



STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
WATER RESOURCE ALLOCATION PROGRAM
WATER RIGHTS DIVISION
DISTRICT IV, LAS CRUCES

LOWER RIO GRANDE WATER MASTER
ANNUAL REPORT
2019 ACCOUNTING YEAR



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INTRODUCTION

On December 3, 2004 the Lower Rio Grande (LRG) Water Master District was established by Order of the State Engineer (SE). The District encompasses a geographic area of 4,224 square miles. The district stretches from its northern extent at the base of Elephant Butte Reservoir in Sierra County, to the southern extent at the New Mexico/Texas/Mexico border in southern Dona Ana County (*See Figure 1 on Page 4*). The District includes the Lower Rio Grande Administrative basin, the Hot Springs Administrative Basin, and the Las Animas Administrative Basin. There are several water users within the District. To name a few: the City of Las Cruces, City of Truth or Consequences, members of the Elephant Butte Irrigation District (EBID), New Mexico State University, New Mexico Spaceport Authority, NASA – Lyndon B. Johnson White Sands Test Facility, Public Utilities of New Mexico, & Union Pacific Intermodal Rail Yard. Additionally, the LRG Water Master District is home to one of the state’s largest agricultural producing regions that heavily contributes to the state’s \$3.17 billion dollar agricultural industry.

The counties within the district consistently maintain top tier national rankings for yield and cash value of crops sold. Examples include: Pecans (National Rank #1 with 91,100,000lbs produced valued at over \$173.09 million). Dona Ana County in particular accounted for 66% of the nation’s total pecan production in 2018 and the state of New Mexico was the number 1 ranked state in the nation for production of pecans. Chile is also a major cash crop within the district. For the first time in 2018 New Mexico surpassed California as the #1 producing state for Chile peppers (National Rank #1 with 71.1 thousand tons produced in 2018 valued at \$53.8 million). A third crop worth mentioning is Onion. New Mexico ranks fifth in the nation for onion production with a 2018 crop value of \$68 million, Sierra & Dona Ana County account for a large portion of this production. *All of the above referenced statistics according to the New Mexico Department of Agriculture’s 2018 Agricultural Statistics Bulletin.*

BACKGROUND

The surface and groundwater of the District are administered in accordance with all applicable New Mexico state laws and more specifically in accordance with all SE Order's, permits, licenses, hydrographic surveys, court adjudications, compacts, and settlement agreements, including the following:

- ❖ New Mexico Statutes Annotated, Chapter 72 & 73
- ❖ The Rio Grande Compact (March. 1938)
- ❖ The Lower Rio Grande Adjudication (State of New Mexico v. EBID)
- ❖ Lower Rio Grande Adjudication, SS-97-101- Settlement Agreement and Third Judicial District Court Final Order (Aug. 2011)
- ❖ SE Order Number 168, First Initial Metering Order (Dec. 2004)
- ❖ SE Order Number 169, Creating the LRG Water Master District (Dec. 2004)
- ❖ SE Order Number 172, Amended Metering Order (Dec. 2005)
- ❖ SE Order Number 180, Supplemental Metering Order (March. 2007)
- ❖ The Hot Springs Hydrographic Survey (1958)
- ❖ The Las Animas Creek Adjudication, Cause No. 6427 (March. 1969)

New Mexico state law declares that SE has a statutory responsibility to supervise, measure, appropriate, and distribute the waters of the state (*NMSA 1978, Section 72-1-1*). Additionally, New Mexico state law declares that the SE has the authority to appoint Water Masters whose job is to appropriate, regulate, and control the waters of such water districts, if it is in the best interests of public safety, and the water users of such water districts (*NMSA 1978, Section 72-3-1 & Section 72-3-2*). In accordance with the above referenced statute, the SE appointed a Water Master to the LRG Water Master District who is charged with administering and apportioning the waters of the District, and whose specific duties include; but are not limited to:

- ❖ Curtailing illegal diversions
- ❖ Measuring and reporting water usage within the district
- ❖ Curtailing out-of-priority diversions
- ❖ Administering water usage according to agreements entered into by the water users of the district
- ❖ Coordinate, where indicated, with the United State Bureau of Reclamation (BOR) and the EBID so as to ensure the appropriate regulation and control of groundwater withdrawals.

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MAP OF THE LOWER RIO GRANDE WATER MASTER DISTRICT

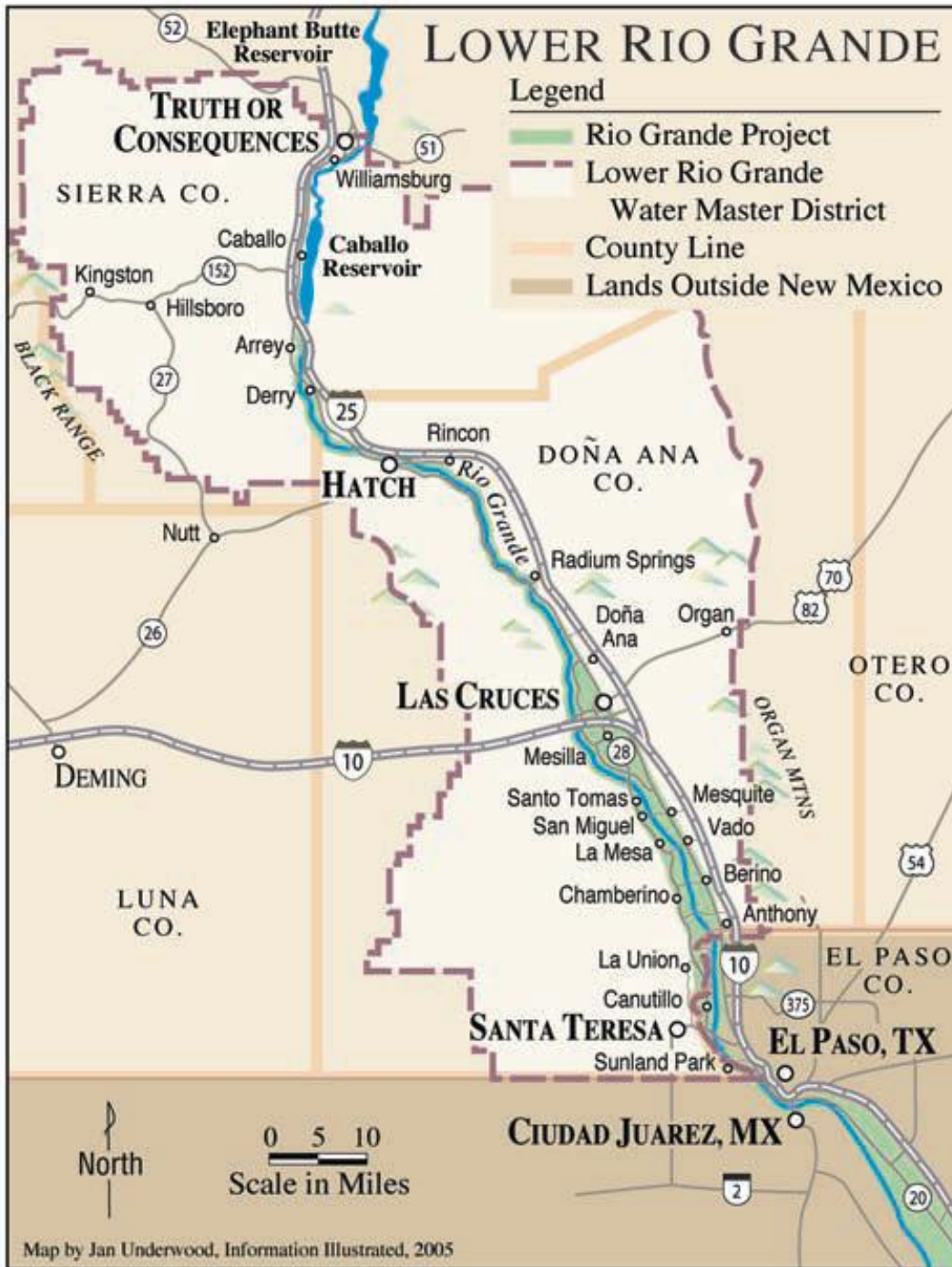


Figure 1.

The LRG Water Master group currently consists of five full time employees who maintain offices at the District IV Las Cruces Office of the State Engineer, at 1680 Hickory Loop, Suite J. Members of the group include LRG Water Master Manager Ryan J. Serrano, Senior Assistant LRG Water Master Juan-Carlos Benavides, Assistant LRG Water Master Demetrio Alanis, and Assistant LRG Water Master Danny Carrillo. We currently have vacant position for a Senior Assistant LRG Water Master. All members of the LRG Water Master group are direct employees of the SE and are compensated from the SE's general fund.

Field work of the Water Master group generally includes inspections of groundwater points of diversion, surface water points of diversions, measurement devices and structures, water right places of use, and any illegal uses or waste of water. Field work also includes the utilization of Trimble GPS technology to acquire well locations and water right place of use locations.

Office work of the Water Master group generally includes preparation of technical reports, memoranda on water rights, and the metered diversions of those rights. The group processes and maintains approximately 14,000 meter records that are submitted to the District IV office annually, tabulates diversion records and determines over diversions, compiles reports, generates compliance notices and general correspondence, provides customer assistance to the general public, coordinates compliance actions with the OSE's Administrative Litigation Unit (ALU), and attends various meetings.

OBJECTIVES

MEETINGS

In 2019, the LRG Water Master Supervisor and his staff participated in several one-on-one meetings with water users both in the office and in the field. Discussions centered on groundwater diversion limits, reconciliation of accounts, settlement provisions, and metering issues. The Water Master Supervisor also participated in occasional meetings with upper management to provide updates and discuss strategy regarding activities within the district. Water Master staff also attended several board of directors meeting for the Elephant Butte Irrigation District.

ENFORCEMENT & COMPLIANCE

In 2019, the LRG Water Master group initiated 102 enforcement and compliance actions for varying degrees of non-compliance within the SE jurisdiction as set forth in the onset of this report. Of the 102 enforcement and compliance actions initiated, 67 (65.68%) have been resolved without further enforcement, and the remaining 35 (34.31%) actions are still pending. If compliance is not achieved on the remaining 35 actions within a timely fashion, then these issues will be forwarded to the SE's ALU to pursue compliance orders in accordance with *NMSA 1978, Section 72-2-18* and enforcement of those orders in either the Third or Seventh Judicial District Courts.

IMPLEMENTATION OF SETTLEMENT TERMS

In addition to the ongoing enforcement and compliance efforts described above, in 2019, Water Master staff also continued to actively implement the 2011 Settlement of LRG Irrigation Water Requirements and Final Judgment issued by the Third Judicial District Court. This Settlement and Judgment set limits on the amount of groundwater that can be diverted for irrigation purposes within the district. The Farm Delivery Requirement (FDR) was set at 4.5 acre-feet/acre, and the Consumptive Irrigation Requirement (CIR) was set at 2.6 acre-feet/acre. Implementation efforts have focused on accurate accounting of the FDR and accommodation of other specific provisions within the settlement that allow for joint management of groundwater rights associated with farms under the same ownership/management (OwMan). Joint management gives water users more flexibility in allocating groundwater pumping among farms (that is, one farm can pump more, if another farm pumps less), even if those farms have different water rights file numbers. This provision can be used in managing groundwater on separate farms owned by the same party. This provision can also be utilized by a farmer who manages a number of farms, not all of which he or she owns, provided there is a written agreement between the farmer and the landowners.

Water Master staff have made considerable efforts in the last six accounting years to implement and effectively manage the basin wide FDR and the other applicable provisions of the settlement,

including but not limited to the OwMan provision. An example of these efforts included the development of accounting mechanisms in the New Mexico Water Rights Reporting System (NMWRRS) website for accurate tracking of diversion on a yearly basis. Other efforts included providing notice to water users of their specific allowable diversion based on their individual water rights and whether or not they had exceeded that allowable limit in any one accounting year. In January of 2019, Water Master staff tabulated the diversion amounts associated with each individual water right for the previous 2018 accounting year, taking into consideration all of the variables associated with the diversion of groundwater within the district including water right specific FDR's, surface water allotments, and settlement provisions. From this tabulation, Water Master staff determined that approximately **5,173 acre-feet** of groundwater was diverted in excess of the total allowable diversion limit associated with the known water rights on file with this office.

In an effort to reconcile the exceeded amount of groundwater in a timely fashion, the Water Master put into motion a stepped procedure for reconciling these diversions. This procedure was developed in coordination with the SE ALU & the SE Hearing Unit. The procedure includes notices to owners, voluntary repayment plans, initiation of compliance orders, and an option for expedited administrative hearings. This effort proved to be extremely effective and resulted in of **97.18%** of the exceeded diversion being successfully reconciled within one year. The details of this effort are summarized in *Figure 2*. On Page 9.

The reconciliation of each exceeded diversion occurred via one of four primary techniques. 1) by identifying and correcting inaccurate acreages in the WATERS database, 2) by verifying and correcting distribution errors (*mostly with a single well that serves multiple water rights*), 3) by grouping farms and associated diversions and averaging the use across several water right files using the OwMan provision of SSI#101, or 4) by paying back via an acceptable voluntary repayment plan. We have instances where water right owners acknowledge their over diversion in which case they are required to repay that overage by either 1) reducing their overall diversion in 2019, 2) by letting land lay fallow in 2019, or 3) temporarily taking land out of production. By far, the use of the OwMan provision is the most commonly

used technique for reconciling diversions, and has resulted in over 53,775 irrigated acres within the district being designated as part of an authorized OwMan plan as recorded in the District IV office water rights files. This is an increase in OwMan acreage over the previous accounting year of 423 acres. A map depicting the physical location of these acres is included hereto as *Figure 3* on Page 10.

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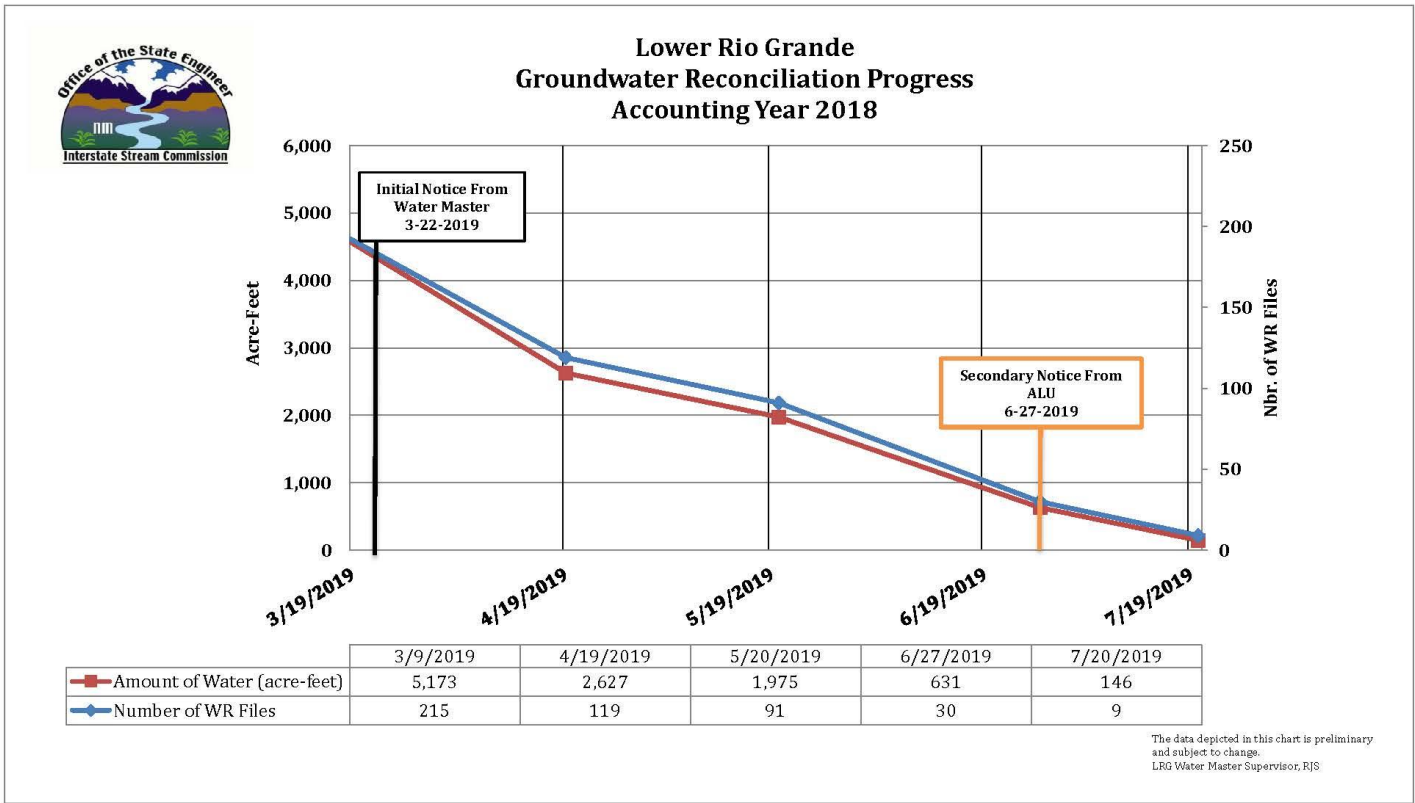


Figure 2.

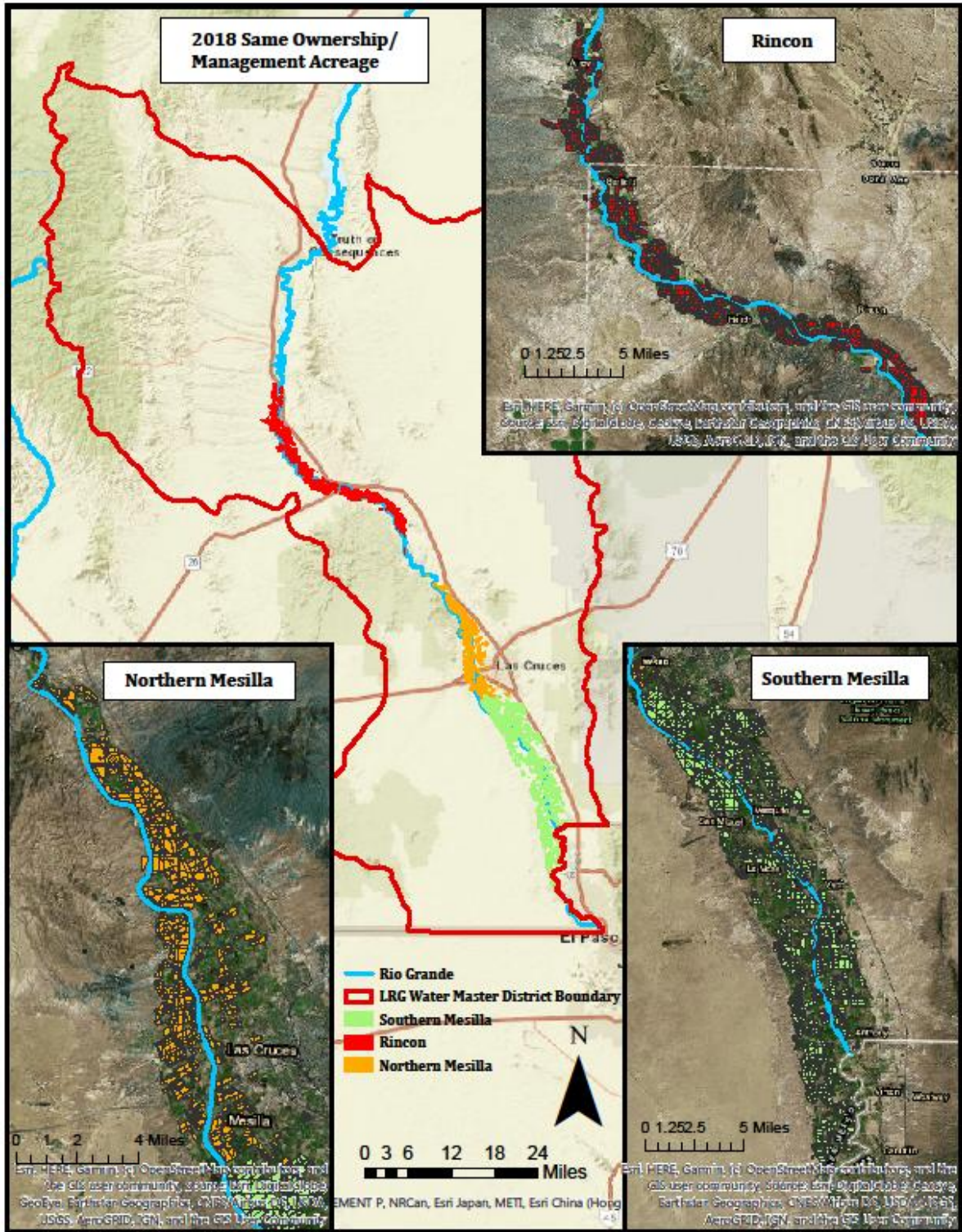


Figure 3.

GROUNDWATER METERING

In accordance with SE Order number 172, it is the responsibility of the water right owners to submit meter readings to the SE on or before the tenth day of January, April, July, and October for the three preceding calendar months, unless otherwise ordered by the SE. In an effort to maintain high voluntary meter reading submittal rates and to ensure a complete and accurate data record, the LRG Water Master group has taken three proactive steps to ensure compliance. Those steps include the following:

STEP 1: Postcard Reminders – In December of each accounting year, LRG Water Master Staff sends a friendly reminder postcard to every water right owner with an actively metered well or diversion. The postcard serves as a general reminder to well owners to submit a final meter reading for the accounting year.

STEP 2: Meter Reading Overdue Letter – In January of the following accounting year, Water Master staff sends out a meter reading delinquency letter to those well owners who failed to submit meter readings for the final reporting period of the year. The letter requires these water right owners to submit their meter reading(s) within 10 days of the receipt of the letter. The letter indicates that if meter readings are not submitted within a timely manner, the issue would be forwarded to the SE's Administrative Litigation Unit.

STEP 3: Outstanding Meter Reading Enforcement – Normally there has been a small percentage of well owners who do not respond to Steps 1 or 2. In order to facilitate a complete data record, Water Master staff conducts field work and physically acquire a meter reading for each of the remaining wells for which a reading has not submitted.

As a result of the LRG Water Master staffs efforts outlined above, **2,443 wells**, or **91.50%** of the actively metered irrigation wells within the LRG Water Master District have a meter reading entered into the WATERS databases to close out the accounting year 2019.

SURFACE WATER METERING

2019 was the third full year of operation for all four surface water measurement sites within the LRG. The sites are fully functional and logging surface flow data daily. Unfortunately, due to budget



restrictions and IT resources, we have not been able to install a data server at the local Las Cruces office to house the real-time transmitted data. To compensate for the lack of a server, water master staff regularly visits each site to ensure proper functionality and to manually download data. The data is then checked for accuracy against field

measurements and certified. A brief summary of the 2019 annual diversion totals for each site is listed below in *table 1*.

Site Name	Basin	Average Daily flow (cfs)	Total Diversion -2019
			(acre-feet)
Paxton/Cates River Pump	Hot Springs	0	190.00
Las Palomas Community Ditch	Hot Springs	1.93	1,529.51
Las Animas Community Ditch	Las Animas	0.69	506.05
Holguin River Pump	Lower Rio Grande	0.79	573.49

The sites selected for measurement were identified as locations in critical need of measurement not only for the purposes of this agency but for the users/managers of these surface water systems and the public at large. The construction of these sites was funded through the State of New Mexico’s Severance Tax Bond Program, and the Legislatures Capital Improvement award process.



ANALYSIS

2019 DIVERSIONS

For 2019, the EBID board of directors allotted 14.0 acre-inches (1.16 acre-feet per acre) of surface water to its constituents. This allocation equates to **105,142** acre-feet of Rio Grande Project surface water being put to beneficial use within the LRG Water Master District; as compared to 10.00 acre-inches (0.833 acre-feet per acre) or 75,503 acre-feet in 2018. This 28% increase in Rio Grande surface water supply from 2018 to 2019 is the result of average to above average snowpack and snowmelt runoff from the upper watershed and below average monsoonal rainfall in south/central New Mexico. This 28% increase in Rio Grande surface water supply translated to a measured decrease in groundwater pumping during the 2019 accounting year.

The increased amount of surface water and the timing of its delivery (*Late May 2019 to the Hatch/Rincon Valley and Early June 2019 to the Mesilla Valley*) had a notable impact on the amount of early season supplemental groundwater pumping that was observed for early season crops such as onions, lettuce, cabbage, wheat, alfalfa, and other silage type crops. This staggered release of surface water has been deployed over the previous four irrigations seasons. This surface water delivery method has proven to be very effective in alleviating the need for early season supplemental groundwater pumping and allowed many farmers to start and in some instances finish crops without supplemental groundwater particularly in the Hatch/Rincon Valley.

An almost nonexistent monsoon season and record breaking high temperature late in the summer and fall led to sustained rates of supplemental groundwater diversions later in the growing season. These groundwater diversions late in the season were necessary to finish late season crops such as cotton, alfalfa and pecans.

In 2019, a total of **265,139 acre-feet** of metered groundwater was diverted within the LRG Water Master District. This is a 10% decrease in groundwater diversions compared to the 2018 accounting year. For irrigation purposes 217,187 acre-feet of groundwater was diverted. This is a 11% decrease from

2018. For municipal and other drinking water purposes 38,719 acre-feet was diverted. This is a 1.91% decrease from 2018. *Table 1* on page 15 compares and summarizes groundwater diversion by category for the 2017, 2018 and 2019 accounting years. Additionally, *Figure 4* on page 16 compares irrigation specific diversion totals for the 2014 thru 2019 accounting years.

The Water Master supervisor fielded many requests in 2019 not only for basin wide groundwater diversion data, but also for sub-basin specific diversion data. Seeing the benefit of further analysis at the sub-basin level we have included a further breakdown of sub-basin groundwater diversion hereto. For the purposes of this report sub-basins are defined according to the criteria set for the Lower Rio Grande Basin Hydrographic Survey Report (*Parsons Et. al, 2000*). There are four distinct sub-basins; they are the Rincon Valley Section (RIN), Northern Mesilla Valley Section (NMES), Southern Mesilla Valley Section, and the Outlying Areas Section (OUTLY). *Table 3* on page 17 details this sub-basin breakdown in greater detail.

In the Hot Springs Administrative Basin, a total of 2,790 acre-feet of metered groundwater was diverted under the jurisdiction of the LRG Water Master in 2019, of which 1,194 acre-feet was diverted for irrigation purposes, and 1,393 acre-feet was diverted for municipal purposes. This municipal use includes the water rights on file with the SE for the City of Truth or Consequences.

In the Las Animas Administrative Basin, a total of 287 acre-feet of metered groundwater was diverted under the jurisdiction of the LRG Water Master in 2019, of which 283 acre-feet were diverted for irrigation purposes. Only 4 acre-feet of groundwater was diverted for a use other than irrigation in the Las Animas Basin.

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Three (3) Year Comparison and Summary of Metered Groundwater Diversions in the Lower Rio Grande Water Master District (Acre-Foot)



Category	2017		2018		2019		3-Year Total	
Irrigation	156,682	77.02%	244,310	83.44%	217,187	81.91%	618,179	81.19%
Drinking Water: Municipal, Mutual Domestic, and individual Domestic Supply <i>(includes 2,400 AF of estimated unmetered domestic)</i>	38,141	18.75%	39,474	13.48%	38,719	14.60%	116,334	15.28%
City of Las Cruces	21,758		22,158		21,316			
New Mexico State University	2,534		2,608		3,028			
Mutual Domestic	7,866		7,213		7,870			
Other Drinking Water	5,983		7,496		6,505			
Commercial/Industrial/Dairy	8,058	3.96%	8,400	2.87%	7,997	3.02%	24,455	3.21%
All Other Uses	544	0.27%	618	0.21%	1,237	0.47%	2,399	0.32%
Total	203,425		292,802		265,139	100.00%	761,367	100%

Reasonable efforts have been made by the New Mexico Office of the State Engineer (OSE) to verify the accuracy of this data. However, this data may be subject to change if and when more information becomes available. 3-18-2020 RJS, LRG Water Master, Manager

Table 2.

Six Year Comparison of Irrigation Groundwater Withdrawals to the EBID Surface Water Allotment (Acre-Feet)

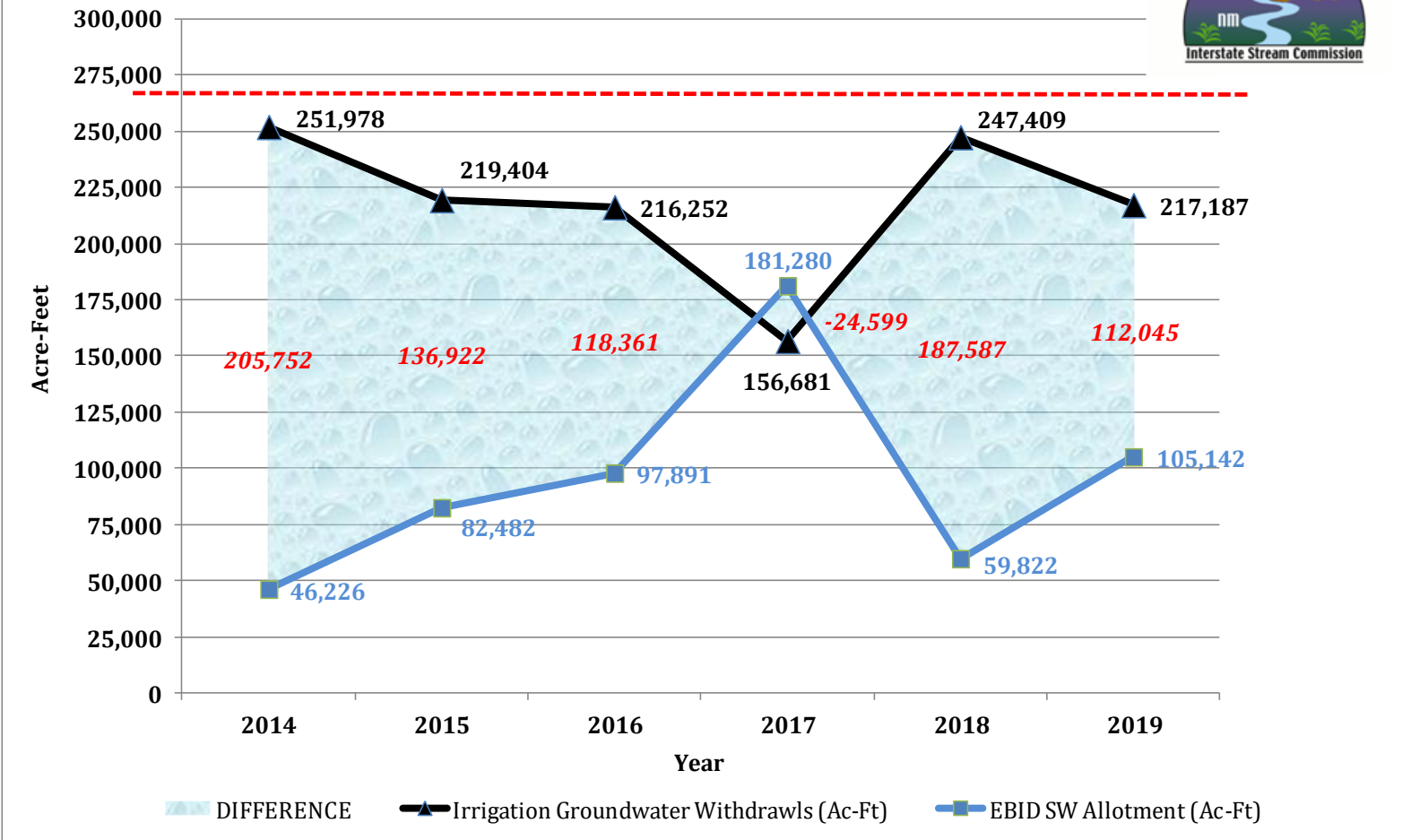


Figure 4.



Lower Rio Grande Sub-Basin Breakdown of Metered Groundwater Diversion (Acre-Feet) - 2019



Category	RINCON		NMES		SMES		OUTLY	
Irrigation	47,998	97.98%	44,658	61.95%	123,646	89.09%	885	16.77%
Drinking Water: Municipal, Mutual Domestic, and individual Domestic Supply <i>(includes 2,400 Ac-Ft of estimated unmetered domestic/all four sub-basins)</i>	895	1.83%	26,291	36.47%	8,080	5.82%	3,453	65.43%
Commercial/Industrial/Dairy	91	0.19%	1,121	1.56%	5,881	4.24%	904	17.13%
All Other Uses	4	0.01%	14	0.02%	1,184	0.85%	35	0.66%
Sub-Basin TOTAL(s)	48,987	100.00%	72,084	100.00%	138,791	100.00%	5,277	100.00%

BASIN WIDE AGRRGATE

	Metered Groundwater	% of Total
RINCON	48,987	18.48%
NMES	72,084	27.19%
SMES	138,791	52.35%
OUTLY	5,277	1.99%
TOTAL	265,139	100.00%

Reasonable efforts have been made by the New Mexico Office of the State Engineer (OSE) to verify the accuracy of this data. However, this data may be subject to change if and when more information becomes available. 3-17-2020 RJS, LRG Water Master. Manager

Table 3.

GROUNDWATER LEVEL OBSERVATIONS 2014-2019

Groundwater levels within the LRG Water Master district are monitored by a network of shallow groundwater monitoring wells that are drilled into the river valley alluvium and the underlying contiguous Santa Fe group geologic formation. These monitoring wells were drilled as part of a cooperative effort between the New Mexico Interstate Stream Commission (ISC) and the EBID. All of the monitoring wells are drilled in the central portion of the district within the Rio Grande valley alluvial flood plain between the east and west mesas (see map of monitoring well location on page 19).

For ease of data interpretation, we separate the monitoring wells into three (3) distinct geographic sub-basins, the Rincon (RIN), the Northern Mesilla (NMES), and the Southern Mesilla (SMES). The data collected at these monitoring wells is maintained by the EBID, and Water Master staff frequently downloads the data from EBID's hosted website (www.ebid-nm.org) to track groundwater level fluctuations throughout the accounting year.

Over the time period of the 2014 - 2019 accounting years (January 2014 - December 2019), groundwater levels in the RIN sub-basin witnessed an average rate of change of **+1.79 feet**, with the most notable variations shown at monitoring locations: RIN_1R, RIN_9R, and RIN_11R. (*RIN Hydrograph, page 22*). In the NMES sub-basin, groundwater levels decreased by an average rate of change of **-0.77 feet**, with the most notable variations shown at monitoring locations: MES_20R, MES_26R, and MES_17R. (*NMES Hydrograph, Page 24*). In the SMES sub-basin, groundwater levels decreased by an average rate of change of **-2.69 feet**, with the most notable variations shown at monitoring locations: MES_14R, MES_9R, and MES_10R. (*Southern Mesilla Hydrograph page 26*).

For the purposes of this report, monthly and yearly rates of change per geographic sub-basin were derived using a simple rate of change formula $R = \frac{\Delta X}{\Delta Y}$. Monthly rates of change are based on seventy two months of groundwater level data at each monitoring location. The monthly rate of change per monitoring well location were then aggregated and averaged per geographic sub-basin to establish a weighted sub-basin rate of change in the groundwater table. NOTE: Within each of the three sub-basin

hydrographs, you will notice occasional gaps in some data series. These gaps are the result of instrumentation error and zero values being reported for that particular time period.

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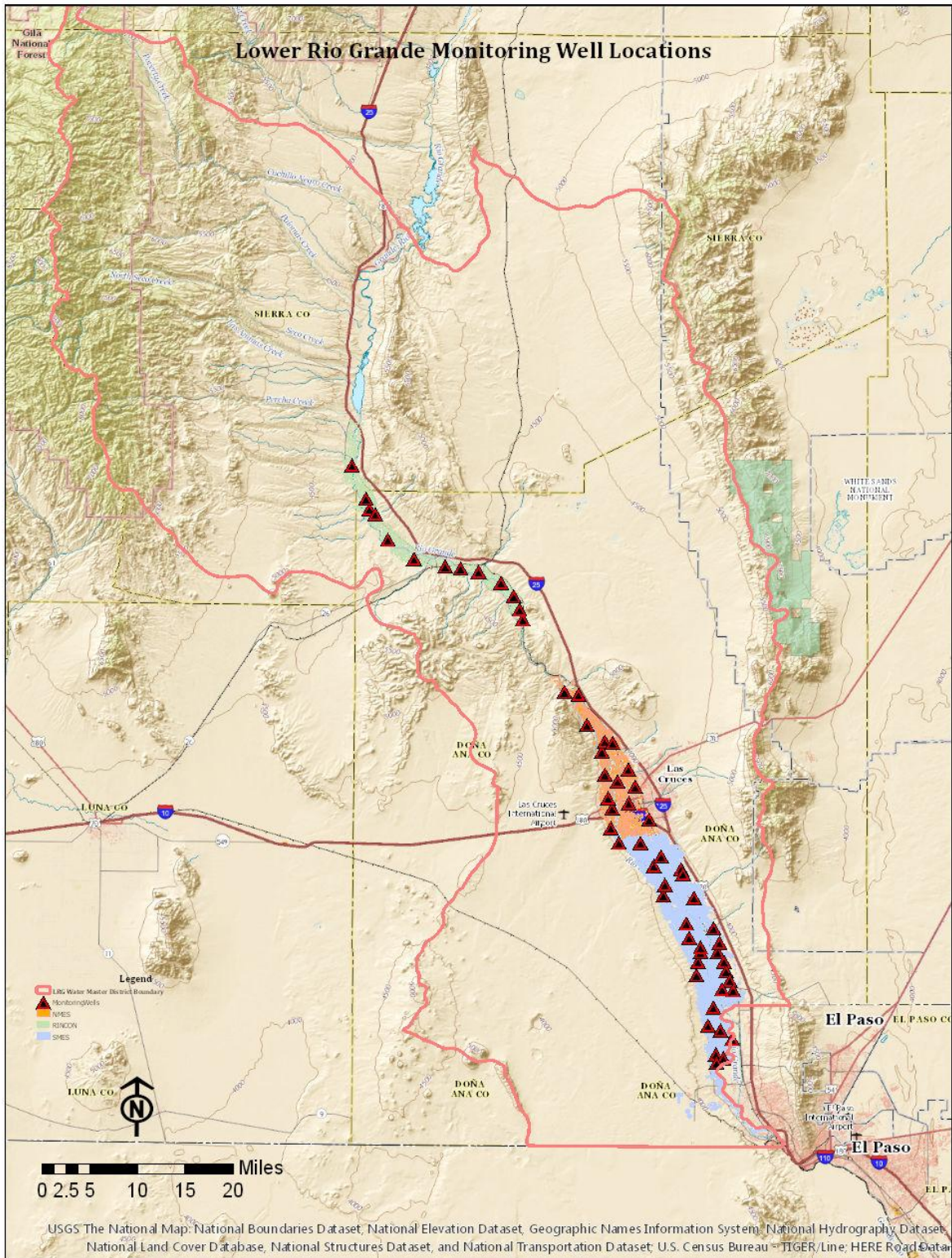
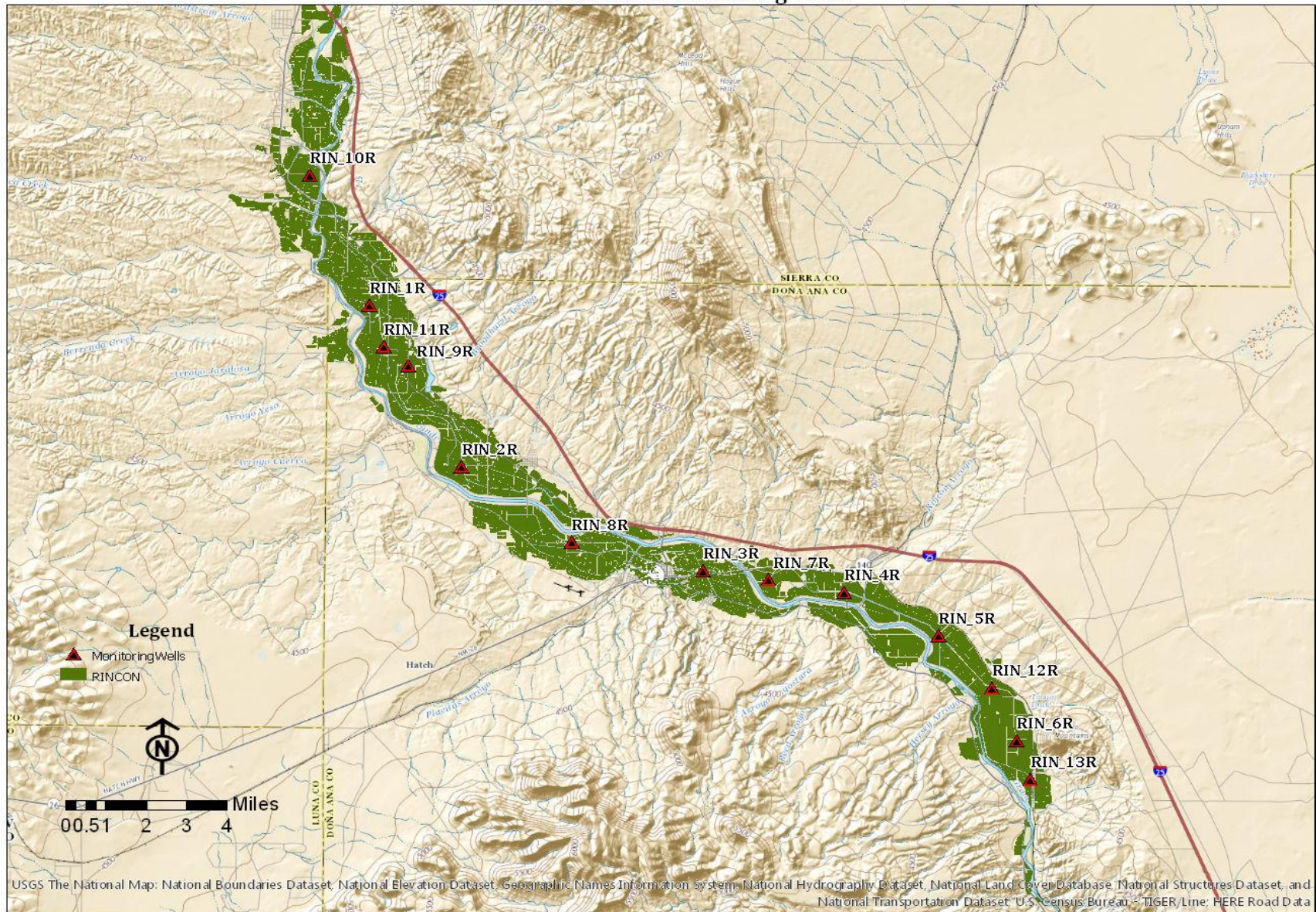
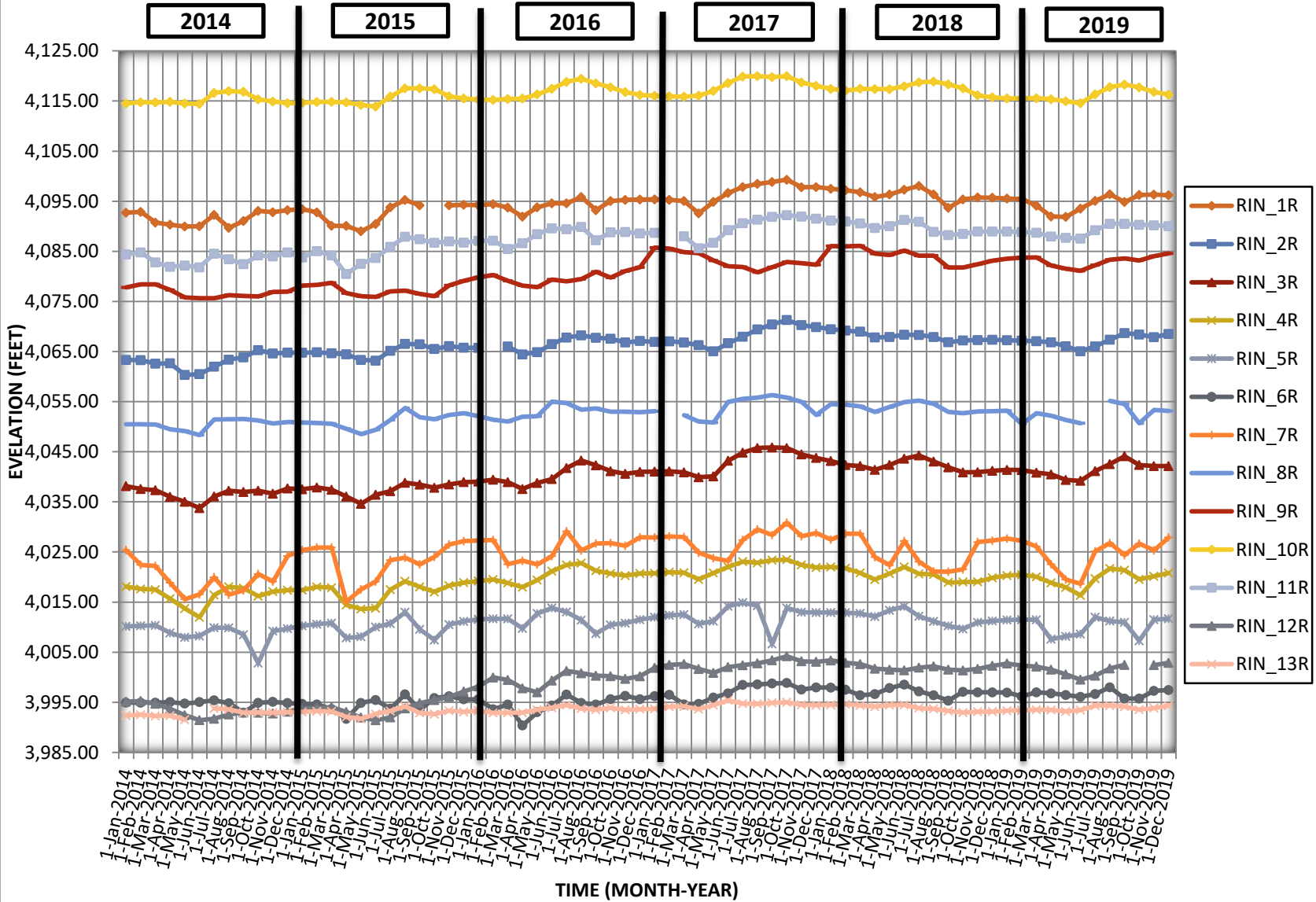


Figure 5.

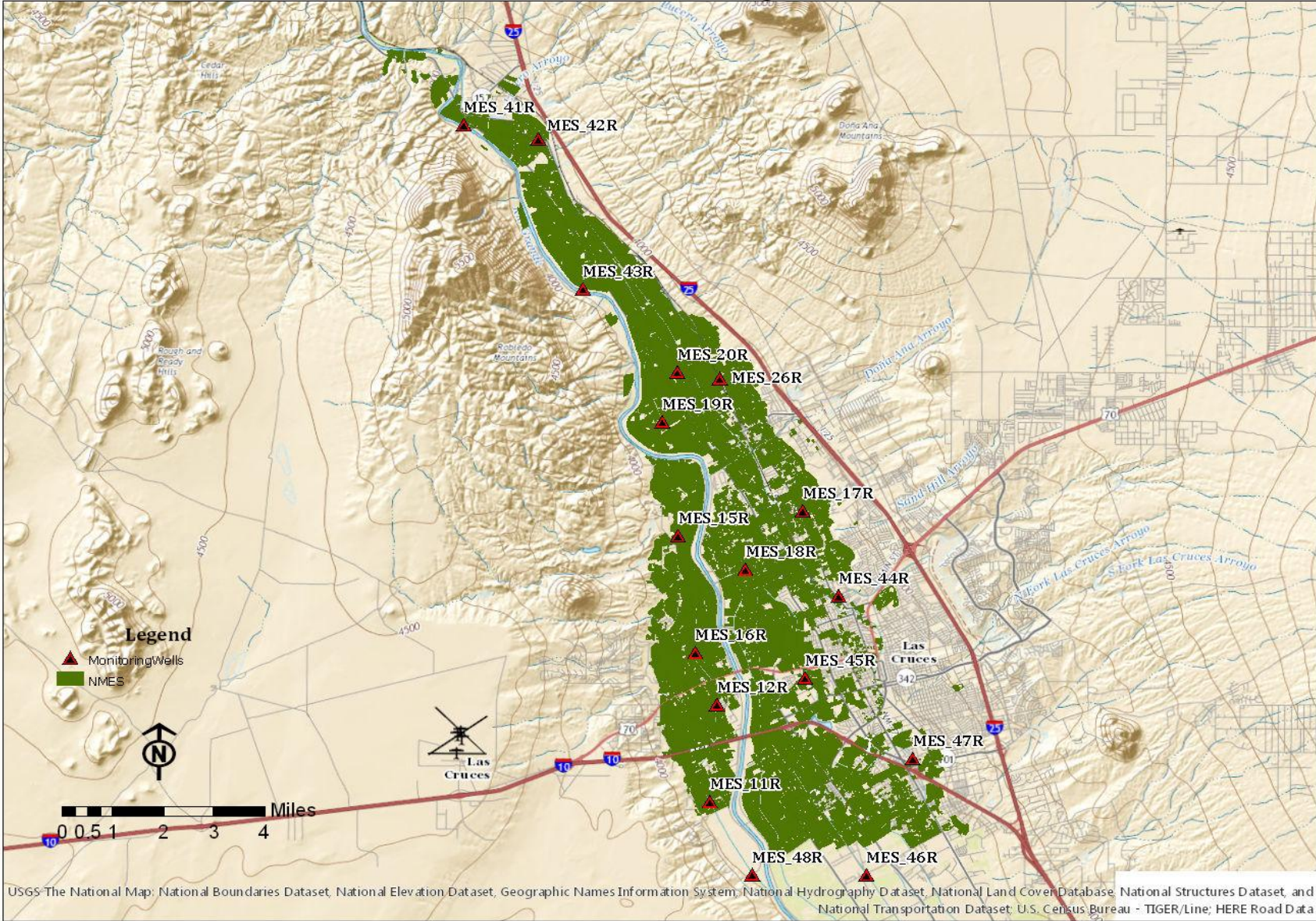
Rincon Sub-Basin Monitoring Wells



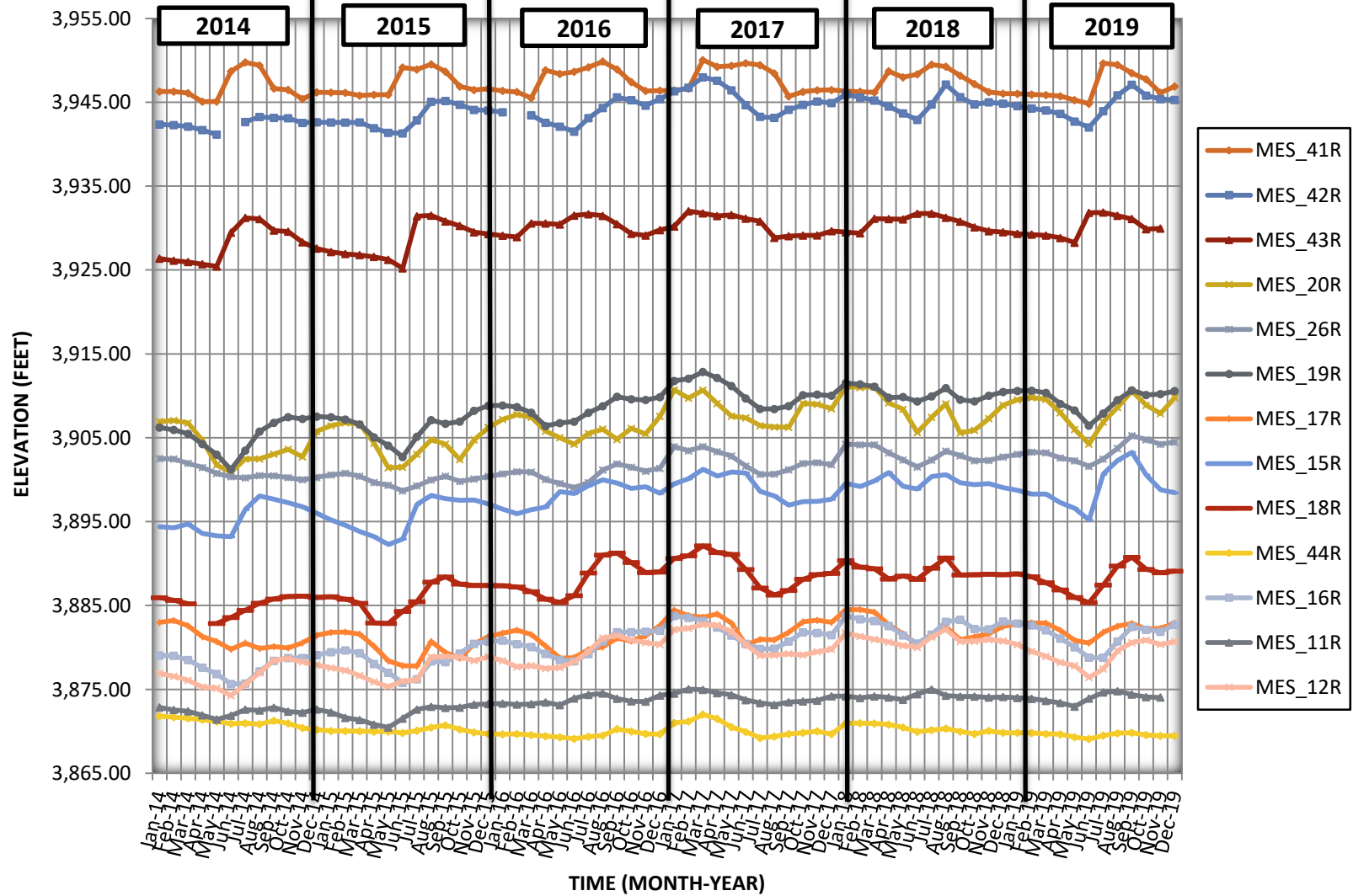
RINCON BASIN HYDROGRAPH



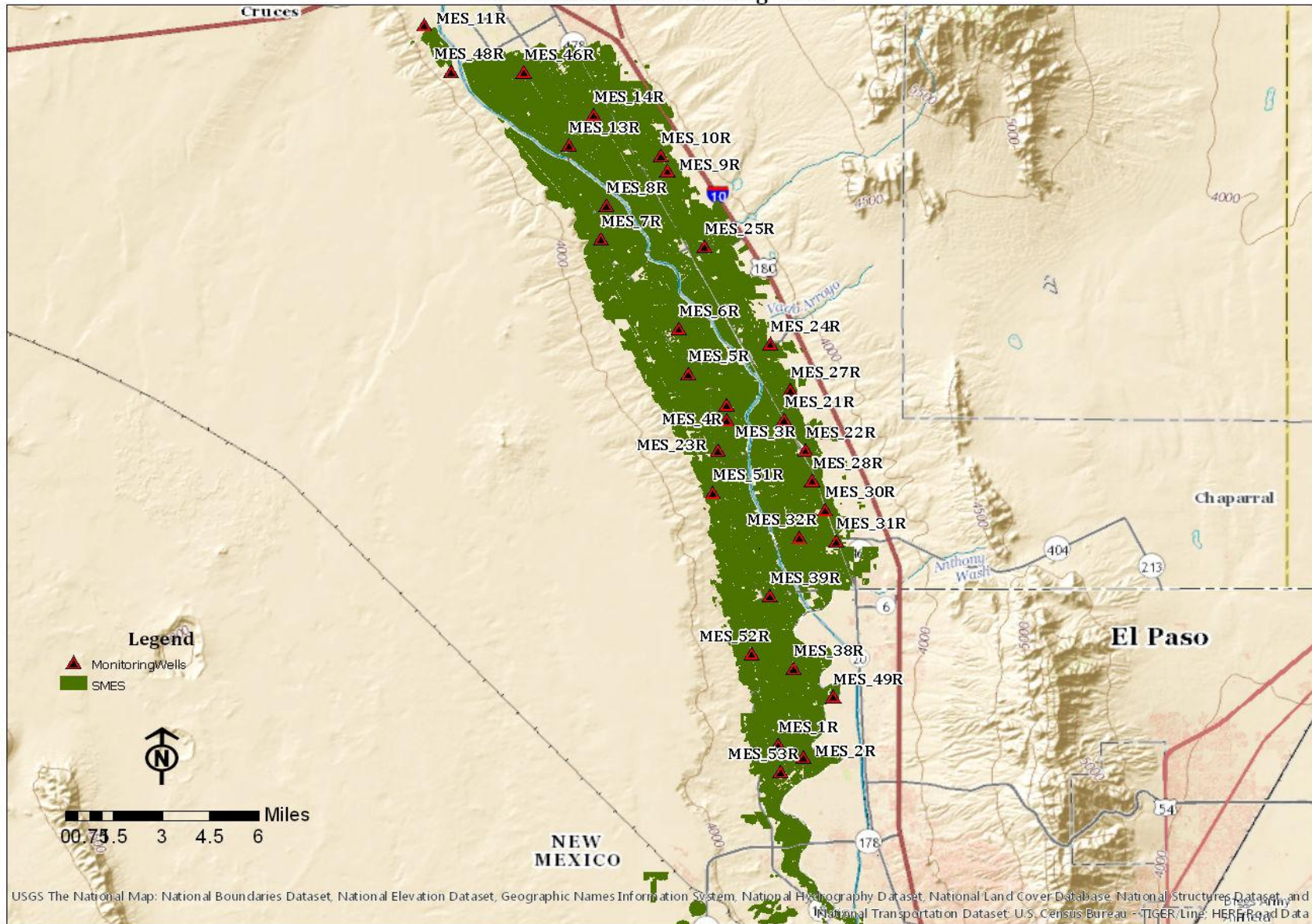
NMES Sub-Basin Monitoring Wells



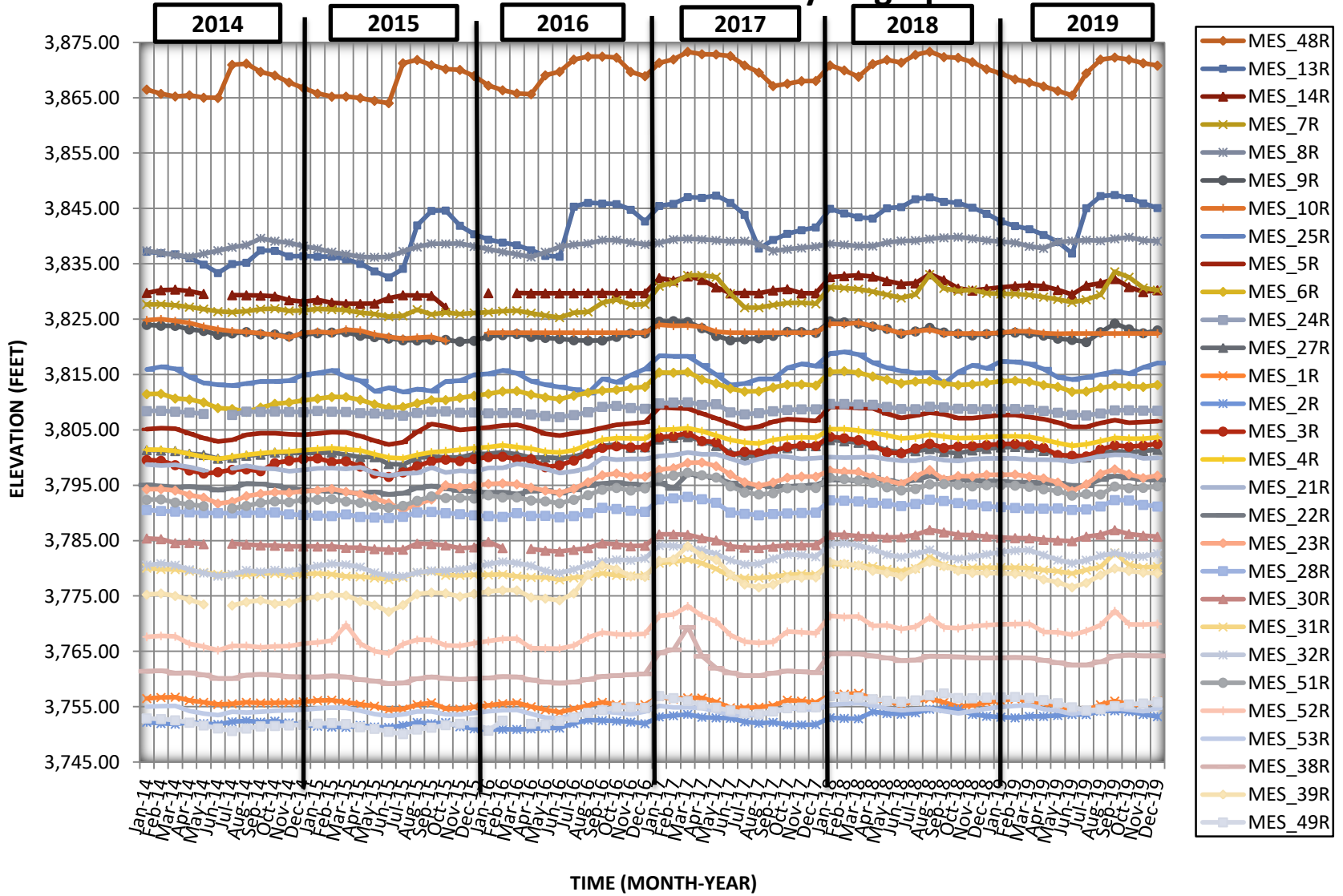
Northern Mesilla Basin Hydrograph



SMES Sub-Basin Monitoring Wells



Southern Mesilla Basin Hydrograph



2019 ACCOUNTING YEAR OUTLOOK

At the time of this report, the United States Department of Agriculture's (USDA), Natural Resource Conservation Service (NRCS) website for the Upper Rio Grande Basin watershed was reporting a basin wide snow water equivalent index number of 92% of normal, or 8% below average. Additionally, the NRCS monthly *New Mexico Basin Outlook Report* for March 2020 forecasts stream flow and runoff at San Marcial to be 50% of normal between March and July of 2020. In terms of available surface water, this means that the Rio Grande Project should not expect to receive a significant boost in usable storage from the 2020 snowmelt runoff.

If this forecast holds true, then water users within the Lower Rio Grande Water Master district (particularly those with an irrigation purpose of use) should anticipate a 1.0+ acre-foot per acre allotment via the Rio Grande project and the EBID during the 2020 irrigation season. That will primarily be based on current usable storage. The EBID Board of Directors has already (at the time of this report) set an initial allotment to its members of 14.0 acre-inches per acre or 1.16 acre-feet per acre. This equates to 38% of a full surface water supply. With similar surface water allotment in 2020 to that of 2019, it should be anticipated that ground water diversions for irrigation purposes will remain in the 240,000+ acre-foot range. All other uses not affected by available surface water supplies should be expected to maintain their observed three year averages, resulting in an anticipated total groundwater diversion in the 2020 accounting year of 260,000+ acre-feet

