Comparing water quality across Marana, AZ

Background information and Rationale

I wanted to know about the quality of water where I live. Does it have below acceptable levels of various chemicals? Does the water quality differ in different neighborhoods? How much better is water from our sink than rainwater or water in a wash or river?

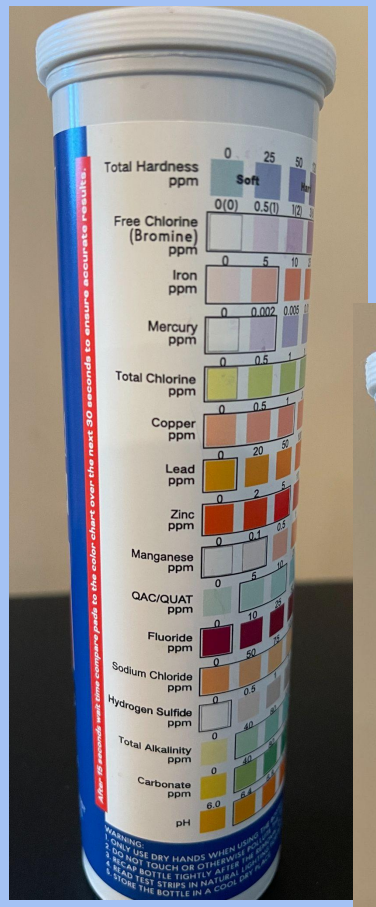
My Hypothesis is the water quality will be similar in neighborhoods across marana even if they come from different sources. I believe the water will be more pure from drinking water sources than water in nature (rainwater/river water). I assume because of laws that regulate water quality, the levels will most likely be within acceptable levels, but they might still be not as good as we would like.

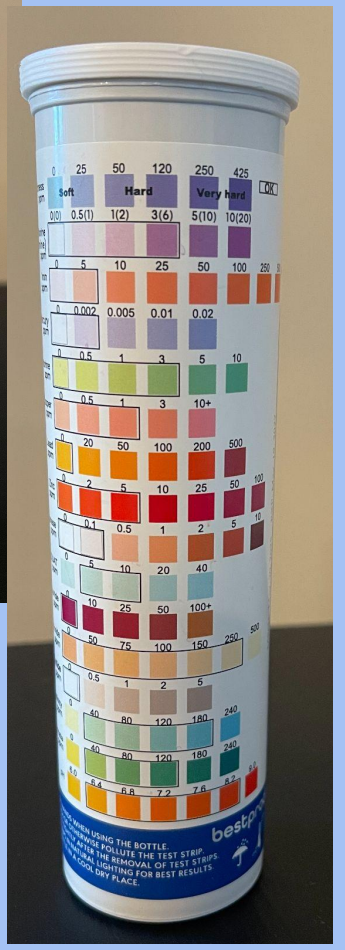
RESEARCH QUESTIONS

What are the chemical, mineral, and PH levels in the water in different neighborhoods in Marana? How are these levels different from natural water sources?

Investigative procedures

I purchased a water testing kit with test strips. These strips test for 16 different levels of elements in the water. You dip the test strips in the water for 2 seconds and let it dry for 15 seconds. You then compare your strip to the color code key to read how much of each element is in the water.



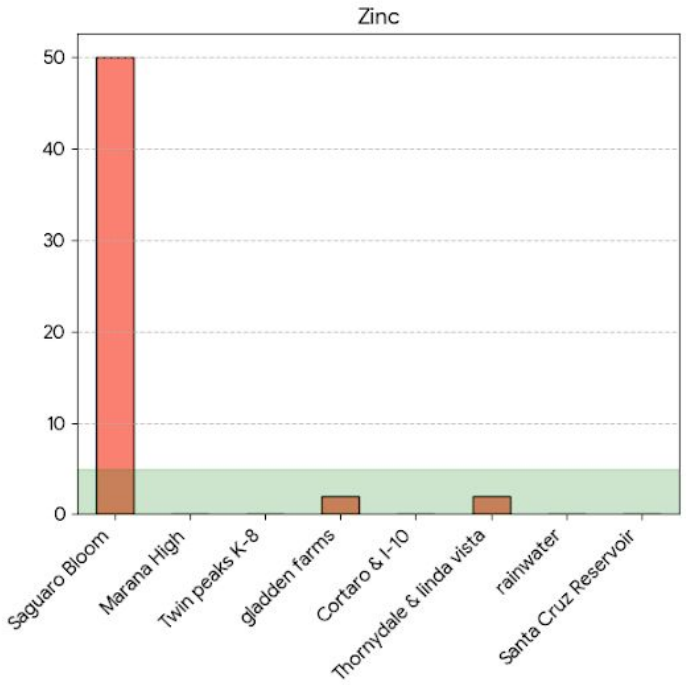


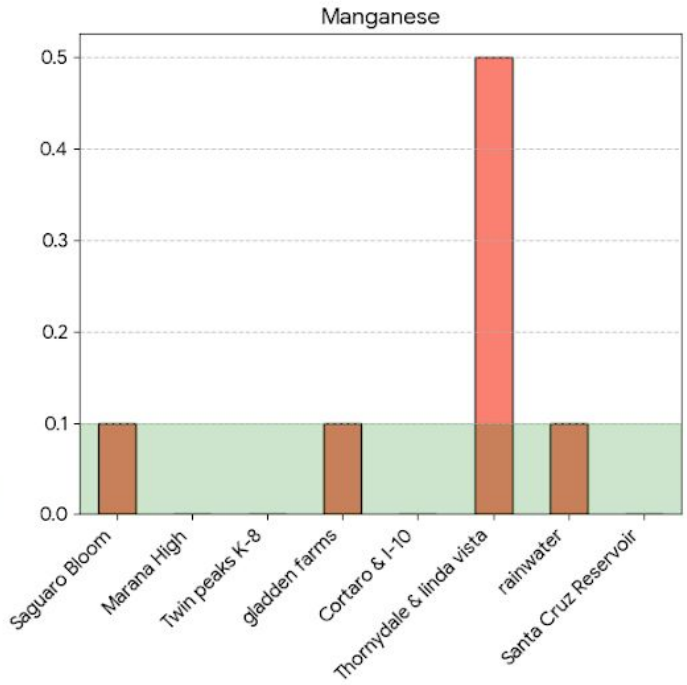
Investigative procedures continued

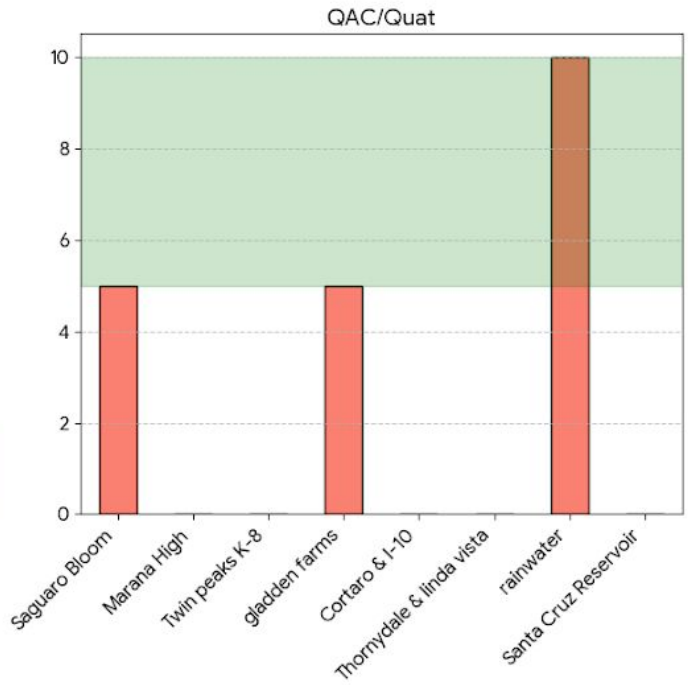
I will collect 8 different samples from a variety of locations in Marana and sample the quality of the water. I will record the data in a chart so I can compare them. The locations are: Saguaro Bloom, Marana High School, Mountain View High School, Gladden Farms, Twin Peaks k-8, Cortaro/I-10 interchange (Wendy's), and river water from the Santa Cruz river. The 8th water sample is from rain collected in Saguaro bloom.

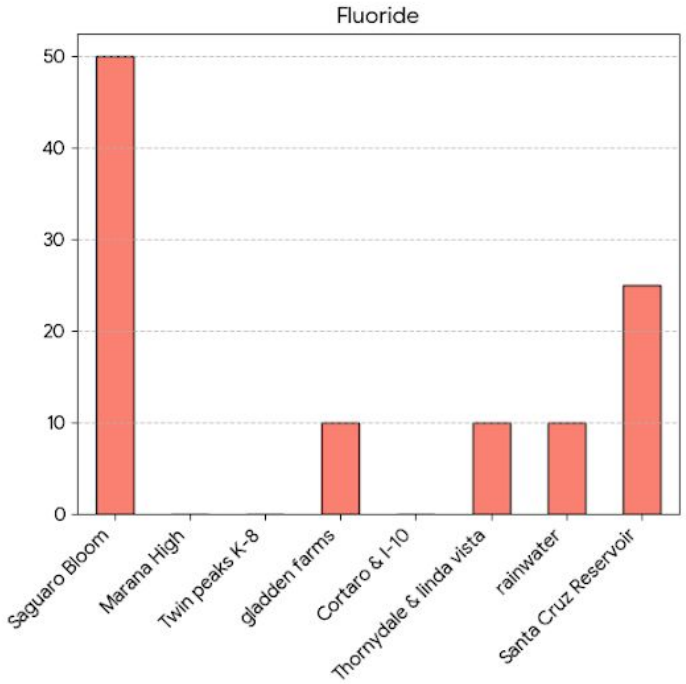
Results and Data Visualization

	Saguaro Bloom	Marana High	Twin peaks K-8	gladden farms	Cortaro & I-10	Thornydale & linda vista	rainwater	Santa Cruz Reservoir	Normal range
water softness	0	120	25	50	50	25	25	120	
(in ppm)									
free chlorine	0	0	0	0	0	0	0	0	0-3
Iron ppm	0	0	0	0	0	0	0	0	0-5
mercury	0	0	0	0	0	0	0	0	0-.002
total chlorine	0	0	0	0	0	0	0	0	0-3
copper	0	0	0	0	0	0	0	0	0-1
lead	0	0	0	0	0	0	0	0	0
zinc	50	0	0	2	0	2	0	0	0-5
manganese	0.1	0	0	0.1	0	0.5	0.1	0	0-.1
qac/quat	5	0	0	5	0	0	10	0	5-10
Fluoride	50	0	0	10	0	10	10	25	0
sodium chloride	0	250	150	150	250	500	150	500	0-250
hydrogen sulfide	0	0	0	0.5	0	0	0	0	0
total alkalinity	180	120	40	0	80	40	0	0	40-180
carbonate	240	120	40	0	40	120	0	0	40-120
PH	9	9	7.6	6	7.6	7.6	6	6	6.4-8.2


Zinc
50
40
30
20
10
0
Saguaro Bloom
Marana High
Twin peaks K-8
gladden farms
Cortaro & I-10
Thornydale & linda vista
rainwater
Santa Cruz Reservoir


Manganese
0.5
0.4
0.3
0.2
0.1
0.0
Saguaro Bloom
Marana High
Twin peaks K-8
gladden farms
Cortaro & I-10
Thornydale & linda vista
rainwater
Santa Cruz Reservoir


QAC/Quat
10
8
6
4
2
0
Saguaro Bloom
Marana High
Twin peaks K-8
gladden farms
Cortaro & I-10
Thornydale & linda vista
rainwater
Santa Cruz Reservoir


Fluoride
50
40
30
20
10
0
Saguaro Bloom
Marana High
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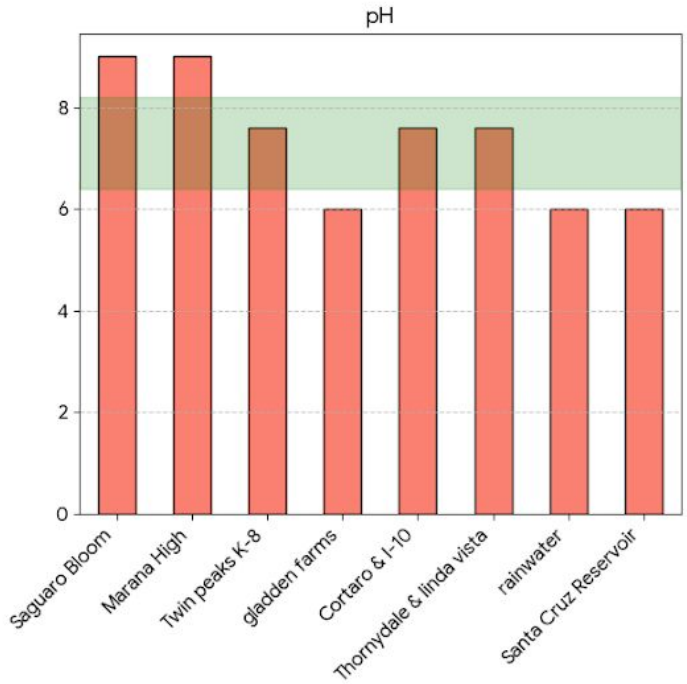
rainwater
Santa Cruz Reservoir


pH
8
6
4
2
0
Saguaro Bloom
Marana High
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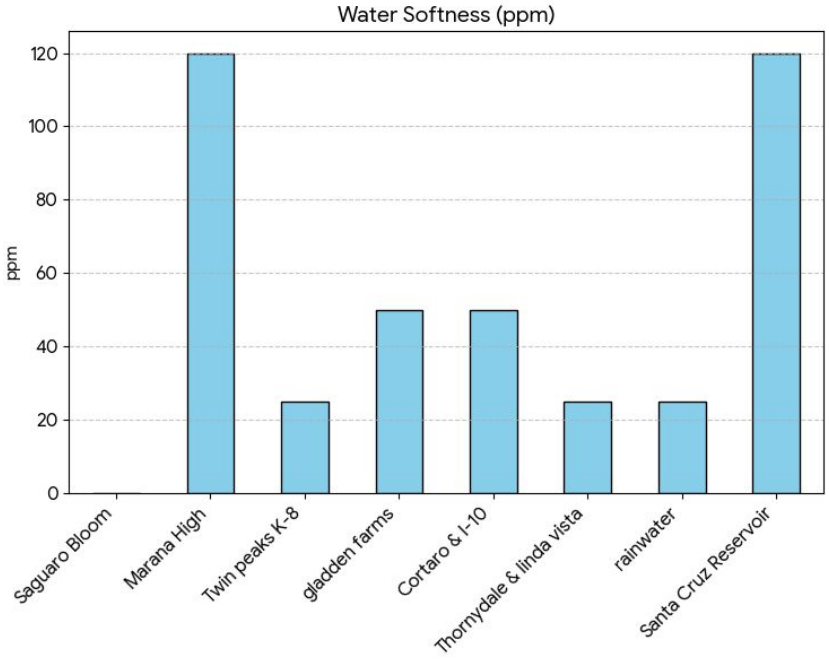
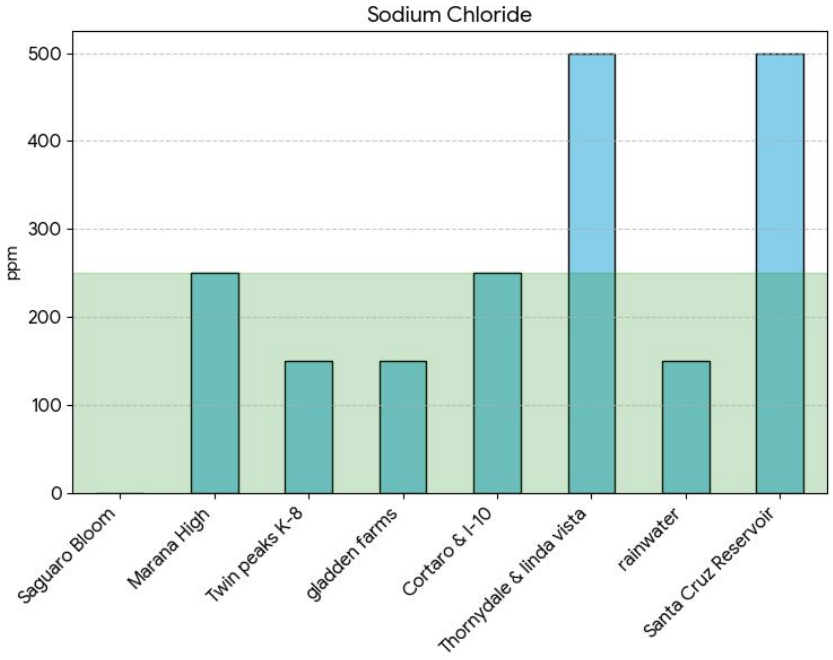
Cortaro & I-10
Thornydale & linda vista
rainwater
Santa Cruz Reservoir


Water Softness (ppm)
ppm
0
20
40
60
80
100
120
Saguaro Bloom
Marana High
Twin peaks K-8
gladden farms
Cortaro & I-10
Thornydale & linda vista
rainwater
Santa Cruz Reservoir


Sodium Chloride
ppm
0
100
200
300
400
500
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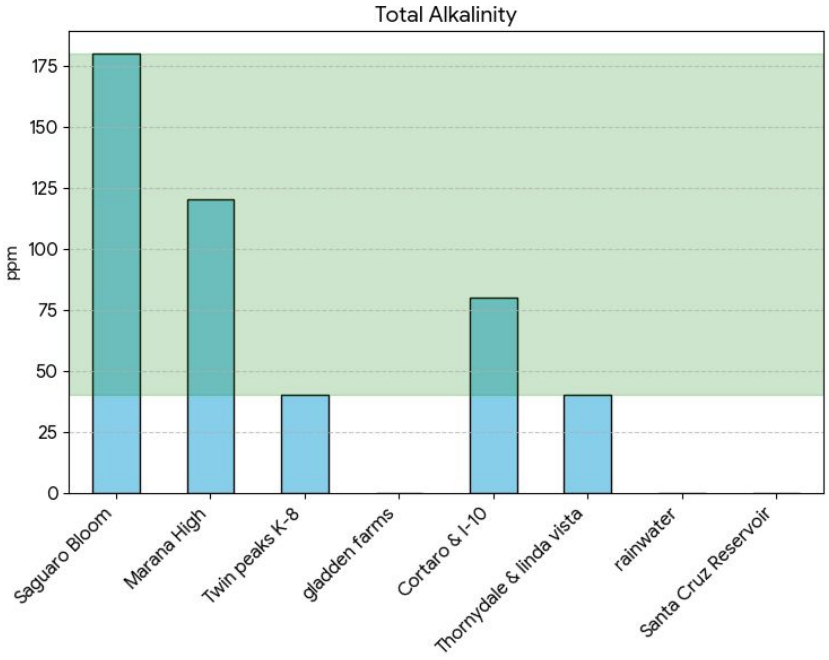
Thornydale & linda vista
rainwater
Santa Cruz Reservoir


Total Alkalinity
ppm
0
25
50
75
100
125
150
175
Saguaro Bloom
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gladden farms
Cortaro & I-10
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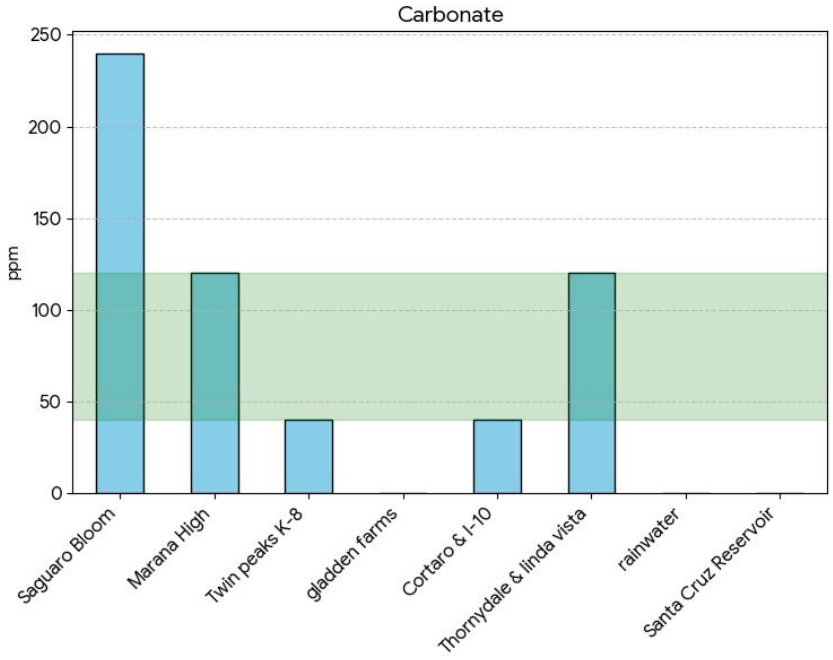
Carbonate
ppm
0
50
100
150
200
250
Saguaro Bloom
Marana High
Twin peaks K-8
gladden farms
Cortaro & I-10
Thornydale & linda vista
rainwater
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Discussion and Interpretation

- Rainwater is not as bad as you would think! It has only two categories outside the normal range.
- Saguaro bloom has really high carbonate and at the very top of the range alkalinity.
- The PH is higher in Saguaro Bloom and Marana high
- Thornydale and Linda Vista had double the amount of sodium chloride that is considered the top of the normal range
- Gladden farms water has almost the same quantities of things as rain water.

Conclusions and Ideas for Future Research

Based on the data provided, Twin Peaks K-8 and Gladden Farms appear to be the healthiest options, as they show lower mineral, chloride, and alkalinity levels compared to others. They maintain lower pH (closer to neutral) and zero to minimal amounts of heavy metals like mercury, zinc, and manganese compared to locations like Saguaro Bloom or Santa Cruz. Some ideas for future research are sampling bacteria from all the rivers or natural springs to see if you can drink it.

References

Best Prod Drinking water test kit (from amazon)