CASTAC BASIN
WATER YEAR 2020 ANNUAL REPORT
GSP IMPLEMENTATION UPDATE

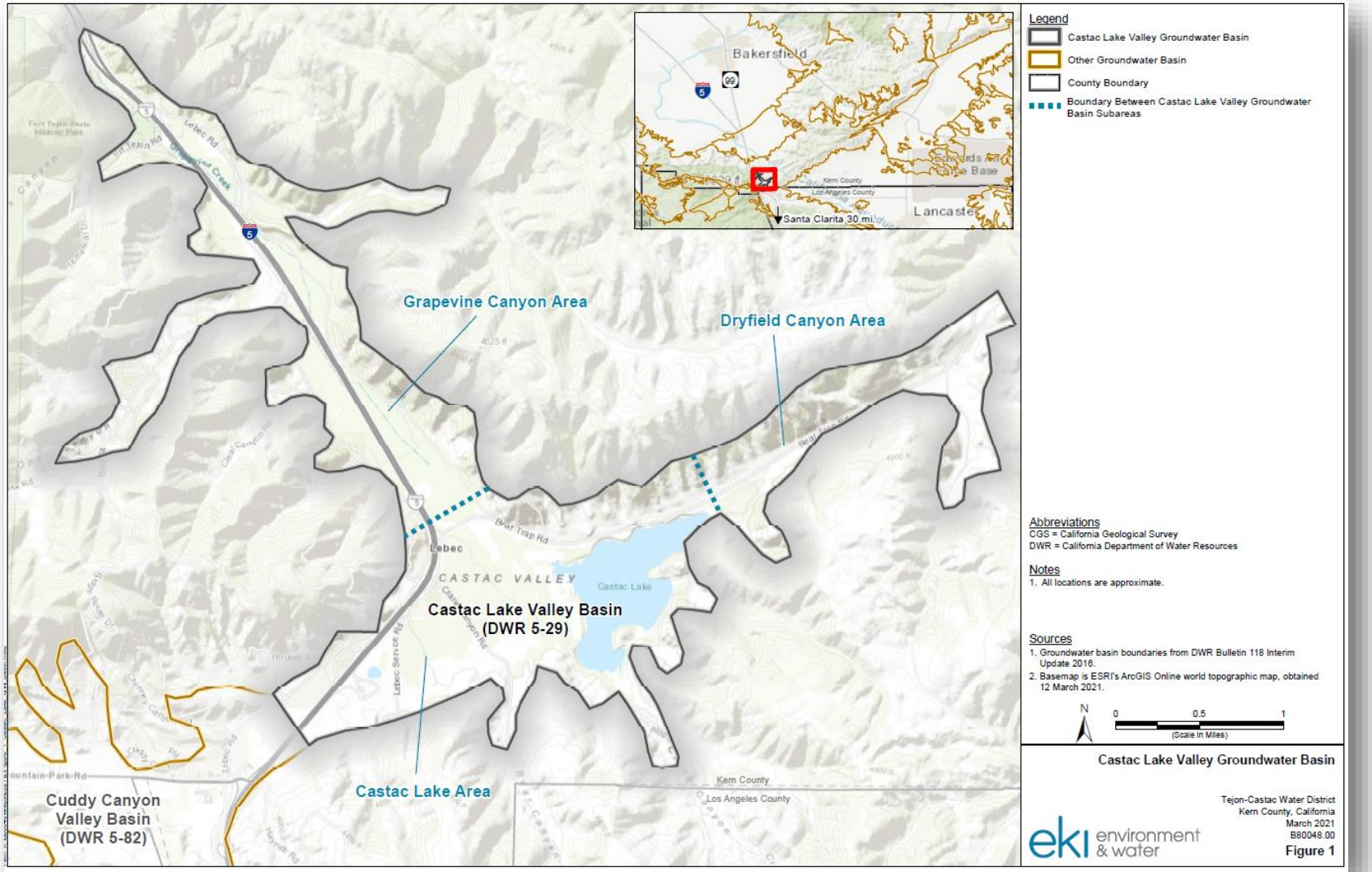
CASTAC BASIN GSA BOARD MEETING

16 MARCH 2021

eki environment & water

Castac Basin Groundwater Sustainability Agency (GSA)

- **Castac Lake Valley Groundwater Basin** (Referenced by DWR as Basin 5-29)
- 3,643 acres
- Groundwater is a source of municipal, domestic, and agricultural supply
- "Very Low" priority ranking for purposes of SGMA
- Not in critical overdraft



Sustainable Groundwater Management Act (SGMA):

Sustainability Indicators

Any of the following effects caused by groundwater conditions occurring throughout the Basin that, when significant and unreasonable, cause "undesirable results"(1):

The Six SGMA "Sustainability Indicators"

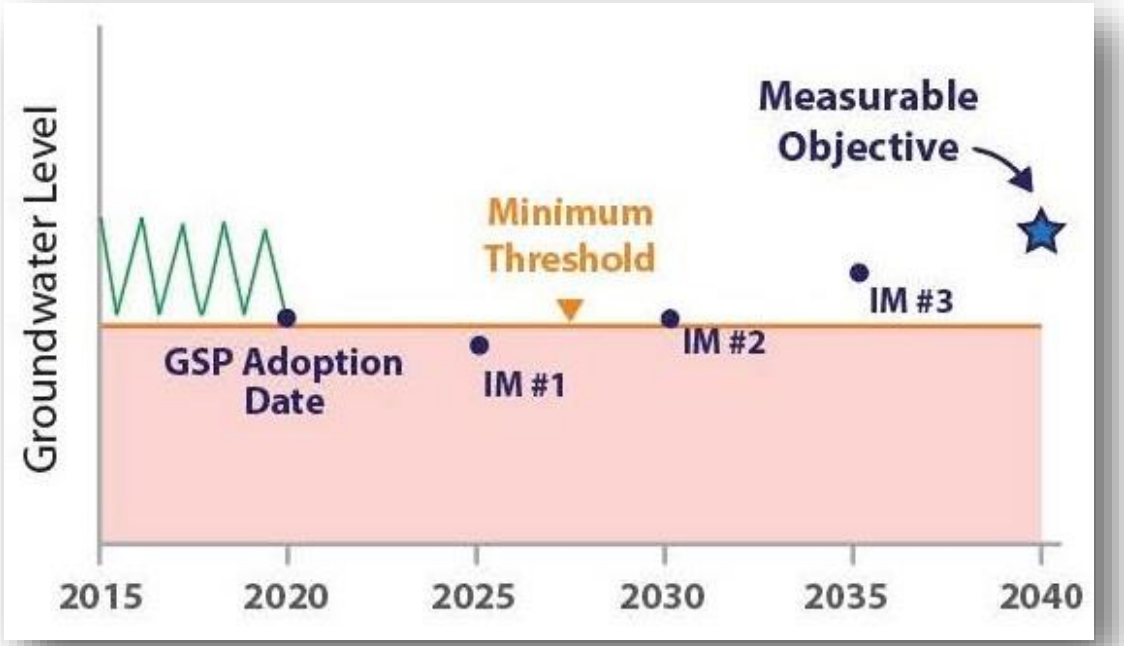
1. Chronic Lowering of Groundwater Levels
2. Reduction of Groundwater Storage
3. Seawater Intrusion
4. Degraded Water Quality
5. Land Subsidence
6. Depletions of Interconnected Surface Water

(All conditions are to be judged against 1 January 2015 baseline)

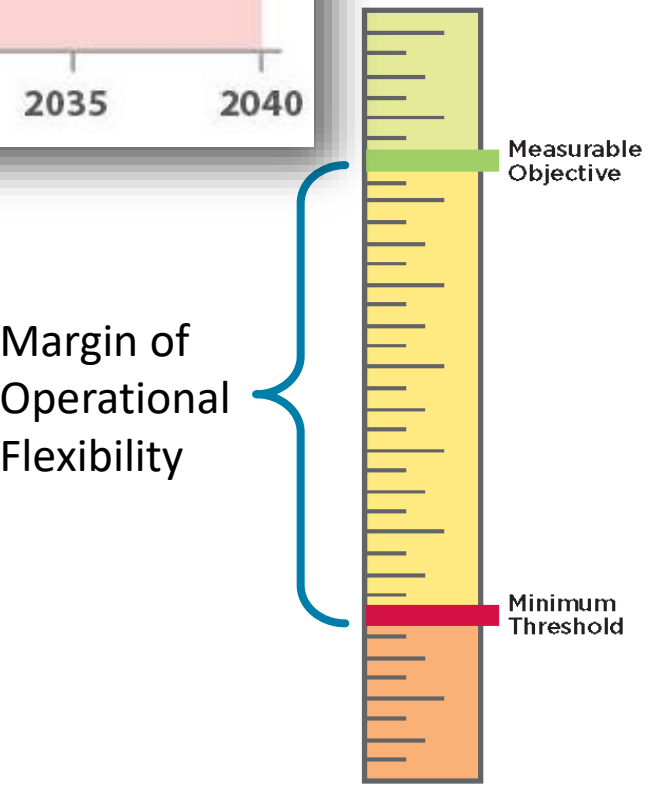
(1) CWC §10721(x)

SGMA:
Sustainability Criteria

- ***Minimum thresholds*** (**MTs**) are the quantitative values representing groundwater conditions at a representative monitoring site that, when exceeded, may cause an undesirable result(s).

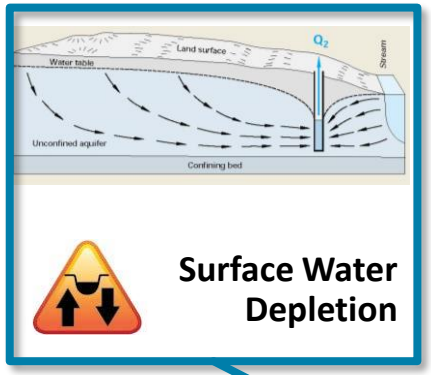


- ***Measurable Objectives*** (**MOs**) are quantitative goals that reflect the basin's desired groundwater conditions and allow the GSA to achieve the sustainability goal within 20 years.
- ***Interim Milestones*** (**IMs**) are target values representing measurable groundwater conditions, in increments of five years, set by an Agency as part of a Plan.

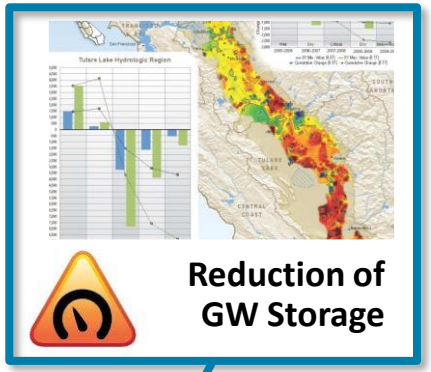


Groundwater Conditions in Castac Basin:

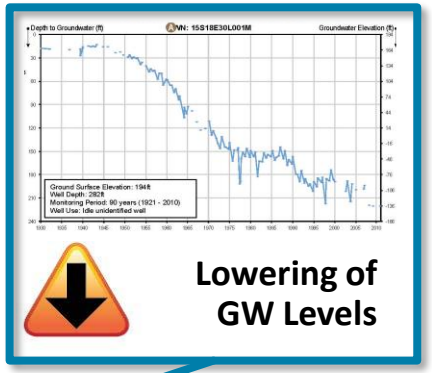
Sustainability indicators of potential concern



Surface Water Depletion



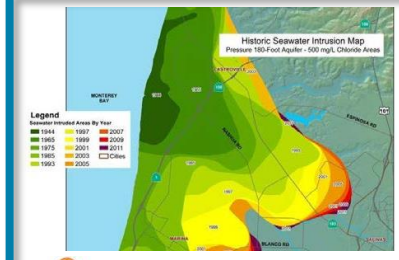
Reduction of GW Storage



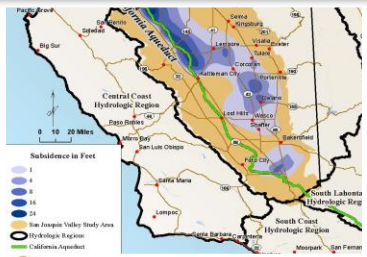
Lowering of GW Levels

Low Concern

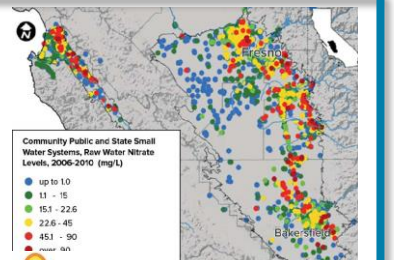
High Concern



Seawater Intrusion



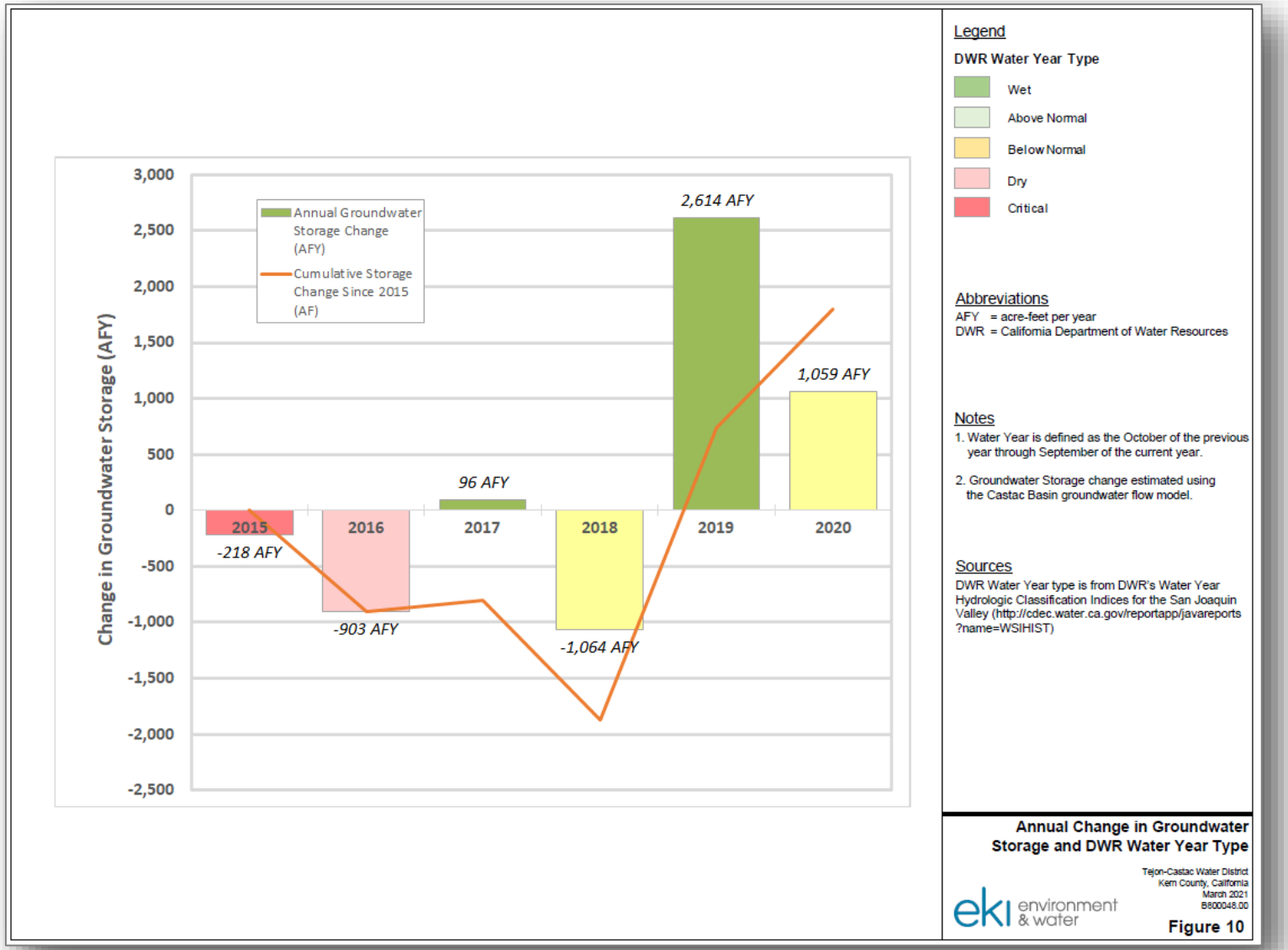
Land Subsidence



Water Quality Degradation

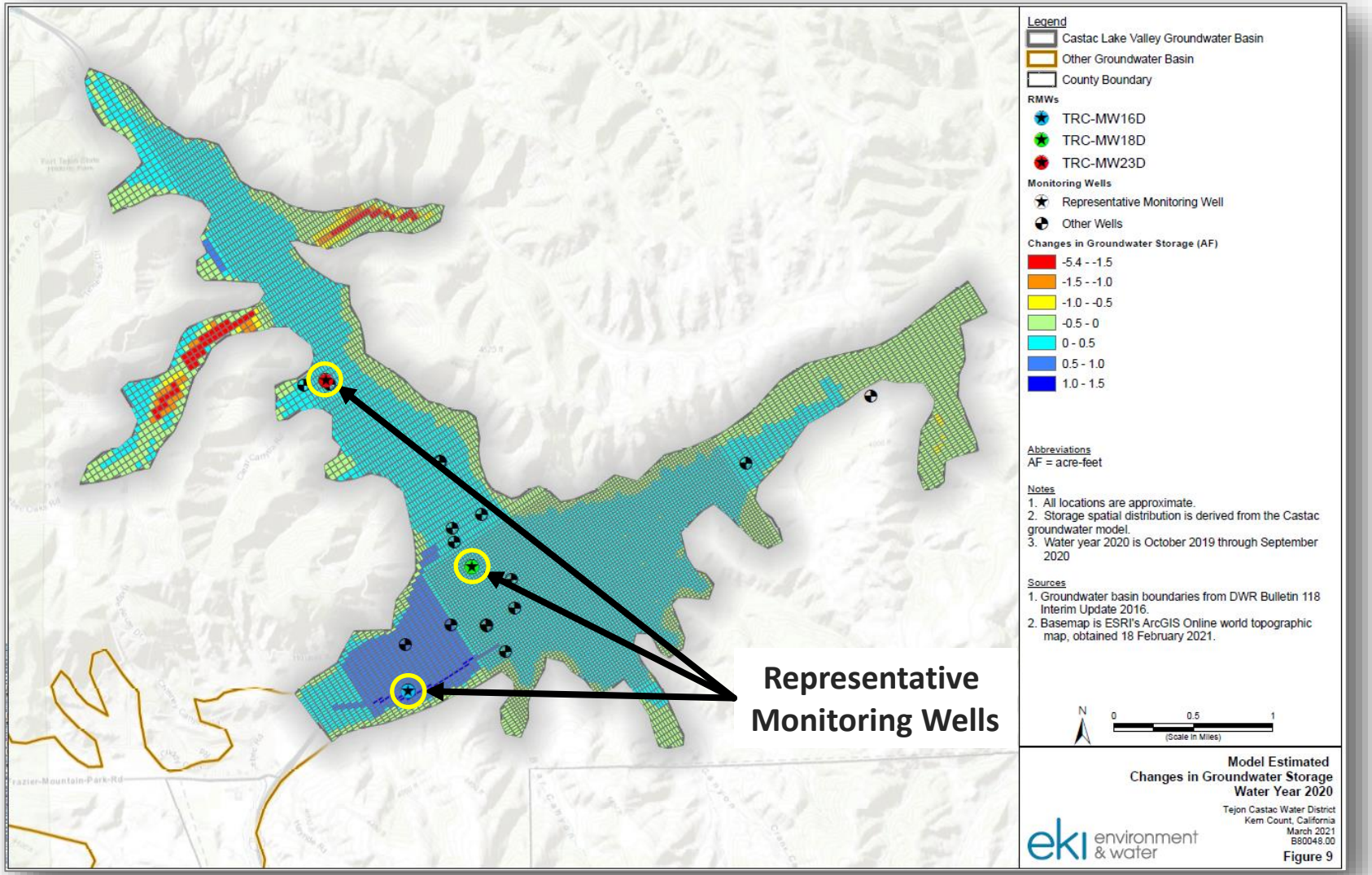
Groundwater Storage in Castac Basin

- Baseline year for comparison is 2015
- Storage estimated using the Castac Basin Groundwater Flow Model
- In Water Year 2020 Castac Basin appears to have gained approximately 1,800 acre-feet (AF) groundwater in storage since 2015



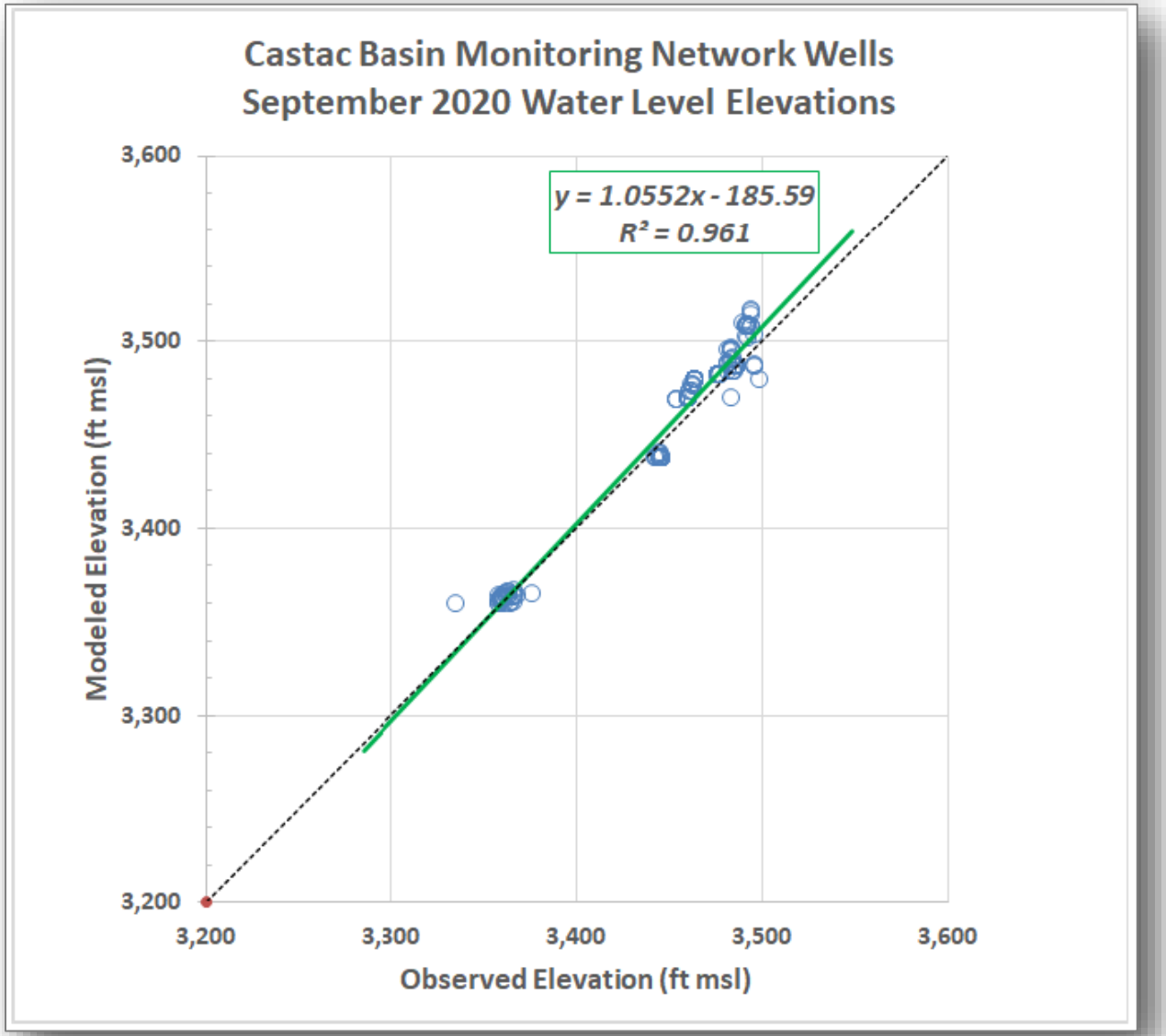
Groundwater Storage in Castac Basin

- Castac Basin Groundwater Flow Model
- Digital representation of the Basin aquifer
- Water levels measured in wells are input to the model
- Model calculates changes in groundwater storage



Groundwater Storage in Castac Basin

- Q: *How do we know the model accurately simulates groundwater conditions in the Basin?*
- A: *We check what the model predicted against what actually happened in 2019-2020.*
- Close to a 1:1 ratio of predicted vs. observed piezometric heads, with a good linear fit.
- <u>Accuracy of the model is acceptable</u>.



Water Levels in Castac Basin

- Groundwater Elevations (GWEs) all are above Measurable Objectives (MOs)
- Water levels are dependent on precipitation and tend to fluctuate widely over multi-year periods
- Dry years can significantly lower water levels
- So far so good, but future precipitation is uncertain.

Table 2. Groundwater Elevations and Relevant Sustainable Management Criteria

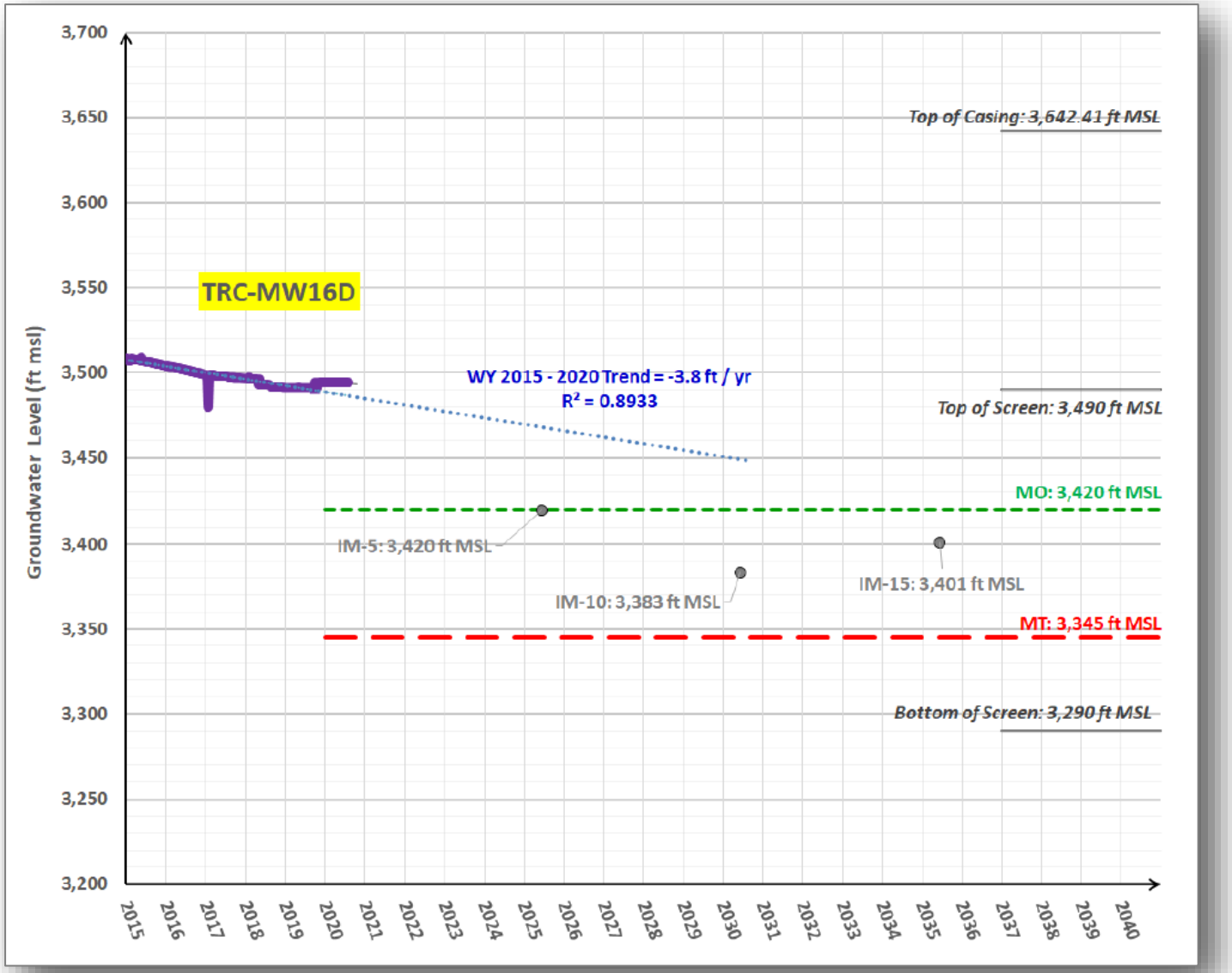
Well Name	Area	Fall 2019 GWE (ft msl)	Spring 2020 GWE (ft msl)	MO (ft msl)	MT (ft msl)	IM-5 (ft msl)	IM-10 (ft msl)	IM-15 (ft msl)
TRC-MW16D	Castac Lake	3,493.7	3,493.5	3,420	3,345	3,420	3,383	3,401
TRC-MW18D	Castac Lake	3,464.0	3,463.9	3,411	3,357	3,411	3,384	3,397
TRC-MW23D	Grapevine	3,359.1	3,362.8	3,356	3,348	3,356	3,352	3,354

Abbreviations:

ft msl = feet above mean sea level
GWE = groundwater elevation
IM = interim milestone
MO = measurable objective
MT = minimum threshold

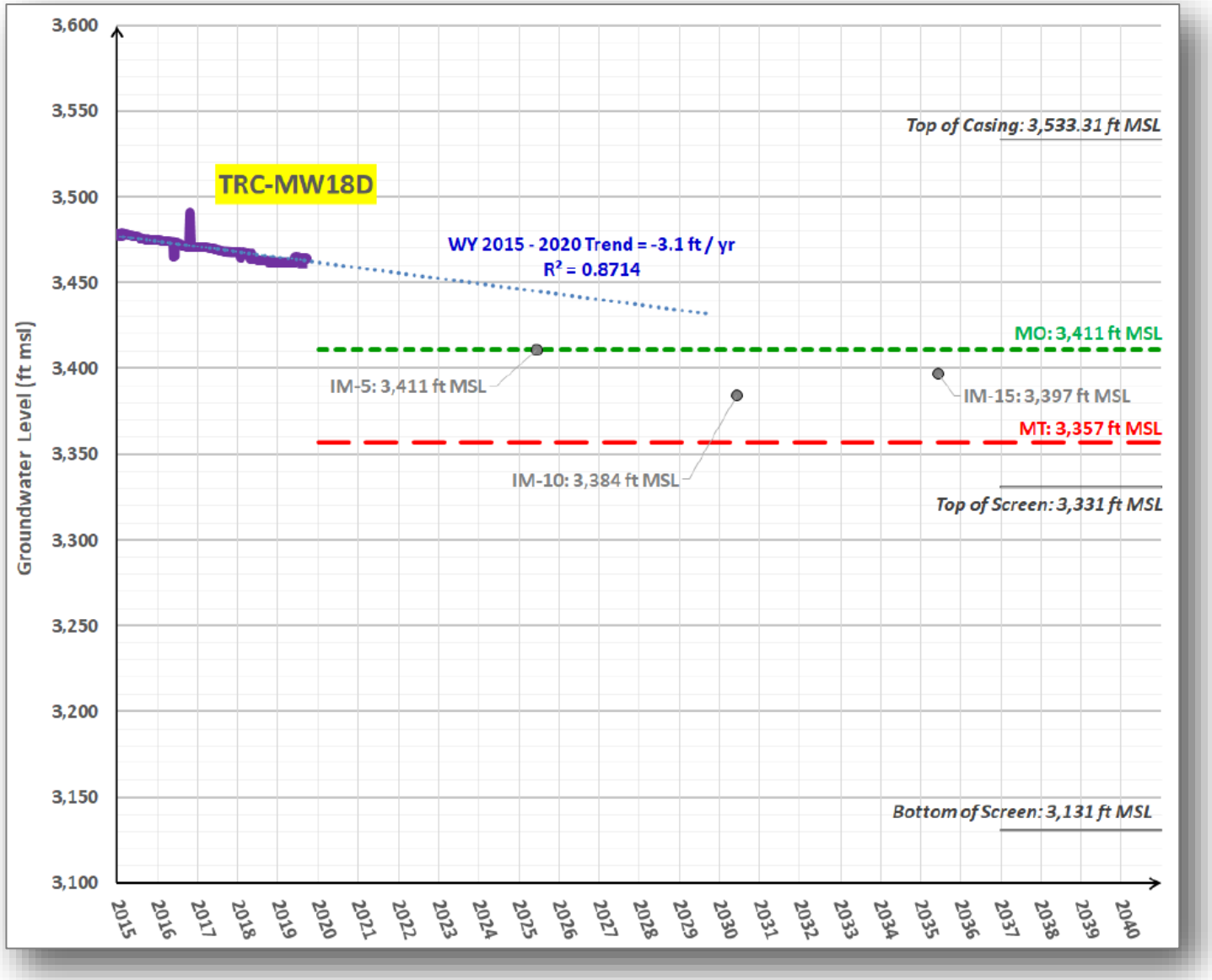
Water Levels in Upper Castac Basin

- Representative Monitoring Well TRC-MW16D, in southwest part of Basin
- Linear trend calculated from WY 2015-2020
- -3.8 ft/year



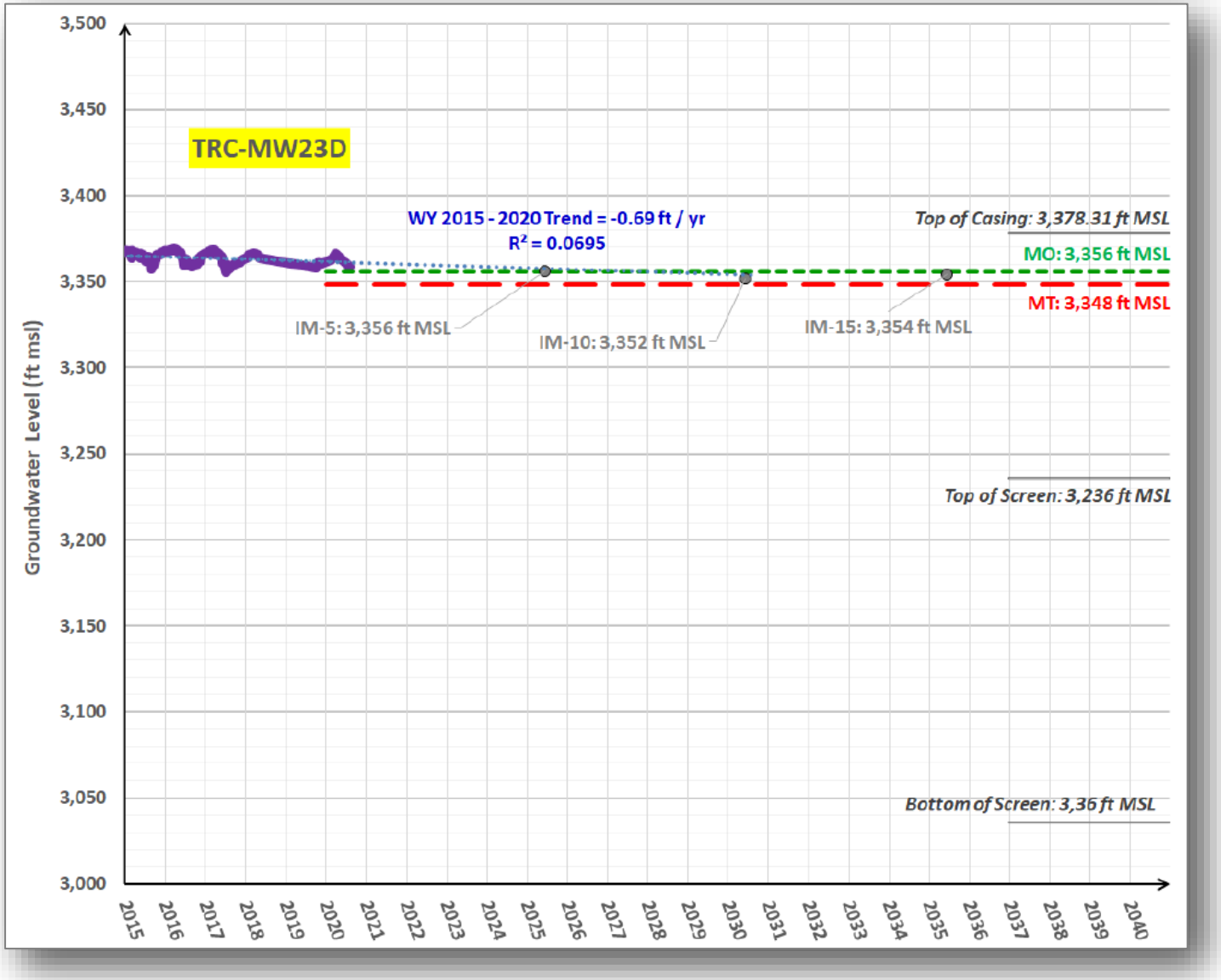
Water Levels in Central Castac Basin

- Representative Monitoring Well TRC-MW18D, in central part of Basin near Castac Lake
- Linear trend calculated from WY 2015-2020
- -3.1 ft/year



Water Levels in Lower Castac Basin

- Representative Monitoring Well TRC-MW23D, in Grapevine part of Basin
- Linear trend calculated from WY 2015-2020
- -0.7 ft/year



Groundwater Use in Castac Basin

- Groundwater pumping is 99.9% for municipal use

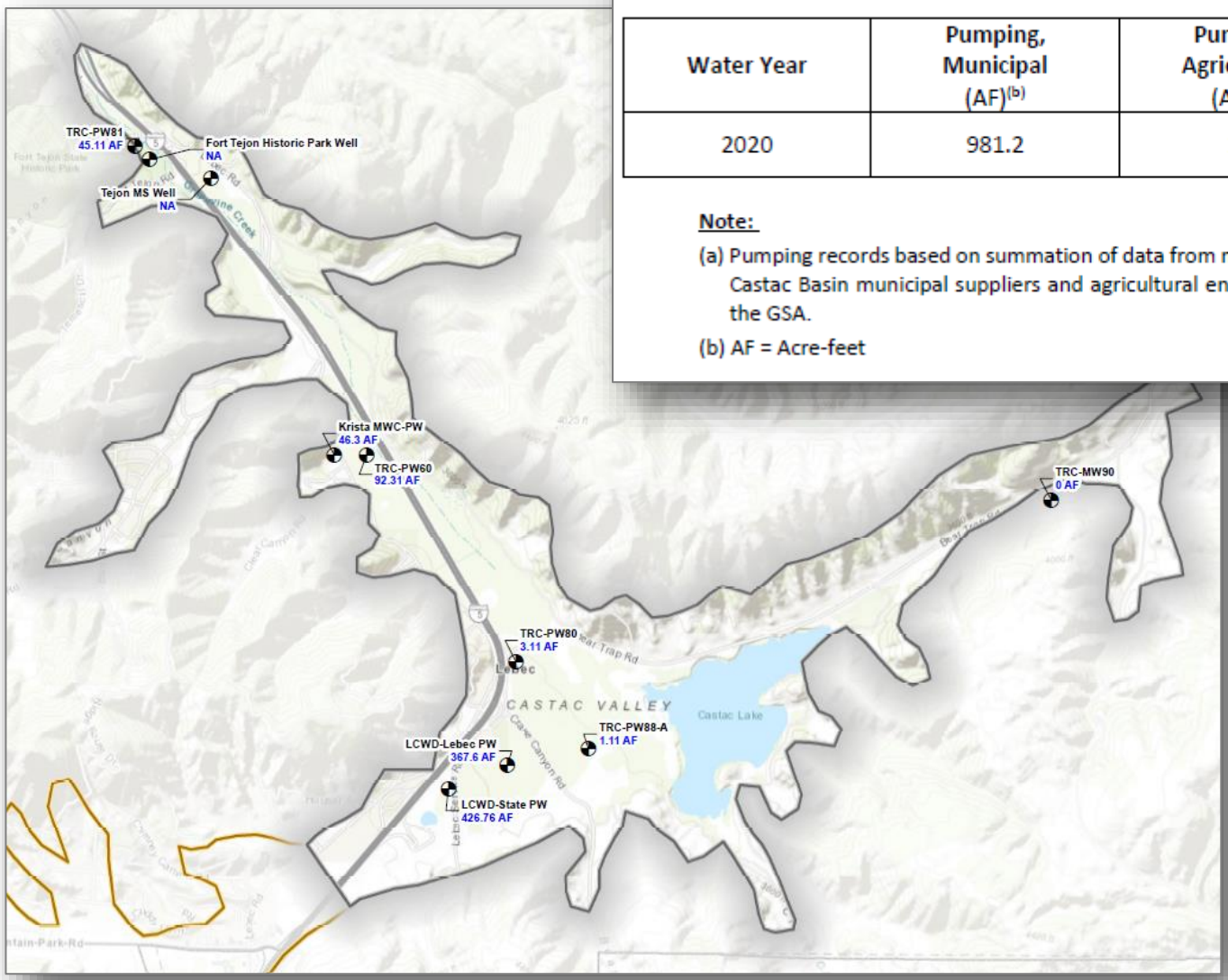


Table 1. Summary of Groundwater Extraction Data by Sector[a]

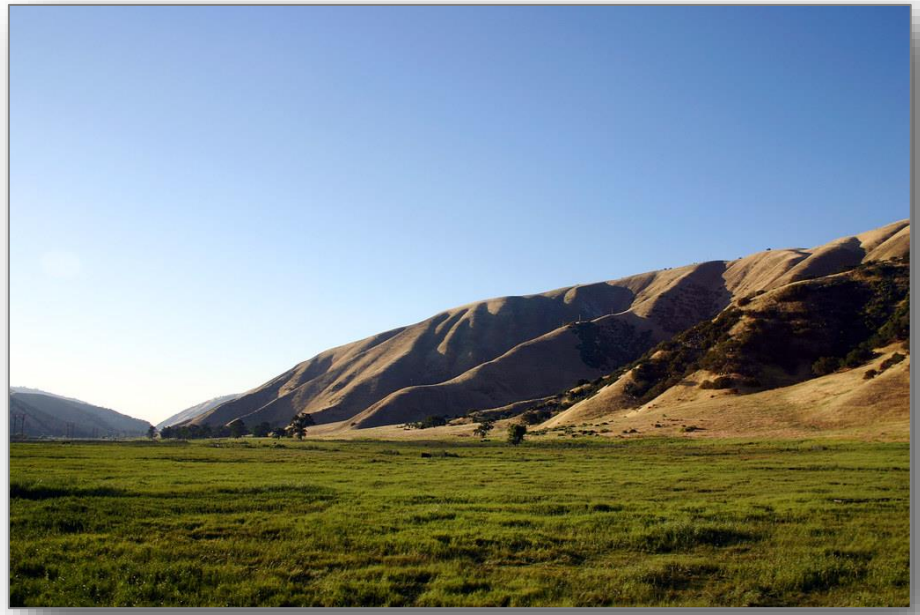
Water Year	Pumping, Municipal (AF)[b]	Pumping, Agricultural (AF)[b]	Pumping, Total (AF)[b]
2020	981.2	1.1	982.3

Note:

(a) Pumping records based on summation of data from metered supply wells provided by Castac Basin municipal suppliers and agricultural entities in response to requests by the GSA.

(b) AF = Acre-feet

Next Steps



1. Board Action: Approval of WY 2020 Annual Report by GSA Board
2. Board Action: EKI Task Order for Technical Support during 2021
    a) Data screening, quality control, and upload to DWR website in 2021
    b) Stakeholder outreach and GSA Board meetings, and Ad-hoc Technical Committee meetings (as-needed)
    c) Maintenance of datalogging pressure transducers in selected monitoring wells
    d) Preliminary planning for new upper basin monitoring well
    e) Preparation of WY 2021 Annual Report to DWR (in early 2022)
3. Submittal of Annual Report to DWR by 1 April 2021
4. Additional actions as approved in Task Order

(END)