DEPARTMENT OF
WATER RESOURCES

# Groundwater Conditions in the Northern Sacramento Valley, and Well Infrastructure Trends

2nd Biennial Meeting on Water Resource Issues in Tehama County and the Surrounding Northern Sacramento Valley

December 03, 2008

Dan McManus
DWR Northern District Groundwater Section

# Talking Points

- Water Supply & Demands
- Well Infrastructure
- Groundwater Status Report
- Groundwater Occurrence & Movement

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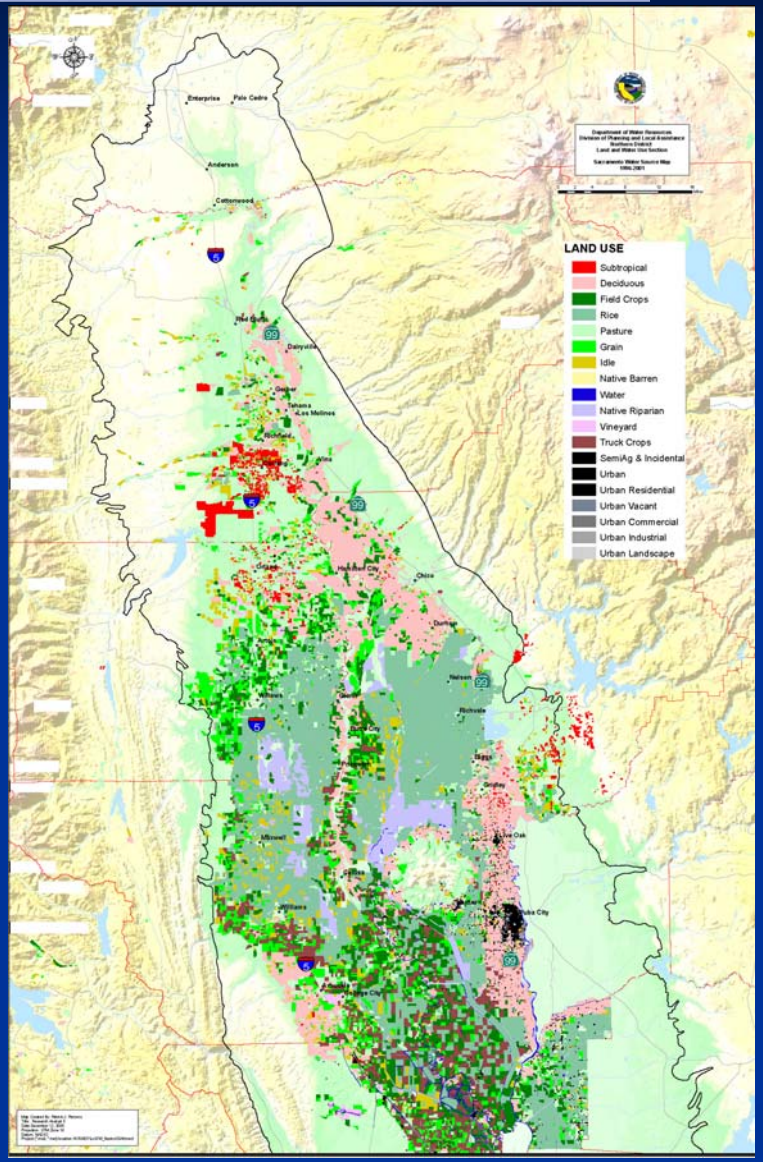
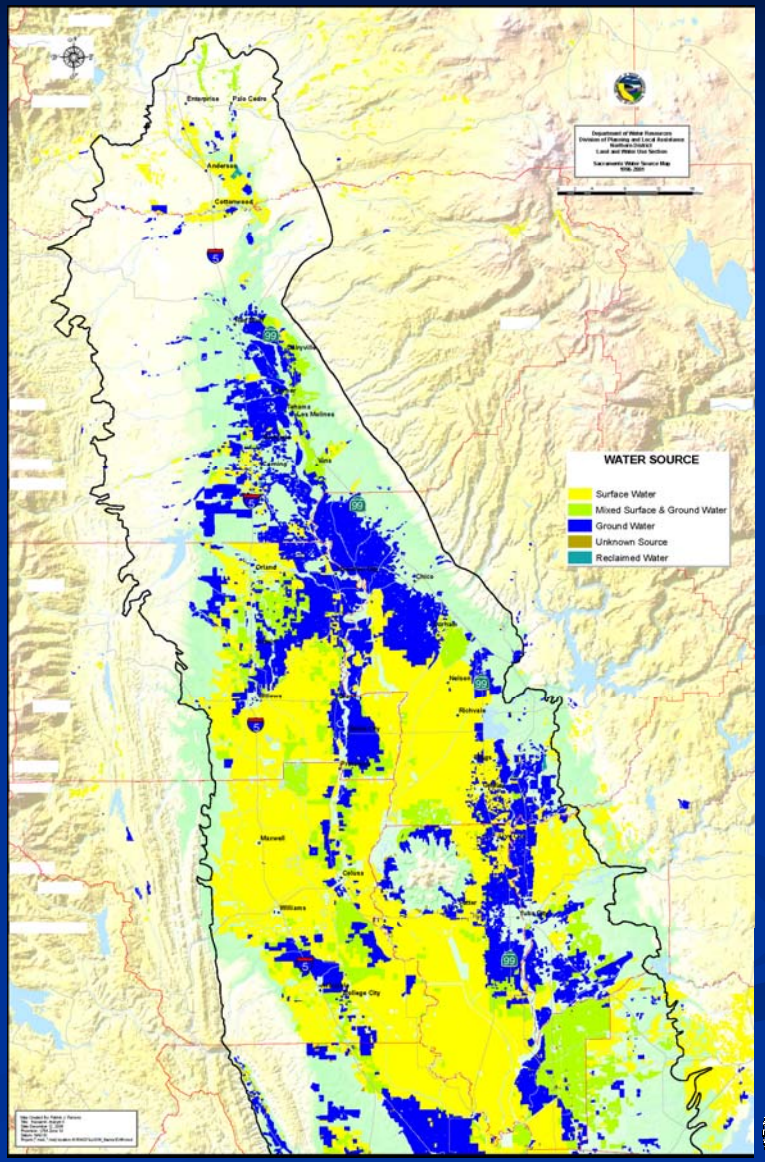
# Water Supply & Demand




Data Source: DWR ND 2000 Land & Water Use Data

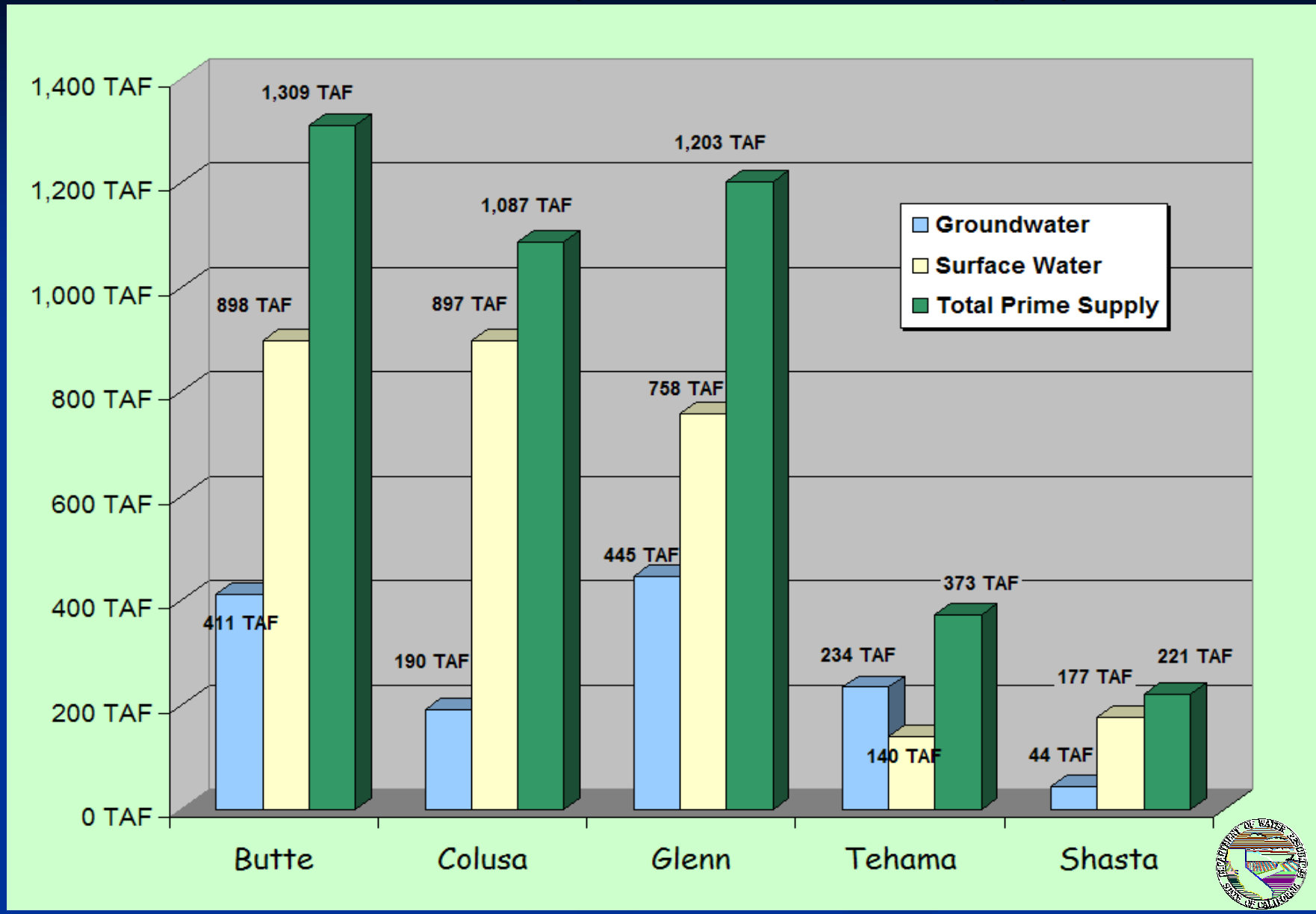
# Northern Sac Valley Prime Water Supply

## Based on Local & Regional Water Balance Data for WY 2000

| | | Butte | Colusa | Glenn | Tehama | Shasta | Totals |
|---|---|---|---|---|---|---|---|
| | ***Local Surface Water (includes FRSC)*** | | | | | | |
| | Agricultural | 571 TAF | 4 TAF | 71 TAF | 98 TAF | 28 TAF | 771 TAF |
| | Wildlife Refuges | 47 TAF | 0 TAF | 14 TAF | 0 TAF | 0 TAF | 61 TAF |
| W | Municipal & Industrial | 14 TAF | 0 TAF | 0 TAF | 1 TAF | 0 TAF | 15 TAF |
| A | Fall Ag Flood / Private Wetland Mgmt | 231 TAF | 0 TAF | 31 TAF | 1 TAF | 0 TAF | 263 TAF |
| T | **Totals:** | **862 TAF** | **4 TAF** | **116 TAF** | **100 TAF** | **28 TAF** | **1,110 TAF** |
| E | ***Federal Project Water (CVP & USCE)*** | | | | | | |
| R | Agricultural | 22 TAF | 760 TAF | 554 TAF | 38 TAF | 116 TAF | 1,489 TAF |
| | Wildlife Refuges | 11 TAF | 43 TAF | 23 TAF | 0 TAF | 0 TAF | 76 TAF |
| S | Municipal & Industrial | 0 TAF | 0 TAF | 0 TAF | 1 TAF | 33 TAF | 34 TAF |
| U | Fall Ag Flood / Private Wetland Mgmt | 3 TAF | 89 TAF | 65 TAF | 1 TAF | 0 TAF | 159 TAF |
| P | **Totals:** | **36 TAF** | **892 TAF** | **642 TAF** | **40 TAF** | **149 TAF** | **1,759 TAF** |
| P | ***Ground Water*** | | | | | | |
| L | Agricultural | 350 TAF | 175 TAF | 426 TAF | 210 TAF | 8 TAF | 1,169 TAF |
| Y | Wildlife Refuges | 8 TAF | 0 TAF | 1 TAF | 0 TAF | 0 TAF | 8 TAF |
| | Municipal & Industrial | 43 TAF | 7 TAF | 10 TAF | 24 TAF | 36 TAF | 119 TAF |
| | Fall Ag Flood / Private Wetland Mgmt | 11 TAF | 8 TAF | 8 TAF | 0 TAF | 0 TAF | 28 TAF |
| | **Totals:** | **411 TAF** | **190 TAF** | **445 TAF** | **234 TAF** | **44 TAF** | **1,323 TAF** |
| | **Sub-Total (Prime) Supply** | **1,309 TAF** | **1,087 TAF** | **1,203 TAF** | **373 TAF** | **221 TAF** | **4,192 TAF** |

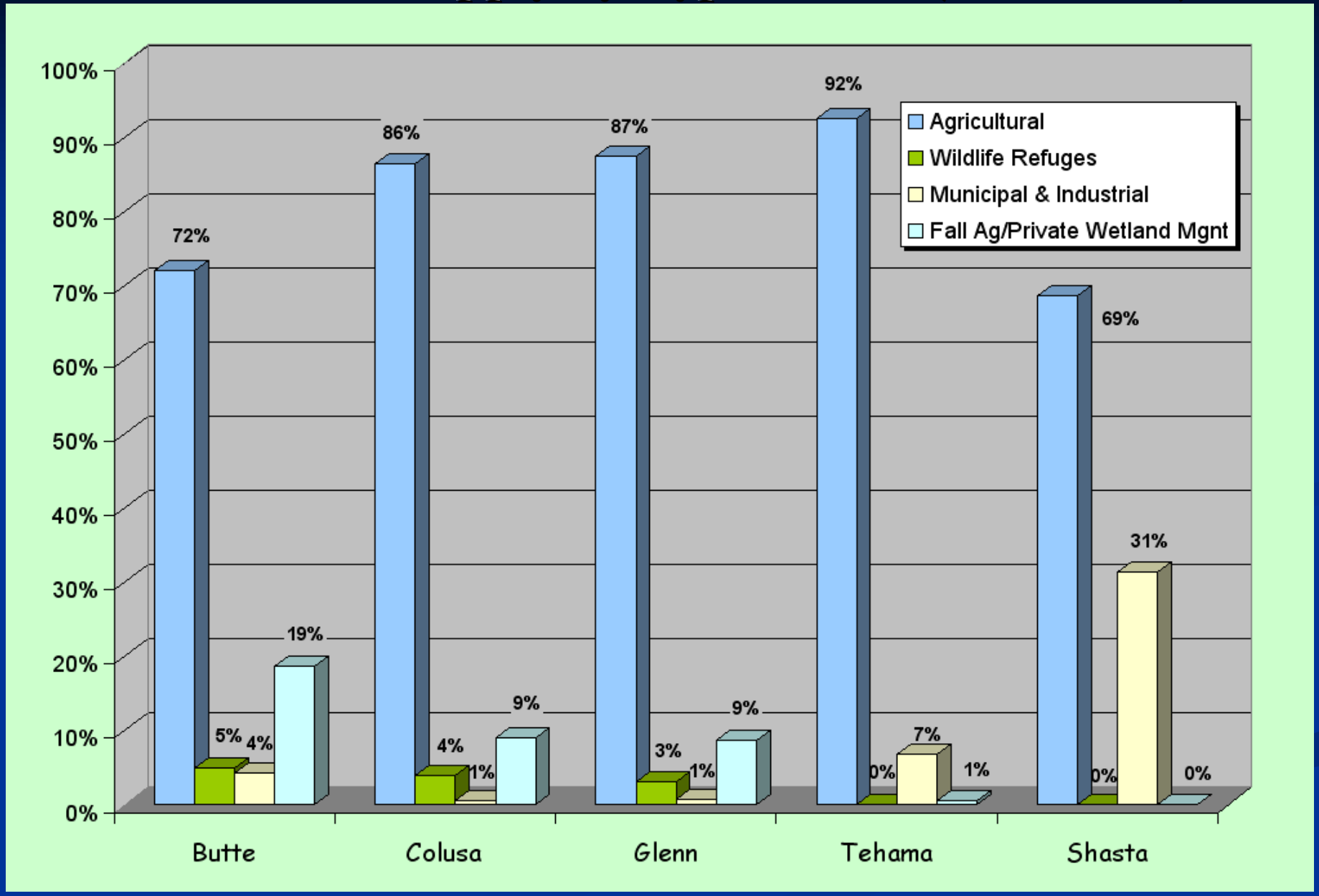
Data Source: DWR ND 2000 Land & Water Use Data

# Northern Sac Valley Prime Water Supply (TAF)




Data Source: DWR ND 2000 Land & Water Use Data

# Prime Water Supply by Type of Use (SW & GW)

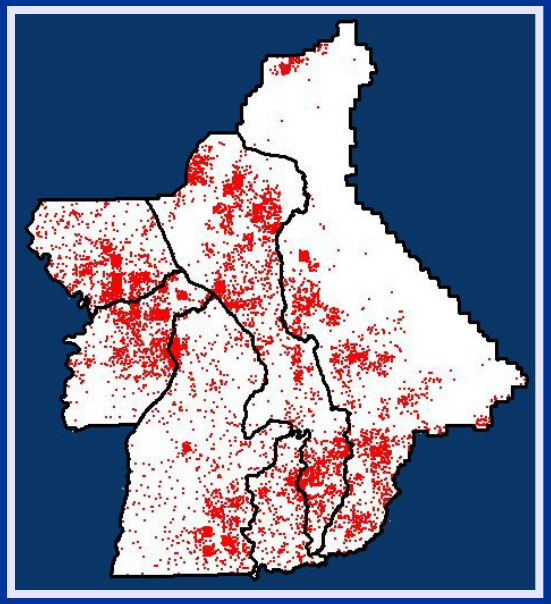


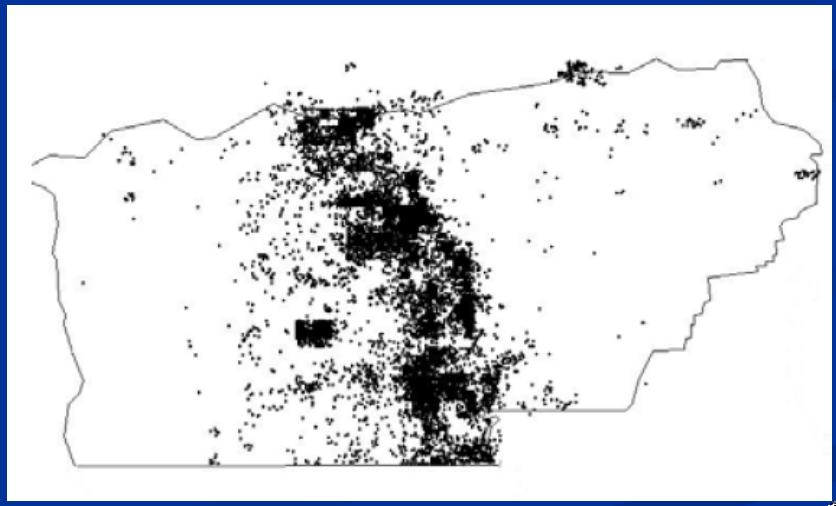

Data Source: DWR ND 2000 Land & Water Use Data

# Well Completion Report Data (Driller's Logs)

| ***Well Use*** | Butte | Colusa | Glenn | Tehama | Shasta | Totals |
|---|---|---|---|---|---|---|
| Domestic | 5,825 | 971 | 2,487 | 8,728 | 4,571 | 22,582 |
| Irrigation | 2,281 | 721 | 1,416 | 1,340 | 114 | 5,872 |
| Municipal, Industrial & Public | 233 | 76 | 72 | 115 | 104 | 600 |
| Other | 1,935 | 788 | 926 | 1,292 | 820 | 5,761 |
| **Totals:** | **10,274** | **2,556** | **4,901** | **11,475** | **5,609** | **34,815** |

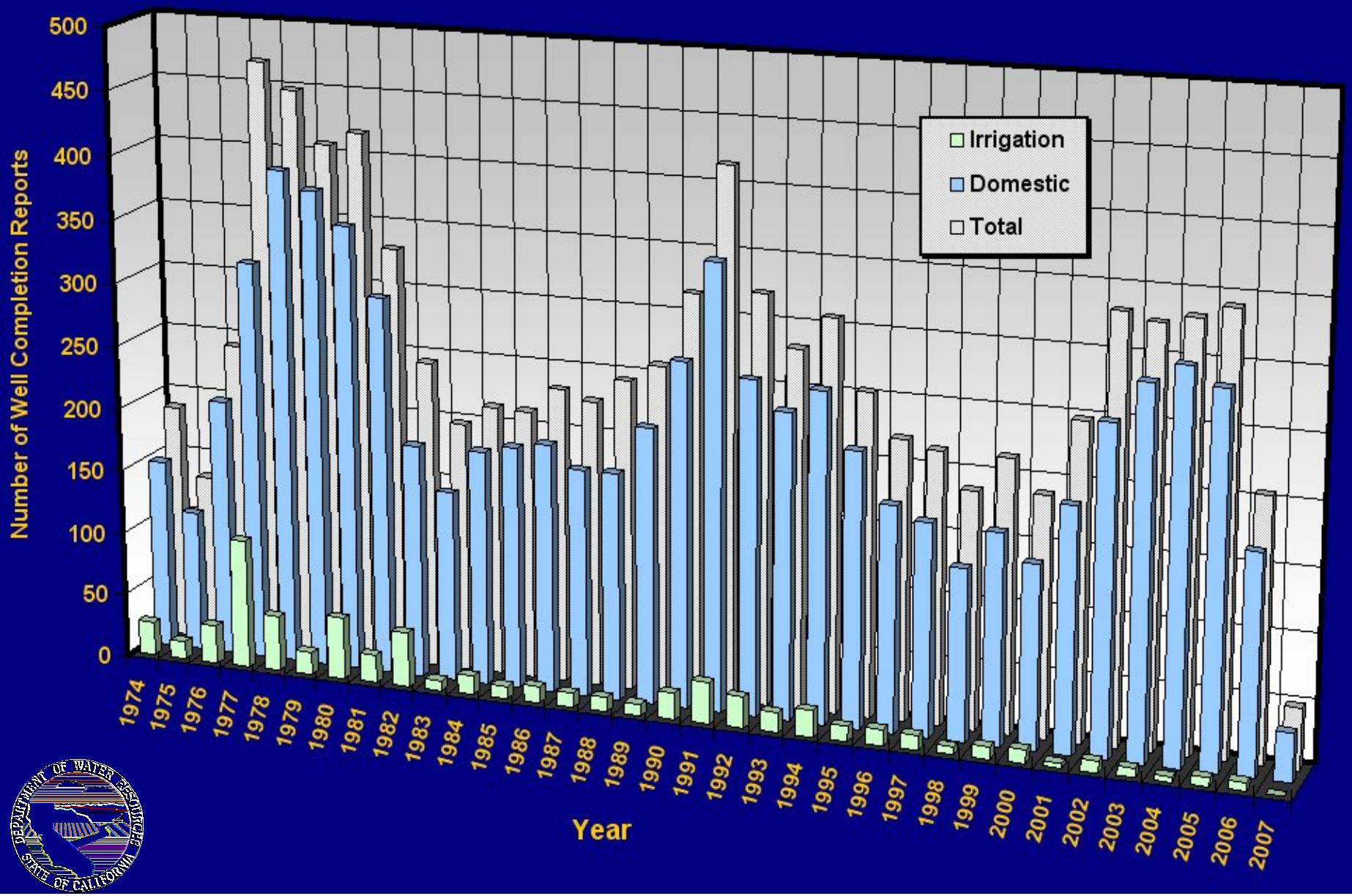
All Logs for Valley Portion of the Five Counties through Dec. 2006



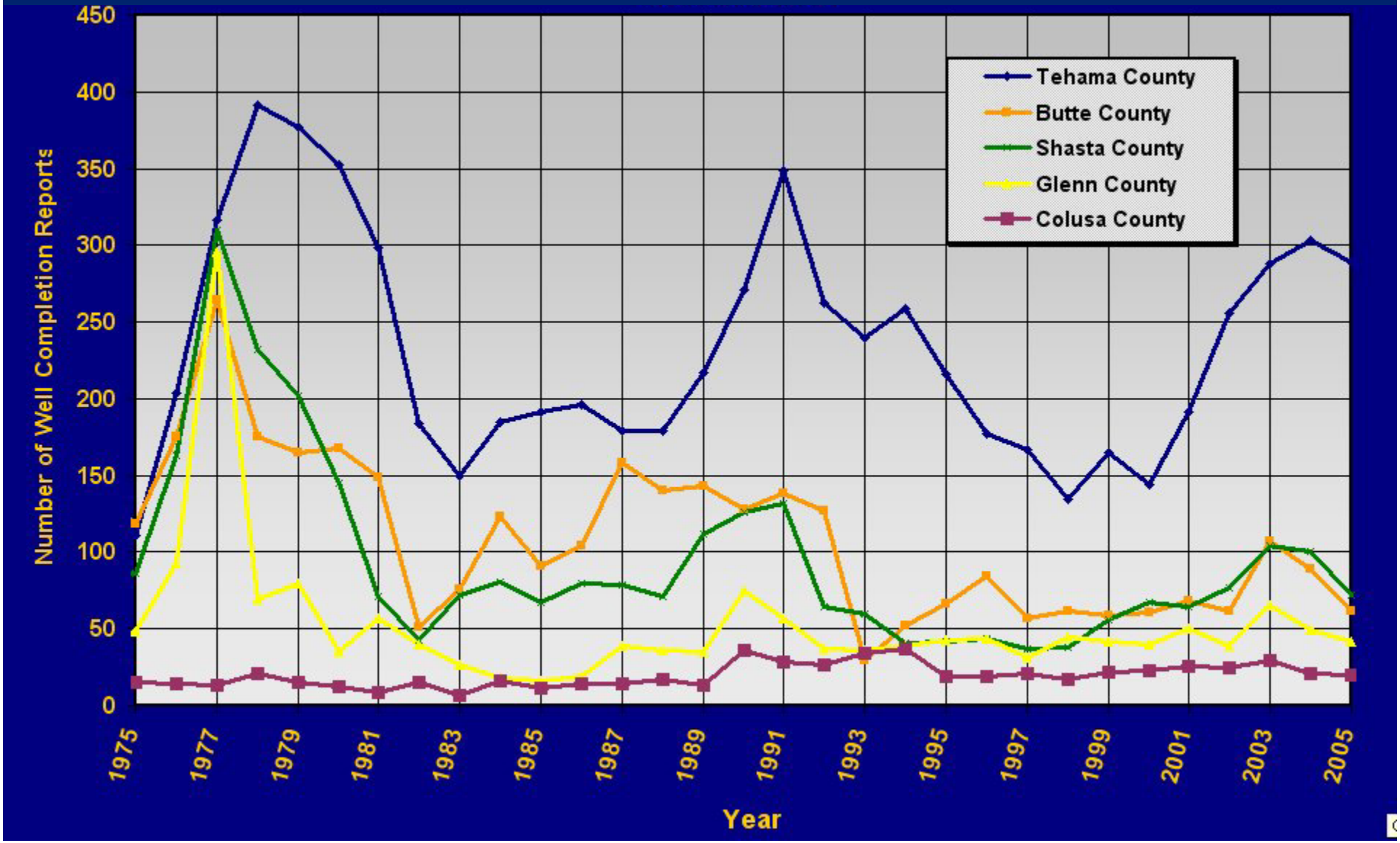


# Tehama County Drillers Logs Filed per Year

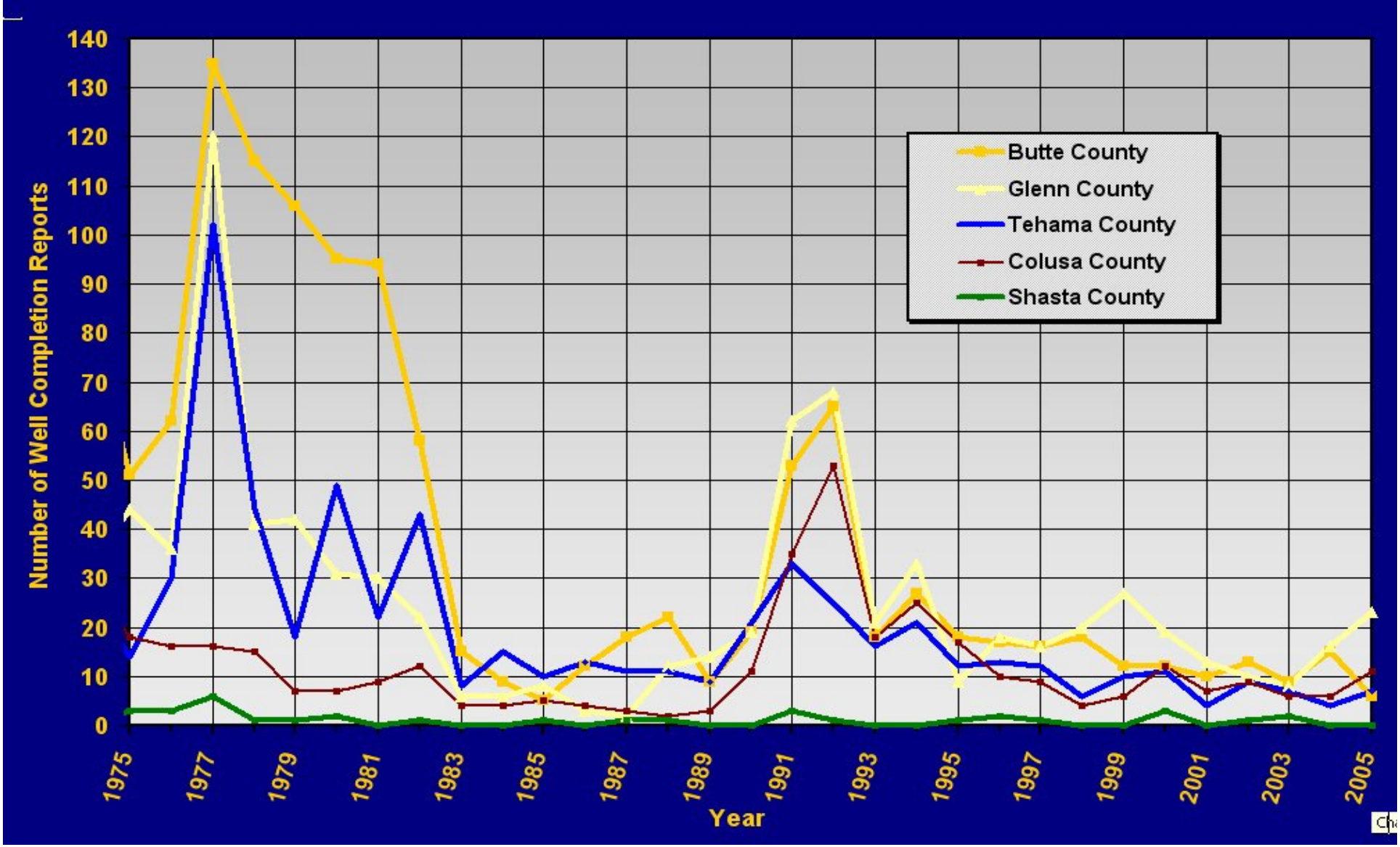
(through Nov. 2008)



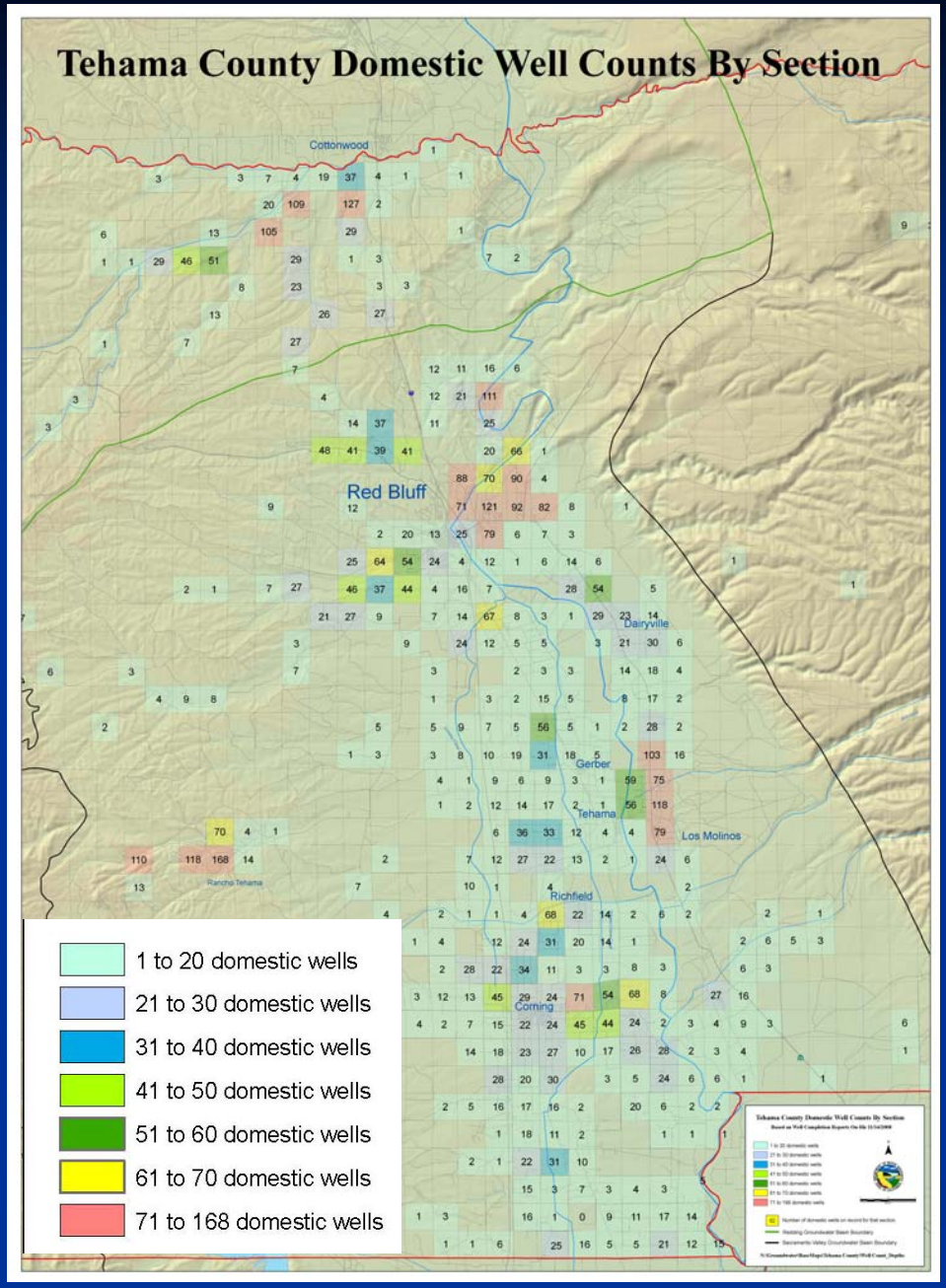
# Domestic Well Logs Filed per Year for: Shasta, Tehama, Glenn, Butte & Colusa (through Dec. 2006)

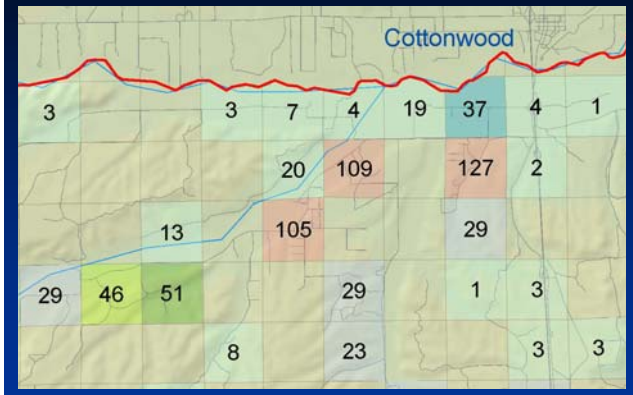


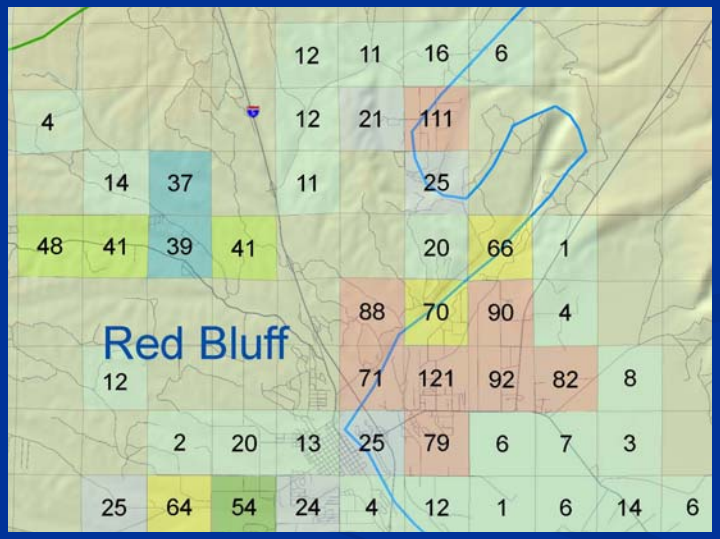
# Irrigation Well Logs Filed per Year for: Shasta, Tehama, Glenn, Butte & Colusa (through Dec. 2006)

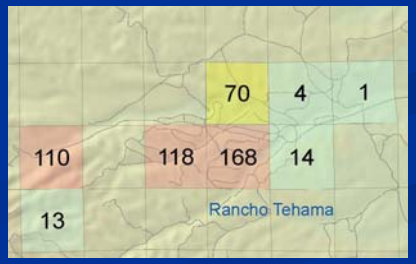


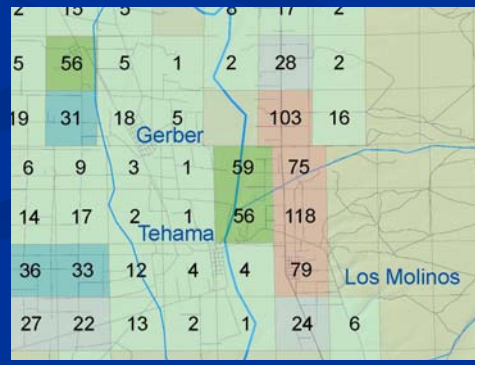
# Domestic Well Counts



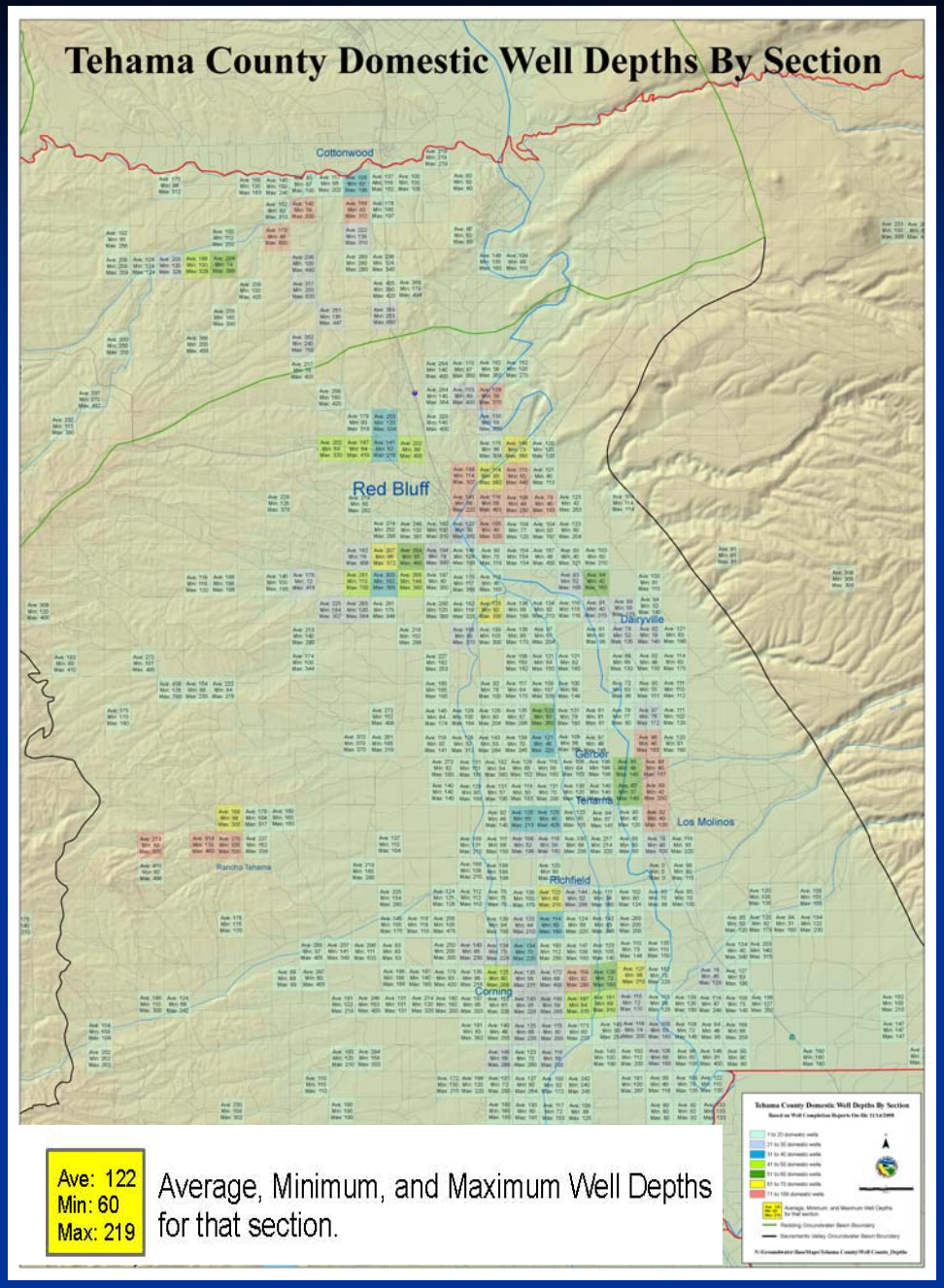



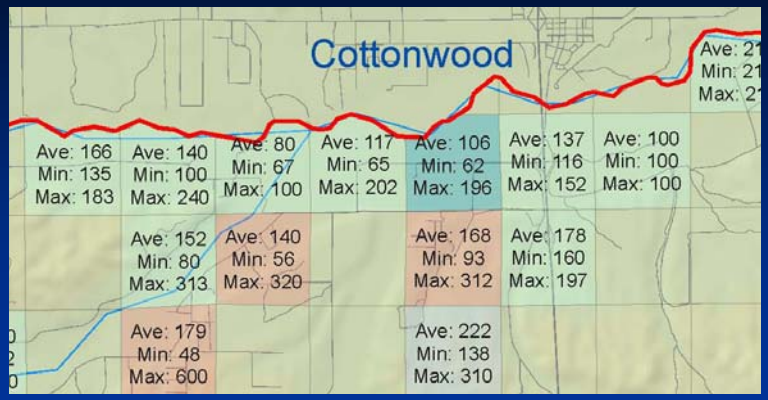



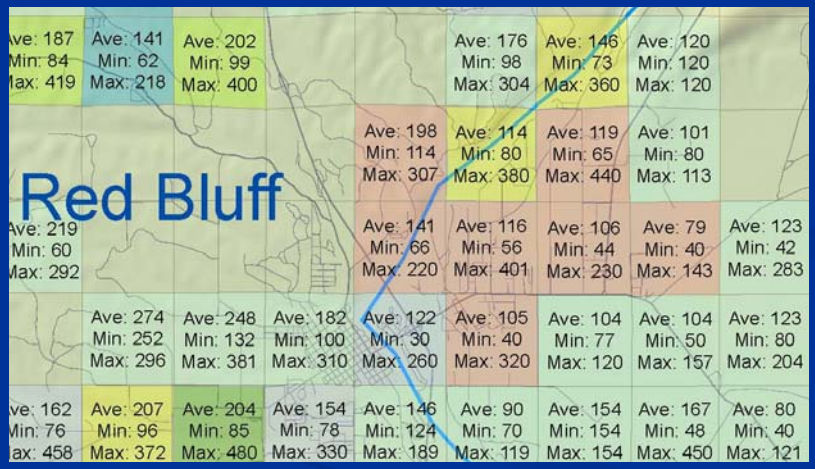



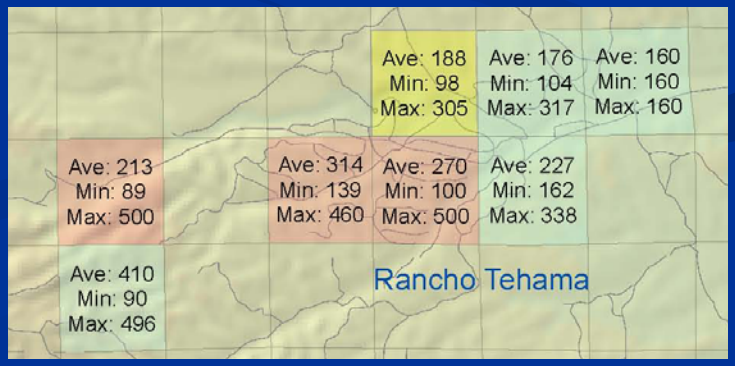



# Domestic Well Depth

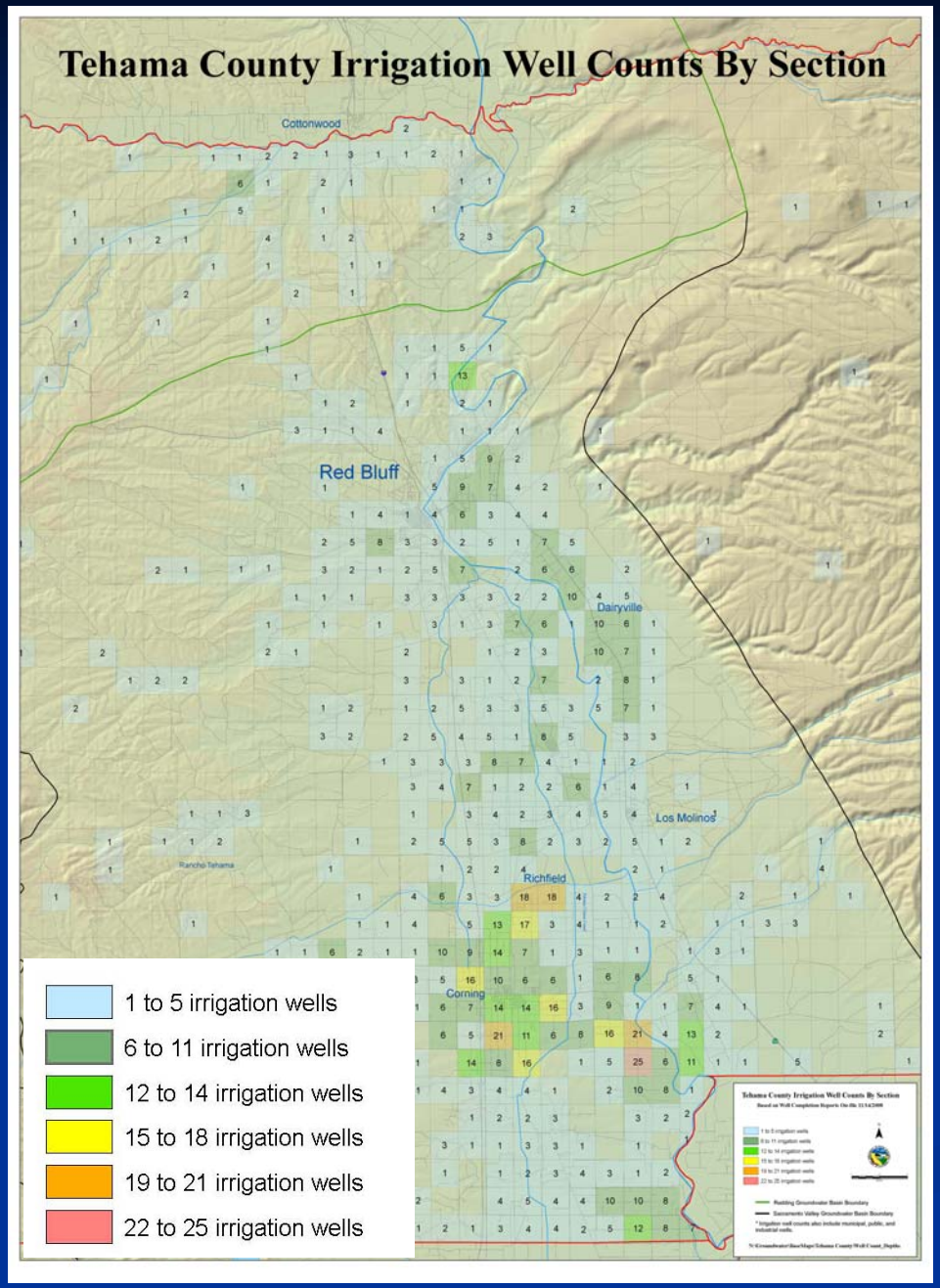


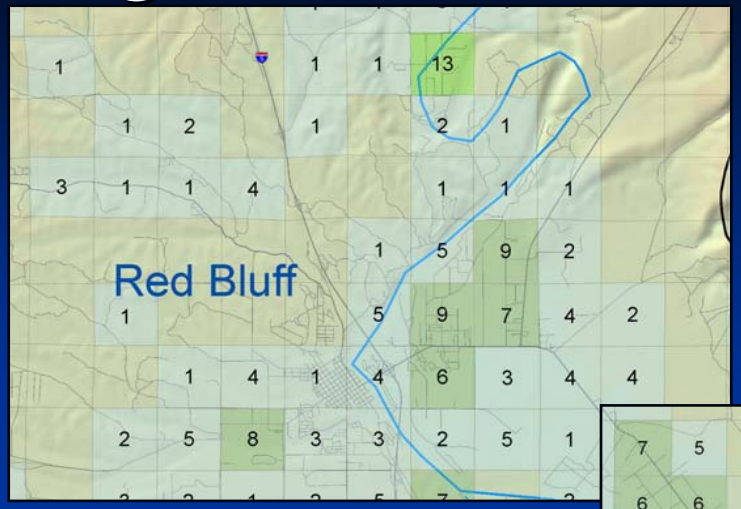



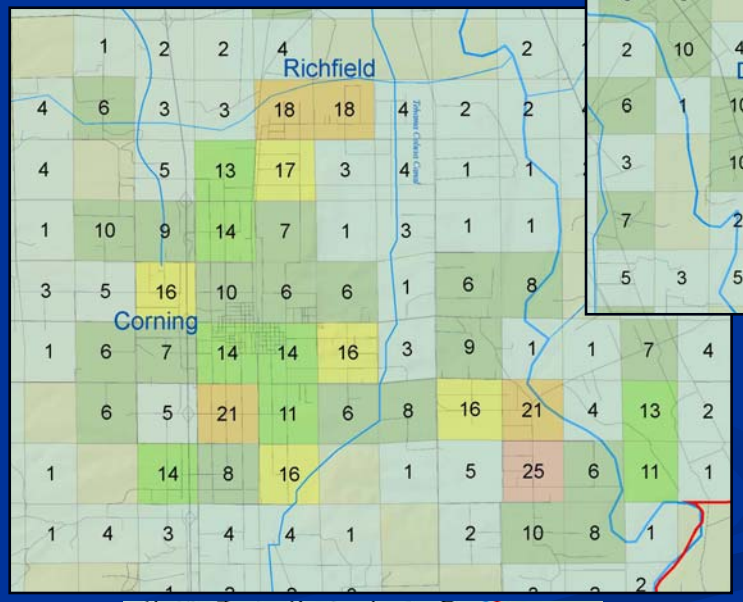



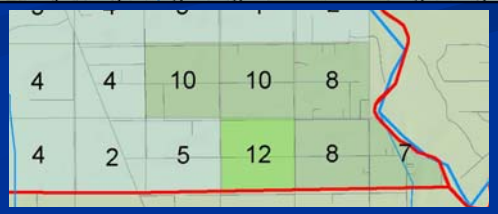
# Irrigation Well Counts



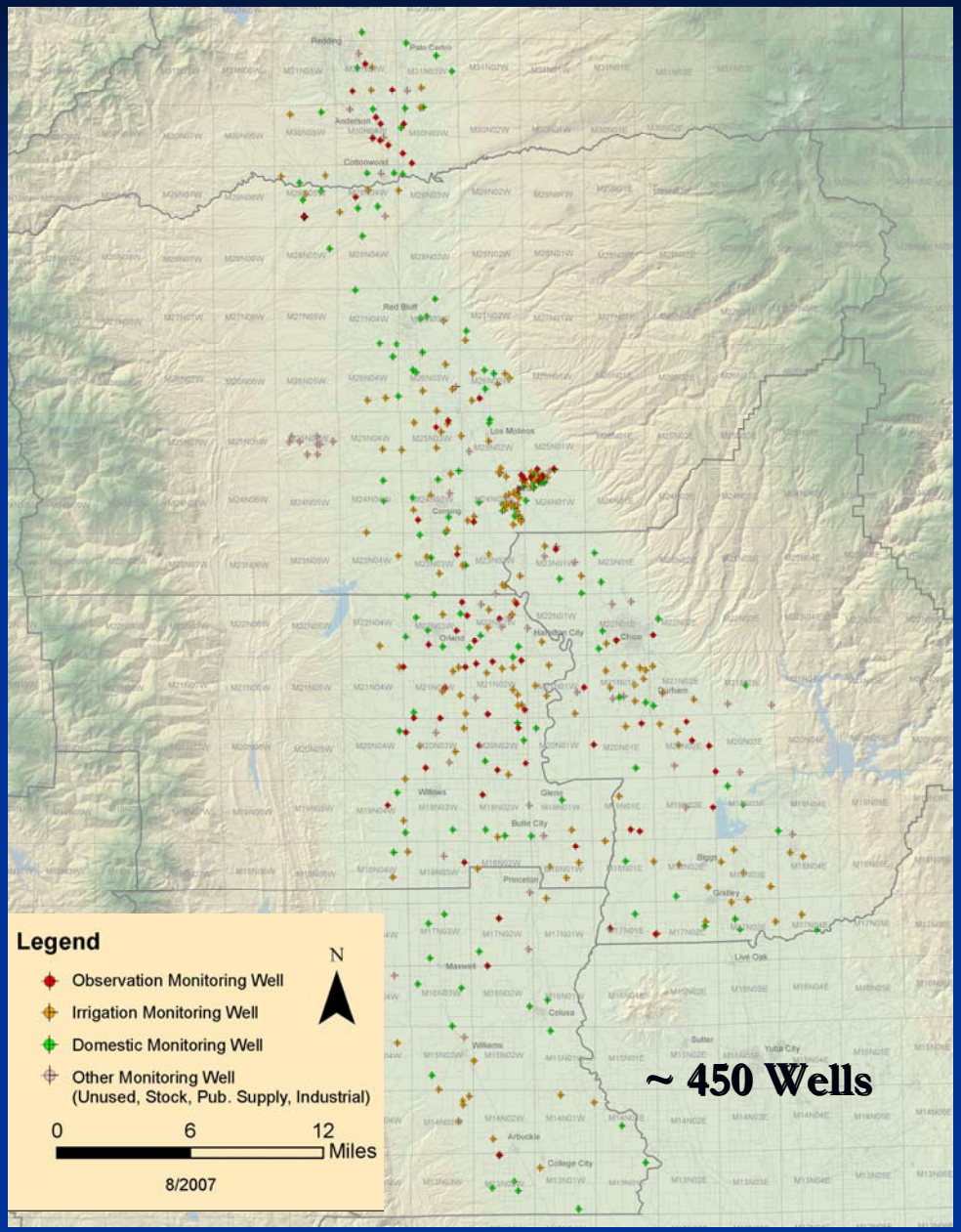



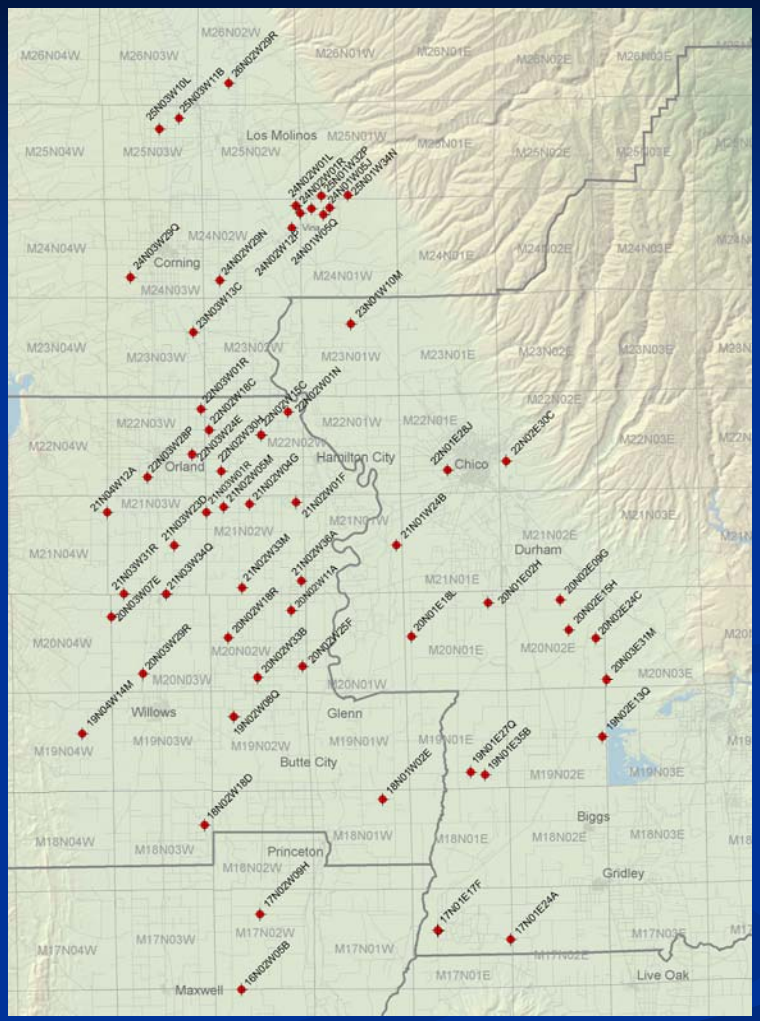







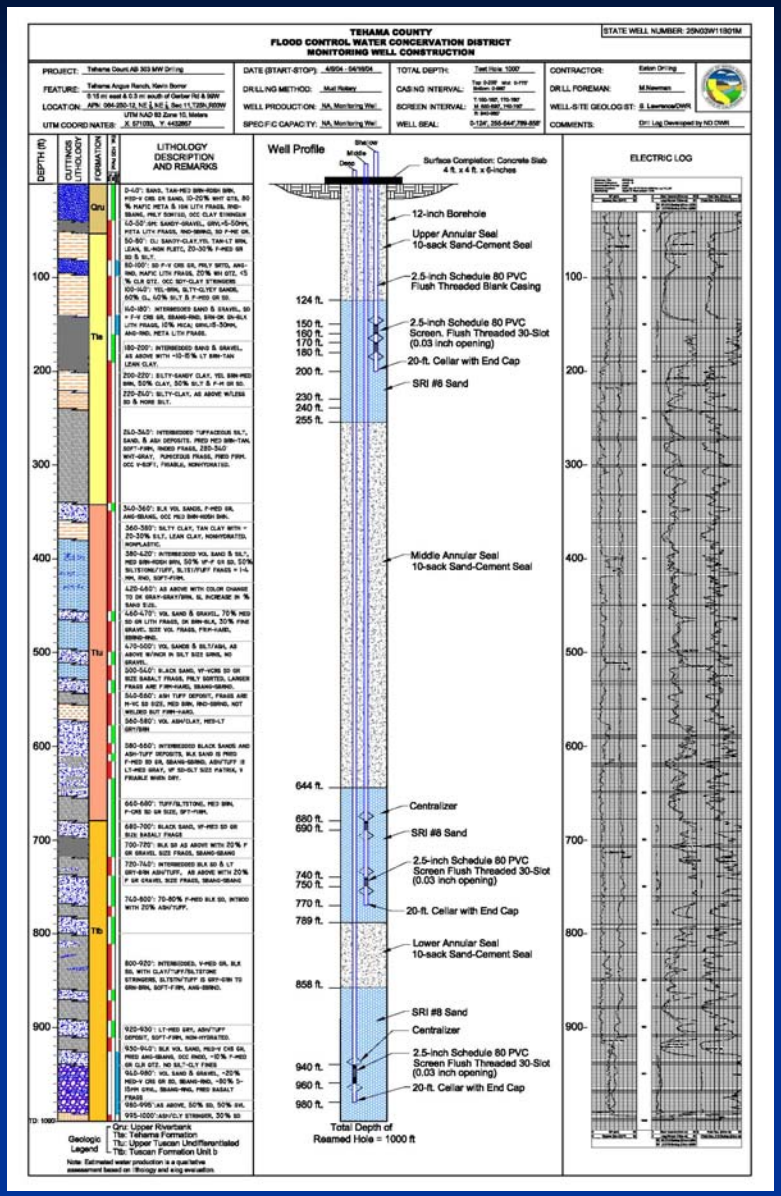
# Sacramento Valley Groundwater Monitoring Grid



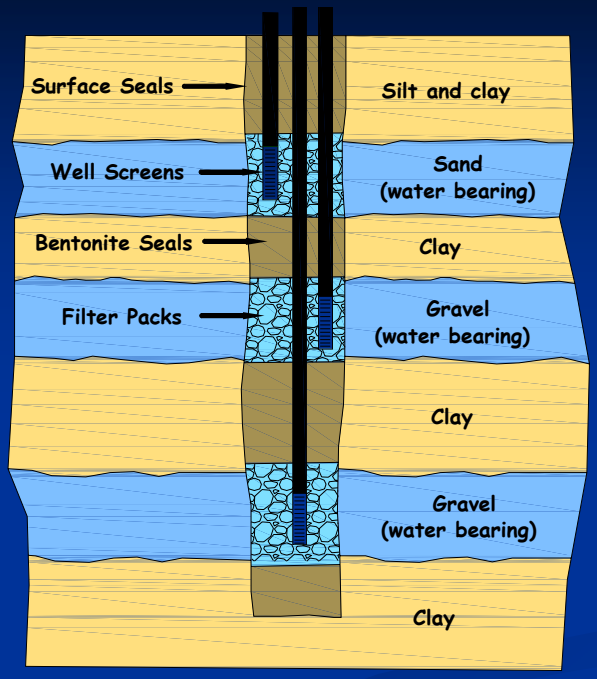




**Dedicated Monitoring Wells**
**~ 60 Well Sites**
**~ 170 Individual Wells**
**(Hourly Data)**

# Multi-Completion Monitoring Wells




MW As-Built Log




Datalogger Installations

MW Surface Completion

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# GW Status Reports
# Fall 2007 – Fall 2008

DEPARTMENT OF WATER RESOURCES
Northern District
2440 Main St.
Red Bluff, CA 96080
*November 19, 2008*

## GROUNDWATER LEVEL MONITORING REPORT
## SACRAMENTO VALLEY and REDDING GROUNDWATER BASINS
## FALL 2008

The Fall 2008 Groundwater Level Monitoring Report summarizes the October 2008 groundwater level measurements collected from wells in the northern Sacramento Valley by the Department of Water Resources (DWR) Northern District and DWR monitoring cooperators. Northern Sacramento Valley groundwater levels are measured approximately four times a year as part of our ongoing data collection program. Many of the wells have over 30 years of monitoring history, with the longest active monitoring well dating back to 1921, or 87 years! The groundwater level data provide valuable information regarding seasonal fluctuations and long-term changes in groundwater level trends over time. The groundwater level data presented in this report includes the Sacramento Valley and Redding groundwater basin portions of Butte, Colusa, Glenn, Tehama, and Shasta counties.

# Statistics by Depth

**CHANGE IN GROUNDWATER ELEVATION BY WELL DEPTH**

FALL 2007 to FALL 2008

| | All Well Depths | Well Depth | | | |
|---|---|---|---|---|---|
| | | 0 to 200 ft-bgs | 200 to 600 ft-bgs | 600 to 1,380 ft-bgs | Unknown |
| BUTTE | | | | | |
| Maximum Increase in GWE* (ft) | 4 | 4 | 4 | -1 | -1 |
| Maximum Decrease in GWE (ft) | -11 | -11 | -11 | -8 | -10 |
| Average GWL Change (ft) | -3 | -2 | -3 | -3 | -5 |
| Range of GWL Change (ft) | 15 | 15 | 15 | 7 | 9 |
| Number of Wells | 89 | 31 | 39 | 11 | 8 |
| COLUSA | | | | | |
| Maximum Increase in GWE* (ft) | 2 | 2 | 1 | -2 | -1 |
| Maximum Decrease in GWE (ft) | -16 | -11 | -10 | -16 | -1 |
| Average GWL Change (ft) | -3 | -2 | -4 | -6 | -1 |
| Range of GWL Change (ft) | 18 | 13 | 11 | 13 | 0 |
| Number of Wells | 49 | 16 | 26 | 6 | 1 |
| GLENN | | | | | |
| Maximum Increase in GWE* (ft) | 11 | 11 | 7 | -1 | 3 |
| Maximum Decrease in GWE (ft) | -26 | -17 | -26 | -22 | -8 |
| Average GWL Change (ft) | -4 | -3 | -5 | -7 | -3 |
| Range of GWL Change (ft) | 37 | 28 | 33 | 21 | 11 |
| Number of Wells | 145 | 57 | 53 | 24 | 11 |
| TEHAMA | | | | | |
| Maximum Increase in GWE* (ft) | 6 | 2 | 5 | 0 | 6 |
| Maximum Decrease in GWE (ft) | -14 | -14 | -13 | -9 | -2 |
| Average GWL Change (ft) | -3 | -2 | -3 | 3 | 1 |
| Range of GWL Change (ft) | 20 | 16 | 18 | 8 | -2 |
| Number of Wells | 129 | 57 | 48 | 19 | 5 |
| REDDING BASIN | | | | | |
| Maximum Increase in GWE* (ft) | 3 | 0 | 3 | 3 | |
| Maximum Decrease in GWE (ft) | -13 | -13 | -5 | 0 | |
| Average GWL Change (ft) | -1 | -2 | -1 | 2 | |
| Range of GWL Change (ft) | 16 | 13 | 8 | 3 | |
| Number of Wells | 33 | 13 | 18 | 2 | 0 |
| TOTAL | | | | | |
| Maximum Increase in GWE* (ft) | 11 | 11 | 7 | 3 | 6 |
| Maximum Decrease in GWE (ft) | -26 | -17 | -26 | -22 | -10 |
| Average GWL Change (ft) | -3 | -2 | -4 | -5 | -3 |
| Range of GWL Change (ft) | 37 | 28 | 33 | 24 | 16 |
| Number of Wells | 445 | 177 | 179 | 64 | 25 |

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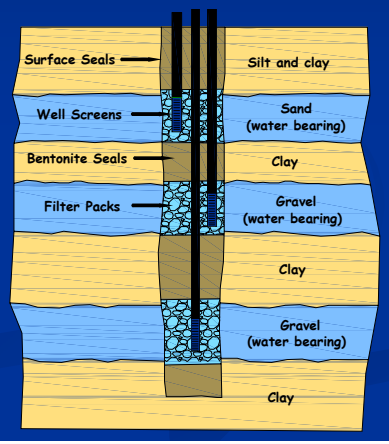
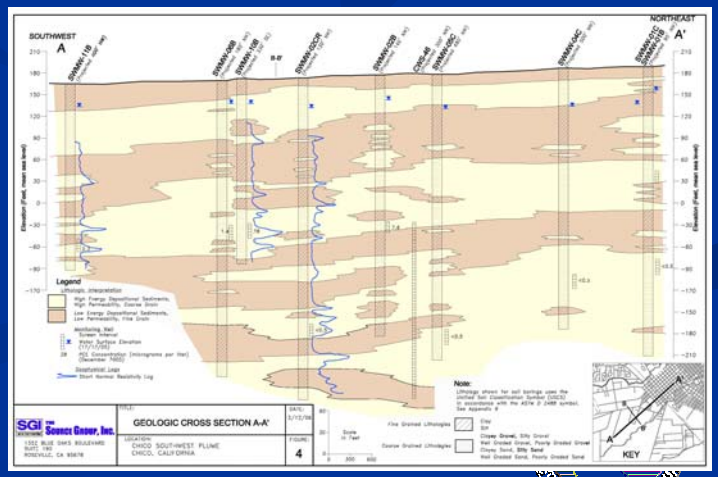
# GW Status Report Fall 2007 – Fall 2008 By Well Depth



# Statistics by Well Use

**CHANGE IN GROUNDWATER ELEVATION BY WELL USE**

FALL 2007 to FALL 2008

| | All Well Depths | Well Use | | | |
|---|---|---|---|---|---|
| | | Domestic | Irrigation | Observation | Other |
| BUTTE | | | | | |
| Maximum Increase in GWE* (ft) | 4 | 4 | 3 | 3 | 0 |
| Maximum Decrease in GWE (ft) | -11 | -11 | -11 | -8 | -10 |
| Average GWL Change (ft) | -3 | -3 | -3 | -2 | -4 |
| Range of GWL Change (ft) | 15 | 15 | 14 | 11 | 9 |
| Number of Wells | 89 | 16 | 28 | 32 | 13 |
| | | | | | |
| COLUSA | | | | | |
| Maximum Increase in GWE* (ft) | 2 | 2 | 1 | -1 | 0 |
| Maximum Decrease in GWE (ft) | -16 | -10 | -16 | -10 | -8 |
| Average GWL Change (ft) | -3 | -2 | -4 | -5 | -3 |
| Range of GWL Change (ft) | 18 | 13 | 17 | 9 | 7 |
| Number of Wells | 49 | 15 | 12 | 7 | 15 |
| | | | | | |
| GLENN | | | | | |
| Maximum Increase in GWE* (ft) | 11 | 9 | 11 | 7 | 3 |
| Maximum Decrease in GWE (ft) | -26 | -17 | -23 | -26 | -10 |
| Average GWL Change (ft) | -4 | -2 | -4 | -5 | -3 |
| Range of GWL Change (ft) | 37 | 26 | 34 | 33 | 13 |
| Number of Wells | 145 | 21 | 33 | 78 | 13 |
| | | | | | |
| TEHAMA | | | | | |
| Maximum Increase in GWE* (ft) | 6 | 6 | 5 | 2 | 1 |
| Maximum Decrease in GWE (ft) | -14 | -7 | -13 | -14 | -4 |
| Average GWL Change (ft) | -3 | -2 | -3 | -3 | -2 |
| Range of GWL Change (ft) | 20 | 13 | 18 | 16 | 5 |
| Number of Wells | 129 | 4 | 40 | 41 | 44 |
| | | | | | |
| REDDING BASIN | | | | | |
| Maximum Increase in GWE* (ft) | 3 | 1 | 3 | 3 | 2 |
| Maximum Decrease in GWE (ft) | -13 | -13 | -5 | -4 | -1 |
| Average GWL Change (ft) | -1 | -2 | -2 | -1 | 1 |
| Range of GWL Change (ft) | 16 | 14 | 8 | 7 | 3 |
| Number of Wells | 33 | 11 | 6 | 13 | 3 |
| | | | | | |
| TOTAL | | | | | |
| Maximum Increase in GWE* (ft) | 11 | 9 | 11 | 9 | 3 |
| Maximum Decrease in GWE (ft) | -26 | -17 | -23 | -26 | -10 |
| Average GWL Change (ft) | -3 | -2 | -3 | -4 | -3 |
| Range of GWL Change (ft) | 37 | 26 | 34 | 35 | 13 |
| Number of Wells | 445 | 107 | 120 | 170 | 48 |

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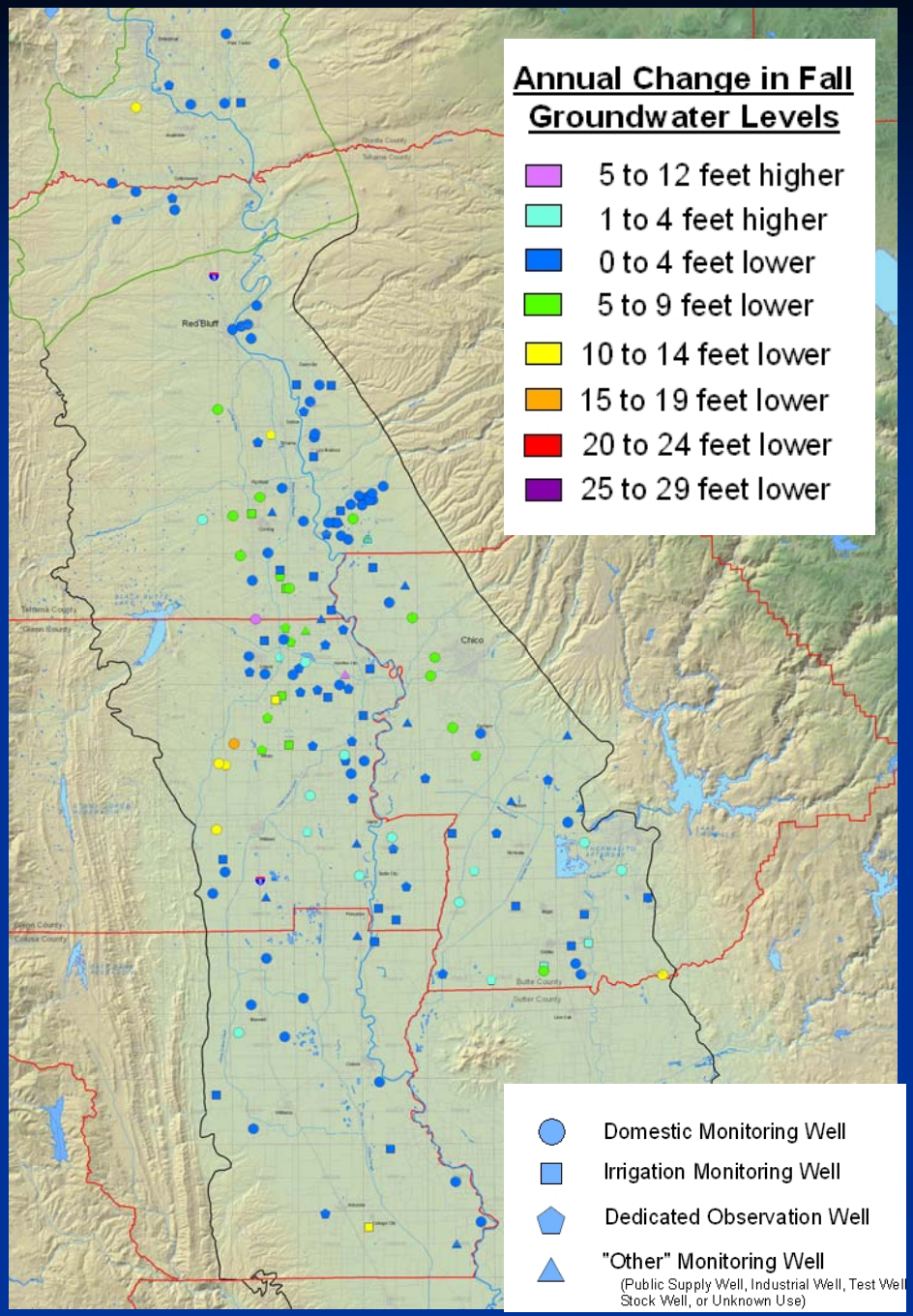
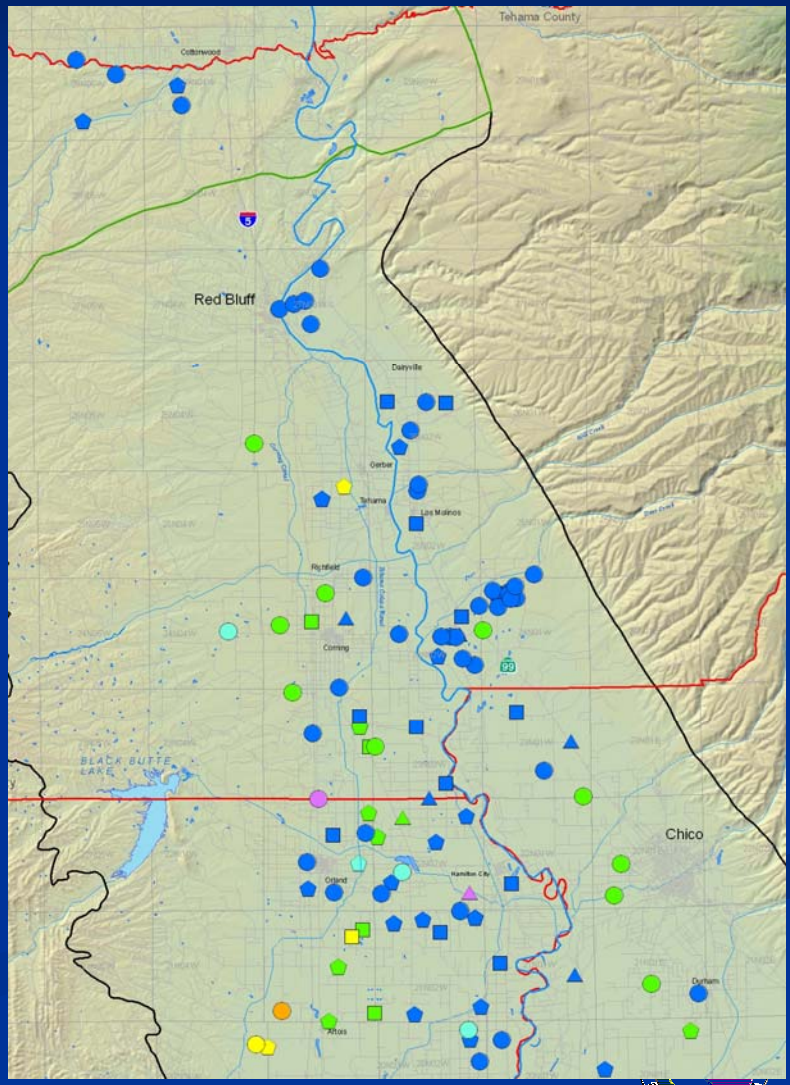
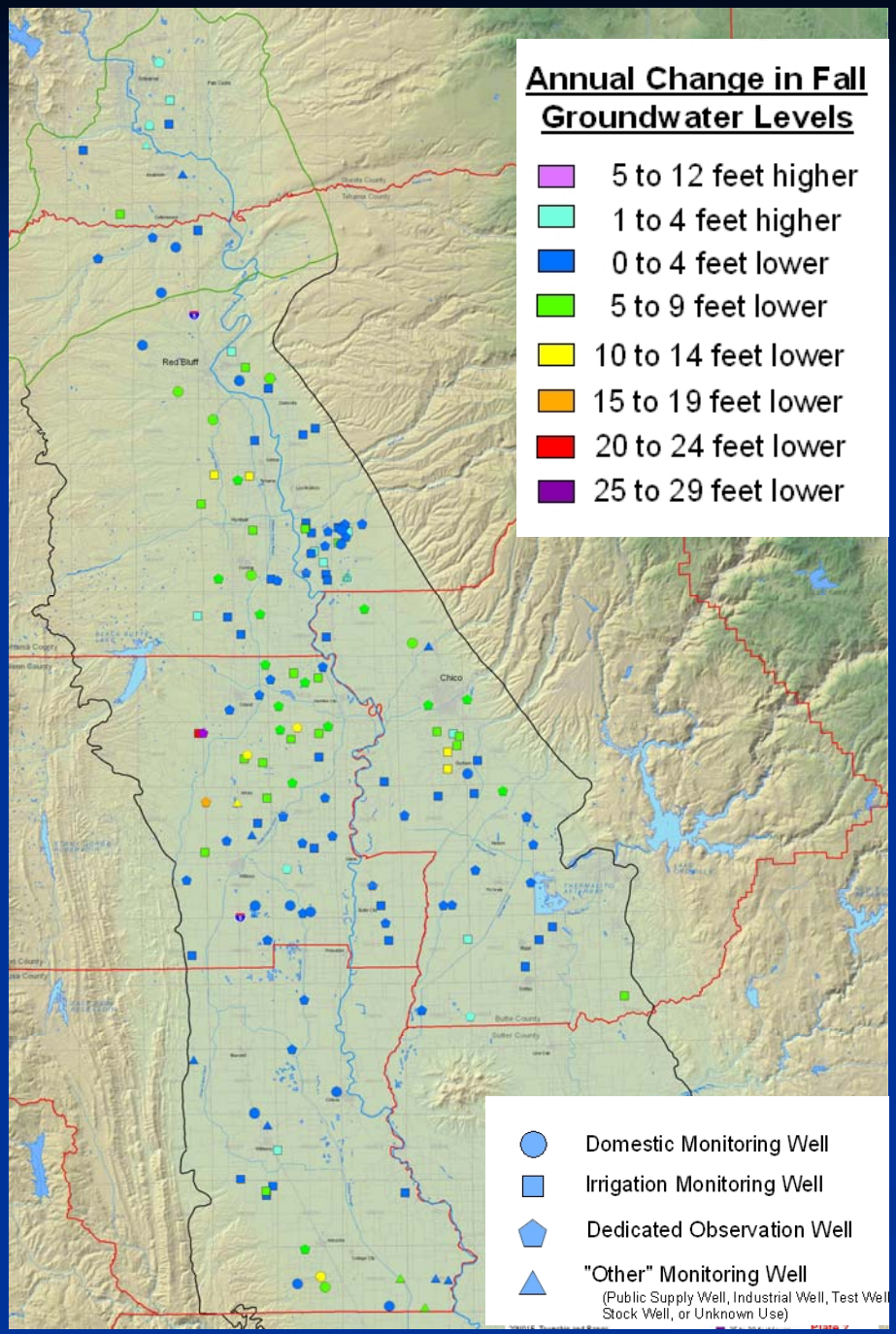
## GW Status Report Fall 2007 – Fall 2008 By Well Use

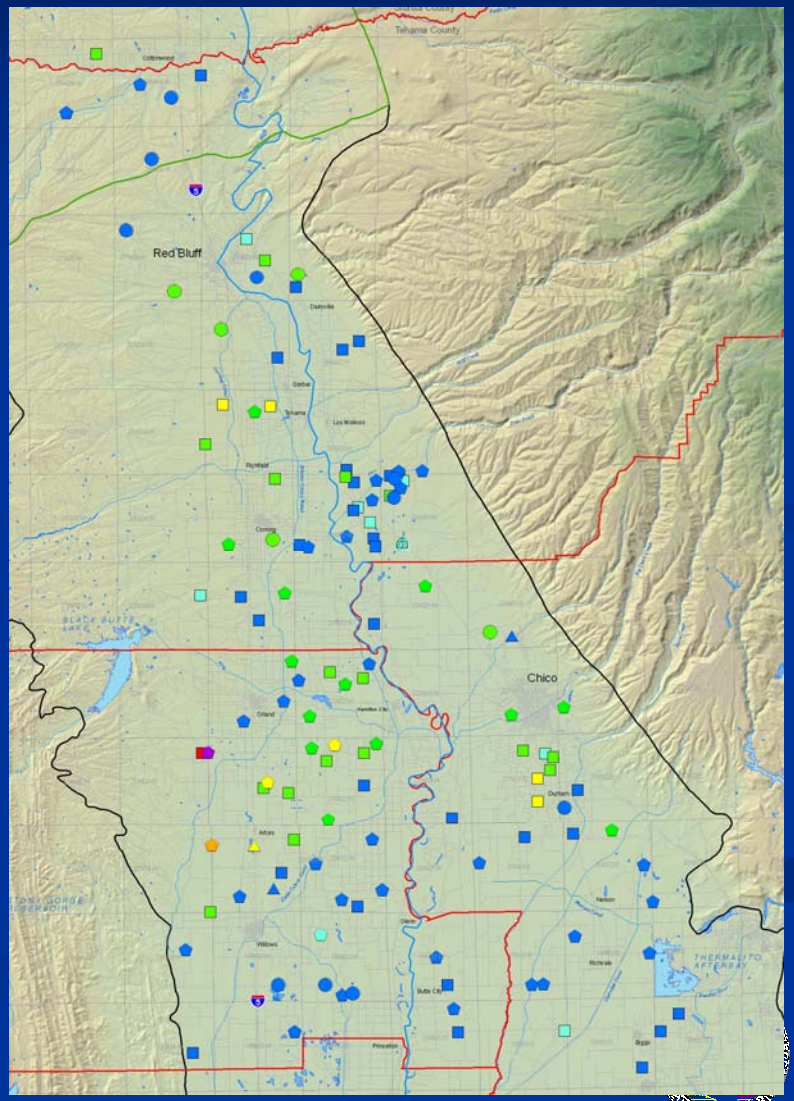
# GW Status Report
# Fall 2007 – Fall 2008 Change
# Wells: 0 – 200 ft



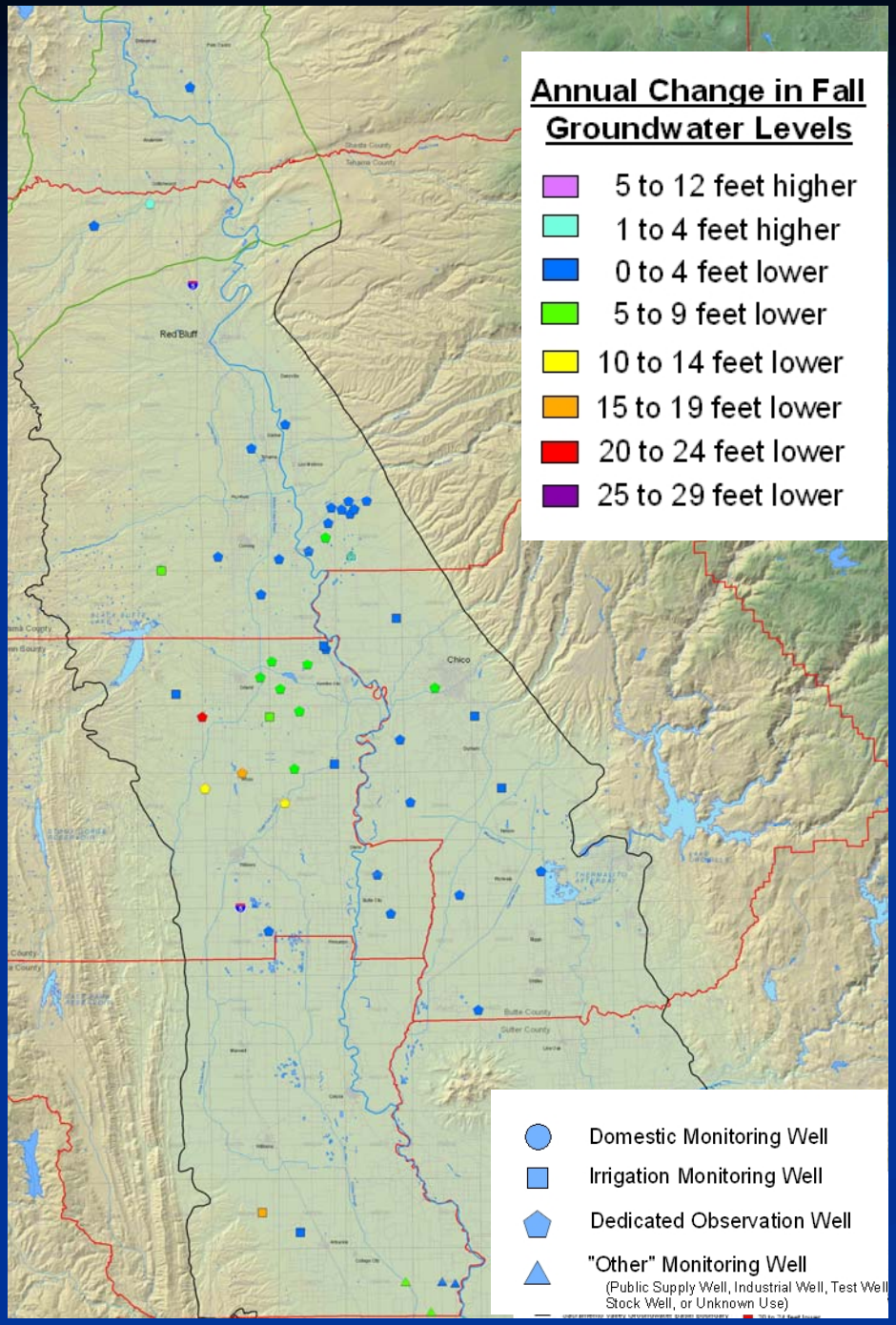



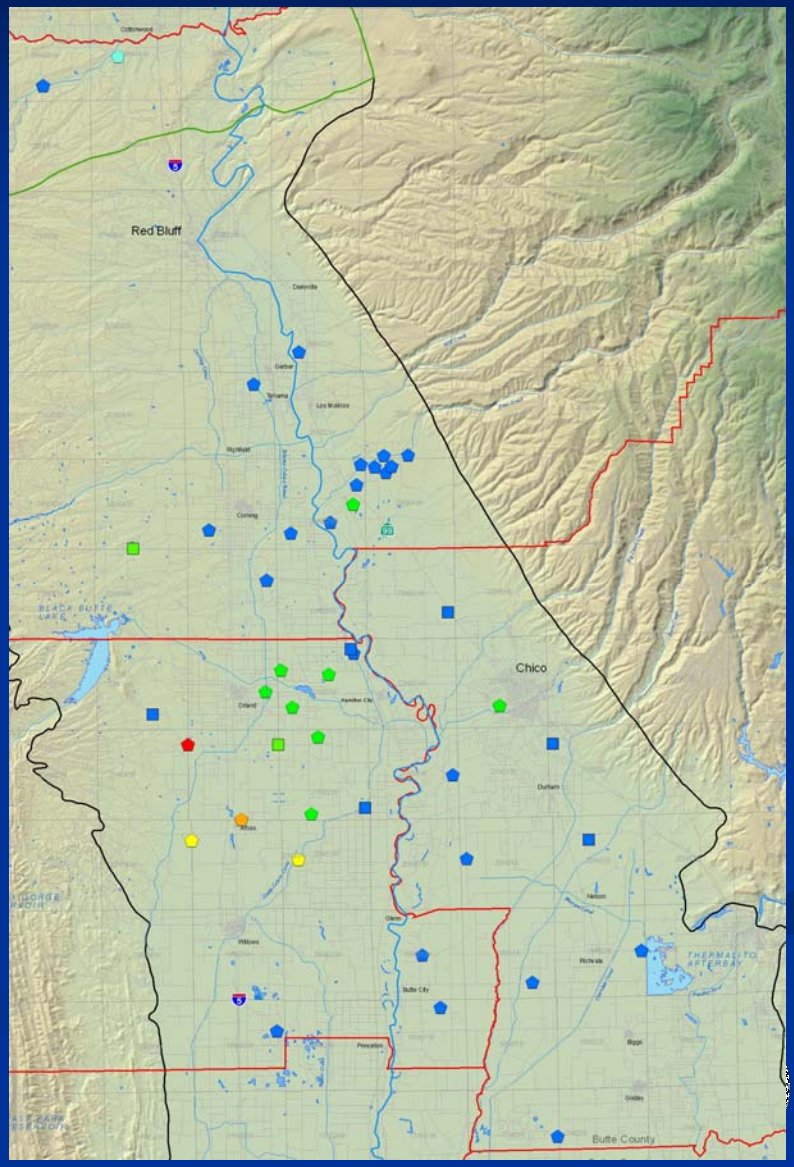
# GW Status Report
# Fall 2007 – Fall 2008 Change
# Wells: 200 – 600 ft



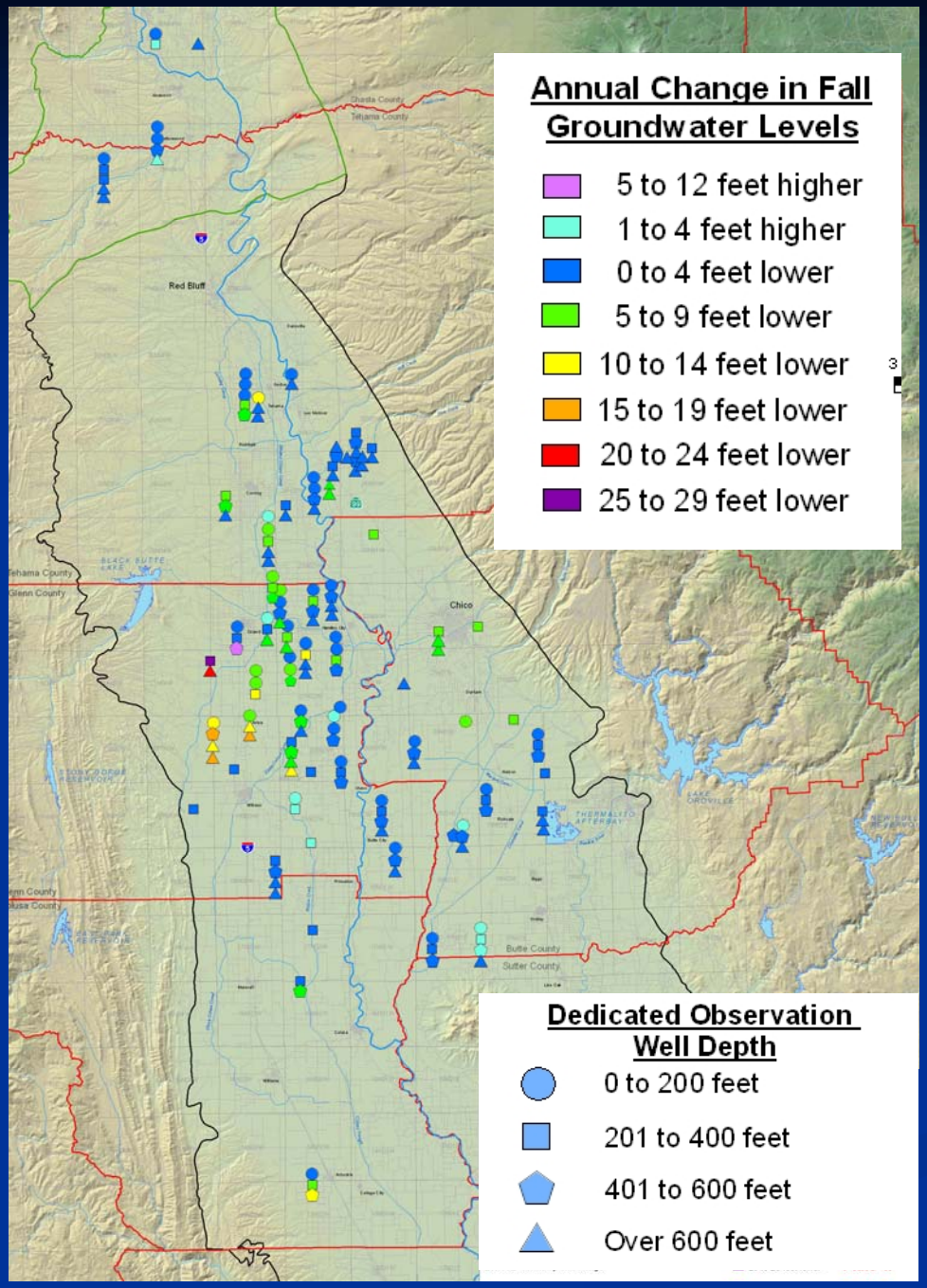



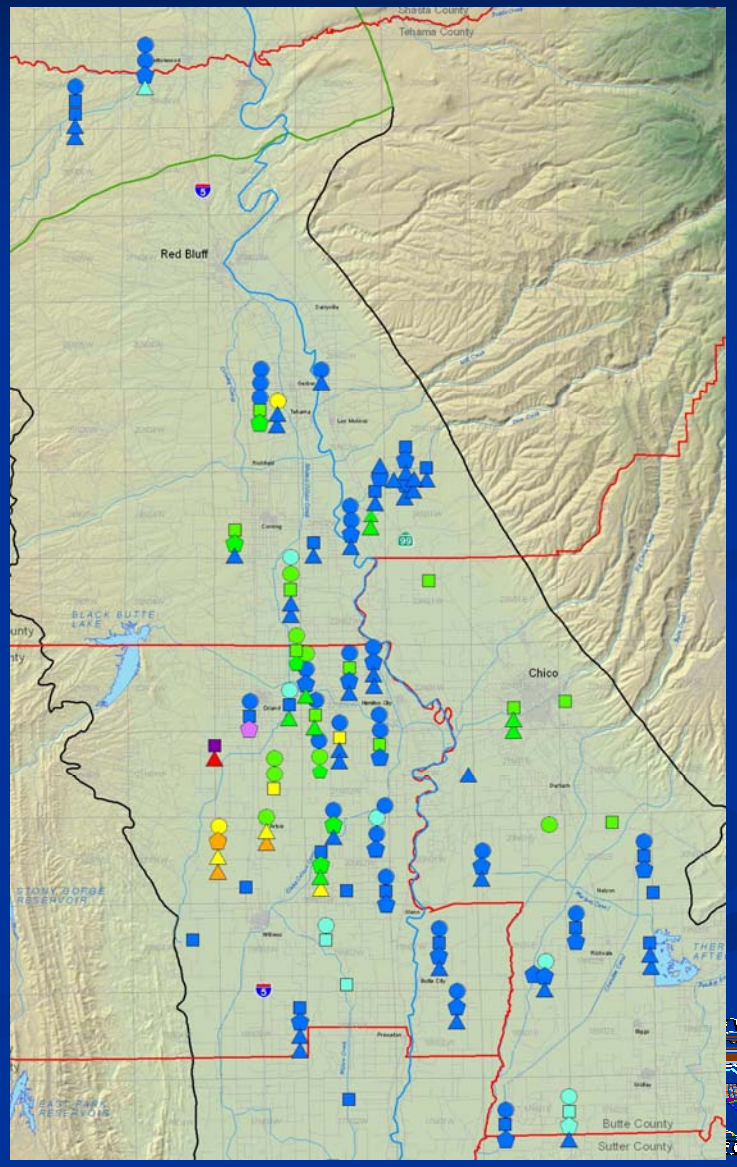
# GW Status Report
# Fall 2007 – Fall 2008 Change
# Wells: > 600 ft



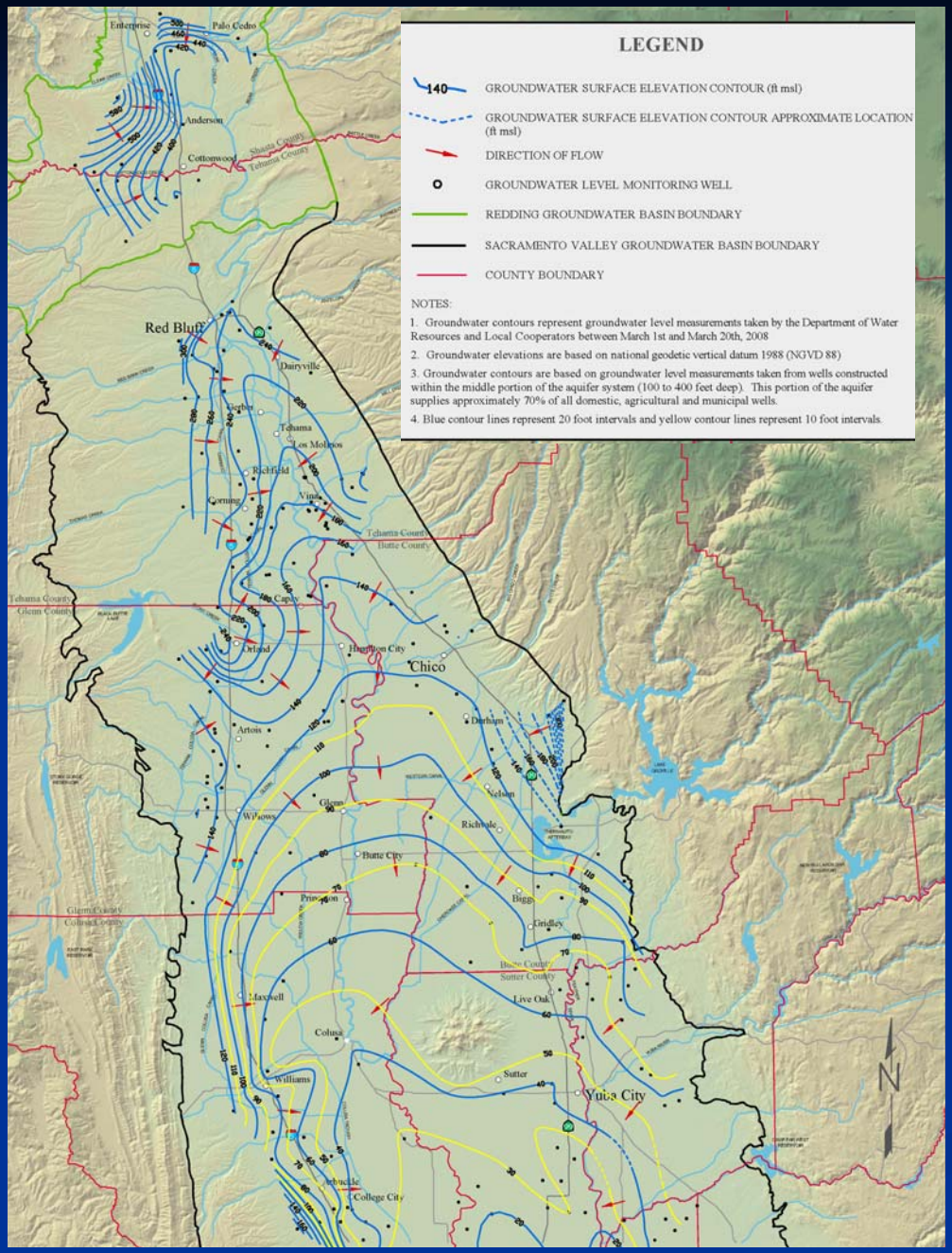



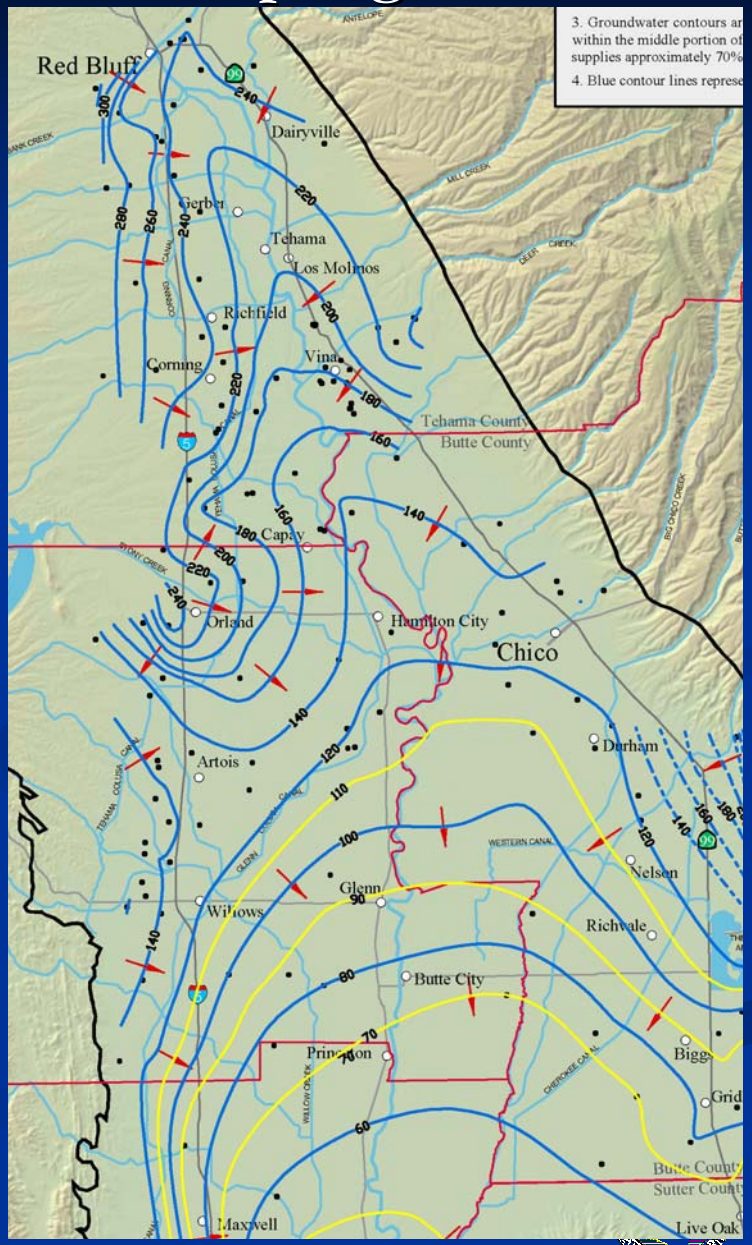
# GW Status Report
# Fall 2007 – Fall 2008 Change
# Multi-Completion Wells



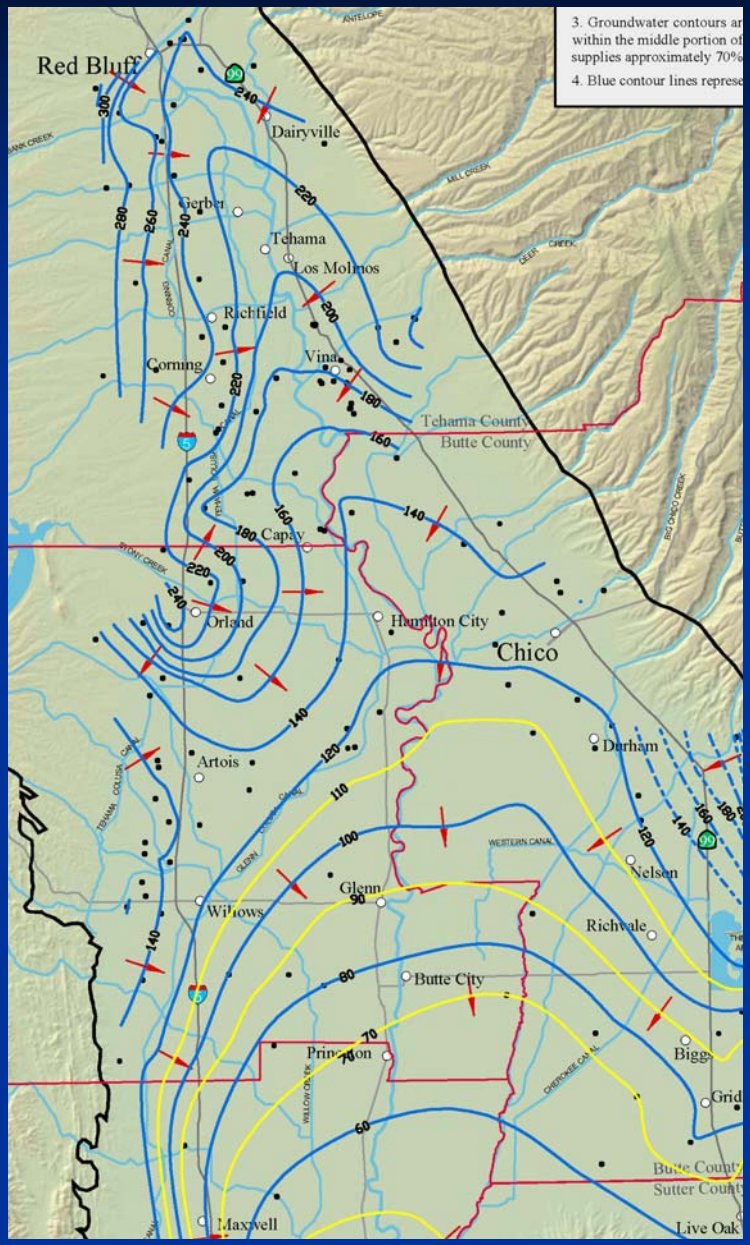
# Groundwater Contours Spring 2008



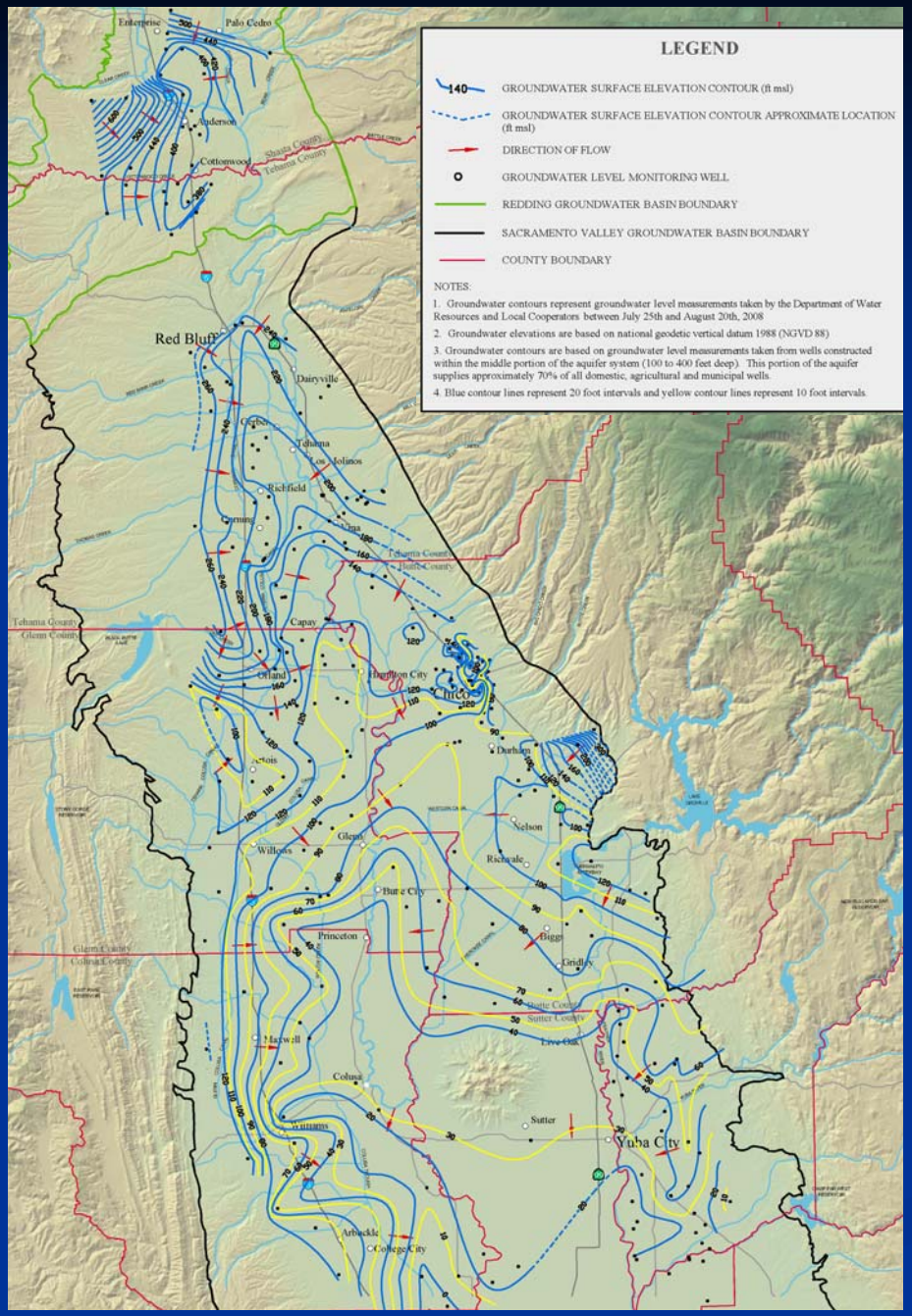



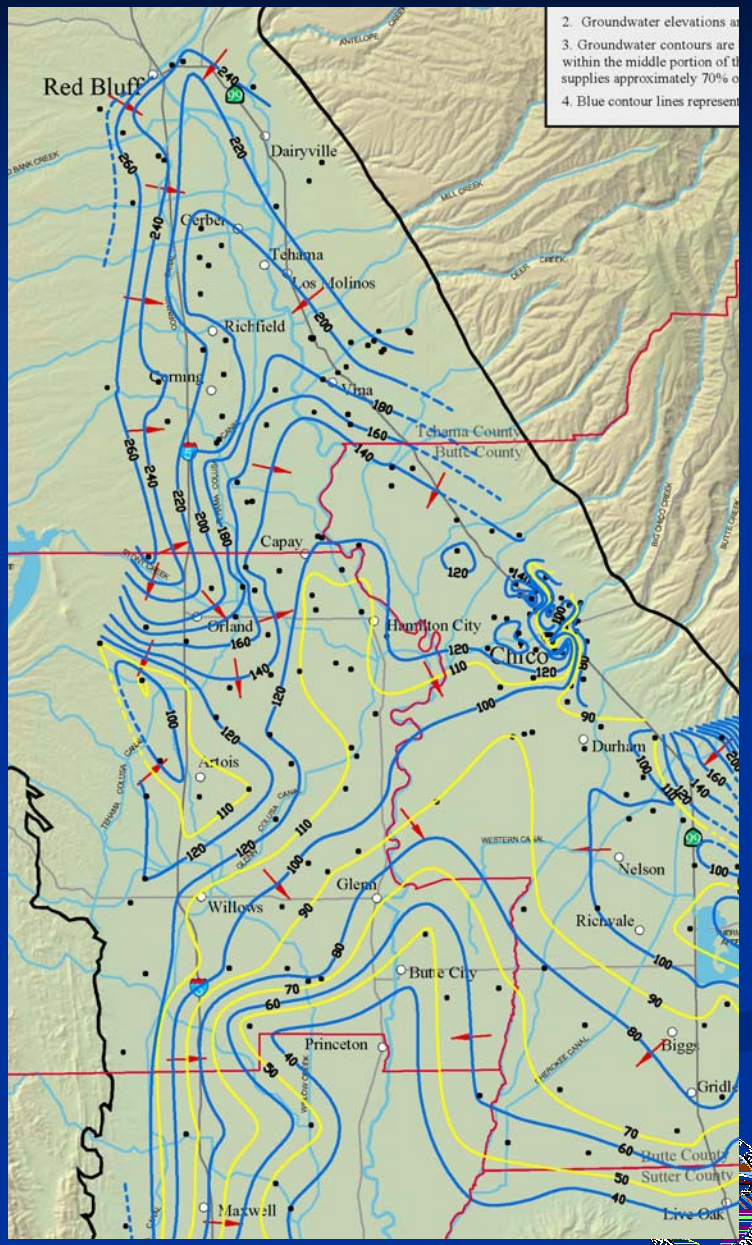

**Based on Wells Constructed with Top Perforation > 100 ft and <400 ft**

# GW Flow Direction



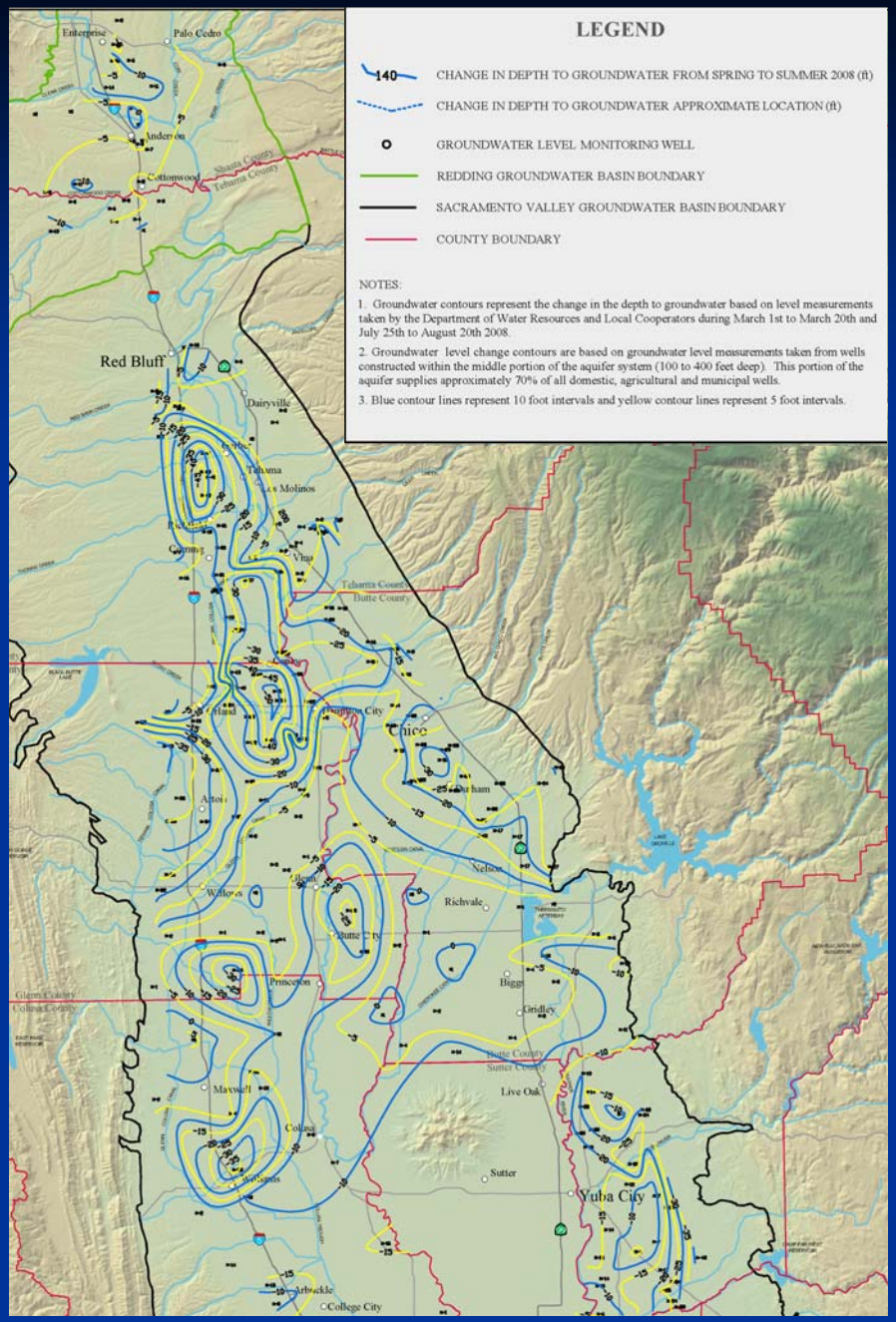

# Groundwater Contours
# Summer 2008

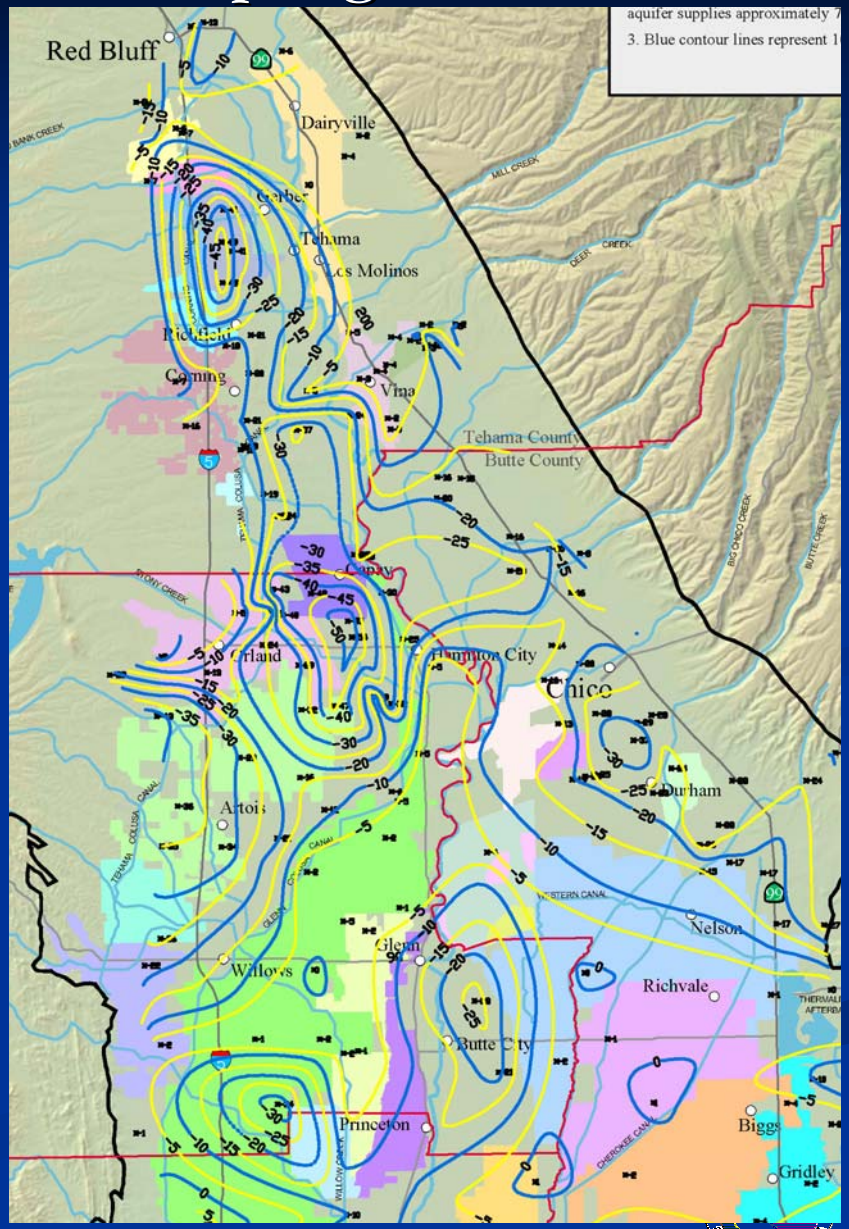



**Based on Wells Constructed with Top Perforation > 100 ft and <400 ft**

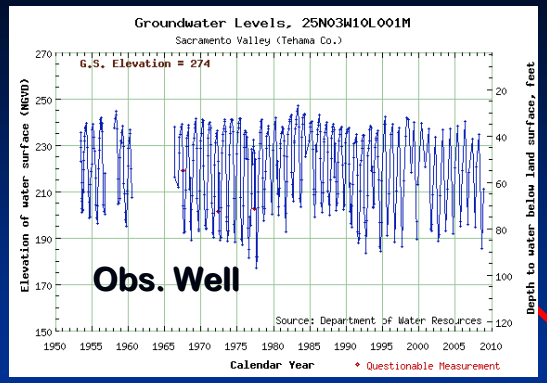
# Groundwater Contours
# Spring - Summer 2008

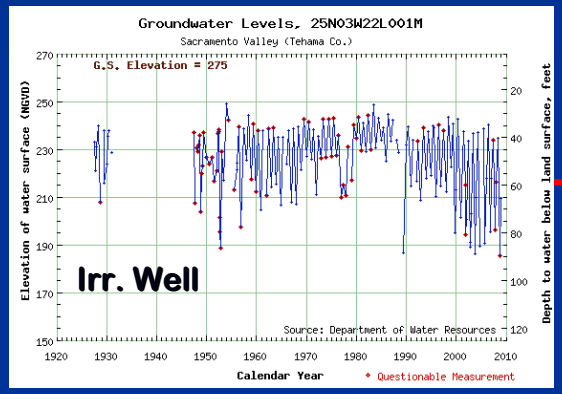


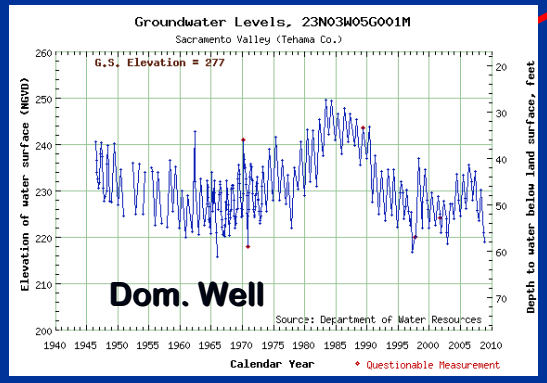



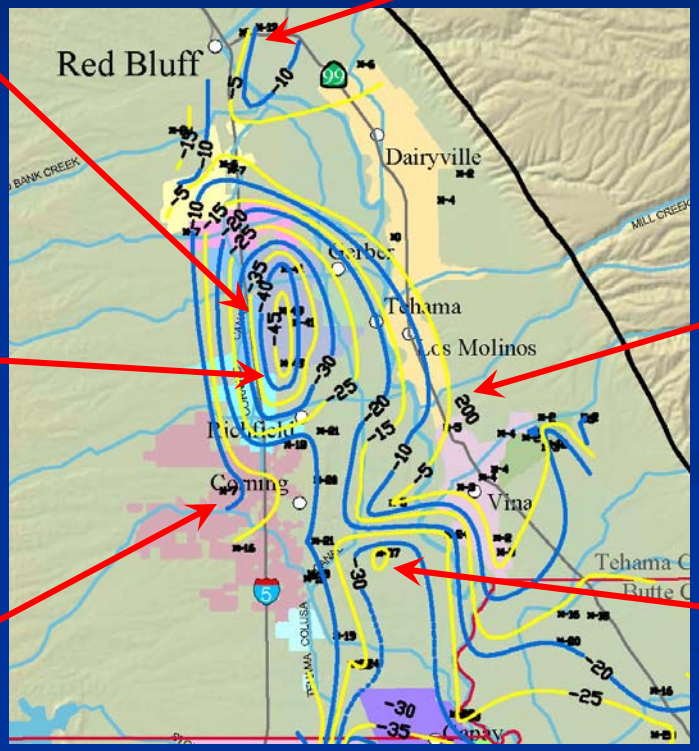

**Based on Wells Constructed with Top Perforation > 100 ft and <400 ft**

# Groundwater Level Trends

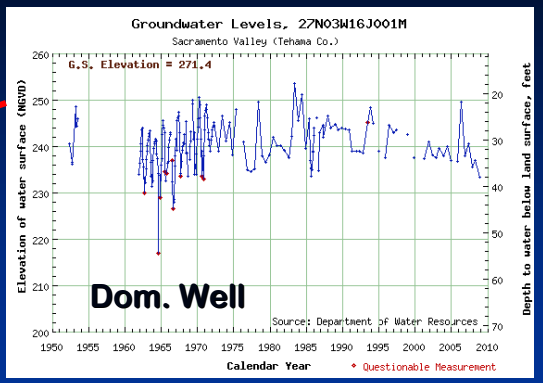


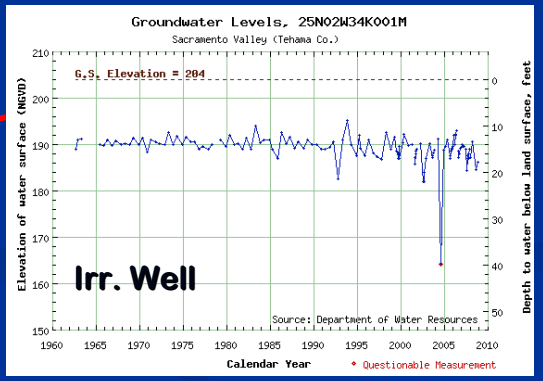



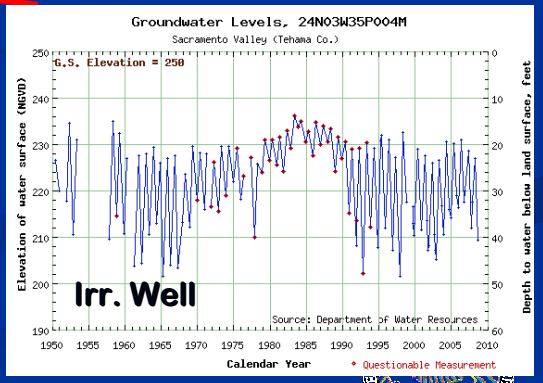



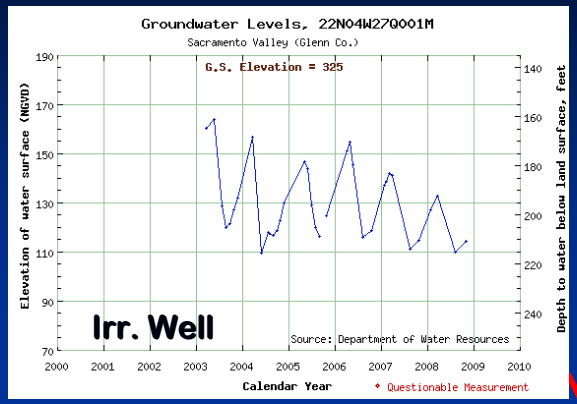

2008 Spring – Summer Change

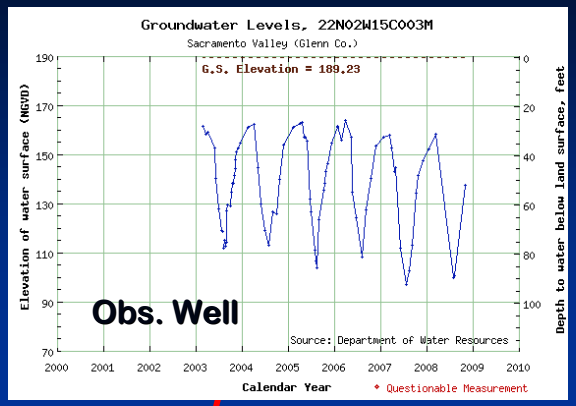


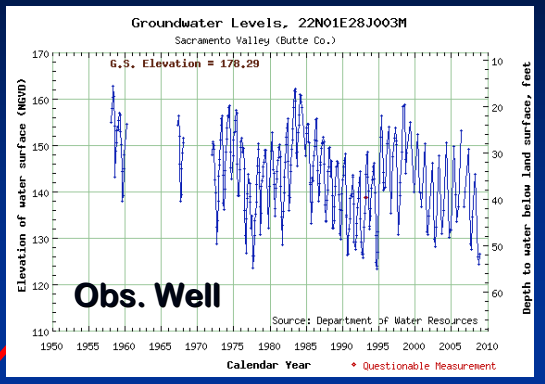



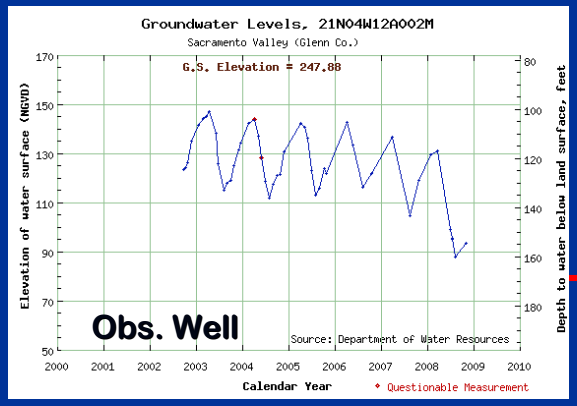



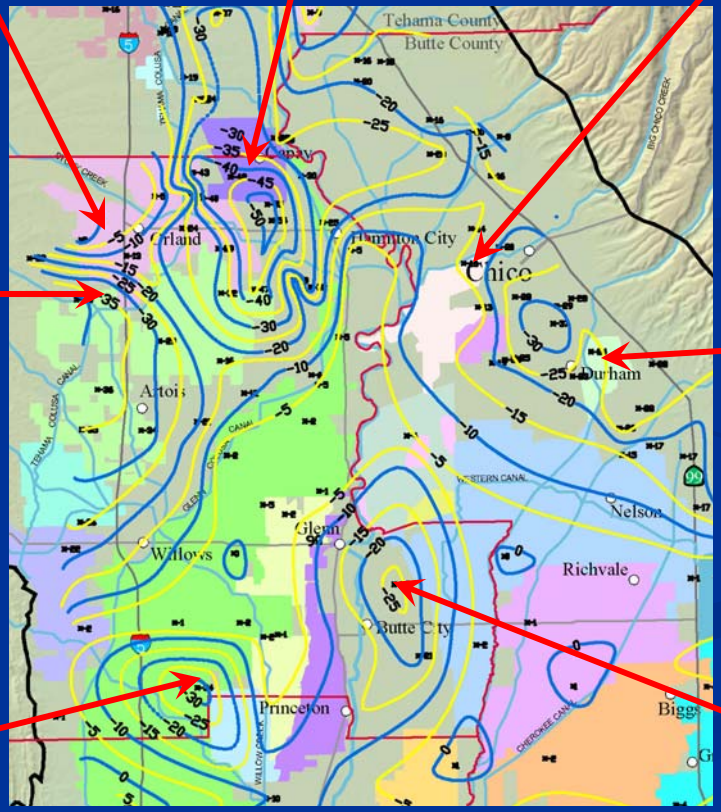
# Groundwater Level Trends

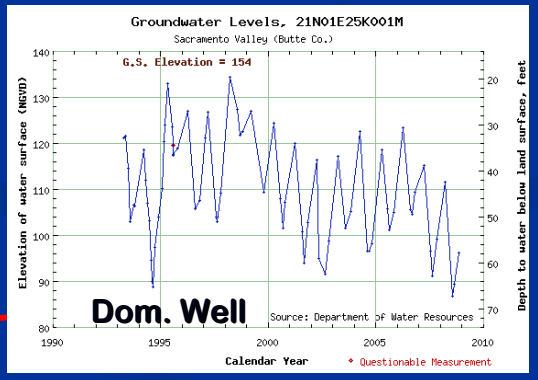


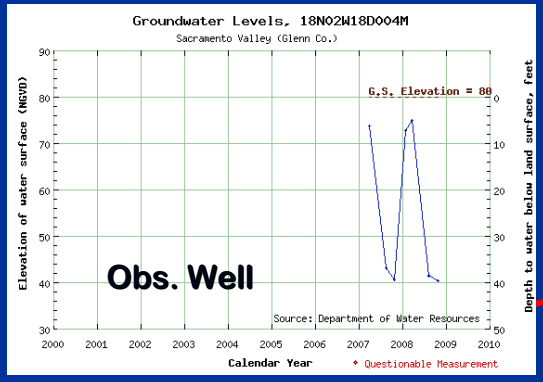



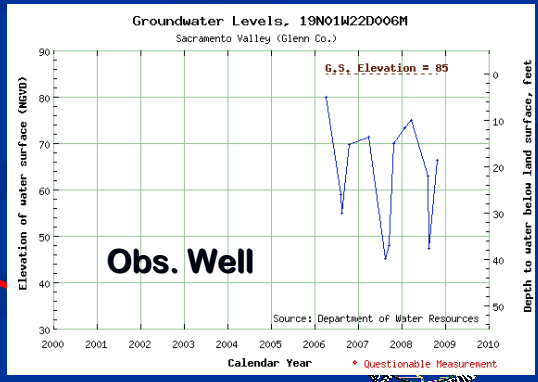



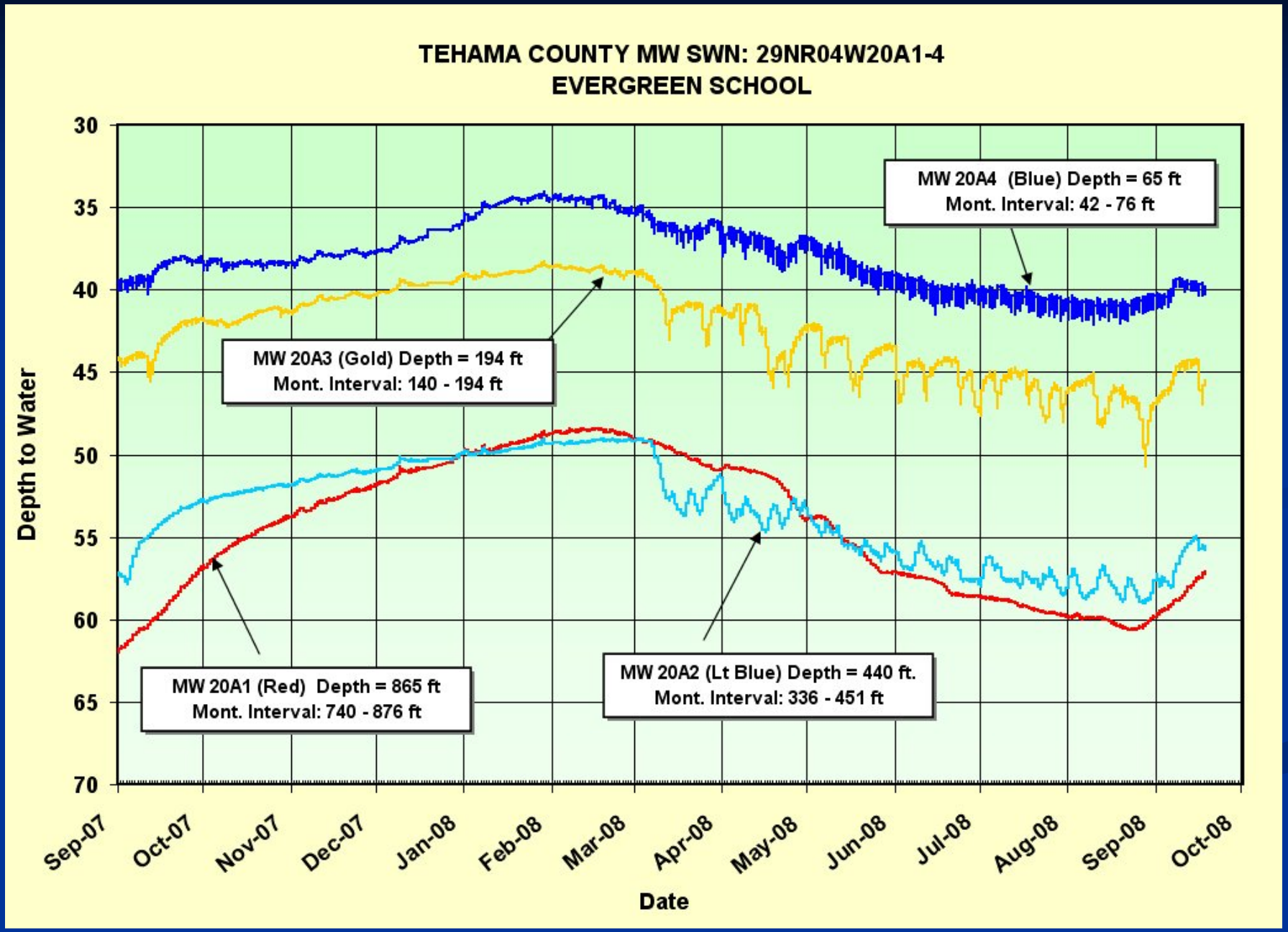



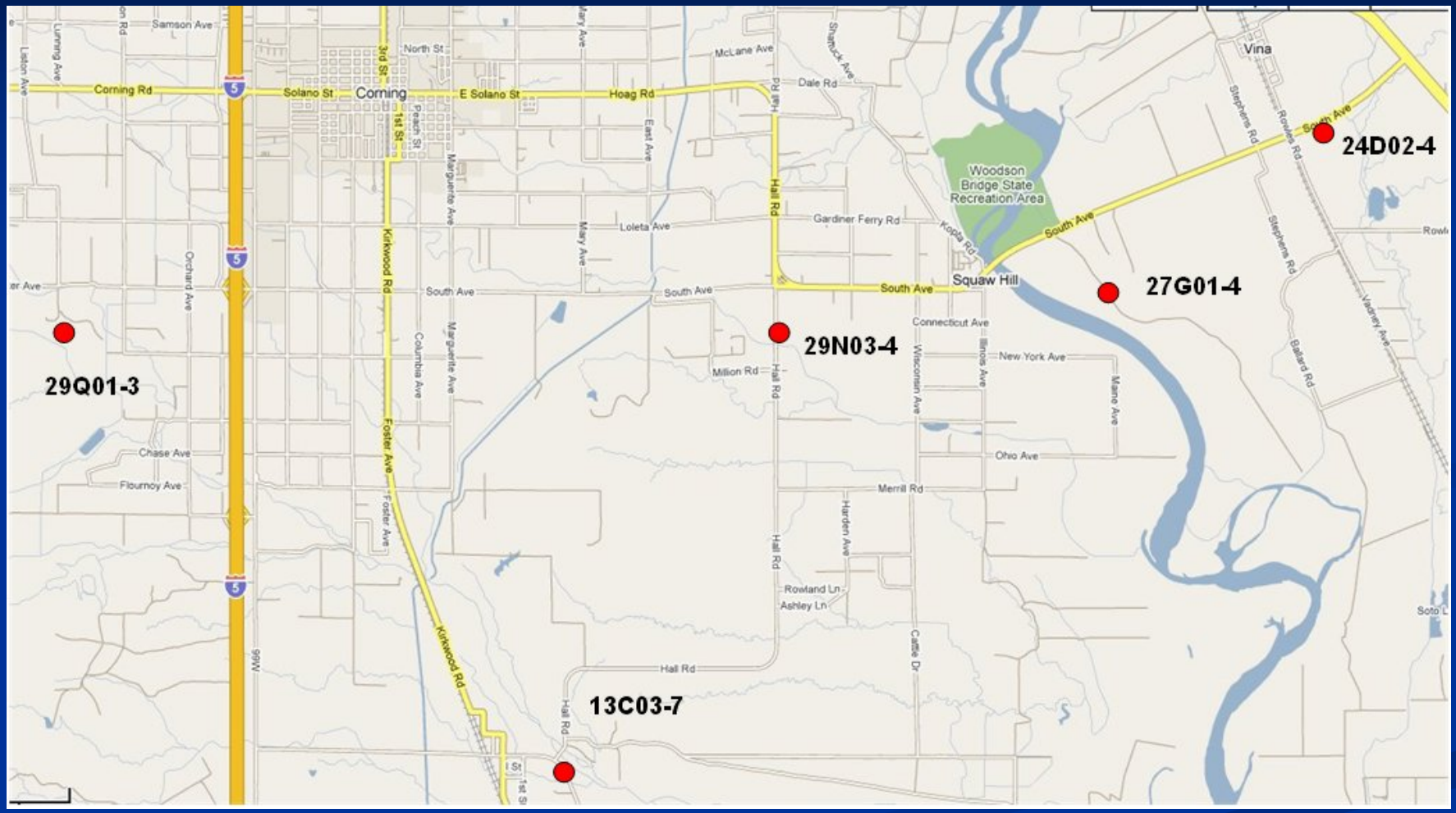




**2008 Spring – Summer Change**

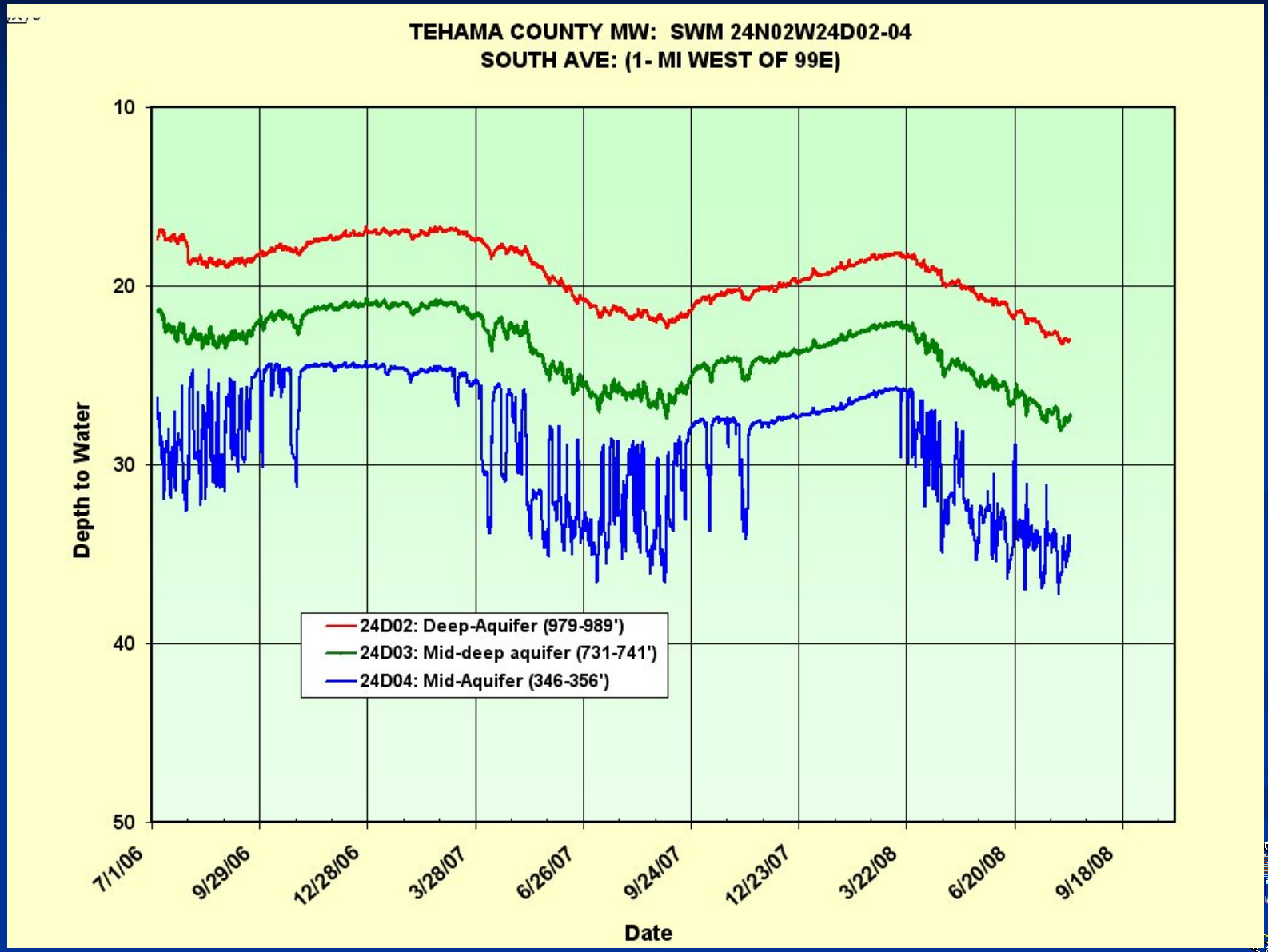
# GW Levels: Northern Tehama Co.



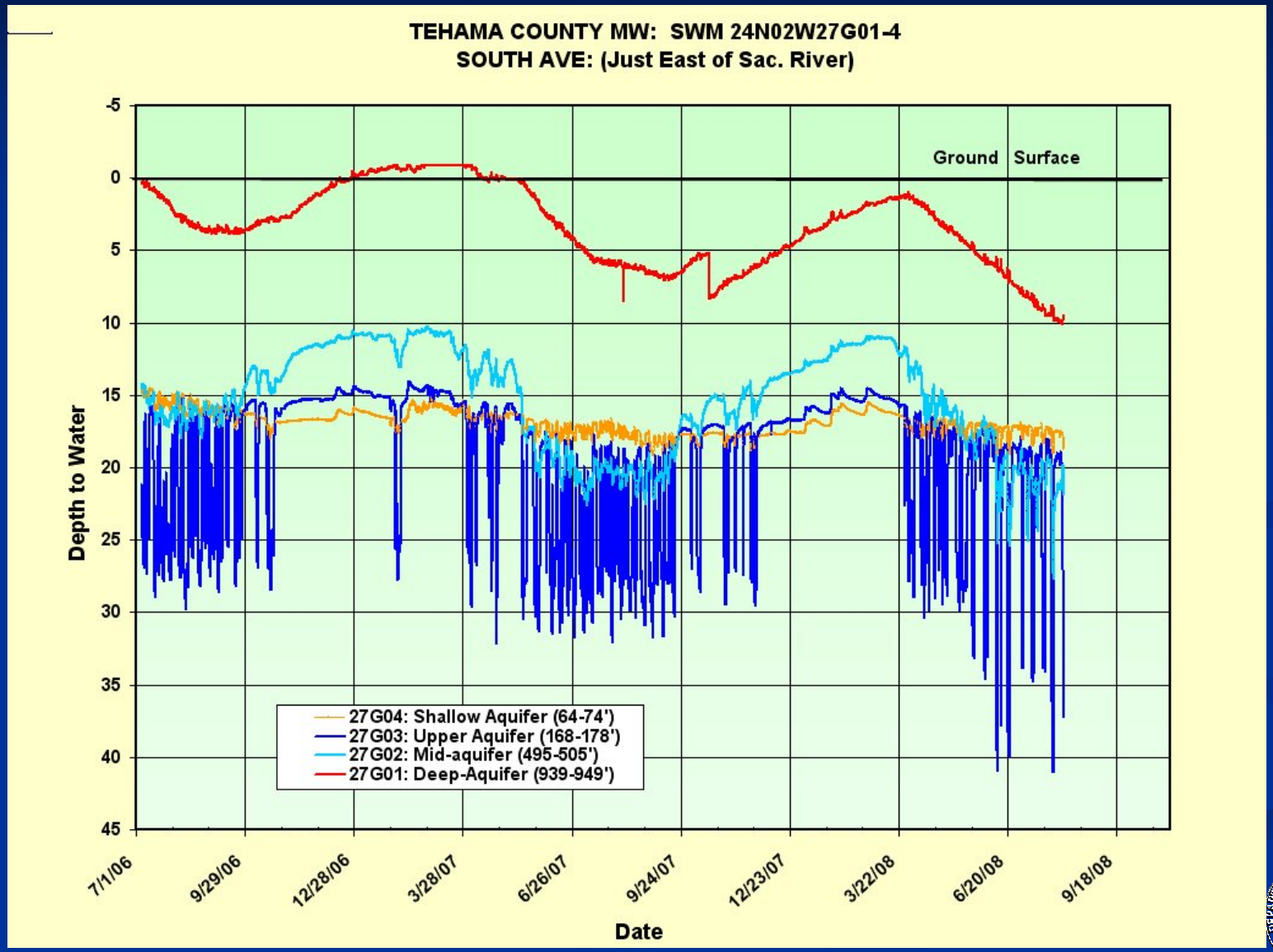
# GW Levels: Dedicated Mont. Wells



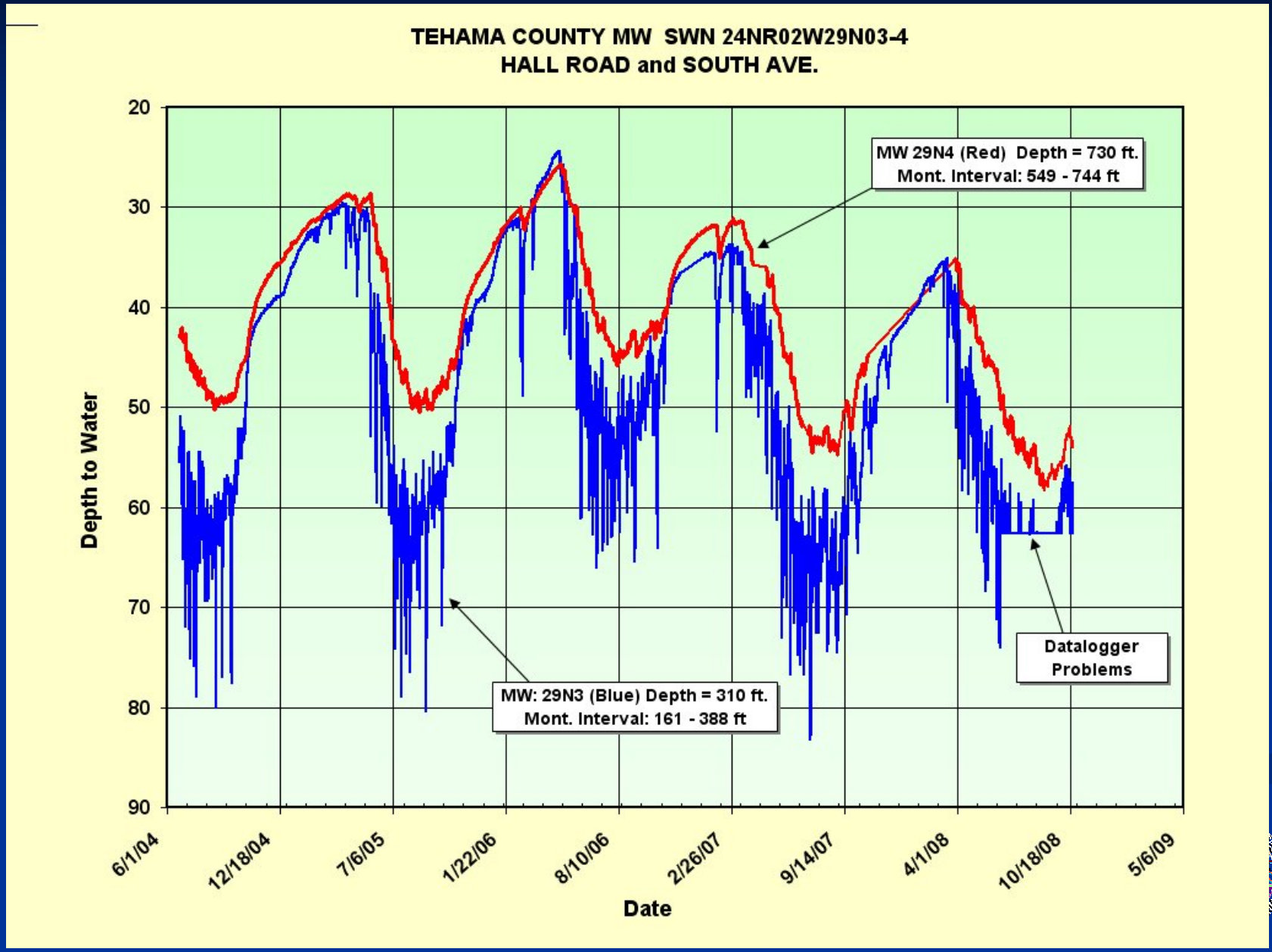
# Dedicated MW: South Ave. West of 99E



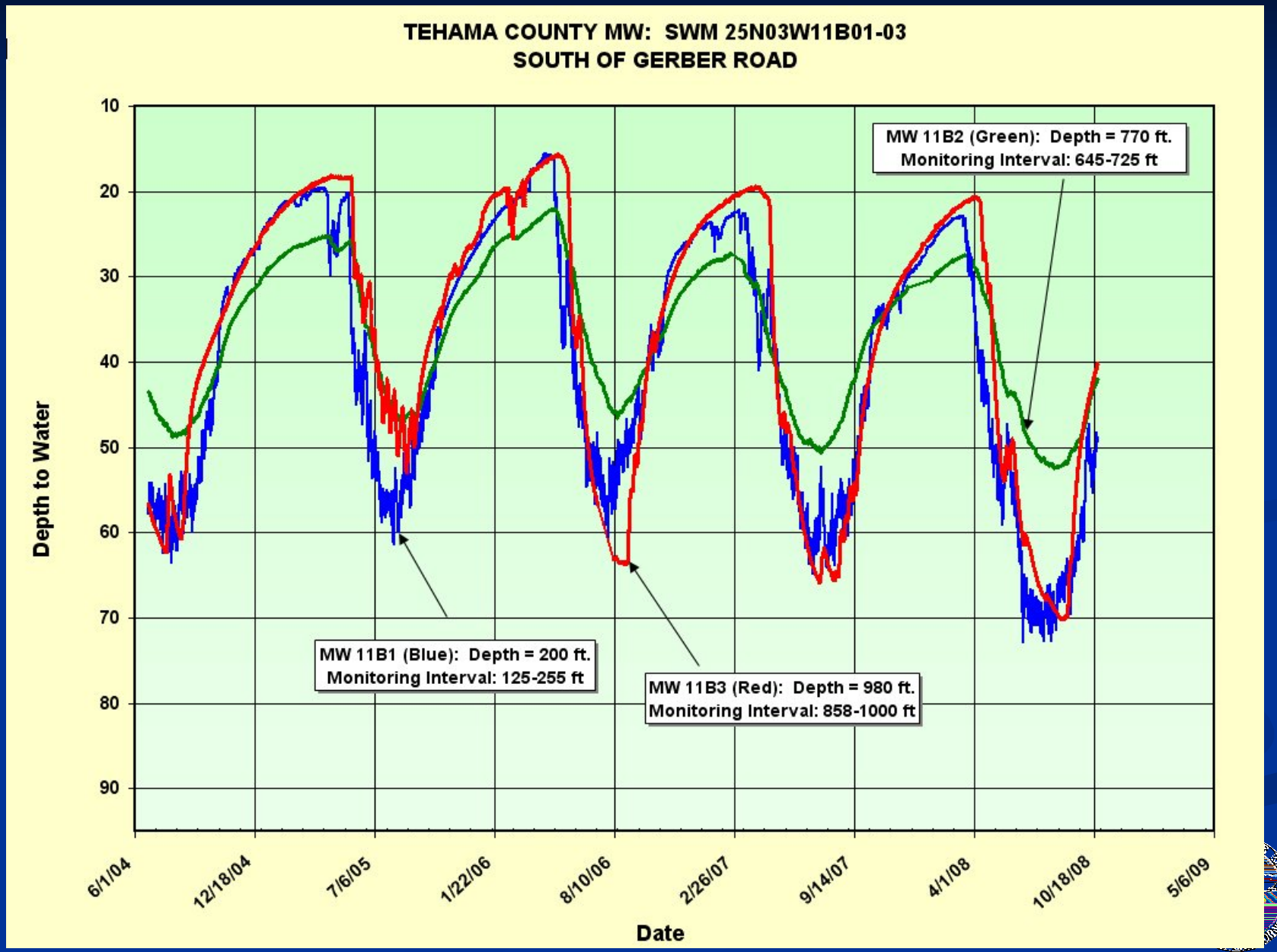
# Dedicated MW: South Ave. East of Sac Riv.



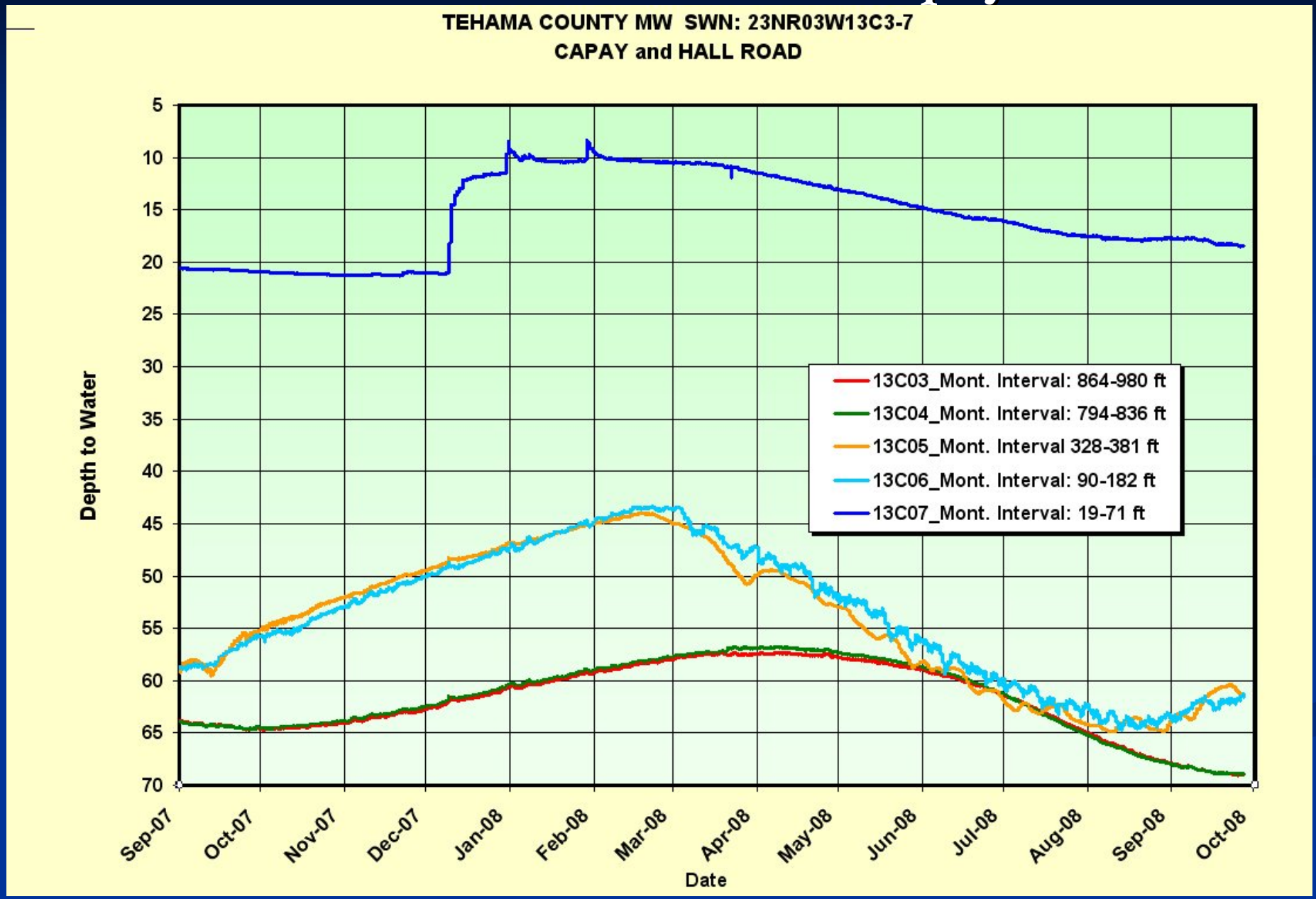
# Dedicated MW: Hall & South Ave



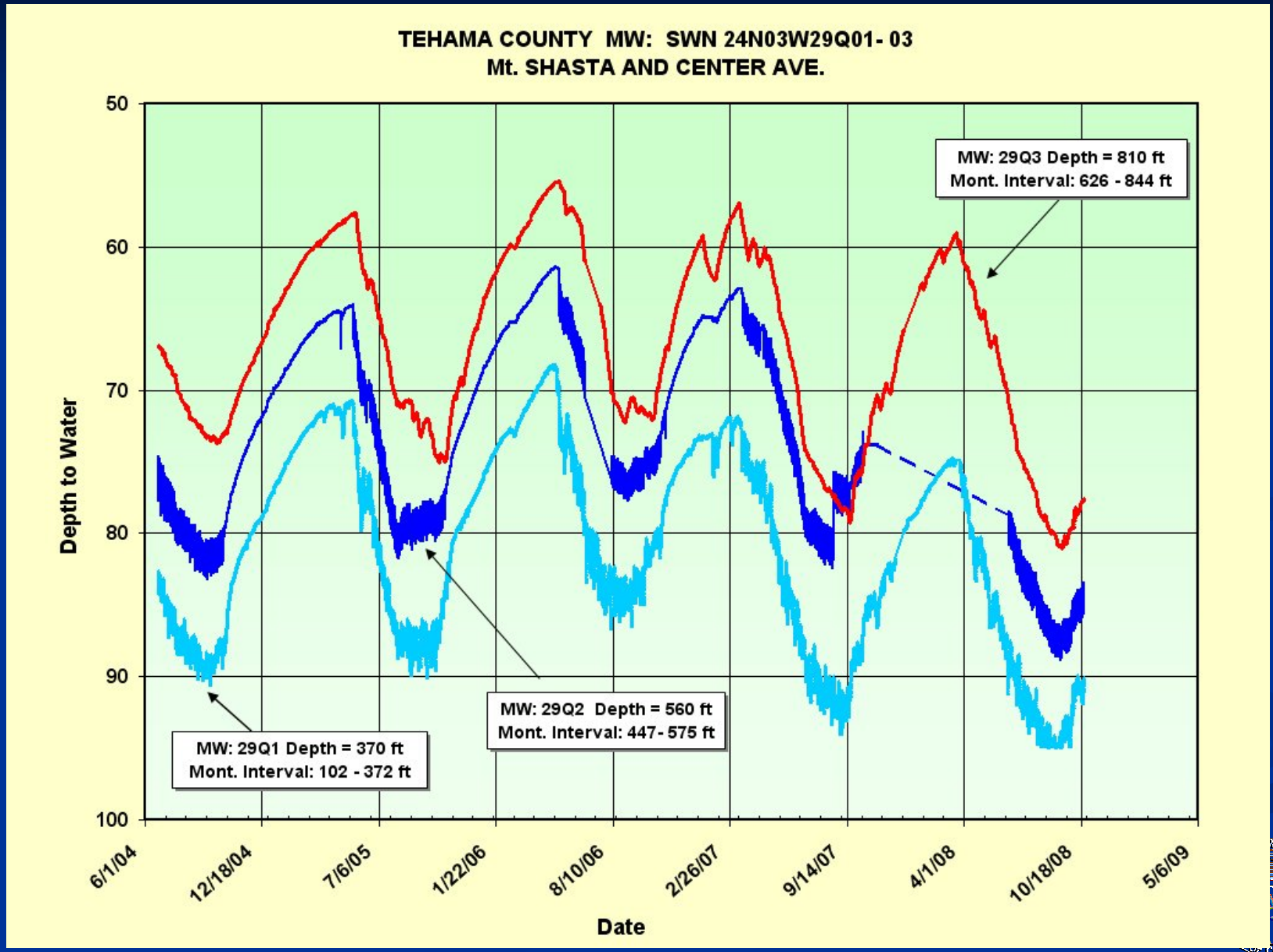
# Dedicated MW: South of Gerber Road



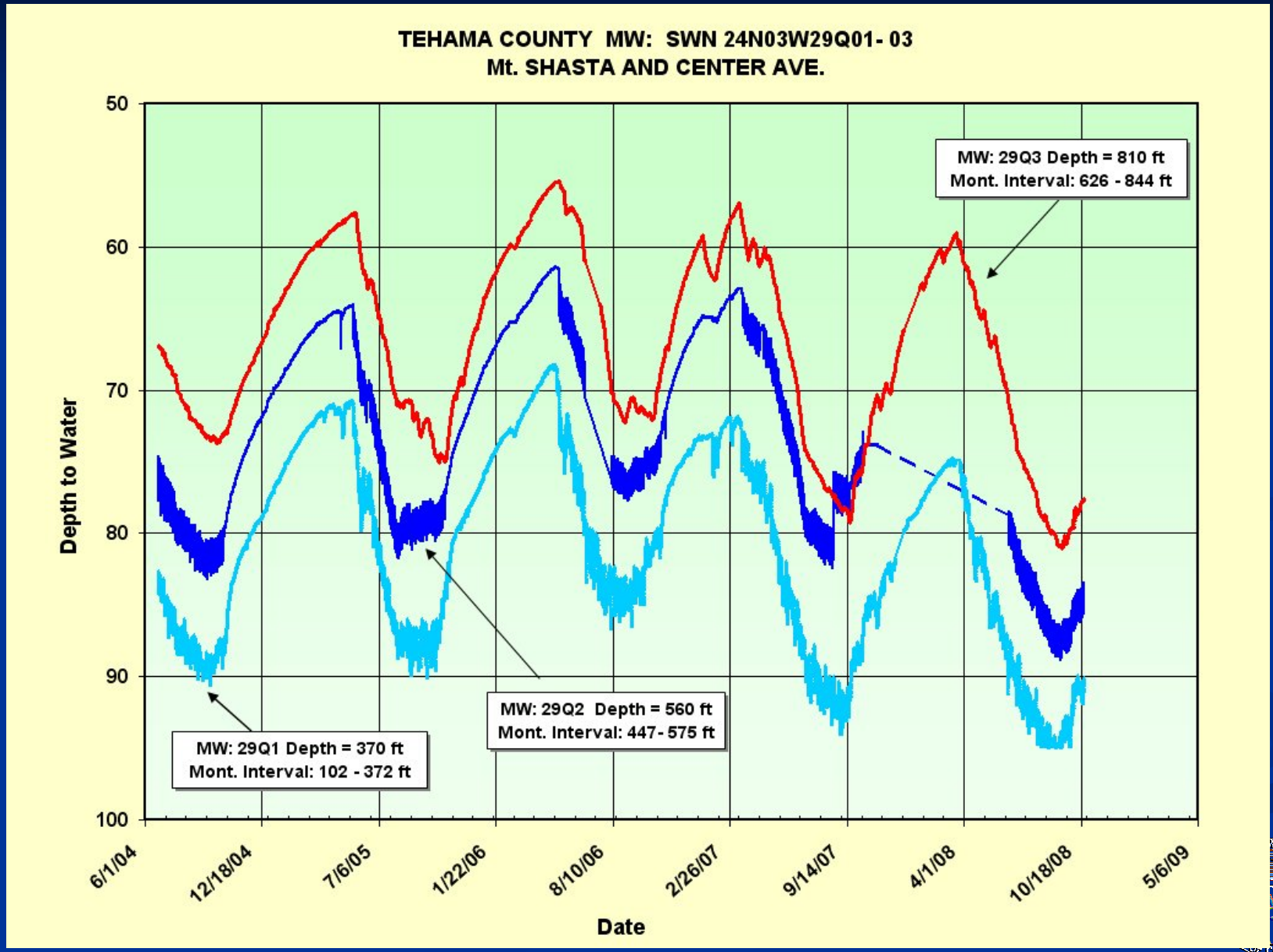
# Dedicated MW: Hall & Capay Rd



# Dedicated MW: East of Corning



# GW Levels: Dedicated Wells



# DWR Groundwater Level Data
# Water Data Library Website
# www.wdl.water.ca.gov

## Department of Water Resources
## Groundwater Data

**DWR Water Data Library:** Water Data Library (http://wdl.water.ca.gov/) provides on-line access to Groundwater, Surface Water, and Climatology Data collected by the DWR Division of Planning and Local Assistance, and local data cooperators.

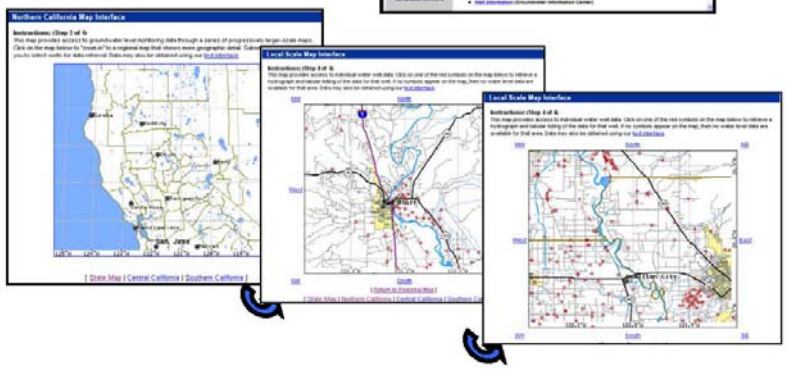
**Access to Groundwater Level Data:**

1. Use your internet browser to access the Water Data Library homepage at wdl.water.ca.gov, then click the "Groundwater Level Data" link.
2. Several options are available to access and download groundwater level data. The "Map Interface" provides an easy graphical interface to locate and view wells in your area. Click on "Map Interface" and a map of California will appear.
3. Click on the approximate location of your well and the map will "zoom-in". Continue to click and zoom-in until you can see to the red circles. The red circles represent wells that are being monitored. Once the red circles, or wells, are shown, the map can be shifted by using the directional links in the map corners, but no additional zooming is available.

1. Water Data Library Home Page

2. Data Retrieval Options

3. Using the Map Interface



**DWR Groundwater Data (continued)**

4. Clicking on the well symbol will display the hydrograph and data for the well and provide several options for downloading the data. The note at the top of the hydrograph provides additional links to information regarding the State *Well Numbering System*, *measurement codes*, and *abbreviations*.

4. Groundwater Hydrograph, Data Table, and informational notes.

**Groundwater Level Data, 24N03W01B001M**

Your selection returned a total of 85 records. Wells in the Department of Water Resources monitoring network are identified by a State Well Number, which is based on the Public Land Grid System. The table headings and records contain several codes and abbreviations. Press the ***New Search*** or ***Nearby Search*** buttons or at the bottom of the page to begin a new data retrieval. Data for this well can also be downloaded in MS Excel or text delimited format.

**DWR Groundwater Information Center:** The DWR Groundwater Information Center (http://www.groundwater.water.ca.gov/) provides on-line access to a variety of groundwater information such as fact sheets, laws & legislation, management and groundwater-related publications.

**DWR Groundwater Contour Maps:** The DWR Sacramento Valley Contour Map link (http://www.nd.water.ca.gov/PPAs/GroundwaterBasins/GroundwaterLevel/SacValGWContours/) provides access to groundwater contour and change maps for the Sacramento Valley, CA

DWR Groundwater Informational Center

**DWR Northern District Contacts:** Additional groundwater information can be obtained by visiting DWR's Northern District website at http://www.nd.water.ca.gov/index.cfm, or by contacting the Northern District Groundwater Section.

Dan McManus
Senior Engineering Geologist,
Groundwater Section
2440 Main Street
Red Bluff, CA 96080
(530) 529-7373
mcmanus@water.ca.gov

DWR Northern District Homepage

**Tehama County Flood Control and Water Conservation District Homepage:** Provides information regarding education, well monitoring, grants, regional management

**Butte County Water & Resource Homepage & Basin Management Objectives Information Center:**
http://www.buttecounty.net/WATERANDRESOURCE/
http://gis.buttecounty.net/bmoic/
Provides information regarding education, well monitoring, grants, regional management issues, etc.

# Questions