Glenn County Prop 1 Stressed Basins Grant Update

Davids Engineering

West Yost Associates

December 11, 2017

Overview

- Background
- Coordination with Colusa County
- Summary of Tasks to Support GSP Development
- Schedule, Progress, and Next Steps
- Highlights

Background

- Funded by DWR through Prop 1 Counties with Stressed Basins Grant
- Applied for by Glenn County in December 2015
- Davids–West Yost Team contracted in December 2016
- Tasks are foundational to GSP Development and directly tied to GSP Regulations
- Complete by March 31, 2018

Coordination with Colusa County

- Concurrent Stressed Basin Grant underway for Colusa County supported by Davids-West Yost
- Efforts to coordinate technical work in early 2017
  - Reach similar level of progress for both counties
  - Maximize value relative to cost through synergies
- Builds upon prior work for Colusa County (e.g. water budget development)
- Areas of Coordination
  - Data Collection and Analysis
  - DMS Design and Preliminary Implementation
  - HCM Development and Assessment of Monitoring Network

Tasks

1. Data Collection and Analysis
2. Data Management System (DMS) Design and Preliminary Implementation for High-Priority Data
3. Initial Water Budget Development
4. Hydrogeologic Conceptual Model (HCM) Development
5. Evaluation of Existing Model Codes and Calibrated Models

Schedule and Progress

- Grant deadline of March 31, 2018
- Slightly behind schedule due to coordination efforts, anticipation of information from DWR, and GSP grant application process
- Substantial progress made on all tasks
- Currently preparing draft deliverables

1. Grant Administration

- Quarterly summaries of work performed
- Coordination meetings
- Public meetings
- Deliverables
  - Work summaries
  - Presentations and other meeting materials

2. Data Collection and Analysis

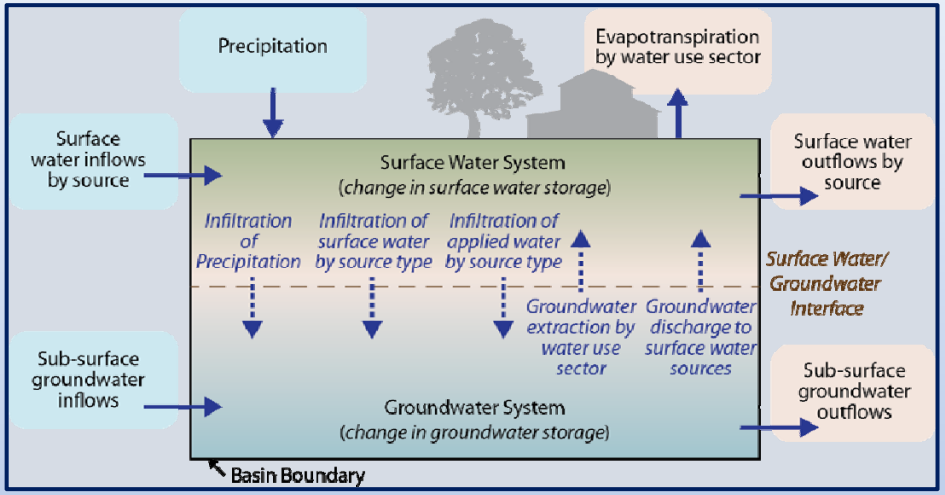
- Existing Data Review
  - Compile data for Hydrogeologic Conceptual Model (HCM) and Water Budgets
    - Geology, soils, precipitation, stream flows, diversions, land use, etc.
  - Organize for inclusion in Data Management System (DMS)
- Data Gap Analysis
  - Identify additional information needed for HCM, water budgets, and development of Sustainable Management Criteria
  - Prepare Data Gap Action Plan
- Deliverables
  - Data Inventory and Organized Datasets
  - Data Gap Action Plan
- Coordinated with Colusa County grant

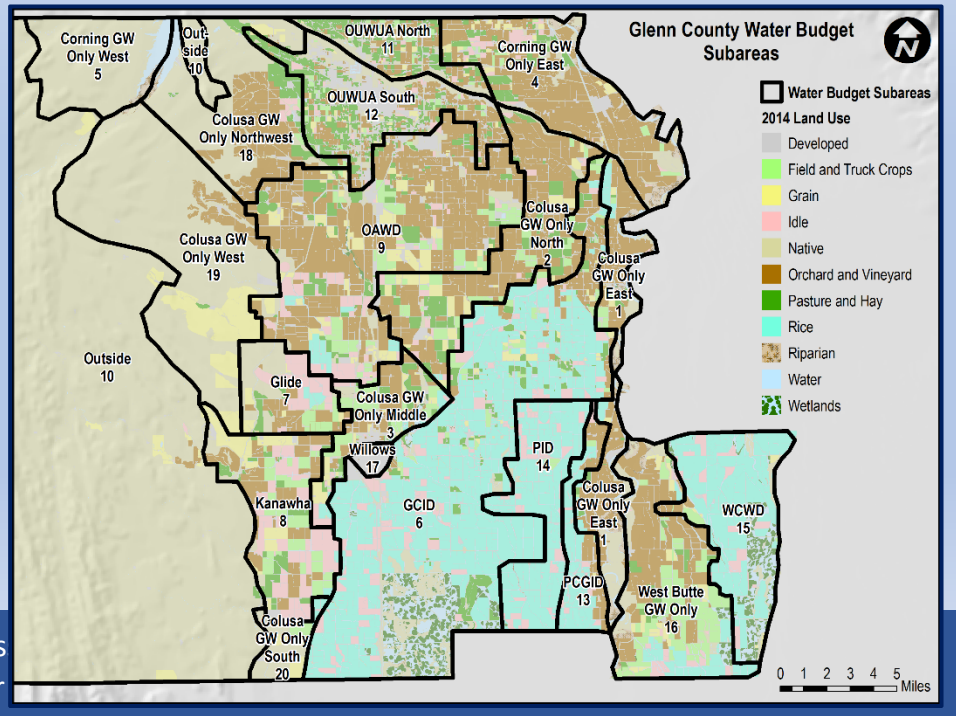
3. Data Management System

- Review GSP Regulations and Identify SGMA Data Requirements
- Define DMS Core Functionality and Specifications
- Implementation
  - Identify priorities and preferences
  - Develop phased implementation plan
  - Integrate with existing data management efforts
  - Develop preliminary DMS
  - Compile and import high priority data
  - Develop and test quality control procedures
- Deliverables
  - Long-Term DMS Implementation Plan
  - Preliminary DMS User Guide
  - Preliminary DMS Programmer's Guide
  - Preliminary DMS Database and Electronic Data Files
- Coordinated with Colusa County grant

4.1. Initial Water Budget

- Initial Basin Water Budgets
  - Surface system and groundwater system
  - Colusa, Corning, and West Butte Subbasins within Glenn County
  - Rely on AWMPs, UWMPs (Willows and Hamilton City) and other available data
  - Compare to existing DWR tools (i.e. C2VSim)
- Deliverables
  - Water Budget Report
  - Water Budget Data
- Builds upon prior work in Colusa County





4.2. Hydrogeologic Conceptual Model

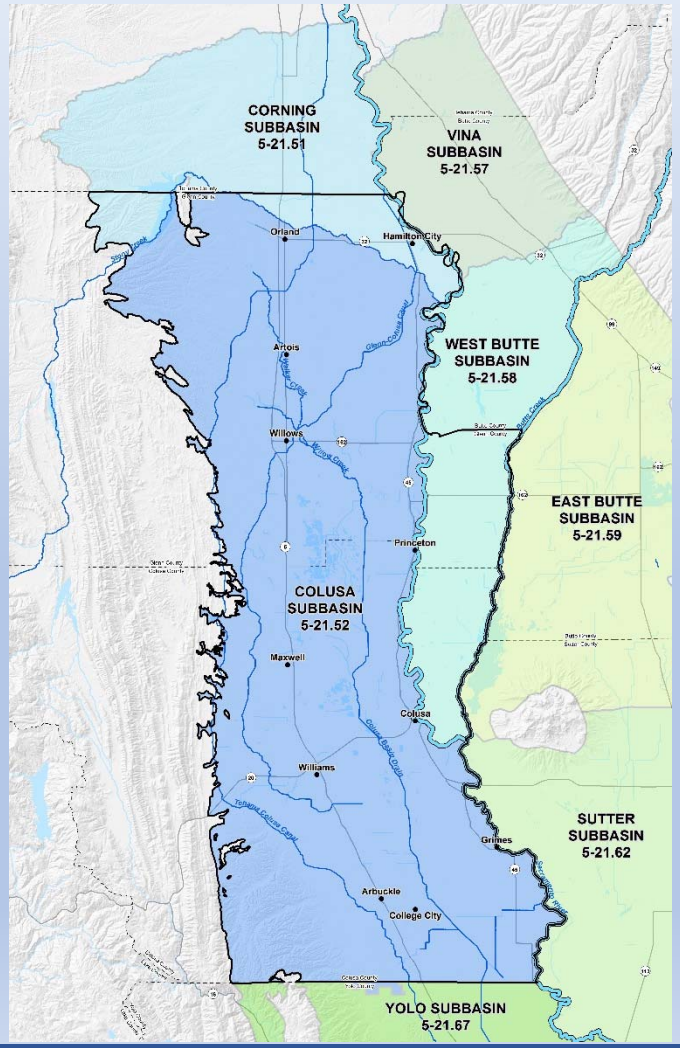
- Characterize alluvial subbasins in Glenn County subject to SGMA
  - Geology and structure, basin boundaries, base of fresh water, principal aquifers and aquitards and physical properties
- Prepare maps
  - Topography, surficial geology, surface soils, existing and potential recharge areas and discharge areas, surface water bodies, sources and points of surface water delivery
- Deliverables
  - HCM Report, including written description, maps, and figures
  - Associated Datasets
- Coordinated with Colusa County

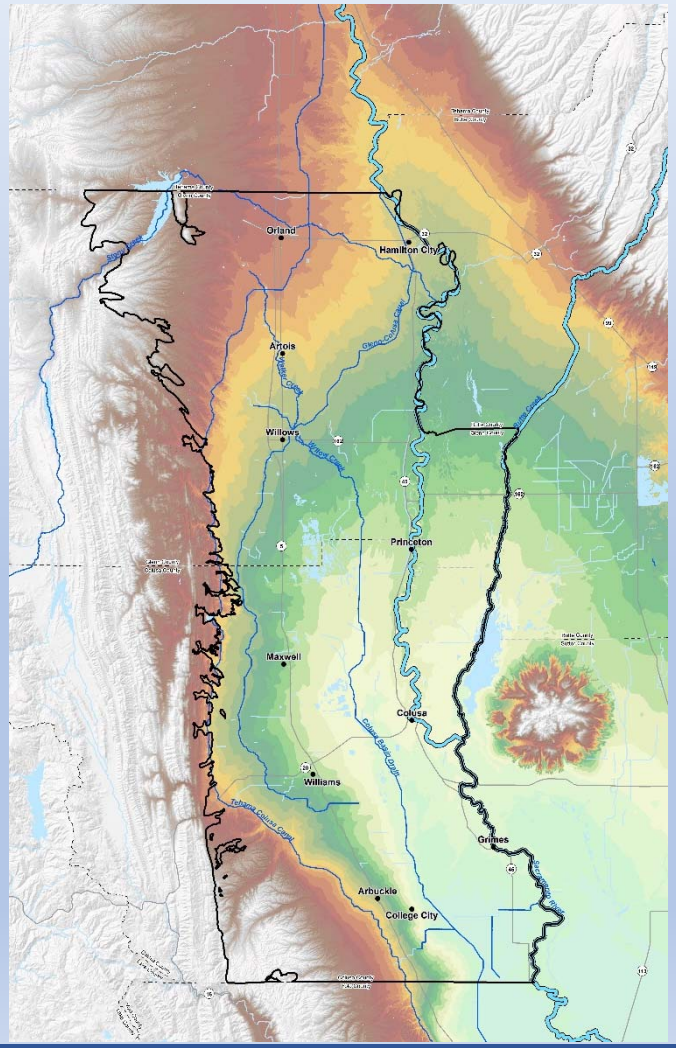
5. Evaluation of Existing Model Codes and Calibrated Models

- Evaluate Integrated Hydrologic Models to support projected water budgets and potential projects and management actions
- Develop and apply criteria to compare and rank existing forthcoming applications
  - DWR California Central Valley Groundwater-Surface Water Simulation Model (C2VSim)
  - DWR Sacramento Valley Simulation Model (SVSim) USGS Central Valley Hydrologic Model (CVHM)
  - Others?
- Stop short of final model selection, pending new and updated applications early next year
- Leverage existing information to develop adequate information while minimizing cost
- Deliverables
  - Model Evaluation Report
- Equally applicable for Colusa County

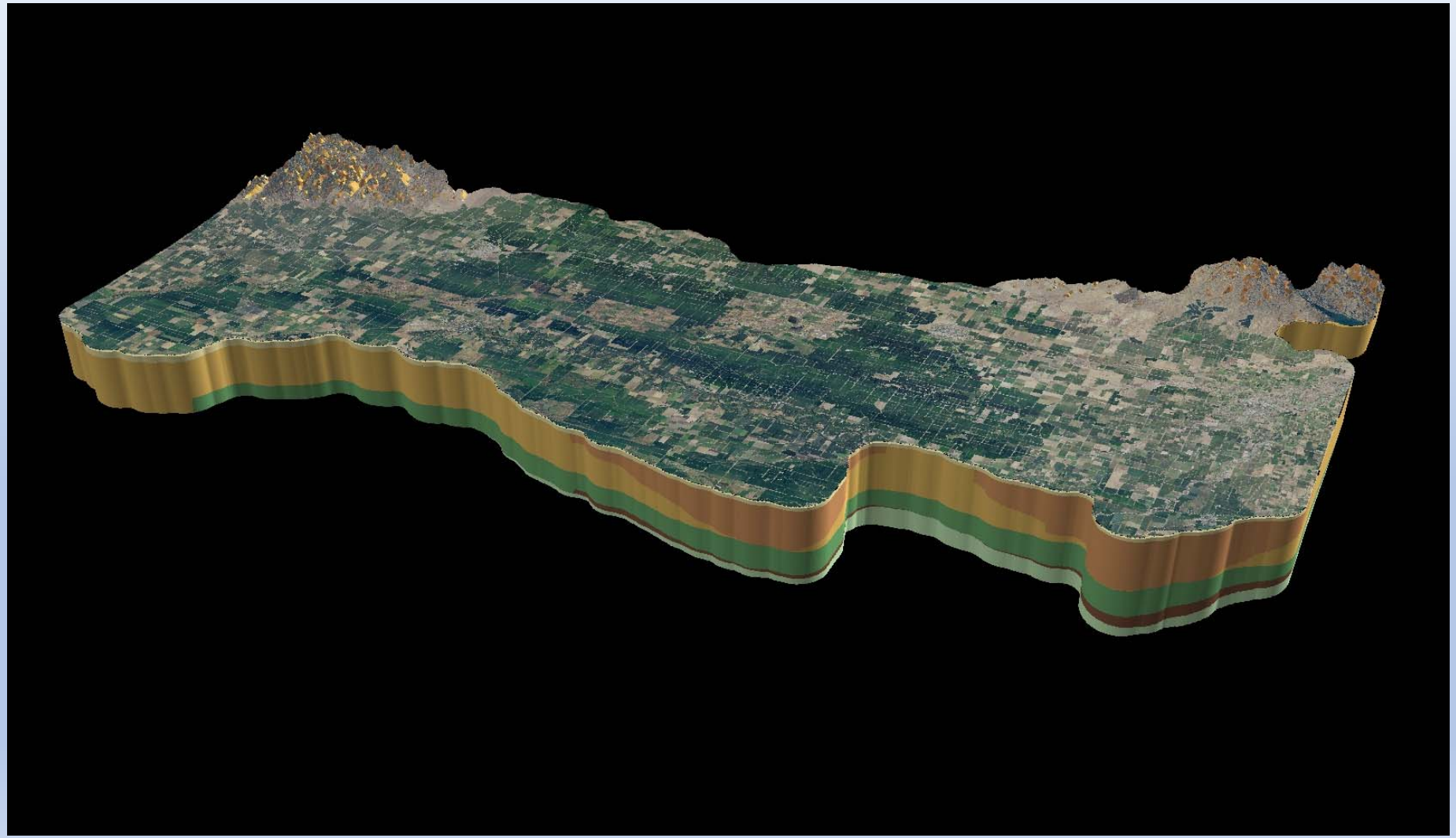
Highlights from Work to Date

Colusa Subbasin Hydrogeologic Conceptual Model



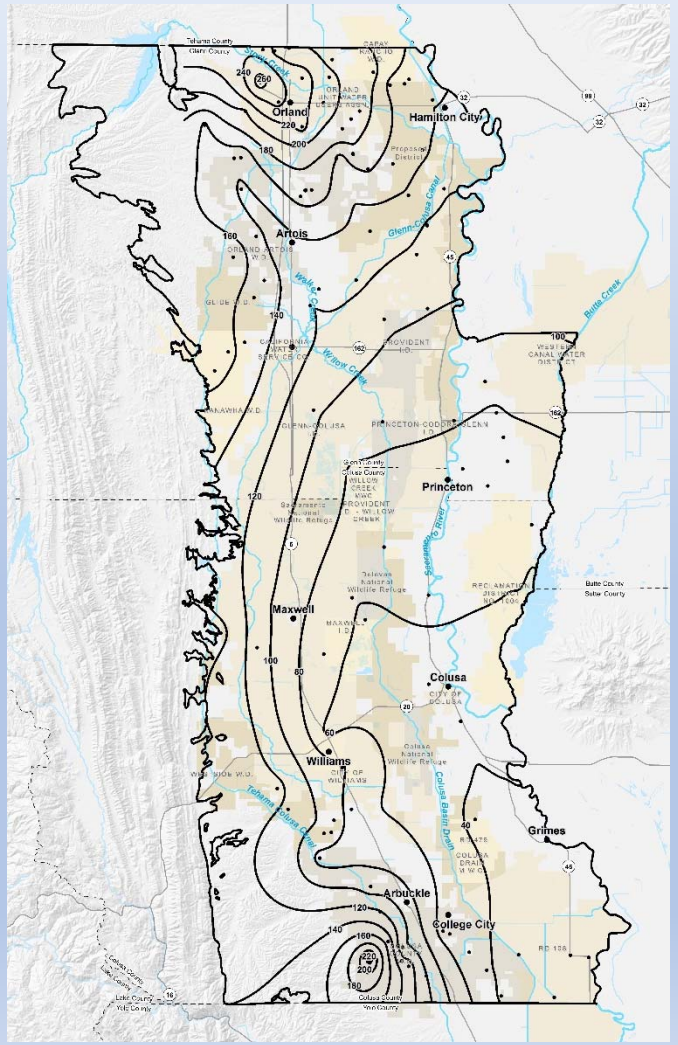


3D Geologic Model

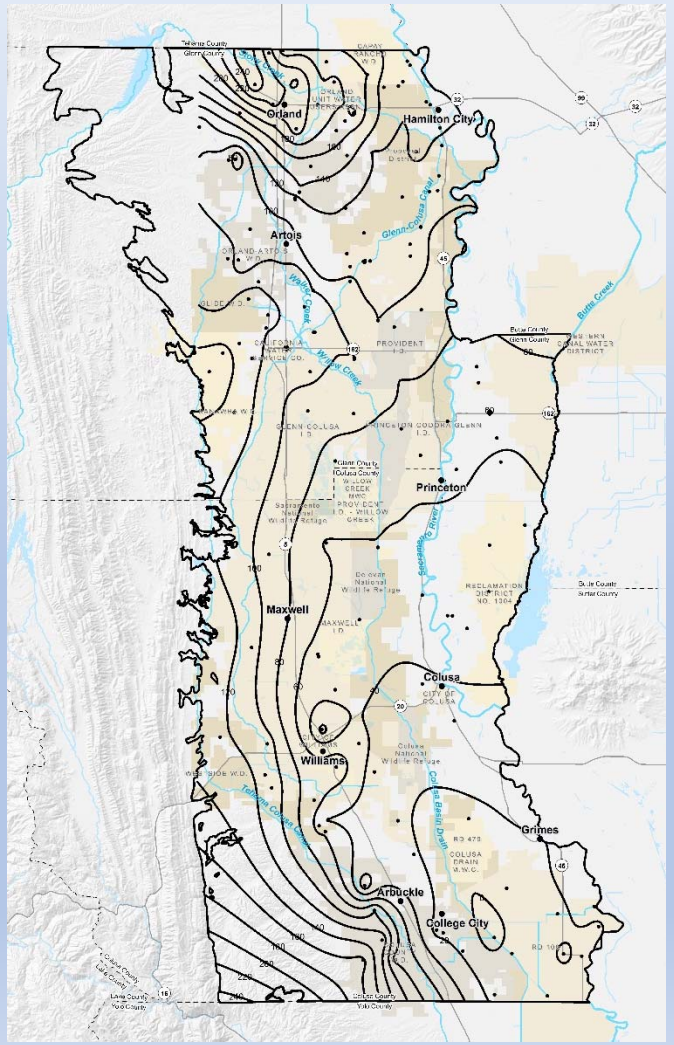


Groundwater Elevation Contours

Spring 2006

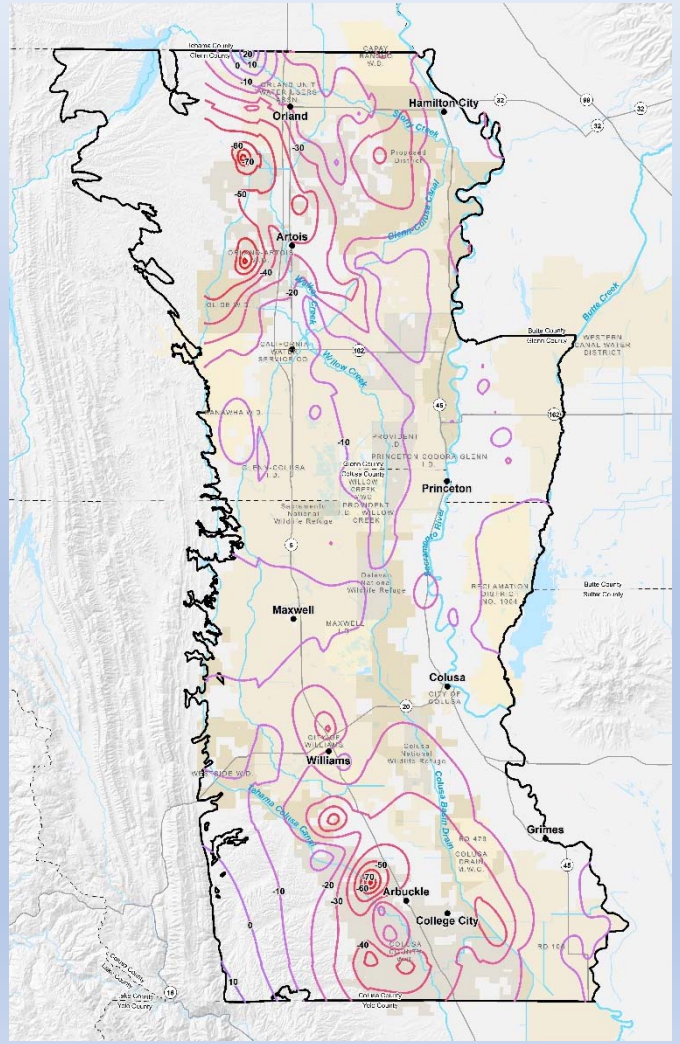


Spring 2015

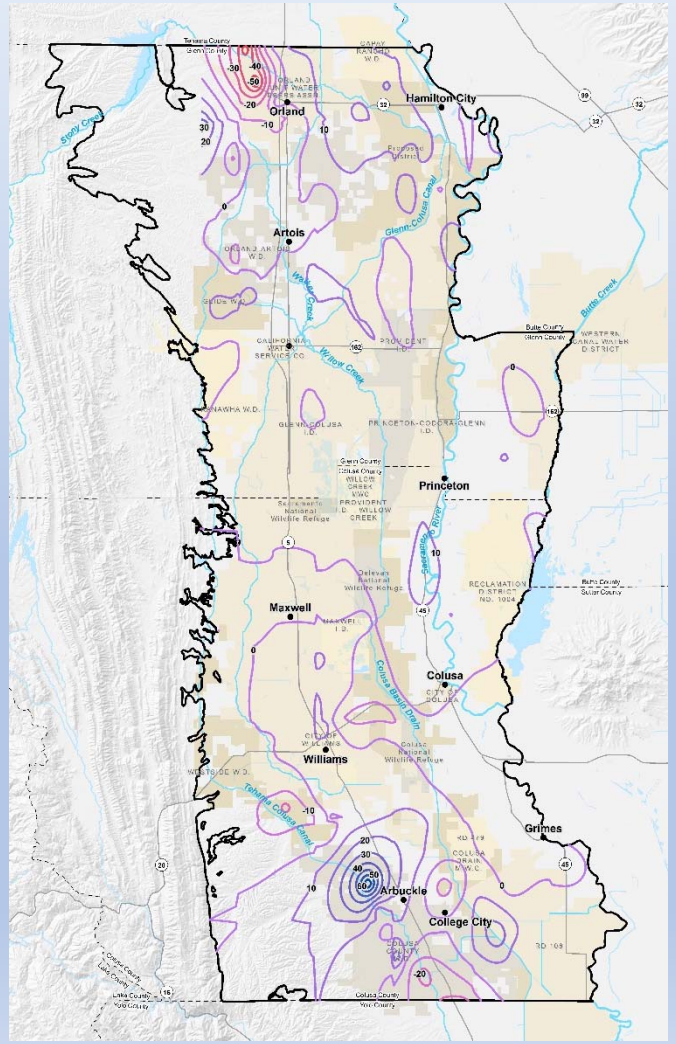


Groundwater Elevation Contours

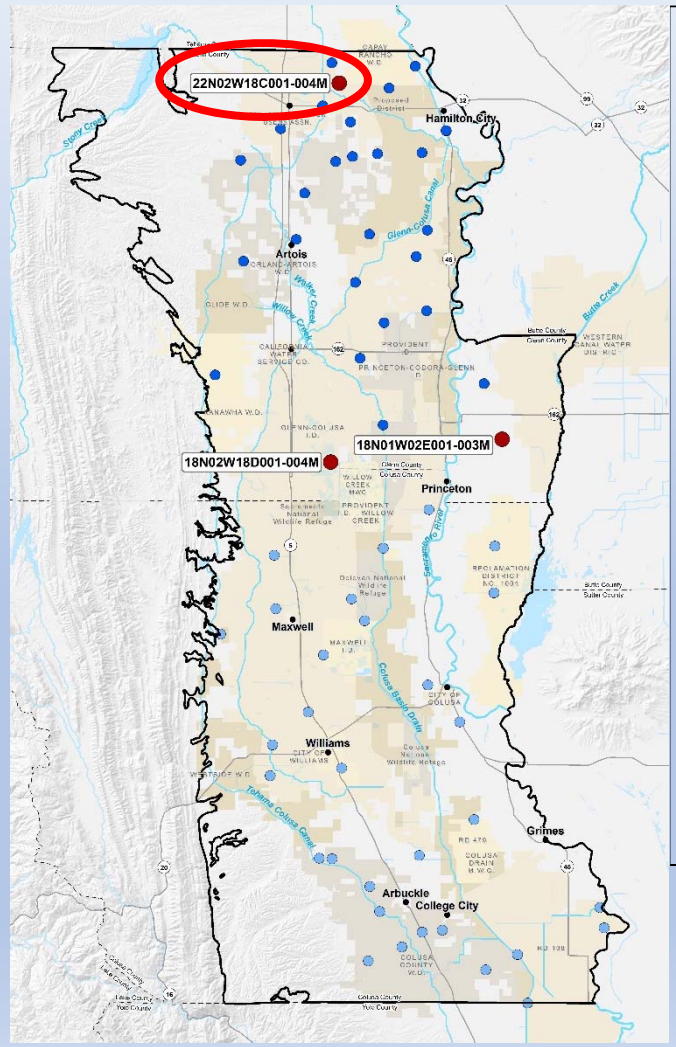
Difference Spring 2006 to Spring 2015

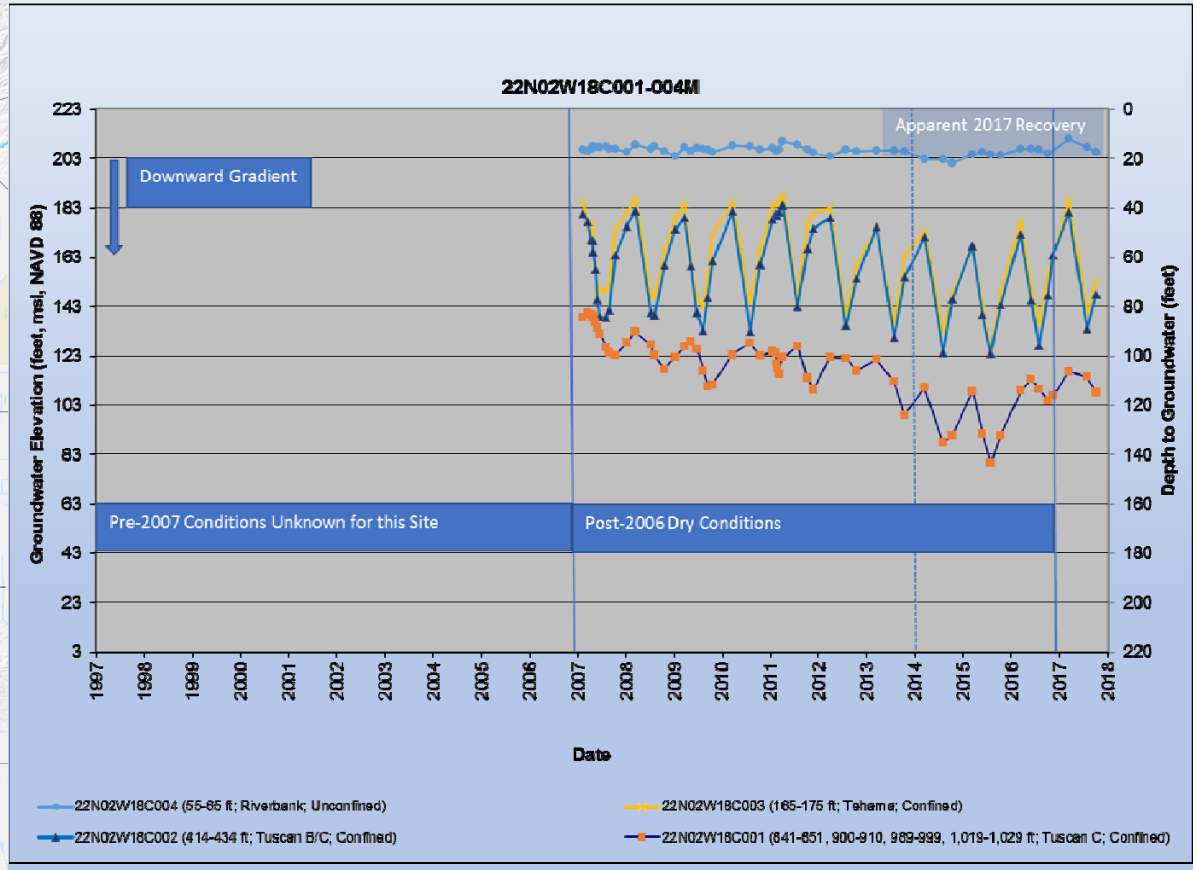


Difference Spring 2015 to Spring 2017



Glenn County Monitoring Well 22N02W18C001-004M





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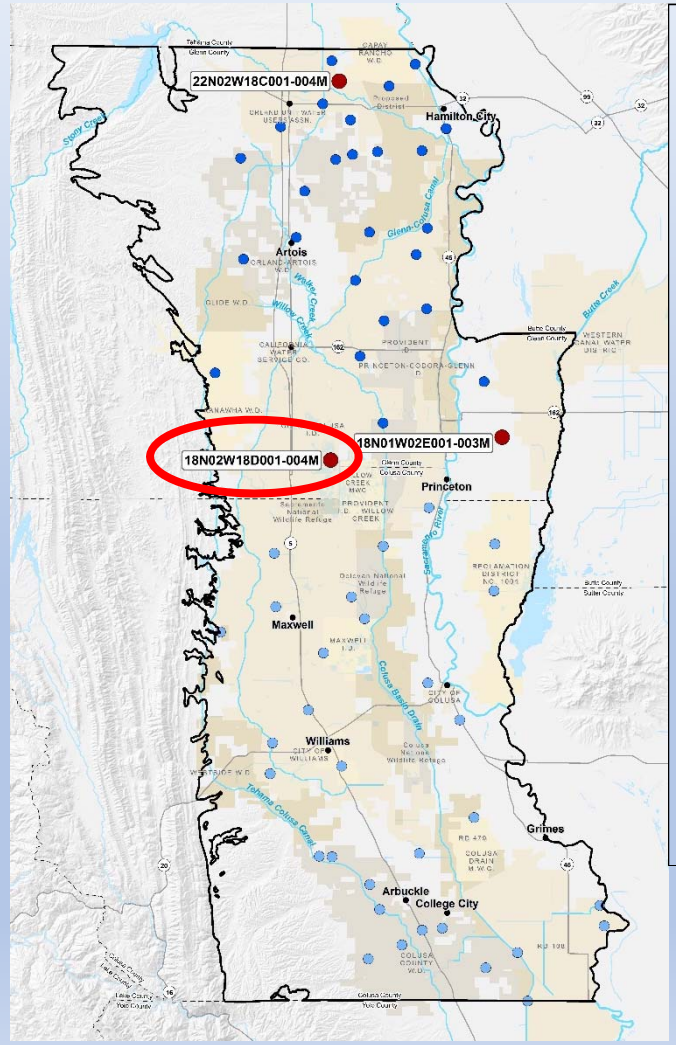
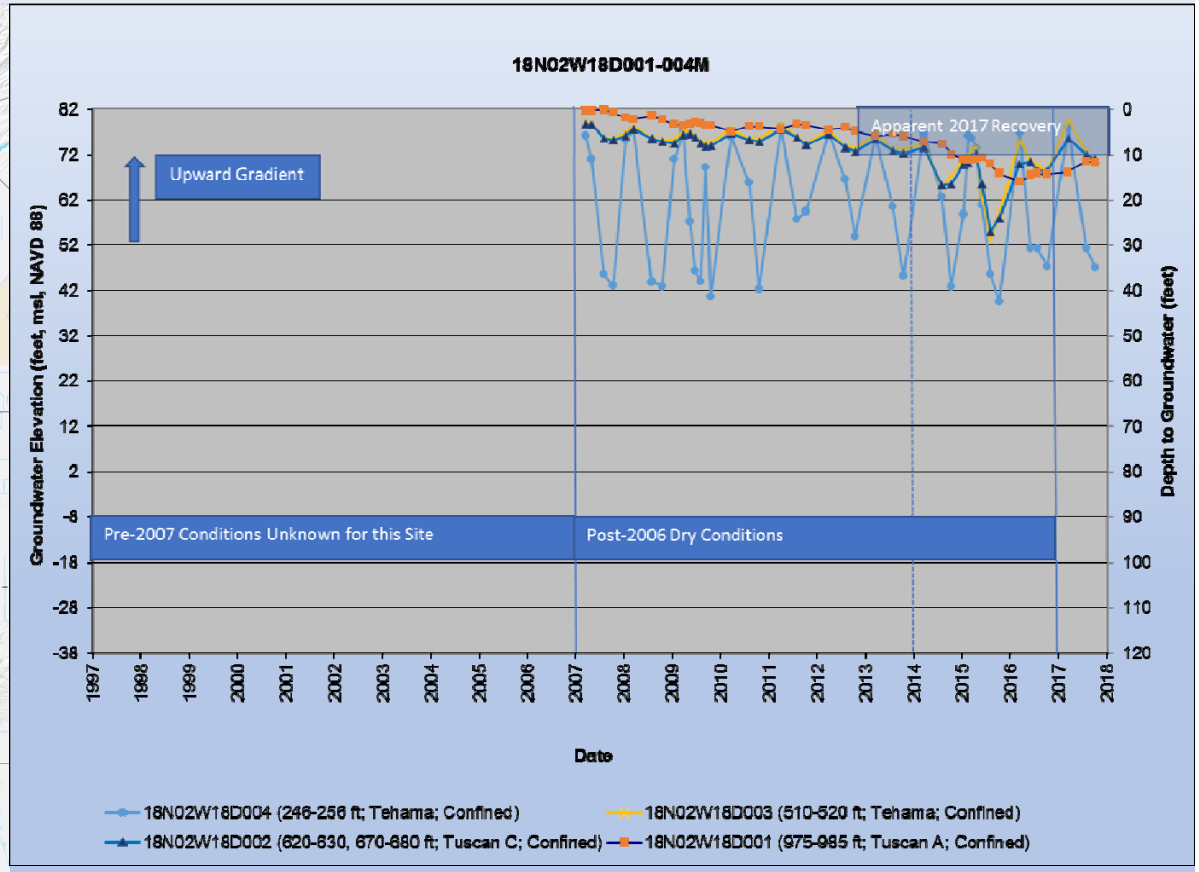
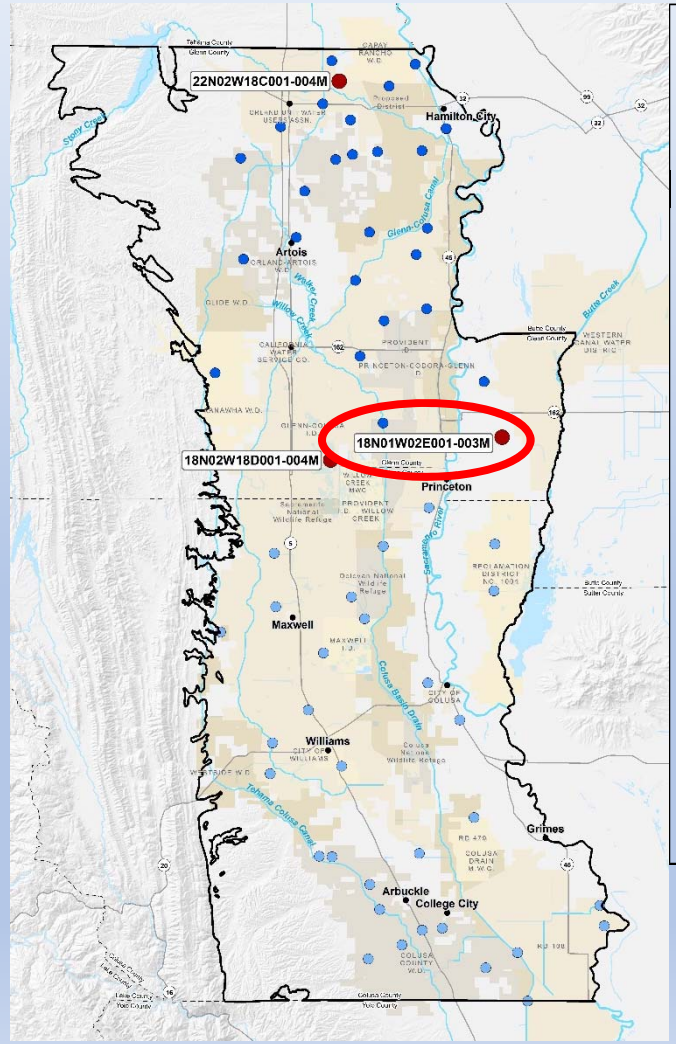
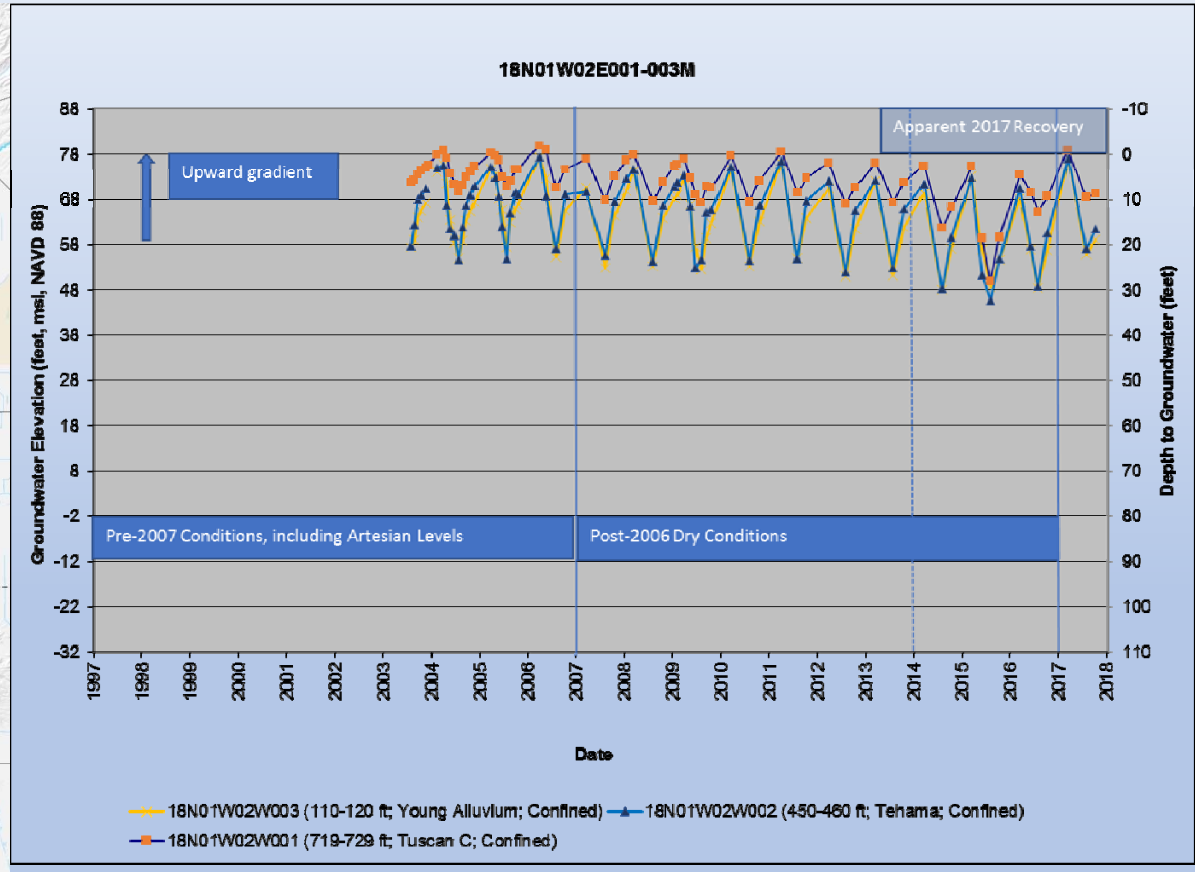




Glenn County Monitoring Well 18N01W02E001-003M





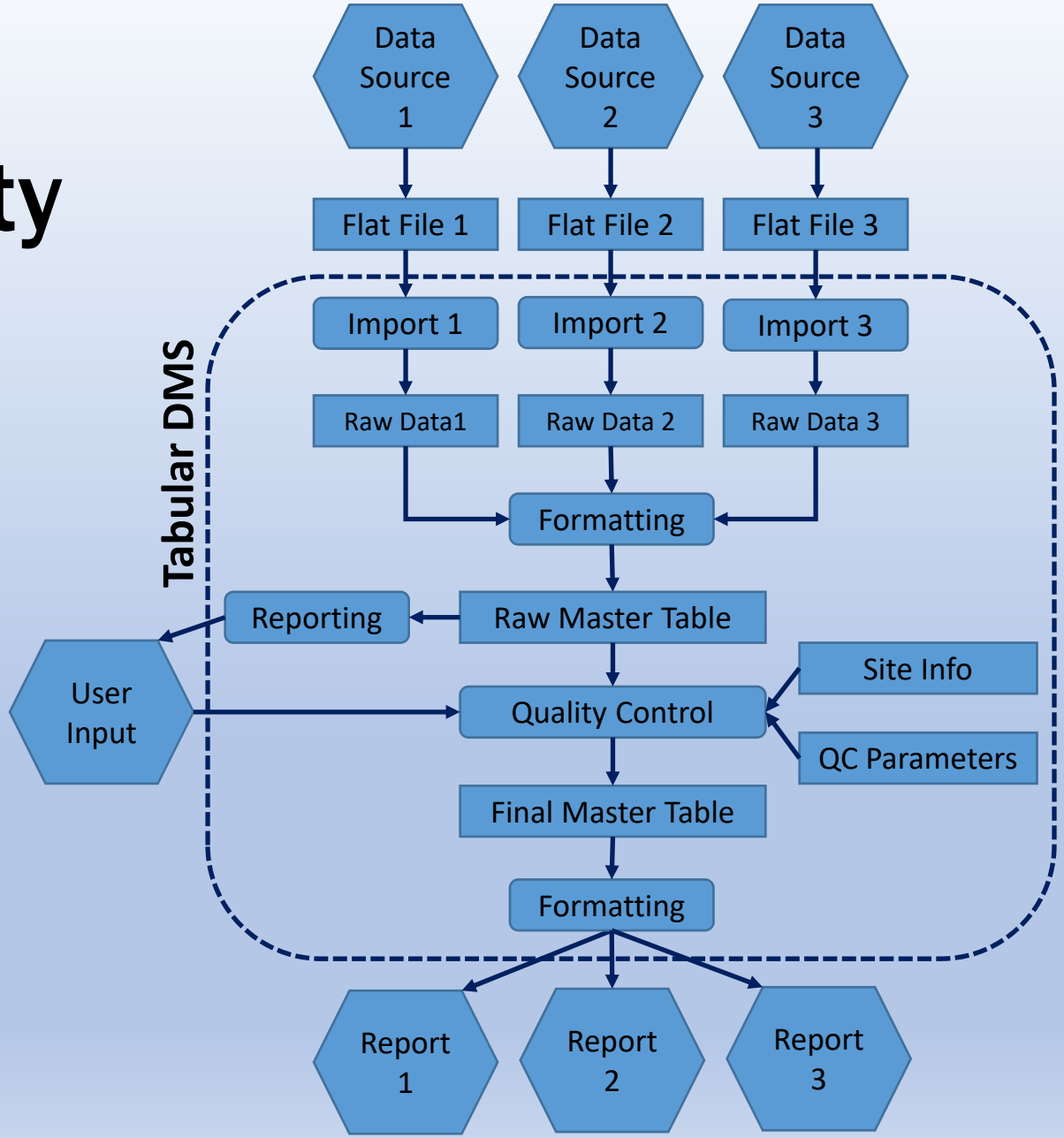
Integrated Hydrologic Model Selection Criteria

- Peer reviewed, publicly available at no cost and can be provided to DWR
- Capabilities:
  - Support development of water budgets
  - Evaluate sustainability indicators
  - Forecast future conditions, including changes in agricultural conditions
  - Evaluate projects and management actions
  - Support identification of data gaps
  - Assess impacts on adjacent basins

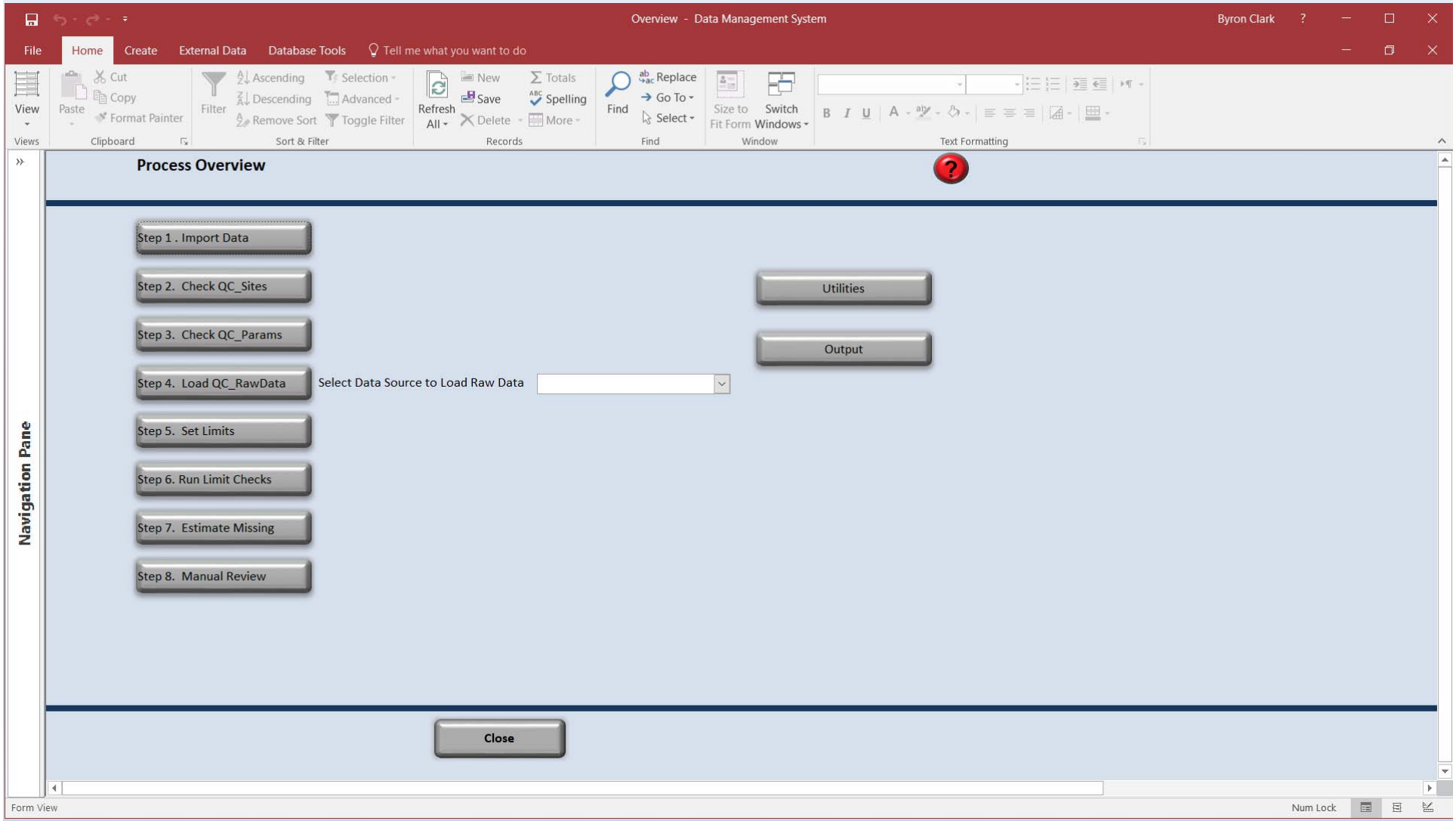
DWR's existing CVSim and C2VSim models, or USGS's CVHM, when updated with basin-specific information, may provide a cost-effective modeling platform that meets SGMA requirements and supports interbasin cooperation.

DMS Core Functionality

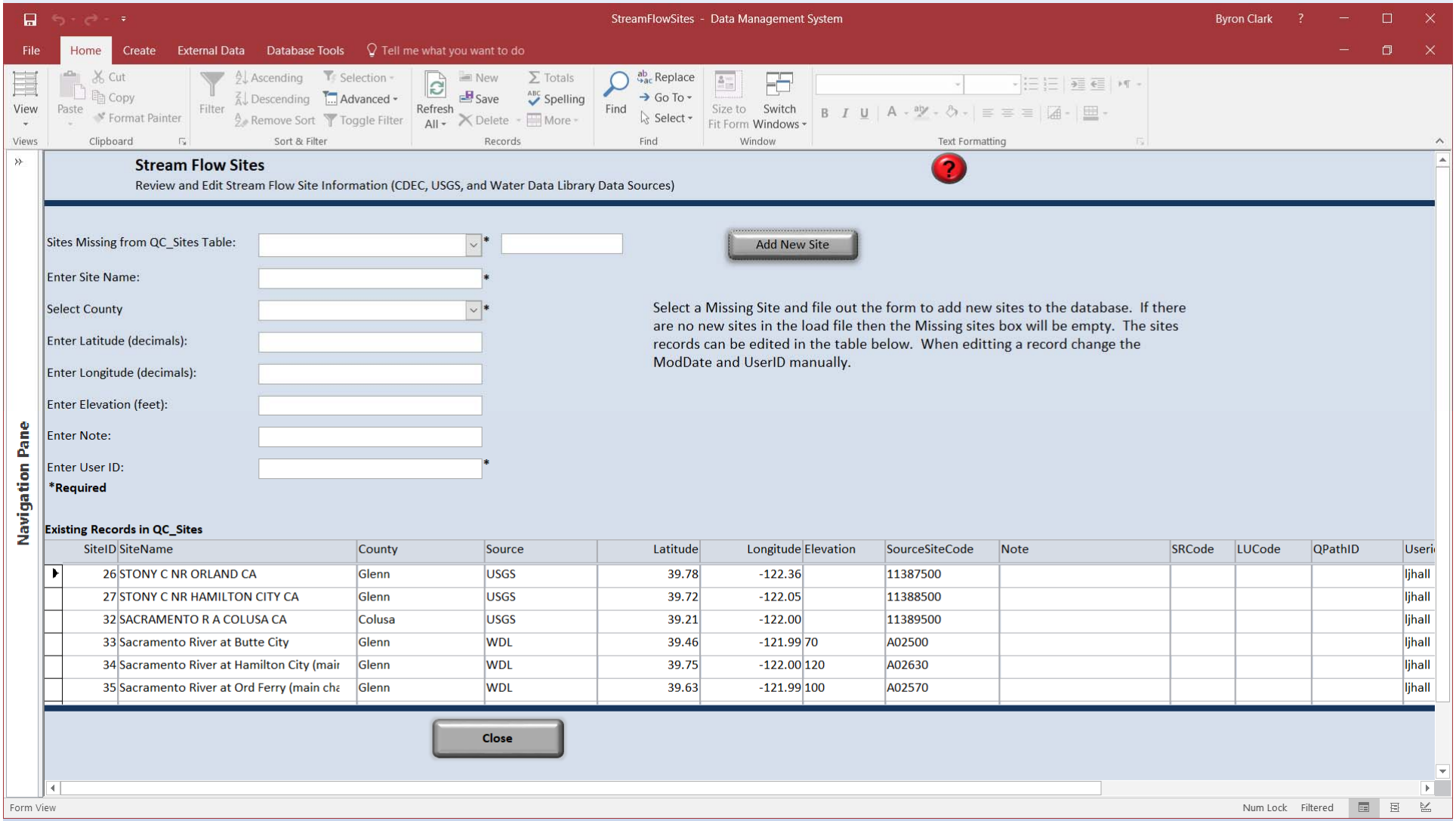
- Data Acquisition
- Formatting
- Quality Control and Assurance
- Storage
- Reporting and Visualization



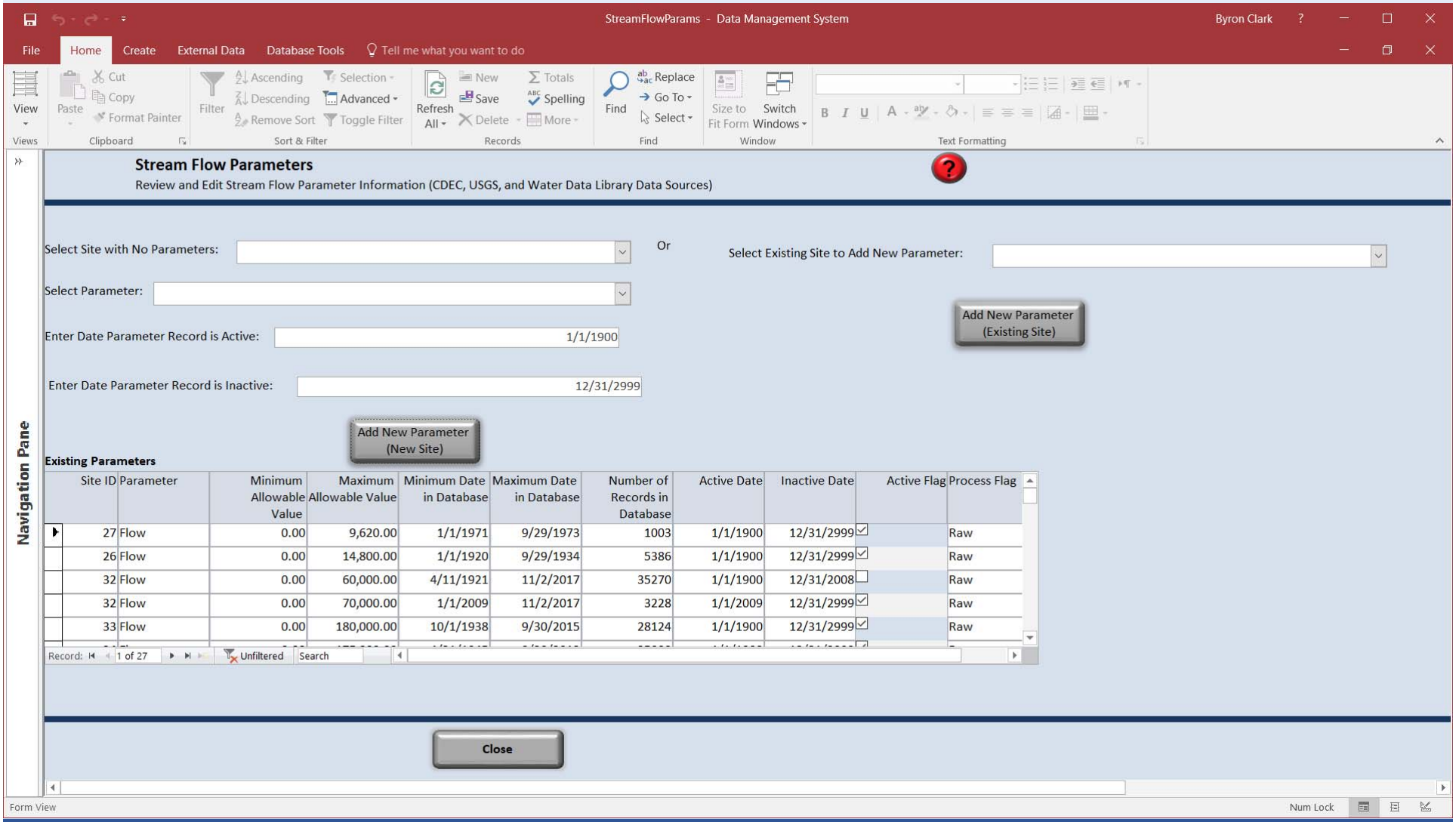
Tabular DMS Home Screen



Site Maintenance Screen



Quality Control Parameter Screen



Site ID	Parameter	Minimum Allowable Value	Maximum Allowable Value	Minimum Date in Database	Maximum Date in Database	Number of Records in Database	Active Date	Inactive Date	Active Flag	Process Flag
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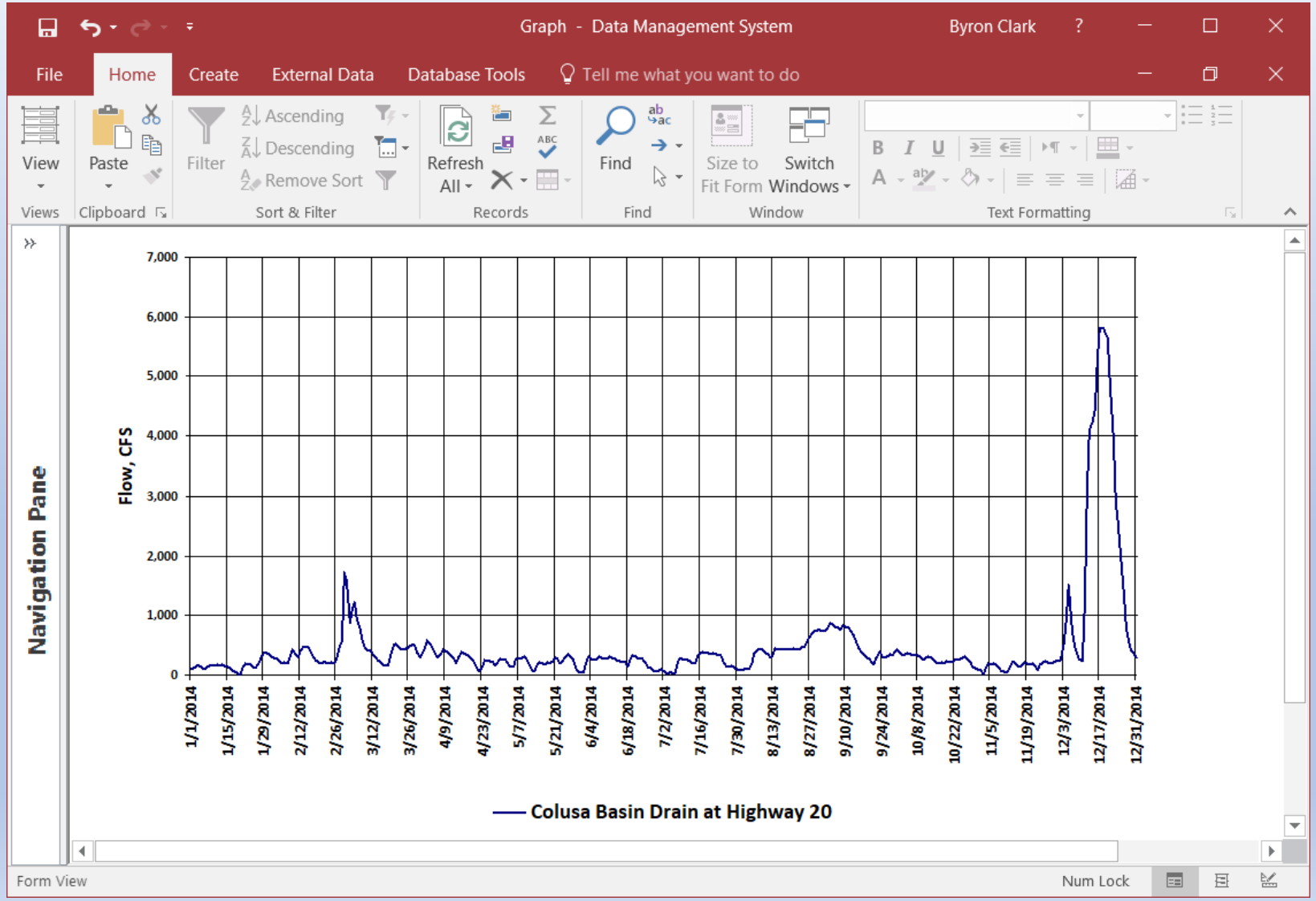
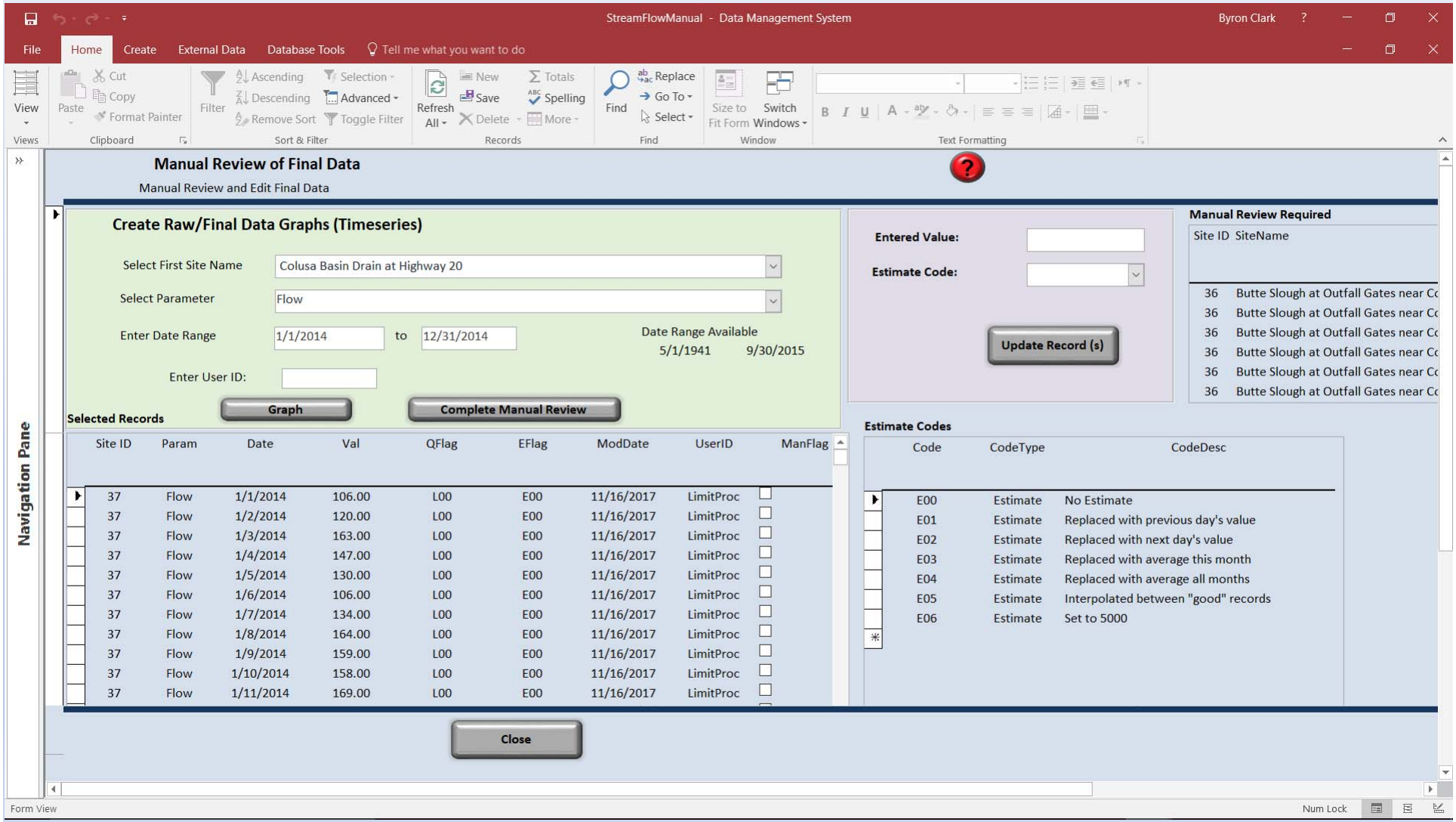
26	Flow	0.00	14,800.00	1/1/1920	9/29/1934	5386	1/1/1900	12/31/2999	☑	Raw
32	Flow	0.00	60,000.00	4/11/1921	11/2/2017	35270	1/1/1900	12/31/2008	☐	Raw
32	Flow	0.00	70,000.00	1/1/2009	11/2/2017	3228	1/1/2009	12/31/2999	☑	Raw
33	Flow	0.00	180,000.00	10/1/1938	9/30/2015	28124	1/1/1900	12/31/2999	☑	Raw

Record: 1 of 27 Unfiltered Search

Visual Review of Raw Data



Automated and Manual Data QC

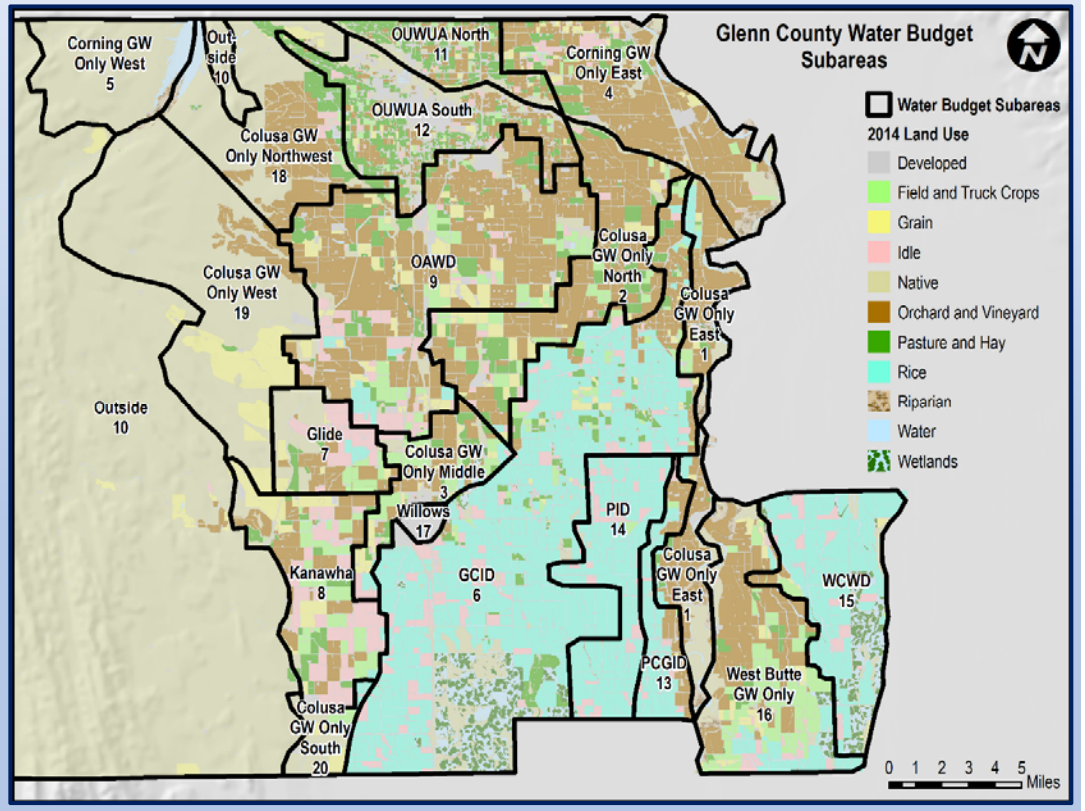


Reporting

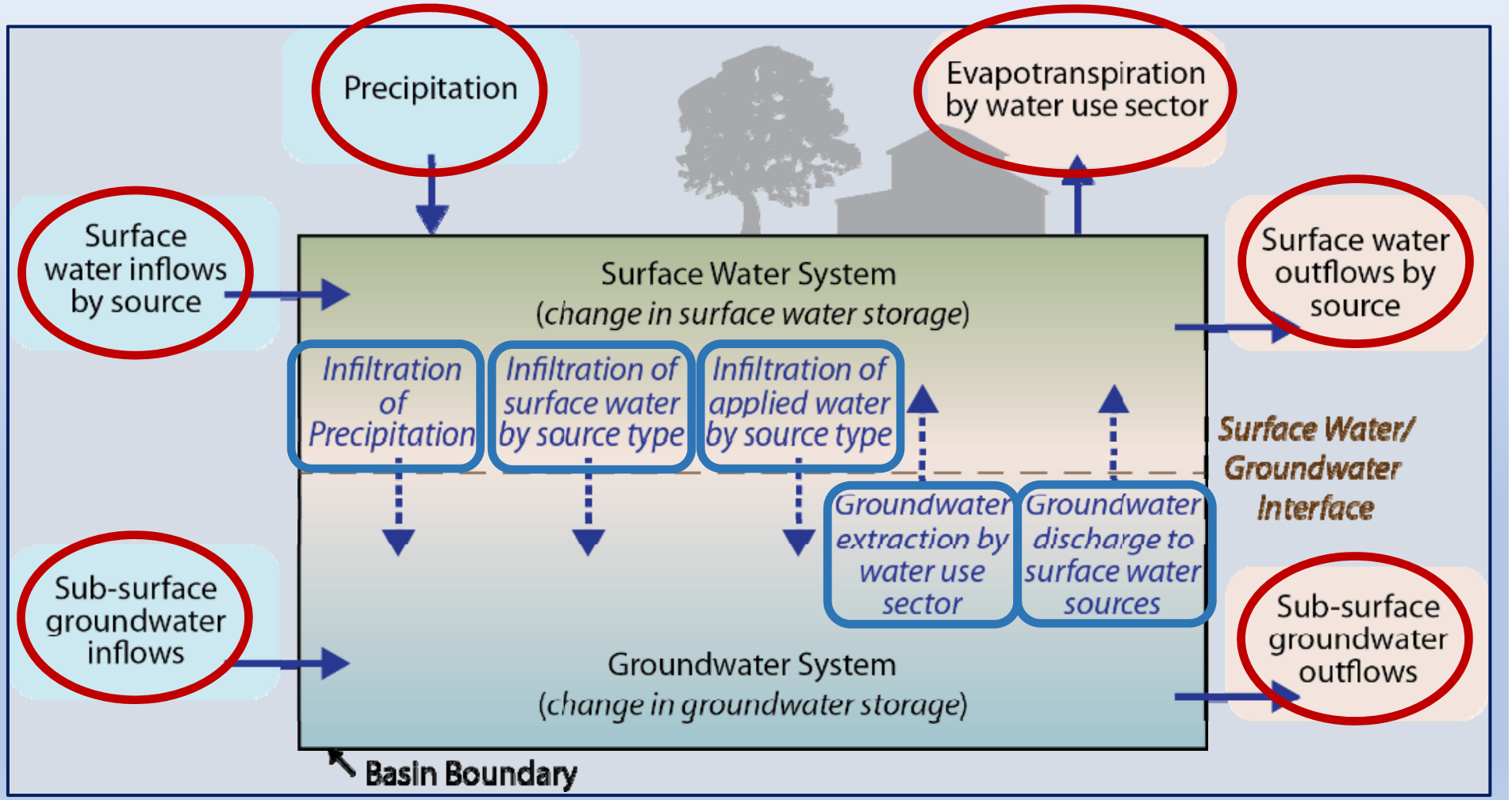
- Currently under development
- Focus on high priority, near-term needs

Water Budget

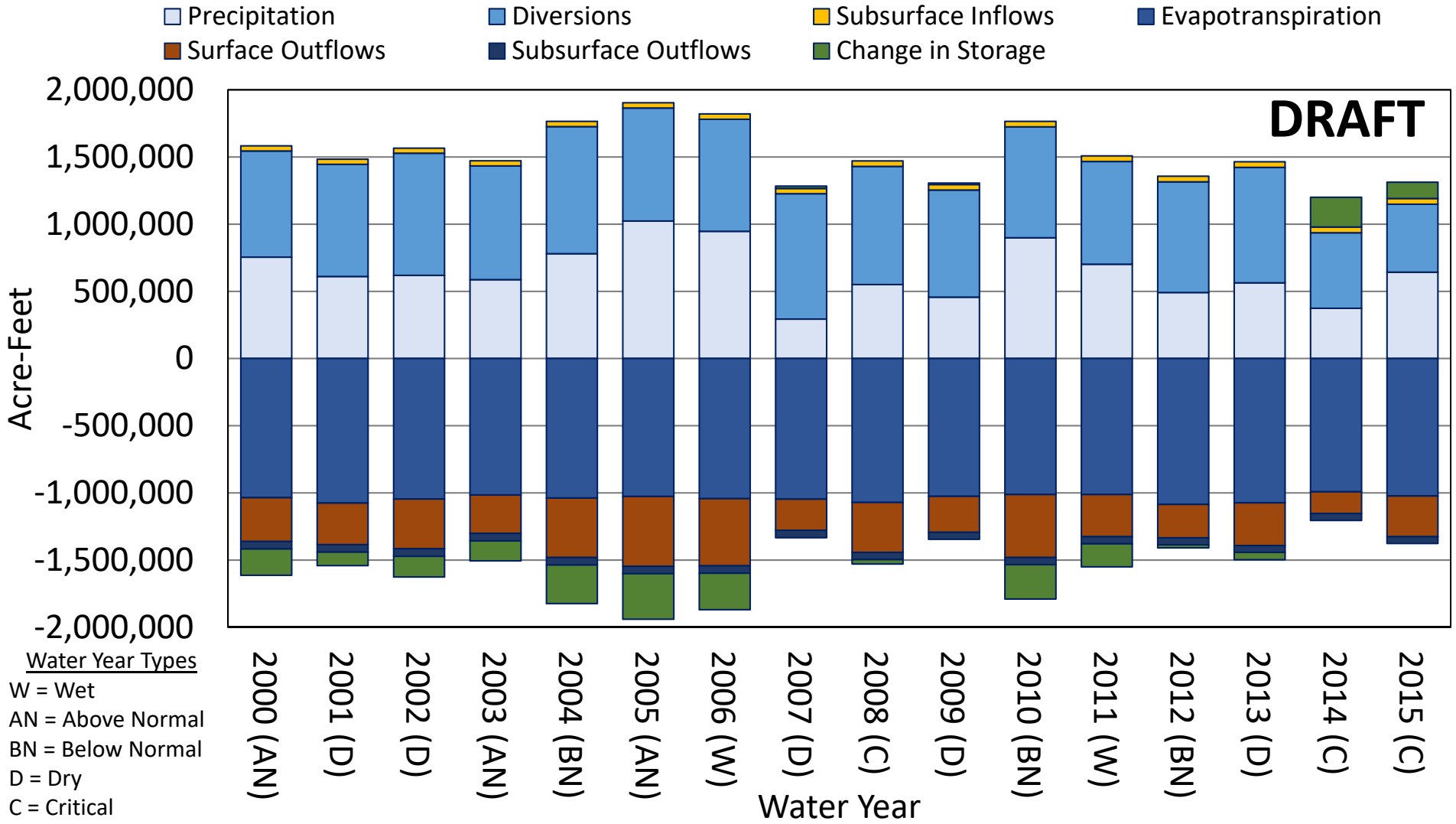
- Explicitly required for GSP
- Monthly and annual accounting of inflows, outflows, and change in storage
- Just like a checking account
  - Deposits – Withdrawals = Balance Change
- Grounded in data
  - Ag WMPs
  - Urban WMPs
  - DWR datasets



Water Budget Required Components

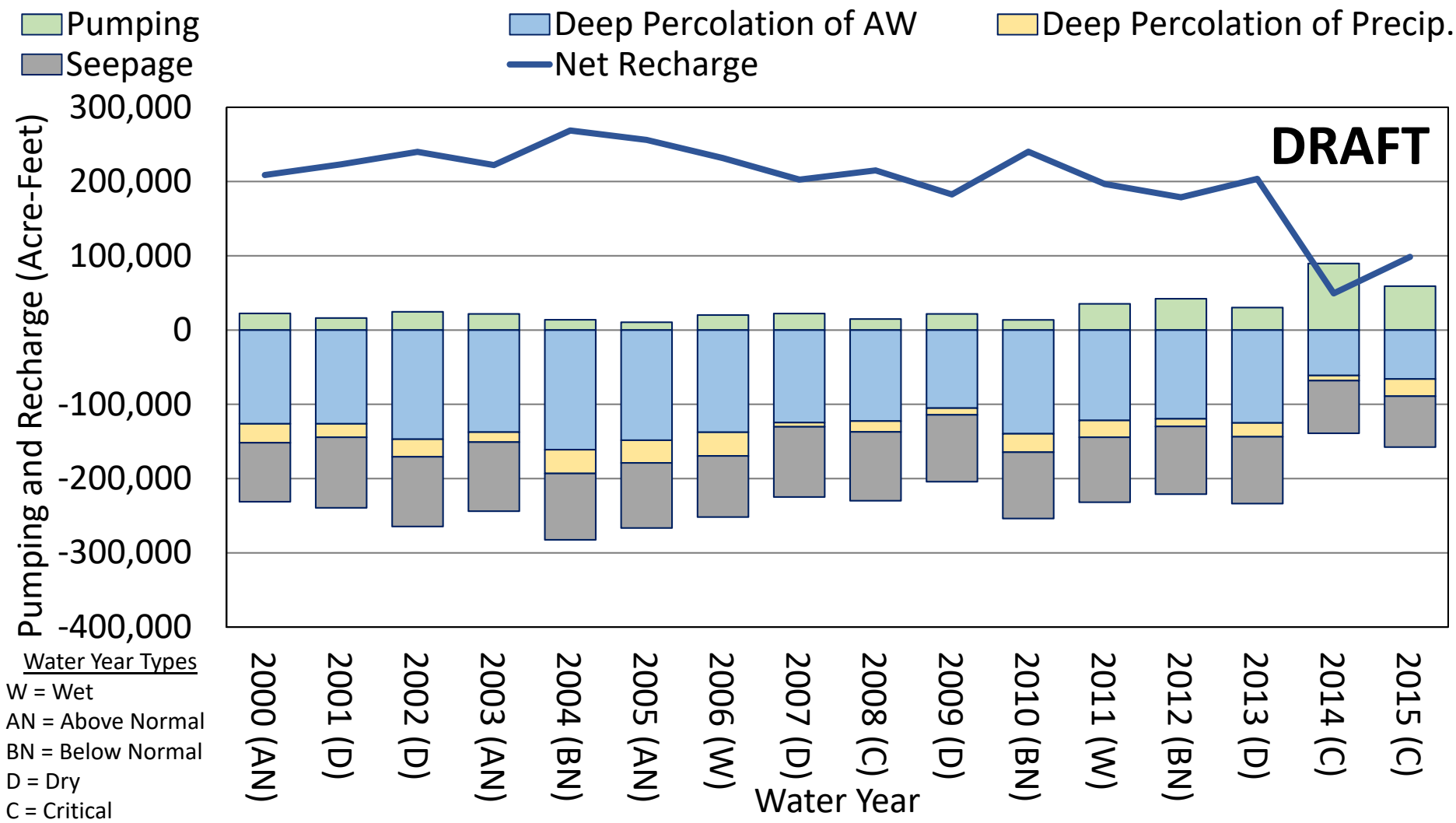


Glenn County Boundary Water Budget (399,000 acres)



Water Year Types
W = Wet
AN = Above Normal
BN = Below Normal
D = Dry
C = Critical

Net Recharge: Surface Water Areas (145,000 acres)



Water Year Types
W = Wet
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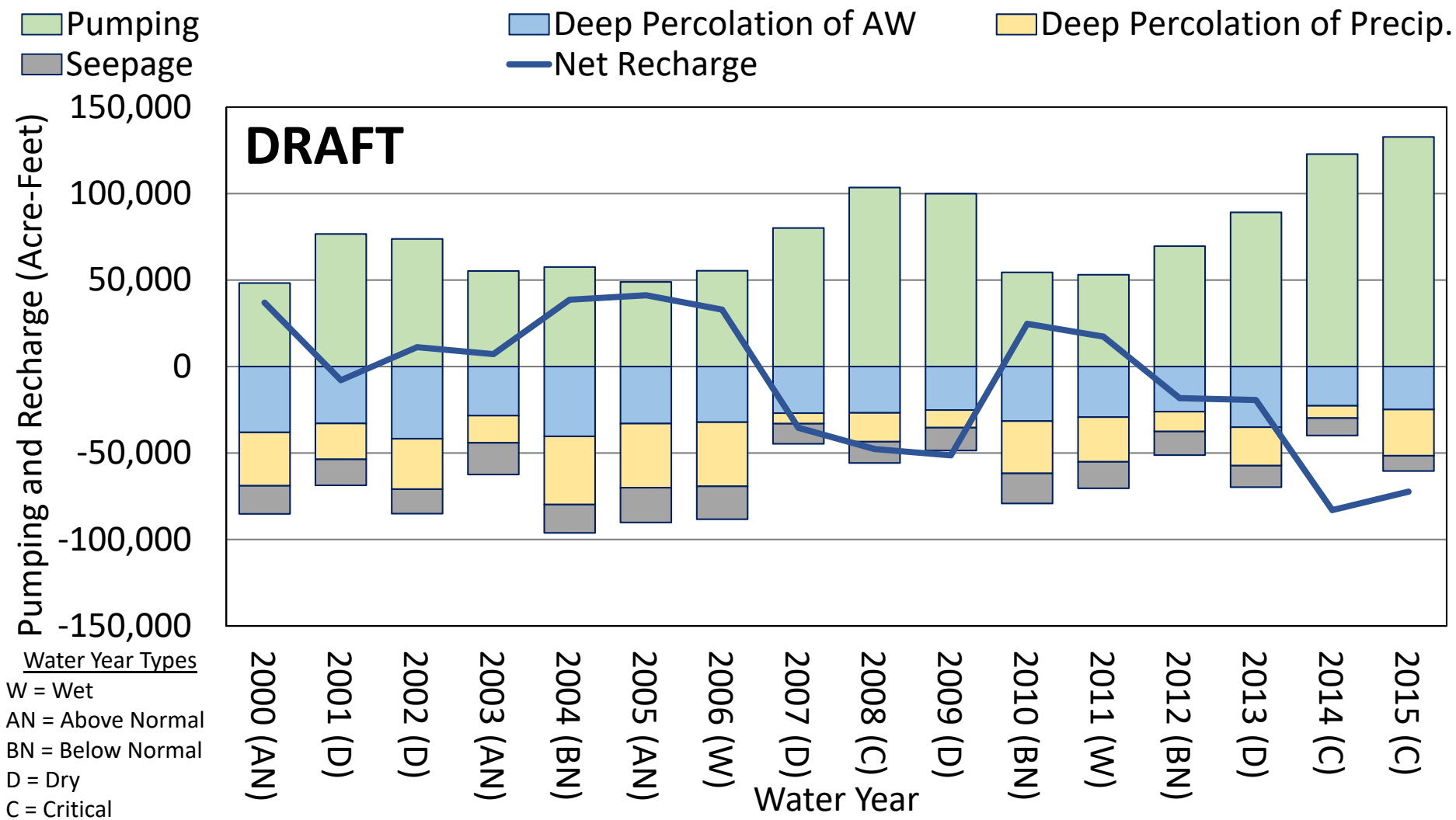
Net Recharge:
Mixed Supply Areas (77,000 acres)



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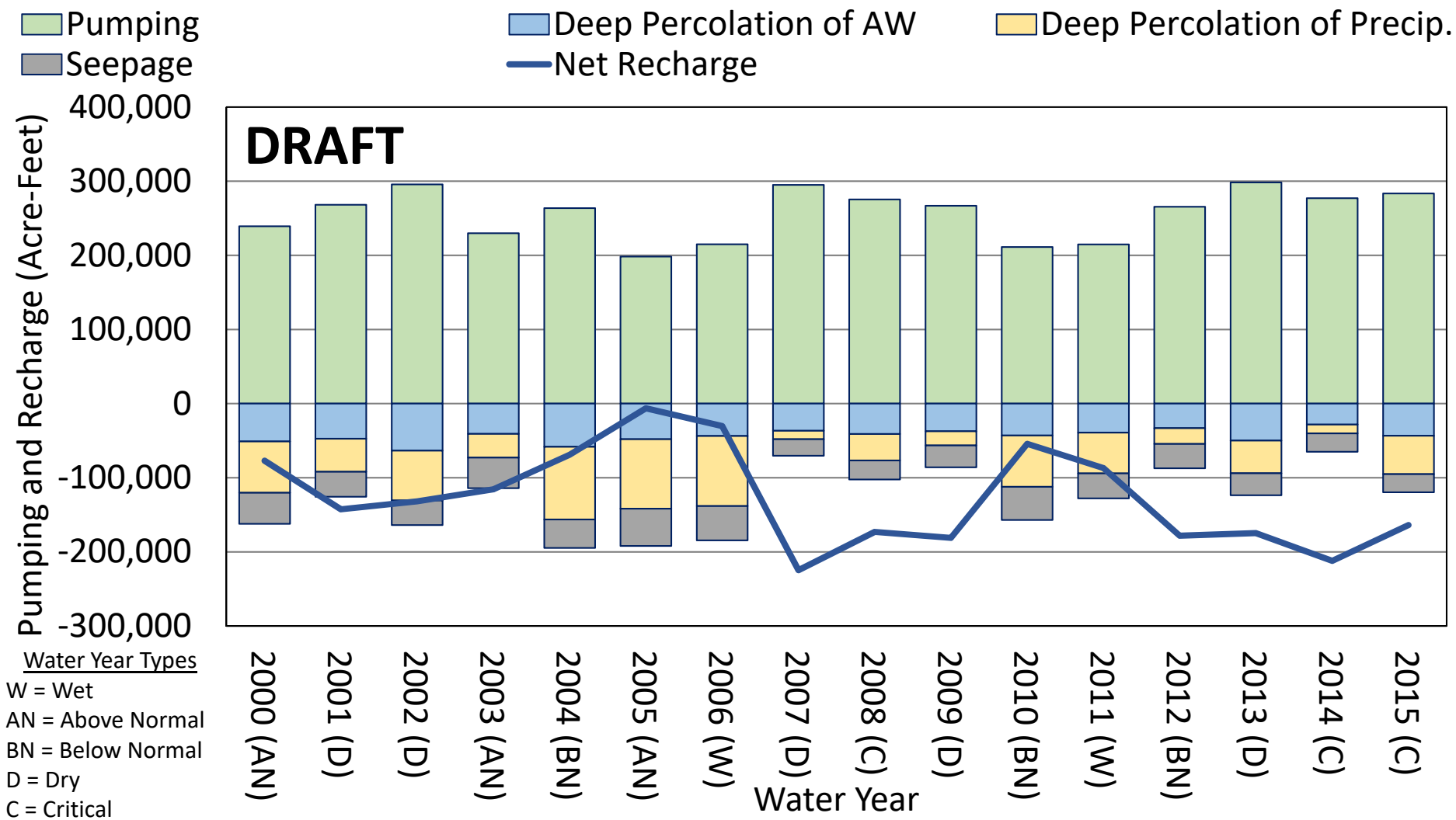
Net Recharge: Groundwater Only Areas (177,000 acres)



Water Year Types
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Next Steps

- Prepare draft deliverables
- Review with GGA staff and others as designated in early 2018
- Finalize prior to deadline

Discussion