People have an intuitive tendency to focus on an action's immediate direct effects. The same intuition leads us to downplay effects that are indirect, long-range, and cumulative. This can lead us astray, as it has the Supreme Court, when dealing with impacts on environmental systems. Writing at the outset of the modern environmental world, biologist Barry Commoner tried to crystalize what was known about the environment into four crisply phrased laws. The first law read simply: "Everything is connected to everything else." What we have learned since Commoner published *The Closing Circle* in 1969 has only confirmed that insight.

This interconnected means that the environment is a system (really, a nested set of systems), where interactions are paramount. It's not just an array of different things happening independently in different places or times. That's true, as we've learned, not only of the environment but the global economy to which it is linked and of the geopolitical realm linked to that.

Reality has a way of reminding us that localized actions can have surprising global ramifications. We are learning, for instance, that a U.S. effort to halt a nuclear program in Iran can lead to a fertilizer shortage because so much of it comes through the straits of Hormuz, currently closed due to the Iran War. That effect threatens the welfare of American farmers and perhaps the lives of vulnerable people in Africa and elsewhere. The same war may spark a surge in clean energy us that could cut greenhouse gas emissions. Or it could lead to frantic efforts to increase fossil fuel production that will make climate change much worse.

Here are two further examples, both relating to climate change. The first example is something I learned when I invited a renowned climate scientist to speak to my class a few years after I came to Berkeley. She explained to the class that climate scientists needed more detailed data about things like what kind of evergreens grow in different parts of the Canada. Why did this matter? Some evergreens, like Christmas trees, have branches that tilt down. That means that snow tends to fall of the branches. The branches of other kinds of evergreens retain more snow. This matters because evergreen needles are darker than snow and therefor absorb more heat. The cumulative effect of this difference across millions of trees affects the amount of warming in that part of the world. So, the type of tree in the remote forests of Canada may ultimately affect the amount of sea level rise in Bangkok.

Another example involves U.S. subsidies for corn ethanol. Because of the subsidies, a lot more corn is planted, which displaces soybean fields. As a result, the global price of soybeans goes up. This makes it more profitable for Brazilian farmers to

grow soybeans, and on order to do so, they cut down rainforest. So a well-intended U.S. biofuel policy may lead to ecological destruction, and the release of a lot of carbon dioxide, thousands of miles away.

When NEPA, the National Environmental Policy Act, was drafted a year after *The Closed Circle* was published, its framers understood the systemic nature of environmental issues. The statute calls on the government to use a "systemic interdisciplinary approach" to analyzing environmental, to "recognize the worldwide and long-range character of environmental problems," and to act "as trustee of the environment for future generations." The conservative majority on the Supreme Court ignored all that in the case of a rail line designed to allow the development of a huge oil field that would result in millions of barrels of oil being refined and used. The Court said that the agency didn't need to consider either the environmental effects of the oil field itself nor the surge in refinery pollution. Both were too far removed and indirect from the physical act of building and operating the rail line itself. This blinkered approach was exactly what Commoner warned about and what NEPA was intended to prevent.

The Trump Administration has used exactly the same blinkered approach to justify ignoring the effect of U.S. vehicles on climate change. The U.S is the second largest emitter of greenhouse gases in the world, and transportation is the largest source of U.S. emissions. The Trump EPA says that the effects of carbon emissions on climate should be ignored because climate change is the cumulative effect of global emissions and because the effects of carbon emissions are indirect and global rather than local or regional. There are none so blind, I guess, as those who will not see.

Focusing on the immediate facts of individual actions in isolation is at the heart of many of our problems. It leads people, for instance, to ignore the ways in which vaccinations are crucial for protect the public's health, not just the vaccinated individuals. This is a convenient perspective who value little beyond themselves. It also leads them to ignore the ways in which individual car use contributes to planetary harm that can last for generations. This short-sighted perspective will lead us nowhere good.