

New Mexico Water Purity

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2013 Science Project

Purpose:

Does all water contain the same amount of dissolved solids and, if not, which type of water has the least amount of dissolved solids in it?

Hypothesis Tested:

All types of water have the same amount of dissolved solids.

Materials:

- Cup
- Water tester
- Well water
- Tap water
- Filtered water
- Bottled water



Intellitec WPT1000 Digital Water Purity Tester

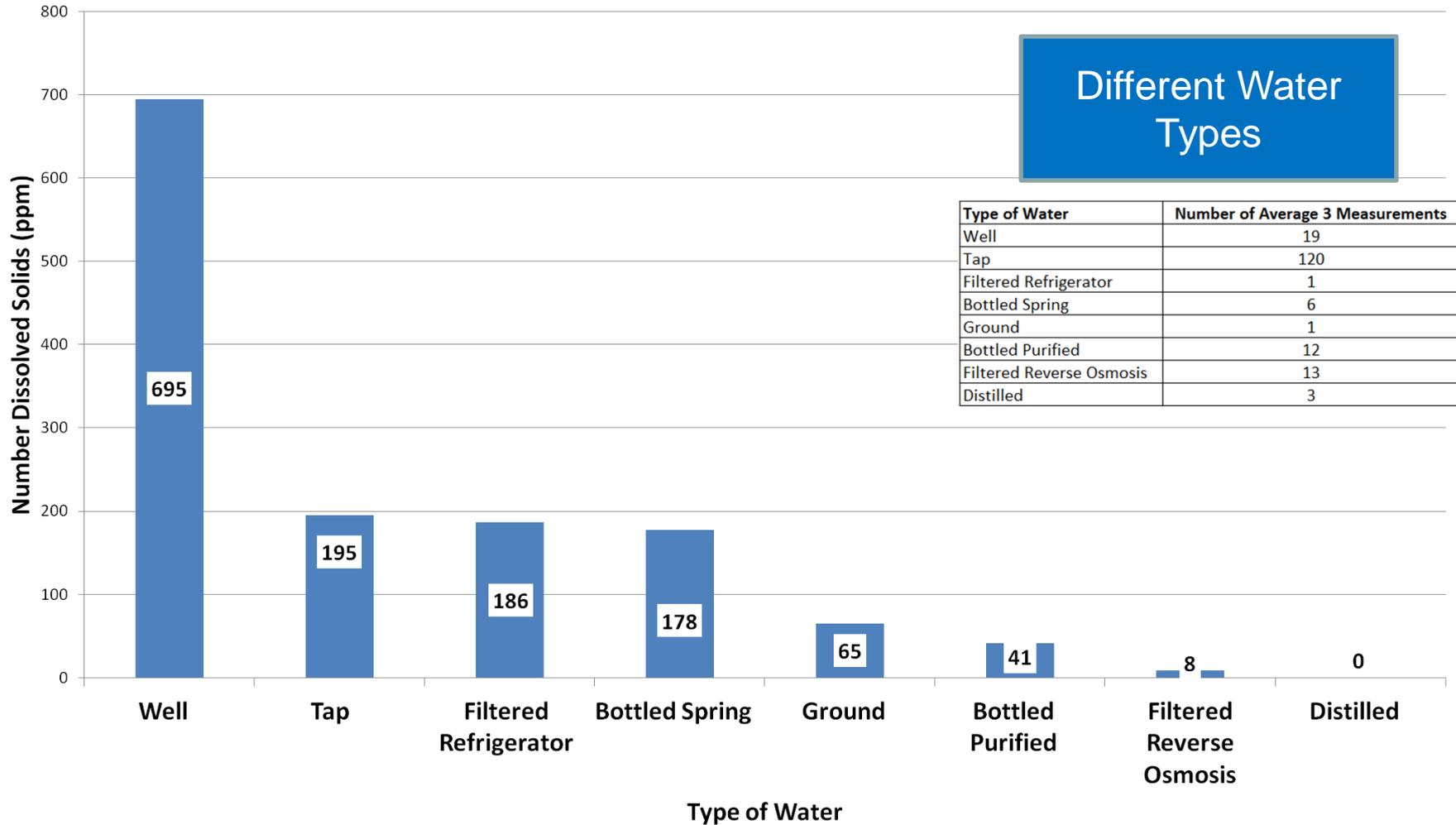
Procedure:

- 1) Fill cup with water being tested.
- 2) Test water to measure dissolved solids in parts per million (ppm).
- 3) Repeat measurement 3 times.
- 4) Record Results.
- 5) Average the 3 measurements.
- 6) Clean cup by wiping it with a paper towel.
- 7) Repeat these steps for different types of water, in different locations, and over time for some locations.
- 8) Analyze data.

Water Samples:

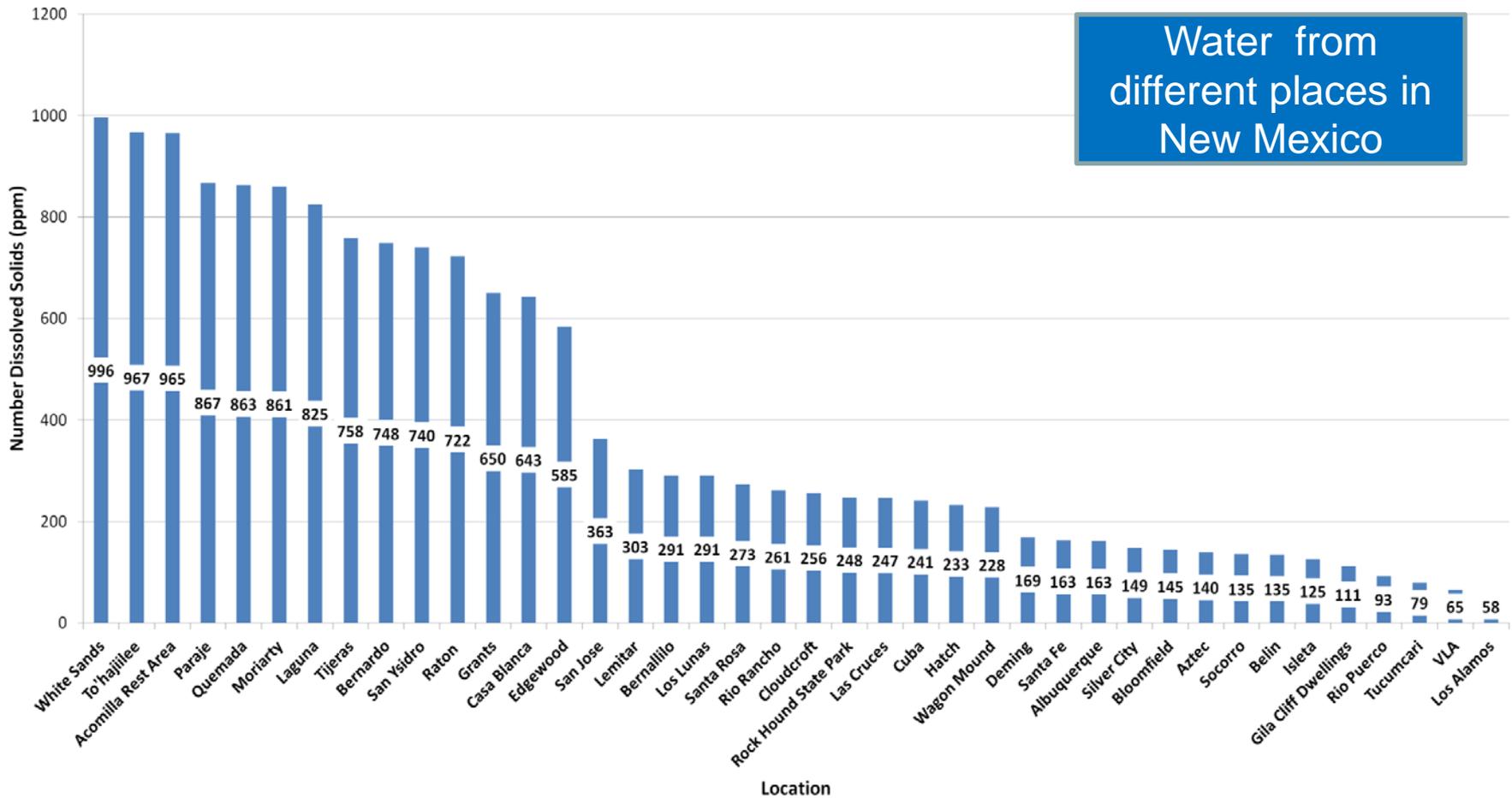
- Type of Water
 - Tap, well, bottle, ground, filtered, etc.
- Location in New Mexico
 - From 39 different places in New Mexico
 - 175 measurements (each an average of 3 tests)
- New Mexico compared to other states
 - From 18 different states in the US
 - 47 additional measurements (each an average of 3 tests)
- US compared to other countries
 - From 4 different countries
- Tested over time in a single location
- Tested in a single location from different taps

Average Number Dissolved Solids in Different Types of Water



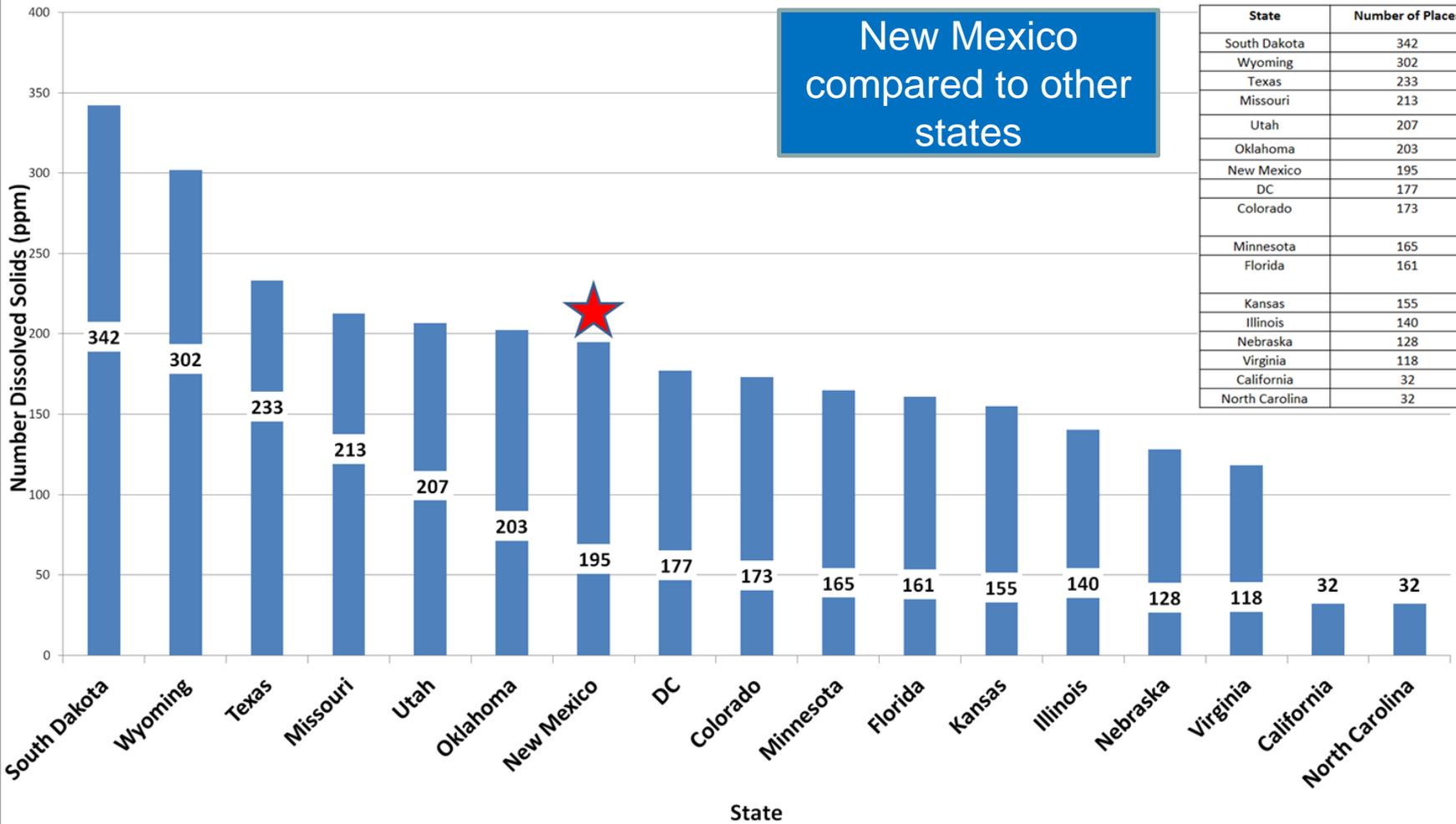
Well water had the most dissolved solids and water filtered by reverse osmosis and distilled water had the least amount of dissolved solids.

Average Number Dissolved Solids in Water for Different Locations in New Mexico



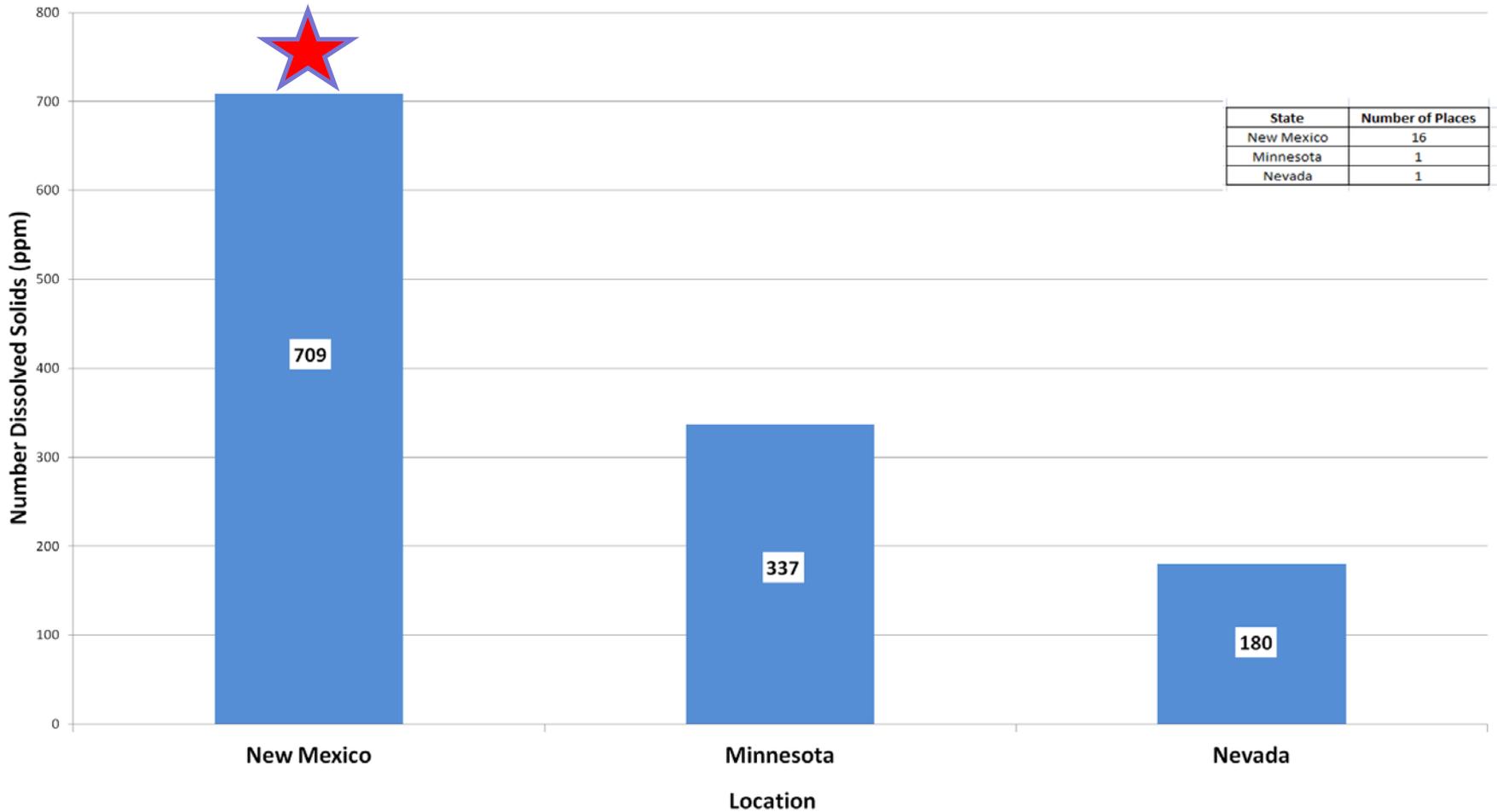
White Sands had the most dissolved solids and the water was well water. Los Alamos had the least dissolved solids.

Average Number Dissolved Solids in Tap Water for Different States



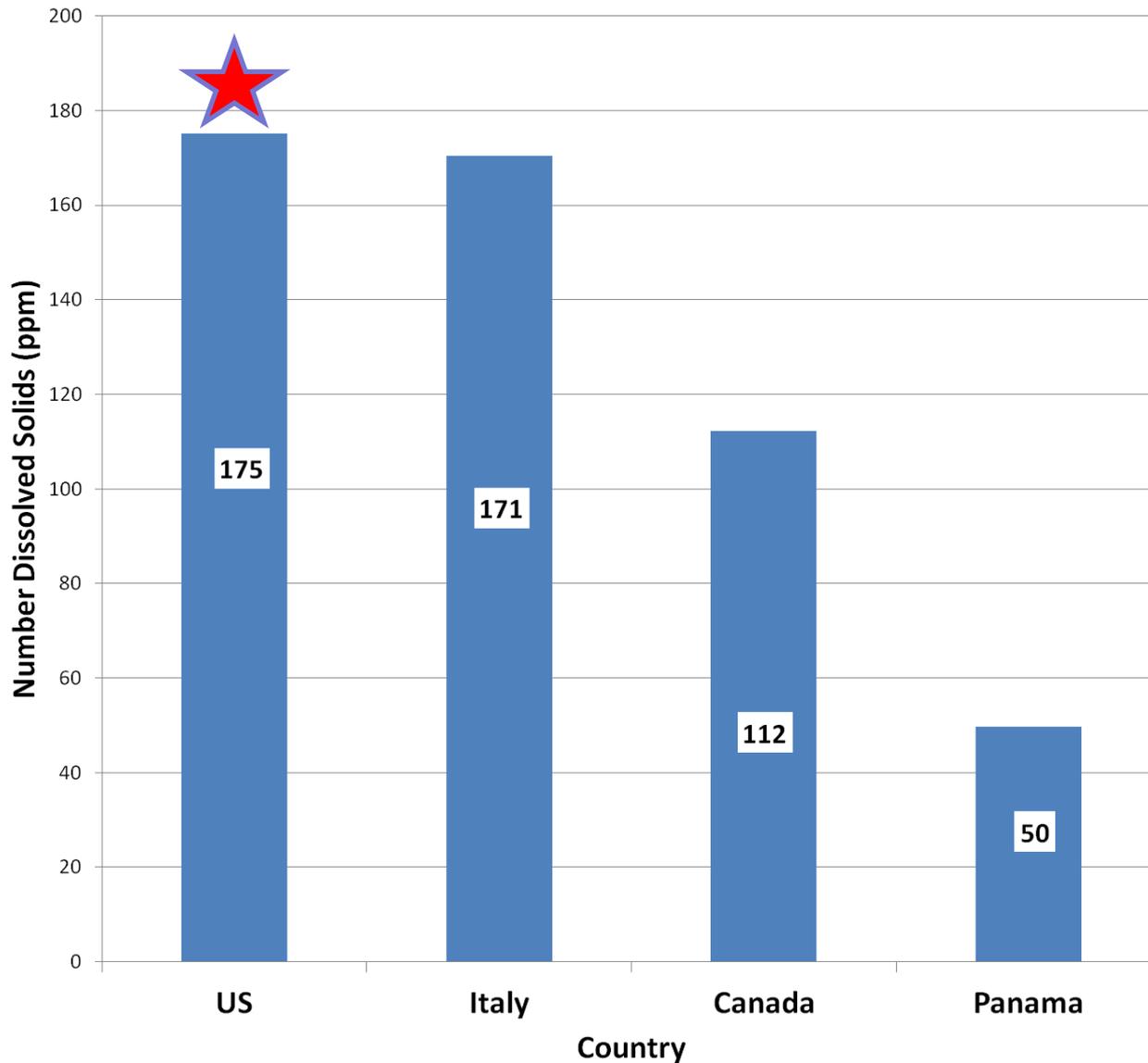
South Dakota had the most dissolved solids.
California & North Carolina had the least.

Average Number Dissolved Solids in Well Water for Different States



For well water, New Mexico had the most dissolved solids and Nevada had the least amount of dissolved solids.

Average Number Dissolved Solids in Tap Water for Countries

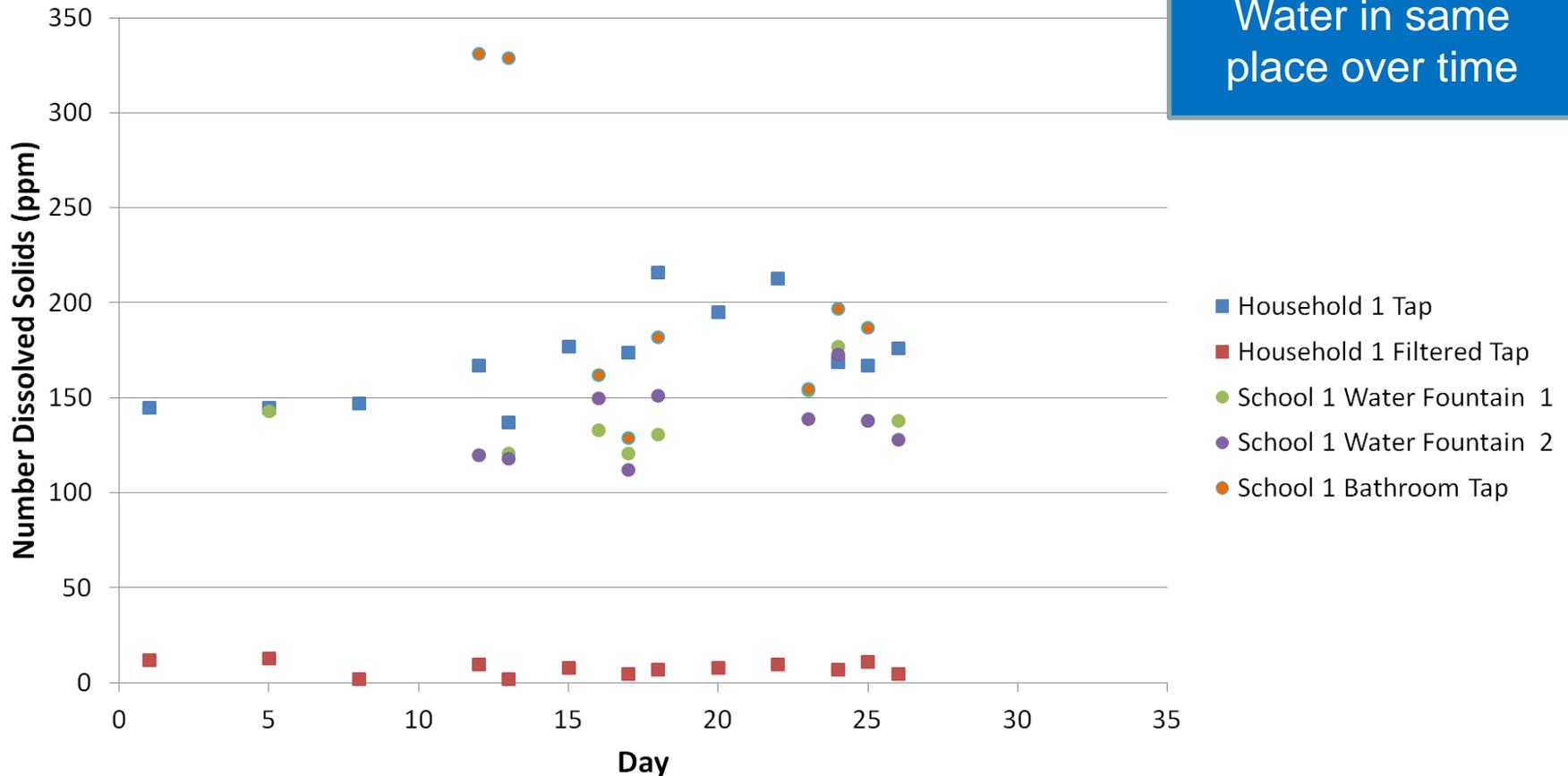


United States compared to other countries

The US had the most dissolved solids. Panama has the least.

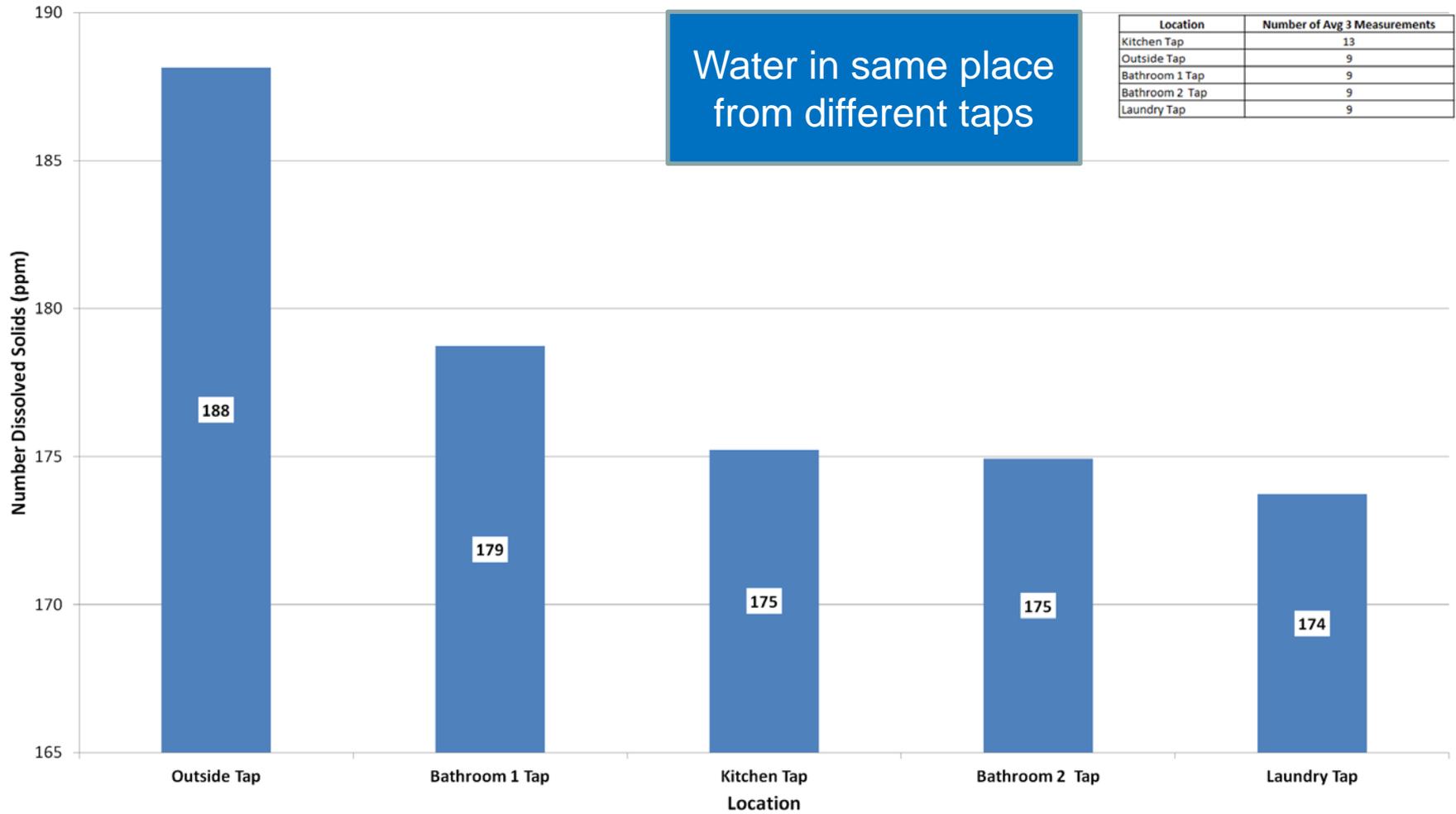
Average Number Dissolved Solids Over Time

Water in same place over time



The amount of dissolved solids was different on different days for the same location. Only water filtered by reverse osmosis seemed to not change from day to day. For both Household 1 and School 1, the dissolved solid measurement was about 150 ppm plus or minus 100 ppm except for two very high measurements on days 11 and 12 for the School 1 bathroom tap.

Average Number Dissolved Solids in Water for Different Taps in the Same Household



For Household 1, all water measurements from the different taps were averaged to see if water from different taps had different amounts of dissolved solids. The outside tap had the most dissolved solids and the laundry tap had the least dissolved solids.

Results: New Mexico

- Well water had the most dissolved solids.
- Water filtered by reverse osmosis and distilled water had the least amount of dissolved solids.
- In New Mexico, White Sands had the most dissolved solids (well water). Los Alamos had the least dissolved solids.

Results: Other States

- Tap water from South Dakota had the most dissolved solids in it and the waters from California and North Carolina had the least amount of dissolved solids. New Mexico tap water was a little higher than the state average.
- Well water from New Mexico had the most dissolved solids and well water from Nevada had the least amount of dissolved solids.

Results: Same Location

- The amount of dissolved solids was different on different days for the same location.
- Only water filtered by reverse osmosis seemed to not change from day to day.
- Water from different taps in the same location can have different amounts of dissolved solids.

Conclusions:

- The hypothesis was incorrect and waters of different types and from different locations have different amounts of dissolved solids in them.
- Well water has the highest amounts of dissolved solids for the types of waters measured.
- Water filtered by reverse osmosis had the least amount of dissolved solids.
- Distilled water had no dissolved solids.