

Editorial on Surface Water Hydrology

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Editorial

Hydrology is the study of the distribution and movement of water both on and below the Earth's surface, as well as the impact of human activity on water availability and conditions. Hydrology is a critical area of research that deals with one of the world's most important resources: water. Experts from a variety of fields, ranging from geologists to engineers, study all facets of the Earth's available water in order to gain the knowledge required to handle this essential resource. Hydrologists rely on their knowledge of how water interacts with its surroundings, such as how it travels from the Earth's surface to the atmosphere and back. The hydrologic cycle, also known as the water cycle, is a never-ending movement.

In response to changes in temperature and other factors, water takes on different forms in the atmosphere. The sun warms the water on the surface of oceans and other bodies of water, causing it to evaporate as water vapour. This moist air cools and condenses into clouds as it rises high into the atmosphere. The moisture in the clouds then falls as precipitation on the Earth's surface. The water is drained until it enters the ground, and it becomes groundwater. Groundwater that is not drained will flow out into creeks, rivers, and streams, ultimately ending up in the oceans. When the surface of bodies of water evaporates, the cycle repeats itself. Plants can also return moisture to the atmosphere through a mechanism known as transpiration.

The field of hydrology is concerned with not only the natural distribution and movement of water, but also the effect of human activities on water quality and water management issues. Water is used for a variety of purposes. People use water in their homes for drinking, cooking, washing, and bathing. Water is needed in a variety of industries. Water is used in agriculture to irrigate farmland and for livestock. Many dams use water to generate hydroelectric power. Water has an almost infinite number of human applications. Hydrologists, including National Geographic Explorer Manase Elisa, are crucial in assessing the effect of human activities on our accessible water supply. Elisa was the first to undertake a comprehensive analysis of the Katuma River-Lake Rukwa ecosystem in Tanzania. Irrigation in the Katuma River basin has resulted in downstream environmental degradation.

Hydrologists work to enhance the quality of water and extend our access to it so that we can continue to use it in all of the ways that we need it.

Water-Worlds

The collection of water on our planet in the ocean, the ground, and the atmosphere—collectively forms the hydrosphere, making it a water-world. But as knowledge expands, we've learned Earth is not the only one that would classify as a water-world.

Earth is rightfully referred to since a water-world, as water covers more than half of our earth. Water can also be found under the earth, in rivers, and in the atmosphere. The hydrosphere is the sum of all of this vapour. Water is essential to life as we know it, which is why scientists are researching how water moves across the hydrosphere and how to better preserve this valuable resource. From space, our world appears to be a blue marble. Since the ocean occupies 71% of the Earth's surface, this is true. As a result, the ocean is a significant component of the hydrosphere and plays an important role in the water cycle on Earth. The ocean holds over 96% of the world's water. When water evaporates from the ocean, it is carried into the atmosphere and eventually falls as rain. Most of this precipitation falls over water, but some falls on land. Rain and snow that fall on land have a variety of fates: some is absorbed into the earth and taken up by plants such as trees, while others flow into streams and rivers and ultimately empty out into the ocean. Water spreads in several directions through Earth's habitats, and some of it pools in polar ice caps, snowpack's, and glaciers. Next time you eat, take a shower, drink a glass of water, or go skiing, remember to thank the hydrosphere.

Water Cycle

The water cycle is the endless process that connects all of the water on Earth.

Water is an important part of life on Earth. Water or ice covers about 75% of our planet. The water cycle is the never-ending mechanism that ties all of the water together. It connects the oceans, soil, and atmosphere of the Earth. Rain fell on a cooling Earth about 3.8 billion years ago, forming the oceans, and the Earth's water cycle began. The rain was caused by water vapour escaping from the Earth's molten core and entering the atmosphere. The water cycle was aided by solar energy, and Earth's gravity prevented water in the atmosphere from escaping the planet.

The oceans contain almost all of the water on the planet. Polar ice caps and glaciers hold about 1.7 % of the world's water. About 1.7 trillion is kept in rivers, lakes, and soil. Water vapours makes up a small fraction of the Earth's atmosphere—just 0.001%. Condensation happens as water vapour molecules revert to liquid or solid form, creating cloud droplets that may fall down to Earth as rain or snow. The majority of precipitation falls into the seas. Rainfall that occurs on land is channelled into rivers, streams, and lakes. Any of it seeps into the soil and is stored as groundwater underground.

Water on the surface of oceans and freshwater bodies evaporates when heated by the light, producing vapour. Clouds form as water vapour rises into the atmosphere and condenses. It then becomes snow and falls to the earth. Ice and snow will also release moisture into the atmosphere. In a process called sublimation, solid water, such as ice or snow, can transform directly into water vapour without first becoming a liquid.

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