Revisiting the “Four Laws of Ecology” ¹

In the early 1970s, American Ecologist Barry Commoner identified what he referred to as the “Four Laws of Ecology.” These laws seem to be as pervasive, almost immutable, as are many of the laws of physics and mathematics. His laws were based on his observations at the time about human interactions with nature. It could be effectively argued that they are generally as valid today as they were then, at the beginning of the contemporary environmental movement. The laws can be applied not only to ecosystems but also to the atmosphere as well (and more specifically to the global climate system).

1. **Everything is Connected to Everything Else.** There is one ecosphere for all living organisms and what affects one, affects all.

2. **Everything Must Go Somewhere.** There is no “waste” in nature and there is no “away” to which things can be thrown.

3. **Nature Knows Best.** Humankind has fashioned technology to improve upon nature, but such change in a natural system is, says Commoner, “likely to be detrimental to that system.”

4. **There Is No Such Thing as a Free Lunch.** Nothing comes from nothing. Exploitation of nature will inevitably involve the conversion of resources from useful to useless forms.

The tall smokestack for a coal-burning power plant illustrates all of these laws. Tall stacks were originally designed to take local pollutants that resulted from manufacturing processes and put them just high enough into the atmosphere that they would be dispersed to … well, frankly, anywhere else but locally. The phrase used at the time to describe this process was “The solution to pollution is dilution.”

As the second law states, “everything must go somewhere.” Coal contains small quantities of mercury that are carried into the atmosphere in the smoke plume and eventually are deposited far from the power plants. This has led to a mercury pollution problem in far-flung locations, for example in the Arctic where it poses a threat to polar bears, whales, and seals and to the Arctic communities who hunt those animals for food. As the first law states, “everything is connected to everything else.” Thinking about the third law, this pollution certainly is detrimental to the Arctic’s ecosystem.

The fourth law is illustrated by the potential loss of resources, such as animals in the Arctic, which no longer are uncontaminated sources of food for humans there.

¹ Based on http://ccb.colorado.edu/skopje2009/training/revisiting.php