YOUR AQUIFER AND YOU:

DATA INSIGHTS FROM THE MIDDLE TRINITY AQUIFER AND THE PEOPLE WHO USE IT

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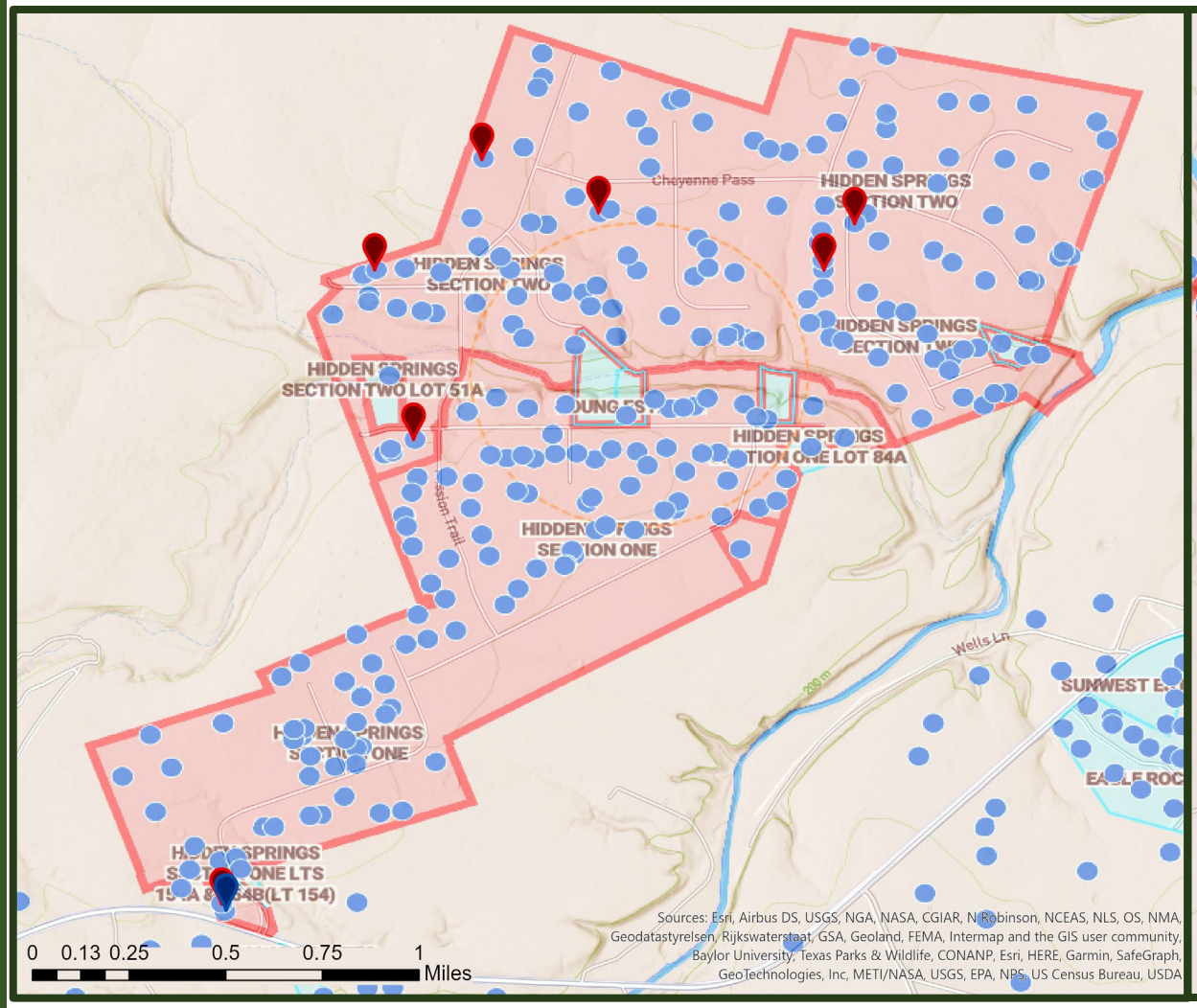
Introduction: Scenario

Unique Opportunity

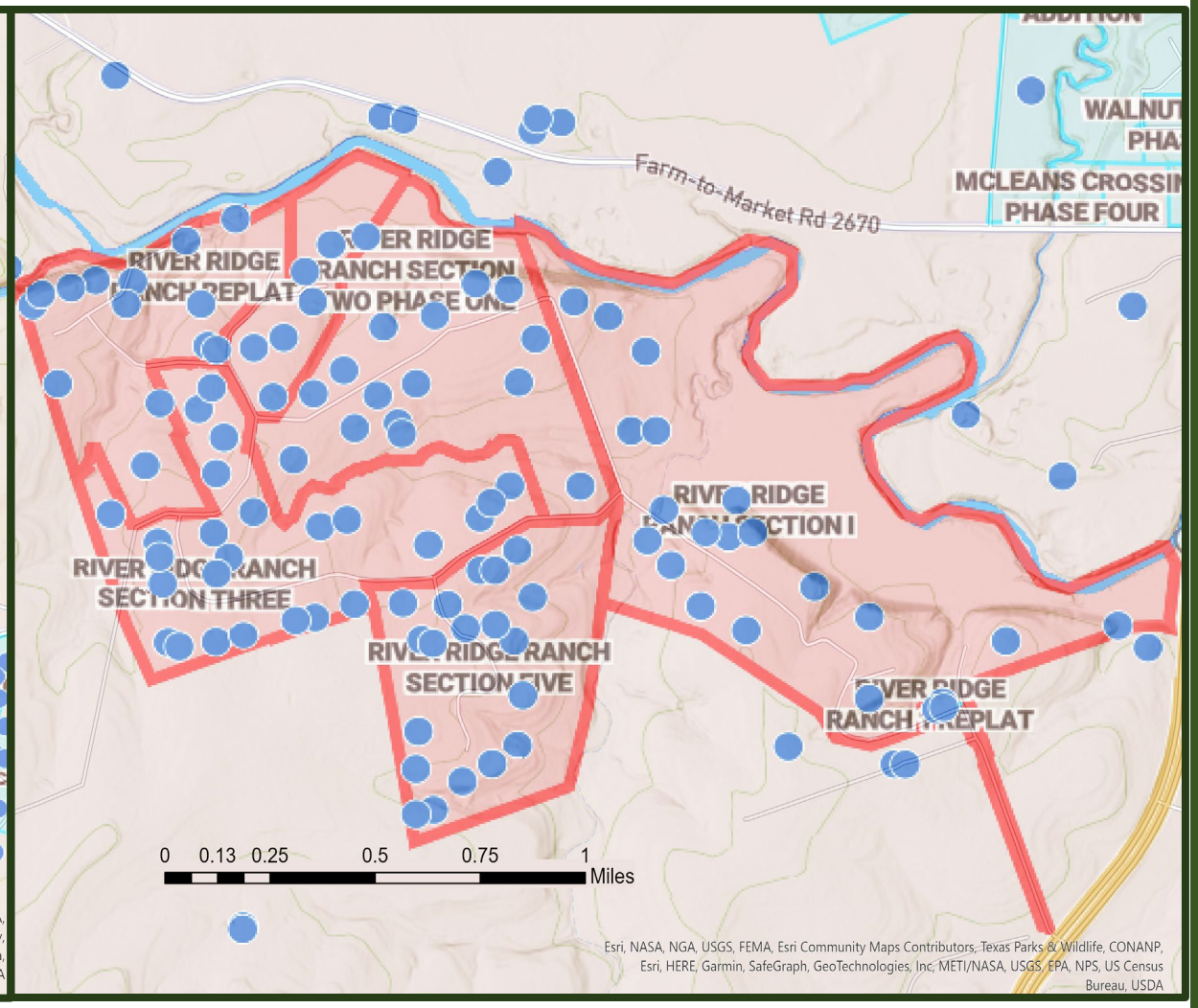
Data sharing and Visualization

A better way to involve the public in groundwater discourse

Introduction: Subdivisions



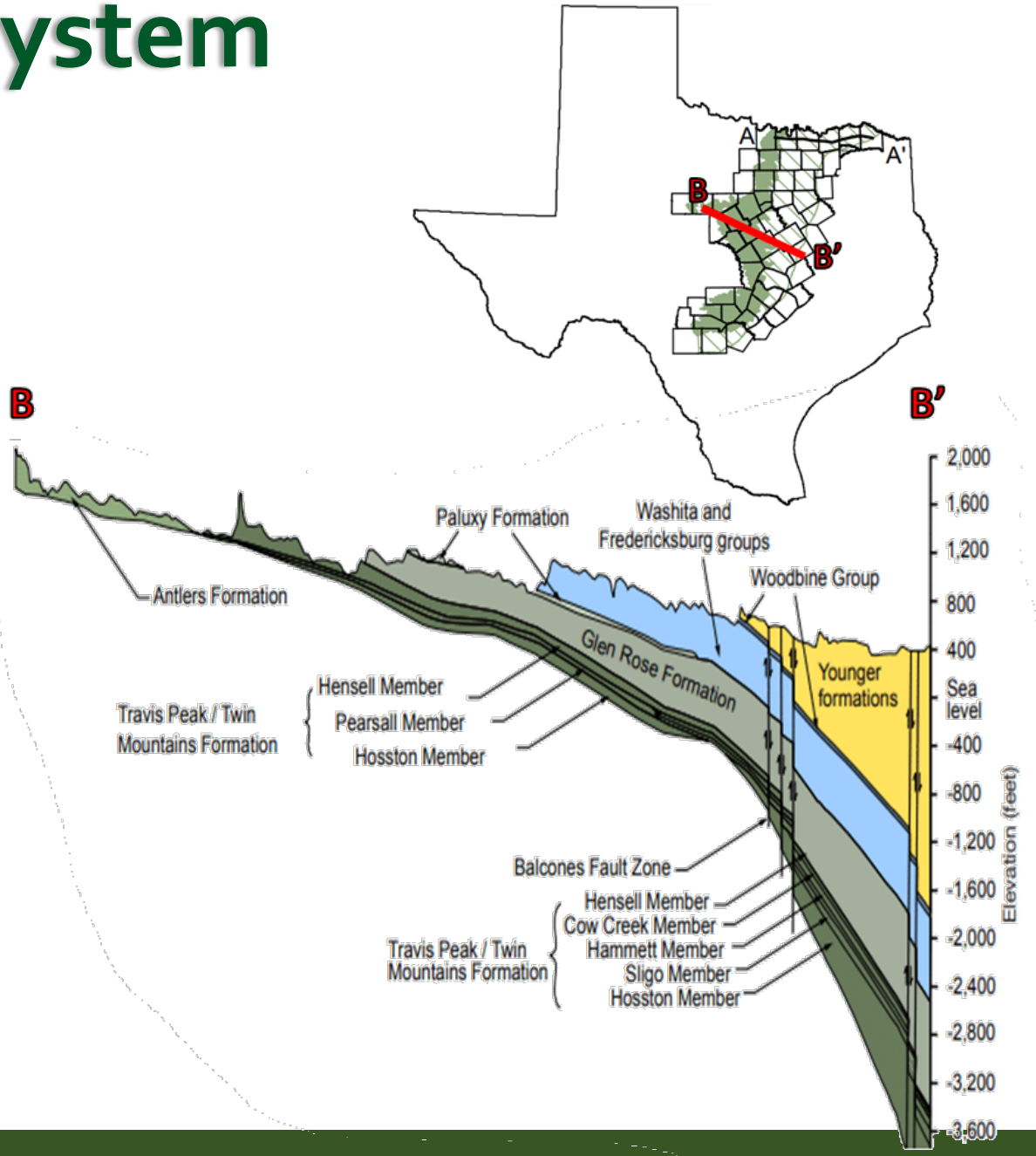
Hidden Springs

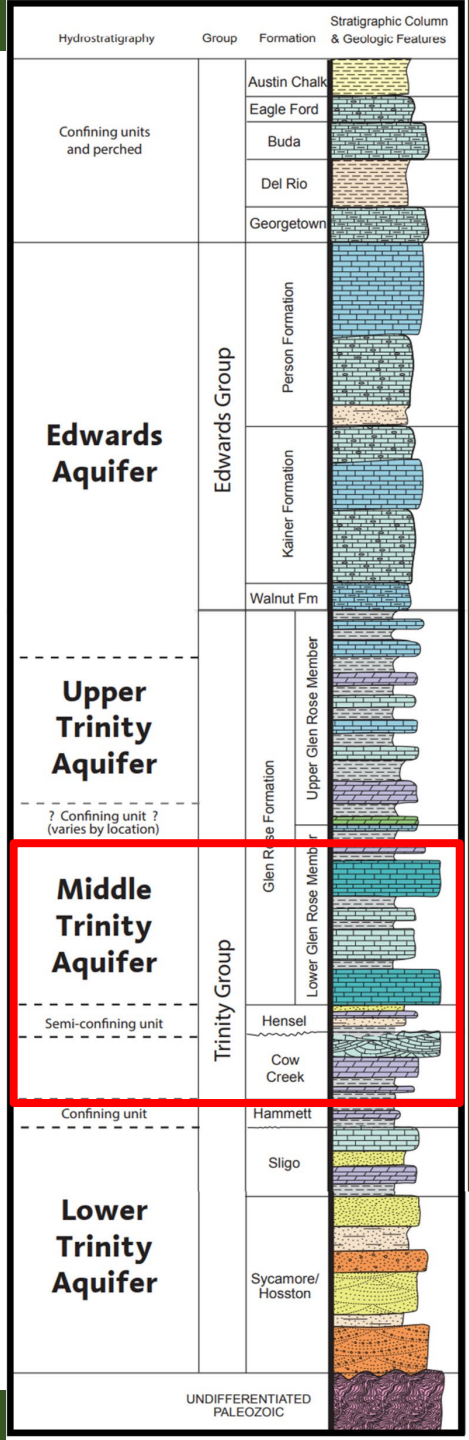


River Ridge Ranch

Introduction: System

- Trinity Aquifer (Middle) was primarily the system in question
- Hensell Sand, faulted cretaceous calcareous sands and limestones





Introduction: Reasoning

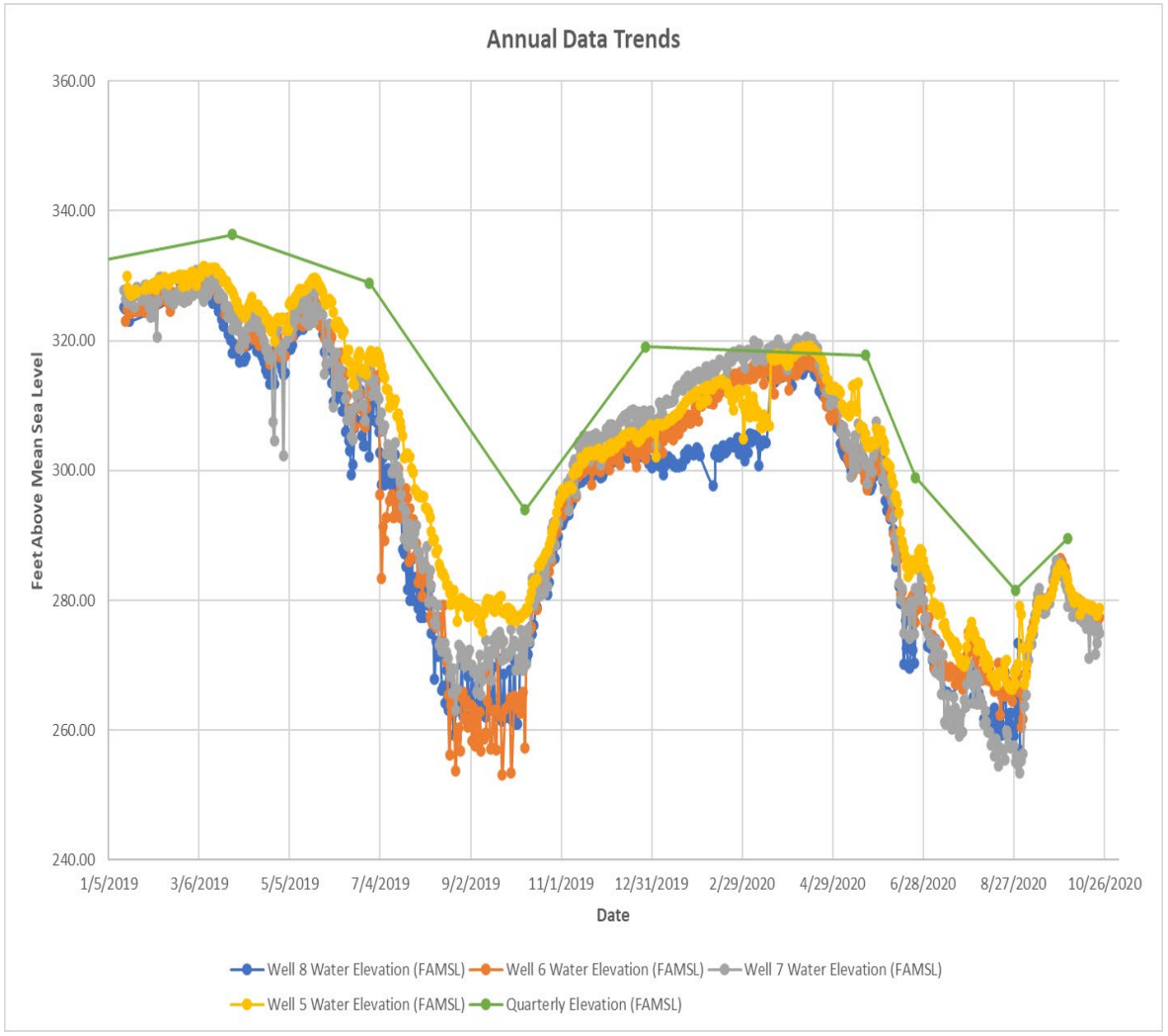
- Diffuse responsibility of groundwater drawdown
- Lack of understanding of long term trends
- Lack of high density shorter term data
- Introducing higher density data, shared regularly, hopefully reduces the diffusion of responsibility and leads to better understanding of the groundwater system on a small scale

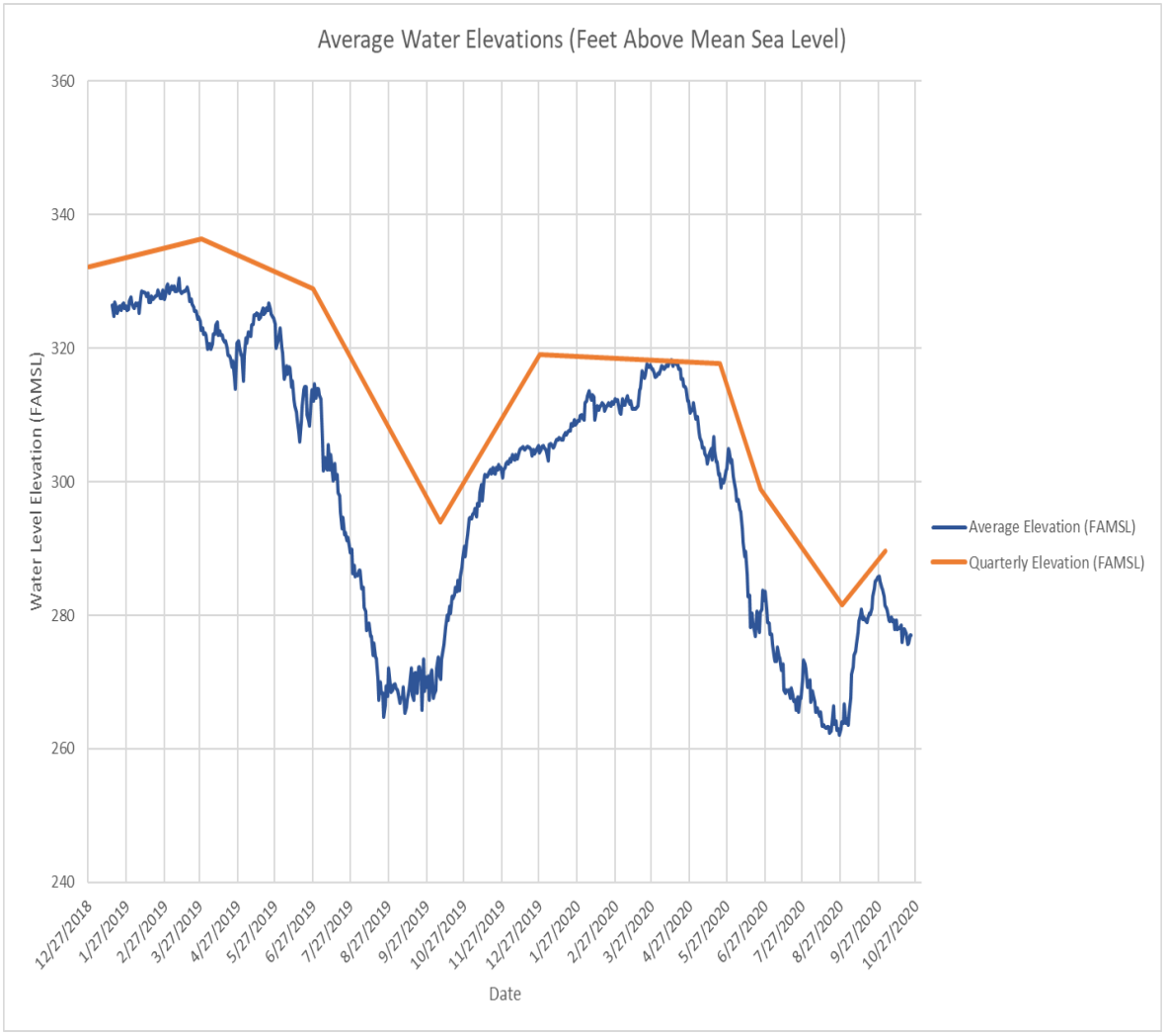
Survey

- Examine water use behaviors, and attitudes
- Before and after study
- Hidden Springs in 2 rounds in October 2019
- River Ridge Ranch added in April 2020
- Total Participants: 56

WellIntel Devices: Before and After

Data Aggregation





Survey Results

High Water Use Behaviors

- Pool ownership and predicted water use (r = .29)
- Owners with irrigation systems were less supportive of water conservation (r = .31)

Conservation Attitudes and Behaviors

- Support for regulation and restrictive policies ($r_{average}$ = .37)
- Less violations (r = .29)
- Greater awareness of monitor wells ($r_{average}$ = .30)

Note. All correlations are absolute values

Survey Results

Modified Rule of Capture

- Support for punitive policies ($r_{average}$ = .51)
- Support for GCD intervention ($r_{average}$ = .43)
- Support for fines (r = .44)

Knowledge of GCD Personnel

- Stronger procedural justice attitudes ($r_{average}$ = .49)
- Greater willingness to pursue surface water (r = .37)
- Higher monitor well awareness and accuracy (r = .35; r = .50)

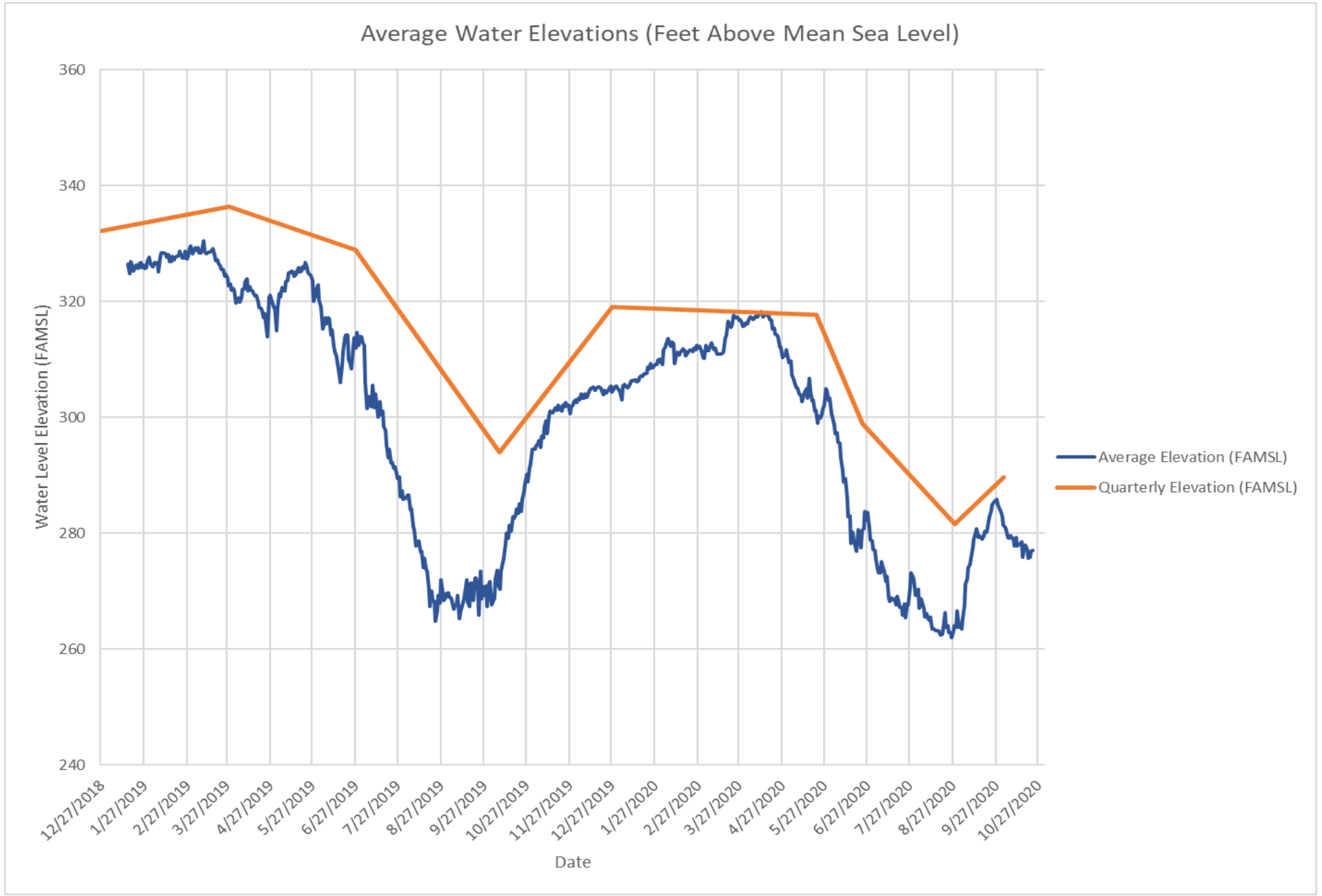
Survey Results

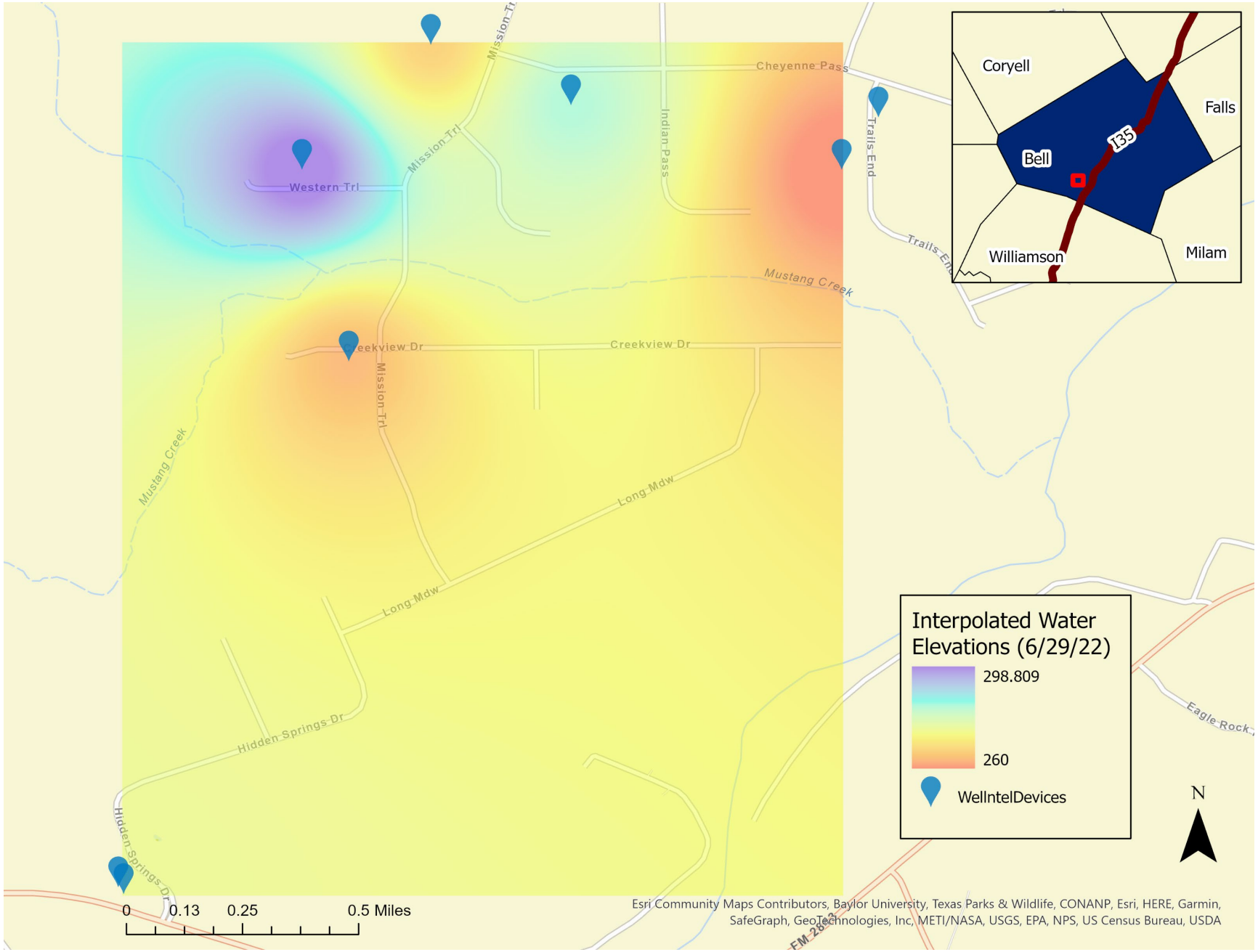
Regulation Violations

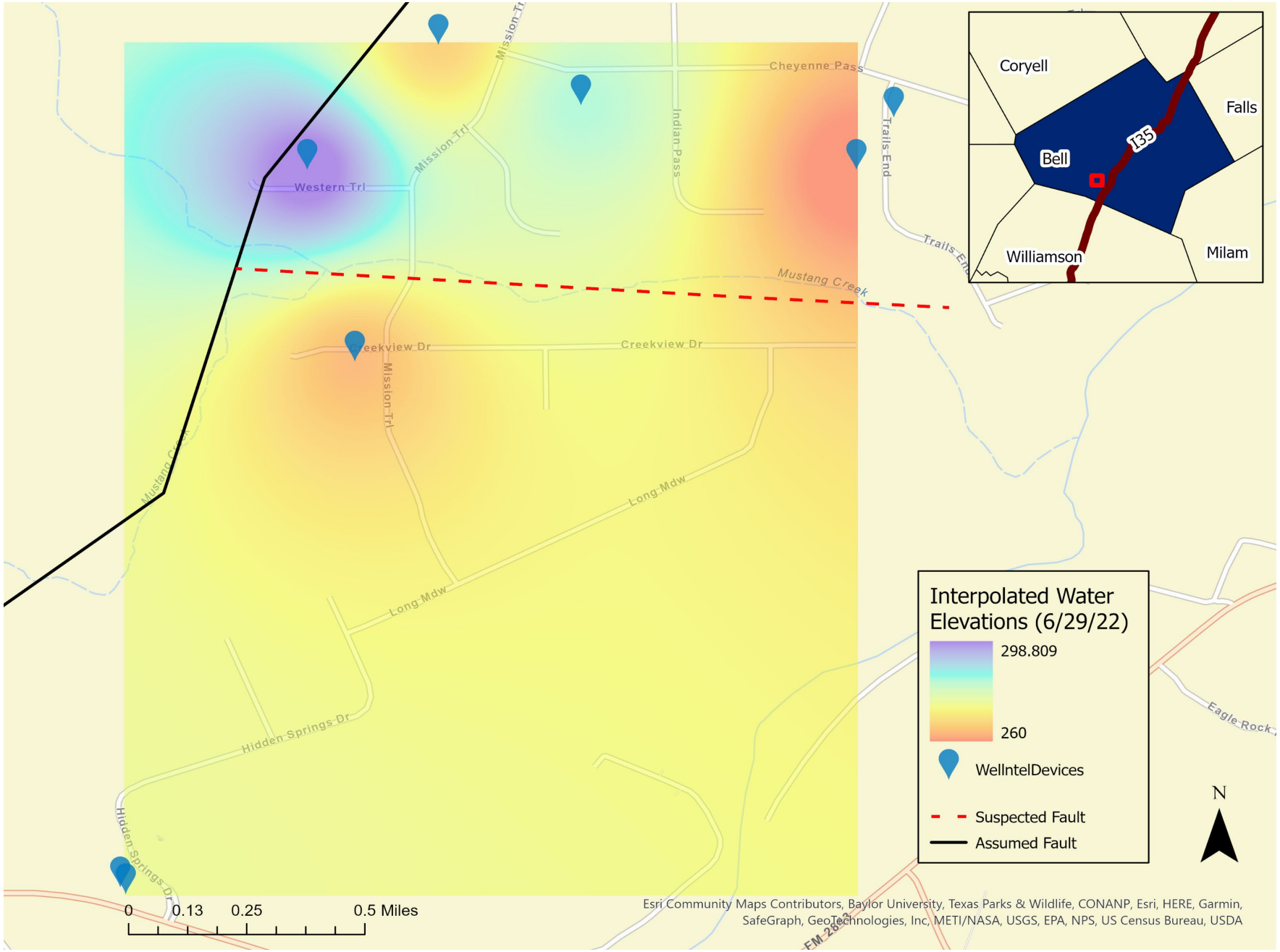
- Less willing to fix leak (r = .29)
- Lower conscientiousness (r = .27)
- Higher reported water use (r = .30)

Demographics

- Younger and retired respondents
  - More overall water use (r = .30)
  - More likely to have a pool ($r_{average}$ = .29)
  - Less thoughtful of others' water use on protecting their water use (r = .30)
- Women
  - More aware of use impact ($r_{average}$ = .28)
  - More supportive of stricter management ($r_{average}$ = .39)


Average Water Elevations (Feet Above Mean Sea Level)
Water Level Elevation (FAMSL)
360
340
320
300
280
260
240
12/27/2018
1/27/2019
2/27/2019
3/27/2019
4/27/2019
5/27/2019
6/27/2019
7/27/2019
8/27/2019
9/27/2019
10/27/2019
11/27/2019
12/27/2019
1/27/2020
2/27/2020
3/27/2020
4/27/2020
5/27/2020
6/27/2020
7/27/2020
8/27/2020
9/27/2020
10/27/2020
Date
Average Elevation (FAMSL)
Quarterly Elevation (FAMSL)


Cheyenne Pass
Mission Trl
Indian Pass
Trails End
Western Trl
Mustang Creek
Creekview Dr
Long Mdw
Hidden Springs Dr
Coryell
Falls
Bell
I35
Williamson
Milam
Interpolated Water Elevations (6/29/22)
298.809
260
WellIntelDevices
N
0
0.13
0.25
0.5 Miles
Esri Community Maps Contributors, Baylor University, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA


Coryell
Falls
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I35
Williamson
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Mission Trl
Indian Pass
Trails End
Western Trl
Mustang Creek
Creekview Dr
Long Mdw
Hidden Springs Dr
Eagle Rock
Interpolated Water Elevations (6/29/22)
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260
WellIntelDevices
Suspected Fault
Assumed Fault
N
0
0.13
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0.5 Miles
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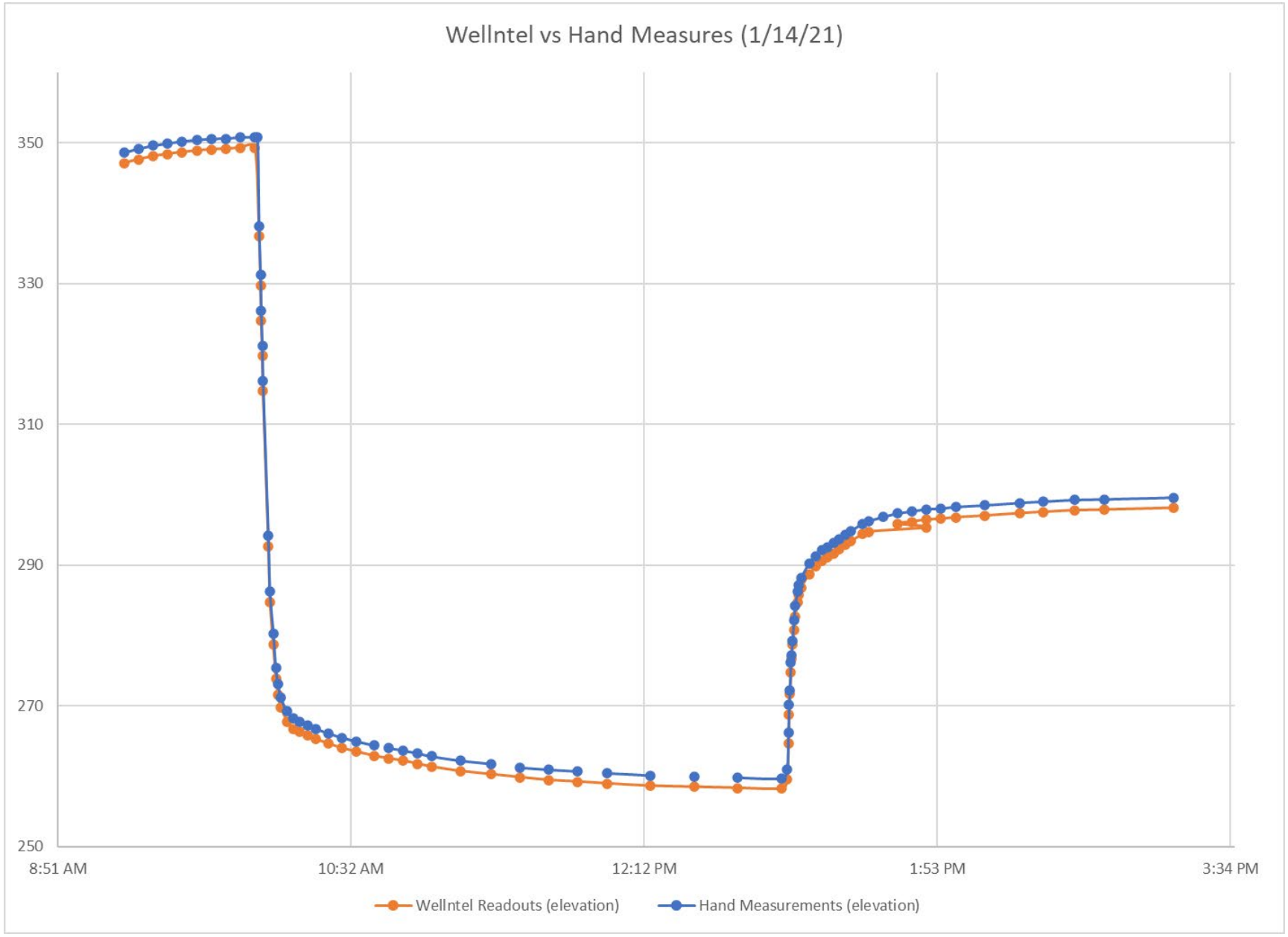
Wellntel vs Hand Measures (1/14/21)
350
330
310
290
270
250
8:51 AM
10:32 AM
12:12 PM
1:53 PM
3:34 PM
Wellntel Readouts (elevation)
Hand Measurements (elevation)

Questions?

Acknowledgements