

DWR Water Data Library

<http://www.water.ca.gov/waterdatalibrary/>

Bruce Agee

Office of Water Quality

Division of Environmental Services

Eric Senter, Greg Smith

Statewide Data Program

Division of Statewide Integrated Water Management

DWR Water Data Library Overview

www.water.ca.gov/waterdatalibrary

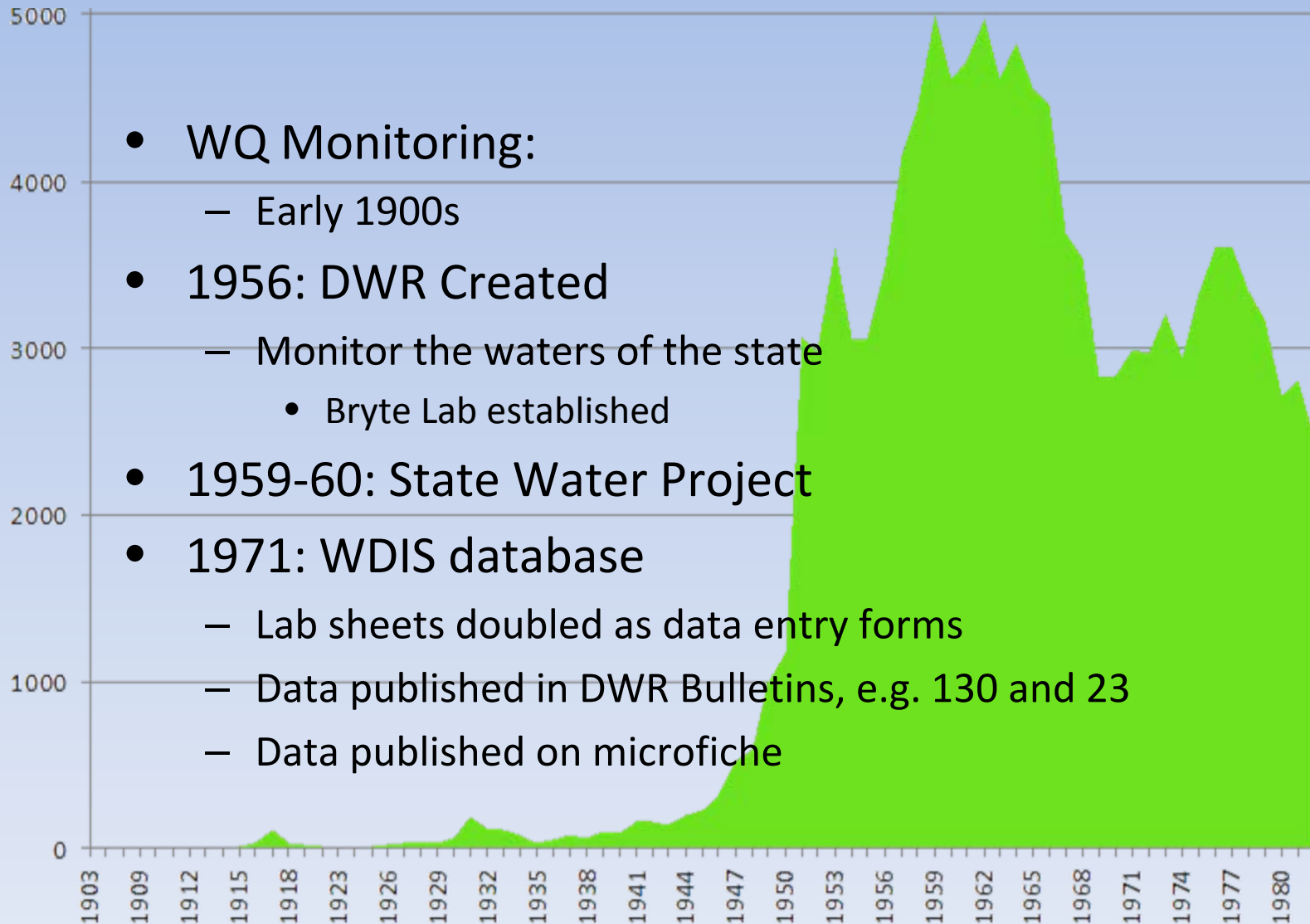
- Continuous Monitoring of physical measures (Corrected Data)

- Groundwater Levels

- Grab Sample Water Quality

The screenshot shows the DWR Water Data Library website. At the top is the CA.GOV logo and the text 'DEPARTMENT OF WATER RESOURCES'. Below this is a navigation bar with links: Home, Newsroom, Flood & Safety, Planning, State Water Project, Funding, Environment, Supply & Use, and Data. Underneath is a secondary navigation bar with links: CDEC, CIMIS, WDL, IEP, WRIS, and All Data Topics... On the left side, there is a sidebar menu with the following sections: 'Water Data Library Home' (with sub-links for Groundwater Level Data, Water Quality Data, Continuous Data, and Contact Information), 'DWR CLIENTS ONLY' (with sub-links for Admin Login, Climate Data (Beta 1.1), and Climate Data (Access Prototype)), 'DWR Documents' (with sub-links for Data Collection in DPLA, Data Coordination Project Charter, Groundwater Strategic Plan, Surface Water Strategic Plan, Water Quality User's Manual, Well Data Strategic Plan, WDL Strategic Plan, and Water PIE Strategic Plan), and 'Hydstra Documents' (with sub-links for Hydstra Procedures, Hydstra Tracking Reports, and Hydstra Use Summary Reports). The main content area is titled 'Water Data Library' and contains a text block explaining how to use the map to locate monitoring stations. Below the text is a 'WDL STATION MAP' section. This section includes a 'Location Search' box with a search button, a 'Site Type' selection area with checkboxes for Groundwater Level, Water Quality, and Continuous Data, and a 'Refresh Map' button. The map itself shows a geographical view of California with various monitoring stations marked by colored dots. A legend at the bottom left of the map explains the symbols: a purple dot for 'Multi-parameter site', a red dot for 'Cluster, showing number of stations', a blue square for 'Groundwater Level', a red square for 'Water Quality', and a green square for 'Continuous Data'. At the bottom of the map, there is a coordinate display: 'Map Center: 38.550000, -121.750000', 'Map SW: 37.679473, -123.403931', 'Mouse LatLon: 37.548933, -120.124512', and 'Mouse Px: 10900, 25383'. The map is powered by Google and includes a scale bar for 20 miles and 50 kilometers.

DWR Water Data Library History



DWR Water Data Library History

- Late 1970's: Decline Cyber Mainframe
 - WDIS shortcomings (flat file limitations)
- Early 1980's: DWR Programs began to abandon WDIS
- Late 1980's: District grass-root efforts to save and unify well and continuous monitoring data. (Eric Senter among them).
- Early 1990's: Concept of Bryte Lab LIMS + WDIS replacement. Bruce Agee (MWQI)

DWR Water Data Library History

- 1998 Field and Laboratory Information Management System (FLIMS) Online
 - Collection to publication on WDL: 1 to 4 weeks
- 1999 Work on WDL began in cooperation with Chico State University
- WDL Online 2002

WDL Features

- **Permanent Storage of DWR Data**
 - Focused on DWR
 - Historic data
- **Station Definitions compatible with GIS**
 - Multiple Station Numbers Accommodated
- **Data searchable by a variety of methods**
 - Map, Location Name, Station Name or Number, Named Station Group, User Project
- **Owner-editable data**
 - Updates instantly 'published'
 - Bryte Lab updates lab results
- **Capability of serving data to other data publishers**
 - DWR Program-specific websites
 - Others?

WDL Features – WQ Module

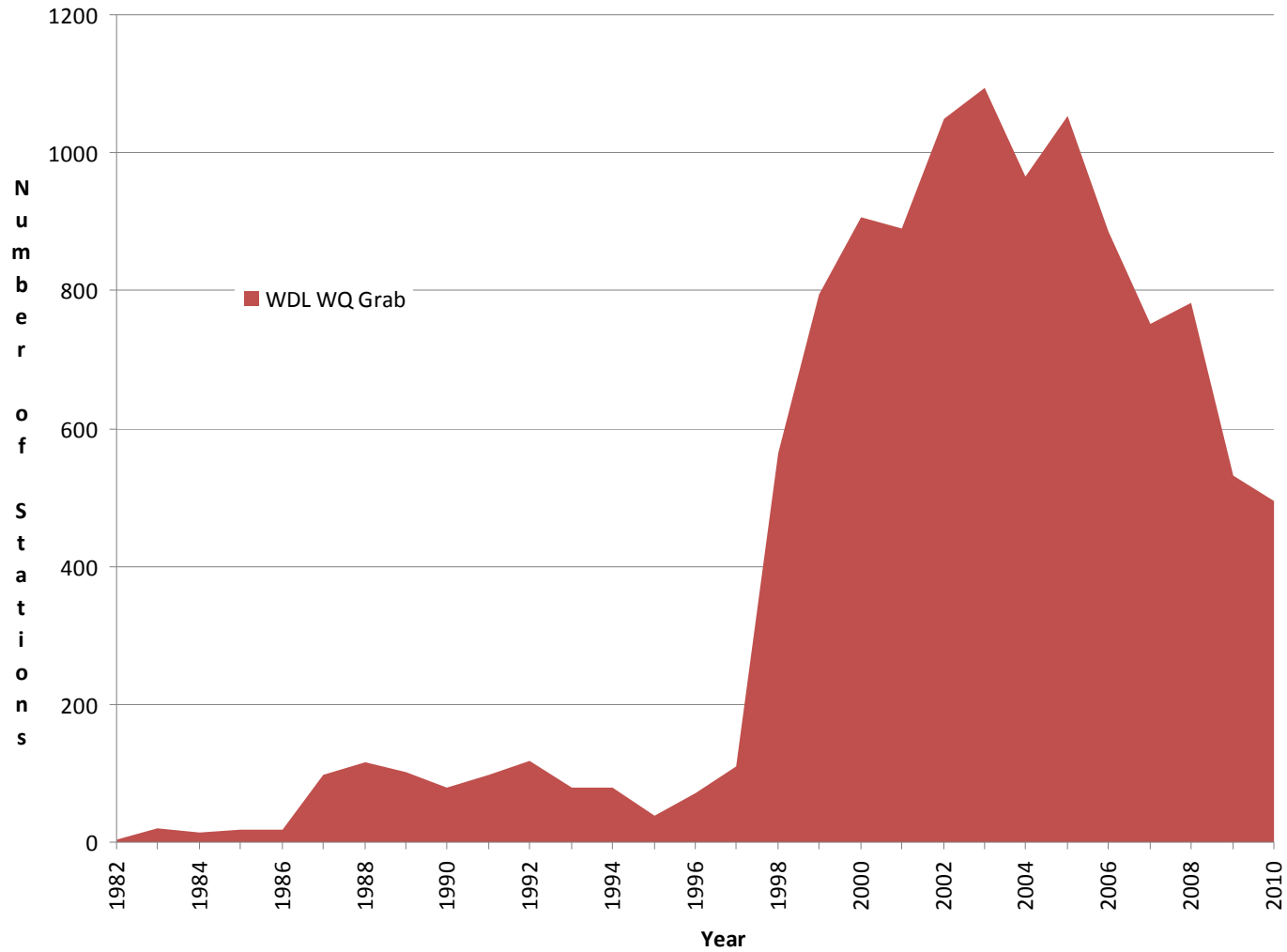
- **Integrated w/FLIMS**
- **Defined data ownership and control**
- **Respect for Security Issues**
 - Status Codes, Station Type
- **Embeds as much descriptive data as possible**
- **Meets DWR requirements for QC Documentation**
- **User Project Tags**
- **Data Comparability Guide**

Data Collection Efforts

WQ Grab Samples

- **28 activity units throughout DWR**
 - 4 Regional Offices: Northern, North Central, South Central, Southern
 - O&M (State Water Project): HQ, OFD, DFD, SLFD, SJFD, SFD
 - DES: MWQI, Compliance Monitoring, Suisun Marsh, Real-Time monitoring, Special Projects ...
 - Division of Engineering, Flood Management

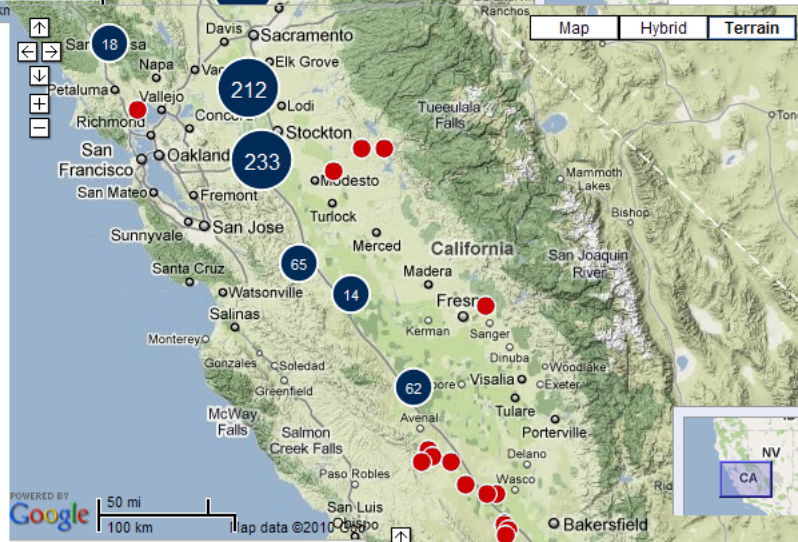
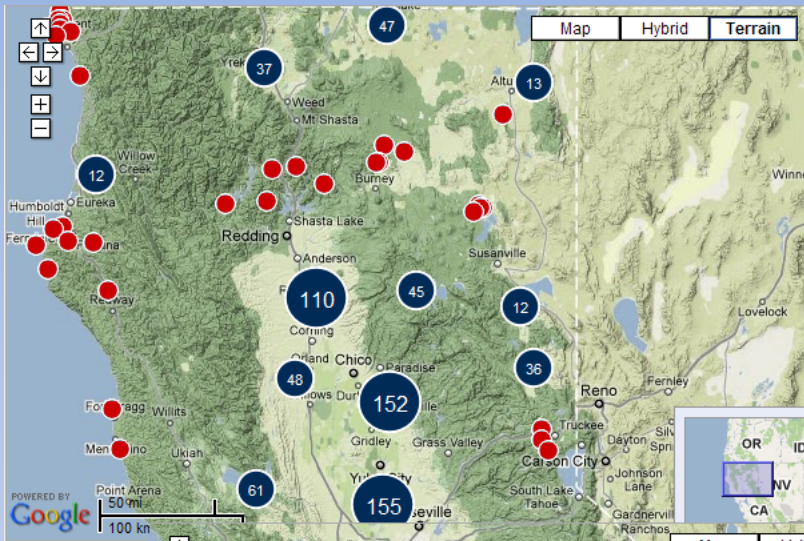
WDL Grab WQ Stations Monitored by Year



Data Availability

Grab Sample Water Quality

- **Public Access**
 - representative of the location
 - station ‘completeness’ requirements
 - Privacy or security limitations for certain stations
 - Data must be ‘published’ by owners
 - Special requests honored
- **QC Data not directly available at this time**



Data Formats

- Available formats: HTML, Excel Spreadsheet, or Text (e.g. comma-delimited)

Station Name: Sacramento River at W. Sac Intake Structure			Station Number: A0210451	
Collection Date: 02/01/2010 10:30			Sample Code: CC0210B0107	
Depth: 1 Meters Matrix: Water, Natural		Purpose: Normal Sample Sample Parent: 0		
Description:				
Analyte	Result	Rpt Limit	Units	Method [1]
Total Alkalinity	64	1	mg/L as CaCO3	Std Method 2320 B [1]
Dissolved Ammonia	0.01	0.01	mg/L as N	EPA 350.1 [1]
Dissolved Boron	0.1	0.1	mg/L	EPA 200.7 (D) [1]
Dissolved Bromide	0.06	0.01	mg/L	EPA 300.0 28d Hold [1]
Dissolved Calcium	14	1	mg/L	EPA 200.7 (D) [1]
Dissolved Chloride	8	1	mg/L	EPA 300.0 28d Hold [1]
Conductance (EC)	176	1	µS/cm	Std Method 2510-B [1]
Dissolved Hardness	68	1	mg/L as CaCO3	Std Method 2340 B [1]
Total Kjeldahl Nitrogen	0.5	0.1	mg/L as N	EPA 351.2 [1]
Dissolved Magnesium	8	1	mg/L	EPA 200.7 (D) [1]
Dissolved Nitrate	1.3	0.1	mg/L	EPA 300.0 28d Hold [1]
Dissolved Nitrate + Nitrite	0.25	0.01	mg/L as N	Std Method 4500-NO3-F (28Day) [1]
Total Organic Carbon	4.2	0.5	mg/L as C	EPA 415.1 (T) Ox [PS-3]
Dissolved Organic Carbon	3.4	0.5	mg/L as C	EPA 415.1 (D) Ox [PS-3]
Dissolved Ortho-phosphate	0.03	0.01	mg/L as P	EPA 365.1 (DWR Modified) [1]
Total Phosphorus	0.1	0.01	mg/L	EPA 365.4 [1]
Dissolved Potassium	1.3	0.5	mg/L	EPA 200.7 (D) [1]
Dissolved Sodium	11	1	mg/L	EPA 200.7 (D) [1]
Total Dissolved Solids	114	1	mg/L	Std Method 2540 C [1]
Dissolved Sulfate	10	1	mg/L	EPA 300.0 28d Hold [1]
Turbidity	62	2	N.T.U.	EPA 180.1 [D-2]
UV Absorbance @254nm	0.139	0.001	absorbance/cm	Std Method 5910B [1]
pH	7.6	0.1	pH Units	Std Method 2320 B [1]
Field Result(s):				
Conductance (EC)	189.7	1	µS/cm	EPA 120.1 (Field) [1]
Dissolved Oxygen	9.2	0.1	mg/L	EPA 360.1 (Field) [1]
Water Temperature	10.8	0.1	°C	EPA 170.1 (Field) [1]
Turbidity	76.9	0	N.T.U.	Turbidity, Compensated, Field [1]
pH	7.6	0.1	pH Units	EPA 150.1 (Field) [1]

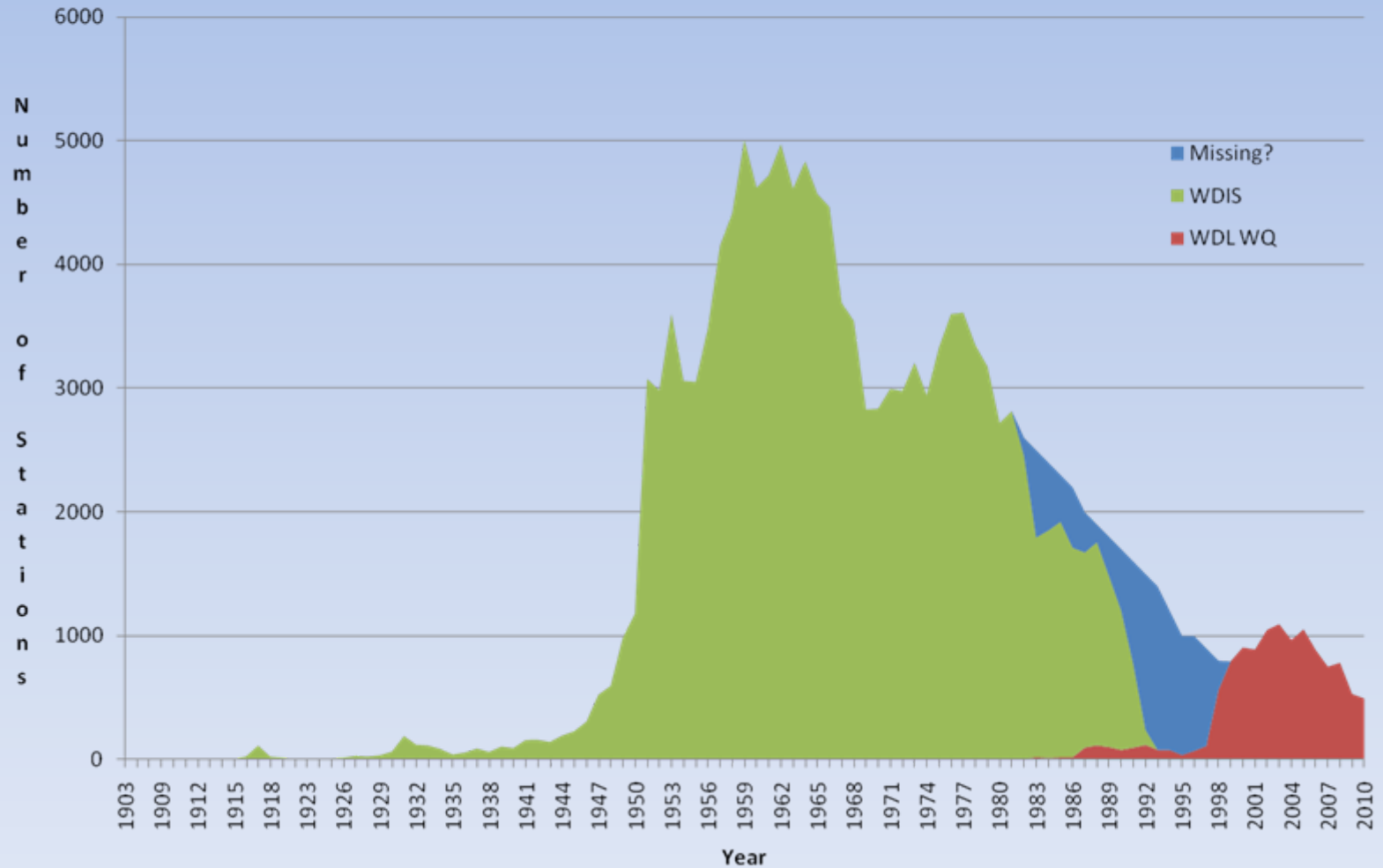
Metadata

- Data sets are so large and cover so much territory that an over-arching metadata description is not meaningful
- Grab Sample WQ database has embedded as much detail as possible
- Metadata available from individual programs
- User Projects

Current Projects

- Northern Region SWCMP data – drawing from both the Grab WQ and Well data modules has recently come online
- Original WDIS data (other than O&M) has been ‘refurbished’ and awaits review before it will be moved into the production database
 - 375+ agencies, 1903-1992, 6 million data points
- O&M historic data (1960-1998) from WDIS and O&M data sets are being reconciled in order to be added in full to WDL WQ
- Water PIE

Grab WQ Stations: WDIS and WDL Combined



Water Data Library

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Greg Smith

Department of Water Resources

Modules

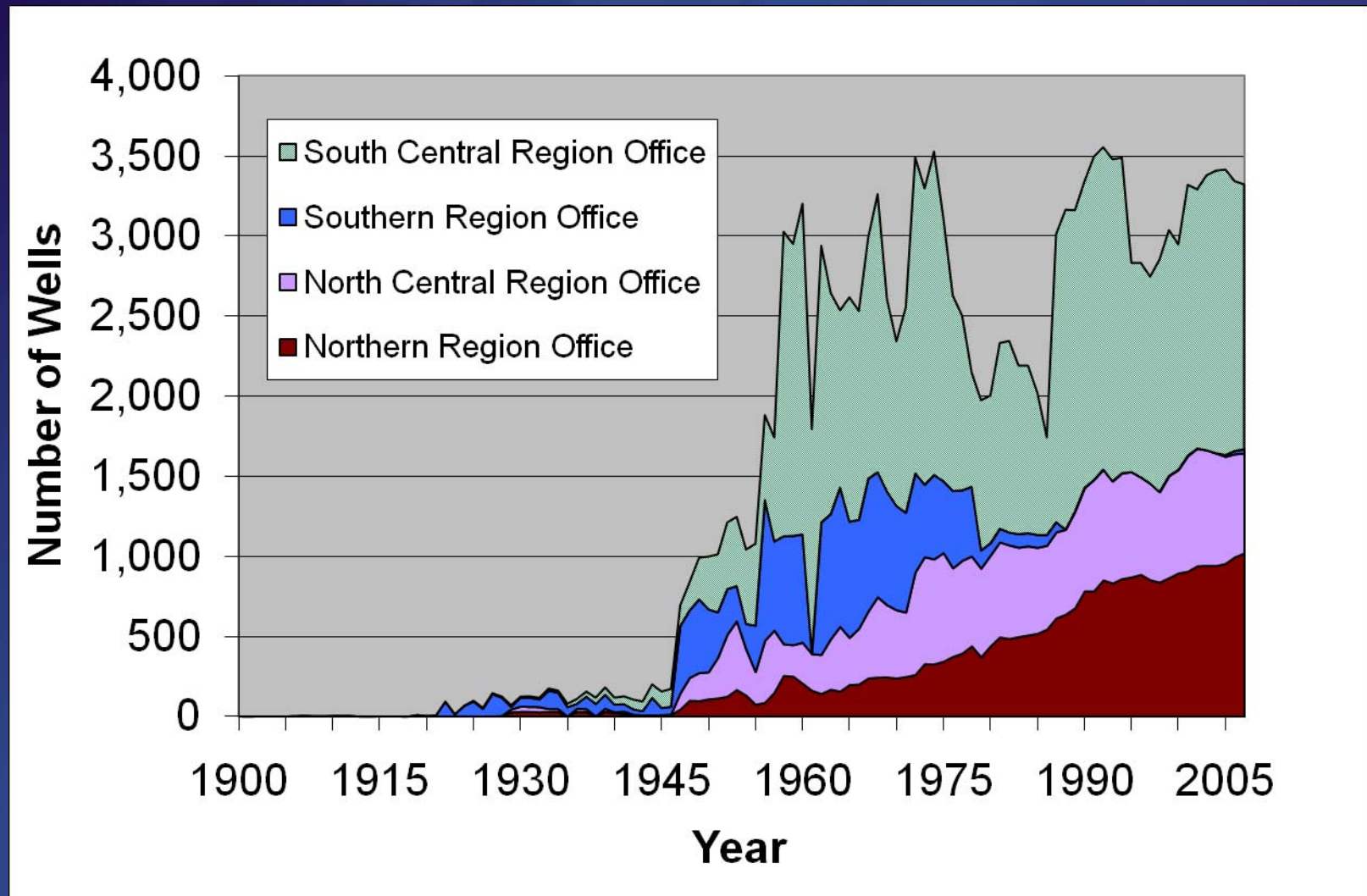
- Water Quality
- Groundwater Levels
- Time Series (Continuous) Data
- {Climate}
- {Well Completion Reports}

Groundwater Levels

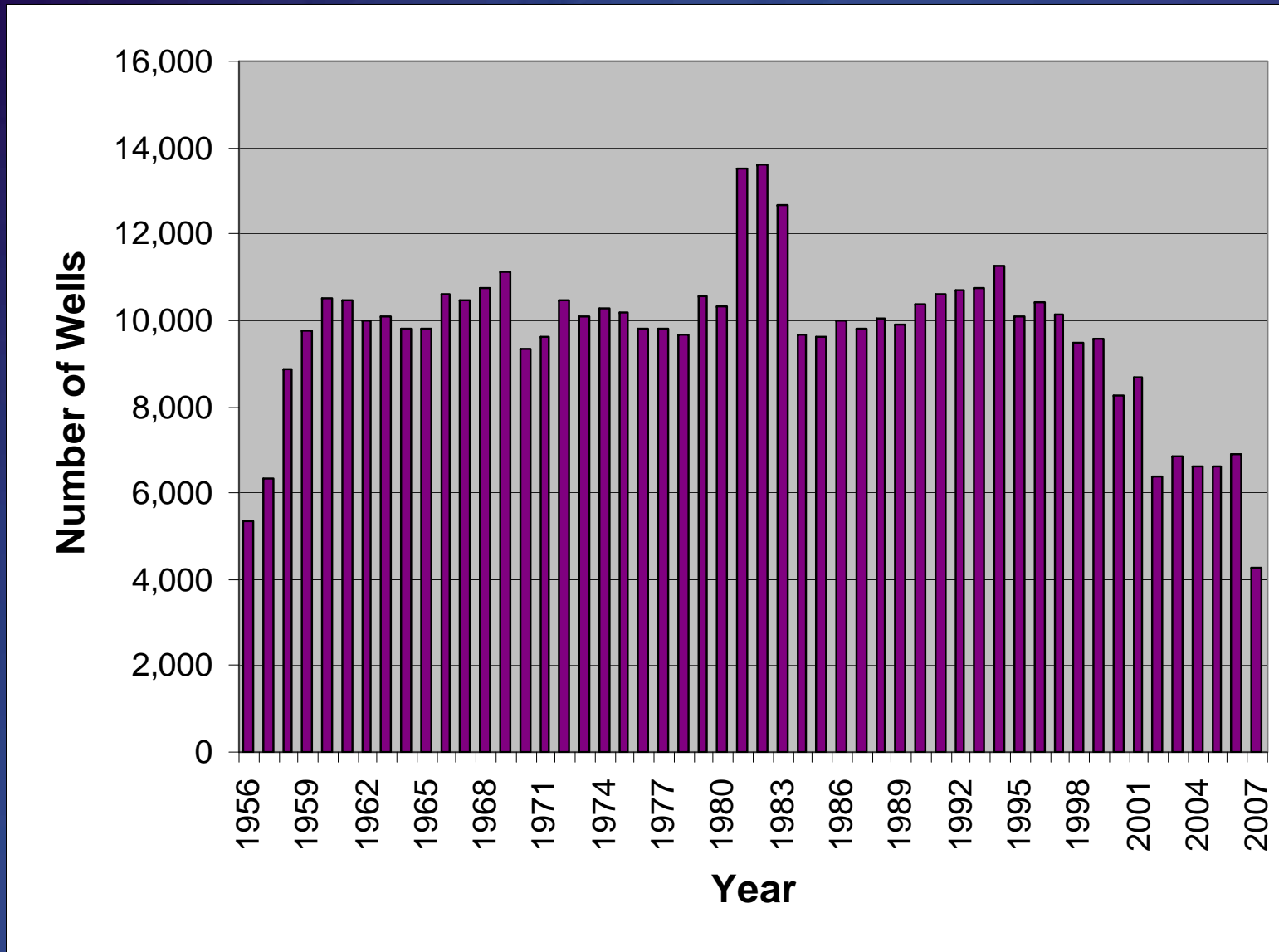
- Groundwater levels first monitored in 1917
- Measurements for about 43,000 wells
- Collected by nearly 80 local, state and federal agencies

- Data gaps in Alameda County, Los Angeles County, Salinas Valley, and Santa Clara Valley

Wells Monitored by DWR by Year



Active Wells by Year



Time-Series Data

- Combination of surface water, groundwater and water quality data
- Collected with data logger; entered into the system periodically
- Reports posted every weekend (not real time)

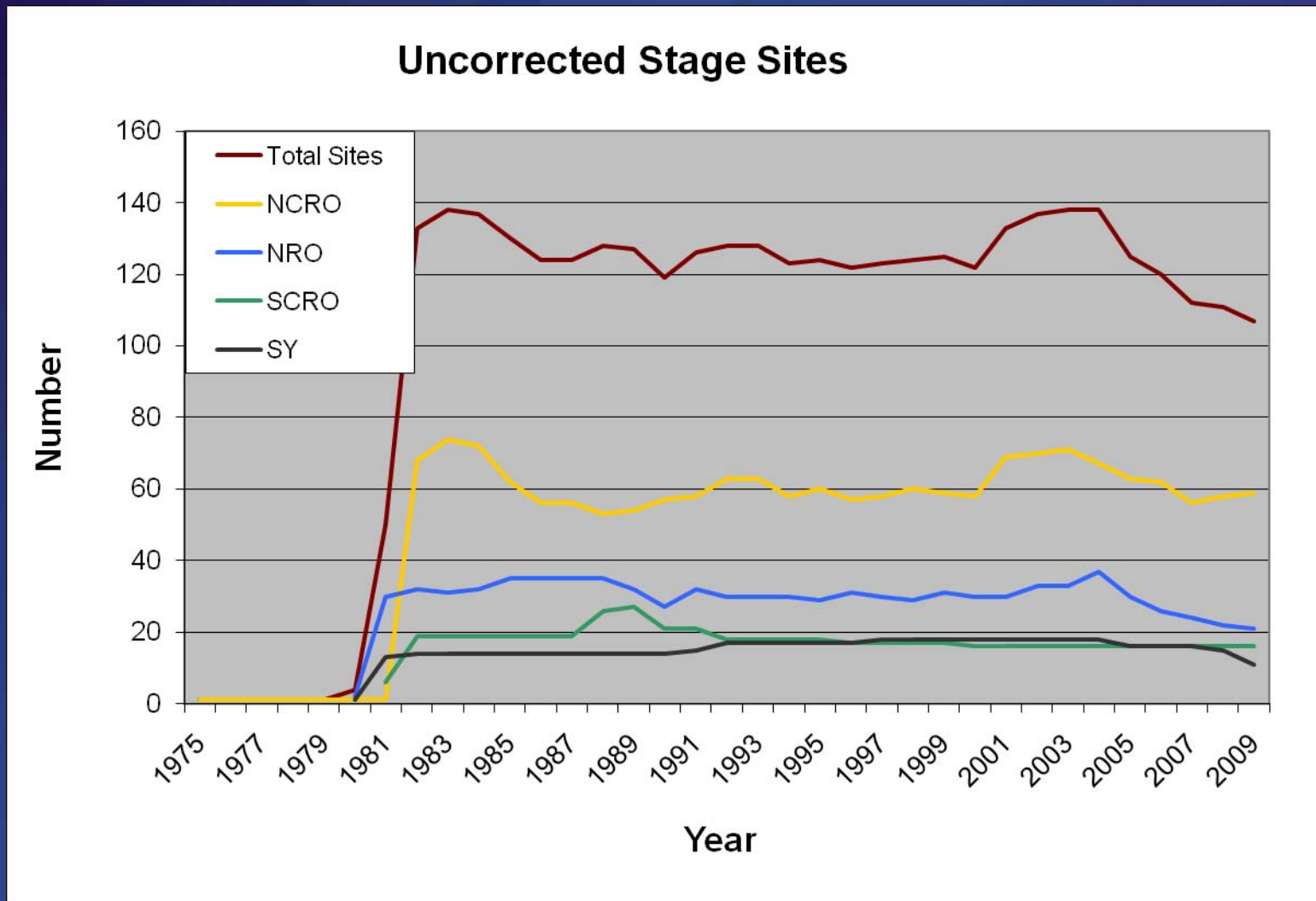
Summary of Time-Series Data

Domain	Variable	Sites	Earliest Date	Years of Data
Climate	Air Temperature	2	4/15/1994	20.7
Groundwater	Ground Surface Displacement	11	1/24/1992	93.3
Groundwater	Groundwater Level	350	3/24/1992	1,812.0
Groundwater	Head above Pressure Transducer	26	10/20/2005	49.7
Surface Water	Stored Corrected Stage	105	10/1/1975	1,525.8
Surface Water	Stored Daily Mean Flow	182	5/1/1941	3,093.7
Surface Water	Uncorrected Stage	253	10/1/1975	3,364.8
Water Quality	Chloride as Cl	2	6/4/2001	2.8
Water Quality	Conductivity	81	10/1/1982	759.5
Water Quality	Groundwater Temperature	84	4/7/2000	317.7
Water Quality	Oxygen (Dissolved)	27	7/14/1999	142.5
Water Quality	Percentage Dissolved Oxygen	23	7/14/1999	129.2
Water Quality	pH	30	7/14/1999	143.6
Water Quality	Practical Salinity (PSS-15)	23	6/4/2002	82.6
Water Quality	Total Chlorophyll	20	7/7/2005	60.9
Water Quality	Turbidity	35	7/14/1999	159.8
Water Quality	Water Temperature C	129	10/1/1988	655.0
Water Quality	Water Temperature F	260	8/4/1995	1,237.7

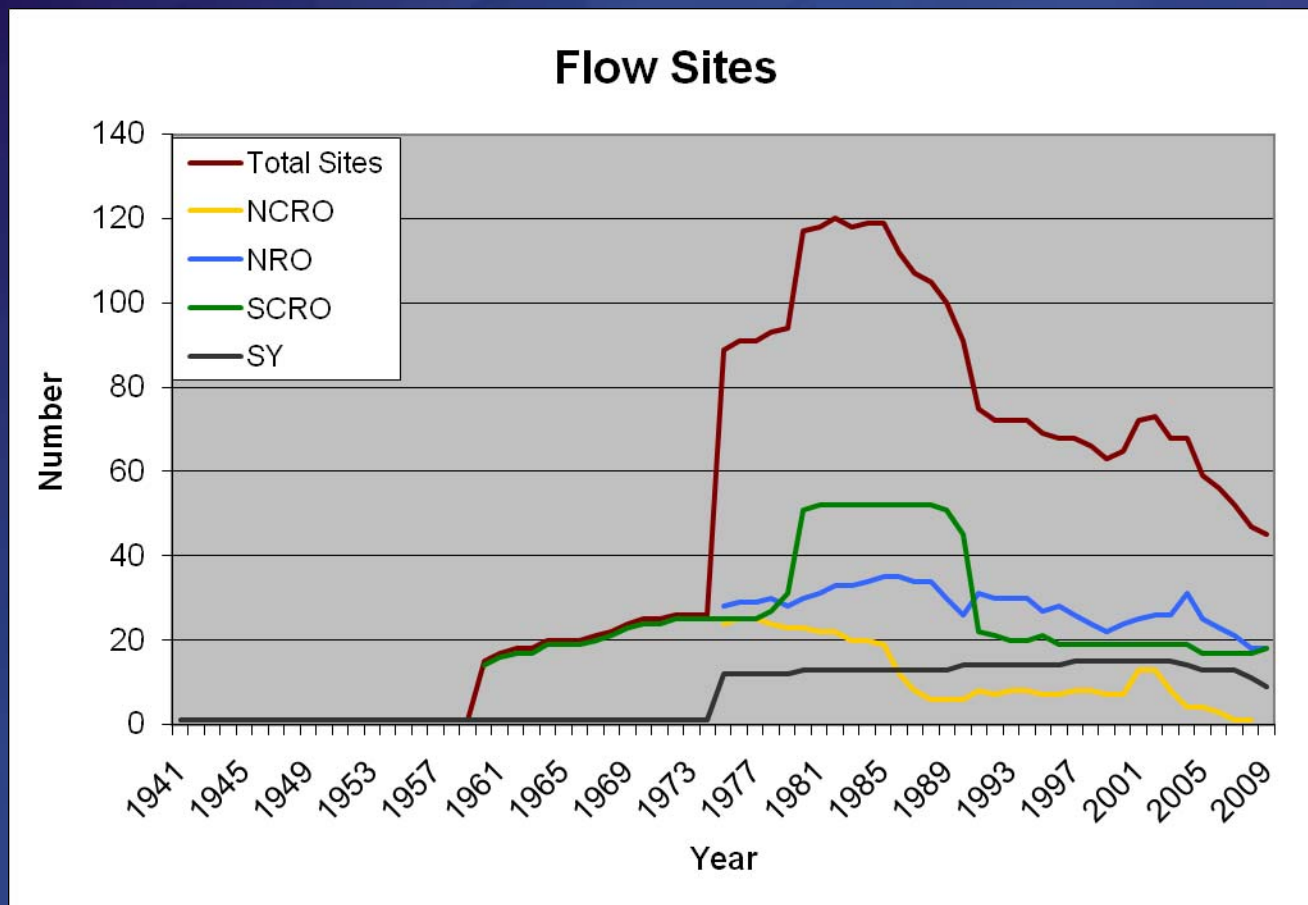
Surface Water History

- First State operated stream gauge in 1878
- 1932 : Flood Flows in Sacramento and Northern San Joaquin Valley (Bulletin 13-25) (1914 – 1925)
- 1954 – 1956 : DWR Bulletin 16
- 1956 – 1962 : DWR Bulletins 23
- 1963 – 1975 : DWR Bulletin 130
- 1971 : Water Data Information System
- 2003 : Water Data Library

Stage Sites



Flow Sites



Customers of Time-Series Data

Org. Type	California	US	International	Unknown	Total
Unknown	118	4,620	274	2,091	7,103
Academic Institution	1,951	756	48		2,755
City Government	29	1	24		54
Corporation	238	152	18		408
County Government	532	1			533
DWR	5,808				5,808
Energy	37	5			42
Eng. & Geotechnical	1,120	2,632	37	5	3,794
Env. Consulting	1,076	30	2		1,108
Federal Government	66	2,623	43		2,732
Financial		7			7
Individual	1	1		108	110
Insurance	2	6			8
Legal	5	4	1		10
Medical		11			11
Non-Profit	5	78	2		85
State Government	628	35	2		665
Tribal	10				10
Water Utility	202	10			212

Questions and Answers

