



Westlands Water District

Groundwater Sustainability Plan Workshop

December 21, 2016
23050 W. Mt Whitney Five Points, CA 93624

Workshop Outline

- **GSP Development Timeline**
- Hydrogeology Overview
- Cross Section Aquifer Characteristics
- Management Areas
- Geologic Characteristics
- SGMA's Undesirable Results by Area
- Optimization Options
- Public Input

GSP Development Timeline

Model WWD

Public

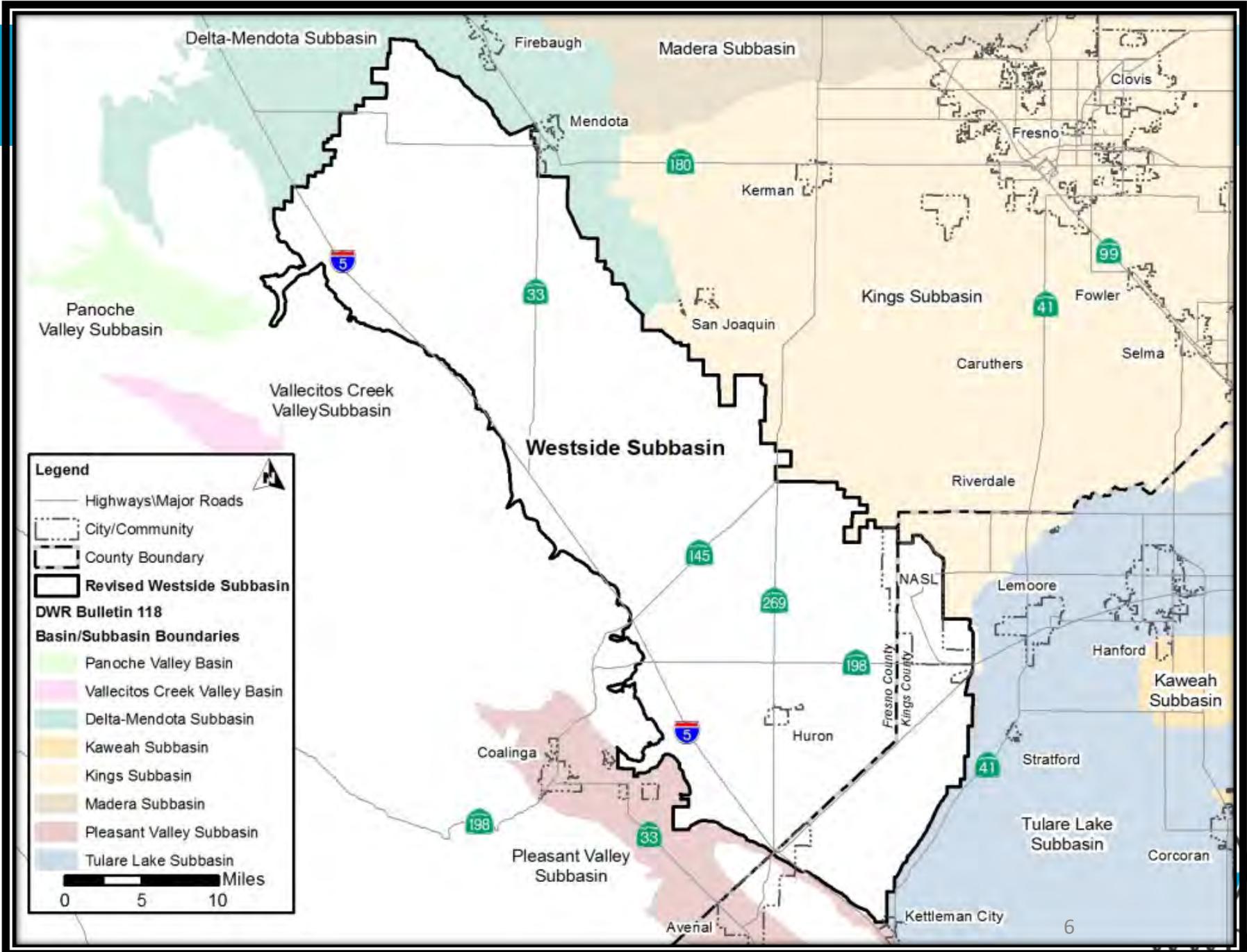


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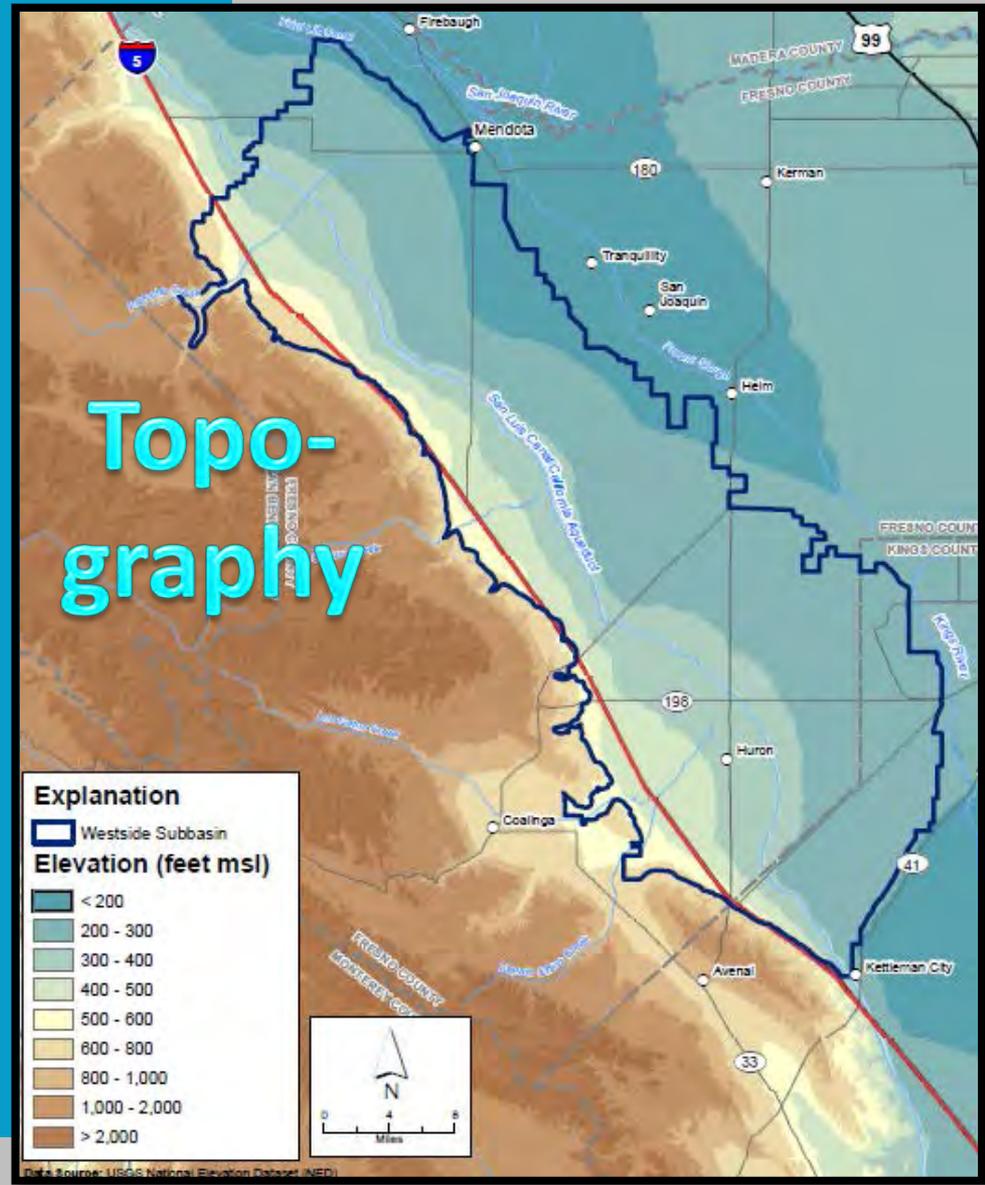
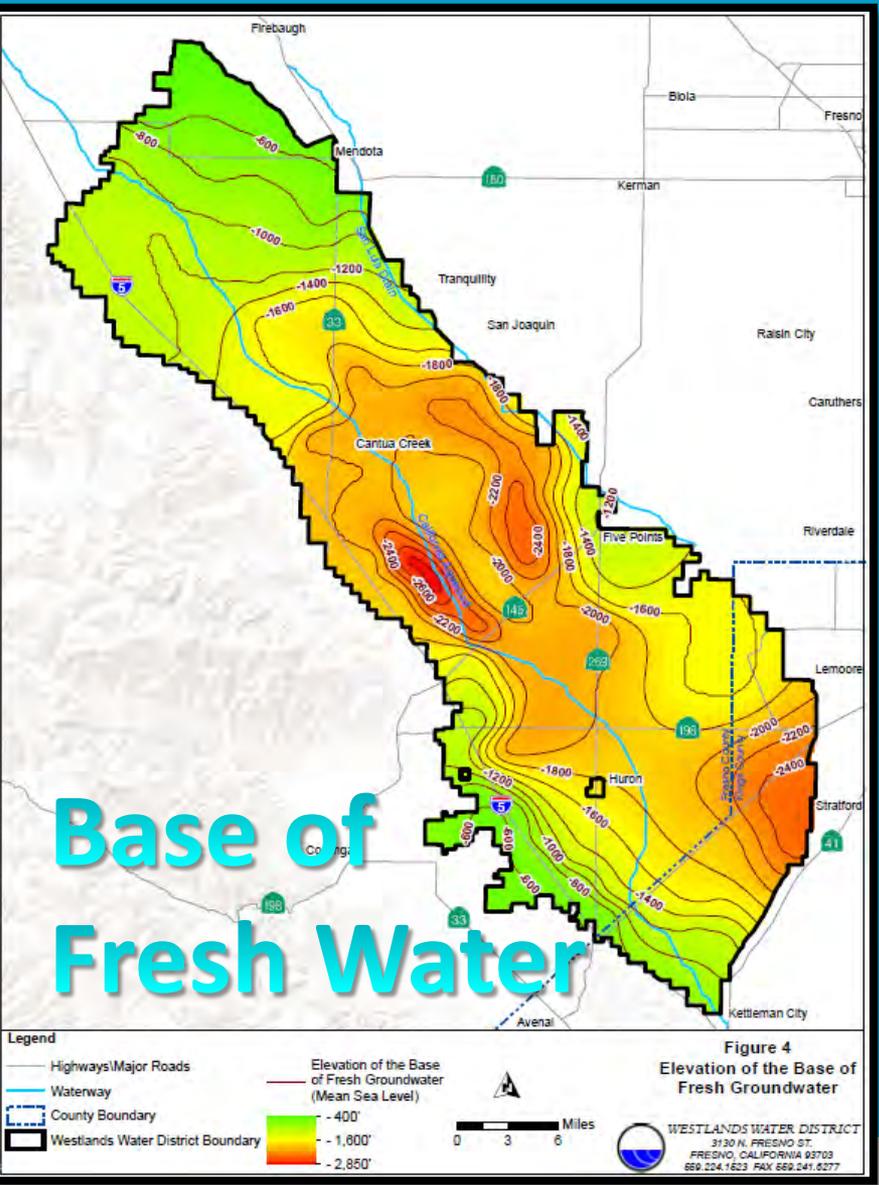
Hydrogeology- Westside Subbasin

- Located in the Western Area of the San Joaquin Groundwater Basin
- Adjacent Subbasin's include the Delta-Mendota, Kings, Tulare Lake and Pleasant Valley (Starting North Clockwise)



Hydrogeology- Westside Subbasin

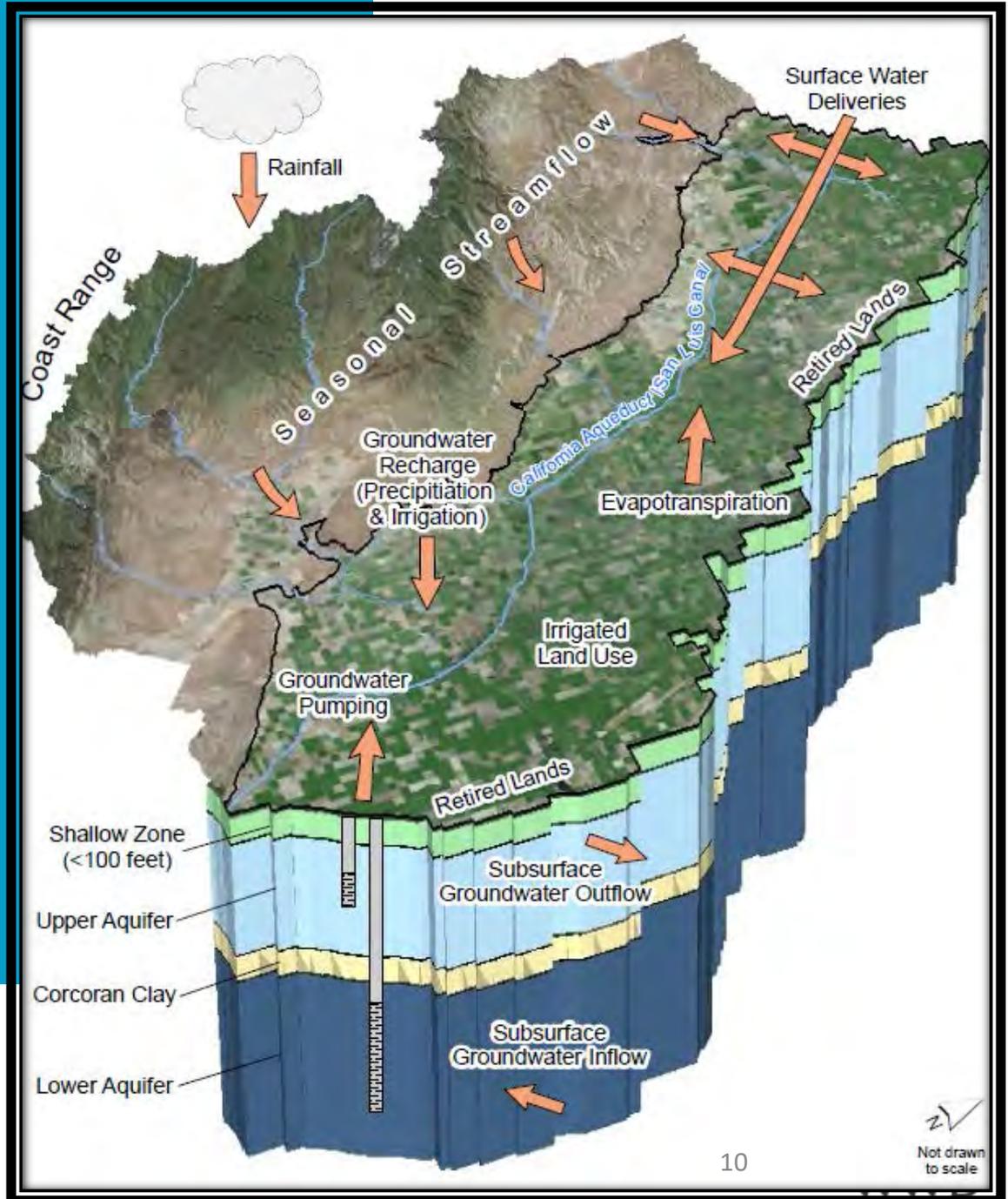
- Located in the Western Area of the San Joaquin Groundwater Basin
- Adjacent Subbasin's include the Delta-Mendota, Kings, Tulare Lake and Pleasant Valley (Starting North Clockwise)
- Topography varies by 800 feet west to east and 50 feet north to south (ground surface)
- Base of Fresh Water ranges from 800 feet to 3,500 feet (below ground surface)



Hydrogeology- Westside Subbasin

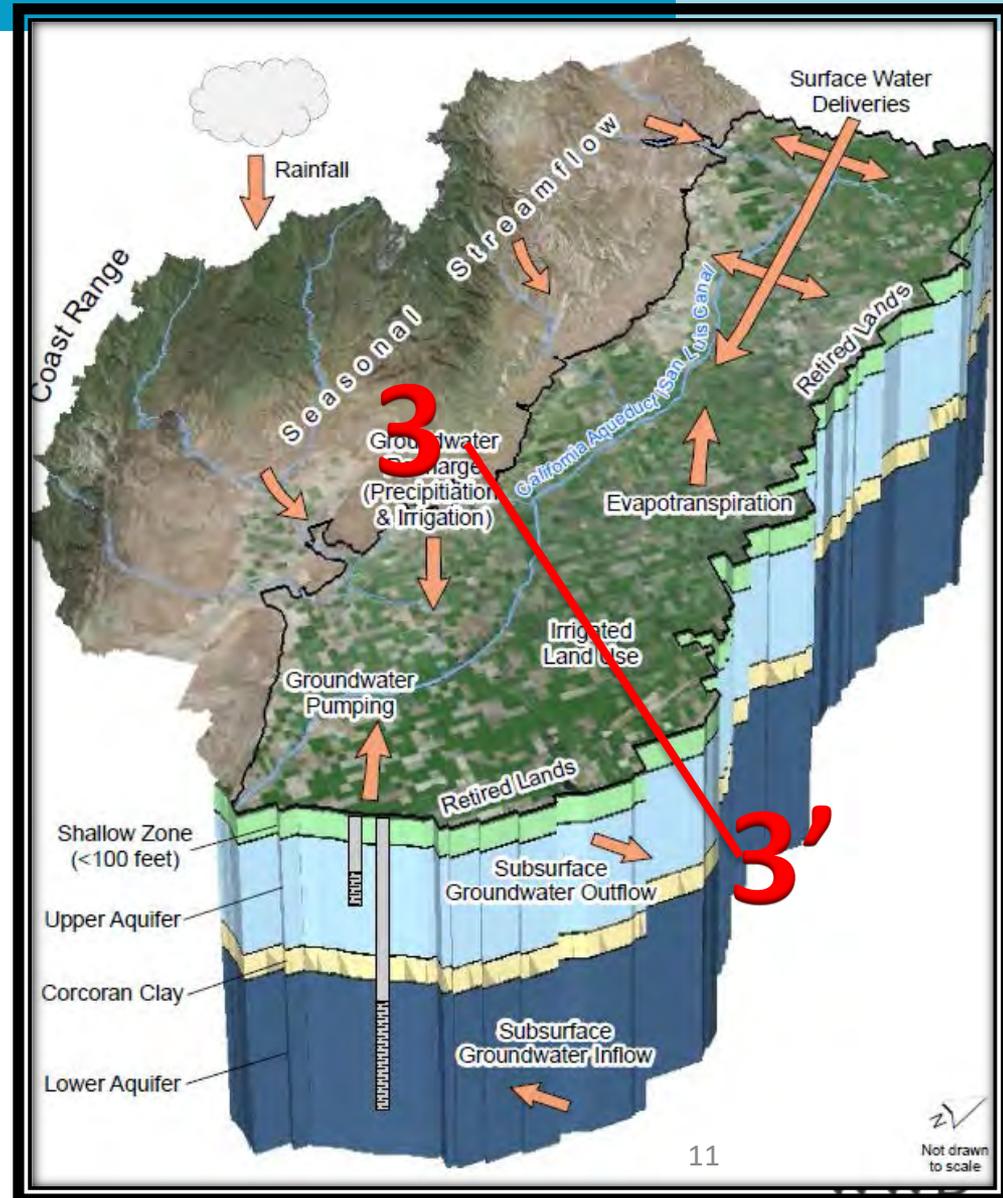
- Sierra Nevada Mountain Range (East) is the source of the younger sedimentary deposits in the Subbasin.
- Diablo Range (West) is source of marine sedimentary rocks in the Subbasin.
- Tulare Lake Bed is the source of the Corcoran Clay.

Hydrogeology- Westside Subbasin



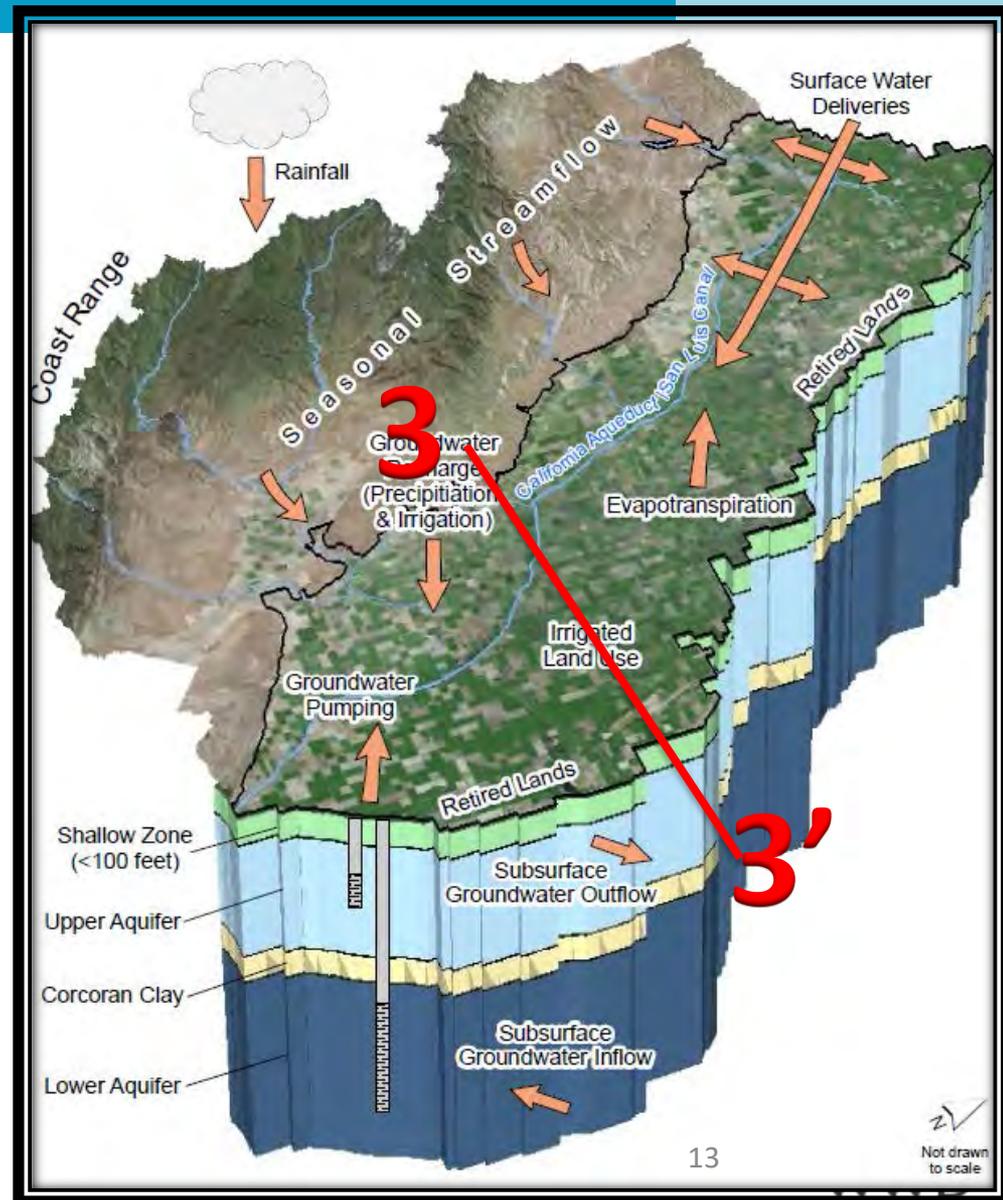
Hydrogeology- Westside Subbasin

- Shallow Aquifer-<100 feet



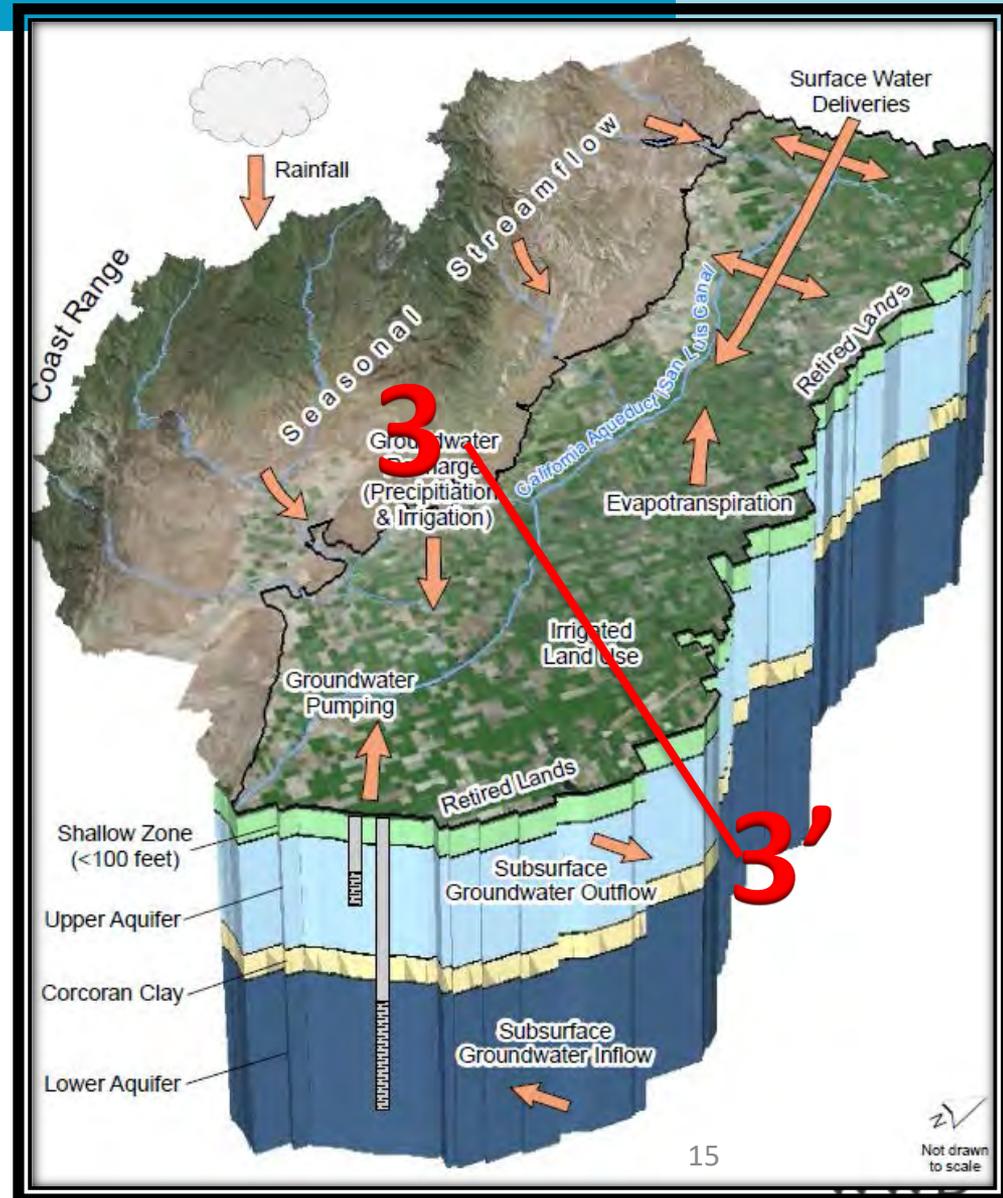
Hydrogeology- Westside Subbasin

- Shallow Aquifer-<100 feet
- Upper Water Bearing Zone - Above the Corcoran Clay
 - 100 feet to 800 feet

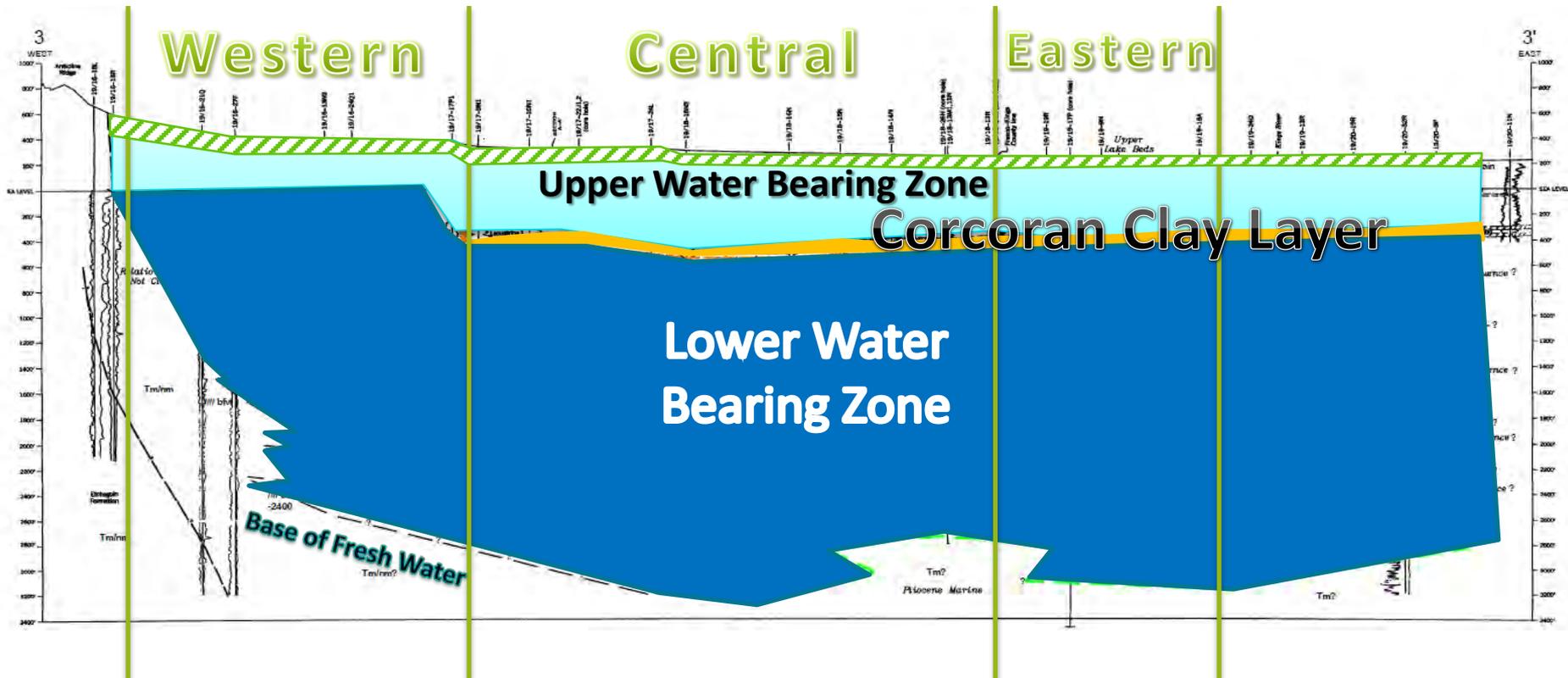


Hydrogeology- Westside Subbasin

- Shallow Aquifer-<100 feet
- Upper Water Bearing Zone - Above the Corcoran Clay
 - 100 feet to 800 feet
- Lower Water Bearing Zone - Below the Corcoran Clay
 - 700 feet to 3,500 feet



Cross Section



Westside
Subbasin
Boundary

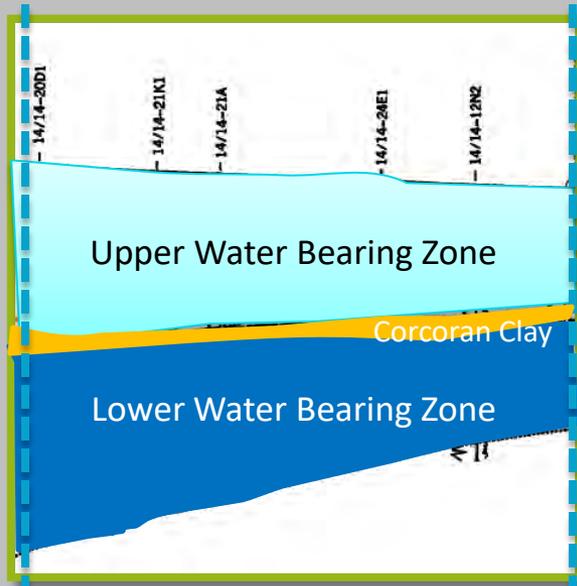
Westside
Subbasin
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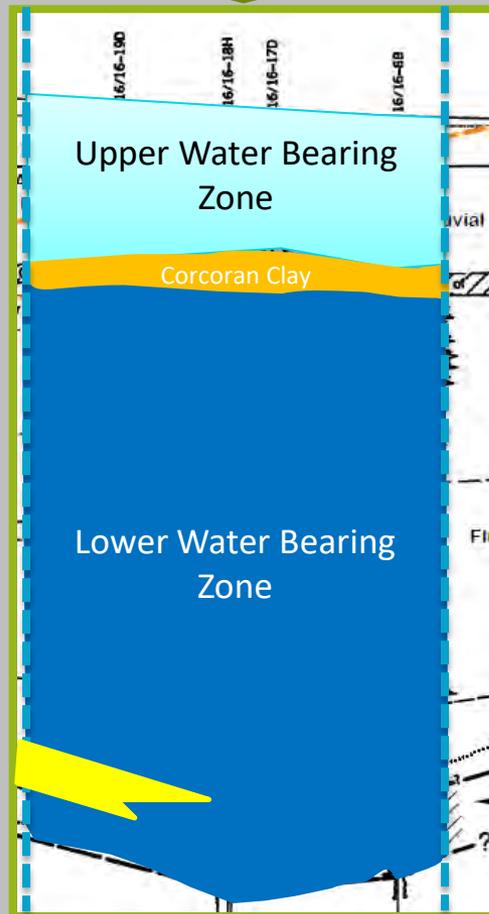
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Cross Section- Eastern



Panoche East

Cantua East



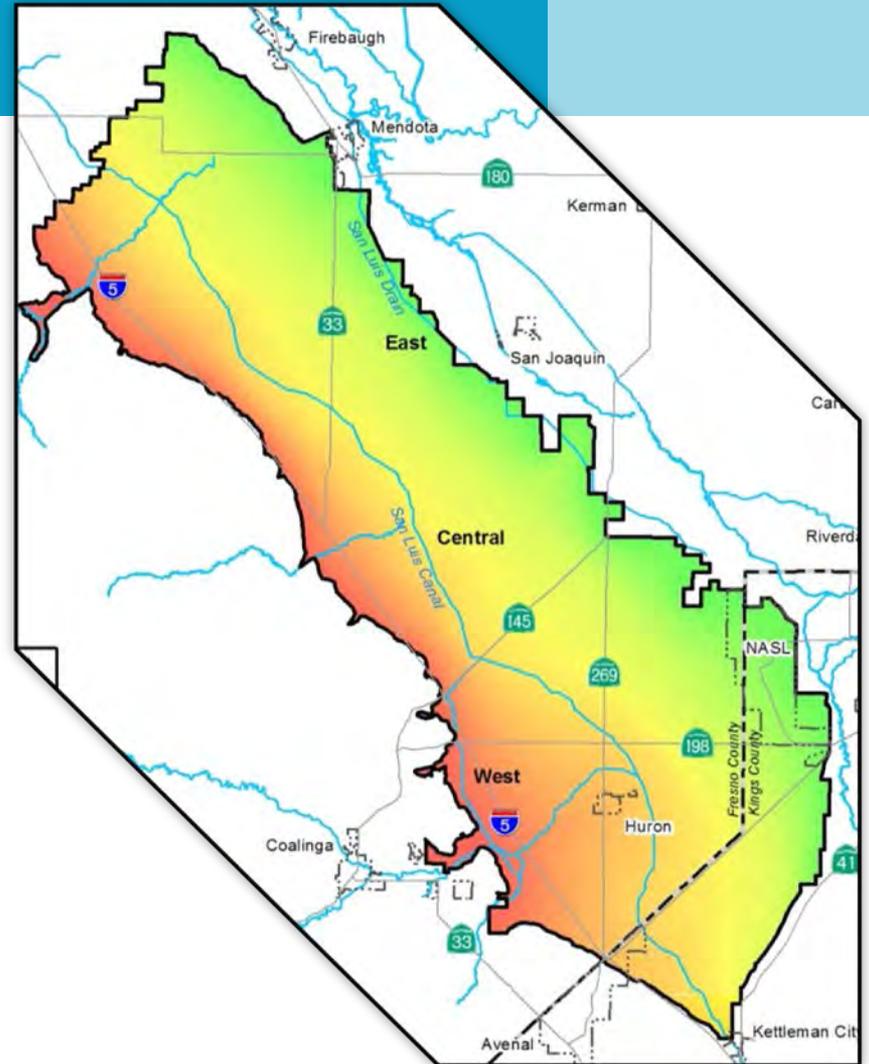
A.P. East

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Management Areas

- Based on the variability of the three cross sections and;
- Dividing the Westside Subbasin into three management areas is supported by:
 - Corcoran Clay (Absent or Thickness)
 - Thickness of Freshwater Aquifer
 - Similar Soil Types



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Eastern Area Geologic Characteristics

1. Corcoran Clay

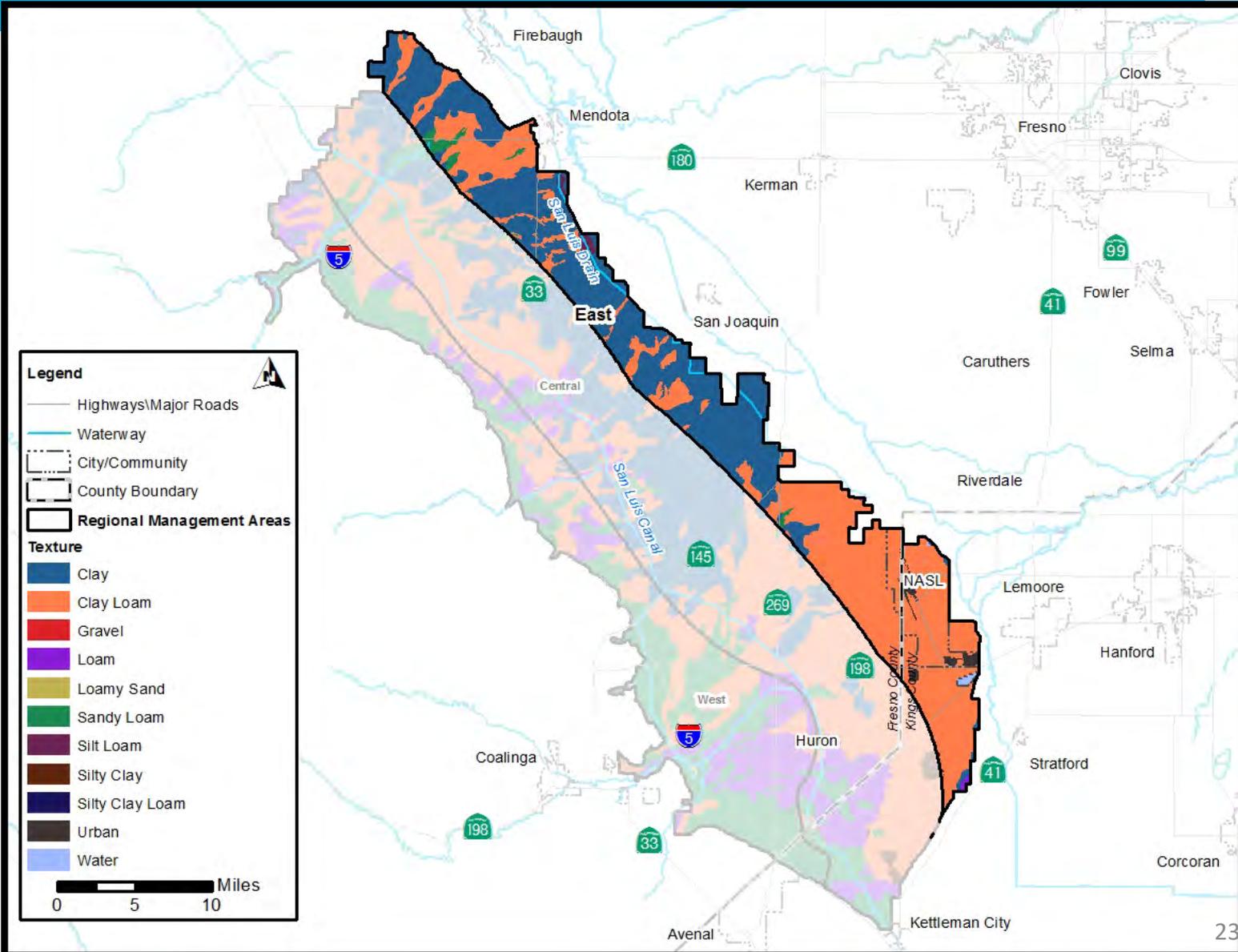
- Panoche East Area- Extremely thick
- Cantua East Area- Moderately thick
- A.P. East Area- Thickness varies from thin to extremely thick

2. Soils

- Panoche East Area- Clay and Clay Loams
- Cantua East Area- Predominantly Clays
- A.P. East Area- Predominantly Clay Loams



Eastern Area Soil Textures



Eastern Area Geologic Characteristics

1. Corcoran Clay

- Panoche East Area- Extremely thick
- Cantua East Area- Moderately thick
- A.P. East Area- Thickness varies from thin to extremely thick

2. Soils

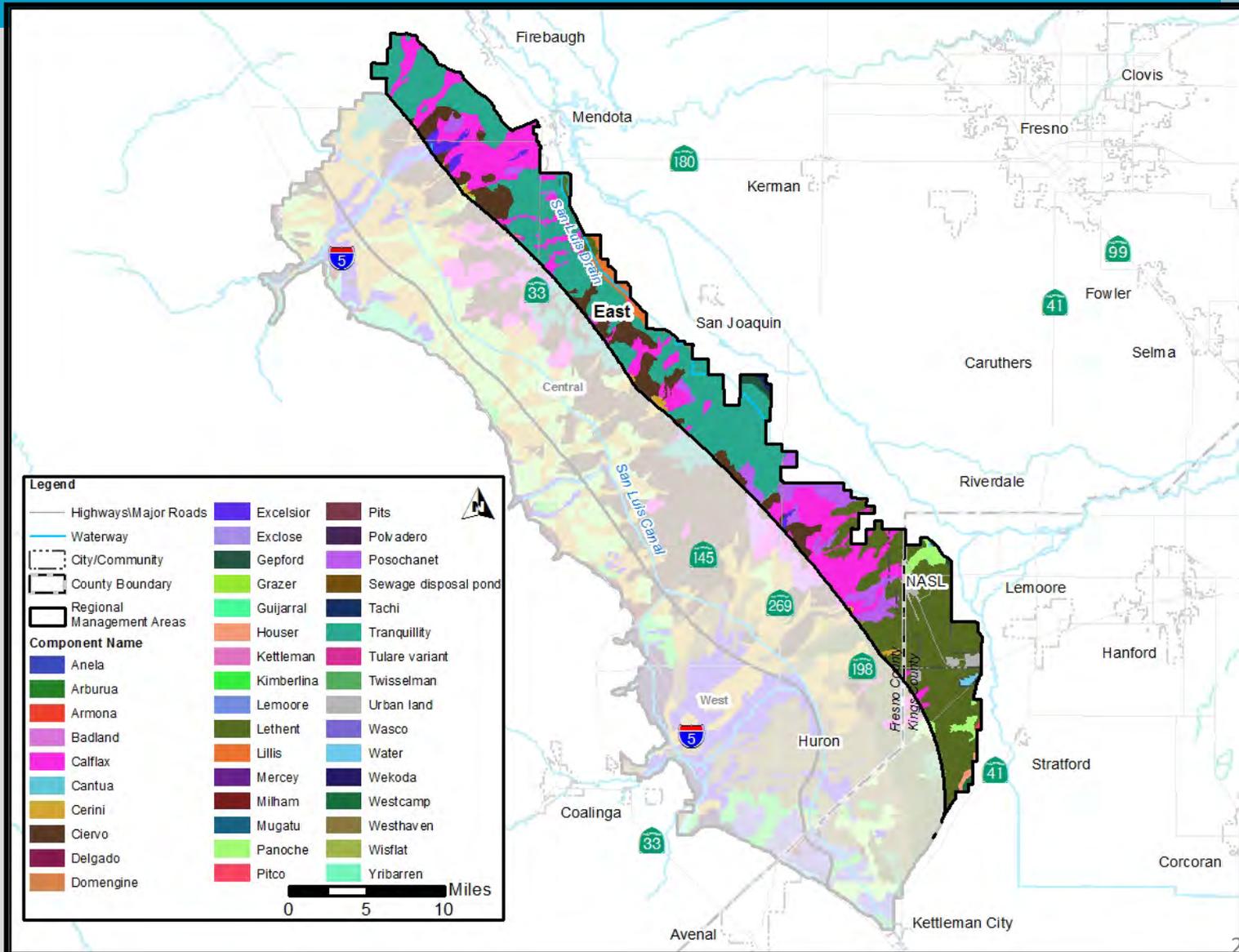
- Panoche East Area- Clay and Clay Loams
- Cantua East Area- Predominantly Clays
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3. Stable Shallow Groundwater Table

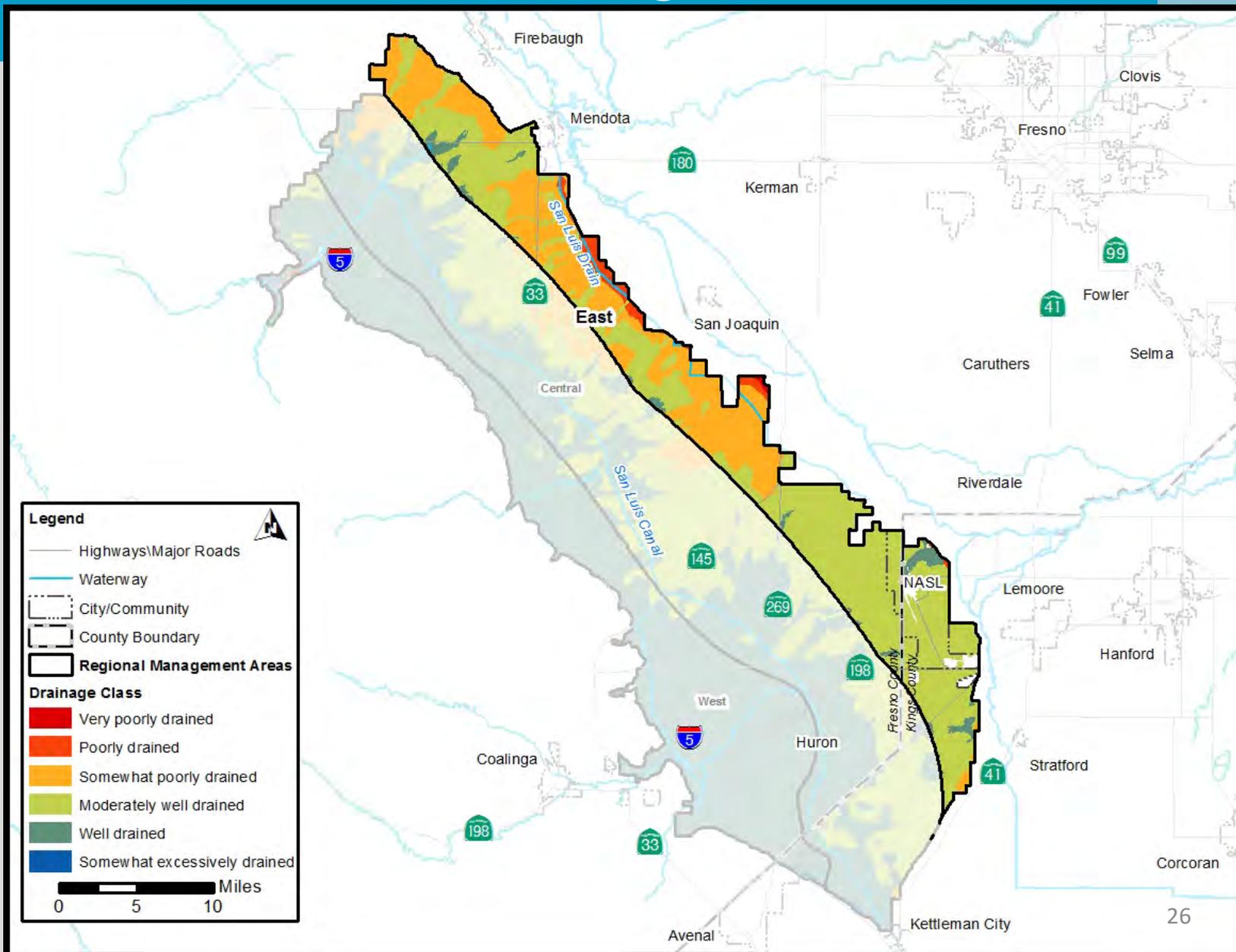
4. Poorly drained to Moderately well drained soils



Eastern Area Soil Types



Eastern Area- Soil Drainage Characteristics



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Sustainable Groundwater Management Act (SGMA)

- Local Management of the Groundwater Basin
- Requires subbasins to be **sustainably** managed by 2040
 - “Sustainability” refers to any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results.



Eastern Area Characteristics- SGMA

- Subsidence records are less complete.
- Groundwater levels are trending near or below pre-CVP levels.
- Areas along the alluvial fans have favorable recharge potential.

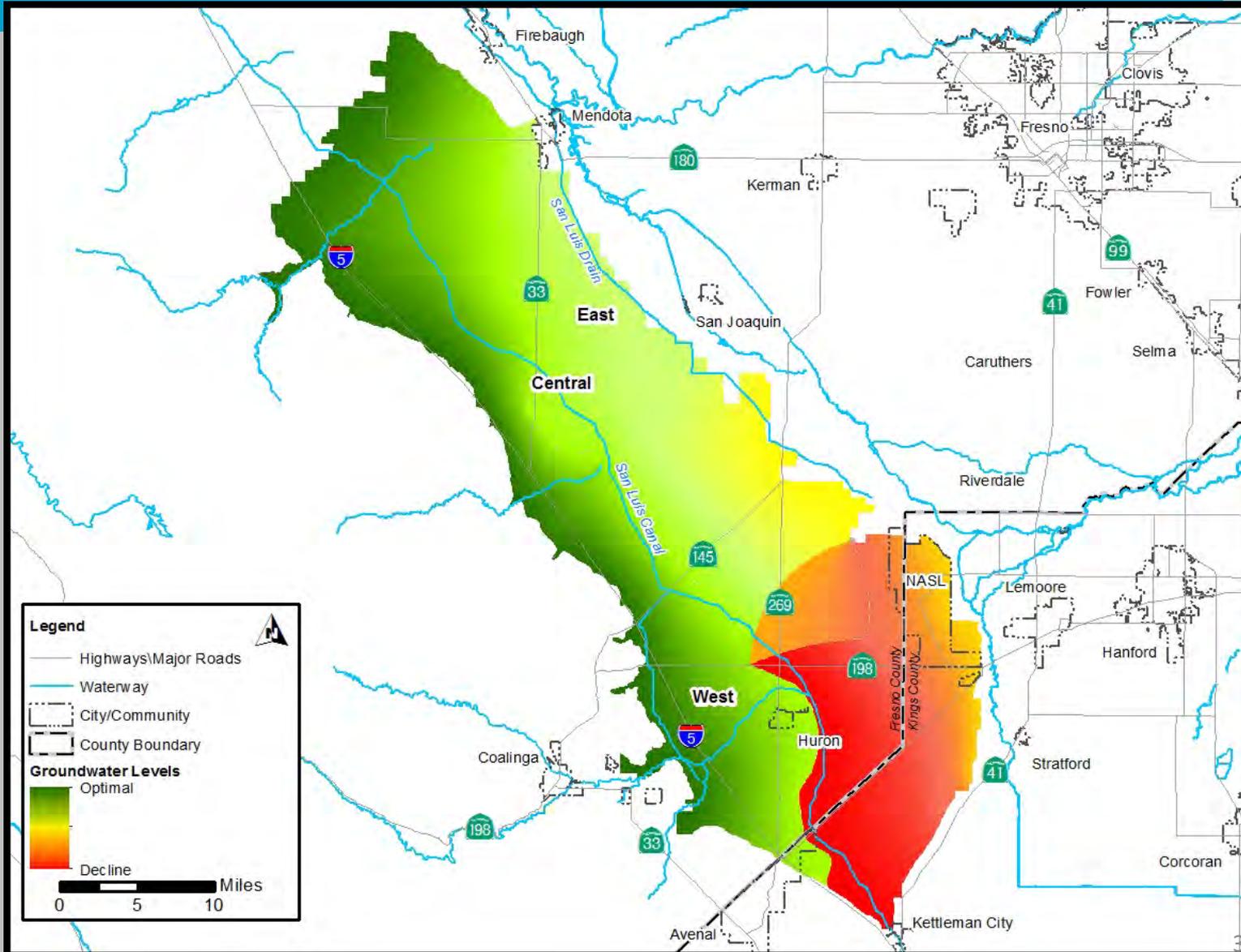


Eastern Area- Undesirable Results

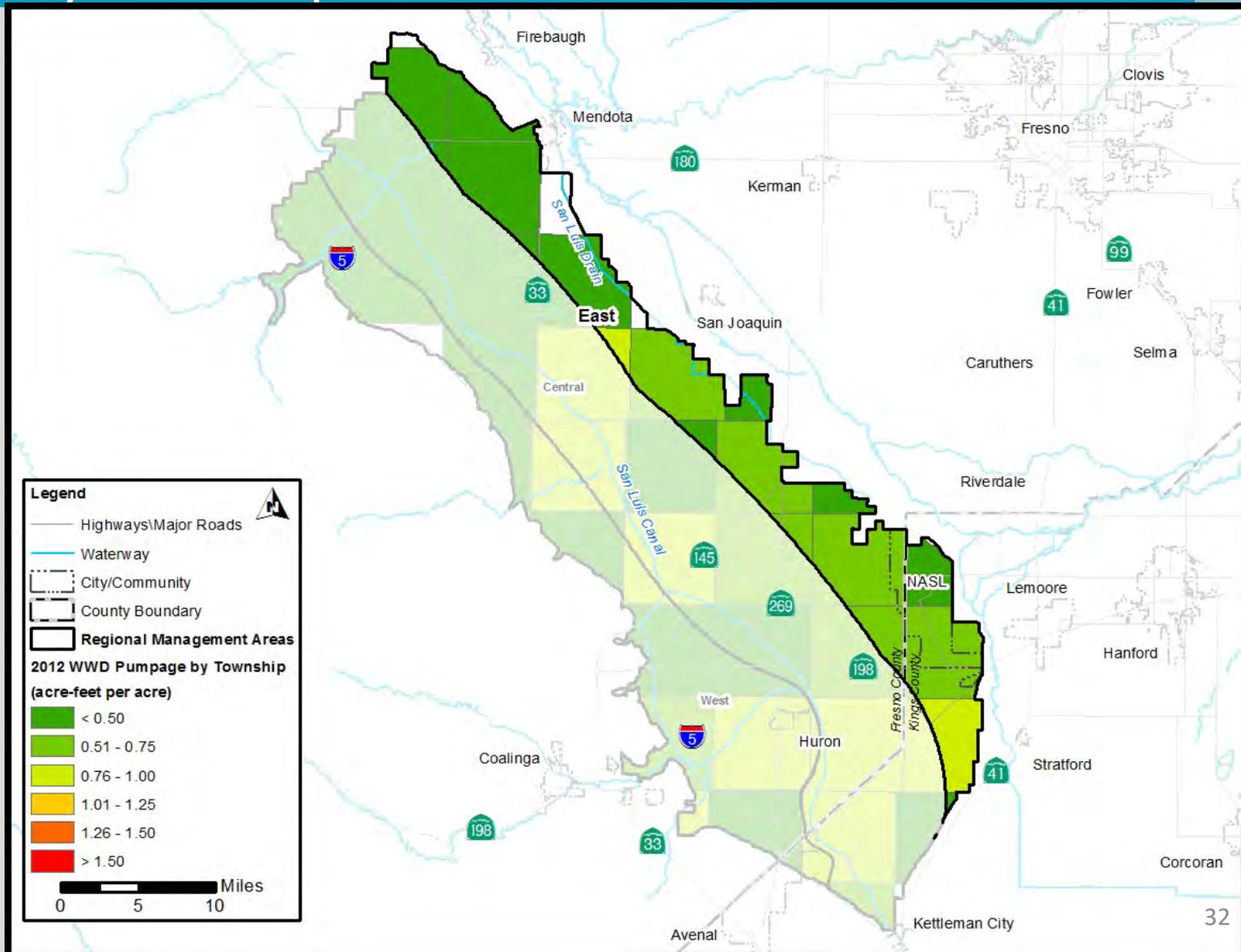
Undesirable Results	Risk
Reduction in Groundwater Storage	Yes
Degradation in Water Quality	Potentially
Land Subsidence	Potentially
Chronic Lowering of Groundwater Levels	Yes



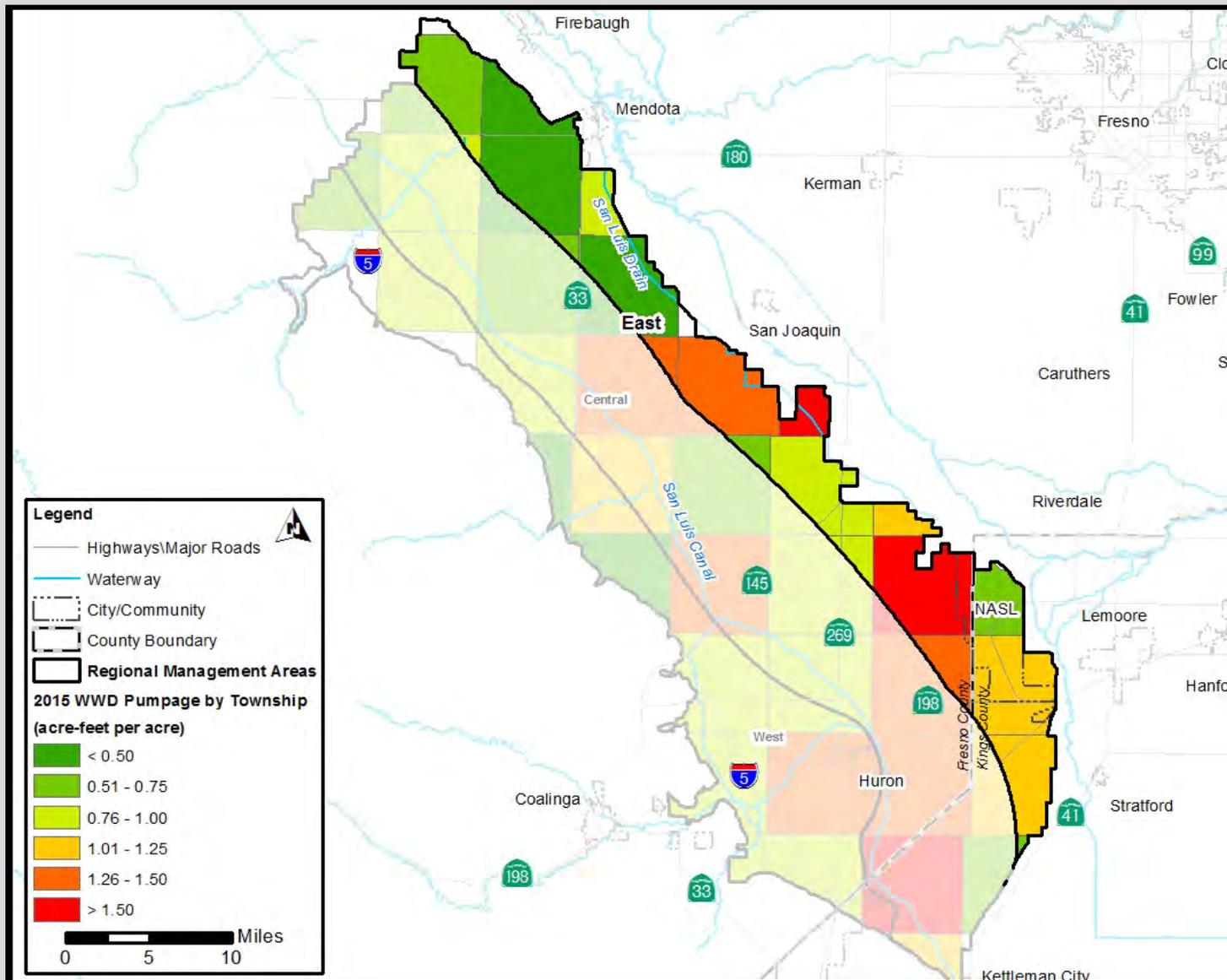
Groundwater Levels District-Wide



Eastern Area- 2012 Groundwater Pumpage by Township



Eastern Area- 2015 Groundwater Pumpage by Township



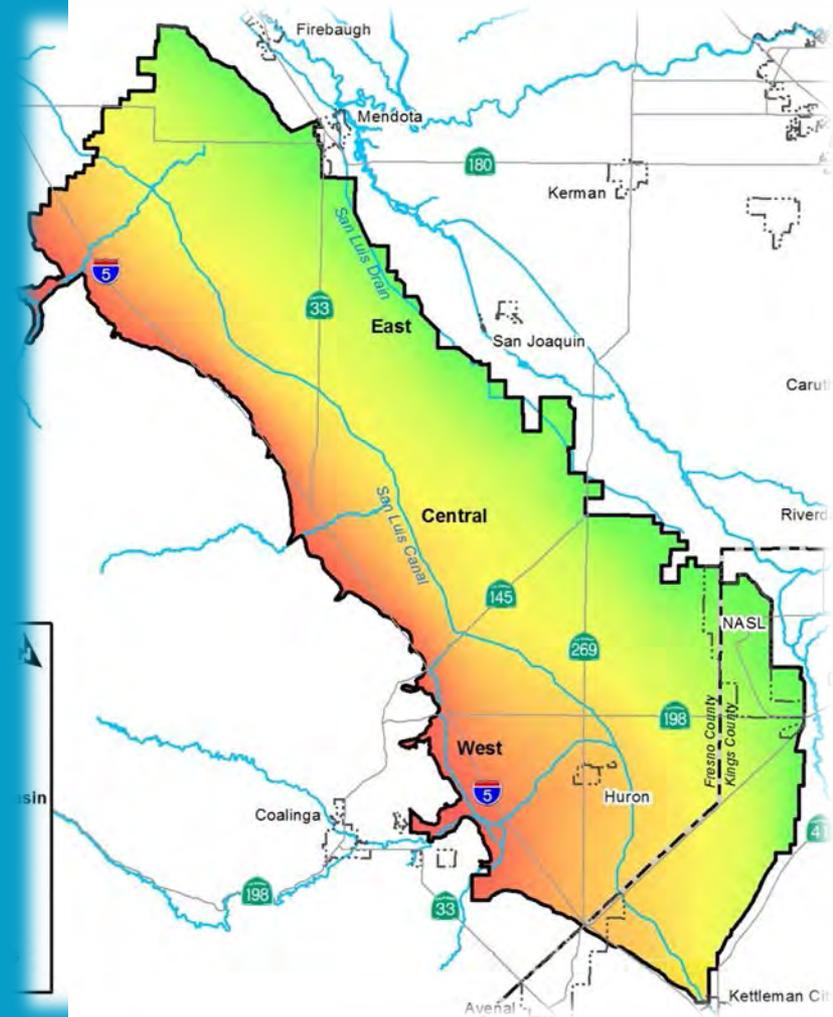
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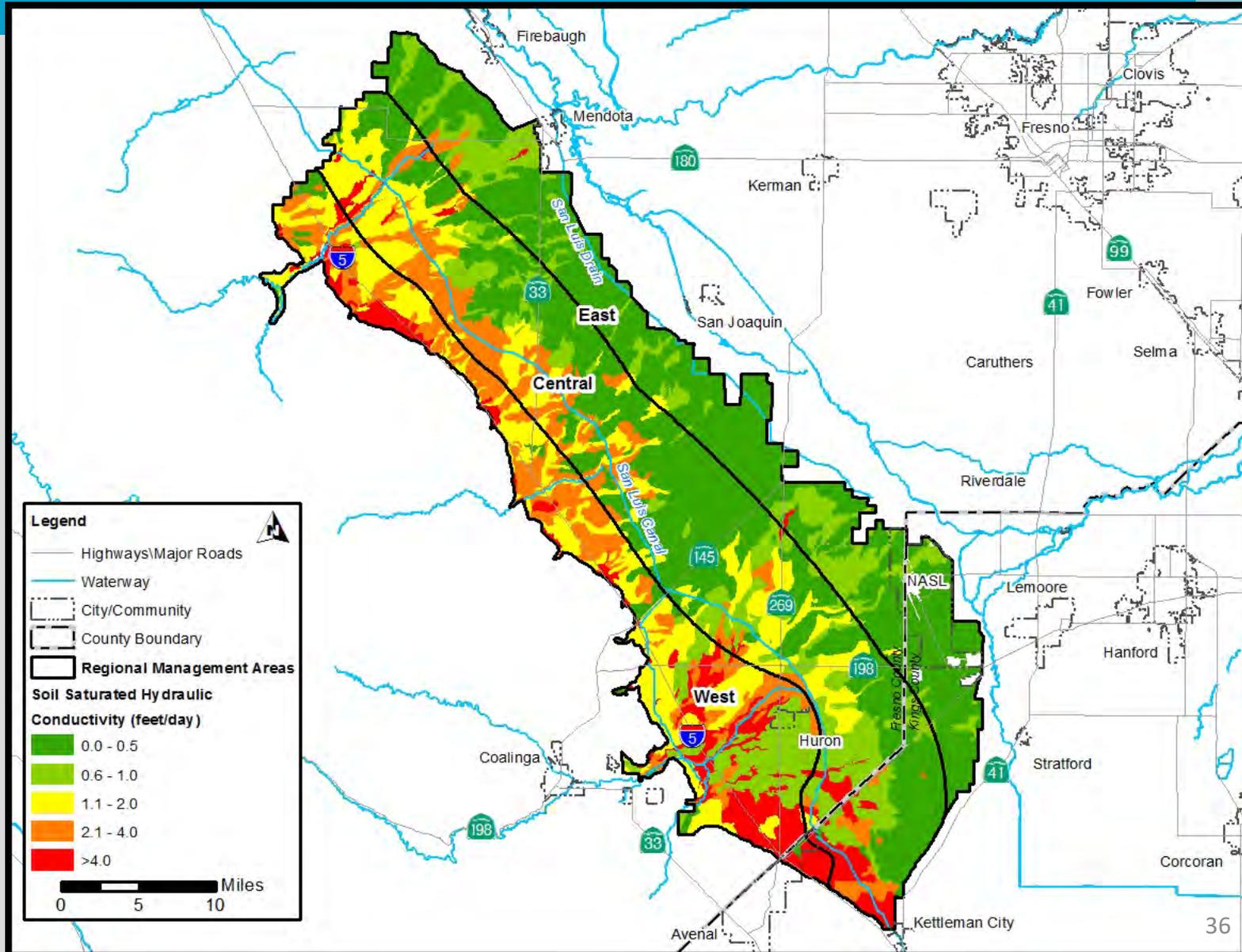


Optimization Options

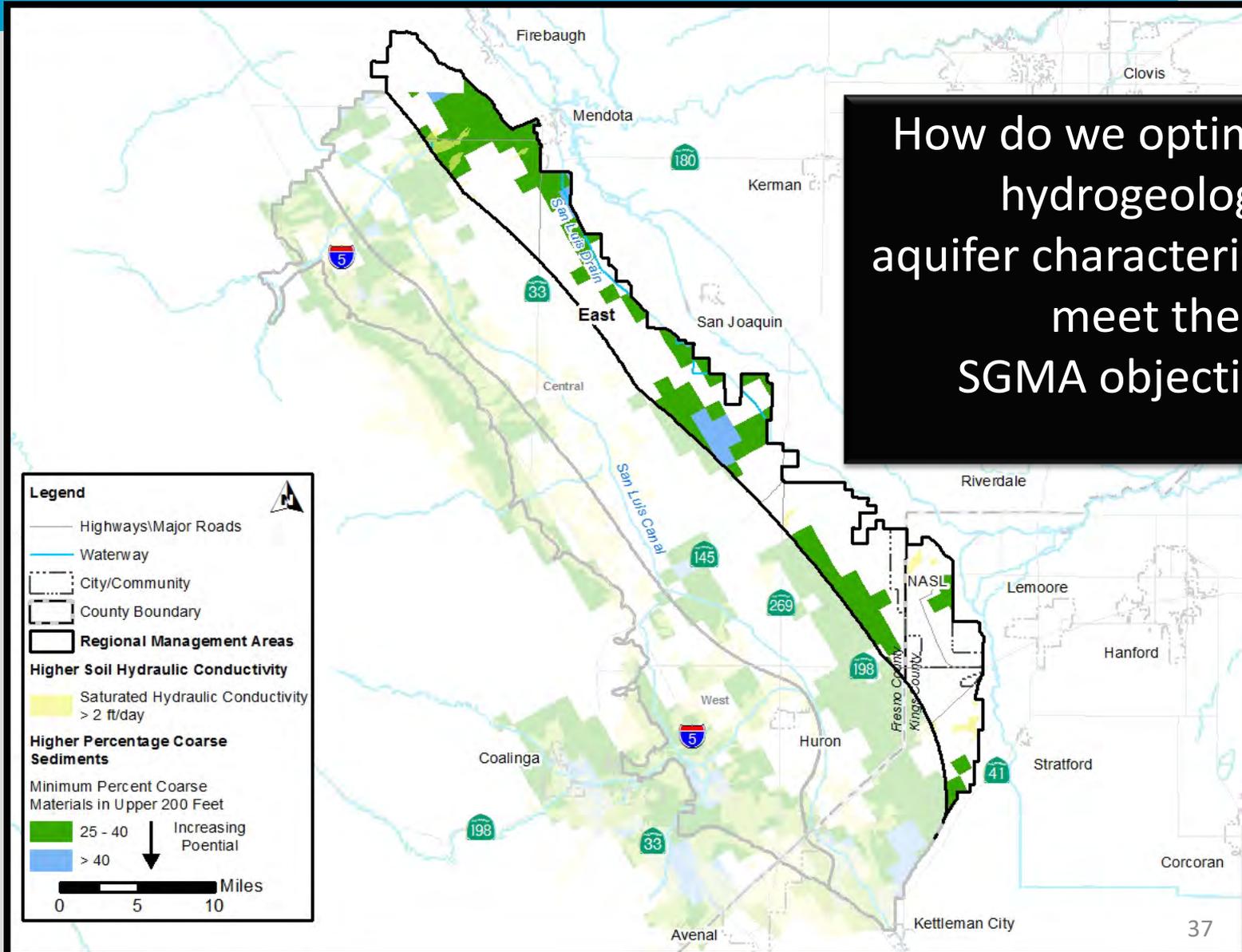
Avoiding the six undesirable results identified in SGMA and optimizing pumping the Westside Subbasin



Soil Hydraulic Conductivity



Eastern Area- Recharge Potential



How do we optimize the hydrogeology, aquifer characteristics and meet the SGMA objectives?

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Groundwater Credit Options

Groundwater Banking Projects developed by:

- The District

OR/AND

- Water Users



Groundwater Credit Options

Aquifer Storage and Recovery (ASR) developed by:

- The District

OR/AND

- Water Users



Groundwater Credit Options

What type of groundwater credit works best with your farming practices?



Management Areas

Group the **Eastern** Area of the subbasin as:

- Three management areas

OR

- One management area



Management Areas

Based on Farm Practices, do you have suggestions or comments on the proposed management areas?



Management Options

What management options would you like the District to incorporate in the GSP?

1. Flexibility to transfer Sustainable Yield Allocation to water users in the same management area
2. Land Fallowing with Compensation
3. Public Input?



SGMA Terminology

Are you understanding the terminology? What can we do differently from a terminology stand point?



GSP IDEAS



QUESTIONS

