

Forever Ours?

The Challenges of Long-Lived Environmental Problems

Pharmaceutical residues in waterways, industrial waste lingering in soils, space debris in orbit for hundreds of years, nuclear waste requiring management for thousands of years, and greenhouse gases affecting carbon cycles subject to geologic time-scales: these pollutants are the potentially long-lasting side effects of modern, growing economies and the attainment of ever-better standards of living.

Policymakers seek to protect the public by balancing the costs and benefits of mitigation, remediation, and other strategies to control these problems. Unlike the case of many shorter-lived pollutants, however, these long-lived contaminants

greenhouse gases, and space debris that self-collide to produce yet more debris are examples of pollution with cumulative effects that can worsen to create significant future harm.

In most cases, technical fixes can mitigate damages of forever-ours problems. For instance, technologies are available for chemical and other special treatments of contaminants in wastewater or soils, underground sequestration of some greenhouse gases, storage of nuclear waste, and the vacuuming of in-orbit space debris. But these solutions are costly, some have yet to be fully tested, and some have met with public resistance. In the case of greenhouse

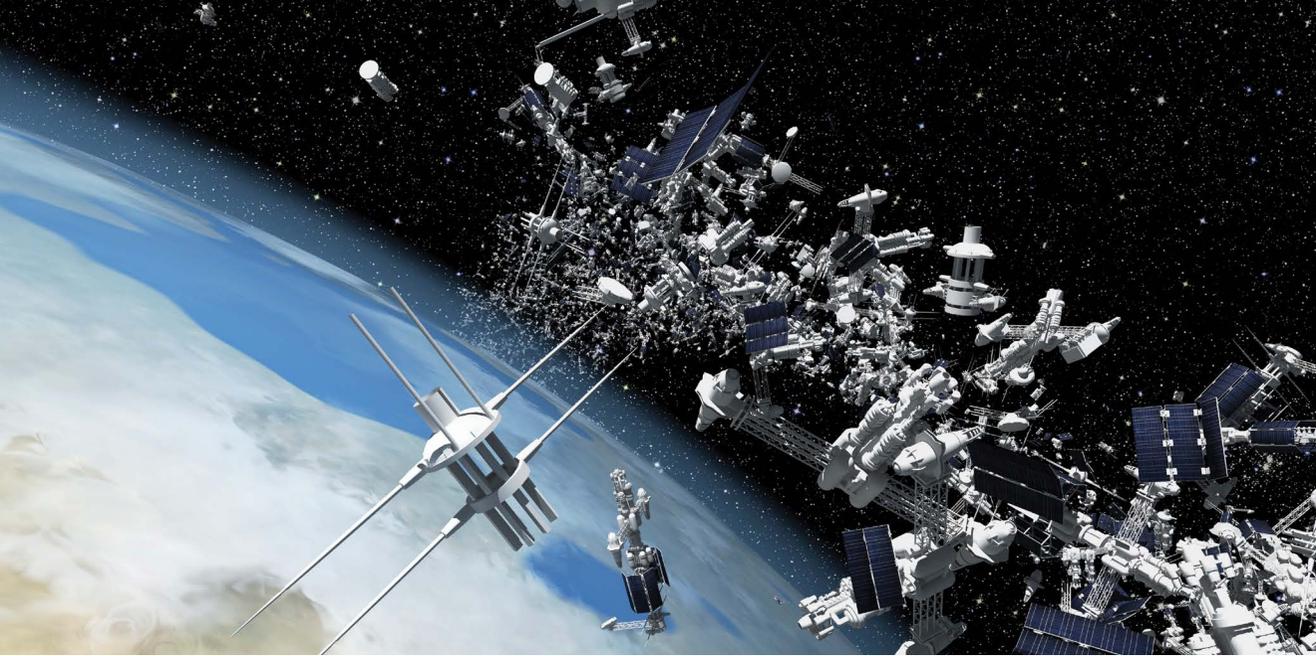
Certain greenhouse gases and space debris that self-collide to produce yet more debris are examples of pollution with cumulative effects that can create significant future harm.

are particularly vexing for regulators and citizens alike. Indeed, these long-lived environmental issues could be thought of as a class of problems that are “forever ours,” unique because of their almost unrestrained temporal scale. The contaminants may be present in trace amounts or have other effects that cause only small damages today; thus the public may not feel urgency to take action. But the contaminants may persist and, even worse, accumulate over time to create much greater damage, although in a perhaps very distant future. Some pharmaceutical residues, certain

gases and space debris, solutions require global cooperation.

Solutions also include public policies—such as taxes or fees—to capitalize the harm, discourage generation of these pollutants, and possibly help to underwrite the cost of technological fixes.

For long-lived problems, the usual point of departure for deciding what to do, when to do it, and how much to spend on technological solutions or specific social policies centers on the practice of discounting. It is widely recognized, however, that discounting can fall well short as a relevant metric



for very-far-into-the-future timescales. A much shorter duration, such as 30-year mortgages for homeownership, is empirical evidence of just how far into the future many citizens are willing to manage their own assets. (Longer-lived transactions, such as bonds with maturities of up to 100 years, are infrequent although not unheard of.)

Some experts suggest that the discount rate should be the same as the rate of per capita economic growth, interpreting this rate as a measure of how well off society is. Others point out that the discount rate probably changes over time—it may be constant, declining, or even quasi-hyperbolic. Some experts find the act of discounting—or market-like thinking more generally—to be acceptable for buying a home or car but wholly inappropriate in decisions about future human lives or the environment. Others expect future generations to be wealthier, smarter, and more innovative than current generations.

Even if the discounting issue could be resolved, the intergenerational nature of forever-ours problems strains the capacity of effective governance. Most governing institutions are subject to harsh myopic pressures. Regulators are stretched thin by the short-run pressures of fiscal year budgets and immediate concerns, with little

capacity to address long-lived problems. In the United States, only the Supreme Court has been endowed with the capacity to think far into the future on behalf of the nation. And, although the Supreme Court has weighed in on a variety of environmental issues, its role is not a regulatory one or necessarily one giving primacy to the effects of pollutants on future generations.

This problem of managing some types of intergenerational environmental issues suggests that the nation may benefit from institutional innovation in capacity to think long term—maybe something like a “science court.” Might a Supreme Court for Intergenerational Resource Allocation make sense?

In 1967, the physicist and engineer Arthur Kantrowitz proposed establishment of a group of independent, neutral, and technical experts that would hear opposing viewpoints publicly. A presidential task force supported the idea—which the media had dubbed a “science court”—and noted that “in almost all cases, the boundary between knowledge and ignorance will continuously shift and revisions to take account of new knowledge may have to be made frequently when issues of great national importance are at stake.” The idea of a science court has since been studied by experts in law, science, and technology policy (see Further

Reading). These studies have focused on other rationale for a science court, however, not on its possible advantages in hearing cases centered on the problem of long-lived environmental concerns.

Since Kantrowitz's idea, the National Research Council and science advisory boards of government agencies have evolved to offer some advice on a host of national problems, including environmental concerns. But these efforts lack the continuity inherent in a standing body of tenured judges and remain stove-piped among agencies, thus unable to treat long-lived concerns as a unique class of problems. A science court could be a solution to provide sustained capacity for objective, dispassionate, consistent, and forward-looking environmental stewardship that is otherwise not practicable among existing institutions.

The potential attributes would be that the court judges would not be subject to election cycles, would enjoy appointments for life, and would hear evidence and make decisions on the basis of science and reasoned argument. The court also would be the body entrusted to adjust decisions in light of new science—such as evidence of greater accumulations of pharmaceutical residues, growing concentrations of greenhouse gases, the propagation of space debris, and so forth. And importantly, the court would keep latent environmental problems prominent before the public.

The court could insist on use of such state-of-the-art tools as structured expert judgment and expert elicitation and require the collection of information critical to decisions about long-term problems. This would benefit scientists and the public alike because few of these data are routinely collected despite their critical role in understanding the effects of long-lived pollutants.

The court could be established by an act of Congress (just as Congress recently

created the US Foreign Intelligence Surveillance Court), with members appointed by the president and subject to Senate confirmation.

Shy of this step, another action that seems particularly suited to help in coping with long-term pollutants is more routine use of sunset provisions in public policies to make explicit that rules will terminate (with new ones put in place), forcing an “on ramp” for both the collection and admitting of new scientific data about mounting environmental problems. Another step could be greater use of price signals, such as taxes and fees, established with explicit dates at which prices will be adjusted in light of new information.

These actions fully complement a science court, should one be instituted. No doubt there are other approaches to be considered. Rethinking long-lived environmental concerns as a unique class of problems could in fact make them less “forever ours,” enabling us to assure our great-great-grandchildren that these concerns will not be theirs. ● —MOLLY K. MACAULEY

This article draws partly from the Carolyn and Edward Wenk, Jr. Lecture in Technology and Public Policy given by Macauley at The Johns Hopkins University on April 27, 2012.

FURTHER READING

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