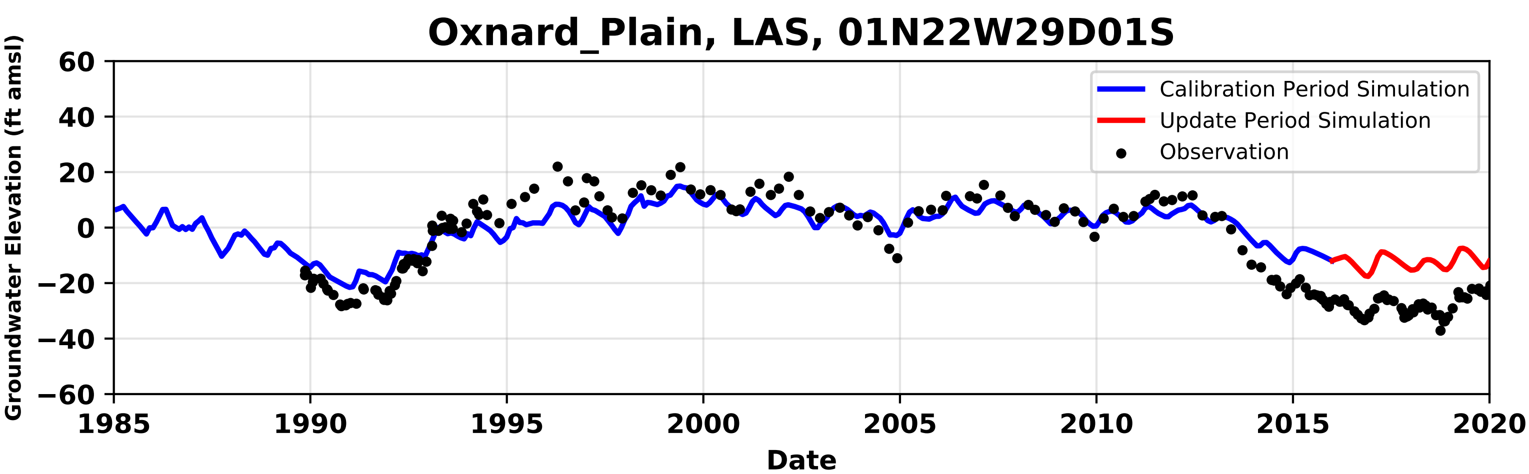

Oxnard_Plain, LAS, 01N22W16D04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

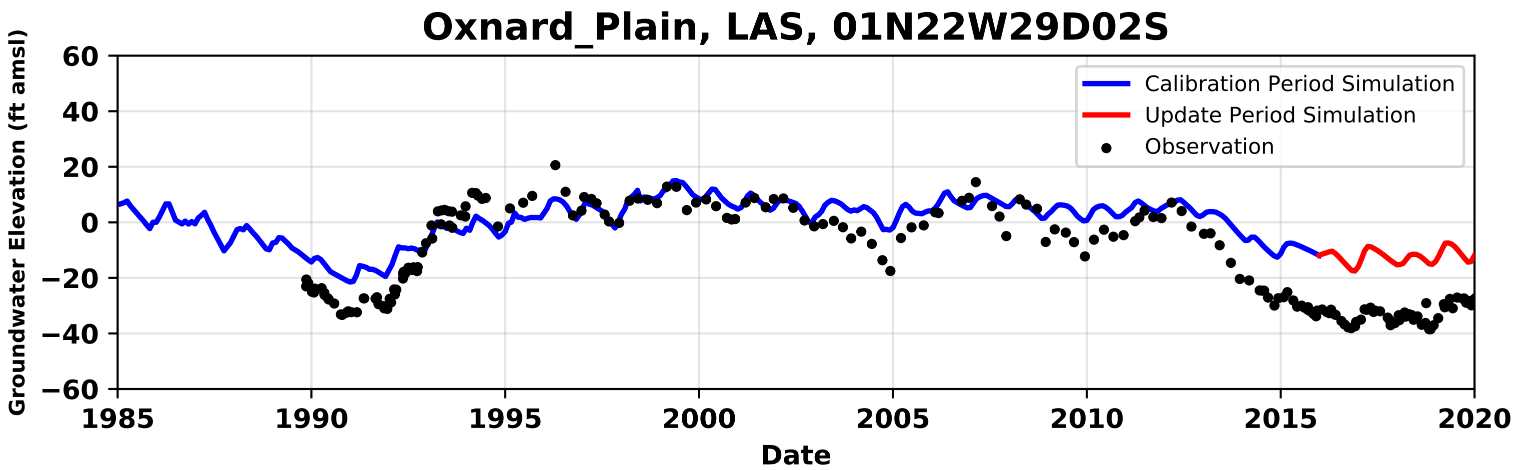

Oxnard_Plain, LAS, 01N22W20J04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

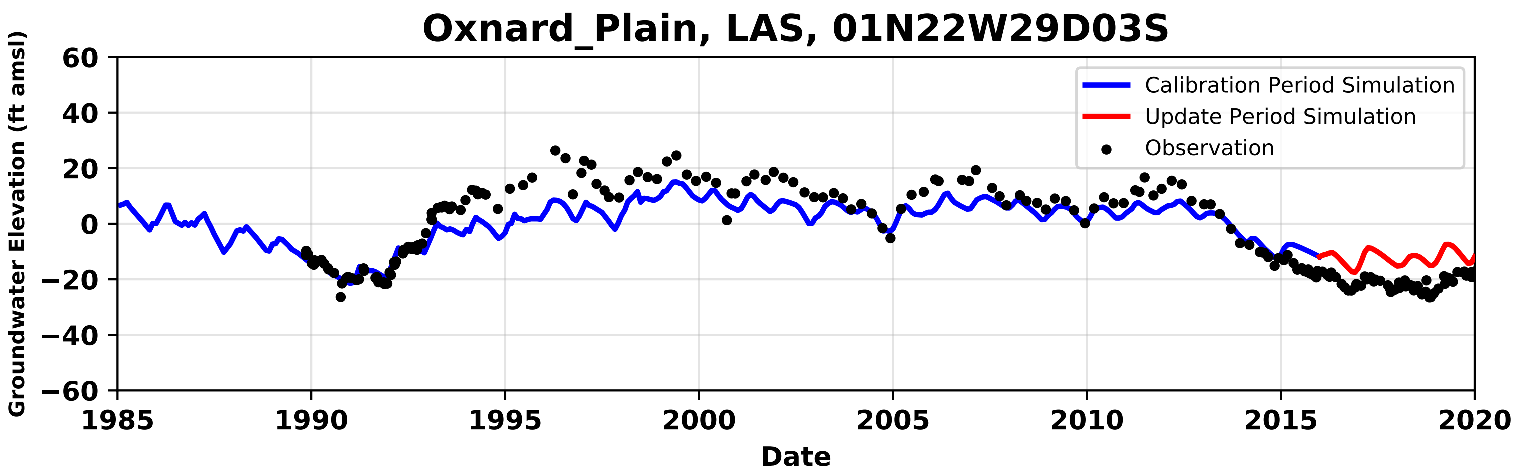

Oxnard_Plain, LAS, 01N22W20J05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020

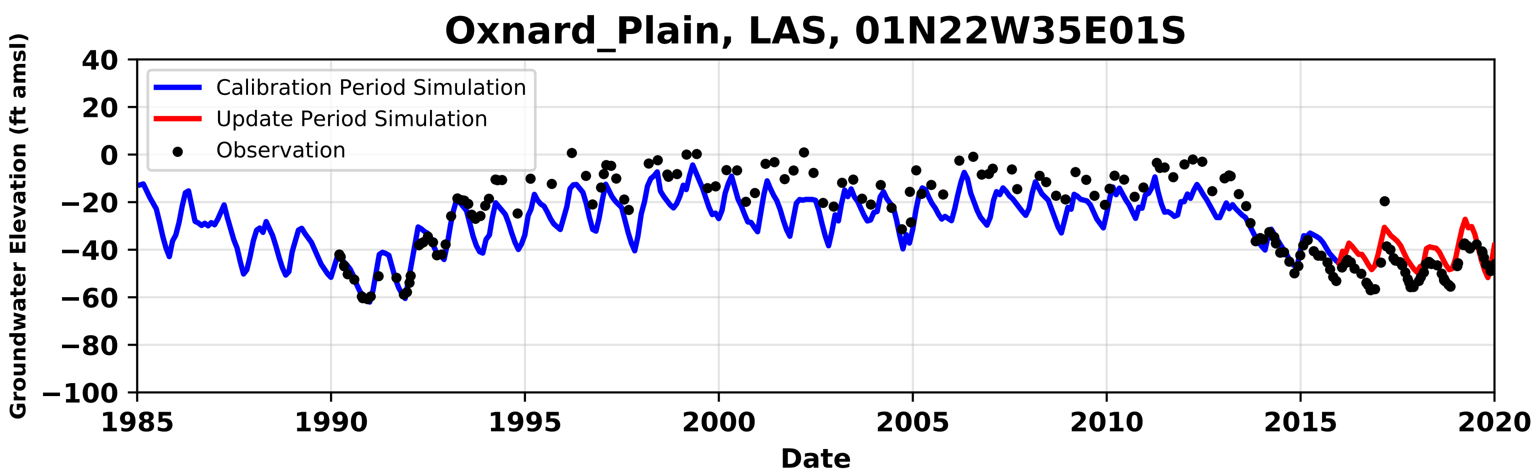

Oxnard_Plain, LAS, 01N22W20J06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

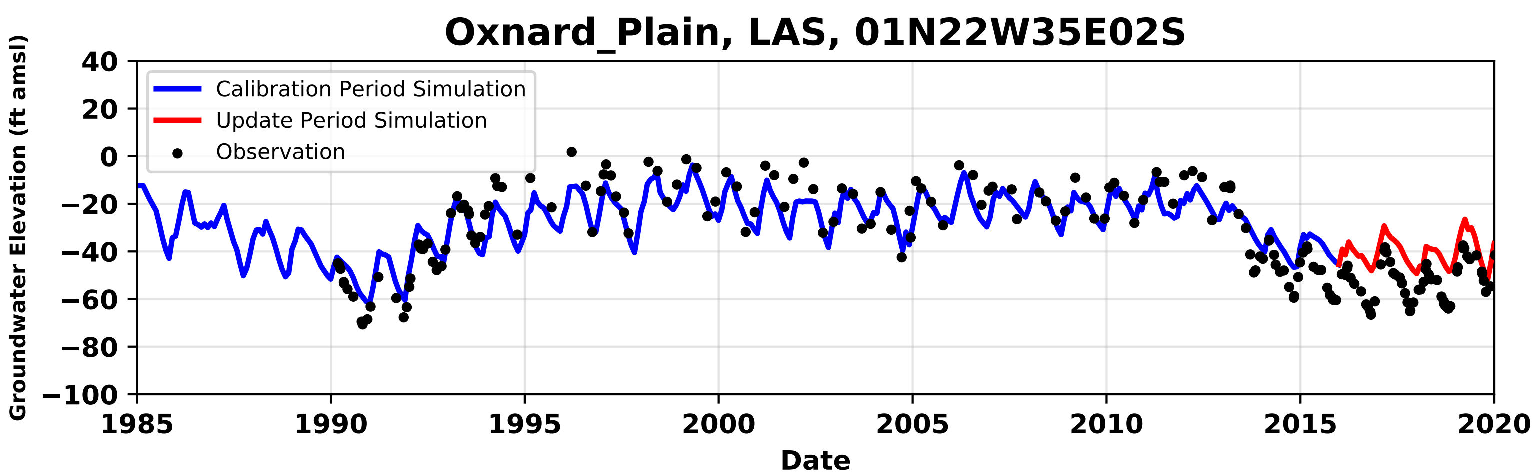

Oxnard_Plain, LAS, 01N22W21B03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020

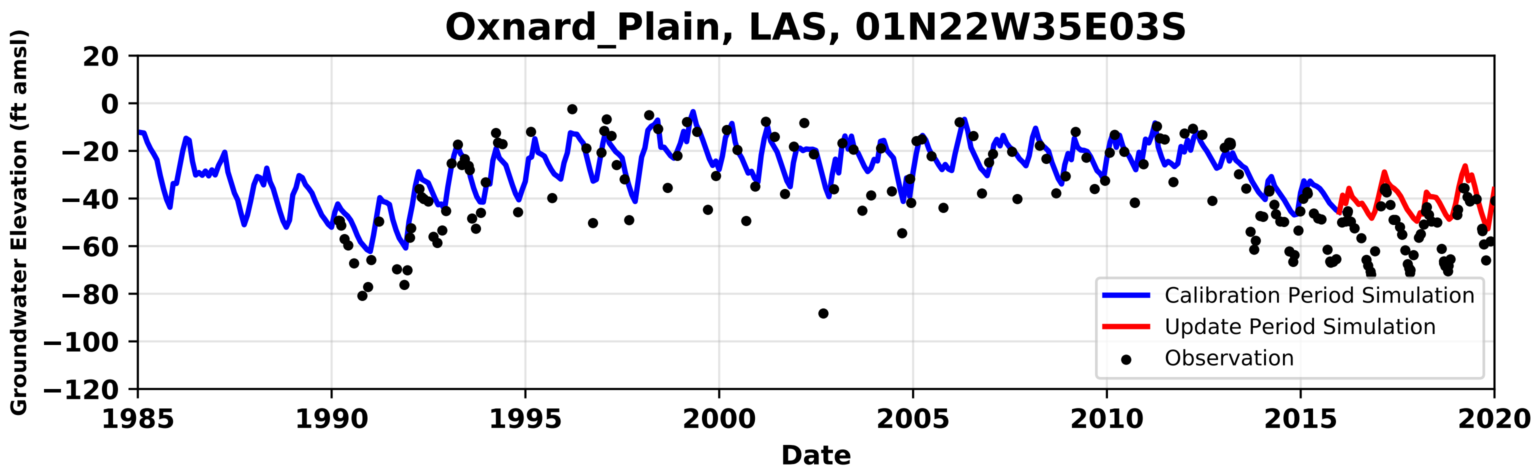

Oxnard_Plain, LAS, 01N22W29D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

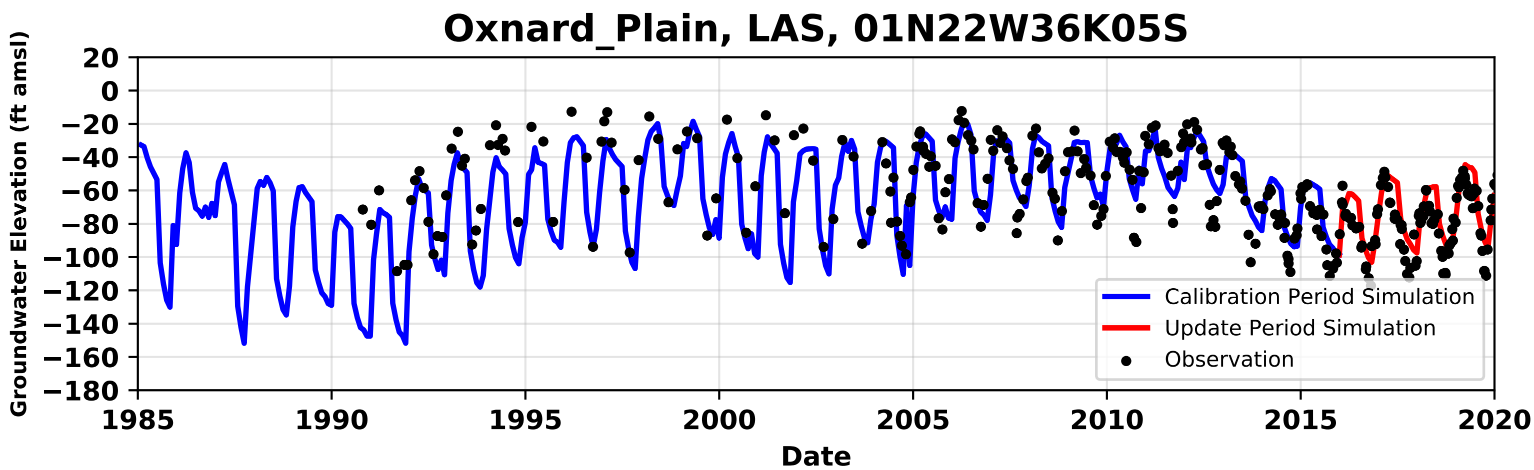

Oxnard_Plain, LAS, 01N22W29D02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

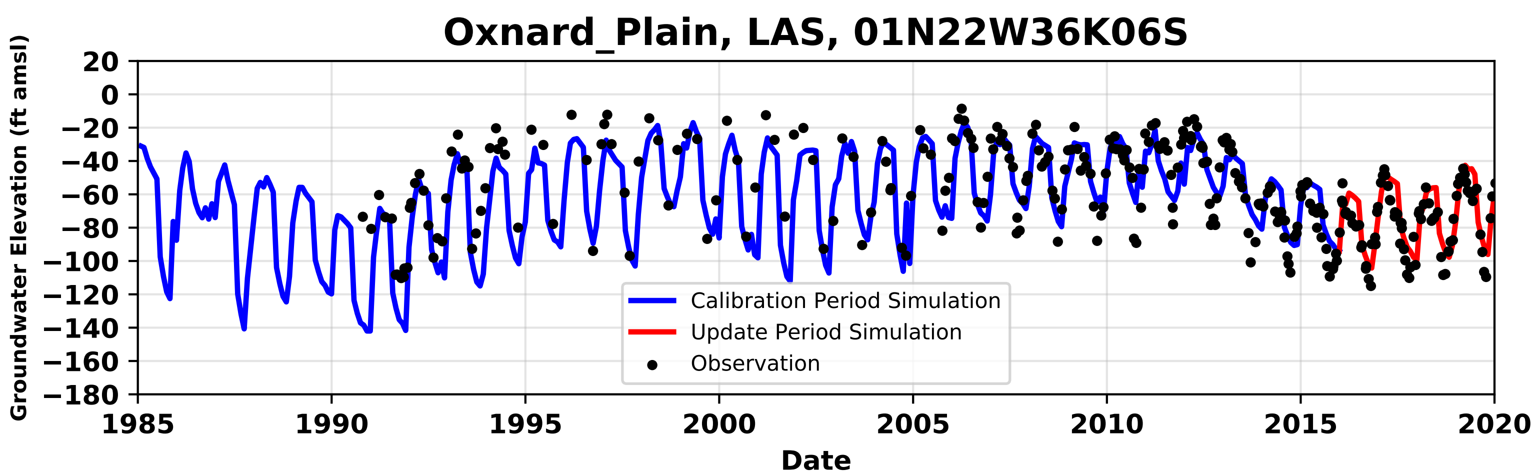

Oxnard_Plain, LAS, 01N22W29D03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

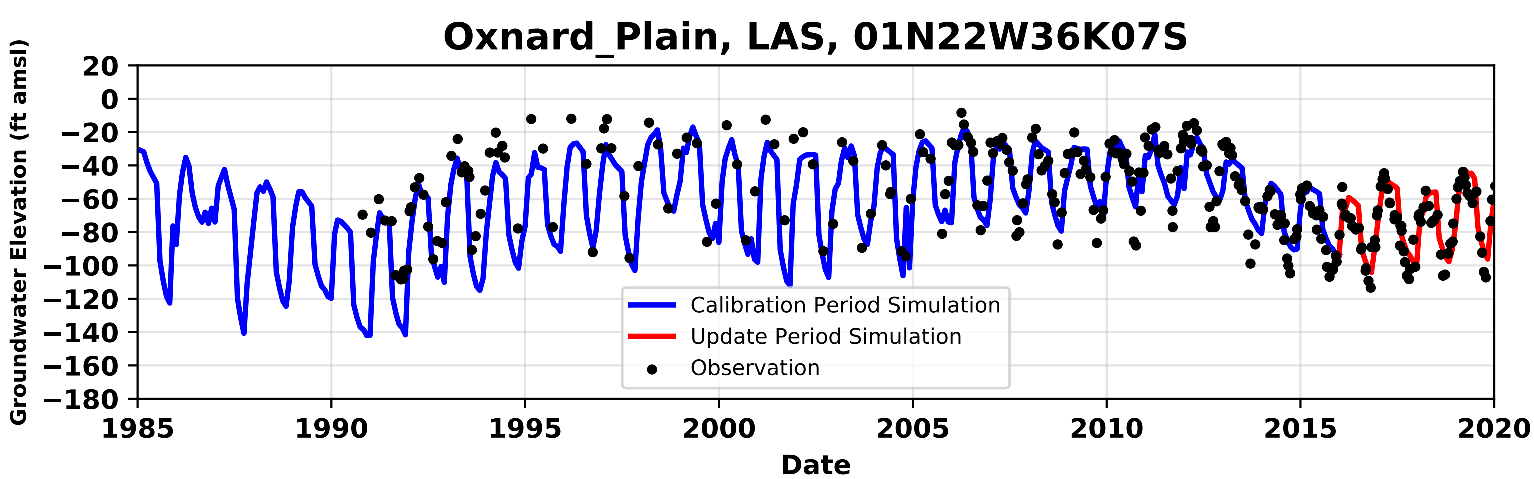

Oxnard_Plain, LAS, 01N22W35E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
40
20
0
−20
−40
−60
−80
−100
1985
1990
1995
2000
2005
2010
2015
2020

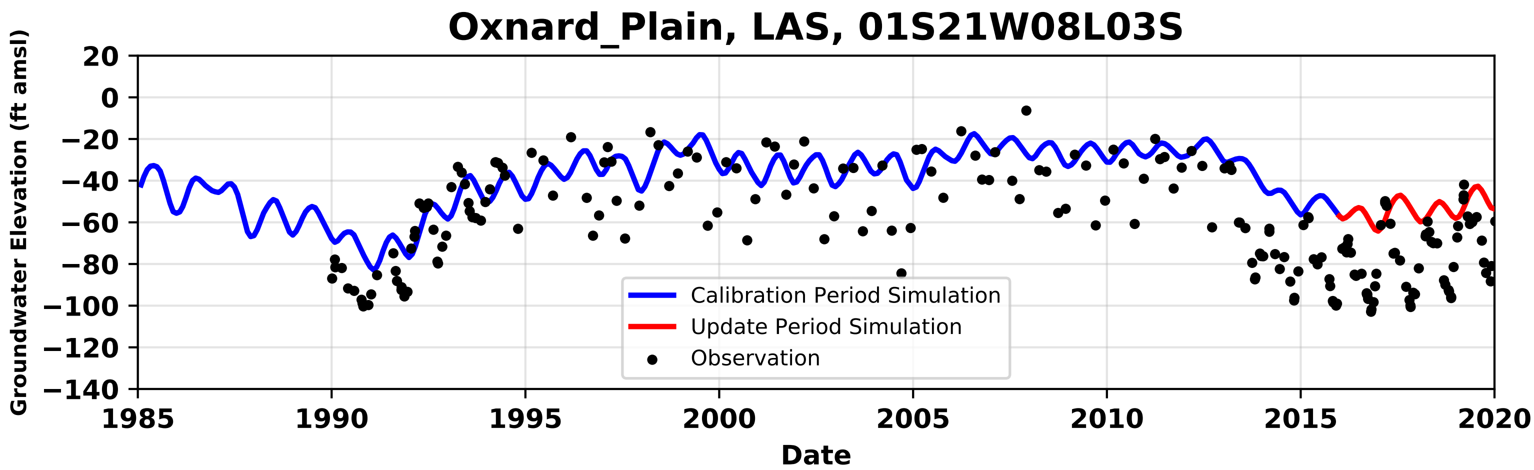

Oxnard_Plain, LAS, 01N22W35E02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
40
20
0
−20
−40
−60
−80
−100
1985
1990
1995
2000
2005
2010
2015
2020

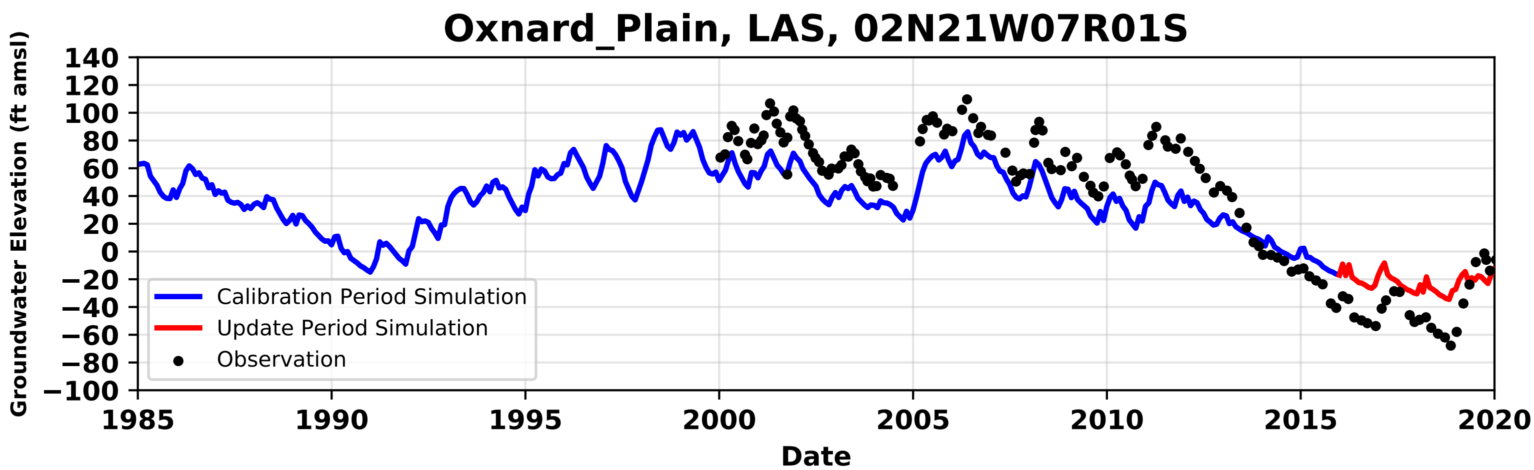

Oxnard_Plain, LAS, 01N22W35E03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

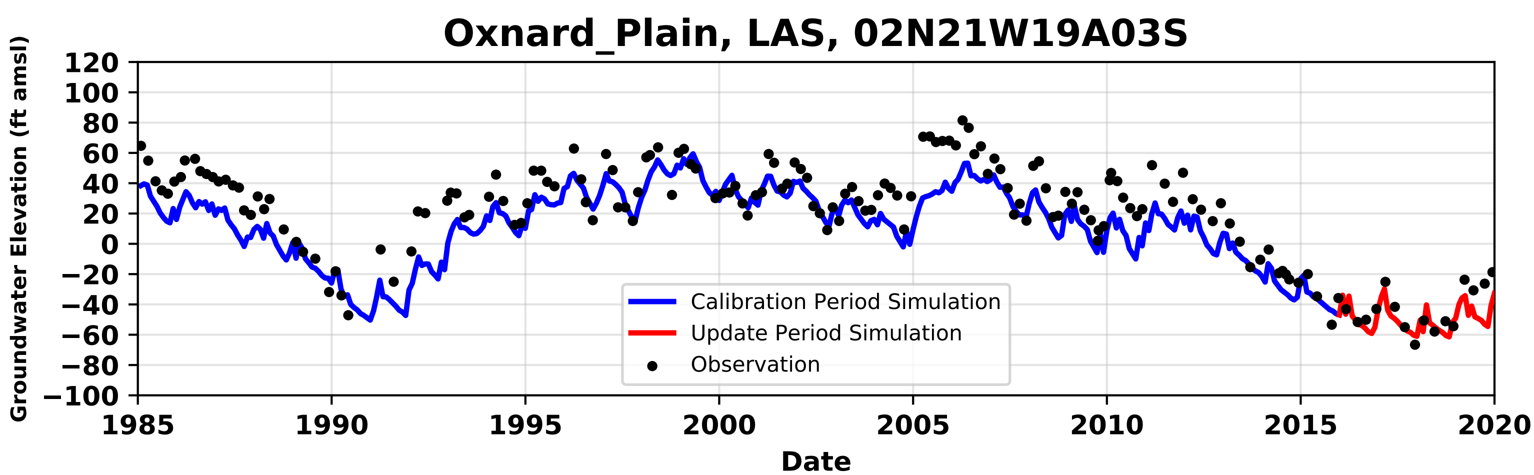

Oxnard_Plain, LAS, 01N22W36K05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

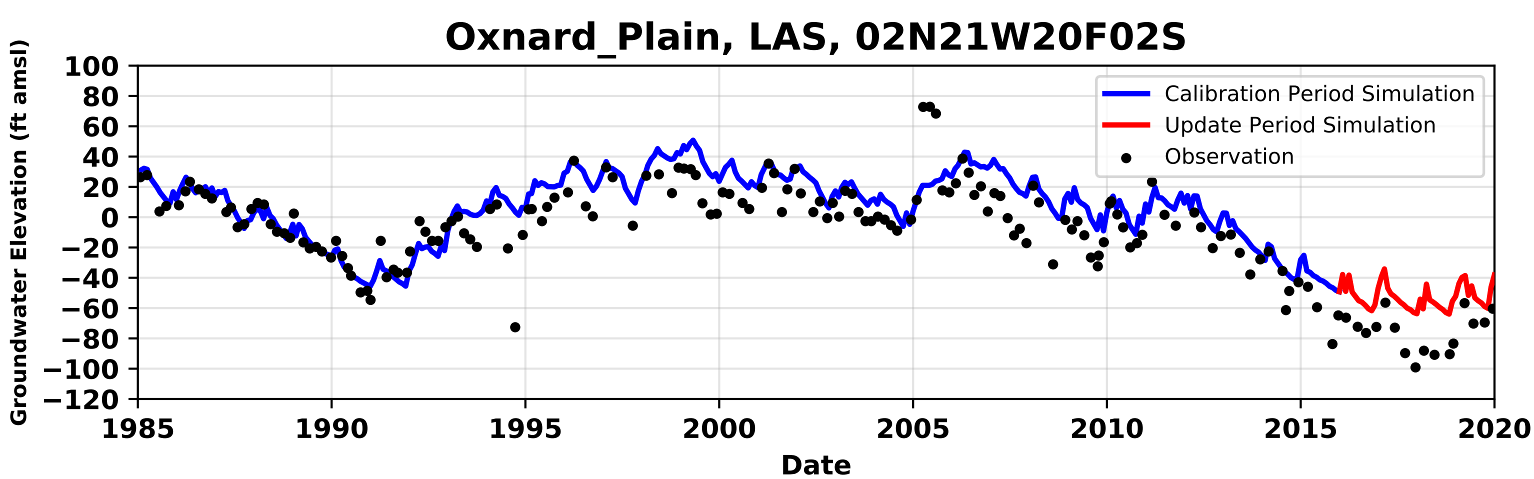

Oxnard_Plain, LAS, 01N22W36K06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

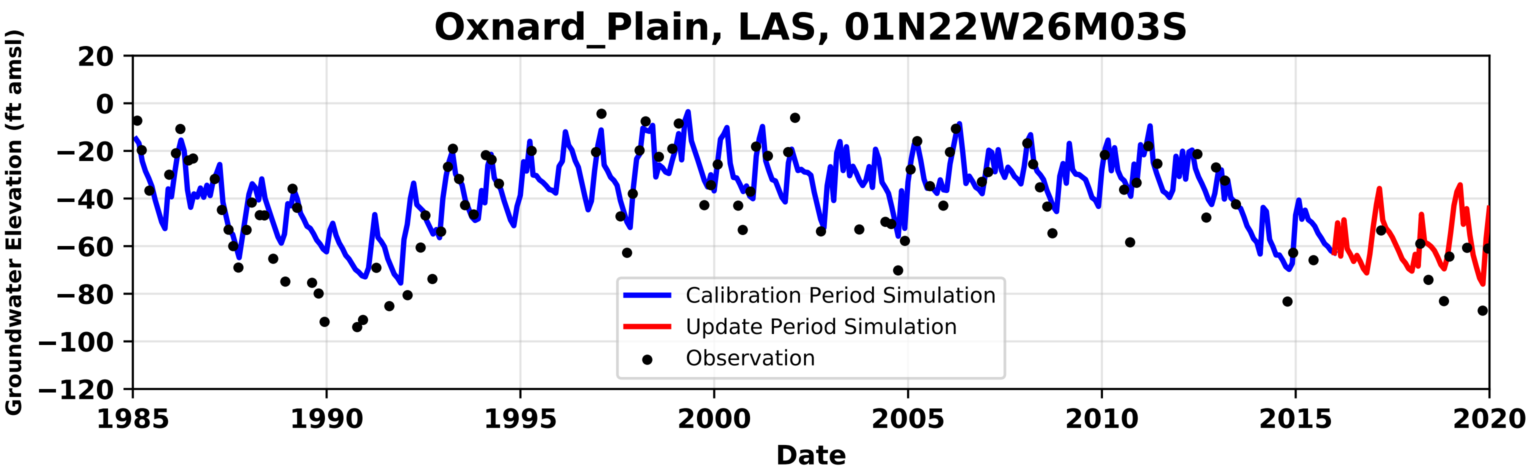

Oxnard_Plain, LAS, 01N22W36K07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, LAS, 01S21W08L03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

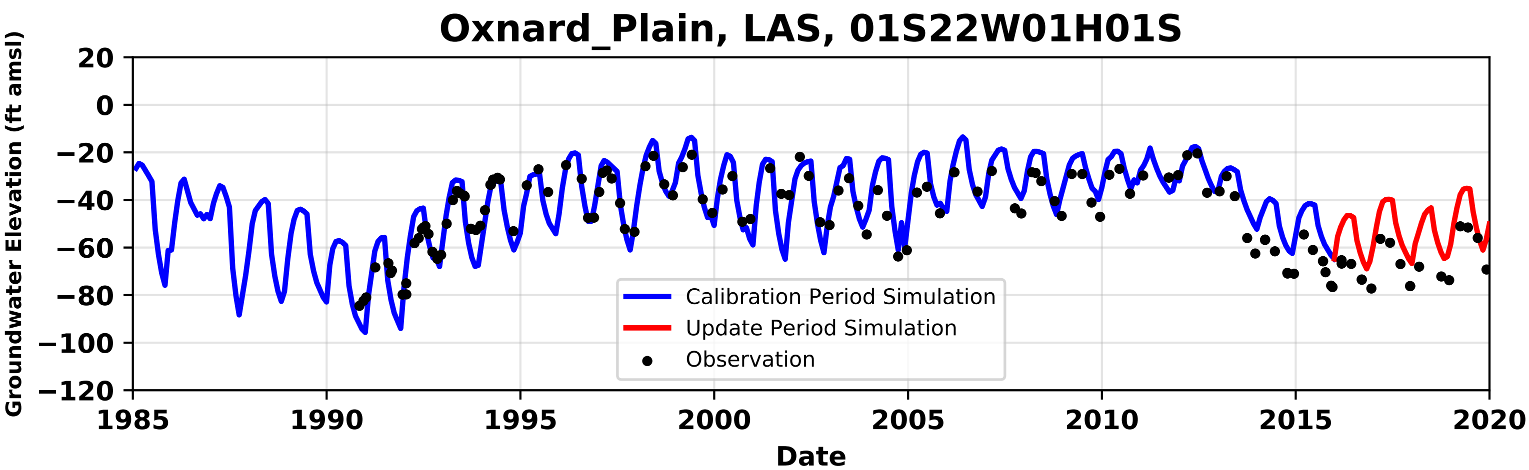

Oxnard_Plain, LAS, 02N21W07R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, LAS, 02N21W19A03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

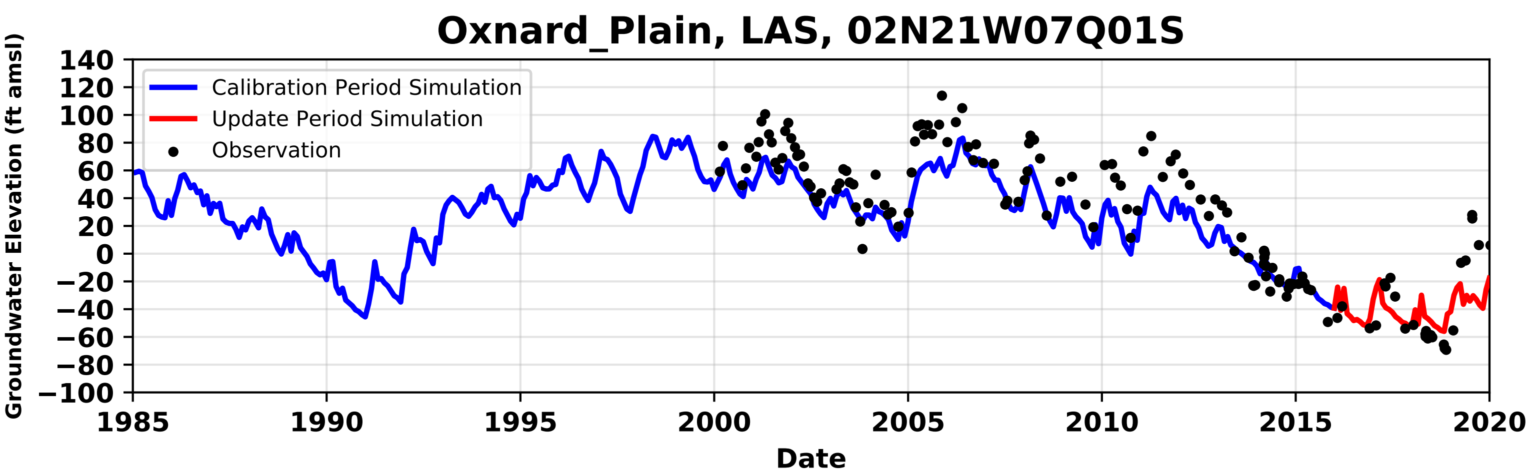

Oxnard_Plain, LAS, 02N21W20F02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



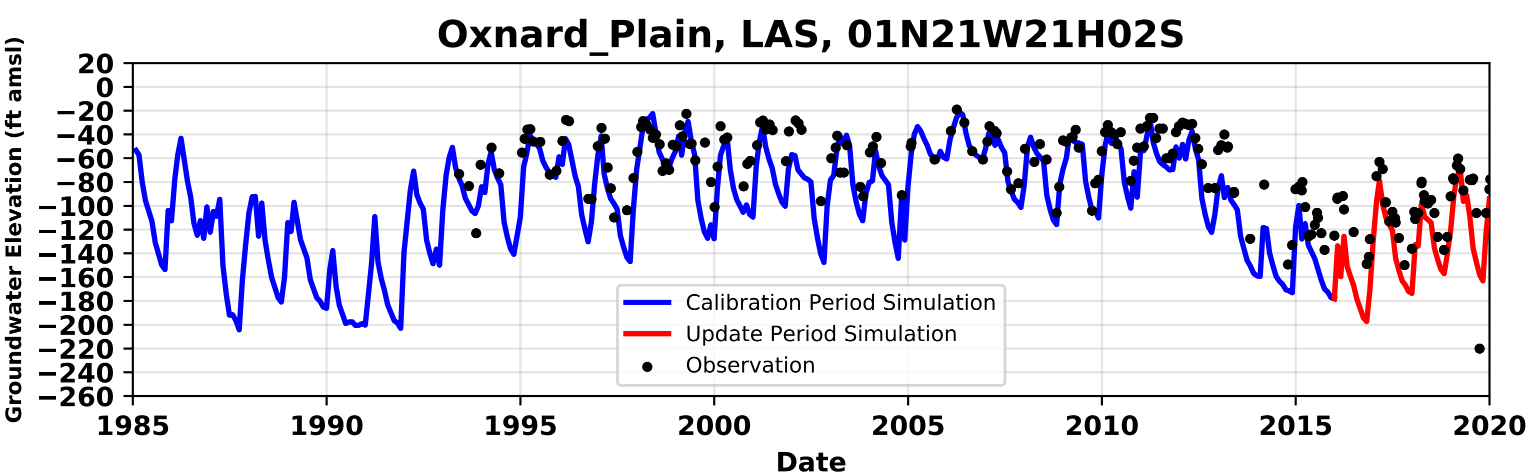
Oxnard_Plain, LAS, 01N22W26M03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation



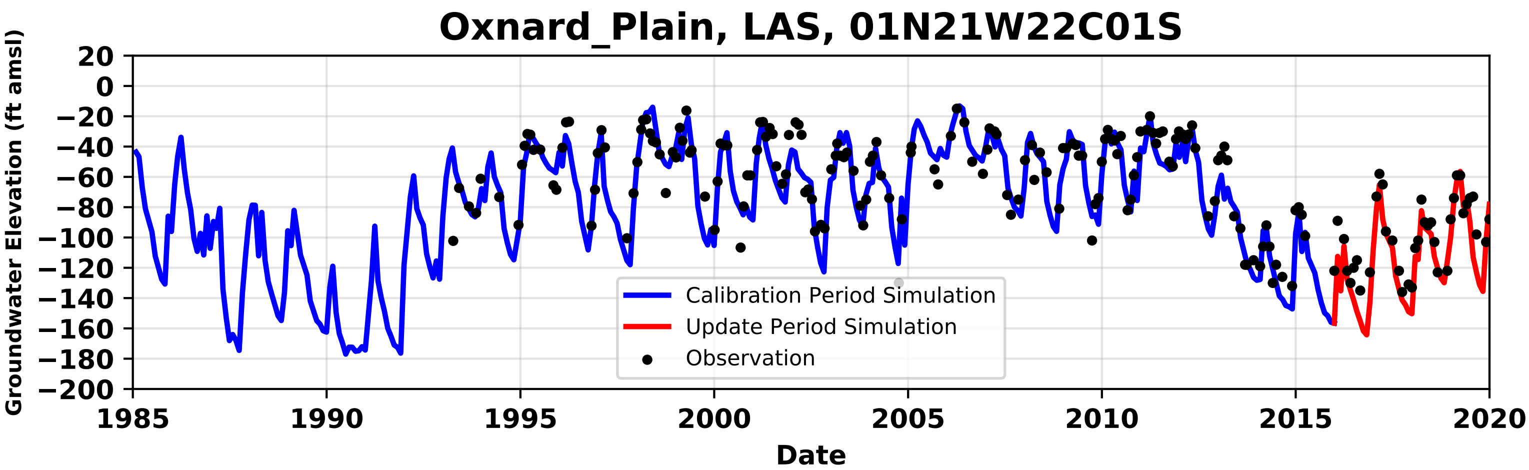
Oxnard_Plain, LAS, 01S22W01H01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

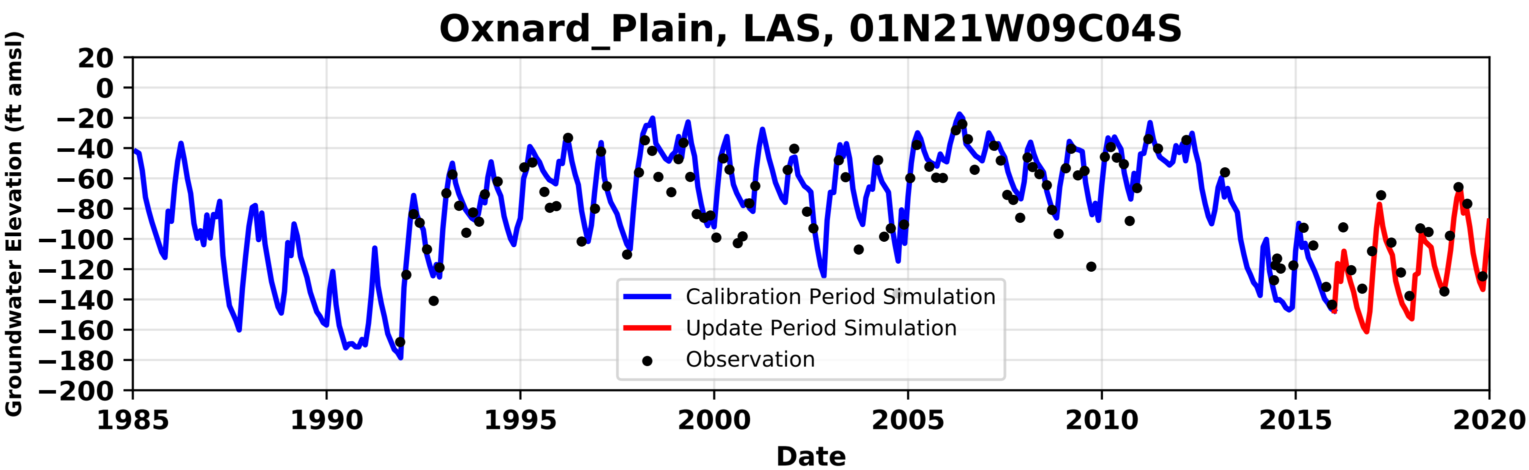


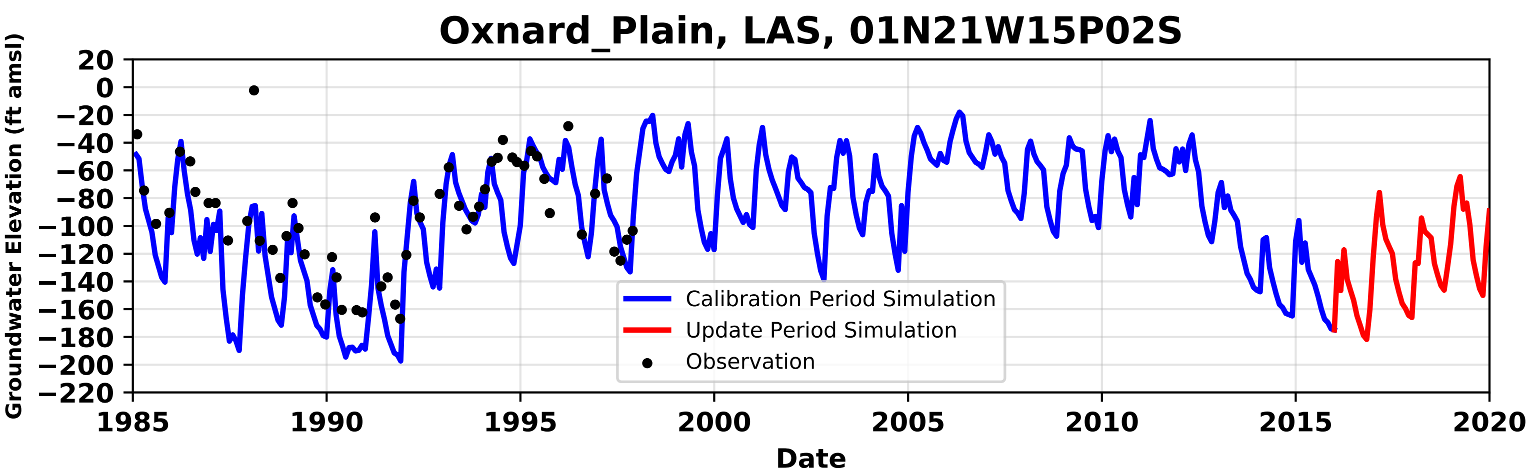
Oxnard_Plain, LAS, 02N21W07Q01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

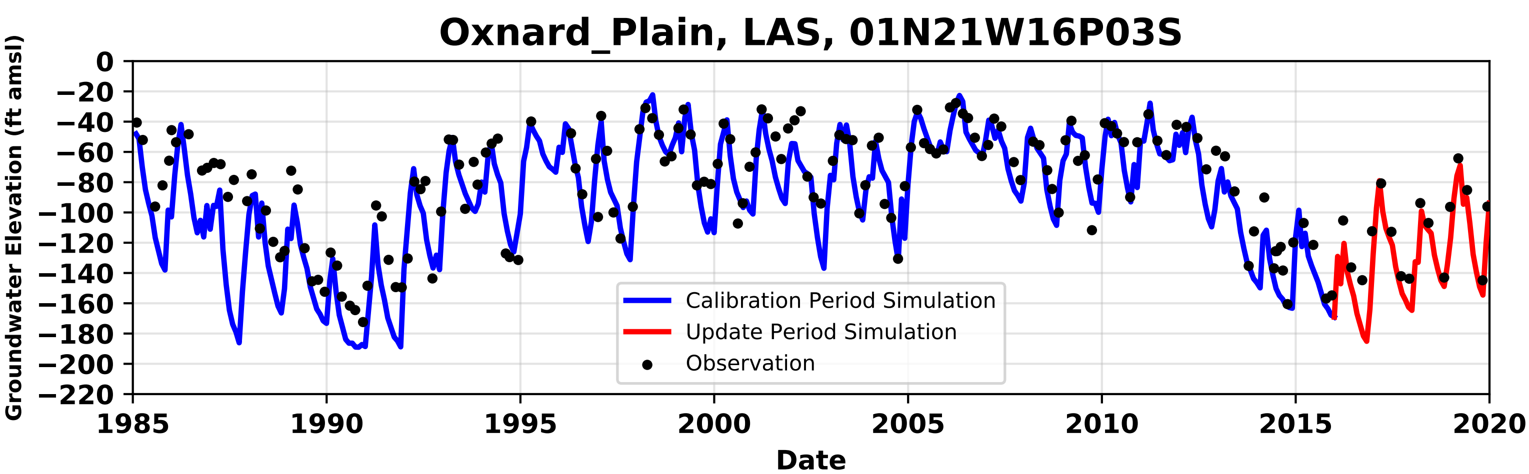


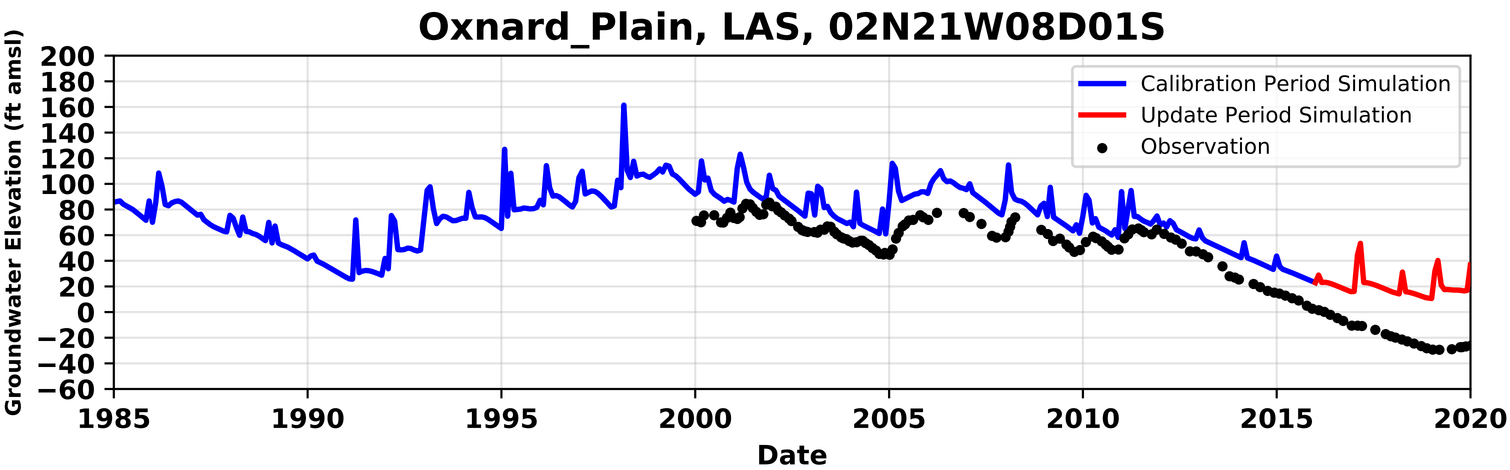
Oxnard_Plain, LAS, 01N21W21H02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

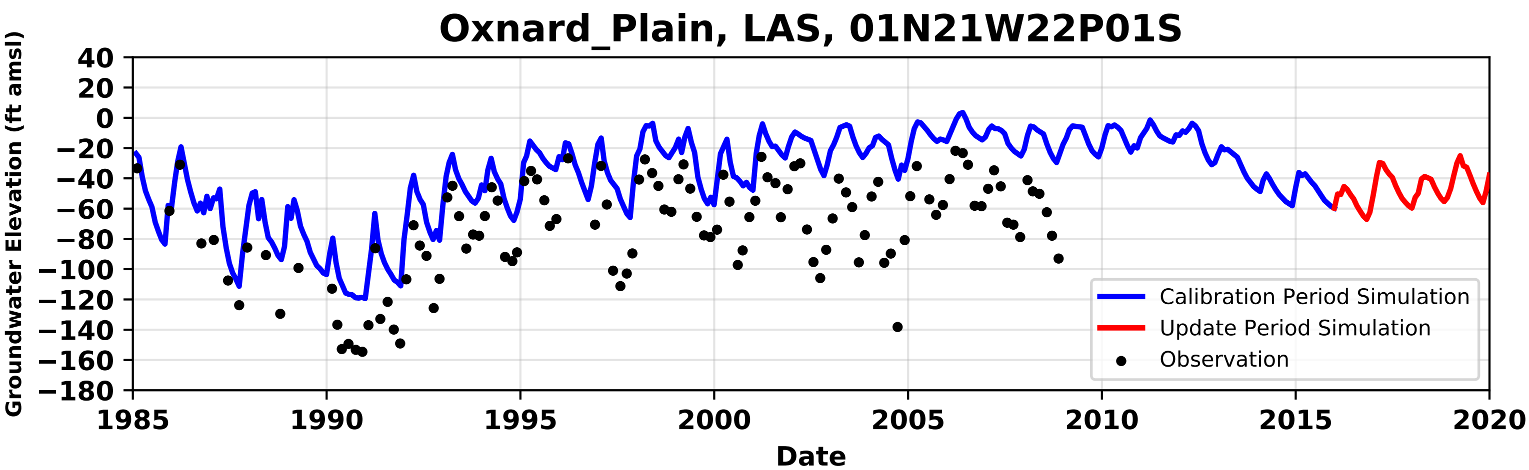

Oxnard_Plain, LAS, 01N21W22C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

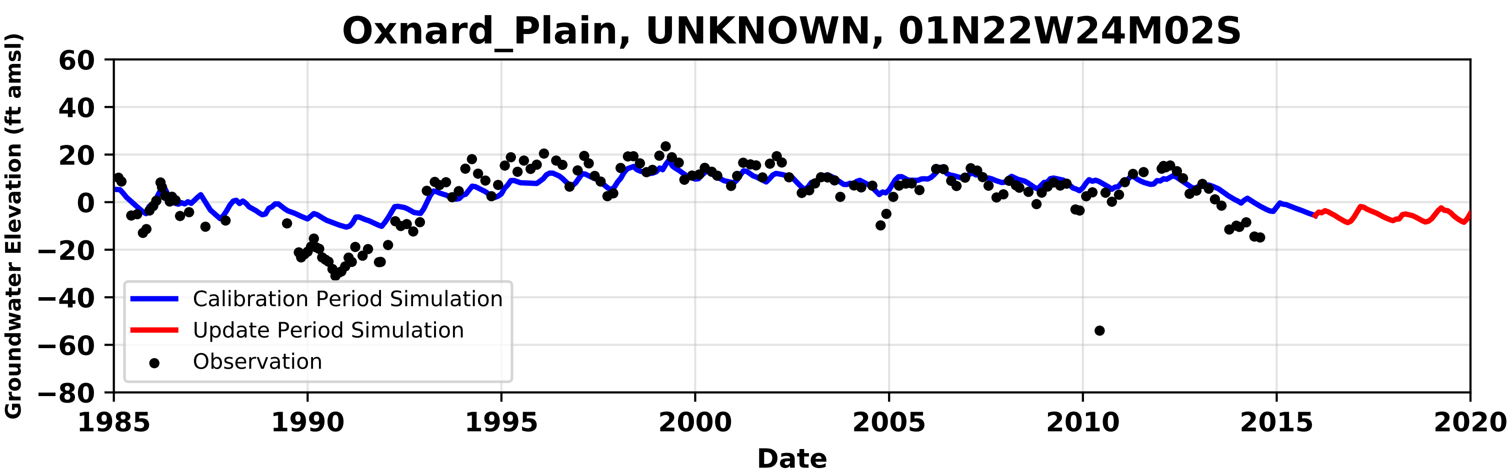

Oxnard_Plain, LAS, 01N21W09C04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

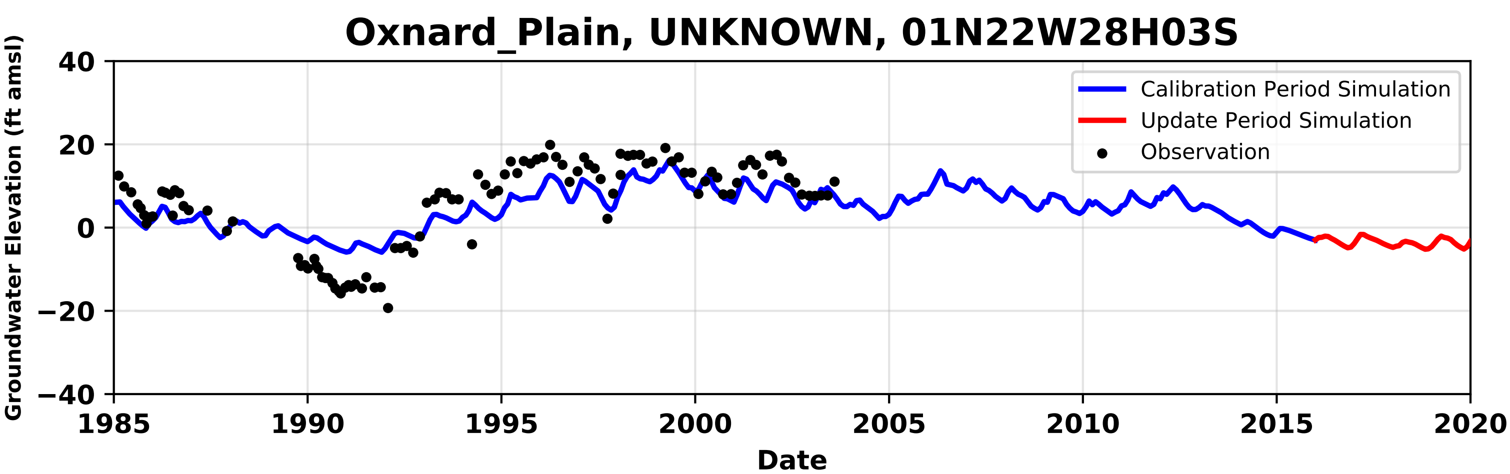

Oxnard_Plain, LAS, 01N21W15P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

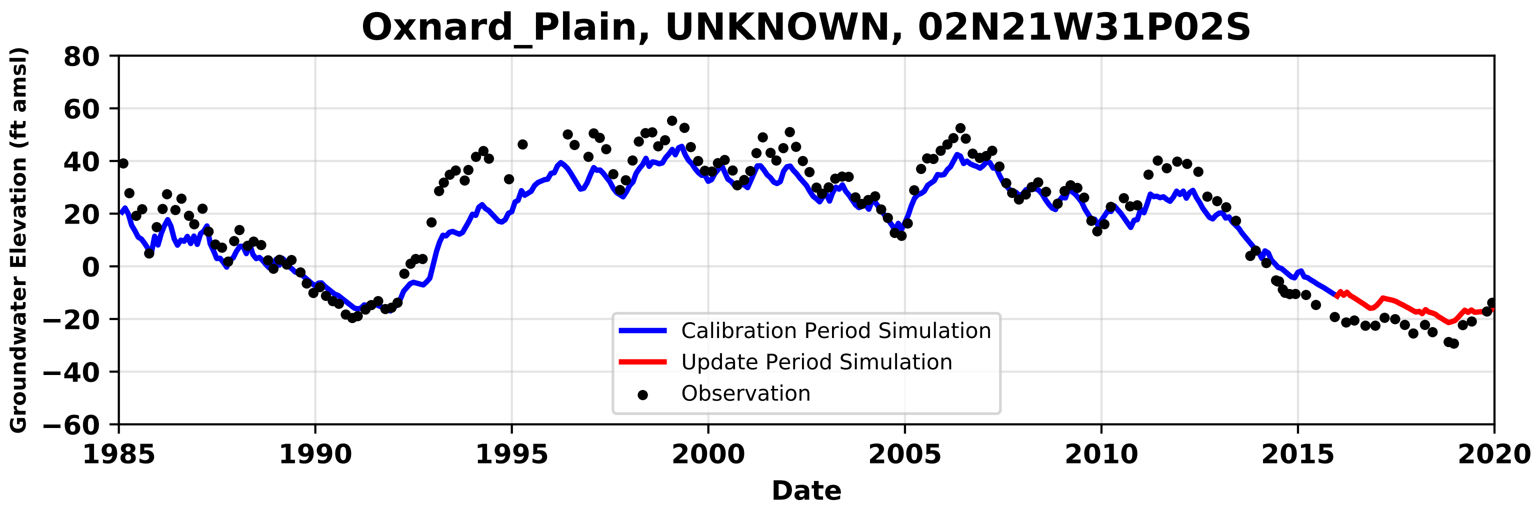

Oxnard_Plain, LAS, 01N21W16P03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, LAS, 02N21W08D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

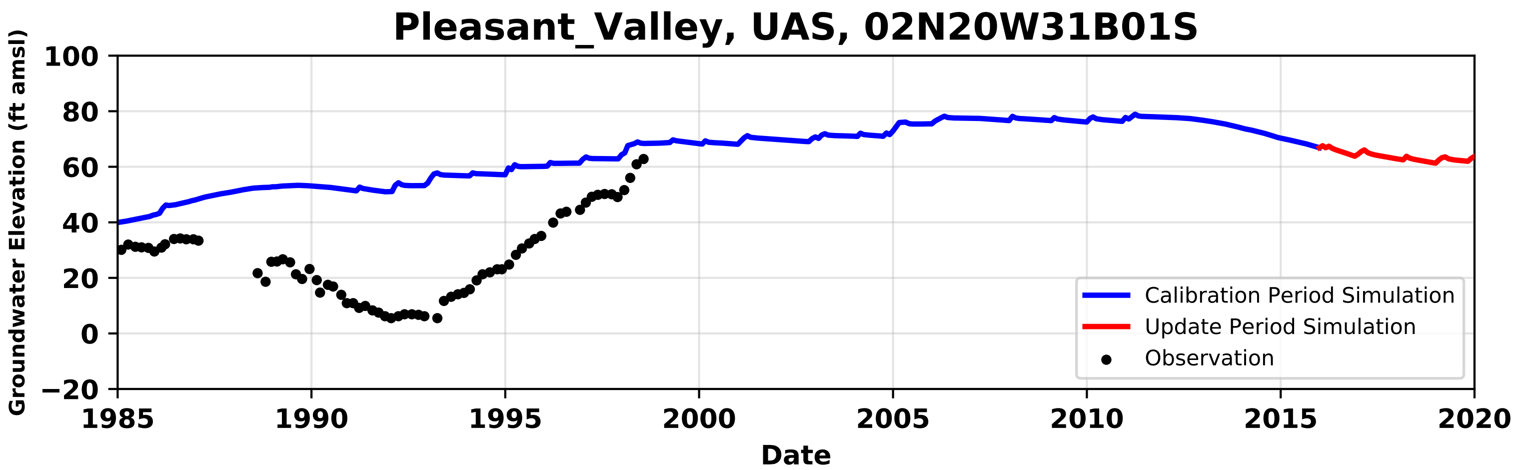

Oxnard_Plain, LAS, 01N21W22P01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

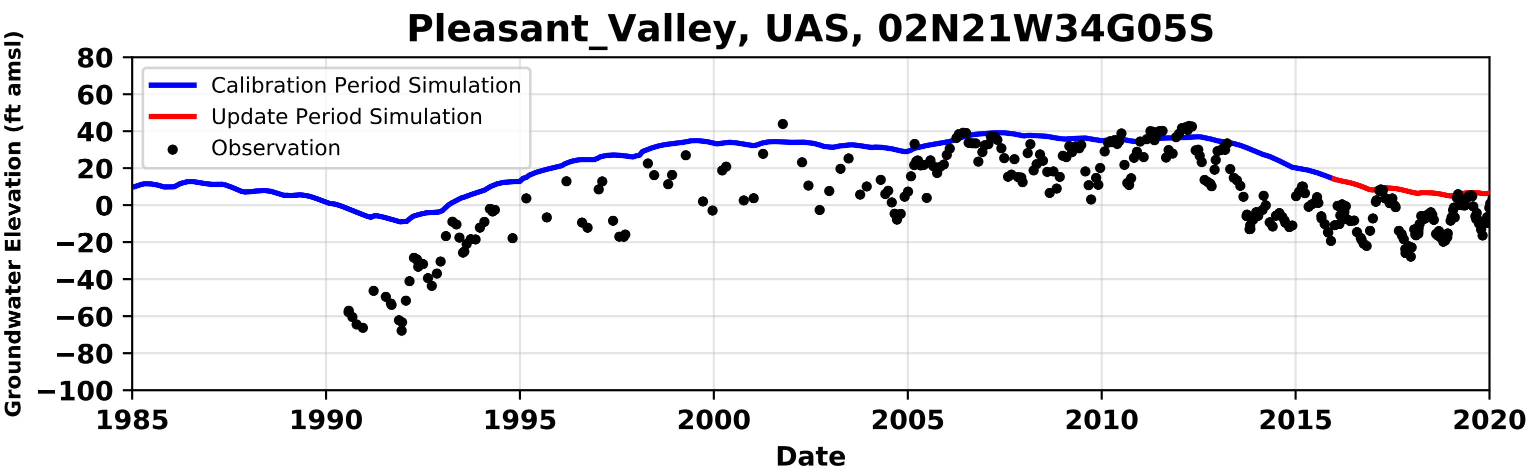

Oxnard_Plain, UNKNOWN, 01N22W24M02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

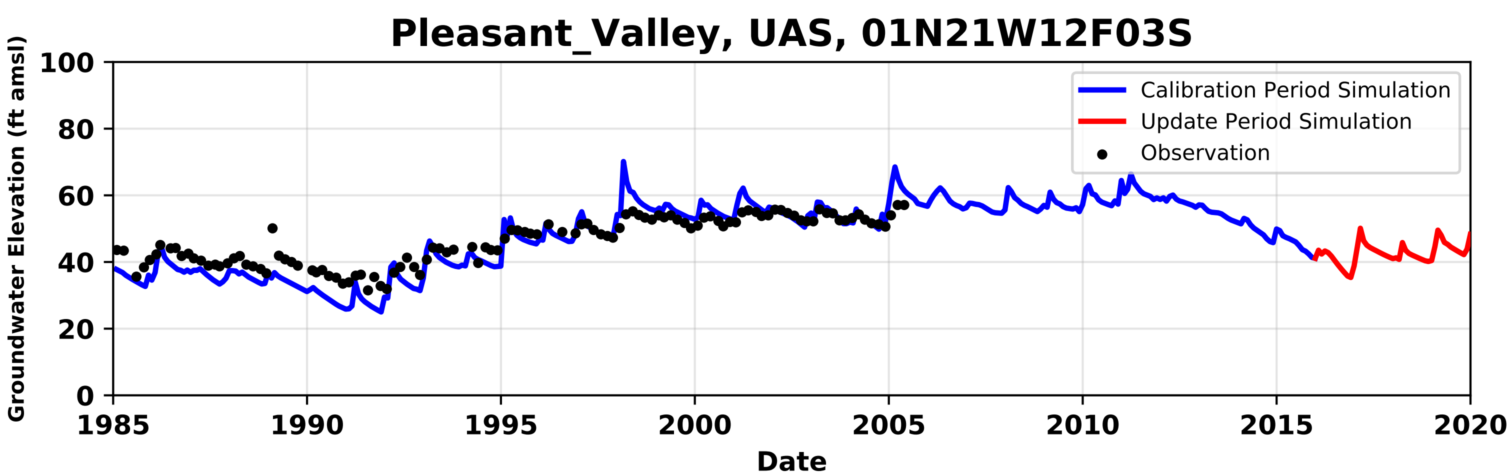

Oxnard_Plain, UNKNOWN, 01N22W28H03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

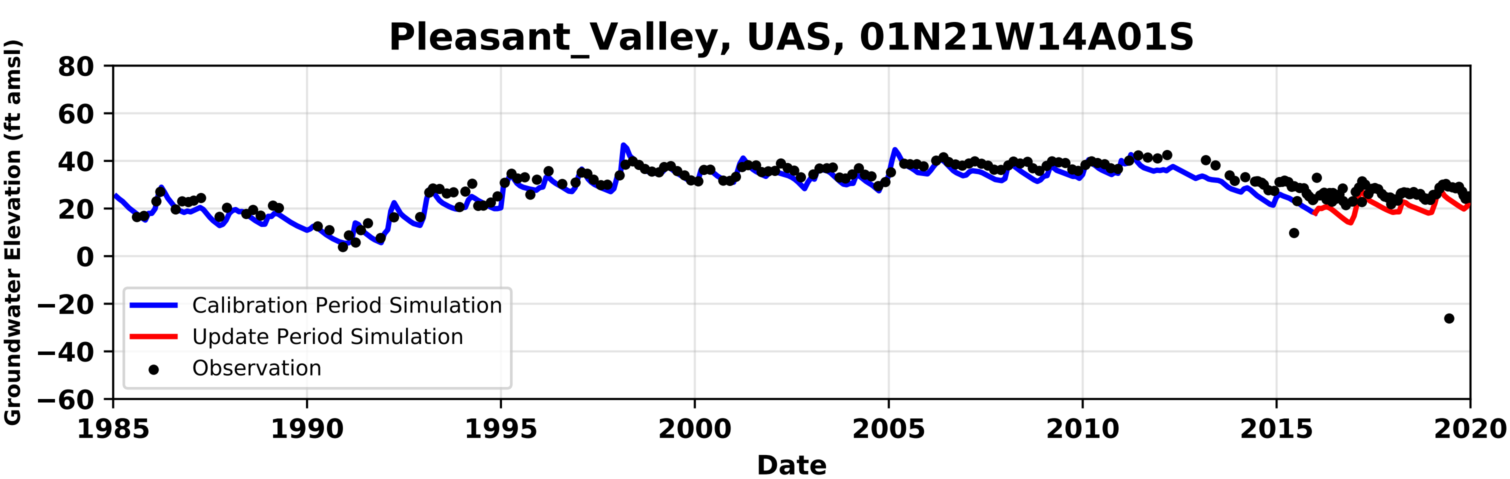


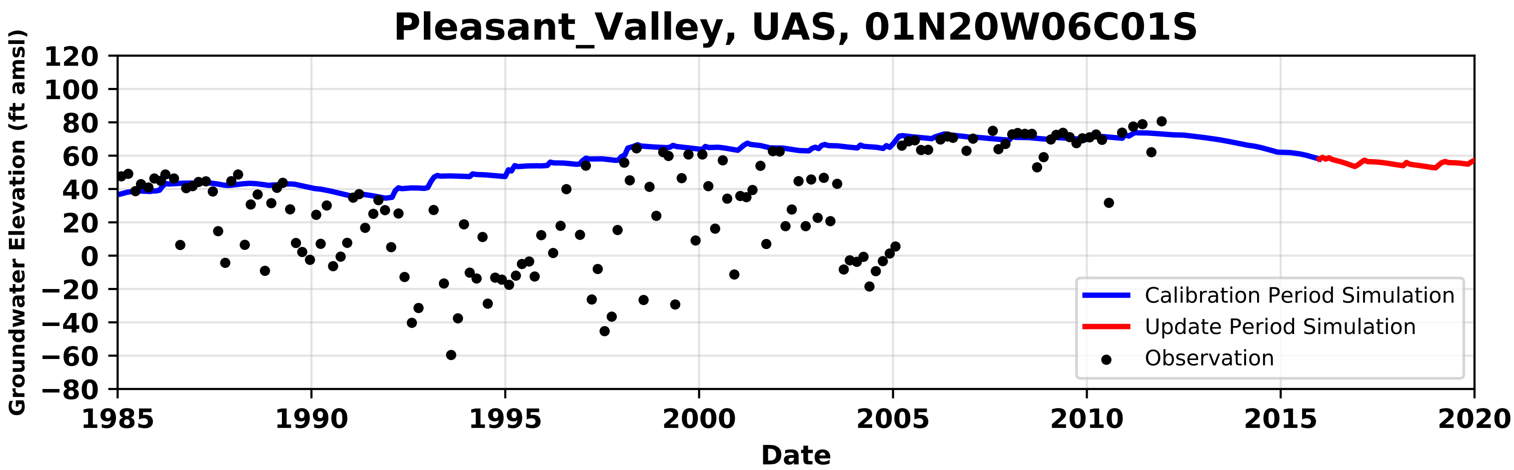
Oxnard_Plain, UNKNOWN, 02N21W31P02S
Groundwater Elevation (ft amsl)
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

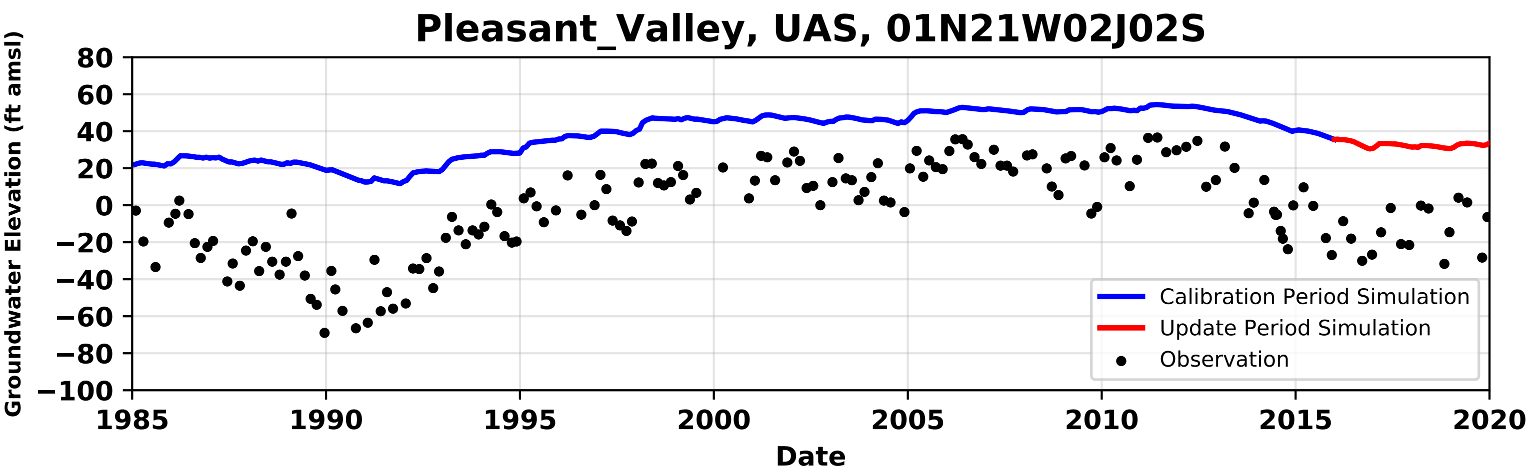

Pleasant_Valley, UAS, 02N20W31B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

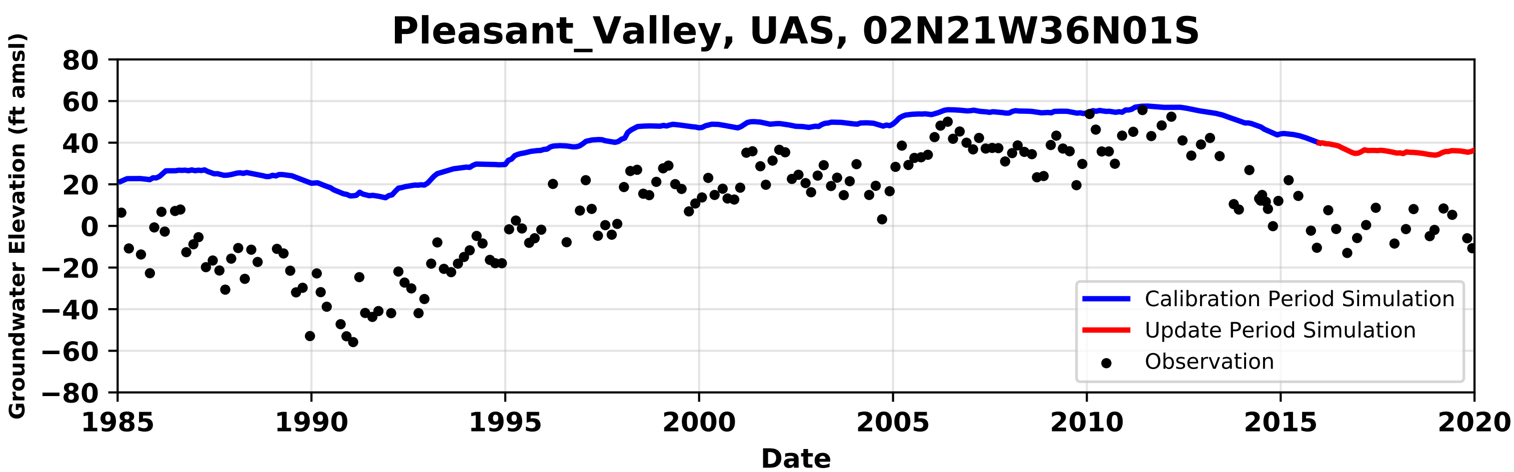

Pleasant_Valley, UAS, 02N21W34G05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

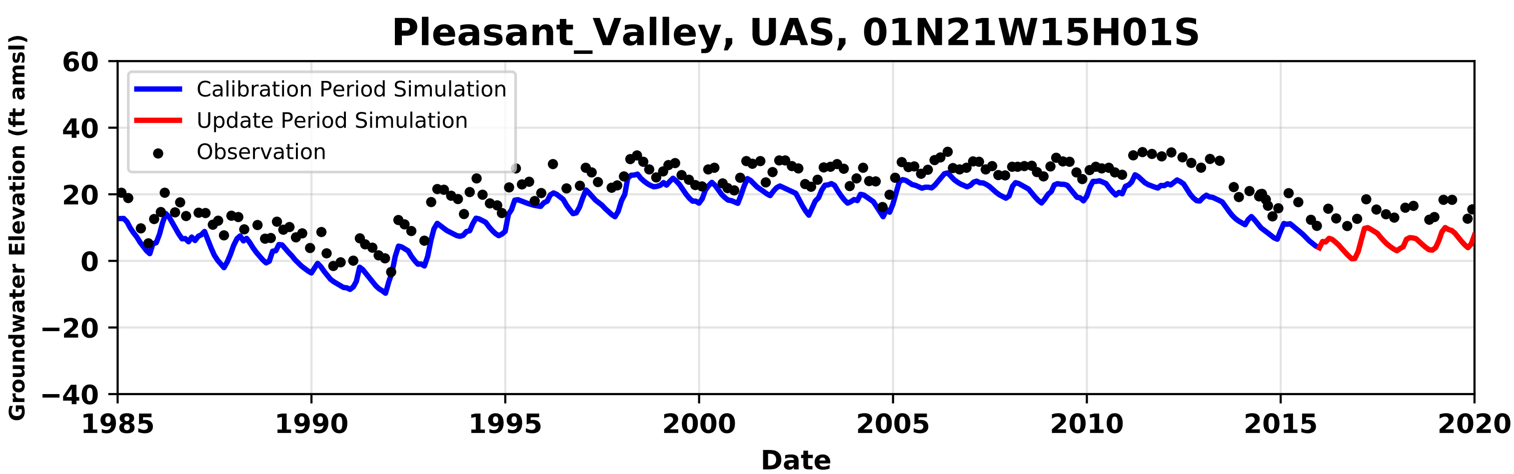

Pleasant_Valley, UAS, 01N21W12F03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

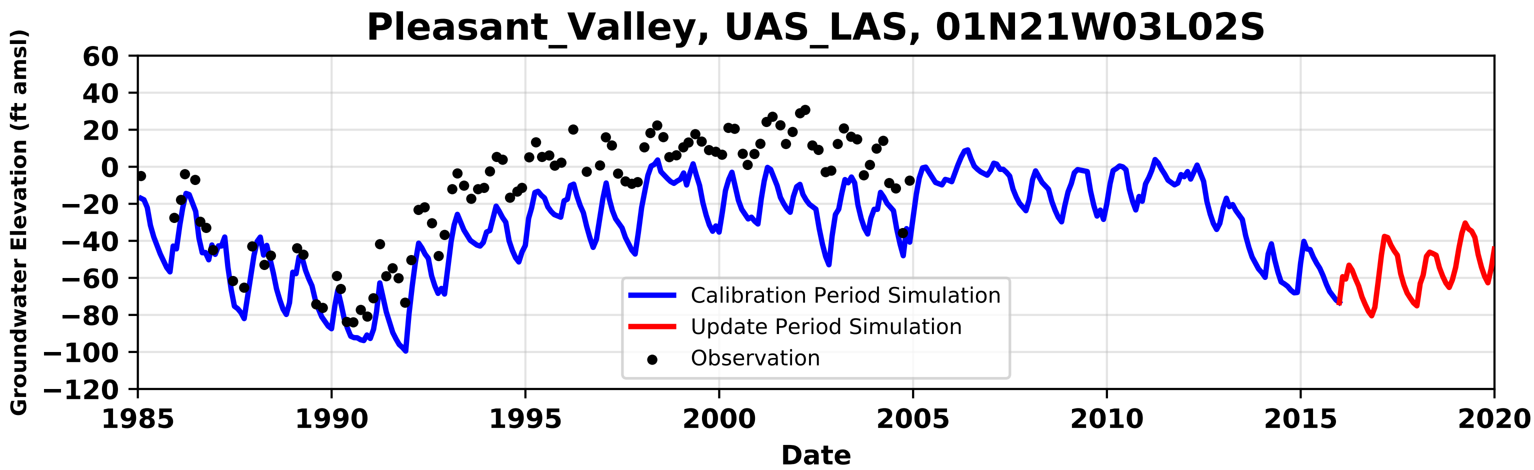

Pleasant_Valley, UAS, 01N21W14A01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

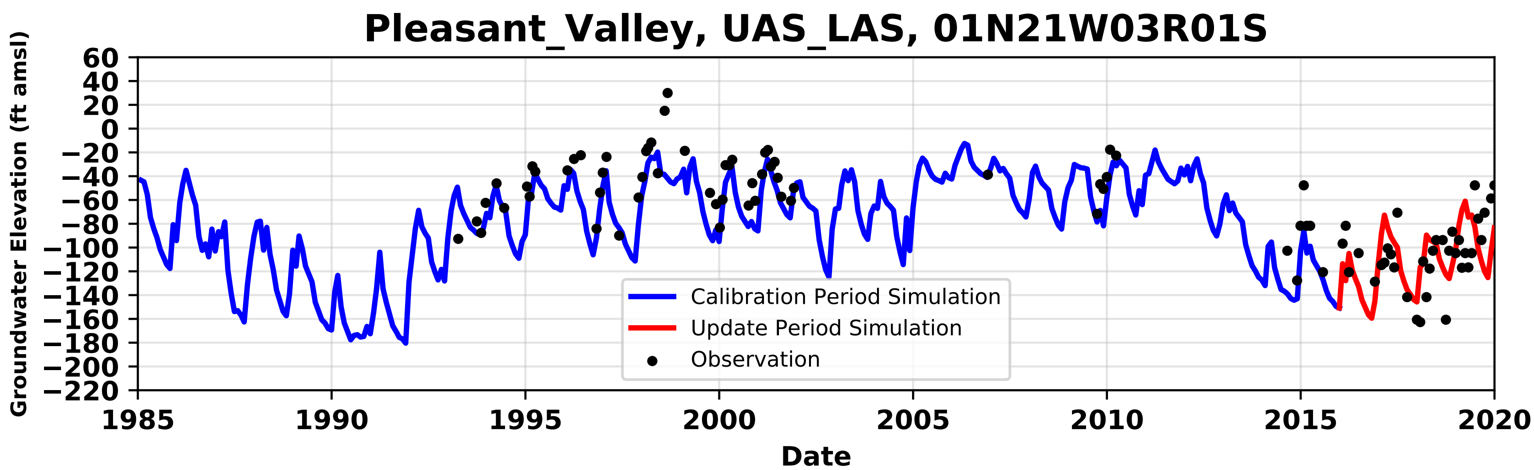

Pleasant_Valley, UAS, 01N20W06C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

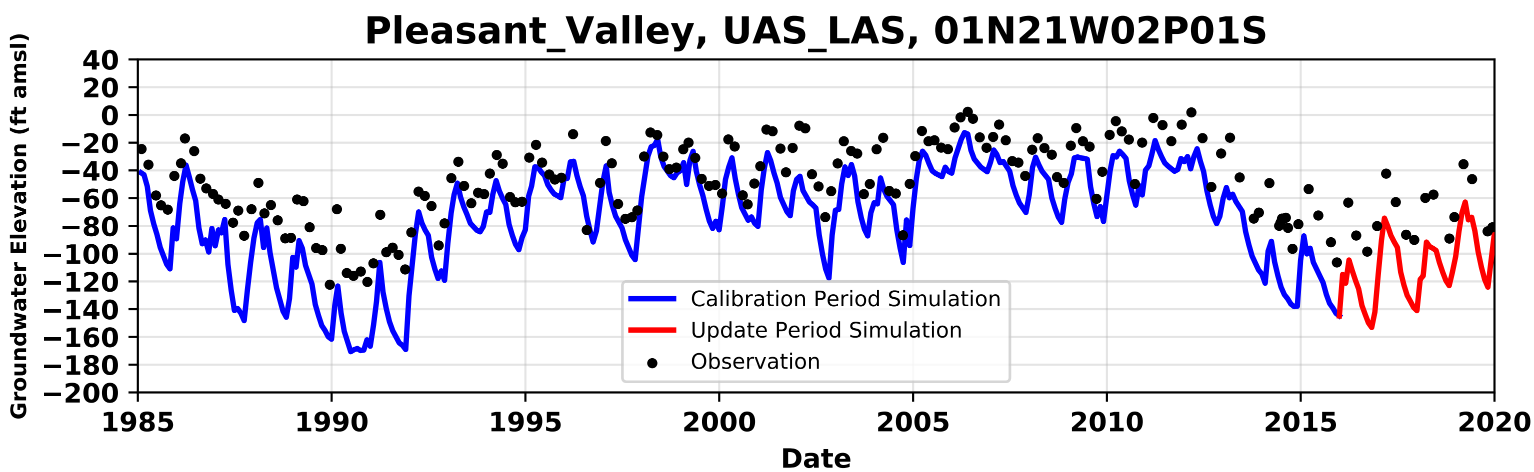

Pleasant_Valley, UAS, 01N21W02J02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

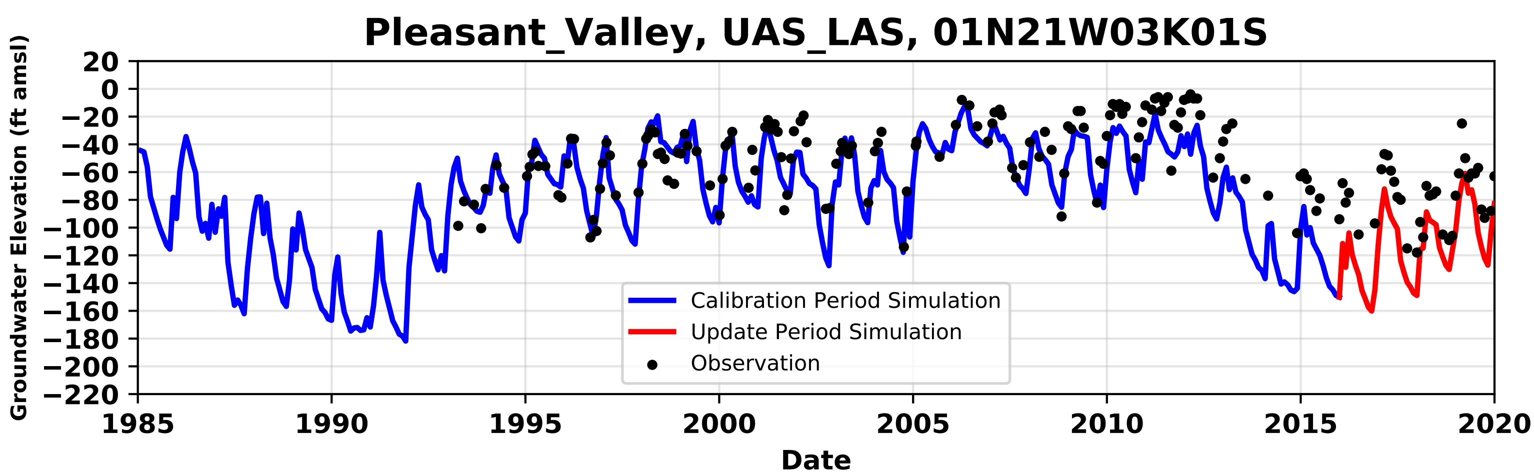

Pleasant_Valley, UAS, 02N21W36N01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

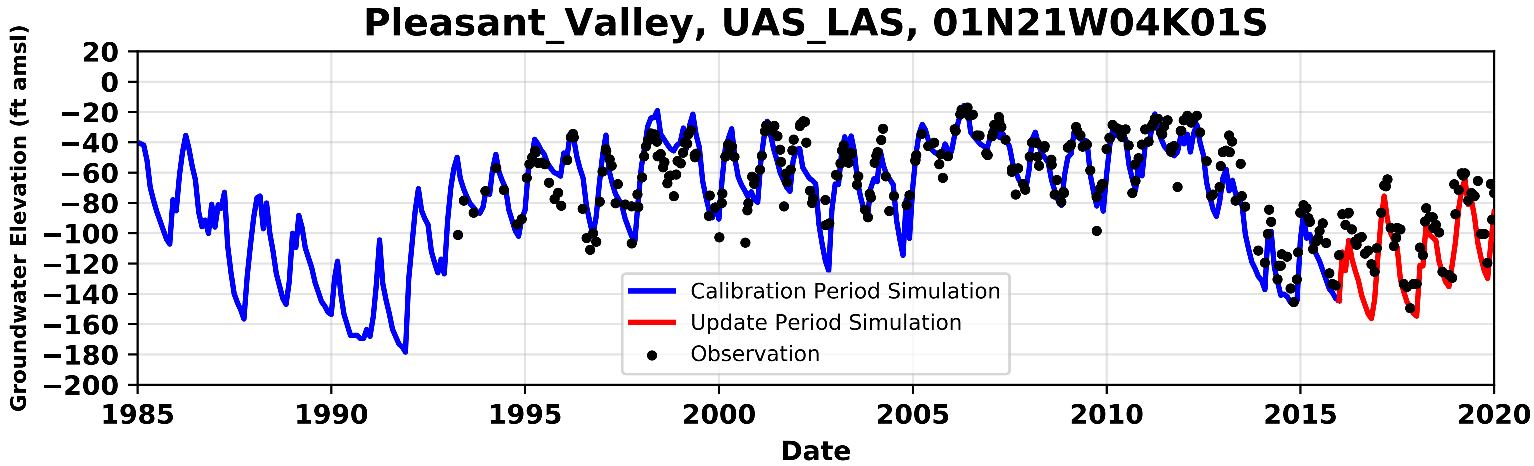

Pleasant_Valley, UAS, 01N21W15H01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

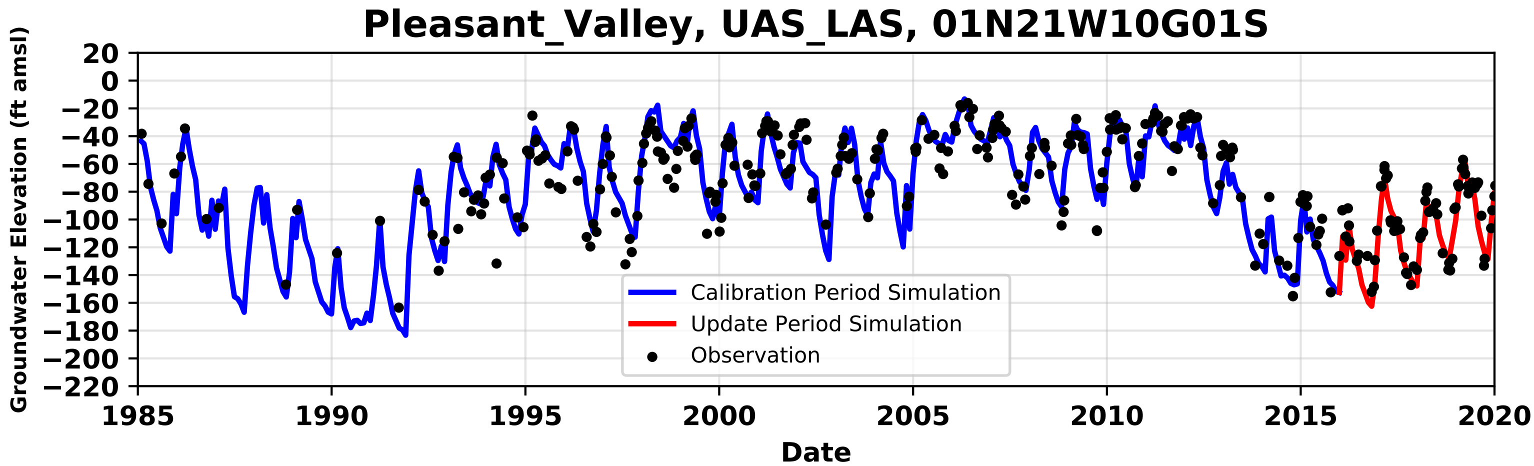

Pleasant_Valley, UAS_LAS, 01N21W03L02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

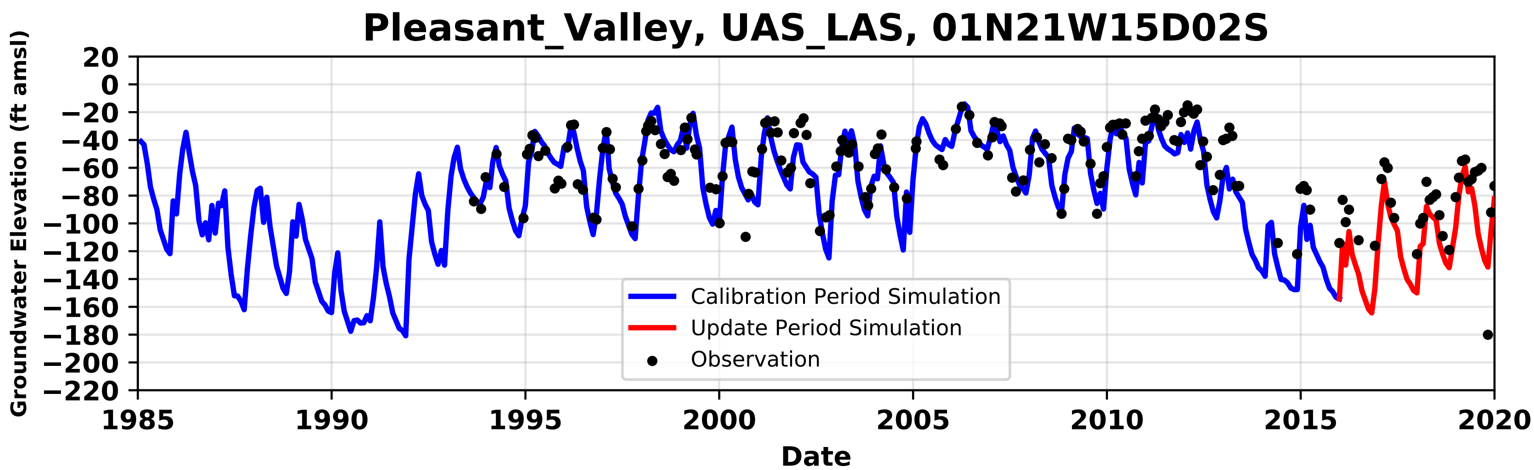

Pleasant_Valley, UAS_LAS, 01N21W03R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

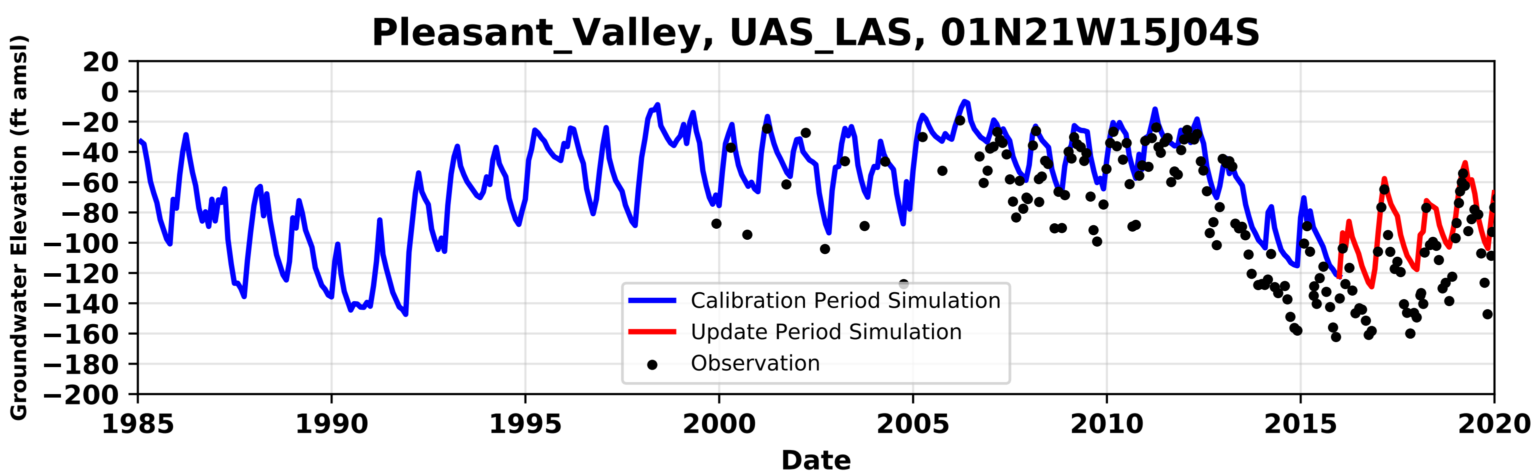

Pleasant_Valley, UAS_LAS, 01N21W02P01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

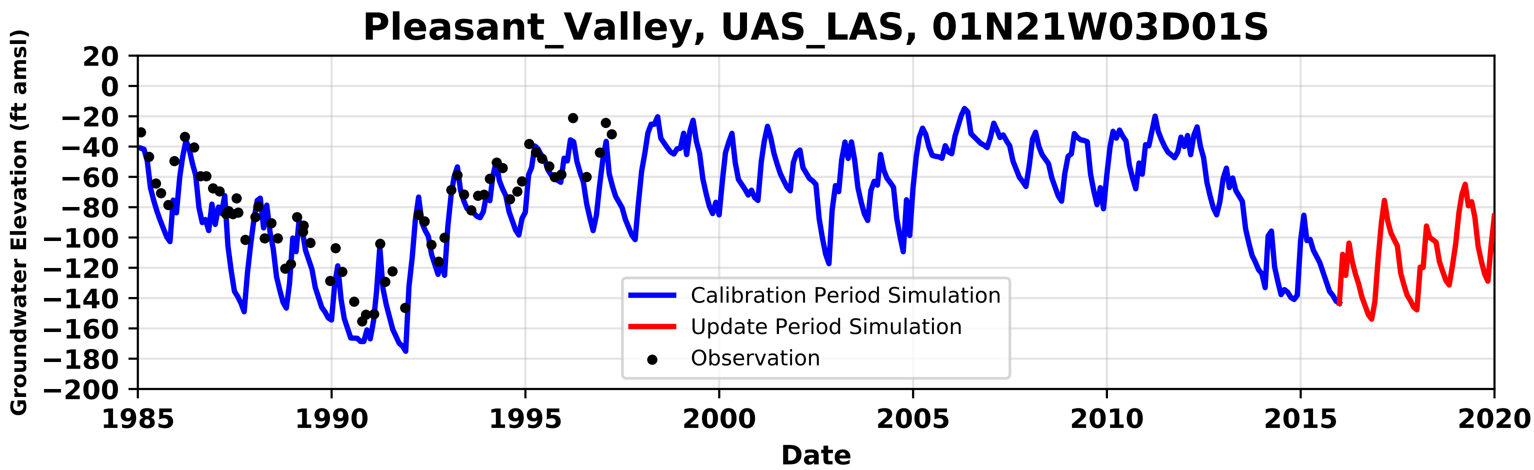

Pleasant_Valley, UAS_LAS, 01N21W03K01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

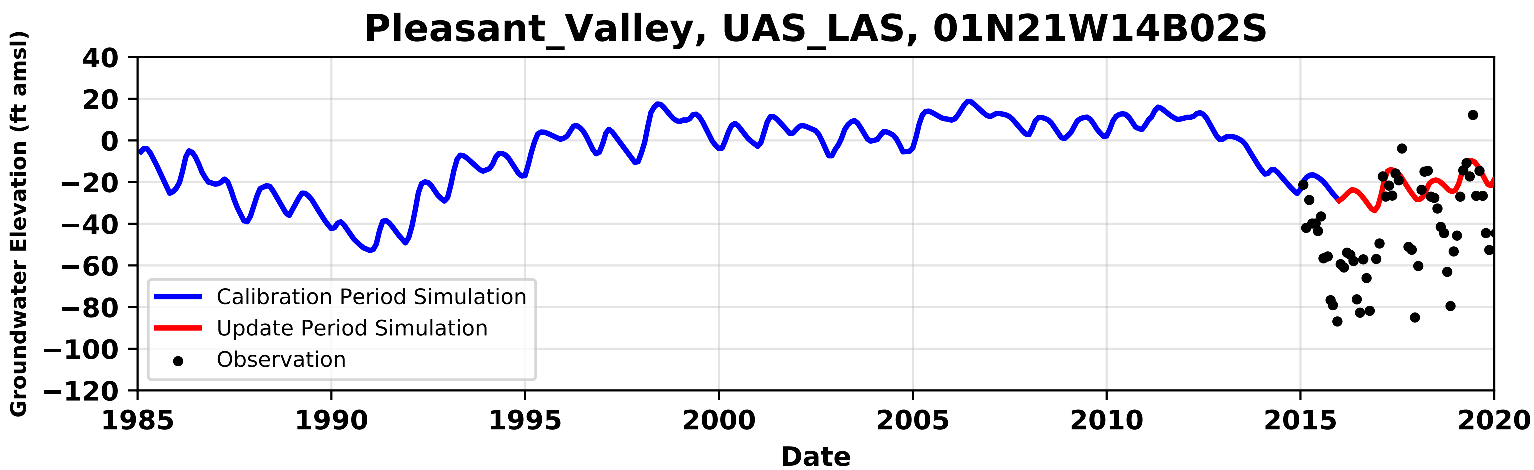

Pleasant_Valley, UAS_LAS, 01N21W04K01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

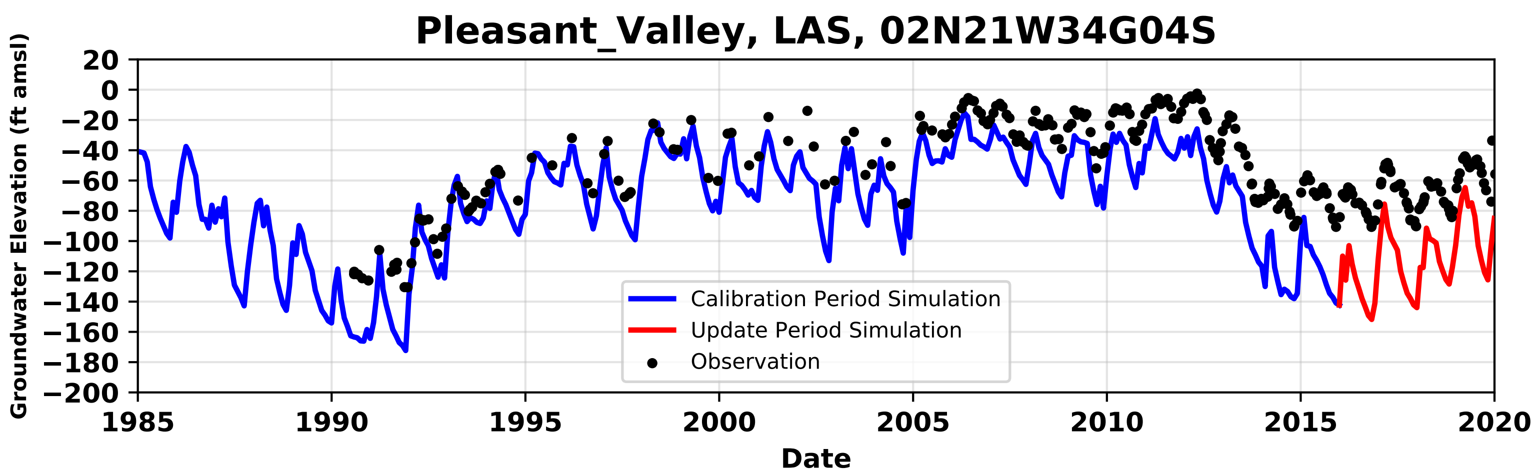

Pleasant_Valley, UAS_LAS, 01N21W10G01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

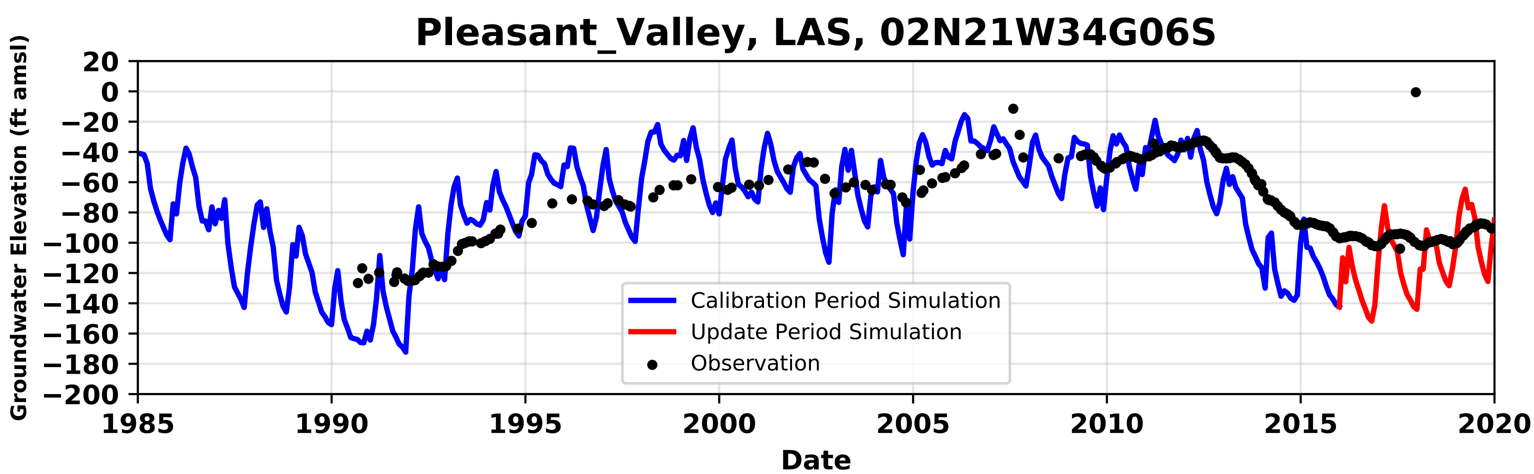

Pleasant_Valley, UAS_LAS, 01N21W15D02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

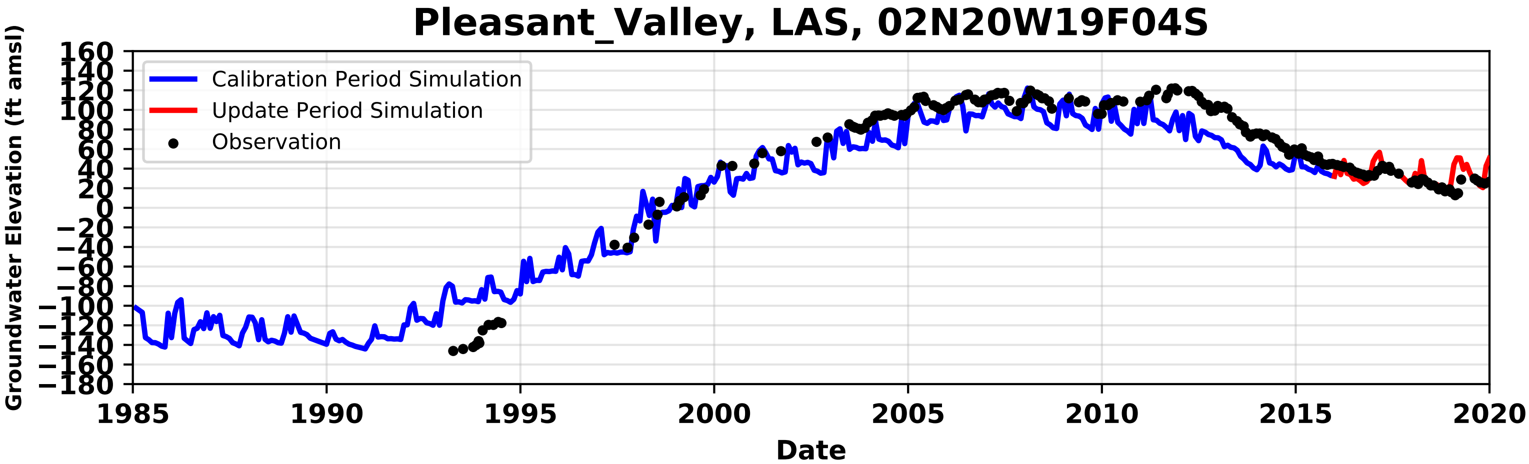

Pleasant_Valley, UAS_LAS, 01N21W15J04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

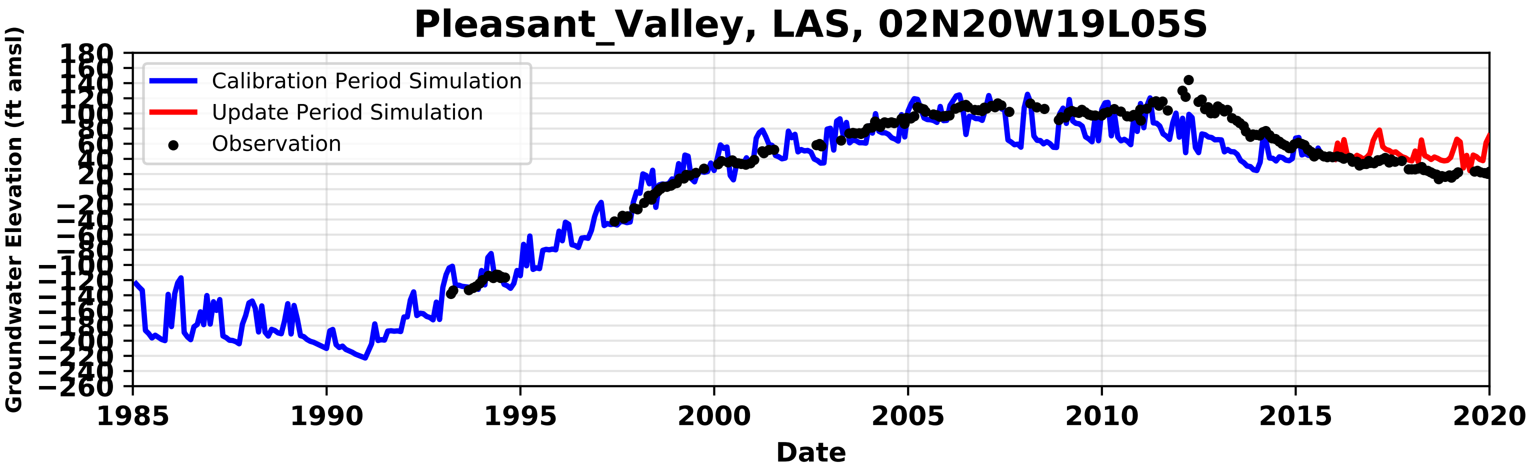

Pleasant_Valley, UAS_LAS, 01N21W03D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

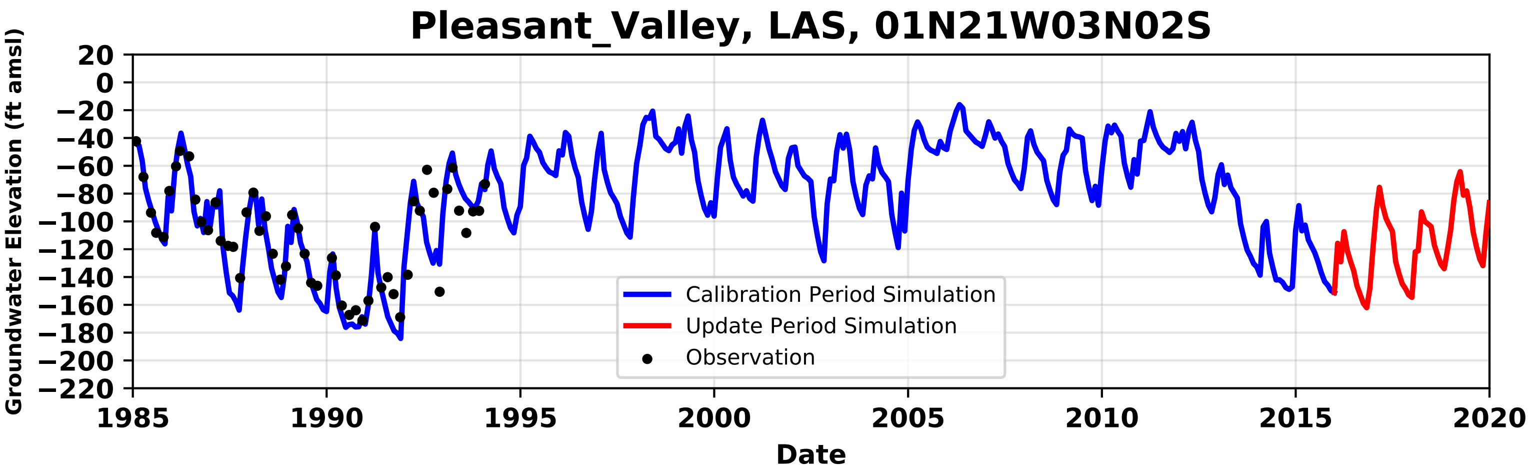

Pleasant_Valley, UAS_LAS, 01N21W14B02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

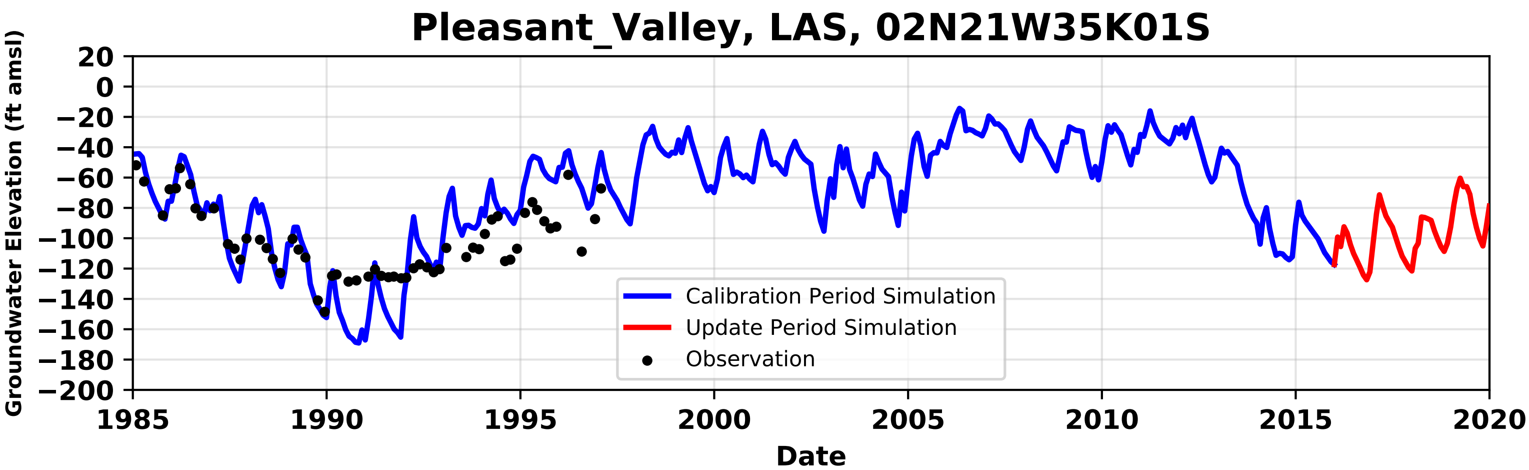

Pleasant_Valley, LAS, 02N21W34G04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

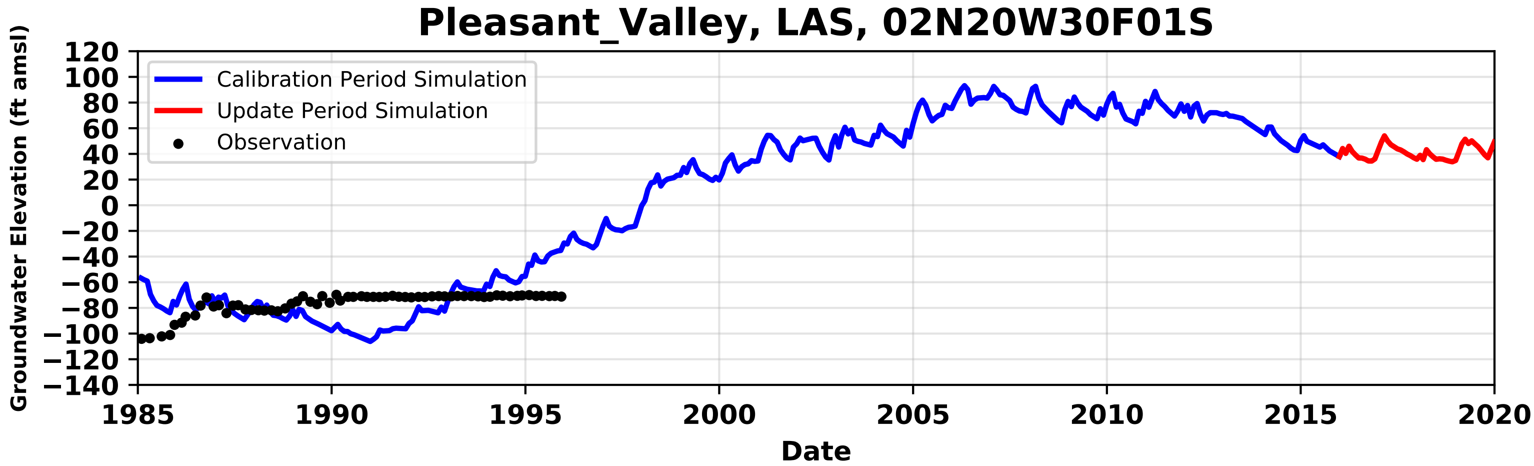

Pleasant_Valley, LAS, 02N21W34G06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

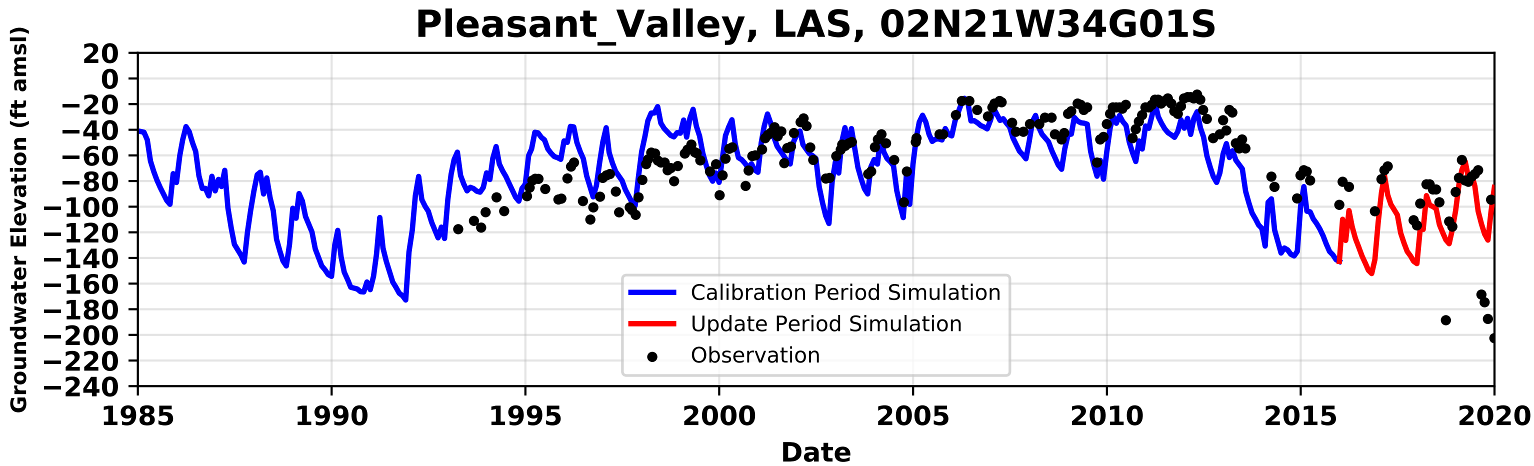

Pleasant_Valley, LAS, 02N20W19F04S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

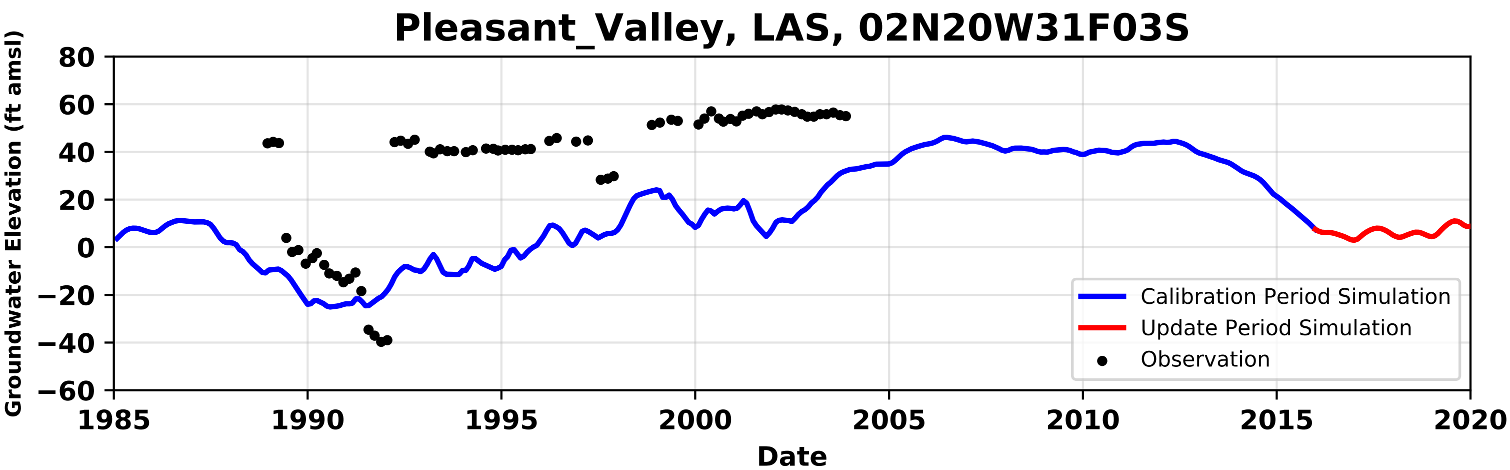

Pleasant_Valley, LAS, 02N20W19L05S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

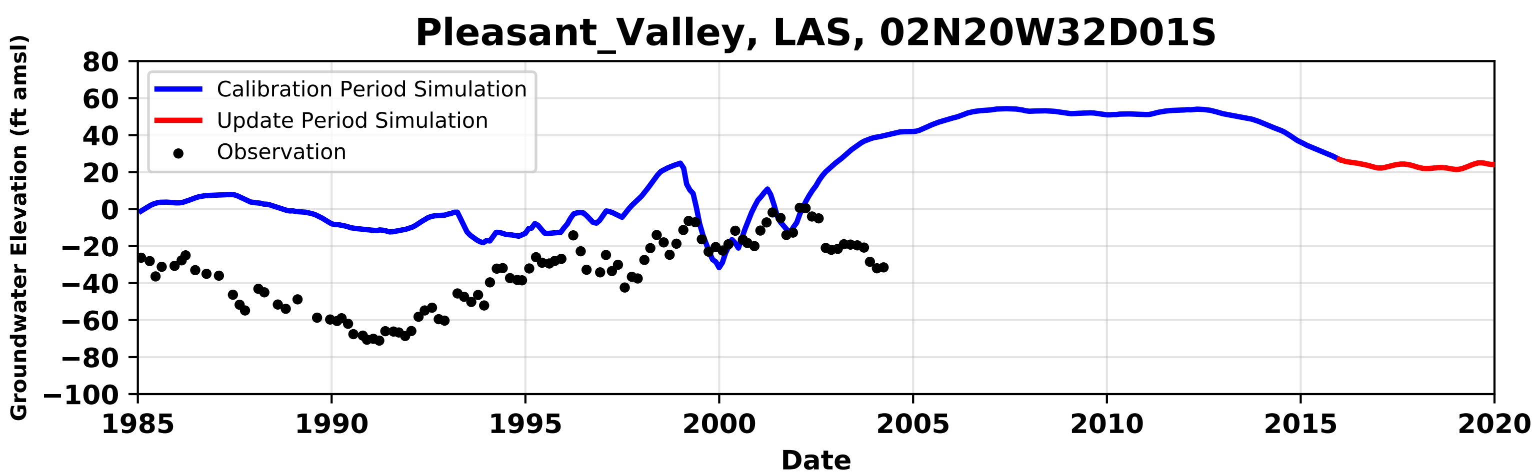

Pleasant_Valley, LAS, 01N21W03N02S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

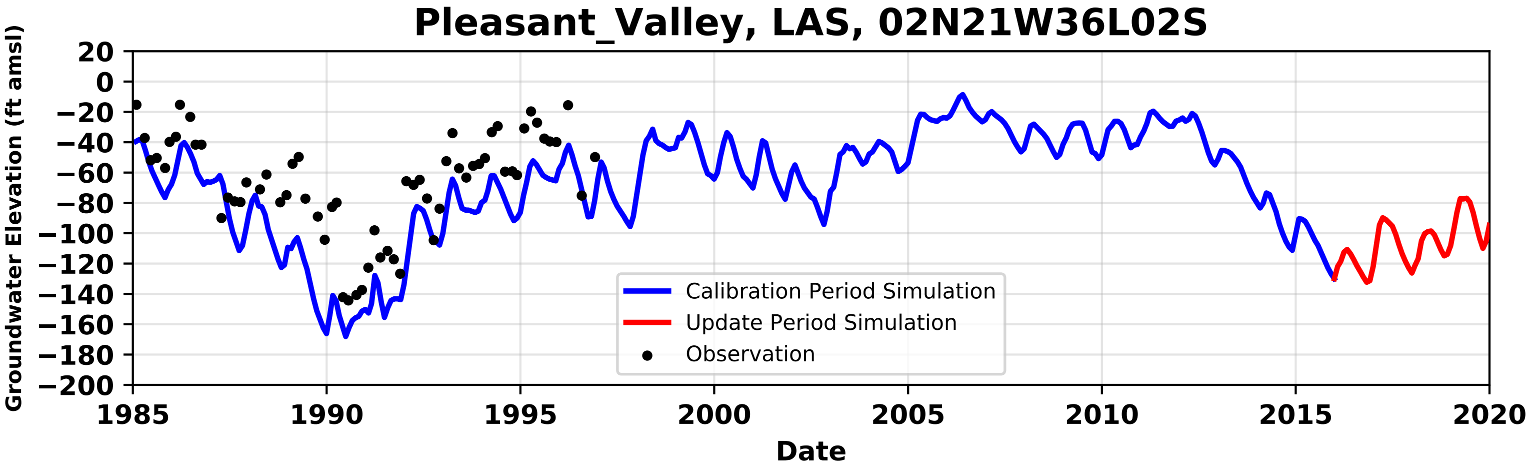

Pleasant_Valley, LAS, 02N21W35K01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

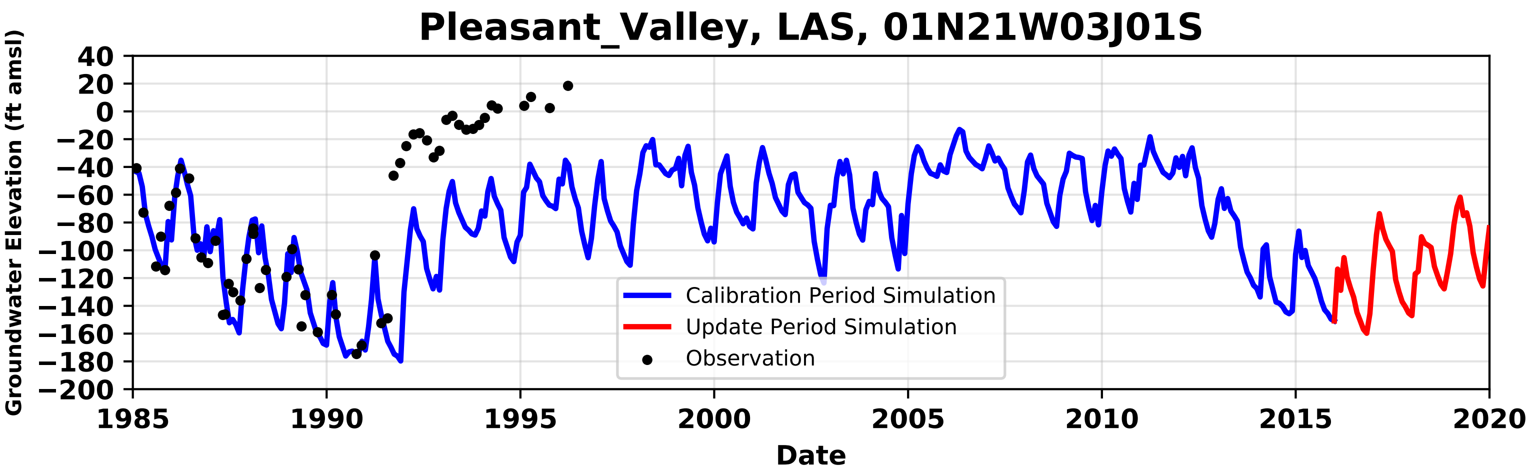

Pleasant_Valley, LAS, 02N20W30F01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

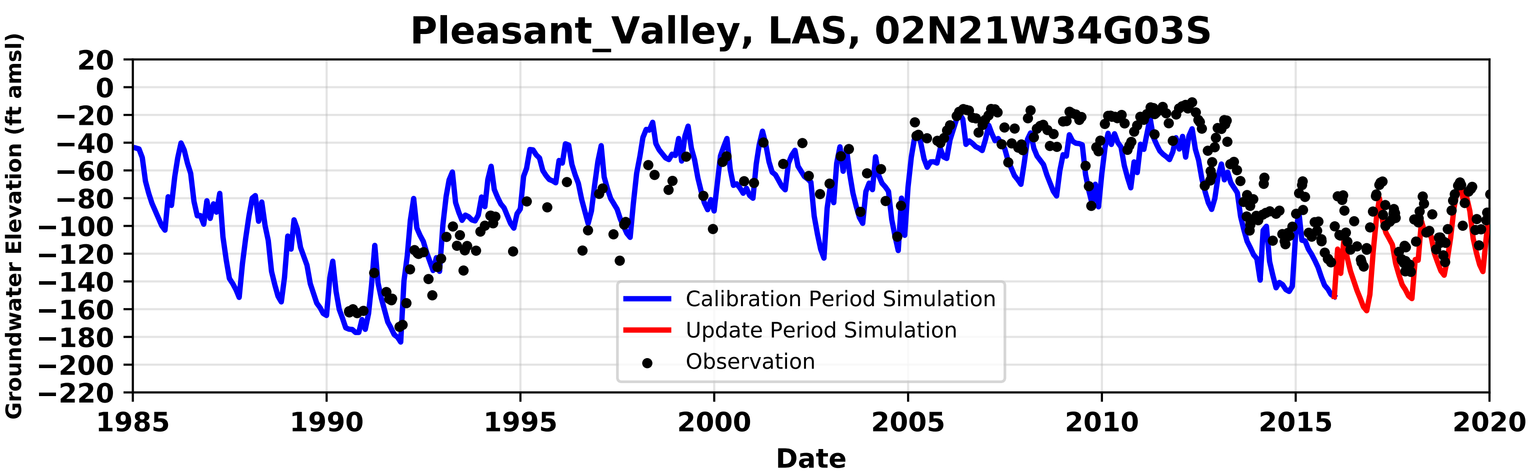

Pleasant_Valley, LAS, 02N21W34G01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

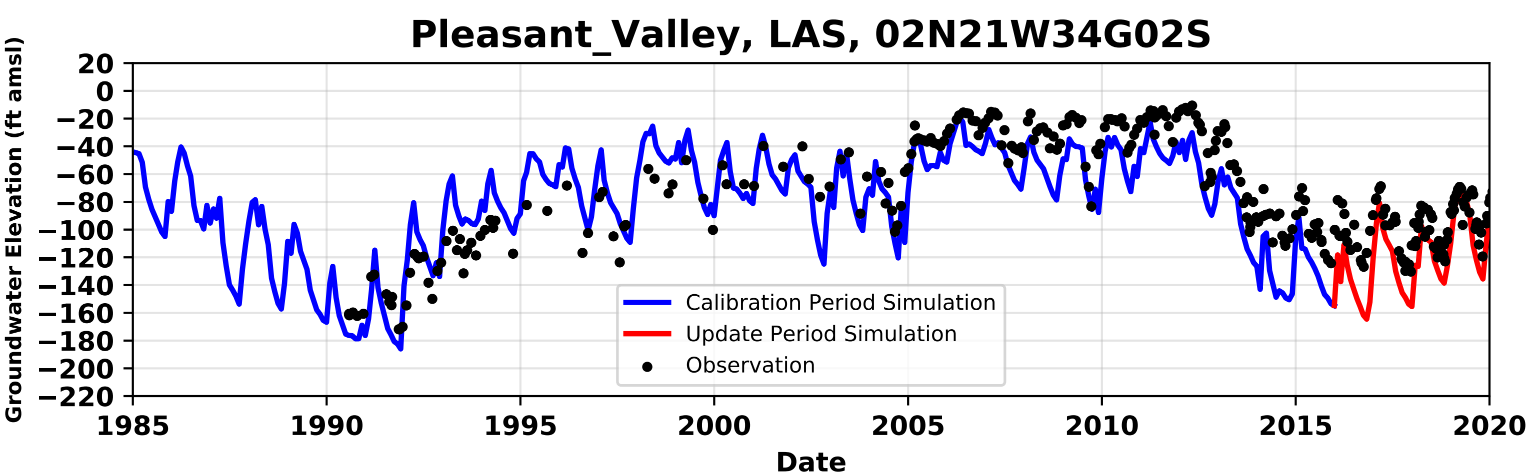

Pleasant_Valley, LAS, 02N20W31F03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

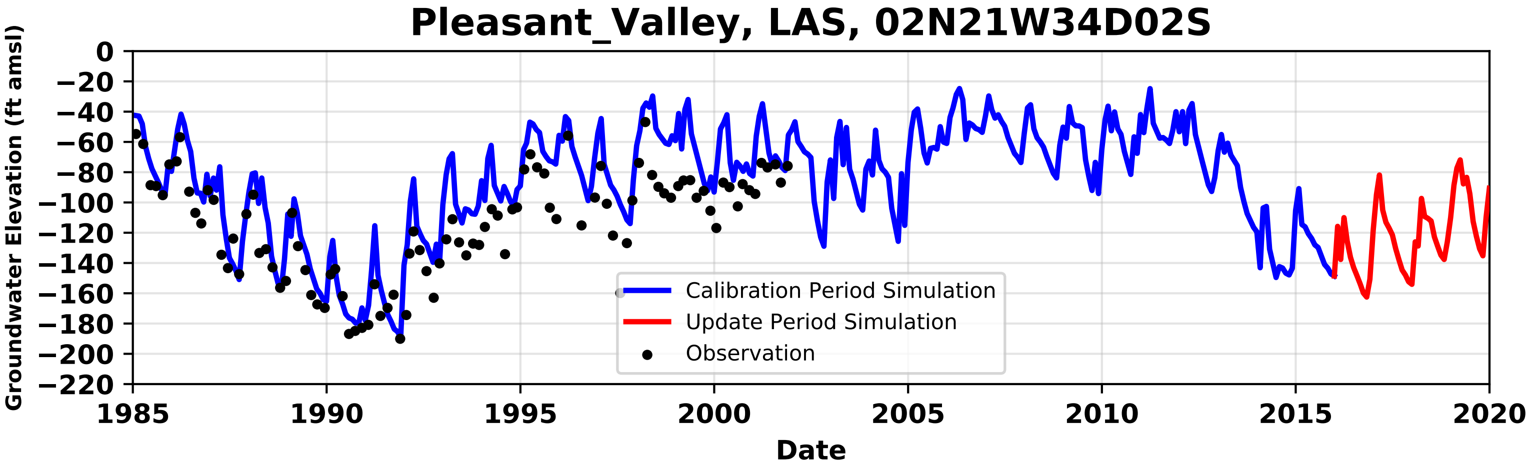

Pleasant_Valley, LAS, 02N20W32D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

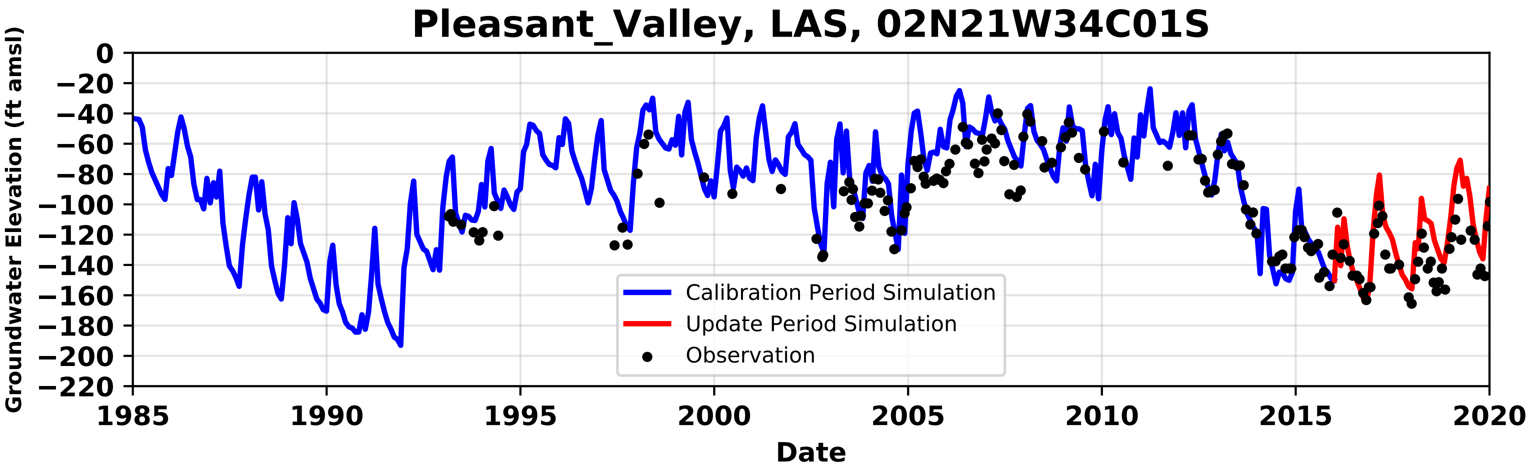

Pleasant_Valley, LAS, 02N21W36L02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

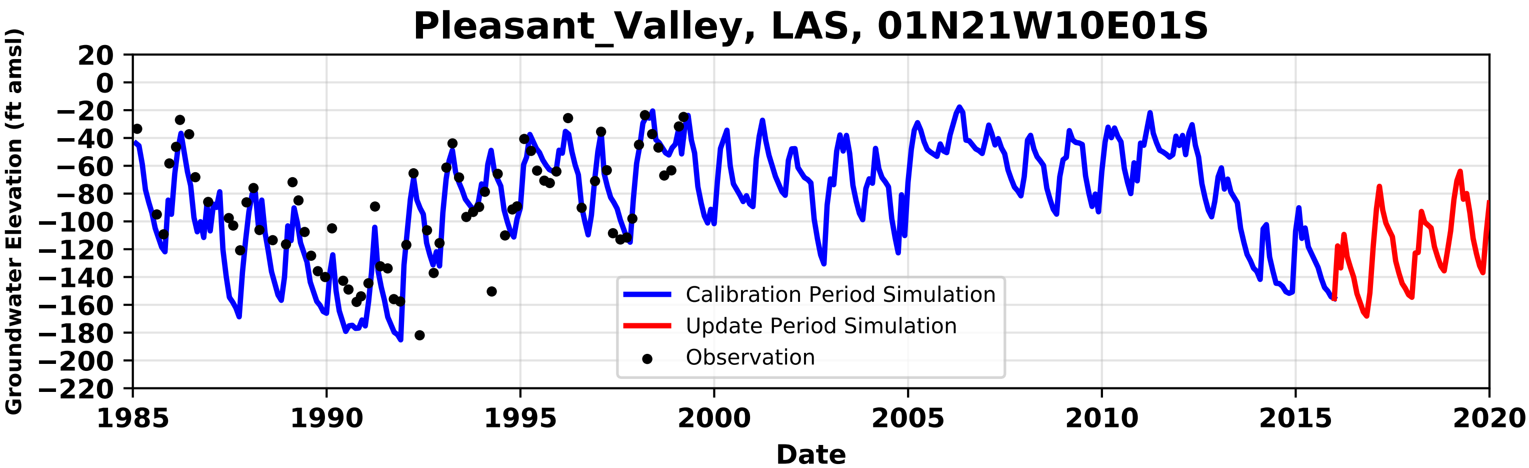

Pleasant_Valley, LAS, 01N21W03J01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

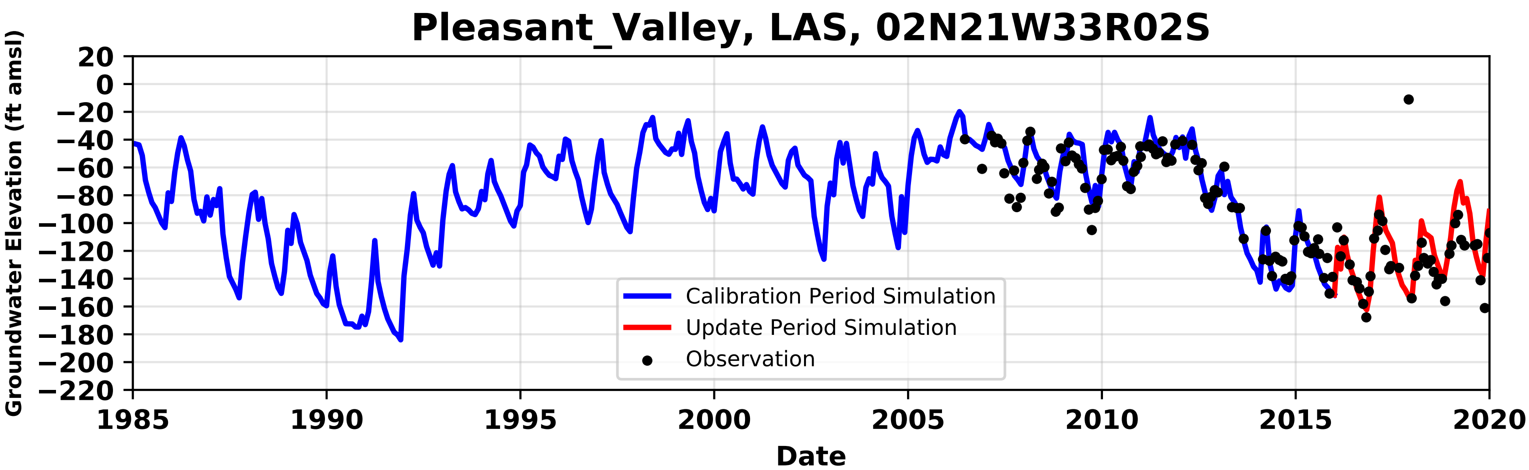

Pleasant_Valley, LAS, 02N21W34G03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

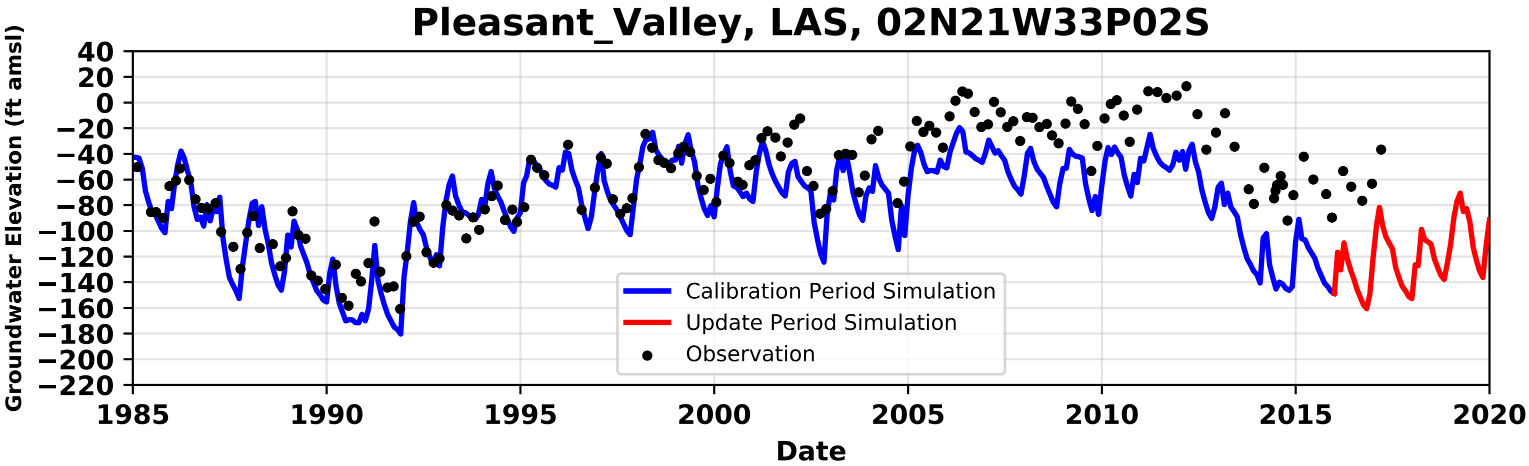

Pleasant_Valley, LAS, 02N21W34G02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

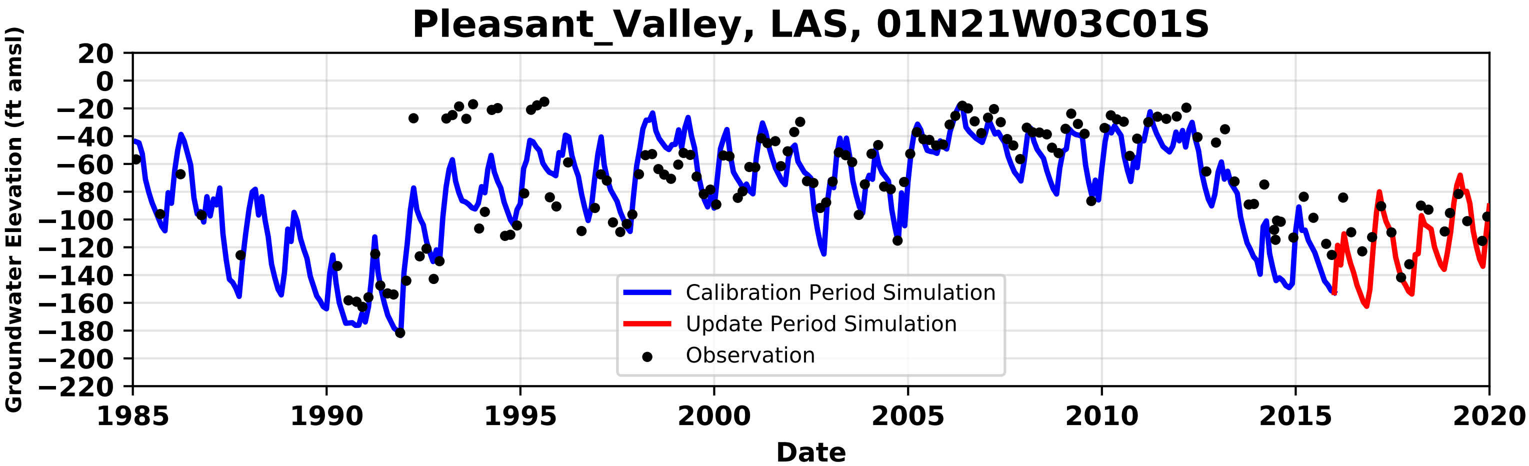

Pleasant_Valley, LAS, 02N21W34D02S
Groundwater Elevation (ft amsl)
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

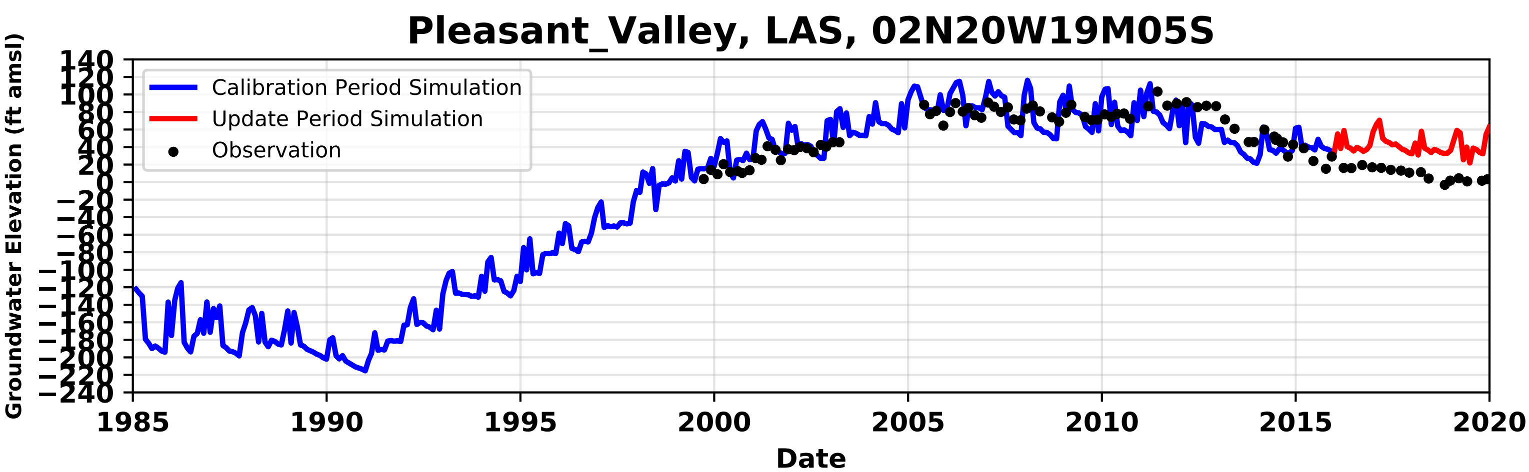

Pleasant_Valley, LAS, 02N21W34C01S
Groundwater Elevation (ft amsl)
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

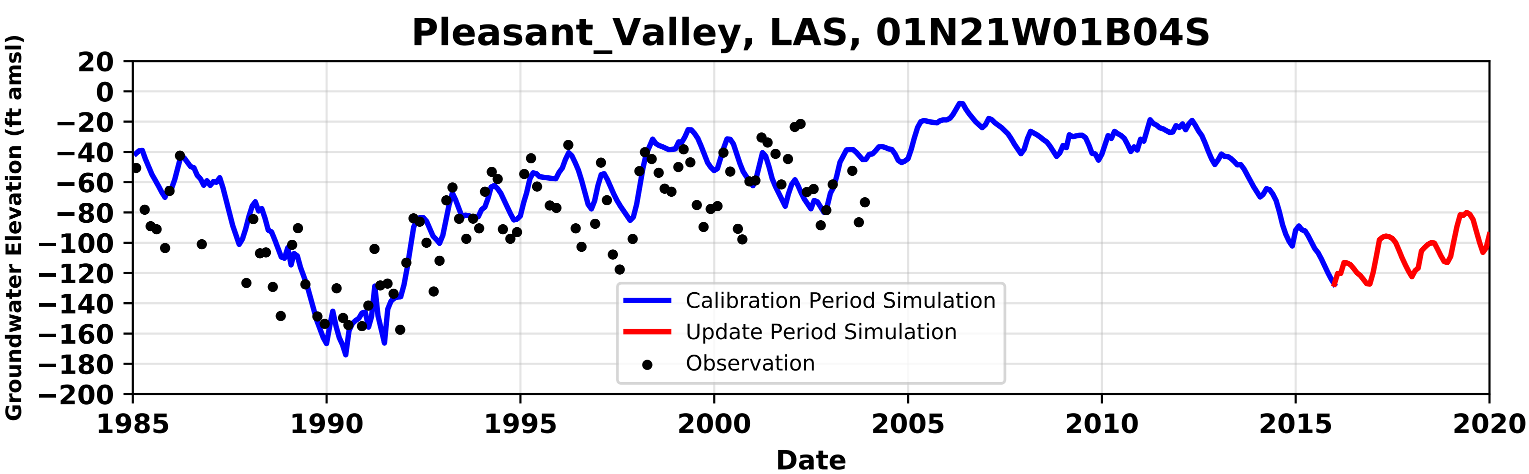

Pleasant_Valley, LAS, 01N21W10E01S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

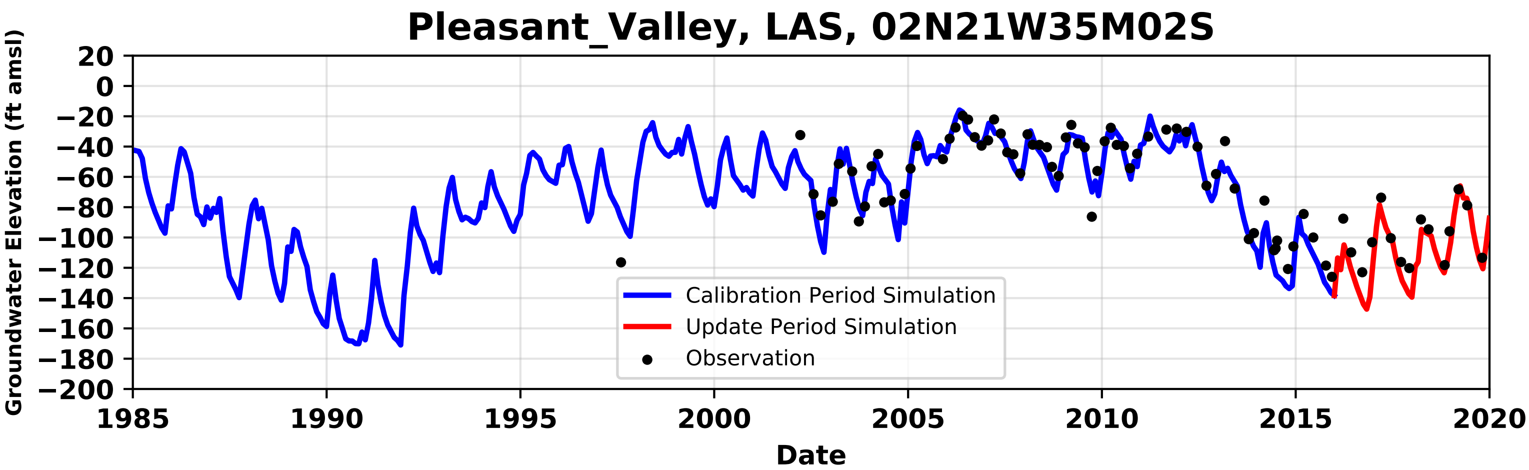

Pleasant_Valley, LAS, 02N21W33R02S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

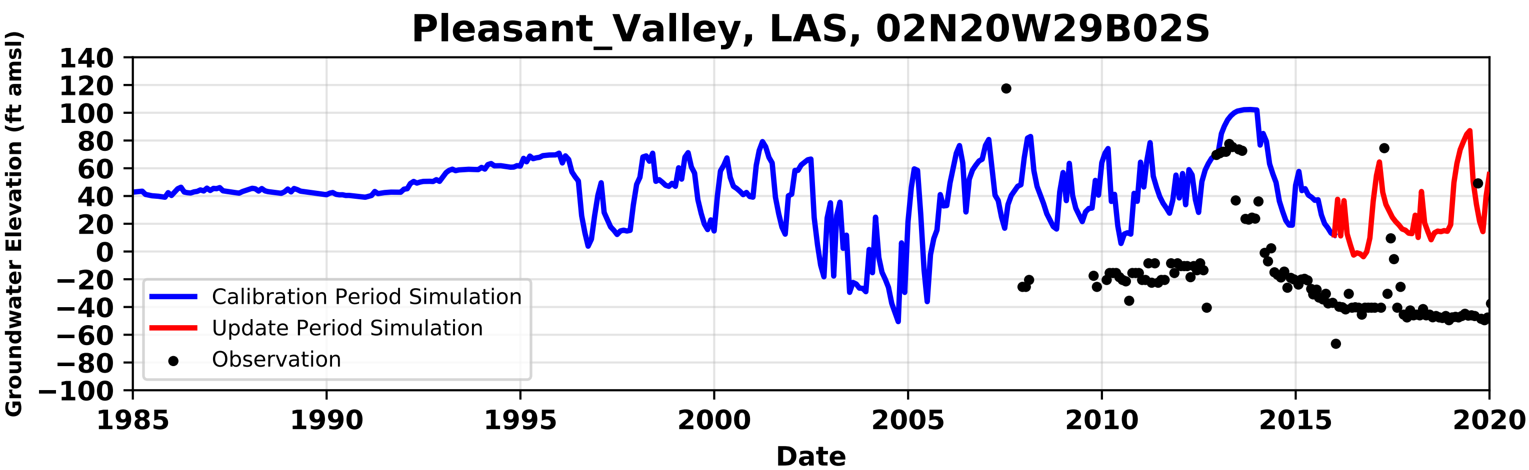

Pleasant_Valley, LAS, 02N21W33P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

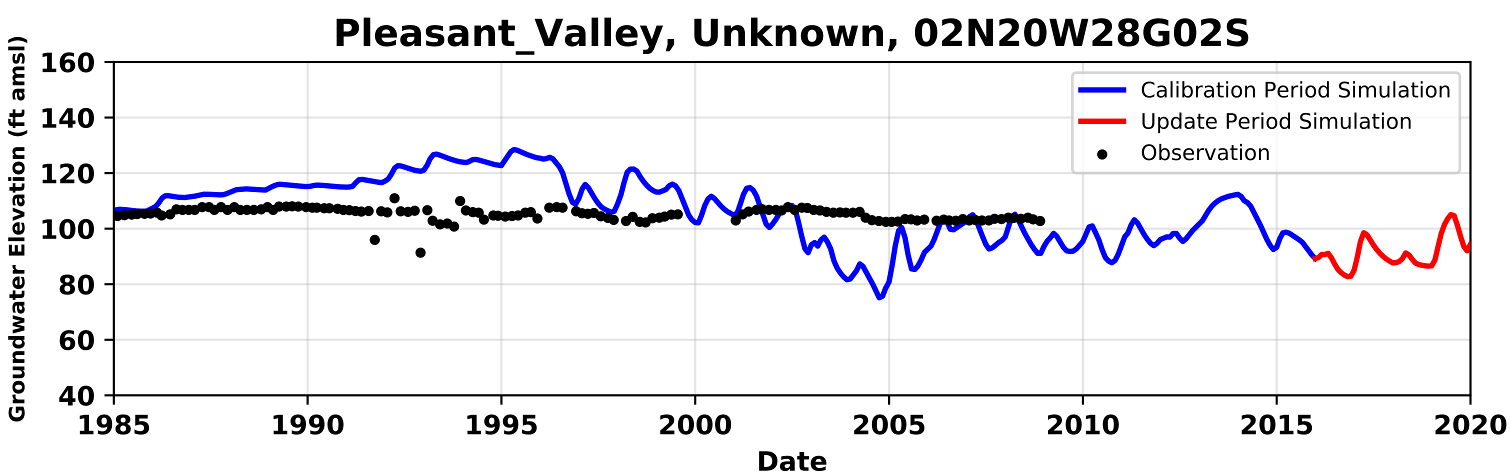

Pleasant_Valley, LAS, 01N21W03C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

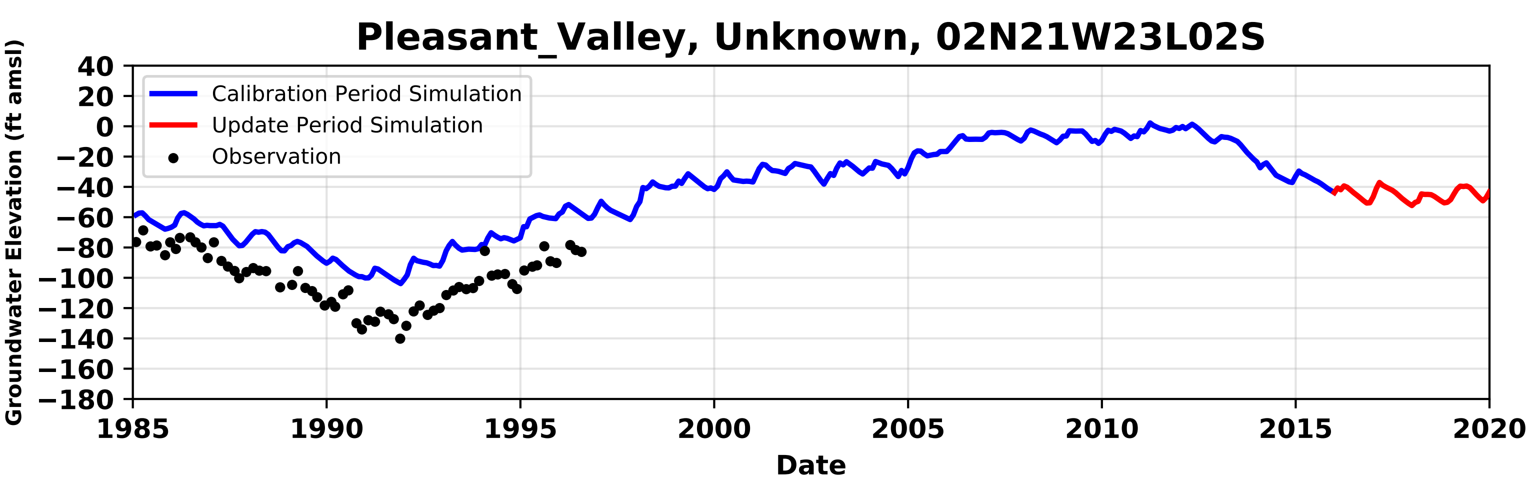

Pleasant_Valley, LAS, 02N20W19M05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

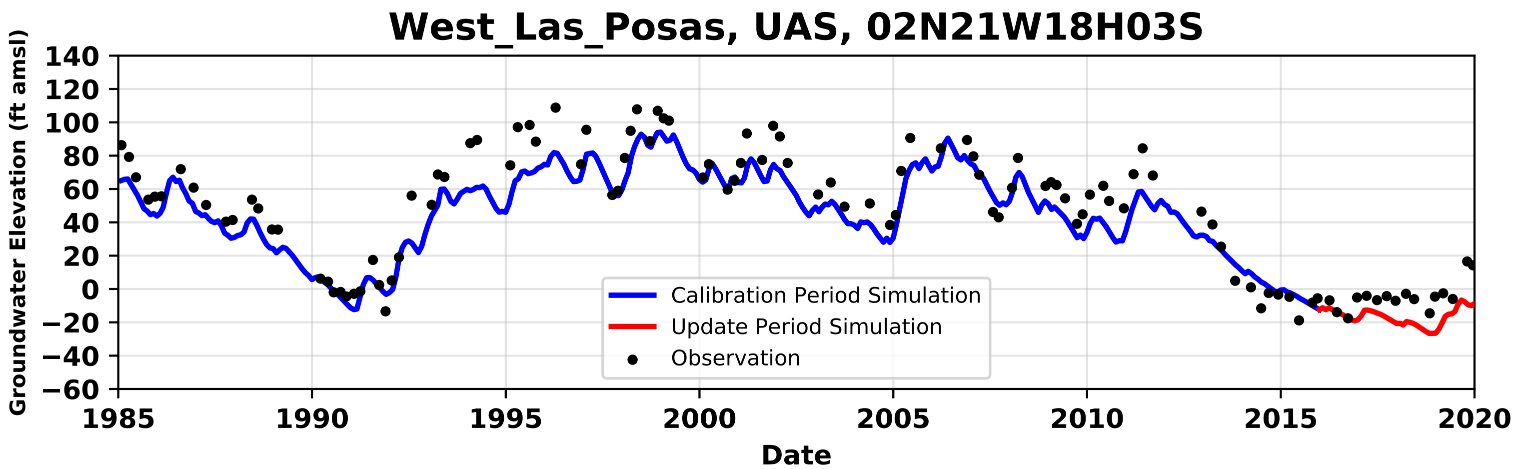

Pleasant_Valley, LAS, 01N21W01B04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

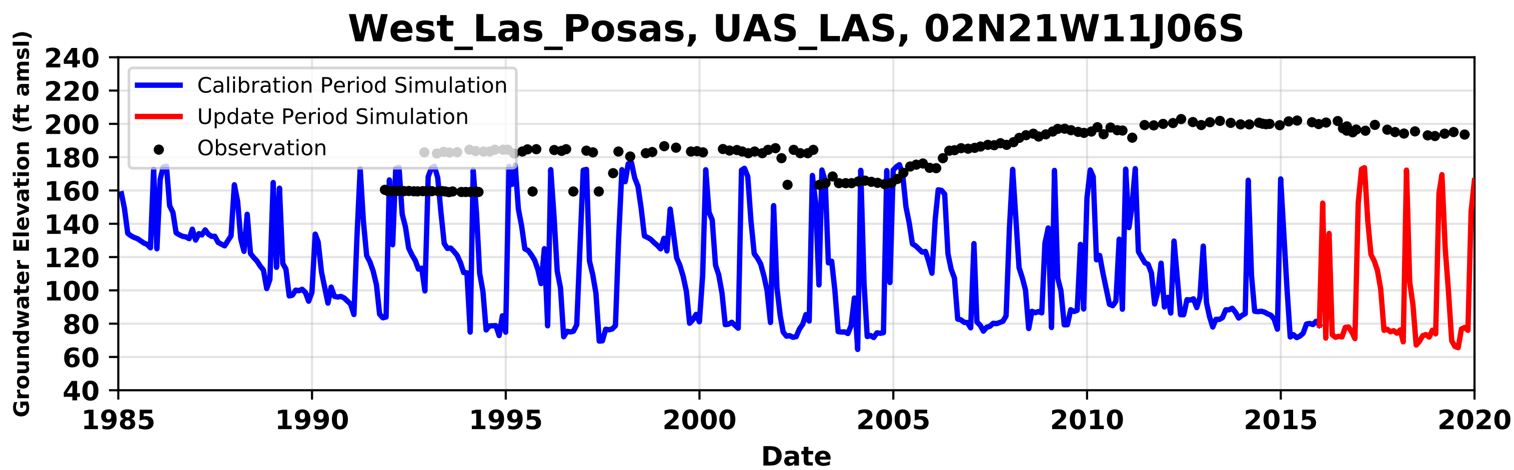

Pleasant_Valley, LAS, 02N21W35M02S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

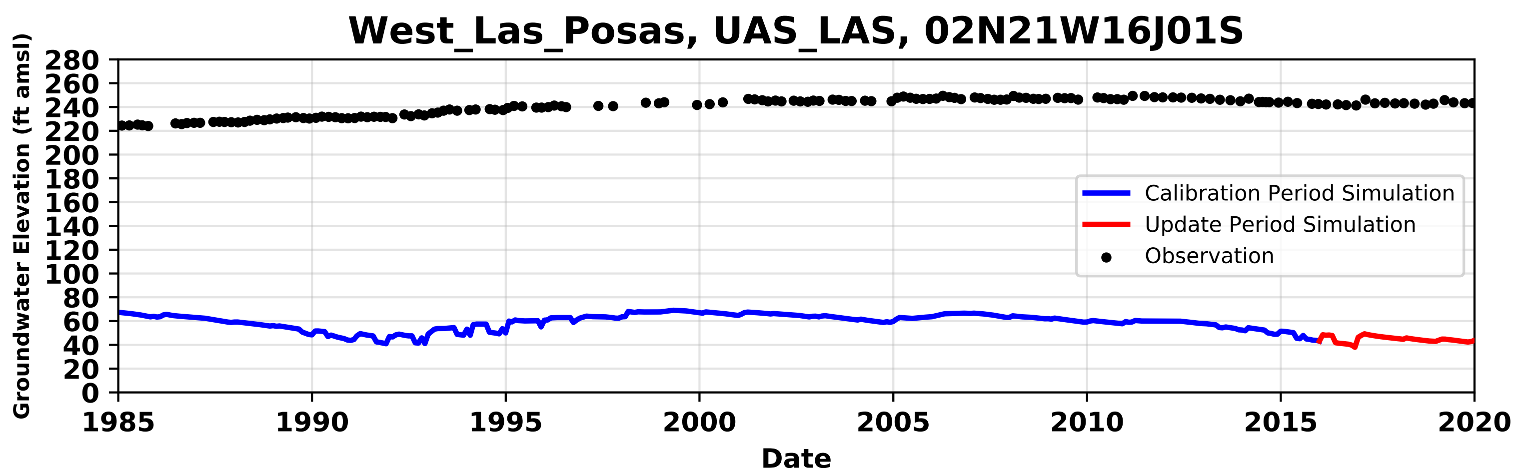

Pleasant_Valley, LAS, 02N20W29B02S
Groundwater Elevation (ft amsl)
140
120
100
80
60
40
20
0
−20
−40
−60
−80
−100
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

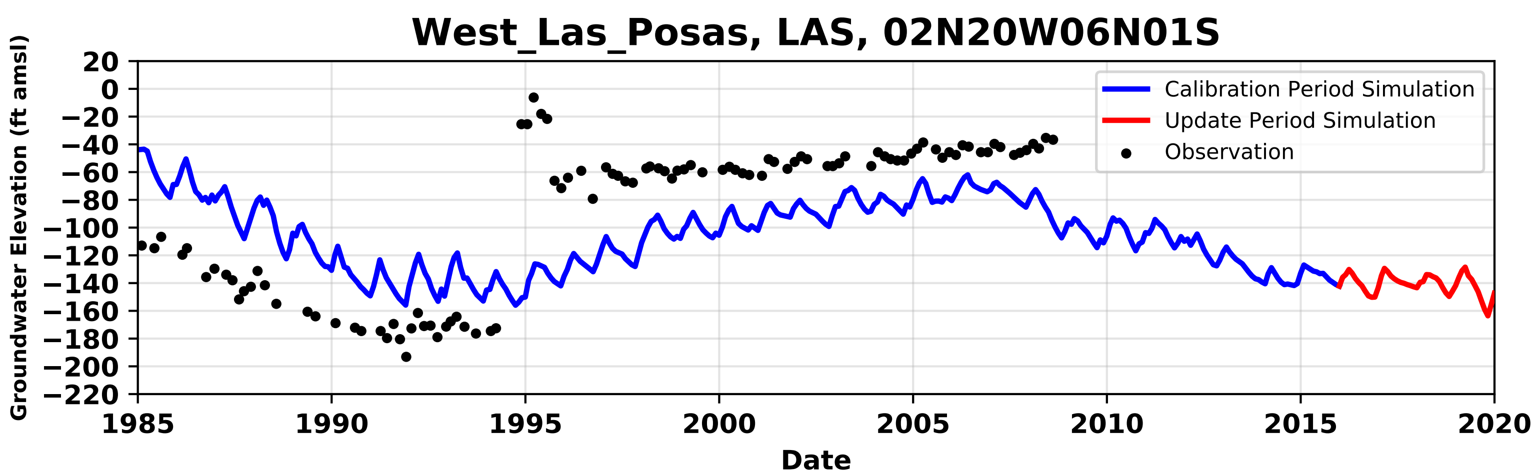

Pleasant_Valley, Unknown, 02N20W28G02S
Groundwater Elevation (ft amsl)
160
140
120
100
80
60
40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

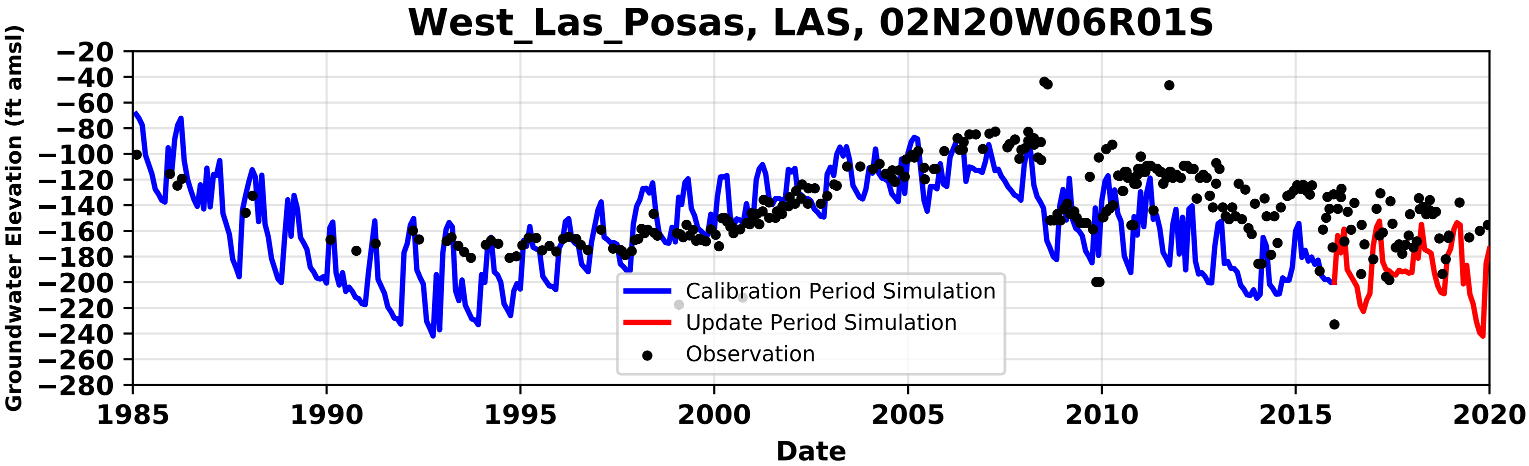

Pleasant_Valley, Unknown, 02N21W23L02S
Groundwater Elevation (ft amsl)
40
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

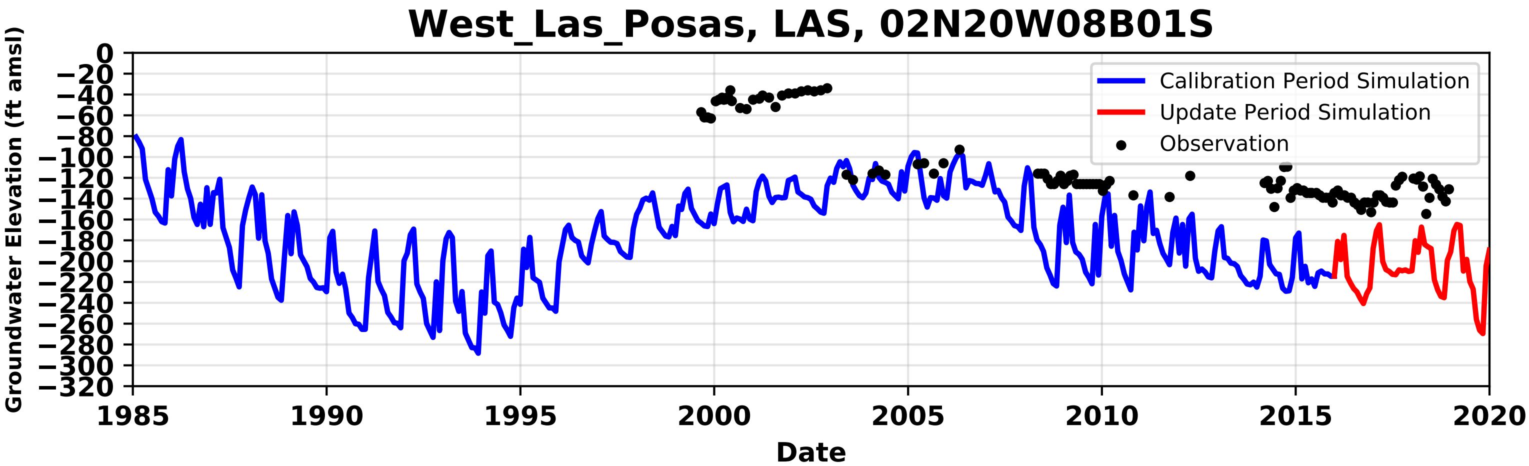

West_Las_Posas, UAS, 02N21W18H03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

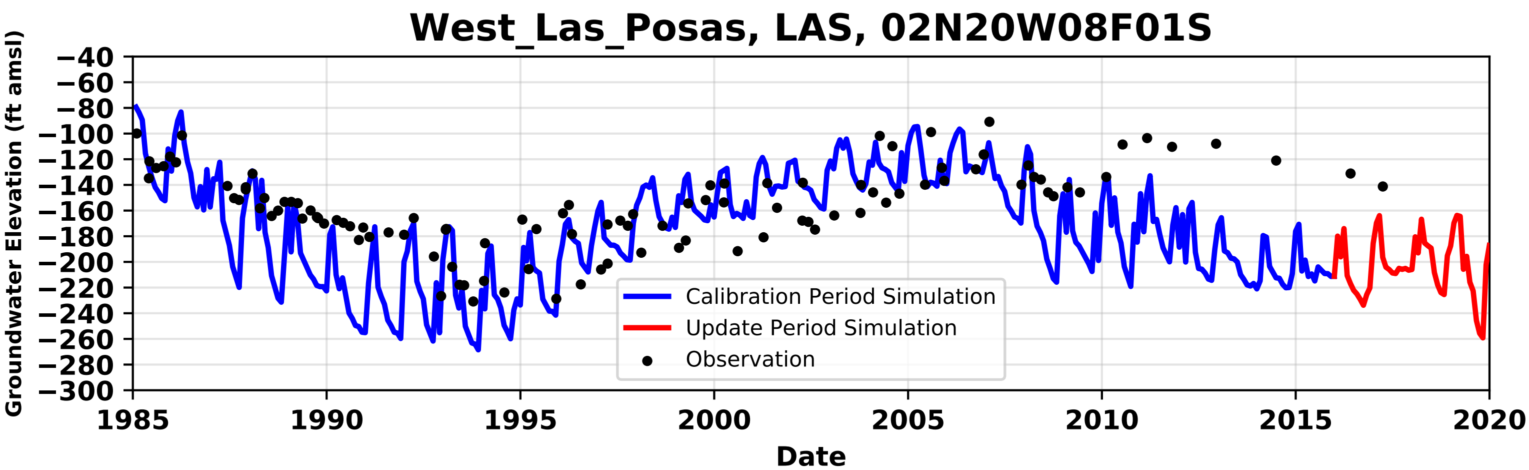

West_Las_Posas, UAS_LAS, 02N21W11J06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

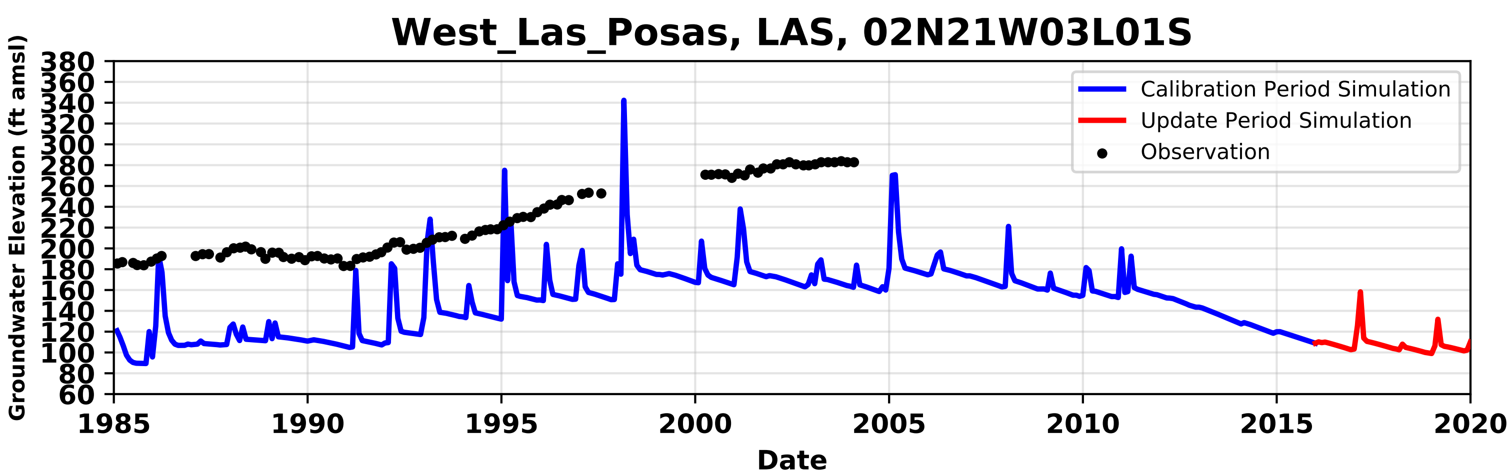

West_Las_Posas, UAS_LAS, 02N21W16J01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

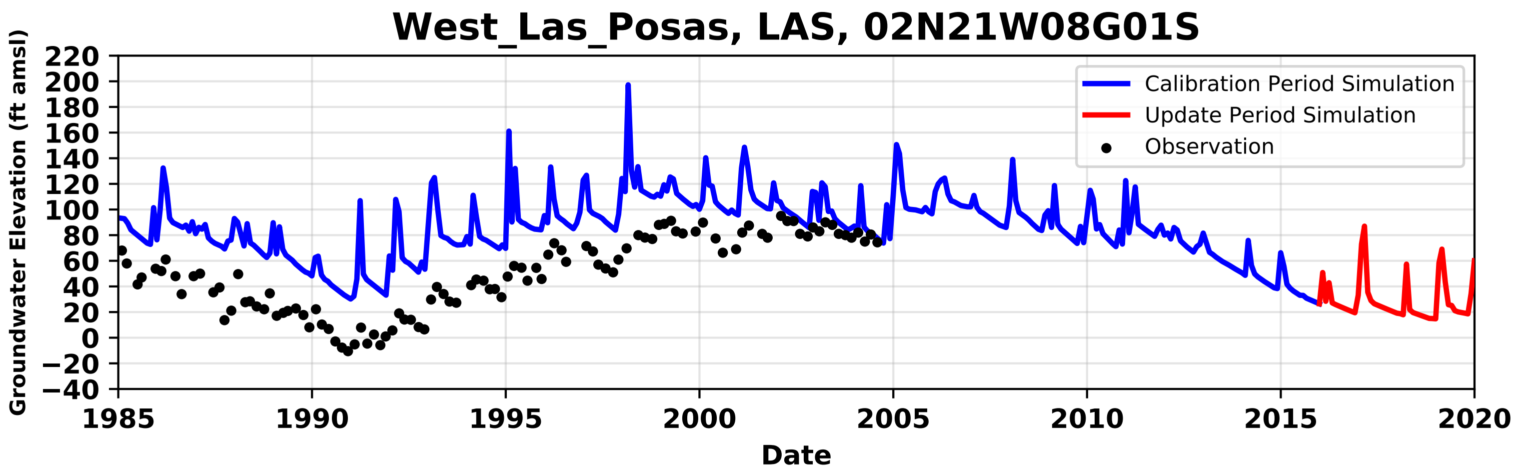

West_Las_Posas, LAS, 02N20W06N01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

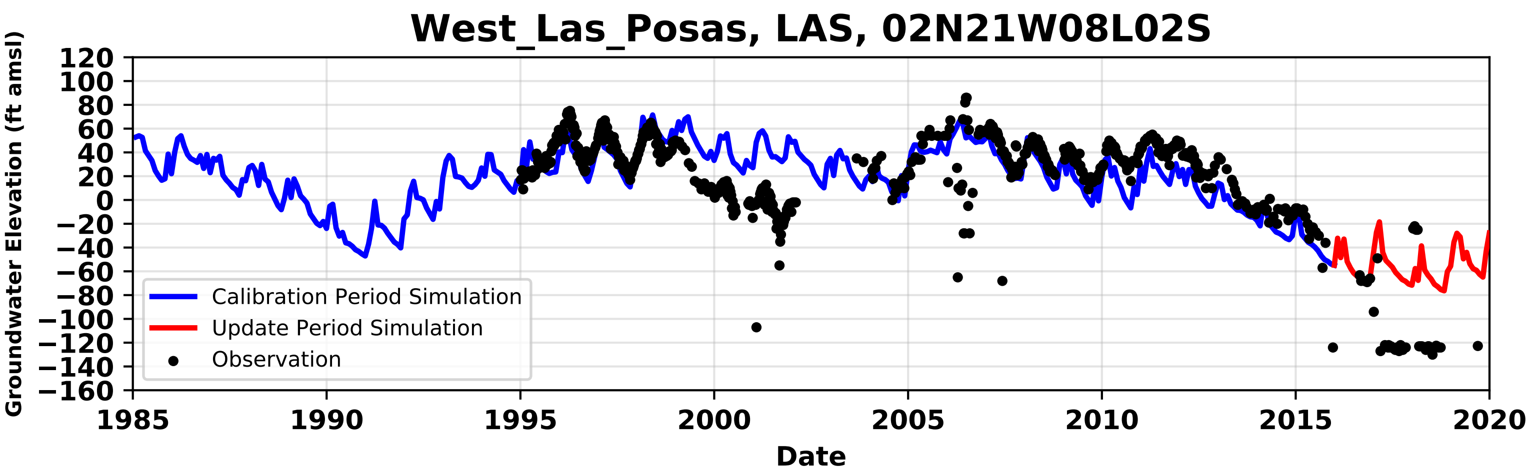

West_Las_Posas, LAS, 02N20W06R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

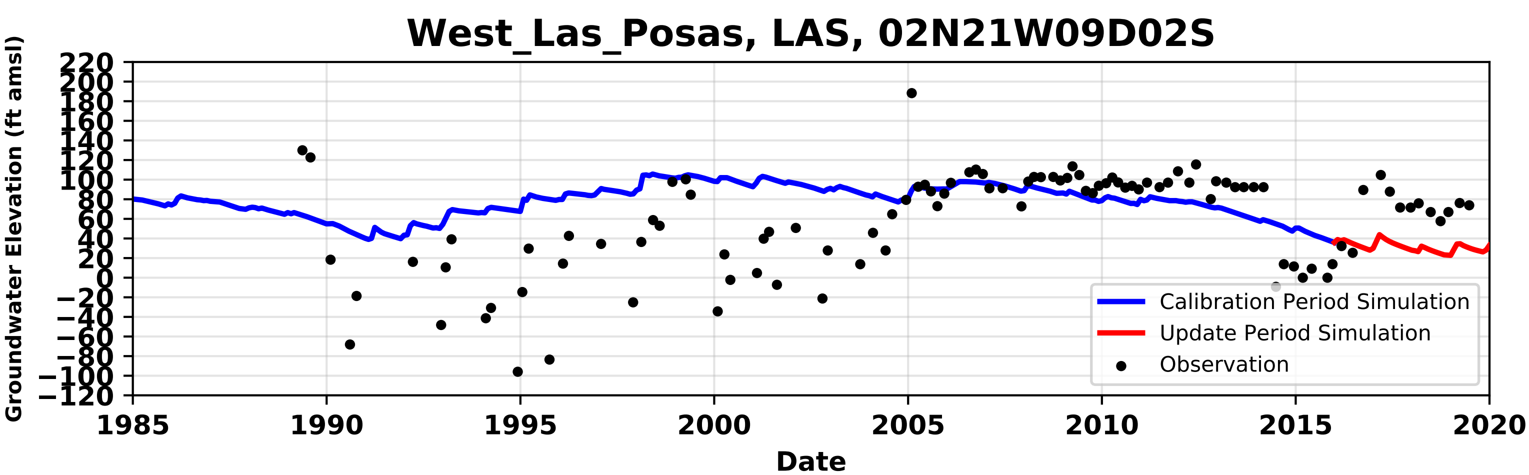

West_Las_Posas, LAS, 02N20W08B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

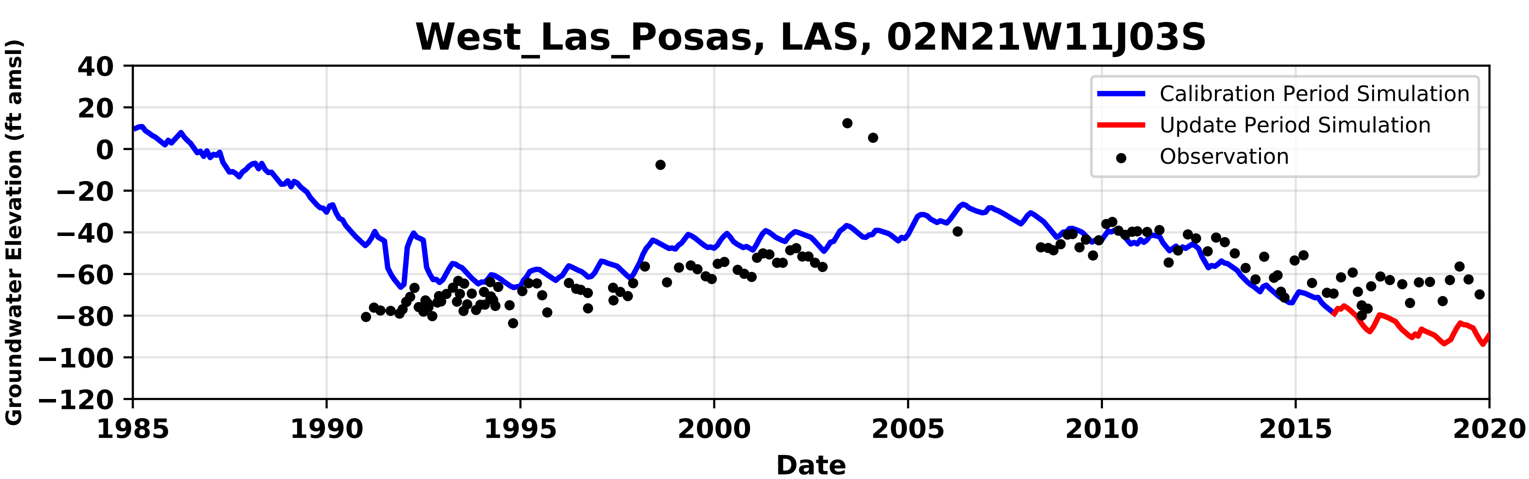

West_Las_Posas, LAS, 02N20W08F01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

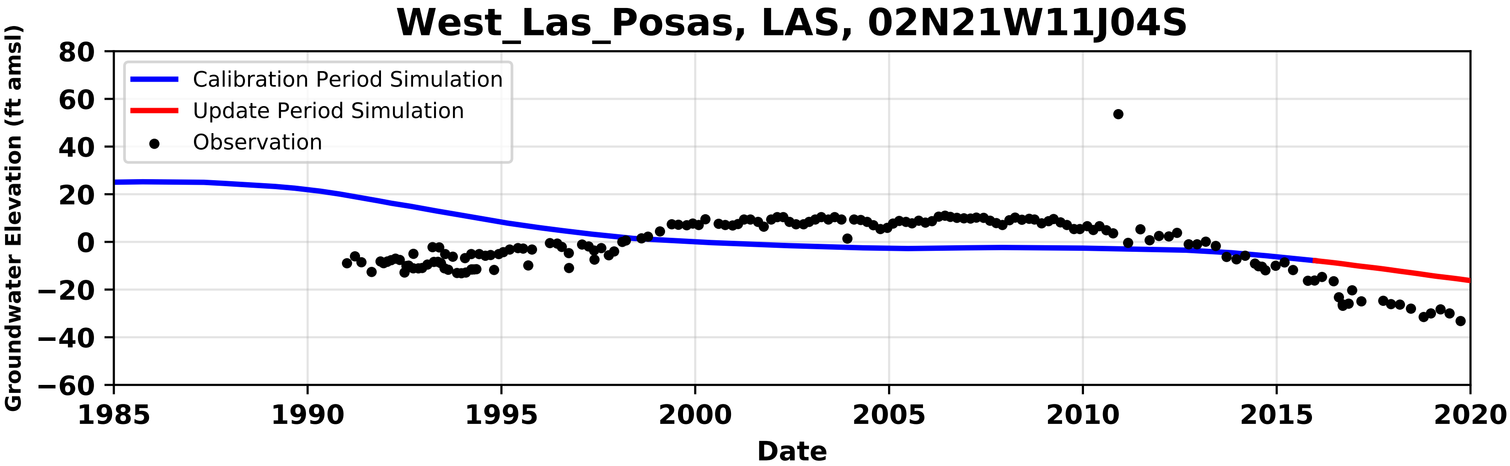

West_Las_Posas, LAS, 02N21W03L01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

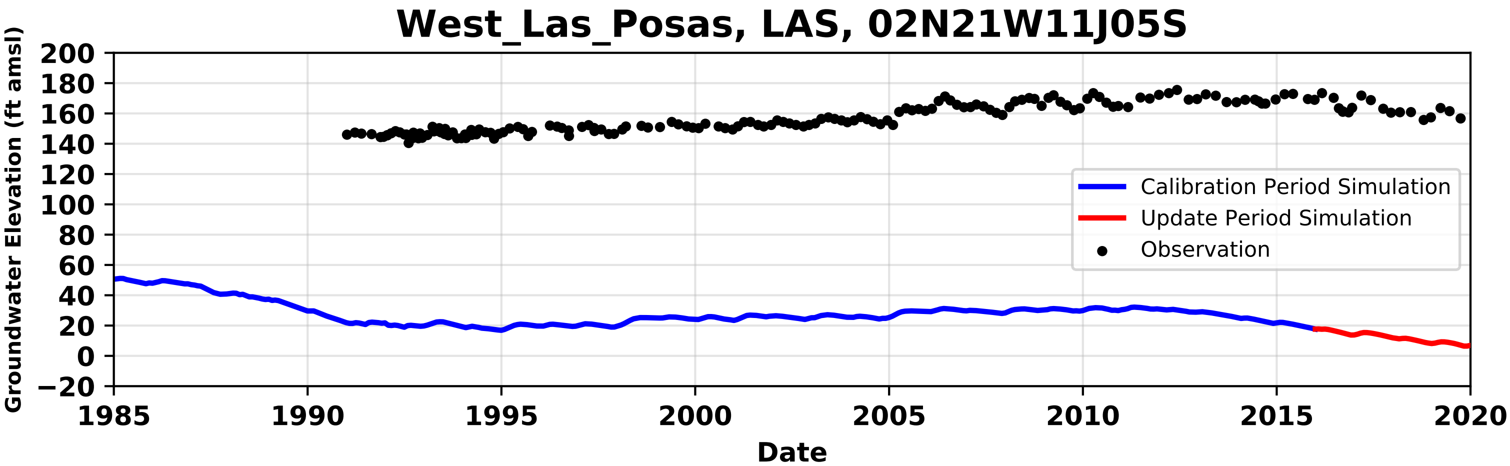

West_Las_Posas, LAS, 02N21W08G01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

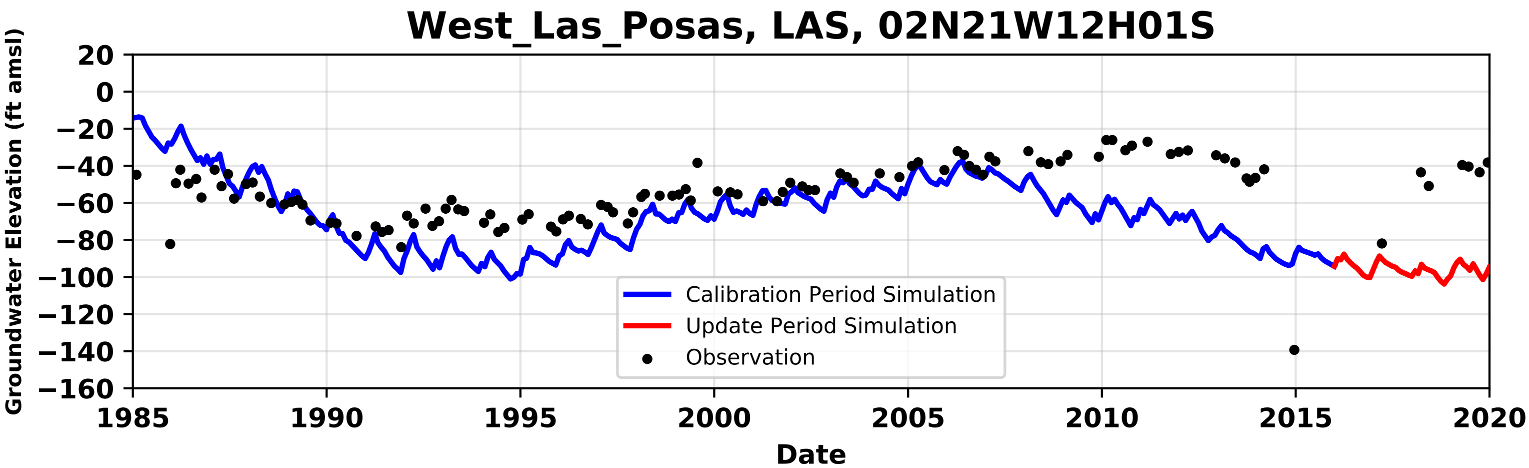

West_Las_Posas, LAS, 02N21W08L02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

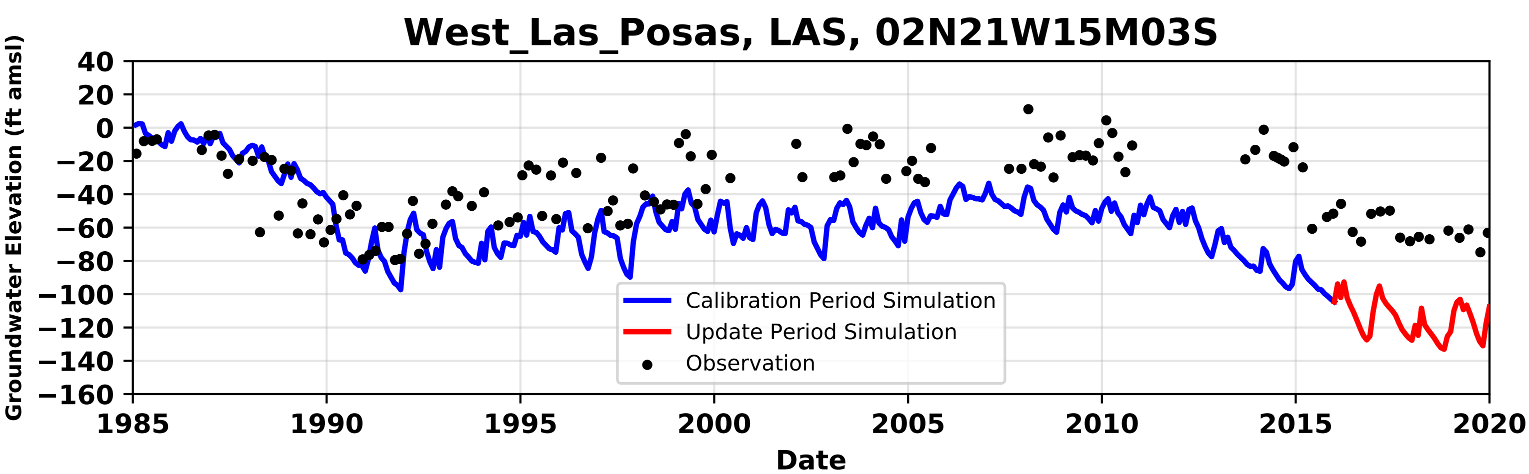

West_Las_Posas, LAS, 02N21W09D02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

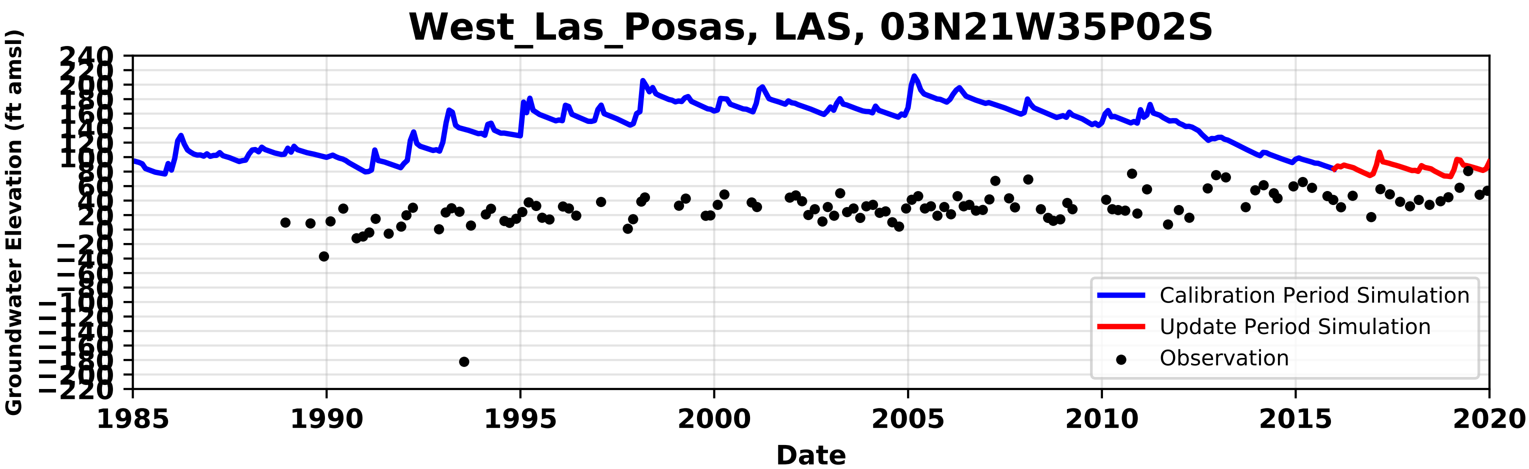

West_Las_Posas, LAS, 02N21W11J03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

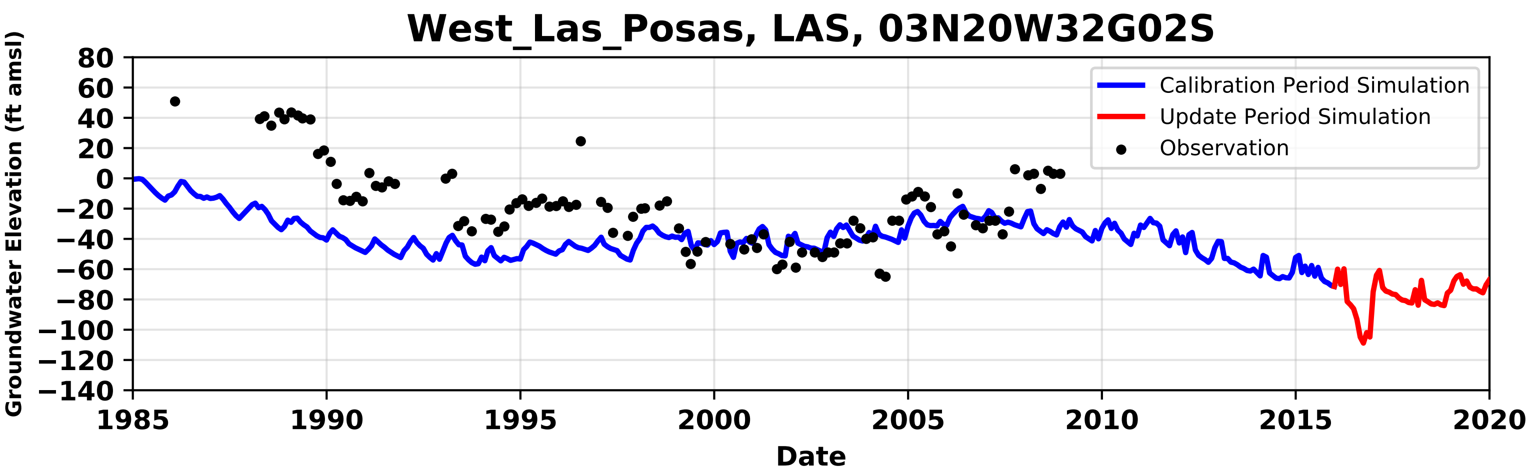

West_Las_Posas, LAS, 02N21W11J04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

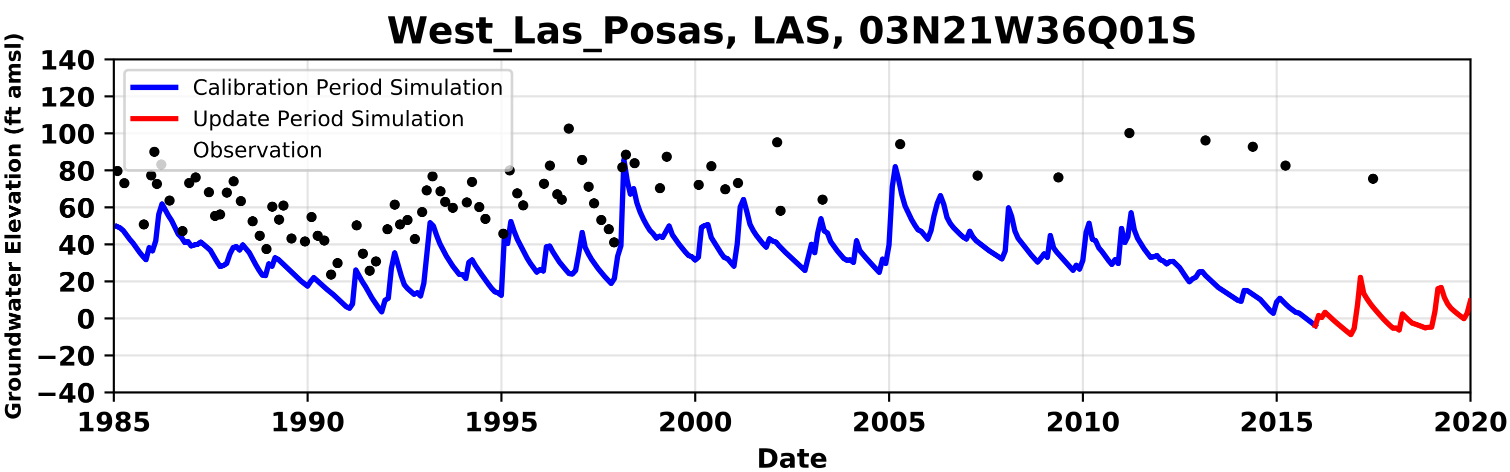

West_Las_Posas, LAS, 02N21W11J05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

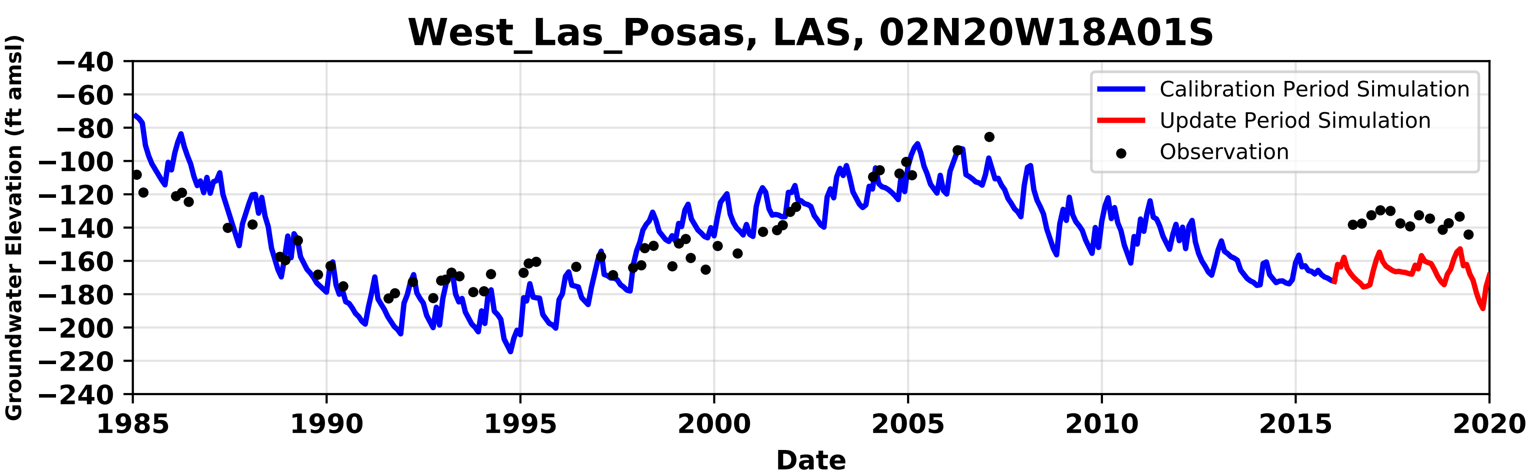

West_Las_Posas, LAS, 02N21W12H01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


West_Las_Posas, LAS, 02N21W15M03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

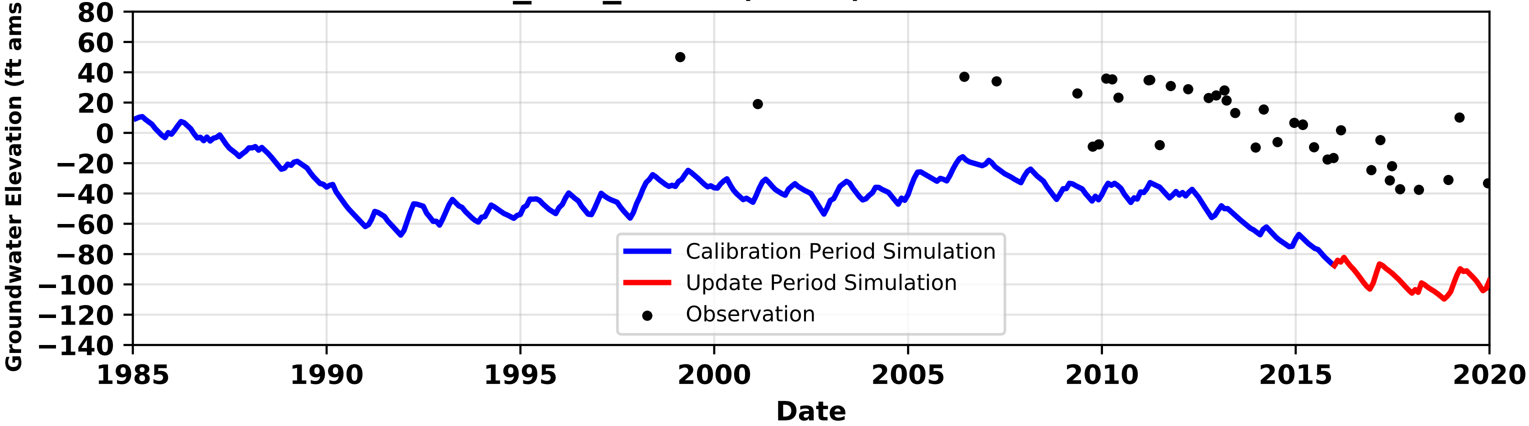

West_Las_Posas, LAS, 03N21W35P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


West_Las_Posas, LAS, 03N20W32G02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

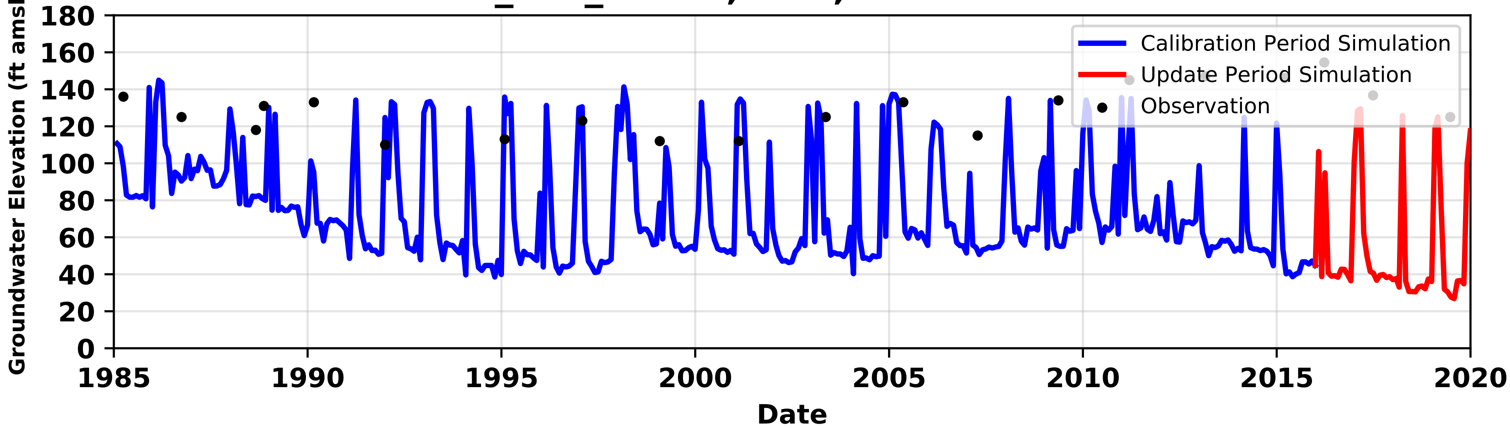

West_Las_Posas, LAS, 03N21W36Q01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


West_Las_Posas, LAS, 02N20W18A01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

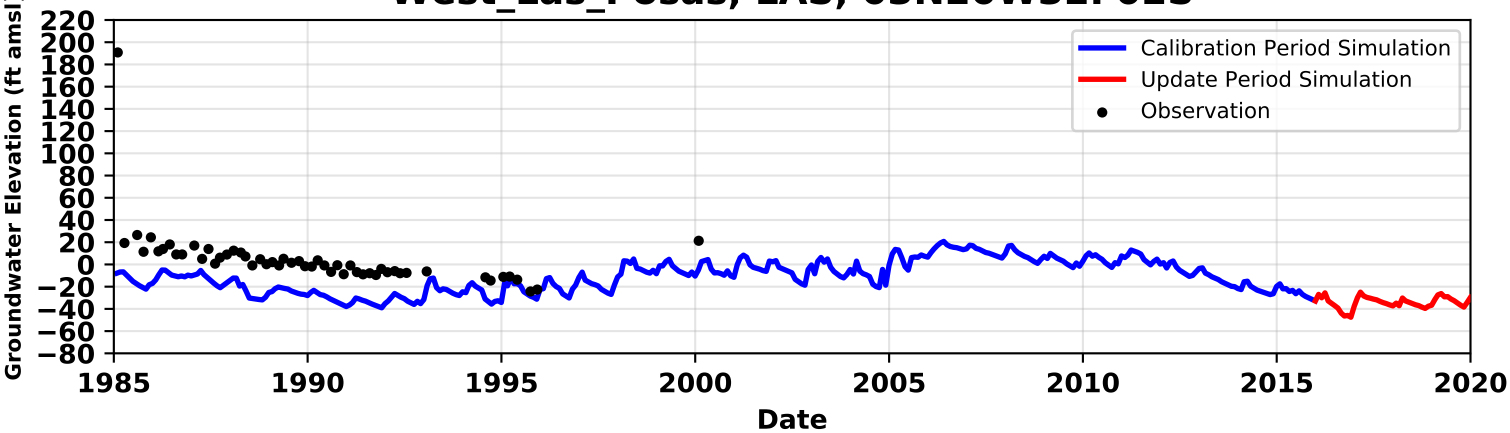
West_Las_Posas, LAS, 02N21W10G03S



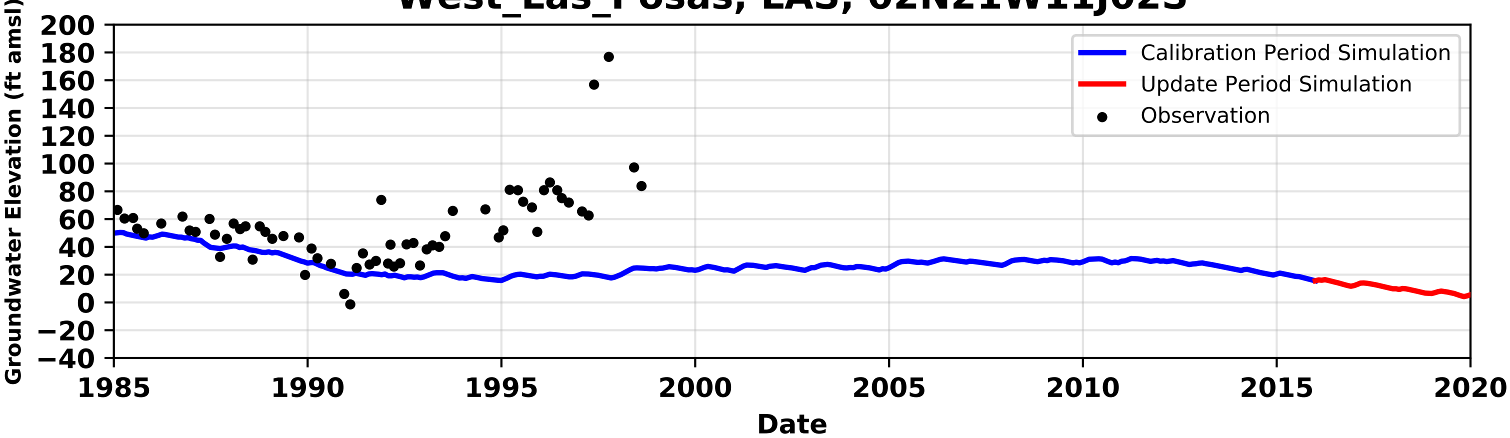
West_Las_Posas, LAS, 02N21W11A02S

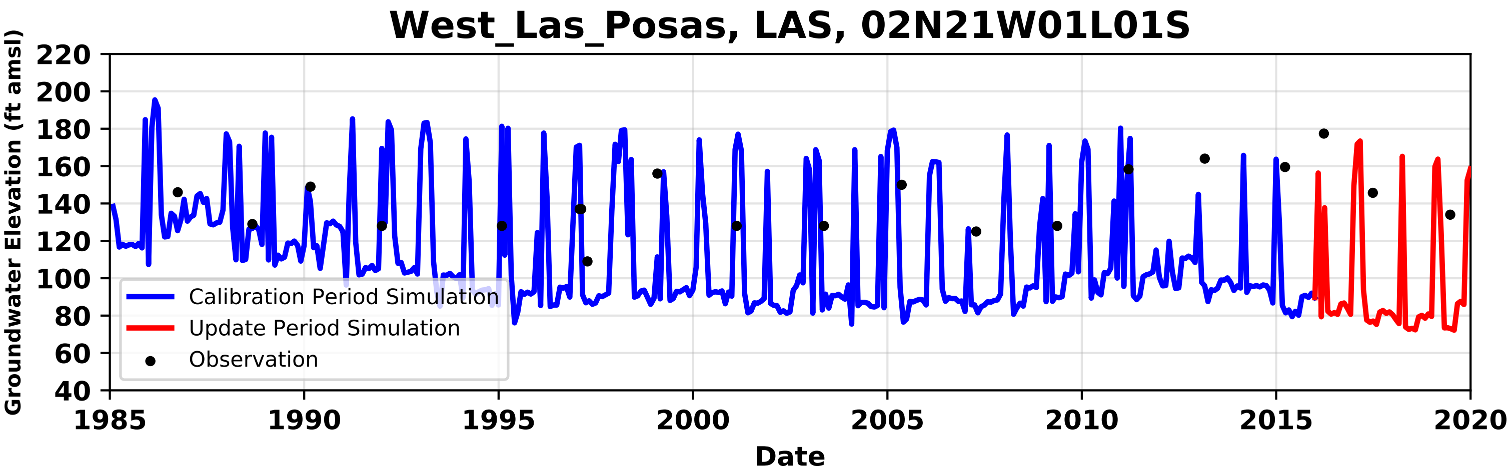


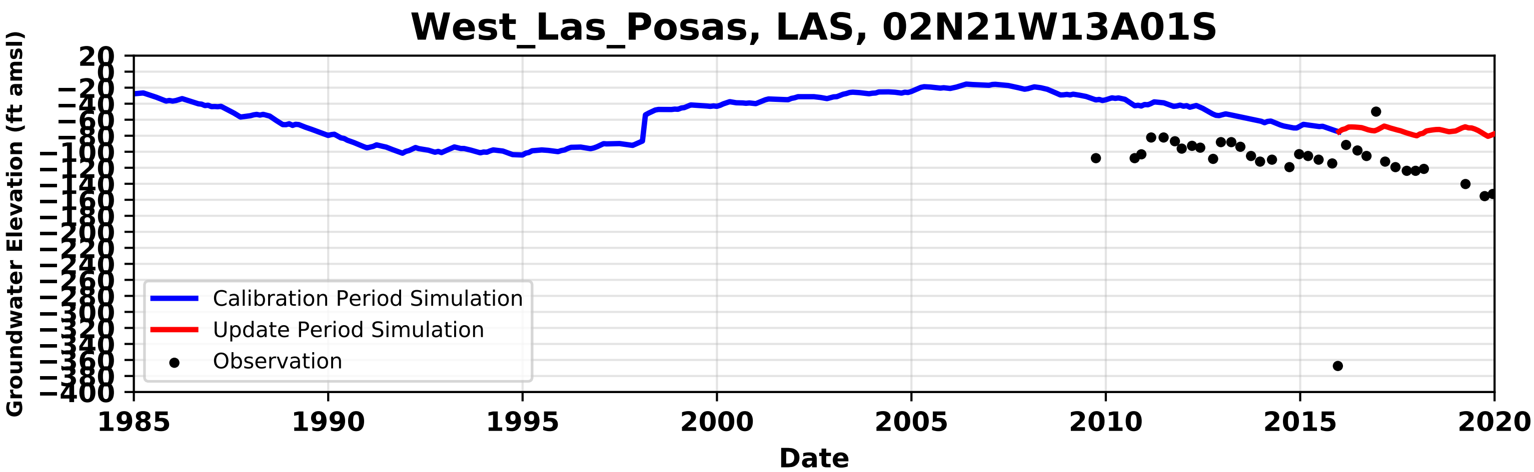
West_Las_Posas, LAS, 03N20W32F02S

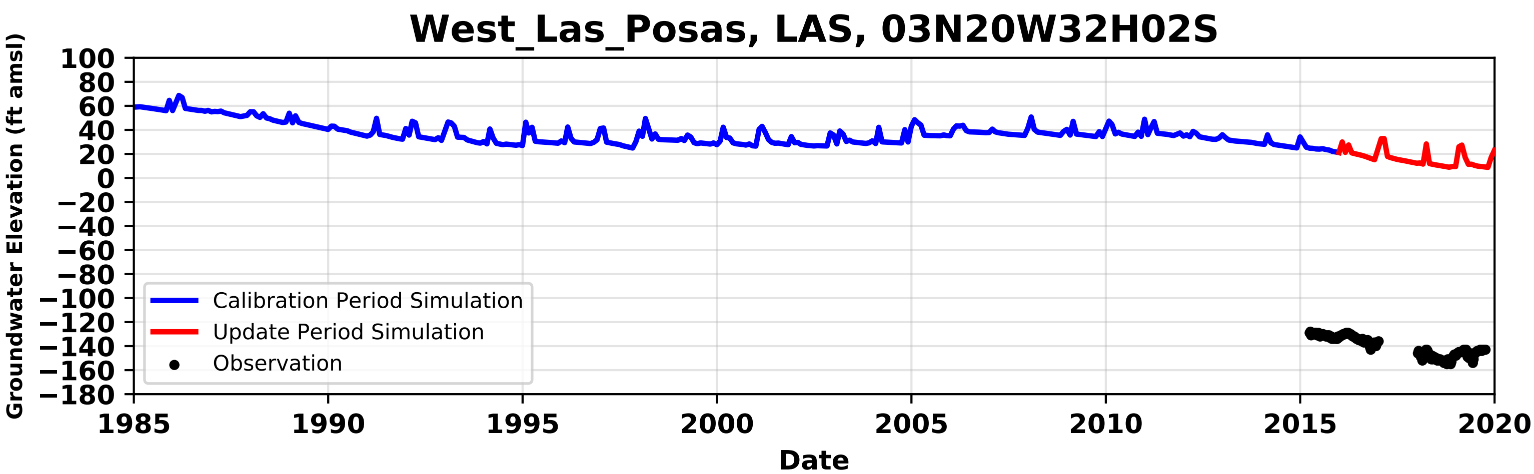


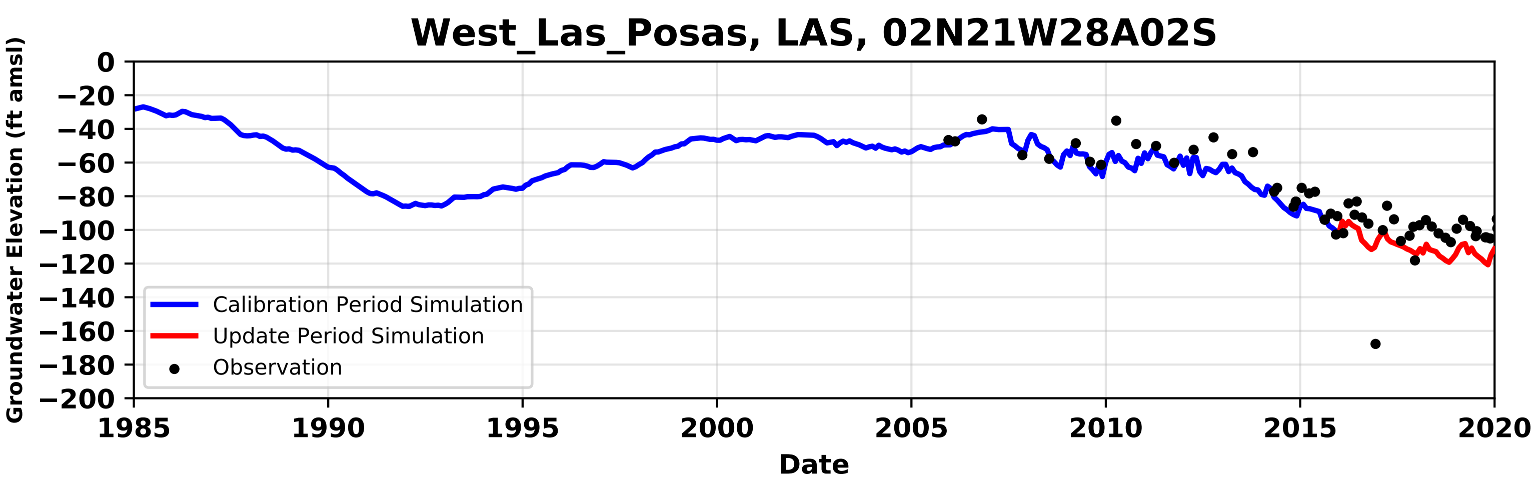
West_Las_Posas, LAS, 02N21W11J02S




West_Las_Posas, LAS, 02N21W01L01S
Groundwater Elevation (ft amsl)
220
200
180
160
140
120
100
80
60
40
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


West_Las_Posas, LAS, 02N21W13A01S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
−220
−240
−260
−280
−300
−320
−340
−360
−380
−400
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


West_Las_Posas, LAS, 03N20W32H02S
Groundwater Elevation (ft amsl)
100
80
60
40
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


West_Las_Posas, LAS, 02N21W28A02S
Groundwater Elevation (ft amsl)
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

Appendix B – Monthly Groundwater Budgets

This page intentionally blank.

Table B-1. Monthly Groundwater Budget for Aquifer A in Piru Basin

			influx(+) outflux(-); units in Acre-feet									
Date	Stress Period	Days in Month	Change in Storage	SCR Underflow	Mountain Front Recharge	ET	Recharge	Pumping from Wells	Outside of Basin	Fillmore A	Piru B	Net Stream Percolation
1/31/2016	11353	31	-1709	424	252	-104	1467	-21	4	-389	-3900	3976
2/29/2016	11382	29	561	397	42	-107	377	-55	1	-356	-2862	2002
3/31/2016	11413	31	-517	424	105	-162	719	-36	2	-383	-3111	2959
4/30/2016	11443	30	1122	411	9	-188	377	-119	0	-349	-2676	1414
5/31/2016	11474	31	981	424	9	-225	390	-117	0	-352	-2306	1195
6/30/2016	11504	30	1232	411	9	-223	398	-114	0	-328	-1897	513
7/31/2016	11535	31	1136	424	9	-219	404	-116	0	-337	-1714	413
8/31/2016	11566	31	746	424	9	-230	409	-115	0	-326	-1503	586
9/30/2016	11596	30	138	411	9	-180	413	-115	0	-298	-1492	1115
10/31/2016	11627	31	350	424	10	-157	347	-71	0	-301	-1628	1026
11/30/2016	11657	30	356	411	9	-111	352	-107	0	-270	-1785	1146
12/31/2016	11688	31	-1388	424	245	-92	1438	-20	4	-287	-3118	2794
1/31/2017	11719	31	-4294	424	515	-121	2759	-11	8	-288	-7320	8329
2/28/2017	11747	28	-2480	383	441	-149	2288	-13	7	-270	-6919	6712
3/31/2017	11778	31	158	424	9	-236	262	-149	0	-301	-5276	5108
4/30/2017	11808	30	219	411	9	-236	271	-157	0	-292	-3500	3276
5/31/2017	11839	31	-1228	424	9	-254	316	-159	0	-317	-3357	4565
6/30/2017	11869	30	-6611	411	9	-331	312	-168	0	-453	-8043	14875
7/31/2017	11900	31	-428	424	9	-331	355	-187	0	-427	-5104	5688
8/31/2017	11931	31	2339	424	9	-232	350	-186	0	-440	-3634	1370
9/30/2017	11961	30	1518	411	9	-180	351	-186	0	-442	-2563	1083
10/31/2017	11992	31	1070	424	9	-157	349	-186	0	-477	-2214	1182
11/30/2017	12022	30	716	411	9	-111	343	-185	0	-469	-2169	1456
12/31/2017	12053	31	734	424	9	-92	348	-179	0	-488	-2270	1513
1/31/2018	12084	31	-480	424	59	-104	473	-55	2	-560	-2406	2647
2/28/2018	12112	28	228	383	9	-103	286	-139	0	-480	-2421	2237
3/31/2018	12143	31	-1864	424	352	-162	1831	-18	5	-563	-3256	3252
4/30/2018	12173	30	696	411	9	-188	287	-147	0	-535	-2939	2407
5/31/2018	12204	31	1345	424	9	-225	316	-145	0	-545	-2458	1278
6/30/2018	12234	30	972	411	9	-223	325	-140	0	-514	-2392	1552
7/31/2018	12265	31	1146	424	9	-237	373	-136	0	-628	-1952	1001
8/31/2018	12296	31	1178	424	9	-231	393	-136	0	-612	-1565	539
9/30/2018	12326	30	775	411	9	-180	390	-136	0	-574	-1501	806
10/31/2018	12357	31	657	424	9	-157	367	-134	0	-574	-1626	1034
11/30/2018	12387	30	-513	411	56	-111	462	-47	1	-545	-1862	2149
12/31/2018	12418	31	-988	424	44	-92	472	-57	2	-551	-3801	4547
1/31/2019	12449	31	-2509	424	394	-104	2018	-16	6	-564	-5234	5585
2/28/2019	12477	28	-5220	383	476	-152	2372	-14	7	-529	-5321	7997
3/31/2019	12508	31	-3526	424	184	-253	1116	-31	4	-616	-4260	6958
4/30/2019	12538	30	-3825	411	9	-311	324	-167	0	-597	-4925	9082
5/31/2019	12569	31	-2412	424	32	-358	380	-76	1	-655	-4781	7444
6/30/2019	12599	30	-5565	411	9	-300	340	-174	0	-800	-7362	13441
7/31/2019	12630	31	-1491	424	9	-239	406	-179	0	-919	-5510	7498
8/31/2019	12661	31	2511	424	9	-231	425	-181	0	-980	-3246	1269
9/30/2019	12691	30	2073	411	9	-181	399	-182	0	-961	-2956	1389
10/31/2019	12722	31	1648	424	9	-161	362	-182	0	-999	-2778	1678
11/30/2019	12752	30	-781	411	89	-116	649	-52	2	-966	-2388	3152
12/31/2019	12783	31	-3184	424	289	-102	1716	-22	5	-996	-2540	4409

Table B-2. Monthly Groundwater Budget for Aquifer B in Piru Basin

Date	Stress Period	Days in Month	influx(+) outflux(-); units in Acre-feet					
			Change in Storage	Mountain Front Recharge	Pumping from Wells	Piru A	Fillmore B	Piru C
1/31/2016	11353	31	-2583	1383	-255	3900	-1798	-648
2/29/2016	11382	29	-271	182	-590	2862	-1677	-505
3/31/2016	11413	31	-924	515	-392	3111	-1776	-535
4/30/2016	11443	30	776	0	-1285	2676	-1700	-467
5/31/2016	11474	31	1228	0	-1297	2306	-1747	-490
6/30/2016	11504	30	1578	0	-1295	1897	-1691	-489
7/31/2016	11535	31	1915	0	-1331	1714	-1841	-456
8/31/2016	11566	31	2108	0	-1327	1503	-1835	-448
9/30/2016	11596	30	2039	0	-1323	1492	-1774	-435
10/31/2016	11627	31	1559	13	-958	1628	-1815	-428
11/30/2016	11657	30	1487	0	-1122	1785	-1739	-411
12/31/2016	11688	31	-1799	1276	-250	3118	-1796	-549
1/31/2017	11719	31	-7640	2839	-142	7320	-1762	-614
2/28/2017	11747	28	-6942	2345	-160	6919	-1624	-539
3/31/2017	11778	31	-2108	0	-951	5276	-1759	-458
4/30/2017	11808	30	-401	0	-939	3500	-1716	-445
5/31/2017	11839	31	-155	0	-938	3357	-1800	-464
6/30/2017	11869	30	-4663	0	-951	8043	-1876	-553
7/31/2017	11900	31	-1433	0	-1069	5104	-2077	-525
8/31/2017	11931	31	28	0	-1053	3634	-2112	-497
9/30/2017	11961	30	1040	0	-1040	2563	-2092	-472
10/31/2017	11992	31	1486	0	-1037	2214	-2184	-478
11/30/2017	12022	30	1459	0	-1032	2169	-2140	-457
12/31/2017	12053	31	1441	0	-1040	2270	-2203	-467
1/31/2018	12084	31	245	314	-422	2406	-1988	-555
2/28/2018	12112	28	832	0	-997	2421	-1781	-475
3/31/2018	12143	31	-2370	1960	-200	3256	-1971	-675
4/30/2018	12173	30	462	0	-996	2939	-1888	-517
5/31/2018	12204	31	975	0	-1006	2458	-1928	-499
6/30/2018	12234	30	965	0	-1007	2392	-1858	-491
7/31/2018	12265	31	1541	0	-1165	1952	-1846	-482
8/31/2018	12296	31	1900	0	-1160	1565	-1833	-472
9/30/2018	12326	30	1871	0	-1155	1501	-1760	-456
10/31/2018	12357	31	1799	0	-1159	1626	-1799	-467
11/30/2018	12387	30	519	285	-462	1862	-1735	-469
12/31/2018	12418	31	-1286	229	-507	3801	-1768	-469
1/31/2019	12449	31	-4791	2080	-191	5234	-1743	-589
2/28/2019	12477	28	-5519	2510	-179	5321	-1586	-547
3/31/2019	12508	31	-2685	995	-304	4260	-1761	-504
4/30/2019	12538	30	-1547	0	-1216	4925	-1698	-464
5/31/2019	12569	31	-2001	164	-631	4781	-1797	-515
6/30/2019	12599	30	-3669	0	-1228	7362	-1887	-578
7/31/2019	12630	31	-1436	0	-1269	5510	-2148	-656
8/31/2019	12661	31	826	0	-1258	3246	-2189	-626
9/30/2019	12691	30	987	0	-1243	2956	-2129	-571
10/31/2019	12722	31	1225	0	-1240	2778	-2195	-568
11/30/2019	12752	30	294	451	-409	2388	-2130	-595
12/31/2019	12783	31	-999	1544	-225	2540	-2195	-665

Table B-3. Monthly Groundwater Budget for Aquifer C in Piru Basin

Date	Stress Period	days in month	Change in Storage	Pumping from Wells	Piru B	Fillmore C
			influx(+) outflux(-); units in Acre-feet			
1/31/2016	11353	31	-214	82	648	-516
2/29/2016	11382	29	-48	25	505	-483
3/31/2016	11413	31	-82	59	535	-512
4/30/2016	11443	30	94	-62	467	-499
5/31/2016	11474	31	80	-51	490	-519
6/30/2016	11504	30	72	-56	489	-505
7/31/2016	11535	31	45	-45	456	-456
8/31/2016	11566	31	54	-50	448	-452
9/30/2016	11596	30	54	-55	435	-434
10/31/2016	11627	31	27	-12	428	-442
11/30/2016	11657	30	44	-33	411	-423
12/31/2016	11688	31	-185	62	549	-426
1/31/2017	11719	31	-228	80	614	-467
2/28/2017	11747	28	-203	86	539	-421
3/31/2017	11778	31	3	18	458	-478
4/30/2017	11808	30	28	14	445	-487
5/31/2017	11839	31	35	16	464	-515
6/30/2017	11869	30	-66	37	553	-525
7/31/2017	11900	31	-68	35	525	-492
8/31/2017	11931	31	-19	18	497	-497
9/30/2017	11961	30	9	6	472	-487
10/31/2017	11992	31	26	3	478	-508
11/30/2017	12022	30	39	-3	457	-493
12/31/2017	12053	31	43	-1	467	-509
1/31/2018	12084	31	-42	60	555	-573
2/28/2018	12112	28	69	-23	475	-521
3/31/2018	12143	31	-203	92	675	-565
4/30/2018	12173	30	42	-16	517	-543
5/31/2018	12204	31	71	-8	499	-562
6/30/2018	12234	30	67	-12	491	-546
7/31/2018	12265	31	49	-34	482	-497
8/31/2018	12296	31	58	-39	472	-492
9/30/2018	12326	30	60	-44	456	-473
10/31/2018	12357	31	60	-43	467	-485
11/30/2018	12387	30	-41	34	469	-462
12/31/2018	12418	31	-35	36	469	-470
1/31/2019	12449	31	-206	78	589	-461
2/28/2019	12477	28	-223	81	547	-405
3/31/2019	12508	31	-129	78	504	-453
4/30/2019	12538	30	22	-34	464	-452
5/31/2019	12569	31	-91	62	515	-486
6/30/2019	12599	30	-67	-16	578	-495
7/31/2019	12630	31	-71	-40	656	-545
8/31/2019	12661	31	-20	-50	626	-556
9/30/2019	12691	30	34	-64	571	-540
10/31/2019	12722	31	56	-67	568	-557
11/30/2019	12752	30	-114	55	595	-537
12/31/2019	12783	31	-202	85	665	-548

Table B-4. Monthly Groundwater Budget for Aquifer A in Fillmore Basin

Date	Stress Period	Days in Month	Change in Storage	Mountain Front Recharge	ET	Recharge	Pumping from Wells	Outside of Basin	Piru A	Santa Paula	Fillmore B	Net Stream Percolation
			influx(+) outflux(-); units in Acre-feet									
1/31/2016	11353	31	-2468	237	-109	2428	-48	-12	389	-251	-558	252
2/29/2016	11382	29	-238	58	-126	1085	-253	-10	356	-248	-870	185
3/31/2016	11413	31	-1482	134	-199	1635	-110	-10	383	-271	-418	261
4/30/2016	11443	30	1528	23	-224	1185	-576	-9	349	-242	-2181	89
5/31/2016	11474	31	1688	23	-241	1191	-574	-9	352	-236	-2211	-41
6/30/2016	11504	30	1808	23	-220	1184	-569	-8	328	-225	-2207	-170
7/31/2016	11535	31	1932	23	-216	1269	-573	-7	337	-253	-2330	-240
8/31/2016	11566	31	1854	23	-195	1270	-569	-6	326	-266	-2312	-182
9/30/2016	11596	30	1816	23	-143	1265	-563	-5	298	-259	-2397	-89
10/31/2016	11627	31	827	25	-122	1130	-384	-6	301	-272	-1537	-20
11/30/2016	11657	30	1655	23	-83	1243	-535	-5	270	-263	-2391	33
12/31/2016	11688	31	-1988	230	-75	2221	-70	-11	287	-278	-696	265
1/31/2017	11719	31	-4968	540	-114	4427	2	-35	288	-282	-1558	1384
2/28/2017	11747	28	-5561	451	-151	3962	-7	-44	270	-259	-1687	2731
3/31/2017	11778	31	843	23	-234	1160	-475	-13	301	-245	-2233	797
4/30/2017	11808	30	990	23	-240	1156	-475	7	292	-211	-2074	463
5/31/2017	11839	31	797	23	-266	1162	-472	6	317	-212	-1986	559
6/30/2017	11869	30	-972	23	-265	1157	-469	-2	453	-200	-2108	2318
7/31/2017	11900	31	1460	23	-265	1278	-583	-6	427	-189	-2247	34
8/31/2017	11931	31	1445	23	-233	1278	-578	-7	440	-179	-2102	-154
9/30/2017	11961	30	1374	23	-170	1273	-573	-8	442	-169	-2021	-235
10/31/2017	11992	31	1211	23	-141	1277	-568	-9	477	-176	-1924	-235
11/30/2017	12022	30	1178	23	-94	1272	-565	-10	469	-169	-1964	-201
12/31/2017	12053	31	1098	23	-75	1276	-561	-11	488	-176	-1943	-183
1/31/2018	12084	31	-1370	68	-91	1075	-152	-13	560	-219	-269	342
2/28/2018	12112	28	753	21	-92	1009	-501	-13	480	-193	-1735	215
3/31/2018	12143	31	-4384	438	-166	3338	-11	-30	563	-244	-809	1034
4/30/2018	12173	30	687	23	-207	1022	-504	-19	535	-219	-1763	377
5/31/2018	12204	31	573	23	-225	1027	-502	-11	545	-207	-1681	393
6/30/2018	12234	30	832	23	-208	1022	-502	-12	514	-196	-1695	158
7/31/2018	12265	31	1256	23	-205	982	-583	-13	628	-208	-2000	56
8/31/2018	12296	31	1282	23	-184	982	-578	-13	612	-213	-1917	-58
9/30/2018	12326	30	1296	23	-134	977	-573	-12	574	-207	-1962	-42
10/31/2018	12357	31	1248	23	-111	979	-569	-12	574	-215	-1961	-18
11/30/2018	12387	30	-1131	98	-84	1099	-147	-12	545	-233	-271	69
12/31/2018	12418	31	-981	53	-82	898	-212	-12	551	-253	-478	449
1/31/2019	12449	31	-4899	426	-116	3344	-10	-25	564	-266	-771	1488
2/28/2019	12477	28	-6093	477	-152	3514	-13	-43	529	-249	-1214	2955
3/31/2019	12508	31	-3156	169	-261	1509	-90	-30	616	-269	-475	1875
4/30/2019	12538	30	850	23	-286	850	-537	-3	597	-212	-1898	544
5/31/2019	12569	31	-1057	45	-328	792	-213	1	655	-225	-388	641
6/30/2019	12599	30	-2374	23	-342	852	-532	-3	800	-197	-1847	3551
7/31/2019	12630	31	-716	23	-391	1059	-602	-13	919	-183	-2130	1966
8/31/2019	12661	31	953	23	-311	1064	-598	-18	980	-179	-1970	-12
9/30/2019	12691	30	801	23	-219	1059	-597	-18	961	-172	-1961	59
10/31/2019	12722	31	767	23	-183	1085	-595	-20	999	-179	-1915	-49
11/30/2019	12752	30	-1675	86	-136	1124	-140	-21	966	-210	-24	-38
12/31/2019	12783	31	-4151	271	-147	2688	-16	-30	996	-254	21	463

Table B-5. Monthly Groundwater Budget for Aquifer B in Fillmore Basin

Date	Stress Period	Days in Month	influx(+) outflux(-); units in Acre-feet								
			Change in Storage	Mountain Front Recharge	Recharge	Pumping from Wells	Outside of Basin	Fillmore A	Piru B	Santa Paula B	Fillmore C
1/31/2016	11353	31	-1003	596	227	-742	30	558	1798	-904	-454
2/29/2016	11382	29	29	178	40	-1784	24	870	1677	-857	-139
3/31/2016	11413	31	-397	299	103	-1050	20	418	1776	-912	-207
4/30/2016	11443	30	523	156	7	-3660	25	2181	1700	-864	-30
5/31/2016	11474	31	487	161	7	-3674	30	2211	1747	-883	-47
6/30/2016	11504	30	531	156	7	-3684	30	2207	1691	-852	-49
7/31/2016	11535	31	617	161	6	-4053	34	2330	1841	-940	41
8/31/2016	11566	31	635	161	6	-4053	36	2312	1835	-949	55
9/30/2016	11596	30	607	156	6	-4063	36	2397	1774	-924	47
10/31/2016	11627	31	267	170	9	-2896	36	1537	1815	-960	60
11/30/2016	11657	30	549	156	6	-3964	35	2391	1739	-935	59
12/31/2016	11688	31	-743	471	175	-1107	28	696	1796	-931	-298
1/31/2017	11719	31	-2375	1186	465	-632	34	1558	1762	-907	-866
2/28/2017	11747	28	-2338	1085	430	-665	42	1687	1624	-813	-844
3/31/2017	11778	31	381	161	3	-3432	59	2233	1759	-832	-279
4/30/2017	11808	30	447	156	3	-3447	62	2074	1716	-780	-182
5/31/2017	11839	31	397	161	3	-3447	60	1986	1800	-800	-111
6/30/2017	11869	30	160	156	3	-3451	42	2108	1876	-762	-85
7/31/2017	11900	31	365	161	3	-4131	39	2247	2077	-762	48
8/31/2017	11931	31	417	161	3	-4128	36	2102	2112	-758	100
9/30/2017	11961	30	487	156	3	-4135	34	2021	2092	-730	116
10/31/2017	11992	31	495	161	3	-4133	33	1924	2184	-759	136
11/30/2017	12022	30	485	156	3	-4139	31	1964	2140	-733	135
12/31/2017	12053	31	457	161	3	-4138	32	1943	2203	-763	143
1/31/2018	12084	31	-402	203	57	-1195	23	269	1988	-851	-49
2/28/2018	12112	28	253	145	3	-3187	22	1735	1781	-733	17
3/31/2018	12143	31	-1994	972	383	-419	23	809	1971	-863	-690
4/30/2018	12173	30	316	156	3	-3171	32	1763	1888	-791	-150
5/31/2018	12204	31	286	161	3	-3178	35	1681	1928	-807	-64
6/30/2018	12234	30	293	156	3	-3183	30	1695	1858	-776	-33
7/31/2018	12265	31	378	161	4	-3620	28	2000	1846	-847	94
8/31/2018	12296	31	448	161	4	-3619	29	1917	1833	-855	125
9/30/2018	12326	30	467	156	4	-3628	29	1962	1760	-831	123
10/31/2018	12357	31	450	161	4	-3629	31	1961	1799	-864	129
11/30/2018	12387	30	-341	226	69	-1078	21	271	1735	-859	0
12/31/2018	12418	31	-197	197	43	-1460	26	478	1768	-895	82
1/31/2019	12449	31	-2051	996	388	-233	32	771	1743	-884	-573
2/28/2019	12477	28	-2379	1038	410	-222	35	1214	1586	-798	-679
3/31/2019	12508	31	-880	358	124	-674	45	475	1761	-874	-253
4/30/2019	12538	30	324	156	3	-3332	50	1898	1698	-763	17
5/31/2019	12569	31	-128	191	36	-1468	52	388	1797	-836	19
6/30/2019	12599	30	116	156	3	-3337	41	1847	1887	-744	79
7/31/2019	12630	31	137	161	3	-3896	30	2130	2148	-727	62
8/31/2019	12661	31	228	161	3	-3896	25	1970	2189	-724	91
9/30/2019	12691	30	263	156	3	-3899	23	1961	2129	-701	108
10/31/2019	12722	31	247	161	3	-3894	23	1915	2195	-732	127
11/30/2019	12752	30	-416	220	63	-1234	14	24	2130	-792	35
12/31/2019	12783	31	-1347	691	266	-523	13	-21	2195	-852	-302

Table B-6. Monthly Groundwater Budget for Aquifer C in Fillmore Basin

Date	Stress Period	Days in Month	Change in Storage	Mountain Front Recharge	Recharge	Pumping from Wells	Outside of Basin	Fillmore B	Piru C	Santa Paula C
			influx(+) outflux(-); units in Acre-feet							
1/31/2016	11353	31	-621	348	22	-372	78	454	516	-390
2/29/2016	11382	29	5	123	9	-446	73	139	483	-362
3/31/2016	11413	31	-142	153	13	-399	77	207	512	-394
4/30/2016	11443	30	240	125	0	-589	77	30	499	-362
5/31/2016	11474	31	191	129	0	-578	80	47	519	-369
6/30/2016	11504	30	191	125	0	-572	78	49	505	-355
7/31/2016	11535	31	165	129	0	-400	79	-41	456	-367
8/31/2016	11566	31	186	129	0	-404	79	-55	452	-367
9/30/2016	11596	30	184	125	0	-400	77	-47	434	-353
10/31/2016	11627	31	111	129	0	-307	78	-60	442	-373
11/30/2016	11657	30	200	125	0	-391	76	-59	423	-355
12/31/2016	11688	31	-503	266	18	-163	75	298	426	-389
1/31/2017	11719	31	-1365	754	47	-352	77	866	467	-403
2/28/2017	11747	28	-1275	696	44	-341	69	844	421	-372
3/31/2017	11778	31	4	129	0	-555	80	279	478	-392
4/30/2017	11808	30	59	125	0	-541	79	182	487	-371
5/31/2017	11839	31	110	129	0	-544	82	111	515	-382
6/30/2017	11869	30	118	125	0	-542	78	85	525	-368
7/31/2017	11900	31	110	129	0	-358	77	-48	492	-382
8/31/2017	11931	31	165	129	0	-365	77	-100	497	-382
9/30/2017	11961	30	181	125	0	-364	74	-116	487	-368
10/31/2017	11992	31	192	129	0	-371	76	-136	508	-379
11/30/2017	12022	30	196	125	0	-368	74	-135	493	-365
12/31/2017	12053	31	199	129	0	-373	76	-143	509	-377
1/31/2018	12084	31	6	133	10	-429	76	49	573	-393
2/28/2018	12112	28	215	116	0	-544	70	-17	521	-342
3/31/2018	12143	31	-1158	643	40	-375	75	690	565	-403
4/30/2018	12173	30	65	125	0	-558	75	150	543	-377
5/31/2018	12204	31	124	129	0	-553	78	64	562	-384
6/30/2018	12234	30	157	125	0	-547	76	33	546	-370
7/31/2018	12265	31	151	129	0	-357	76	-94	497	-381
8/31/2018	12296	31	194	129	0	-363	76	-125	492	-382
9/30/2018	12326	30	198	125	0	-359	74	-123	473	-368
10/31/2018	12357	31	201	129	0	-362	76	-129	485	-379
11/30/2018	12387	30	-67	129	13	-200	72	0	462	-384
12/31/2018	12418	31	56	132	8	-235	74	-82	470	-399
1/31/2019	12449	31	-1130	633	40	-162	73	573	461	-412
2/28/2019	12477	28	-1251	675	42	-149	66	679	405	-382
3/31/2019	12508	31	-347	197	15	-189	73	253	453	-425
4/30/2019	12538	30	90	125	0	-307	73	-17	452	-394
5/31/2019	12569	31	-22	131	8	-218	75	-19	486	-416
6/30/2019	12599	30	108	125	0	-308	73	-79	495	-392
7/31/2019	12630	31	124	129	0	-390	75	-62	545	-400
8/31/2019	12661	31	146	129	0	-394	74	-91	556	-400
9/30/2019	12691	30	168	125	0	-392	71	-108	540	-385
10/31/2019	12722	31	183	129	0	-399	74	-127	557	-398
11/30/2019	12752	30	-42	129	8	-240	69	-35	537	-402
12/31/2019	12783	31	-644	380	24	-211	70	302	548	-430

Table B-7. Monthly Groundwater Budget for Aquifer A in Santa Paula Basin

Date	Stress Period	Days in Month	Change in Storage	ET	Recharge	Pumping from Wells	Outside of Basin	Fillmore A	Mound L1	Santa Paula B	Mound L2 L3	Oxnard UAS	Net Stream Percolation
			influx(+) outflux(-); units in Acre-feet										
1/31/2016	11353	31	-1440	-38	1662	-8	-3	251	0	-37	-1	-350	-53
2/29/2016	11382	29	-268	-39	768	-73	-6	248	0	-236	-1	-326	-89
3/31/2016	11413	31	-1018	-59	1081	-25	-5	271	0	163	-2	-346	-80
4/30/2016	11443	30	579	-68	750	-154	-19	242	0	-918	1	-331	-100
5/31/2016	11474	31	698	-82	754	-154	-26	236	0	-1018	4	-336	-91
6/30/2016	11504	30	710	-80	764	-155	-26	225	0	-1054	4	-322	-82
7/31/2016	11535	31	738	-81	802	-196	-27	253	0	-1101	5	-332	-78
8/31/2016	11566	31	719	-76	787	-195	-26	266	0	-1092	5	-332	-73
9/30/2016	11596	30	727	-59	774	-195	-24	259	0	-1114	5	-323	-66
10/31/2016	11627	31	537	-51	753	-165	-23	272	0	-942	5	-335	-67
11/30/2016	11657	30	540	-36	746	-184	-23	263	0	-935	4	-326	-64
12/31/2016	11688	31	-1119	-33	1318	-27	-7	278	0	-27	-1	-343	-55
1/31/2017	11719	31	-2437	-38	2604	5	2	282	0	-53	-4	-357	-37
2/28/2017	11747	28	-2533	-38	2589	7	6	259	0	23	-5	-326	-9
3/31/2017	11778	31	-177	-59	734	-82	-1	245	0	-284	-5	-348	-46
4/30/2017	11808	30	100	-68	758	-85	-19	211	0	-502	-2	-331	-83
5/31/2017	11839	31	154	-82	775	-87	-24	212	0	-572	-1	-340	-57
6/30/2017	11869	30	10	-81	741	-87	-38	200	0	-657	0	-335	227
7/31/2017	11900	31	464	-86	831	-116	-30	189	0	-878	0	-349	-42
8/31/2017	11931	31	532	-84	828	-116	-27	179	0	-883	1	-342	-106
9/30/2017	11961	30	531	-65	802	-115	-26	169	0	-897	1	-328	-89
10/31/2017	11992	31	499	-57	804	-115	-26	176	0	-876	1	-340	-84
11/30/2017	12022	30	492	-40	802	-115	-24	169	0	-892	1	-331	-77
12/31/2017	12053	31	456	-33	824	-115	-23	176	0	-880	1	-344	-77
1/31/2018	12084	31	-467	-38	792	-44	-15	219	0	-55	-1	-348	-62
2/28/2018	12112	28	408	-38	739	-126	-17	193	0	-789	0	-315	-70
3/31/2018	12143	31	-1877	-59	2145	-2	-2	244	0	-92	-2	-352	-31
4/30/2018	12173	30	223	-68	785	-124	-11	219	0	-637	-2	-338	-67
5/31/2018	12204	31	382	-81	801	-125	-22	207	0	-758	1	-343	-80
6/30/2018	12234	30	447	-77	786	-126	-23	196	0	-810	2	-331	-82
7/31/2018	12265	31	691	-78	850	-178	-26	208	0	-1067	2	-341	-78
8/31/2018	12296	31	711	-73	830	-177	-26	213	0	-1082	3	-341	-73
9/30/2018	12326	30	729	-56	805	-176	-24	207	0	-1101	3	-332	-67
10/31/2018	12357	31	685	-48	827	-176	-24	215	0	-1087	3	-344	-65
11/30/2018	12387	30	-478	-36	821	-51	-13	233	0	-96	-1	-337	-61
12/31/2018	12418	31	-444	-33	770	-70	-10	253	0	-95	-3	-360	-27
1/31/2019	12449	31	-2081	-38	2298	3	1	266	0	-73	-5	-369	-32
2/28/2019	12477	28	-2166	-38	2185	4	3	249	0	44	-6	-333	22
3/31/2019	12508	31	-1326	-59	1087	-14	0	269	0	355	-7	-358	29
4/30/2019	12538	30	290	-68	814	-99	-20	212	0	-763	-3	-334	-47
5/31/2019	12569	31	-293	-82	777	-50	-22	225	0	-187	-1	-342	-47
6/30/2019	12599	30	72	-81	841	-102	-45	197	0	-943	0	-324	365
7/31/2019	12630	31	265	-86	866	-133	-67	183	0	-1046	1	-311	309
8/31/2019	12661	31	599	-84	882	-133	-45	179	0	-1026	1	-289	-105
9/30/2019	12691	30	596	-65	854	-133	-31	172	0	-1035	1	-282	-95
10/31/2019	12722	31	572	-57	858	-133	-27	179	0	-1022	1	-300	-90
11/30/2019	12752	30	-667	-40	941	-33	-12	210	0	-37	-2	-304	-75
12/31/2019	12783	31	-1790	-33	1880	-4	2	254	0	87	-5	-332	-78

Table B-8. Monthly Groundwater Budget for Aquifer B in Santa Paula Basin

Date	Stress Period	Days in Month	Change in Storage	Mountain Front Recharge	Recharge	Pumping from Wells	Outside of Basin	Santa Paula A	Fillmore B	Mound L2-4	Oxnard UAS	Santa Paula C	Mound L5	Oxnard LAS	Mound L6 L7
			influx(+) outflux(-); units in Acre-feet												
1/31/2016	11353	31	-1152	371	677	-275	28	37	904	0	0	-328	-38	-1	-221
2/29/2016	11382	29	246	42	135	-1377	40	236	857	0	0	61	-28	-1	-204
3/31/2016	11413	31	-453	183	317	-507	19	-163	912	0	0	-36	-37	-1	-228
4/30/2016	11443	30	524	16	111	-2457	92	918	864	0	0	181	-26	-1	-216
5/31/2016	11474	31	417	16	111	-2455	79	1018	883	0	0	189	-24	-1	-227
6/30/2016	11504	30	411	16	111	-2457	77	1054	852	0	0	186	-23	-1	-220
7/31/2016	11535	31	384	16	114	-2570	83	1101	940	0	0	191	-24	-1	-227
8/31/2016	11566	31	387	16	114	-2572	82	1092	949	0	0	191	-24	-1	-227
9/30/2016	11596	30	390	16	114	-2575	82	1114	924	0	0	186	-22	-1	-221
10/31/2016	11627	31	345	16	101	-2356	56	942	960	0	0	197	-24	-1	-229
11/30/2016	11657	30	283	16	104	-2280	73	935	935	0	0	190	-26	-1	-222
12/31/2016	11688	31	-759	241	454	-450	0	27	931	0	0	-169	-38	-1	-231
1/31/2017	11719	31	-1930	696	1161	-75	86	53	907	0	0	-616	-43	-1	-223
2/28/2017	11747	28	-1907	728	1215	-82	135	-23	813	0	0	-632	-40	-1	-194
3/31/2017	11778	31	743	16	80	-1744	109	284	832	0	0	-67	-34	-1	-211
4/30/2017	11808	30	492	16	80	-1741	67	502	780	0	0	53	-30	-1	-212
5/31/2017	11839	31	384	16	80	-1735	49	572	800	0	0	96	-31	-1	-222
6/30/2017	11869	30	319	16	80	-1736	40	657	762	0	0	116	-29	-1	-217
7/31/2017	11900	31	293	16	113	-2011	66	878	762	0	0	142	-29	-1	-225
8/31/2017	11931	31	270	16	113	-2013	67	883	758	0	0	166	-28	-1	-225
9/30/2017	11961	30	271	16	113	-2016	67	897	730	0	0	172	-27	-1	-218
10/31/2017	11992	31	261	16	113	-2013	65	876	759	0	0	182	-27	-1	-226
11/30/2017	12022	30	270	16	113	-2016	66	892	733	0	0	175	-26	-1	-219
12/31/2017	12053	31	255	16	113	-2013	64	880	763	0	0	182	-27	-1	-226
1/31/2018	12084	31	-211	80	182	-761	1	55	851	0	0	70	-32	-1	-226
2/28/2018	12112	28	367	15	99	-2004	61	789	733	0	0	167	-23	-1	-199
3/31/2018	12143	31	-1618	568	940	-133	65	92	863	0	0	-508	-36	-1	-220
4/30/2018	12173	30	556	16	99	-2003	92	637	791	0	0	48	-27	-1	-201
5/31/2018	12204	31	363	16	99	-1999	67	758	807	0	0	136	-25	-1	-216
6/30/2018	12234	30	310	16	99	-2000	61	810	776	0	0	167	-23	-1	-210
7/31/2018	12265	31	360	16	119	-2425	89	1067	847	0	0	177	-23	-1	-221
8/31/2018	12296	31	343	16	119	-2428	84	1082	855	0	0	181	-23	-1	-224
9/30/2018	12326	30	347	16	119	-2430	84	1101	831	0	0	178	-22	-1	-218
10/31/2018	12357	31	331	16	119	-2428	81	1087	864	0	0	186	-23	-1	-227
11/30/2018	12387	30	-284	86	182	-757	7	96	859	0	0	71	-32	-1	-222
12/31/2018	12418	31	-47	56	141	-1014	22	95	895	0	0	123	-34	-1	-227
1/31/2019	12449	31	-1684	592	999	-133	75	73	884	0	0	-531	-39	-1	-222
2/28/2019	12477	28	-1514	596	993	-153	107	-44	798	0	0	-538	-36	-1	-193
3/31/2019	12508	31	-169	184	324	-487	72	-355	874	0	0	-185	-38	-1	-215
4/30/2019	12538	30	648	16	96	-2193	100	763	763	0	0	53	-26	-1	-215
5/31/2019	12569	31	91	43	122	-1102	27	187	836	0	0	68	-31	-1	-232
6/30/2019	12599	30	448	16	96	-2188	72	943	744	0	0	122	-24	-1	-224
7/31/2019	12630	31	274	16	110	-2121	64	1046	727	0	0	146	-25	-1	-233
8/31/2019	12661	31	264	16	110	-2121	81	1026	724	0	0	163	-25	-1	-232
9/30/2019	12691	30	272	16	110	-2122	83	1035	701	0	0	161	-24	-1	-225
10/31/2019	12722	31	256	16	110	-2120	79	1022	732	0	0	170	-25	-1	-233
11/30/2019	12752	30	-408	116	211	-549	23	37	792	0	0	44	-33	-1	-226
12/31/2019	12783	31	-1269	470	788	-174	81	-87	852	0	0	-391	-38	-1	-226

Table B-9. Monthly Groundwater Budget for Aquifer C in Santa Paula Basin

Date	Stress Period	Days in Month	influx(+) outflux(-); units in Acre-feet								
			Change in Storage	Mountain Front Recharge	Recharge	Pumping from Wells	Outside of Basin	Santa Paula B	Fillmore C	Oxnard	Mound L8 L11
1/31/2016	11353	31	-469	1	123	-78	-7	328	390	-2	-273
2/29/2016	11382	29	12	0	32	-80	-5	-61	362	-2	-245
3/31/2016	11413	31	-122	1	54	-81	-6	36	394	-2	-260
4/30/2016	11443	30	182	0	0	-89	-4	-181	362	-2	-257
5/31/2016	11474	31	199	0	0	-90	-5	-189	369	-2	-275
6/30/2016	11504	30	204	0	0	-88	-4	-186	355	-2	-272
7/31/2016	11535	31	219	0	0	-98	-5	-191	367	-2	-285
8/31/2016	11566	31	220	0	0	-96	-5	-191	367	-2	-288
9/30/2016	11596	30	219	0	0	-94	-5	-186	353	-2	-282
10/31/2016	11627	31	223	0	0	-94	-5	-197	373	-2	-294
11/30/2016	11657	30	221	0	0	-92	-5	-190	355	-2	-284
12/31/2016	11688	31	-255	1	76	-81	-7	169	389	-2	-282
1/31/2017	11719	31	-901	3	232	-77	-6	616	403	-2	-254
2/28/2017	11747	28	-946	3	227	-66	-5	632	372	-2	-198
3/31/2017	11778	31	-146	0	0	-82	-4	67	392	-2	-210
4/30/2017	11808	30	3	0	0	-81	-4	-53	371	-2	-221
5/31/2017	11839	31	61	0	0	-85	-5	-96	382	-2	-242
6/30/2017	11869	30	94	0	0	-83	-5	-116	368	-2	-246
7/31/2017	11900	31	140	0	0	-99	-5	-142	382	-2	-264
8/31/2017	11931	31	169	0	0	-97	-5	-166	382	-2	-271
9/30/2017	11961	30	181	0	0	-94	-5	-172	368	-2	-267
10/31/2017	11992	31	194	0	0	-96	-5	-182	379	-2	-280
11/30/2017	12022	30	189	0	0	-93	-5	-175	365	-2	-274
12/31/2017	12053	31	197	0	0	-95	-5	-182	377	-2	-285
1/31/2018	12084	31	20	0	37	-81	-6	-70	393	-2	-282
2/28/2018	12112	28	171	0	0	-81	-4	-167	342	-2	-253
3/31/2018	12143	31	-761	3	213	-78	-6	508	403	-2	-265
4/30/2018	12173	30	19	0	0	-86	-4	-48	377	-2	-243
5/31/2018	12204	31	114	0	0	-89	-5	-136	384	-2	-256
6/30/2018	12234	30	157	0	0	-86	-5	-167	370	-2	-257
7/31/2018	12265	31	186	0	0	-101	-5	-177	381	-2	-275
8/31/2018	12296	31	192	0	0	-99	-5	-181	382	-2	-282
9/30/2018	12326	30	194	0	0	-96	-5	-178	368	-2	-278
10/31/2018	12357	31	204	0	0	-98	-5	-186	379	-2	-290
11/30/2018	12387	30	17	0	45	-81	-6	-71	384	-2	-277
12/31/2018	12418	31	86	0	22	-89	-5	-123	399	-2	-281
1/31/2019	12449	31	-788	2	204	-77	-6	531	412	-2	-263
2/28/2019	12477	28	-820	3	203	-68	-5	538	382	-2	-212
3/31/2019	12508	31	-358	1	67	-75	-5	185	425	-2	-218
4/30/2019	12538	30	-15	0	0	-82	-4	-53	394	-2	-224
5/31/2019	12569	31	-30	0	27	-80	-5	-68	416	-2	-244
6/30/2019	12599	30	84	0	0	-84	-4	-122	392	-2	-249
7/31/2019	12630	31	126	0	0	-92	-5	-146	400	-2	-268
8/31/2019	12661	31	147	0	0	-91	-5	-163	400	-2	-274
9/30/2019	12691	30	152	0	0	-87	-5	-161	385	-2	-271
10/31/2019	12722	31	164	0	0	-89	-5	-170	398	-2	-284
11/30/2019	12752	30	-15	0	30	-82	-6	-44	402	-2	-272
12/31/2019	12783	31	-587	2	134	-81	-6	391	430	-2	-265

Table B-10. Monthly Groundwater Budget for Layer 1 in Mound Basin											
			influx(+) outflux(-); units in Acre-feet								
Date	Stress Period	Days in Month	Change in Storage	Tile Drains	ET	Recharge	Santa Paula A	Oxnard L1	Coastal Flux	Mound L2-L4	Stream Perc
1/31/2016	11353	31	-203	0	-12	419	0	39	-28	-190	-22
2/29/2016	11382	29	94	0	-14	109	0	36	-13	-97	-116
3/31/2016	11413	31	4	0	-19	219	0	42	-14	-135	-96
4/30/2016	11443	30	70	0	-20	130	0	43	-9	-97	-117
5/31/2016	11474	31	65	0	-21	131	0	48	-8	-98	-116
6/30/2016	11504	30	57	0	-19	130	0	47	-7	-95	-113
7/31/2016	11535	31	27	0	-19	160	0	48	-7	-97	-112
8/31/2016	11566	31	24	0	-17	160	0	48	-7	-97	-110
9/30/2016	11596	30	14	0	-13	158	0	45	-8	-96	-101
10/31/2016	11627	31	22	0	-11	156	0	44	-8	-97	-106
11/30/2016	11657	30	18	0	-8	167	0	40	-8	-109	-101
12/31/2016	11688	31	-118	0	-7	342	0	36	-15	-162	-76
1/31/2017	11719	31	-437	0	-11	721	0	25	-39	-266	18
2/28/2017	11747	28	-494	-2	-20	747	0	12	-59	-266	92
3/31/2017	11778	31	129	-4	-38	116	0	20	-43	-133	-47
4/30/2017	11808	30	143	-1	-38	115	0	37	-18	-114	-124
5/31/2017	11839	31	121	0	-36	116	0	41	-16	-112	-114
6/30/2017	11869	30	45	0	-33	115	0	33	-31	-105	-24
7/31/2017	11900	31	30	0	-35	161	0	26	-34	-111	-36
8/31/2017	11931	31	108	0	-30	161	0	32	-14	-110	-146
9/30/2017	11961	30	63	0	-20	160	0	37	-11	-106	-123
10/31/2017	11992	31	54	0	-15	161	0	39	-12	-108	-118
11/30/2017	12022	30	40	0	-10	160	0	36	-13	-105	-108
12/31/2017	12053	31	42	0	-8	161	0	36	-13	-109	-109
1/31/2018	12084	31	52	0	-9	148	0	32	-16	-119	-87
2/28/2018	12112	28	56	0	-8	124	0	28	-12	-93	-94
3/31/2018	12143	31	-284	0	-15	549	0	27	-29	-230	-12
4/30/2018	12173	30	115	0	-19	127	0	25	-18	-113	-117
5/31/2018	12204	31	100	0	-19	128	0	32	-12	-110	-118
6/30/2018	12234	30	81	0	-16	127	0	32	-10	-104	-110
7/31/2018	12265	31	42	0	-15	170	0	34	-10	-110	-110
8/31/2018	12296	31	38	0	-13	170	0	34	-11	-111	-107
9/30/2018	12326	30	28	0	-10	168	0	32	-11	-109	-99
10/31/2018	12357	31	32	0	-8	170	0	31	-11	-113	-101
11/30/2018	12387	30	20	0	-5	185	0	26	-13	-130	-82
12/31/2018	12418	31	-12	0	-5	169	0	18	-27	-123	-20
1/31/2019	12449	31	-397	0	-8	696	0	7	-42	-266	18
2/28/2019	12477	28	-381	-1	-17	576	0	-9	-71	-239	150
3/31/2019	12508	31	-62	-5	-36	253	0	-12	-71	-172	105
4/30/2019	12538	30	86	-4	-40	145	0	1	-46	-129	-13
5/31/2019	12569	31	79	-2	-43	153	0	9	-38	-133	-25
6/30/2019	12599	30	113	0	-37	145	0	18	-22	-119	-97
7/31/2019	12630	31	88	0	-30	166	0	27	-16	-115	-121
8/31/2019	12661	31	76	0	-23	166	0	32	-14	-113	-124
9/30/2019	12691	30	53	0	-16	165	0	33	-14	-109	-112
10/31/2019	12722	31	40	0	-13	166	0	43	-15	-112	-109
11/30/2019	12752	30	-45	0	-11	226	0	36	-21	-139	-46
12/31/2019	12783	31	-260	0	-11	506	0	21	-42	-211	2

Table B-11. Monthly Groundwater Budget for Layers 2 through 4 in Mound Basin											
Date	Stress Period	Days in Month	influx(+) outflux(-); units in Acre-feet								
			Change in Storage	Recharge	Pumping from Wells	Santa Paula A	Mound L1	Santa Paula B	Oxnard UAS	Coastal Flux	Mound L5
1/31/2016	11353	31	-35	36	-1	1	190	0	-27	7	-171
2/29/2016	11382	29	62	6	-1	1	97	0	-56	10	-118
3/31/2016	11413	31	-6	21	0	2	135	0	-32	8	-127
4/30/2016	11443	30	71	5	-1	-1	97	0	-55	10	-127
5/31/2016	11474	31	93	6	0	-4	98	0	-58	11	-145
6/30/2016	11504	30	99	5	0	-4	95	0	-59	11	-146
7/31/2016	11535	31	161	6	-1	-5	97	0	-59	13	-212
8/31/2016	11566	31	148	6	-1	-5	97	0	-55	13	-204
9/30/2016	11596	30	142	6	-1	-5	96	0	-52	13	-198
10/31/2016	11627	31	138	6	-1	-5	97	0	-52	14	-197
11/30/2016	11657	30	73	11	0	-4	109	0	-38	12	-162
12/31/2016	11688	31	-33	25	0	1	162	0	-23	9	-141
1/31/2017	11719	31	-121	54	0	4	266	0	-14	8	-199
2/28/2017	11747	28	-170	57	0	5	266	0	0	7	-199
3/31/2017	11778	31	-30	6	-1	5	133	0	-20	12	-104
4/30/2017	11808	30	33	5	-1	2	114	0	-35	12	-131
5/31/2017	11839	31	60	6	-1	1	112	0	-42	13	-149
6/30/2017	11869	30	77	5	-1	0	105	0	-46	13	-153
7/31/2017	11900	31	93	6	-4	0	111	0	-52	13	-168
8/31/2017	11931	31	94	6	-2	-1	110	0	-52	14	-169
9/30/2017	11961	30	98	5	-2	-1	106	0	-52	14	-169
10/31/2017	11992	31	100	6	-1	-1	108	0	-53	14	-172
11/30/2017	12022	30	97	5	-2	-1	105	0	-54	14	-164
12/31/2017	12053	31	97	6	-1	-1	109	0	-56	14	-167
1/31/2018	12084	31	16	13	1	1	119	0	-41	12	-122
2/28/2018	12112	28	74	5	-2	0	93	0	-49	12	-133
3/31/2018	12143	31	-79	42	1	2	230	0	-23	9	-185
4/30/2018	12173	30	46	5	-2	2	113	0	-47	12	-129
5/31/2018	12204	31	68	6	-1	-1	110	0	-50	13	-145
6/30/2018	12234	30	80	5	-1	-2	104	0	-51	13	-148
7/31/2018	12265	31	142	6	-4	-2	110	0	-59	15	-207
8/31/2018	12296	31	126	6	-2	-3	111	0	-57	15	-196
9/30/2018	12326	30	122	5	-2	-3	109	0	-57	15	-191
10/31/2018	12357	31	123	6	-2	-3	113	0	-59	16	-193
11/30/2018	12387	30	-2	15	1	1	130	0	-33	12	-124
12/31/2018	12418	31	12	13	-1	3	123	0	-37	13	-126
1/31/2019	12449	31	-124	52	2	5	266	0	-18	10	-195
2/28/2019	12477	28	-154	44	0	6	239	0	-1	8	-144
3/31/2019	12508	31	-153	21	-1	7	172	0	28	9	-83
4/30/2019	12538	30	2	5	-2	3	129	0	2	11	-151
5/31/2019	12569	31	-22	12	0	1	133	0	-8	10	-126
6/30/2019	12599	30	63	5	-2	0	119	0	-31	12	-167
7/31/2019	12630	31	51	5	-4	-1	115	0	-37	16	-145
8/31/2019	12661	31	4	5	-2	-1	113	0	-7	16	-129
9/30/2019	12691	30	58	5	-2	-1	109	0	-23	16	-161
10/31/2019	12722	31	89	5	-2	-1	112	0	-36	16	-184
11/30/2019	12752	30	-46	18	2	2	139	0	-7	10	-118
12/31/2019	12783	31	-115	36	0	5	211	0	1	8	-151

Table B-12. Monthly Groundwater Budget for Layer 5 in Mound Basin									
			influx(+) outflux(-); units in Acre-feet						
Date	Stress Period	Days in Month	Change in Storage	Pumping from Wells	Santa Paula B	Mound L2-L4	Oxnard UAS	Coastal Flux	Mound L6-L7
1/31/2016	11353	31	14	-13	38	171	-214	69	-65
2/29/2016	11382	29	89	-79	28	118	-226	94	-24
3/31/2016	11413	31	28	-27	37	127	-199	76	-42
4/30/2016	11443	30	67	-86	26	127	-208	99	-25
5/31/2016	11474	31	77	-87	24	145	-234	106	-32
6/30/2016	11504	30	89	-88	23	146	-241	106	-35
7/31/2016	11535	31	168	-277	24	212	-235	142	-34
8/31/2016	11566	31	167	-277	24	204	-230	147	-34
9/30/2016	11596	30	166	-277	22	198	-223	148	-35
10/31/2016	11627	31	168	-277	24	197	-229	154	-37
11/30/2016	11657	30	118	-182	26	162	-209	129	-44
12/31/2016	11688	31	29	-59	38	141	-187	100	-62
1/31/2017	11719	31	-81	-14	43	199	-141	86	-92
2/28/2017	11747	28	-180	-13	40	199	-24	74	-96
3/31/2017	11778	31	-43	-178	34	104	10	121	-48
4/30/2017	11808	30	-8	-180	30	131	-70	121	-25
5/31/2017	11839	31	27	-180	31	149	-130	125	-21
6/30/2017	11869	30	54	-180	29	153	-161	124	-19
7/31/2017	11900	31	71	-208	29	168	-186	147	-20
8/31/2017	11931	31	79	-210	28	169	-194	149	-21
9/30/2017	11961	30	90	-209	27	169	-203	148	-21
10/31/2017	11992	31	99	-210	27	172	-219	153	-22
11/30/2017	12022	30	112	-209	26	164	-223	152	-22
12/31/2017	12053	31	118	-210	27	167	-237	157	-23
1/31/2018	12084	31	61	-85	32	122	-224	123	-29
2/28/2018	12112	28	93	-146	23	133	-215	129	-17
3/31/2018	12143	31	-44	-18	36	185	-191	98	-65
4/30/2018	12173	30	56	-145	27	129	-182	133	-17
5/31/2018	12204	31	53	-146	25	145	-203	141	-15
6/30/2018	12234	30	71	-146	23	148	-222	140	-14
7/31/2018	12265	31	138	-289	23	207	-241	174	-13
8/31/2018	12296	31	146	-291	23	196	-239	180	-16
9/30/2018	12326	30	150	-291	22	191	-233	180	-18
10/31/2018	12357	31	153	-292	23	193	-242	186	-21
11/30/2018	12387	30	67	-118	32	124	-216	141	-31
12/31/2018	12418	31	66	-149	34	126	-204	148	-21
1/31/2019	12449	31	-101	-24	39	195	-145	110	-73
2/28/2019	12477	28	-194	-27	36	144	6	95	-61
3/31/2019	12508	31	-302	-66	38	83	172	108	-33
4/30/2019	12538	30	-158	-244	26	151	102	138	-14
5/31/2019	12569	31	-88	-152	31	126	-16	123	-24
6/30/2019	12599	30	0	-246	24	167	-66	141	-18
7/31/2019	12630	31	-31	-309	25	145	9	180	-19
8/31/2019	12661	31	-81	-311	25	129	79	179	-20
9/30/2019	12691	30	-3	-311	24	161	-25	174	-21
10/31/2019	12722	31	39	-312	25	184	-92	179	-23
11/30/2019	12752	30	-40	-95	33	118	-95	116	-37
12/31/2019	12783	31	-105	-41	38	151	-82	99	-60

Table B-13. Monthly Groundwater Budget for Layers 6 and 7 in Mound Basin											
			influx(+) outflux(-); units in Acre-feet								
Date	Stress Period	Days in Month	Change in Storage	Mountain Front Recharge	Recharge	Pumping from Wells	Santa Paula B	Mound L5	Oxnard LAS	Coastal Flux	Mound L8-L11
1/31/2016	11353	31	-276	448	150	-71	221	65	-229	28	-337
2/29/2016	11382	29	235	31	25	-427	204	24	-312	47	172
3/31/2016	11413	31	-125	150	74	-137	228	42	-244	37	-24
4/30/2016	11443	30	213	0	8	-483	216	25	-310	54	277
5/31/2016	11474	31	217	0	8	-484	227	32	-326	68	258
6/30/2016	11504	30	217	0	8	-483	220	35	-323	72	253
7/31/2016	11535	31	206	0	9	-553	227	34	-290	83	284
8/31/2016	11566	31	207	0	9	-553	227	34	-296	84	288
9/30/2016	11596	30	215	0	9	-553	221	35	-294	83	285
10/31/2016	11627	31	208	0	9	-553	229	37	-306	86	290
11/30/2016	11657	30	45	0	11	-360	222	44	-270	68	239
12/31/2016	11688	31	-215	255	96	-111	231	62	-231	42	-129
1/31/2017	11719	31	-683	737	238	-16	223	92	-204	21	-414
2/28/2017	11747	28	-749	786	253	-17	194	96	-169	12	-381
3/31/2017	11778	31	244	0	7	-212	211	48	-315	36	-19
4/30/2017	11808	30	114	0	7	-212	212	25	-326	49	132
5/31/2017	11839	31	36	0	7	-212	222	21	-341	54	213
6/30/2017	11869	30	33	0	7	-212	217	19	-341	54	224
7/31/2017	11900	31	78	0	9	-415	225	20	-281	66	298
8/31/2017	11931	31	80	0	9	-415	225	21	-286	65	300
9/30/2017	11961	30	94	0	9	-415	218	21	-284	64	292
10/31/2017	11992	31	94	0	9	-415	226	22	-296	66	294
11/30/2017	12022	30	107	0	9	-415	219	22	-292	65	286
12/31/2017	12053	31	104	0	9	-415	226	23	-303	66	289
1/31/2018	12084	31	-109	77	43	-143	226	29	-270	41	108
2/28/2018	12112	28	54	0	9	-298	199	17	-267	41	245
3/31/2018	12143	31	-471	573	184	-32	220	65	-222	25	-348
4/30/2018	12173	30	116	0	9	-297	201	17	-259	34	179
5/31/2018	12204	31	57	0	9	-298	216	15	-273	44	230
6/30/2018	12234	30	34	0	9	-298	210	14	-267	46	251
7/31/2018	12265	31	227	0	10	-587	221	13	-282	68	330
8/31/2018	12296	31	220	0	10	-587	224	16	-279	76	320
9/30/2018	12326	30	222	0	10	-587	218	18	-274	78	314
10/31/2018	12357	31	209	0	10	-586	227	21	-282	82	319
11/30/2018	12387	30	-102	64	48	-215	222	31	-230	55	127
12/31/2018	12418	31	-71	43	37	-280	227	21	-228	48	202
1/31/2019	12449	31	-559	631	224	-54	222	73	-193	27	-377
2/28/2019	12477	28	-555	618	197	-65	193	61	-166	17	-305
3/31/2019	12508	31	-68	187	78	-180	215	33	-192	22	-95
4/30/2019	12538	30	354	0	9	-619	215	14	-285	56	256
5/31/2019	12569	31	44	33	32	-391	232	24	-239	58	209
6/30/2019	12599	30	244	0	9	-618	224	18	-291	71	342
7/31/2019	12630	31	146	0	11	-582	233	19	-249	83	339
8/31/2019	12661	31	132	0	11	-581	232	20	-249	80	355
9/30/2019	12691	30	145	0	11	-582	225	21	-250	78	351
10/31/2019	12722	31	142	0	11	-581	233	23	-263	80	354
11/30/2019	12752	30	-192	81	56	-168	226	37	-207	47	120
12/31/2019	12783	31	-443	457	155	-74	226	60	-184	26	-224

Table B-14. Monthly Groundwater Budget for Layers 8 through 11 in Mound Basin									
			influx(+) outflux(-); units in Acre-feet						
Date	Stress Period	Days in Month	Change in Storage	Mountain Front Recharge	Pumping from Wells	Santa Paula C	Oxnard LAS	Mouond L6-L7	Coastal Flux
1/31/2016	11353	31	-904	448	-7	273	-146	337	0
2/29/2016	11382	29	129	31	-26	245	-212	-172	4
3/31/2016	11413	31	-267	150	-11	260	-160	24	3
4/30/2016	11443	30	257	0	-30	257	-213	-277	6
5/31/2016	11474	31	229	0	-29	275	-227	-258	10
6/30/2016	11504	30	224	0	-29	272	-226	-253	11
7/31/2016	11535	31	222	0	-27	285	-208	-284	13
8/31/2016	11566	31	225	0	-28	288	-210	-288	12
9/30/2016	11596	30	228	0	-27	282	-209	-285	12
10/31/2016	11627	31	228	0	-27	294	-216	-290	12
11/30/2016	11657	30	153	0	-20	284	-187	-239	9
12/31/2016	11688	31	-506	255	-9	282	-153	129	2
1/31/2017	11719	31	-1266	737	-3	254	-132	414	-3
2/28/2017	11747	28	-1248	786	-3	198	-110	381	-5
3/31/2017	11778	31	-5	0	-10	210	-215	19	0
4/30/2017	11808	30	140	0	-9	221	-225	-132	5
5/31/2017	11839	31	208	0	-9	242	-235	-213	7
6/30/2017	11869	30	215	0	-9	246	-234	-224	7
7/31/2017	11900	31	232	0	-22	264	-185	-298	8
8/31/2017	11931	31	230	0	-22	271	-187	-300	8
9/30/2017	11961	30	224	0	-22	267	-185	-292	8
10/31/2017	11992	31	220	0	-22	280	-192	-294	8
11/30/2017	12022	30	216	0	-22	274	-189	-286	7
12/31/2017	12053	31	213	0	-22	285	-195	-289	7
1/31/2018	12084	31	-66	77	-13	282	-173	-108	2
2/28/2018	12112	28	188	0	-28	253	-171	-245	2
3/31/2018	12143	31	-1038	573	-5	265	-142	348	-1
4/30/2018	12173	30	128	0	-28	243	-165	-179	0
5/31/2018	12204	31	175	0	-28	256	-177	-230	4
6/30/2018	12234	30	191	0	-28	257	-174	-251	5
7/31/2018	12265	31	261	0	-28	275	-188	-330	9
8/31/2018	12296	31	241	0	-28	282	-187	-320	11
9/30/2018	12326	30	237	0	-28	278	-184	-314	12
10/31/2018	12357	31	235	0	-28	290	-190	-319	12
11/30/2018	12387	30	-57	64	-11	277	-151	-127	7
12/31/2018	12418	31	37	43	-14	281	-148	-202	4
1/31/2019	12449	31	-1141	631	-7	263	-123	377	-1
2/28/2019	12477	28	-1019	618	-8	212	-105	305	-3
3/31/2019	12508	31	-360	187	-14	218	-125	95	-2
4/30/2019	12538	30	250	0	-35	224	-189	-256	7
5/31/2019	12569	31	112	33	-22	244	-167	-209	9
6/30/2019	12599	30	315	0	-34	249	-199	-342	11
7/31/2019	12630	31	248	0	-16	268	-174	-339	13
8/31/2019	12661	31	258	0	-17	274	-171	-355	12
9/30/2019	12691	30	257	0	-17	271	-170	-351	11
10/31/2019	12722	31	254	0	-17	284	-178	-354	11
11/30/2019	12752	30	-91	81	-8	272	-138	-120	4
12/31/2019	12783	31	-818	457	-7	265	-119	224	-2

Table B-15. Monthly Groundwater Budget for the Semi-Perched Aquifer in Oxnard Basin

			influx(+) outflux(-); units in Acre-feet														
Date	Stress Period	Days in Month	Change in Storage	Tile Drains	ET	Recharge	Pumping from Wells	Mound	Pleasant Valley	West Las Posas	Coastal Flux north to Channel Islands Horbor	Coastal flux from Channel Islands Harbor to South of Port Hueneme	Coastal Flux from South of Port Hueneme to Arnold Road	Coastal Flux from Arnold Road to Point Mugu	Oxnard Basin UAS	Partial Santa Clara River Net Percolation	Calleguas Creek Net Percolation
1/31/2016	11353	31	-471	-331	-335	2087	0	-39	195	0	-58	-44	11	50	-1653	13	574
2/29/2016	11382	29	727	-338	-368	1282	0	-36	187	0	-52	-38	11	47	-1433	12	0
3/31/2016	11413	31	463	-349	-551	1407	0	-42	194	0	-55	-41	14	56	-1494	12	386
4/30/2016	11443	30	907	-311	-585	1292	0	-43	194	0	-51	-37	16	61	-1443	0	0
5/31/2016	11474	31	952	-272	-589	1298	0	-48	193	0	-51	-37	17	71	-1535	0	0
6/30/2016	11504	30	865	-228	-517	1266	0	-47	177	0	-47	-35	17	70	-1521	0	0
7/31/2016	11535	31	790	-212	-509	1412	0	-48	173	0	-47	-35	17	72	-1612	0	0
8/31/2016	11566	31	806	-195	-471	1397	0	-48	164	0	-47	-35	17	71	-1658	0	0
9/30/2016	11596	30	698	-182	-368	1397	0	-45	150	0	-45	-34	14	65	-1652	0	0
10/31/2016	11627	31	749	-185	-329	1401	0	-44	146	0	-46	-34	13	64	-1735	0	0
11/30/2016	11657	30	749	-174	-245	1226	0	-40	133	0	-43	-33	11	56	-1639	0	0
12/31/2016	11688	31	-799	-243	-259	2515	0	-36	137	0	-44	-33	9	48	-1740	14	430
1/31/2017	11719	31	-3689	-515	-472	5385	0	-25	164	0	-44	-33	8	33	-2052	25	1216
2/28/2017	11747	28	-3499	-846	-638	5434	0	-12	184	0	-42	-31	6	12	-1793	92	1132
3/31/2017	11778	31	1621	-891	-996	1174	0	-20	216	0	-46	-29	12	32	-1501	172	258
4/30/2017	11808	30	1395	-611	-908	1152	0	-37	203	0	-46	-26	15	55	-1458	45	221
5/31/2017	11839	31	1323	-470	-862	1109	0	-41	208	0	-48	-27	17	69	-1495	0	216
6/30/2017	11869	30	1042	-364	-711	1127	0	-33	201	0	-43	-25	17	70	-1463	1	182
7/31/2017	11900	31	847	-332	-670	1330	0	-26	206	0	-40	-25	17	72	-1559	0	180
8/31/2017	11931	31	822	-306	-600	1313	0	-32	204	0	-40	-25	17	71	-1590	0	168
9/30/2017	11961	30	674	-285	-459	1318	0	-37	195	0	-40	-24	14	64	-1579	0	159
10/31/2017	11992	31	694	-293	-410	1307	0	-39	199	0	-41	-24	13	62	-1651	0	182
11/30/2017	12022	30	555	-290	-306	1336	0	-36	190	0	-39	-23	11	55	-1632	0	180
12/31/2017	12053	31	600	-312	-272	1346	0	-36	193	0	-40	-23	10	52	-1703	0	186
1/31/2018	12084	31	983	-285	-304	1019	0	-32	191	0	-38	-23	10	51	-1603	18	13
2/28/2018	12112	28	571	-236	-299	1067	0	-28	171	0	-31	-18	10	49	-1463	0	209
3/31/2018	12143	31	-2016	-391	-599	3871	0	-27	198	0	-34	-21	11	49	-1879	82	757
4/30/2018	12173	30	1121	-411	-706	1076	0	-25	201	0	-30	-17	13	54	-1486	0	209
5/31/2018	12204	31	1059	-328	-688	1077	0	-32	203	0	-30	-16	16	67	-1523	0	195
6/30/2018	12234	30	920	-260	-576	1049	0	-32	194	0	-28	-15	16	69	-1476	0	138
7/31/2018	12265	31	700	-237	-547	1306	0	-34	198	0	-27	-15	16	71	-1568	0	136
8/31/2018	12296	31	685	-222	-502	1302	0	-34	196	0	-27	-15	16	70	-1610	0	141
9/30/2018	12326	30	557	-212	-392	1317	0	-32	186	0	-25	-15	13	64	-1603	0	141
10/31/2018	12357	31	575	-223	-355	1325	0	-31	189	0	-25	-15	12	63	-1681	0	167
11/30/2018	12387	30	714	-207	-257	1117	0	-26	177	0	-24	-14	10	55	-1556	11	0
12/31/2018	12418	31	251	-228	-250	1203	0	-18	177	0	-21	-13	9	50	-1551	3	387
1/31/2019	12449	31	-2401	-372	-400	4054	0	-7	188	0	-20	-13	9	39	-1890	26	788
2/28/2019	12477	28	-2614	-569	-536	4056	0	9	191	0	-16	-11	8	24	-1700	125	1031
3/31/2019	12508	31	119	-693	-887	1984	0	12	229	0	-16	-10	12	35	-1503	183	537
4/30/2019	12538	30	886	-542	-872	1335	0	-1	219	0	-17	-7	15	52	-1413	104	241
5/31/2019	12569	31	901	-430	-841	1166	0	-9	222	0	-19	-8	16	65	-1420	105	252
6/30/2019	12599	30	569	-346	-705	1386	0	-18	212	0	-19	-7	16	68	-1436	80	199
7/31/2019	12630	31	481	-324	-653	1667	-40	-27	215	0	-22	-8	16	71	-1567	19	172
8/31/2019	12661	31	559	-300	-574	1551	-40	-32	211	0	-24	-9	15	71	-1602	0	174
9/30/2019	12691	30	370	-279	-442	1496	-40	-33	200	0	-24	-9	13	64	-1592	60	216
10/31/2019	12722	31	361	-288	-398	1497	-40	-43	203	0	-25	-10	12	62	-1684	143	210
11/30/2019	12752	30	-340	-329	-344	1775	-11	-36	200	0	-23	-10	9	50	-1598	113	544
12/31/2019	12783	31	-2638	-564	-425	4022	-5	-21	227	0	-22	-10	7	32	-1777	28	1146

Table B-16. Monthly Groundwater Budget for the UAS in Oxnard Basin

influx(+) outflux(-); units in Acre-feet

Date	Stress Period	Days in Month	Change in Storage	Volcanic Outcrop Recharge	Tile Drains	ET	Recharge	Pumping from Wells	Oxnard Basin Semi-Perched Aquifer	Santa Paula	Mound	Pleasant Valley	Las Posas	Coastal Flux north to Channel Islands Horbor	Coastal flux from Channel Islands Harbor to South of Port Hueneme	Coastal Flux from South of Port Hueneme to Arnold Road	Coastal Flux from Arnold Road to Point Mugu	Oxnard Basin LAS	Partial Santa Clara River Net Percolation
1/31/2016	11353	31	-1086	2	0	0	322	-920	1653	350	242	363	-37	280	214	130	279	-1841	49
2/29/2016	11382	29	1235	0	0	0	770	-3641	1433	326	282	315	-38	332	203	120	247	-1717	135
3/31/2016	11413	31	-1632	1	0	0	1285	-1270	1494	347	232	351	-61	295	212	124	260	-1760	123
4/30/2016	11443	30	1750	0	0	0	435	-3771	1443	331	263	316	-67	345	208	120	243	-1746	129
5/31/2016	11474	31	1882	0	0	0	305	-3796	1535	336	292	322	-63	377	232	135	268	-1955	124
6/30/2016	11504	30	2041	0	0	0	164	-3799	1521	322	300	311	-56	378	233	136	270	-1989	167
7/31/2016	11535	31	2133	0	0	0	152	-3940	1612	332	293	317	-63	426	254	147	293	-2135	177
8/31/2016	11566	31	2159	0	0	0	144	-3947	1658	332	285	318	-63	438	265	154	310	-2227	173
9/30/2016	11596	30	2224	0	0	0	144	-3946	1652	323	275	306	-66	437	266	155	313	-2241	158
10/31/2016	11627	31	2200	0	0	0	142	-3958	1735	335	281	316	-76	456	282	165	335	-2378	165
11/30/2016	11657	30	923	0	0	0	128	-2583	1639	327	247	316	-76	402	266	153	318	-2218	158
12/31/2016	11688	31	-1170	3	0	0	383	-989	1740	344	210	355	-74	341	248	138	297	-1972	146
1/31/2017	11719	31	-6060	6	0	0	4339	-447	2052	357	155	379	-71	294	218	117	255	-1645	49
2/28/2017	11747	28	-6572	8	0	0	5018	-420	1793	326	24	344	-109	243	177	91	197	-1272	153
3/31/2017	11778	31	1877	0	0	0	176	-3812	1501	349	11	329	-159	355	207	109	212	-1418	263
4/30/2017	11808	30	1332	0	0	0	870	-3825	1458	331	104	301	-131	367	219	119	223	-1517	149
5/31/2017	11839	31	1674	0	0	0	537	-3841	1495	340	171	314	-117	384	233	128	241	-1661	101
6/30/2017	11869	30	1288	0	0	0	1005	-3839	1463	335	207	308	-101	383	232	128	241	-1670	21
7/31/2017	11900	31	2016	0	0	0	195	-3823	1559	349	239	292	-89	424	246	136	261	-1832	28
8/31/2017	11931	31	2002	0	0	0	143	-3833	1590	342	246	287	-79	431	253	143	279	-1935	131
9/30/2017	11961	30	2048	0	0	0	144	-3833	1579	328	255	278	-69	429	252	144	285	-1957	117
10/31/2017	11992	31	2015	0	0	0	137	-3847	1651	340	273	292	-67	447	267	154	306	-2082	114
11/30/2017	12022	30	2035	0	0	0	139	-3843	1632	331	277	286	-64	443	264	153	306	-2066	106
12/31/2017	12053	31	1977	0	0	0	141	-3854	1703	344	293	301	-67	462	278	161	324	-2171	108
1/31/2018	12084	31	223	1	0	0	493	-2462	1603	348	264	345	-76	402	268	149	311	-1989	120
2/28/2018	12112	28	2200	0	0	0	156	-4072	1463	315	264	320	-62	385	240	131	267	-1714	99
3/31/2018	12143	31	-4034	6	0	0	2408	-621	1879	352	214	387	-75	341	246	129	273	-1669	164
4/30/2018	12173	30	1288	0	0	0	868	-4052	1486	339	229	356	-88	389	234	121	243	-1521	109
5/31/2018	12204	31	1926	0	0	0	169	-4068	1523	344	252	360	-78	419	254	133	260	-1610	117
6/30/2018	12234	30	1968	0	0	0	133	-4065	1476	331	273	351	-56	414	250	131	255	-1571	111
7/31/2018	12265	31	2173	0	0	0	151	-4398	1568	341	300	344	-66	479	270	141	274	-1703	110
8/31/2018	12296	31	2194	0	0	0	148	-4406	1610	342	295	346	-67	493	281	148	291	-1803	108
9/30/2018	12326	30	2247	0	0	0	148	-4406	1603	332	289	340	-65	490	281	150	296	-1829	97
10/31/2018	12357	31	2200	0	0	0	145	-4418	1681	344	302	359	-68	510	297	159	317	-1952	98
11/30/2018	12387	30	22	0	0	0	165	-2132	1556	338	249	365	-69	435	279	150	305	-1759	98
12/31/2018	12418	31	-770	1	0	0	706	-1928	1551	360	240	382	-77	434	272	141	294	-1631	22
1/31/2019	12449	31	-6112	4	0	0	4397	-666	1890	369	163	406	-90	358	247	123	262	-1404	51
2/28/2019	12477	28	-8737	6	0	0	7241	-688	1700	333	-5	380	-125	303	204	97	206	-1113	198
3/31/2019	12508	31	-6219	2	0	0	5844	-1454	1503	358	-200	389	-223	328	214	99	205	-1133	287
4/30/2019	12538	30	3178	0	0	0	358	-5146	1413	334	-103	345	-229	390	224	109	206	-1239	160
5/31/2019	12569	31	989	0	0	0	139	-2893	1420	342	25	358	-175	367	238	119	227	-1316	159
6/30/2019	12599	30	-5131	0	0	0	8582	-5198	1436	324	97	345	-155	402	237	121	227	-1450	164
7/31/2019	12630	31	-7572	0	0	0	11266	-5240	1567	312	28	353	-281	492	268	141	264	-1786	153
8/31/2019	12661	31	3586	0	0	0	397	-5232	1602	289	-72	348	-357	489	277	151	290	-1920	133
9/30/2019	12691	30	3361	0	0	0	350	-5217	1592	282	48	335	-250	474	274	153	298	-1906	180
10/31/2019	12722	31	3274	0	0	0	156	-5227	1684	300	128	347	-173	491	289	164	322	-2028	250
11/30/2019	12752	30	-315	2	0	0	193	-1568	1598	304	102	353	-131	363	258	143	297	-1771	172
12/31/2019	12783	31	-5457	5	0	0	4349	-759	1777	332	80	379	-136	308	229	120	261	-1532	43

Table B-17. Monthly Groundwater Budget for the LAS in Oxnard Basin														
			influx(+) outflux(-); units in Acre-feet											
Date	Stress Period	Days in Month	Change in Storage	Mountain Front Recharge	Recharge	Pumping from Wells	Oxnard Basin UAS	Santa Paula	Pleasant Valley	Las Posas	Mound	Coastal Flux north to Channel Islands Horbor	Coastal flux from Channel Islands Harbor to South of Port Hueneme	Costal Flux from South of Port Hueneme to Arnold Road	Costal Flux from Arnold Road to Point Mugu
1/31/2016	11353	31	-2268	0	7	-912	1841	3	97	109	375	308	215	103	123
2/29/2016	11382	29	1183	0	1	-4456	1717	2	135	217	523	284	194	101	98
3/31/2016	11413	31	-1767	0	4	-1357	1760	3	118	129	404	304	208	98	95
4/30/2016	11443	30	1227	0	1	-4561	1746	2	158	228	523	292	196	101	87
5/31/2016	11474	31	828	0	1	-4535	1955	2	183	259	552	332	216	115	91
6/30/2016	11504	30	774	0	1	-4533	1989	2	184	265	548	341	220	117	92
7/31/2016	11535	31	981	0	1	-4931	2135	2	204	275	498	373	238	117	107
8/31/2016	11566	31	816	0	1	-4924	2227	2	216	275	506	389	247	119	125
9/30/2016	11596	30	795	0	1	-4925	2241	2	219	276	503	388	248	120	131
10/31/2016	11627	31	546	0	1	-4908	2378	3	231	283	523	411	264	127	142
11/30/2016	11657	30	-1065	0	1	-2905	2218	2	181	224	456	386	253	114	135
12/31/2016	11688	31	-2533	0	5	-877	1972	3	125	109	384	350	240	100	122
1/31/2017	11719	31	-2621	0	13	-177	1645	3	76	47	336	288	209	82	99
2/28/2017	11747	28	-1913	0	12	-225	1272	2	39	21	279	217	163	62	71
3/31/2017	11778	31	1081	0	1	-3885	1418	2	133	151	530	244	171	83	69
4/30/2017	11808	30	812	0	1	-3872	1517	2	185	188	552	272	179	94	68
5/31/2017	11839	31	524	0	1	-3857	1661	2	211	203	576	303	197	103	74
6/30/2017	11869	30	494	0	1	-3858	1670	2	218	210	576	307	199	104	76
7/31/2017	11900	31	872	0	1	-4221	1832	3	84	217	465	331	213	110	92
8/31/2017	11931	31	734	0	1	-4210	1935	3	58	216	473	341	221	117	112
9/30/2017	11961	30	707	0	1	-4209	1957	2	53	218	469	339	220	118	120
10/31/2017	11992	31	489	0	1	-4196	2082	3	57	225	488	359	234	124	132
11/30/2017	12022	30	523	0	1	-4199	2066	2	55	225	481	354	231	123	132
12/31/2017	12053	31	339	0	1	-4188	2171	3	58	230	499	372	244	128	140
1/31/2018	12084	31	-1788	0	1	-1757	1989	3	127	138	443	353	241	120	130
2/28/2018	12112	28	-5	0	1	-3181	1714	2	131	176	439	304	210	108	100
3/31/2018	12143	31	-2665	0	10	-238	1669	3	91	46	364	307	219	98	97
4/30/2018	12173	30	370	0	1	-3201	1521	2	100	136	423	276	195	94	82
5/31/2018	12204	31	148	0	1	-3185	1610	3	124	153	451	301	206	106	82
6/30/2018	12234	30	199	0	1	-3188	1571	2	130	155	441	300	204	106	79
7/31/2018	12265	31	959	0	1	-4148	1703	3	97	160	470	326	217	113	94
8/31/2018	12296	31	781	0	1	-4140	1803	3	105	168	466	346	225	120	114
9/30/2018	12326	30	735	0	1	-4140	1829	2	109	173	458	349	226	121	122
10/31/2018	12357	31	515	0	1	-4128	1952	3	120	180	473	371	241	129	134
11/30/2018	12387	30	-977	0	2	-2191	1759	3	109	89	381	343	232	120	130
12/31/2018	12418	31	-1358	0	2	-1581	1631	3	87	67	376	321	223	107	122
1/31/2019	12449	31	-2127	0	10	-346	1404	3	66	6	316	281	201	86	101
2/28/2019	12477	28	-1556	0	10	-375	1113	2	36	-18	272	219	160	65	71
3/31/2019	12508	31	-1038	0	3	-934	1133	3	32	-32	316	224	162	66	65
4/30/2019	12538	30	1764	0	1	-4228	1239	2	107	81	475	252	164	84	59
5/31/2019	12569	31	-372	0	1	-2150	1316	2	127	41	406	288	185	91	65
6/30/2019	12599	30	1328	0	1	-4187	1450	2	163	104	491	297	187	98	67
7/31/2019	12630	31	1079	0	1	-4354	1786	2	229	76	423	332	210	120	87
8/31/2019	12661	31	910	0	1	-4362	1920	2	231	59	420	340	221	133	111
9/30/2019	12691	30	902	0	1	-4377	1906	2	230	75	420	341	224	136	122
10/31/2019	12722	31	668	0	1	-4367	2028	2	238	91	441	363	240	144	136
11/30/2019	12752	30	-2036	0	4	-1029	1771	2	148	0	345	327	225	117	126
12/31/2019	12783	31	-2180	0	8	-385	1532	2	84	-44	303	280	203	90	106

Table B-18. Monthly Groundwater Budget for the Semi-Perched Aquifer in Pleasant Valley												
			influx(+) outflux(-); units in Acre-feet									
Date	Stress Period	Days in Month	Change in Storage	Tile Drains	ET	Recharge	Pumping from Wells	Oxnard Basin	Pleasant Valley UAS	Arroya Las Posas Net Percolation	Conejo Creek Net Percolation	Calleguas Creek Net Percolation
1/31/2016	11353	31	-530	-24	0	511	-24	-195	-1119	269	545	566
2/29/2016	11382	29	548	-22	0	243	-21	-187	-910	0	306	43
3/31/2016	11413	31	-209	-23	0	358	-22	-194	-1081	259	451	463
4/30/2016	11443	30	249	-23	0	225	-21	-194	-904	0	350	318
5/31/2016	11474	31	669	-23	0	241	-23	-193	-964	0	293	0
6/30/2016	11504	30	693	-22	0	217	-23	-177	-948	0	259	0
7/31/2016	11535	31	750	-22	0	268	-24	-173	-1072	0	273	0
8/31/2016	11566	31	778	-21	0	255	-25	-164	-1076	0	253	0
9/30/2016	11596	30	773	-20	0	256	-25	-150	-1058	0	224	0
10/31/2016	11627	31	780	-19	0	258	-27	-146	-1089	0	242	0
11/30/2016	11657	30	528	-18	0	263	-25	-133	-980	0	317	48
12/31/2016	11688	31	-756	-19	0	780	-24	-137	-1067	284	453	487
1/31/2017	11719	31	-2258	-22	0	1430	-22	-164	-1107	387	825	930
2/28/2017	11747	28	-2351	-25	-4	1307	-18	-184	-833	317	865	926
3/31/2017	11778	31	137	-27	-1	220	-19	-216	-888	0	401	394
4/30/2017	11808	30	204	-25	0	204	-20	-203	-912	0	376	374
5/31/2017	11839	31	256	-25	0	171	-21	-208	-942	0	386	384
6/30/2017	11869	30	254	-24	0	184	-21	-201	-932	0	371	368
7/31/2017	11900	31	256	-25	0	258	-23	-206	-1022	0	383	379
8/31/2017	11931	31	302	-25	0	247	-24	-204	-1055	0	381	378
9/30/2017	11961	30	309	-24	0	251	-24	-195	-1050	0	369	365
10/31/2017	11992	31	337	-24	0	244	-26	-199	-1094	0	383	379
11/30/2017	12022	30	318	-23	0	266	-26	-190	-1083	0	371	368
12/31/2017	12053	31	329	-23	0	272	-27	-193	-1121	0	383	380
1/31/2018	12084	31	234	-23	0	241	-26	-191	-953	0	365	354
2/28/2018	12112	28	227	-21	0	176	-22	-171	-892	0	352	351
3/31/2018	12143	31	-1344	-25	0	1094	-23	-198	-1098	342	584	668
4/30/2018	12173	30	201	-25	0	181	-21	-201	-880	0	374	371
5/31/2018	12204	31	233	-25	0	182	-22	-203	-929	0	384	381
6/30/2018	12234	30	251	-24	0	161	-21	-194	-902	0	367	362
7/31/2018	12265	31	270	-24	0	206	-23	-198	-982	0	378	373
8/31/2018	12296	31	289	-24	0	206	-24	-196	-1004	0	379	374
9/30/2018	12326	30	287	-23	0	217	-24	-186	-1000	0	367	363
10/31/2018	12357	31	301	-23	0	223	-26	-189	-1046	0	381	378
11/30/2018	12387	30	495	-22	0	202	-24	-177	-978	38	329	136
12/31/2018	12418	31	-36	-22	0	257	-24	-177	-928	10	456	464
1/31/2019	12449	31	-1180	-24	0	828	-22	-188	-1045	342	604	685
2/28/2019	12477	28	-1884	-24	-1	1091	-19	-191	-843	314	748	811
3/31/2019	12508	31	-547	-29	-1	455	-19	-229	-978	264	532	550
4/30/2019	12538	30	158	-27	0	206	-19	-219	-864	0	383	383
5/31/2019	12569	31	113	-28	0	237	-20	-222	-872	0	396	396
6/30/2019	12599	30	208	-27	0	203	-20	-212	-894	0	373	370
7/31/2019	12630	31	223	-28	0	286	-22	-215	-1004	0	382	378
8/31/2019	12661	31	311	-27	0	232	-24	-211	-1041	0	382	378
9/30/2019	12691	30	311	-26	0	227	-24	-200	-1035	0	375	373
10/31/2019	12722	31	337	-26	0	227	-26	-203	-1077	0	385	383
11/30/2019	12752	30	-404	-25	0	477	-25	-200	-1149	279	506	541
12/31/2019	12783	31	-1676	-29	-2	981	-24	-227	-1063	284	863	892

Table B-19. Monthly Groundwater Budget for the UAS in Pleasant Valley

			influx(+) outflux(-); units in Acre-feet												
Date	Stress Period	Days in Month	Change in Storage	Mountain Front Recharge	GW Flux from East Las Posas	ET	Recharge	Pumping from Wells	Pleasant Valley Semi-Perched Aquifer	Oxnard Basin	Las Posas	Pleasant Valley LAS	Arroyo Las Posas Percolation	Conejo Creek Net Percolation	Calleguas Creek Net Percolation
1/31/2016	11353	31	-758	282	109	-95	106	-468	1119	-363	-14	-832	705	211	0
2/29/2016	11382	29	229	1	121	-97	16	-581	910	-315	-29	-784	345	184	0
3/31/2016	11413	31	-584	169	124	-144	72	-444	1081	-351	-50	-793	691	230	0
4/30/2016	11443	30	578	0	128	-160	17	-561	904	-316	-42	-782	0	234	0
5/31/2016	11474	31	628	0	121	-181	17	-607	964	-322	-24	-839	0	242	0
6/30/2016	11504	30	626	0	117	-170	17	-614	948	-311	-16	-832	0	236	0
7/31/2016	11535	31	676	0	105	-177	17	-752	1072	-317	-13	-858	0	247	0
8/31/2016	11566	31	696	0	96	-169	19	-762	1076	-318	-11	-874	0	247	0
9/30/2016	11596	30	676	0	96	-136	19	-763	1058	-306	-9	-865	0	231	0
10/31/2016	11627	31	430	0	95	-125	17	-789	1089	-316	-12	-904	281	235	0
11/30/2016	11657	30	282	36	95	-96	32	-641	980	-316	-20	-871	297	222	0
12/31/2016	11688	31	-890	459	95	-84	148	-458	1067	-355	-37	-867	729	192	0
1/31/2017	11719	31	-1765	903	112	-95	323	-334	1107	-379	-65	-855	922	127	0
2/28/2017	11747	28	-1500	936	129	-94	270	-256	833	-344	-82	-721	770	59	0
3/31/2017	11778	31	539	0	136	-147	15	-470	888	-329	-73	-683	0	124	0
4/30/2017	11808	30	446	0	139	-171	15	-489	912	-301	-41	-685	0	176	0
5/31/2017	11839	31	464	0	129	-188	15	-518	942	-314	-26	-723	0	219	0
6/30/2017	11869	30	442	0	122	-173	15	-520	932	-308	-18	-718	0	226	0
7/31/2017	11900	31	504	0	114	-180	15	-665	1022	-292	-14	-749	0	244	0
8/31/2017	11931	31	543	0	102	-174	18	-698	1055	-287	-11	-792	0	245	0
9/30/2017	11961	30	537	0	95	-140	18	-704	1050	-278	-9	-799	0	230	0
10/31/2017	11992	31	565	0	95	-128	18	-733	1094	-292	-8	-842	0	232	0
11/30/2017	12022	30	547	0	95	-96	18	-727	1083	-286	-7	-835	0	208	0
12/31/2017	12053	31	575	0	95	-83	18	-750	1121	-301	-7	-872	0	203	0
1/31/2018	12084	31	-129	77	95	-94	36	-496	953	-345	-11	-808	513	208	0
2/28/2018	12112	28	447	0	95	-92	12	-487	892	-320	-12	-725	0	190	0
3/31/2018	12143	31	-1445	708	95	-147	234	-350	1098	-387	-22	-815	834	198	0
4/30/2018	12173	30	490	0	95	-163	12	-443	880	-356	-24	-694	0	203	0
5/31/2018	12204	31	461	0	96	-181	12	-461	929	-360	-15	-719	0	239	0
6/30/2018	12234	30	449	0	96	-170	12	-456	902	-351	-12	-706	0	236	0
7/31/2018	12265	31	495	0	96	-177	13	-578	982	-344	-10	-725	0	248	0
8/31/2018	12296	31	512	0	95	-171	14	-602	1004	-346	-9	-746	0	249	0
9/30/2018	12326	30	493	0	95	-138	14	-608	1000	-340	-8	-743	0	234	0
10/31/2018	12357	31	511	0	95	-125	14	-633	1046	-359	-8	-779	0	238	0
11/30/2018	12387	30	-175	28	95	-96	23	-504	978	-365	-11	-786	594	219	0
12/31/2018	12418	31	-223	97	95	-84	39	-451	928	-382	-20	-826	609	219	0
1/31/2019	12449	31	-1291	640	95	-95	171	-313	1045	-406	-40	-807	834	166	0
2/28/2019	12477	28	-1530	926	118	-94	269	-235	843	-380	-61	-711	763	90	0
3/31/2019	12508	31	-805	275	131	-147	95	-255	978	-389	-85	-633	699	137	0
4/30/2019	12538	30	389	0	138	-171	12	-374	864	-345	-64	-622	0	172	0
5/31/2019	12569	31	-61	40	133	-198	28	-336	872	-358	-58	-624	344	219	0
6/30/2019	12599	30	339	0	136	-176	13	-406	894	-345	-48	-632	0	224	0
7/31/2019	12630	31	361	0	125	-181	15	-505	1004	-353	-28	-682	0	243	0
8/31/2019	12661	31	415	0	116	-174	17	-570	1041	-348	-18	-724	0	245	0
9/30/2019	12691	30	429	0	103	-141	17	-585	1035	-335	-12	-743	0	233	0
10/31/2019	12722	31	479	0	95	-129	17	-616	1077	-347	-10	-798	0	232	0
11/30/2019	12752	30	-877	240	95	-100	93	-411	1149	-353	-16	-745	713	213	0
12/31/2019	12783	31	-1339	682	95	-84	208	-327	1063	-379	-38	-767	729	157	0

Table B-20. Monthly Groundwater Budget for the LAS in Pleasant Valley								
			influx(+) outflux(-); units in Acre-feet					
Date	Stress Period	Days in Month	Change in Storage	Recharge	Pumping from Wells	Pleasant Valley UAS	Oxnard Basin	Las Posas
1/31/2016	11353	31	-866	47	105	832	-97	-21
2/29/2016	11382	29	331	10	-946	784	-135	-43
3/31/2016	11413	31	-603	29	-48	793	-118	-53
4/30/2016	11443	30	335	9	-905	782	-158	-62
5/31/2016	11474	31	322	9	-947	839	-183	-40
6/30/2016	11504	30	304	9	-940	832	-184	-21
7/31/2016	11535	31	317	9	-970	858	-204	-10
8/31/2016	11566	31	284	10	-953	874	-216	1
9/30/2016	11596	30	287	10	-952	865	-219	8
10/31/2016	11627	31	193	9	-886	904	-231	10
11/30/2016	11657	30	-210	11	-483	871	-181	-8
12/31/2016	11688	31	-901	53	150	867	-125	-44
1/31/2017	11719	31	-1070	125	260	855	-76	-94
2/28/2017	11747	28	-818	100	157	721	-39	-121
3/31/2017	11778	31	271	7	-693	683	-133	-134
4/30/2017	11808	30	259	7	-673	685	-185	-92
5/31/2017	11839	31	200	7	-644	723	-211	-75
6/30/2017	11869	30	194	7	-641	718	-218	-60
7/31/2017	11900	31	433	7	-1060	749	-84	-46
8/31/2017	11931	31	358	8	-1073	792	-58	-30
9/30/2017	11961	30	325	8	-1067	799	-53	-18
10/31/2017	11992	31	251	8	-1036	842	-57	-11
11/30/2017	12022	30	254	8	-1042	835	-55	-7
12/31/2017	12053	31	196	8	-1018	872	-58	-4
1/31/2018	12084	31	-602	15	-71	808	-127	-23
2/28/2018	12112	28	45	6	-599	725	-131	-46
3/31/2018	12143	31	-979	91	243	815	-91	-78
4/30/2018	12173	30	148	6	-644	694	-100	-103
5/31/2018	12204	31	109	6	-624	719	-124	-86
6/30/2018	12234	30	122	6	-630	706	-130	-74
7/31/2018	12265	31	299	7	-874	725	-97	-60
8/31/2018	12296	31	257	7	-857	746	-105	-48
9/30/2018	12326	30	248	7	-852	743	-109	-37
10/31/2018	12357	31	191	7	-825	779	-120	-32
11/30/2018	12387	30	-168	11	-479	786	-109	-42
12/31/2018	12418	31	-344	14	-328	826	-87	-81
1/31/2019	12449	31	-819	62	134	807	-66	-117
2/28/2019	12477	28	-757	99	119	711	-36	-136
3/31/2019	12508	31	-434	36	-30	633	-32	-173
4/30/2019	12538	30	304	7	-671	622	-107	-155
5/31/2019	12569	31	-77	12	-294	624	-127	-138
6/30/2019	12599	30	283	7	-639	632	-163	-122
7/31/2019	12630	31	542	8	-917	682	-229	-85
8/31/2019	12661	31	459	9	-900	724	-231	-60
9/30/2019	12691	30	405	9	-885	743	-230	-43
10/31/2019	12722	31	318	9	-852	798	-238	-34
11/30/2019	12752	30	-620	32	40	745	-148	-48
12/31/2019	12783	31	-803	74	145	767	-84	-99

Table B-21. Flow Budget for the Shallow Aquifer in West Las Posas Valley Basin								
			influx(+) outflux(-); units in Acre-feet					
Date	Stress Period	Days in Month	Change in Storage	Recharge	Pumping from Wells	Oxnard Basin	Pleasant Valley	Las Posas LAS
1/31/2016	11353	31	-21	862	-12	37	14	-880
2/29/2016	11382	29	88	213	-55	38	29	-313
3/31/2016	11413	31	-49	623	-17	61	50	-667
4/30/2016	11443	30	48	236	-62	67	42	-331
5/31/2016	11474	31	100	235	-63	63	24	-359
6/30/2016	11504	30	122	236	-63	56	16	-367
7/31/2016	11535	31	140	252	-79	63	13	-389
8/31/2016	11566	31	144	276	-79	63	11	-415
9/30/2016	11596	30	140	274	-79	66	9	-410
10/31/2016	11627	31	126	255	-79	76	12	-390
11/30/2016	11657	30	86	212	-58	76	20	-335
12/31/2016	11688	31	-82	841	-18	74	37	-853
1/31/2017	11719	31	-395	1973	-6	71	65	-1708
2/28/2017	11747	28	-395	1758	-6	109	82	-1548
3/31/2017	11778	31	42	219	-66	159	73	-427
4/30/2017	11808	30	50	220	-67	131	41	-374
5/31/2017	11839	31	78	222	-68	117	26	-376
6/30/2017	11869	30	100	222	-68	101	18	-373
7/31/2017	11900	31	94	249	-43	89	14	-403
8/31/2017	11931	31	109	263	-43	79	11	-418
9/30/2017	11961	30	119	262	-43	69	9	-415
10/31/2017	11992	31	131	262	-44	67	8	-424
11/30/2017	12022	30	132	260	-43	64	7	-419
12/31/2017	12053	31	136	259	-44	67	7	-426
1/31/2018	12084	31	68	254	-14	76	11	-395
2/28/2018	12112	28	66	215	-25	62	12	-330
3/31/2018	12143	31	-204	1494	-4	75	22	-1383
4/30/2018	12173	30	62	217	-24	88	24	-366
5/31/2018	12204	31	61	219	-25	78	15	-348
6/30/2018	12234	30	80	219	-25	56	12	-343
7/31/2018	12265	31	117	248	-65	66	10	-376
8/31/2018	12296	31	128	277	-65	67	9	-416
9/30/2018	12326	30	133	276	-65	65	8	-417
10/31/2018	12357	31	138	276	-65	68	8	-424
11/30/2018	12387	30	72	292	-28	69	11	-417
12/31/2018	12418	31	29	292	-27	77	20	-391
1/31/2019	12449	31	-218	1341	-3	90	40	-1250
2/28/2019	12477	28	-304	1386	-3	125	61	-1264
3/31/2019	12508	31	-254	568	-6	223	85	-615
4/30/2019	12538	30	-172	246	-21	229	64	-346
5/31/2019	12569	31	-105	236	-13	175	58	-351
6/30/2019	12599	30	-61	248	-22	155	48	-368
7/31/2019	12630	31	-136	283	-29	281	28	-427
8/31/2019	12661	31	-165	336	-30	357	18	-516
9/30/2019	12691	30	-29	335	-30	250	12	-538
10/31/2019	12722	31	75	334	-30	173	10	-562
11/30/2019	12752	30	-8	783	-10	131	16	-912
12/31/2019	12783	31	-170	1177	-6	136	38	-1175

Table B-22. Monthly Groundwater Budget for the LAS in West Las Posas Valley Basin										
			influx(+) outflux(-); units in Acre-feet							
Date	Stress Period	Days in Month	Change in Storage	San Pedro Outcrop Recharge	Recharge	Pumping from Wells	Outside Area	Las Posas UAS	Oxnard Basin	Pleasant Valley
1/31/2016	11353	31	-1366	452	376	-261	6	880	-109	21
2/29/2016	11382	29	784	13	71	-1014	7	313	-217	43
3/31/2016	11413	31	-816	280	253	-316	9	667	-129	53
4/30/2016	11443	30	1121	0	53	-1347	8	331	-228	62
5/31/2016	11474	31	1151	0	53	-1352	8	359	-259	40
6/30/2016	11504	30	1168	0	54	-1352	7	367	-265	21
7/31/2016	11535	31	1288	0	60	-1479	6	389	-275	10
8/31/2016	11566	31	1390	0	66	-1600	6	415	-275	-1
9/30/2016	11596	30	1404	0	65	-1600	5	410	-276	-8
10/31/2016	11627	31	1298	0	59	-1458	5	390	-283	-10
11/30/2016	11657	30	1060	0	52	-1235	4	335	-224	8
12/31/2016	11688	31	-1122	313	324	-309	6	853	-109	44
1/31/2017	11719	31	-3422	885	864	-95	12	1708	-47	94
2/28/2017	11747	28	-3280	910	815	-111	19	1548	-21	121
3/31/2017	11778	31	728	0	77	-1236	21	427	-151	134
4/30/2017	11808	30	858	0	81	-1234	17	374	-188	92
5/31/2017	11839	31	877	0	93	-1233	15	376	-203	75
6/30/2017	11869	30	904	0	93	-1233	12	373	-210	60
7/31/2017	11900	31	1009	0	100	-1353	11	403	-217	46
8/31/2017	11931	31	1052	0	105	-1399	10	418	-216	30
9/30/2017	11961	30	1076	0	99	-1399	9	415	-218	18
10/31/2017	11992	31	1082	0	98	-1399	8	424	-225	11
11/30/2017	12022	30	1101	0	89	-1399	7	419	-225	7
12/31/2017	12053	31	1109	0	82	-1399	7	426	-230	4
1/31/2018	12084	31	72	70	124	-553	7	395	-138	23
2/28/2018	12112	28	899	0	70	-1175	6	330	-176	46
3/31/2018	12143	31	-2690	710	676	-122	10	1383	-46	78
4/30/2018	12173	30	751	0	81	-1177	12	366	-136	103
5/31/2018	12204	31	790	0	93	-1175	10	348	-153	86
6/30/2018	12234	30	811	0	93	-1174	9	343	-155	74
7/31/2018	12265	31	1029	0	106	-1419	8	376	-160	60
8/31/2018	12296	31	1178	0	112	-1593	8	416	-168	48
9/30/2018	12326	30	1200	0	106	-1593	7	417	-173	37
10/31/2018	12357	31	1206	0	105	-1593	6	424	-180	32
11/30/2018	12387	30	125	90	147	-738	6	417	-89	42
12/31/2018	12418	31	107	80	140	-738	7	391	-67	81
1/31/2019	12449	31	-2551	754	601	-176	11	1250	-6	117
2/28/2019	12477	28	-2603	718	616	-165	16	1264	18	136
3/31/2019	12508	31	-970	245	261	-377	20	615	32	173
4/30/2019	12538	30	970	0	89	-1495	17	346	-81	155
5/31/2019	12569	31	331	33	128	-956	16	351	-41	138
6/30/2019	12599	30	994	0	100	-1494	13	368	-104	122
7/31/2019	12630	31	1175	0	111	-1735	12	427	-76	85
8/31/2019	12661	31	1420	0	120	-2068	11	516	-59	60
9/30/2019	12691	30	1439	0	115	-2068	9	538	-75	43
10/31/2019	12722	31	1440	0	114	-2068	9	562	-91	34
11/30/2019	12752	30	-1164	293	324	-422	9	912	0	48
12/31/2019	12783	31	-2249	639	571	-293	14	1175	44	99

Table B-23. Monthly Streamflow Budget
units in Acre-feet

Year	Month	Days in Month	Rising Groundwater									Stream Percolation								
			System A			System B			System C			System A			System B			System C		
			Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula	Piru	Fillmore	Santa Paula
2016	1	31	-2324	-503	-69	0	-106	-40	0	-41	-14	6300	896	33	0	0	37	0	5	0
2016	2	29	-1713	-584	-163	0	-38	-12	0	-31	-14	3715	830	95	0	0	5	0	7	0
2016	3	31	-1861	-651	-151	0	-50	-24	0	-33	-14	4820	988	90	0	0	19	0	7	0
2016	4	30	-1536	-540	-168	0	-38	-11	0	-30	-13	2950	686	86	0	0	5	0	10	0
2016	5	31	-1513	-457	-161	0	-38	-11	0	-31	-10	2708	474	85	0	0	5	0	11	0
2016	6	30	-1314	-394	-153	0	-37	-11	0	-30	-9	1826	279	86	0	0	5	0	11	0
2016	7	31	-1163	-356	-150	0	-38	-10	0	-31	-9	1576	173	89	0	0	4	0	11	0
2016	8	31	-1277	-308	-145	0	-38	-10	0	-31	-9	1863	184	88	0	0	4	0	12	0
2016	9	30	-1388	-254	-129	0	-36	-10	0	-30	-9	2502	220	78	0	0	3	0	11	0
2016	10	31	-1482	-266	-134	0	-37	-10	0	-31	-9	2508	303	84	0	0	2	0	12	0
2016	11	30	-1463	-231	-127	0	-36	-10	0	-30	-9	2608	318	78	0	0	3	0	11	0
2016	12	31	-2178	-393	-117	0	-87	-29	0	-34	-13	4972	772	78	0	0	25	0	7	0
2017	1	31	-4091	-512	-72	0	-224	-67	0	-91	-16	12420	2211	67	0	0	51	0	1	0
2017	2	28	-3344	-627	-119	0	-208	-72	0	-87	-17	10056	3652	138	0	0	61	0	0	0
2017	3	31	-2791	-752	-168	0	-53	-10	0	-31	-16	7899	1625	146	0	0	3	0	8	0
2017	4	30	-2258	-561	-164	0	-50	-10	0	-30	-14	5534	1094	102	0	0	3	0	10	0
2017	5	31	-2257	-556	-147	0	-50	-10	0	-31	-14	6822	1186	111	0	0	3	0	11	0
2017	6	30	-2525	-625	-69	0	-47	-10	0	-30	-13	17400	3009	317	0	0	3	0	10	0
2017	7	31	-1870	-348	-48	0	-47	-11	0	-31	-14	7559	450	25	0	0	6	0	11	0
2017	8	31	-1512	-412	-170	0	-46	-11	0	-31	-13	2882	325	82	0	0	6	0	11	0
2017	9	30	-1430	-356	-154	0	-44	-11	0	-30	-13	2513	184	82	0	0	6	0	11	0
2017	10	31	-1498	-336	-150	0	-44	-11	0	-31	-12	2681	165	83	0	0	6	0	11	0
2017	11	30	-1496	-297	-139	0	-42	-11	0	-30	-10	2952	158	75	0	0	6	0	11	0
2017	12	31	-1546	-285	-141	0	-43	-11	0	-31	-10	3060	164	79	0	0	6	0	11	0
2018	1	31	-1722	-348	-129	0	-44	-16	0	-33	-12	4368	758	86	0	0	8	0	8	0
2018	2	28	-1479	-298	-123	0	-37	-10	0	-28	-9	3717	570	67	0	0	5	0	10	0
2018	3	31	-2614	-509	-131	0	-193	-55	0	-78	-16	5866	1813	128	0	0	43	0	2	0
2018	4	30	-1794	-497	-148	0	-46	-10	0	-30	-15	4201	942	101	0	0	5	0	8	0
2018	5	31	-1538	-393	-157	0	-46	-11	0	-31	-14	2817	852	96	0	0	5	0	11	0
2018	6	30	-1443	-344	-146	0	-44	-10	0	-30	-13	2996	565	83	0	0	5	0	11	0
2018	7	31	-1458	-304	-146	0	-44	-11	0	-31	-12	2458	424	84	0	0	7	0	11	0
2018	8	31	-1337	-264	-141	0	-43	-11	0	-31	-10	1876	269	83	0	0	6	0	11	0
2018	9	30	-1404	-221	-130	0	-41	-11	0	-30	-10	2210	239	76	0	0	7	0	11	0
2018	10	31	-1470	-203	-130	0	-42	-11	0	-31	-10	2504	247	79	0	0	6	0	11	0
2018	11	30	-1542	-292	-119	0	-42	-15	0	-32	-13	3691	428	77	0	0	8	0	7	0
2018	12	31	-1906	-275	-38	0	-42	-13	0	-32	-12	6453	790	30	0	0	5	0	8	0
2019	1	31	-2895	-483	-66	0	-190	-56	0	-76	-16	8480	2235	63	0	0	43	0	1	0
2019	2	28	-3940	-616	-96	0	-205	-58	0	-84	-19	11937	3859	152	0	0	43	0	0	0
2019	3	31	-3313	-813	-129	0	-81	-23	0	-34	-19	10271	2800	182	0	0	18	0	4	0
2019	4	30	-2551	-661	-108	0	-51	-10	0	-30	-15	11633	1276	80	0	0	5	0	9	0
2019	5	31	-2016	-623	-114	0	-53	-12	0	-32	-15	9460	1341	90	0	0	4	0	8	0
2019	6	30	-1699	-994	-177	0	-48	-10	0	-30	-14	15140	4613	562	0	0	5	0	10	0
2019	7	31	-1786	-819	-192	0	-48	-11	0	-31	-14	9284	2854	520	0	0	6	0	11	0
2019	8	31	-1621	-538	-172	0	-47	-11	0	-31	-14	2890	594	86	0	0	6	0	11	0
2019	9	30	-1468	-502	-161	0	-45	-11	0	-30	-13	2857	626	84	0	0	6	0	10	0
2019	10	31	-1533	-495	-158	0	-45	-11	0	-31	-14	3211	511	87	0	0	6	0	11	0
2019	11	30	-1721	-566	-126	0	-45	-15	0	-31	-14	4874	596	71	0	0	8	0	8	0
2019	12	31	-2528	-734	-92	0	-119	-43	0	-43	-16	6937	1356	35	0	0	38	0	4	0