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Biology 1610

### Signature Assignment

#### Observation:

Soils that are up to 100 years old in Salt Lake Valley are not saturated enough with the nutrient nitrogen, indicating that something different is happening to Salt Lake Valleys soil.

#### Background Research:

According to the article, nitrogen is considered one of the key nutrients for plants. The nitrogen cycle is how nitrogen in the atmosphere is converted into forms that plants are able to use. The article further discusses that the bacteria has transformed gaseous nitrogen into nitrates which can be taken up by plants. The cycle continues to decompose the bacteria, which later returns the nitrogen into the soil or it could be released into the atmosphere where it can act as a pollutant. Also to take note of, nitrogen could be lost from the soil as it is leached through lakes or streams.

#### Question:

Do nitrogen levels rise over time and then plateau?

#### Hypothesis:

Over time, the nitrogen levels will rise over time and then plateau, indicating that the soil is saturated.

#### Test Hypothesis:

My colleagues and I took soil samples from 40 lawns in the Salt Lake Valley from homes built between the 1900's to the 2000's to study soil carbon. We had gathered the soil samples to get a better understanding of the nitrogen accumulation over the years. This experiment will be comparing the range of possible fertilization behaviors to the rate of nitrogen accumulation. During this experiment we had expected to see high levels of nitrogen over a certain period of time and then plateauing--indicating that the soil was saturated. However, this was not that case. My colleagues and I found a roughly straight line between the nitrogen content and time. That indicates about after 100 years, Salt Lake Valley soils are still accumulating nitrogen, which means an abundance quantities of nitrogen is basically gone.

Modify hypothesis:

After all the research and data collecting, it has caused a conflict with the hypothesis by proving everything we thought was suppose to happen, was in fact not true--at least for this experiment. Although, other studies have shown many of the soils that was taken for samples were rich in clay-- inhibiting water drainage and leaching--however, it wasn't the case for this particular experiment.

Start over:

My colleagues and I need to gather more information as to why Salt Lake Valley soil wasn't saturated enough for it to level off. Some helpful clues to make our next experiment more successful is to measure ratios of stable isotopes of nitrogen in the soils. In which we later found out that the ratio of nitrogen-15 increased with the soils age, which indicates that nitrogen loses to the air; and is more likely to lose to air than leach.

[https://www.eurekalert.org/pub\\_releases/2018-07/uou-uss070218.php](https://www.eurekalert.org/pub_releases/2018-07/uou-uss070218.php)