5 Regulatory Context

This section provides an overview of information on existing regulations related to MP. The section includes regulatory programs and actions that may address all sizes of plastics (macro, micro, nano) due to their potential to act as sources that generate MP but tries to emphasize and focus on MP to the extent possible. This section focuses on regulations that occur at the state, national, and international levels. There may be local jurisdictions that have regulations in place that are more stringent than those found at the state level.

5.1 State Survey

The ITRC Microplastics Team sent a survey (see Appendix B) to all the states in the United States in the summer of 2021 to gather information on the state's efforts to regulate MP. The survey included questions on current status, such as what media the states are monitoring for MP; whether MP have been detected; if the states have issued any criteria, limits, standards, or guidance regarding MP; and if the states have developed any site-specific or permit-specific guidance or restriction to minimize discharges of any MP to surface waters or other media. Other questions addressed the availability of data and information on sampling methods, if states are contemplating developing criteria in the future on MP, and whether states intend to develop restrictions to minimize the discharge of MP to surface water or other media.

A total of 43 responses were submitted from 26 states and one territory. In some cases, responses from multiple agencies were received from a single state. Figure 5-1 provides a summary of answers to two of the key survey questions. The survey shows that for the most part, the states have not conducted sampling for MP, with only four of 26 states responding positively (Figure 5-1A) and only one additional state responding that they plan to do so within a year. Of the four states currently conducting sampling, most sampled ambient water (three states) and sediment (two states); only single states had sampled for each of the following parameters: stormwater, permitted discharges, fish tissue, and wild animal tissue. Given the limited number of states that have sampled MP so far, it is not surprising that few states have developed MP criteria or standards. Figure 5-1B shows that no states responding to the survey indicated that they had established a criterion or standard for MP in any media. The survey results further show the developing nature of the MP issue. The responses to the question on whether or not an agency is currently considering establishing MP were 67% negative, with only eight states noting that they will adopt or may consider criteria or standards for MP in the future. These agencies were considering the criteria in part to respond to proposed legislation, legislative mandates, or governor's directives, but more often as part of an agency-level initiative. The state agencies were generally equally divided between using USEPA-developed criteria, establishing their own criteria, or a combination of the two approaches; this approach is not specific to only MP and is applied to other pollutants.

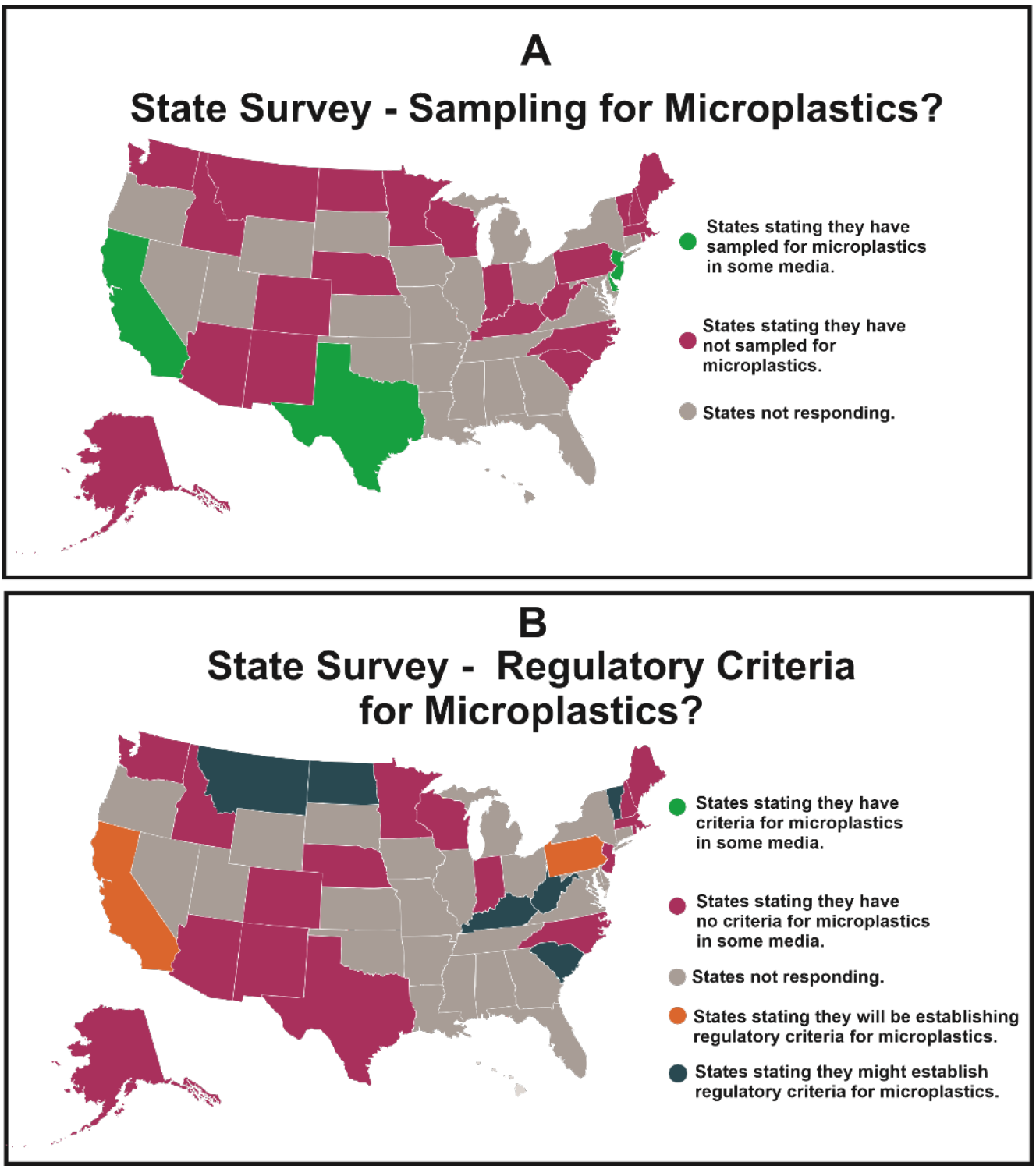


Figure 5-1. Summary of Key Responses from the ITRC State Survey (2021).
Source: MP Team

The state-of-the-science for MP is growing at a very rapid pace and is expected to lead to development of MP regulations in more states as the risks associated with MP are better understood. As such, there may have been regulatory updates since the time the survey was conducted. The tables provided in Sections 5.2.6 and 5.2.7 contain the regulations and regulatory values available at the time of production of this document. Updates to these tables will be made periodically and can be found on the ITRC website at https://mp-1.itrcweb.org/appendix-c/#ctables.

5.2 Overview of Legislation and Regulatory Programs

In the United States, federal, state, and local regulations for MP are virtually nonexistent even though MP have been found in all components of our environment and in select human tissue samples (lungs and placenta, see Section 4.5), although some initiatives and regulations exist to limit or eliminate intentionally added MP in consumer products (for example, microbeads in some cosmetic products). The ubiquity of plastic pollution and secondary MP contamination make regulations challenging.

Furthermore, complicating the effort is the myriad of chemical formulations of plastics, the use of additives (colorants, plasticizers, etc.) to plastics, and the wide size range of MP source particles. Because of these difficulties, efforts by state, city, and county regulators largely focus on policies that reduce use, reuse, recycle, and dispose of plastics. These policies have focused on banning single-use plastics (bags, straws, etc.), requiring recycling programs, or imposing taxes on plastic products. Many states have bolstered recycling efforts and the states of Maine (H.P. 1146 – L.D. 1541) and Oregon (SB 582) have imposed a recycling mandate. Though those policies do not specifically address MP, they aim to reduce macroplastics in the environment, which will ultimately reduce the amount of MP generated.

Appendix C, Table 1—Regulatory Programs and Legislation tracks and highlights emerging MP regulation and policy development (see Section 5.2.5). A discussion of some of the more significant regulations is provided below.

5.2.1 Federal Regulations

Federal regulations specifically addressing MP include the Microbead-Free Waters Act of 2015. This law prohibits the manufacturing, packaging, and distribution of rinse-off cosmetics containing plastic microbeads and defines microbeads as 5 millimeters or less in size. In 2020, the Save Our Seas Act 2.0 (SOS 2.0) was signed into law. Although not directly pertaining to MP, SOS 2.0 provides grant funding for new research, a microfiber report to Congress, and the development of a microfiber pollution prevention strategy.

The Clean Water Act Tools for Trash provides regulatory tools at the state and local levels to address trash in U.S. waterways, including Municipal Separate Storm Sewer Permits, 303(d) Listings for Trash Impairment, Total Maximum Daily Load for Trash, and NPDES Stormwater Permits for Trash.

On March 8, 2022, Congress passed the bipartisan Infrastructure Investment and Jobs Act. This law gave the U.S. Environmental Protection Agency (USEPA) $50 billion to invest in the nation’s drinking water and wastewater. The USEPA issued memorandum Implementation of the Clean Water and Drinking Water State Revolving Fund Provisions of the Bipartisan Infrastructure Law that includes funding for MP. Microplastics are specifically listed as an emerging contaminant. Appendix B provides the Clean Water State Revolving Fund definition of microplastics/nanoplastics: “synthetic solid particle or polymeric matrix, with regular or irregular shape and with size smaller than 5 mm, of either primary or secondary manufacturing origin, or larger plastic materials that degrade into smaller pieces, including from tire wear (such as 6PPD), which are insoluble in water. Primary MP include particles produced intentionally of this very small dimension, like preproduction pellets used as an intermediate in plastic production, microbeads for abrasive functions or microfibers that form from synthetic textiles” (USEPA 2022b).

5.2.2 State Statutes and Regulations

As of early 2022, there are four major state statutes regarding MP.

The first is California SB 1422 (State of California 2018b), which requires the State Water Resources Control Board (SWRCB) to adopt regulations requiring annual testing for, and reporting of, the number of MP in drinking water, including public disclosure of those amounts. SB 1422 also requires adopting a method for analyzing MP. On September 28, 2021, the SWRCB published documents providing acceptable analytical methods using Raman spectroscopy (CA SWRCB 2021b) and infrared spectroscopy (CA SWRCB 2021a). Appendix A.1 summarizes California approach to MP.

The second, also in California, is SB 1263, Ocean Protection Council: Statewide Microplastics Strategy (State of California 2018a), directing the state’s Ocean Protection Council to develop, adopt, and implement a statewide microplastics strategy to build greater understanding of the risks of MP in the marine environment. The Statewide Microplastics Strategy was adopted by the California Ocean Protection Council on February 23, 2022, with recommended early actions and research priorities to inform future management actions to address MP pollution in California. The statute requires the council to return to the legislature with additional findings and recommendations in 2025 (California Ocean Protection Council 2022).

The third major action is from Maine, where H.P. 1146 – L.D. 1541 was signed into law (State of Maine 2021). This law requires plastic “producers” to pay for recycling of, be responsible for, and steward their product. Similar legislation has recently passed in Oregon and has been proposed in Washington, New York, and California. The Plastic Pollution Prevention and Packaging Producer Responsibility Act (Senate Bill 54, Allen) passed in California on June 30, 2022 (State of California 2022)

Some states have adopted legislation that prohibits local, city, and county governments from issuing regulations regarding usage restrictions and disposal or recycling of plastics and plastic products. Examples include Alabama, which prohibits local

communities from deciding how to manage plastic waste; Mississippi, Idaho, and Wisconsin, which prohibit local governments from adopting requirements restricting use or sale of plastic bags, cups, bottles, and other packaging; and Montana, which prohibits local governments from adopting or enforcing ordinances regulating the use or sale of auxiliary containers (bags, bottles, restaurant containers, etc.).

Many states and territories have adopted regulations on plastics regarding single-use bags and disposable restaurant utensils and containers. Over 14 states, six territories, and the District of Colombia regulate the use and recycling or impose fees on such products.

Meanwhile, several states have enacted regulations regarding use of microbeads in personal care products (Colorado, California, Connecticut, Illinois, and Wisconsin) and the storage and handling of plastic resin pellets or powdered coloring for plastics (California and South Carolina).

Most of the regulatory measures do not address MP directly; however, they have a common goal of trash reduction, which in turn will reduce plastics in the environment that could break down to MP.

5.2.3 Tribal Regulations

No specific tribal MP regulations have been enacted prior to publication of this guidance. That is mainly because many tribal entities use the USEPA tribal regulations for Indian Country. USEPA allows tribes to administer their own regulatory programs. Funding for this is provided through the Indian Environmental General Assistance Program. See Tribes and EPA: 50 Years of Environmental Partnership (USEPA 2021a).

Many tribes have initiated plastic reduction strategies, single-use plastic bans, and marine debris cleanups. Through USEPA Environmental Justice Small Grant funding, the Sitka Tribe of Alaska investigated MP content in traditional subsistence foods. Coastal villages have active marine debris, derelict fishing gear, and seaborne waste cleanup and recycling programs. The Aleut Community of St. Paul Island has initiated the Pribilof Islands Marine Ecosystem for Tribal Co-Management and Indigenous-Led Research and Economic Development that looks to prevent MP pollution in the form of marine debris pollution prevention (Aleut Community of St. Paul Island 2021).

5.2.4 International Regulations

Many of the countries belonging to the European Union (EU) are considering restrictions on MP under the program for Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). The action focuses primarily on restrictions in products, and some countries have also implemented initiatives at a local level. More detailed information is available at the European Commission–Environment web page (European Commission 2022). In addition, the United Nations Environment Assembly of the United Nations Environment Programme has adopted resolution 5/14 to end plastic pollution (United Nations Environment Assembly 2022).

Canada is the first known country to list plastics as a toxic substance. In April 2021, Canada added plastic manufactured items to their Schedule 1—List of Toxic Substances to the Canadian Environmental Protection Act, 1999 (Government of Canada 2021).

Numerous other countries and regions have planned, enacted, and implemented various types of actions regarding plastics, including MP. Many of these publications can be found on the United Nations Environment Programme web page (UNEP 2022b). As an example, a 2021 draft report by the UN (Policies, Regulations and Strategies in Latin America and the Caribbean to Prevent Marine Litter and Plastic Waste) details actions being taken by at least 27 of the 33 countries that make up Latin America and the Caribbean to reduce plastic waste and trash in the ocean environment. These actions do not specifically deal with MP, but mostly reducing the use of single-use plastics and general plastics that are the precursors to MP in the environment (UNEP 2021b). For additional regulatory actions, please see Appendix C.

5.2.5 Microplastics Classifications Used in Regulatory Programs

MP are classified and described in many ways in the various regulatory programs and legislation, which are designed to deal with various aspects of plastics and MP. These aspects include, but are not limited to, the definition of MP, use of MP in consumer products, use and handling of plastic resin pellets (also known as nurdles) used in making plastic products, single-use plastic consumer products, recycling of plastics, solid waste disposal, and the effects on waste streams for municipal wastewater and industrial wastewater treatment facilities. The regulation of MP falls into two broad categories—one being the intentional use of MP in products and the other being the use, waste streams produced, and recycling of the more inclusive category of plastics. The majority of issues surround plastics in general and not specifically MP. The restrictions

placed on the use, disposal, and recycling of plastics will have an impact on the amount of MP that are found in the environment.

5.2.6 Regulatory Programs and Legislation

Appendix C, Table 1 provides a programmatic listing of the federal and state regulations that have passed. The table also includes general international laws and regulations on MP. Table C-1 summarizes an initial search of environmental agencies and legislatures for all 50 states and seven U.S. territories and the results of the state survey discussed in Section 5.1. The search results included guidance and regulatory programs covering any aspect of MP sources, products, waste, etc.; requirements for best management practices and best available technologies regarding MP that may have been established by the states; and similar programs from other countries.

MP are an emerging contaminant. Knowledge on sources, toxicity, mobility, occurrence, and treatment is in the early stages of development with information expanding rapidly, so the development of regulations and standards may become more widespread. As such, the tables in Appendix C (Section 5.2.7) are periodically updated. These updated tables can be found at the ITRC website https://mp-1.itrcweb.org/appendix-c/#ctables.

Table C-1 is divided into four tabs. The first two tabs provide MP regulations developed and enacted in the United States by state or federal agencies and the third tab provides MP regulations adopted in other countries. The fourth tab provides examples of regulations that primarily focus on macroplastics and is not intended to be comprehensive. Macroplastic releases are a significant source of MP in the environment.

A summary of the information provided in Appendix C is as follows:

- Sixteen states (Alaska, Arizona, Arkansas, Iowa, Kansas, Kentucky, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Pennsylvania, South Dakota, Utah, and Wyoming) currently have no MP regulation.
- Five states (Idaho, Mississippi, Montana, North Carolina and Wisconsin) enacted legislation limiting the ability of local government to impose restrictions on MP or use of plastics.
- Thirty-nine states have enacted regulations or legislation regarding primary MP or single-use plastic bans.
- Seventeen states (Colorado, Connecticut, Delaware, Georgia, Hawaii, Illinois, Maine, Maryland, Massachusetts, New Jersey, New York, Montana, Rhode Island, Tennessee, Vermont, Virginia, and Washington) and all U.S. territories (American Samoa, District of Columbia, Guam, Northern Mariana Islands, U.S. Virgin Islands, and Puerto Rico) have enacted some form of plastic (bags, straws, Styrofoam, etc.) ban. This is the most widely reported consumer product legislation.
- Six states (California, Colorado, Connecticut, Illinois, South Carolina, and Wisconsin) have enacted primary MP regulations aimed at phasing out microbeads.
- Six states (Illinois, Louisiana, Michigan, Minnesota, Missouri, and Washington) have enacted legislation aimed at bolstering plastic recycling, with two states, Maine and Oregon, making it the financial responsibility of producers.
- Five states are trying to address water and wastewater MP pollution. California is the most active state and the only state at this time to have MP regulations on these issues.
- Connecticut is addressing microfiber contamination.
- Hawaii and Louisiana are addressing plastics as contaminants in wastewater.
- Texas is considering regulating both point and nonpoint sources of preproduction plastics, and South Carolina is looking at regulating MP in stormwater.
- Florida is attempting to address cleanup of MP in both the aquatic and terrestrial environment.
- No states are currently directly addressing MP atmospheric emissions. There are general air pollution control standards in most states that limit discharge of particulates based on size of particle, but they are not plastic-specific.

5.2.7 (Appendix C)—Regulatory Standards and Criteria Values

A compilation of current regulatory standards and criteria for MP is provided in Appendix C. Standards for MP may be based on mass per volume (for example, mg plastic/L) or density (for example, number of particles/L). The intention of this compilation is to assist readers and users with following the development of numeric guidelines for MP in the environment for water (for example, drinking water, surface water), solid phase media (soils, sediments, biosolids), and air. As of the

initial completion of this document there are no established regulatory criteria or standards for MP. Once values are established for protection of human health as well as ecological receptors in the aquatic and terrestrial environments, Table C-2 in Appendix C will be added as a repository for those values.

As of the date of publication of this document, no numeric values with regulatory standing were identified in online searches and outreach efforts (discussed in Section 5.1) to federal and state regulators in the United States. Some preliminary risk-based screening levels have been proposed in the academic literature. California has also developed a process to determine health-based thresholds for MP and has calculated threshold values for the protection of aquatic biota. These values are being used in establishing 303d listings of impaired water bodies for that state. This approach has yet to undergo technical review and has no regulatory or enforcement authority at this time (Mehinto 2021).

The reader is cautioned that the contents of the table are current only as of the date of entry and are provided by ITRC only for general informational and educational purposes. Standards may change rapidly; therefore, the user is strongly encouraged to confirm the entries by using the associated references and provided links. ITRC may decide to maintain and update this table on a regular basis.