

Michelle Yue

Geoscientists study the four systems of Earth Science (geosphere, hydrosphere, atmosphere, and biosphere) in order to seize opportunities and vastly improve the world. Earth's systems are connected through the study of water pollution, specifically stormwater runoff. Geoscientists study the effects of stormwater runoff through the four systems in order to create solutions preventing harmful effects on the environment. Stormwater runoff immensely affects Earth's systems, especially through the hydrosphere. It occurs when precipitation flows off impervious surfaces. Therefore, non-point source pollution is easily carried away. The pollution travels directly into natural waterways, leaving debris it picked up in the water, creating water supply, wildlife, and recreation hazards. This also causes erosion, part of the geosphere, creating shallow, murky water and less farmland topsoil.

The biosphere is harmed by erosion creating murky water blocking sunlight which aquatic plants need. By killing aquatic plants, animal populations depending on these plants decrease along with dissolved oxygen. Additionally, pesticides and fertilizers harm wildlife after being released into water through skin absorption, drinking contaminated water, and eating another creature exposed to these conditions. Furthermore, oxygen demanding substances, heavy metals, and acidity in stormwater runoff are components leading to atmospheric deposition, a problem occurring in Earth's atmosphere.

Through research and addressing problems found relating to stormwater runoff, geoscientists have found solutions, improving the world and its environment. One solution is through rainscaping, an approach involving techniques like planting native plants that don't need pesticides or fertilizers while reducing erosion. Other solutions include vehicle maintenance (repairing leaks, washing vehicles on grass or gravel, etc.), picking up pet waste, and using alternative products. Ultimately, geoscientist's studies on relationships between stormwater runoff and Earth's systems successfully help the world by creating various solutions which prevent these problems from happening by addressing the problem, and experimenting for ways to fix it.