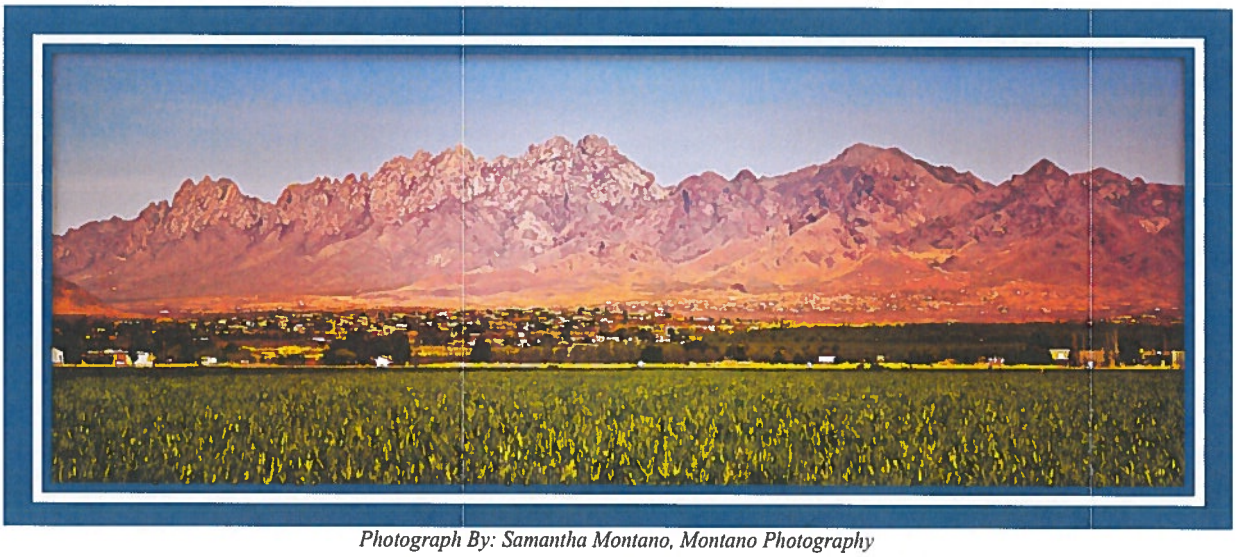
STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
WATER RESOURCE ALLOCATION PROGRAM
WATER RIGHTS DIVISION
DISTRICT IV, LAS CRUCES

LOWER RIO GRANDE WATER MASTER
ANNUAL REPORT
2014 ACCOUNTING YEAR



Photograph By: Samantha Montano, Montano Photography

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LOWER RIO GRANDE WATER MASTER, SUPERVISOR
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INTRODUCTION

The Lower Rio Grande (LRG) Water Master District was established by Order of the State Engineer (SE) on December 3, 2004. The District encompasses a geographic area of 4,224 square miles and stretches from its northern extent at the base of Elephant Butte Reservoir in central Sierra County, to its southern extent at the New Mexico/Texas/Mexico border in southern Dona Ana County. The District includes the main stem of the Rio Grande, its tributaries, and the underground waters within the geographic area described above. There are several water users within the District, including the City of Las Cruces, City of Truth or Consequences, 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 to name a few. Additionally, the LRG Water Master District is home to one of the states largest, if not the largest, agricultural producing regions. The average size of a farm within the district is 300+ acres, and the region consistently ranks in the top two for market value of crops sold for crops such pecans (tree nuts), vegetables (melons, lettuce, onions), nursery stock, and cotton *(USDA Census of Agriculture, 2012)*.

The surface and groundwaters of the District are administered in accordance with all applicable 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
- The Rio Grande Compact
- 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 (2011)
- SE Order Number 169, Creating the LRG Water Master District
- SE Order Number 170, Metering Order
- SE Order Number 172, Amended Metering Order

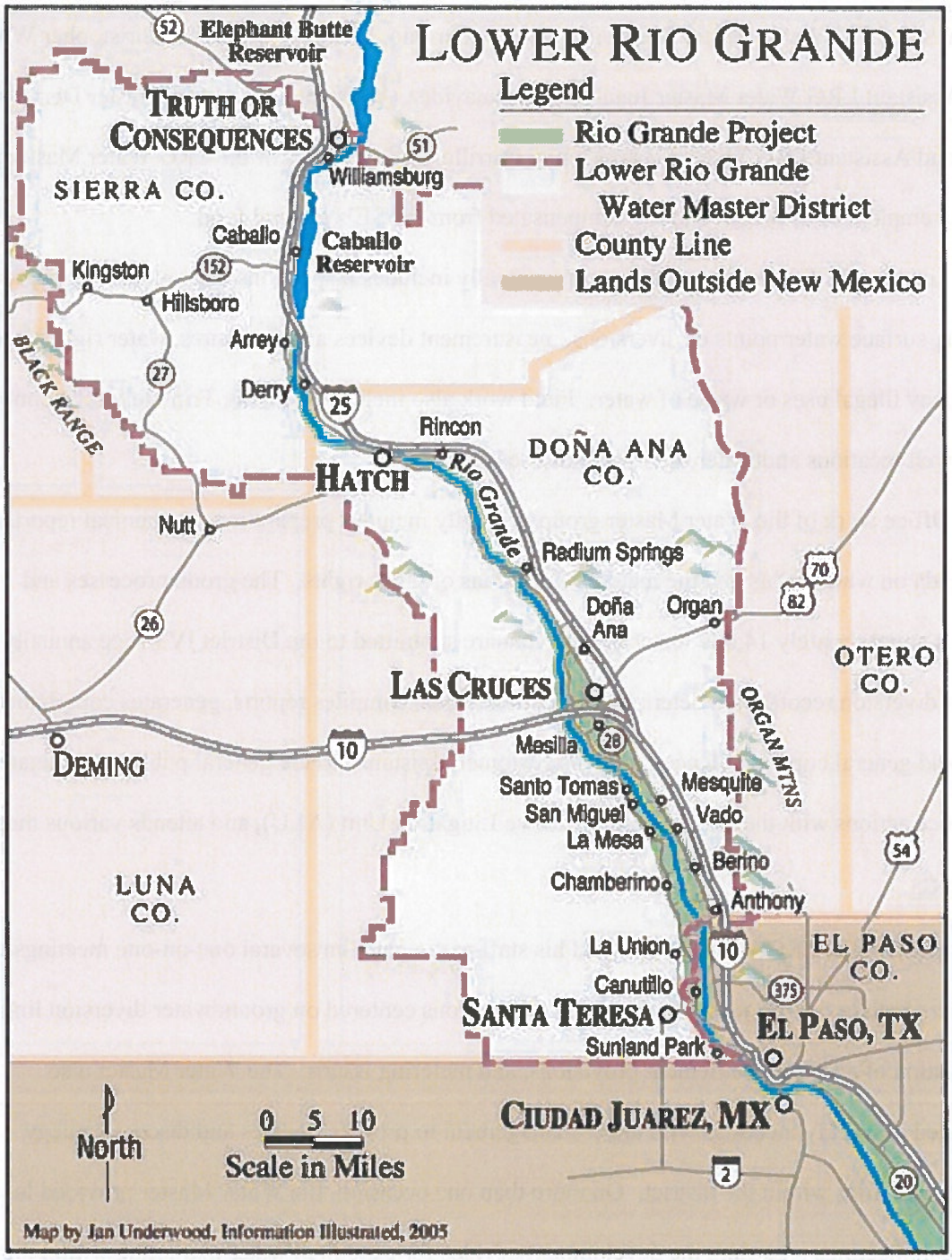
- SE Order Number 180, Supplemental Metering Order
- The Hot Springs Hydrographic Survey (1958)
- The Las Animas Creek Adjudication, Cause No. 6427

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.

MAP OF THE LOWER RIO GRANDE WATER MASTER DISTRICT



GENERAL

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 Supervisor Ryan J. Serrano, LRG Water Master Christopher Whitman, Senior Assistant LRG Water Master Juan-Carlos Benavidez, Assistant LRG Water Master Demetrio Alanis, and Assistant LRG Water Master Danny Carrillo. 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 utilizing 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 and 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.

MEETINGS

In 2014, the LRG Water Master 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 also participated in weekly meetings with upper management to provide updates and discuss strategy regarding activities within the district. On more than one occasion, the Water Master provided local expertise in meetings regarding the development of rules for expedited water marketing within the LRG.

ENFORCEMENT & COMPLIANCE

In 2014, The LRG Water Master group initiated 139 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 139 enforcement and compliance actions initiated, 84 (60%) have been resolved without further enforcement, and the remaining 55 actions are still pending. If compliance is not achieved on the remaining 55 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 the either the Third or Seventh Judicial District Courts.

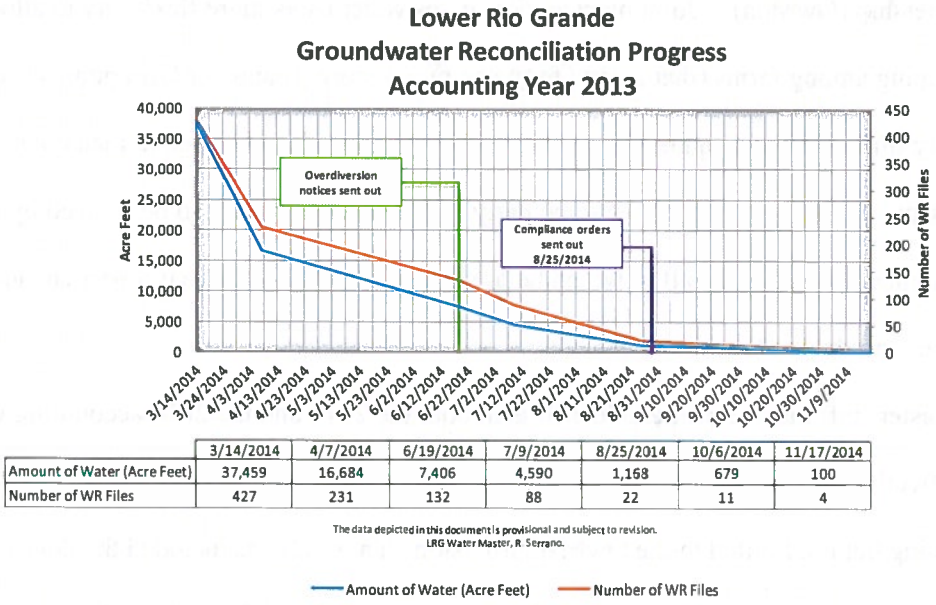
IMPLEMENTATION OF SSI NO. 101 SETTLEMENT TERMS

In addition to the ongoing enforcement and compliance efforts described above, in 2014, Water Master staff also continued to actively implement the terms of Stream System Issue 101 (SSI No. 101) Settlement Agreement and Final Judgment of the Third Judicial District Court. Specifically, implementation of the Farm Delivery Requirement (FDR) and specific provisions within the settlement that allow for joint management of groundwater rights associated with "farms under the same management/ownership (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 made considerable efforts in both the 2013 and the 2014 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. Those efforts included the development of accounting mechanisms in both the W.A.T.E.R.S database and the 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 March of 2014, Water Master staff tabulated the diversion amounts associated with each individual water right for the previous 2013 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 37,459 acre-ft 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, initiation of compliance orders, and an option for expedited administrative hearings. This effort proved to be extremely effective and resulted in upwards of 98% of the exceeded diversion being successfully reconciled within one year. The details of this effort are summarized in *Figure 1*.



	3/14/2014	4/7/2014	6/19/2014	7/9/2014	8/25/2014	10/6/2014	11/17/2014
Amount of Water (Acre Feet)	37,459	16,684	7,406	4,590	1,168	679	100
Number of WR Files	427	231	132	88	22	11	4

The data depicted in this document is provisional and subject to revision.
LRG Water Master, R Serrano.

Amount of Water (Acre Feet) — Number of WR Files

Figure 1.

The reconciliation of each exceeded diversion occurred via one of three primary techniques. 1) by identifying and correcting inaccurate acreages in the WATERS database, 2) by verifying and correcting of distribution errors (mostly with a single well that serves multiple water rights), or 3) by grouping farms and associated diversions and averaging the use across several water right files using the OwMan provision of SSI#101. The use of the OwMan provision is the most commonly used technique for reconciling diversions, and has resulted in over **42,000** irrigated acres within the district being designated as part of an authorized OwMan plan.

METERING

In accordance with SE Order number 172, it is the responsibility of the water right owners within the LRG Water Master district 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 several proactive steps to ensure compliance. Those steps include the following:

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

Meter Reading Overdue Letter - In January of the following accounting year, Water Master staff sends out a meter reading delinquency letter to those water right owners who failed to submit their meter readings for the final reporting period of the year. The letter requires these water right owners to submit their meter reading(s) within 5 days of the receipt of the letter. The letter also indicates that if meter readings are not submitted within a timely manner, the issue would be forwarded to the SE's Administrative Litigation Unit.

Outstanding Meter Reading Enforcement – Traditionally there is a small percentage of water right owners who do not respond to either of the two above referenced efforts. In order to facilitate a complete data record Water Master staff will conduct field work and physically acquire a meter reading for each of the remaining wells for which a reading was not submitted. To follow up and ensure that these water right owner's submit their meter readings in the future, the LRG Water Master in conjunction with the SE's ALU will pursue enforcement actions.

In 2014, as a result of the efforts outlined above **2,803 wells**, or **96.8%** of the actively metered wells within the LRG Water Master District have a meter reading entered into the WATERS databases for the final reporting period of 2014. This data is tabulated in the diversion summary included hereto.

2014 DIVERSIONS

In 2014, the EBID board of directors allotted 7.2 Acre-inches (0.62 acre-ft per acre) of surface water to its constituents. This allocation equates to **56,197** acre-ft of Rio Grande Project surface water being put to beneficial use within the LRG Water Master District in 2014, as compared to 3.5 Acre-inches (0.29 acre-ft per acre) or 26,285 acre-ft in 2013. This 47% increase in Rio Grande surface water supply from 2013 to 2014 for the most part is the result of late season monsoonal rainfall and runoff into both Elephant Butte and Caballo reservoirs in August and September of 2013. True to form, this increase in Rio Grande surface water supply translated to decreased groundwater pumping being witnessed for irrigation purposes in 2014. In fact groundwater diversions in 2014 were at a three year low.

Even though groundwater diversion hit a three year low, irrigation pumping remained relatively static. This occurred primarily because the extra surface water was not made available for delivery until the first week of June 2014. This late delivery of surface water meant that those farmers who had invested in early season crops such onions, lettuce, wheat, alfalfa, and silage had to start and in many instances finish these crops with supplemental groundwater. Additionally, the surface water delivery window was short with only approximately 45 days for EBID constituents to take delivery of their surface water. This small window for delivery also led to increased supplemental groundwater diversions later in

the growing season in an effort to finish late season crops such as alfalfa and pecans. These two factors played key roles in average groundwater diversions being witnessed in 2014.

In 2014, a total of **302,783 acre-ft** of metered groundwater was diverted within the LRG Water Master District. This is a 9% decrease in groundwater diversions over the 2013 accounting year. Of the described total diversion, 251,978 acre-ft of groundwater was diverted for irrigation purposes (11% decrease from 2013), and 38,943 acre-ft was diverted for municipal purposes (3% increase from 2013). *Table 1* on page 10 and *Figure 2* on page 11 compare and summarize groundwater diversion by use for 2012, 2013, and 2014.

In the Hot Springs Underground Water Basin, a total of 2,636 acre-ft of metered groundwater was diverted under the jurisdiction of the LRG Water Master in 2014, of which 1,299 acre-ft was diverted for irrigation purposes, and 1,226 acre-ft 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 Underground Water Basin a total of 109 acre-ft of metered groundwater was diverted under the jurisdiction of the LRG Water Master in 2014, of which 102 acre-ft were diverted for irrigation purposes. Only 7 acre-ft 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 Diversion in the Lower Rio Grande Water Master District (Acre-ft)

Use Category	2012		2013		2014		3-Year Total	
Irrigation	**265,321**	**82%**	**286,050**	**86%**	**251,978**	**83%**	**803,349**	**84%**
Drinking Water: Municipal, Mutual Domestic, and individual Domestic Supply (includes 2,400 AF of estimated unmetered domestic)	**44,869**	**14%**	**38,087**	**11%**	**38,943**	**13%**	**121,899**	**13%**
City of Las Cruces	19,804		17,624		19,658			
New Mexico State University	2,190		2,328		2,765			
Mutual Domestic	13,785		7,651		7,664			
Other Drinking Water	9,090		10,484		8,856			
Commercial/Industrial/Dairy	**3,550**	**1%**	**7,252**	**2%**	**7,829**	**3%**	**18,631**	**2%**
All Other Uses	**9,388**	**3%**	**1,020**	**1%**	**4,033**	**1%**	**14,441**	**1%**
Total	**323,128**		**332,409**		**302,783**		**958,320**	**100%**

Table 1.

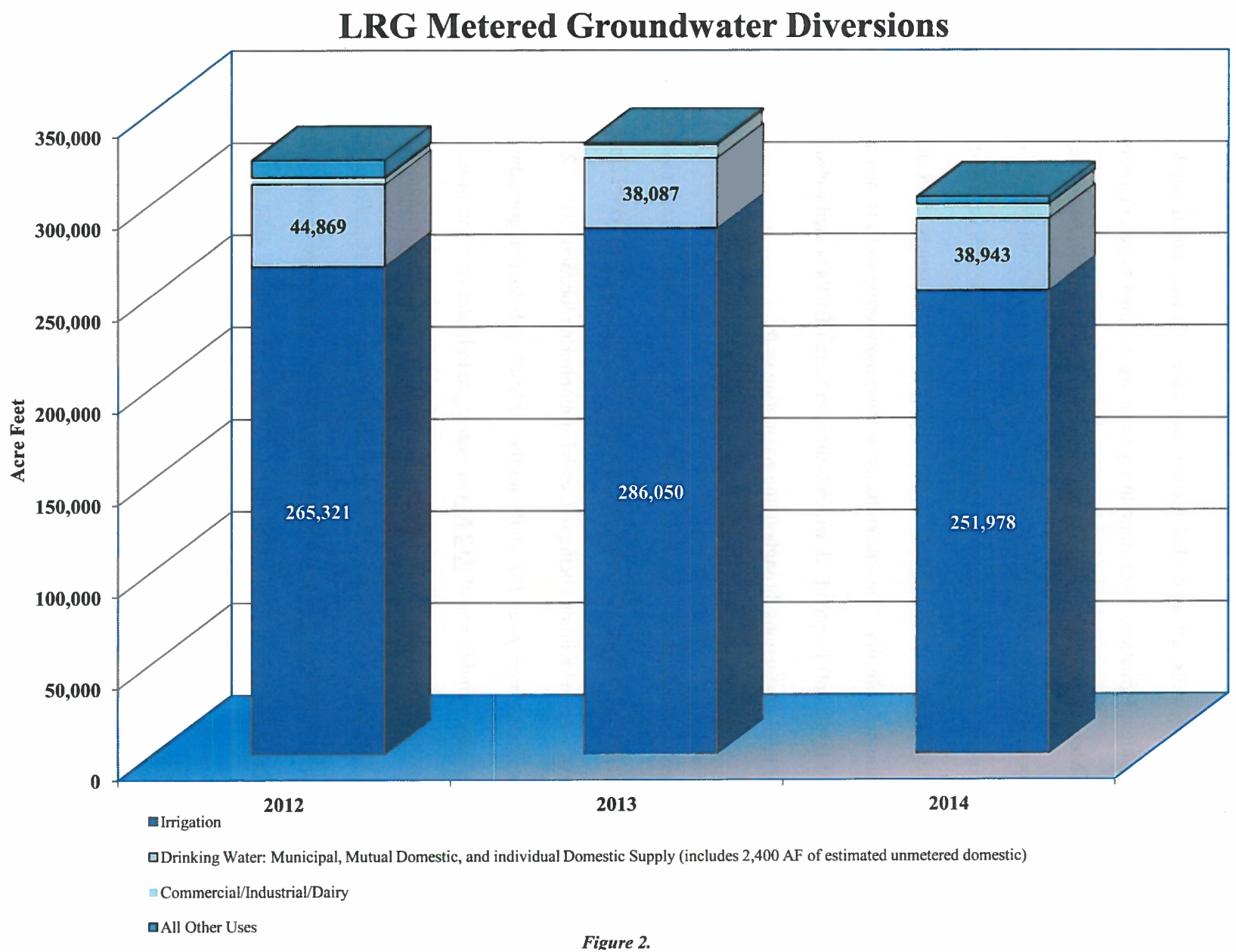

LRG Metered Groundwater Diversions
Acre Feet
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
44,869
265,321
38,087
286,050
38,943
251,978
2012
2013
2014
Irrigation
Drinking Water: Municipal, Mutual Domestic, and individual Domestic Supply (includes 2,400 AF of estimated unmetered domestic)
Commercial/Industrial/Dairy
All Other Uses

Figure 2.

2014 GROUNDWATER LEVELS

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 13). For ease of data interpretation we separate the monitoring wells into three (3) distinct geographic sub-districts, the Rincon, the Northern Mesilla, and the Southern Mesilla. 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 in an effort to track groundwater level fluctuations throughout the accounting year.

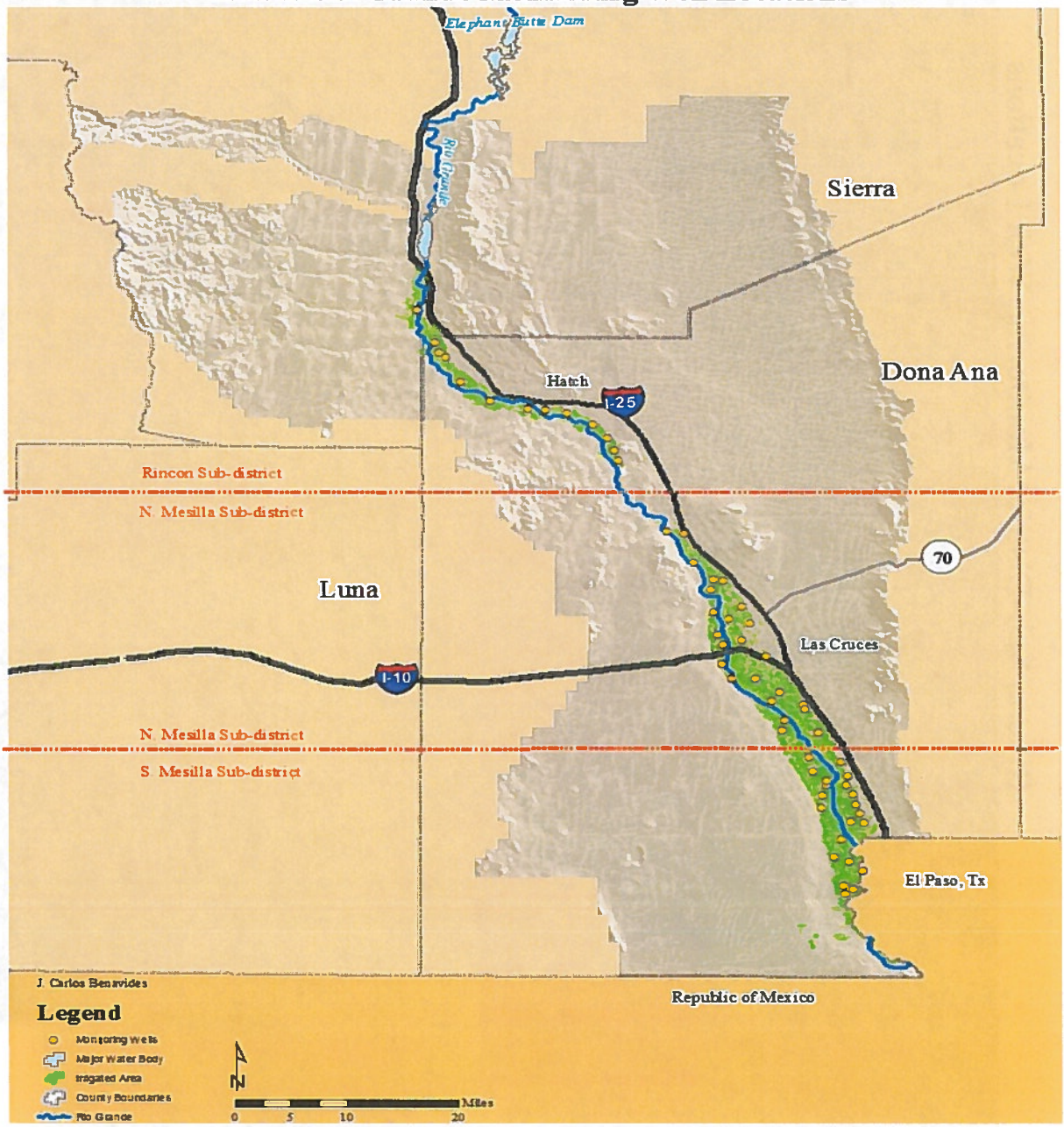
http://www.ebid nm.org/WRIS2008_new/RTUInventory.asp?Type=Monitoring%20Well

In 2014, groundwater levels in the Rincon sub-district witnessed an average monthly rate of decline of **-0.11 feet** or a yearly groundwater level decline of **-1.32 feet** (-0.11 feet*12months = -1.32 feet), with the most notable variations being witnessed at monitoring locations RIN_2R, RIN_3R, and RIN_12R (*Rincon Hydrograph, page 16)*. In the northern Mesilla sub-district, groundwater levels increased by an average monthly rate of **0.02 feet** or yearly groundwater level increase of **0.30 feet** (0.025 feet*12months = 0.30 feet), with the most notable variations being witnessed at monitoring locations MES_10R, MES_26R, and MES_46R *(Northern Mesilla Hydrographs 1, 2 & 3, Pages 18, 20, & 21)*. In the southern Mesilla sub-district, groundwater levels decreased by an average monthly rate of **-0.07 feet** or a yearly groundwater level decrease of **-0.84 feet** (-0.07 feet*12months = -0.84 feet), with the most notable variations being witnessed at monitoring locations MES_30R and MES_49R *(Southern Mesilla Hydrograph page 23)*.

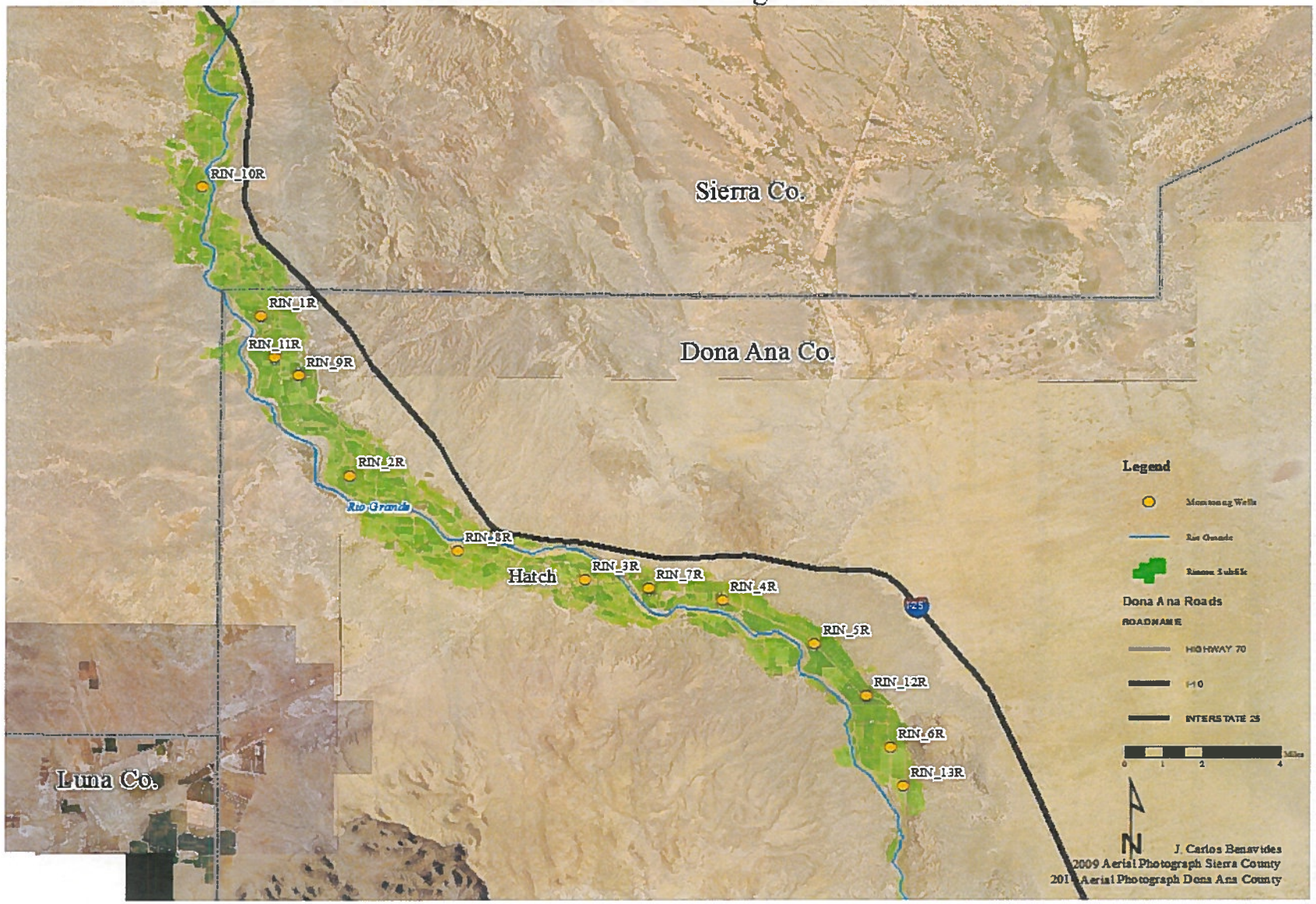
For the purposes of this report, monthly and yearly rates of change per geographic sub-district were derived using a simple rate of change formula $R = \frac{\Delta X}{\Delta Y}$. Monthly rates of change were

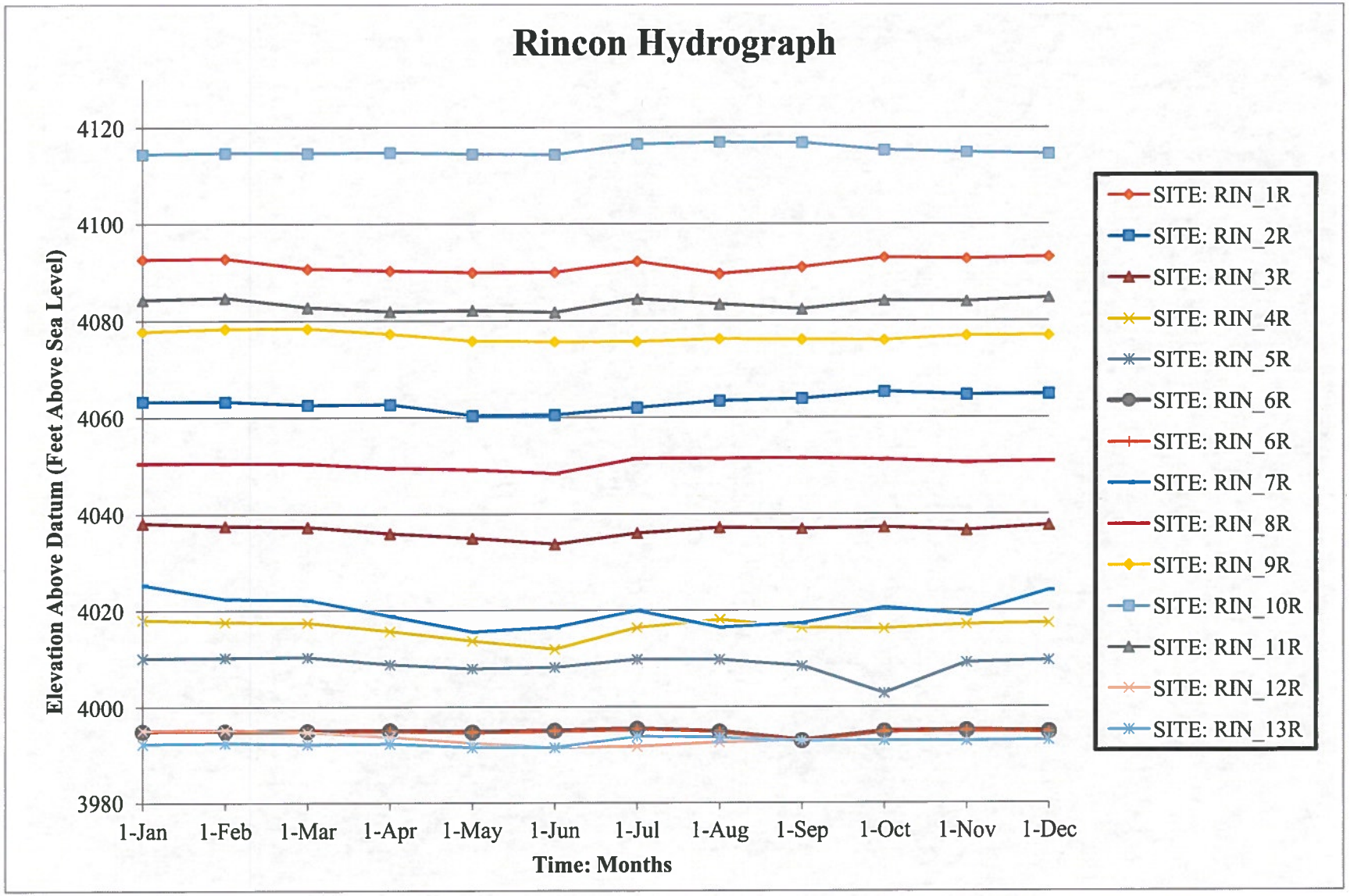
established based on twelve months of groundwater level data at each monitoring location. The monthly rate of change per monitoring location were then aggregated and averaged per geographic sub-district to establish a weighted sub-district rate of change in the groundwater table.

Lower Rio Grande Monitoring Well Locations



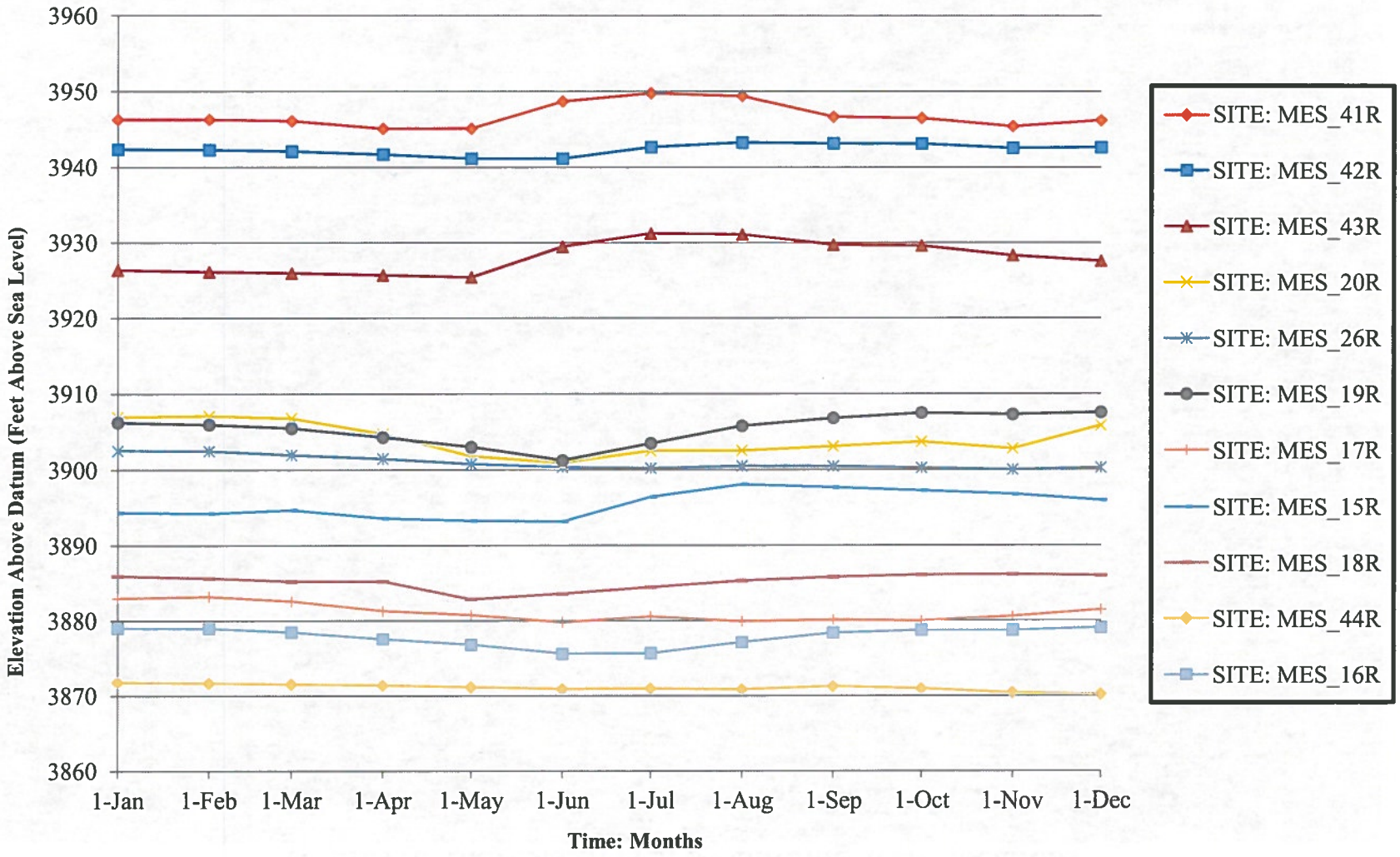
Rincon Sub-District Monitoring Well Locations



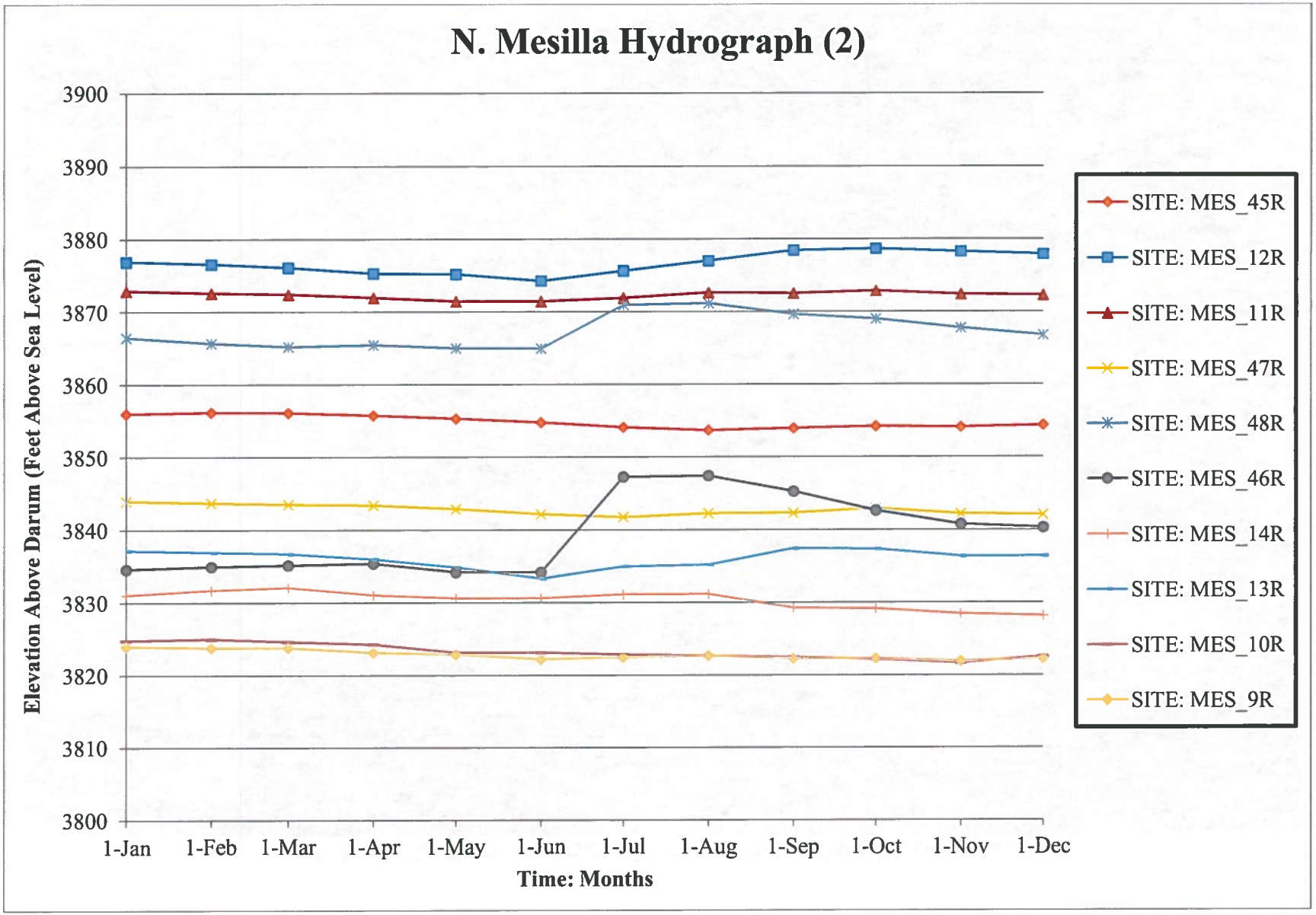

Rincon Hydrograph
Elevation Above Datum (Feet Above Sea Level)
4120
4100
4080
4060
4040
4020
4000
3980
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Time: Months
SITE: RIN_1R
SITE: RIN_2R
SITE: RIN_3R
SITE: RIN_4R
SITE: RIN_5R
SITE: RIN_6R
SITE: RIN_6R
SITE: RIN_7R
SITE: RIN_8R
SITE: RIN_9R
SITE: RIN_10R
SITE: RIN_11R
SITE: RIN_12R
SITE: RIN_13R

N. Mesilla Sub-District (1) Monitoring Well Locations

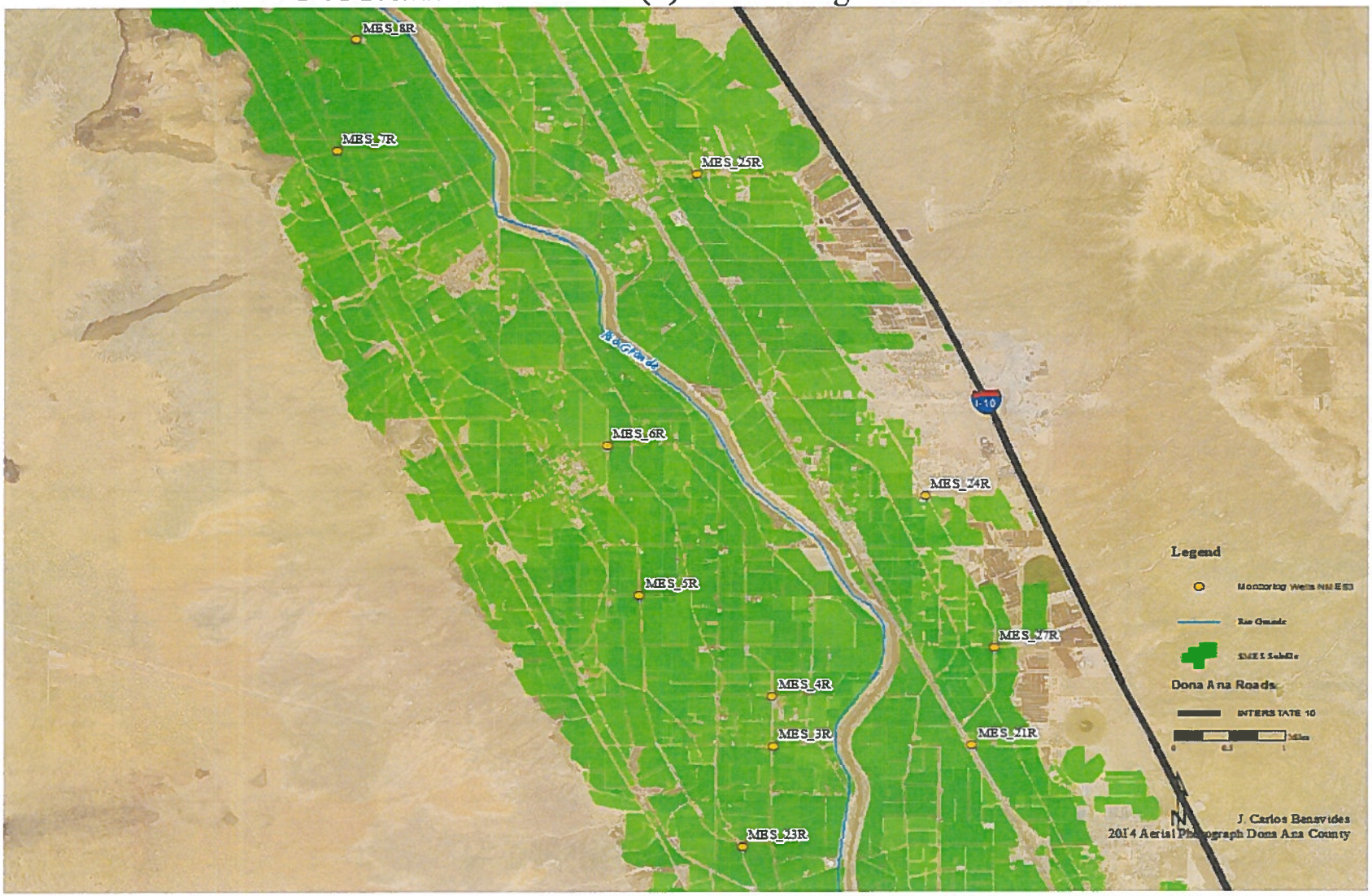
N. Mesilla Hydrograph (1)

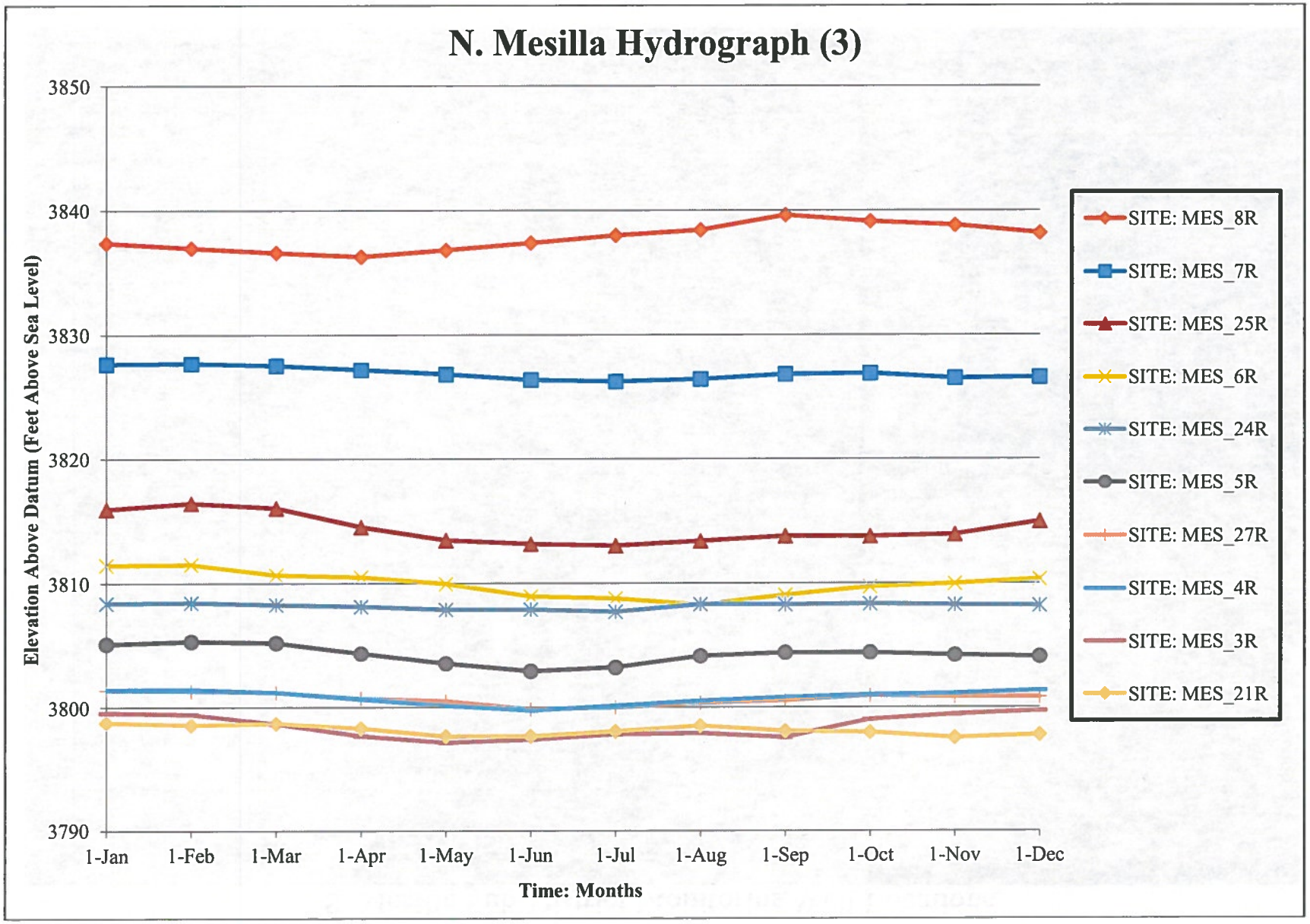


N. Mesilla Sub-District (2) Monitoring Well Locations

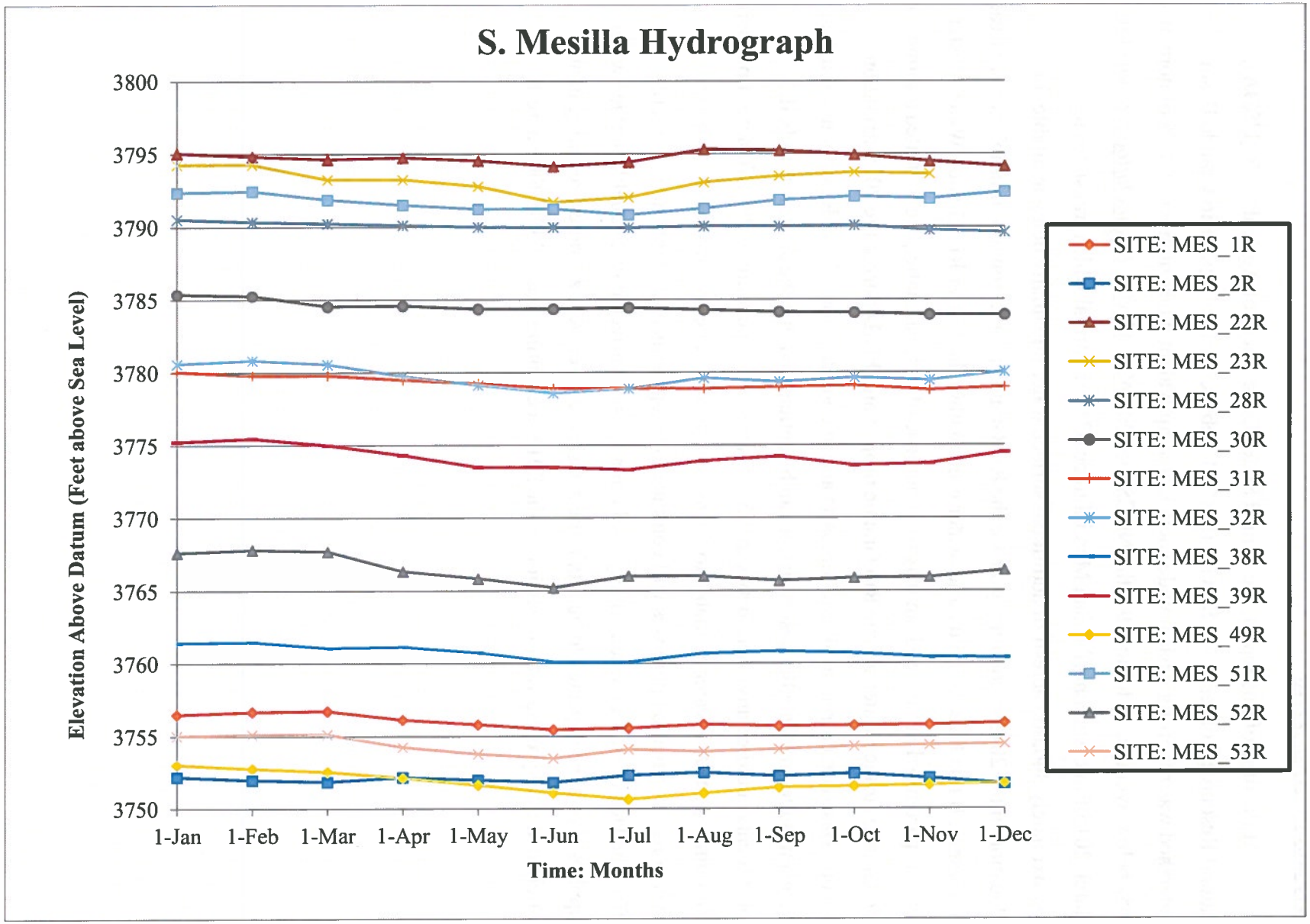

N. Mesilla Hydrograph (2)
Elevation Above Darum (Feet Above Sea Level)
3900
3890
3880
3870
3860
3850
3840
3830
3820
3810
3800
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Time: Months
SITE: MES_45R
SITE: MES_12R
SITE: MES_11R
SITE: MES_47R
SITE: MES_48R
SITE: MES_46R
SITE: MES_14R
SITE: MES_13R
SITE: MES_10R
SITE: MES_9R

N. Mesilla Sub-District (3) Monitoring Well Locations




N. Mesilla Hydrograph (3)
Elevation Above Datum (Feet Above Sea Level)
3850
3840
3830
3820
3810
3800
3790
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Time: Months
SITE: MES_8R
SITE: MES_7R
SITE: MES_25R
SITE: MES_6R
SITE: MES_24R
SITE: MES_5R
SITE: MES_27R
SITE: MES_4R
SITE: MES_3R
SITE: MES_21R

S. Mesilla Sub-District Monitoring Well Locations


S. Mesilla Hydrograph
Elevation Above Datum (Feet above Sea Level)
3800
3795
3790
3785
3780
3775
3770
3765
3760
3755
3750
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Time: Months
SITE: MES_1R
SITE: MES_2R
SITE: MES_22R
SITE: MES_23R
SITE: MES_28R
SITE: MES_30R
SITE: MES_31R
SITE: MES_32R
SITE: MES_38R
SITE: MES_39R
SITE: MES_49R
SITE: MES_51R
SITE: MES_52R
SITE: MES_53R

2015 Accounting Year

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 84% of normal, or 16% below average. Additionally, the NRCS monthly *New Mexico Basin Outlook Report* for March 2015 forecasts runoff at San Marcial to be 67% of normal which translates to approximately 340,000 acre-ft of additional surface water potentially being available for allocation in the 2015 accounting year for the Rio Grande project (on top of usable water already in storage). If this forecast holds true, water users within the Lower Rio Grande Water Master district (particularly those with an irrigation purpose of use) can anticipate a limited allotment of Rio Grande surface water via the Rio Grande project and EBID during the 2015 irrigation season. Based on current available forecasts and in consideration of usable water in storage at Elephant Butte and Caballo Reservoirs, it can be anticipated that the allotment to EBID constituents could be anywhere between 3.5-8.5 acre-inches per acre (0.29-0.70 acre-ft per acre). With limited surface water available to the system, it should be anticipated that ground water diversions for irrigation purposes will continue to be upwards of 250,000 acre-ft in order to offset the lack of surface water supply. 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 2015 accounting year of 320,000+ acre-ft.