

COORDINATES: 78°S, 163°E

TWITTER TIME

8:06 AM
Sampling at the stream, it's one of the 20 days it gets warmer than 0° C! 🌨️

8:48 AM
One of the benefits of being this far south during an austral summer is having daylight for 24 hours! Yes, I know it's winter in the Northern Hemisphere but the seasons are reversed in the Southern Hemisphere. 🌞

8:50 AM
We've seen the water levels of this stream get lower and higher over the years. It depends on how much the glacier is melting rather than the rain or snow.

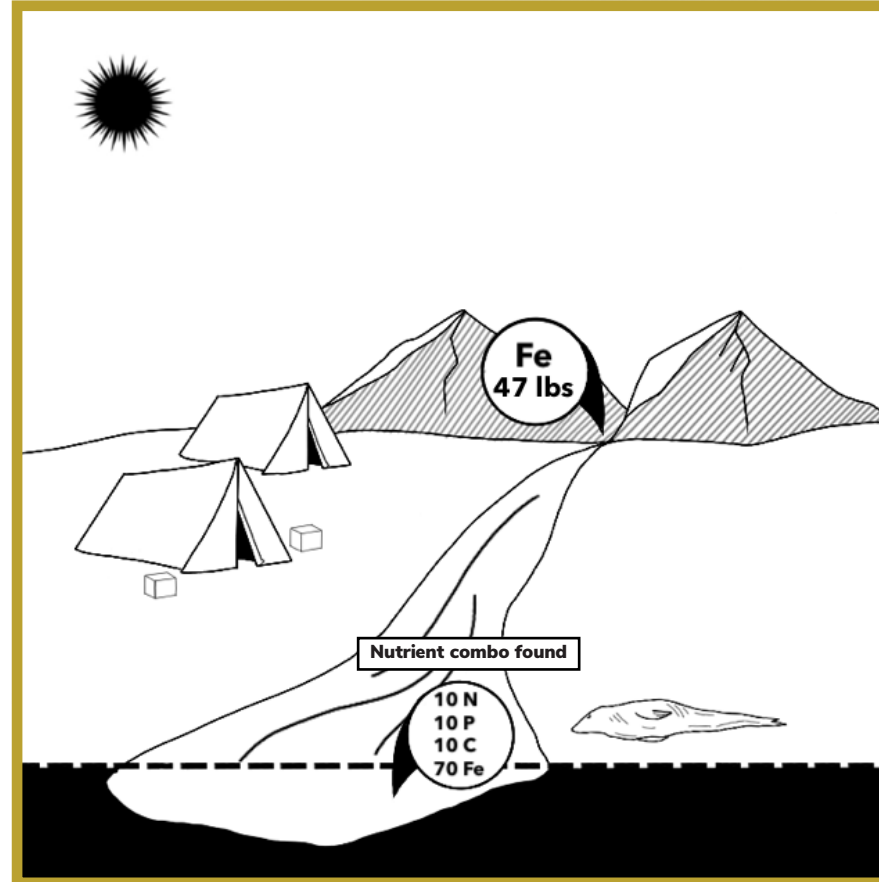
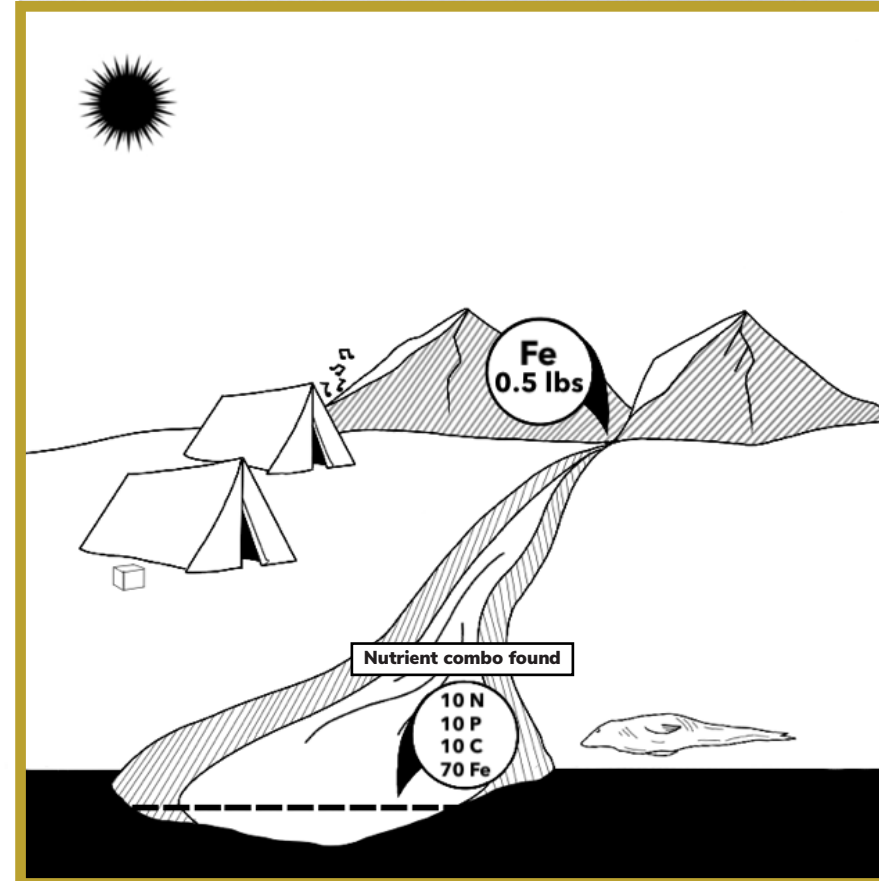
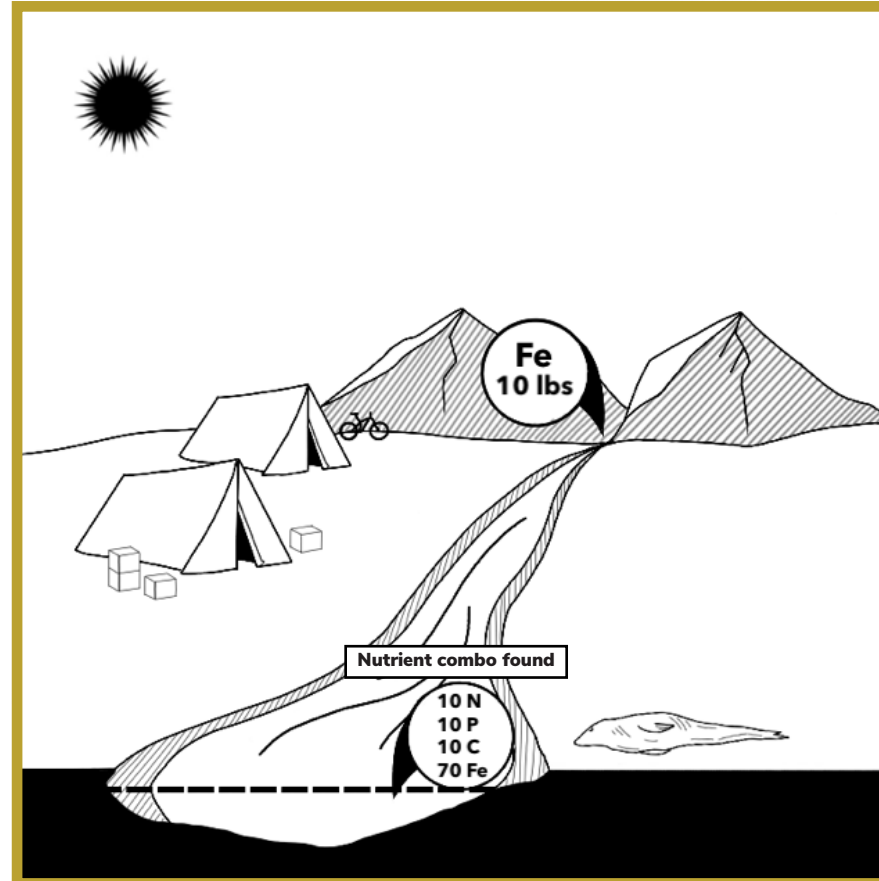
8:52 AM
There seems to be a connection between the amount of stream water and the amount of available iron in the stream water. When one rises, so does the other!

11:00 AM
Besides iron, we're searching for N, P, and C in the water melting from glacier. In what combination will we find them?

11:02 AM
Will the combination of elements be the same as the last two years? Without the right combination, plants and phytoplankton can't grow and make food. We call these plants and phytoplankton that make their own food producers. Yes! They are the same.

2:08 PM
This place is a cold desert, we hardly get rain or snow all year. It's so dry that the mummified seal looks as good as last year! 🐾

3:05 PM
For everyone back home, HAPPY NEW YEAR FROM THE MCMURDO DRY VALLEYS OF ANTARCTICA! Check out our arrival at our home away from home. 🎉



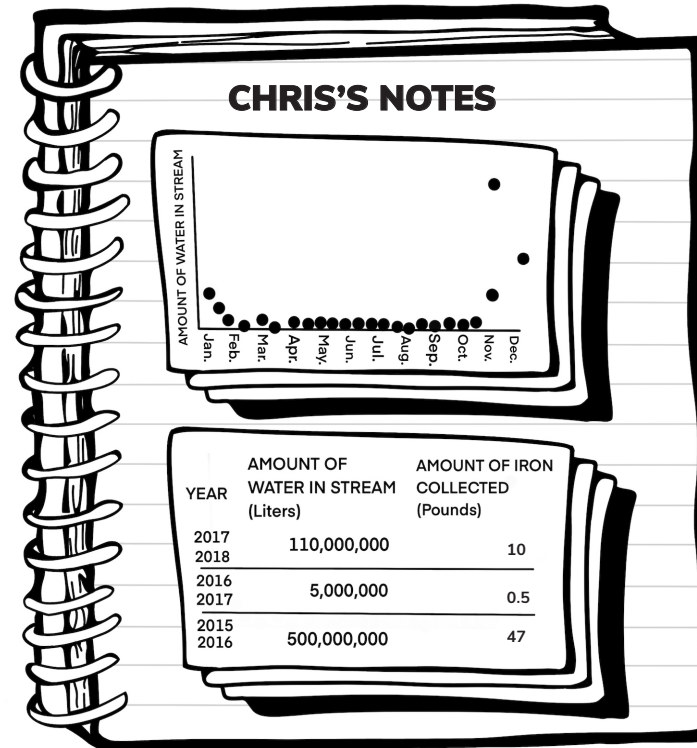
Nutrients

26
Fe
Iron

7
N
Nitrogen

15
P
Phosphorus

6
C
Carbon



NUTRIENT COMBINATIONS

NECESSARY FOR LIVING THINGS:
15N 15P 15C 55Fe

WATER IN GULF OF MEXICO:
10N 10P 30C 50Fe

WATER IN SOUTHERN OCEANS:
10N 10P 10C 70Fe

WATER IN GREAT LAKES:
20N 10P 20C 50Fe



Activity How-To Video

Rivers can carry nutrients such as carbon (C), nitrogen (N), phosphorus (P), and iron (Fe) to lakes and oceans around the world. Producers, like phytoplankton, need these nutrients to grow and make food. The problem is that these nutrients are not needed in the same amount. The need for these nutrients in a certain combination for living things is called Redfield's Ratio. For every 106 units of carbon, living things need 16 units of nitrogen, 1 unit of phosphorus, and 1/10 of a unit of iron. Phytoplankton use the nutrients in the combination of Redfield's Ratio to survive. Humans need nutrients, too! We can mix a certain combination of ingredients to make the perfect trail mix. To help learn about the nutrients in the Southern Ocean, use this recipe to make a trail mix that you can eat!

Materials:

- 3 cups of cereal of your choice. This represents Carbon.
- 1 cup of nuts or seeds. This represents Nitrogen.
- ½ cup of raisins or dried fruit. This represents Phosphorus.
- 1 tablespoon of chocolate chips, shaved chocolate, or candy. This represents Iron.



Directions:

1. Set out all the ingredients that you would like to include in your trail mix. Use Redfield's Trail mix to measure the correct ratio of grains, filler, sweets, and topping.
2. In a large bowl, mix in each ingredient with a serving spoon. Shake to mix. Enjoy!

Furthermore, some of these nutrients are not always easy to find in ecosystems. In fact, some nutrients are easier to find than others! This is like going to your pantry and finding out that you don't have the right stuff or enough of it to make the mix.

Particle Article

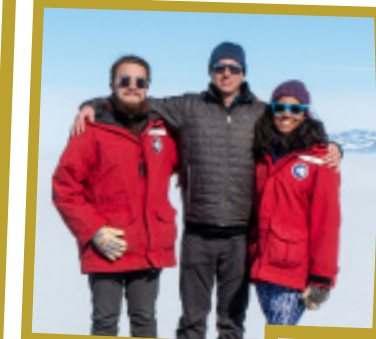
**In this cold, dry land of seasons reversed;
To collect samples in a narrow travel burst.**

**While the water may look the same to our naked eye;
It's clear appearance hides the smallest particles in disguise.**

**Bottles, filters, and chemistry are the tools of his strife;
For he teases out the amount of particles that limit microbe life.**



Where I sleep.



With my team!



Chris Gardner



Valley where we work.



Collecting water samples.