

Ground Water; Community Knowledge, Watershed Process & Importance

9th Grade
Modeling Our World
May 29, 2018

Why is my project important?

Our group is the community knowledge, watershed process, and importance group. We have focused mainly on our watershed on Lāna'i. We want to inform our community about the watershed process because knowing how it works could help us understand how we can protect it. The watershed is important because without it there would not be enough water to sustain the community on Lāna'i which means we would have to move. But with the help of our community, we could make advances in helping protect our watershed. Also we'd like to inform the community that our watershed is not healthy and that it faces many issues such as ungulates, invasive plants, erosion, and limited supply. If the Lāna'i community is informed about our watershed, we could ask for their help by conserving water, volunteering in cleanups or activities that has to do with our watershed. The message that people need to take from our project is to take action and help protect our watershed, because if we do not do anything our lives will be impacted.

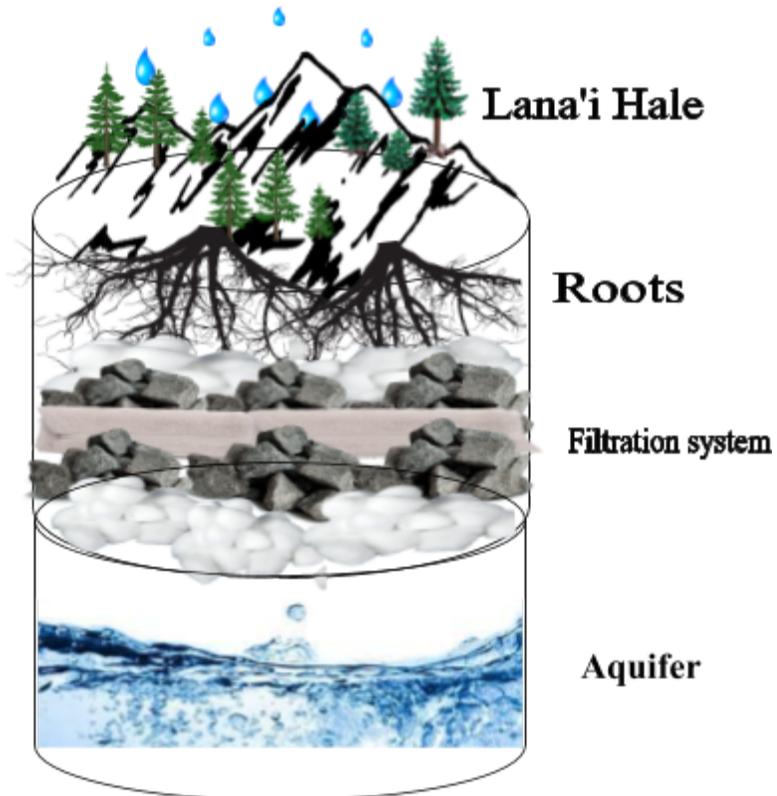
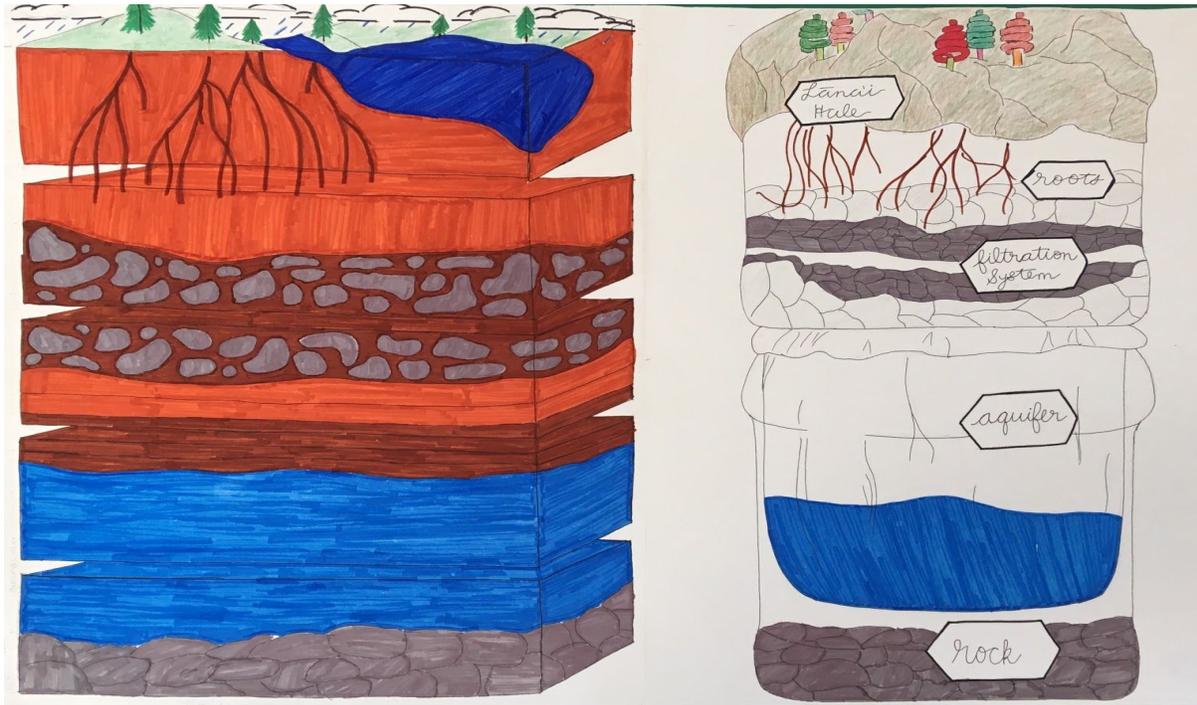
During this past year we have researched and learned more about our watershed on Lāna'i. A watershed is an area or ridge of land that separates waters flowing to different rivers, basins, or seas, and stores water.

The water on Lāna'i goes through a long process. According to the Board of Water Supply, it takes about twenty five years for the water to reach the aquifer on Oahu (*Board of Water Supply*). First, the trees collect fog drip. The water then goes through a filtration system, where the water is being filtered. Lastly the water then seeps down into the aquifer. Later the water is pumped up and becomes available to us.

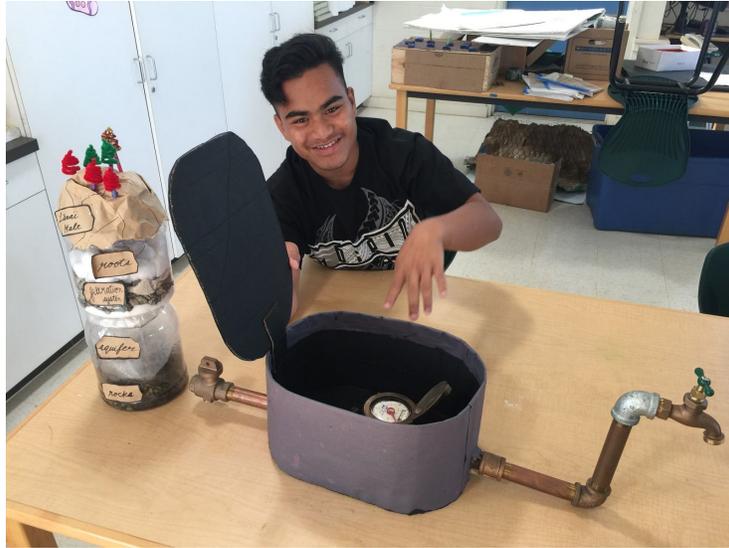
We have learned that our watershed on Lānaʻi is not as healthy as we expect it to be because it faces many issues. The issues our watershed is facing are ungulates, invasive plants, erosion, and limited water. The ungulates on Lānaʻi are spreading invasive plants and eating the native cover which can lead to erosion. According to Joy Gannon from the Lānaʻi Water Company, we are taking up water more than the water can restore itself. This could lead to not having enough water and we would have to move.

Our watershed on Lānaʻi is very important because it is our main source of water. Without water there would not be a community on Lānaʻi so it is very important people are informed about our watershed. We could help spread this information to the community to inform them about our watershed because it is very important and is in need of protection. According to Lānaʻi Island WUDP, we can conserve our watershed by putting up fences, controlling ungulates, controlling invasive plants, controlling erosion, and planting more native plants.

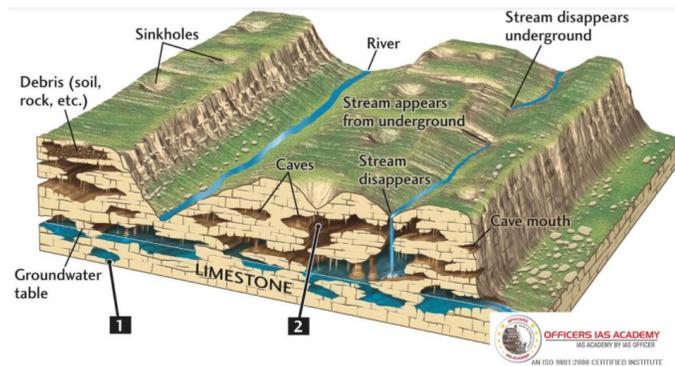
Model



This model represents the process of our watershed on Lānaʻi starting from top to bottom. The reason why we chose to create this model is to give a better look into the process and how it relatively looks in real life.



This is our water meter box model. We made made this model to show what a water meter box looks like, how it works, and how you could read it. Knowing this information could tell a person how much water they have been using and could help them find the cost of their next water bill.



(Right) This is a picture that shows the different layers of our watershed, how the process works how water gets into aquifers underground.

Place

How does Hi'i relate to our watershed process?

As a class we decided to learn more about Hi'i. We read an article about the history of Hi'i and took quizzes on it. We later went there for a field trip. We learned that Hi'i is an important educational site that helps us see how the ancient Hawaiians valued agriculture.

Hi'i is a heiau or temple that the Hawaiians used to make offerings and grow their crops. When we visited Hi'i in Quarter 3 we saw that there were lots of native plants up there. The Hawaiians chose to grow their crops at Hi'i because of its rich soil due to its location. Hi'i means to uplift or nestle. This describes how the land captures water from the clouds. When clouds pass over the mountains, Hi'i is like a bench where the moisture collects.

Hi'i is related to our watershed process because it shows how the native cover affects the culmination of water that seeps into the aquifer. It also gave us ideas on how to help protect our watershed like fencing, weed pulling, and clearing out invasive plants.

Reflections

Hi'i Reflection

Student A

What is Palawai Basin? Palawai Basin is the ancient caldera (larger crater) of the shield volcano that formed the island of Lāna'i. The Hawaiian islands were formed by shield volcanoes (made by pahoehoe and a'a) that erupted from a crater or rift zone. It was estimated that Lāna'i, Maui, Molokai and Kaho'olawe used to be one island a million years ago. But began to separate for a couple of years later. Around eight hundred years ago, ancient Hawaiians came to Lāna'i and found rich soil to sustain their crops. Eventually, the land was unique than other Hawaiian islands due to native plants, and birds were only found there. Hi'i or lifting up, nestling, descriptive of the bench land holding up the mountain and carries the clouds.

It was important to ancient Hawaiians who settled on Lāna'i. The forest is where they build their homes and the valley where they provide basalt lava can be used as tools or weapons. In 1922, James Dole purchased Lāna'i and turned Palawai basin into a pineapple plantation. Where the location was, it provided clouds and fog to be near to the plants and receive moisture. Where you can find what is left of it is the black plastic that was used for making pineapple.

In Hi'i, many crops were grown by the po'e kahiko (people of old) such as kale (taro), 'uala (sweet potatoes), uhi (yams), kō (sugarcane), mai'a (bananas), ipu (gourds), and pia (arrow root). They also planted wauke, which it was used for making clothes.

At Hi'i Heiau, it has a number of artifacts that have been located. Kuaiwi or low wall alignments were put to use as a garden or a place to grow their plants, to keep moisture near the roots. There is also fire pits that were found and were used around the 1860s. Hala or Pandanus

Tree is a greatly valued plant in ancient Hawaii. It's leaves were used as mats, baskets, thatching houses, and sails for voyaging canoes.

My personal thought of Hi'i is important to the island because the resources were used, and was planted for many years. Also some of the plants that were planted, are only grown here on Lāna'i. It's better to understand what's left on Hi'i and what happened to it. After living on Lāna'i for a long time, I realized there's something special about the island that the other Hawaiian islands don't have.

Student B

It was an honor and privilege to visit Hi'i. I visited Hi'i to learn more about the native plants there, what they are used for, & most importantly how they impact our watershed. On our way up to Hi'i I saw different plants, erosion, landslides, and even the different benches. Once we entered Hi'i I noticed that it was very open for sunlight and it was fenced to keep all the ungulates out. There was also a sign in the front that showed a map of Hi'i. I thought it was very neat and important because it is very detailed and we can use it to see how Hi'i will change in the next hundred years.

While we were up at Hi'i I learned that what happens up in the mountains affect what happens in the ocean. I also learned more about the invasive plants up at Hi'i. These invasive plants were the fake Koa tree, eucalyptus tree, fireweed, and albizia. Something new I learned about the eucalyptus tree is that there are three different types. The firewood plant also is very poisonous to the deer on Lāna'i, which causes them to die. So if the deer eats the fireweed plant and we are out hunting for deer there is a possibility that the deer we are eating can affect us. Up at Hi'i I also learned new native plants. Up at Hi'i there were also ti leaf. When Pulama Lāna'i

began clearing up Hi'i for sunlight, ti leaf began to grow back by itself. There were also the ohia lehua. (Another plant) They are used to soothe your bones. Lastly, I learned that there were corals found at Hi'i. This was probably because Hawaiians brought them from the ocean as offerings.

Right above Hi'i there was Lāna'i Hale in the back. I also saw albizia trees, native plants, invasive plants, the small enclosure, and the heiau. The light area in between Hi'i and Lāna'i Hale were the uluhe ferns. I saw many native plants, invasive plants, and I also saw lots of roots. The native plants that I saw were wauke, kō, kalo, hala and 'uala. The heiau was enclosed with rocks, and these rocks had moss on them. This meant it was very moist.

How do I feel now that I have physically seen Hi'i? Now that I have physically visited Hi'i I would like to go back to do more stewardship. This is so we can help protect and maintain the sacred site, and also because I had a really fun time. My emotions are happy because I've finally gotten a chance to visit a sacred site in my home place. Visiting Hi'i is also important to me because I got a chance to see the different native plants that collect the water to store in our watershed.

Student C

I saw that there was a voluminous amount of invasive plants that covered Hi'i and the other benches. I also saw that there was some native plants that grew inside or the fenced protected area and learned that they grew on their own once some of the invasive trees were taken down. Some other things I saw was that the soil was a little red, there was trails that guided you around Hi'i. and that the huge trees blocked a lot of the sun from the ground.

I felt like I had to be super polite and respectful. I felt this way because I learned that a Heiau is sacred to the ancient Hawaiians, and I also felt as if my eyes were being opened to what was happening all around Hawaii, that all these sacred places are being lost or destroyed.

I learned about some of the medicinal properties of native plants that grew in Hi'i. For example, you have to pee on a plant that you smash into a paste, then apply it over the area of your broken bone and pray to the gods, and if you did the process correctly then your bone will heal. The plants that the Hawaiians planted at Hi;i all had a purpose, whether it would be for food, medicine, or crafts.

Various Reflections

English as a Second Language Student

The thing I would never forget is the watershed process. I would never forget the watershed process because it was my job to explain the watershed process to people who don't know it. That's the thing I would not forget about our project. My biggest challenge was going to give a presentation at the senior center. It's my challenge because I was afraid I was gonna make mistakes during our presentations.

I would say our project was fine. The thing is we should've connected the watershed to our water meter so they could see what it really looks like and imagine the watershed better. The most valuable thing I learned about myself is that I can actually do work but I choose not to. I realized that I can be smart. My learning skills developed because I wanted to learn about the island. I want to have more classes like this because these projects are fun. Just by doing all these projects brings me more knowledge about where I live and it also helps me work better with my classmates so we can become friends.

What did you enjoy about project-based learning?

What I enjoyed about project-based learning is creating models about the topic we were given, learning more what's going on in our community and environment, and talking to the community about what we're facing and what we can do to prevent or improve it.

What I enjoyed about PBL is that it was easier to find information because living in the place that you are making a project on will give you many sources like family, friends, locals, library, and yourself. I would like more classes like this because learning about the island I'm living on opened my eyes to some of the issues it's facing like erosion, ungulate control, and our watershed.

The past year I enjoyed learning about our watershed on Lāna'i because it is my home. I enjoyed being able to visit Hi'i and being able to physically see the different native plants. Yes, I would like more classes like this because we have the advantage of learning about our own island while on the island.

What is something that you learned this year?

What I learned from this year that I would never forget is that our watershed is important and that it is in danger. The watershed is in danger from ungulates, erosion, and lack of water conservation.

One thing I learned from this school year and I will never forget is how important our watershed is to us because without it we won't have a water source. Also, we won't be able to live on Lāna'i because there won't be any water.

Something I learned this whole entire year that I would never forget is that our watershed is not as healthy as we expect it to be. Our watershed is our ONLY water source and if we do not

protect it, it can and will affect the future of our lives. Our generation needs to be informed about our watershed of how it works, why it is important, and what they can do to help protect our watershed.

What is something you learned about yourself by doing place-based learning?

The most valuable thing I learned about myself this school year is that I am a leader. During this school year I have noticed that this school is divided by followers and leaders. I noticed myself not following but leading, I didn't follow people, I walked with them, I didn't go along with plans, I made them. I also felt myself being one of the leaders in my group.

I learned that I can get things done on time if I really tried and that our watershed is actually really important even though we act like it doesn't matter and that we have a healthy watershed when we really don't.

The most valuable thing I learned about myself this school year is being a leader. During the year when we were working on our projects I took the initiative of assigning my group members what to do.