



Adapting to Pollution

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Climate change, we are told, is a pollution problem.¹ The law is quite familiar with pollution. Generally, there are four responses to pollution. We can *prevent* it from ever happening. We can *control* what pollution enters the environment. We can *separate* pollution from those who would be harmed by it. Or we can simply *tolerate* pollution. And we need not choose only one response for each type of pollution. Indeed, it is far more common to employ multiple responses at the same time.

Most environmental law seeks to prevent pollution. The pollution that cannot be prevented is either controlled or tolerated, depending on the nature of the harm resulting from the pollution. Pollution control efforts seek to reduce the amount of pollution to the level that can be tolerated without suffering any harm. Many environmental statutes pursue an ideal of ensuring that all places are equally free from pollution. This paradigm, then, would eliminate all harmful pollution while ignoring pollution that is not harmful.

Separation occupies an uneasy middle ground between preventing or controlling environmental pollution, on the one hand, and tolerating such pollution on the other. It is the most controversial response to pollution. Separation provides that there are certain places where pollution is allowed and other places where it is prohibited. The premise of separation is that the harms of pollution can be avoided by locating any pollution apart from anyone (or anything) that could be harmed by it. In doing so,

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¹ See *Massachusetts v. EPA*, 549 U.S. 497 (2007); Remarks of President Barack Obama, Weekly Address, Feb. 28, 2009, available at <http://www.whitehouse.gov/blog/09/02/28/Keeping-Promises/> (encouraging efforts to combat “climate pollution”); see generally John Copeland Nagle, *Climate Exceptionalism*, 40 ENVTL. L. 523 (2010) (analyzing the understanding of climate change as a problem of pollution).

however, both the polluting activity and the victims of pollution are often dissatisfied with the result.

A broader understanding of “pollution” beyond the familiar environmental pollution reveals the same pattern, though with different emphasis. Sensory pollution – noises, lights, odors, or sights that offend our senses – relies much more on separation because no one wants to eliminate all sounds, lights, smells, or sights. Instead, the law tries to separate unwanted noises, lights, and the like from those who would be harmed by them. Separation is also a more common strategy in response to claims of cultural pollution resulting from pornography, violent entertainment, or hostile work environments. The first amendment often limits the ability to prevent or control sexist, violent, or racist speech, but first amendment jurisprudence is more accepting of efforts to separate such speech from those who do not want to be exposed to it.

The same four responses to pollution appear in the context of climate change. Prevention and control are called mitigation. Most international and domestic responses to climate change have focused on efforts to mitigate the harms associated with climate change by reducing the emission of greenhouse gases. The Kyoto Protocol, for example, requires developed nations to reduce their greenhouse gas emissions by specified amounts. Proposed federal climate change legislation would regulate greenhouse gas emissions from electric utilities, industry, and other sources throughout the United States. Absent such a statute, and in the aftermath of *Massachusetts v. EPA*, EPA is crafting greenhouse gas emission regulations under the authority of the Clean Air Act.

Adaptation becomes necessary because of the failure of mitigation to prevent or control the harms of climate change. Mitigation is inadequate both because some climate change will occur as a result of past emissions and because the global community has been unable to agree on how to reduce future emissions. Nor is

toleration a viable option if the worst fears of climate change scientists are realized. That leaves adaptation.

In this paper, I explore how the use of separation as a response to other kinds of pollution can help us understand the effectiveness of various approaches to adapting to climate change. I first explain why adaptation is necessary, then I examine the ways in which the law already seeks to separate pollution from those who could be harmed by it, and finally I consider the implications of those existing approaches for climate change adaptation.

I.

Mitigation has been the preferred approach to climate change. Comprehensive mitigation measures such as the Kyoto Protocol and proposed federal climate change legislation emphasize the need to reduce greenhouse gas emissions that result in climate change. Mitigation also mimics environmental law's general approach to pollution. The Pollution Prevention Act (PPA) articulates "the national policy of the United States that pollution should be prevented or reduced at the source whenever feasible."² Similarly, the Clean Air Act and the Clean Water Act seek to control the amount of pollution that is released into the environment.

Mitigation draws further support from the critiques of separation as a response to pollution. Catherine O'Neill's scholarship has been especially forceful in arguing against risk avoidance mechanisms that simply manage exposure to pollutants that are already in the environment.³ According to O'Neill, efforts to separate pollution and its

² 42 U.S.C. § 13101(b).

³ See Catherine A. O'Neill, *No Mud Pies: Risk Avoidance as Risk Regulation*, 31 Vt. L. REV. 273, 297 (2007); Catherine A. O'Neill, *Risk Avoidance, Cultural Discrimination, and Environmental Justice for Indigenous Peoples*, 30 ECOLOGY L. Q. 1, 2-3 (2003); see also Alex Geisinger, *Rethinking Risk-Based Environmental Cleanup*, 76 IND. L.J. 367, 371 (2001).

potential victims are “perilous” because

First, risk avoidance narrows the focus of environmental regulatory efforts, foregoing a web of ancillary benefits to human and ecological health. Second, risk avoidance often misses the complete roster of target human health effects. Third, risk avoidance is ineffective, frequently failing to achieve the behavioral changes necessary for avoidance. Additionally, risk avoidance offers diminishing and, ultimately, finite options for managing environmental risks. Risk avoidance also often introduces risk. Risk avoidance discourages plural and diverse practices. Finally, risk avoidance is often unjust.⁴

These arguments help to explain why environmental law prefers prevention and control to separation, and why the response to climate change has favored mitigation to adaptation.

But mitigation is not a sufficient response to climate change for the same reasons that prevention and control are not always a sufficient response to pollution. Sometimes the law is disabled from regulating pollution, especially in the case of claims of cultural pollution resulting from speech that is protected by the first amendment.⁵ Sometimes the law is unable to achieve the elimination of harmful pollution. That appears to be the case with respect to climate change insofar as it results from greenhouse gases that have already been emitted and which cannot be removed from the atmosphere. And sometimes we are unwilling to use the law to fully regulate

⁴ O’Neill, *No Mud Pies*, *supra* note 3, at 306-07.

⁵ See, e.g., *Video Software Dealers Ass’n v. Schwarzenegger*, 556 F.3d 950 (9th Cir. 2009) (holding that a California law regulating access to violent video games violates the first amendment), *cert. granted*, *Schwarzenegger v. Entm’t Merchs. Ass’n*, 2010 U.S. LEXIS 3573 (U.S., Apr. 26, 2010); John Copeland Nagle, *Pornography as Pollution*, 70 MD. L. REV. (forthcoming 2011).

pollution. Cost concerns explain the push for risk avoidance that O'Neill criticizes in her work. Or we may actually like the substances that can become pollutants so long as they exist in lesser amounts. No one wants to get rid of all sounds, lights, and sights, but noise pollution, light pollution, and visual pollution are the subject of frequent complaints. In all such cases we often simply seek to separate the pollution from those who would be harmed by it. So, too, we must turn to adaptation because of our inability and unwillingness to achieve the mitigation that is necessary to avoid the harms of climate change.

II.

Separation is the response to pollution that is harmful but that we are unwilling or unable to prevent or control. The initial question that the law must answer is whether we should expect the polluter to stop harming the victims, or instead whether the victims should be responsible for avoiding the harms caused by the pollution. And that is the question addressed by one of the most famous scholarly discussions of pollution: Ronald Coase's theorem questioning any presumption concerning the identity of the harmed party. The very example with which Coase begins his article concerns a factory that emits smoke that harms its neighbors. In popular discourse, the factory is the polluter, and the neighbors are the victims. But Coase sees the problem as reciprocal: "To avoid the harm to B would inflict harm on A. The real question that has to be decided is: should A be allowed to harm B or should B be allowed to harm A?" Moving from air pollution to water pollution that kills fish, Coase asks whether "the value of the fish lost [is] greater or less than the value of the product which the contamination of the stream makes possible." Indeed, Coase's formulation encompasses every conceivable instance of pollution: a noisy hotel that keeps neighbors from sleeping, an employee whose racist comments offend his co-workers, video game afficiandos enjoying a violent game in the lobby of a restaurant, and residents of a once pastoral community complaining about the sprawl that brings an

influx of unwanted newcomers. The appellation “pollution” connotes that the wrongdoer and the victim are readily identified, but Coase’s theorem insists otherwise.⁶

The policy question for Coase and for the generation of economists and law-and-economics scholars whom he has inspired is how the law should help the competing parties will resolve their dispute. My concern here is simply with Coase’s initial assertion that every instance of harm resulting from pollution is reciprocal. Coase has correctly identified one sense in which that is so: a factory can object to being harmed if its operations are constrained because neighboring residents complain that their water supply has been polluted by toxic chemicals discharged from the factory. But there is another sense which supports the distinction between polluter and victim, and it is the sense that follows from the very definition of pollution. Recall my suggestion that the essence of pollution is the introduction of a pollutant into an environment. The factory that discharges toxic chemicals into the water is a polluter; the people living nearby are not. The idea of pollution helps to explain the intuitive sense that the factory is the cause of the harm rather than the neighboring residents. Even so, the question remains whether the burden to avoid that harm should be placed upon the polluter or the residents. That is the question that Coase sought to answer, and it is a question that the law frequently addresses as well. Not surprisingly, the law offers different answers for different kinds of pollution.

As early as 1971, Robert Bork wrote in 1971 that “pornography is increasingly seen as a problem of pollution of the moral and aesthetic atmosphere precisely analogous to smoke pollution.” The analogy suggests that the presence of pornography in the cultural environment is just as harmful to some individuals as the presence of air pollutants in the natural environment. Yet the law has a much different response to

⁶. R.H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1, 2 (1960). Coase’s own examples involve several of the things that are commonly described as pollution: noise, *id.* at 8-9; air pollution, *id.* at 1, 10-13, 41-42; and odors, *id.* at 26.

such pollution claims. *Erznoznik v. City of Jacksonville* provides the best illustration. In response to the complaints that a local drive-in movie theater was showing a pornographic movie that could be seen from residential homes, the Court held that “the burden normally falls upon the viewer to ‘avoid further bombardment of [his] sensibilities simply by averting his eyes.’” In other words, if you regard this as a pollution problem, then it is your responsibility to avoid it.

Generally, environmental law places the burden to eliminate the harm upon the polluter. Consider *Richmond Manufacturing Co. v. Atlantic DeLaine Co.*, an 1871 dispute between two textile producers along the Woonasquatucket River in Rhode Island. Atlantic DeLaine complained that it could not use the water from the river because of the dyes and other pollutants that Richmond Manufacturing discharged into the river less than one mile upstream. The case presents a perfect illustration of Coase’s reciprocal harms: to rule in favor of either company would harm the business of the other. Moreover, each producer pointed to the steps that the other could take to resolve the problem. Atlantic DeLaine wanted an injunction against Richmond’s discharging pollutants into the river; Richmond countered that Atlantic DeLaine “might have protected themselves from all injury by a properly constructed filter.” The state supreme court had no trouble in deciding the case, even though it ruled nearly a century too early to have benefitted from the insights offered by Coase. Richmond was enjoined from further pollution because riparian owners do not have the right to pollute the water. Atlantic DeLaine, by contrast, was “under no obligation” to filter the water, “and the respondents have no right to put them to the expense of doing it.”⁷ To be sure, the victims of air, noise, and other kinds of environmental or sensory pollution can purchase filters, install shields, or simply move away from it. Many people pursue that

⁷ *Richmond Mfg. Co. v. Atlantic De Laine Co.*, 10 R.I. 106, 110-11 (1871). James Krier endorsed the court’s intuition when he noted that “many people would simply take the position that Coase’s theorem is irrelevant to the liability decision in any event, that pollution is bad and should be forbidden or penalized on purely moral grounds.” Krier at 445 n.43.

course, occasionally with financial assistance from the government. But we do not expect environmental law to force people to make that choice.

Yet it does. There are numerous – and increasing – instances in which the law requires individuals to avoid the risks associated with pollution. The question for us is whether or not climate change is such a case. Consider, therefore, the following five possible methods of separating pollution and victims that could also be employed in the context of adapting to climate change.

1. Do nothing

The law may decide not to address the pollution at all. That was often the case before Congress enacted the environmental statutes that have become so familiar. Doing nothing is also the strategy that the law takes to certain contested claims of pollution outside of the environmental context, such as violent entertainment and pornography that is protected by the first amendment.

If the law refuses to respond to pollution, the burden is on the victim to avoid the pollution as best as possible. Again, that was a regular strategy before the advent of modern federal environmental statutes. For example, doctors frequently advised their patients to move away from the polluted air of Los Angeles in the 1940s and 1950.⁸

That approach is not too encouraging to the potential victims of climate change. It means that it is up to them to avoid whatever harms result from a changing climate. They may choose to defend themselves from those harms, or they may choose to move away. In both instances, the victims bear the cost of any adaptation measures. That is problematic when the victims have the resources to take such measures, but it is simply

⁸ See **ERROR! MAIN DOCUMENT ONLY.**SCOTT HAMILTON DEWEY, DON'T BREATHE THE AIR: AIR POLLUTION AND U.S. ENVIRONMENTAL POLITICS, 1945-1970 (2000).

impossible in many parts of the developing world that are simultaneously home to the world's poorest residents and to the greatest impacts of climate change.

2. Move the polluter

A second method of separation is to order the polluter to move away from the pollution. Zoning law often requires polluting businesses to locate away from residential homes and schools. Zoning personifies Mary Douglas's suggestion that pollution is avoided by maintaining boundaries.⁹ Zoning law separates polluters from those who do not want to be exposed to pollution. Most commonly, municipal zoning ordinances decree that conflicting uses of land should be separated, with polluting businesses are placed in zones apart from retail stores, office buildings, and especially schools and residences. Some zoning ordinances expressly state that they are intended to prevent environmental pollution. By contrast, places that are zoned for industrial uses often become "pollution magnets."¹⁰ The legendary fires along the Cuyahoga River occurred on waters that the state had zoned for industrial water supply.¹¹ Nuisance law may produce the same result, even in the rare instance when the law actually pays the polluter to move elsewhere.¹²

But moving the polluter fails as a response to climate change. Greenhouse gas emissions contribute to climate change in the same way regardless of where they are emitted. It makes no difference whether the polluter is next door or across the world; the harms associated with climate change result from the total amount of greenhouse

⁹ See MARY DOUGLAS, PURITY AND DANGER: AN ANALYSIS OF THE CONCEPTS OF POLLUTION AND TABOO (1966).

¹⁰ Rachel D. Godsil, *Viewing the Cathedral From Behind the Color Line: Property Rules, Liability Rules, and Environmental Racism*, 53 EMORY L.J. 1807, 1879 (2004).

¹¹ See Arnold W. Reitze, Jr., *Wastes, Water and Wishful Thinking: The Battle of Lake Erie*, 20 Case WESTERN RES. L. REV. 5, 33-54 (1968).

¹² See Spur Industries, Inc. v. Del E. Webb Development Co., 494 P. 2d 700 (Ariz. 1972)

gases in the atmosphere, not where they were those gases are emitted.

Adaptation, then, depends on some method of protecting potential victims from the seemingly inevitable harms of pollution. That, in turn, can be accomplished in one of three ways: shielding the victims from the pollution, moving the victim away from the pollution, or compensating the victim for the harms resulting from the pollution.

3. Shield the victim from the pollution

The law often seeks to shield potential victims from exposure to pollution. This can be accomplished by something as simple as a fence.¹³ Shielding is an especially common strategy with respect to noise and light pollution. Numerous local light pollution ordinances mandate that businesses shield their lights so that they do not shine into the eyes of drivers or the homes of neighbors. Noise pollution laws employ a similar approach. Laws requiring the installation of filters to prevent exposure to internet pornography or violent entertainment operate in the same way.

Such defensive measures have become a common strategy for addressing the harms of climate change. The residents of coastal communities are trying to erect barriers to rising sea levels. Concerns about excessive heat, especially in urban areas, have prompted adaptation measures that plant new trees or make air conditioning more available.

4. Keep the victim away from the pollution

The most common separation strategy is to keep the victim away from the harms

¹³ See Haniszewski v. Cadby, 2009 U.S. Dist. LEXIS 91695, *14 (W.D.N.Y. 2009) (plaintiff alleged that a neighboring property owner “have failed to use storm water pollution prevention devices such as hay bales and silt fences to capture sediment-laden runoff”).

of pollution. This approach presumes either that the polluter is located in the right place or that it is impossible to move the polluter. That is the view that Judge Richard Posner demonstrated when he refused to impose strict liability for the costs of a chemical spill on a small railroad operating in a busy metropolitan Chicago railyard. "Brutal though it may seem to say it," Posner explained, "the inappropriate use to which land is being put in the Blue Island yard and neighborhood may be, not the transportation of hazardous chemicals, but residential living."¹⁴

A similar theme runs through most adaptation strategies. Given that some climate change is unavoidable, the only way to avoid its harms is to move away from where they occur. So we see farmers moving their crops,¹⁵ wildlife moving to new habitats,¹⁶ and the possibility of millions of human climate refugees.¹⁷ There are a number of ways to achieve such movement, including advisories, payment, and legal mandates.

a. Advise the victim to stay away

Often the law simply warns affected individuals about the presence of pollution. Fish and wildlife consumption advisories, ozone alerts, pesticide and herbicide warnings, beach advisories and closures, drinking water advisories, and shellfish bed closures all seek to prevent exposure to pollution in the environment.¹⁸ The dissemination of such warnings shifts the burden away from the polluter and onto those who could be harmed by the pollution unless they act to avoid it. But the desired

¹⁴ Indiana Harbor Belt R.R. Co. v. American Cyanamid Co., 916 F.2d 1174, 1181 (7th Cir. 1990).

¹⁵ See William E. Easterling III, Brian H. Hurd & Joel B. Smith, *Coping with Global Climate Change: The Role of Adaptation in the United States* (June 2004).

¹⁶ See Alejandro E. Camacho, *Assisted Migration: Redefining Nature and Natural Resource Law Under Climate Change*, 27 YALE J. REG. 171 (2010).

¹⁷ See COLLECTIF ARGOS, CLIMATE REFUGEES (2010).

¹⁸ See O'Neill, *No Mud Pies*, *supra* note 3, at 278-84, 289-93; William H. Rodgers, Jr., *Improving Laws, Declining World: The Tort of Contamination*, 38 VAL. U.L. REV. 1249, 1251-56 (2004).

separation of pollution and its victims fails when warnings and advisories are not received, understood, and followed. Many people object to being told to move elsewhere, to stay inside, or to stop eating fish. So the efficacy of this strategy is questionable with respect to climate change, which could require far more extensive changes in the victim's lifestyle.

b. Pay the victim to stay away

Rachel Godsil has articulated the theoretical basis for paying the victims of pollution to move elsewhere.¹⁹ Heeding her advice, the law pays to relocate the victims of pollution, but only rarely. Relocation is not a permissible remedy according to CERCLA. But Congress has overridden that prohibition in individual cases. Most recently, Congress empowered EPA to pay to relocate the residents of Treece, Kansas. Treece is a small town in the far southeastern corner of Kansas, just across the border from Picher, Oklahoma. The area long served as a leading lead mining district, providing the lead for nearly every bullet used in both world wars. The industry closed in the 1970s, and the site was listed on CERCLA's National Priorities List because of the blowing piles of chat. Congress authorized EPA to relocate the residents of Picher, but that authority did not extend to Treece, which is located across the border in a different EPA region. By 2010, Congress extended the same authority to Treece, and EPA quickly developed a relocation program. Pursuant to that program, EPA will buy the homes of anyone living in Treece so that they can move elsewhere. EPA will pay the average of two appraisals of each home. That sum may not be sufficient to purchase property elsewhere, especially given the fact that property values in Treece are depressed precisely because of the pollution there. The program is voluntary, but EPA has advised current residents that municipal services – including water and electricity – may not be available once the buyout is completed. And there were only 100 or so

¹⁹ See Rachel D. Godsil, *Viewing the Cathedral from Behind the Color Line: Property Rules, Liability Rules, and Environmental Racism*, 53 EMORY L.J. 1807 (2004).

residents in Treece once Congress authorized the relocation payments. Treece, in short, is not a promising example for the law's ability to pay to relocate thousands or even millions of people away from the harms of climate change.

c. *Order the victim to stay away*

Environmental law may prohibit a potential victim from getting too close to pollution. Many CERCLA sites now feature "institutional controls," which is a euphemism for restrictions on access to areas that are not fully decontaminated. For example, rather than spending millions of dollars to remove unexploded ordinance from a desolate Aleutian island, the Navy instead fenced off the area from any curious individuals.²⁰ Such cost savings often explain why institutional controls are adopted instead of the complete removal of all contamination from a site.

More generally, zoning law may preclude people from getting too close to sources of pollution. Such zoning provisions could also be employed to force people to avoid places that are most likely to suffer from the effects of climate change. Experience suggests, though, that it difficult to prohibit people from locating near coastal areas and other places that are especially susceptible to recurring natural disasters. The attempt to deny national flood insurance to properties located in floodplains is sufficiently controversial that some communities have finessed the issue by adopting exceptionally narrow definitions of the relevant "floodplain."²¹

Occasionally the law orders the potential victims to move away from pollution. This is usually in response to a specific, significant threat of imminent pollution. Most

²⁰ See JOHN COPELAND NAGLE, LAW'S ENVIRONMENT: HOW THE LAW SHAPES THE PLACES WE LIVE (2010).

²¹ See *id.* (describing the narrow definition of the Susquehanna River's floodplain even after repeated flooding).

dramatically, the Nuclear Regulatory Commission (NRC) regulations condition the licensing of each nuclear power plant on the preparation of an acceptable emergency response plan.²² Such plans include a plan to evacuate people within ten miles of the plant. One scholarly article identifies the purported flaws with such plans, including the possibilities that more people will want to flee the radiation than the evacuation order requires (thus overwhelming the transportation system) and that the volunteers responsible for managing the evacuation will abandon their posts if a real radiation emergency occurs.²³ The recent and ongoing nuclear power plant emergency in Japan confirms that the evacuation process does not always work as smoothly as it appears on paper. The experience with such evacuation plans will be critical as planners seek to develop similar strategies for avoiding flooding and other disasters that could be precipitated by climate change.

5. Compensate the victim for being harmed by pollution

A final method of encouraging the separation of polluters and victims is to compensate the victims for the harms that they suffer from pollution. Nuisance law pays permanent damages to those who own property adjacent to a polluting facility that qualifies as a nuisance, but which the courts are unwilling to enjoin. CERLCA imposes liability on polluters whose hazardous wastes must be removed from a victim's property. Social security disability payments are available to those whose sensitivity to polluted work environments prevents them from being employed. Liability also attaches to employers who oversee a hostile work environment that is polluted by discrimination.

There have been numerous efforts to hold polluters liable for the harms resulting

²² See 10 C.F.R. § 50.47.

²³ See Lindsey Conlow, *Evaluation of the Emergency Evacuation Plan for the Oyster Creek Nuclear Plant*, 41 MIDDLE STATES GEOGRAPHER 36 (2008) (citing, but dismissing, those concerns).

from climate change. These steps are often intended to encourage mitigation efforts, but they play an important role in adaptation as well. As with other kinds of pollution, financial liability provides a means of compensating the victims of pollution that occurs notwithstanding prevention or control efforts. This aspect of climate change liability schemes should be emphasized. Compensation may provide the resources that the victims of climate change need, but lack, to avoid the harms resulting from climate change.

III.

Environmental law's experience in attempting to separate pollution from its potential victims is not particularly encouraging as one confronts the need to adapt to climate change. That there is experience in such matters does provide lessons for adaptation, but the problem remains daunting. How, therefore, can one "adapt" to the harms resulting from pollution?

Adaptation implies that the victims must be willing to accept significant changes in their lives, probably for the foreseeable future. That complicates the task because the issue isn't simply to avoid the harm, but to surrender a presumptively valuable status quo. Few individuals have demonstrated a willingness to move away from areas that are threatened by pollution or by natural disasters, sometimes even when the law compels them to do so.

Adaptation, then, is not simply about avoiding the harms of pollution. It is also about accepting a new reality that results from that pollution. As adaption planning gains momentum, it will be important to address both the logistic issues and the behavioral issues that result from living in a new place or a new climate. The lessons of previous responses to pollution will help in that project, but new lessons will need to be learned to adapt to this new kind of pollution.