Napa County Groundwater Resources: Overview of Studies & Monitoring Plan 2012

presentation for

Napa County Groundwater Resources Advisory Committee

WICC

by

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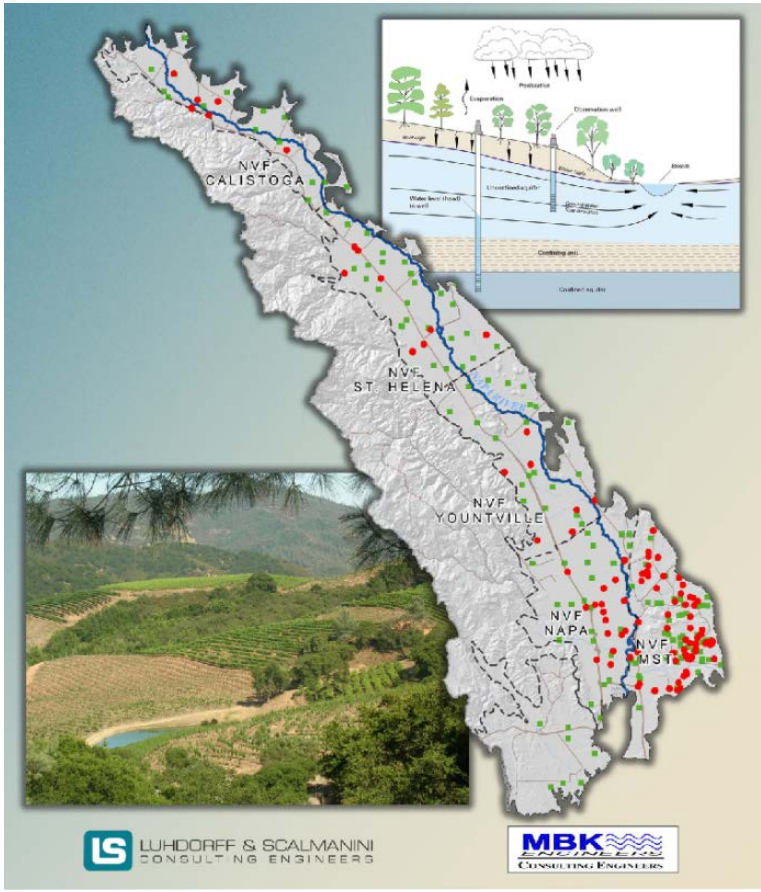
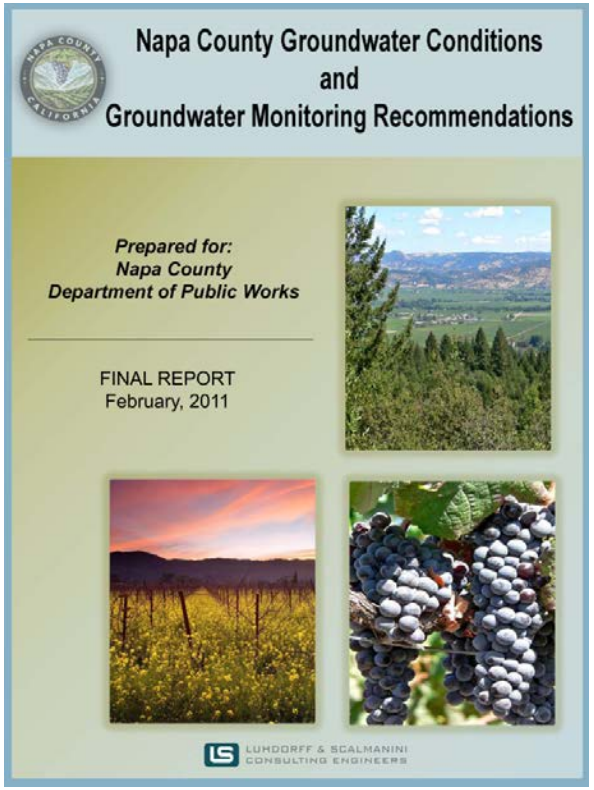
Presentation Overview

- Key Recent Groundwater Studies and CASGEM Program (2009-2011)
- Study Recommendations and Data Gaps
- Hydrogeologic Conceptualization & Characterization (2012)
- GW Monitoring Plan 2012



Napa Co. Comprehensive GW Monitoring Program

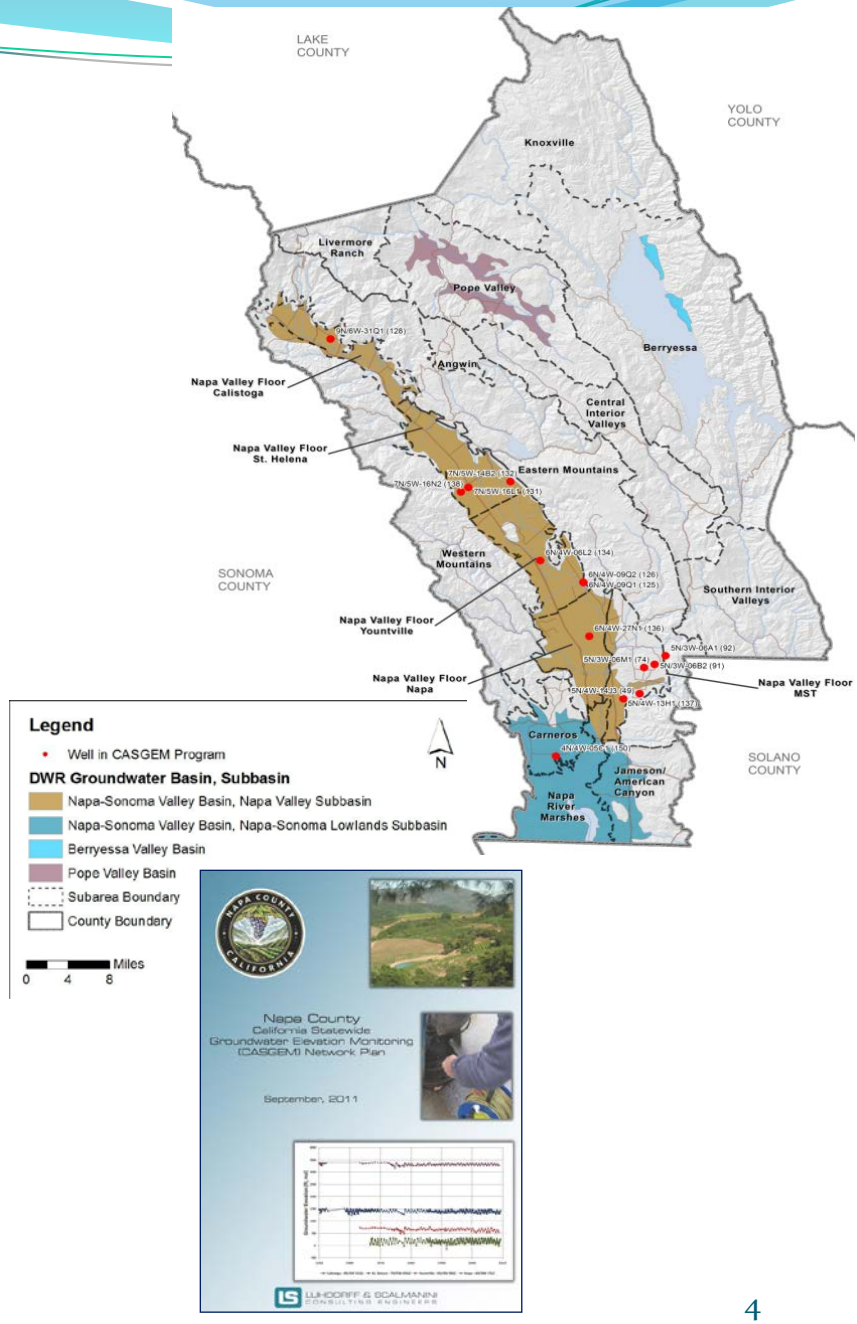
- Data Management System (DMS)
  [Task 1 TM]
- Evaluation of Data
  [Task 2 TM]
- Evaluation of County GW Model
  [Task 3.2 TM]
- Guidance on Precipitation & Streamflow Monitoring
  [Task 3.3 TM]
- Napa County GW Conditions
  [Task 4, Report]
- GW Planning Considerations & Ordinance & Permit Process
  [Task 5 TM]
- Executive Summary



Available on Napa County web site at:
http://www.countyofnapa.org/bos/grac

CASGEM Network Plan (2011)

- Provide representative GW conditions in Napa County GW basins, subbasins, and/or subareas
- Provide systematic GW elevations to demonstrate seasonal & long-term trends
- Subset of overall countywide monitoring program
- 14 wells in initial program; increased to 19 (as of 6/12)



Study Recommendations & Data Gaps

Broad Criteria Identifying Countywide Monitoring Needs

- Some Subareas sparse Level and/or Quality data (and/or lack of info related to measured well)
- Subareas where population/ag or other GW demands are relatively greater
- Improved overall spatial (horizontal and vertical) distribution
- Improve understanding of SW/GW interrelationships

Updated Conceptualization & Characterization of Hydrogeologic Conditions in Napa County

Project Overview/Work by LSCE & MBK

Task 1: Updated hydrogeologic conceptualization and characterization for priority areas

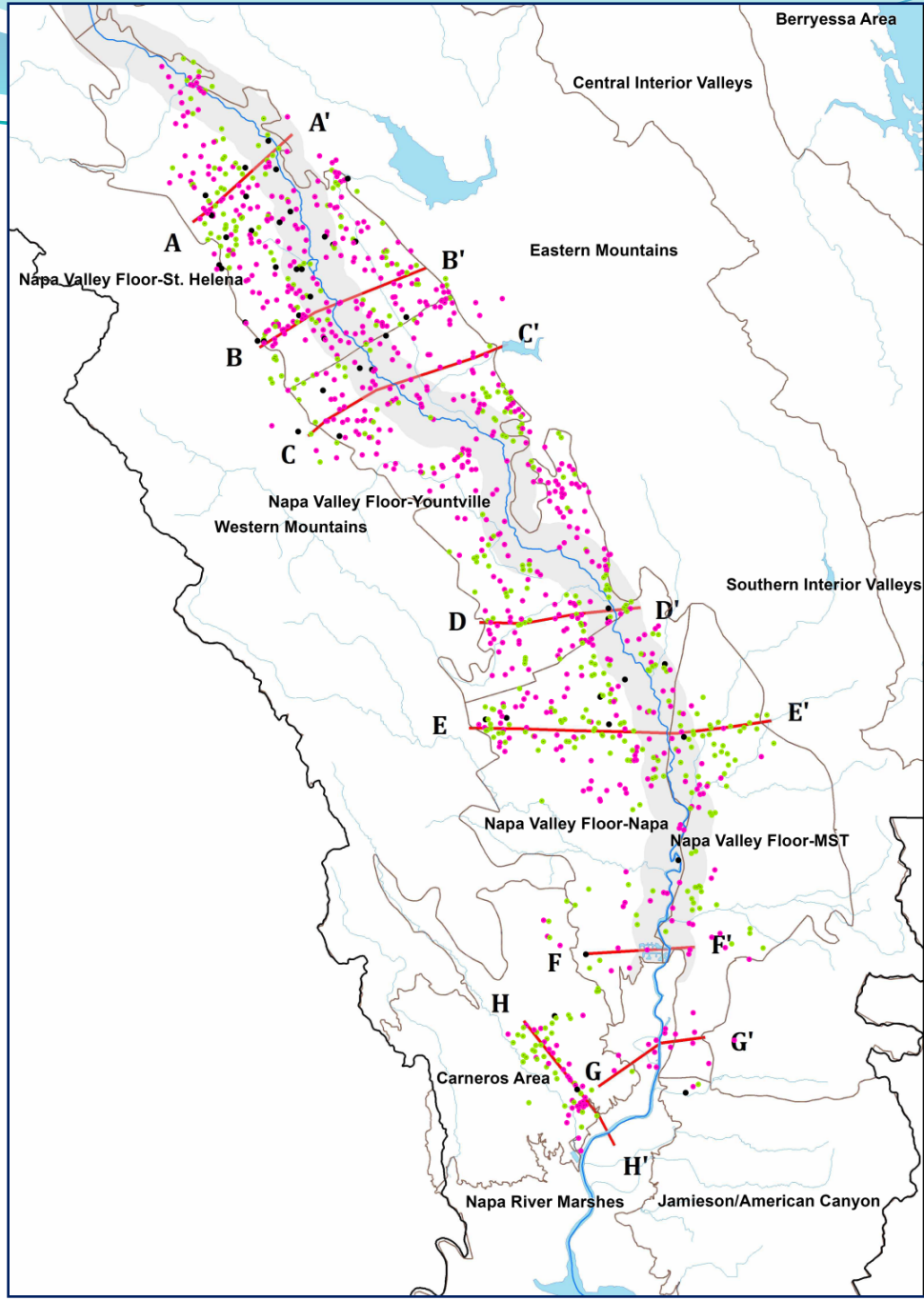
Task 2: ID supplemental GW monitoring wells for high priority areas

Task 3: Refine and further characterize areas with greatest recharge potential

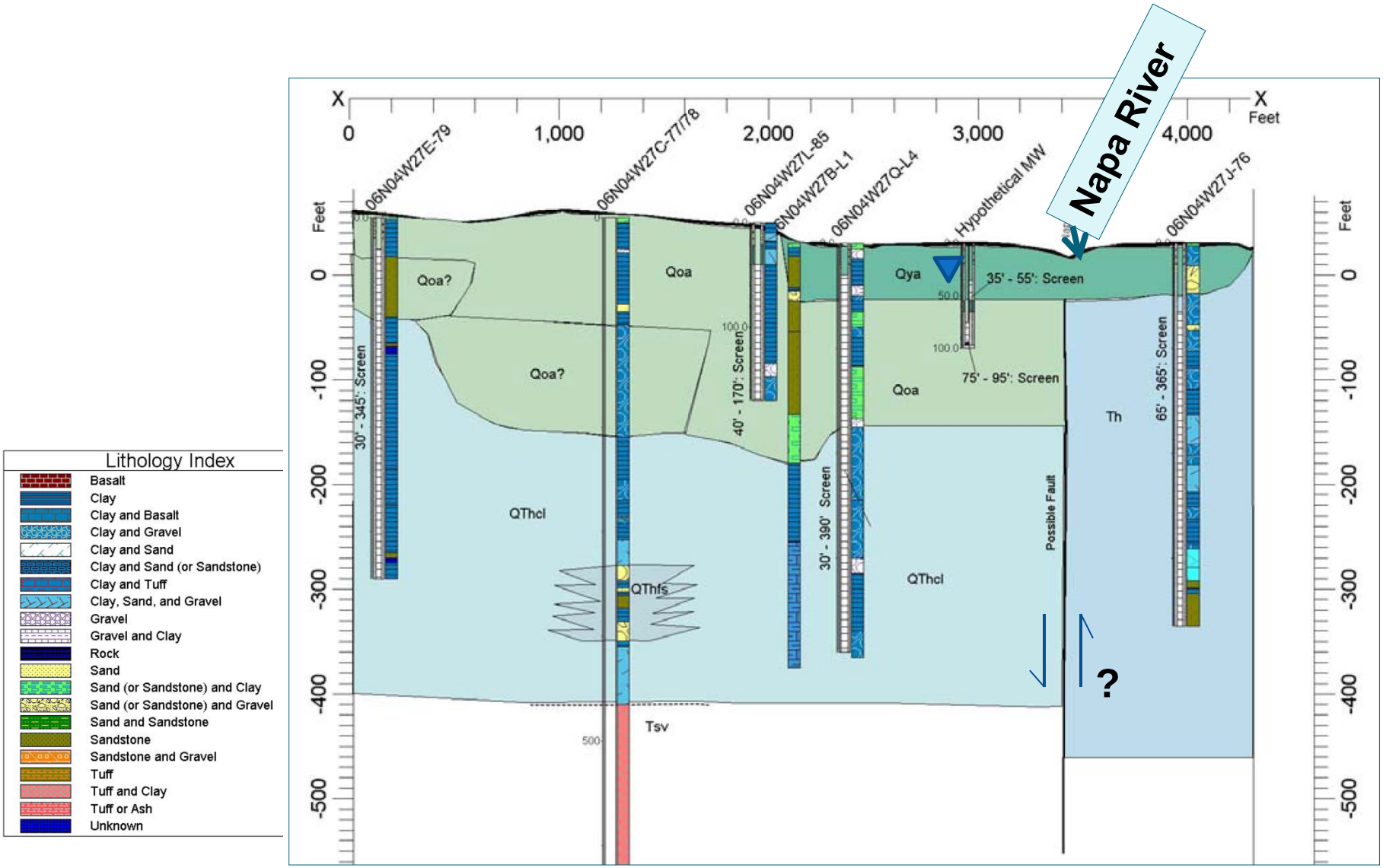
Task 4: Guidance for CEQA-related issues and analysis of SW/GW interactions

Task 1: Geologic Data and Cross Sections

- **Update with decades of geologic data**
- **1087 drillers' reports reviewed**
  - 632 Domestic
  - 409 Irrigation wells
  - Other (undesignated well type and/or testholes)

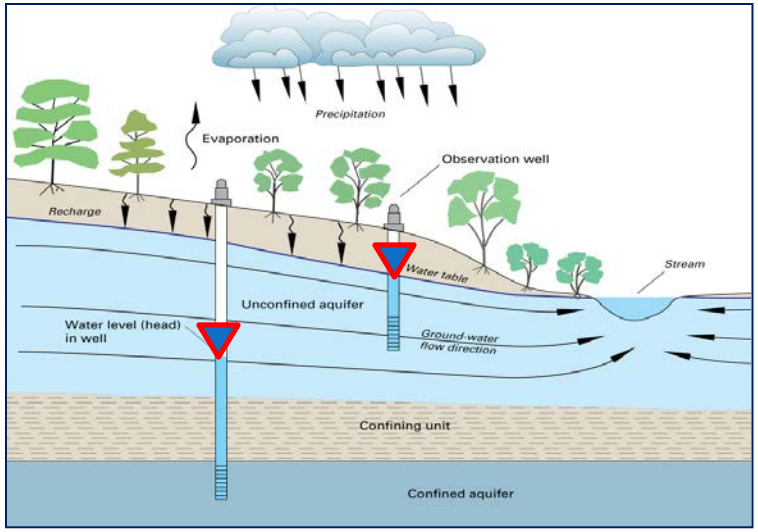


Geologic Cross Section E-E' (excerpt)

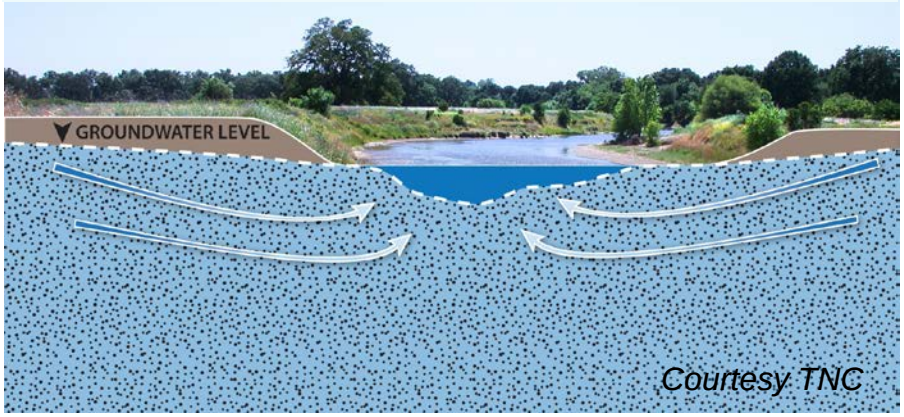


Task 2: Example of Groundwater Level Monitoring Objective

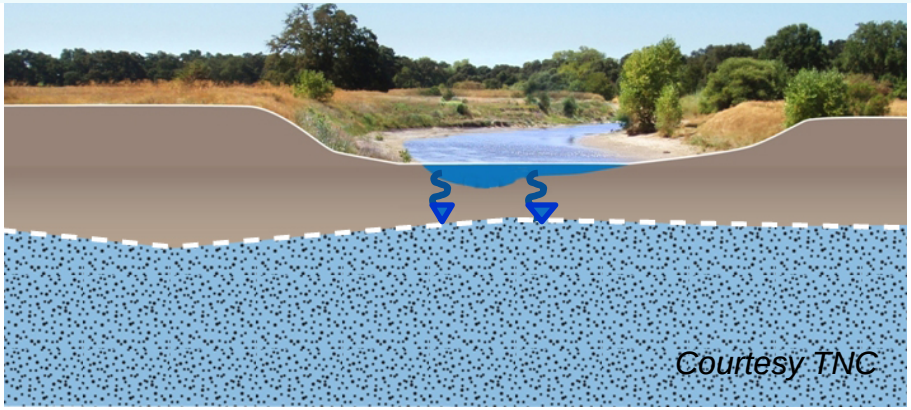
Further evaluate SW-GW interaction



Direct Connection Maintains/Recharges Stream

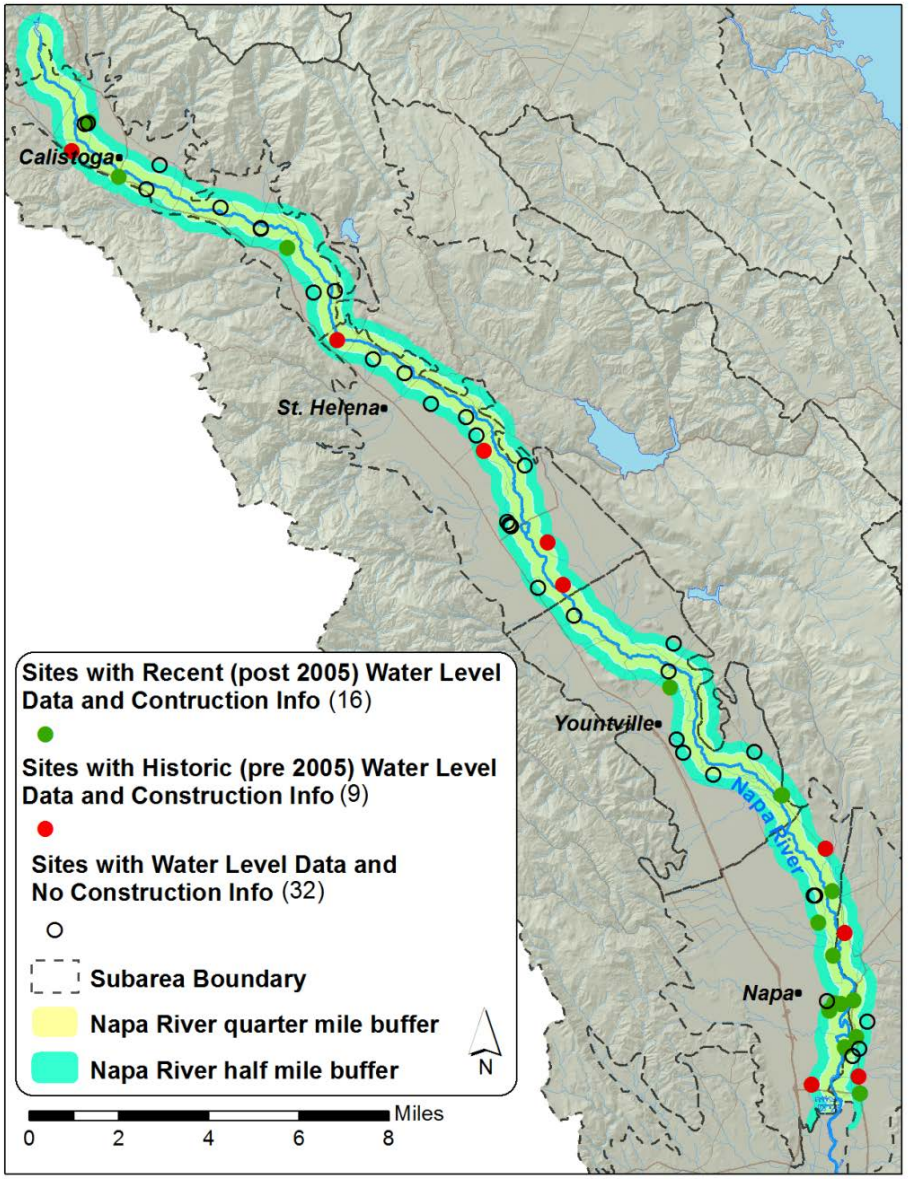


Indirect Connection Stream Seepage Independent of GW Levels



Task 2 - Connecting wells with WL Data to Well Construction Data

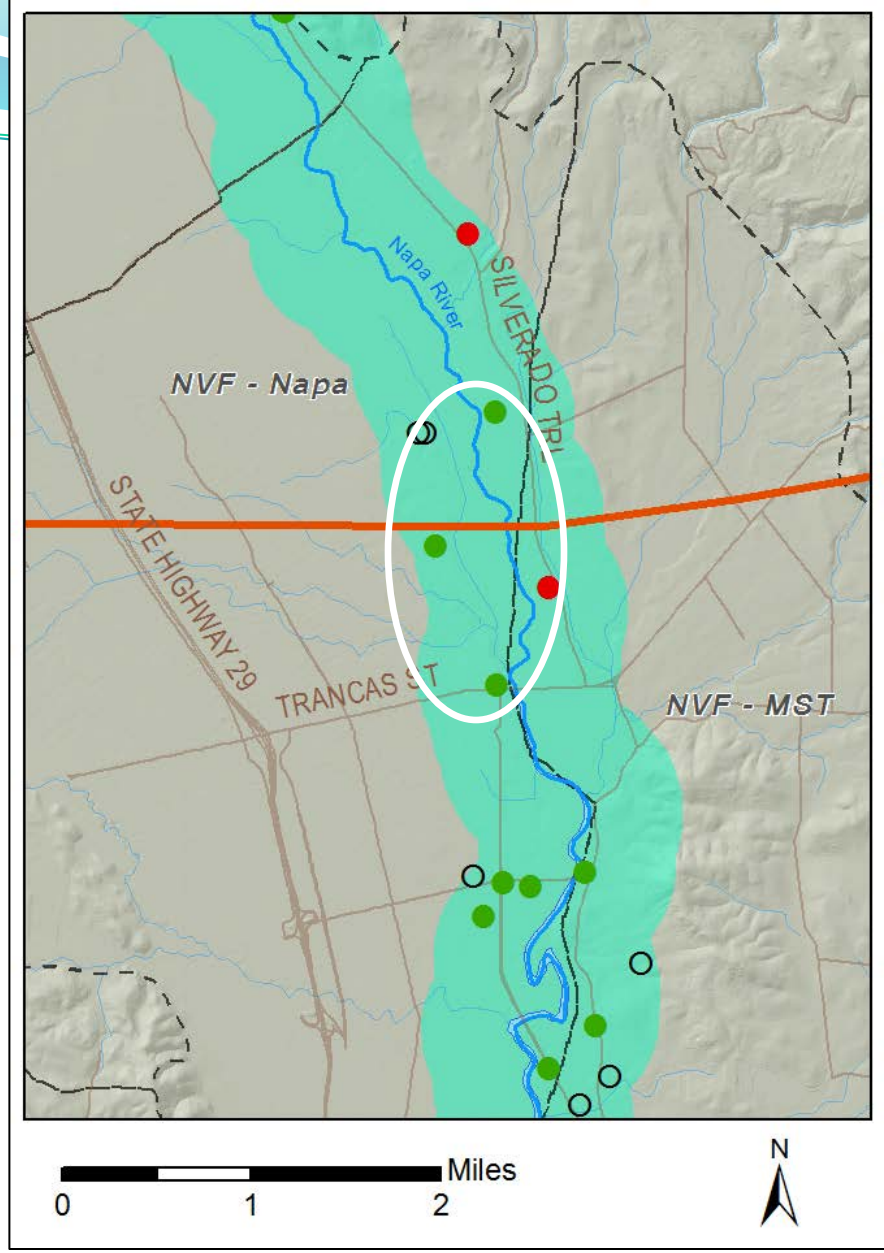
	¼ mile buffer	½ mile buffer
Non-Geotracker sites with WL data and Driller's Log	**6**	**16**
Geotracker sites with WL data and Driller's Log	**6**	**9**



Critical to Understand GW Levels and Quality Relative to Well Construction and the Aquifer System.

Task 2 – NVF Napa: Comparing WL Data and Well Construction

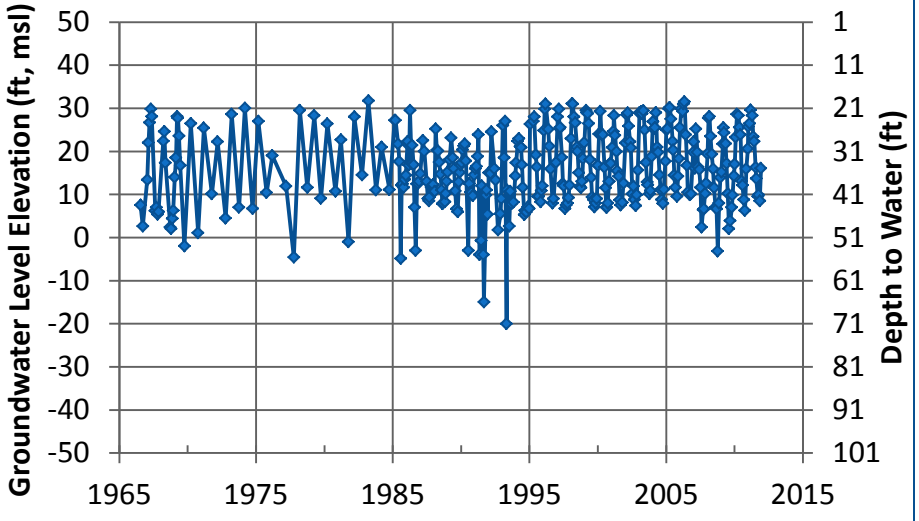
- Sites with Recent (post 2005) water level data and construction info
- Sites with Historical (pre 2005) water level data and construction info
- Sites with water level data and no construction info



06N/04W-27L2

Perforated Interval = **60' - 120'**

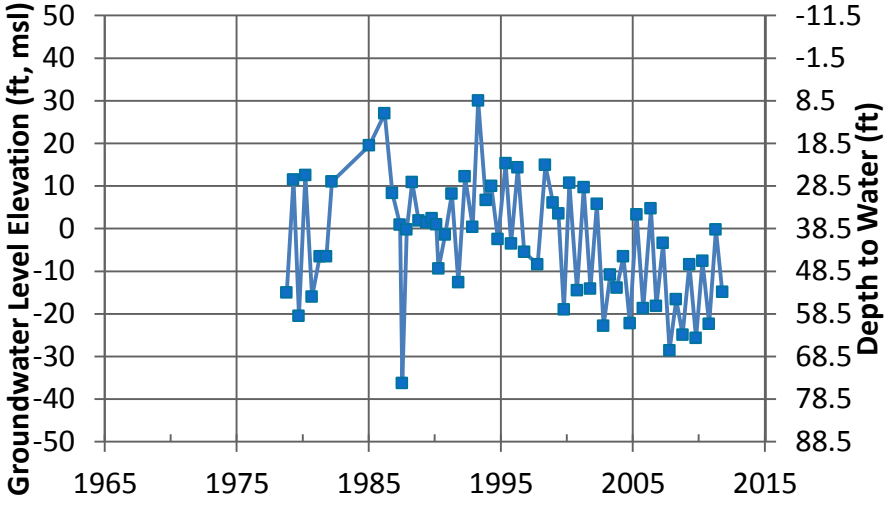
Source: **DWR**
RPE: **51', msl**



NapaCounty-75

Perforated Interval = **45'-205'**

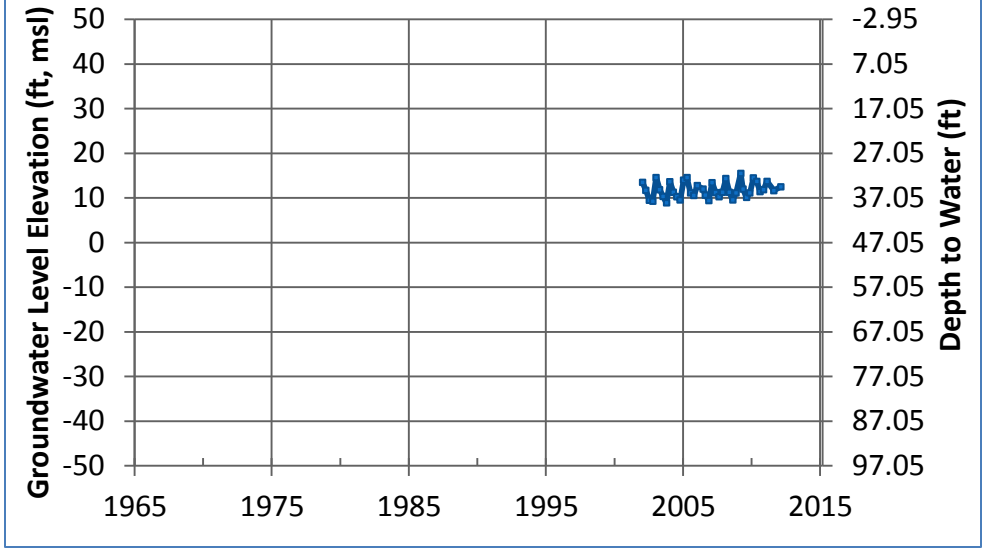
Source: **Napa County**
RPE: **38.5', msl**

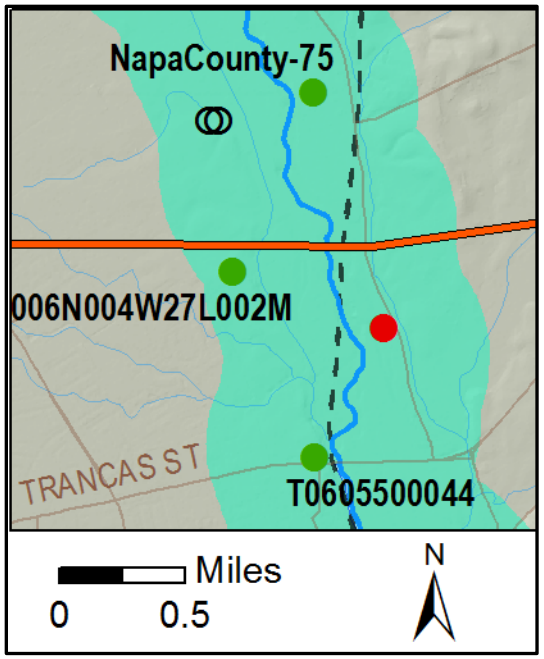


T0605500044 MW-16

Perforated Interval = **42' - 47'**

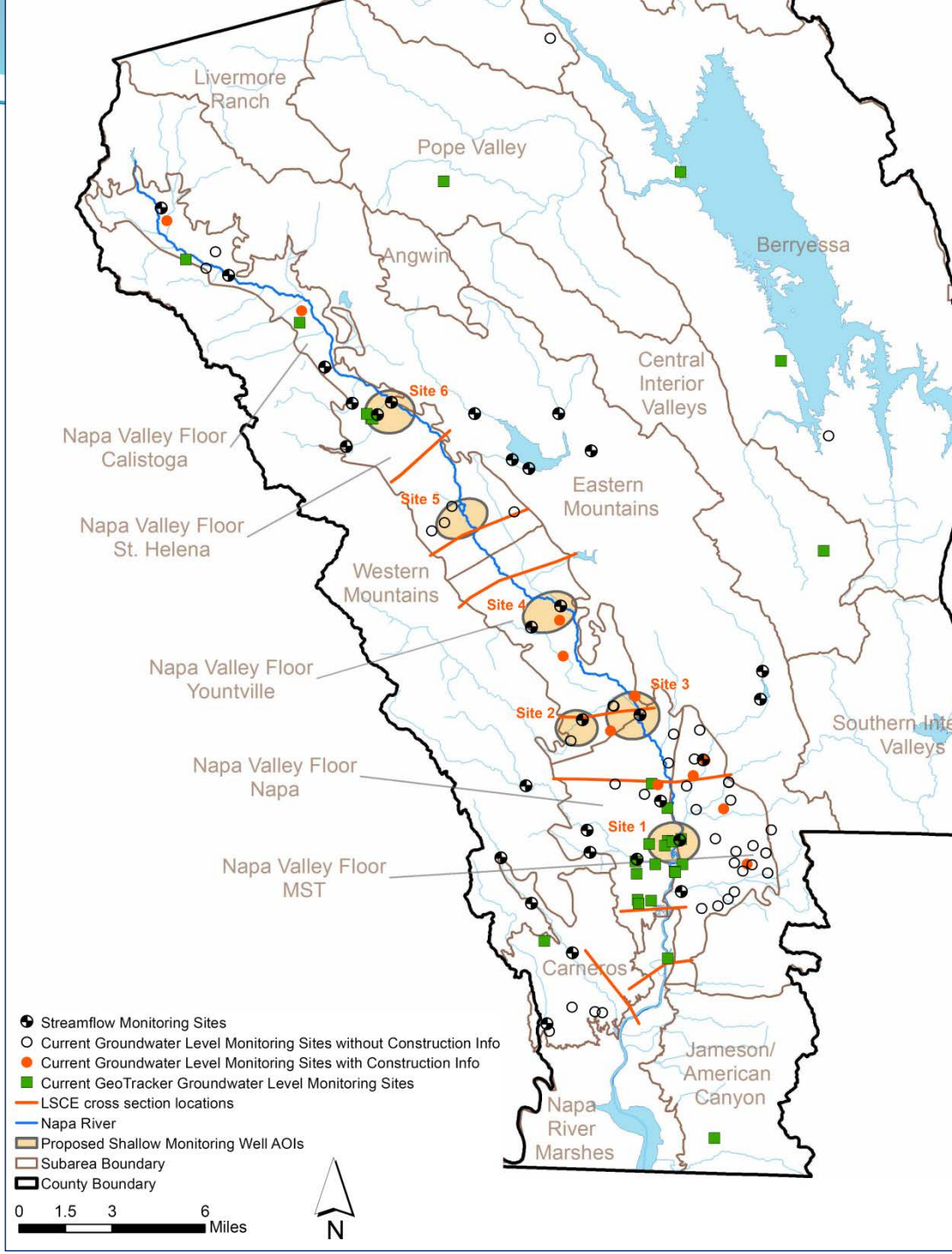
Source: **GeoTracker**
RPE: **47.05', msl**





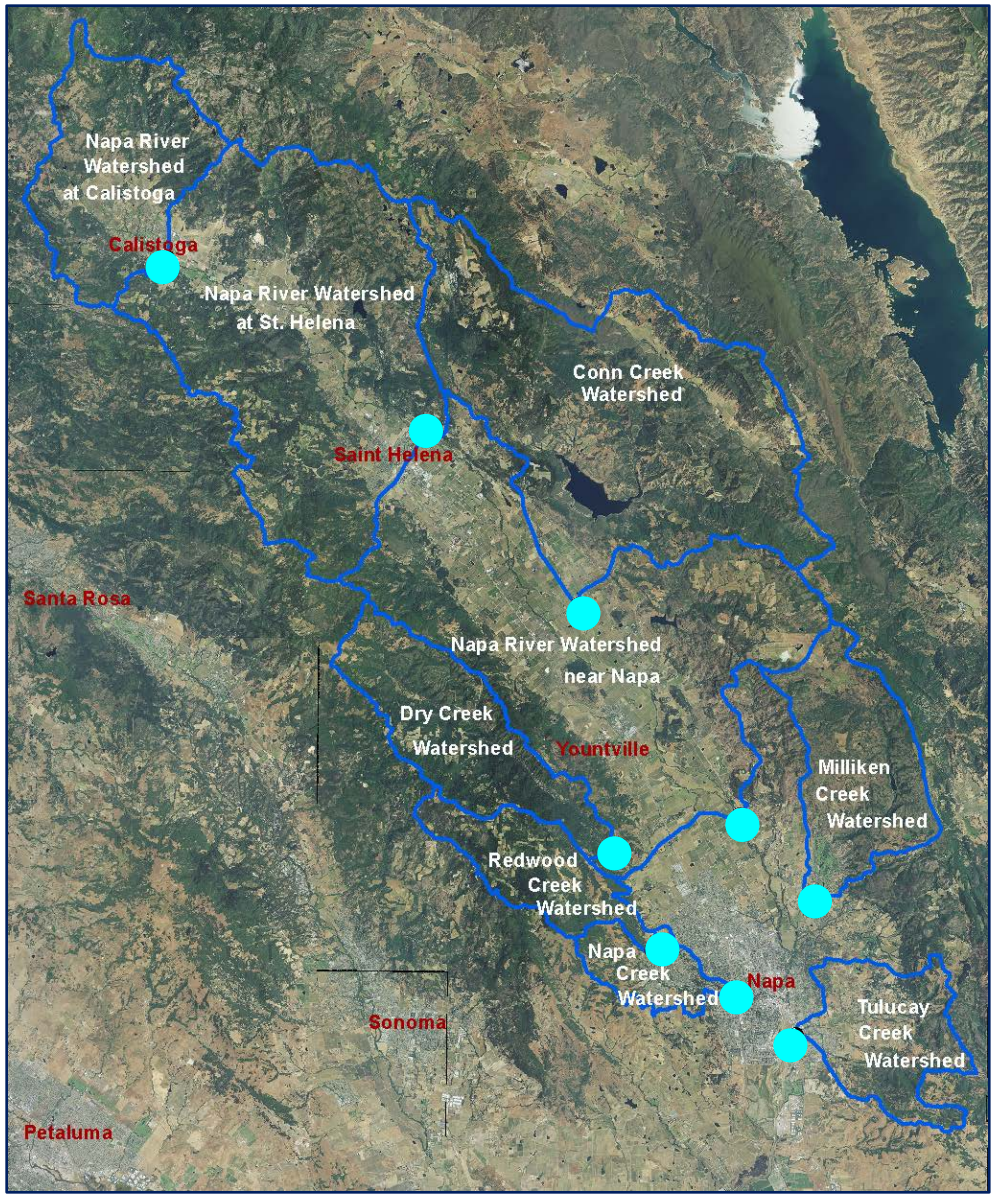
SW/GW Related Recommendations

- Build on 2012 hydrogeologic conceptualization
- Examine SW-GW interrelationships
- Near streamflow monitoring sites
- Preferably near MWs with some prior WL record (and w/ well info)



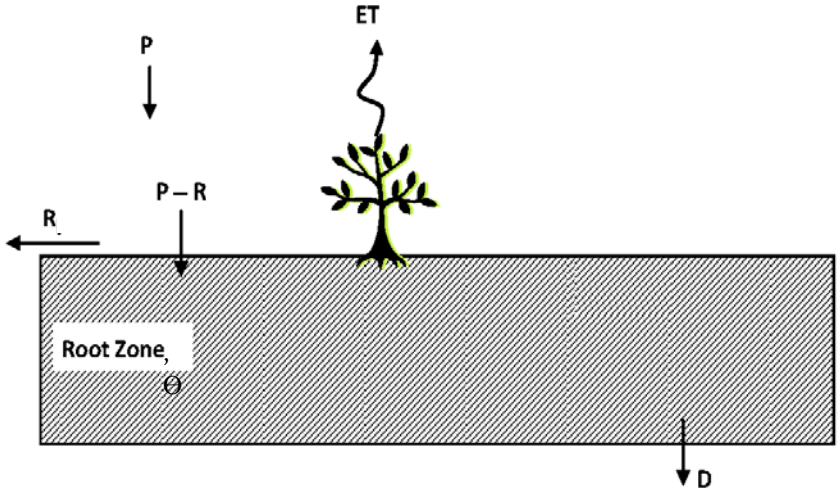
Task 3: Groundwater Recharge Estimate

- Estimate GW recharge with water balance method for nine gauged(●) subwatersheds
- Extrapolate results for Napa River watershed and/or county



Water Balance

- GW recharge estimated with soil moisture model that considers:
  - Precipitation on subwatershed
  - Runoff as the gauged streamflow
  - Infiltration of precip to root-zone soils
  - ET from plants, vines, & trees
  - Soil moisture storage



- Recharge = P – R – ET – change in Θ

Review of Napa County Water Resources Goals

- **Goal CON-12:** Collect info about **status of SW and GW resources** to provide for improved forecasting of future supplies and effective management of the resources in each of the County's watersheds.

- **Action Item CON WR-4:** Implement a **countywide watershed monitoring program** to assess the health of the County's watersheds…

- **Action Item CON WR-8:** County shall **monitor GW/SW interrelationships**, using County-owned MWs and stream and precipitation gauges, data obtained from private property owners on a voluntary basis, data obtained via conditions of approval associated with discretionary projects, data from DWR and other agencies and organizations…

Groundwater Monitoring Plan 2012 Draft Plan Outline:

1: Introduction

2: Hydrogeology of Napa County

- **3: GW Resources Goals and Monitoring Objectives**

4: GW Monitoring Network Design and Development

5: GW Data Management

6: Reporting and Assessment

GW Level and Quality Monitoring Objectives

Overall Objectives

- Monitoring aligned with County water resources goals
- Address data gaps: provide infill, replacement, and/or project-specific monitoring as needed
- Coordinate with other entities on collection and incorporation of GW quality data in the DMS

GW Level Monitoring Objectives

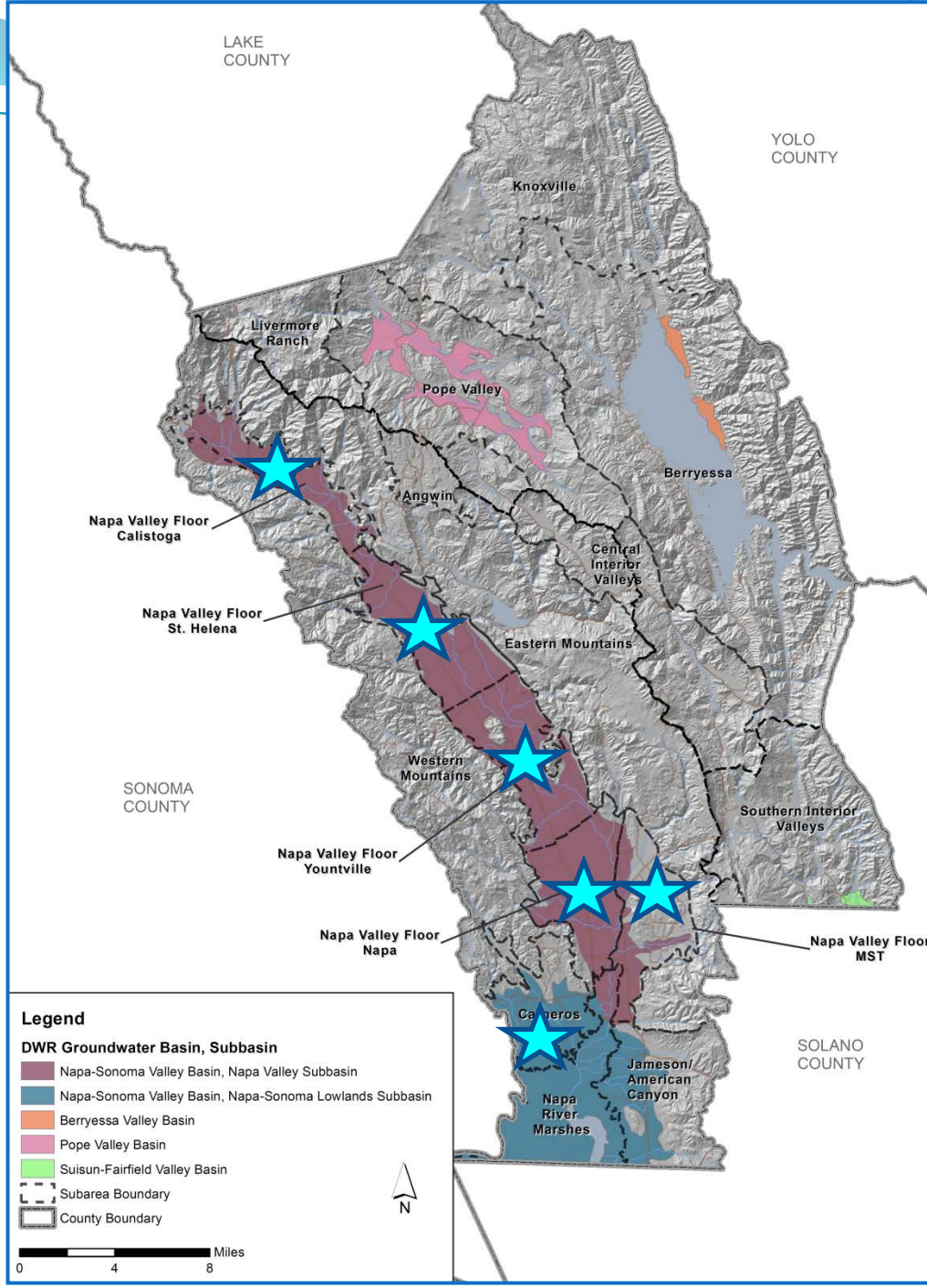
- GW conditions, including local and regional water supply availability & reliability
- GW Budget: refine estimates of **GW inflows** (basin inflows, recharge, rainfall, streamflow, irrigation, …), **GW outflows** (pumping, ET, basin outflow, ...) & **change in GW storage**
- Improve understanding of occurrence & movement of GW, trends, & factors related to trends
- Further evaluate SW-GW interaction

GW Quality Monitoring Objectives

- Evaluate GW quality conditions in Subareas; differences in WQ spatially between areas & vertically within a Subarea
- Assess changes & trends in GW quality, and corresponding factors for changes
- Establish baseline conditions in areas of potential salt water intrusion (e.g., Carneros, Jameson/American Canyon and Napa River Marshes Subareas)
- Detect the occurrence of & factors attributable to natural (e.g., general minerals and trace metals) or other constituents

GW Levels: Priority Subareas

- NVF-Calistoga
- NVF- St. Helena
- NVF- Yountville
- NVF-Napa
- NVF-MST
- Carneros

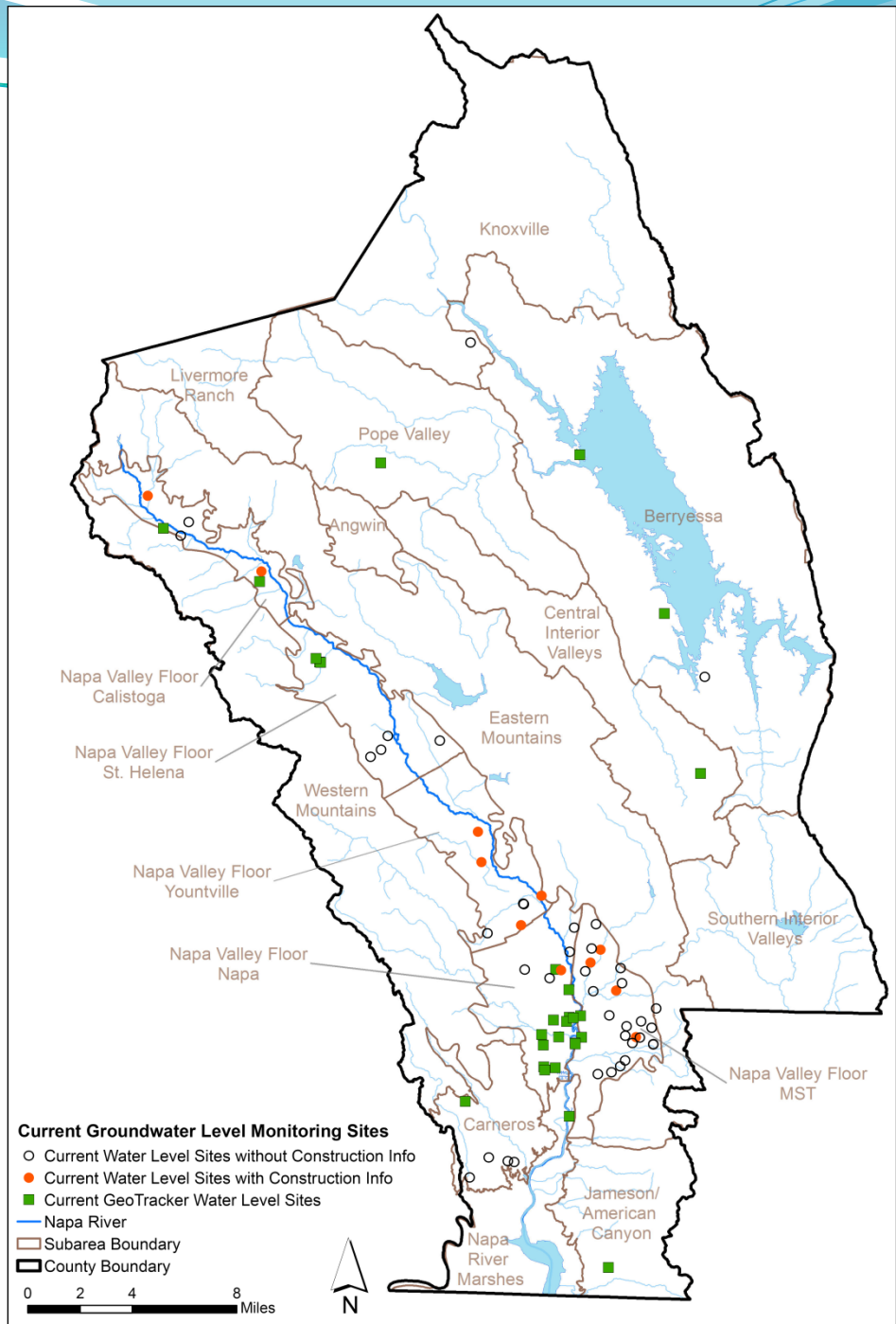


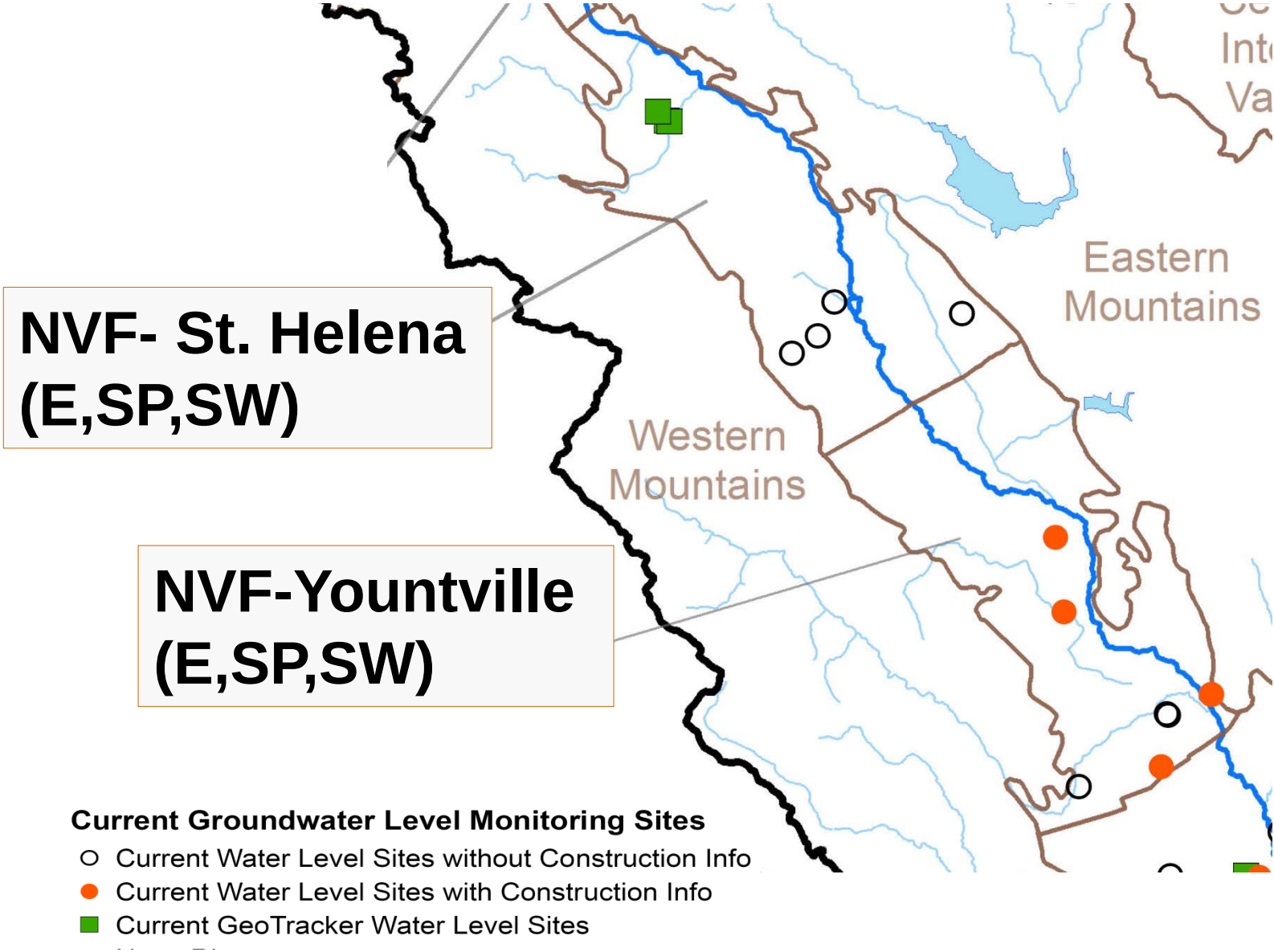
GW Levels: Priority Subareas

- **NVF-Calistoga (E,SP,SW)**
- **NVF- St. Helena (E,SP,SW)**
- **NVF- Yountville (E,SP,SW)**
- **NVF-Napa (R,SP,SW)**
- **NVF-MST (R,SP,SW)**
- **Carneros (E,B)**

79 Current Sites

E= Expand; R= Refine
SP= Spatial Coverage; SW= SW/GW Interaction

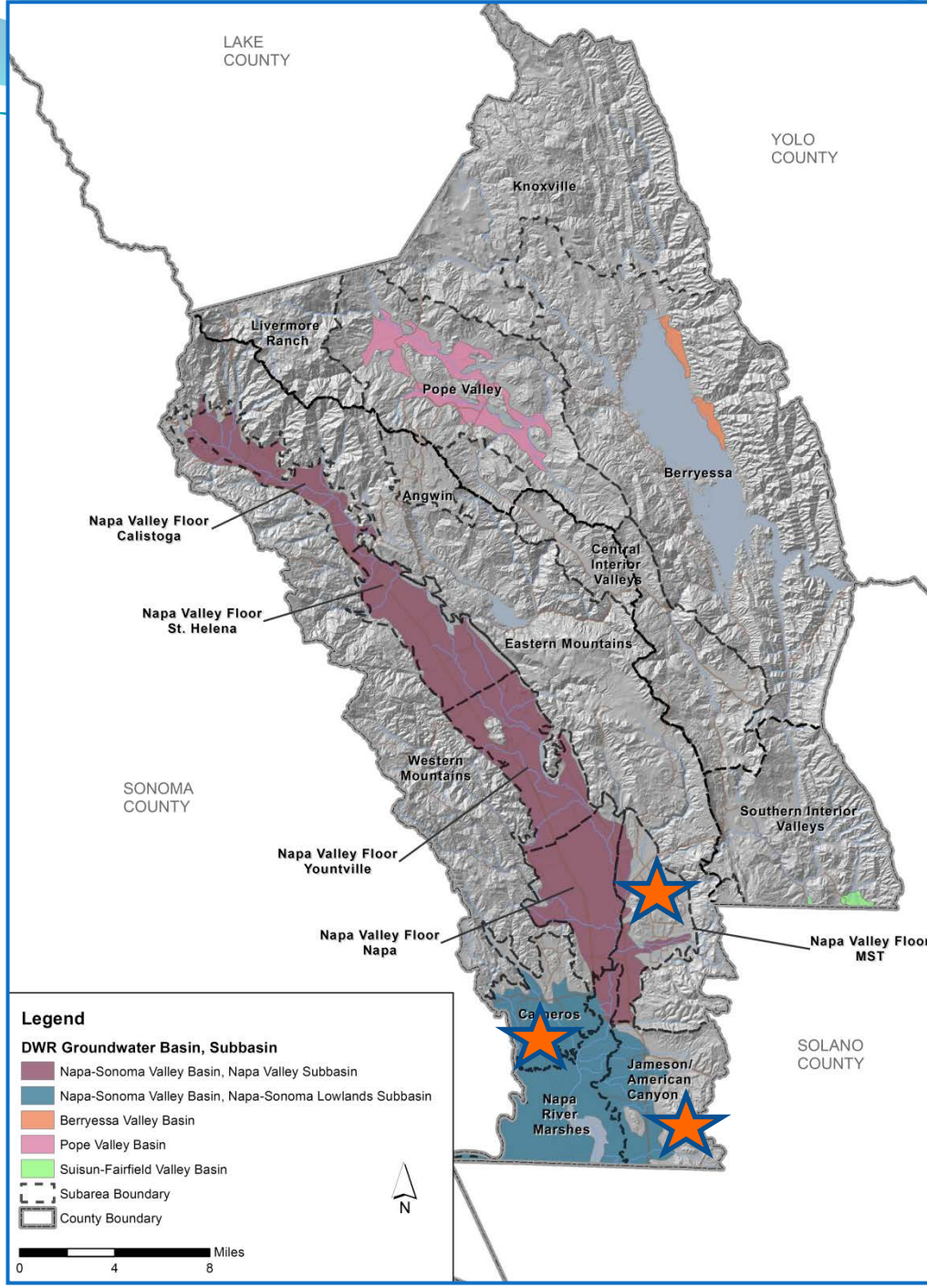




Example Subareas: GW Levels & Data Gaps

GW Quality: Priority Subareas

- NVF-MST
- Carneros
- Jameson/American Canyon



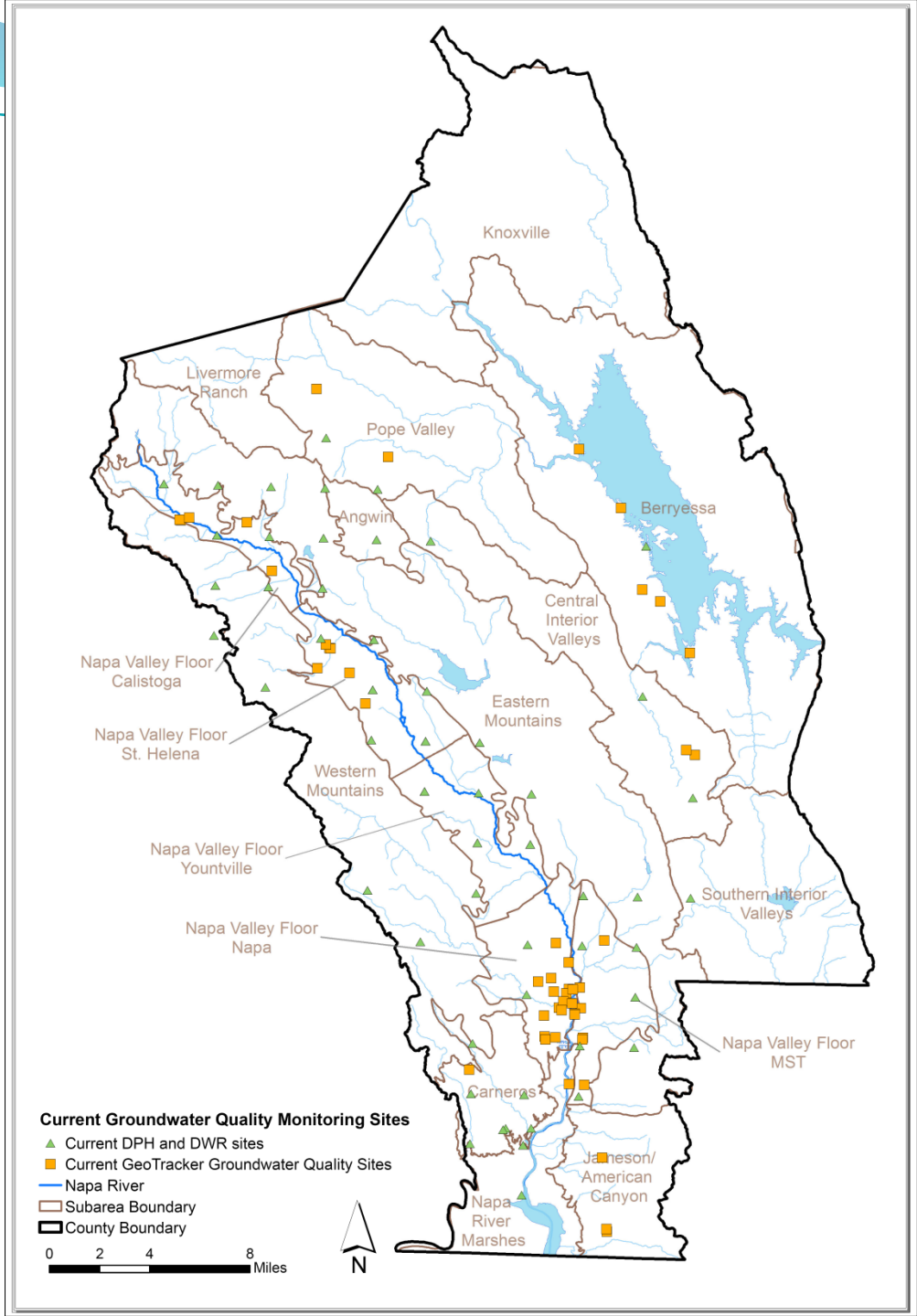
GW Quality: Priority Subareas

- **NVF-MST (R,SP)**
- **Carneros (R, SP)**
- **Jameson/American Canyon (E,B,SP)**

➢ **Coordinate w/GW Level Monitoring**

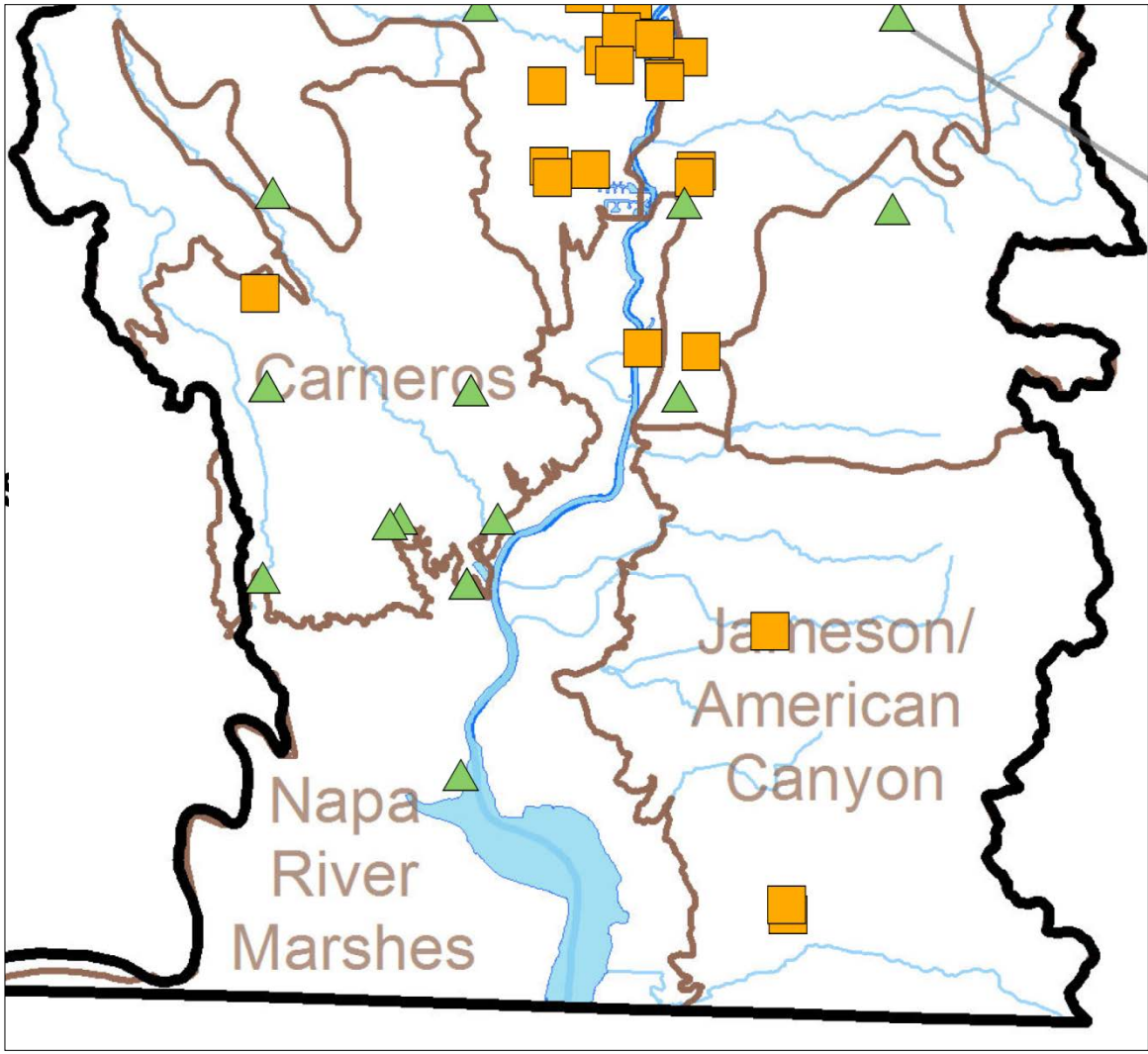
185 Current Sites

E= Expand; R= Refine
SP= Spatial Coverage; B= Baseline



Example Subarea: GW Quality

- Carneros (R, SP)
- Jameson/ American Canyon (E,B,SP)



Napa County Groundwater Program

Next Steps

- Completed Draft of Groundwater Monitoring Plan (August 2012)
- Report on Updated Hydrogeologic Characterization & Conceptualization (Fall 2012), including:
  - Geologic maps and cross sections
  - Recharge area map
  - Groundwater recharge estimate
  - Groundwater level monitoring recommendations

Thank You

Discussion
&
Questions