CMA

Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

February 2021

Stakeholder Workshop

STETSON ENGINEERS INC.

DUDEK

Geosyntec consultants

engineers | scientists | innovators

Housekeeping

- Recording the meeting for the purpose of capturing public feedback
- Recording can be made available upon request
- Opportunities for public feedback and questions throughout the workshop
- Public comments on the GCTM should be submitted to the website:

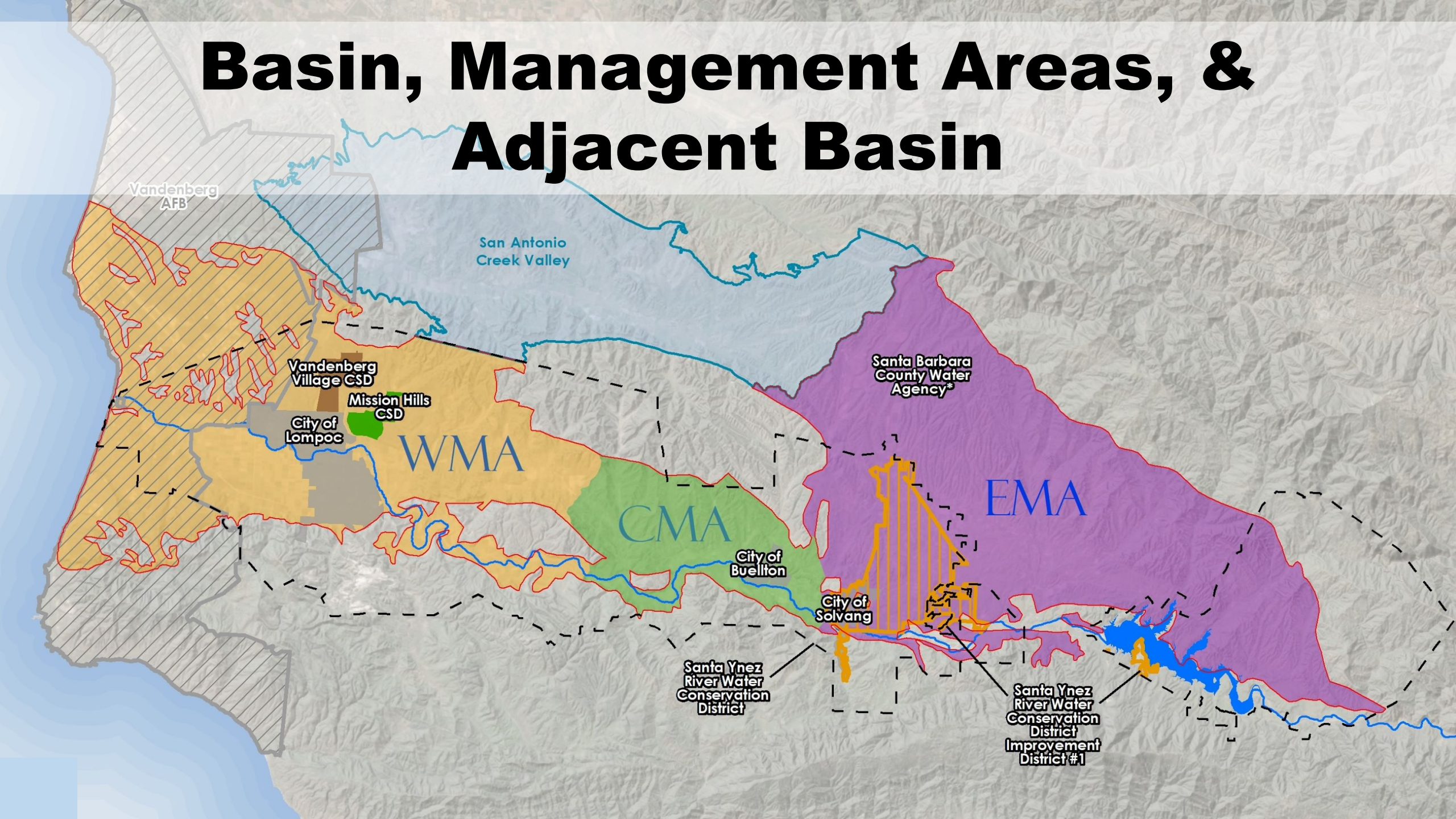
www.santaynezwater.org

- Slide numbers in lower right

Agenda

1. Groundwater Conditions Tech Memo Available for Public Comment
2. Water Budget, Sustainable Yield, Safe Yield, and Overdraft Discussion
3. Groundwater Model Update
4. Way Ahead/ Schedule

Basin, Management Areas, & Adjacent Basin



Groundwater Conditions Technical Memo

Describes the current groundwater conditions within the CMA for sustainability indicators:

- Groundwater Elevations and Hydrographs
- Groundwater Storage
- Groundwater Quality
- Land Subsidence
- Interconnected Surface Water and Groundwater Dependent Ecosystems

- Currently Available for Public Comment; Due by March 19, 2021

Demonstration of Comment Features on Santa Ynez River Groundwater Basin Communications Portal

- https://www.santaynezwater.org/
  - Site for entire Santa Ynez River Valley Groundwater Basin
  - CMA page

Groundwater Conditions Technical Memo

Questions?

Sustainable Yield, “Safe” Yield, and Overdraft Discussion

- Previous Groundwater Management Legislation before SGMA
    - AB3030
- Previous Determinations of Safe Yield and Overdraft in the CMA
    - Buellton Uplands Groundwater Management Plan 1995
    - County of Santa Barbara Groundwater Basins Summary Reports (2019, 2014)
    - Annual Engineering Survey and Report on Water Supply Conditions of the Santa Ynez River Water Conservation District
- SGMA’s Definitions of Sustainable Yield and Overdraft and Process to Determine

AB3030 1992

- 1992: Assembly Bill 3030 (AB3030) first established California's Groundwater Management Act (GMA).
- Authorized local agencies to prepare and implement groundwater management plans (GMPs) by following a uniform, systematic procedure.
- Agency participation was voluntary.
- Mitigation of conditions of overdraft:
  - AB3030 – Optional
  - SGMA ------→ Required

Buellton Uplands Groundwater Management Plan 1995

- "**Perennial yield**" = long term average annual amount of water which can be withdrawn from a basin under specified operating conditions(e.g. legal, economic, environmental and management parameters) without inducing a long term progressive drop in water levels.
- "**Overdraft**" = Sustained consumption beyond perennial yield.
    - Distinguished overdraft- long term decline- versus the concept of overdrafting the basin in any single year, or a dry series of years.

Buellton Uplands Groundwater Management Plan 1995

Buellton Upland Perennial Yield Determination

	AFY
Recharge from Precipitation (+)	2,642
Recharge from Streamflow Infiltration (+)	300
Natural Discharge (-)	255
Net Recharge	2,687
Return flow from imported Ag water use (alluvium)	250
Perennial Yield w/ Imports	2,900
Perennial Yield w/o Imports	2,650

County of Santa Barbara
Groundwater Basins Status Report

Public Works Department
Water Resources Division
Water Agency

130 East Victoria Street
Santa Barbara, CA 93101
(805) 568-3440

October 14, 2014

Other Estimates of Perennial Yield for the Buellton Upland Aquifer

DRAFT
WATER RESOURCES MANAGEMENT PLAN
SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

May 28, 1992

STETSON ENGINEERS INC.
San Rafael West Covina San Clemente
California

Mesa, Arizona

Pre-SGMA Estimates of Perennial ("Safe") Yield for Buellton Upland

	AFY	County 1991	SYRWCD Water Resources Management Plan 1992	County 2014; Stetson 2019
Estimated Perennial Yield (afy)		1,820	2,500	2,800
2015 Groundwater Pumpage	4,526			
1- year Perennial Yield less Pumping		-2,706	-2,026	-1,726
1982-2018 Groundwater Average Pumpage	2,560			
37- year Perennial Yield less Pumping		-740	-60	240

Overdraft, Sustainable Yield, and SGMA

"Overdraft" (DWR Bulletin 118): Condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years, during which the water supply conditions approximate average conditions. Overdraft can be characterized by groundwater levels that decline over a period of years and never fully recover, even in wet years.

Overdraft is similar in concept to perennial ("safe") yield concept used in the 1995 Buellton Upland Management Plan.

Overdraft, Sustainable Yield, Overdraft and SGMA

"~~Safe~~ Sustainable yield" = Maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result.

GSP Undesirable Results – SMCs
GSP Water Budget Analysis Time Period (W.Y. 1982 – W.Y. 2018) representative of long-term conditions.
Preliminary CMA GSP Water Budget being refined through groundwater model calibration on a monthly basis.

Water Budget Technical Memo

Questions?

Groundwater Model Update

Groundwater Model Uses and SGMA:

- Quantitative estimate of groundwater inflows and outflows to the CMA (informs the Water Budget),
- Considerations for seasonality and temporal changes to groundwater availability and recharge,
- Quantitative framework to estimate future potential scenarios, and
- Guide development of SMC thresholds.

Groundwater Modeling Steps:

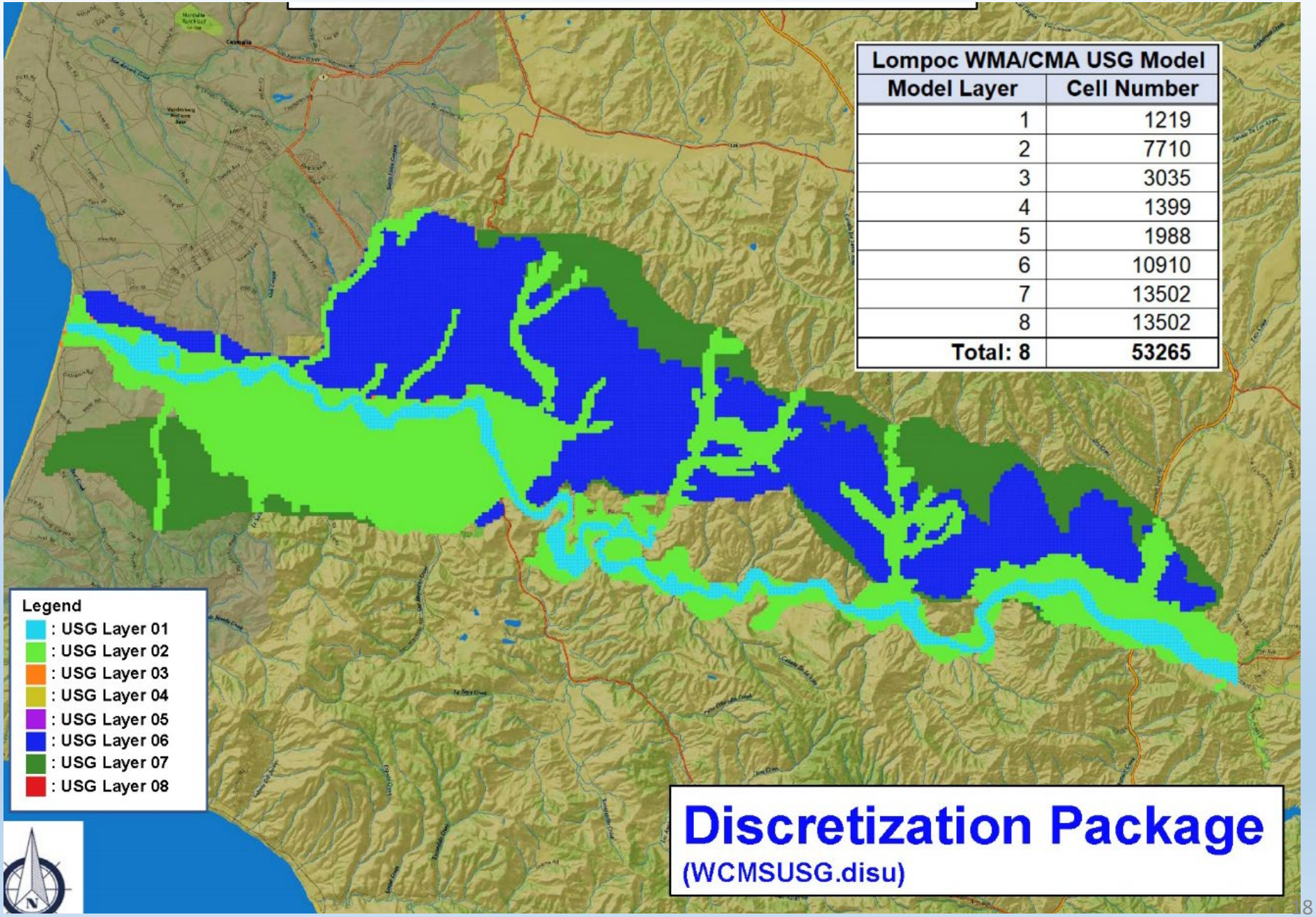
- Build
- Calibrate
- Run Scenarios

Model Grid

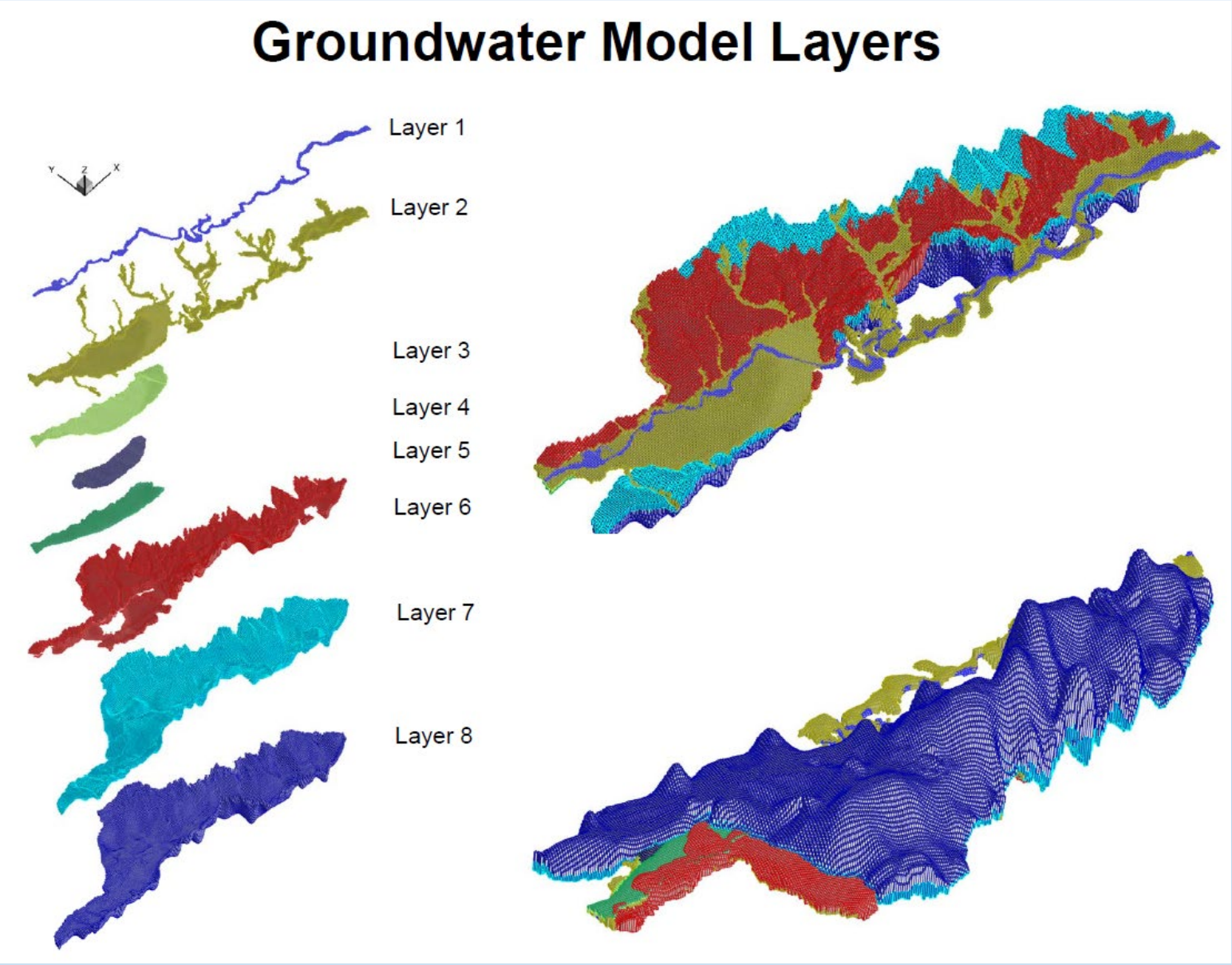
Model cells are 4 acres.

Monthly timestep.

Solvang to Pacific Ocean



Groundwater Model Update



The 3D subsurface geologic model was used to export the various groundwater model layers.

Each layer correlates to a different geologic formation (or unit) and identified Principal Aquifer.

These layers are used as the basis for the groundwater model.

The model estimates groundwater flow velocities, recharge rates, and model scenarios to predict future groundwater supply and demand based on current groundwater uses.

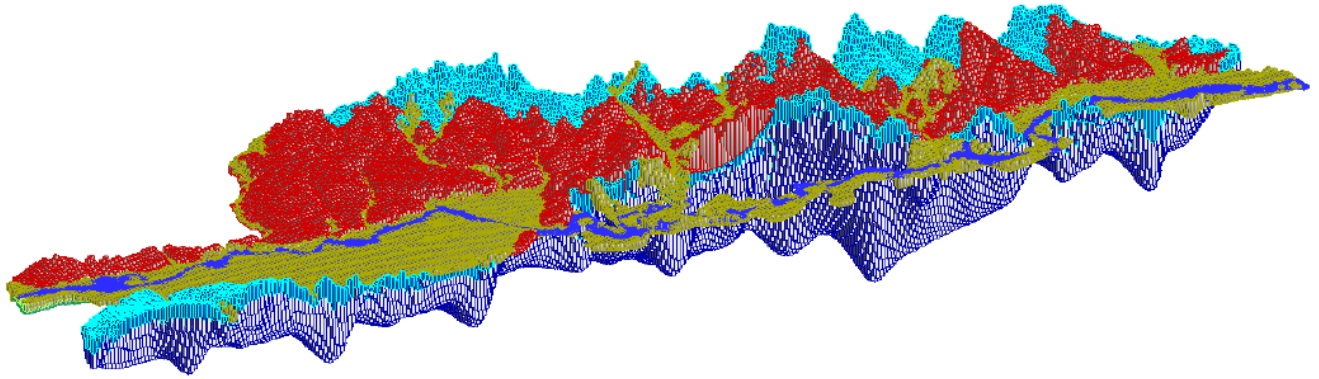
Groundwater Model Update

View of all Groundwater Model Layers stacked together

Layer Property Flow Package
(WCMSUSG.lpf)

Model Aquifer Properties

Model Layer	Kx = Ky (ft/day)	Kz (ft/day)	Ss (ft^{-1})	Sy	Remark
1	240	0.24	0.0001	0.1	Stream Deposits
2	55	0.055	0.0001	0.1	Upper Alluvium
3	35.5	0.0355	0.0001	0.1	Lower Alluvium
4	2.2	0.0022	0.0001	0.1	Silt
5	300	0.3	0.0001	0.1	Main Water Bearing Zone
6	15	0.015	0.0001	0.1	Older Alluvium
7	50	0.05	0.0001	0.1	Upper Careaga
8	10	0.01	0.0001	0.1	Lower Careaga

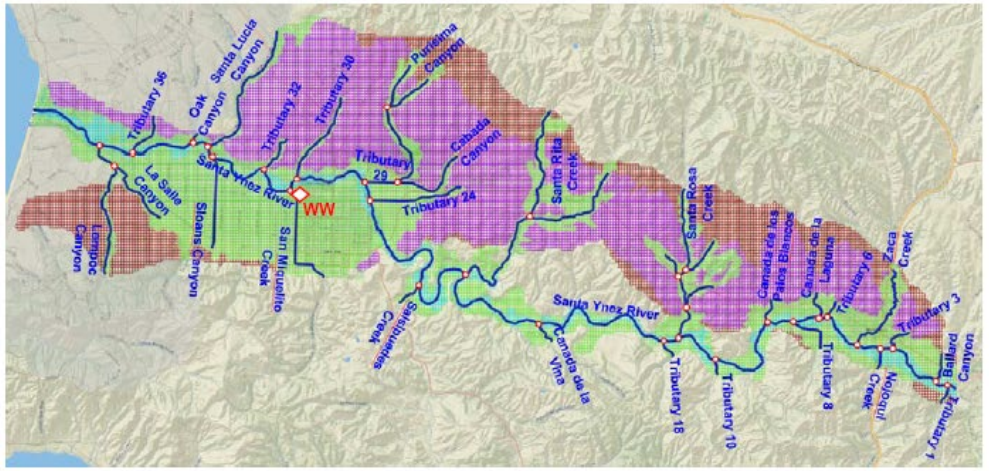


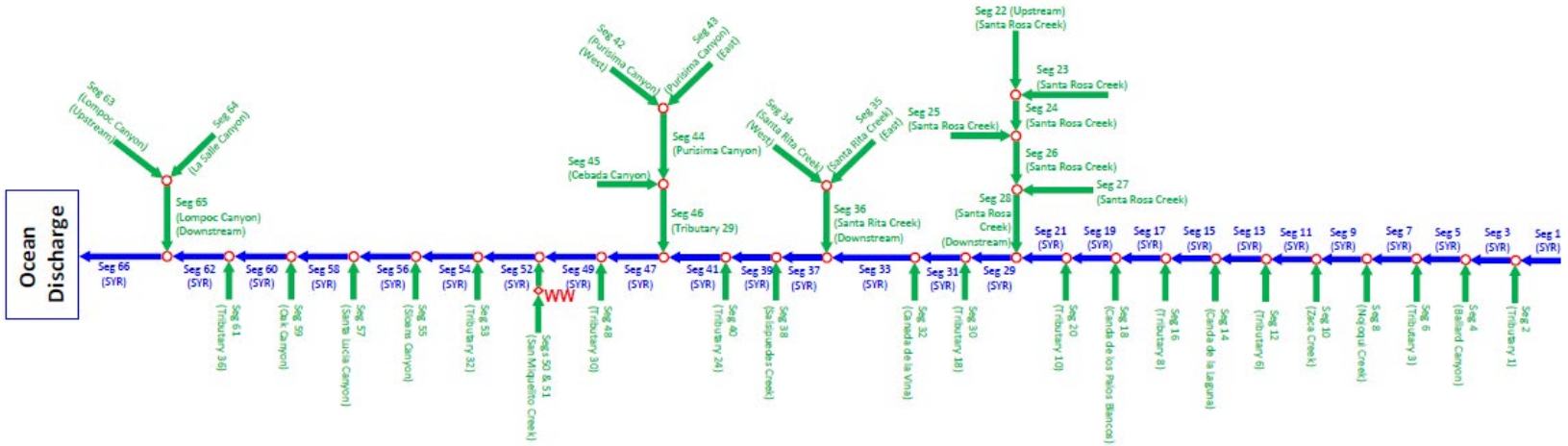
Aquifer properties for each model cells will be adjusted based on model cell locations during model calibration

Groundwater Model Update

Stream Flow Routing Package
(WCMSUSG.sfr)

WMA/CMA USG Model Stream Flow System



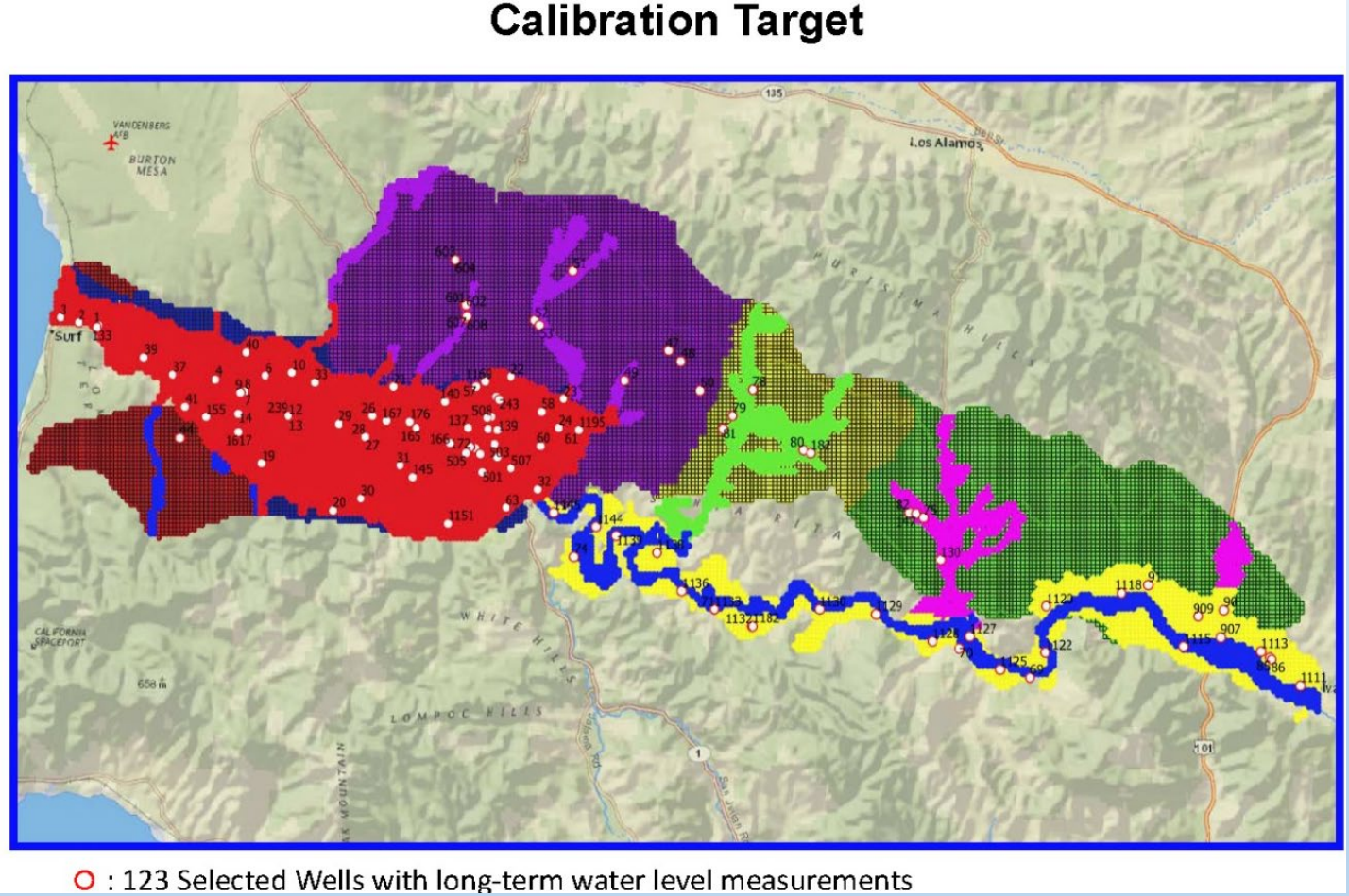


Visual representation of how stream flows are considered and integrated into the groundwater model.

Stream flows contribute to recharge of the identified Principal Aquifers.

Calibration time period WY 1982-2018

Groundwater Model Update



Water Budgets developed per subareas. For CMA: Buellton Upland and Santa Ynez River Alluvium subareas

Calibration time period
WY 1982-2018

Calibrated to Measured:
-Groundwater Levels/Contours
-Streamflow gages
-Intra/Inter Annual Variability

Groundwater Model Update

Questions?

The Way Ahead

- ~~Complete the Groundwater Conditions Tech Memo~~
- Complete the Water Budget
- Complete the Groundwater Model
- Establish Monitoring Network
- Establish Sustainable Management Criteria Thresholds
- Identify Projects and Management Actions
- Release DRAFT GSP

The Way Ahead

Questions?

Comments can be submitted to the website:

www.santaynezwater.org