

Enrich

The Earth System

Read the passage below. Then use a separate sheet of paper to answer the questions that follow.

Yellowstone's 1988 Forest Fire

Disastrous natural events such as fires can impact all four spheres of the Earth system through the interaction of those spheres. One such event occurred in Yellowstone National Park in the summer of 1988.

One of the worst forest fires in the park's history began on June 22 when lightning struck and ignited a small cluster of pine trees. With the combination of high air temperatures, an unusually severe drought, and strong winds, the fire quickly spread and began to burn out of control.

On August 20, a day known as "Black Saturday," a cold front passed through the area bringing wind gusts as high as 70 miles per hour. Huge firestorms exploded, sending flames so high into the air they created their own wind. Smoke rose some 30,000 feet into the air. Flames devoured the forests and threatened animal and human inhabitants, buildings, and towns in and around Yellowstone. Hundreds of large animals were killed and thousands of elk died during the following winter from a lack of food.

Flames engulfed about 1.4 million acres of forested land in and around the park. Approximately 9,500 fire fighters battled the fire unsuccessfully. It continued to burn for months until falling rain and snow put the flames out. The fire was finally extinguished by the end of October.

The fire had many short-term effects. It left large areas of cleared ground open to agents of weathering and erosion. Falling ash changed the soil composition, adding plant nutrients to the soil. The nutrients caused new vegetation including pines, wildflowers, and grasses to thrive. Ash and eroded sediment also changed the chemistry and increased the sediment load of water in rivers and streams, killing many fish.

1. What caused the fire to start? In which of Earth's four main spheres did the cause of the fire originate?
2. What impact did the fire have on the atmosphere?
3. Once the fire started burning, what impact did the atmosphere have on the fire?
4. What affect did the feedback of falling ash have on the hydrosphere?
5. Describe how a change in the geosphere affected the biosphere.

