Sonoma Valley Groundwater Management Program

2015 Annual Report

April 2016

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1.0 Introduction

This 2015 Annual Report presents an update on the progress of the Sonoma Valley Groundwater Management Program (GMP) during 2015. The Sonoma Valley GMP is being implemented in accordance with the Sonoma Valley Groundwater Management Plan (Plan), which was completed in 2007 by a broad coalition of local stakeholders. The Plan was prepared to inform and guide the Sonoma County Water Agency (Water Agency), as the lead agency, as well as stakeholders and other interested parties for the purpose of maintaining a sustainable, high-quality groundwater resource for the users of the groundwater basin underlying the Sonoma Valley.

This report covers the eighth year of implementation of the Sonoma Valley GMP and is organized as follows:

- Section 1 provides the purpose of this annual report, background information on the Plan, including the GMP organization and structure, and a summary of the recently enacted Sustainable Groundwater Management Act (SGMA)
- Section 2 provides an update on Water Year 2015 Sonoma Valley hydrologic conditions
- Section 3 presents a summary of activities conducted in 2015 and an overview of GMP activities planned for 2016

1.1 Purpose of the Annual Report

The purpose of this Annual Report is: (1) to provide an overview of groundwater conditions and monitoring results during Water Year 2015; (2) to summarize and document the activities conducted and accomplishments achieved in 2015; and (3) to present a summary of planned future management activities. For a more comprehensive summary of hydrogeologic conditions, including an assessment of progress on basin management objectives, the reader is referred to the Five Year Review Report http://www.scwa.ca.gov/five-year-review/. This Annual Report is also intended to be a tool for updating and obtaining feedback from stakeholder constituency groups and other interested parties on various aspects of the Sonoma Valley GMP, including the progress made to date on Plan implementation and plans for the future.

1.2 Overview of Sonoma Valley Groundwater Management Plan

1.2.1. Plan Area

The area subject to the Plan and GMP is shown in Figure 1-1, and lies within the San Francisco Bay Hydrologic Region. The GMP area encompasses the Sonoma Creek Watershed and includes the Sonoma Valley and the southern portion of the Kenwood Valley, designated groundwater basins 2-2.02 and 2-19, respectively, as determined by the California Department of Water Resources (DWR). For the purposes of this report, the GMP Area is the Sonoma Valley and includes the City of

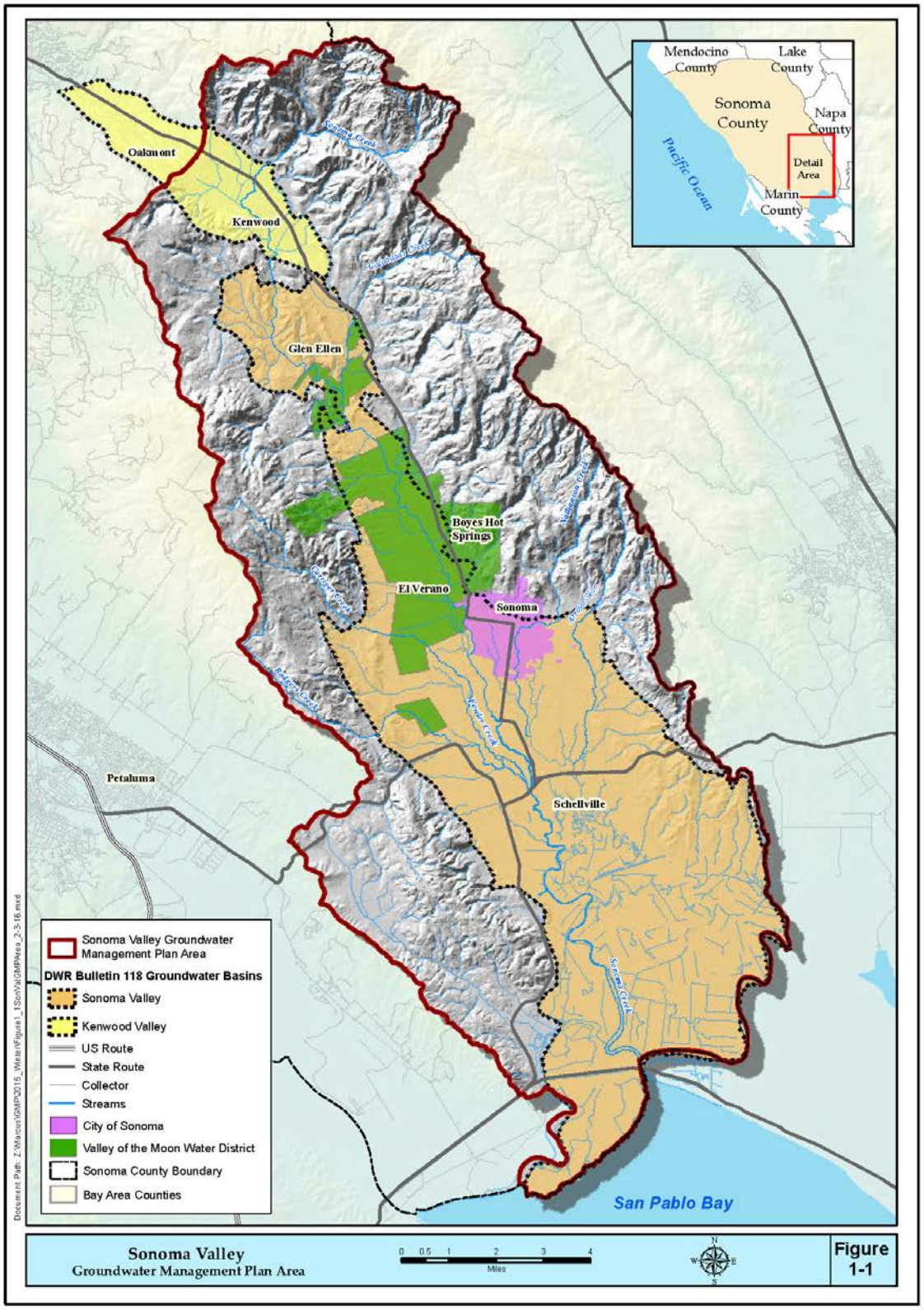


Figure 1-1 Sonoma Valley Groundwater Management Plan Area

Sonoma and communities of El Verano, Boyes Hot Springs, Glen Ellen, Kenwood, and the southernmost portions of Oakmont.

1.2.2. Plan Background

Groundwater resources have long played a significant role in the development, growth and sustainability of the Sonoma Valley, with more than half the water demand in a given year met by local groundwater resources. With increasing demand on finite local groundwater supplies, stored groundwater in the Sonoma Valley has been and will continue to be depleted without appropriate actions being taken in the near future. In response, the Plan was developed in coordination with the Water Agency, the Valley of the Moon Water District (VOMWD) and the City of Sonoma (City) under a collaborative and cooperative process that included a broad range of 20 stakeholders participating on the Basin Advisory Panel (Panel). The Panel consists of representatives from local agriculture, dairies, government, private business enterprises, environmental groups, and domestic well users. The Plan was adopted by the Water Agency, City, VOMWD, and the Sonoma Valley County Sanitation District in late 2007. Additionally, letters of support and endorsement for the Plan were received from the Sonoma Valley Vintners & Growers, Valley of the Moon Alliance, the Sonoma Ecology Center, the Mission Highlands Mutual Water Company, and the Sonoma County Water Coalition. The Plan identifies a range of water management options, including groundwater recharge and greater conservation, to help balance water demand with water supply.

The Plan was prepared under the authority of the Groundwater Management Act, California Water Code (Water Code) § 10750 *et seq.*, originally enacted as Assembly Bill (AB) 3030 in 1992 to encourage voluntary, non-regulatory groundwater management at the local level. The Plan also conforms to additional Water Code amendments enacted as Senate Bill (SB) 1938 in 2002 and AB 359 in 2011.

1.2.3. Lead Agency, Basin Advisory Panel and Technical Advisory Committee

The Water Agency is the lead agency and is responsible for managing GMP activities and progress. The lead agency directs and is responsible for all GMP studies, projects, and programs it directly or indirectly finances. The lead agency coordinates with Sonoma Valley stakeholders through the Panel, who provide input and direction to the lead agency in implementing the GMP. The VOMWD and the City, in coordination with the lead agency and the Panel, also undertake actions identified in the Plan. In addition, a Technical Advisory Committee (TAC) provides technical support to the Panel and the Agency.

1.2.4. GMP Goal, Basin Management Objectives, Management Components and Actions

The stated goal of the Sonoma Valley GMP, as presented in the Plan is:

To locally manage, protect, and enhance groundwater resources for all beneficial uses in a sustainable, environmentally sound, economical, and equitable manner for generations to come.

The purpose of the GMP is to serve as the initial framework for integrating the many independent groundwater management activities to meet this goal.

As part of the Plan, Basin Management Objectives (BMOs) were developed by the Panel to provide measurable and verifiable accomplishments for meeting the overall goal of the Plan. Ten BMOs provide the foundation for achieving the Plan's goal (Table 1-1).

The Plan includes a variety of components that are required by Water Code § 10753.7, recommended in DWR Bulletin 118 California's Groundwater (DWR 2003), and identified as optional programs under Water Code § 10753.8. These components are grouped into five general categories termed Plan Component Actions:

1. Stakeholder Involvement
2. Monitoring Program
3. Groundwater Resource Protection
4. Groundwater Sustainability
5. Planning Integration

Management actions for each Plan Component Action form the foundation for meeting the BMOs and goal. Management actions, management components, and the Sonoma Valley GMP organization are identified in Section 3. Details on the GMP actions are provided in the Plan, which is available for review at http://www.scwa.ca.gov/svgroundwater/.

1.3 New Sustainable Groundwater Management Act

In September 2014, Governor Brown signed legislation requiring that California's critical groundwater resources be sustainably managed by local agencies. The Sustainable Groundwater Management Act (SGMA) gives local agencies (cities, counties and water districts) powers to sustainably manage groundwater over the long-term, and requires Groundwater Sustainability Agencies (GSAs) be formed and Groundwater Sustainability Plans (GSPs) be developed for medium- and high-priority groundwater basins. The Sonoma Valley groundwater sub-basin (as defined in DWR's Bulletin 118 and shown on Figure 1-1) is identified as a medium priority basin and is, therefore, subject to the requirements of SGMA.

The first step in implementing the new law is to form a Groundwater Sustainability Agency (GSA) for the Sonoma Valley groundwater basin. In the meantime, the existing Lead Agency, Basin Advisory Panel and TAC will continue to function under the GMP. The existing stakeholder participation framework forms a strong basis for

Table 1-1 Basin Management Objectives and Management Components

Basin Management Objectives	BMO No.1 Maintain groundwater elevations for the support of beneficial uses of groundwater, and to proctect against inelastic land subsidence.	BMO No.2 Balance use of groundwater relative to other water sources.	BMO No.3 Protect against adverse impacts on surface water quantity from interation between groundwater and surface water flows.	BMO No.4 Identify and protect groundwater recharge areas and enhance the recharge of groundwater where appropriate.	BMO No.5 Maintain or improve groundwater quality for beneficial uses. Minimize saline intrusion.	BMO No.6 Protect against adverse impacts on water quality from interaction between groundwater and surface water flows.	BMO No.7 Improve the community's awareness of groundwater planning, water resources, and legal issues.	BMO No.8 Increase water conservation and water use efficiency practices that help achieve the plan goal.	BMO No.9 Improve understanding of the Sonoma Valley basin groundwater resource through consistent monitoring and continuing focused studies	BMO No.10 Manage groundwater with local control.	BMO No.11 Explore, Identify and maximize non-regulatory approaches to manage the groundwater resource.
Component No.1 Stakeholder Involvement											
Involving the Public	√		√	√		√	√			√	√
Public Education			√	√		√	√			√	√
Involving Other Agencies Within & Adjacent to			√	√		√	√			√	√
Utilizing Advisory Committe	√		√	√		√	√			√	√
Developing Relationships with State & Federal	√		√	√		√	√			√	√
Pursuing Partnership Opportunities	√		√	√		√	√			√	√
Component No.2 Monitoring Program											
Groundwater Elevation Monitoring	√				√	√			√	√	
Groundwater Quality Monitoring	√				√	√			√	√	
Land Surface Elevation Monitoring	√					√			√	√	
Surface Water-Groundwater Interaction Monitoring	√		√			√			√	√	
of Groundwater Data	√		√			√			√	√	
Data Management System	√		√			√			√	√	
Component No.3 Groundwater Resources Protection											
Well Construction Policies				√	√					√	
Well Abandonment & Destruction Policies				√	√					√	
Wellhead Protection Measures				√	√					√	
Protection of Recharge Areas	√	√		√	√		√	√	√	√	
Control of the Migration & Remediation of Contaminated Water				√	√					√	
Control of Saline Water Intrusion				√	√					√	
Component No.4 Groundwater Sustainability											
Demand Reduction, Conjunctive Management Activities	√	√	√	√	√	√	√	√	√	√	√
Component No.5 Planning Integration											
Land Use Planning, DWSAP Program, Groundwater Model	√	√	√	√	√	√	√	√	√	√	√

Table 1-1 Basin Management Objectives and Management Components

the collaborative processes encouraged under SGMA, including the use of advisory groups and considering the interests of the beneficial uses and users of groundwater. Section 3.1 provides a summary of progress and public outreach conducted in 2015 on the process of forming a GSA for the Sonoma Valley.

The second step required under SGMA will be to develop a new groundwater sustainability plan, which must be completed by 2022. Moreover, the existing GMP forms a strong foundation upon which to build in the development of the new GSP.

For further information on the new groundwater law and SGMA activities in Sonoma County, visit SonomaCountyGroundwater.org. For further information on the Plan implementation, contact Marcus Trotta, Sonoma County Water Agency (707) 547-1978, mtrotta@scwa.ca.gov.

2.0 Summary of 2015 Hydrologic Conditions

This section provides a summary of hydrologic conditions for Sonoma Valley during Water Year 2015 based on precipitation, stream flow, and groundwater data collected in 2015 from the locations shown on Figure 2-1. The following primary findings are further described in the following sections:

- Water Year 2015 was the fourth consecutive drought year within a longer-term dry period (eleven of the last 15 years have exhibited below average rainfall).
- Surface water-groundwater interaction is an important component of the groundwater system in Sonoma Valley. Data from the GMP monitoring program demonstrates both the importance of groundwater discharge from the shallow aquifer in providing flow to Sonoma Creek and many of its tributaries and the important role streams play in recharging groundwater in some areas.
- Groundwater level declines are present within deep zone aquifers primarily in the City and El Verano/Fowler Creek subareas. These two areas of decline have persisted for the last decade or more and appears to be expanding. While the magnitude of the declining rate may be influenced, in part, by the lower than average rainfall in recent years, many of the wells with declining groundwater levels exhibit persistent declines and do not recover during relatively wetter years. This indicates that groundwater withdrawals are occurring at a rate exceeding the rate of recharge or replenishment within the deeper zones.

2.1 Climate Conditions

The climate of the study area is Mediterranean, with moderate temperatures and distinct wet and dry seasons. About 90 percent of the annual precipitation typically occurs during the months of November through April. Precipitation is highly affected by atmospheric rivers, which concentrate rainfall and runoff along narrow bands, typically a few hundred kilometers (km) wide and several thousand km long. Nearly 50% of the precipitation in the Sonoma County area is due to atmospheric rivers (Dettinger, et al, 2011). While the rainfall pattern is generally consistent, rainfall amounts can vary considerably throughout Sonoma Valley based on elevation and geographic location within the valley.

Mean annual precipitation at Sonoma averaged 28.84 inches during the 63-year period from 1953 through 2015 (Figure 2-2), as calculated from rainfall measurements collected at the Climate Station SONOMA.C (NCDC #8351, Sonoma). This calculation is based on the annual Water Year standard nomenclature, which begins on October 1 and ends the following calendar year on September 30. This station is located approximately 0.5 miles northwest of the Sonoma Post Office at latitude 38°17’55” N, longitude 122°27'43"W, elevation 97 ft (NGVD 29). For the past 15 years, annual Water Year precipitation has been significantly lower than the long-term and has averaged 24.7 inches per year between 2000 and 2015. As indicated in Figure 2-2, 2015 was the fourth consecutive year of well below average rainfall, with a total of approximately 19.5 inches of precipitation. Additionally, eleven of the last 15 years exhibited below average annual rainfall. The majority of the

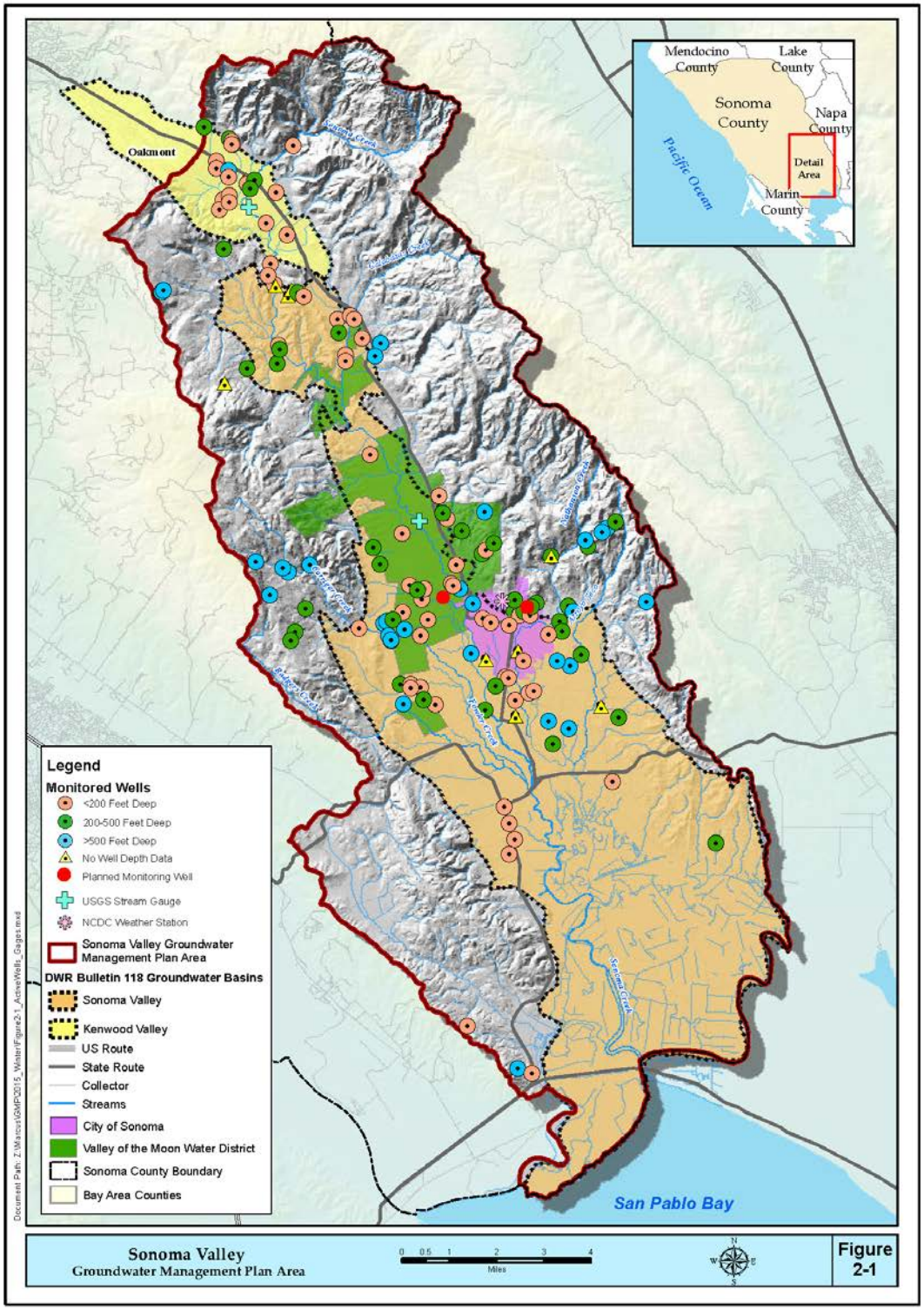


Figure 2-1 Monitoring Network

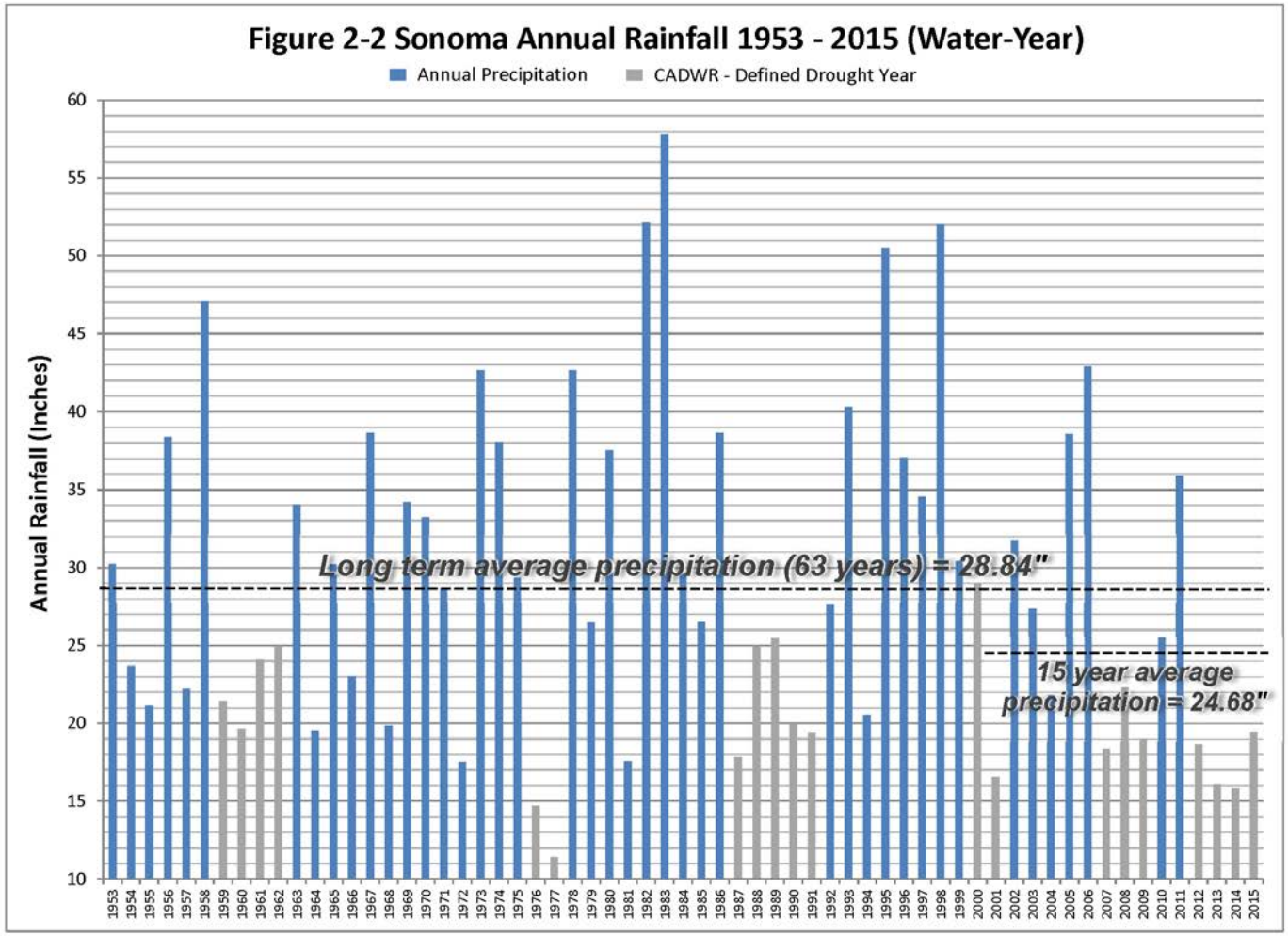


Figure 2-2 Annual Precipitation and 63-Year Average Precipitation for 1953-2015 - City of Sonoma

rainfall for Water Year 2015 (beginning October 1, 2014 and ending September 30, 2015) fell during the month of December 2014.

2.2 Surface Water Conditions

USGS Gauged Flow

Discharge in Sonoma Creek is gaged near the middle part of the valley at the Agua Caliente Avenue bridge near Agua Caliente (USGS station number 11458500), and near Kenwood (USGS station number 11458433) (as shown in Figure 2-1). The Kenwood stream gage was installed in the fall of 2008 and does not have a long-term record. The Agua Caliente gage operated from 1955 through 1981 and was then temporarily discontinued until 2001 when it was restarted.

Discharge measured at the Agua Caliente gage varies considerably annually, as shown in the graph of total annual discharge in acre-feet. The mean annual discharge of Sonoma Creek at the Agua Caliente gage (Figure 2-3) is 50,836 acre-feet (AF), on the basis of records for water years 1956–81 and 2002–15 (1 acre foot = 43,560 cubic feet = 325,900 gallons which is enough water to cover a football field with one foot of water). A maximum annual discharge of 123,402 AF was measured in 2006, and a minimum discharge of 1,002 AF was measured in 1977. Compared to the mean, total annual discharge of Sonoma Creek measured at the Agua Caliente gage in 2015 was appreciably lower at 29,065 acre-ft.

The mean annual discharge of Sonoma Creek at the Kenwood gage for the eight years it has been operating is approximately 8,695 AF, ranging from approximately 4,283 AF in Water Year 2009 to approximately 19,495 AF in Water Year 2011(Figure 2-3). It is important to note that the period of record for the Kenwood gage upon which this mean is based is quite short and primarily encompasses rainfall years that are well below average. Total annual discharge of Sonoma Creek at the Kenwood gage in 2015 was 6,111 acre-ft, indicating that between Kenwood and Agua Caliente, Sonoma Creek gained approximately 22,900 acre-ft (from a combination of tributary inflows and groundwater seepage).

In most water years, daily discharge does not increase markedly until November or December, after which it begins to rapidly decrease in April or May in response to the normal annual cycle of precipitation. In 2015, the discharge pattern mirrored the rainfall pattern, with the peak flows occurring in December that dropped off appreciably in early 2016 with the exception of flow increases in response to relatively modest storms in early February, as shown on Figure 2-4. With the dry spring conditions, discharge declines commenced earlier than normal in late February. Due to the dry conditions, streamflow at the Agua Caliente gage declined to immeasurable flow in early September compared with the 40 year median of approximately 0.4 cfs for September. Similarly, streamflow at the Kenwood gage declined to immeasurable flow in mid-July.

Seepage Runs

Synoptic streamflow measurements (seepage runs) were also conducted on Sonoma Creek and its tributaries in 2015. These seepage runs consist of a series of streamflow measurements made at multiple sites over a short time period (e.g., single day to several

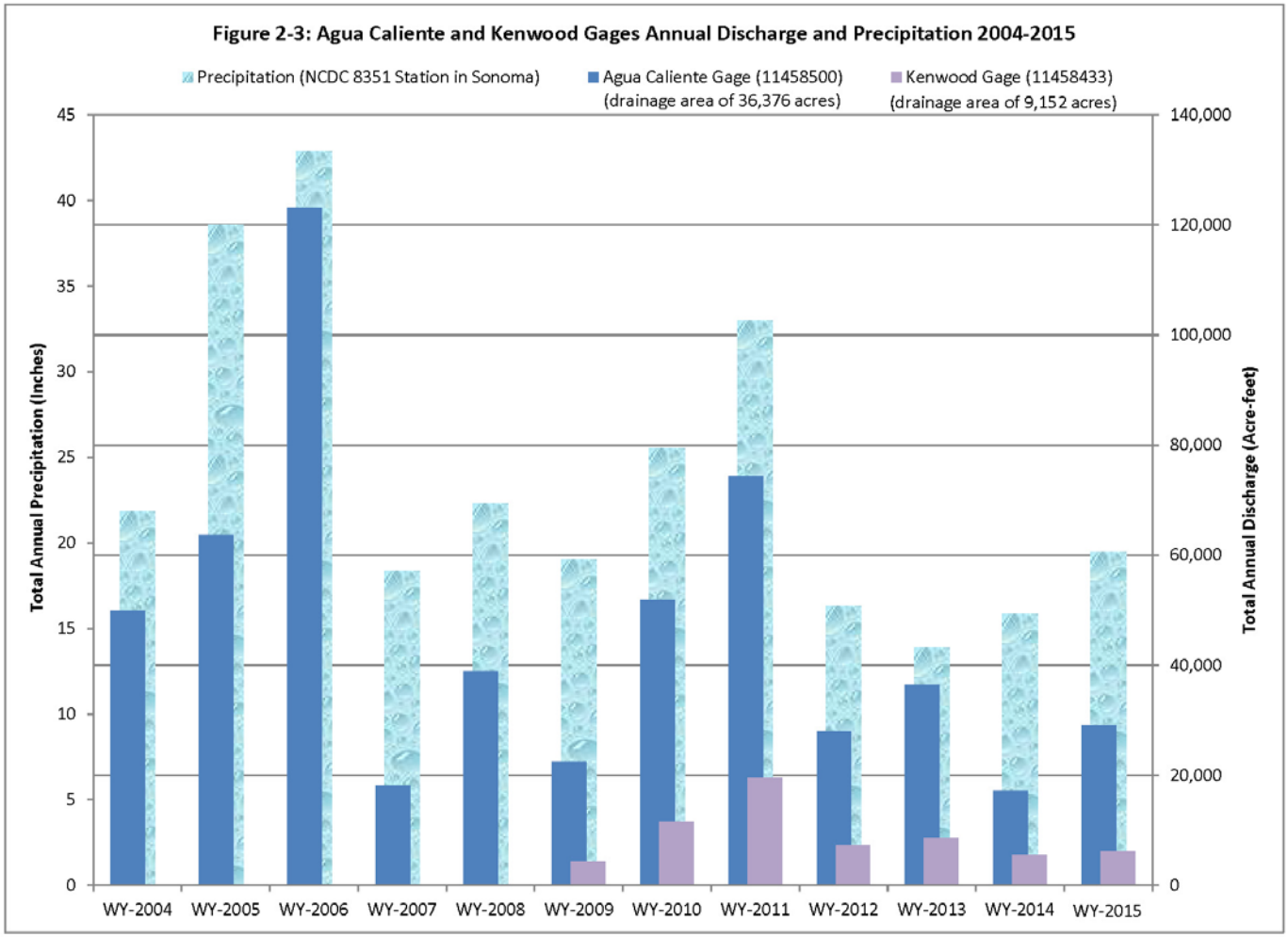


Figure 2-3 Agua Caliente and Kenwood Gages Annual Discharge and Precipitation - 2004-2015

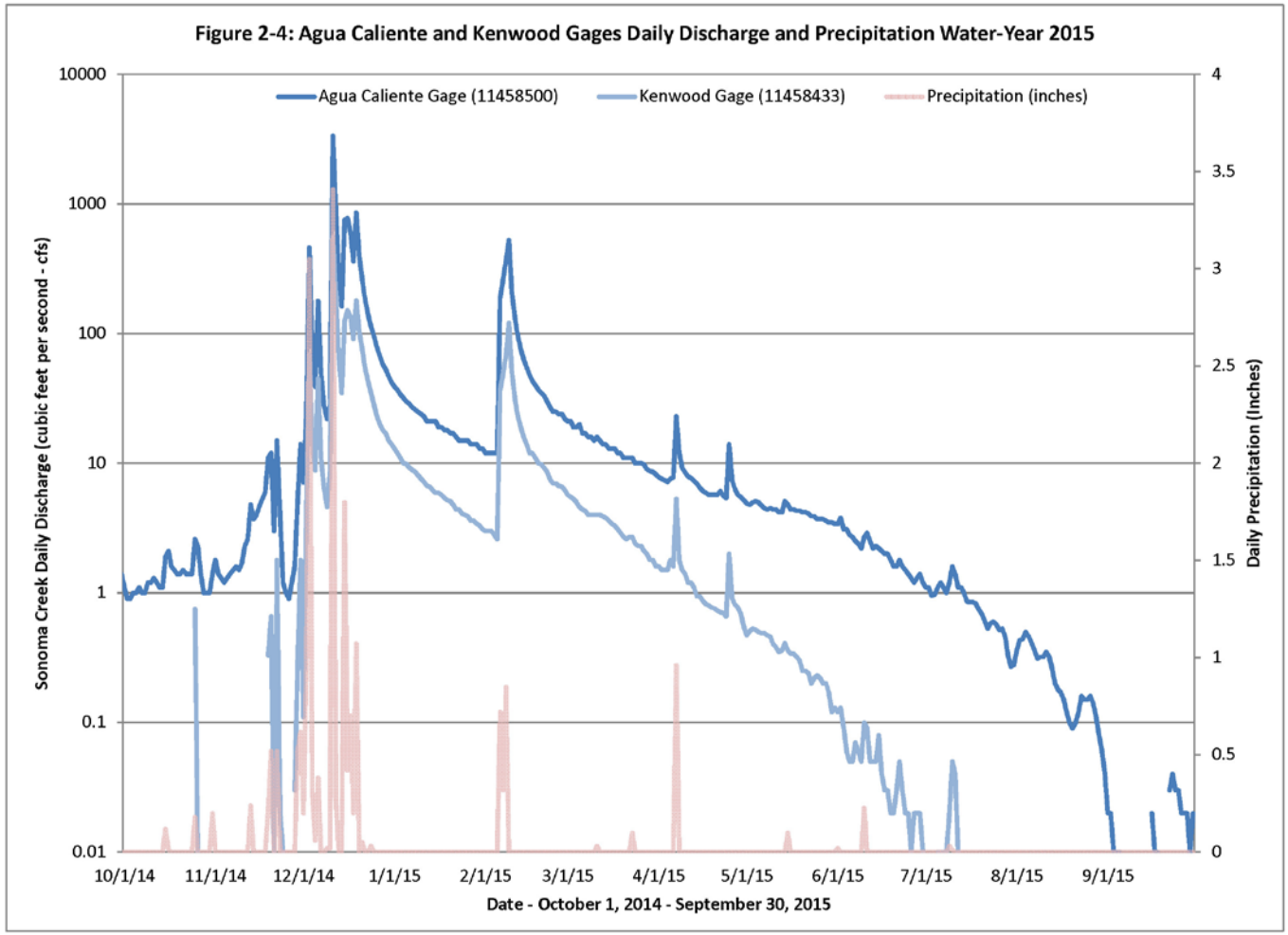


Figure 2-4 Agua Caliente and Kenwood Gages Annual Discharge and Precipitation - Water Year 2015

days) along Sonoma Creek and its tributaries to quantify streamflow gains and losses for a specific time period. In 2015, monthly measurements were collected at approximately 19 sites and semiannual measurements were collected at approximately 70 sites in February and October 2015.

Results from the seepage measurements for March 2015 are provided on Figure 2-5. Consistent with previous seepage runs conducted in Spring 2003, 2010, and 2014 (USGS, 2006), the results from March 2015 indicate that the majority of the mainstem of Sonoma Creek is gaining (groundwater is discharging into the creek) or neutral in the springtime. The more significant gaining reaches along Sonoma Creek include:

- USGS Gauge at Kenwood to Randolph Road
- Yulupa Creek confluence to the Calabazas Creek confluence
- Madrone Road Bridge to Agua Caliente Road Bridge
- Agua Caliente Road Bridge to Verano Avenue Bridge
- Leveroni Road Bridge to Watmaugh Road Bridge

More significant gaining reaches along tributaries includes:

- Calabazas Creek from Dunbar Road to Warm Springs Road
- Lower reaches of Nathanson Creek

The primary losing reaches along Sonoma Creek are limited to:

- Upper reach near Kenwood where Sonoma Creek leaves Adobe Canyon and crosses over its alluvial fan upstream of Highway 12
- Verano Avenue Bridge to Leveroni Road Bridge

The primary losing reaches along tributaries include:

- Carriger Creek from Grove Street Bridge to Arnold Drive Bridge
- Arroyo Seco Creek from Bartholomew Park to E. Napa Street Bridge
- Nathanson Creek from Ravenswood Winery to Patten Street Bridge
- Rodgers Creek from via Columbard Bridge to Watmaugh Road Bridge

2.3 Groundwater Conditions

This section presents the results of the groundwater level monitoring program in the Sonoma Valley performed as part of the GMP. To maintain consistency with the approach utilized in the 2006 USGS report, the 158 groundwater level monitoring program wells were subdivided according to their well-screen depth or total depth into the following three categories: (1) 200-feet deep or less; (2) 200 to 500 feet deep; and (3) greater than 500 feet deep. As indicated on Figure 2-1, 67 wells are less than 200-feet deep, 47 wells are between 200 to 500 feet deep, 33 wells are greater than 500 feet deep, and 11 wells lack information to determine their depth. Due to the limited number and distribution of wells that are greater than 500 feet deep, for the purposes of preparing depth-specific groundwater-level hydrographs and groundwater-level contour maps, wells were grouped into two categories: (1) 200-feet deep or less; and (2) greater than 200-feet deep.

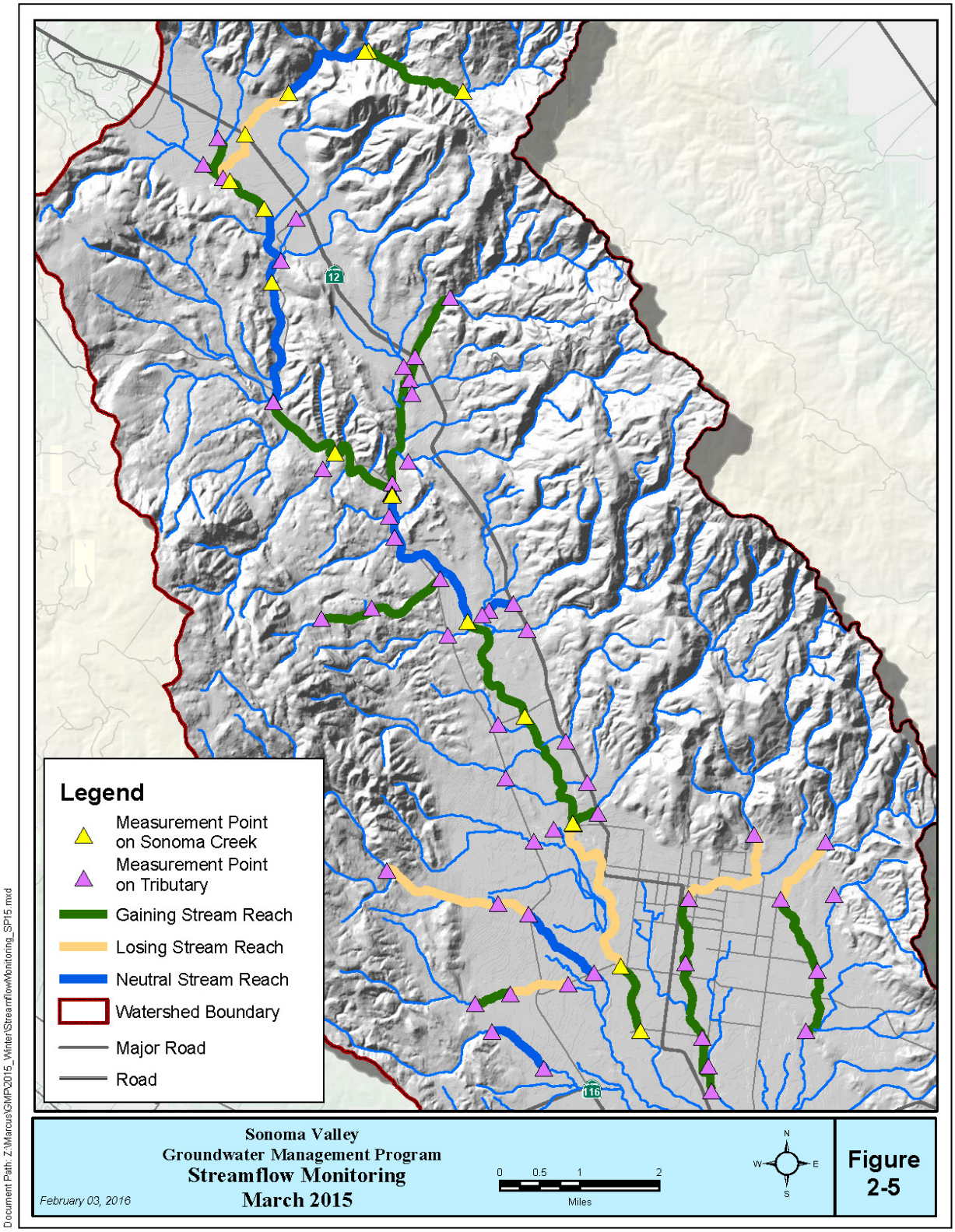


Figure 2-5 Streamflow Monitoring - March 2015

Additionally, groundwater-level data has been collected utilizing Water Agency pressure transducers at a number of dedicated monitoring wells, private, mutual water company, City of Sonoma and VOMWD wells over the past several years. Groundwater-level data collected from these wells is included in Appendix B.

2.3.1. Groundwater Level Elevations

Groundwater level elevation contour maps for Spring 2015 in both shallow wells (200-feet deep or less) and deeper wells (greater than 200-feet deep) are shown in Figures 2-6 and 2-7, respectively. Spring 2015 groundwater level elevations ranged from approximately:

- 487 feet mean sea level (msl) in the north end of the Sonoma Valley to 3 feet msl in the south end measured in shallow wells
- 496 feet msl in the north end of the Sonoma Valley to -126 feet msl in southern Sonoma Valley measured in deeper wells

The Spring 2015 groundwater-level contour maps in both the shallow and deeper zones indicate that groundwater flows from recharge areas in the mountains toward the valley axis, and in a generally southern direction along the valley floor towards San Pablo Bay. Comparison of the shallow and deeper groundwater-level contour maps indicates that groundwater elevations in the deeper zone range up to 100 feet lower than groundwater elevations in the shallow-zone in portions of southern Sonoma Valley.

There are two persistent groundwater pumping depressions in the southern Sonoma Valley, first identified in a 1999 report prepared for the VOMWD (LSCE, 1999) and further described in the 2006 USGS report, which are most apparent in the deeper zone groundwater level contour maps (Figure 2-7). Southeast of the City of Sonoma, measured groundwater levels ranged up to 126 feet below sea level and southwest of El Verano groundwater levels ranged up to 42 feet below sea level in in these two deeper zone pumping depressions. As further shown on Figure 2-7, the lowest groundwater levels occur east of the Eastside Fault, which may indicate that the fault forms a barrier to groundwater flow.

It is important to note that groundwater elevations measured in nearby wells can be highly variable due to differences in well design (i.e., the depth and length of well screen intervals) and the spatial variations in aquifer materials (which can vary abruptly due to the complex geologic conditions and numerous fault zones present in Sonoma Valley). Therefore, the associated groundwater level contour maps represent regional groundwater level flow patterns and should not be used to interpret more localized or site-specific conditions.

2.3.2. Groundwater Level Trends

Representative hydrographs are provided in Figures 2-8 and 2-9 for the shallow and deeper-zone wells, respectively, showing a select number of well hydrographs distributed throughout the valley. Hydrographs for all wells included in the groundwater-level monitoring program are provided in Appendix A. These hydrographs present the change in groundwater elevation (vertical axis in feet) over time (horizontal axis in years). On the hydrographs, groundwater measurements representative of spring groundwater-level data are depicted in green and fall groundwater-level data are shown in red and all other measurements are shown in black.

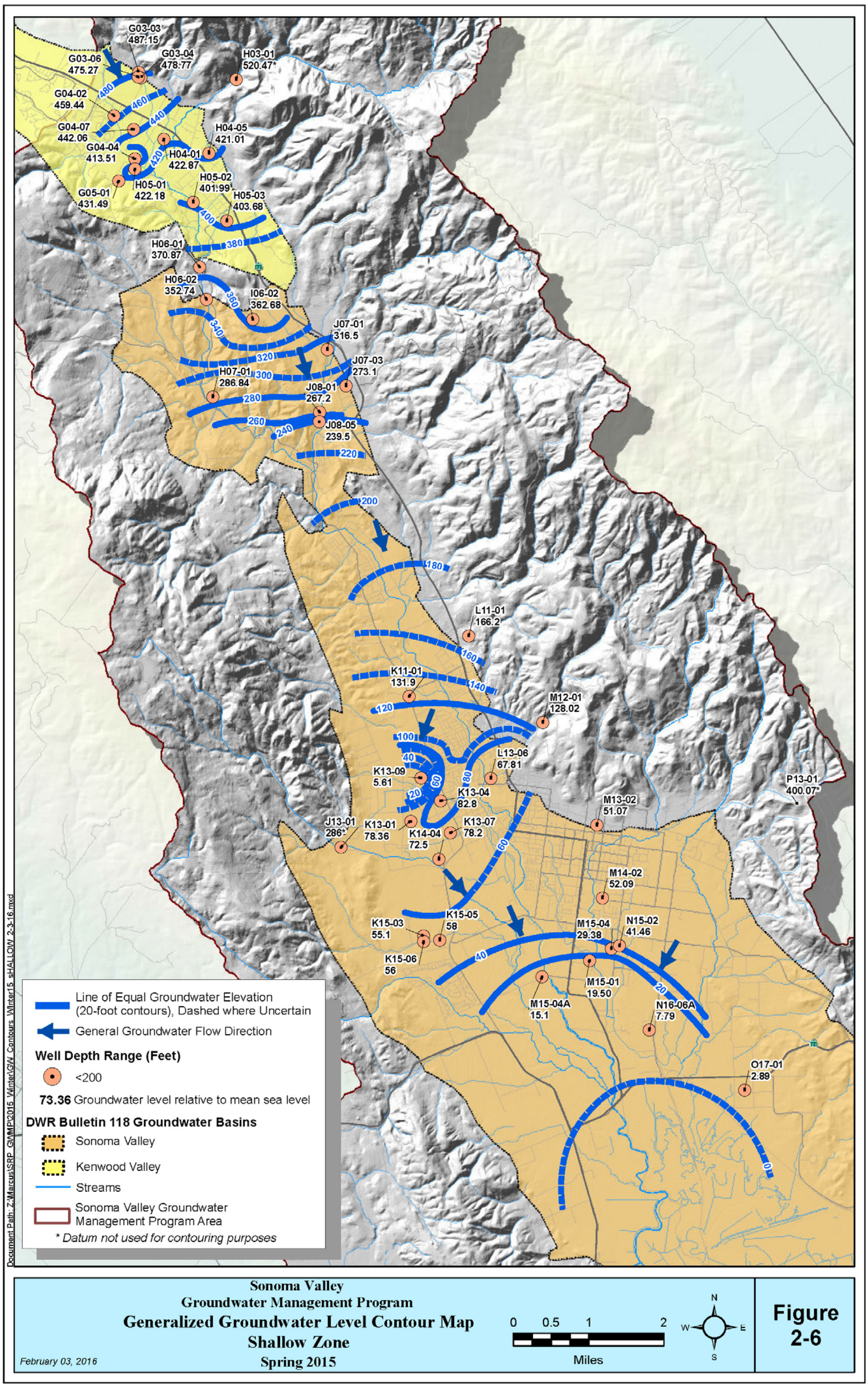


Figure 2-6 Spring 2015 Groundwater Level Contour Map - Shallow Zone (≤200 feet deep)

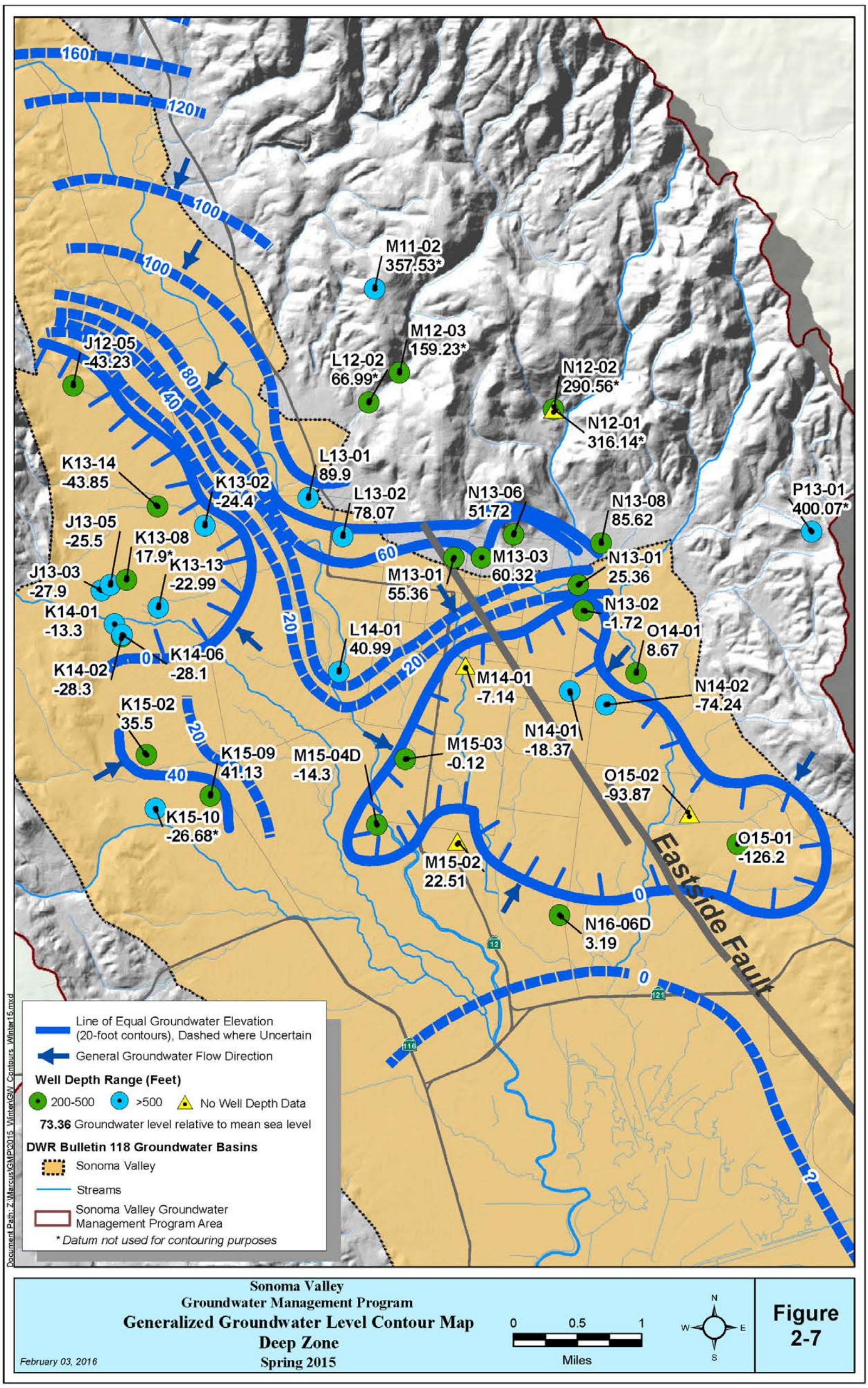


Figure 2-7 Spring 2015 Groundwater Level Contour Map - Deeper Zone (>200 feet deep)

As indicated on Figure 2-8, while many shallow-zone wells exhibit relatively stable long-term groundwater levels that predominantly remain above sea level, a number of shallow-zone wells have exhibited declines during the last decade, with the majority of these declines occurring in the El Verano area. As indicated in Figure 2-9, declining groundwater level trends are more pervasive in deeper-zone wells, with wells in the El Verano Area and southeast of the City of Sonoma trending below sea level. Numerous well hydrographs shown on Figure 2-9 exhibit groundwater level declines ranging up to 80 feet over the last 30 years.

Many of the hydrographs have less than 10 years of monitoring record, making it unclear whether these are long-term trends, short-term accelerated declines, a reflection of the dry years or some combination. To help address this issue, groundwater level changes were further evaluated for a larger subset of wells and computed results are included in Appendix A. These computed groundwater-level changes are provided in Figures 2-10 and 2-11 for the shallow and deeper-zone wells, respectively, to display the average groundwater level change per year at selected wells over 2005 to 2015 (displayed as circles) and 2010 to 2015 (displayed as squares).

As shown on Figure 2-10, 32 of the 47 shallow zone wells exhibit declining groundwater level trends. Nine of the 47 wells exhibited declining trends of 0.5 to 1.0 feet per year, 16 of the 47 wells exhibited declining trends of 1.0 to 2.0 feet per year and 7 of the 47 wells exhibit declining trends of over 2 feet per year. The majority of wells exhibiting declines exceeding one foot per year are located in the El Verano/Fowler Creek subarea. 13 of the 47 shallow-zone wells exhibited a change of less than 0.5 feet per year and two exhibited increasing trends.

As indicated in Figure 2-11 declining groundwater level trends are more prevalent in deeper-zone wells with 53 of the 63 wells exhibiting declining trends. Nine of the 63 wells exhibited declining trends of 0.5 to 1.0 feet per year, 22 of the 63 wells exhibited declining trends of 1.0 to 2.0 feet per year and 22 of the 60 wells exhibit declining trends of over 2 feet per year. The most pronounced short-term declines are observed in wells located within the western and eastern highlands and within the El Verano/Fowler Creek and City subareas. The most pronounced long-term declines are within the El Verano/Fowler Creek and City subareas and are located within or near areas where groundwater levels have declined below sea level. Four of the 63 deep-zone wells throughout Sonoma Valley exhibited a change of less than 0.5 feet per year while five exhibited an increasing trend.

Most of the groundwater level declines are considered to likely have resulted from increased groundwater withdrawals in localized areas (USGS 2006 and Sonoma County Water Agency, 2014). The groundwater level declines are due to a combination of increasing demands and declining levels of precipitation over last few decades. In the vicinity of groundwater level pumping depressions located within the City and El Verano/Fowler Creek subareas, groundwater demands are primarily a combination of agricultural and rural domestic pumping (Sonoma County Water Agency, 2014).

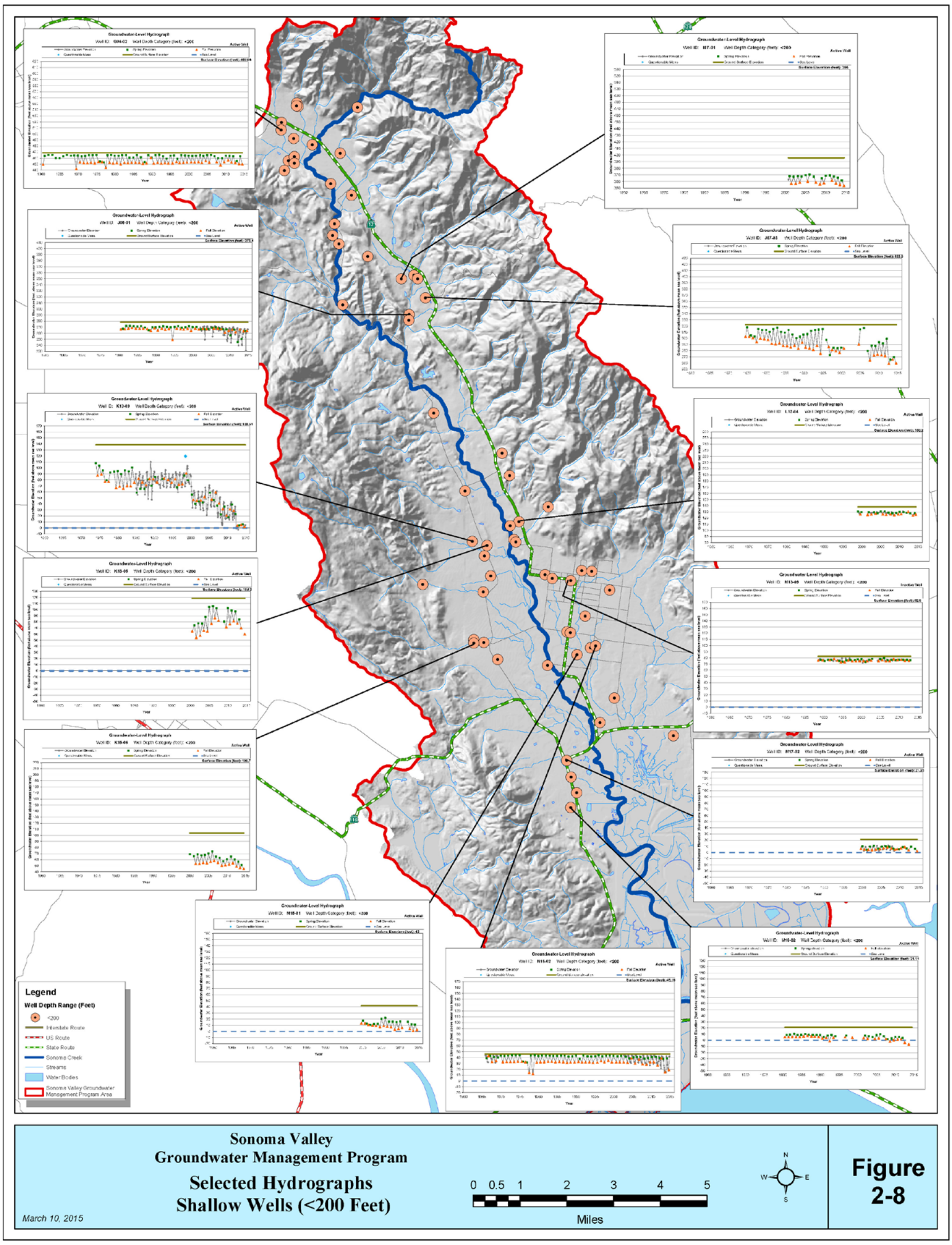


Figure 2-8 Selected Hydrographs - Shallow Wells

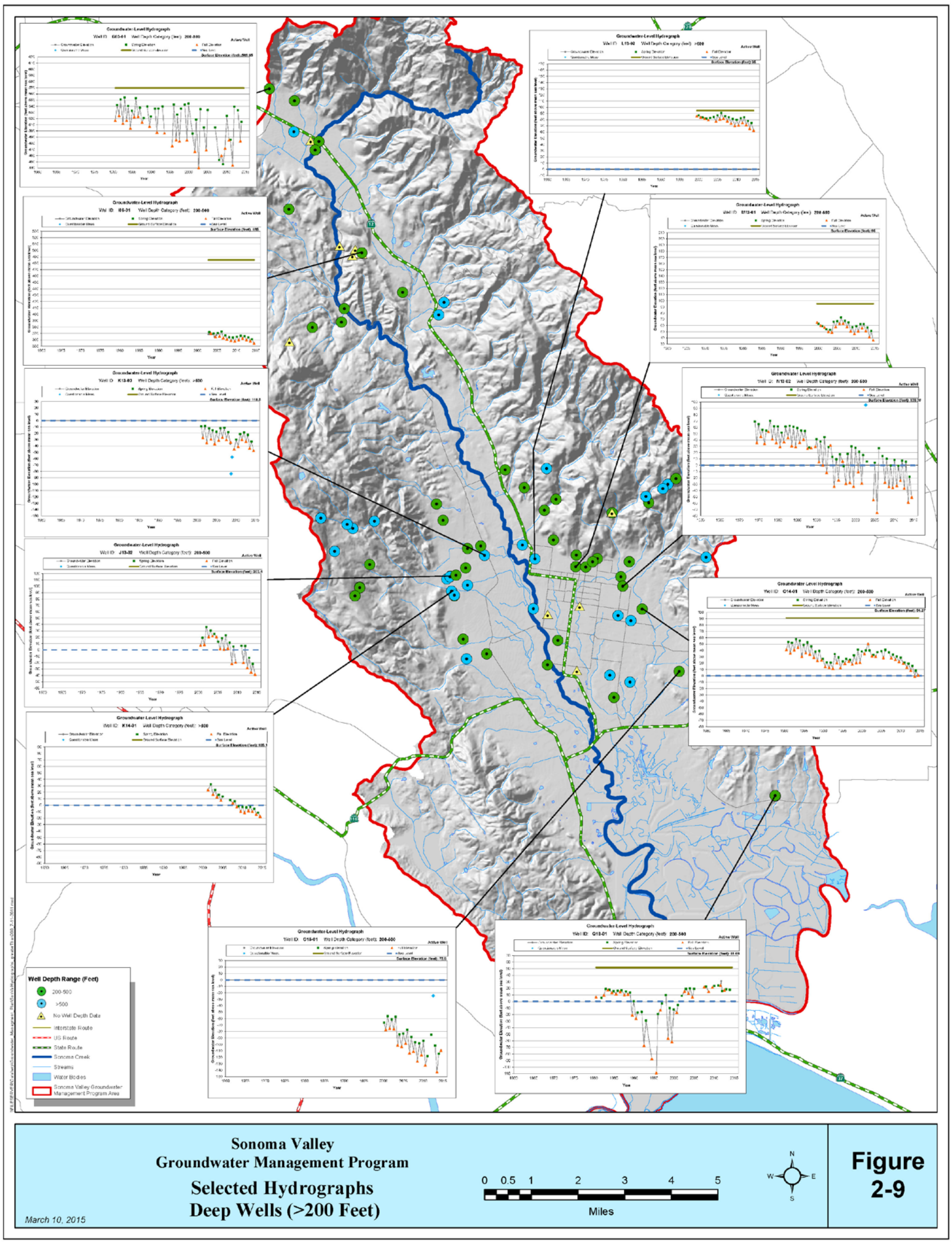


Figure 2-9 Selected Hydrographs - Deeper Wells

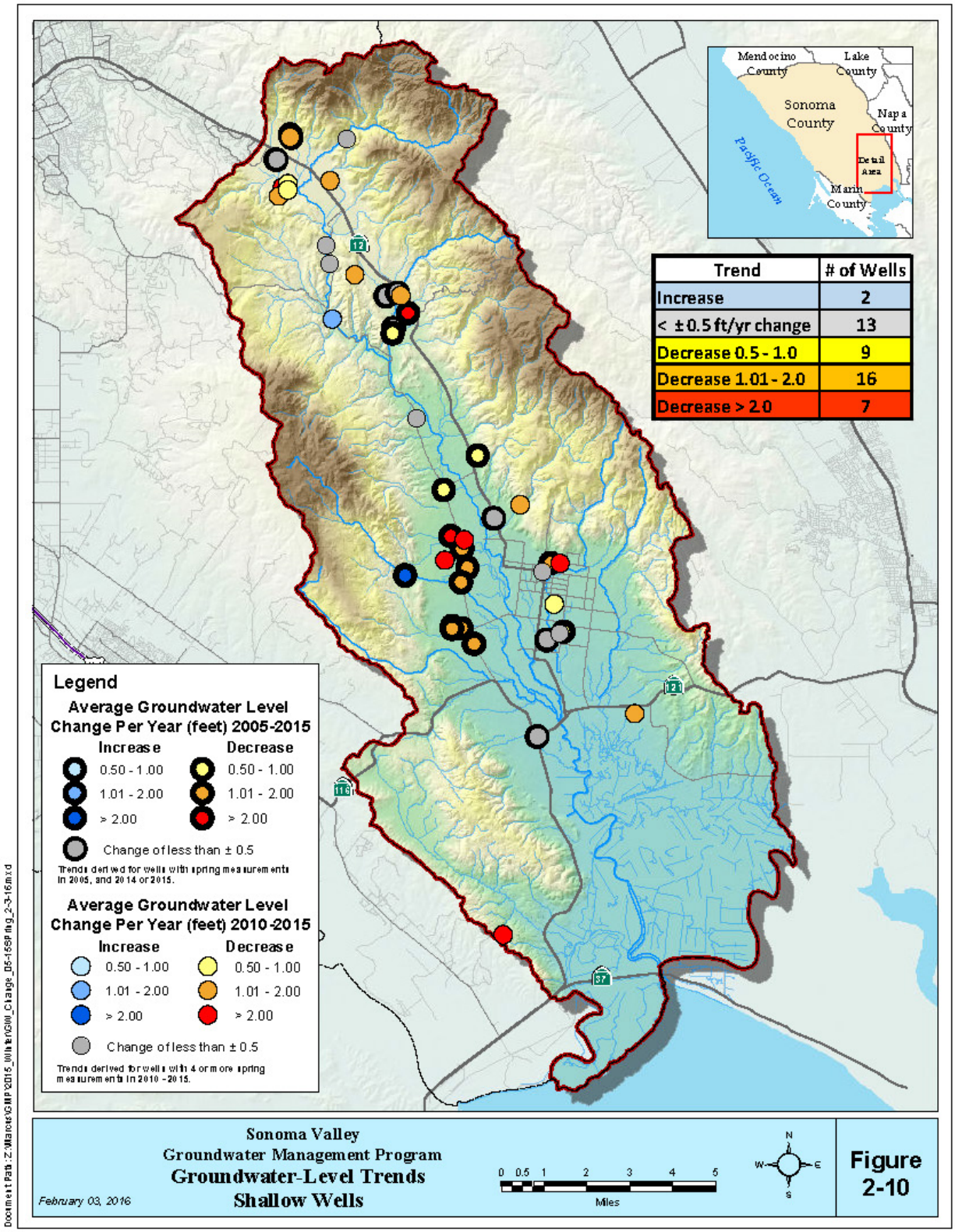


Figure 2-10 Groundwater Level Change - Shallow Wells

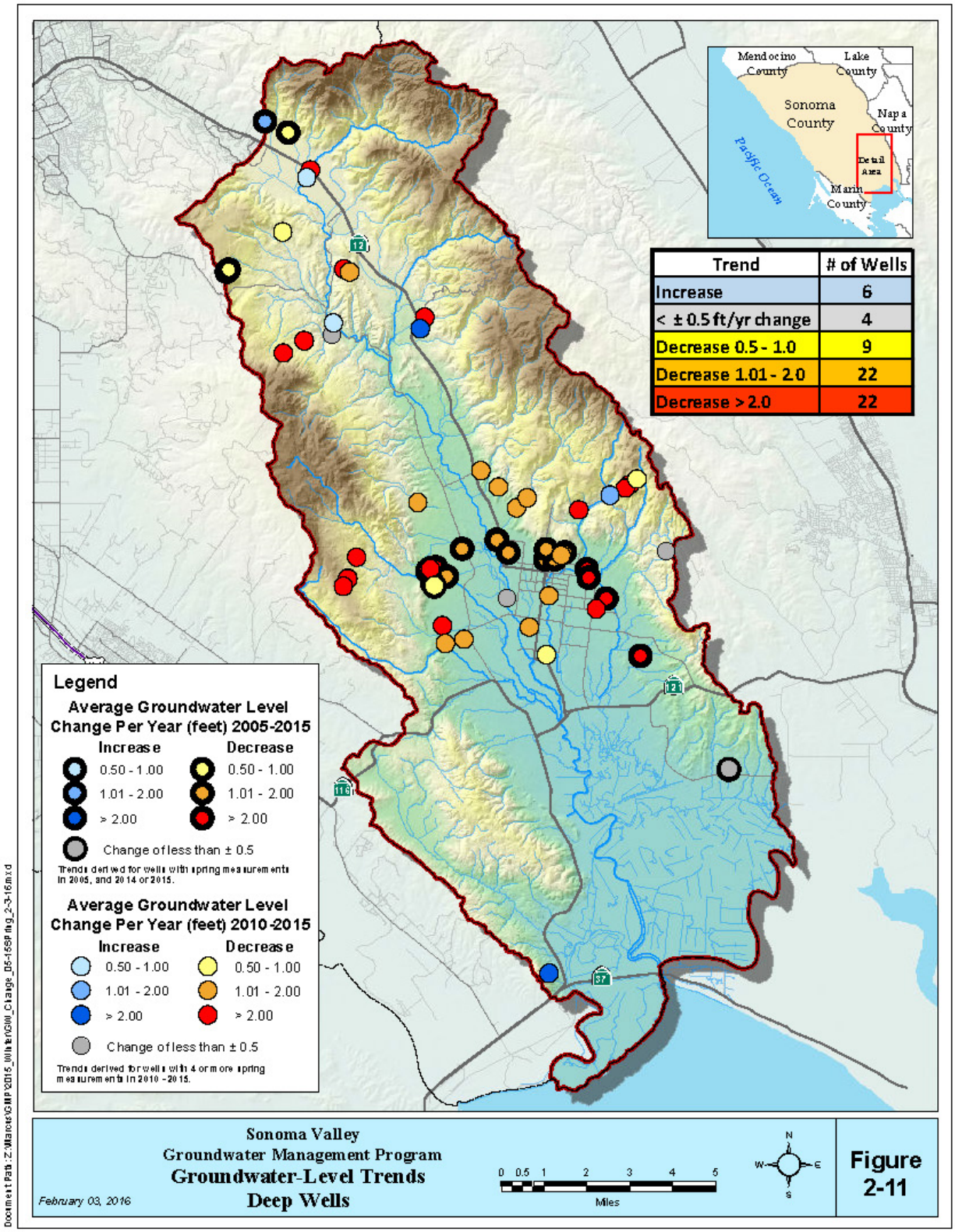


Figure 2-11 Groundwater Level Change - Deeper Wells

The two areas of decline (pumping depressions) have persisted for the last decade or more and appear to be expanding. While the magnitude of the declining rate may be influenced, in part, by the lower than average rainfall which has occurred in eight of the last ten years (most notably the last three years), many of the wells with declining groundwater levels exhibit persistent declines, which do not recover during relatively wetter years (for example see well N13-02 and K14-01 on Figure 2-9), indicating that groundwater withdrawals are occurring at a rate exceeding the rate of recharge or replenishment within the deeper zones.

2.3.3. Summary of Groundwater Conditions

Declining groundwater levels (primarily observed in the deeper aquifers in the El Verano and area of southeast of the City of Sonoma) indicate groundwater withdrawals in excess of recharge in the southern portion of the Sonoma Valley. The net loss of groundwater is due to a combination of increasing groundwater demands and declining levels of precipitation over the last few decades. These declining groundwater levels, which have fallen below sea level in areas, could exacerbate the intrusion of poor quality water (either from brackish water or geothermal fluids) into the deeper aquifers in these areas. Reversing the declining trends and recovering groundwater levels in the deeper aquifers is necessary to protect and preserve groundwater uses in these areas and will require a number of management actions over the coming years.

3.0 Management Actions and Progress on Plan Components

This section describes the significant activities and accomplishments of 2015, the eighth year of Plan implementation. The section also describes activities planned for 2016. Some of the more significant activities include the following:

- **Monitoring of groundwater levels and surface water/groundwater interaction** through the collection of semi-annual groundwater-level measurements from over 150 wells and streamflow measurements from approximately 70 locations (Section 3.2). More frequent measurements were also collected at a subset of these locations to better track seasonal and short-term trends.
- **Additional groundwater quality sampling** in southern Sonoma Valley by the USGS was initiated to better understand the occurrence and potential threat posed by higher salinity groundwater near areas of declining groundwater-levels (Section 3.3).
- **Progress on construction of additional recycled water pipeline** to deliver water to the high school and the city park for turf irrigation (Section 3.4). The new pipeline will be constructed in 2016 and have a capacity of about 300AF per year and will also have capacities for agricultural users along the alignment to offset existing groundwater use.
- **Progress on performing an alternatives screening** for potential technical, regulatory, land use and institutional response action alternatives to mitigate declining groundwater levels (Section 3.4). Steps associated with the alternatives screening are shown on Figure 3-1 and include: developing alternatives and screening criteria; integrating agricultural conservation alternatives provided by the Sonoma Resource Conservation District; updating the numerical groundwater flow model for Sonoma Valley; and developing scenarios for simulating future conditions under a range of management alternatives to help identify and prioritize the most effective solutions. Table 3-1 identifies the status for each of the steps associated with the alternatives analysis.
- **Progress on design of the City Watersheds project,** based on neighborhood and stakeholder input, which will include a stormwater detention facility in the northern portion of the City of Sonoma and is planned for construction in 2018 or 2019 (section 3.4).

These activities and actions and many others associated with or complementary to the GMP are outlined in Table 3-2, and further described in the following pages and grouped according to the Plan Component Actions:

- Stakeholder Involvement,
- Monitoring Program,
- Groundwater Resources Protection, and
- Planning Integration.

3.1 Component 1 - Stakeholder Involvement

Stakeholder involvement continued to provide the foundation for the collaborative process of decision-making and actions during GMP implementation and in 2015 included:

- **Basin Advisory Panel** - met quarterly to direct implementation of the groundwater management program.

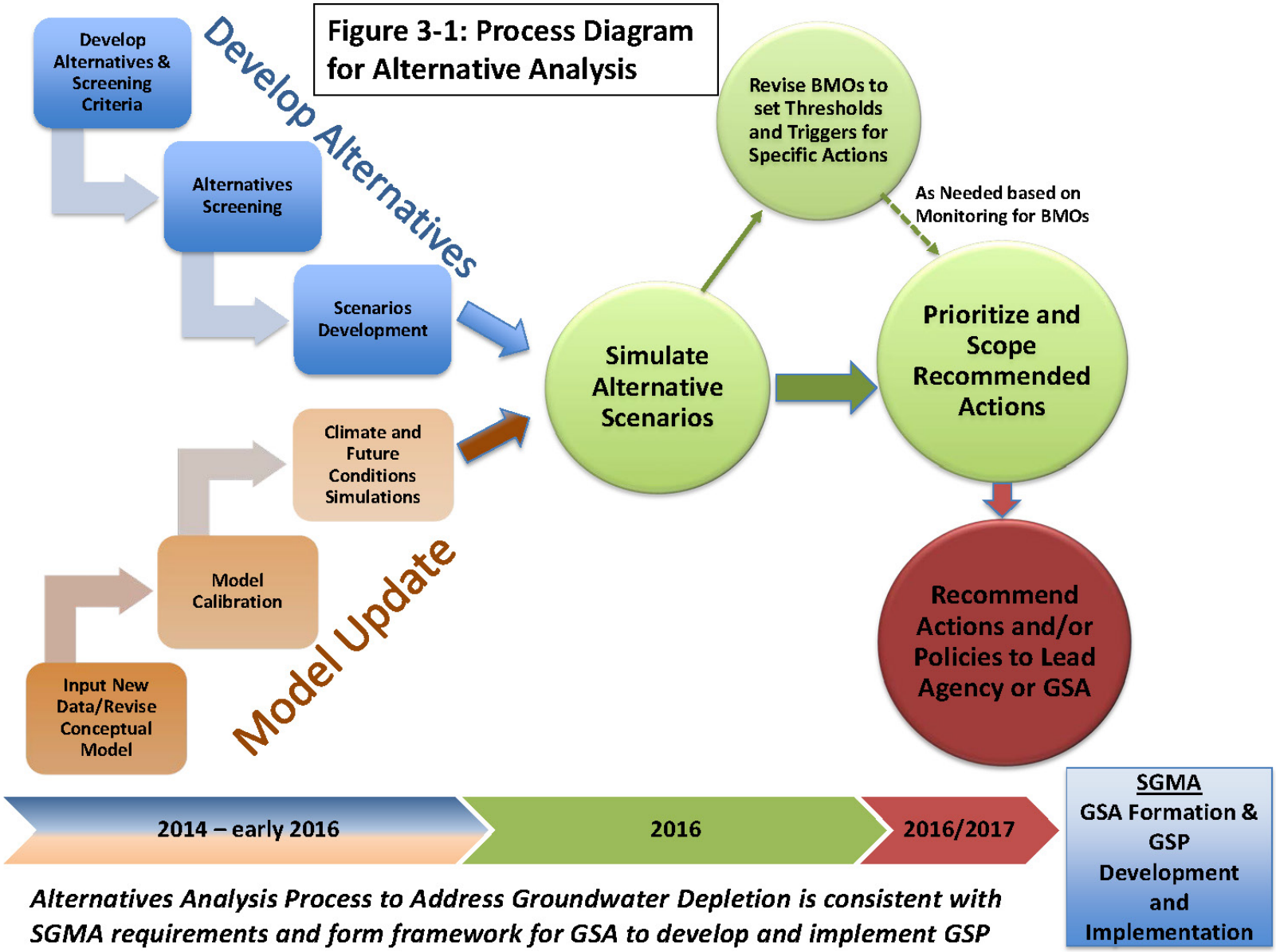


Figure 3-1 Process Flow Diagram for Alternatives Analysis

Table 3-1
Steps for Analyzing Alternatives to Address Groundwater Depletion
From Five Year Review Report (2014)

Step	Activity	Status
1)	Panel/TAC to **identify potential technical, regulatory, land use and institutional response action alternatives** to mitigate declining groundwater levels. Response action alternatives could include but are not limited to additional water supply programs, conservation and efficiency programs, increased data collection and reporting, implementation of land use strategies, regulatory responses, and institutional approaches.	**In Process – initial list of alternatives and assumptions developed. Will be refined upon completion of model calibration.**
2)	Panel/TAC will **develop screening criteria** to evaluate the viability of possible response action alternatives.	**Completed.**
3)	Panel/TAC will **prioritize response action alternatives and develop scenarios** consisting of one or more of these alternative actions, and evaluate how effective the alternative actions might be in mitigating declining groundwater levels.	**In Process – prioritization and development of scenarios will be done upon completion of model calibration.**
4)	Refine conceptual model in the southern Sonoma Valley and **refine MODFLOW groundwater flow model** to support scenario based planning.	**In Process – model calibration complete in early 2016.**
5)	TAC to work with Panel and SVGMP staff for **input and review on the scenario based planning** to include baseline conditions, no action alternative, and a range of climate impacts and land use changes.	**In Process – assumptions for baseline land use/climate change conditions being developed. Develop scenarios for modeling early 2016.**
6)	Panel ultimately to **approve response action alternatives screening and make recommendations regarding any technical or policy proposals** that come out of the process.	**To be completed following scenario modeling. Likely in mid- to late-2016.**
7)	**Community outreach** will be needed throughout this process to educate local stakeholders of basin conditions, inform them of possible response action alternatives, policy recommendations and consider their input.	**Ongoing.**

Table 3-1 Steps for Analyzing to Address Groundwater Depletion

Table 3-2 - Management Components and Actions - Progress and Plans

Management Components/Actions	Completed Actions - Years 1-8								Future Plans		Relative
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Cost
4 Stakeholder Involvement											
4.1.1 Involving the Public											
Meetings, coordination, and communication	√	√	√	√	√	√	√	√	❖	❖	----
Public Outreach Plan for implementation	√	√				√				❖	----
4.1.2 Advisory Groups											
Hold TAC bimonthly meetings	√	√	√	√	√	√	√	√	❖	❖	----
Hold Quarterly Meetings with the Panel	√	√	√	√	√	√	√	√	❖	❖	----
4.1.3 Informing Public Agencies and Stakeholders											
Meetings, coordination, and communication	√	√	√	√	√	√	√	√	❖	❖	----
4.1.4 Partnerships & Coordination											
Meetings, coordination, and communication	√	√	√	√	√	√	√	√	❖	❖	----
Seek grant funding for Plan actions	√	√	√	√	√	√	√	√	❖	❖	----
4 Monitoring Program											
4.2.2 Groundwater Elevation Monitoring											
Groundwater Elevation Monitoring & Expand Volunteer Wells	√	√	√	√	√	√	√	√	❖	❖	----
Project - Install New Multi-depth Monitoring Wells						√			❖		$$
CASGEM Monitoring Plan and Annual Data Submittals						√	√	√	❖	❖	$
4.2.3 Groundwater Quality Monitoring											
Groundwater Quality Monitoring-long-term porgram		√	√	√	√	√				❖	----
Conduct Depth Specific Salinity Monitoring - South Valley				√	√	√		√	❖	❖	----
4.2.4 Land Subsidence Monitoring											
Establish Long-Term Monitoring Program for Land Subsidence									❖		$
4.2.5 Surface Water-Groundwater Interaction Monitoring											
Study - Tracer Test and Modeling											$$$
Study - Stable Isotope Analysis	√		√	√	√			√	❖		$$
Project - Install and Maintain New and Existing Stream Gauges	√	√	√	√	√	√	√	√	❖	❖	$$
Project - Conduct Seepage Runs		√	√	√	√	√	√	√	❖	❖	$
4.2.6 Monitoring Protocols											
Adopt and Implement Protocols & Monitoring Program	√	√	√	√	√	√	√	√	❖	❖	----
4.2.7 Central GIS Data Management System											
Update GIS Mapping of Drainage Network										❖	$
Maintain and Update GIS Groundwater Database			√	√	√	√	√	√	❖	❖	$
Web-Based Data Management System	√	√	√	√					❖	❖	$$
4 Groundwater Quality Protection											
4.3.1 Well Construction, Abandonment, and Destruction											
Study - Obtain Better Information during Well Installations											----
Study - Conduct Well/Abandoned Well Survey											$$
Project - Develop & Distribute Guide for Well Owners		√	√	√	√						----
4.3.2 Wellhead Protection											
Incorporate Information from DWSAP Plans										❖	----
4.3.3 Control Migration and Remediation of Contaminated Groundwater											
Provide Well Owners with County Guide			√	√	√	√					----
Incorporate & Distribute Information on Sources											----
4.3.4 Control of Saline Water Intrusion											
Study - Salinity Sources and Distribution (Salt & Nutrient Plan)					√	√			❖	❖	$$
Study - Seawater Intrusion Mitigation Measures (if appropriate)											$$$
4 Groundwater Sustainability											
4.4.1 Stormwater Recharge											
Study - Groundwater Recharge Area Mapping & Analysis		√	√	√	√						$
Study - Recharge Area Alternatives											$$
Project - Public Outreach Program			√	√	√	√					$
Study/Pilot - Stormwater Capture/Groundwater Recharge Scoping			√	√	√	√					$$$
4.4.2 Groundwater Banking											
Study - Conduct Groundwater Banking/Conjunctive Use Assessment			√	√	√	√					$$$
Study/Pilot - Feasibility Analysis/Pilot Groundwater Banking							√		❖	❖	$$
4.4.3 Recycled Water Supply											
Study - Evaluate Graywater			√	√	√						$$$
Project - Increase Recycled Water for Irrigation			√	√	√	√					$$$
Study - Evaluate Recycled Water Groundwater Recharge Feasibility											$$
4.4.4 Conservation & Demand Reduction											
Continue Implementing Conservation BMPs & Report Annually	√	√	√	√	√	√	√	√	❖	❖	----
Encourage Water Conservation BMPs for Non-Viticulture Agriculture											$
Encourage Additional Conservation and Best Practices for Viticulture						√				❖	$
Study - Voluntary Water Conservation BMPs for Uninc. Areas		√	√	√	√						----
Project - Landscape Irrigation Efficiency											$
Pilot/Project - Stormwater Capture and Reuse for Irrigation											$$
4.4.5 Groundwater Modeling											
Study - Update Land Cover Map & Water Use Estimates						√		√			$$
Update Hydrogeologic Conceptual Model						√	√	√			$$
Project - Upgrade Groundwater Flow Model							√	√	❖		$$$
Feasibility Study to Assess Ways to Address Groundwater Depletion							√	√	❖		$
5 Planning Integration											
Project - Develop Multi-Beneficial Projects for Flood Hazards						√					$$$
5 Implementation Administration											
Implementation Prioritization and Financing	√	√	√	√	√	√	√	√	❖	❖	----
Annual Summary Status Report and Data Transmittal							√	√	❖	❖	----
Five-Year Program Review and Implementation Report						√	√			❖	----

Notes:

---- - Funded action

$$$ - Unfunded action; indicates relative order magnitude cost

Table 3-2 Management Components and Actions - Progress and Plans

- **Technical Advisory Committee** - met nine times in 2015 to provide technical advice on the groundwater management program.
- **Other Meetings and Informational Briefings** - Conducted local technical presentations and briefings.
- **Community-Based Outreach Subcommittee** – Formed a new Community-Based Outreach Subcommittee develop focused outreach to engage landowners and residents in discussions about groundwater conditions and use in their area, with the hope of leading to development and implementation of practical, community-driven strategies to address groundwater depletion in the southern Sonoma Valley.
- **Media** - GMP staff and stakeholders continued the relationships and work with local media to provide press releases on key events and milestones for the GMP.
  SGMA Specific Activities
- **Public Outreach –** Efforts were completed to provide information and updates to stakeholders and the public on progress on GSA formation and transitioning from a GMP to GSP in the basin. Information and updates were provided at existing periodic stakeholder involvement meetings and an additional public meeting in November 2015.

Key activities Stakeholder Involvement actions planned for 2016 include the following:

- **Continue outreach and briefings** - Quarterly Panel meetings, bi-monthly TAC meetings, several targeted briefings, and focused outreach for water conservation, stormwater capture and recharge, and groundwater banking will continue to be implemented. The Community-Based Outreach Subcommittee and funding work group will also continue to meet, as needed.
- **Communications** – Communications will be heightened by preparing and disseminating this annual report, sending out meeting announcements and supporting materials in advance to stakeholders, providing periodic informational newsletters and progress reports, developing and distributing fact sheets on the volunteer groundwater monitoring program, maintaining email distribution lists of Sonoma Valley stakeholders, including the Panel and TAC, and maintaining the project website.
- **Media** - GMP staff and stakeholders will continue the relationships and work with local media to provide press releases on key events and milestones for the GMP.
  SGMA Specific Activities
- **Public Outreach –** Efforts will continue to provide information and updates to stakeholders and the public on progress on GSA formation and transitioning from a GMP to GSP in the basin. Information and updates will be provided at existing periodic stakeholder involvement meetings and additional public meetings in the basin.

3.2 Component 2 - Monitoring Program

The basin monitoring program continued in 2015 with some enhancements as discussed below.

- **Continued to perform semi-annual groundwater level monitoring and expand the groundwater monitoring network as appropriate**
  Coordinated groundwater-level monitoring events were conducted through the performance of spring and fall water level measurements at over 150 wells in 2015.

- **Developed improved monitoring approaches –** Improved groundwater monitoring approaches were developed to consider how to enhance the comprehensive monitoring program in the basin, including identification of data gaps, and approximate monitoring efforts needed to fill the gaps. This information may be used to apply for Proposition 1 grants in 2016.
- **Continued California Groundwater Elevation Monitoring Program data reporting to DWR**
  SCWA will continue to submit groundwater elevation monitoring data to DWR to meet the CASGEM monitoring requirements, mandated under SBX7-6. The CASGEM monitoring network data submittal is a subset of 33 wells from the Sonoma Valley monitoring program groundwater level data.
- **Continued stream gaging of Sonoma Creek**
  The two stream gages on Sonoma Creek will continue to be monitored by the USGS under contract to the Water Agency to collect stream flow data in Sonoma Valley in 2016. Stream gage data is extremely useful in measuring flow, flood prediction, water management, and facilitating the estimation of groundwater recharge and discharge in the area.
- **Surface Water – Groundwater Interaction Surveys for Sonoma Creek**
  Sonoma Ecology Center is under contract with the Water Agency and conducted seepage runs on Sonoma Creek and major tributaries in the Sonoma Valley in 2015. The information obtained from this program is be used to refine gains and losses along reaches of Sonoma Creek, spatially and temporally, in the MODFLOW model. Combined, information form the seepage runs and model improvement will enhance the understanding of recharge mechanisms in the valley.
- **GIS Database System –** A GIS Database system has continued to be updated as new data are obtained on the program.

Plans for the basin monitoring program in 2016 include:

- **Install two dedicated multi-level monitoring wells**
  Two multi-depth monitoring wells will be installed in 2016 in the southern Sonoma Valley under an AB303 grant awarded to the Agency in 2014. The objectives of the wells are to monitor water levels and water quality at several depth intervals in the southern portions of Sonoma Valley in conjunction with aquifer storage and recovery well pilot testing (see Figure 2-1).
- **Continue to expand the groundwater monitoring network and perform groundwater level monitoring**
  Coordinated groundwater-level monitoring events will be continued through the performance of spring and fall water level measurements through 2016, and this will incorporate the two new multi-depth monitoring wells, and any additional voluntary monitoring wells added in 2015-16. Priority for adding additional wells into the groundwater-level program should focus on deep-zone wells in the following areas: (1) between Kenwood and Glen Ellen; (2) southeast of El Verano; (3) southeast of the City of Sonoma; and (4) southern Sonoma Valley (vicinity of Highway 121 and Bonneau Road). The addition of wells to the monitoring program in other areas of Sonoma Valley with

sparse monitoring coverage (e.g., within the northwestern and northeastern upland areas) should also continue to be pursued and incorporated into the program.

- **Continue California Groundwater Elevation Monitoring Program data reporting to DWR**
  SCWA will continue to submit groundwater elevation monitoring data to DWR to meet the CASGEM monitoring requirements, mandated under SBX7-6. The CASGEM monitoring network data submittal is a subset of the Sonoma Valley monitoring program groundwater level data.
- **Continue stream gaging of Sonoma Creek**
  The two stream gages on Sonoma Creek will continue to be used to collect stream flow data in Sonoma Valley in 2016. Stream gage data is extremely useful in measuring flow, flood prediction, water management, and facilitating the estimation of groundwater recharge and discharge in the area.
- **Surface Water – Groundwater Interaction Study for Sonoma Creek - Conduct Seepage Runs**
  The program for routine performance of seepage runs conducted by the Sonoma Ecology Center will be refined based on results obtained to date and will continue in 2016. The information obtained from this program is used to refine gains and losses along reaches of Sonoma Creek, spatially and temporally, in the MODFLOW model, providing an improved understanding of recharge mechanisms in the valley.
- **Develop plan for future subsidence monitoring**
  While land subsidence has not been identified as an issue in Sonoma Valley, land subsidence monitoring is a GMP action that will be conducted periodically to monitor the potential for lowering of the land surface due to groundwater extractions. A long term, monitoring program will be developed in 2016 to assess the potential for land subsidence related to groundwater extractions. This will include coordination with VOMWD and the City to assess if there are additional and/or other suitable benchmarks in the Sonoma Valley to aid in monitoring for potential land subsidence.
- **Develop new web-based data management system** – The County of Sonoma applied for a grant to develop a new web-based data management system to be used to help implement SGMA. If the grant is obtained, the new data management system would compile the many disparate datasets and databases currently in use and allow cooperating agencies to share data online. A public web portal that would provide groundwater and hydrologic data to the public would also be developed.

3.3 Component 3 – Groundwater Resources Protection

Groundwater Resources Protection actions in 2015 included:

- **Conduct targeted salinity monitoring in southern Sonoma Valley**
  Voluntary salinity monitoring of private wells was initiated in the southern Sonoma Valley in 2015 and will be completed and reported in 2016 by the USGS. The monitoring being conducted is intended to be very similar in scope to that conducted as part of the USGS study (USGS Scientific Investigations Report 2006-5092, 2006), which was focused on collecting field and laboratory sampling and analysis for electrical conductivity and total dissolved solids. The 2015-2016 sampling will also include stable isotope and some general mineral analysis.

- **Urban Conservation Best Management Practices** – Continued implementing, maintaining, updating and reporting California Urban Water Conservation Council (CUWCC) best management practices (BMPs) as appropriate for urban areas. Additionally, urban users within the Plan Area achieved the State's mandatory water reduction of 25%.

Groundwater Resources Protection actions planned for 2016 include:

- **Conduct targeted salinity monitoring in southern Sonoma Valley**
  The voluntary salinity monitoring of private wells initiated in the southern Sonoma Valley in 2015 will be completed and reported in 2016 by the USGS.
- **Urban Conservation Best Management Practices** – Continue implementing, maintaining, updating and reporting CUWCC BMPs as appropriate for urban areas.

3.4 Component 4 - Groundwater Sustainability

In 2015, Integrated Groundwater Sustainability actions included:

- **Upgrade of Existing Sonoma Valley Groundwater Flow Model**
  The Water Agency made significant progress in enhancing and improving the groundwater flow model, addressing limitations in recharge, discharge, and the conceptual hydrogeologic model. The focus of this effort in 2015 was: (1) incorporate a basin characterization model to enhance recharge estimates and incorporate climate change into model scenarios; (2) incorporate refined lithologic data to improve the layering of the model; (3) develop refined estimates of water demands by obtaining publically-available records and developing an irrigation-demand model using the Farm Management Package; (4) synthesizing calibration datasets including groundwater-level and streamflow data; and (5) performing model calibration using both automated and manual parameter estimation techniques.
- **Revised BMOs and alternatives screening to address groundwater depletion** – An alternatives screening was continued in 2015 to look at ways to address groundwater declines in the two areas of depletion in the southern Sonoma Valley: (1) El Verano area on the west and (2) southeast of the City of Sonoma on the east. The study alternatives include increased conservation, increased use of recycled water, stormwater capture and recharge or storage, groundwater banking, in lieu surface water substitution for groundwater, pumping redistribution to reduce groundwater demand in depletion areas, salinity intrusion mitigation and desalination. These options will be developed into scenarios using the model to assess how much each option can accomplish to address depletion.
- **Recycled Water**
  Activities conducted in 2015 related to the SVRWP include the current project that is being constructed (the McGill pipeline), which will go up 5th Street East and will deliver water to the high school and the city park for turf irrigation. The new pipeline will have a capacity of about 300AF per year and will also have capacities for agricultural users along the alignment. The Sonoma Valley County Sanitation District also opened a residential recycled water fill station near the wastewater treatment plant on Eighth Street East that provides free recycled water for local residents that can be used to water lawns, gardens and landscaped areas.

Groundwater Sustainability actions planned for 2016 include:

- **Complete Upgrade of Existing Sonoma Valley Groundwater Flow Model**
  The Water Agency will complete the project to enhance and improve the groundwater flow model, addressing limitations in recharge, discharge, and the conceptual hydrogeologic model. Primary efforts in 2016 will include completing the model calibration and calibration assessment, developing assumptions and water management scenarios to run using the model.
- **Groundwater Recharge**
  Work with Sonoma Resource Conservation District and other entities to identify practices and projects to increase surface infiltration and groundwater recharge on agricultural properties.
- **Groundwater Banking Pilot Study**
  A groundwater banking feasibility study including the Santa Rosa Plain and Sonoma Valley basins was completed in 2012. Conceptually, the groundwater banking program would involve the diversion and transmission of surplus Russian River water produced at the Agency's existing production facilities for storage in the Santa Rosa Plain Groundwater Basin and/or Sonoma Valley Groundwater Basin during wet weather conditions (i.e., the winter and spring seasons) for subsequent recovery and use during dry weather conditions (i.e., the summer and fall seasons) or emergency situations. Following construction of the nested monitoring wells, an Aquifer Storage and Recovery Pilot Study using Russian River drinking water is planned to be implemented using the City of Sonoma's Well No. 6 in 2016. Informational updates will be presented to the TAC and Panel during 2016.
- **Recycled Water**
  Expanded use of recycled water up to an additional 300 afy is currently planned for construction in phases as funding and recycled water users are identified. Construction is in progress on one mile of purple pipe to deliver 300 afy of recycled water for irrigation to urban and agricultural users beginning in late 2016/early 2017. Additional future activities include a developing a recycled water policy, a trucking program, and a distribution study.
- **Stormwater Capture**
  The City Watersheds project is a stormwater capture project, which will include a stormwater detention facility in the northern portion of the City of Sonoma and is planned for construction in 2018 or 2019.

3.5 Component 5 - Planning Integration

Planning integration through efforts and discussions were continued in 2015 and will continue through 2016 at the GMP Panel, TAC, outreach meetings and focused briefings to facilitate integrated planning and coordination at the basin and regional scale. This will include SGMA specific discussions regarding implementation of the new groundwater law and transitioning from the existing Plan and planning processes.

3.6 Annual Summary Report

The Water Agency will continue to provide annual summary reports that outline activities conducted and synthesize groundwater conditions in the Sonoma Valley until a GSP is prepared and adopted.

The Annual Summary Report will include the following:

- List of stakeholder meetings and outreach activities
- Groundwater level contour maps and hydrographs illustrating groundwater level and water quality trends in the basin
- Groundwater level tables and water quality data collected during the reporting year
- A written discussion of groundwater conditions
- A one page, two sided fact sheet summarizing all the above for stakeholder outreach communications

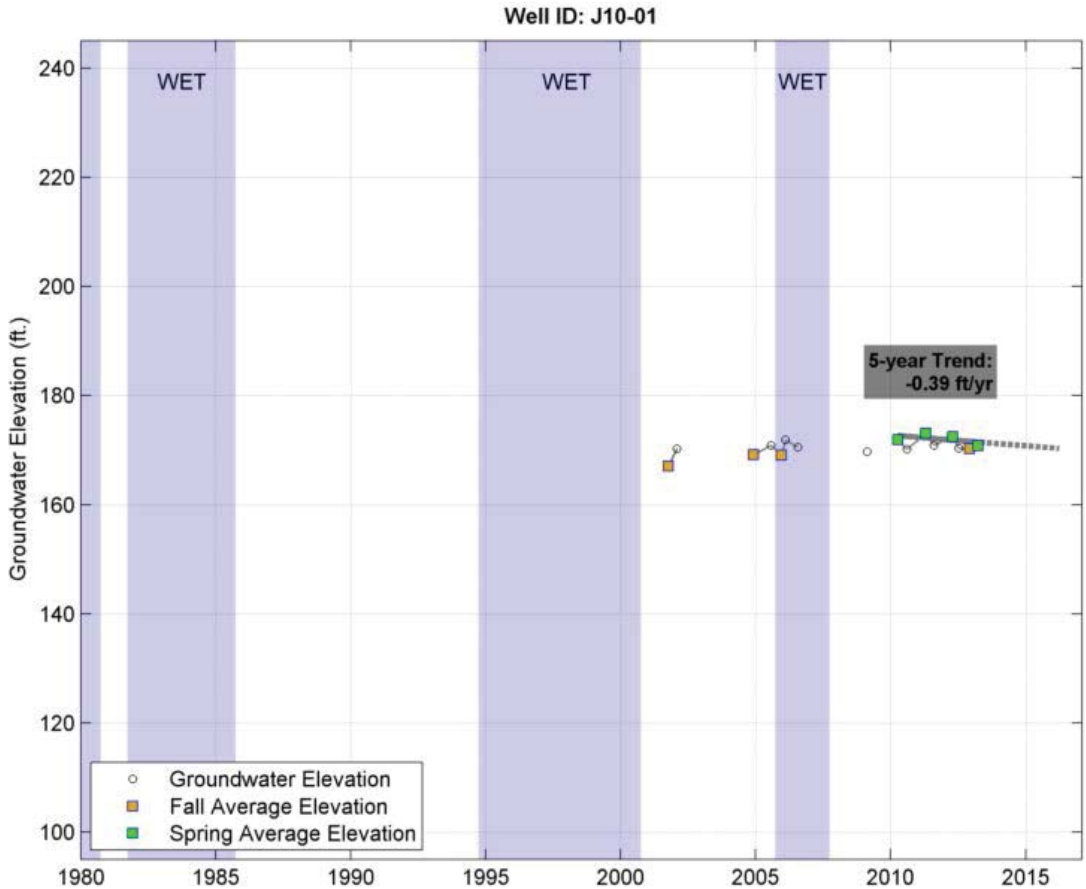
3.7 2016 Funding

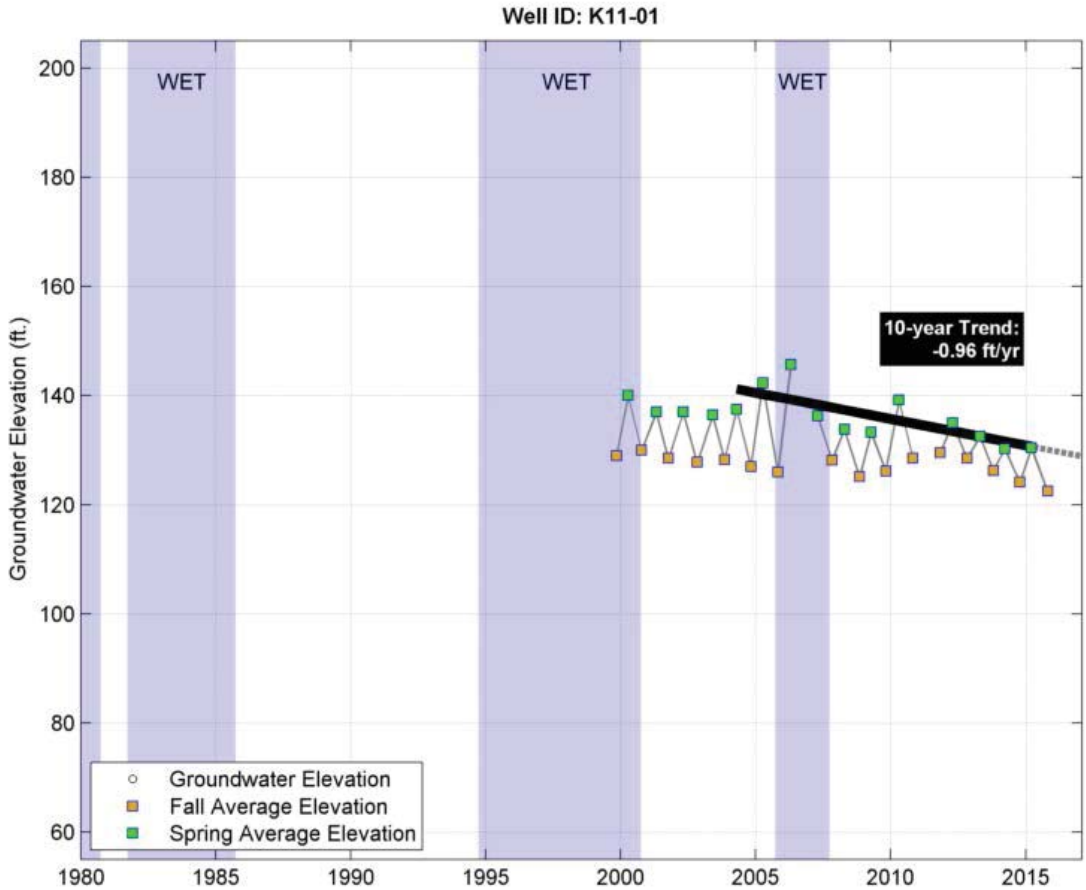
Currently funded programs include ongoing stakeholder involvement, groundwater elevation monitoring program, stream gage monitoring, and water conservation programs, which are currently funded collectively through financial contributions or in-kind services by the Water Agency, City, VOMWD, and the County and volunteer services from several BAP and TAC members. The groundwater monitoring program water level data collection is largely completed by local volunteers. Funding for the two new well installations were awarded under the AB303 grant program in 2014, and will be installed in 2016.

For some proposed actions for 2016 and beyond, funding mechanisms will need to be identified and pursued. Some of the potential funding mechanisms include state grants and loan programs, such as Clean Water State Revolving Fund, Infrastructure State Revolving Fund, IRWMP, Water Recycling Funding Program, Stormwater Grant Program, Water Use Efficiency Grants Program and federal programs including Water SMART. Considering the current economic situation and passage of Proposition 1 in 2015 with $100 million in grant funding for implementation of the Sustainable Groundwater Management Act, grant monies should be available to help fund some GMP efforts and transitioning to a new GSA and GSP development in the coming years.

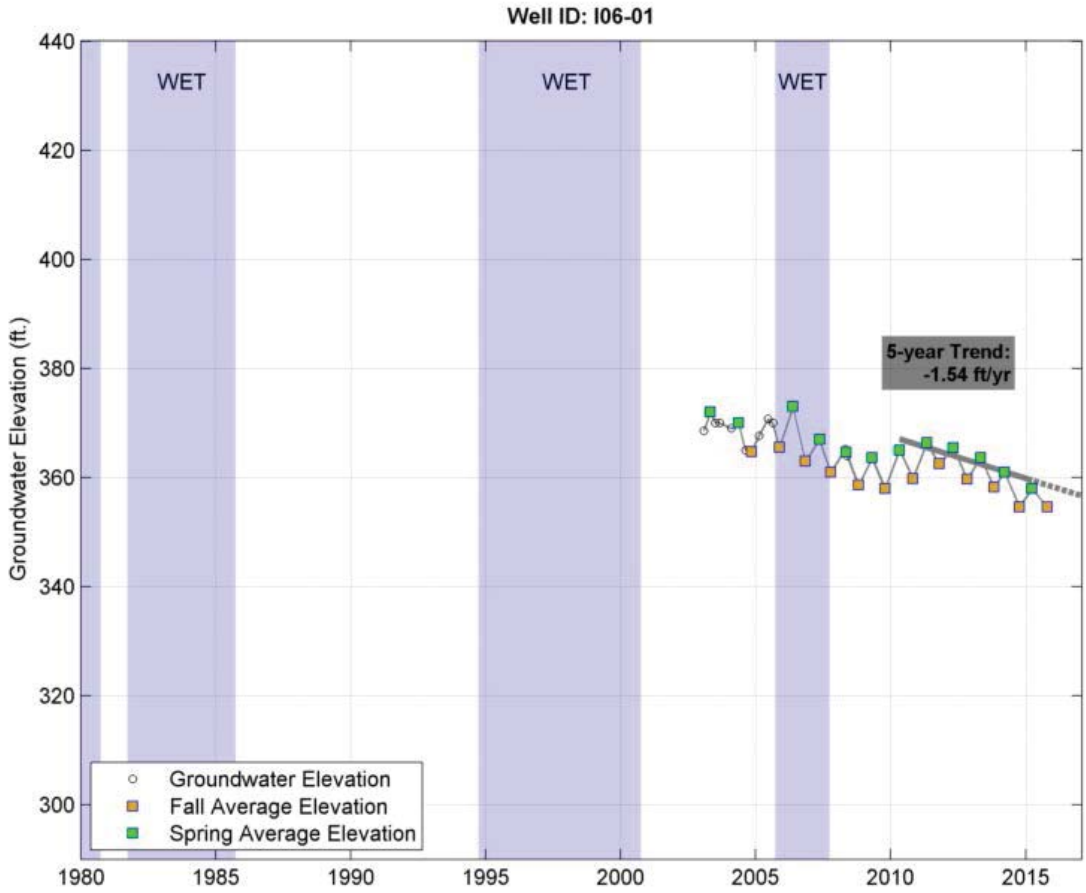
Appendix A
Well Hydrographs

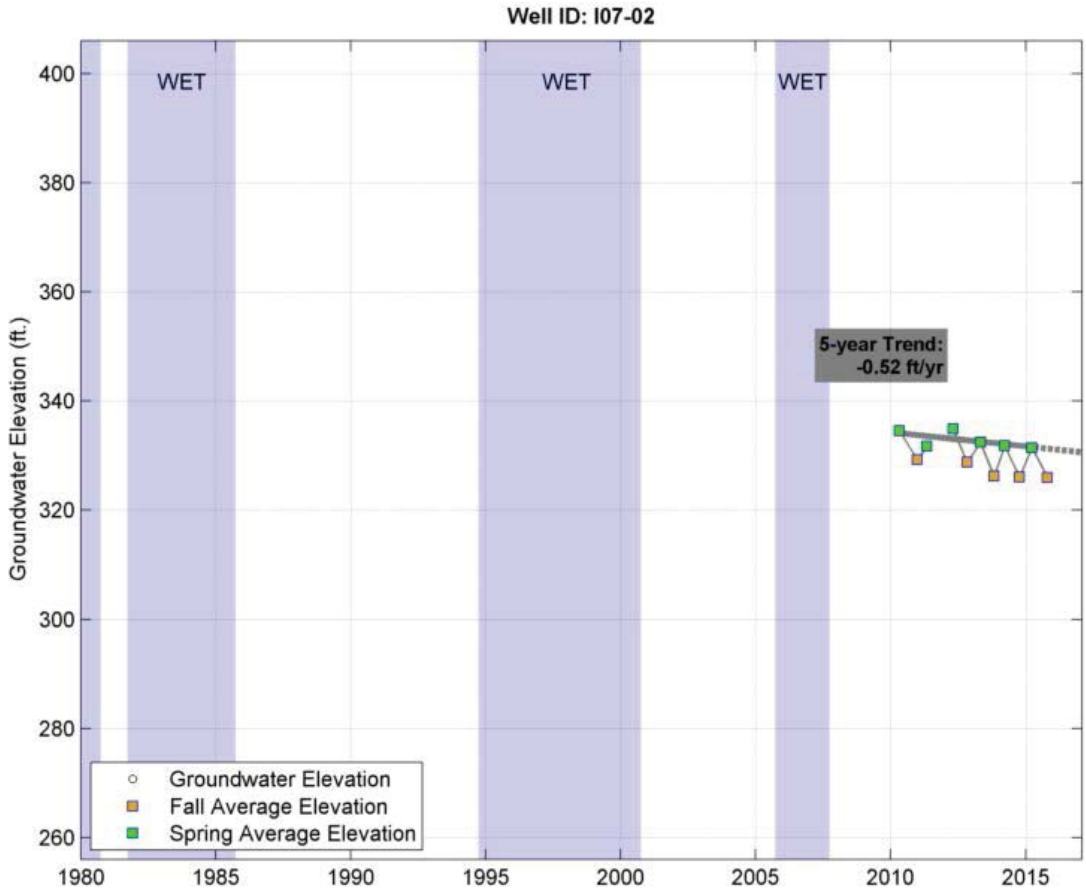
Agua Caliente Subarea
Shallow Wells (<200 feet deep)


Well ID: J10-01
WET
WET
WET
5-year Trend:
-0.39 ft/yr
Groundwater Elevation (ft.)
240
220
200
180
160
140
120
100
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

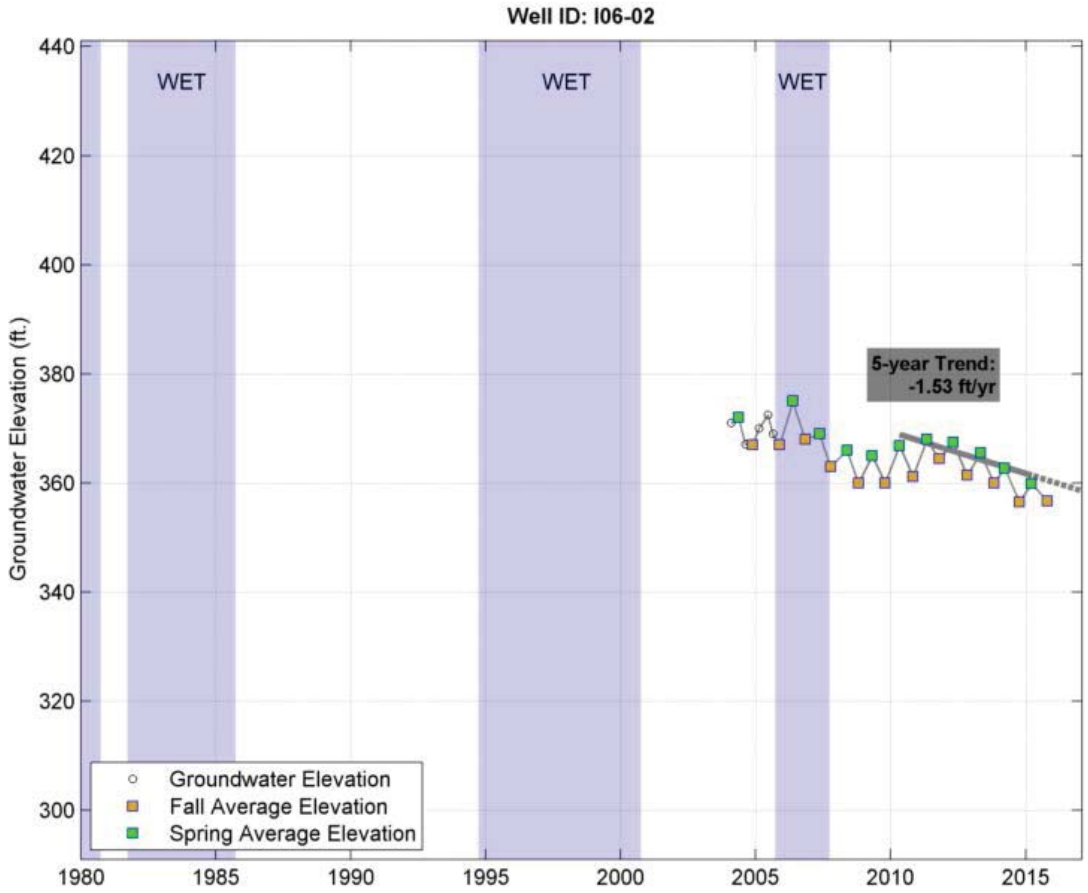

Well ID: K11-01
WET
WET
WET
10-year Trend:
-0.96 ft/yr
Groundwater Elevation (ft.)
200
180
160
140
120
100
80
60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

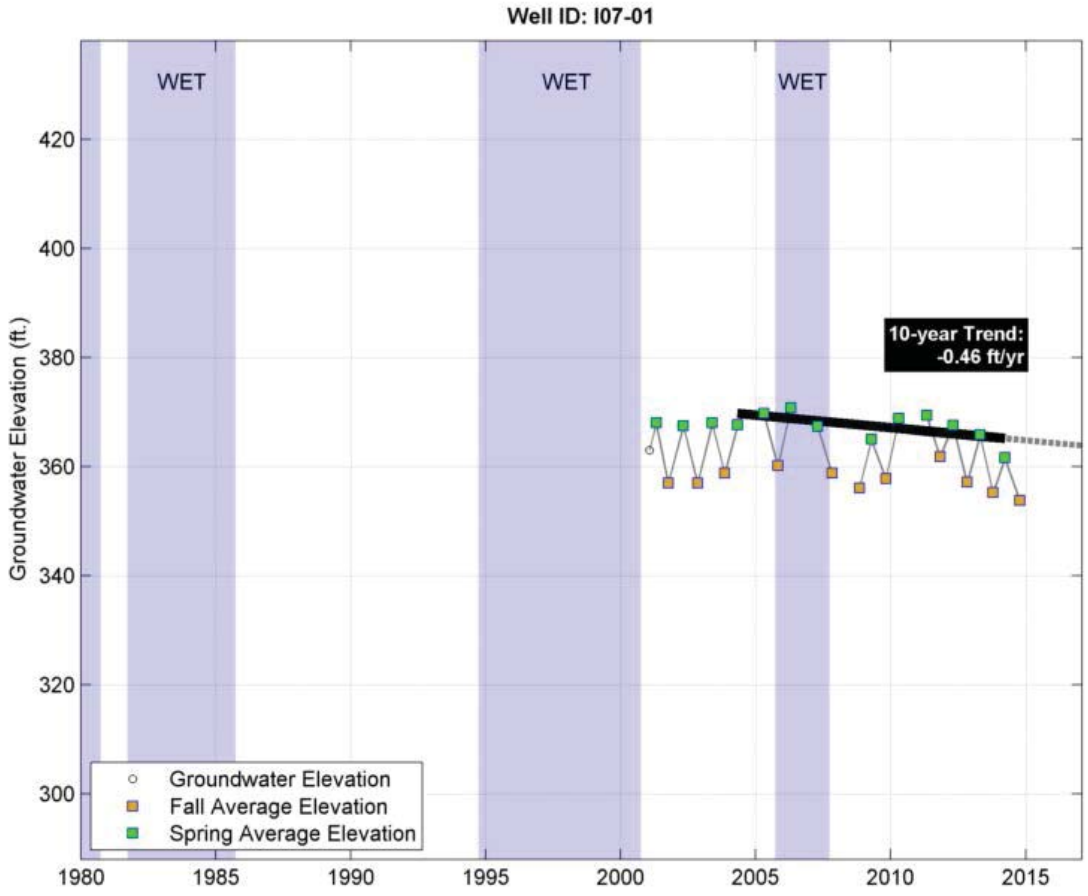
Calabazas Subarea
Deeper Wells (>200 feet deep)

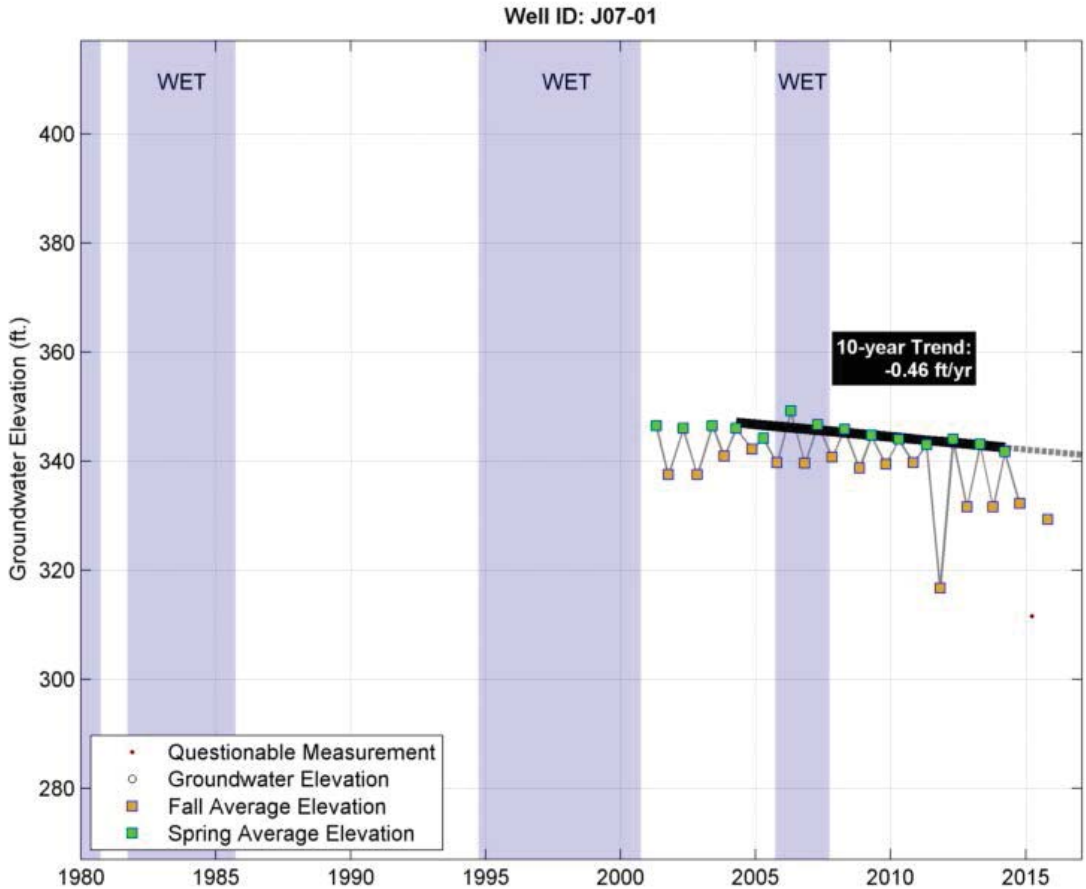

Well ID: I06-01
WET
WET
WET
5-year Trend:
-1.54 ft/yr
Groundwater Elevation (ft.)
440
420
400
380
360
340
320
300
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

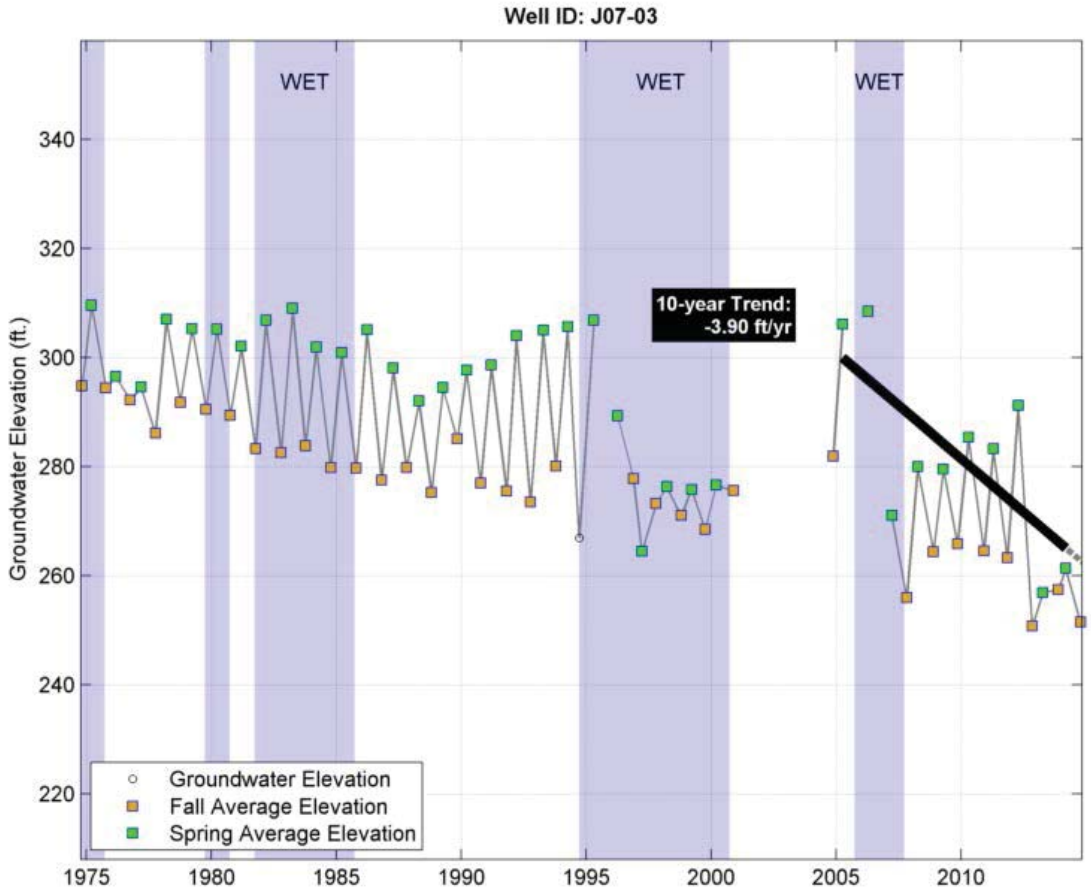

Well ID: I07-02
WET
WET
WET
5-year Trend:
-0.52 ft/yr
Groundwater Elevation (ft.)
400
380
360
340
320
300
280
260
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

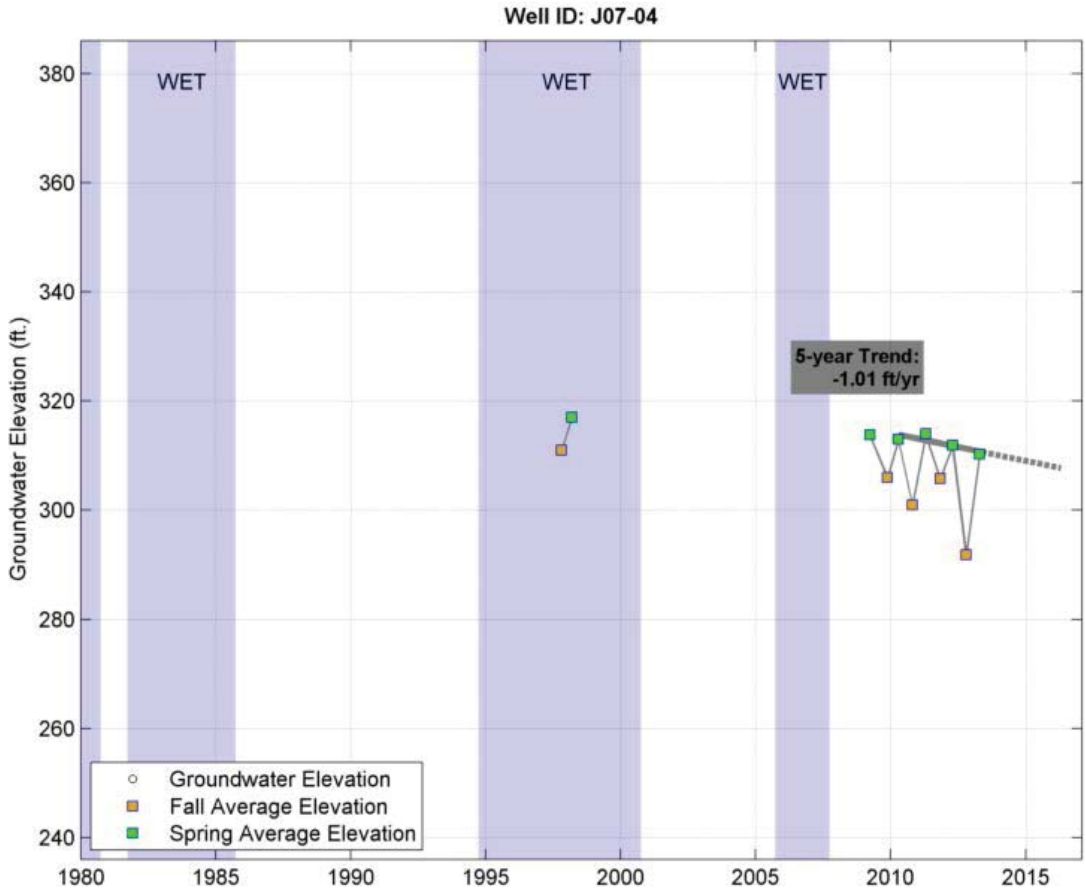
Calabazas Subarea
Shallow Wells (<200 feet deep)

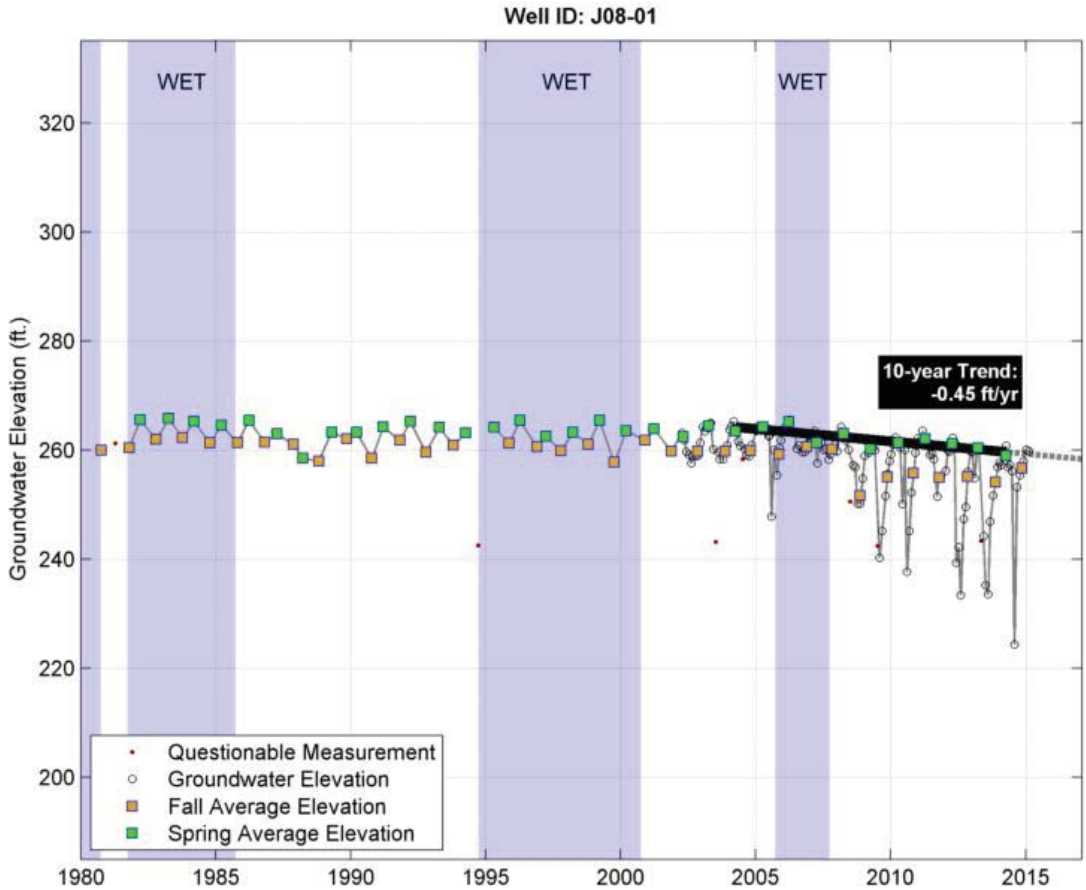

Well ID: I06-02
WET
WET
WET
5-year Trend:
-1.53 ft/yr
Groundwater Elevation (ft.)
440
420
400
380
360
340
320
300
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

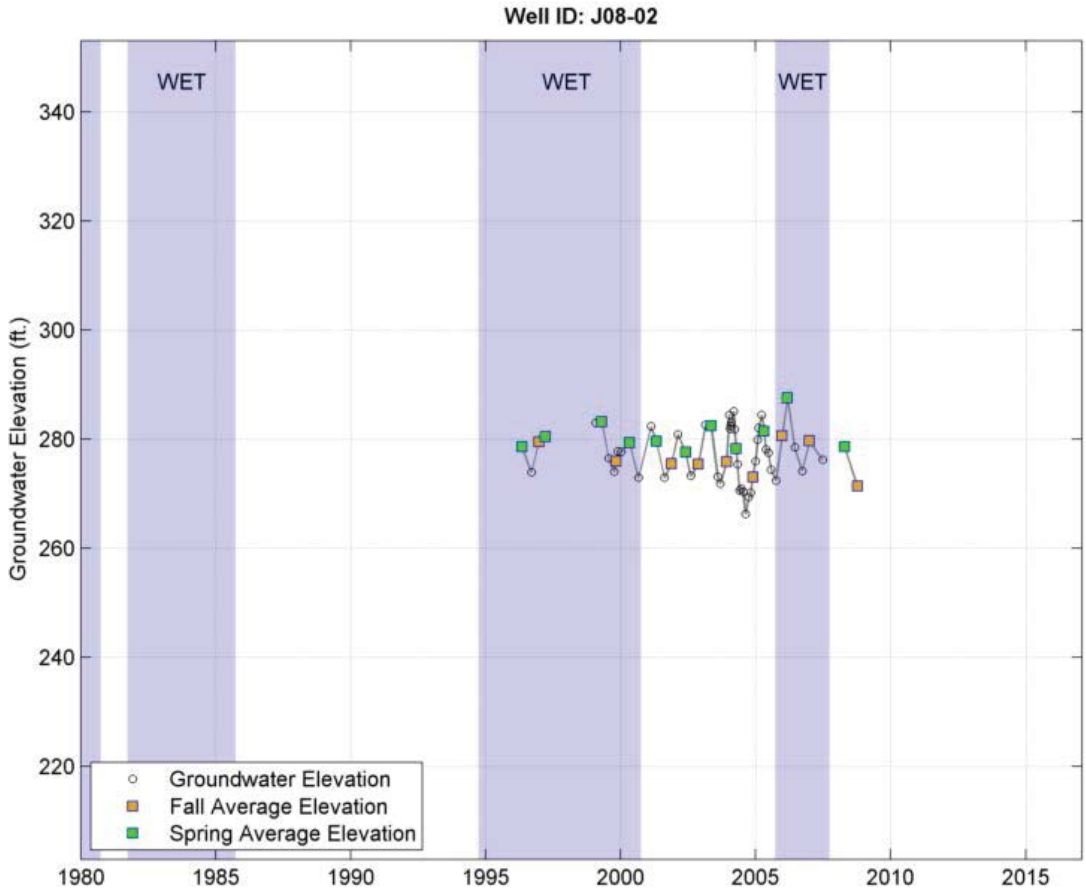

Well ID: I07-01
WET
WET
WET
10-year Trend:
-0.46 ft/yr
Groundwater Elevation (ft.)
420
400
380
360
340
320
300
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

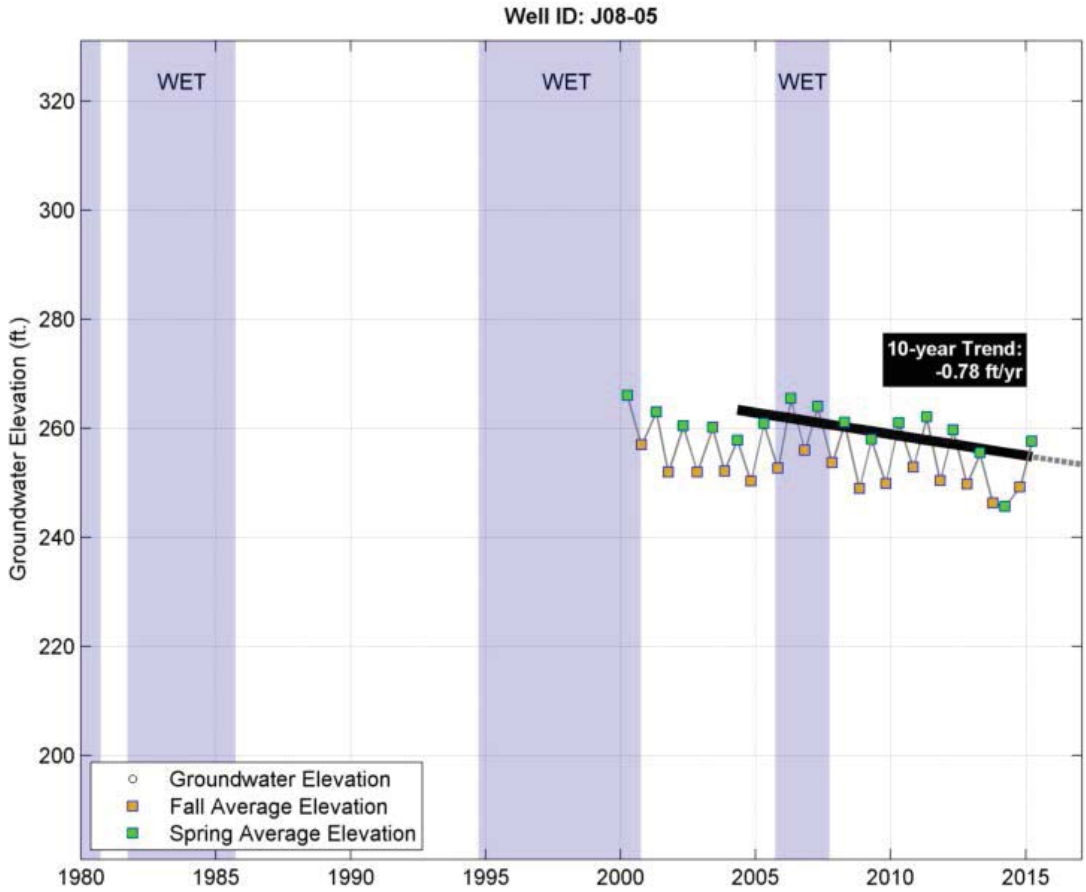

Well ID: J07-01
WET
WET
WET
10-year Trend:
-0.46 ft/yr
Groundwater Elevation (ft.)
400
380
360
340
320
300
280
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: J07-03
WET
WET
WET
10-year Trend:
-3.90 ft/yr
Groundwater Elevation (ft.)
340
320
300
280
260
240
220
1975
1980
1985
1990
1995
2000
2005
2010
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

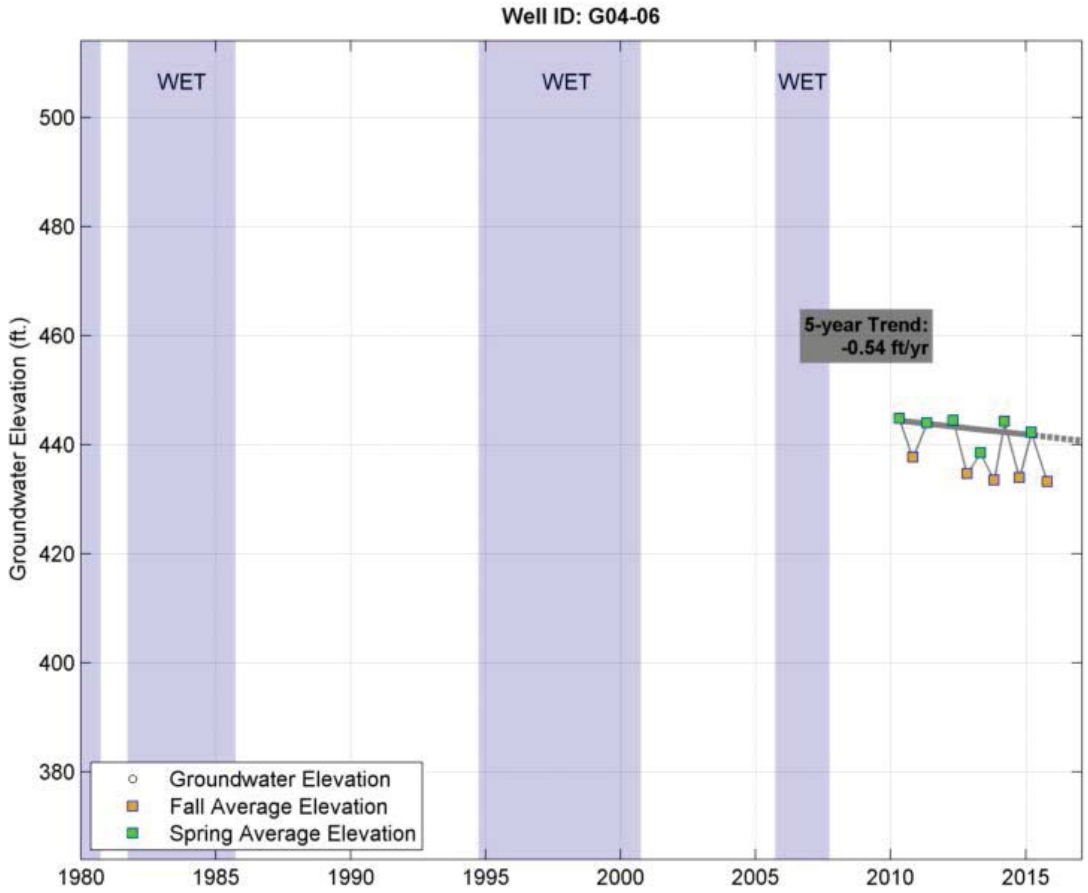

Well ID: J07-04
WET
WET
WET
5-year Trend:
-1.01 ft/yr
Groundwater Elevation (ft.)
380
360
340
320
300
280
260
240
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: J08-01
WET
WET
WET
10-year Trend:
-0.45 ft/yr
Groundwater Elevation (ft.)
320
300
280
260
240
220
200
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: J08-02
WET
WET
WET
Groundwater Elevation (ft.)
340
320
300
280
260
240
220
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: J08-05
WET
WET
WET
10-year Trend:
-0.78 ft/yr
Groundwater Elevation (ft.)
320
300
280
260
240
220
200
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

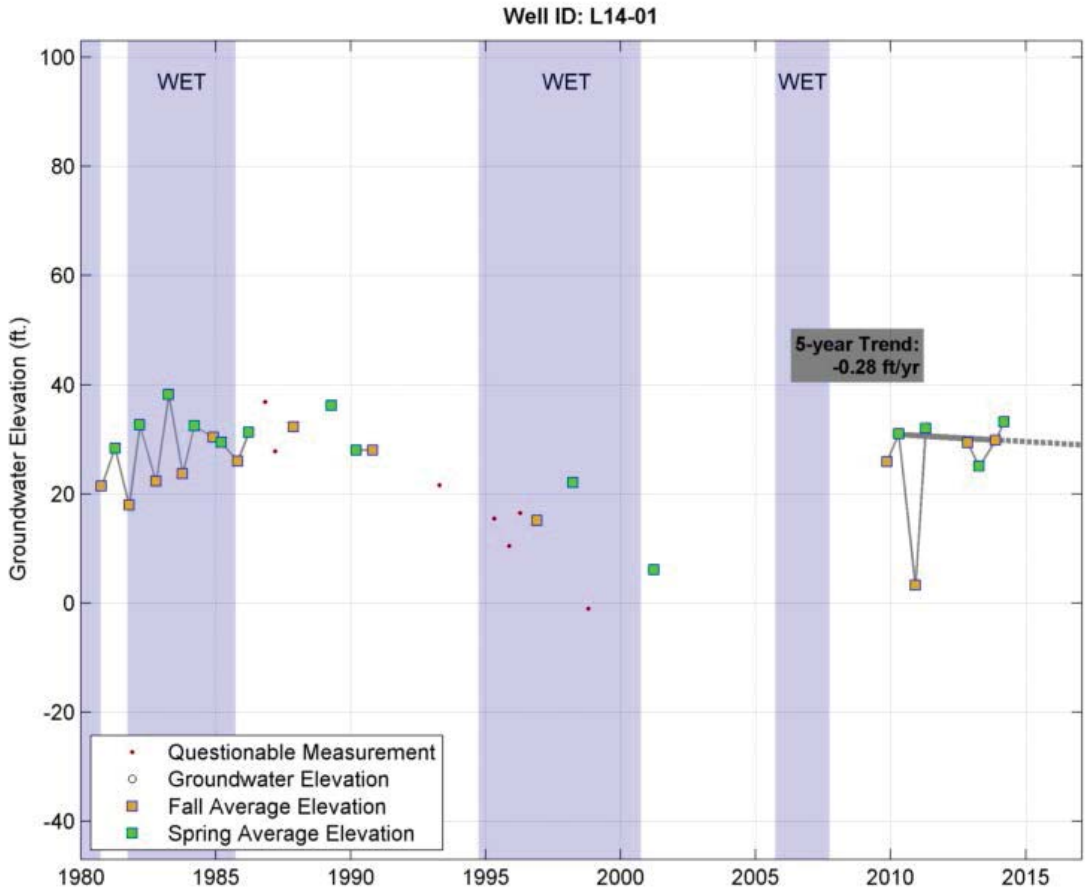
Calabazas Subarea
Unknown Depth


Well ID: G04-06
WET
WET
WET
5-year Trend:
-0.54 ft/yr
Groundwater Elevation (ft.)
500
480
460
440
420
400
380
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

City Subarea
Deeper Wells (>200 feet deep)

Well ID: L13-01
WET
WET
WET
10-year Trend:
-1.08 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015

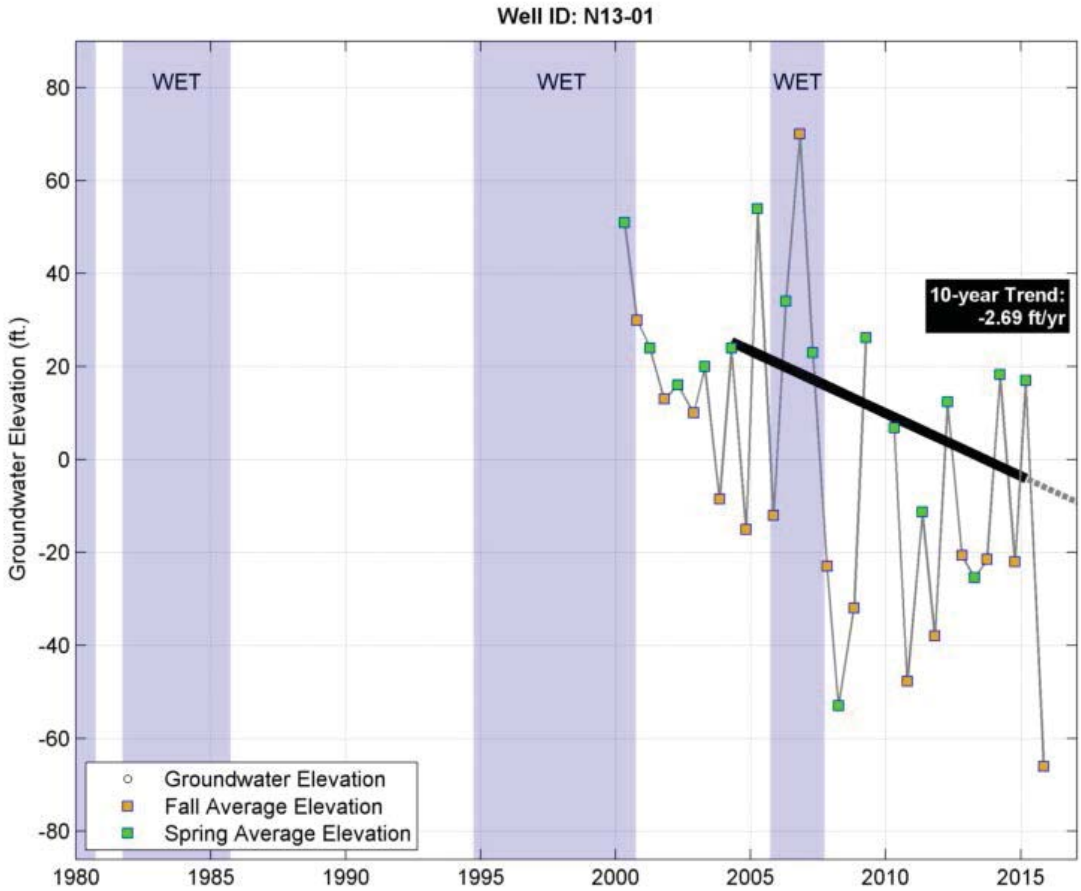
Well ID: L13-02
WET
WET
WET
10-year Trend:
-1.24 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015

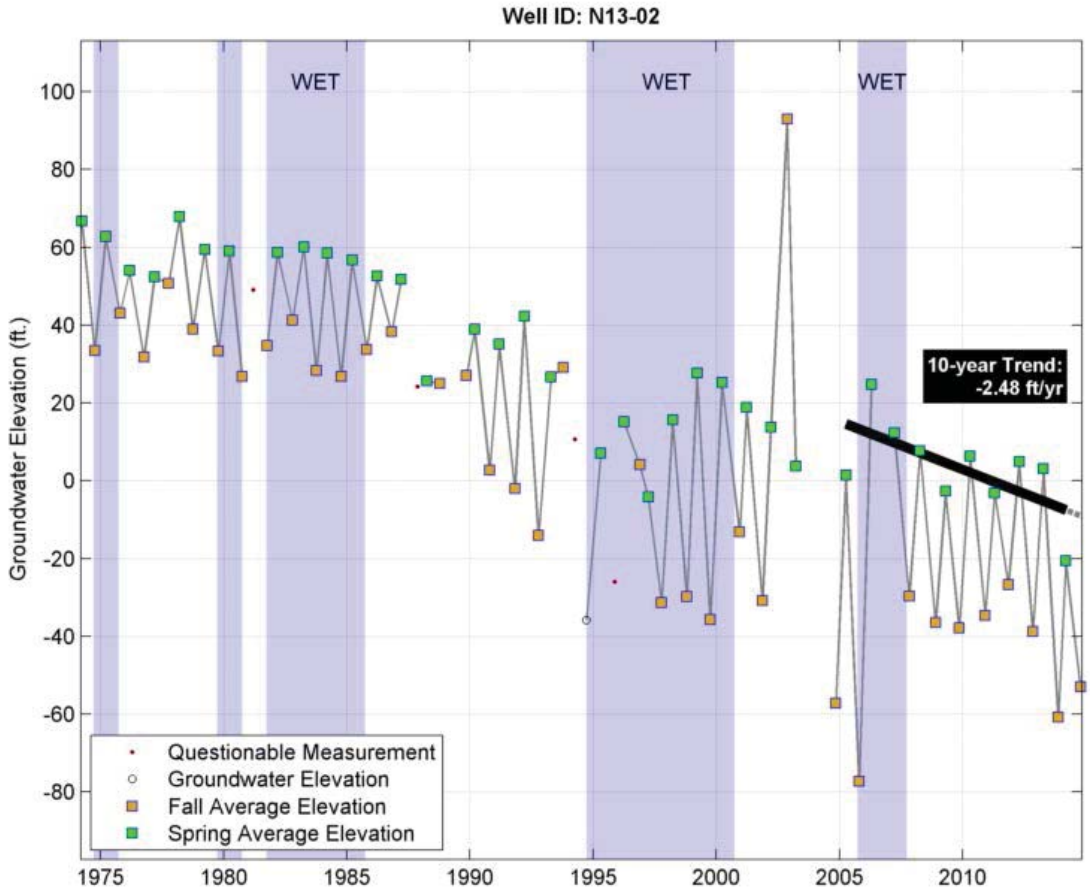

Well ID: L14-01
WET
WET
WET
5-year Trend:
-0.28 ft/yr
Groundwater Elevation (ft.)
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

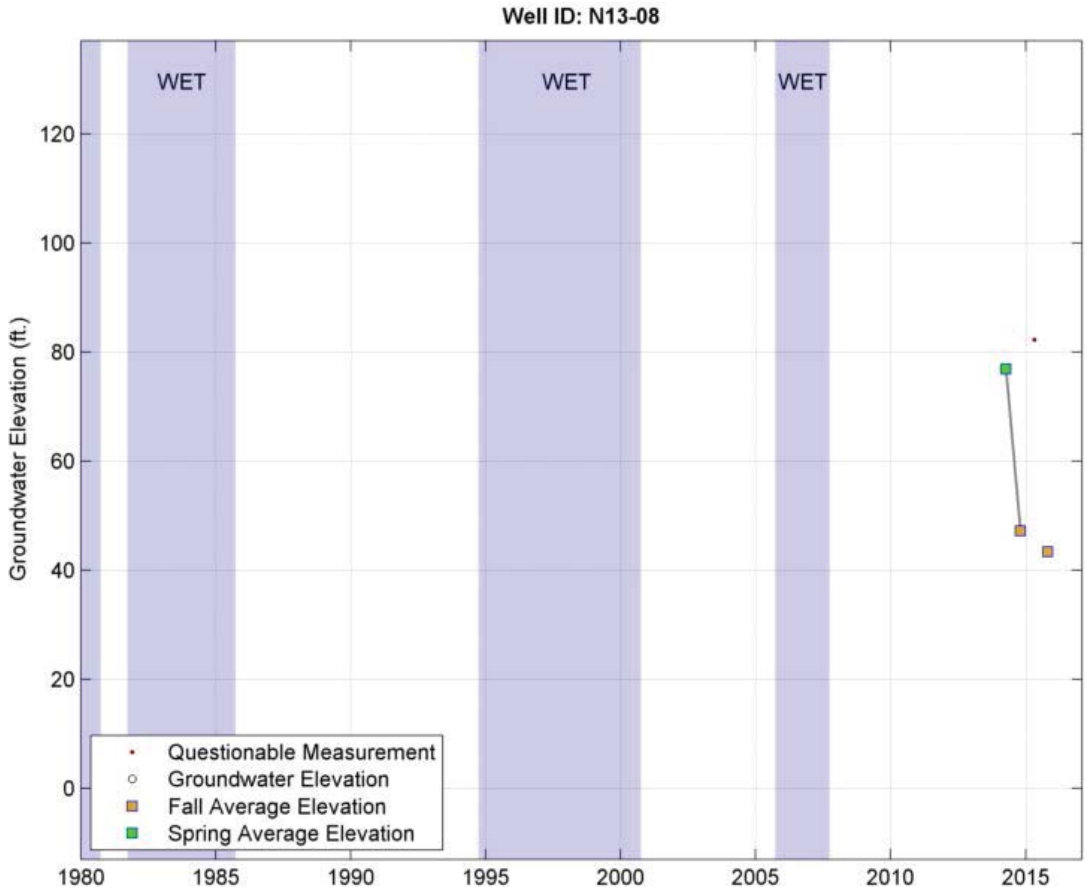
Well ID: M13-01
WET
WET
WET
10-year Trend:
-1.59 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

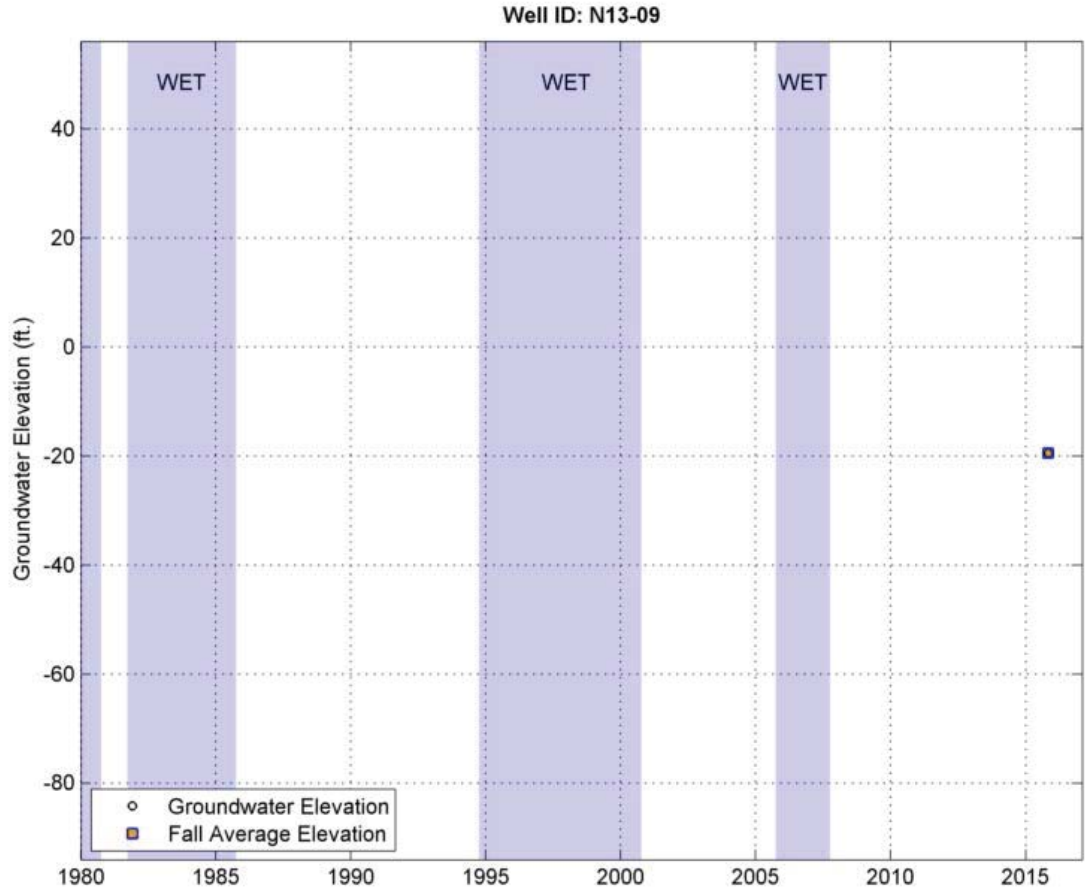
Well ID: M13-03
WET
WET
WET
10-year Trend:
-1.77 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015

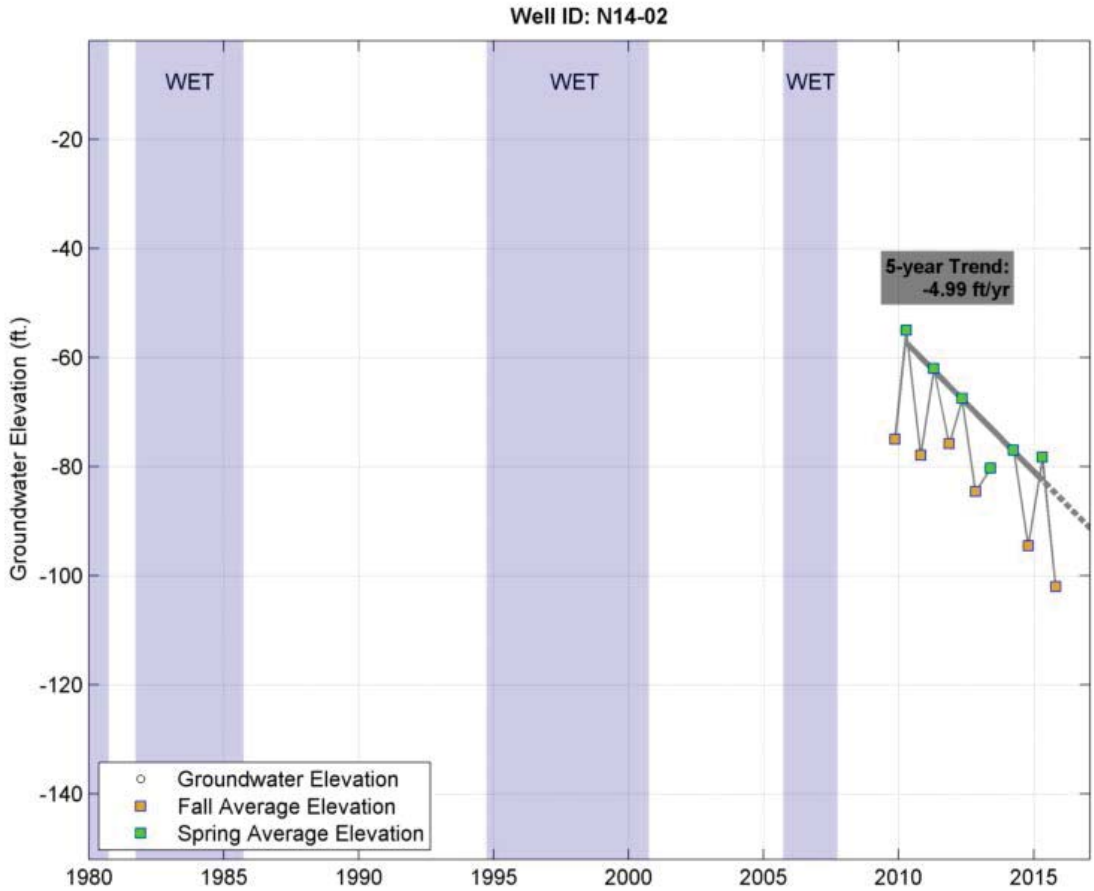
Well ID: M15-03
WET
WET
WET
5-year Trend:
-1.41 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
60
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015

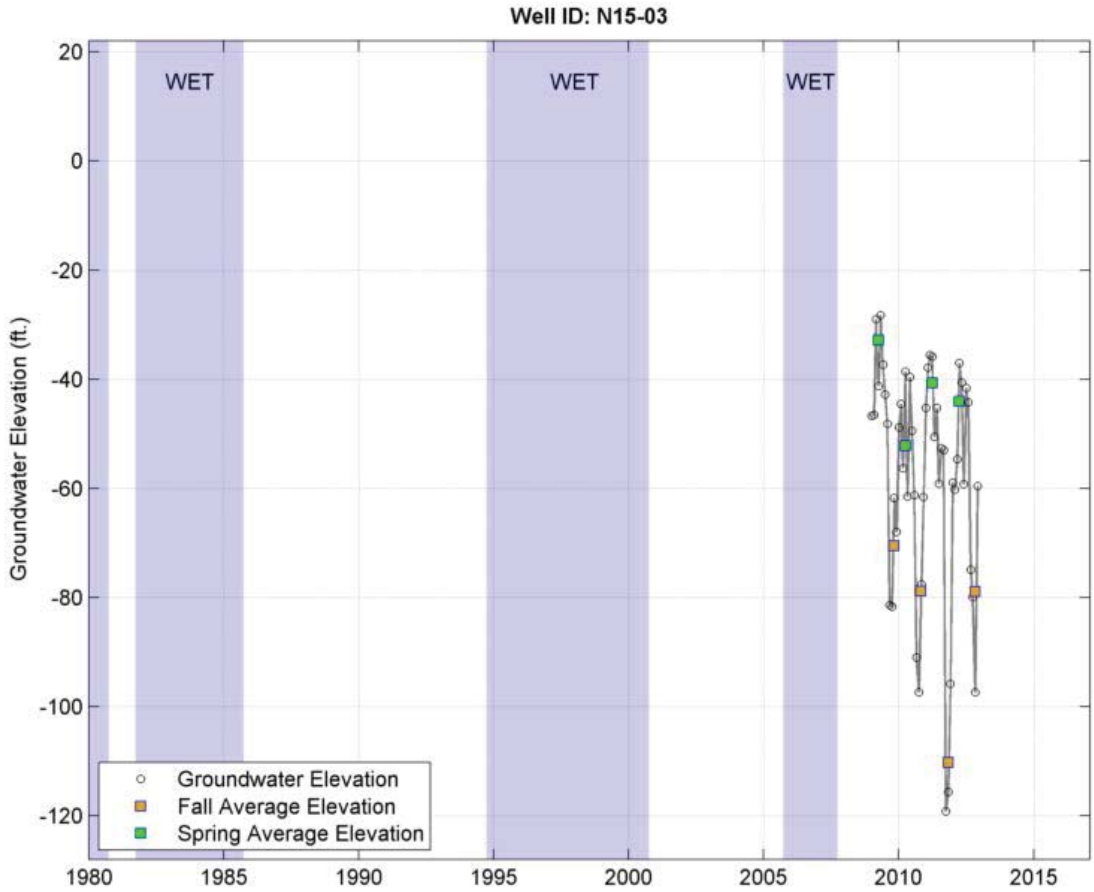

Well ID: N13-01
WET
WET
WET
10-year Trend:
-2.69 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
80
60
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015

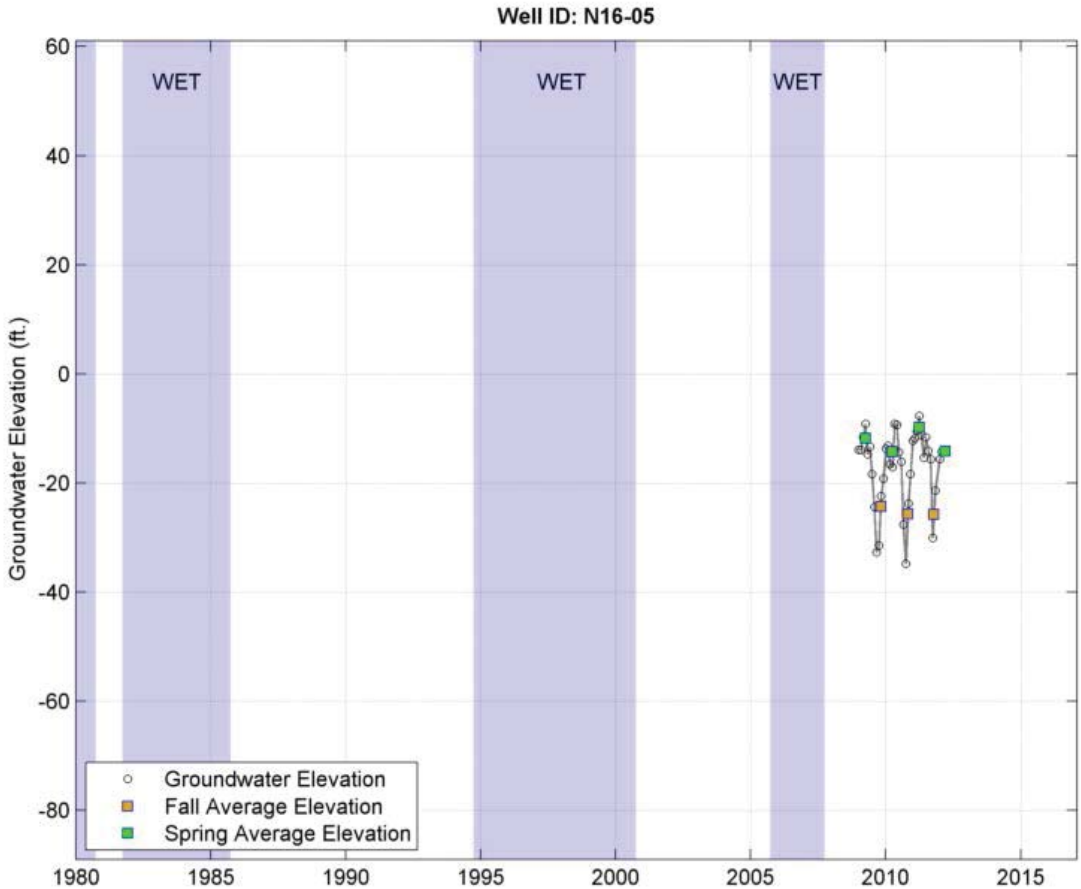

Well ID: N13-02
WET
WET
WET
10-year Trend:
-2.48 ft/yr
Groundwater Elevation (ft.)
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
100
80
60
40
20
0
-20
-40
-60
-80
1975
1980
1985
1990
1995
2000
2005
2010

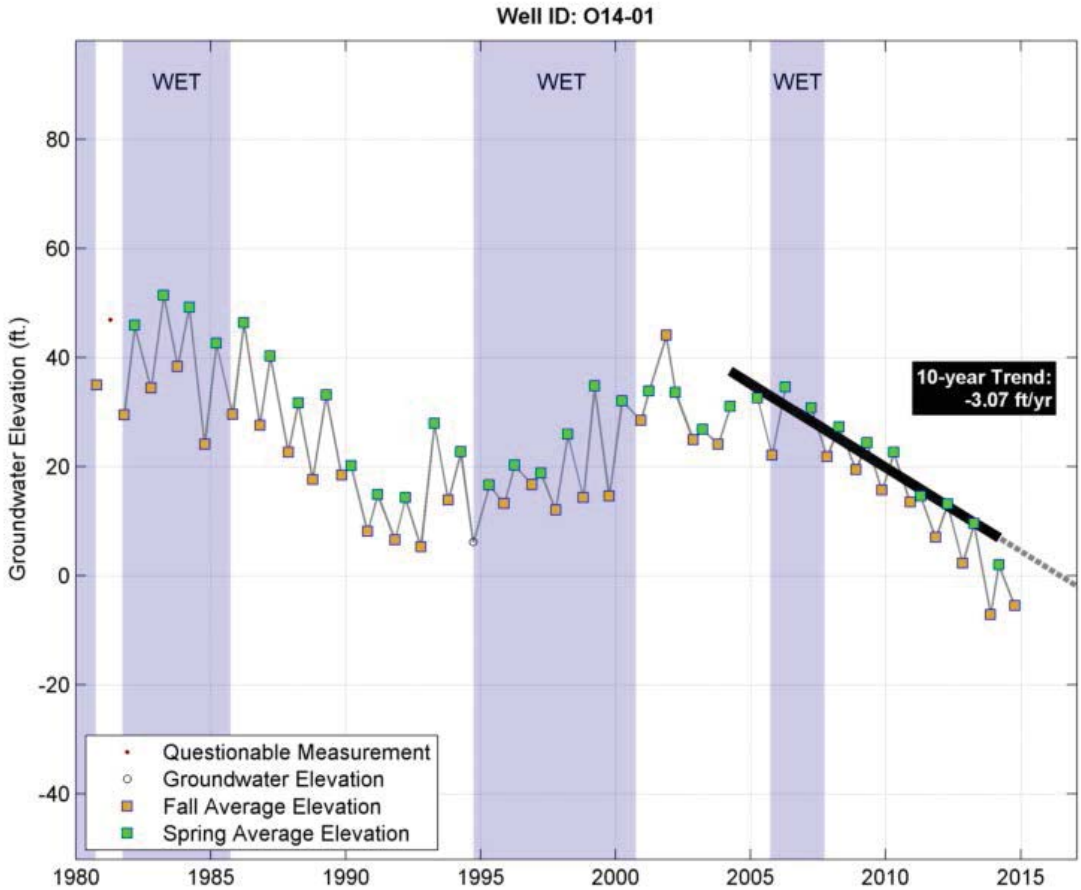

Well ID: N13-08
WET
WET
WET
Groundwater Elevation (ft.)
120
100
80
60
40
20
0
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

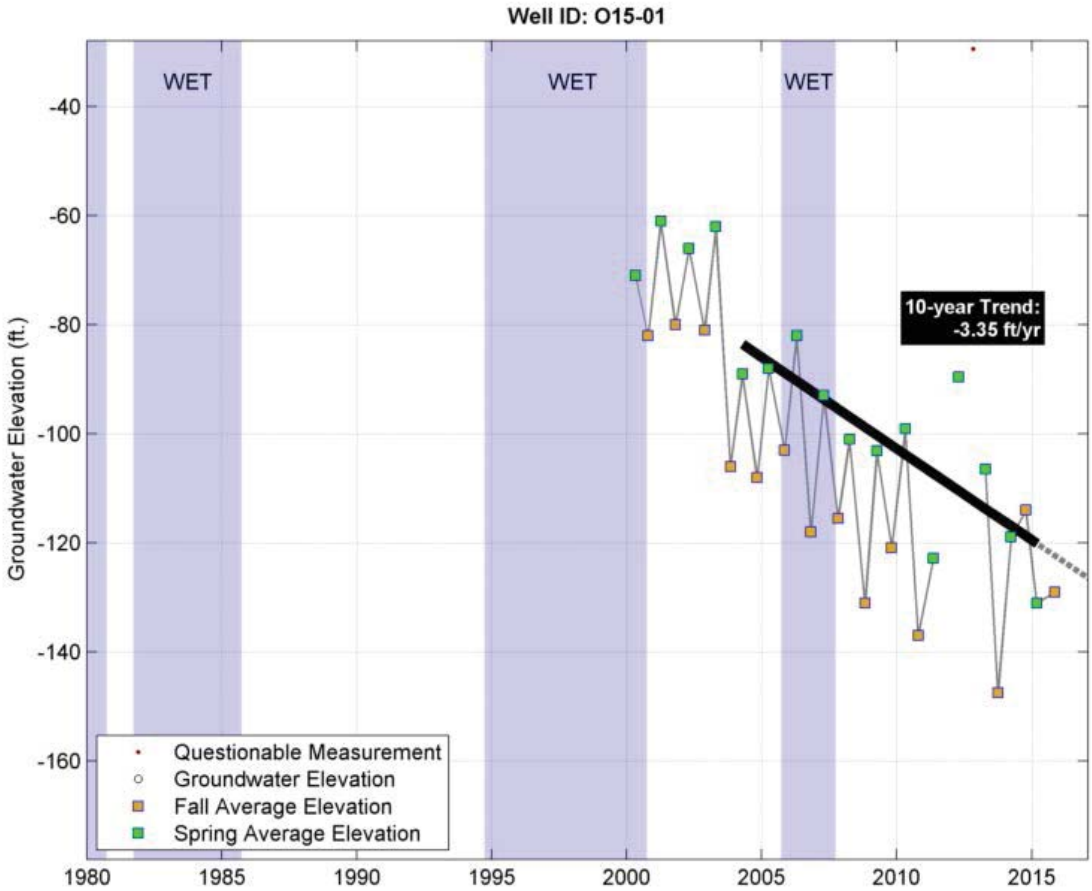

Well ID: N13-09
WET
WET
WET
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
Groundwater Elevation
Fall Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015


Well ID: N14-02
WET
WET
WET
5-year Trend:
-4.99 ft/yr
Groundwater Elevation (ft.)
-20
-40
-60
-80
-100
-120
-140
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

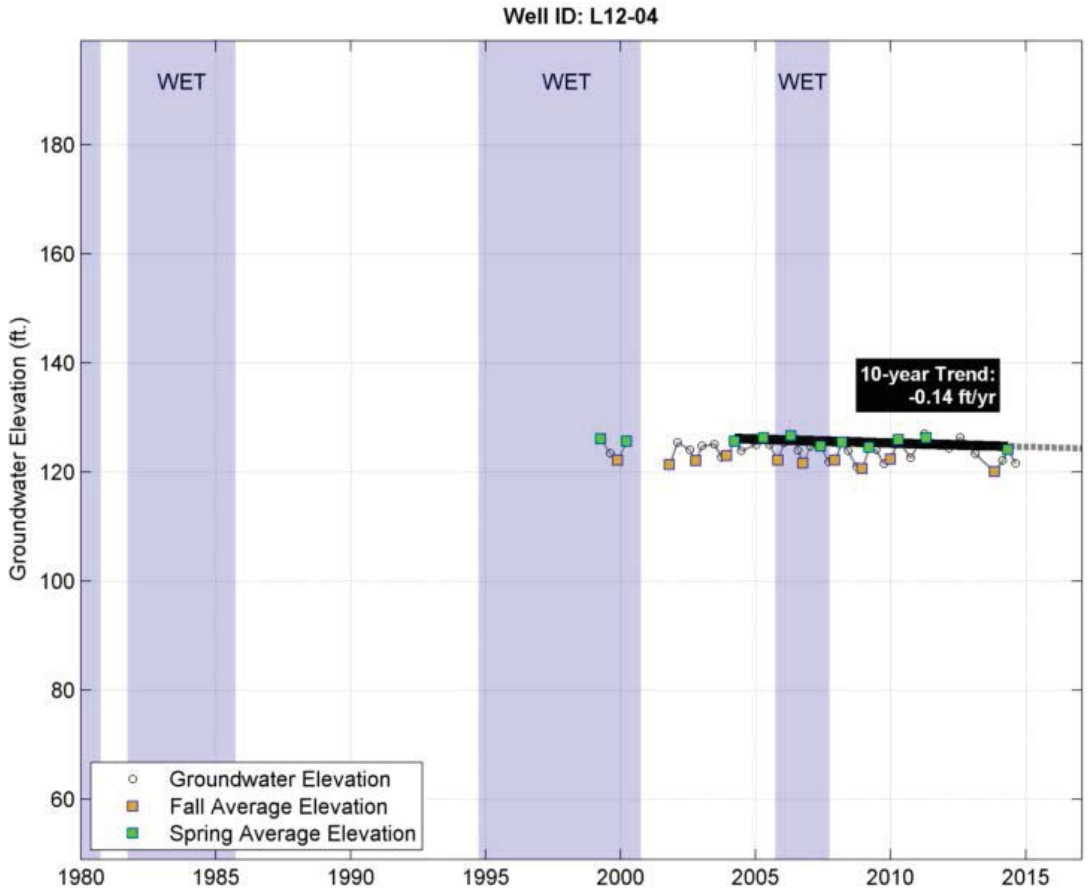

Well ID: N15-03
WET
WET
WET
Groundwater Elevation (ft.)
20
0
-20
-40
-60
-80
-100
-120
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

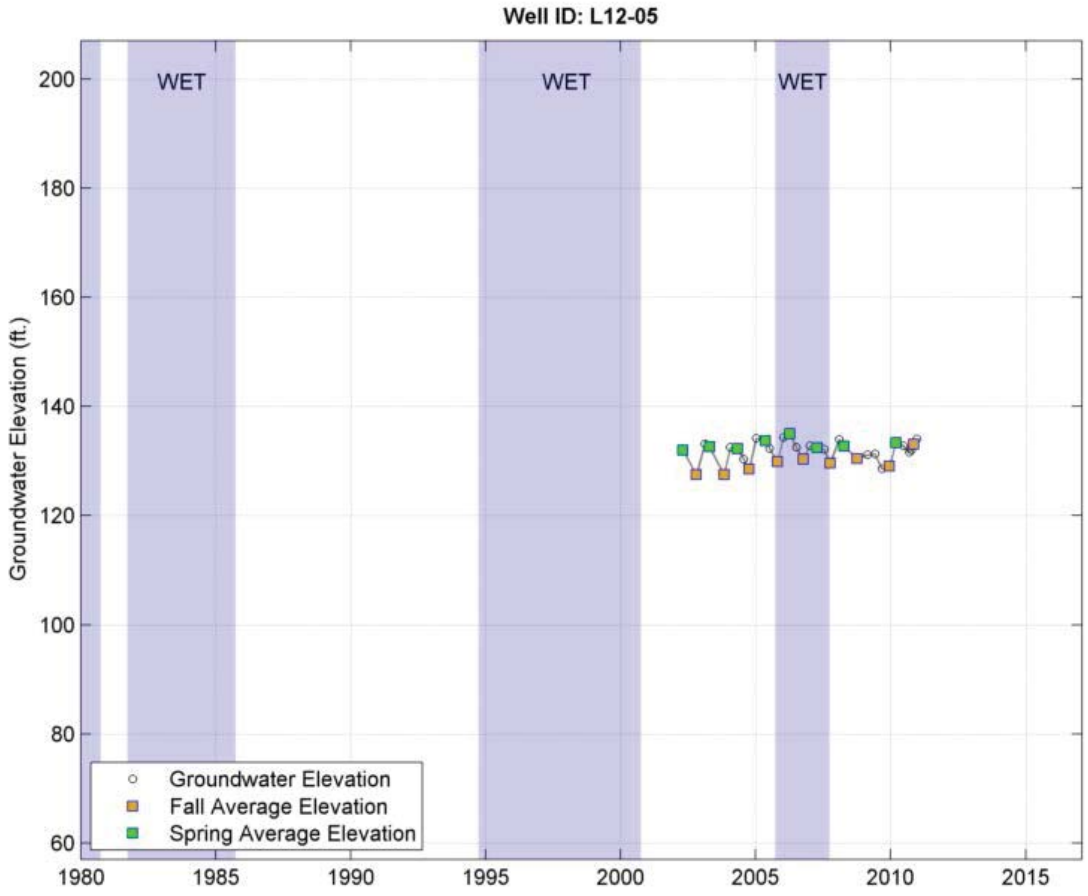

Well ID: N16-05
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

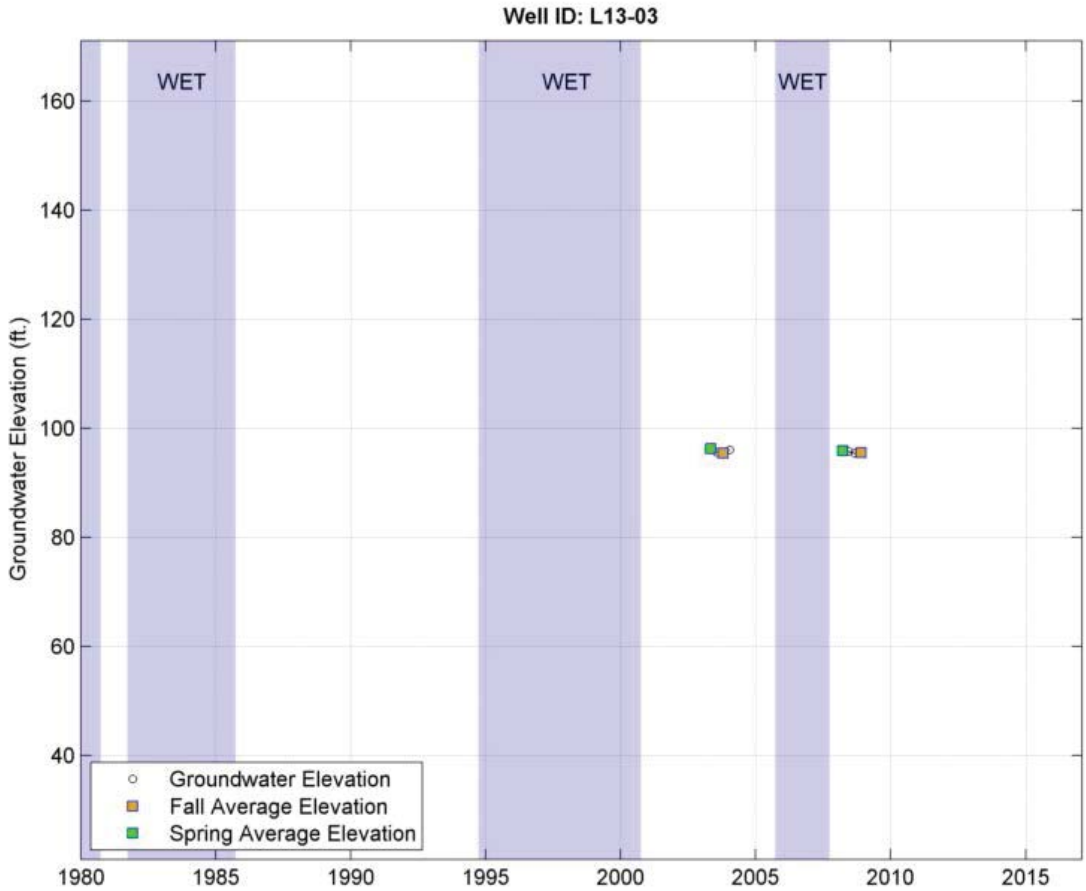

Well ID: O14-01
WET
WET
WET
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
10-year Trend:
-3.07 ft/yr
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

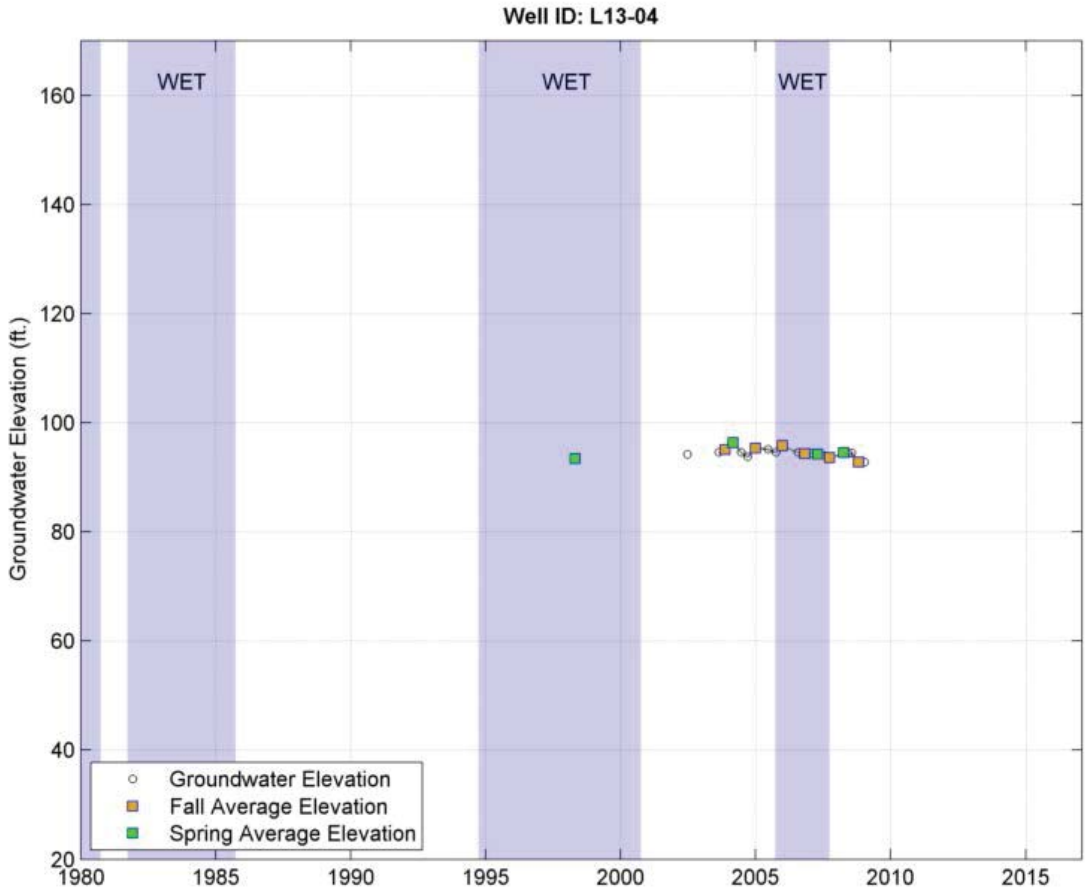

Well ID: O15-01
WET
WET
WET
10-year Trend:
-3.35 ft/yr
Groundwater Elevation (ft.)
-40
-60
-80
-100
-120
-140
-160
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

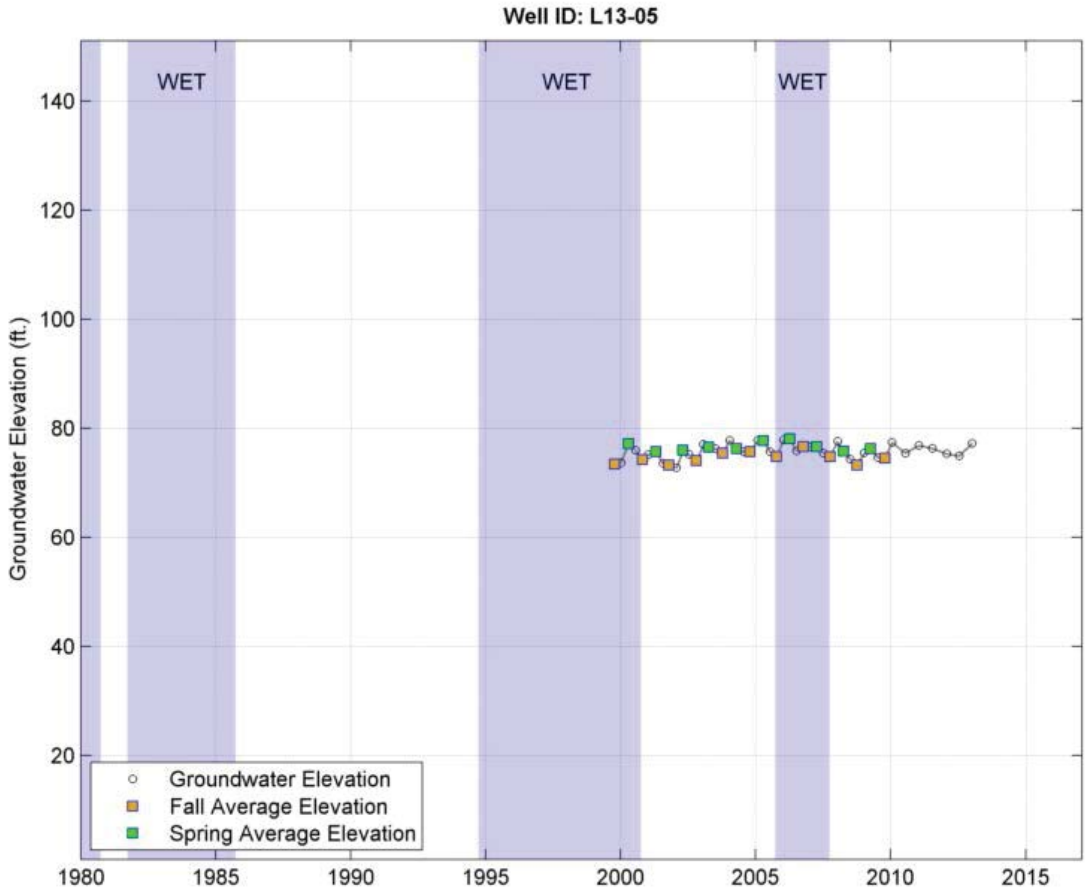
City Subarea
Shallow Wells (<200 feet deep)

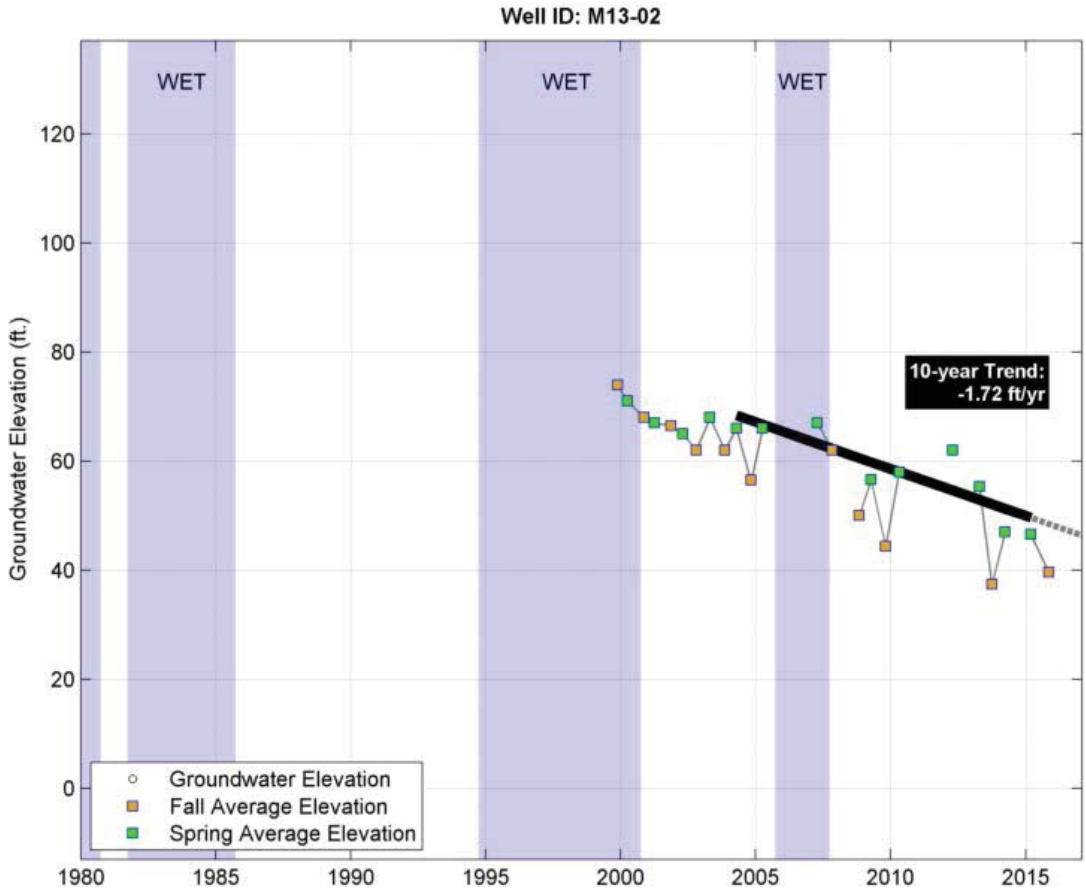

Well ID: L12-04
WET
WET
WET
10-year Trend:
-0.14 ft/yr
Groundwater Elevation (ft.)
180
160
140
120
100
80
60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

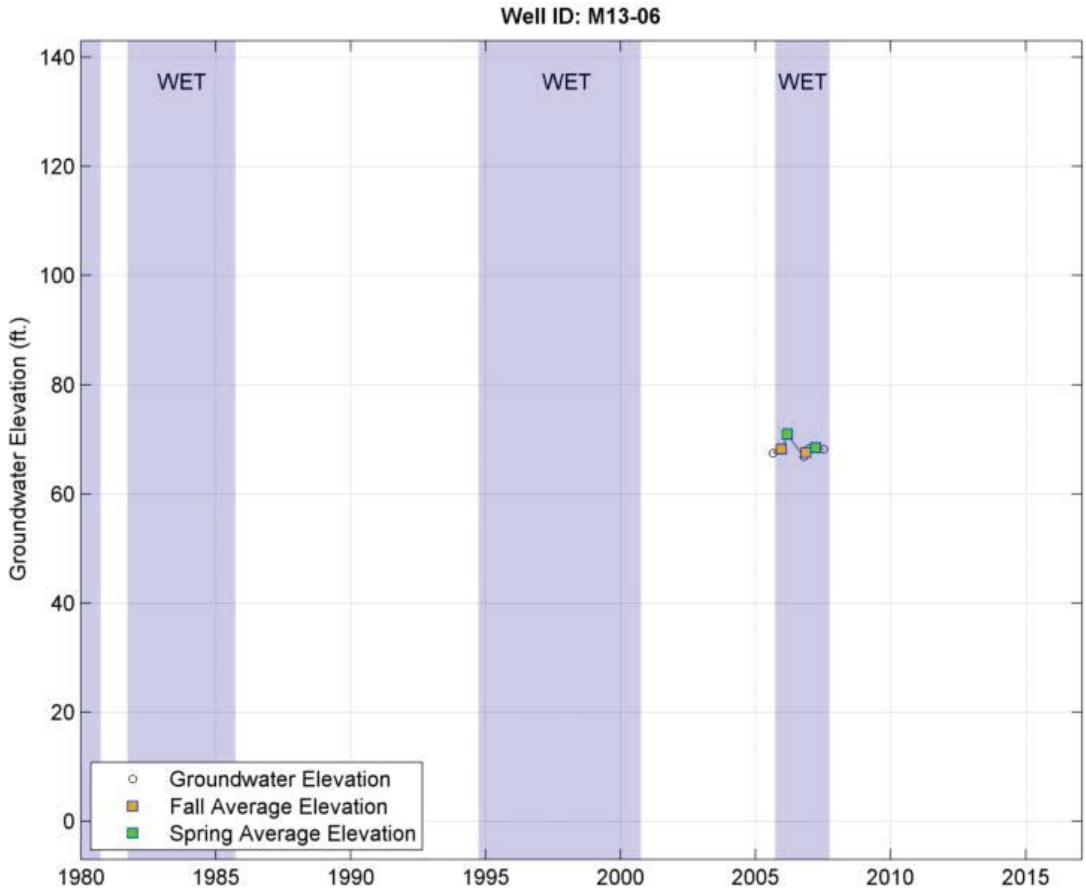

Well ID: L12-05
WET
WET
WET
Groundwater Elevation (ft.)
200
180
160
140
120
100
80
60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

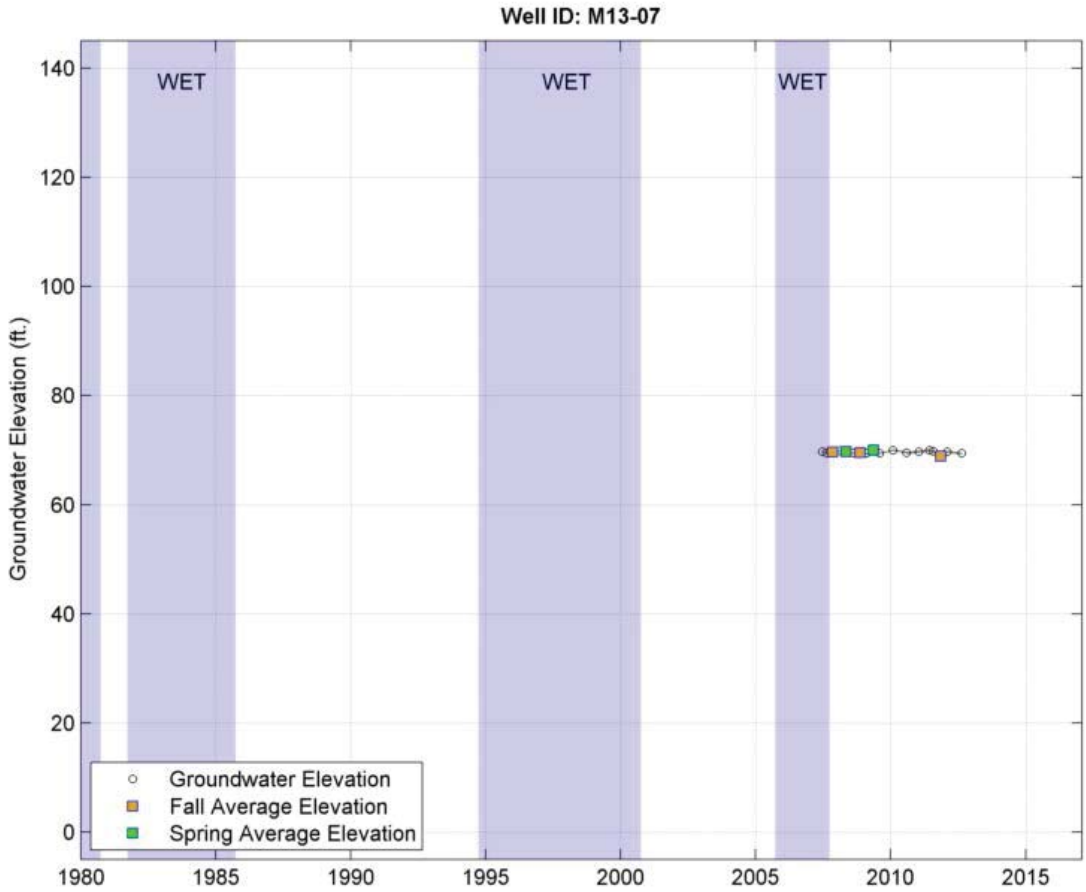

Well ID: L13-03
WET
WET
WET
Groundwater Elevation (ft.)
160
140
120
100
80
60
40
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

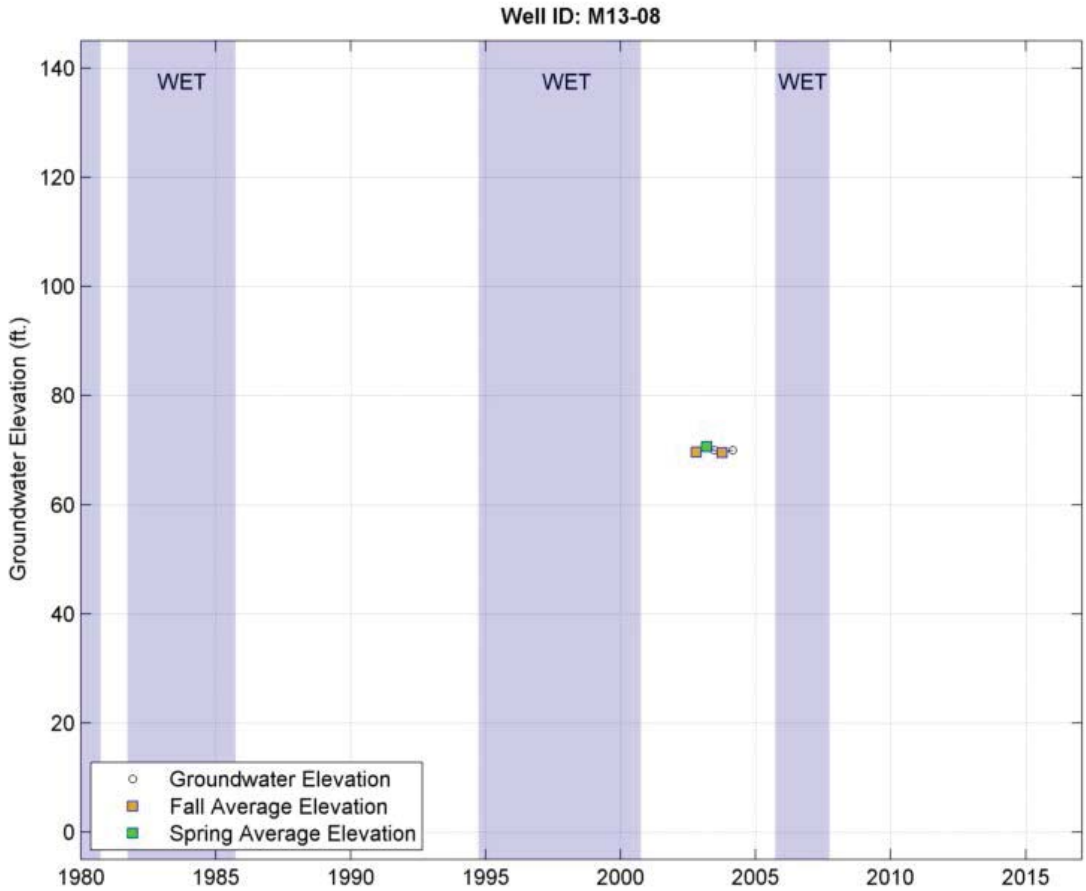

Well ID: L13-04
WET
WET
WET
Groundwater Elevation (ft.)
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

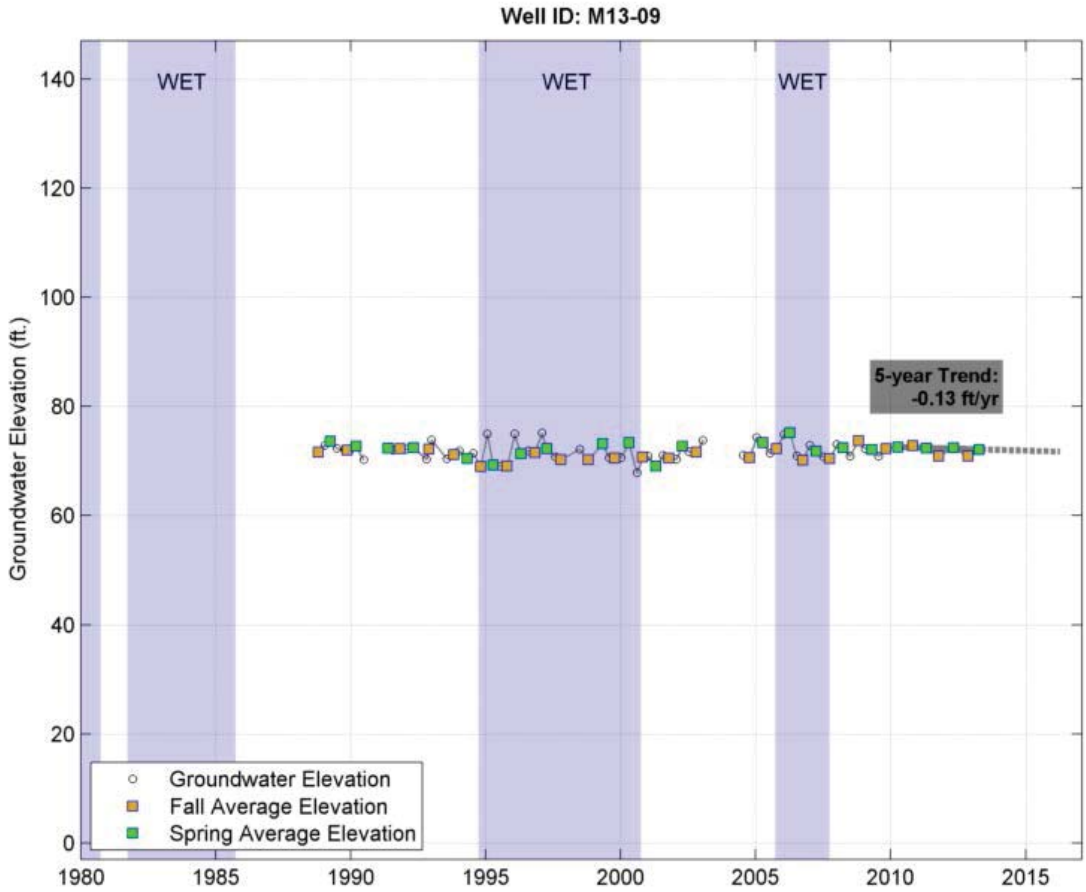

Well ID: L13-05
WET
WET
WET
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

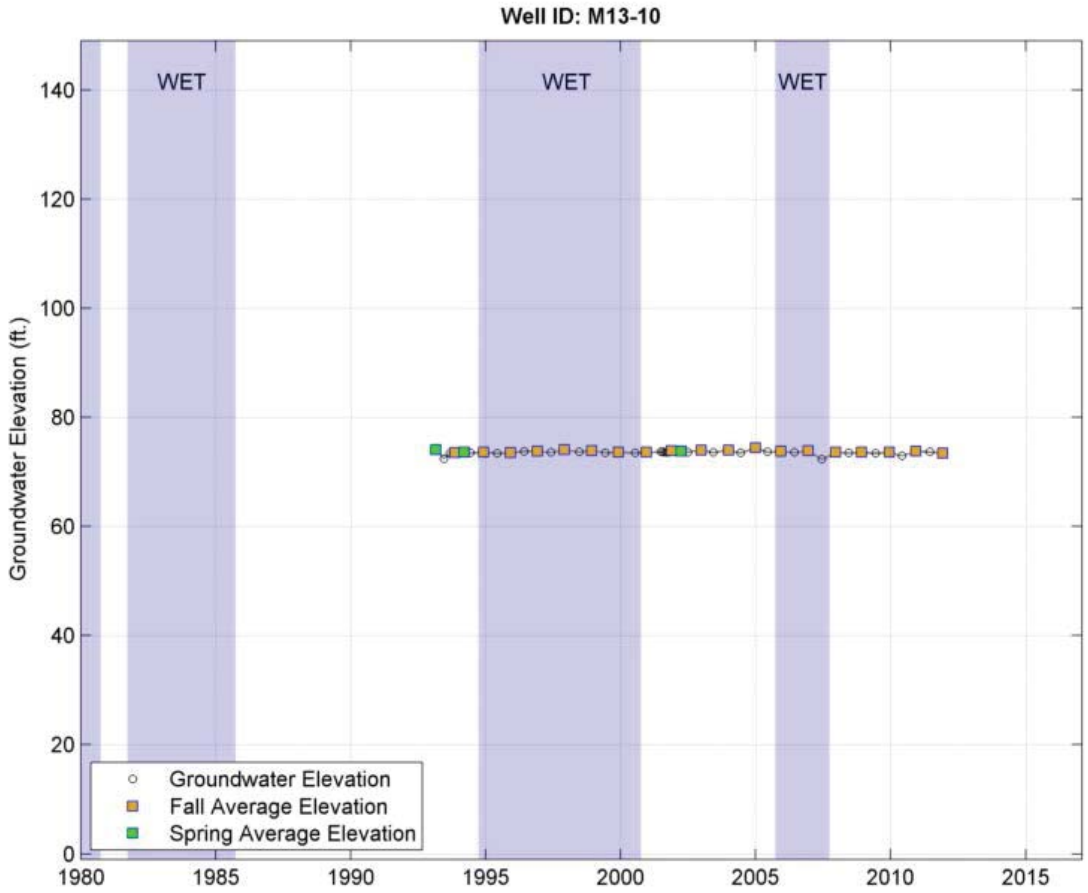

Well ID: M13-02
WET
WET
WET
10-year Trend:
-1.72 ft/yr
Groundwater Elevation (ft.)
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

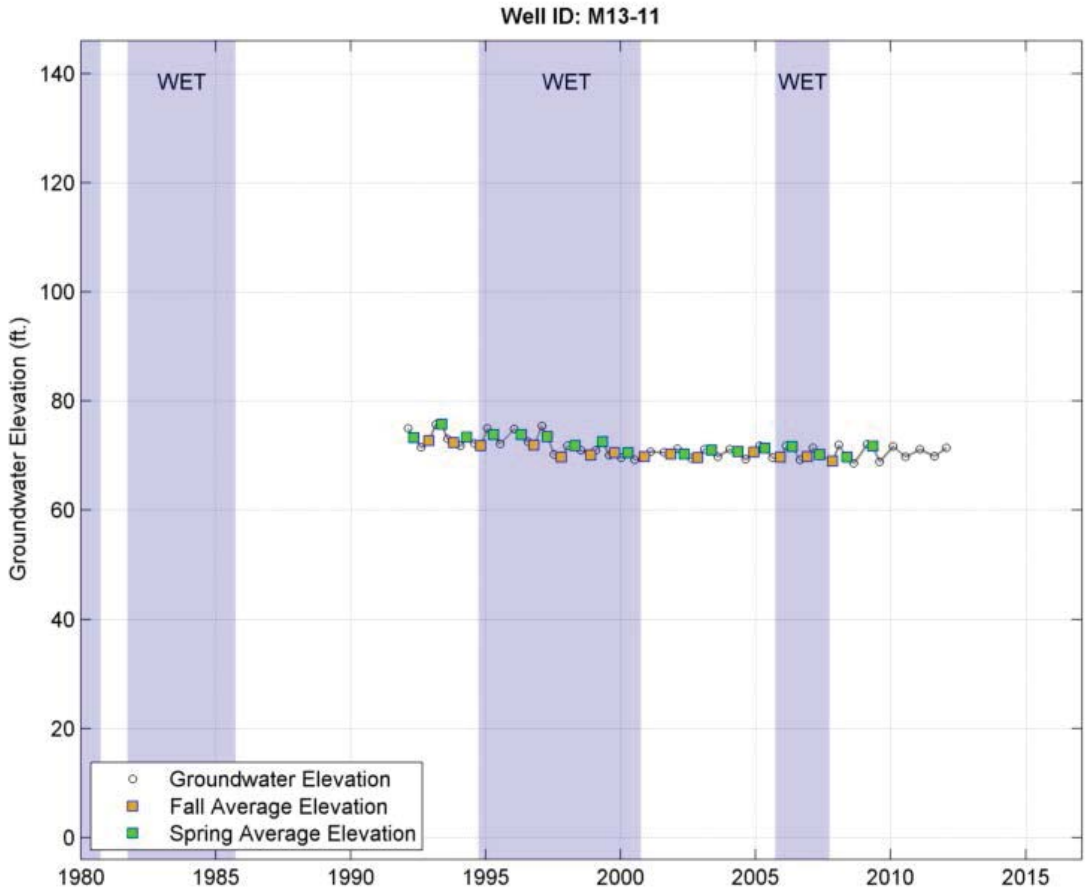

Well ID: M13-06
WET
WET
WET
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

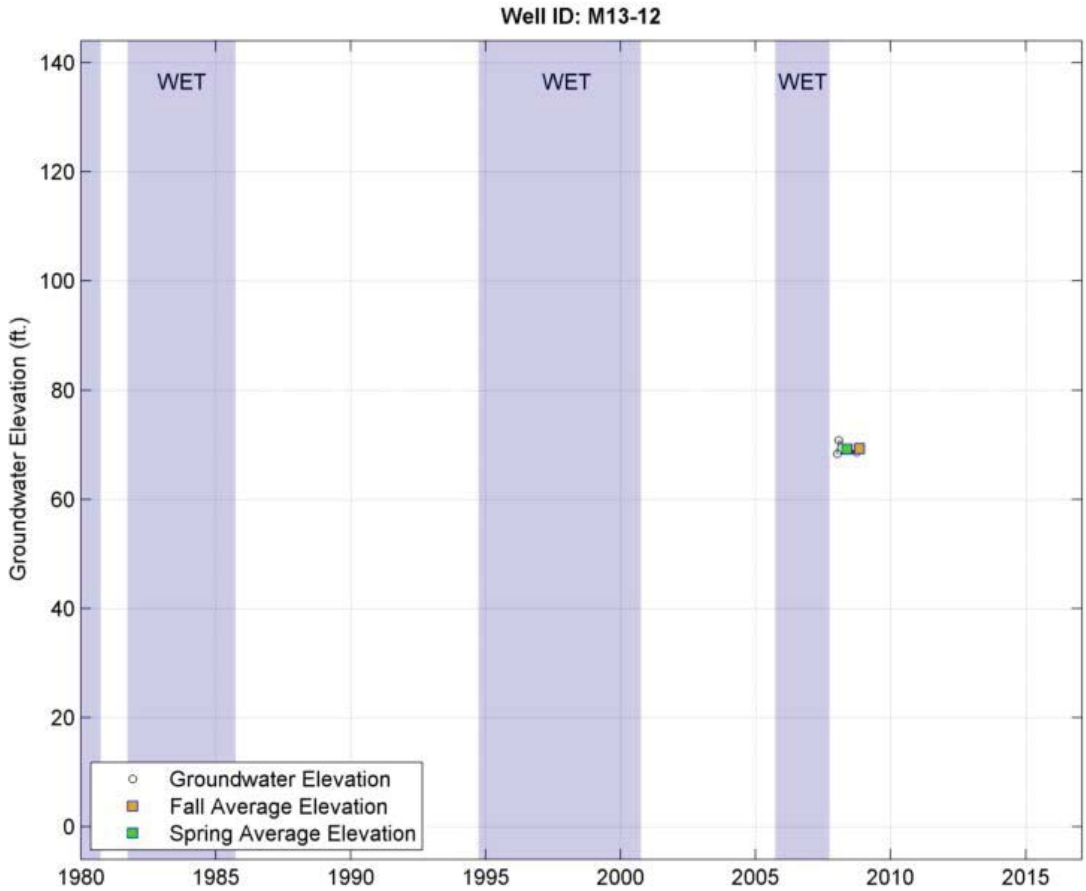

Well ID: M13-07
WET
WET
WET
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

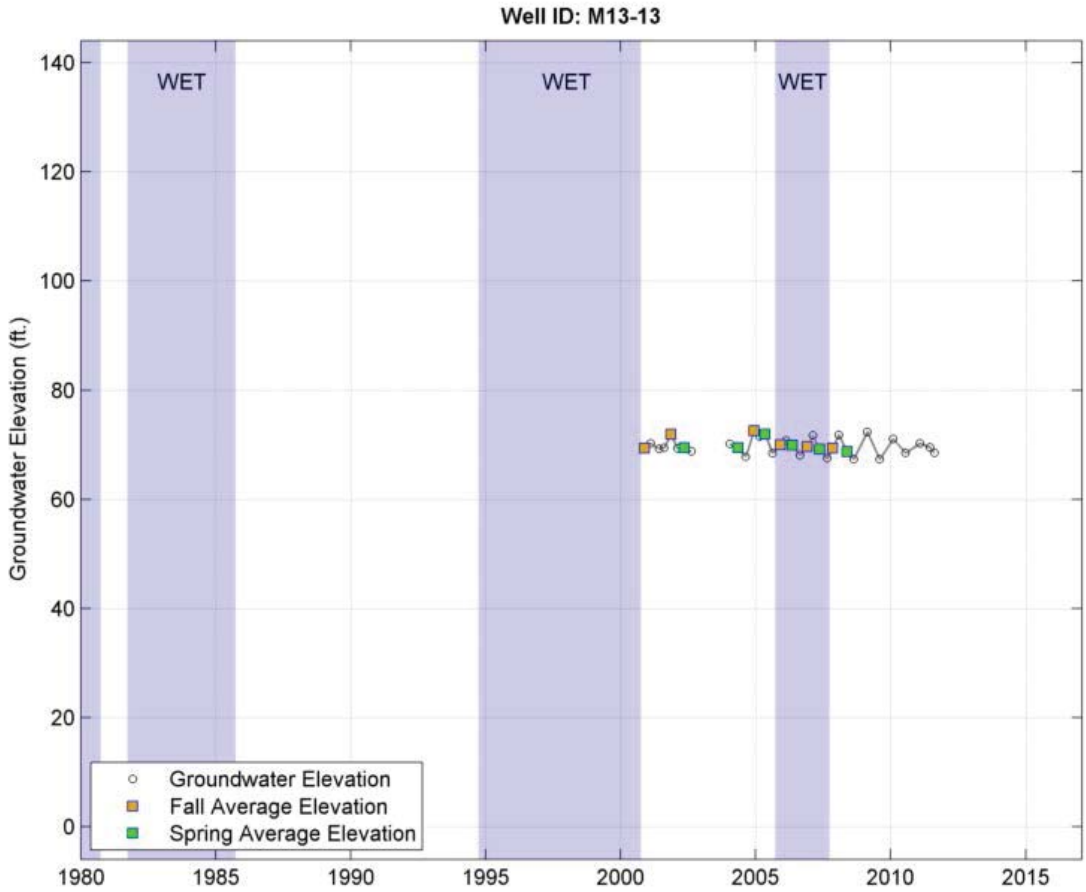

Well ID: M13-08
WET
WET
WET
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

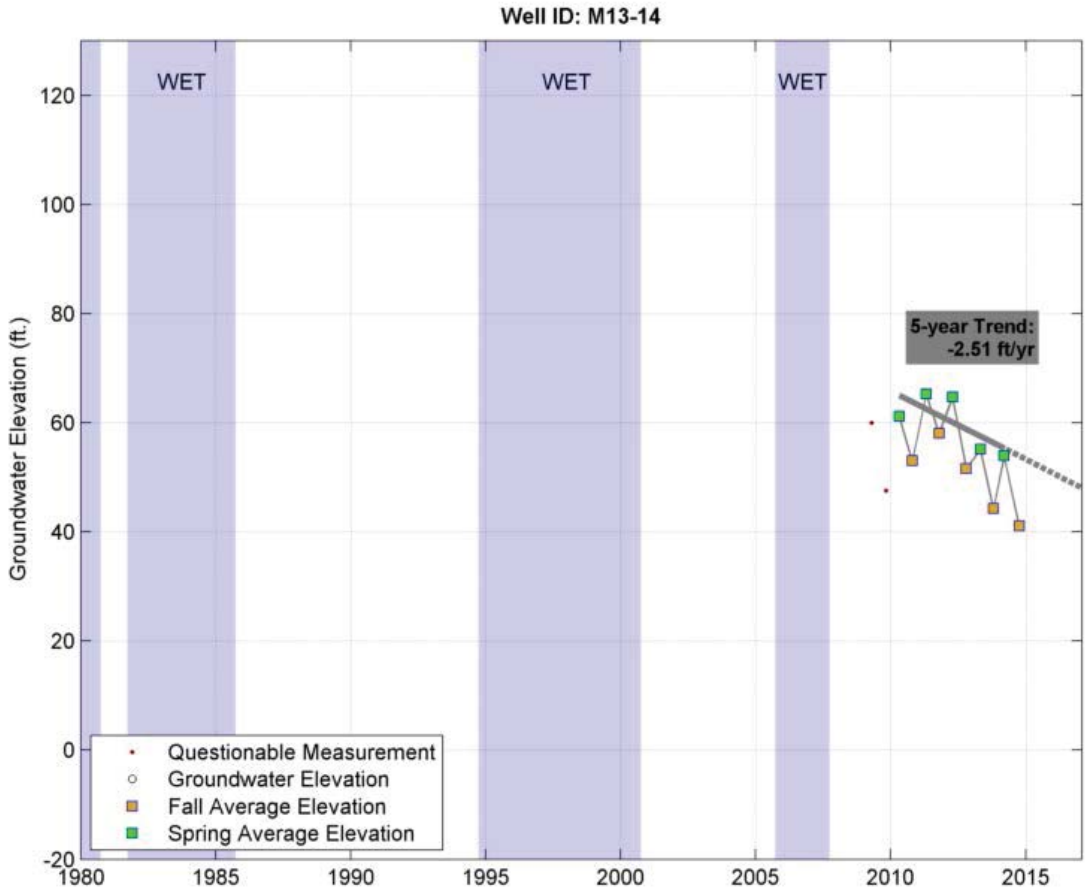

Well ID: M13-09
WET
WET
WET
5-year Trend:
-0.13 ft/yr
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

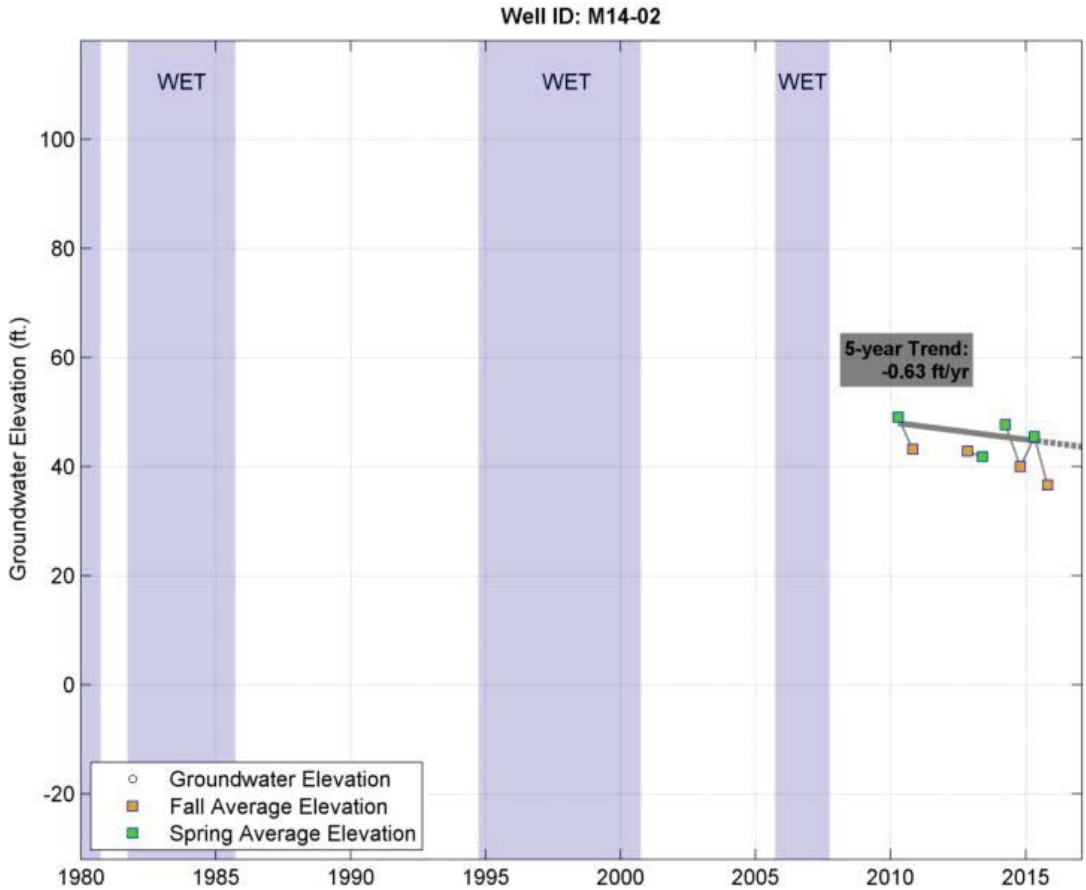

Well ID: M13-10
WET
WET
WET
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

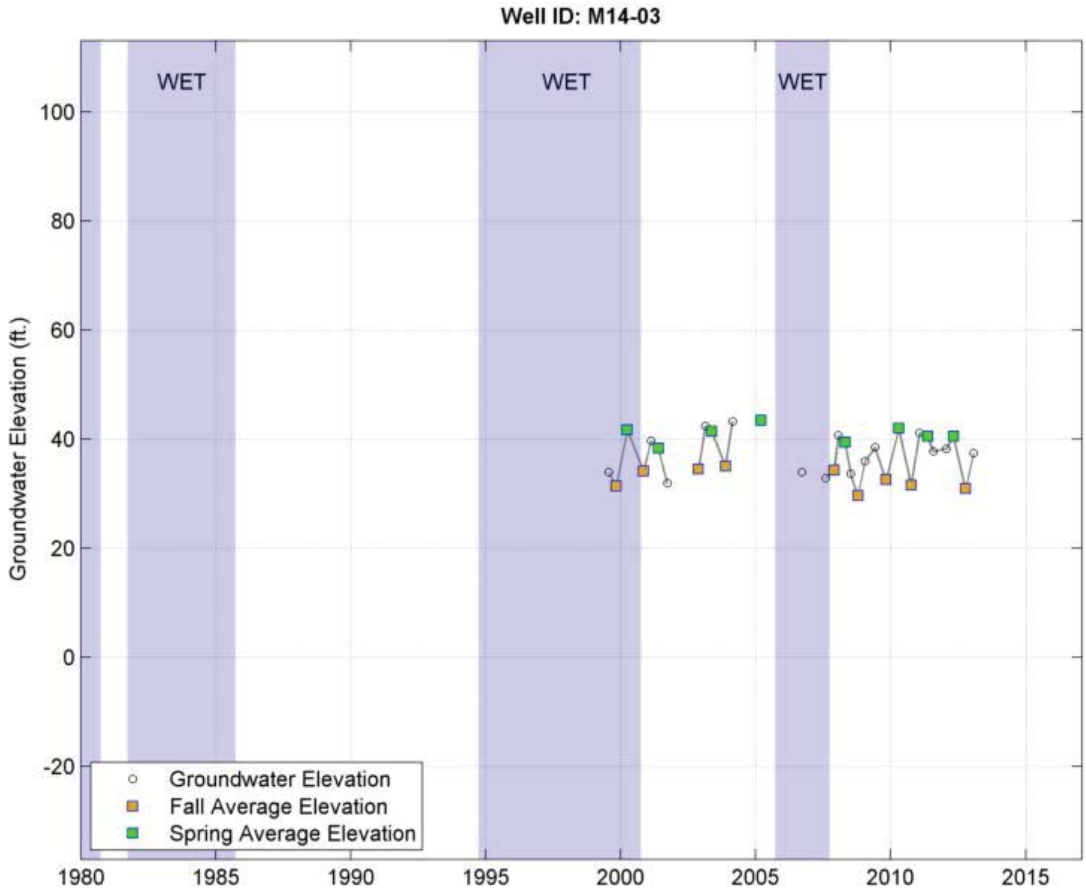

Well ID: M13-11
WET
WET
WET
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

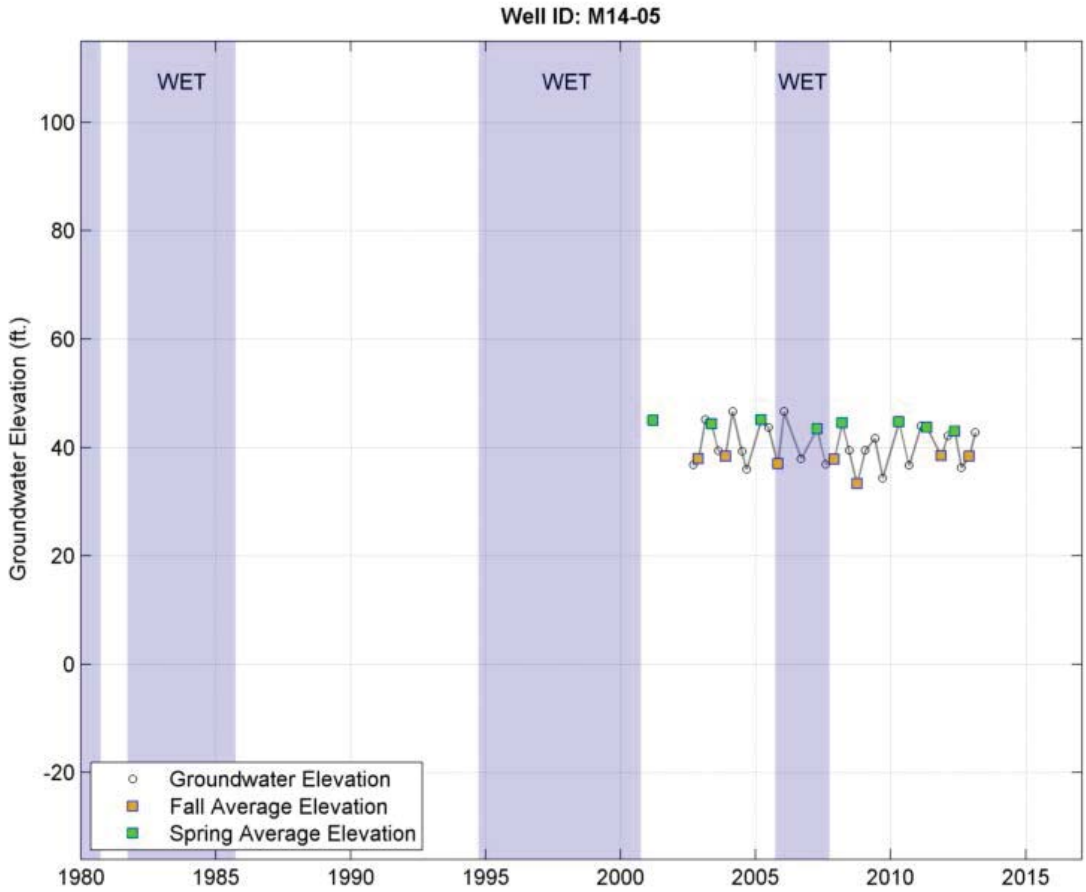

Well ID: M13-12
WET
WET
WET
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

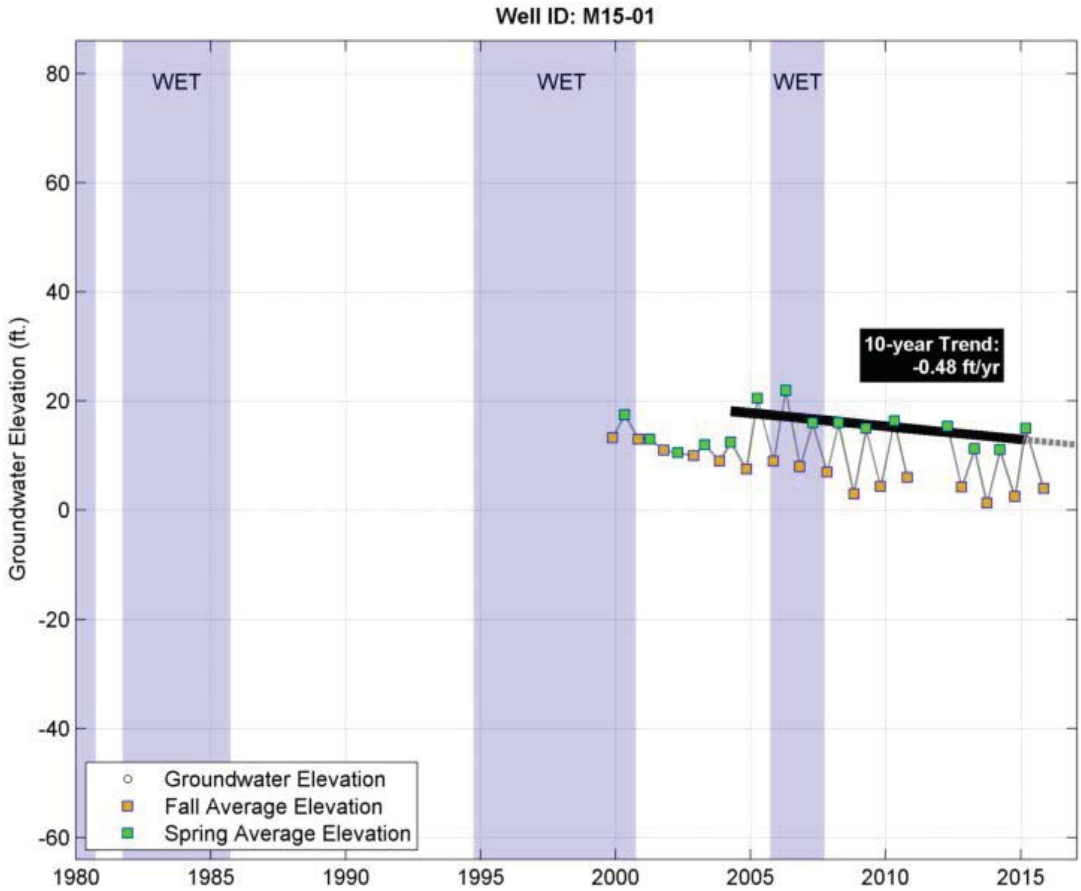

Well ID: M13-13
WET
WET
WET
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

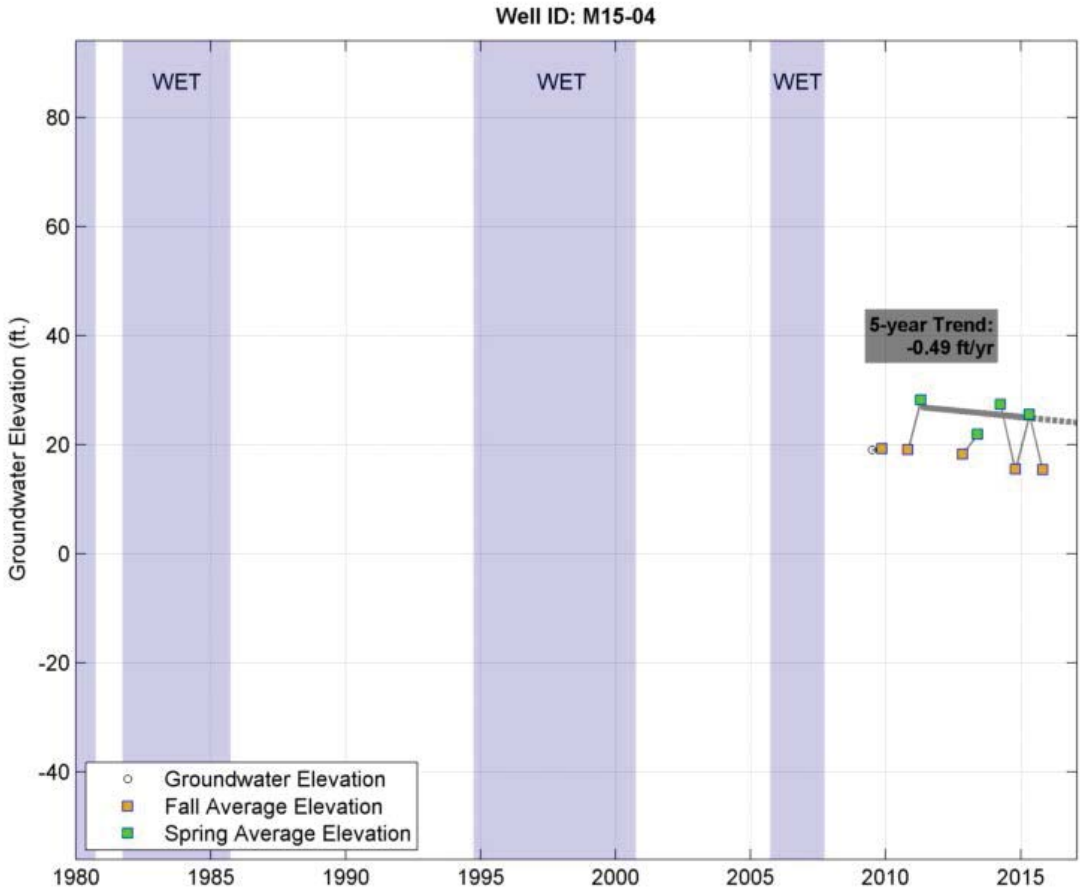

Well ID: M13-14
WET
WET
WET
5-year Trend:
-2.51 ft/yr
Groundwater Elevation (ft.)
120
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

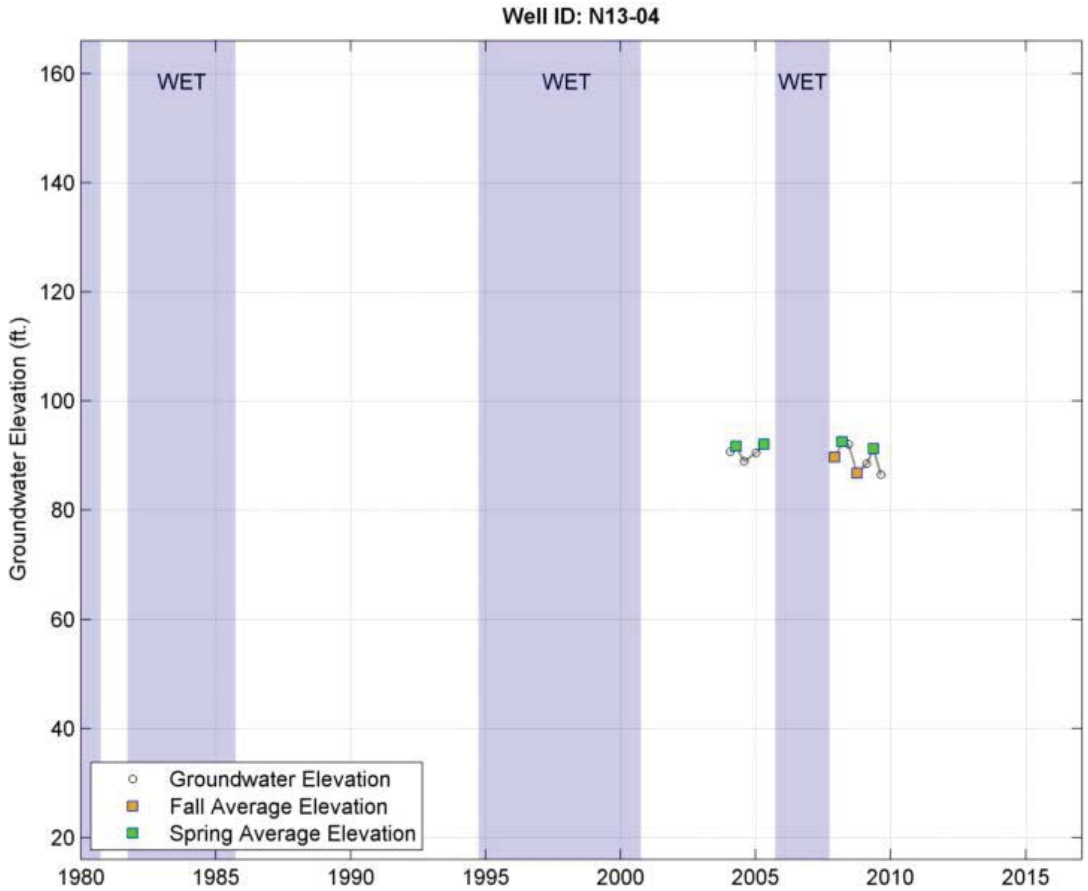

Well ID: M14-02
WET
WET
WET
5-year Trend:
-0.63 ft/yr
Groundwater Elevation (ft.)
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

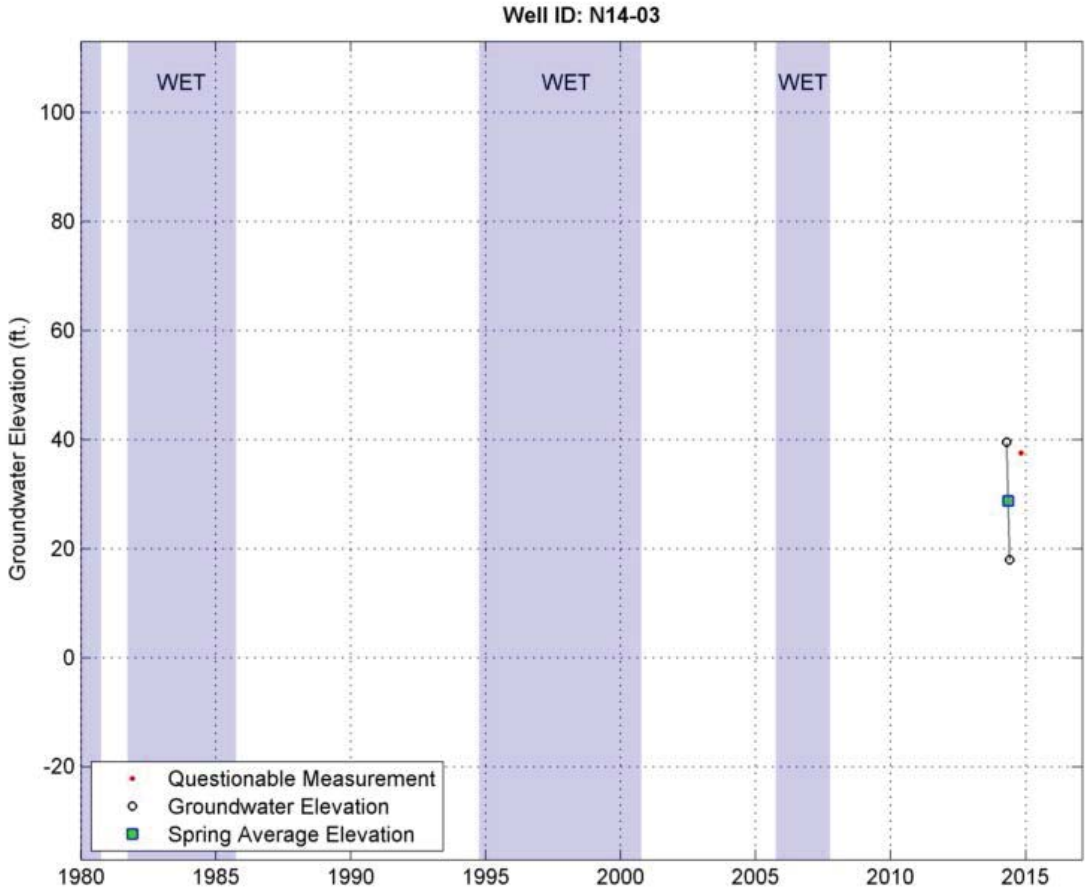

Well ID: M14-03
WET
WET
WET
Groundwater Elevation (ft.)
100
80
60
40
20
0
-20
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

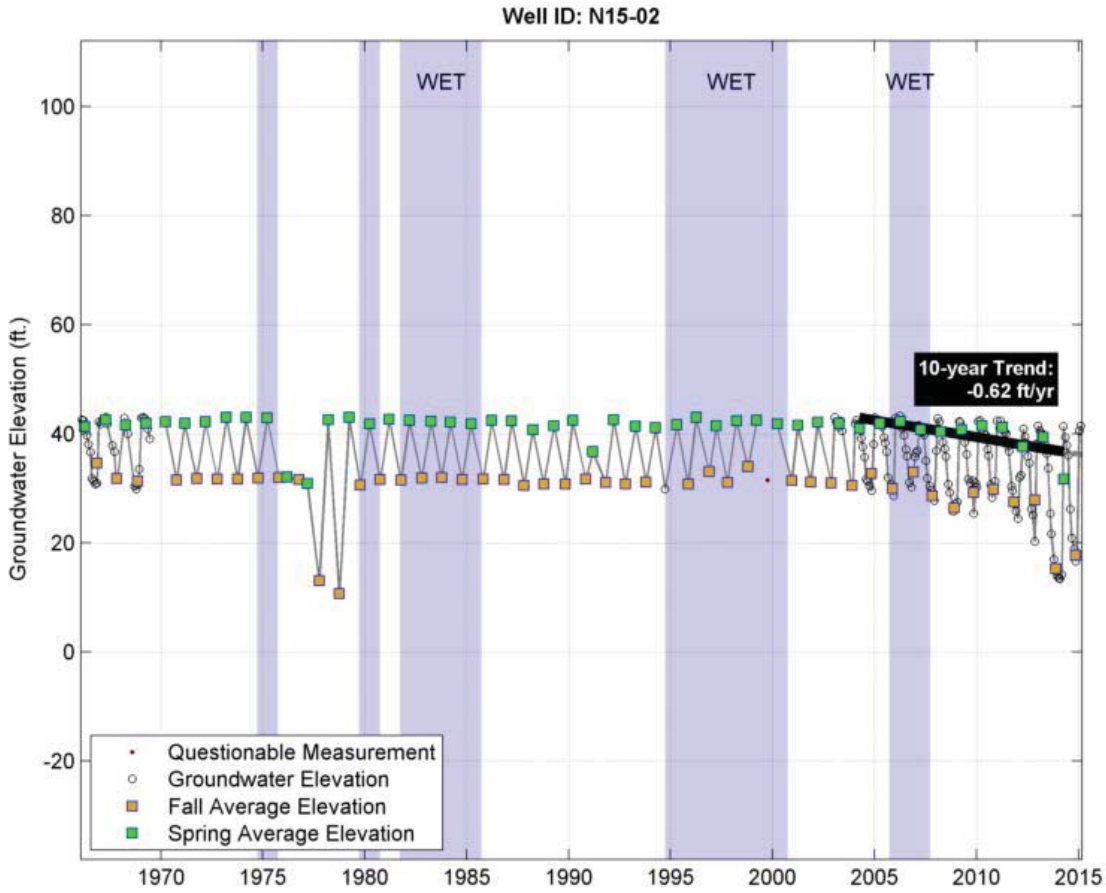

Well ID: M14-05
WET
WET
WET
Groundwater Elevation (ft.)
100
80
60
40
20
0
-20
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

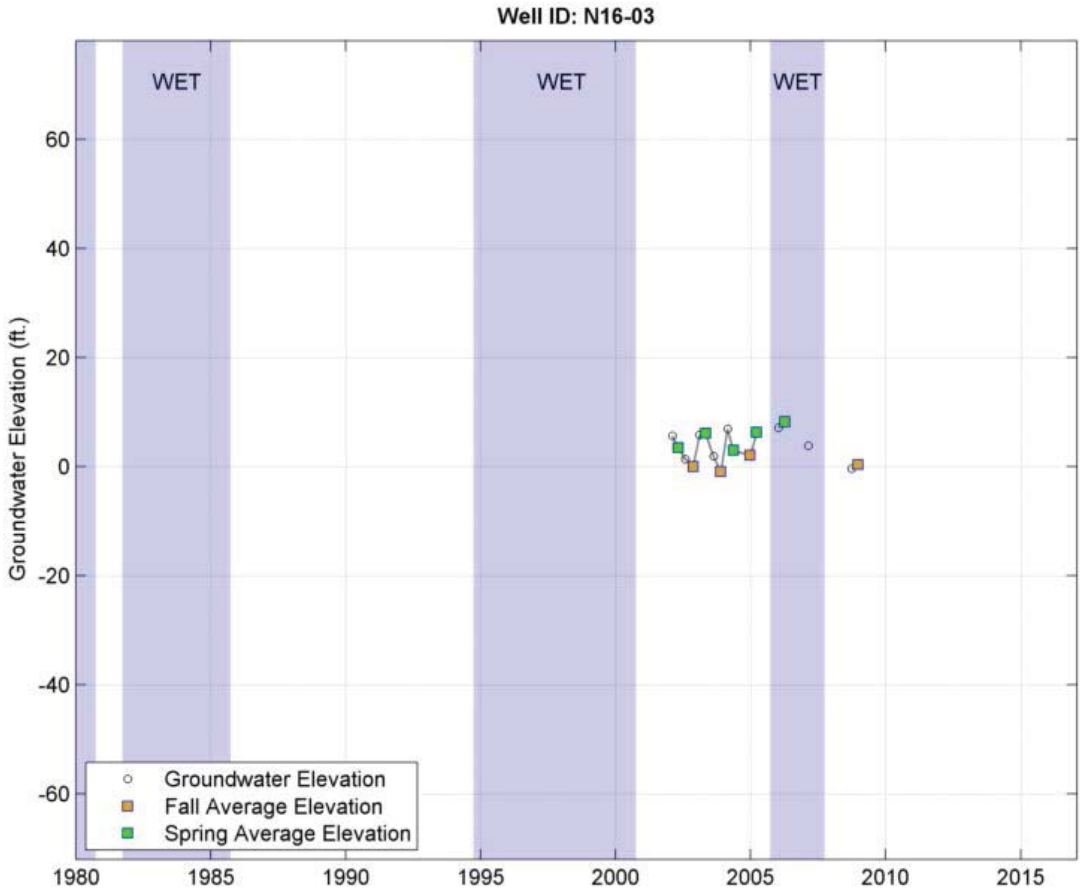

Well ID: M15-01
WET
WET
WET
10-year Trend:
-0.48 ft/yr
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: M15-04
WET
WET
WET
5-year Trend:
-0.49 ft/yr
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

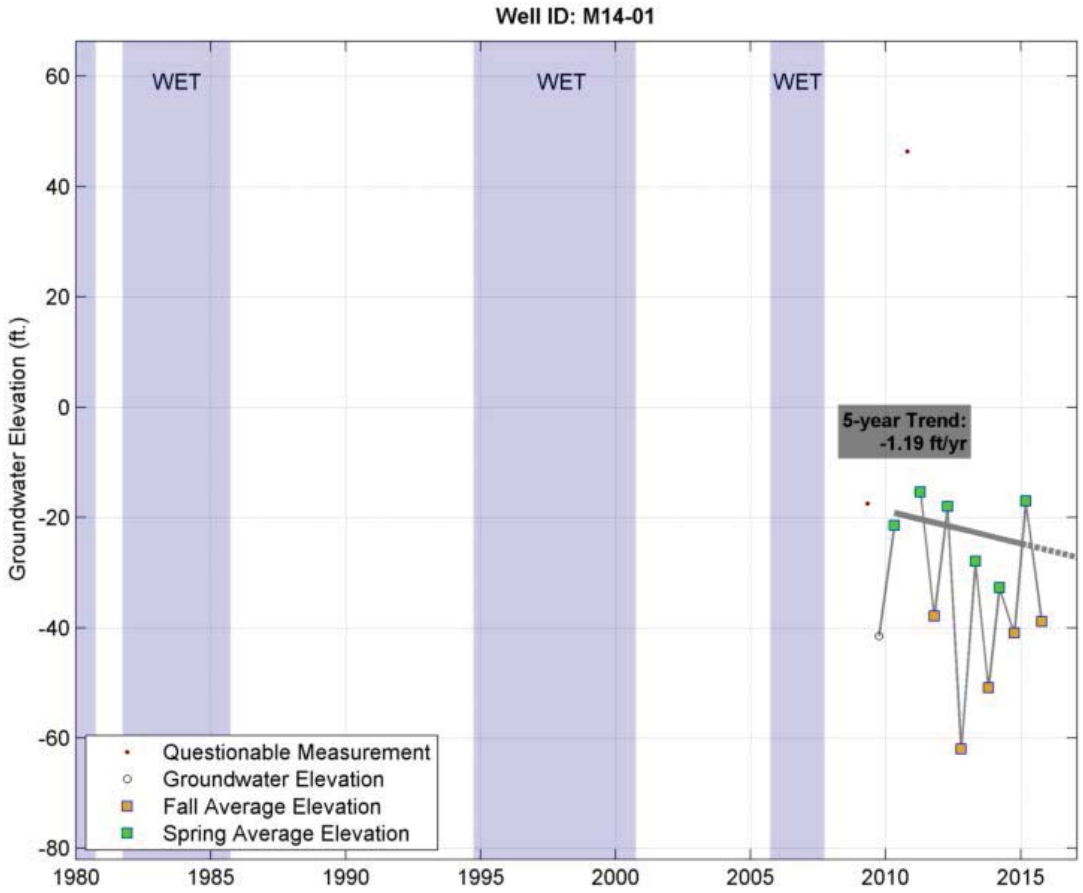

Well ID: N13-04
WET
WET
WET
Groundwater Elevation (ft.)
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

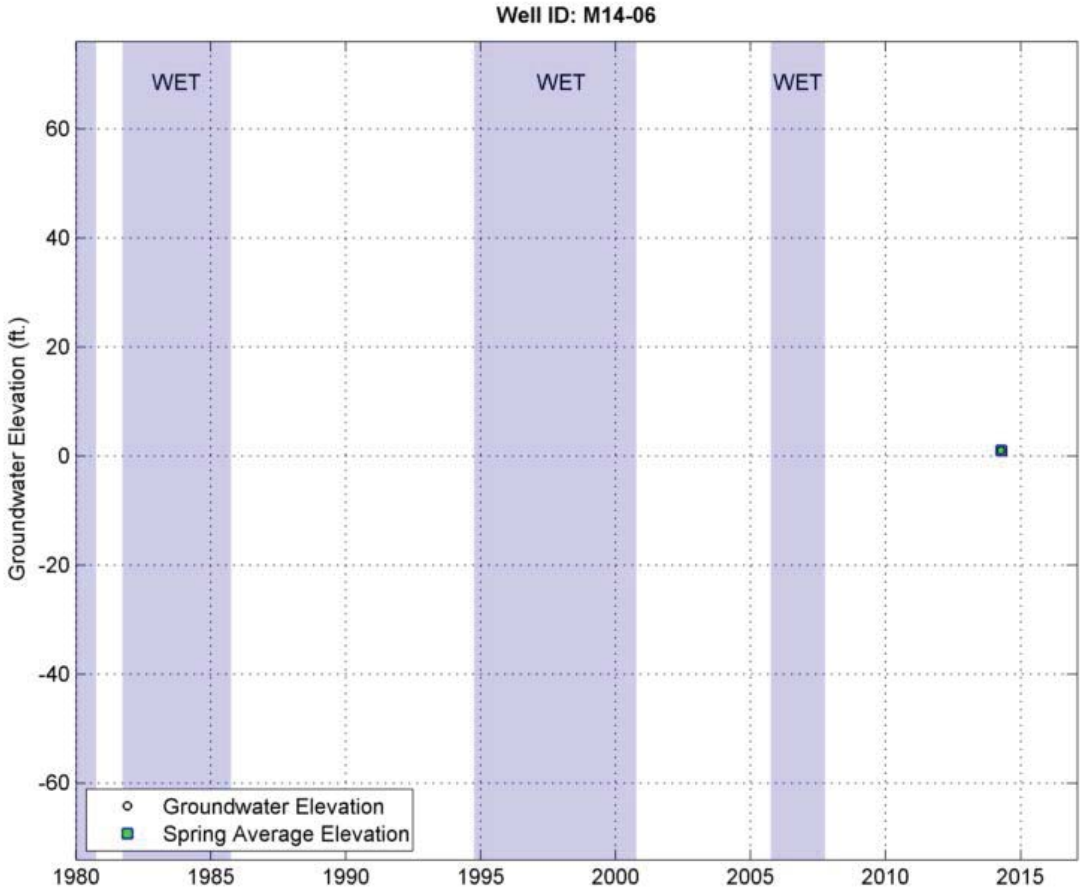

Well ID: N14-03
WET
WET
WET
Groundwater Elevation (ft.)
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Spring Average Elevation

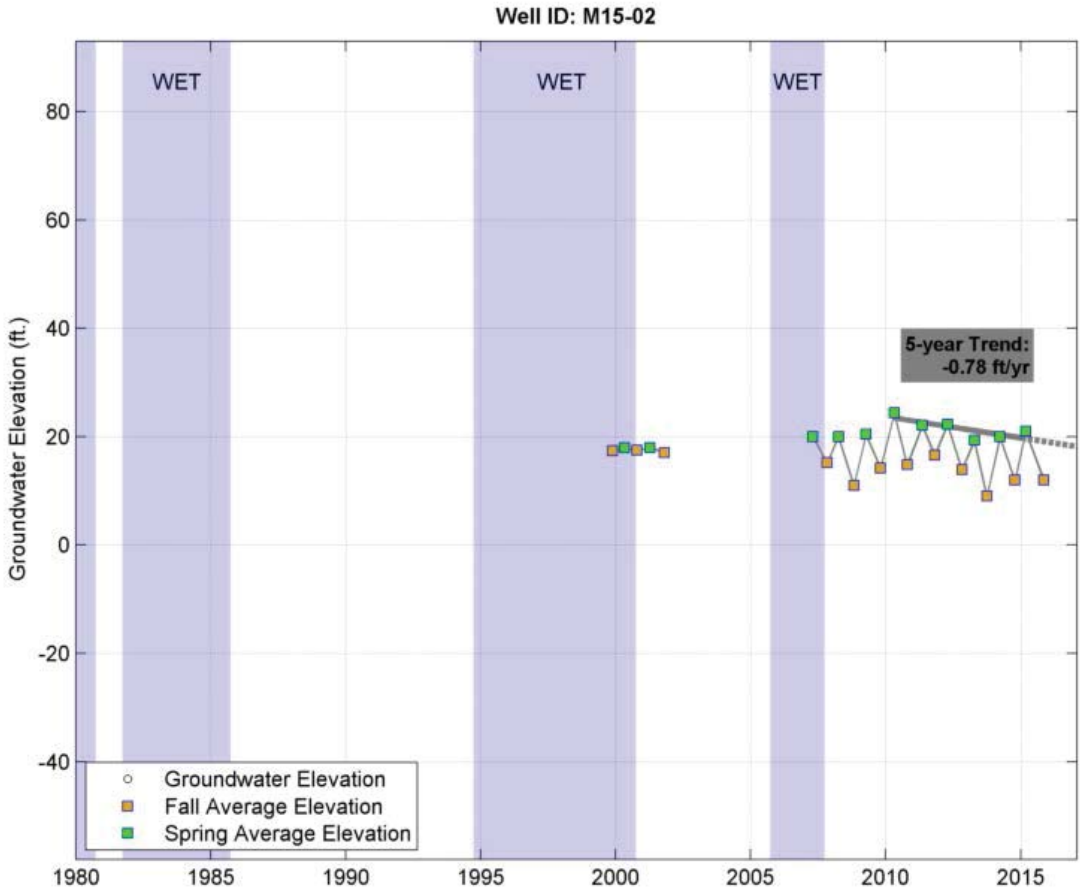

Well ID: N15-02
WET
WET
WET
10-year Trend:
-0.62 ft/yr
Groundwater Elevation (ft.)
100
80
60
40
20
0
-20
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

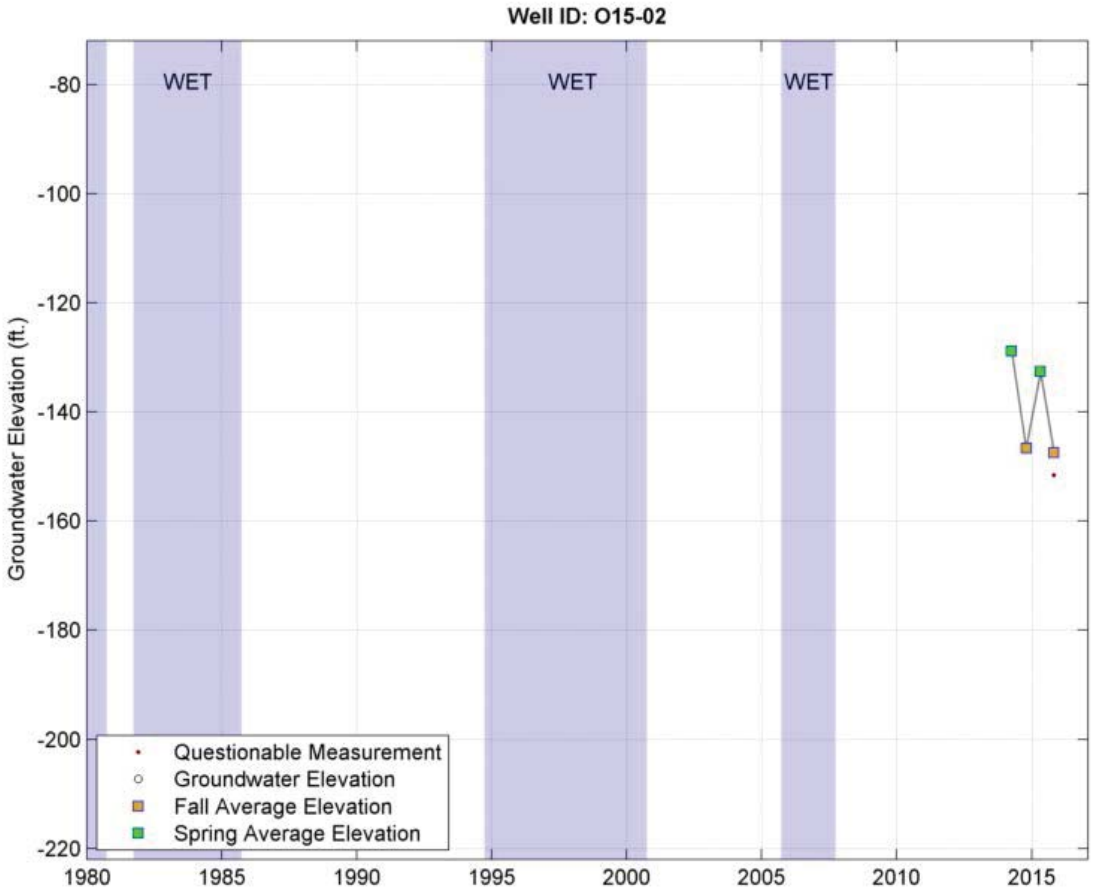

Well ID: N16-03
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

City Subarea
Unknown Depth

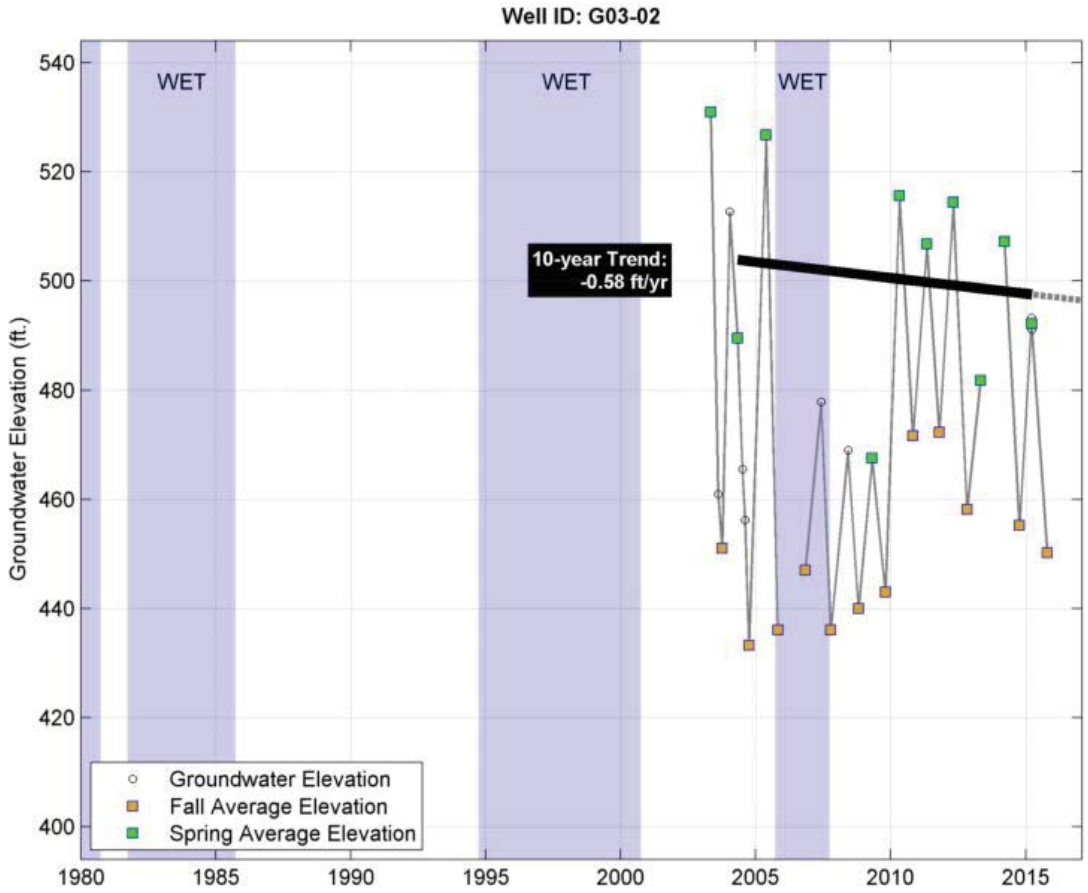

Well ID: M14-01
WET
WET
WET
5-year Trend:
-1.19 ft/yr
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

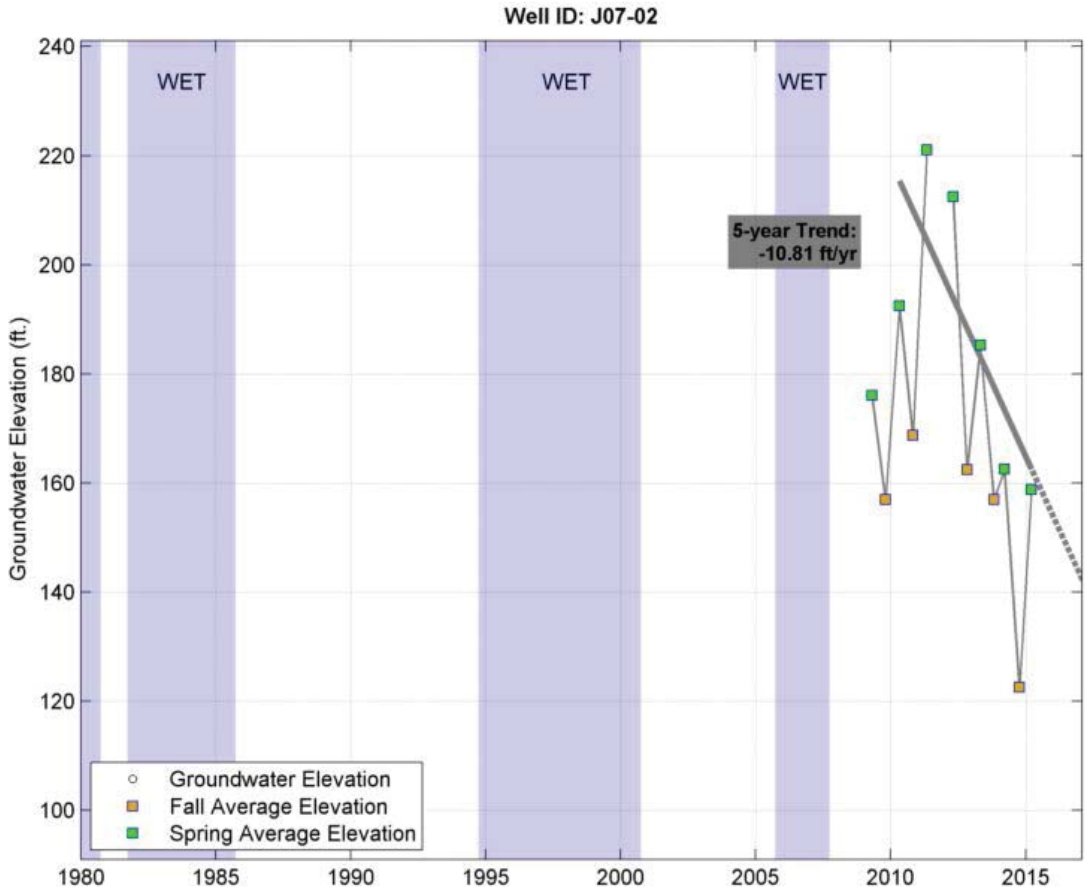

Well ID: M14-06
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Spring Average Elevation

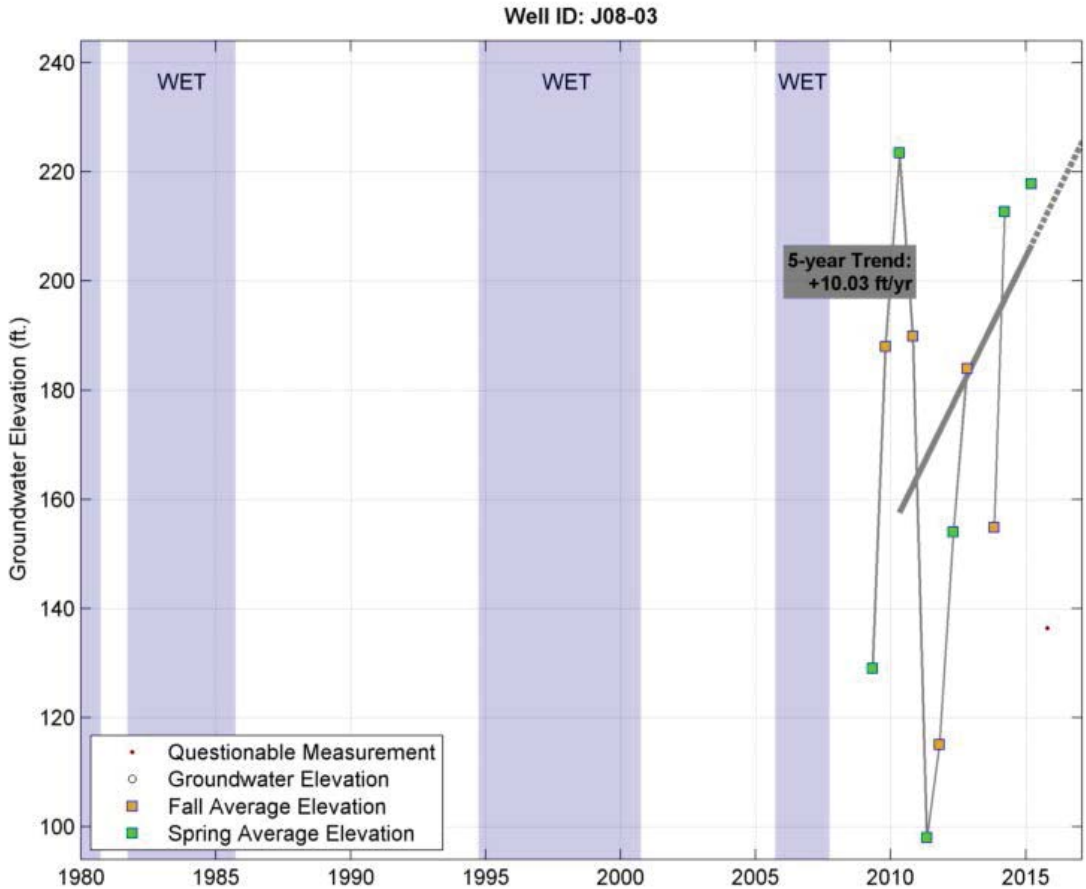

Well ID: M15-02
WET
WET
WET
5-year Trend:
-0.78 ft/yr
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

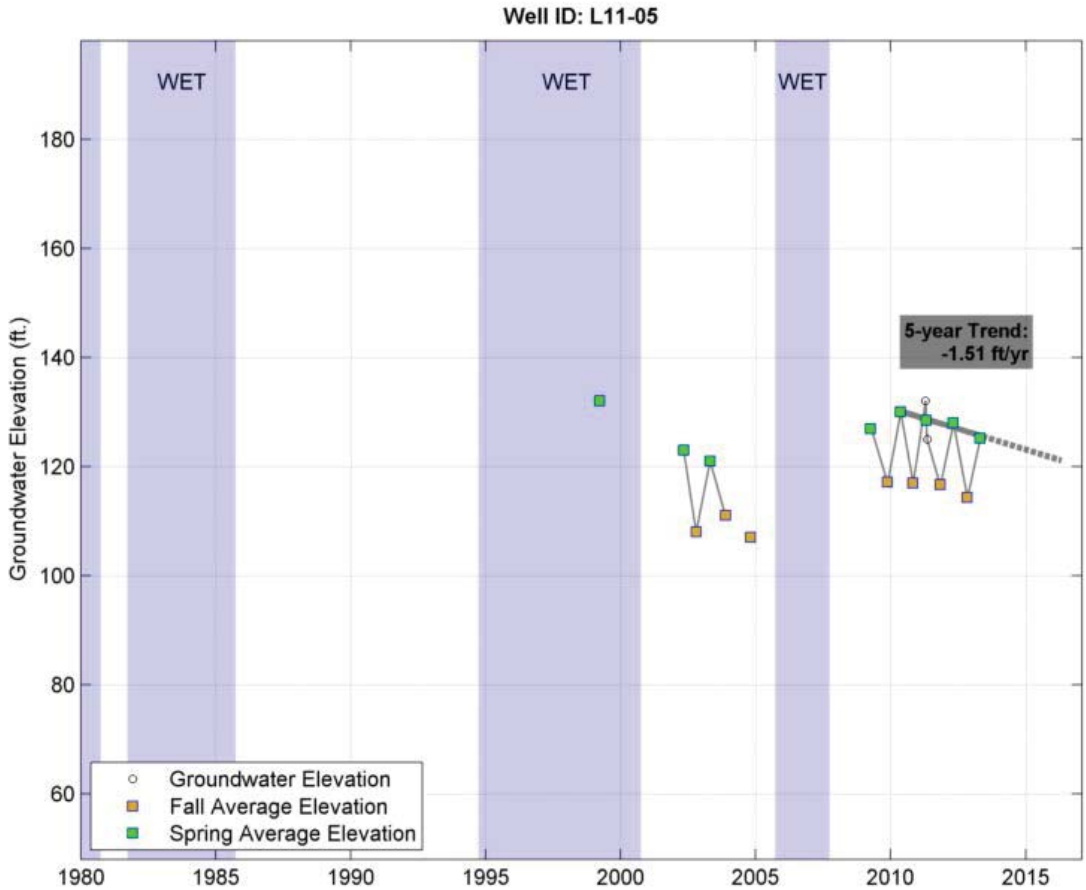

Well ID: O15-02
WET
WET
WET
Groundwater Elevation (ft.)
-80
-100
-120
-140
-160
-180
-200
-220
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

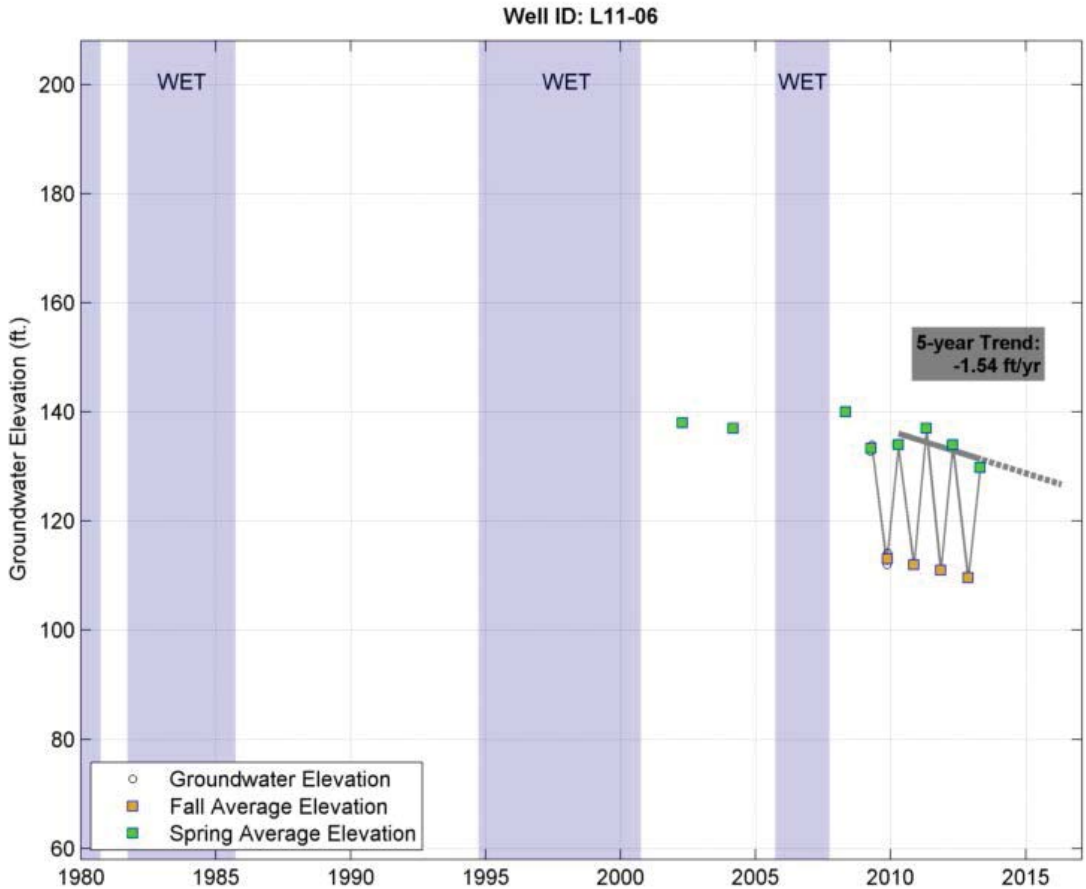
Eastern Upland Subarea
Deeper Wells (>200 feet deep)

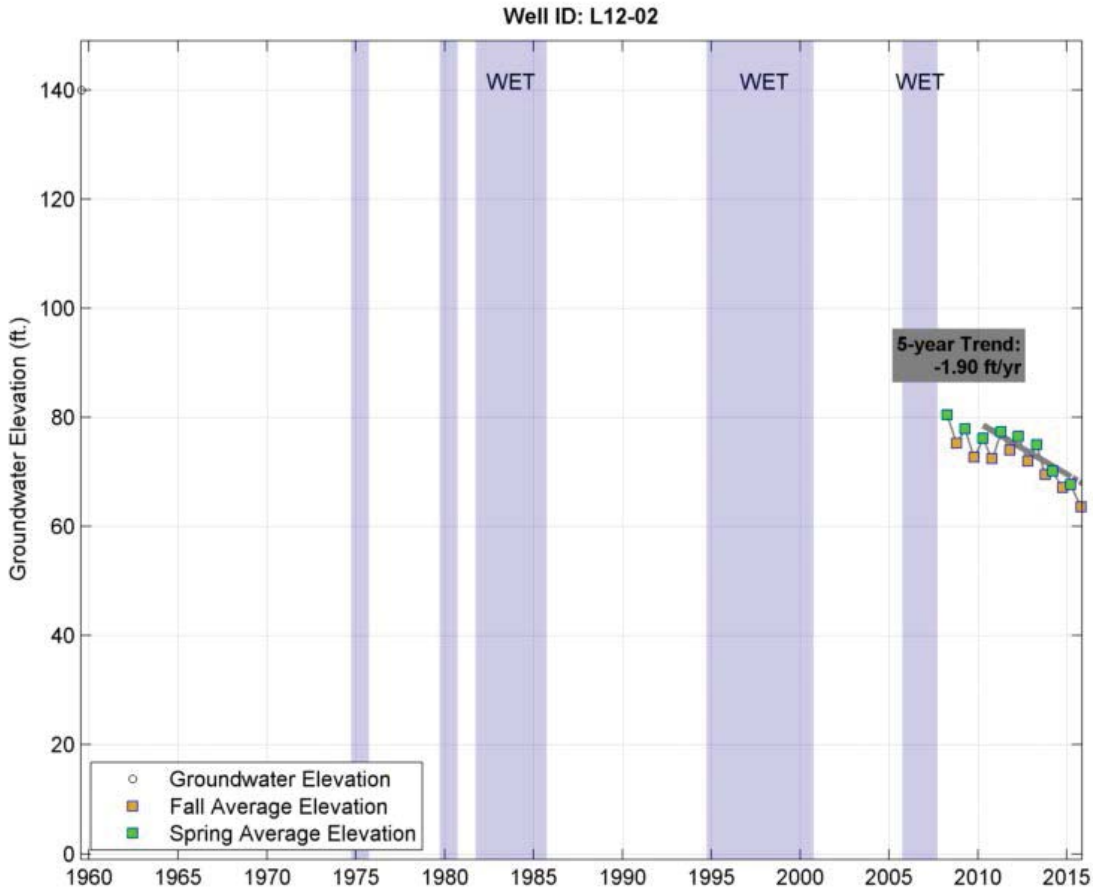

Well ID: G03-02
WET
WET
WET
10-year Trend:
-0.58 ft/yr
Groundwater Elevation (ft.)
540
520
500
480
460
440
420
400
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

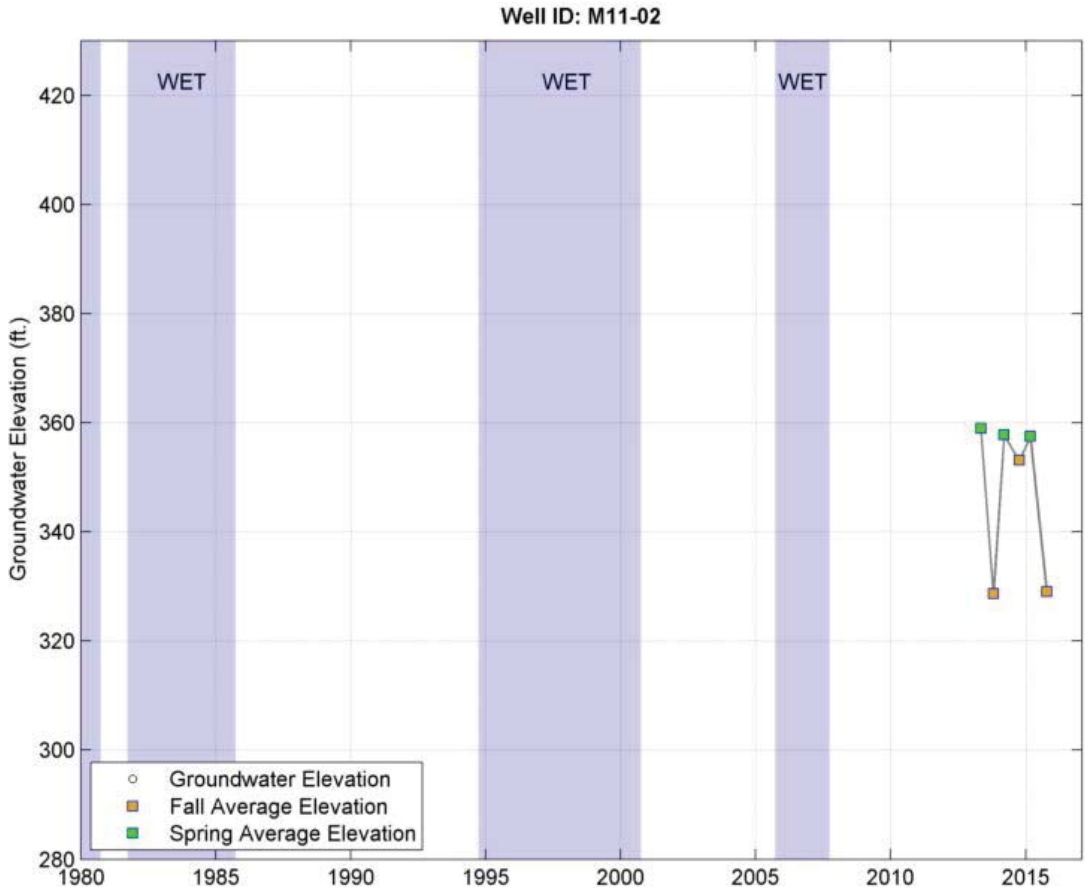

Well ID: J07-02
WET
WET
WET
5-year Trend:
-10.81 ft/yr
Groundwater Elevation (ft.)
240
220
200
180
160
140
120
100
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

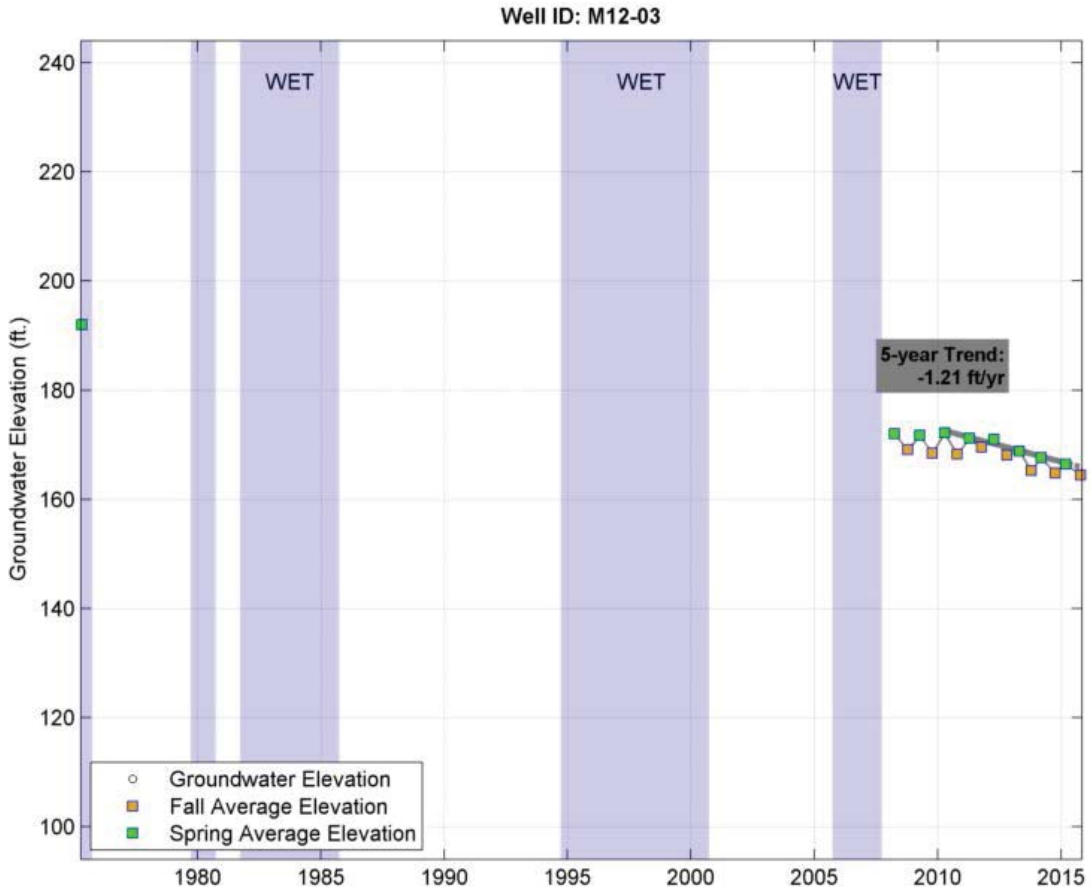

Well ID: J08-03
WET
WET
WET
5-year Trend:
+10.03 ft/yr
Groundwater Elevation (ft.)
240
220
200
180
160
140
120
100
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

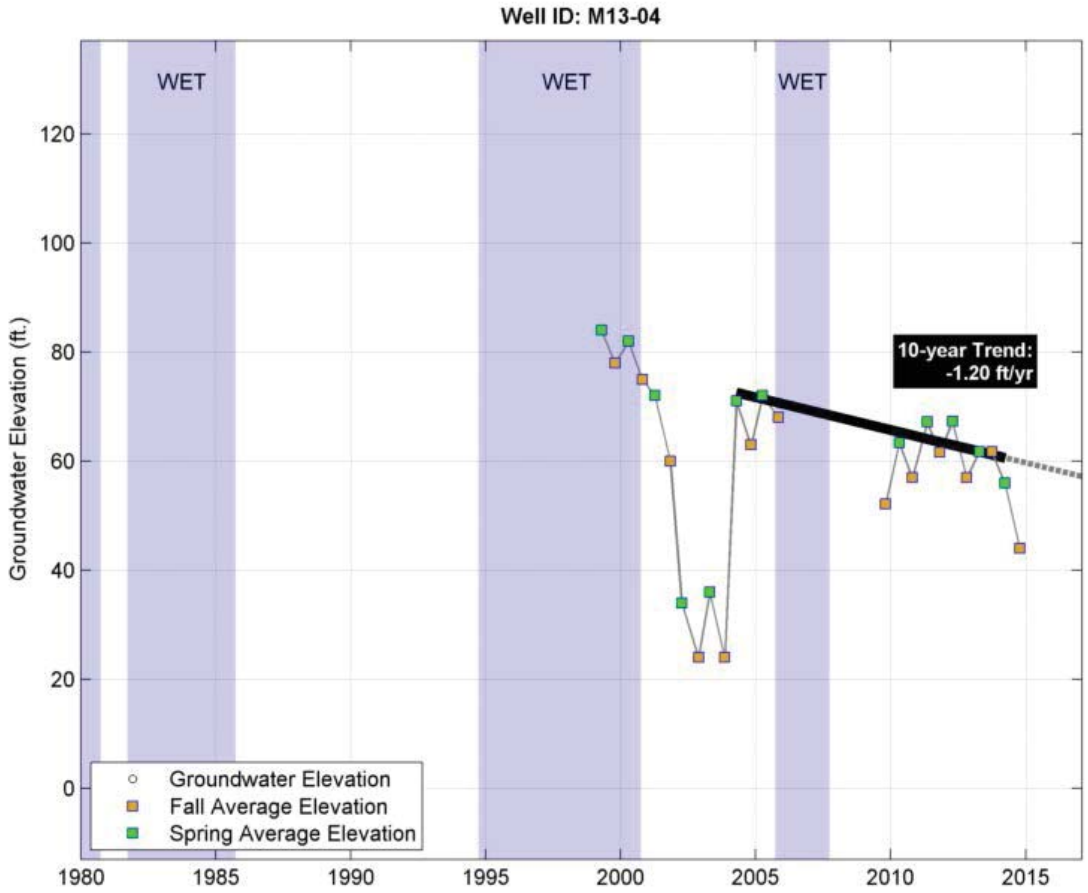

Well ID: L11-05
WET
WET
WET
5-year Trend:
-1.51 ft/yr
Groundwater Elevation (ft.)
180
160
140
120
100
80
60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

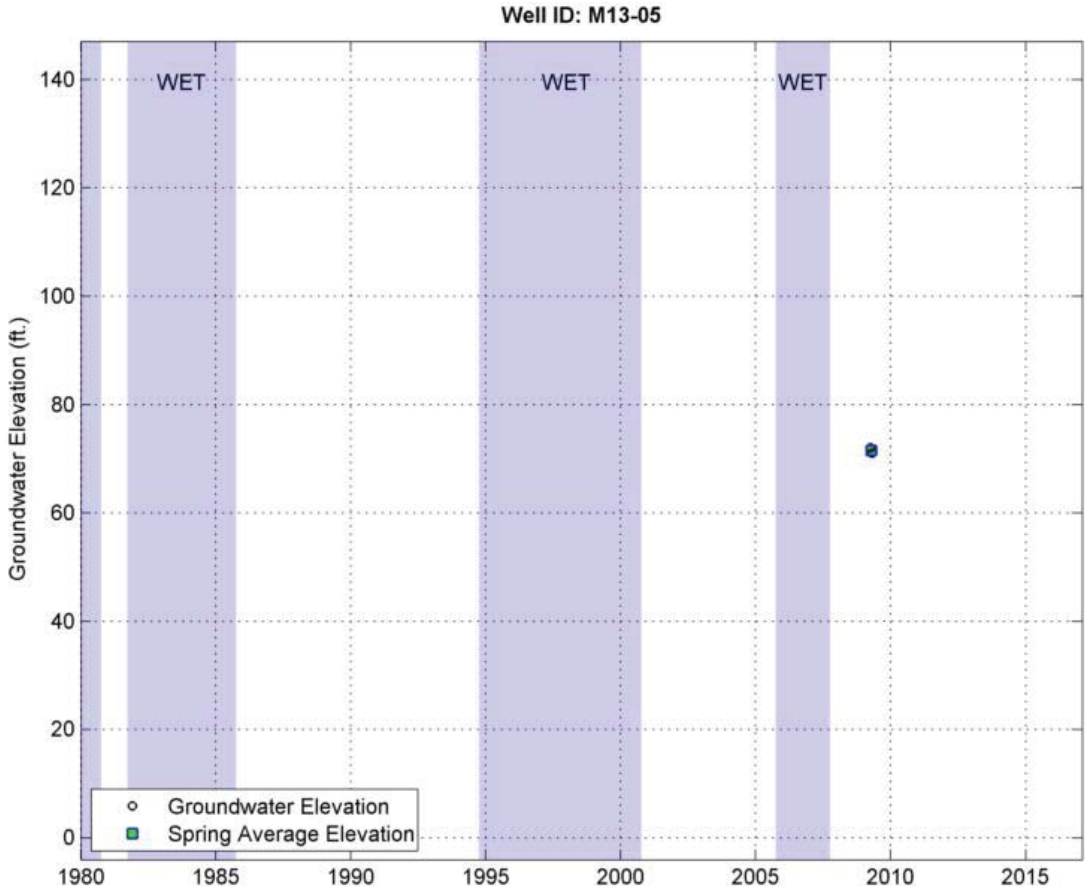

Well ID: L11-06
WET
WET
WET
5-year Trend:
-1.54 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
200
180
160
140
120
100
80
60
1980
1985
1990
1995
2000
2005
2010
2015

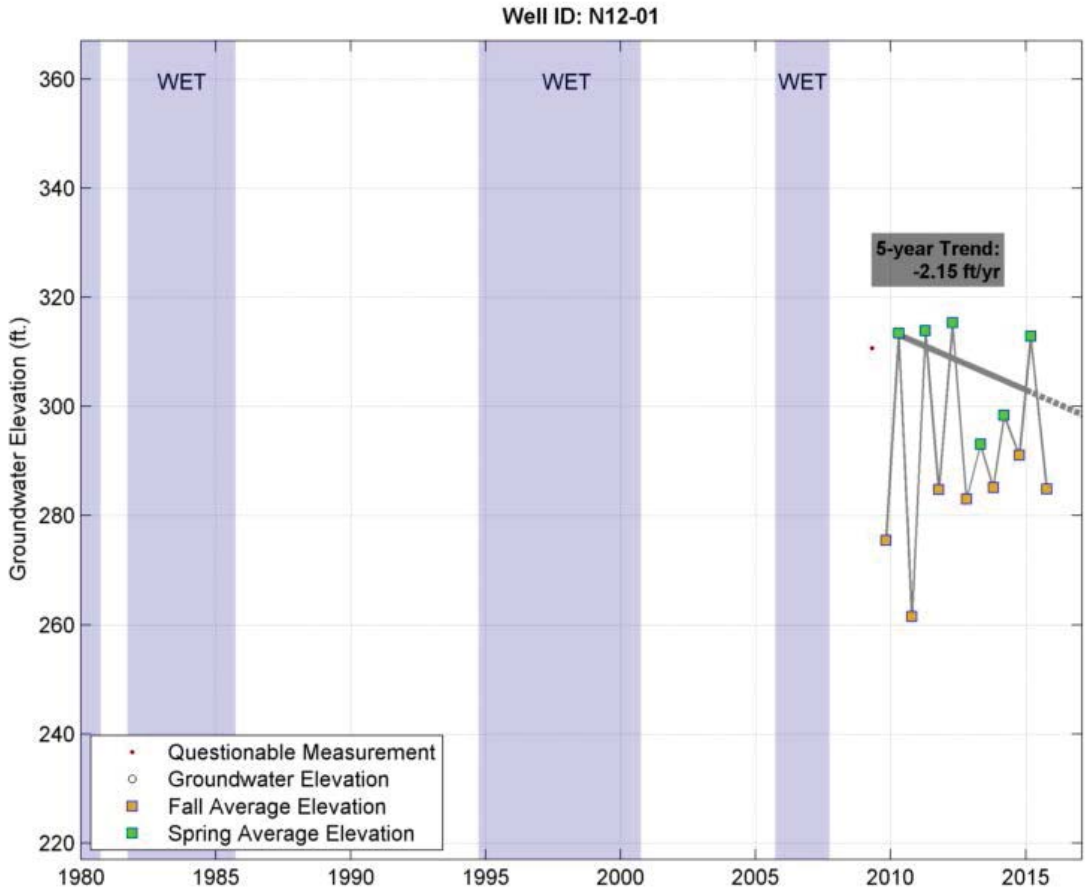

Well ID: L12-02
WET
WET
WET
5-year Trend:
-1.90 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
140
120
100
80
60
40
20
0
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015

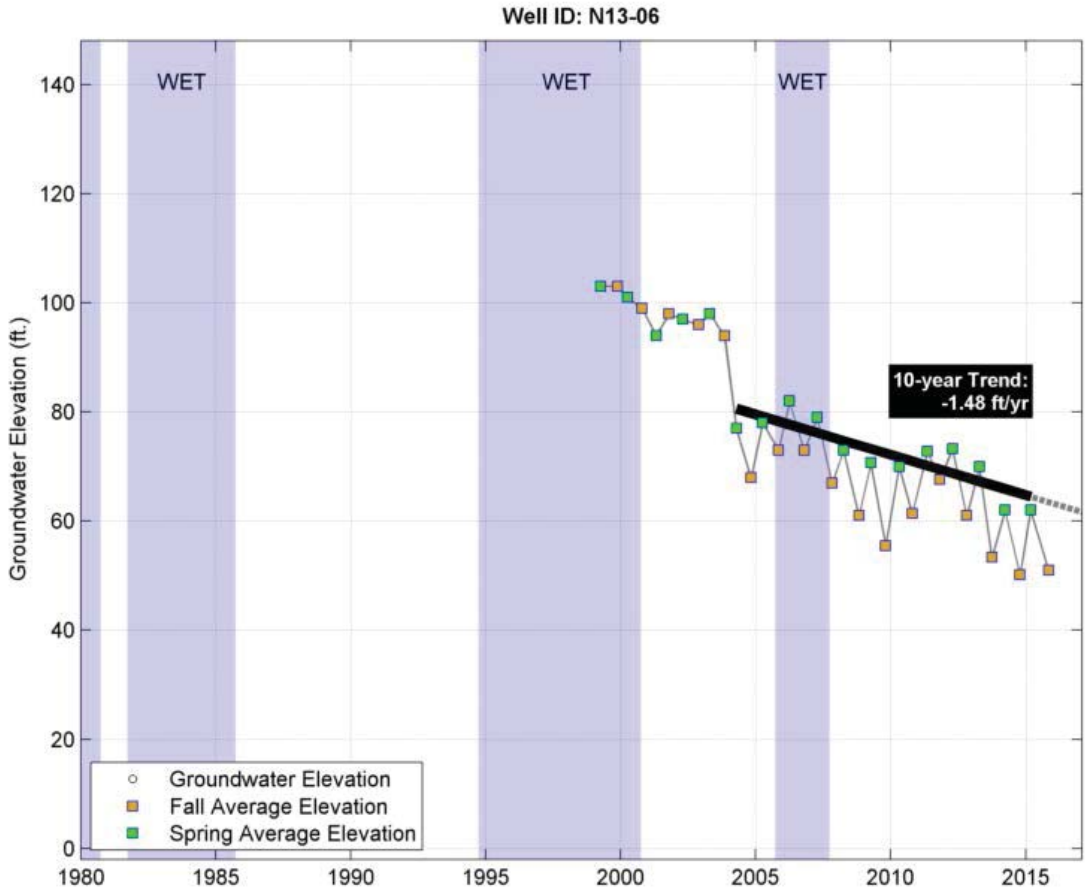

Well ID: M11-02
WET
WET
WET
Groundwater Elevation (ft.)
420
400
380
360
340
320
300
280
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

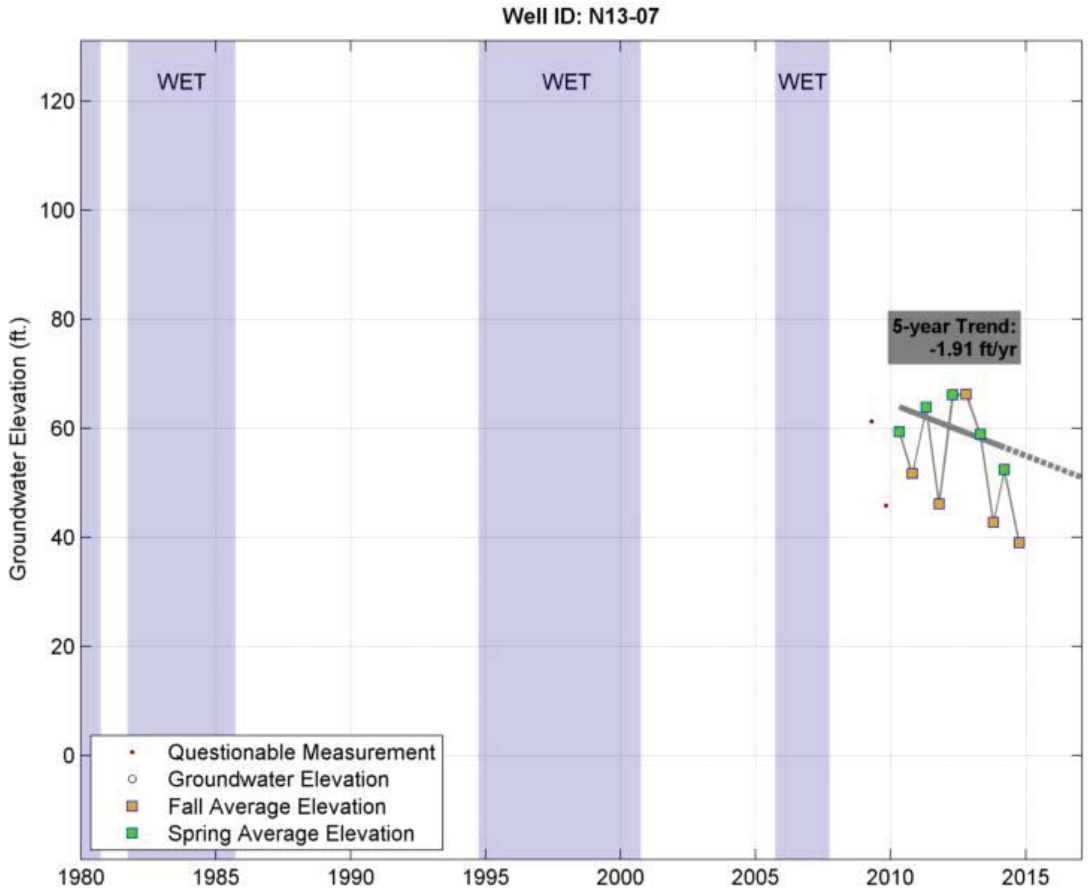

Well ID: M12-03
WET
WET
WET
5-year Trend:
-1.21 ft/yr
Groundwater Elevation (ft.)
240
220
200
180
160
140
120
100
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: M13-04
WET
WET
WET
10-year Trend:
-1.20 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015

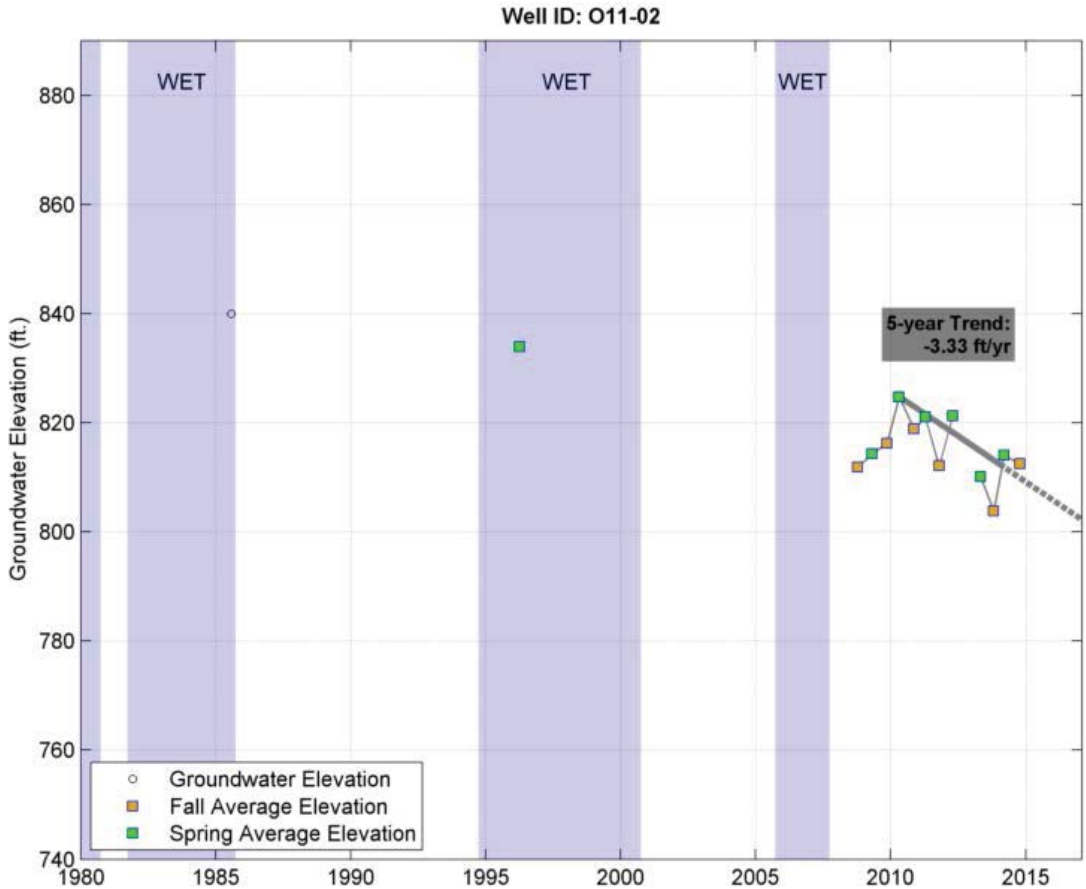

Well ID: M13-05
WET
WET
WET
Groundwater Elevation (ft.)
Groundwater Elevation
Spring Average Elevation
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015

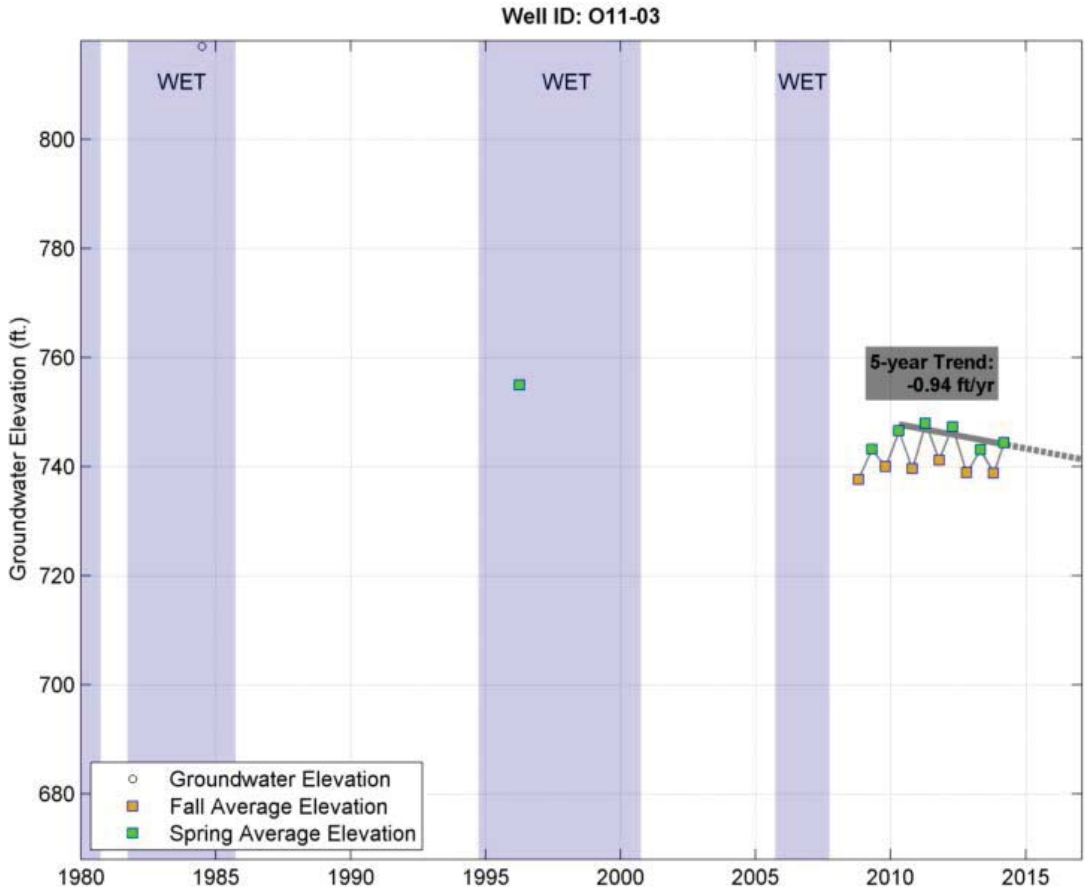

Well ID: N12-01
WET
WET
WET
5-year Trend:
-2.15 ft/yr
Groundwater Elevation (ft.)
360
340
320
300
280
260
240
220
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

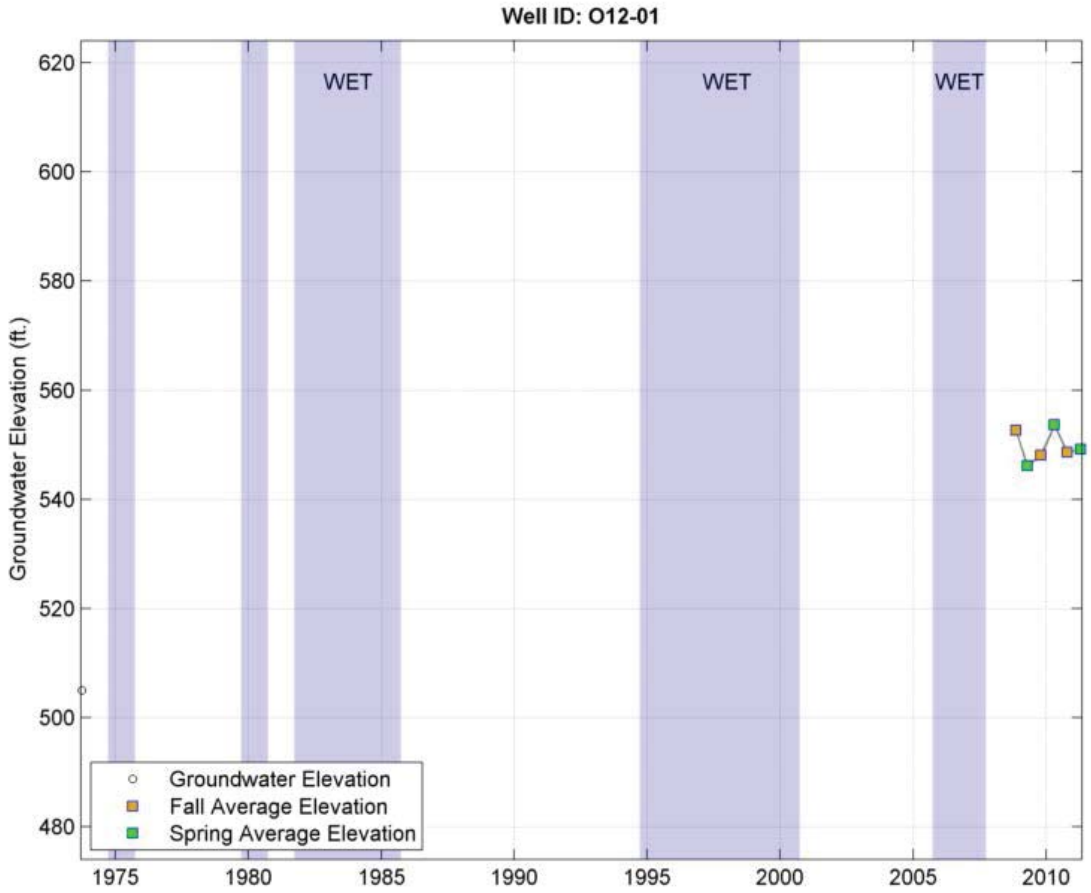

Well ID: N13-06
WET
WET
WET
10-year Trend:
-1.48 ft/yr
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

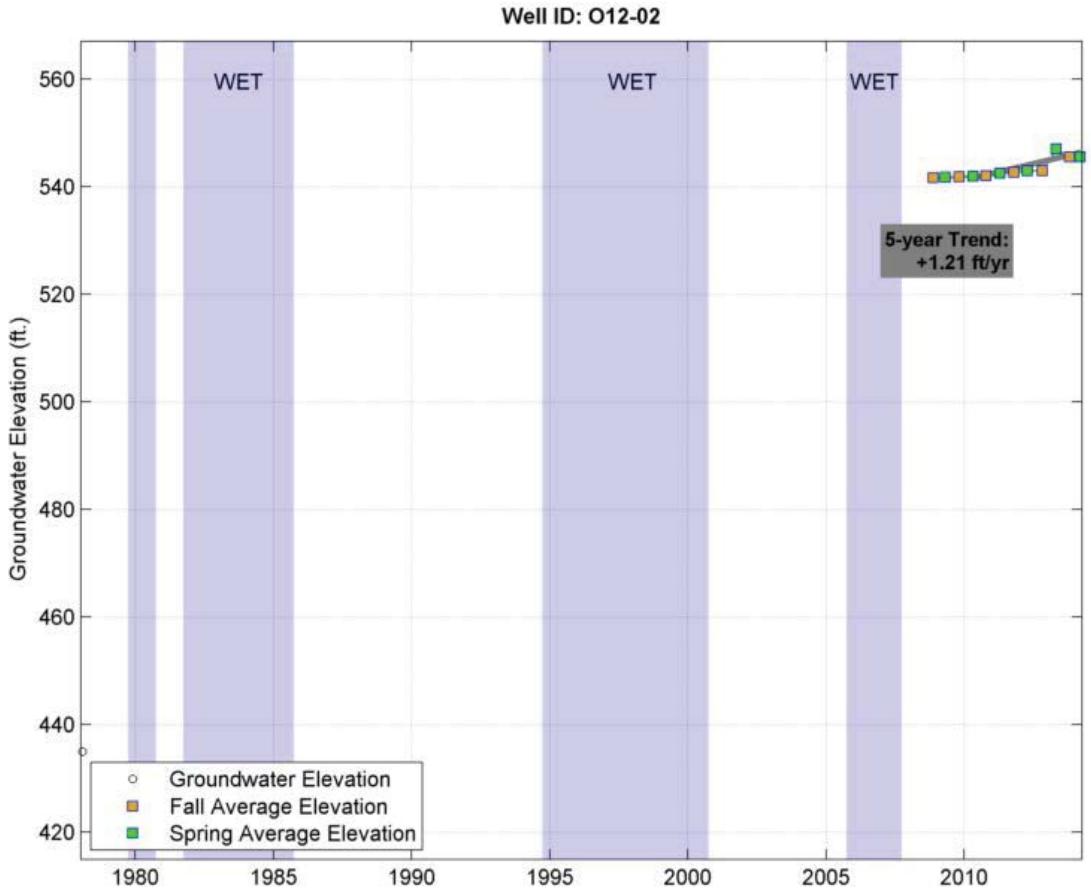

Well ID: N13-07
WET
WET
WET
5-year Trend:
-1.91 ft/yr
Groundwater Elevation (ft.)
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

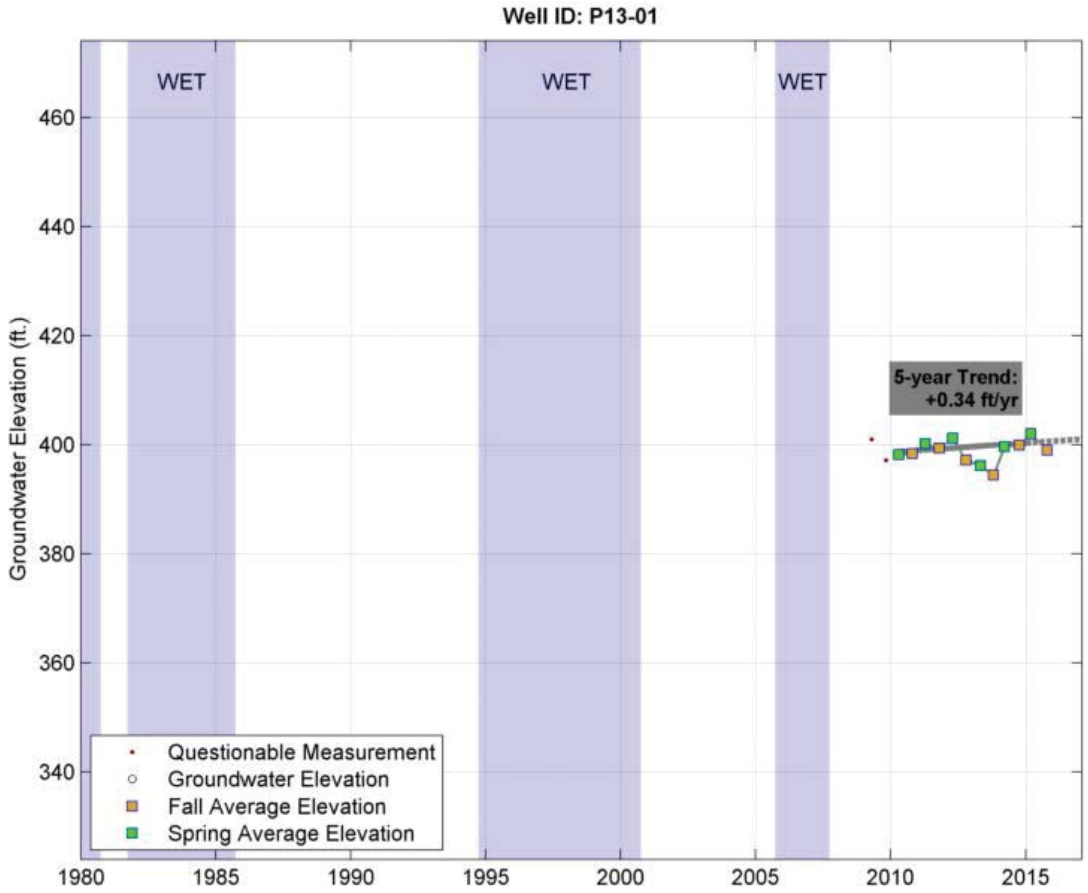
Well ID: O11-01
WET
WET
WET
5-year Trend:
-3.89 ft/yr
Groundwater Elevation (ft.)
900
880
860
840
820
800
780
760
1980
1985
1990
1995
2000
2005
2010
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: O11-02
WET
WET
WET
5-year Trend:
-3.33 ft/yr
Groundwater Elevation (ft.)
880
860
840
820
800
780
760
740
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

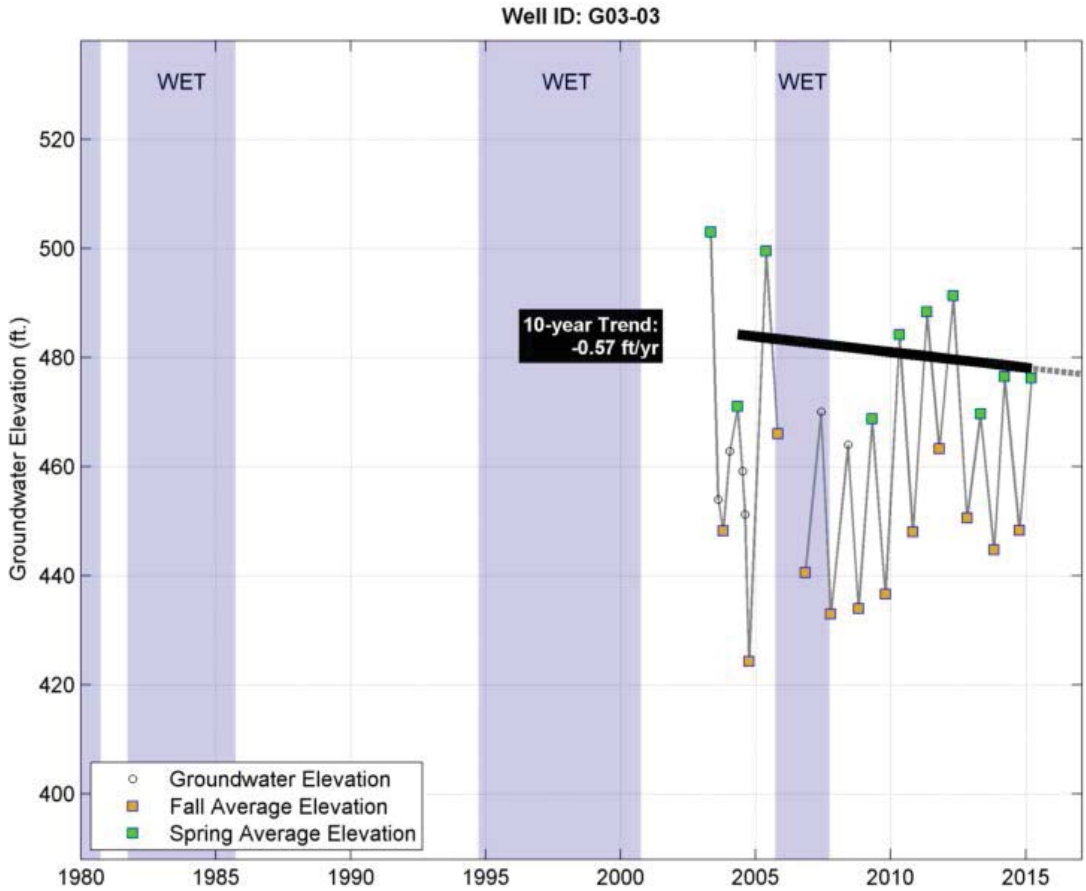

Well ID: O11-03
WET
WET
WET
5-year Trend:
-0.94 ft/yr
Groundwater Elevation (ft.)
800
780
760
740
720
700
680
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

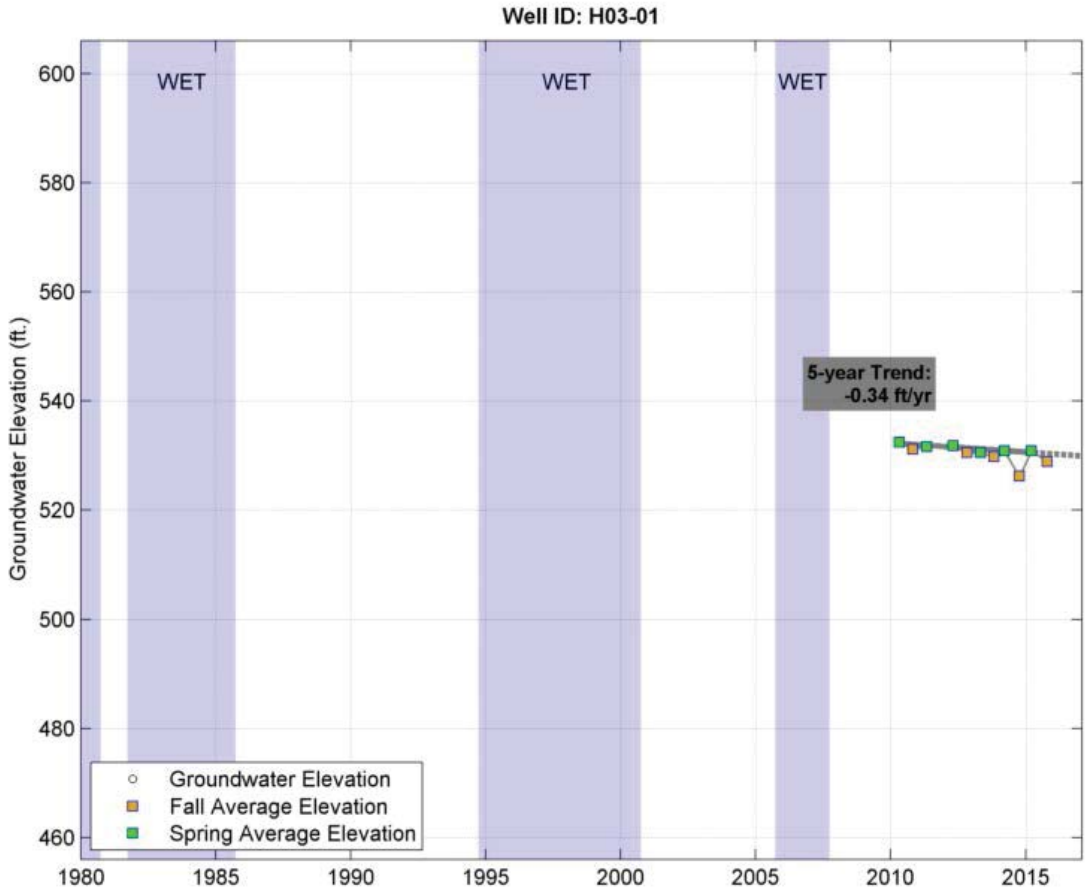

Well ID: O12-01
WET
WET
WET
Groundwater Elevation (ft.)
620
600
580
560
540
520
500
480
1975
1980
1985
1990
1995
2000
2005
2010
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

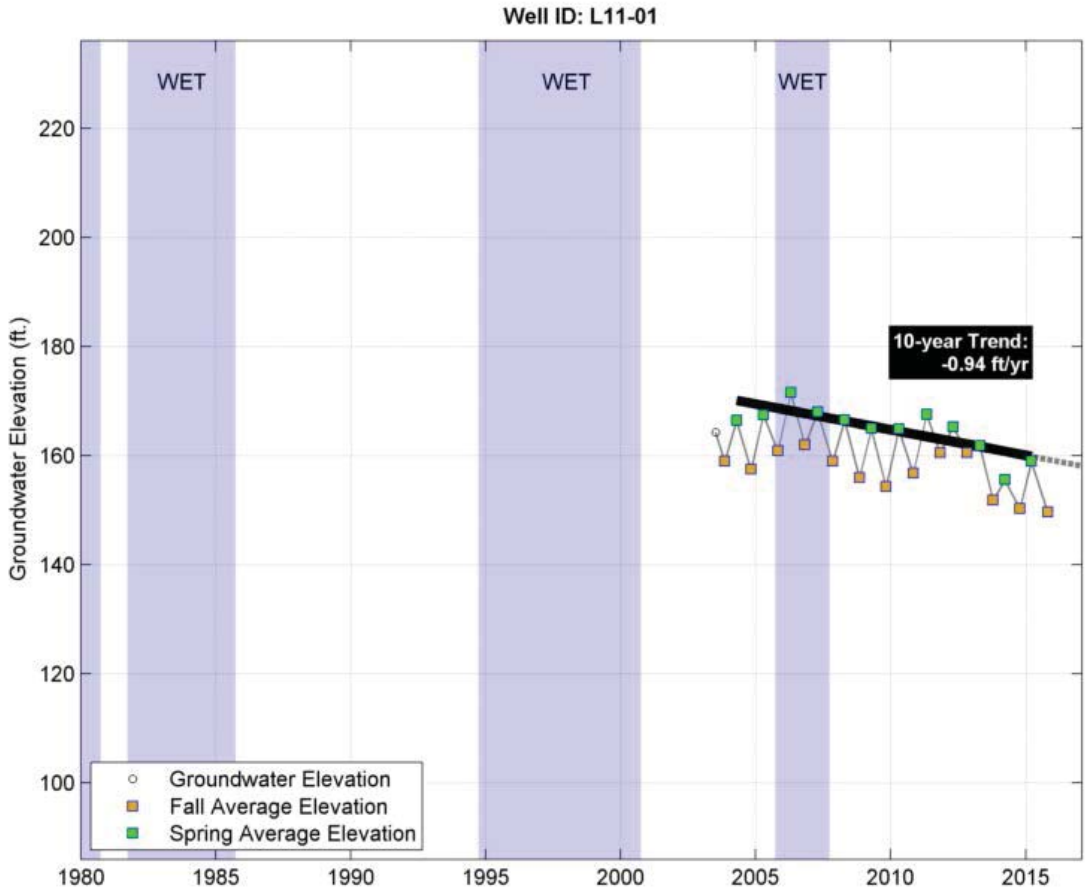

Well ID: O12-02
WET
WET
WET
5-year Trend:
+1.21 ft/yr
Groundwater Elevation (ft.)
560
540
520
500
480
460
440
420
1980
1985
1990
1995
2000
2005
2010
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

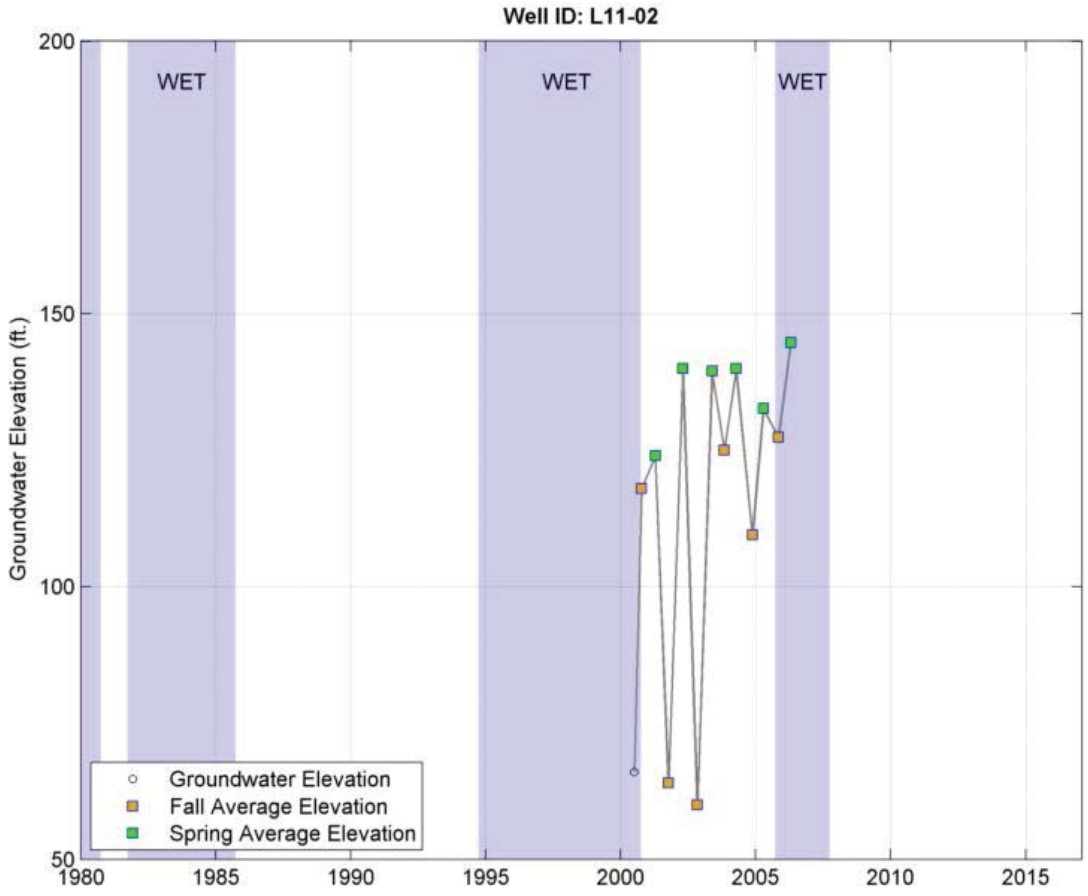

Well ID: P13-01
WET
WET
WET
5-year Trend:
+0.34 ft/yr
Groundwater Elevation (ft.)
460
440
420
400
380
360
340
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

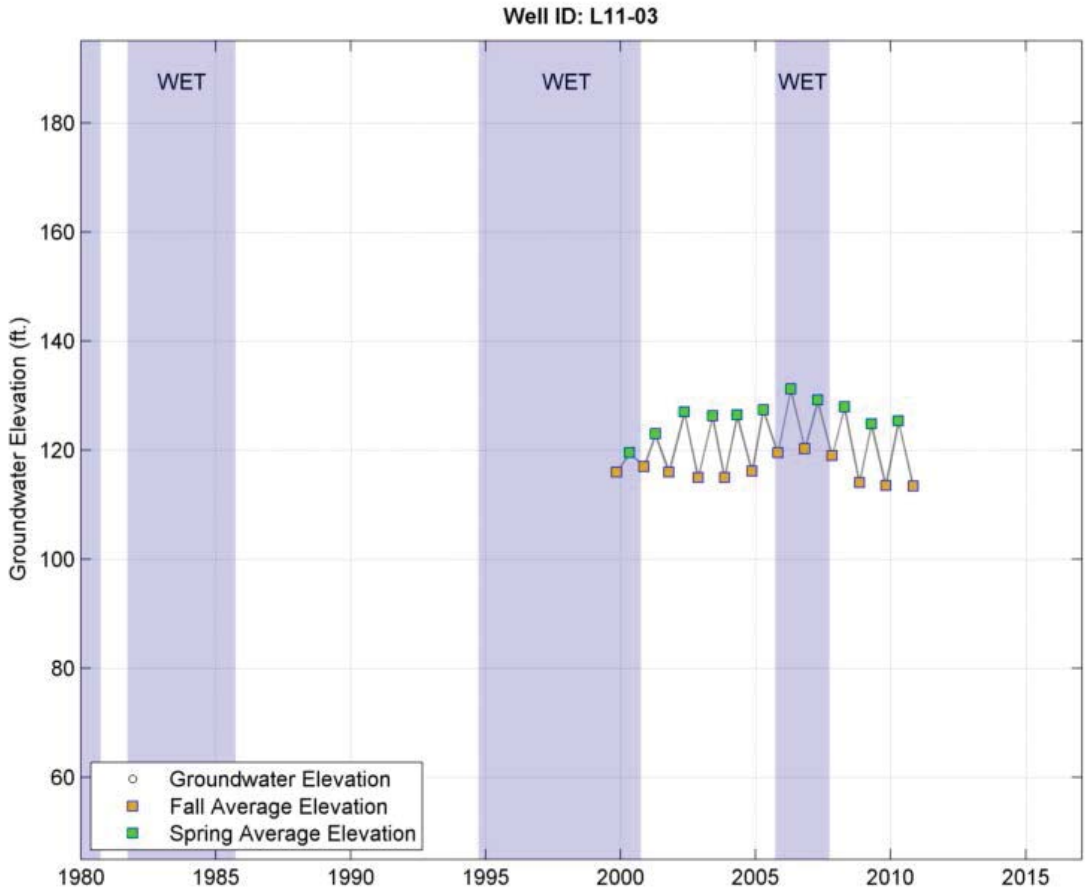
Eastern Upland Subarea
Shallow Wells (<200 feet deep)

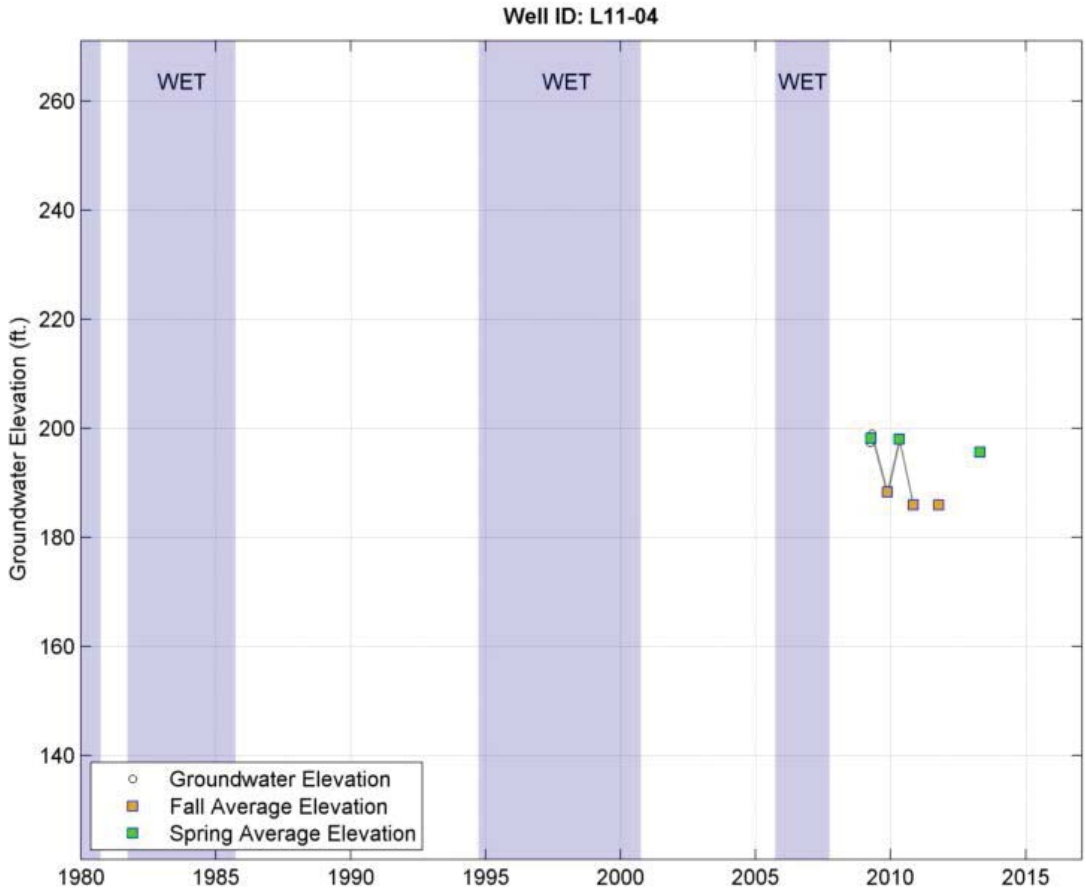

Well ID: G03-03
WET
WET
WET
10-year Trend:
-0.57 ft/yr
Groundwater Elevation (ft.)
520
500
480
460
440
420
400
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

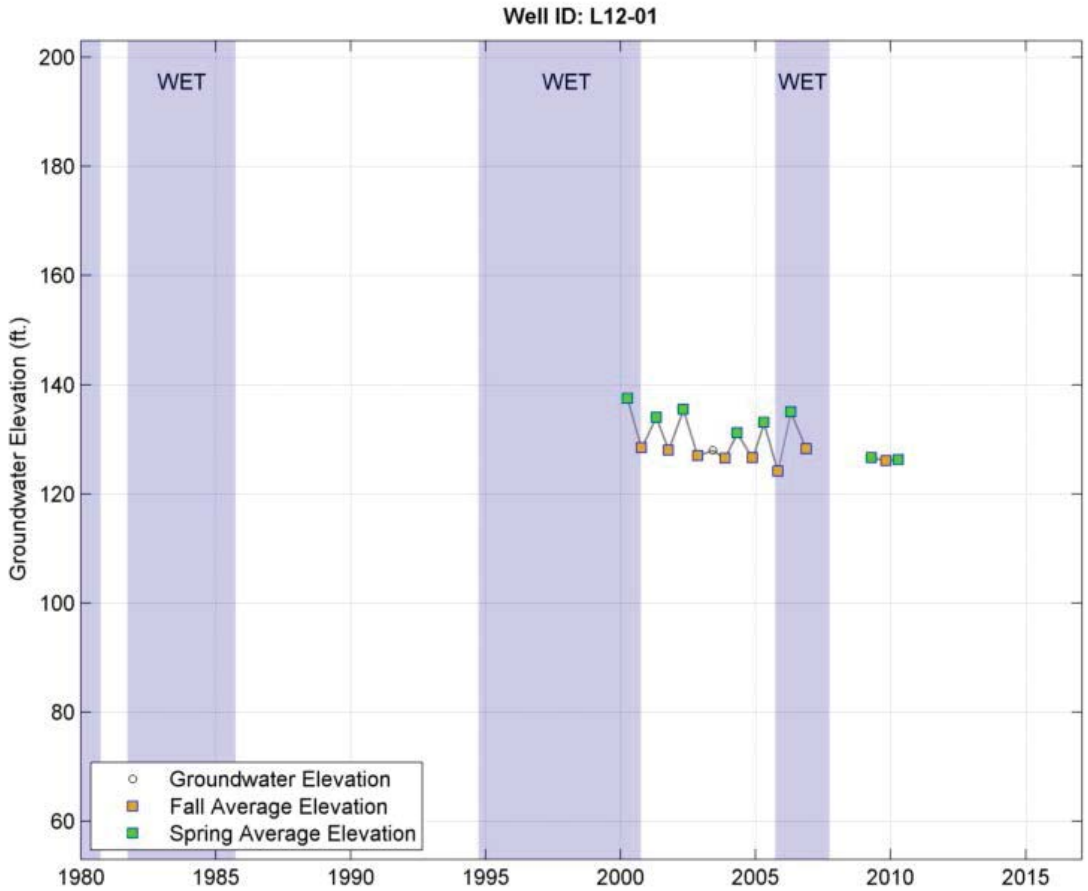

Well ID: H03-01
WET
WET
WET
5-year Trend:
-0.34 ft/yr
Groundwater Elevation (ft.)
600
580
560
540
520
500
480
460
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

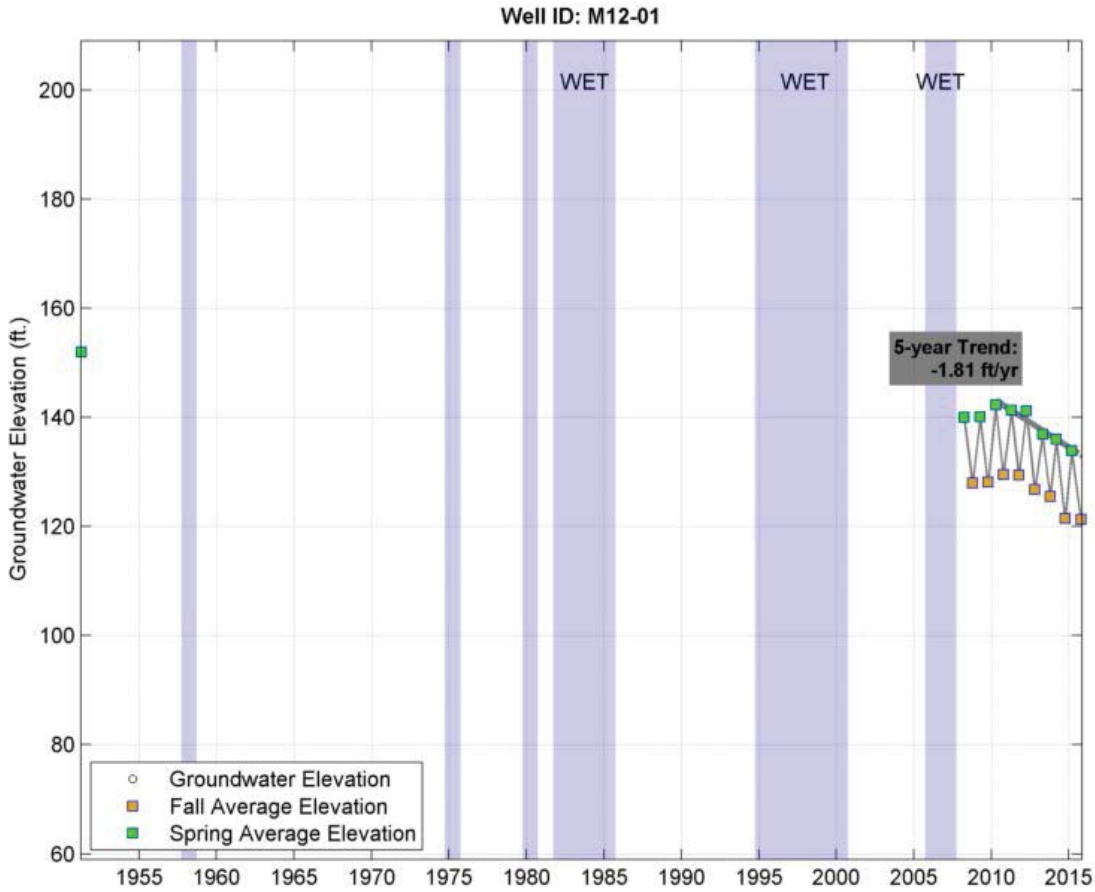

Well ID: L11-01
WET
WET
WET
10-year Trend:
-0.94 ft/yr
Groundwater Elevation (ft.)
220
200
180
160
140
120
100
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: L11-02
WET
WET
WET
Groundwater Elevation (ft.)
200
150
100
50
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

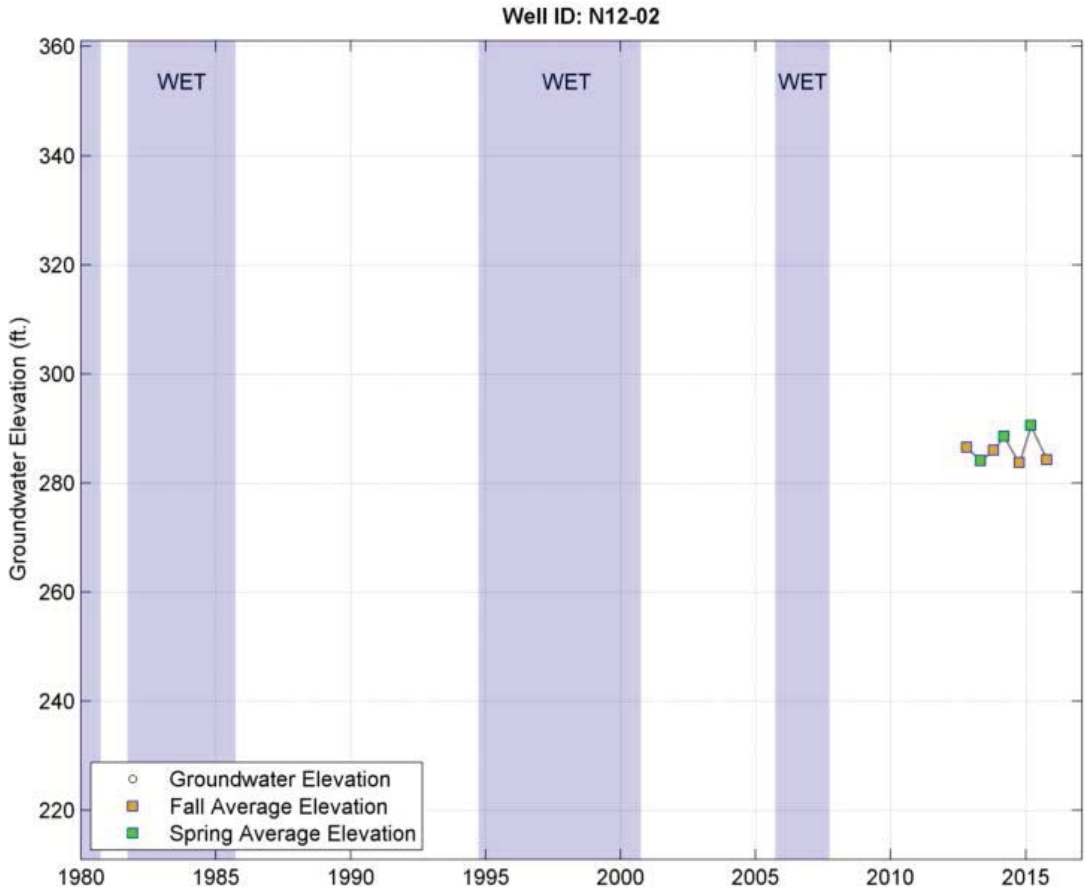

Well ID: L11-03
WET
WET
WET
Groundwater Elevation (ft.)
180
160
140
120
100
80
60
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015


Well ID: L11-04
WET
WET
WET
Groundwater Elevation (ft.)
260
240
220
200
180
160
140
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

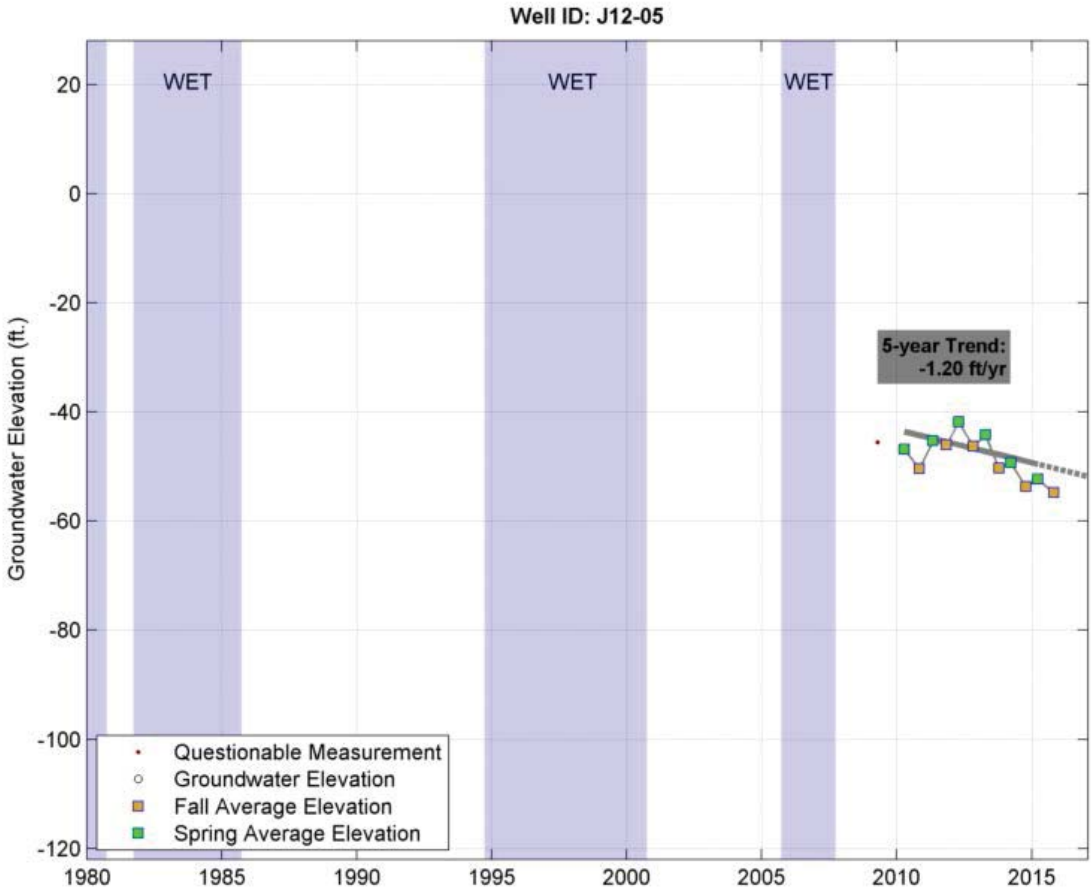

Well ID: L12-01
WET
WET
WET
Groundwater Elevation (ft.)
200
180
160
140
120
100
80
60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

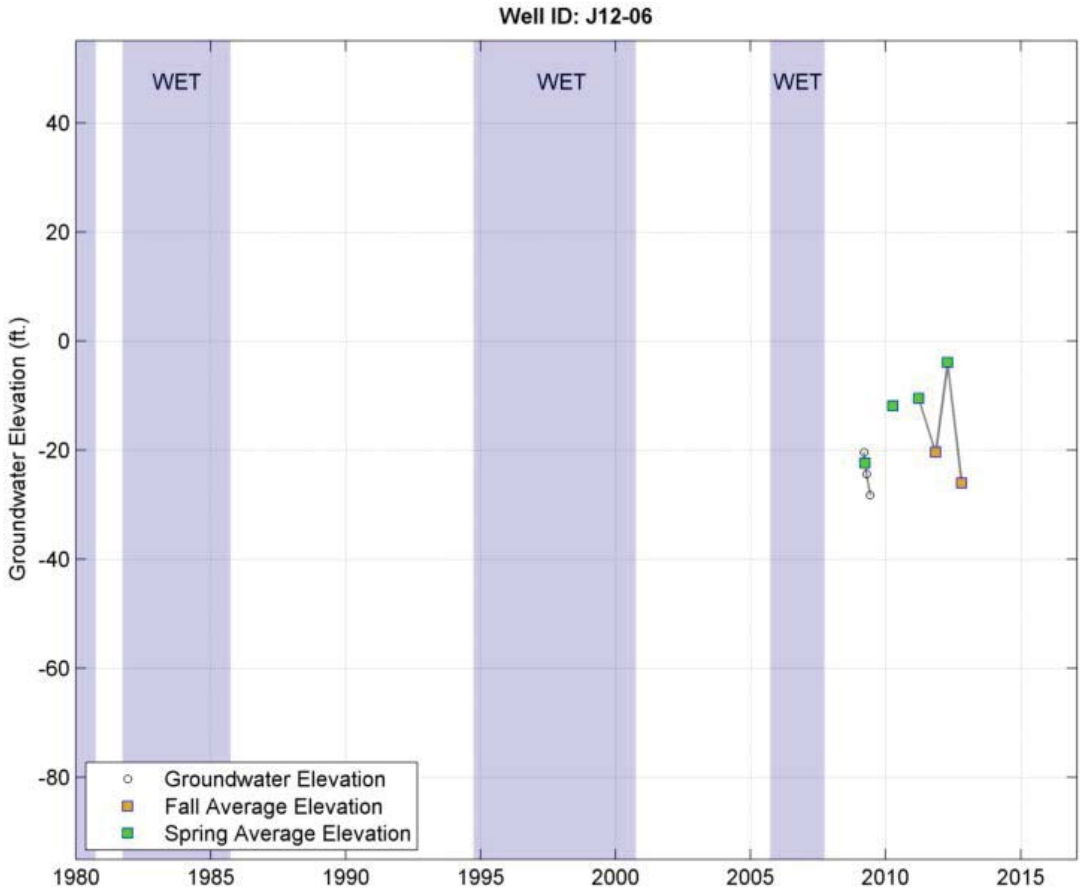

Well ID: M12-01
WET
WET
WET
5-year Trend:
-1.81 ft/yr
Groundwater Elevation (ft.)
200
180
160
140
120
100
80
60
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

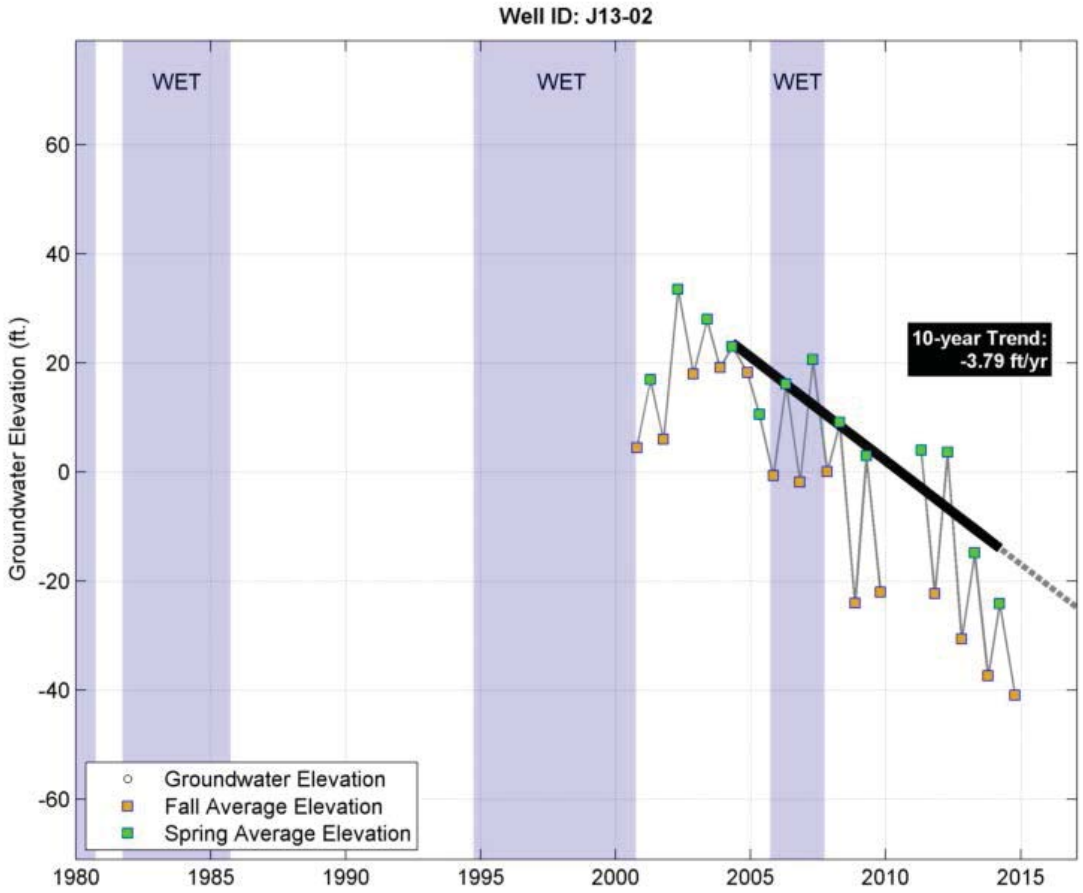
Eastern Upland Subarea
Unknown Depth

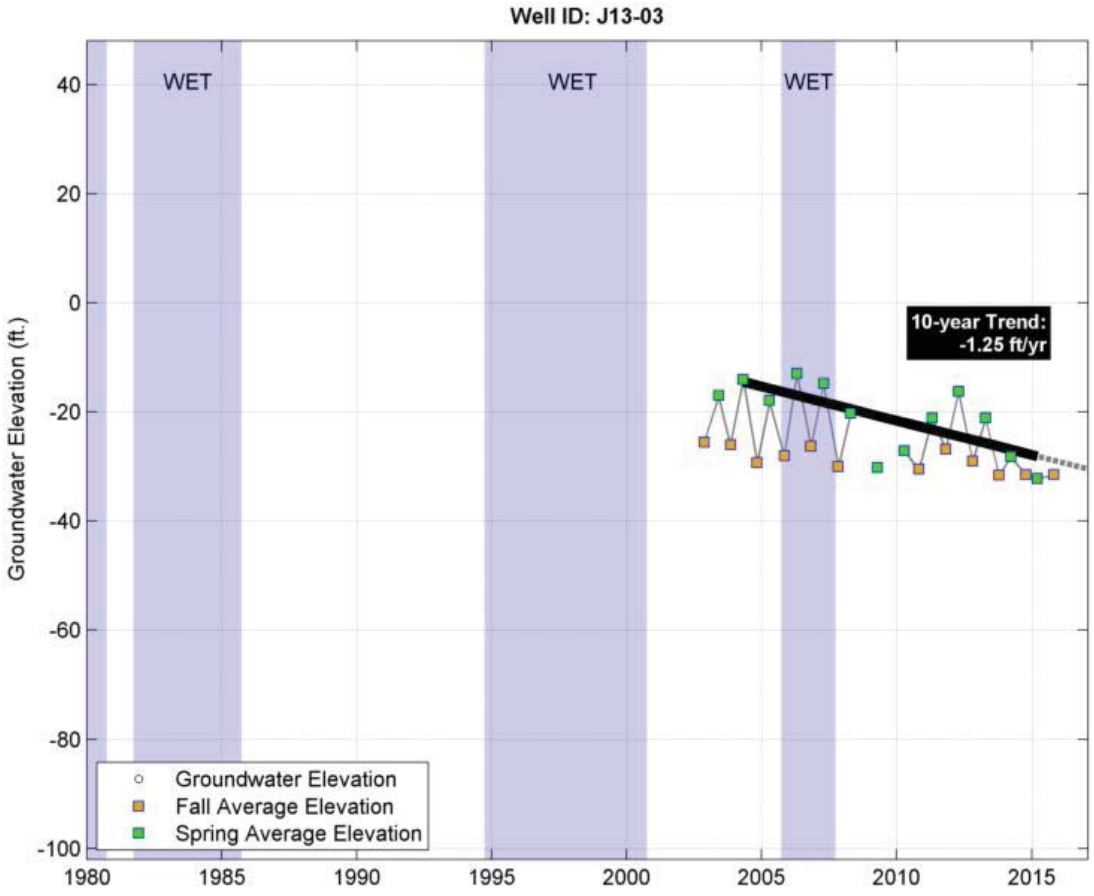

Well ID: N12-02
WET
WET
WET
Groundwater Elevation (ft.)
360
340
320
300
280
260
240
220
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

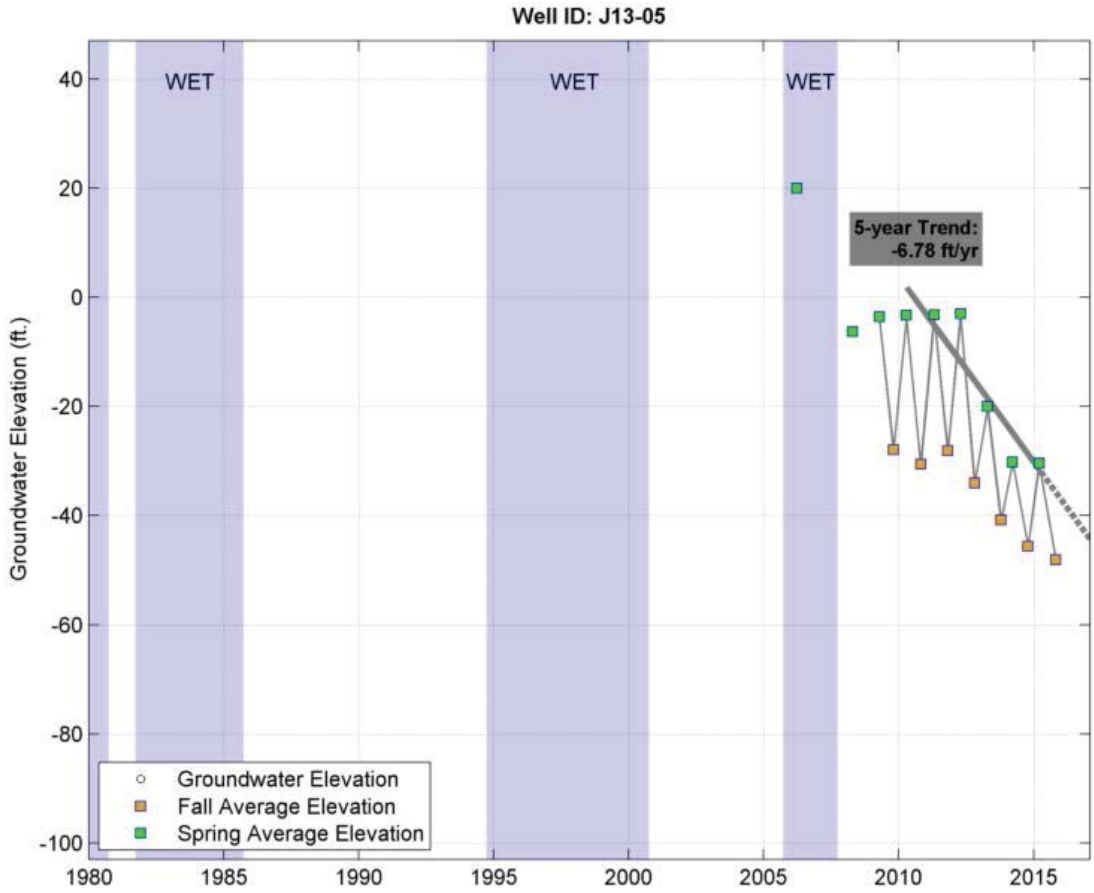
El Verano/Fowler Creek Subarea
Deeper Wells (>200 feet deep)

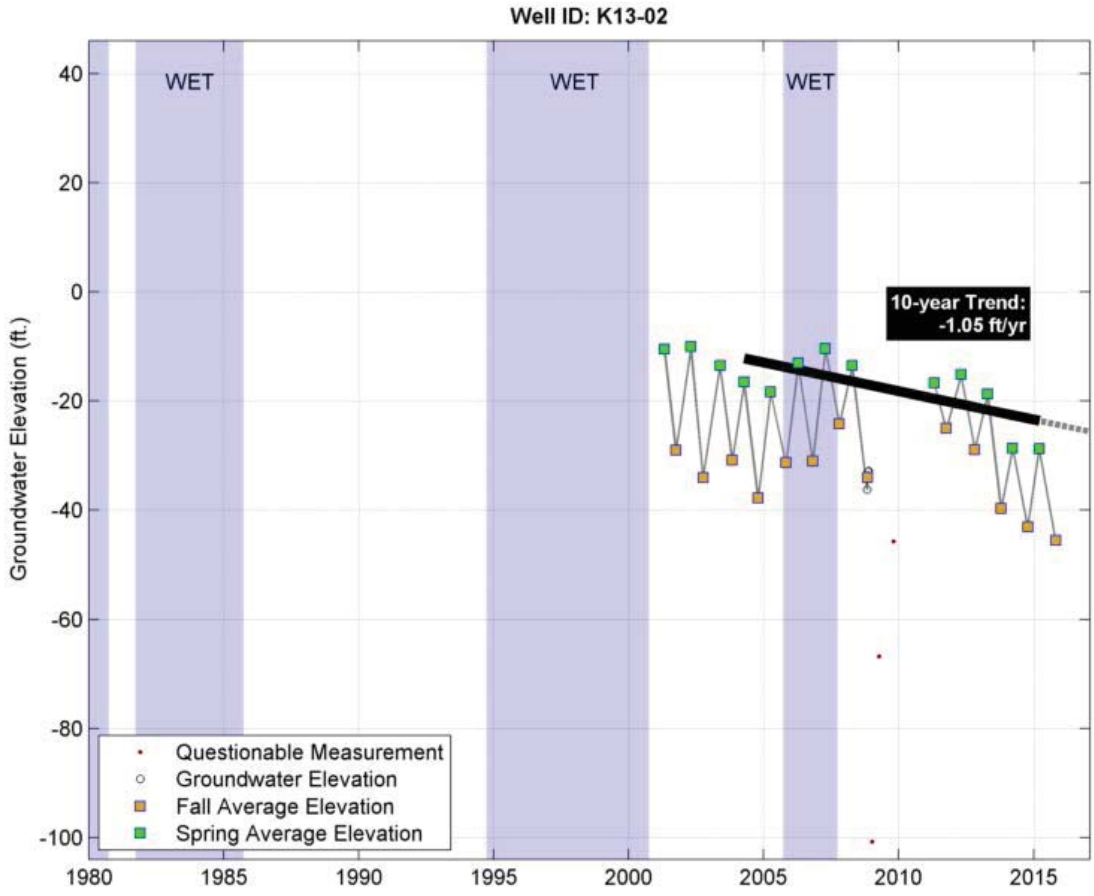

Well ID: J12-05
WET
WET
WET
5-year Trend:
-1.20 ft/yr
Groundwater Elevation (ft.)
20
0
-20
-40
-60
-80
-100
-120
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

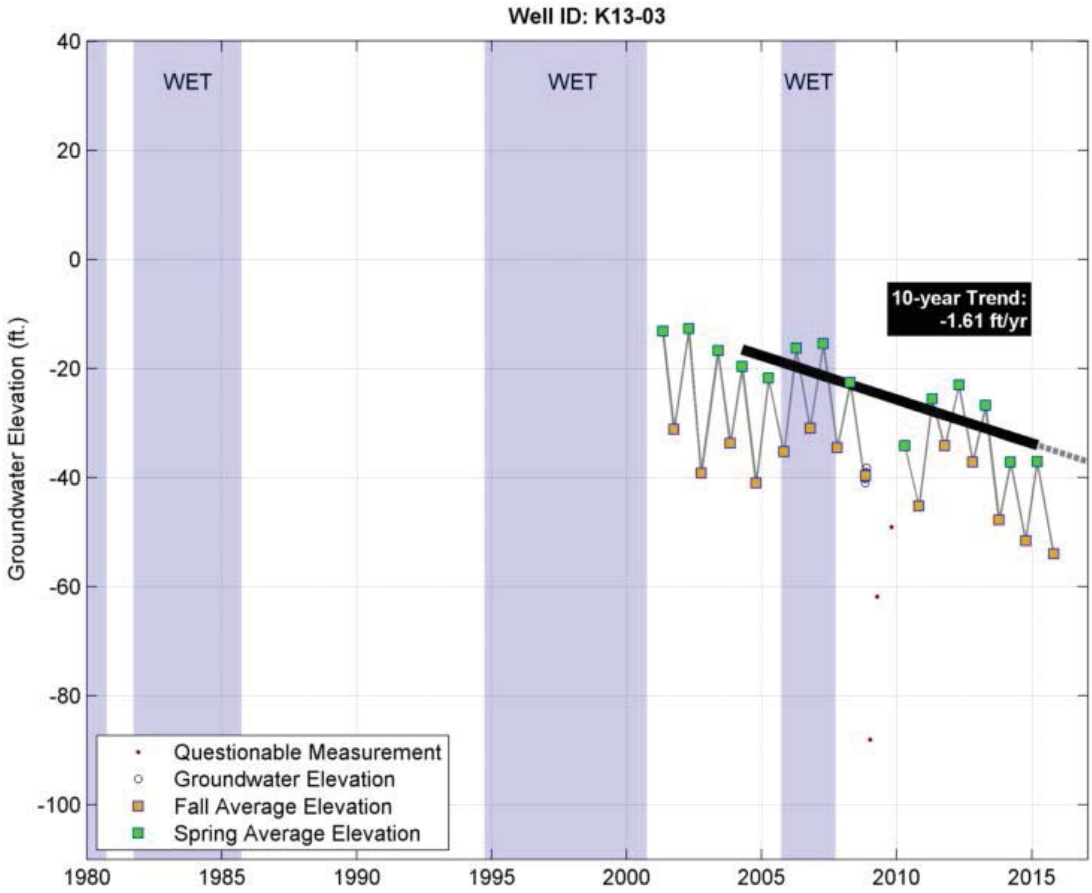

Well ID: J12-06
WET
WET
WET
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

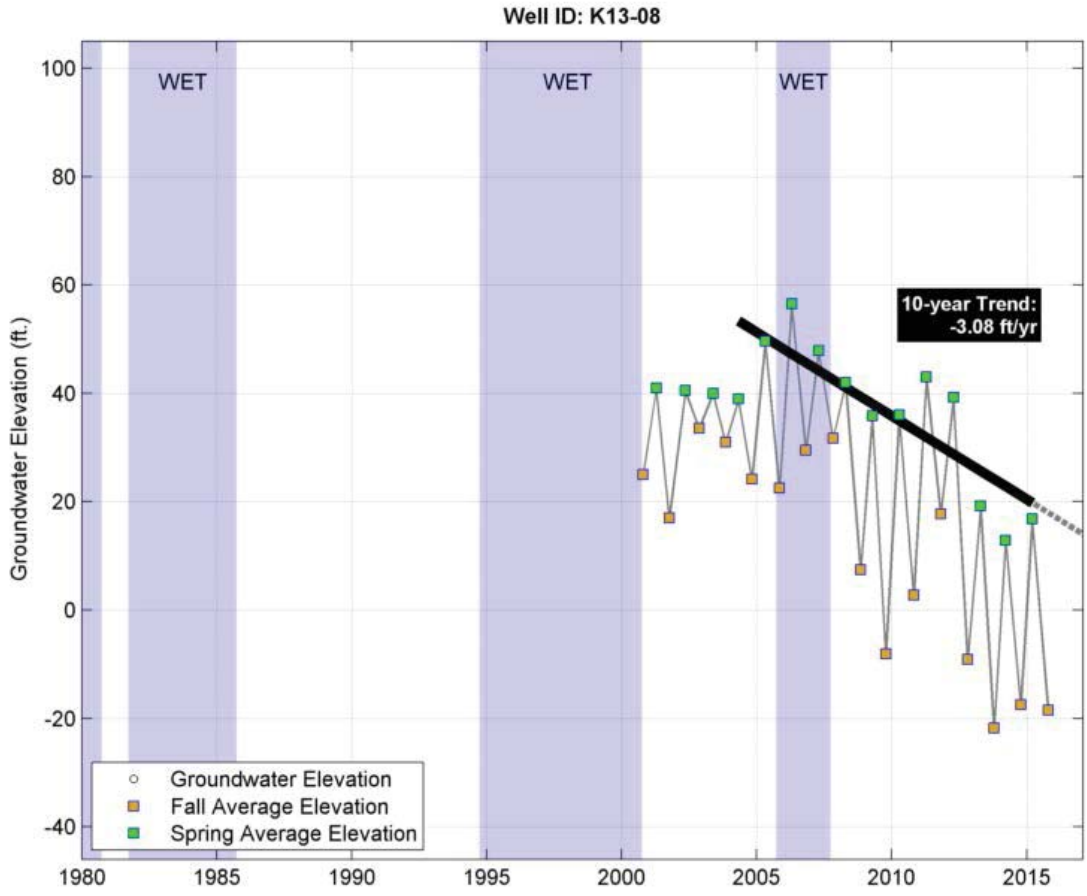

Well ID: J13-02
WET
WET
WET
10-year Trend:
-3.79 ft/yr
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

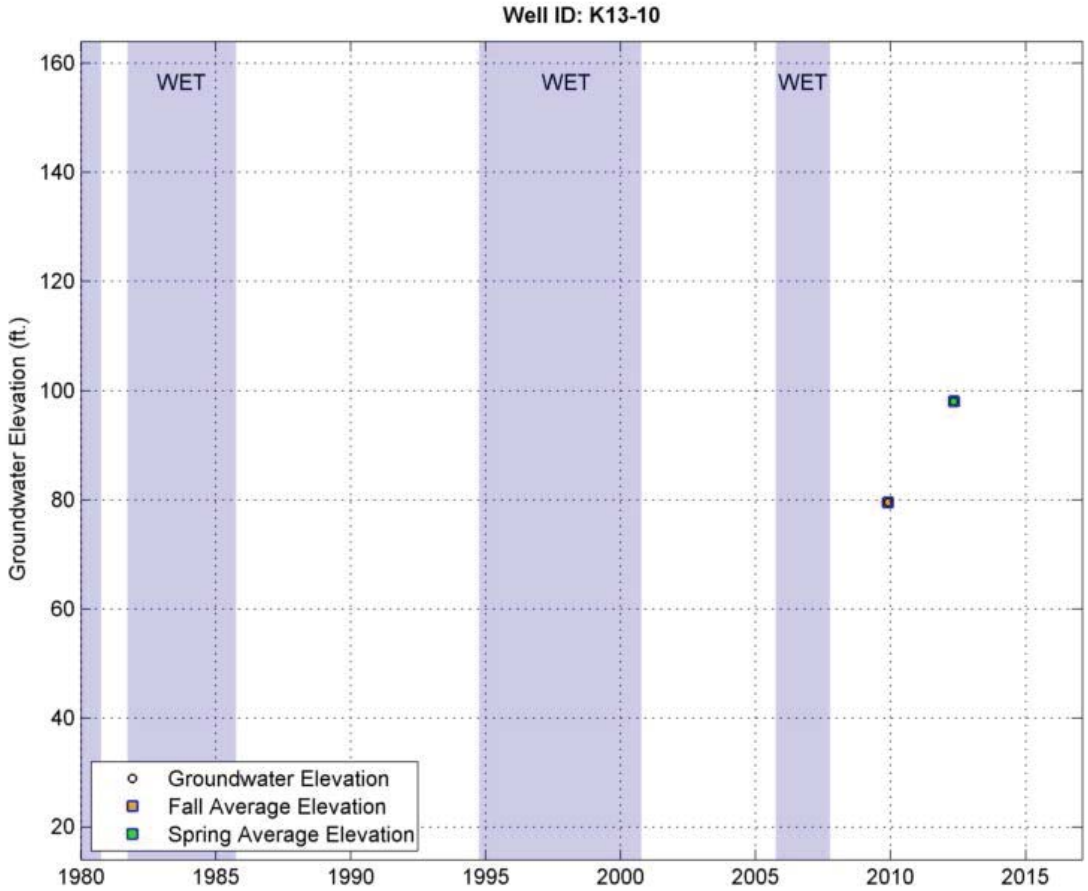

Well ID: J13-03
WET
WET
WET
10-year Trend:
-1.25 ft/yr
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
-100
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

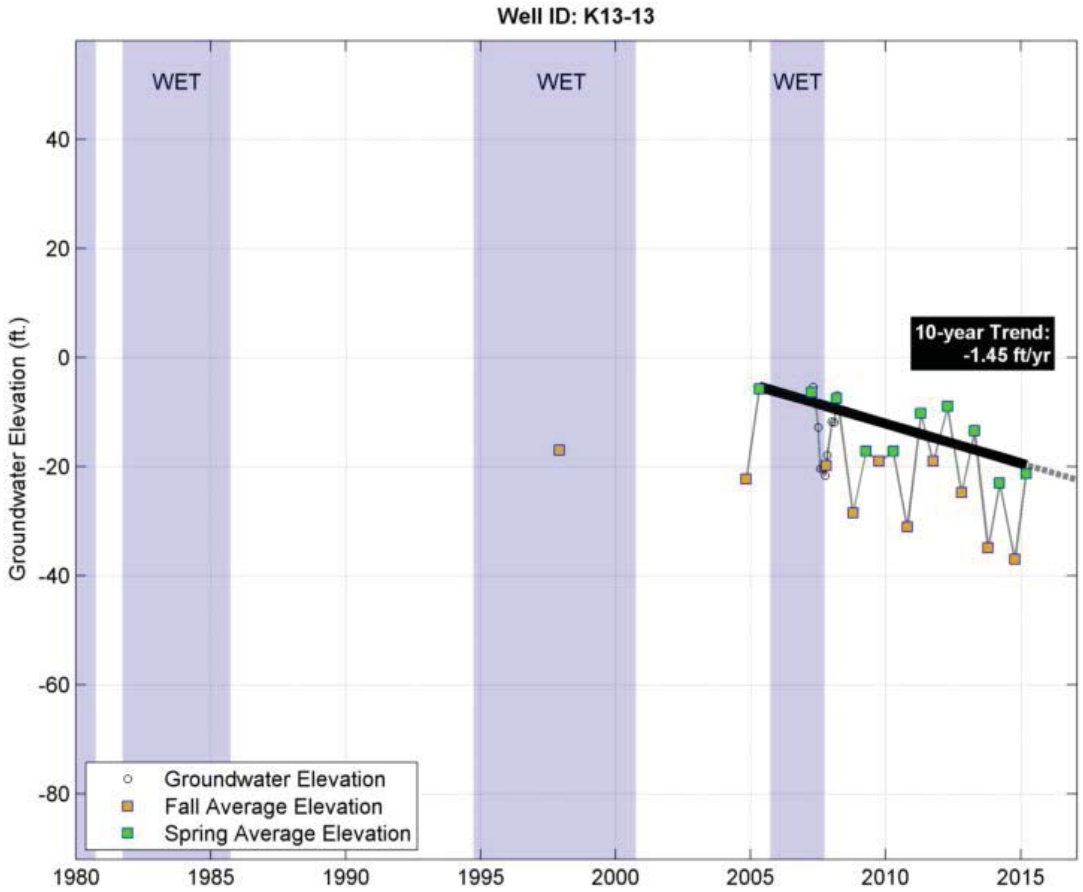

Well ID: J13-05
WET
WET
WET
5-year Trend:
-6.78 ft/yr
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
-100
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

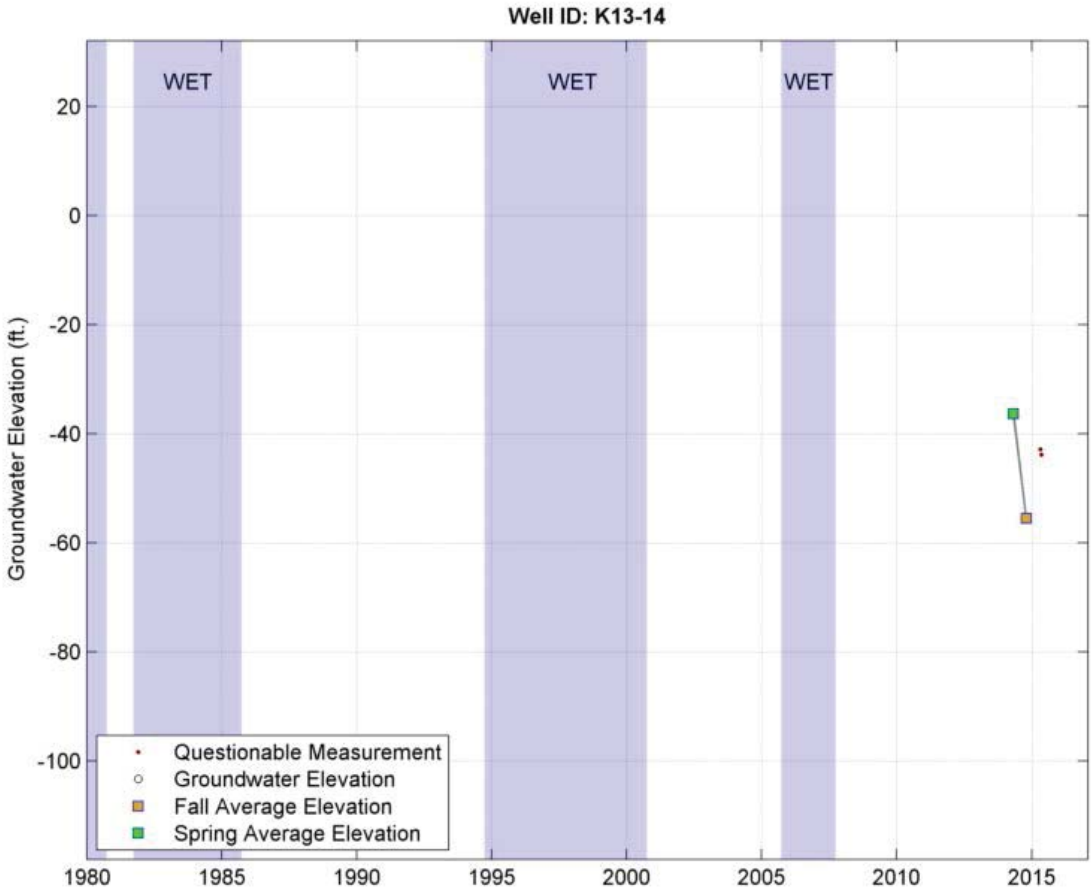

Well ID: K13-02
WET
WET
WET
10-year Trend:
-1.05 ft/yr
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
-100
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

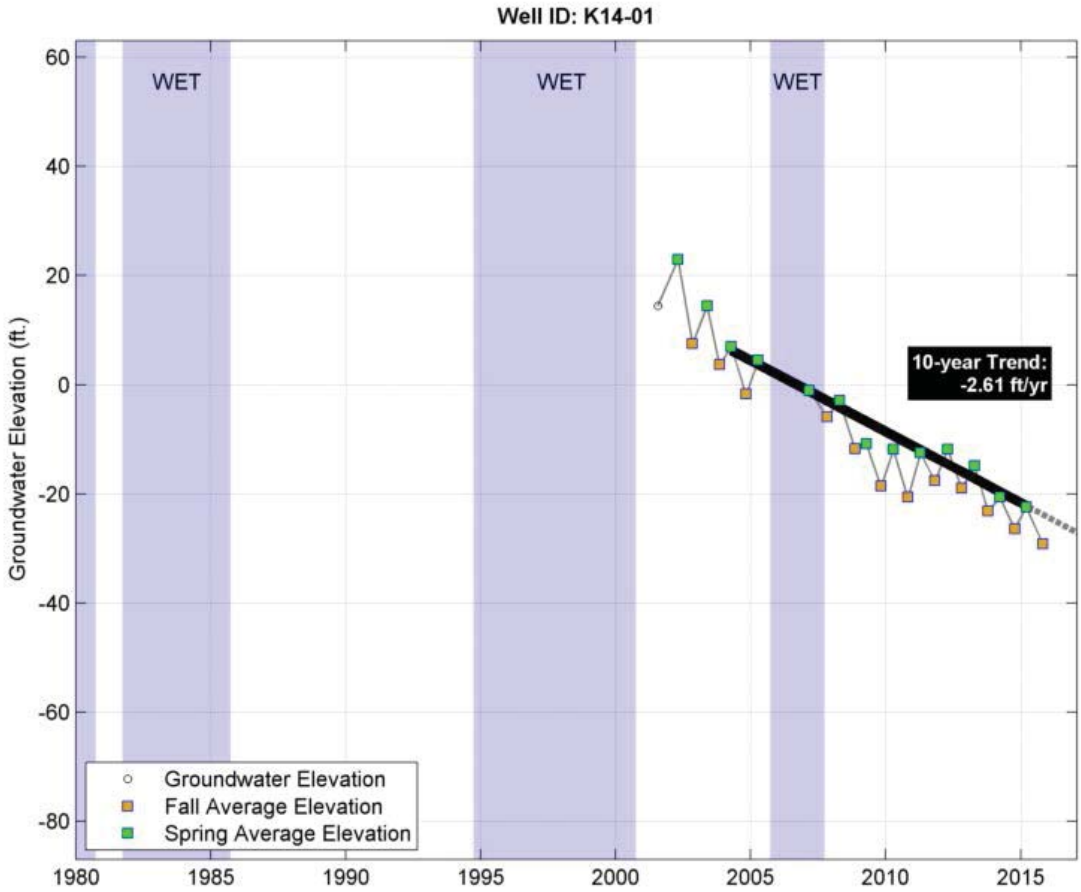

Well ID: K13-03
WET
WET
WET
10-year Trend:
-1.61 ft/yr
Groundwater Elevation (ft.)
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
40
20
0
-20
-40
-60
-80
-100
1980
1985
1990
1995
2000
2005
2010
2015

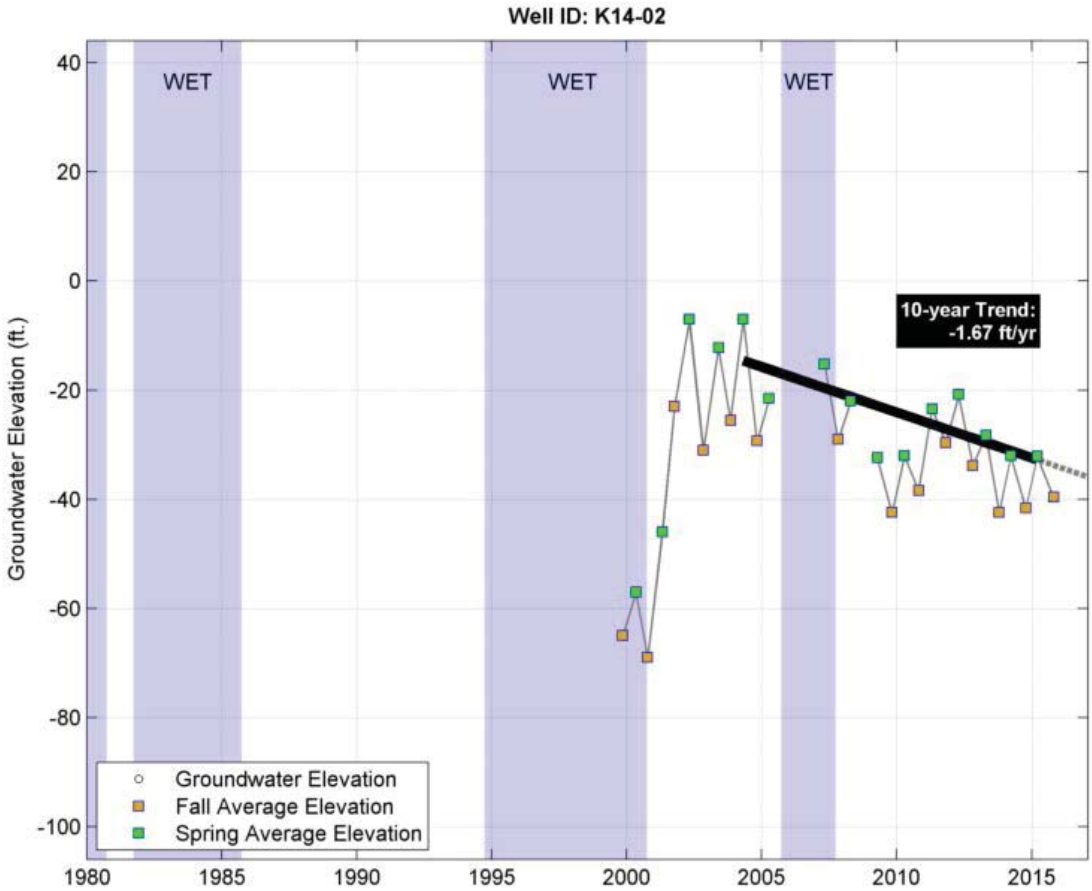

Well ID: K13-08
WET
WET
WET
10-year Trend:
-3.08 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
100
80
60
40
20
0
-20
-40
1980
1985
1990
1995
2000
2005
2010
2015

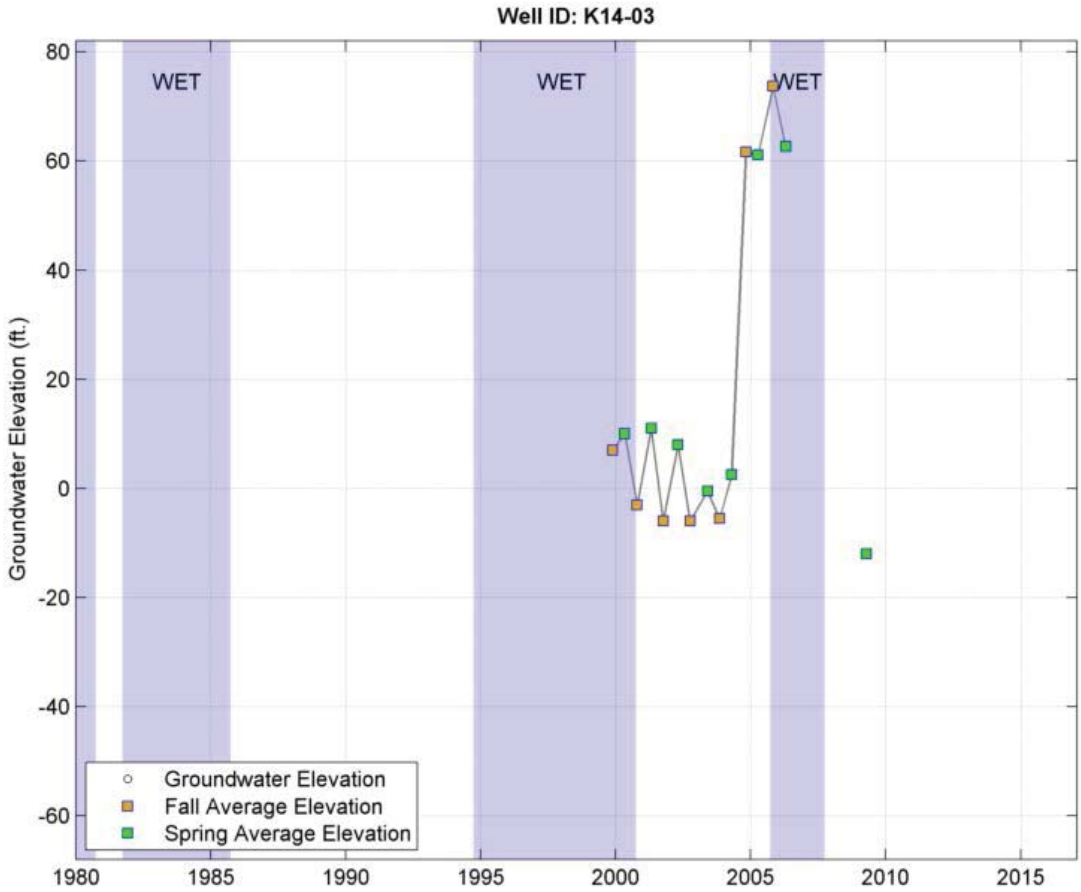

Well ID: K13-10
WET
WET
WET
Groundwater Elevation (ft.)
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

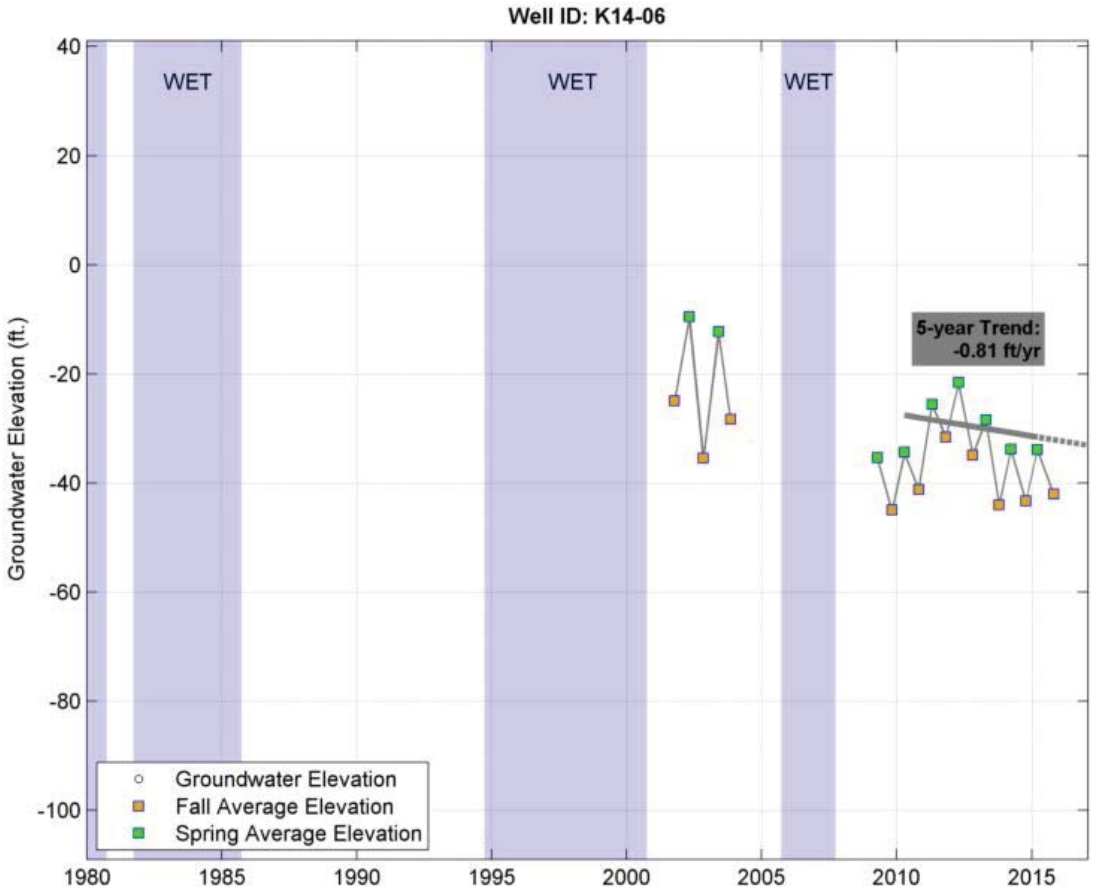

Well ID: K13-13
WET
WET
WET
10-year Trend:
-1.45 ft/yr
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

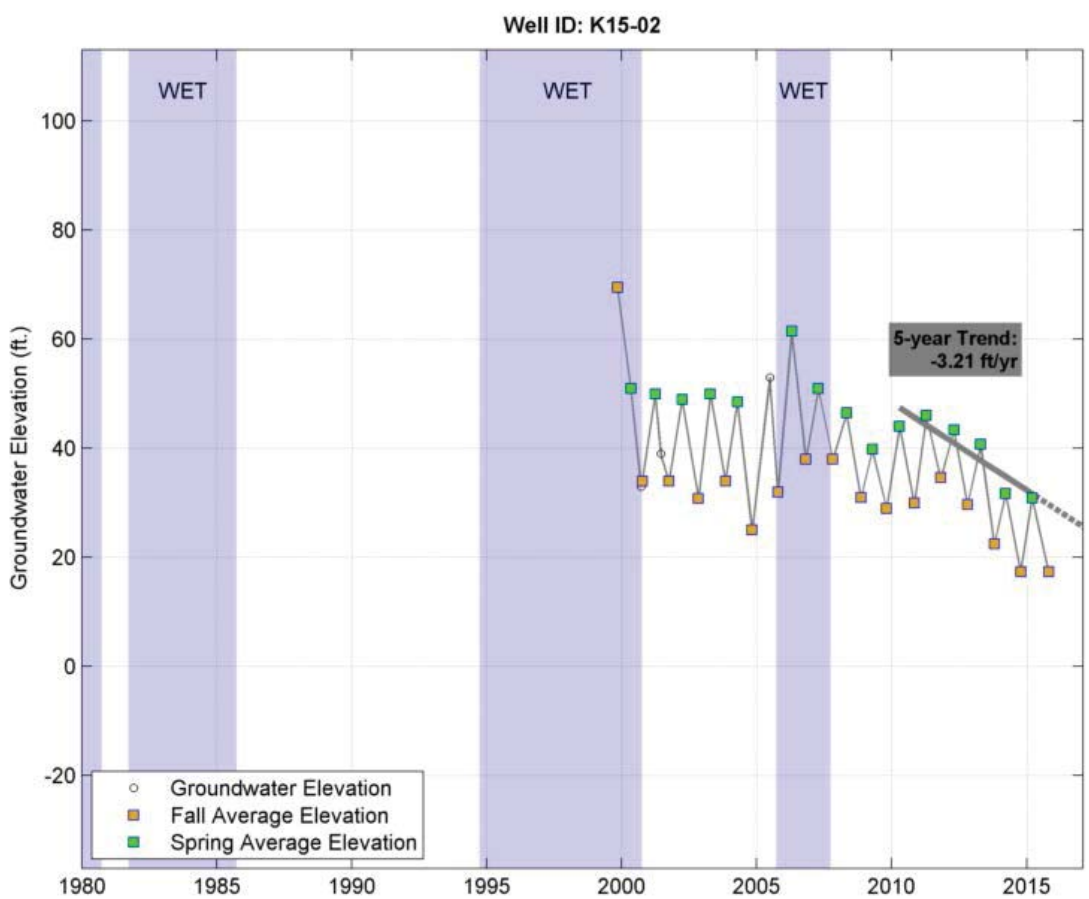

Well ID: K13-14
WET
WET
WET
Groundwater Elevation (ft.)
20
0
-20
-40
-60
-80
-100
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

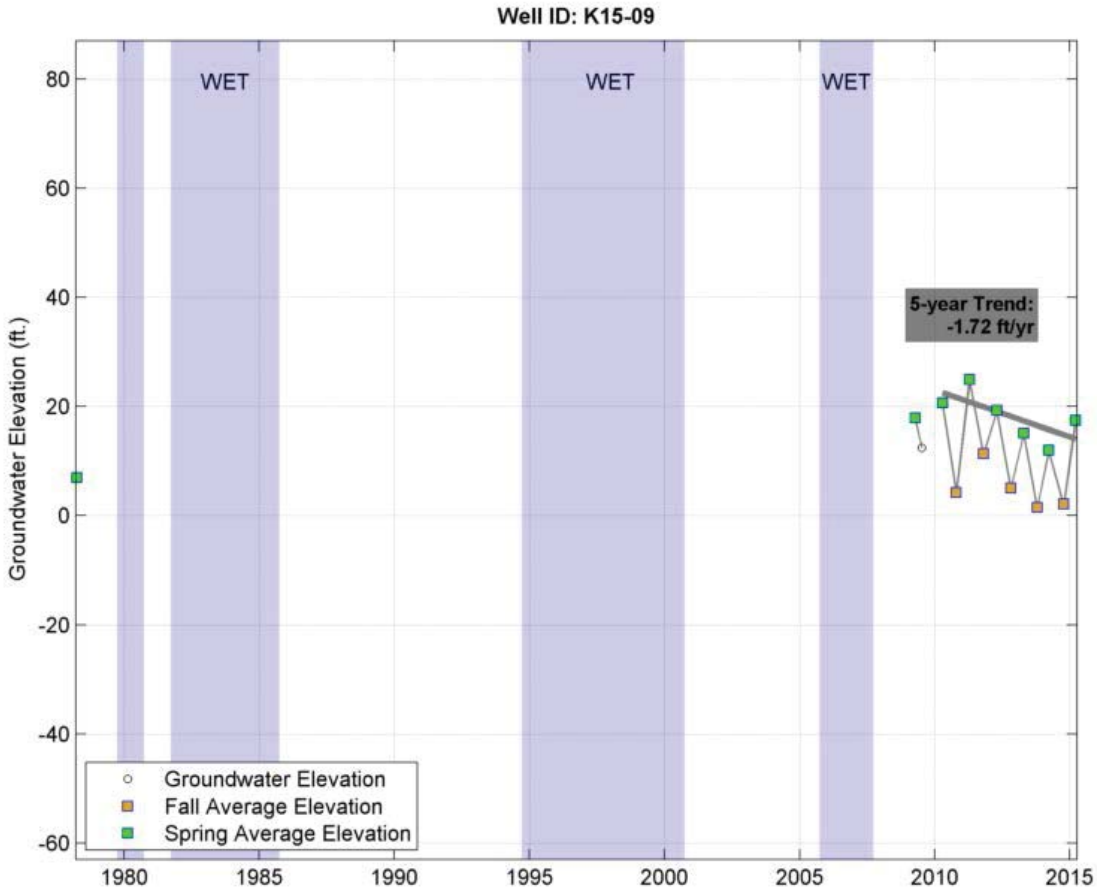

Well ID: K14-01
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
-80
10-year Trend:
-2.61 ft/yr
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015


Well ID: K14-02
WET
WET
WET
10-year Trend:
-1.67 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
40
20
0
-20
-40
-60
-80
-100
1980
1985
1990
1995
2000
2005
2010
2015

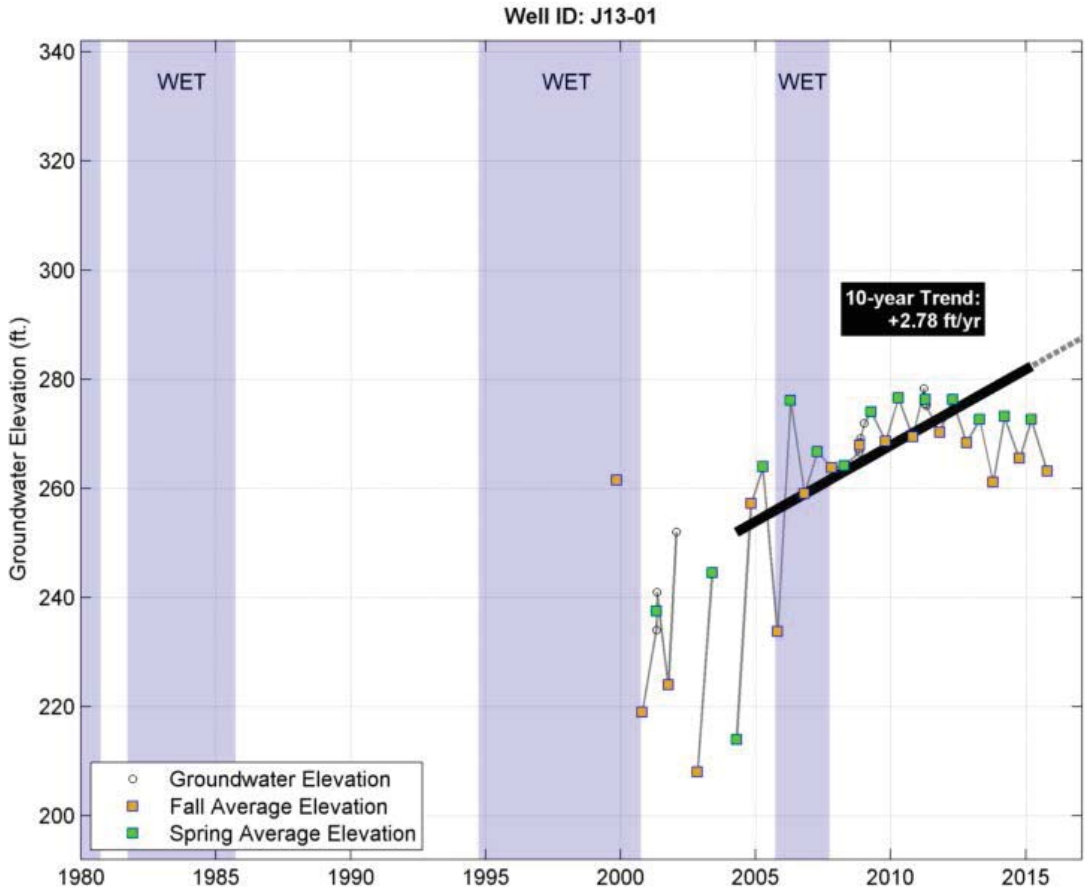

Well ID: K14-03
WET
WET
WET
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
80
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015

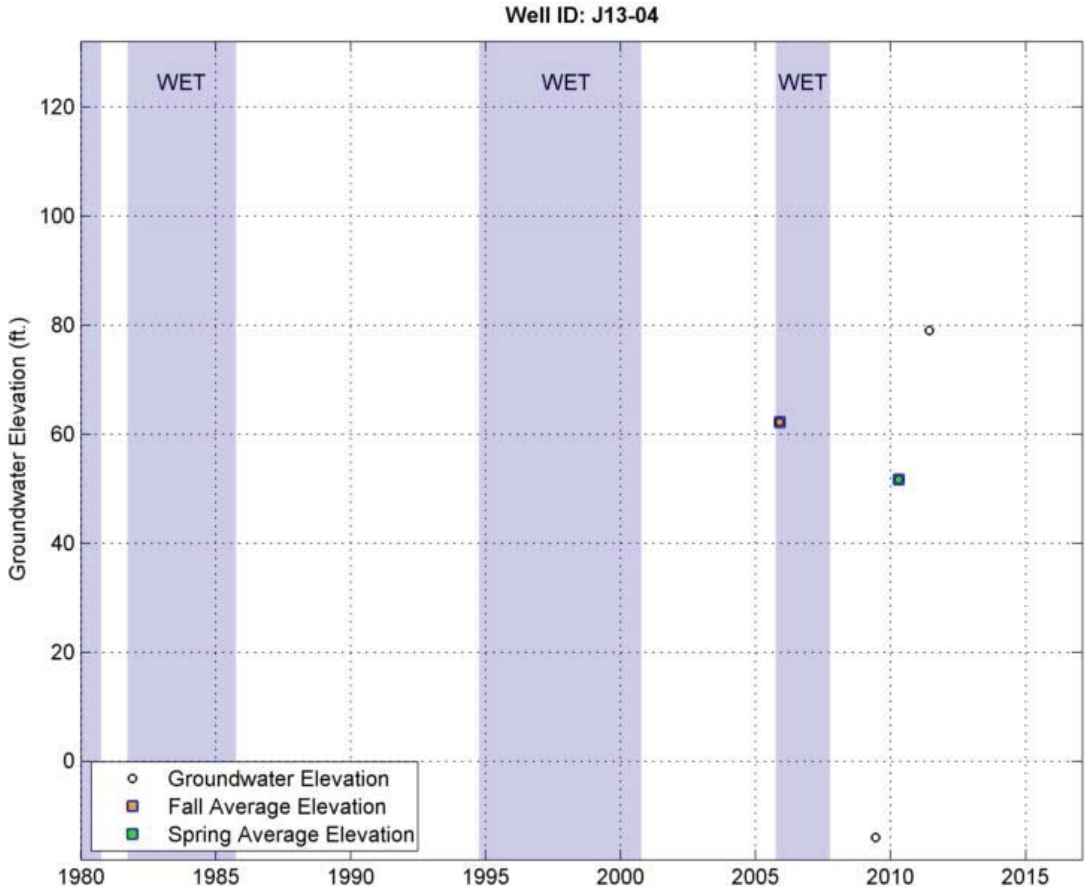

Well ID: K14-06
WET
WET
WET
5-year Trend:
-0.81 ft/yr
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
-100
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

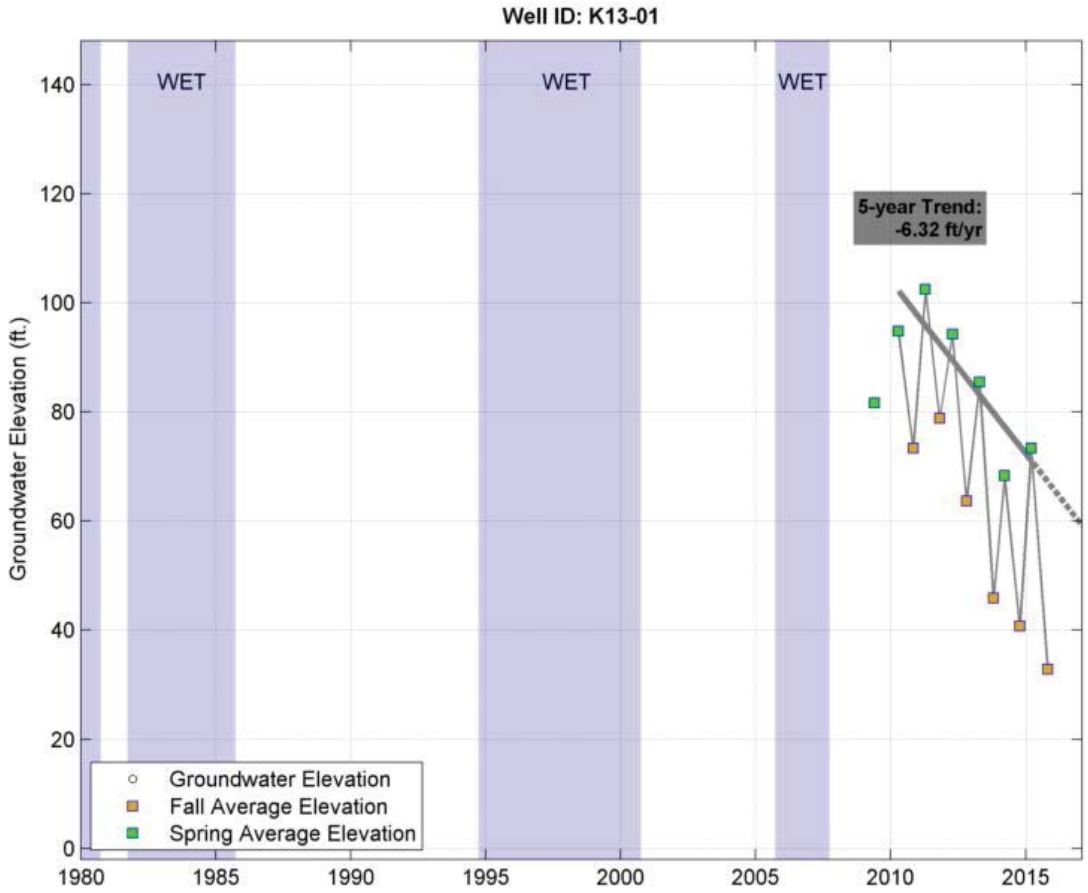

Well ID: K15-02
WET
WET
WET
5-year Trend:
-3.21 ft/yr
Groundwater Elevation (ft.)
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

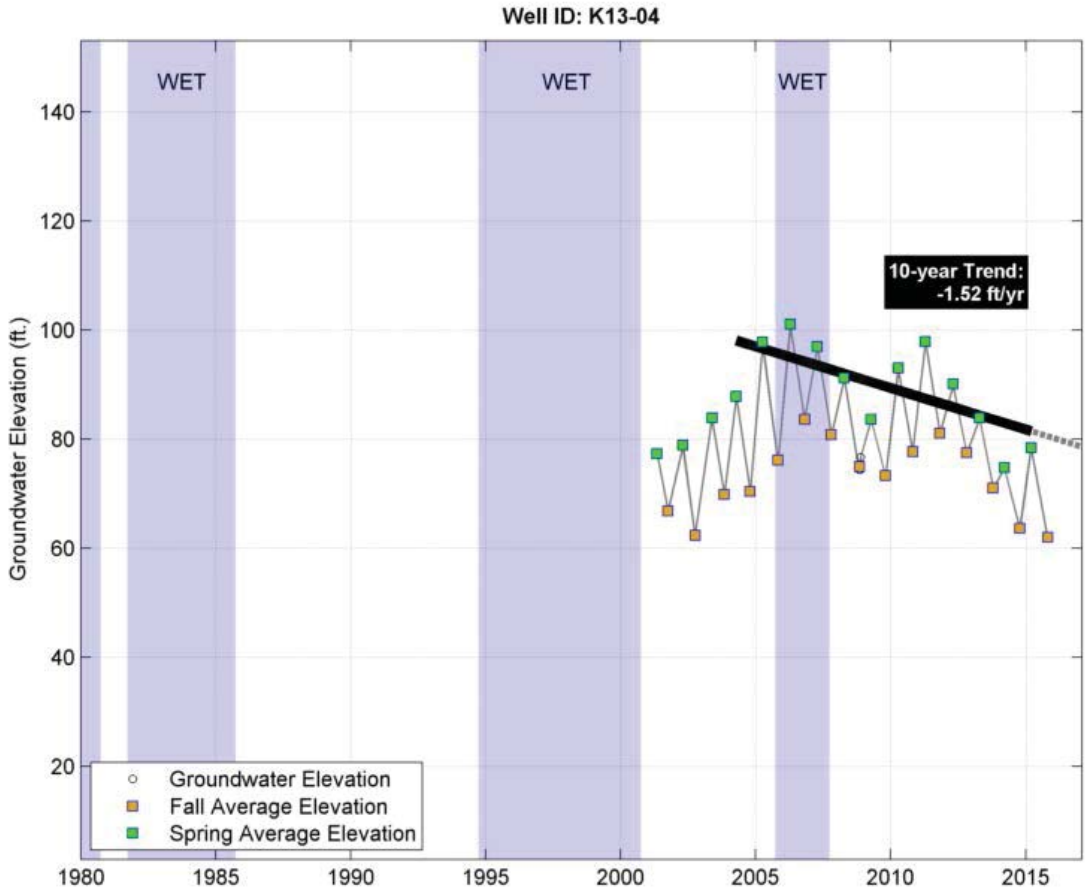

Well ID: K15-09
WET
WET
WET
5-year Trend:
-1.72 ft/yr
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

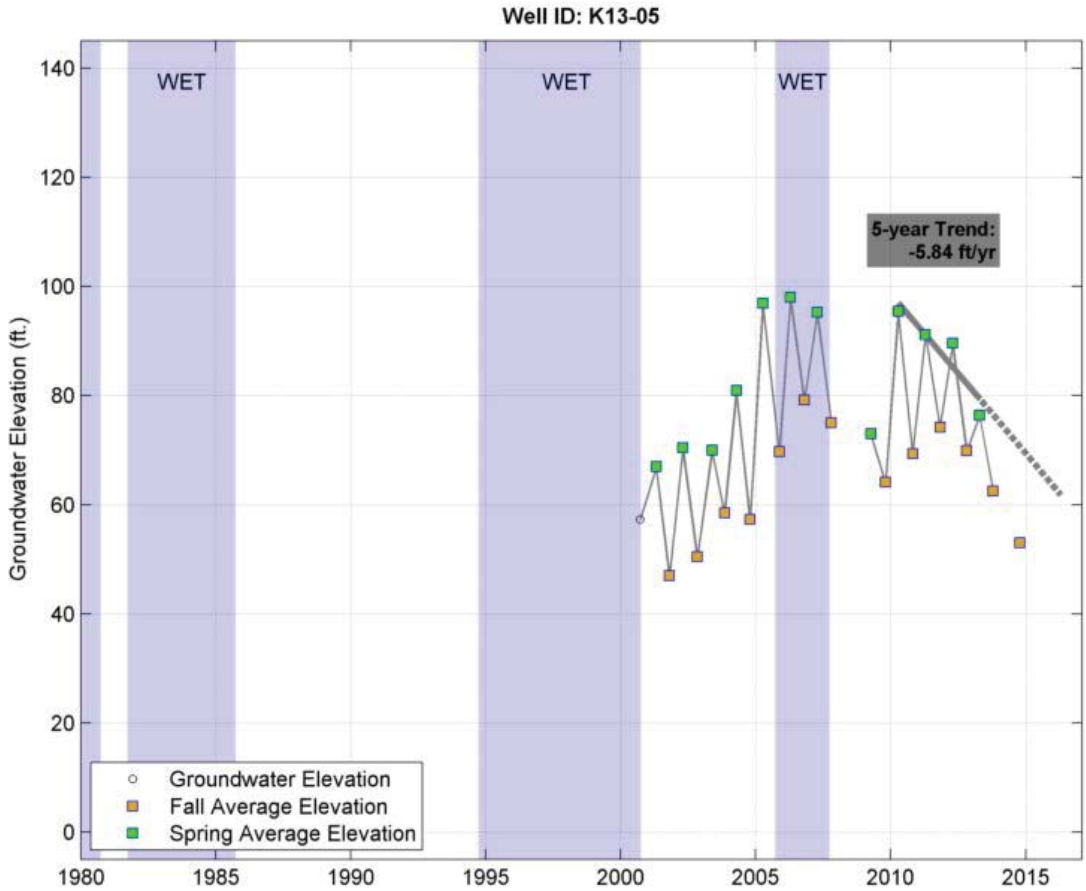
El Verano/Fowler Creek Subarea
Shallow Wells (<200 feet deep)

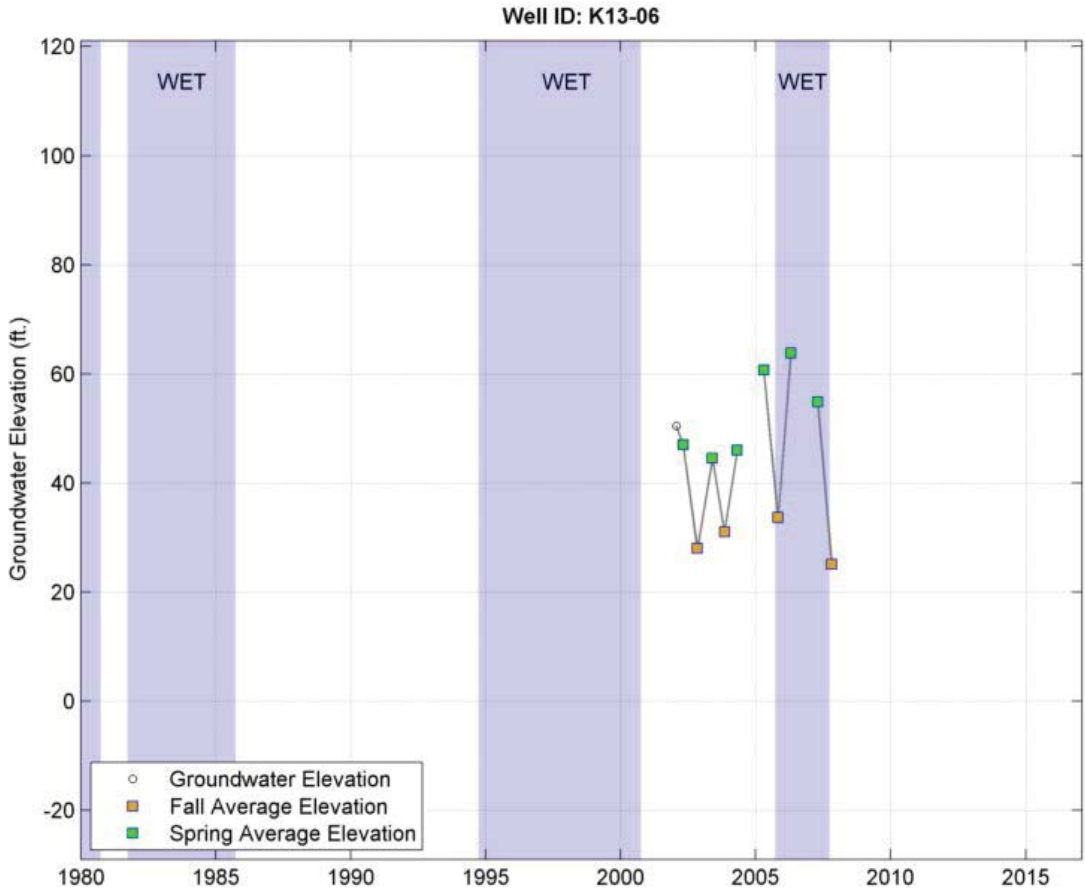

Well ID: J13-01
WET
WET
WET
10-year Trend:
+2.78 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
340
320
300
280
260
240
220
200
1980
1985
1990
1995
2000
2005
2010
2015

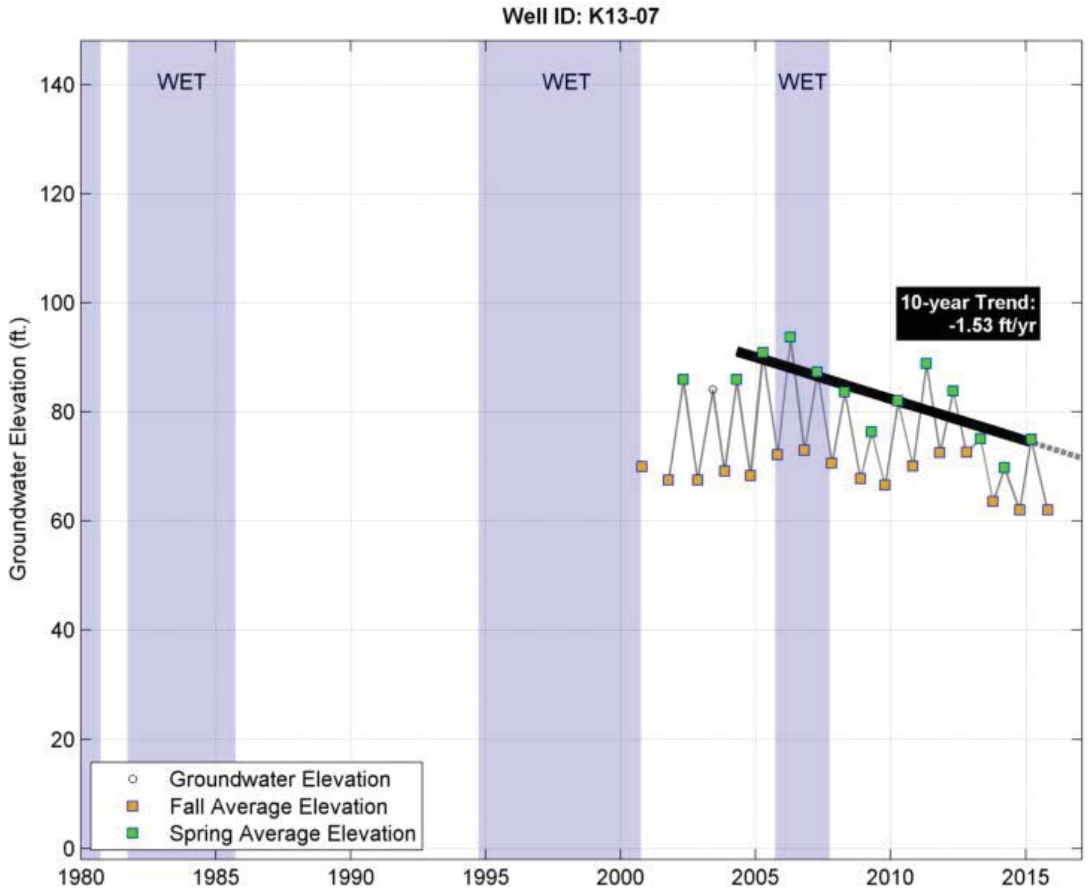

Well ID: J13-04
WET
WET
WET
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015

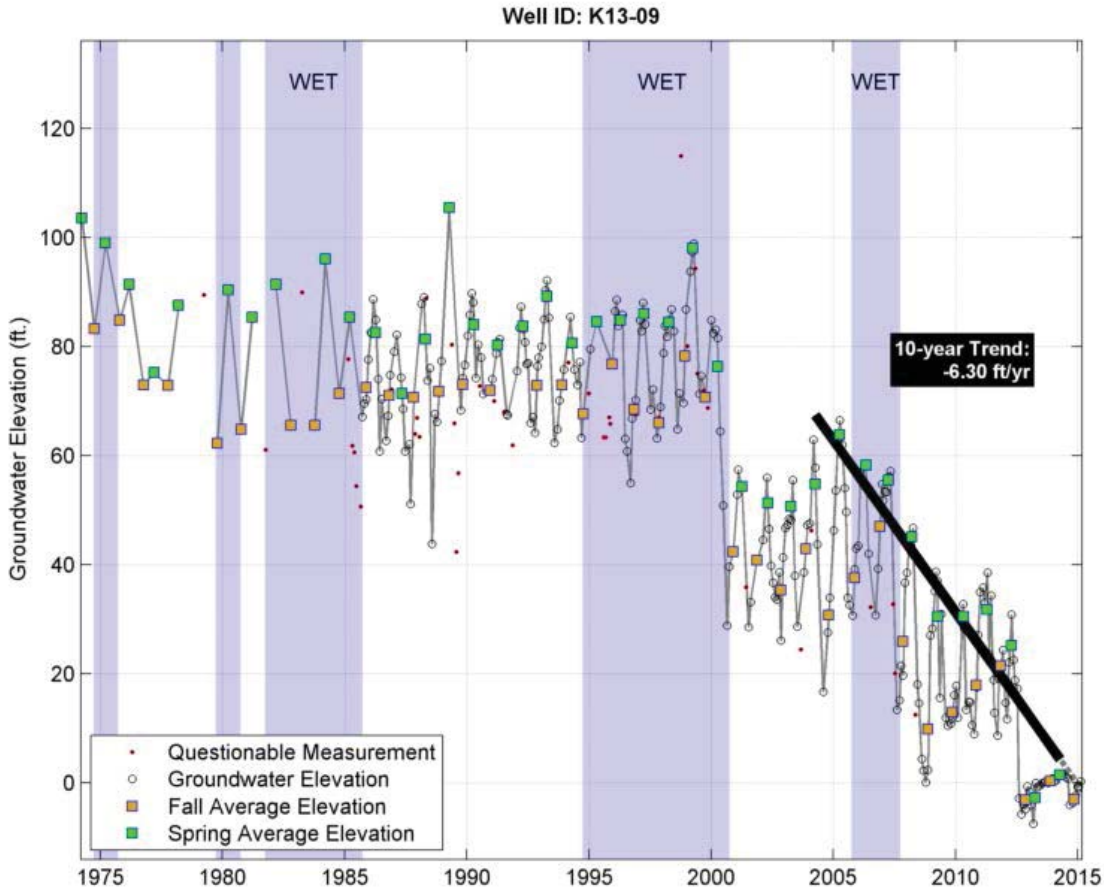

Well ID: K13-01
WET
WET
WET
5-year Trend:
-6.32 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
0
20
40
60
80
100
120
140
1980
1985
1990
1995
2000
2005
2010
2015

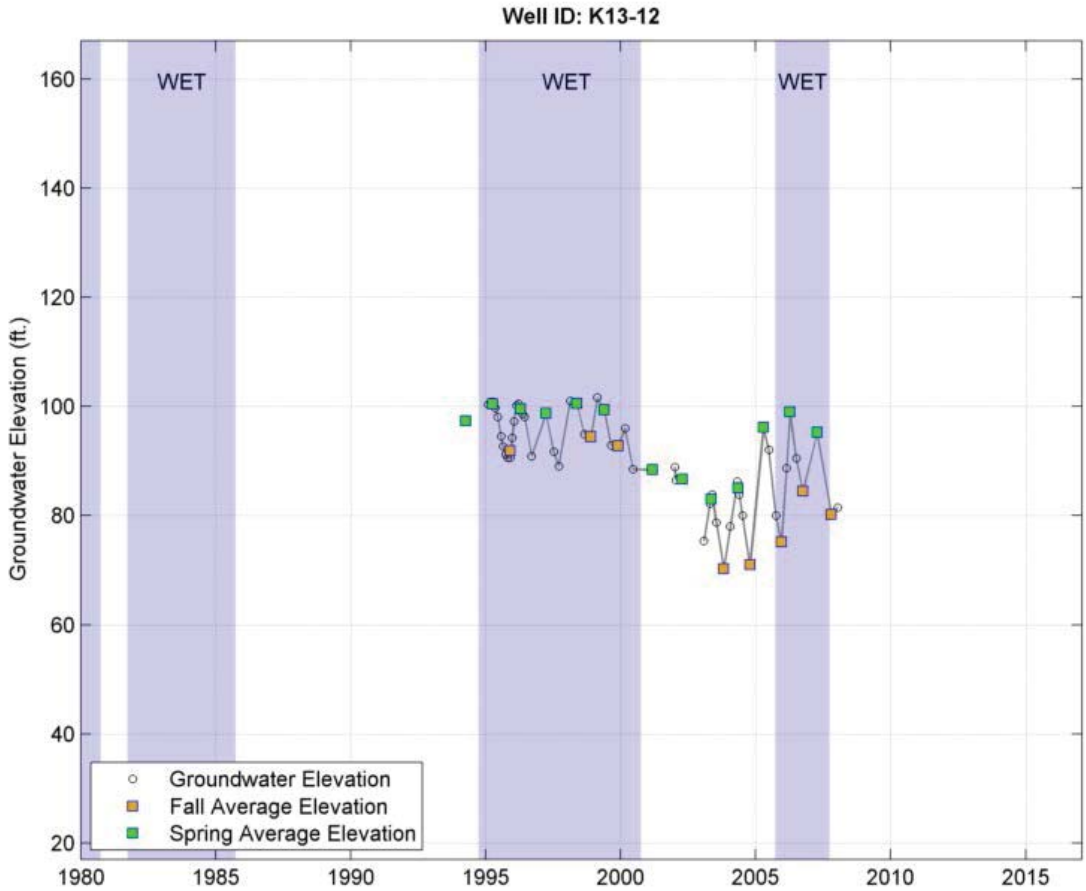

Well ID: K13-04
WET
WET
WET
10-year Trend:
-1.52 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
20
40
60
80
100
120
140
1980
1985
1990
1995
2000
2005
2010
2015

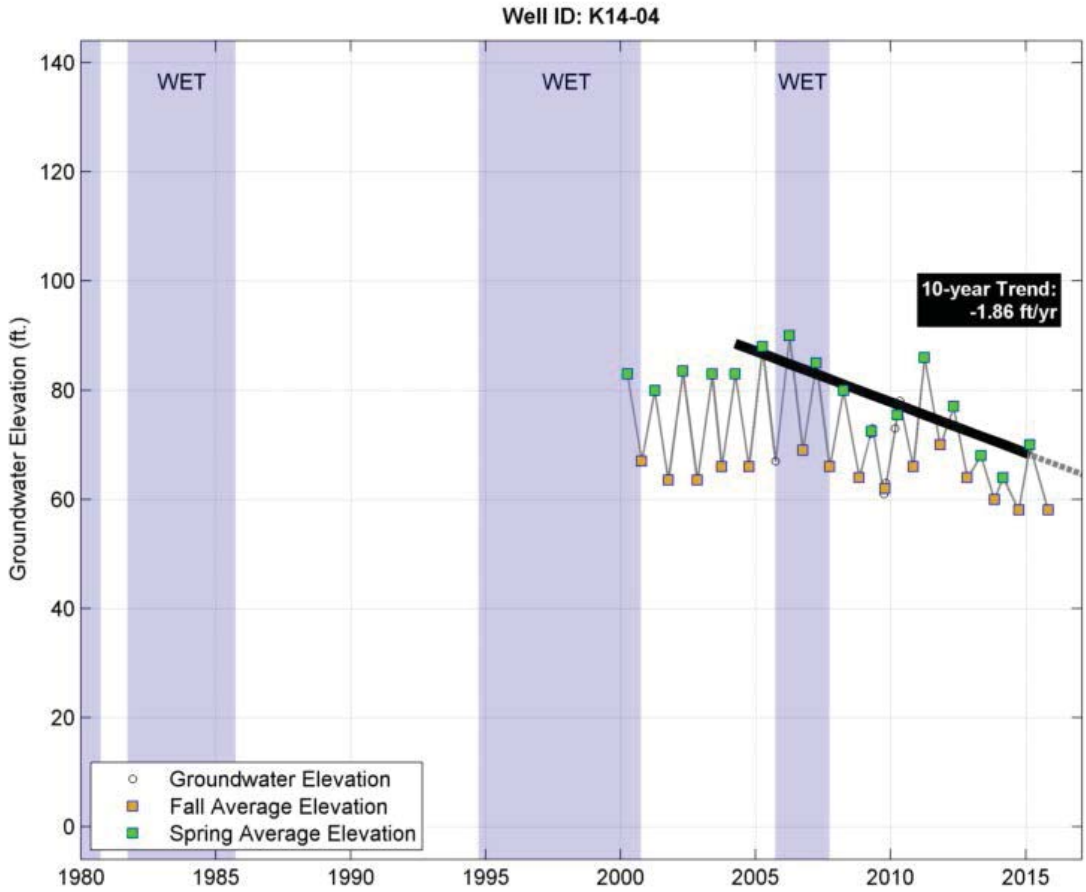

Well ID: K13-05
WET
WET
WET
5-year Trend:
-5.84 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015

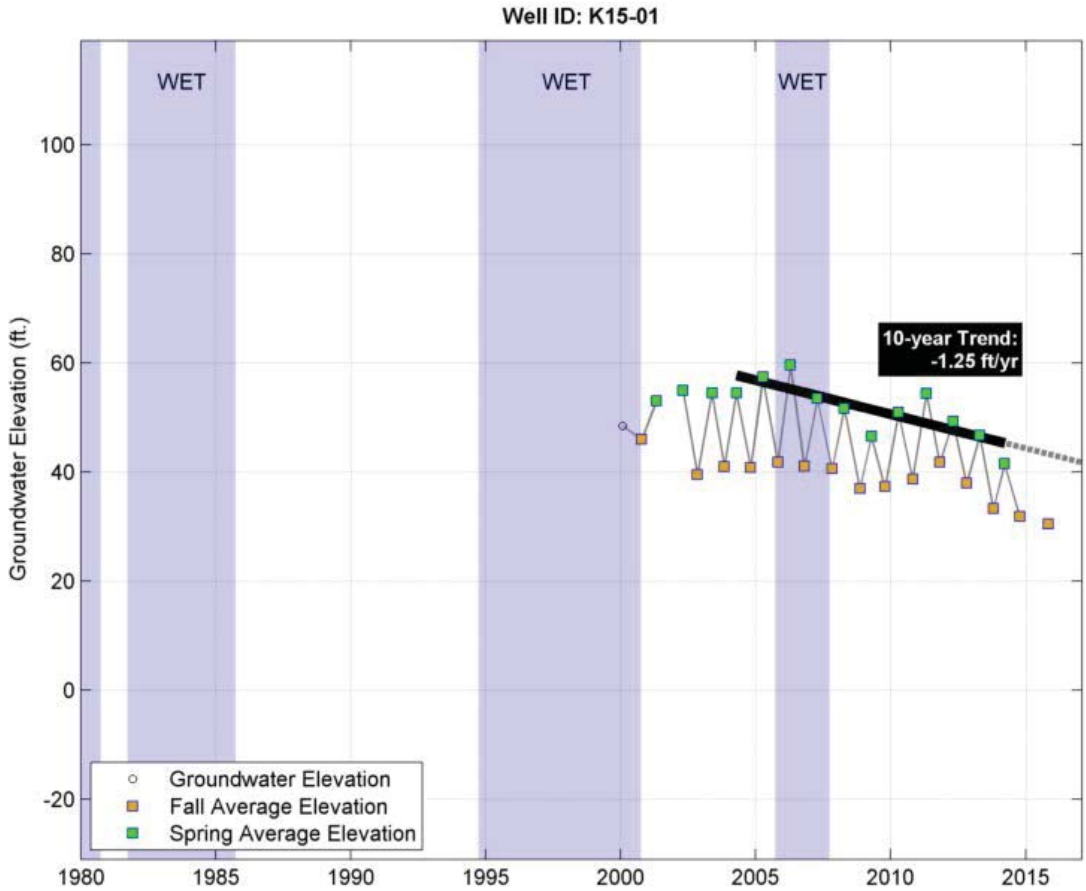

Well ID: K13-06
WET
WET
WET
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
120
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015

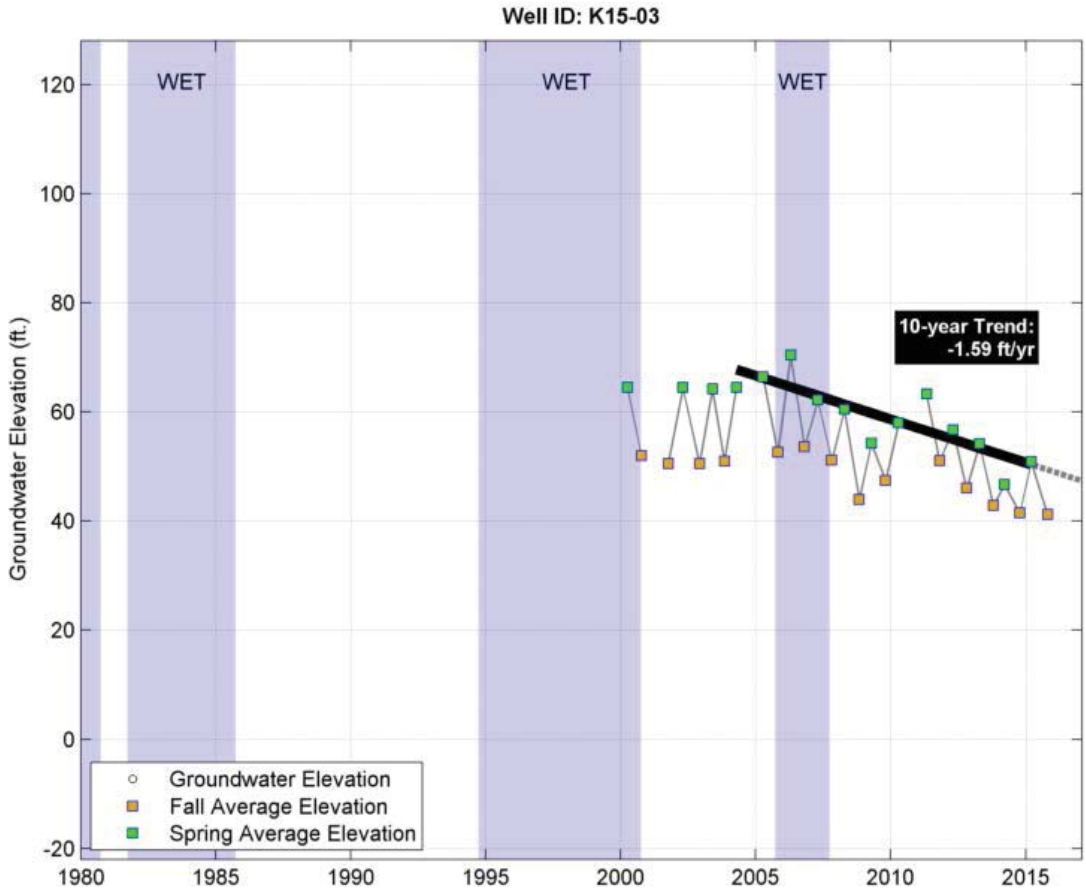

Well ID: K13-07
WET
WET
WET
10-year Trend:
-1.53 ft/yr
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
0
20
40
60
80
100
120
140
1980
1985
1990
1995
2000
2005
2010
2015

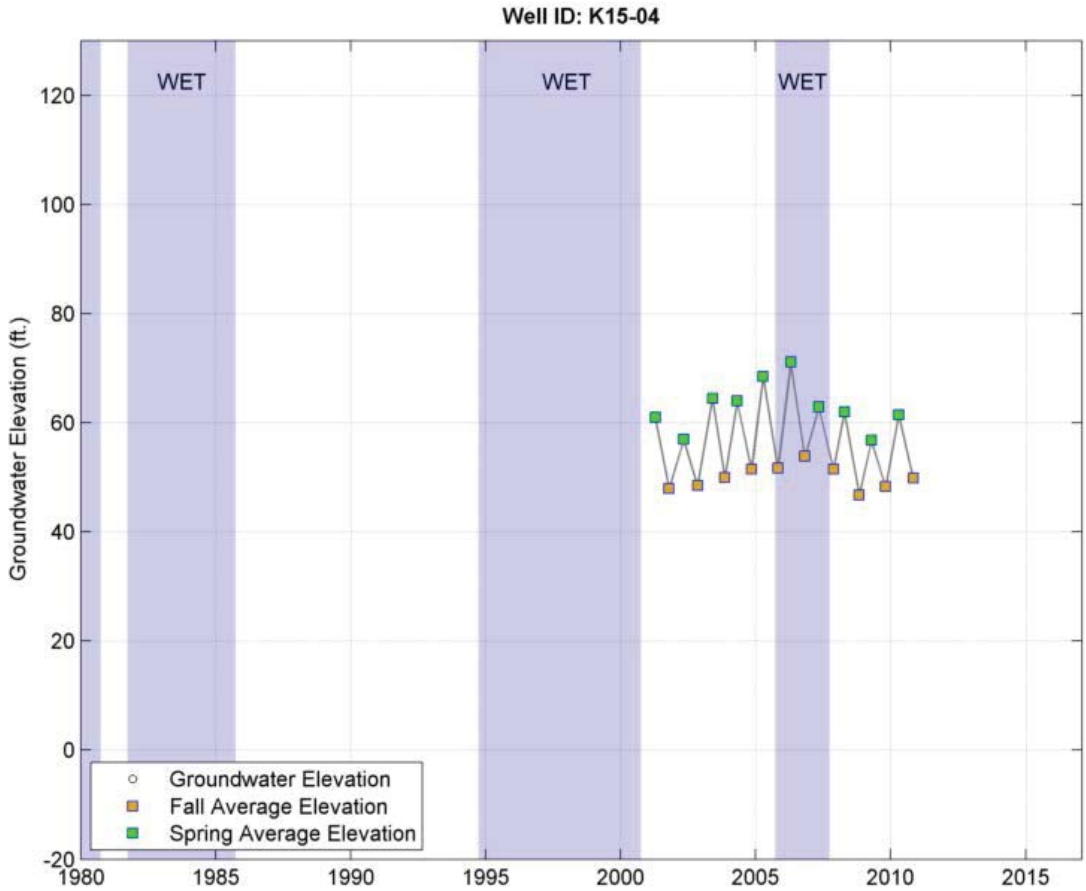

Well ID: K13-09
WET
WET
WET
10-year Trend:
-6.30 ft/yr
Groundwater Elevation (ft.)
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
0
20
40
60
80
100
120
1975
1980
1985
1990
1995
2000
2005
2010
2015

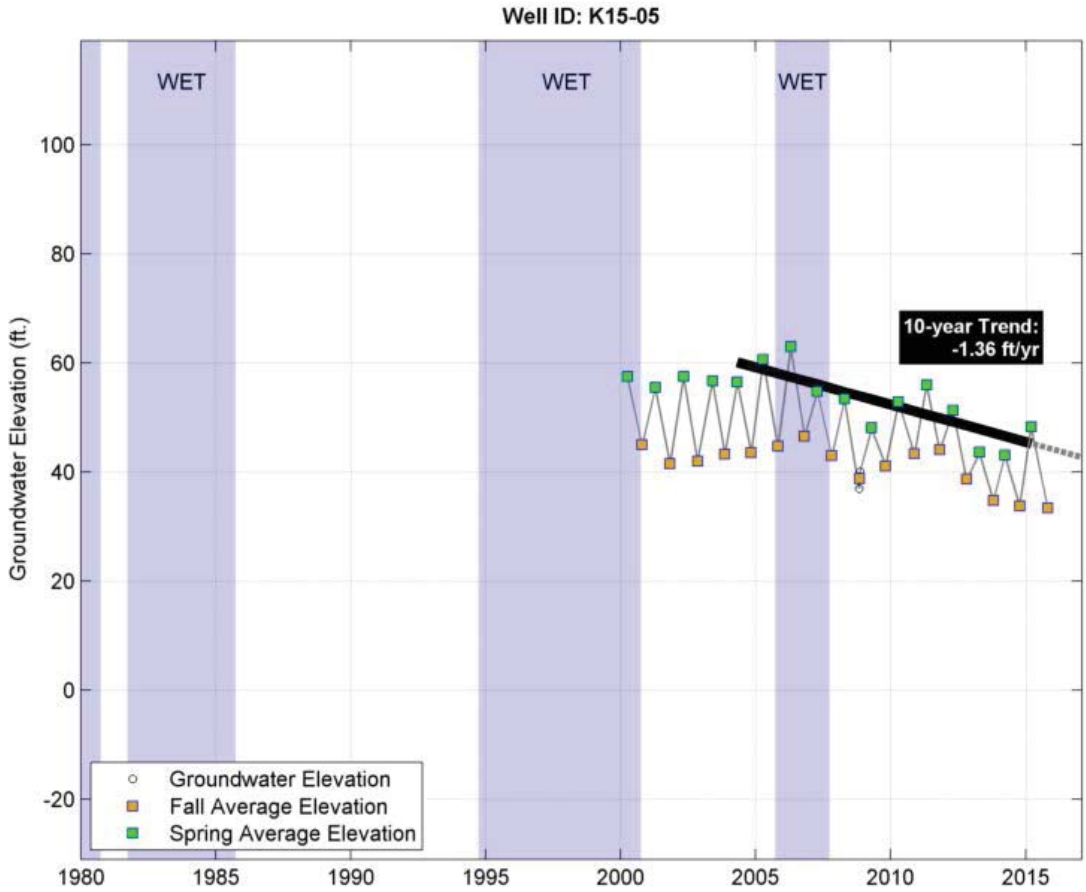

Well ID: K13-12
WET
WET
WET
Groundwater Elevation (ft.)
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

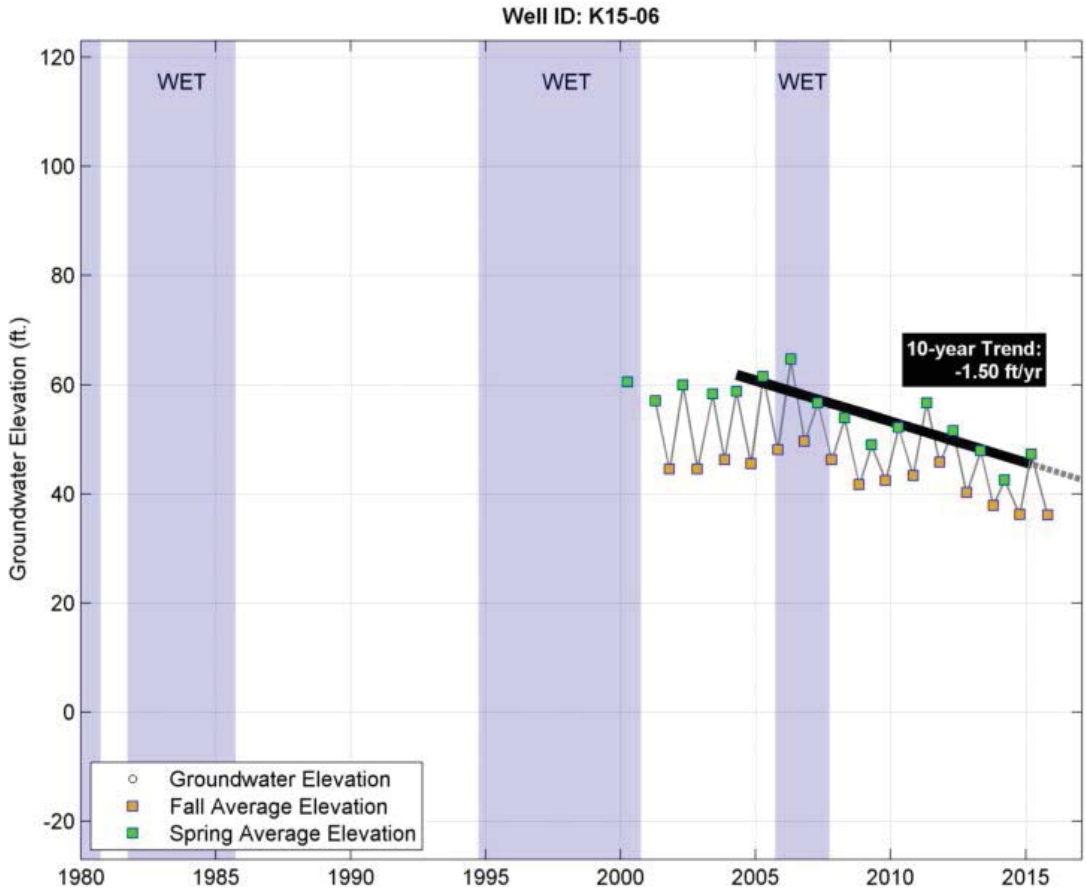

Well ID: K14-04
WET
WET
WET
10-year Trend:
-1.86 ft/yr
Groundwater Elevation (ft.)
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: K15-01
WET
WET
WET
10-year Trend:
-1.25 ft/yr
Groundwater Elevation (ft.)
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

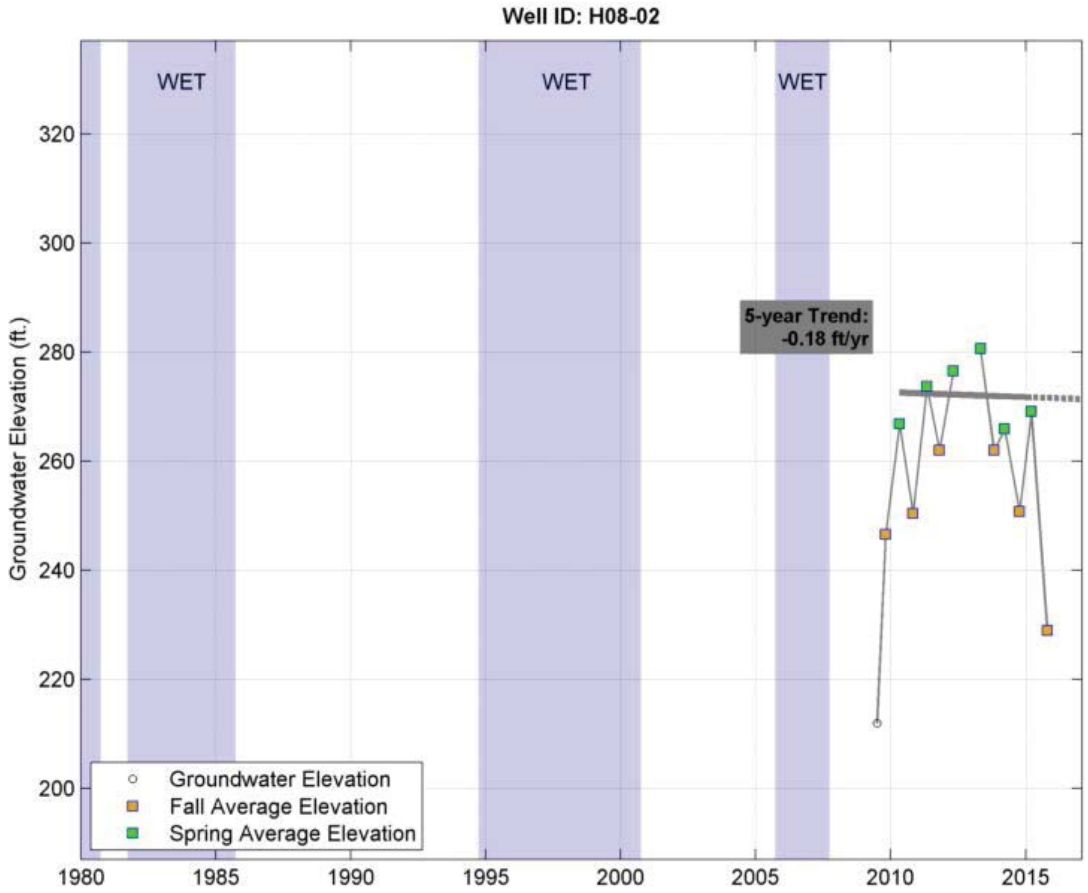

Well ID: K15-03
WET
WET
WET
10-year Trend:
-1.59 ft/yr
Groundwater Elevation (ft.)
120
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

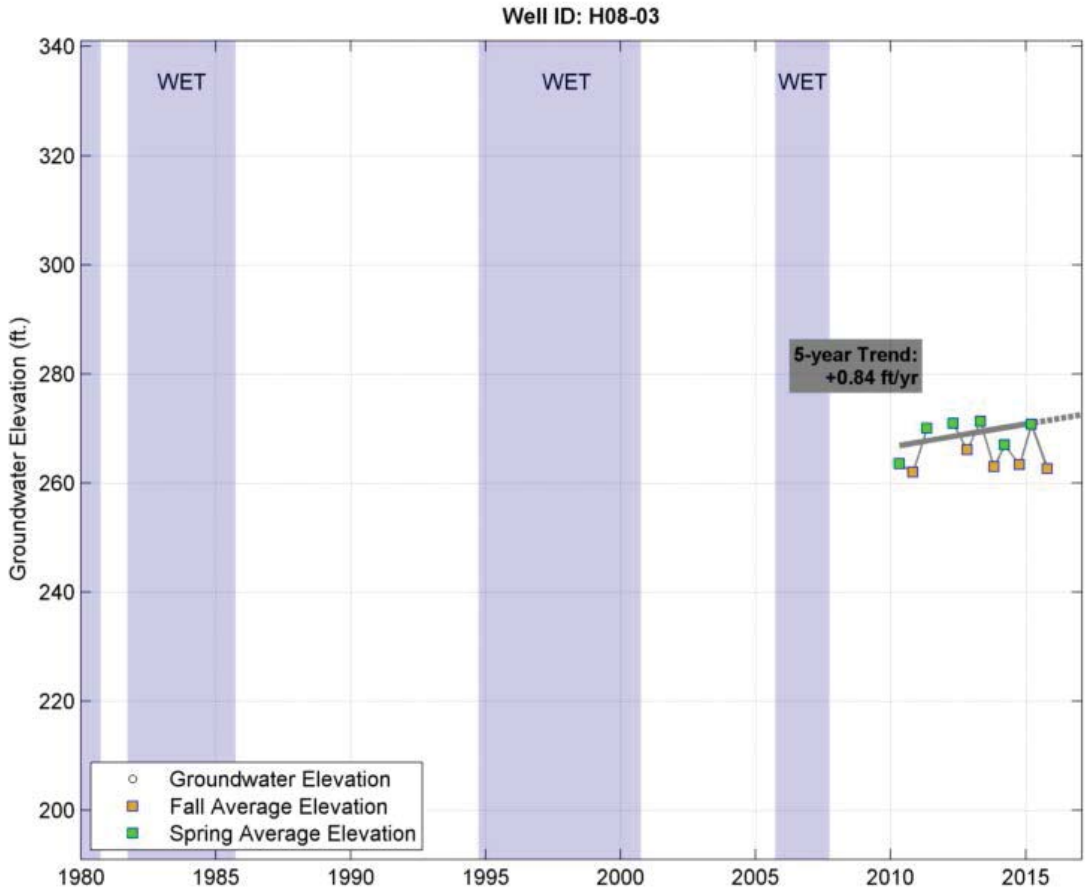

Well ID: K15-04
WET
WET
WET
Groundwater Elevation (ft.)
120
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: K15-05
WET
WET
WET
10-year Trend:
-1.36 ft/yr
Groundwater Elevation (ft.)
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

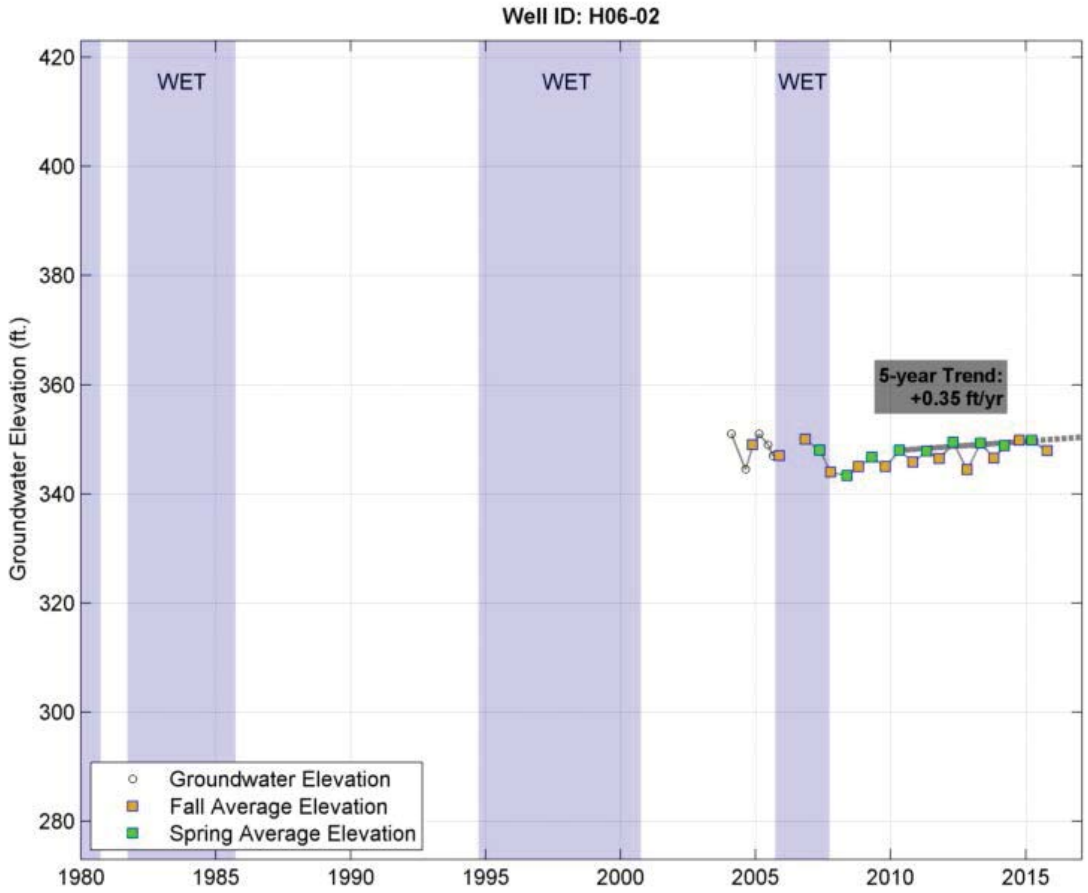

Well ID: K15-06
WET
WET
WET
10-year Trend:
-1.50 ft/yr
Groundwater Elevation (ft.)
120
100
80
60
40
20
0
-20
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

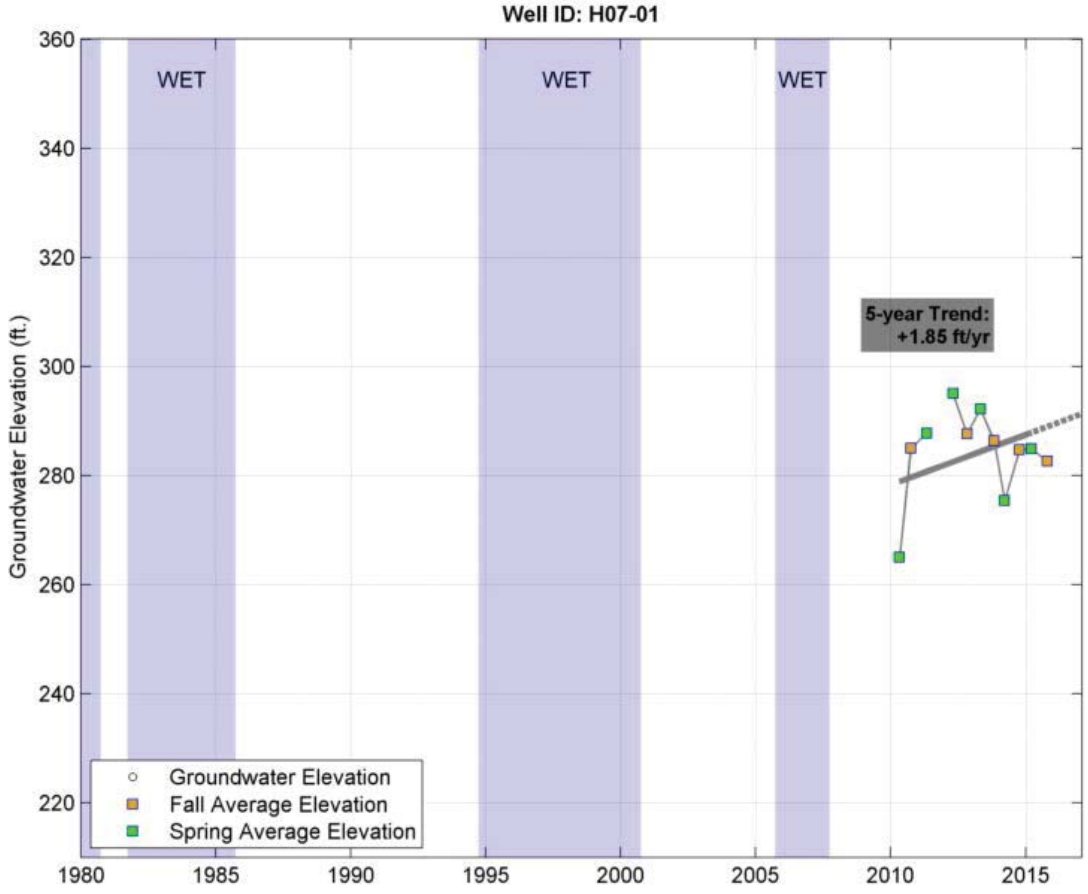
Glen Ellen Subarea
Deeper Wells (>200 feet deep)


Well ID: H08-02
WET
WET
WET
5-year Trend:
-0.18 ft/yr
Groundwater Elevation (ft.)
320
300
280
260
240
220
200
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

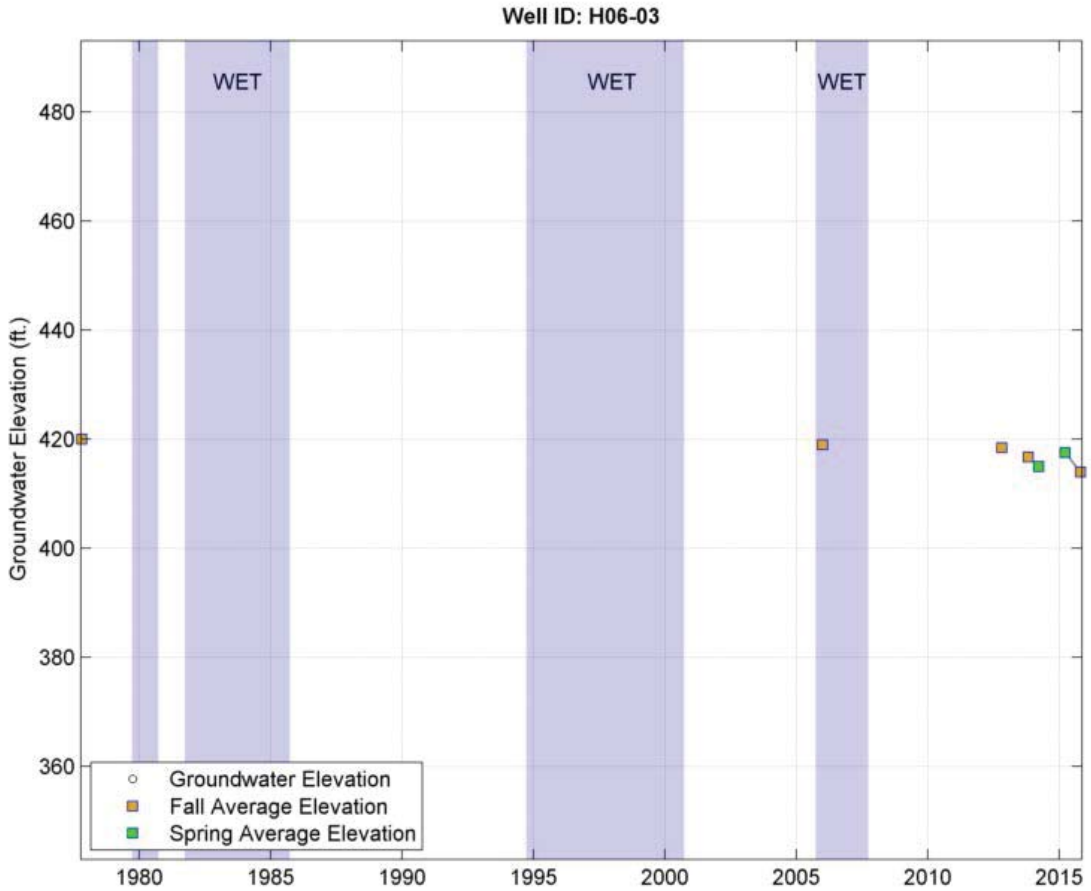

Well ID: H08-03
WET
WET
WET
5-year Trend:
+0.84 ft/yr
Groundwater Elevation (ft.)
340
320
300
280
260
240
220
200
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

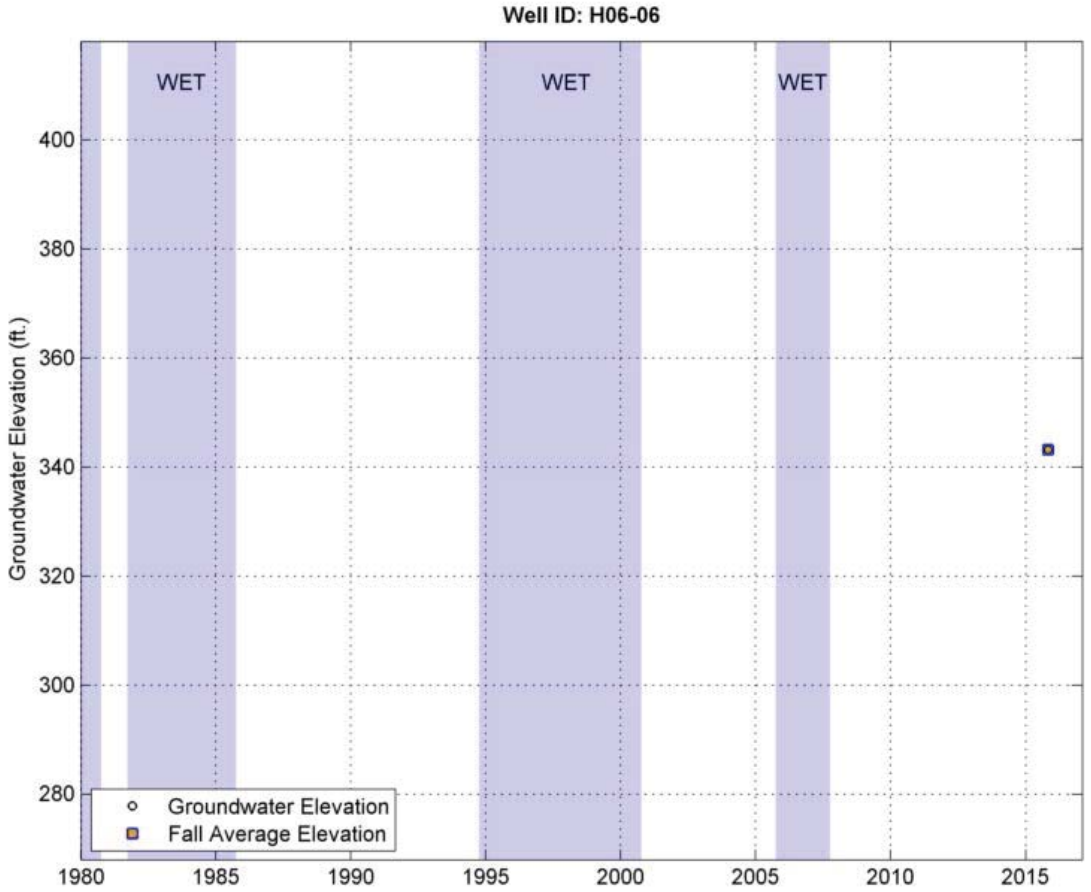
Glen Ellen Subarea
Shallow Wells (<200 feet deep)


Well ID: H06-02
WET
WET
WET
5-year Trend:
+0.35 ft/yr
Groundwater Elevation (ft.)
420
400
380
360
340
320
300
280
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

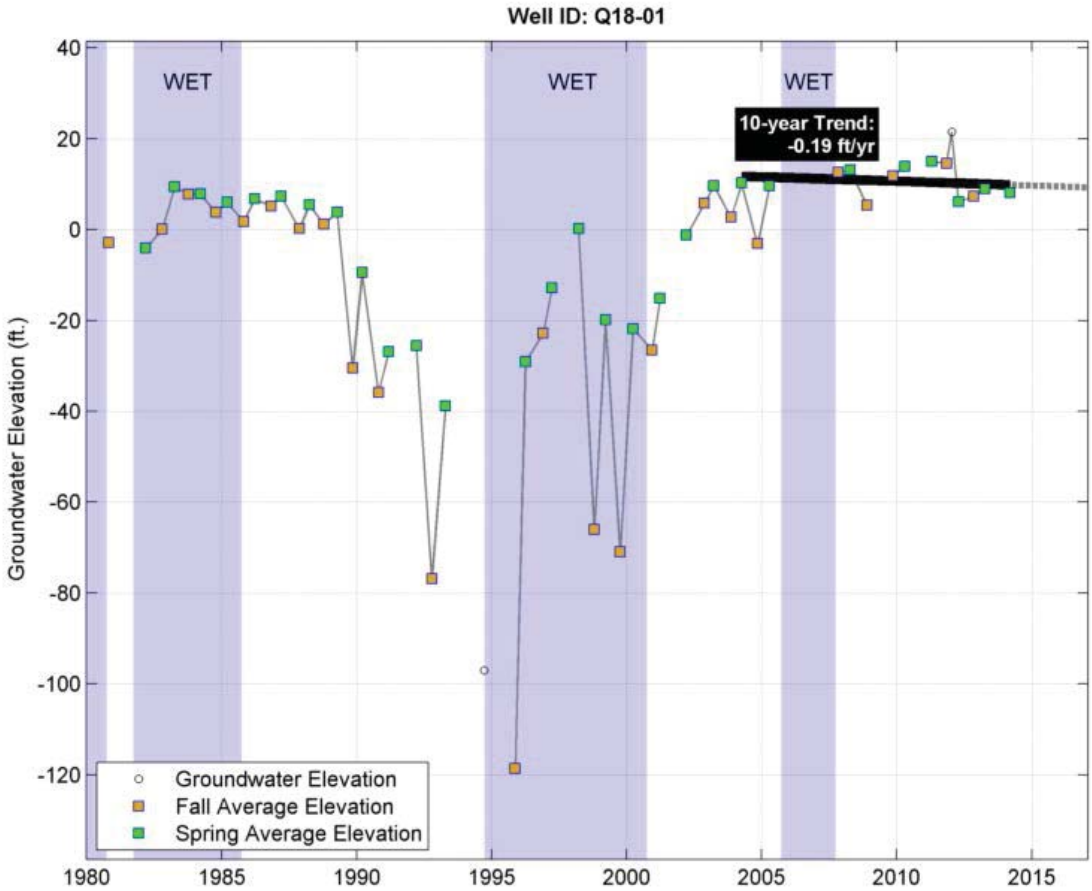

Well ID: H07-01
WET
WET
WET
5-year Trend:
+1.85 ft/yr
Groundwater Elevation (ft.)
360
340
320
300
280
260
240
220
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

Glen Ellen Subarea
Unknown Depth

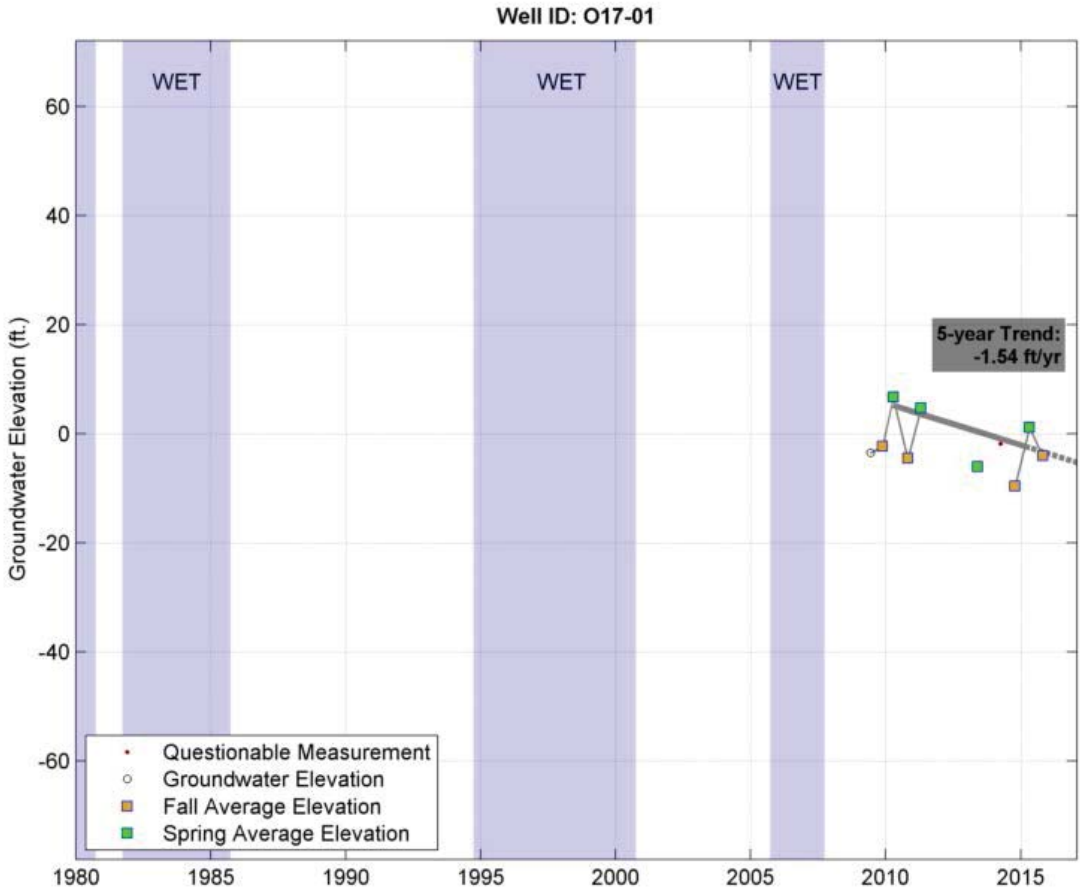

Well ID: H06-03
WET
WET
WET
Groundwater Elevation (ft.)
480
460
440
420
400
380
360
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015


Well ID: H06-06
WET
WET
WET
Groundwater Elevation (ft.)
400
380
360
340
320
300
280
Groundwater Elevation
Fall Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

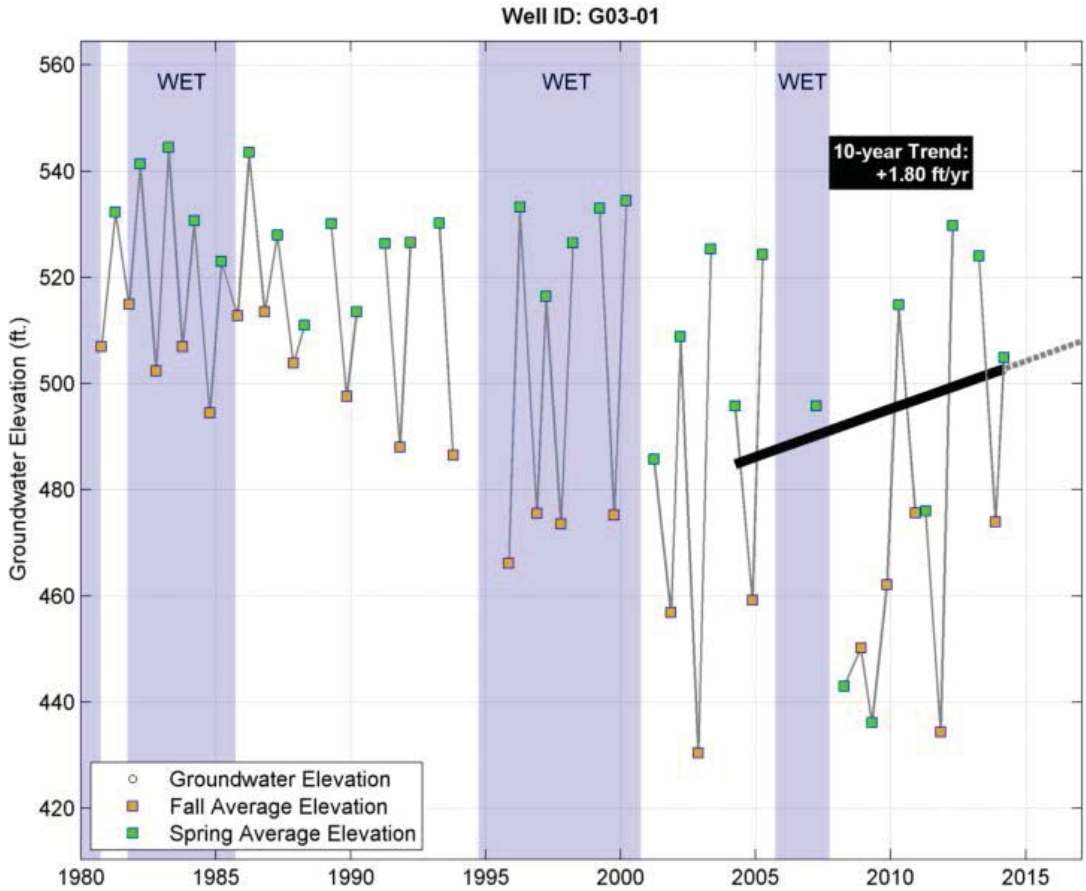
Huichica Subarea
Deeper Wells (>200 feet deep)

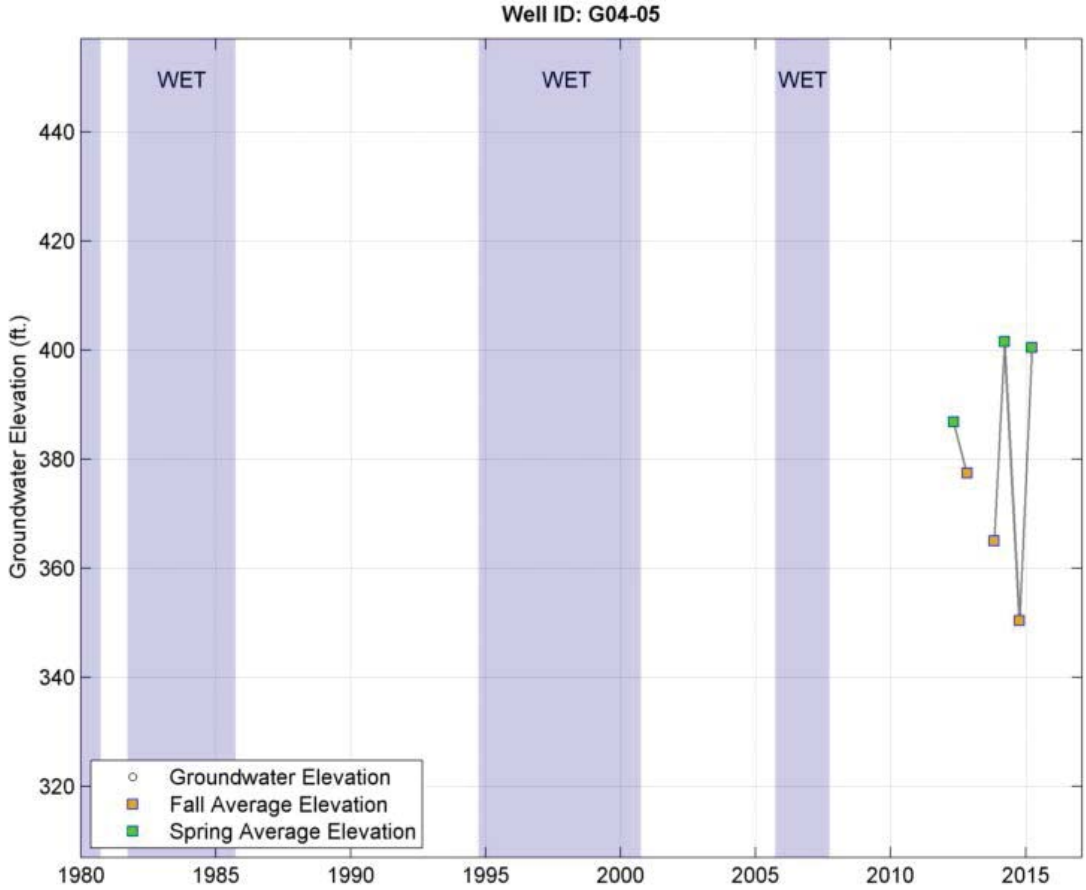

Well ID: Q18-01
WET
WET
WET
10-year Trend:
-0.19 ft/yr
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
-100
-120
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

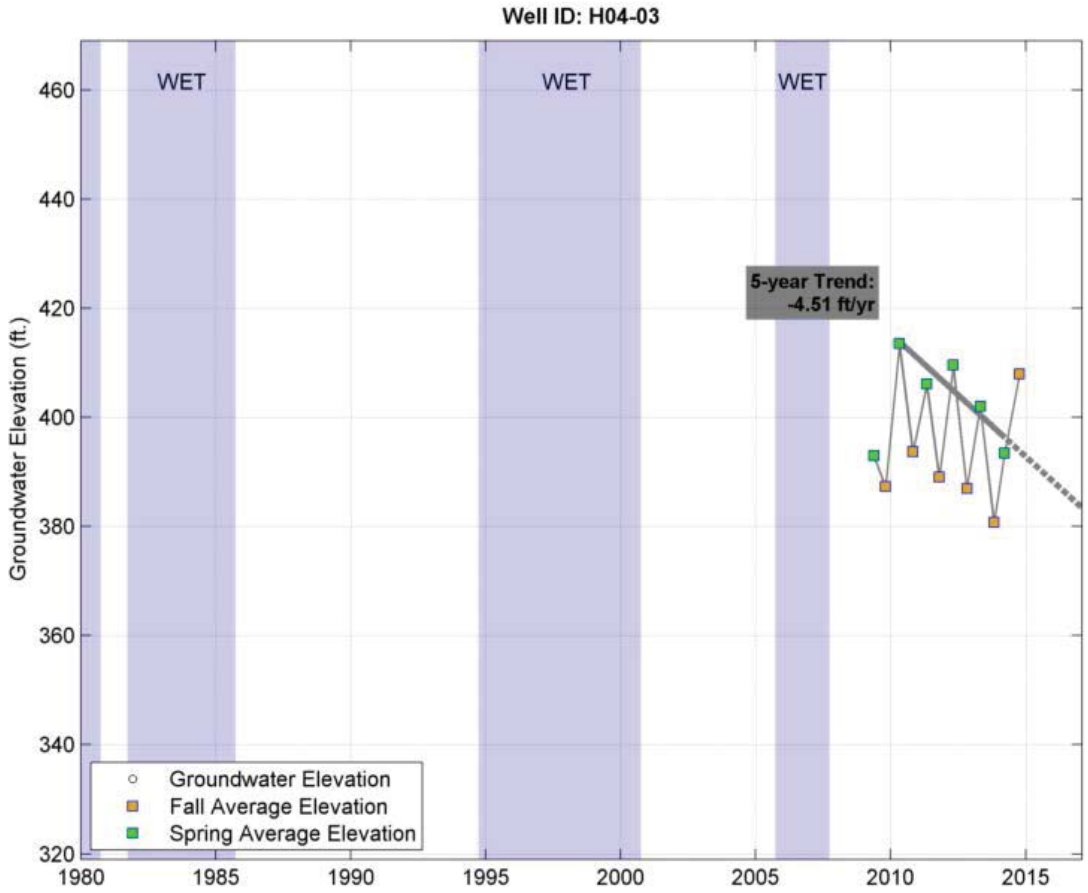
Huichica Subarea
Shallow Wells (<200 feet deep)

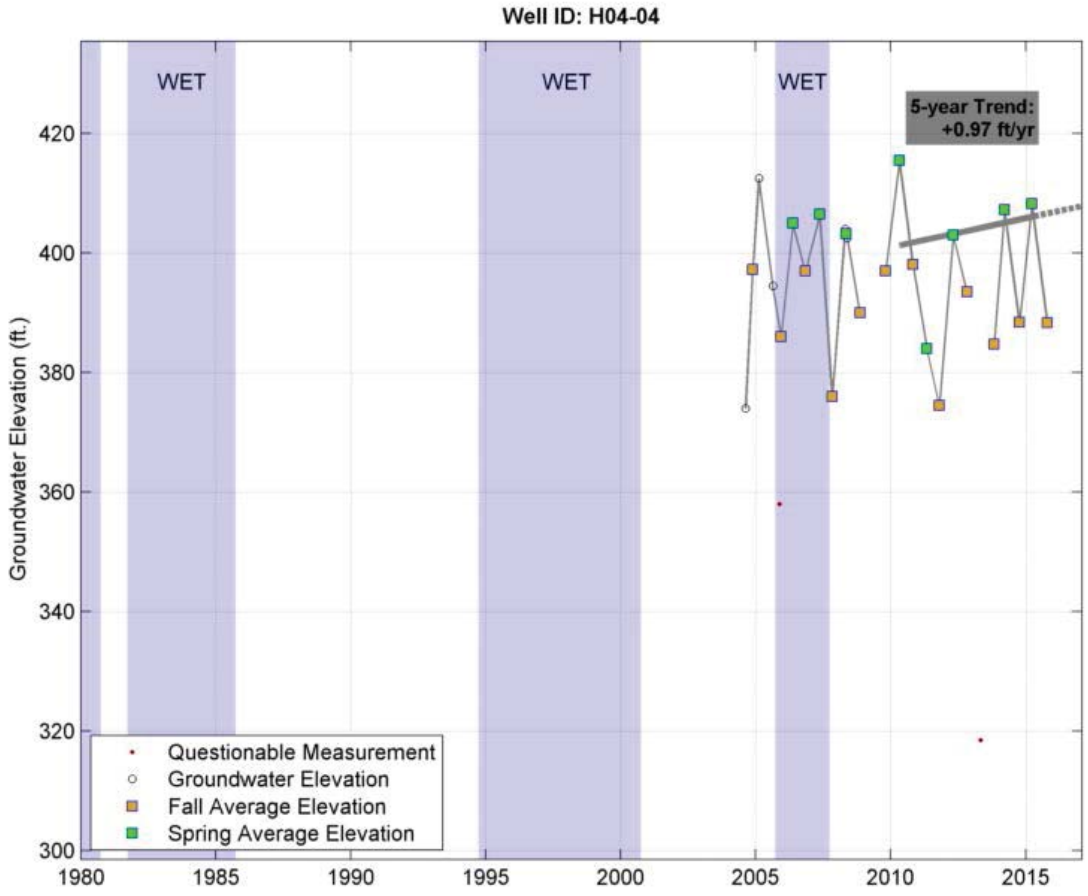

Well ID: O17-01
WET
WET
WET
5-year Trend:
-1.54 ft/yr
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

Kenwood Subarea
Deeper Wells (>200 feet deep)

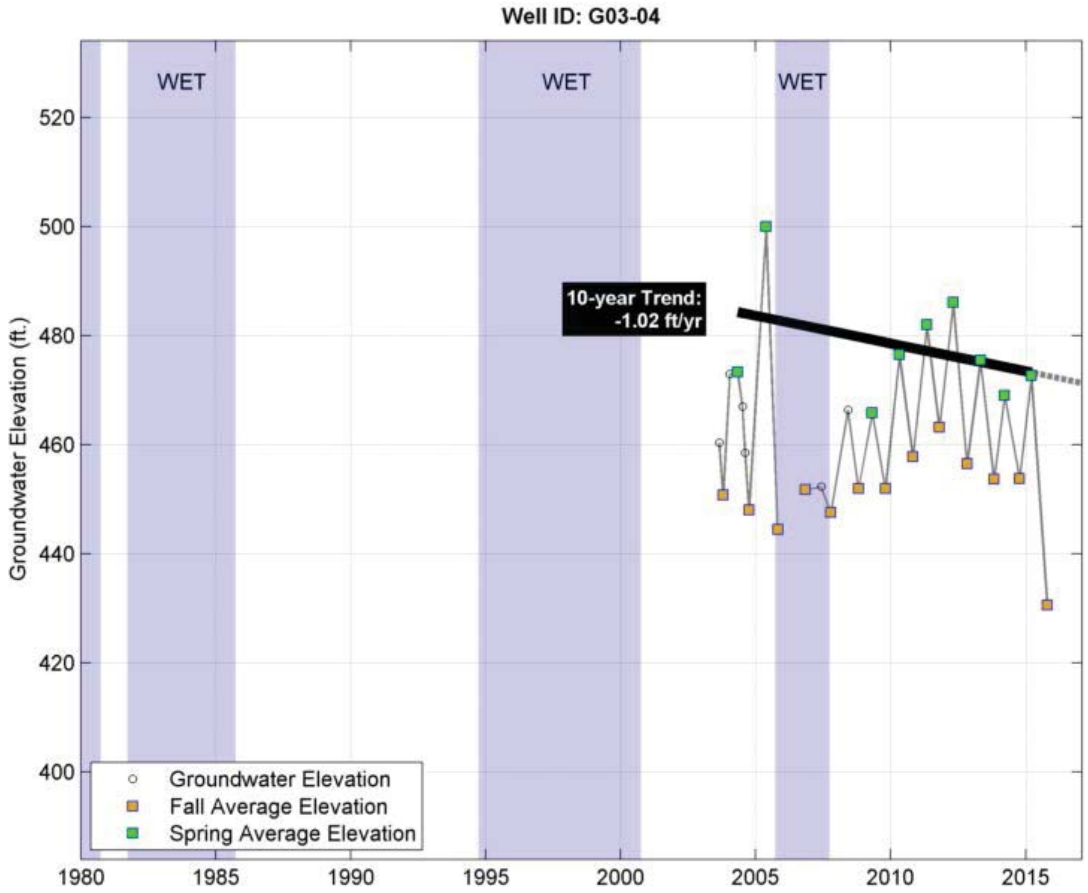

Well ID: G03-01
WET
WET
WET
10-year Trend:
+1.80 ft/yr
Groundwater Elevation (ft.)
560
540
520
500
480
460
440
420
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

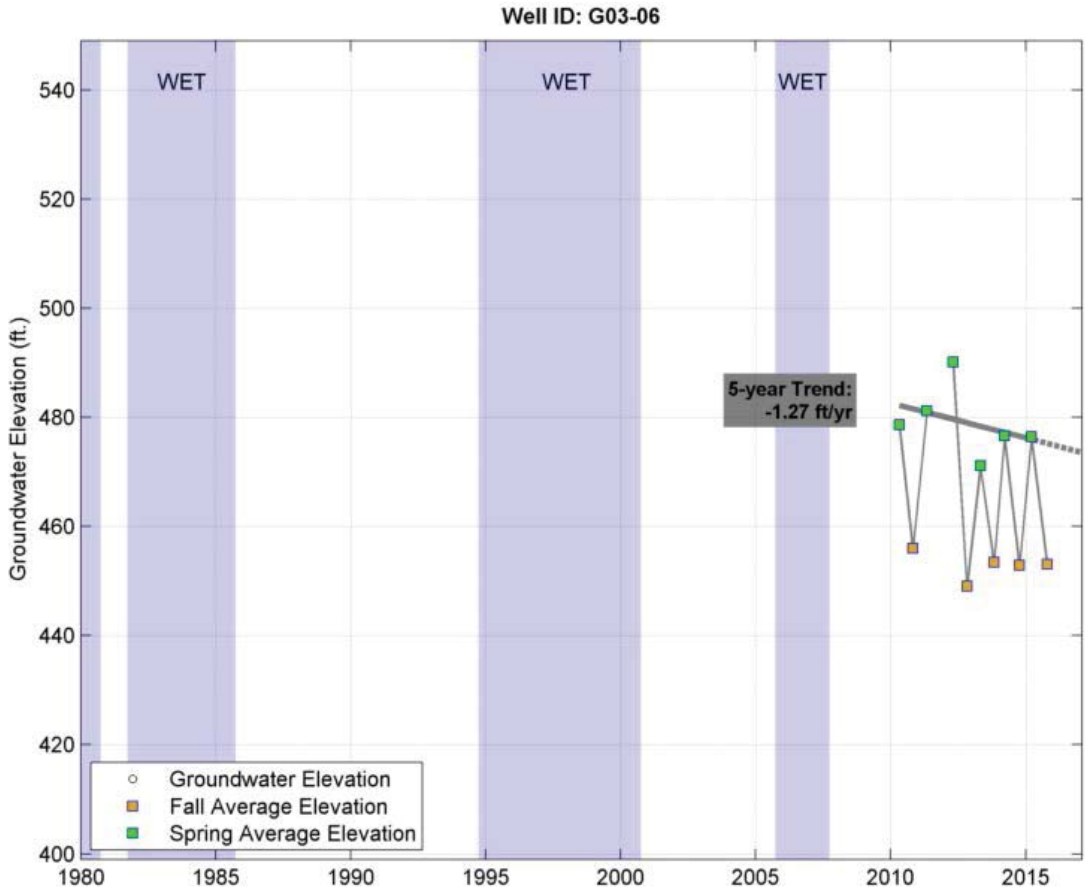

Well ID: G04-05
WET
WET
WET
Groundwater Elevation (ft.)
440
420
400
380
360
340
320
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

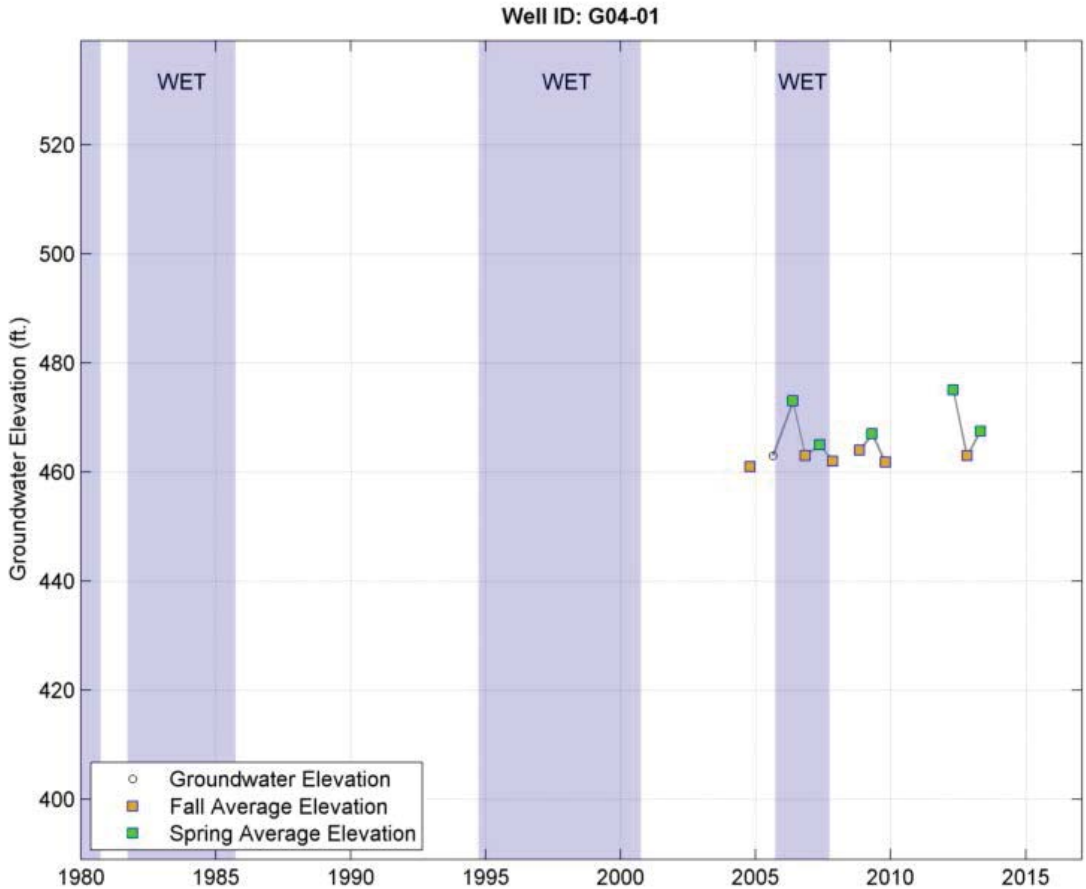

Well ID: H04-03
WET
WET
WET
5-year Trend:
-4.51 ft/yr
Groundwater Elevation (ft.)
460
440
420
400
380
360
340
320
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

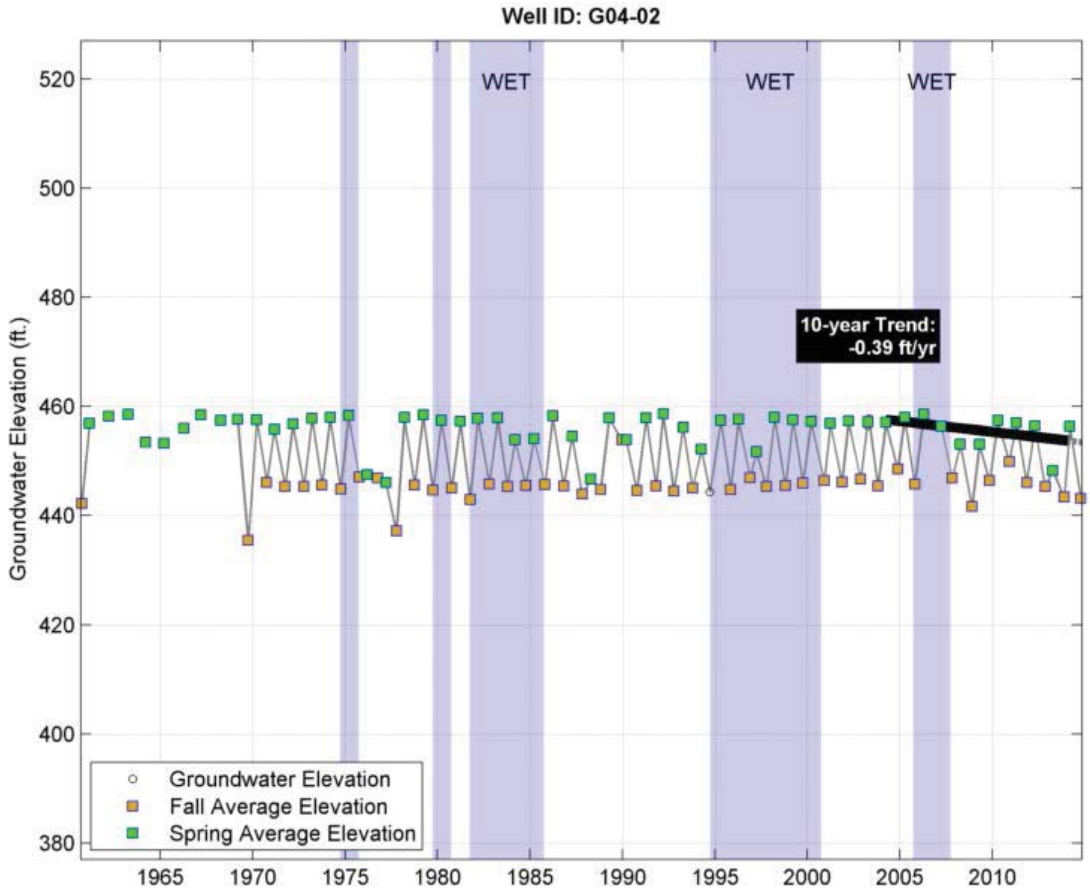

Well ID: H04-04
WET
WET
WET
5-year Trend:
+0.97 ft/yr
Groundwater Elevation (ft.)
420
400
380
360
340
320
300
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

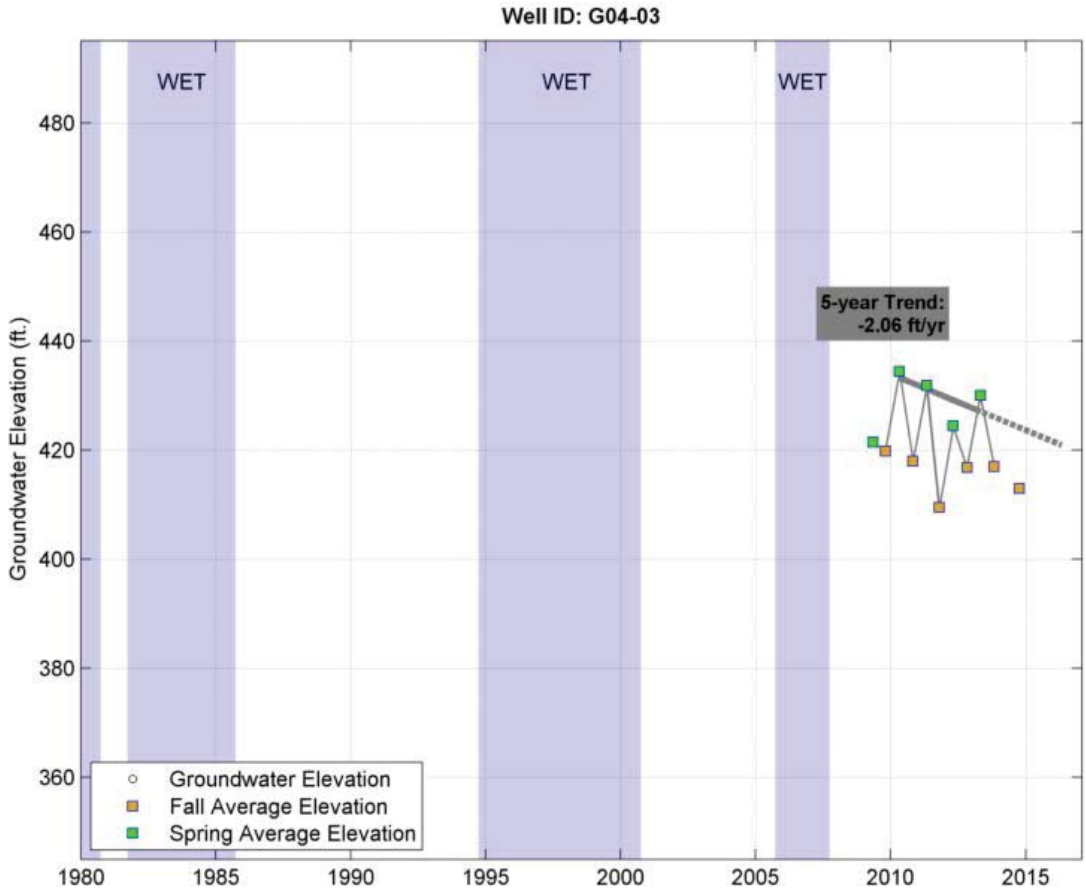
Kenwood Subarea
Shallow Wells (<200 feet deep)

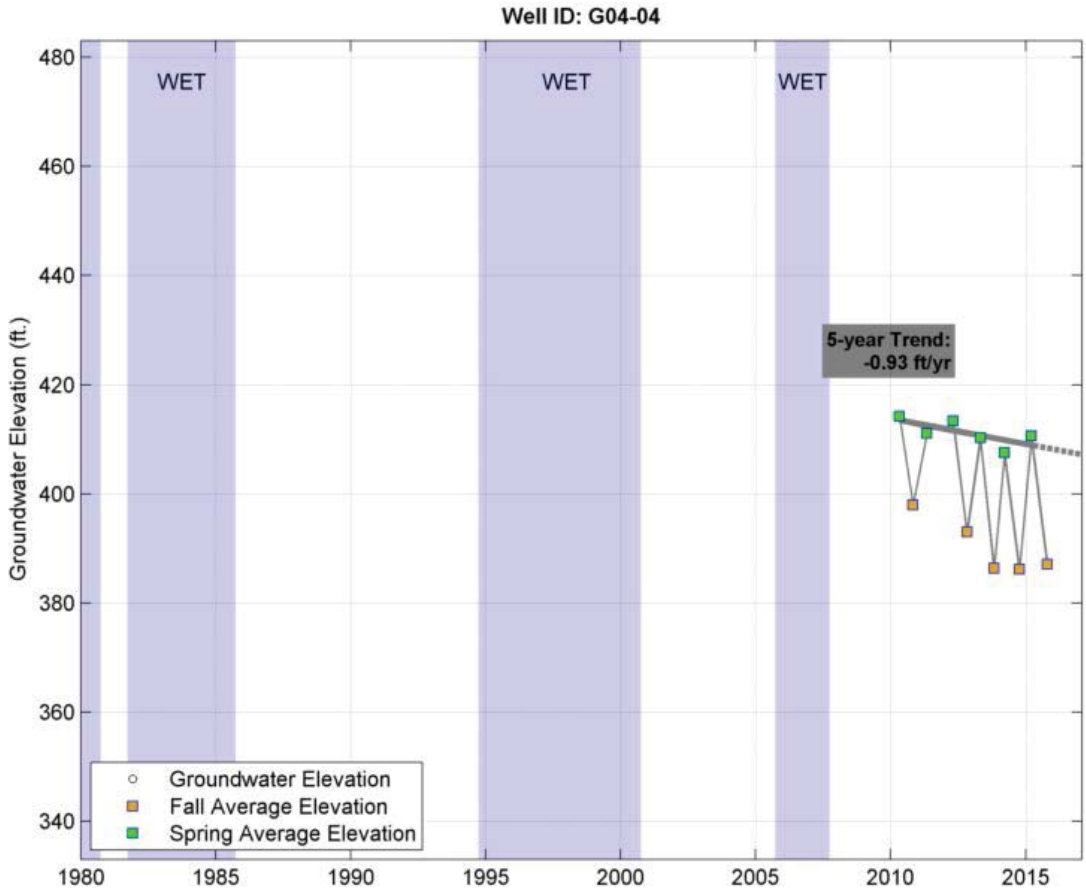

Well ID: G03-04
WET
WET
WET
10-year Trend:
-1.02 ft/yr
Groundwater Elevation (ft.)
520
500
480
460
440
420
400
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

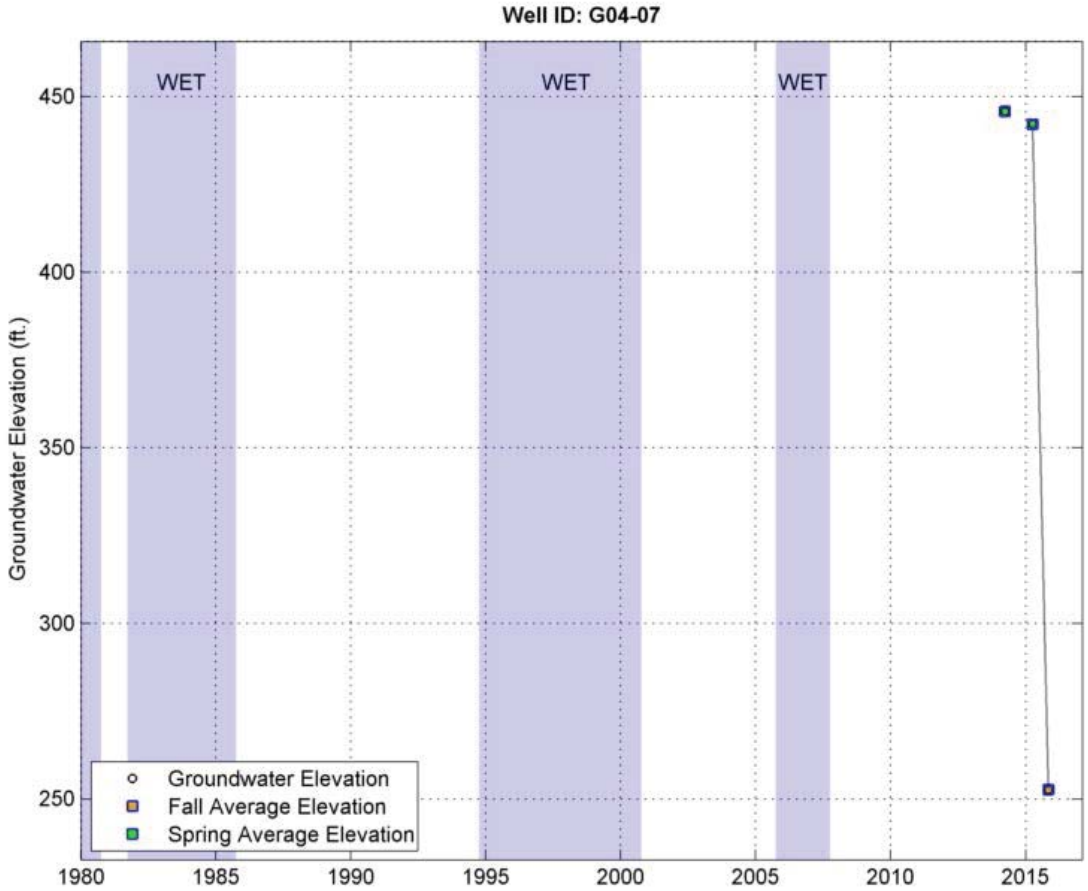

Well ID: G03-06
WET
WET
WET
5-year Trend:
-1.27 ft/yr
Groundwater Elevation (ft.)
540
520
500
480
460
440
420
400
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

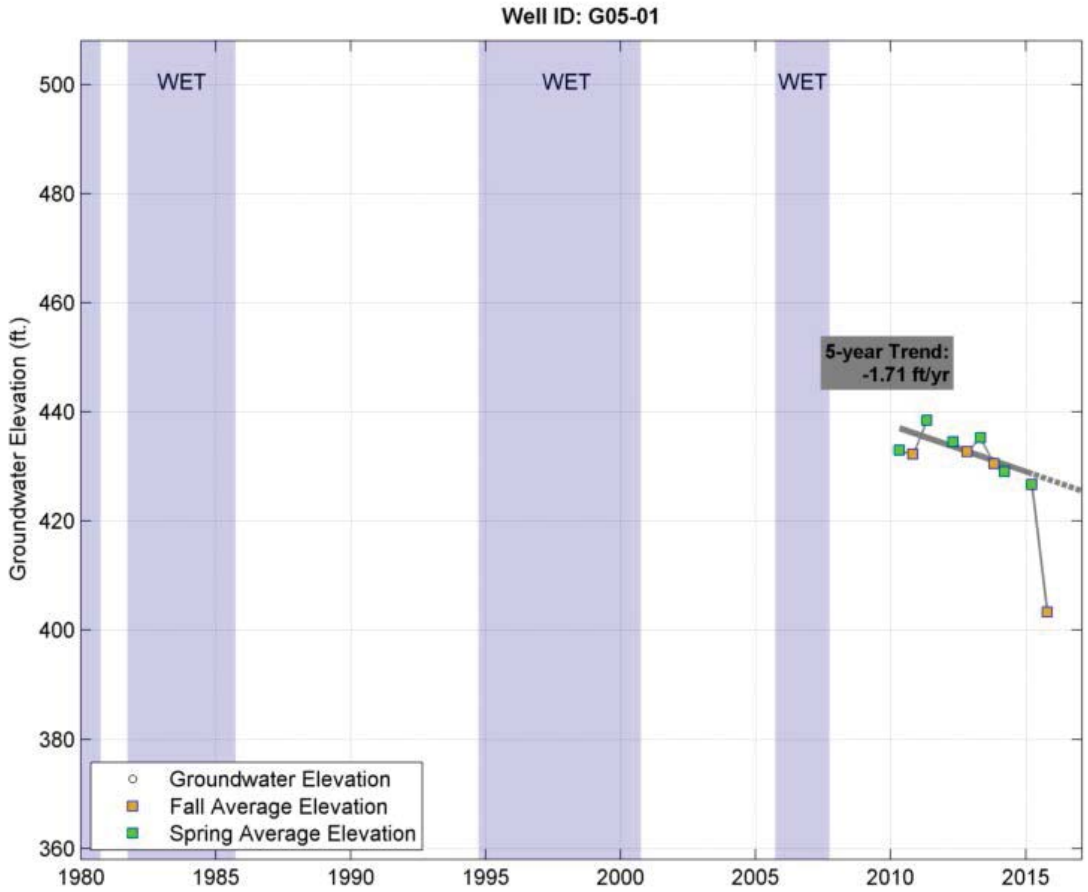

Well ID: G04-01
WET
WET
WET
Groundwater Elevation (ft.)
520
500
480
460
440
420
400
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

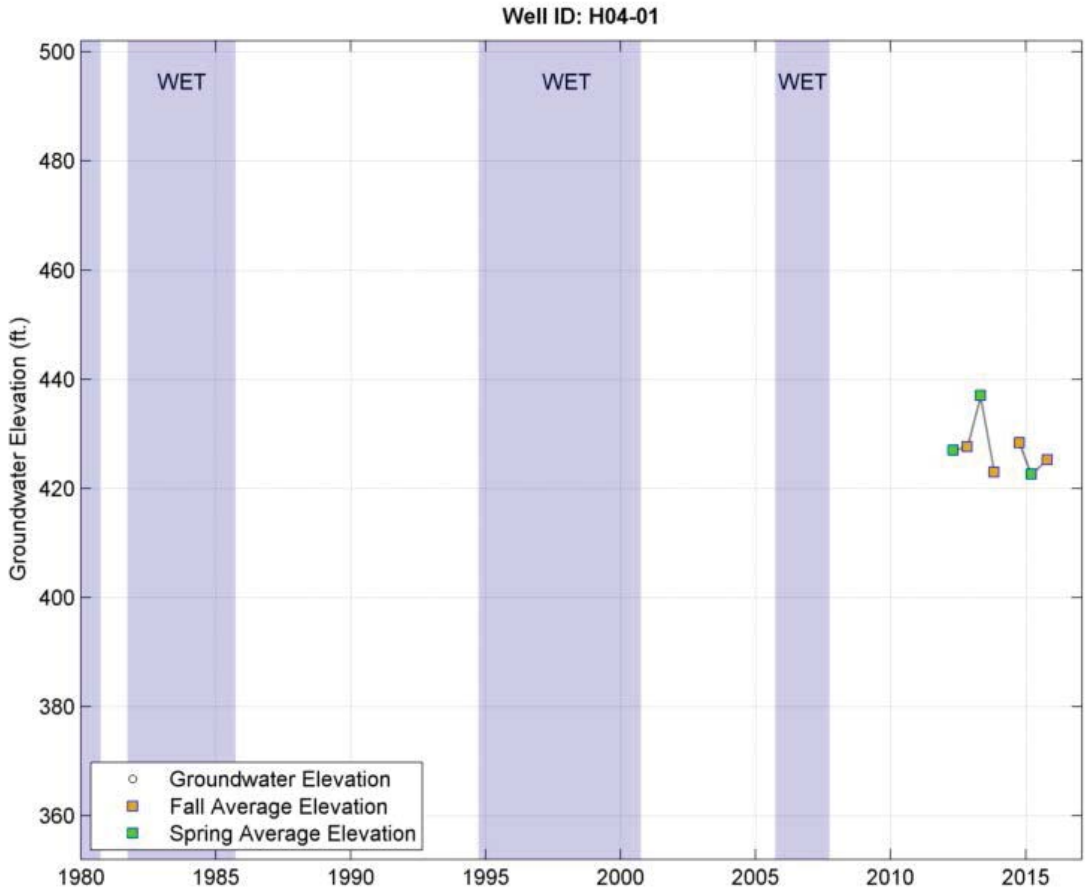

Well ID: G04-02
WET
WET
WET
10-year Trend:
-0.39 ft/yr
Groundwater Elevation (ft.)
520
500
480
460
440
420
400
380
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

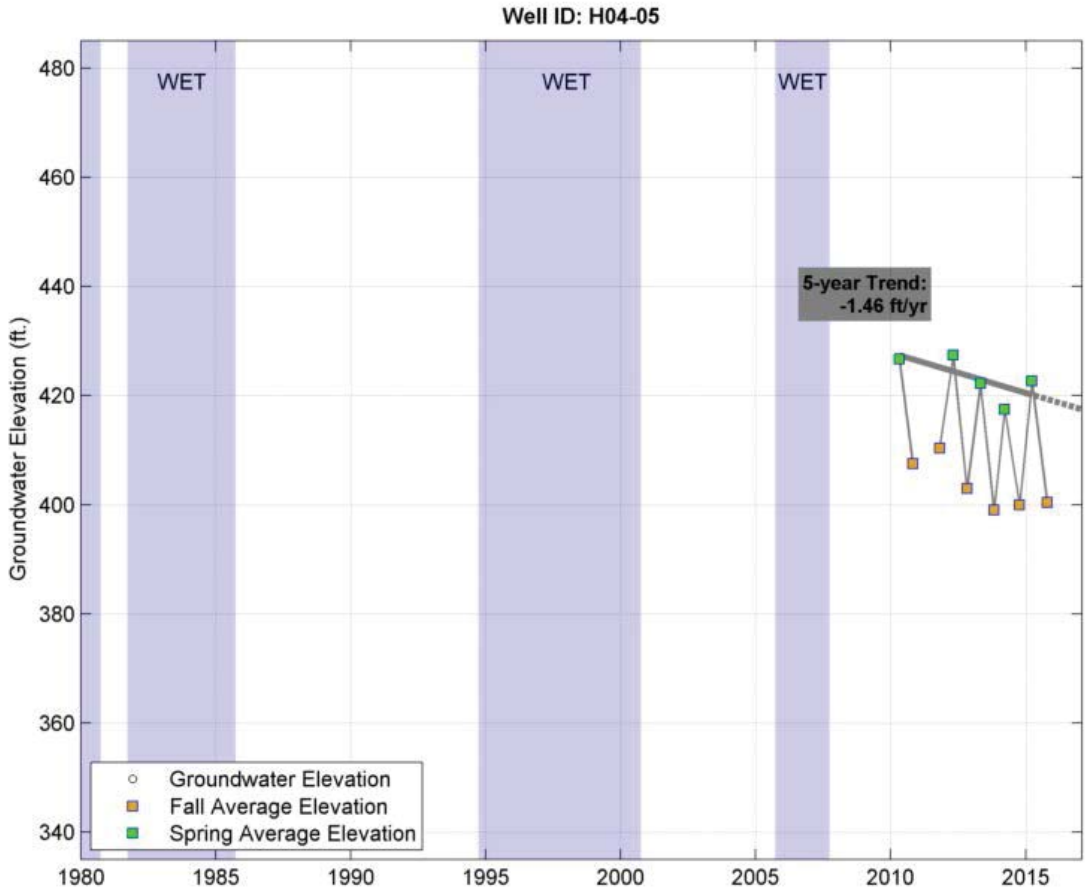

Well ID: G04-03
WET
WET
WET
5-year Trend:
-2.06 ft/yr
Groundwater Elevation (ft.)
480
460
440
420
400
380
360
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

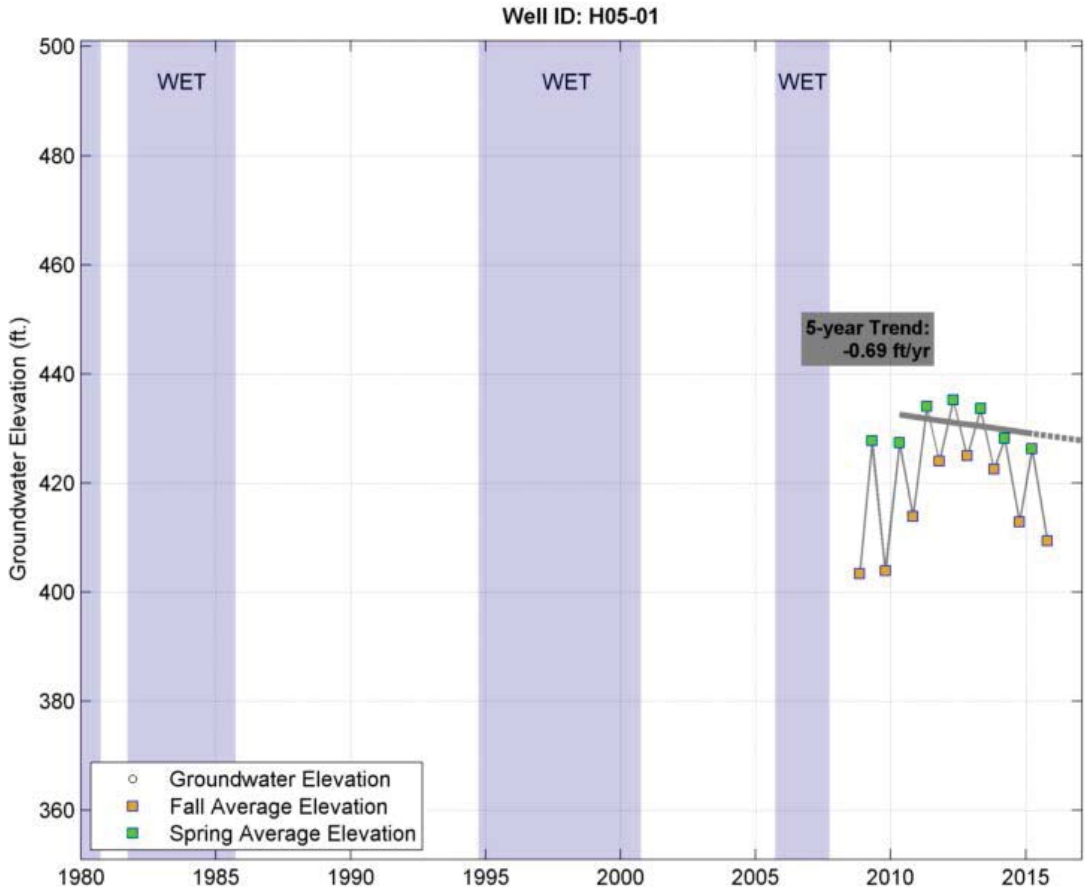

Well ID: G04-04
WET
WET
WET
5-year Trend:
-0.93 ft/yr
Groundwater Elevation (ft.)
480
460
440
420
400
380
360
340
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

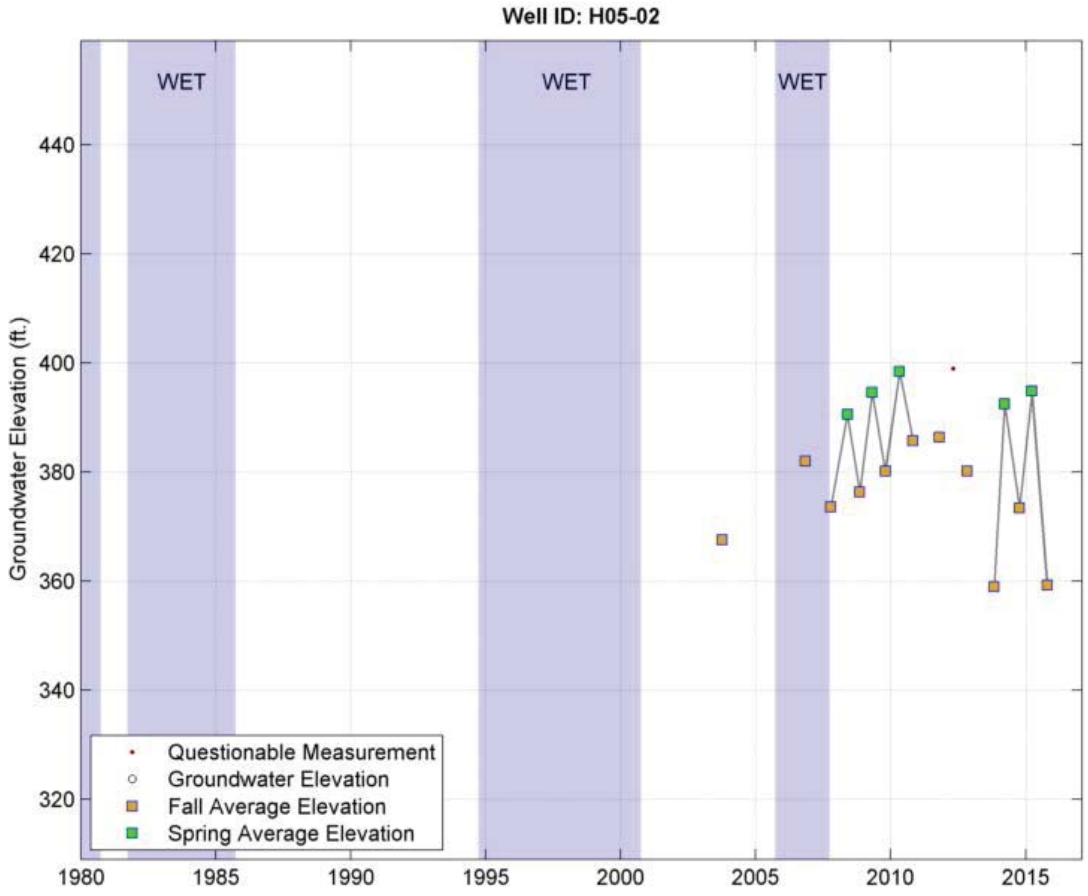

Well ID: G04-07
WET
WET
WET
Groundwater Elevation (ft.)
450
400
350
300
250
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

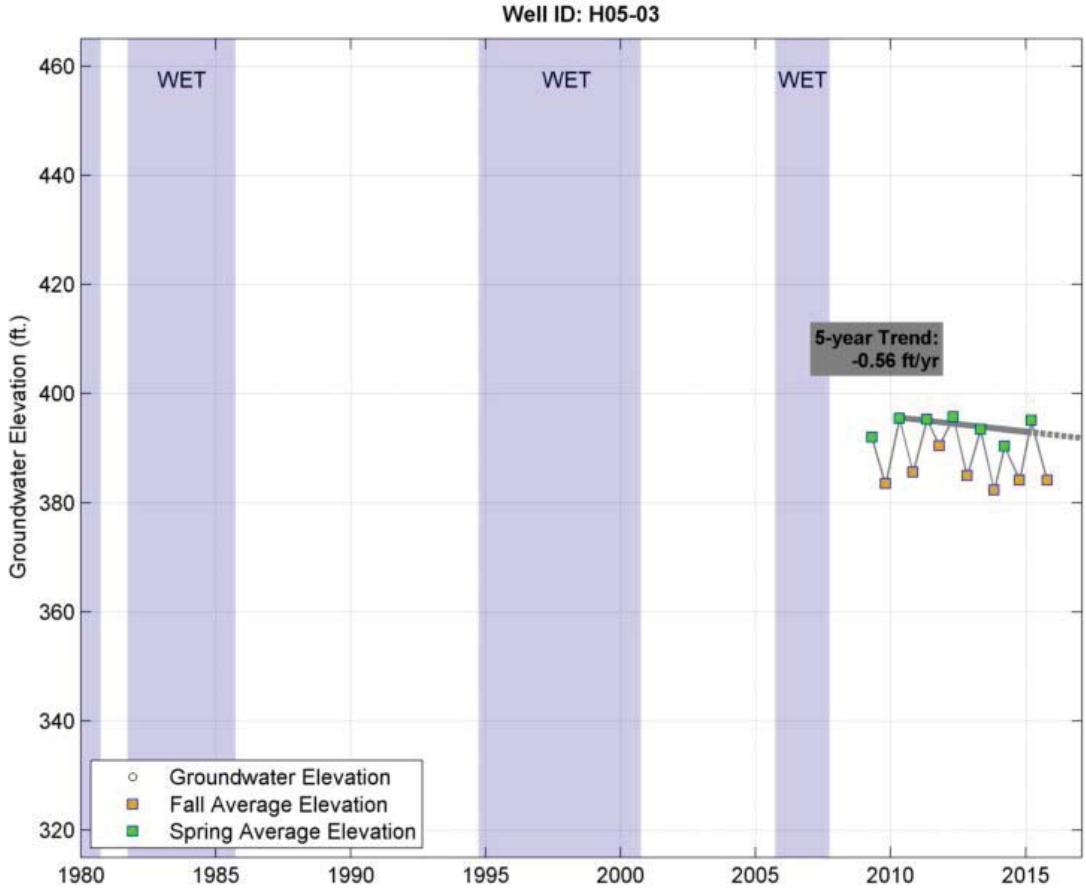

Well ID: G05-01
WET
WET
WET
5-year Trend:
-1.71 ft/yr
Groundwater Elevation (ft.)
500
480
460
440
420
400
380
360
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: H04-01
WET
WET
WET
Groundwater Elevation (ft.)
500
480
460
440
420
400
380
360
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

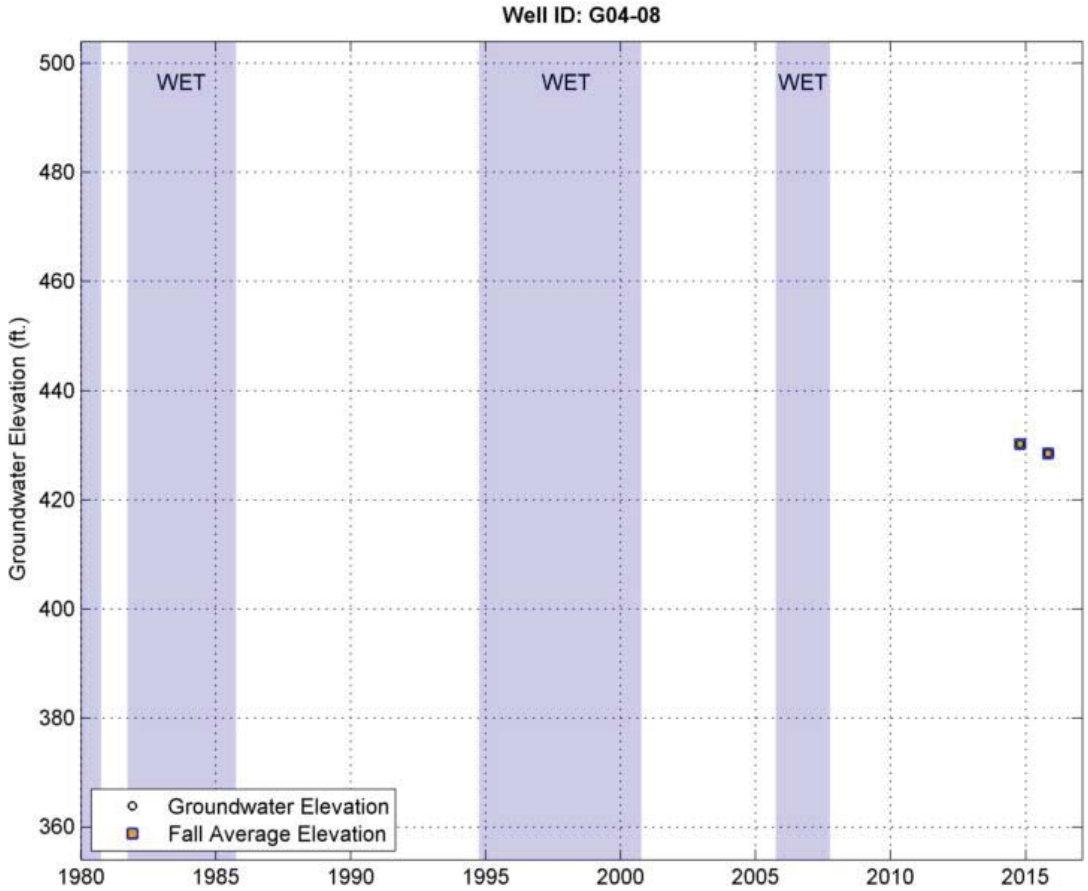

Well ID: H04-05
WET
WET
WET
5-year Trend:
-1.46 ft/yr
Groundwater Elevation (ft.)
480
460
440
420
400
380
360
340
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: H05-01
WET
WET
WET
5-year Trend:
-0.69 ft/yr
Groundwater Elevation (ft.)
500
480
460
440
420
400
380
360
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

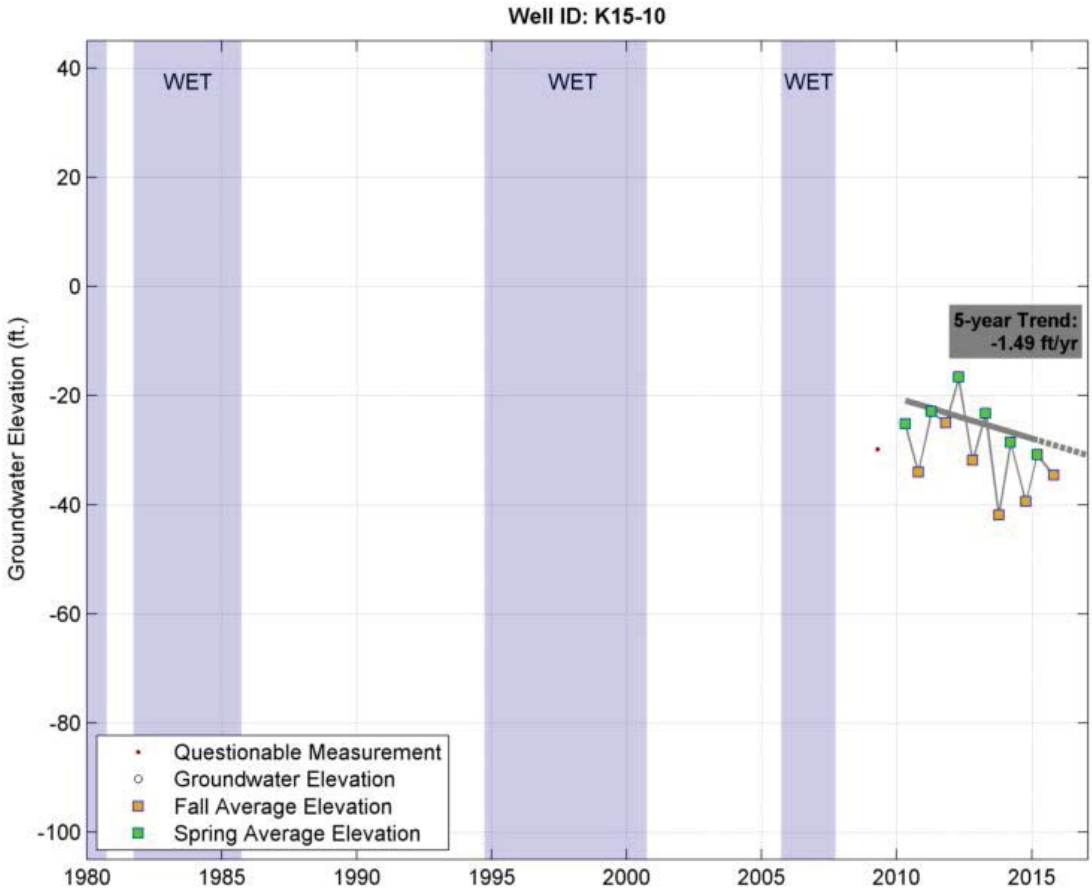

Well ID: H05-02
WET
WET
WET
Groundwater Elevation (ft.)
440
420
400
380
360
340
320
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: H05-03
WET
WET
WET
5-year Trend:
-0.56 ft/yr
Groundwater Elevation (ft.)
460
440
420
400
380
360
340
320
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

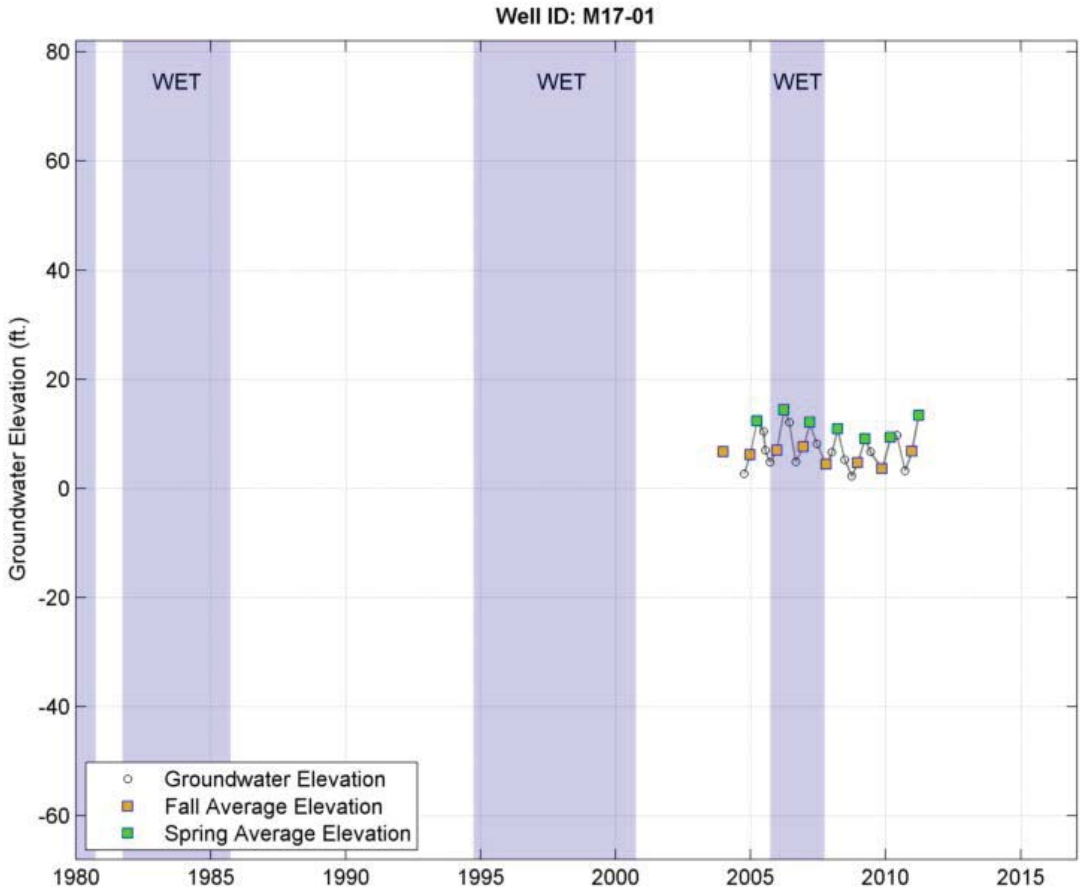
Kenwood Subarea
Unknown Depth

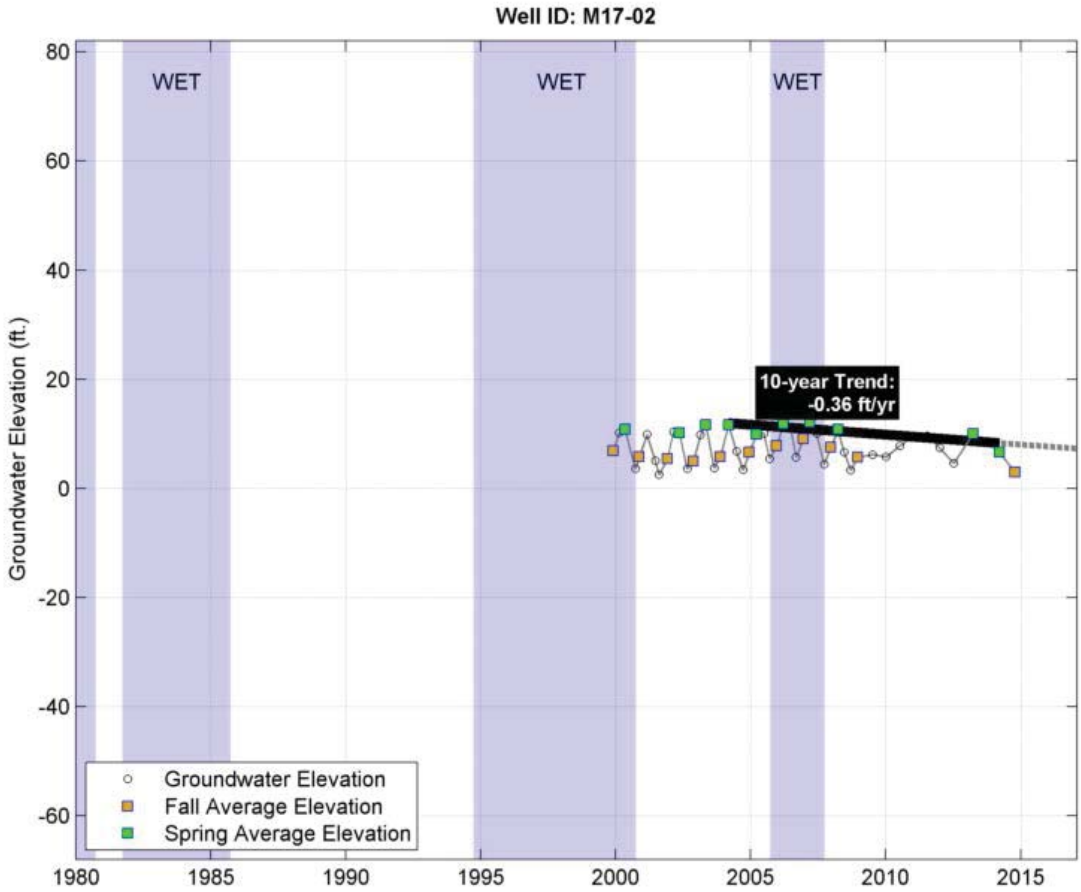

Well ID: G04-08
WET
WET
WET
Groundwater Elevation (ft.)
500
480
460
440
420
400
380
360
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation

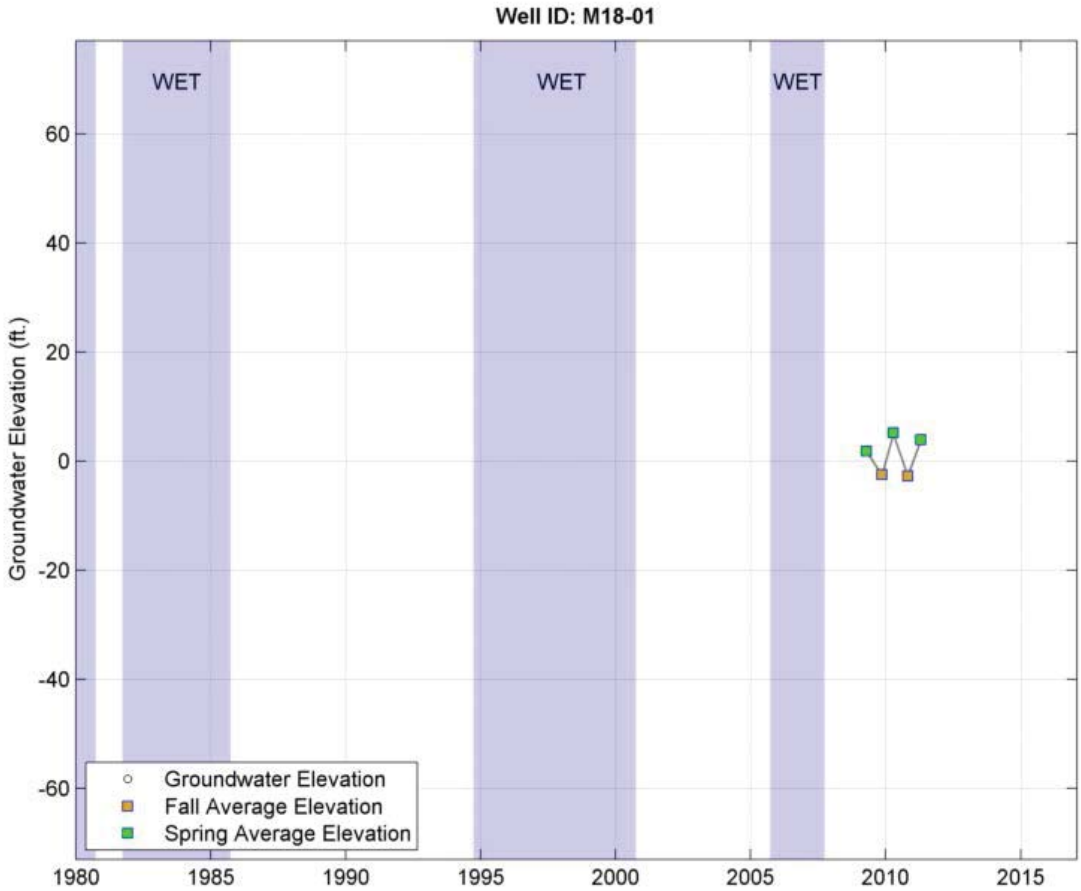
Rogers Creek Subarea
Deeper Wells (>200 feet deep)

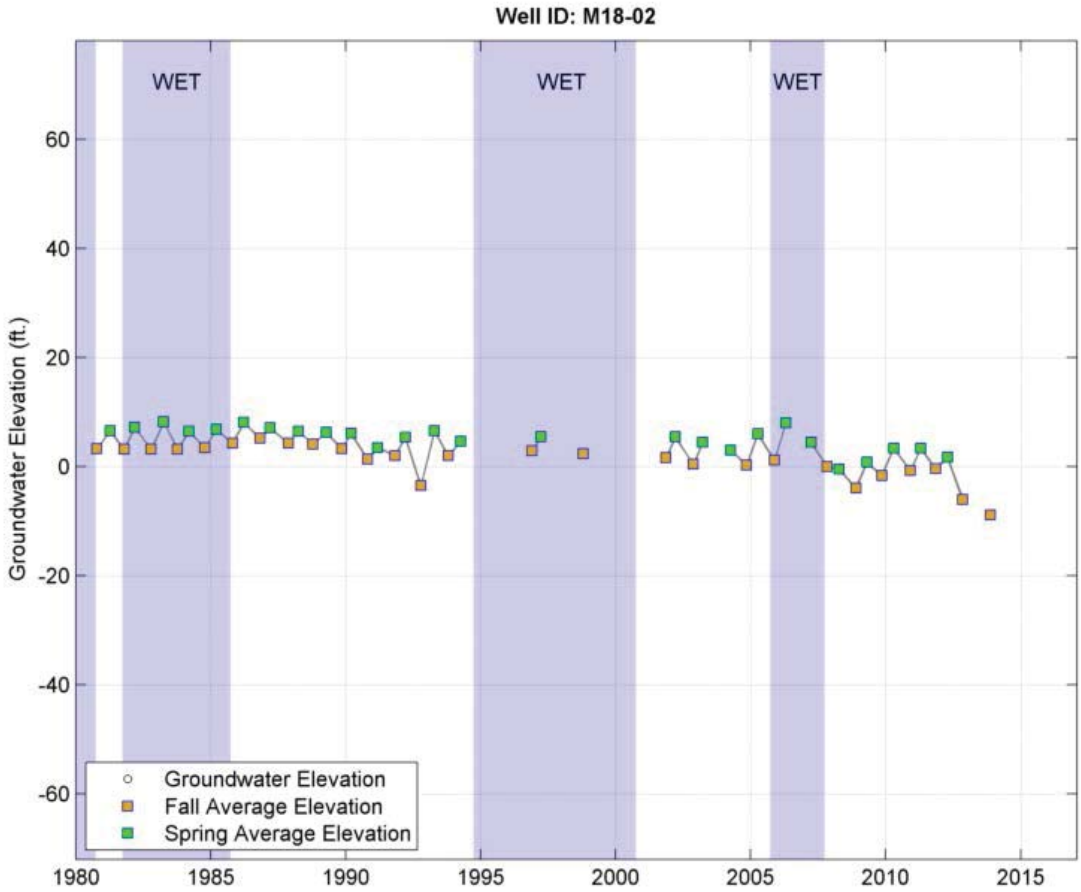

Well ID: K15-10
WET
WET
WET
5-year Trend:
-1.49 ft/yr
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
-100
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

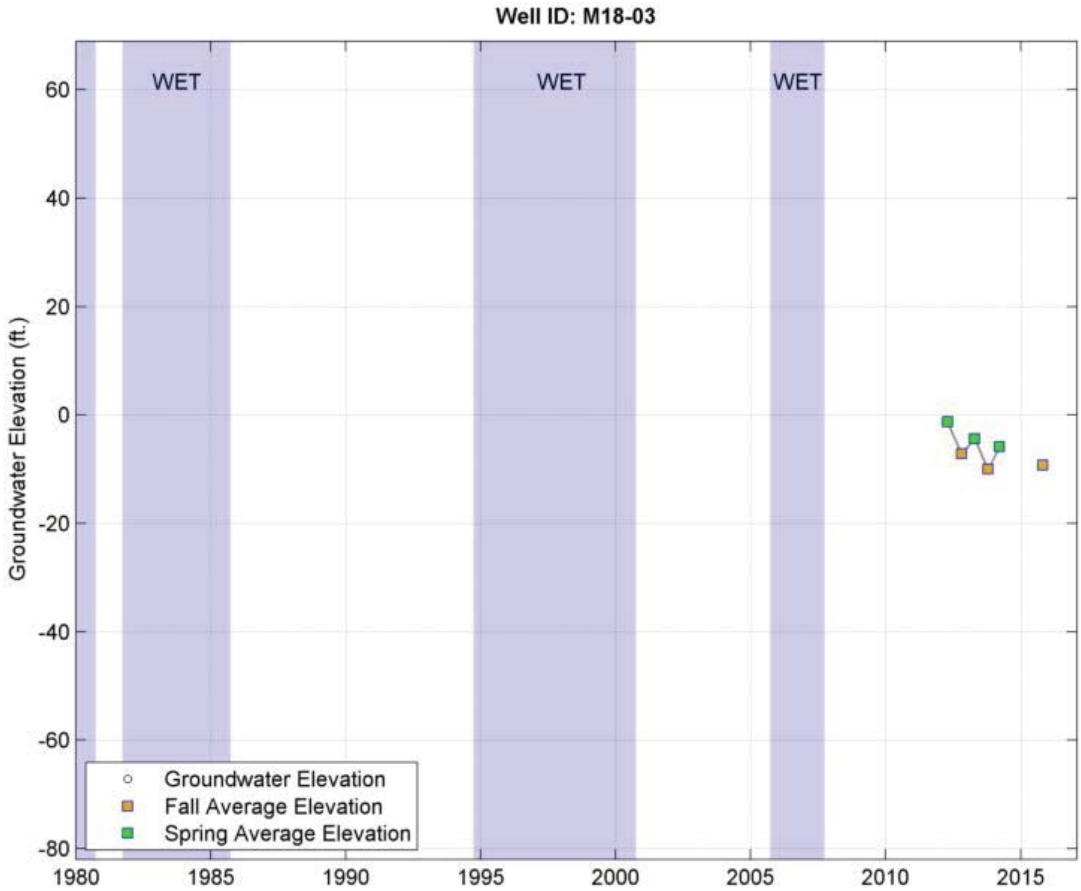
Rogers Creek Subarea
Shallow Wells (<200 feet deep)

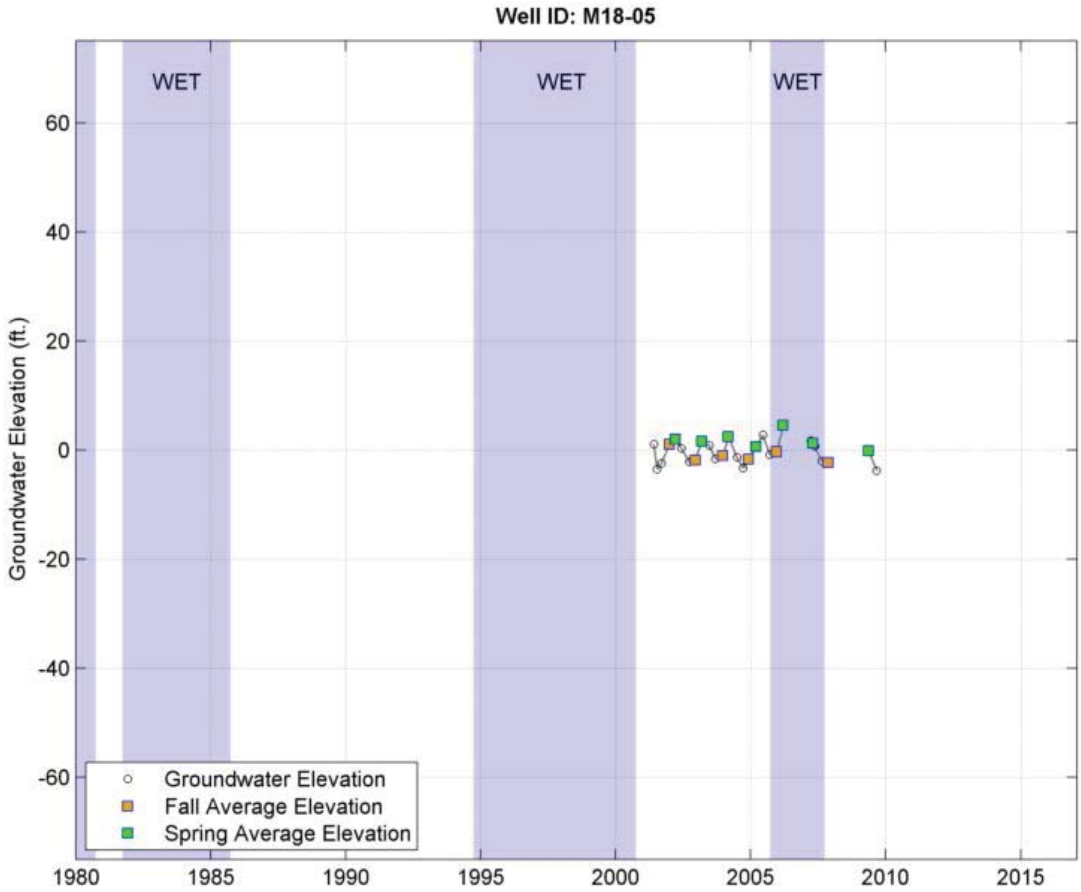

Well ID: M17-01
WET
WET
WET
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: M17-02
WET
WET
WET
10-year Trend:
-0.36 ft/yr
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

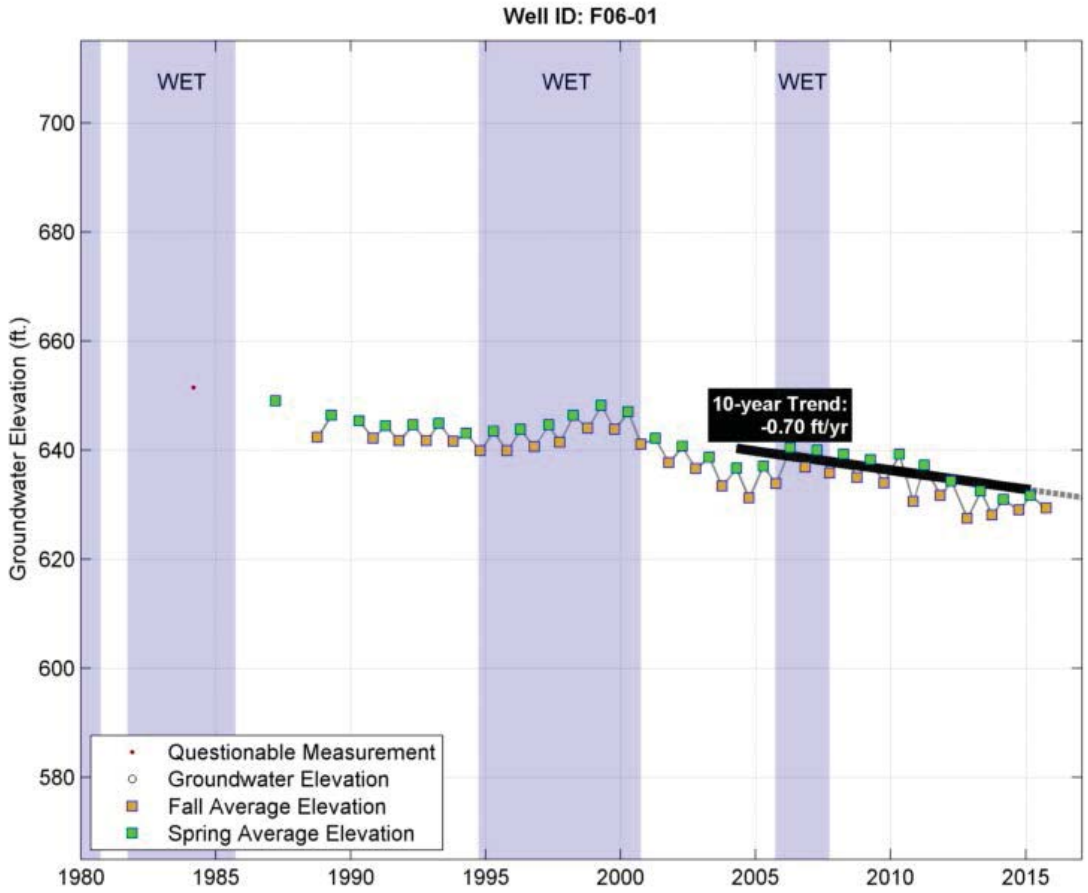

Well ID: M18-01
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

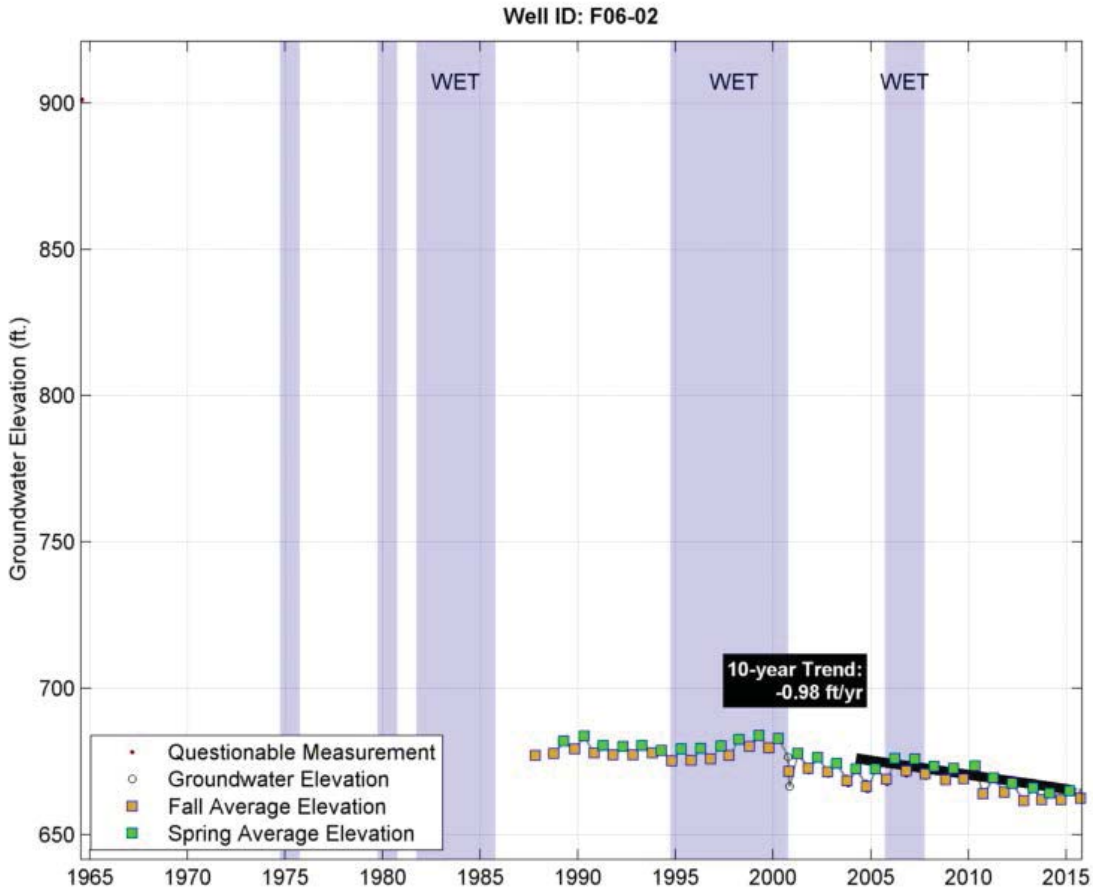

Well ID: M18-02
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

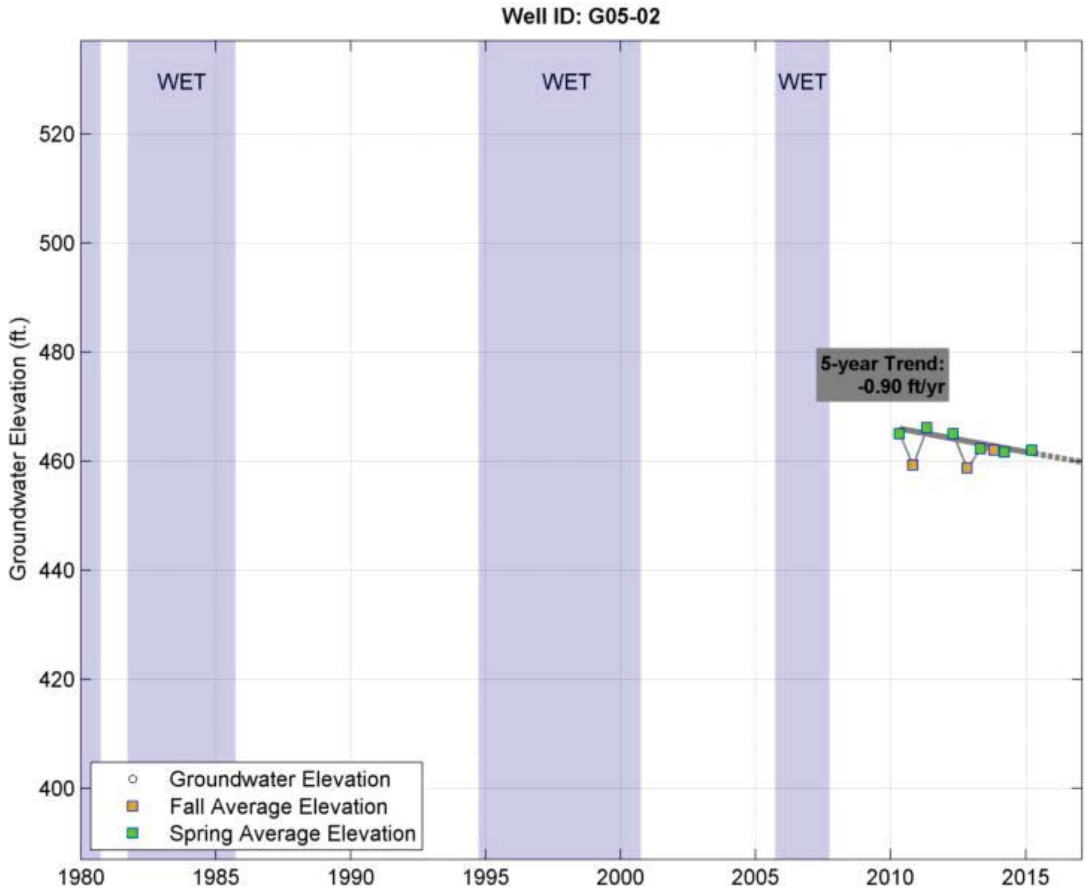

Well ID: M18-03
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

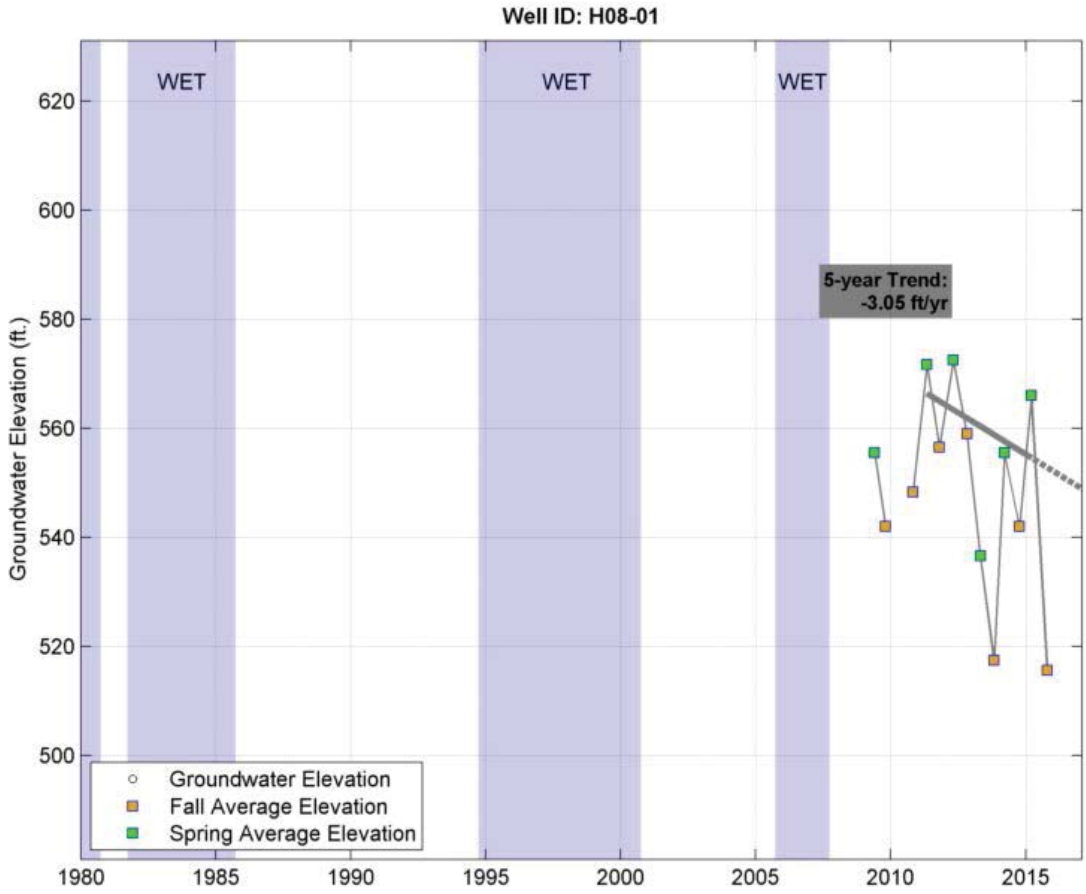

Well ID: M18-05
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

Western Upland Subarea
Deeper Wells (>200 feet deep)

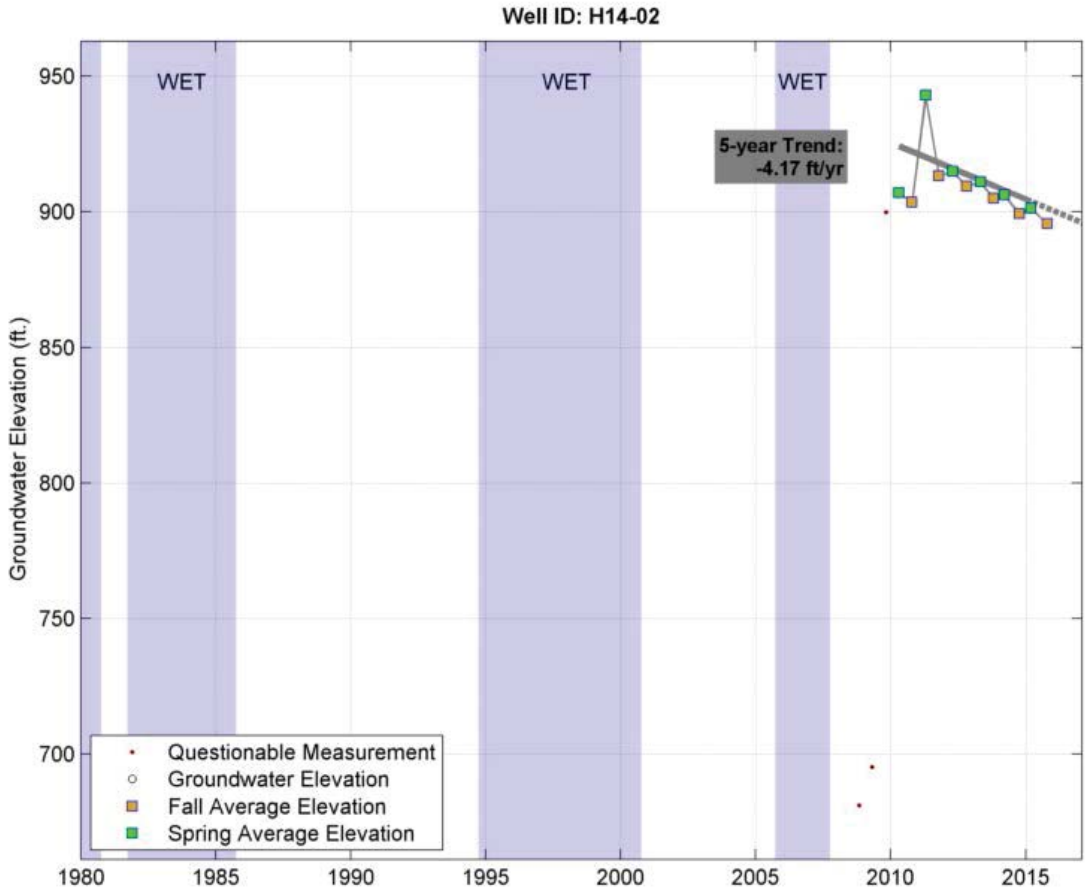

Well ID: F06-01
WET
WET
WET
10-year Trend:
-0.70 ft/yr
Groundwater Elevation (ft.)
700
680
660
640
620
600
580
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

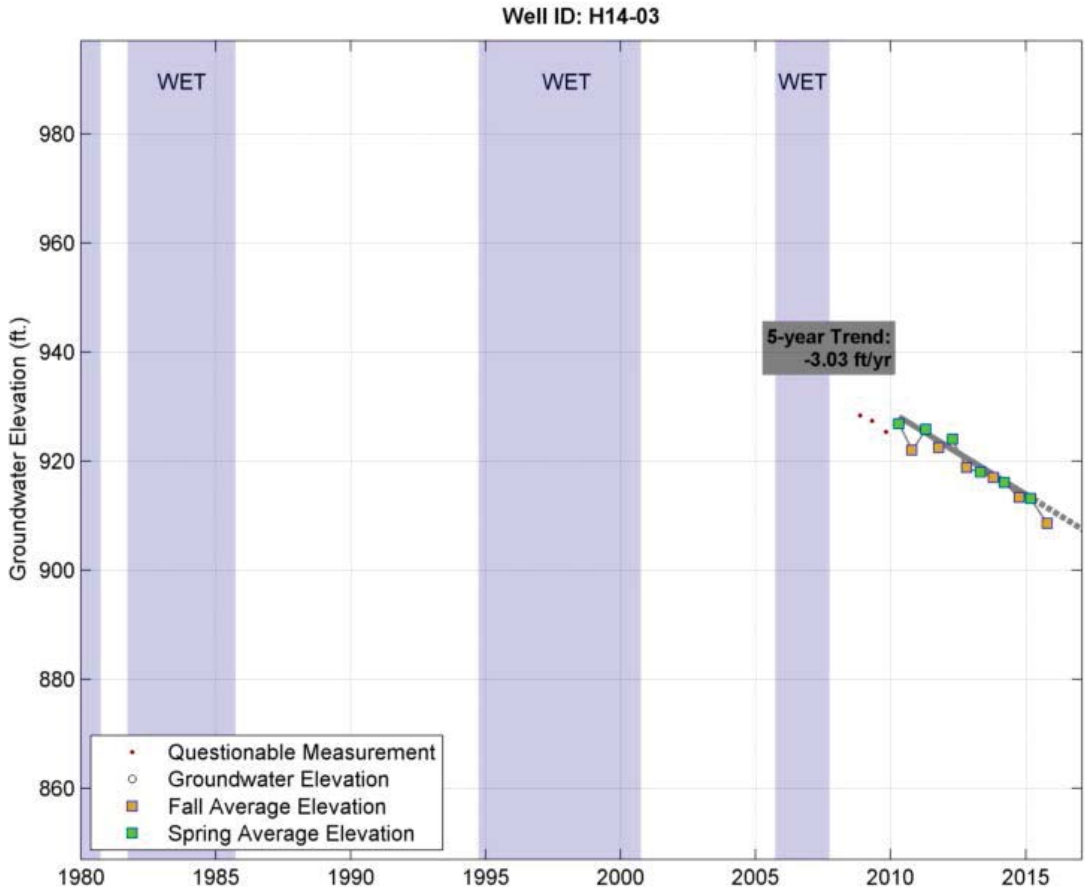

Well ID: F06-02
WET
WET
WET
10-year Trend:
-0.98 ft/yr
Groundwater Elevation (ft.)
900
850
800
750
700
650
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

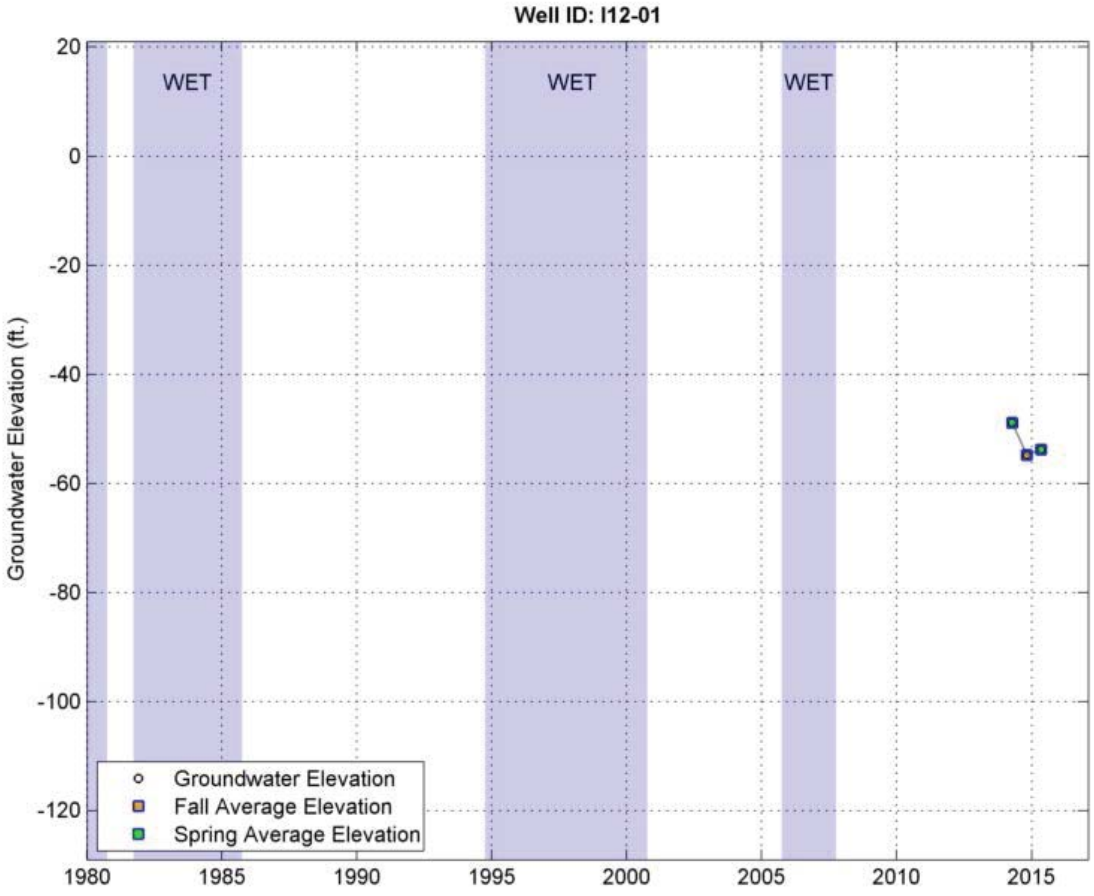

Well ID: G05-02
WET
WET
WET
5-year Trend:
-0.90 ft/yr
Groundwater Elevation (ft.)
520
500
480
460
440
420
400
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

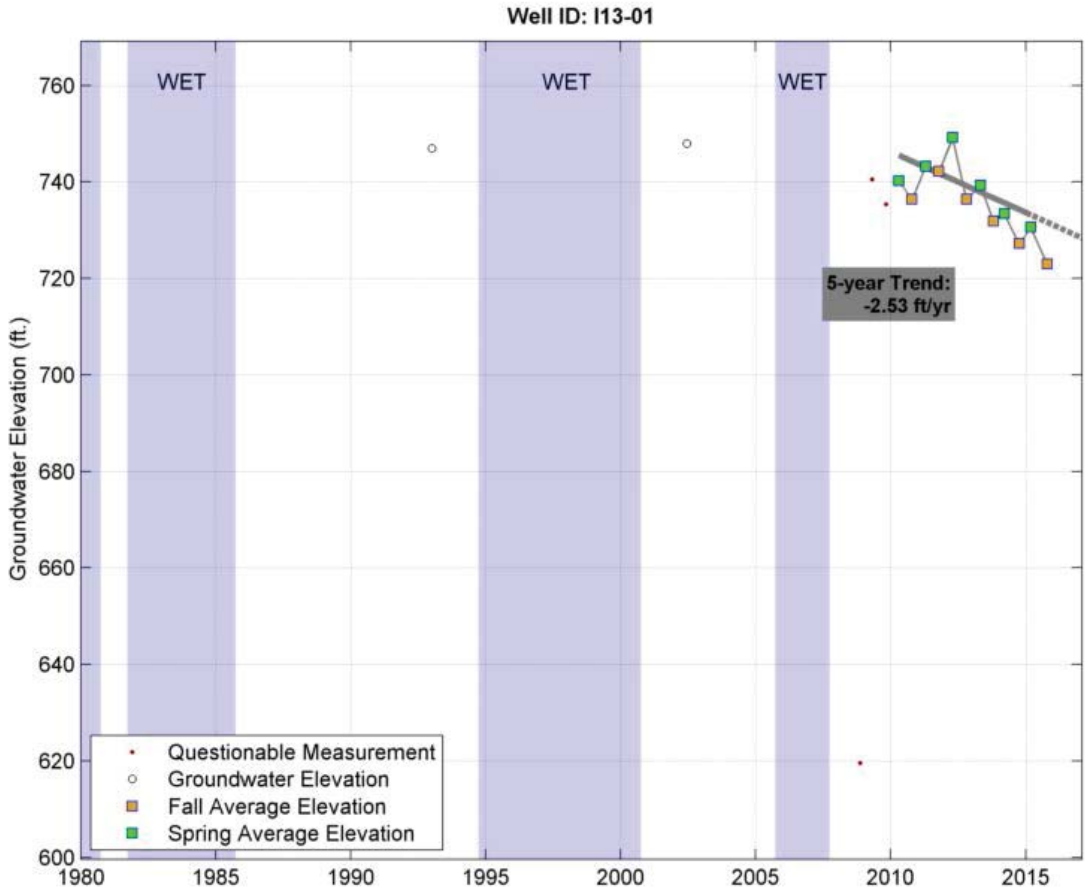

Well ID: H08-01
WET
WET
WET
5-year Trend:
-3.05 ft/yr
Groundwater Elevation (ft.)
620
600
580
560
540
520
500
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

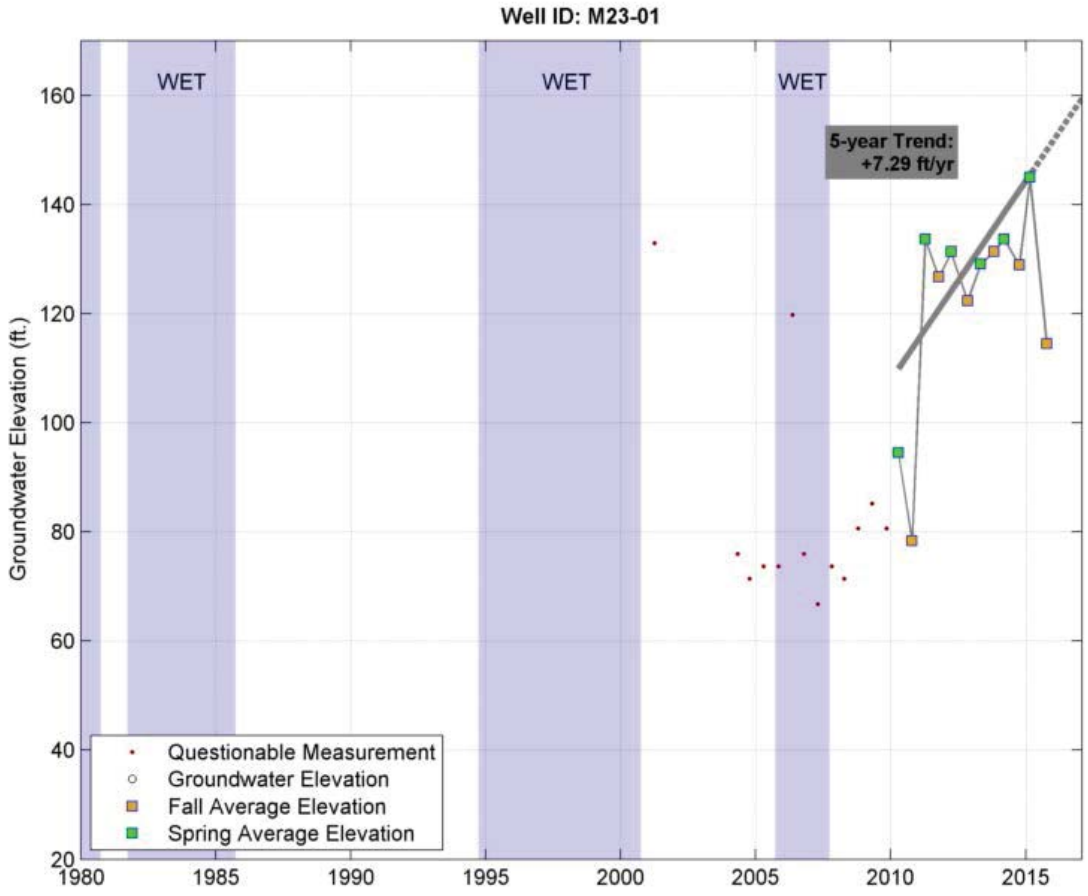
Well ID: H14-01
WET
WET
WET
5-year Trend:
-4.94 ft/yr
Groundwater Elevation (ft.)
980
960
940
920
900
880
860
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: H14-02
WET
WET
WET
5-year Trend:
-4.17 ft/yr
Groundwater Elevation (ft.)
950
900
850
800
750
700
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

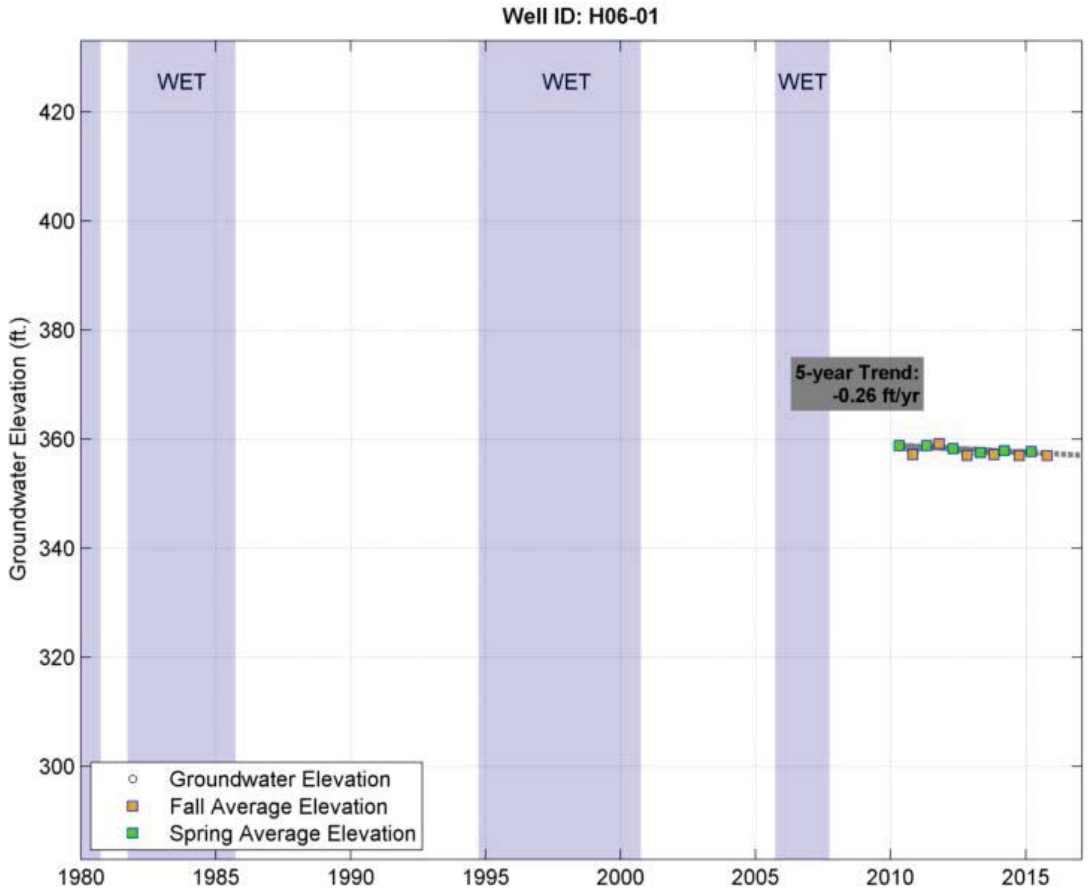

Well ID: H14-03
WET
WET
WET
5-year Trend:
-3.03 ft/yr
Groundwater Elevation (ft.)
980
960
940
920
900
880
860
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

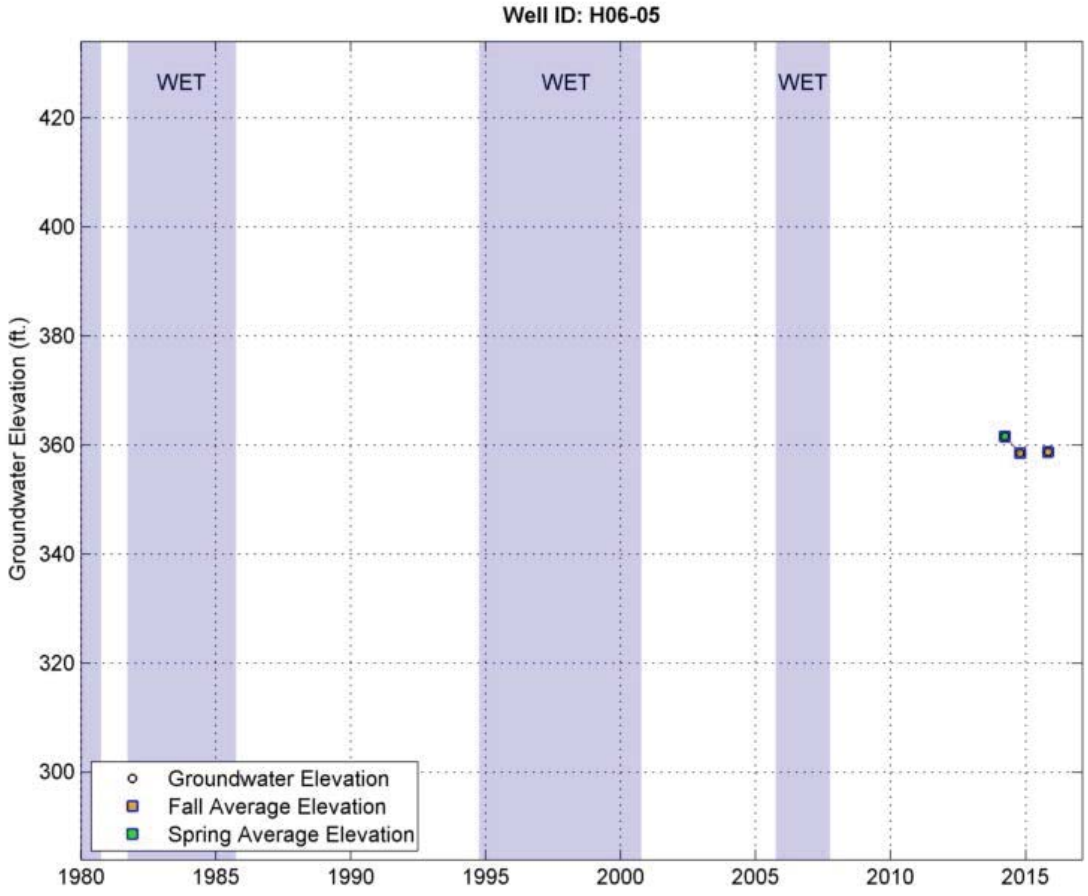

Well ID: I12-01
WET
WET
WET
Groundwater Elevation (ft.)
20
0
-20
-40
-60
-80
-100
-120
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

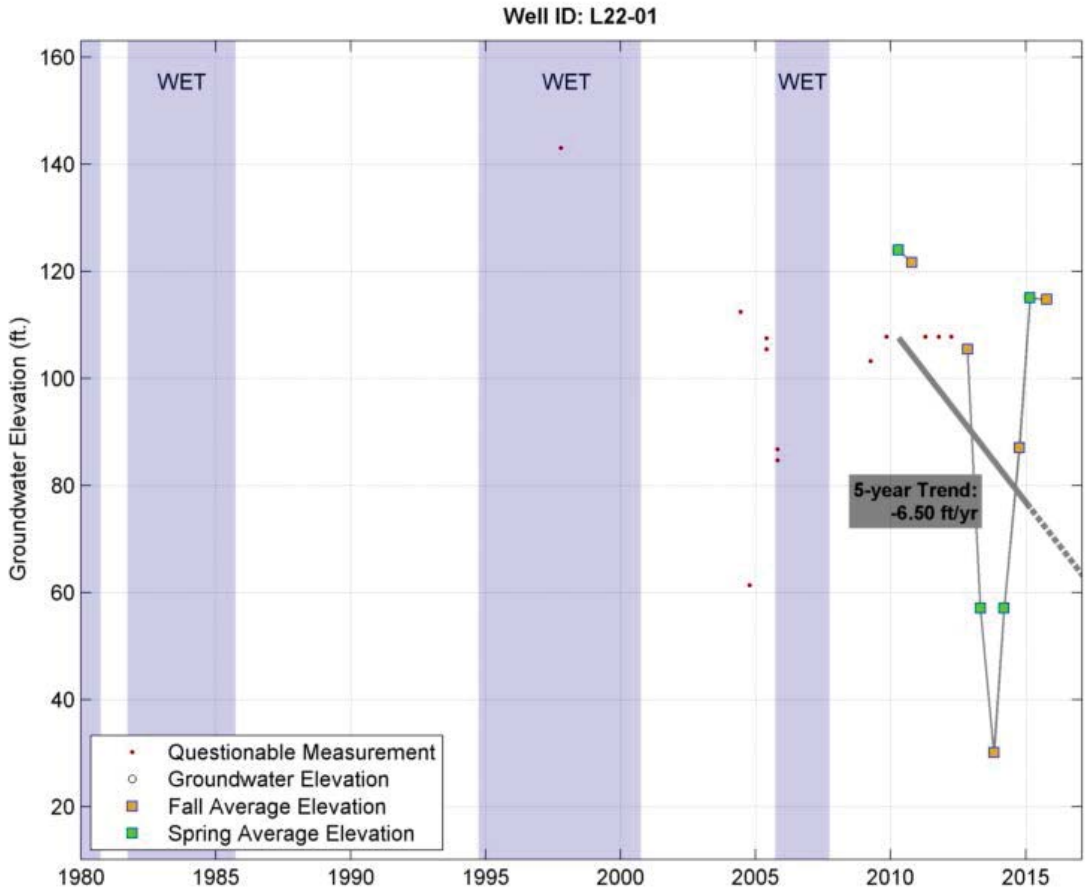

Well ID: I13-01
WET
WET
WET
5-year Trend:
-2.53 ft/yr
Groundwater Elevation (ft.)
760
740
720
700
680
660
640
620
600
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

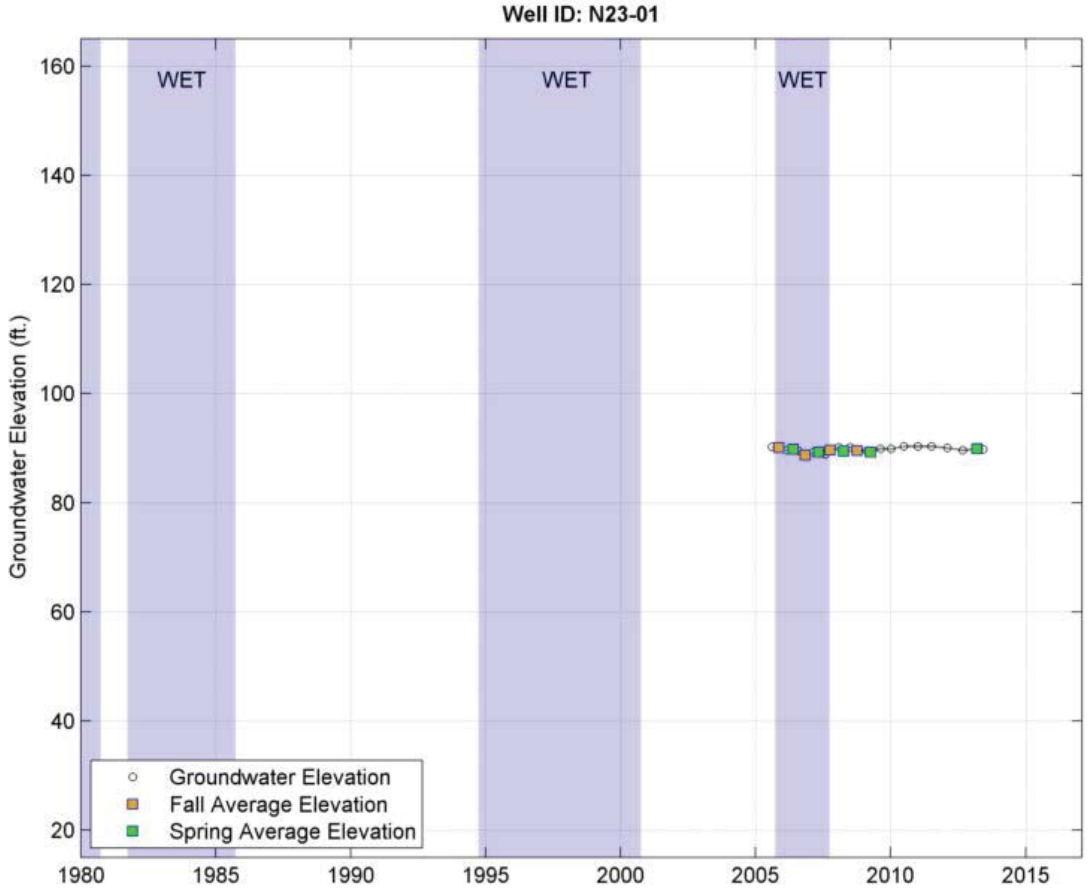

Well ID: M23-01
WET
WET
WET
5-year Trend:
+7.29 ft/yr
Groundwater Elevation (ft.)
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

Western Upland Subarea
Shallow Wells (<200 feet deep)

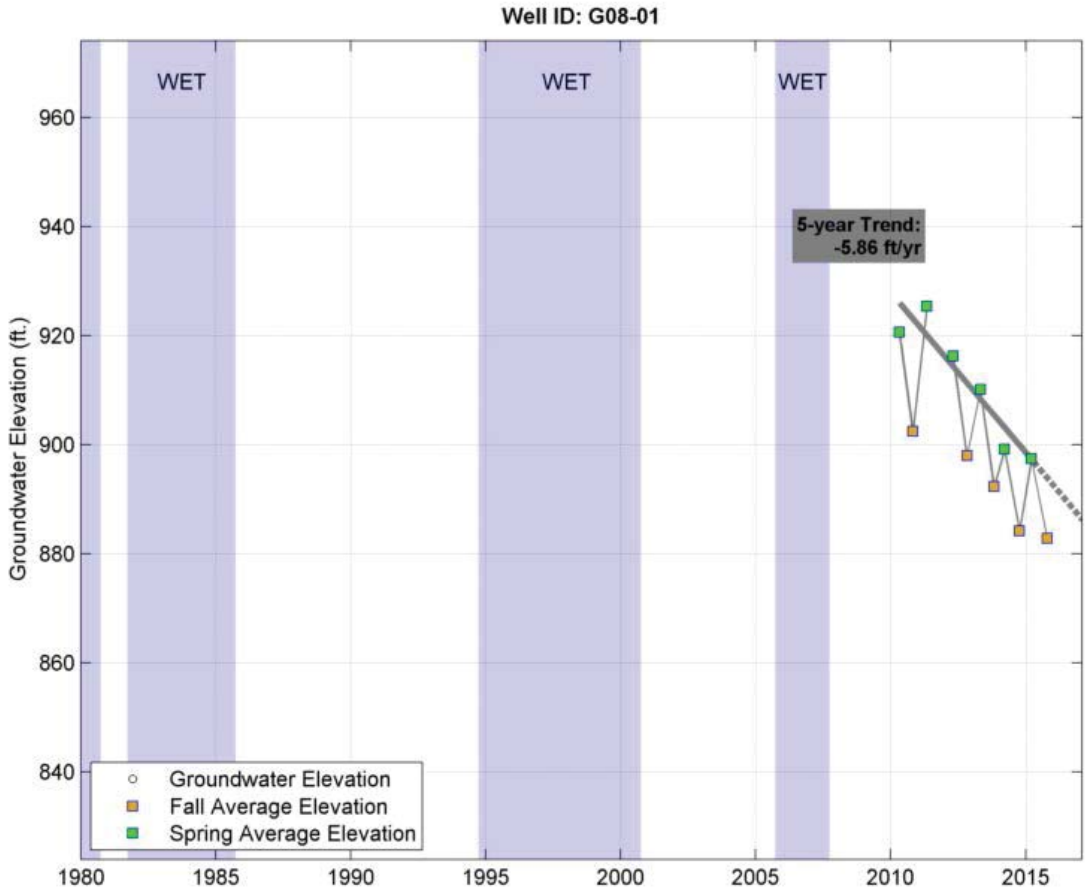

Well ID: H06-01
WET
WET
WET
5-year Trend:
-0.26 ft/yr
Groundwater Elevation (ft.)
420
400
380
360
340
320
300
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

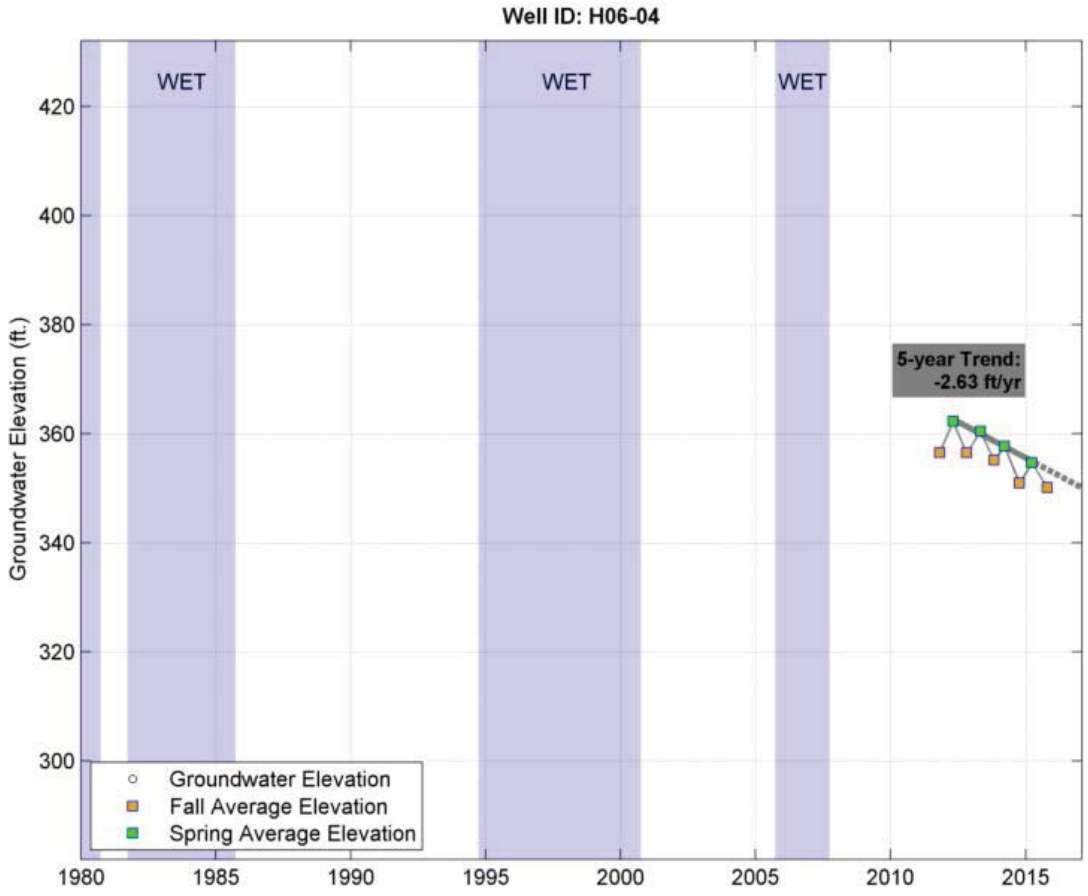

Well ID: H06-05
WET
WET
WET
Groundwater Elevation (ft.)
420
400
380
360
340
320
300
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: L22-01
WET
WET
WET
5-year Trend:
-6.50 ft/yr
Groundwater Elevation (ft.)
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015


Well ID: N23-01
WET
WET
WET
Groundwater Elevation (ft.)
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015

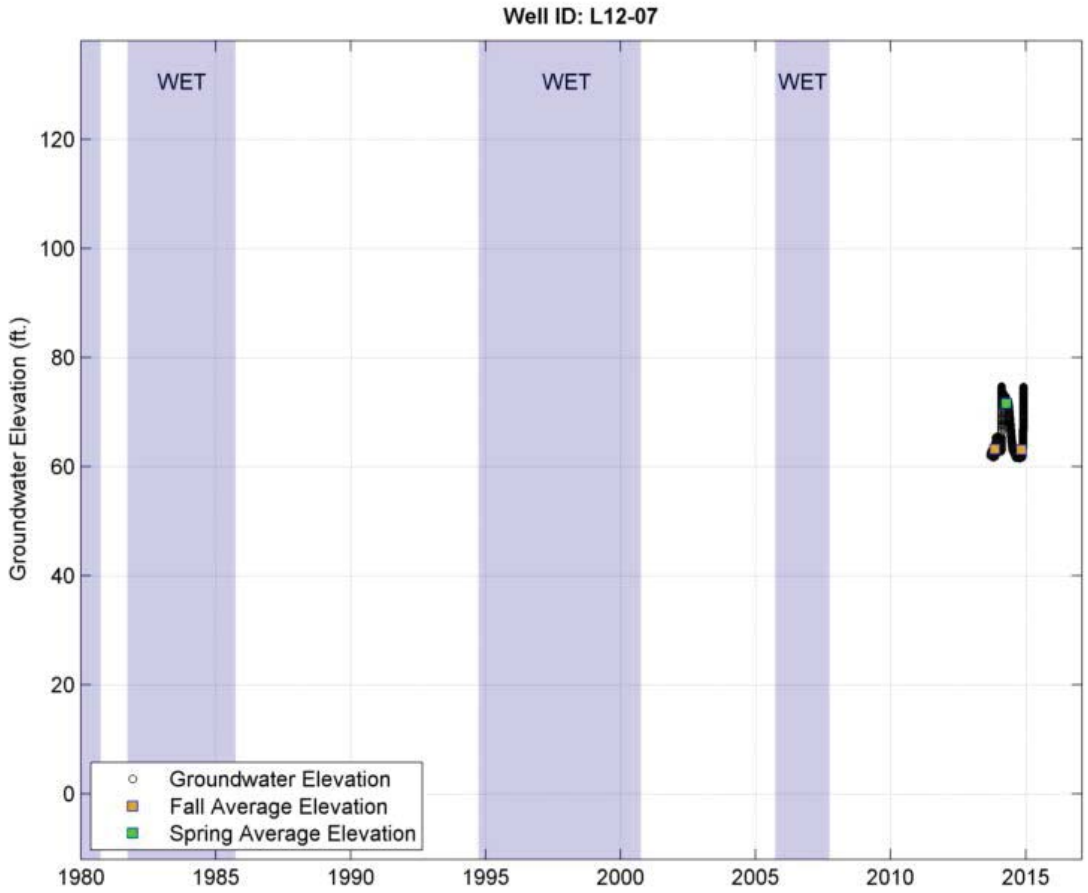
Western Upland Subarea
Unknown Depth

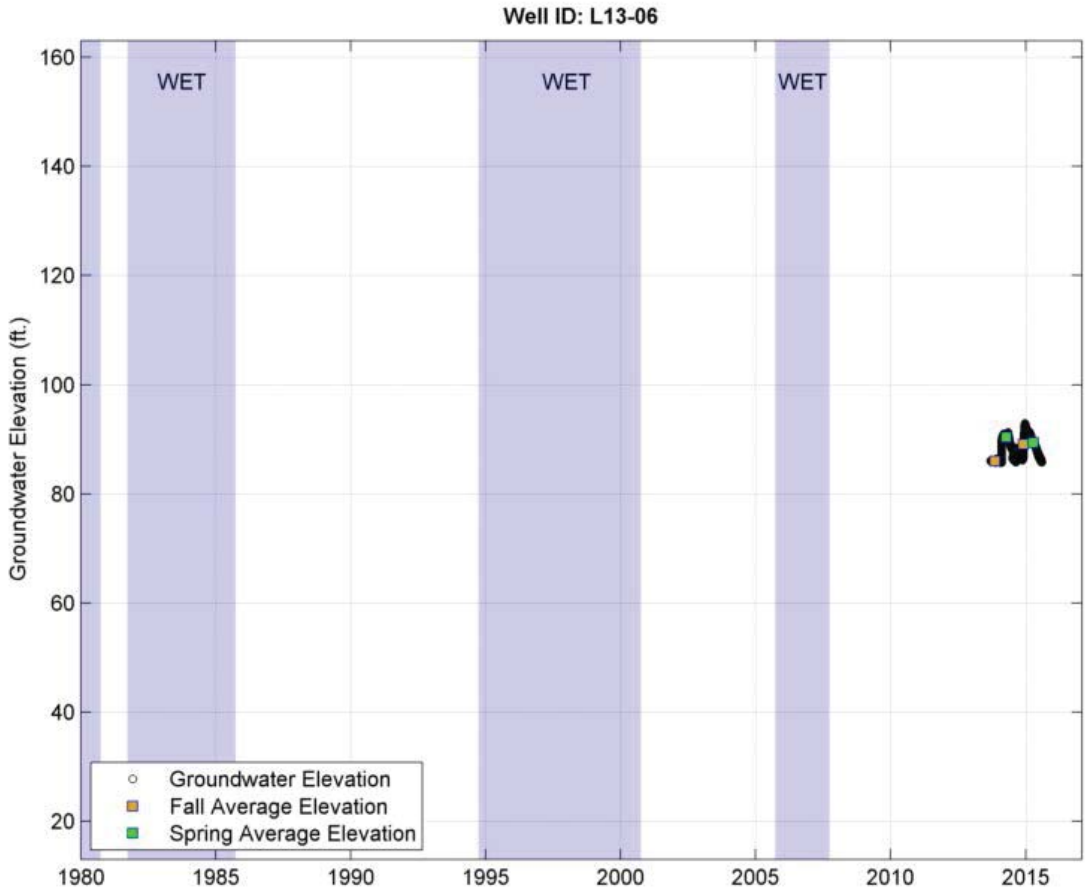

Well ID: G08-01
WET
WET
WET
5-year Trend:
-5.86 ft/yr
Groundwater Elevation (ft.)
960
940
920
900
880
860
840
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

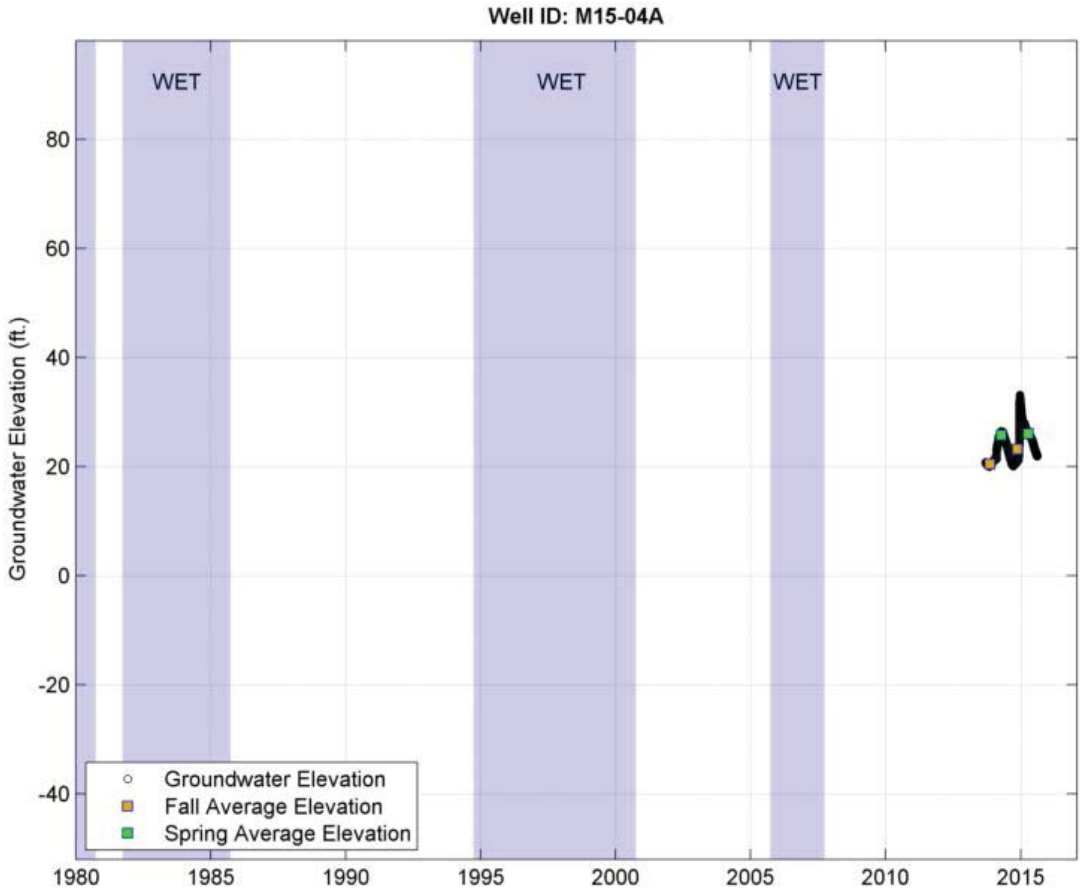

Well ID: H06-04
WET
WET
WET
5-year Trend:
-2.63 ft/yr
Groundwater Elevation (ft.)
420
400
380
360
340
320
300
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

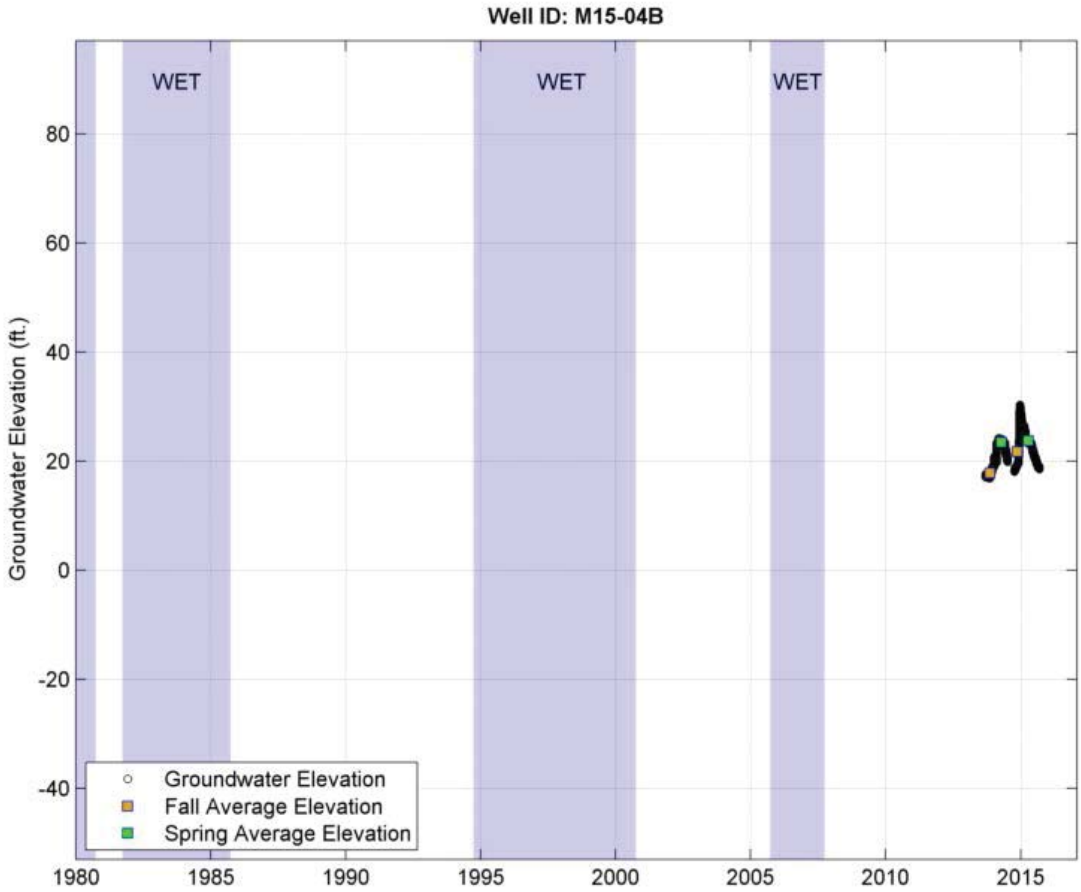
Appendix B
Data From Pressure Transducers

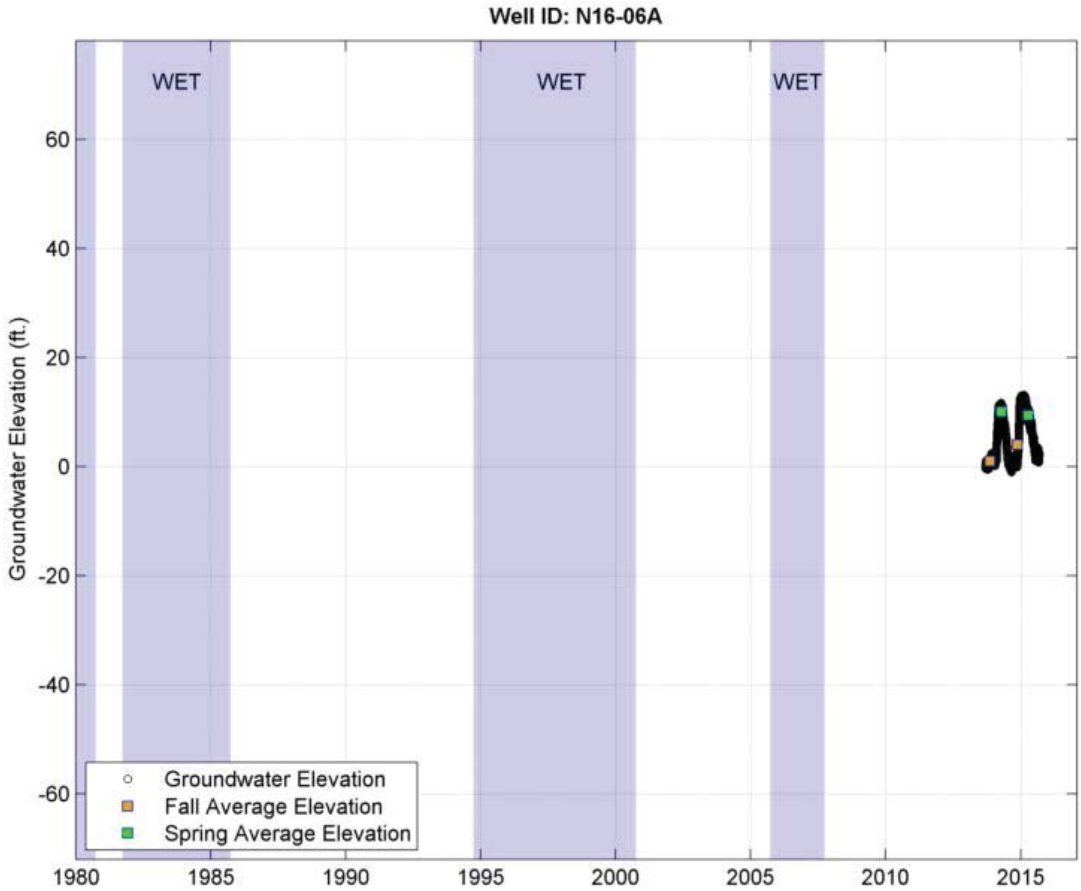
Shallow Wells (<200 feet deep)


Well ID: L12-07
WET
WET
WET
Groundwater Elevation (ft.)
120
100
80
60
40
20
0
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

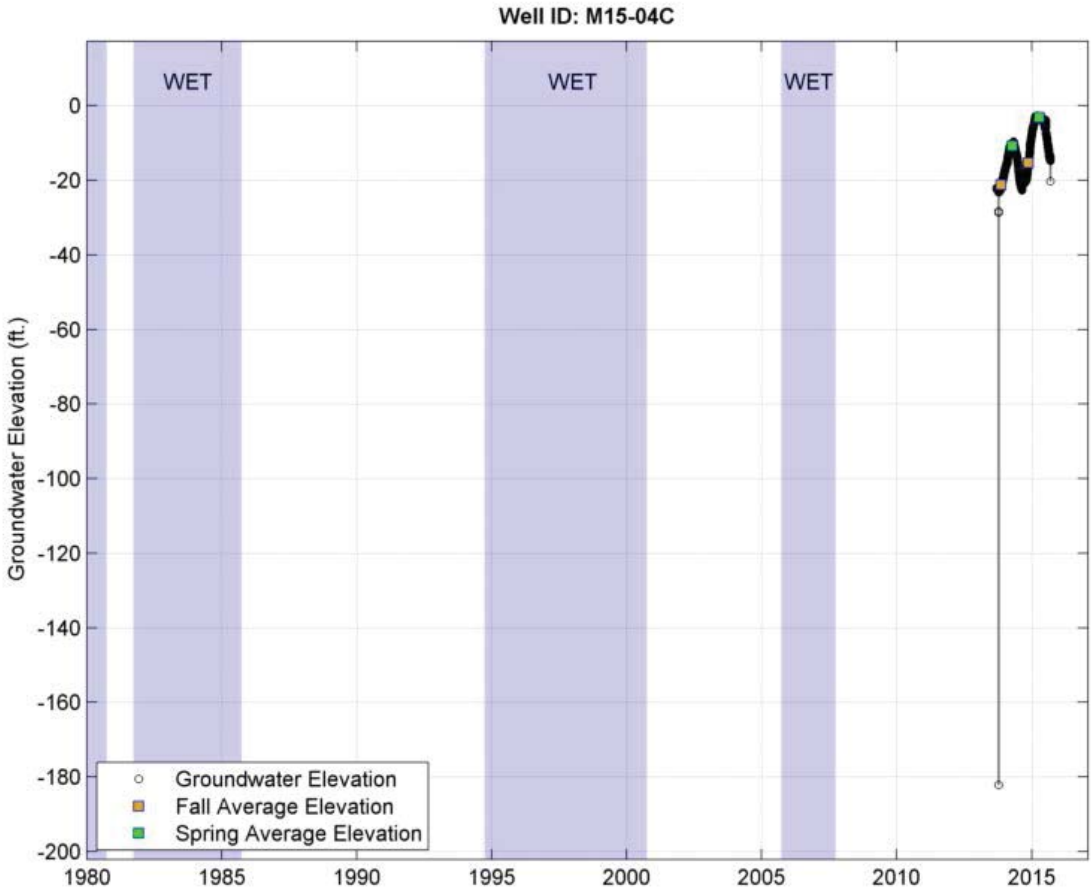

Well ID: L13-06
WET
WET
WET
Groundwater Elevation (ft.)
160
140
120
100
80
60
40
20
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation
1980
1985
1990
1995
2000
2005
2010
2015

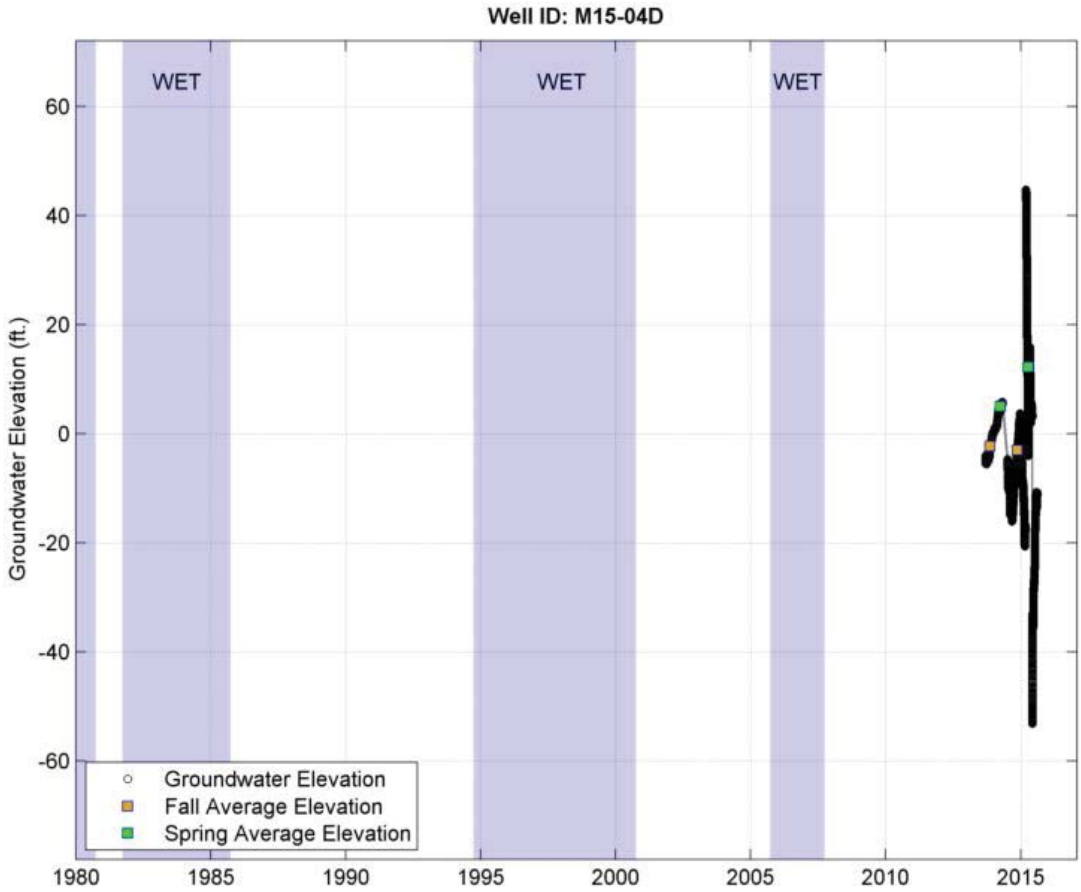

Well ID: M15-04A
WET
WET
WET
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

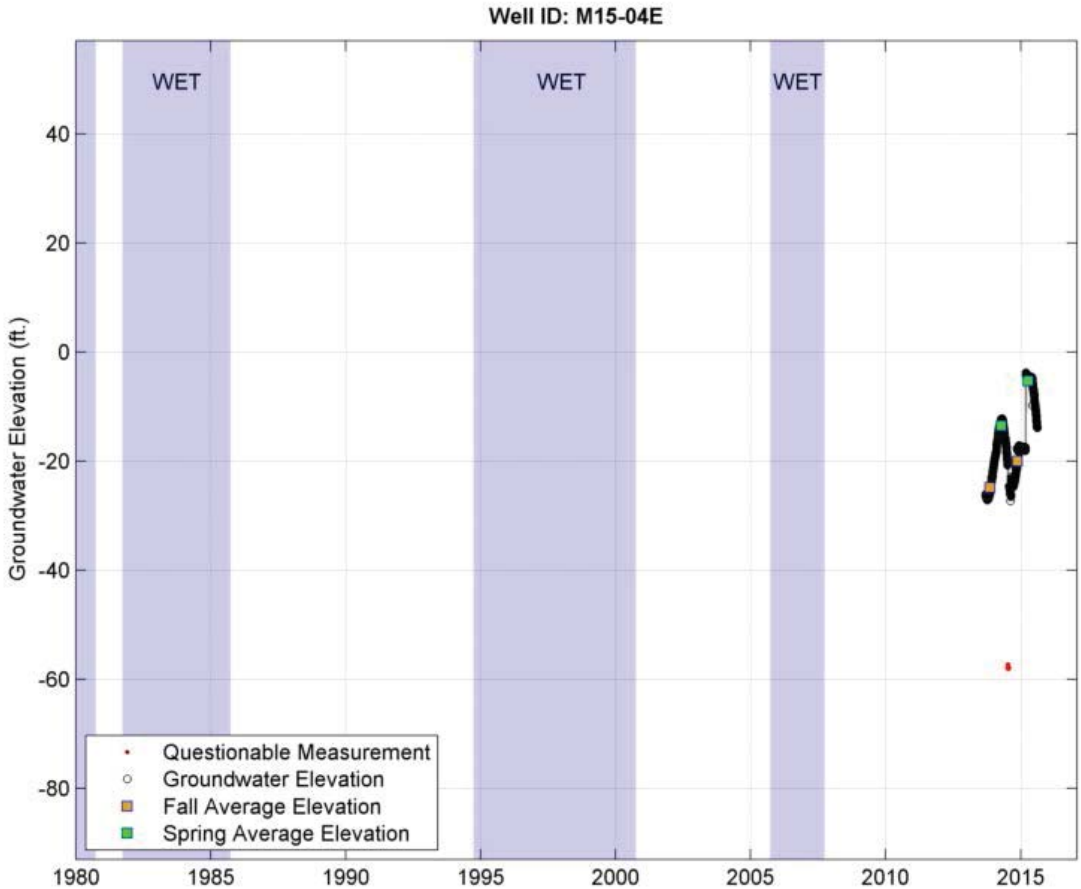

Well ID: M15-04B
WET
WET
WET
Groundwater Elevation (ft.)
80
60
40
20
0
-20
-40
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

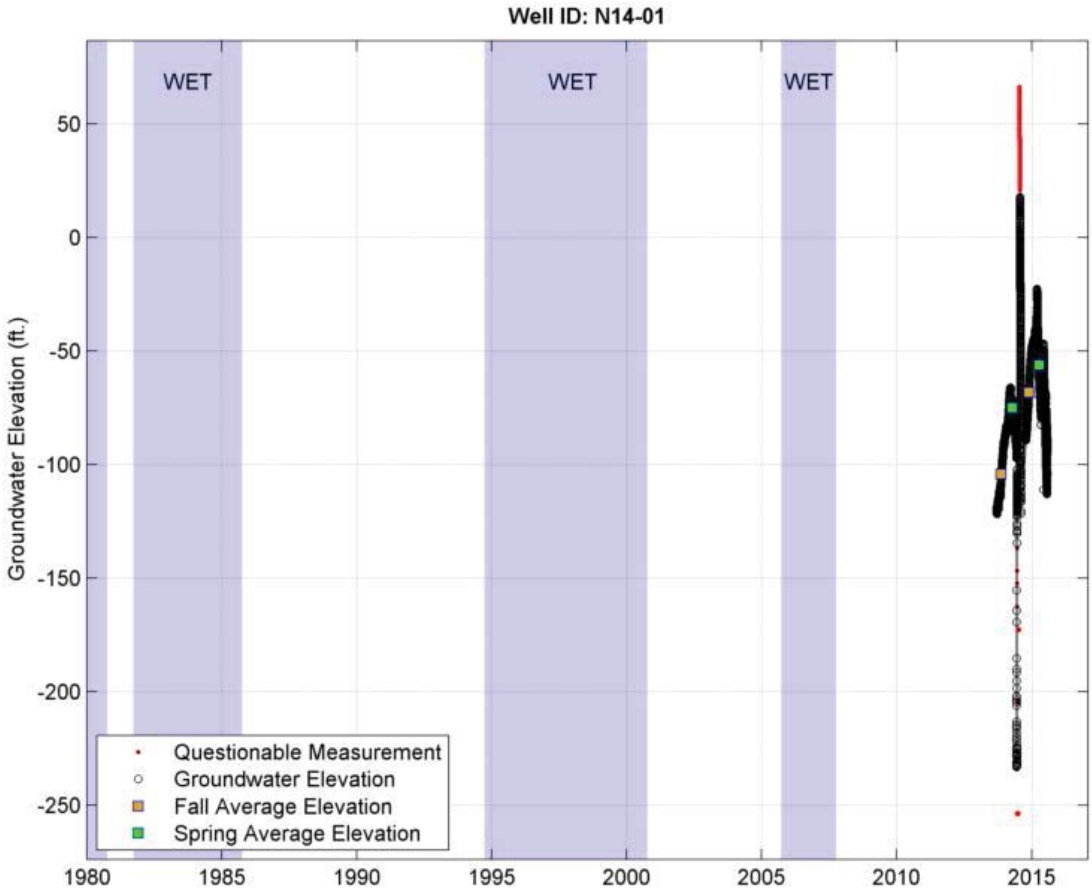

Well ID: N16-06A
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation

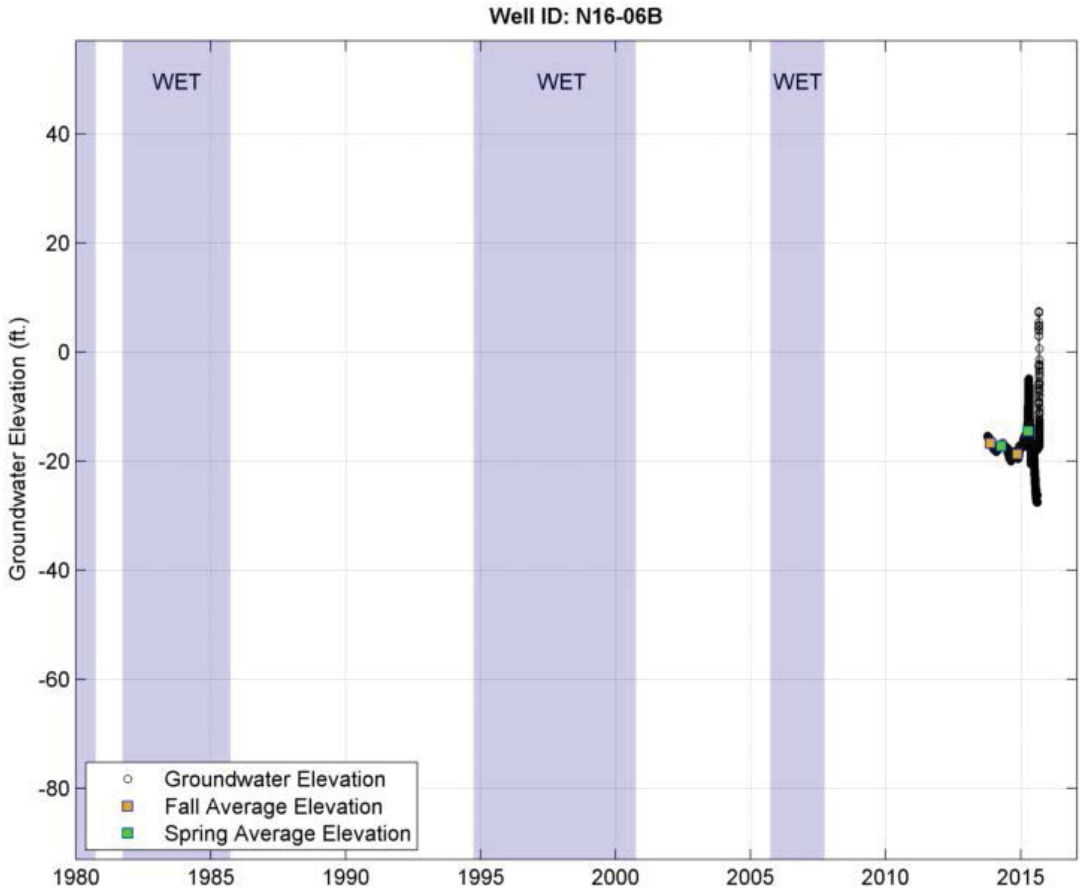
Deeper Wells (>200 feet deep)

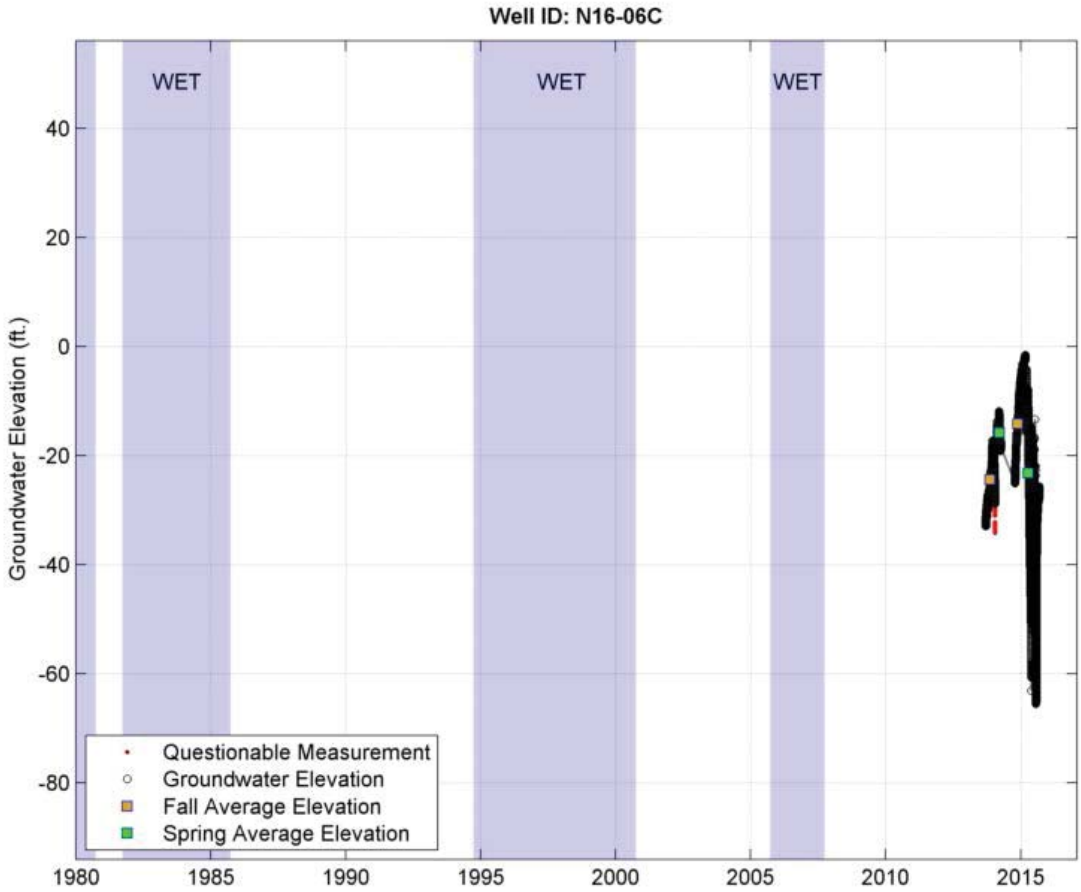

Well ID: M15-04C
WET
WET
WET
Groundwater Elevation (ft.)
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: M15-04D
WET
WET
WET
Groundwater Elevation (ft.)
60
40
20
0
-20
-40
-60
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: M15-04E
WET
WET
WET
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: N14-01
WET
WET
WET
Groundwater Elevation (ft.)
50
0
-50
-100
-150
-200
-250
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: N16-06B
WET
WET
WET
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation


Well ID: N16-06C
WET
WET
WET
Groundwater Elevation (ft.)
40
20
0
-20
-40
-60
-80
1980
1985
1990
1995
2000
2005
2010
2015
Questionable Measurement
Groundwater Elevation
Fall Average Elevation
Spring Average Elevation