How Property Rights Can Fight Pollution

Toxic contamination is a form of trespass. Restoring traditional legal protections could improve public health and hold industry accountable.

Lawrence B. Cahoon, Robert H. Cutting, and Michael A. Mallin

There is a home-invasion crisis underway all around us, and yet we rarely speak about it. Air, water, and soil are subject to a growing array of invisible pollutants. Many of them pose well-established hazards or health risks, but existing environmental regulations provide little or no protection. And because of antiquated court decisions, these pollutants are allowed free passage throughout the United States, into our private property and our public spaces.

Human-generated greenhouse gases, for example, lead to disruptive and destructive climate change. Ammonia from animal feedlots affects respiratory health, and nitrate used on farms creates aquatic “dead zones.” Mercury from coal-fired power plants causes developmental and neurological problems in children. What these pollutants have in common is that they are invisible and, therefore, irrational to distinguish them from other property or that, if they do, they should be considered harmless unless the property holder proves they are “unreasonable.” This highly subjective “nuisance” standard has come to be known as modern trespass.

Scientists, in their roles as data generators and expert witnesses, could be instrumental in overturning those decisions and restoring traditional property rights. They can demonstrate to the courts that invisible materials—alone and synergistically—can have significant deleterious effects on health and property, and that it is therefore irrational to distinguish visible and invisible pollutants. Fortunately, the courts that caused the pollution problems have the power to realign the law with modern science, as the U.S. Supreme Court has repeatedly noted.

Citizens and environmentalists are familiar with the prevailing top-down approach of trying to reduce pollution through government regulations. Here we argue instead for a bottom-up approach that draws upon property rights concepts that cut across left–right political lines. Respected, self-described conservative property-rights scholars reasonably ask why government has the right to grant waste disposal rights to private companies without compensation to the individuals and groups affected. Addressing that question could provide an evidence-based correction to the nonscience guiding public policy. It could also mark a return to fundamental legal principles of property rights, a foundation of our modern legal system.

A Litany of “Invisible” Pollutants

A closer look at a few of the major environmental pollutants dramatically illustrates why invisibility is not a rational basis for determining the presence or effects of sources on a property.

Perfluoro-octanoic acid (PFOA) is an industrial chemical that was used in the manufacture of textiles, carpeting, upholstery, floor wax, and sealants. Scientific studies have demonstrated its toxicity hazards, its environmental persistence, and its accumulation in the human food chain, and as a result

Since the 19th century activist courts in the United States have eroded traditional property rights, allowing polluters to discharge “invisible” materials with little consequence.

Weakened laws against trespass amount to a subsidy for industry at the expense of the public, the lack of accounting for these external social costs represents a market failure.

Courts can restore protections and award pollution damages based on transparent, scientific evidence. But scientists will need to participate more actively in the legal system.
its use was largely phased out by 2015. The compound (along with its broader family of industrial chemicals known as per- and polyfluoroalkyl substances, or PFAS) is now detectable nearly everywhere in the world at parts-per-trillion levels, rendering unsupported any claim of its absence by virtue of invisibility.

The widespread release of PFOA exposes millions of people to its effects—in food, water, and indoor air—without their knowledge, consent, or compensation. One PFOA manufacturer, DuPont, was the subject of the recent film *Dark Waters*, which portrays a major class-action suit that was settled long after harm had occurred. A DuPont spin-off company, Chemours, is still in litigation in the state of North Carolina over drinking water tainted by other PFAS. Another case, involving PFAS contamination of hundreds of private wells in Vermont by Saint-Gobain Performance Plastics, was just settled.

Groundwater nitrate results from the extensive use of nitrogen-rich synthetic fertilizers and animal manures from giant livestock farms, technically known as concentrated animal feeding operations (CAFOs). Nitrate runoff leaches into local groundwater and travels long distances. Elevated concentrations of nitrate in drinking water can cause methemoglobinemia ("blue baby syndrome") (*see related article in March–April 2009*); recent research suggests they can lead to cancer as well. When nitrate reaches surface waters, it can trigger troublesome algal blooms and hypoxic dead zones in large estuaries such as the Gulf of Mexico and the Chesapeake Bay (*see related article in March–April 2015*).

Although nitrate is invisible, it is detectable by standard chemical analysis techniques. Moreover, isotope analysis makes it possible to identify specific sources of nitrate found in groundwater. Mercury is a potent, persistent neurotoxin released into the air by coal-burning power plants and other industrial sources. From there, mercury is deposited onto the land and water. In surface waters, especially wetlands, it is microbially transformed to methylmercury, its most toxic form. Methylmercury exposure can lead to loss of vision, speech, hearing, and muscle control. Organisms accumulate methylmercury up the food chain, where it concentrates particularly in game fish and causes widespread fish consumption advisories in both fresh and salt water.

The mercury pathway in the environment confounds the current limitations of environmental law. Mercury concentrations in the air and water are rarely directly harmful; the biological transformation to methylmercury is "natural"; and consumption advisories have no force of law. Nevertheless, the anthropogenic sources of mercury are well understood, as are the long-term dangers of this invisible pollutant. The current administration has proposed weakening existing standards, drawing opposition from three key Republican senators, which illustrates the bipartisan effects of pollutant decisions: Emissions do not respect any human boundaries.

The town of Picher, Oklahoma, was disincorporated in 2009 and is now abandoned because of toxic heavy-metal contamination from lead and zinc mining. Pollution from those mines trespassed onto private property without the consent of the owners and without compensation. Meanwhile, taxpayers will spend at least $300 million to clean up the region.
Greenhouse gases—including carbon dioxide, methane, and nitrous oxide—are the ultimate invisible, trespassing pollutants. Setting aside the global nature of emissions and harms, it is clear that emissions from U.S. sources alone have contributed significantly to climate effects on public and private spaces in this country. The effects include damage to property and infrastructure through increasingly powerful storms, sea-level rise, permafrost melting, flooding, wildfires, and invasive species, as well as a growing impact on disease and public health.

Through the nuisance test, U.S. courts have shifted to the general population the burden of discovering, analyzing, and prosecuting waste disposal. If the waste were a pile of trash or even a neighbor’s errant Frisbee, consent would be required to allow it on your property because visible violation of boundaries establishes liability. But with invisible materials, the burden is on victims to prove that the source’s actions were “unreasonable.”

How Did We Get Here?
The erosion of traditional property rights began during the Industrial Revolution, when manufacturers needed low-cost waste disposal. Courts were sympathetic to the interests of fast-growing, highly lucrative industries at the expense of individual property owners. In response, the courts concocted several terms for what was effectively an “out of sight, out of mind” argument, including the “dimensional test” and the “direct–indirect” trespass distinction.

One particularly egregious argument was that chemical pollutants are genuinely “intangible”: that they have no substance at all, in defiance of the laws of physics. Other times, the courts simply denied that materials moved to other properties. These activist courts, without accurate evidence and against case precedent, thus created nationwide easements for disposal of pollutants into both public and private property, and we humans became test subjects.

*Sanderson v. Pennsylvania Coal* illustrates the shift of the courts from the rule of strict liability to the nuisance rule over four separate appeals. The 1878 case involved a railroad’s pollution of a stream. On the first appeal, the plaintiff won and no evidence was allowed on the social utility of Pennsylvania Coal’s business. But by the fourth appeal in 1886, legal attitudes had changed. This time, the court not only considered the defendant’s social value but went further: “Mere private personal inconveniences [of those downstream] ... must yield to the necessities of a great public industry, which, although in the hands of a private corporation, subserves a great public interest. To encourage the development of the great natural resources of a country tripling inconveniences to particular persons must sometimes give way to the necessities of a great community.”

The modern, stunted concept of trespass was worn down further in the courts. In the 1959 *Martin v. Reynolds Metals* case, Oregon ranchers Paul and Verla Martin alleged that fluoride gases and particulates had poisoned their cattle through contamination of food and water. The court acknowledged that the dimensional test was dated and even noted that “we think that a possessor’s interest in land as defined by the considerations recited above may, under the appropriate circumstances, be violated by a ray of light, by an atomic particle, or by a particular of fluoride.” Nevertheless, the Oregon court refused to return to the historic trespass rule and instead required that the plaintiff detect and prove an invasion of “substantial rights.” Consent was not required, free passage was granted to the polluter, and the burden of detection and prosecution remained on every affected landowner rather than on the source of the invading mate-
The Washington Supreme Court issued a similar ruling in Bradley v. American Smelting, a 1985 action for damages from air emissions of sulfur dioxide and particulates of arsenic, cadmium, and other metals. The court declared that if trespass were properly applied in the case of every substance, manufacturers would endure the burden of no longer enjoying publicly subsidized waste disposal.

The legal literature is replete with references to “modern trespass” as a subsidy for the protection of industry, not protection of property or population. But what of the costs to those affected by the trespasses, especially those not obvious until later? The exemption of invisible materials from the rules of traditional trespass, requiring victims to prove the polluters’ conduct to be “unreasonable,” made it so difficult to secure damages that some judges eventually wrote that legislation was needed. With no incentive for expensive testing, polluters would frequently discharge first, then address problems later.

The legal literature is replete with references to “modern trespass” as a subsidy for the protection of industry, not protection of property or population. But what of the costs to those affected by the trespasses, especially those not obvious until later? The exemption of invisible materials from the rules of traditional trespass, requiring victims to prove the polluters’ conduct to be “unreasonable,” made it so difficult to secure damages that some judges eventually wrote that legislation was needed. With no incentive for expensive testing, polluters would frequently discharge first, then address problems later.

There is a fundamental problem with a nuisance-based approach: Public nuisances can be legalized for zoning and other reasons, even at the local level. On the other hand, there are also constitutional limits on what governments can allow. The federal and state supreme courts have for decades recognized that legalizing an environmental nuisance grants an easement—in essence, a right to trespass—on a limited number of affected properties, and the government must compensate the property holders in return.

The Failure of Regulation
In the aftermath of disasters—such as the Santa Barbara oil spill and Cuyahoga River fire, both in 1969—science-based regulatory standards to protect air and water attracted widespread public support. The U.S. Congress responded by creating new regulatory systems, most notably the Clean Water Act, the Clean Air Act, and the Environmental Protection Agency.

Today, most scientists involved in pollution studies accept the regulatory paradigm as the default method for protecting the environment. Laws are passed, and agencies are tasked with
Invisible pollutants such as perfluoro-octanoic acid (PFOA) have become pervasive in part because the courts made it so difficult to secure damages for their release. Here, workers with the Air Force Civil Engineer Center monitor PFOA contamination of drinking water near the former Wurtsmith Air Force Base in Oscoda, Michigan.

Creating the regulations that implement them. The primary strategy has been to identify and control discharges of pollutants through a system of permitting, compliance monitoring, and enforcement. Although it has racked up many notable successes, the regulatory system also has significant flaws that limit its ability to protect human and ecosystem health.

The current system attempts to balance the protection of public and environmental health against the economic desire of polluters for cheap waste disposal, but it does so without adequate data. New materials and their by-products are discovered and brought into production faster than toxicological research can identify all forms of potential harm. Only a tiny percentage of industrial chemicals have been evaluated for human and animal exposure effects. Toxicological evaluations are generally conducted by the producers themselves, with much of that information considered confidential. Likewise, monitoring of permitted discharges is usually carried out by the dischargers, and self-reporting for compliance purposes is common.

Effective enforcement requires resources and knowledge of complex technical issues, rigorous inspection regimes, and objective application of rules and regulations. Politics and a lack of science permeate the regulatory process at every level, however.

Politicians and key appointees often have strong ties to the industries they are policing. Antiscience attitudes, evidence manipulation, and well-funded disinformation campaigns have stymied effective regulation in areas ranging from tobacco to climate change.

The perverse result is that epidemiological studies have become a primary pollution safety net. The public is used as test subjects, allowing companies to save money on research into the effects of materials before they are released into the environment. To list just two major problems with that approach, some of the key discoveries in pollution risk (such as the hazards of fine particulates) were purely accidental, and only recently have agencies such as the Centers for Disease Control and Prevention begun performing comprehensive longitudinal health studies.

Property Rights as Safeguards

The court system is responsible for much of the current pollution mess, and it may be the only source of a solution. What’s needed is not an activist court, but rather a conservative court, in the old sense of the word. We advocate for restoring individual property rights, the rights that have been subsumed by large polluters.

Self-described conservative defenders of property rights, such as Jonathan Adler at the Case Western Reserve School of Law, hold that the regulatory system cannot limit the right of property holders to exclusive use of their property—even for the common good—without compensation. Provision of “subsidized waste disposal,” such as disposal of pollutants at the expense of other property owners, is a significant market failure that masks the true costs of production, and burdens the general population and government with property damage and health costs.

Courts can restore a scientific basis to the antiquated decisions that permitted pollution without consent. We argue that reconciliation of the law with modern science is therefore essential. Many (if not most) scientists currently shy away from litigation, even though the rigor of the scientific method and the peer-review system prepare us well to be expert witnesses. For the courts to adapt to modern science, though, scientists will need to provide their expertise to the judiciary. Many scientists are employed or funded by the public, and clearly there is an obligation here to serve the public’s interest.

Some courts are already engaged. Claims of damages related to climate change have been made recently against power companies, energy producers, and car manufacturers. In a 2011 case, nine states, New York City, and a group of land trusts filed suit against American Electric Power and four other power generators responsible for 25 percent of greenhouse-gas emissions from the domestic electric-power sector. The plaintiffs alleged that public lands, infrastructure, and health were all at risk and sought injunctive relief requiring each defendant “to cap its carbon dioxide emissions and then reduce them by a specified percentage each year for at least a decade.”

The U.S. Supreme Court allowed the plaintiffs to continue, but restricted them to using individual state law rather than federal nuisance law. In other recent pollution cases, the Court has rejected appeals and thus upheld lower court rulings that allowed state nuisance law actions. The Supreme Court has also considered cases involving pollution by toxic compounds of all sorts: particulates, volatile organic compounds, dioxin and dioxin-like compounds, polycyclic aromatic compounds, sulfur dioxide, hydrochloric acid, hydrogen fluoride, sulfuric acid, and compounds of arsenic, barium, chromium, copper, lead, manganese, mercury, nickel, vanadium, and zinc. The length of that list...
testifies to the broad failures of environmental regulation.

**Beyond “Reasonableness”**
The courts have frequently allowed litigation to proceed, but under the subjective “reasonableness” standard. Fortunately, each individual state high court decides state property law and therefore has both the authority and the duty to reverse the scientific errors of the 19th century. The judicial system that concocted “invisibility” as a cloak for pollution can use modern science to erase the fiction that invisible agents either do not cross property lines or are harmless when they do. Once that fiction is dispelled, the previous rule of trespass should be restored so that consent is required for all entry, visible or invisible.

At that point, the burden would then shift back to pollution sources to manage their wastes on-site, obtain consent for off-site pollution, or convince a governmental unit to condemn pollution easements and to provide compensation. Extensive evidence based on research from the scientific community would be required, and courts can order payment from sources as a package of conditions for continued operation.

If property is subjected to transboundary pollution, another legal question arises. The U.S. Constitution and most state constitutions contain “taking clauses” that require just compensation for taking private property for public use. For more than a century, federal and state courts have sometimes ordered compensation for government permits that authorize discharges of pollutants that enter and affect other private property without consent of the owners.

The 1913 Richards *v.* Washington Terminal case involved smoke and fumes from a federally permitted train terminal. The court ruled:

“We deem the true rule, under the Fifth Amendment . . . to be that state “right to farm” statutes that permitted odors to invade other properties, because the laws constituted a taking of the property rights of those who were subjected to them.

Wide-ly discussed cap-and-trade schemes impose a cost on pollution, but are not a relevant solution to the issue of “taking”: The emissions price is set only by what the market is willing to pay for the right to pollute, not by the actual costs imposed, and no funds are allocated to the negative effects. Emissions charges (costs per unit that reflect the cost of pollution to society) provide a more direct pricing mechanism, but legislatures have been reluctant to implement them. Gerald Torres, an expert in environmental law at the Yale School of Forestry and Environmental Studies, has therefore suggested the creation of “sky trusts” to collect and manage fees for disposal of greenhouse gases, including payments to those persons adversely affected.

**Legal Challenges Ahead**
Any state supreme court could implement a change in the law of trespass, and state courts can rule on the takings provisions of the state’s law with limited U.S. Supreme Court review. Federal courts have the power to hear U.S. Constitutional “takings” cases as well. Changing the law of trespass would be difficult and time-consuming for plaintiffs, but it would address all transboundary pollutants. It is worth noting that legislatures could also impose emissions charges directly, but the politics do not favor that approach.

A major advantage of treating pollution as a property rights issue is that the courts offer a relatively transparent, evidence-based forum compared with the other branches of government. Fact-finding in a court case includes consideration of sophisticated scientific topics and even sensitive data through the use of properly qualified experts. Court proceedings offer methods to obtain data from the opposition through discovery. Witnesses are subject to cross-examination. Decisions are generally reviewable by higher courts. The result is a decision that can become precedent and can order comprehensive remedies, such as monetary damages, studies and monitoring, and security for future damages.

Scientific evidence would be required to identify effects and provide data so that economists can calculate the costs of the direct and secondary effects of the pollutants, including property damage and personal injuries. These costs would form the basis for the ultimate decision on compensation for damages and for any corrective measures. Emissions charges could be added to regulatory permits or to sky trust fees. The courts could then condition continued operation of a polluting facility on monetary damages, injunctions to perform particular activities, and the provision of security, such as bonding and insurance.

For two centuries, the court system has failed to keep up with modern science and has failed to protect the health and property rights of individuals. The current regulatory approach, which emerged to fill in for lost legal protections, is fraught with limitations and inefficiencies. Court actions can transcend partisanship and restore traditional property rights. But getting there will require concerted action by aggrieved parties, judges who respect traditional notions of property rights—and the willing participation of scientists in the courtroom.

(References for this article are available online at [https://www.americanscientist.org](https://www.americanscientist.org))

Laurence B. Cahoon is a biological oceanographer and limnologist at the University of North Carolina, Wilmington. Robert H. Cutting is a member of the California and North Carolina bars with experience in white collar crime and environmental law and an associate professor at UNC Wilmington (retired). Michael A. Mallin is a marine and freshwater ecologist at the University of North Carolina, Wilmington. Email for Cahoon: cahoon@uncw.edu

---

**Disposal of pollutants at the expense of other property owners is a significant market failure that masks the true costs of production.**