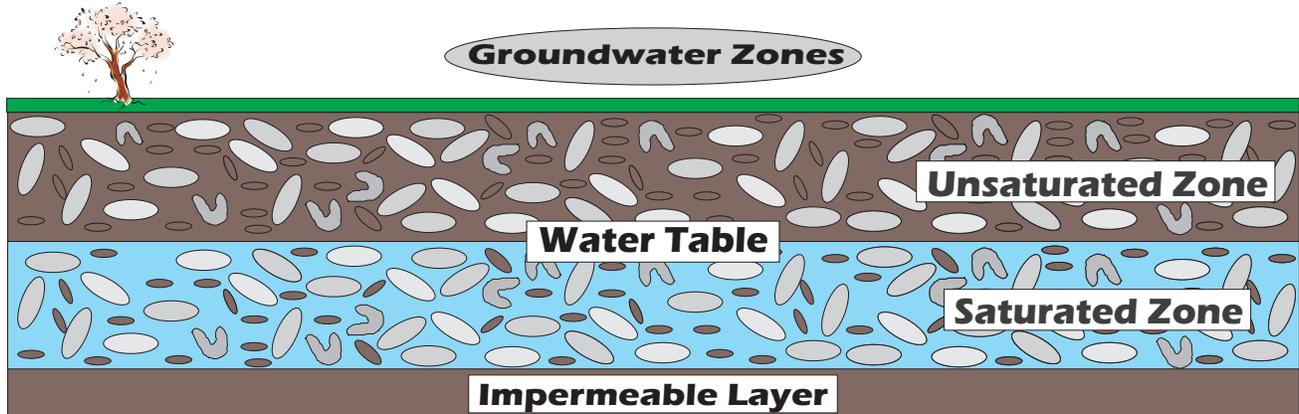


“It All Flows to Me” Diving Deeper: Concepts & Vocabulary



Dive deeper with your students as you review watershed concepts and vocabulary words. This sheet is a wonderful resource for beginning your journey into a more in depth study of the watershed.



Layers of an Aquifer:

Aquifer

A geological formation of sand and gravel where groundwater is stored.

Unsaturated Zone

The zone above the saturation zone that water flows through.

How deep is this zone? When a lake or marsh is at the surface, then the unsaturated zone can be right at the surface. In arid areas it can be hundreds of meters thick.

What happens in this zone?

- 1) Water, plant nutrients, and other substances are stored here. This zone stores only a small amount of water and therefore it is quite difficult to extract large amounts of water for consumption.**
- 2) This zone basically controls the transmission of water to aquifers, land surfaces, water surfaces, and to the atmosphere. Some scientists believe that this zone may give information that would allow the process of groundwater replenishment to be quantified with numbers.**

Saturated Zone

The area where the water completely fills the spaces between soil, sand, and rocks underground.

How deep is this zone? Depth varies due to rainfall. During times of heavier rainfall this zone will become deeper and during times of drought this zone will become more shallow. The water table (surface of the saturated zone) rises and falls as water fills up the saturated zone.

What happens in this zone? Water is stored in this zone and may be pumped out by a well to be processed for drinking water or may flow out on to the surface.

Do different types of sediment hold the same amount of water? No, different types of sediment (rock, sand, dirt, etc.) hold different amounts of water.

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Layers of an Aquifer (Continued)

Impermeable Layer

A solid layer, of rock or clay, that water cannot pass through.

Discharge Area

A discharge area is an area where water from the aquifer moves back to the surface. Examples: spring, stream, river, lake, ocean, etc.

Recharge Area

An area where rain, imported, or recycled water can be absorbed into the ground and travel down to the aquifers. Examples: Parks, lawns, fields, etc.

Note: If the ground is covered by concrete, then this surface area can not be a recharge area since concrete is not permeable to water.

Pollution

Point Source Pollution

This is a type of pollution that can be easily tracked back to its source. Examples: oil spill, factory smoke, etc.

Note: If you can point to the source of pollution, then it is point source pollution.

Nonpoint Source Pollution

This is a type of pollution that cannot be easily tracked back to its source. Examples: trash, pet waste, pesticide, used motor oil, fertilizer, etc.

- Nonpoint source pollution may be left behind by a person and is carried by the rain into the ocean or local aquifer.
- This is the type of pollution that we are all responsible for. It happens everyday and in all communities.

Why is pollution harmful?

Trash: Some animals in the ocean mistake trash for food and when these animals eat trash they can become very ill. Animals like leatherback sea turtles often mistake trash for their prey items and sometimes try to eat plastic bags, mistaking them for sea jellies. Other animals may become entangled by trash. For instance, some animals get their mouths and necks caught in six-pack soda rings.

Waste: Animal waste can also carry many diseases that may harm ocean animals and even people.

Pesticide: Pesticides can become dangerous to people if they travel into an aquifer and contaminate our groundwater supply. If they are washed into the watershed, then they may also harm marine animals.

Oil: Oil is harmful for many reasons. It acts as a poison if injected or inhaled by animals. Oil may also foul fur or feathers and make it impossible for some types of marine animals to stay warm.

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Pollution (Continued)

Fertilizer: In order for plants to grow they need water, sunlight, and nutrients. Some gardeners give their plants extra nutrients by adding fertilizer to their lawns and flowerbeds; however, this same fertilizer can also stimulate growth in marine plants (including algae). When algae is exposed to extra nutrients it can result in an algal bloom (excessive growth of plants). Algae growth can significantly reduce the amount of oxygen in the ocean, because this large amount of algae will eventually die and become decomposed by bacteria. Bacteria take oxygen out of the ocean and use it to decompose biological materials. Therefore, decomposing plant material from an algal bloom can remove a large portion of oxygen from the ocean.

Ways to Stop Nonpoint Source Pollution

- 1. Place all recyclable materials (paper, plastic, glass, etc.) in the proper recycle bins.**
- 2. Place all trash in trash cans and cut six pack rings before disposing of them. If you see a piece of trash lying on the ground, then pick it up even if you did not leave it there.**
- 3. Pick up the waste left by your animals and deposit it in the trash can.**
- 4. Instead of using pesticides, ask your local gardening store what environment friendly solutions are available for eliminating specific garden pests.**
- 5. Take your car or encourage your family to take their car to get regularly serviced by a mechanic. This may prevent oil leaks from happening before they even start.**
- 6. Use fertilizer sparingly and do not fertilize on days when you know that the rain is coming.**

For More Information

Ø Aquarium of the Pacific:

The Aquarium regularly hosts teacher workshops that introduce science topics to the classroom. We also present a variety of school and public programs that educate students of all ages about the importance of environmental stewardship. Call (562) 591-1630 or visit www.aquariumofthepacific.org for more information.

Ø Water Replenishment District of Southern California (WRD):

The WRD highlights the challenges we face in supplying water to southern Los Angeles County each year by sponsoring groundwater tours of the Central and West Coast Basins. This amazing tour offers a firsthand look at water treatment facilities and groundwater projects. Tour attractions include a visit to either the San Gabriel River or Rio Hondo Spreading Grounds and Leo J. Vander Lans Water Treatment Facility. Your students will learn how micro filtration, reverse osmosis, and ultraviolet light help recycle over 2.7 million gallons of water each day. Upon request, the WRD will send out a water expert to speak to your group about the critical issues surrounding groundwater and to explain how the District works to safeguard this precious resource. Call the District's External Affairs Department at (562) 921-5521 or visit www.wrd.org for more information on watersheds.