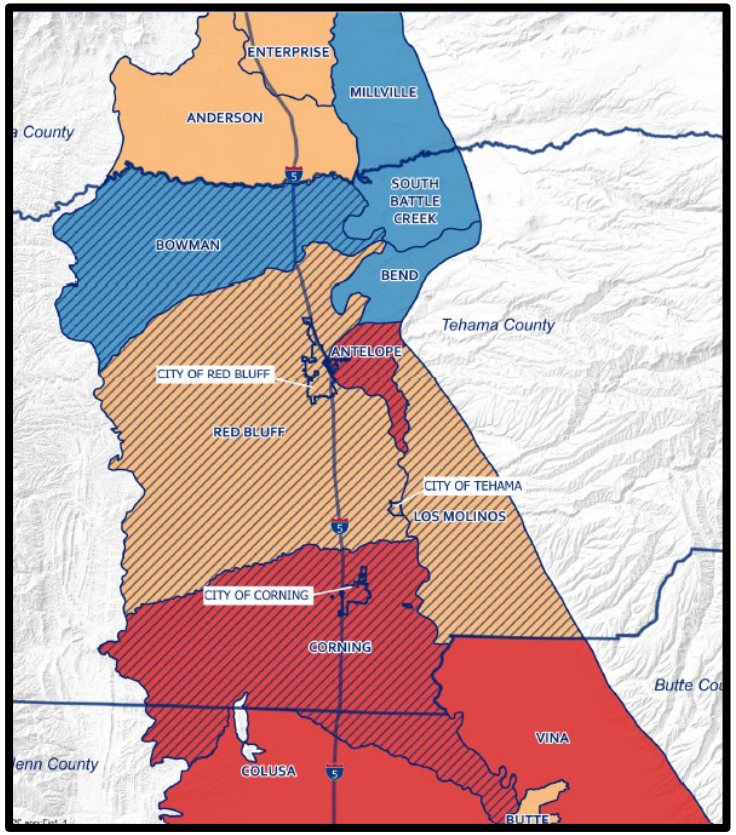
Managing Our Groundwater for the Future

Implementing the Sustainable Groundwater Management Act (SGMA) in Tehama County



Thomes Creek Tailgate
October 6, 2020 (5:30 – 6:30 PM)

Participant Set-Up

Project Team

- **Tehama County Groundwater Sustainability Agency**
  - Ryan Teubert, GSA Project Manager
  - Nichole Bethurem
- **Technical Consultant:** Luhdorff & Scalmanini, Consulting Engineers (LSCE)
  - Eddy Teasdale

CBI

Agenda

5:30 pm	**Welcome & Meeting Overview**
5:40 pm	**Background** - SGMA 101 - Governance – Implementing SGMA in Tehama County - Q&A Discussion
6:00 pm	**Information Needs** - Developing GSPs in Tehama County - Q&A Discussion
6:20 pm	**Outreach & Engagement** - How can I be involved?
6:30 pm	**Next Steps and Wrap Up***

**Project Team will stick around if folks have additional questions*

COMMON TERMS
SGMA *("Sigma")*: Sustainable Groundwater Management Act
GSA: Groundwater Sustainability Agency
GSP: Groundwater Sustainability Plan

CBI

Multiple Opportunities to be Involved

EMAIL UPDATES

Sign Up for the interested parties email list and/or to receive meeting agendas - contact nbethurem@tcpw.ca.gov

UPCOMING MEETINGS – October 2020

Outdoor Tailgates | October 14, 15, 21, and 22 | 5:30-6:30 pm

(Specific to the Bowman, Red Bluff, Antelope, and Los Molinos Subbasins)

Oct 14 – Tehama District Fairgrounds

Oct 15 – Evergreen Middle School (Lower Parking Lot), 19500 Learning Way, Cottonwood, CA

Oct 21 – Tehama County Public Works, 9380 San Benito Ave., Gerber

Oct 22 – Los Molinos Veterans Hall, 7980 Sherwood Blvd., Los Molinos

Corning Subbasin tailgate meeting dates and locations TBD

Board of Supervisors Presentation | October 20 | 1:30 pm

To listen to live audio: http://tehamacountyca.iqm2.com/Citizens/Default.aspx

November/December 2020

Next Round of Public Meetings

County-wide and subbasin-specific Groundwater conditions

REGULAR MEETINGS

Groundwater Commission Meetings | 4th Wednesdays | 8:30a

District Board Meetings | 3rd Monday, every other month (Next meeting 11/16/20) | 11:00a

Corning Subbasin Advisory Board Meetings | 1st Wednesdays | 1:30p

TehamaCountyPublicWorks.CA.gov and CorningSubbasinGSP.org

Background
SGMA 101

COMMON TERMS

SGMA *("Sigma")*: Sustainable Groundwater Management Act

GSA: Groundwater Sustainability Agency

GSP: Groundwater Sustainability Plan

What is SGMA?



The Sustainable Groundwater Management Act (SGMA) -- law was passed in 2014



Values Local Control

Local responsible agencies = Groundwater Sustainability Agencies (GSAs)



Management plans = Groundwater Sustainability Plans (GSPs)



GSPs submitted to the State by January 31, 2022

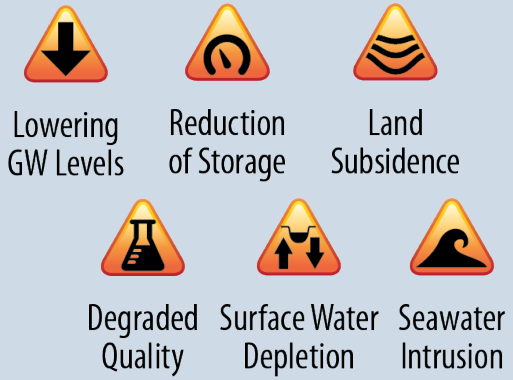


Sustainability must be achieved within 20 years (by 2042)

What is the purpose of SGMA?

- Promote sustainable management of groundwater basins
- Enhance local management of groundwater (State to step in if necessary)
- Improve data collection and understanding of groundwater resources and management
- Avoid or minimize undesirable results to groundwater





Undesirable Results



What are the major roles?



COMMON TERMS

SGMA *("Sigma")*: Sustainable Groundwater Management Act

GSA: Groundwater Sustainability Agency

GSP: Groundwater Sustainability Plan

DWR: California Department of Water Resources

SWRCB ("State Board"): State Water Resources Control Board

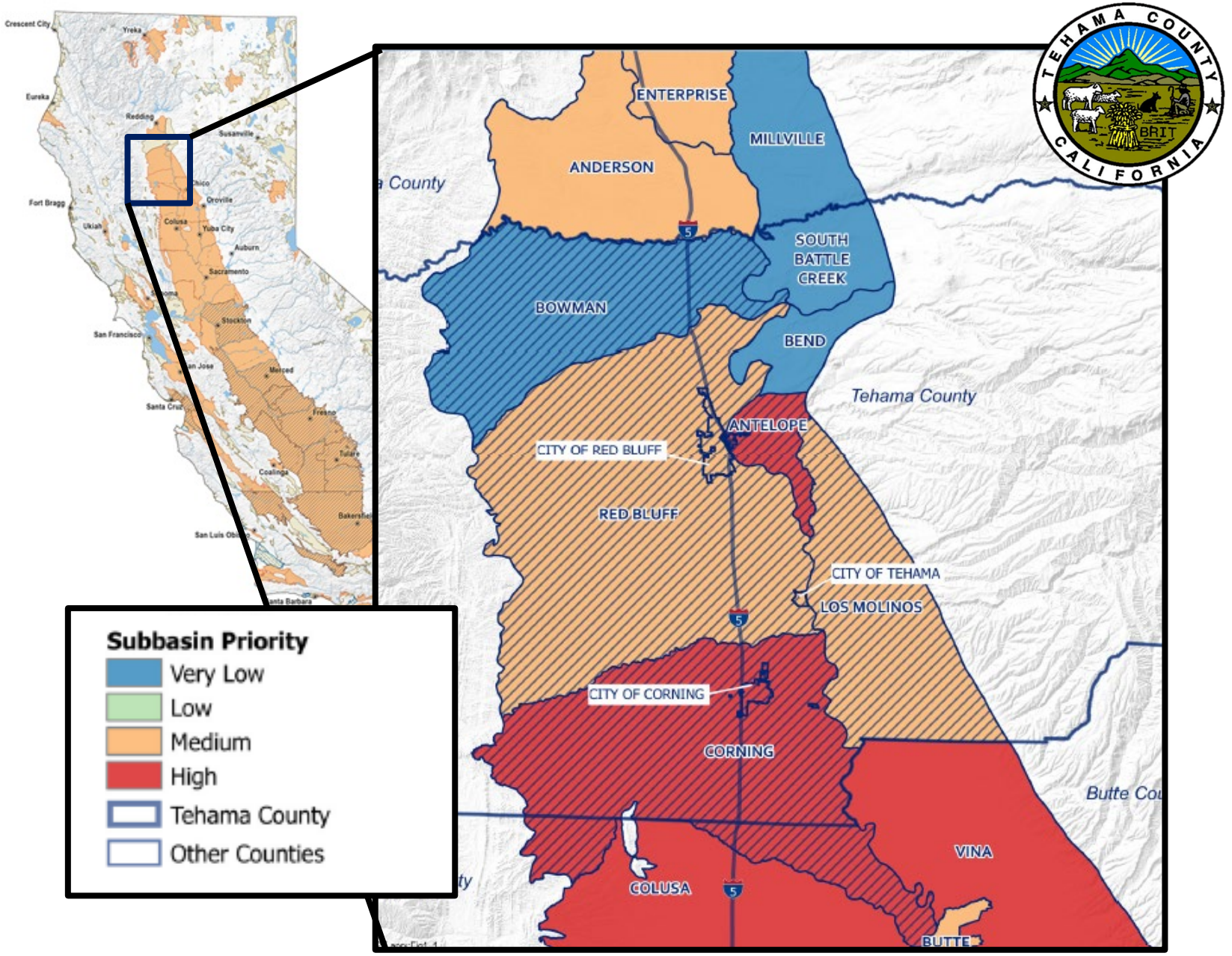
What is the SGMA Implementation Timeline?



Occurring throughout:

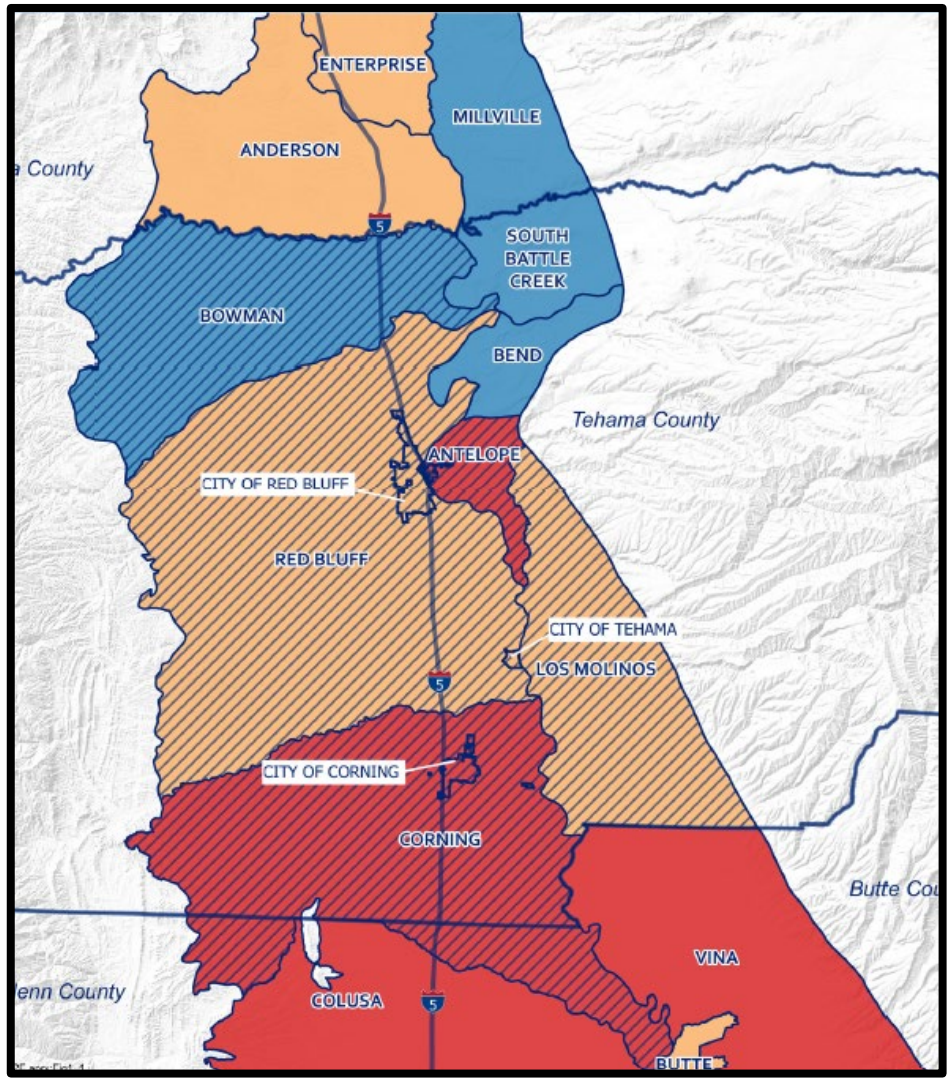
- Conduct Outreach & Engagement
- Evaluate and Modify

What are our subbasins?



Background | Governance

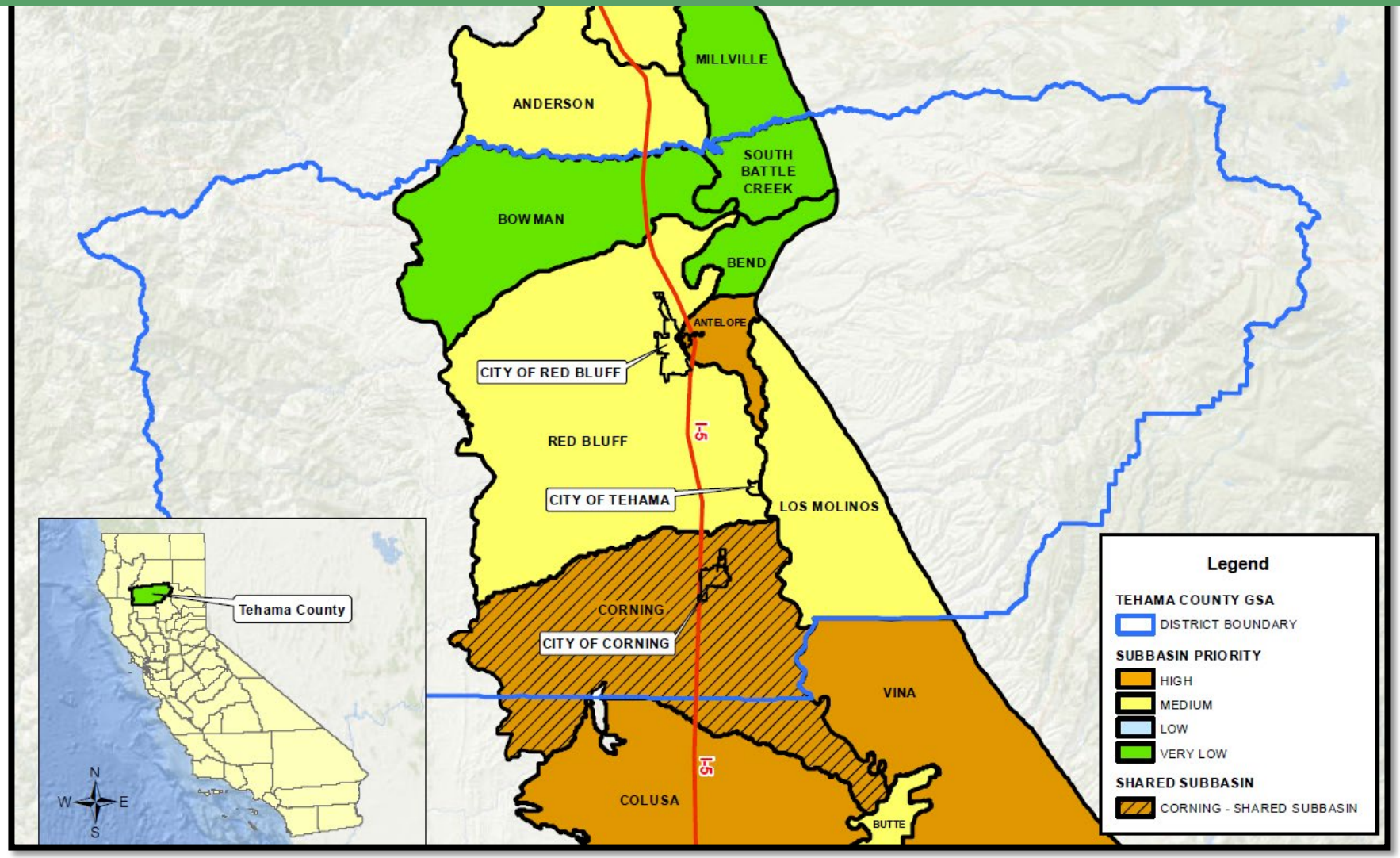
Implementing SGMA in Tehama County



Subbasin Priority

- Very Low
- Low
- Medium
- High
- Tehama County
- Other Counties

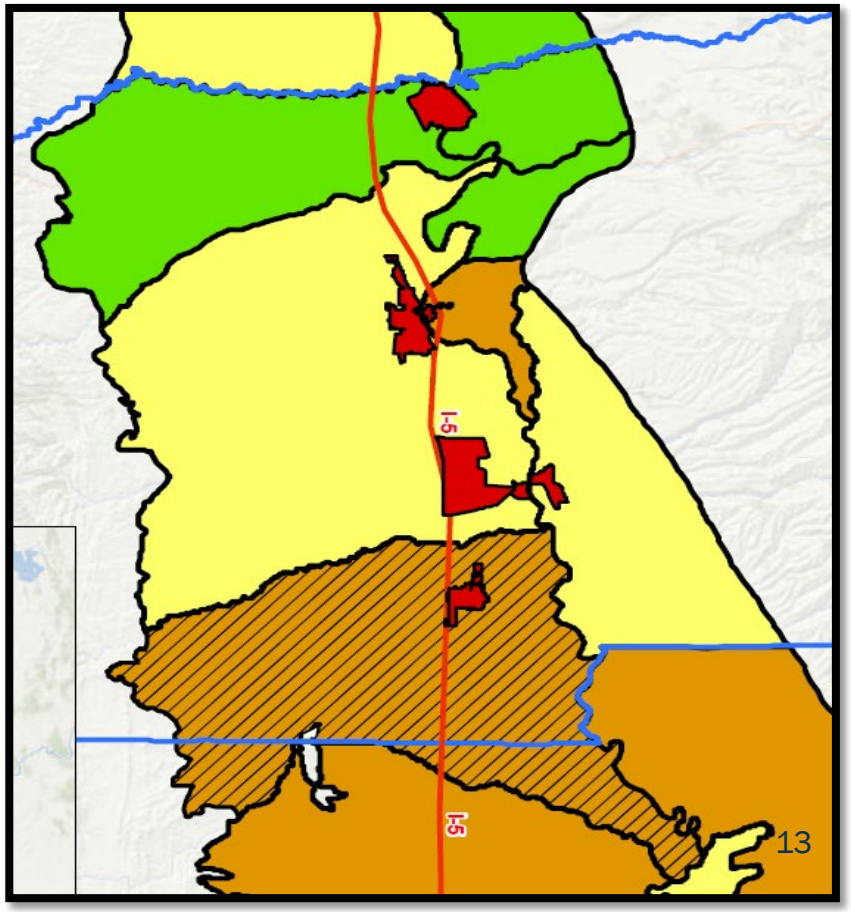
Tehama County Groundwater Sustainability Agency



District Recognized as Exclusive GSA in February 2016

Tehama County GSA Governance Structure

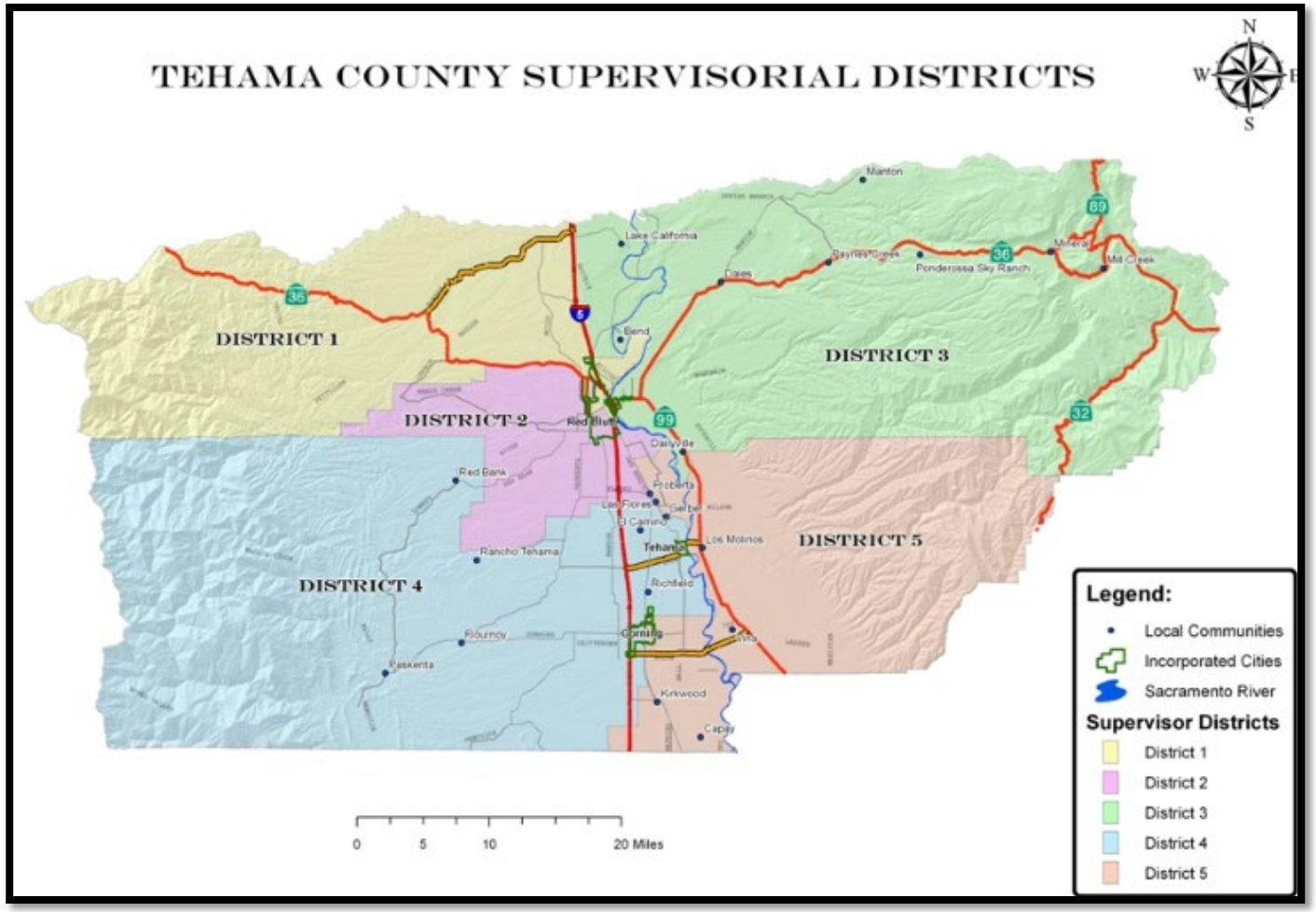
- **Governing Board** – Tehama County Flood Control & Water Conservation District Board of Directors (County Board of Supervisors)
- **Groundwater Commission** (similar to Planning Commission)
  - The Commission is made up of 11 members
  - Six agencies will have designated seats on the Commission and appoint their own members.
    - 1 – City of Corning
    - 1 – City of Red Bluff
    - 1 – City of Tehama
    - 1 – El Camino Irrigation District
    - 1 – Los Molinos Community Services District
    - 1 – Rio Alto Water District



Groundwater Commission Membership (*continued*)

Additional Members will Include 1 Representative from each County Supervisorial District

- Members should be a resident, property owner, or groundwater user within Tehama County;
- 2 members should represent surface water agencies/districts;
- 2 members should represent private pumpers;
- 1 member should represent the general public.



Groundwater Commission Members

- City of Corning – Kristina Miller
- City of Red Bluff – Clay Parker
- City of Tehama – Bill Borror
- El Camino Irrigation District – Kris Lamkin
- Los Molinos Community Services District – Todd Hamer
- Rio Alto Water District – Martha Slack
- District 1 – Harley North, private pumper
- District 2 – Sam Mudd, general public
- District 3 – Bart Fleharty, surface water agency/district
- District 4 – Hal Crain, surface water agency/district
- District 5 – David Lester, private pumper

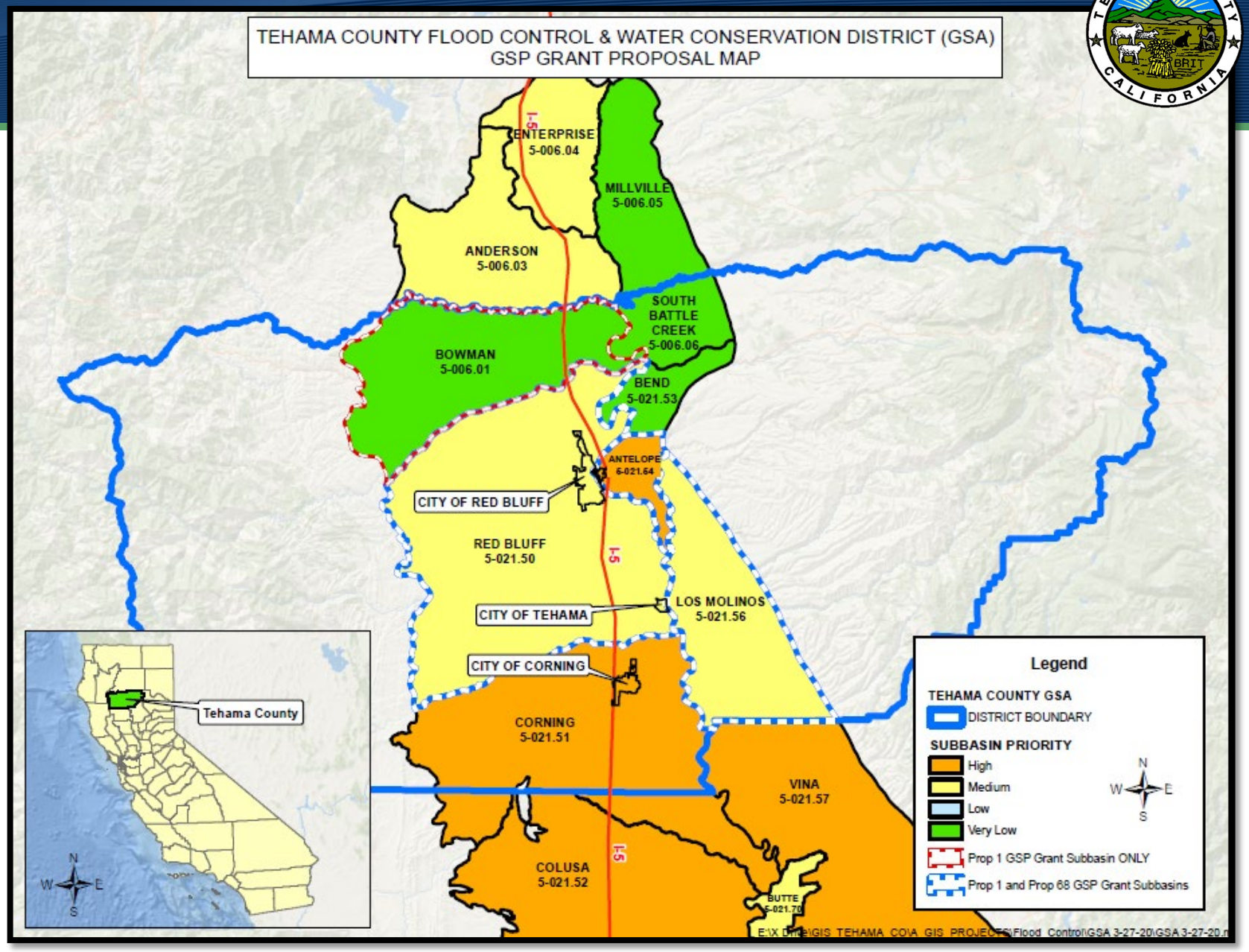


Groundwater Commission Duties

- Develop GSP and all GSA ordinances, rules, and regulations, making final recommendations to the Board of Directors.
- Conduct investigations to determine the need for groundwater management, monitor compliance and enforcement, and potential future funding costs.
- Review all proposed grant applications
- Decision-making authority for permits or similar entitlements
- Make quasi-judicial decisions in GSA enforcement matters

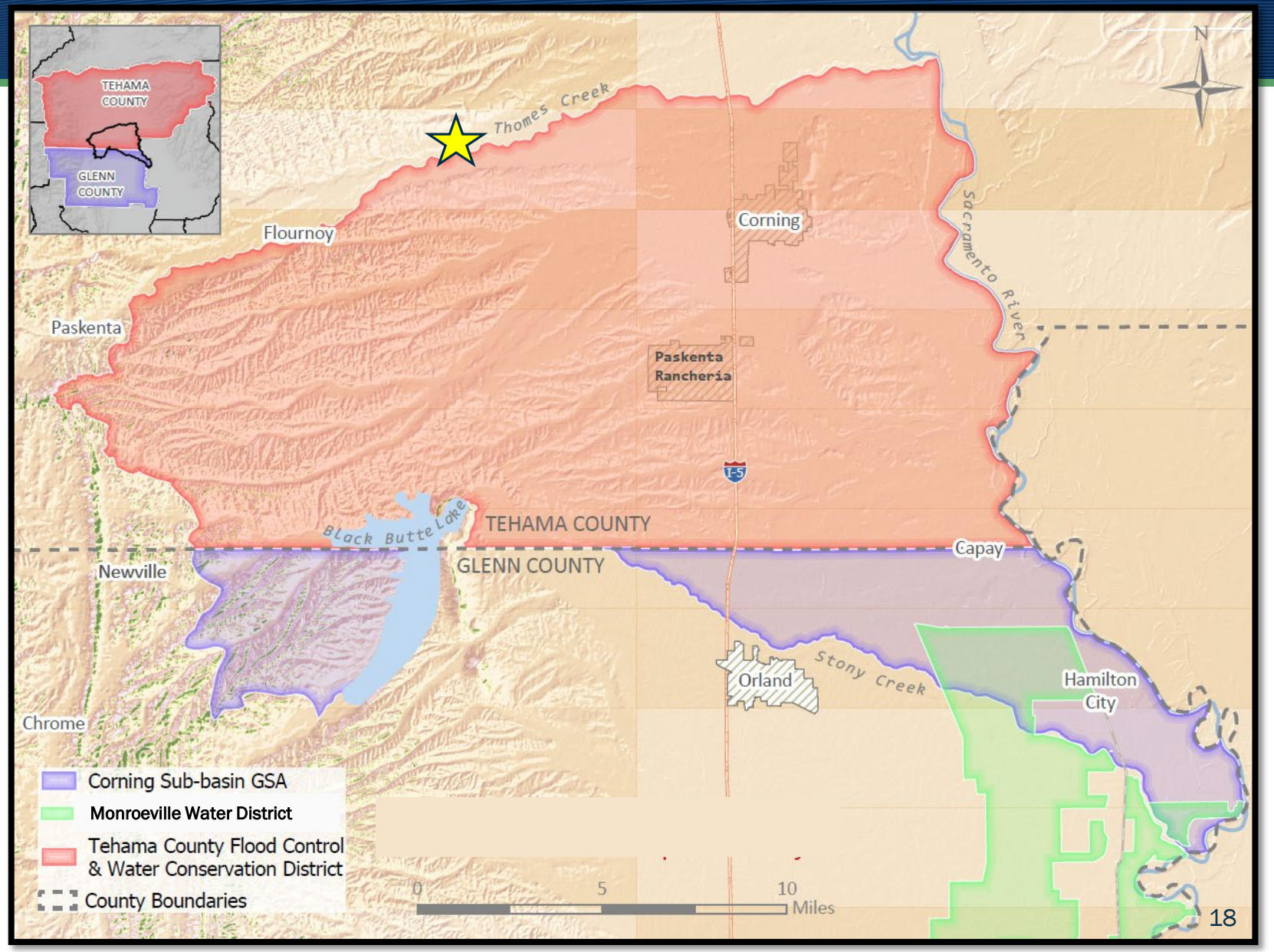


The Antelope, Bowman, Los Molinos, and Red Bluff Groundwater Sustainability Plans being funded under Proposition 1 and 68 funding programs.



Corning Subbasin

- 2 GSA Agencies
- Co-Management of the Subbasin
- Develop 1 GSP
- Separate Prop 1 Grant



Corning Subbasin Advisory Board (CSAB)

Purpose:

- Make advisory recommendations to the Members concerning development and implementation of the GSP.
- All decision-making authority resides with each Member's governing bodies.

Membership:

Tehama County Flood Control and Water Conservation District GSA

- **Bob Williams,** Board of Director, Flood Control and Water Conservation District
- **Steven Gruenwald**, Grower, Capay
- **David Lester**, Groundwater Commissioner

Alternates

- **Ian Turnbull**, Member of the AB3030 TAC for the District

Corning Sub-basin GSA

- **John Viegas**, Supervisor, Glenn County Board
- **Lisa Hunter**, Water Resources Coordinator, Glenn County
- **Julia Violich**, Board member, Monroeville Water District

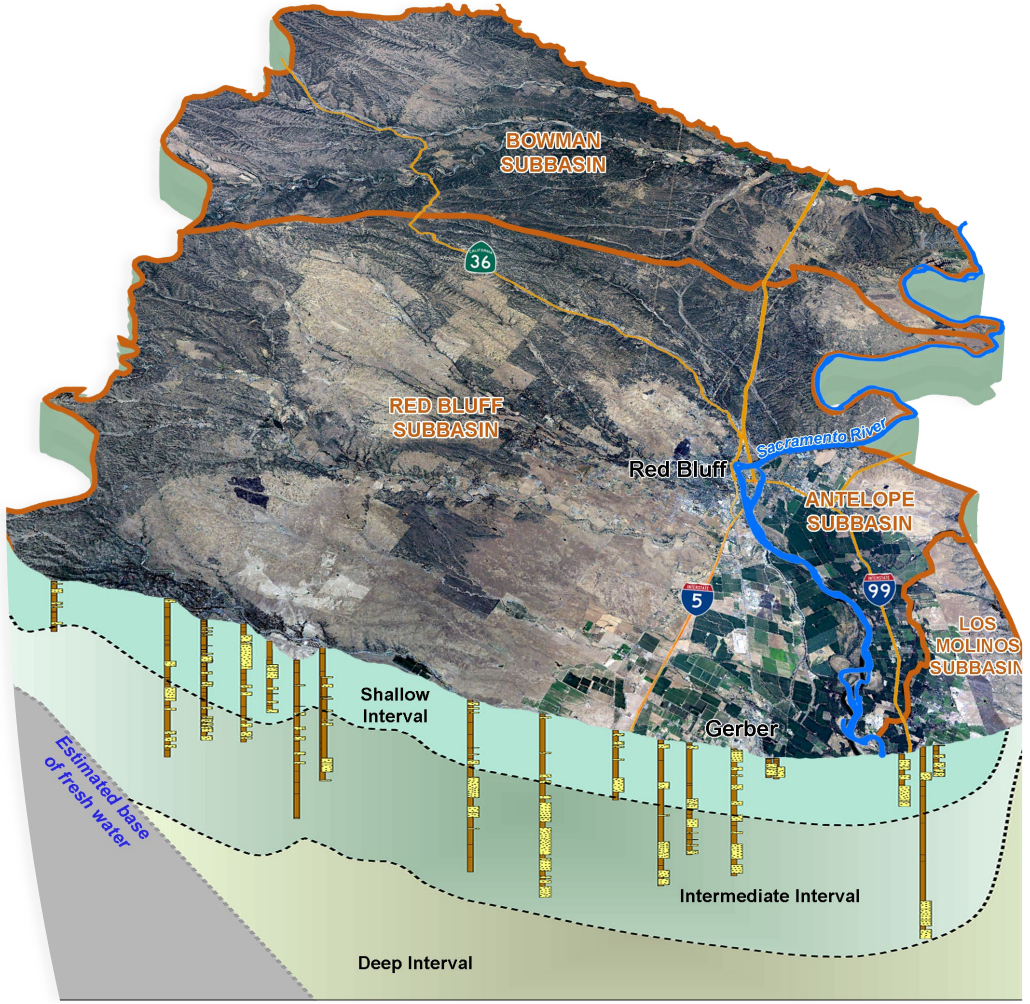
Alternates

- **John Amaro,** Glenn Colusa Irrigation District

Memorandum of Understanding to jointly develop the Corning Subbasin GSP

Information Needs

Developing GSPs in Tehama County



SGMA Background
Interested parties must be included in SGMA Planning

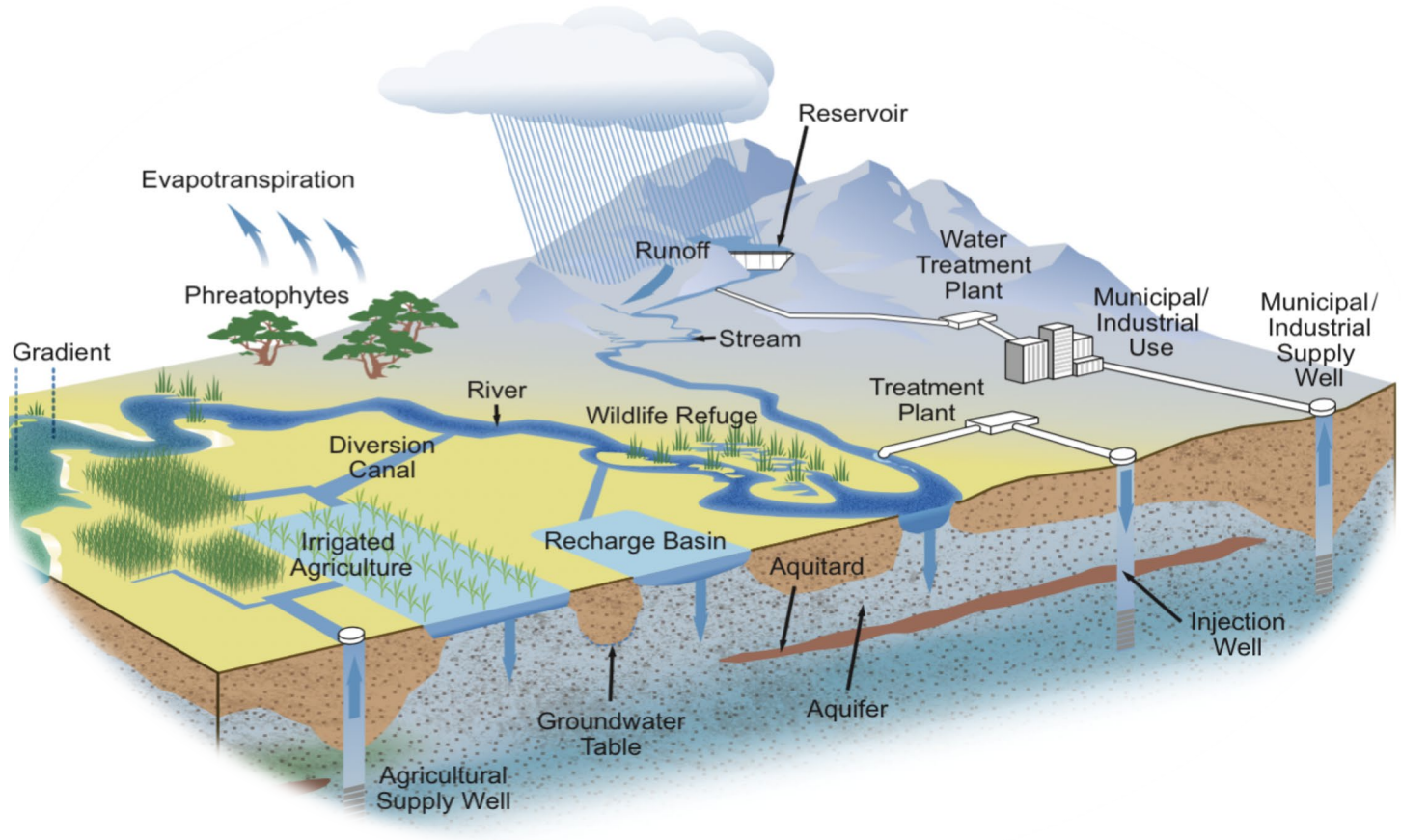
- All Groundwater Users
- Holders of Overlying Rights (agriculture and domestic)
- Municipal Well Operators and Public Water Systems
- Tribes
- County
- Planning Department/Land Use
- Local Landowners
- Disadvantaged Communities
- Business
- Federal Government
- Environmental Users
- Surface Water Users (if connection between surface and groundwater)

How are domestic well owners affected by SGMA

- **Referred to in SGMA as “de minimis” user IF……**
  - **Use 2 acre-feet per year or less for domestic purposes**
- **De minimis users are subject to SGMA, depending on the local needs**
  - **GSA will decide how de minimis users are addressed**
  - **GSA can decide to exclude or include**
  - **GSAs can decide on fees but cannot require metering**
  - **May be subject to reporting/fees to State if intervention occurs**
- **Domestic wells can also be regulated by authorities (counties) outside scope of SGMA**

Understanding the Hydrogeologic Setting

- Graphical and narrative description of the physical components of the basin
- At least two scaled cross-sections
- Map(s) of physical characteristics
  - Topographic information
  - Surficial geology
  - Soil characteristics
  - Delineation of existing recharge areas that substantially contribute to the replenishment of the basin, potential recharge areas, and discharge areas
  - Surface water bodies
  - Source and point of delivery for local and imported water supplies



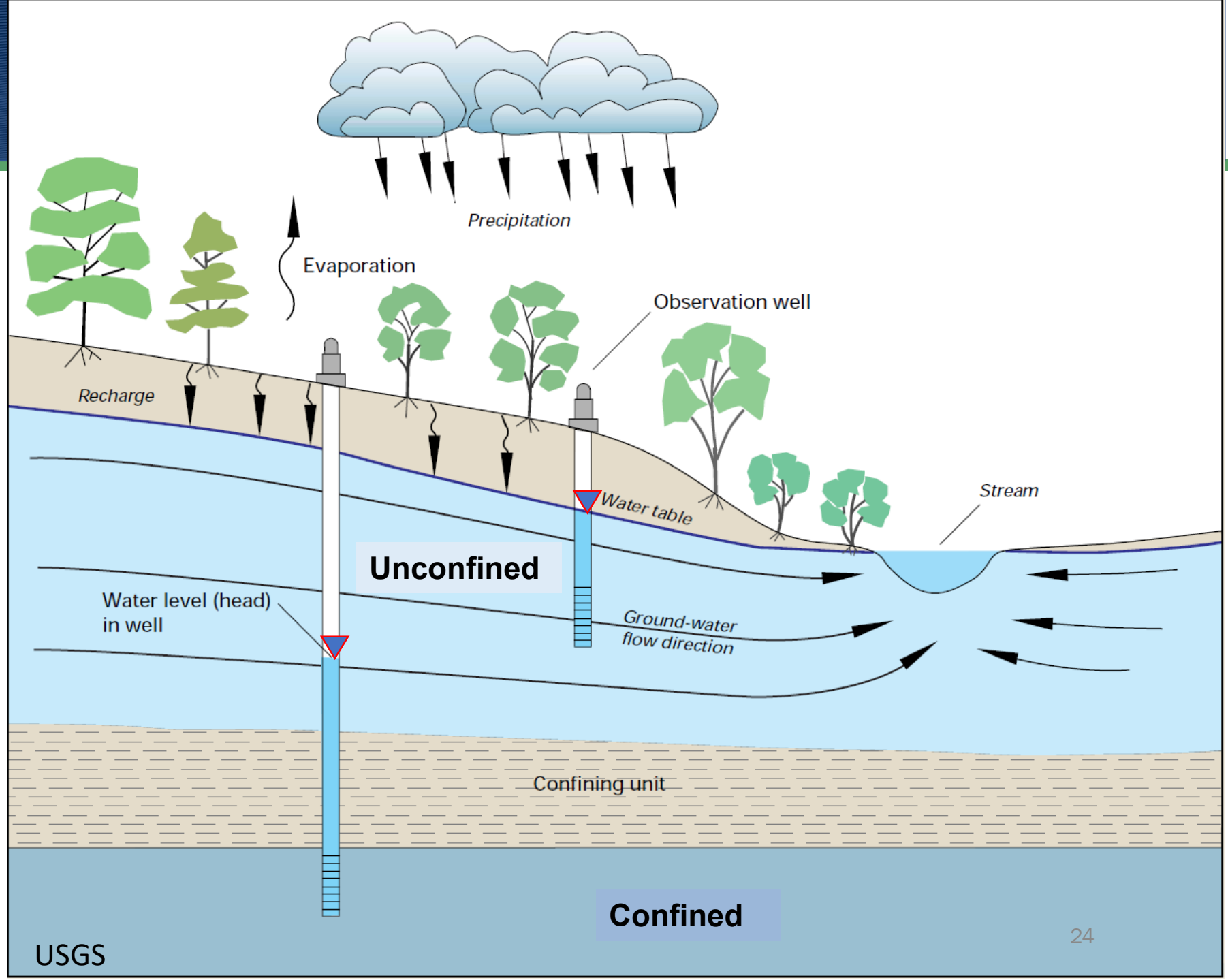
Groundwater:
Unconfined & Confined

Unconfined:

At atmospheric pressure; no overlying low Permeability materials

Confined:

Groundwater under pressures greater than atmospheric by overlying low permeability (confining) materials



Account for Water with a "Budget"

Inflows

- Precipitation;
- SW inflow & infiltration;
- Intentional recharge (ponds, ditches, etc.);
- Applied water, net recharge (e.g., irrigation);
- Unintentional recharge (leaky pipelines);
- Subsurface inflows from outside basin.

Outflows

- GW extraction by wells;
- GW discharge to SW/springs;
- Evapotranspiration; and
- Subsurface outflow from basin.

***Inflows* – *Outflows* = ΔS**

Change in GW Storage

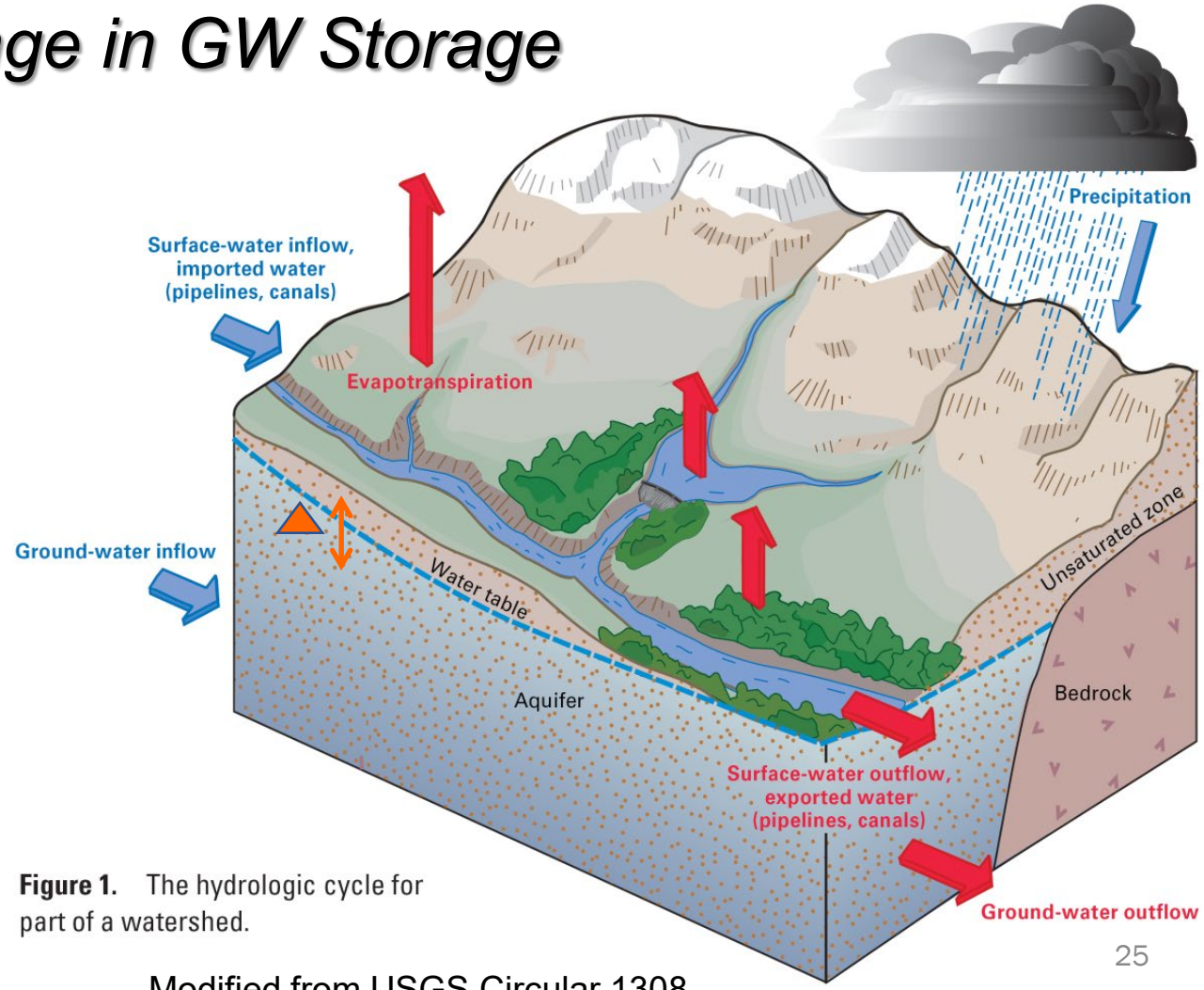


Figure 1. The hydrologic cycle for part of a watershed.

Modified from USGS Circular 1308

SGMA Terms Explained

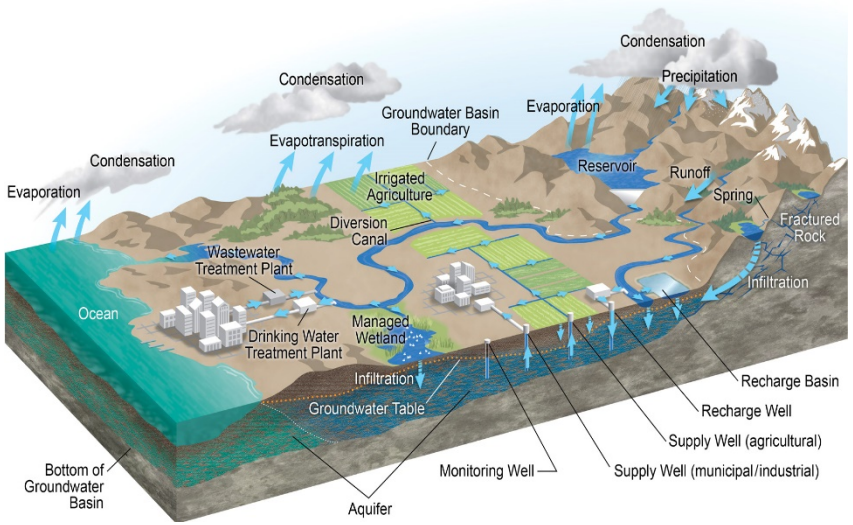
SGMA Term

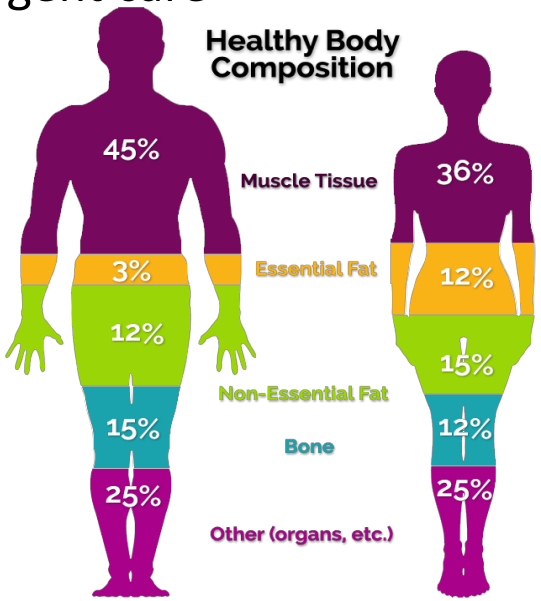
- Sustainability Goal
- Sustainability Indicators
- Measurable Objective
- Minimum Threshold
  - Undesirable Result
- Significant and Unreasonable

=

Health Analogy

- Staying healthy and fit
- Weight, Blood Pressure, etc
- Doctors recommendations
- Healthy limit
  - When limit is surpassed
- Urgent care



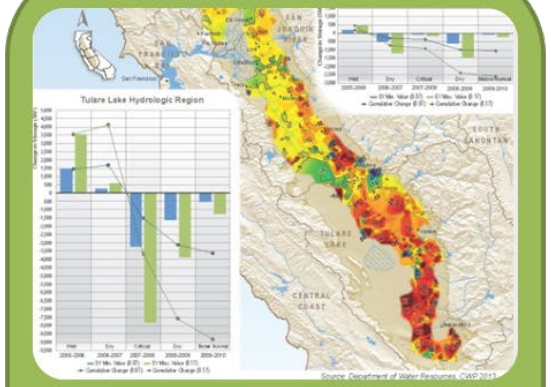


DWR, 2018

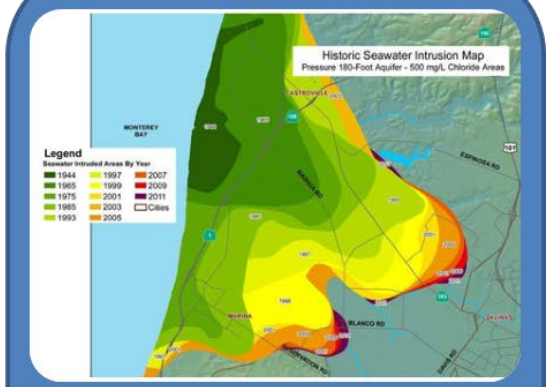
Avoiding Undesirable Results for Six Sustainability Indicators



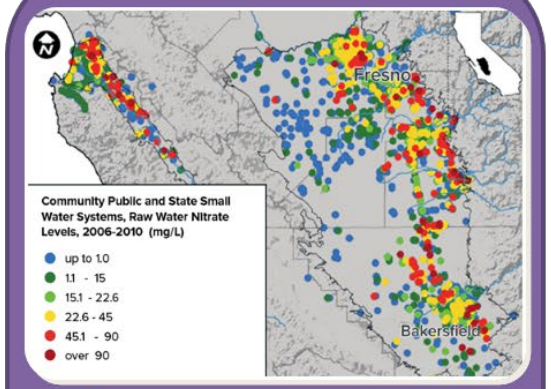
Lowering of GW Levels



Reduction of GW Storage



Seawater Intrusion



Degraded Water Quality

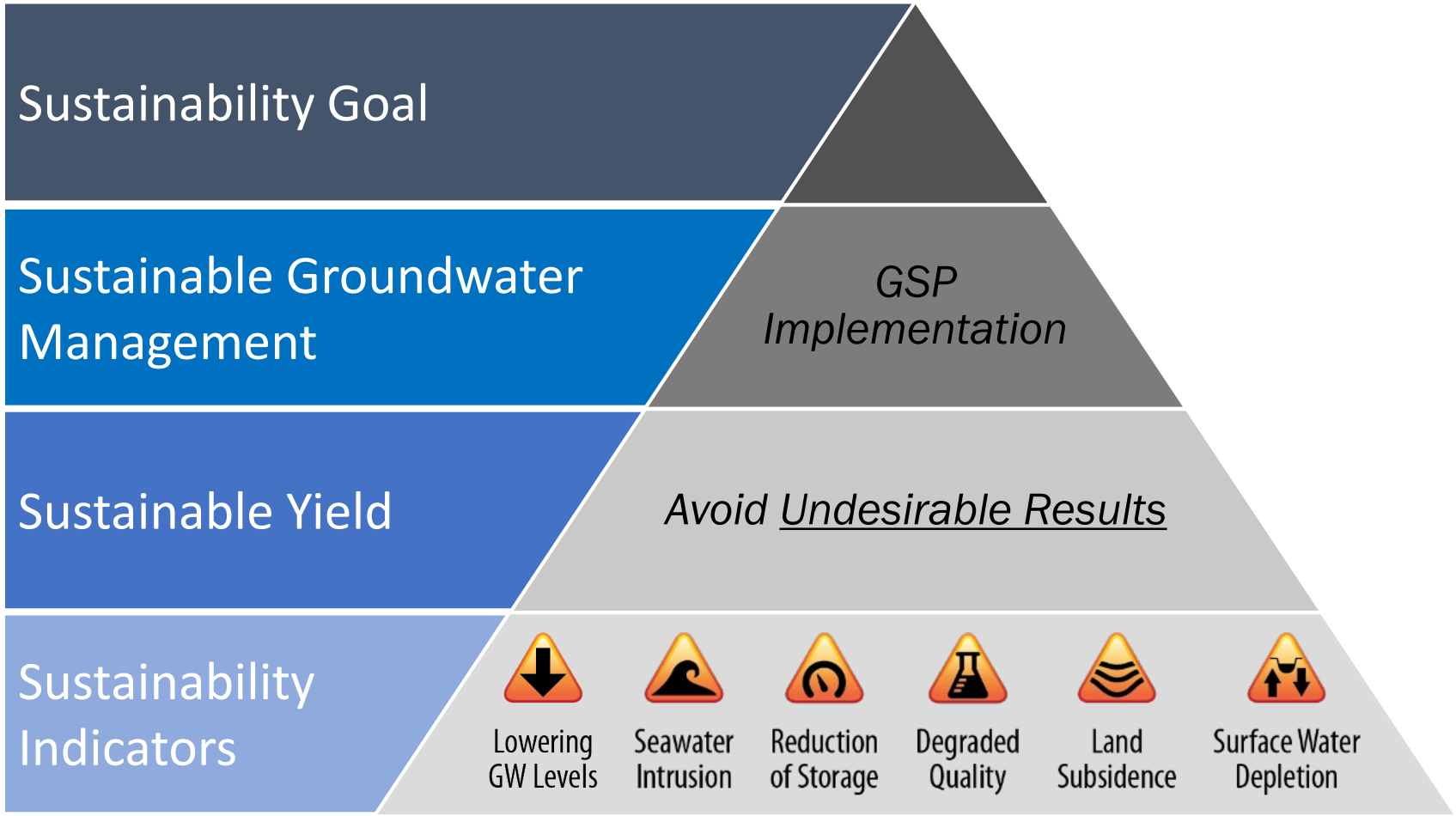


Land Subsidence



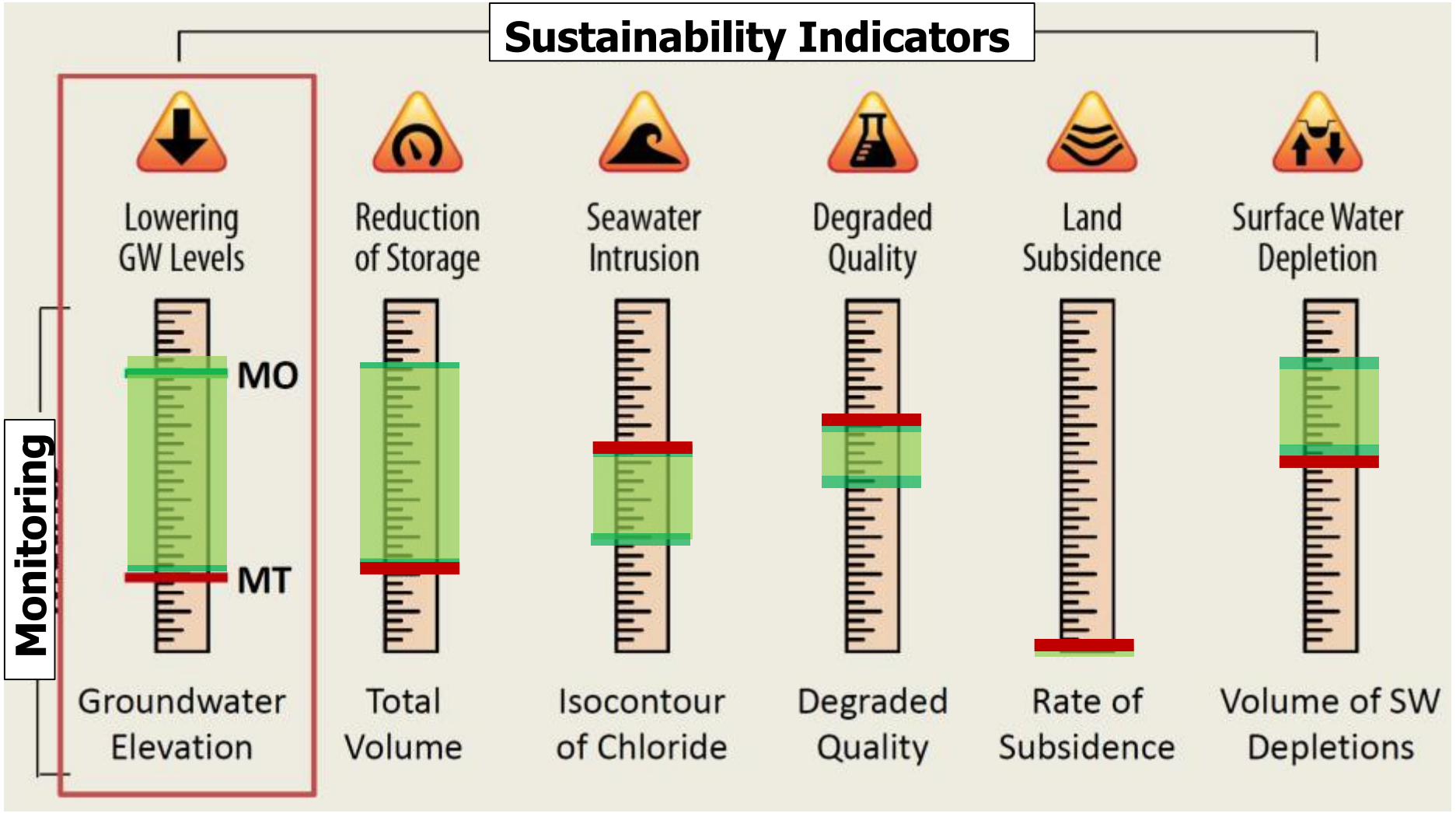
Depletion of Inter-connected Streams

Background - SGMA

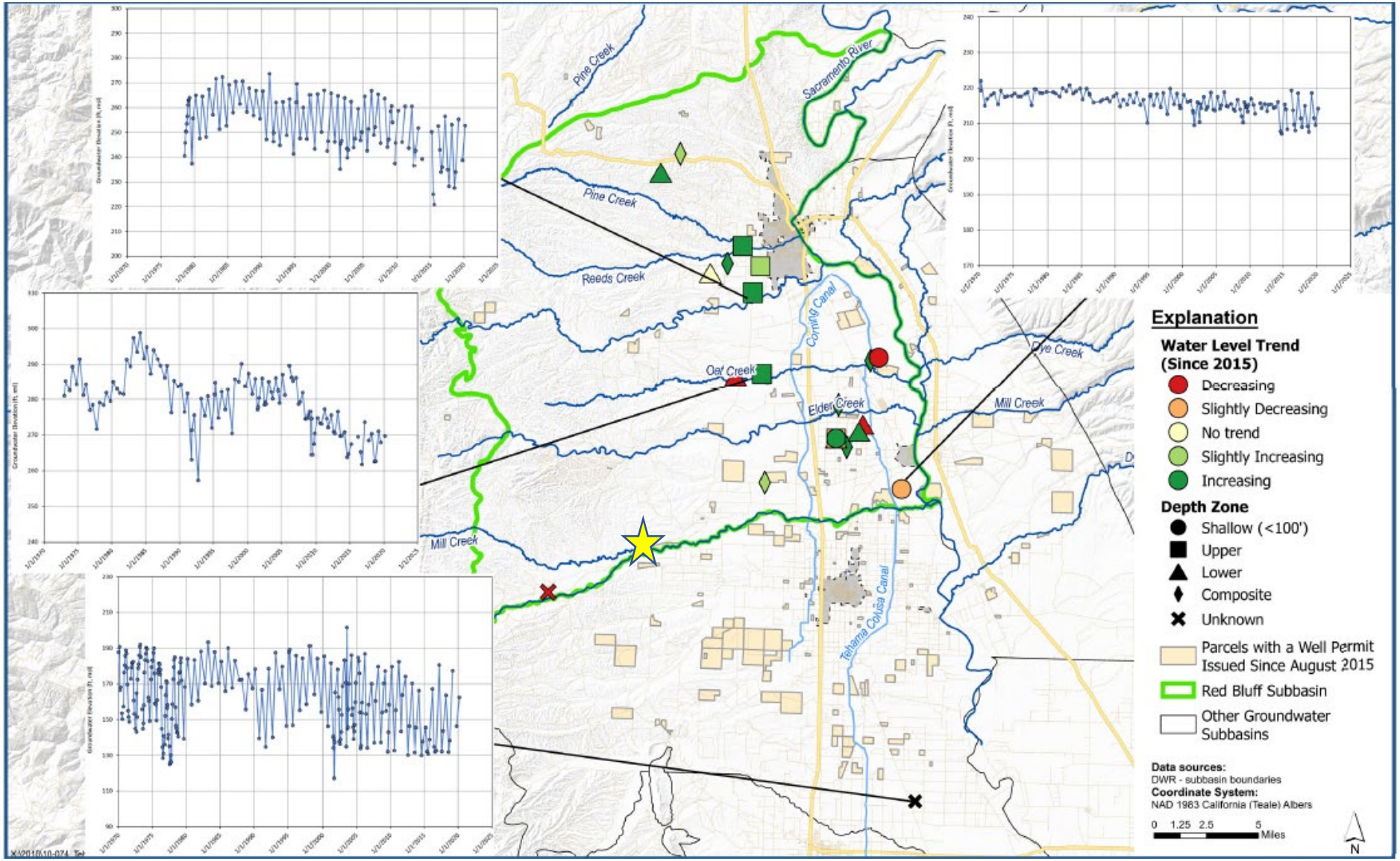


SGMA Terms Explained

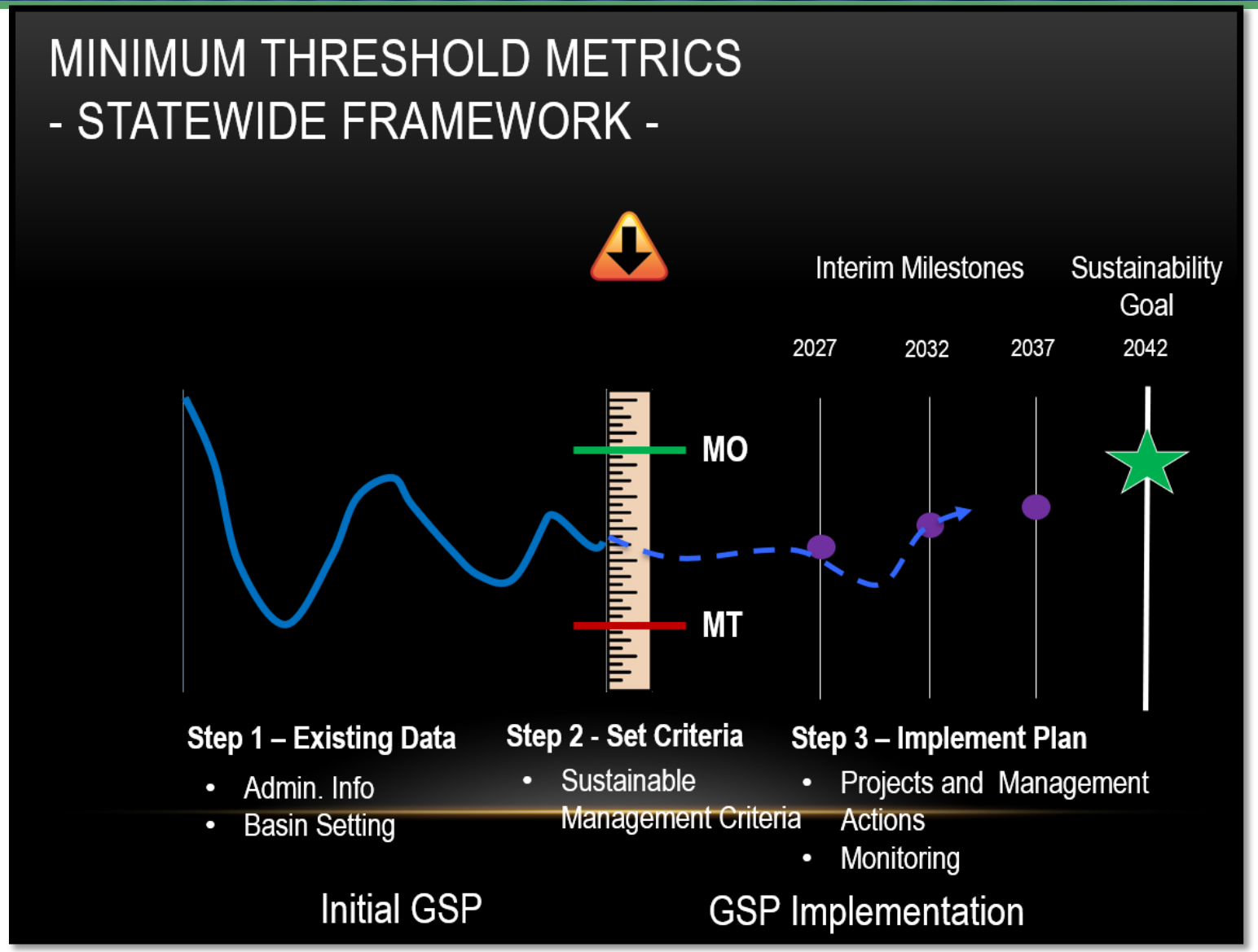
Sustainable Management Criteria for
all applicable Sustainability Indicators



SGMA Terms Explained



SGMA Terms Explained



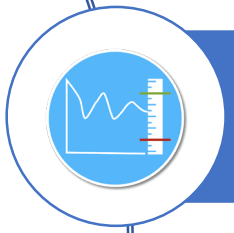
Tehama Subbasins Groundwater Sustainability Plan



Describe the Basin Conditions

Plan Area, Subbasin Setting & Water Supplies

What water sources are used in the basin and what are the basin conditions related to those uses?



Define Basin Sustainability

Sustainable Management Criteria & Monitoring

What is sustainable groundwater management?



Develop Projects/Management Actions & Implementation Plan

How can we ensure groundwater sustainability?

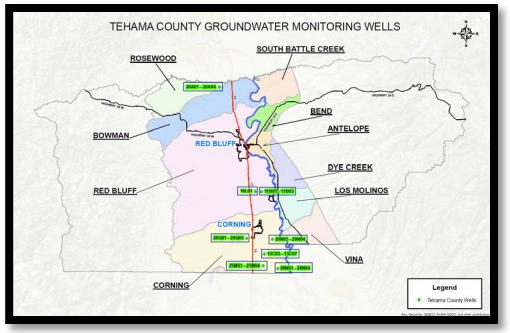


Develop & Adopt GSP

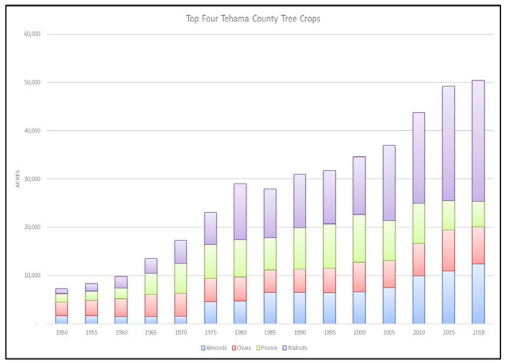
Submit GSP to DWR: January 31, 2022

Will this plan meet our sustainability goals?

GSP Section Preparation





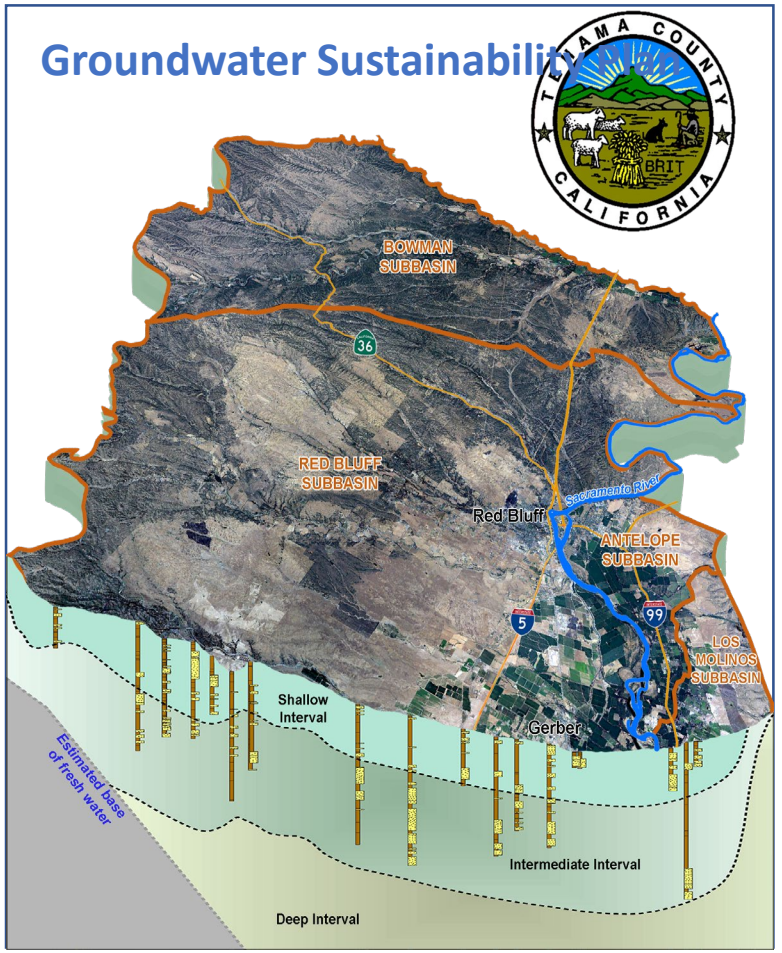




- A friendly, “good read”
- Supported by Technical Memorandums and other appendices
- Draft Sections: Periodic Review in Advance of Full Draft GSP Delivery

Looking Ahead: Draft GSP in 2021

- Much underway in 2020
- Outreach Continues (October and November 2020)
- Draft GSP Sections
- Fall 2020: Developing Chapter 1 & Chapter 2
- Spring 2021: Defining sustainability criteria (including undesirable results)
- Spring 2021: Develop concepts for projects and management actions
- Modeling: anticipate completion of model calibration and running project-related and future conditions scenarios in Fall 2020/Spring 2021
- Draft GSPs Early Fall 2021



Developing GSPs | Questions?

Project Team

Tehama County GSA

- Ryan Teubert, GSA Project Manager

Technical Consultants, LSCE

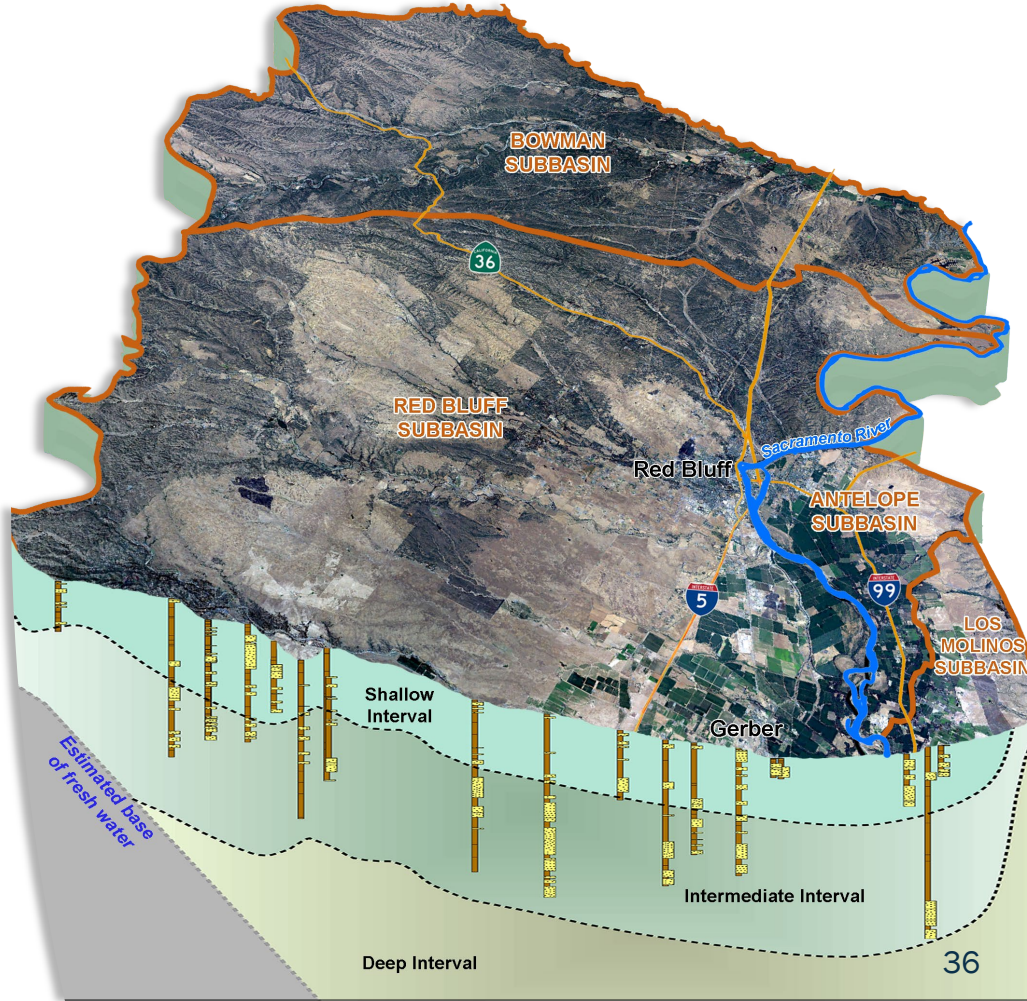
- Eddy Teasdale

COMMON TERMS

SGMA *("Sigma")*: Sustainable Groundwater Management Act • **GSA:** Groundwater Sustainability Agency • **GSP**: Groundwater Sustainability Plan

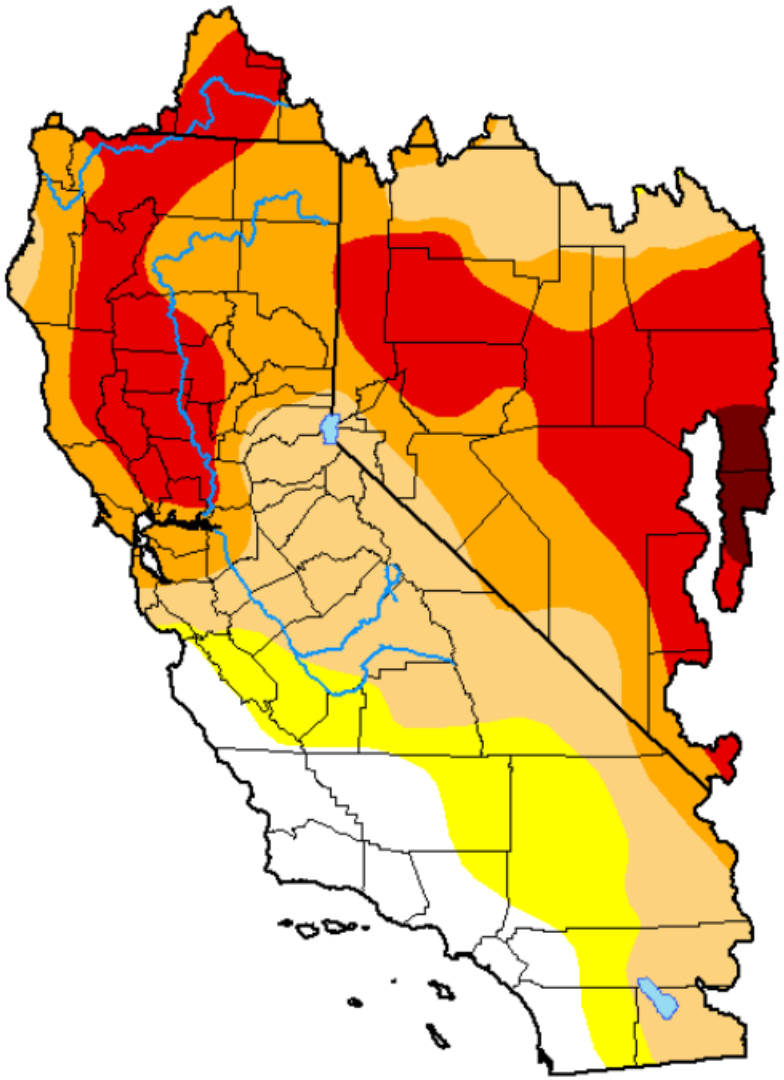
INFORMATION NEEDS

Current Groundwater Levels in Tehama County



U.S. Drought Monitor

California Nevada RFC



September 29, 2020

(Released Thursday, Oct. 1, 2020)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	9.72	90.28	79.50	53.46	26.97	1.24
Last Week *09-22-2020*	9.89	90.11	79.14	53.09	19.54	1.24
3 Months Ago *06-30-2020*	28.21	71.79	58.46	23.40	1.56	0.00
Start of Calendar Year *12-31-2019*	94.60	5.40	0.00	0.00	0.00	0.00
Start of Water Year *10-01-2019*	97.03	2.97	0.36	0.00	0.00	0.00
One Year Ago *10-01-2019*	97.03	2.97	0.36	0.00	0.00	0.00

Intensity:

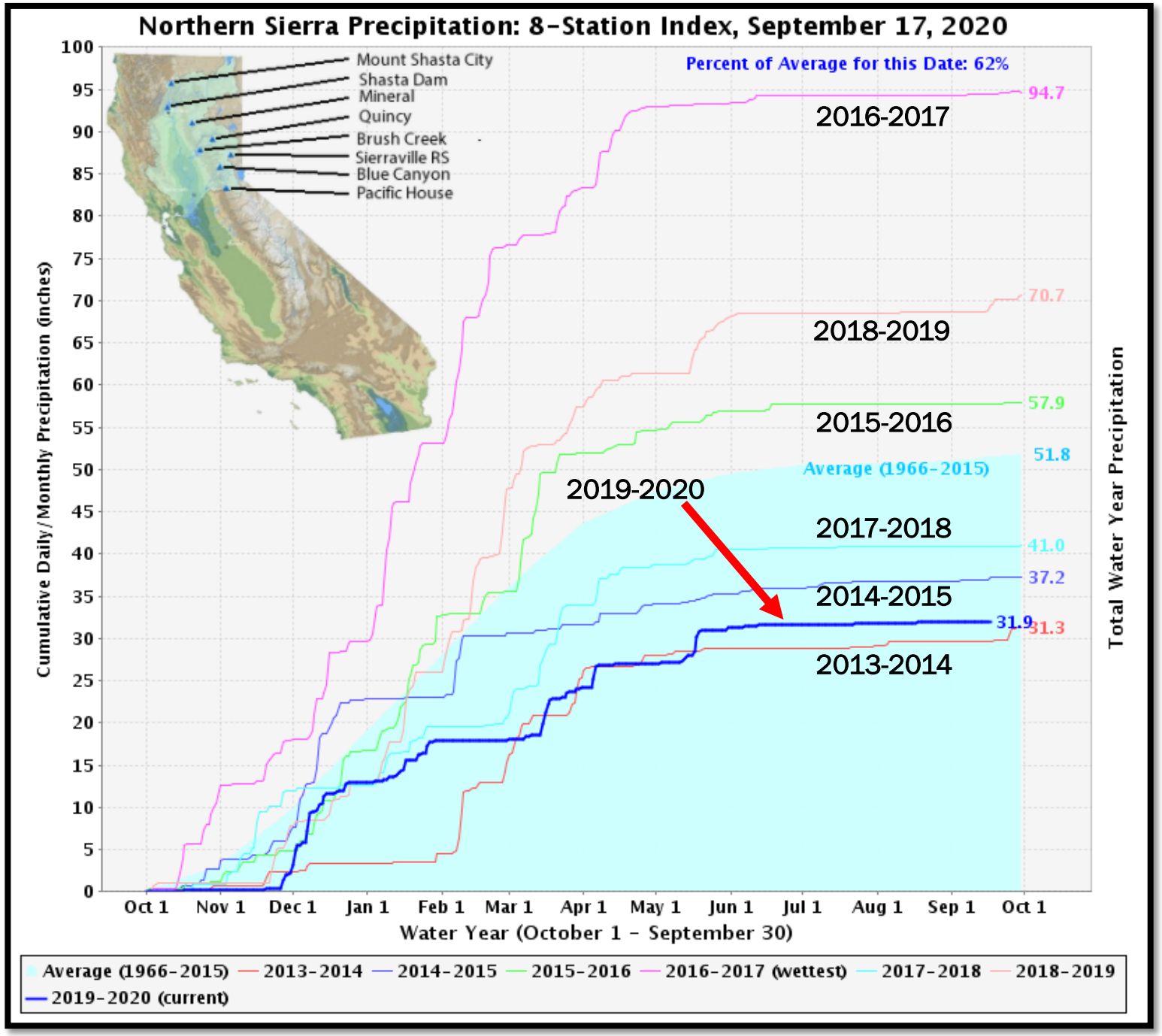
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

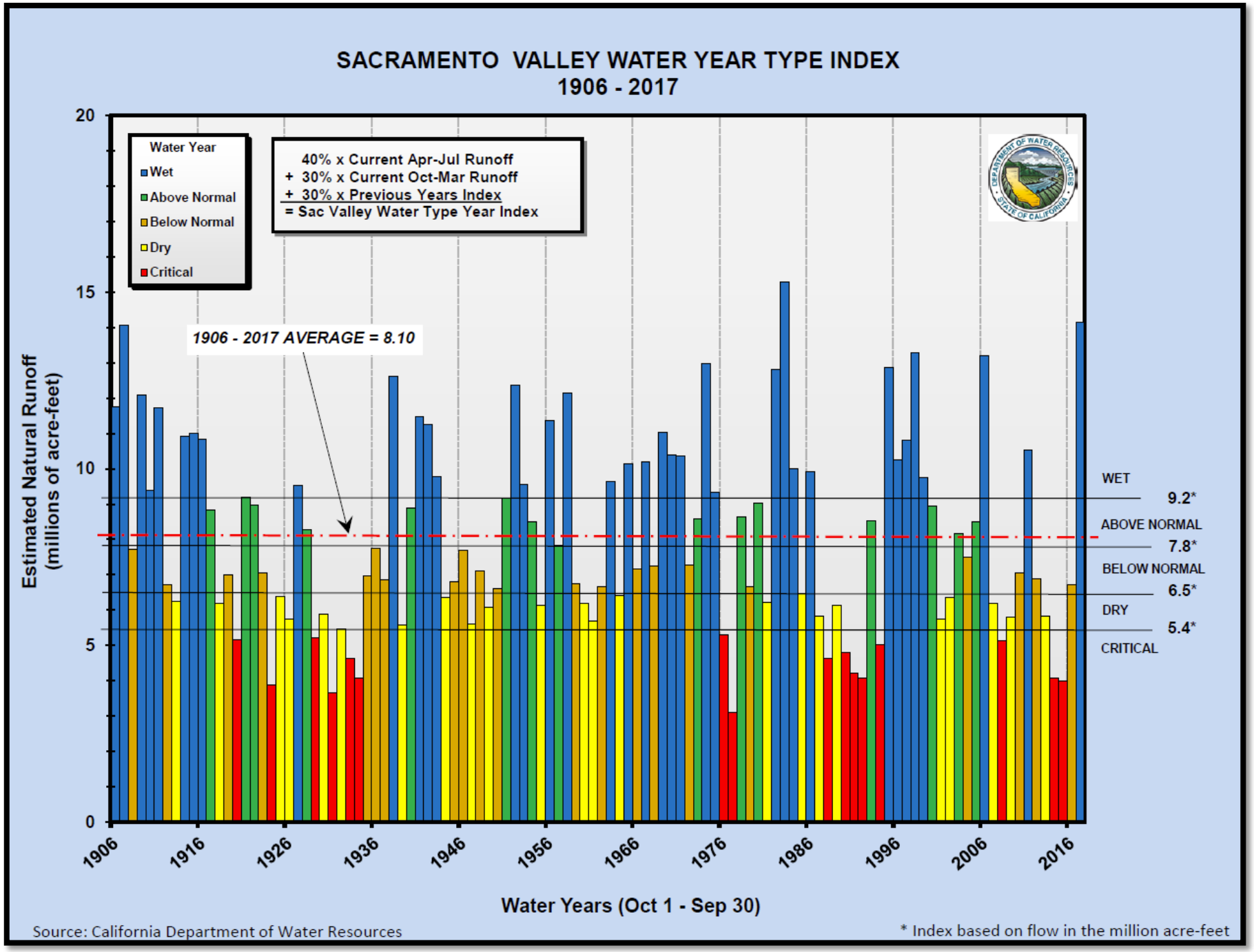
Author:

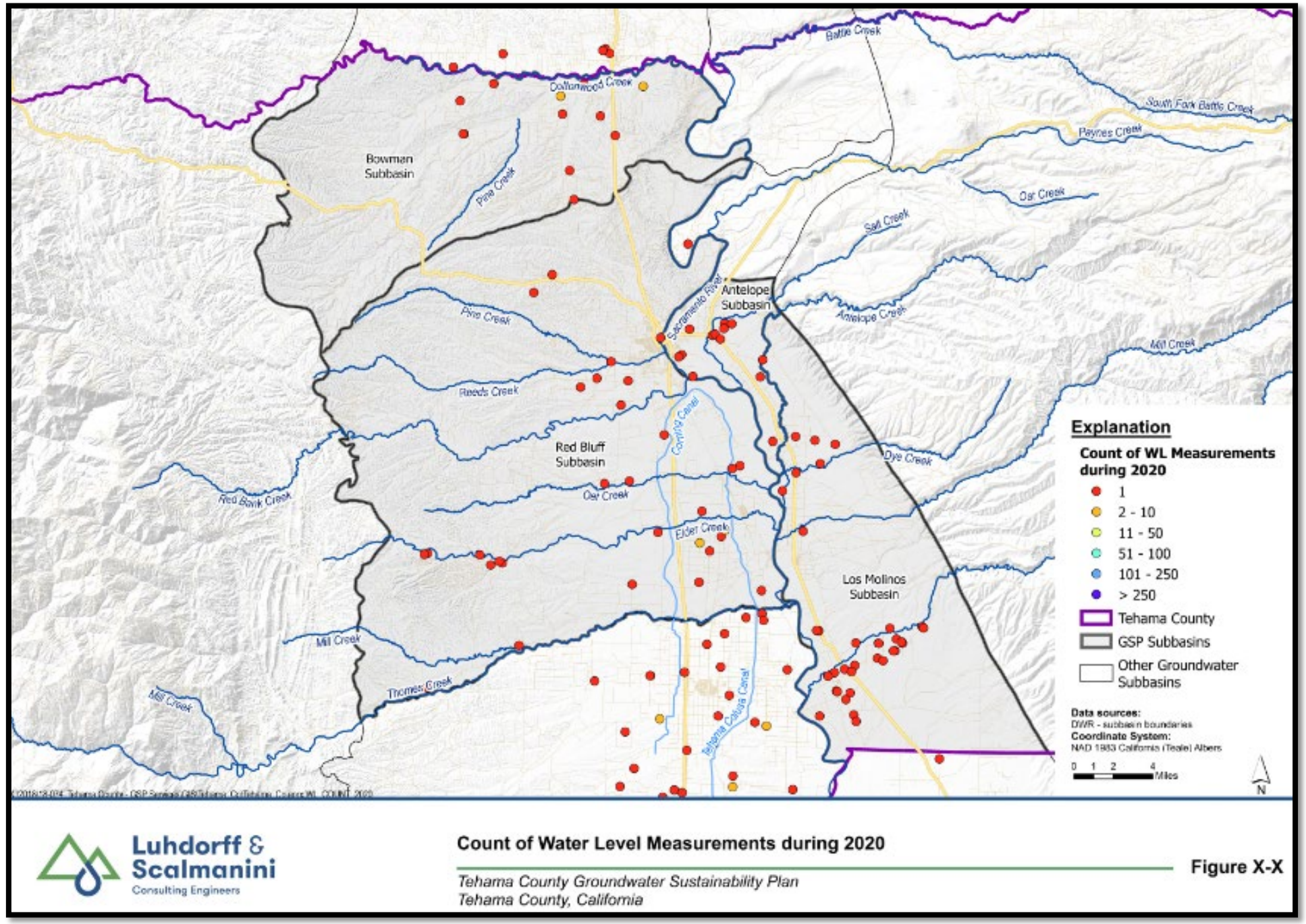
Brad Rippey
U.S. Department of Agriculture

droughtmonitor.unl.edu



http://cdec.water.ca.gov


SACRAMENTO VALLEY WATER YEAR TYPE INDEX
1906 - 2017
Water Year
Wet
Above Normal
Below Normal
Dry
Critical
40% x Current Apr-Jul Runoff
+ 30% x Current Oct-Mar Runoff
+ 30% x Previous Years Index
= Sac Valley Water Type Year Index
1906 - 2017 AVERAGE = 8.10
Estimated Natural Runoff
(millions of acre-feet)
20
15
10
5
0
1906
1916
1926
1936
1946
1956
1966
1976
1986
1996
2006
2016
Water Years (Oct 1 - Sep 30)
WET
9.2*
ABOVE NORMAL
7.8*
BELOW NORMAL
6.5*
DRY
5.4*
CRITICAL
Source: California Department of Water Resources
* Index based on flow in the million acre-feet

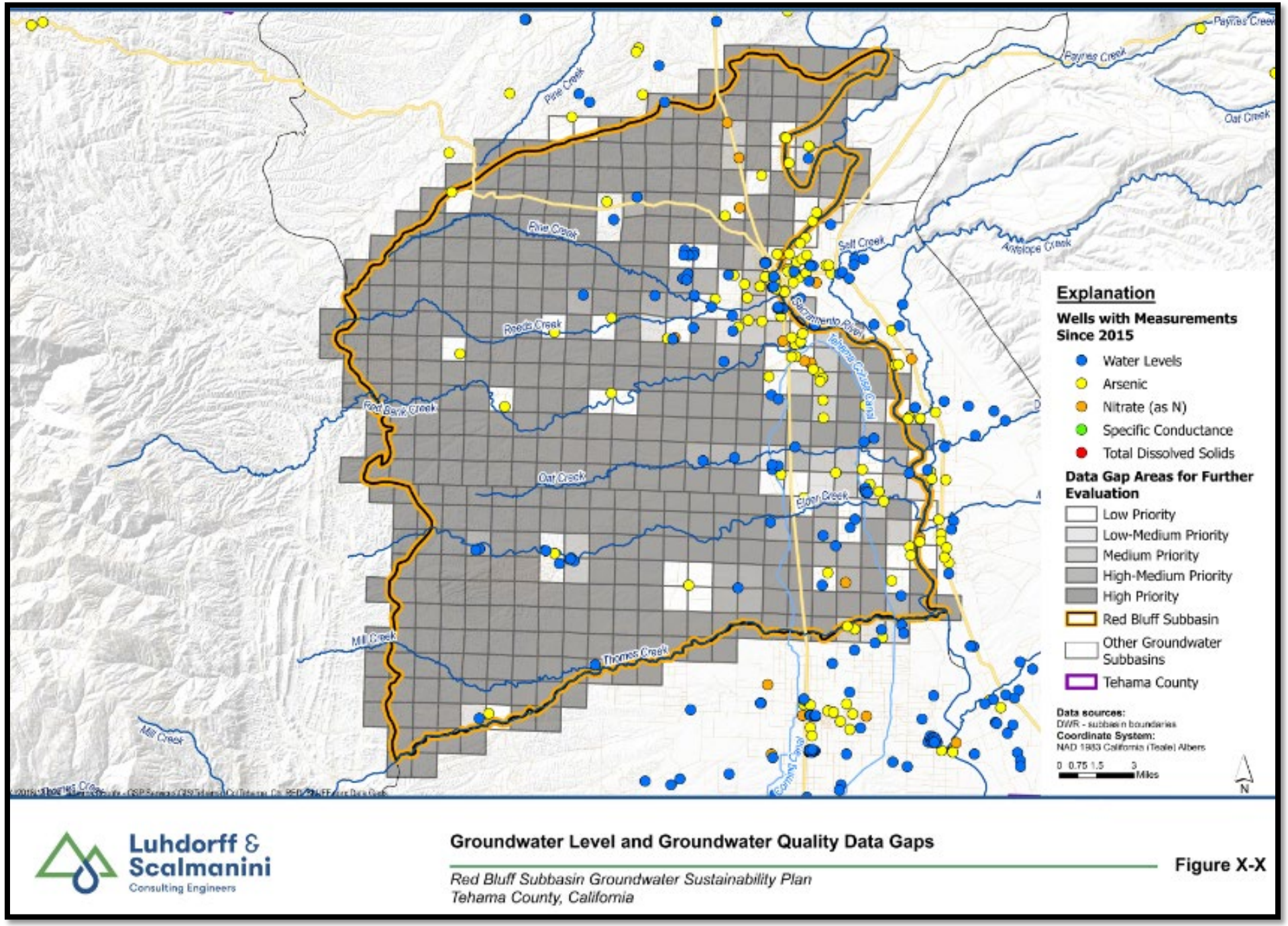


Luhdorff & Scalmanini
Consulting Engineers

Count of Water Level Measurements during 2020

Tehama County Groundwater Sustainability Plan
Tehama County, California

Figure X-X

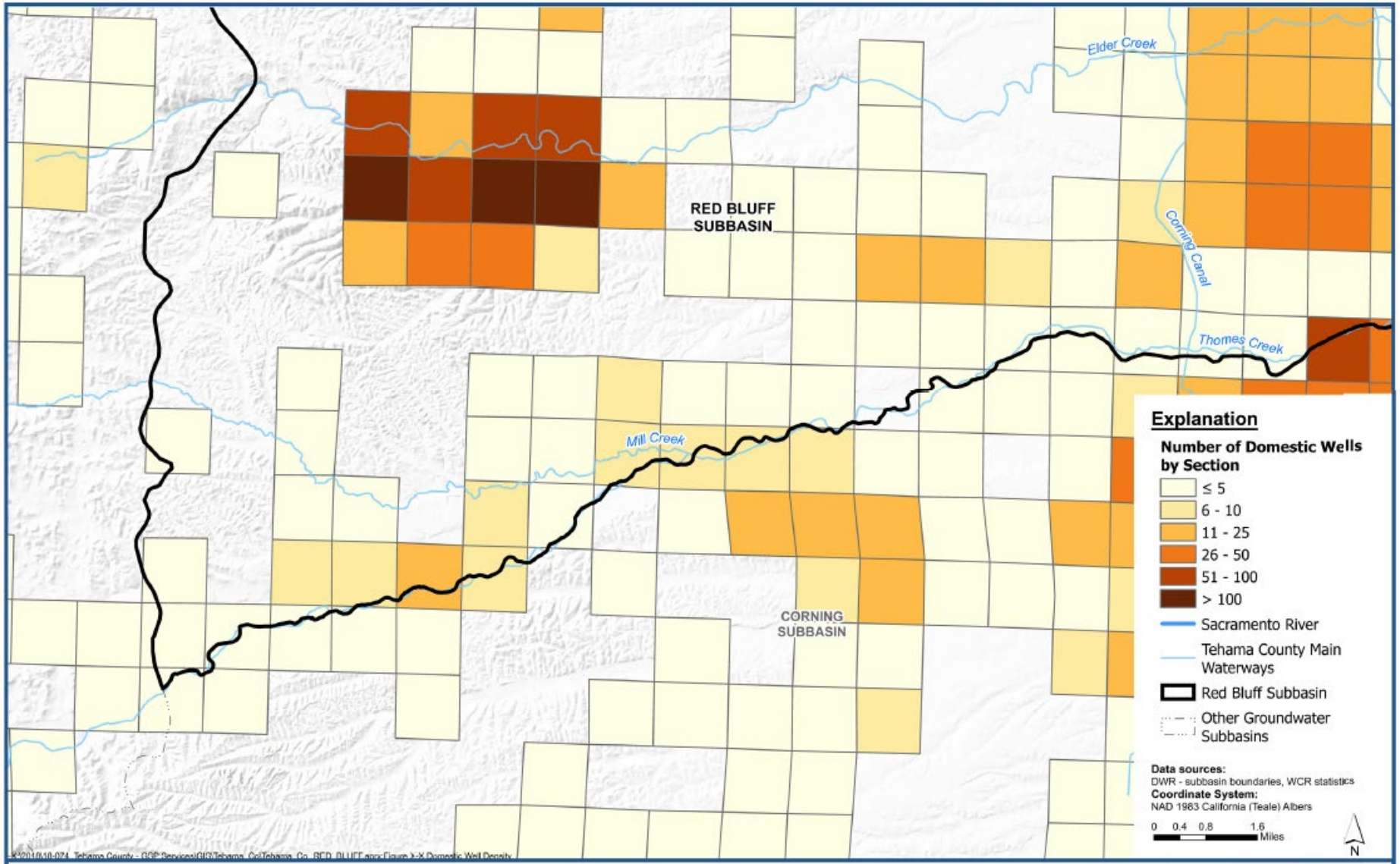


Luhdorff & Scalmanini
Consulting Engineers

Groundwater Level and Groundwater Quality Data Gaps

Red Bluff Subbasin Groundwater Sustainability Plan
Tehama County, California

Figure X-X

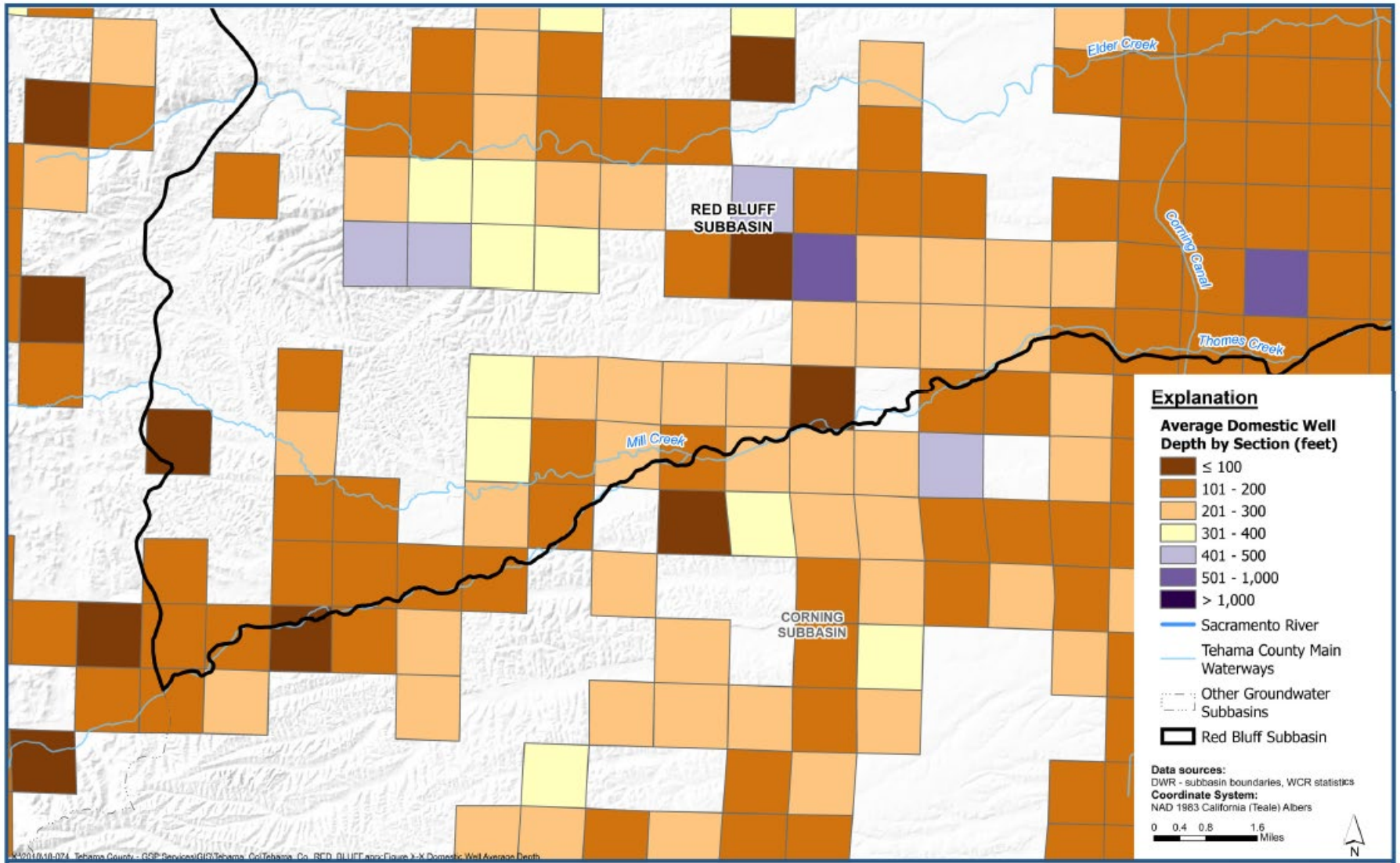


Luhdorff & Scalmanini
Consulting Engineers

Domestic Well Density by Section

Red Bluff Subbasin Groundwater Sustainability Plan
Tehama County, California

Figure X-X

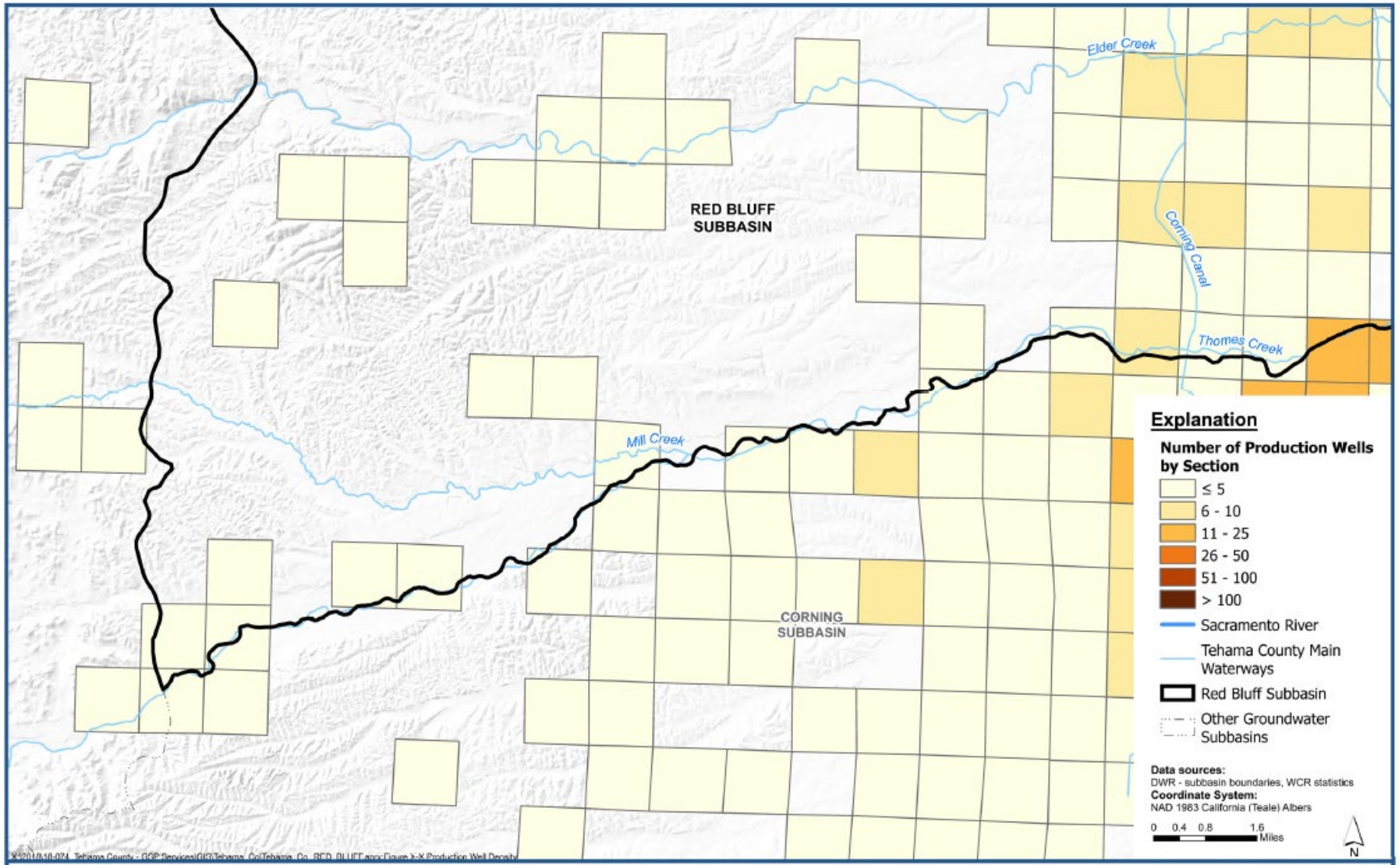


Luhdorff & Scalmanini
Consulting Engineers

Average Domestic Well Depth by Section

Red Bluff Subbasin Groundwater Sustainability Plan
Tehama County, California

Figure X-X

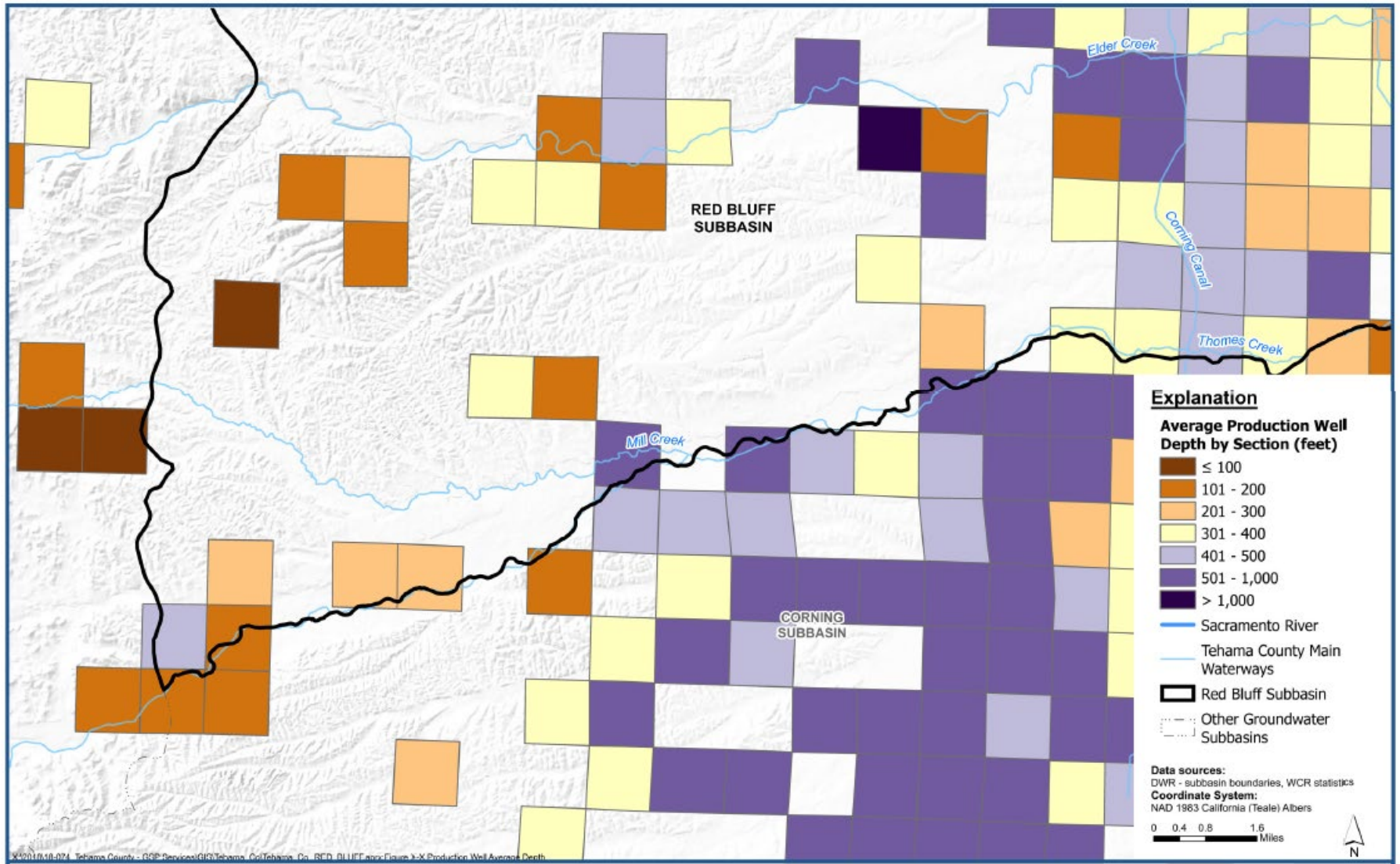


Luhdorff & Scalmanini
Consulting Engineers

Production Well Density by Section

Red Bluff Subbasin Groundwater Sustainability Plan
Tehama County, California

Figure X-X

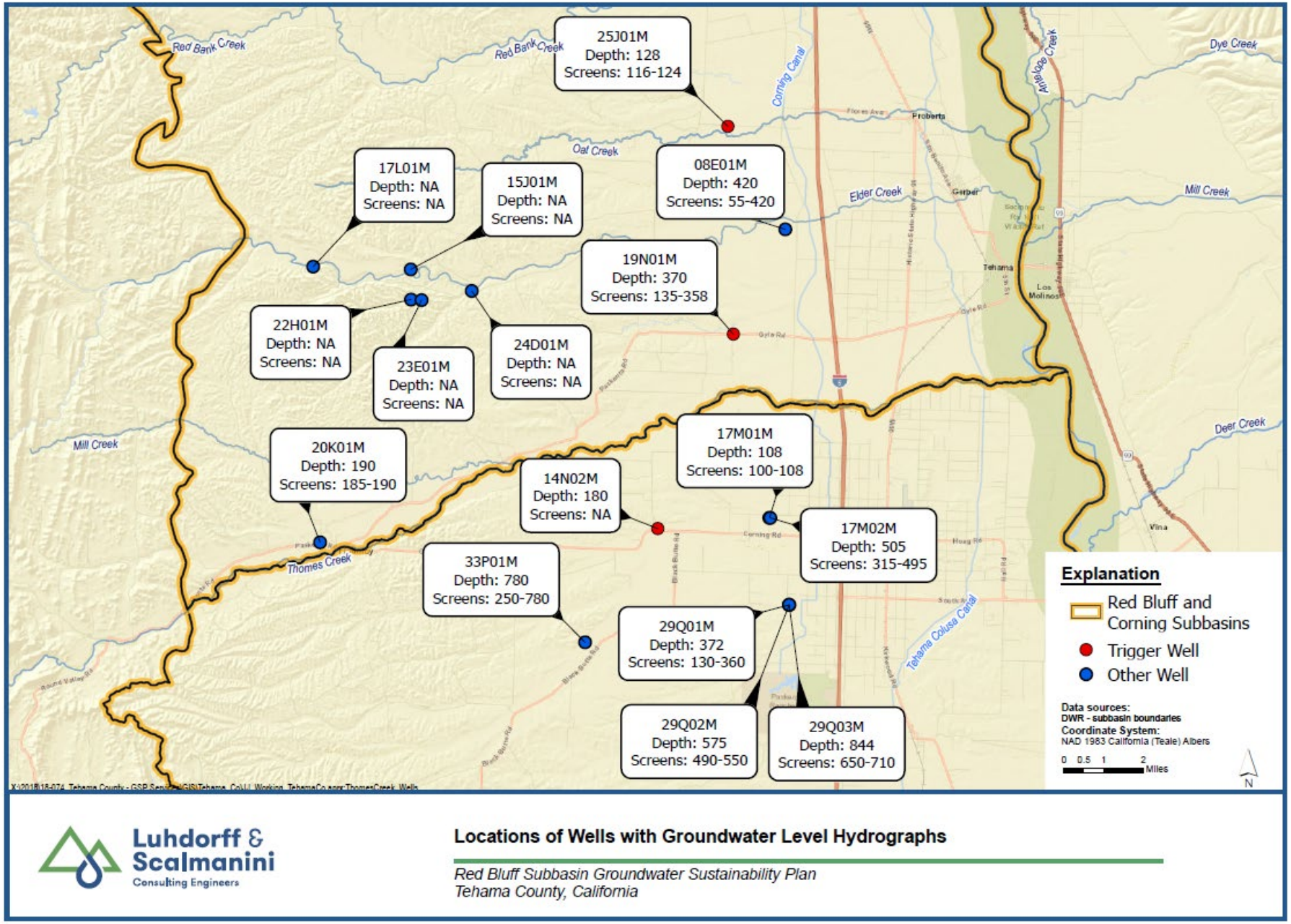


Luhdorff & Scalmanini
Consulting Engineers

Average Production Well Depth by Section

Red Bluff Subbasin Groundwater Sustainability Plan
Tehama County, California

Figure X-X



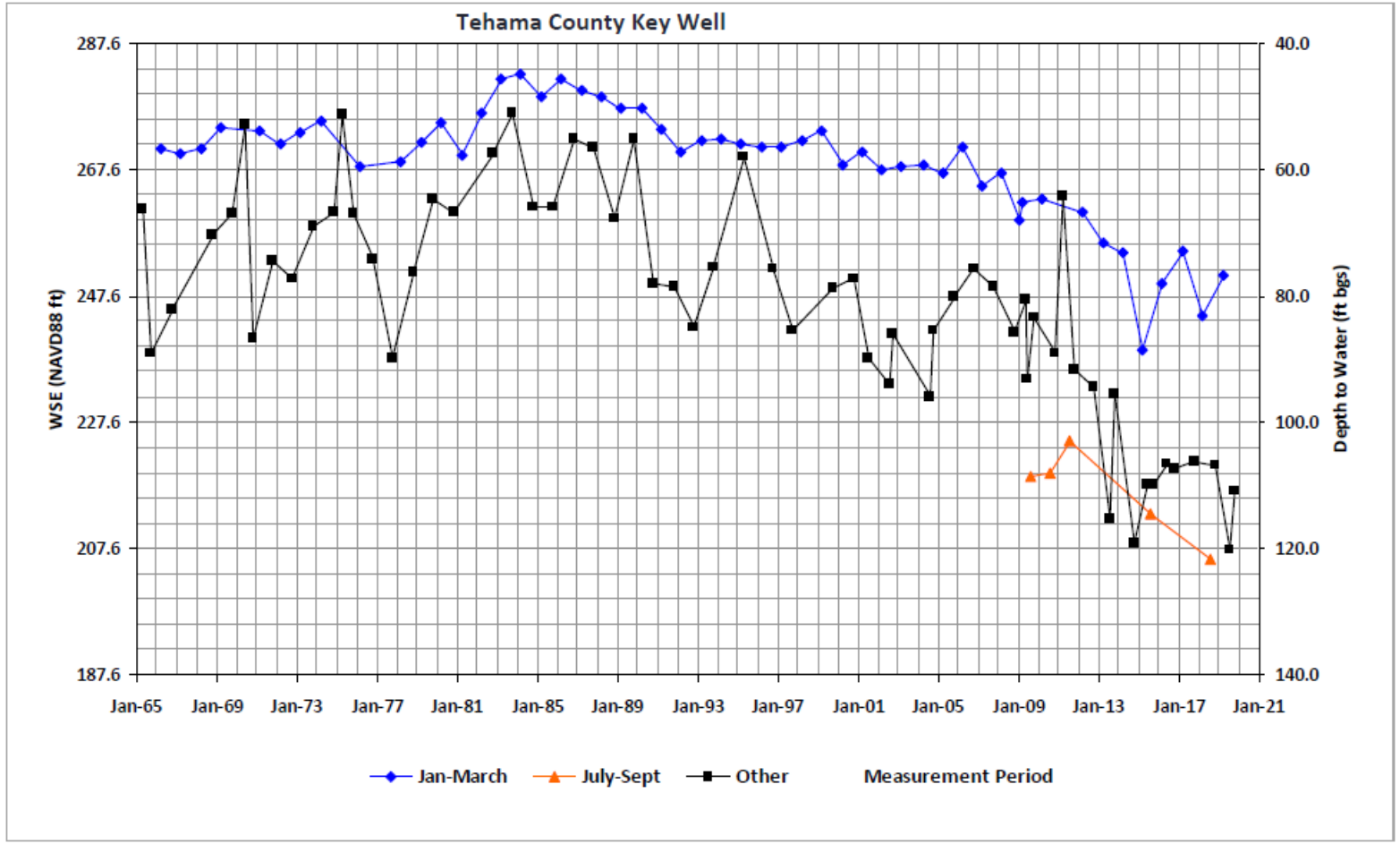
Luhdorff & Scalmanini Consulting Engineers

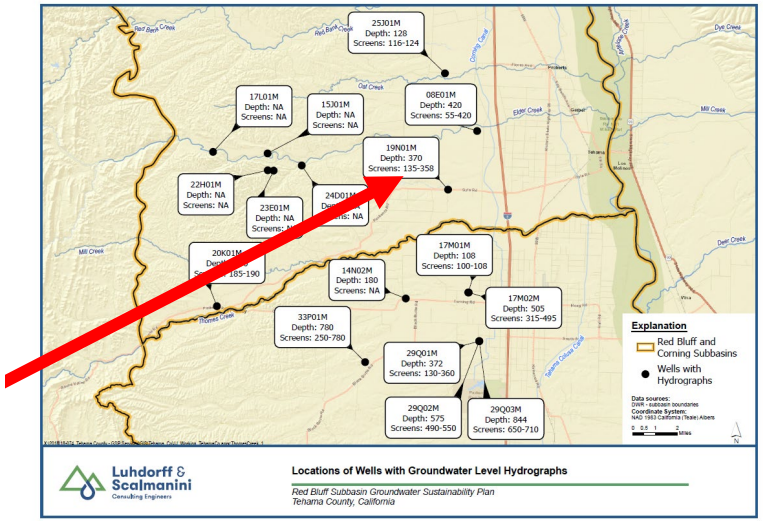
Locations of Wells with Groundwater Level Hydrographs

Red Bluff Subbasin Groundwater Sustainability Plan
Tehama County, California

Well ID: 25N03W19N001M | Well Depth (ft): 370 | GSE (NAVD88 ft): 327.5 | Subbasin: Red Bluff

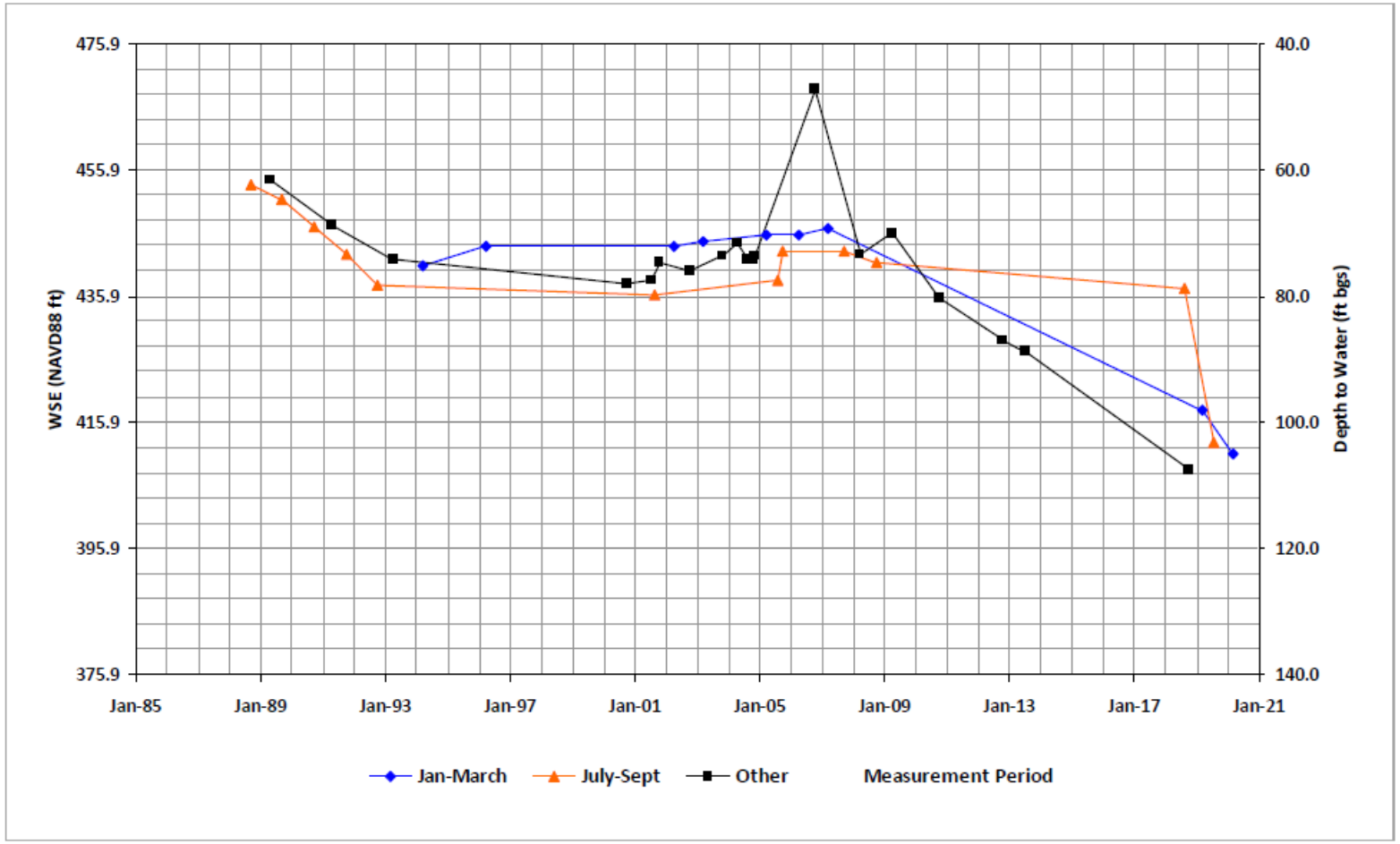
Short Well ID: 19N01M | Screen Top (ft bgs): 135 | Screen Bot (ft bgs): 358 | Well Type: Irrigation

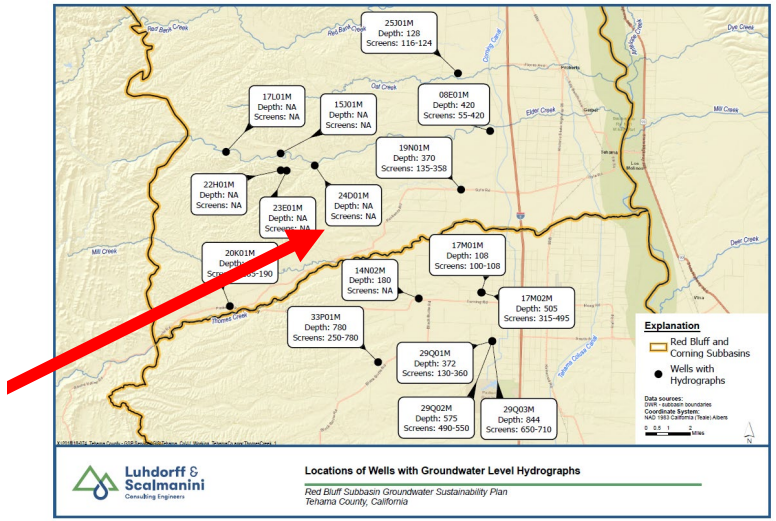




Well ID: 25N05W24D001M | **Well Depth (ft): N/A** | **GSE (NAVD88 ft): 515.6** | **Subbasin: Red Bluff**

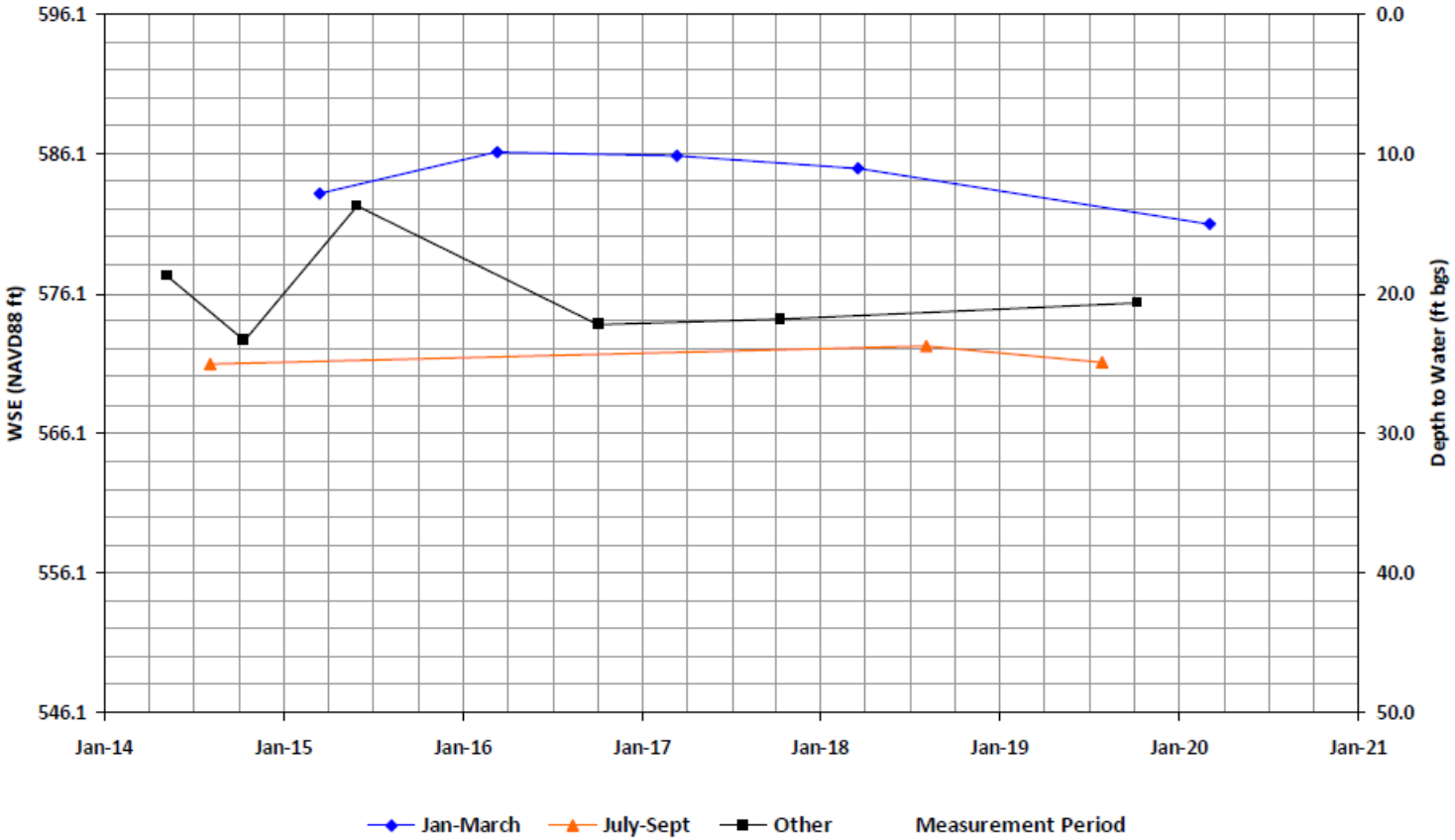
Short Well ID: 24D01M | **Screen Top (ft bgs): N/A** | **Screen Bot (ft bgs): N/A** | **Well Type: Industrial**

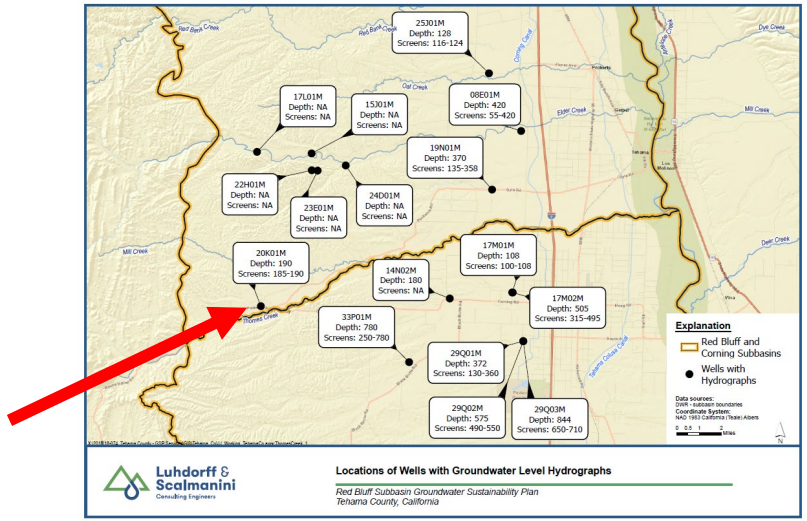




Well ID: 24N05W20K001M | **Well Depth (ft): 190** | **GSE (NAVD88 ft): 595** | **Subbasin: Red Bluff**

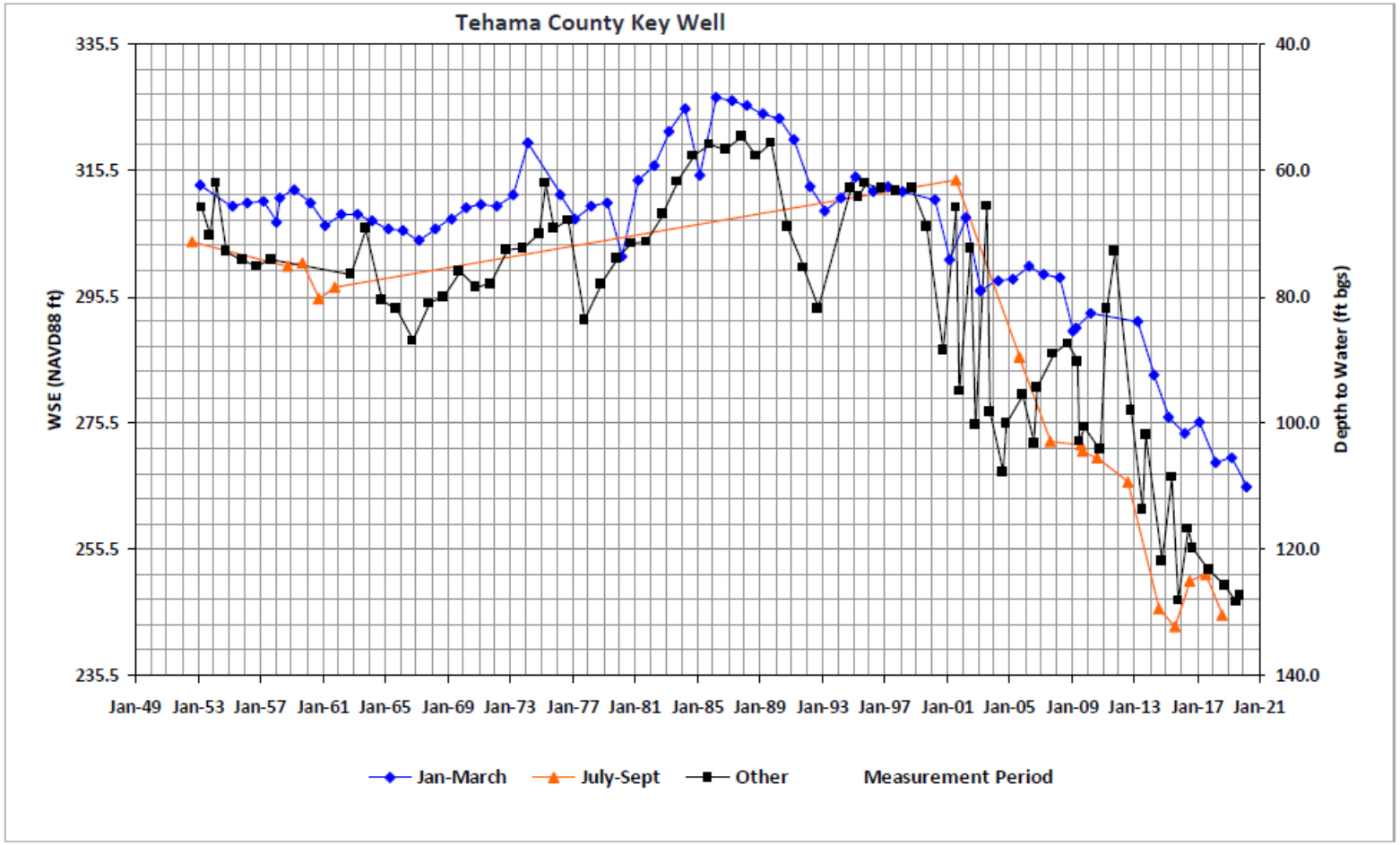
Short Well ID: 20K01M | **Screen Top (ft bgs): 185** | **Screen Bot (ft bgs): 190** | **Well Type: Domestic**

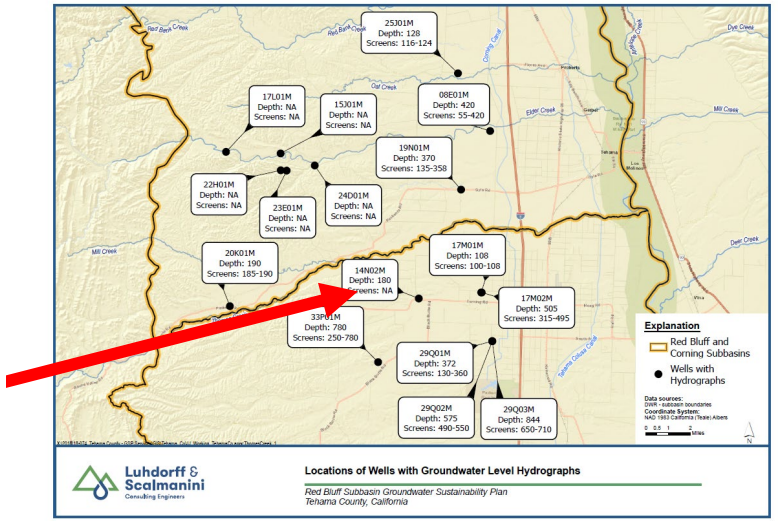




Well ID: 24N04W14N002M | **Well Depth (ft): 180** | **GSE (NAVD88 ft): 375** | **Subbasin: Corning**

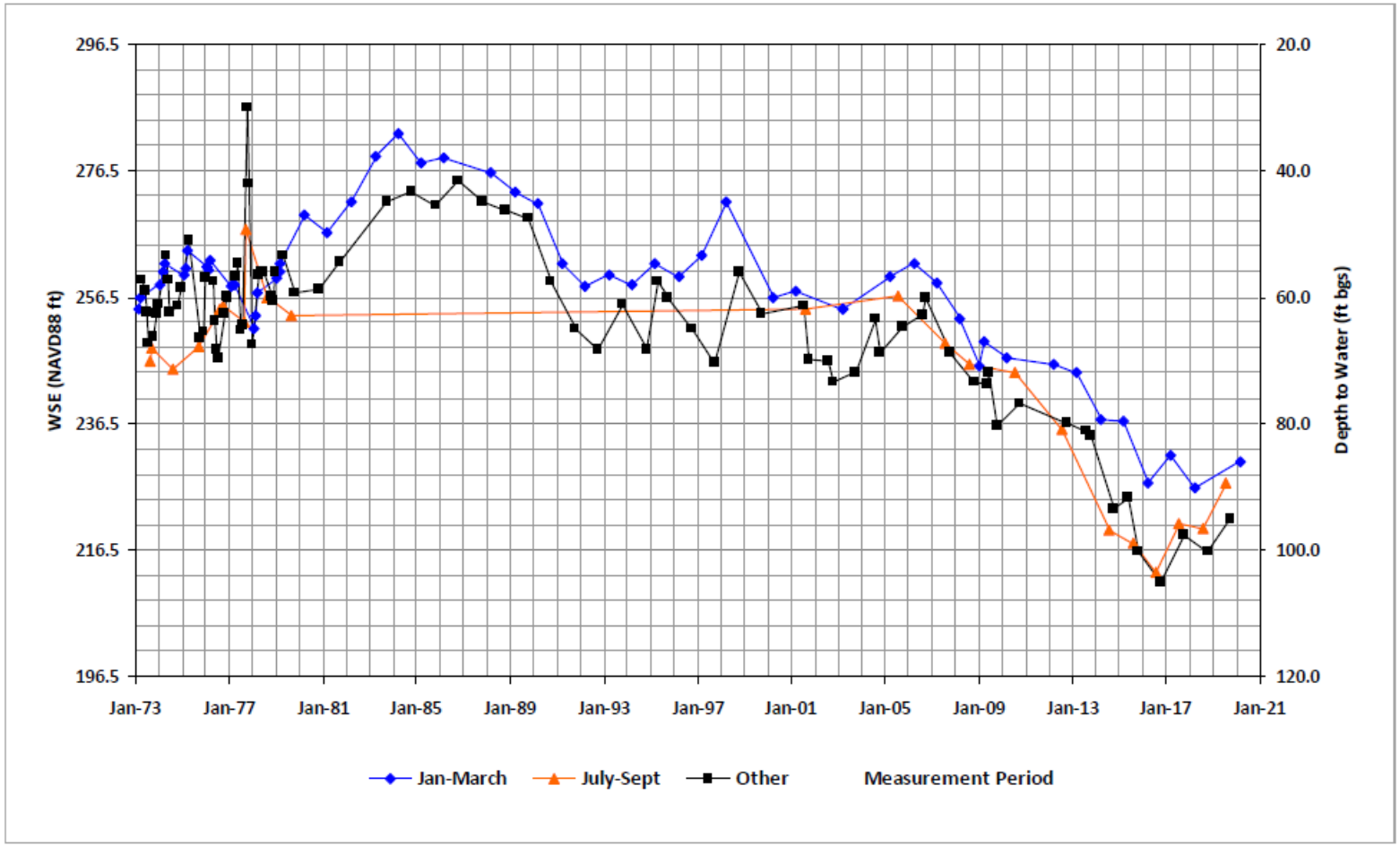
Short Well ID: 14N02M | **Screen Top (ft bgs): N/A** | **Screen Bot (ft bgs): N/A** | **Well Type: Domestic**

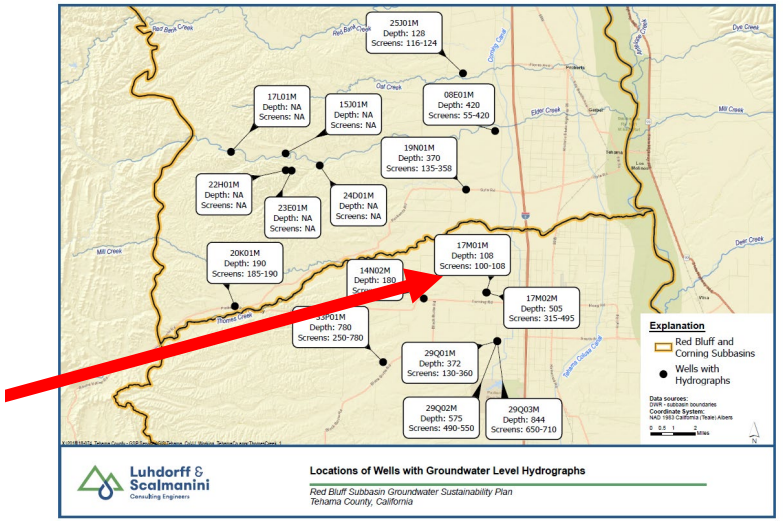




Well ID: 24N03W17M001M | **Well Depth (ft): 108** | **GSE (NAVD88 ft): 315.5** | **Subbasin: Corning**

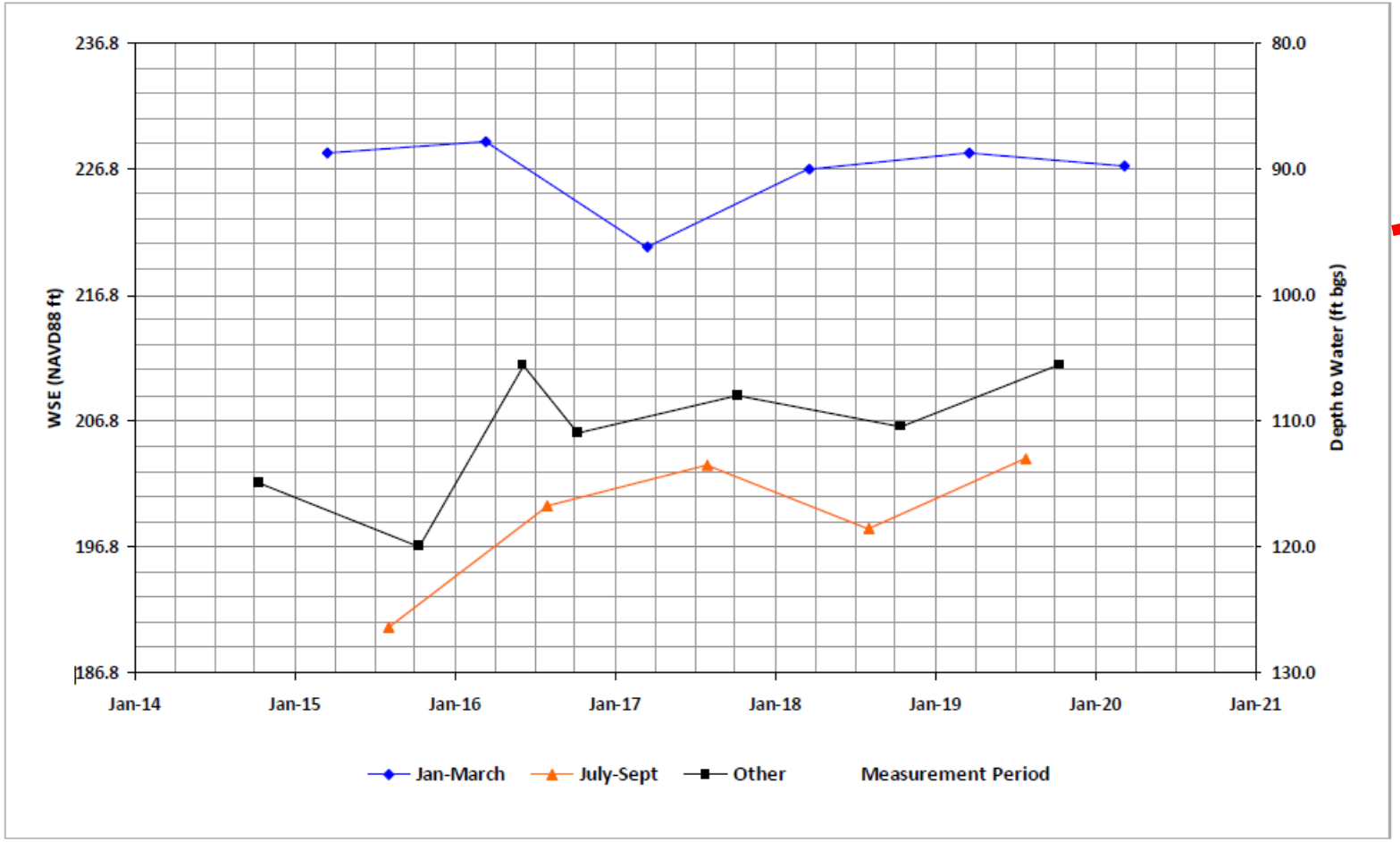
Short Well ID: 17M01M | **Screen Top (ft bgs): 100** | **Screen Bot (ft bgs): 108** | **Well Type: Domestic**

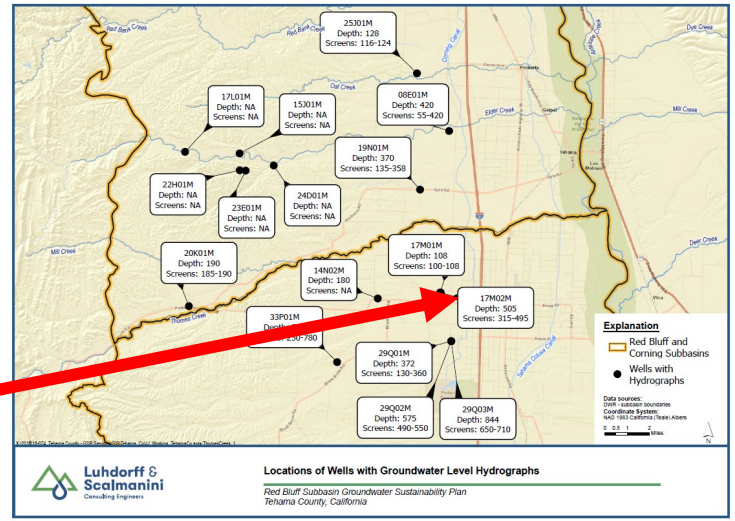




Well ID: 24N03W17M002M | Well Depth (ft): 505 | GSE (NAVD88 ft): 315.5 | Subbasin: Corning

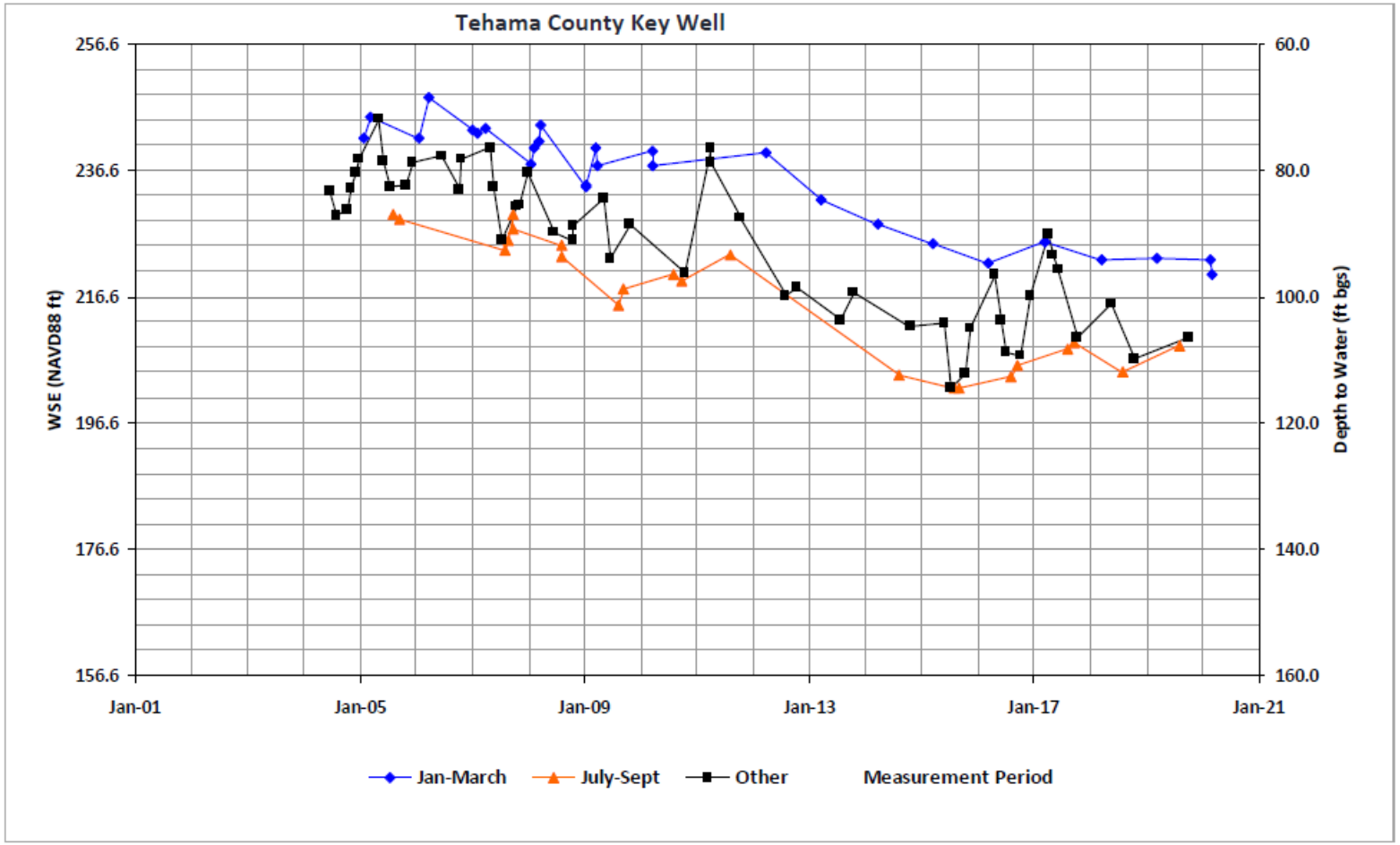
Short Well ID: 17M02M | Screen Top (ft bgs): 315 | Screen Bot (ft bgs): 495 | Well Type: Irrigation

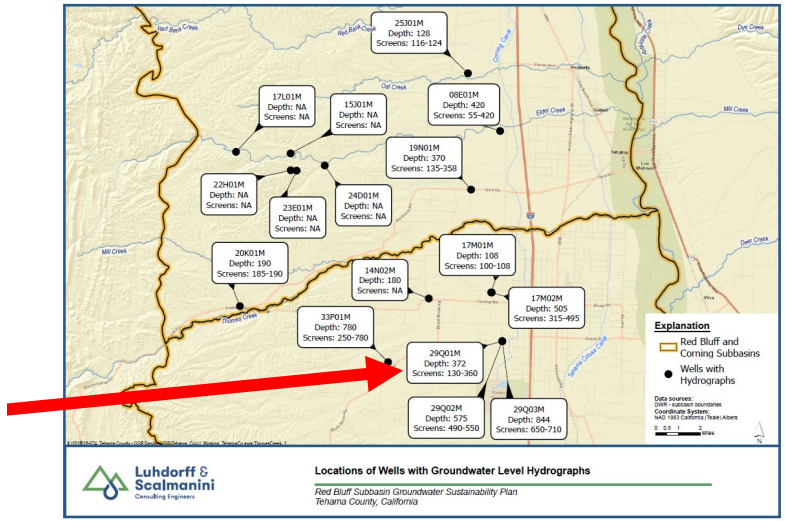


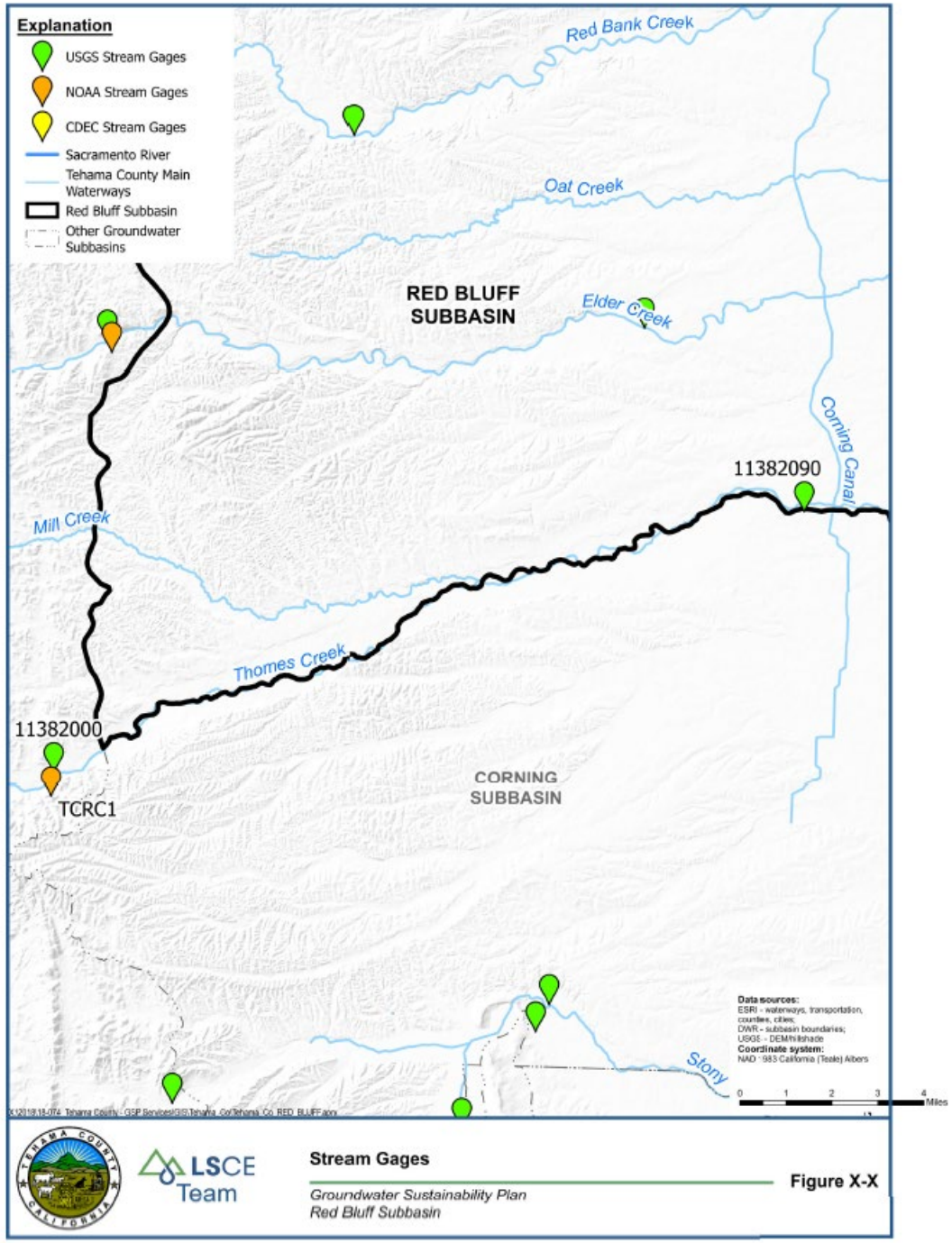


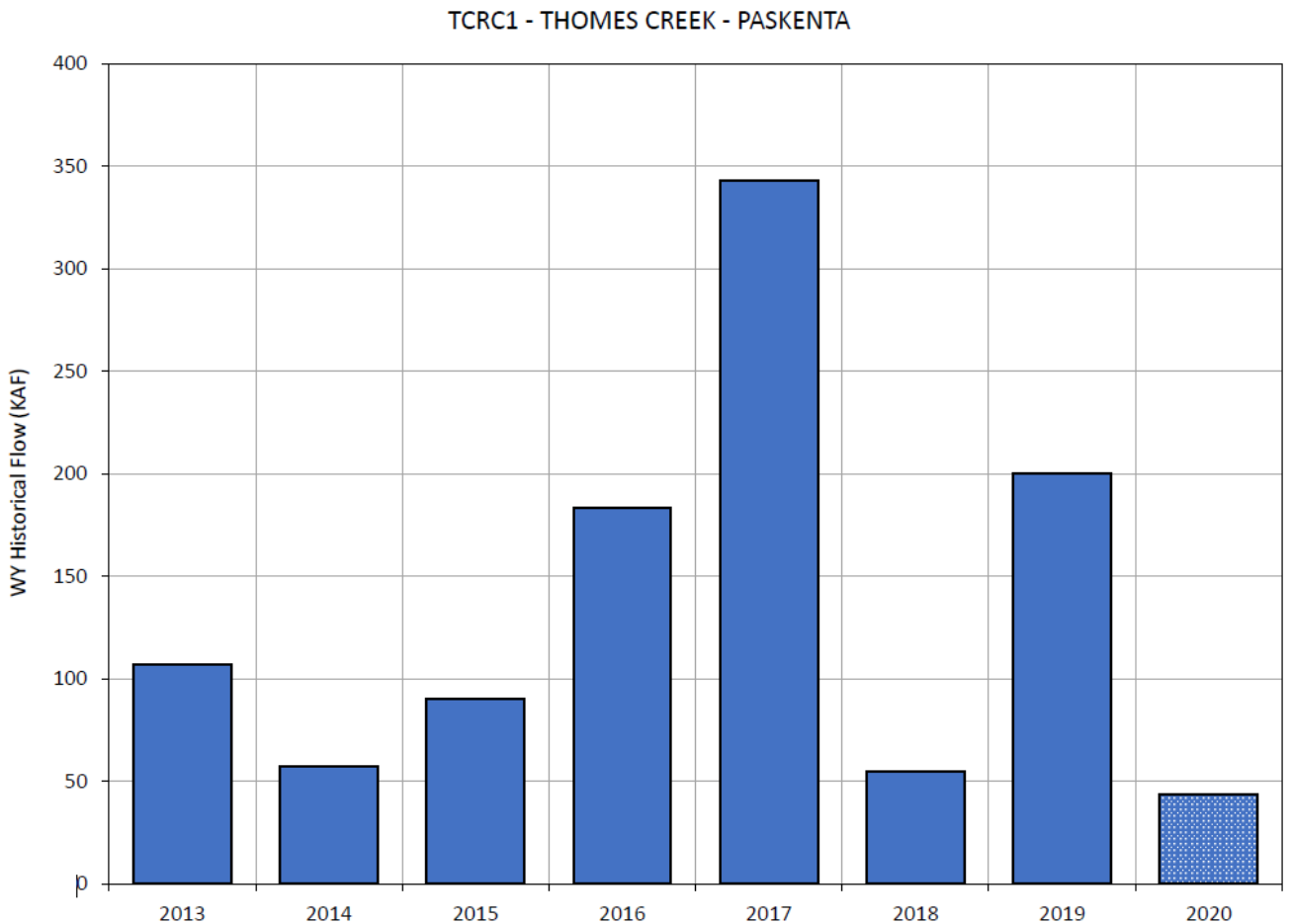
Well ID: 24N03W29Q001M | **Well Depth (ft): 372** | **GSE (NAVD88 ft): 314.2** | **Subbasin: Corning**

Short Well ID: 29Q01M | **Screen Top (ft bgs): 130** | **Screen Bot (ft bgs): 360** | **Well Type: Monitoring**






Explanation
USGS Stream Gages
NOAA Stream Gages
CDEC Stream Gages
Sacramento River
Tehama County Main Waterways
Red Bluff Subbasin
Other Groundwater Subbasins
Red Bank Creek
Oat Creek
RED BLUFF SUBBASIN
Elder Creek
Corning Canal
11382090
Mill Creek
Thomes Creek
11382000
TCRC1
CORNING SUBBASIN
Stony
Data sources:
ESRI - waterways, transportation, counties, cities;
DWR - subbasin boundaries;
USGS - DEM/hillshade
Coordinate system:
NAD 1983 California (Teale) Albers
0 1 2 3 4 Miles
LSCE Team
Stream Gages
Groundwater Sustainability Plan
Red Bluff Subbasin
Figure X-X

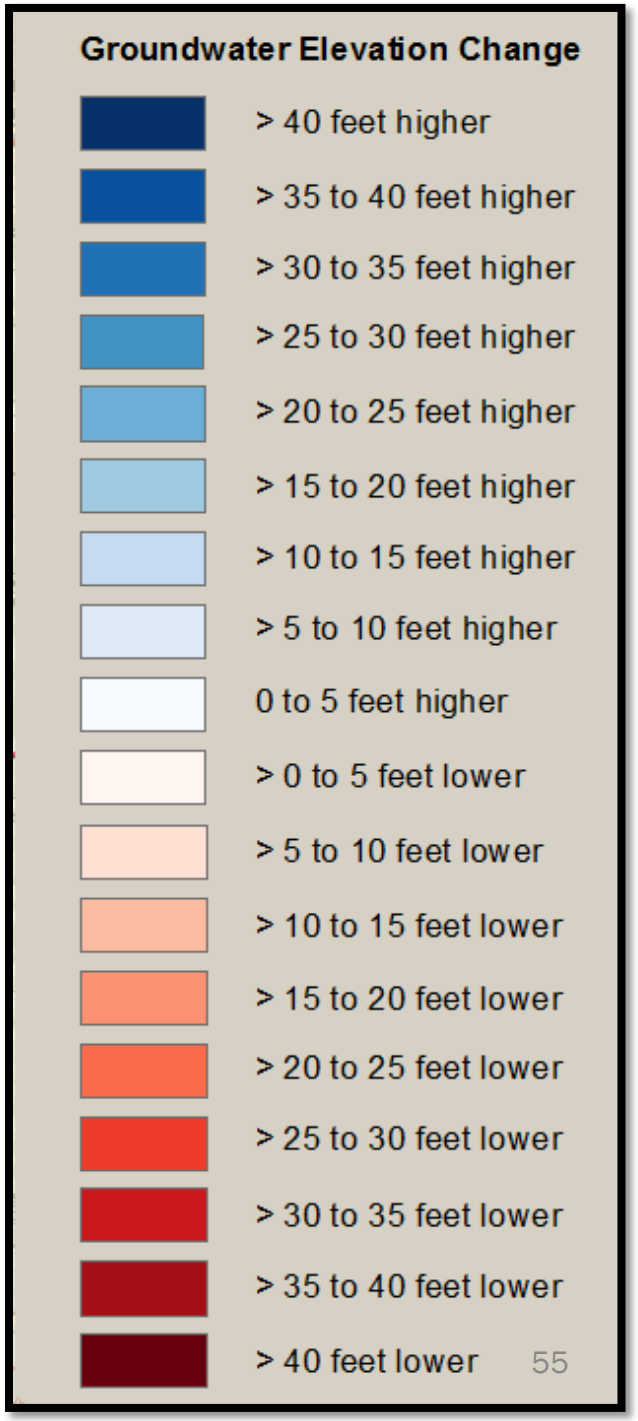

TCRC1 - THOMES CREEK - PASKENTA
WY Historical Flow (KAF)
400
350
300
250
200
150
100
50
0
2013
2014
2015
2016
2017
2018
2019
2020

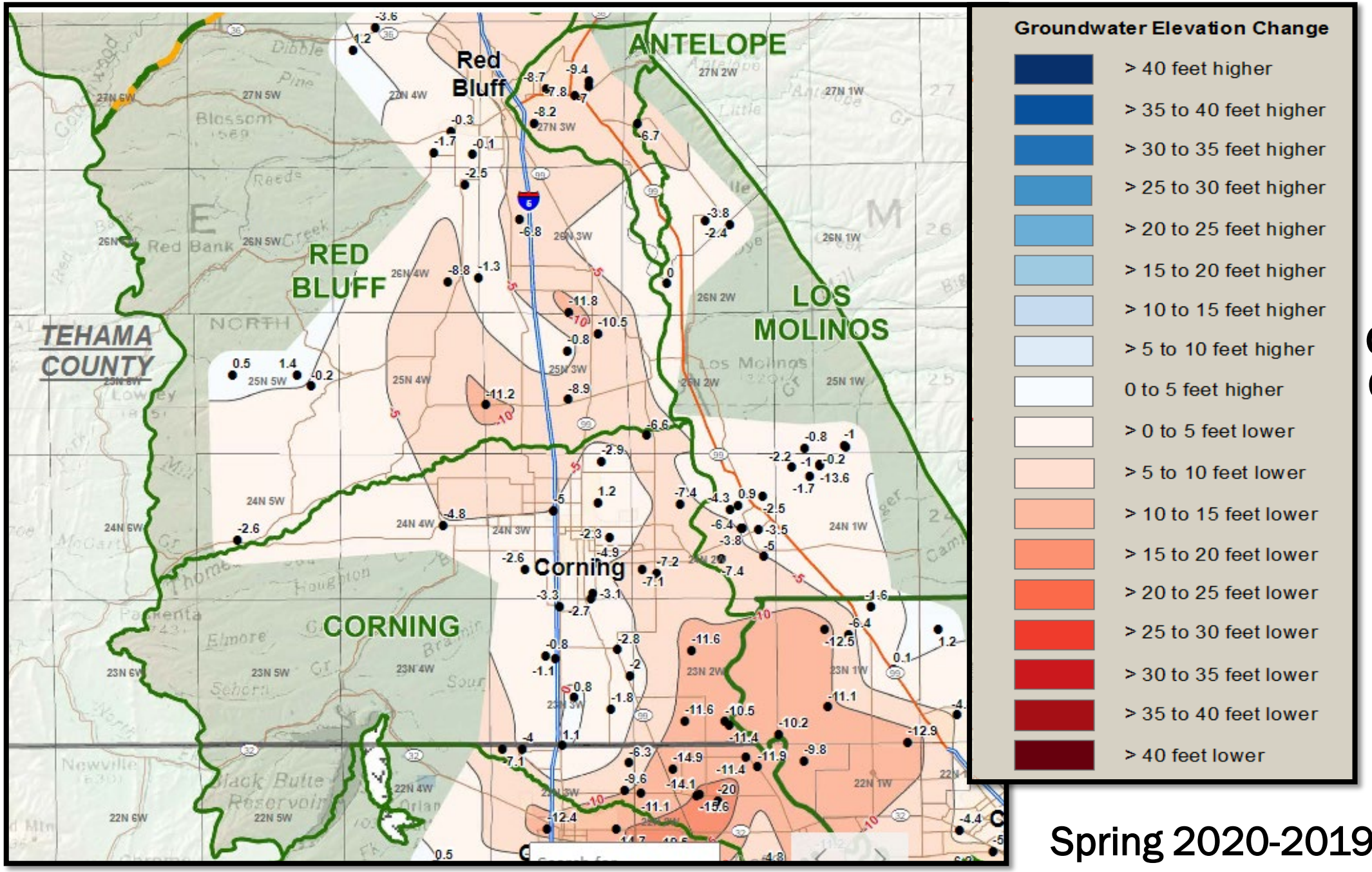
Groundwater Change Maps

100 - 450 ft Deep Wells (~70% of all wells)

Comparison Between Spring:

- 2020-2019
- 2020-2015
- 2020-2004

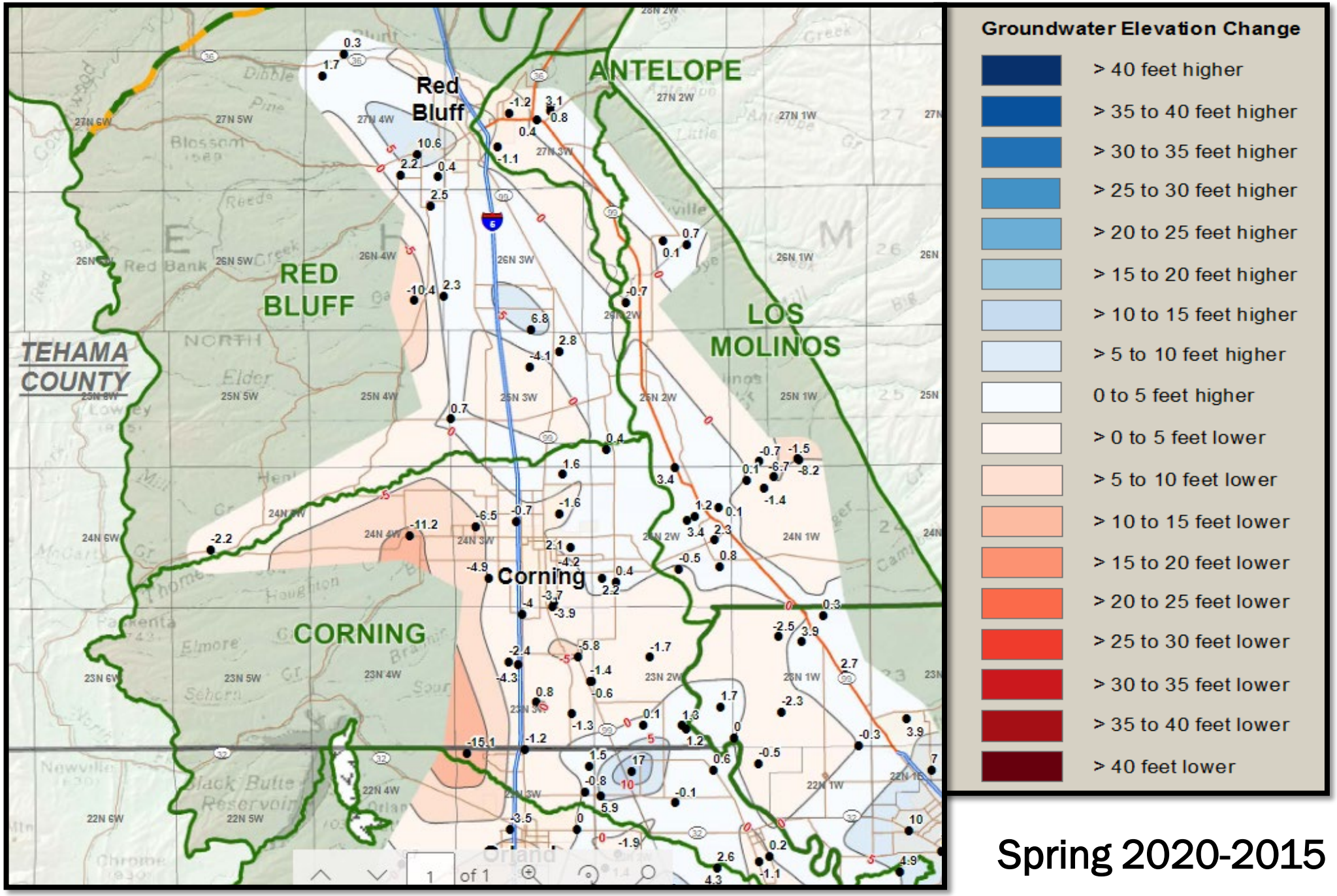




Groundwater Change Map

100-450 ft deep wells

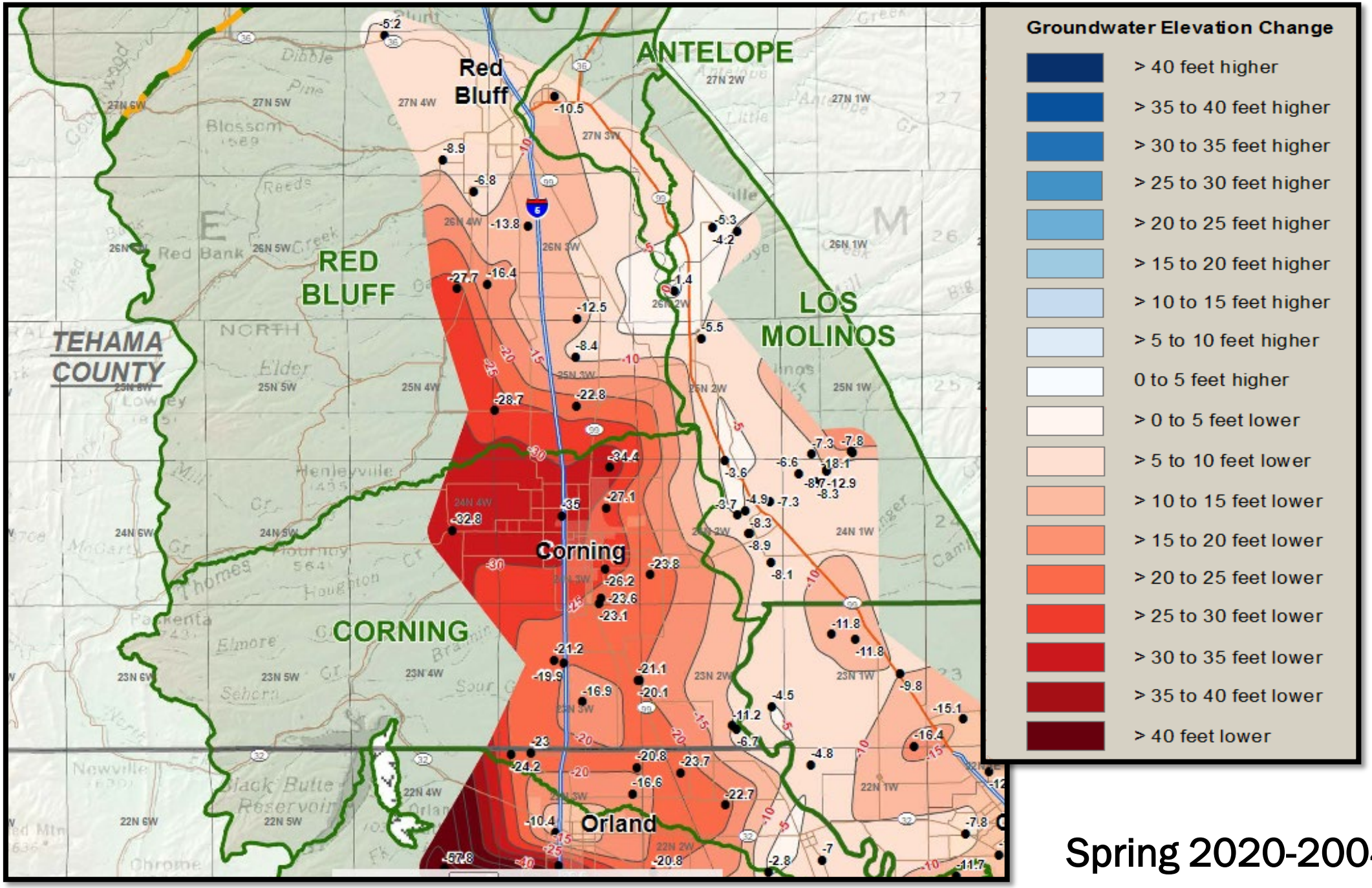
Spring 2020-2019



Groundwater Change Map

100-450 ft deep wells

Spring 2020-2015



Groundwater Change Map

100-450 ft deep wells

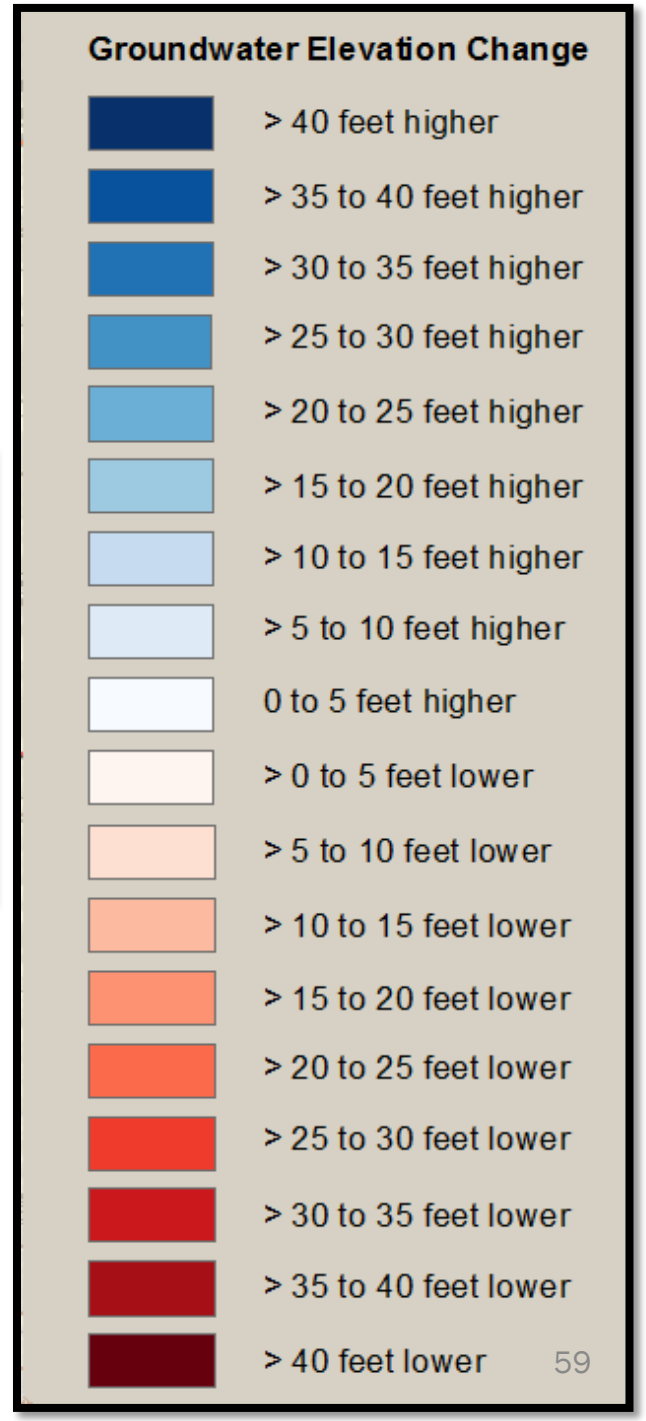
Spring 2020-2004

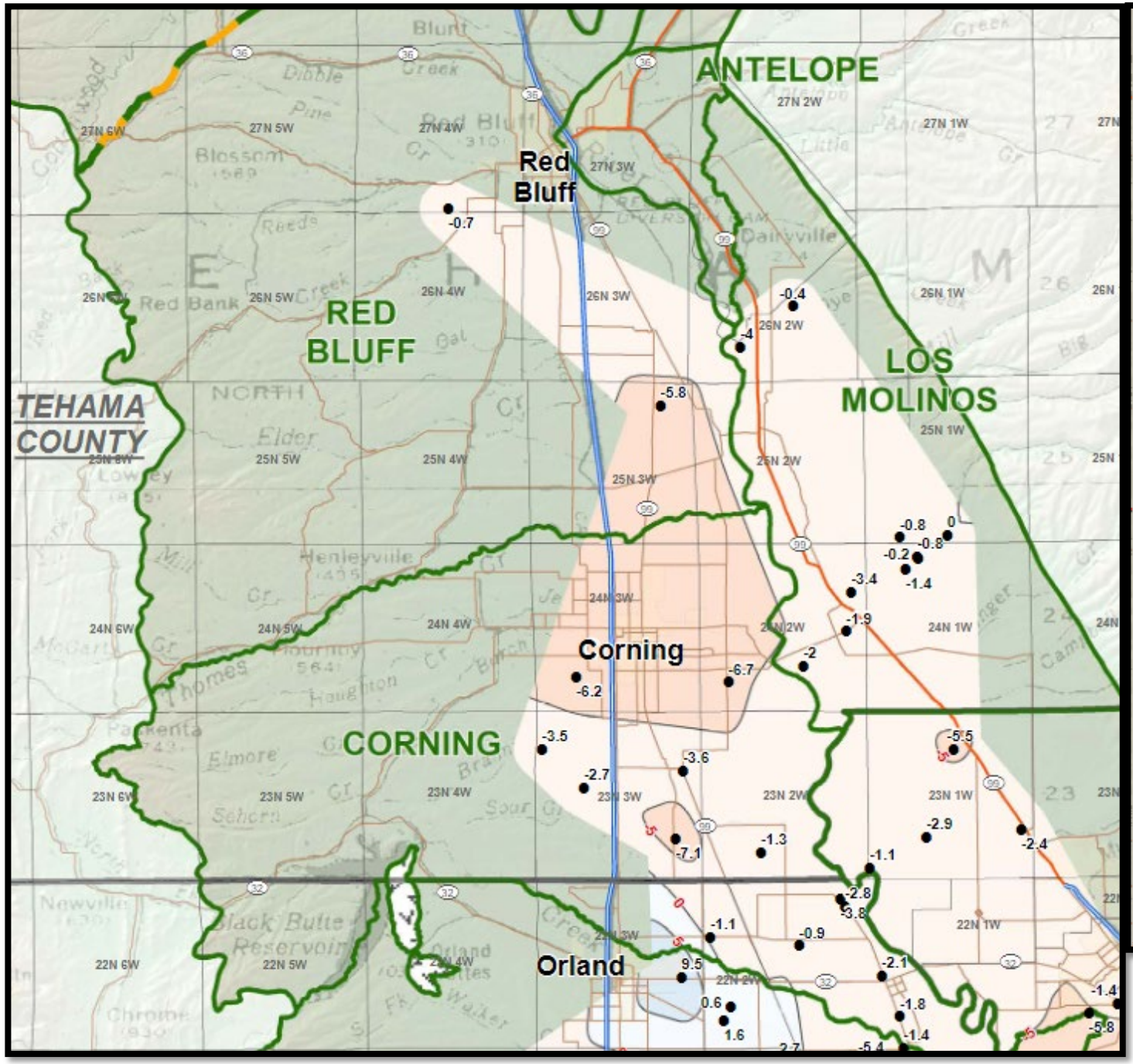
Groundwater Change Maps

>600 ft Deep Wells

Comparison Between Spring:

- 2020-2019
- 2020-2015
- 2020-2004





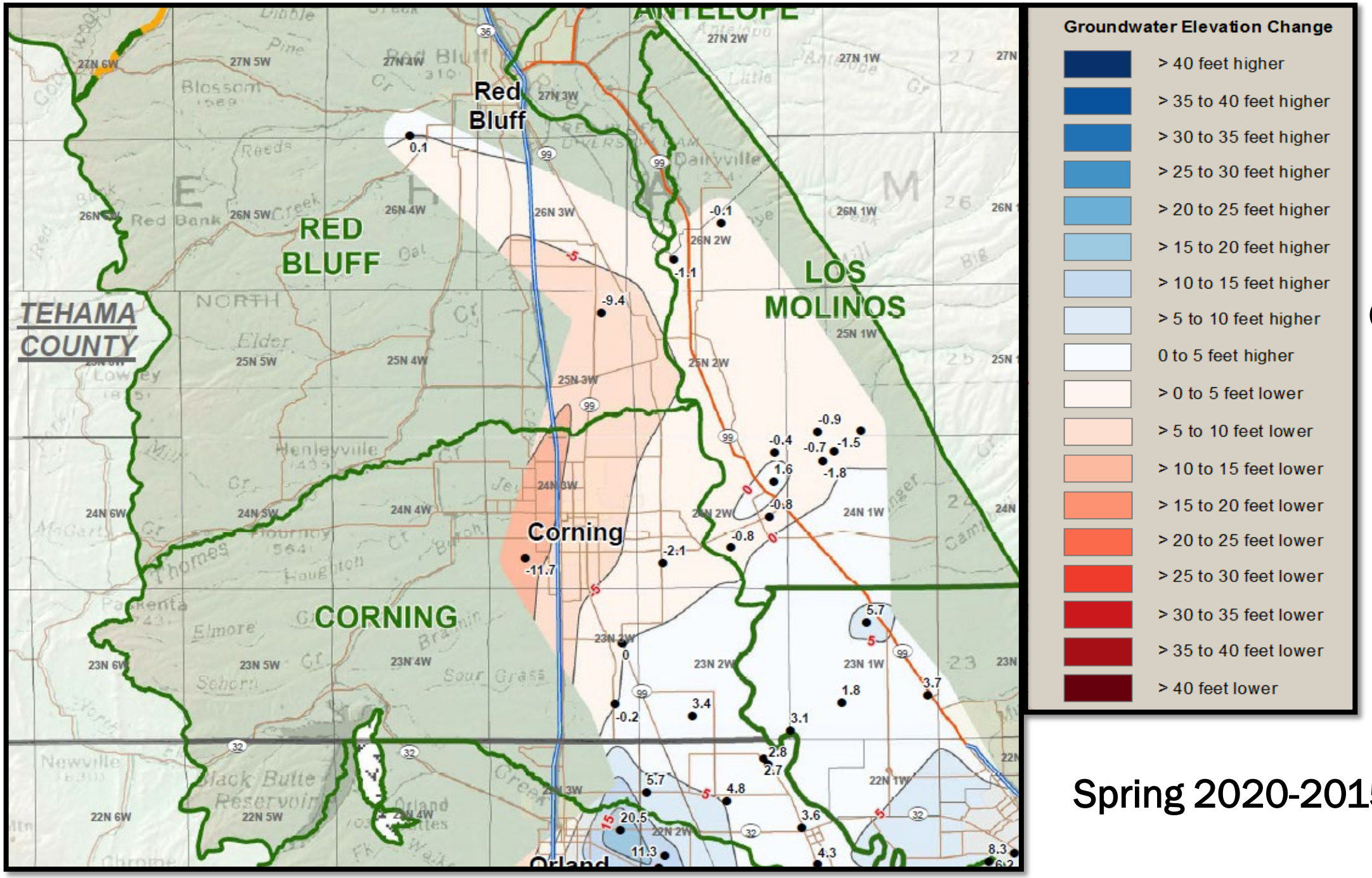
Groundwater Elevation Change

- > 40 feet higher
- > 35 to 40 feet higher
- > 30 to 35 feet higher
- > 25 to 30 feet higher
- > 20 to 25 feet higher
- > 15 to 20 feet higher
- > 10 to 15 feet higher
- > 5 to 10 feet higher
- 0 to 5 feet higher
- > 0 to 5 feet lower
- > 5 to 10 feet lower
- > 10 to 15 feet lower
- > 15 to 20 feet lower
- > 20 to 25 feet lower
- > 25 to 30 feet lower
- > 30 to 35 feet lower
- > 35 to 40 feet lower
- > 40 feet lower

Groundwater Change Map

> 600 ft deep wells

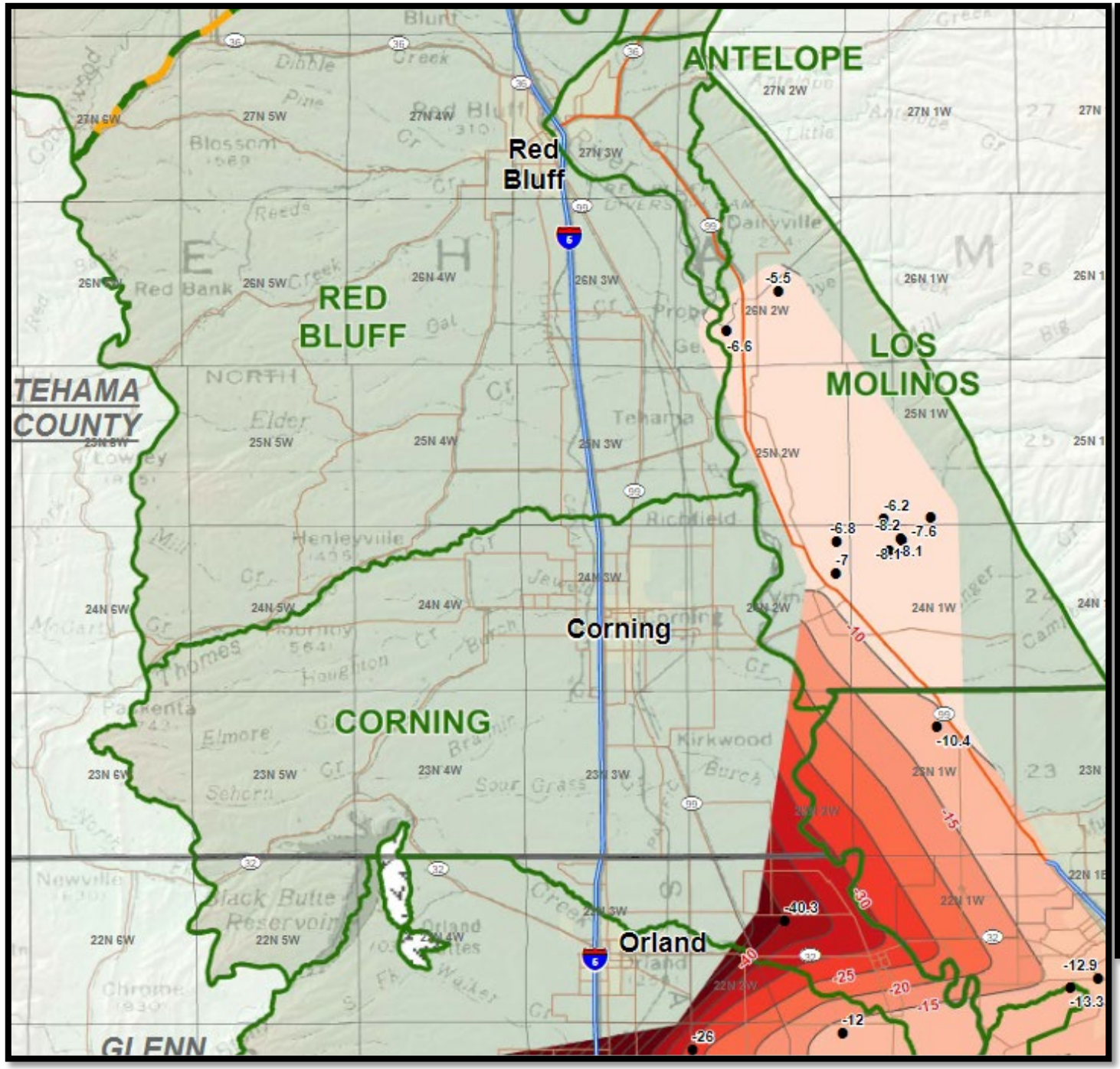
Spring 2020-2019

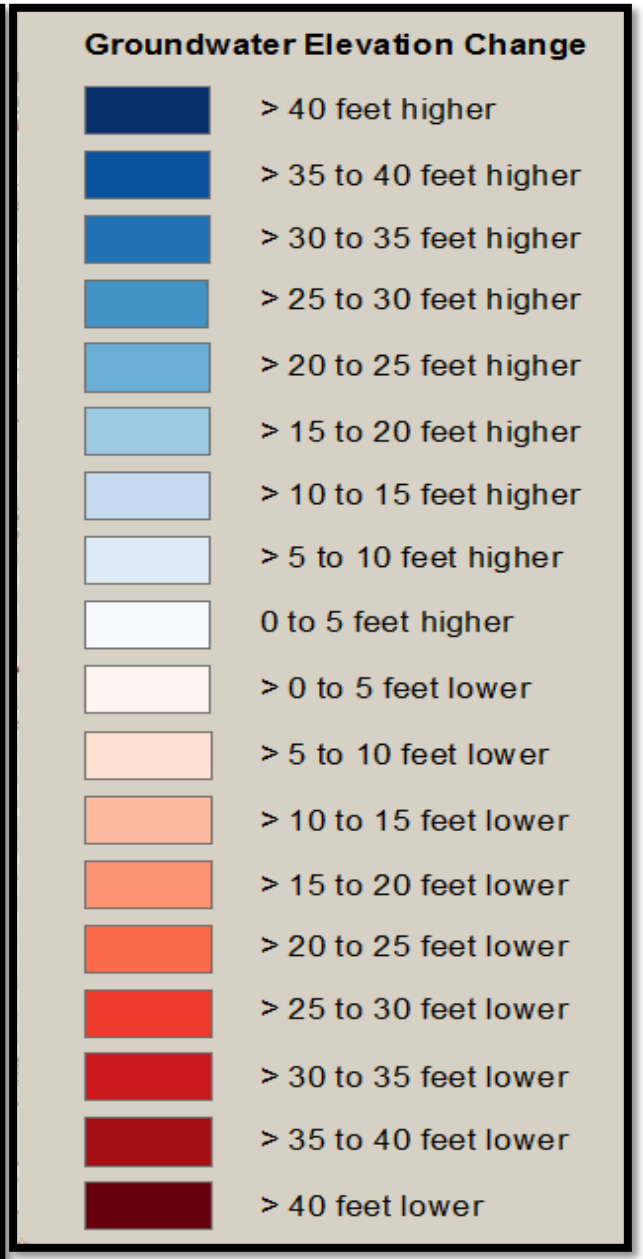


Groundwater Change Map

> 600 ft deep wells

Spring 2020-2015

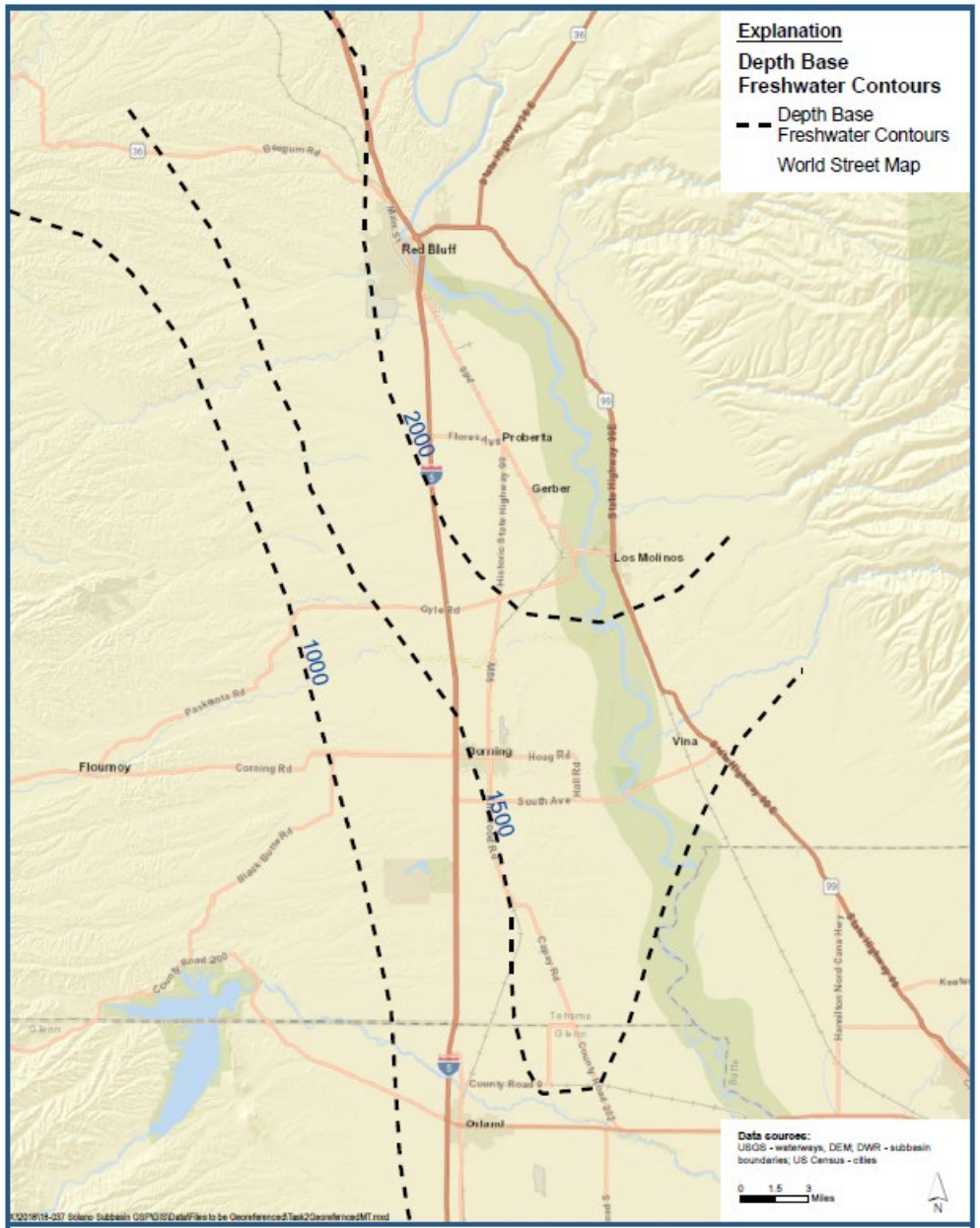




Groundwater Change Map

> 600 ft deep wells

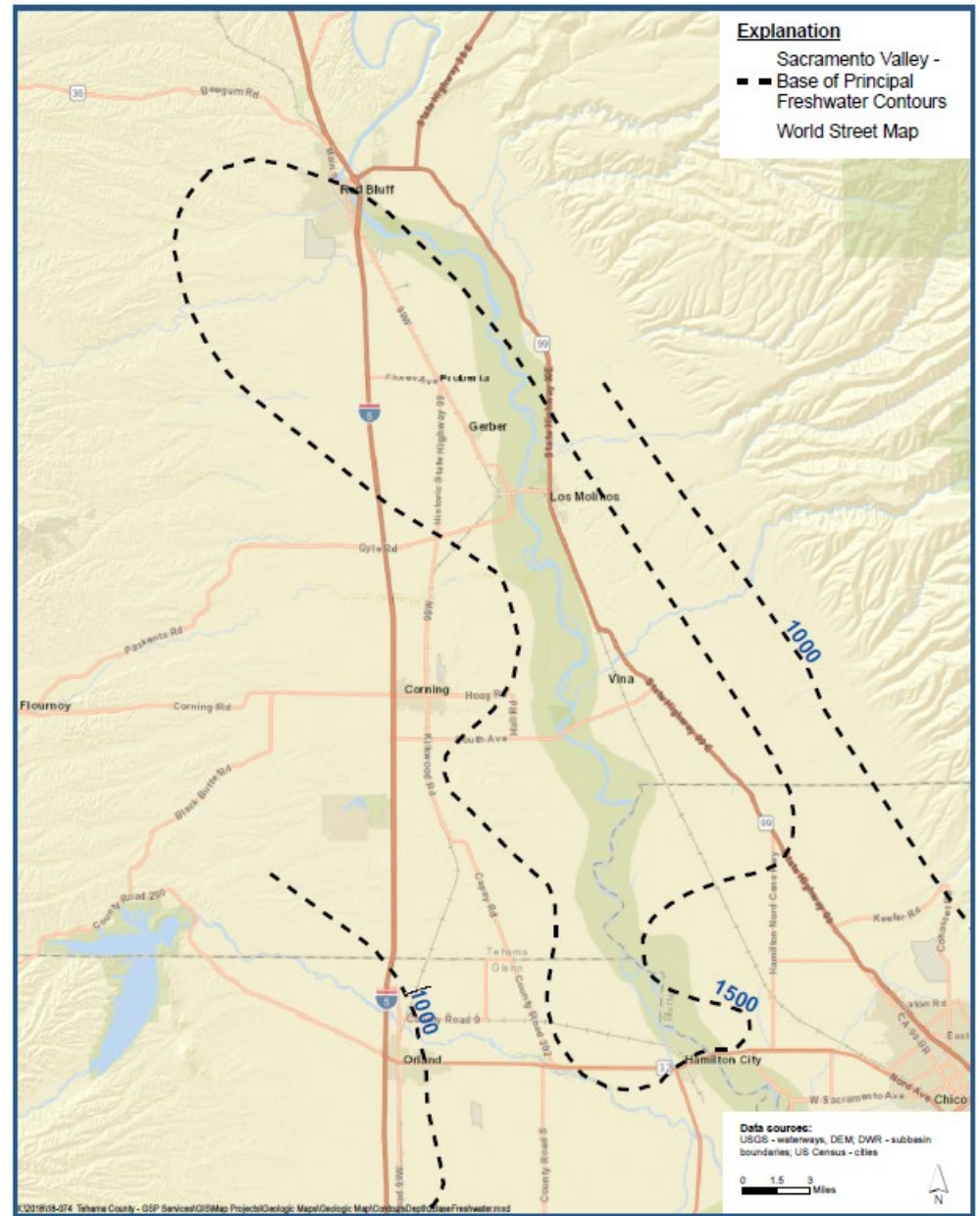
Spring 2020-2004



Luhdorff & Scalmanini Consulting Engineers

Contours showing Depth to Base of Freshwater (ft)

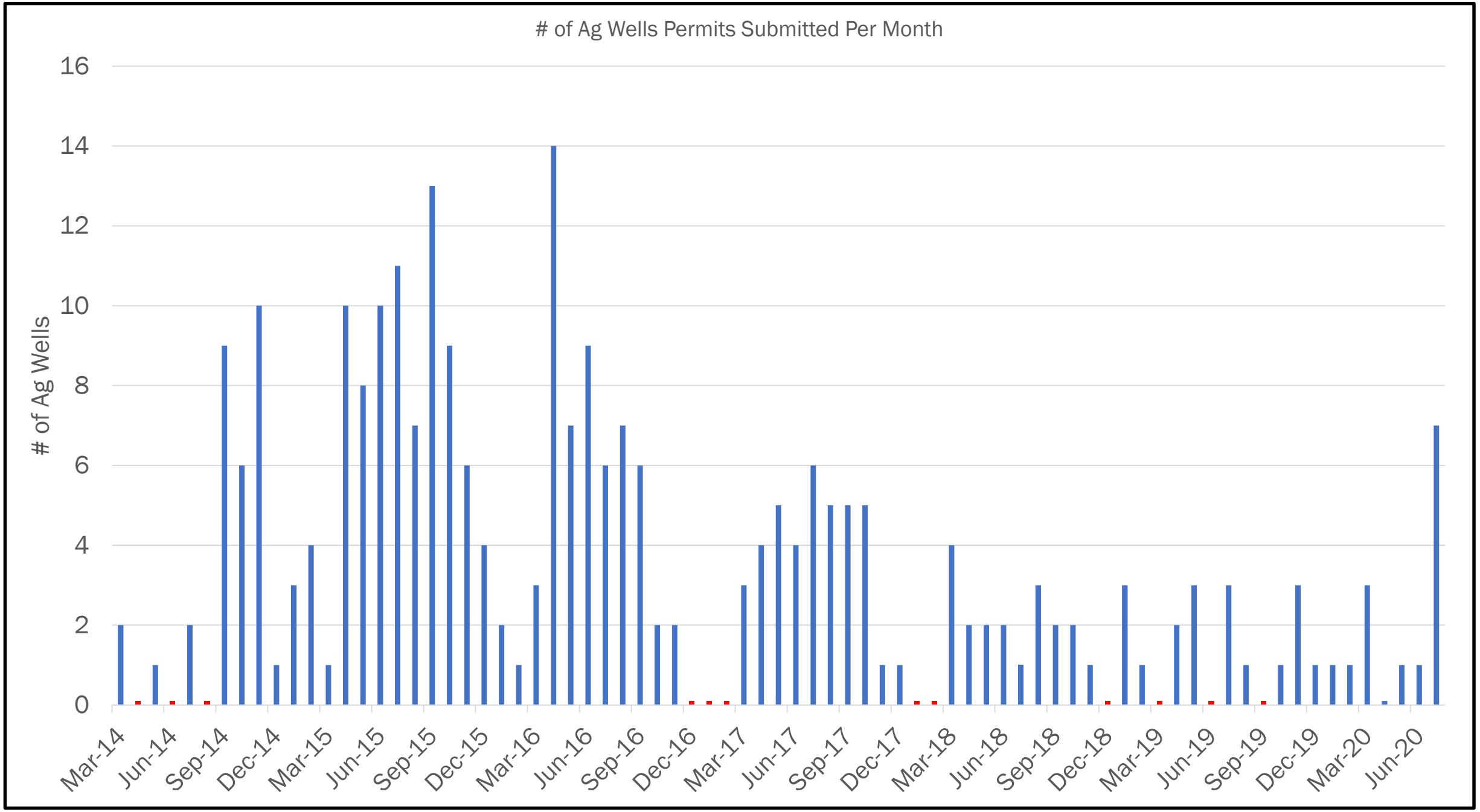
Tehama County

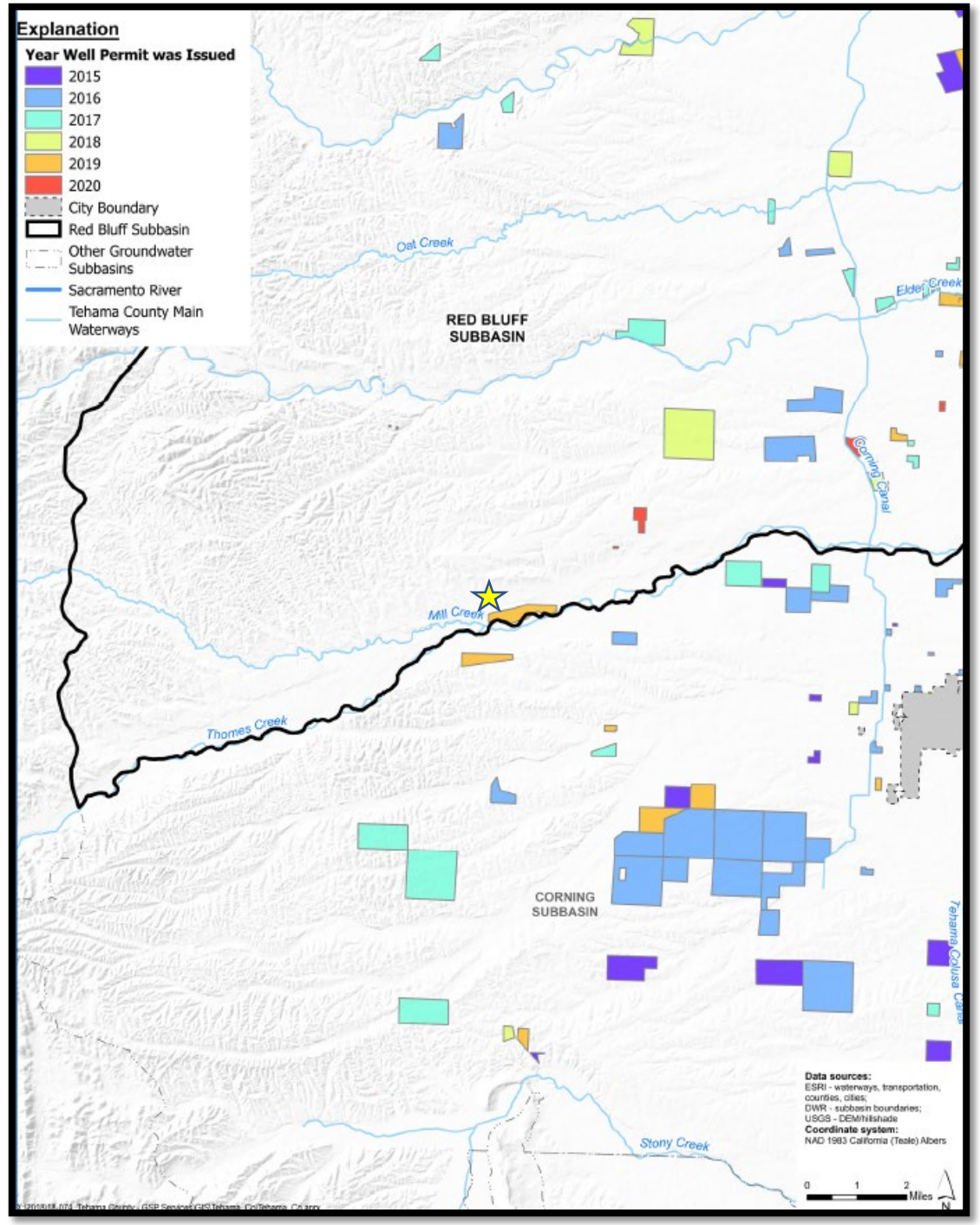


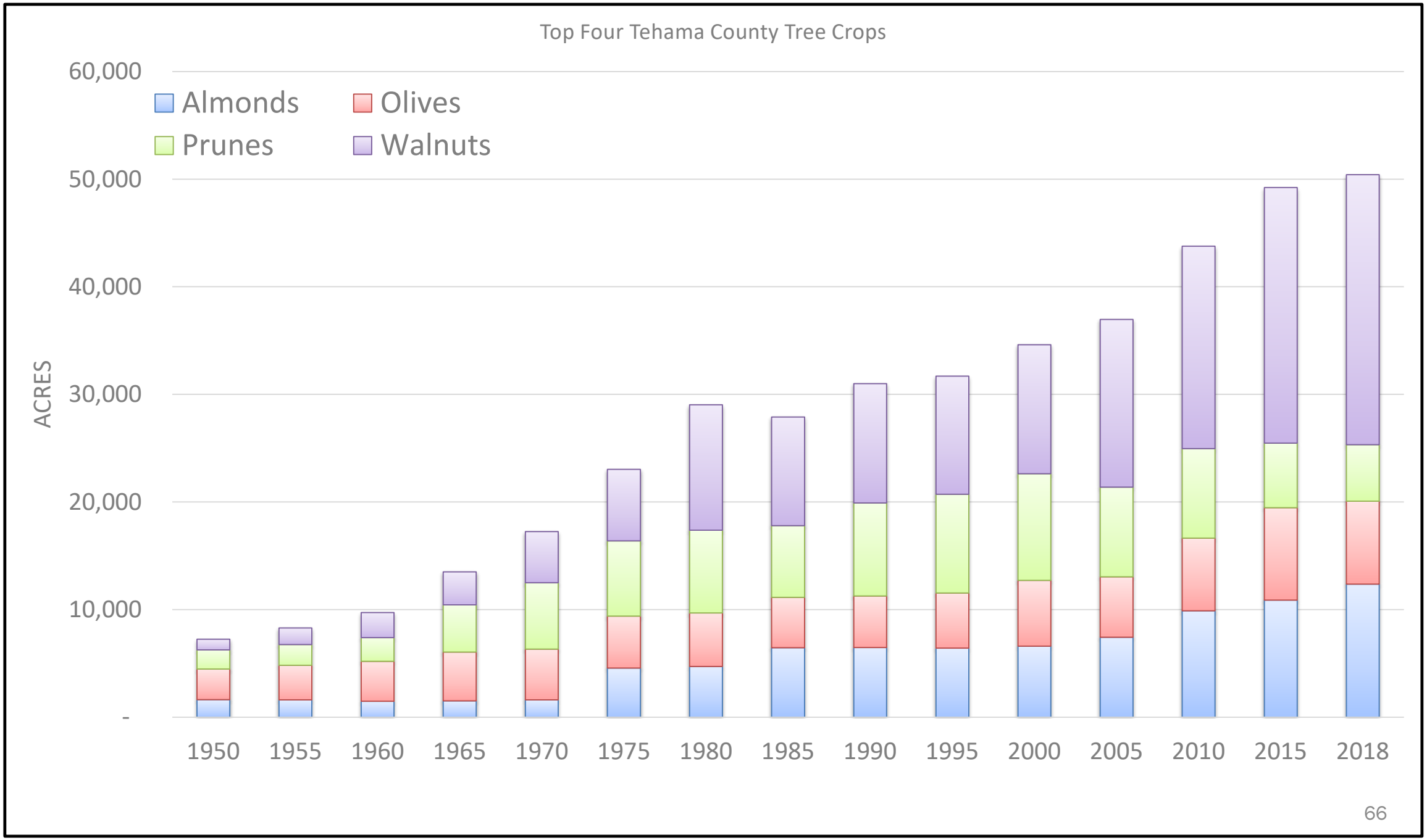
Luhdorff & Scalmanini Consulting Engineers

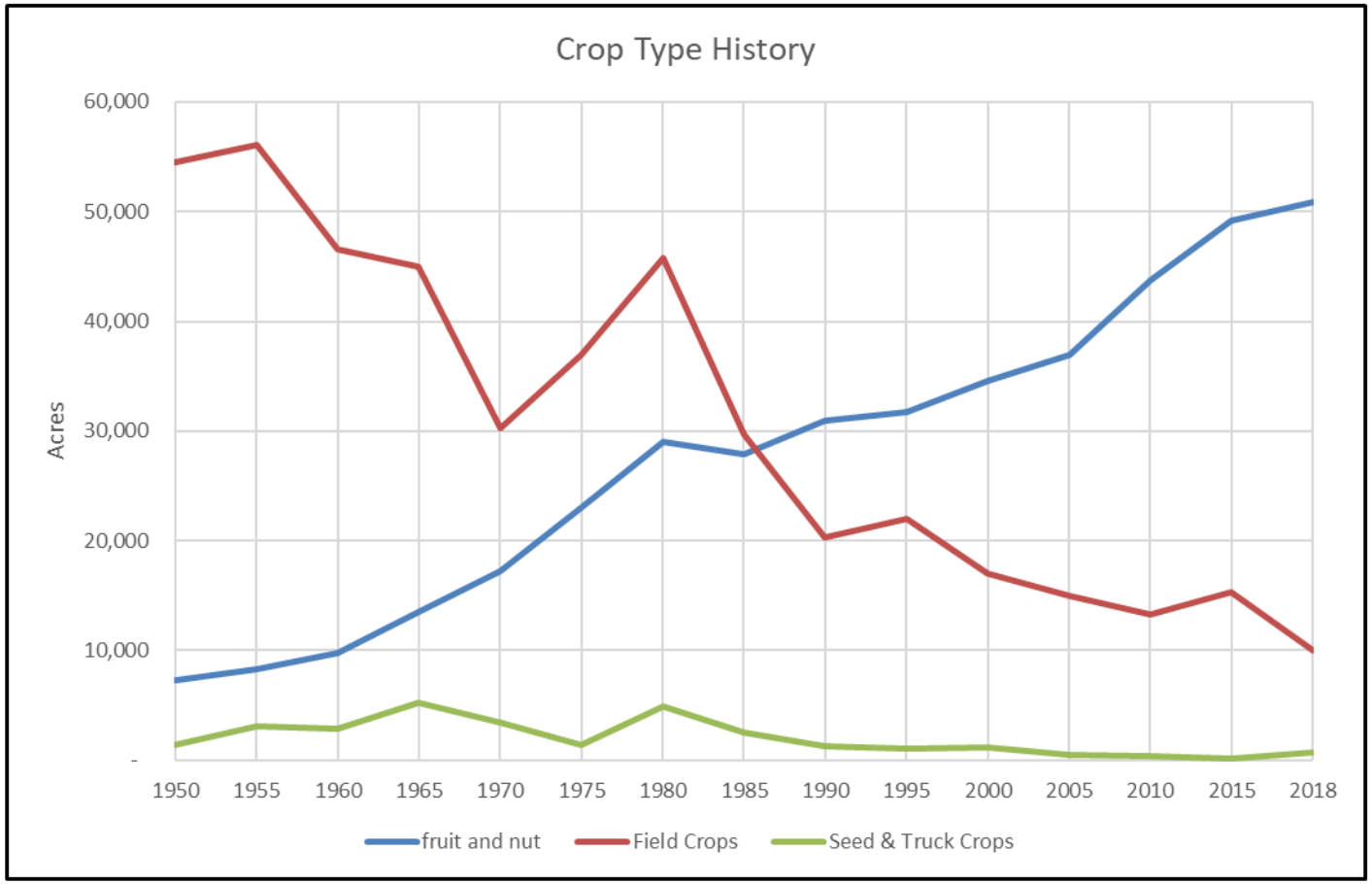
Contours showing Elevation of Base of Freshwater (ft)

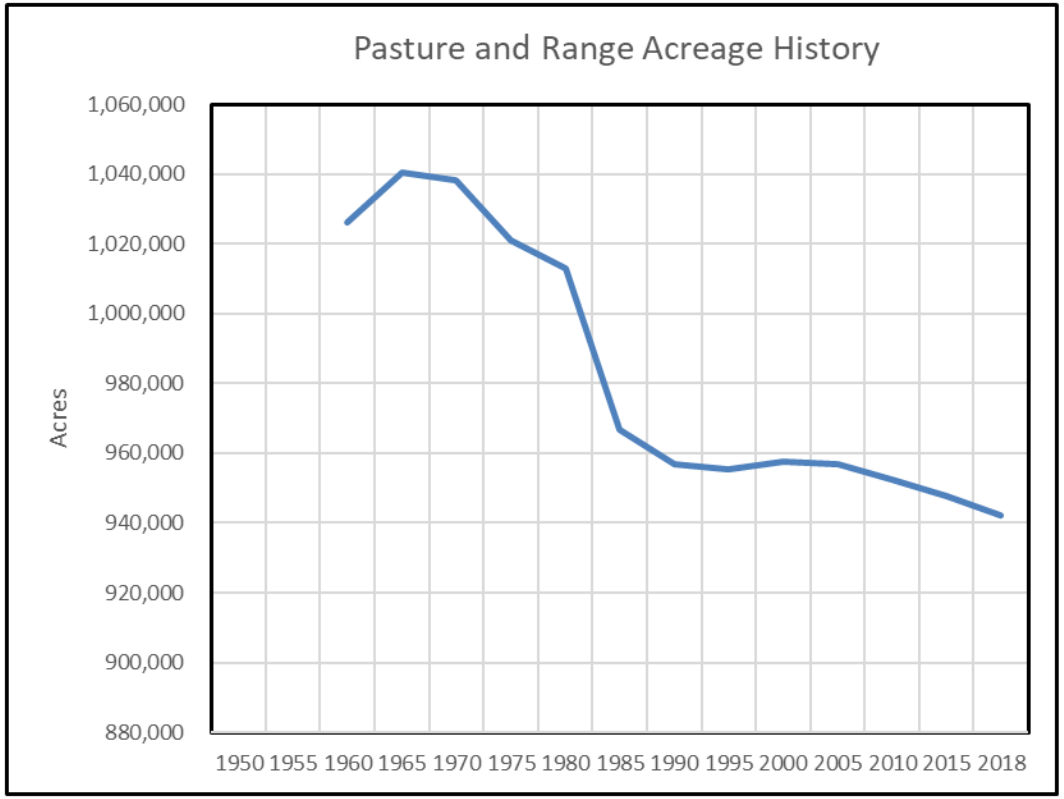
Tehama County


# of Ag Wells Permits Submitted Per Month
# of Ag Wells
16
14
12
10
8
6
4
2
0
Mar-14
Jun-14
Sep-14
Dec-14
Mar-15
Jun-15
Sep-15
Dec-15
Mar-16
Jun-16
Sep-16
Dec-16
Mar-17
Jun-17
Sep-17
Dec-17
Mar-18
Jun-18
Sep-18
Dec-18
Mar-19
Jun-19
Sep-19
Dec-19
Mar-20
Jun-20


Explanation
Year Well Permit was Issued
2015
2016
2017
2018
2019
2020
City Boundary
Red Bluff Subbasin
Other Groundwater Subbasins
Sacramento River
Tehama County Main Waterways
RED BLUFF SUBBASIN
CORNING SUBBASIN
Oat Creek
Elder Creek
Corning Canal
Mill Creek
Thomes Creek
Stony Creek
Tehama Colusa Canal
Data sources:
ESRI - waterways, transportation, counties, cities;
DWR - subbasin boundaries;
USGS - DEM/hillshade
Coordinate system:
NAD 1983 California (Teale) Albers
0 1 2 Miles
N


Top Four Tehama County Tree Crops
60,000
50,000
40,000
30,000
20,000
10,000
-
ACRES
Almonds
Olives
Prunes
Walnuts
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2018

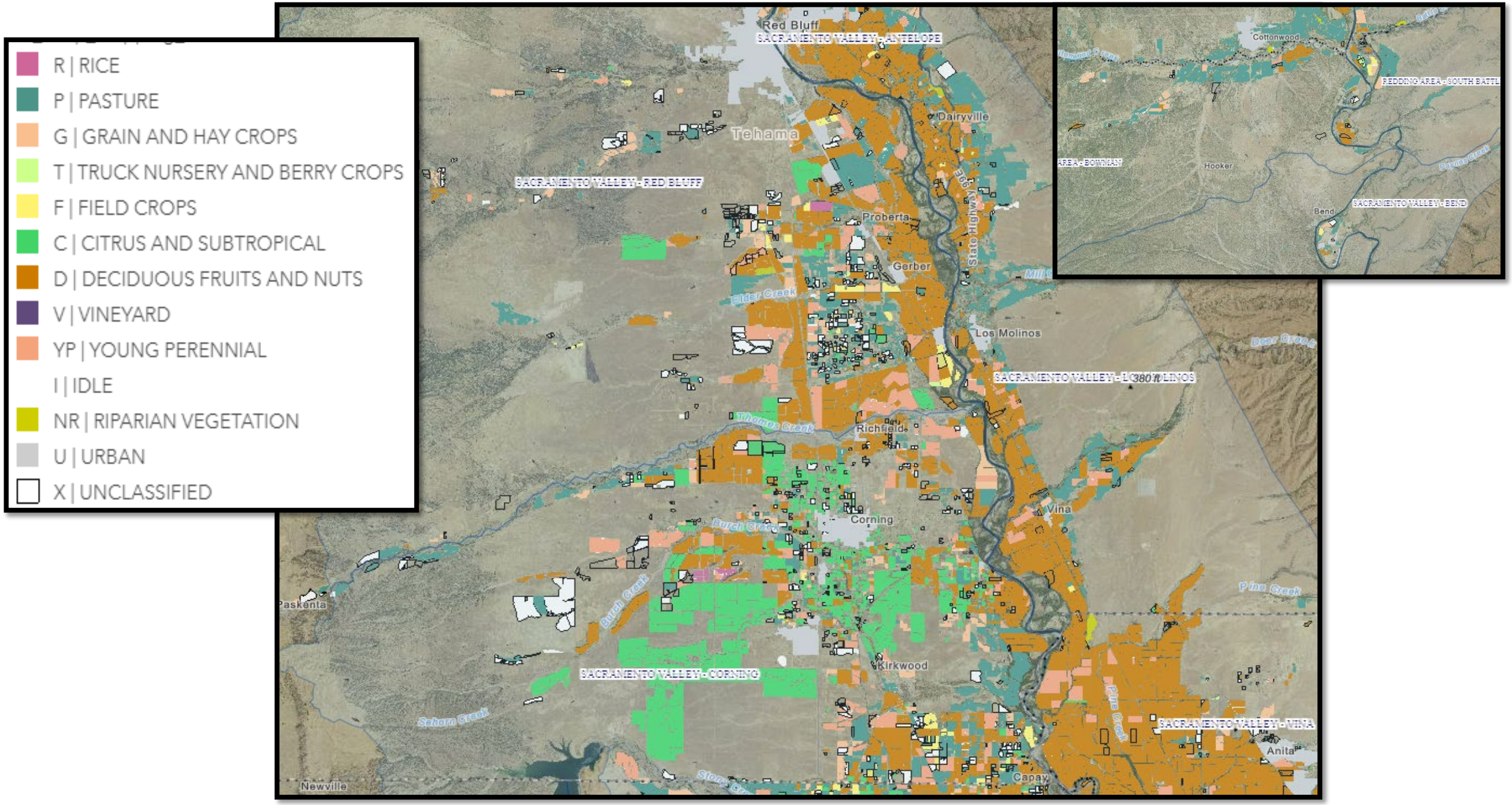




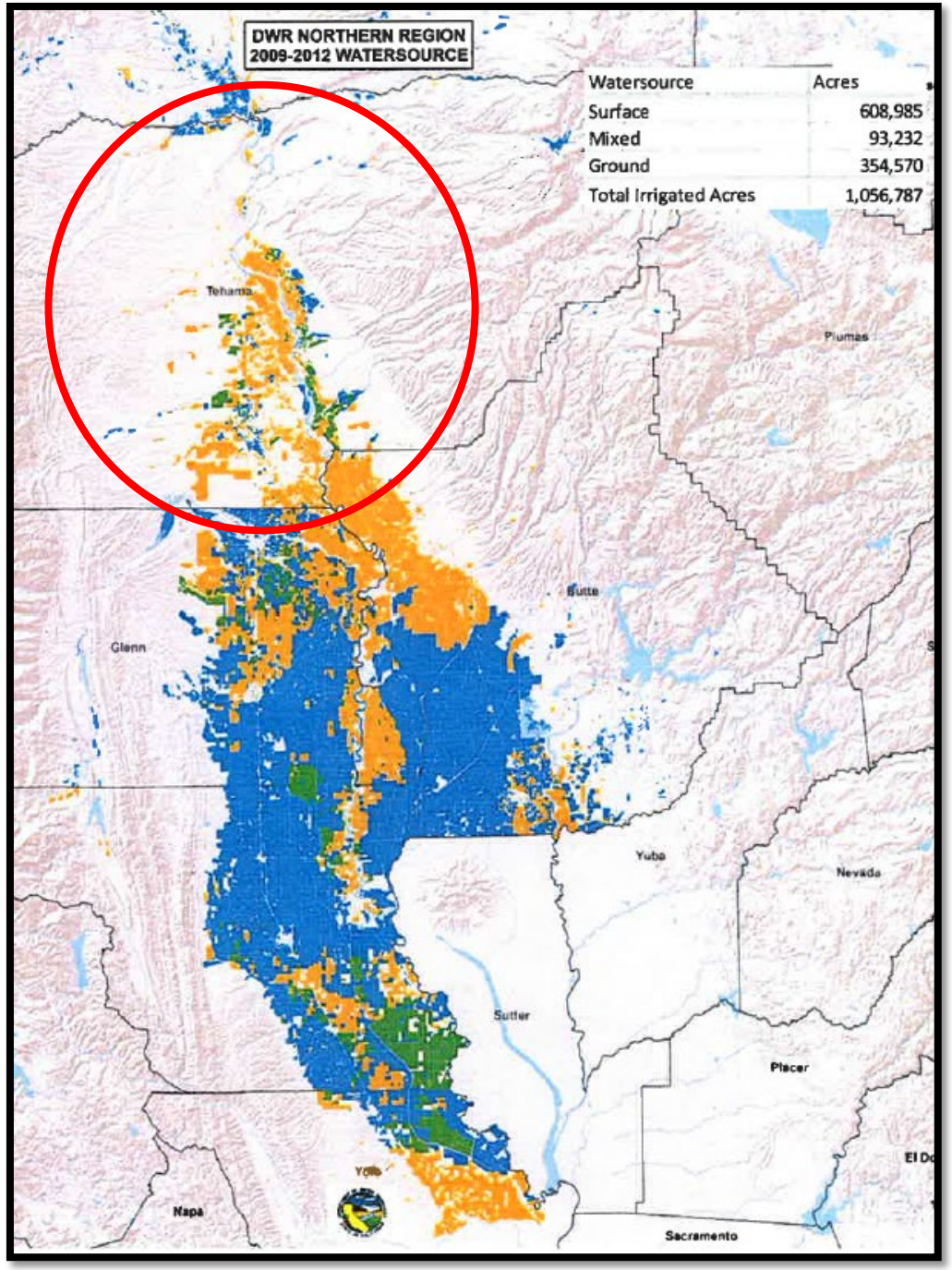
Fruit and Nut Crops - Almonds, Olives, English Walnuts, Prunes, (miscellaneous crops not included due to inconsistency in records).

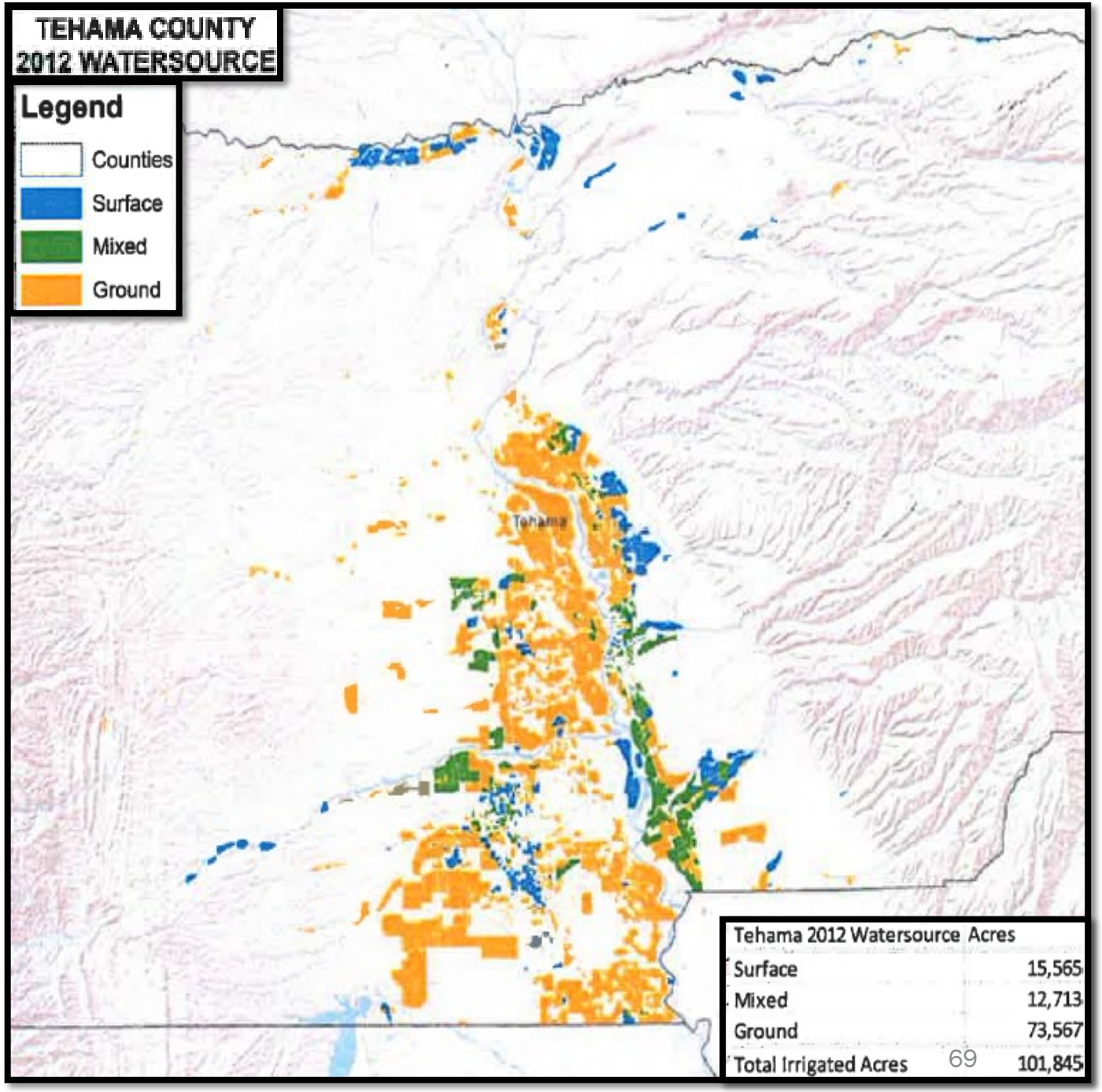
Field Crops - Wheat, Corn, Alfalfa, Oats, Hay, Barley, Beans, Rice, Rye Grass, Safflower, Sudangrass, Sugar Beets, Sorghum grain, other.

Seed & Truck Crops - Watermelon, Landio Clover, Cantaloupe, berries, bean seed, Sudan, Sunflowers, pumpkins, onions, cucumbers, other.



https://gis.water.ca.gov/app/CADWRLandUseViewer/

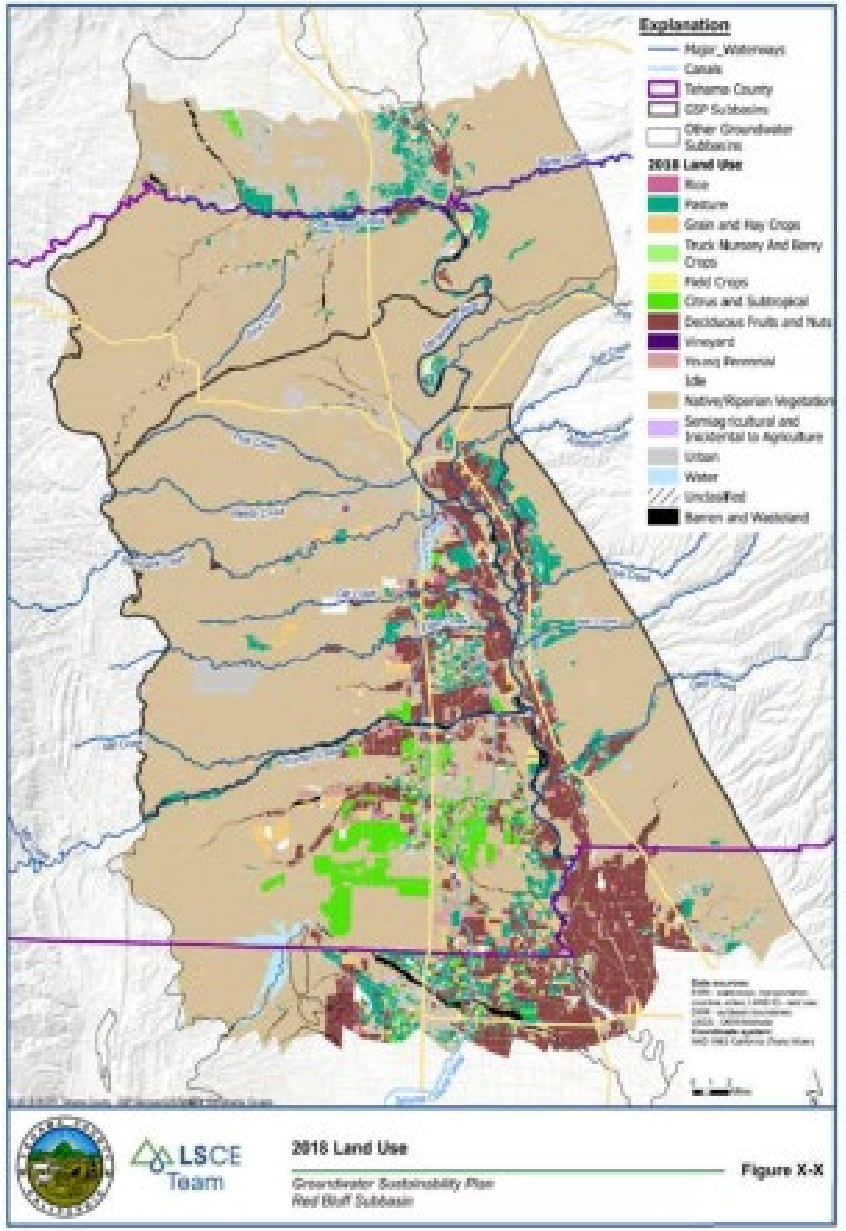

DWR NORTHERN REGION
2009-2012 WATERSOURCE
Watersource | Acres
Surface | 608,985
Mixed | 93,232
Ground | 354,570
Total Irrigated Acres | 1,056,787
Tehama
Plumas
Butte
Glenn
Yuba
Nevada
Sutter
Placer
Napa
Sacramento


TEHAMA COUNTY
2012 WATERSOURCE
Legend
Counties
Surface
Mixed
Ground
Tehama
Tehama 2012 Watersource Acres
Surface | 15,565
Mixed | 12,713
Ground | 73,567
Total Irrigated Acres | 101,845

GSP Chapter 2 – Plan Area

2018	Irrigated	Non-Irrigated
TEHAMA COUNTY	114,117	617,698
ANTELOPE SUBBASIN	8,342	10,749
BOWMAN SUBBASIN	3,755	118,048
LOS MOLINOS SUBBASIN	16,360	82,983
RED BLUFF SUBBASIN	32,766	238,468
CORNING SUBBASIN (TEHAMA CO)	50,683	110,269

	Irrigated Acres	
	2016	2018
TEHAMA COUNTY	123,978	114,117
ANTELOPE SUBBASIN	9,936	8,342
BOWMAN SUBBASIN	3,723	3,755
LOS MOLINOS SUBBASIN	16,813	16,360
RED BLUFF SUBBASIN	36,854	32,766
CORNING SUBBASIN (TEHAMA CO)	52,310	50,683



Multiple Opportunities to be Involved

EMAIL UPDATES

Sign Up for the interested parties email list and/or to receive meeting agendas - contact nbethurem@tcpw.ca.gov

UPCOMING MEETINGS – October 2020

Outdoor Tailgates | October 14, 15, 21, and 22 | 5:30-6:30 pm

(Specific to the Bowman, Red Bluff, Antelope, and Los Molinos Subbasins)

Oct 14 – Tehama District Fairgrounds

Oct 15 – Evergreen Middle School (Lower Parking Lot), 19500 Learning Way, Cottonwood, CA

Oct 21 – Tehama County Public Works, 9380 San Benito Ave., Gerber

Oct 22 – Los Molinos Veterans Hall, 7980 Sherwood Blvd., Los Molinos

Corning Subbasin tailgate meeting dates and locations TBD

Board of Supervisors Presentation | October 20 | 1:30 pm

To listen to live audio: http://tehamacountyca.iqm2.com/Citizens/Default.aspx

November/December 2020

Next Round of Public Meetings

County-wide and subbasin-specific Groundwater conditions

REGULAR MEETINGS

Groundwater Commission Meetings | 4th Wednesdays | 8:30a

District Board Meetings | 3rd Monday, every other month (Next meeting 11/16/20) | 11:00a

Corning Subbasin Advisory Board Meetings | 1st Wednesdays | 1:30p

TehamaCountyPublicWorks.CA.gov and CorningSubbasinGSP.org

Thank you! | General Questions?

Project Team

Tehama County GSA

- Ryan Teubert, GSA Project Manager
- rteubert@tcpw.ca.gov or 385-1462 x3020

Technical Consultants, LSCE

- Eddy Teasdale

COMMON TERMS

SGMA *("Sigma")*: Sustainable Groundwater Management Act • **GSA:** Groundwater Sustainability Agency • **GSP:** Groundwater Sustainability Plan