



# WMA

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

## February 2021

# Stakeholder Workshop



**DUDEK**

Geosyntec  
consultants

engineers | scientists | innovators



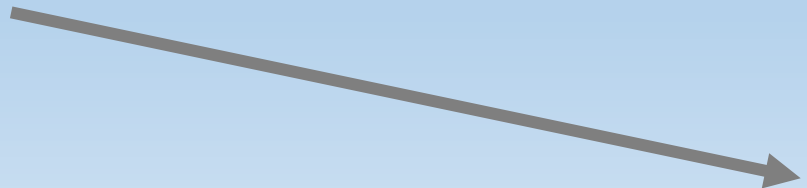
# Housekeeping

- 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](http://www.santaynezwater.org)

- Slide numbers in lower right

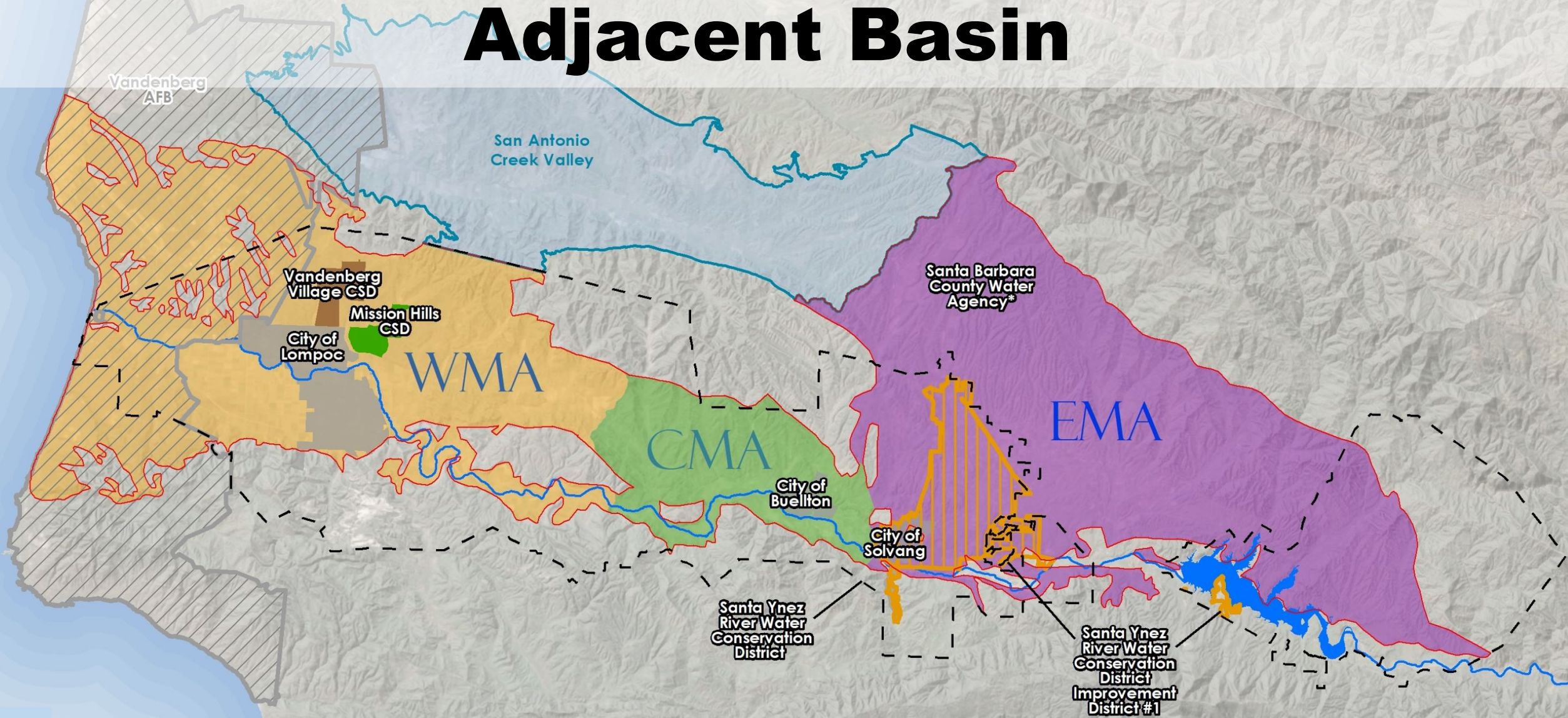




# Agenda

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 WMA for sustainability indicators:

- Groundwater Elevations and Hydrographs
- Groundwater Storage
- Groundwater Quality
- Seawater Intrusion
- Land Subsidence
- Interconnected Surface Water and Groundwater Dependent Ecosystems
- Currently Available for Public Comment; Due by March 9, 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
  - WMA 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 WMA
  - 1997 Lompoc Plain and Upland groundwater models by USGS and HCI
  - Lompoc Groundwater Management Plan 2013
  - 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

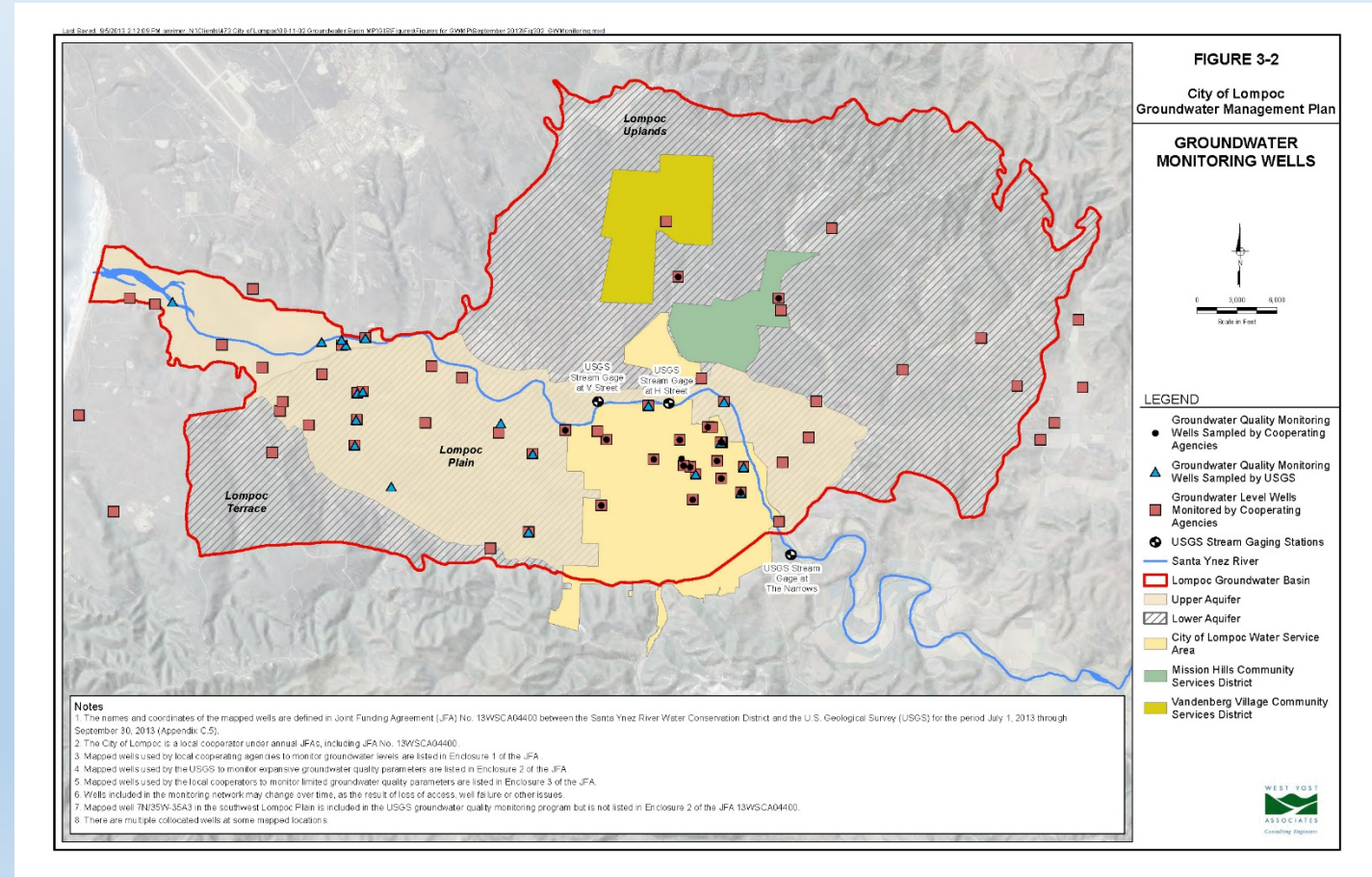




# AB3030 1992

- 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

# Lompoc Groundwater Management Plan 2013





# Lompoc Groundwater Management Plan 2013

“The historical data for the Lompoc Groundwater Basin indicate that long-term groundwater levels are not declining and groundwater quality is not deteriorating with respect to groundwater use by the City, MHCSD, and VVCSD. Correspondingly, the Lompoc Groundwater Basin is not in overdraft. Nevertheless, that status is dependent on the quantity and quality of Santa Ynez River stream flow at the Narrows and Cachuma Project operations under State Board Order 89-18.”

**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 Overdraft  
for the  
WMA  
Aquifers**

**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

|  | AFY    | USGS 1997 | HCI 1997                                    | SYRWCD Water Resources Management Plan 1992 | County 2014     |
|--|--------|-----------|---|---|-----------------|
| <b>Estimated Perennial Yield (afy)</b> |        |           |   |   |                 |
| Lompoc Plain                           |        | 20,900    | 17,500                                      | 24,100                                      | manged by SWRCB |
| Lompoc Upland                          |        |           | 2,470                                       | 3,300                                       | 4,400           |
| Santa Rita Upland                      |        | NA        | NA  | 1,800                                       |                 |
| 2015 Groundwater Pumpage               |        |           | <u>Perennial Yield Less 1-Year Pumping</u>  |   |                 |
| Lompoc Plain                           | 23,516 | NA        | NA  | 584   | NA              |
| Lompoc Upland                          | 2,719  |           | -249  | 581   | -531            |
| Santa Rita Upland                      | 2,212  |           | NA  | -412  |                 |
| 1982-2018 Groundwater Average Pumpage  |        |           | <u>Perennial Yield Less 37-year Pumping</u> |   |                 |
| Lompoc Plain                           | 22,800 | NA        | NA  | 1,300                                       | NA              |
| Lompoc Upland                          | 3,100  |           | -630  | 200   | 0               |
| Santa Rita Upland                      | 1,300  |           | NA  | 500   |                 |



# 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 a perennial yield, distinguishing long term decline versus the concept of overdrafting the basin in any single year or even a dry series of years.



# 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 WMA 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 WMA (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:

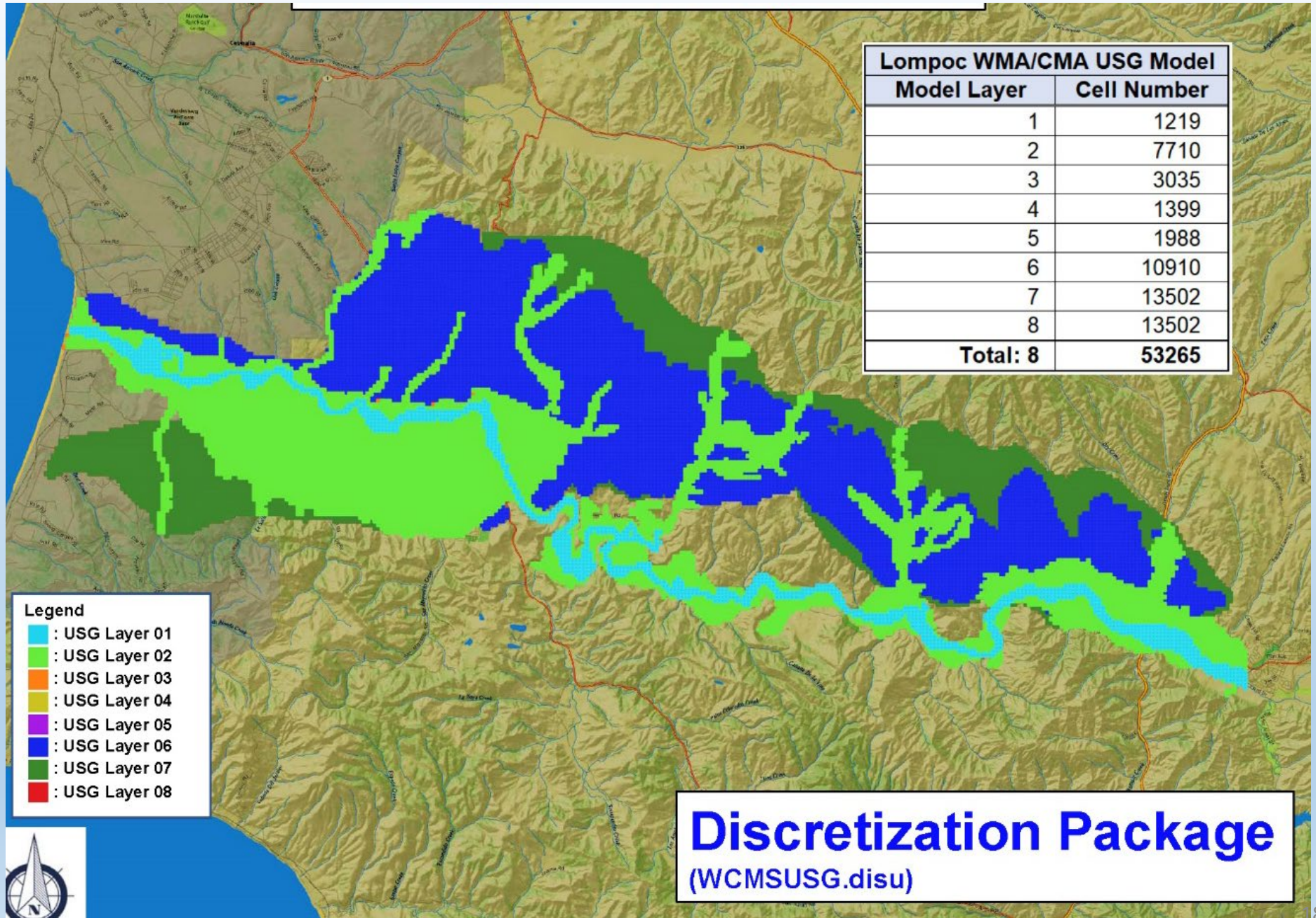
- Build
- Calibrate
- Run Scenarios

# Model Grid

Model cells are 4 acres.

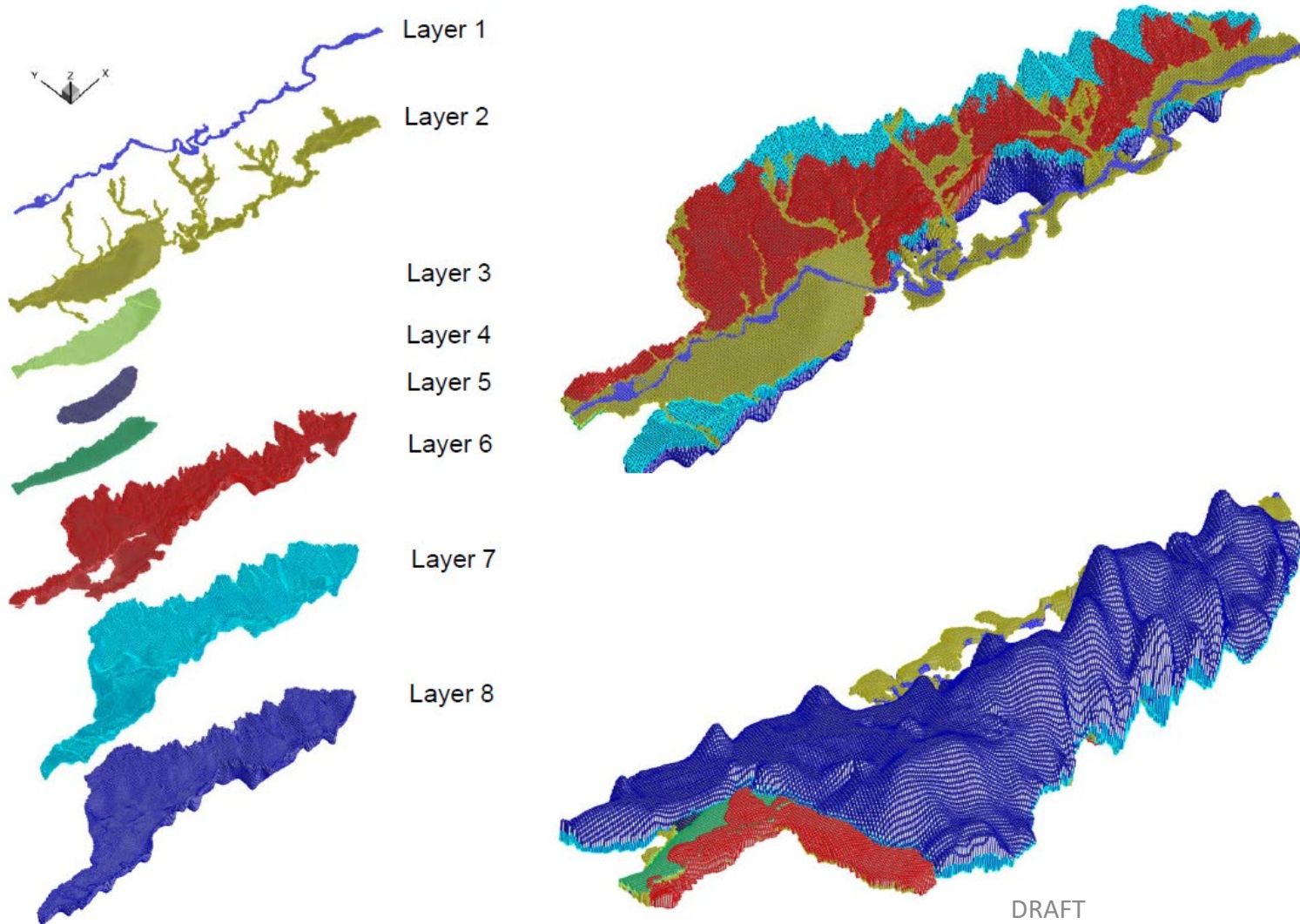
Monthly timestep.

Solvang to Pacific Ocean



# Groundwater Model Update

## Groundwater Model Layers



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

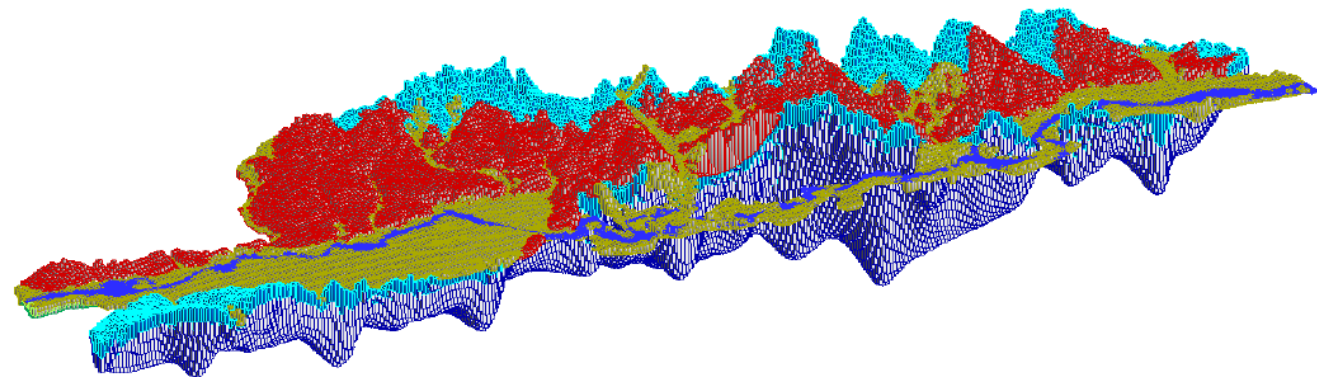
View of all  
Groundwater  
Model Layers  
stacked  
together

## Layer Property Flow Package

(WCMSUSG.Ipf)

### Model Aquifer Properties

| Model Layer | Kx = Ky (ft/day) | Kz (ft/day) | Ss (ft <sup>-1</sup> ) | 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           |

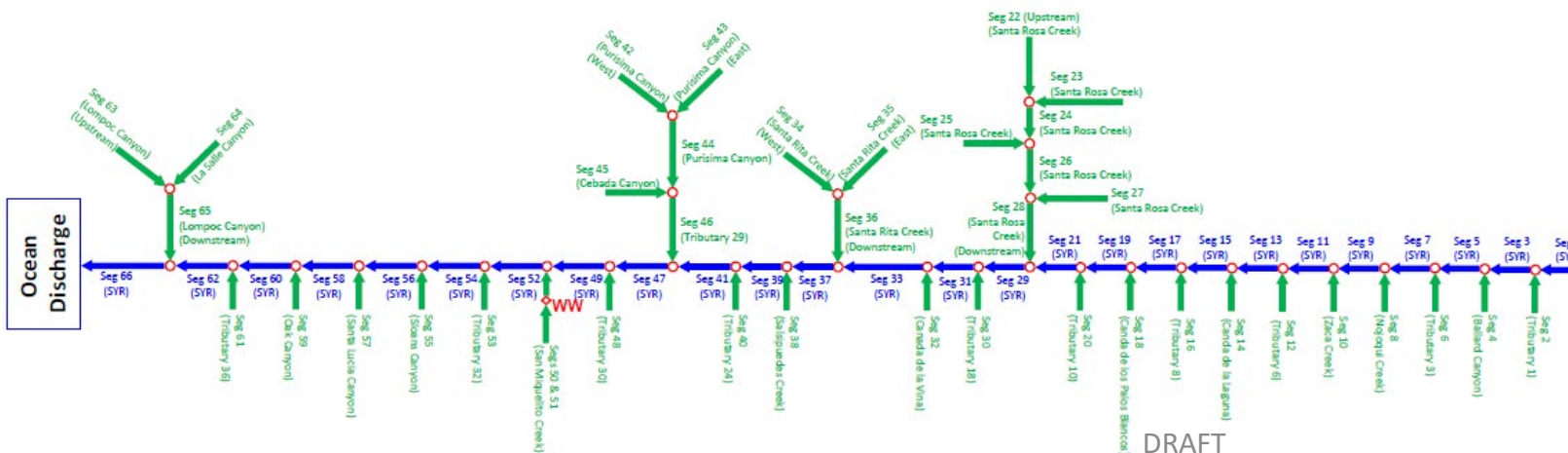
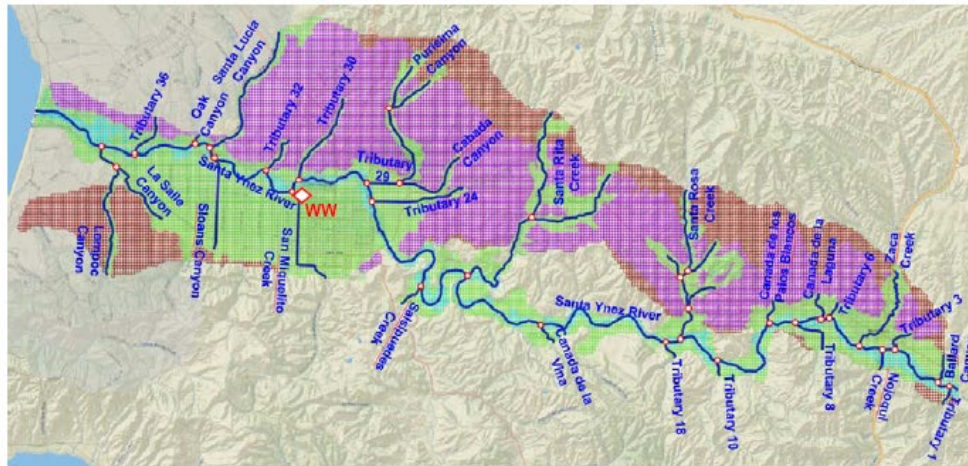


Aquifer properties for each model cells will be adjusted based on model cell locations during model calibration

# Groundwater Model Update

## Stream Flow Routing Package (WCMSUSG.sfr)

WMA/CMA USG Model  
Stream Flow System



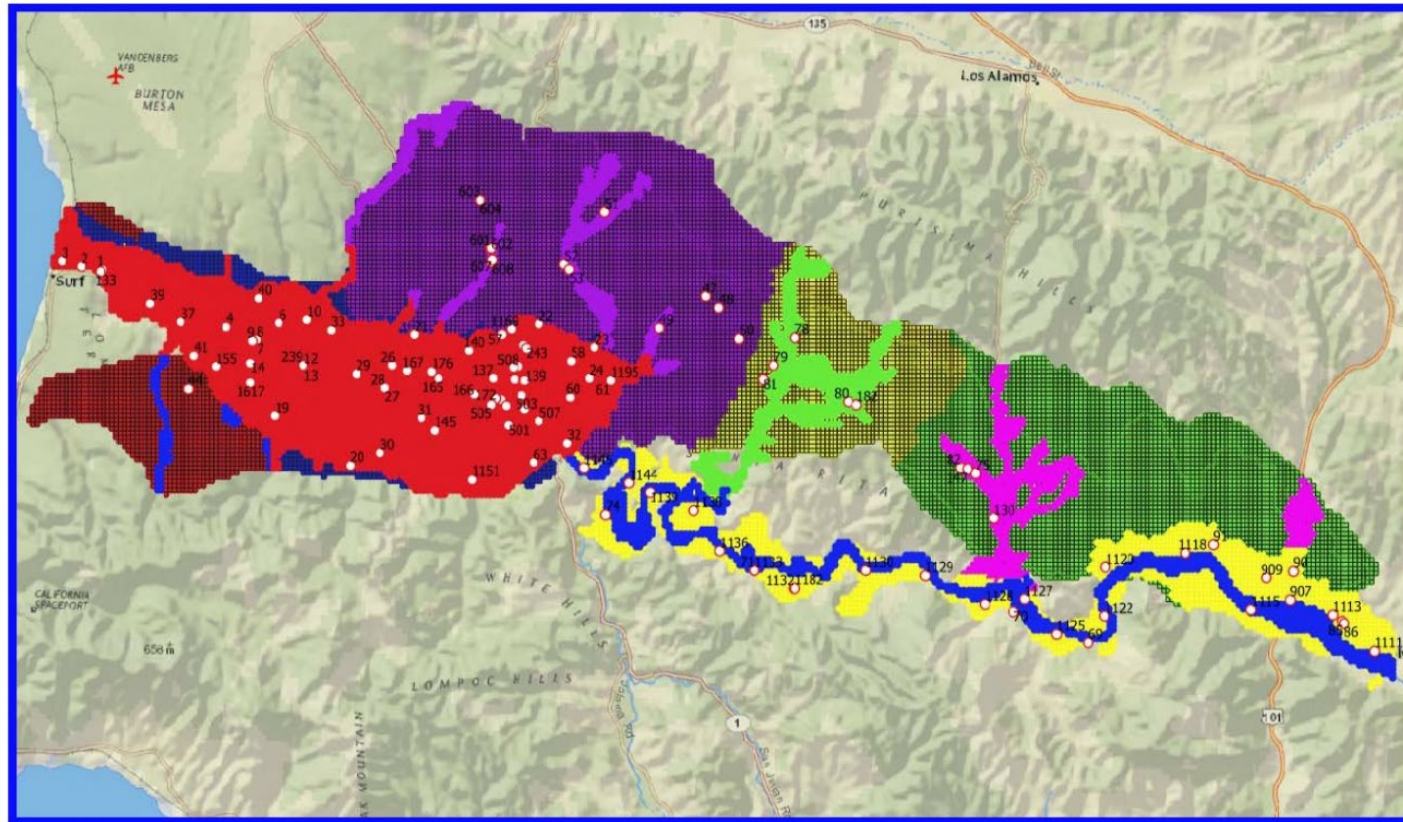
Visual representation of how stream flows are considered and integrated into the groundwater model.

Stream flows contribute to recharge of the identified Principal Aquifers.

Calibration time period  
WY 1982-2018

# Groundwater Model Update

## Calibration Target



○ : 123 Selected Wells with long-term water level measurements

Water Budgets developed per subareas. For WMA: Santa Rita Upland, Lompoc Upland, Lompoc Terrace, Lompoc Plain, 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

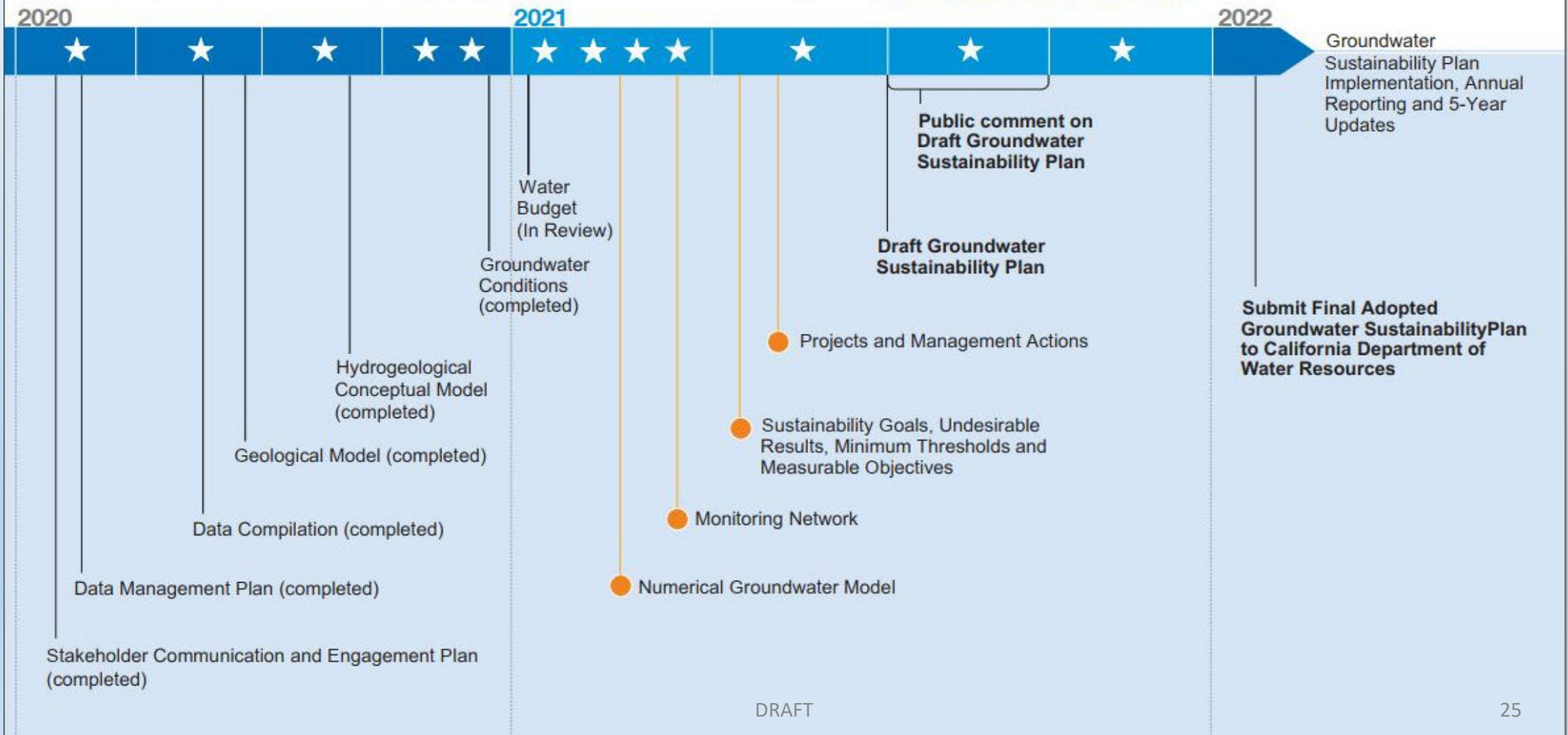


# The Way Ahead

## Groundwater Sustainability Plan Development Milestones

☆ Groundwater Sustainability Agency Committee Public Meeting

● Technical Memorandum



# Questions?

Comments can be submitted to the website:



[www.santaynezwater.org](http://www.santaynezwater.org)