Cami Provencher

Username: camiprovencher

Email: camiprovencher@gmail.com

School: Joliet Junior College

Day 17 Greener Challenge

Literature: https://news.stanford.edu/2017/10/05/soil-holds-potential-slow-global-warming/

2 Soil-Heroes: Wes Jackson (president of the Land Institute) and Andy Lipkis (founder of Tree People)- both of these men spoke in Dirt the Movie, and have a deep sense of appreciation and understanding for the soil, that both men have put into their organizations. The Land Institute as said on their website, "The Institute's goal is to create an agriculture system that mimics natural systems in order to produce ample food and reduce or eliminate the negative impacts of industrial agriculture." Likewise, Tree People's website states, "We unite with communities to grow a greener, shadier and more water-secure city at homes, neighborhoods, schools and in the local mountains. We work with volunteer leaders using our unique Citizen Forester model, and we influence government agencies for a healthy, thriving Los Angeles."

Soil Lesson Plan

I for one, am more of a visual person- I gain more out of seeing information, by reading, diagrams, pictures, etc., and likewise I know many others are more visual learners as well. Therefore, my whole presentation will be centered around building a visual (picture) that depicts the relationship between the excessive amount of carbon in the atmosphere and the problematic factors and solutions that go along with this excessive carbon (climate change).

To begin, I will start by sharing what people think are the solutions to climate change. After a few answers, I will share that even myself was not aware of one of the most profound solutions to climate change, until I learned about the soil. I will then begin drawing the outline of my diagram, in which I will draw land, water, the sun, and some clouds for the atmosphere. In simple terms, I will tell the class how climate change has come about by the excessive carbon lurking in our atmosphere from *various factors*, and such I will label the atmosphere,

"excess carbon in atmosphere = climate change"

I will then begin to explain some of the factors causing climate change as I had alluded to, by drawing a little factory on the land and drawing an arrow to the atmosphere- mentioning how fossils are a carbon source that have been burned by

man, releasing the solid carbon into gas form which consequently reaches our atmosphere. I will also erase a different part of the line that represents the land, and in that space write in,

“damaged, depleted, or exposed soil”

and will therefore draw an arrow from these words to the atmosphere as I did the factory-showing such “damaged, depleted, or exposed soil” are contributors to releasing carbon into the atmosphere. I will also share some of the current practices that occur that cause such depleted soil, and I will make a bullet point list under the “damaged, depleted, or exposed soil” part, and say how it is

- **Tilling**
- **Soil Erosion**
- **Deforestation**
- **Urbanization**
- **Monoculture cropping**

that are all factors associated with the release of carbon from the damaged soil that ends up back into our atmosphere. I will mention that these are the many methods/consequences of current and conventional agriculture practices, and as mentioned in the article Connecting the Dots on Ag and Climate Change, author Debbie Barker says, “Massive use of agricultural chemicals has degraded the health of our soils so significantly that crop yields have plateaued or collapsed in some regions. Scientists estimate that 50 to 70 percent of carbon has been lost in industrially farmed soils.” I will then mention how according to the video *The Soil Story* by the organization *Kiss the Ground*, “humans have moved 880 gigatons of carbon dioxide into the atmosphere.” Given this, I will write

“880 gigatons”

right near the top of the atmosphere. I will then discuss how some carbon in the atmosphere has been taken in by the ocean- but with too much excess carbon, the ocean starts to acidify- resulting in what I will write by my ocean waves

“ocean acidification”

which can be detrimental to sea life and result in endangerment and even extinction of marine species. I will add the arrow from the atmosphere pointing to the ocean. I will then offer the solution I have been hinting at all along- which is by restoring healthy, productive soils to take in all the excess carbon in our atmosphere, and will write

“healthy, productive soil”

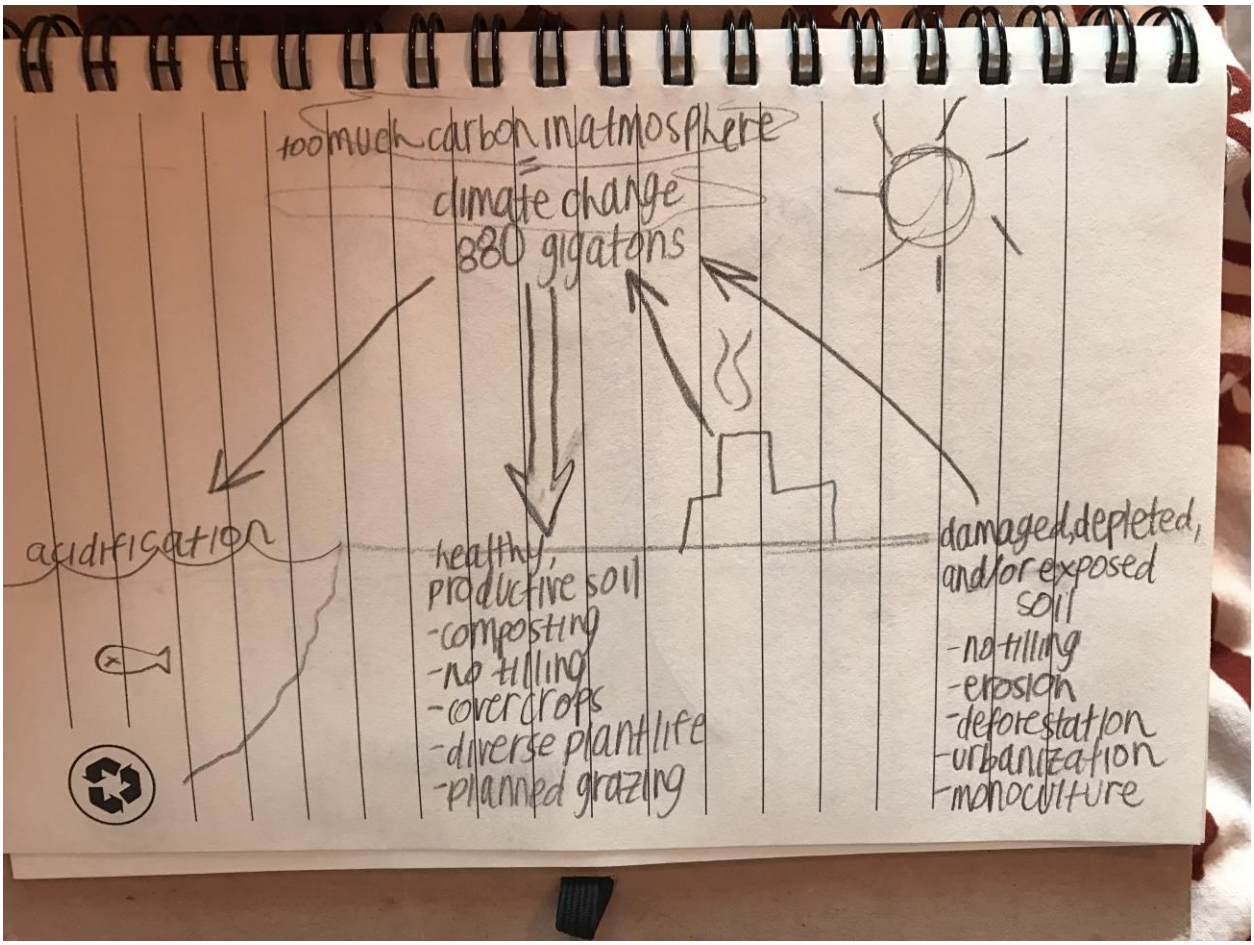
in the land portion of my drawing. Like I did for the “damaged, depleted, and exposed soil” section, I will include some bullet points of agricultural methods that can be done to harness some of the excess carbon that is contributing to climate change, which is

- **Composting**

- **No tilling**
- **Cover crops**
- **Diverse plant life**
- **Planned grazing**

I will then show another diagram about why specifically soil and these solutions are so beneficiary to carbon sequestration. In this second diagram, I will draw a picture of a plant and its roots underneath the soil. I will go over the basic process of photosynthesis- that **CO2, water, and sunlight are all taken in, and oxygen is what is exchanged**. As in the film *Soil Solutions for Climate Problems,* I will draw an arrow down the plant to say that carbohydrates are produced and as many stay within the plant, other carbohydrates are given off from the roots to the soil where the many microbes that live in the soil may feed on the carbon rich carbohydrates, and make more topsoil. I will label little dots underneath the roots **"micro-organisms"** and mention from the film *Soil Solutions to Climate Problems,* that "in one handful of soil, there are more organisms than humans on earth." Finally, I will close by recapping how even though soil may not look or seem like much more than the brown stuff under your grass, soil is extremely important- not only to plant life, but the life of all. So, we need to look at soil as a solution to one of the biggest problems we face today.

[here are some pictures of what the diagrams will look like]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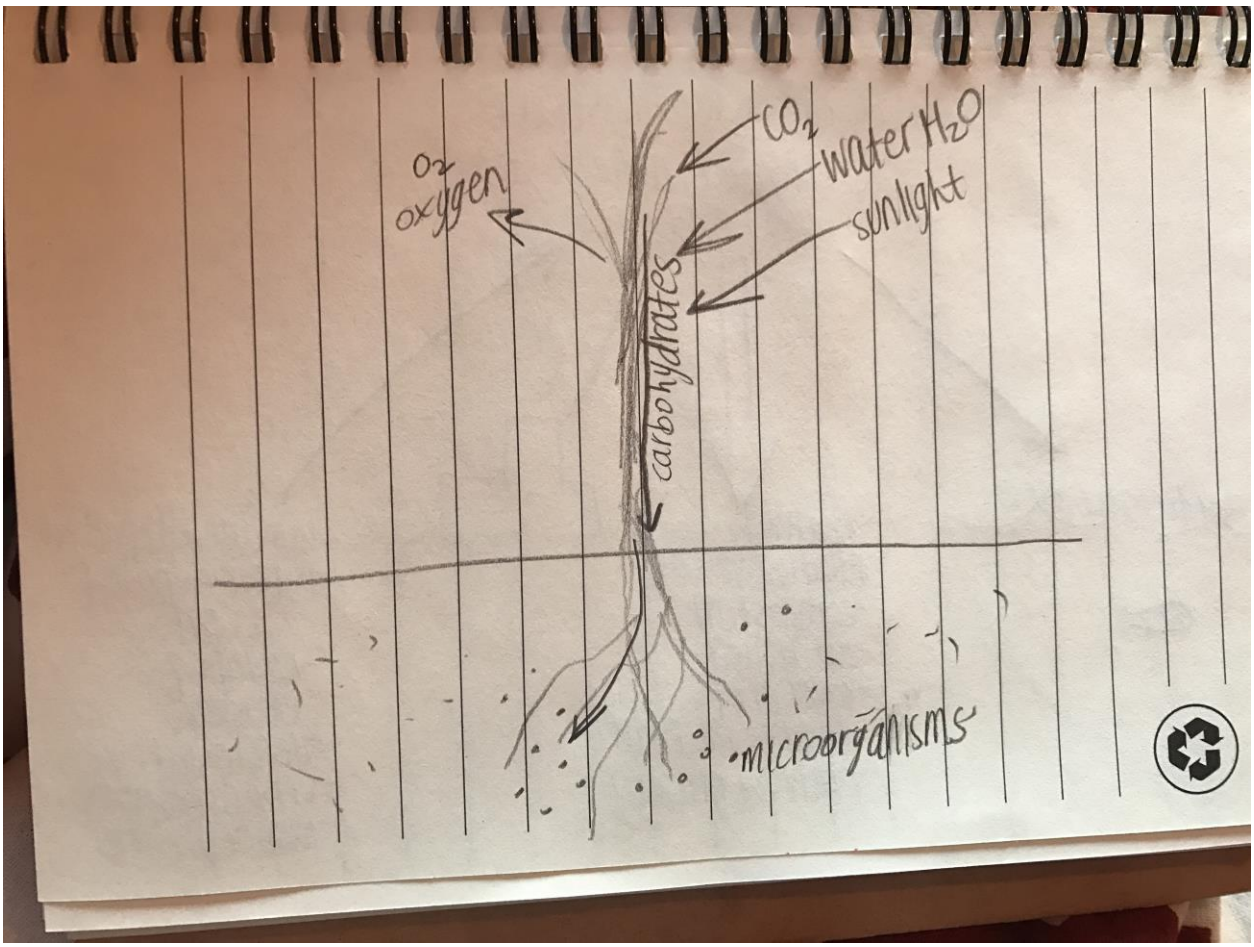
O_2
oxygen
CO_2
water H_2O
sunlight
carbohydrates
microorganisms