A Policy Analysis of PFAS Regulations in Maine and the US Federal Government

by Edward E. Nachamie, Rachel E. Schattman, and Lindsey D. Pollard

ABSTRACT

Per- and polyfluoroalkyl substances (PFAS) contamination has become a prevalent problem due to their widespread accumulation in the environment and concerns over their public health implications. The US federal government has had a fragmented response to PFAS contamination; however, some states have adopted multifaceted policy approaches. The state of Maine has implemented several such interventions including education and outreach, labeling and registry requirements, prosecution, prohibitions, victim support, and remediation. We propose that Maine is at the leading edge of regulation of PFAS compounds with first-of-their-kind action thresholds in beef, dairy, and eggs as well as bans on spreading agricultural sludge. We summarize Maine's existing regulatory landscape and articulate an integrated policy framework intended to generate improved environmental and human health outcomes. Since contamination does not recognize state lines; the nation needs protective, comprehensive, and consistent polices to effectively eliminate PFAS pollution and remediate the widespread contamination.

INTRODUCTION

Per- and polyfluoroalkyl substances (PFAS) are widespread, used for numerous industrial purposes, and found in thousands of different products including textiles, personal care products, building materials, and many others (Panieri et al. 2022). Since their initial development in the 1950s, thousands of PFAS chemicals have been identified. PFAS releases during manufacturing, during use (i.e., firefighting foam), and at end-of-life disposal (products in landfill or washed down drain) have led to widespread contamination in water, soil, air, and food (Brunn et al. 2023). Introducing PFAS to the environment has long-lasting consequences, as they do not break down under normal environmental conditions. Exposure to PFAS via direct occupational exposure, drinking water, food, and other routes can pose increased health risks (Sunderland et al. 2019). In recent decades, health effects have been documented for a number of PFAS including increased risk of some cancers such as kidney, prostate, and testicular; developmental effects or delays in children; effects on the endocrine system; metabolic effects such as higher cholesterol levels or increased risk of obesity; reproductive effects such as decreased fertility and complications in pregnancy; neurotoxicity; and others (Habib et al. 2024).[1]

In the United States, both federal and state policies related to PFAS have evolved since the early 2000s, as public scrutiny of these substances has increased. Contamination governance in the United States is complex, multidimensional, and includes federal, state, and local actors, as well as other stakeholders (Heard 2025). However, the federal response has been reactive, incomplete, and slow, failing to keep up with the ecological and economic harm caused by PFAS, and by extension failing to protect public health (Brennan et al. 2021). In the absence of federal leadership on this issue, individual states have stepped in to regulate PFAS in drinking water, consumer products, and food.

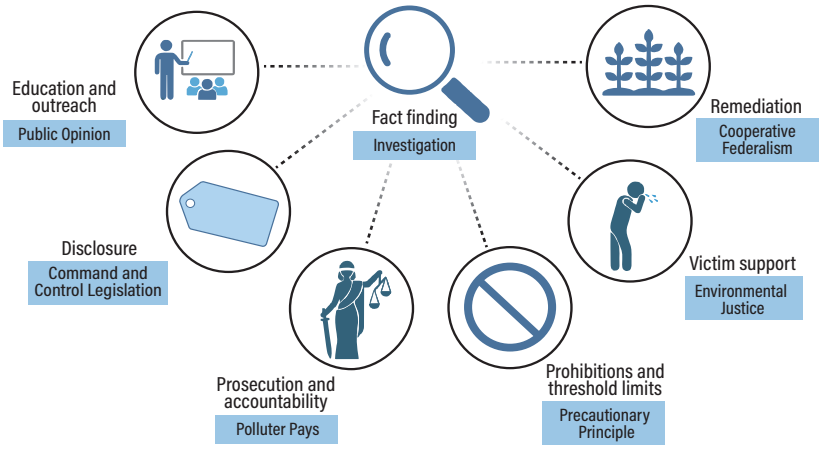
The state of Maine has some of the most stringent PFAS legislation in the country. Even among the few other active states, such as Michigan, Washington, and Minnesota, Maine stands apart for the breadth, diversity, and number of legislative actions related to PFAS management. Initial and ongoing state investigations have resulted in prohibitions, threshold limits, victim support programs, and remediation or mitigation plans. This review builds on prior assessments of Maine's response (Heard 2025), expanding our consideration of the multifaceted and rapidly evolving response in the state. We provide a nonexhaustive but up-to-date description of Maine's governance actions, with the intent of demonstrating how much state action can achieve and where the governance gaps left by federal action persist. We organize our analysis around an integrated policy response framework that addresses multiple modes of governance. We conclude by offering policy recommendations for addressing this significant environmental and human health concern.

PFAS REGULATION: THE NEED FOR A NEW FRAMEWORK

Due to the multifaceted effects of PFAS on the environment and on human health, an effective regulatory response must be similarly multifaceted and based in complementary governance frameworks (Figure 1). We propose that an integrated approach draws on six existing governance frameworks: (1) public opinion, or "free and public communications from citizen to their government on matters of concern" (Speier 1950); (2) command and control, which relies on prescribing rules and standards and using sanctions to enforce compliance (Beiser-McGrath et al. 2023); (3) polluter pays, which implies that the value of pollution should be paid by the polluter and not by the public (Barthakur 2021); (4) the precautionary principle, which includes four central components: prioritizing preventive action when facing scientific uncertainty; shifting the burden of proof to manufacturers (rather than the public); exploring safer alternatives; and increasing public participation in decision-making (Martuzzi et al. 2004); (5) environmental justice, which states that all people and communities are entitled to equal protection (Bullard 1993); and (6) cooperative federalism, which delineates between state and federal powers (Fischman 2005). All of the above are enabled by investigation, a fact-finding governance approach that lends legitimacy to state and federal actions, as well as social license to address environmental contamination (Lesch 2023).

Our review finds that Maine regulators and legislators have used at least one governance approach in each of the six categories to address PFAS (see Appendix 1). Because each framework is multifaceted, we have articulated the element of the framework most notably used in PFAS policy approaches. For example, Maine employed the disclosure principle stemming from the command-and-control framework, but the disclosure principle is not representative of the framework in its entirety. We propose that these complementary approaches constitute an integrated framework and that this approach is necessary to comprehensively address PFAS contamination in the United States. In the following sections, we use terms that refer to the principles described in Figure 1.

FIGURE 1: **PFAS Policy Framework, Based on Progression of Maine's Regulatory Response to Widespread Contamination**



US FEDERAL RESPONSE

To understand how states like Maine have addressed PFAS contamination, we must first describe the federal regulatory landscape. In general, industrial chemicals management in the United States is limited. Federal regulators historically have allowed chemicals to go on the market before risks are fully assessed. Despite these trends, several federal PFAS-specific policies, designed to improve understanding of the public health implications of PFAS, have been enacted over the last two decades. These efforts also have sought to measure or control use and contamination and aid clean-up efforts. It is important to acknowledge that federal rules and regulations on PFAS have been subject to changes under different presidential administrations, which complicate and delay federal policy responses.

The primary federal agency responsible for monitoring and enforcing PFAS regulations is the Environmental Protection Agency (EPA), operating primarily under the authority of the Safe Drinking Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, and the Federal Insecticide, Fungicide, and Rodenticide Act (Table 1). Initial regulatory efforts targeting PFAS hazards, beginning in 2006, were voluntary in nature. For example, the EPA created the PFOA Stewardship Program wherein eight manufacturing companies voluntarily pledged, but were not required, to reduce PFOA, PFOA salts, and their precursors (Klingelhöfer et al. 2024) in manufacturing of industrial and consumer products. In 2021, the agency published its PFAS

TABLE 1: **Federal PFAS Policy Timeline Illustrating Major Developments in PFAS Regulation**

Date	Legislation/Action
July 1960	**Federal Hazardous Substances Act (FHSA) is passed** This federal environmental statute was passed to require precautionary labeling of hazardous substances.
December 1974	**Safe Drinking Water Act (SDWA) is passed** This federal environmental statute was passed to protect public health by regulating the nation's public drinking water supply. It provides the federal government with the authority to regulate drinking water contaminants.
October 1976	**Toxic Substances Control Act (TSCA) and Resource Conservation and Recovery Act (RCRA) are passed** These federal environmental statutes provide authority to regulate toxic substances and their disposal.
December 1980	**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is passed** This federal environmental statute provides the EPA with authority to clean up hazardous waste sites and recover costs from responsible parties.
October 2006	**PFOA Stewardship Program is launched by the EPA** This voluntary program worked with eight companies to stop producing PFOA in their manufacturing of industrial and consumer products.
June 2016	**TSCA Lautenberg Amendment is passed** This amendment reshaped US Federal chemical policy by requiring mandatory EPA evaluation of existing chemicals with clear and enforceable deadlines, risk-based chemical assessments, and increased public transparency
October 2021	**First PFAS Strategic Roadmap is published** This report set a timeline for the EPA's actions and enforcement of regulations regarding PFAS.
February 2024	**Investigation into hazardous constituents** The EPA proposed nine PFAS compounds to add as hazardous constituents under the Resource Conservation and Recovery Act.
April 2024	**EPA issues the first ever national drinking water standards for PFAS** Six compounds were regulated to set enforceable limits in drinking water.
September 2024	**PFOA and PFOS designated as hazardous substances under CERCLA** This opens up new litigation, remediation, and compensation opportunities for affected plaintiffs.
November 2024	**EPA awards $15 million to research reduction of PFAS in food** This represents a step towards regulatory action of the impact of PFAS on the food system. **EPA releases the third annual PFAS Strategic Roadmap** This report highlights accomplishments in regulating PFAS in the U.S. thus far.
May 2025	**EPA delays and rescinds enforcement of 2024 national drinking water standards for PFAS** The EPA announced a delay in reporting requirements for PFOA and PFOS until 2031 and rescinded the limit on the four other compounds.

Note: While PFAS was not a target contaminant for many federal actions until 2006, these broad-reaching actions allowed for future oversight of PFAS and related compounds in the United States.

Strategic Roadmap outlining their commitments until 2024, including actions to regulate through multiple offices.[2]

The EPA has regulatory authority, granted by Congress, to address contaminants in industrial, residential, and rural environments. While this authority was granted prior to concern about PFAS, within that authority there is latitude for the EPA to oversee PFAS and related compounds among many other known contaminants.

The Federal Insecticide, Fungicide, and Rodenticide Act (passed in 1947) is the primary mechanism to regulate the registration, distribution, sale, and use of pesticides in the United States. Before a pesticide can be used, it must be registered with the EPA. Applicants must prove that the substance will not cause any unreasonable risk to people or the environment and consider the economic, social, and environmental costs and benefits. In recent years, this act has been used to require pesticide registrants to report the presence of PFAS in their production lines. It now requires registrants who become aware of PFAS to take corrective action and remove contaminated products from manufacturing and distribution. The EPA has conducted a review

under the act to determine whether pesticides use PFAS as inert ingredients in their formulations, finding that PFOS-containing inert ingredients are not currently used in any registered pesticide product.[3] However, many active ingredients in pesticides contain PFAS as defined by the Organization for Economic Cooperation and Development (OECD). A review conducted in 2024 found that of the 471 conventional active ingredients registered in the United States, 107 (23 percent) had at least one fully fluorinated carbon atom and 66 (14 percent) met the OECD's definition of PFAS compounds (Donley et al. 2024).

The Federal Hazardous Substances Act, enacted in 1960, requires labeling of hazardous substances to help consumers safely store and use those products and to give them information about immediate first aid steps to take if exposure occurs. This law also stipulates that the Consumer Product Safety Commission may ban certain products that pose such a danger or hazard to consumers that precautionary labeling is not adequate to protect consumers.[4] As of July 2026, the EPA has not used this authority to require labeling of PFAS in either consumer or industrial products.

The Safe Drinking Water Act, originally passed by US Congress in 1974, allows the EPA to set standards for drinking water quality through nonenforceable maximum contaminant level goals and enforceable maximum contaminant levels. In establishing maximum contaminant level goals and maximum contaminant levels, the EPA seeks to keep contaminants below levels that will harm the public, while avoiding onerous burdens on drinking water suppliers. The agency initially issued national drinking water standards for PFAS (a first among nations globally) in April 2024 (US EPA 2024a). As of the writing of this article, the EPA has proposed two new rules related to these standards. One would rescind the drinking water standards for PFHxS, PFNA, HFPO-DA, and Hazard Index mixtures; the other would extend the compliance deadlines for PFOA and PFOS in drinking water and establish a federal exemption framework.[5]

The Comprehensive Environmental Response, Compensation, and Liability Act, also known as the Superfund Act, allows the EPA to regulate PFAS compounds by designating certain compounds as hazardous substances; in 2024, the act listed PFOA and PFOS as such (US EPA 2024b). A superfund designation at a residential or industrial site allows the agency to financially support remediation of PFOA and PFOS. It does not apply to sites contaminated by other PFAS compounds, though many sites are contaminated with a mixture of PFAS compounds that includes PFOA or PFOS. The EPA has indicated that they do not intend to seek claims against parties who would likely be unable to pay for cleanup, such as community water systems and publicly owned treatment works, municipal separate storm sewer systems, publicly owned or operated municipal solid waste landfills, publicly owned airports and fire departments, or farms (Uhlmann 2024).

Under the Toxic Substances Control Act of 1976, the EPA is granted oversight of the production, importation, use, and disposal of identified chemicals. This act is the primary US regulatory authority for industrial chemicals (Silbergeld et al. 2015) and authorizes EPA's oversight of the production, importation, use, and disposal of identified chemicals through record keeping, testing, and restrictions on hazardous.[6] Some categories of chemicals, it should be noted, are regulated under alternative legal restrictions; these include pesticides, cosmetics, food, and drugs. Under the original 1976 Toxic Substances Control Act, chemicals already on the market, including PFAS chemicals, were assumed to be "safe until shown harmful" by the EPA (Rayasam et al. 2022). The 1976 version of the act gave limited authority to EPA to obtain information needed to assess chemical risks. The law included notification requirements for new chemicals but did not require any premarket testing or safety provisions (thereby making it virtually impossible for the EPA to require toxicity testing).

The Toxic Substances Control Act was amended in 2016 to expand EPA's authority and create timelines and requirements for the EPA to regulate specific chemicals. The amendments include mandates for the EPA to conduct risk evaluations for all new chemicals introduced into commerce and prioritize and conduct risk evaluations for substances in the existing chemicals inventory. It also provided more authority for EPA to obtain the data necessary to require a risk evaluation from manufacturers. This expanded authority had little effect on PFAS-related evaluation and limitation, however. In the time between the enactment of the Toxic Substances Control Act in 1976 and amendments passed in 2016, the EPA banned or limited fewer than 10 of over 86,000 chemicals that were registered for use (Silbergeld et al. 2015). Therefore, the reformed version of the Toxic Substances Control Act remains flawed and incomplete in many ways. In addition to the small number of regulated PFAS substances, the burden of proof for safety remains with the EPA instead of the chemical manufacturer. Additionally, there are no published guidelines on what toxicological data companies must provide to the EPA

during the safety evaluation process. Concerns have also been raised related to state preemption provisions in the amended Toxic Substances Control Act, which may limit the ability of states to take protective action on chemicals for which EPA has made a risk determination.

The Resource Conservation and Recovery Act, also originally passed in 1976, gives the EPA the authority to control hazardous waste from production to final disposal (Phifer 2010). Subtitle C of the act set criteria for hazardous waste generators, transporters, and treatment, storage and disposal facilities including permitting requirements, enforcement, and corrective action or cleanup. In February 2024, the EPA proposed to amend the Resource Conservation and Recovery Act to include PFOA, PFOS, PFBS, HFPO-DA or GenX, PFNA, PFHxS, PFDA, PFHxA, and PFBA as hazardous constituents. If approved, this would require users to document and report their use, transportation, and disposal of PFAS. As of August 2026, a final rule has yet to be announced and implemented.[7]

It is also important to note the role of the Food and Drug Administration (FDA) in regulating PFAS because of the impact of these compounds on the food system. Since PFAS uptake in crops is tied to historical sludge spreading initiated by the Safe Drinking Water Act of 1970, the extent of contamination in our food system may be massive. This is likely due to the ineffectiveness of wastewater treatment process in removing PFAS and the resulting biosolids containing PFAS (Saliu and Sauvé 2024). Several states have introduced or adopted legislation to regulate biosolid land application or to monitor PFAS in biosolids (Rabinow and Scott 2026).

However, due to a lack of nationwide testing, we are only beginning to understand the threat these compounds pose towards food system integrity (Hayes 2025). The FDA began to monitor PFAS in food in 2019 and has since tested 1,900 samples of foods on the US market. This represents a small subsample of the sprawling US food system, and because of the broad variety and number of potential sources of these compounds in both soils and drinking water, more robust testing is necessary. The FDA has taken some action: in February 2024, "the FDA announced that all grease-proofing agents containing PFAS are no longer being sold," and in January 2025, the FDA, via a notice in the Federal Register, announced that "the 35 food contact notifications (FCNs) related to PFAS-containing food contact substances such as grease-proofers applied to paper and paperboard food packaging are no longer effective based on the abandonment of these uses."[8]

Many US states have not yet addressed PFAS through regulatory efforts or legislation. Additionally, efforts vary widely among the states that have sought to protect their residents from the negative effects of PFAS, which has led to inconsistency in regulatory requirements and has created uneven economic burden. Some state-level PFAS regulations have been met with both industry resistance and labor constraints. For example, Maine's wild blueberry industry has advocated against the ban of PFAS in pesticides due to the cost to blueberry producers, and the Maine Potato Board has advocated for more permissive PFAS regulations so potato growers are able to compete in national and international markets (Tapley 2025; Venturini 2022). Laws regulating PFAS in products have been difficult to implement because of the volume of use cases. A coordinated effort at the federal level would provide clarity and consistency to state and local governments in their response to PFAS hazards. Additionally, the financial scope of PFAS contamination and remediation efforts requires federal funding. Having consistent regulatory standards nationwide would allow for faster adoption of new standards for PFAS compliance and protect the health of millions of Americans.

MAINE'S RESPONSE

The Maine Department of Environmental Protection (DEP) first discovered PFAS contamination in the state in 2013, when analyzing fish tissue samples at several retired military installations. The extensive nature of PFAS contamination in Maine was not realized, however, until 2016, when a dairy farm found evidence of PFAS contamination in soil, groundwater, forage, and milk (Heard 2025).[9] The primary sources of environmental contamination in Maine include the historic spreading of biosolids—also called sewage sludge or wastewater residuals—as a soil amendment, as well as the use of Class B aqueous film-forming foams. In 2021, Maine became the first and only state to systematically test agricultural lands for PFAS, and testing is still underway in 2026. In August 2024, a malfunctioning fire-suppression system at the former Brunswick Naval Air Station led to the release of more than 1,450 gallons of PFAS-containing foam concentrate (mixed with 51,000 gallons of water). This incident was the largest accidental spill of PFAS firefighting foam in Maine's history. Testing following this incident showed levels of PFAS in surface waters far exceeding the EPA's draft human health ambient water quality criteria for PFOA, PFOS, and PFBS (Hannan et al. 2025).

In response to these contamination events, Maine became one of the first states to enact laws to fill gaps left by the federal government. In 2019, Governor Janet Mills created the Maine PFAS Task Force by executive order. The initial charge of the task force was to review existing data related to the extent of PFAS contamination in Maine and provide recommendations about protecting Maine residents (Maine PFAS Task Force 2020). The state legislature has likewise addressed PFAS contamination. As of January 2026, Maine has adopted more laws on PFAS than any other state in the country.[10]

Ours is not the first review of Maine's policy response to PFAS. Notably, Heard (2025) summarized actions taken by Maine's legislature up until the conclusion of the 131st legislative session in April 2024. The policy landscape in Maine has significantly evolved since then, with nine new bills passed in the combined 132nd and 133rd Maine legislative sessions. We describe policies enacted between 2008 and 2026, organized around the framework articulated in Figure 1. Legislative actions are summarized in Appendix 1, which was compiled using data from Safer States and verified through review of the Maine Legacy Bill Search repository.[11] We have organized Maine's response actions into the six framework principles: investigation (fact-finding); public opinion (education and outreach); command and control legislation (disclosure); polluter pays (prosecution and accountability); precautionary principle (prohibitions or threshold limits), environmental justice (victim support), cooperative federalism (remediation).

Investigation: Fact-Finding for Water, Food, and Soils

PFAS-related fact-finding efforts in Maine have focused on three areas: water, food, and soil. Since 2016, several state agencies have participated in investigations, including the Maine DEP, the Maine Center for Disease Control and Prevention (Maine CDC), and the Maine Department of Agriculture, Conservation, and Forestry (DACF).

The Maine CDC's Drinking Water Program has monitored community water systems since 2013. A 70 parts per trillion screening limit (applied to PFOA and PFOS, and their total concentration) was derived from a 2016 EPA Health advisory on drinking water for state and public water systems. Of Maine's 36 public water systems, 17 were eligible for the testing in 2019. At that time, many water system administrators declined to participate, stating that they wished to wait until testing was required by law. In 2021, the Maine Legislature passed LD 129—Resolve, To Protect Consumers of Public Drinking Water by Establishing Maximum Contaminant Levels for Certain Substances and Contaminants, which mandated all Maine public water systems test for PFAS (LD 129). These results are available through the Maine Drinking Water Program's data repository.[12]

The Maine DACF, DEP, and CDC have investigated PFAS contamination in foods produced by Maine farms. The need to study PFAS in food became clear in 2016 when elevated levels of PFAS were detected in milk produced at Stoneridge Dairy Farm in Arundel, Maine (Heard 2025). Follow-up testing on other Maine dairy farms showed the problem extended to other farms (Maine PFAS Task Force 2020). DACF conducted two statewide retail milk surveys, including products bottled in state and out of state. Results from the 2019 survey found all sampled milk was below the laboratory's reporting threshold; however, results from a follow-up 2020 survey showed one sample with PFOS levels of concern. The contaminated sample was ultimately traced back to a farm in Fairfield, Maine, which also had an extensive history of biosolids application.[13]

The historic practice of spreading biosolids on Maine's agricultural lands has not been limited to dairy farms. Investigations by the Maine DEP have identified at least 100 agricultural sites where at least 5,000 cubic yards of biosolids were applied between 1970 and 2023. As of 2025, over 1,000 agricultural and nonagricultural sites have been identified and are being tested for both soil and groundwater quality (Miller 2025).

Further investigation of agricultural food products in Maine was supported through 2021's LD 1600—An Act To Investigate Perfluoroalkyl and Polyfluoroalkyl Substance Contamination of Land and Groundwater. This act established the Maine DEP's Land Application Contaminant Monitoring Fund to continue testing of soil and groundwater for PFAS across the state to better understand the full extent of PFAS contamination.

Public Opinion: Education and Outreach

Education and outreach about PFAS have been the purview of both Maine state agencies and other entities such as the University of Maine, the Maine Organic Farmers and Gardeners Association, Maine Farmland Trust, Defend Our Health, Bigelow Labs, among others. While the efforts of these groups are critical to protecting residents of Maine, we summarize here only the state legislative actions that have supported education and outreach in the state. Several

of Maine's legislative actions that supported fact-finding activities also included public education requirements. For example, the DEP has compiled PFAS testing data collected under the mandate of LD 1600 in several formats publicly available on their website: an interactive mapping tool and all supporting data in a downloadable format called the PFAS Investigation Map; a table that includes information for all licensed residual land application sites; and a copy of all PFAS test results for all sites included in Maine DEP's database, including contaminated drinking water and farmland.[14] LD 1600 also provided funding for two DEP staff positions related to the implementation of laws governing products with PFAS. DACF personnel are actively engaged in education and outreach work with farmers and other stakeholders with PFAS-related questions and services.

Command and Control: Disclosure

The Maine Legislature has passed several iterations of legislation requiring labeling of PFAS compounds in pesticides or requiring that pesticides that contain PFAS be listed on a statewide registry. In 2021, the legislature passed LD 264—An Act To Prohibit Aerial Application of Perfluoroalkyl and Polyfluoroalkyl Substances, which directed the DACF to amend its rules governing the registration of pesticides in the state. The act requires manufacturers to provide an affidavit stating whether a perfluoroalkyl or polyfluoroalkyl substance is in the formulation of the registered pesticide. The act additionally requires manufacturers and distributors to provide affidavits stating whether the registered pesticide had ever been stored, distributed, or packaged in a fluorinated high-density polyethylene container. This type of container has been shown to lead to PFAS leaching into some pesticide solutions (Vitale et al. 2022).

Based on findings from research conducted after the passage of LD 264, the legislature passed LD 2019—An Act To Require the Registration of Adjuvants in the State and To Regulate the Distribution of Pesticides with Perfluoroalkyl and Polyfluoroalkyl Substances—in 2022, which prohibits registration of a pesticide that is known to have been contaminated by PFAS. The act states that beginning January 1, 2032, a pesticide that contains intentionally added PFAS may not be sold or distributed in Maine. Agricultural industry groups have actively lobbied against this legislation.

Polluter Pays: Prosecution and Accountability

In March 2023, Maine filed a lawsuit against PFAS manufacturers 3M and DuPont for damages related to PFAS exposure from aqueous film forming foam and non-aqueous film forming foam sources (Miller 2023). This case is ongoing, and it is expected that it will take years before this lawsuit along with other individual lawsuits against PFAS products manufacturers will be settled or fully adjudicated.

A separate multidistrict class action lawsuit filed by a variety of states in a US District Court in Charleston, South Carolina, was settled against 3M and DuPont in March 2024. This settlement is available to all US public water suppliers that detect PFAS at any level, now or over the next 13 years (3M 2024). The total settlement accrued in this multidistrict litigation equals $13 billion. The Maine Office of the Attorney General released an information sheet for public water systems to determine their eligibility and to apply for payments or opt-out based on their interest (Maine OAG 2023). The State of Maine cannot join the plaintiffs to apply for payments, but it actively encourages water utilities and public water systems within the state to apply. Litigation and subsequent settlements from PFAS chemical producers will be essential in overcoming the massive financial burden of PFAS investigation, victim support, research, and remediation. Maine municipalities continue to file lawsuits against these companies for claims related to lack of disclosure of health and environmental hazards (SL Environmental Law Group 2026).

Precautionary Principle: Prohibitions and Threshold Limits

Maine is the first state in the nation to set threshold limits in food products. It is also among the first to set prohibitions on PFAS in consumer goods and industrial products. In 2017, the DACF and Maine CDC set an action level for PFOS in milk at 210 parts per trillion (Smith and Simones 2020). The state also set an action level for PFOS in beef at 3.4 parts per billion.[15] Additionally, following the passage of LD 130—An Act to Establish the PFAS Response Program and to Modify the Fund To Address PFAS Contamination—in 2025, the Maine DACF has given regulatory authority to the PFAS Response Program, which can now set health-based action levels for food products without legislative approval and has set a food action level for chicken eggs at 4.7 parts per billion of PFOS (Hennessey 2025).

Maine's regulatory restrictions on PFAS extend beyond water and food and focus also on pollution prevention. In 2021, the Maine Legislature passed LD 1505—An Act To Restrict the Use of Perfluoroalkyl and

Polyfluoroalkyl Substances in Firefighting Foam—to reduce contamination from firefighting foam. Aqueous film-forming foam is a Class B firefighting foam designed to fight combustible and flammable fuel fires. Some Class B foams have contained PFAS for decades, though fluorine-free options are now available. These foams have been linked to groundwater and drinking water PFAS pollution (Jahura et al. 2024). Beginning in January 2022, LD 1505 prohibited the discharge and manufacture, sale, or distribution of firefighting or fire-suppressing foam containing PFAS except when the foam is "entirely collected for proper disposal." The act also required the DEP to collaborate with other state agencies to develop a framework for the collection and safe storage of such foams.

Since future contamination can only be avoided by reducing PFAS use, Maine has passed a variety of regulations to prohibit the production of PFAS-laden products and industrial uses. For example, LD 1503—An Act To Stop Perfluoroalkyl and Polyfluoroalkyl Substances Pollution—was passed in April 2021. This act prohibited the sale of carpets, rugs, or fabric treatments intentionally treated with PFAS and required manufacturers of products with intentionally added PFAS to report the presence of those substances in products to the DEP beginning in 2023. Under LD 1503, beginning in 2030, products containing intentionally added PFAS cannot be sold in the state unless the use of PFAS is designated as a currently unavoidable use (i.e., their use is essential for health, safety, or the functioning of society).

LD 1503 has since been amended by LD 1537—An Act to Amend the Laws Relating to the Prevention of Perfluoroalkyl and Polyfluoroalkyl Substances Pollution. According to the Maine DEP

> The recent legislation eliminates the general notification requirement that was previously scheduled to take effect January 1, 2025. This legislation also created a number of new sales prohibitions for products with intentionally added PFAS with varying effective dates, created some specific exemptions to the prohibitions, and established a new reporting program for those product categories that receive a Currently Unavoidable Use (CUU) determination from the Department.[16]

This legislation pushes back the full prohibition of sale of any products with intentionally added PFAS until 2032. It also extends the phase-out deadline for the sale of cooling, heating, ventilation, air conditioning or refrigeration equipment, refrigerants, foams or aerosol propellants with intentionally added PFAS until 2040. The law aligns Maine's phase-out timeline with a similar act passed in Minnesota, commonly referred to as Amara's Law.[17] The large number of product exemptions is due, in large part, to the financial, labor, and logistical reporting burden of implementing LD 1503 as originally written.

Several Maine laws attempt to phase out nonessential use of PFAS and encourage the use of safer alternatives. LD 1537 describes the development of a PFAS source reduction program and defines alternative as "a substance or chemical that, if used in place of a PFAS in a product, would result in a functionally equivalent product and would reduce the potential for harm to human health or the environment or that has not been shown to pose the same or greater potential harm to human health or the environment as the PFAS." From 2008, LD 2048—An Act To Protect Children's Health and the Environment from Toxic Chemicals in Toys and Children's Products—focuses on toys and children's products and prohibits the manufacture, sale, or distribution of those products that contain chemicals from the state's priority list of chemicals, including PFOS and its salts.[18] It mandates that manufacturers must replace chemicals with safer alternatives. The law also provides some guidance on conducting alternatives assessments.

Environmental Justice: Victim Support

Victim support has been authorized through several legislative acts in Maine, with funds and programmatic support geared towards helping both individuals and organizations affected by PFAS contamination. In 2021, LD 1600—An Act To Investigate Perfluoroalkyl and Polyfluoroalkyl Substance Contamination of Land and Groundwater—provided funding for the DEP to offer emergency dewatering (the removal of waste) grants to certain facilities that did not have a way to dispose of low-solids wastewater sludge. The legislation provides funding to assist these same facilities in planning for future wastewater sludge disposal. In that same year, the aforementioned LD 1503 required the DEP to create a PFAS source reduction program that provided information, education, and grants to publicly owned wastewater and water treatment works and municipalities to reduce PFAS contamination.

Governor Mills's office has also created the PFAS Fund to support farmers whose land or water are contaminated with PFAS and households with wells affected by sludge spreading. The Maine Legislature further supported this fund by appropriating $60 million dollars for the same purpose. In addition to providing direct financial support to

farmers, the fund allows the DACF to purchase PFAS-contaminated agricultural land from willing sellers. It also provides financial support for research and for blood testing, mental health services, and other health-related initiatives for affected farmers and community members.[19]

The DACF also operates the PFAS Response Program through which affected farmers can apply for grants, income replacement, and other assistance. The program provides farmers with a water treatment program and a livestock depopulation grant program for situations where animals have become extremely contaminated with PFAS compounds). The DACF also operates the PFAS Navigator Program through which farmers can access one-on-one assistance and support for PFAS hazards. Program staff work with producers to identify their goals and needs and to connect farmers to various assistance programs and resources.[20]

The agency has budgeted over $30 million for direct support to farmers between 2024 and 2028 as part of the PFAS Fund (Maine DACF 2023). The DACF's Annual Report from the PFAS Fund to the Legislature states that the PFAS Response Program provided over $2.6 million in financial support to producers, of which $1.4 million was for income-replacement payments and $884,000 was for farm viability payments (Maine DACF 2024).

Cooperative Federalism: Remediation

One of the most notable aspects of Maine's response to PFAS contamination has been in supporting treatment for community drinking water systems (public water utilities as well as schools and daycares) and private residents with contaminated well water through grant programs managed by the Maine CDC and DEP. The Maine CDC's Drinking Water Program offers several different grants targeting PFAS for large, small, or very small public water systems to plan for PFAS contamination or to address contamination issues. Given that more than half of Maine residences rely on a private well for drinking water, another critical grant program is the Water Maine Extension to Private Wells Containing PFAS, wherein water systems can apply for up to $250,000 to fund the extension of their distribution systems to private homes dealing with PFAS-contaminated wells. The DEP has also worked with residents with PFAS-contaminated private wells to supply bottled water for residents until an effective filtration system has been installed.[21]

These and other remediation efforts are expensive. The PFAS Task Force collected estimates on the financial cost of PFAS remediation and prevention for the state in a variety of contexts. In the Maine PFAS Task Force report (2020), the authors discussed the significant financial burden that PFAS remediation will place upon municipalities for drinking water treatment and firefighting foam disposal and replacement (absent state or federal financial support). Other costs associated with remediation would likely be borne by state agencies. If remediation is pursued in a meaningful way, the financial burden on Maine CDC, DACF, and DEP will be in the millions of dollars in the cost of staff time, sampling, and laboratory fees.

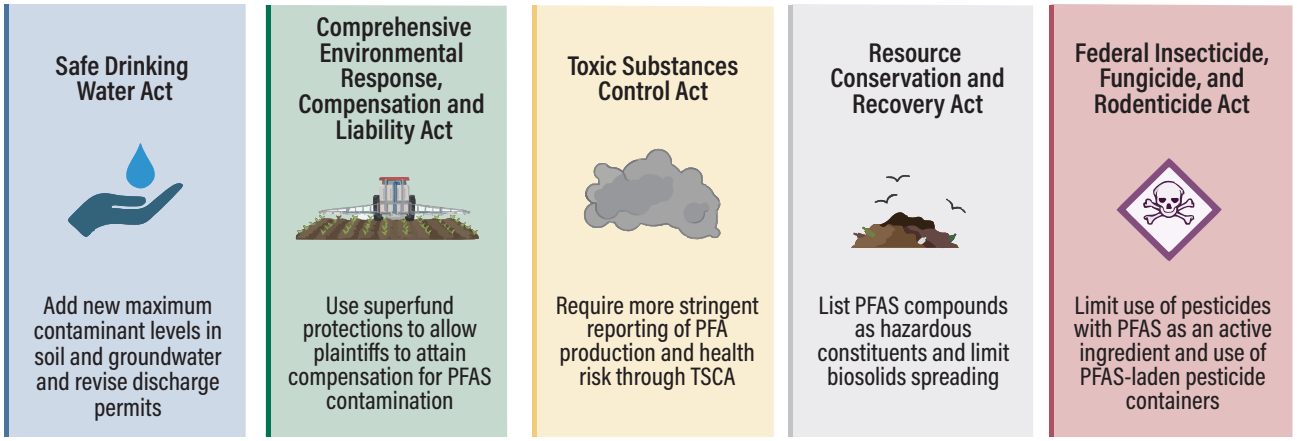
There is limited knowledge on PFAS remediation in soils, which is a significant challenge. To address the challenge, DACF has provided support through the PFAS Fund to researchers who have investigated remediation technologies.[22] For example, researchers at the University of Maine, Northern Tilth, and other research organizations have explored phytoremediation and biochar amendments for PFAS-contaminated sites (Thapa 2025). The Maine DACF's are helping Maine farmers to continue to farm their land while minimizing both interaction with contaminated soil or water sources and PFAS uptake levels in crops.

REGULATORY REFORM IS NEEDED

US chemical hazards are addressed under separate pieces of legislation—there is no comprehensive federal legislation for chemicals of concern. Lack of federal regulatory action on chemicals of concern to human health and the environment has led to the emergence of a patchwork of state policies. US states, such as Maine, Michigan, and Oregon, are leading an evolving governance response to PFAS by designing innovative policies: for example, regulating PFAS in consumer products through bans, limitations on use, and alternatives assessment. The aim of these efforts is to tighten regulatory control and better protect public health, particularly in areas where federal regulation has not yet developed.

To reduce the regulatory burden on states and offer a more cohesive response to PFAS contamination, reforms of federal legislation, including the Safe Drinking Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, and the Federal Insecticide, Fungicide, and Rodenticide Act, are needed, along with stronger support within federal agencies to implement and execute these reforms. We propose changes to improve control and management of PFAS

FIGURE 3: **Summary of PFAS Policy Recommendations for Strengthening Federal Environmental Legislation**



hazards in existing federal policies (Figure 3), which should be further developed, ideally in a cooperative effort between states and willing federal partners. We offer them here, hoping to generate conversation and collaboration.

Designate Hazards, Regulate Classes

Twenty-four US states have defined PFAS compounds as any substance with at least one fully fluorinated carbon atom, while others use the EPA's definition encompassing a narrower array of compounds (any substance with at least two fully fluorinated carbon atoms).[23] Due to the high number of compounds within the PFAS class, this leads to a conflict between states in which compounds are regulated and further fractures the response to PFAS contamination nationwide. Clarity from the federal level on an agreed upon definition would allow for more effective regulation and enforcement by all levels of government. All states that define PFAS compounds use the OECD's definition, which identifies them as any substance with at least one fully fluorinated carbon atom. To unify the federal and state response to PFAS hazards, the EPA should update their definition to match state-level action and the OECD.

How the EPA classifies PFAS has direct implications for the agency's ability to regulate them. For example, there is an opportunity to modify the Safe Drinking Water Act's maximum contaminant levels to include a greater number of PFAS compounds, which would effectively protect public drinking water supplies. While the list of PFAS contaminants is extremely large, grouping PFAS into class based on chemical characteristics could simplify the task. By designating classes of PFAS compounds as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act, state governments, nonprofits, and private citizens can more effectively sue polluters to secure private funds to clean up contaminated sites. Such a change would cost the federal government little but provide much needed legitimacy to communities that have been negatively affected by PFAS contamination. Taking this step may expose PFAS manufacturers to greater liability, which could motivate them to use PFAS alternatives sooner than they would choose to otherwise.

We also think the Toxic Substances Control Act would be more effective for controlling PFAS compounds if these substances were regulated as a class rather than as individual chemicals, a recommendation made previously by governance scholars (Heard 2025). The sheer number of PFAS compounds makes it difficult to satisfy reporting requirements through this act. Additionally, if PFAS were listed as one or more classes under the Resource Conservation and Recovery Act, waste managers would be required to monitor, document, and report a wider range of PFAS levels than they currently are required to do. This would also make it federally illegal to dispose of PFAS in nonhazardous landfills or spread PFAS-contaminated biosolids on agricultural land. The American Water Works Association has written that these regulations could force waste managers to "shift to more restrictive practices such as hazardous waste landfilling or incineration" (Moody and Murray 2023: 7).

Set Thresholds, Support Cleanup

Following the effective classification of PFAS and designation of these classes as hazardous compounds, the Safe Drinking Water Act's National Pollutant Discharge

Elimination System (NPDES) could be used to curb the amount of PFAS allowed in industrial effluent. This action would require a federal will to set and enforce thresholds, support regular testing, and connect communities with remediation and treatment resources, which is no small task. PFAS cleanup is prohibitively expensive in many cases, and funding large-scale decontamination efforts is a growing challenge. However, EPA already has the authority to carry out these goals if they have administrative support to do so.

Given the variety in toxicological impacts of various PFAS compounds at different concentrations, it would take significant funding and time to understand the effects of different compounds and allow them to be effectively controlled through the Toxic Substances Control Act. The burden of researching toxicity information should be moved onto manufacturers by using the EPA's authority under the amended Toxic Substances Control Act to require manufacturers to complete health effects studies prior to production (Rayasam et al. 2022). For example, the Federal Insecticide, Fungicide, and Rodenticide Act could be used to enact a prohibition on pesticides with PFAS constituents. This act should be used to ban pesticides with PFAS as active and inert constituents because of the dangers they pose to agricultural workers and the environment (Andersen et al. 2024). This example illustrates why this type of action should occur at the federal, rather than state level. If such bans are enacted by individual states, businesses within these states may be disadvantaged by any associated increase in the cost of production. Solely relying on state-by-state regulations is inadequate for a food system that is both national and international.

Source Reduction, Find Alternatives

The most effective means of PFAS hazards management is a broad phase-out of the manufacture, distribution, and sale of these compounds and products containing them. Due to the global nature of our food and product systems, these compounds must be addressed at an international scale. By focusing on turning off the tap for chemicals of concern, research agencies can better understand and build public policy around the precautionary principle to reduce exposures and environmental contamination downstream.

Additionally, some PFAS use cases have been identified as nonessential. Legislation is needed to limit PFAS use to only essential-use cases where their application is unavoidable for health and safety reasons. Limiting PFAS to essential uses will only reduce the amount of PFAS being used and will ensure that companies understand the risks of these compounds in their products. Further, this will improve public understanding of the presence of PFAS compounds in certain products. Passing legislation that mandates producers assess PFAS alternatives to identify safer options for their products will also protect public health and the environment from chemicals of concern. These assessments will help producers avoid substitutions that would cause as much, or more, harm. Existing guidelines for alternatives assessment could act as a framework for policymakers in response to PFAS hazards. These exist at the state level already, such as the Massachusetts Toxics Use Reduction Act.[24]

There remains a role for federal agencies, including but not limited to the EPA, to address PFAS. Ideally this could be accomplished in consultation and cooperation with states who have been leading the charge to address PFAS. In the near future, however, such cooperation may be unlikely. After an influx of federal and other funding targeting PFAS-related research between 2020 and 2024, the current federal administration is taking a different approach. The administration has claimed that the agency will maintain a strong emphasis on PFAS. However, in July 2025, the EPA closed its Office of Research and Development, the arm of the agency responsible for analyzing dangers posed by toxic chemicals and which managed grants and contracts to scientific organizations outside of the agency. The federal government has also greatly reduced the EPA's capacity to effectively research and regulate PFAS compounds by shrinking its labor force and funding (van Deelen 2025). This deliberate reduction in regulatory and scientific capacity represents the federal government's effective abdication of its role in protecting the public from the dangers of PFAS. It will be difficult—or impossible—for PFAS to be effectively addressed at the federal level and sufficient staff and funding for implementing product restrictions and reporting requirements. Further, in May 2026, the federal government proposed to roll back certain federal drinking water regulations for PFAS in drinking water. If adopted, the rollback of drinking water limits would represent another step backwards in regulation of PFAS and may increase the risk of these chemicals harming public health and the environment.

CONCLUSION

The need to regulate, remediate, and manage per- and polyfluoroalkyl substances within the United States is clear based on the overwhelming evidence of the dangers these chemicals pose to environmental and individual

health. Federal legislation has been limited, leaving states to address this important issue independently. In this article, we summarize the multifaceted regulatory framework developed by the state of Maine, which provides an example of how to simultaneously address fact-finding, education and outreach, labeling and registration, prosecution and accountability, prohibitions and thresholds, victim support, and remediation. However, a state-by-state approach is insufficient: limited access to funding and technical expertise, and inconsistent threshold limits between states perpetuate inefficiencies, inequity, and poor public health. While Maine's multifaceted PFAS governance approach provides useful instruction for how to tackle this challenge, there remains an urgent need for a more cohesive and rigorous federal response to PFAS and for greater coordination between federal and state governing bodies. To effectively address this significant environmental and public health problem, a strong and coordinated federal-state response is needed.

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Edward Nachamie is a graduate of the University of Maine's Ecology and Environmental Sciences Program. He is currently working as a wildland firefighter and fire effects monitor for the US Wildland Fire Service. While at UMaine he worked as a resident steward at the Terrell House Permaculture Living & Learning Center, an undergraduate research assistant in the Agroecology Lab, and as a forest technician for the University Forest.

Rachel Schattman is an associate professor of sustainable agriculture at the University of Maine where she leads the Agroecology Lab. Her work focuses on agricultural adaptation to and mitigation of climate change, community learning and wellbeing, and sustainability. Much of her recent work focuses on water use and access in temperate climates, irrigation practices in diversified cropping systems, temperate agroforestry, and contamination of agricultural lands.

Lindsey Pollard is the PFAS research coordinator at the University of Maine Cooperative Extension. Prior to joining UMaine Extension, Pollard was a research associate at the University of Massachusetts Lowell in the Massachusetts Toxics Use Reduction Institute and the Lowell Center for Sustainable Production. She has a background in aquatic ecology and understanding the connections between urban and natural environments.