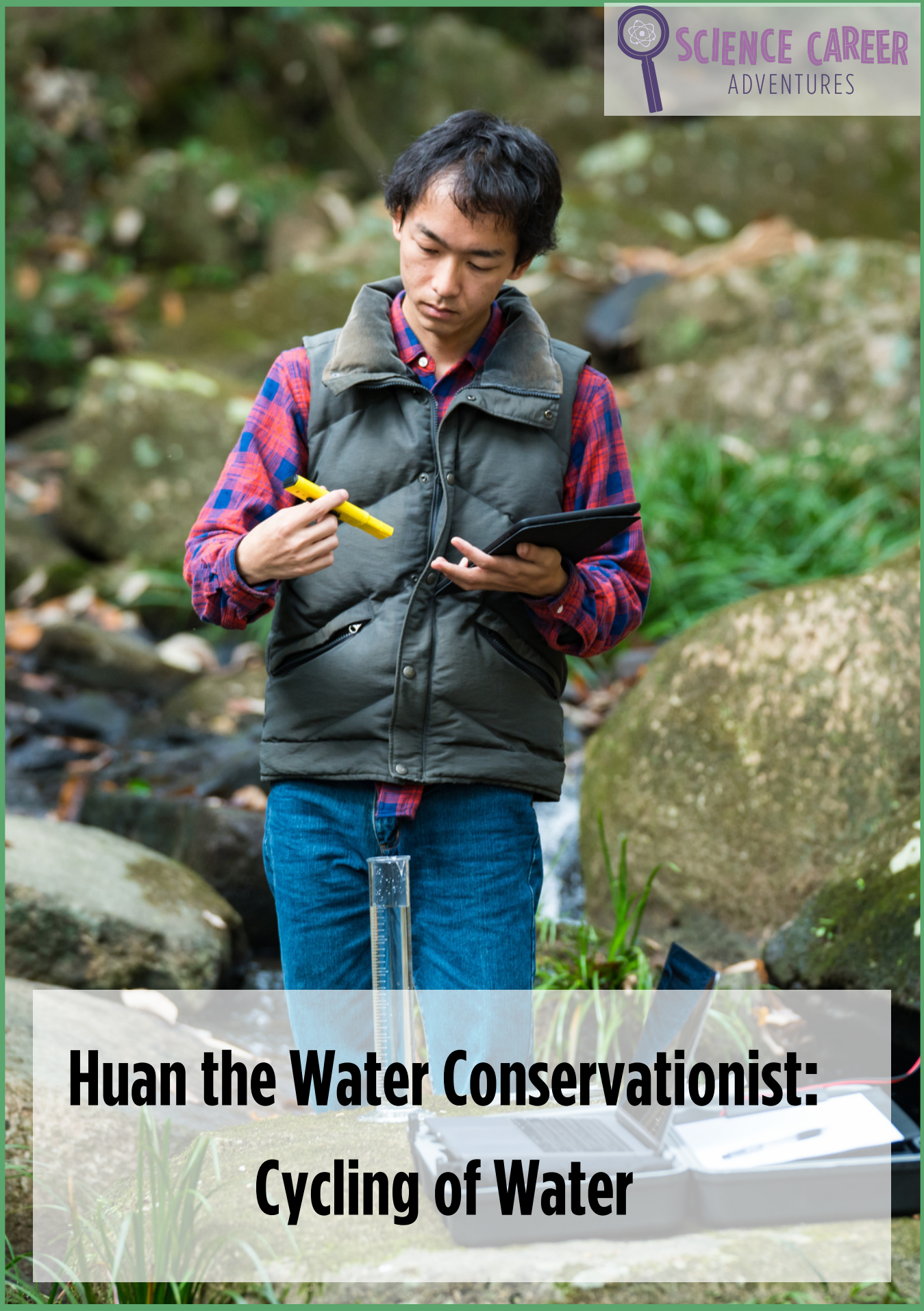


Huan the Water Conservationist: Cycling of Water

Who is Huan?

Hi! My name is Huan and I am a water conservationist.

A water conservationist is someone that develops new ways to use our water resources more efficiently. There is a lot of water on Earth, but we can only use less than 1% of the water for showering and drinking. The rest is trapped in glaciers or salty ocean water or is too polluted for us to use.

Here are some examples of projects that water conservationists work on:

Developing Hybrid Toilet-Sinks

When you wash your hands, the water goes into the toilet tank so it can be used for the next flush, instead of pulling clean water to flush the toilet.

Image Courtesy of: earthwiseharmony.com

Researching Water-Wasting Foods

Some plants and animals that we eat end up using more water than others. Water conservationists are researching the best and the worst foods for water conservation.

Developing Moisture-Monitoring Drones

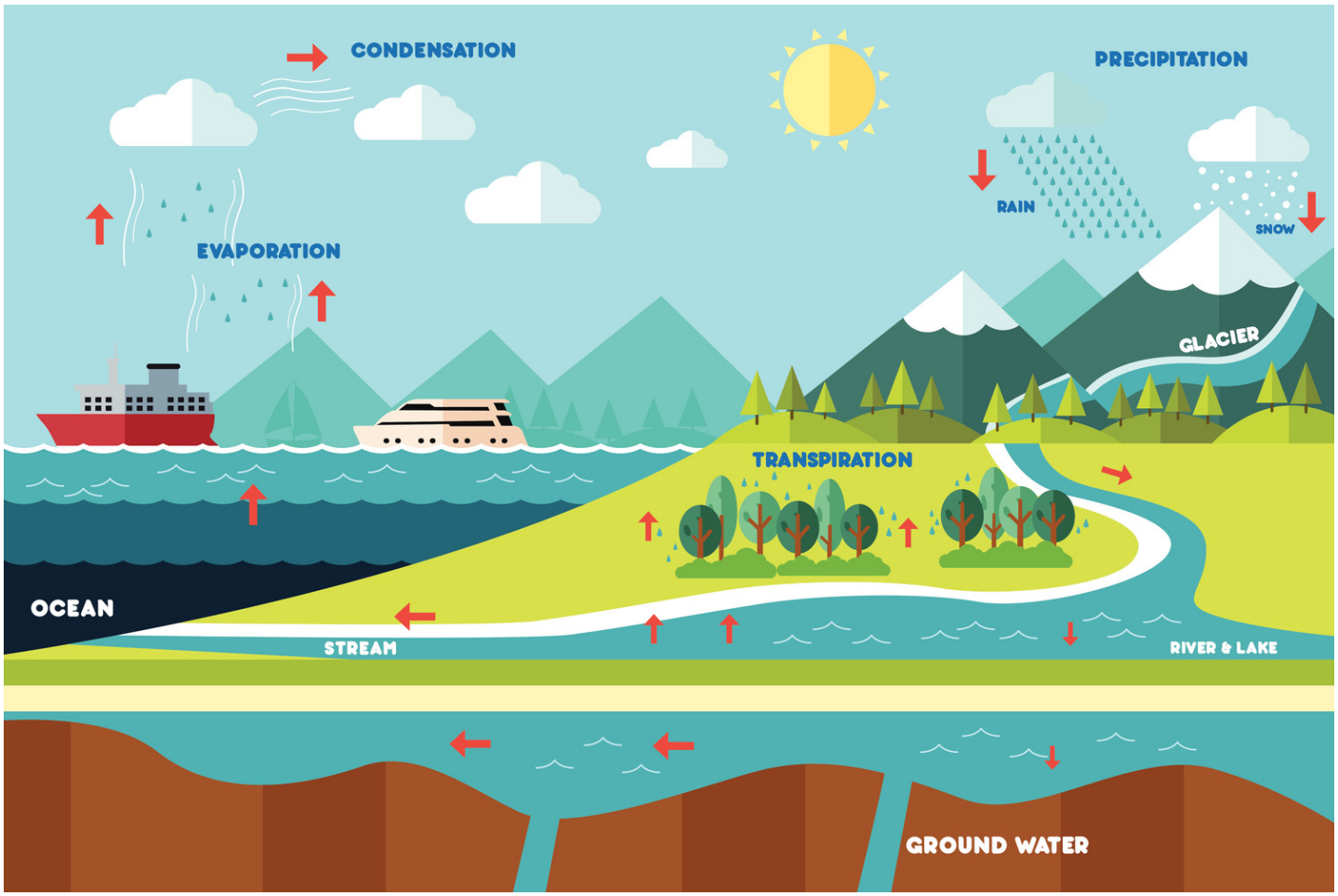
Water conservationists are working on drones that measure the moisture of each farm field so farmers don't waste water on fields that don't really need to be watered.

The Water Cycle

As a water conservationist, I am an expert on the water cycle. The water cycle is a process on Earth where water is constantly moved around due to the sun's energy and Earth's gravity. As water moves through the water cycle, it also gets cleaned.

Here is how the water cycle works above the ground:

- When the sun heats salty or polluted water, clean water evaporates and leaves the salt and pollution behind.
- Clean water becomes part of clouds until big water droplets form.
- Gravity pulls them back down to Earth as clean water that fills up lakes and streams.



Here is how the water cycle works below the ground:

- Gravity pulls water from lakes and streams down through the layers of the Earth. This is called ground water because it is below the ground. These layers are made of rocks, clay, and sand.
- These layers filter out the pollution, leaving clean water.
- Clean water can be found in wells that people dig. It also comes back out of the ground to make fresh water streams.

Not Enough Water

Even though the water cycle is always moving and cleaning water, we sometimes just don't have enough water.

Here are a few reasons we don't have enough water:

- There isn't enough rain falling to fill up lakes and streams which then flow into the ground as groundwater. For example, changes in wind patterns might make the clouds that are usually over an area drift away. This can cause there to be less rain than normal.
- People are using up the groundwater faster than the water cycle can replace it. For example, cities pump out too much groundwater to run factories, and farmers pump out too much groundwater to water their crops. People also waste water in their homes by leaving faucets running and taking extended showers.

When there is not enough water in an area, there is a drought. Droughts occur around the world and have affected more than 1 billion people over the past 10 years. Droughts are problematic for many reasons:

- There isn't enough water for human consumption.
- There isn't enough water for plants or animals.
- Too many dried-up plants can cause out-of-control wildfires.
- There aren't as many plant roots holding the soil in place so it blows away.
- Mudslides, like the one on the right, can occur after rain finally comes.

Scientists in Europe are developing drought-resistant plants. These plants have been changed so that they can absorb water and then keep the water inside the plant for a long time. This way, if there is a drought, the plant can live longer than other plants.

What I am Working On

Right now, I am collaborating with a group of scientists at NASA to help cities fight droughts. We are creating an app that scientists can use that will show where droughts are going to happen all around the world. Our first step to create the app is to brainstorm a few ideas about how the app will work. Here is what we came up with:

- We will use data from NASA that shows where droughts might happen. The data was collected by satellites and shows how groundwater levels are changing in different locations.

- We will alert city officials that droughts might happen and will provide suggestions on how to avoid the drought. For example, cities can provide people with two different kinds of water. Super clean water for drinking and cooking and water that isn't quite so clean for watering gardens and flushing toilets.That way, the city won't use up all the clean water so fast.

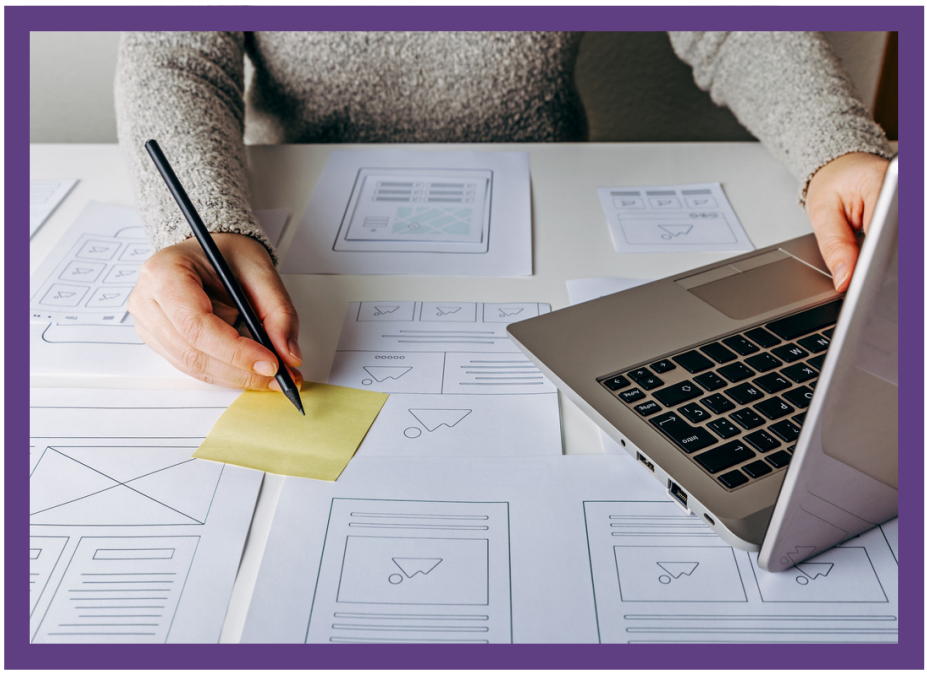
Curious how the satellites measure water levels?

- Satellites measure the difference in gravitational pull when they fly over different areas.
- When there is more ground water in an area, the gravitational pull is greater.
- When there is less ground water in an area, the gravitational pull is less.
- The satellites keep track of the gravitational pull in different areas to see how it is changing. They can warn people if ground water is decreasing in their area.

Next Steps

After we brainstorm ideas, we will work with a developer to create a wireframe.

A wireframe is a drawing that shows how the app will work.



Once the wireframe is complete, we will have a developer build the app!

I can't wait to see how the app turns out! I know it will help people make smart choices about conserving water!