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Ryan Ranch Data Interpretation:
Step 1: Determining Interactions Between (ABIOTIC)Physical and (BIOTIC)Biological Factors – What is affecting what?

Title of graph/data set you are analyzing: <u>Soil moisture</u>

I can use data and observations to describe the conditions in an ecosystem.

1. Summarize trends in the data – what did you notice/learn about this type of data by looking at your graph?

All of the data is below 20% individually. Their seems to be the most soil moisture on 60ft. Transect three has the most over all soil moisture.

The most soil moisture is on T6 0 ft with 15%.

The lowest transect overall is T4.

There seems to be more soil moisture in the meadow

T6 has a 14 percent difference

I can make evidence-based inferences that explain how abiotic and biotic factors may be interacting and influencing one another in an ecosystem.

2. Look at Ryan Ranch Interactions mind map…

What other factors/data that we measured might your data be connected to or interacting with and what is the connection?

My data might be affecting	By
Shrub density	
Ground cover	Different plants require different amounts of soil moisture
Seedling and sapling and mature tree density	
Mature tree density	

My data might be affected by	Because
Fire	Fire can change the moisture in the soil because of the heat in the flames.
Soil type	Soil type can make a difference in how much moisture is in the soil
Canopy cover	Shade could effect how much soil moisture there is because the amount of shade or sun could make it have less or more soil moisture.

3. Craft your ideas about interactions into questions. Use the information above to write questions for the three most interesting/powerful/significant/likely relationships from the previous section. Make sure you will be able to answer your question with the data that we have available to us. This is a "testable question."
Examples:
- *Is the amount of Coarse Woody Debris related to the density of large trees?*
- *Do plots with soil moisture have more small trees and shrubs?*
- *Does grass grow more in a particular soil type?*

Your Questions:

1. Does canopy cover increase the amount of soil moisture in the ground?

2. Do mature trees rely on soil moisture to grow bigger?

3. Does the amount of ground cover rely on the amount of soil moisture.

4. Make a hypothesis about interactions at Ryan Ranch. For each of the questions you wrote, make a prediction about what other graphs **would** show **if** the relationship between the two factors **is** working the way you think it is.
Examples:
- *If more large trees per acre leads to more CWD, then transects with a higher density of large trees should have more CWD.*
- *If soil moisture helps small trees get started and grow, then plots with high soil moisture should have more small trees.*
- *If soil type is affecting how much grass is growing on the ground, then plots with lots of grass should have similar soil types and plots with little grass should have a different soil type.*

Your <u>first</u> statement:
If… Canopy cover effects the amount of soil moisture

Then… Transects with more canopy cover should have more soil moisture

Your <u>second</u> statement:
If… Mature trees rely on more soil moisture to grow bigger

Then… Transects with more soil moisture should have bigger trees

Your third statement:

If... The moisture in the soil depends on the ground cover

Then... Transects with more soil moisture should have the more ground cover

I can interpret data and develop evidence-based explanations.

5. Conclusions: Look at graphs and see if this is true – is the correlation hypothesis you described above supported by the data?

➢ If it **is supported** – answer you question below and explain the evidence that proves your conclusions.
➢ If it **is not supported** – still answer your question below, then explain what the data/graphs do show. Make new statements that accurately reflect the data or, if it seems like there is not a good correlation between the two pieces of data, say that. If this happens more than once, go through the above process with a new question, hypothesis, and conclusion.

Results of first question and hypothesis:

Canopy cover doesn't effect soil moisture soil moisture effects canopy cover. Canopy cover is made by tall tress that need lots of water if there is more canopy cover there is more trees that soak up more of the soil moisture. On T6 there is the largest amount of soil moisture and there is one of the least amounts of canopy cover on that same t6 0ft. Another example of the fact canopy cover effects the soil moisture is on T3 60ft there is a significant amount soil moisture and a low amount of canopy cover.
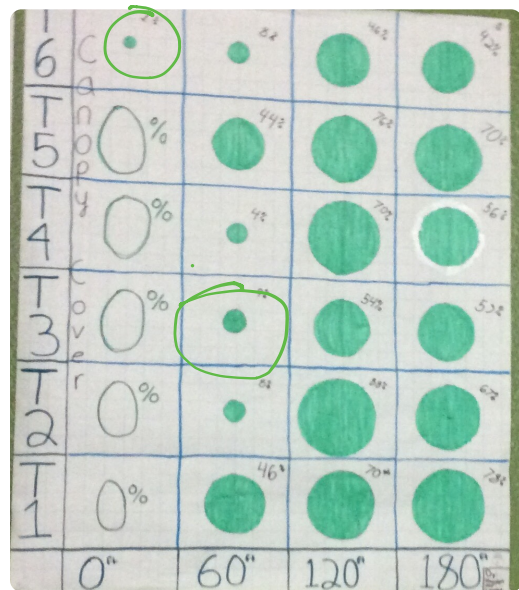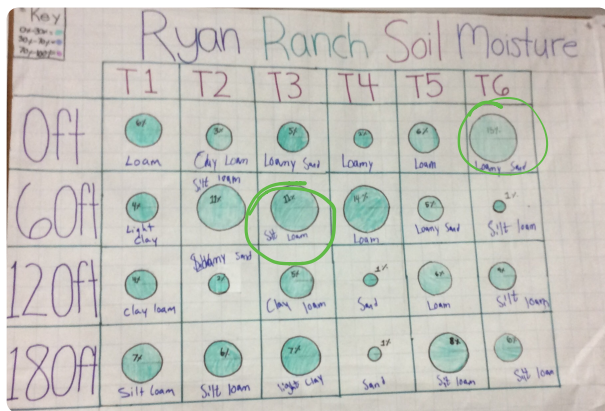
Results of second question and hypothesis:

Soil moisture does not effect mature trees but mature trees seem to effect soil moisture.

In place where there is more soil moisture there are not many trees to soak up the soil moisture. An example is that on T6 0 ft there is no mature trees to soak up the soil moisture and the soil lost urge on that same T6 0ft is the most amount of soil moisture recorded.
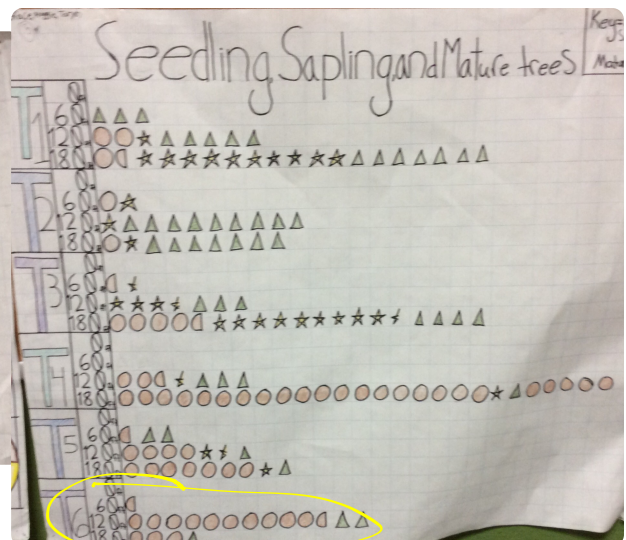
Results of third question and hypothesis:

Where there is more bare ground there is more soil moisture because there is less water needed to grow stuff. An example is on T6 0ft there is a lot of bare ground and on the soil moisture graph it says that that same transect and feet has the most amount of soil moisture. Another example is on T4 60ft where there is a lot of bare ground and on the soil moisture graph that is one of the biggest amounts of soil moisture.

Canopy Cover
Soil moisture

Ryan Ranch Soil Moisture

	T1	T2	T3	T4	T5	T6
0ft	Loam	Clay Loam	Loamy Sand	Loamy	Loam	Loamy Sand
60ft	Light Clay	Silt Loam / Loamy Sand	Silt Loam	Loam	Loamy Sand	Silt Loam
120ft	Clay Loam		Clay Loam	Sand	Loam	Silt Loam
180ft	Silt Loam	Silt Loam	Sandy Clay	Sand	Silt Loam	Silt Loam

Canopy Cover	0"	60"	120"	180"
T6	2%	8%	46%	42%
T5	0%	44%	76%	70%
T4	0%	4%	70%	56%
T3	0%	8%	54%	56%
T2	0%	8%	80%	62%
T1	0%	46%	70%	78%

Soil moisture + Mature Trees

Ryan Ranch Soil Moisture

	T1	T2	T3	T4	T5	T6
0ft	Loam	Clay Loam	Loamy Sand	Loamy	Loam	Loamy Sand
60ft	Light clay	Silt loam	Silt loam	Loam	Loamy Sand	Silt loam
120ft	Clay loam	Loamy Sand	Clay loam	Sand	Loam	Silt loam
180ft	Silt Loam	Silt Loam	Light clay	Sand	Silt loam	Silt loam

Seedling Sapling and Mature trees
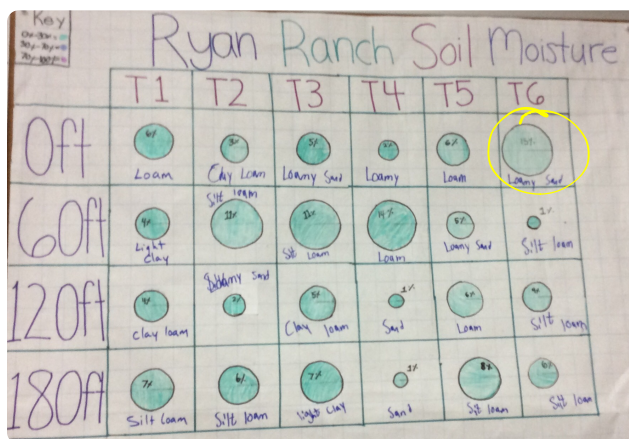
Ground Cover + Soil Moisture
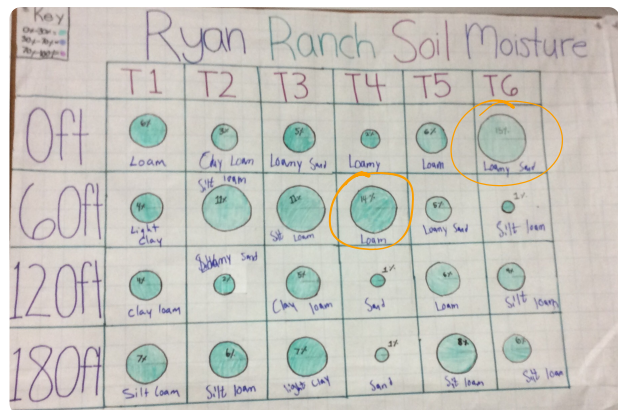
Ryan Ranch Data Interpretation:
Step 2: Why is our data important?

Now that you have established some connections and interactions between your data and other data, it's time to think about why the data that you looked at might be important.

➢ Your data will <u>not</u> necessarily be connected to all of the ideas below, so <u>just answer the ones that relate to your data</u>.

➢ **Think about trends concerning how your data changes from**
   o <u>Transect to Transect</u> (or group transects together to look for patterns)
   o As we move from <u>the Meadow to the Forest</u> (compare 0 ft to 180 ft or group sampling plots together to look for trends)

<u>***I can make evidence-based inferences that explain how abiotic and biotic factors may be interacting and influencing one another in an ecosystem.***</u>

SO WHAT?

1. What do the trends/patterns/relationships mean in terms of **<u>Fire Risk</u>**? Are some transects or areas safer from fire than others, based on the data that you are looking at? This is particularly important with data sets that deal with any kind of fuel (trees of any size, grass, or CWD)

2. What do the trends/patterns/relationships mean in terms of **<u>Species Diversity</u>** (of both plants and animals)? Might different animals like different areas and why? Again, keep this discussion connected to your data set. (transect to transect or meadow to forest differences)

Different plants require different amount of soil moisture so the plant s affect soil moisture by soaking up the moisture in the soil. Some transects my have different amounts of soil moisture because of those transects may have different plants then others. Most of the plants on the transects don't need that much water such as canary reed but trees need lots of water and they use more water then canary reed. For an example on t6 0ft there is a lot of soil moisture and in the ground cover there is a lot of bare ground and carry reed so there is not much water soaking up. When we looked at the mature trees it seemed places like on t2 120 ft there was a low amount of soil moisture and there was 9 trees therefore the trees where soaking up the moisture.

3. What do the trends mean in terms of **<u>ecosystem health</u>** or other aspects of the **<u>general ecology</u>** of the area? This is particularly important for data sets that deal with density.

For some plants they need less water and for others they need a significant amount of water. Rabbit brush and bitter brush needs a very little amount of water. An example of this is on T4 0 ft where there is only 2% soil moisture and for shrubs there is none. This connects because the shrubs are rabbit brush and bitter brush and they don't need much water so on that place if there was a lot of shrubs there should have been more sip moisture but there isn't. Another example is on T3 60 ft there are 4 shrubs and the soil moisture is 11% the shrubs are not soaking up soil moister because they do not need much so there should be more soil moisture and there is. On T1-2 there is a lot of wild rose and willow. These plants need a lot of water.

NOW WHAT?

4. What do the trends/patterns/relationships that you saw in your data mean in terms of **Future Forest Management** decisions; what are your **Recommendations for how to improve ecosystem health or fire safety**?

5. What will be the **Effects of the Restoration** (the flooding of Ryan Ranch Meadow) on this type of data in future years? How do you anticipate the forest and meadow changing at Ryan Ranch as a result of the meadow being re-inundated with water (the levee being breeched)? Speak specifically to the set of data that you looked at.