

## D6. Factors Influencing Watershed Health

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#### Higher Elevations Separate Watersheds

Watersheds are the geographical areas that drain into a specific body of water, such as a river, lake, or bay. One essential feature of watersheds is that they are defined by natural boundaries, often formed by higher elevations like mountains and ridges. These higher elevations serve as dividers, separating one watershed from another. This division has a profound impact on the flow of water, as water tends to flow downhill. Consequently, water from higher elevations flows into lower areas and eventually into larger bodies of water.

#### Natural Processes, Human Activities, and Influences on Watershed Health

Watersheds are complex ecosystems influenced by a combination of natural processes, human activities, and various biotic (living) and abiotic (non-living) factors. Understanding these influences is crucial for assessing and maintaining the health of a watershed system.



#### Dry and Wet Lands

Within a watershed, you can find both dry upland areas and wetlands. These landscapes play essential roles in regulating water flow and filtering pollutants. Dry uplands absorb rainfall and reduce runoff, allowing water to slowly infiltrate the soil and recharge groundwater. In contrast, wetlands act as natural sponges, trapping excess water, and filtering out pollutants before releasing cleaner water downstream. The balance between dry and wet areas is vital for the overall health of the watershed. Alterations to these landscapes, such as urbanization or deforestation, can disrupt natural processes.

## Runoff and Pollutants

One significant influence on watershed health is runoff. Runoff occurs when precipitation, such as rain or snowmelt, flows over the land surface rather than infiltrating into the soil. As runoff moves across the landscape, it can pick up pollutants like sediment, nutrients (such as fertilizers), pesticides, and bacteria. Urban areas with impervious surfaces like roads and buildings are particularly prone to generating runoff. When runoff reaches streams and rivers, it can harm water quality, damage aquatic habitats, and negatively impact the organisms living within the watershed.



## Freshwater and Saltwater - Chesapeake Bay

The Chesapeake Bay is a unique example of where freshwater and saltwater meet. This estuary is located along the East Coast of the United States and serves as a transitional zone between rivers that carry freshwater from the land and the saltwater of the Atlantic Ocean. The mixing of these two water types creates a distinctive environment with its own set of challenges. Changes in salinity levels, for example, can influence the bay's ecosystems, affecting the distribution and health of various

species.

## Human Activities and Decline

Human activities have had a significant impact on the health of many watershed systems. Urbanization, deforestation, industrial pollution, and agriculture have led to changes in land use and increased pollution levels. The consequences include habitat destruction, altered water flow patterns, and the introduction of invasive species. These changes have disrupted the natural balance of ecosystems within watersheds.

1. What separates different watersheds within a region?
  - a) Rivers
  - b) Mountains and higher elevations
  - c) Lakes
  - d) Wetlands
2. What is the role of dry upland areas in a watershed?
  - a) Trapping excess water and filtering pollutants
  - b) Promoting runoff and pollution
  - c) Slowing down water flow and recharging groundwater
  - d) Maintaining a constant water level
3. What happens when runoff occurs in urban areas with impervious surfaces?
  - a) It has no impact on water quality.
  - b) It flows directly into wetlands.
  - c) It picks up pollutants and can harm water quality.
  - d) It helps recharge groundwater.
4. Which of the following is an example of a pollutant that runoff can pick up?
  - a) Oxygen
  - b) Sediment
  - c) Aquatic plants
  - d) Freshwater
5. What type of water bodies meet in the Chesapeake Bay?
  - a) Two separate rivers
  - b) Freshwater rivers and saltwater from the ocean
  - c) Two oceans
  - d) Saltwater rivers and freshwater from underground springs
6. How can changes in salinity levels in the Chesapeake Bay affect its ecosystems?
  - a) They have no impact on the bay's ecosystems.
  - b) They can lead to an increase in freshwater species.
  - c) They can influence the distribution and health of various species.
  - d) They make the bay unsuitable for aquatic life.

7. What is one of the significant influences on watershed health mentioned in the passage?
- a) Air pressure
  - b) Atmospheric conditions
  - c) The age of the mountains
  - d) Runoff and pollutants
8. Why is the balance between dry upland areas and wetlands important for a watershed's health?
- a) It prevents all water from flowing into rivers.
  - b) It reduces sediment erosion.
  - c) It helps regulate water flow and filter pollutants
  - d) It creates a uniform landscape.
9. How have human activities affected watershed systems?
- a) They have increased natural processes.
  - b) They have led to habitat restoration.
  - c) They have disrupted the natural balance of ecosystems.
  - d) They have reduced the importance of wetlands.
10. What happens when runoff reaches streams and rivers?
- a) It improves water quality.
  - b) It has no impact on aquatic habitats.
  - c) It can harm water quality and aquatic habitats.
  - d) It decreases the number of pollutants in the water.

## ANSWERS & EXPLANATIONS

1. b) Mountains and higher elevations  
Higher elevations, such as mountains and ridges, serve as dividers that separate different watersheds within a region.
2. c) Slowing down water flow and recharging groundwater  
Dry upland areas in a watershed slow down water flow and allow water to infiltrate the soil, recharging groundwater.
3. c) It picks up pollutants and can harm water quality  
Runoff in urban areas with impervious surfaces can pick up pollutants and harm water quality.
4. b) Sediment  
Runoff can pick up pollutants like sediment, nutrients, pesticides, and bacteria.
5. b) Freshwater rivers and saltwater from the ocean  
The Chesapeake Bay is a meeting point for freshwater rivers and saltwater from the Atlantic Ocean.
6. c) They can influence the distribution and health of various species  
Changes in salinity levels in the Chesapeake Bay can affect the distribution and health of various species within the bay's ecosystems.
7. d) Runoff and pollutants  
One of the significant influences on watershed health mentioned in the passage is runoff and pollutants.
8. c) It helps regulate water flow and filter pollutants  
The balance between dry upland areas and wetlands is important because wetlands trap excess water and filter pollutants, while dry uplands allow water to slowly infiltrate the soil and recharge groundwater.
9. c) They have disrupted the natural balance of ecosystems  
Human activities have disrupted the natural balance of ecosystems within watershed systems.
10. c) It can harm water quality and aquatic habitats  
Runoff reaching streams and rivers can harm water quality and aquatic habitats by carrying pollutants and causing habitat disruption.