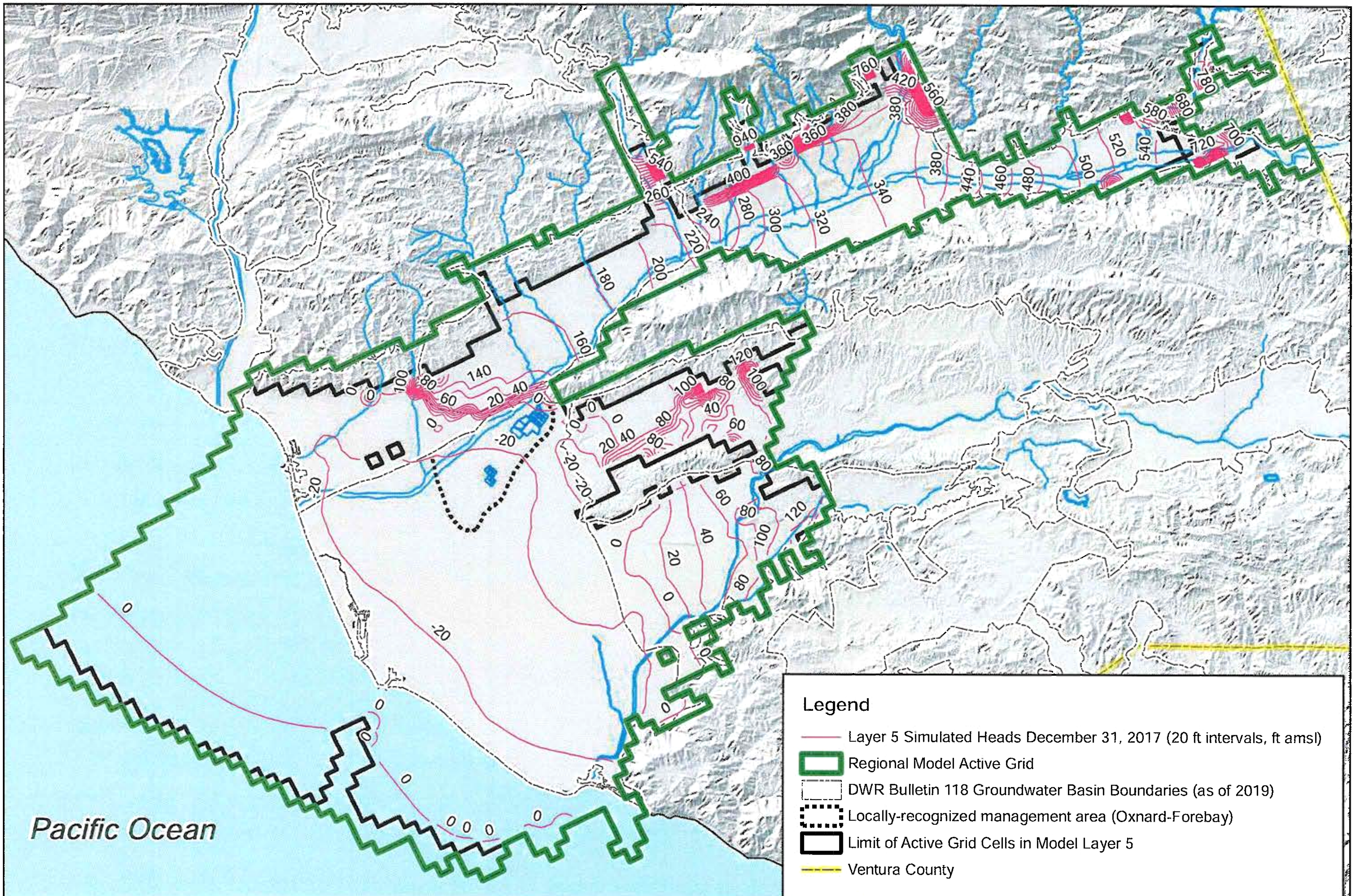


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**Figure 3-41.**
**December 2017 Simulated Head Contours of Model Layer 5**

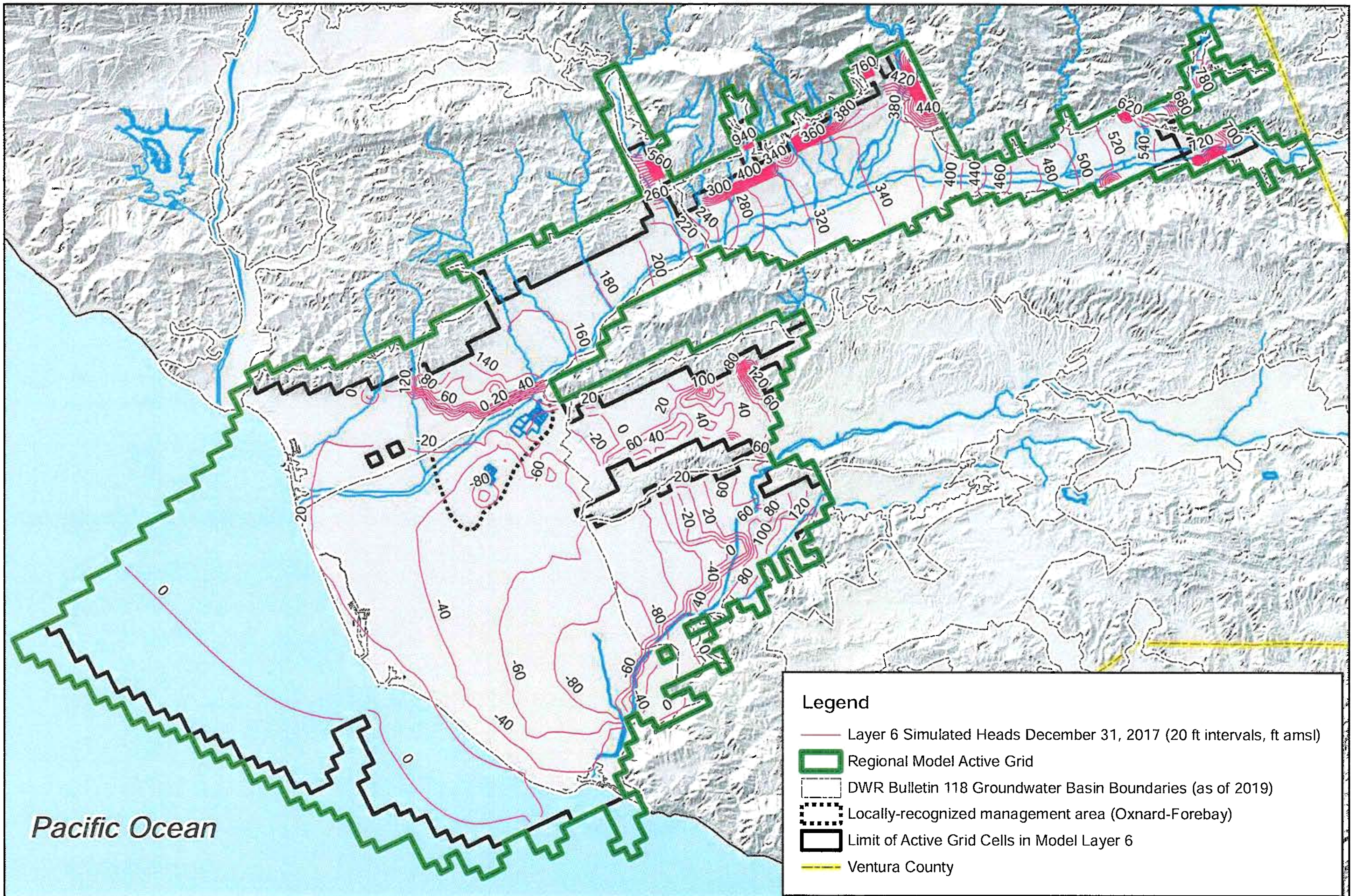


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**Figure 3-42.**
**December 2017 Simulated Head Contours of Model Layer 6**

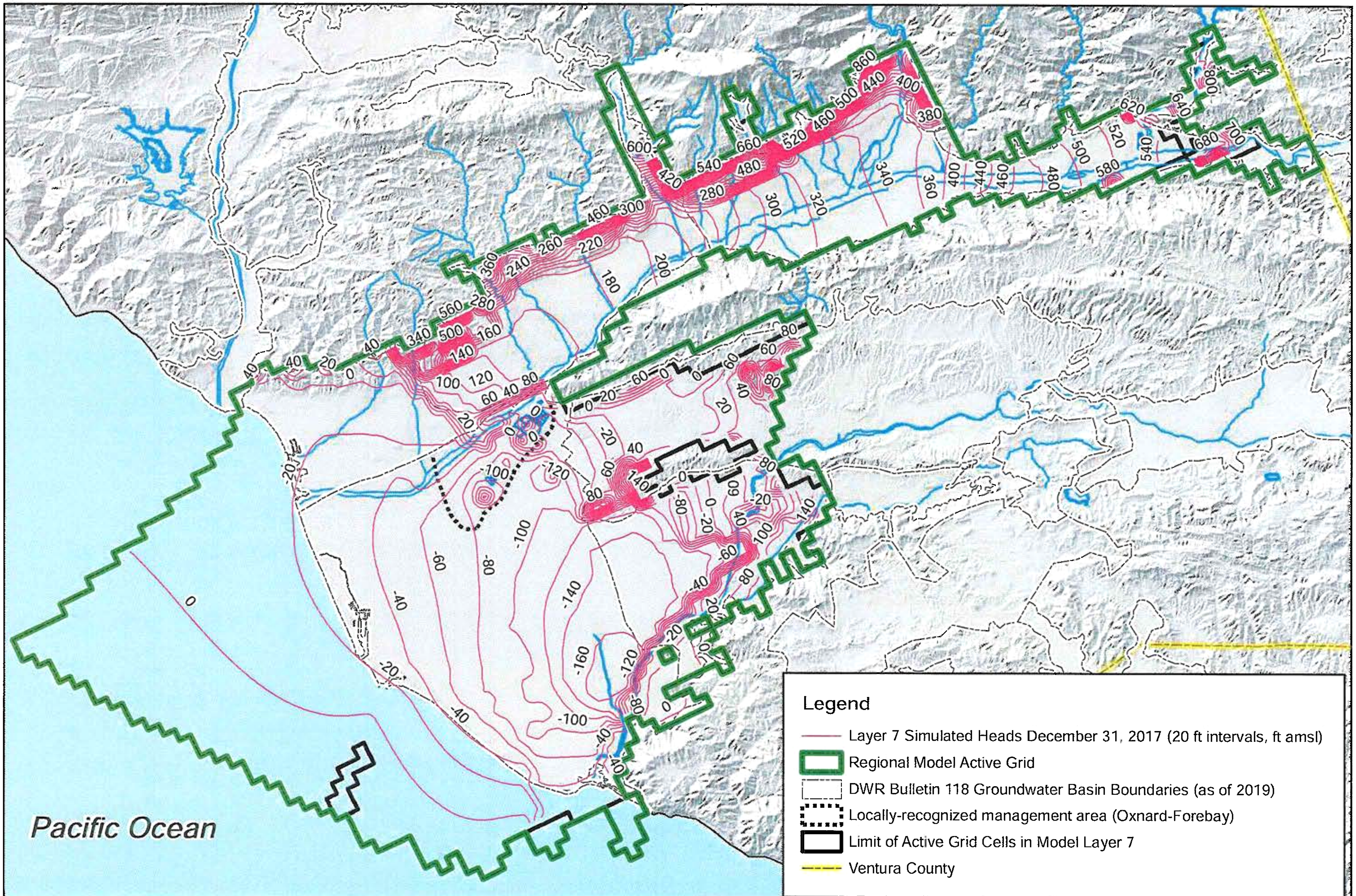


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**Figure 3-43.**
**December 2017 Simulated Head Contours of Model Layer 7**

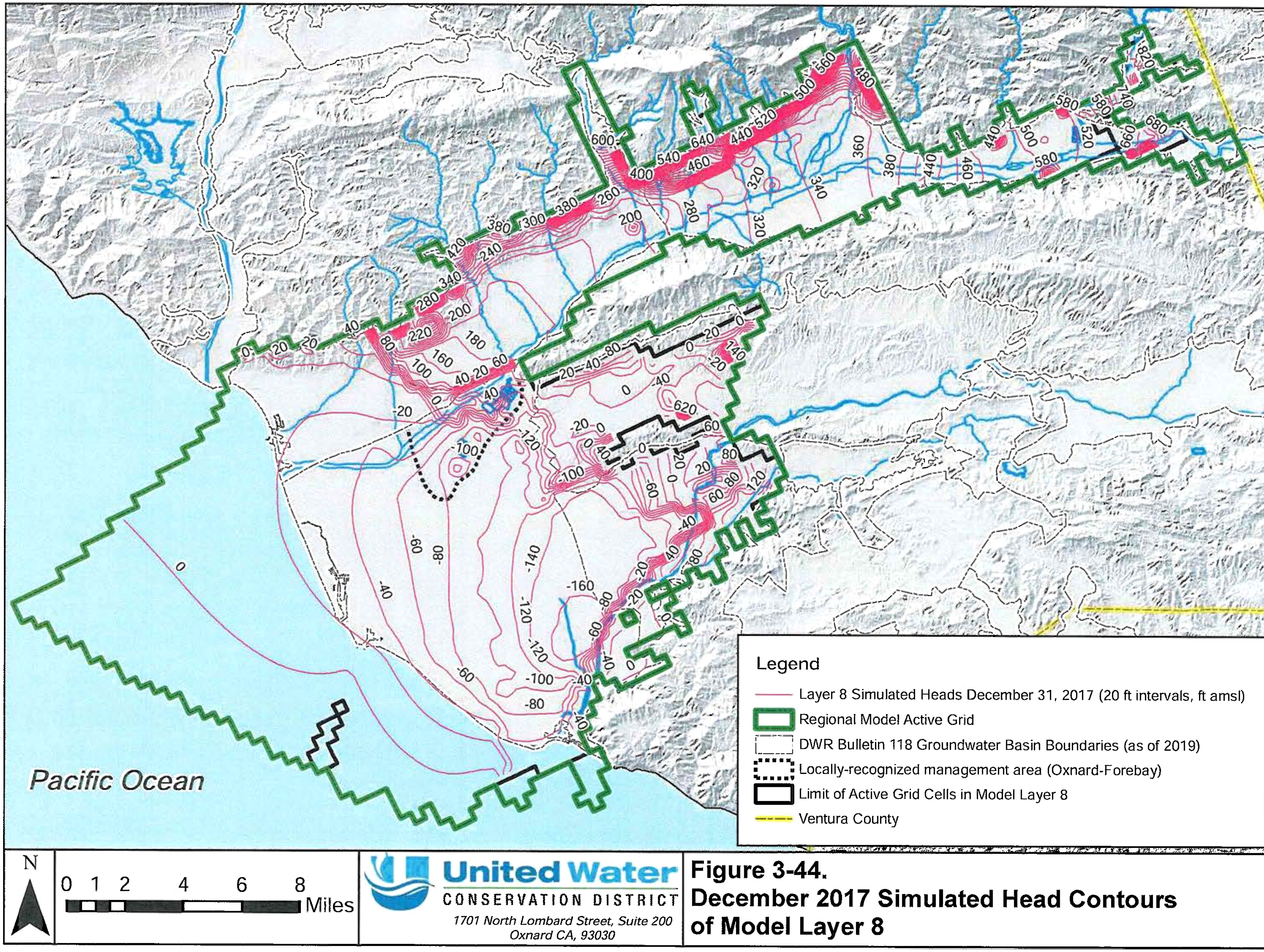


**Figure 3-44.**
**December 2017 Simulated Head Contours of Model Layer 8**

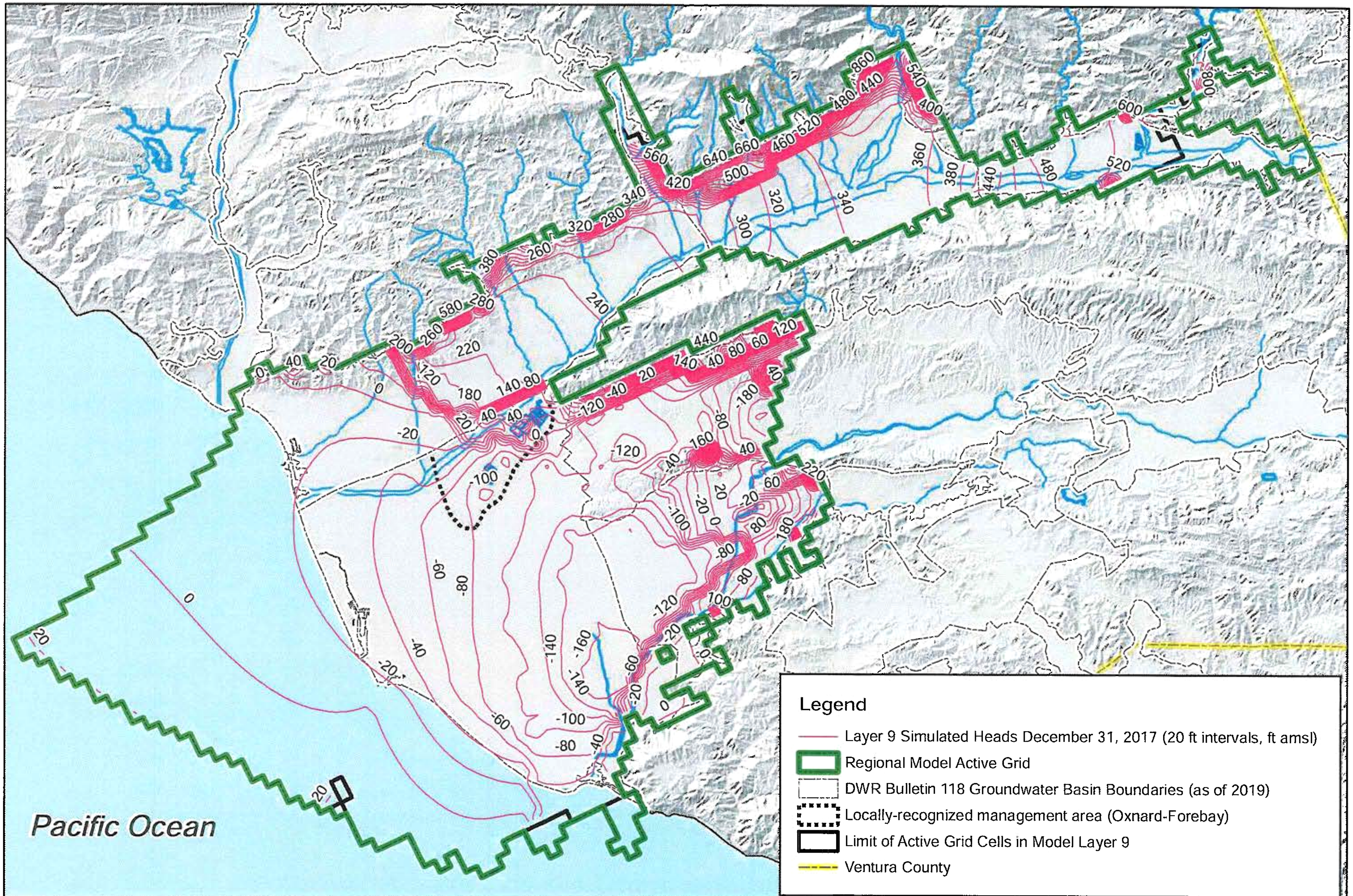


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**Figure 3-45. December 2017 Simulated Head Contours of Model Layer 9**

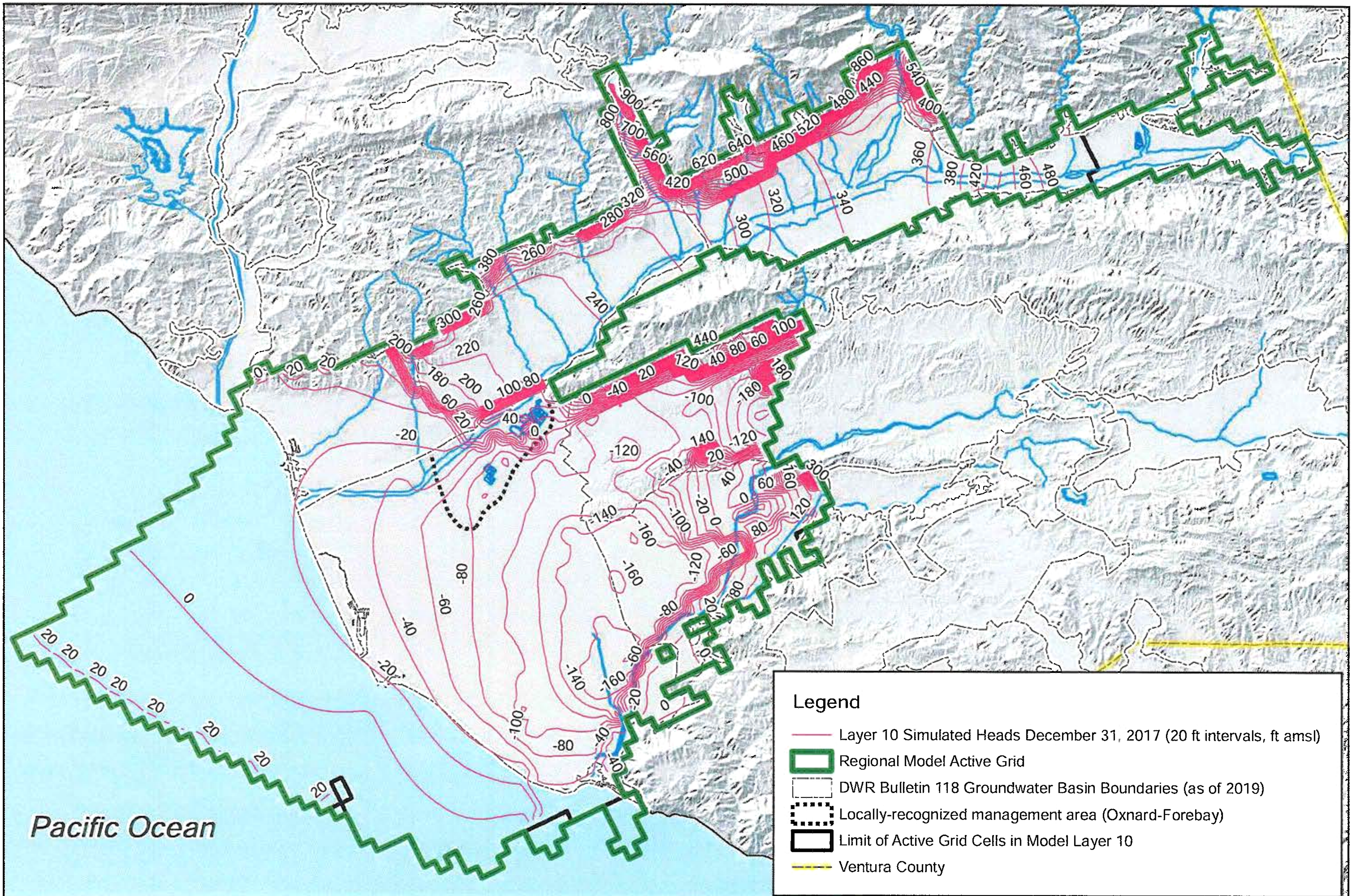


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**Figure 3-46. December 2017 Simulated Head Contours of Model Layer 10**

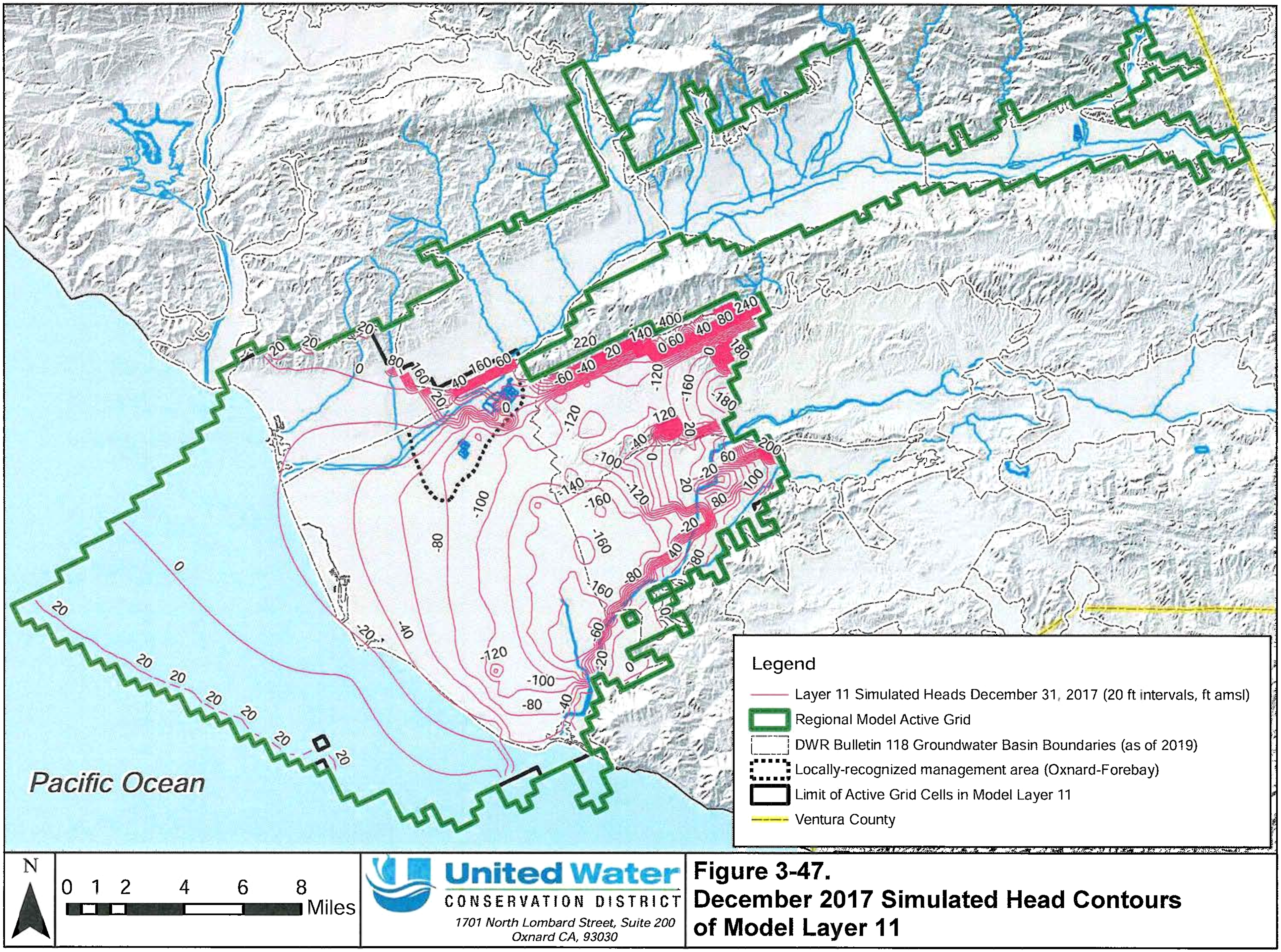


**Figure 3-47.**
**December 2017 Simulated Head Contours of Model Layer 11**

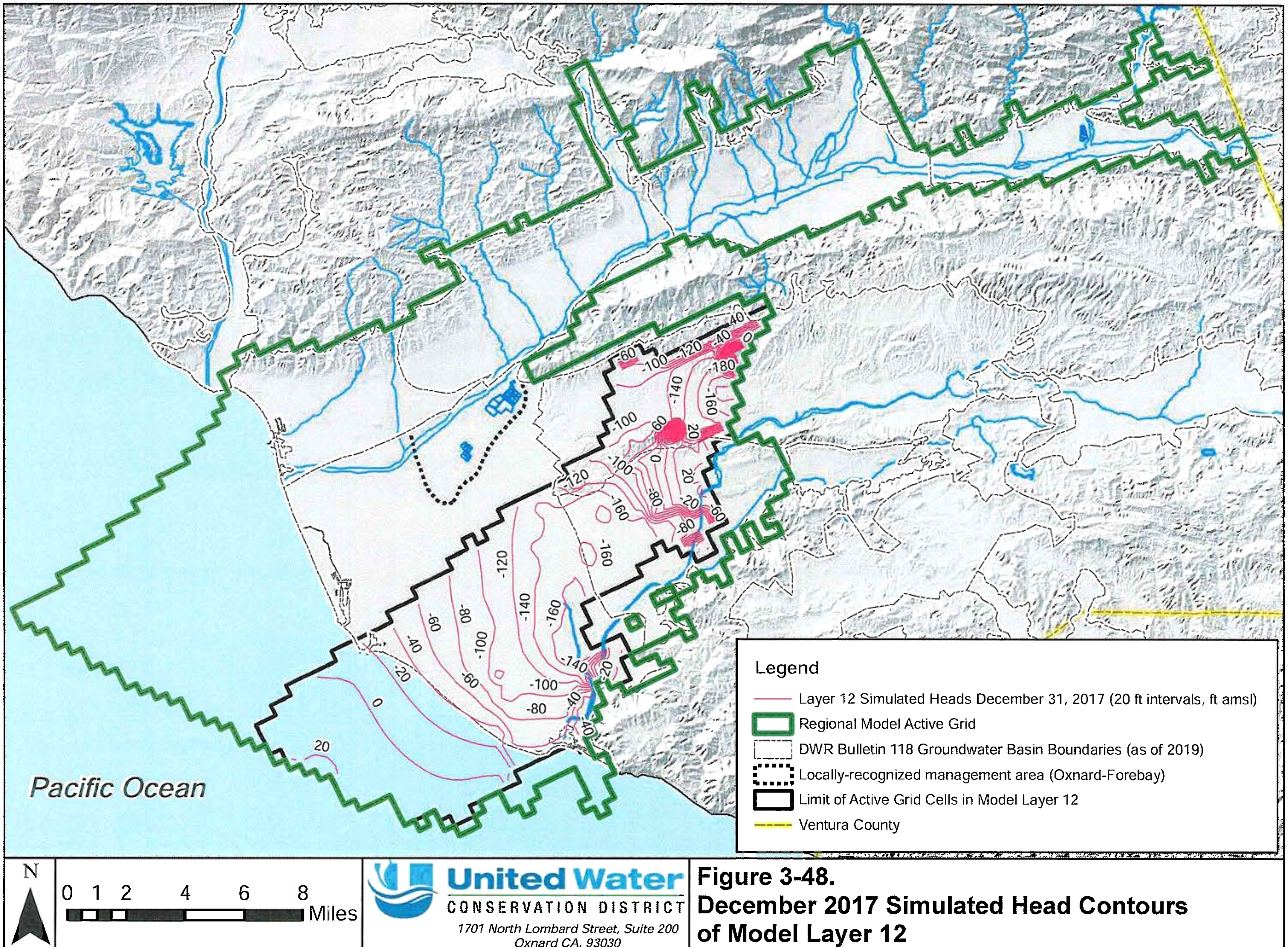


**Figure 3-48.**
**December 2017 Simulated Head Contours of Model Layer 12**

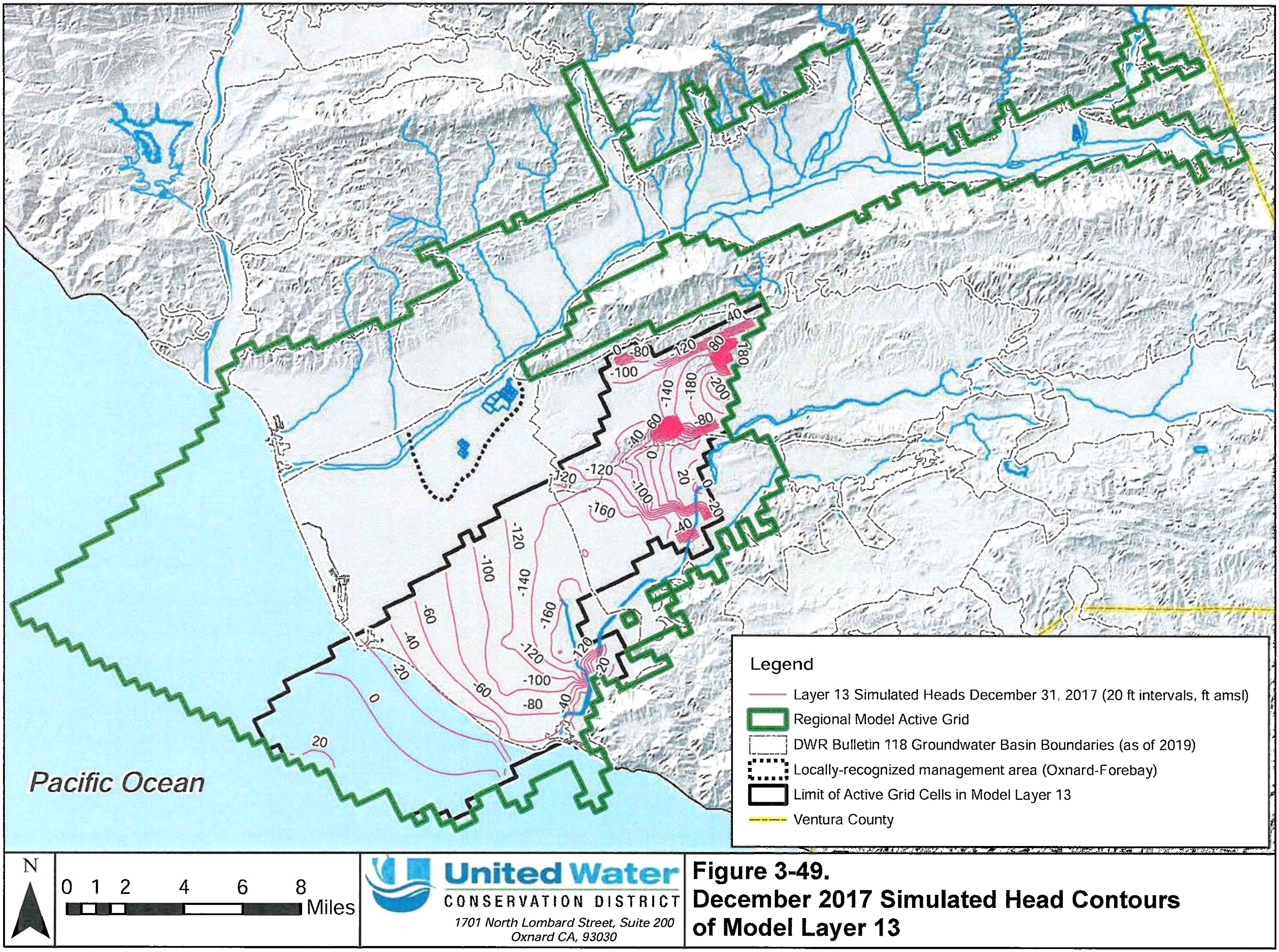


**Figure 3-49.**
**December 2017 Simulated Head Contours of Model Layer 13**

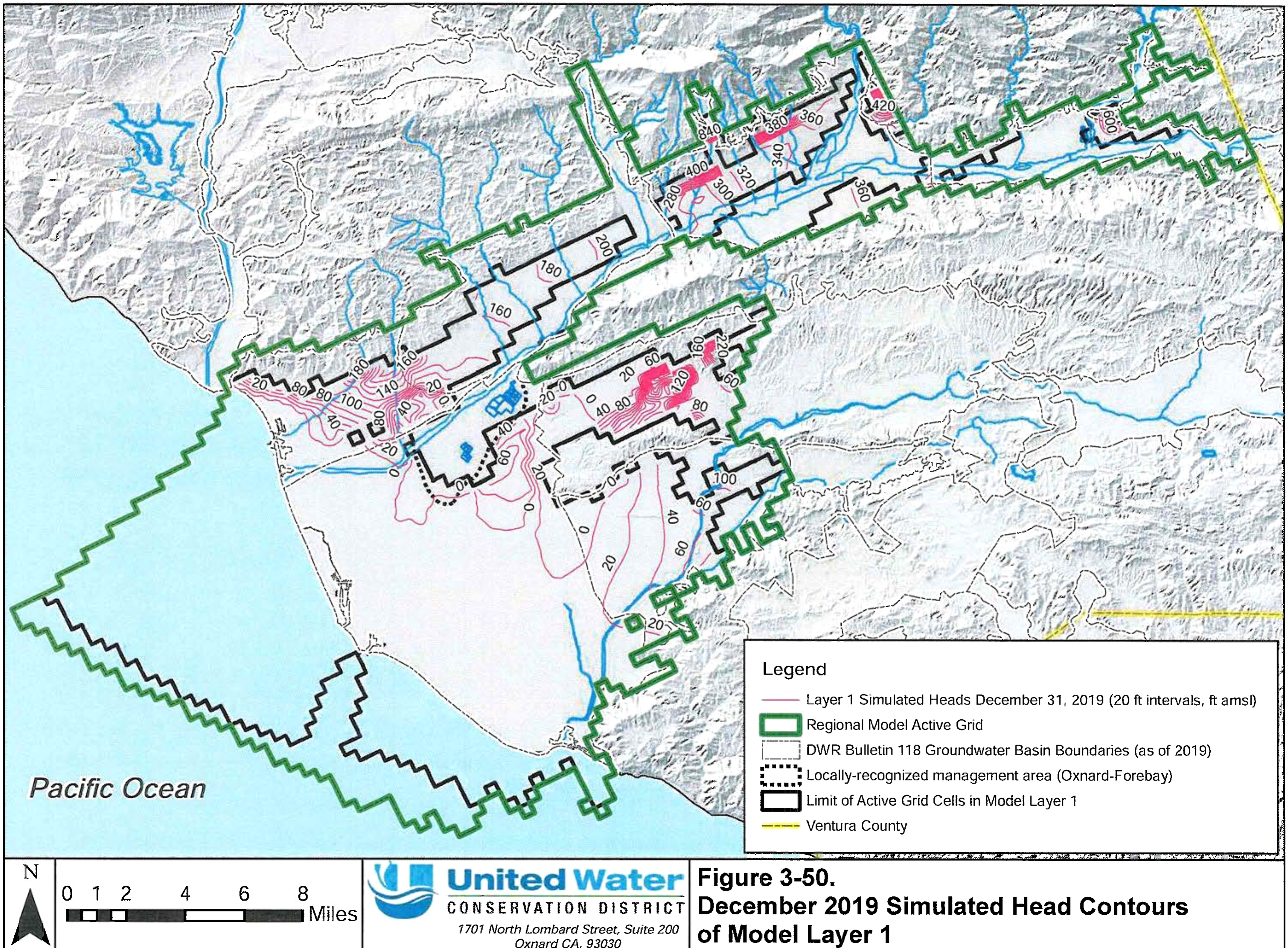


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**Figure 3-50.**
**December 2019 Simulated Head Contours of Model Layer 1**

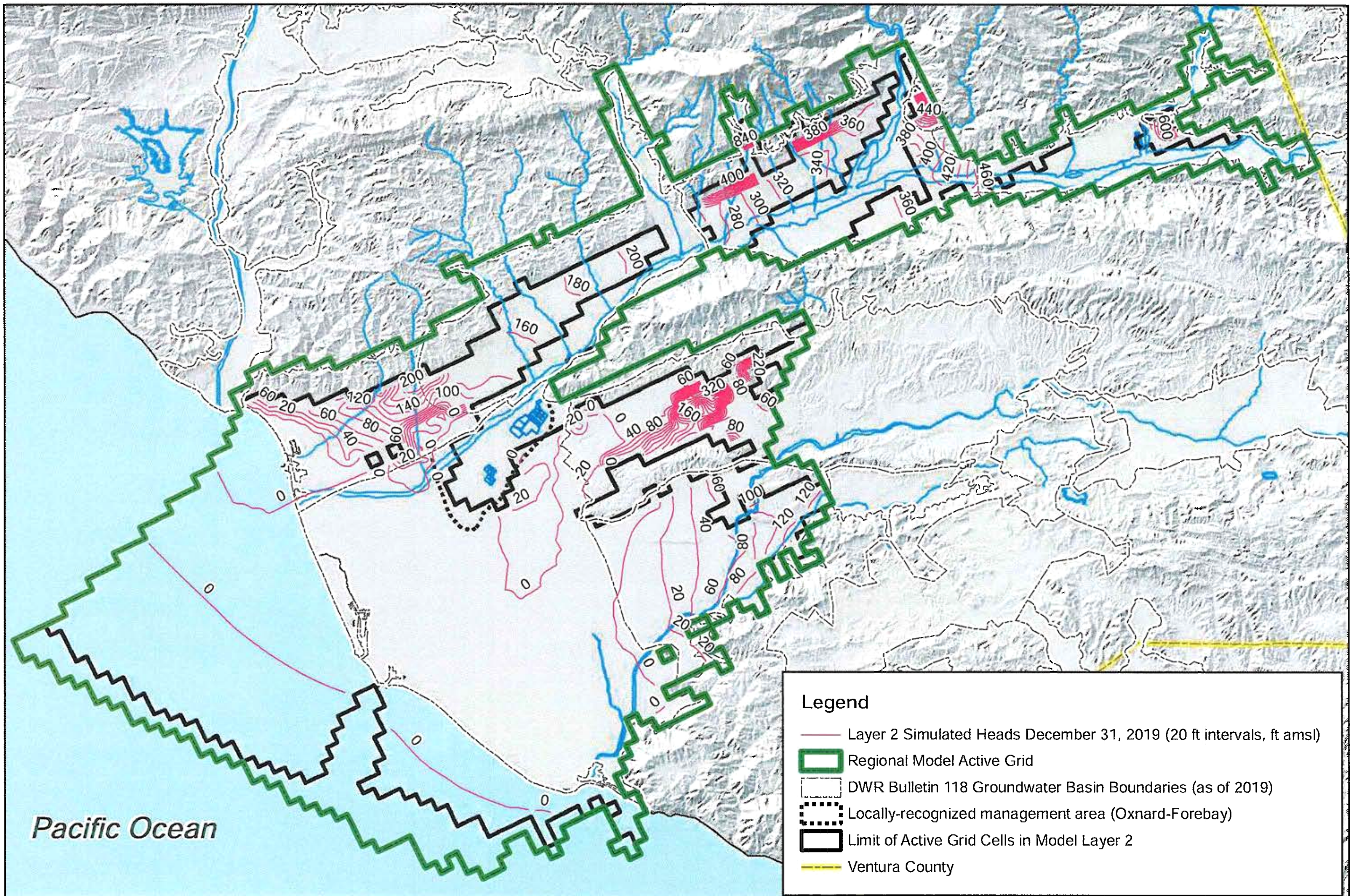


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**Figure 3-51. December 2019 Simulated Head Contours of Model Layer 2**

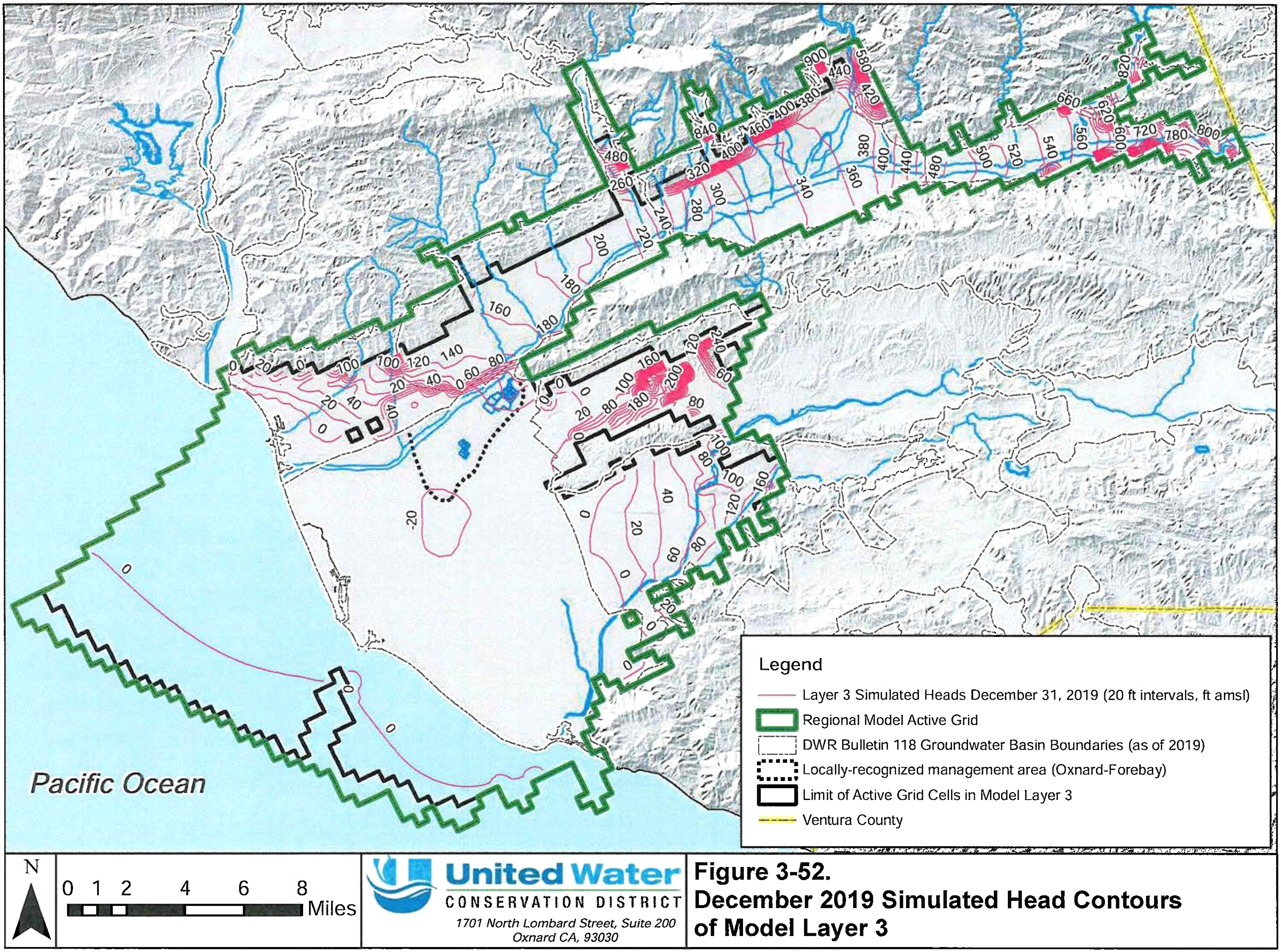


**Figure 3-52.**
**December 2019 Simulated Head Contours of Model Layer 3**

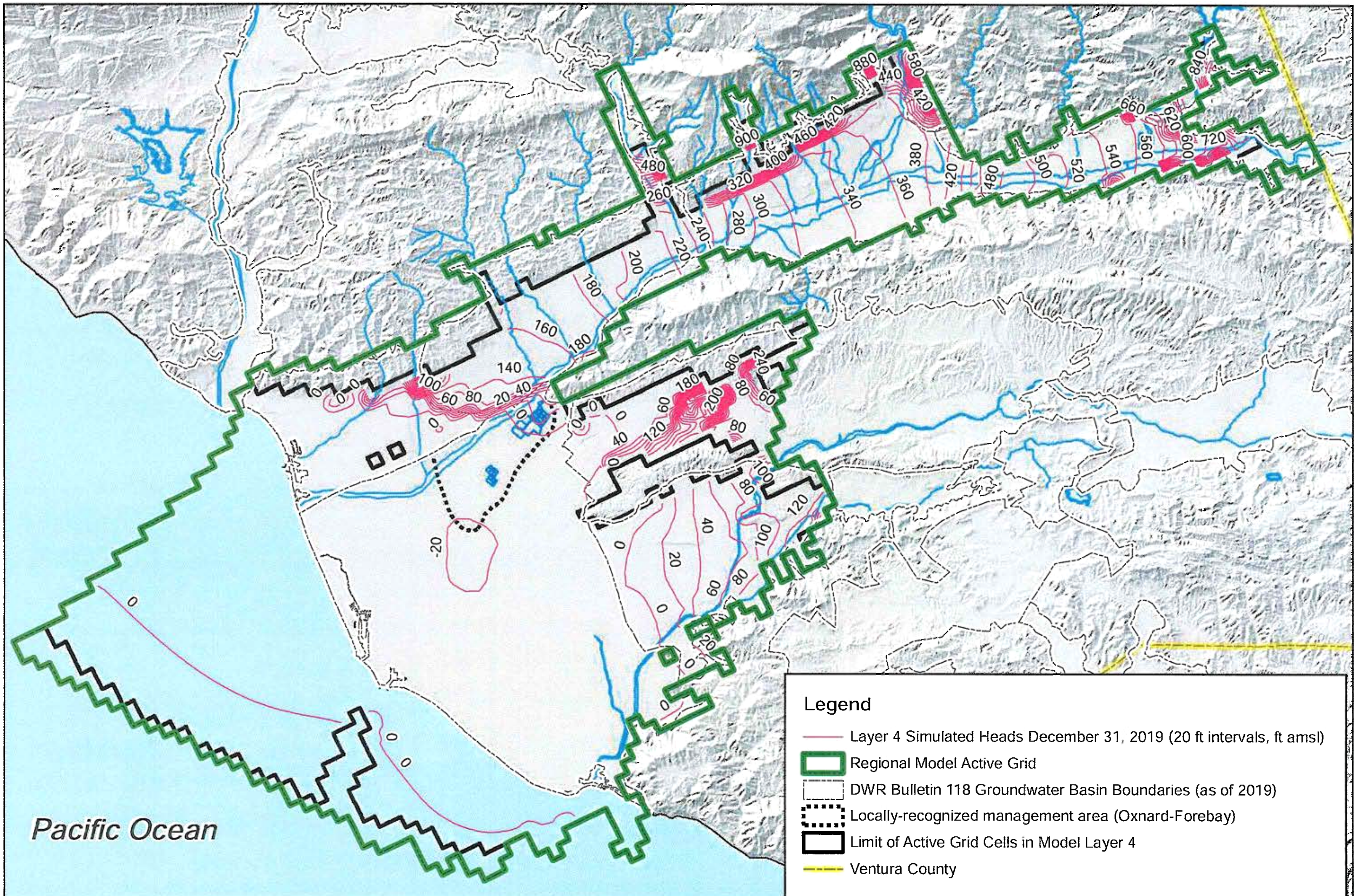


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**Figure 3-53.**
**December 2019 Simulated Head Contours of Model Layer 4**

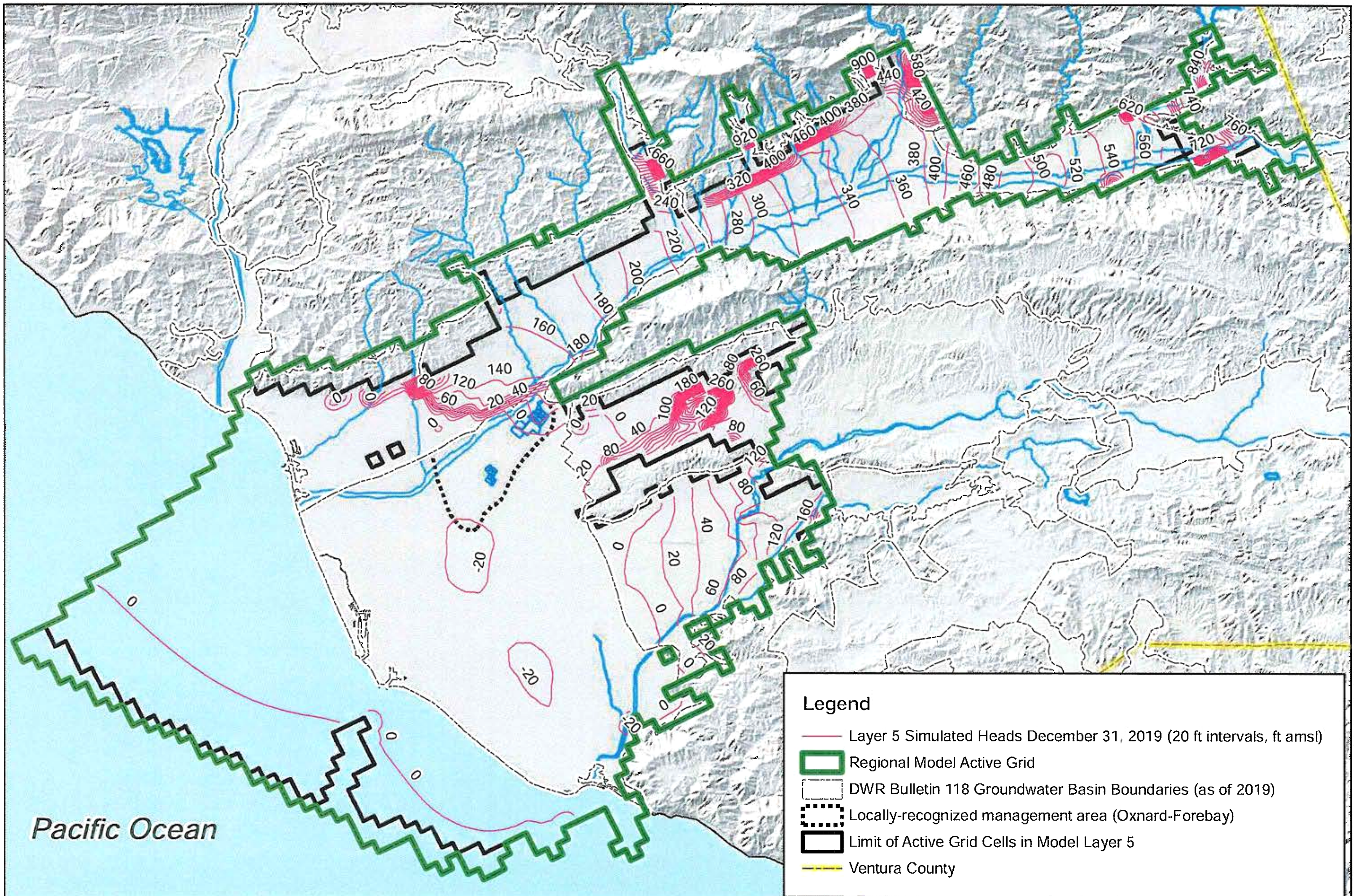


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**Figure 3-54.**
**December 2019 Simulated Head Contours of Model Layer 5**

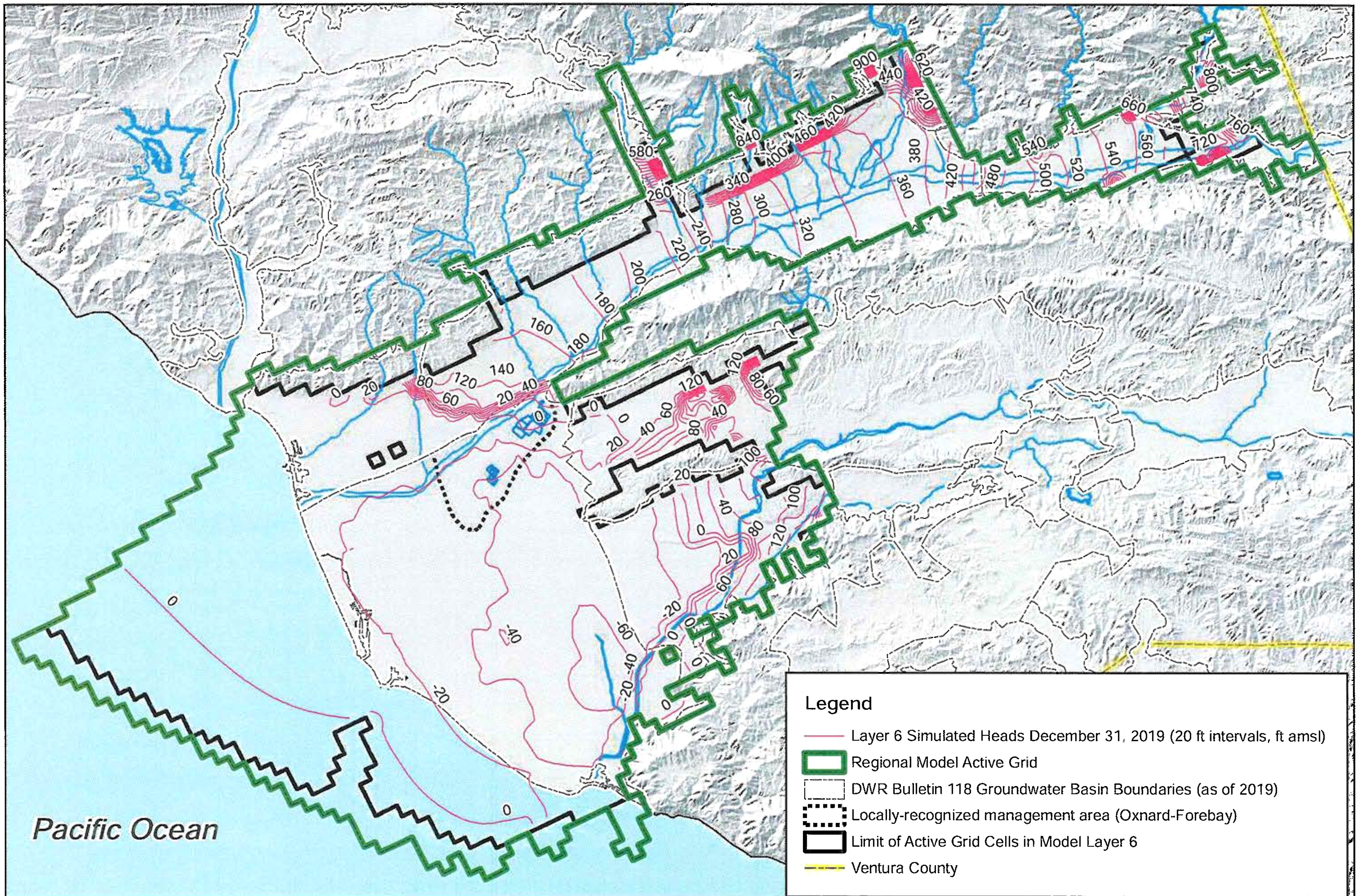


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**Figure 3-55.**
**December 2019 Simulated Head Contours of Model Layer 6**

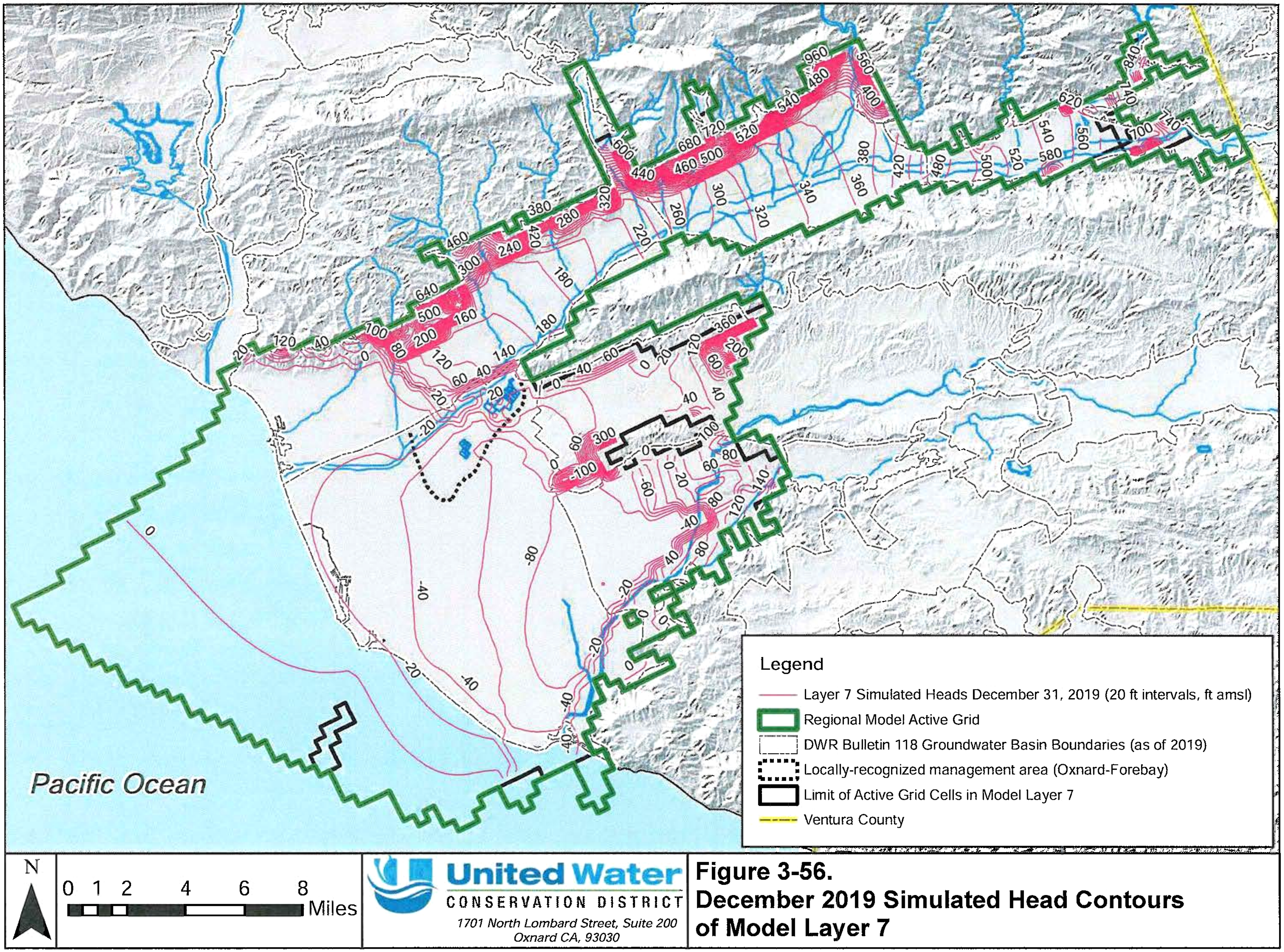


**Figure 3-56.**
**December 2019 Simulated Head Contours of Model Layer 7**

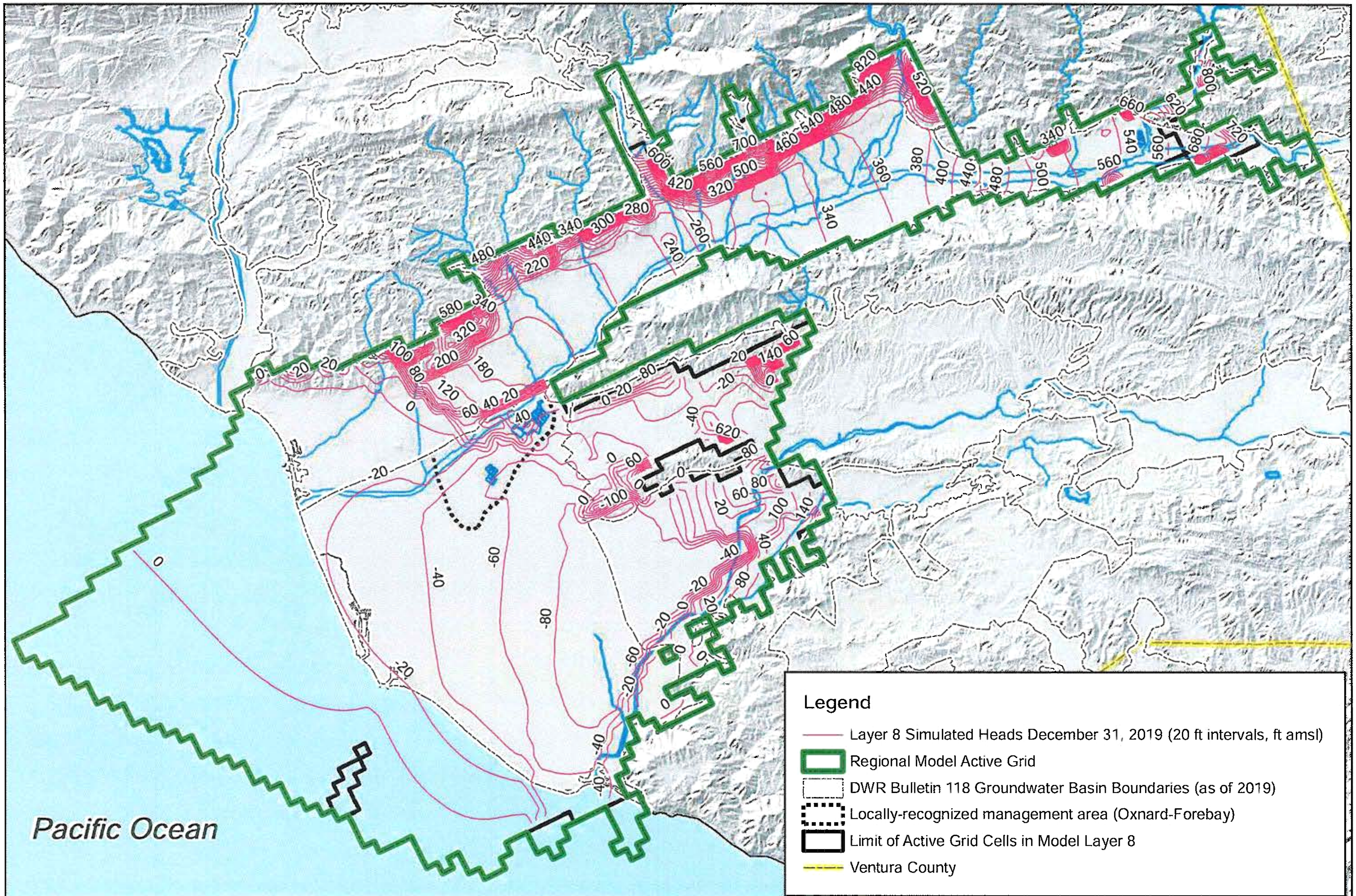


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**Figure 3-57.**
**December 2019 Simulated Head Contours of Model Layer 8**

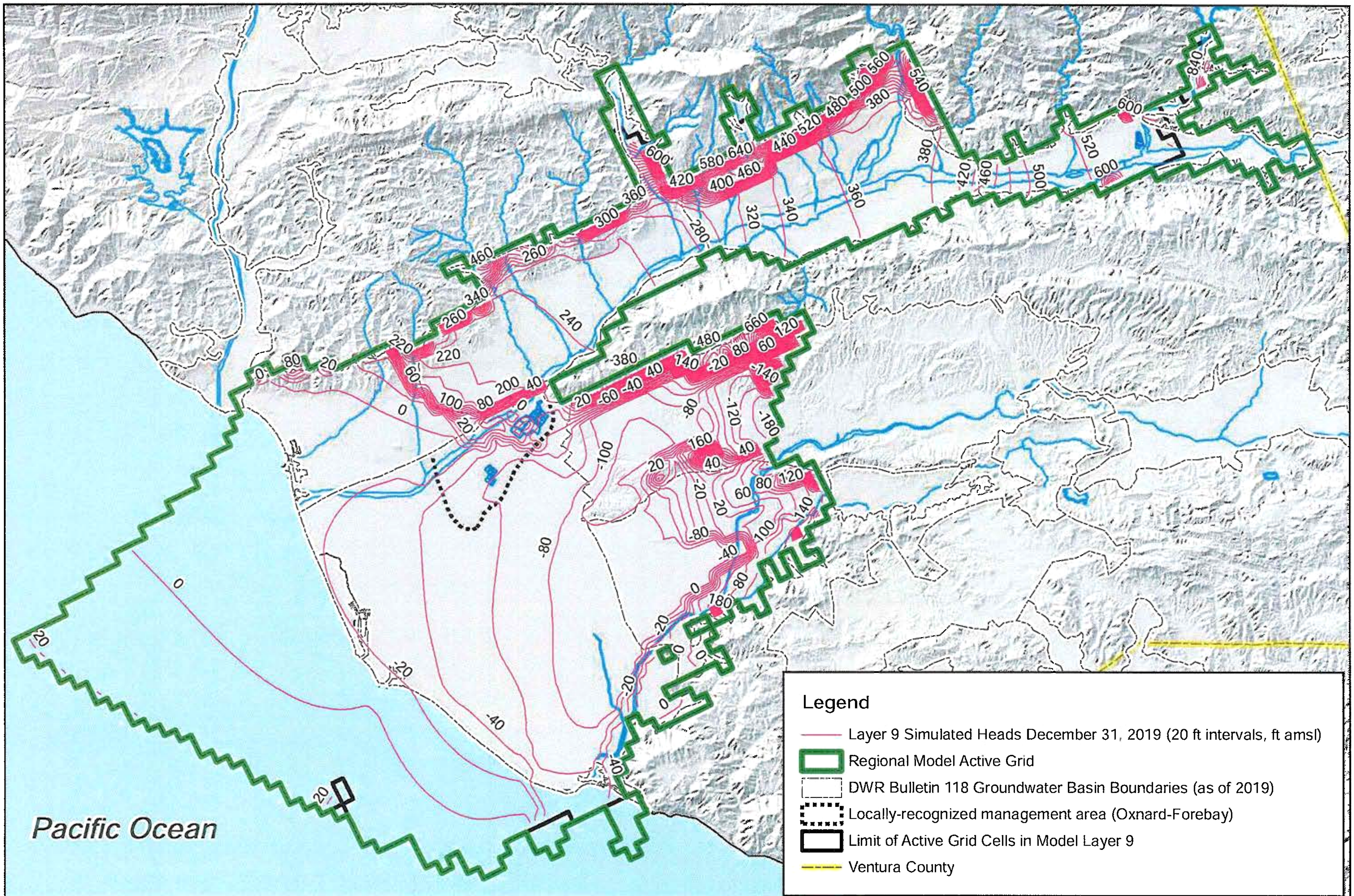


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**Figure 3-58.**
**December 2019 Simulated Head Contours of Model Layer 9**

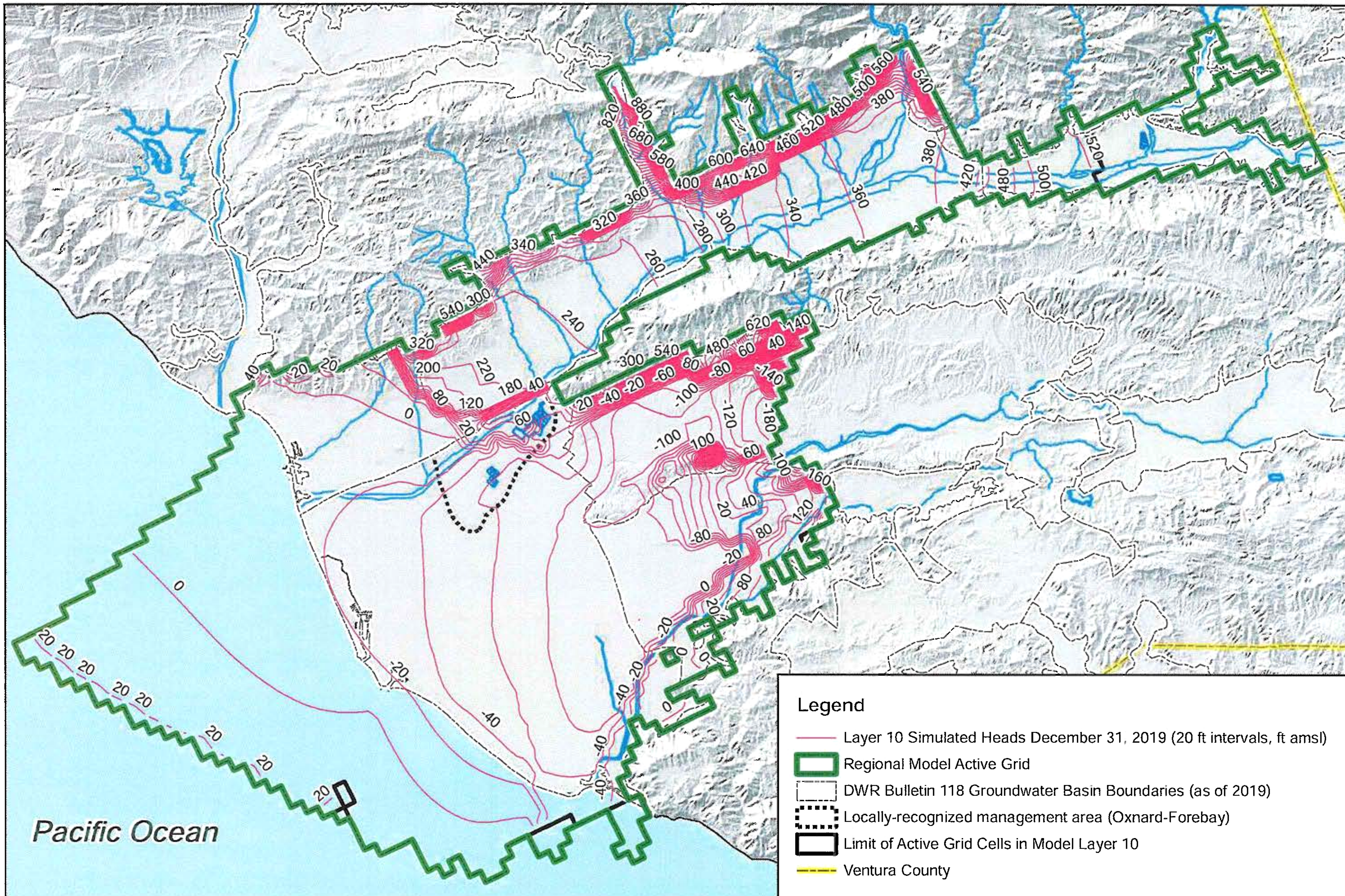


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**Figure 3-59. December 2019 Simulated Head Contours of Model Layer 10**

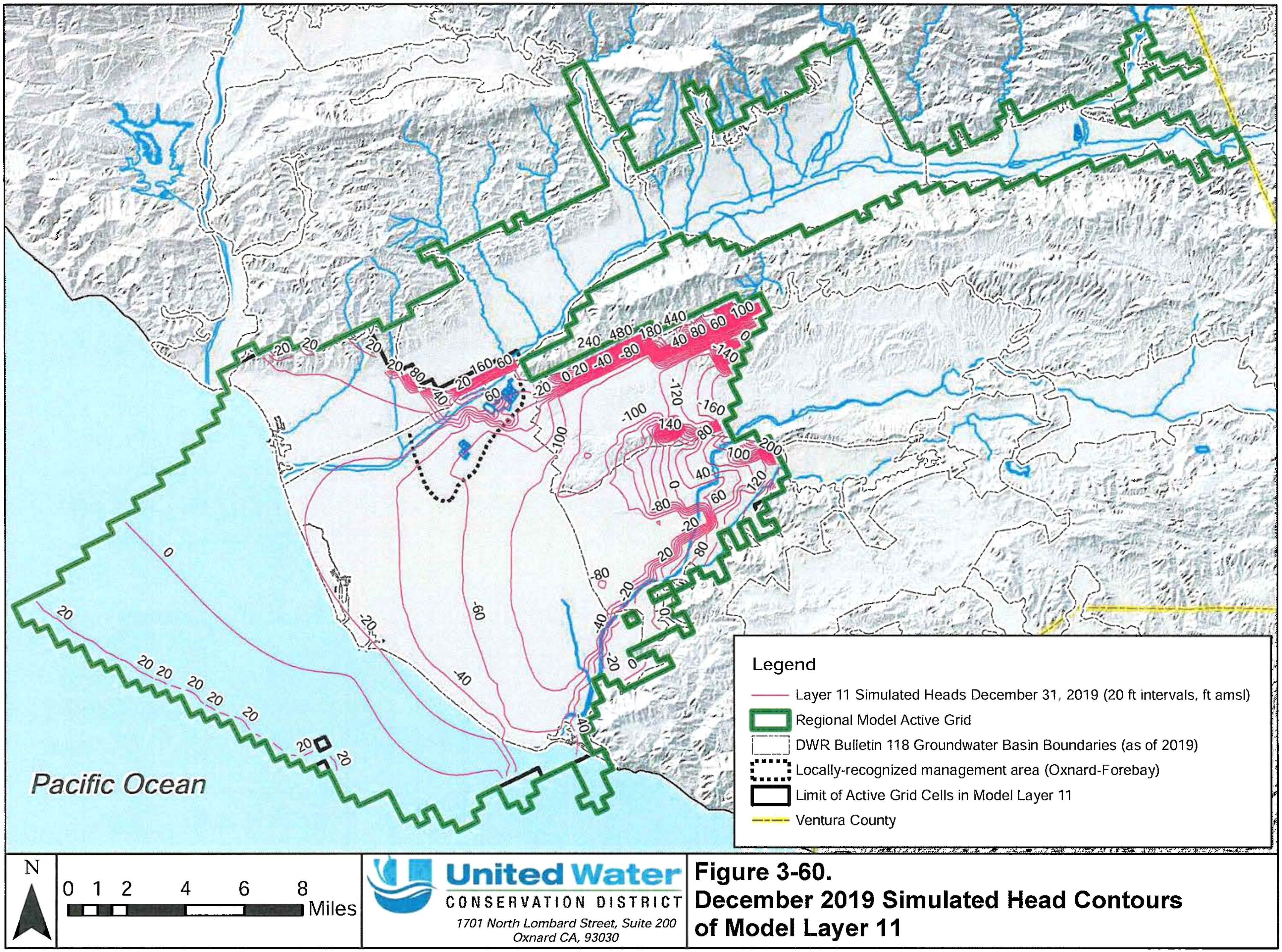



**Figure 3-60.**
**December 2019 Simulated Head Contours of Model Layer 11**

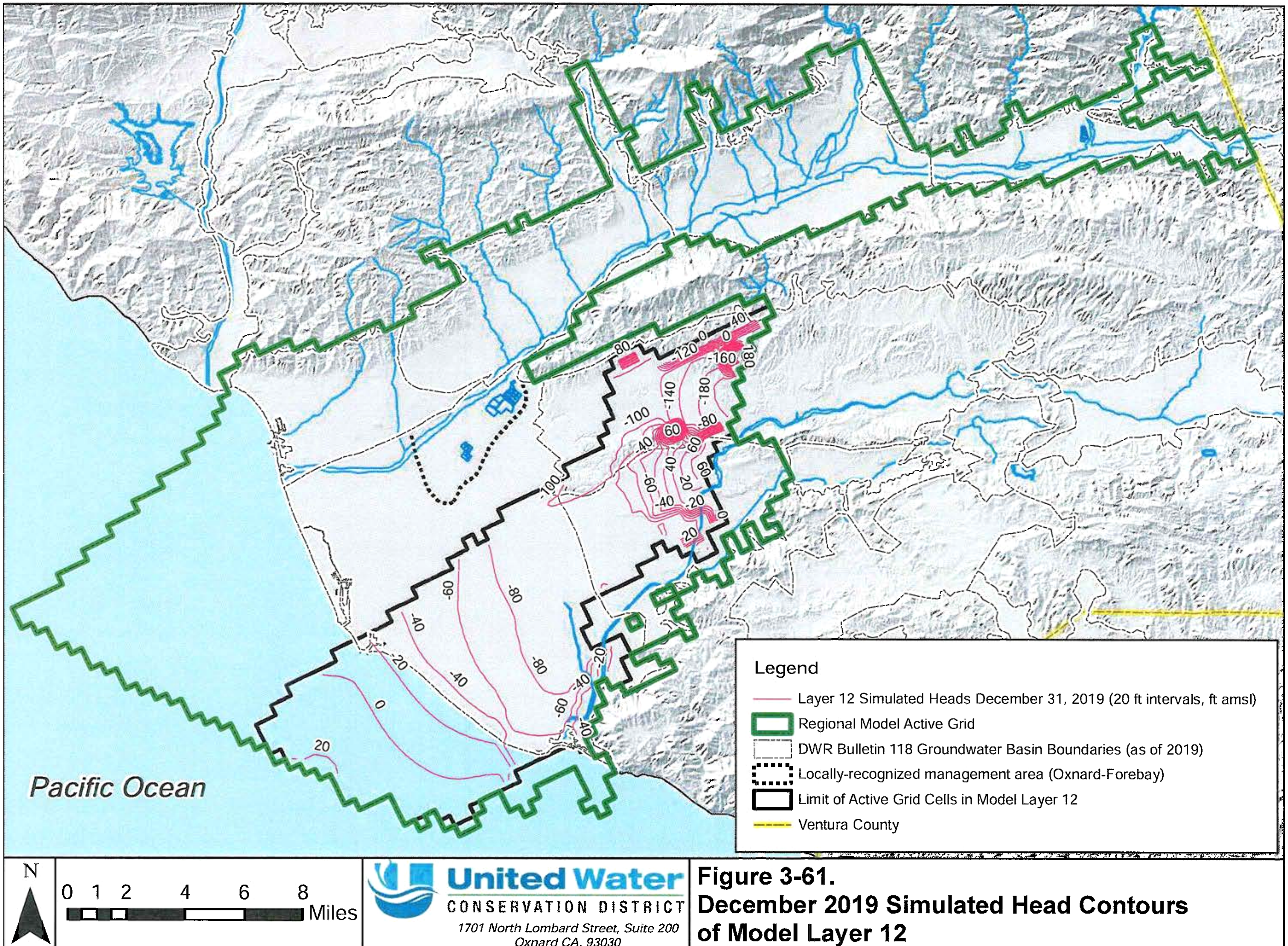



**Figure 3-61.**
**December 2019 Simulated Head Contours of Model Layer 12**

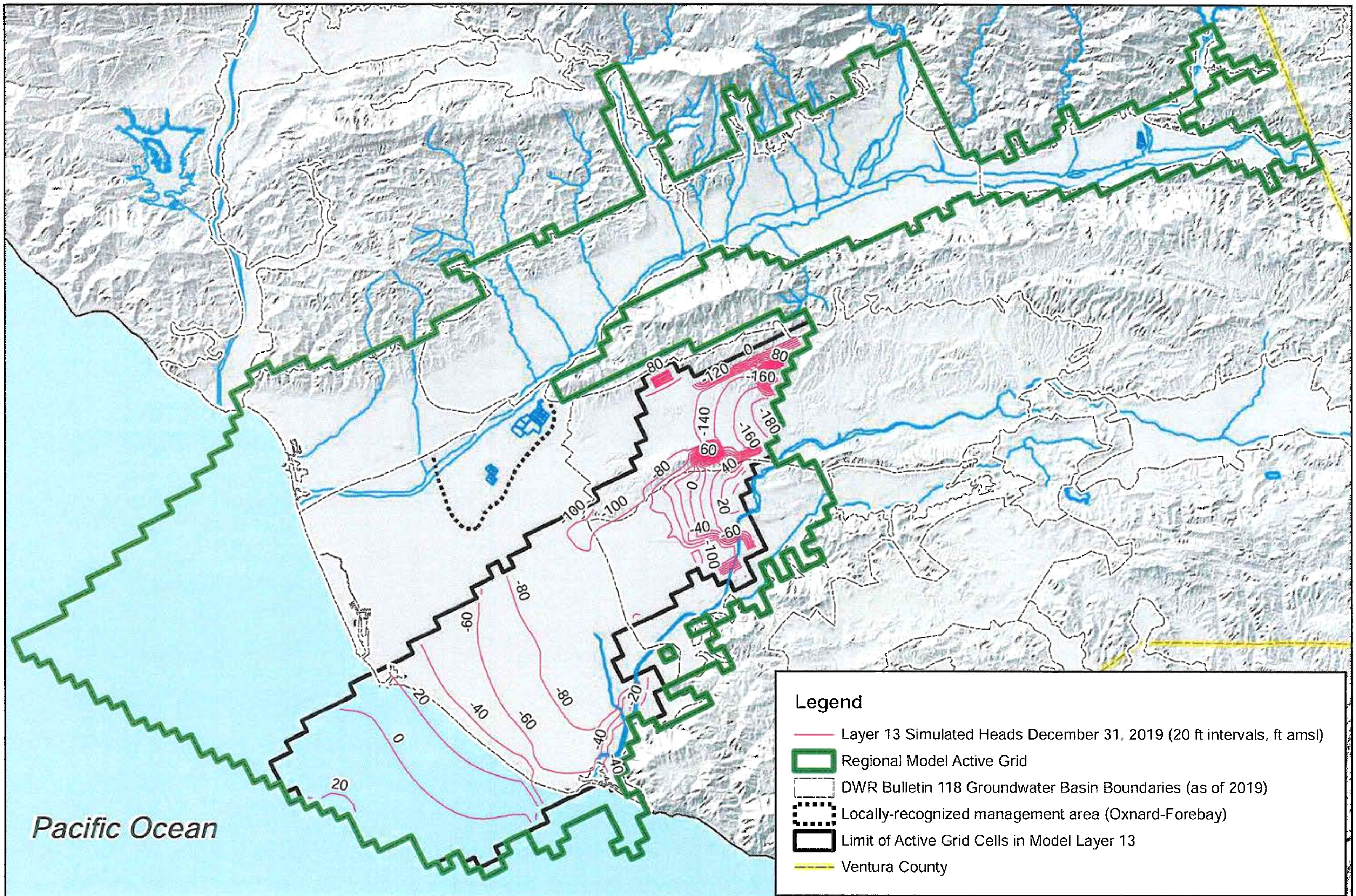



**Figure 3-62.
December 2019 Simulated Head Contours of Model Layer 13**

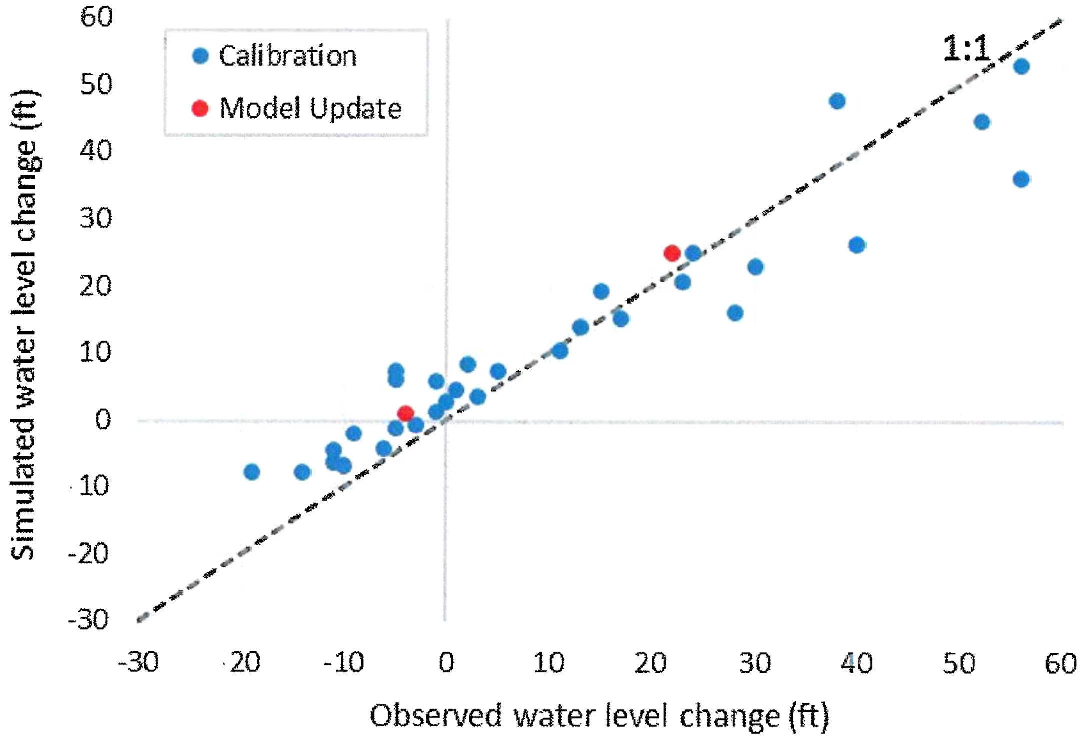



**Figure 3-63. Simulated and Observed Change in Groundwater Elevation in Piru Basin (04N18W29M2) During the Wet Season (January 1 to May 1)). Groundwater elevation increases were calculated by subtracting January 1 elevations from May 1 elevations, resulting in one data point annually. Positive changes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

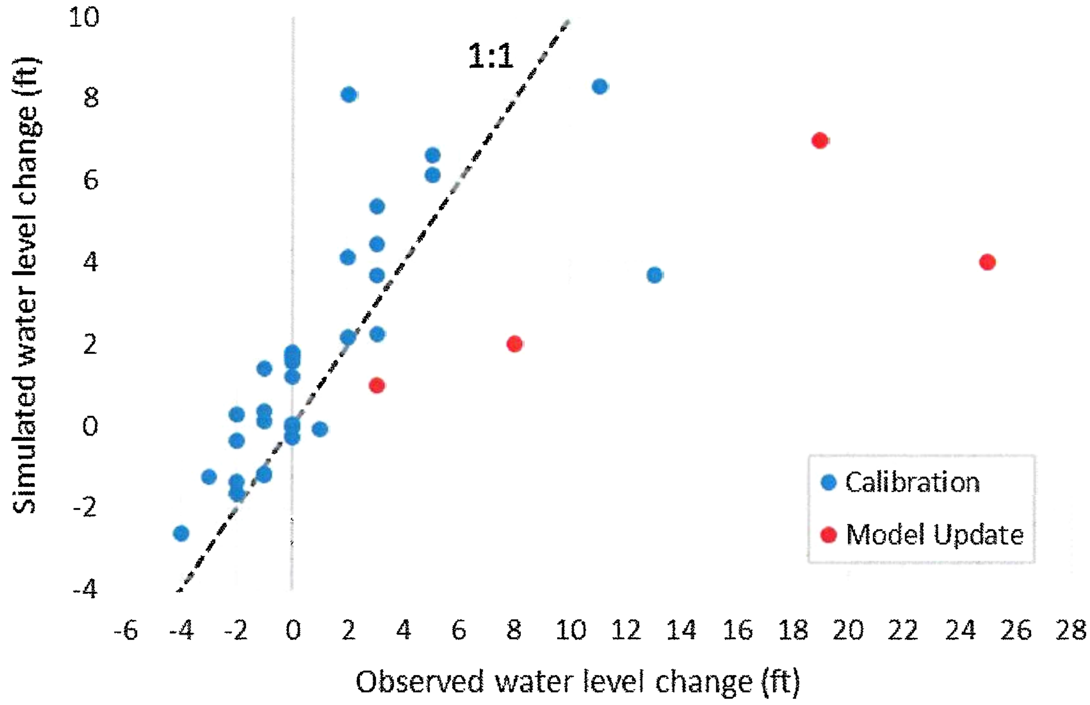



**Figure 3-64. Simulated and Observed Change in Groundwater Elevation in Fillmore Basin (03N20W02A01) During the Wet Season (January 1 to May 1). Groundwater elevation increases were calculated by subtracting January 1 elevations from May 1 elevations, resulting in one data point annually. Positive changes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

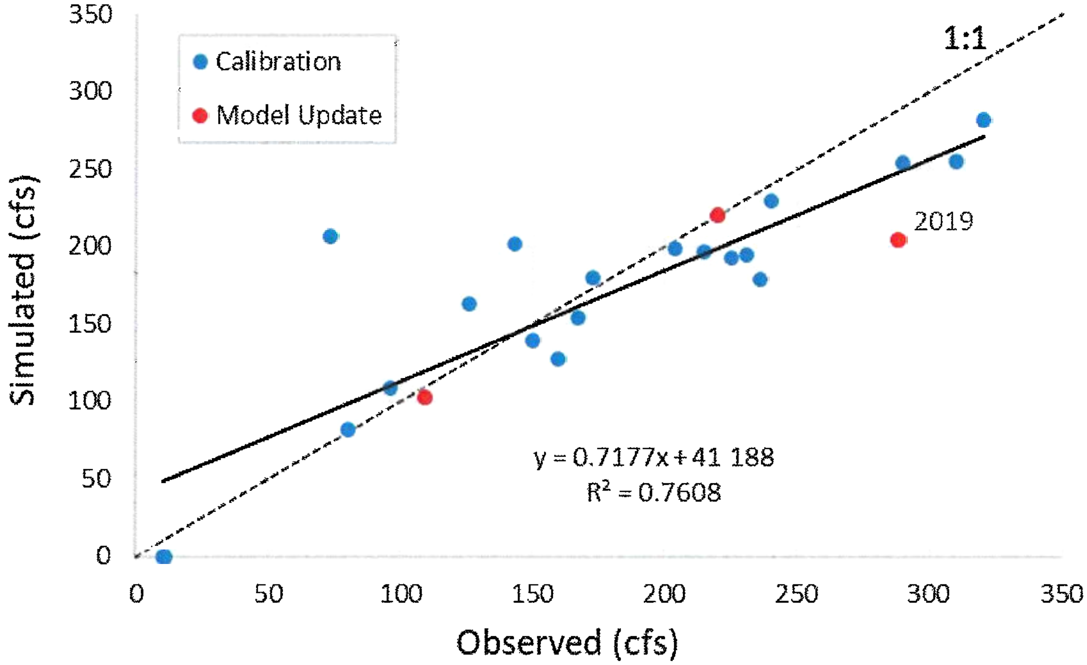



**Figure 3-65. Simulated and Observed Monthly Average Streamflow Near the Downstream End of Piru Basin (Cavin Rd.) During Conservation Releases (2000-2019). Observed monthly average streamflows were calculated as the mean of observed flows when multiple flow measurements were performed during one month.**

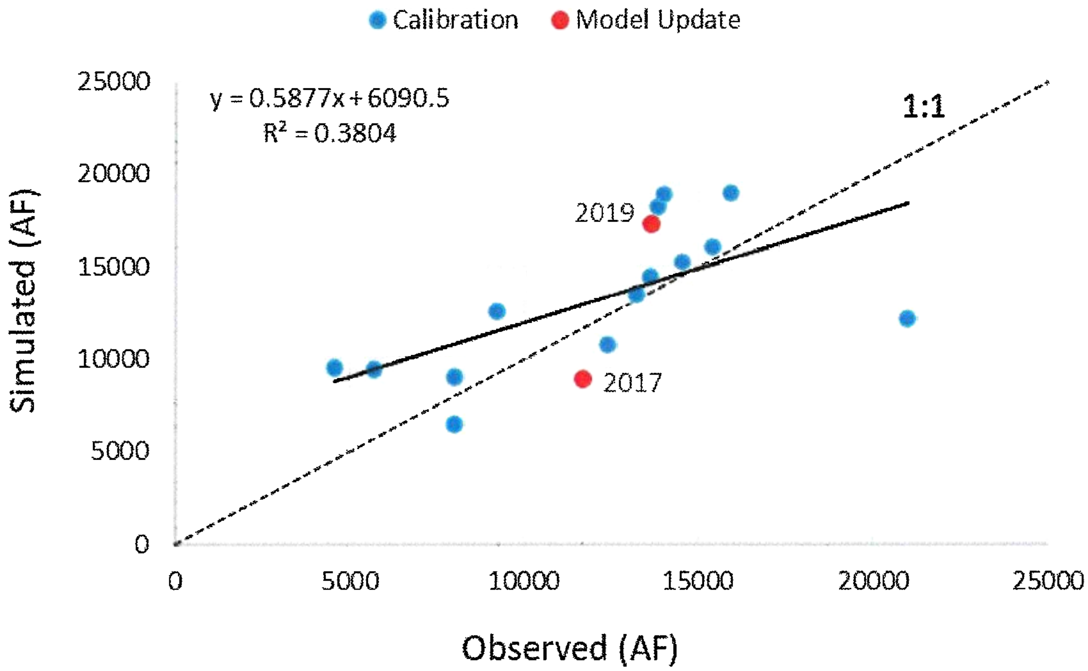



**Figure 3-66. Simulated and Observed Total Percolation Volume to Piru Basin (acre-feet) During Conservation Releases (1999-2019).**

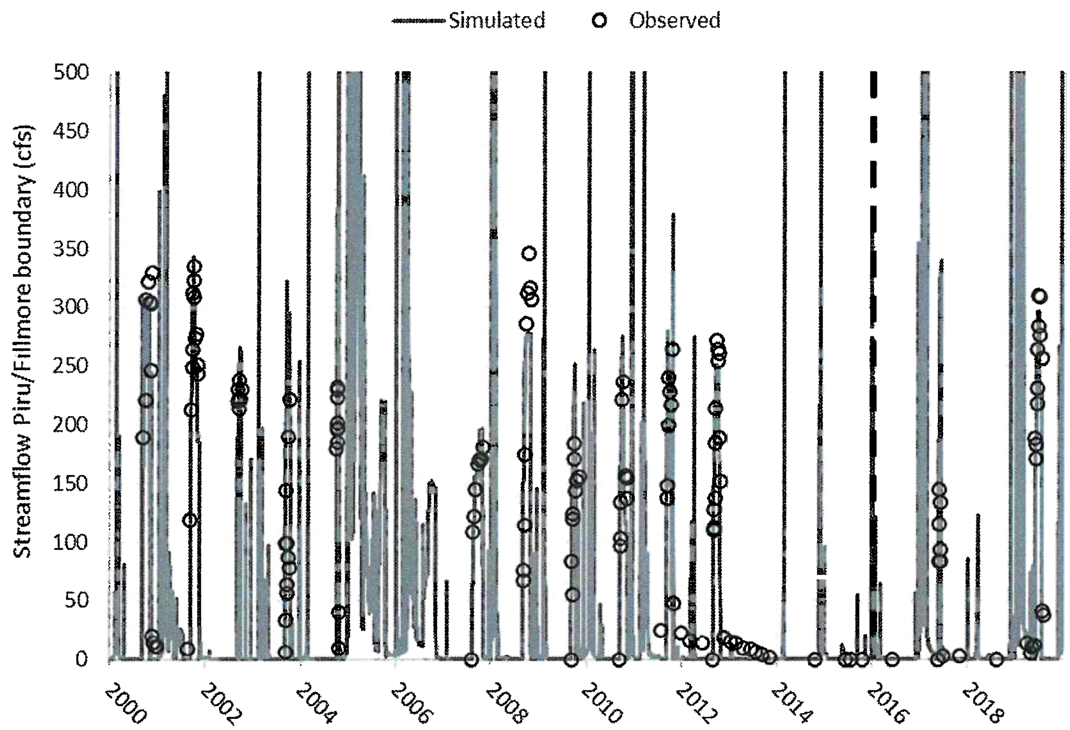
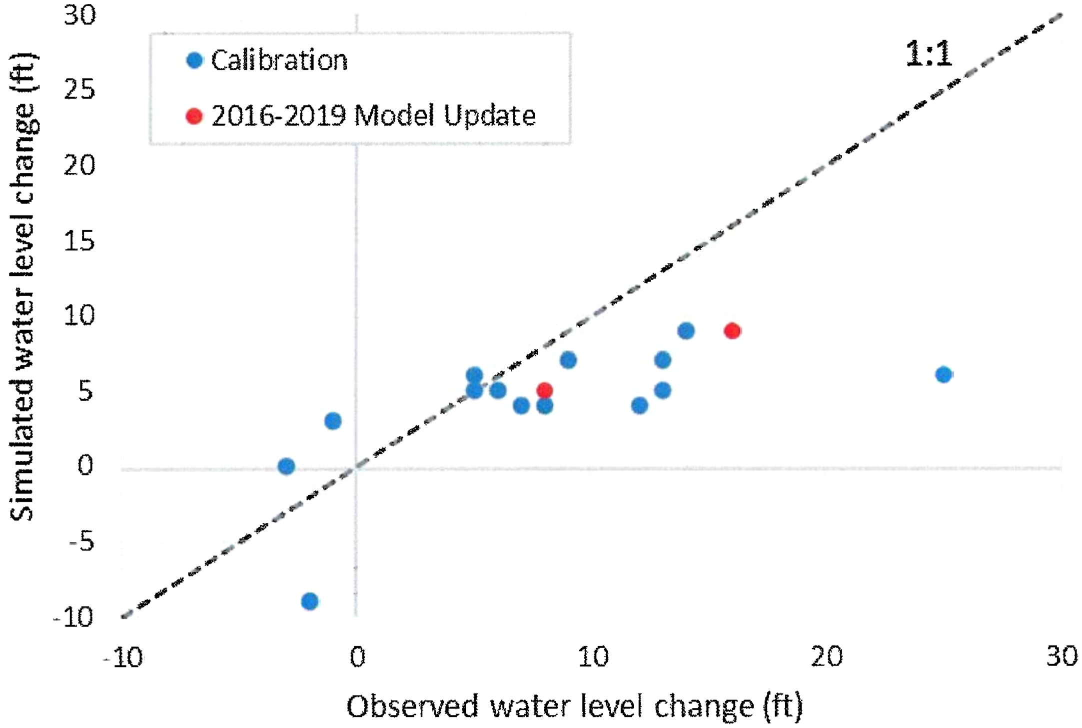



**Figure 3-67. Simulated and Observed Streamflow Near the Downstream End of Piru Basin (Cavin Rd.). The hydrograph shows daily simulated streamflow, observations are discrete manual measurements (available for the period 2000-2019). The dashed black line marks the start of the Update Period.**

(A)




(B)

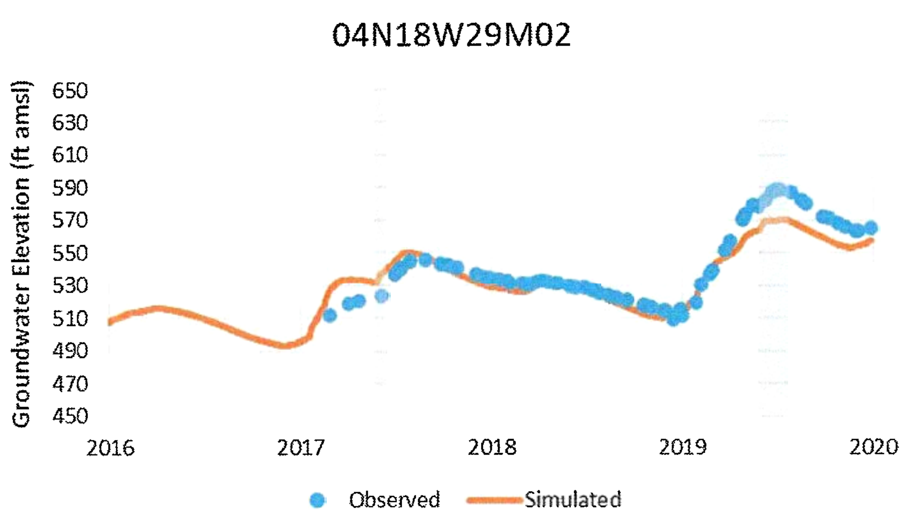



**Figure 3-68. (A) Simulated and Observed Change in Groundwater Elevation in Piru Basin (well 04N18W29M2) Due to Conservation Releases. Changes in groundwater elevations were calculated as elevations just after minus elevations just before conservations releases. Positive changes indicate an increase 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.**

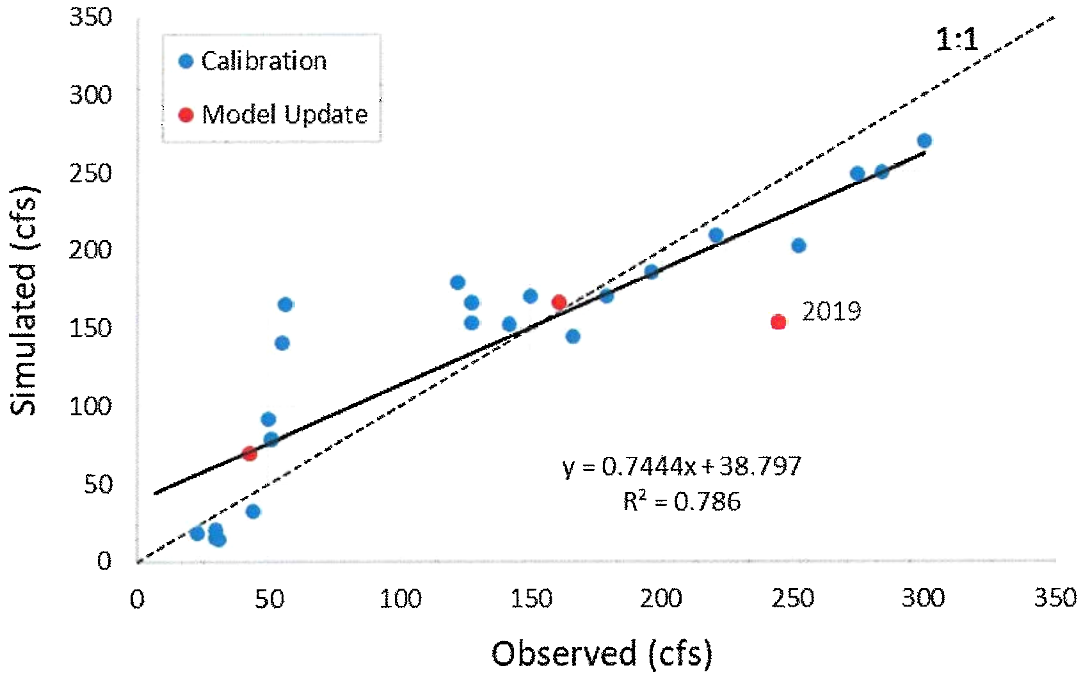



**Figure 3-69. Simulated and Observed Monthly Average Streamflow Near the Downstream End of Fillmore Basin (Willard Rd.) During Conservation Releases (2000-2019). Observed monthly average streamflows were calculated as the mean of observed flows when multiple flow measurements were performed during one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

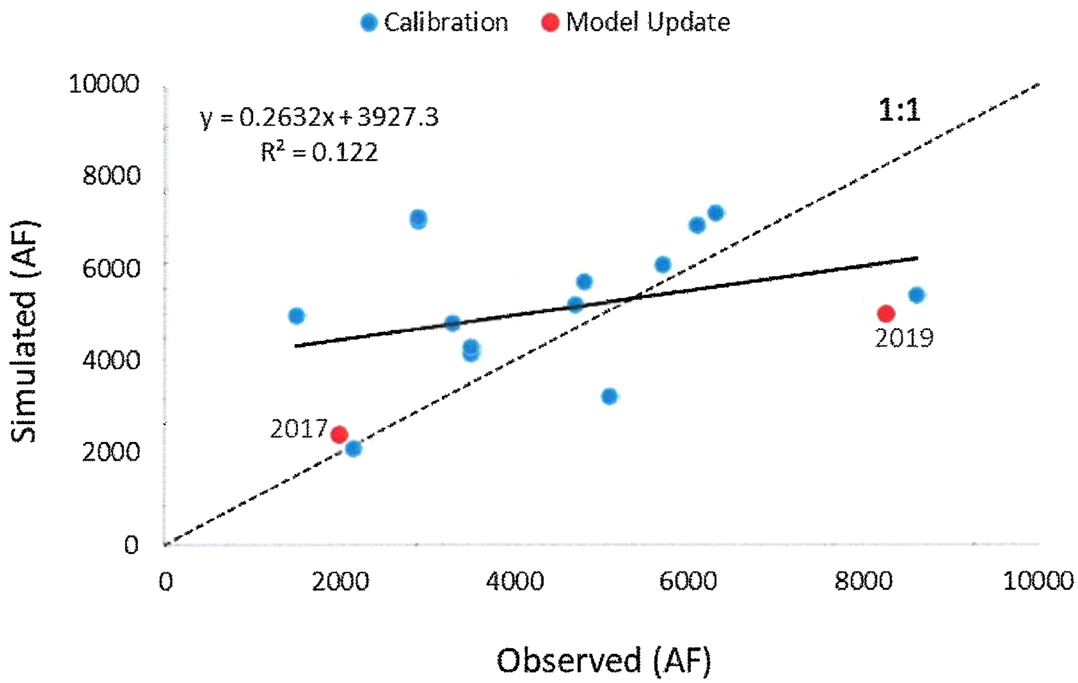



**Figure 3-70. Simulated and Observed Total Percolation Volume in Fillmore Basin (acre-feet) During Conservation Releases (1999-2019).**

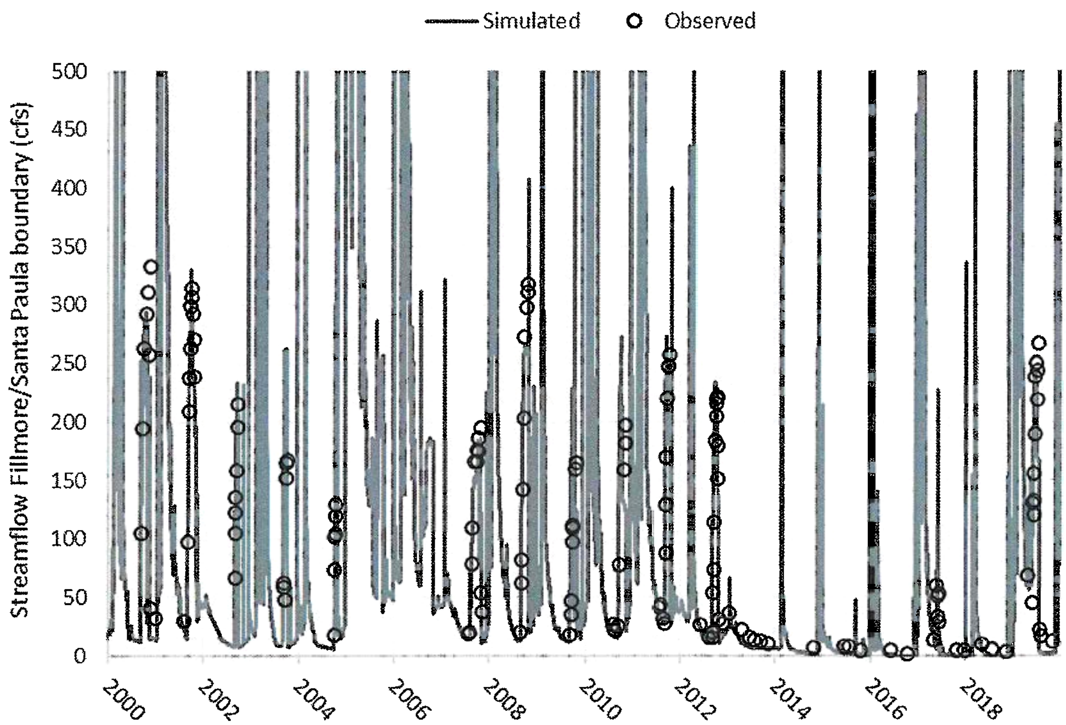
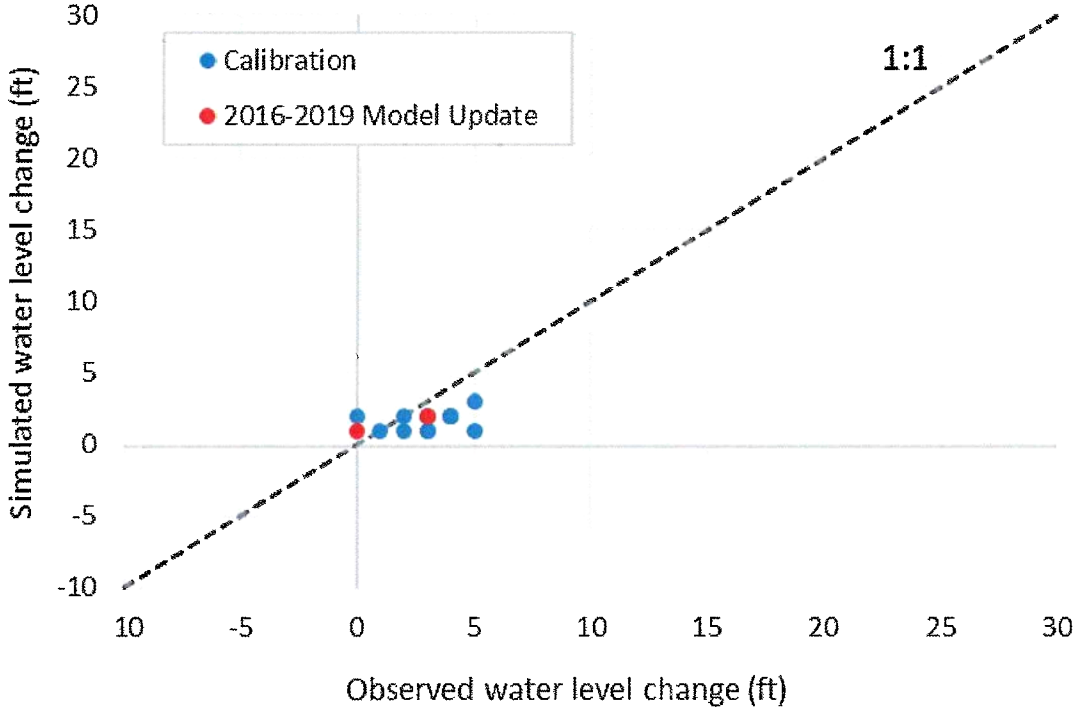



**Figure 3-71. Simulated and Observed Streamflow Near the Downstream End of Fillmore Basin (Willard). The hydrograph shows daily simulated streamflow, observations are discrete manual measurements (available for the period 2000-2019). The dashed black line marks the start of the Update Period.**

(A)




(B)

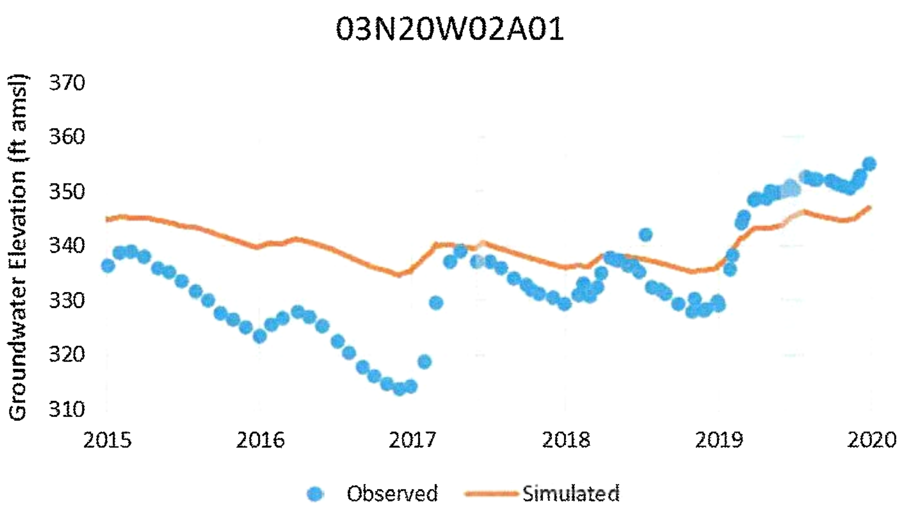



**Figure 3-72. (A) Simulated and Observed Change in Groundwater Elevation in Fillmore Basin (03N20W02A01) Due to Conservation Releases. Changes in groundwater elevations were calculated as elevations just after minus elevations just before conservations releases. Positive changes indicate an increase 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.**

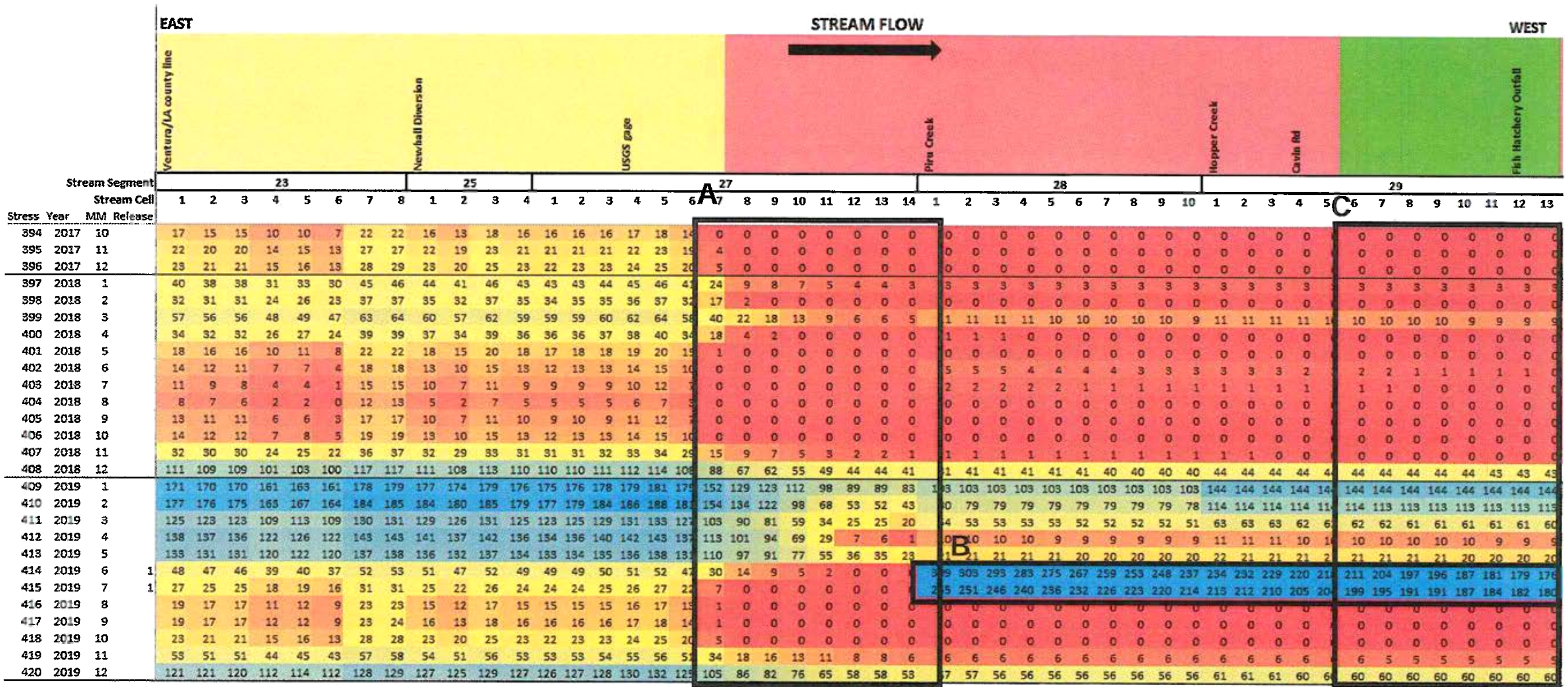



**Figure 3-73. Simulated Monthly Streamflow in the Santa Clara River across Piru basin (UWCD groundwater model stream segments 23 –29). Monthly streamflow is derived from daily model outputs. Columns indicate one model cell, rows indicate months, flow direction is from left to right. Watershed features 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.**

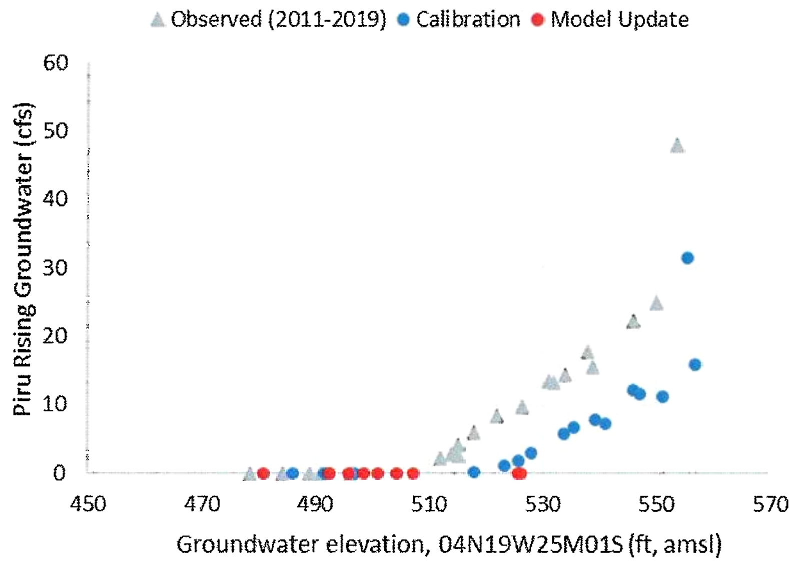
EAST | STREAM FLOW → | WEST

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

| Stress | Year | MM | Release | | | | | 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 |
| 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 | | 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 | 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 | | 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)

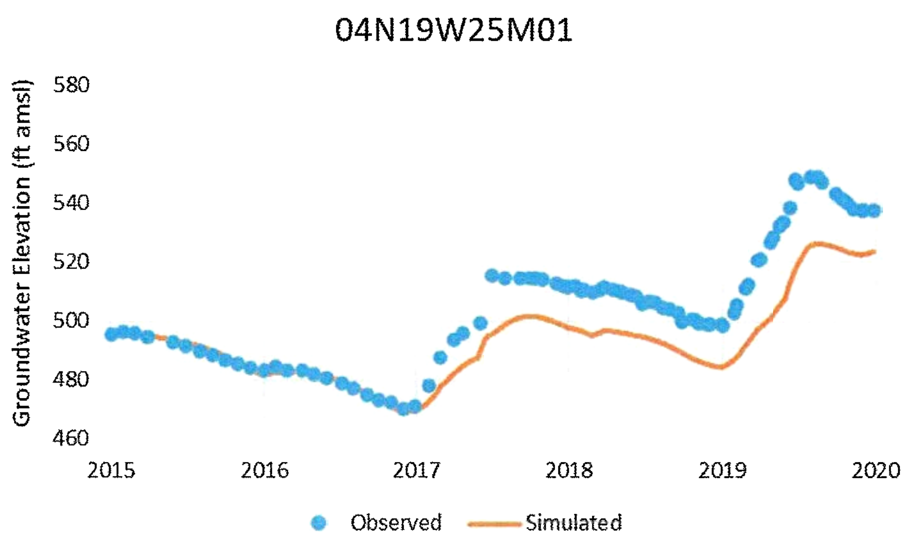
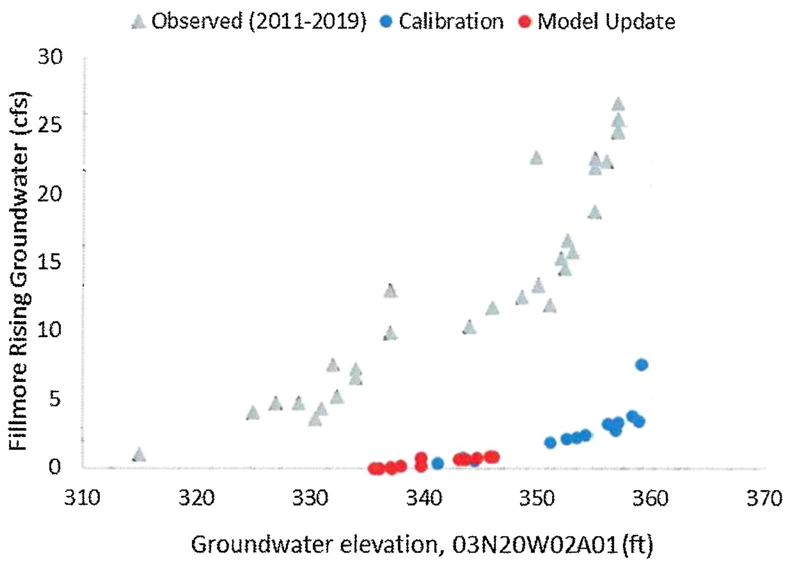



**Figure 3-75. (A) Simulated and Observed Relationship Between Rising Groundwater at the Piru-Fillmore Basin Boundary and Groundwater Elevation in Piru Basin Well 04N19W25M01. (B) Simulated (orange line) and observed (blue dots) groundwater elevations in Piru basin well 04N19W25M01.**

(A)




(B)

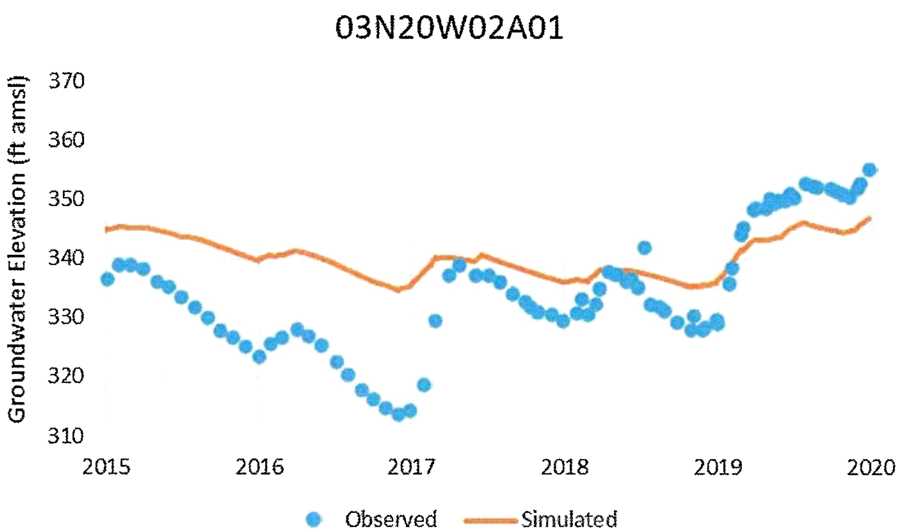



**Figure 3-76. (A) Simulated and Observed Relationship Between Rising Groundwater at the Fillmore-Santa Paula Basin Boundary and Groundwater Elevation in Fillmore Basin Well 03N20W02A01. (B) Simulated (orange line) and observed (blue dots) groundwater elevations in Fillmore basin well 03N20W02A01.**

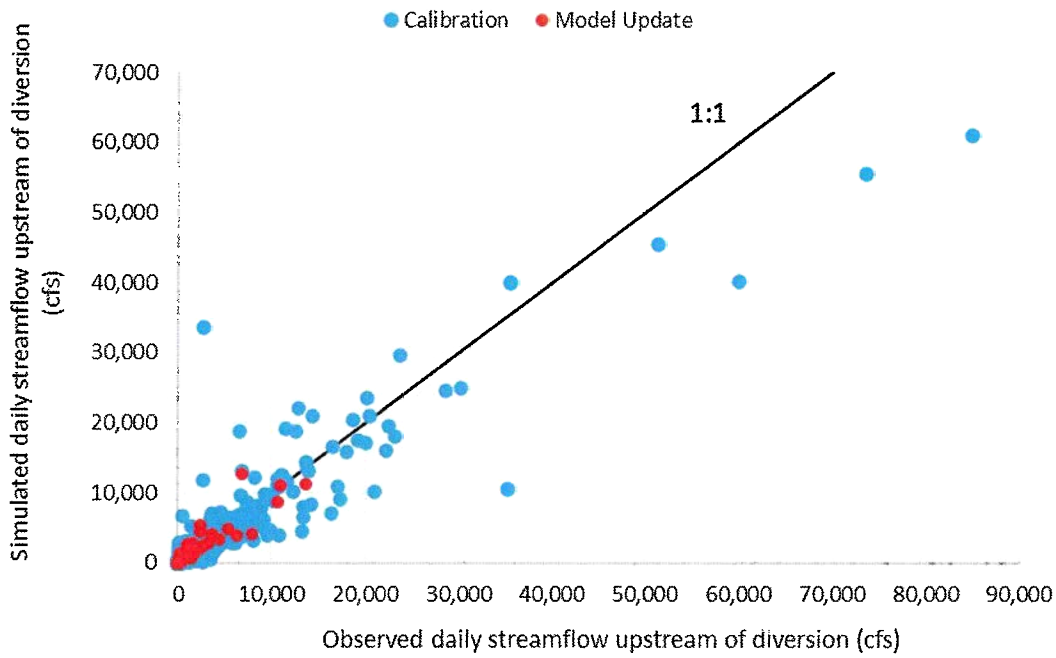



**Figure 3-77. Simulated and Observed Daily Streamflow Upstream of the Freeman Diversion.**

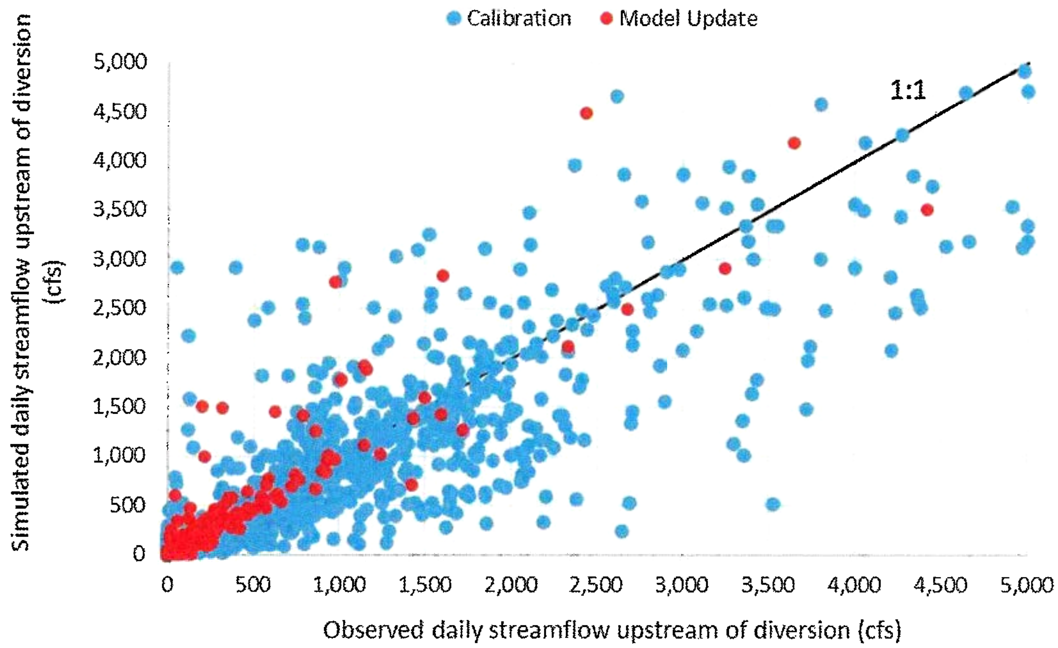



**Figure 3-78. Simulated and Observed Daily Streamflow (Low Ranges) Upstream of the Freeman Diversion.**

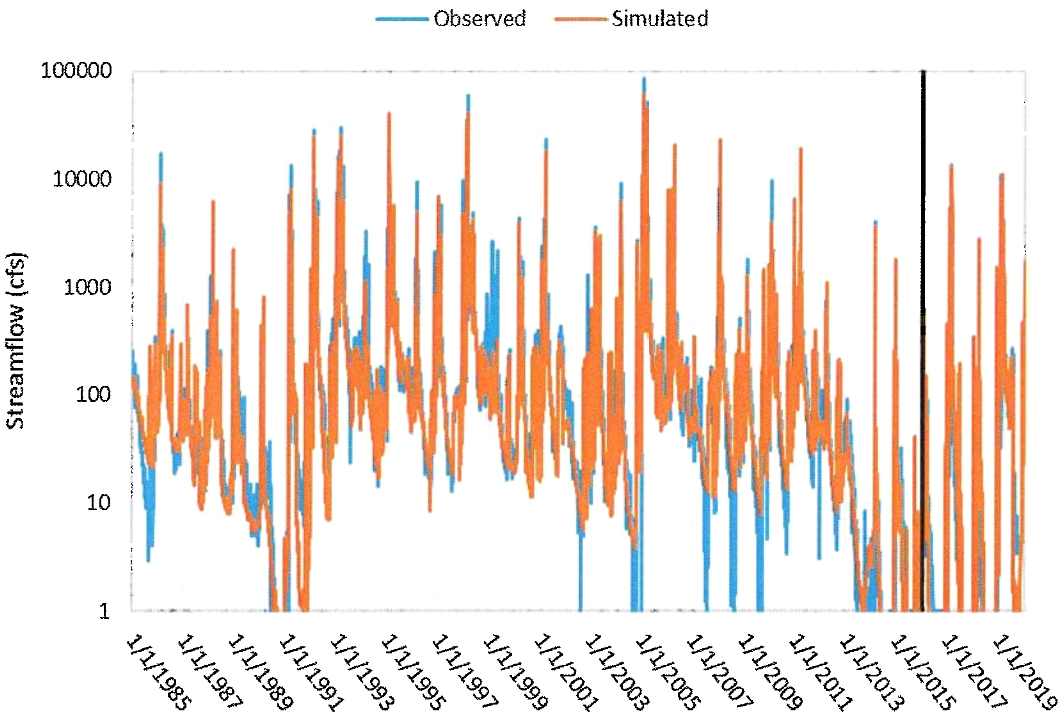



**Figure 3-79. Observed and simulated daily streamflow in the SCR just upstream of the Freeman Diversion. The black vertical line indicates the start of the Update Period.**

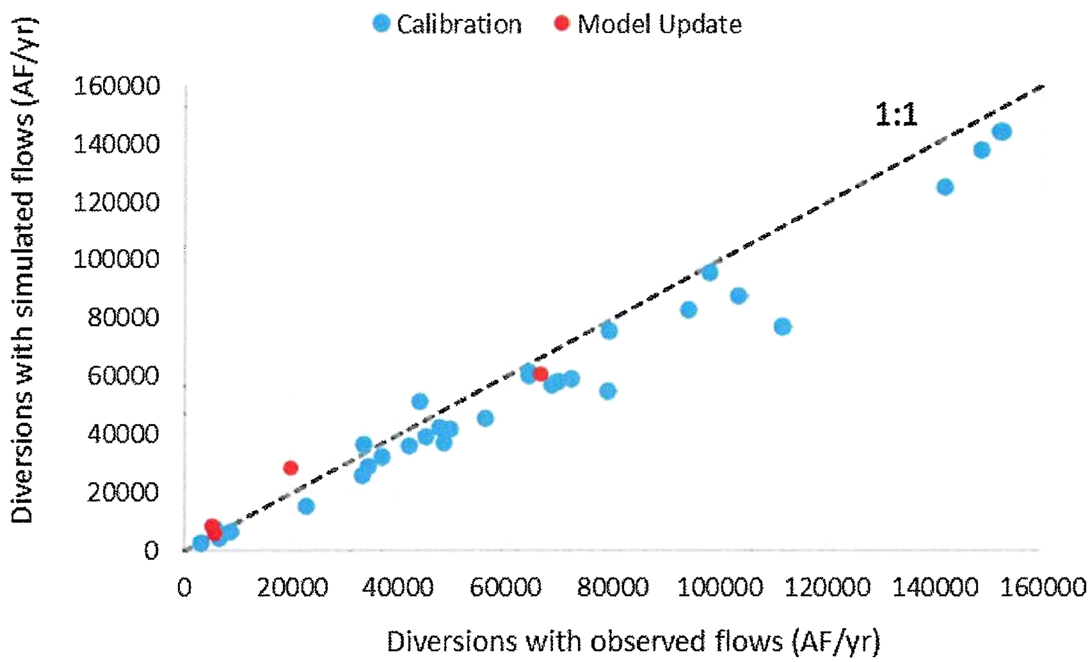



**Figure 3-80. Correlation between simulated annual diversions based on observed streamflow and simulated annual diversions based on streamflow from Regional Model. Simulated annual diversions were calculated using the Hydrological Operations Simulation System (HOSS) model, assuming bypass flow operations 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

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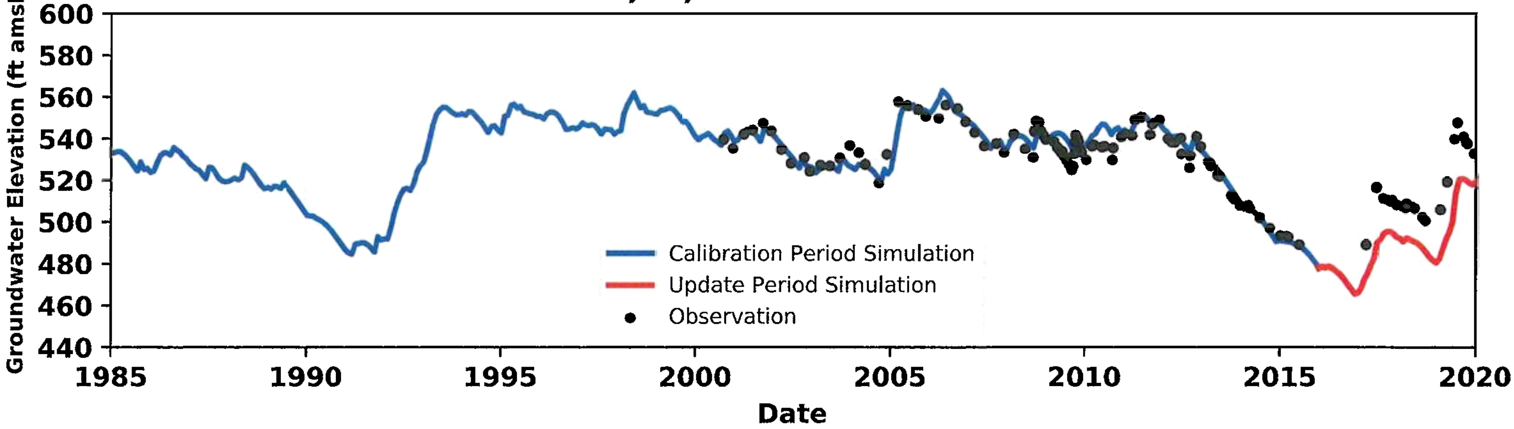
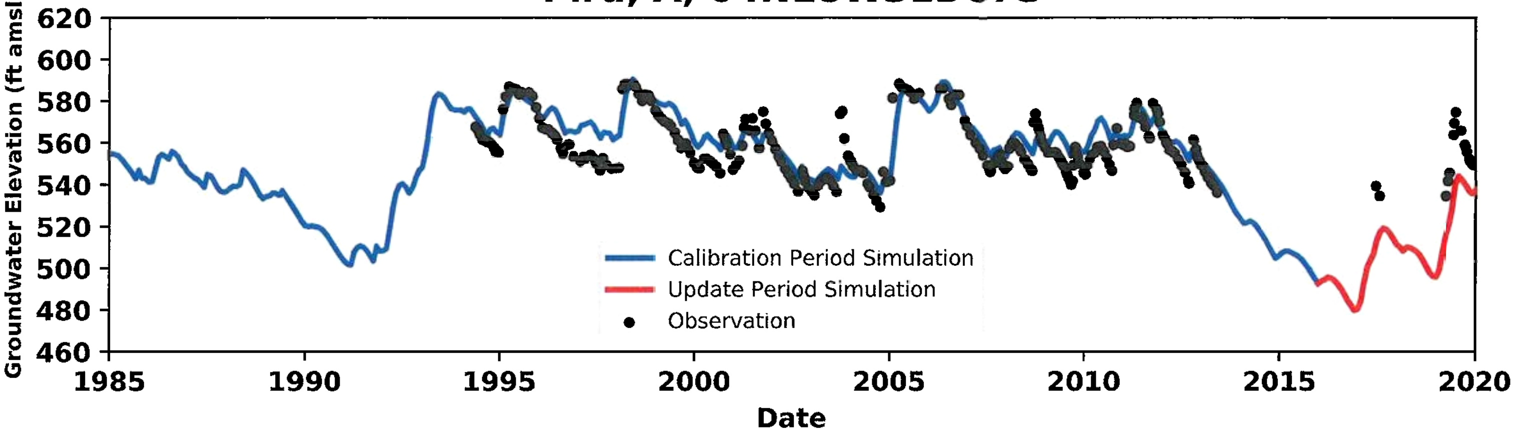
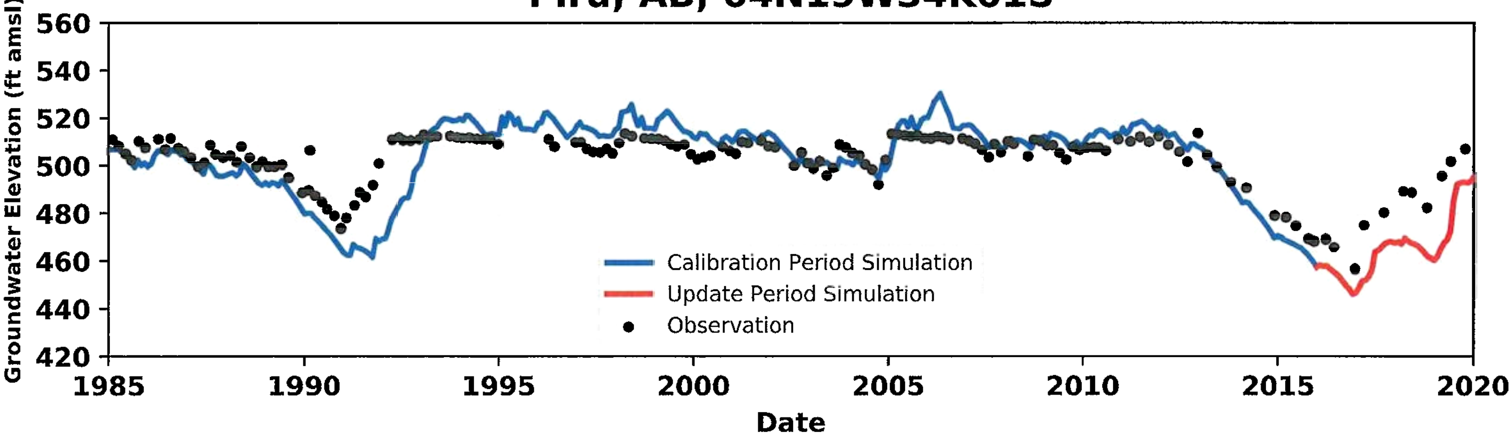
## Piru, A, 04N19W36D01S



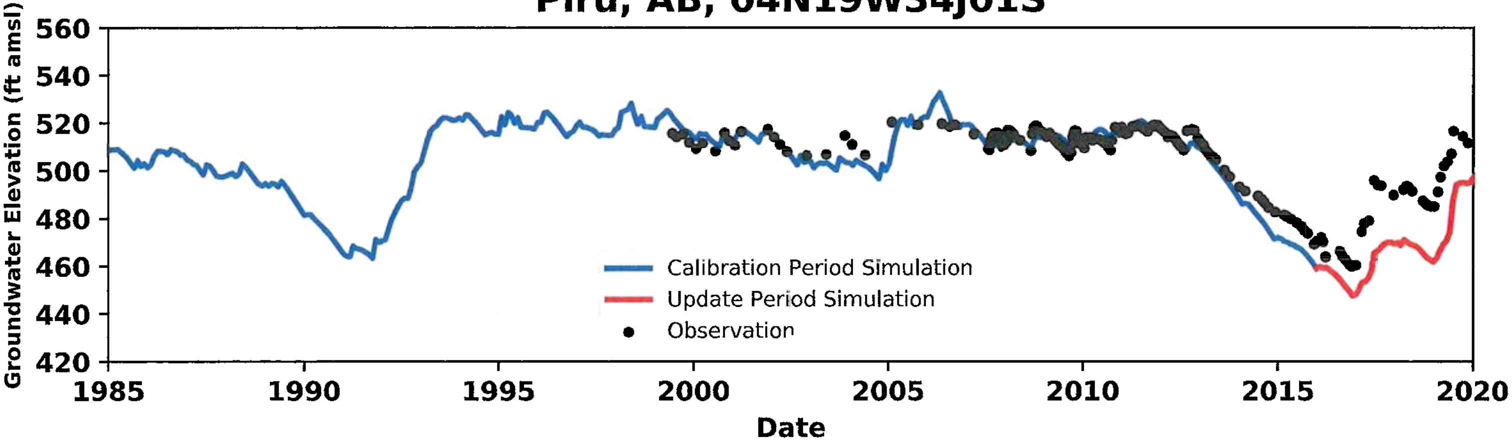

## Piru, A, 04N18W31D07S

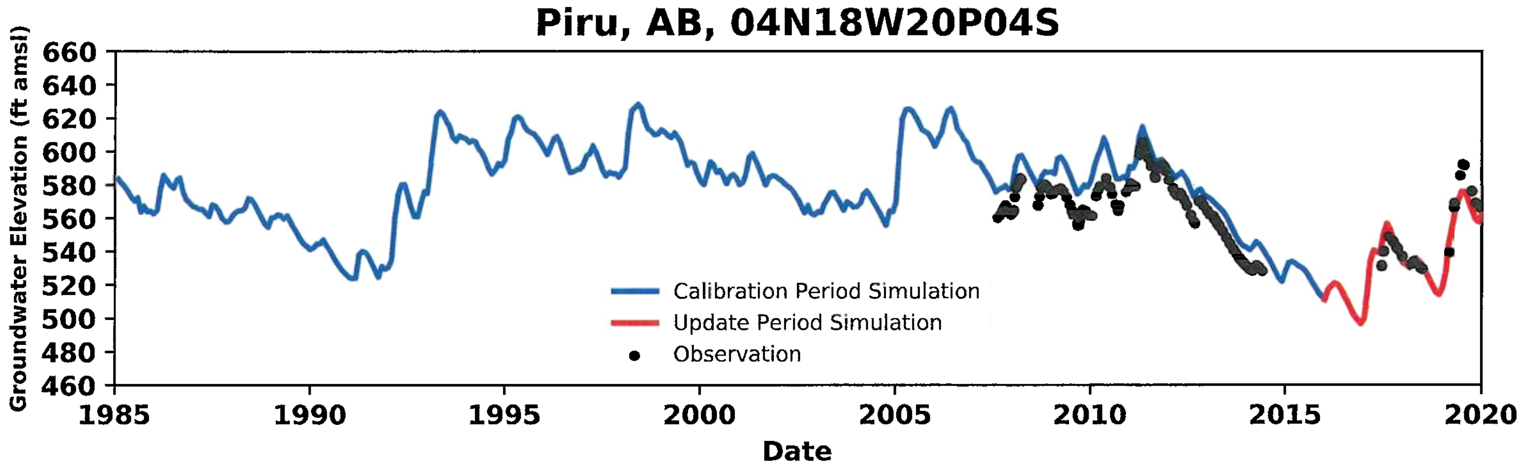


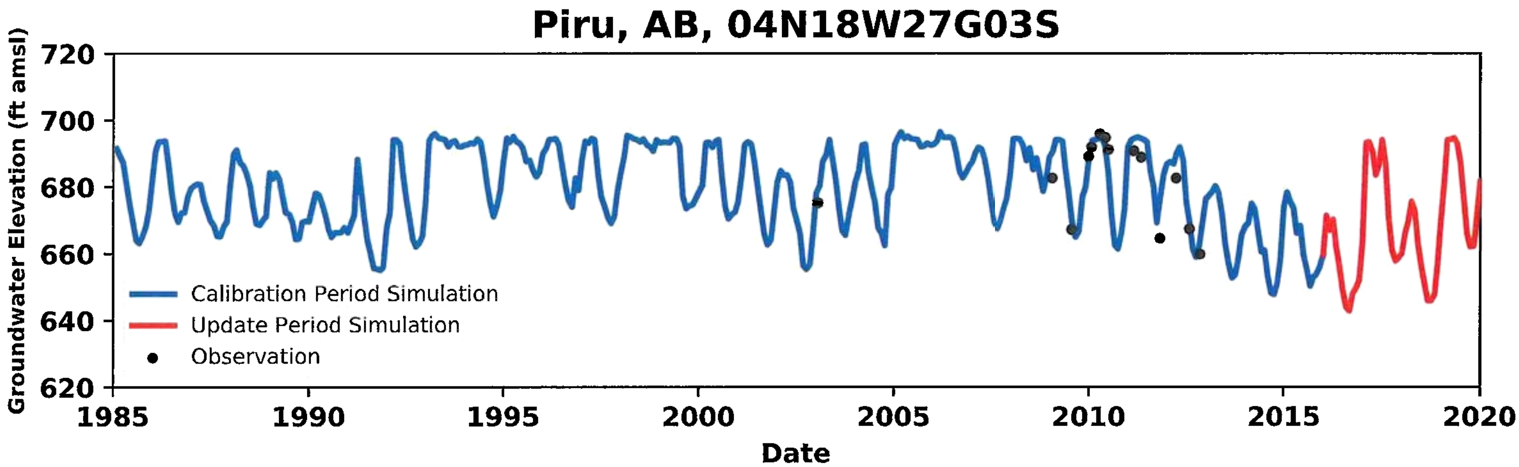

## Piru, AB, 04N19W34K01S

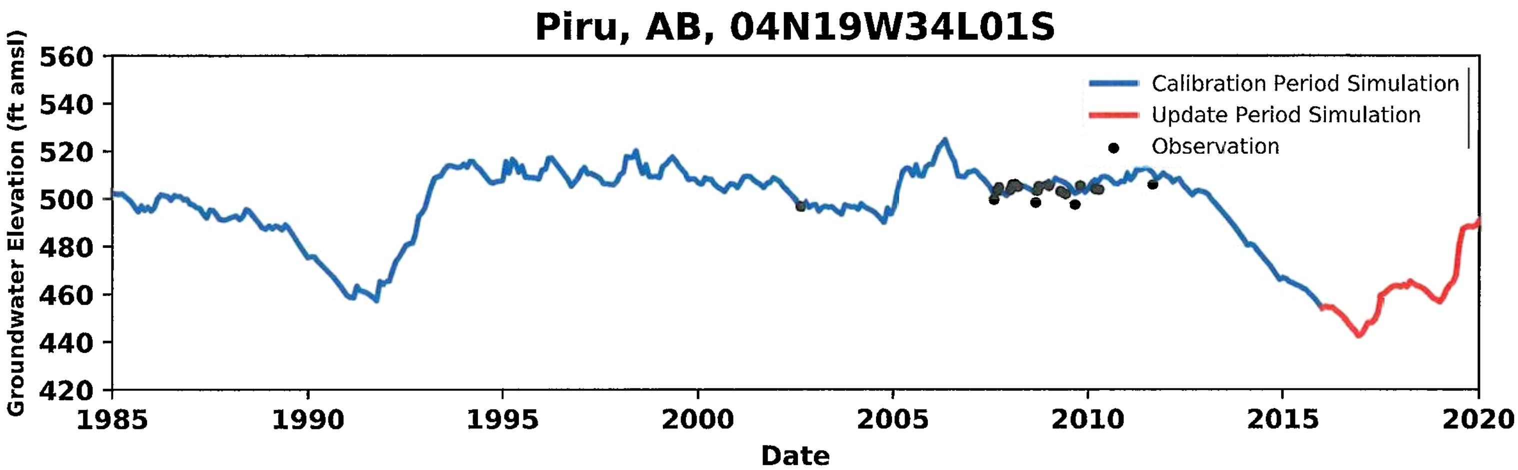


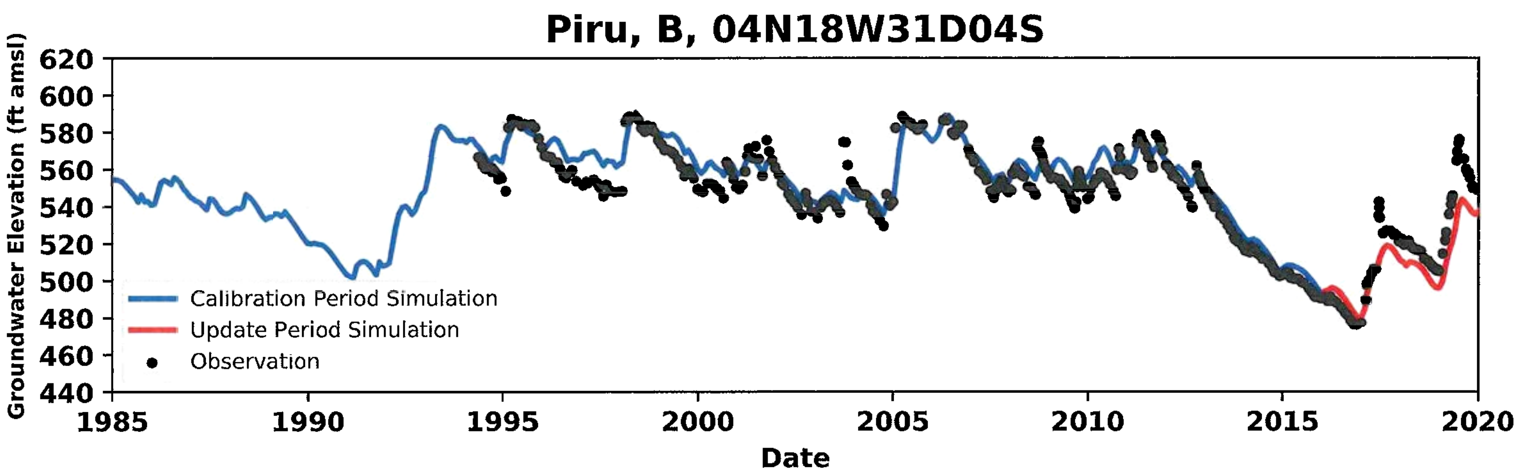

## Piru, AB, 04N19W34J01S



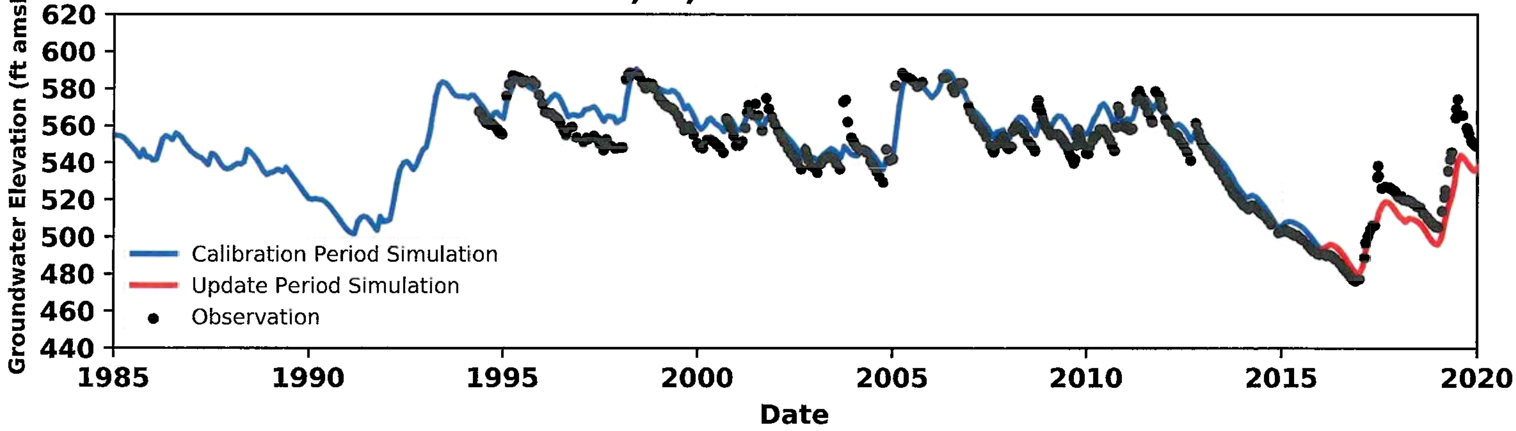

Piru, AB, 04N18W20P04S
Groundwater Elevation (ft amsl)
660
640
620
600
580
560
540
520
500
480
460
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, AB, 04N18W27G03S
Groundwater Elevation (ft amsl)
720
700
680
660
640
620
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

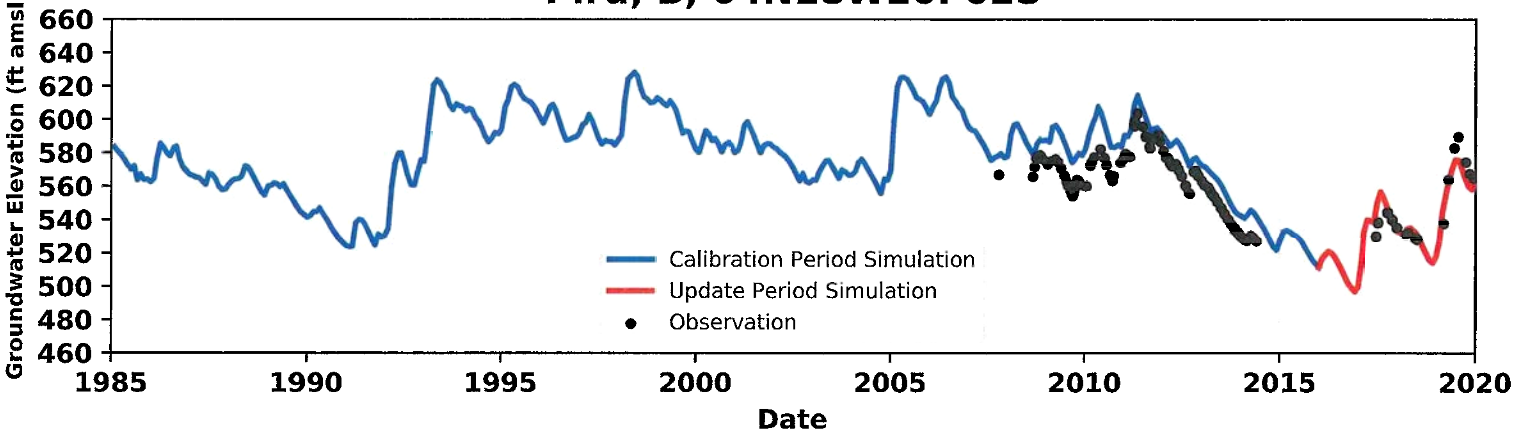

Piru, AB, 04N19W34L01S
Groundwater Elevation (ft amsl)
560
540
520
500
480
460
440
420
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, B, 04N18W31D04S
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

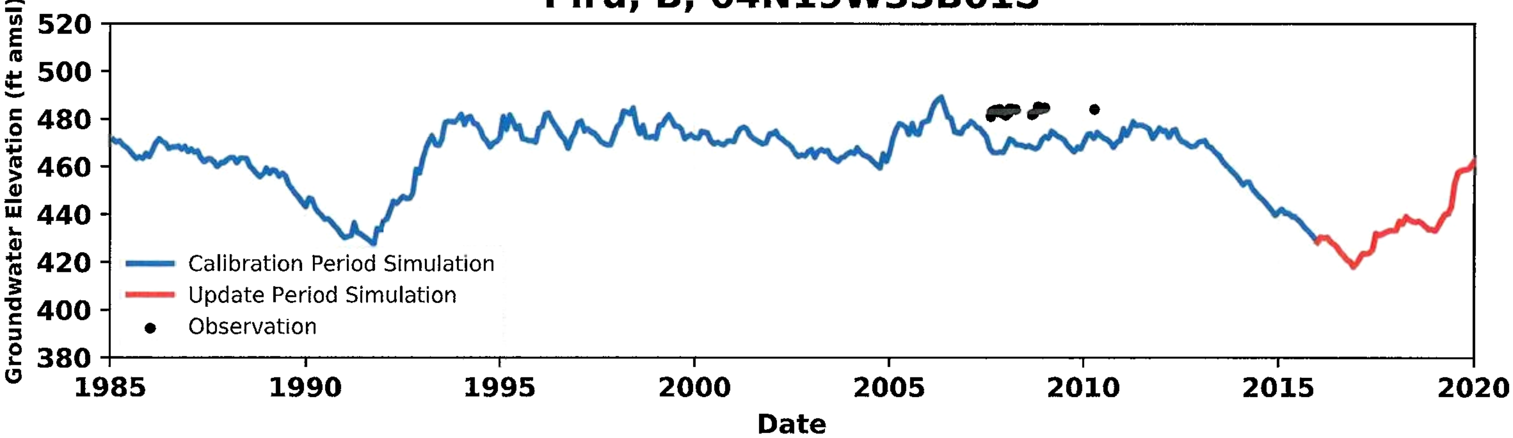
## Piru, B, 04N18W31D06S



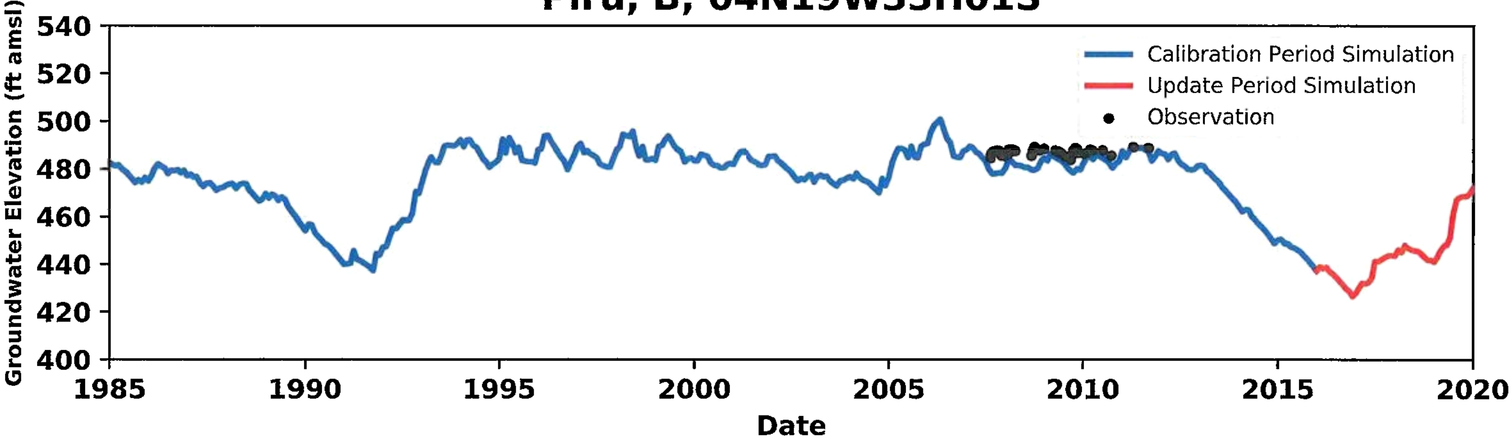

## Piru, B, 04N18W20P02S

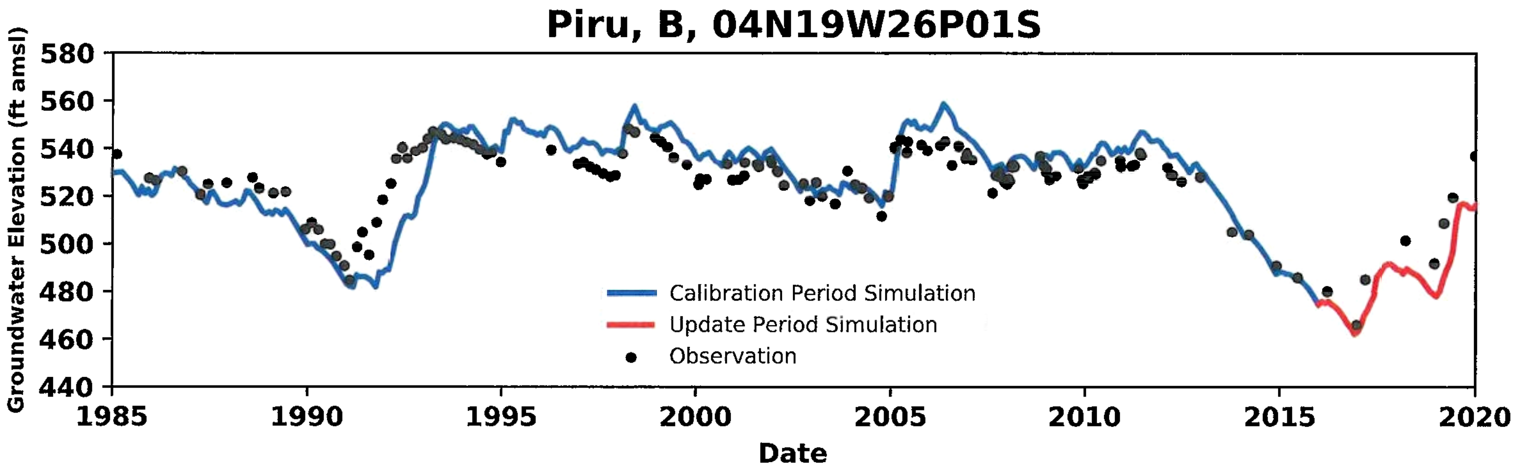


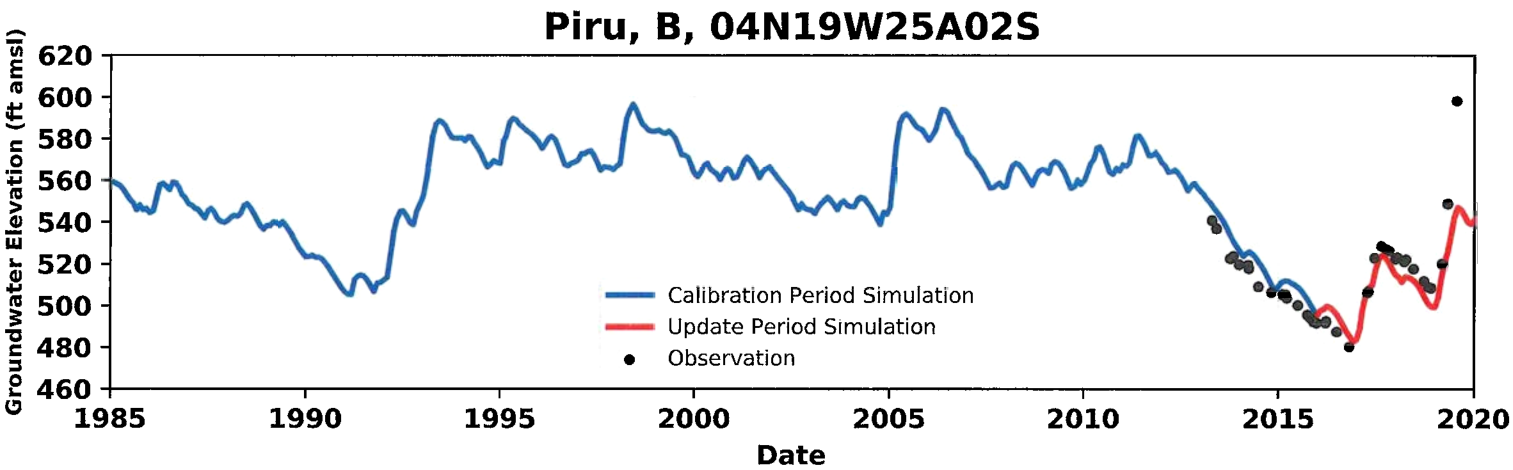

## Piru, B, 04N19W33B01S

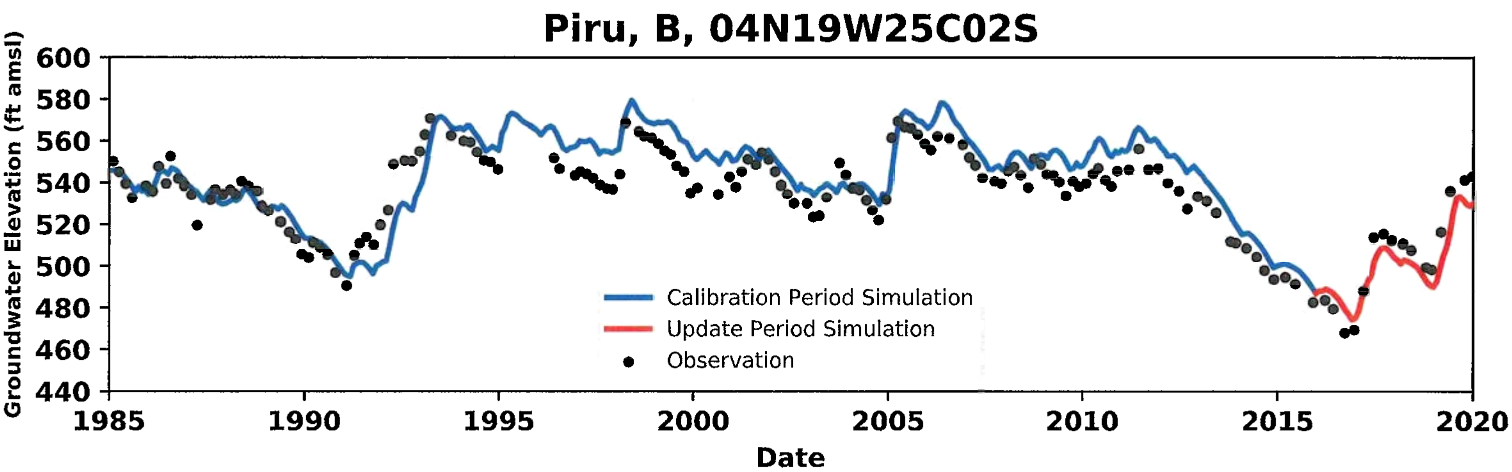


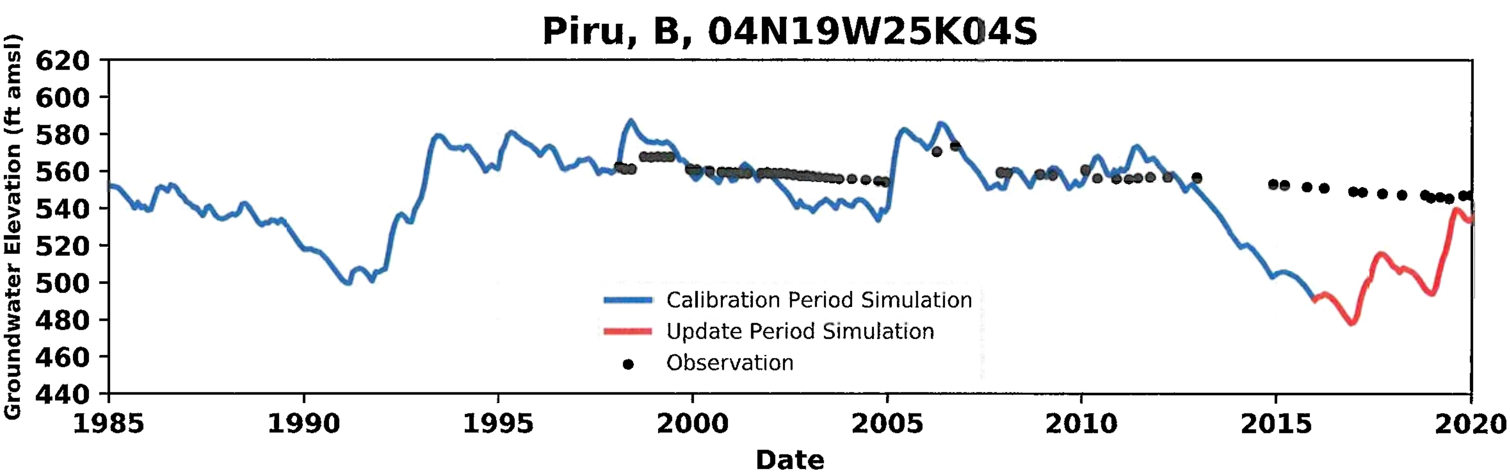

## Piru, B, 04N19W33H01S



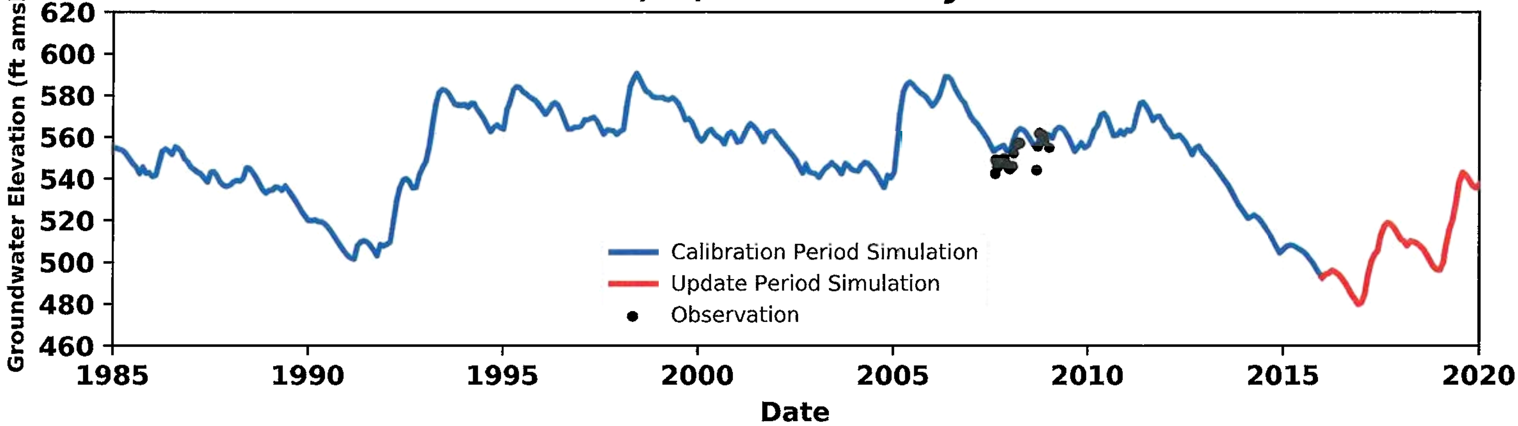

Piru, B, 04N19W26P01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, B, 04N19W25A02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

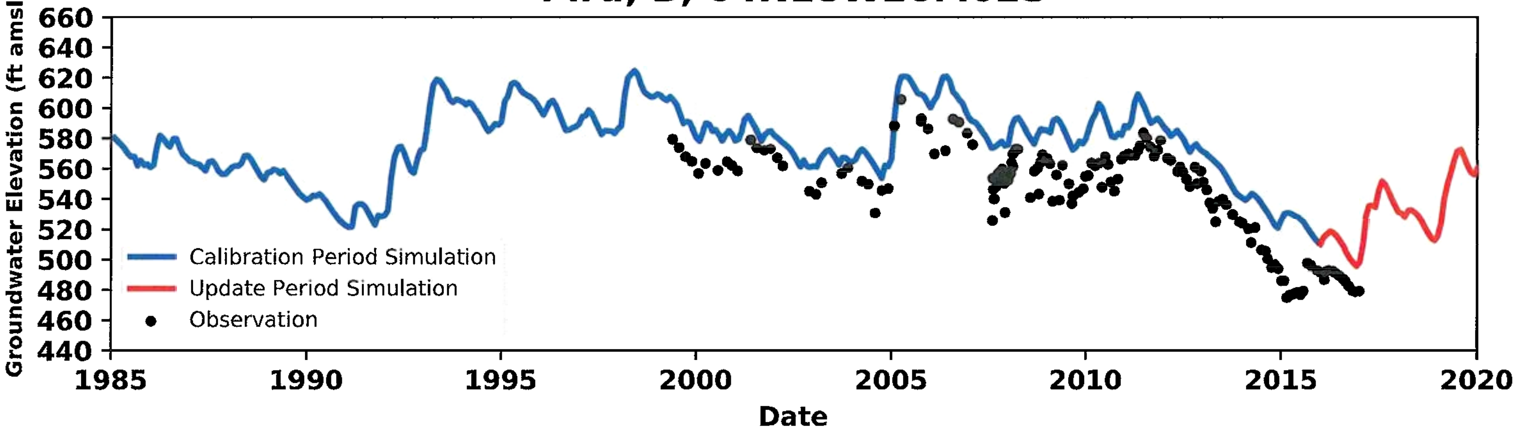

Piru, B, 04N19W25C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, B, 04N19W25K04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

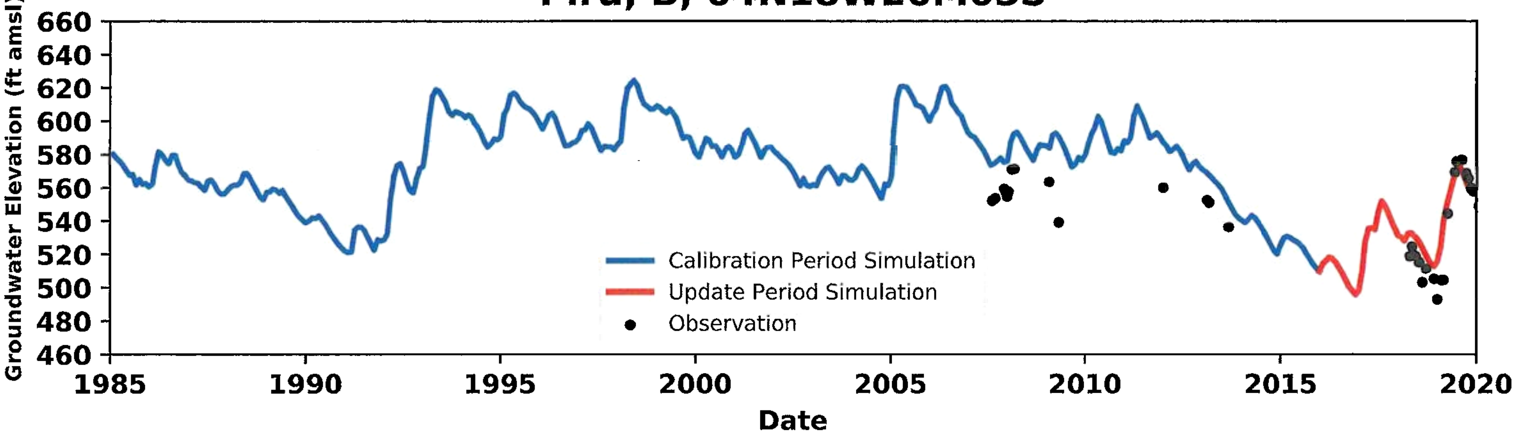
## Piru, B, 04N19W25J05S



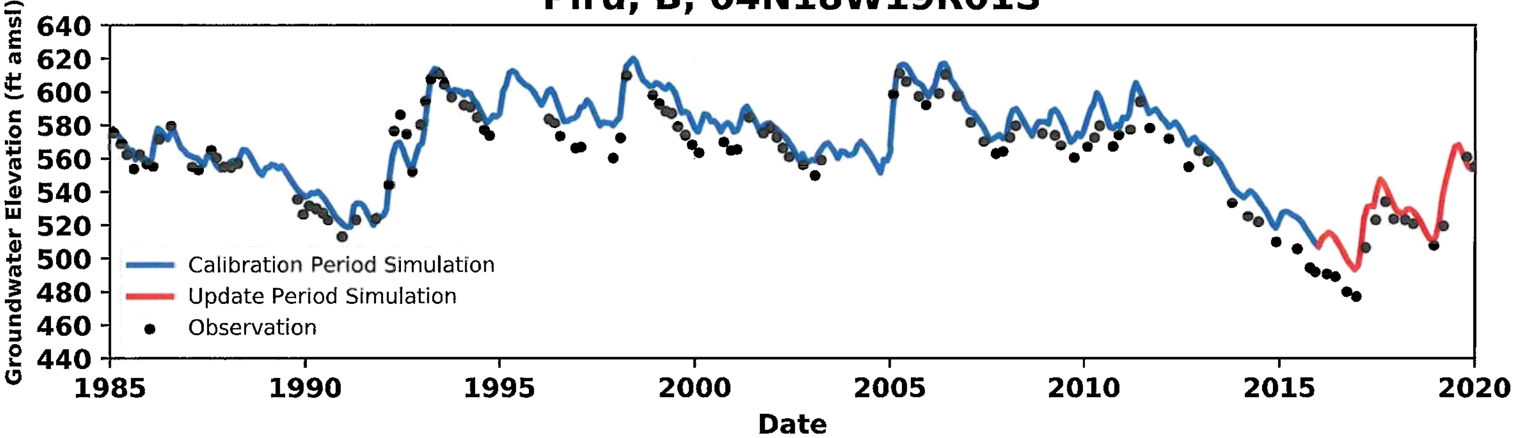

## Piru, B, 04N18W20M02S

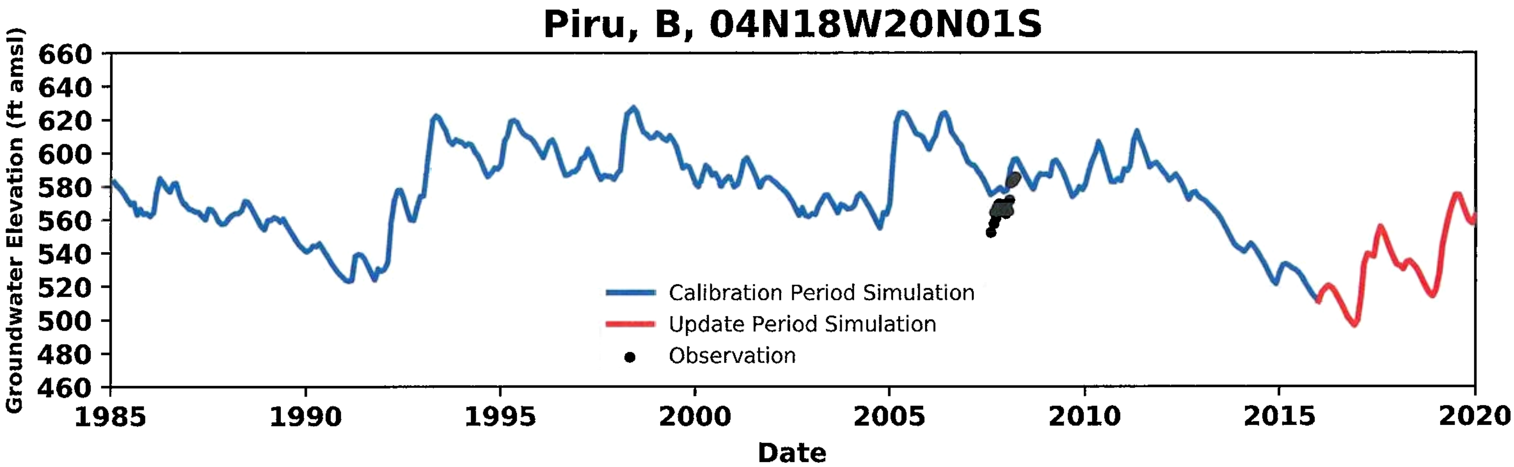


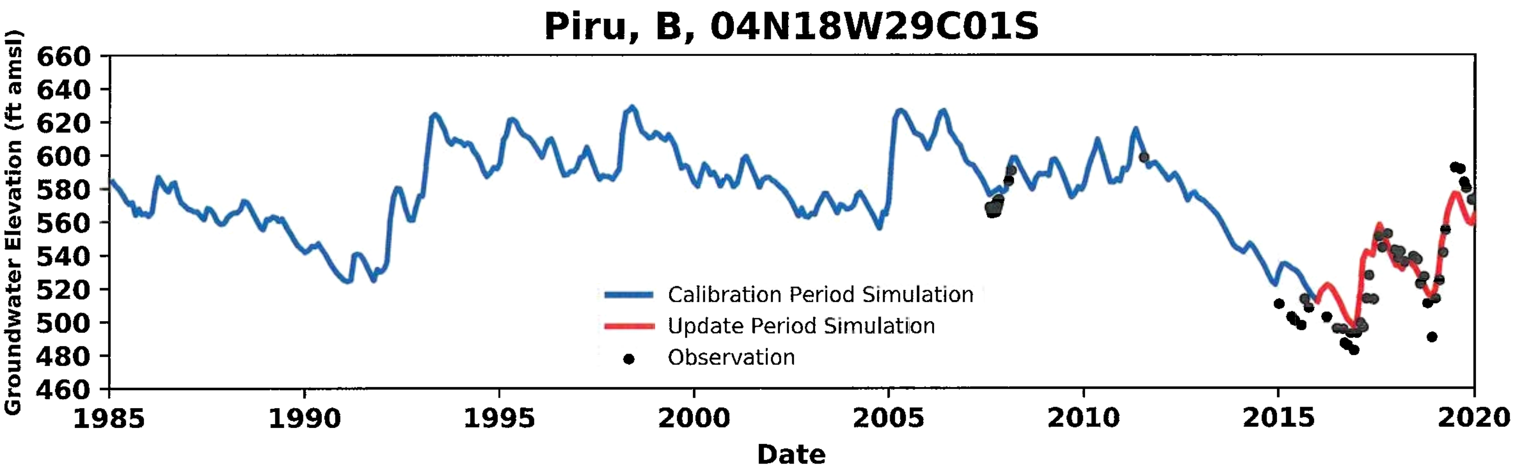

## Piru, B, 04N18W20M03S

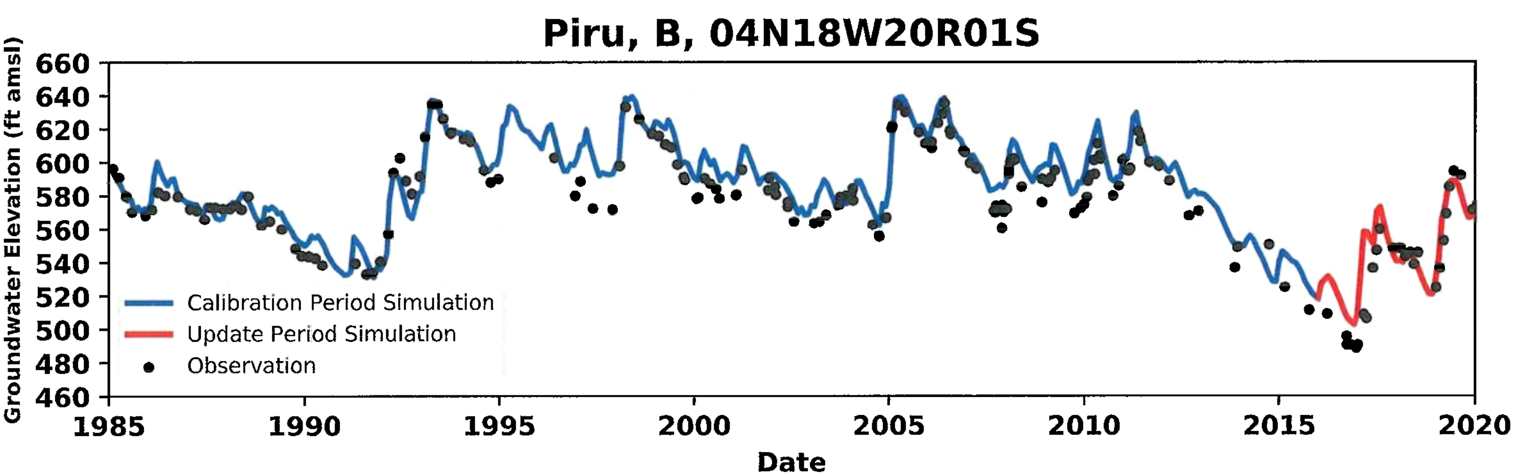


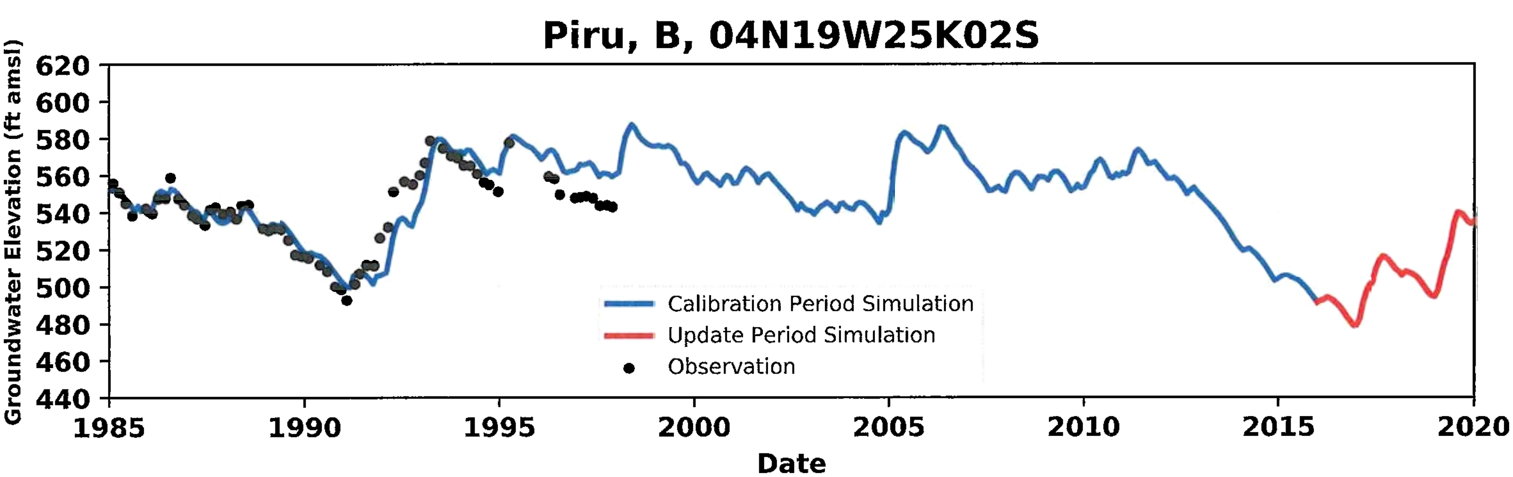

## Piru, B, 04N18W19R01S



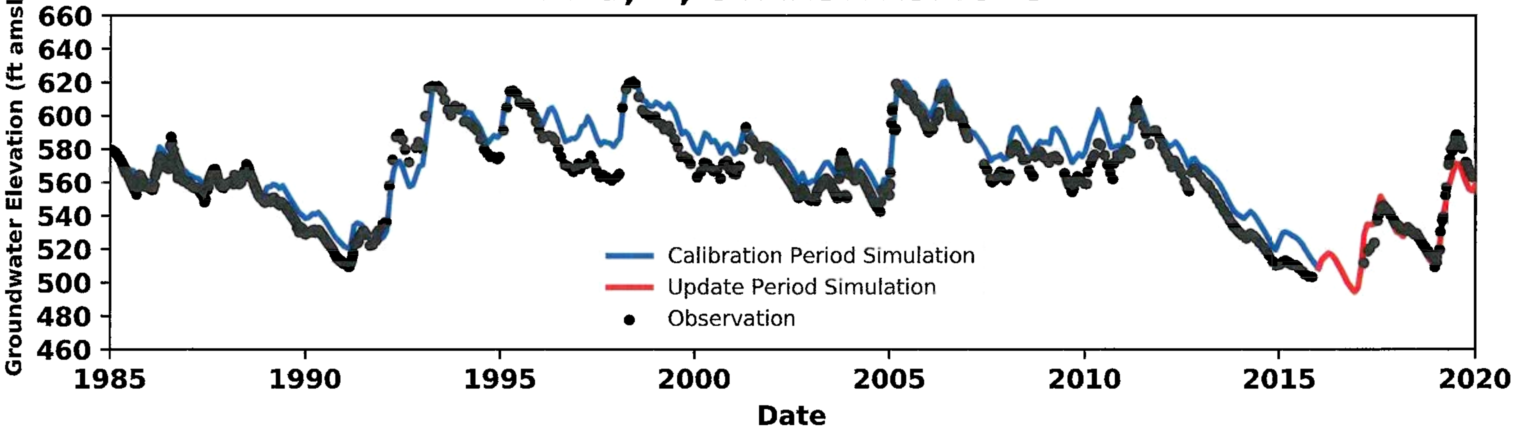

Piru, B, 04N18W20N01S
Groundwater Elevation (ft amsl)
660
640
620
600
580
560
540
520
500
480
460
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, B, 04N18W29C01S
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

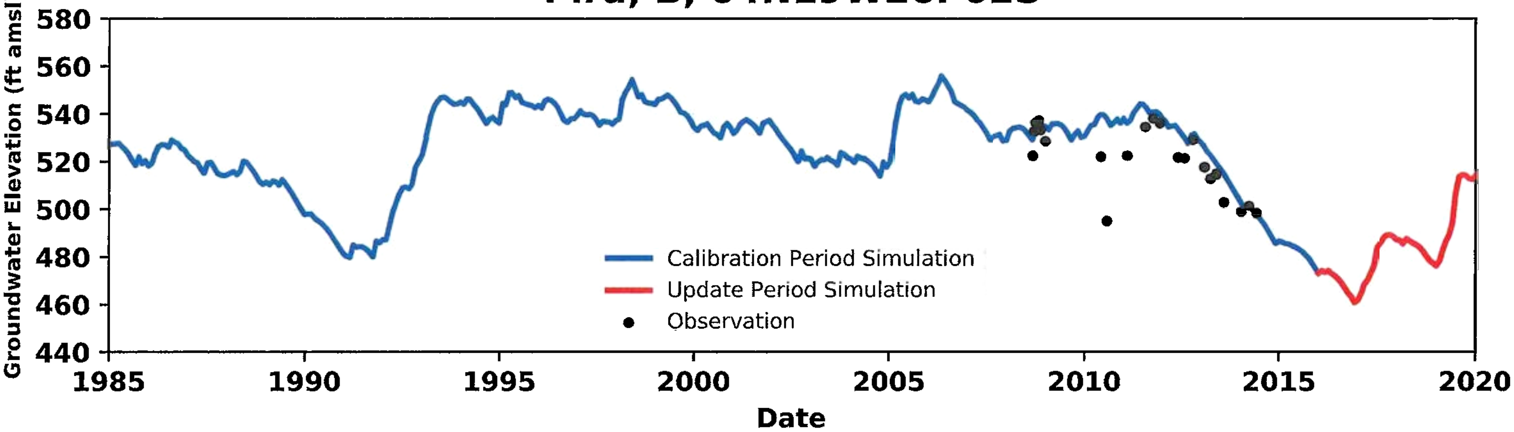

Piru, B, 04N18W20R01S
Groundwater Elevation (ft amsl)
660
640
620
600
580
560
540
520
500
480
460
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Piru, B, 04N19W25K02S
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

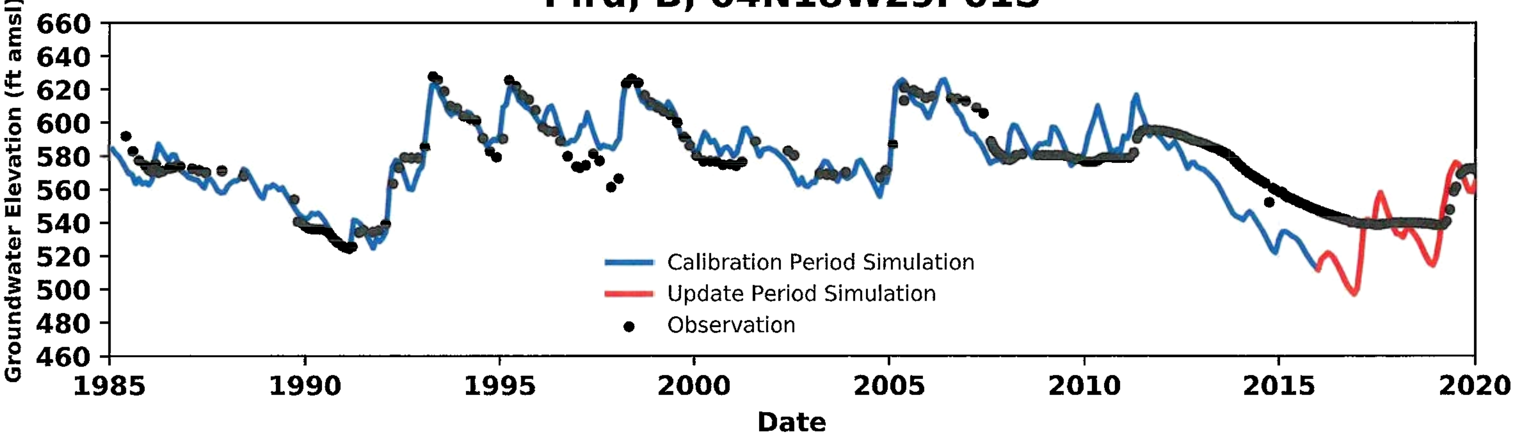
## Piru, B, 04N18W29M02S



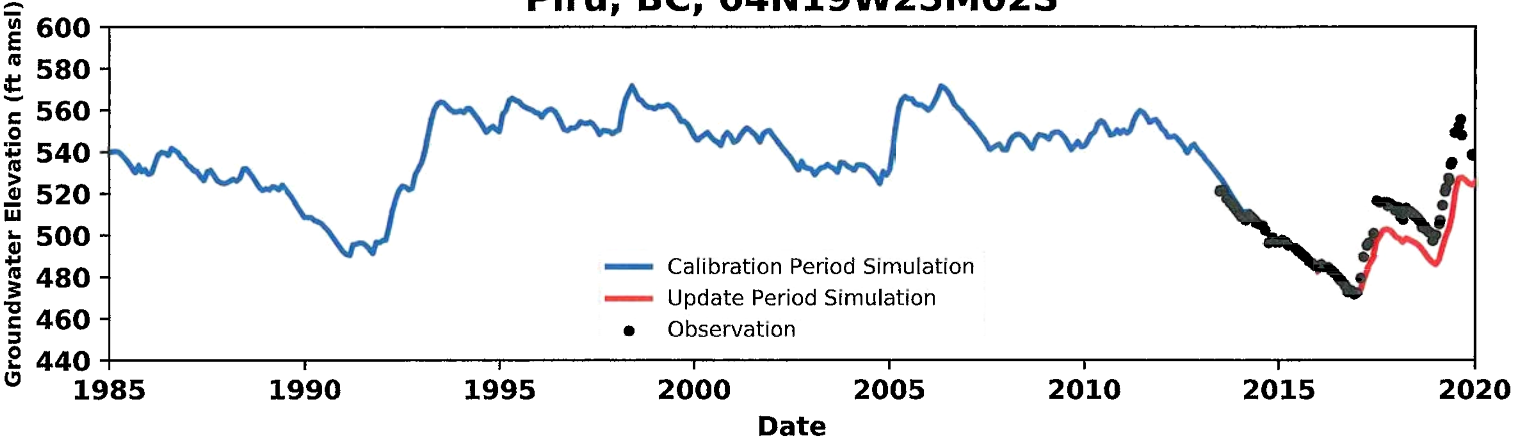

## Piru, B, 04N19W26P02S



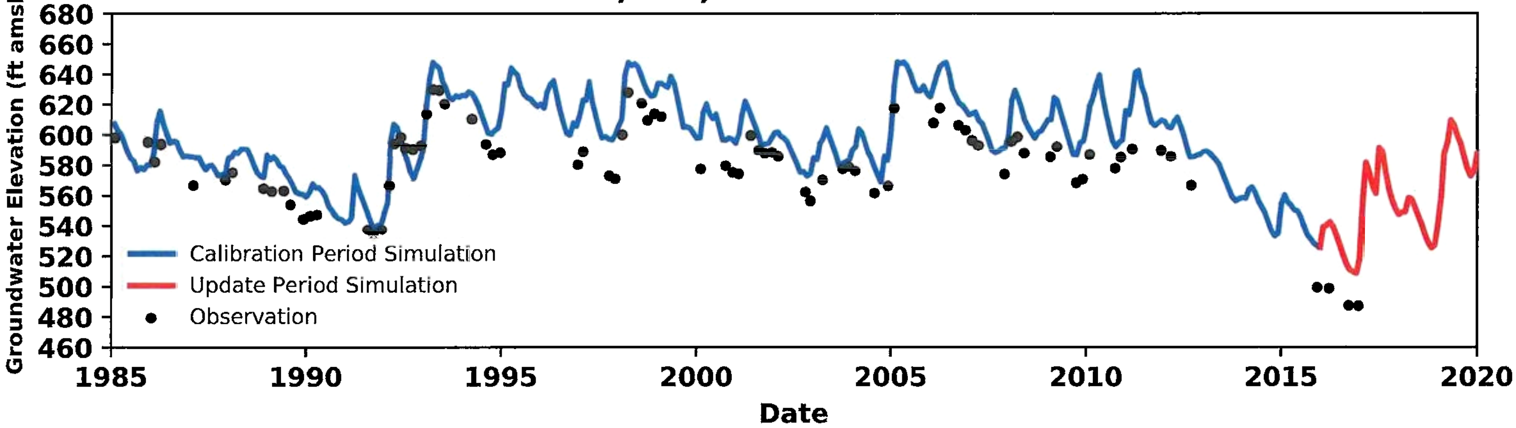

## Piru, B, 04N18W29P01S



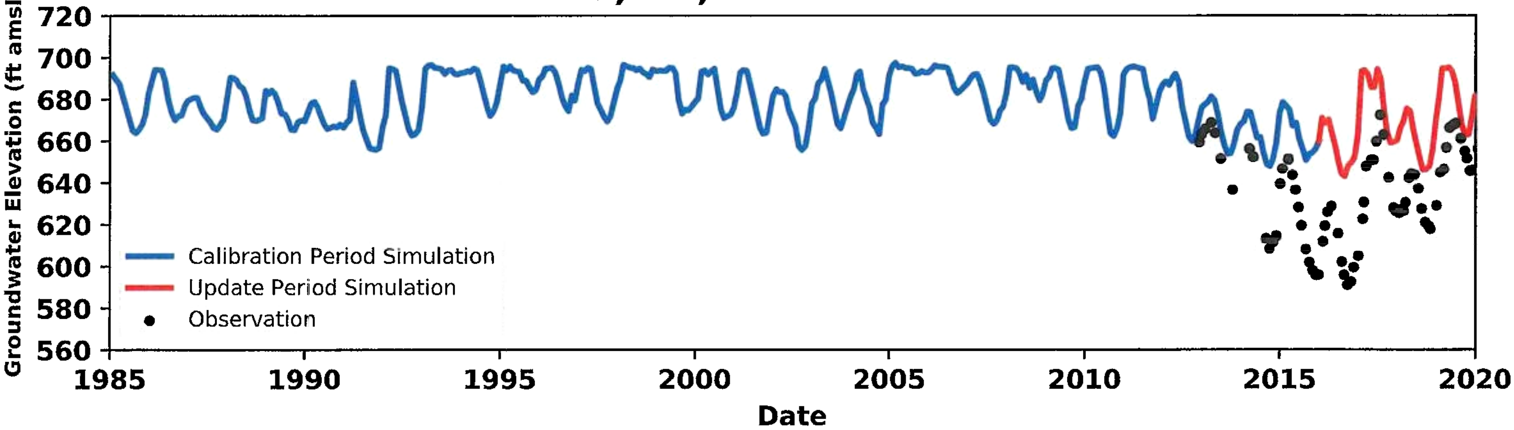

## Piru, BC, 04N19W25M02S



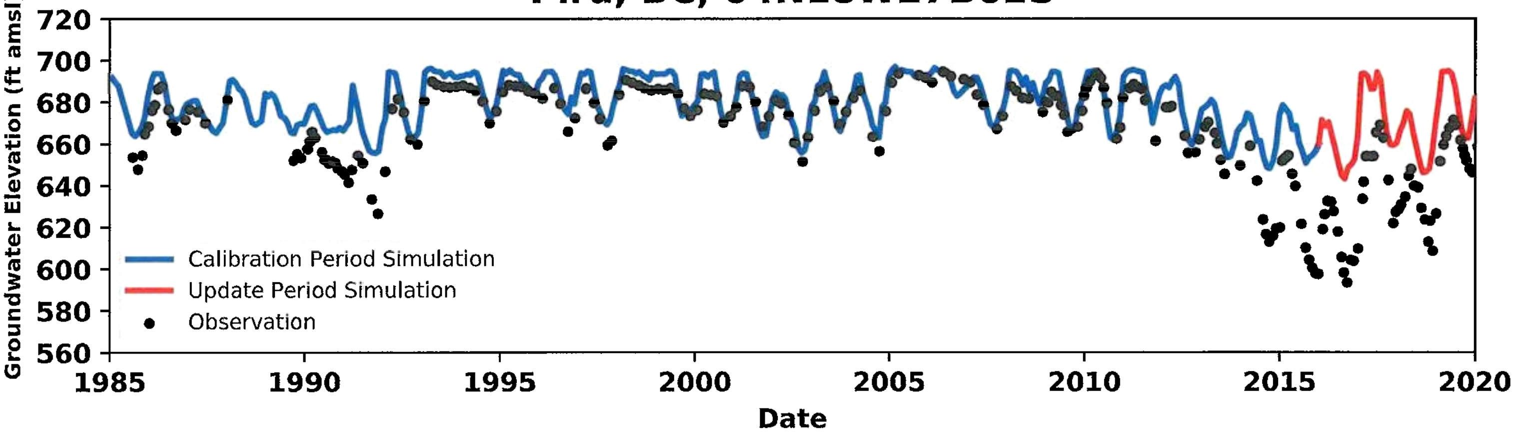
## Piru, BC, 04N18W28C02S



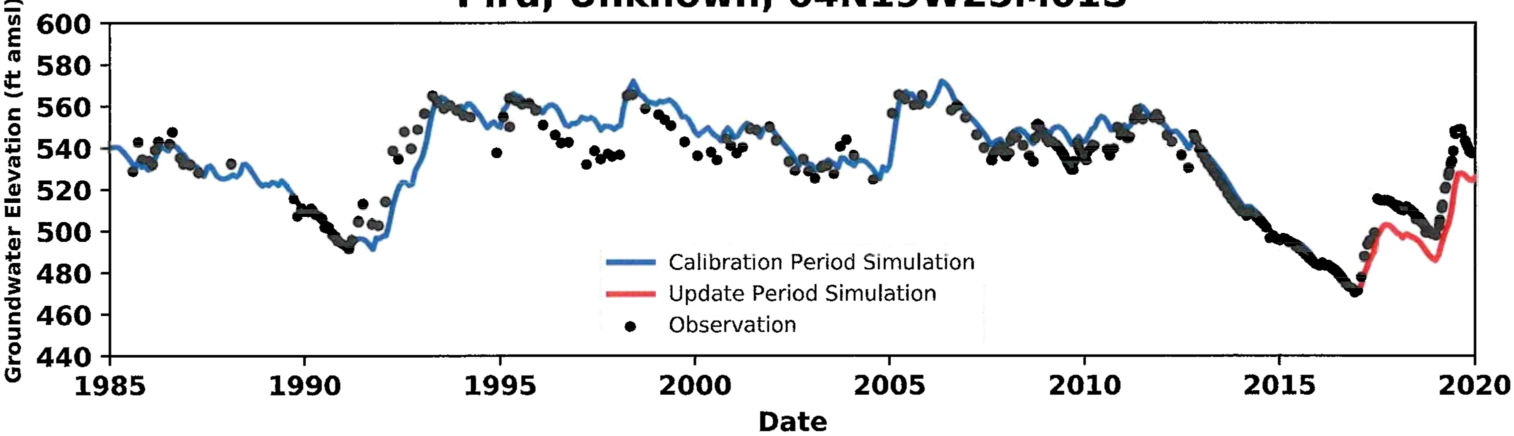

## Piru, BC, 04N18W27B01S

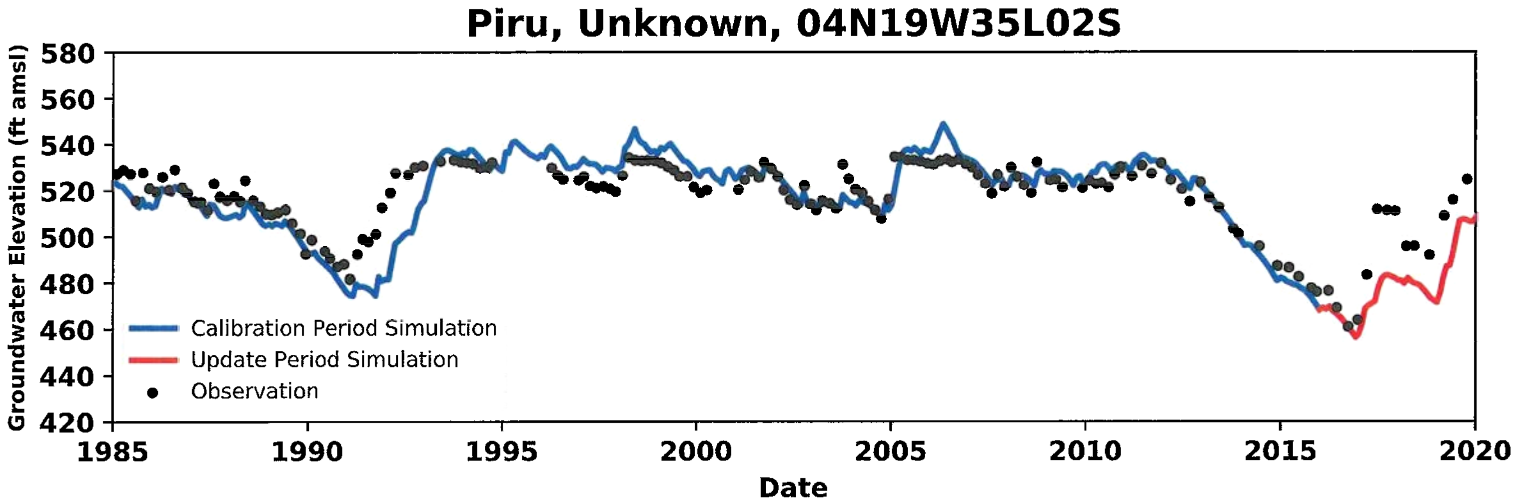



## Piru, BC, 04N18W27B02S

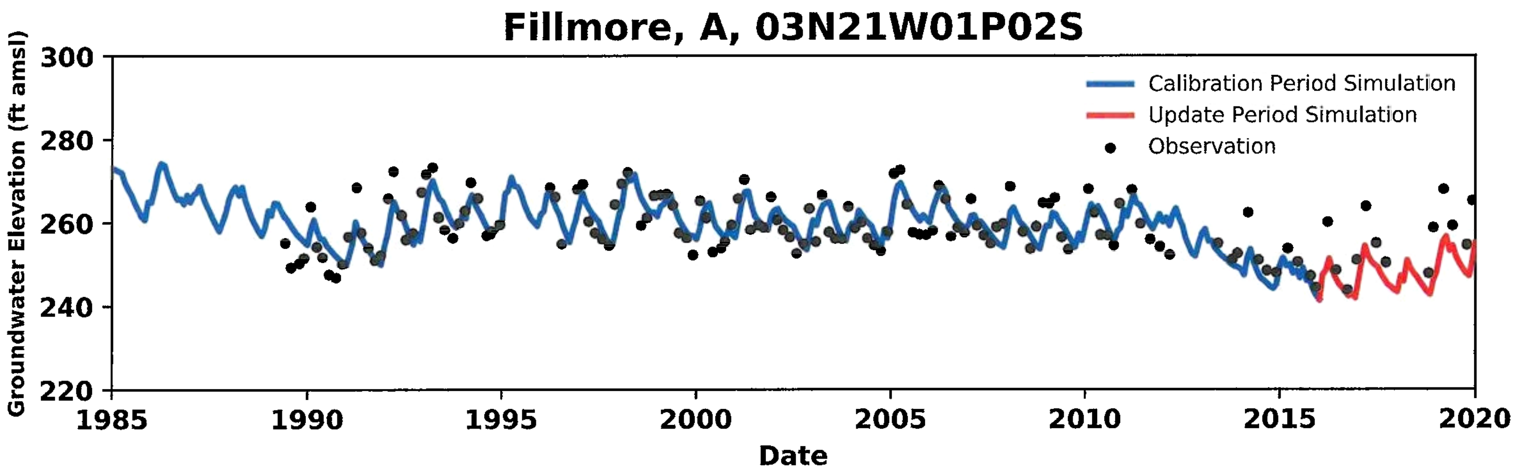


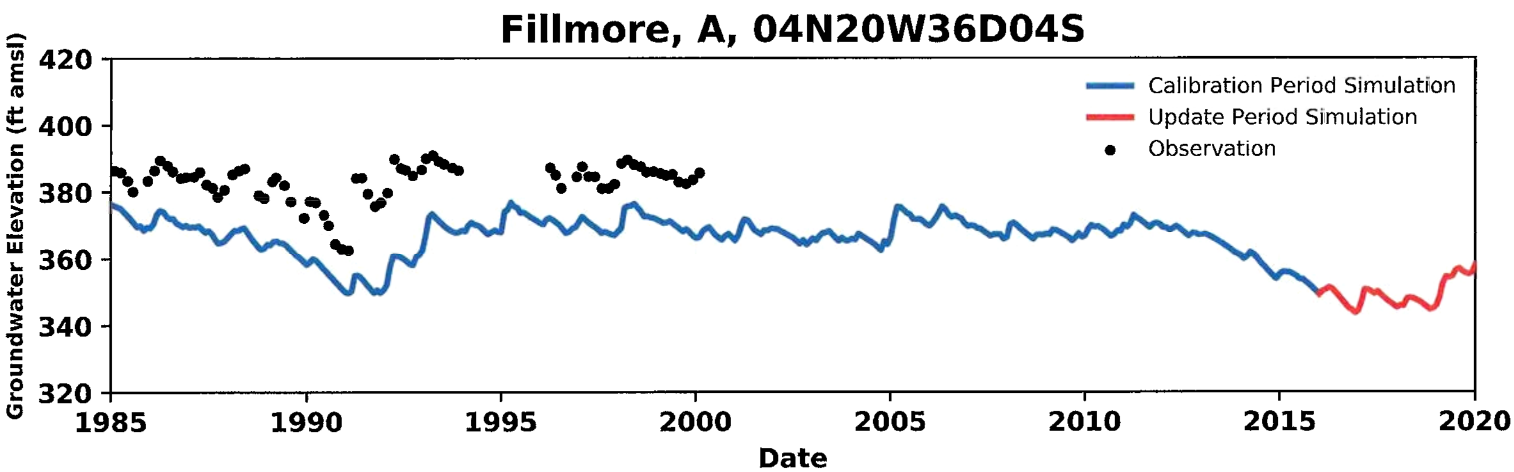

## Piru, Unknown, 04N19W25M01S

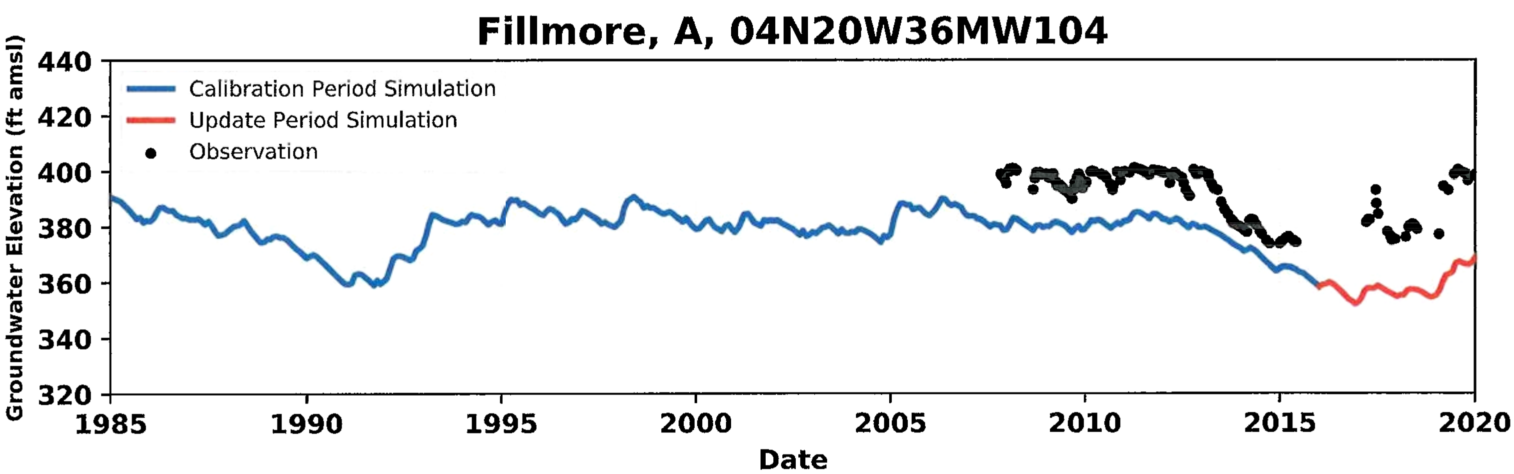


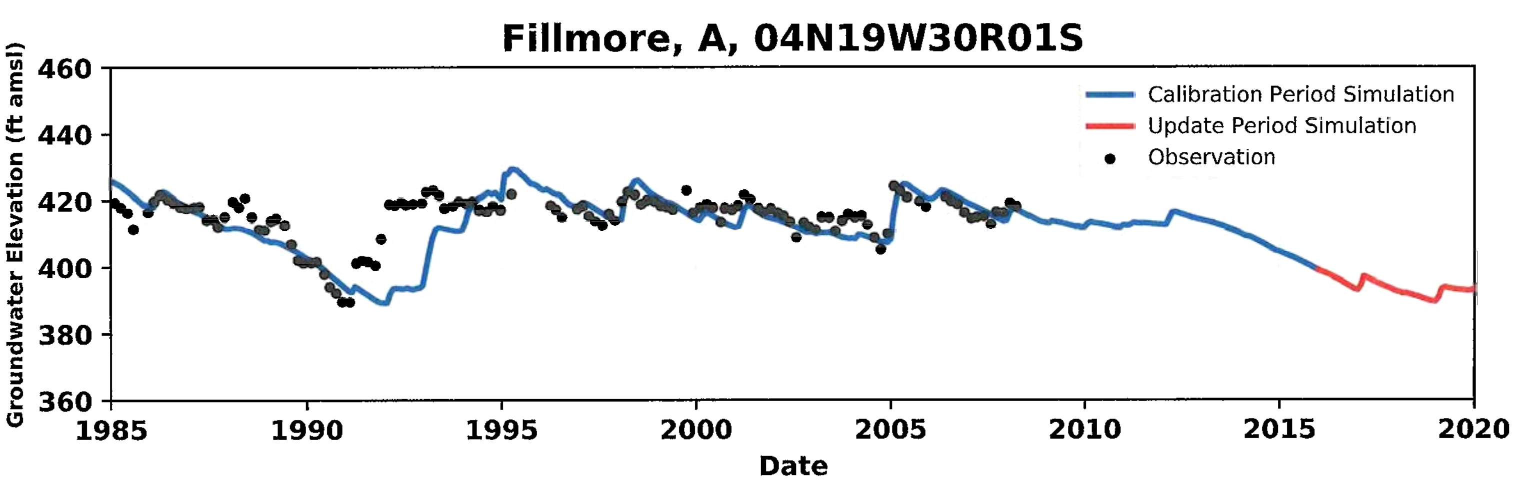


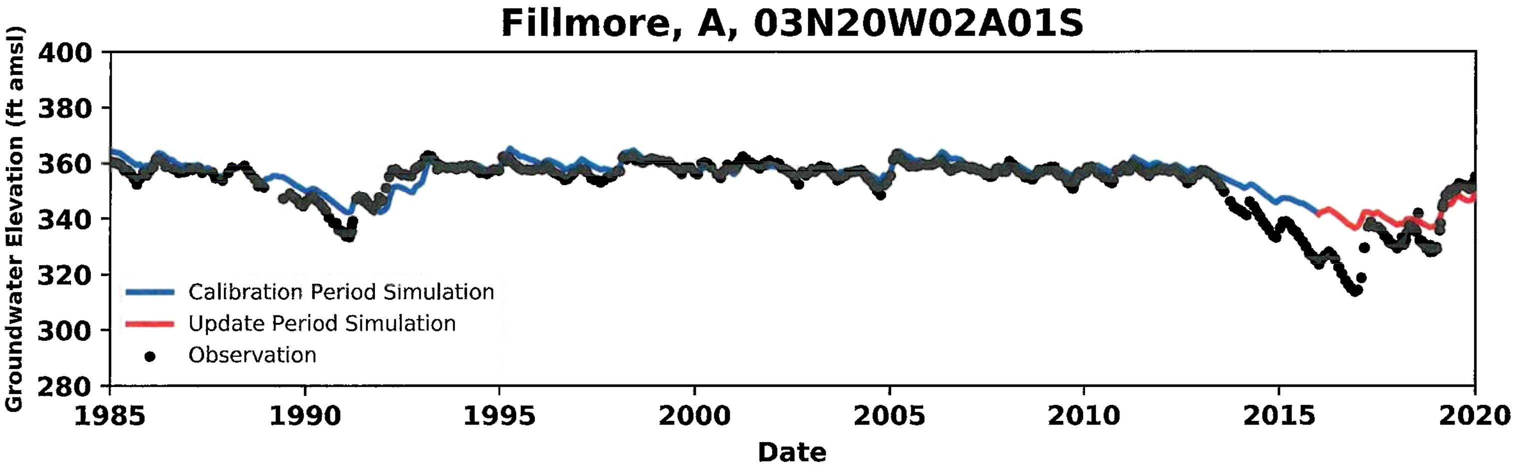
Piru, Unknown, 04N19W35L02S
Groundwater Elevation (ft amsl)
580
560
540
520
500
480
460
440
420
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

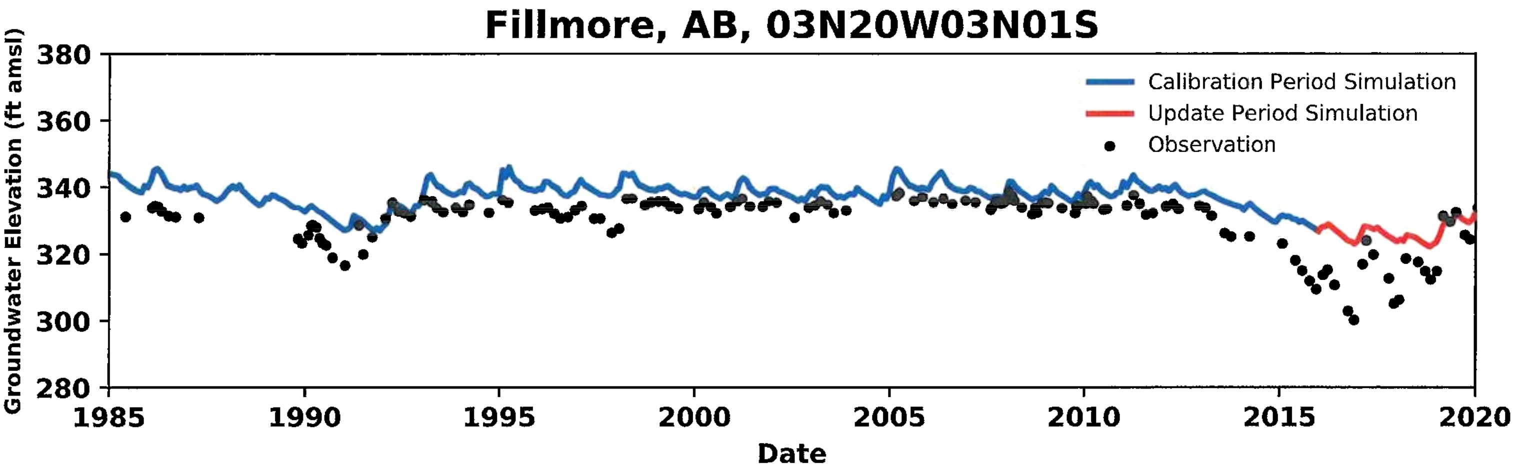

Fillmore, A, 03N21W01P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
300
280
260
240
220
1985
1990
1995
2000
2005
2010
2015
2020

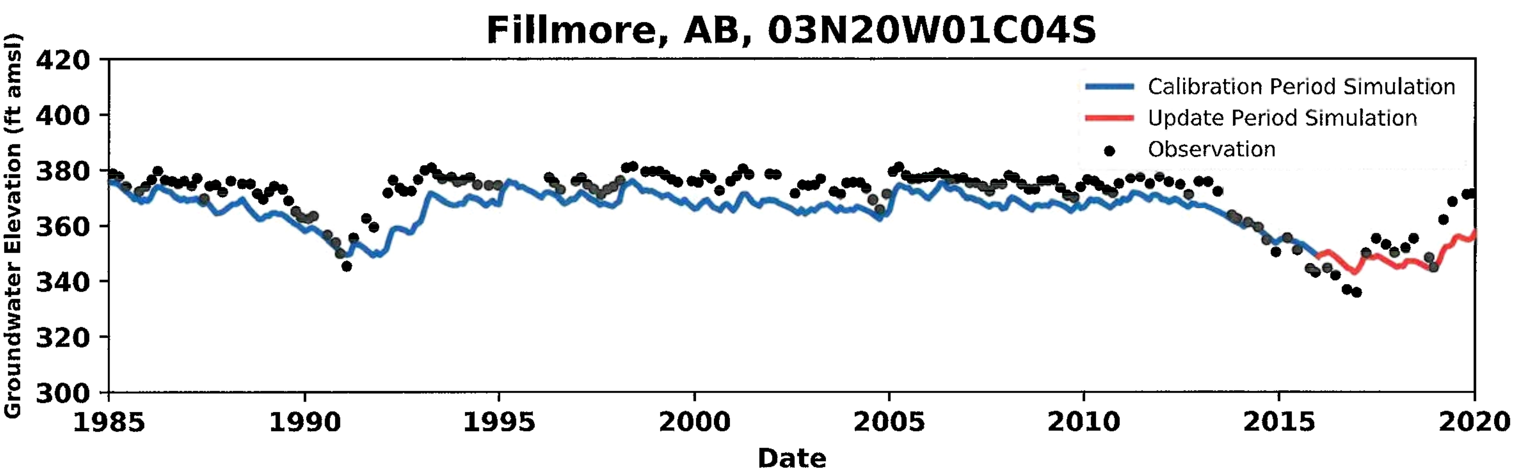

Fillmore, A, 04N20W36D04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020

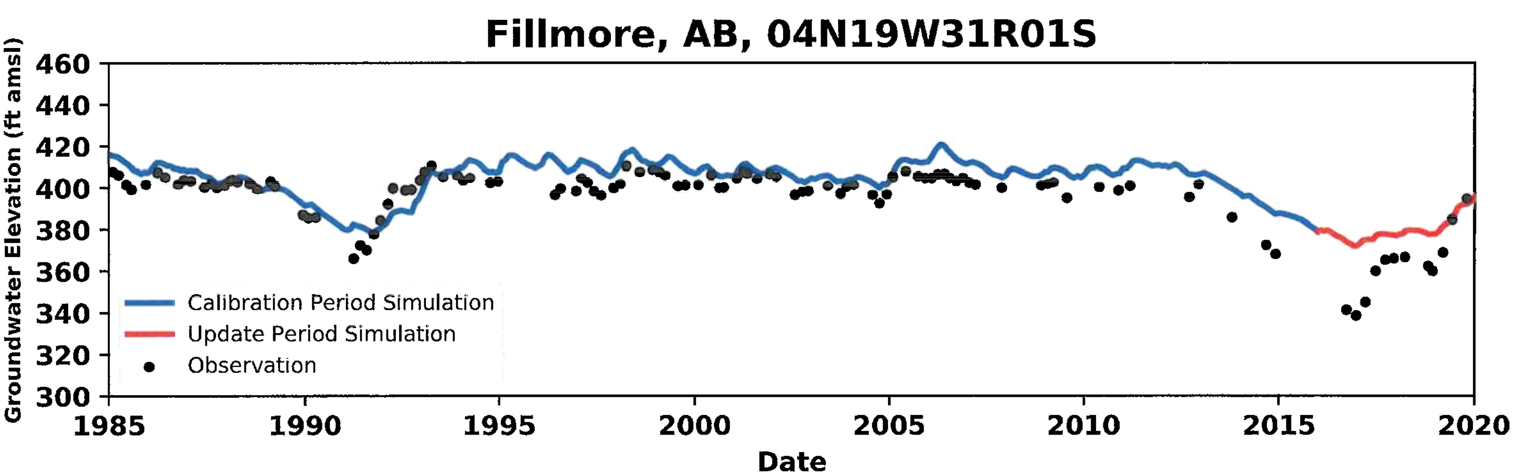

Fillmore, A, 04N20W36MW104
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020


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

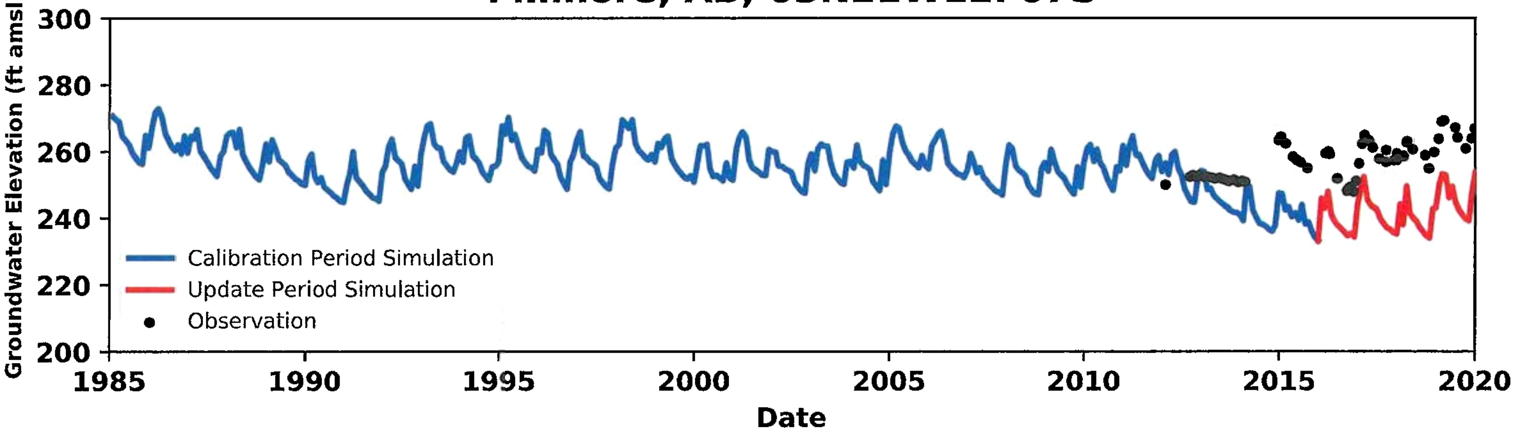

Fillmore, A, 03N20W02A01S
Groundwater Elevation (ft amsl)
400
380
360
340
320
300
280
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, AB, 03N20W03N01S
Groundwater Elevation (ft amsl)
380
360
340
320
300
280
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

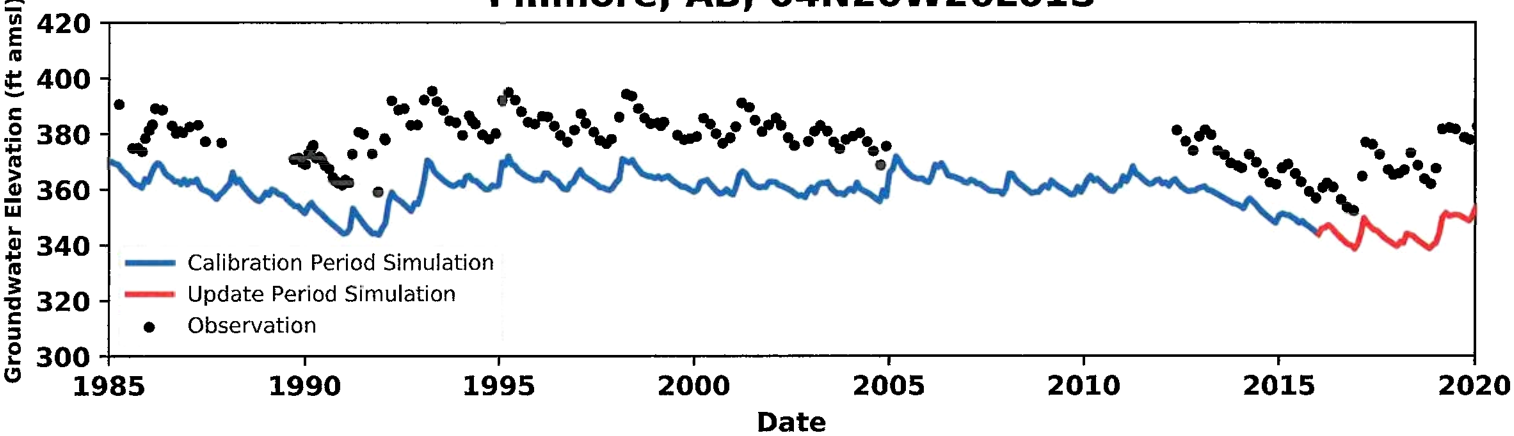

Fillmore, AB, 03N20W01C04S
Groundwater Elevation (ft amsl)
420
400
380
360
340
320
300
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, AB, 04N19W31R01S
Groundwater Elevation (ft amsl)
460
440
420
400
380
360
340
320
300
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

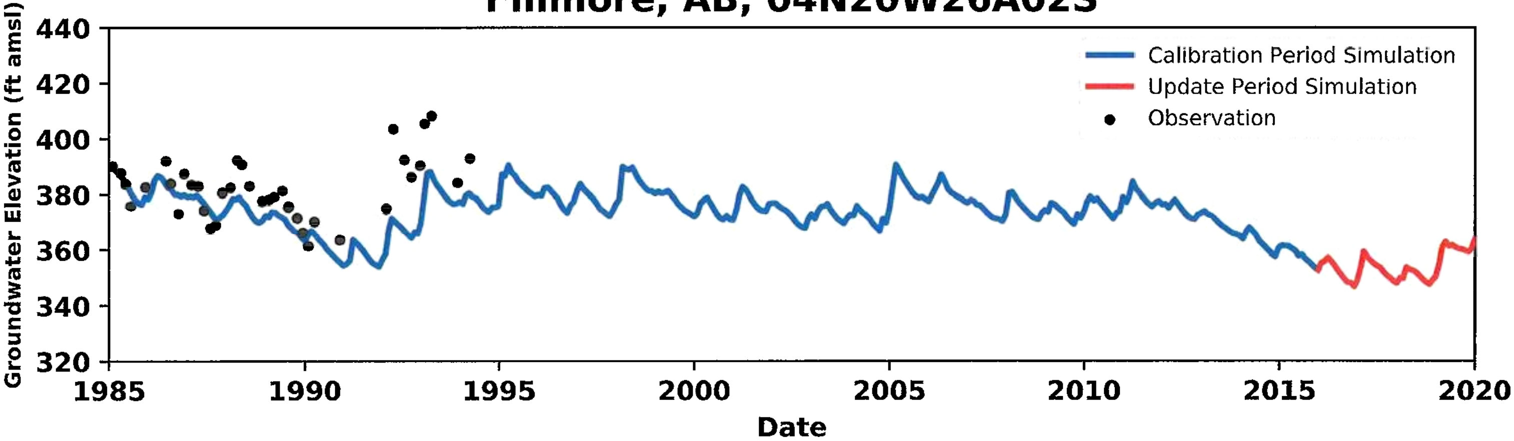
## Fillmore, AB, 03N21W12F07S



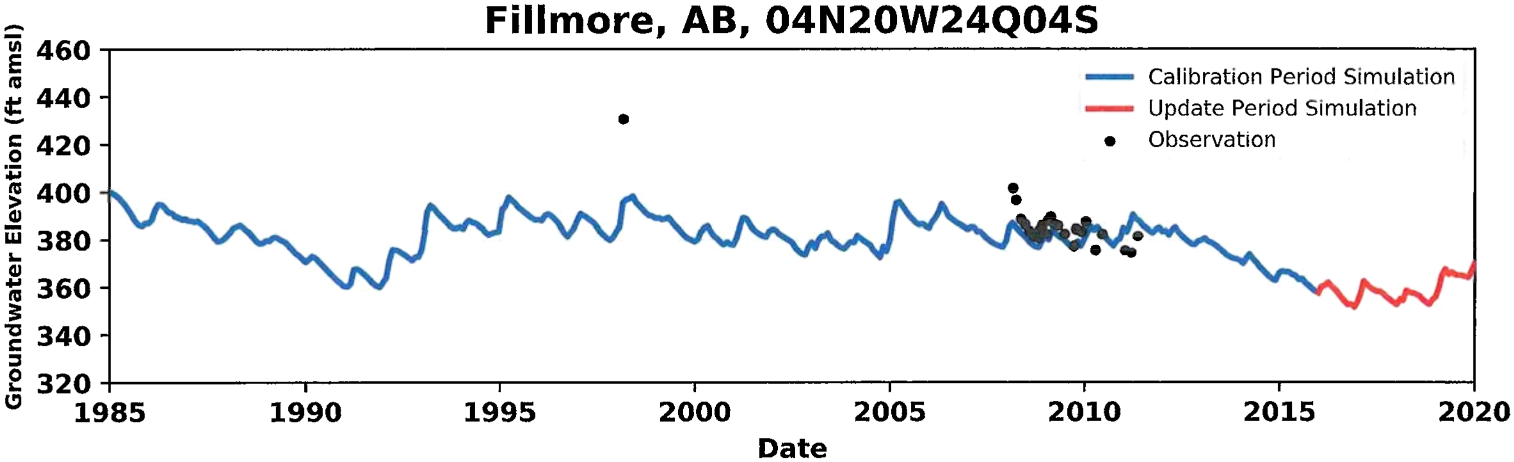

## Fillmore, AB, 04N20W26L01S

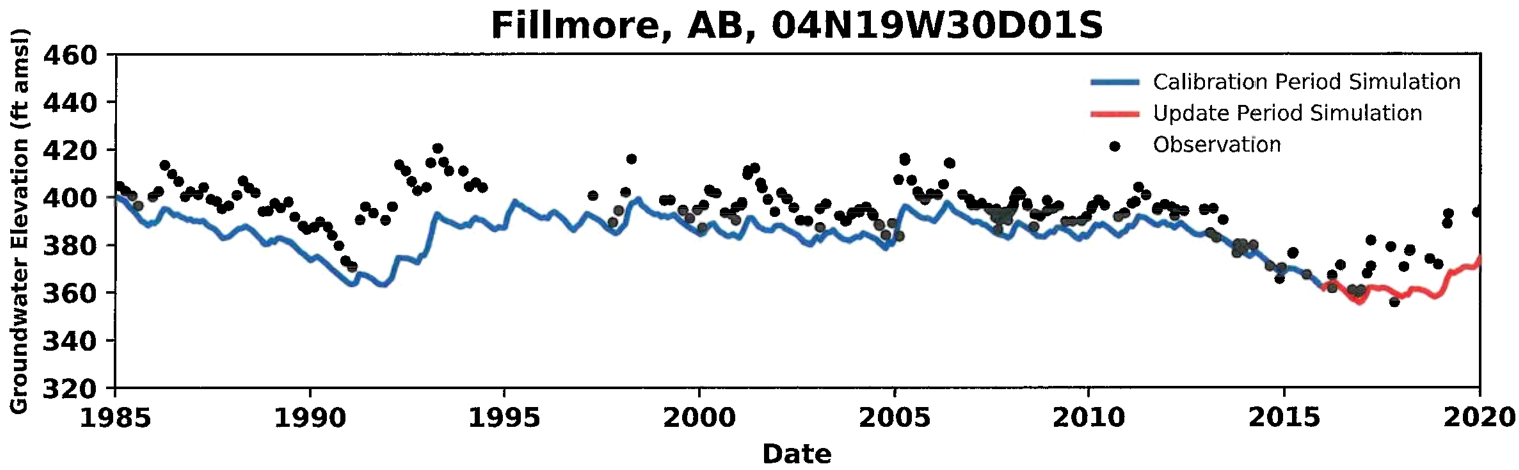


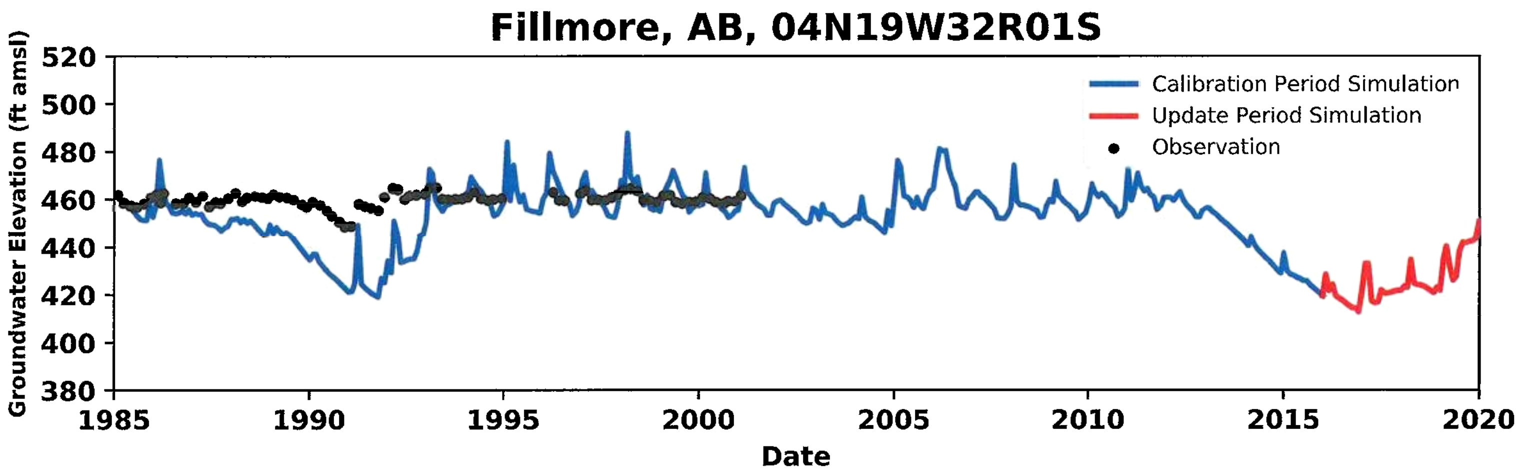

## Fillmore, AB, 04N20W26A02S

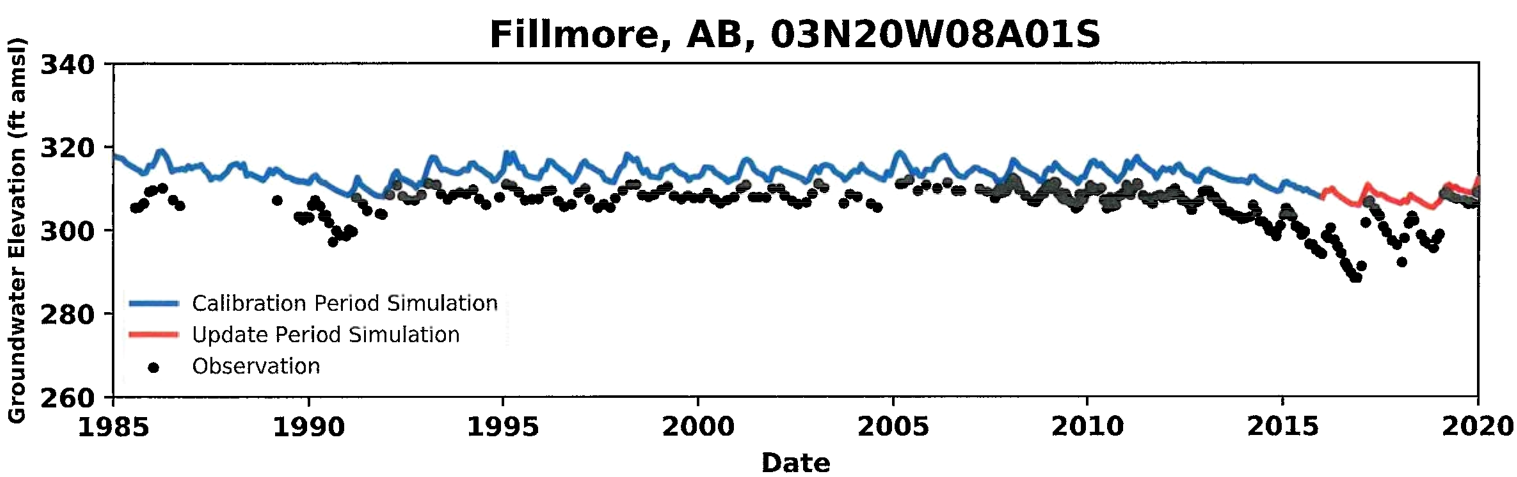


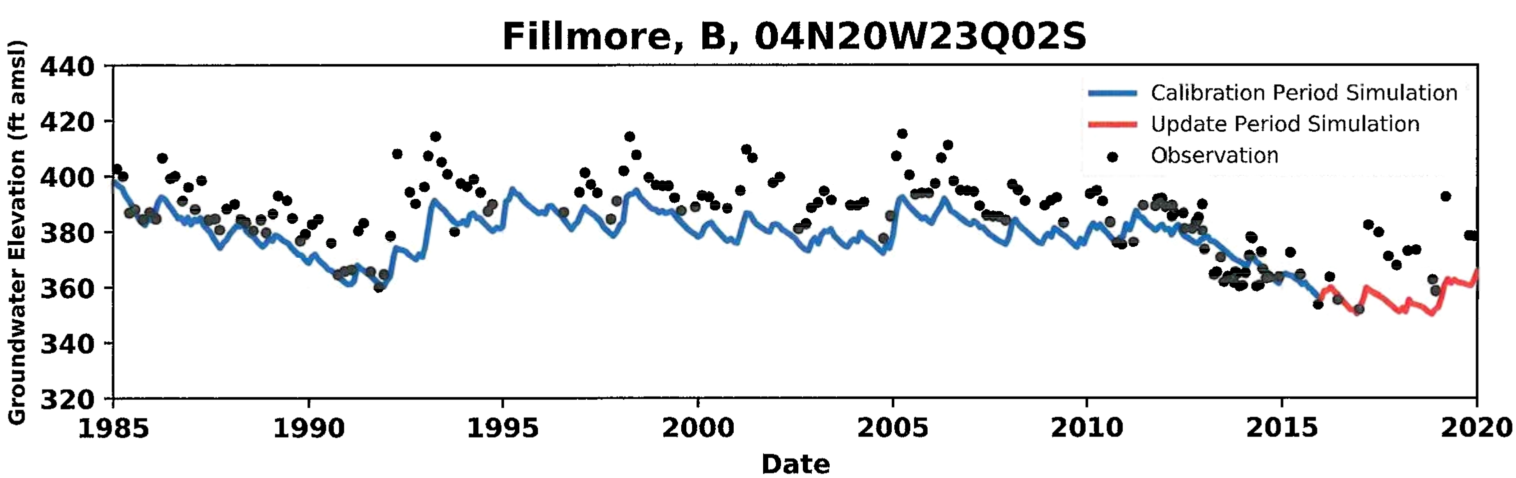

## Fillmore, AB, 04N20W24Q04S




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
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380
360
340
320
1985
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1995
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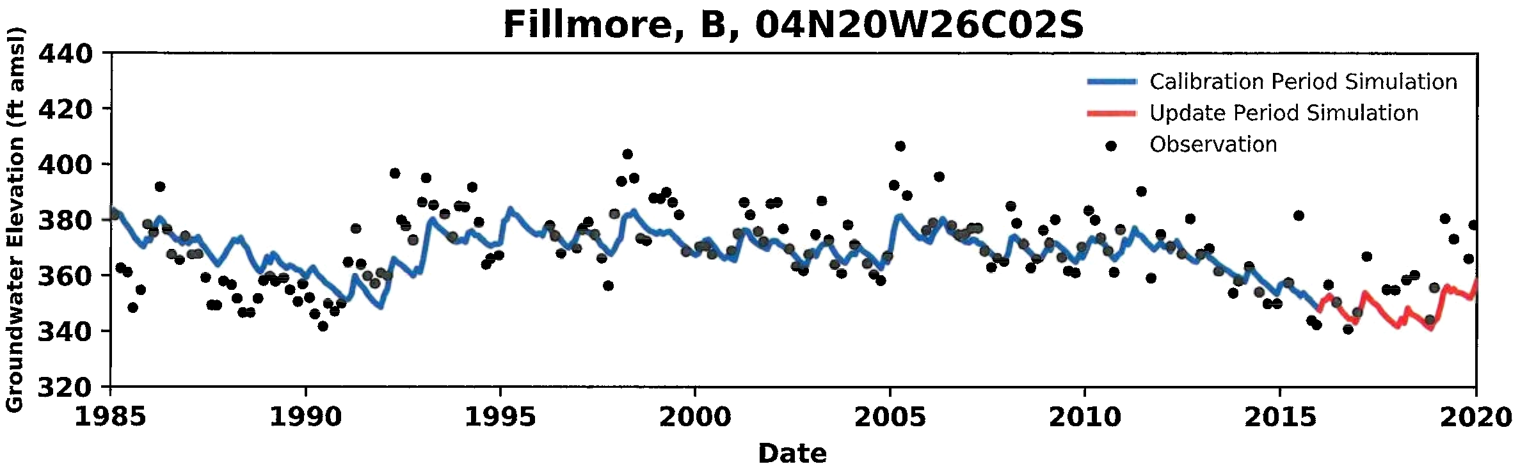
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, B, 04N20W26C02S
Groundwater Elevation (ft amsl)
440
420
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380
360
340
320
1985
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1995
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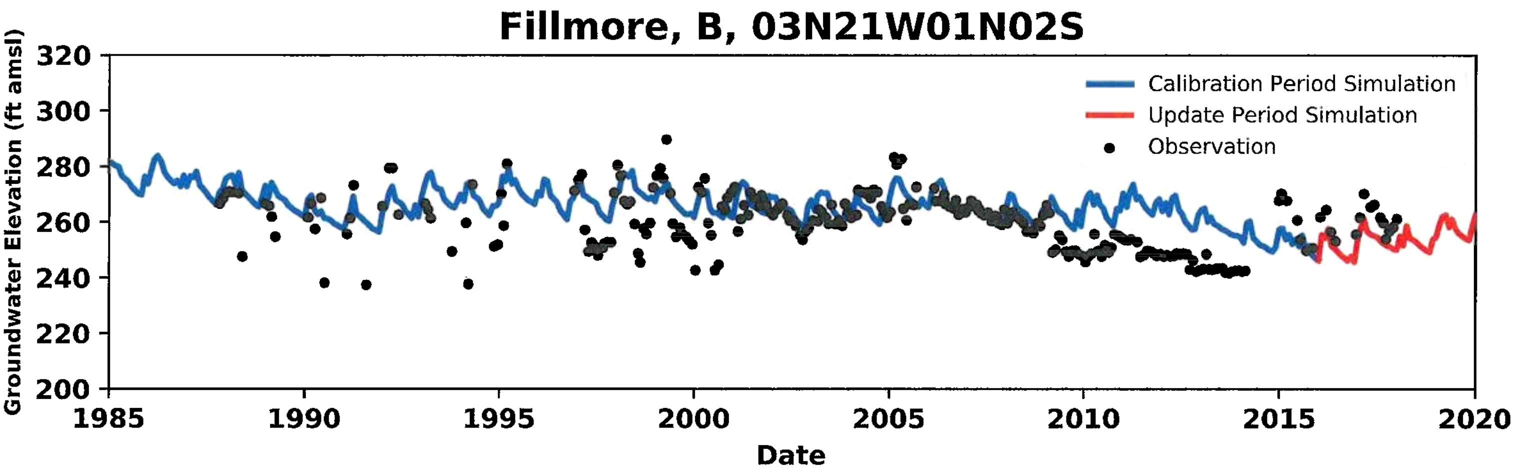
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, B, 03N21W01N02S
Groundwater Elevation (ft amsl)
320
300
280
260
240
220
200
1985
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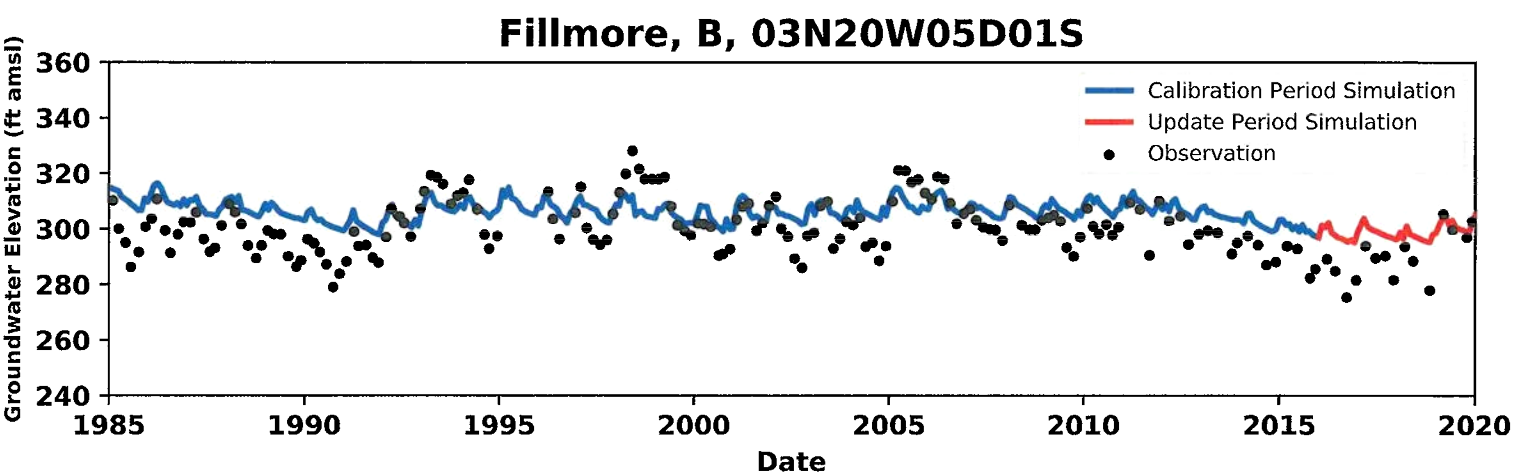
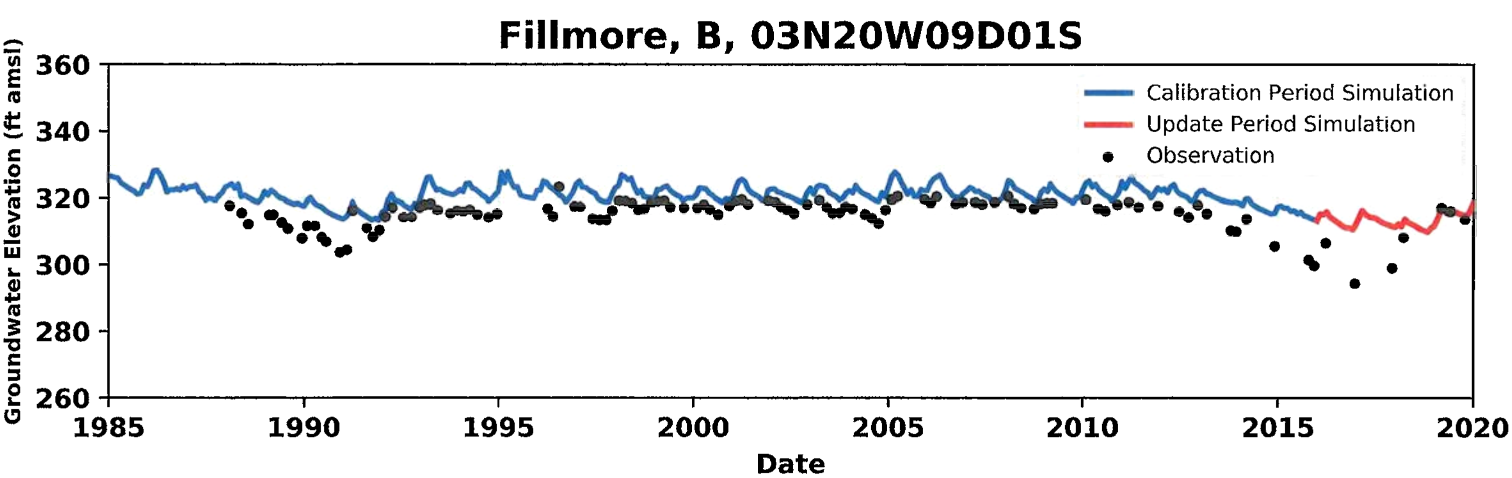
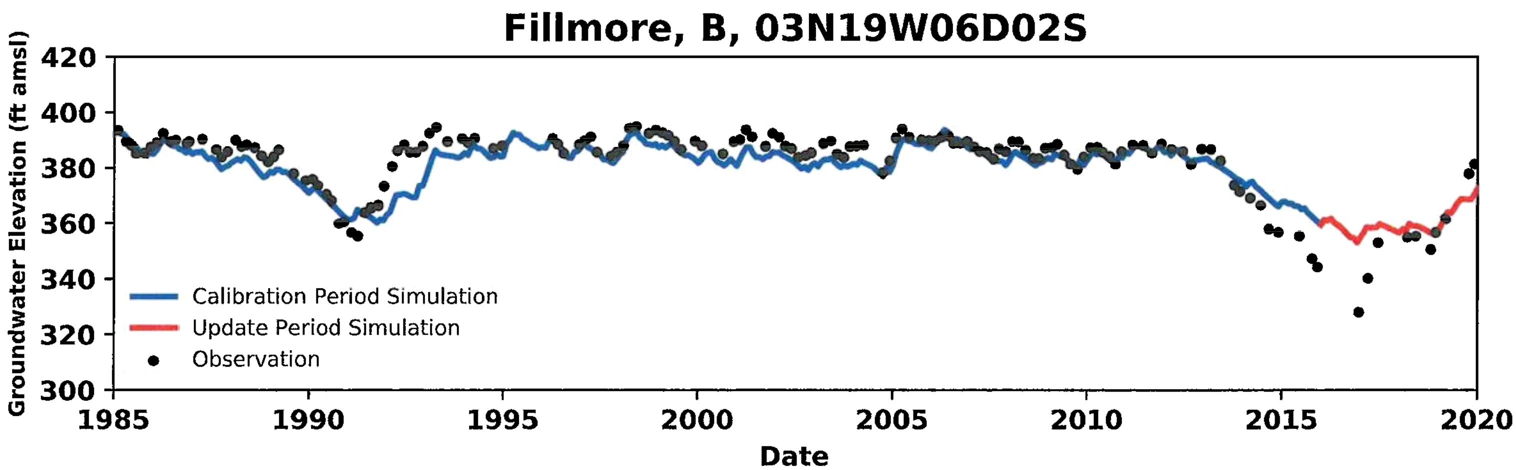
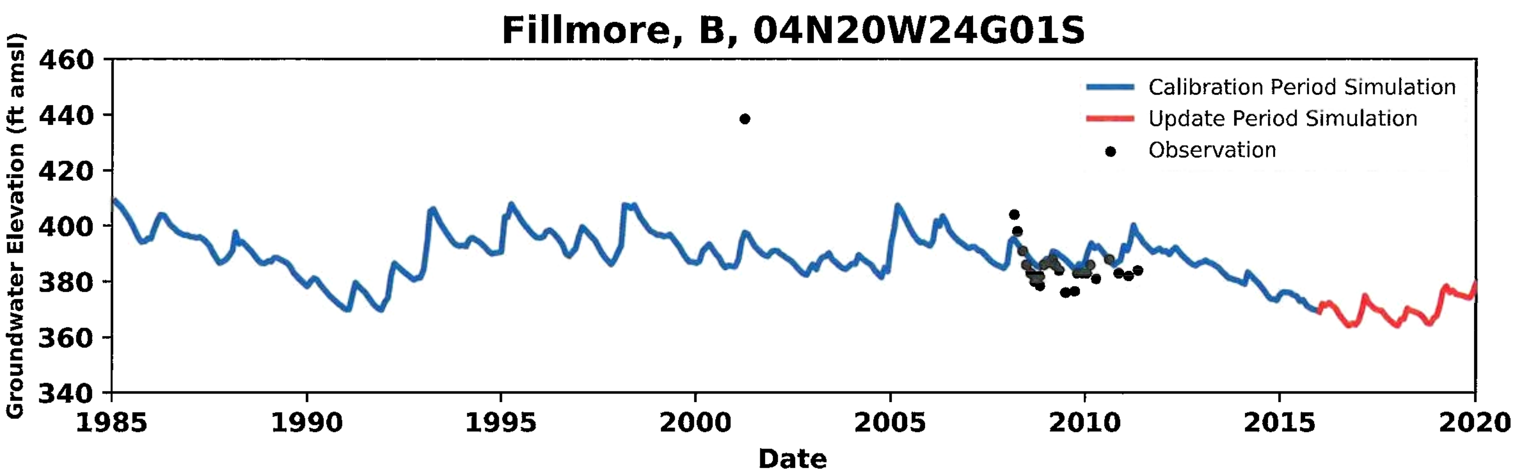
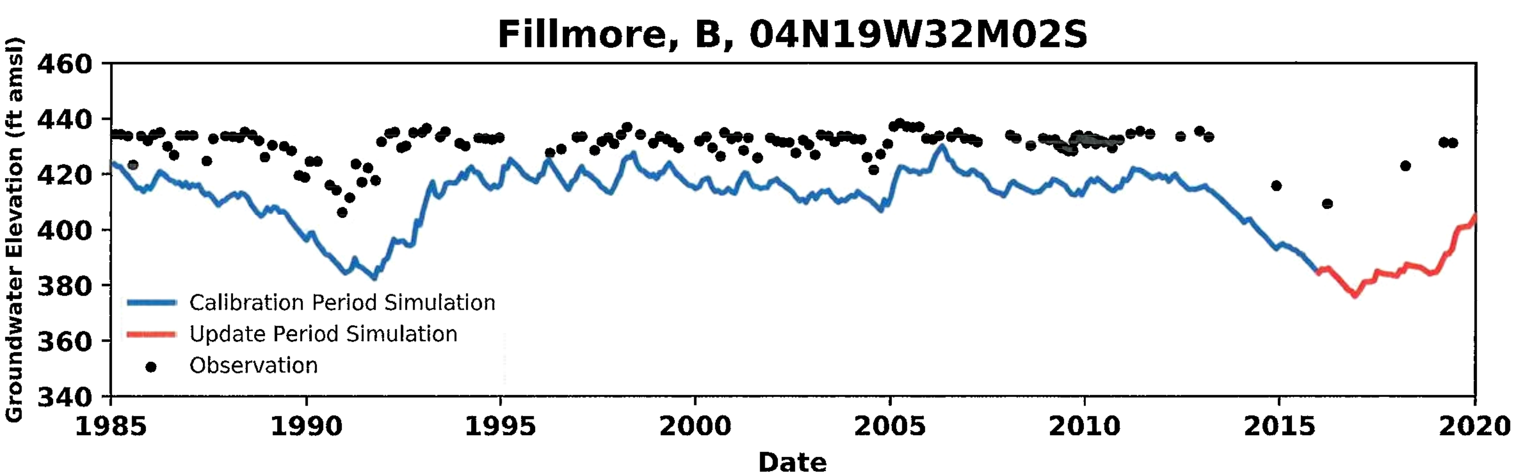
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, B, 03N20W05D01S
Groundwater Elevation (ft amsl)
360
340
320
300
280
260
240
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Fillmore, B, 03N20W09D01S
Groundwater Elevation (ft amsl)
360
340
320
300
280
260
1985
1990
1995
2000
2005
2010
2015
2020
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
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360
340
1985
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1995
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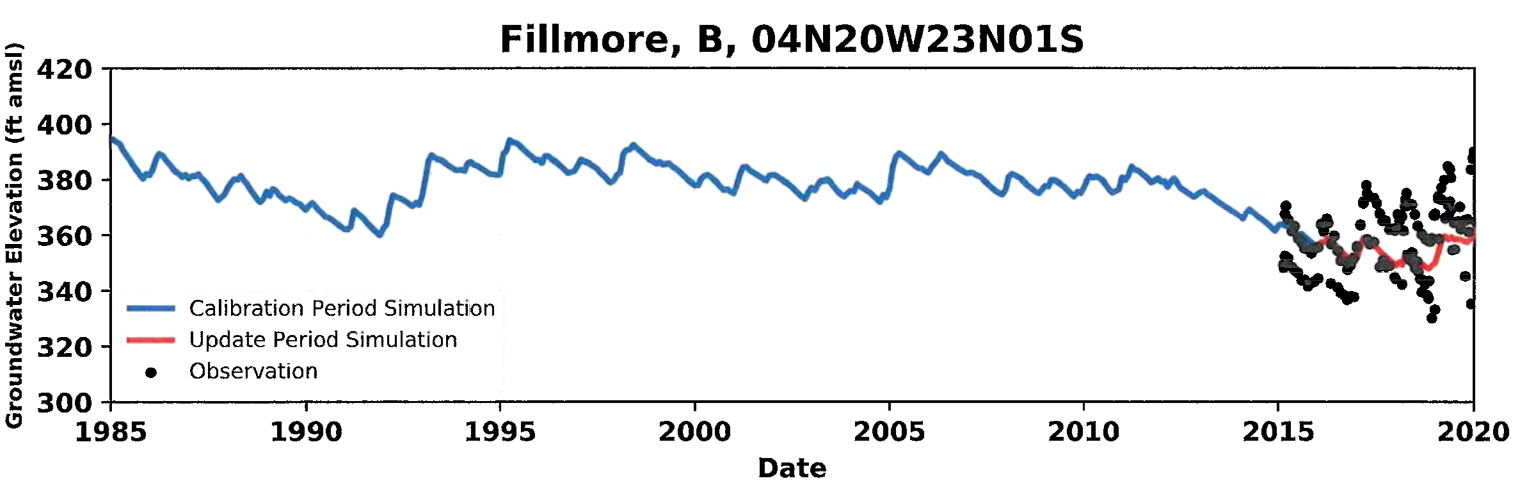
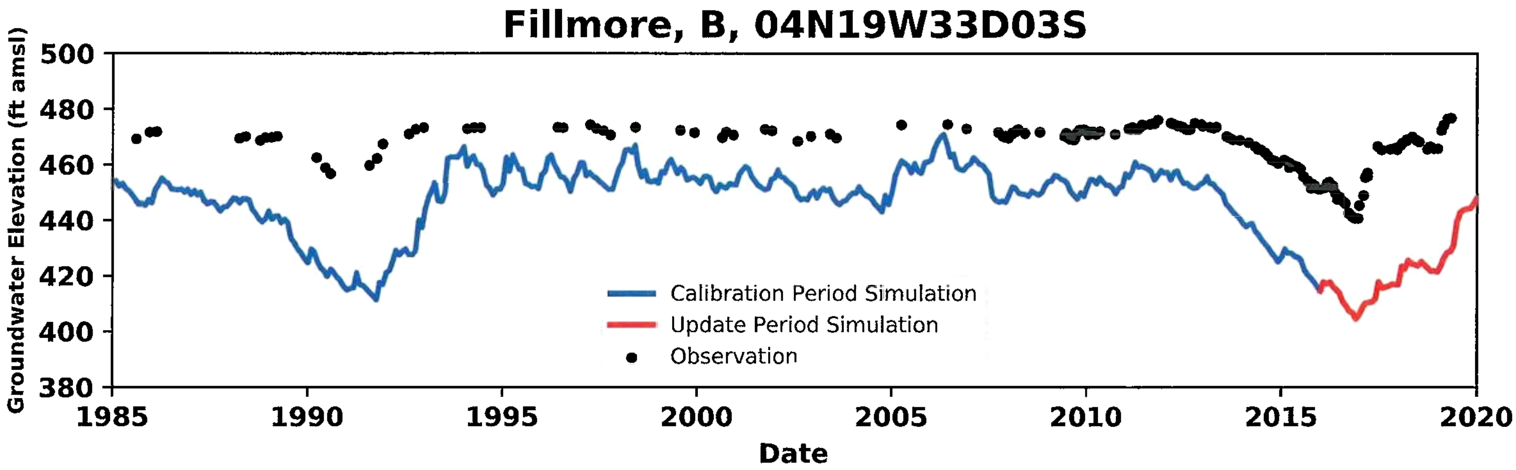
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


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
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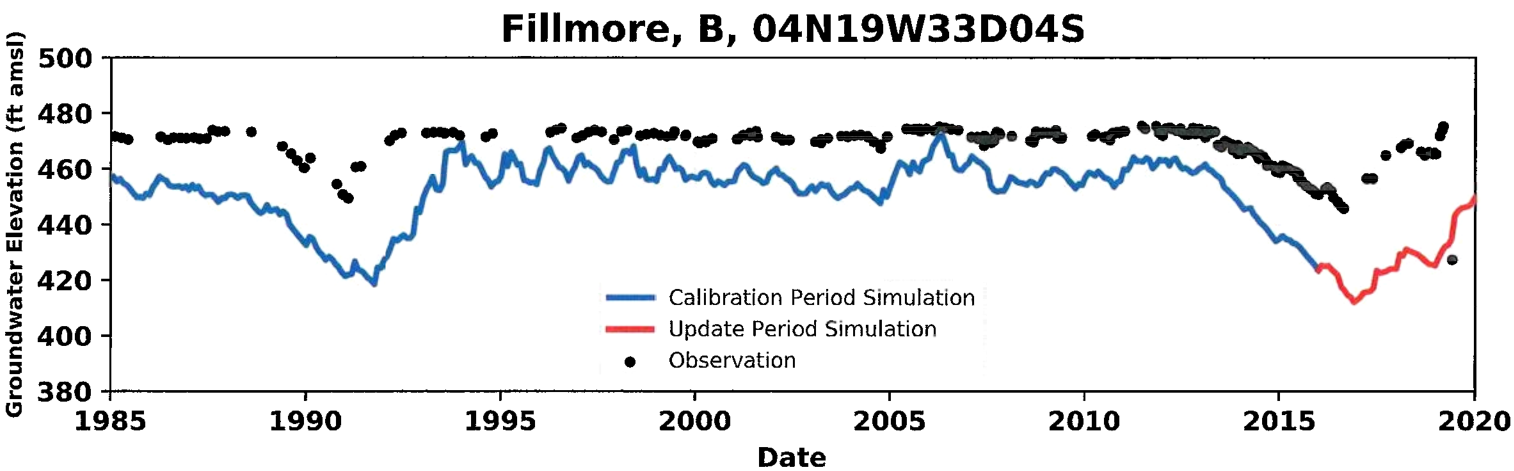
440
420
400
380
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


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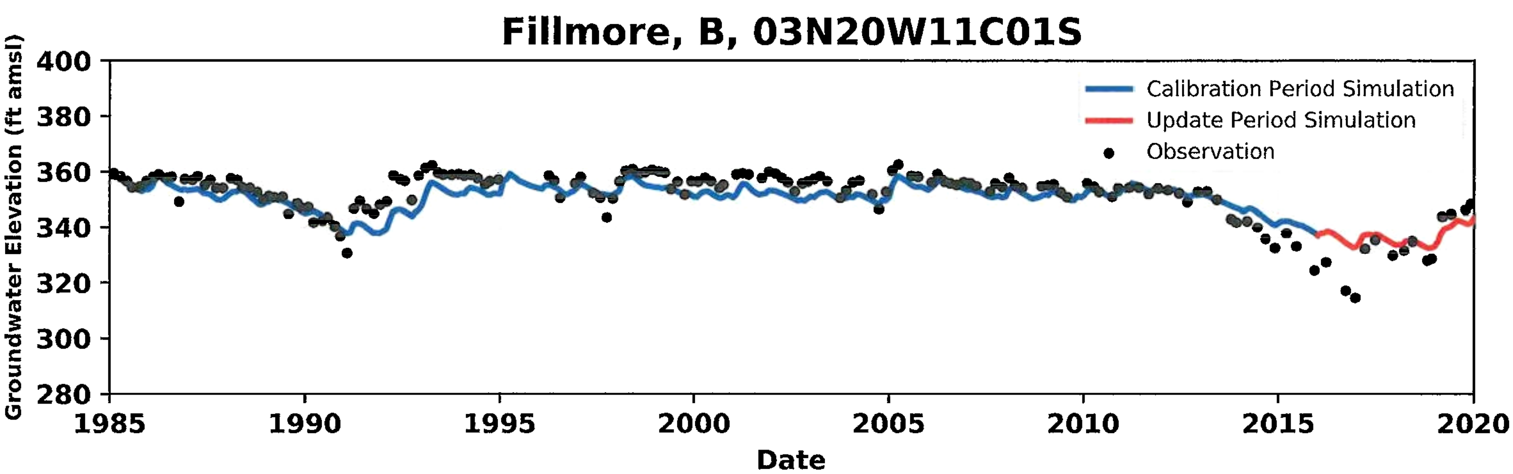
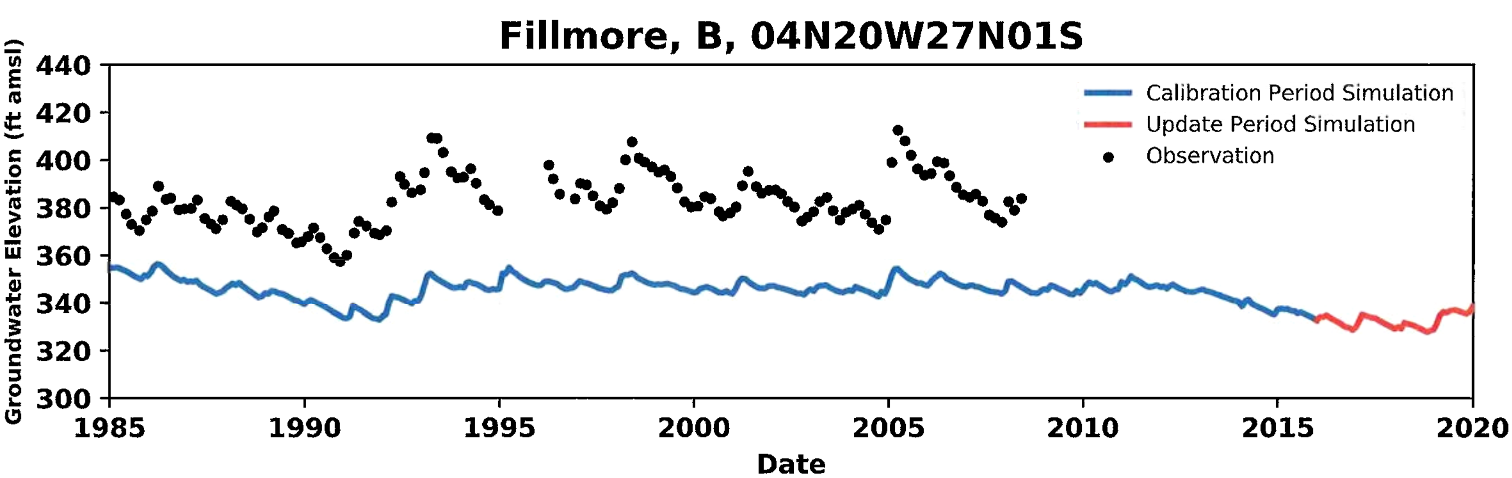
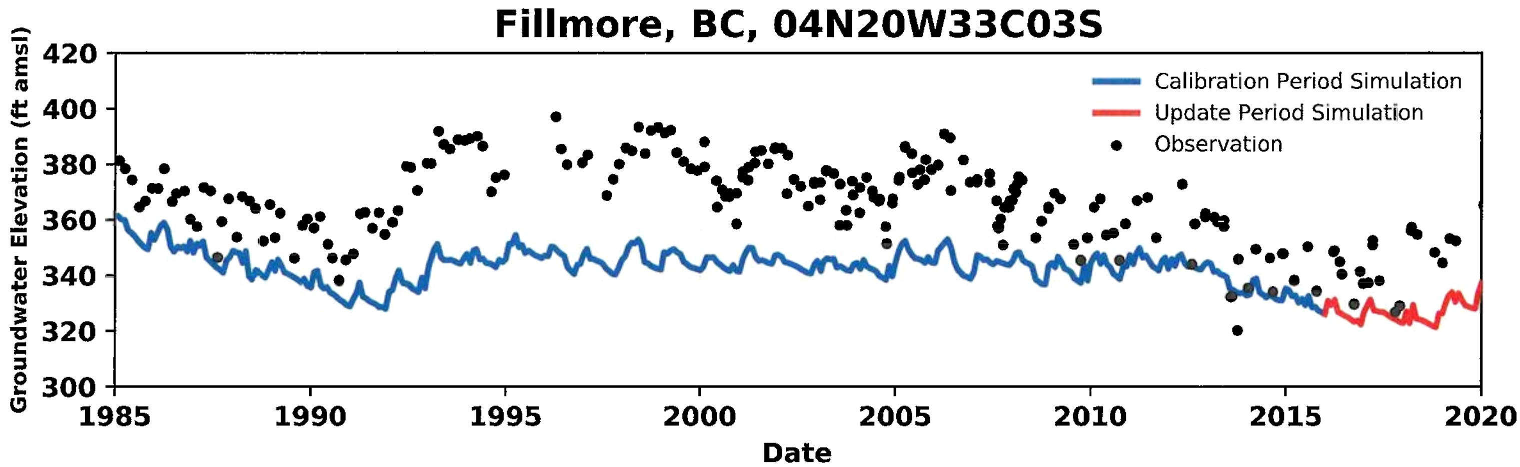
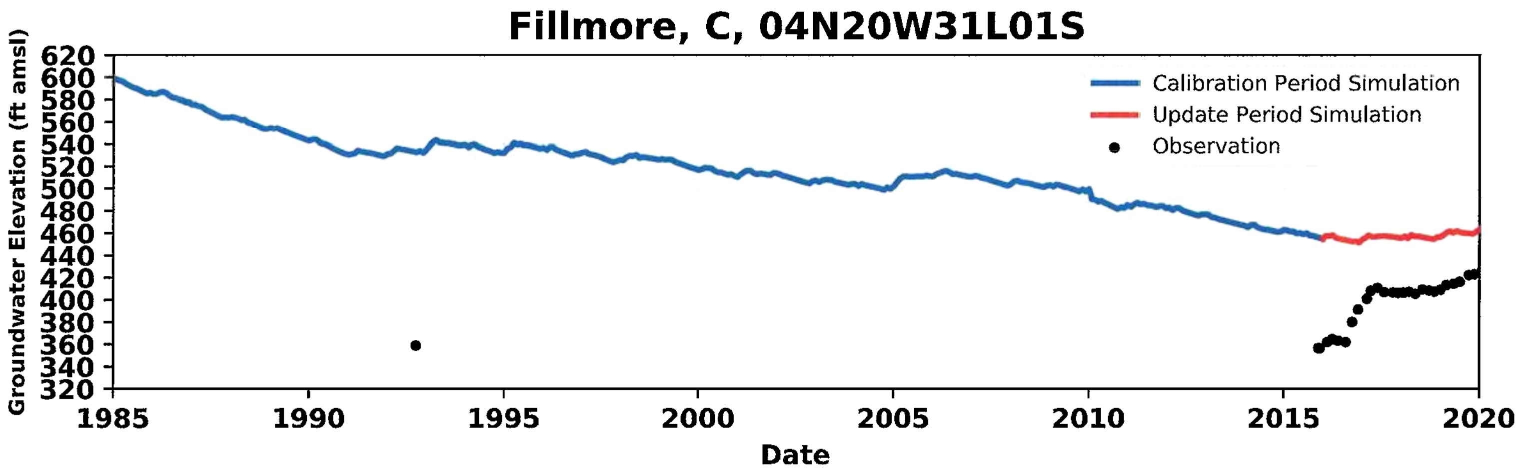
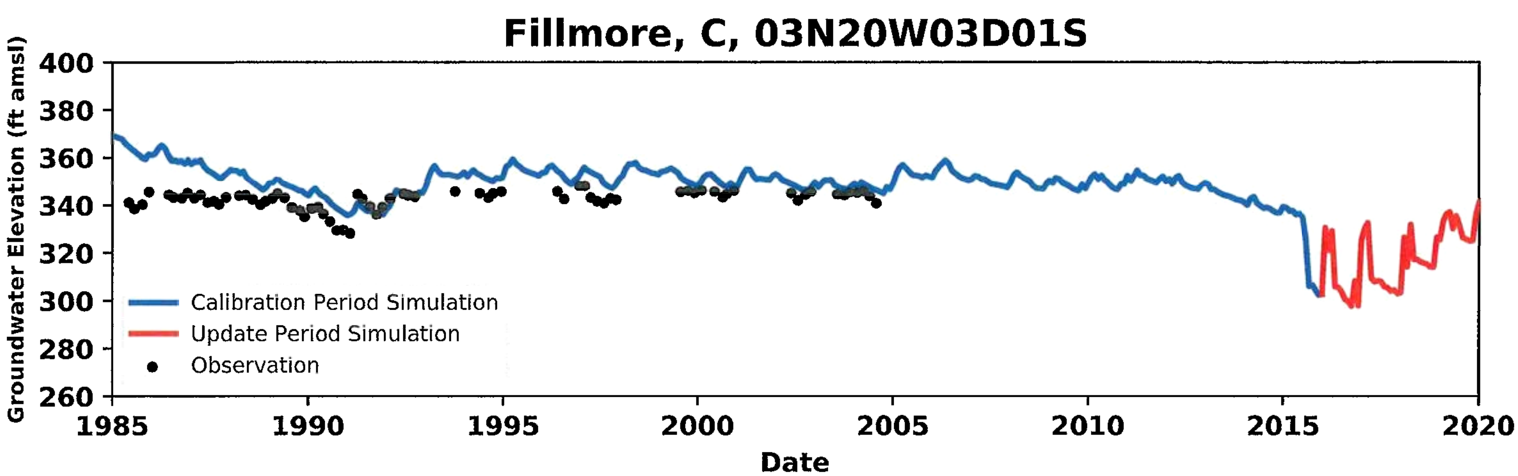
400
380
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

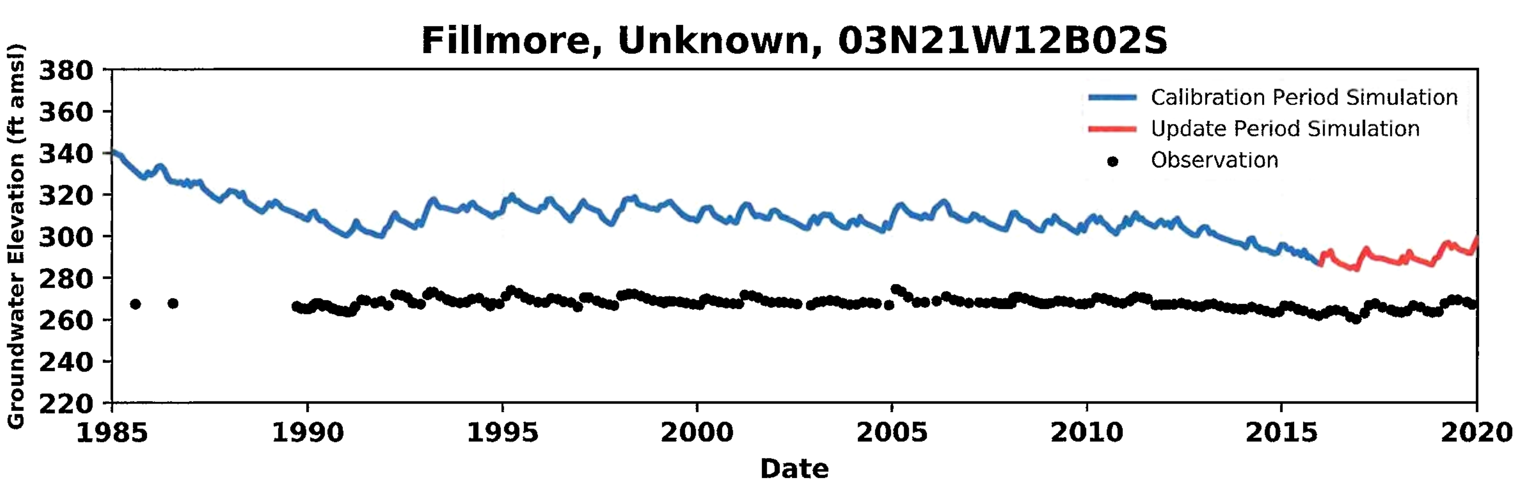

Fillmore, B, 03N20W11C01S
Groundwater Elevation (ft amsl)
400
380
360
340
320
300
280
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

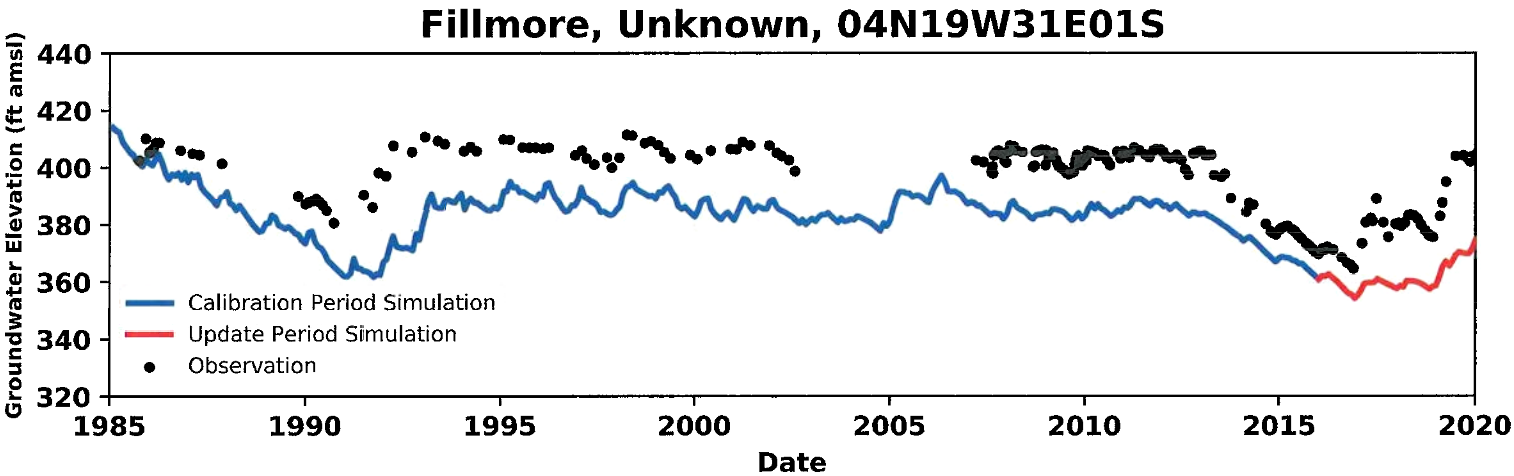

Fillmore, B, 04N20W27N01S
Groundwater Elevation (ft amsl)
440
420
400
380
360
340
320
300
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

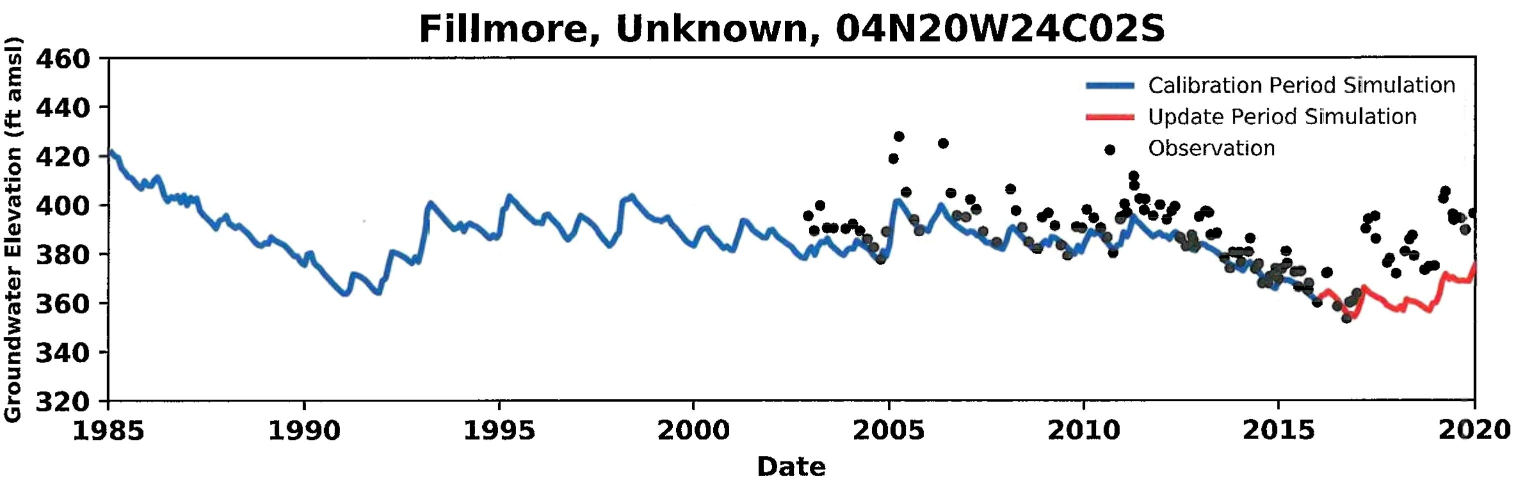

Fillmore, BC, 04N20W33C03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
300
320
340
360
380
400
420
1985
1990
1995
2000
2005
2010
2015
2020

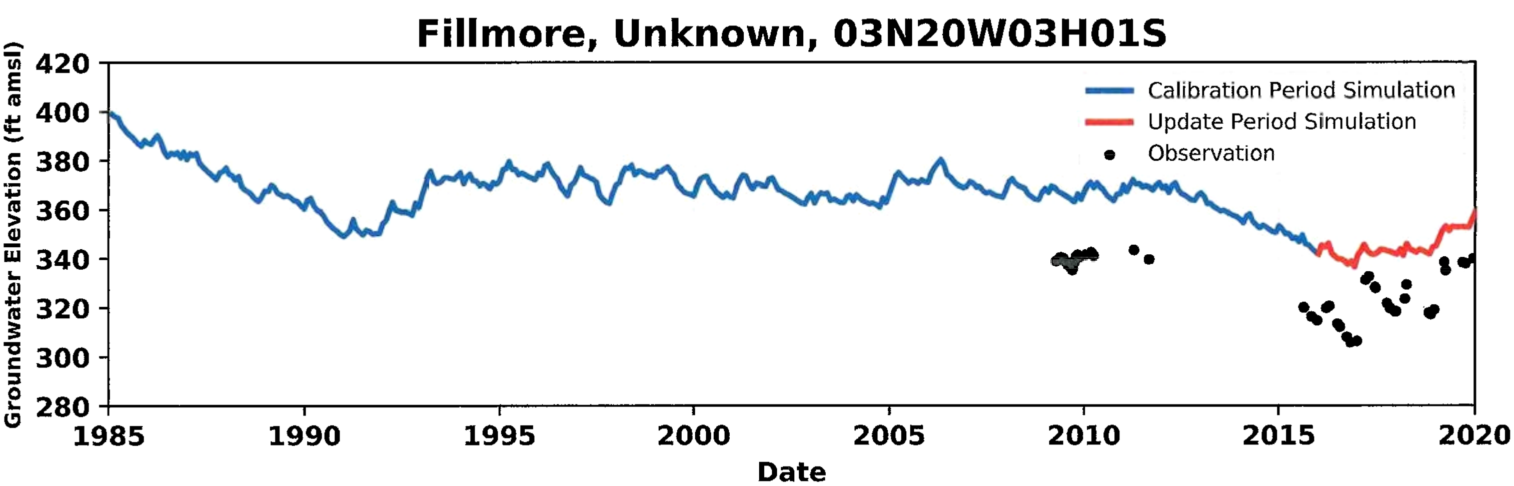

Fillmore, C, 04N20W31L01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
320
340
360
380
400
420
440
460
480
500
520
540
560
580
600
620
1985
1990
1995
2000
2005
2010
2015
2020

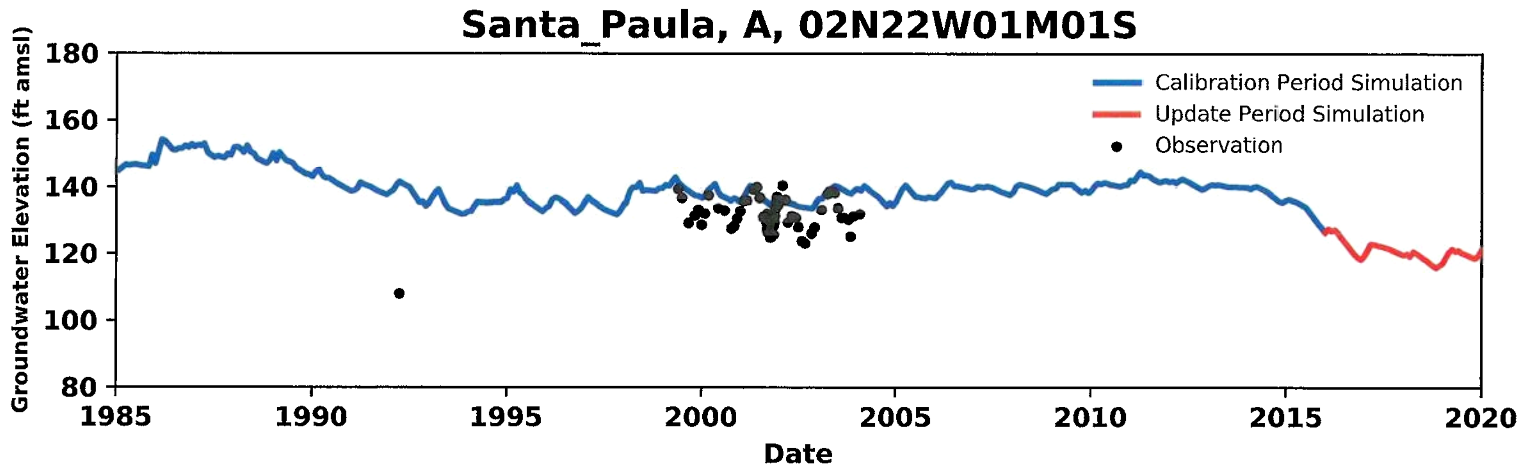

Fillmore, C, 03N20W03D01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
260
280
300
320
340
360
380
400
1985
1990
1995
2000
2005
2010
2015
2020

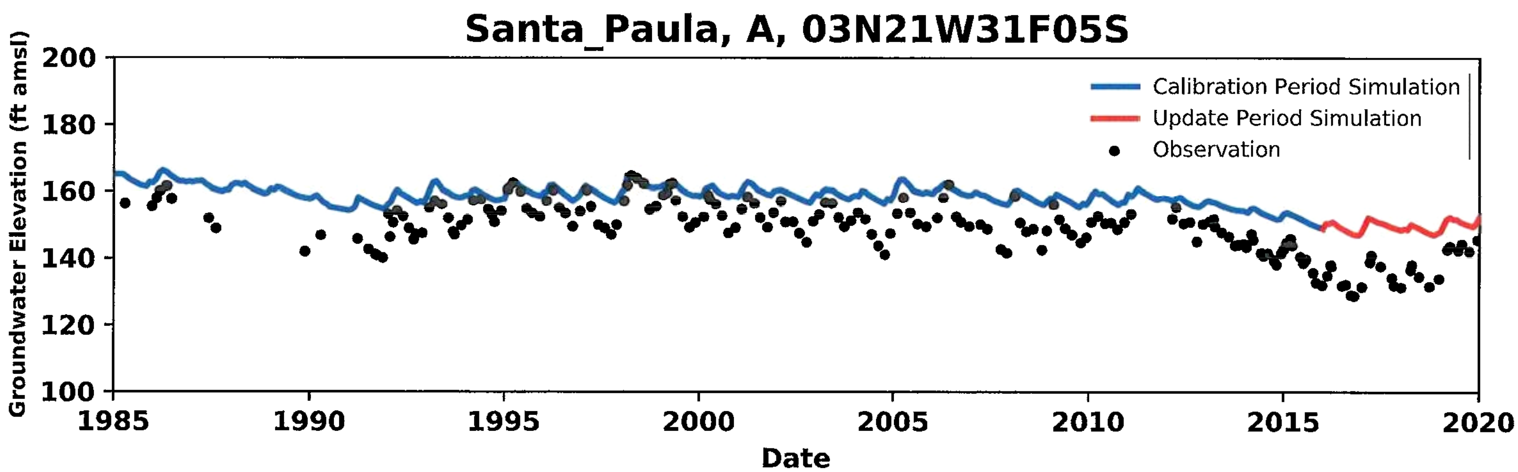

Fillmore, Unknown, 03N21W12B02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
220
240
260
280
300
320
340
360
380
1985
1990
1995
2000
2005
2010
2015
2020

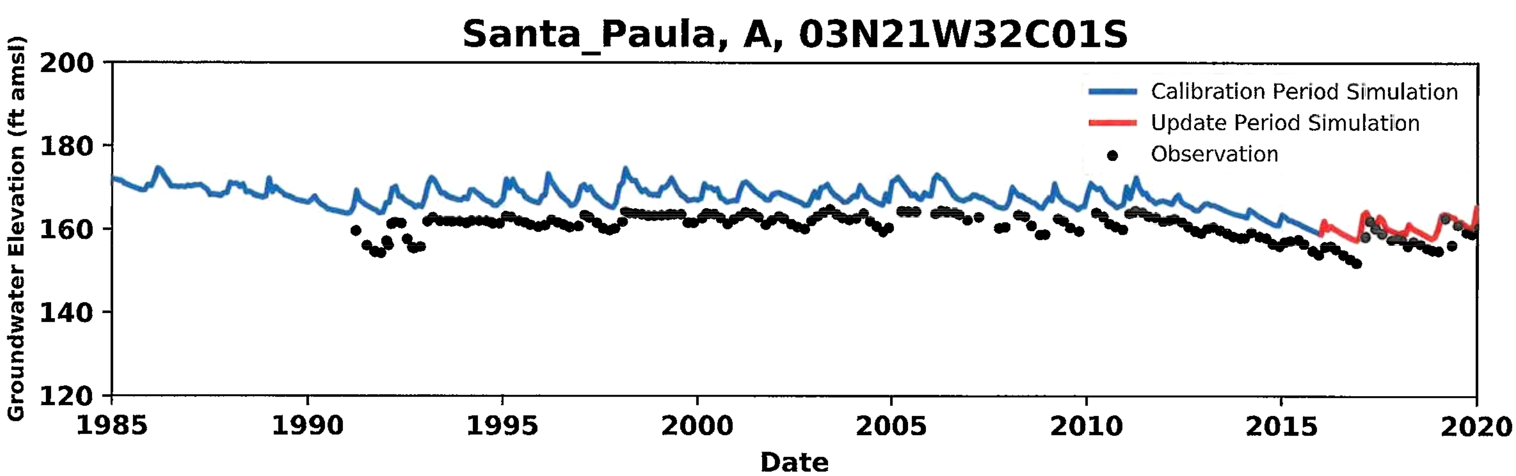

Fillmore, Unknown, 04N19W31E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020

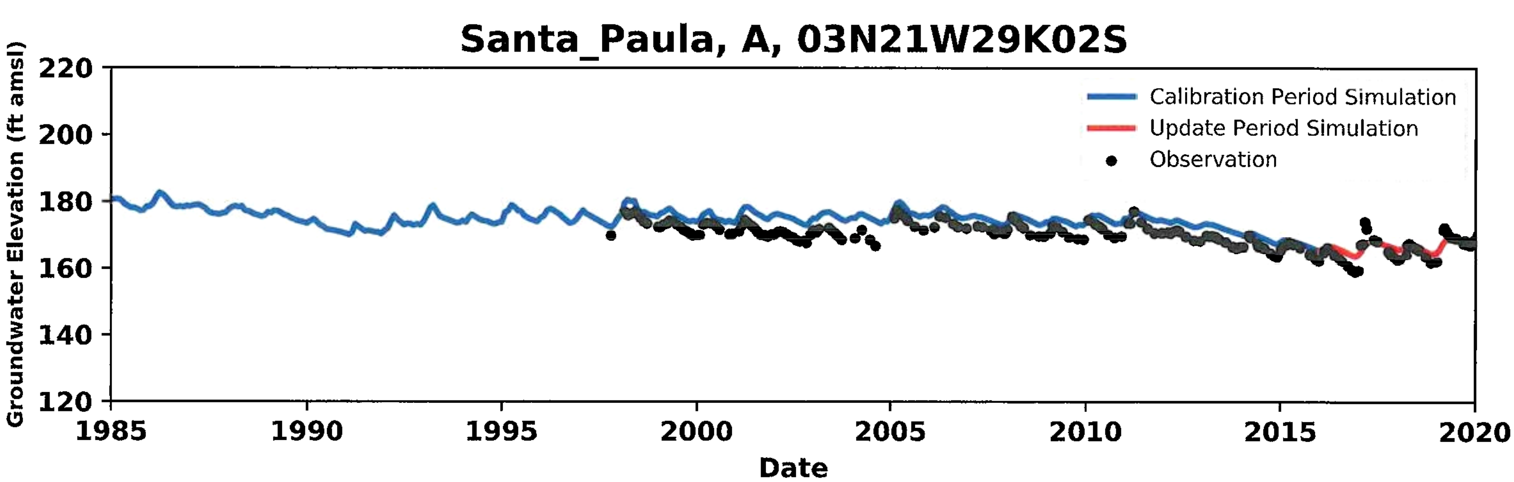

Fillmore, Unknown, 04N20W24C02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
460
440
420
400
380
360
340
320
1985
1990
1995
2000
2005
2010
2015
2020

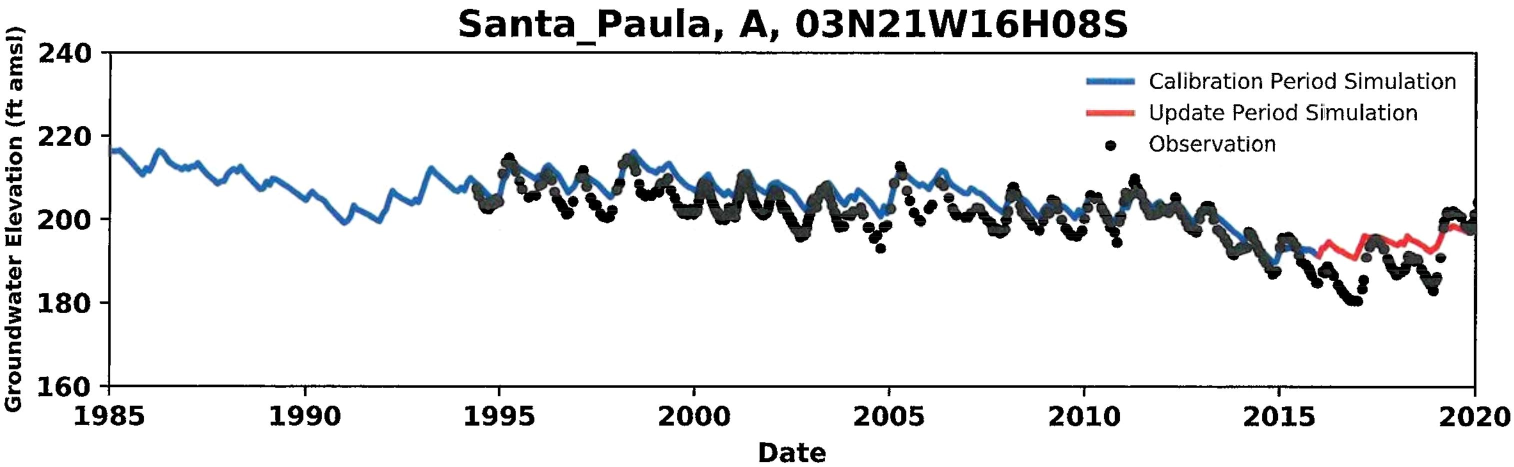

Fillmore, Unknown, 03N20W03H01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
420
400
380
360
340
320
300
280
1985
1990
1995
2000
2005
2010
2015
2020

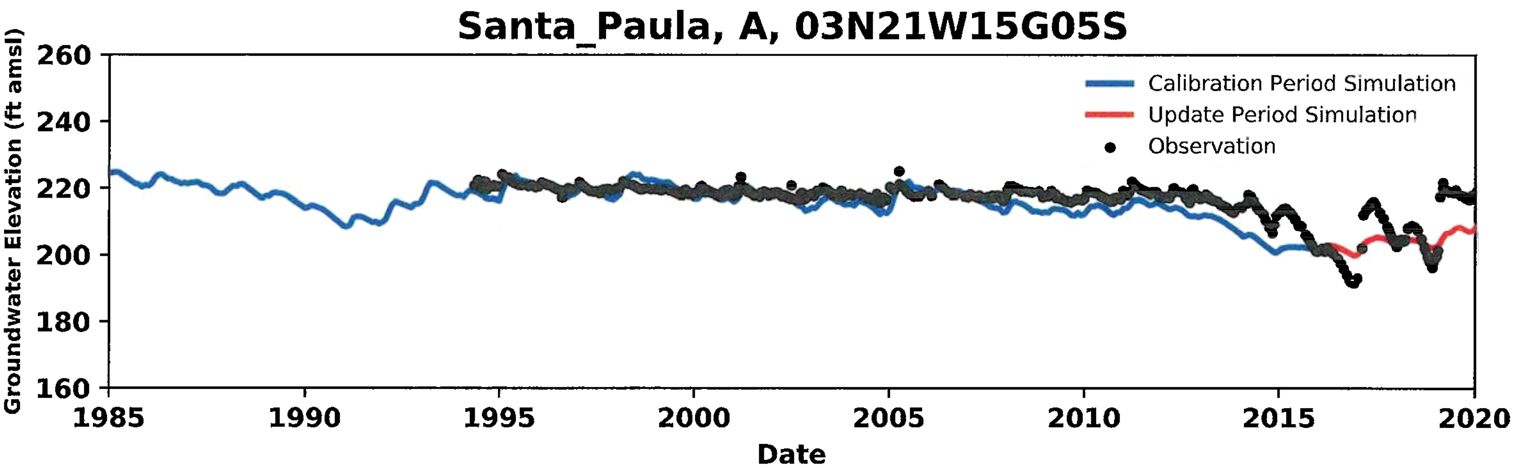

Santa_Paula, A, 02N22W01M01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

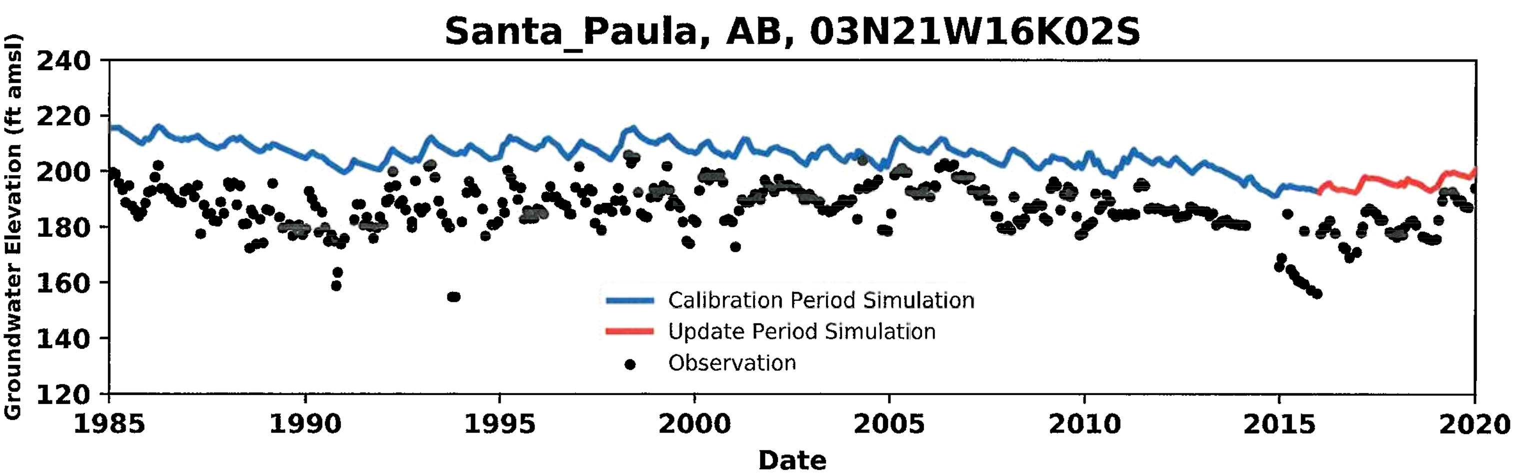

Santa_Paula, A, 03N21W31F05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

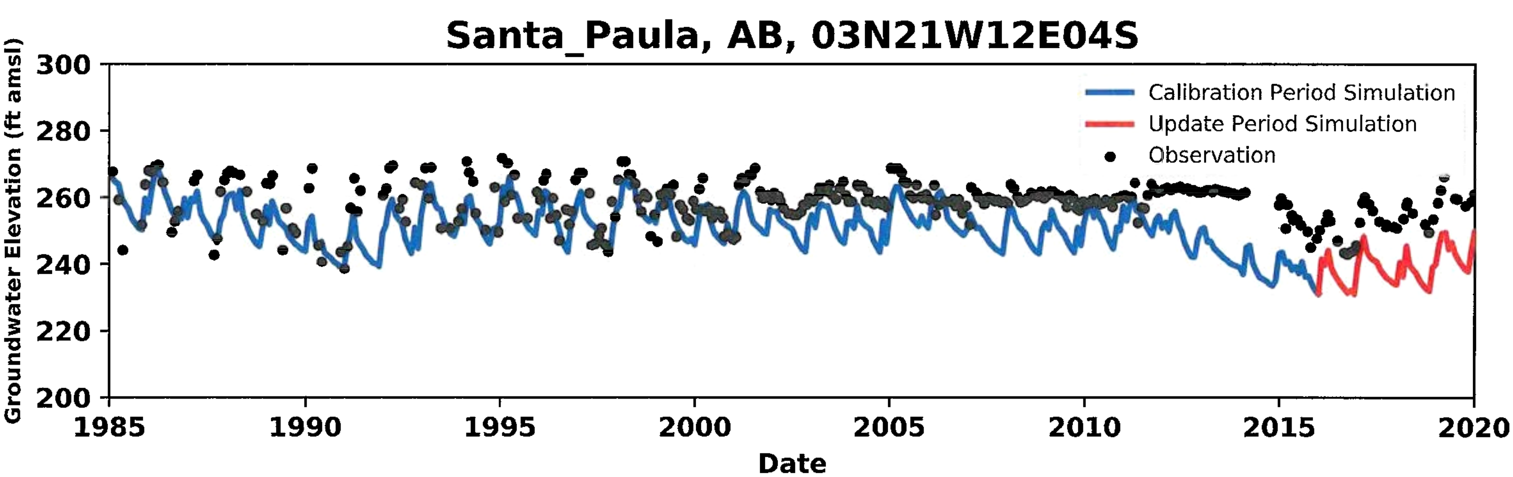

Santa_Paula, A, 03N21W32C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Santa_Paula, A, 03N21W29K02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

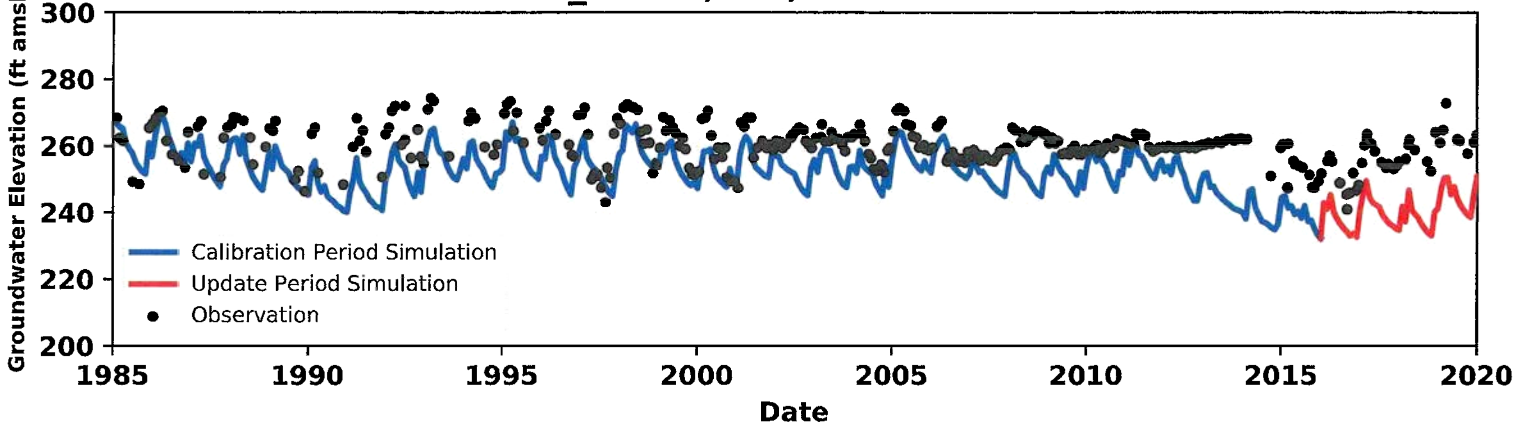

Santa_Paula, A, 03N21W16H08S
Groundwater Elevation (ft amsl)
240
220
200
180
160
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Santa_Paula, A, 03N21W15G05S
Groundwater Elevation (ft amsl)
260
240
220
200
180
160
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

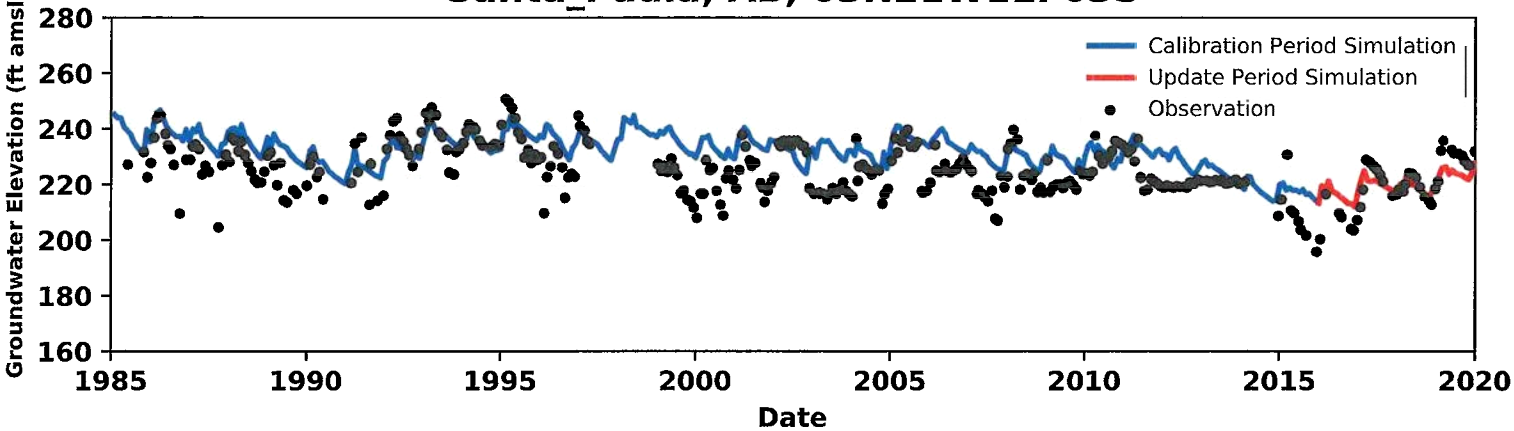

Santa_Paula, AB, 03N21W16K02S
Groundwater Elevation (ft amsl)
240
220
200
180
160
140
120
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Santa_Paula, AB, 03N21W12E04S
Groundwater Elevation (ft amsl)
300
280
260
240
220
200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

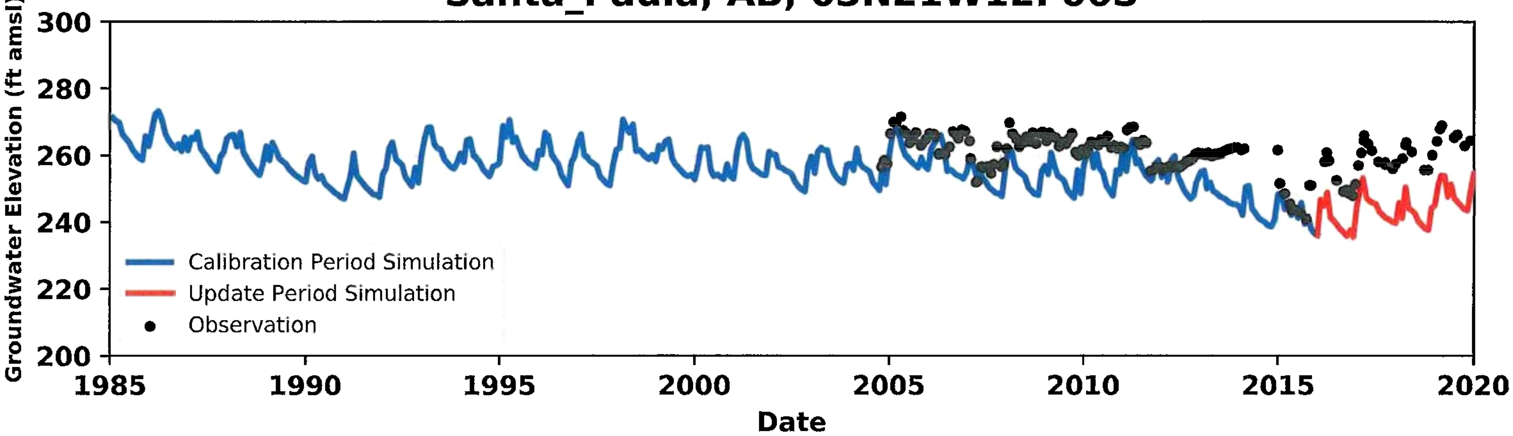
Santa_Paula, AB, 03N21W12F03S



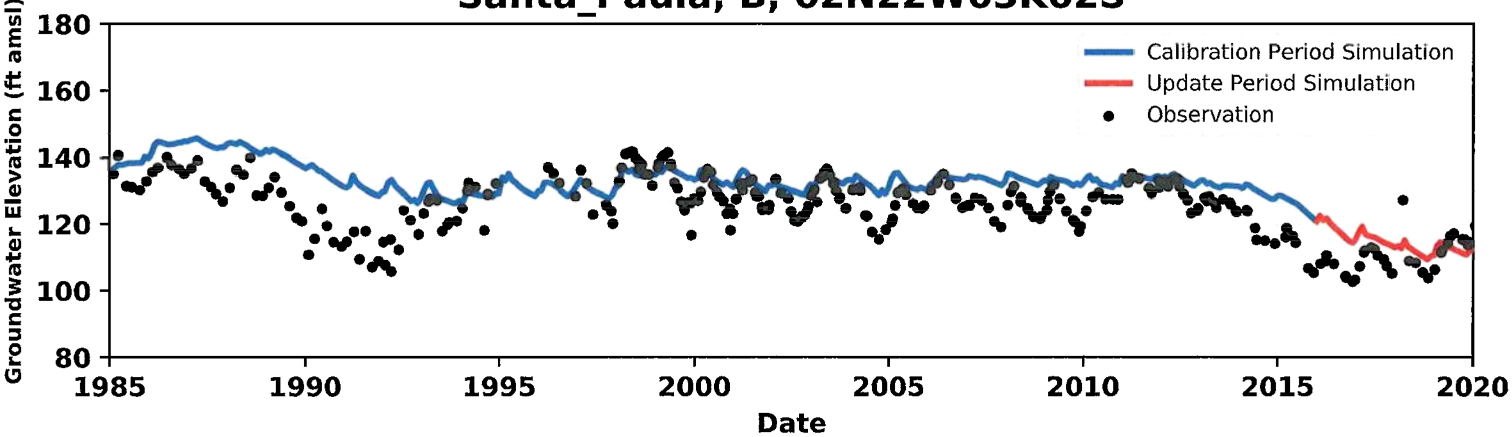

Santa_Paula, AB, 03N21W11F03S

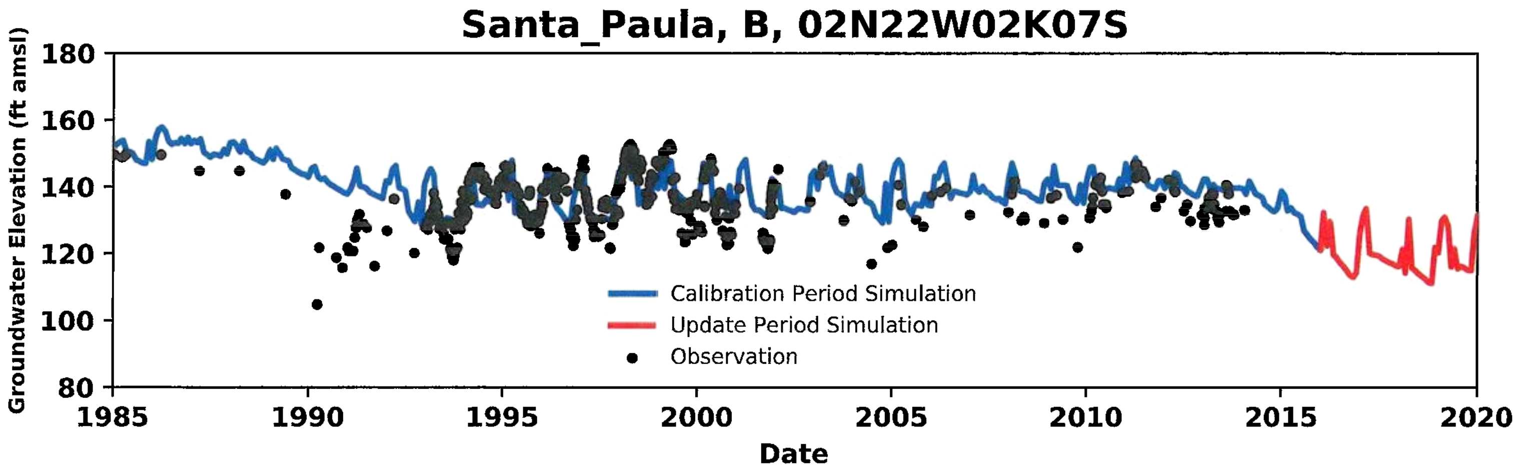


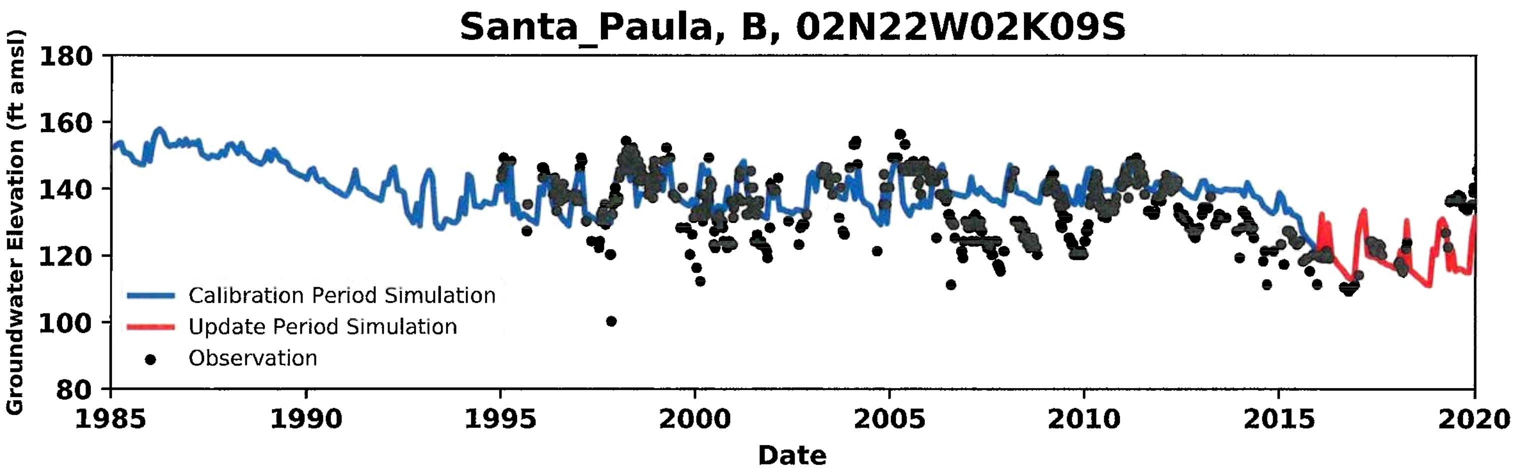

Santa_Paula, AB, 03N21W12F06S

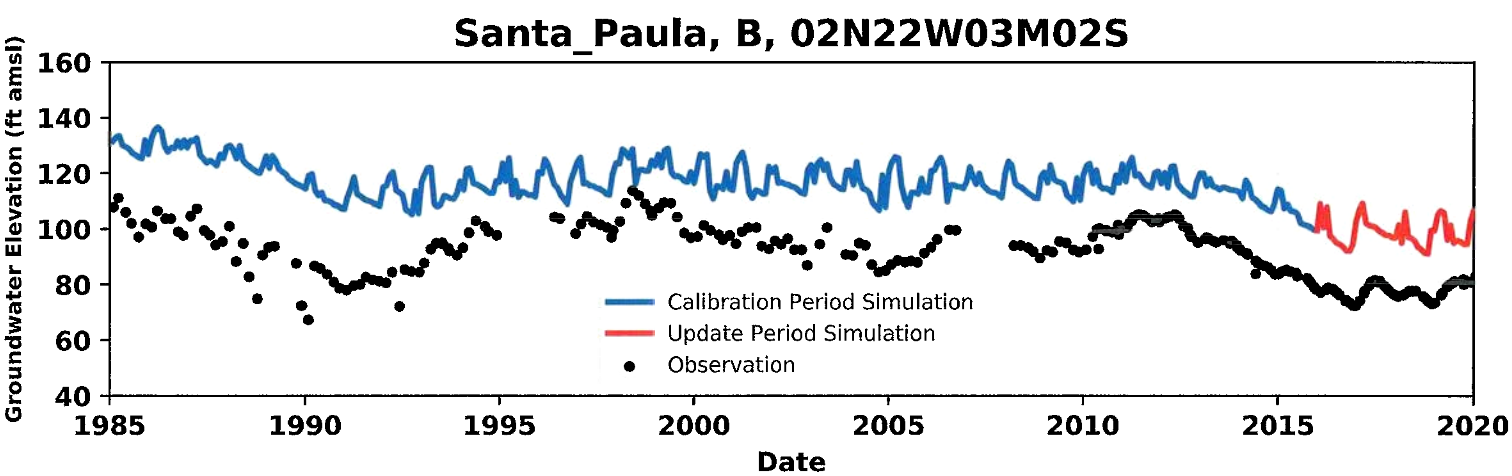


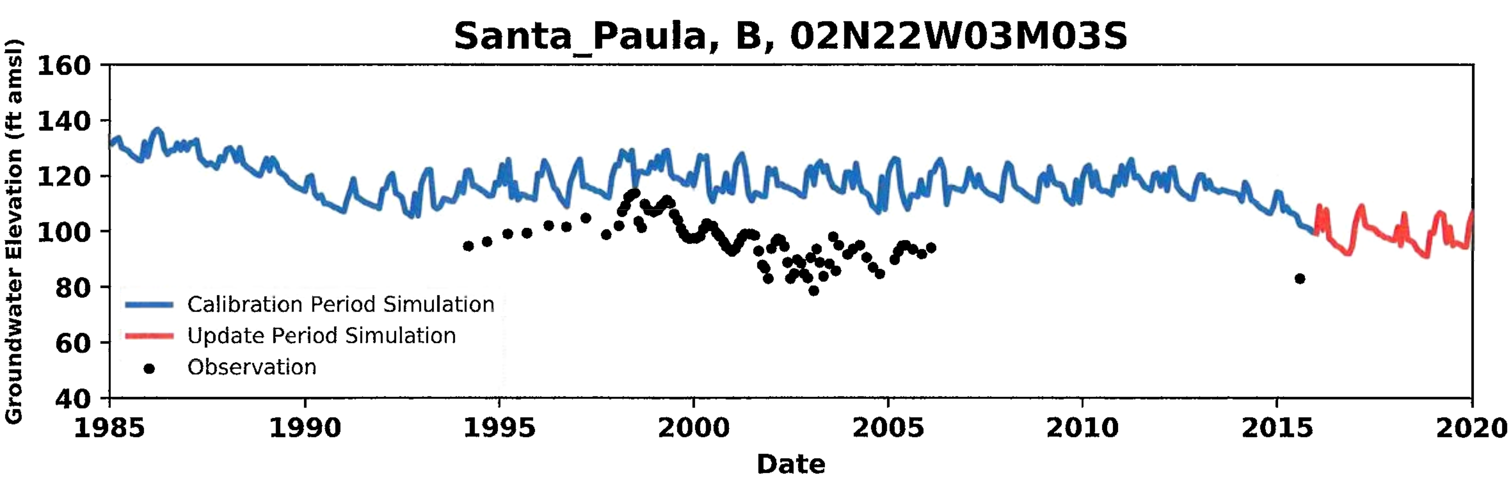

Santa_Paula, B, 02N22W03K02S

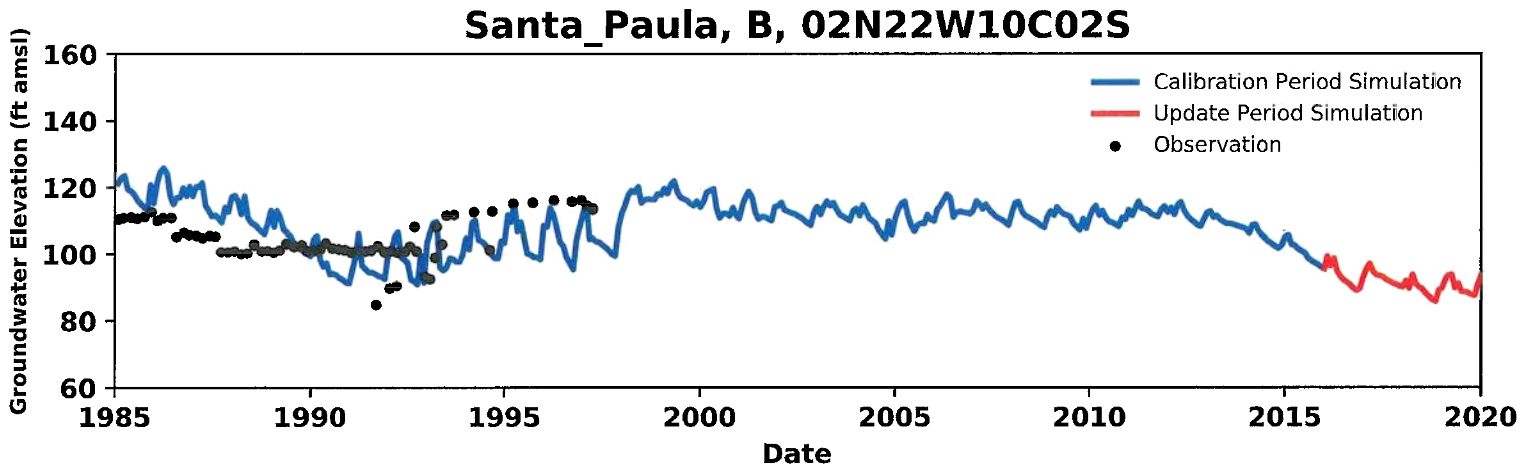


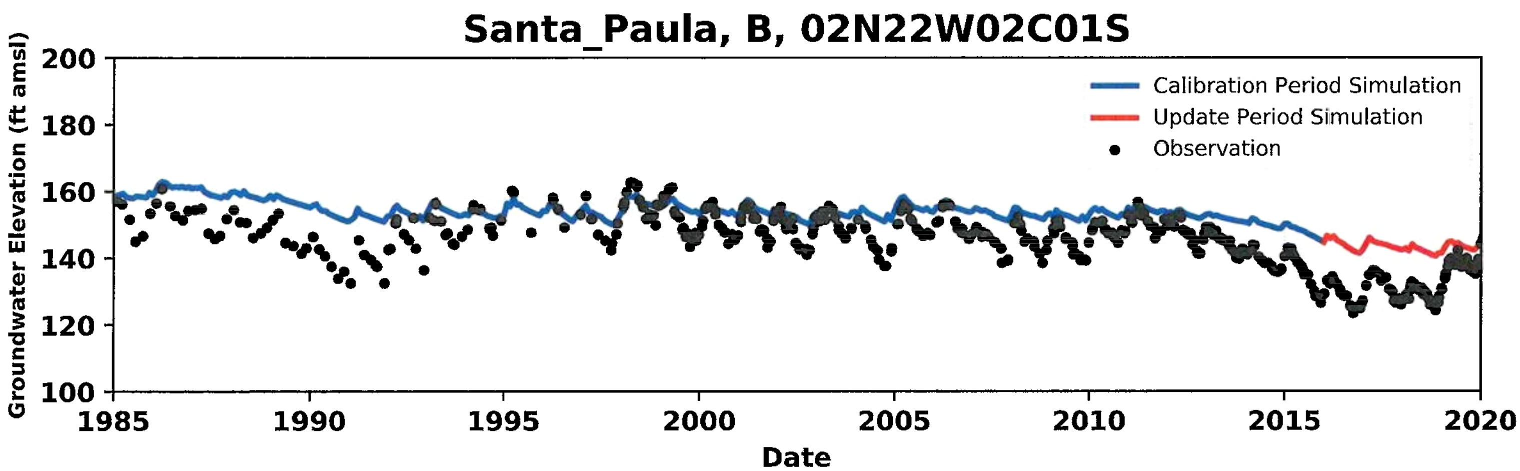

Santa_Paula, B, 02N22W02K07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

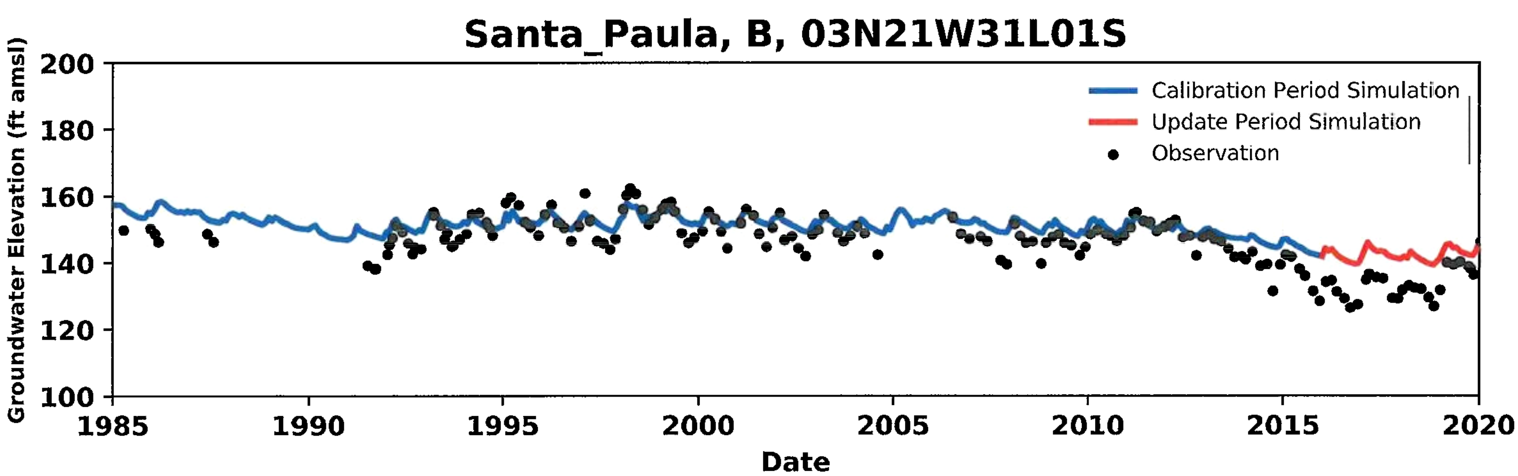

Santa_Paula, B, 02N22W02K09S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

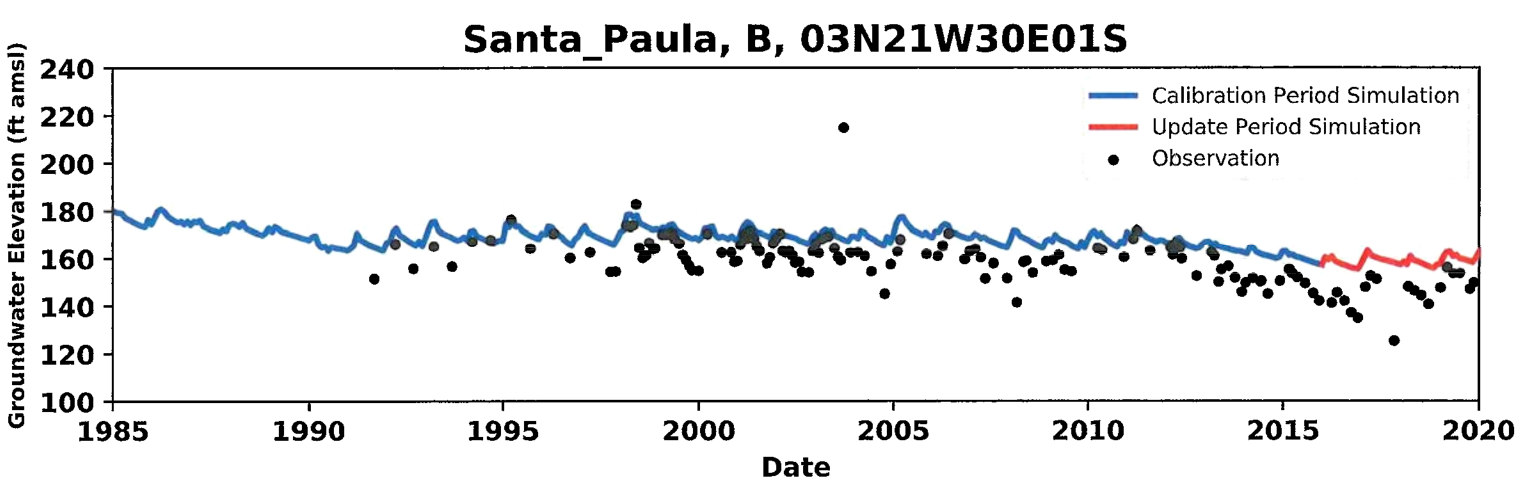

Santa_Paula, B, 02N22W03M02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

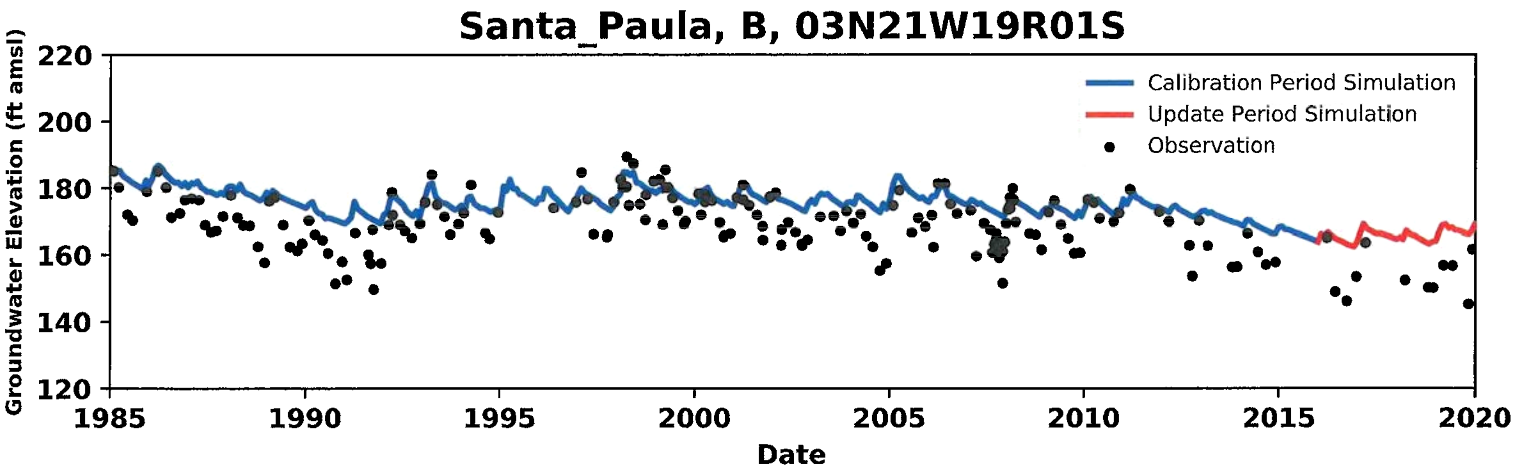

Santa_Paula, B, 02N22W03M03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

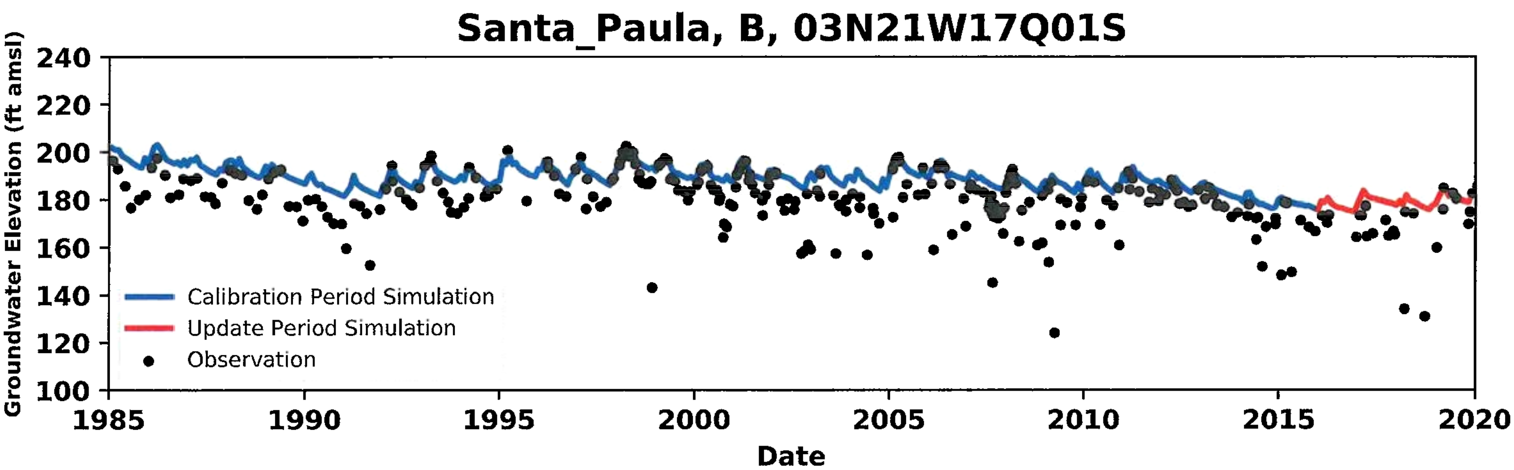

Santa_Paula, B, 02N22W10C02S
Groundwater Elevation (ft amsl)
160
140
120
100
80
60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

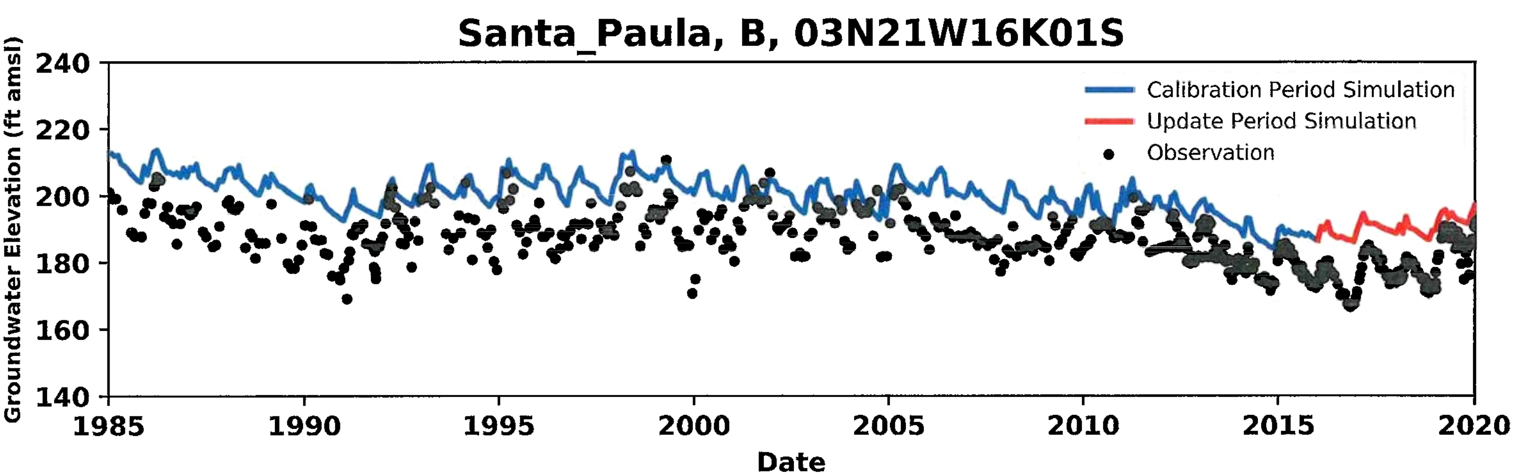

Santa_Paula, B, 02N22W02C01S
Groundwater Elevation (ft amsl)
200
180
160
140
120
100
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

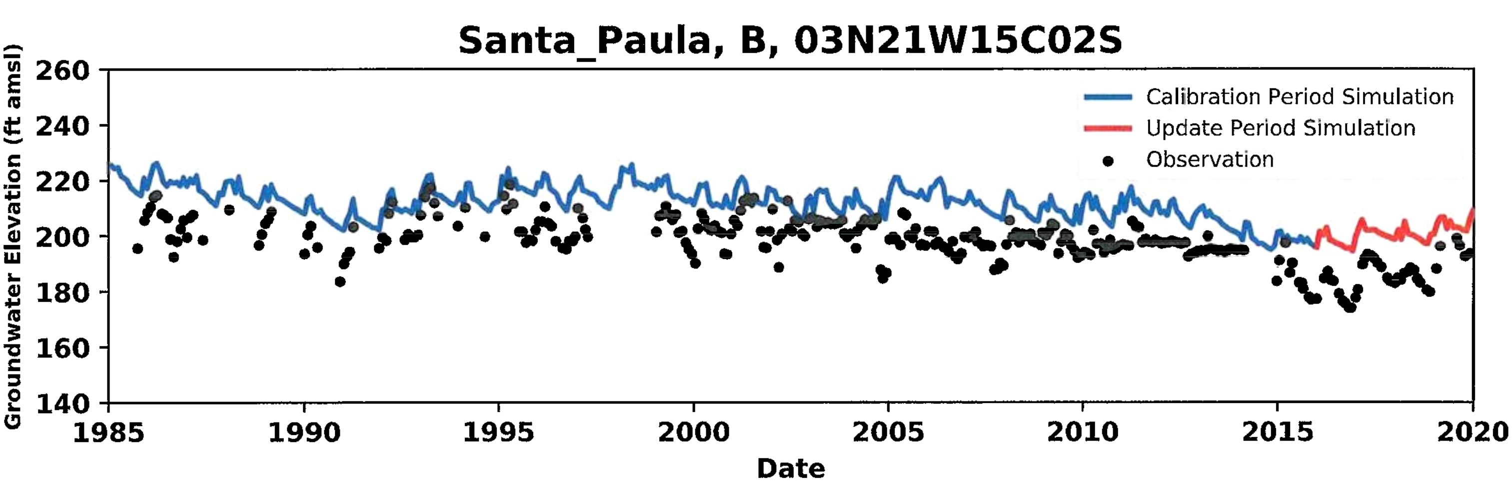

Santa_Paula, B, 03N21W31L01S
Groundwater Elevation (ft amsl)
200
180
160
140
120
100
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

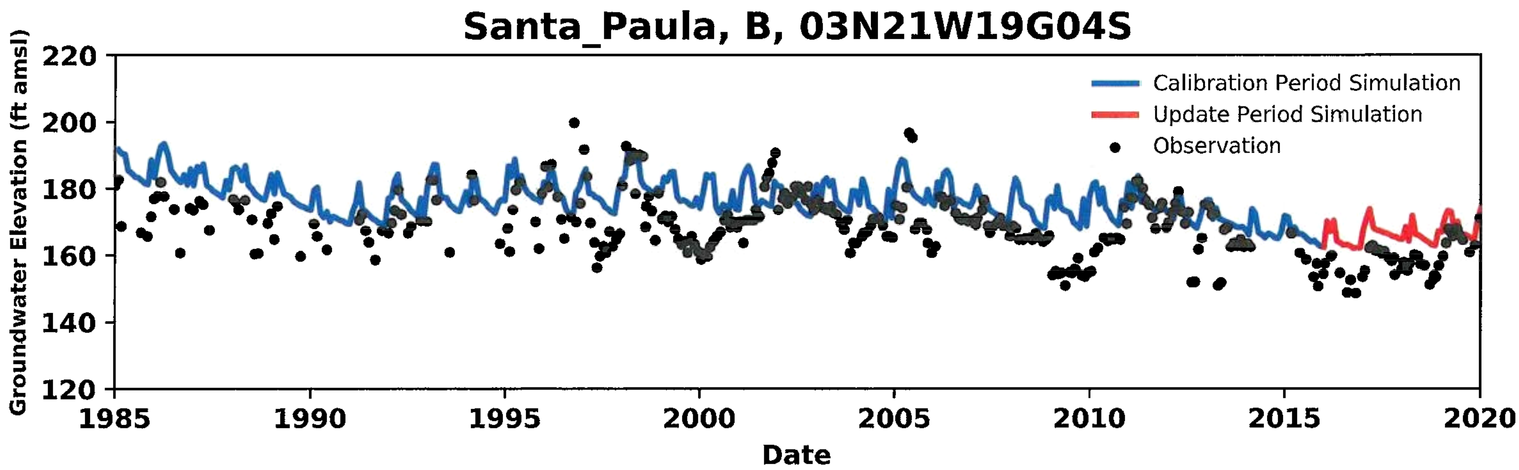

Santa_Paula, B, 03N21W30E01S
Groundwater Elevation (ft amsl)
240
220
200
180
160
140
120
100
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

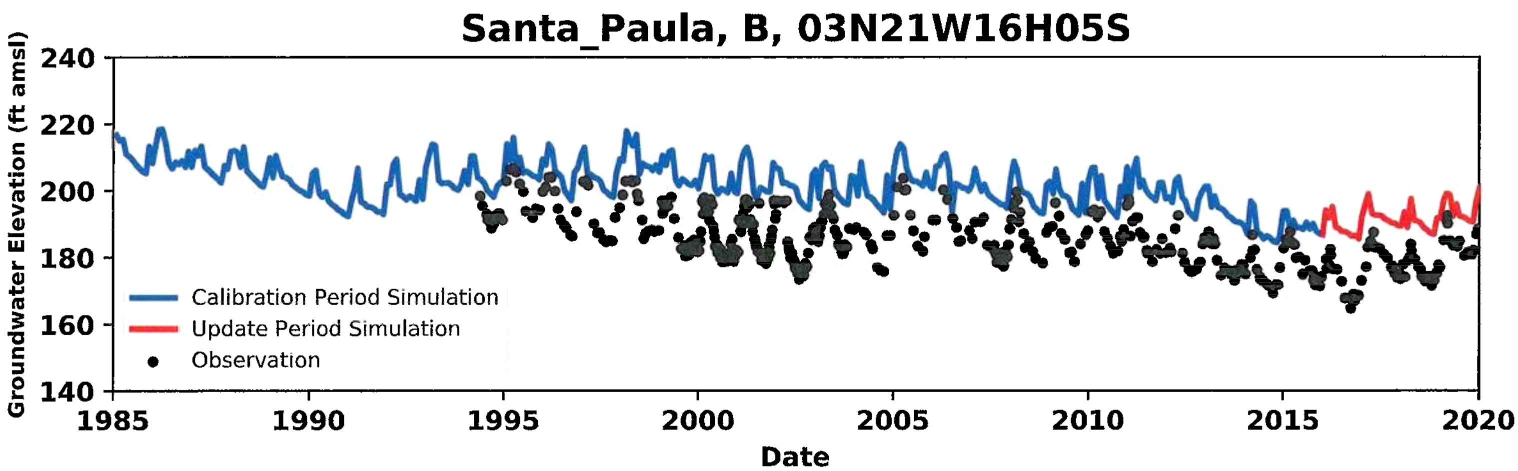

Santa_Paula, B, 03N21W19R01S
Groundwater Elevation (ft amsl)
220
200
180
160
140
120
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

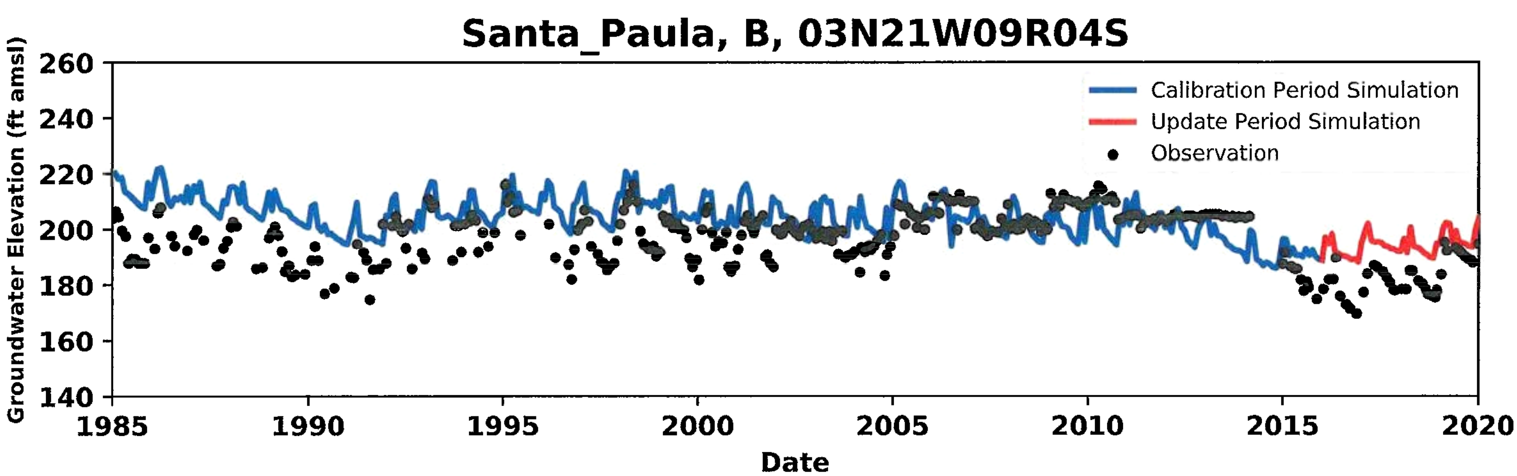

Santa_Paula, B, 03N21W17Q01S
Groundwater Elevation (ft amsl)
240
220
200
180
160
140
120
100
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

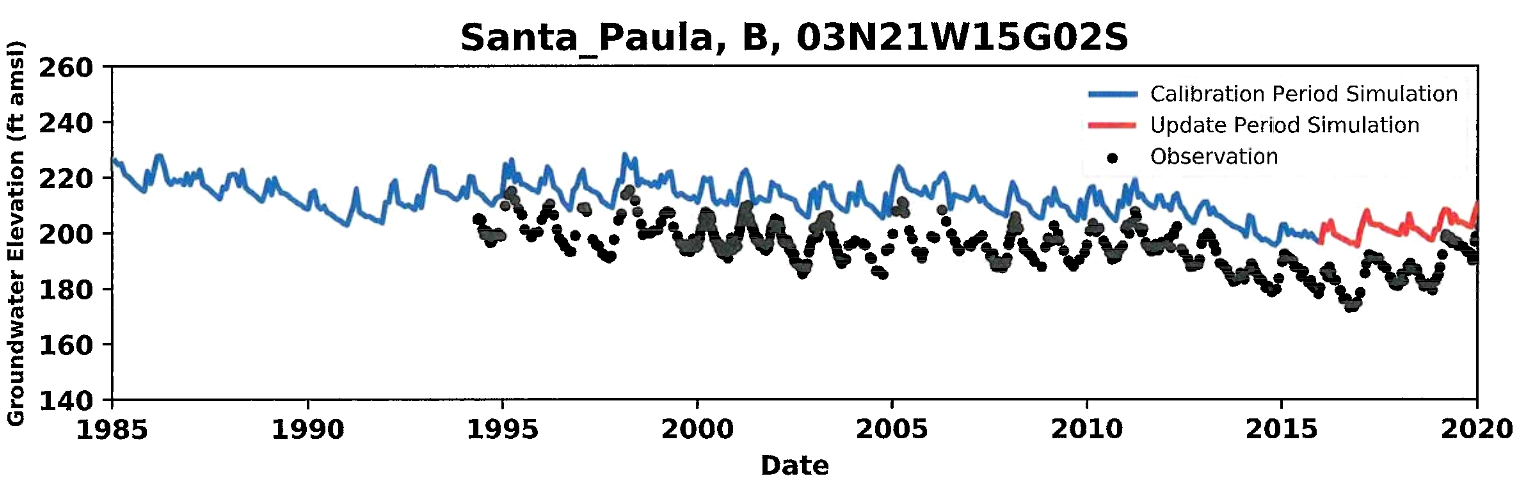

Santa_Paula, B, 03N21W16K01S
Groundwater Elevation (ft amsl)
240
220
200
180
160
140
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

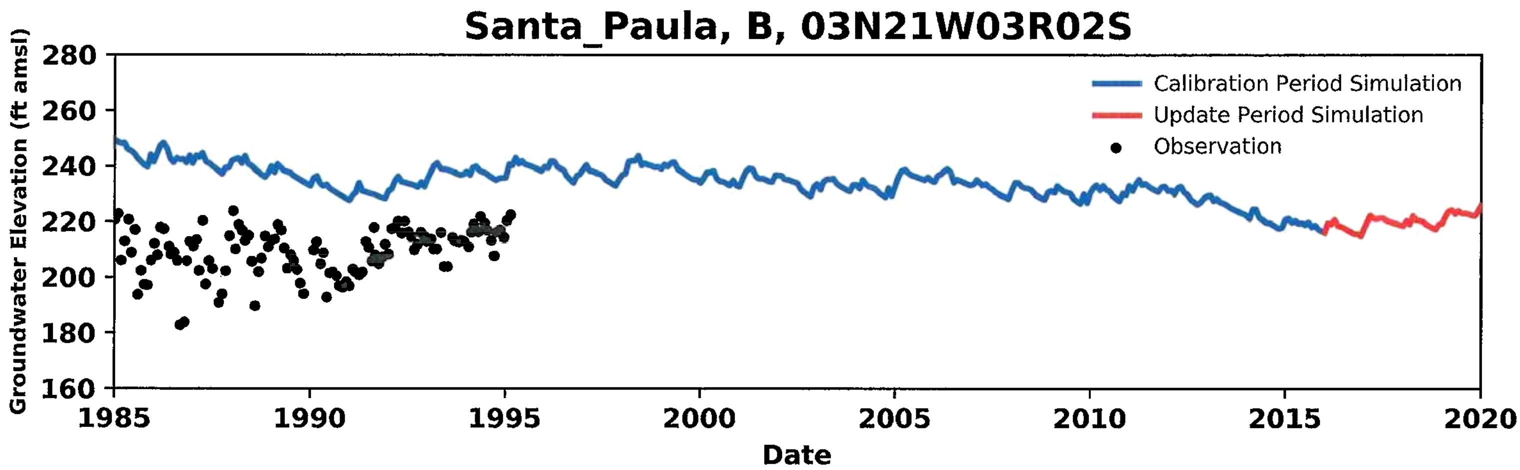

Santa_Paula, B, 03N21W15C02S
Groundwater Elevation (ft amsl)
260
240
220
200
180
160
140
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Santa_Paula, B, 03N21W19G04S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

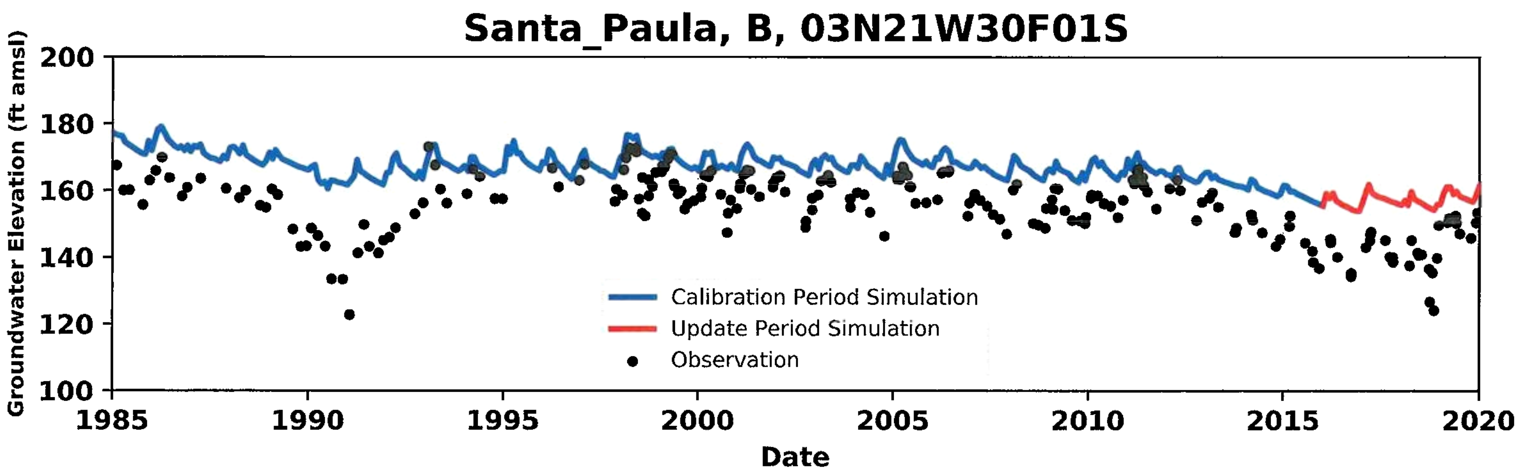

Santa_Paula, B, 03N21W16H05S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date


Santa_Paula, B, 03N21W09R04S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

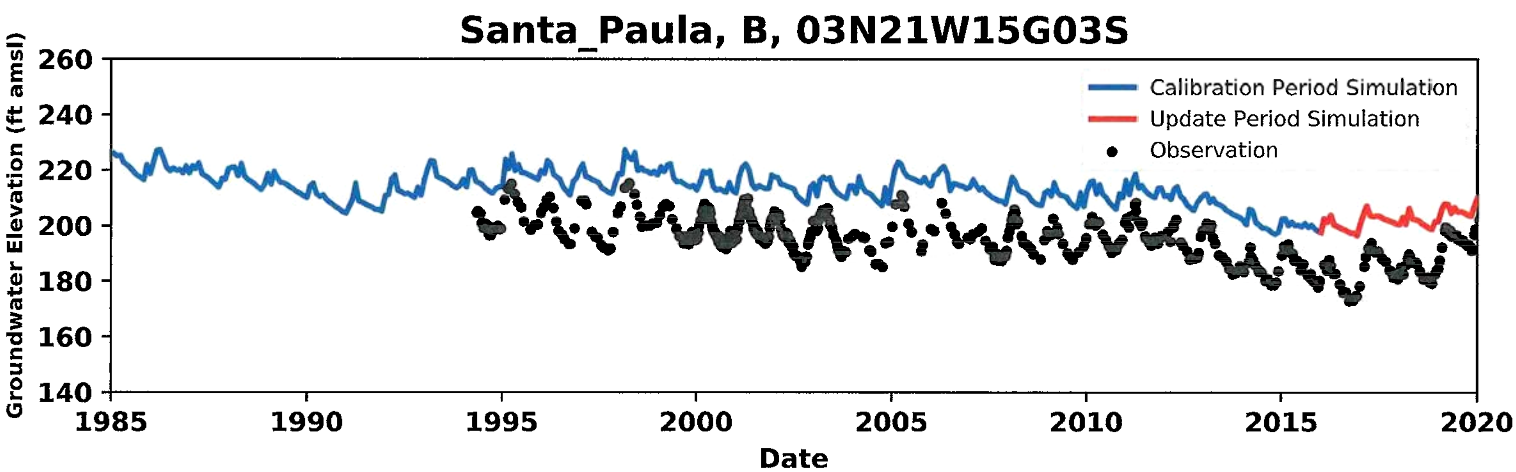

Santa_Paula, B, 03N21W15G02S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date



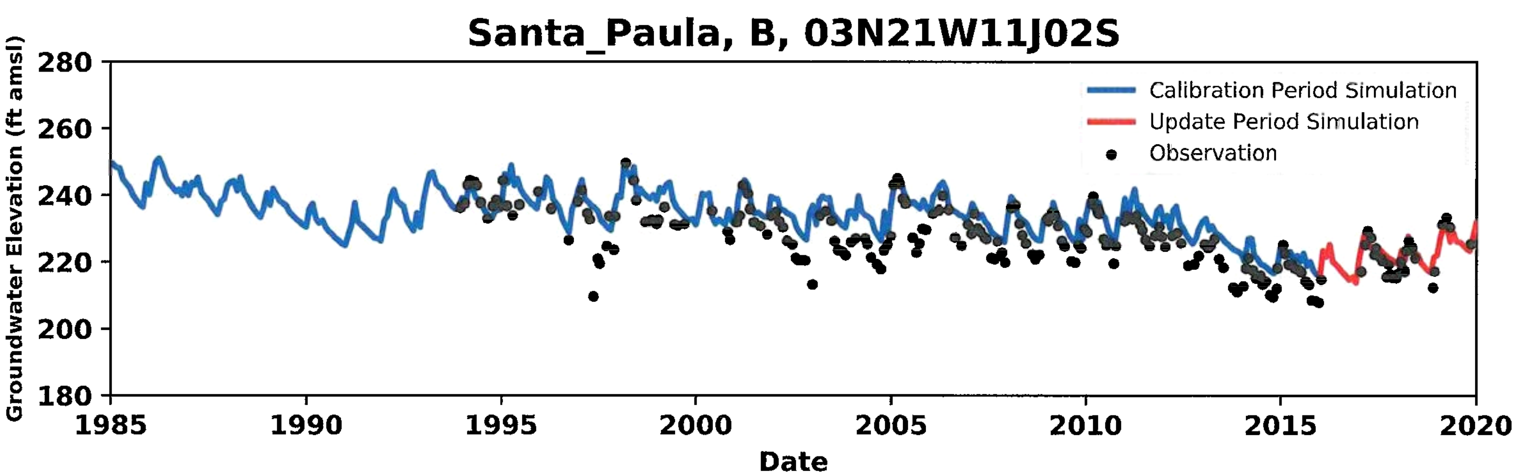
Santa_Paula, B, 03N21W03R02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

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

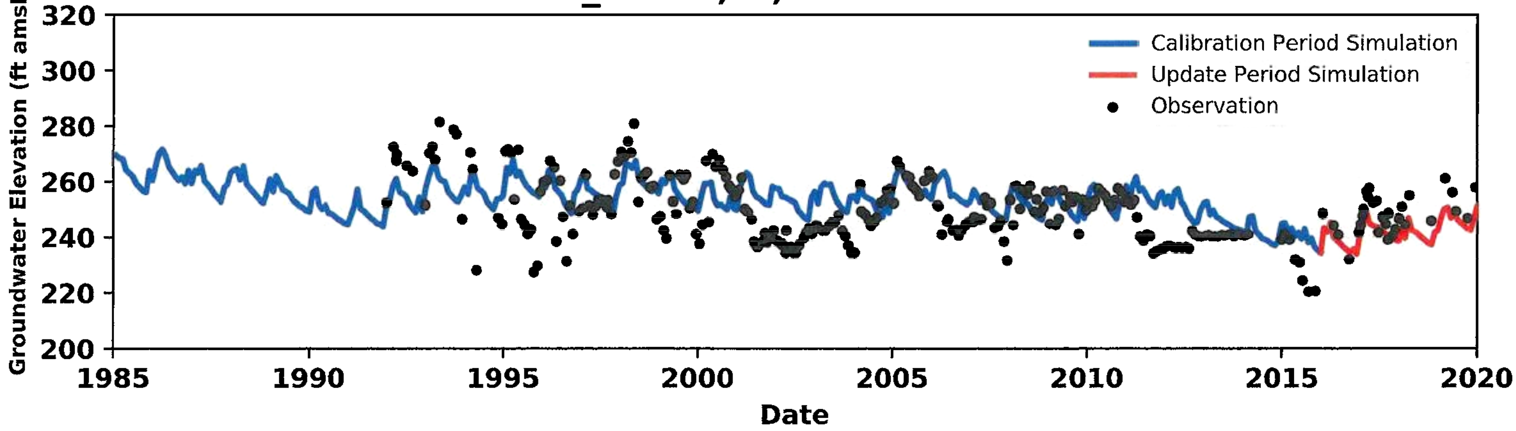



Santa_Paula, B, 03N21W15G03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

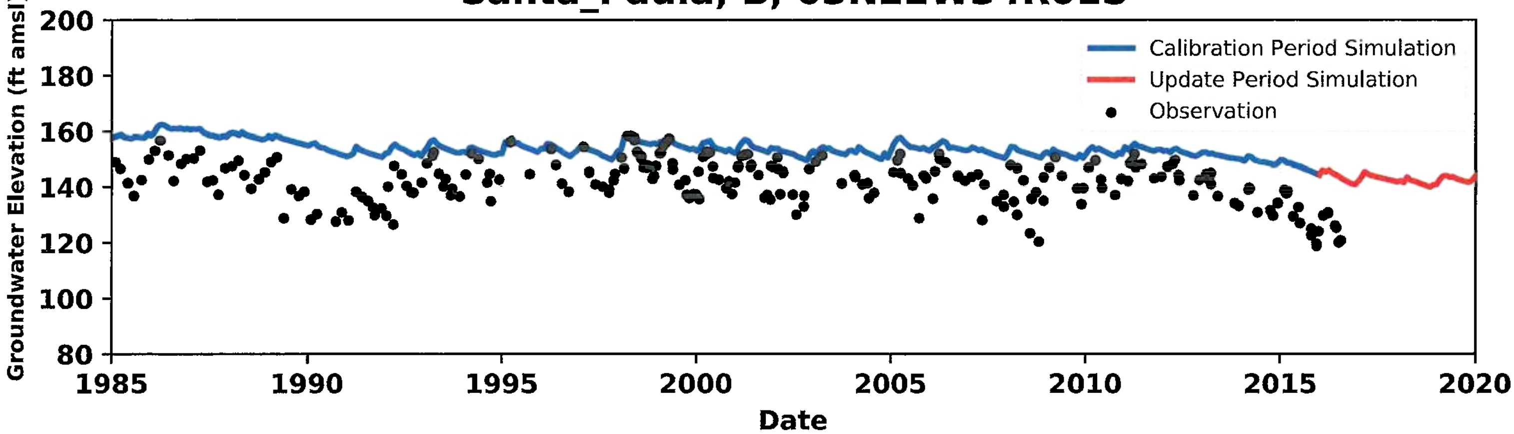



Santa_Paula, B, 03N21W11J02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

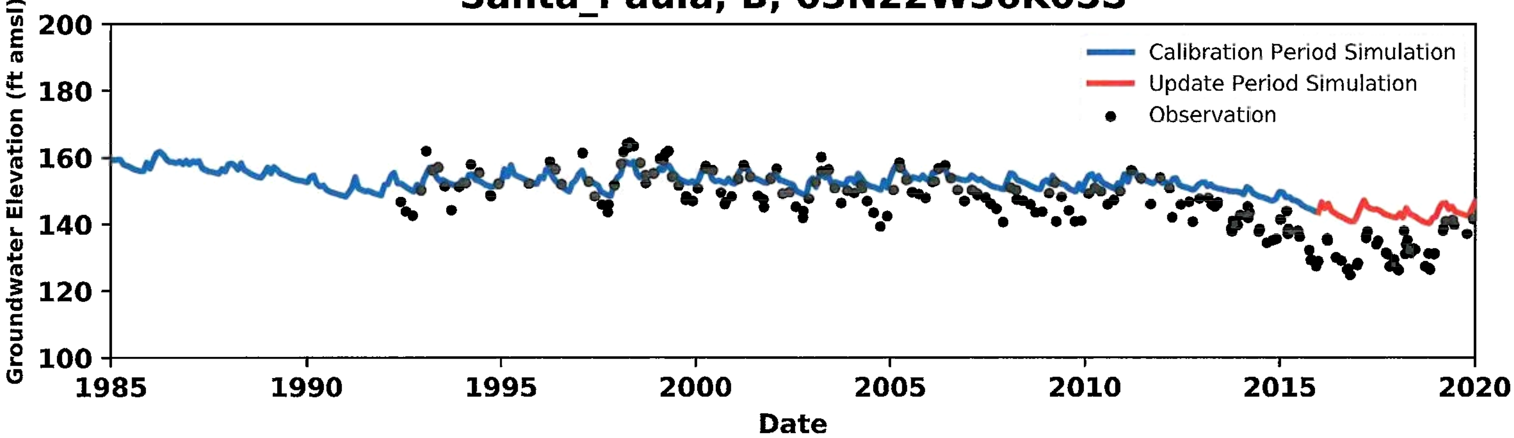
## Santa_Paula, B, 03N21W02R02S



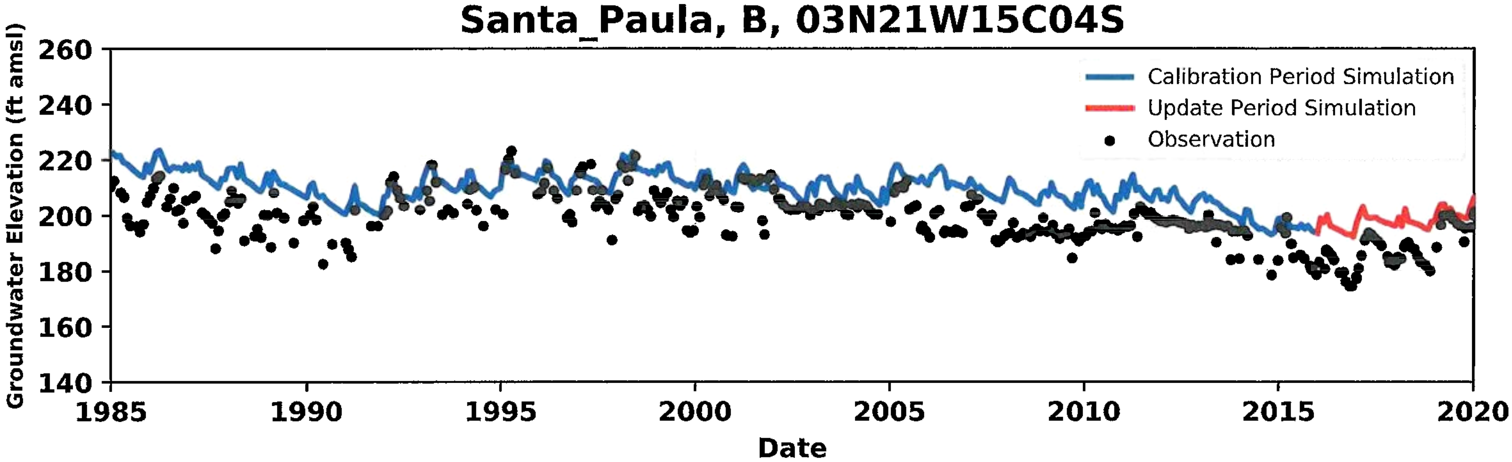

## Santa_Paula, B, 03N22W34R01S

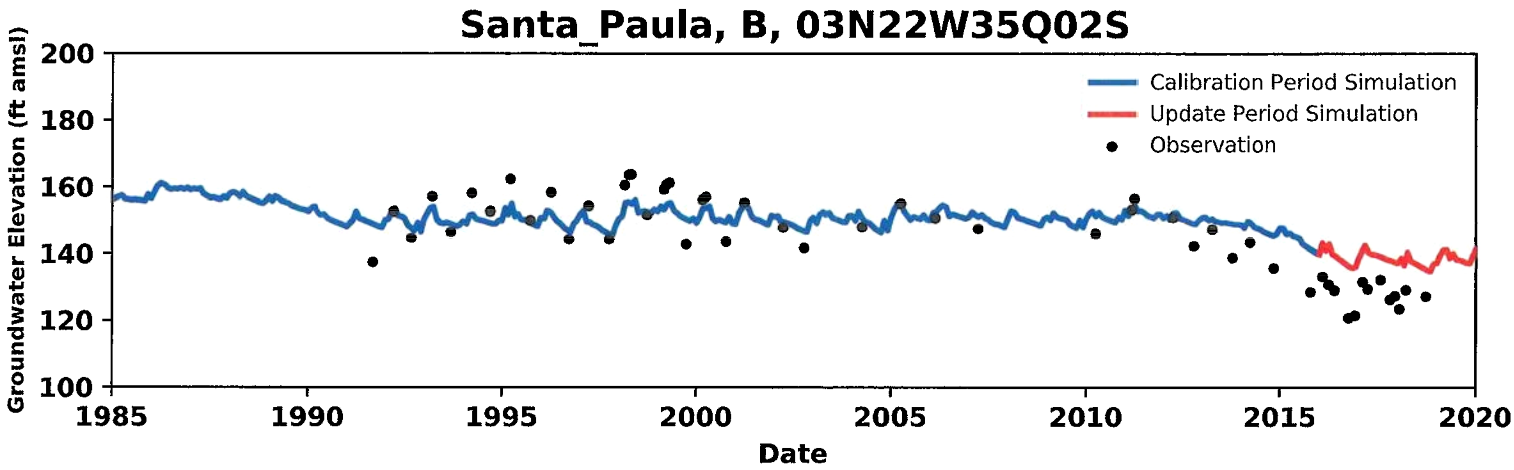


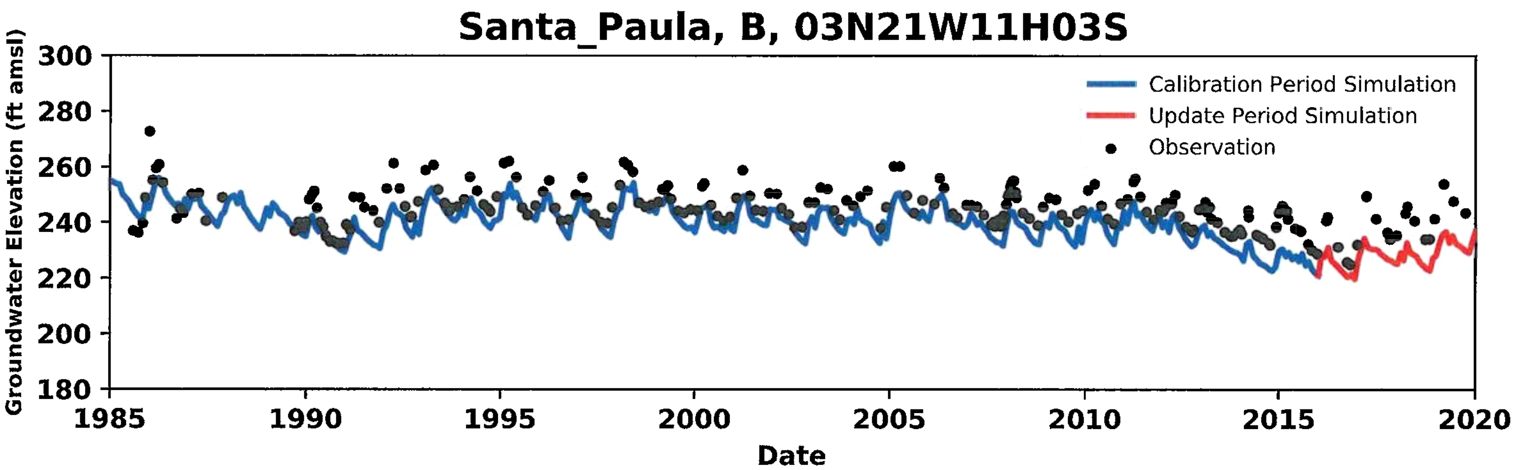

## Santa_Paula, B, 03N22W36K05S

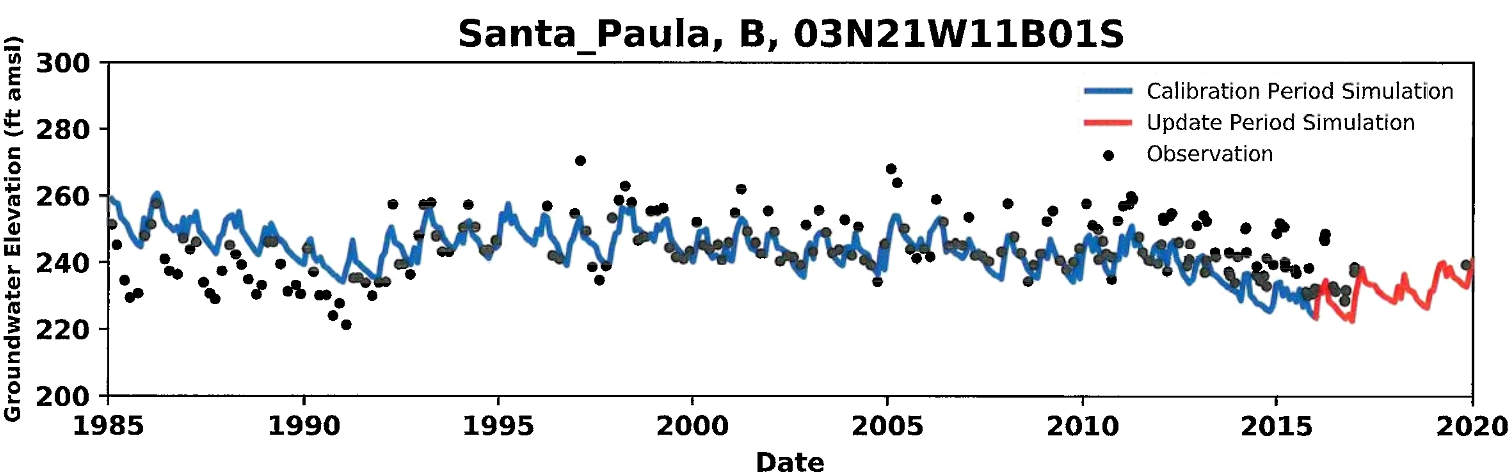


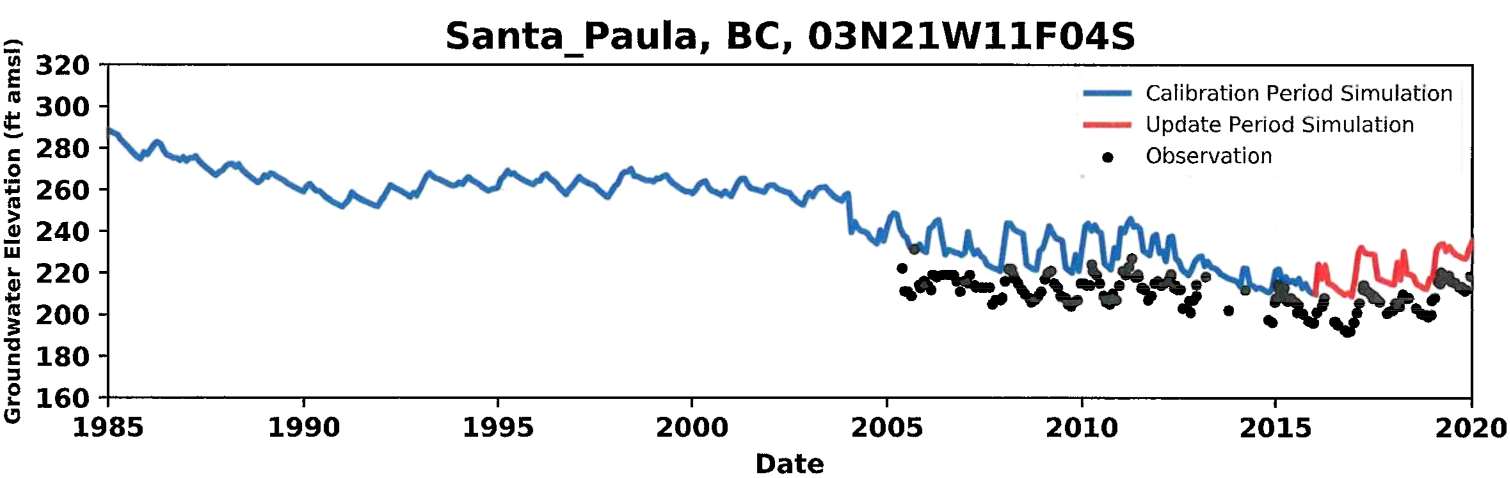

## Santa_Paula, B, 03N21W15C04S

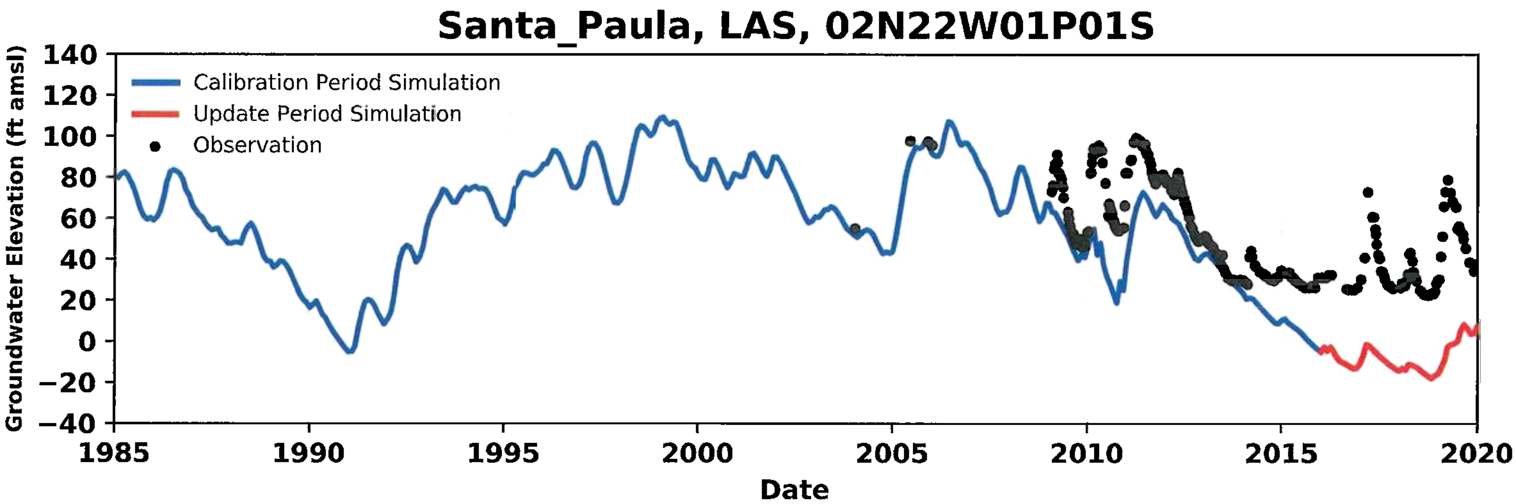



Santa_Paula, B, 03N22W35Q02S
Groundwater Elevation (ft amsl)
200
180
160
140
120
100
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

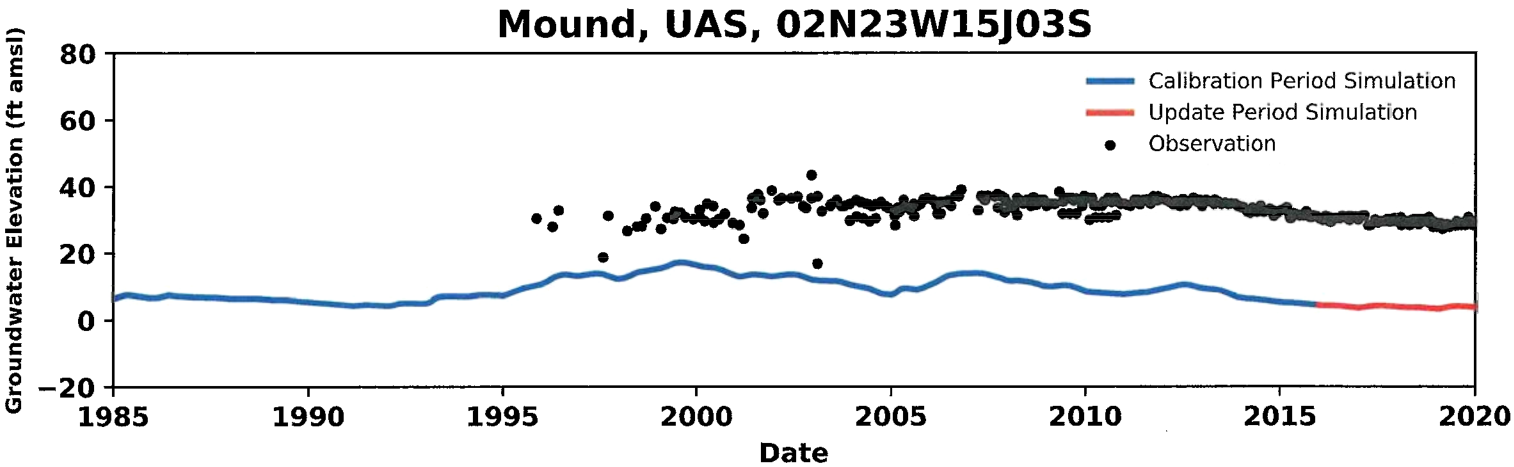

Santa_Paula, B, 03N21W11H03S
Groundwater Elevation (ft amsl)
300
280
260
240
220
200
180
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

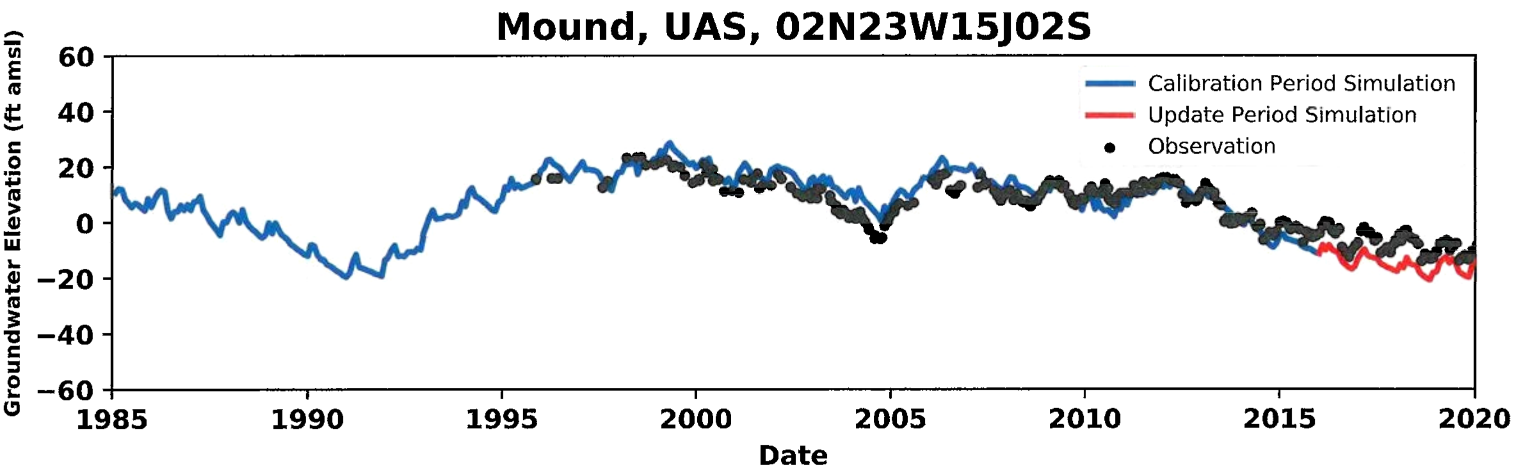

Santa_Paula, B, 03N21W11B01S
Groundwater Elevation (ft amsl)
300
280
260
240
220
200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

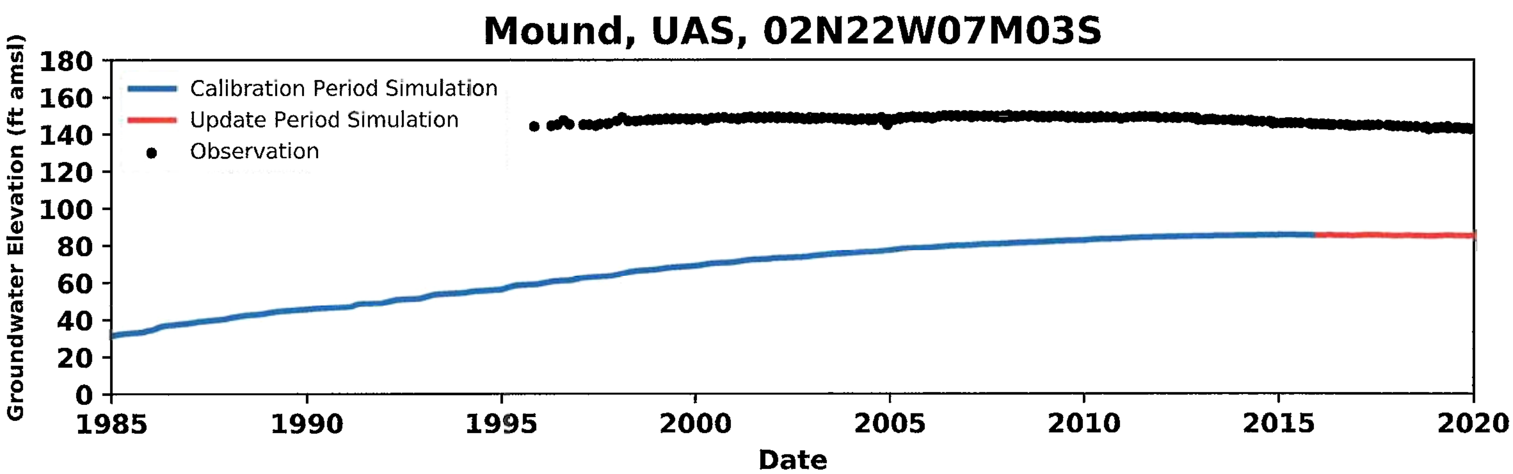

Santa_Paula, BC, 03N21W11F04S
Groundwater Elevation (ft amsl)
320
300
280
260
240
220
200
180
160
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

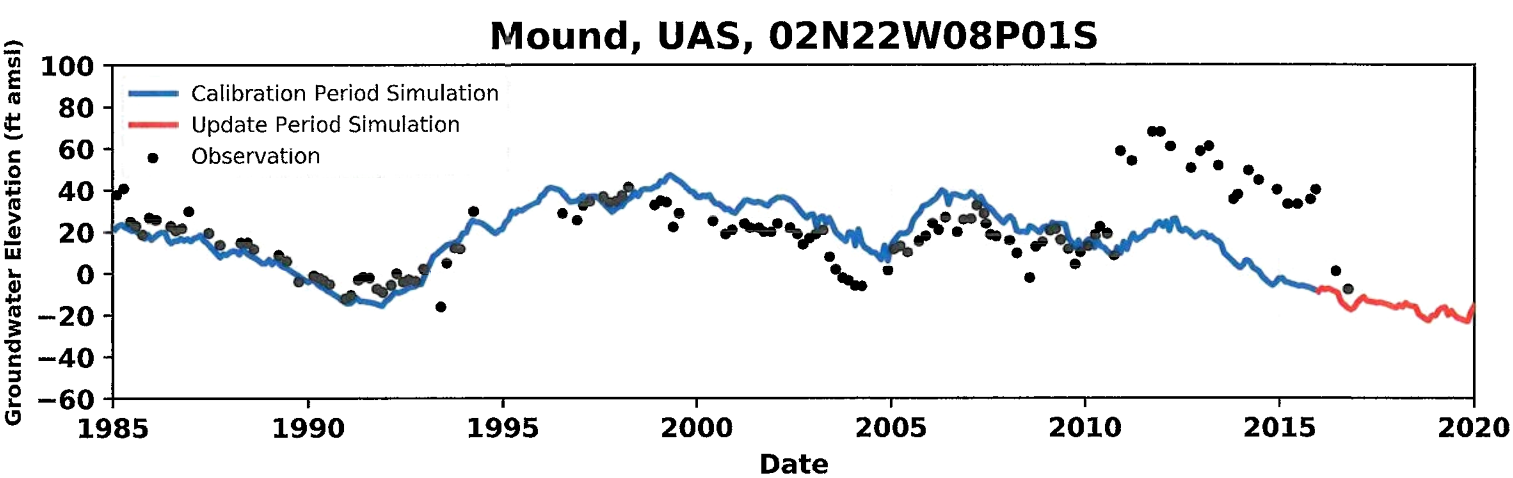


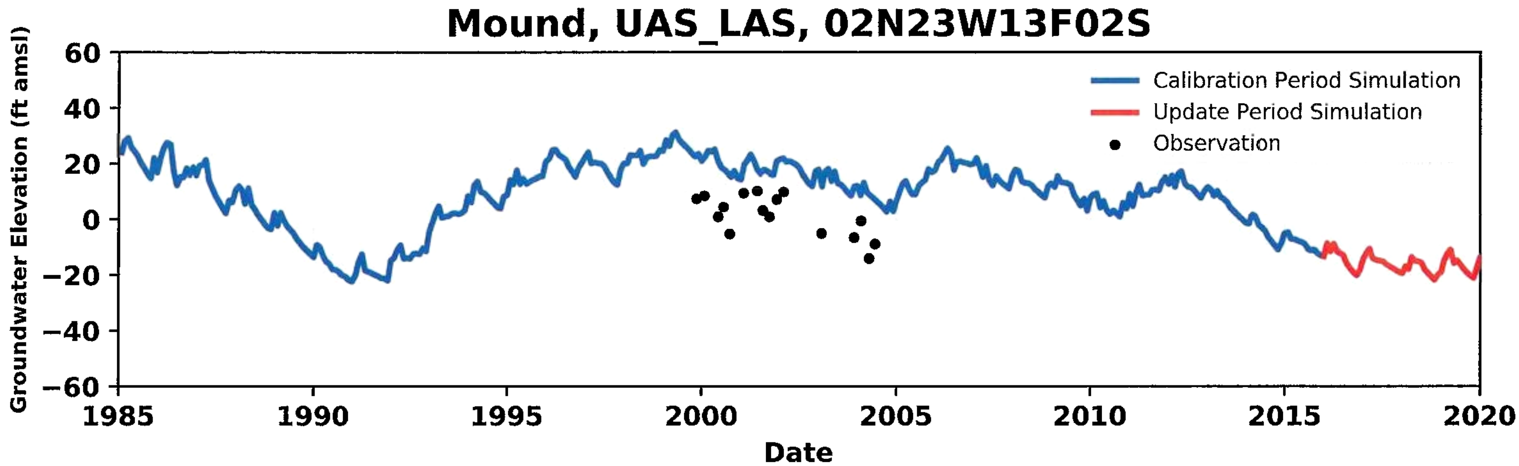
Santa_Paula, LAS, 02N22W01P01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
140
120
100
80
60
40
20
0
−20
−40
1985
1990
1995
2000
2005
2010
2015
2020
Date

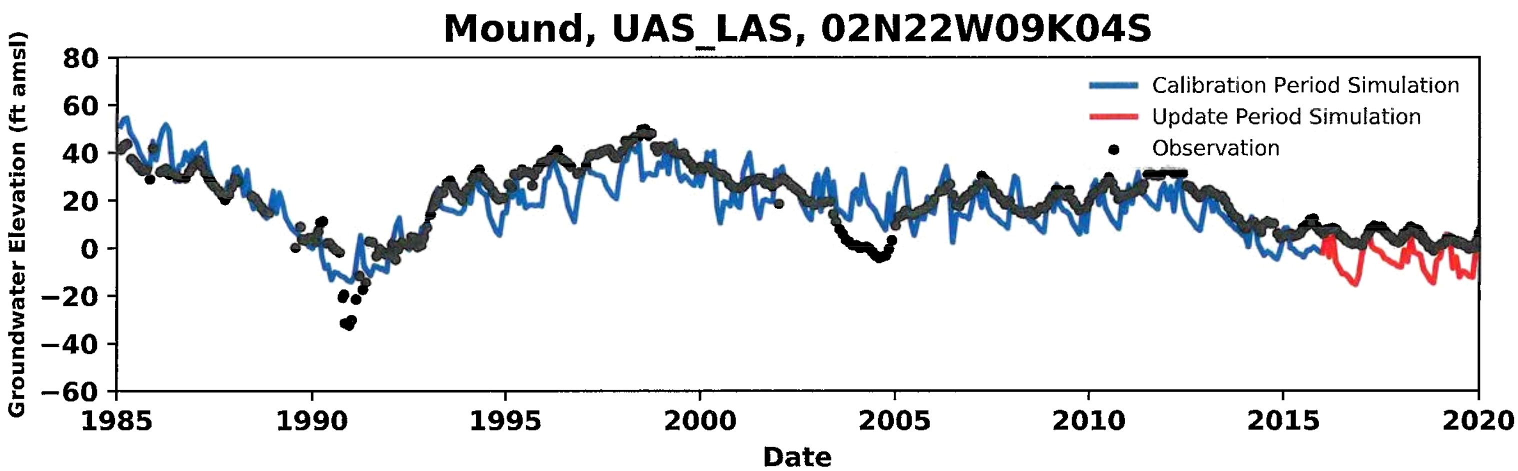

Mound, UAS, 02N23W15J03S
Groundwater Elevation (ft amsl)
80
60
40
20
0
−20
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

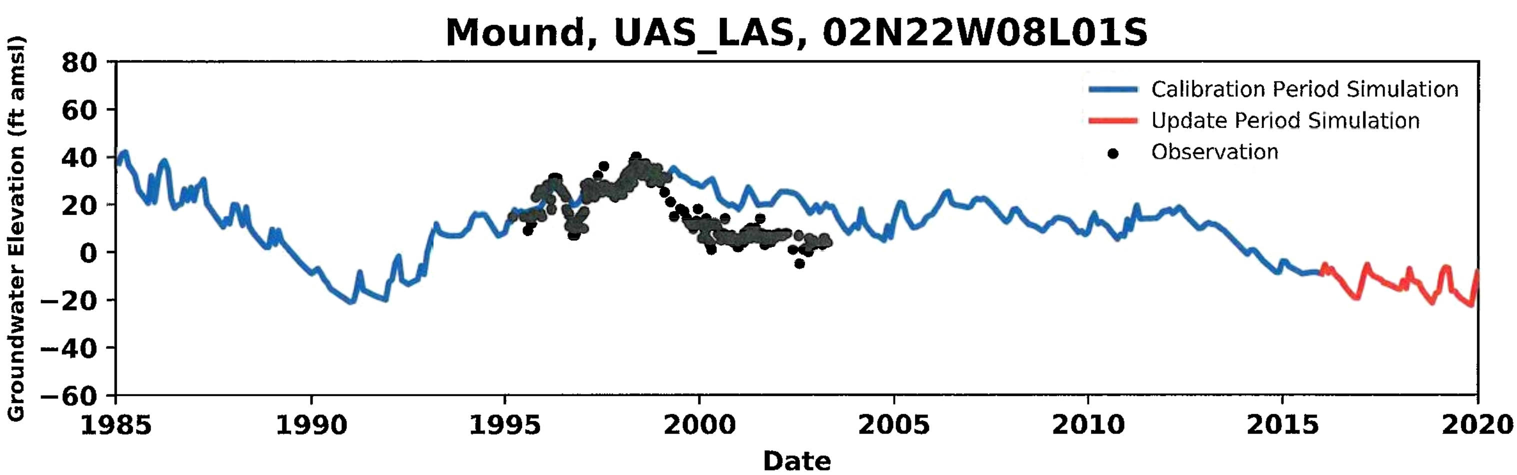

Mound, UAS, 02N23W15J02S
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

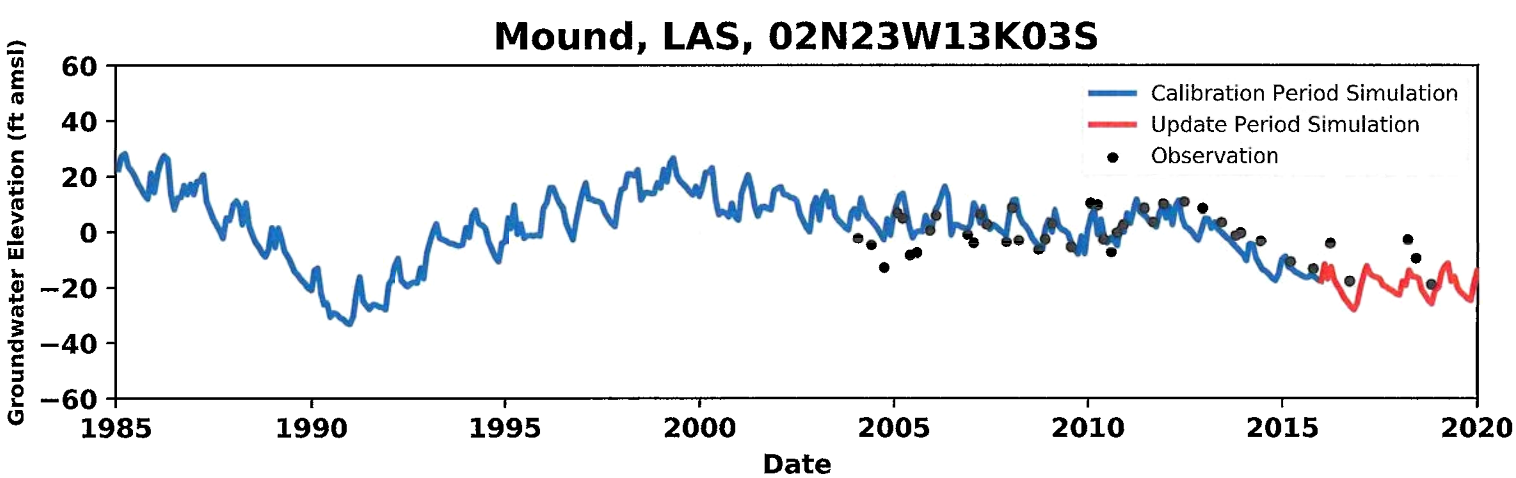

Mound, UAS, 02N22W07M03S
Groundwater Elevation (ft amsl)
180
160
140
120
100
80
60
40
20
0
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

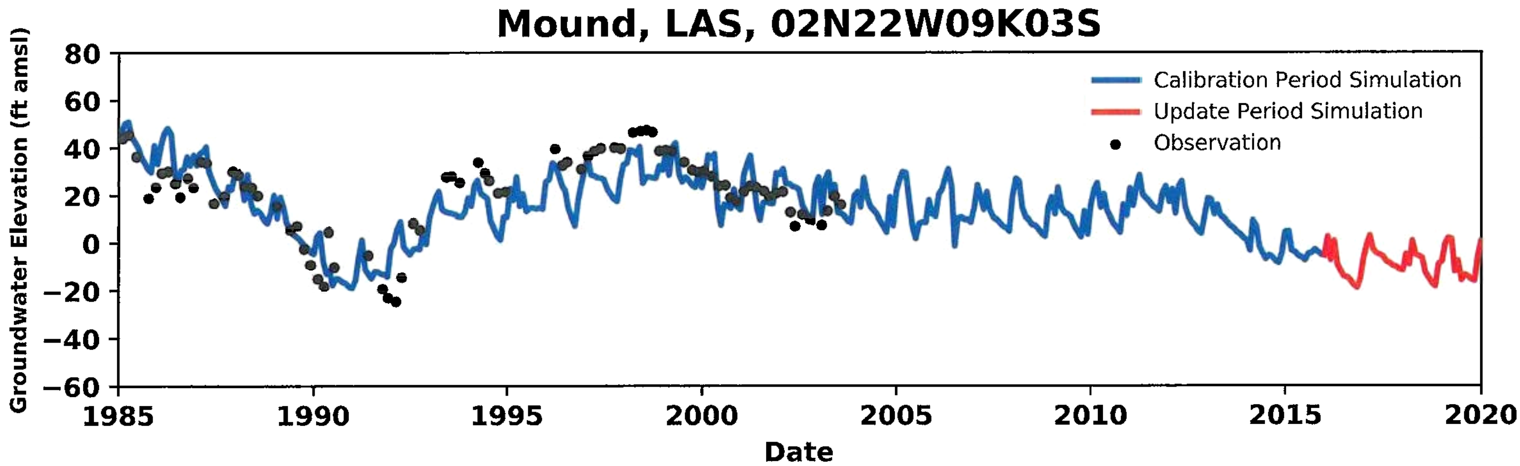

Mound, UAS, 02N22W08P01S
Groundwater Elevation (ft amsl)
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

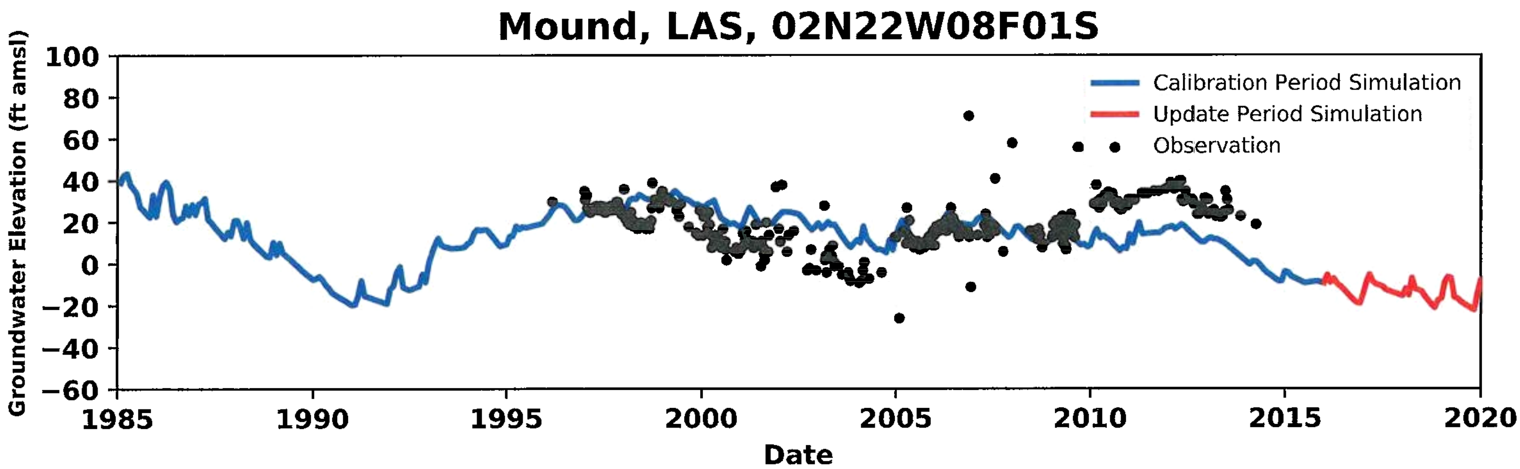

Mound, UAS_LAS, 02N23W13F02S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

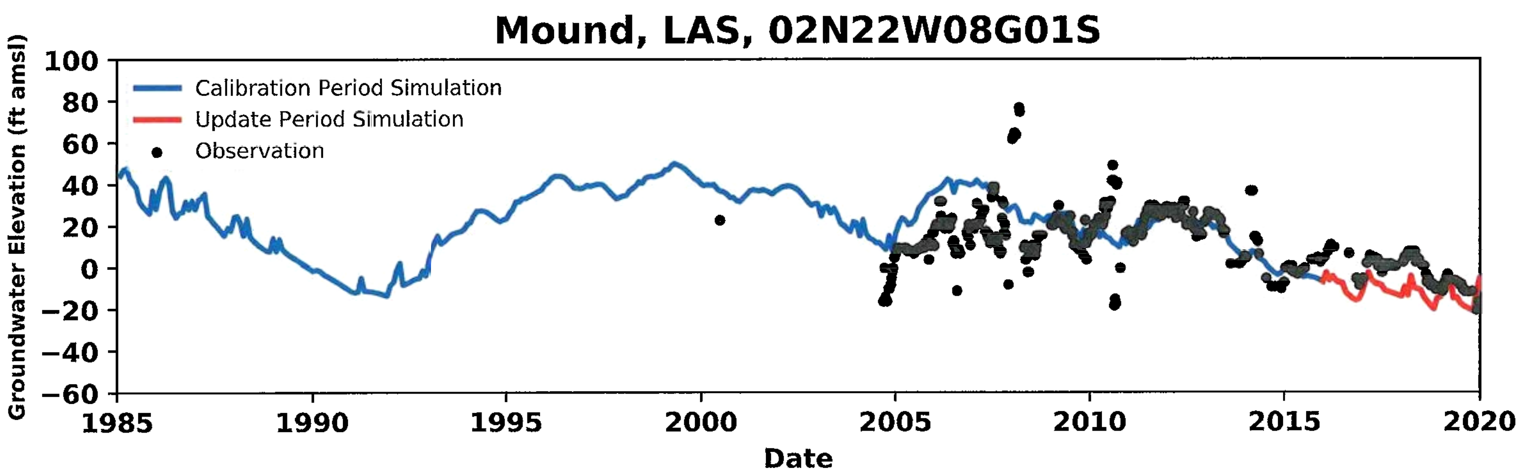

Mound, UAS_LAS, 02N22W09K04S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

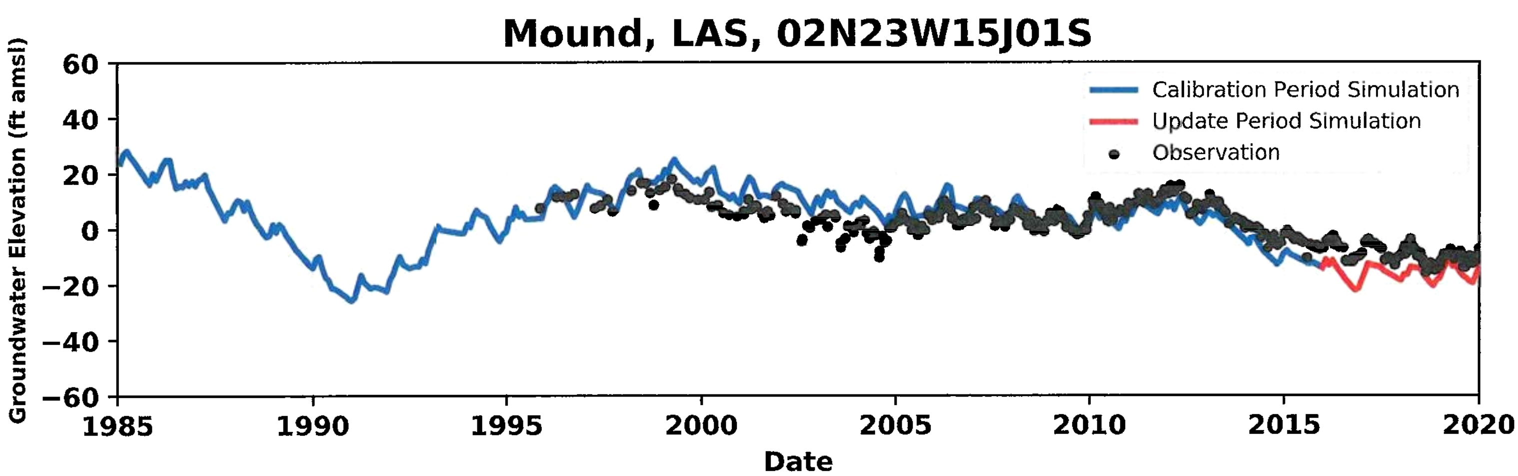

Mound, UAS_LAS, 02N22W08L01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date


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

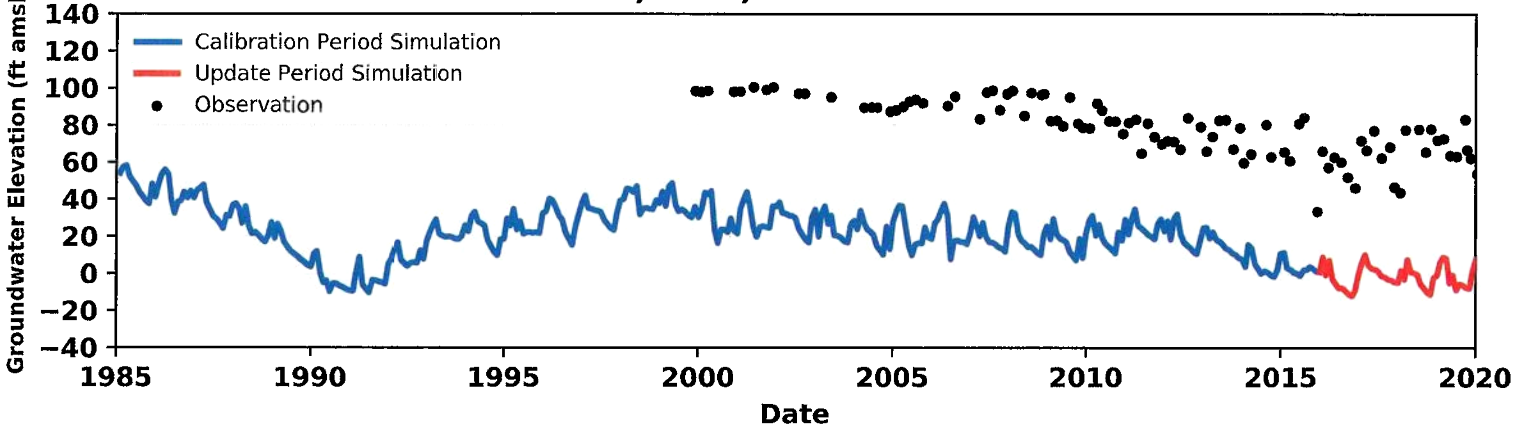

Mound, LAS, 02N22W09K03S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date


Mound, LAS, 02N22W08F01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

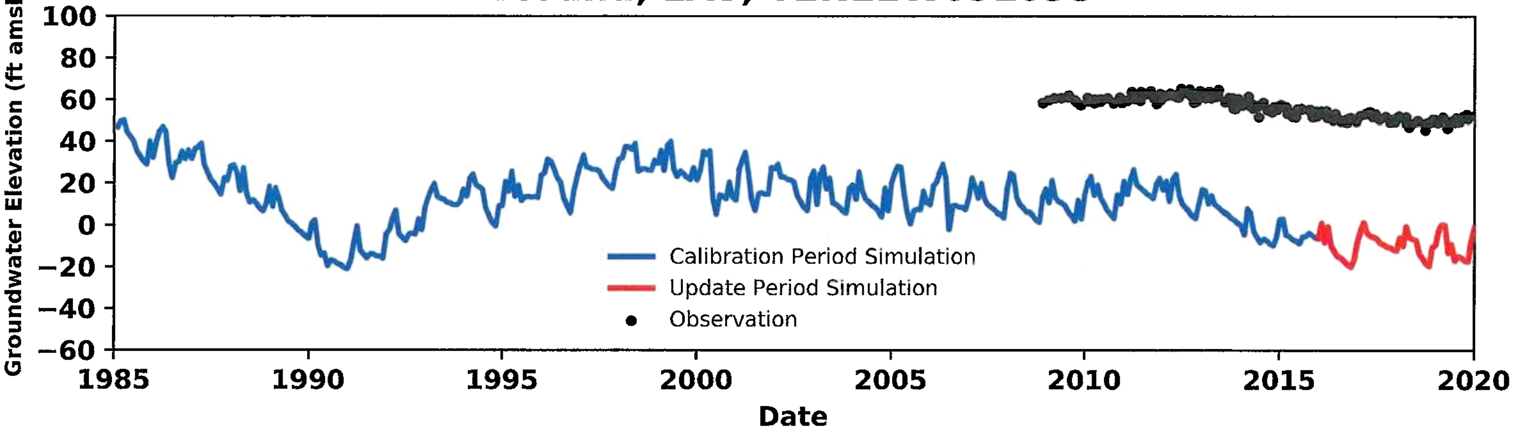

Mound, LAS, 02N22W08G01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date


Mound, LAS, 02N23W15J01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

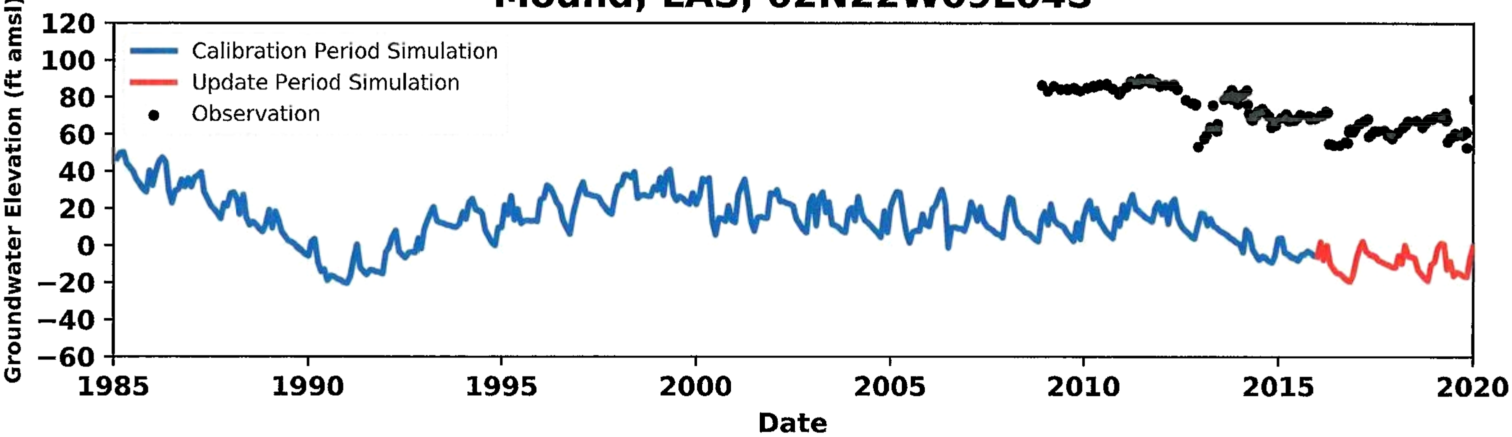
## Mound, LAS, 02N22W09K05S



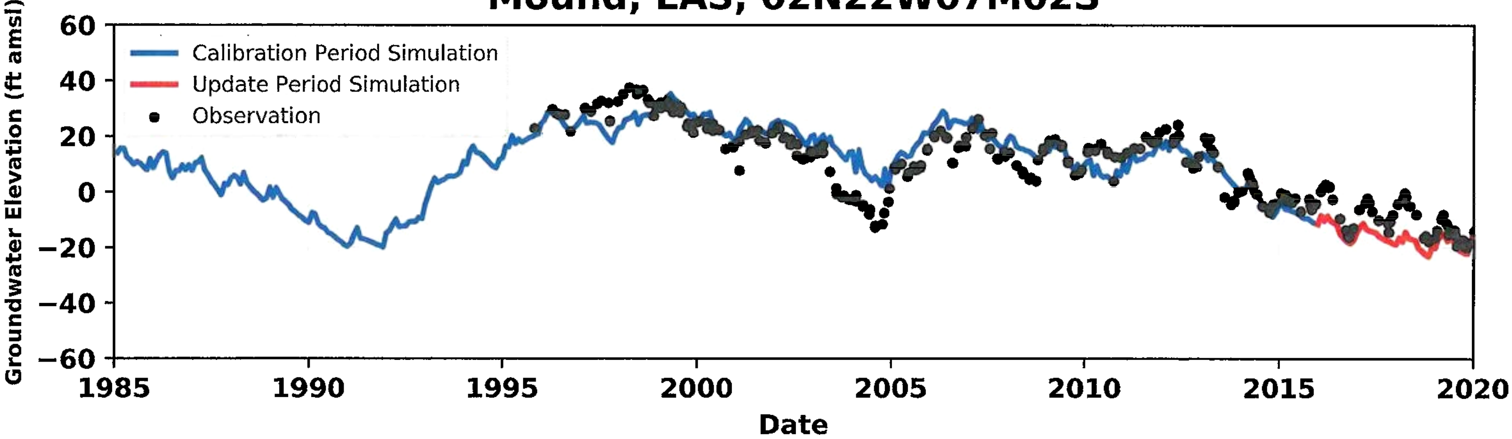

## Mound, LAS, 02N22W09L03S



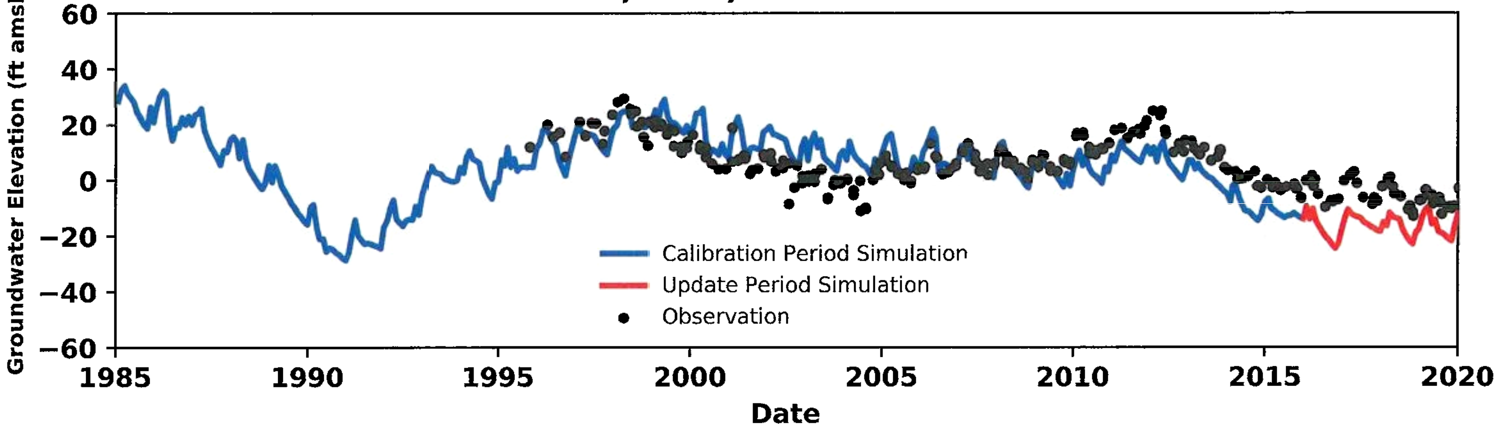

## Mound, LAS, 02N22W09L04S



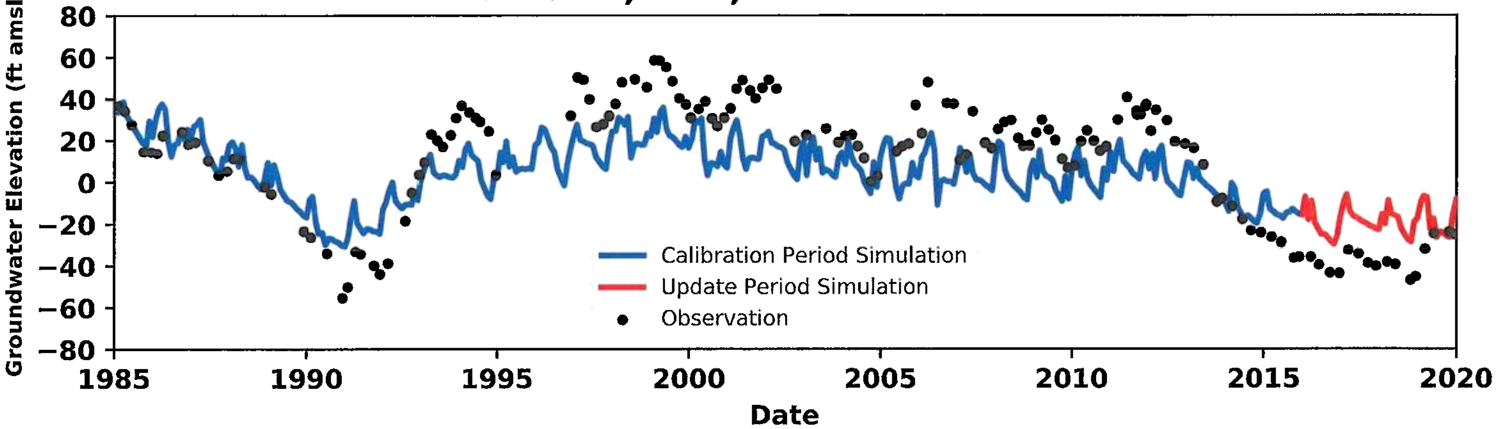

## Mound, LAS, 02N22W07M02S



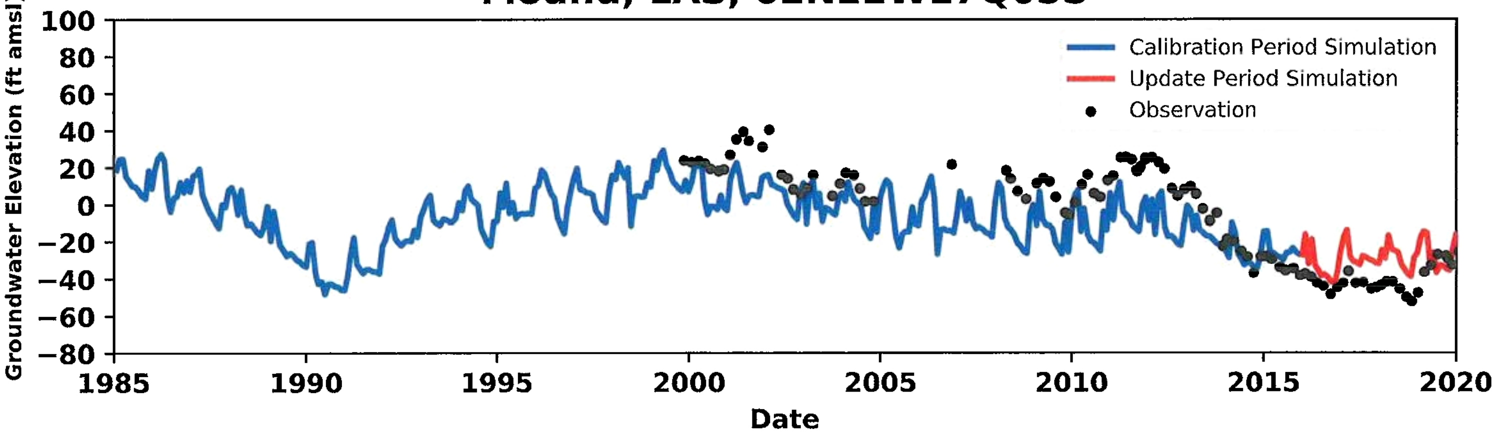
## Mound, LAS, 02N22W07M01S



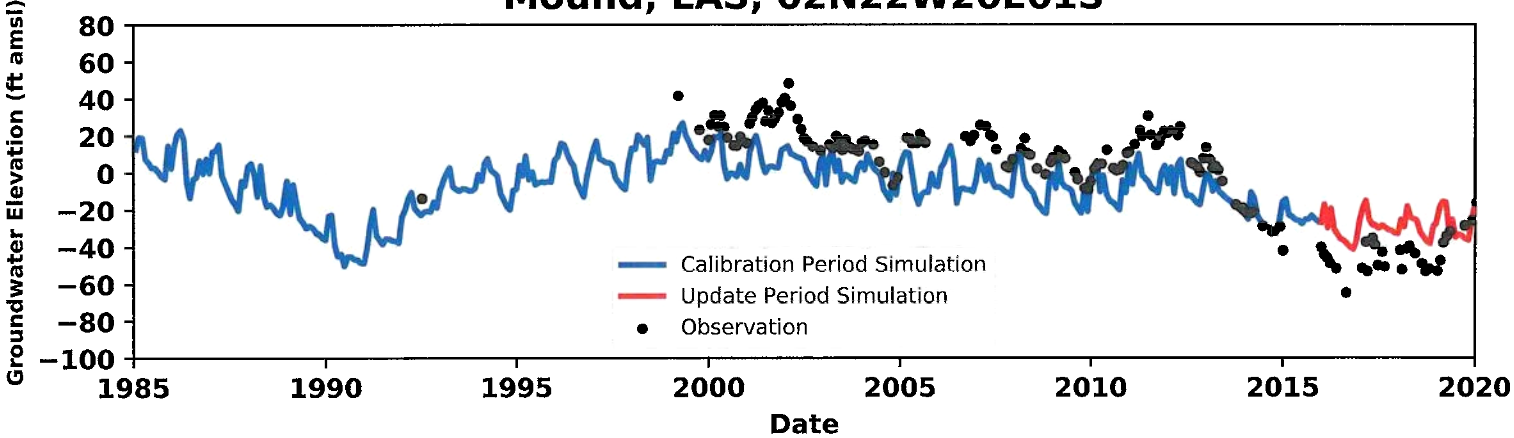

## Mound, LAS, 02N22W16K01S

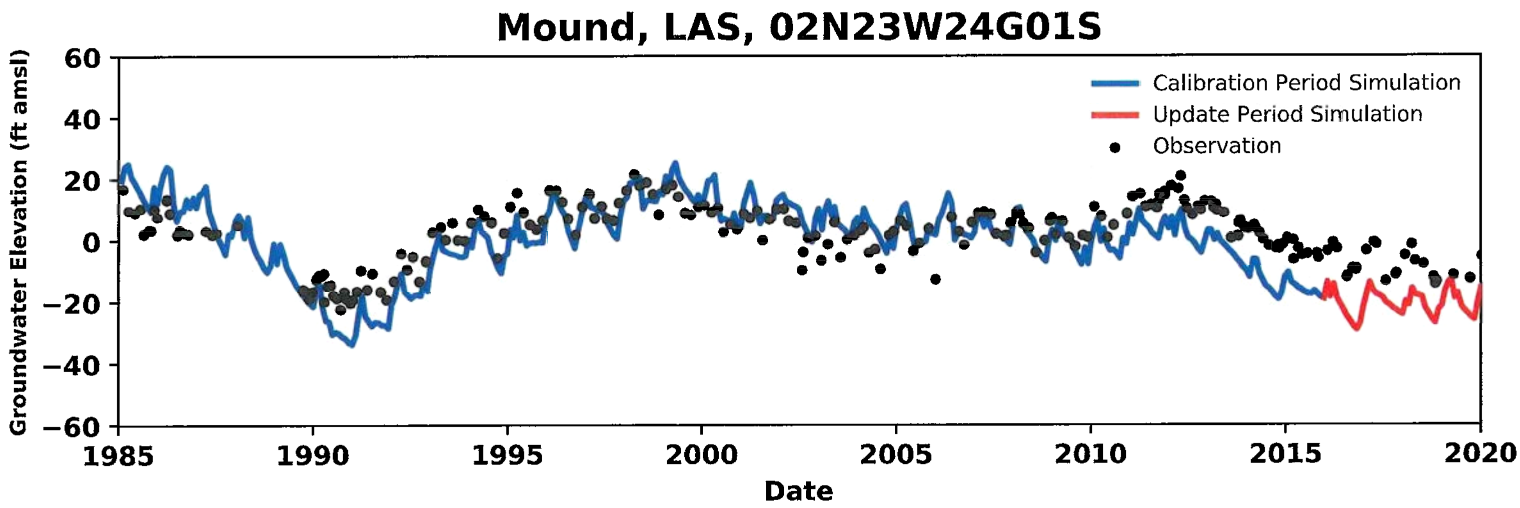



## Mound, LAS, 02N22W17Q05S

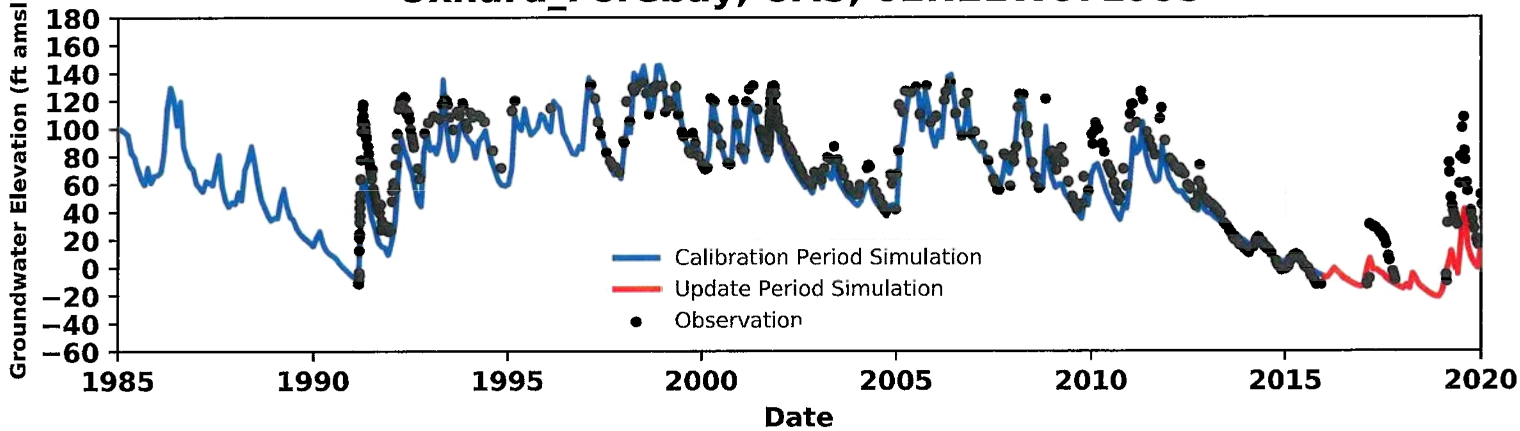



## Mound, LAS, 02N22W20E01S

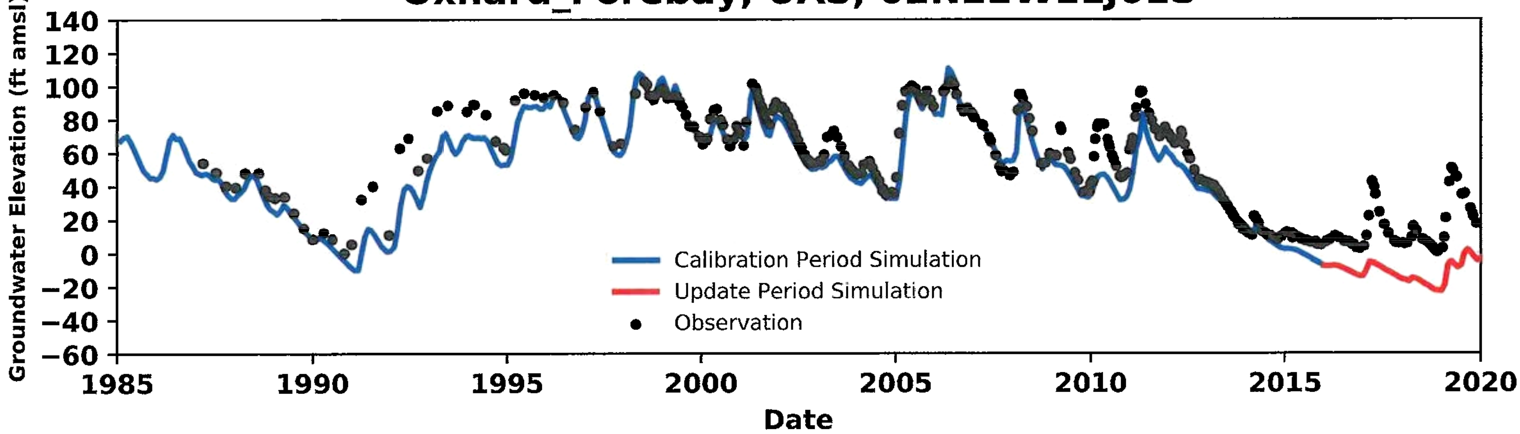



Mound, LAS, 02N23W24G01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date

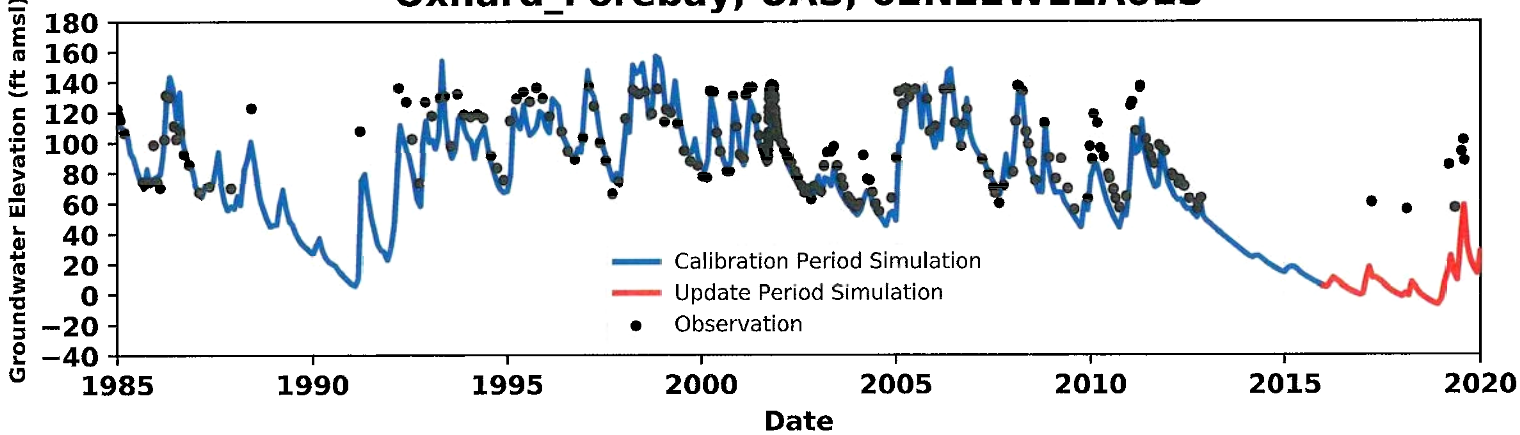
## Oxnard_Forebay, UAS, 02N21W07L06S



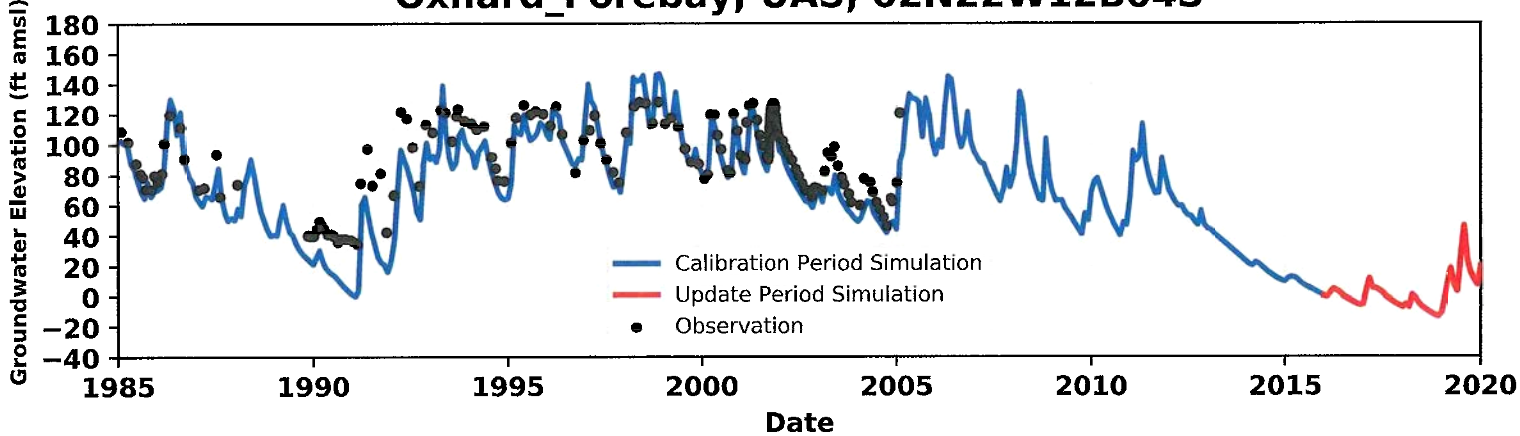

## Oxnard_Forebay, UAS, 02N22W11J01S

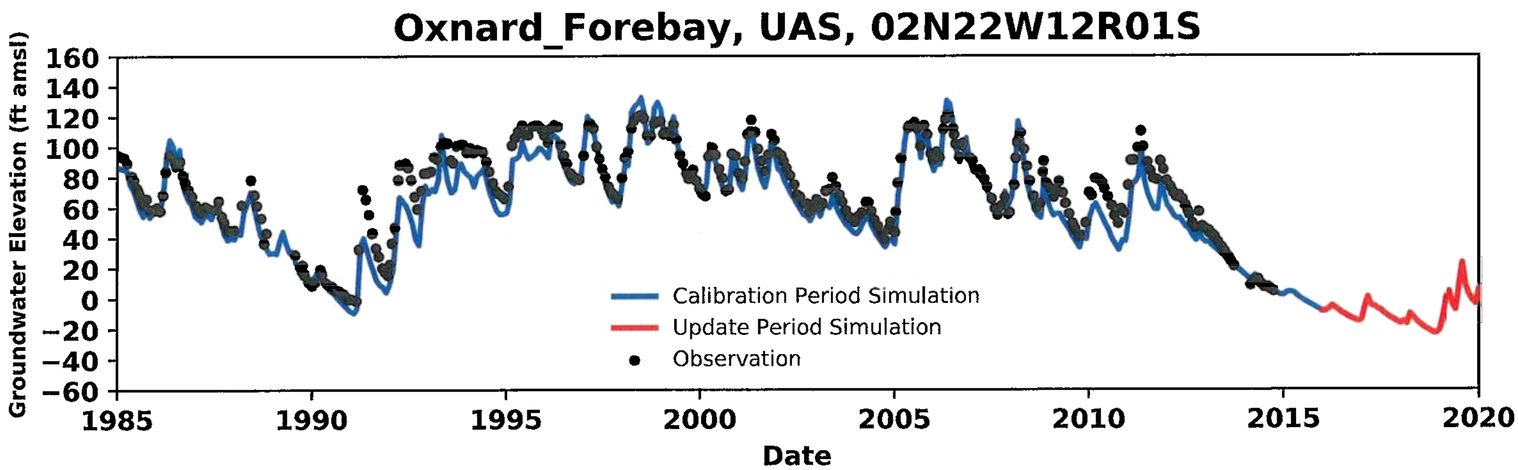


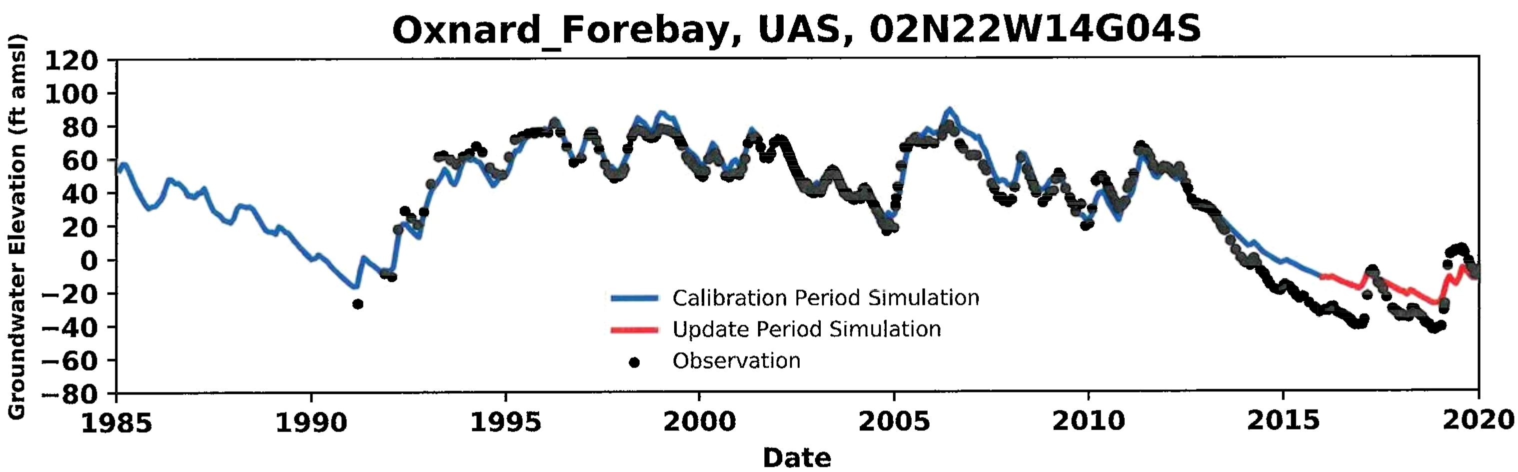

## Oxnard_Forebay, UAS, 02N22W12A01S

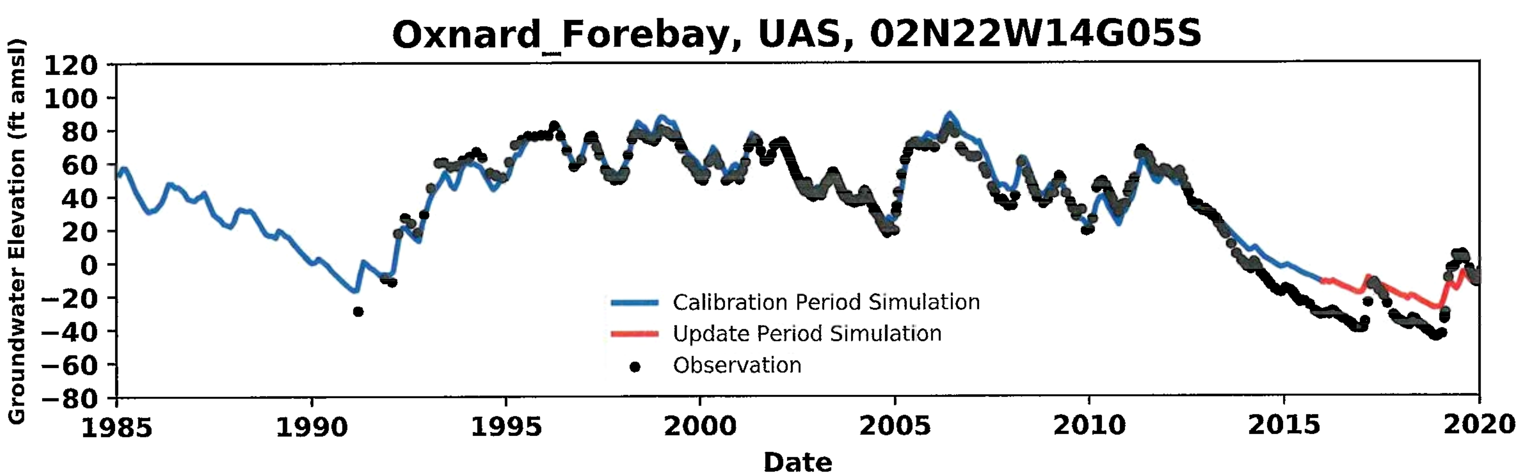


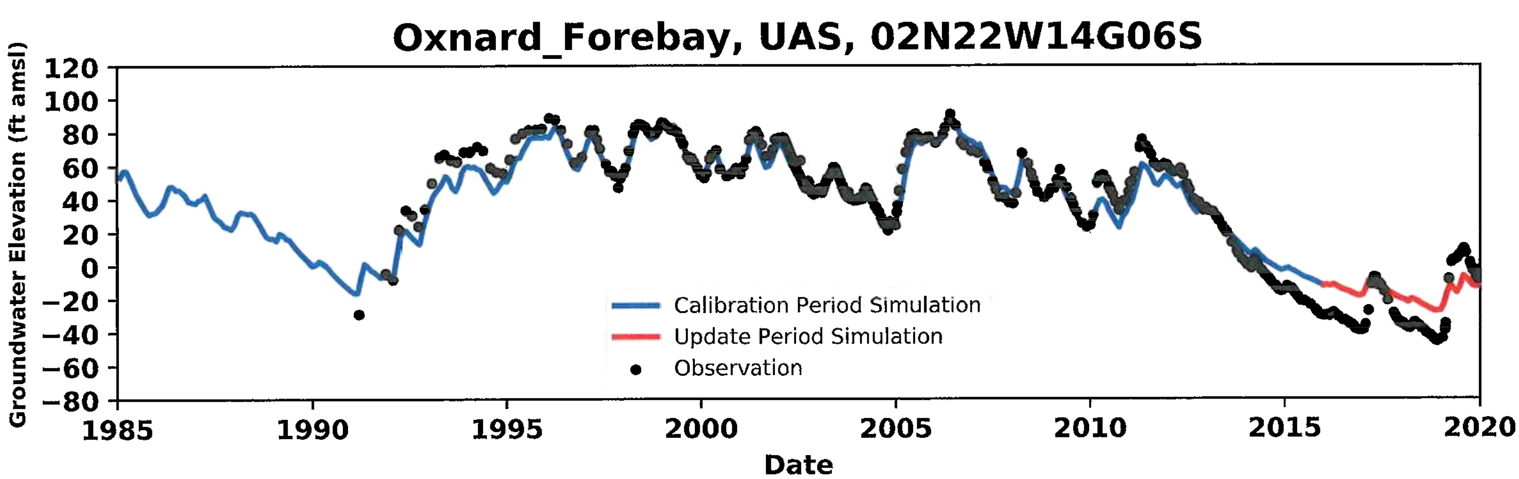

## Oxnard_Forebay, UAS, 02N22W12B04S

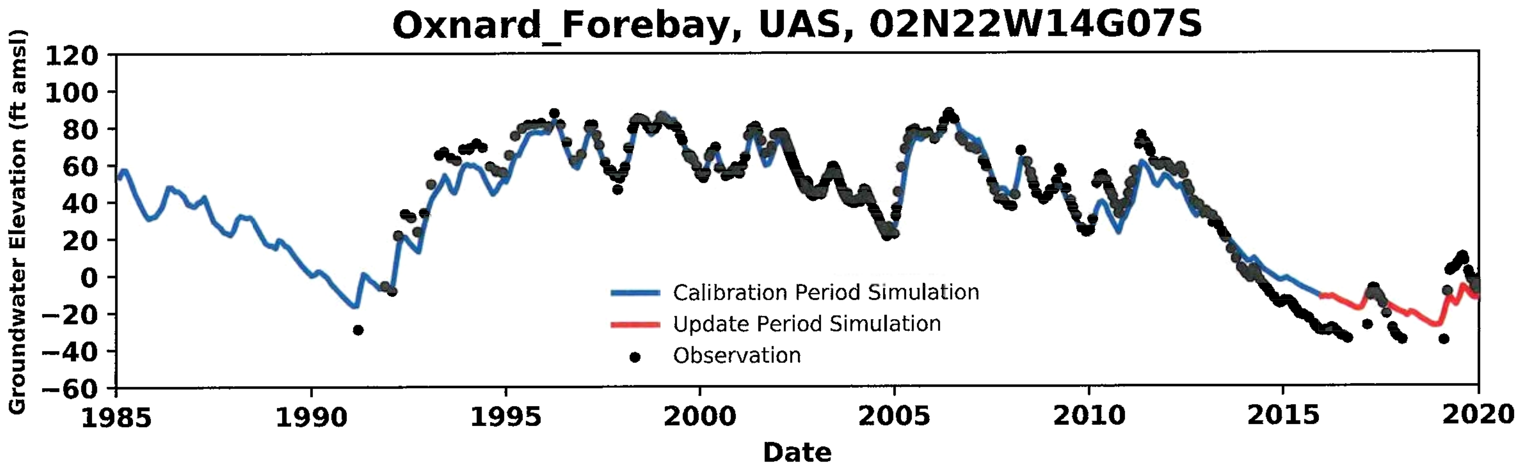


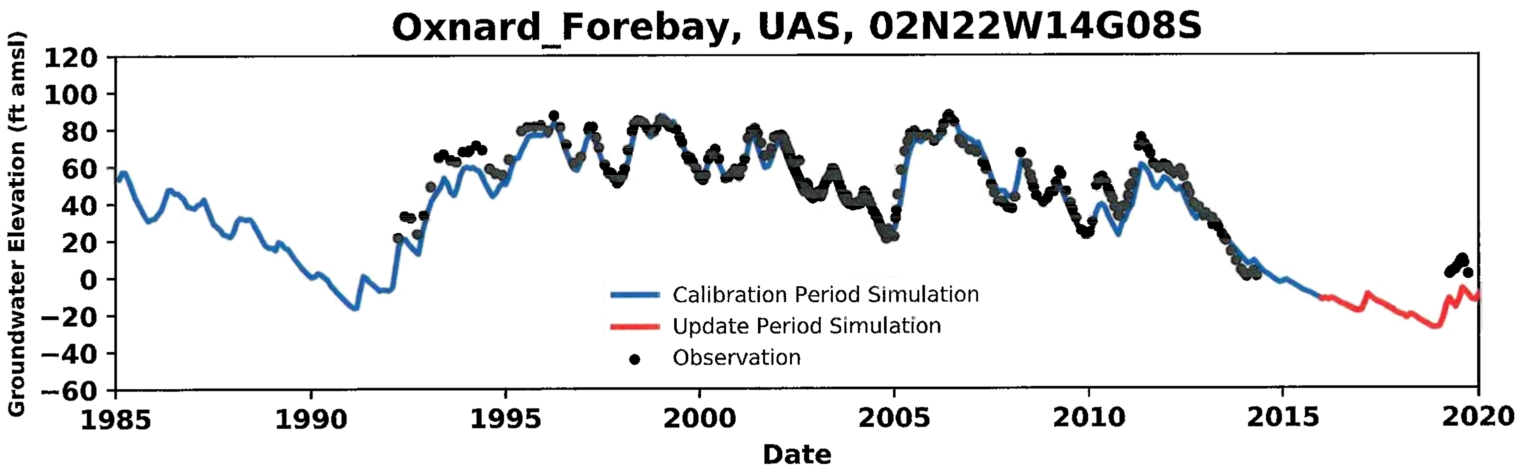

Oxnard_Forebay, UAS, 02N22W12R01S
Groundwater Elevation (ft amsl)
160
140
120
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

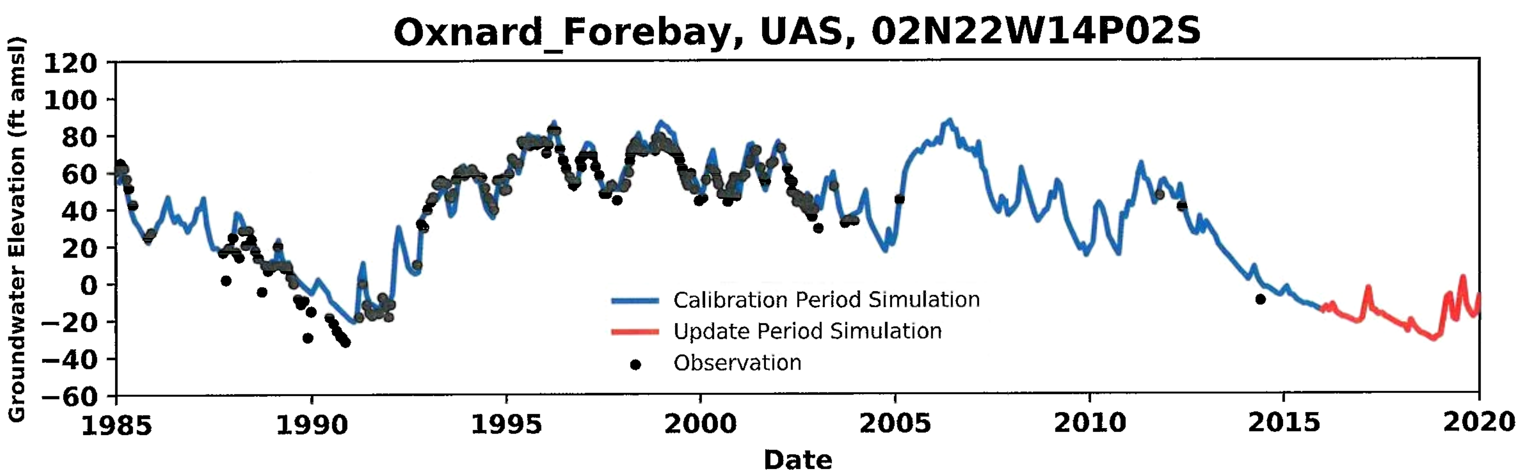

Oxnard_Forebay, UAS, 02N22W14G04S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

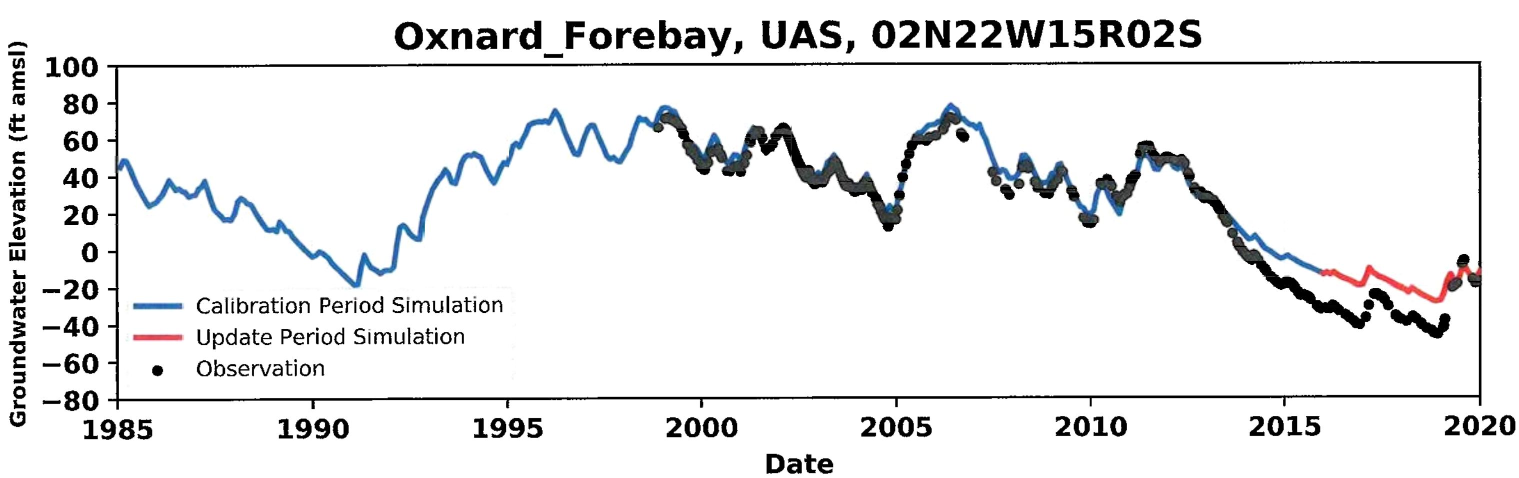

Oxnard_Forebay, UAS, 02N22W14G05S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

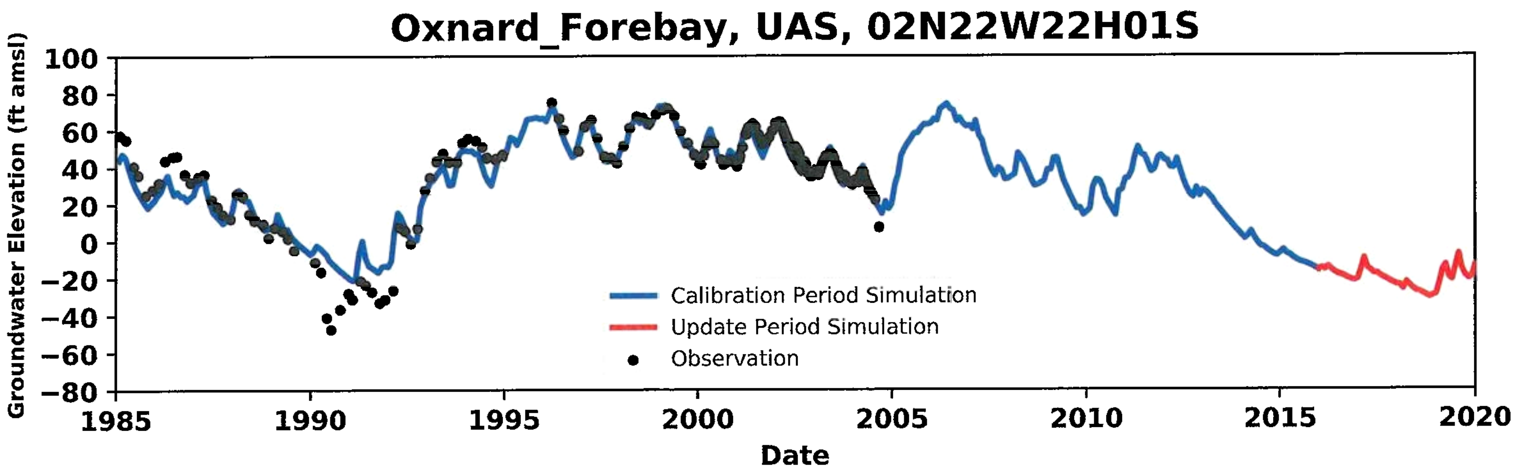

Oxnard_Forebay, UAS, 02N22W14G06S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

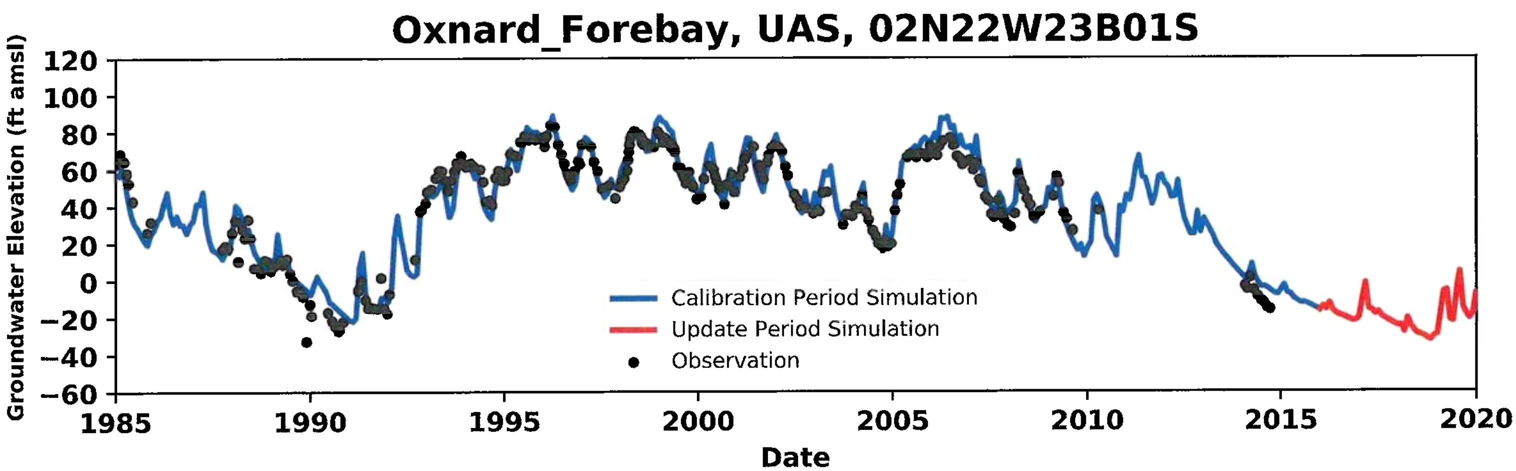

Oxnard_Forebay, UAS, 02N22W14G07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

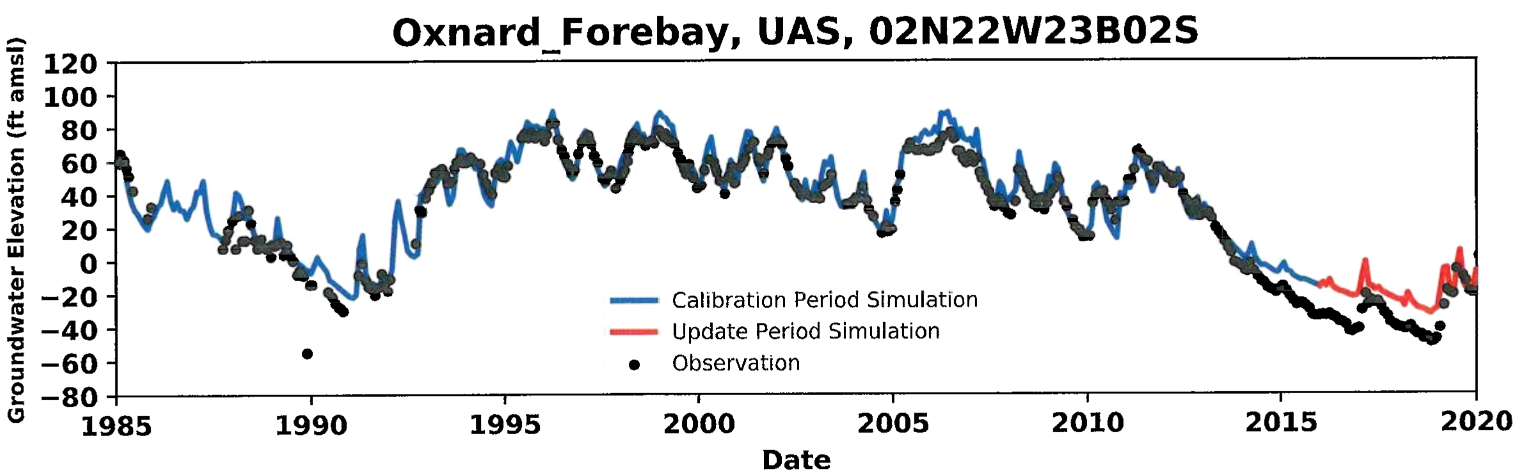

Oxnard_Forebay, UAS, 02N22W14G08S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

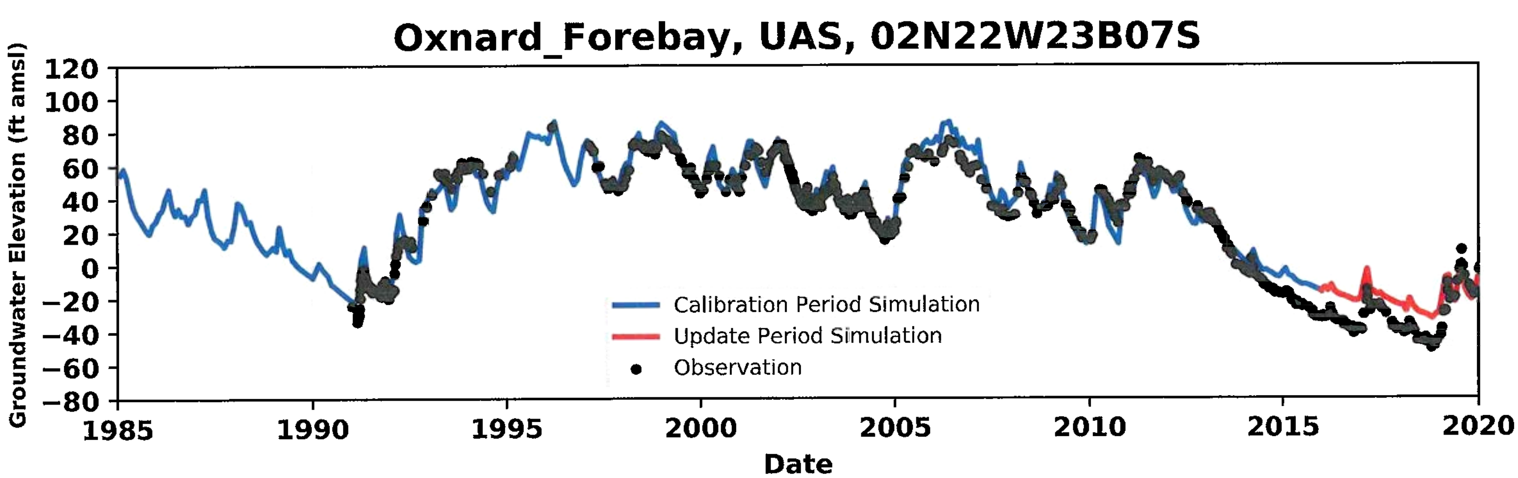

Oxnard_Forebay, UAS, 02N22W14P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

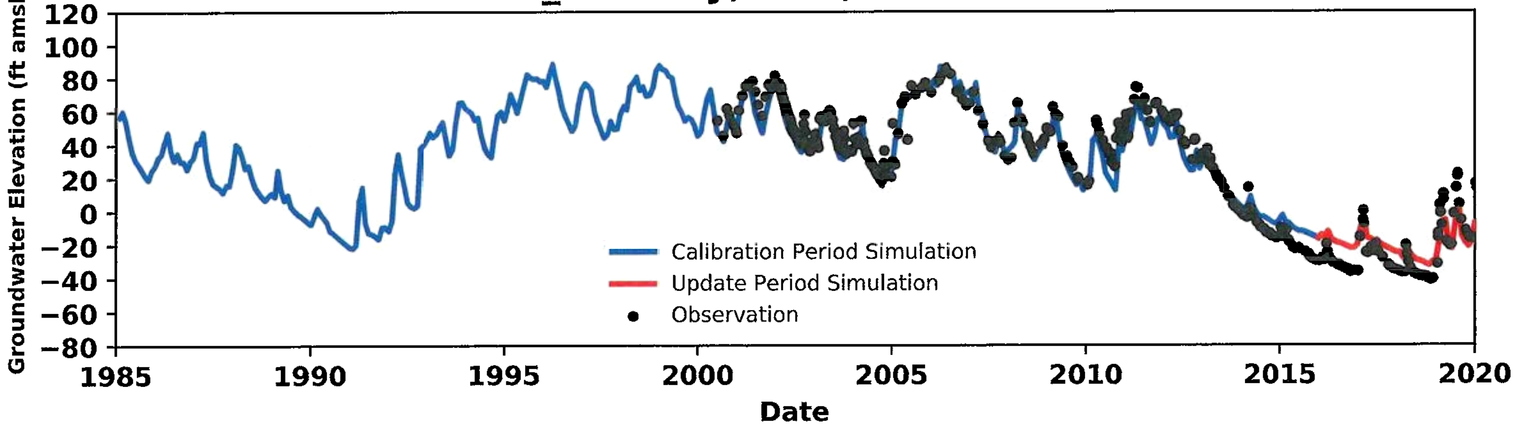

Oxnard_Forebay, UAS, 02N22W22H01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Forebay, UAS, 02N22W23B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

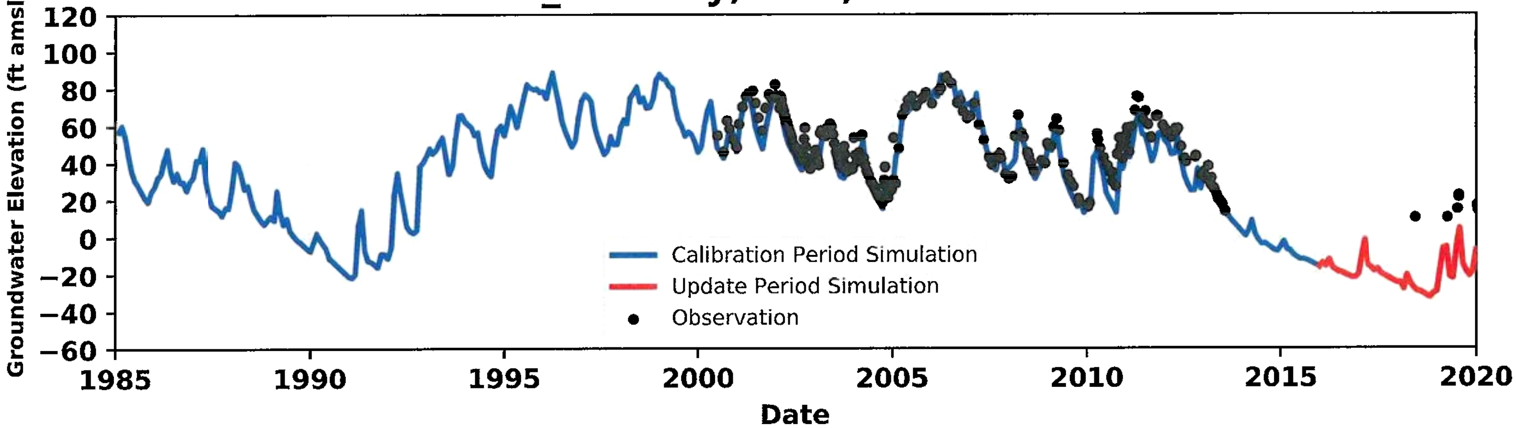

Oxnard_Forebay, UAS, 02N22W23B02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Forebay, UAS, 02N22W23B07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

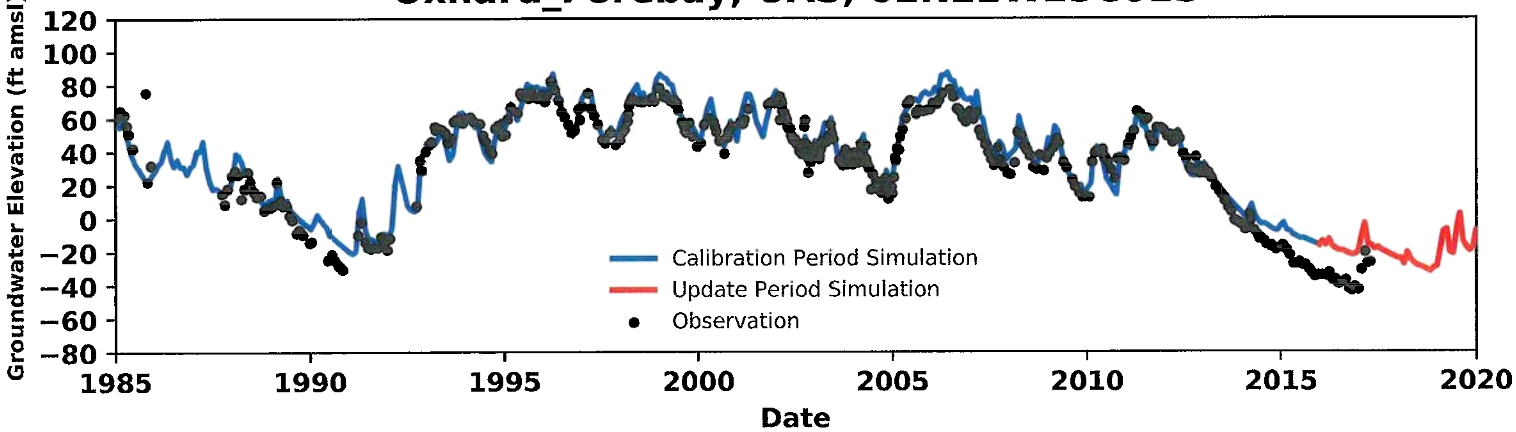
## Oxnard_Forebay, UAS, 02N22W23B08S



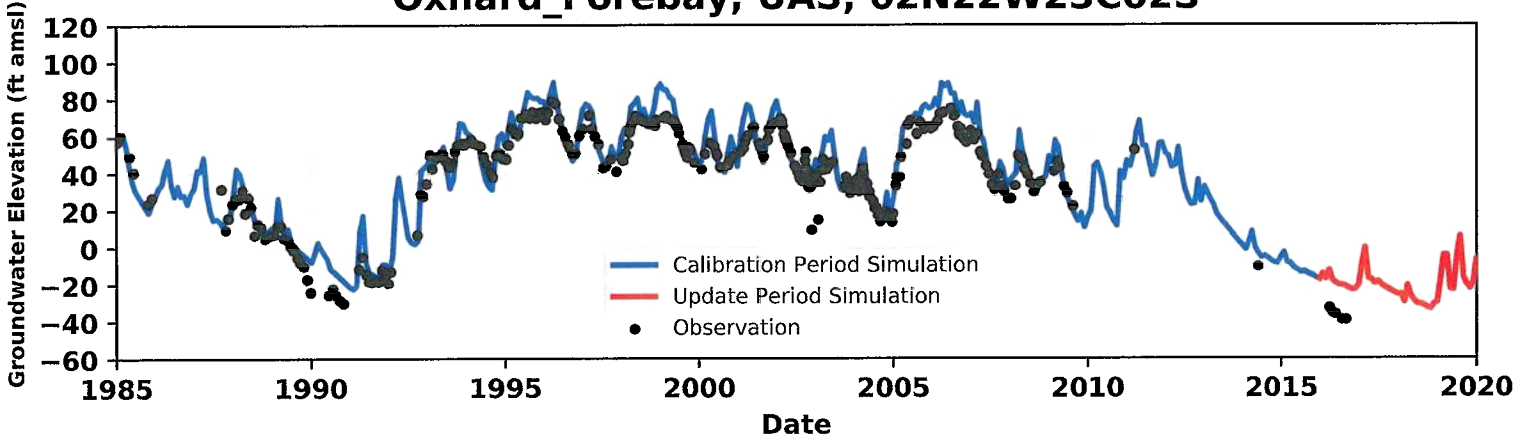

## Oxnard_Forebay, UAS, 02N22W23B09S

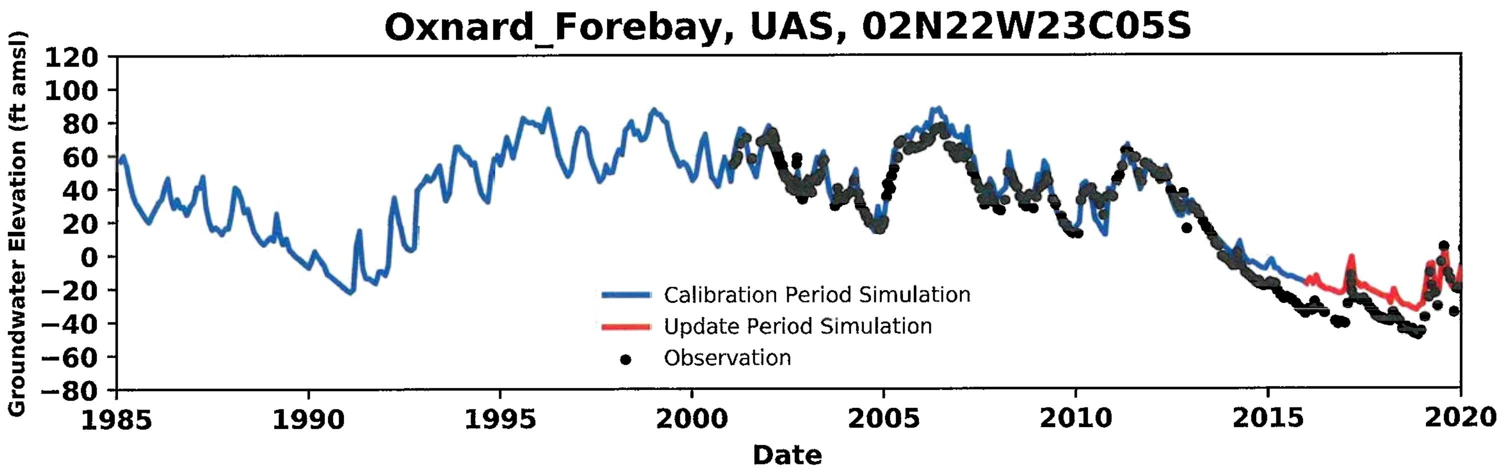


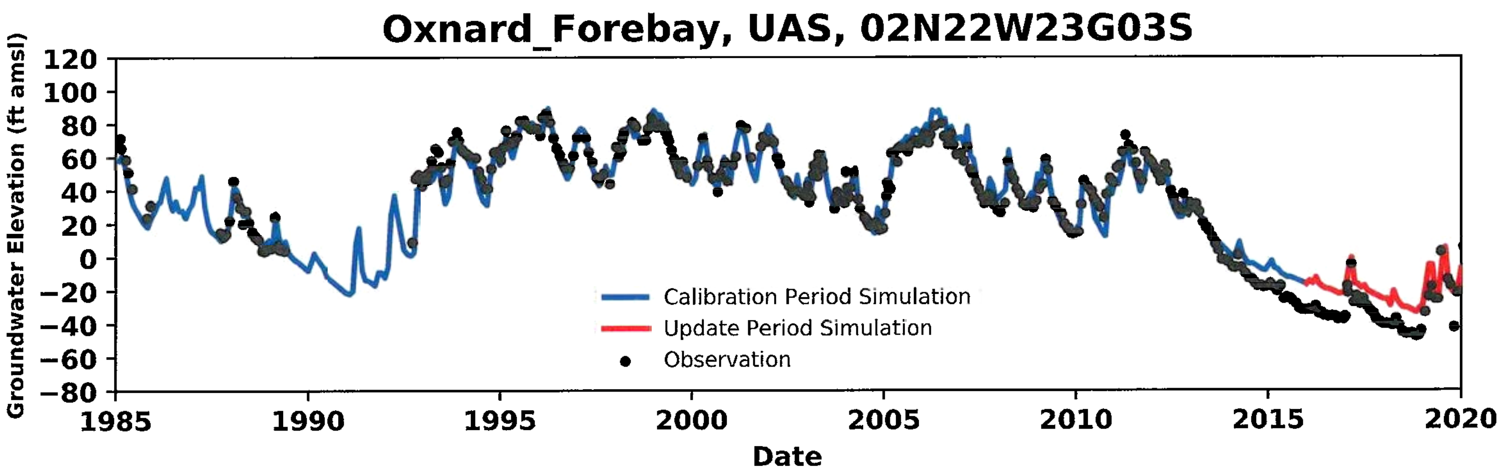

## Oxnard_Forebay, UAS, 02N22W23C01S

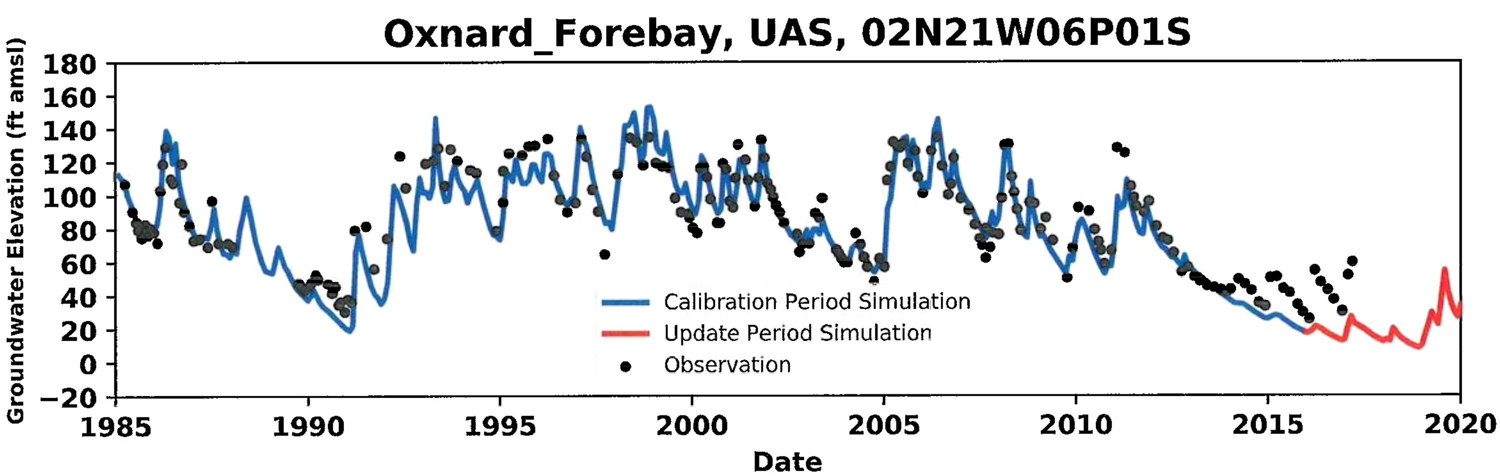


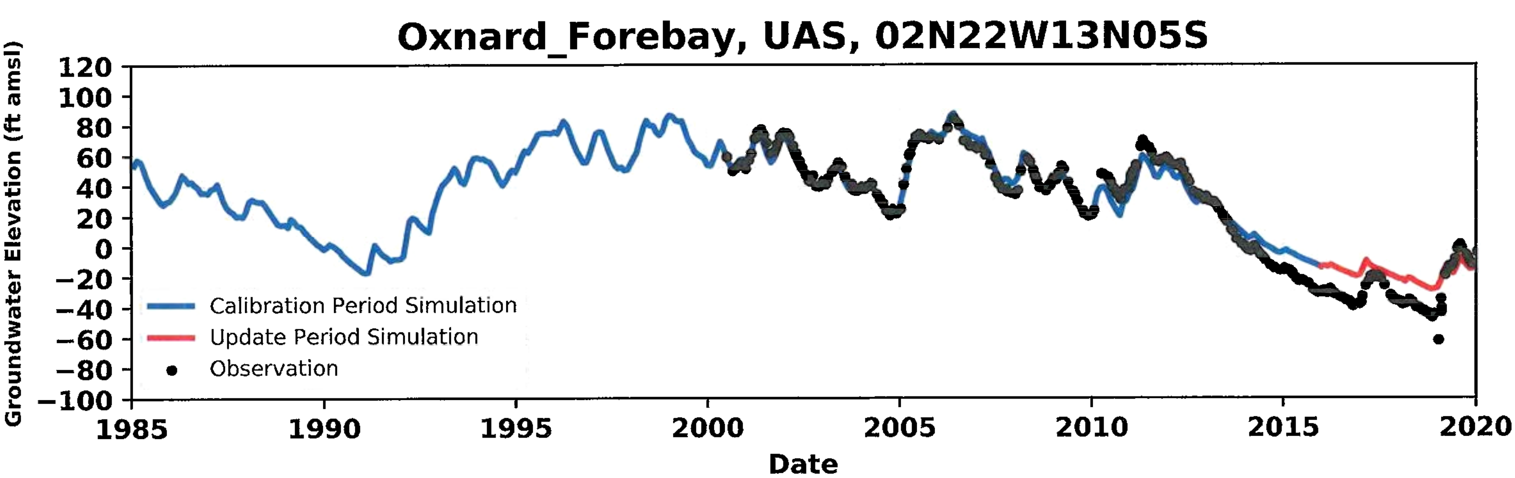

## Oxnard_Forebay, UAS, 02N22W23C02S

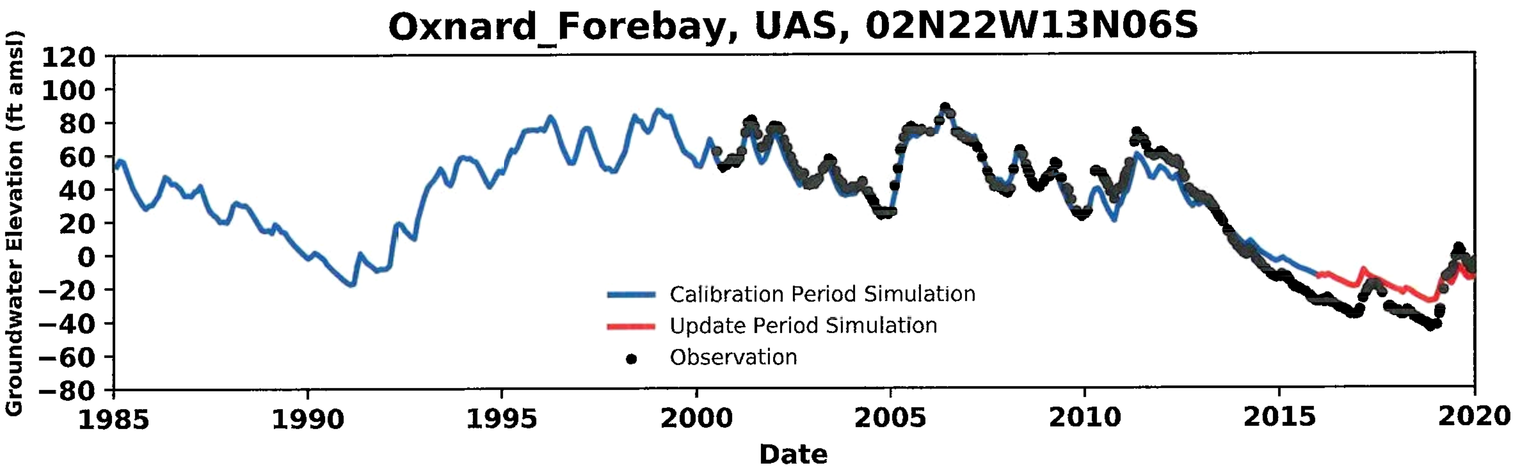


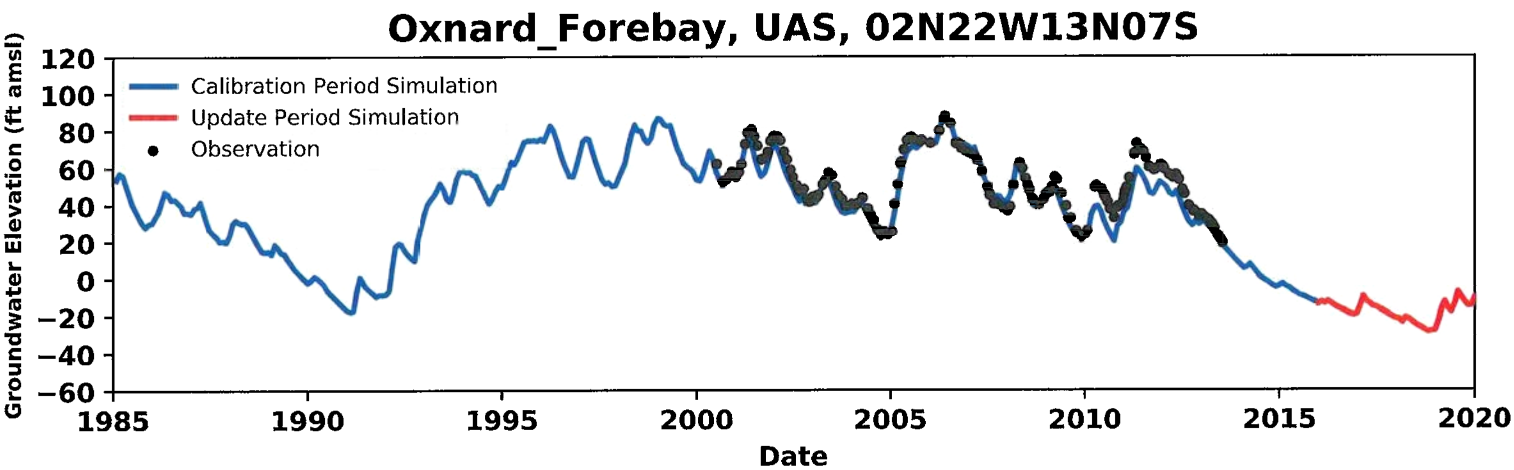

Oxnard_Forebay, UAS, 02N22W23C05S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

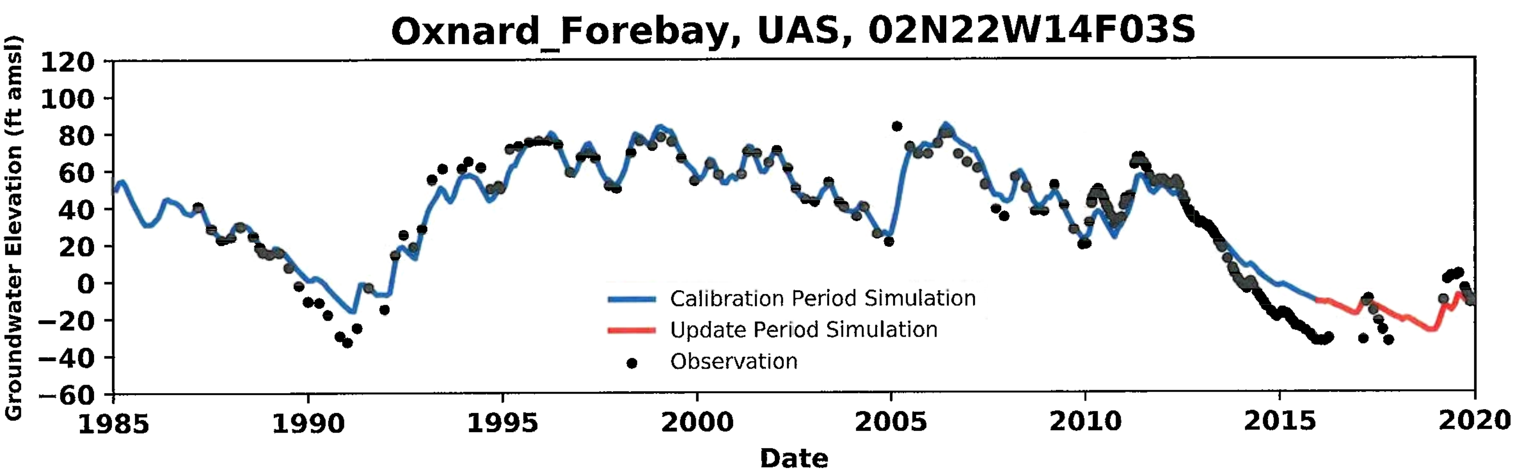

Oxnard_Forebay, UAS, 02N22W23G03S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

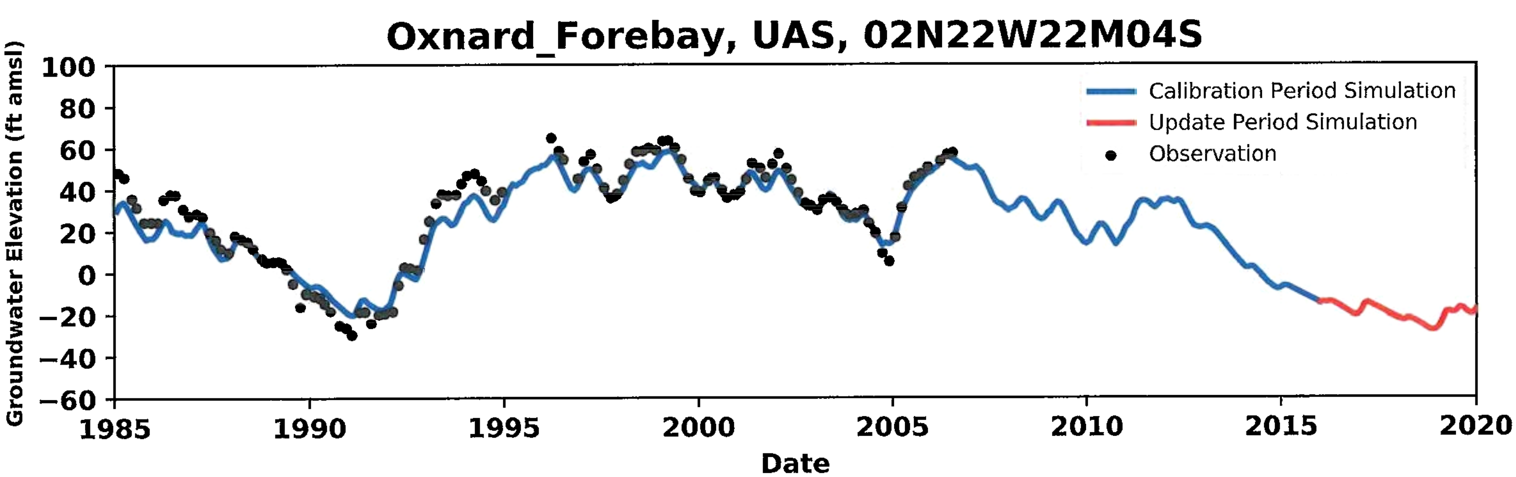

Oxnard_Forebay, UAS, 02N21W06P01S
Groundwater Elevation (ft amsl)
180
160
140
120
100
80
60
40
20
0
−20
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

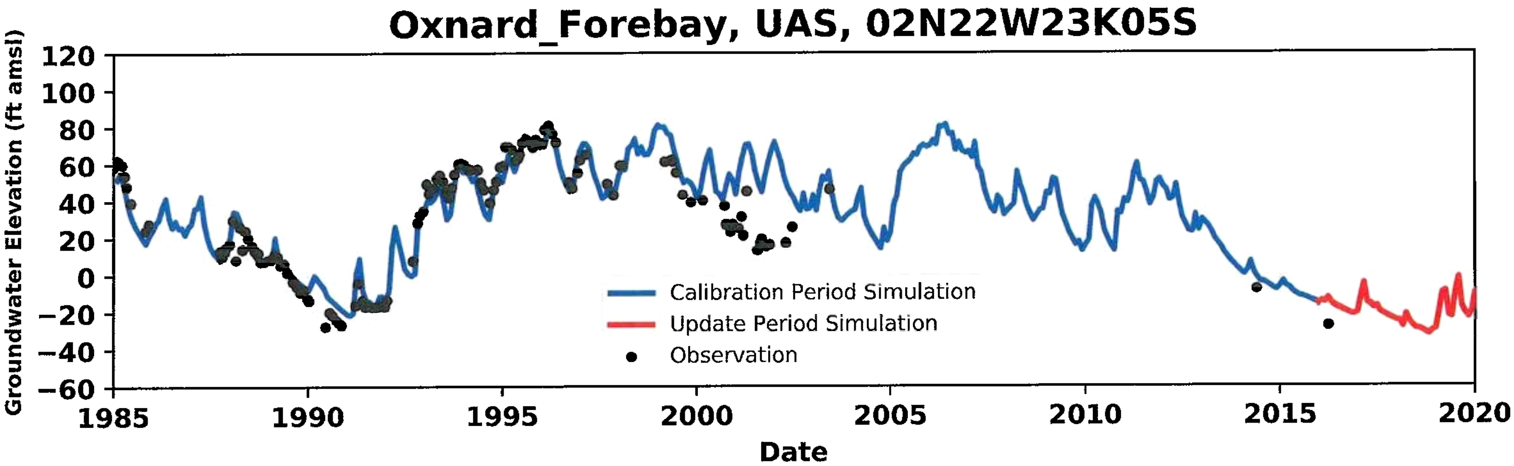

Oxnard_Forebay, UAS, 02N22W13N05S
Groundwater Elevation (ft amsl)
120
100
80
60
40
20
0
−20
−40
−60
−80
−100
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

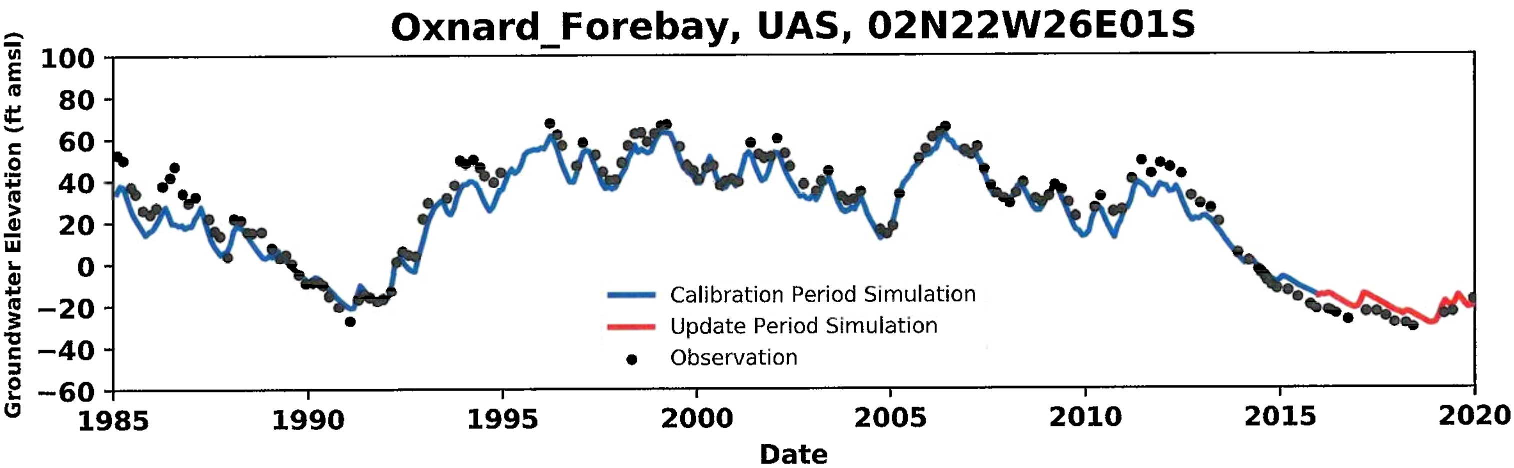

Oxnard_Forebay, UAS, 02N22W13N06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

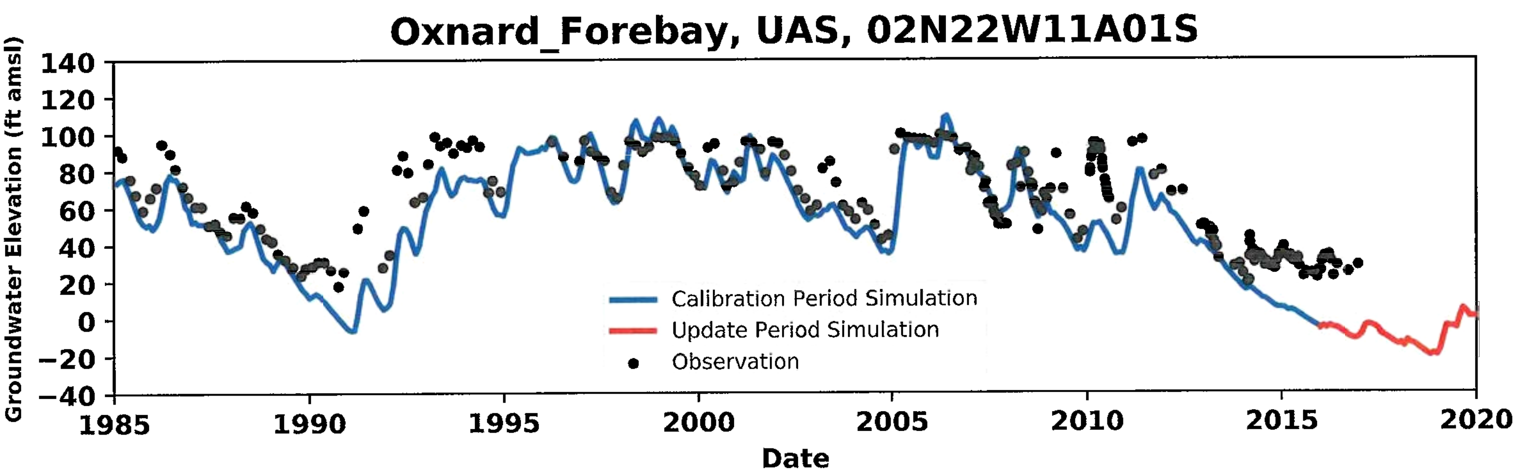

Oxnard_Forebay, UAS, 02N22W13N07S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

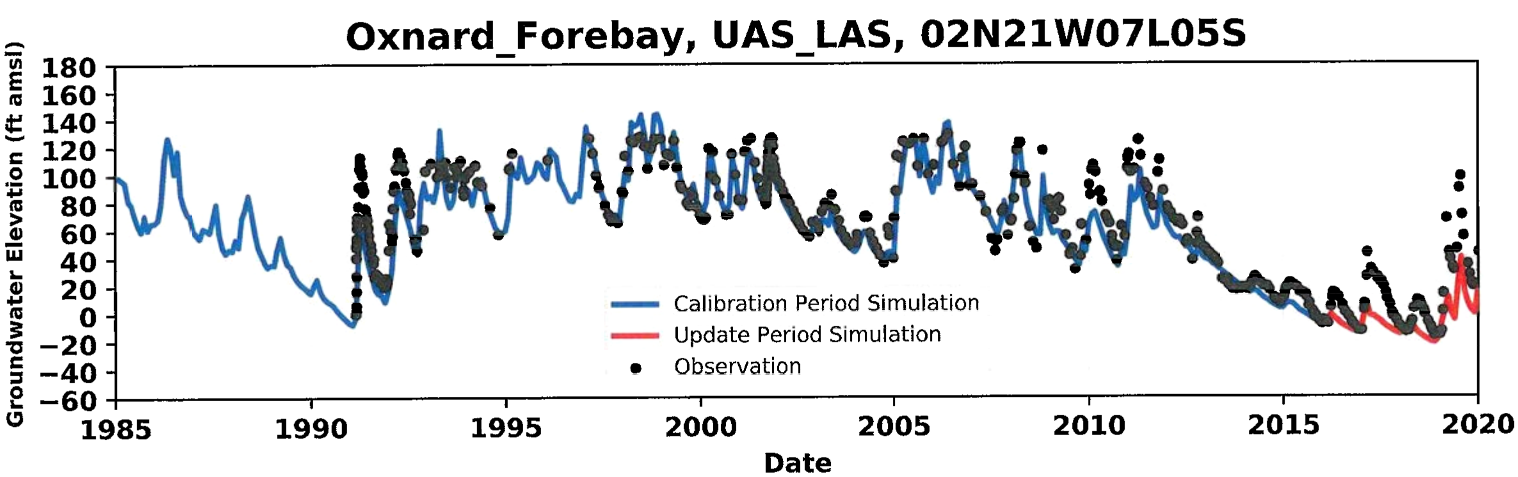

Oxnard_Forebay, UAS, 02N22W14F03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

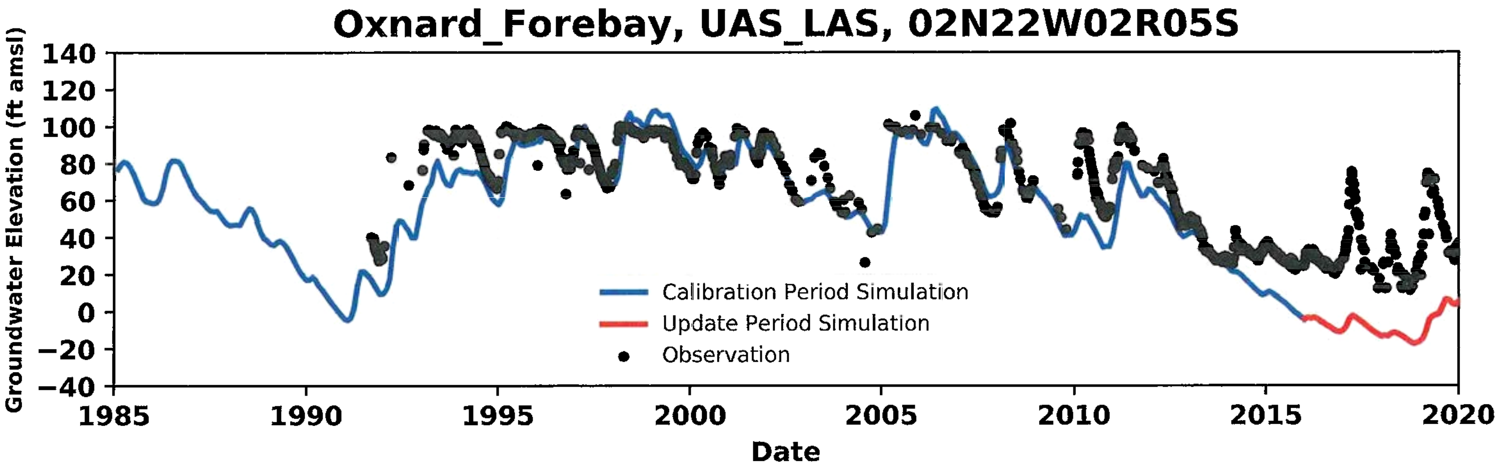

Oxnard_Forebay, UAS, 02N22W22M04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

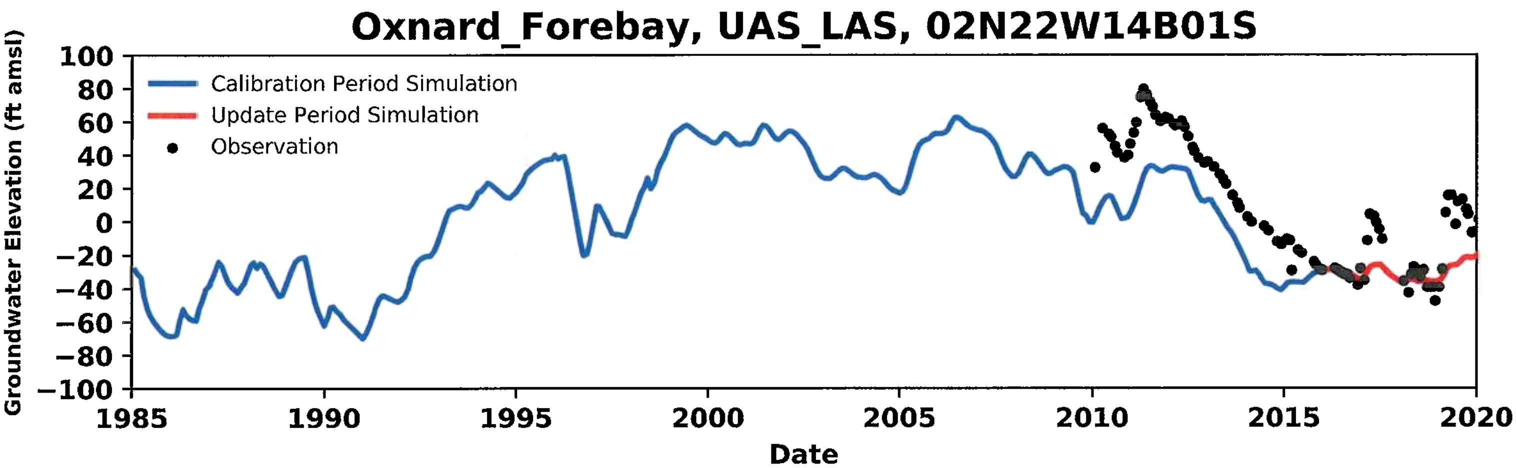

Oxnard_Forebay, UAS, 02N22W23K05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

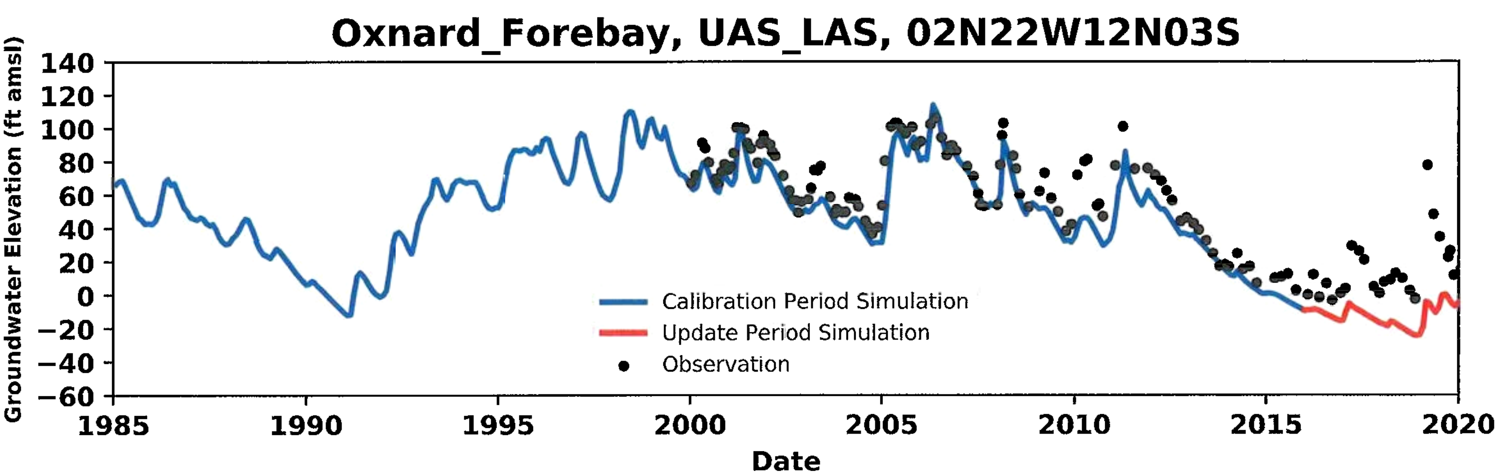

Oxnard_Forebay, UAS, 02N22W26E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

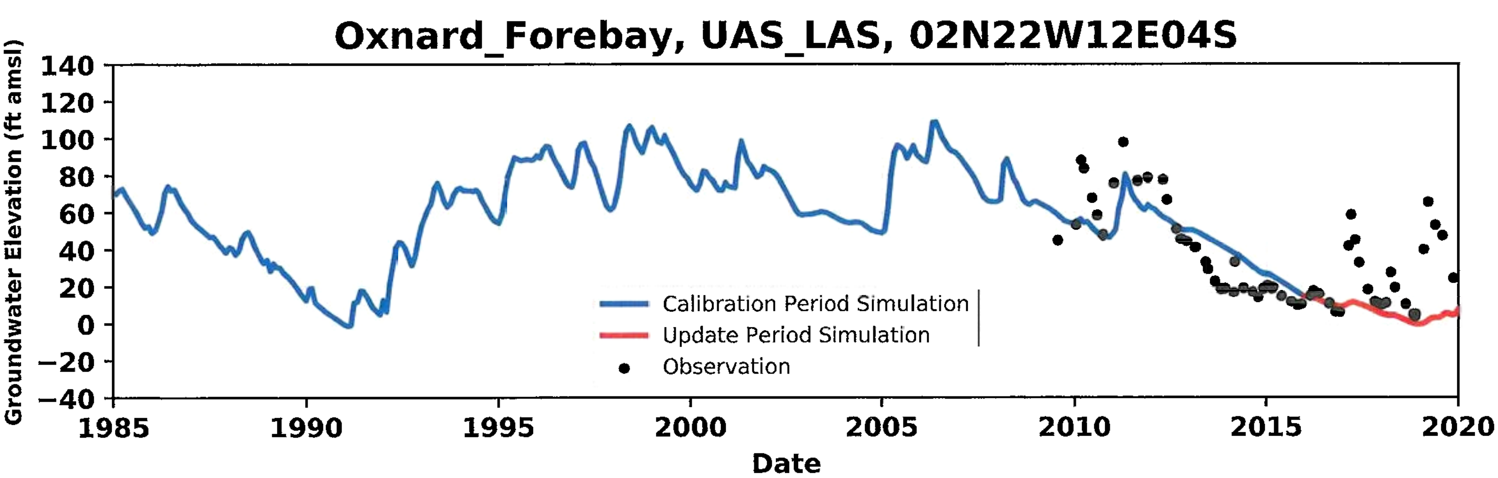

Oxnard_Forebay, UAS, 02N22W11A01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

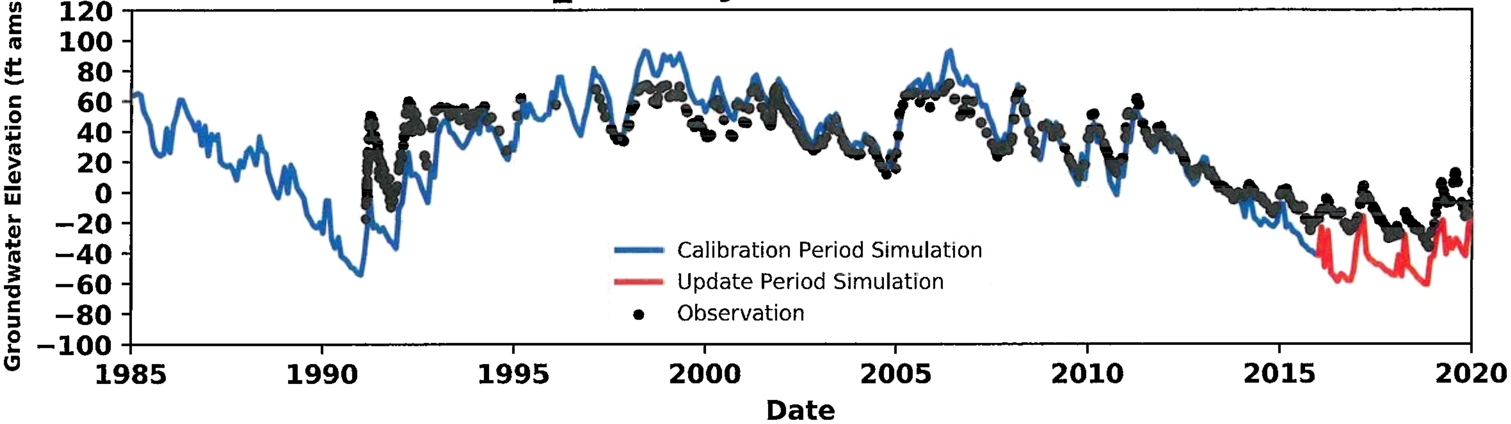

Oxnard_Forebay, UAS_LAS, 02N22W02R05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

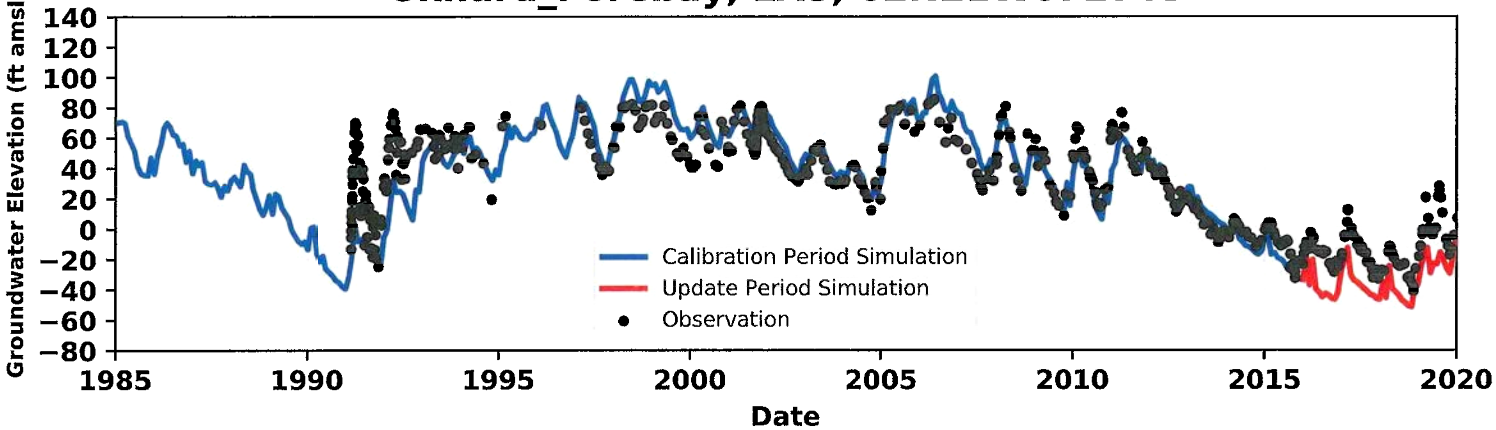

Oxnard_Forebay, UAS_LAS, 02N22W12N03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

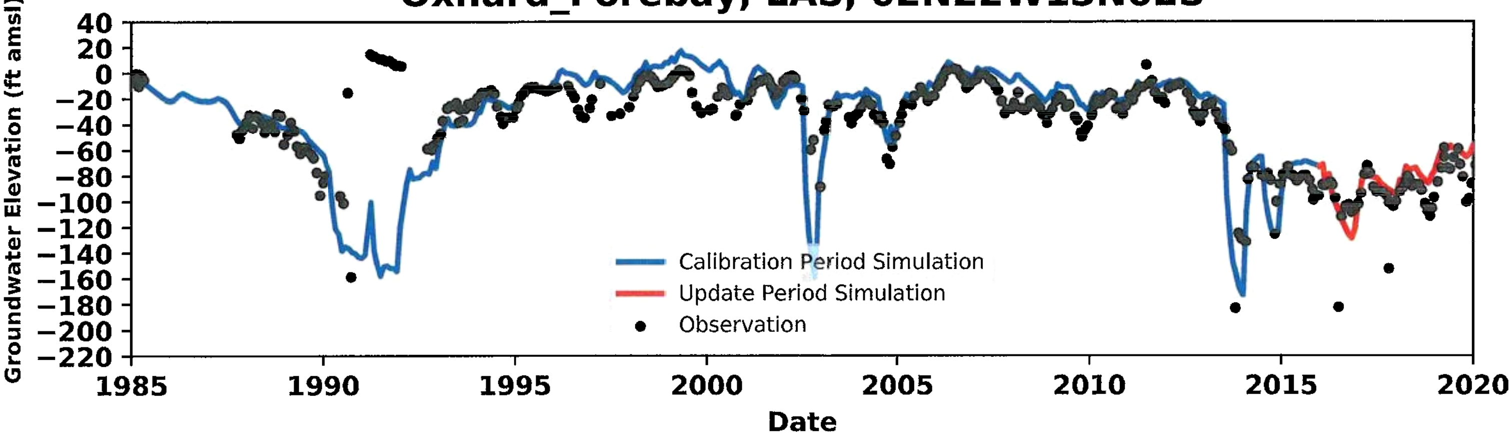
## Oxnard_Forebay, LAS, 02N21W07L03S



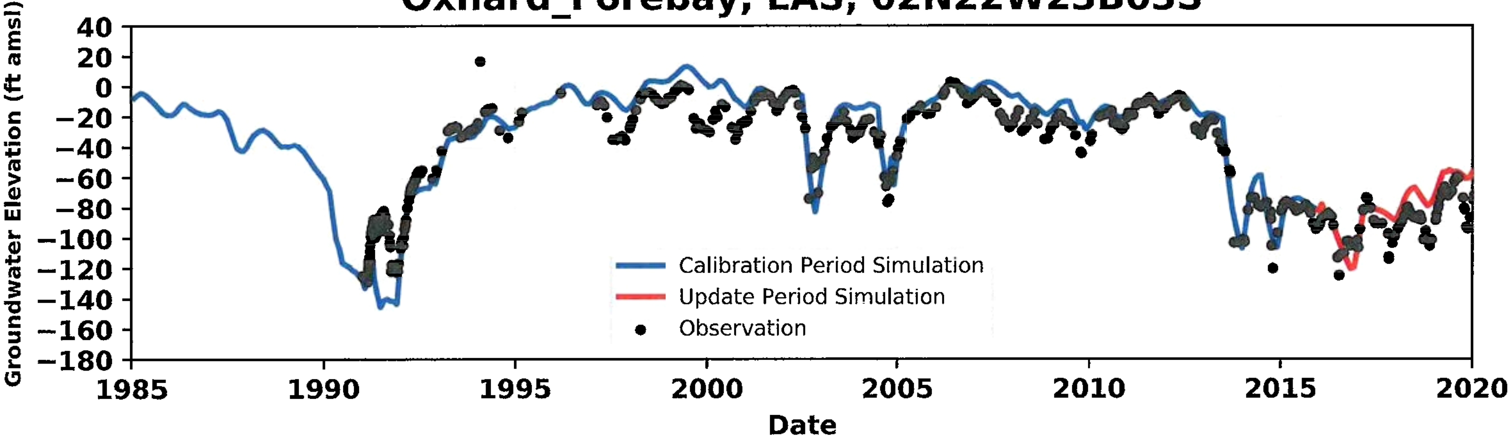

## Oxnard_Forebay, LAS, 02N21W07L04S

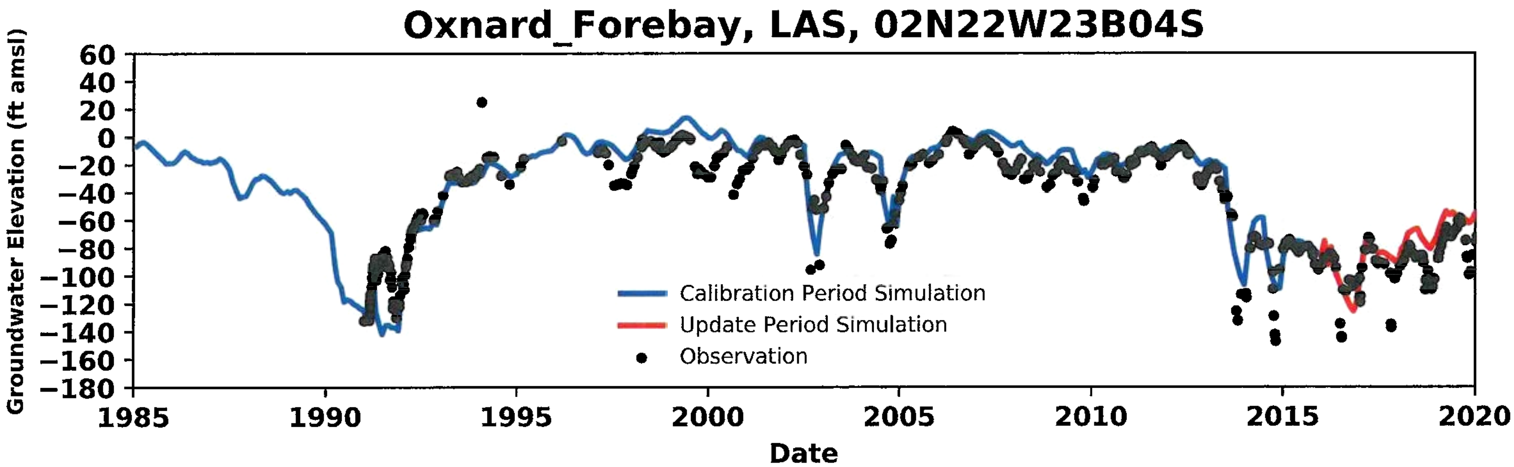



## Oxnard_Forebay, LAS, 02N22W13N02S

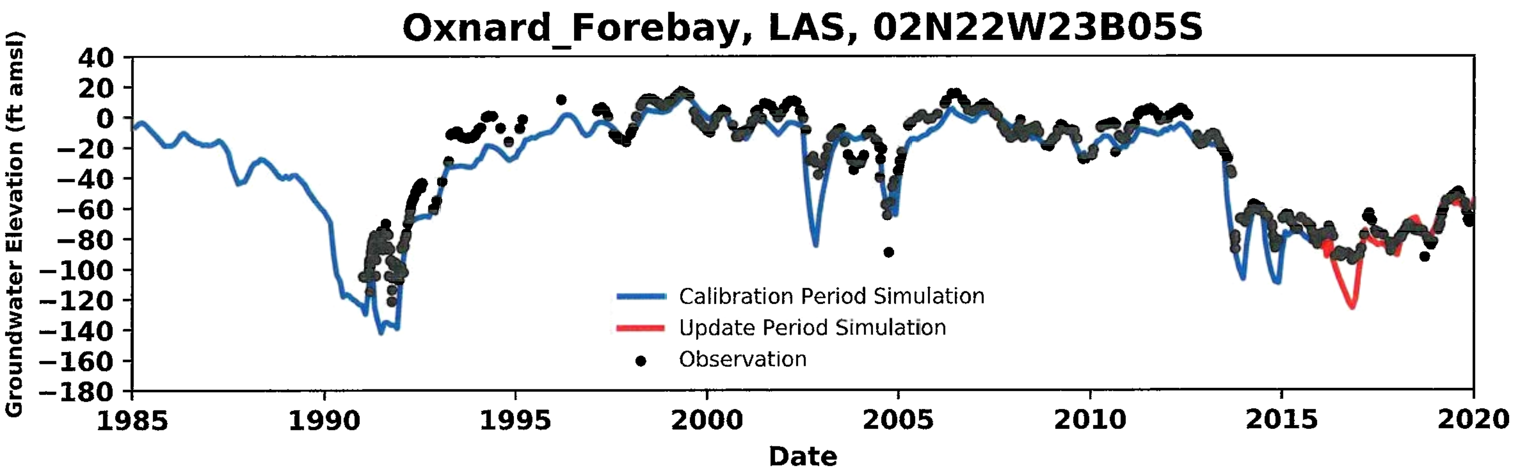



## Oxnard_Forebay, LAS, 02N22W23B03S

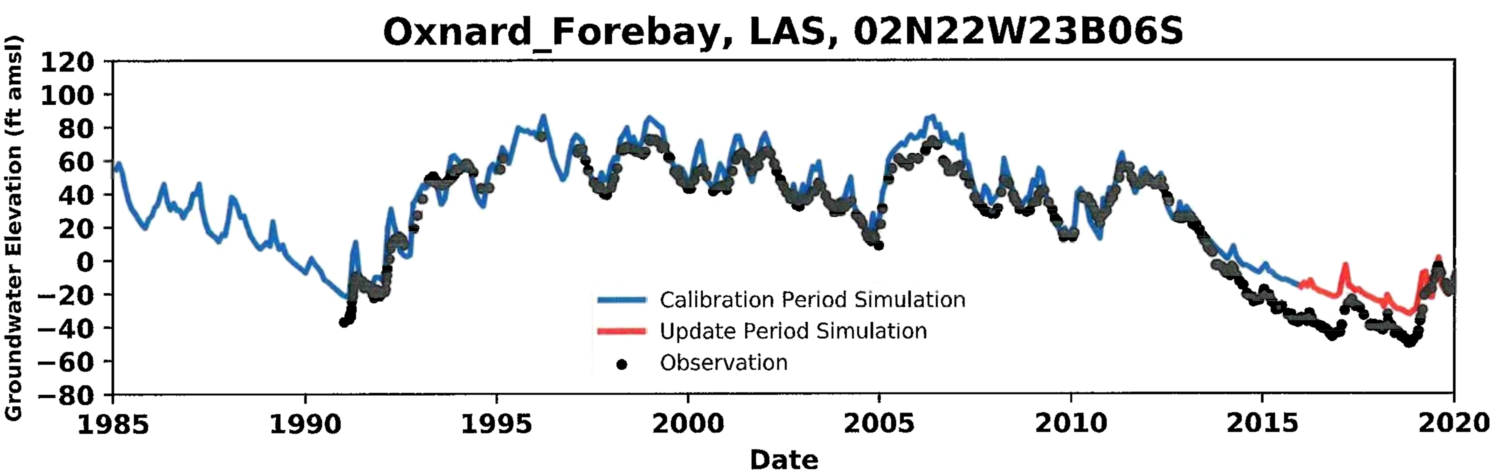




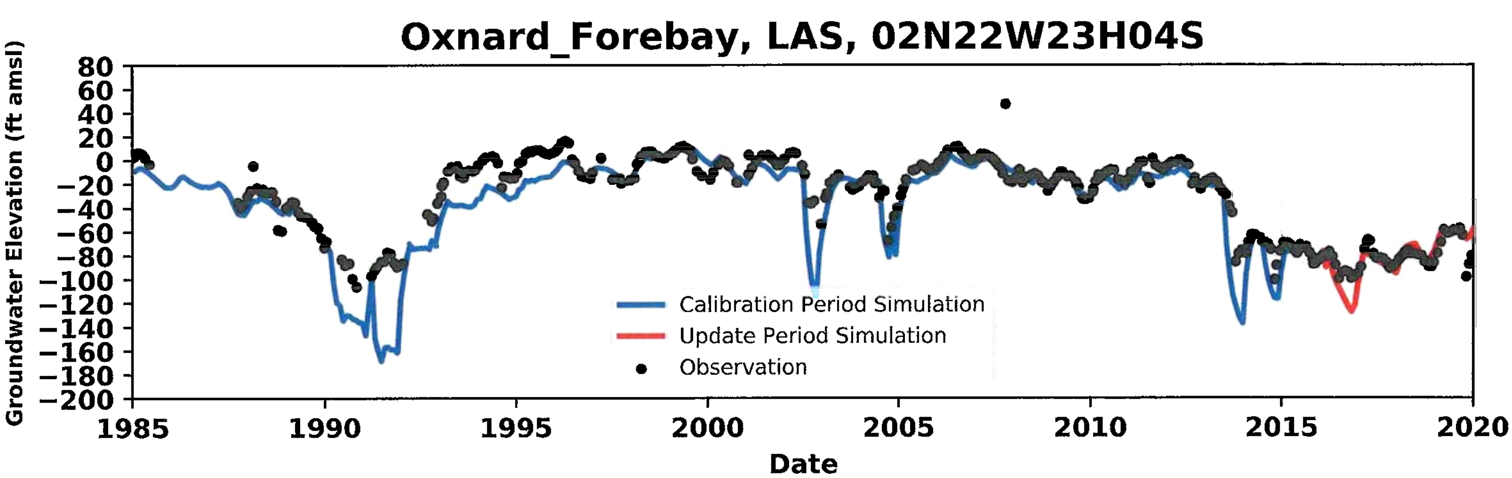
Oxnard_Forebay, LAS, 02N22W23B04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

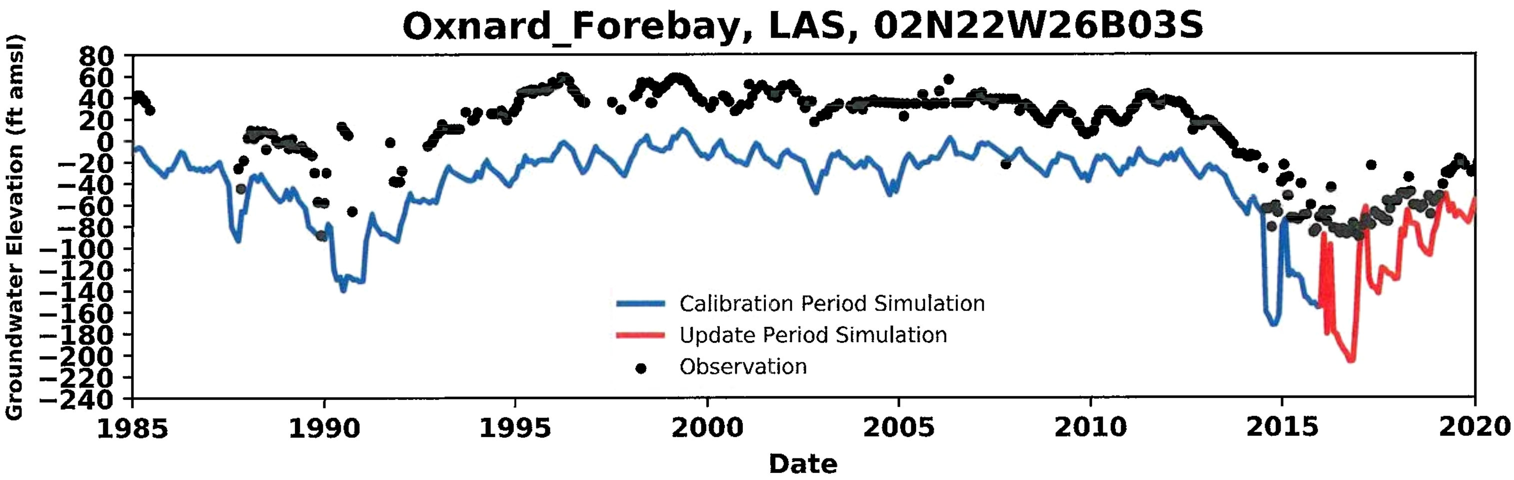
Oxnard_Forebay, LAS, 02N22W23B05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

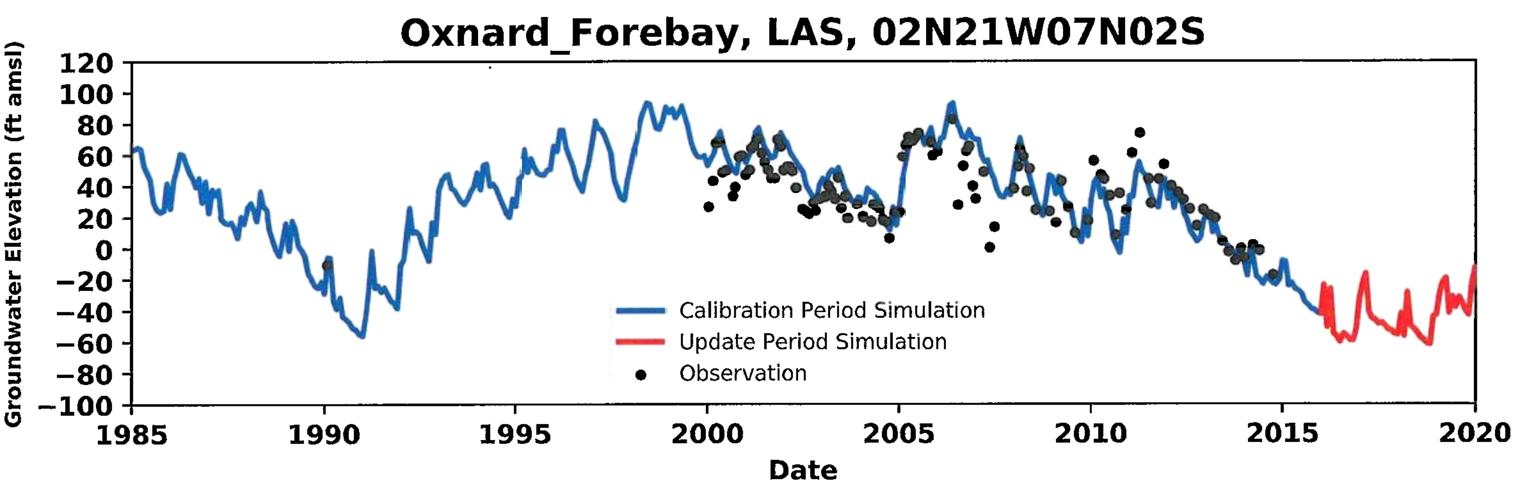



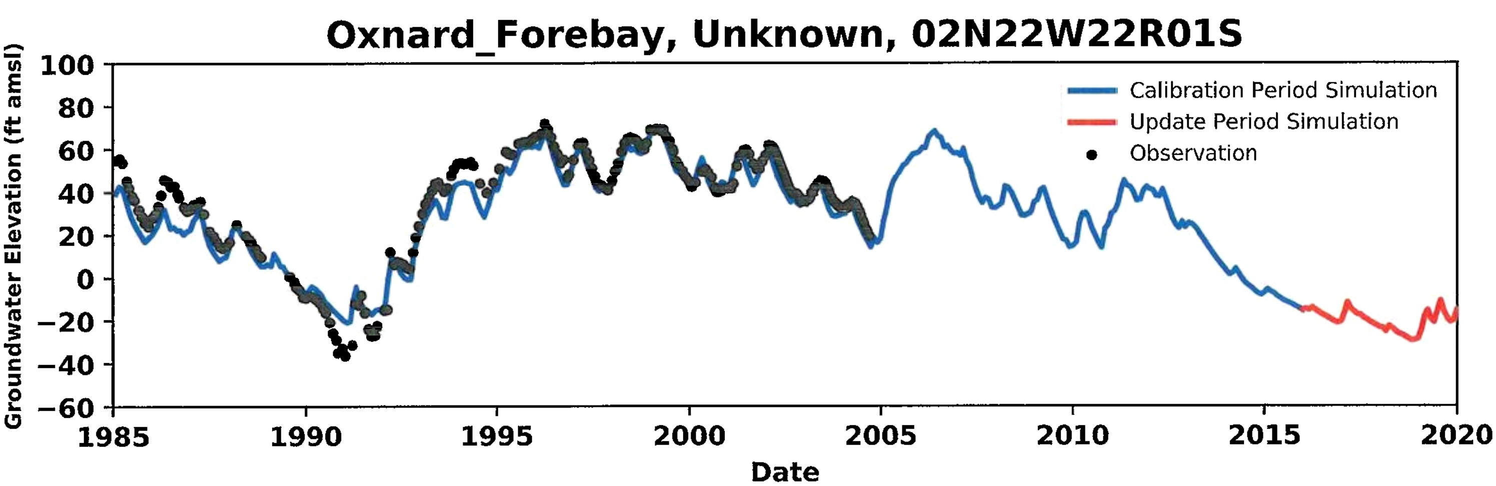
Oxnard_Forebay, LAS, 02N22W23B06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

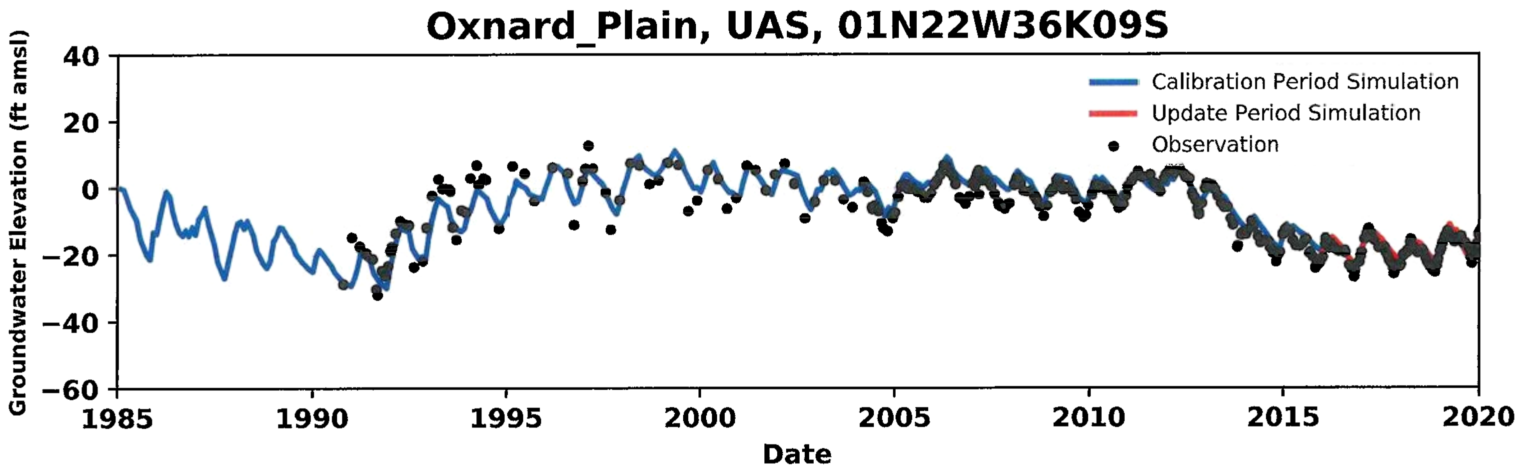



Oxnard_Forebay, LAS, 02N22W23H04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

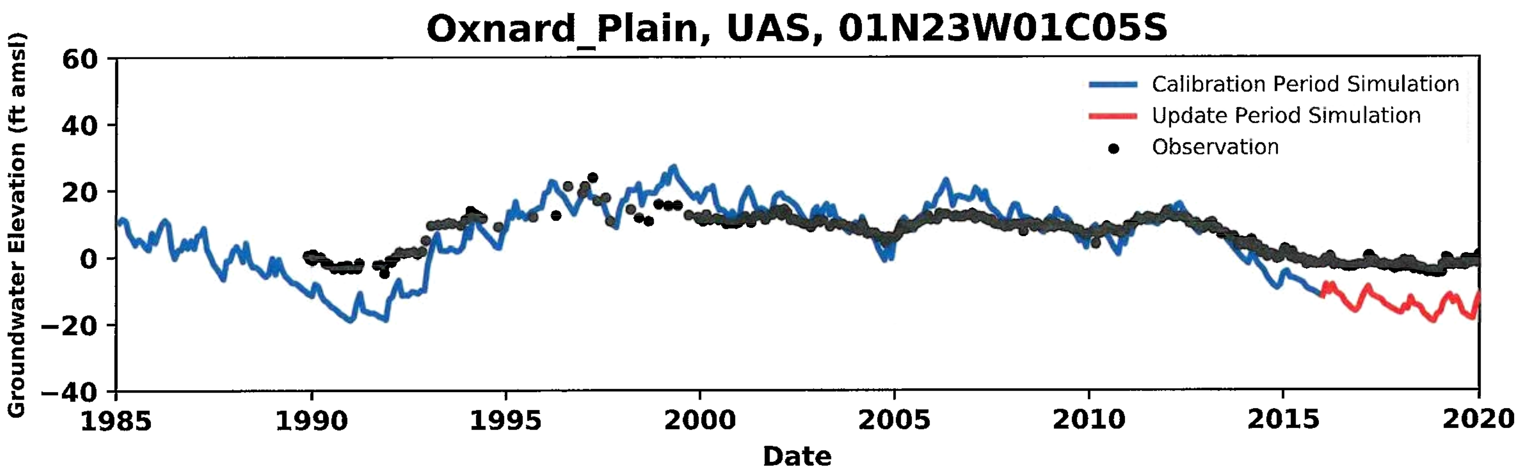

Oxnard_Forebay, LAS, 02N22W26B03S
Groundwater Elevation (ft amsl)
80
60
40
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
−220
−240
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Forebay, LAS, 02N21W07N02S
Groundwater Elevation (ft amsl)
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

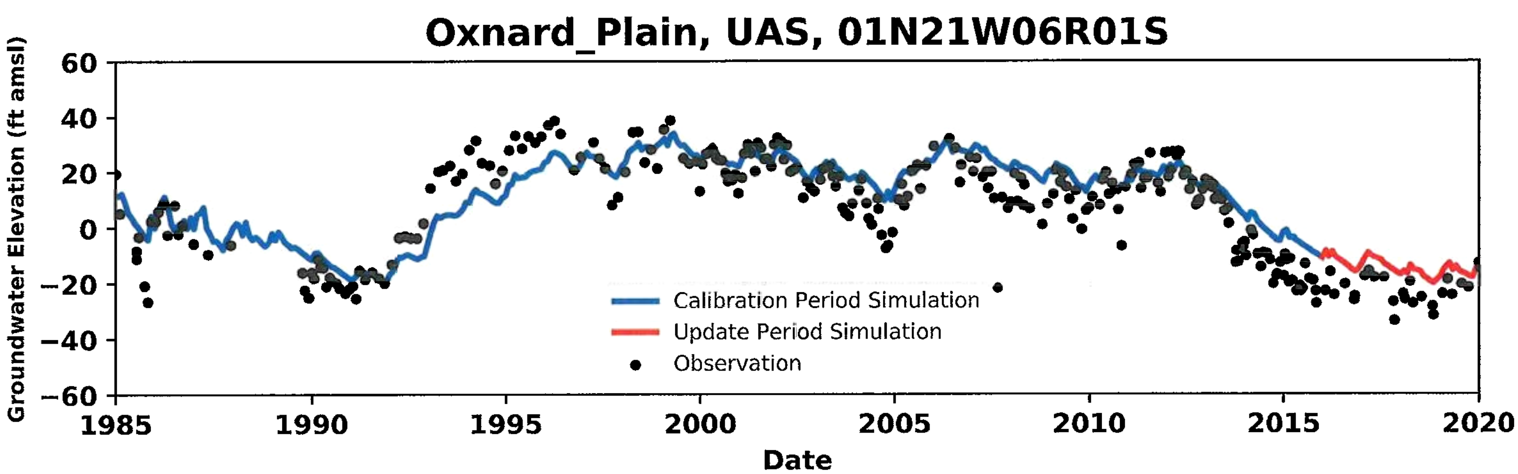

Oxnard_Forebay, Unknown, 02N22W22R01S
Groundwater Elevation (ft amsl)
100
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



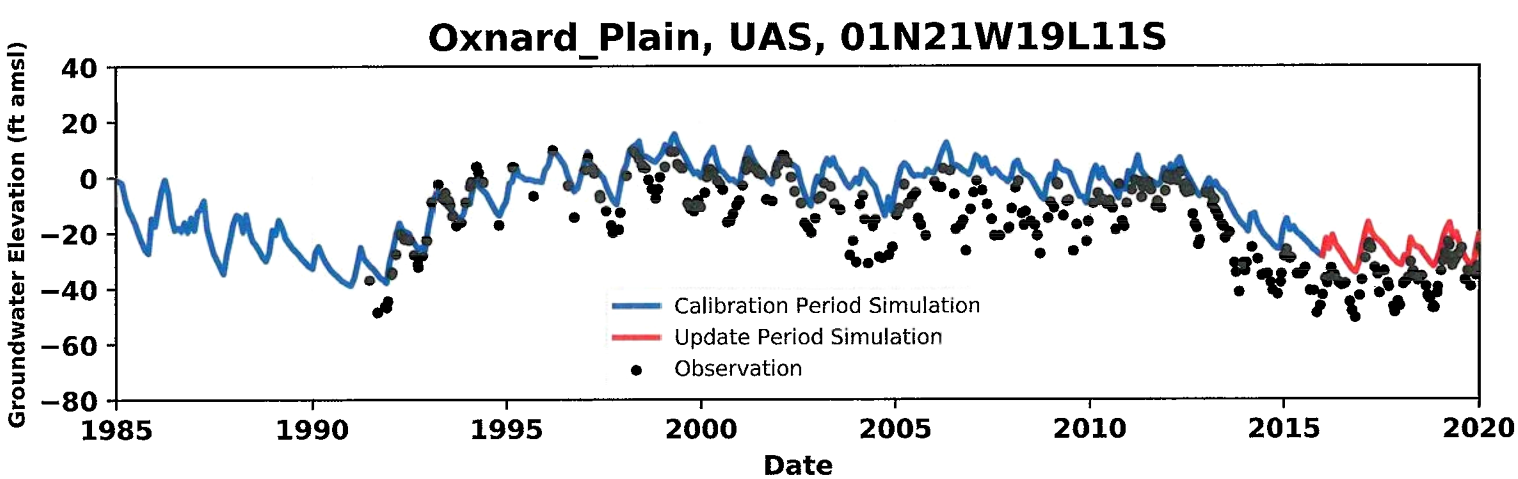
Oxnard_Plain, UAS, 01N22W36K09S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

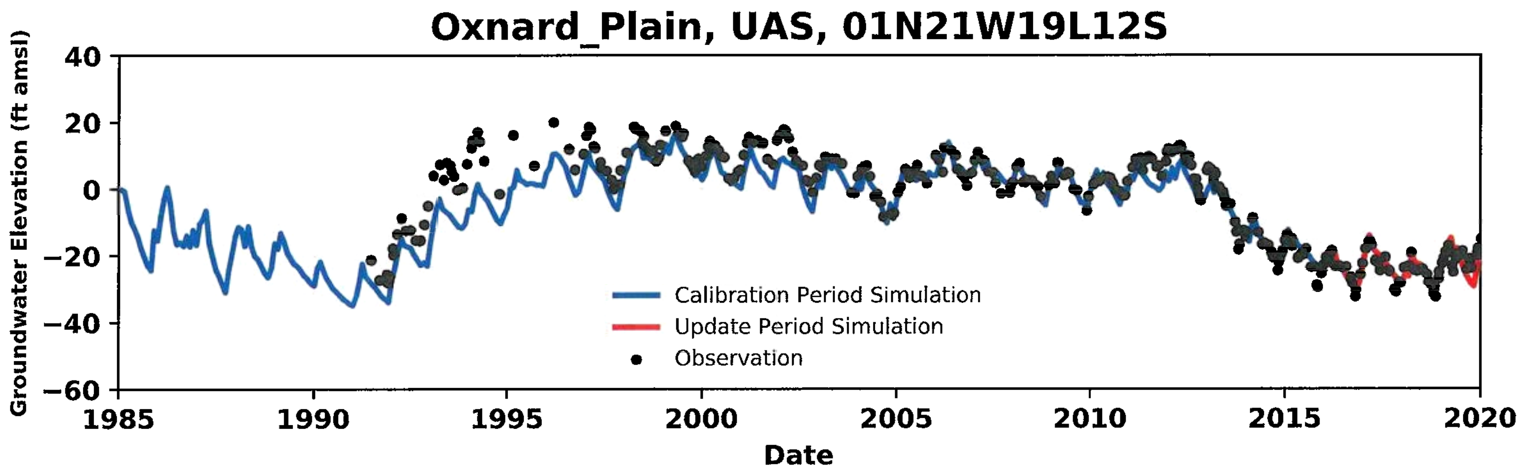
Oxnard_Plain, UAS, 01N23W01C05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

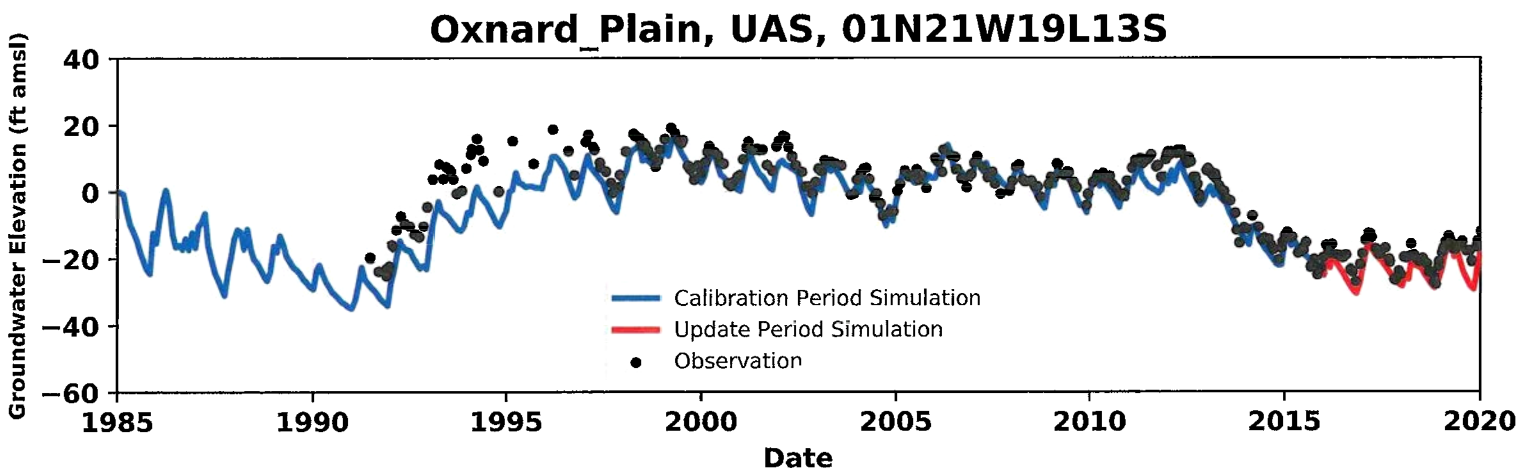



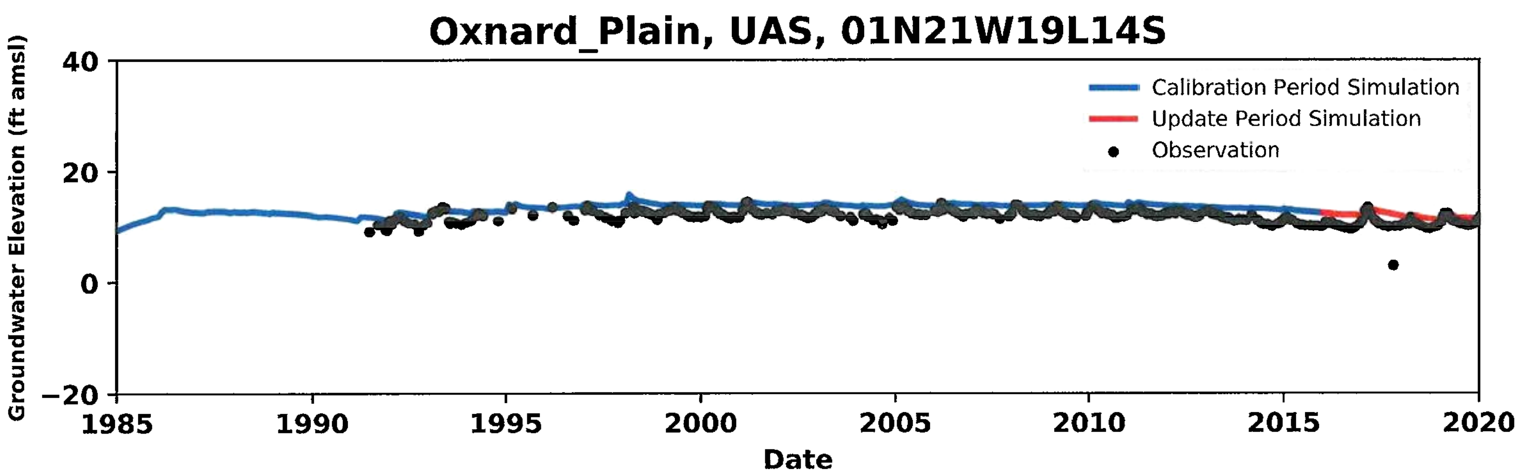
Oxnard_Plain, UAS, 01N21W06R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

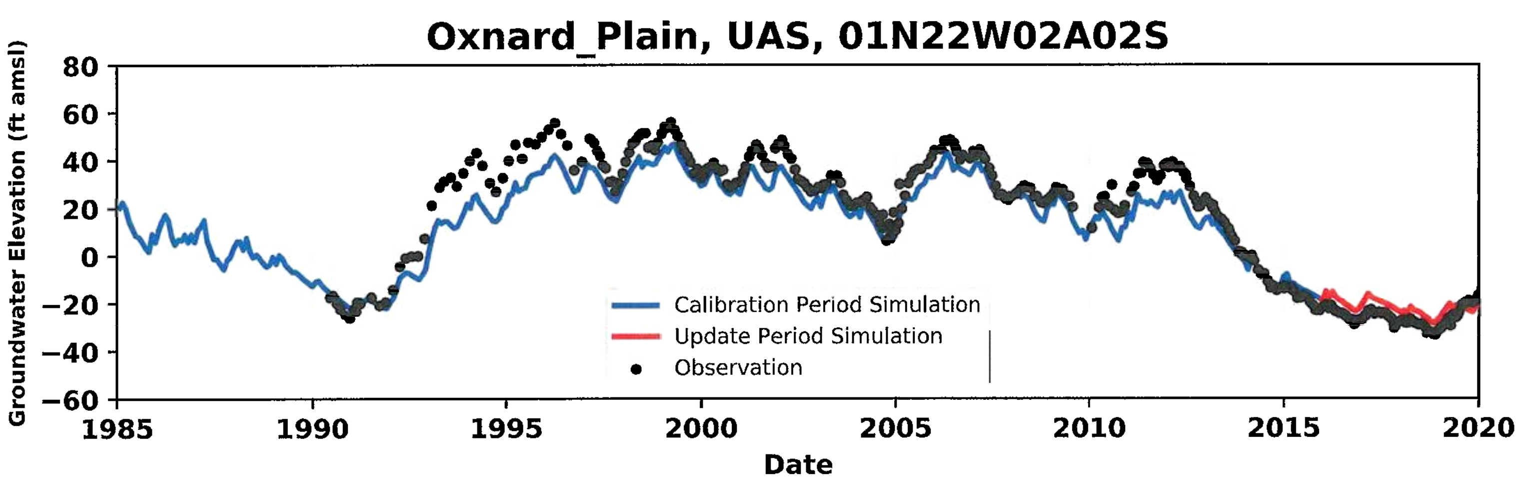



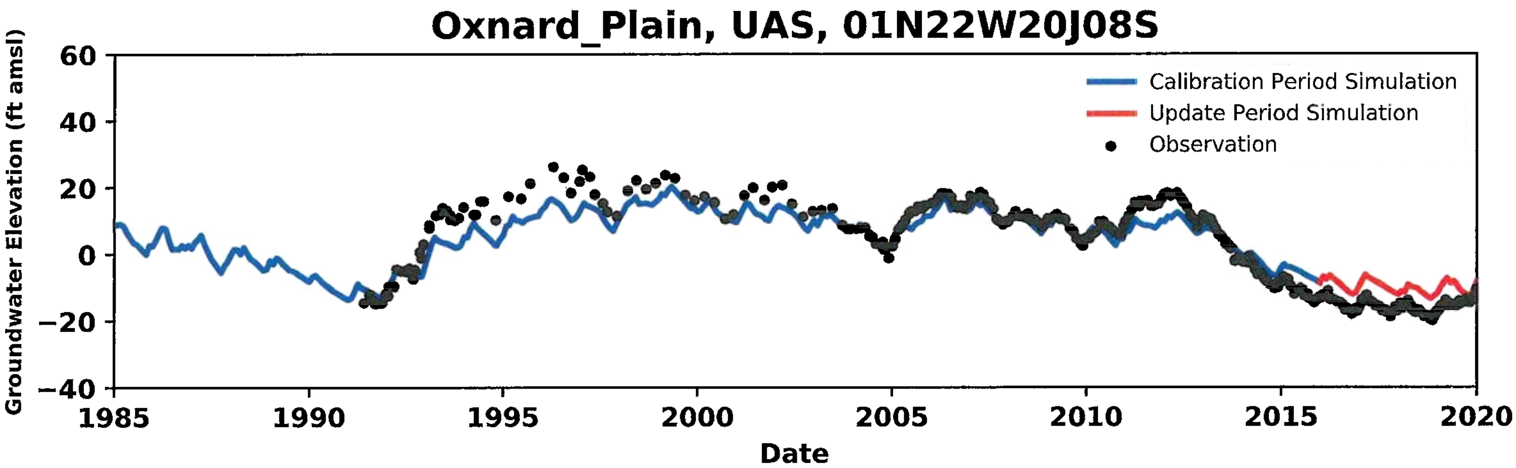
Oxnard_Plain, UAS, 01N21W19L11S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N21W19L12S
Groundwater Elevation (ft amsl)
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

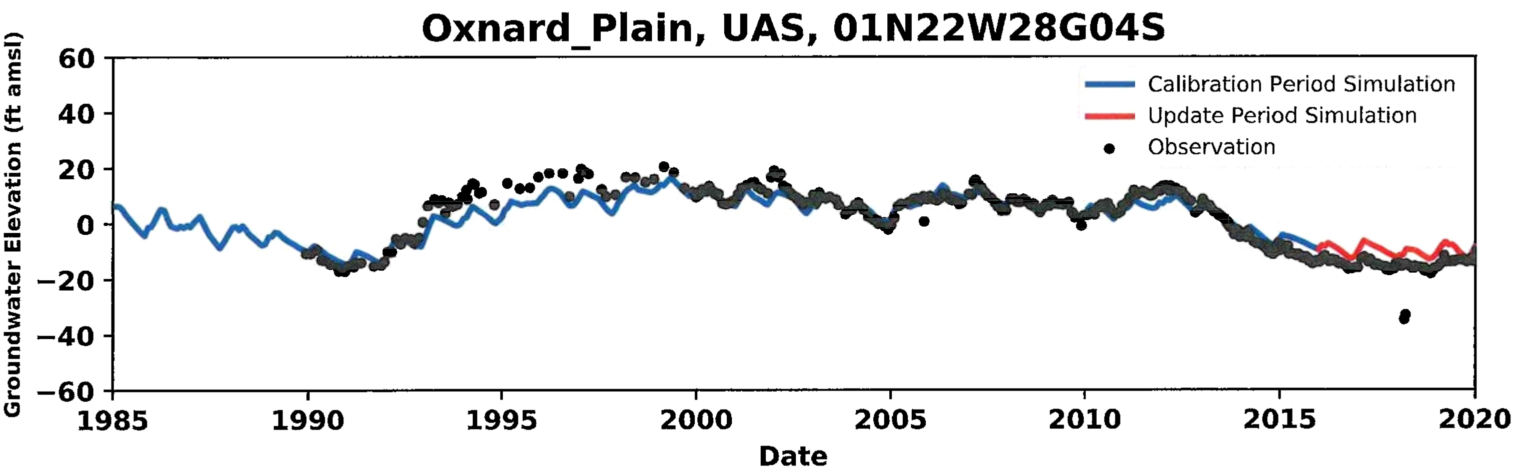

Oxnard_Plain, UAS, 01N21W19L13S
Groundwater Elevation (ft amsl)
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N21W19L14S
Groundwater Elevation (ft amsl)
40
20
0
−20
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

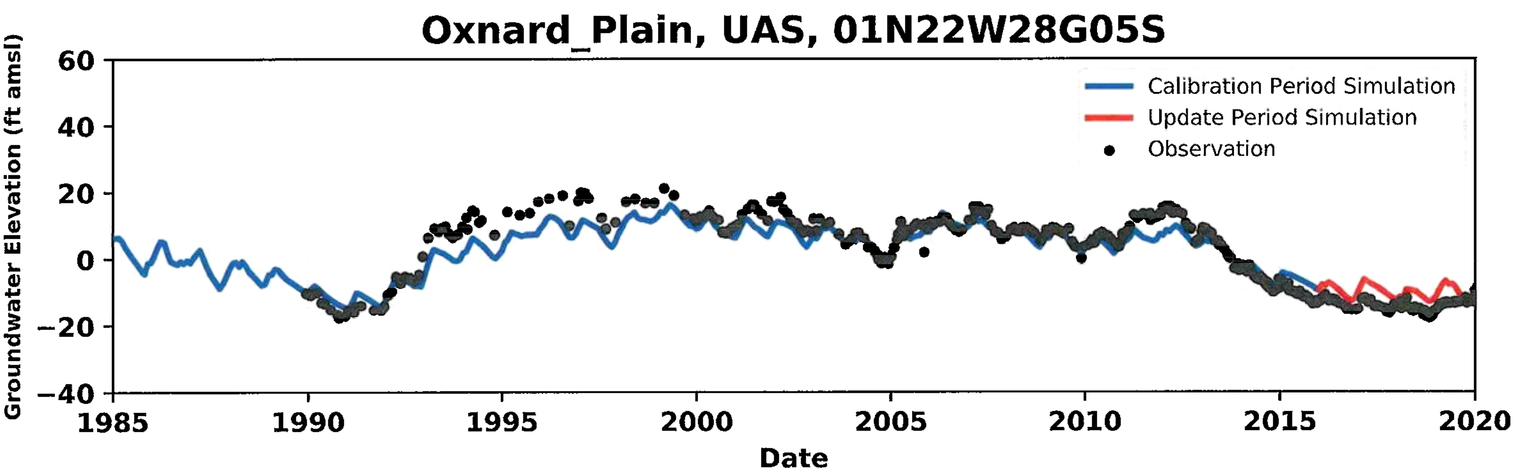

Oxnard_Plain, UAS, 01N22W02A02S
Groundwater Elevation (ft amsl)
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation



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

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

Oxnard_Plain, UAS, 01N22W28G05S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
60
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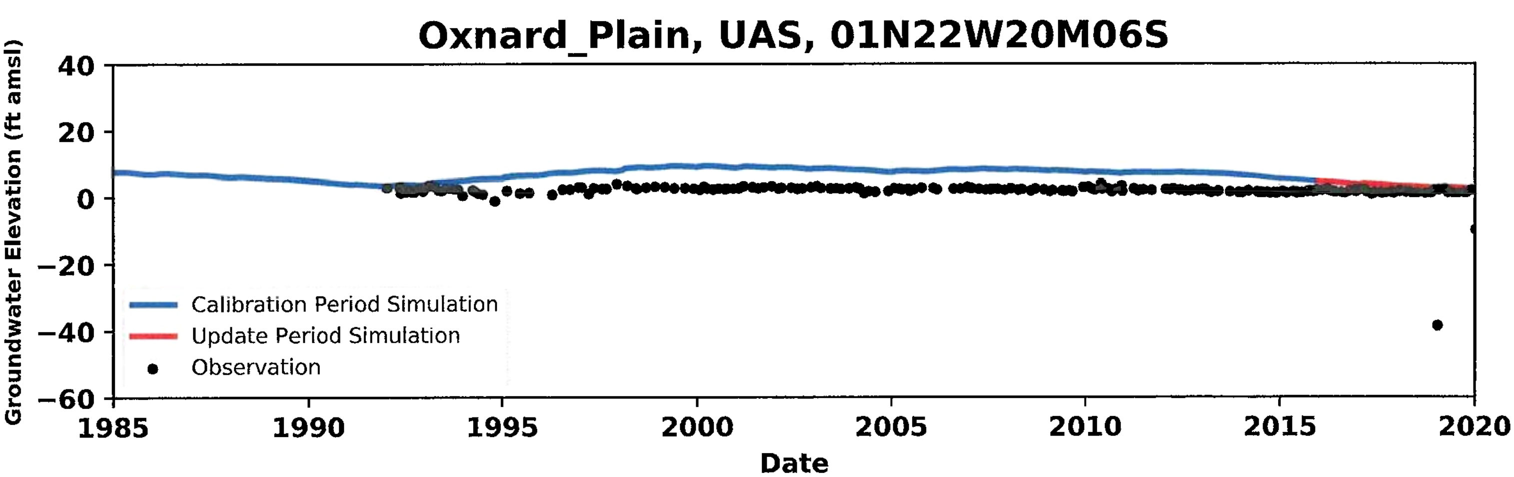
2020
Date

Oxnard_Plain, UAS, 01N22W20M06S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
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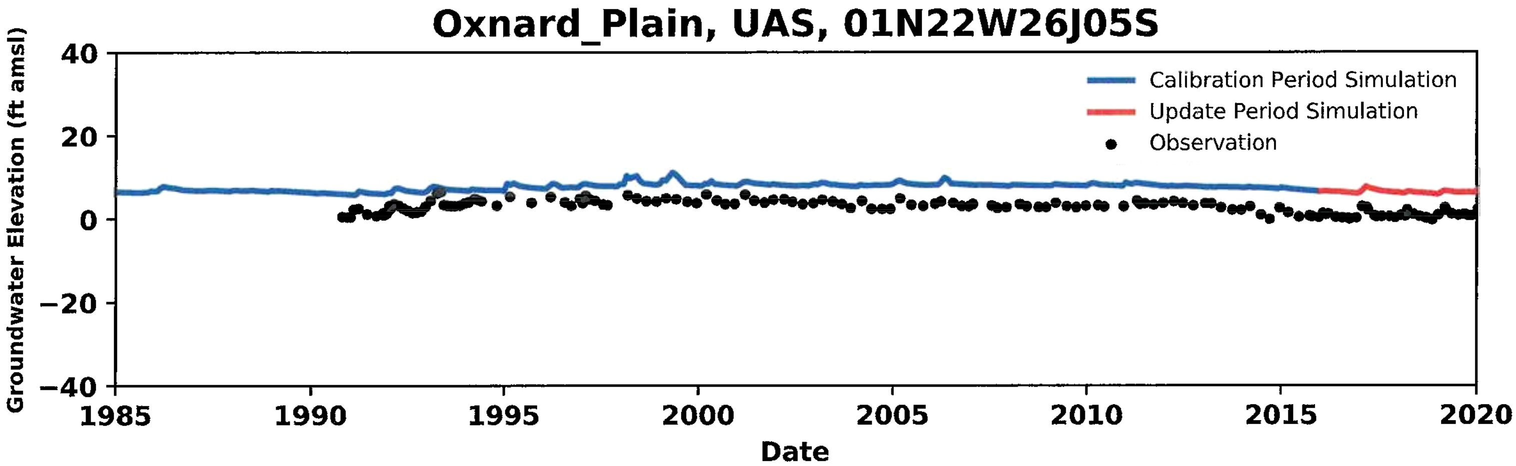
Date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Groundwater Elevation (ft amsl)
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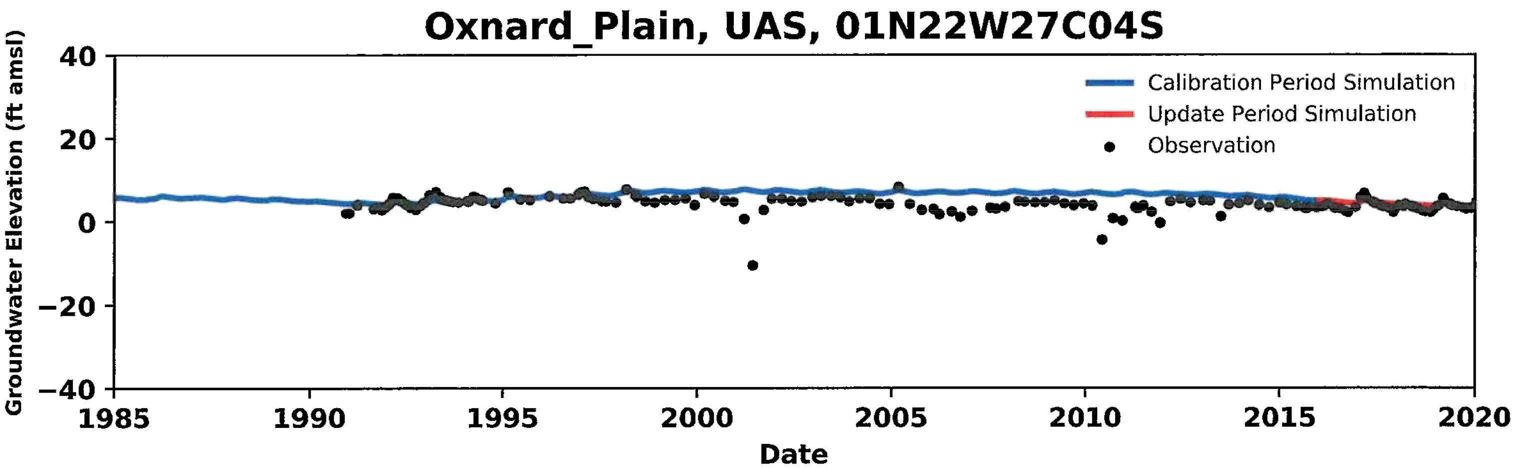
Date
Calibration Period Simulation
Update Period Simulation
Observation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Groundwater Elevation (ft amsl)
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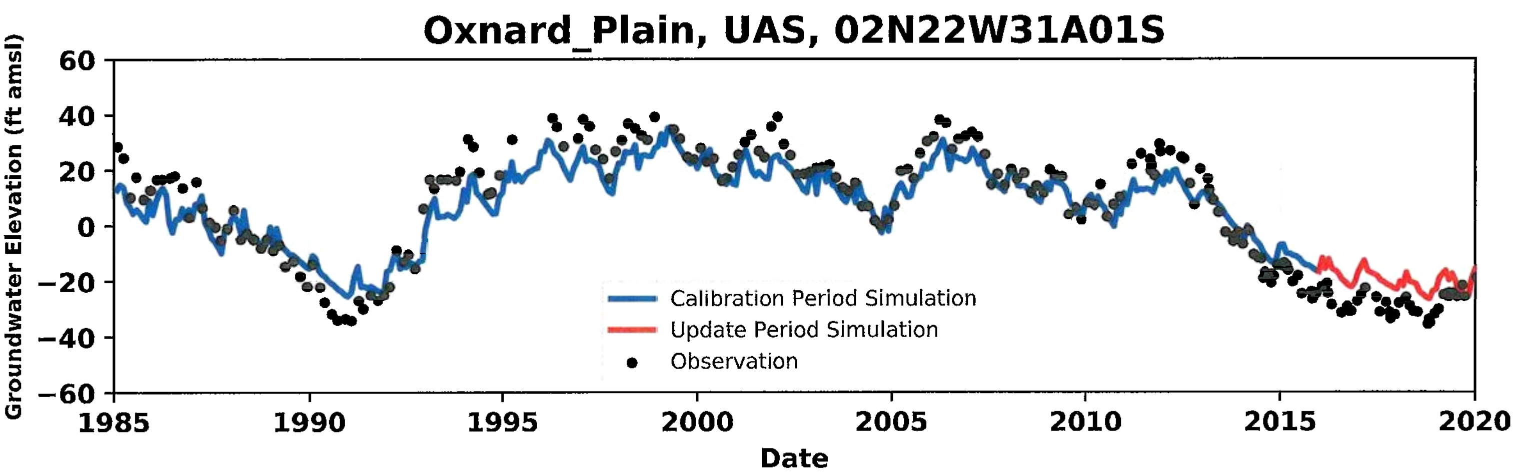
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 02N22W31A01S
Groundwater Elevation (ft amsl)
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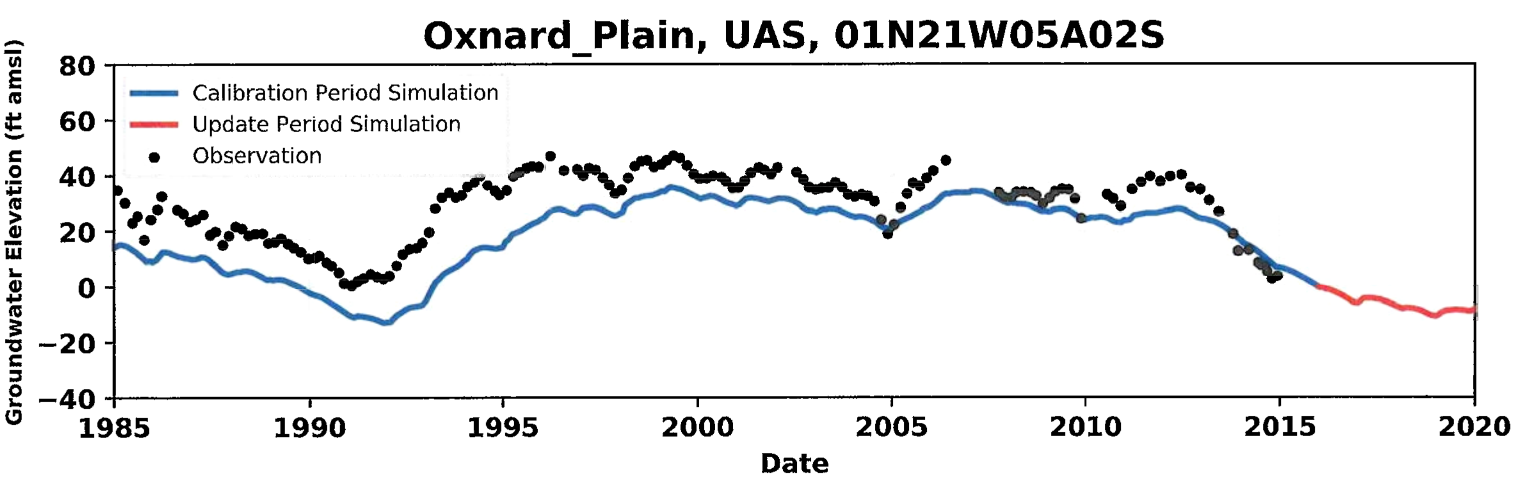
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N21W05A02S
Groundwater Elevation (ft amsl)
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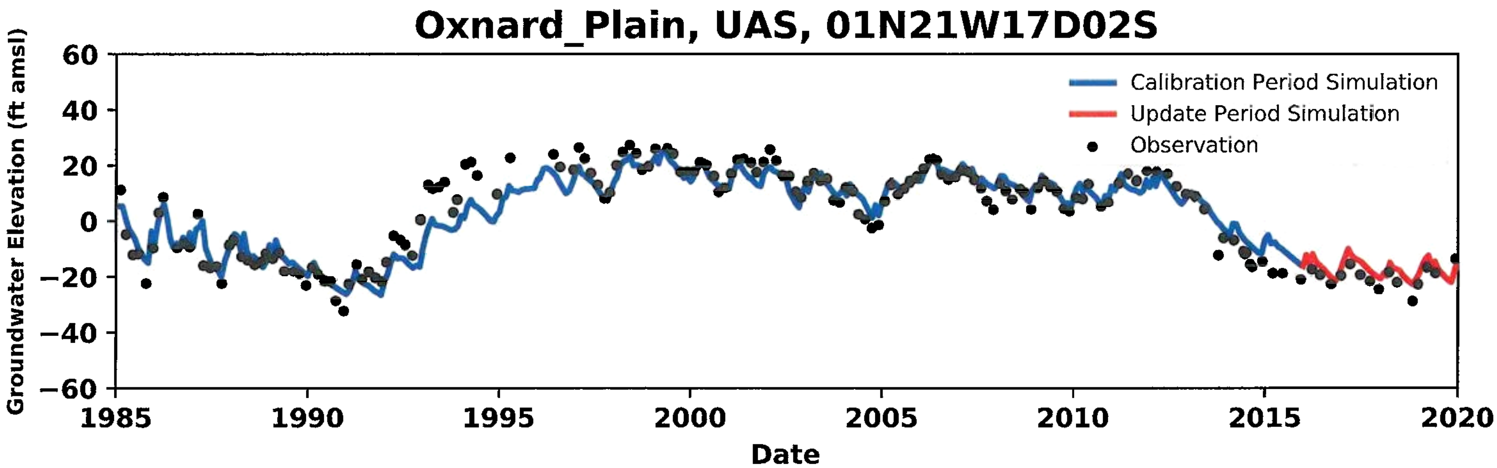
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation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Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
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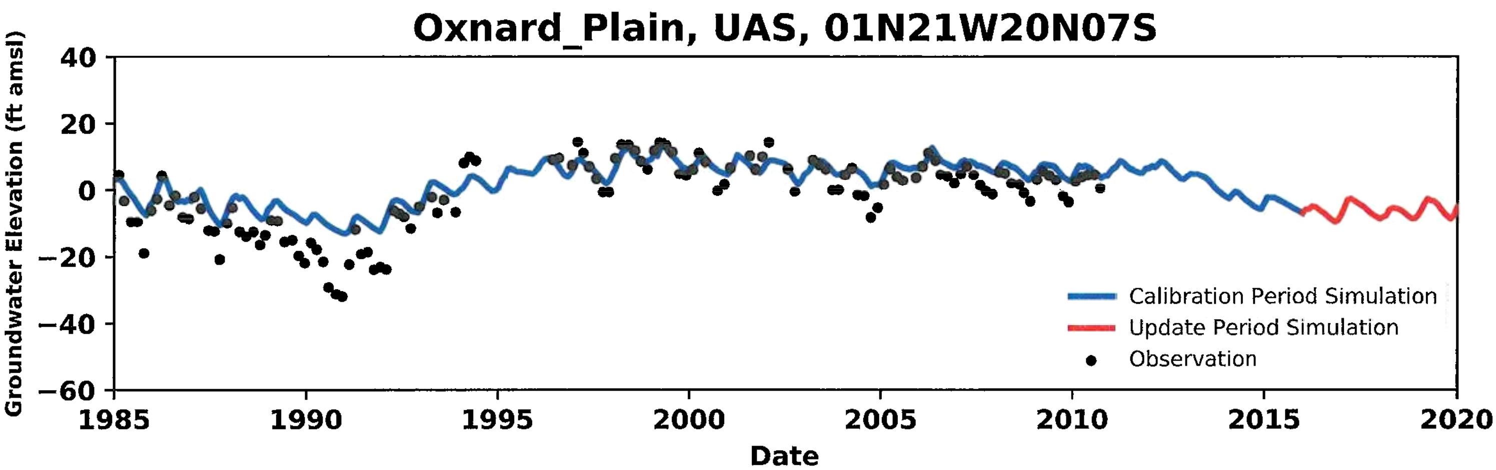
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Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
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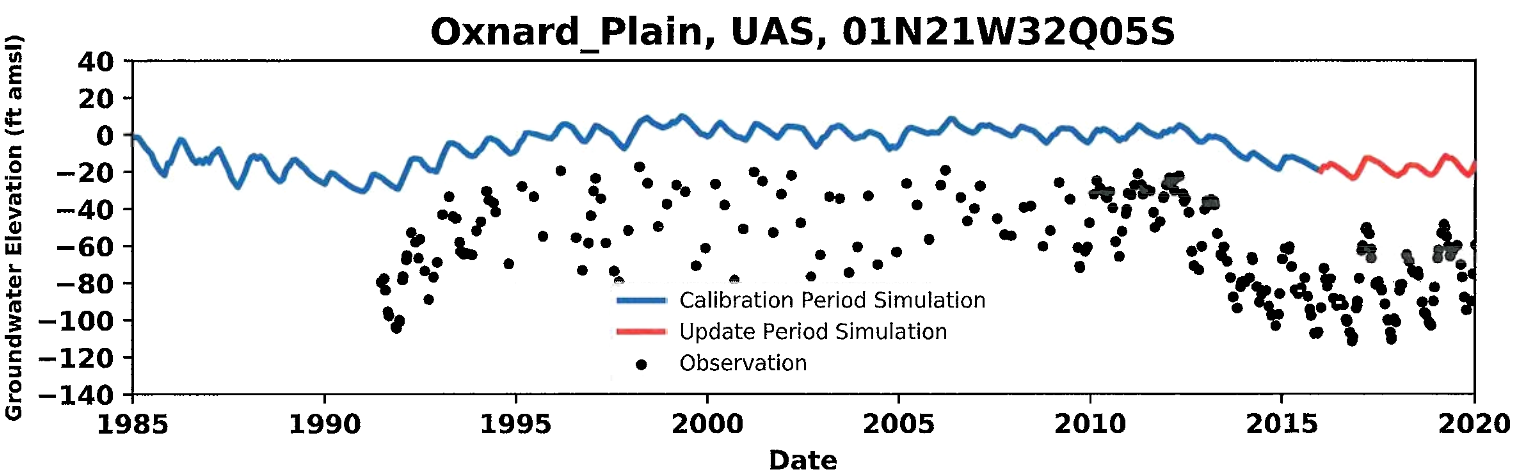
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Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
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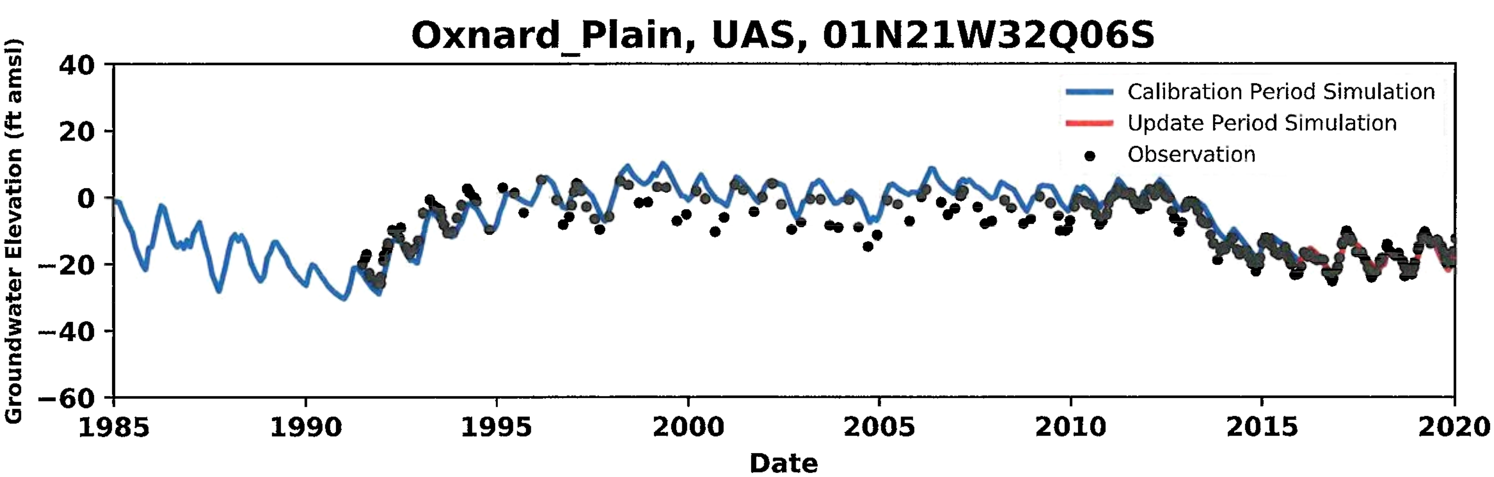
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Calibration Period Simulation
Update Period Simulation
Observation
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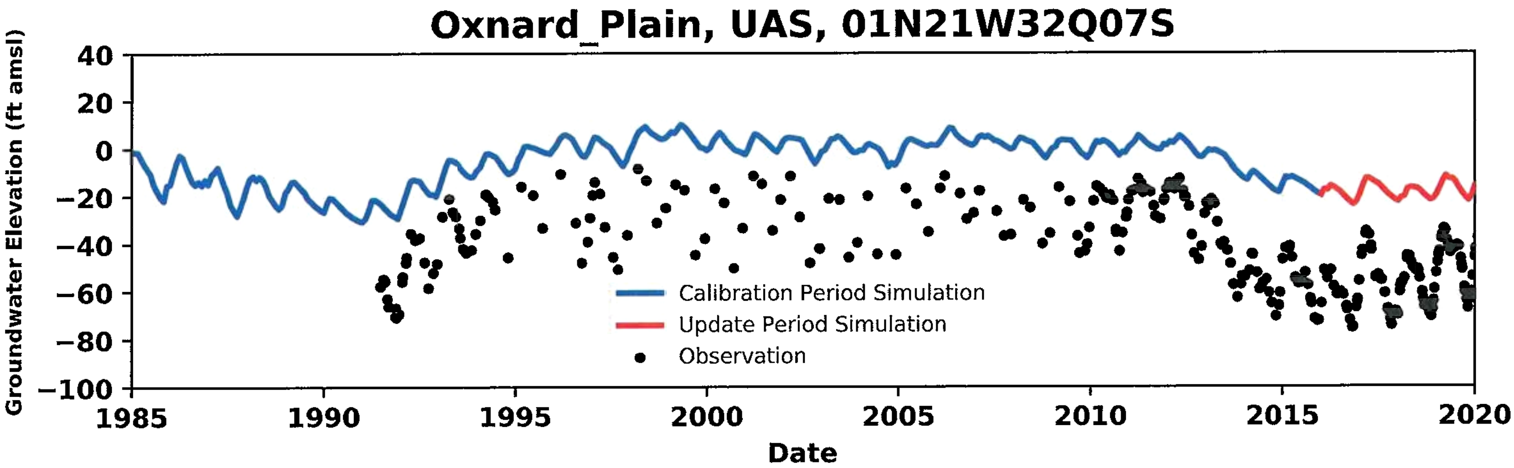
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Groundwater Elevation (ft amsl)
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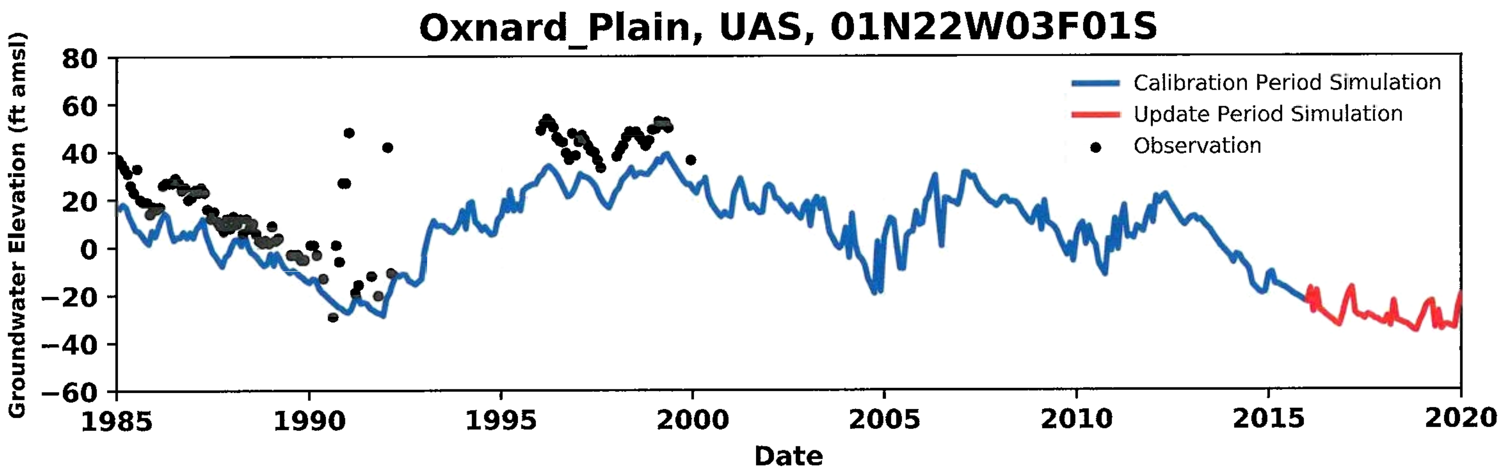
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation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Groundwater Elevation (ft amsl)
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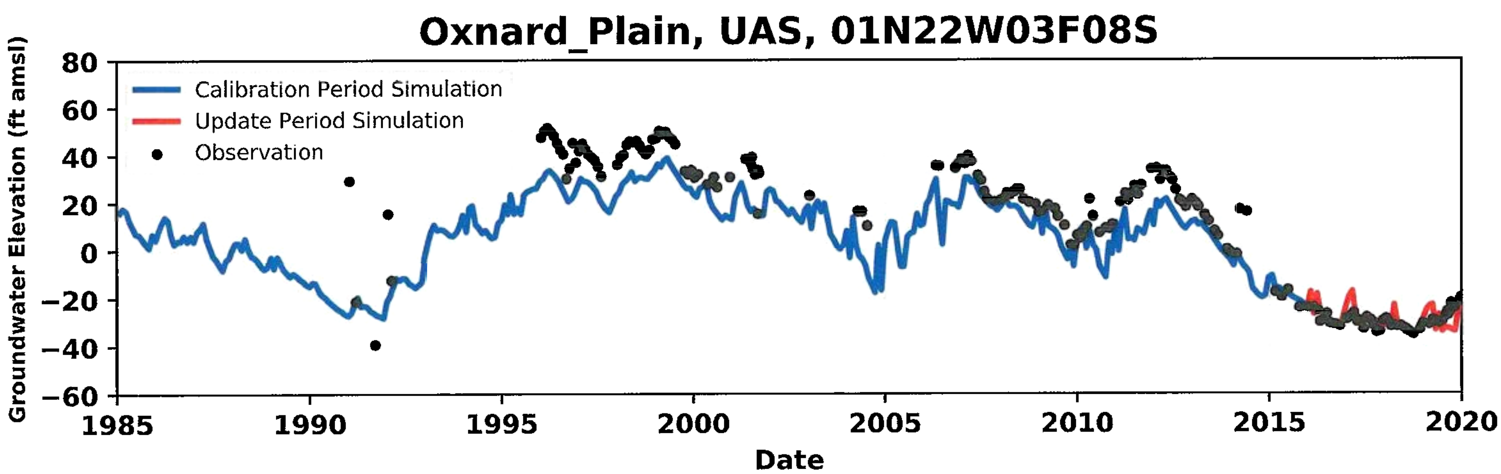
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N22W03F08S
Groundwater Elevation (ft amsl)
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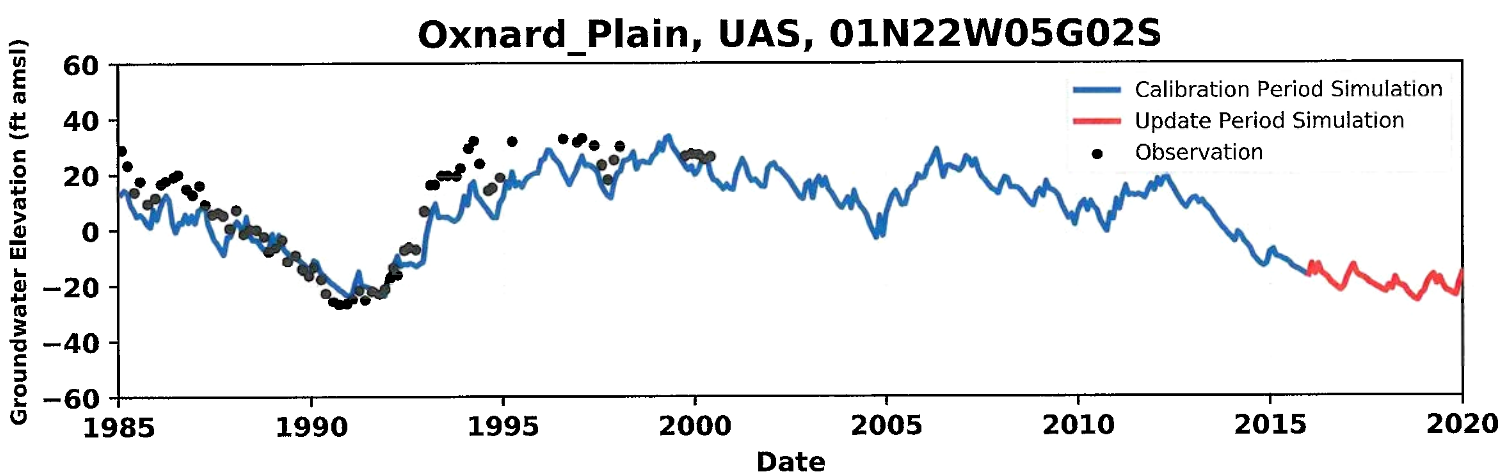
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N22W05G02S
Groundwater Elevation (ft amsl)
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2020
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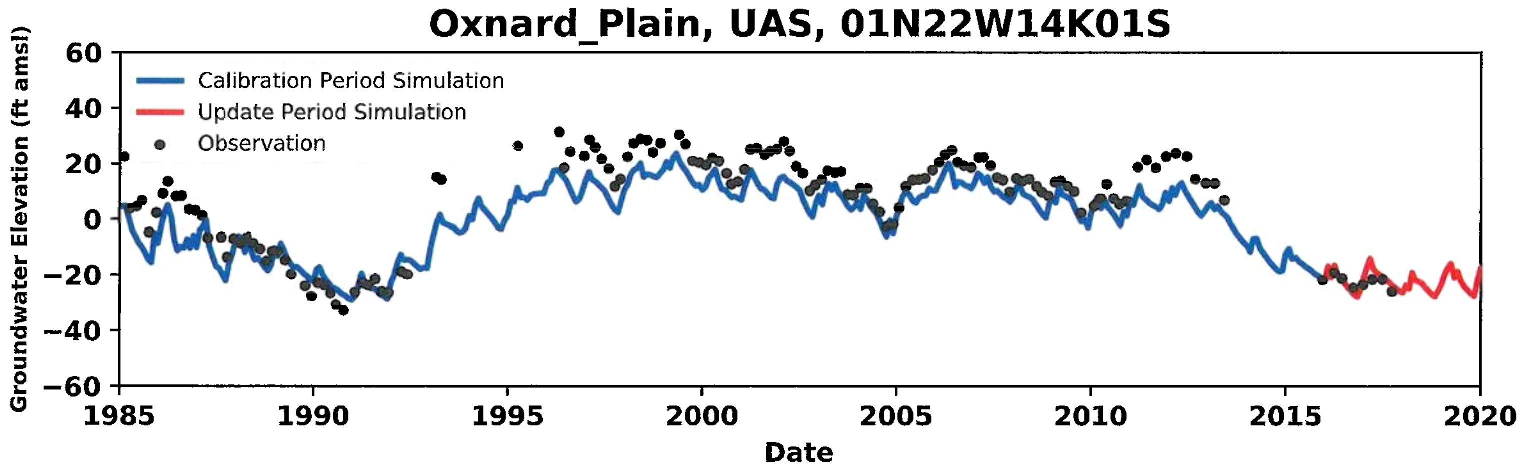
Calibration Period Simulation
Update Period Simulation
Observation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Calibration Period Simulation
Update Period Simulation
Observation
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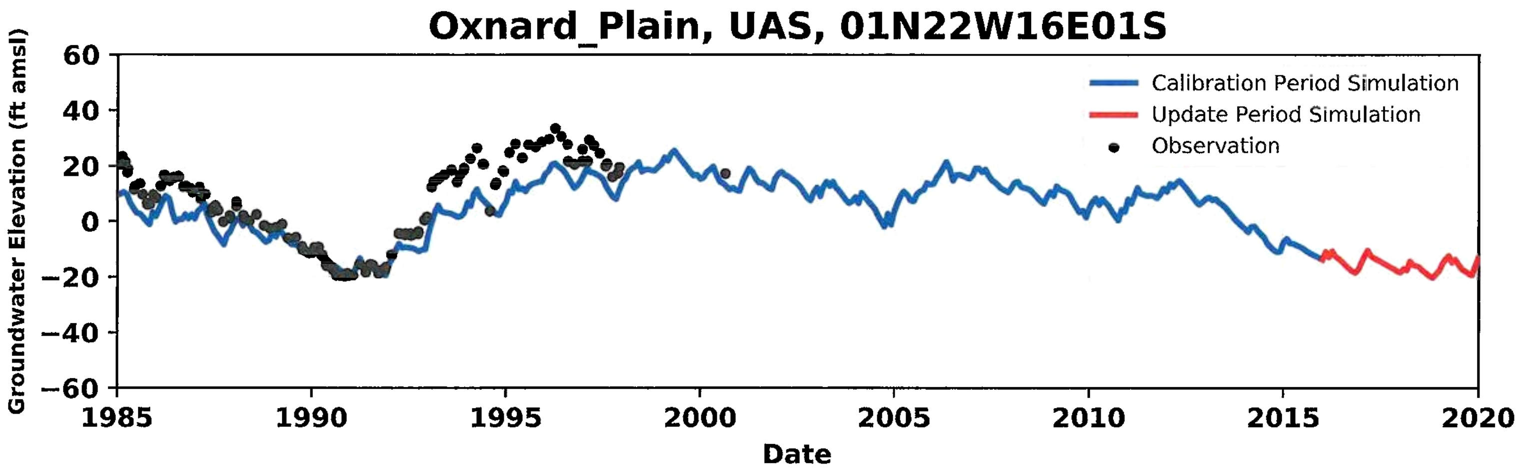
Date


Oxnard_Plain, UAS, 01N22W16E01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
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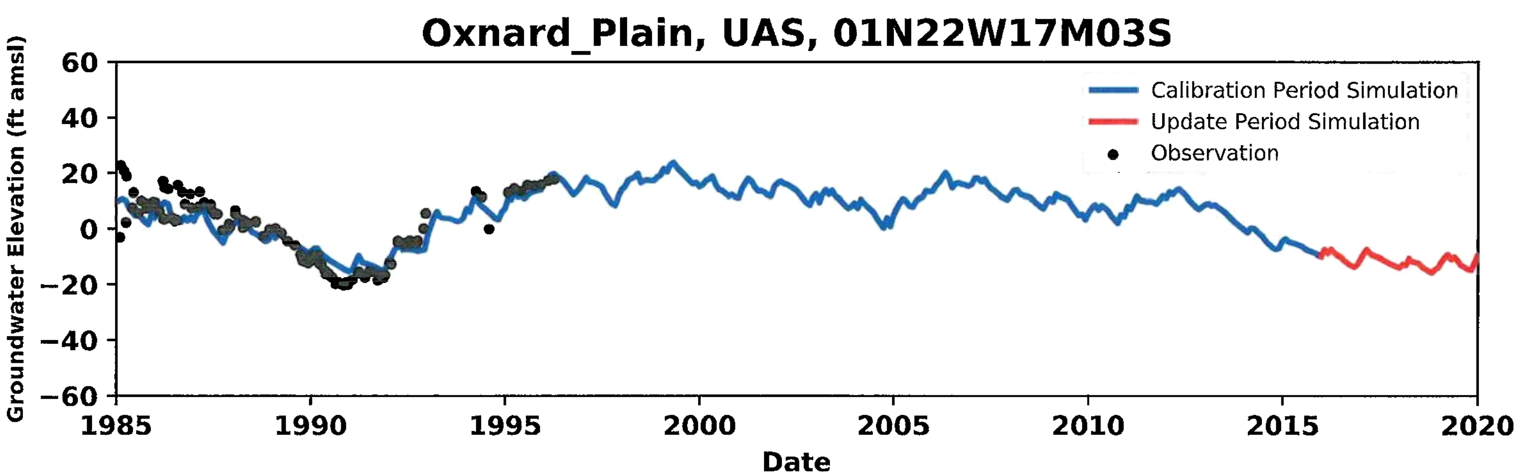
Oxnard_Plain, UAS, 01N22W17M03S
Calibration Period Simulation
Update Period Simulation
Observation
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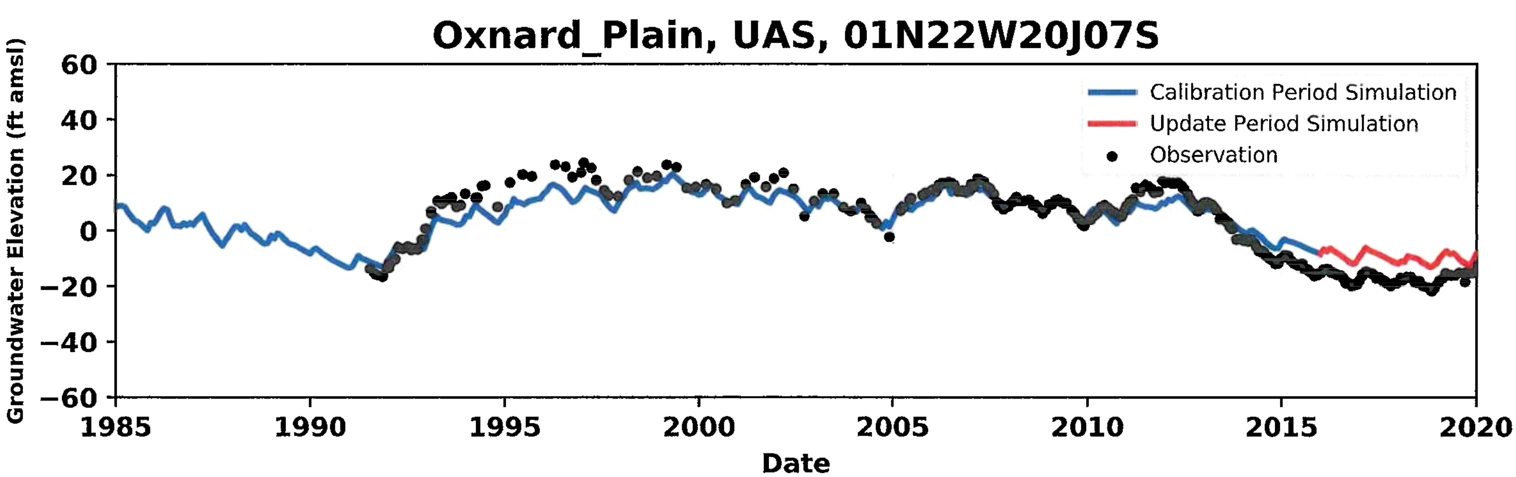
Oxnard_Plain, UAS, 01N22W20J07S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
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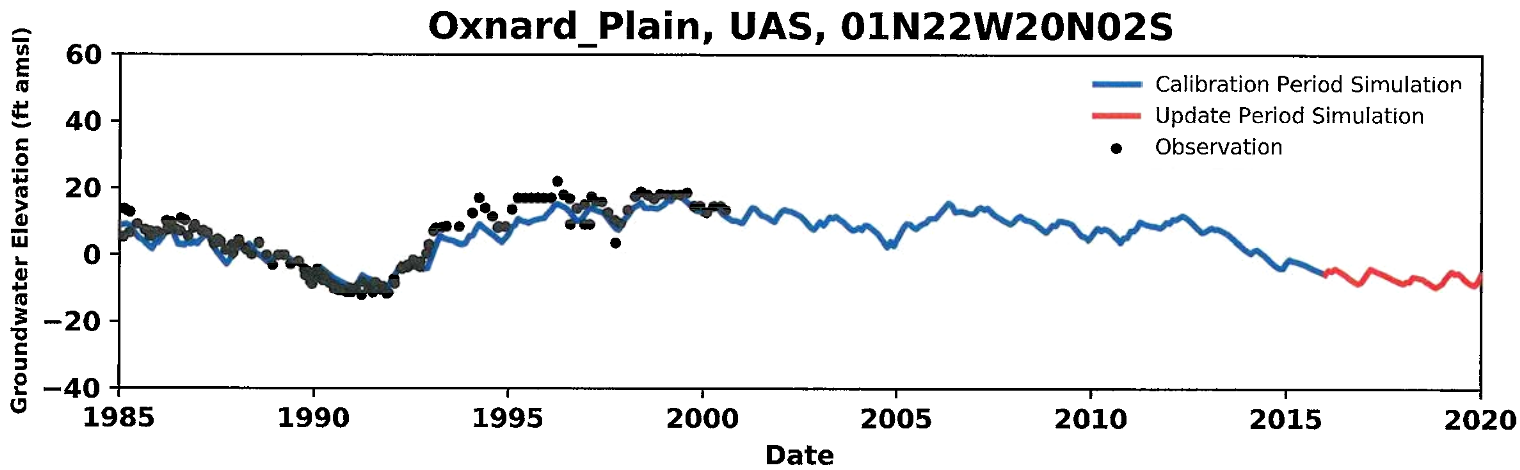
Oxnard_Plain, UAS, 01N22W20N02S
Groundwater Elevation (ft amsl)
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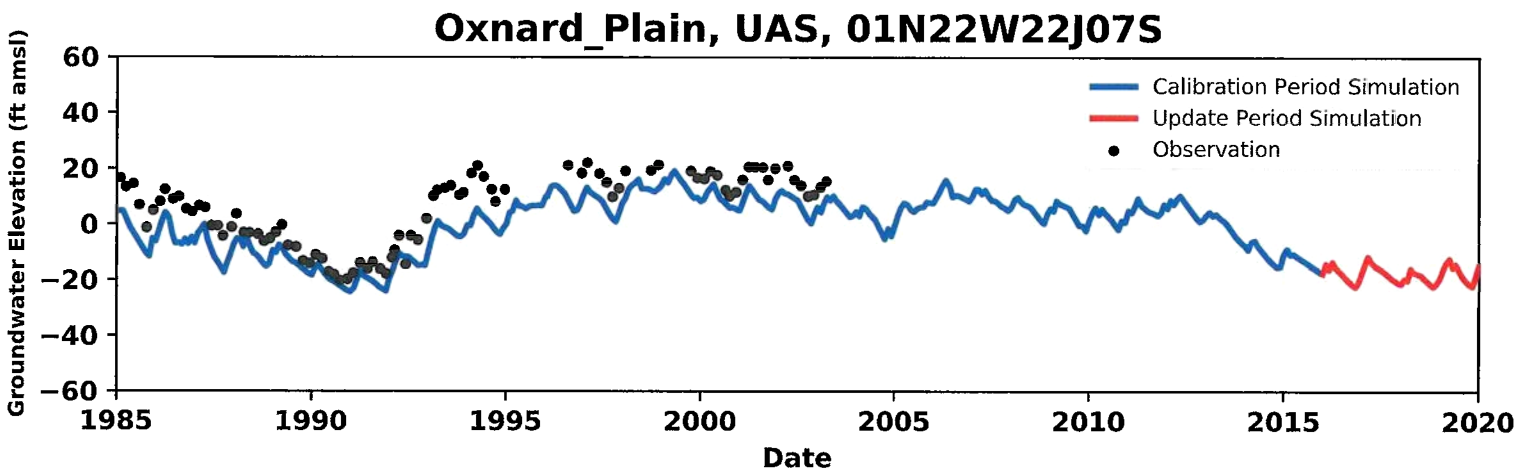
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N22W22J07S
Groundwater Elevation (ft amsl)
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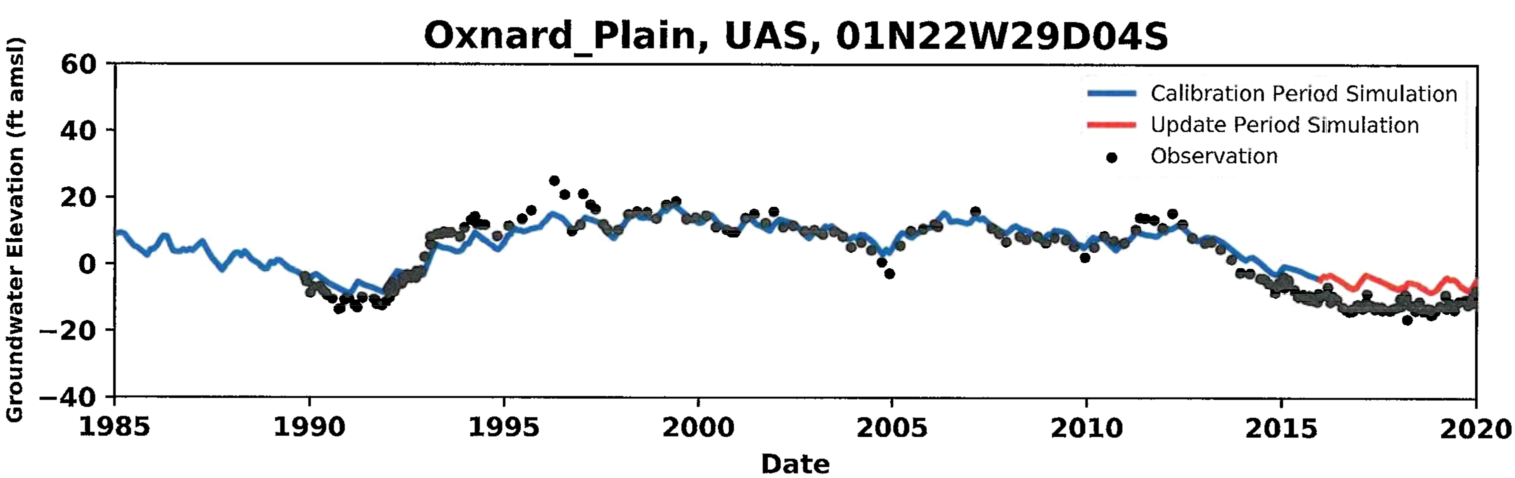
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N22W29D04S
Groundwater Elevation (ft amsl)
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2005
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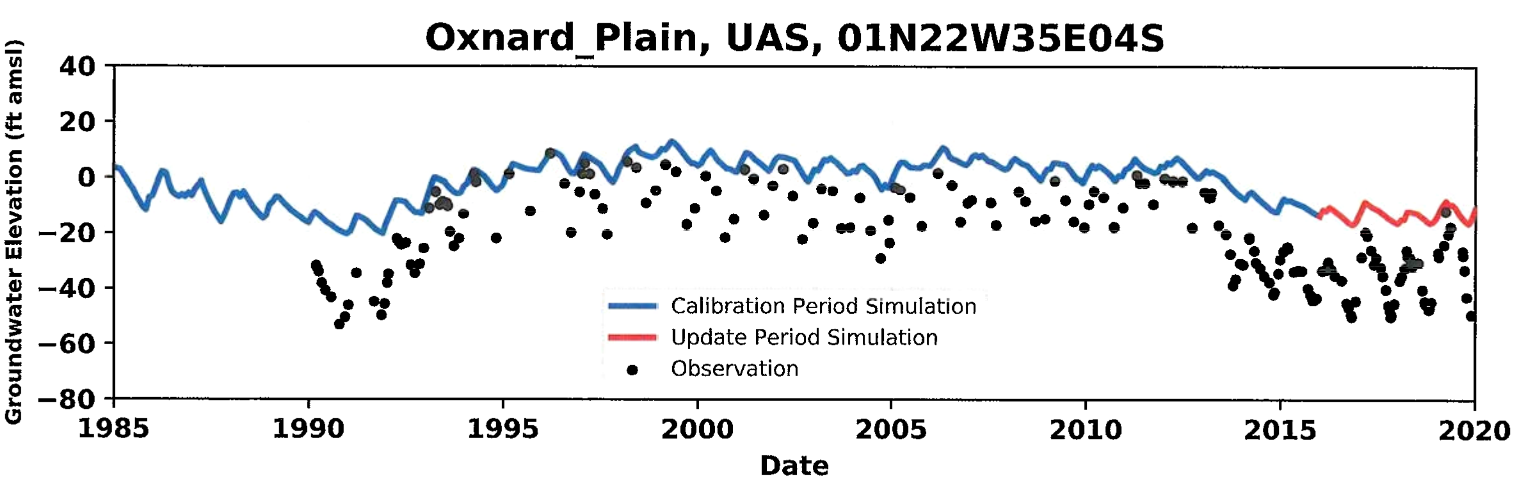
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N22W35E04S
Groundwater Elevation (ft amsl)
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20
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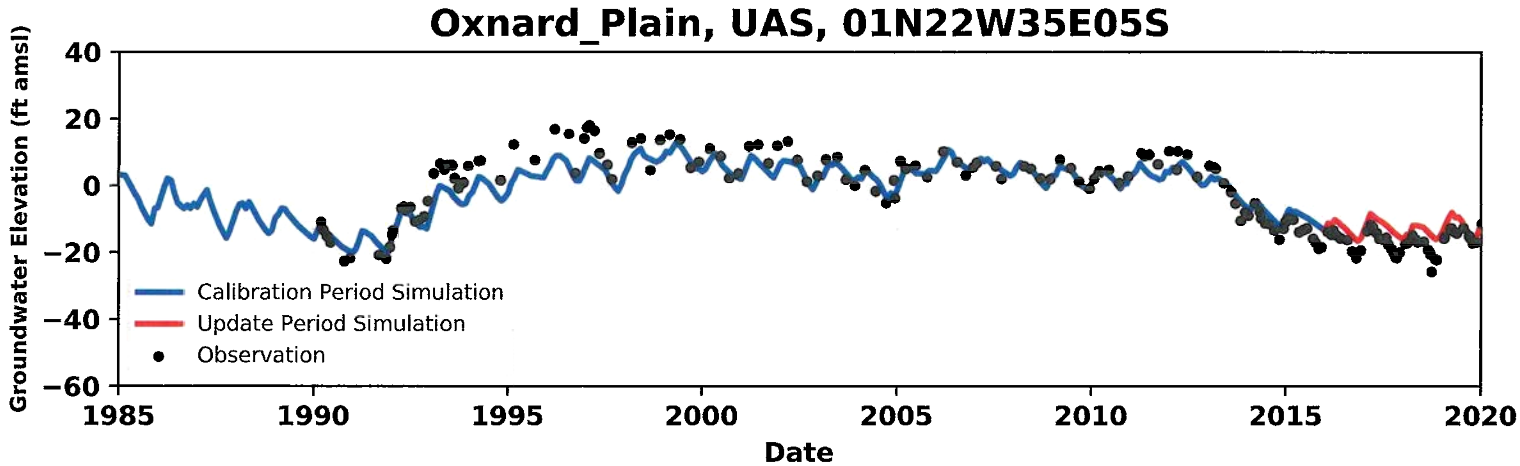
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N22W35E05S
Groundwater Elevation (ft amsl)
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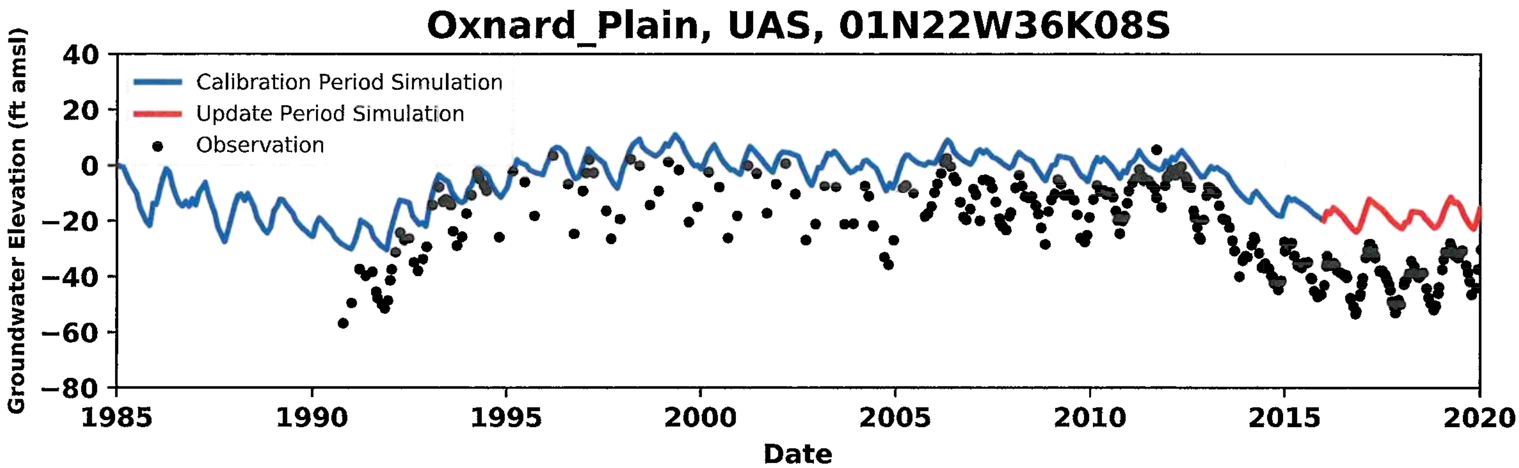
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N22W36K08S
Groundwater Elevation (ft amsl)
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2005
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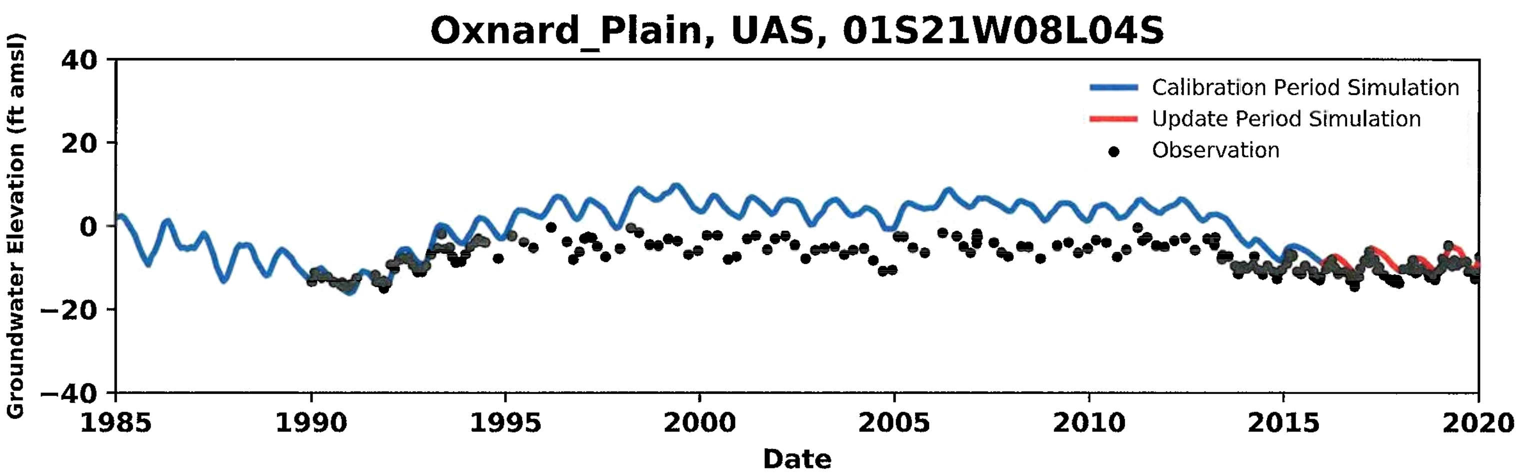
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


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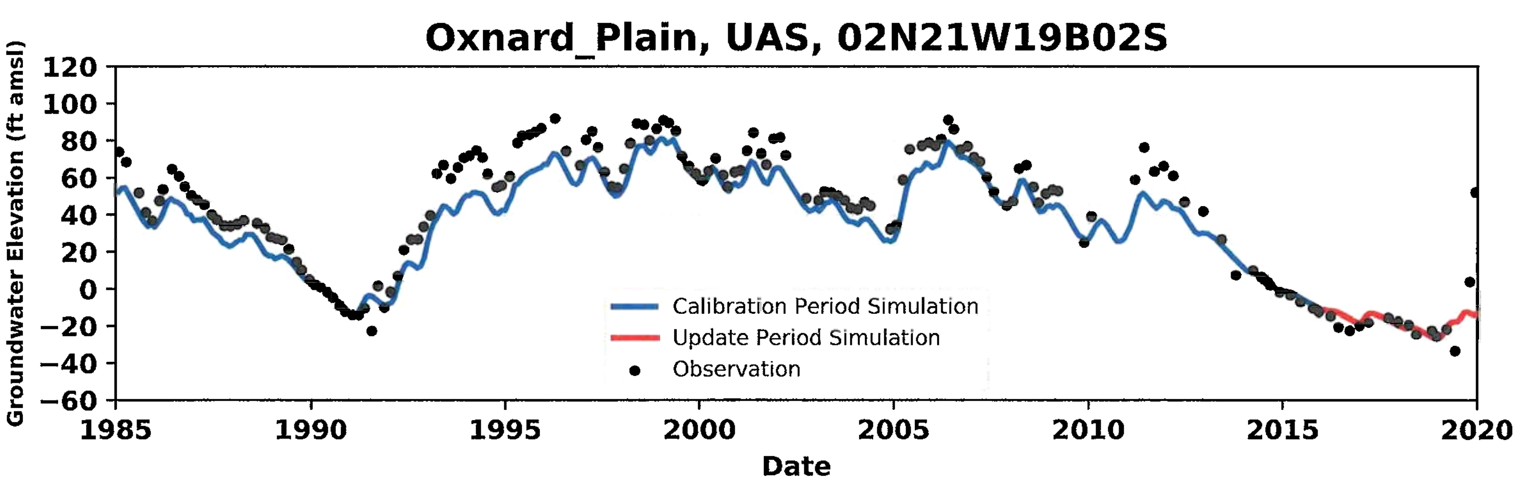
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 02N21W19B02S
Groundwater Elevation (ft amsl)
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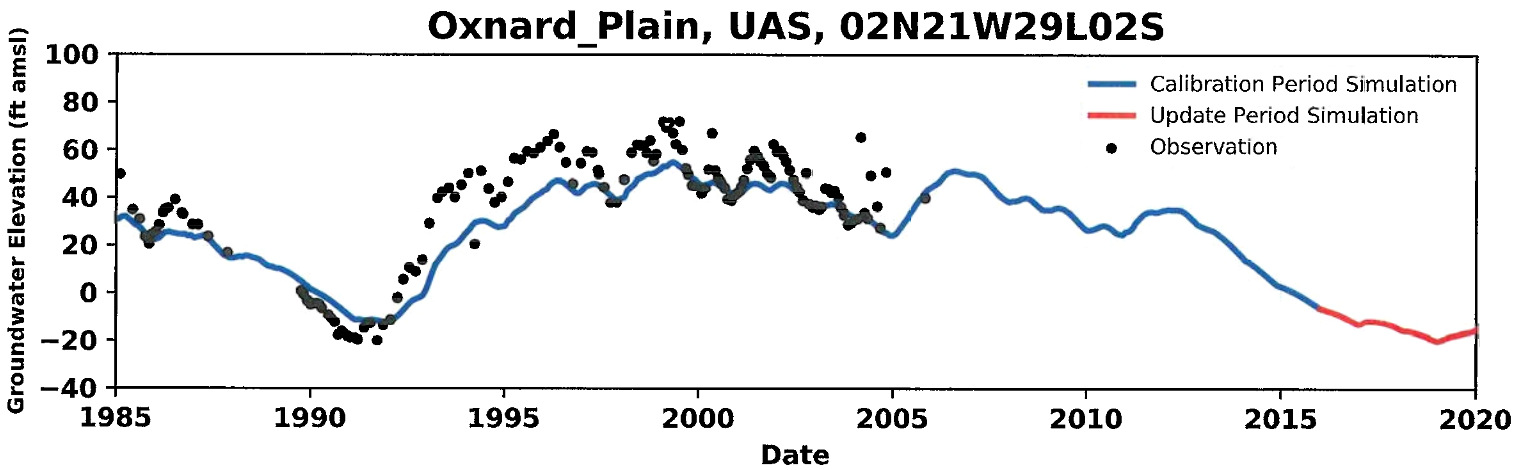
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 02N21W29L02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
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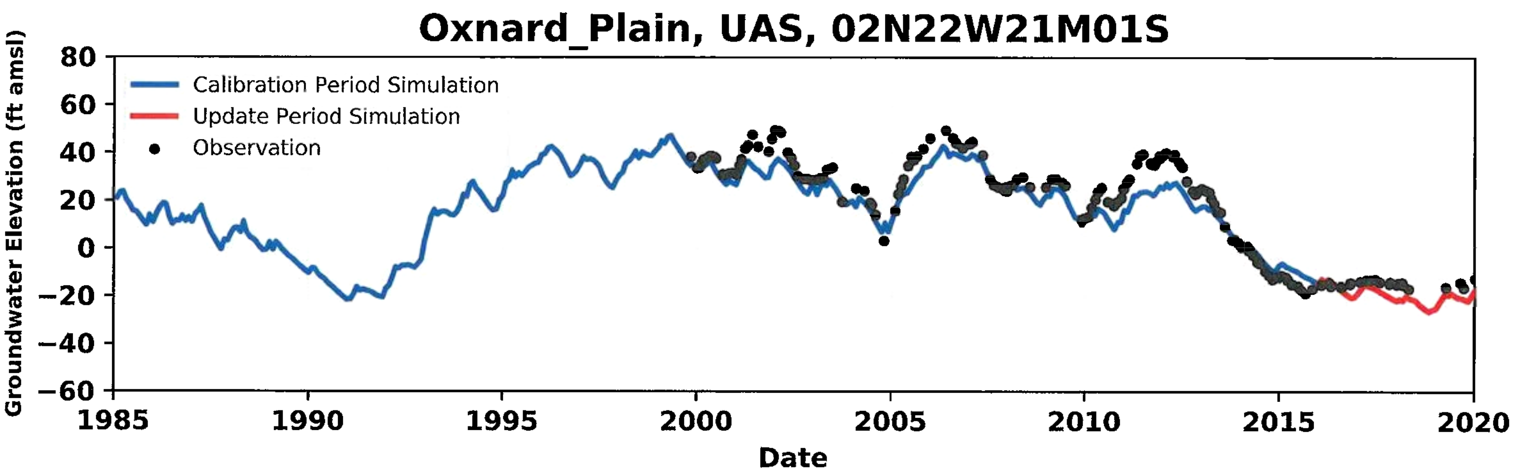
Oxnard_Plain, UAS, 02N22W21M01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
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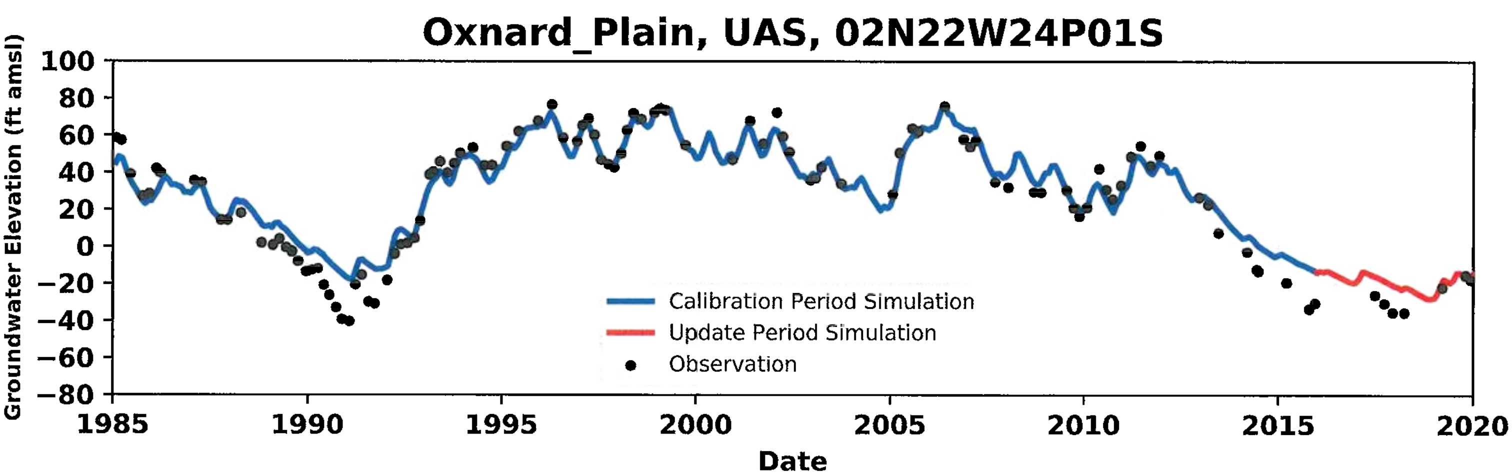
Oxnard_Plain, UAS, 02N22W24P01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
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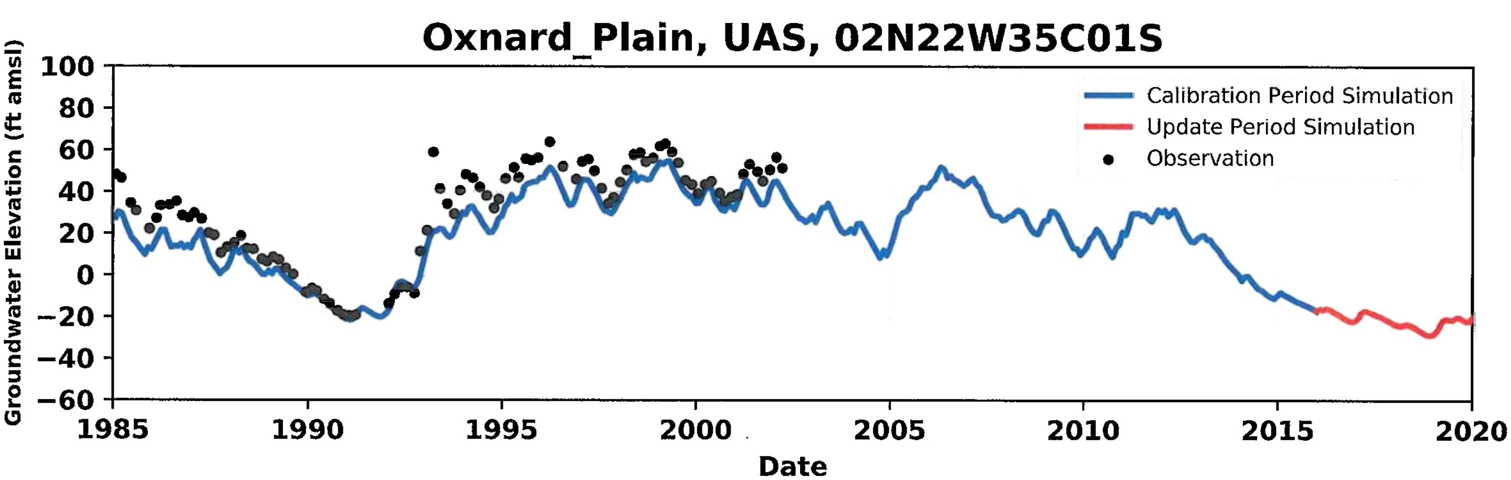
2015
2020


Oxnard_Plain, UAS, 02N22W35C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
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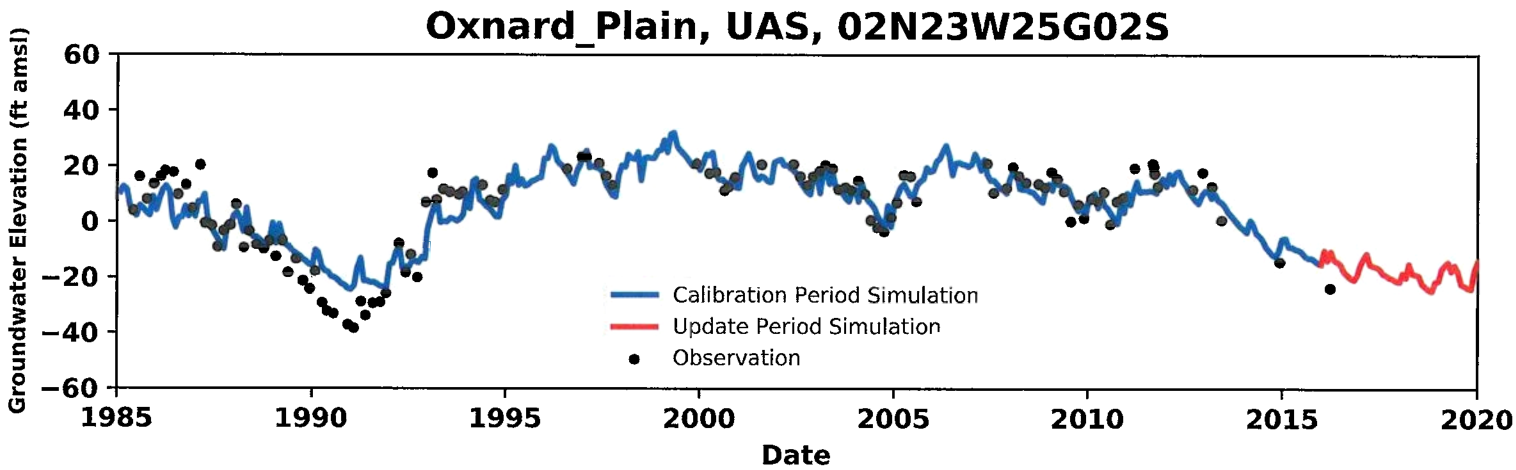
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Groundwater Elevation (ft amsl)
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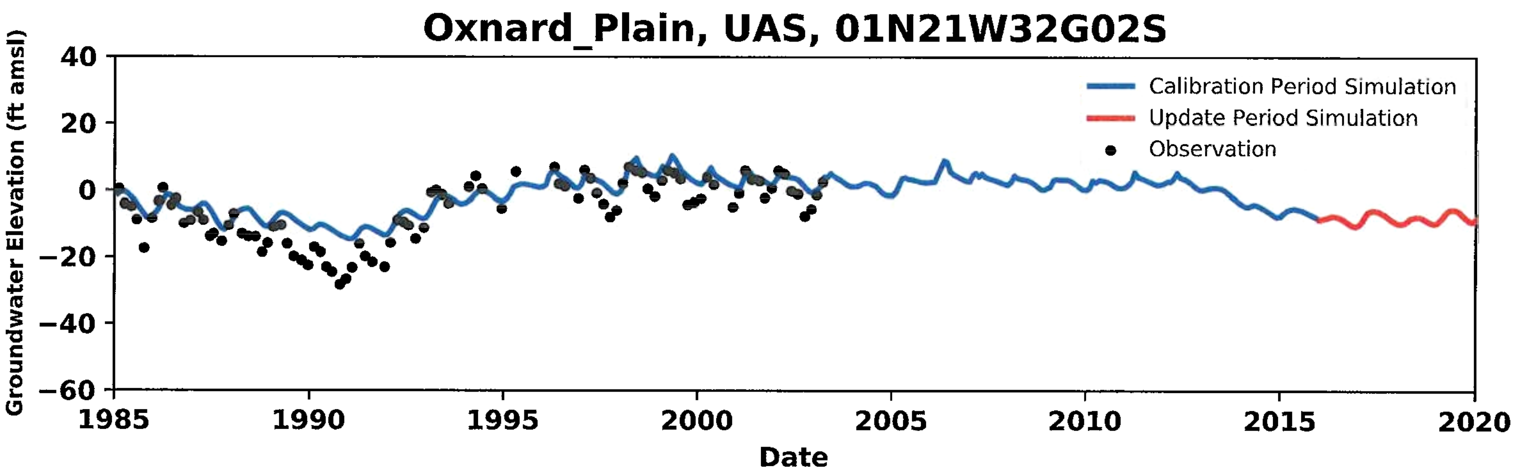
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N21W32G02S
Groundwater Elevation (ft amsl)
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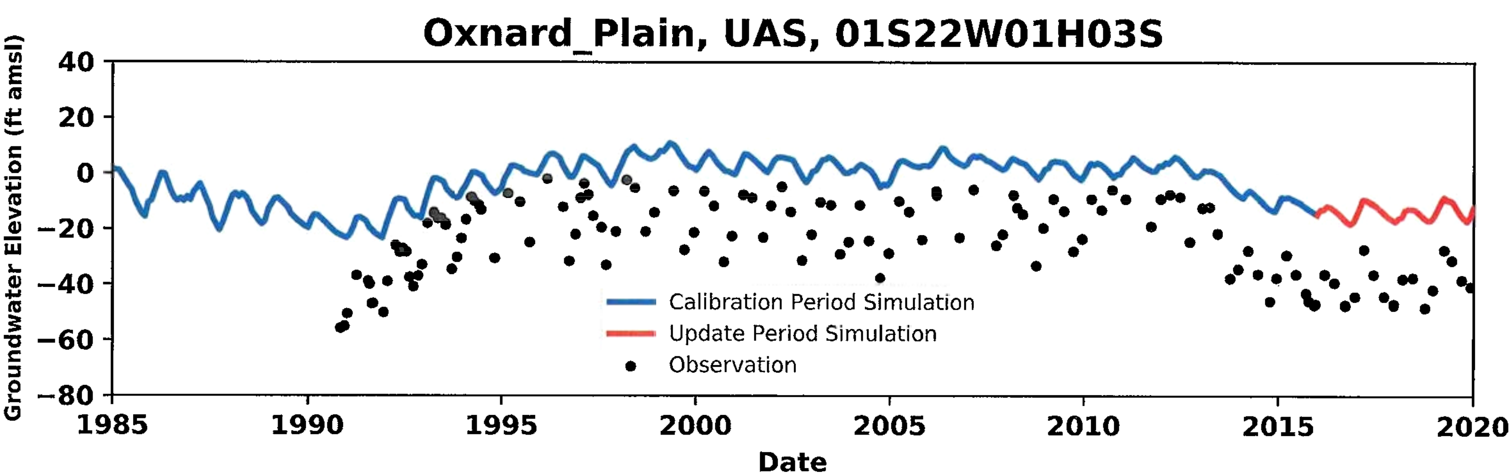
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation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Groundwater Elevation (ft amsl)
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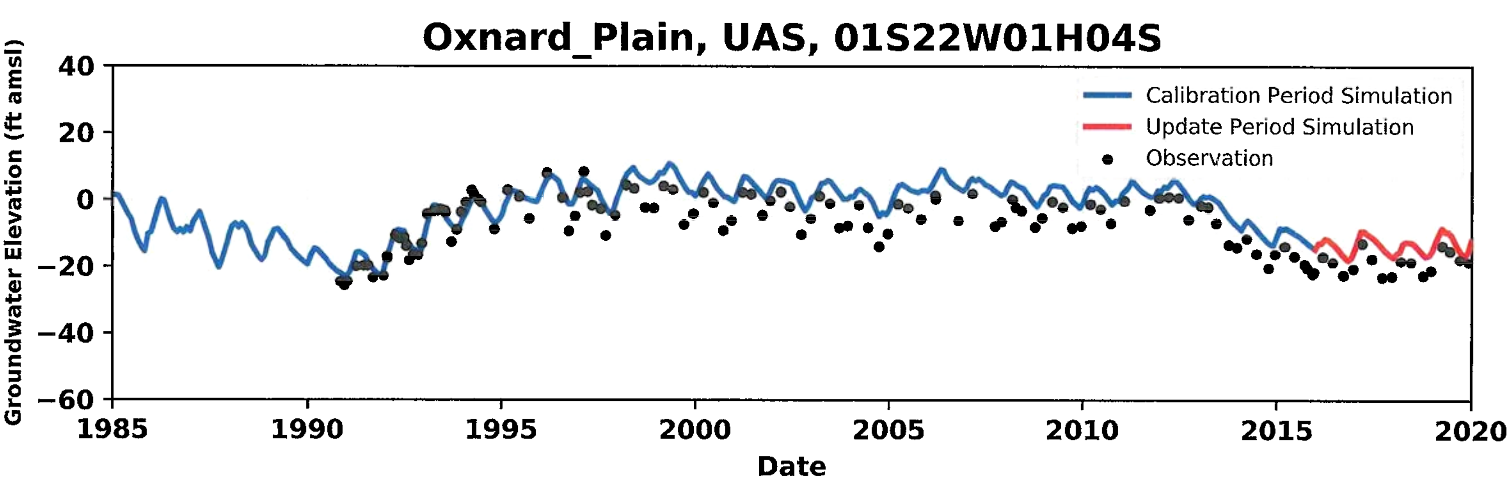
Calibration Period Simulation
Update Period Simulation
Observation


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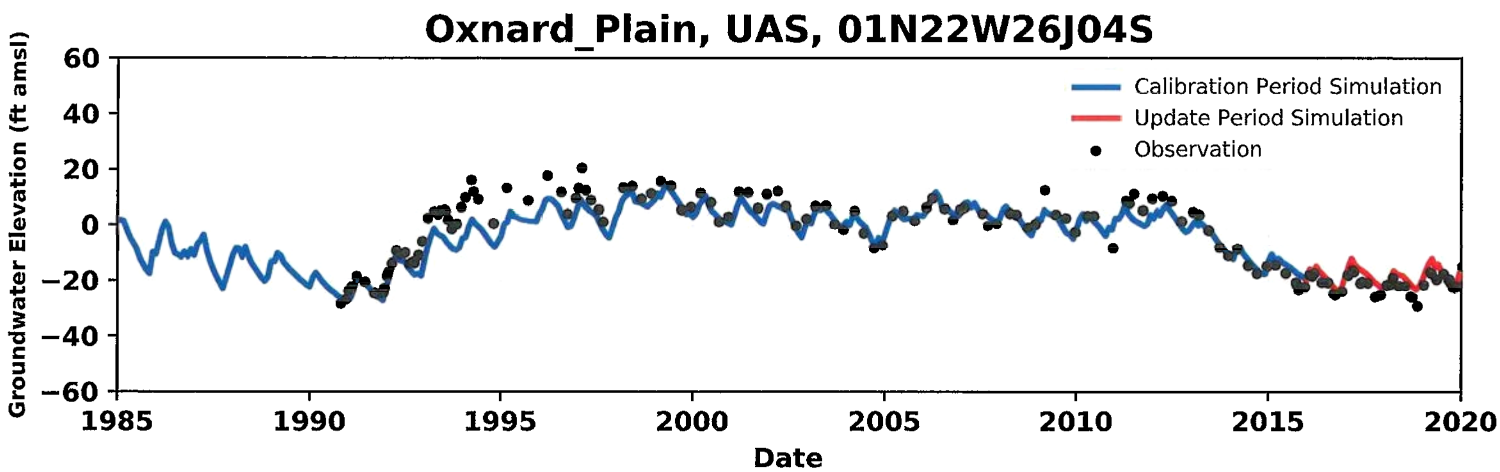
Date
Calibration Period Simulation
Update Period Simulation
Observation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Groundwater Elevation (ft amsl)
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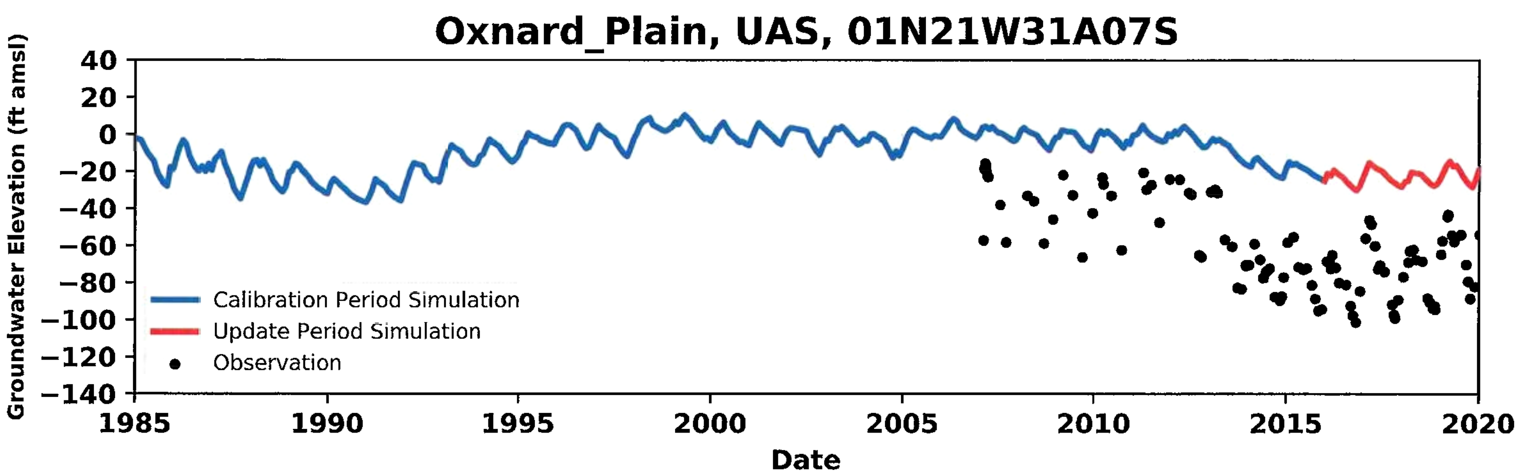
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 01N21W31A07S
Groundwater Elevation (ft amsl)
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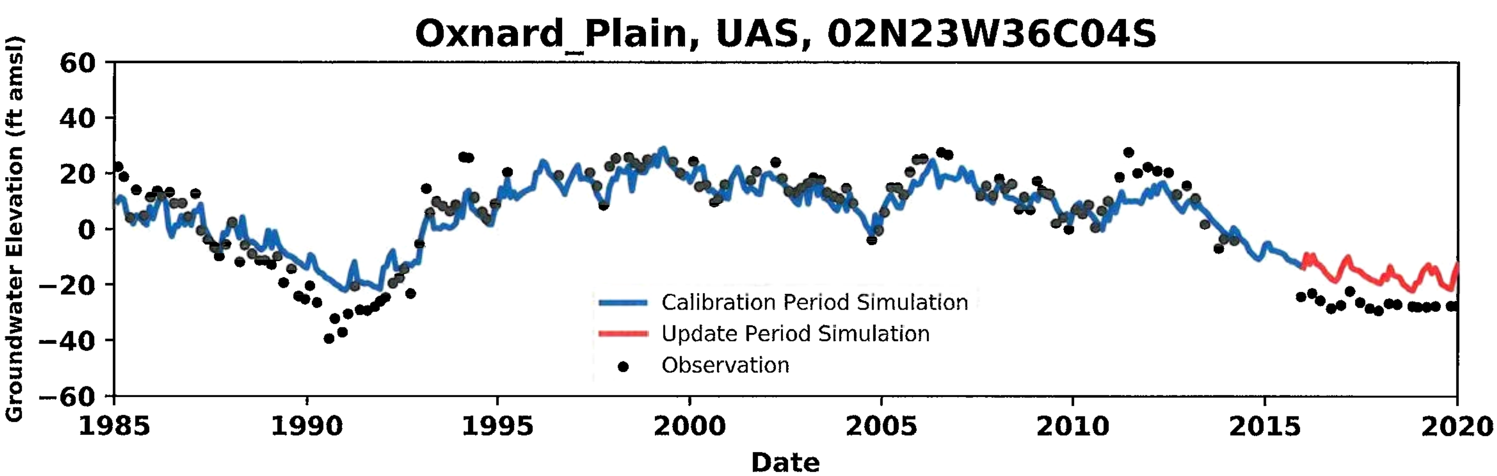
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS, 02N23W36C04S
Groundwater Elevation (ft amsl)
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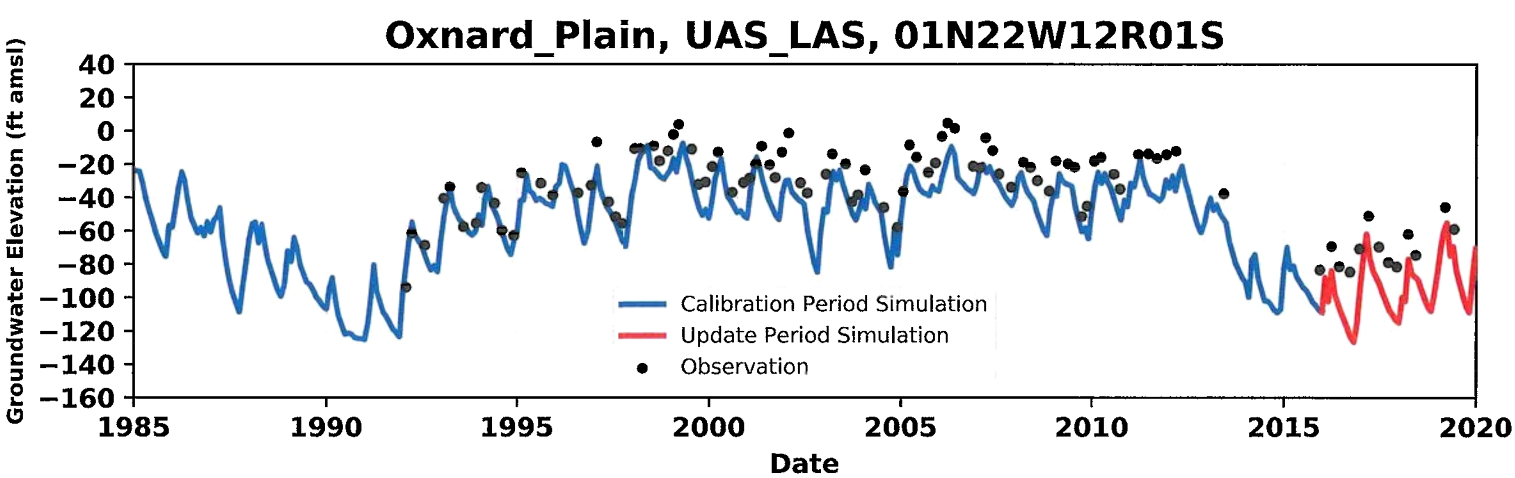
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS_LAS, 01N22W12R01S
Groundwater Elevation (ft amsl)
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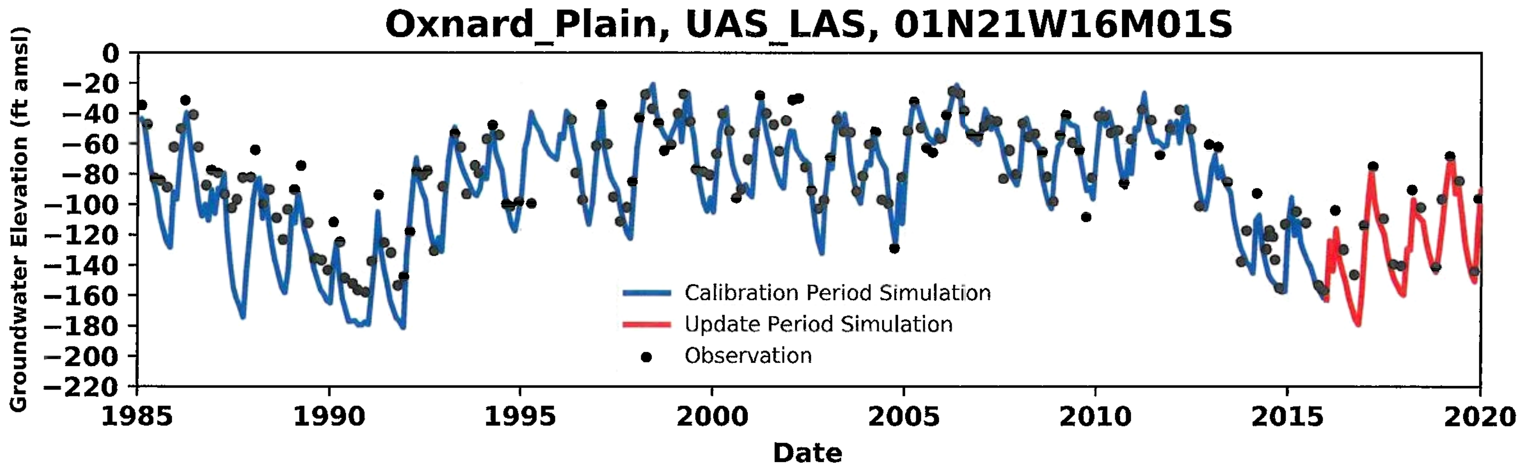
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS_LAS, 01N21W16M01S
Groundwater Elevation (ft amsl)
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−140
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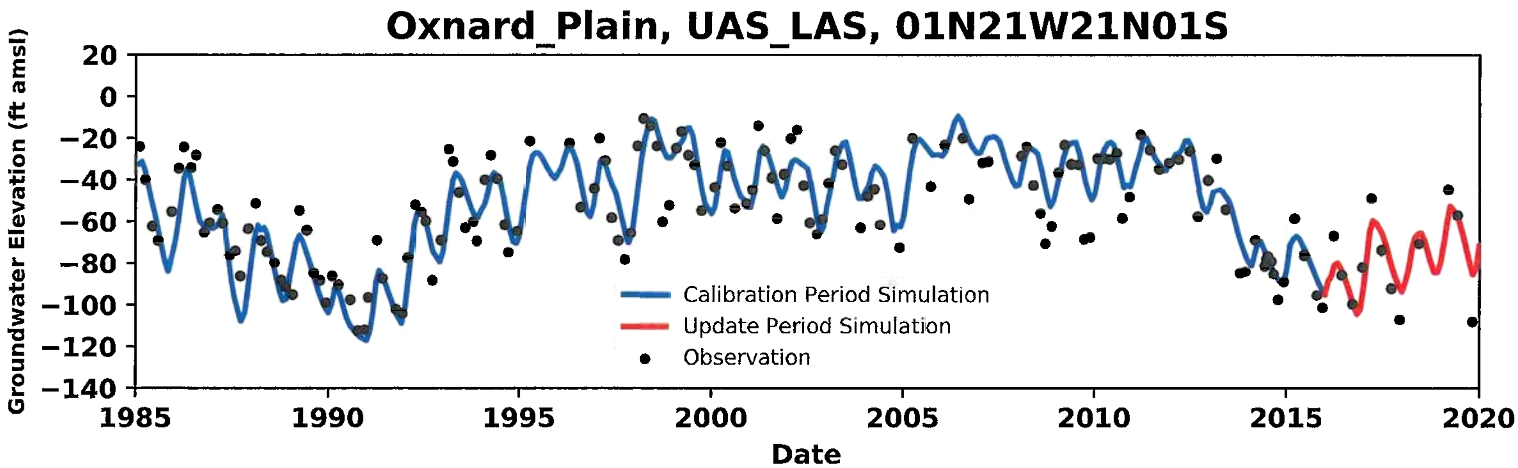
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS_LAS, 01N21W21N01S
Groundwater Elevation (ft amsl)
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−20
−40
−60
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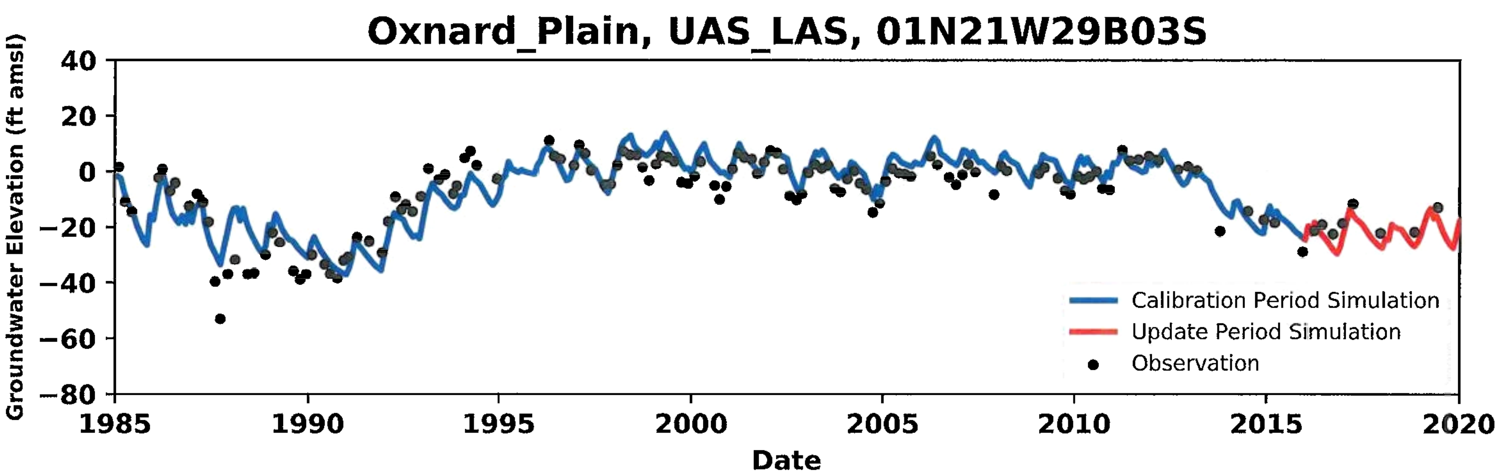
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS_LAS, 01N21W29B03S
Groundwater Elevation (ft amsl)
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20
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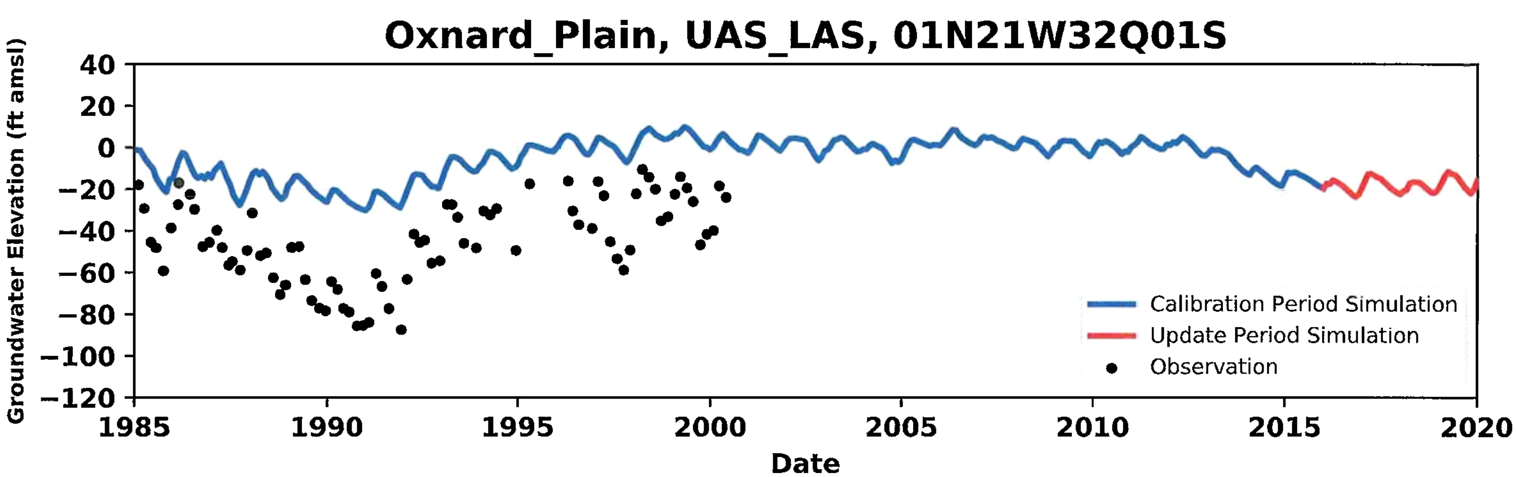
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS_LAS, 01N21W32Q01S
Groundwater Elevation (ft amsl)
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20
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−40
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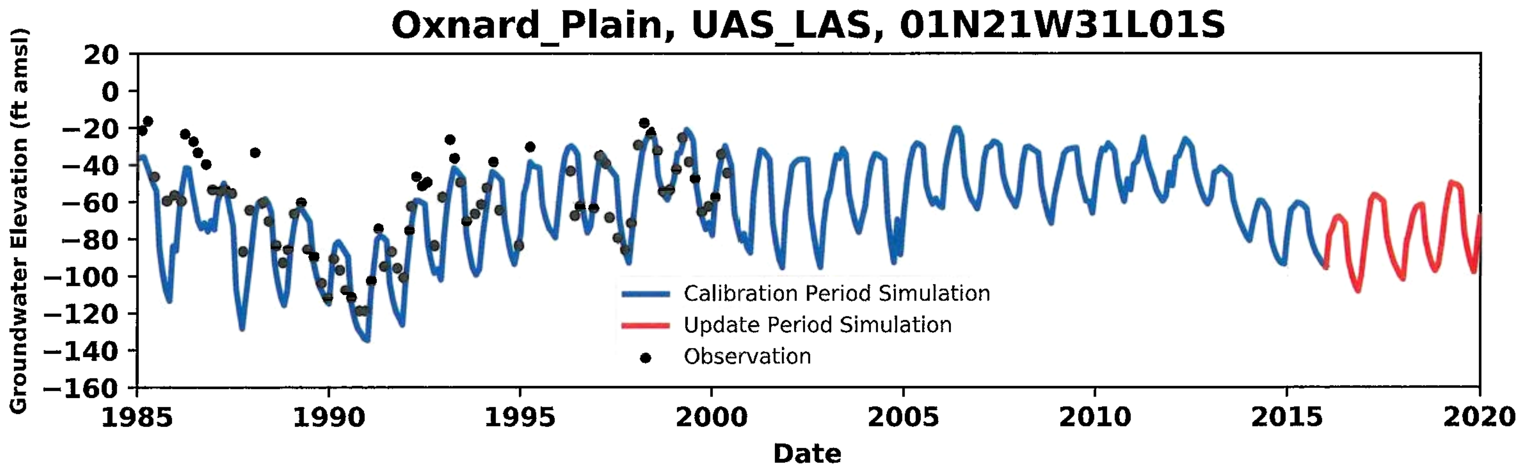
Date
Calibration Period Simulation
Update Period Simulation
Observation


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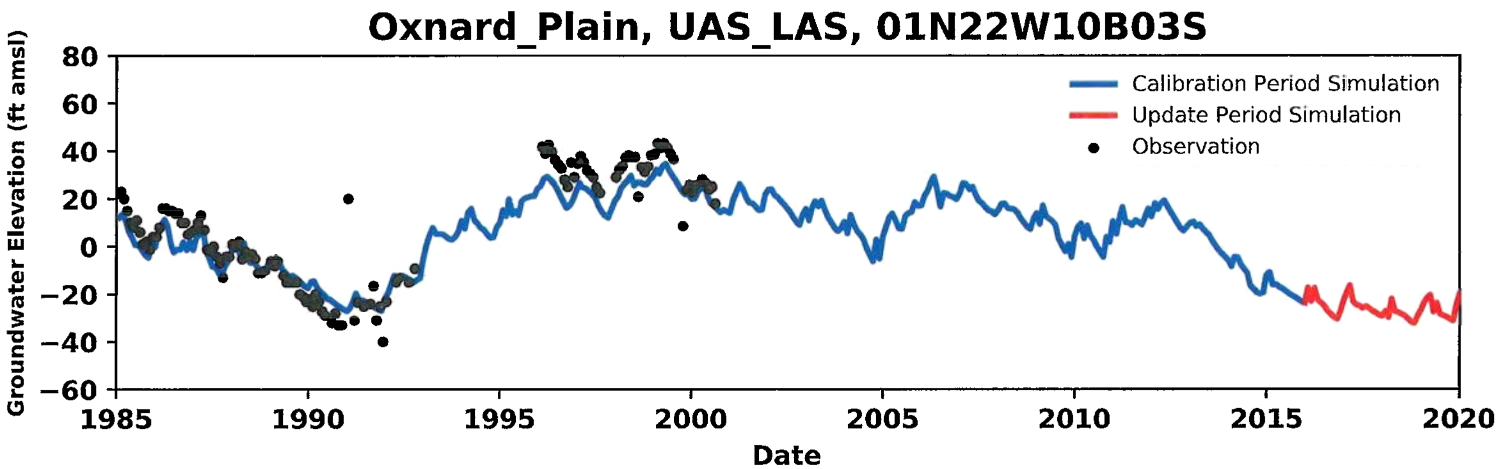
Date
Calibration Period Simulation
Update Period Simulation
Observation


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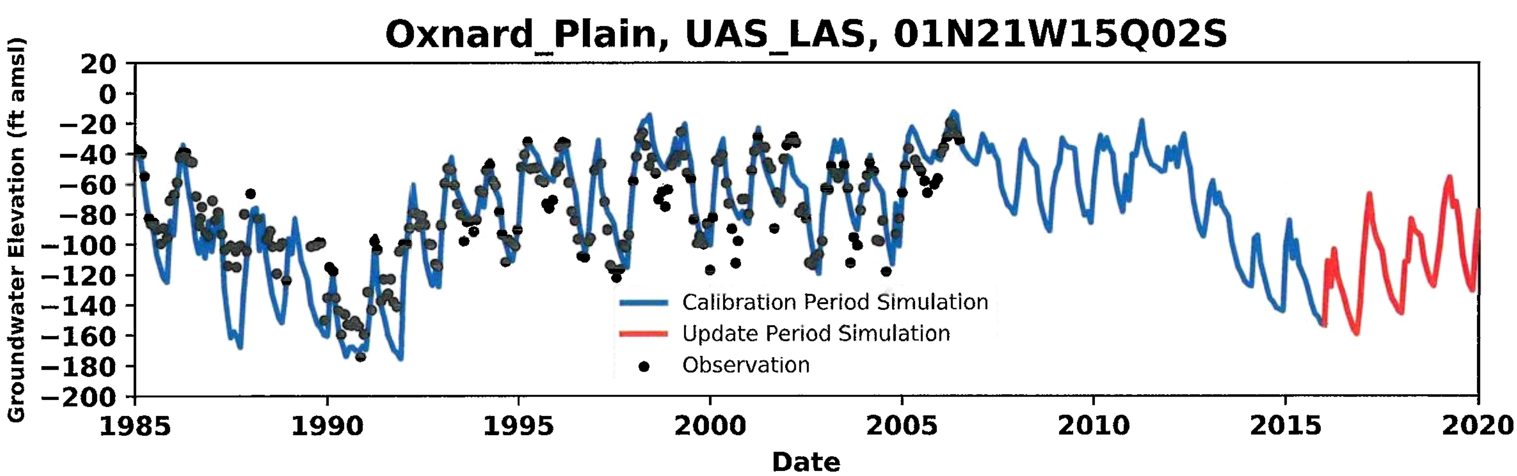
Calibration Period Simulation
Update Period Simulation
Observation


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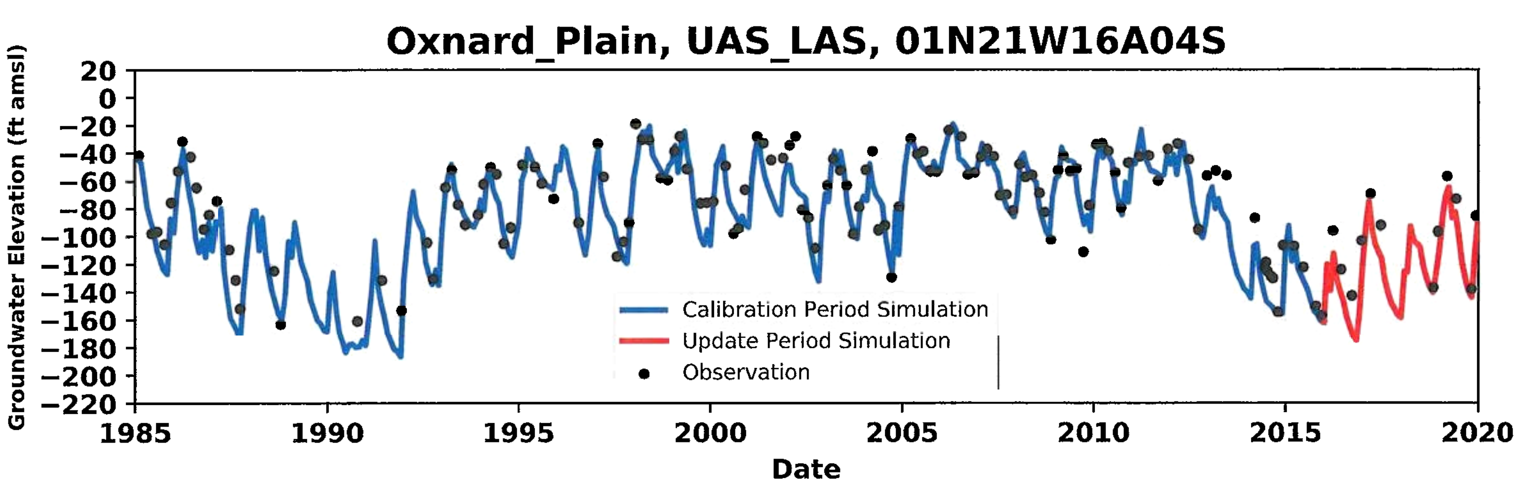
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, UAS_LAS, 01N21W16A04S
Groundwater Elevation (ft amsl)
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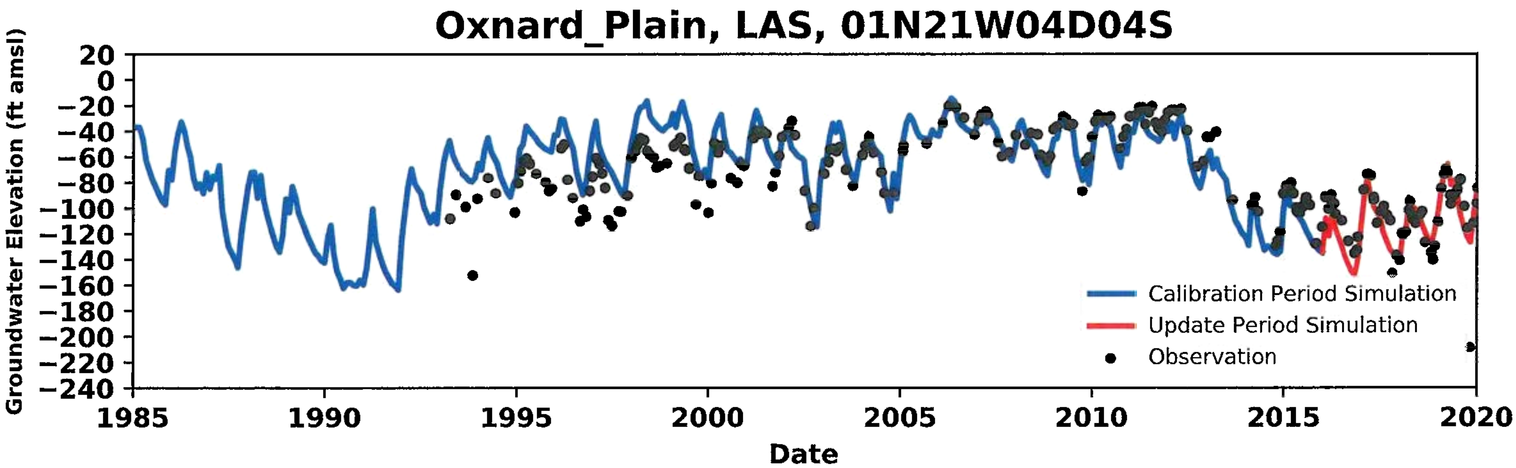
Date
Calibration Period Simulation
Update Period Simulation
Observation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Groundwater Elevation (ft amsl)
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−100
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−140
−160
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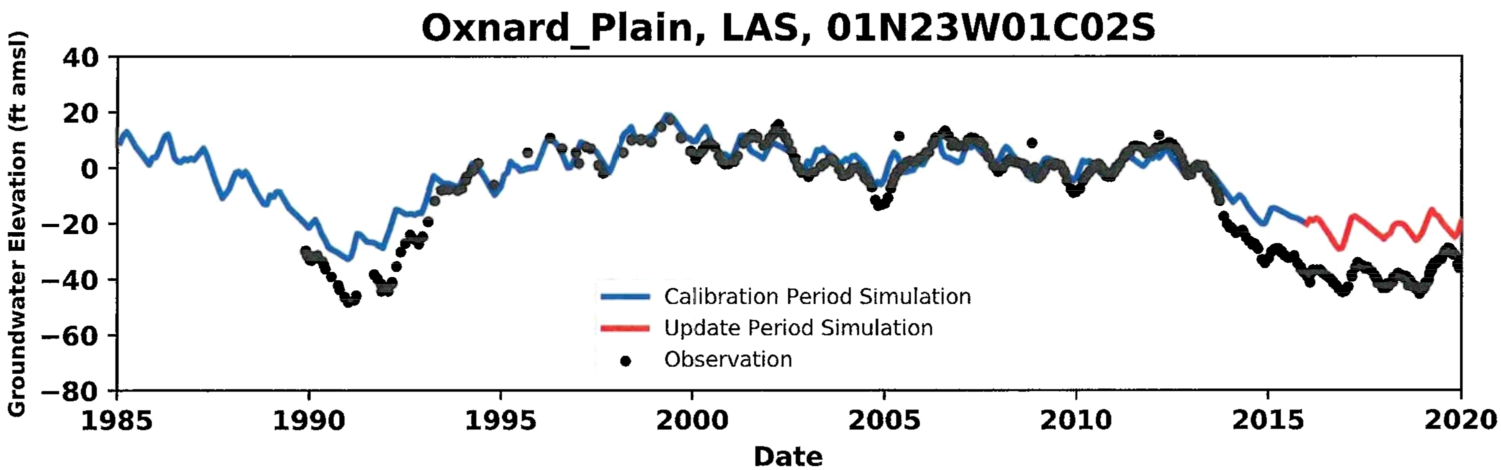
Calibration Period Simulation
Update Period Simulation
Observation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Groundwater Elevation (ft amsl)
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2020
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Calibration Period Simulation
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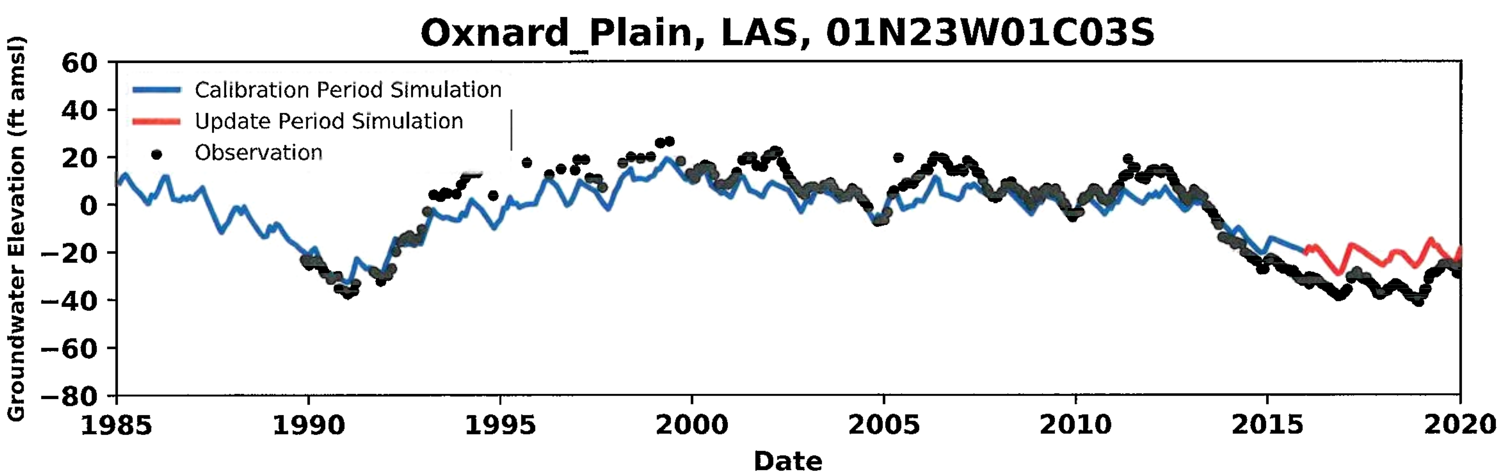
Observation


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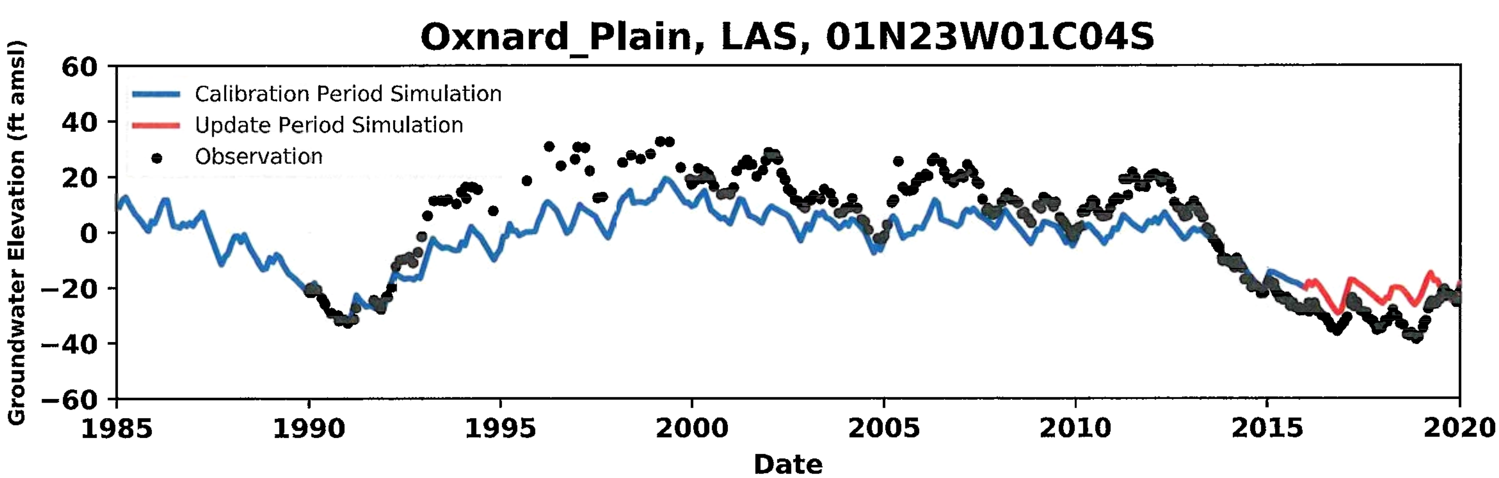
Observation


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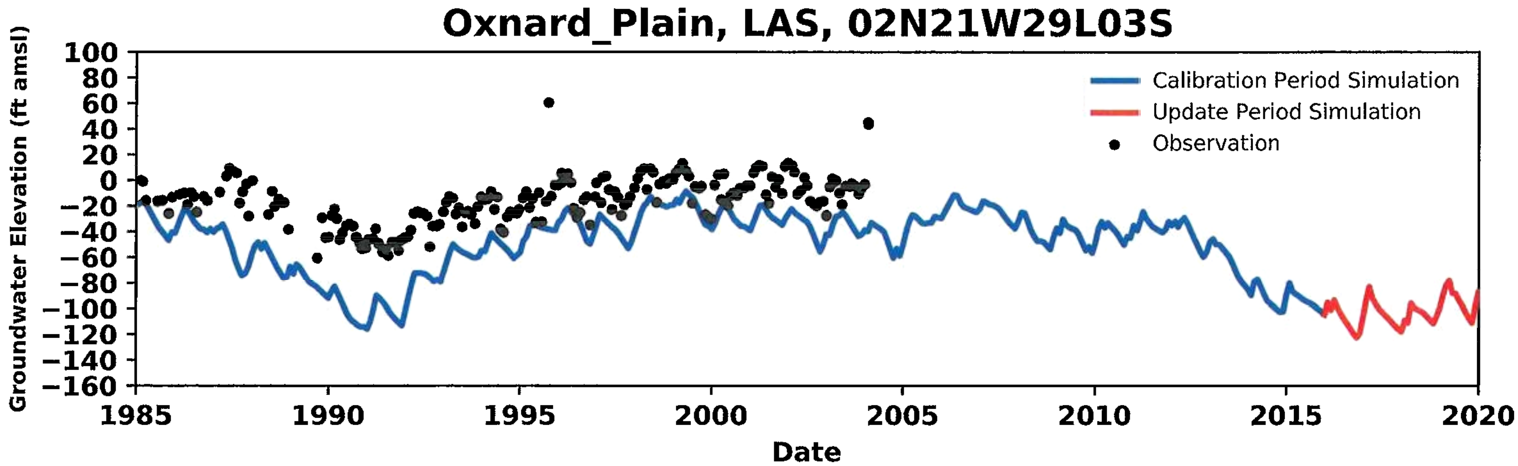
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, LAS, 02N21W29L03S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
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60
40
20
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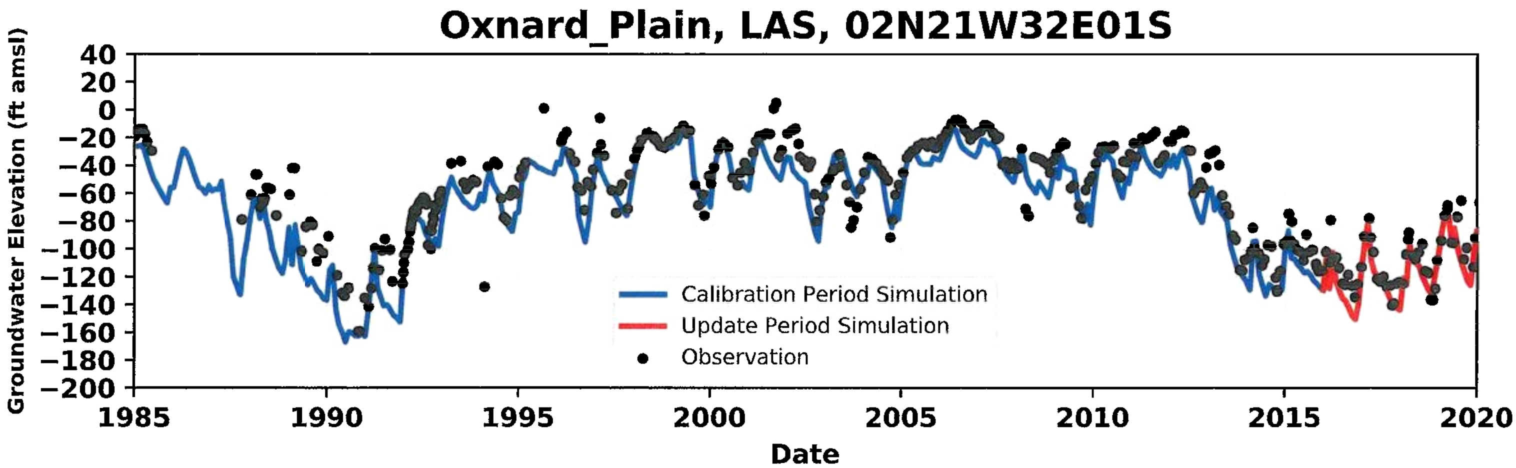
Date


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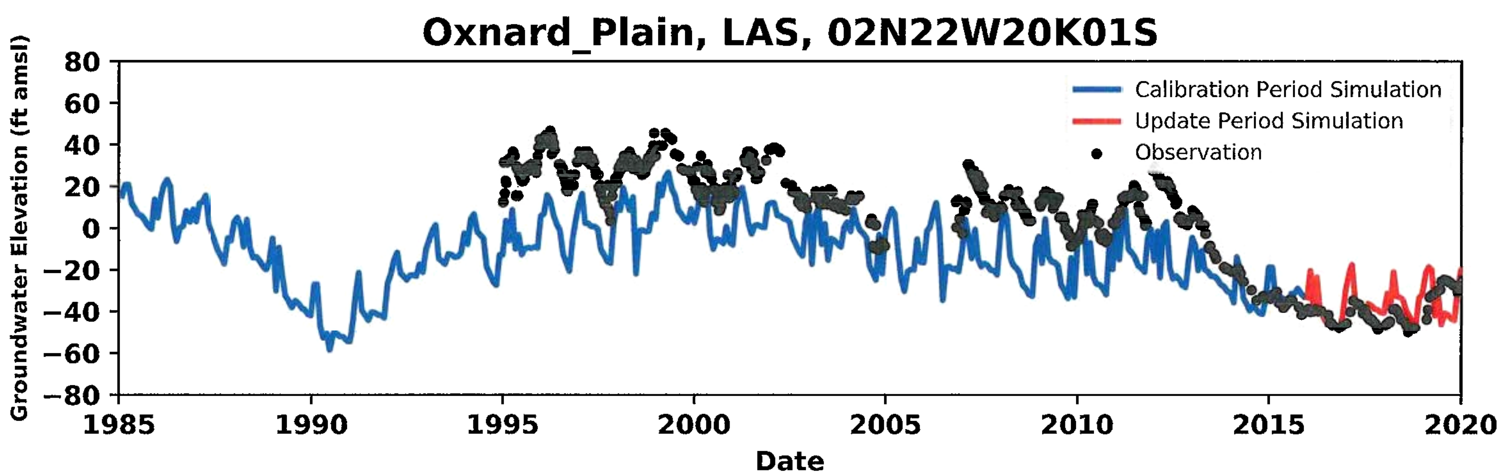
Date


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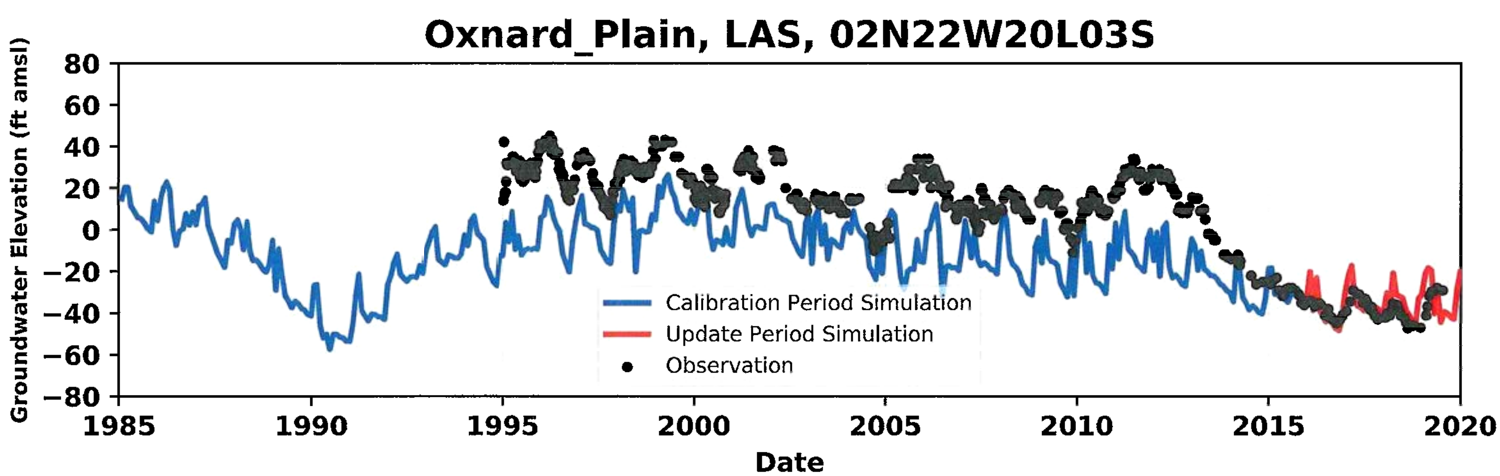
Date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Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
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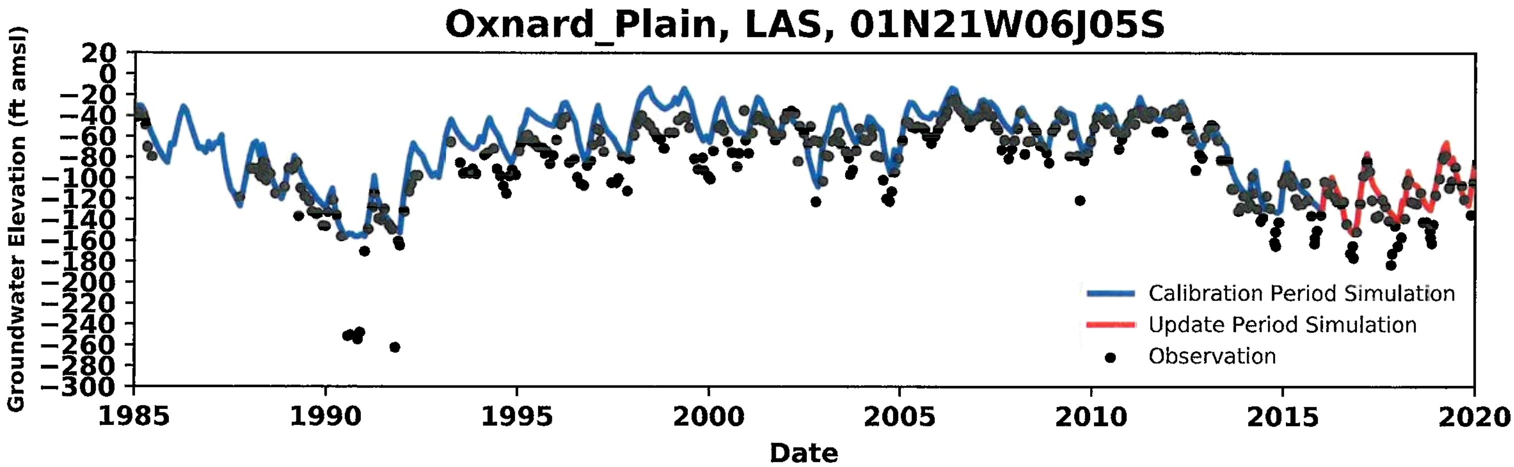
Date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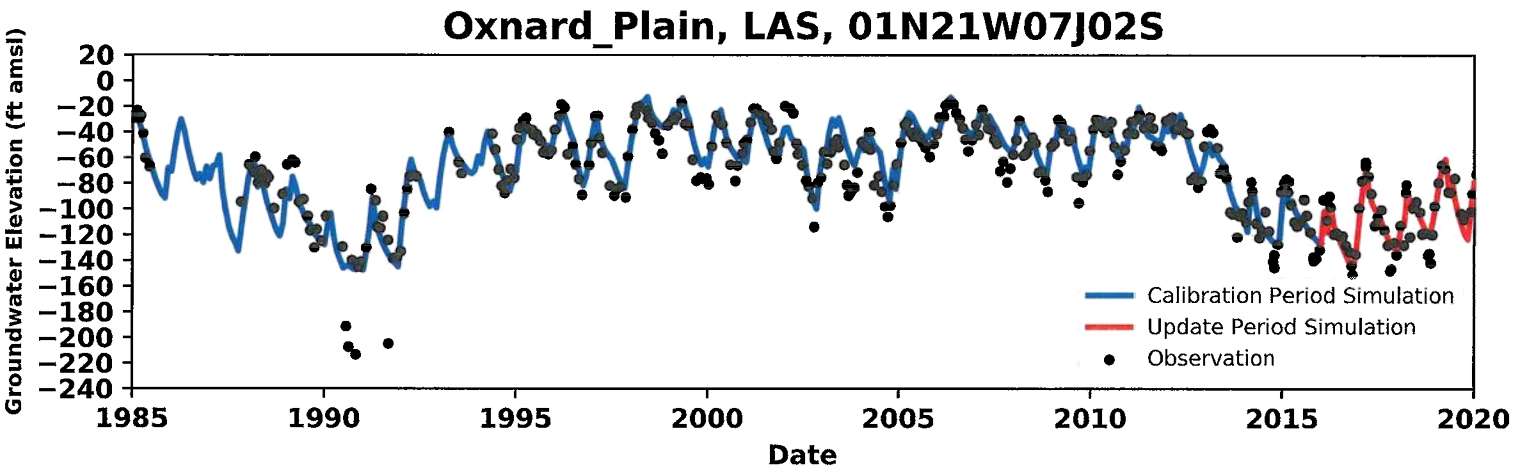
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation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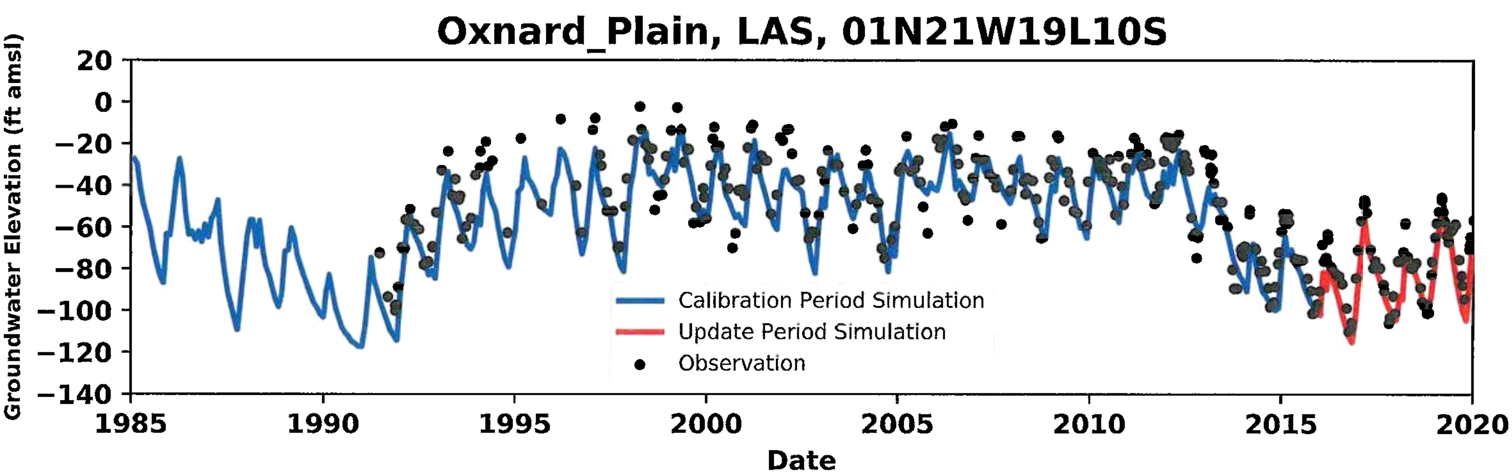
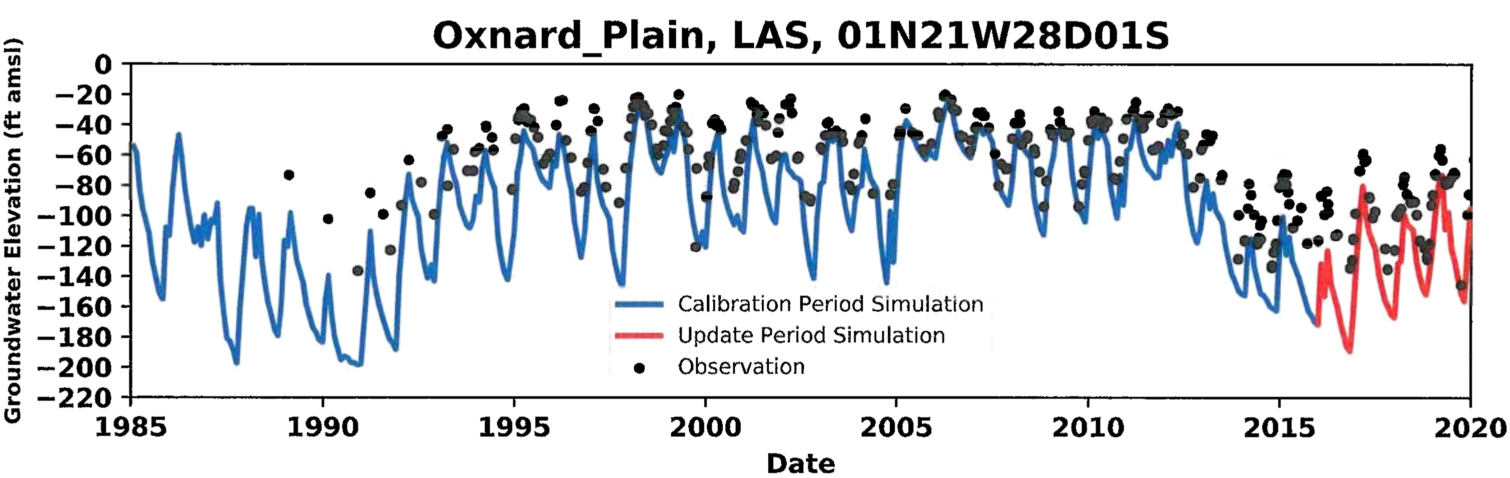
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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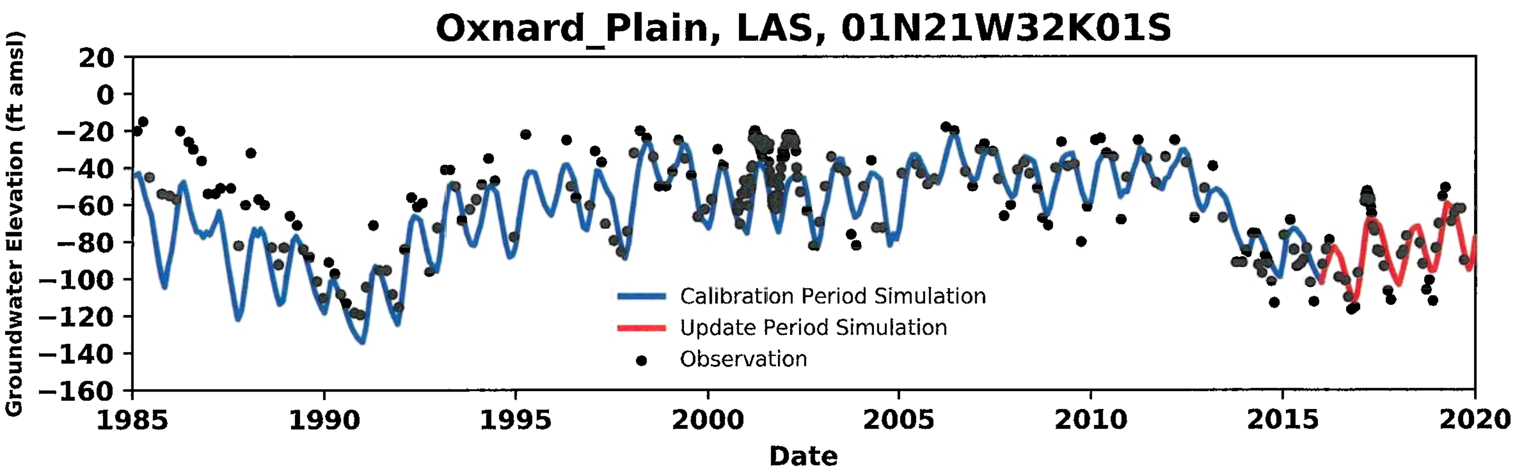
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, LAS, 01N21W32K01S
Groundwater Elevation (ft amsl)
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−60
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−160
1985
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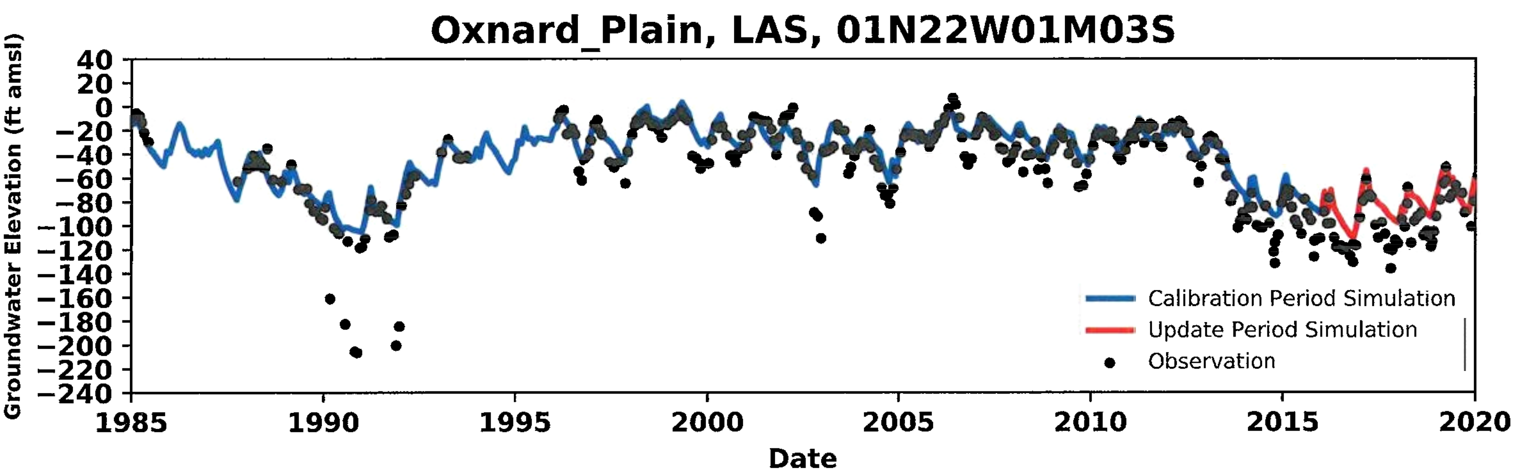
Date
Calibration Period Simulation
Update Period Simulation
Observation


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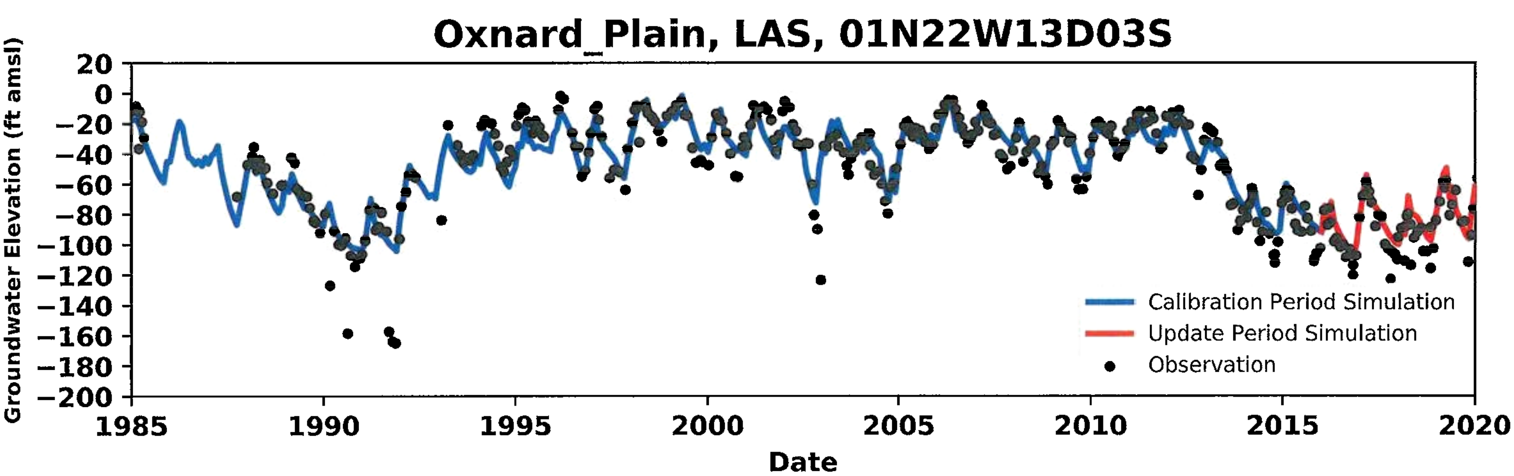
Observation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Groundwater Elevation (ft amsl)
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Calibration Period Simulation
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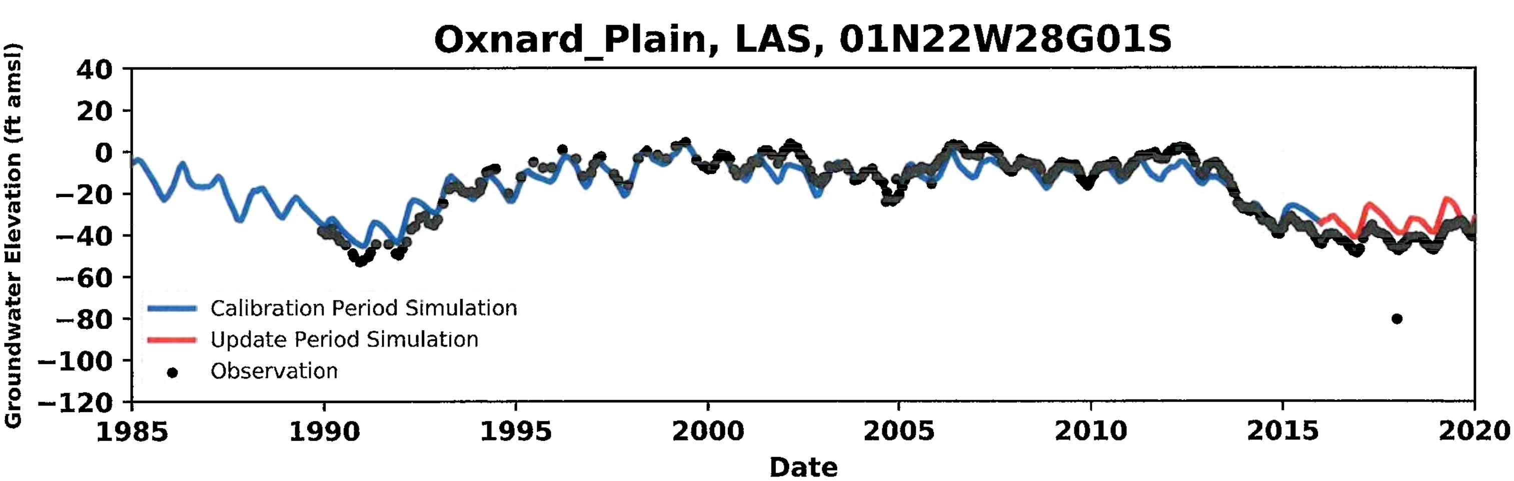
Observation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Groundwater Elevation (ft amsl)
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Calibration Period Simulation
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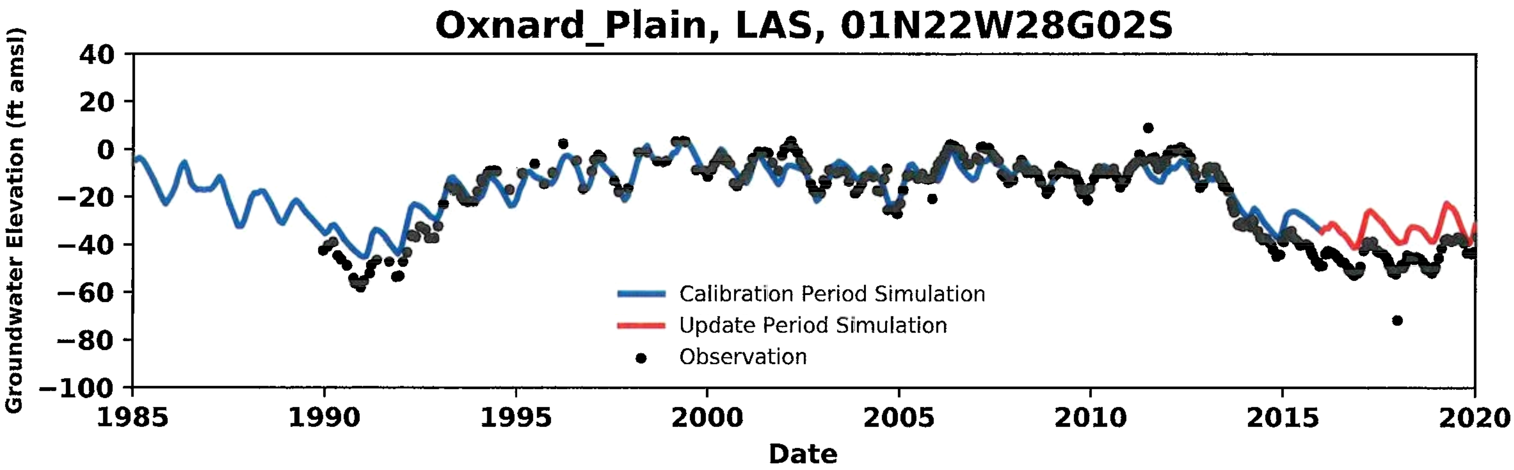
Observation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Groundwater Elevation (ft amsl)
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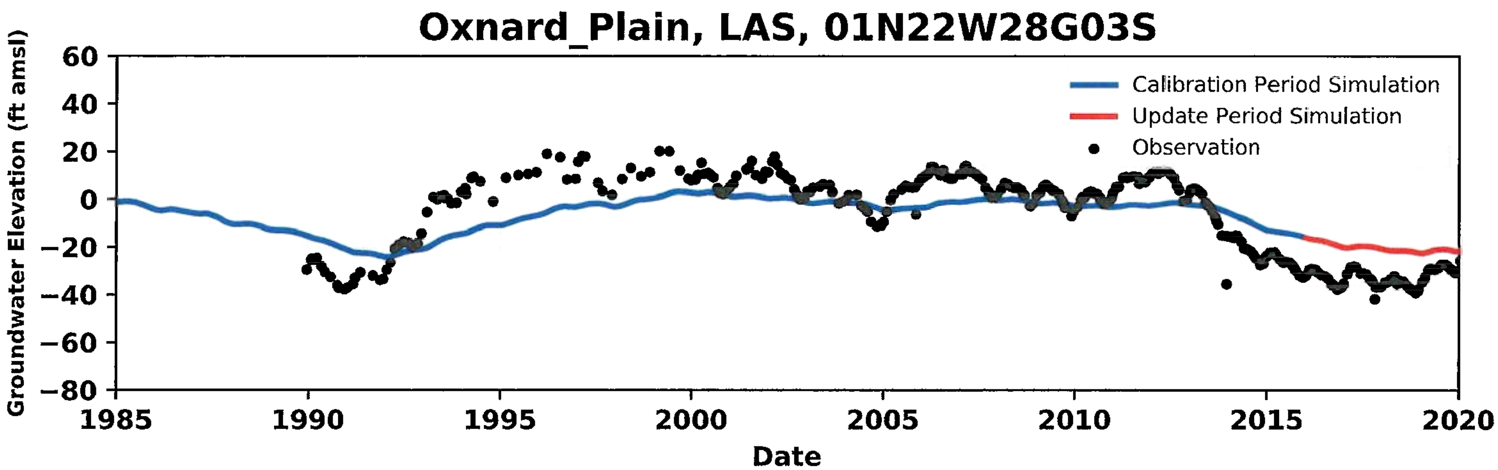
Observation


Oxnard_Plain, LAS, 01N22W28G03S
Groundwater Elevation (ft amsl)
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Calibration Period Simulation
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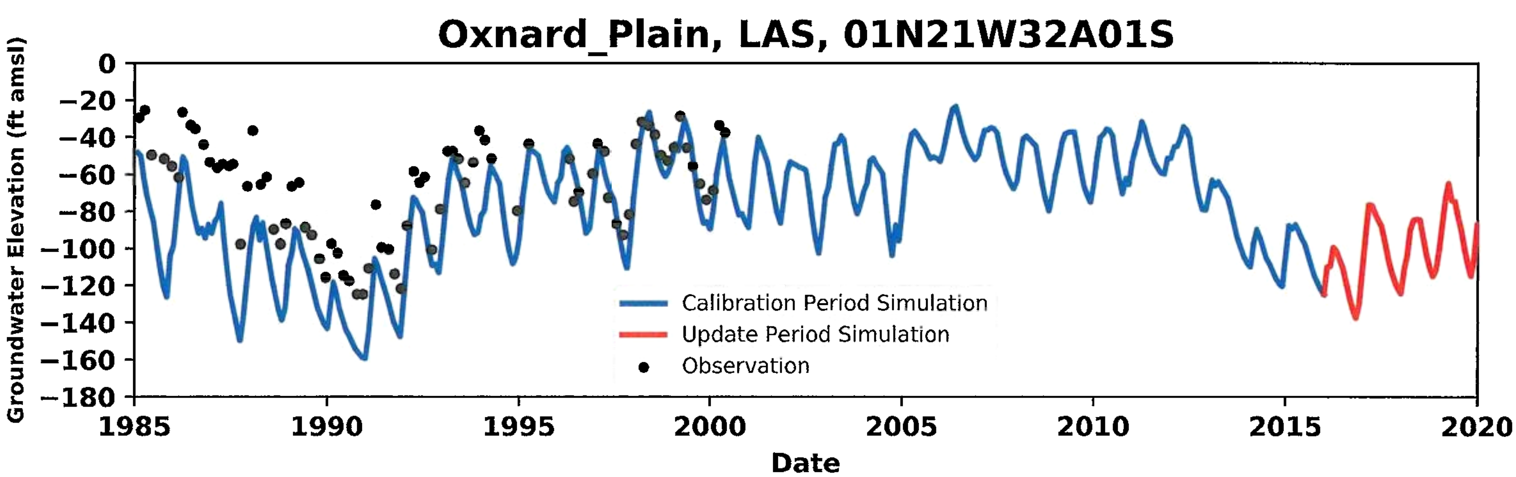
Observation


Oxnard_Plain, LAS, 01N21W32A01S
Groundwater Elevation (ft amsl)
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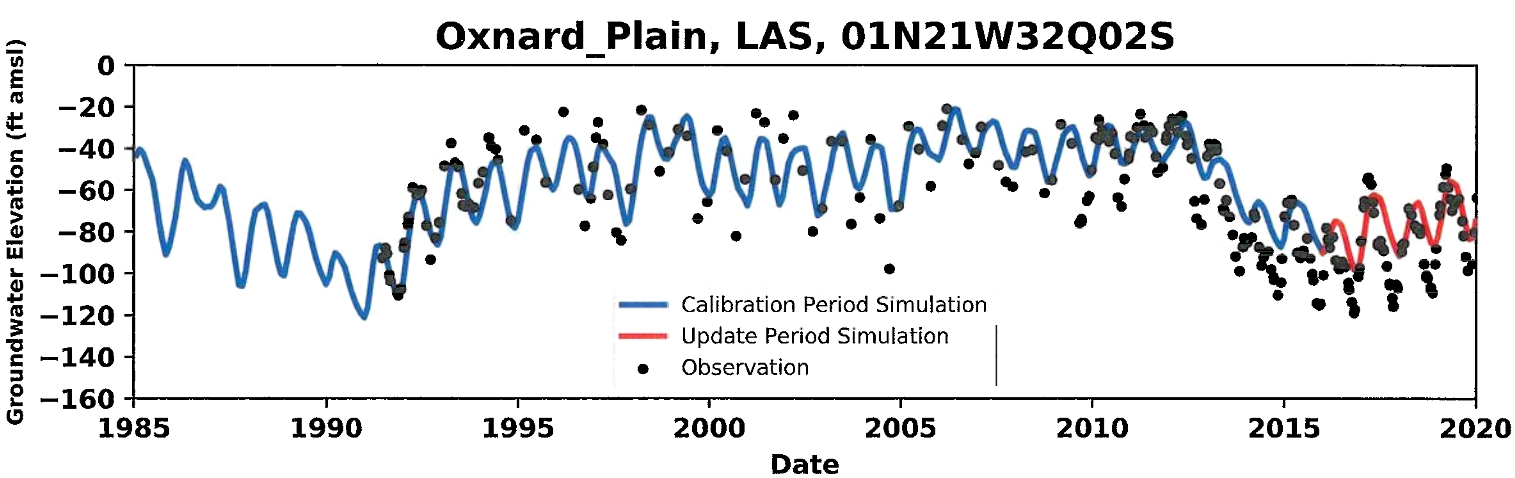
Observation


Oxnard_Plain, LAS, 01N21W32Q02S
Groundwater Elevation (ft amsl)
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Calibration Period Simulation
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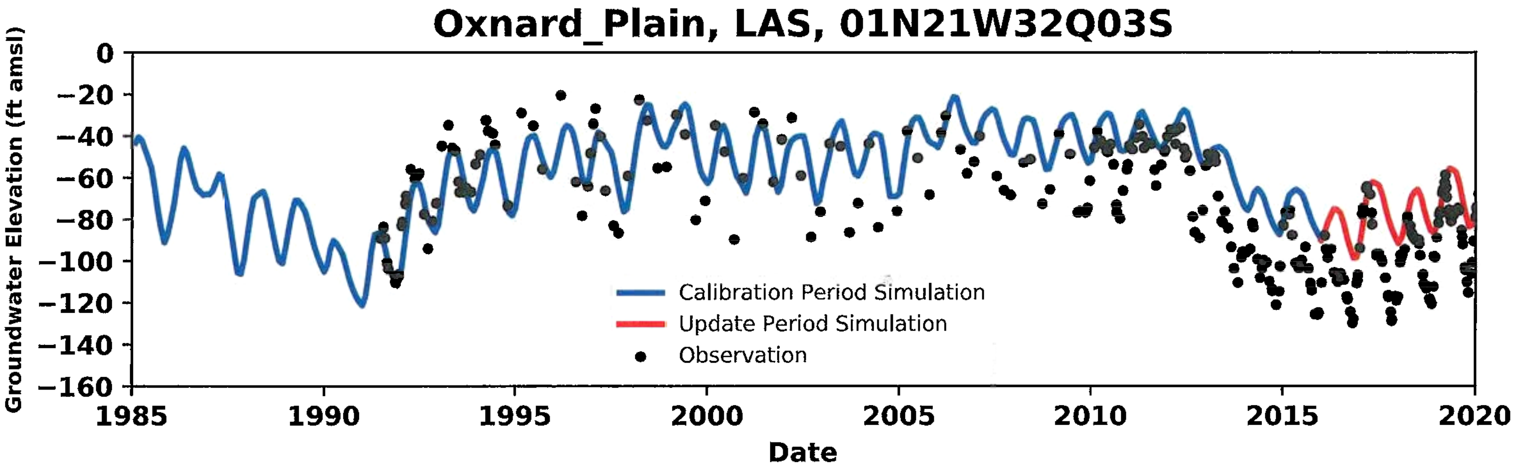
Oxnard_Plain, LAS, 01N21W32Q03S
Groundwater Elevation (ft amsl)
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Calibration Period Simulation
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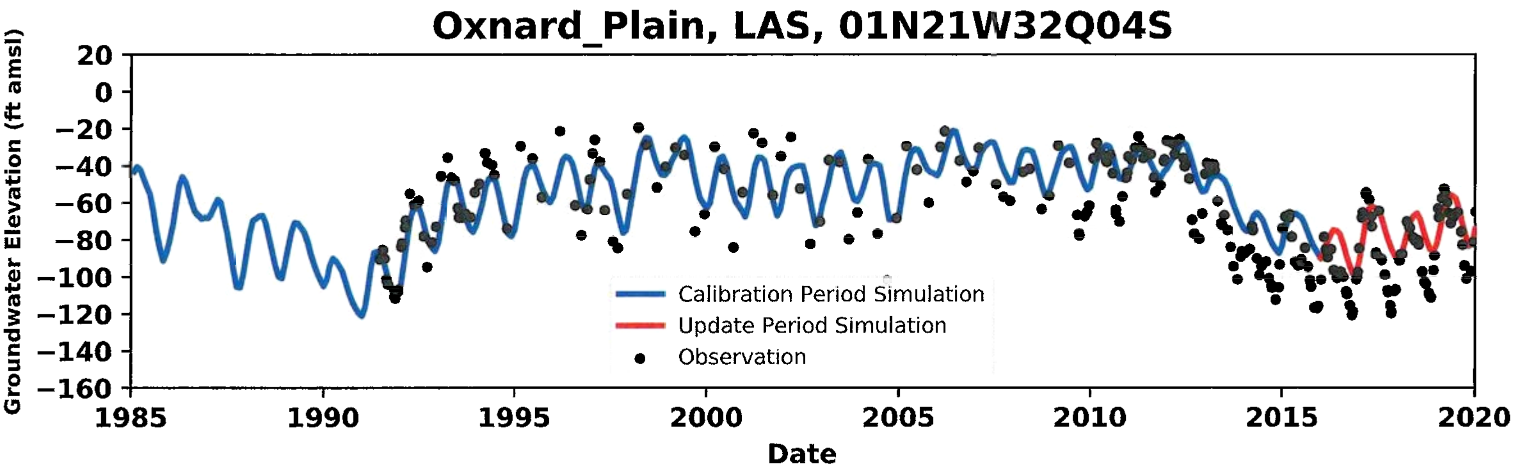
Observation


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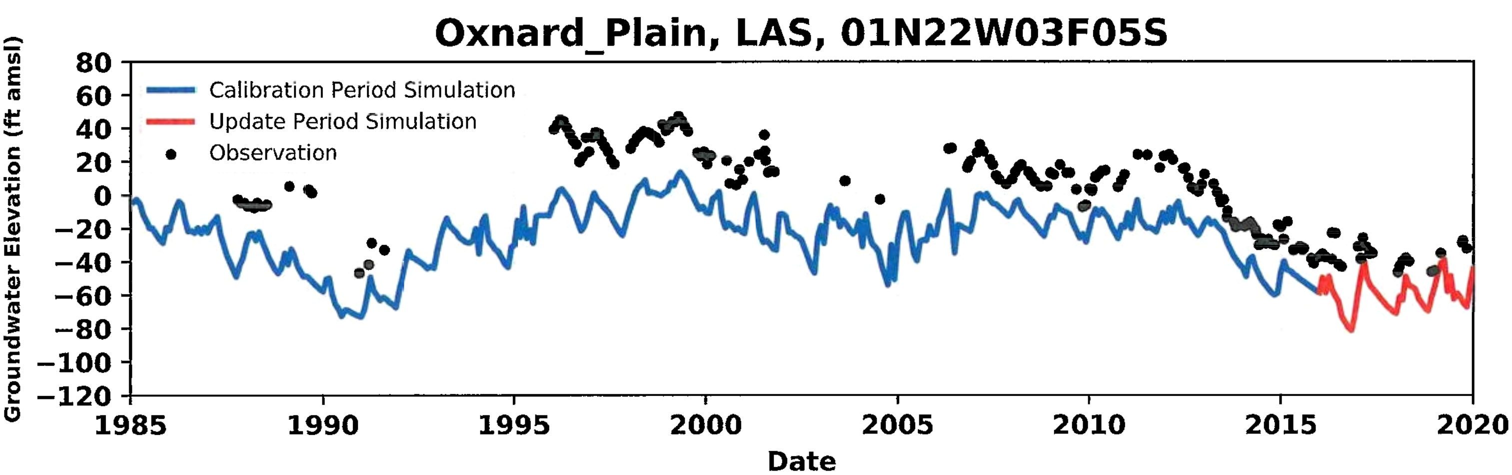
Calibration Period Simulation
Update Period Simulation
Observation


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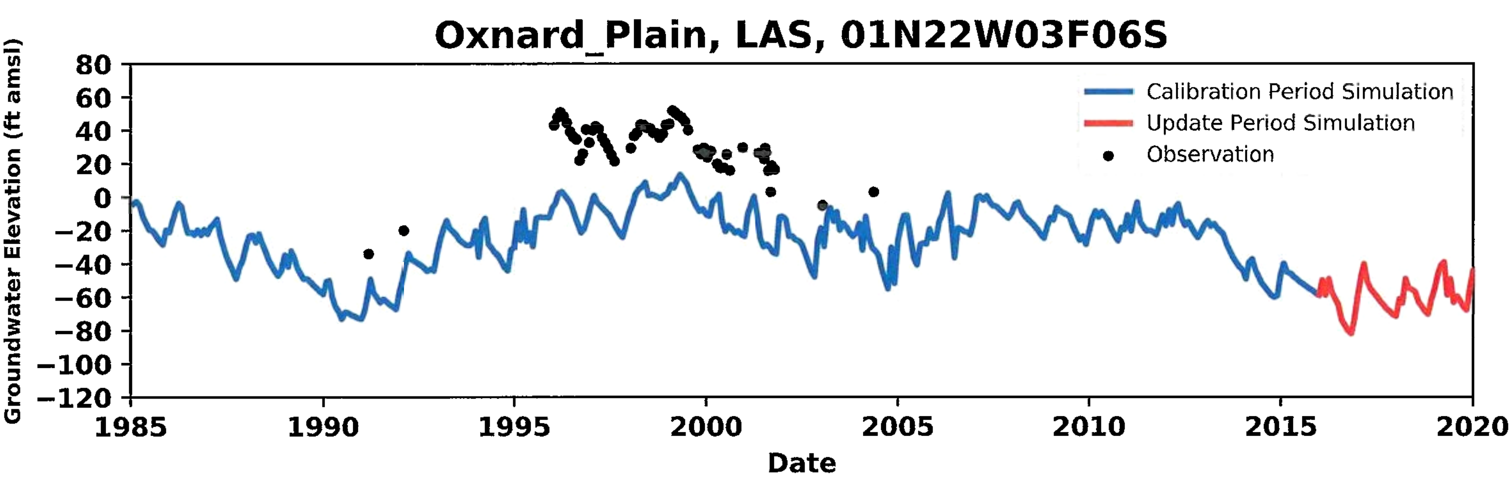
Calibration Period Simulation
Update Period Simulation
Observation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Groundwater Elevation (ft amsl)
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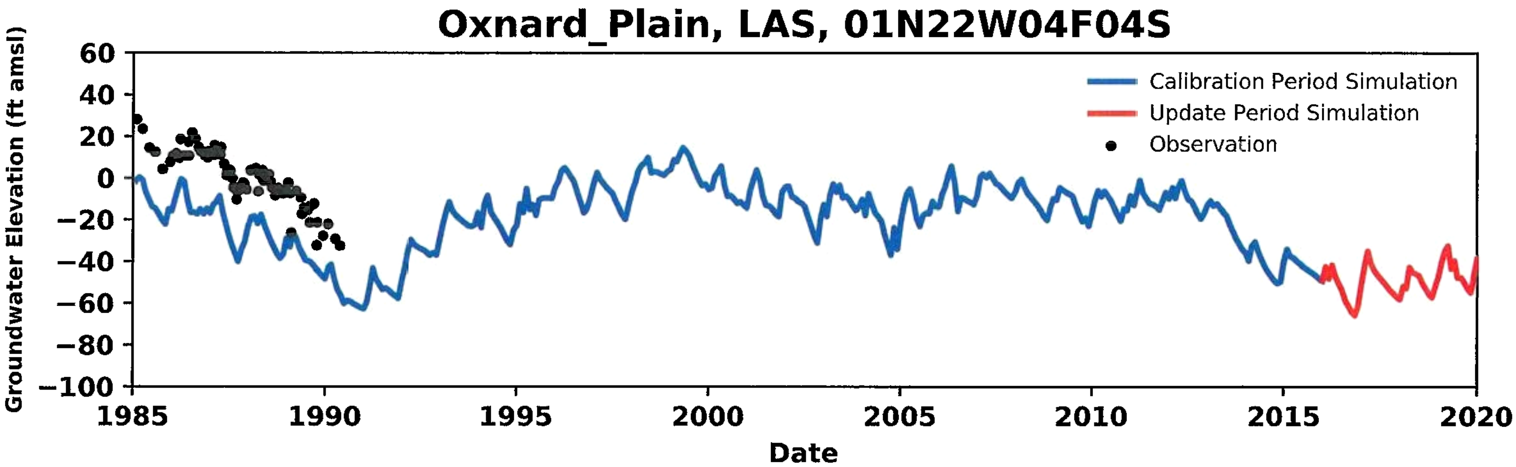
Date
Calibration Period Simulation
Update Period Simulation
Observation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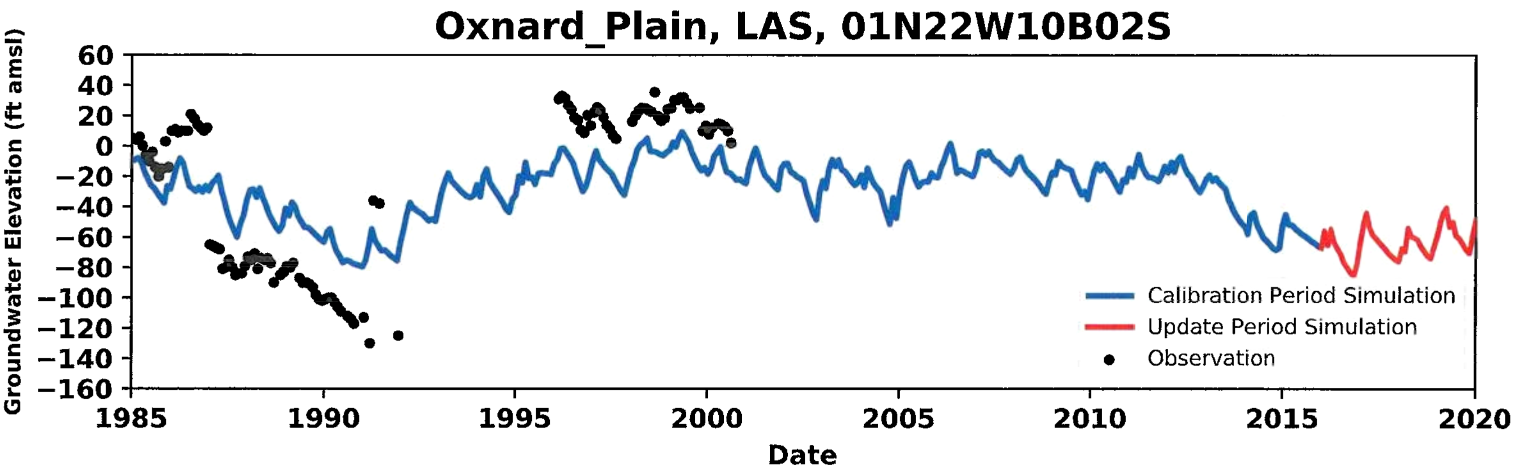
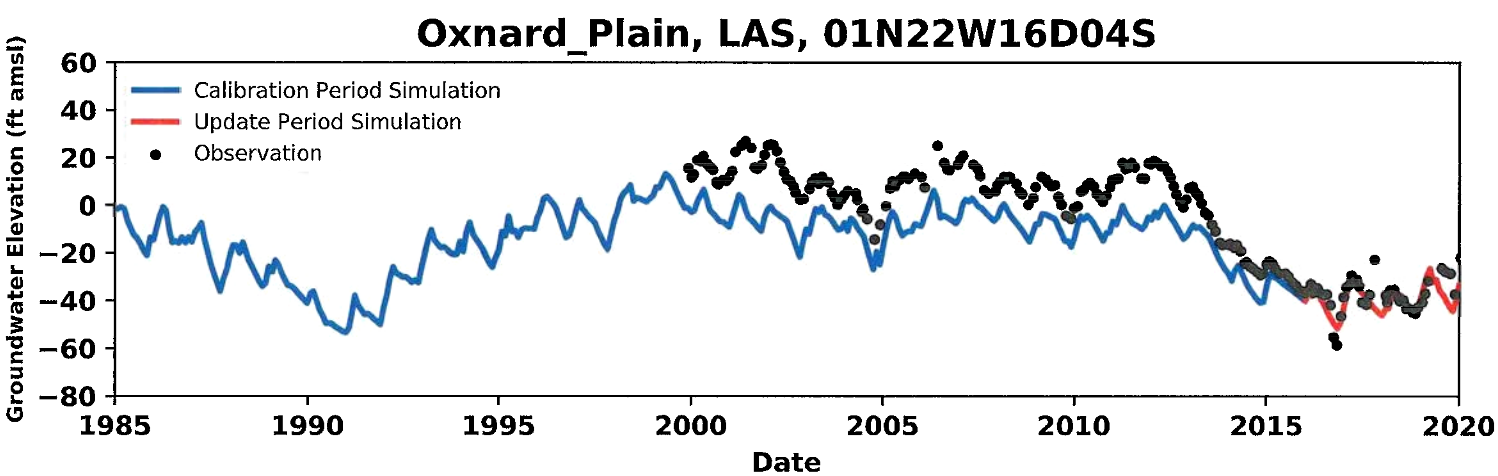
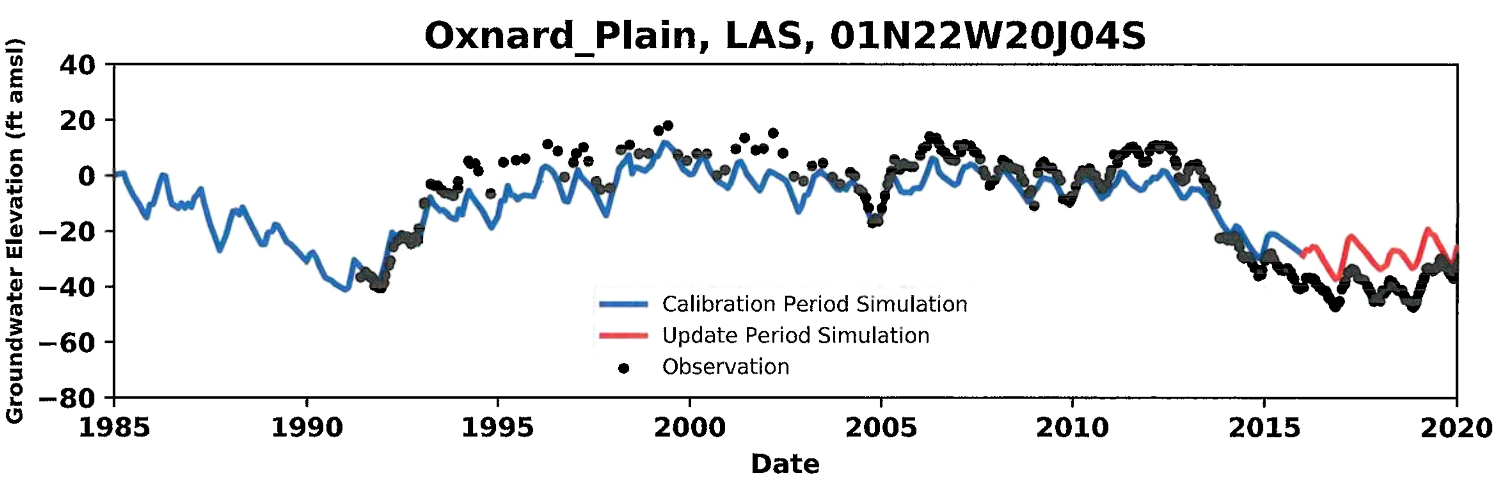
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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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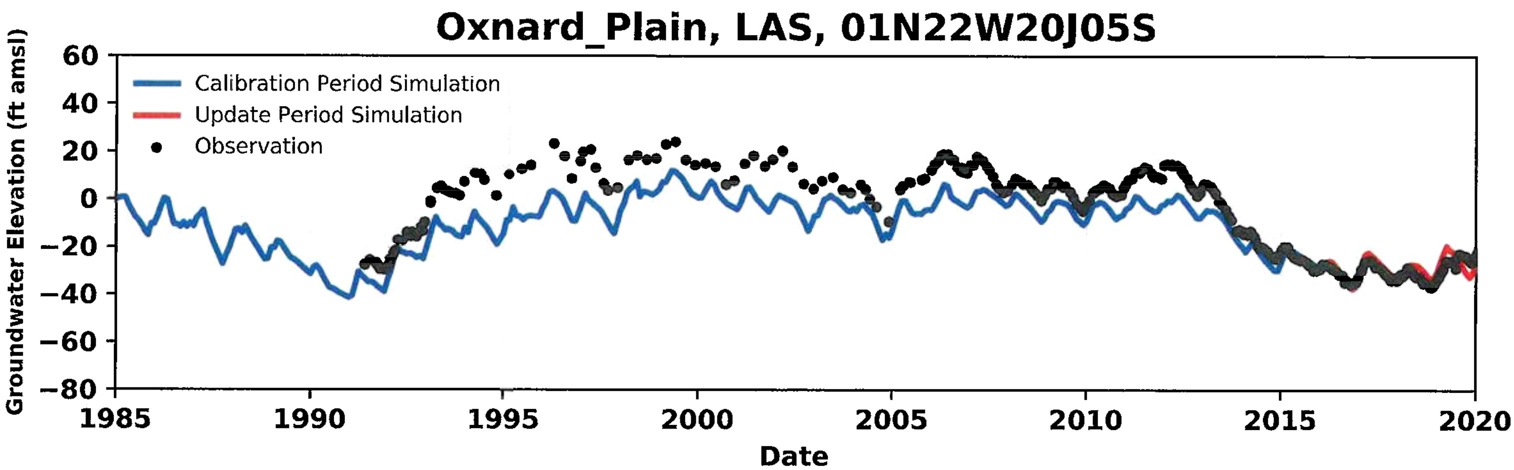
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation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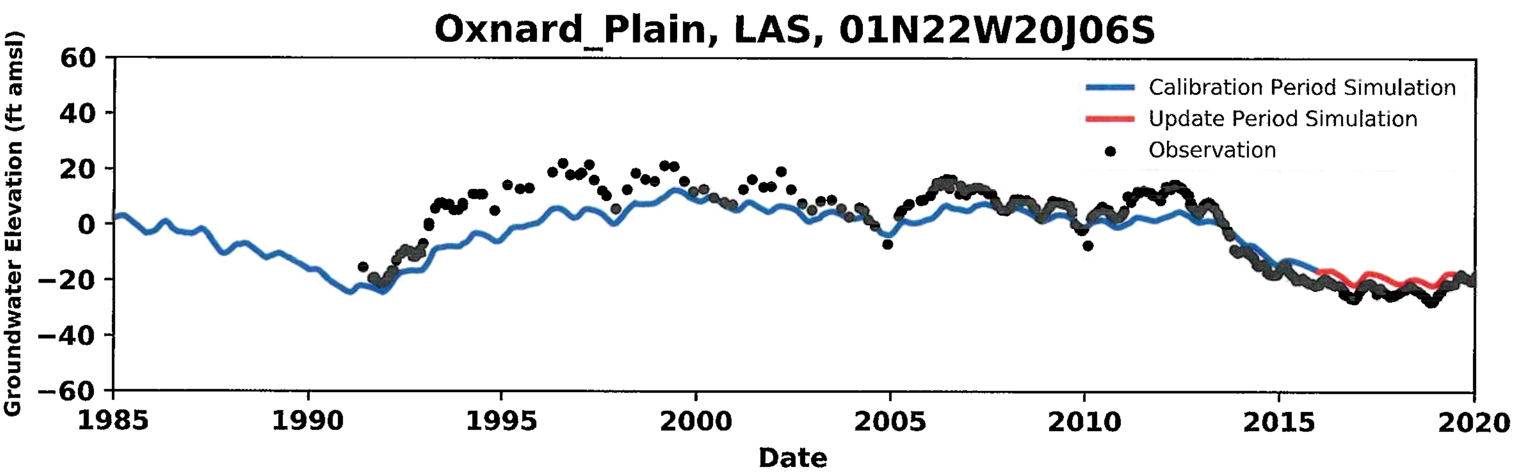
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date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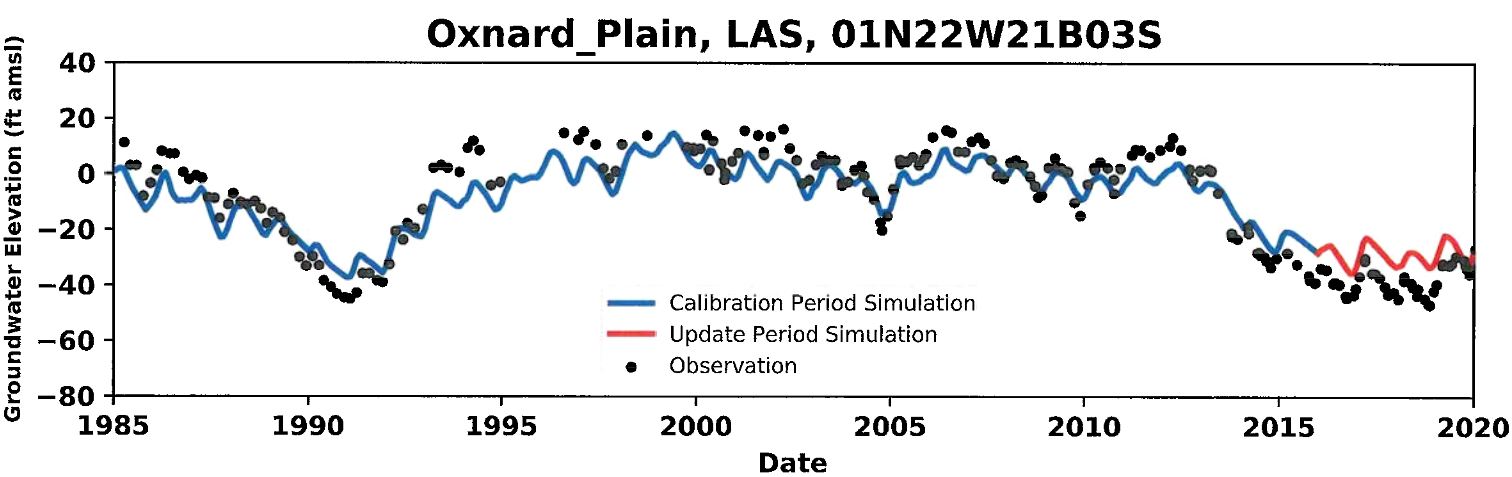
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date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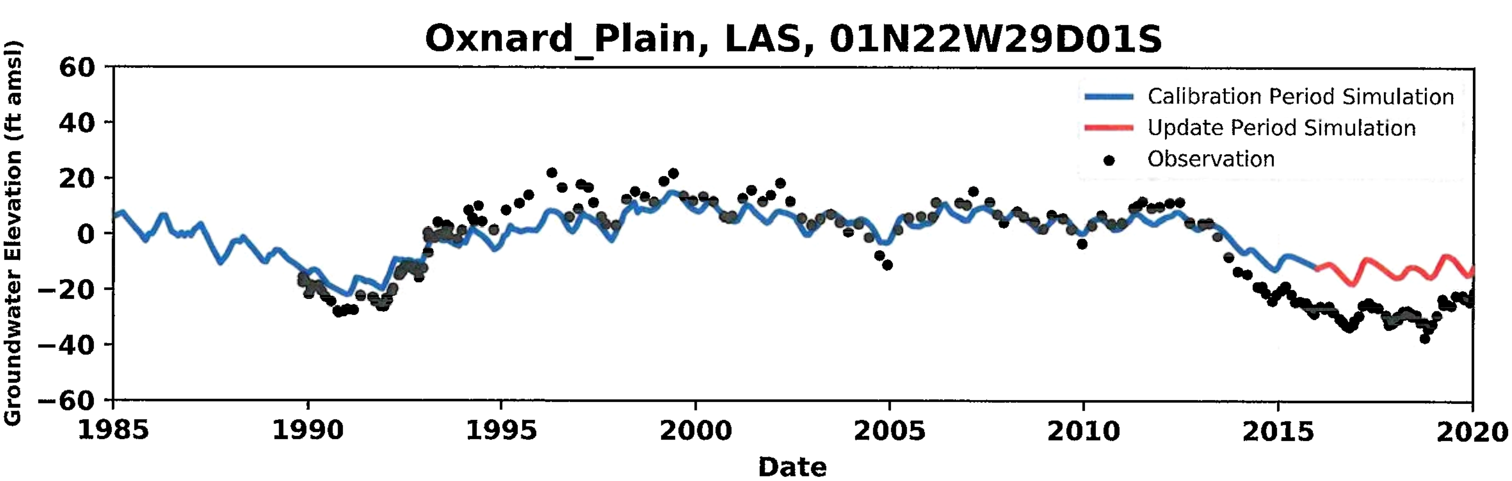
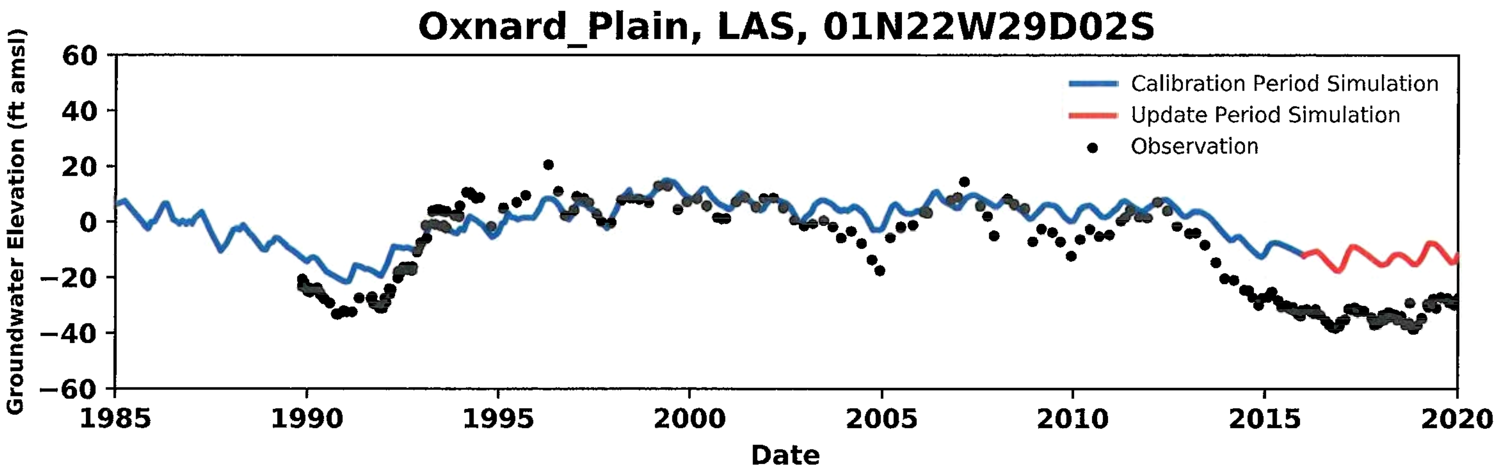
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date


Oxnard_Plain, LAS, 01N22W29D01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date


Oxnard_Plain, LAS, 01N22W29D02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
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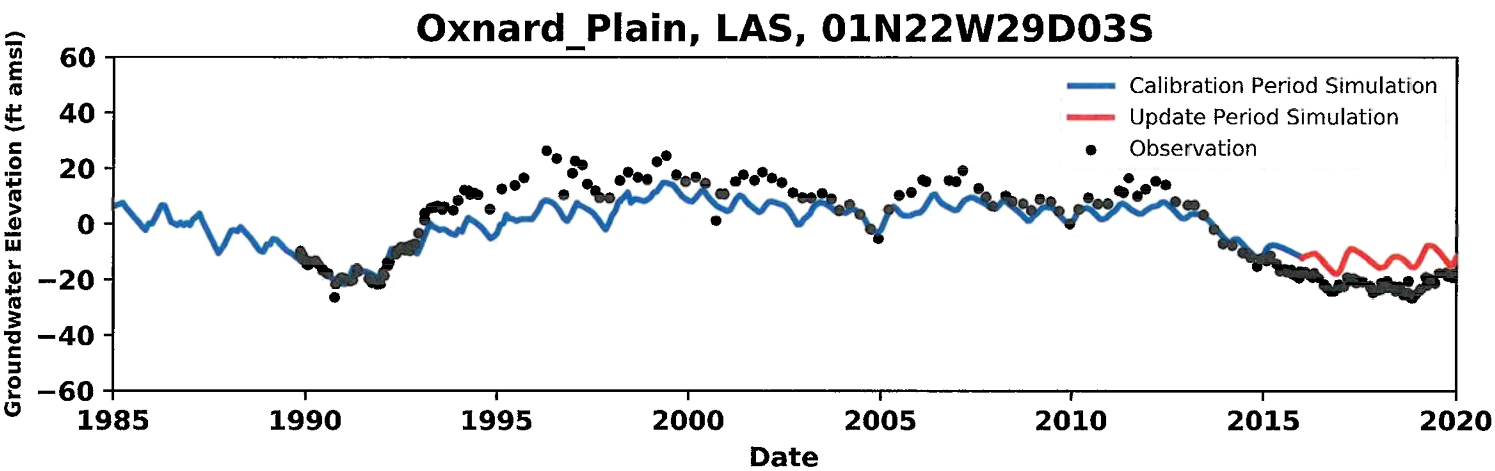
Oxnard_Plain, LAS, 01N22W29D03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
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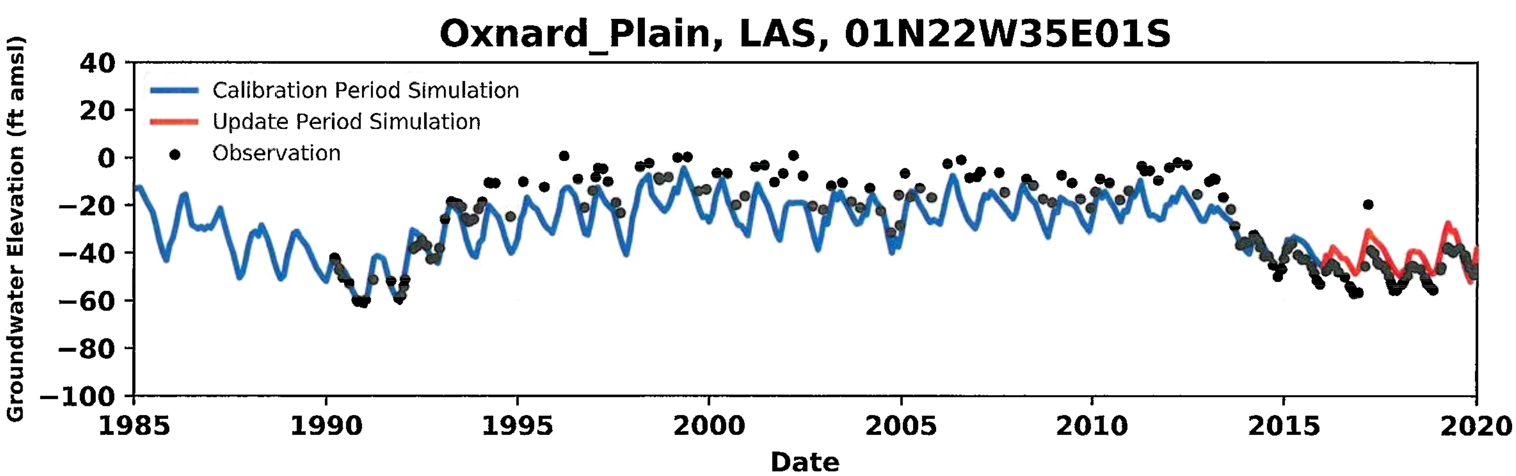
Oxnard_Plain, LAS, 01N22W35E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation
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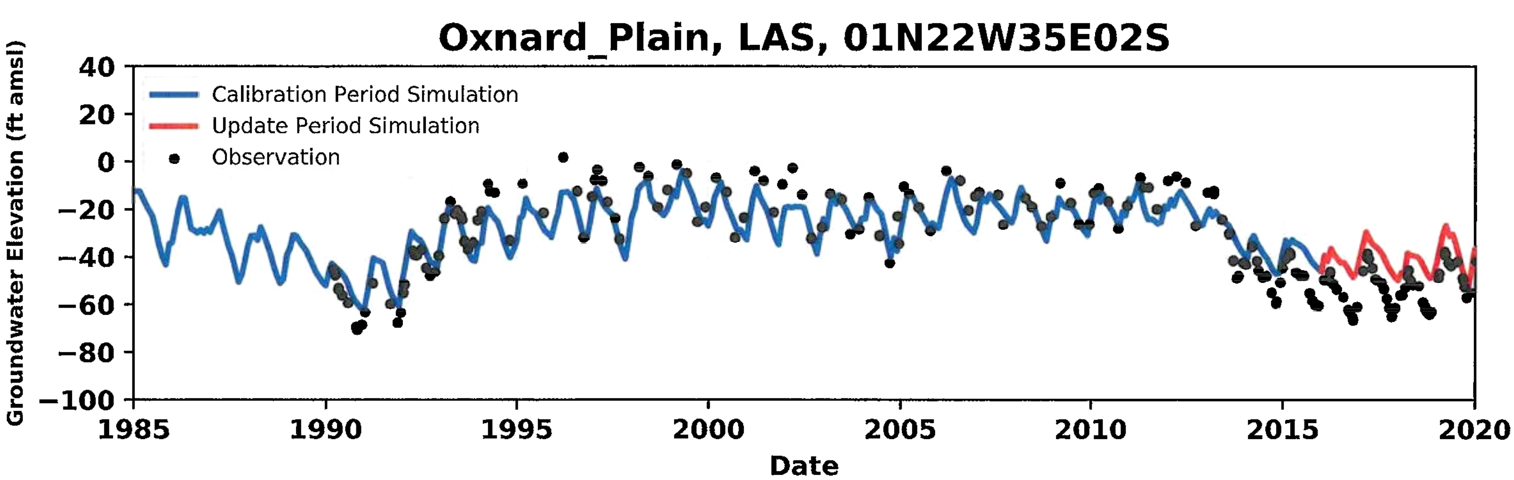
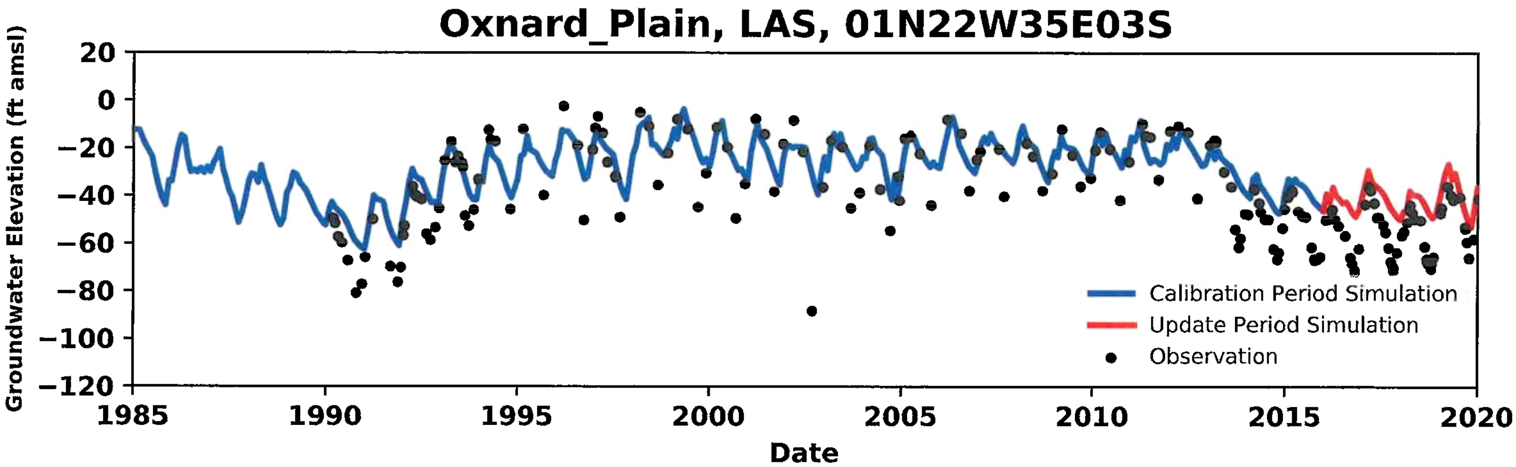
1990
1995
2000
2005
2010
2015
2020


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)
20
0
−20
−40
−60
−80
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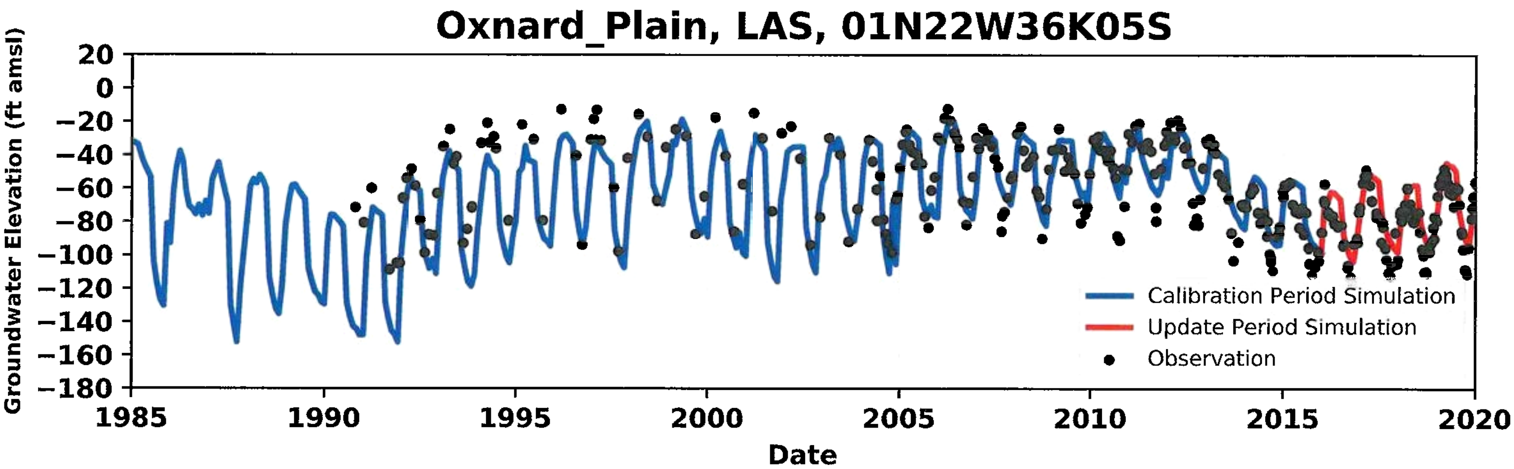
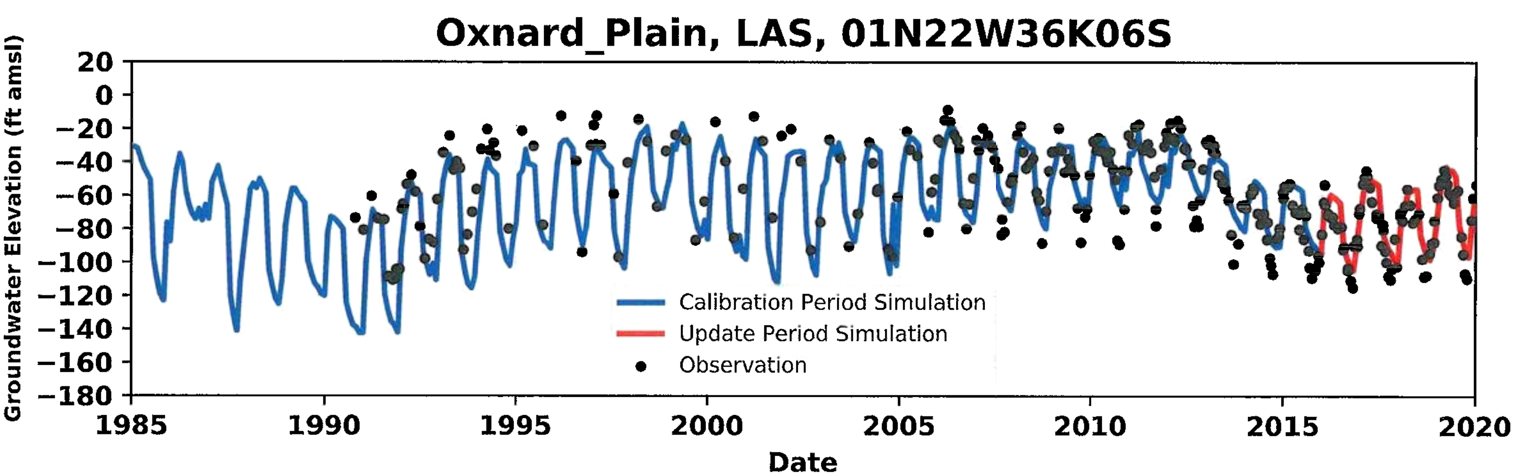
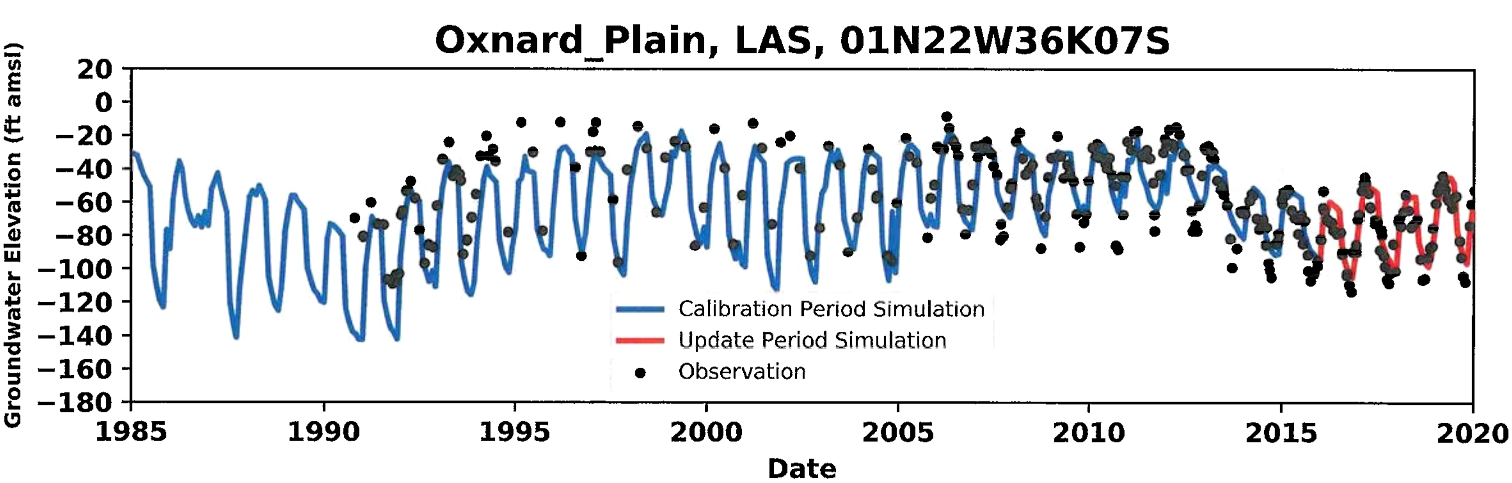
−120
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Oxnard_Plain, LAS, 01N22W36K05S
Groundwater Elevation (ft amsl)
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


Oxnard_Plain, LAS, 01N22W36K06S
Groundwater Elevation (ft amsl)
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


Oxnard_Plain, LAS, 01N22W36K07S
Groundwater Elevation (ft amsl)
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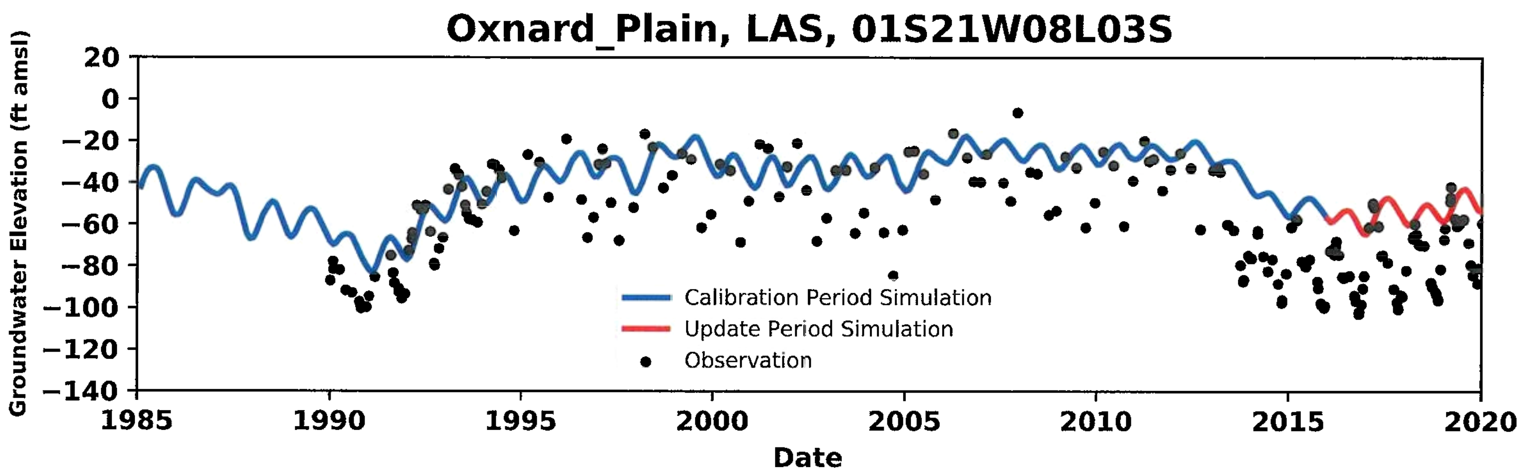
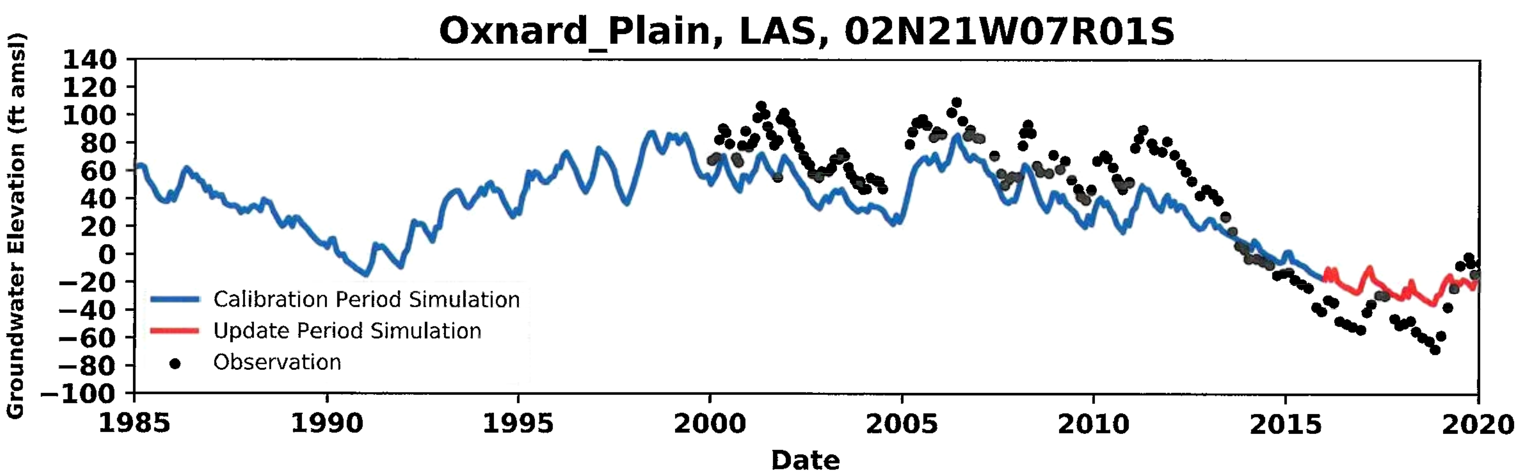
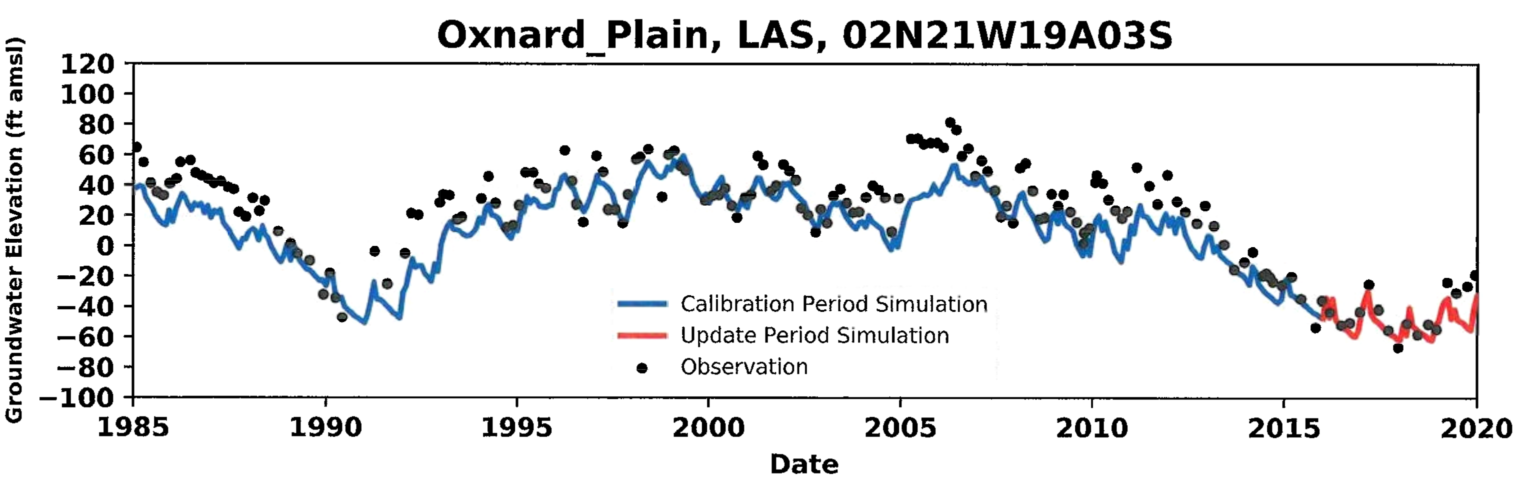
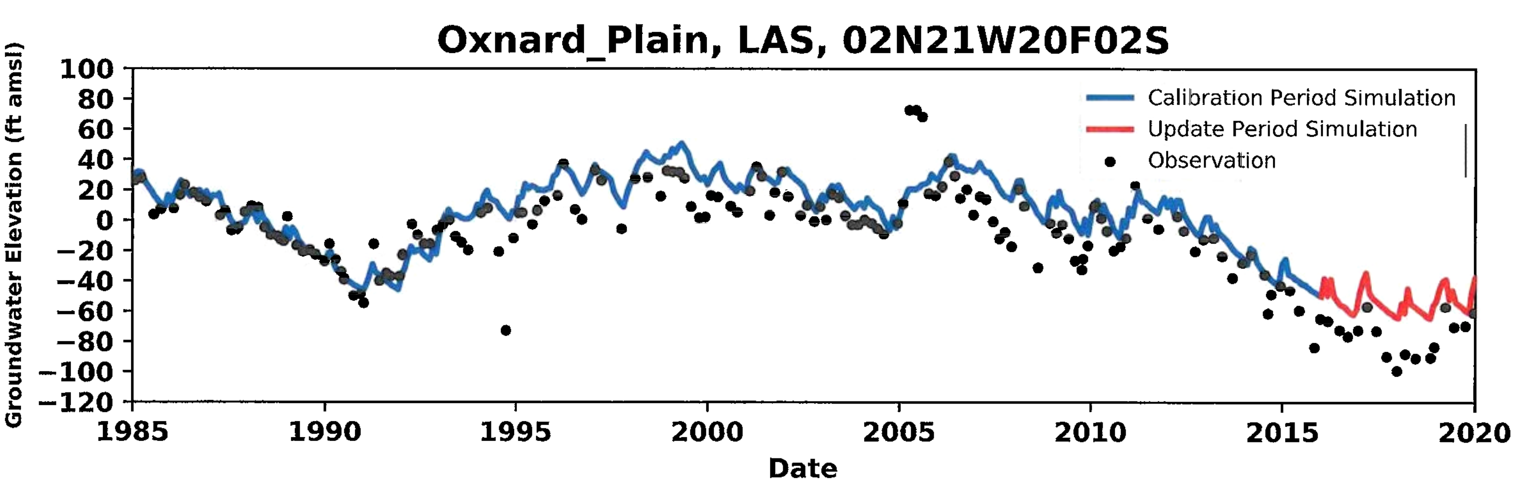
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

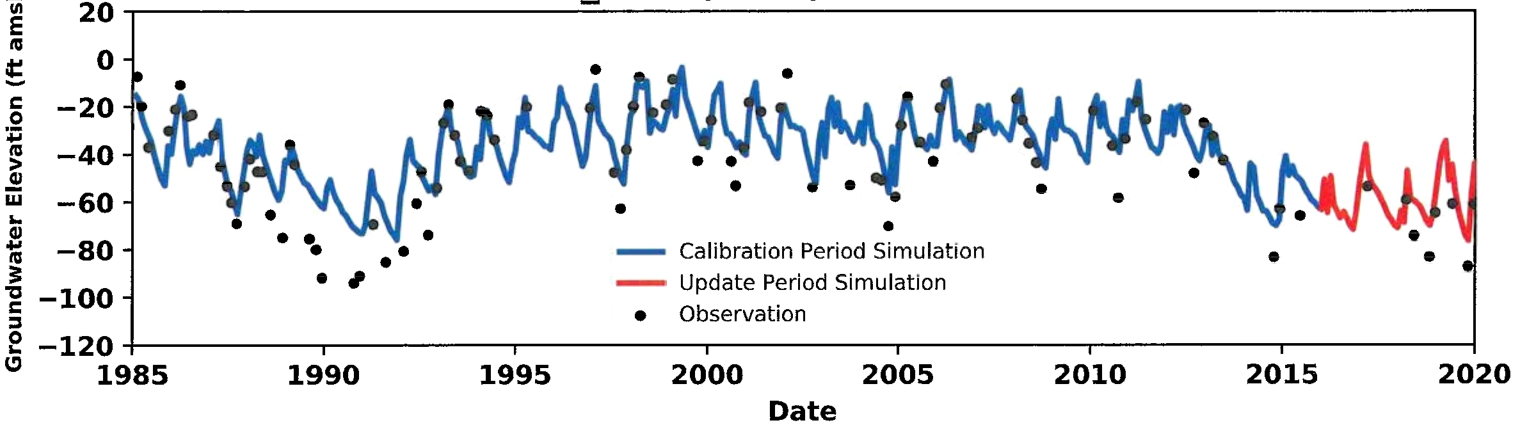

Oxnard_Plain, LAS, 01S21W08L03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

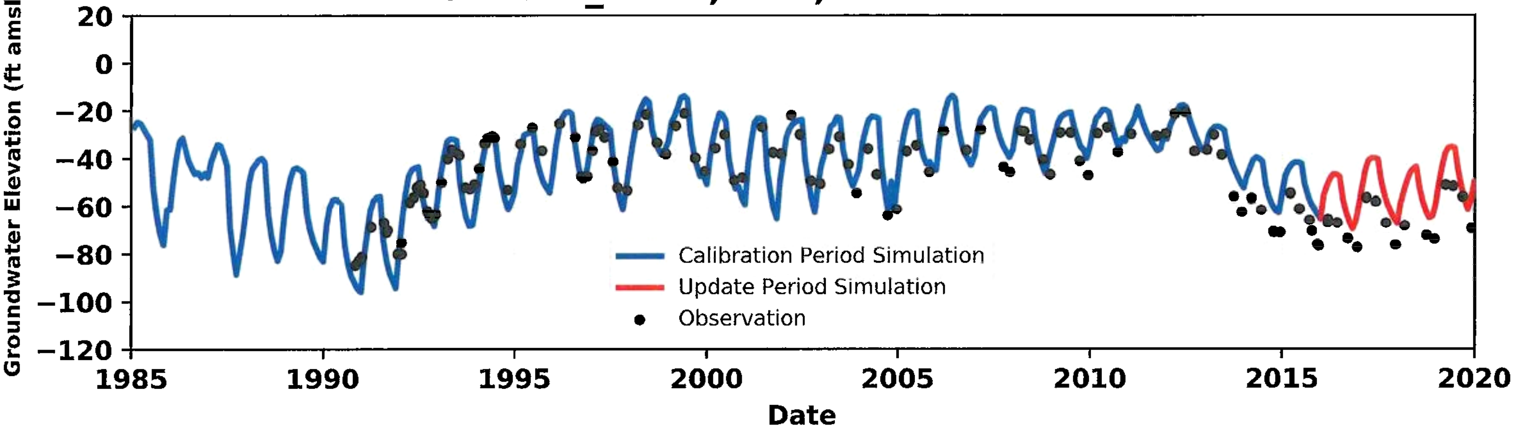

Oxnard_Plain, LAS, 02N21W19A03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

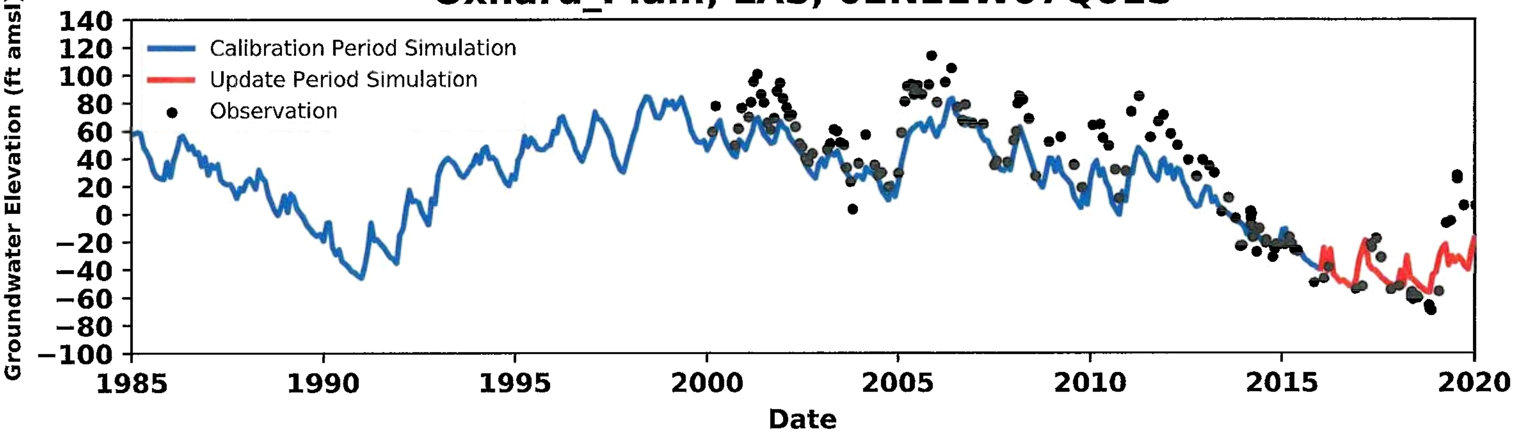
## Oxnard_Plain, LAS, 01N22W26M03S



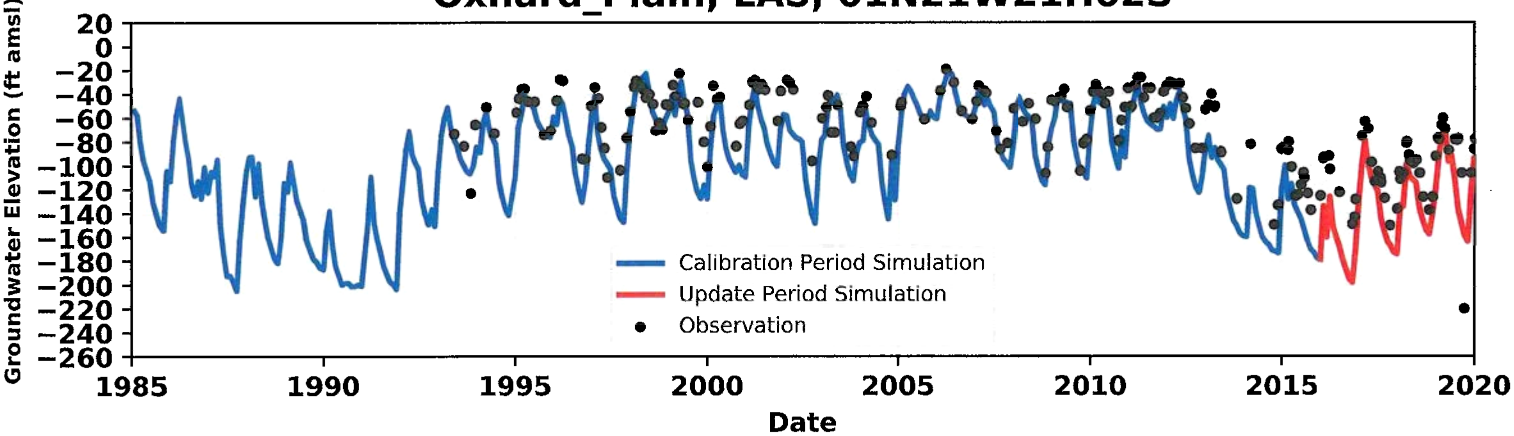

## Oxnard_Plain, LAS, 01S22W01H01S

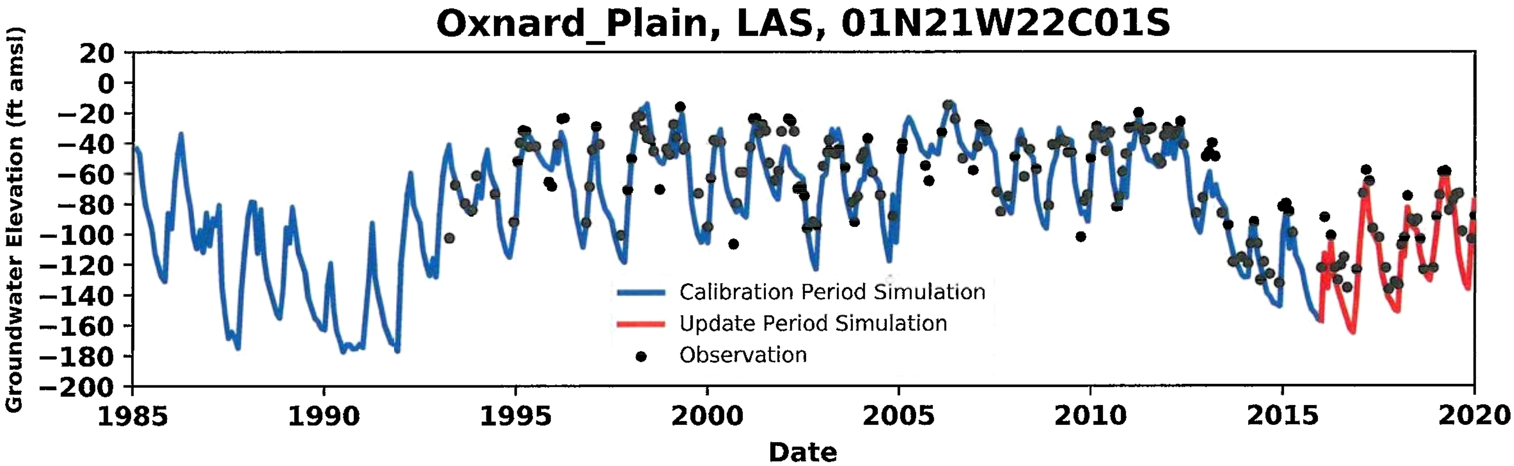


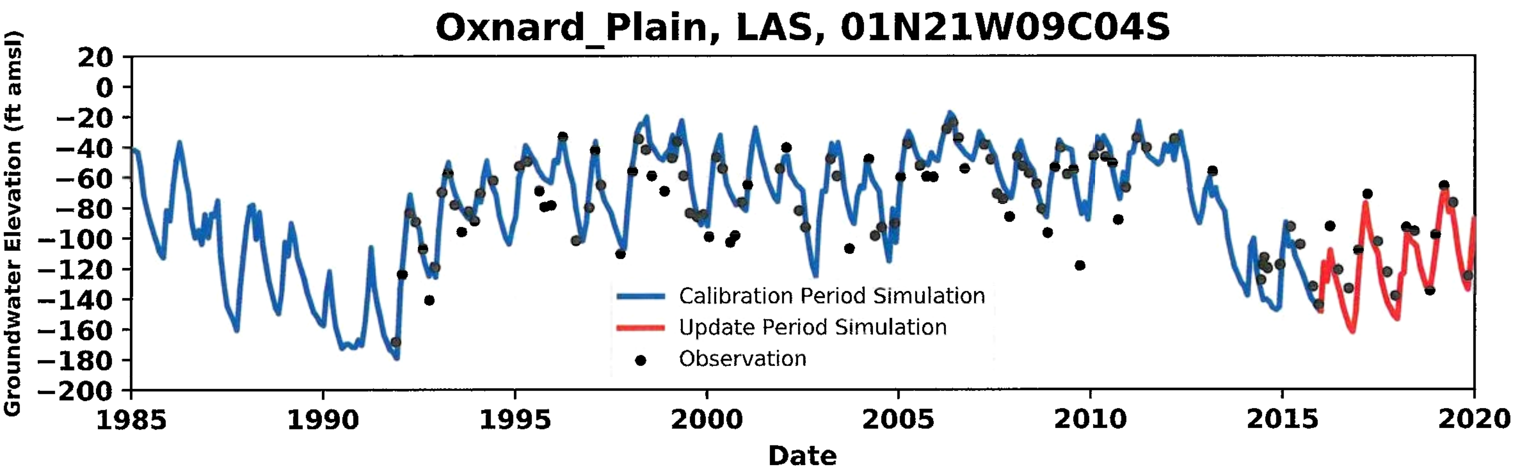

## Oxnard_Plain, LAS, 02N21W07Q01S

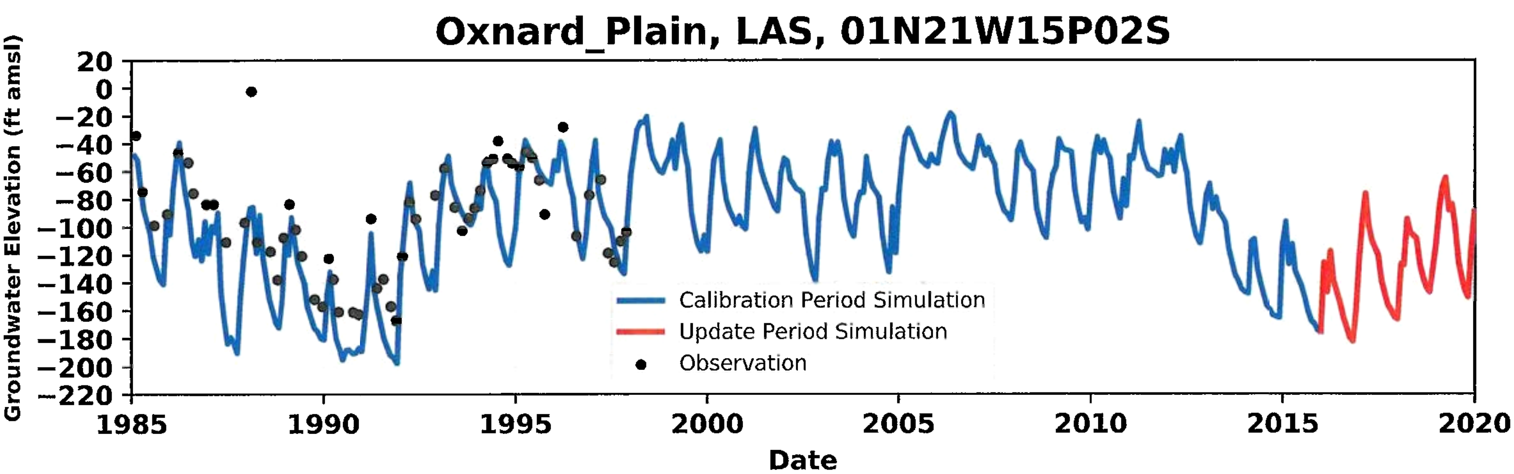


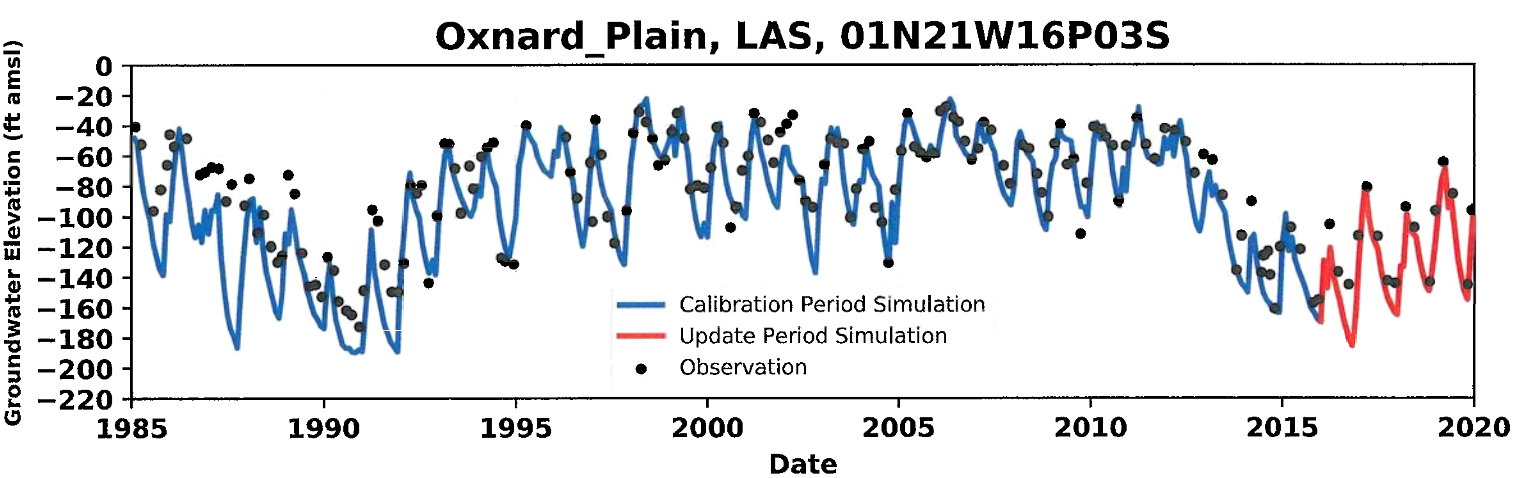

## Oxnard_Plain, LAS, 01N21W21H02S

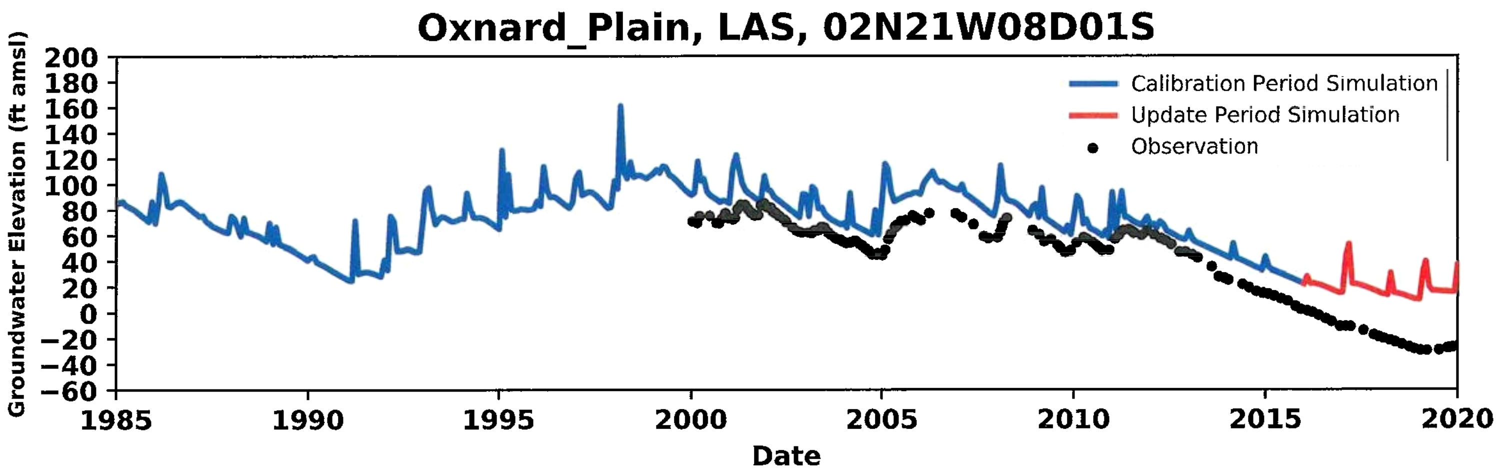



Oxnard_Plain, LAS, 01N21W22C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
200
180
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140
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60
40
20
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−20
−40
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1985
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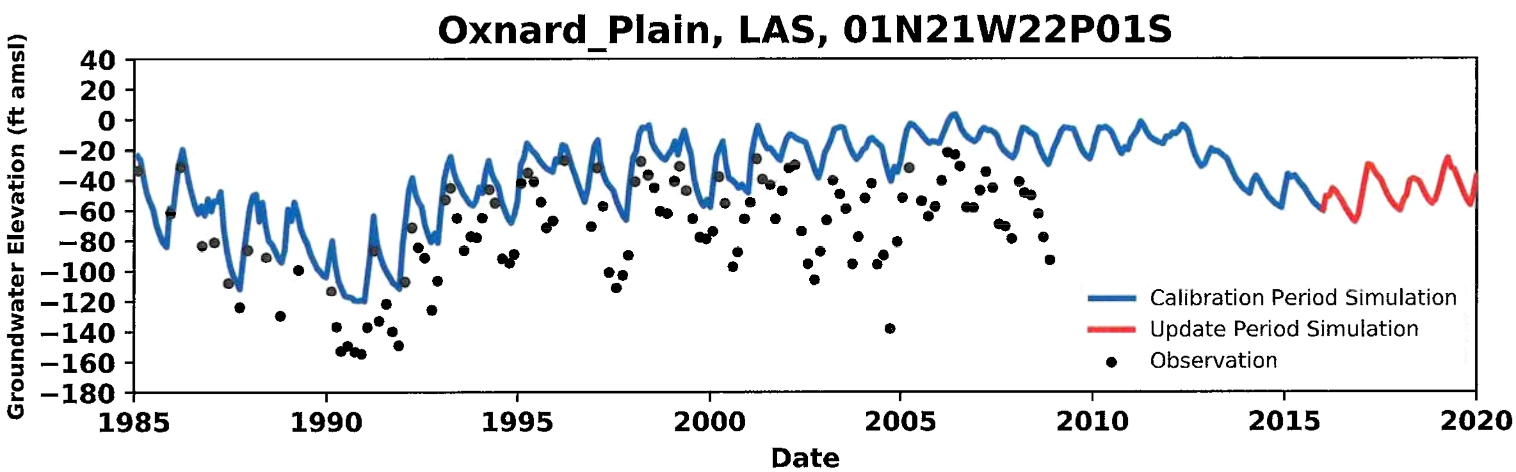
2000
2005
2010
2015
2020


Oxnard_Plain, LAS, 01N21W22P01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
40
20
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−80
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1985
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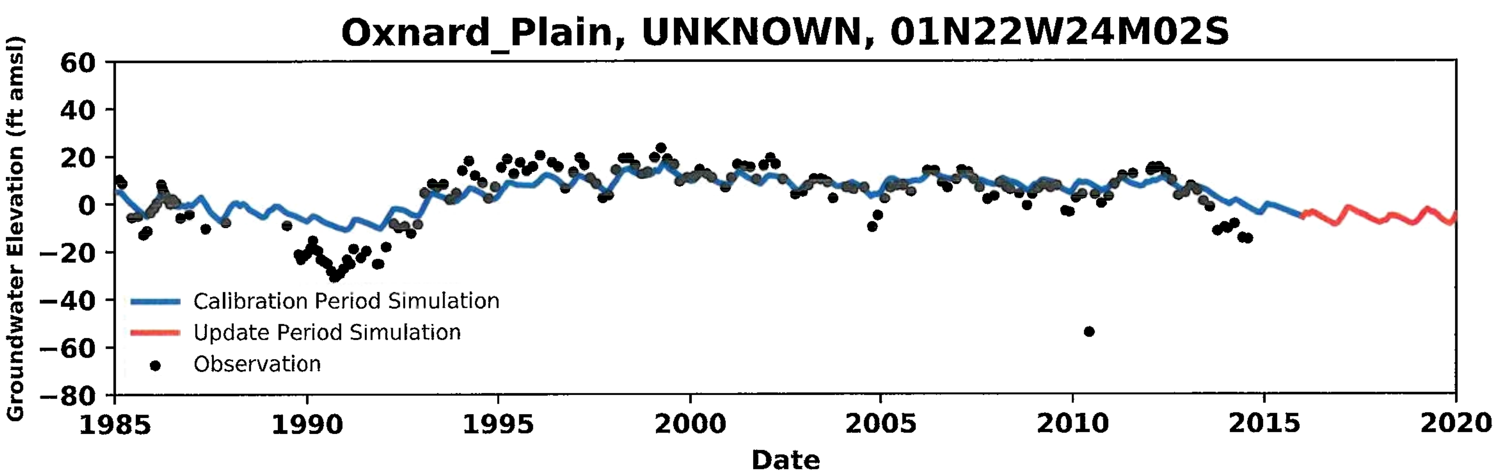
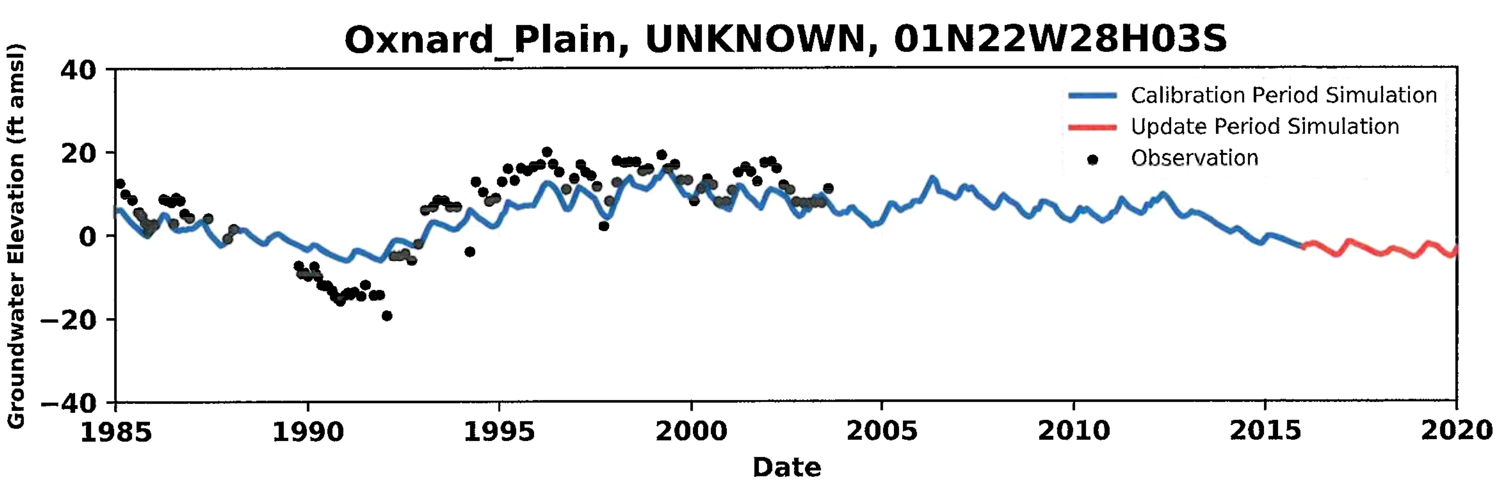
2000
2005
2010
2015
2020


Oxnard_Plain, UNKNOWN, 01N22W24M02S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
60
40
20
0
−20
−40
−60
−80
1985
1990
1995
2000
2005
2010
2015
2020


Oxnard_Plain, UNKNOWN, 01N22W28H03S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
40
20
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1985
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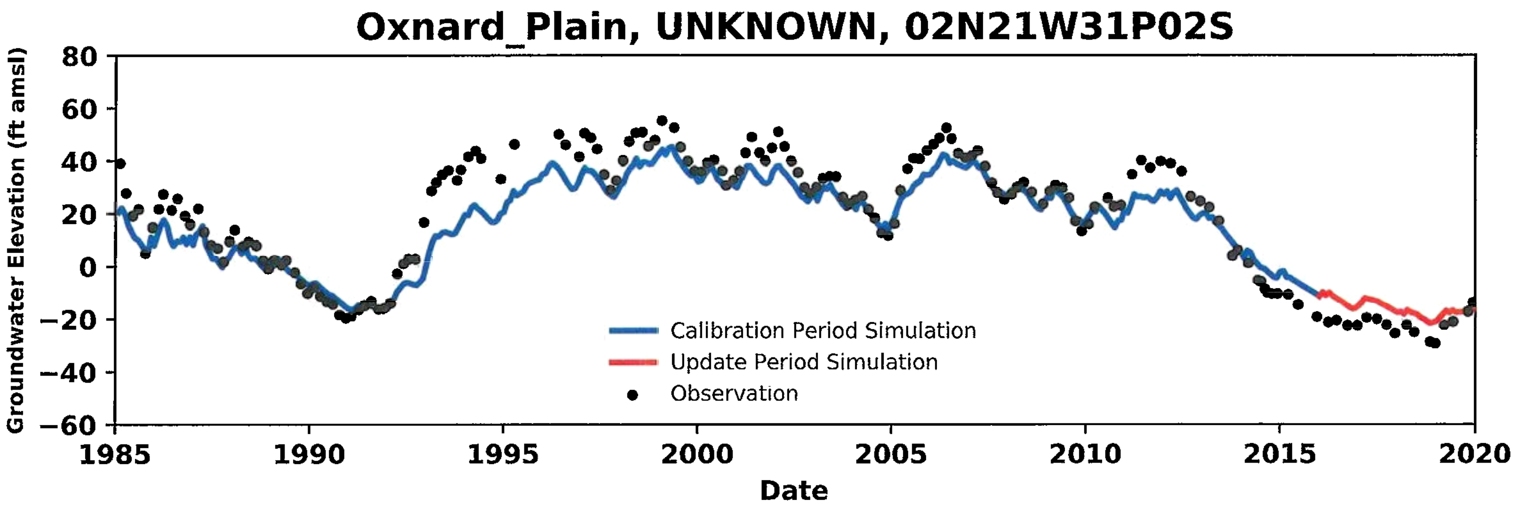
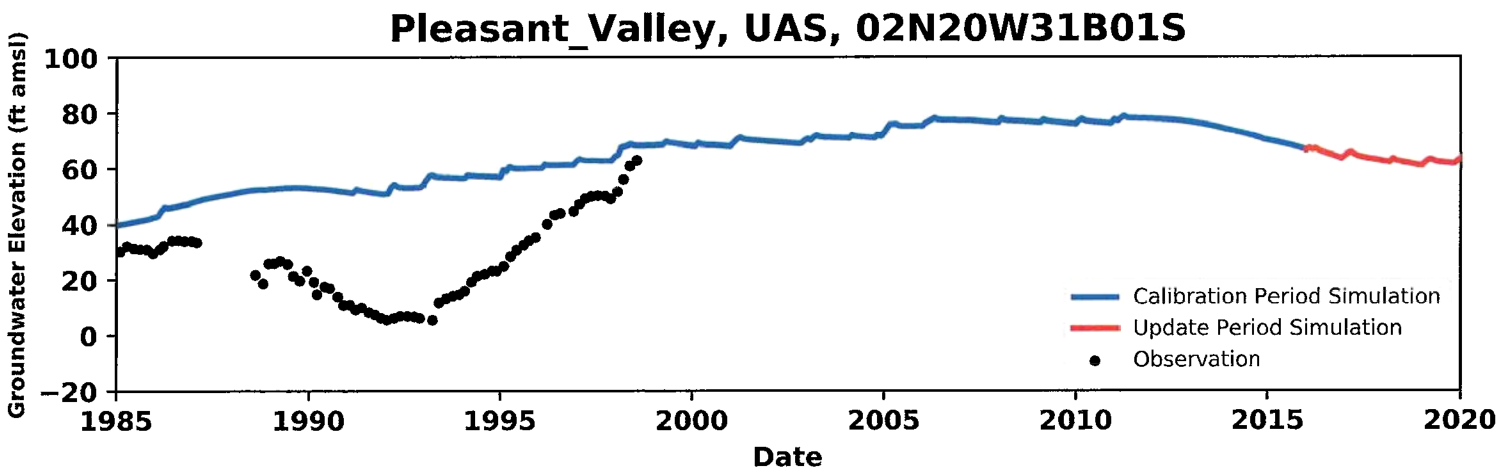
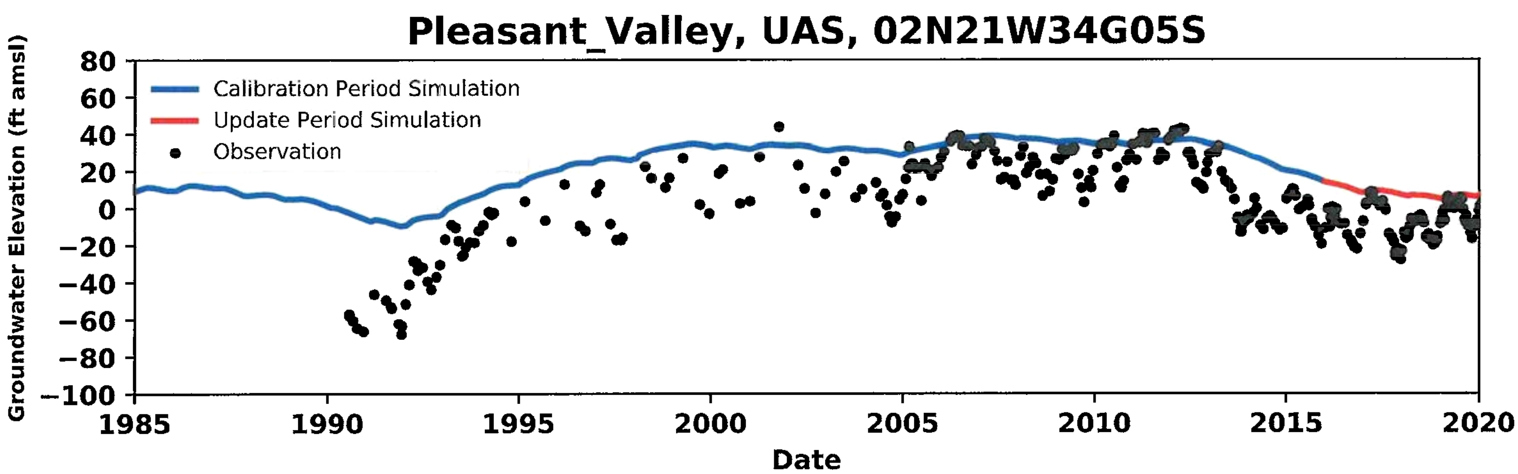
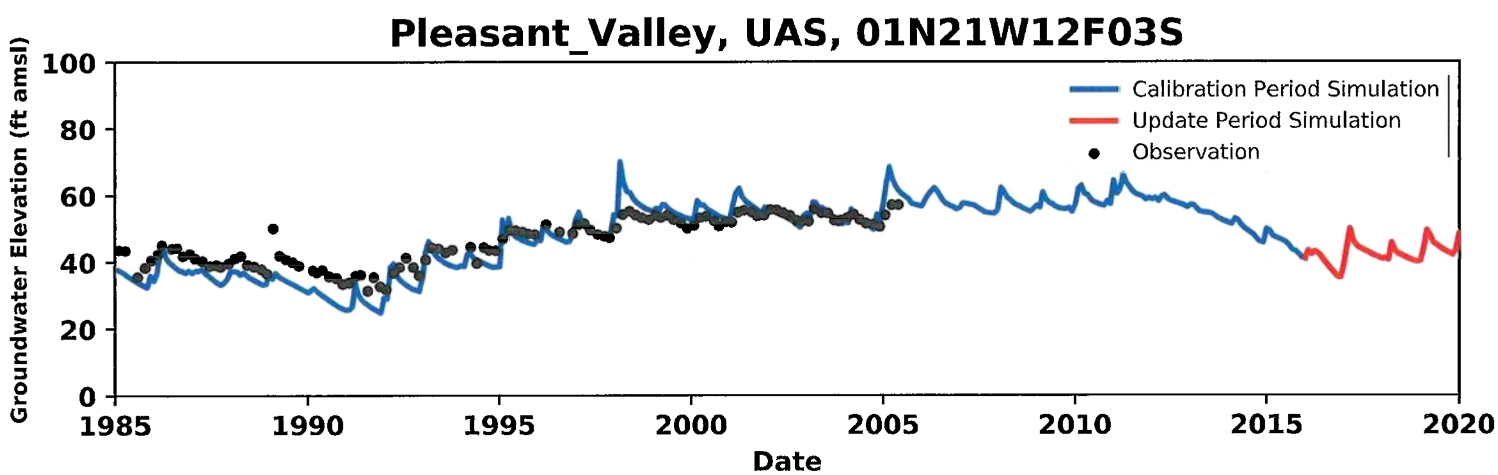
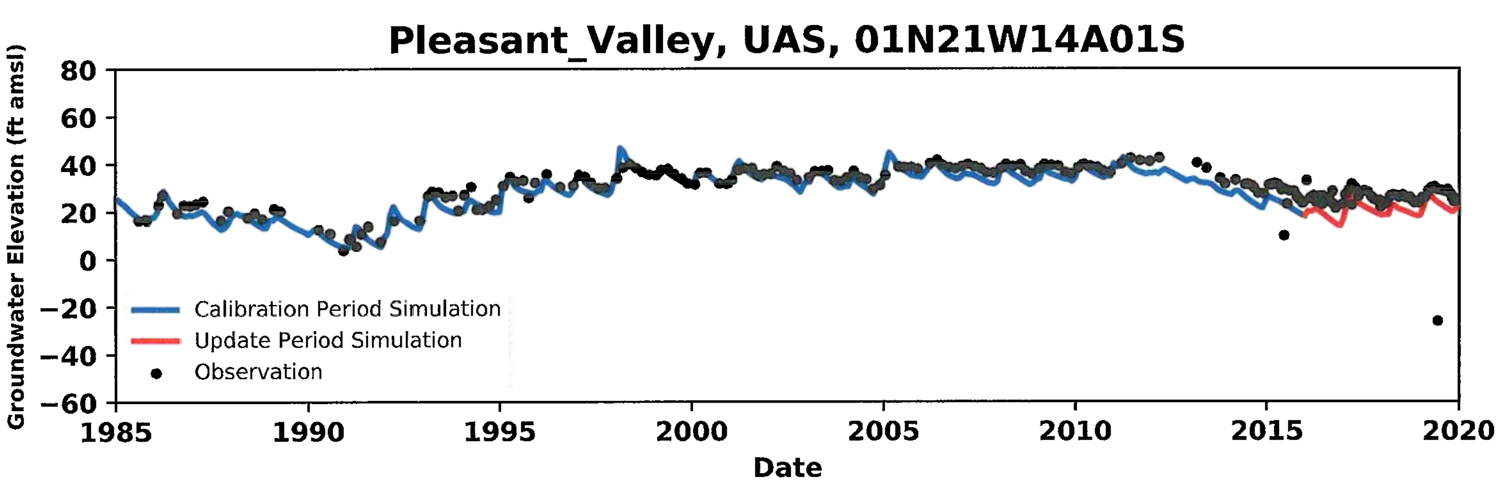
2000
2005
2010
2015
2020


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

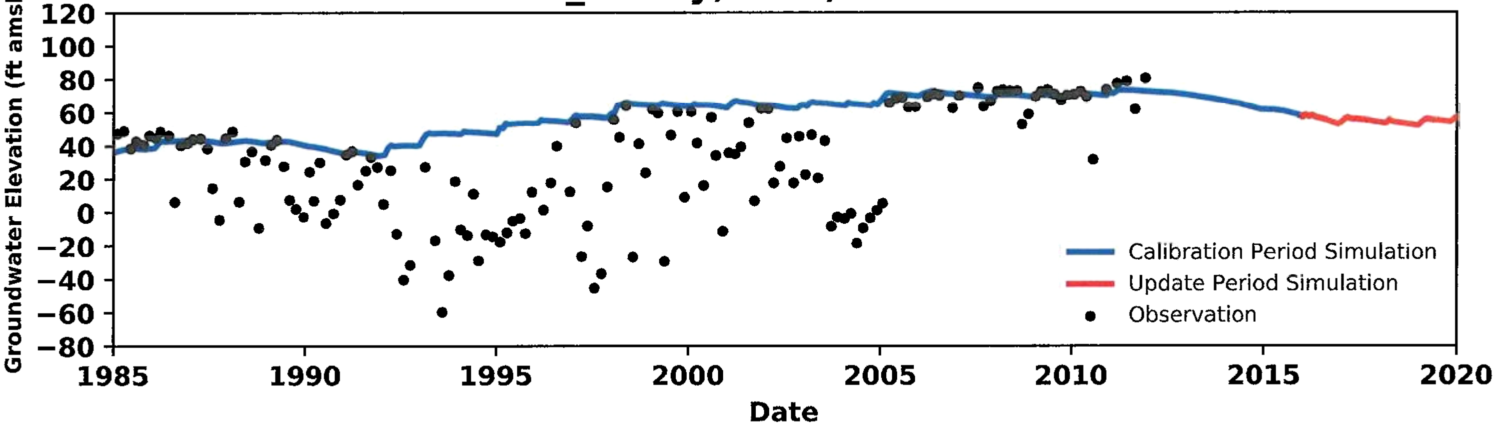

Pleasant_Valley, UAS, 02N20W31B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

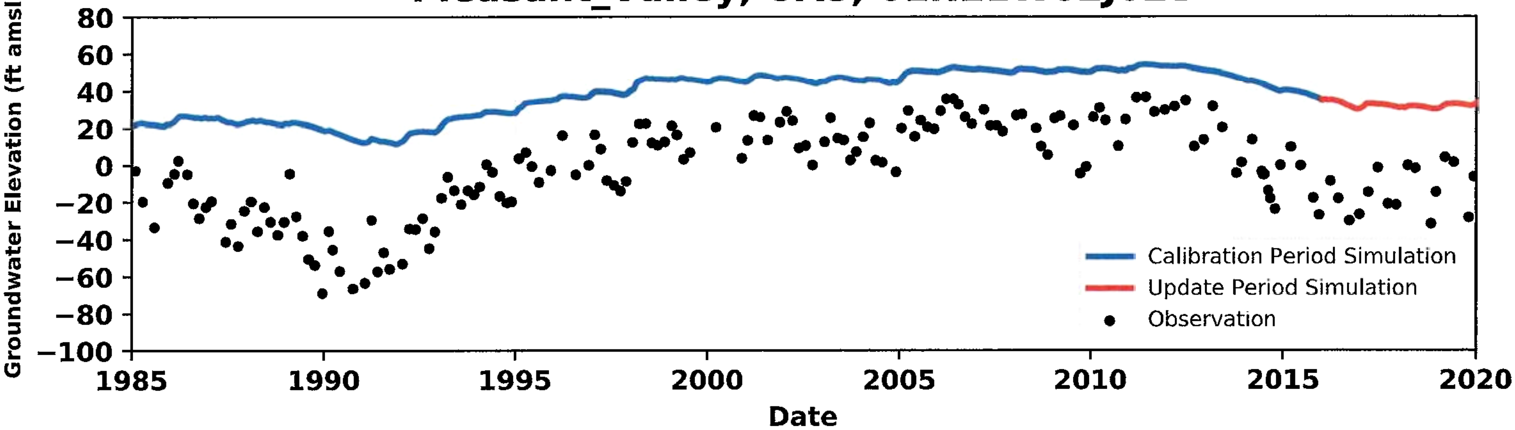

Pleasant_Valley, UAS, 01N21W12F03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

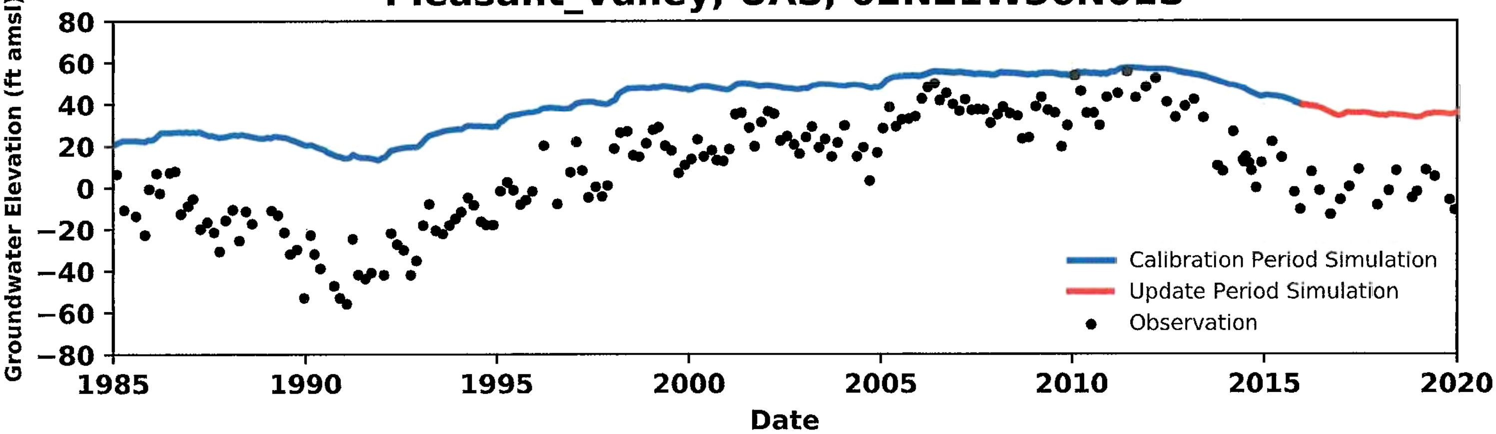
Pleasant_Valley, UAS, 01N20W06C01S



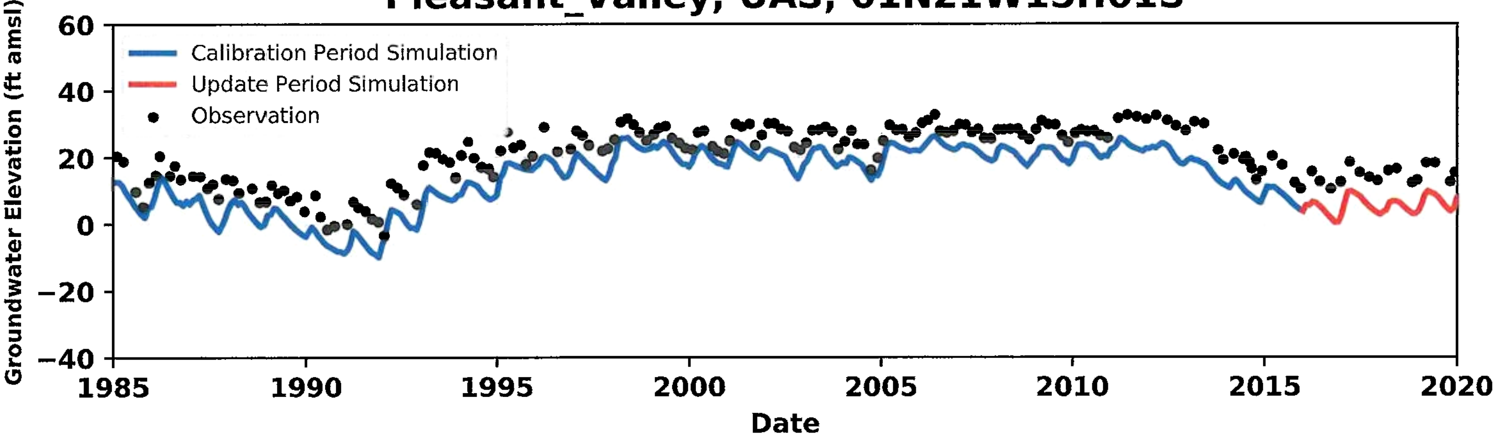

Pleasant_Valley, UAS, 01N21W02J02S

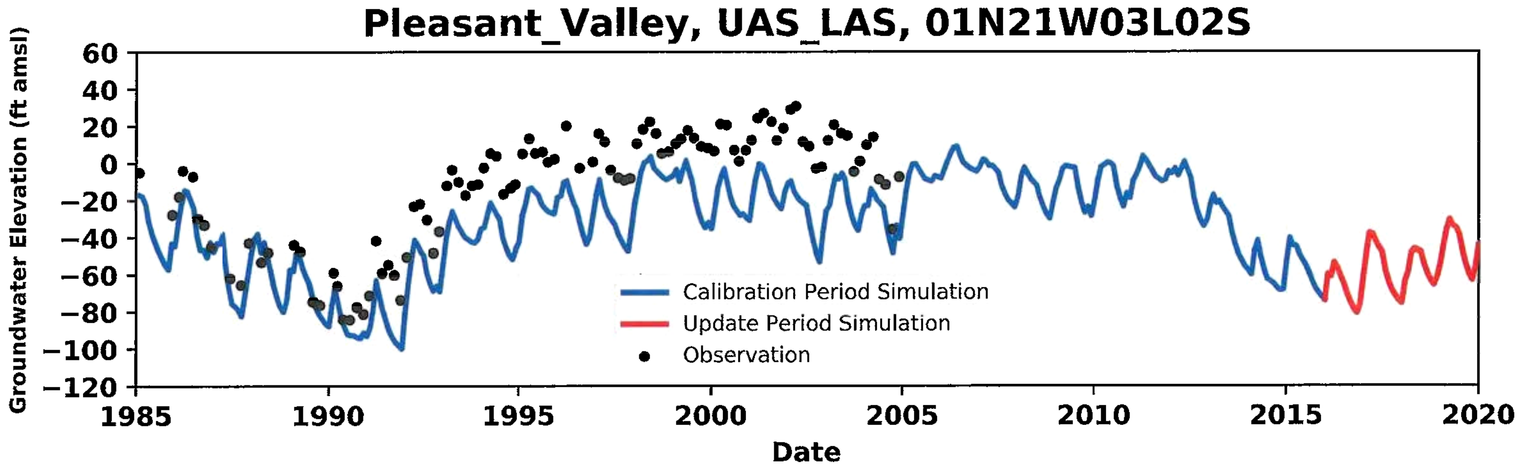



Pleasant_Valley, UAS, 02N21W36N01S




Pleasant_Valley, UAS, 01N21W15H01S




Pleasant_Valley, UAS_LAS, 01N21W03L02S
Groundwater Elevation (ft amsl)
60
40
20
0
−20
−40
−60
−80
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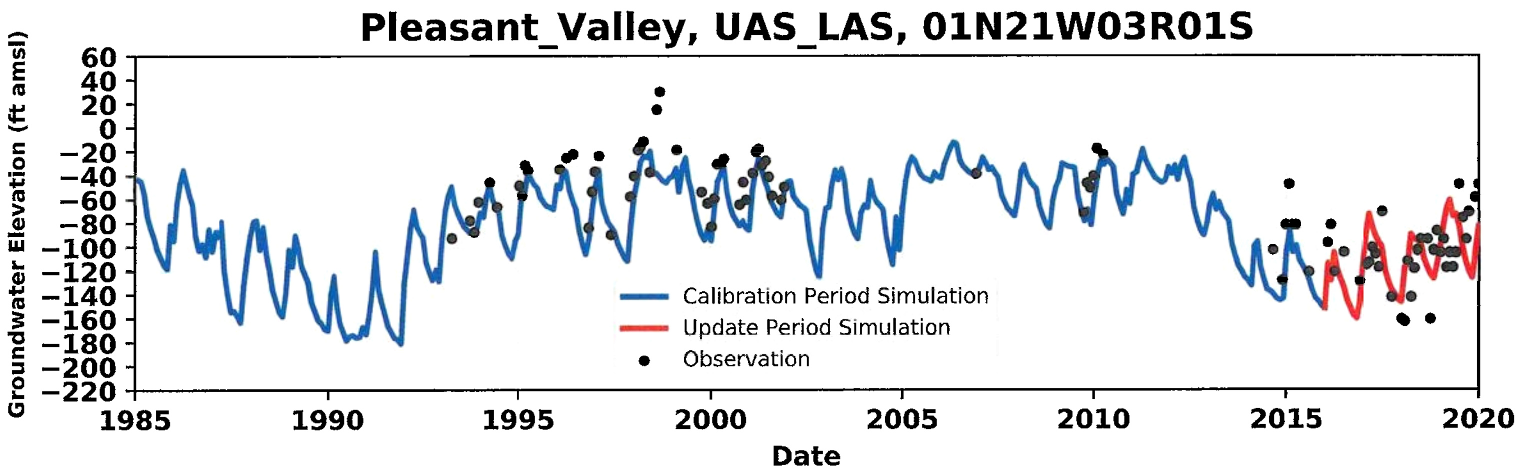
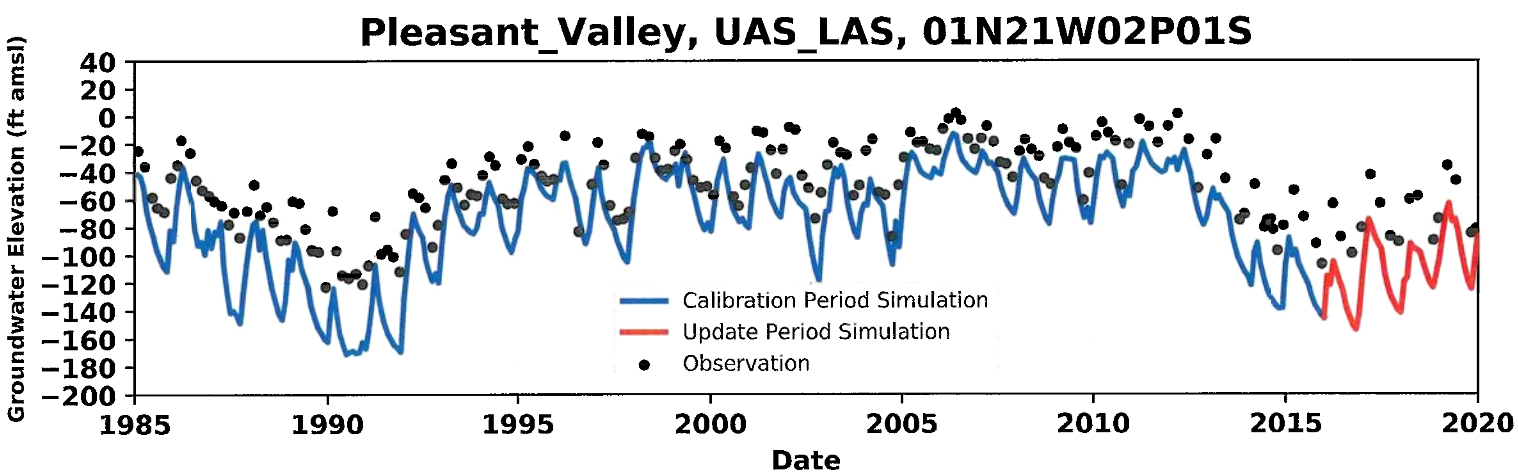
−120
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Pleasant_Valley, UAS_LAS, 01N21W03R01S
Groundwater Elevation (ft amsl)
60
40
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, UAS_LAS, 01N21W02P01S
Groundwater Elevation (ft amsl)
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20
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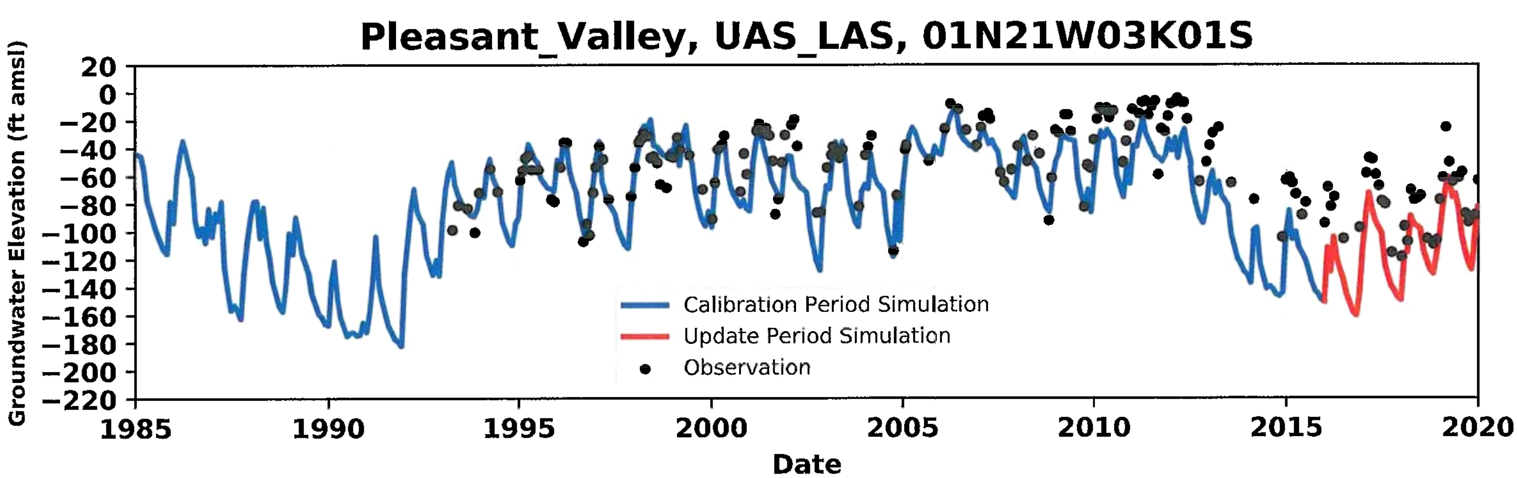
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Pleasant_Valley, UAS_LAS, 01N21W03K01S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
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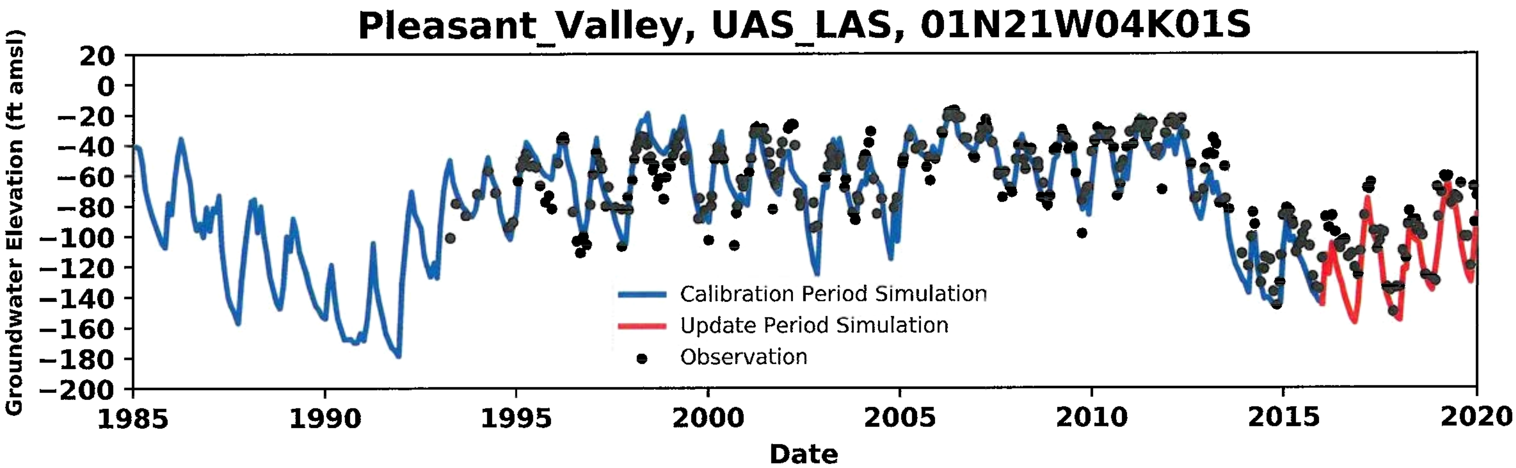
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Pleasant_Valley, UAS_LAS, 01N21W04K01S
Groundwater Elevation (ft amsl)
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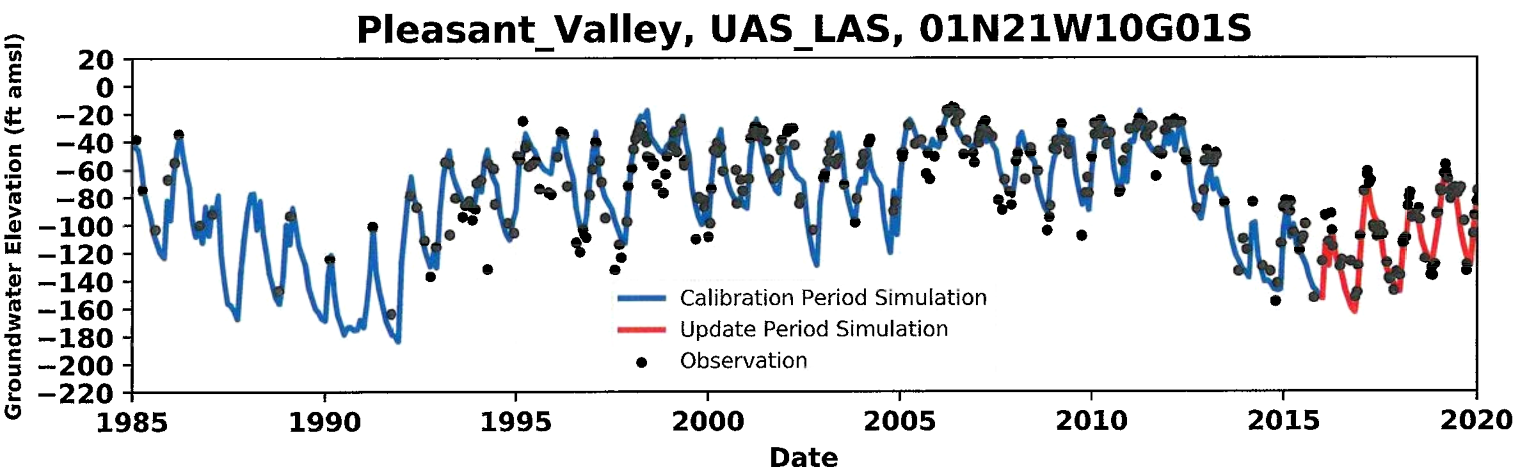
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Pleasant_Valley, UAS_LAS, 01N21W10G01S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
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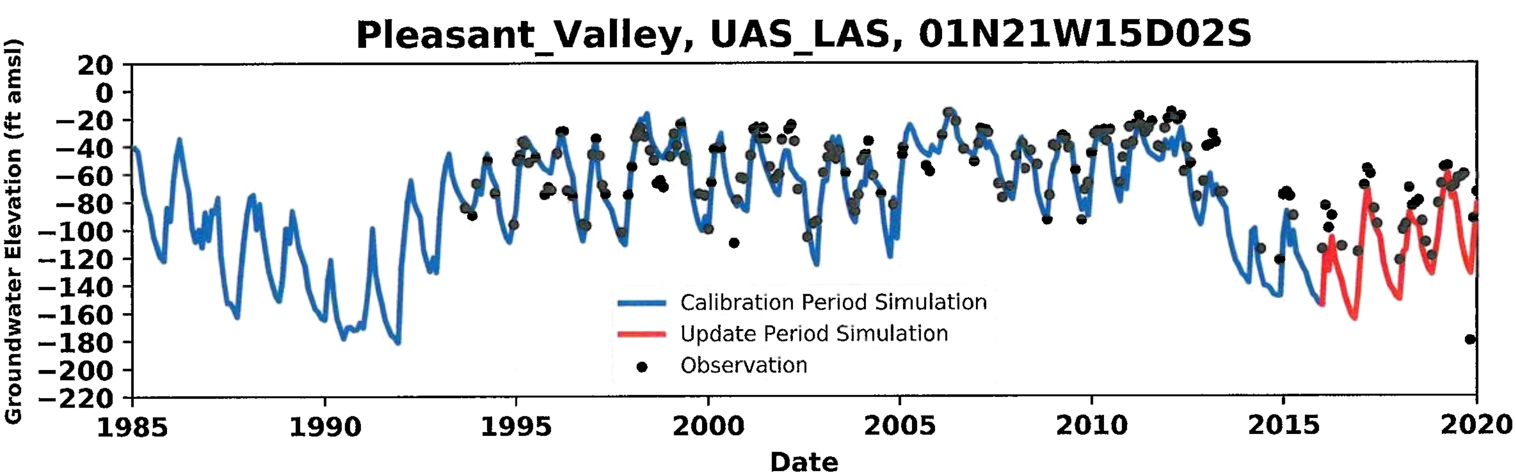
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Pleasant_Valley, UAS_LAS, 01N21W15D02S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
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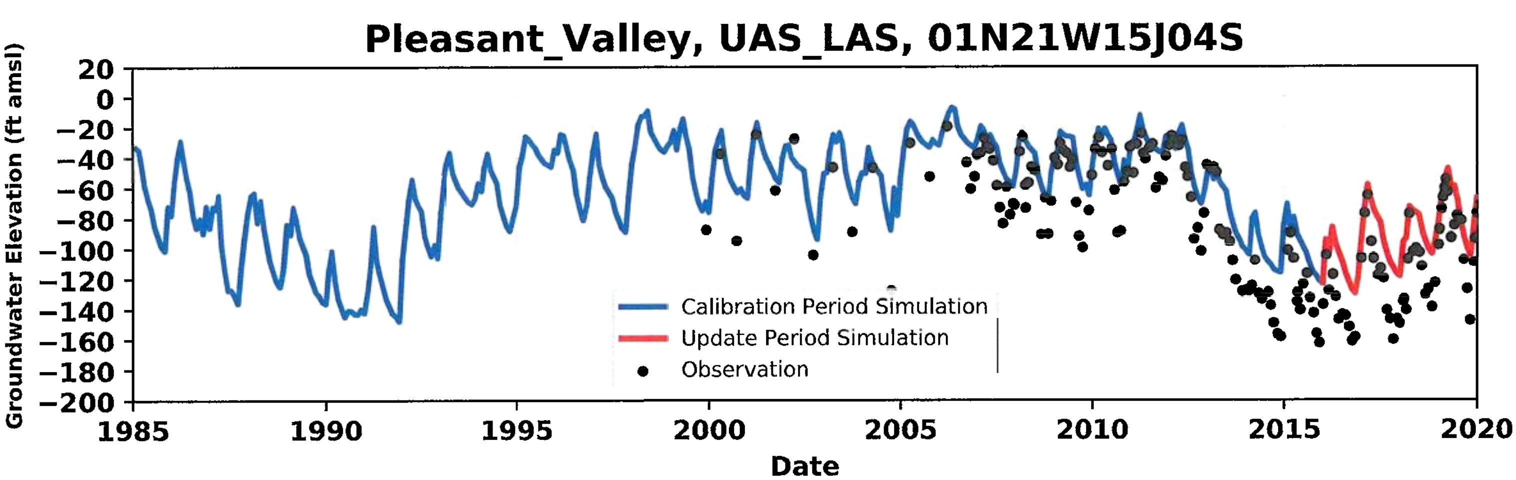
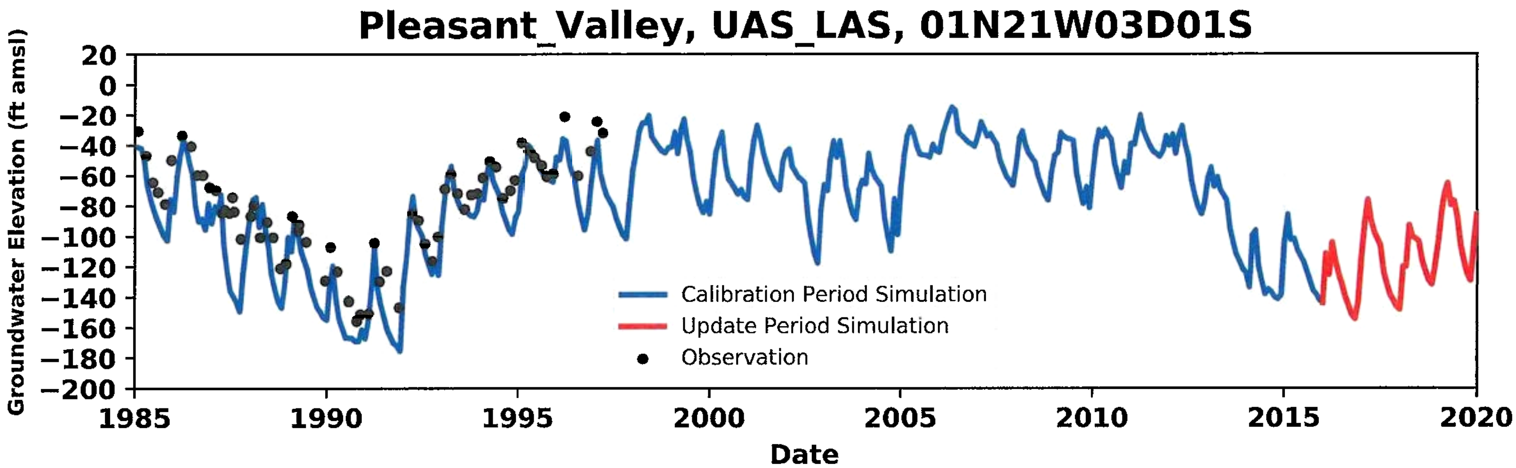
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Pleasant_Valley, UAS_LAS, 01N21W15J04S
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, UAS_LAS, 01N21W03D01S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
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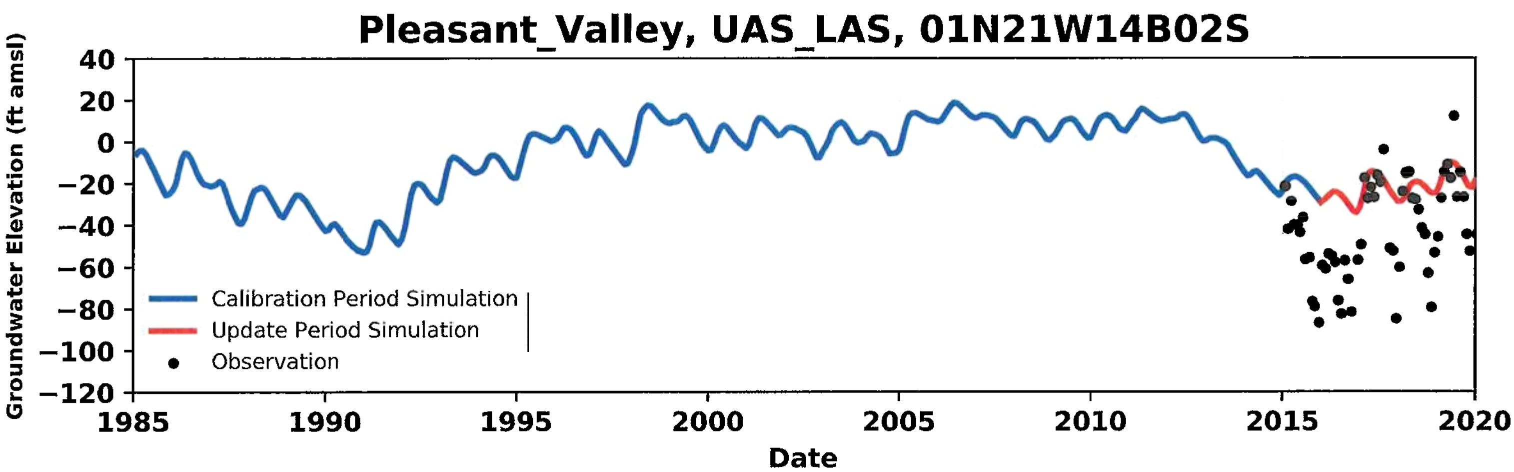
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation


Pleasant_Valley, UAS_LAS, 01N21W14B02S
Groundwater Elevation (ft amsl)
40
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−20
−40
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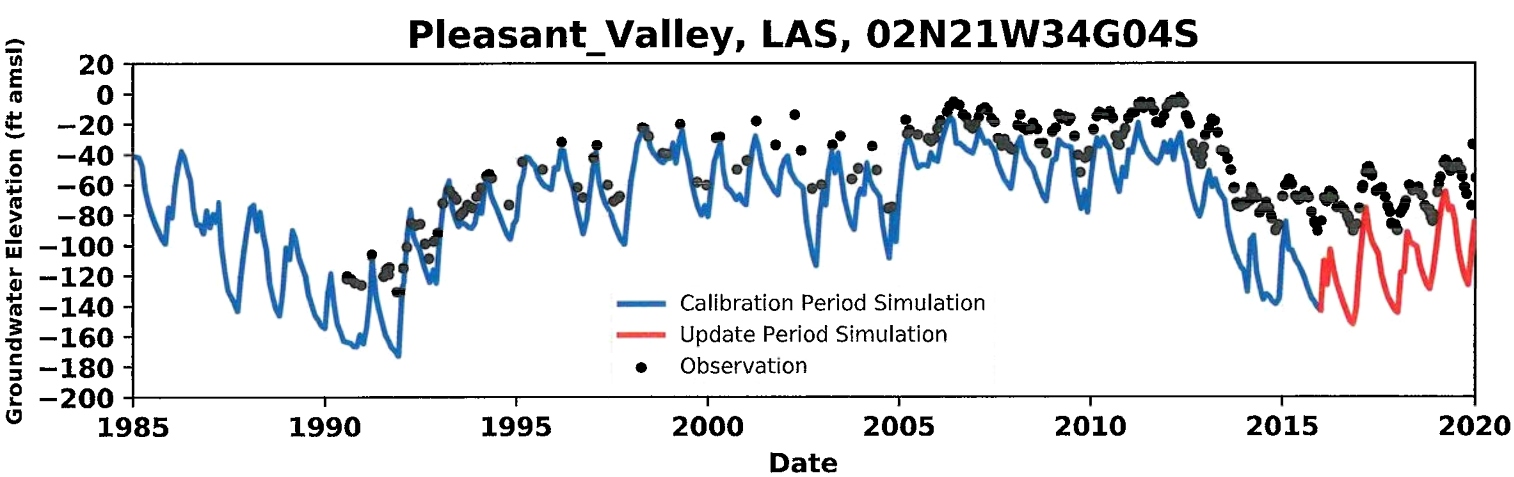
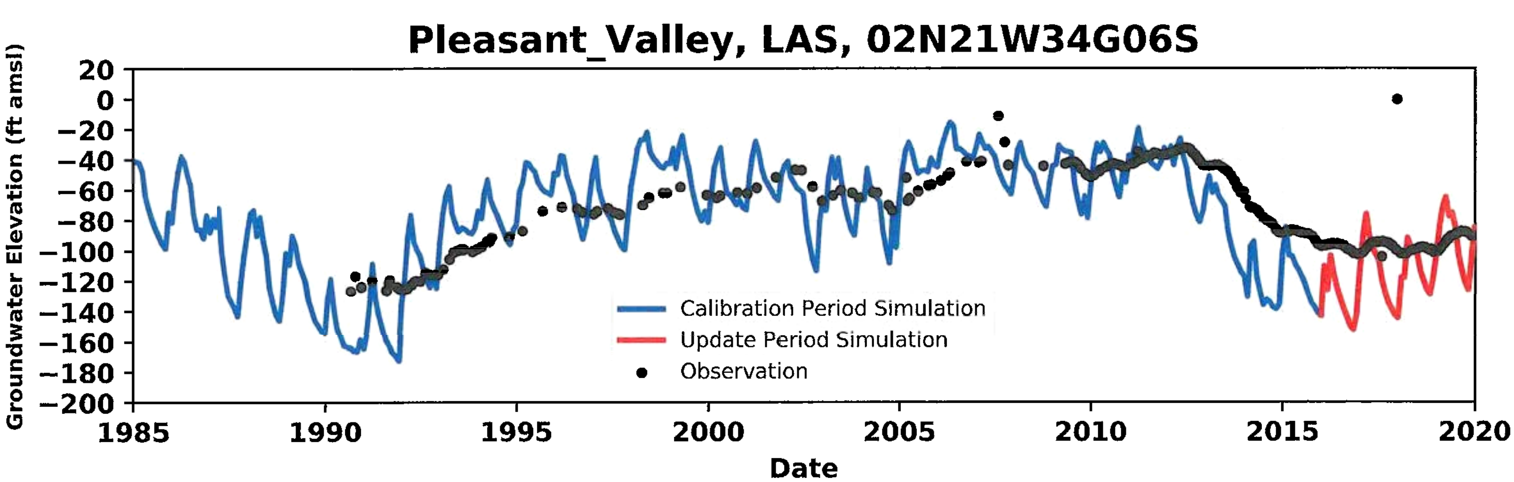
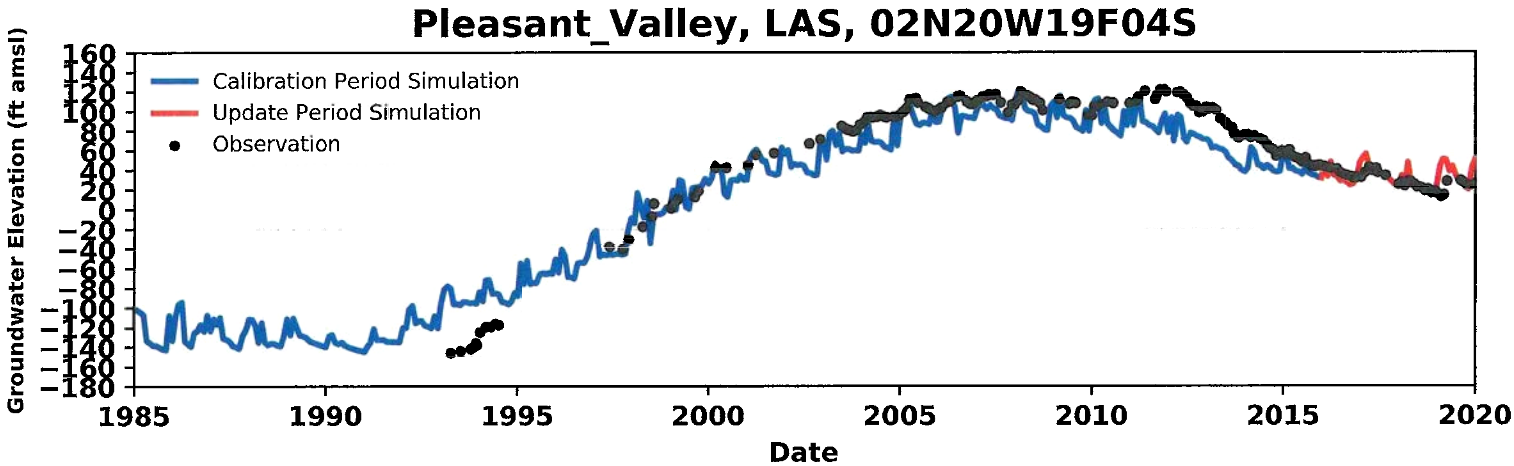
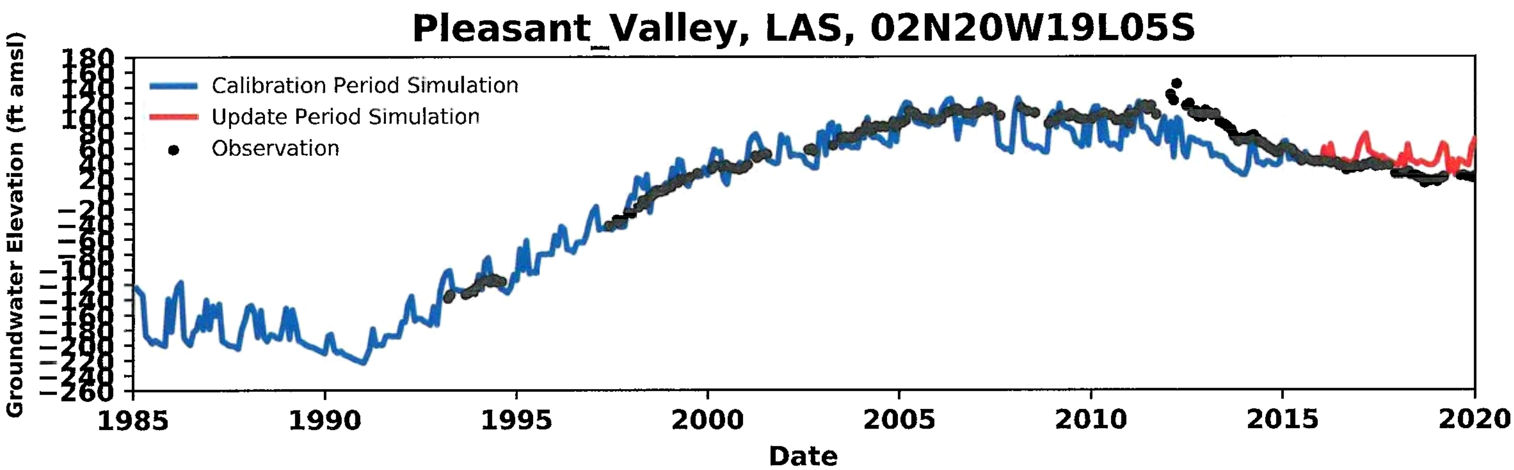
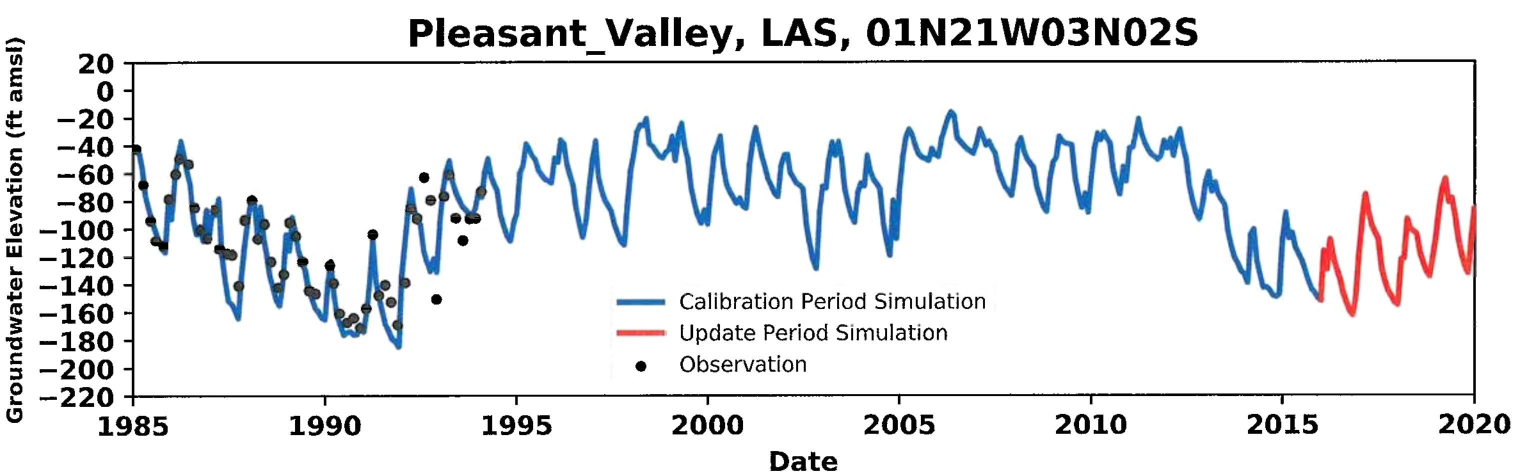
−80
−100
−120
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

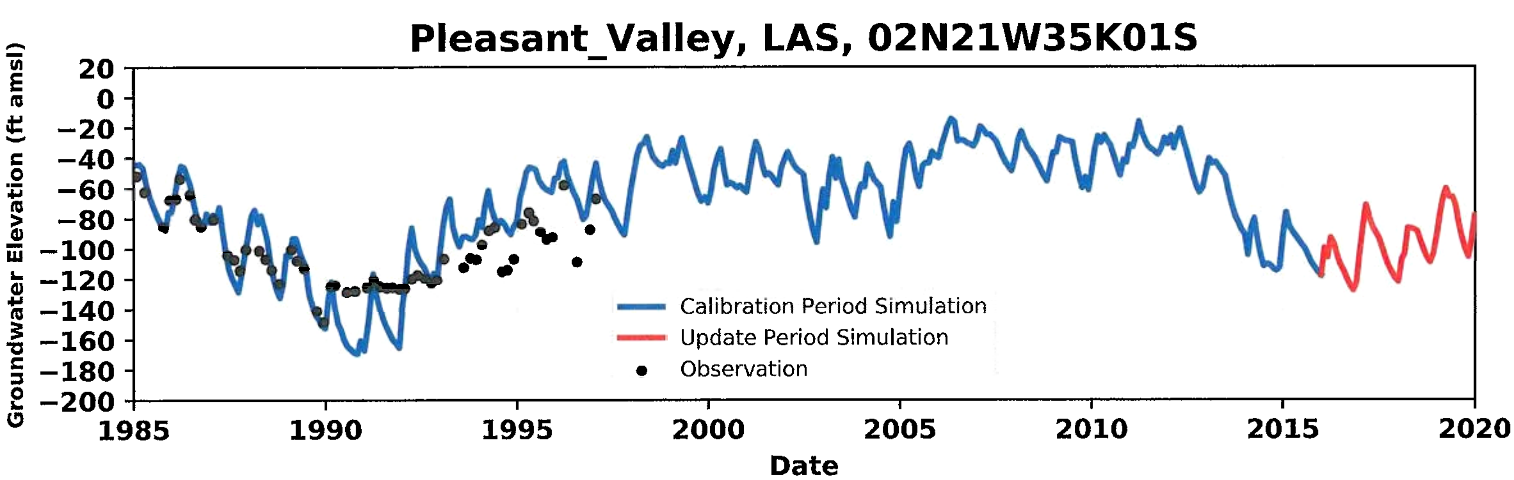

Pleasant_Valley, LAS, 02N21W34G04S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

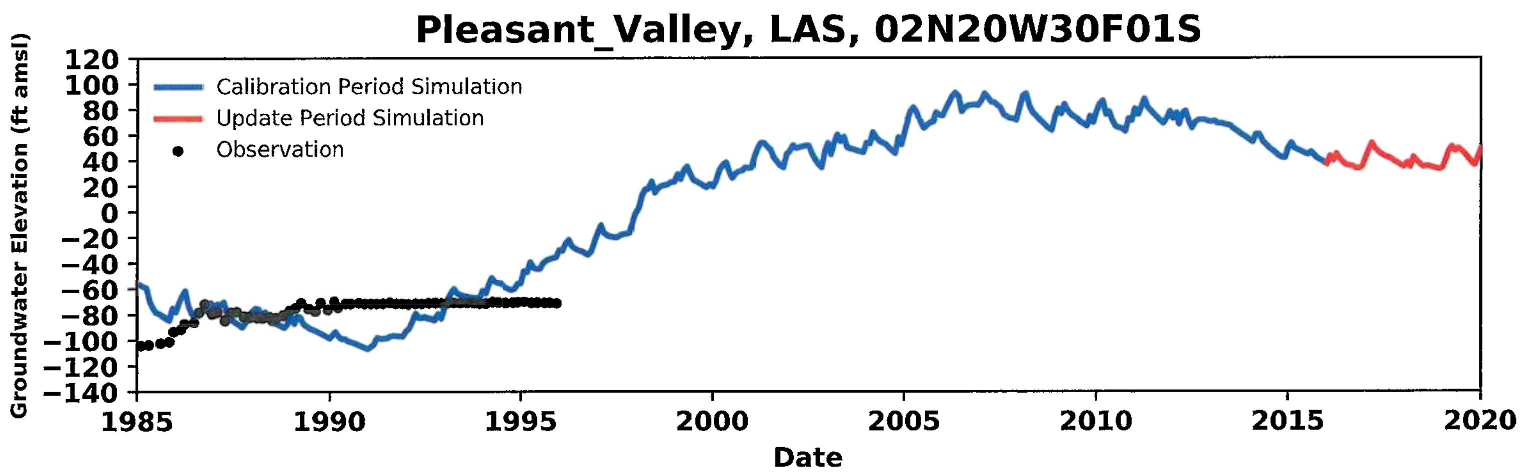

Pleasant_Valley, LAS, 02N21W34G06S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

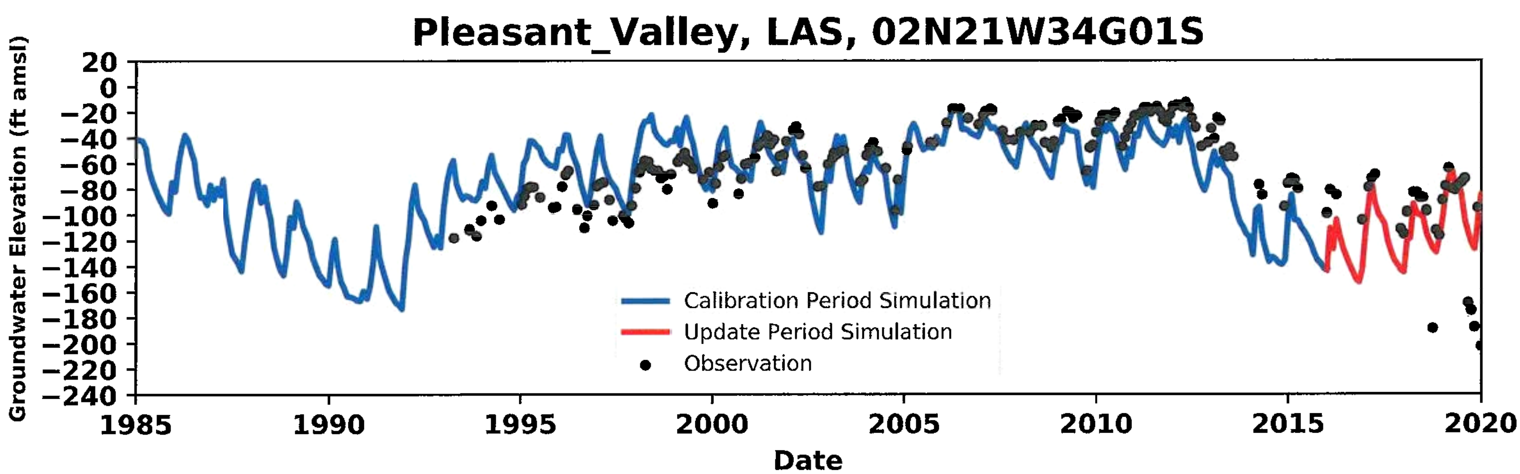

Pleasant_Valley, LAS, 02N20W19F04S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
160 140 120 100 80 60 40 20 0 −20 −40 −60 −80 −100 −120 −140 −160 −180
1985 1990 1995 2000 2005 2010 2015 2020
Date

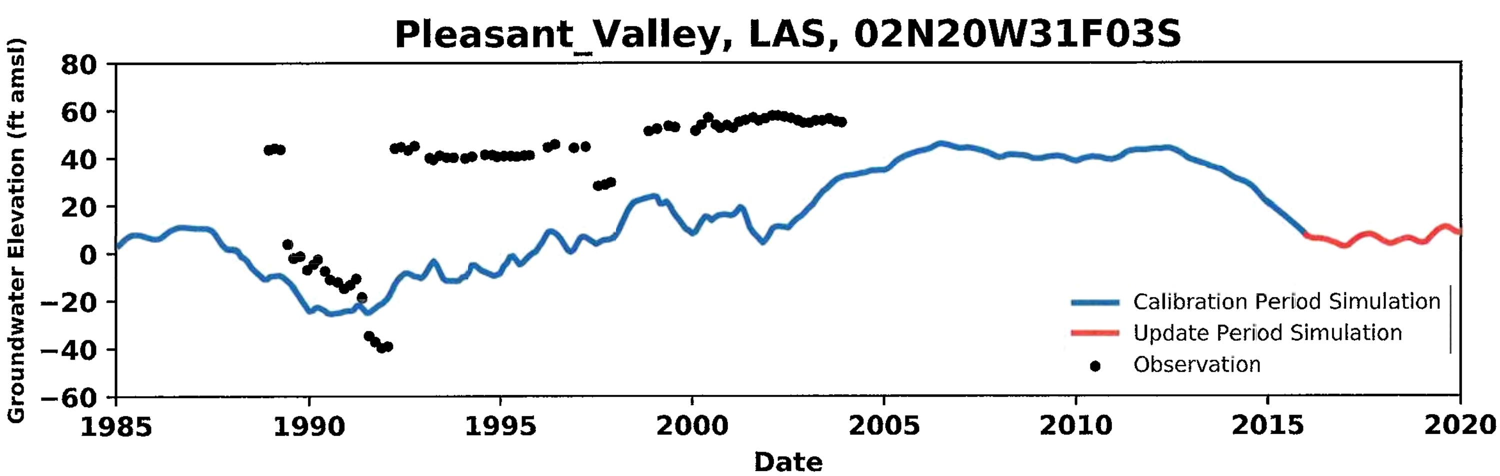

Pleasant_Valley, LAS, 02N20W19L05S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
180 160 140 120 100 80 60 40 20 0 −20 −40 −60 −80 −100 −120 −140 −160 −180 −200 −220 −240 −260
1985 1990 1995 2000 2005 2010 2015 2020
Date

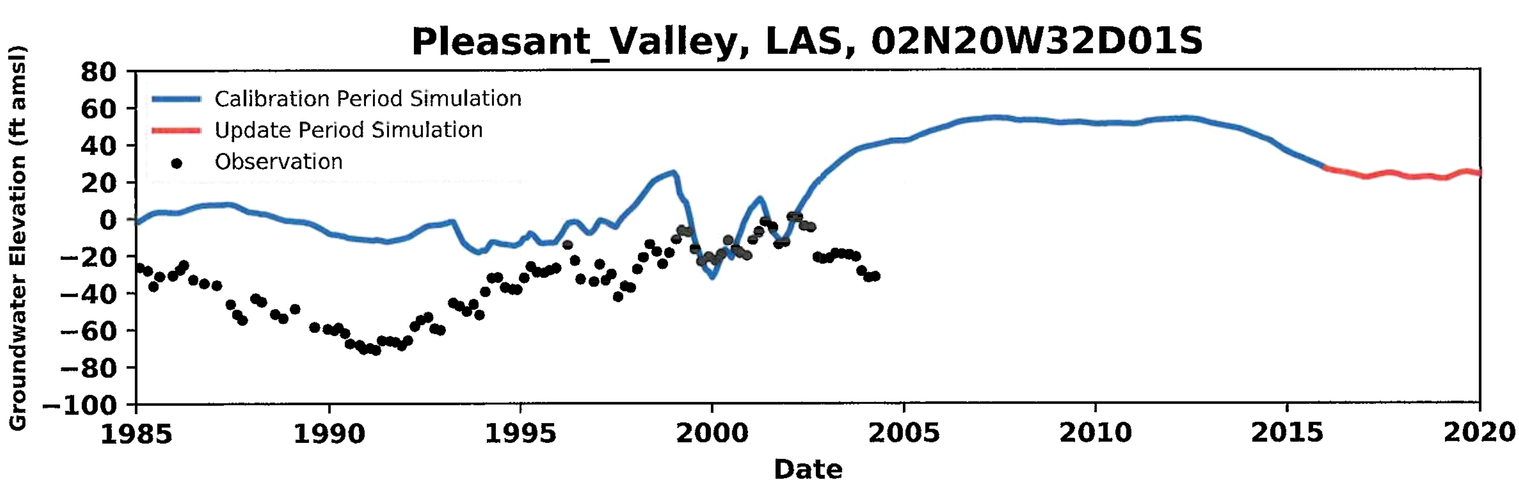

Pleasant_Valley, LAS, 01N21W03N02S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
20 0 −20 −40 −60 −80 −100 −120 −140 −160 −180 −200 −220
1985 1990 1995 2000 2005 2010 2015 2020
Date

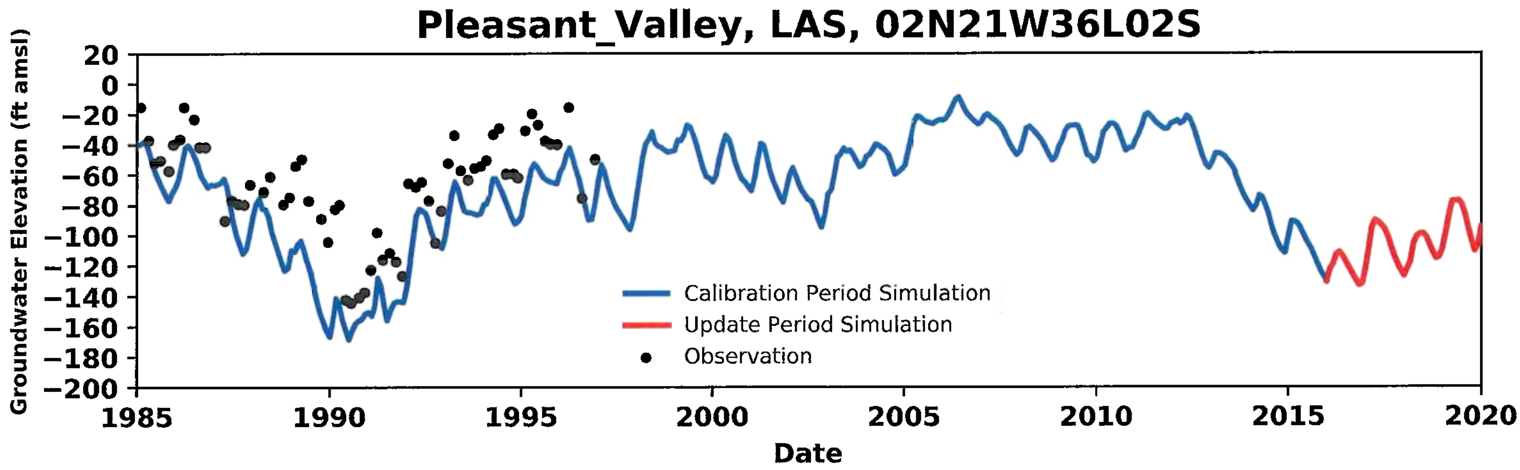

Pleasant_Valley, LAS, 02N21W35K01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
20 0 −20 −40 −60 −80 −100 −120 −140 −160 −180 −200
1985 1990 1995 2000 2005 2010 2015 2020
Date

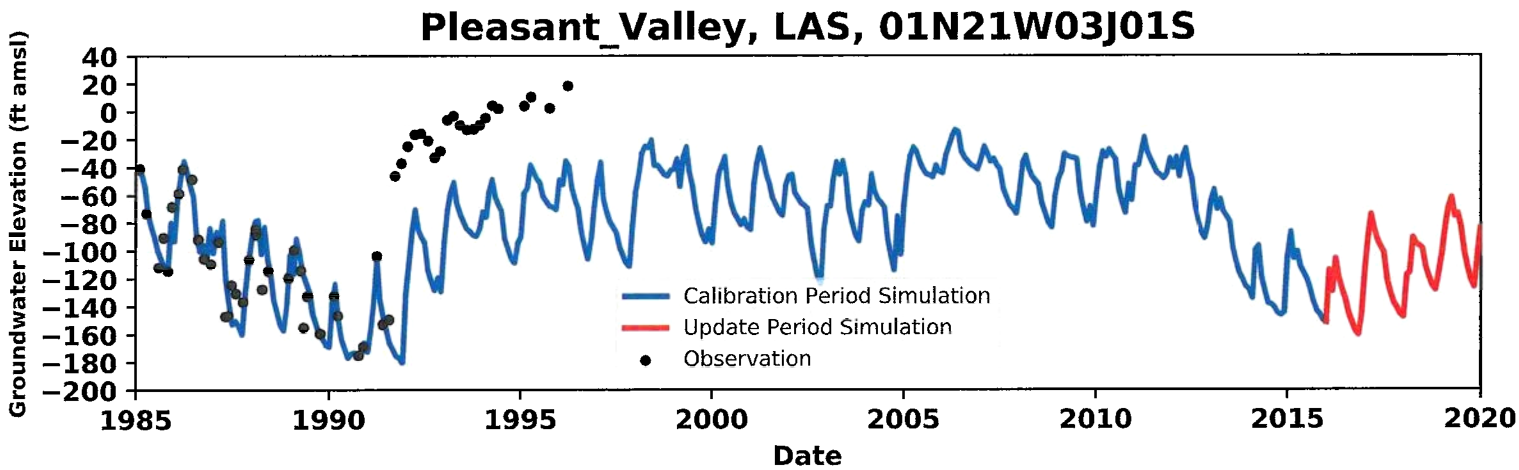

Pleasant_Valley, LAS, 02N20W30F01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

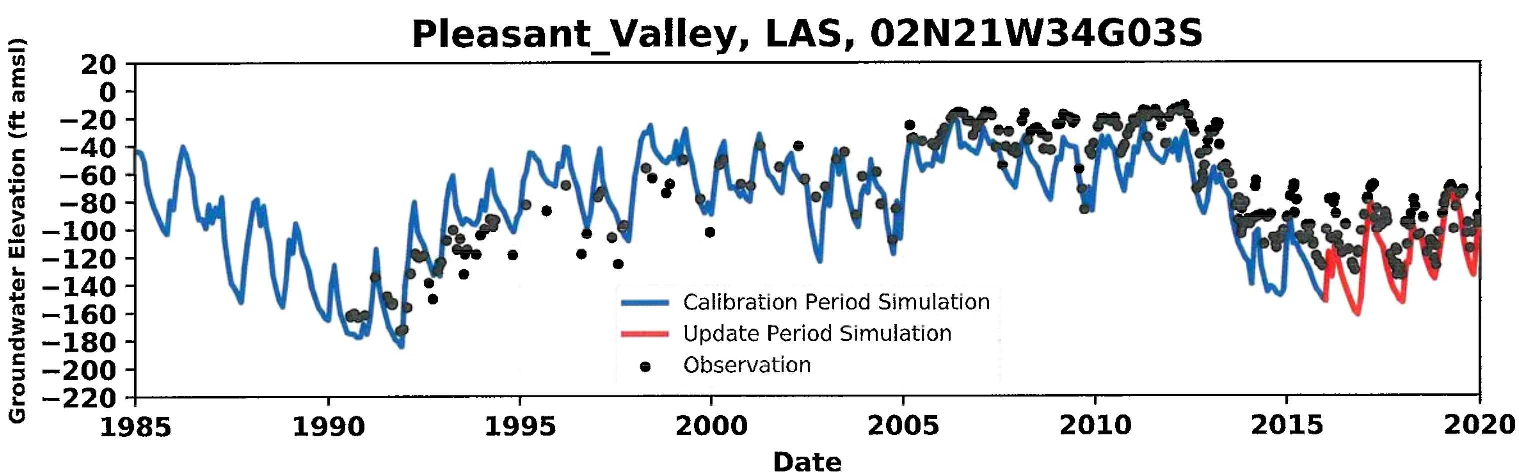

Pleasant_Valley, LAS, 02N21W34G01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

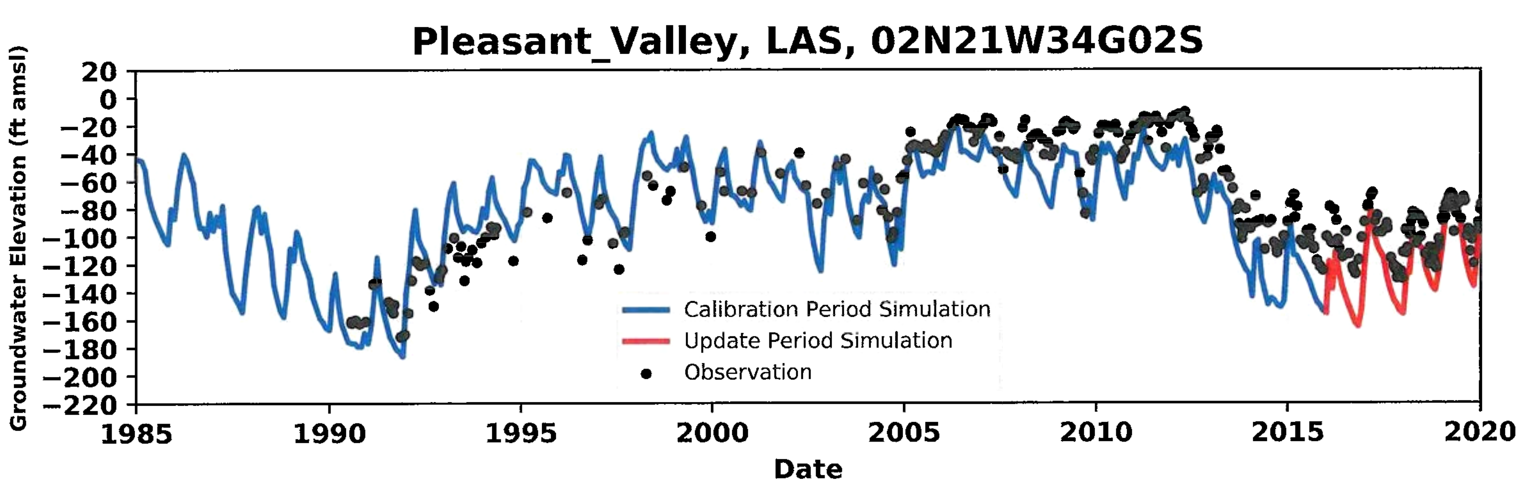

Pleasant_Valley, LAS, 02N20W31F03S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

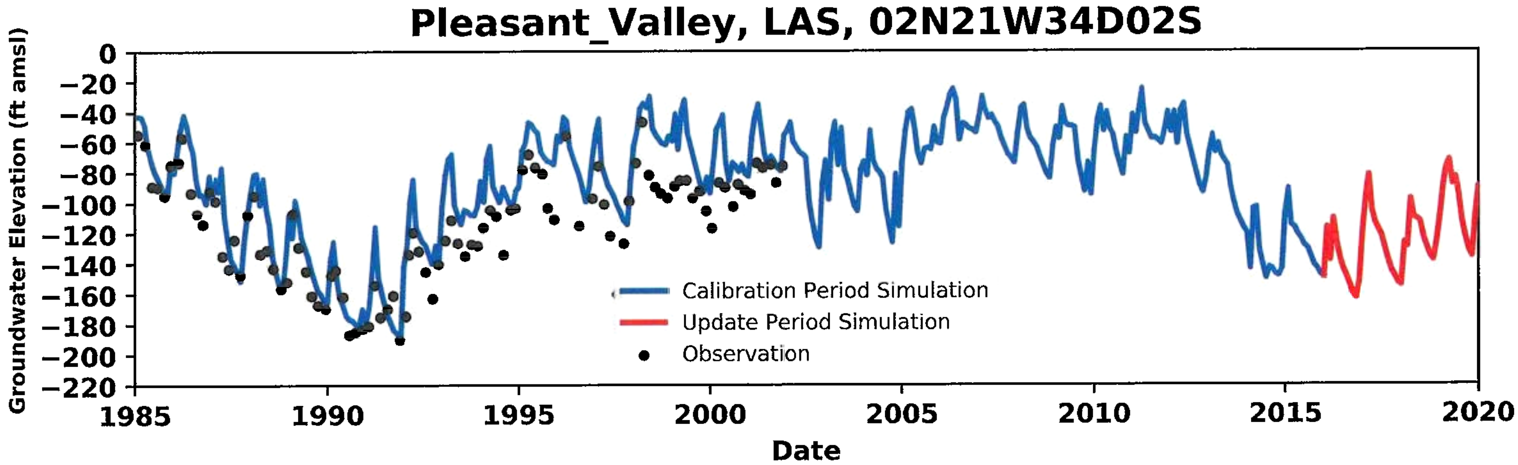

Pleasant_Valley, LAS, 02N20W32D01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date

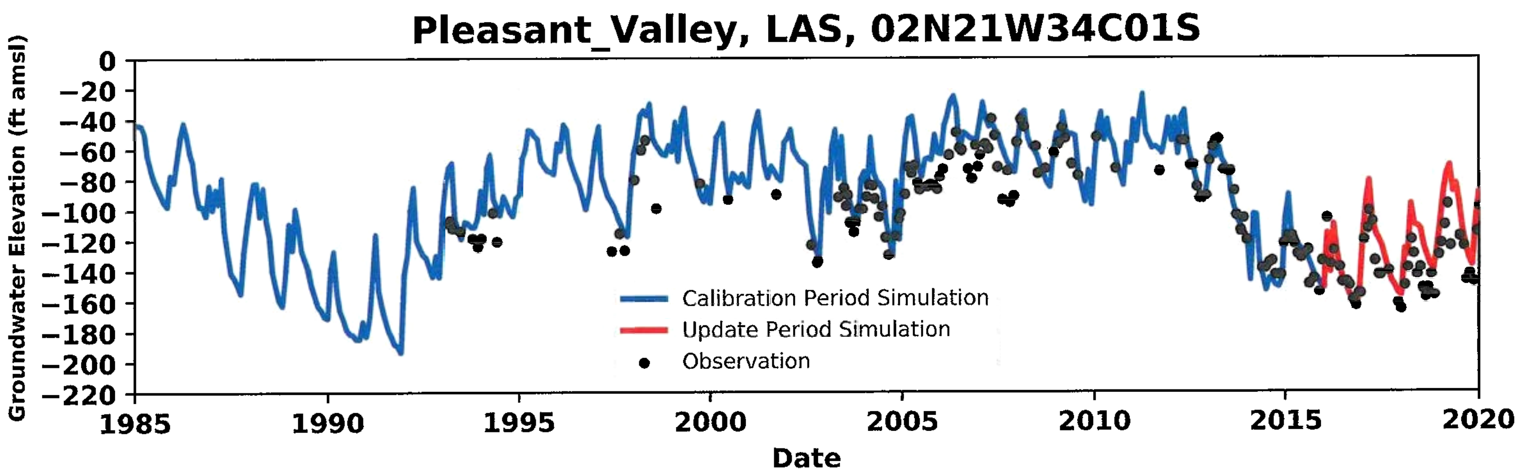

Pleasant_Valley, LAS, 02N21W36L02S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

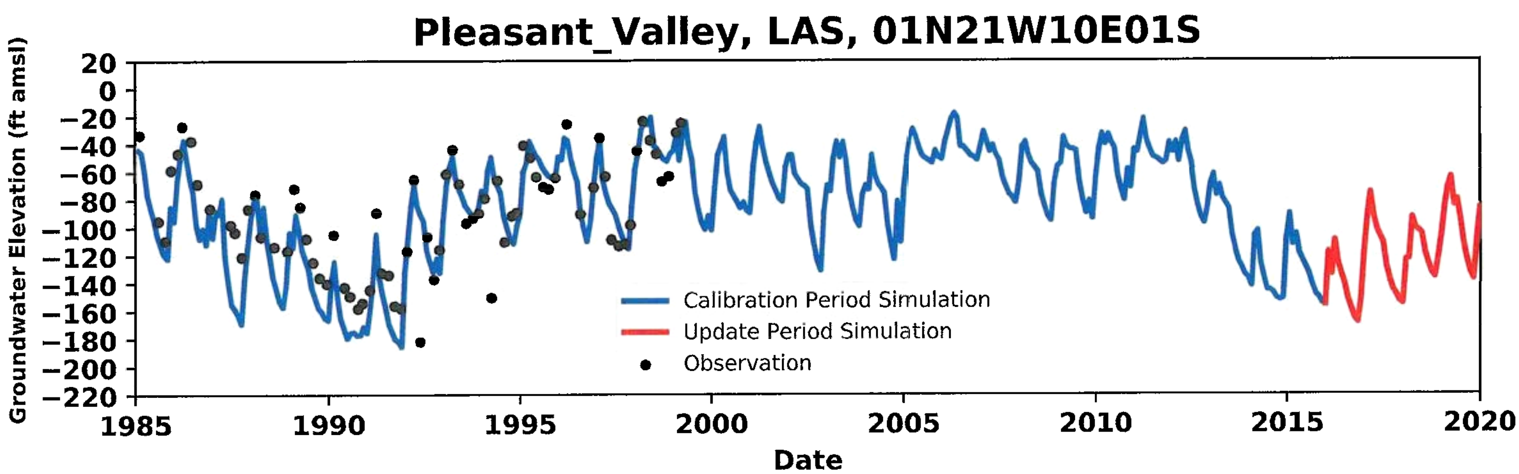

Pleasant_Valley, LAS, 01N21W03J01S
Groundwater Elevation (ft amsl)
40
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

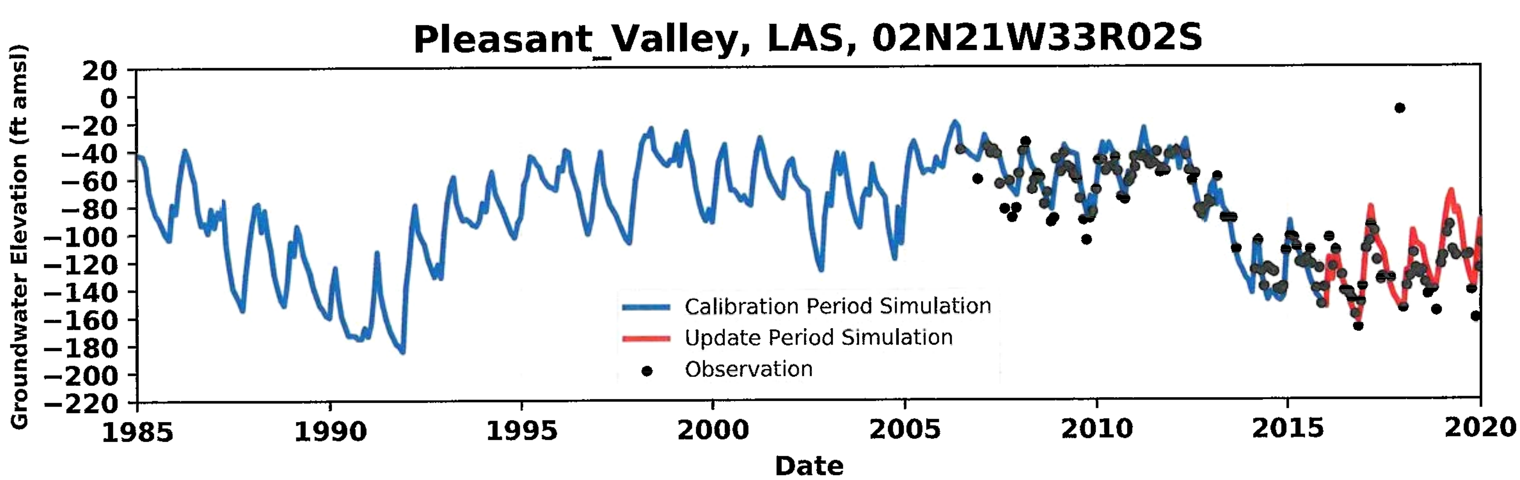

Pleasant_Valley, LAS, 02N21W34G03S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

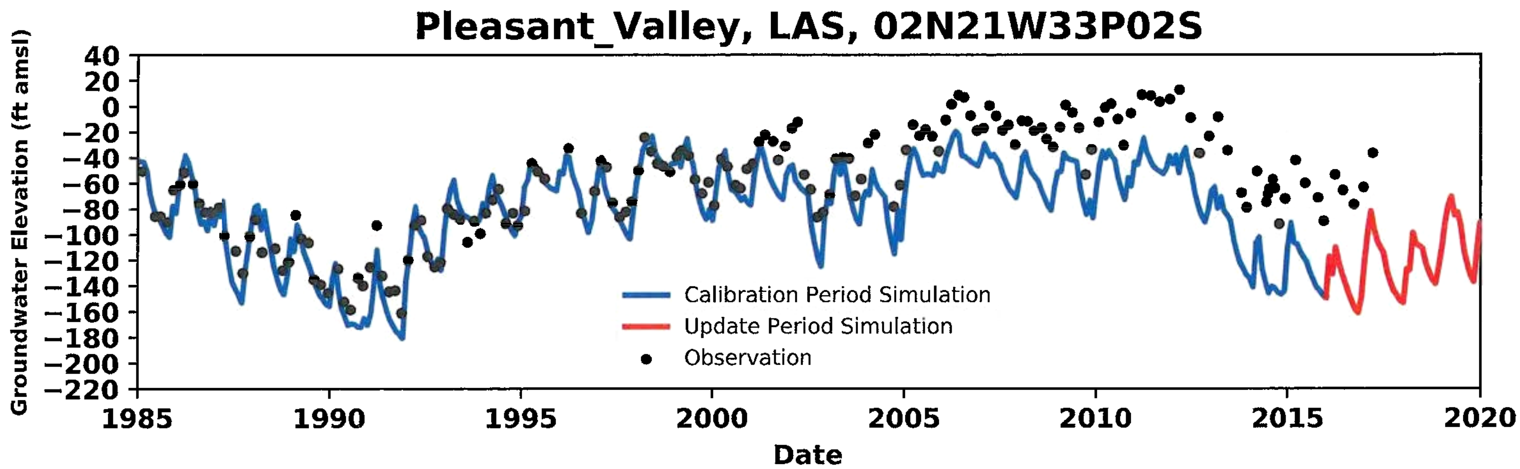

Pleasant_Valley, LAS, 02N21W34G02S
Groundwater Elevation (ft amsl)
20
0
−20
−40
−60
−80
−100
−120
−140
−160
−180
−200
−220
1985
1990
1995
2000
2005
2010
2015
2020
Date
Calibration Period Simulation
Update Period Simulation
Observation

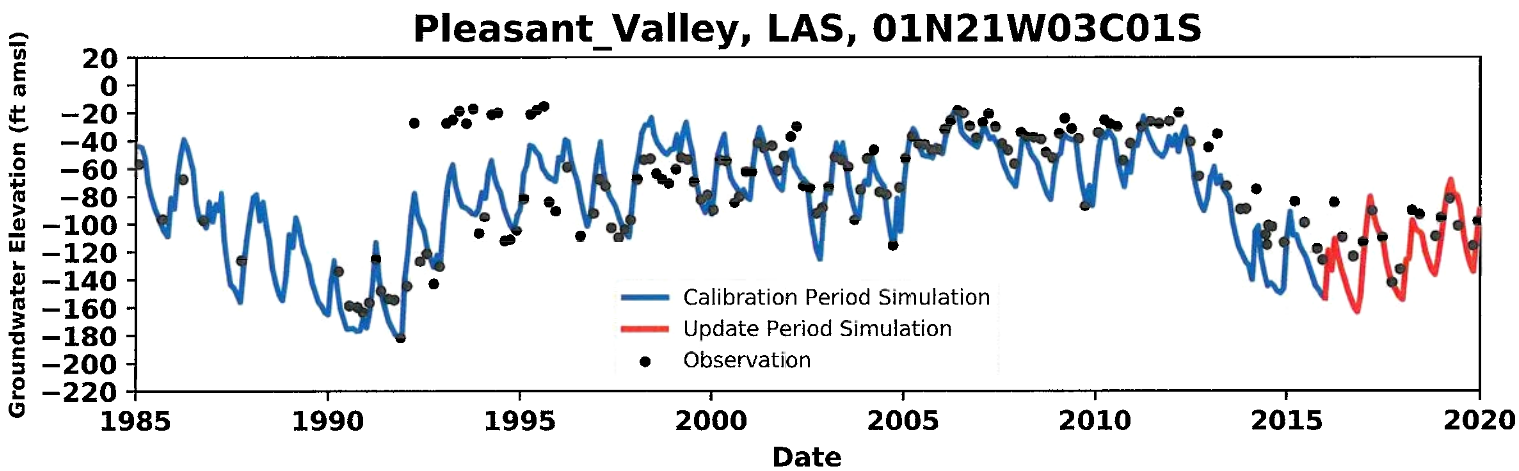

Pleasant_Valley, LAS, 02N21W34D02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

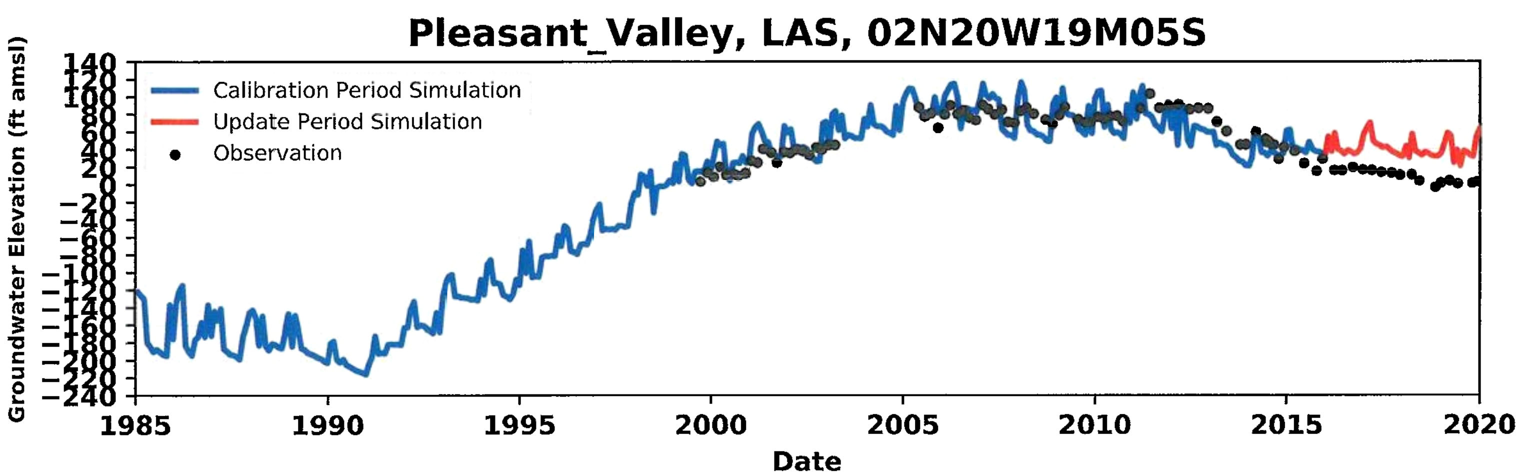

Pleasant_Valley, LAS, 02N21W34C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

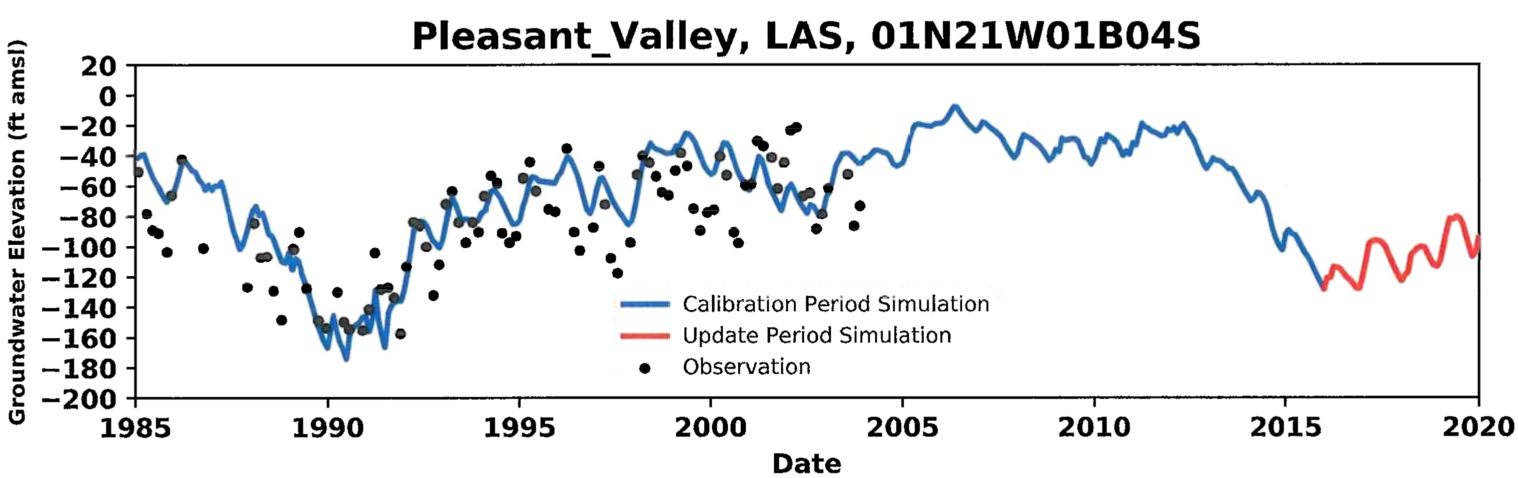

Pleasant_Valley, LAS, 01N21W10E01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

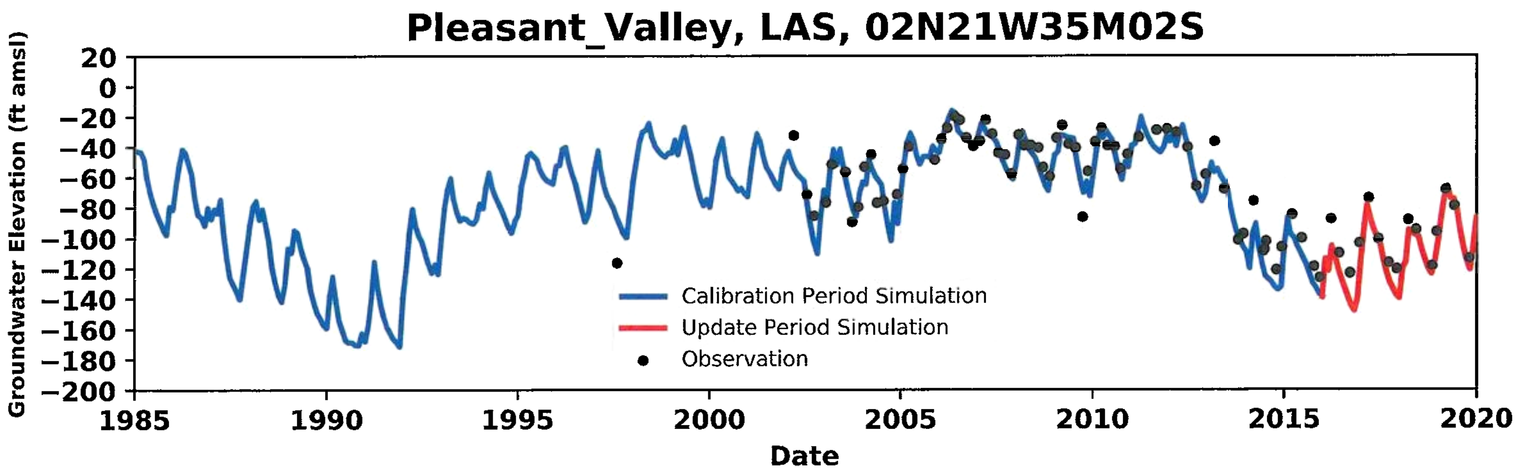

Pleasant_Valley, LAS, 02N21W33R02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

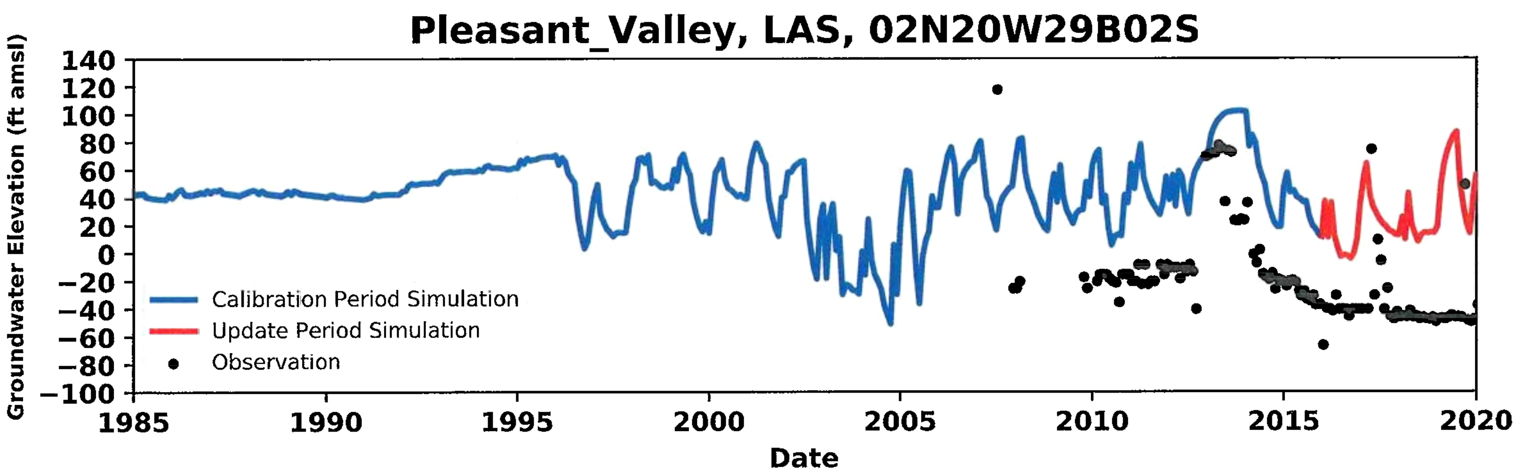

Pleasant_Valley, LAS, 02N21W33P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

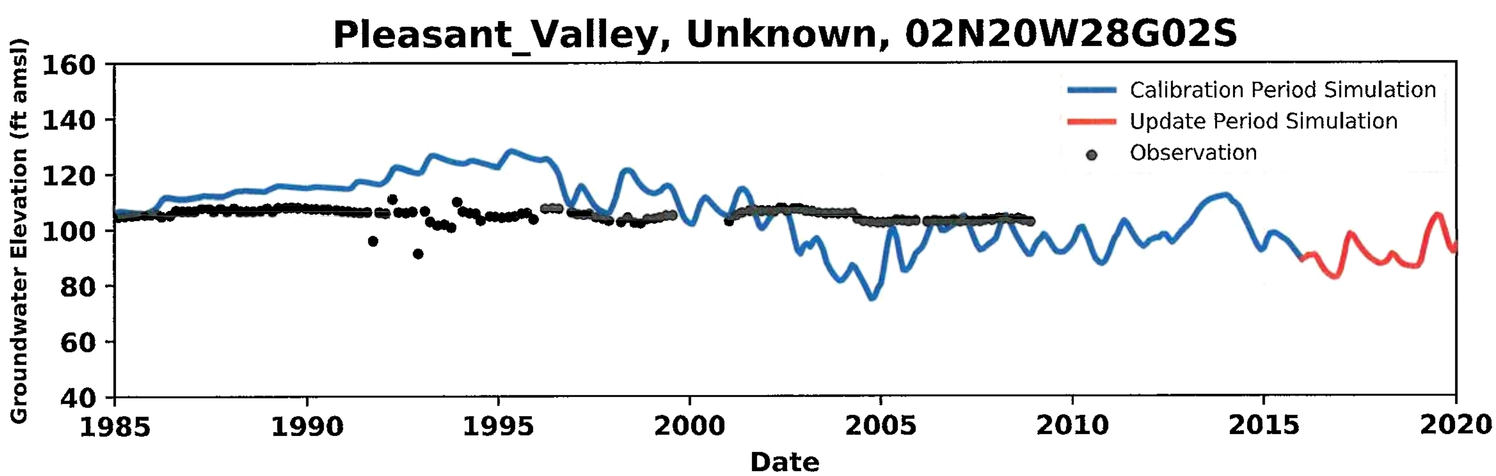

Pleasant_Valley, LAS, 01N21W03C01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

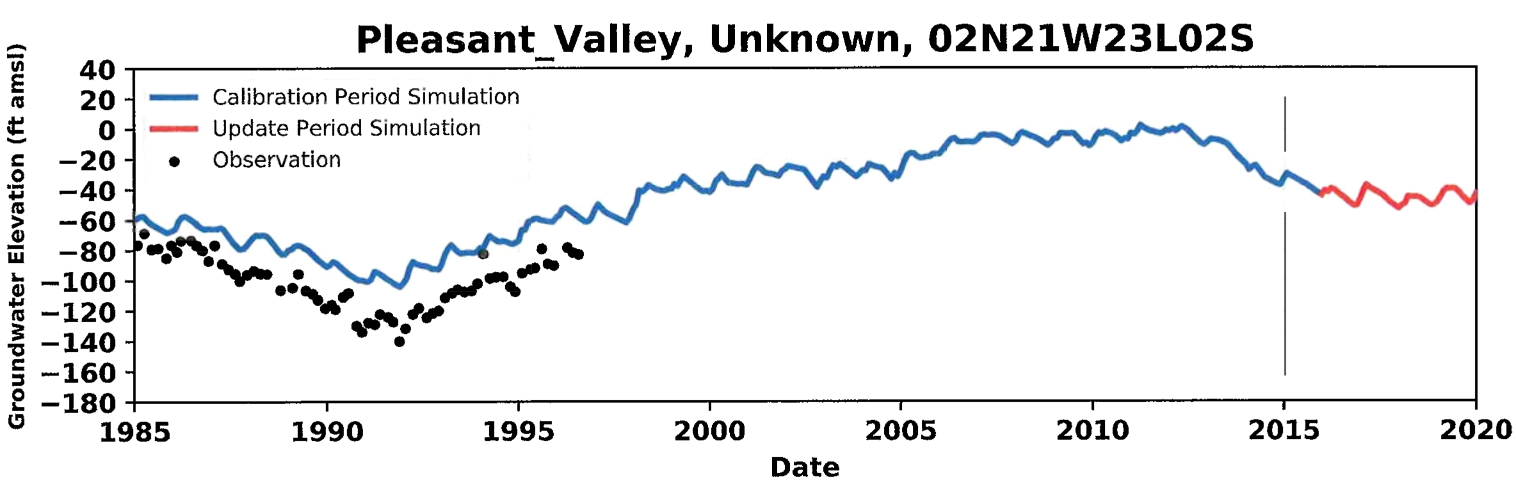

Pleasant_Valley, LAS, 02N20W19M05S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

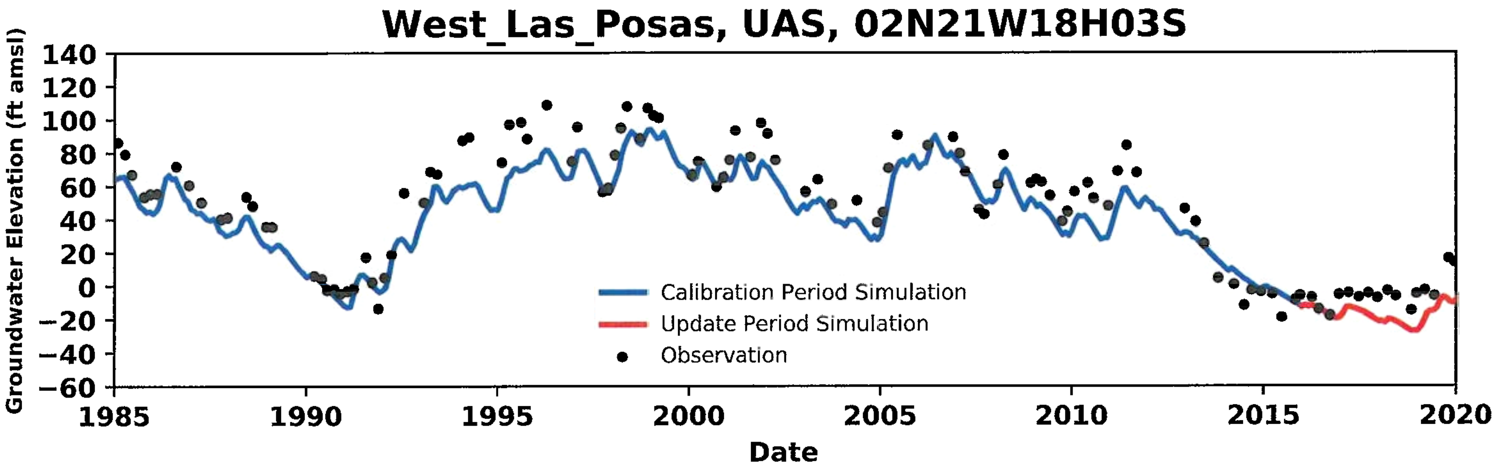

Pleasant_Valley, LAS, 01N21W01B04S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

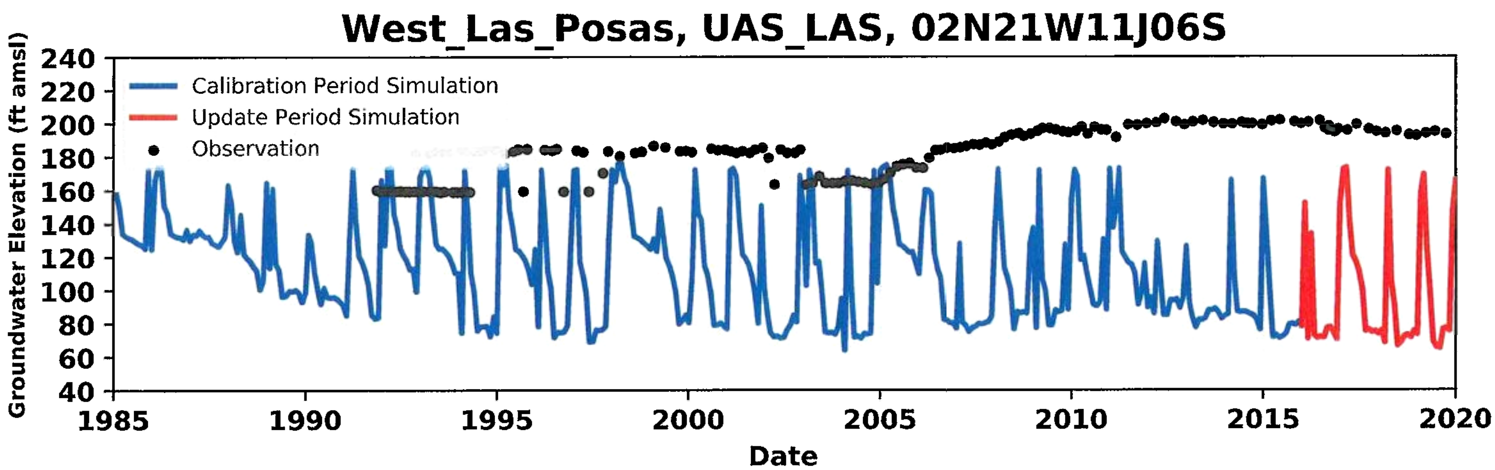

Pleasant_Valley, LAS, 02N21W35M02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

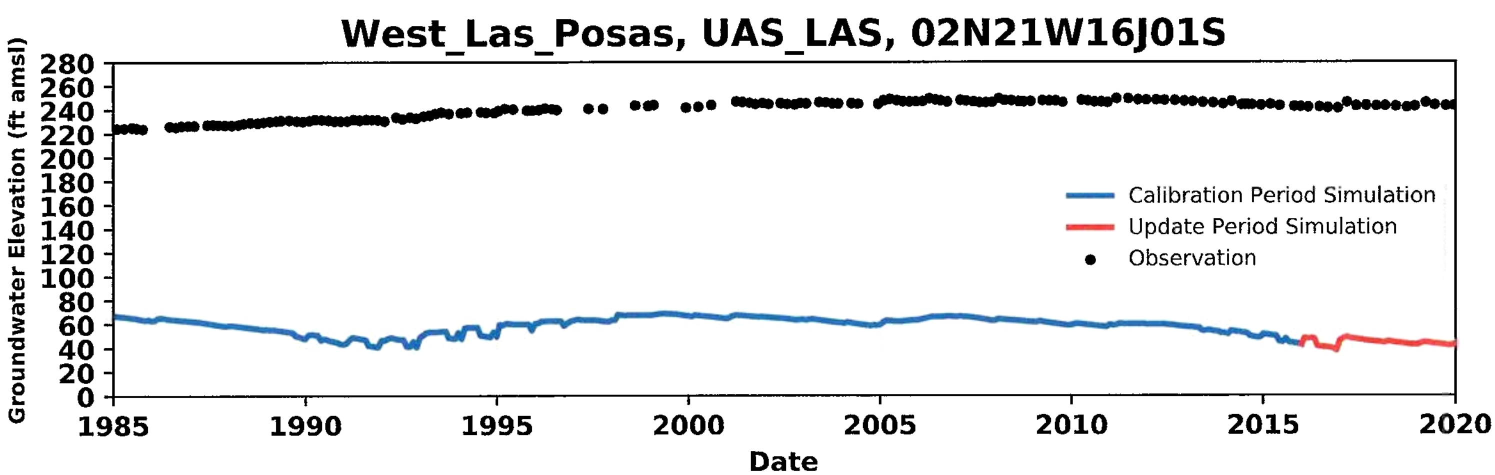

Pleasant_Valley, LAS, 02N20W29B02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

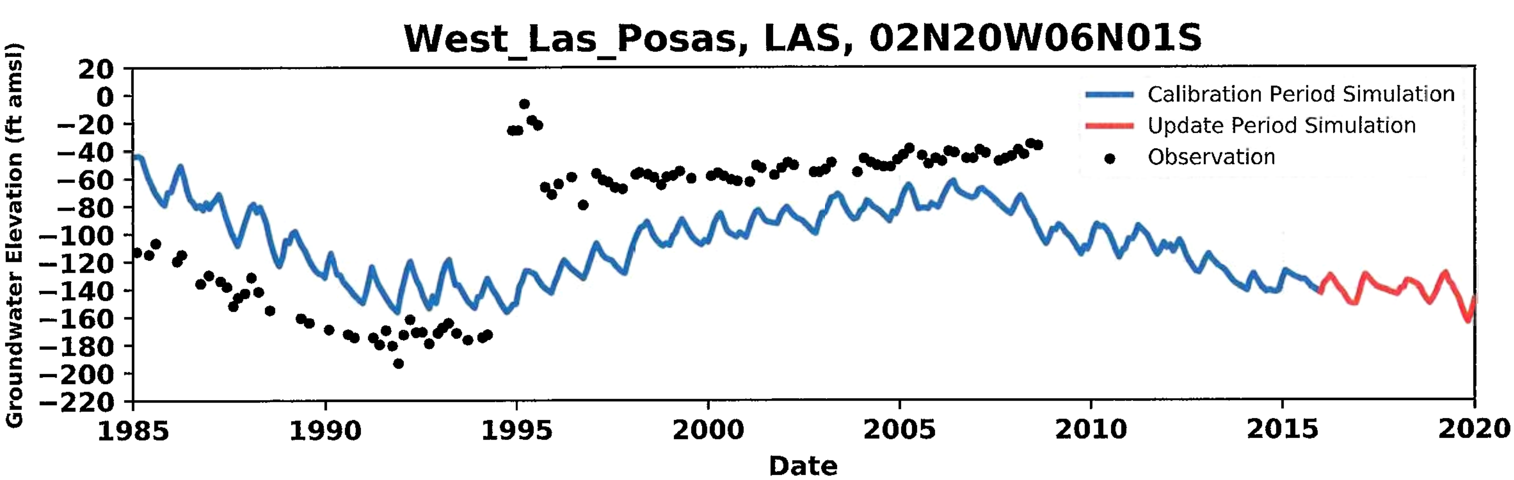

Pleasant_Valley, Unknown, 02N20W28G02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

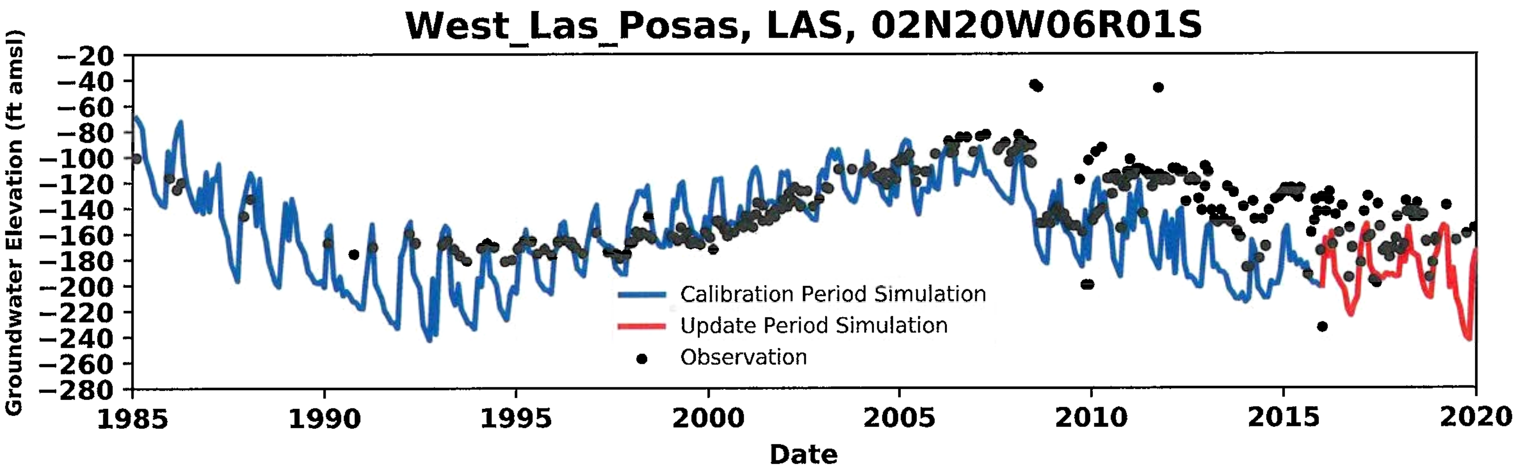

Pleasant_Valley, Unknown, 02N21W23L02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

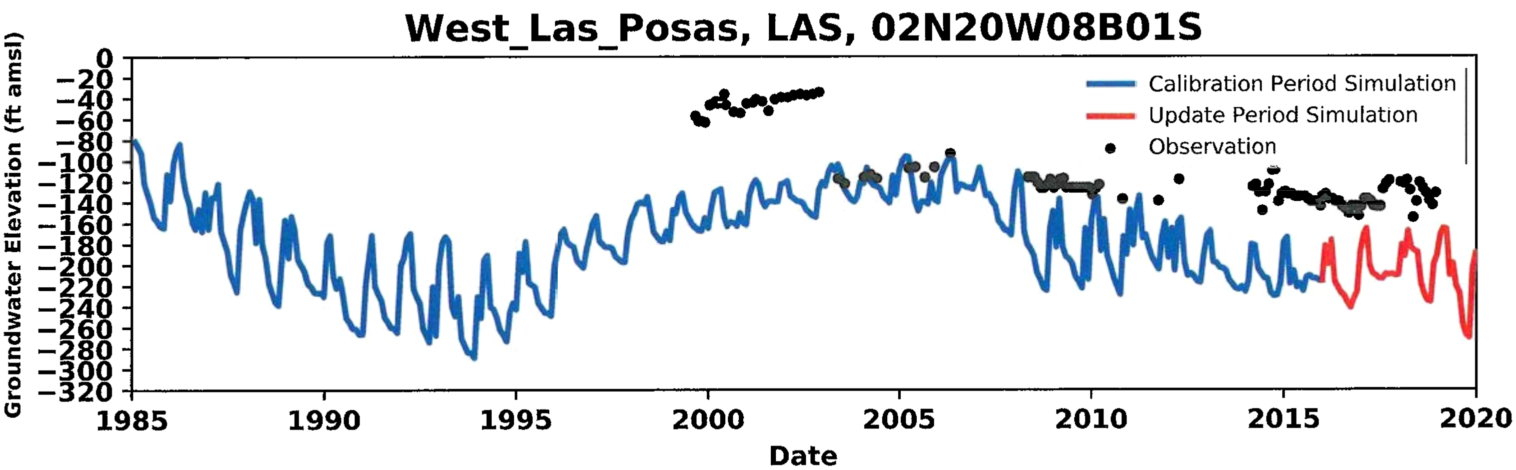

West_Las_Posas, UAS, 02N21W18H03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

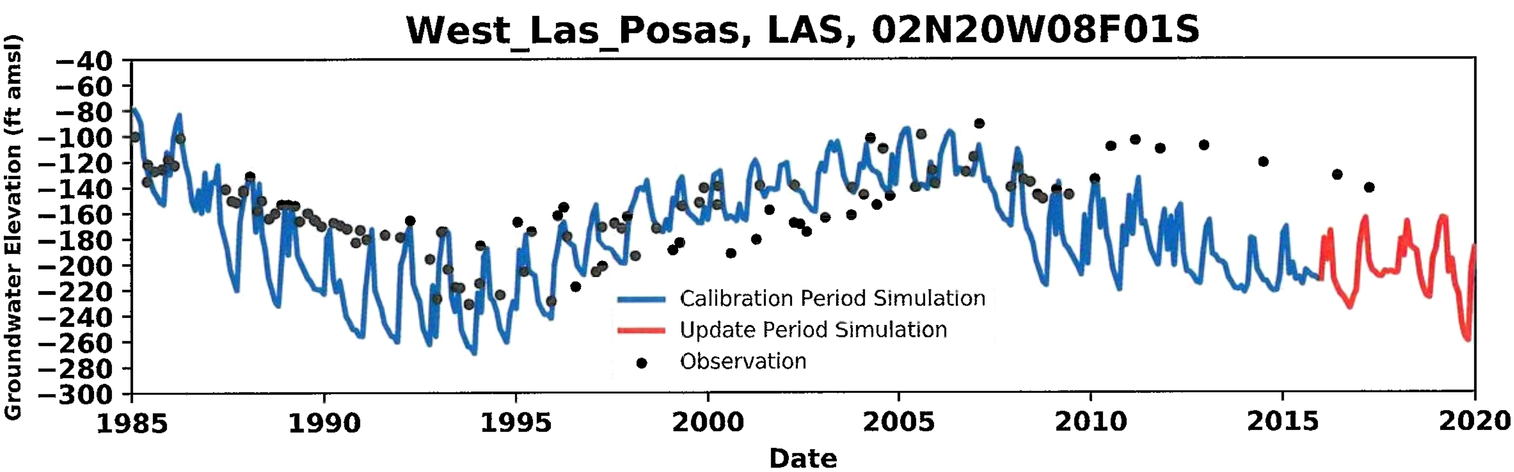

West_Las_Posas, UAS_LAS, 02N21W11J06S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

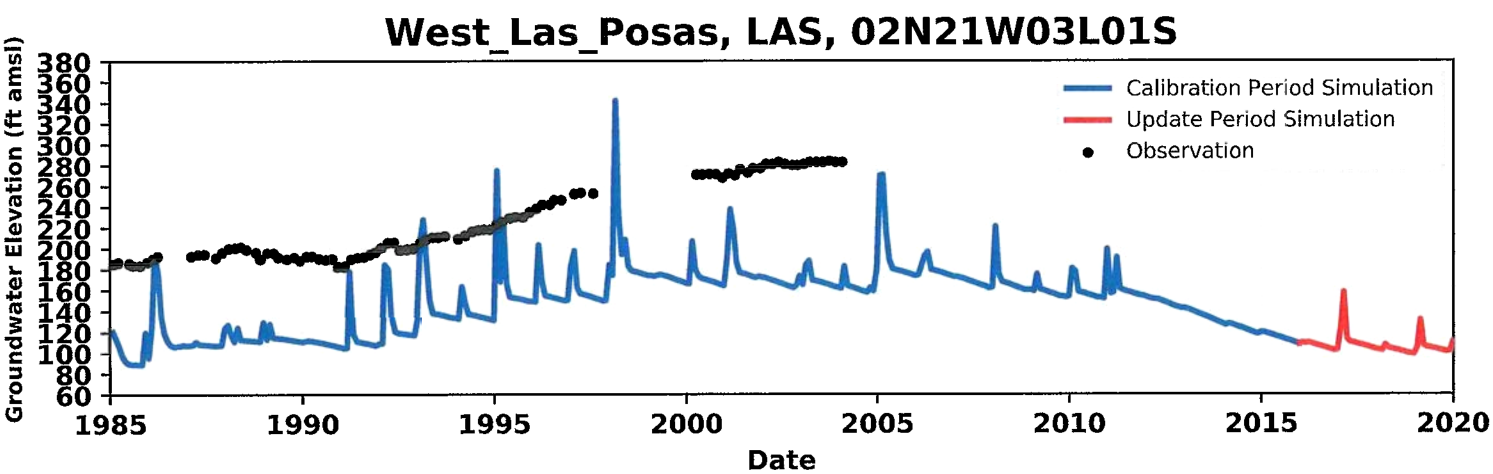

West_Las_Posas, UAS_LAS, 02N21W16J01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

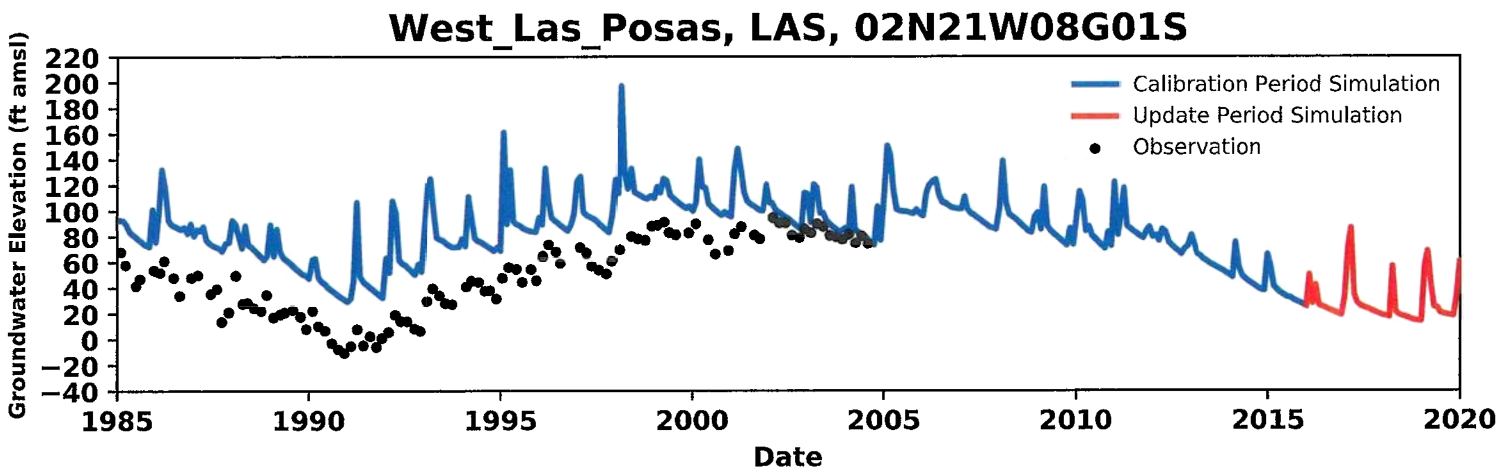

West_Las_Posas, LAS, 02N20W06N01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

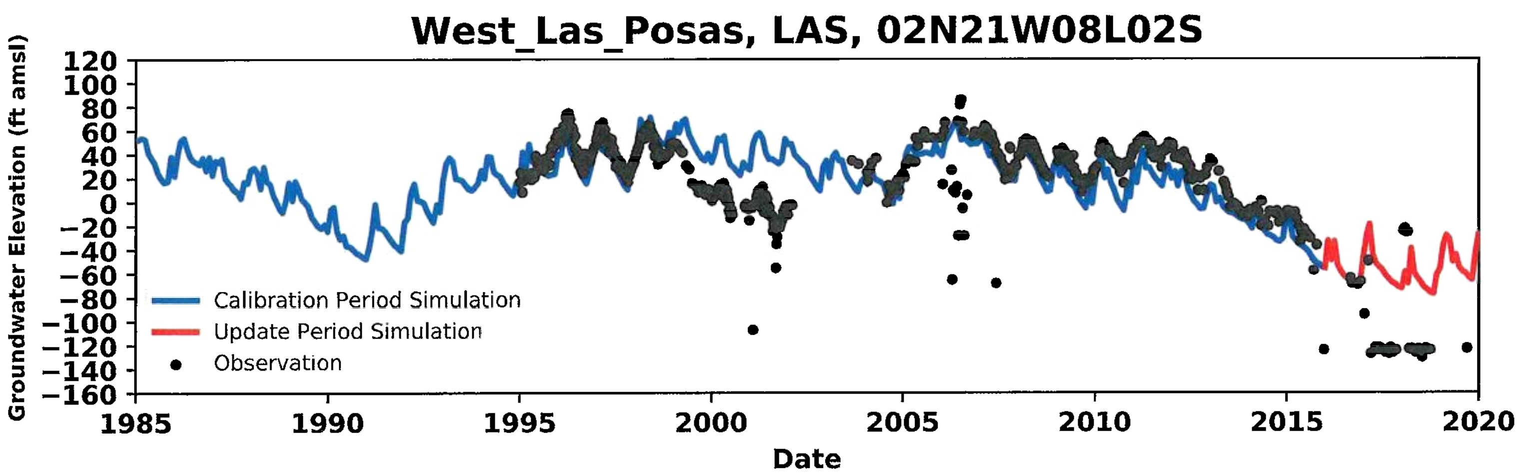

West_Las_Posas, LAS, 02N20W06R01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

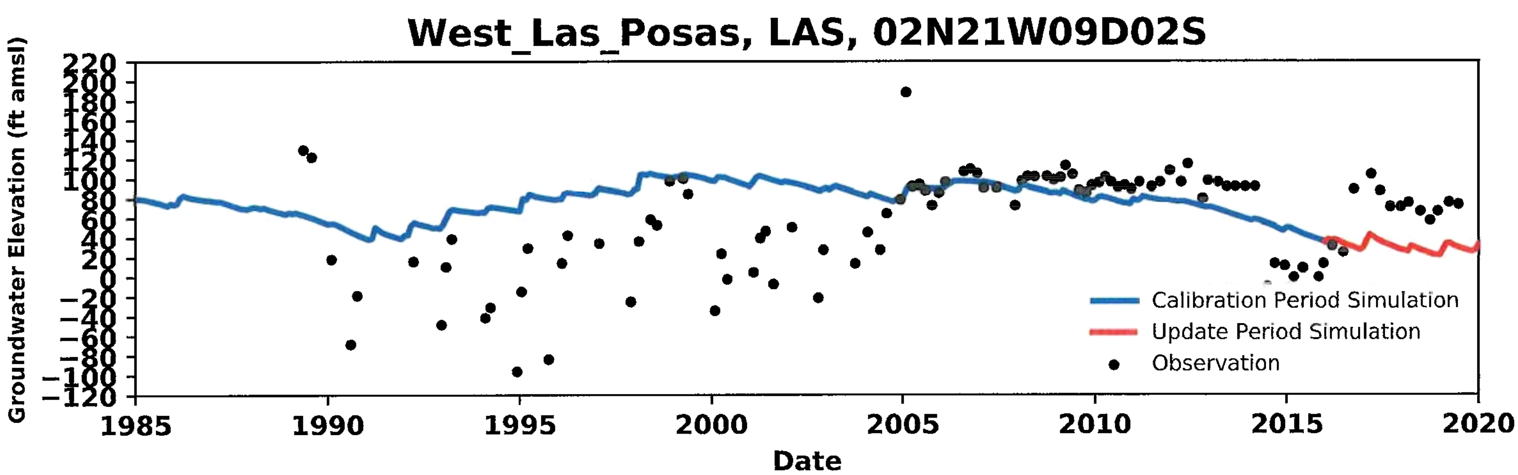

West_Las_Posas, LAS, 02N20W08B01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

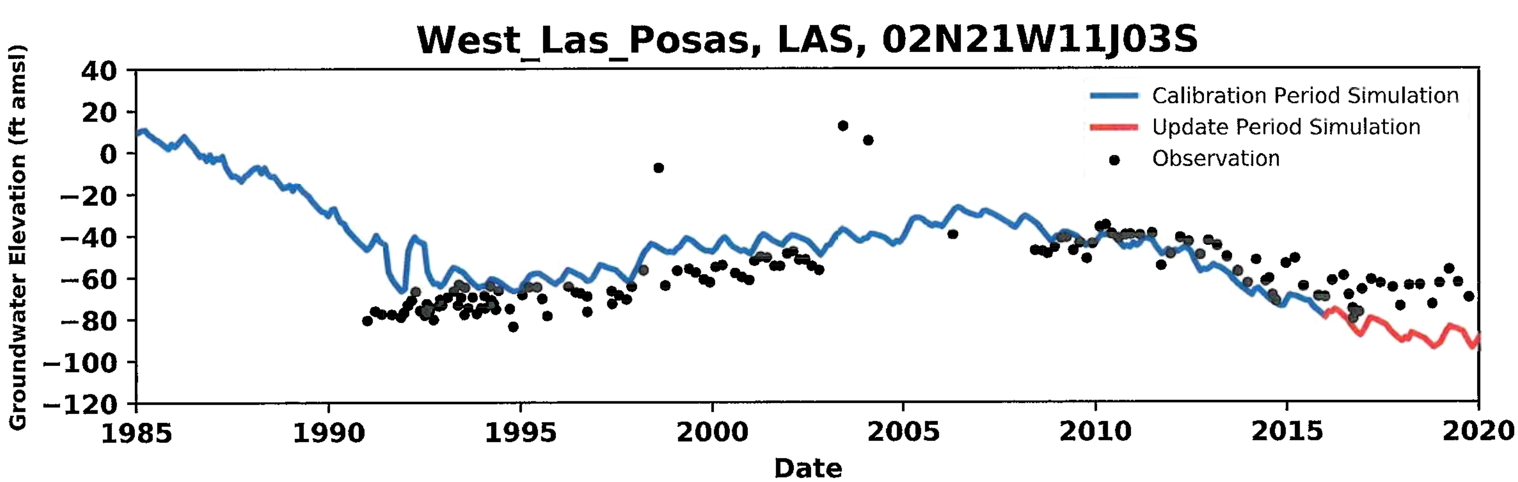

West_Las_Posas, LAS, 02N20W08F01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

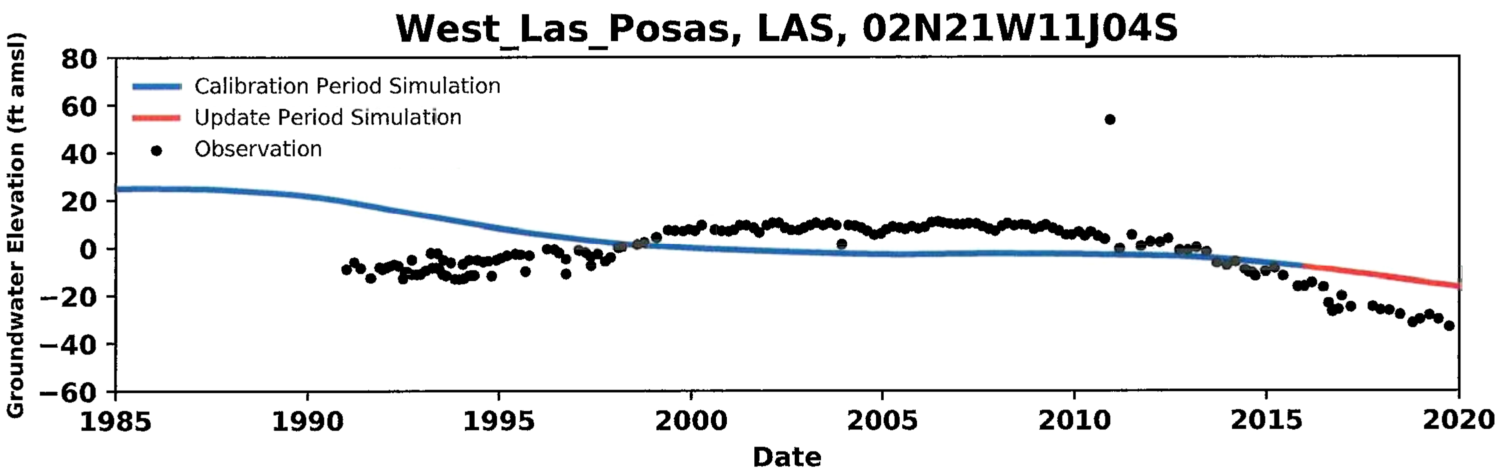

West_Las_Posas, LAS, 02N21W03L01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

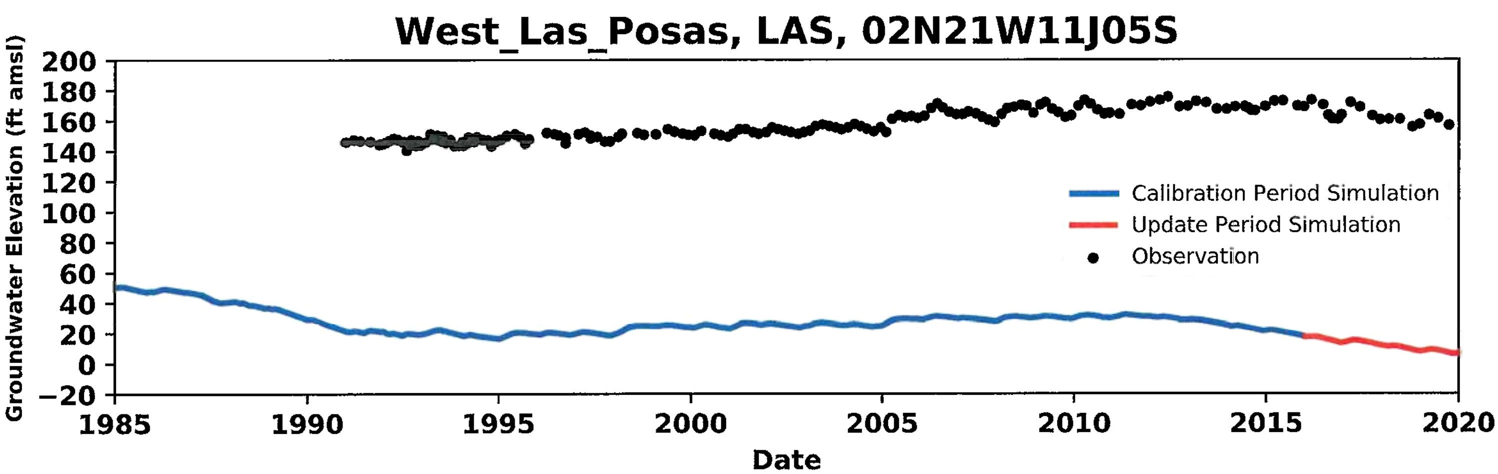

West_Las_Posas, LAS, 02N21W08G01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

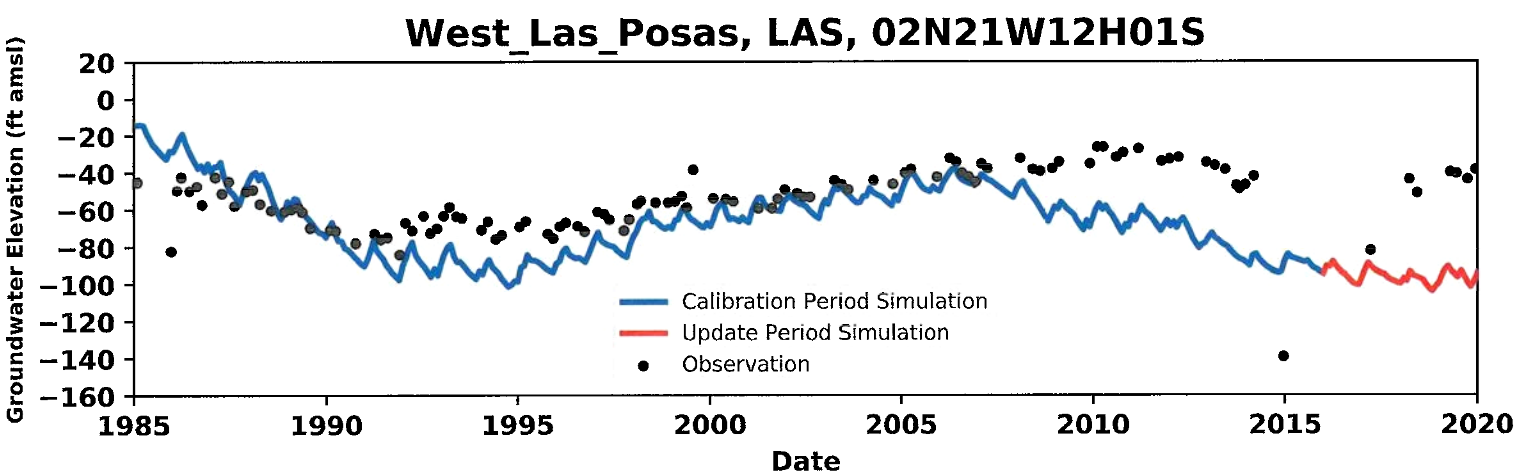

West_Las_Posas, LAS, 02N21W08L02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

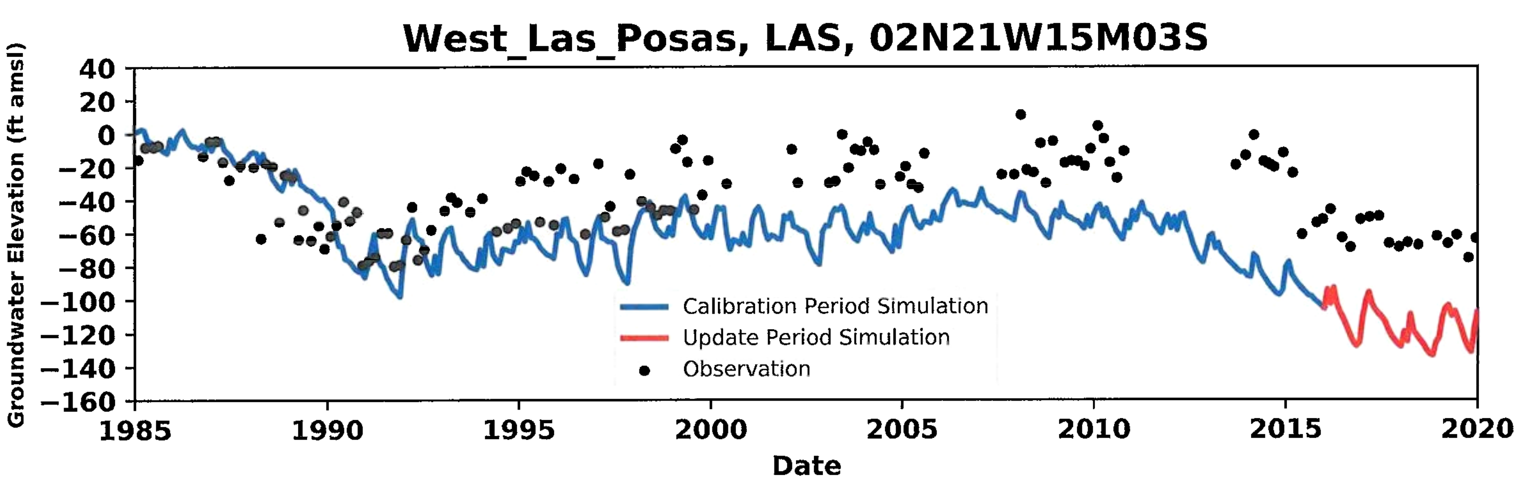

West_Las_Posas, LAS, 02N21W09D02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

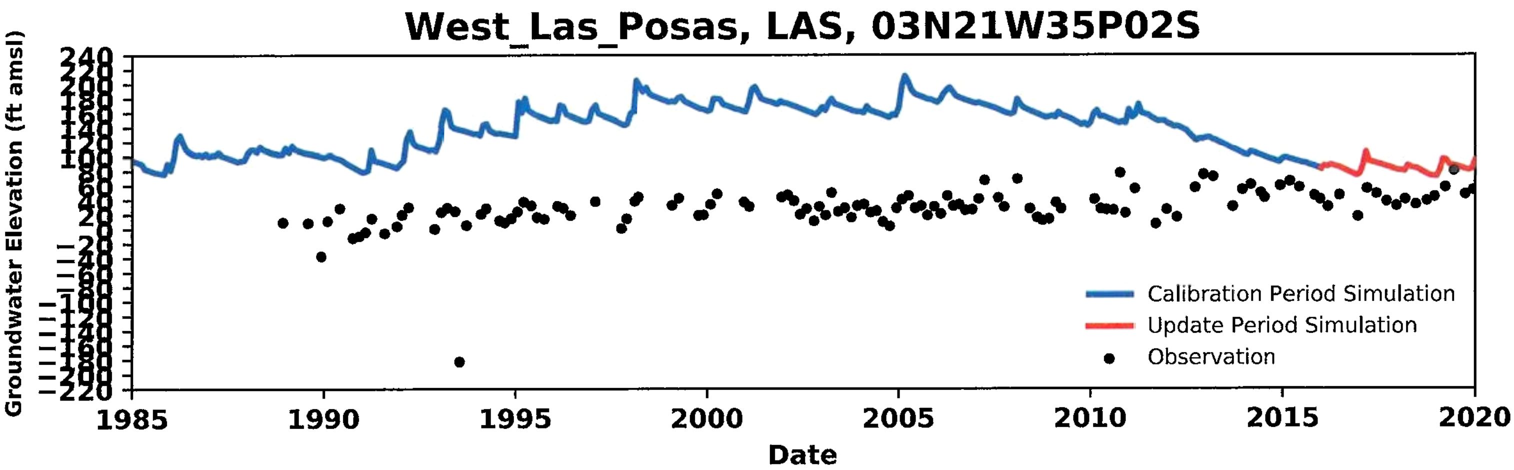

West_Las_Posas, LAS, 02N21W11J03S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation

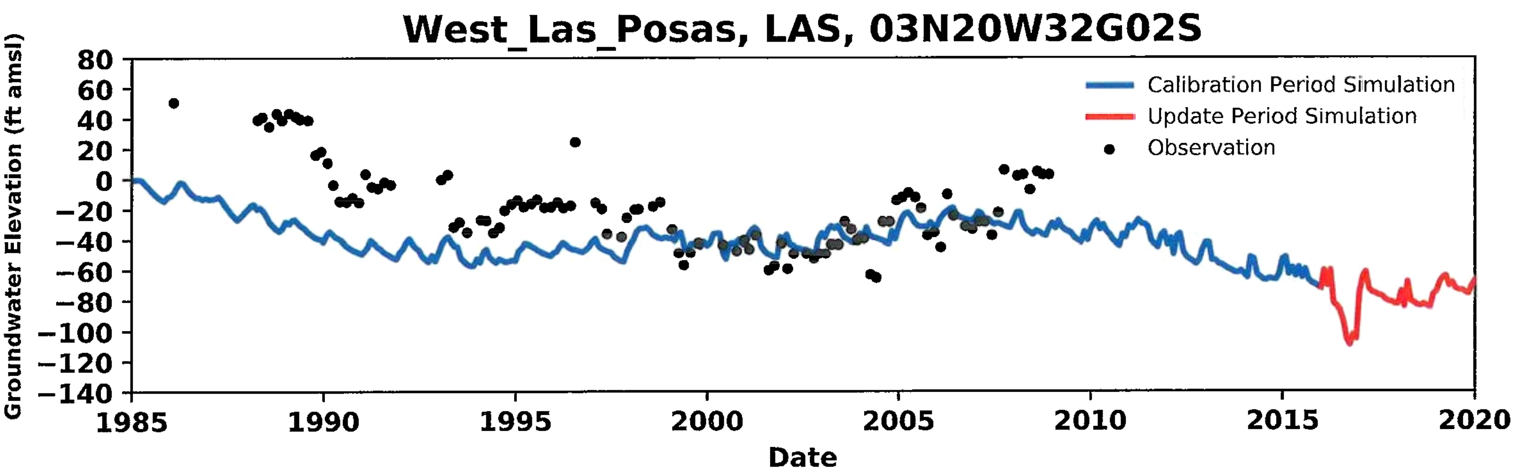

West_Las_Posas, LAS, 02N21W11J04S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
80
60
40
20
0
−20
−40
−60
1985
1990
1995
2000
2005
2010
2015
2020

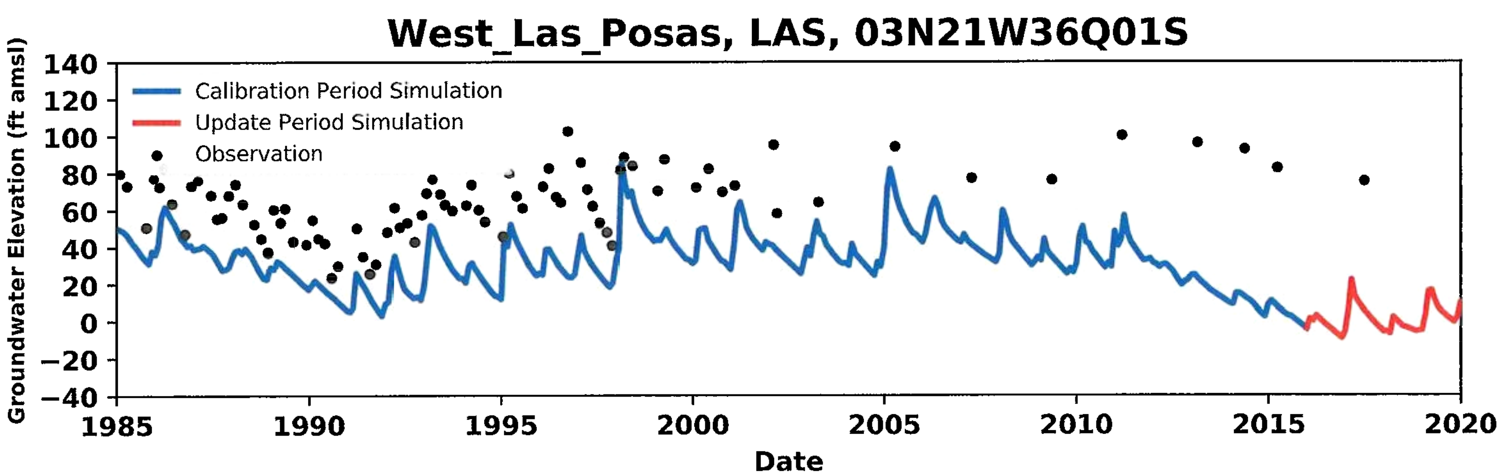

West_Las_Posas, LAS, 02N21W11J05S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
200
180
160
140
120
100
80
60
40
20
0
−20
1985
1990
1995
2000
2005
2010
2015
2020

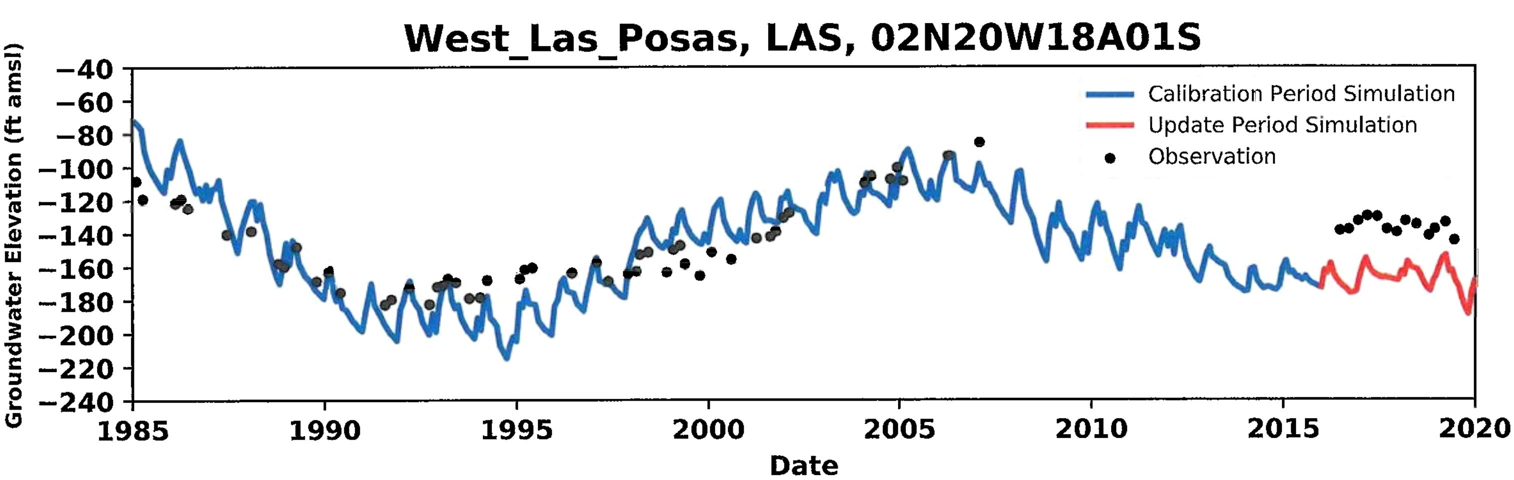

West_Las_Posas, LAS, 02N21W12H01S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
20
0
−20
−40
−60
−80
−100
−120
−140
−160
1985
1990
1995
2000
2005
2010
2015
2020


West_Las_Posas, LAS, 02N21W15M03S
Calibration Period Simulation
Update Period Simulation
Observation
Groundwater Elevation (ft amsl)
Date
40
20
0
−20
−40
−60
−80
−100
−120
−140
−160
1985
1990
1995
2000
2005
2010
2015
2020

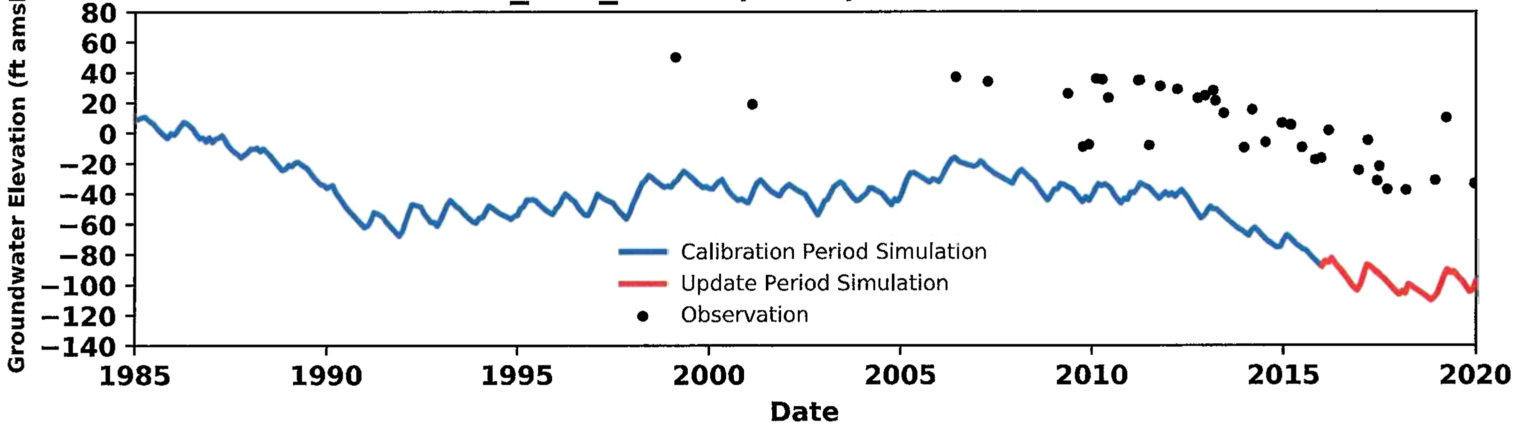

West_Las_Posas, LAS, 03N21W35P02S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

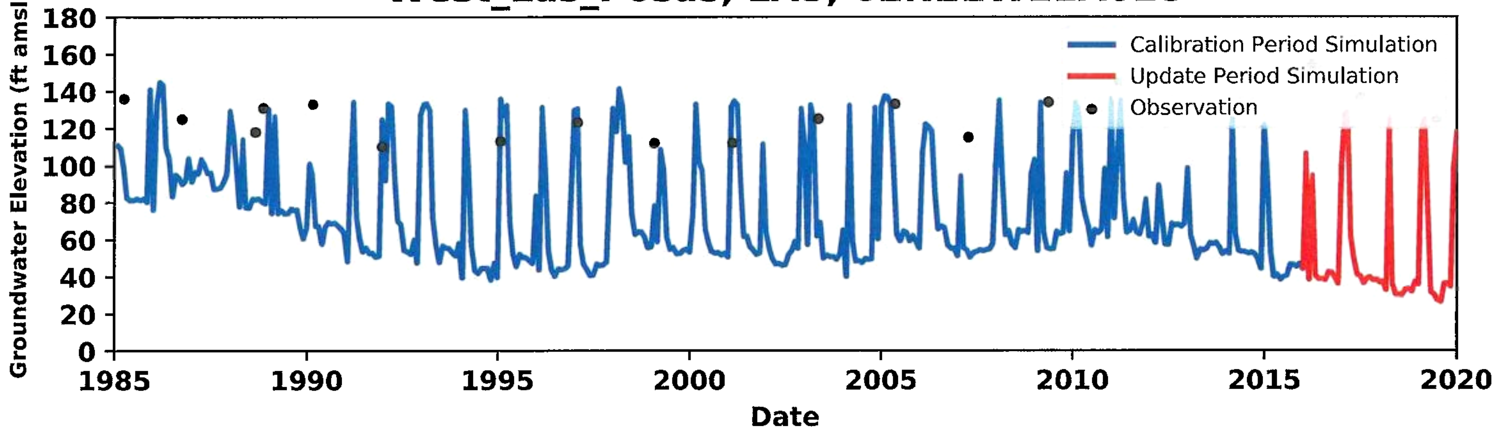

West_Las_Posas, LAS, 03N21W36Q01S
Groundwater Elevation (ft amsl)
Date
Calibration Period Simulation
Update Period Simulation
Observation


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

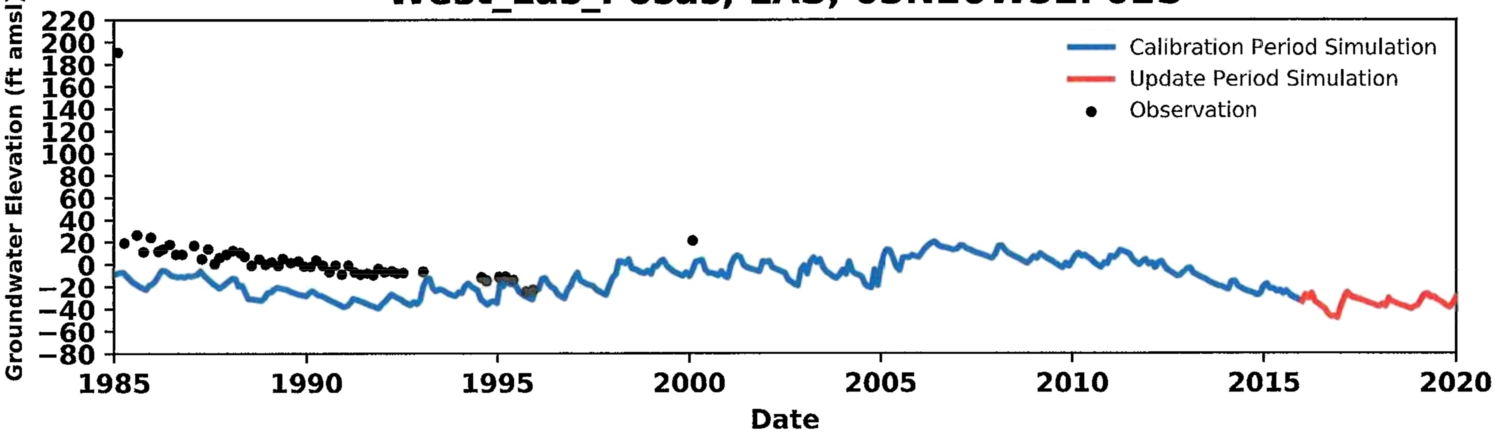
## West_Las_Posas, LAS, 02N21W10G03S



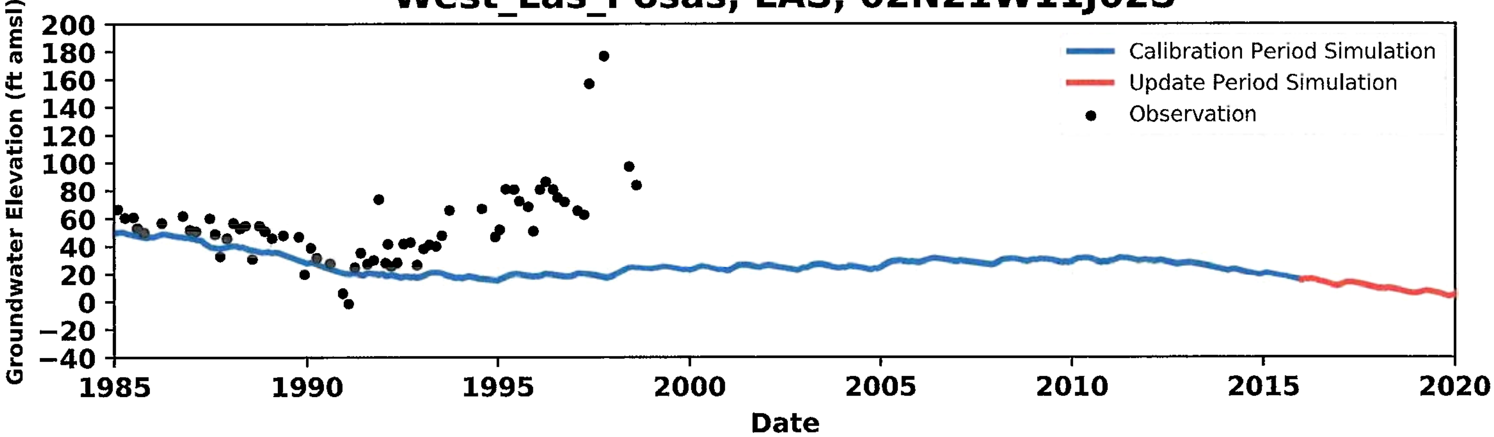

## West_Las_Posas, LAS, 02N21W11A02S



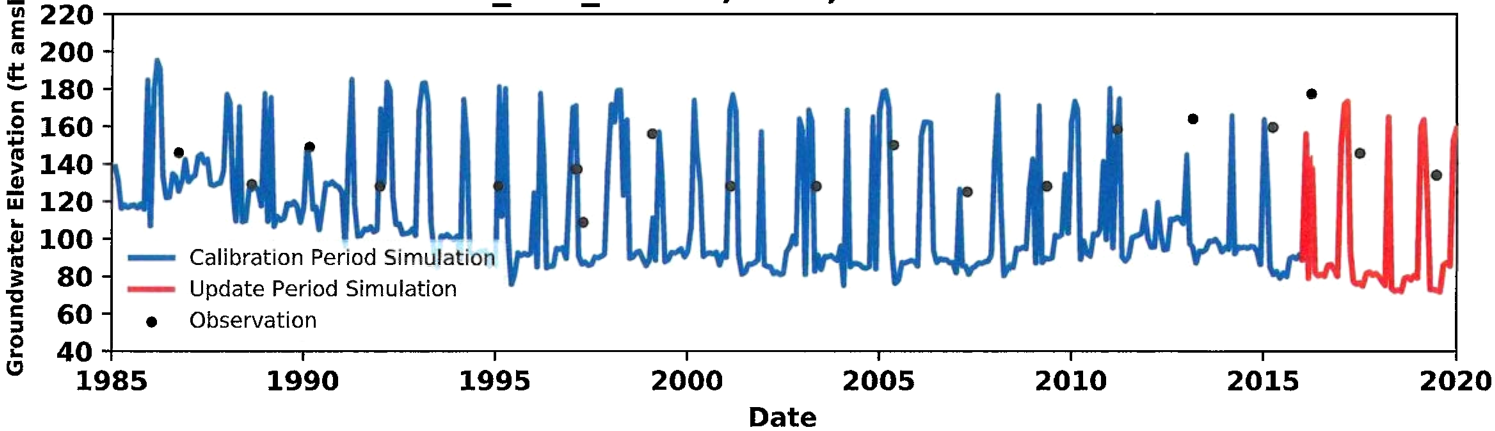

## West_Las_Posas, LAS, 03N20W32F02S



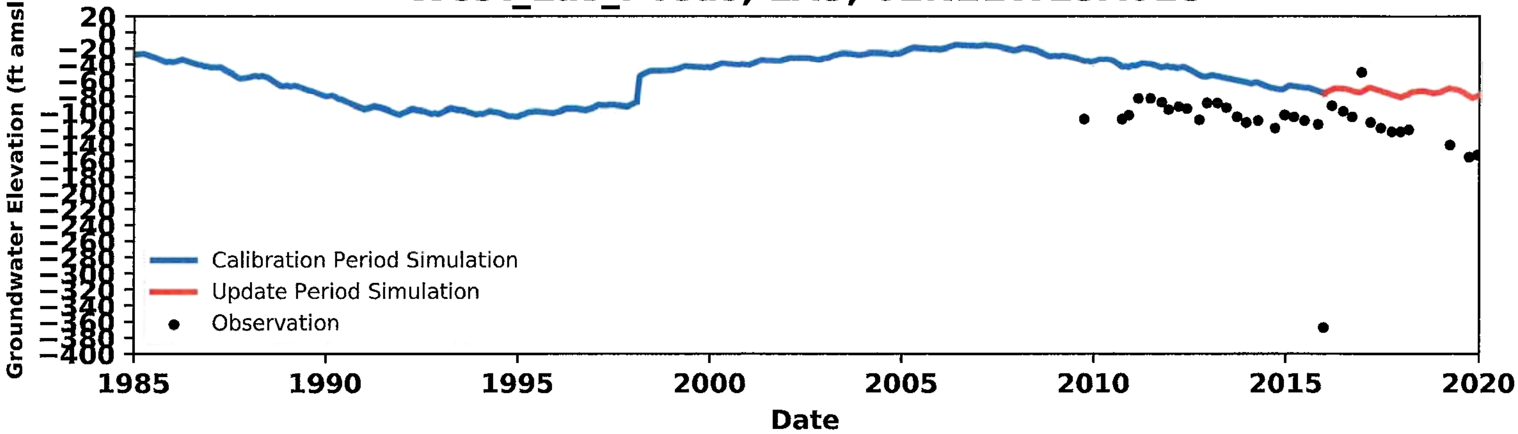

## West_Las_Posas, LAS, 02N21W11J02S



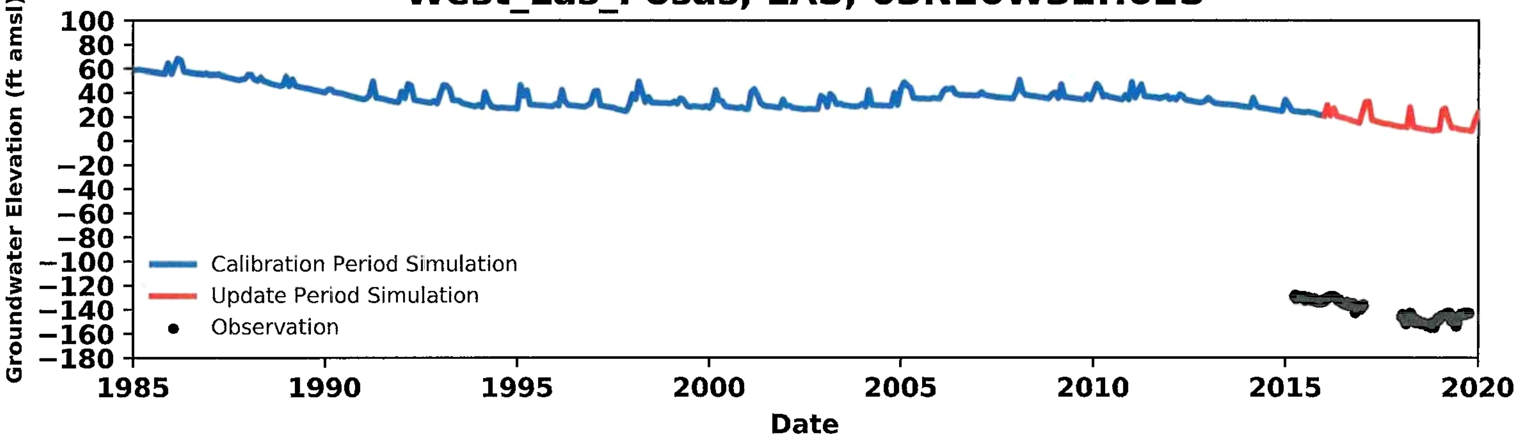
## West_Las_Posas, LAS, 02N21W01L01S



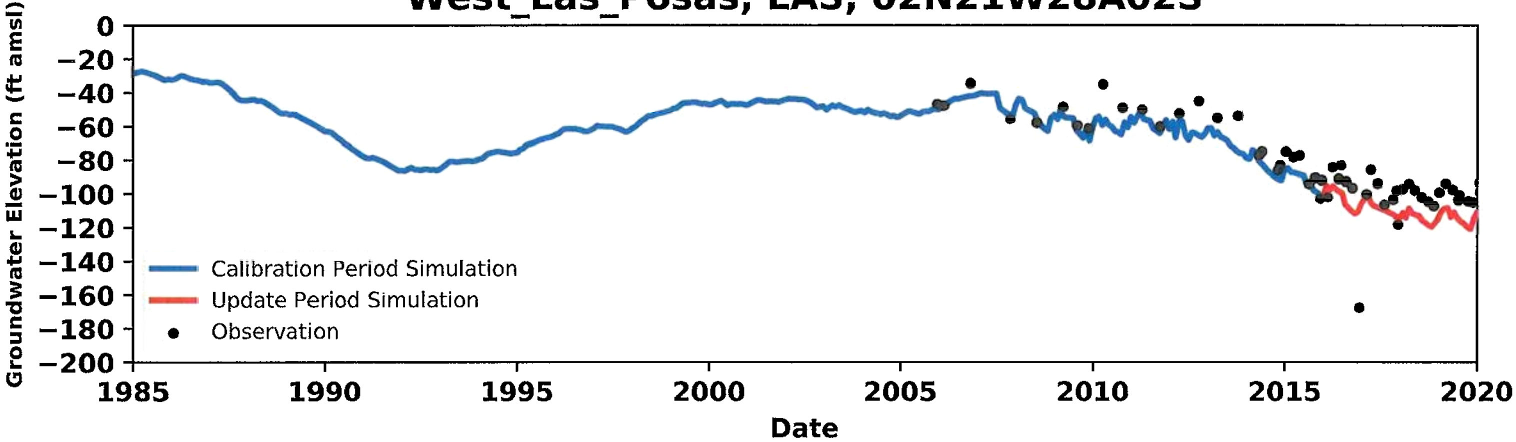

## West_Las_Posas, LAS, 02N21W13A01S




## West_Las_Posas, LAS, 03N20W32H02S




## West_Las_Posas, LAS, 02N21W28A02S



# Appendix B – Monthly Groundwater Budgets

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

| Date | Stress Period | Days in Month | influx(+) outflux(-); units in Acre-feet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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 | | | | | | |
|---|---|---|---|---|---|---|
| | | | influx(+) outflux(-); units in Acre-feet | | | |
| Date | Stress Period | days in month | Change in Storage | Pumping from Wells | Piru B | Fillmore C |
| 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 | influx(+) outflux(-); units in Acre-feet | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Change in Storage | Mountain Front Recharge | Recharge | Pumping from Wells | Outside of Basin | Fillmore B | Piru C | Santa Paula C |
| 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 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | influx(+) outflux(-); units in Acre-feet | | | | | | | | | | |
| 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 |
| 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 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | influx(+) outflux(-); units in Acre-feet | | | | | | | | | | | | |
| 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 |
| 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 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Stress Period | Days in Month | influx(+) outflux(-); units in Acre-feet | | | | | | | | |
| | | | 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 | Change in Storage | Recharge | Pumping from Wells | Santa Paula A | Mound L1 | Santa Paula B | Oxnard UAS | Coastal Flux | Mound L5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | influx(+) outflux(-); units in Acre-feet | | | | | | | | |
| 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 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Date | Stress Period | Days in Month | influx(+) outflux(-); units in Acre-feet | | | | | | |
| | | | 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 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Stress Period | Days in Month | influx(+) outflux(-); units in Acre-feet | | | | | | | | |
| | | | 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

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

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

| Date | Stress Period | Days in Month | Change in Storage | Recharge | Pumping from Wells | Oxnard Basin | Pleasant Valley | Las Posas LAS |
|---|---|---|---|---|---|---|---|---|
| | | | influx(+) outflux(-); units in Acre-feet | | | | | |
| 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 |

Fillmore and Piru Basins Groundwater Sustainability Agency

# Appendix E-4

# Expert Panel Review of the Expansion and Update to the Ventura Regional Groundwater Flow Model (Ventura County, California) (Porcello et al., 2021)

# Memorandum

**To:** Jason Sun / United Water Conservation District (UWCD)

**Copy:** Dan Detmer / UWCD

**From:** John Porcello / GSI Water Solutions, Inc.
Jim Rumbaugh / Environmental Simulations, Inc.
Sorab Panday, Ph.D. / GSI Environmental, Inc.

**Date:** August 19, 2021

**Re:** Expert Panel Review of the Expansion and Update to the Ventura Regional Groundwater Flow Model (Ventura County, California)

# Introduction

The United Water Conservation District (UWCD) has developed a numerical groundwater flow model of a series of interconnected groundwater basins in the southern portion of Ventura County, California where UWCD is charged with managing, protecting, conserving, and enhancing the region's water resources. This regional model initially was constructed for the four westernmost groundwater basins along the coast in southern Ventura County (the Oxnard, Pleasant Valley, West Las Posas, and Mound groundwater basins) and is referred to as the "Coastal Plain Model" in this memorandum and in a June 2021 report (UWCD, 2021a). The development and calibration of the Coastal Plain Model is documented and referred to as the VRGWFM in a report that also presented the underlying hydrogeologic conceptual model for those four groundwater basins (UWCD, 2018). The newest version of the numerical groundwater flow model (herein referred to as the Regional Model) expanded the Coastal Plain Model by adding three other groundwater basins (Piru, Fillmore, and Santa Paula) that occupy the alluvial valley of the Santa Clara River in the eastern portion of the county. The effort to expand and calibrate the model in the Piru, Fillmore, and Santa Paula groundwater basins was completed in August 2020 and documented in a June 2021 report (UWCD, 2021a). The report focuses on conceptual and numerical models for these three added groundwater basins but also discusses pertinent aspects of model development for the entire area simulated in the new Regional Model. The model's simulation period (originally calendar years 1985 through 2015) was later updated to include four more years of recent hydrologic and water use data (2016 through 2019) and is described in an August 2021 report (UWCD, 2021b).

The Regional Model has been developed to provide a new management tool to guide future policy decisions regarding groundwater management at wellfield to basin scales and potentially in various aquifers or groups of aquifers. The model initially has been used to support the development and implementation of Groundwater Sustainability Plans (GSPs) in several of these basins under the State of California's Sustainable Groundwater Management Act (SGMA). Aspects of GSP development and implementation that have made use of the model include (1) establishing sustainability goals and criteria in critical regions of the local groundwater basins, (2) developing numerical thresholds for evaluating compliance with the sustainability goals and criteria during the ensuing 20-year period for implementing each GSP, and (3) analyzing the hydrogeological impact of various projects and management actions intended to provide and/or maintain sustainability in a given groundwater basin.

UWCD has retained the services of an expert review panel consisting of the three groundwater modeling consultants who are the co-authors of this memorandum. Working individually and collectively, this panel has conducted a review of the Regional Model's construction, calibration, and simulation performance, with a focus on evaluating (1) the suitability of the overall modeling approach and model design to meet GSP objectives, (2) the conceptualization, construction, and simulation techniques by which the geologic and hydrologic attributes of the multi-aquifer groundwater system are represented in the model, and (3) the quality of the model's calibration. The panel also has considered the model's suitability for a variety of anticipated future uses, as well as potential limitations on its use. The panel conducted this work for the Coastal Plain Model from 2016 through 2018, and then resumed its efforts in 2020 once an initial version of the newly expanded Regional Model became available for review. UWCD has implemented many of the expert panel's suggestions and recommendations during the past five years and plans to further refine the model as needed to support future specific applications of the tool. Accordingly, this memorandum provides a summary of the panel's evaluation of the Regional Model as documented in UWCD's June 2021 model development report (UWCD, 2021a), with the recognition that the model is likely to evolve through a series of refinements as it is applied to specific projects and planning efforts in the region.

**In summary, the expert review panel finds the model to be a well-designed and well-calibrated tool that is a substantial enhancement and upgrade over previously available models. The Regional Model provides a newer and more detailed representation of groundwater flow in the hydrostratigraphic units in these basins than was previously available. Accordingly, the Regional Model provides a sound platform for evaluating how the multiple aquifers in the region behave and how they might respond to the design and implementation of regional management programs in the seven groundwater basins that the model simulates in southern Ventura County. A detailed sensitivity analysis has been conducted on the model with regards to water levels in the various basins, the basin water budgets, and the inter-basin flows. The sensitivities are categorized as per ASTM guidelines (ASTM, 2016) which provide an overview of the significance of various parameters to model results. Use of the model for decision making can additionally use the sensitivity coefficients to evaluate impacts of parameter uncertainty to decision results. A future upgrade to an**

**unstructured-grid version of MODFLOW will allow this model to become a robust platform for evaluating projects and management actions in localized areas (i.e., at the land-parcel and wellfield scales).**

Groundwater models commonly contain a very large amount of data and can be extremely complex. This model is no exception, and in some respects is more complicated and detailed than other regional-scale or locally-focused groundwater models. While the review team has spent considerable time working with the model and discussing its underlying assumptions with UWCD, future reviews of the model's applications may turn up further recommendations and suggested changes to the model.

The expert review panel focused its review work during 2020 and 2021 on the model's expansion into the three eastern basins along the Santa Clara River (Piru, Fillmore, and Santa Paula) and the update of the model time period to include the years 2016 through 2019. The remainder of this memorandum discusses the following topics:

- The expert review panel's evaluation methods and activities
- A summary-level description of the model
- The panel's assessment of the model's calibration quality and representativeness of the hydrogeological conditions of the basins
- The model's uses and potential enhancements
- A list of the references cited in this memorandum

# Expert Panel Evaluation Methods and Activities

The review process for the model expansion began with an online technical meeting hosted by UWCD in March 2020. UWCD staff presented details on the conceptual model of land uses, surface water hydrology (including water storage and releases into streams), the subsurface geology and hydrostratigraphy, and previous hydrogeologic investigations and water budget estimates for the Piru, Fillmore, and Santa Paula basins. UWCD's lead modeler then presented the construction and calibration status of the model in the expansion area. The numerical model and a write-up of the conceptual model for these three basins were then provided to the expert review panel for detailed review in March and April 2020, from which the panel provided an initial set of comments in June 2020. Later, newer versions of the model were provided to the panel for review in July 2020 (another draft version of the model) and in August 2020 (the final model that is described in the June 2021 documentation report). In April 2021, the panel also reviewed and provided comments on a draft version of the report. In July 2021, the panel reviewed a draft version of a second report issued in August 2021 that discusses the update of the model for the time period of calendar years 2016 through 2019 (UWCD, 2021b).

# Model Summary

The original Coastal Plain Model developed by UWCD in 2018 was expanded during 2020 to include the Piru, Fillmore, and Santa Paula basins (from east to west), which are present in the lowland valley containing the reach of the Santa Clara River that extends from the Ventura/Los Angeles County Line downstream to the Mound basin and the Pacific Ocean. The expanded model used the same cell spacing for the model grid (2,000 feet) as was used in the Coastal Plain Model and simulates the same original time period (calendar years 1985 through 2015) for calibration purposes. The model update simulates four additional years (2016 through 2019) to serve as a further calibration check on the expanded model. The expanded model uses a daily stress period to capture the impacts of highly variable flows within the Santa Clara River and its tributaries; flow is otherwise more stable in the other streams that are located in the original model domain. (The Coastal Plain Model had used monthly stress periods.) In addition, the model domain for the expansion area (the Piru, Fillmore, and Santa Paula basins) has different hydrogeologic characteristics which are represented by 10 active model layers. (The portion of the model domain covering the four basins in the Ventura coastal plan has 13 active model layers). The expanded model domain interfaces with the original 2018 model domain across the Country Club fault, which distinctly divides the hydrogeology of the extended domain from the geological units further downstream in the Oxnard and Mound basins.

Boundary conditions for the expanded model domain represent similar features as in the original model, including similar conceptual representations for areal recharge, mountain front recharge, subsurface underflow, consumptive water use pumping, and streamflows entering the model (at the eastern end of the domain within the Santa Clara River and at model boundaries to various tributaries of the Santa Clara River). Riparian evapotranspiration is also included along the Santa Clara River corridor.

The expanded numerical model compares well with the descriptions of geology and hydrogeology that were developed from the data, in the conceptual model section of the model development report (UWCD, 2021a). Descriptions of soil material types or of semi-confined conditions, along with data from field tests and measurements, generally conform with values of hydraulic conductivities and water levels simulated by the numerical model. The expansion of the model domain into the Piru, Fillmore, and Santa Paula basins and the increased temporal resolution of the model's stress periods (from monthly to daily) did not affect the model results within the original model domain.

# Assessment of Calibration Quality

During the process of reviewing and commenting on the expanded Regional Model, the expert review panel observed that the model's calibration quality was improved by several incremental changes made by UWCD during the spring and summer of 2020 within the expanded area. The incremental improvements arose from internal consultations among the members of the panel, panel member discussions with UWCD's lead groundwater modeler, and the internal review processes at UWCD (which included review of the simulated rates of surface water/groundwater exchanges and streamflows by UWCD's surface water hydrology team members). The incremental improvements and refinements within the expansion area included the following:

1. Splitting the San Pedro Formation aquifer system into three layers (rather than its original single layer) to obtain enhanced resolution of the hydrostratigraphic sequence within that model layer as shown in Table 2-10 of the model development report (UWCD, 2021a; Upper Saugus – Aquitard – Lower Saugus).

2. Incorporating ET processes from riparian plant communities into the model.

3. Resolving issues with dry cells and reduced pumping from certain wells, which were problems that occurred primarily along the model's edges.

4. Simulating storm flow components separately and discretely from conservation releases of water occurring from the Santa Felicia Dam.

5. Incorporating LIDAR elevation data sets into the definitions of the riverbed profiles and bed elevations.

6. Increasing the model's time resolution to daily, so that daily variations in stream flows could be simulated (which is critical to UWCD's groundwater resource management programs and water supply operations).

7. Coordinating the representation of hydraulic conductivity values and subsurface inflow at the east end of the Piru basin (at the Ventura/Los Angeles County Line) with the representations of these conditions in western Los Angeles County as contained in a numerical groundwater model that was concurrently being developed for the East Subbasin by the Santa Clarita Valley Water Agency (GSI Water Solutions, 2021). This coordination effort not only improved conditions at and near the county line, but also resolved the Regional Model's initial inability to simulate the dry gap that is present in the Santa Clara River upstream of the mouth of Piru Creek.

During the course of its review, the expert review panel observed that the process of calibrating the Regional Model was complicated by a number of factors. Specifically:

1. The multi-layered and faulted aquifer system is complex in structure, and the wells that penetrate these units commonly penetrate more than one aquifer system. Some wells penetrate 1, 2, or 3 layers in the model, while other wells penetrate as many as 7 or 8 model layers. Accordingly, the water level measured in a well is the result of not only its use at the time the water level is measured, but also the large ambient (natural) differences in groundwater elevations that are commonly present in the three primary aquifer systems that are present in the expansion area (identified by UWCD as Aquifer Systems A, B, and C which are represented in model layers 1 through 3, 4 through 7, and 8 through 10, respectively).

2. As discussed in Section 2.2 of the June 2021 model development report (UWCD, 2021a), the majority of the available groundwater elevation data are from production wells. The production wells are simulated as pumping wells in the model, in order to simulate this

important discharge term in the groundwater budget for each individual aquifer. Yet the water level data from these same wells consist almost exclusively of measurements that are made once a well has been off for a period of time that can range from (a) a few hours in the case of municipal wells (year-round) and agricultural wells (during the peak-pumping season) to (b) several days or weeks (primarily in the case of agricultural wells during the winter months). The use of these measurements in evaluating calibration quality is quite complicated and difficult to interpret because (a) the hourly and daily operations of each well are unknown, and (b) the duration of time a well has been off before a water level measurement is collected is unknown (and likely varies from well to well and over time at any individual well). Both factors affect the water level measurement and may be the cause of slight over-predictions in groundwater elevations at several well locations in the model (due to incomplete water level recovery and/or interference from nearby wells).

3. Large fluctuations in water levels occur in these wells because of changes in recharge and pumping. The magnitudes of both terms (recharge and pumping) can only be estimated from the available data sources, and therefore may contain large errors or may not be well represented by average conditions simulated by the model.

Even with these complexities, the expert review panel concludes that the model is generally well developed and well calibrated in the model expansion area, based on qualitative analyses (consisting of visual inspection of hydrographs) and quantitative statistical evaluations (consisting of tables, maps and scatter plots showing residual statistics for groundwater elevations, and groundwater elevation changes arising from pumping, changes in recharge, and controlled releases to streams). The expert review panel's specific observations regarding calibration quality are as follows:

1. The numerical model is well developed and consistent with the data and the conceptual model. Flow rates for model inputs were provided using the best information / estimates available for precipitation recharge; agricultural, domestic, and M&I return flows; recharge from WWTP discharges to streams or at recharge ponds; mountain-front recharge; inflow at streams; and groundwater pumping. Model parameters were estimated from various aquifer tests conducted in the region. The 2,000-foot grid-block size is appropriate for regional-scale simulations; monthly variations in pumping and recharge stresses are appropriate for seasonal planning purposes; and daily variation of streamflows in the Santa Clara River are appropriate for capturing groundwater responses to the flashy flow behavior of the river.

2. Some slight biases in the calibration are evident. For example, the residuals maps contained in the June 2021 model development report (UWCD, 2021a) show predominantly positive residuals (under-simulated) in the east and negative (over-simulated) residuals in the west for water levels in Aquifer System A (see report Figure 4-1), and predominantly negative residuals (over-simulated) in the west for Aquifer

System B (see report Figure 4-3). Scatter plots show that there is a tendency to overpredict water levels in the Santa Paula basin, primarily in Aquifer System B (see report Figure 4-61), whereas there is a tendency to underpredict water levels in Fillmore (see report Figure 4-60). Section 4.2.6 of the model development report mentions that natural baseflows are underpredicted in the Fillmore basin, which fits with our observation that heads have a tendency to be underpredicted in that basin as well.

3. However, in our opinion, none of these issues are critical enough to require revisions to the model because individual wells in these areas and certain aquifer systems show very robust calibration. For example, most of the simulated hydrographs in Aquifer Systems A and B in the Piru basin show an excellent fit to historical data, including good simulation of declining groundwater levels during drought periods. In the Fillmore basin where the statistics indicate a tendency to underpredict water levels, there are certain wells in the A and B aquifers that have only small to moderate underpredictions of groundwater elevations (see for example well 03N21W01P02S in Aquifer System A) while showing simulated fluctuations that are similar to historically observed fluctuations through multiple wet/dry hydrologic cycles (see wells 03N20W01C04S, 03N20W08A01S, and 04N19W30D01S, which are all screened within both the A and B aquifer systems, and wells 03N19W06D02S and 04N20W26C02S in Aquifer System B). In the Santa Paula basin, certain wells are quite well simulated – in particular, wells 03N21W32C01S and 03N21W29K02S in Aquifer System A and wells 03N21W11J02S and 03N21W02R02S in Aquifer System B. However, there are fewer wells in the Santa Paula basin that show as strong a match to groundwater elevations and elevation changes as are seen in Piru and Fillmore; in particular, the model has a tendency to predict too little seasonal fluctuation in Santa Paula groundwater levels and in some cases not enough of a decline in water levels during the two drought periods that are simulated (from 1988 through 1992, and from 2012 through 2016). This is a more frequent observation for wells in Aquifer System B than for wells in Aquifer System A. These observations are useful for evaluating prediction results within these basins when the model is being used for various analyses.

4. In our experience, scaled statistics less than 0.1 (i.e., 10 percent) are indicative of good calibration on an area-wide basis. Scaled statistics are defined as the statistic of interest divided by the range in values in the measured data set. The scaled groundwater elevation statistics for the absolute residual mean and the residual standard deviation are well below 10 percent, ranging between 2.5 and 6.0 percent during the calibration period (1985-2015) for the group of three basins along the Santa Clara River (Piru, Fillmore, and Santa Paula) and between 3.9 and 8.5 percent during the update period for these same three basins. When excluding outlier wells and wells with fewer than 10 water level records, these statistics range from 3.9 to 6.4 percent during the calibration period and 3.9 to 8.4 percent during the update period.

5. A detailed sensitivity analysis was conducted on every variable and stress within each of the modeled basins. The sensitivity analysis produced reasonable results in that the model's relative sensitivity or insensitivity to each type of parameter was consistent with what a modeler would expect to be the case in this type of setting. Specifically, the model showed sensitivity to horizontal hydraulic conductivity values, areal recharge rates, evapotranspiration rates, streambed conductance values in losing stream reaches, and certain other parameters in localized areas. The model was generally less sensitive to the vertical hydraulic conductivity, fault conductance terms, the dimensionless storage coefficient, and the specific yield – though there are localized areas where the choices of these terms are influential (for example, the fault conductance for the County Club fault, which controls the subsurface lateral flux term from the Santa Paula basin into the Mound basin).

6. In future model updates, we recommend comparing zone water budgets from the model (as presented in Section 4.3 of the June 2021 model development report) with estimates of groundwater inflow and outflow components from the conceptual model discussion that is presented in Section 2.6 of the model development report. Generally, the model compares well; however, some modeled water budget terms are beyond the conceptualized minimum or maximum values, so a discussion may help in this regard.

7. Inclusion of zone budget analyses for the Piru, Fillmore, and Santa Paula basins would be useful to conduct in future updates of the model, especially considering the hydrogeology of how one basin spills into the other. For example, we note that Figures 4-77A and 4-78A in the model development report indicate that groundwater elevation at the index wells underpredict flow across the basin boundary for high flows, while Figure 4-79 indicates that high flow rates in the stream are underpredicted at the Freeman Diversion. Therefore, it would be helpful in future model updates to see how total water budgets perform across basin boundaries in terms of cumulative volumes of water (against time) to see if total water budgets are as observed/conceptualized for measured or estimated components of the water budget.

8. The model was evaluated by comparing the original 1985-2015 calibration period to the extended model period 2016-2019. This update period exhibits the same type of calibration quality to the original calibration with just a few minor exceptions. In Piru basin, water levels over 600 ft in the 2016-2019 period were higher than in the original calibration. Water levels in the UAS/LAS of Oxnard Forebay were underestimated in the 2016-2019 period. The update period shows that the model calibration remains of good quality without having to change the conceptual model or aquifer properties even when simulating a different time period from the original calibration.

While there are uncertainties in this and any other groundwater model due to spatial variability or errors in data, model conceptualization, subsurface parameterization, and numerical representation, the expert review panel believes that the current model is a well-designed and well-calibrated tool that is a substantial enhancement and upgrade over previously available models and hence will be useful for understanding and managing the groundwater resources in southern Ventura County currently and in the future. This includes the influence of controlled surface water releases on groundwater levels, streamflow-derived groundwater recharge, and monthly streamflow volumes. However, UWCD has noted that the model currently does not have good calibration to daily streamflows and therefore should be used with caution for making daily streamflow predictions. Otherwise, the expert review panel sees no major problems with model development and calibration, and we understand that UWCD intends to continue evaluating whether improvements can be made to the simulation of streamflows arriving at the Freeman Diversion (which the groundwater model could not capture well, resulting in the use of a surface-water model to provide flows to the diversion and beyond in the Santa Clara River). Regardless of the refinements (if any) that arise from that effort, the three of us believe that the model replicates the historically observed conditions quite well during the calibration period. The model also shows similar behavior during the update period, providing consistent results to those of the calibration period. This is a very complicated and detailed modeling effort that has resulted in a model that will be useful for making regional management decisions within the UWCD jurisdiction. Accordingly, the UWCD team should feel proud of the current model.

# Model Uses and Potential Enhancements

The Regional Model – the groundwater flow model that UWCD has developed for the Piru, Fillmore, Santa Paula, Mound, Oxnard (Forebay and Plain), Pleasant Valley, and (West) Las Posas Valley groundwater basins – is viewed by the expert review panel as an appropriate tool for meeting UWCD's stated objective of improving the understanding of key factors that affect the availability and usability of groundwater resources in the seven southern Ventura County basins that are simulated by this model. The spatial extent of the model, the use of monthly stress periods to simulate temporal variations in groundwater conditions, the use of daily stress periods to simulate streamflows, and the use of a calibration and update period spanning 35 years of fluctuating weather conditions (and changing land and water uses) together make the model suitable for assisting with long-term sustainable management of the groundwater resources in these seven groundwater basins. The Regional Model is viewed by the expert panel as being ready for use in regional and local planning efforts and is of sufficient quality to support the development and implementation of GSPs under SGMA. The model can facilitate GSP planning and implementation by simulating future potential changes in groundwater pumping, natural and artificial recharge, and future land and water uses.

The expert review panel has identified four potential enhancements to the model that warrant consideration in the future.

1. Local refinements to the representation of groundwater withdrawals by phreatophytes (riparian plant communities) may be warranted if projects are being considered in and near riparian habitats. Refinements to consider are (1) developing ET zones for

geographic areas to distinguish the types/mixtures of habitats/plant communities and their corresponding differences in ET rates and extinction depths; and (2) adding monthly/seasonal variations to the ET rates in each of these zones/geographics areas.

2. Local refinements in the magnitudes of irrigation recharge rates may be warranted for agricultural lands, based on differences in irrigation practices, crop types, and soil types.

3. The availability of tools such as MODFLOW-USG (Panday et al., 2013; Panday, 2021) allows for local-scale grid refinements to be made to the Regional Model, which can efficiently provide a representation of local-scale features and projects while also accounting for regional (basin-scale) processes and conditions. As recommended by the review panel, UWCD has stated that it is beginning to use the MODFLOW-USG software as it conducts applications with the model. MODFLOW-USG allows nested grids to be inserted into localized areas in the model which can be turned on and off as needed, according to the needs of future studies requiring predictive simulations with the model. This allows refined grids to be developed only where needed, which avoids creating finer grid spacing throughout the model and thereby reduces run-times and file sizes. Also, only one model needs to be maintained instead of separate models that have fine and coarse grid sizes. Additionally, the use of MODFLOW-USG allows multi-layer wells to be represented fully implicitly (as connected linear networks [CLNs]), allows lateral pinch-outs of hydrostratigraphic units to be explicitly modeled (to better honor the geology and provide more robustness to the simulation), and includes additional capabilities that may be of future use such as evaluations of seawater intrusion or agricultural return flow. Initial testing of the Regional Model by the panel indicates that model run times and file sizes may be improved by moving the model into the MODFLOW-USG environment in the future. UWCD can readily transfer the modeling software to MODFLOW-USG when refined simulations are required, because MODFLOW-USG uses similar numerical routines as the currently used software MODFLOW-NWT (Niswonger et al., 2011), and results should be similar.

4. The Regional Model is a complex model covering multiple basins and aquifers. The Regional Model simulates various stresses, parameters, and flows in the subsurface and in streams at a temporal resolution as fine as 1 day covering the hydrogeologic system for 35 years. This complexity does not affect the overall utility of the model if UWCD will be the sole user of the model (i.e., conducting all future predictive analyses). However, if this model were to be transferred outside UWCD, a user's guide would definitely be necessary. We also suggest providing users outside UWCD with a version of the model that uses a graphical user interface such as Groundwater Vistas (ESI, 2020) to promote usability and visualization. This would also allow the user to imbed local grids as desired, and it would provide the opportunity for other users of the model to make use of MODFLOW-USG as well. Providing outside users with a version of the MODFLOW-NWT model that is in Groundwater Vistas would allow UWCD to know that outside users have a version of the model that was correctly imported to (and

represented in) Groundwater Vistas. Furthermore, Groundwater Vistas keeps track of any changes made to a "final distributed" model, which helps maintain quality assurance and quality control of the model once other entities start modifying stresses or parameters and get different results.

# References Cited

ASTM D5611-94(2016), Standard Guide for Conducting a Sensitivity Analysis for a Groundwater Flow Model Application, ASTM International, West Conshohocken, PA, 2016, www.astm.org

ESI. 2020. *Guide to Using Groundwater Vistas, Version 8.* Prepared by the Environmental Simulations, Inc. (ESI) Programming Team (James O. Rumbaugh and Douglas B. Rumbaugh).

GSI Water Solutions. 2021. *DRAFT: Development of a Numerical Groundwater Flow Model for the Santa Clara River Valley East Groundwater Subbasin.* Prepared for the Santa Clarita Valley Water Agency (SCV Water). June 2021.

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

Panday, S., Langevin, C.D., Niswonger, R.G., Ibaraki, M., and J.D. Hughes. 2013. *MODFLOW–USG Version 1: An Unstructured Grid Version of MODFLOW for Simulating Groundwater Flow and Tightly Coupled Processes using a Control Volume Finite-Difference Formulation.* U.S. Geological Survey Techniques and Methods, Book 6, Chapter A45, 66 p.

Panday, S. 2021. *USG Transport Version 1.6.0: Block–Centered Transport (BCT) Process for MODFLOW-USG.* Prepared by GSI Environmental, Inc., January 21, 2021.

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

UWCD. 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 (UWCD) Open File Report 2021-01. June 2021.

UWCD. 2021b. *Ventura Regional Groundwater Flow Model 2016-2019 Update: Piru, Fillmore, Santa Paula, Mound, Oxnard, Pleasant Valley, and West Las Posas Valley Groundwater Basins.* United Water Conservation District (UWCD) Open File Report 2021-02. August 2021.

Fillmore and Piru Basins Groundwater Sustainability Agency

# Appendix F

# Fillmore and Piru Basins Land Subsidence Evaluation Technical Memorandum (DBS&A, 2021b)

# Fillmore and Piru Basins Land Subsidence Evaluation Technical Memorandum

Submitted to

Fillmore and Piru Basins Groundwater Sustainability Agency

Prepared by

DBS&A
Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

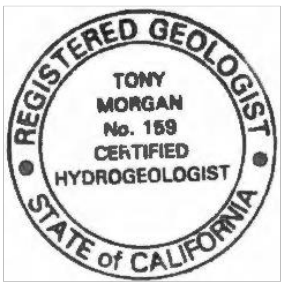
3916 State Street, Garden Suite
Santa Barbara, CA 93105
www.dbstephens.com
Project DB19.1084

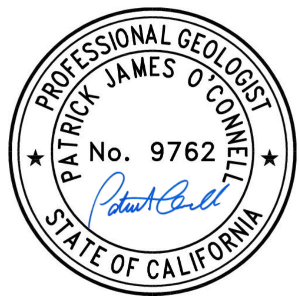
December 16, 2021

# Certification

This Technical Memorandum was prepared in accordance with generally accepted professional hydrogeologic principles and practices.  This Technical Memorandum makes no other warranties, either expressed or implied as to the professional advice or data included in it.  This Technical Memorandum has not been prepared for use by parties or projects other than those named or described herein.  It may not contain sufficient information for other parties or purposes.

**DANIEL B. STEPHENS & ASSOCIATES, INC.**




Tony Morgan, PG, CHG
Vice President/Principal Hydrogeologist
tmorgan@geo-logic.com
3916 State Street, Garden Suite
Santa Barbara, CA  93105

Patrick O'Connell, PG
Project Hydrogeologist
poconnell@geo-logic.com
3916 State Street, Garden Suite
Santa Barbara, CA  93105

Date signed:    December 16, 2021

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# List of Acronyms and Abbreviations

| | |
|---|---|
| AB | assembly bill |
| ADCP | acoustic doppler current profiler |
| AF | acre-feet |
| AFY | acre-feet per year |
| Ag | agriculture |
| AMI | automated (or advanced) metering infrastructure |
| amsl | above mean sea level |
| APN | assessor parcel number |
| B | boron |
| bgs | below ground surface |
| BMP | best management practices |
| BOS | bottom of screen |
| CA | California |
| CalGEM | Geologic Energy Management Division (formerly DOGGR) |
| CASGEM | California statewide groundwater elevation monitoring |
| CCR | California Code of Regulations |
| CDPH | California Department of Public Health |
| CFS | cubic feet per second |
| CIMIS | California irrigation management information system |
| Cl | chloride |
| COC | chemical of concern |
| CWC | California Water Code |
| CWL | Critical Water Level |
| DBS&A | Daniel B. Stephens & Associates, Inc. |
| DDW | [SWRCB] Division of Drinking Water |
| DEM | digital elevation model |
| DOGGR | Division of Oil, Gas, and Geothermal Resources (reorganized as CalGEM) |
| DQO | data quality objective |
| DTW | depth to water |
| DWR | [CA] Department of Water Resources |
| DWUs | downstream water users |
| EGM96 | Earth Gravitational Model of 1996 |
| ENSO | El Niño Southern Oscillation |

| | |
|---|---|
| EPA | U.S. Environmental Protection Agency |
| ET | evapotranspiration |
| $ET_0$ | reference evapotranspiration |
| FCGMA | Fox Canyon Groundwater Management Agency |
| FICO | Farmers Irrigation Company |
| FPBGSA | Fillmore and Piru Basins Groundwater Sustainability Agency (also called GSA or Agency) |
| FT | feet |
| GAMA | [USGS] groundwater ambient monitoring & assessment |
| GIS | geographic information system |
| GPS | global positioning system |
| GSP | groundwater sustainability plan |
| HASP | health and safety plan |
| HCM | hydrogeologic conceptual model |
| Hydrodata | [VCWPD] hydrologic data server |
| ID | identification |
| LARWQCB | Los Angeles Regional Water Quality Control Board |
| LiDAR | light detection and ranging |
| NCCAG | natural communities commonly associated with groundwater |
| M&I | municipal and industrial |
| MCL | maximum contaminant level |
| MOU | memorandum of understanding |
| MS4 | municipal separate storm sewer system |
| NAD | North American datum |
| NAVD88 | North American vertical datum of 1988 |
| ND | not detected |
| NGVD29 | national geodetic vertical datum of 1929 |
| NO3 | nitrate |
| NWIS | national water information system |
| OFR | open file report |
| PBP | priority basin project |
| PDO | Pacific Decadal Oscillation |
| PSI | pounds per square inch |
| PSW | public-supply well |
| PVC | polymerizing vinyl chloride |

| | |
|---|---|
| QA | quality assurance |
| QC | quality control |
| RASA | regional aquifer-system analysis |
| RP | reference point (elevation) |
| RWQCB | [CA] Regional Water Quality Control Board |
| SAP | sampling and analysis plan |
| SCE | Southern California Edison |
| SCV-GSA | Santa Clarita Valley Groundwater Sustainability Agency |
| SMC | Sustainable Management Criteria |
| SNMP | Salt and Nutrient Management Plan |
| SO4 | sulfate |
| SUM | summation |
| SWL | static water level |
| SWN | [CA DWR] state well number |
| SWRCB | [CA] State Water Resource Control Board |
| TD | total depth |
| TDS | total dissolved solids |
| TFR | total filterable residue |
| TMDL | total maximum daily load |
| TNC | The Nature Conservancy |
| TOS | top of screen |
| URL | uniform resource locator (web address) |
| USGS | U.S. Geological Survey |
| UWCD | United Water Conservation District |
| VC | Ventura County |
| VCWPD | Ventura County Watershed Protection District |
| VCWWD#16 | Ventura County Waterworks District Number 16 |
| VRGWFM | Ventura Regional Groundwater Flow Model |
| WGS84 | world geodetic system 1984 |
| WL | water level |
| WLE | water level elevation |
| WQ | water quality |
| WY | water year |

# 1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this Fillmore and Piru Groundwater Basins Land Subsidence Evaluation Technical Memorandum (Tech Memo) for the Fillmore and Piru Basins Groundwater Sustainability Agency (FPBGSA or Agency) and is under contract to prepare their mandated Groundwater Sustainability Plans (GSP or Plan) under the Sustainable Groundwater Management Act (SGMA) of 2014. Although SGMA requires separate Plans to be prepared for each basin, Fillmore and Piru subbasins (hereafter referred to as "basins") are hydrogeologically connected and have historically been managed and monitored together. The FPBGSA Board of Directors has memorialized in Resolution 2021-05 their intent continue this precedent and to manage these basins together. In keeping with this historical precedent, this tech memo has been prepared to cover both basins. This document includes references to Appendices in the GSPs to provide supplemental information on several topics.

Land subsidence is one of six sustainability indicators defined in the SGMA legislation. This document provides a background discussion on inelastic land subsidence (subsidence), summaries of previous investigations, a review of current data sets (e.g., geodetic monitoring, interferometric synthetic radar), and an evaluation of subsidence susceptibility for both basins.

Responses to the stakeholder comments on the draft Subsidence Technical Memorandum (February 4, 2021) that was posted to the FPBGSA website are contained in Appendix C of the GSP.

# 2. Background

Subsidence directly related to subsurface fluid extractions (e.g., groundwater and hydrocarbons) has been observed for several decades in California. Compaction of fine-grained sediments occurs due to the increase in the effective stress of overburden caused by fluid removal (i.e., lowering of groundwater levels), which reduces the volume of pore spaces between sediment grains (i.e., volume available for groundwater storage). For this evaluation, it is important to acknowledge the difference between inelastic and elastic subsidence in relation to changes in groundwater levels. Inelastic subsidence is interpreted to occur where land surface elevations do not recover following recovery of groundwater levels. On the other hand, elastic subsidence is that which land surface elevation does recover following rising groundwater levels. A detailed discussion of the geomechanics associated with subsidence can be found in Poland (1984) and Poland and Davis (1969) and its effects in USGS (1999, 2016). In the context of SGMA, the potential for inelastic subsidence is the primary concern because it is essentially irreversible (i.e., lost groundwater storage capacity).

Hanson (1995) proposed causal factors of subsidence in Ventura County could be groundwater extraction, hydrocarbon extraction (i.e., petroleum and natural gas), and tectonic movement. A detailed discussion of the steady increase of groundwater pumping in the basins since the late 1800's through the late 1980's is included in the Plan. Regional tectonic movement and surrounding hydrocarbon extraction areas are briefly discussed in this section. Although the basins are located in or near tectonically active and active hydrocarbon extraction areas, the purpose of this document is to address subsidence related to the lowering of groundwater levels.

Hydrocarbon extraction has occurred in Ventura County for many decades, however, subsidence related to oil and gas withdrawal specifically in the basins has not been historically observed or determined. Figure 1 shows well sites near the basins associated with hydrocarbon extraction as listed by California Geologic Energy Management Division's (CalGEM, formerly the Department of Oil, Gas and Geothermal Resources [DOGGR]). Active oil and gas production in the area occurs primarily outside of the basins with several hydrocarbon well fields located in the surrounding mountains. A few active wells of the Bardsdale and Shiells Canyon Oil Fields are located less than 0.25 miles inside of the southeastern Fillmore basin boundary. Three Holser Oil Field active wells are located just inside the Piru basin boundary in Holser Canyon (tributary east of Piru Creek). There are no reported instances of subsidence directly associated with hydrocarbon extraction areas within the basins or those well fields immediately adjacent to the basins.

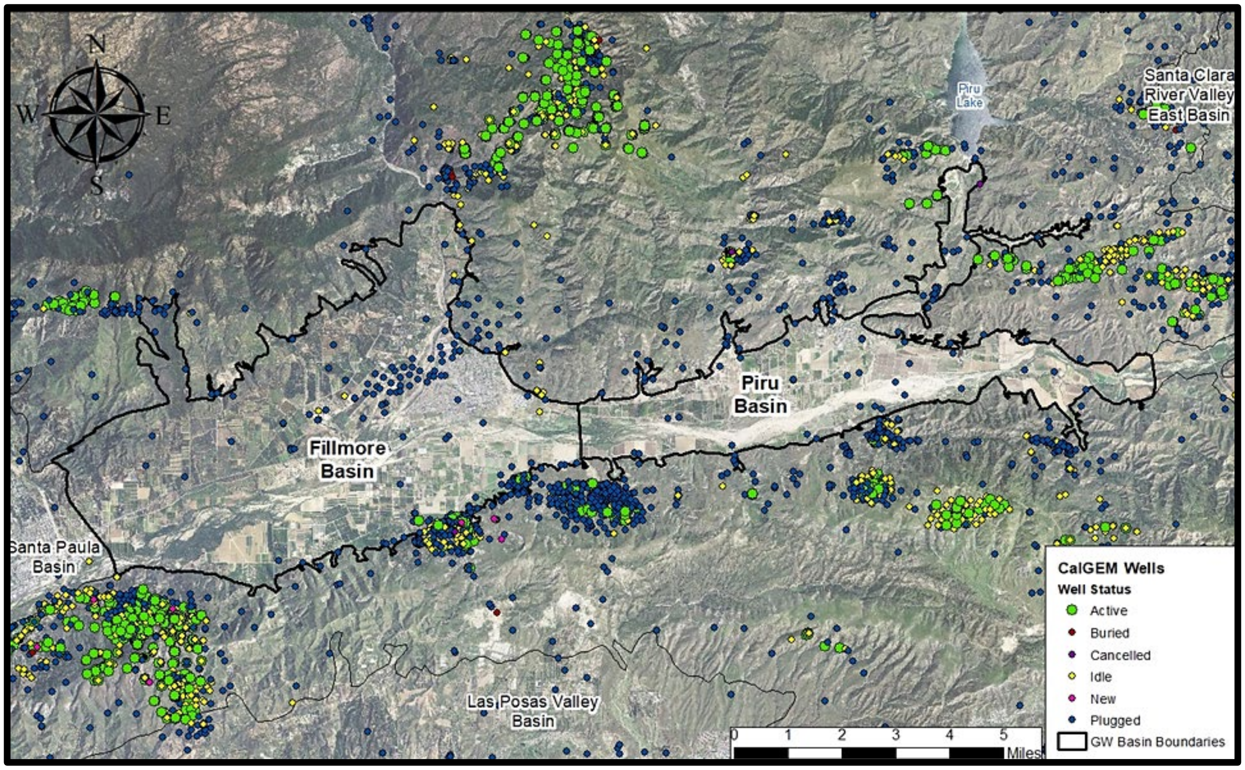


**Figure 1: Fillmore and Piru basins area map showing CalGEM hydrocarbon extraction-related wells.**

The basins are part of the tectonically active Transverse Ranges, where crustal shortening and rapid uplift rates have occurred for millions of years. Orme (1998) reports a broad range of 0.05 to 9 mm/year of long-term uplift for the coastal Transverse Ranges region. The basins consist of varying thicknesses of alluvium underlain primarily by the San Pedro Formation synclinal fold. Studies have estimated a maximum dip-displacement for the north basin-bounding San Cayetano reverse fault and south basin-bounding Oak Ridge fault to be 8.8 mm/year (about 0.03 feet/year) (Rockwell, 1988) and 12.5 mm/year (about 0.04 feet/year) (Yeats, 1988), respectively. Not only is the region's topography vertically affected by gradual long-term tectonic shifts, but the area is prone to earthquakes which can cause sudden land movements.

The evaluation of subsidence for the Fillmore and Piru basins in this document is based on review of the following lines of evidence:

- Previous investigations and reports;
- Geodetic surveys;
- Interferometric Synthetic Aperture Radar (InSAR) data;
- Analytical subsidence susceptibility evaluations.

# 3. Previous Investigations

Numerical groundwater flow modeling by Hanson et al. (2003) was used to estimate the timing and magnitude of historical subsidence in coastal Ventura County from 1891 through 1993. The use of a groundwater flow model to infer subsidence is not a direct measurement or observation of subsidence. Groundwater flow model estimated historical subsidence is a calculated value based on the geomechanical properties of the geologic material and the rate and magnitude of historical groundwater level change predicted by the model. Simulated subsidence was compared to select benchmarks on the South Oxnard Plain for subsidence model calibration. Hanson et al. (2003) stated the majority of the subsidence in their model domain occurred following the drought of the late 1920s and increase in agricultural pumping that occurred between the 1950's and 1993. The highest modeled subsidence was in the South Oxnard Plain and Las Posas Valley subareas where 3 and 5 feet was simulated, respectively (Figure 2). During the early development period from 1939 to 1960, subsidence occurred primarily in the upper aquifer system on the Oxnard Plain before pumping increased in the lower aquifer system from 1959 to 1993. The model indicates a maximum value of just over 0.1 feet (0.00098 ft/yr) of subsidence from 1891 to 1993 in the Fillmore basin and just over 0.25 feet (0.0024 ft/yr) in the eastern portion of the Piru Basin.

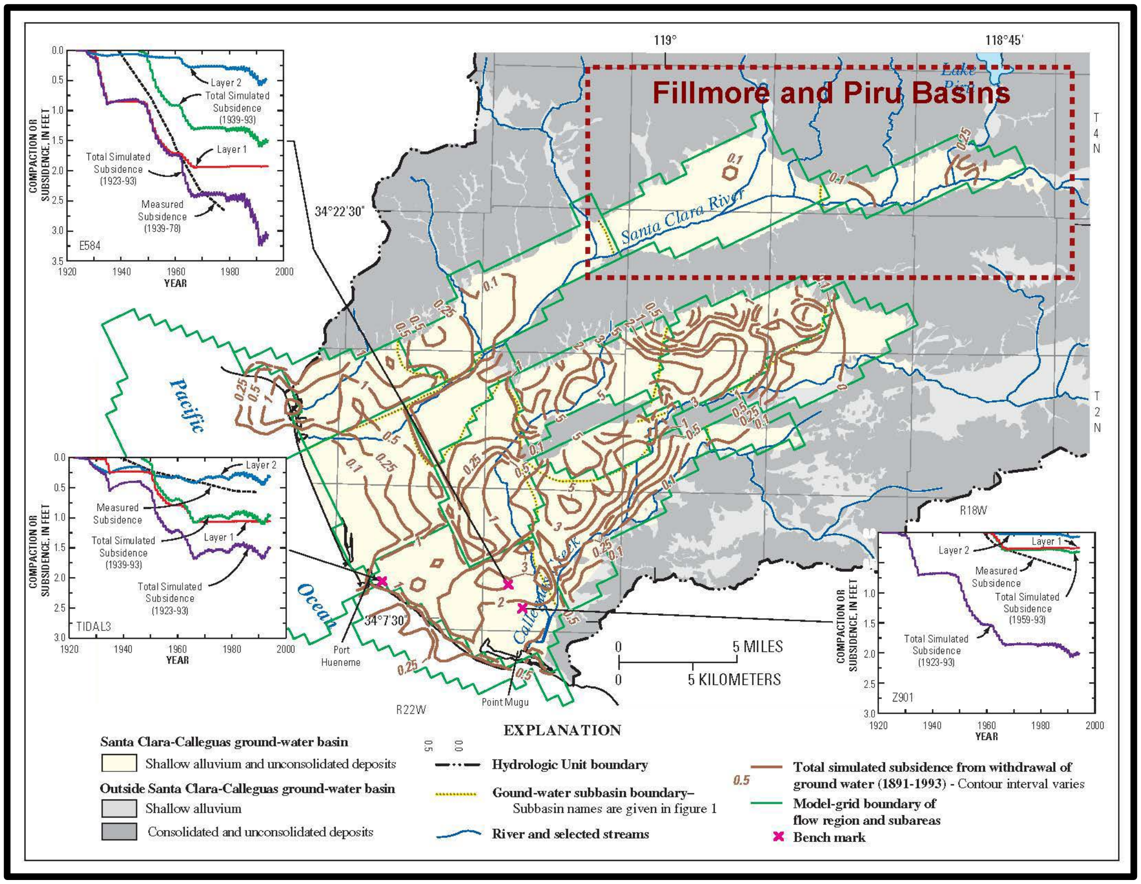


**Figure 2: Simulated subsidence in the Santa Clara-Calleguas groundwater basin due to groundwater withdrawal from 1891 to 1993. Figure originally produced by Hanson et al. (2003).**

Borchers (2014) summarizes results from the Hanson et al. (2003) study, solely focusing on areas of more significant subsidence (i.e. Oxnard Plain, Las Posas Valley, and South Pleasant Valley subbasins).

The 2013 Ventura County General Plan Hazards Appendix (Ventura County, 2013) contains a brief section and map showing the limits of subsidence zones. The zones were based on figures from the 1973 Hazards Appendix and have not been updated due to lack of geodetic data in these areas. Part of the zone extends along the Santa Clara River Valley, including the basins. The report states that sediment loading and groundwater level decline in the present Santa Clara River course could lead to hydrocompaction (assumed to be equivalent to subsidence for the General Plan, however, hydrocompaction and subsidence are related but not identical geologic processes)  and possible flooding in lower lands (Oxnard Plain) could occur. Ventura County recently produced a 2040 General Plan Environmental Impact Report (Ventura County, 2020), which provides a general statement and map showing the Santa Clara River Valley (including the basins), Oxnard Plain, and Las Posas Valley as part of the subsidence risk area caused by groundwater extraction.

In 2014, California Department of Water Resources (DWR) prepared a document summarizing recent, historical, and estimated future subsidence potential for groundwater basins included in CA DWR Bulletin 118 (DWR, 2014). The purpose of the document was to provide screening-level information with respect to subsidence. DWR lists Fillmore basin with low potential for future subsidence. The ranking was determined from less than 10 percent of wells with long term water level trends (well records longer than 10 years) with current water levels (2008-2014) at or below historical low spring levels and one active continuous GPS monitoring station (see Geodetic Surveys) that showed 0.03 feet of maximum decrease in ground elevation. The Piru basin had insufficient data to establish a subsidence ranking.

# 4. Geodetic Surveys

UNAVCO monitors continuously operating geodetic instrument networks, including Continuous Global Positioning Systems (CGPS) stations, that measure three-dimensional positions (generally every 15 or 30 seconds) of a point near the earth's surface. Four CGPS stations are found near the basins (less than 5 miles away) with surface elevation data extending back to either 1999 or 2000. All four stations are mounted outside of the alluvial basins and in bedrock, suggesting any vertical movement is likely caused by tectonic movement rather than compaction of fine-grained materials due to groundwater withdrawal.

Figure 3 shows locations of these CGPS stations, along with UNAVCO time-series graphs displaying measured land displacement relative to the first measurement of each station. Data displayed in the time-series graphs are referenced to the North American tectonic plate (NAM14) reference frame. Outliers with a standard deviation greater than 20 mm (about 0.8 inches) were removed by UNAVCO. Long-term general vertical movement rate trends were determined by applying a line of best fit to each station's entire measured timeframe of data. Three of the four CGPS stations surrounding Fillmore basin (KBRC, SOMT, and FMVT) are all set in weathered or poorly lithified sedimentary bedrock (UNAVCO) and show a long-term trend of approximately 0.003 mm/year (0.000009 feet/year) of downward vertical movement since December 2000. Just south of Lake Piru, CGPS station SFDM set in bedrock (UNAVCO) indicates a linear trend of 0.001 mm/year (0.000003 feet/year) of upward vertical movement since 1999.

Looking on a smaller timescale, the four stations show similar seasonal upward and downward movement trends.

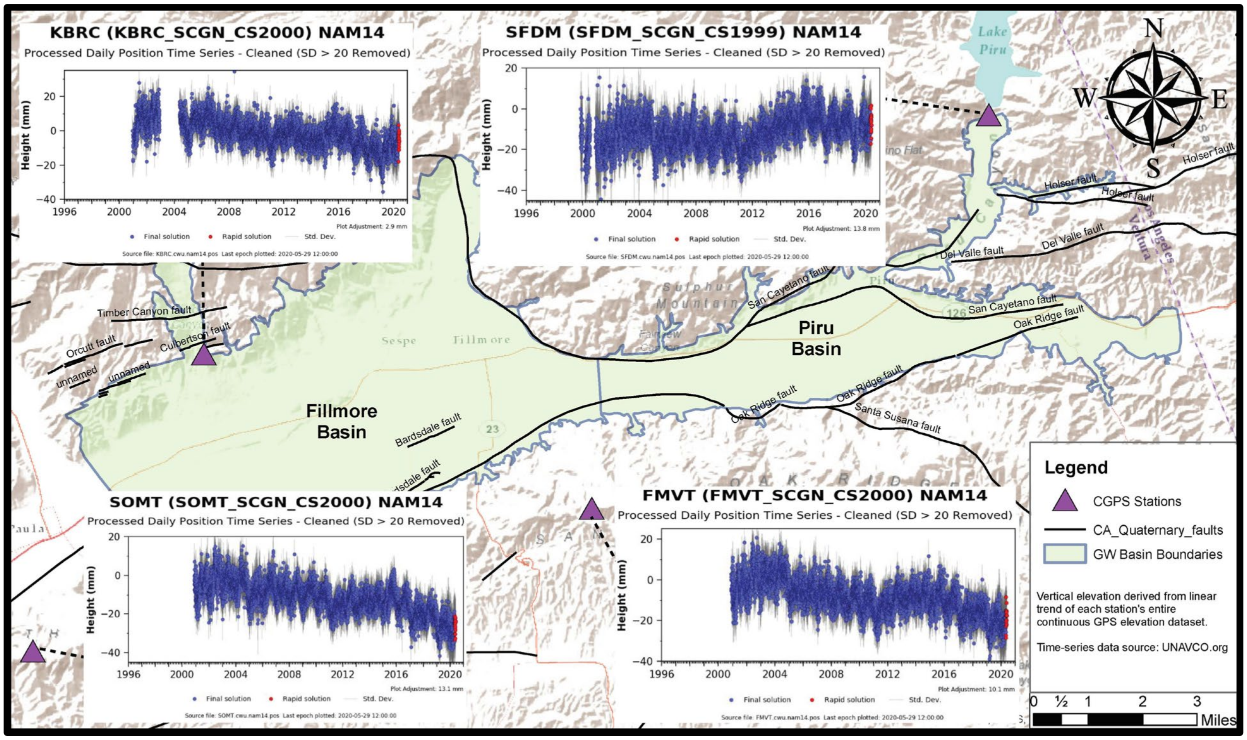


**Figure 3: Map showing CGPS locations and vertical movement time-series data provided by UNAVCO.**

Following the 1994 Northridge earthquake (magnitude 6.7), the USGS (1996) conducted a study to assess and restore geodetic infrastructure affected or damaged by land elevation changes caused by the earthquake. A geophysical model of permanent ground deformation, based on the geodetic infrastructure movement, was developed and benchmarks that differed +/- 1.2 inches (3 cm) from the model were considered anomalous (suggesting needed replacement). The model required non-tectonic deformation (i.e., subsidence due to groundwater withdrawal) to be removed from measured elevation changes to infer deformation solely due to tectonic activity. Therefore, at least three pre-seismic surveys made between 1971 and 1989 were used to subtract the elevation changes from the 1994 measurements. The National Geodetic Survey (NGS) conducted leveling surveys along routes in areas affected by the earthquake, including routes cutting through the Fillmore and Piru basins (Figure 4).

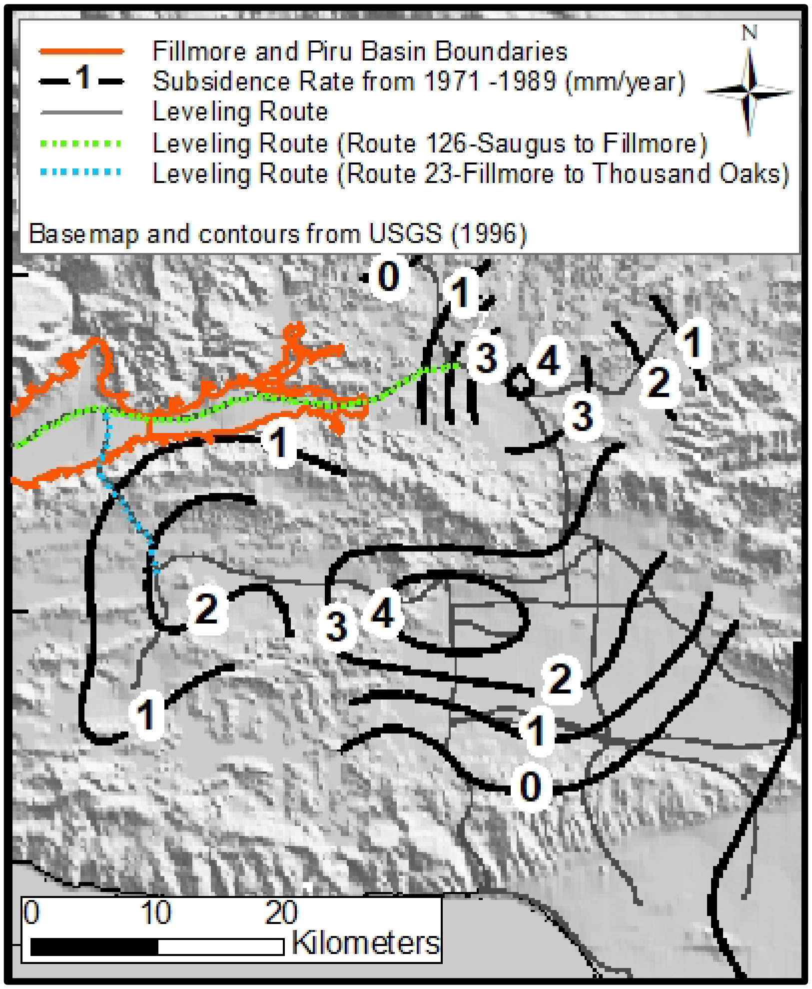


**Figure 4: Map from USGS 1994 Northridge Earthquake report (USGS, 1996) showing NGS leveling routes and contours of measured pre-seismic subsidence rates (mm/year) from 1971 to 1989.**

Figure 4 includes subsidence rate contours that the USGS produced from the 1971 to 1989 pre-seismic surveys covering the Los Angeles Basin. Based on these contours, average subsidence rates in the Fillmore and Piru Basins were under 1 mm (0.003 feet) per year from 1971 to 1989. A comparison of 1975 and 1989 leveling surveys (pre-1994 Northridge earthquake) taken along Route 126 (Los Angeles Avenue) from Saugus to Fillmore determined 15 mm (0.05 feet) of cumulative subsidence over the 14-year period, with maximum subsidence of 60 mm (0.2 feet) occurring between the 1975 and 1978 surveys. The area of maximum subsidence was 20 km (12.4 miles) wide and centered around the Town of Piru. The rebound in ground elevation following 1978 could have been due to groundwater recharge or a systematic error in the 1978 survey. A survey along Route 23 (Moorpark Freeway) from Fillmore to Thousand Oaks determined a maximum subsidence of 8 mm (0.03 feet) at Fillmore between 1975 and 1989.

The final modeled coseismic uplift extent related to the 1994 Northridge earthquake is shown in Figure 5. Within the basins, only the very eastern portion of the Piru basin showed tectonic deformation related to the earthquake and fell within the 0 to 10 cm (less than 0.3 feet) zone of the coseismic uplift contours modeled by USGS.

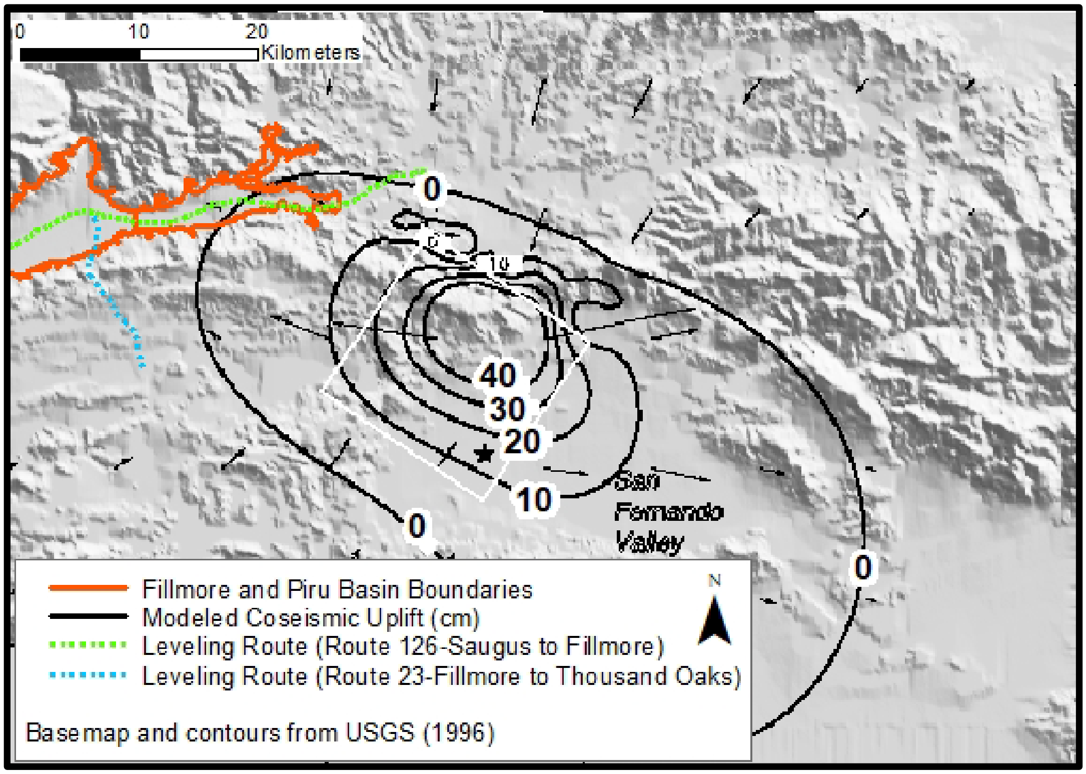


**Figure 5: Map from USGS 1994 Northridge Earthquake report (USGS, 1996) modeled coseismic uplift related to the 1994 Northridge Earthquake in relation to the basin boundaries and NGS leveling routes surveyed in the basins.**

# 5. Interferometric Synthetic Aperture (InSAR) Data

Interferometric Synthetic Aperture (InSAR) is a satellite-based remote sensing method used to map ground surface elevation change over large areas with high accuracy. Satellites emit electromagnetic pulses that produce measurements upon their return. These measurements are processed to create synthetic aperture radar images. The InSAR method calculates the change in elevation from one measurement to the next and presents the changes as raster images. To assist with quantitative subsidence evaluations for GSP development, DWR contracted TRE Altamira Inc. (TRE) to process InSAR data collected by the European Space Agency (ESA) Sentinel-1A satellite covering Bulletin 118 groundwater basins. The processed TRE InSAR datasets are available to the public on DWR's SGMA Map Viewer: (https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub).

TRE processed InSAR point data (measured about every two weeks) to get values representing average monthly vertical movement per 100 square meter (about 1,000 square feet) areas within the basins from May 20, 2015 to September 1, 2019. TRE also provided rasters interpolated from the point data representing total and annual vertical displacement relative to June 13, 2015 (date entire CA study coverage began), both in monthly time steps. Towill Inc., contracted by DWR, conducted an accuracy study by comparing the InSAR vertical displacement data with CGPS data (including CPGS station, KBRC, mentioned in Section 4). The study (Towill, 2020) determined that InSAR data within California provided accurate vertical displacement measurements within 16 mm (+/-0.05 feet or +/-0.6 inch) at the 95% confidence interval.

Figure 6 shows TRE-processed InSAR data representing total vertical displacement in the basins over the longest available time period, June 13, 2015 through September 19, 2019. The Fillmore basin generally did not have vertical land movement that fell outside of the measurement accuracy range of +0.05 feet to -0.05 feet. The central portion of Piru basin shows uplift of up to 0.14 feet that extends westward from near the confluence of Piru Creek and SCR to the Piru-Fillmore basin boundary. This area spatially corresponds with the areas along the Santa Clara River where high surface water infiltration rates associated with natural runoff or man-made surface water enhancement projects (e.g., Article 21 Water, releases of water from Santa Felicia Dam).  The areas of uplift above the minimum measurement accuracy are likely related to basin recharge (i.e., recovery of groundwater levels following the 2012-2016 drought), resulting in elastic recovery.

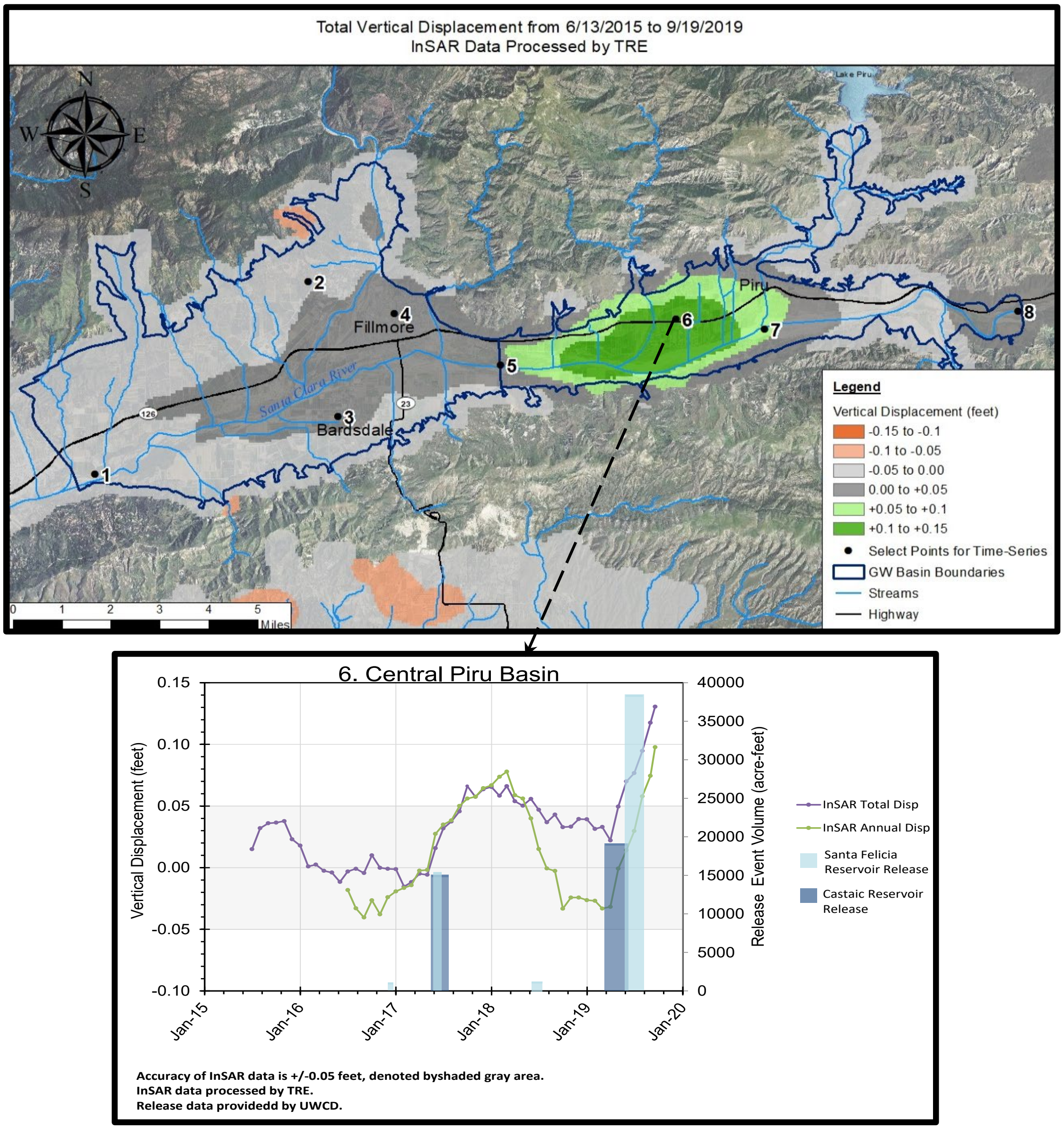


**Figure 6: InSAR data processed by TRE showing total vertical displacement within the basins from June 13, 2015 to September 19, 2019. Time-series graph shows relationship of upward movement observed in InSAR data in relation to reservoir releases.**

Eight points within the basins were chosen for vertical displacement time-series analysis based on special geographical characteristics and/or hydrogeological settings (e.g., likelihood of the area having significant thicknesses of fine-grained sediment, presence or absence of rising groundwater elevations, and general depths-to-groundwater). Locations of these points are shown on the maps in Figure 6 and described below:

1. Fillmore-Santa Paula Basin Boundary
2. Sespe Uplands
3. Bardsdale
4. City of Fillmore (Pole Creek Fan)
5. Fillmore-Piru Basin Boundary
6. Central Piru Basin
7. Piru Creek/Santa Clara River Confluence
8. Piru-SCR East Basin Boundary

Time-series graphs showing total and annual vertical displacement from the available TRE - processed InSAR datasets are shown in Figure 7. The values represent the vertical elevation change for the end date of the analyzed periods. Total displacement shows monthly cumulative departure change from a beginning reference date of June 13, 2015 for TRE data. Annual vertical displacement shows a monthly moving window representing displacement occurring within the past 12 months. Annual vertical displacement measurements allow analysis of annual land elevation change without seasonal variation.


**Figure 7: Time-series graphs showing running annual and total land surface elevation changes derived from InSAR data processed by TRE for select points in the basins.**

Figure 7 shows that the majority of the measured land elevation changes fall within the measurement accuracy range of +/-0.05 feet (grey bands on the plots). Quantitative interpretations of the land surface movement in the +/-0.05 feet range should be done with caution. However, general land surface movement trends can be seen in the InSAR data.

Fillmore basin locations 1 through 4 and Piru basin location 8 show a similar pattern of land elevation fluctuation within the accuracy range over the time span (i.e., no significant change in land surface). Locations 5 and 7 show a small jump in total vertical displacement of approximately 0.05 feet of uplift beginning in May 2017 and somewhat stabilizes by October 2017. Location 6 has a similar jump of about 0.07 feet from May to October 2017 and another jump of about 0.11 feet beginning in April 2019 to the end of the dataset (September 2019), corresponding with groundwater recharge efforts performed by UWCD, as mentioned earlier in this section. Overall, the InSAR data set does not suggest land surface movements in excess of the minimum resolution of this instrumental technique.

# 6. Future Potential Subsidence

The datasets and reports previously discussed in this document provide insight on historical subsidence, however, a prediction method is needed to project possible future subsidence for the basins. Potential subsidence is significantly influenced by fine-grained layer distribution, thickness and compressibility, amount and timing of water-level changes, and lowest historical water level. It is important to note that any significant predicted subsidence would not occur until water levels drop below historical lows. The UWCD-developed groundwater flow model (UWCD, 2021) was used to simulate future groundwater water elevations under moderately extreme climate change conditions (the central tendency 2070 Climate Change Factors [2070CF]). The simulated water level time-series allow the effect of general hydrologic conditions (e.g., wet versus dry conditions) to be compared over a multi-decadal timeframe (1986 through 2096). In order to assess the potential for future subsidence with groundwater declines, simulated future groundwater elevation time-series at select wells in the Fillmore and Piru basins were evaluated by comparing future water levels against estimated historical lows (Figure 8).


N
E
S
W
Lake Piru
04N18W20M04S
Piru
Fillmore
04N19W33D03S
04N18W31D03S
04N20W33C03S
Santa Clara River
126
23
0 1 2 3 4
Miles
Source: Esri, DigitalGlobe, GeoEye, USDA, USGS, AeroGRID, IGN, and
Legend
Wells Analyzed for Predicted Subsidence
GW Basin Boundaries
Streams
Highway

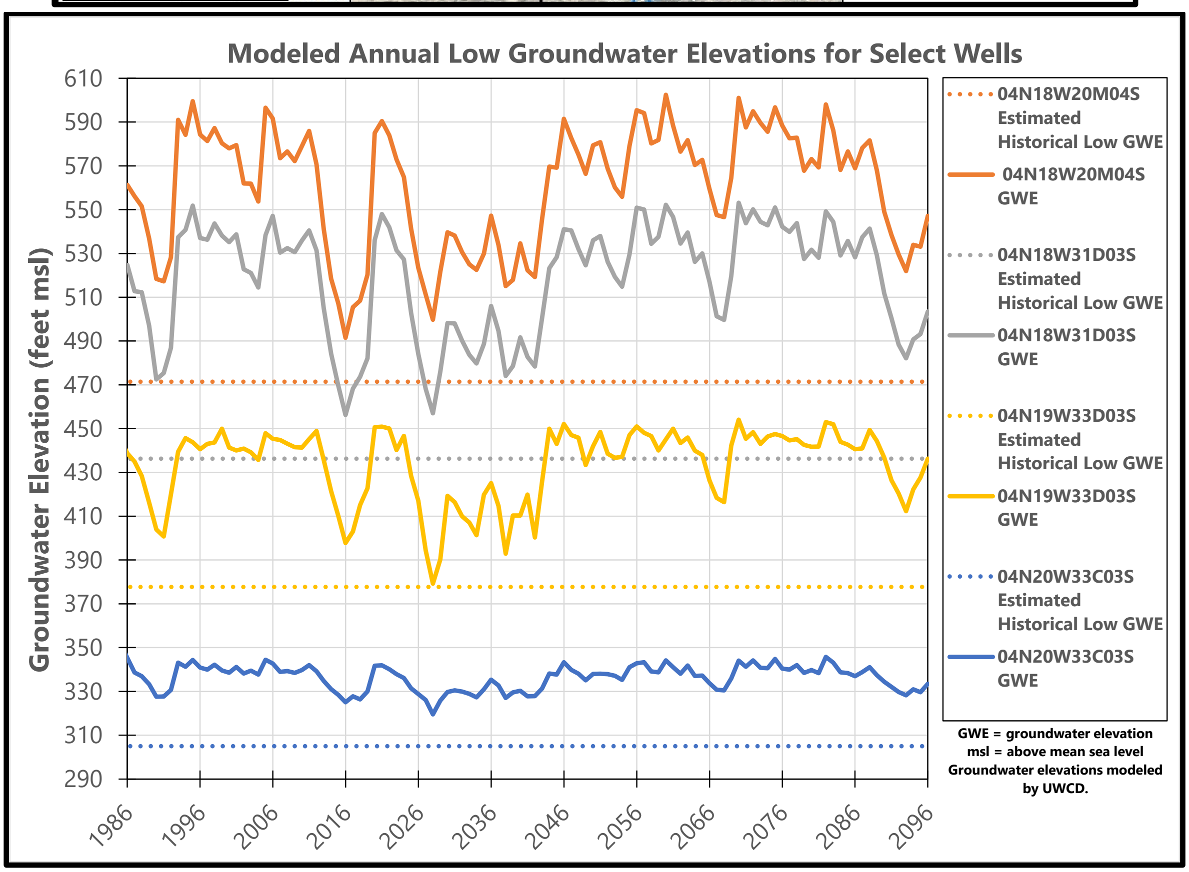
Modeled Annual Low Groundwater Elevations for Select Wells
Groundwater Elevation (feet msl)
610
590
570
550
530
510
490
470
450
430
410
390
370
350
330
310
290
1986
1996
2006
2016
2026
2036
2046
2056
2066
2076
2086
2096
04N18W20M04S Estimated Historical Low GWE
04N18W20M04S GWE
04N18W31D03S Estimated Historical Low GWE
04N18W31D03S GWE
04N19W33D03S Estimated Historical Low GWE
04N19W33D03S GWE
04N20W33C03S Estimated Historical Low GWE
04N20W33C03S GWE
GWE = groundwater elevation
msl = above mean sea level
Groundwater elevations modeled by UWCD.

**Figure 8: Map showing example wells locations used for analysis for potential future subsidence. Graphs represent modeled annual low water levels for the example wells, with their respective estimated historical low water levels**

Simulated annual low water levels for the four example wells for the available model timeframe were used for the evaluation. In order to account for maximum historical lows anticipated prior to the modeled timeframe, the historical low water level was estimated to be 20 feet lower than the modeled 2016 drought water level. This historical low estimate was based on the review of wells with long-term water level records (e.g., back to the 1940s) that showed early drought levels generally measured about 20 feet lower than the measured 2016 drought low water levels.

The hydrographs in Figure 8 reveal that the future water levels predicted by the 2070 climate change factor scenario (2020-2096) are functionally identical to those experienced during the historical period of record (1986-2019). The range between the minimum water levels during major drought periods and the maximum water levels during wet periods for the historic and future modeling timeframes are very similar. Additionally, the future simulated water levels do not decline to the elevation of the estimated historical low water levels. In the absence of future water levels below the estimated historical low water levels, it is unlikely that subsidence would be experienced at these well locations.

A basin-wide review of the relationship between the estimated historical low groundwater elevation and the low groundwater level predicted by the 2070 CF model scenario allows the determination of where in the basins the change in groundwater levels might initiate conditions susceptible to subsidence. Figure 9 shows that nearly all wells (for which the well construction details are known) are predicted to have future water levels shallower than the estimated historic low levels. This relationship suggests that it is unlikely that subsidence in either basin would be experienced in the future under the modeled climatic and groundwater extraction scenario.

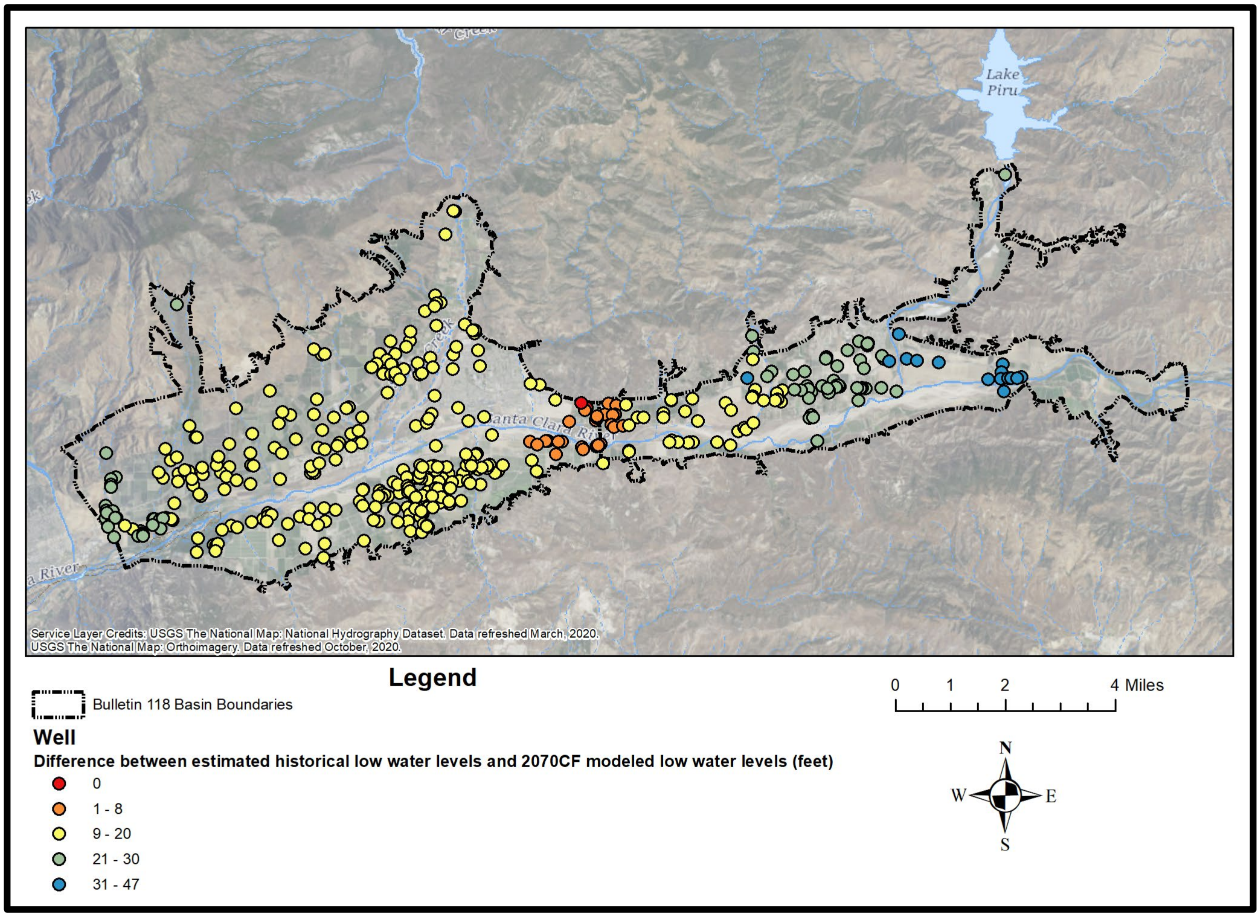


**Figure 9: Difference between estimated historical low water level and 2070CF modeled low water levels**

The water levels near the boundary between the Fillmore and Piru basins are typically some of the shallowest in the basins and the 2070CF modeled water levels are predicted to be less than 10 feet above the estimated historical low in this area. In general, the differences between the estimated historical low water level and the 2070CF modeled low water levels increase to the east and west away from the Fillmore-Piru basin boundary.

# 7. Discussion

The potential for subsidence in the Fillmore and Piru basins has been approached from multiple aspects and is summarized in Table 1.

| Study/Investigator | Fillmore Basin | Piru Basin | Comments |
|---|---|---|---|

| Study/Investigator | Fillmore Basin | Piru Basin | Comments |
|---|---|---|---|
| USGS, 1996 | maximum subsidence of 0.03 feet (8 mm, 0.6 mm/yr) near City of Fillmore | maximum subsidence zone up to 0.05 feet (15 mm, ~1 mm/year) around the Town of Piru | 1975-1989 study period |
| Hanson, 2003 | maximum value of just over 0.1 feet (0.00098 ft/yr) of subsidence | 0.25 feet (0.0024 ft/yr) in the eastern portion of Piru Basin | 1891 to 1993 study period |
| Ventura County, 2013 and 2020 | Lies within subsidence hazard zone | Lies within subsidence hazard zone | No technical analyses conducted. |
| DWR, 2014 | Low potential | Insufficient data | |
| InSAR | Less than +/-0.05 ft | Generally, less than +/-0.05 ft except during periods of artificial recharge, then up to +0.14 ft of rebound in Piru basin | June 2015 – Sept 2019 study period |
| 2070 Climate Change Modeling by UWCD | No subsidence anticipated | No subsidence anticipated | 1986 to 2096 model timeframe |

**Table 1. Summary of Subsidence Evaluations**

The susceptibility of each basin to subsidence is rooted in a few key factors:

- The hydrostratigraphic setting (i.e., do the geologic units contain fine-grained sediments); and
- If the water level is below, or projected to be below, the historic lows in the future.

In general, both of these factors must be present to initiate subsidence. Site-specific subsidence monitoring data (e.g., extensometer or tiltmeter) can be used, if available, to augment the hydrostratigraphic setting and water level data sets and develop a subsidence susceptibility ranking for the basins as summarized in Table 2 below.

| Basin | Hydro-stratigraphic Setting Susceptibility | Chronic Declines in Groundwater Levels | Geodetic / Extensometer / Tiltmeter Evidence of Subsidence | InSAR Evidence of Subsidence | Subsidence Susceptibility Ranking |
|---|---|---|---|---|---|
| Fillmore | Low to Moderate | No | No | No | **Low** |
| Piru | Low | No | No | No | **Low** |

**Table 2. Summary of (Inelastic) Subsidence Potential**

The hydrostratigraphic setting for the Fillmore basin is identified as Low to Moderate to reflect the greater amount of fine-grained alluvial sediments in the western portion of the basin compared to the eastern portion. As a contrast, the Piru basin hydrostratigraphic setting is dominated by coarse-grained materials and consequently assigned a Low value. Consideration of each of the input variables supports the assignment of an overall Low Subsidence Susceptibility Ranking for each basin.

# 8. Conclusion

This review of available historical reports, geodetic survey data, and satellite imagery (InSAR) indicates that the Fillmore and Piru basins have historically shown little to no subsidence related to groundwater withdrawal, even through multiple droughts and record low water levels.

The basins are located in a very tectonically active region that also has oil and gas extraction operations, which adds complexity to determination of the cause(s) of land elevation changes. Previous historical investigations covering the basins have primarily been inconclusive in determining actual rates or values of subsidence, due to lack of available data, and focus on a regional scale or areas of significant subsidence (i.e., Oxnard Plain). The following key takeaway points are:

- Multi-decadal historical datasets involving geodetic measurements and model simulations have revealed very low overall subsidence rates throughout the basins;
- Recent InSAR data covering the 2015 to 2019 time period suggests little to no subsidence throughout the Fillmore basin, while rebound is observed in the Piru basin associated with elastic recovery related to recharge following a multi-year drought;