

Times Beach, Missouri, used to be a tight-knit, working-class community along the Meramec River southwest of St. Louis. Now the people are gone. Empty houses and stores, abandoned cars, and rusting refrigerators stand silent. “Thanks for coming,” says the sign on the Easy Living Laundromat to nonexistent customers. Wildflowers bloom on overgrown lawns. Flies buzz, squirrels chase each other up trees, and an occasional coyote prowls the streets. Were they allowed, visitors might think they were seeing an uncannily realistic Hollywood stage set. Instead, the ghost town is a symbol of what happens when hazardous wastes contaminate a community.

The trouble began in the summer of 1971, when Times Beach hired a man to spread oil on its 16 kilometers (10 mi) of dirt roads to keep down the dust. Unfortunately, his chief occupation was removing used oil and other waste from a downstate chemical factory, and it was a mixture of these products that he sprayed all over town that summer and the next. The tens of thousands of gallons of purple sludge were contaminated with dioxin, the most toxic substance ever manufactured.

Effects of the dioxin exposure appeared almost immediately in two riding arenas that had been sprayed. Within days, hundreds of birds and small animals died, kittens were stillborn, and many horses became ill and died. Then residents began reporting a variety of medical disorders, including miscarriages, seizure disorders, liver impairment, and kidney cancer. Not until 1982 did the Environmental Protection Agency (EPA), alerted to high levels of dioxin in wastes stored at the chemical plant, make a thorough investigation of Times Beach. They found levels of the dioxin compound TCDD as high as 300 parts per billion in some of the soil samples; 1 part per billion is the maximum concentration deemed safe. The EPA purchased every piece of property in town and ordered its evacuation (Figure 5.1).



Figure 5.1 Times Beach, Missouri. Most new highway maps no longer mark the location of this former community.

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The story of Times Beach is one of many that could have been selected to illustrate how people can affect the quality of the water, air, and soil on which their existence depends.

Terrestrial features and ocean basins, elements of weather and characteristics of climate, flora, and fauna comprise the building blocks of that complex mosaic called the *environment*, or the totality of things that in any way may affect an organism. Plants and animals, landforms, soils and nutrients, weather and climate all comprise an organism’s environment. The study of how organisms interact with one another and with their physical environment is called **ecology**. It is critically important in understanding environmental problems, which usually arise from a disturbance of the natural systems that make up our world.

Humans exist within a natural environment that they have modified by their individual and collective actions. Forests have been cleared, grasslands plowed, dams built, and cities constructed. On the natural environment, then, has been erected a cultural environment, modifying, altering, or destroying the balance of nature that existed before human impact was expressed. This chapter is concerned with the interrelation between humans and the natural environment that they have so greatly altered.

Since the beginning of agriculture, humans have changed the face of the earth, have distorted delicate balances and interplays of nature, and, in the process, have both enhanced and endangered the societies and the economies that they have erected. The essentials of the natural balance and the ways in which humans have altered it are not only our topics here but are also matters of social concern that rank among the principal domestic and international issues of our times. As we shall see, the fuels we consume, the raw materials we use, the products we create, and the wastes we discard all contribute to the harmful alteration of the **biosphere**, the thin film of air, water, and earth within which we live.