

Tehama County Groundwater Trigger Levels and Awareness Actions

December 3, 2008

BROWN AND CALDWELL



Agenda

- Why develop Trigger Levels?
- What are Trigger Levels?
- Outreach Documents
- Background Document
- Individual Subbasin Documents
- Details of Trigger Level Development
- Example Hydrographs
- Subbasins Without Monitoring
- Next Steps

Why Develop Trigger Levels?

- Required by Tehama County's AB3030 Groundwater Management Plan
- "Safe Yield" difficult to define, and varies year to year
- Helps prevent groundwater overdraft in Tehama County
- Potential changes in surface water use patterns
- Long term precipitation patterns (Climate Change) may lead to more groundwater use

Why Develop Trigger Levels?

- Trigger levels utilize existing water level monitoring
- Proactive awareness actions
- Implemented on a local level
- Trigger Levels are similar to Butte and Glenn BMO efforts
- Sub-basins cross county lines and political boundaries.

Trigger Level Development Team:

Technical Advisory Committee Members (TAC):

- Mark Barthel, City of Red Bluff
- Steve Kimbrough, City of Corning
- Colin Klinesteker, Private Pumper
- Allan Fulton, Agricultural Pumpers
- Bill Richardson, Agricultural Pumpers
- Roger Sherrill, Small Districts
- Bob Steinacher, Water Districts
- Walt Mansell, Natural Resources
- Chuck Crain Jr., Water Districts

Department of Water Resources (DWR):

- Bill Ehorn
- Dan McManus

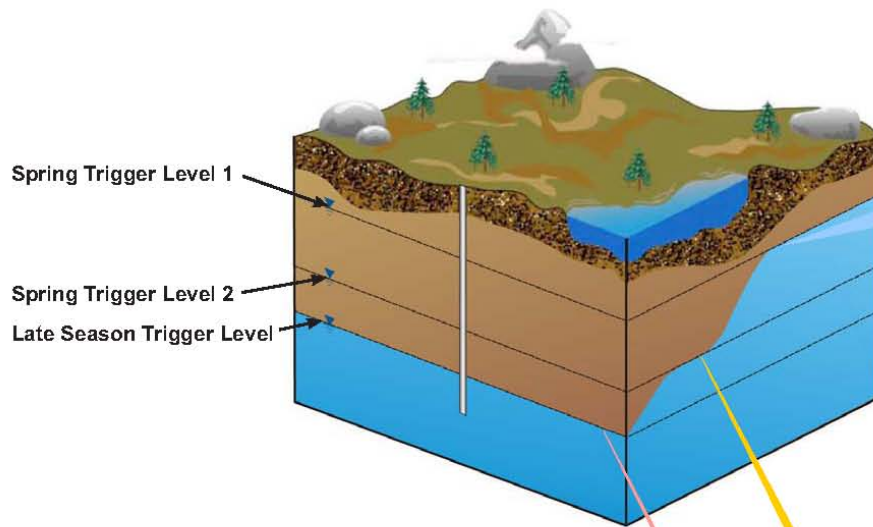
Flood Control and Water Conservation District:

- Ernie Ohlin

What are Trigger Levels?

Trigger Levels create an awareness of fluctuations in groundwater conditions within Tehama County over time and develop actions to inform water users of the conditions and potential management needs in the County.

What are Trigger Levels?



Spring Trigger Level 1 Awareness Actions

- ONE YEAR BELOW TRIGGER LEVEL 1**
- TAC meetings to address issues in the area
 - Water user/stakeholder meeting for the subbasin
 - Send mail to known water users in subbasin, notifying them about a overall decrease in water levels or quality in the subbasin
 - Notify public of groundwater issue
 - County to make a press release
 - Updates to the District website
 - District to attend agriculturally related and city meetings
 - Site visits
 - Review recent precipitation trends to look for drought trends
- CONSECUTIVE YEARS BELOW TRIGGER LEVEL 1**
- Continue to inform water users and general public
 - Verify data
 - Increase monitoring frequency in subbasin
 - Add new monitoring location in subbasin
 - Begin monitoring land subsidence
 - Install data loggers
 - Investigate cause of low groundwater levels

Spring Trigger Level 2 Awareness Actions

- Continue Spring Trigger Level 1 Awareness Actions
- Solicit voluntary public involvement in resolving issues in the area
- Consider groundwater recharge efforts
- Review condition of approval for new development reliant on groundwater by the County
- Review of the County's approval process regarding water supply for development or additional groundwater pumping projects
- Increase land subsidence monitoring

Late Summer Trigger Level Awareness Actions

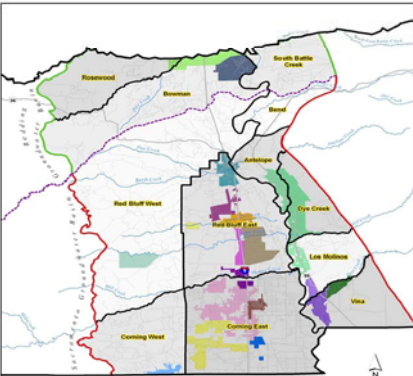
- Perform Spring Trigger Level 1 and 2 Awareness Actions
- Investigate potential higher groundwater demand or other causes

Outreach Documents

**Tehama County AB-3030
Groundwater Management Plan**

Background Document

Proposing Groundwater Trigger Levels and Awareness Actions
for Tehama County



The map shows various groundwater sub-basins in Tehama County, including Red Bluff West, Red Bluff East, and several smaller basins like Comstock West and Comstock East. It also shows major creeks and irrigation districts.

Tehama County
Groundwater Sub-Basins
Figure
1-1

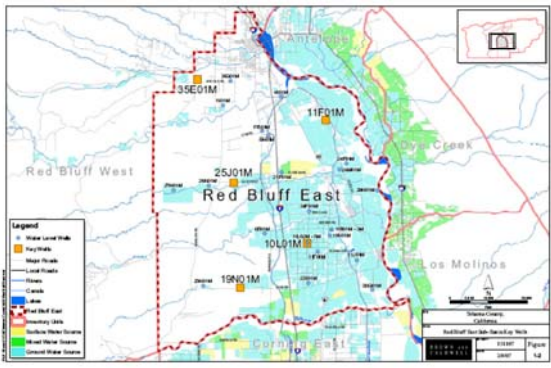
July 1, 2008

Tehama County Flood Control and Water Conservation District
9380 San Benito Avenue
Gerber, CA 96035-9701
(530)-385-1462

**Tehama County AB-3030
Groundwater Management Plan**

Technical Memorandum

For the Red Bluff East Sub-basin of Tehama County



The map focuses on the Red Bluff East sub-basin, showing specific groundwater trigger levels (e.g., 350'1M, 110'1M, 250'1M, 100'1M, 190'1M) and awareness actions. It includes a legend for water level status, water rights, and various basins.

Proposed Groundwater Trigger Levels and Awareness Actions

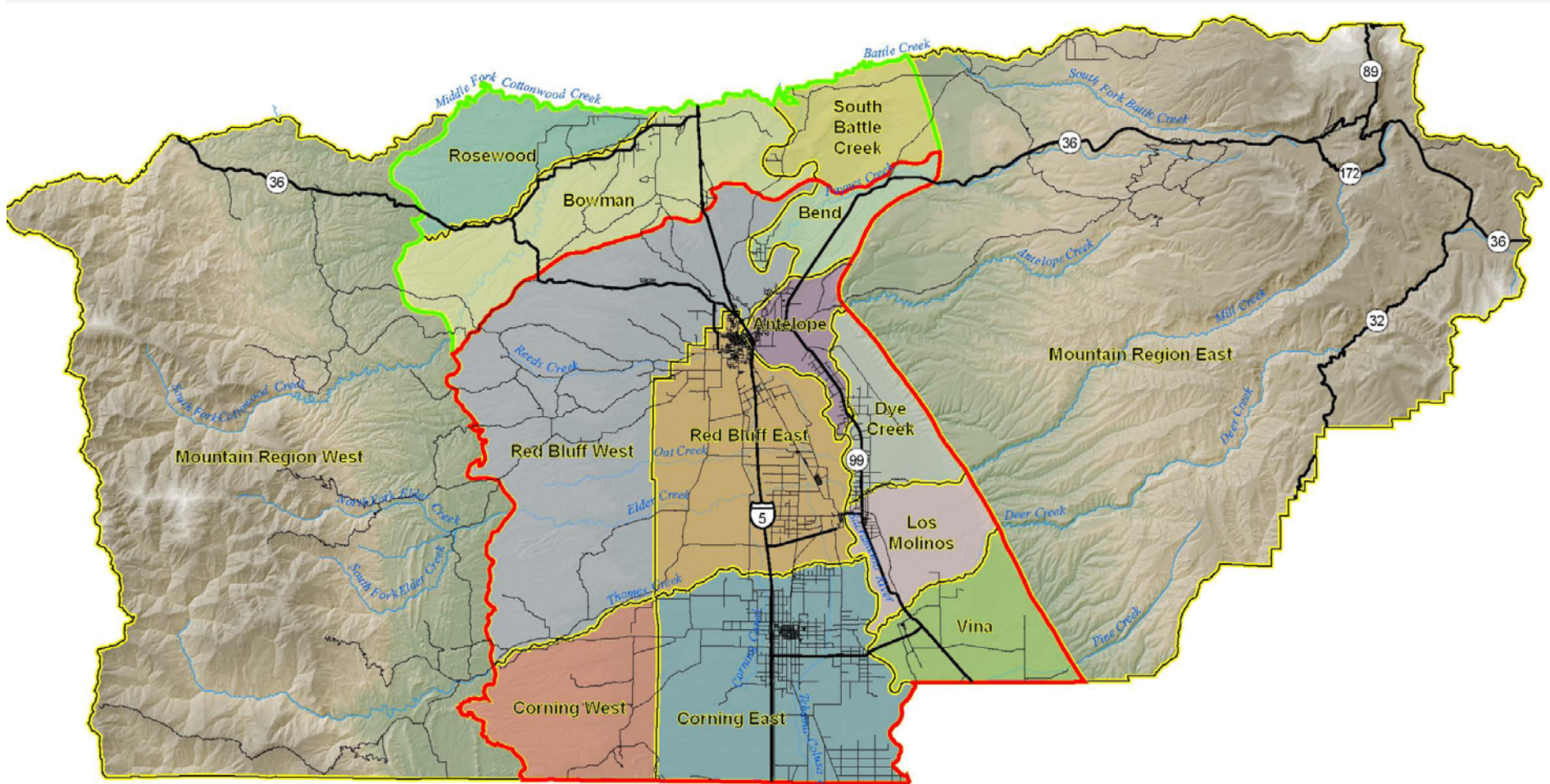
July 1, 2008

Tehama County Flood Control and Water Conservation District
9380 San Benito Avenue
Gerber, CA 96035-9701
(530)-385-1462

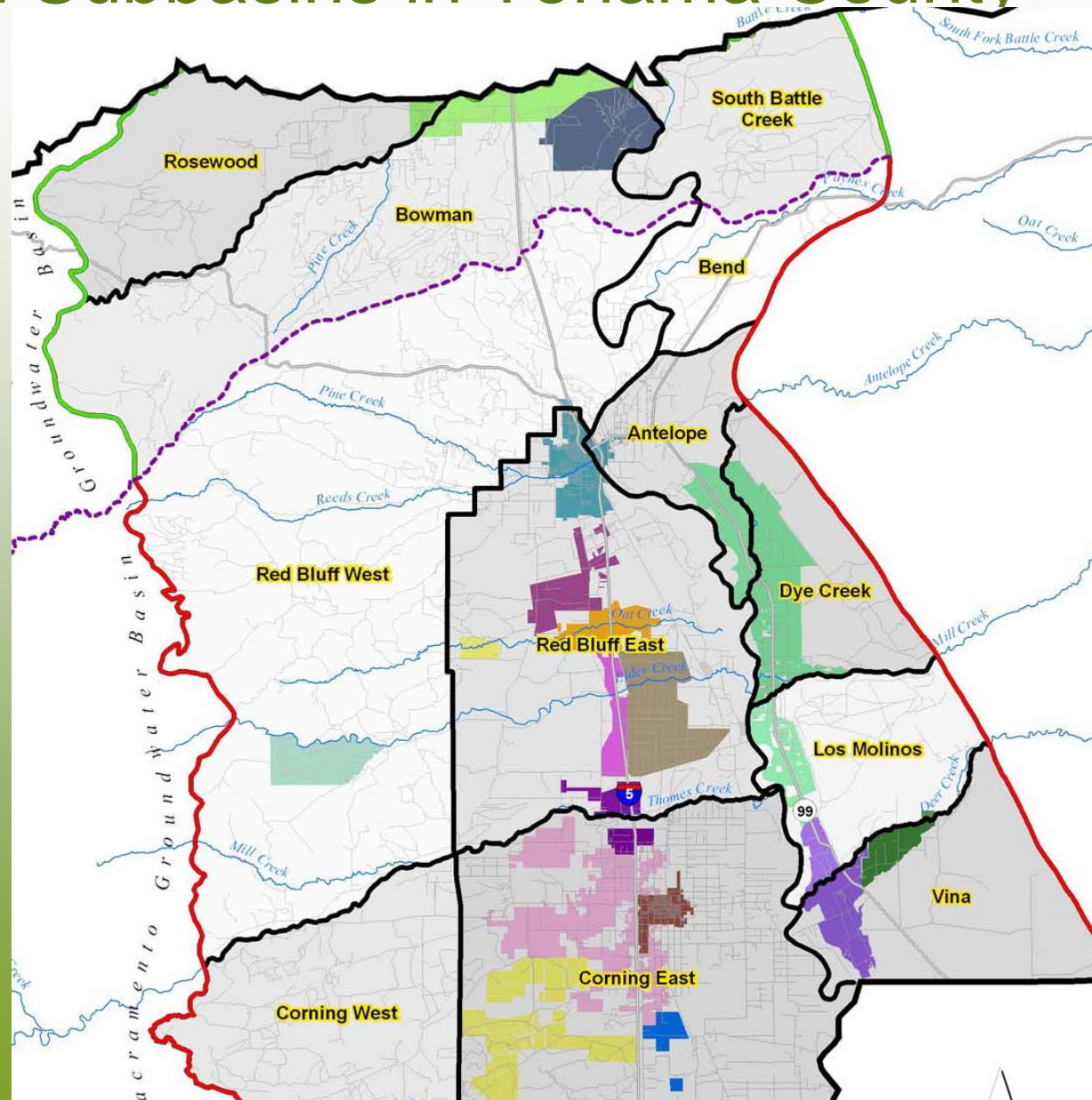
Background Document

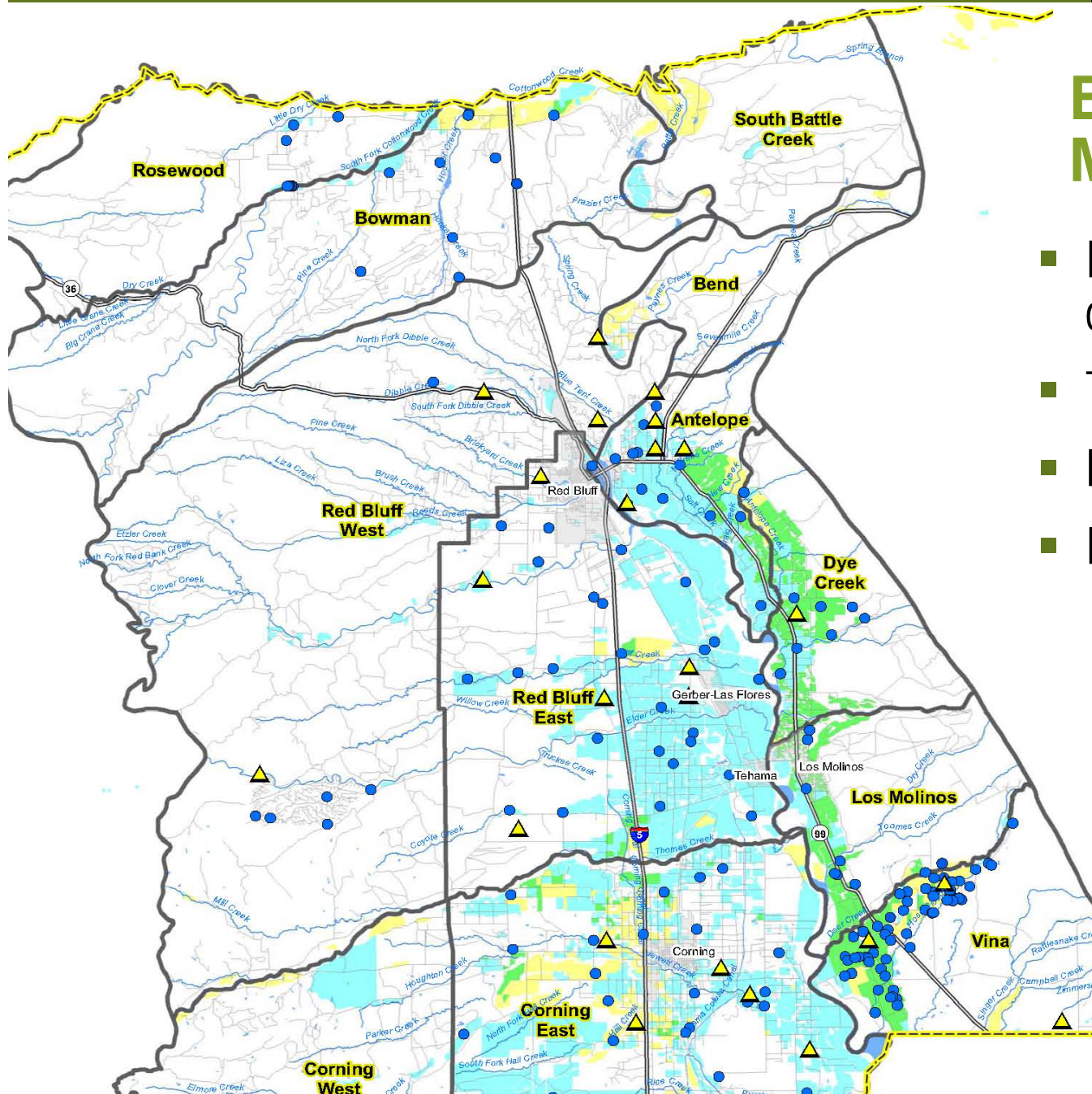
- Introduction
 - Identifies role of the District
 - Identifies 12 groundwater basins
- Trigger Level Concept
 - Describes the types and purpose of Trigger Levels
- Methods used to develop groundwater level triggers
 - Five steps
- County and Regional Groundwater Setting

Valley Floor Context



The 12 Subbasins in Tehama County





Existing DWR Monitoring Grid

- Reliable groundwater data
- Trusted data source
- Long periods of record
- Regular monitoring

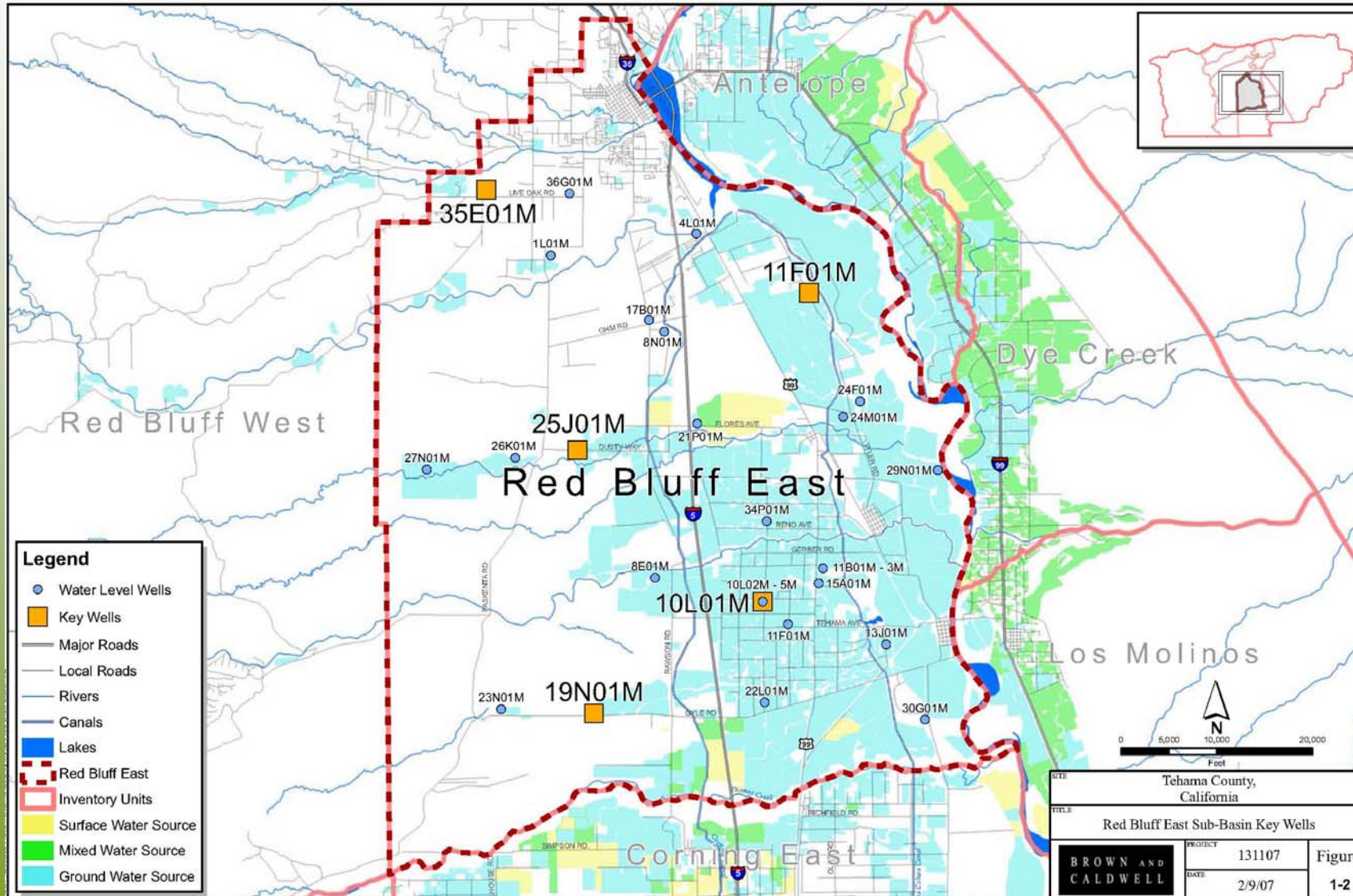


Individual Subbasin Documents Red Bluff East Example

- Introduction
 - Reference to Background Document
- Five steps used to develop groundwater level triggers
 - Key well selection
 - Time of seasonal measurement
 - Establish trigger levels and awareness actions for key wells

Individual Subbasin Documents

Red Bluff East Key Wells



Individual Subbasin Documents Red Bluff East Key Wells

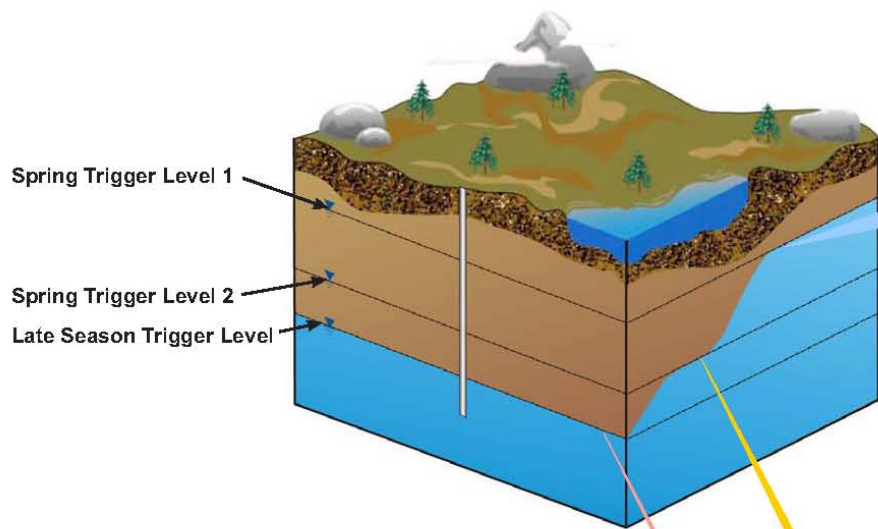
- 26N03W11F01M (11F01M)
- Well construction information:
 - 190 feet deep
 - screened interval from 70 to 80 feet below ground surface (bgs).
- Situated near pasture irrigated with groundwater.
- The nine square miles near this well contain 31 domestic wells with an average depth of 127 feet bgs, and 24 irrigation wells with an average depth of 218 feet bgs.
- Period of record longer than 30 years

Time of Seasonal Measurement

Table 1-1. Trigger Level Methodology

Groundwater Trigger Level and Awareness Action	Red Bluff East Monitoring Well Number				
	10L01M	25J01M	19N01M	11F01M	35E01M
Spring Trigger Level 1 – Notify and Inform Public	Historical low of spring measurements plus 20 % of the range of spring measurements				
Monitor and investigate Cause					
Spring Trigger Level 2 – Consider Management Options	Historical low of spring measurements				
Late Season Trigger Level – Notify public and begin investigations	Historical low of late season groundwater measurements				
Data Anomalies	None	None	None	None	None

Establish Awareness Actions



Spring Trigger Level 1 Awareness Actions

ONE YEAR BELOW TRIGGER LEVEL 1

- TAC meetings to address issues in the area
- Water user/stakeholder meeting for the subbasin
- Send mail to known water users in subbasin, notifying them about a overall decrease in water levels or quality in the subbasin
- Notify public of groundwater issue
 - County to make a press release
 - Updates to the District website
 - District to attend agriculturally related and city meetings
 - Site visits
- Review recent precipitation trends to look for drought trends

CONSECUTIVE YEARS BELOW TRIGGER LEVEL 1

- Continue to inform water users and general public
- Verify data
- Increase monitoring frequency in subbasin
- Add new monitoring location in subbasin
- Begin monitoring land subsidence
- Install data loggers
- Investigate cause of low groundwater levels

Spring Trigger Level 2 Awareness Actions

- Continue Spring Trigger Level 1 Awareness Actions
- Solicit voluntary public involvement in resolving issues in the area
- Consider groundwater recharge efforts
- Review condition of approval for new development reliant on groundwater by the County
- Review of the County's approval process regarding water supply for development or additional groundwater pumping projects
- Increase land subsidence monitoring

Late Summer Trigger Level Awareness Actions

- Perform Spring Trigger Level 1 and 2 Awareness Actions
- Investigate potential higher groundwater demand or other causes

Red Bluff East Key Well 25J01 Hydrograph

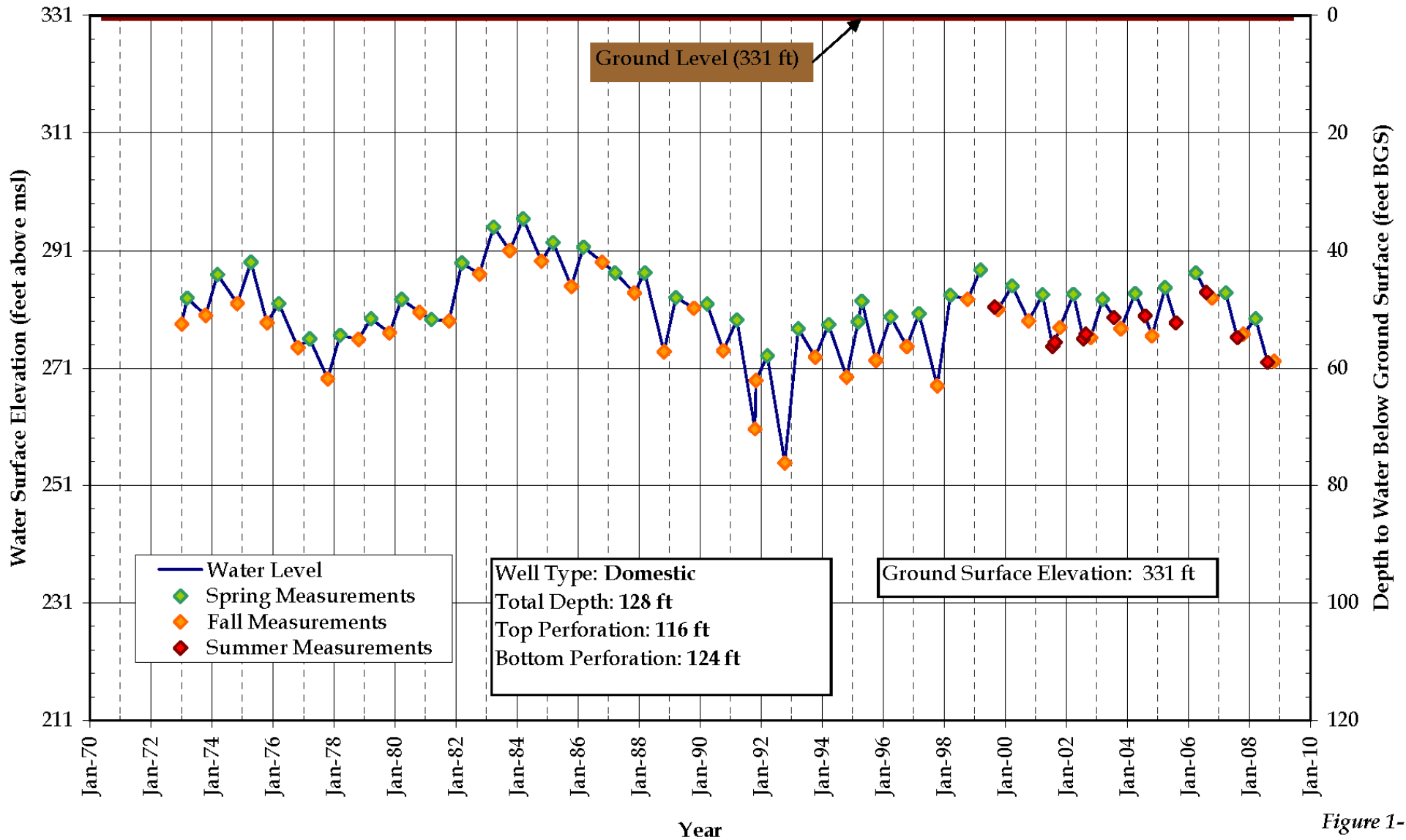


Figure 1- Hydrograph of Key Well 26N04W25J01M

Red Bluff East Key Well 25J01 Spring Hydrograph

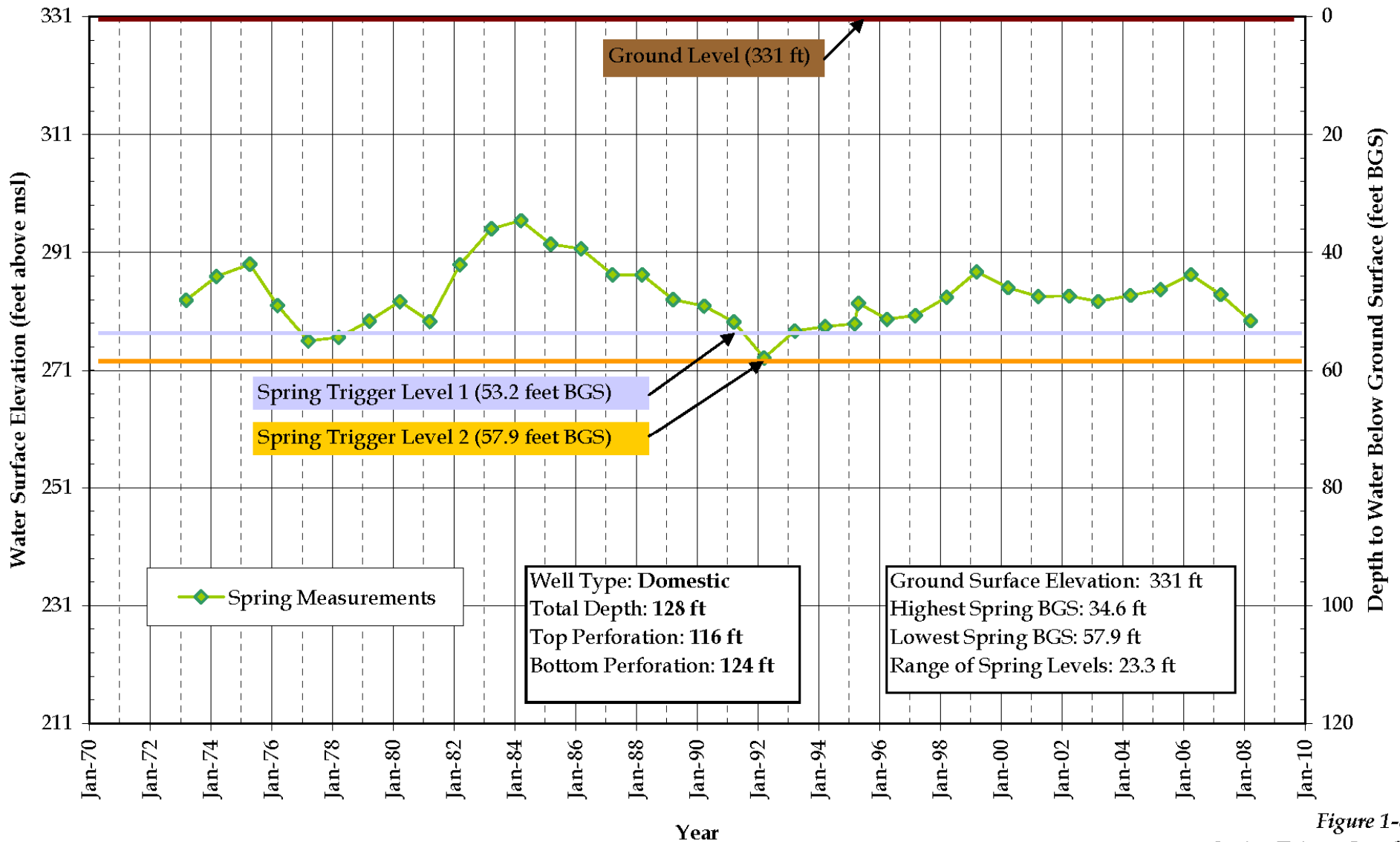


Figure 1-8
Spring Trigger Levels

Red Bluff East Key Well 25J01 Late Season Hydrograph

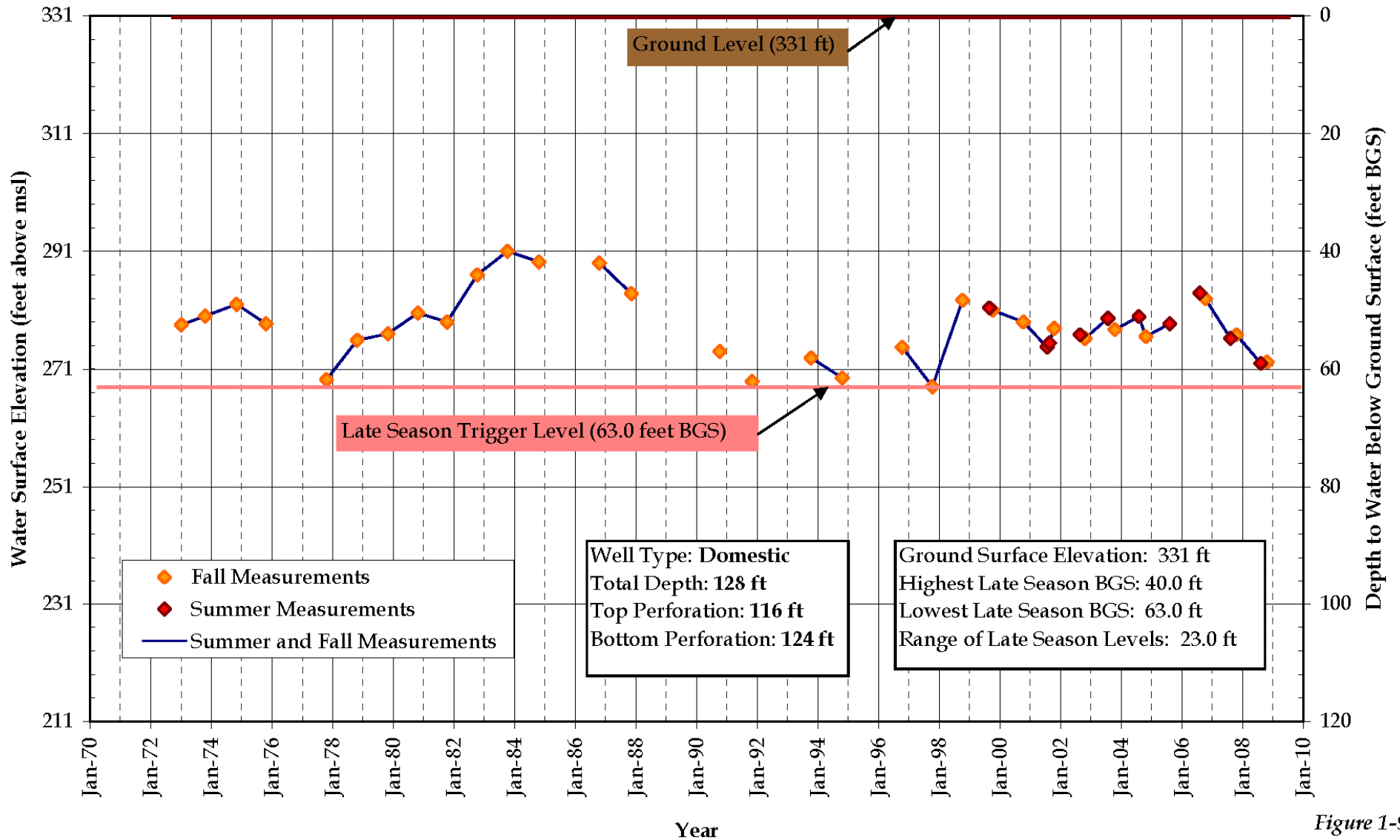


Figure 1-9
Late Season Awareness Stage

Red Bluff East Key Well 19N01 Hydrograph

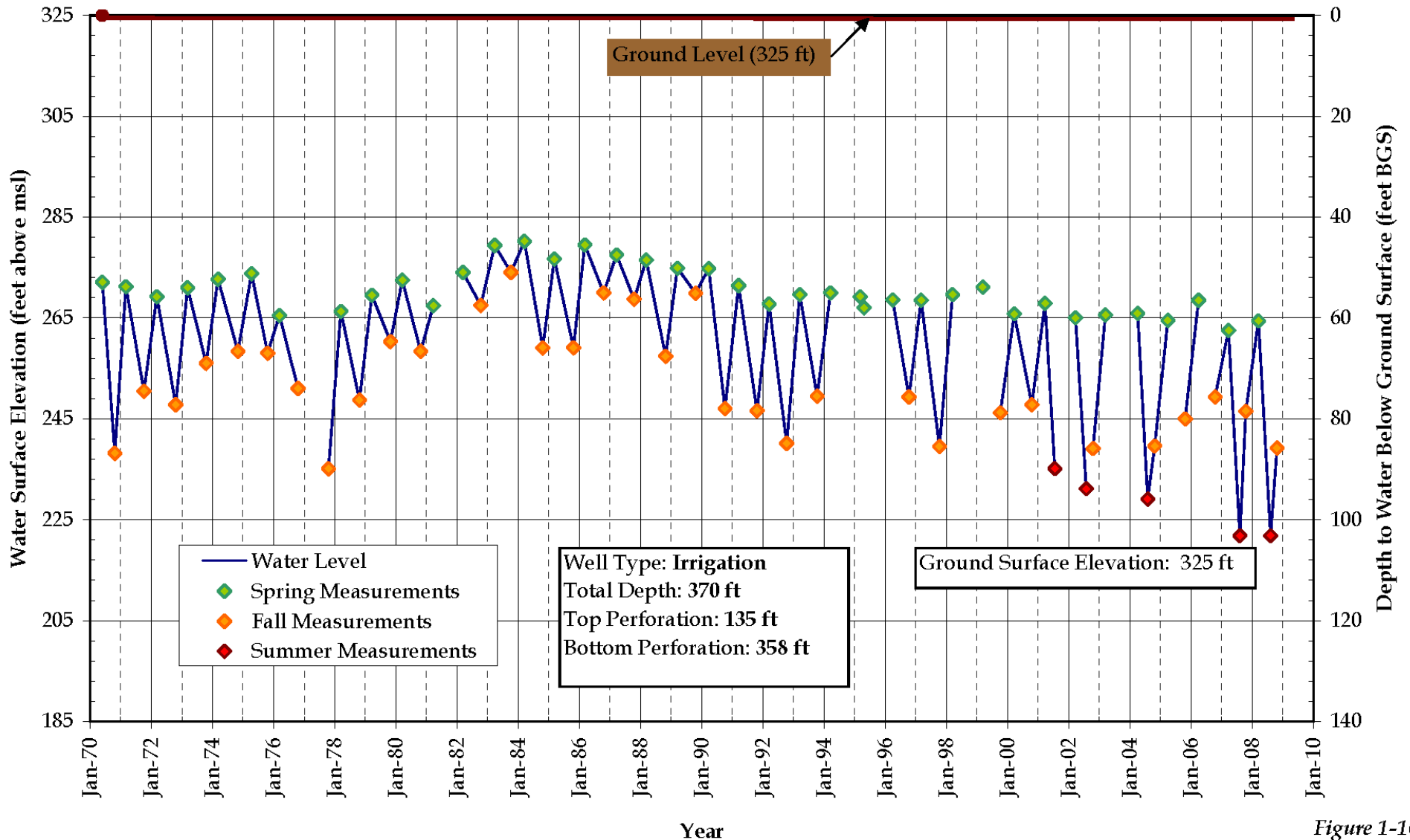


Figure 1-10
Hydrograph of Key Well 25N03W19N01M

Red Bluff East Key Well 19N01 Spring Hydrograph

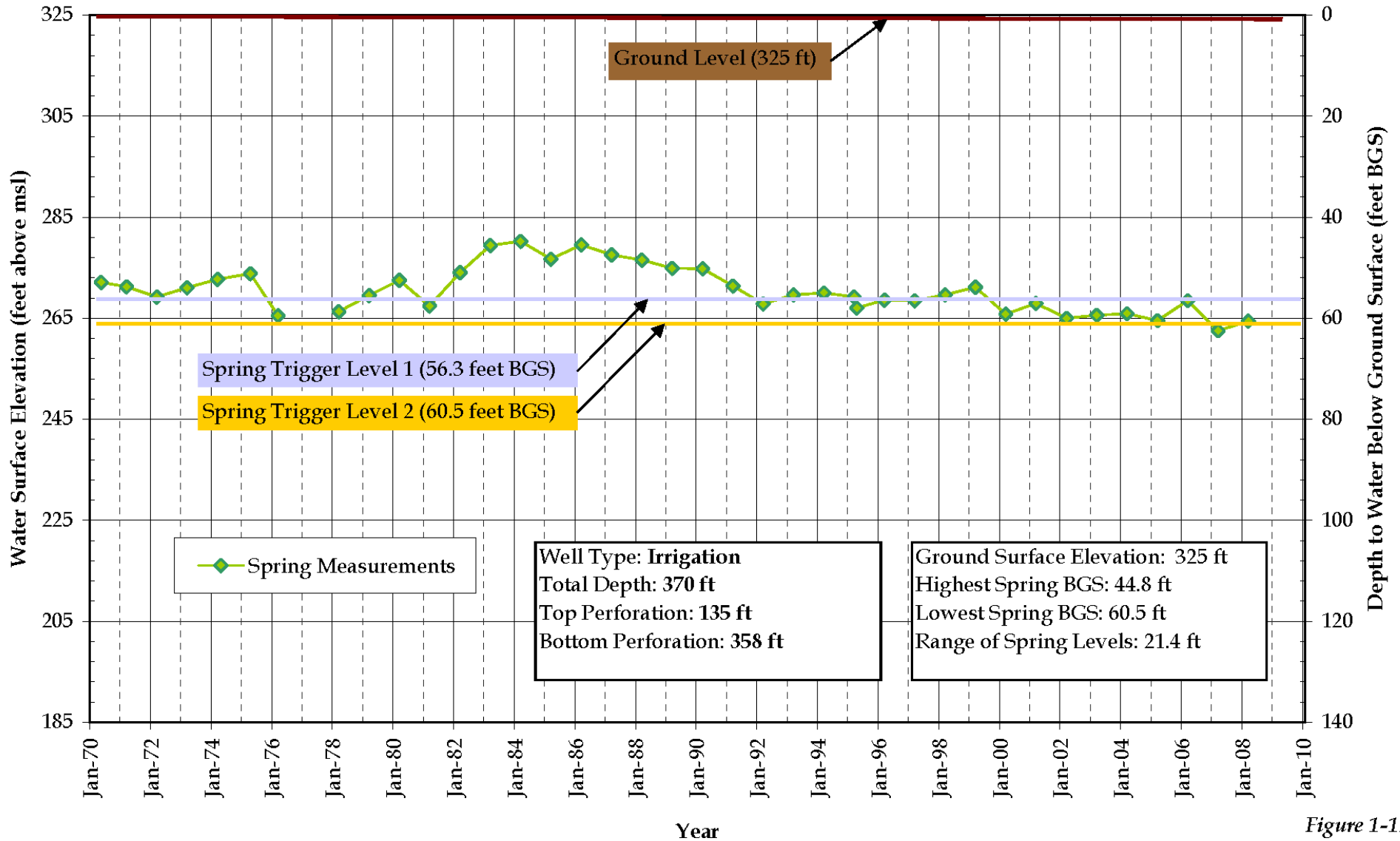


Figure 1-11
Spring Trigger Levels

Red Bluff East Key Well 19N01 Late Season Hydrograph

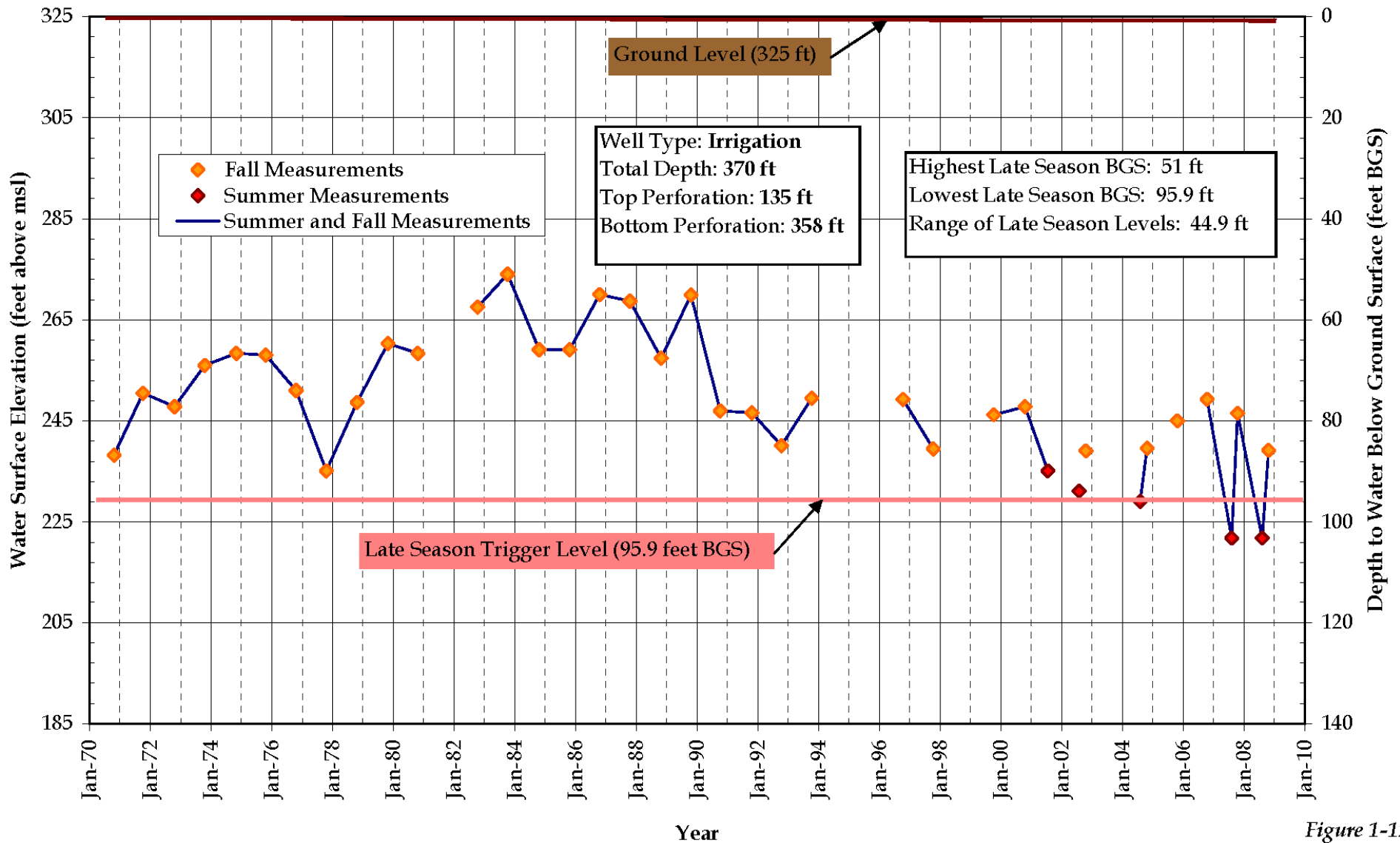
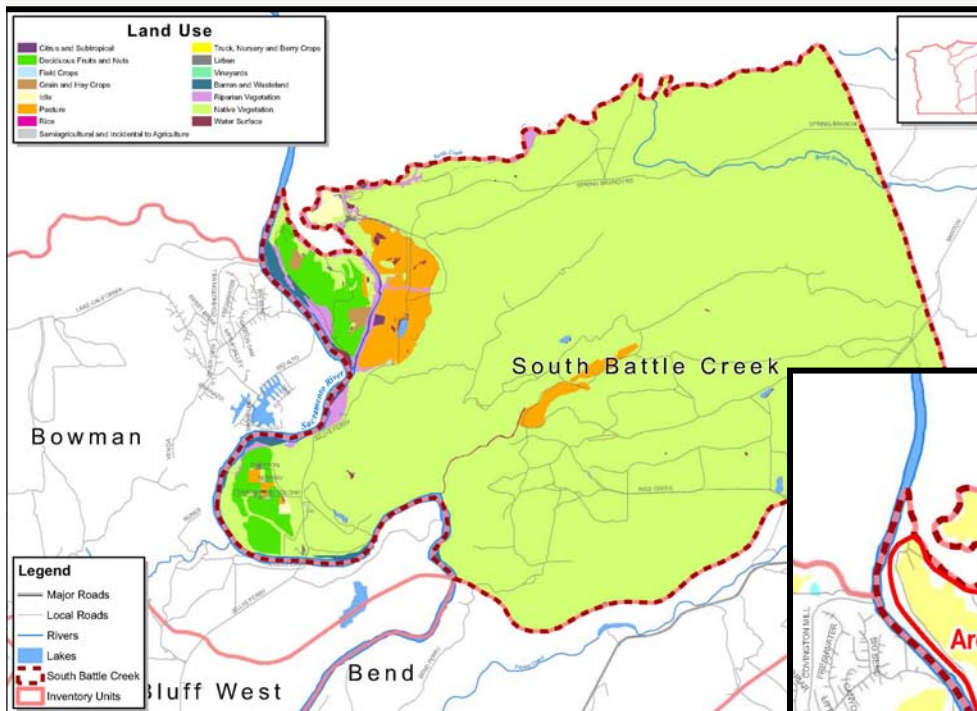


Figure 1-12
Late Season Trigger Level

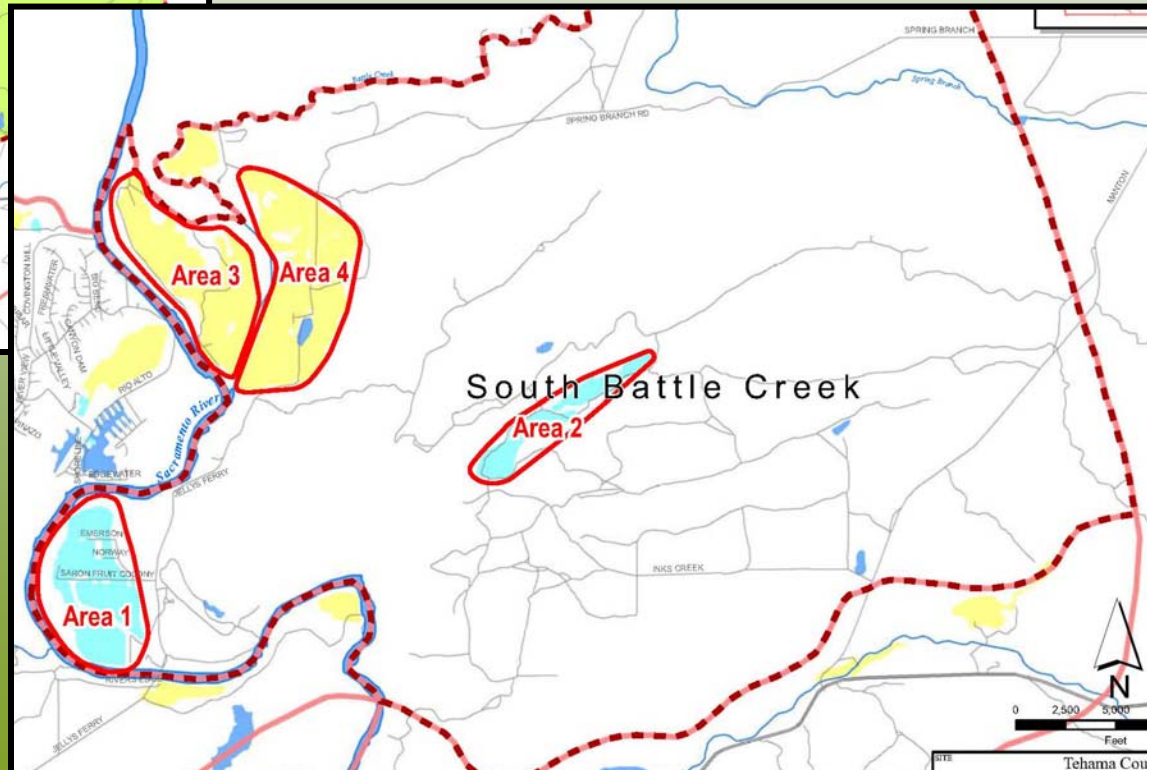
Subbasins Without Adequate Monitoring

South Battle Creek, Bend, Red Bluff West, Corning West



Considered:

- Land Use
- Irrigation water source



- Recommended areas for groundwater monitoring

Next Steps

- Public Outreach
 - Countywide workshops
 - Meet with individual water users
 - Additional outreach partially funded through awarded AB303 grant
- Adoption of trigger levels by subbasins after public input
- Implementation of trigger level program through:
 - Continued monitoring
 - Continued outreach
 - Awareness action implementation as needed
 - Adaptive management

