

# WATER QUALITY

## Water Quality within New River Gorge

### Overview

The dictionary defines water as a colorless, odorless, transparent liquid occurring on earth as rivers, lakes, oceans, glaciers, ground water, and so forth. Water also falls from the clouds as rain, snow, and ice. Water is important for many reasons, but most importantly, it is needed for the survival of all living things.

Everywhere we look, we see water. It gushes from our taps, shower heads, and water hoses. With this abundance of clean, fresh water all around us, it seems reasonable that water is the most plentiful and least valuable resource around. The reality is that water is a limited and precious resource.

Fresh water available for our many needs comes from lakes, ponds, streams, rivers, and underground reserves. There is a great deal more water underground than on the surface. As rain falls to the earth's surface, some of it seeps into the ground and is collected in open areas between rock layers. These areas serve as storage tanks for ground water and are called aquifers. The New River and its tributaries serve as a primary source of water for many communities in this area. Water is taken from lakes and reservoirs created by damming rivers and streams, treated with chemicals and pumped to our homes and businesses. Some people get water through wells by pumping it directly from underground aquifers.



*Sandstone Falls on the New River*

Despite the extent to which natural forces control water, humans exert a strong influence over it in many ways. We convert, transport, and store water to meet our needs. Dikes, dams, reservoirs, canals, and aqueducts provide water for personal use, irrigation of crops, industry, transportation, and recreation. Of all the fresh water used, about two-thirds (69 percent) goes to agriculture. The remaining fresh water use is divided between industrial use (23 percent) and domestic use (8 percent).

In the United States the average person uses about 176 gallons of water per day for drinking, bathing, cooking, washing, watering gardens, and so forth. We must take in about half a gallon of water every day just to stay alive and healthy.

Nonpoint source pollution is the pollution of water resources from a wide variety of human activities that take place over a large geographic area. It comes from farms, cities, forests, mining operations, construction sites, and our homes. It occurs when runoff from rain and melting snow picks up pollutants in its path and carries them into our streams, rivers, lakes, and ground water. These pollutants include sediments, fertilizers and nutrients, oils, pesticides, toxic chemicals, road salts, domestic animal waste, untreated sewage, and other contaminants.



Another type of pollution, point source pollution, comes from a specific location. An industrial site with a pipe directly dumping into a water supply or a sewage treatment plant of a large city are both examples of point source pollution.

Gross pollution of the nation's rivers, lakes, and coastal waters by sewage and industrial wastes is largely a thing of the past. This success, however, is at best only a partial one. If we are to continue to make progress in water quality, we must begin focusing on nonpoint source pollution. This pollution is diffuse. It is very difficult to pinpoint the origin and way in which it enters ground and surface waters.

Pollution from nonpoint sources cannot be controlled by permits governing discharge from

individual pipes. Success in the effort to control this pollution requires finding solutions for managing stormwater runoff and minimizing migration of pollutants into rivers, lakes, and ground water. It is essential to convince individuals, and society as a whole, that there is a problem and a compelling need for action. Changes in lifestyles and behaviors will be needed to prevent this type of pollution. Nonpoint source pollution is everyone's problem.

It is the responsibility of farmers to grow their crops and graze their animals in ways that protect nearby streams and ground water. It is the responsibility of those who harvest timber to do so in ways that prevent soil runoff. It is the responsibility of backyard mechanics to take used motor oil to collection or recycling centers. It is the responsibility of homeowners to apply lawn care chemicals and fertilizers carefully and safely only when necessary. It is the responsibility of car owners to keep their vehicles maintained so they don't leak oil onto the roadway.

Agricultural activities are the largest contributor to nonpoint source pollution. Sediments are eroded into surface waters from croplands and overgrazed pastures. Fertilizers, pesticides, and animal waste are washed from fields and animal facilities. Urban runoff from streets,



National Park Service Photo

**Water quality monitoring**

roadways, parking lots, and commercial and industrial sites contributes to pollution. Pollutants include salts, oils and grease, and toxins, as well as litter and trash (cans, bottles, plastic, etc.) dumped or thrown along our roadways.

Acid drainage from abandoned mines and strip operations and pollutants washed from mill tailings and mining waste piles add to nonpoint source pollution runoff. Commercial timber cutting operations that are not properly managed can increase sedimentation into streams and lakes.

Construction projects for new buildings, industrial complexes, and highways can sometimes lead to sediments and toxic materials being washed into surface and ground water during rainstorms. Domestic sources of pollution include leakage from septic tanks; disposal of household chemicals,



paints, oil, and so forth directly down the drain or on the ground; overuse of fertilizers and pesticides on the lawn and garden; and poorly maintained automobiles.

Contaminants such as sediments, nutrients, pesticides, toxins, human and animal waste, and bacteria degrade the ecosystem, pose health hazards, and impair the use of water resources. These contaminants make water unsafe for drinking and destroy wildlife habitat. Fertilizers and nutrients promote excessive growth of aquatic plants resulting in an imbalance in the habitat. Animal waste contains nutrients and bacteria that result in fish kills. Pesticides and acids are toxic or deadly to aquatic life, as well as humans. Sediments degrade water quality and alter wildlife and fishery habitats. Human waste washed from old or faulty septic systems or dumped directly into streams and rivers can cause severe sickness or infection to humans.

Water quality means that the quality of the water in a stream, river, pond, lake, wetland, or that of ground water is such that it can support aquatic life and beneficial uses.

Beneficial uses include water for drinking, bathing and swimming; agriculture; wildlife management; transportation and recreational boating; power production; and industry.

The quality of our water is affected by the type and amount of pollutants that enter the water from point and nonpoint sources. Poor water quality over an extended period will result in the death of the water resource. To maintain a healthy river, we must ensure that water quality conditions remain within the optimal range for the health and vitality of the native species. By monitoring water quality, we can determine the conditions that are suitable for the survival of aquatic species and for the safe use of water by humans.



*Cleanup along the New River*

National Park Service Photo



# TEACHER NOTES

