Evidence of Water-Rock Interactions in FOP

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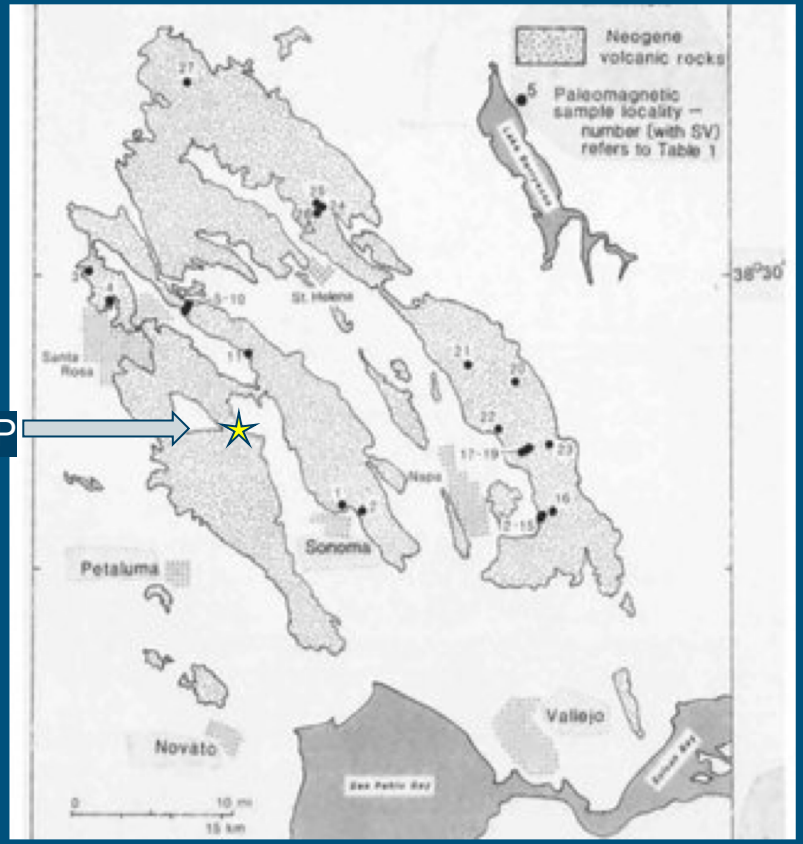
Background I...

- When water makes contact with rocks, material is taken off the rocks and put dissolved solids into the water source
- Sonoma volcanics underlie Sonoma and Napa Valley
- Rodgers Creek Fault System
  - Two plates rubbing together creating crushed rock material that dissolves in the groundwater (Robin Glass, 2019)



https://www.researchgate.net/figure/Sketch-showing-major-occurrences-of-the-Sonoma-Volcanics-and-paleomagnetic-sample_fig1_253839224

Background II...

- Conductivity is measured with a conductivity probe
- It shows the specific conductance in the water, and the more dissolved solids in the water the higher the conductivity will be

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Hypothesis...

- There will be a difference in dissolved ions in the springs.
  - Caused by the Rodgers Creek Fault system, which breaks down the rocks and distributes those nutrients into the water
- The spring will have higher Conductivity
- The ephemeral (short-lived water flow) channel will have no dissolved ions
- The perennial stream (continuous flow all year) be a mixture of spring and rain water

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Methods...

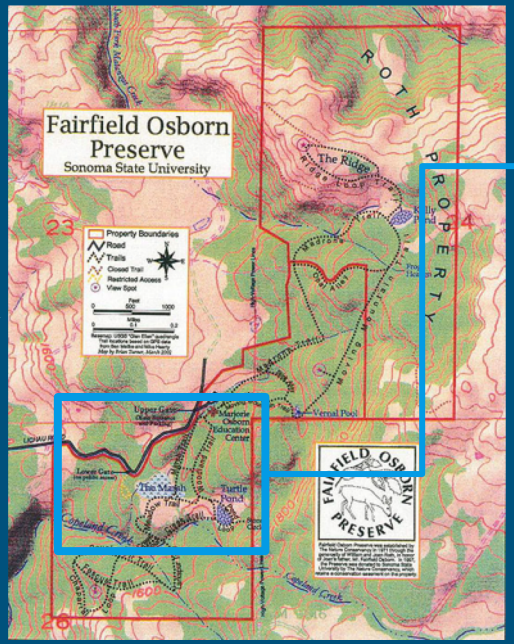
- Study site: Perennial spring below mole track
- Test spring water for their conductivity content and ion concentrations
- Compare results with creek, both perennial (likely has GW influence) and ephemeral (likely rain-fed)

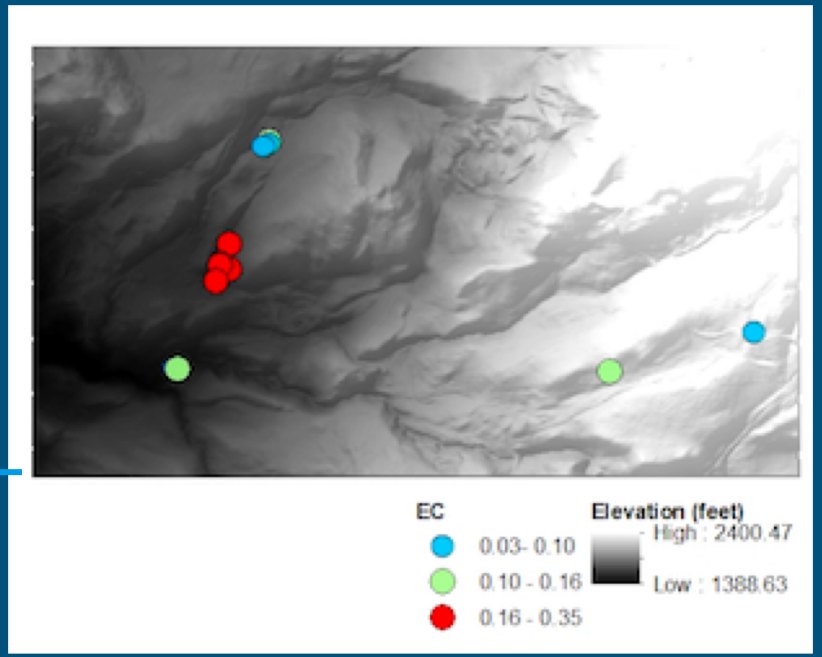
Copeland Creek

Copeland Creek

GIS Map...

- BLUE means Ephemeral
- READ means Spring
- GREEN means Copeland Creek

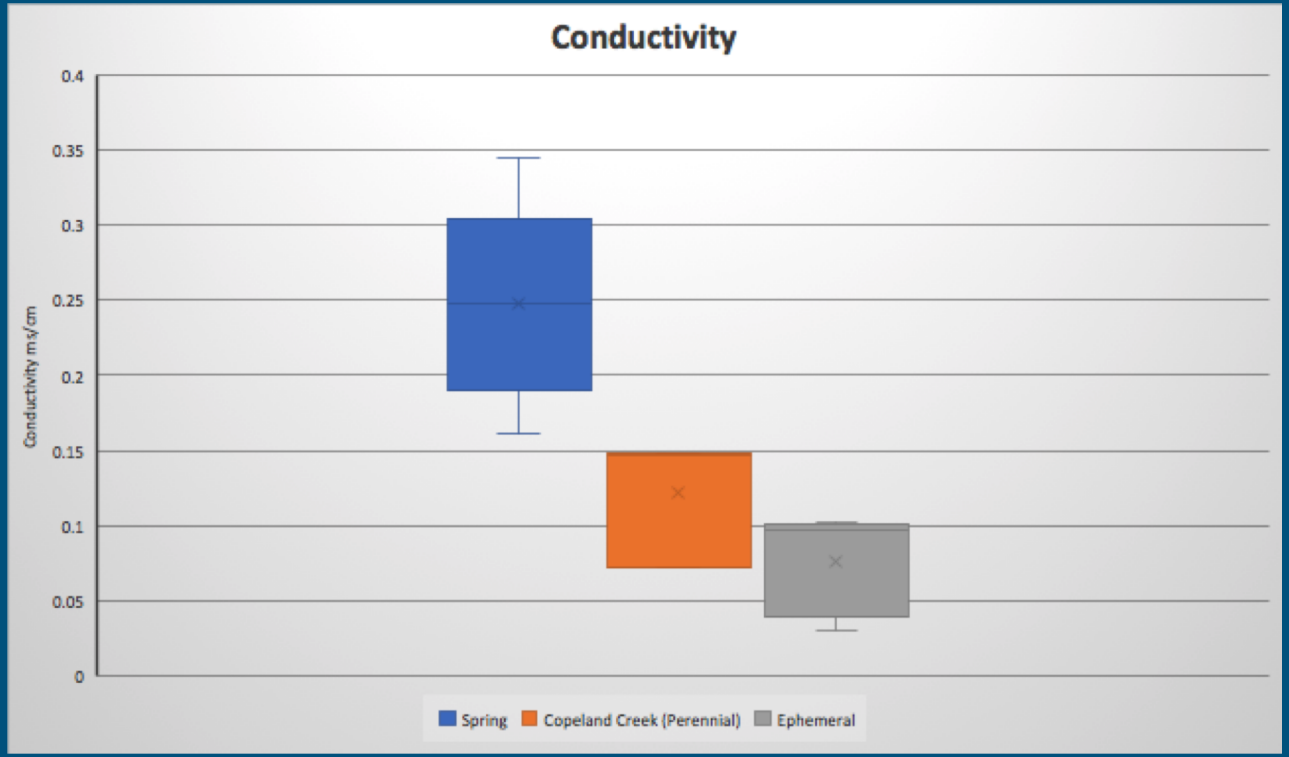




Helped by
Robin Glass

Results...

- Spring contains highest conductivity (pure groundwater)
- Perennial creek has medium conductivity
- Ephemeral creek has lowest conductivity (rain-fed water)



Conclusion...

- We have found evidence of water rock interaction within the Fairfield Osborn Preserve
  - dissolved solids are caused by water- rock interactions
  - Helps understand how much of the water in FOP is groundwater
  - Copeland Creek is a mixture of groundwater and surface water

Ephemeral Stream

Spring

Future Research...

- To create a mathematical model to show how the true amount of groundwater and surface water
- Climate Change and lack of surface water
- Shrimp Habitat

Work Cited...

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THANK YOU