

Conservation Study: Phase IV COHYST Model Status Update

The Flatwater Group, Inc.

8/17/2023

NRD information added 8/28/2023

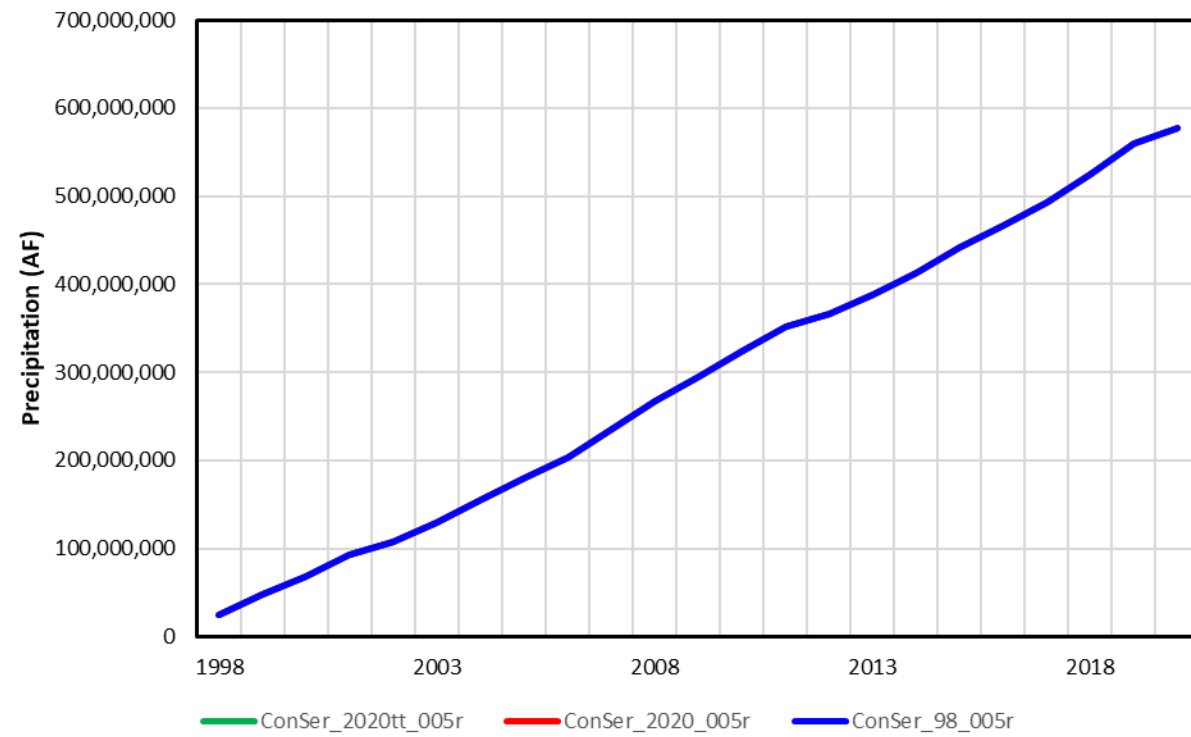
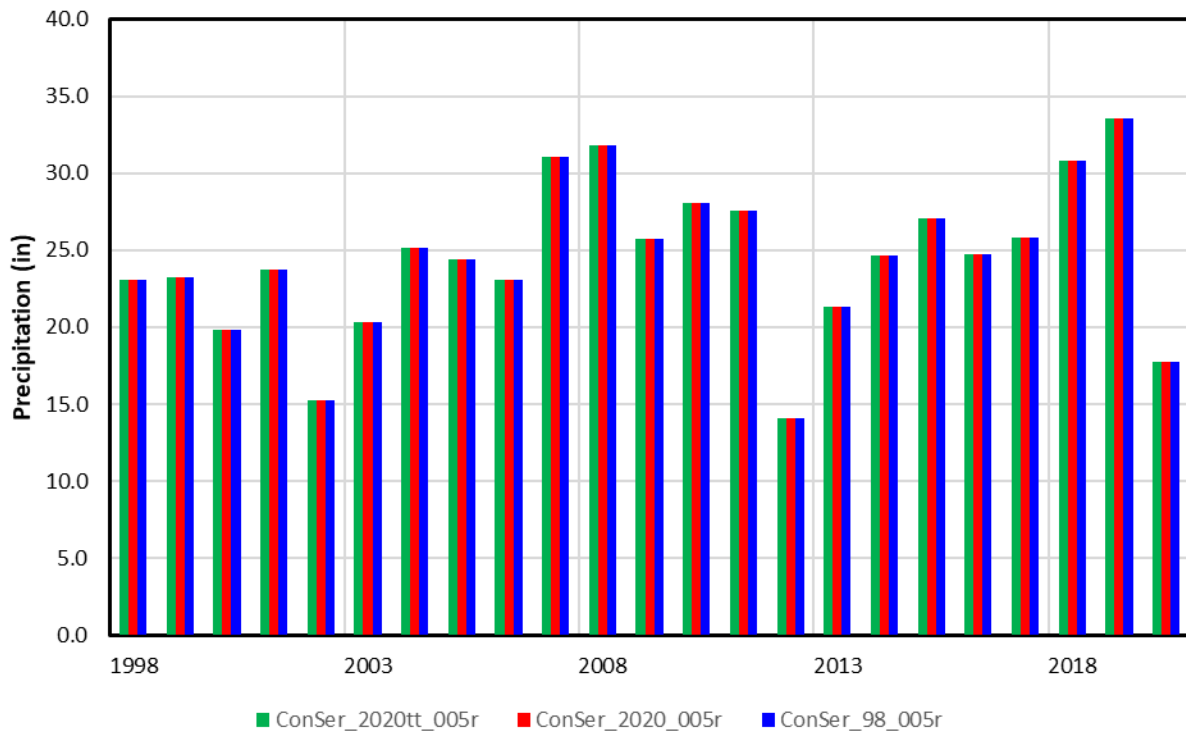
Regionalized Soil Water Balance Model Setup

- Modeled Period 1998-2020
- Land Use Information taken from 2019 Robust Review
 - 1998-2010 time period used 1998-2010 land use estimates
 - 2011-2020 time period repeated 2010 land use estimate
- Results reflect “on field” actions
 - Canal Recharge, M&I pumping, and Miscellaneous Pumping and Recharge were not included
 - Surface water deliveries taken from STELLA Demand Run (the ‘a’ run)

Regionalized Soil Water Balance Model Setup

- Three scenarios were developed
 - ConSer_98_005r
 - Farming practices circa 1998 were used for the modeling period 1998-2020
 - ConSer_2020_005r
 - Farming practices reflect circa 2020 practices
 - Includes tillage and crop phenology updates (planting dates, harvest index, GDD, etc.)
 - Reflects explicit modeling of corn/soybean rotation
 - ConSer_2020tt_005r
 - Results reflect a temporal trending of results between the above two scenarios from 1998 through 2020

Annual Precipitation Model Domain



COHYST

Regional Water Balance – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|-------------------|---------------|---------------|-------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 12,336,000 | | | 12,336,000 | | | 12,336,000 | | |
| Precipitation | 25,120,822 | 24.44 | 89.9% | 25,120,822 | 24.44 | 90.6% | 25,120,822 | 24.44 | 90.3% |
| Groundwater Pumping | 2,603,516 | 2.53 | 9.3% | 2,399,577 | 2.33 | 8.7% | 2,507,970 | 2.44 | 9.0% |
| Surface Water Deliveries | 209,675 | 0.20 | 0.8% | 193,958 | 0.19 | 0.7% | 202,397 | 0.20 | 0.7% |
| Total Applied Water | 27,934,013 | 27.17 | 100.0% | 27,714,358 | 26.96 | 100.0% | 27,831,188 | 27.07 | 100.0% |
| Field Evapotranspiration | 23,443,184 | 22.80 | 83.9% | 23,029,292 | 22.40 | 83.1% | 23,232,621 | 22.60 | 83.5% |
| Field Deep Percolation | 2,659,265 | 2.59 | 9.5% | 3,018,825 | 2.94 | 10.9% | 2,855,410 | 2.78 | 10.3% |
| Field Runoff | 1,877,683 | 1.83 | 6.7% | 1,717,197 | 1.67 | 6.2% | 1,793,900 | 1.75 | 6.4% |
| Irrigation Surface Losses | 136,466 | 0.13 | 0.5% | 125,798 | 0.12 | 0.5% | 131,470 | 0.13 | 0.5% |
| Field Water Balance | (182,585) | (0.18) | -0.7% | (176,753) | (0.17) | -0.6% | (182,213) | (0.18) | -0.7% |
| Lateral Losses | 13,215 | 0.01 | 0.0% | 12,124 | 0.01 | 0.0% | 12,738 | 0.01 | 0.0% |
| Field Runoff | 1,877,683 | 1.83 | 6.7% | 1,717,197 | 1.67 | 6.2% | 1,793,900 | 1.75 | 6.4% |
| Runoff Contributions to Streamflow | 1,057,114 | 1.03 | 3.8% | 970,906 | 0.94 | 3.5% | 1,012,136 | 0.98 | 3.6% |
| Runoff Losses to Recharge | 410,284 | 0.40 | 1.5% | 373,146 | 0.36 | 1.3% | 390,882 | 0.38 | 1.4% |
| Runoff Losses to Evapotranspiration | 410,284 | 0.40 | 1.5% | 373,146 | 0.36 | 1.3% | 390,882 | 0.38 | 1.4% |

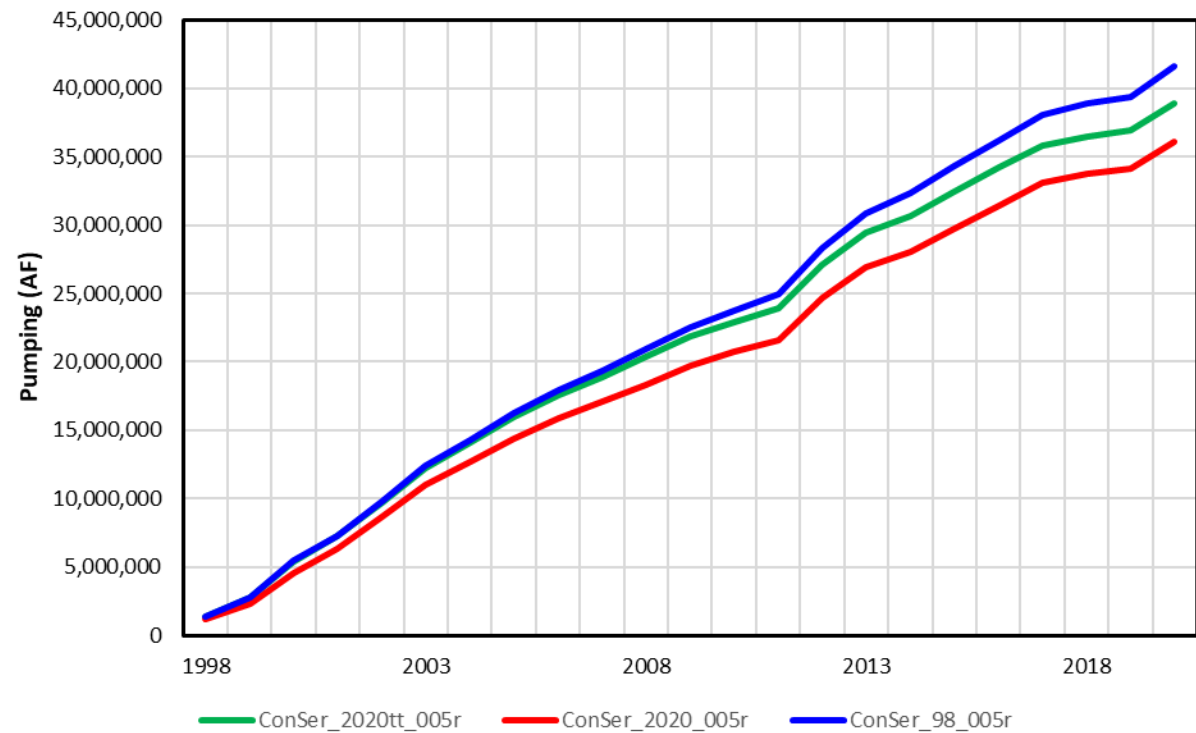
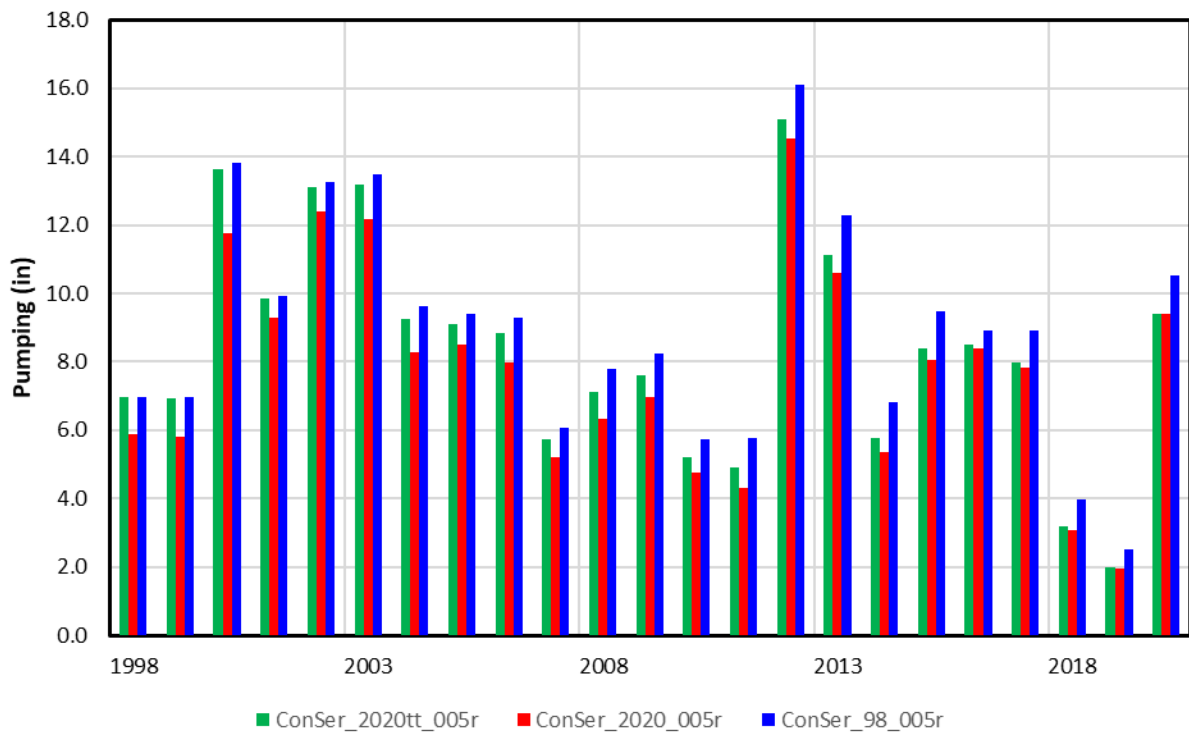
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Regional Water Balance

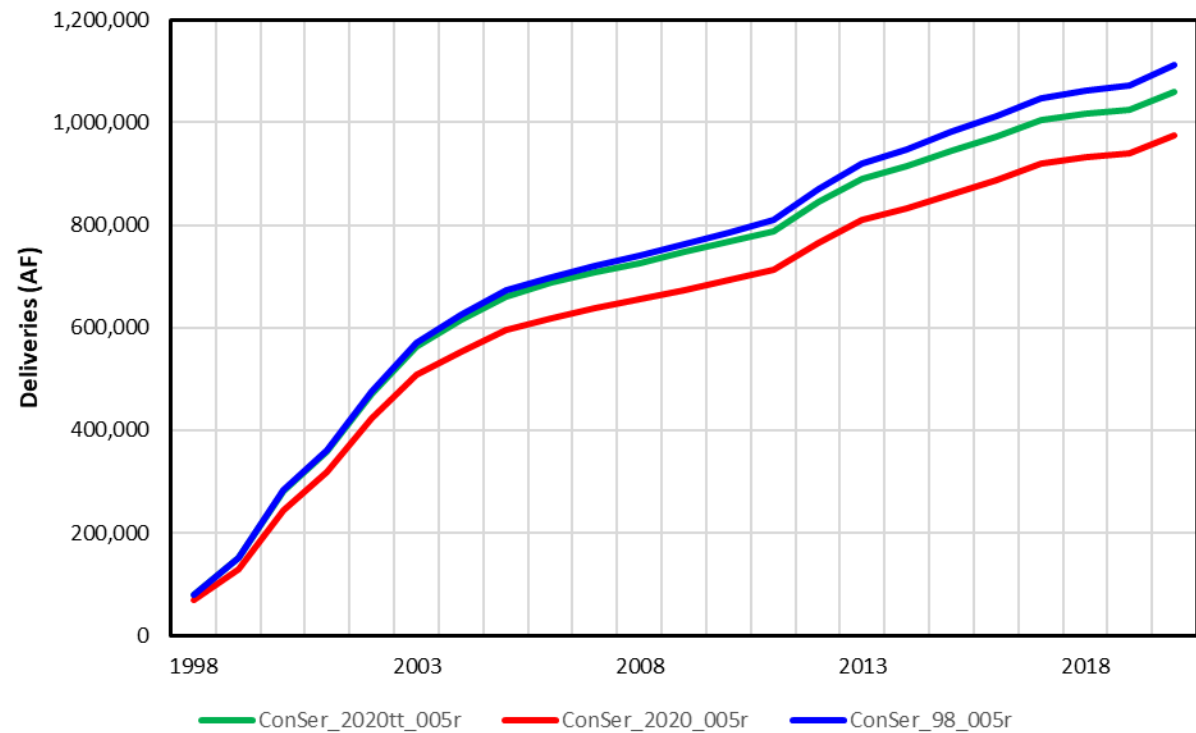
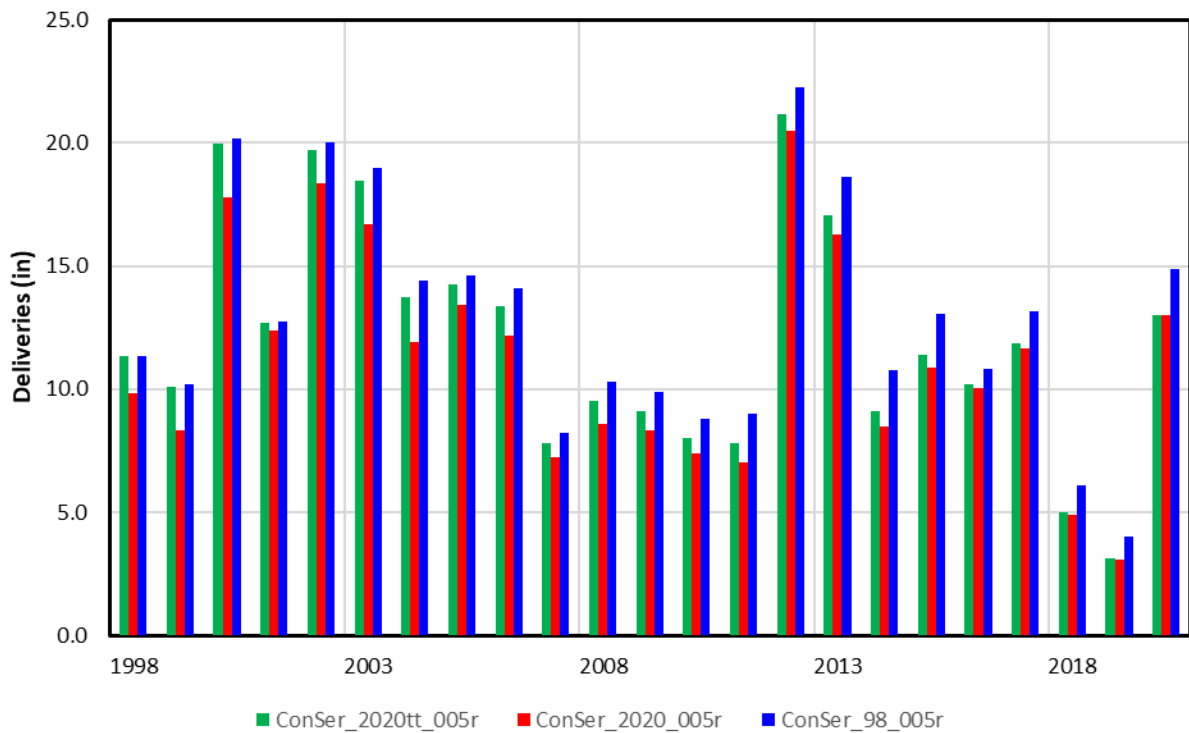
Groundwater Only Corn – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|--|----------------|--------|--------|------------------|--------|--------|--------------------|--------|--------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 2,440,656 | | | 2,440,656 | | | 2,440,656 | | |
| Precipitation | 5,281,339 | 25.97 | 74.5% | 5,281,339 | 25.97 | 77.1% | 5,281,339 | 25.97 | 75.8% |
| Groundwater Pumping | 1,807,547 | 8.89 | 25.5% | 1,569,262 | 7.72 | 22.9% | 1,690,431 | 8.31 | 24.2% |
| Surface Water Deliveries | - | - | 0.0% | - | - | 0.0% | - | - | 0.0% |
| Total Applied Water | 7,088,886 | 34.85 | 100.0% | 6,850,601 | 33.68 | 100.0% | 6,971,770 | 34.28 | 100.0% |
| Field Evapotranspiration | 5,667,817 | 27.87 | 80.0% | 5,298,061 | 26.05 | 77.3% | 5,481,957 | 26.95 | 78.6% |
| Field Deep Percolation | 576,227 | 2.83 | 8.1% | 819,404 | 4.03 | 12.0% | 705,185 | 3.47 | 10.1% |
| Field Runoff | 793,336 | 3.90 | 11.2% | 702,282 | 3.45 | 10.3% | 743,803 | 3.66 | 10.7% |
| Irrigation Surface Losses | 90,377 | 0.44 | 1.3% | 78,463 | 0.39 | 1.1% | 84,522 | 0.42 | 1.2% |
| Field Water Balance | (38,872) | (0.19) | -0.5% | (47,609) | (0.23) | -0.7% | (43,697) | (0.21) | -0.6% |
| Lateral Losses | - | - | 0.0% | - | - | 0.0% | - | - | 0.0% |
| Field Runoff | 793,336 | 3.90 | 11.2% | 702,282 | 3.45 | 10.3% | 743,803 | 3.66 | 10.7% |
| Runoff Contributions to Streamflow | 447,120 | 2.20 | 6.3% | 398,206 | 1.96 | 5.8% | 420,527 | 2.07 | 6.0% |
| Runoff Losses to Recharge | 173,108 | 0.85 | 2.4% | 152,038 | 0.75 | 2.2% | 161,638 | 0.79 | 2.3% |
| Runoff Losses to Evapotranspiration | 173,108 | 0.85 | 2.4% | 152,038 | 0.75 | 2.2% | 161,638 | 0.79 | 2.3% |

Groundwater Pumping Model Domain Groundwater Only Irrigated Lands – Corn



Surface Water Deliveries Model Domain Surface Water Only Irrigated Lands – Corn

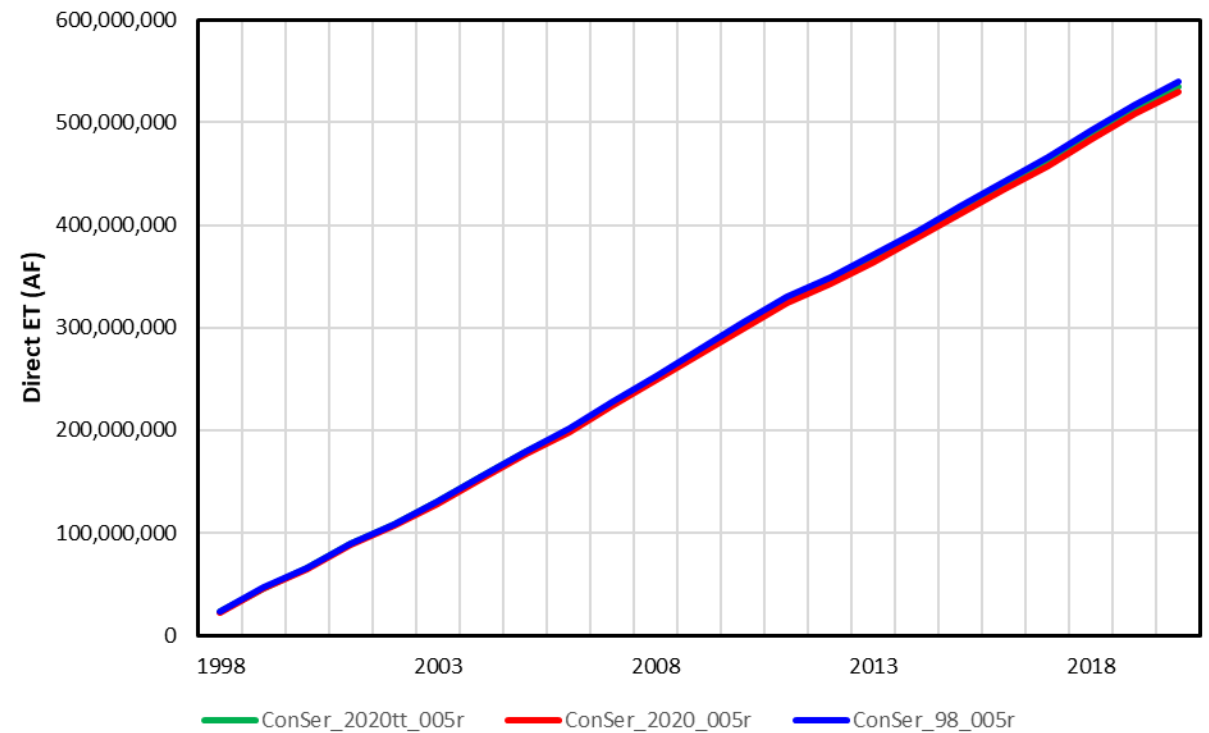
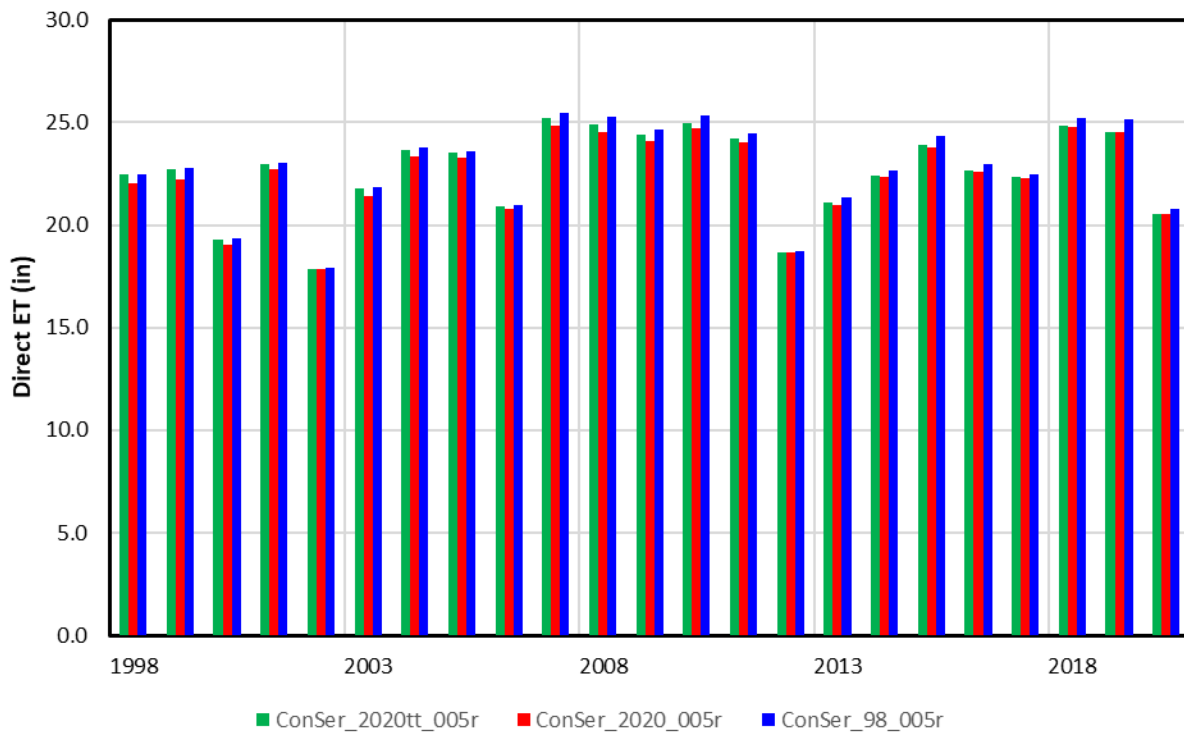


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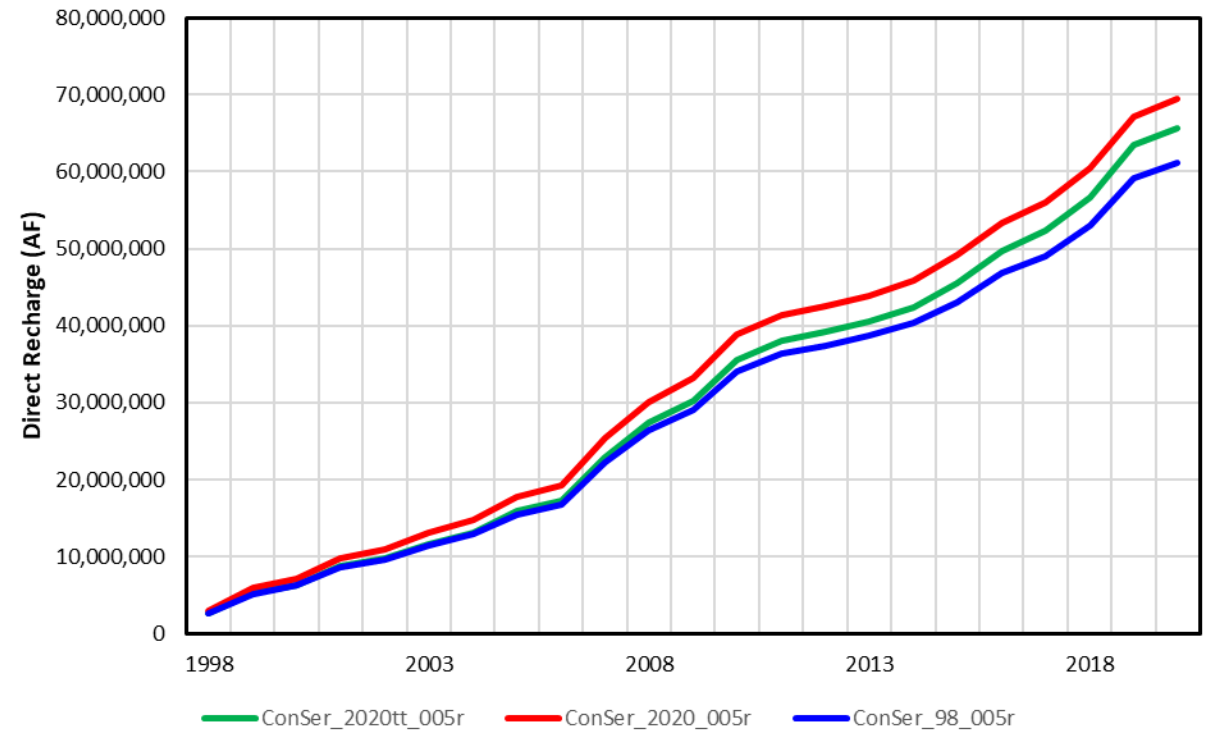
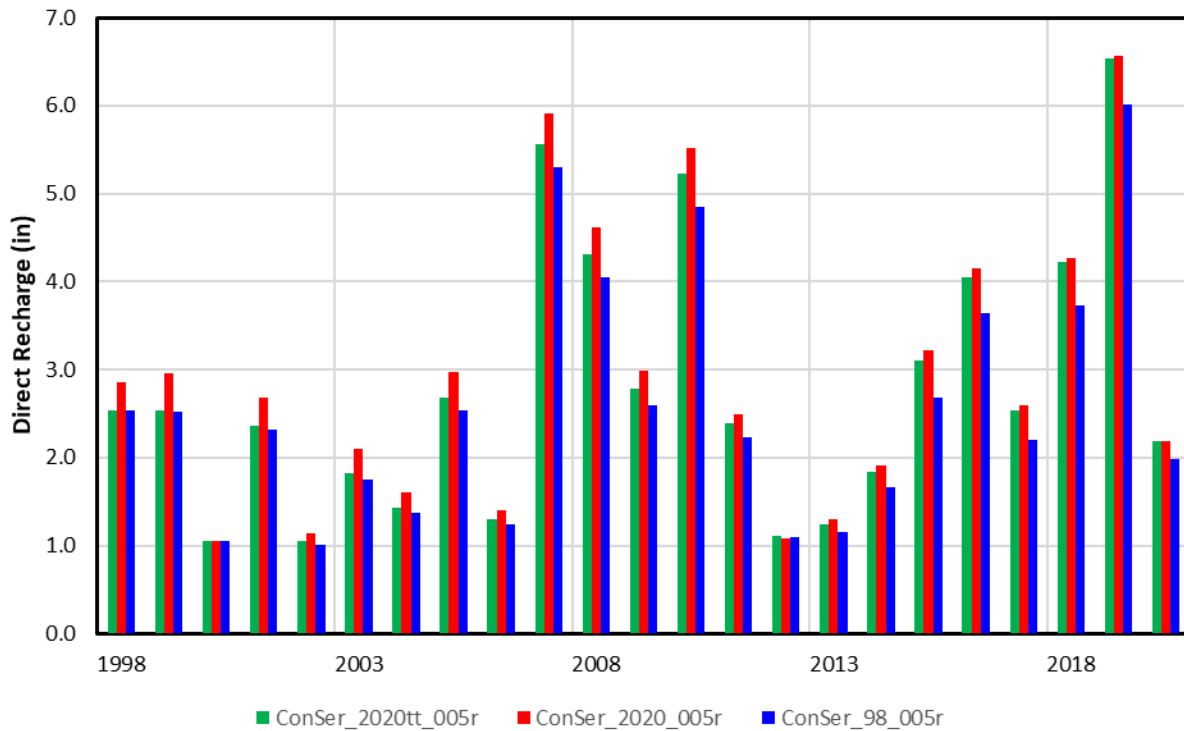
Regional Water Balance – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|-------------------|--------------|---------------|-------------------|--------------|---------------|--------------------|--------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 12,336,000 | | | 12,336,000 | | | 12,336,000 | | |
| Precipitation | 25,120,822 | 24.44 | 89.9% | 25,120,822 | 24.44 | 90.6% | 25,120,822 | 24.44 | 90.3% |
| Groundwater Pumping | 2,603,516 | 2.53 | 9.3% | 2,399,577 | 2.33 | 8.7% | 2,507,970 | 2.44 | 9.0% |
| Surface Water Deliveries | 209,675 | 0.20 | 0.8% | 193,958 | 0.19 | 0.7% | 202,397 | 0.20 | 0.7% |
| Total Applied Water | 27,934,013 | 27.17 | 100.0% | 27,714,358 | 26.96 | 100.0% | 27,831,188 | 27.07 | 100.0% |
| Field Evapotranspiration | 23,443,184 | 22.80 | 83.9% | 23,029,292 | 22.40 | 83.1% | 23,232,621 | 22.60 | 83.5% |
| Field Deep Percolation | 2,659,265 | 2.59 | 9.5% | 3,018,825 | 2.94 | 10.9% | 2,855,410 | 2.78 | 10.3% |
| Field Runoff | 1,877,683 | 1.83 | 6.7% | 1,717,197 | 1.67 | 6.2% | 1,793,900 | 1.75 | 6.4% |
| Irrigation Surface Losses | 136,466 | 0.13 | 0.5% | 125,798 | 0.12 | 0.5% | 131,470 | 0.13 | 0.5% |
| Field Water Balance | (182,585) | (0.18) | -0.7% | (176,753) | (0.17) | -0.6% | (182,213) | (0.18) | -0.7% |
| Lateral Losses | 13,215 | 0.01 | 0.0% | 12,124 | 0.01 | 0.0% | 12,738 | 0.01 | 0.0% |
| Field Runoff | 1,877,683 | 1.83 | 6.7% | 1,717,197 | 1.67 | 6.2% | 1,793,900 | 1.75 | 6.4% |
| Runoff Contributions to Streamflow | 1,057,114 | 1.03 | 3.8% | 970,906 | 0.94 | 3.5% | 1,012,136 | 0.98 | 3.6% |
| Runoff Losses to Recharge | 410,284 | 0.40 | 1.5% | 373,146 | 0.36 | 1.3% | 390,882 | 0.38 | 1.4% |
| Runoff Losses to Evapotranspiration | 410,284 | 0.40 | 1.5% | 373,146 | 0.36 | 1.3% | 390,882 | 0.38 | 1.4% |

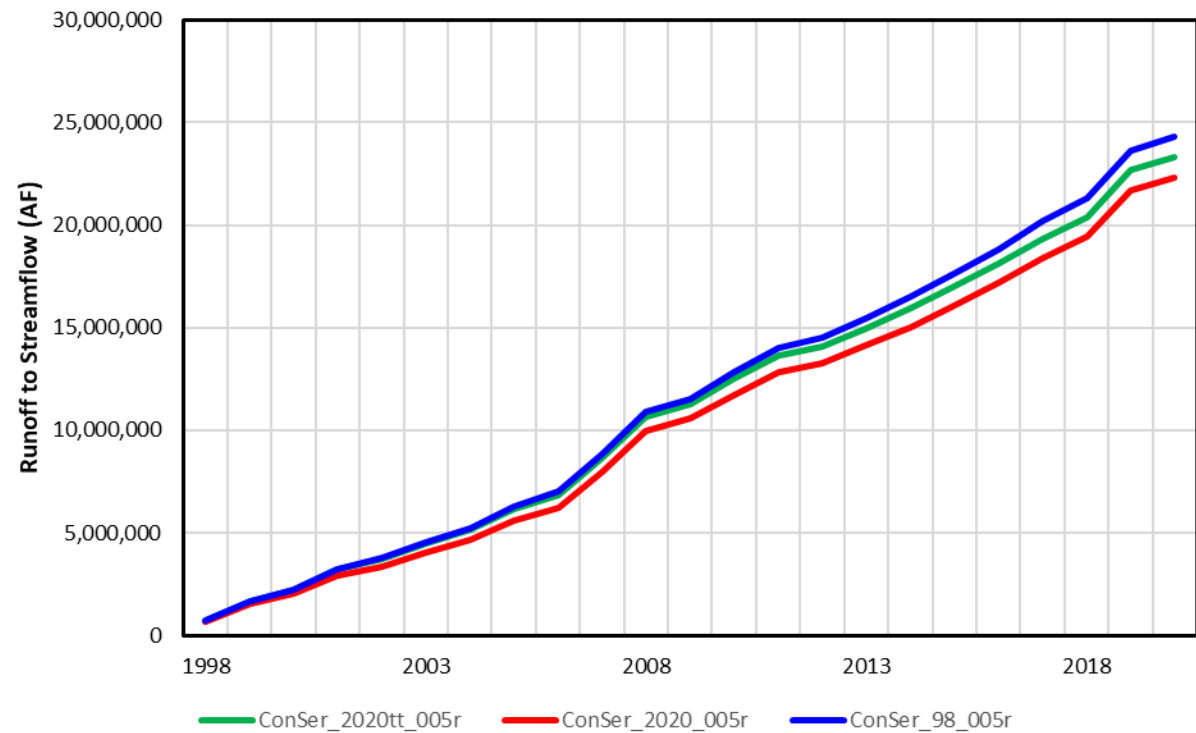
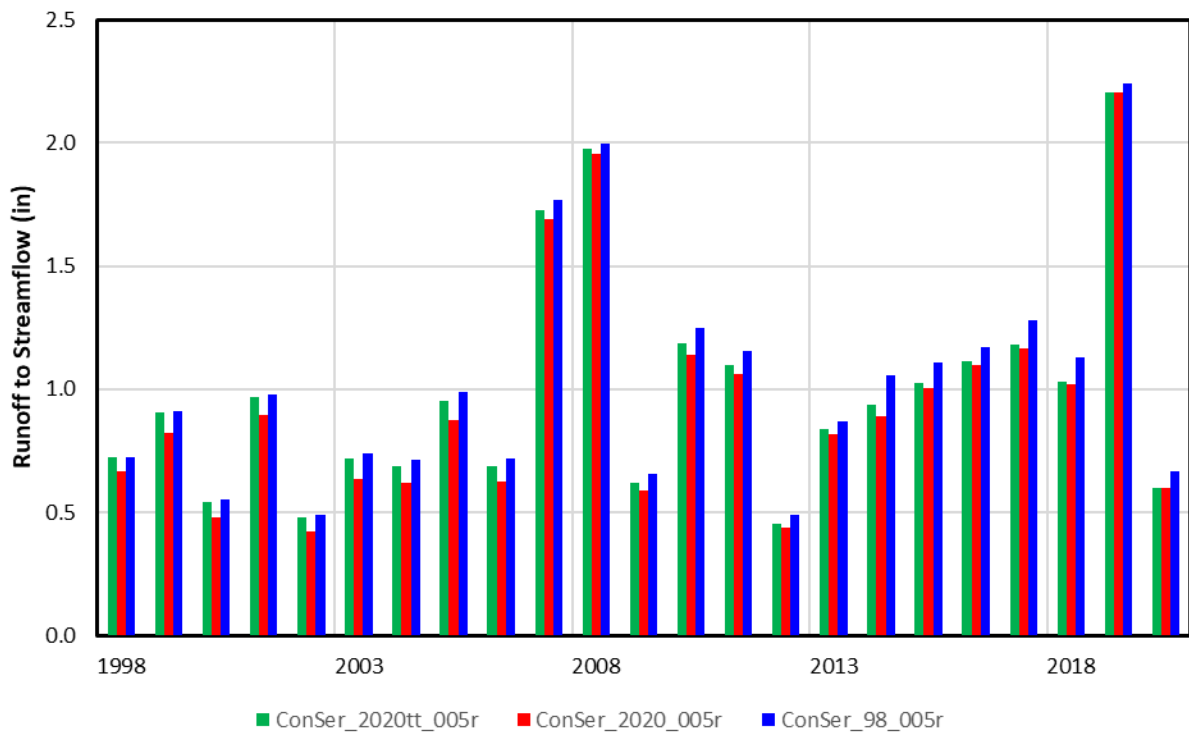
Direct Evapotranspiration Model Domain



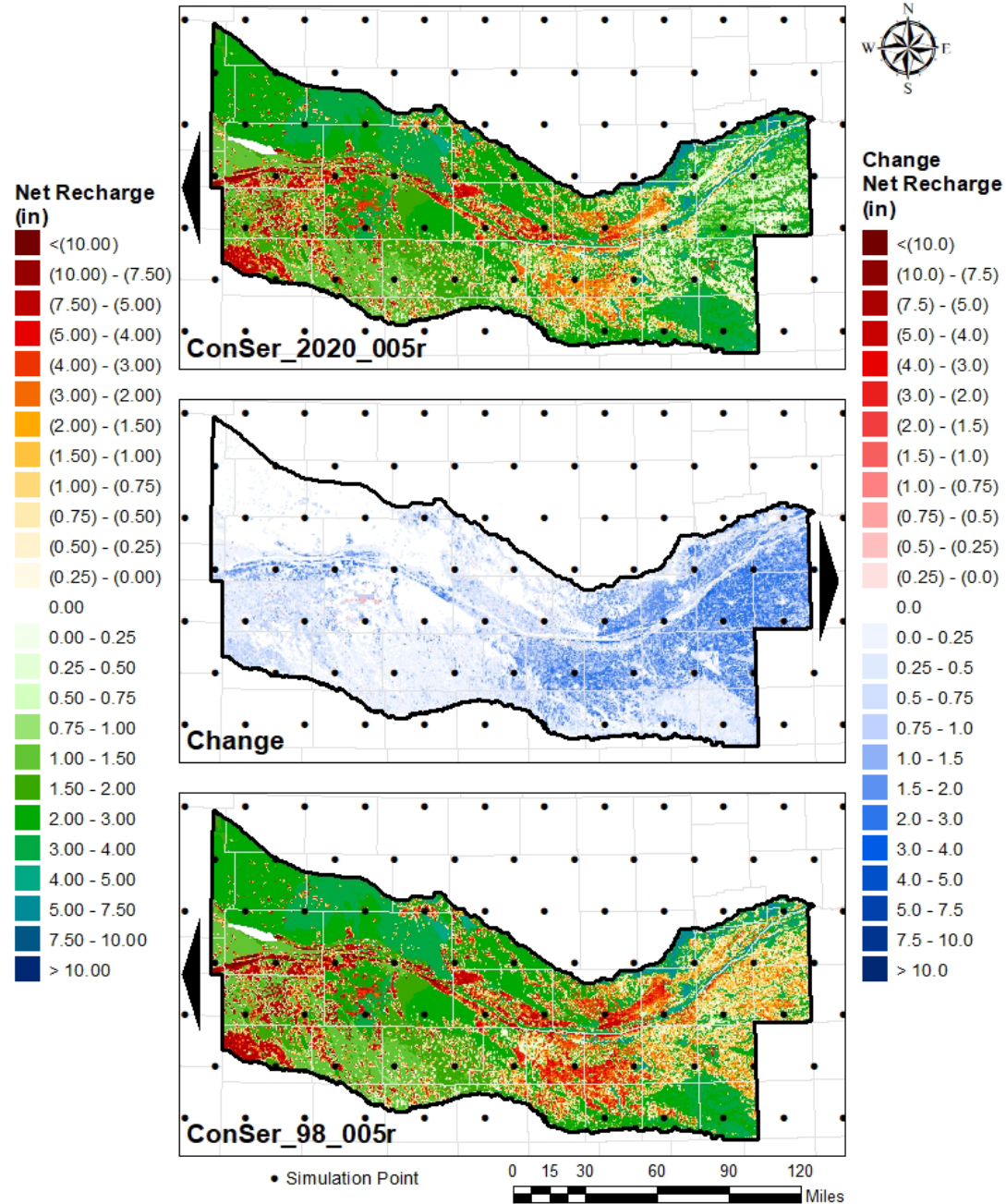
Direct Recharge Model Domain



Runoff Contributions to Streamflow Model Domain



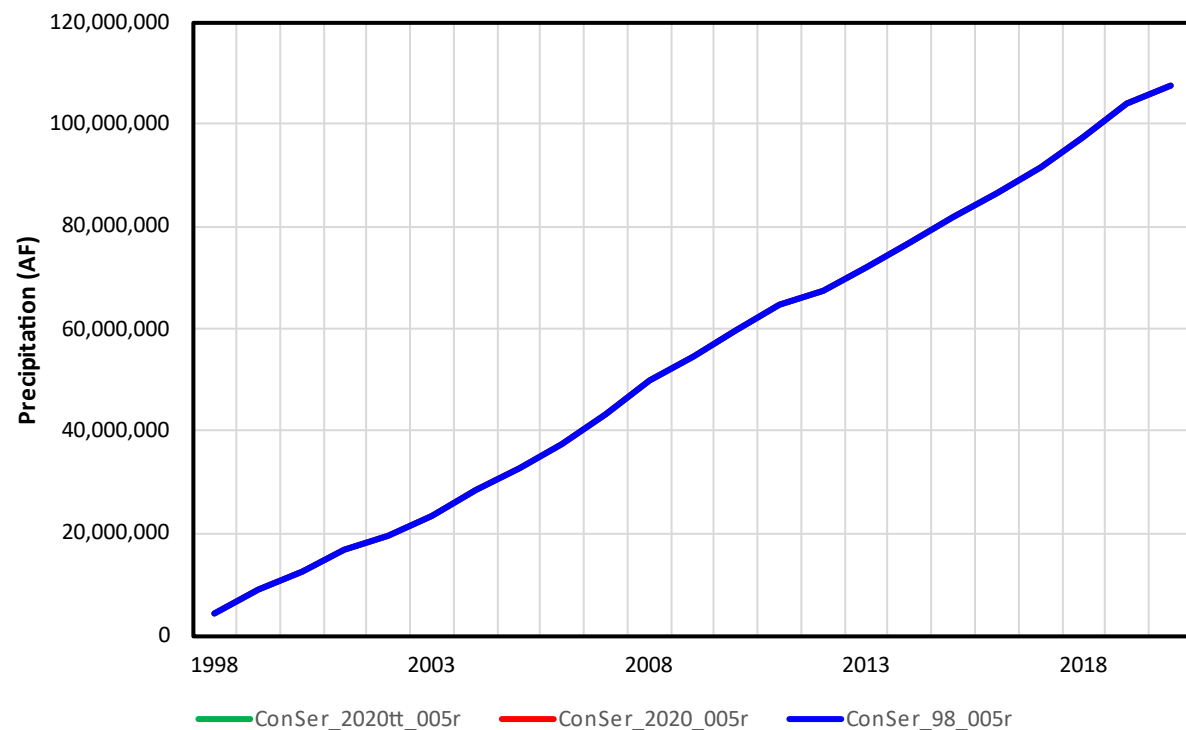
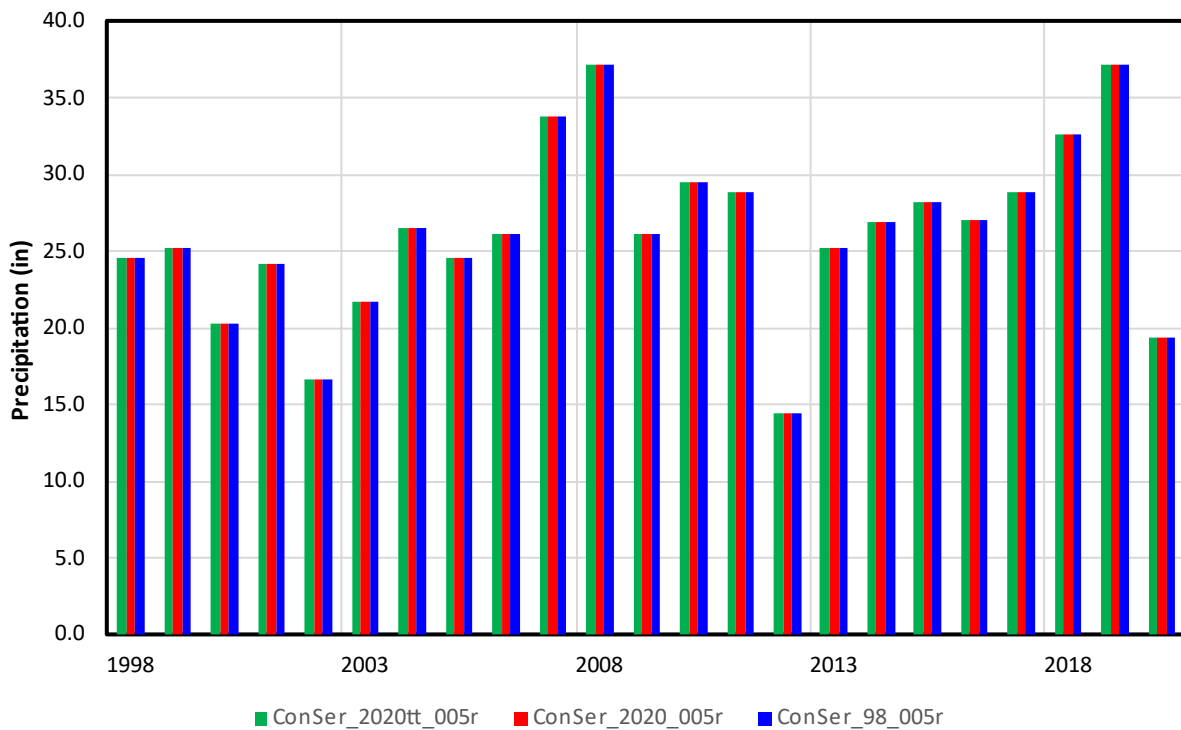
Average Net Recharge COHYST Model Area: 1998-2020





Central Platte NRD

Annual Precipitation Central Platte NRD



COHYST - Central Platte NRD

Regional Water Balance – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|------------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 2,133,760 | | | 2,133,760 | | | 2,133,760 | | |
| Precipitation | 4,675,706 | 26.30 | 87.1% | 4,675,706 | 26.30 | 87.7% | 4,675,706 | 26.30 | 87.4% |
| Groundwater Pumping | 631,942 | 3.55 | 11.8% | 597,815 | 3.36 | 11.2% | 617,817 | 3.47 | 11.5% |
| Surface Water Deliveries | 58,579 | 0.33 | 1.1% | 55,929 | 0.31 | 1.0% | 57,307 | 0.32 | 1.1% |
| Total Applied Water | 5,366,227 | 30.18 | 100.0% | 5,329,450 | 29.97 | 100.0% | 5,350,830 | 30.09 | 100.0% |
| Field Evapotranspiration | 4,326,656 | 24.33 | 80.6% | 4,233,392 | 23.81 | 79.4% | 4,281,248 | 24.08 | 80.0% |
| Field Deep Percolation | 603,499 | 3.39 | 11.2% | 674,190 | 3.79 | 12.7% | 641,212 | 3.61 | 12.0% |
| Field Runoff | 432,775 | 2.43 | 8.1% | 419,231 | 2.36 | 7.9% | 425,600 | 2.39 | 8.0% |
| Irrigation Surface Losses | 33,354 | 0.19 | 0.6% | 31,569 | 0.18 | 0.6% | 32,610 | 0.18 | 0.6% |
| Field Water Balance | (30,058) | (0.17) | -0.6% | (28,931) | (0.16) | -0.5% | (29,840) | (0.17) | -0.6% |
| Lateral Losses | 5,570 | 0.03 | 0.1% | 5,318 | 0.03 | 0.1% | 5,450 | 0.03 | 0.1% |
| Field Runoff | 432,775 | 2.43 | 8.1% | 419,231 | 2.36 | 7.9% | 425,600 | 2.39 | 8.0% |
| Runoff Contributions to Streamflow | 282,067 | 1.59 | 5.3% | 273,004 | 1.54 | 5.1% | 277,249 | 1.56 | 5.2% |
| Runoff Losses to Recharge | 75,354 | 0.42 | 1.4% | 73,113 | 0.41 | 1.4% | 74,176 | 0.42 | 1.4% |
| Runoff Losses to Evapotranspiration | 75,354 | 0.42 | 1.4% | 73,113 | 0.41 | 1.4% | 74,176 | 0.42 | 1.4% |

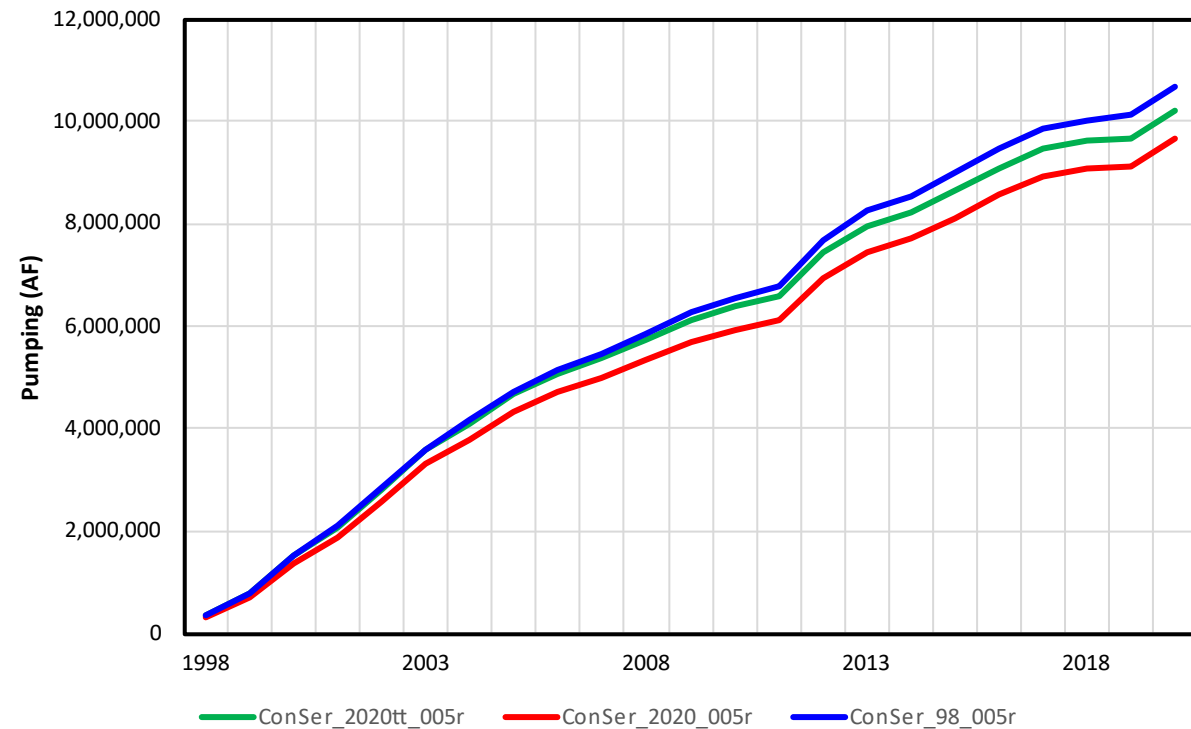
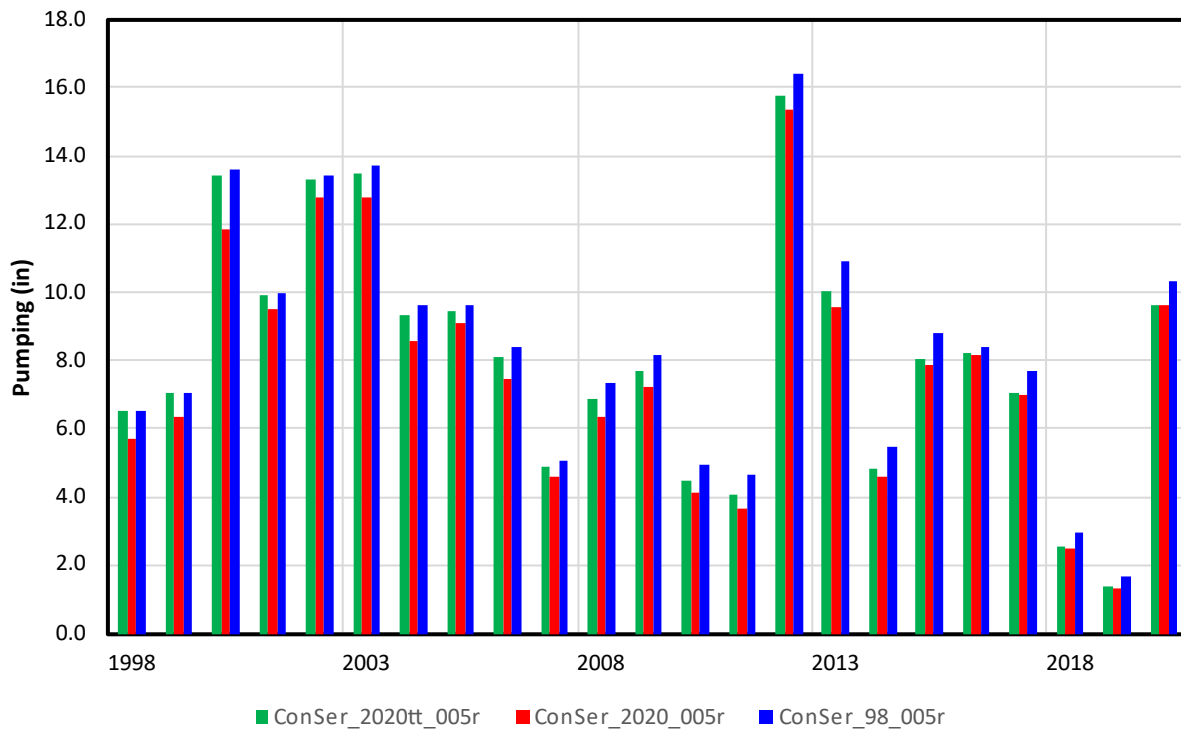
COHYST - Central Platte NRD

Regional Water Balance

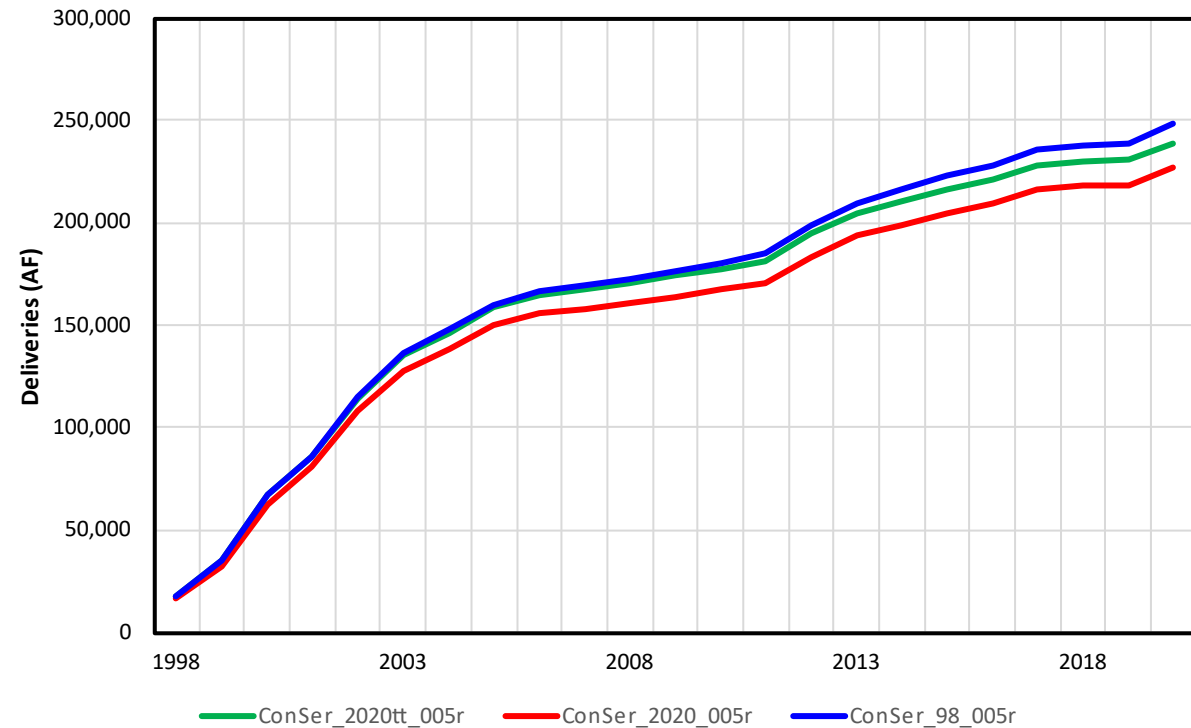
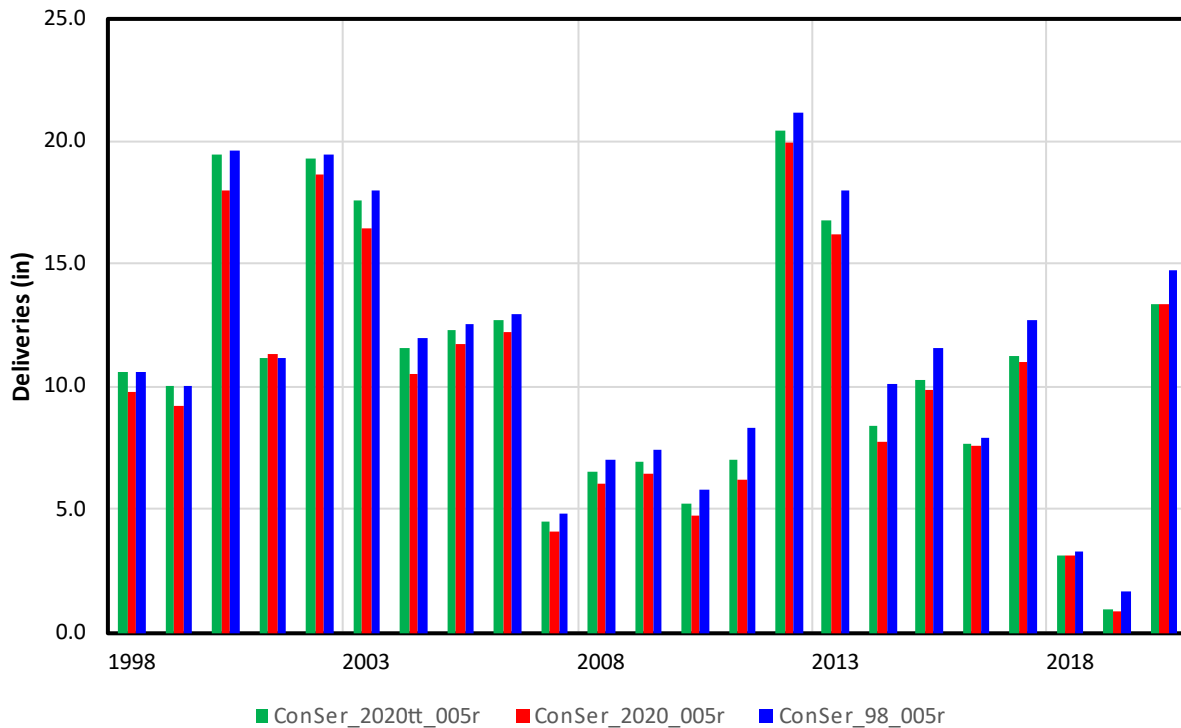
Groundwater Only Corn – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|------------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 482,738 | | | 482,738 | | | 482,738 | | |
| Precipitation | 1,074,851 | 26.72 | 75.8% | 1,074,851 | 26.72 | 77.4% | 1,074,851 | 26.72 | 76.5% |
| Groundwater Pumping | 342,313 | 8.51 | 24.2% | 313,004 | 7.78 | 22.6% | 330,084 | 8.21 | 23.5% |
| Surface Water Deliveries | - | - | 0.0% | - | - | 0.0% | - | - | 0.0% |
| Total Applied Water | 1,417,164 | 35.23 | 100.0% | 1,387,854 | 34.50 | 100.0% | 1,404,934 | 34.92 | 100.0% |
| Field Evapotranspiration | 1,119,835 | 27.84 | 79.0% | 1,052,439 | 26.16 | 75.8% | 1,088,553 | 27.06 | 77.5% |
| Field Deep Percolation | 135,293 | 3.36 | 9.5% | 178,421 | 4.44 | 12.9% | 156,586 | 3.89 | 11.1% |
| Field Runoff | 152,338 | 3.79 | 10.7% | 148,536 | 3.69 | 10.7% | 150,654 | 3.74 | 10.7% |
| Irrigation Surface Losses | 17,116 | 0.43 | 1.2% | 15,650 | 0.39 | 1.1% | 16,504 | 0.41 | 1.2% |
| Field Water Balance | (7,418) | (0.18) | -0.5% | (7,192) | (0.18) | -0.5% | (7,362) | (0.18) | -0.5% |
| Lateral Losses | - | - | 0.0% | - | - | 0.0% | - | - | 0.0% |
| Field Runoff | 152,338 | 3.79 | 10.7% | 148,536 | 3.69 | 10.7% | 150,654 | 3.74 | 10.7% |
| Runoff Contributions to Streamflow | 98,457 | 2.45 | 6.9% | 95,880 | 2.38 | 6.9% | 97,306 | 2.42 | 6.9% |
| Runoff Losses to Recharge | 26,941 | 0.67 | 1.9% | 26,328 | 0.65 | 1.9% | 26,674 | 0.66 | 1.9% |
| Runoff Losses to Evapotranspiration | 26,941 | 0.67 | 1.9% | 26,328 | 0.65 | 1.9% | 26,674 | 0.66 | 1.9% |

Groundwater Pumping Central Platte NRD Groundwater Only Irrigated Lands – Corn



Surface Water Deliveries Central Platte NRD Surface Water Only Irrigated Lands – Corn

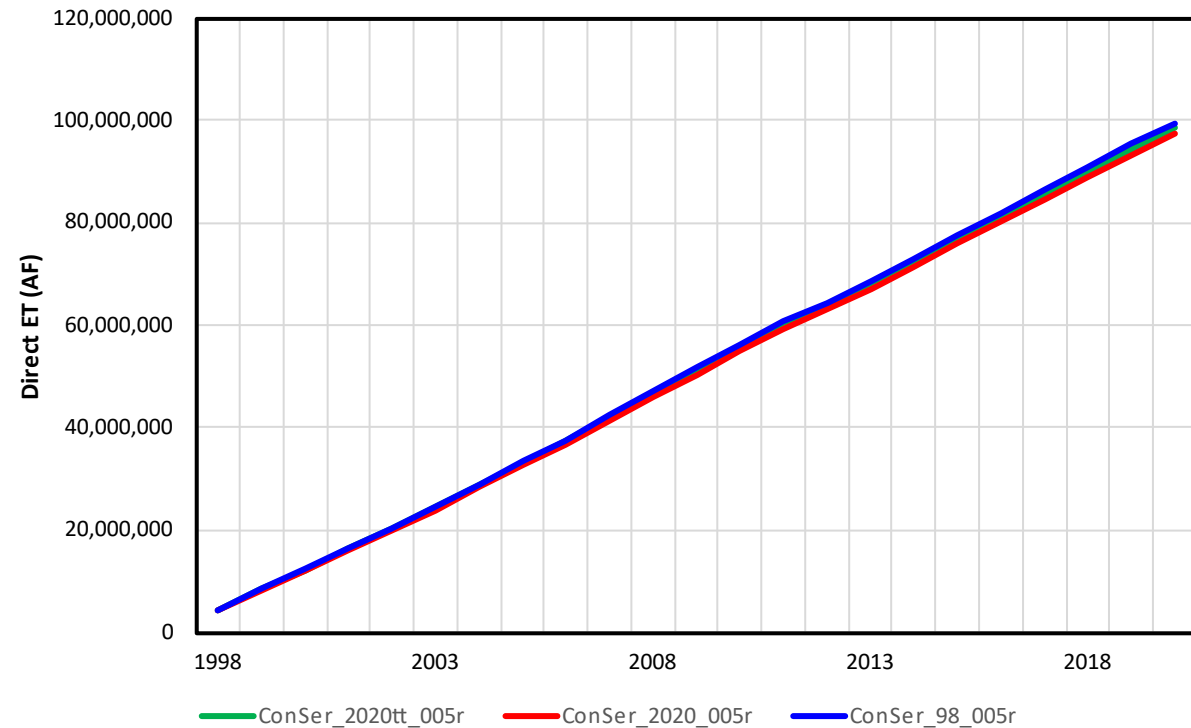
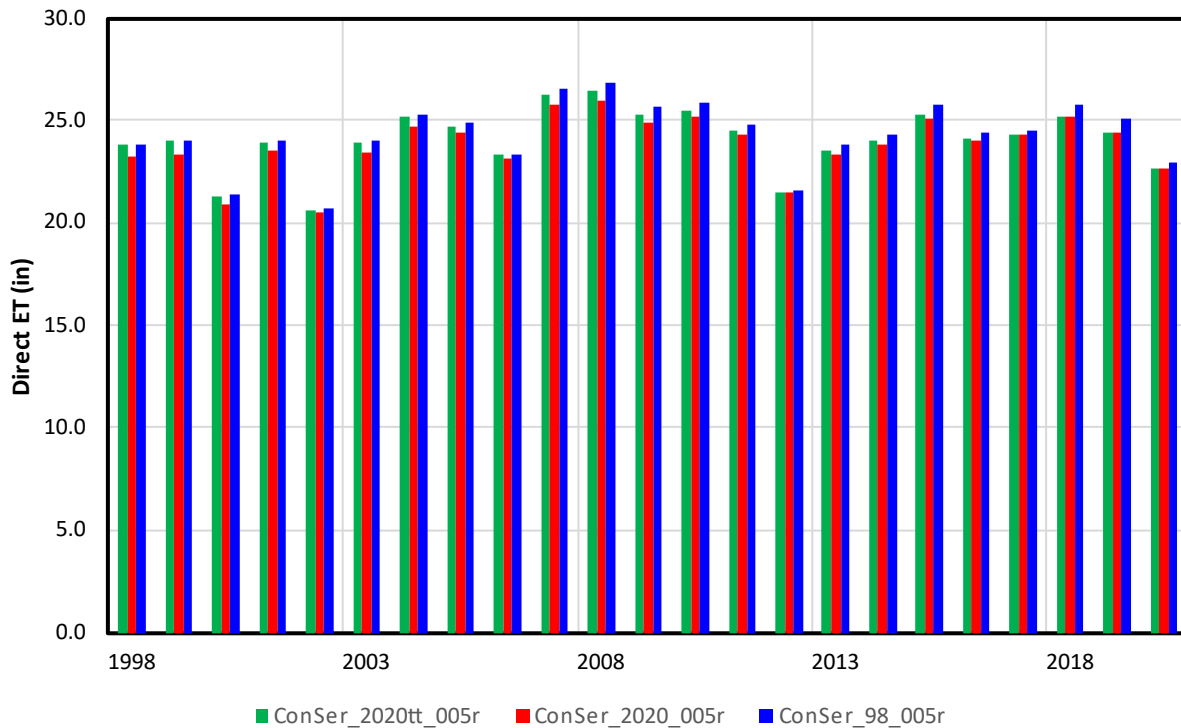


COHYST - Central Platte NRD

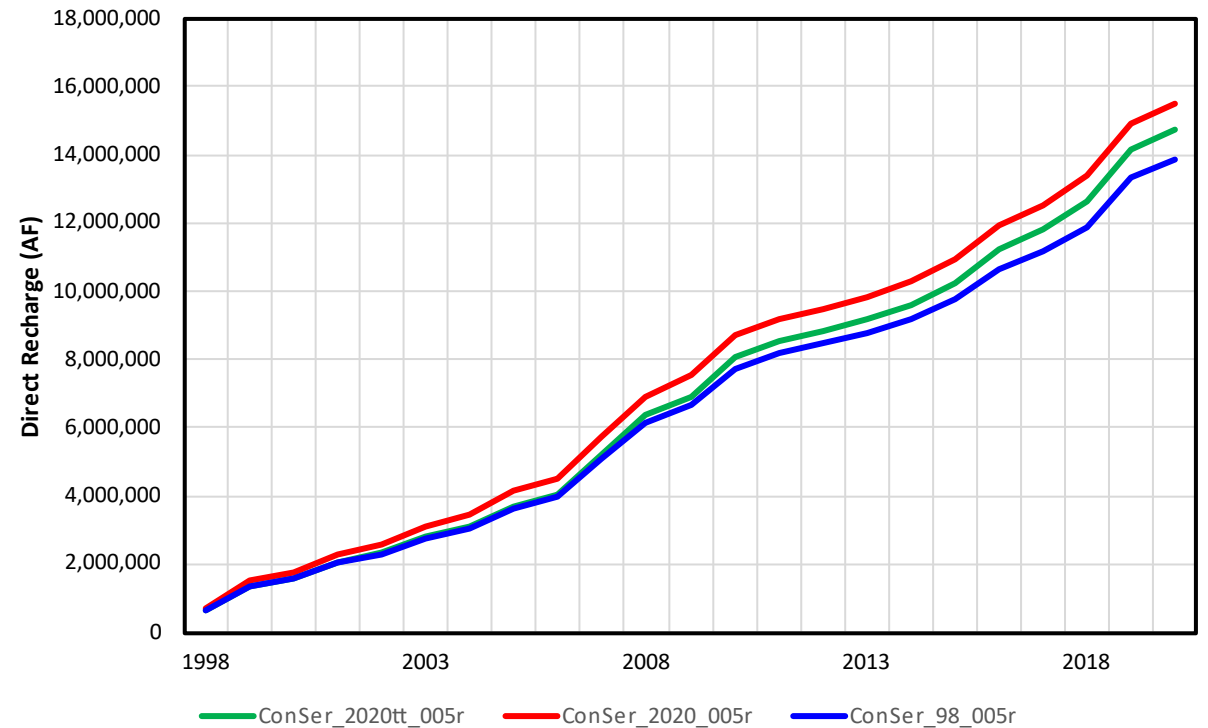
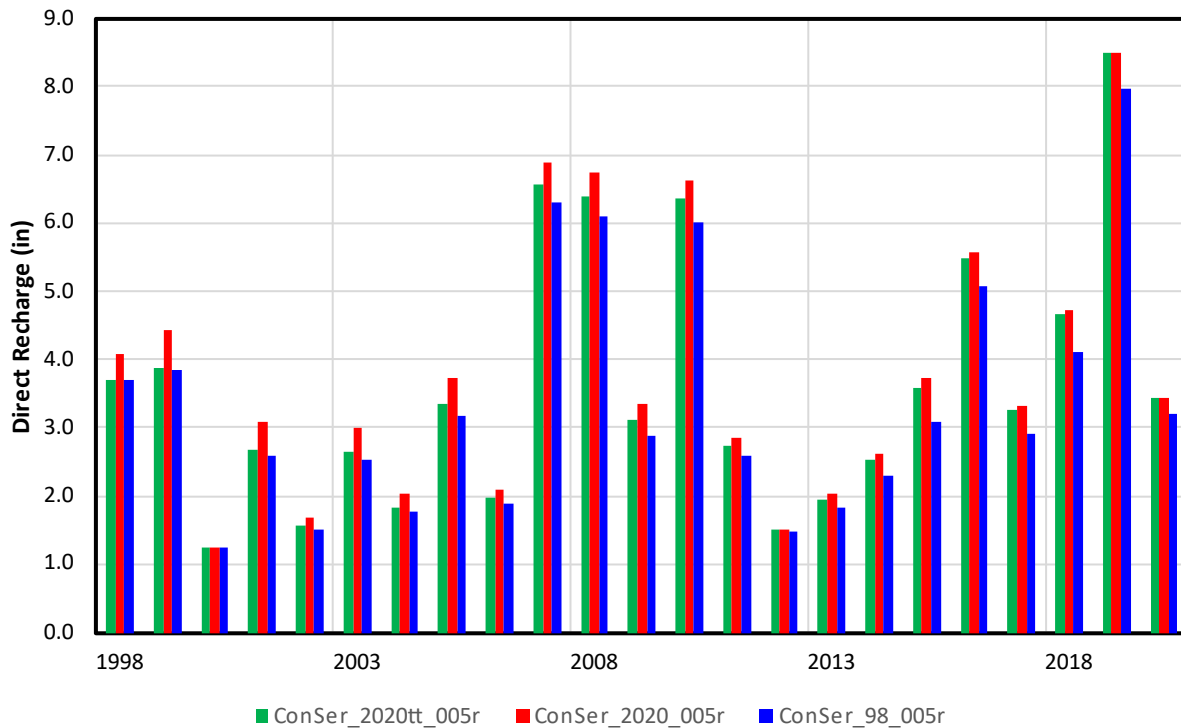
Regional Water Balance – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|------------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 2,133,760 | | | 2,133,760 | | | 2,133,760 | | |
| Precipitation | 4,675,706 | 26.30 | 87.1% | 4,675,706 | 26.30 | 87.7% | 4,675,706 | 26.30 | 87.4% |
| Groundwater Pumping | 631,942 | 3.55 | 11.8% | 597,815 | 3.36 | 11.2% | 617,817 | 3.47 | 11.5% |
| Surface Water Deliveries | 58,579 | 0.33 | 1.1% | 55,929 | 0.31 | 1.0% | 57,307 | 0.32 | 1.1% |
| Total Applied Water | 5,366,227 | 30.18 | 100.0% | 5,329,450 | 29.97 | 100.0% | 5,350,830 | 30.09 | 100.0% |
| Field Evapotranspiration | 4,326,656 | 24.33 | 80.6% | 4,233,392 | 23.81 | 79.4% | 4,281,248 | 24.08 | 80.0% |
| Field Deep Percolation | 603,499 | 3.39 | 11.2% | 674,190 | 3.79 | 12.7% | 641,212 | 3.61 | 12.0% |
| Field Runoff | 432,775 | 2.43 | 8.1% | 419,231 | 2.36 | 7.9% | 425,600 | 2.39 | 8.0% |
| Irrigation Surface Losses | 33,354 | 0.19 | 0.6% | 31,569 | 0.18 | 0.6% | 32,610 | 0.18 | 0.6% |
| Field Water Balance | (30,058) | (0.17) | -0.6% | (28,931) | (0.16) | -0.5% | (29,840) | (0.17) | -0.6% |
| Lateral Losses | 5,570 | 0.03 | 0.1% | 5,318 | 0.03 | 0.1% | 5,450 | 0.03 | 0.1% |
| Field Runoff | 432,775 | 2.43 | 8.1% | 419,231 | 2.36 | 7.9% | 425,600 | 2.39 | 8.0% |
| Runoff Contributions to Streamflow | 282,067 | 1.59 | 5.3% | 273,004 | 1.54 | 5.1% | 277,249 | 1.56 | 5.2% |
| Runoff Losses to Recharge | 75,354 | 0.42 | 1.4% | 73,113 | 0.41 | 1.4% | 74,176 | 0.42 | 1.4% |
| Runoff Losses to Evapotranspiration | 75,354 | 0.42 | 1.4% | 73,113 | 0.41 | 1.4% | 74,176 | 0.42 | 1.4% |

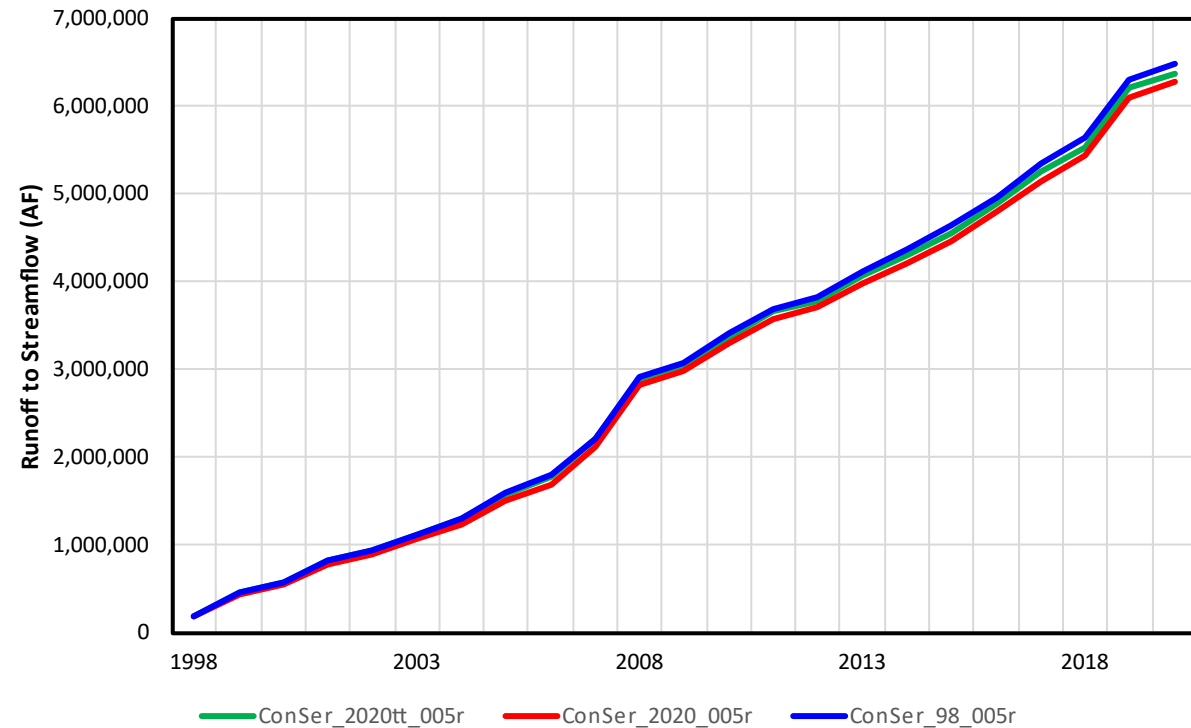
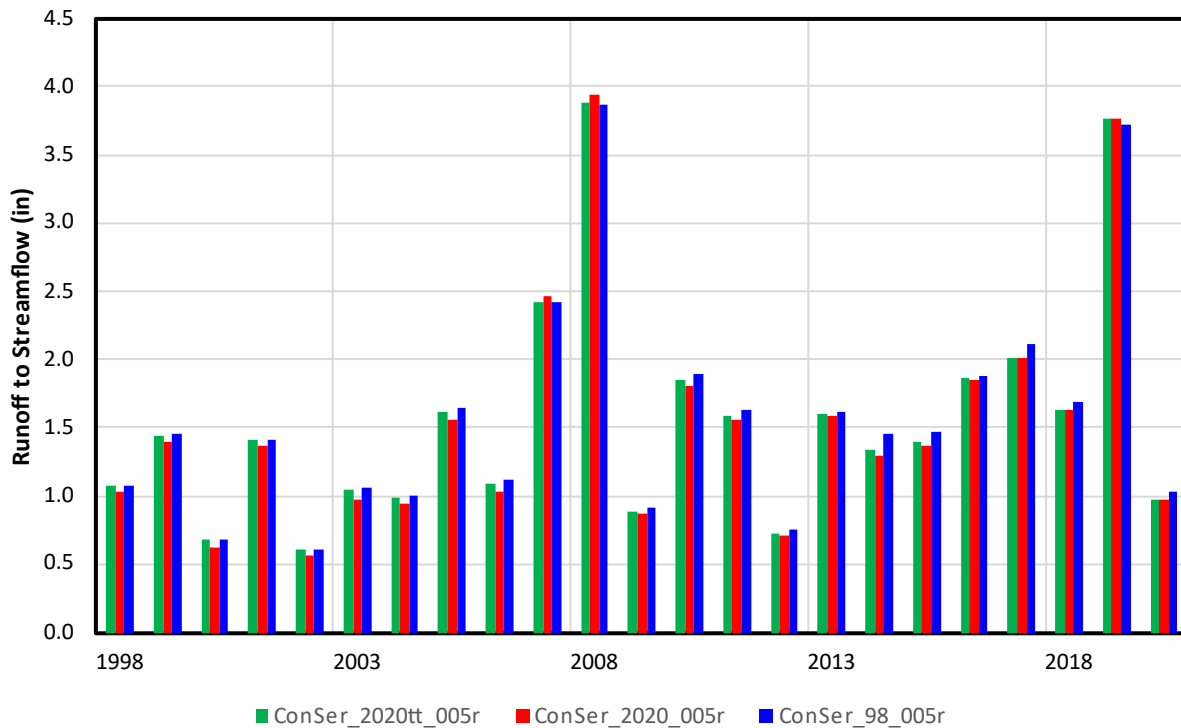
Direct Evapotranspiration Central Platte NRD



Direct Recharge Central Platte NRD



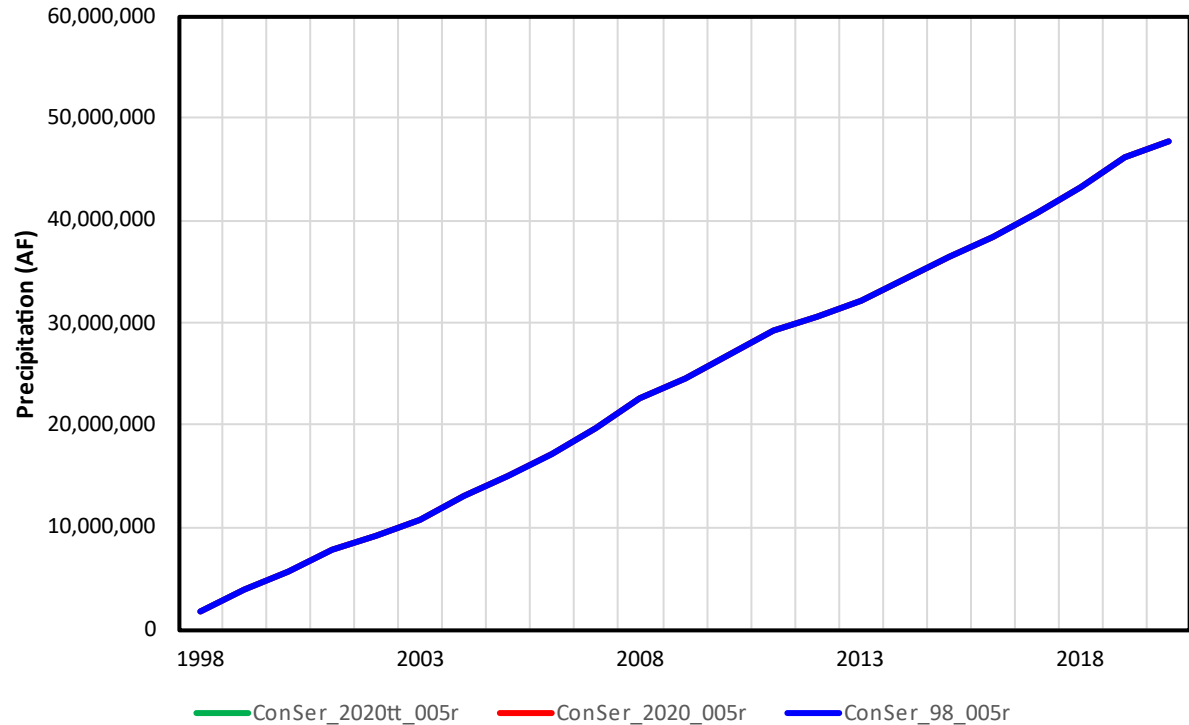
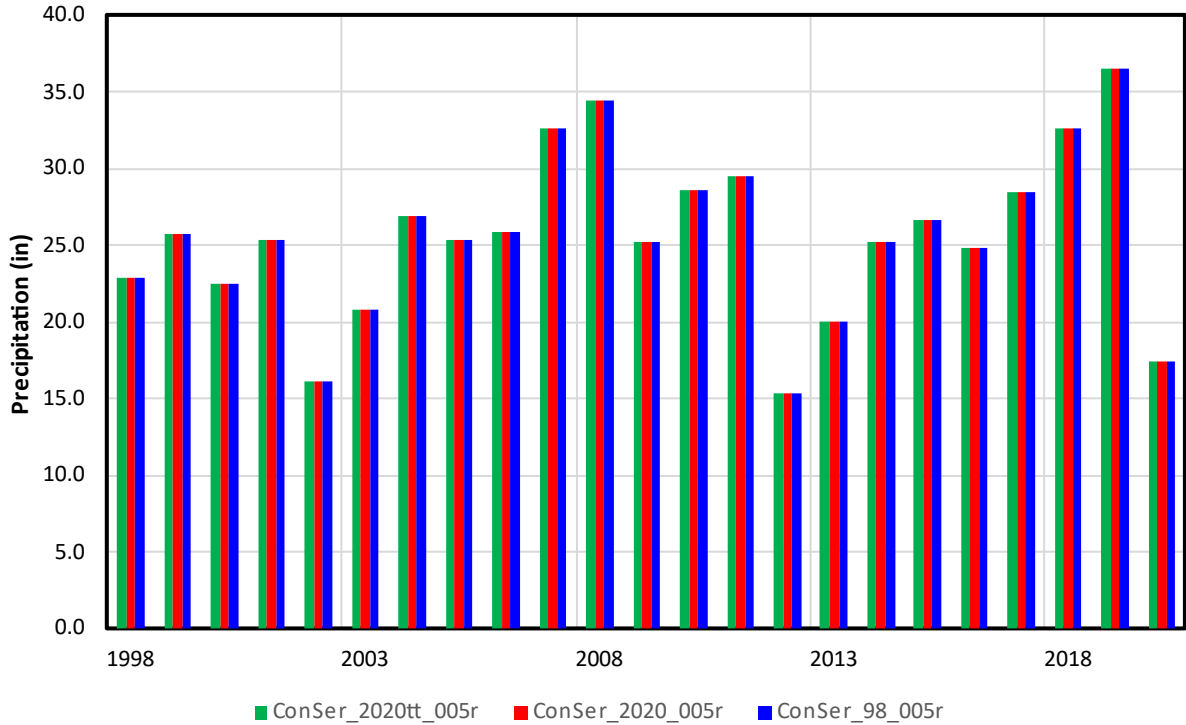
Runoff Contributions to Streamflow Central Platte NRD





Tri-Basin NRD

Annual Precipitation Tri-Basin NRD



COHYST – Tri-Basin NRD

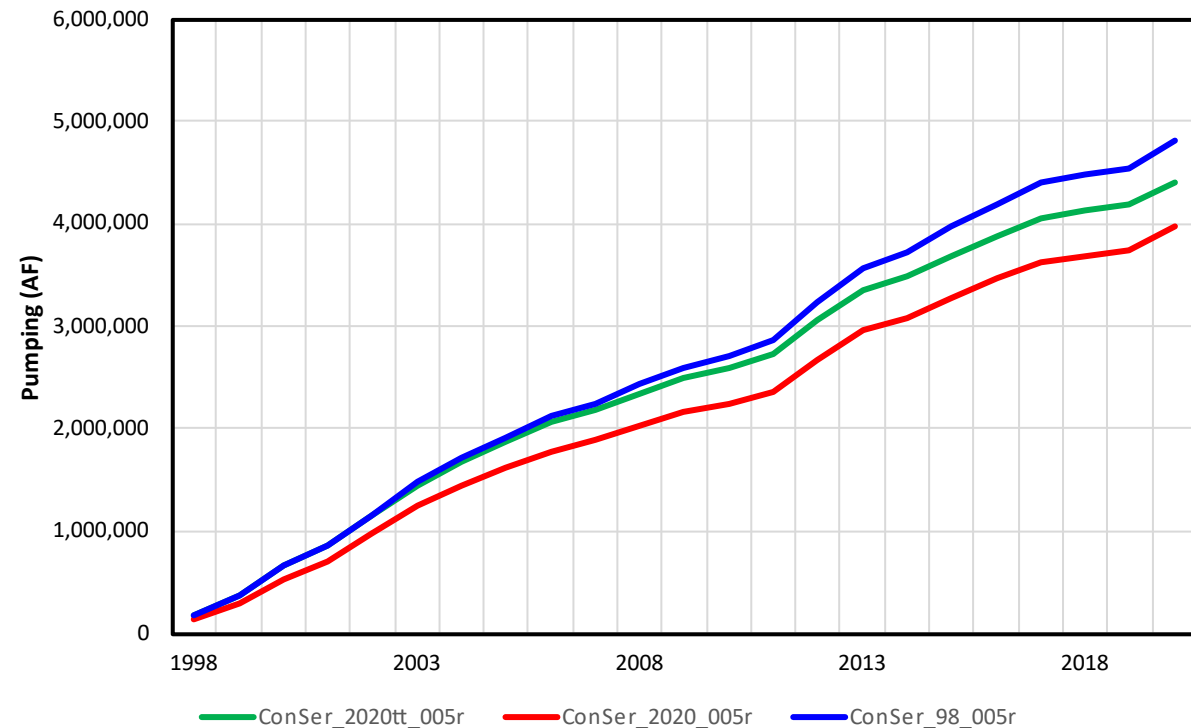
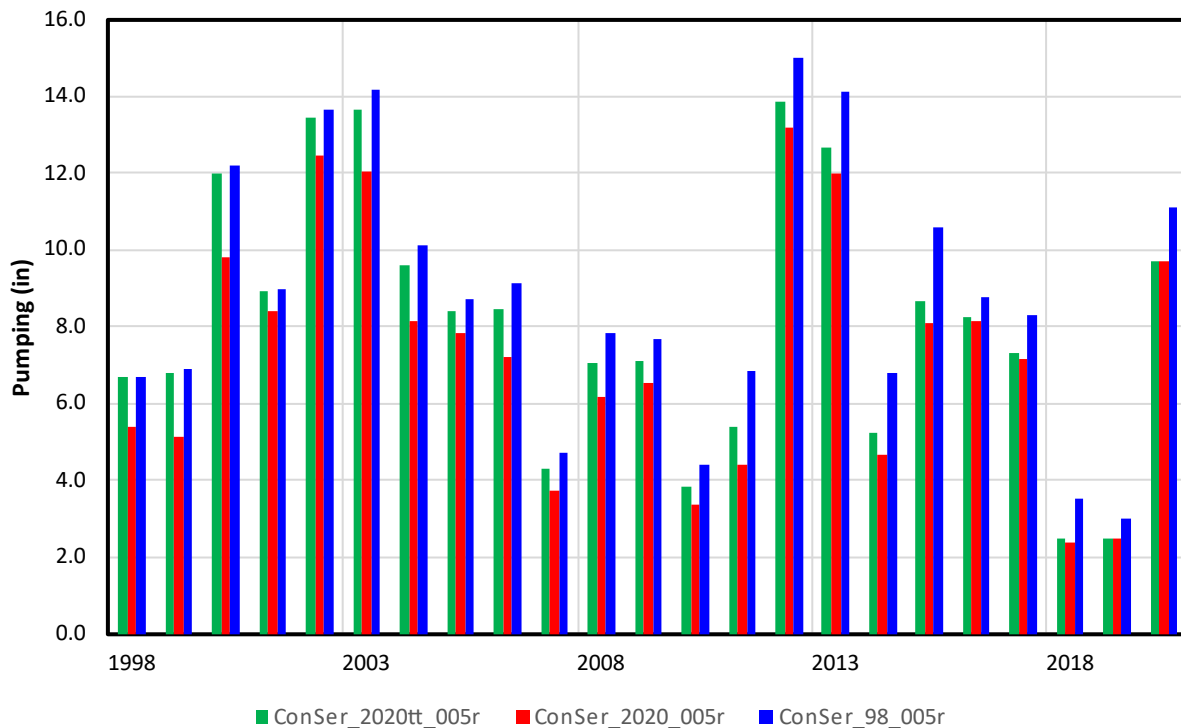
Regional Water Balance – Average Annual

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|-------------------------------------|------------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 972,160 | | | 972,160 | | | 972,160 | | |
| Precipitation | 2,073,844 | 25.60 | 84.3% | 2,073,844 | 25.60 | 85.7% | 2,073,844 | 25.60 | 84.9% |
| Groundwater Pumping | 329,931 | 4.07 | 13.4% | 295,462 | 3.65 | 12.2% | 313,828 | 3.87 | 12.9% |
| Surface Water Deliveries | 57,345 | 0.71 | 2.3% | 50,075 | 0.62 | 2.1% | 54,257 | 0.67 | 2.2% |
| Total Applied Water | 2,461,120 | 30.38 | 100.0% | 2,419,381 | 29.86 | 100.0% | 2,441,929 | 30.14 | 100.0% |
| Field Evapotranspiration | 2,024,642 | 24.99 | 82.3% | 1,958,342 | 24.17 | 80.9% | 1,991,189 | 24.58 | 81.5% |
| Field Deep Percolation | 203,397 | 2.51 | 8.3% | 251,359 | 3.10 | 10.4% | 230,350 | 2.84 | 9.4% |
| Field Runoff | 235,170 | 2.90 | 9.6% | 213,181 | 2.63 | 8.8% | 223,745 | 2.76 | 9.2% |
| Irrigation Surface Losses | 18,217 | 0.22 | 0.7% | 16,275 | 0.20 | 0.7% | 17,319 | 0.21 | 0.7% |
| Field Water Balance | (20,305) | (0.25) | -0.8% | (19,776) | (0.24) | -0.8% | (20,675) | (0.26) | -0.8% |
| Lateral Losses | 5,488 | 0.07 | 0.2% | 4,790 | 0.06 | 0.2% | 5,196 | 0.06 | 0.2% |
| Field Runoff | 235,170 | 2.90 | 9.6% | 213,181 | 2.63 | 8.8% | 223,745 | 2.76 | 9.2% |
| Runoff Contributions to Streamflow | 138,187 | 1.71 | 5.6% | 125,693 | 1.55 | 5.2% | 131,680 | 1.63 | 5.4% |
| Runoff Losses to Recharge | 48,491 | 0.60 | 2.0% | 43,744 | 0.54 | 1.8% | 46,033 | 0.57 | 1.9% |
| Runoff Losses to Evapotranspiration | 48,491 | 0.60 | 2.0% | 43,744 | 0.54 | 1.8% | 46,033 | 0.57 | 1.9% |

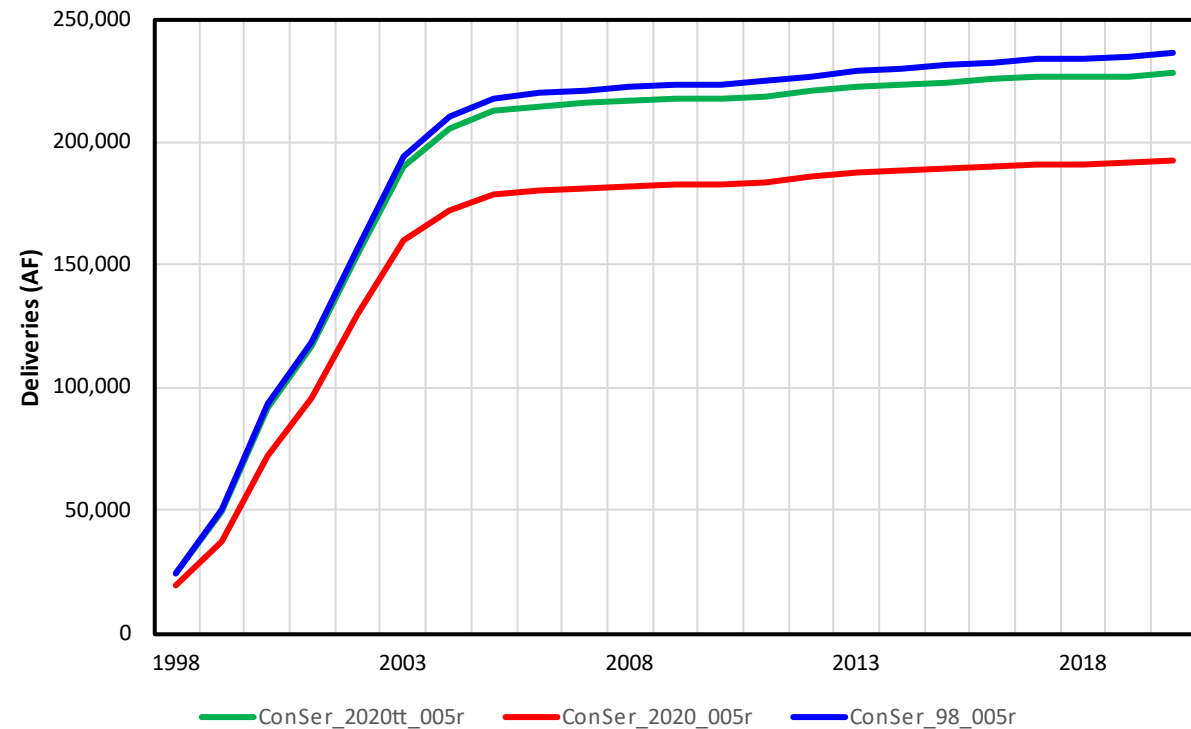
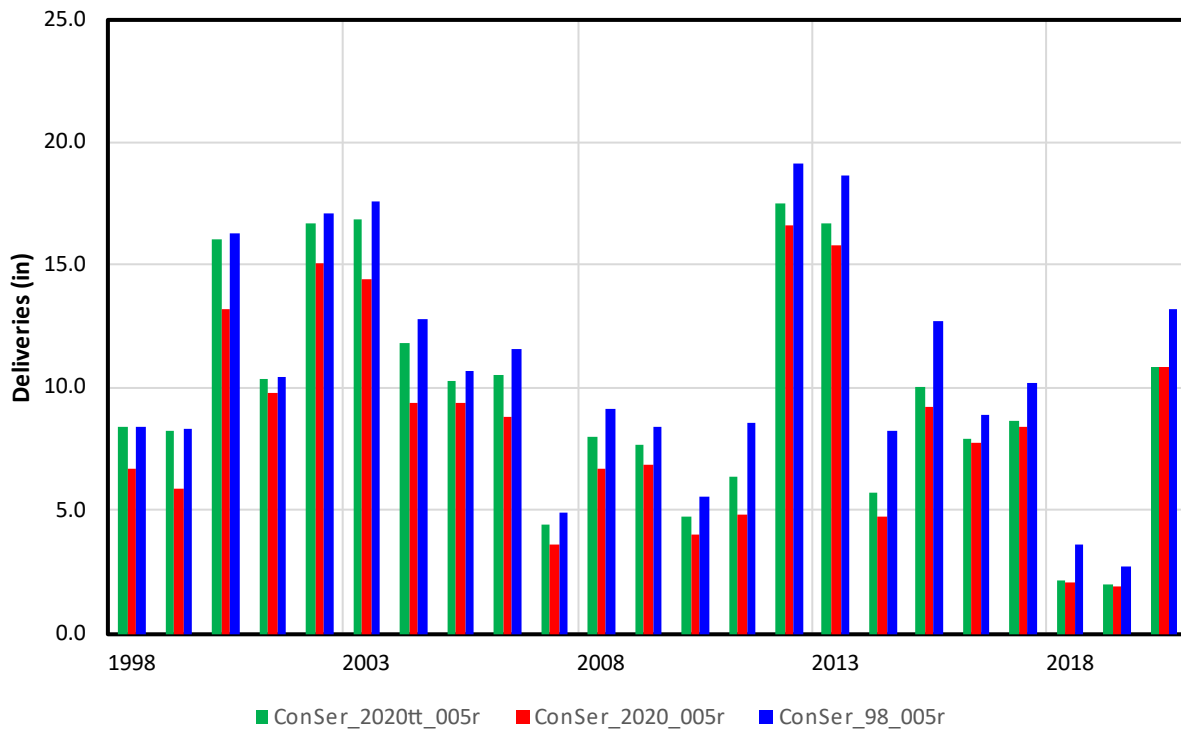
COHYST – Tri-Basin NRD Regional Water Balance Groundwater Only Corn – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|----------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 156,384 | | | 156,384 | | | 156,384 | | |
| Precipitation | 336,864 | 25.85 | 75.1% | 336,864 | 25.85 | 78.0% | 336,864 | 25.85 | 76.3% |
| Groundwater Pumping | 111,641 | 8.57 | 24.9% | 94,826 | 7.28 | 22.0% | 104,734 | 8.04 | 23.7% |
| Surface Water Deliveries | - | - | 0.0% | - | - | 0.0% | - | - | 0.0% |
| Total Applied Water | 448,504 | 34.42 | 100.0% | 431,690 | 33.13 | 100.0% | 441,598 | 33.89 | 100.0% |
| Field Evapotranspiration | 365,039 | 28.01 | 81.4% | 338,406 | 25.97 | 78.4% | 353,177 | 27.10 | 80.0% |
| Field Deep Percolation | 33,058 | 2.54 | 7.4% | 47,502 | 3.65 | 11.0% | 40,149 | 3.08 | 9.1% |
| Field Runoff | 48,739 | 3.74 | 10.9% | 44,919 | 3.45 | 10.4% | 47,037 | 3.61 | 10.7% |
| Irrigation Surface Losses | 5,582 | 0.43 | 1.2% | 4,741 | 0.36 | 1.1% | 5,237 | 0.40 | 1.2% |
| Field Water Balance | (3,914) | (0.30) | -0.9% | (3,878) | (0.30) | -0.9% | (4,002) | (0.31) | -0.9% |
| Lateral Losses | - | - | 0.0% | - | - | 0.0% | - | - | 0.0% |
| Field Runoff | 48,739 | 3.74 | 10.9% | 44,919 | 3.45 | 10.4% | 47,037 | 3.61 | 10.7% |
| Runoff Contributions to Streamflow | 29,092 | 2.23 | 6.5% | 27,029 | 2.07 | 6.3% | 28,166 | 2.16 | 6.4% |
| Runoff Losses to Recharge | 9,823 | 0.75 | 2.2% | 8,945 | 0.69 | 2.1% | 9,435 | 0.72 | 2.1% |
| Runoff Losses to Evapotranspiration | 9,823 | 0.75 | 2.2% | 8,945 | 0.69 | 2.1% | 9,435 | 0.72 | 2.1% |

Groundwater Pumping Tri-Basin NRD Groundwater Only Irrigated Lands – Corn



Surface Water Deliveries Tri-Basin NRD Surface Water Only Irrigated Lands – Corn

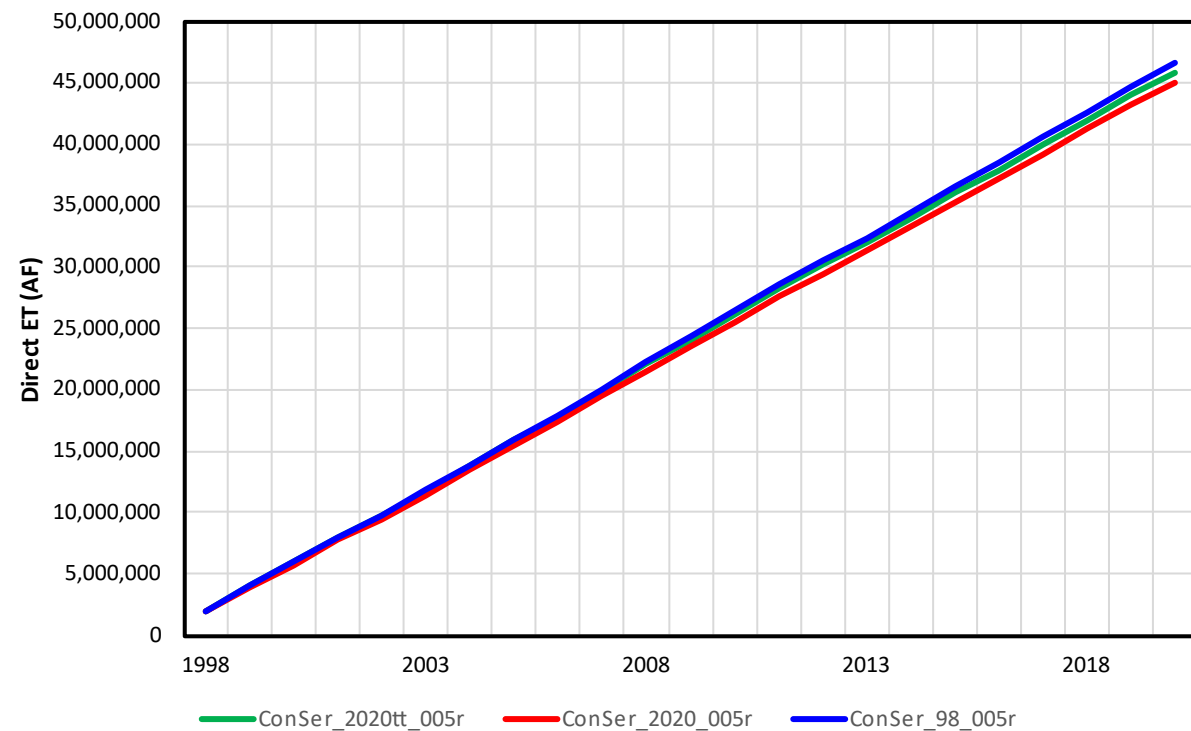
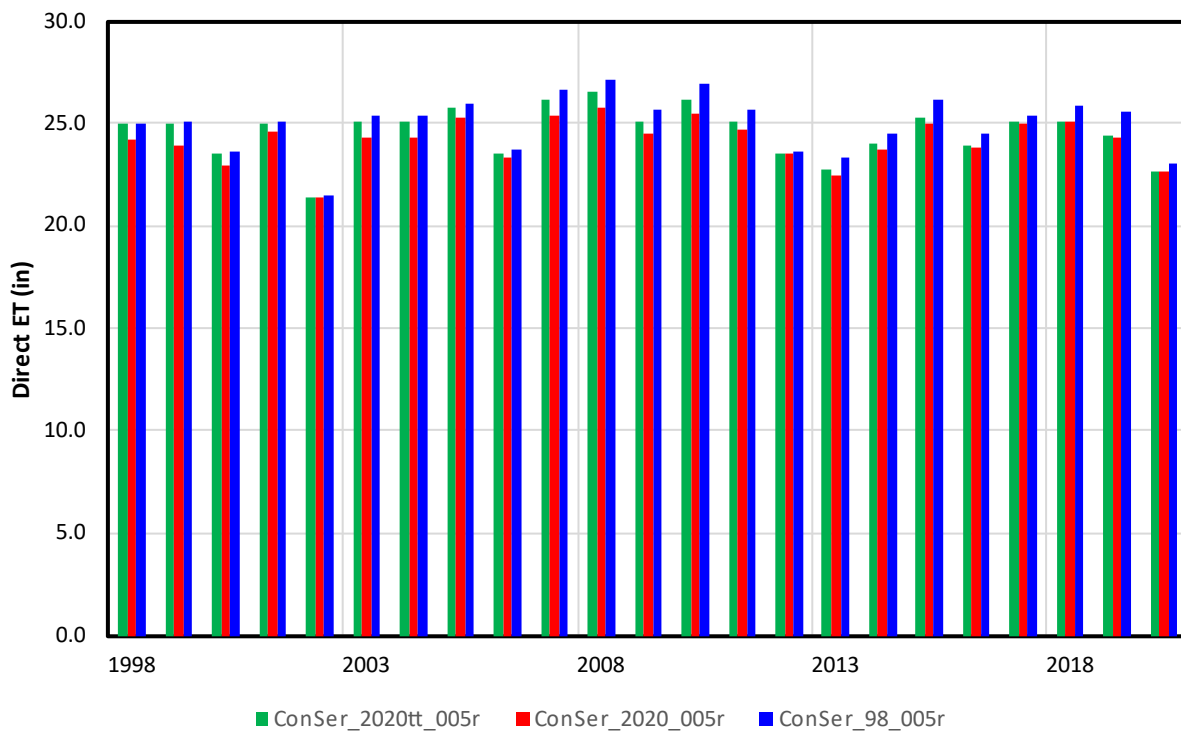


COHYST – Tri-Basin NRD

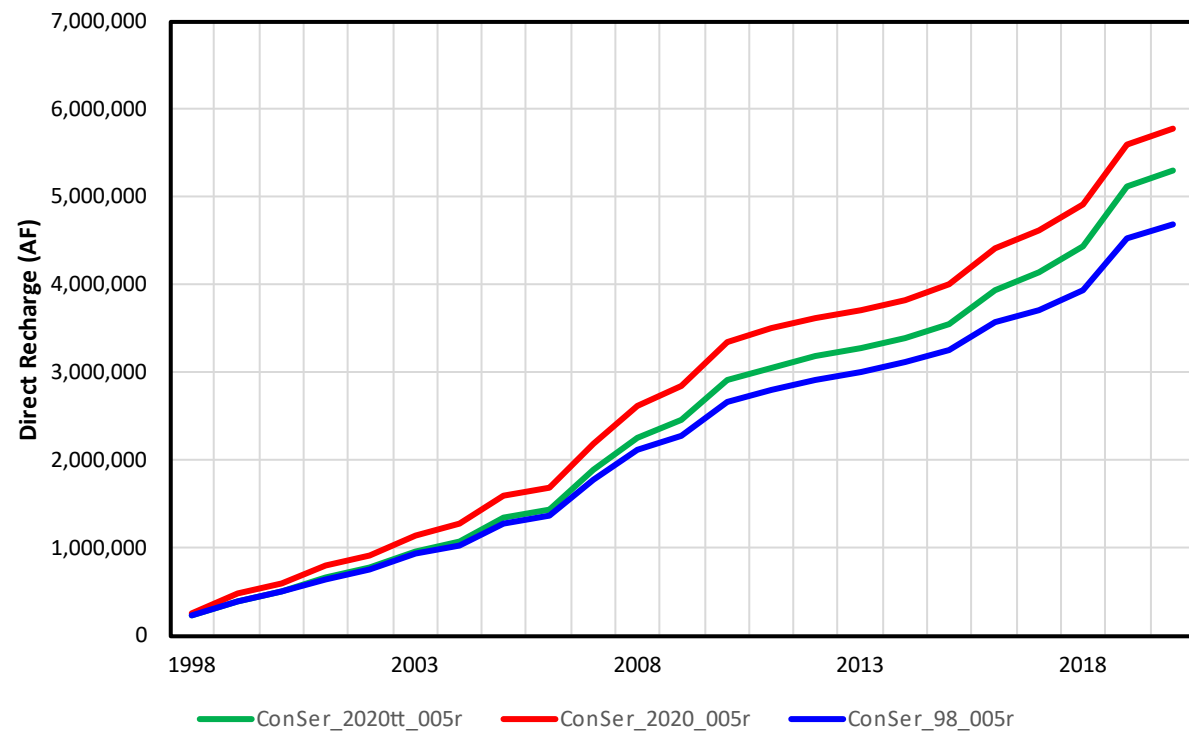
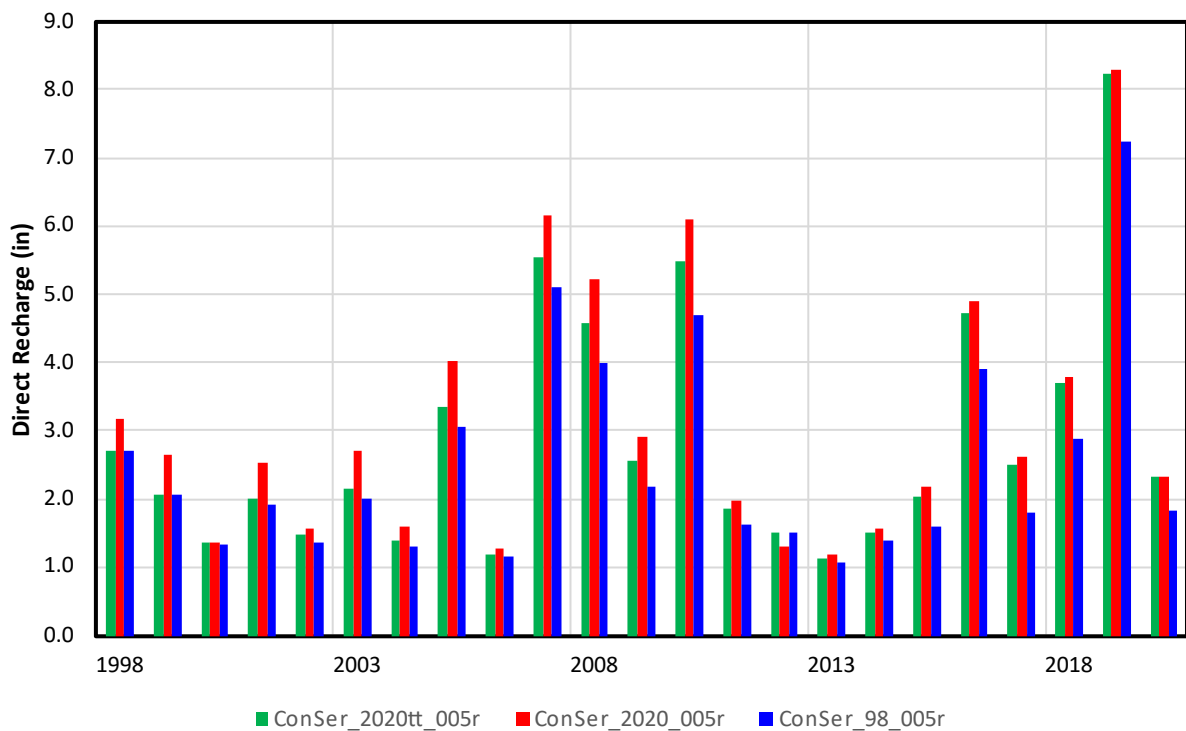
Regional Water Balance – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|------------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 972,160 | | | 972,160 | | | 972,160 | | |
| Precipitation | 2,073,844 | 25.60 | 84.3% | 2,073,844 | 25.60 | 85.7% | 2,073,844 | 25.60 | 84.9% |
| Groundwater Pumping | 329,931 | 4.07 | 13.4% | 295,462 | 3.65 | 12.2% | 313,828 | 3.87 | 12.9% |
| Surface Water Deliveries | 57,345 | 0.71 | 2.3% | 50,075 | 0.62 | 2.1% | 54,257 | 0.67 | 2.2% |
| Total Applied Water | 2,461,120 | 30.38 | 100.0% | 2,419,381 | 29.86 | 100.0% | 2,441,929 | 30.14 | 100.0% |
| Field Evapotranspiration | 2,024,642 | 24.99 | 82.3% | 1,958,342 | 24.17 | 80.9% | 1,991,189 | 24.58 | 81.5% |
| Field Deep Percolation | 203,397 | 2.51 | 8.3% | 251,359 | 3.10 | 10.4% | 230,350 | 2.84 | 9.4% |
| Field Runoff | 235,170 | 2.90 | 9.6% | 213,181 | 2.63 | 8.8% | 223,745 | 2.76 | 9.2% |
| Irrigation Surface Losses | 18,217 | 0.22 | 0.7% | 16,275 | 0.20 | 0.7% | 17,319 | 0.21 | 0.7% |
| Field Water Balance | (20,305) | (0.25) | -0.8% | (19,776) | (0.24) | -0.8% | (20,675) | (0.26) | -0.8% |
| Lateral Losses | 5,488 | 0.07 | 0.2% | 4,790 | 0.06 | 0.2% | 5,196 | 0.06 | 0.2% |
| Field Runoff | 235,170 | 2.90 | 9.6% | 213,181 | 2.63 | 8.8% | 223,745 | 2.76 | 9.2% |
| Runoff Contributions to Streamflow | 138,187 | 1.71 | 5.6% | 125,693 | 1.55 | 5.2% | 131,680 | 1.63 | 5.4% |
| Runoff Losses to Recharge | 48,491 | 0.60 | 2.0% | 43,744 | 0.54 | 1.8% | 46,033 | 0.57 | 1.9% |
| Runoff Losses to Evapotranspiration | 48,491 | 0.60 | 2.0% | 43,744 | 0.54 | 1.8% | 46,033 | 0.57 | 1.9% |

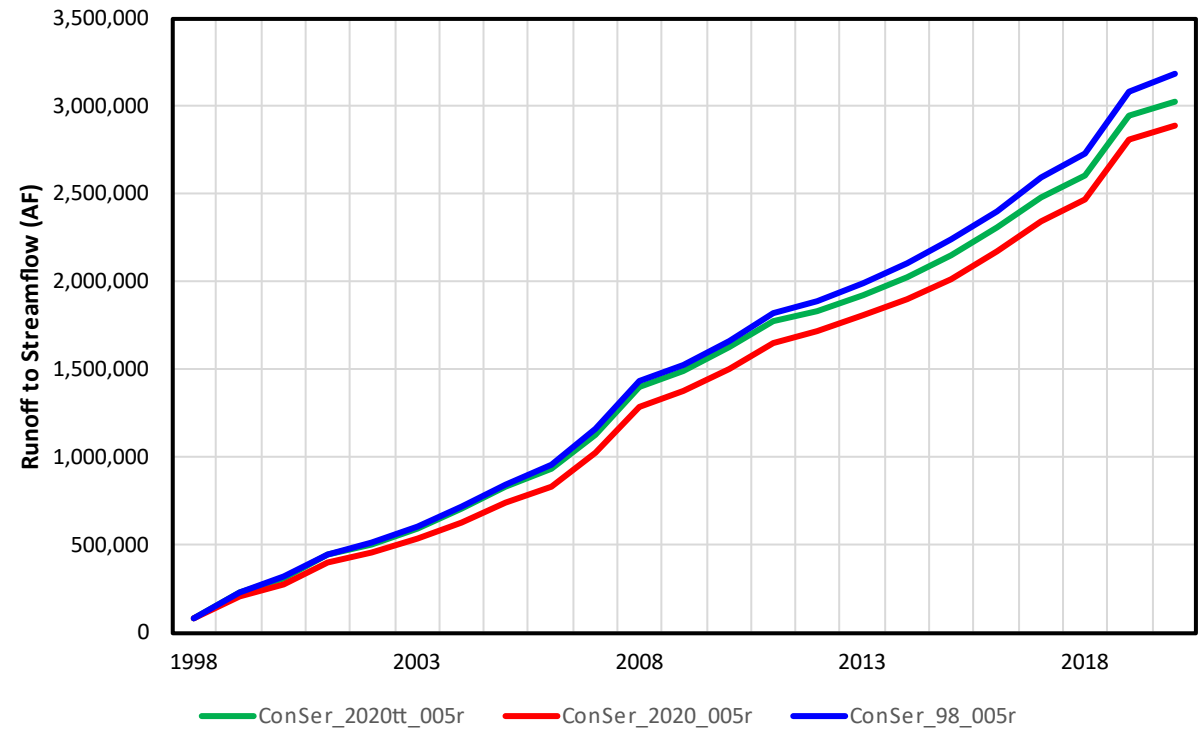
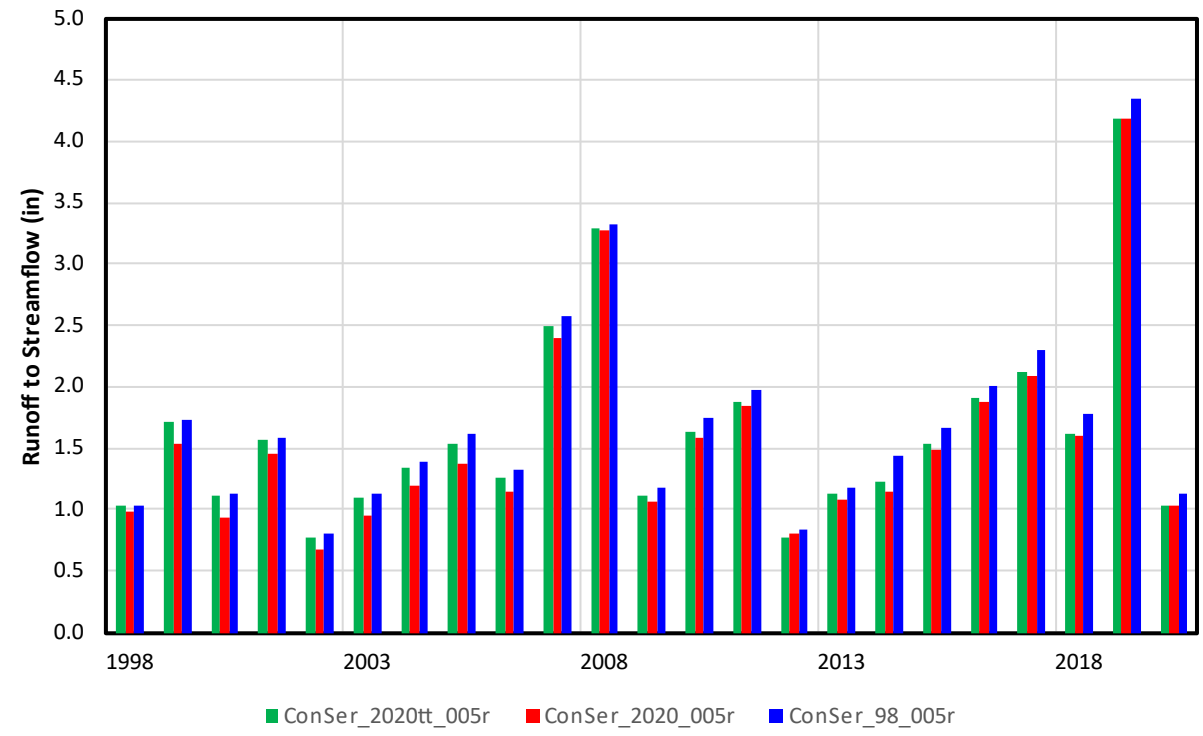
Direct Evapotranspiration Tri-Basin NRD



Direct Recharge Tri-Basin NRD

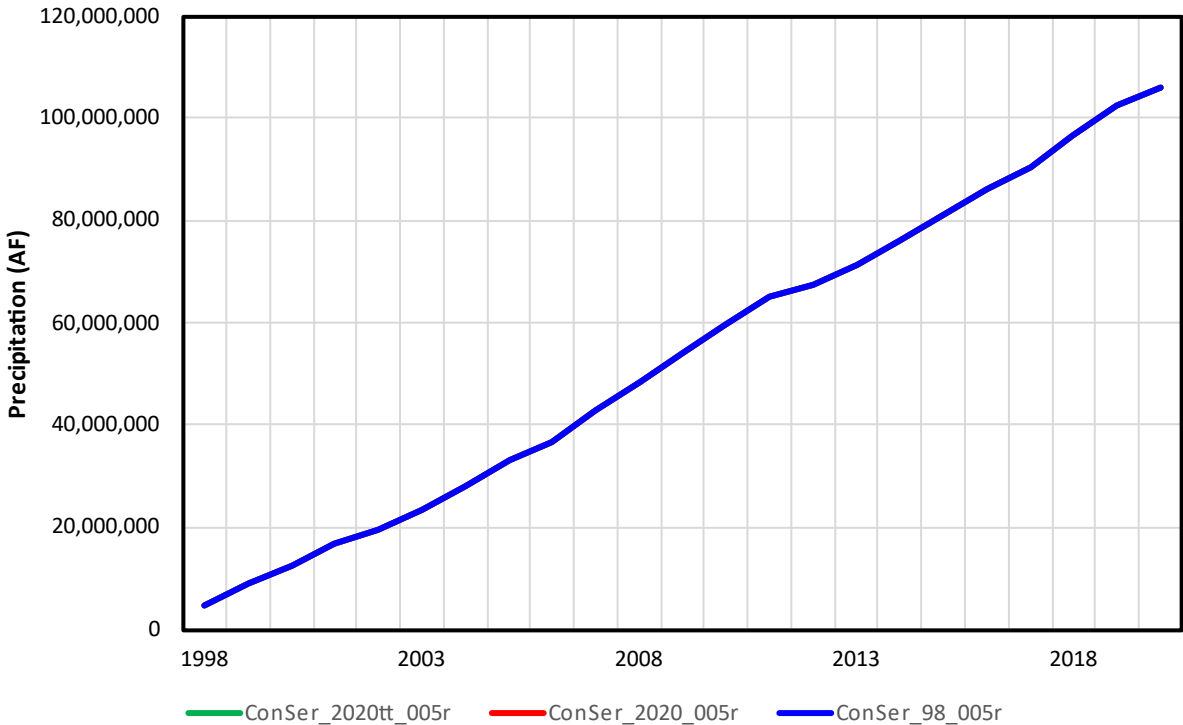
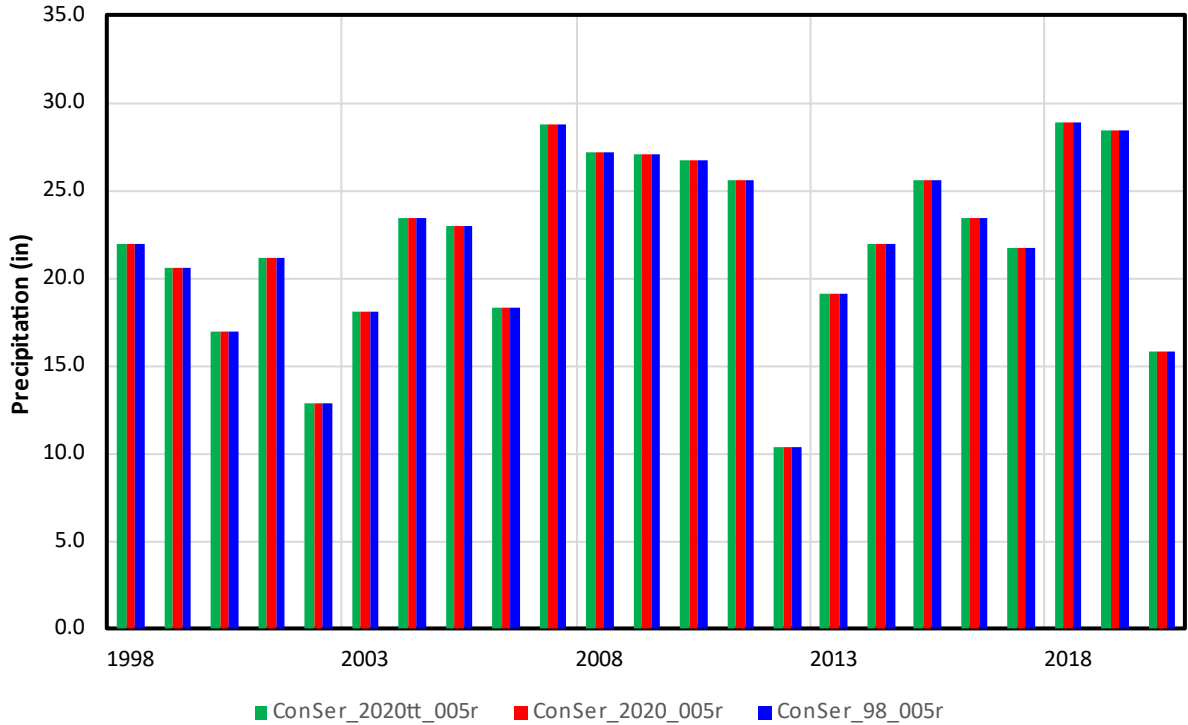


Runoff Contributions to Streamflow Tri-Basin NRD



Twin Platte NRD

Annual Precipitation Twin Platte NRD



COHYST – Twin Platte NRD

Regional Water Balance – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|------------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 2,507,680 | | | 2,507,680 | | | 2,507,680 | | |
| Precipitation | 4,604,316 | 22.03 | 92.7% | 4,604,316 | 22.03 | 93.2% | 4,604,316 | 22.03 | 93.0% |
| Groundwater Pumping | 324,340 | 1.55 | 6.5% | 302,003 | 1.45 | 6.1% | 312,556 | 1.50 | 6.3% |
| Surface Water Deliveries | 36,548 | 0.17 | 0.7% | 34,495 | 0.17 | 0.7% | 35,662 | 0.17 | 0.7% |
| Total Applied Water | 4,965,204 | 23.76 | 100.0% | 4,940,813 | 23.64 | 100.0% | 4,952,533 | 23.70 | 100.0% |
| Field Evapotranspiration | 4,280,122 | 20.48 | 86.2% | 4,247,948 | 20.33 | 86.0% | 4,262,827 | 20.40 | 86.1% |
| Field Deep Percolation | 550,330 | 2.63 | 11.1% | 566,229 | 2.71 | 11.5% | 558,990 | 2.67 | 11.3% |
| Field Runoff | 136,986 | 0.66 | 2.8% | 128,926 | 0.62 | 2.6% | 133,003 | 0.64 | 2.7% |
| Irrigation Surface Losses | 17,313 | 0.08 | 0.3% | 16,135 | 0.08 | 0.3% | 16,698 | 0.08 | 0.3% |
| Field Water Balance | (19,547) | (0.09) | -0.4% | (18,425) | (0.09) | -0.4% | (18,984) | (0.09) | -0.4% |
| Lateral Losses | 2,133 | 0.01 | 0.0% | 1,993 | 0.01 | 0.0% | 2,069 | 0.01 | 0.0% |
| Field Runoff | 136,986 | 0.66 | 2.8% | 128,926 | 0.62 | 2.6% | 133,003 | 0.64 | 2.7% |
| Runoff Contributions to Streamflow | 98,009 | 0.47 | 2.0% | 92,067 | 0.44 | 1.9% | 95,086 | 0.46 | 1.9% |
| Runoff Losses to Recharge | 19,488 | 0.09 | 0.4% | 18,430 | 0.09 | 0.4% | 18,958 | 0.09 | 0.4% |
| Runoff Losses to Evapotranspiration | 19,488 | 0.09 | 0.4% | 18,430 | 0.09 | 0.4% | 18,958 | 0.09 | 0.4% |

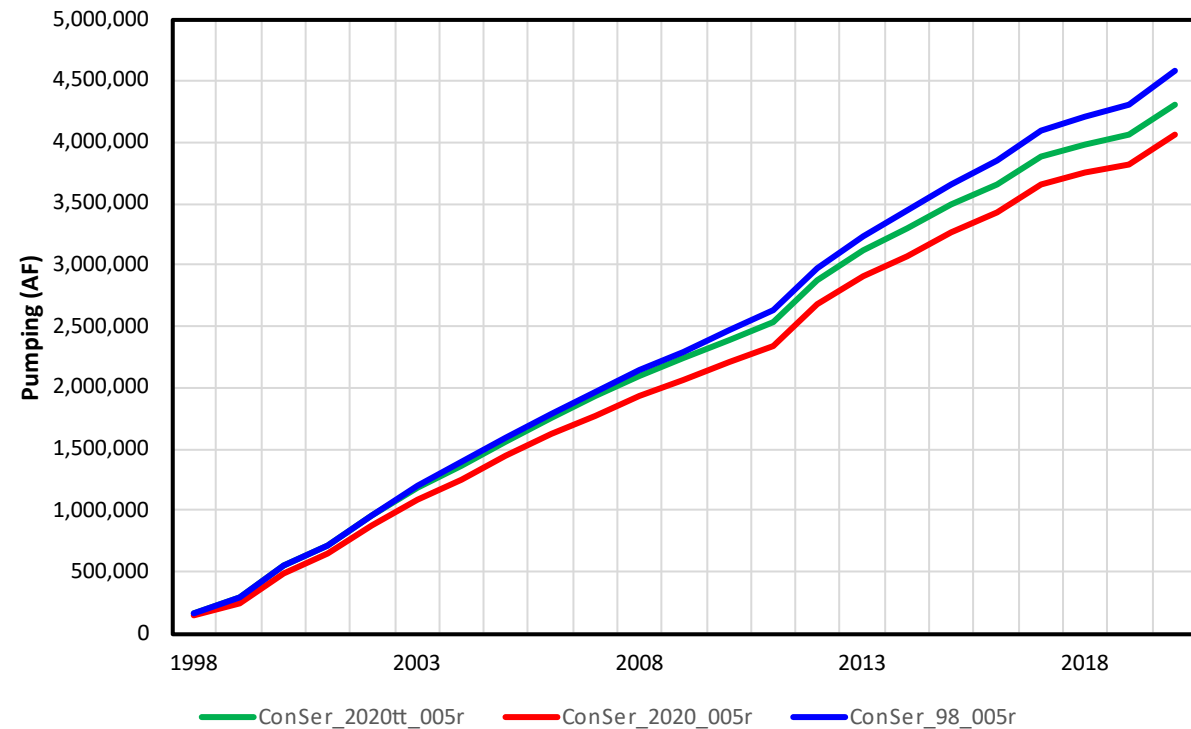
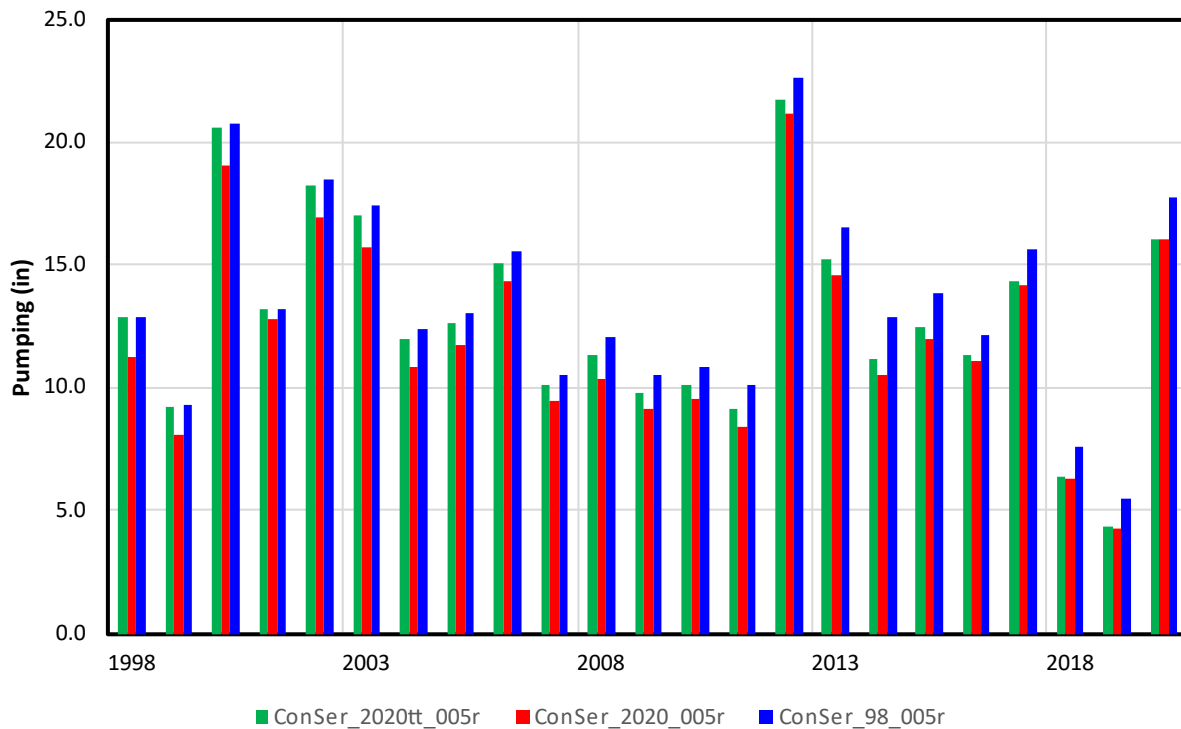
COHYST – Twin Platte NRD

Regional Water Balance

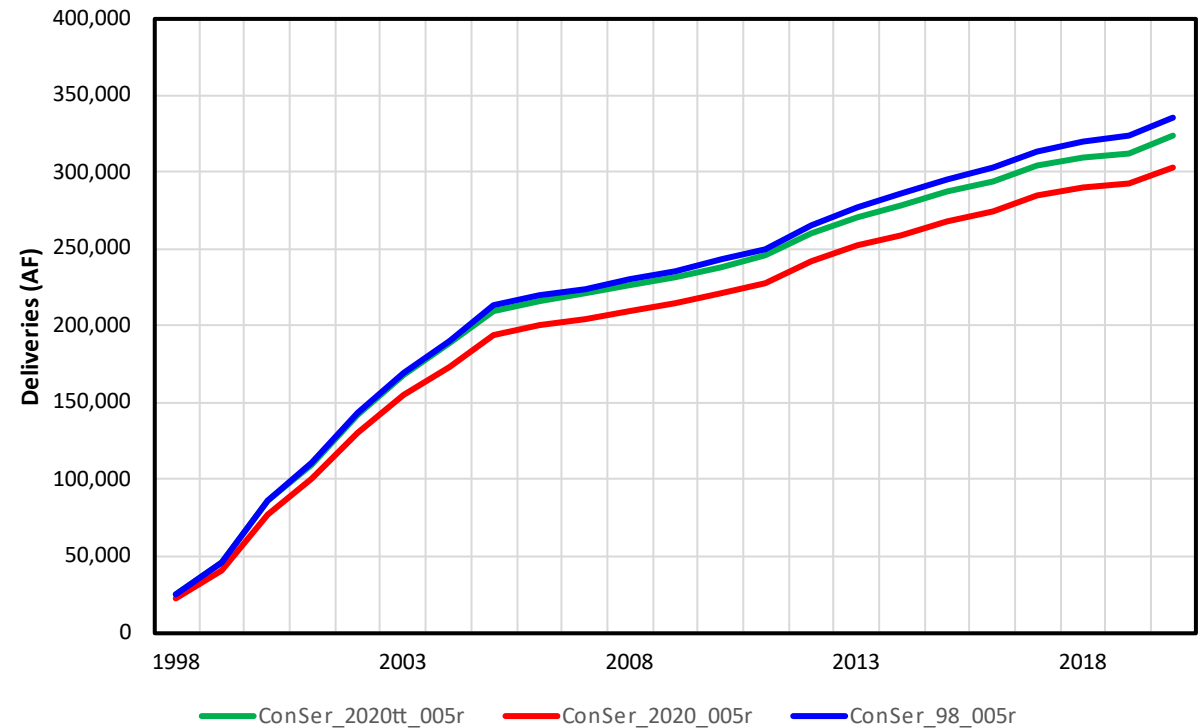
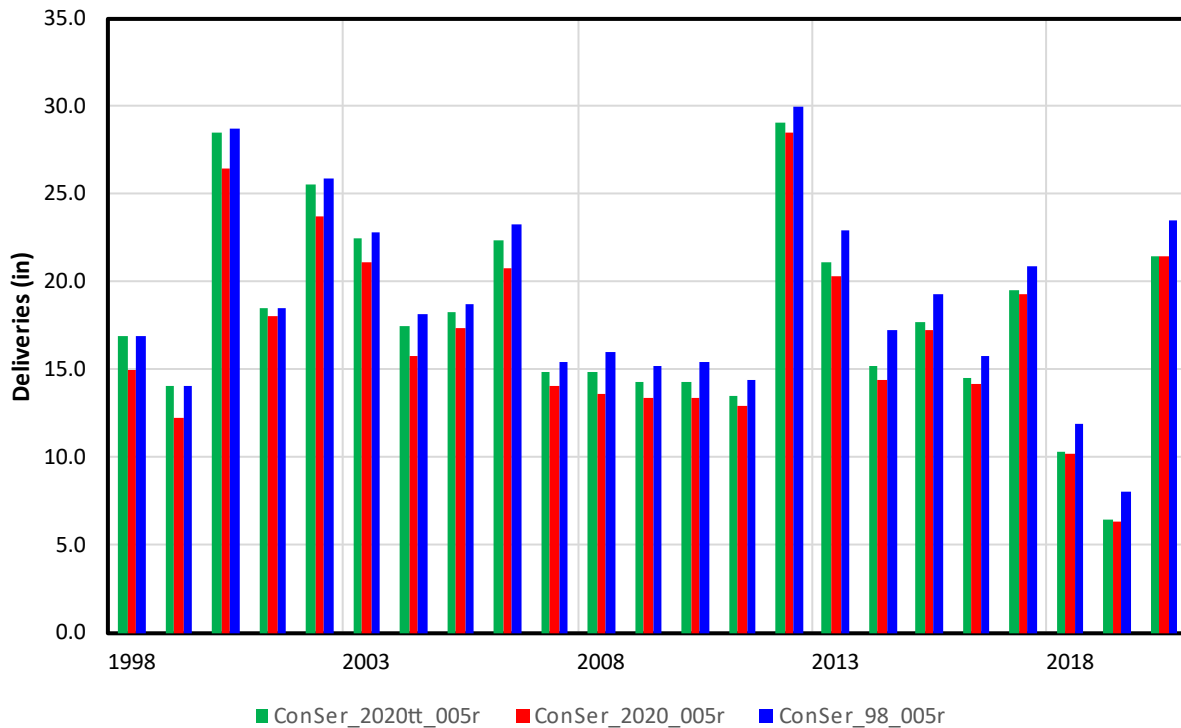
Groundwater Only Corn – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|----------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 145,942 | | | 145,942 | | | 145,942 | | |
| Precipitation | 266,030 | 21.87 | 62.1% | 266,030 | 21.87 | 64.4% | 266,030 | 21.87 | 63.2% |
| Groundwater Pumping | 162,379 | 13.35 | 37.9% | 147,137 | 12.10 | 35.6% | 154,776 | 12.73 | 36.8% |
| Surface Water Deliveries | - | - | 0.0% | - | - | 0.0% | - | - | 0.0% |
| Total Applied Water | 428,410 | 35.23 | 100.0% | 413,168 | 33.97 | 100.0% | 420,806 | 34.60 | 100.0% |
| Field Evapotranspiration | 344,480 | 28.32 | 80.4% | 325,333 | 26.75 | 78.7% | 334,722 | 27.52 | 79.5% |
| Field Deep Percolation | 42,463 | 3.49 | 9.9% | 49,004 | 4.03 | 11.9% | 45,873 | 3.77 | 10.9% |
| Field Runoff | 34,530 | 2.84 | 8.1% | 32,769 | 2.69 | 7.9% | 33,698 | 2.77 | 8.0% |
| Irrigation Surface Losses | 8,119 | 0.67 | 1.9% | 7,357 | 0.60 | 1.8% | 7,739 | 0.64 | 1.8% |
| Field Water Balance | (1,182) | (0.10) | -0.3% | (1,295) | (0.11) | -0.3% | (1,226) | (0.10) | -0.3% |
| Lateral Losses | - | - | 0.0% | - | - | 0.0% | - | - | 0.0% |
| Field Runoff | 34,530 | 2.84 | 8.1% | 32,769 | 2.69 | 7.9% | 33,698 | 2.77 | 8.0% |
| Runoff Contributions to Streamflow | 24,332 | 2.00 | 5.7% | 23,021 | 1.89 | 5.6% | 23,711 | 1.95 | 5.6% |
| Runoff Losses to Recharge | 5,099 | 0.42 | 1.2% | 4,874 | 0.40 | 1.2% | 4,994 | 0.41 | 1.2% |
| Runoff Losses to Evapotranspiration | 5,099 | 0.42 | 1.2% | 4,874 | 0.40 | 1.2% | 4,994 | 0.41 | 1.2% |

Groundwater Pumping Twin Platte NRD Groundwater Only Irrigated Lands – Corn



Surface Water Deliveries Twin Platte NRD Surface Water Only Irrigated Lands – Corn

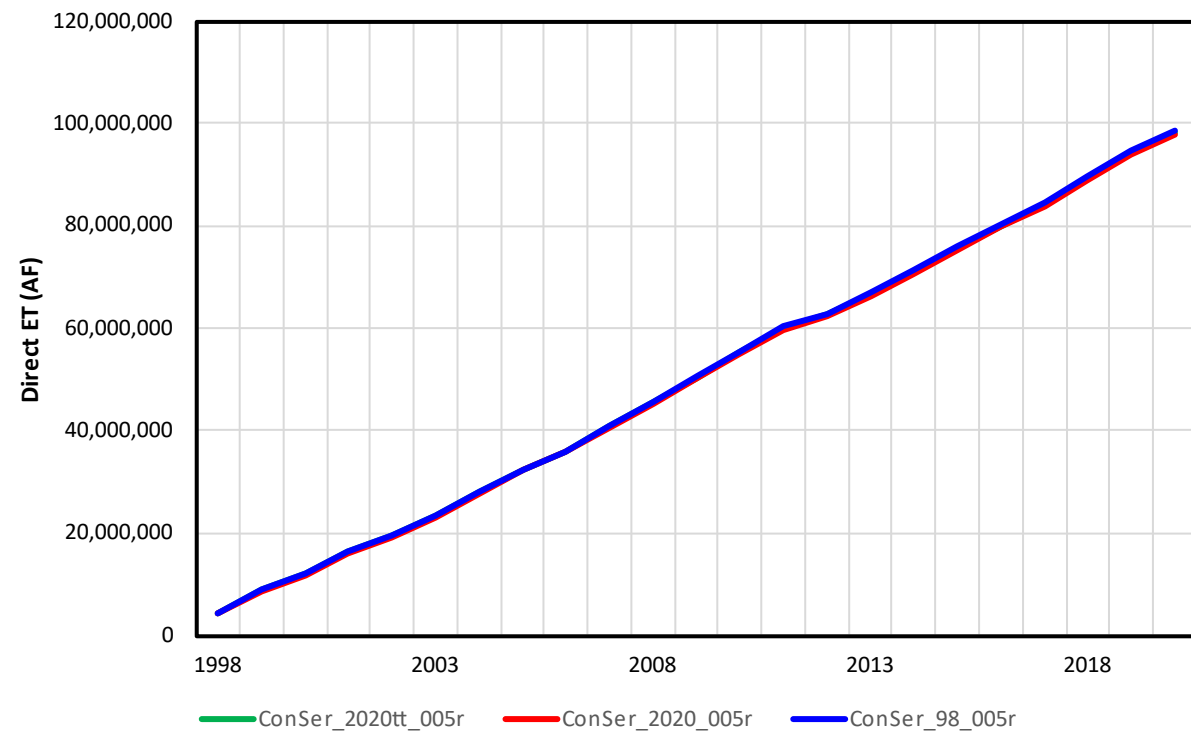
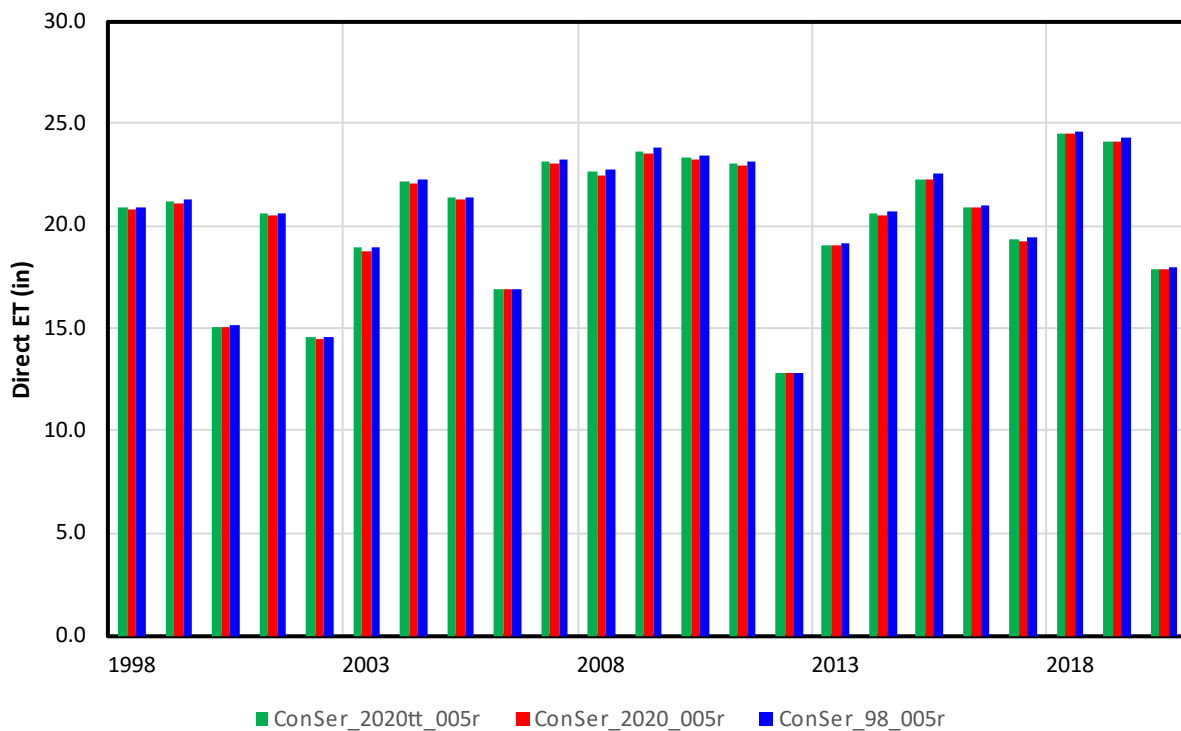


COHYST – Twin Platte NRD

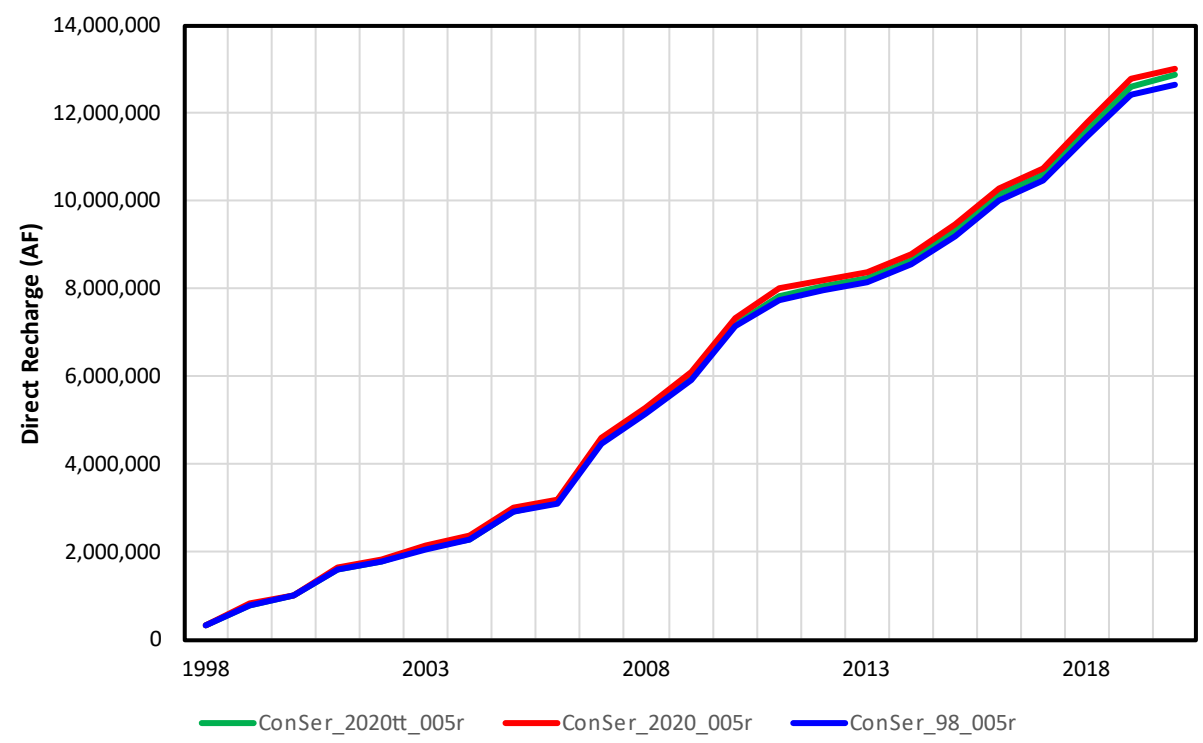
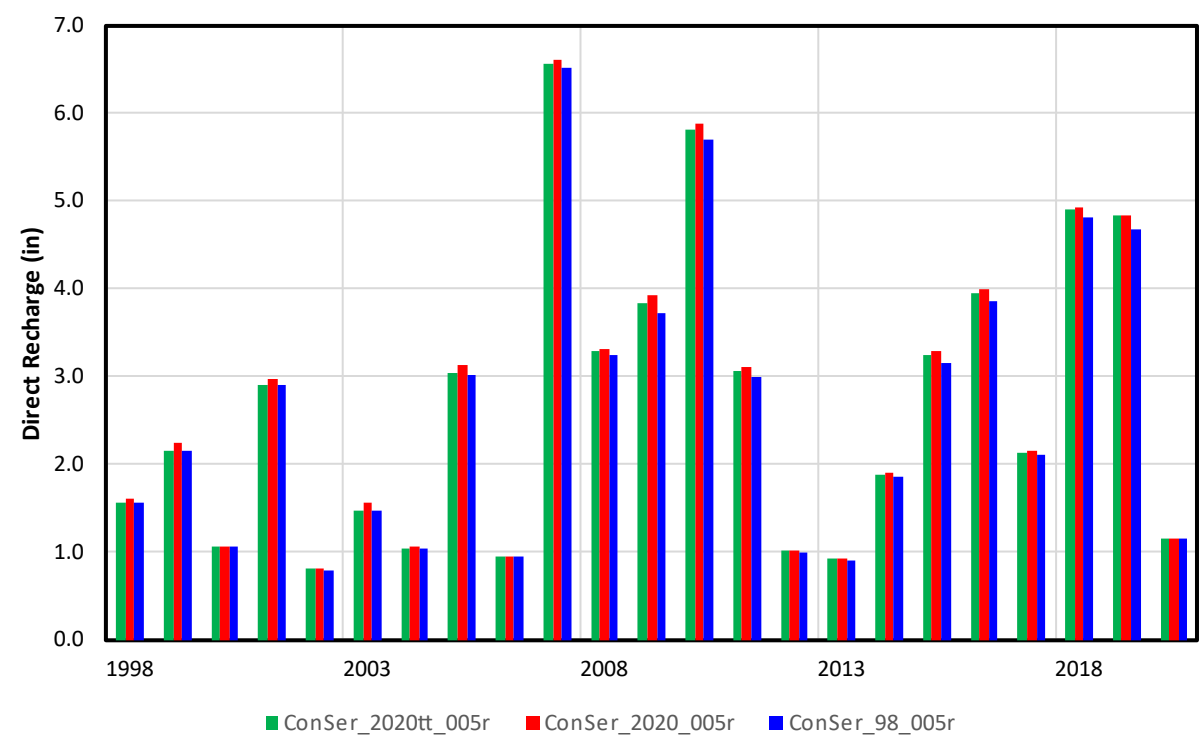
Regional Water Balance – Average Annual

| Parameter | ConSer_98_005r | | | ConSer_2020_005r | | | ConSer_2020tt_005r | | |
|-------------------------------------|------------------|---------------|---------------|------------------|---------------|---------------|--------------------|---------------|---------------|
| | AF | in | % | AF | in | % | AF | in | % |
| Acres | 2,507,680 | | | 2,507,680 | | | 2,507,680 | | |
| Precipitation | 4,604,316 | 22.03 | 92.7% | 4,604,316 | 22.03 | 93.2% | 4,604,316 | 22.03 | 93.0% |
| Groundwater Pumping | 324,340 | 1.55 | 6.5% | 302,003 | 1.45 | 6.1% | 312,556 | 1.50 | 6.3% |
| Surface Water Deliveries | 36,548 | 0.17 | 0.7% | 34,495 | 0.17 | 0.7% | 35,662 | 0.17 | 0.7% |
| Total Applied Water | 4,965,204 | 23.76 | 100.0% | 4,940,813 | 23.64 | 100.0% | 4,952,533 | 23.70 | 100.0% |
| Field Evapotranspiration | 4,280,122 | 20.48 | 86.2% | 4,247,948 | 20.33 | 86.0% | 4,262,827 | 20.40 | 86.1% |
| Field Deep Percolation | 550,330 | 2.63 | 11.1% | 566,229 | 2.71 | 11.5% | 558,990 | 2.67 | 11.3% |
| Field Runoff | 136,986 | 0.66 | 2.8% | 128,926 | 0.62 | 2.6% | 133,003 | 0.64 | 2.7% |
| Irrigation Surface Losses | 17,313 | 0.08 | 0.3% | 16,135 | 0.08 | 0.3% | 16,698 | 0.08 | 0.3% |
| Field Water Balance | (19,547) | (0.09) | -0.4% | (18,425) | (0.09) | -0.4% | (18,984) | (0.09) | -0.4% |
| Lateral Losses | 2,133 | 0.01 | 0.0% | 1,993 | 0.01 | 0.0% | 2,069 | 0.01 | 0.0% |
| Field Runoff | 136,986 | 0.66 | 2.8% | 128,926 | 0.62 | 2.6% | 133,003 | 0.64 | 2.7% |
| Runoff Contributions to Streamflow | 98,009 | 0.47 | 2.0% | 92,067 | 0.44 | 1.9% | 95,086 | 0.46 | 1.9% |
| Runoff Losses to Recharge | 19,488 | 0.09 | 0.4% | 18,430 | 0.09 | 0.4% | 18,958 | 0.09 | 0.4% |
| Runoff Losses to Evapotranspiration | 19,488 | 0.09 | 0.4% | 18,430 | 0.09 | 0.4% | 18,958 | 0.09 | 0.4% |

Direct Evapotranspiration Twin Platte NRD



Direct Recharge Twin Platte NRD



Runoff Contributions to Streamflow Twin Platte NRD

