Update on San Joaquin Valley Groundwater Conditions
Outline

- Measured Precipitation
- Groundwater Conditions
- Groundwater and Land Subsidence
- Questions and Answers
San Joaquin Precipitation
Central Sierra – 5 year annual average

Measured Precipitation:

2013-14: 51%
2014-15: 48%
2015-16: 99%
2016-17: 179%
2017-18: 74%

Source: CDEC
Tulare Basin Precipitation
Southern Sierra – 5 year annual average

Measured Precipitation:

2013-14: 49%
2014-15: 47%
2015-16: 90%
2016-17: 162%
2017-18: 62%

Source: CDEC
Water Level Measurements
San Joaquin Valley

Measurement by Well Type:

- Industrial: 1
- Irrigation: 549
- Observation: 271
- Residential: 56
- Stock Watering: 5
- Unknown: 416
- Total: 1,298
Groundwater Level Change 2017-2018

Groundwater Level Change 2017-2018 (1 Year)
San Joaquin River & Tulare Lake Hydrologic Region

<table>
<thead>
<tr>
<th>Total Number of Wells</th>
<th>San Joaquin River HR</th>
<th>Tulare Lake HR</th>
<th>San Joaquin River/Tulare Lake HR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>72 (11%)</td>
<td>198 (31%)</td>
<td>418 (32%)</td>
</tr>
<tr>
<td></td>
<td>130 (19%)</td>
<td>119 (19%)</td>
<td>225 (17%)</td>
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<tr>
<td></td>
<td>297 (45%)</td>
<td>121 (19%)</td>
<td>136 (11%)</td>
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<tr>
<td></td>
<td>127 (19%)</td>
<td>98 (16%)</td>
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</tr>
<tr>
<td></td>
<td>41 (12%)</td>
<td>85 (10%)</td>
<td></td>
</tr>
</tbody>
</table>

- Decrease > -10 ft
- Decrease > -10 to -2.5 ft
- Change +/- 2.5 ft
- Increase > 2.5 to 10 ft
- Increase > 10 ft

San Joaquin River Hydrologic Region
Tulare Lake Hydrologic Region
Groundwater Level Change 2017-2018

Groundwater Level Change 2017-2018 (1 Year)
San Joaquin River & Tulare Lake Hydrologic Region

- San Joaquin River HR:
  - Decrease > -10 ft: 41 (6%)
  - Decrease > -10 to -2.5 ft: 127 (19%)
  - Change +/- 2.5 ft: 297 (45%)
  - Increase > 2.5 to 10 ft: 198 (31%)
  - Increase > 10 ft: 130 (19%)

- Tulare Lake HR:
  - Decrease > -10 ft: 95 (15%)
  - Decrease > -10 to -2.5 ft: 98 (16%)
  - Change +/- 2.5 ft: 121 (19%)
  - Increase > 2.5 to 10 ft: 119 (19%)
  - Increase > 10 ft: 249 (19%)

- San Joaquin River/Tulare Lake HR:
  - Decrease > -10 ft: 136 (11%)
  - Decrease > -10 to -2.5 ft: 225 (17%)
  - Change +/- 2.5 ft: 418 (32%)
  - Increase > 2.5 to 10 ft: 270 (21%)
  - Increase > 10 ft: 418 (32%)

CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT PROGRAM
Groundwater Level Change 2015-2018

Groundwater Level Change 2015-2018 (3 Year)
San Joaquin River & Tulare Lake Hydrologic Region

San Joaquin River Hydrologic Region
Tulare Lake Hydrologic Region

Groundwater Level Change
- Increase > 10 feet
- Increase 10 to 25 feet
- Change +/- 2.5 feet
- Decrease 2.5 to 10 feet
- Decrease > 10 feet
Groundwater Level Change 2015-2018

San Joaquin River & Tulare Lake Hydrologic Region
Groundwater Level Change 2013-2018

Groundwater Level Change 2013-2018 (5 Year)
San Joaquin River & Tulare Lake Hydrologic Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Number of Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Joaquin River HR</td>
<td>38 (10%)</td>
</tr>
<tr>
<td></td>
<td>66 (20%)</td>
</tr>
<tr>
<td></td>
<td>94 (29%)</td>
</tr>
<tr>
<td>Tulare Lake HR</td>
<td>67 (12%)</td>
</tr>
<tr>
<td></td>
<td>24 (5%)</td>
</tr>
<tr>
<td></td>
<td>40 (7%)</td>
</tr>
<tr>
<td>San Joaquin River/Tulare Lake HR</td>
<td>100 (12%)</td>
</tr>
<tr>
<td></td>
<td>56 (6%)</td>
</tr>
<tr>
<td></td>
<td>106 (12%)</td>
</tr>
</tbody>
</table>

Legend:
- Decrease > -10 ft
- Decrease > -10 to -2.5 ft
- Change +/- 2.5 ft
- Increase > 2.5 to 10 ft
- Increase > 10 ft

Groundwater Level 5-year Change 2013-2018

San Joaquin River Hydrologic Region
Tulare Lake Hydrologic Region
Groundwater Level Change 2013-2018

Groundwater Level Change 2013-2018 (5 Year)
San Joaquin River & Tulare Lake Hydrologic Region

- San Joaquin River HR:
  - Decrease > -10 ft: 32 (10%)
  - Decrease > -10 to -2.5 ft: 66 (20%)
  - Change +/- 2.5 ft: 94 (29%)
  - Increase > 2.5 to 10 ft: 104 (31%)
  - Increase > 10 ft: 100 (12%)

- Tulare Lake HR:
  - Decrease > -10 ft: 24 (5%)
  - Decrease > -10 to -2.5 ft: 40 (7%)
  - Change +/- 2.5 ft: 68 (13%)
  - Increase > 2.5 to 10 ft: 338 (63%)
  - Increase > 10 ft: 162 (19%)

- San Joaquin River/Tulare Lake HR:
  - Decrease > -10 ft: 56 (6%)
  - Decrease > -10 to -2.5 ft: 106 (12%)
  - Change +/- 2.5 ft: 162 (19%)
  - Increase > 2.5 to 10 ft: 442 (51%)
  - Increase > 10 ft: 106 (12%)

Legend:
- Decrease > -10 ft
- Decrease > -10 to -2.5 ft
- Change +/- 2.5 ft
- Increase > 2.5 to 10 ft
- Increase > 10 ft

Graph showing the percentage of wells experiencing different levels of groundwater change from 2013 to 2018 in the San Joaquin River and Tulare Lake Hydrologic Regions.
San Joaquin River Hydrologic Region

Groundwater Level Findings:

- **2017-2018:** 30% increased by 2.5 feet or greater
  - 25% declined by 2.5 feet or greater
- **2015-2018:** 45% increased by 2.5 feet or greater
  - 28% declined by 2.5 feet or greater
- **2013-2018:** 60% declined by 2.5 feet or greater
  - 20% increased by 2.5 feet or greater
Tulare Lake Hydrologic Region
Groundwater Level Findings:

- **2017-2018**: 50% increased by 2.5 feet or greater.
  - 31% declined by 2.5 feet or greater

- **2015-2018**: 52% increased by 2.5 feet or greater.
  - 35% declined by 2.5 feet or greater

- **2013-2018**: 76% declined by 2.5 feet or greater.
  - 17% increased by 2.5 feet or greater
SJ & TL Hydrologic Region

Groundwater Level Findings:

- **2017-2018**: 40% increased by 2.5 feet or greater.
  - 28% declined by 2.5 feet or greater
- **2014-2018**: 49% increase by 2.5 feet or greater.
  - 33% decreased by 2.5 feet or greater
- **2013-2018**: 71% declined by 2.5 feet or greater.
  - 18% increased by 2.5 feet or greater
Water Level Measurement Information

Reporting Well Data:
- Spring 2017-2018: 1,298 wells
- Spring 2015-2018: 948 wells
- Spring 2013-2018: 866 wells

Variations in Reporting due to:
- CASGEM
- Reduction in monitoring
- No Measurement/Pumping/Other
- Loss of wells from grid- drought
- QA/QC of data
Groundwater and Land Subsidence

- California Aqueduct
- Friant/Kern Canal
- El Nido Area/Merced
California Aqueduct Subsidence

Subsidence Contours (2008-2010)

- 25 mm (estimated)
- 25mm
- 50-100mm
- 100-150mm
- 150-280mm
- 280-410mm
- 410-540mm
- >540mm

Source: USGS
California Aqueduct Subsidence/GW Levels

SWN# 18S16E33A004M
Period of record: 1968-1994
Total GWL Decline: 38 feet

SWN# 19S17E16C002M
Period of Record: 1992-2018
Total GW Level Decline: 107.71 feet

SWN# 22S18E01E002M
Period of Record: 2009-2018
Total GW Level Decline: 80.25 feet

SWN# 21S19E020D001M
Period of Record: 2008-2017
Total GW Level Decline: 84.98 feet
2008-2010 Decline: 27 feet

Source: USGS
Friant-Kern Canal Subsidence

Subsidence

Subsidence Contours (2008-2010)

- 25 mm (estimated)
- 25mm
- 50-100mm
- 100-150mm
- 150-280mm
- 280-410mm
- 410-540mm
- >540mm

Source: USGS
Friant-Kern Canal Subsidence/GW Levels

**SWN# 24S26E03A001M**
- Period of record: 1979-2018
- Total GWL Decline: 54 feet
- 2008-2010 Decline: 16 feet

**SWN# 24S26E04P001M**
- Period of record: 1979-2017
- Total GWL Decline: 71 feet
- 2008-2010 Decline: 14 feet

**SWN# 24S26E03P002M**
- Period of record: 1979-2018
- Total GWL Decline: 61 feet
- 2008-2010 Decline: 4 feet

**SWN# 25S26E16P001M**
- Period of record: 1959-2018
- Total GWL Decline: 84.4 feet
- 2008-2010 Decline: 16 feet

**SWN# 23S26E23H001M**
- Period of record: 1979-2018
- Total GWL Decline: 42 feet
- 2008-2010 Decline: 16 feet

**SWN# 24S26E10A001M**
- Period of record: 1979-2017
- Total GWL Decline: 66 feet

**SWN# 24S26E24Q001M**
- Period of record: 1987-2018
- Total GWL Decline: 54 feet
- 2008-2010 Decline: 14 feet
El Nido Area Subsidence

**Subsidence**

Subsidence Contours (2008-2010)
- 25 mm (estimated)
- 25mm
- 50-100mm
- 100-150mm
- 150-280mm
- 280-410mm
- 410-540mm
- >540mm

Source: USGS
El Nido Area Subsidence/GW Levels

SWN# 10S13E35K001M
Period of Record: 1960-2017
Total GW Level Decline: 10 feet

SWN# 11S14E09A003M
Period of Record: 1961-2017
Total GW Level Decline: 75.6 feet
2008-2010 Decline: 1.6 feet

SWN# 11S14E12E001M
Period of Record: 1976-2009
Total GW Level Decline: 25.76 feet

SWN# 11S14E13R001M
Period of Record: 1963-2017
Total GW Level Decline: 120.4 feet

SWN# 11S15E29H001M
Period of Record: 1949-2017
Total GW Level Decline: 31.6 feet

SWN# 12S15E17E001M
Period of Record: 1952-2008
Total GW Level Decline: 55 feet

Source: USGS
Contact Information

South Central Region Office

Mission Statement: To carry out the Department's work within the South Central Region's boundaries and to maintain close contact with local interests to facilitate communication on integrated water-related matters, towards sustainable water resources management.

Service Area
The South Central Region Office, headquartered in Fresno, covers 14 counties including Fresno, Kings, Madera, Mariposa, Merced, Monterey, San Benito, Santa Cruz, Stanislaus, and Tulare Counties as well as portions of Kern, Tuolumne, Stanislaus and San Joaquin Counties.

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CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT PROGRAM