



Findings of the 2024 Biennial ERIS Survey on State Environmental Agency Research Needs

Introduction

The Environmental Research Institute of the States (ERIS) conducts biennial surveys of state and territorial (hereinafter, state) environmental agency research needs to identify key research priorities and to support the U.S. Environmental Protection Agency (EPA)'s Office of Research and Development (ORD) with research planning. ERIS conducted its sixth biennial survey in Fall 2024. 46 states, two territories and the District of Columbia responded to the survey, the largest number of respondents to an ERIS state research needs survey to date.

Process

State environmental agency leaders were asked to identify their top research needs in each of five categories: per- and polyfluoroalkyl substances (PFAS); air, adaptation, and energy; water; land and materials management; and chemicals and contaminants. In each category, respondents could select from a provided list of issues, as well as "other" to write in a research need not listed. Respondents also provided a point of contact for a subject-matter expert in their state who could provide additional details.

ERIS staff then followed up with the state agency staff and subject-matter experts to gather more details on state needs. To do this, ERIS held five calls, one for each category. Each call was open to all states that had selected one of the top two identified priority issues for that category. For instance, in water, the top two selected issues were nonpoint source nutrient reduction and wastewater treatment technologies for difficult pollutants. A call was organized to hear from states that selected either of these issues. Staff and scientists from ORD joined these five calls to hear directly from states and to ask clarifying questions as needed. ERIS staff also followed up with states who had selected other priority issues to gather more information about research that would help address their needs.

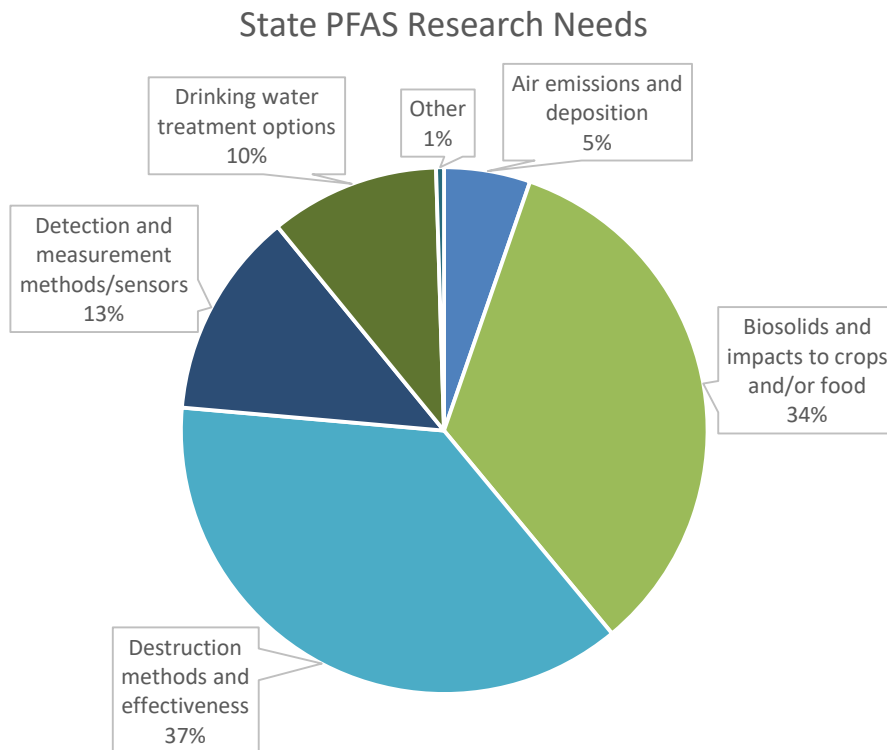
Information gathered from the survey and follow-up conversations is compiled below.

Summary of State Research Needs Across Environmental Media

The pie charts below reflect the percentage of ECOS members that identified each issue as their top priority for additional research in each category. Greater specificity on these research needs were gathered through follow up discussions with state agency staff, and are provided following this summary section.

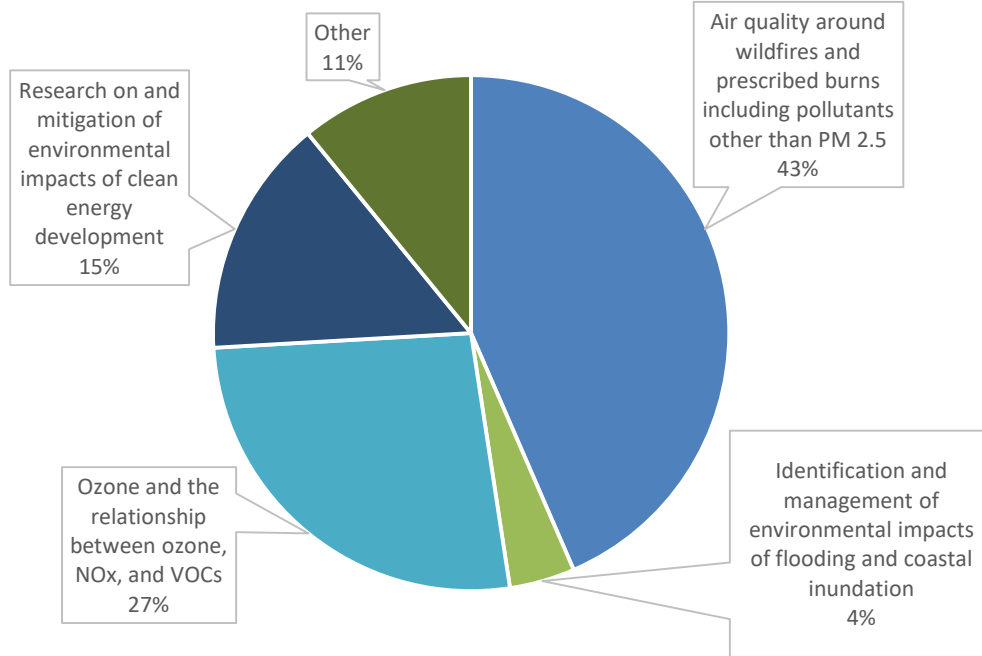
Most states indicated that more research on either *destruction methods and effectiveness* or *biosolids and related impacts to crops and/or food* would be most helpful. This could include additional research on incineration, disposal and reuse for drinking water treatment media, waste management, and other areas expanded on below. 13 percent of states would like more research on *detection and measurement methods/sensors*, including detection methods that are rapid or can be used in the field, and 10 percent

of states would like assistance with *drinking water treatment options*, especially ones that are affordable and effective for small drinking water and wastewater systems. The state that selected *other* identified its top PFAS research needs as the development of PFAS criteria for fish and wildlife, toxicity reference values, methods for estimating cumulative impacts, PFAS and replacement chemical technology, and PFAS fate and use.



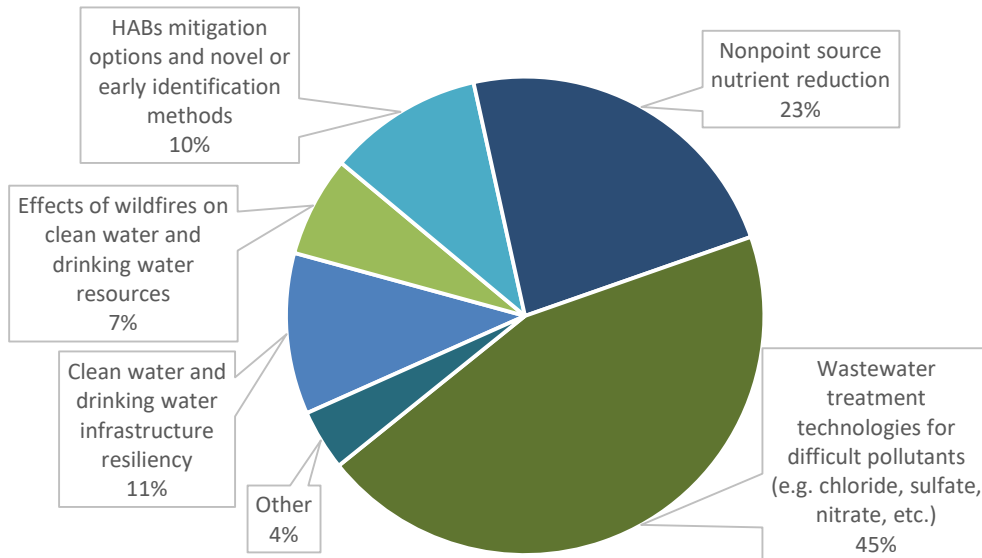
In the Air, Adaptation, & Energy section of the survey, almost half of state respondents said that more research on *air quality around wildfires and prescribed burns, including pollutants other than PM 2.5*, would be most helpful. A couple of states noted that information to help determine the impact of exceptional air quality events, such as impacts from out of state wildfires, would be useful. 27 percent of states prioritized *ozone and the relationship between ozone, nitrogen oxides (NOx), and volatile organic compounds (VOCs)*, and 15 percent of states selected *research on and mitigation of environmental impacts of clean energy development* as a priority, including one state that specified that research on clean energy development impacts is helpful, especially as PFAS are used in large-scale batteries and energy storage systems. The states that selected *other* noted that some helpful research areas in this category include wood stove testing resources; climate vulnerabilities and impacts; the implementation and use of advanced monitors, sensors, and technologies; improved area source emission factors; air emissions and deposition of PFAS; and assistance monitoring major sources of air quality impacts, particularly the use of private generators. One state indicated that they do not need additional research on air, adaptation, and energy issues.

State Air, Adaptation, & Energy Research Needs

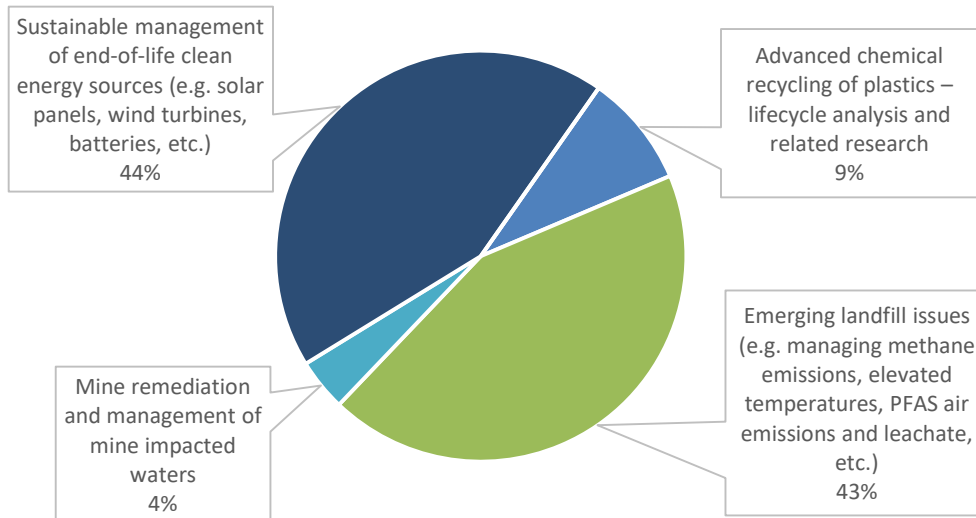


Nearly half of states indicated that *wastewater treatment technologies for difficult pollutants (e.g., chloride, sulfate, nitrate, etc.)* would be the most helpful area for additional water research. 23 percent of states selected *nonpoint source nutrient reduction*. The two states that selected the *other* category said that exposure studies on fish consumption and sampling protocols for microplastics in surface and/or ambient waters would be most helpful.

State Water Research Needs

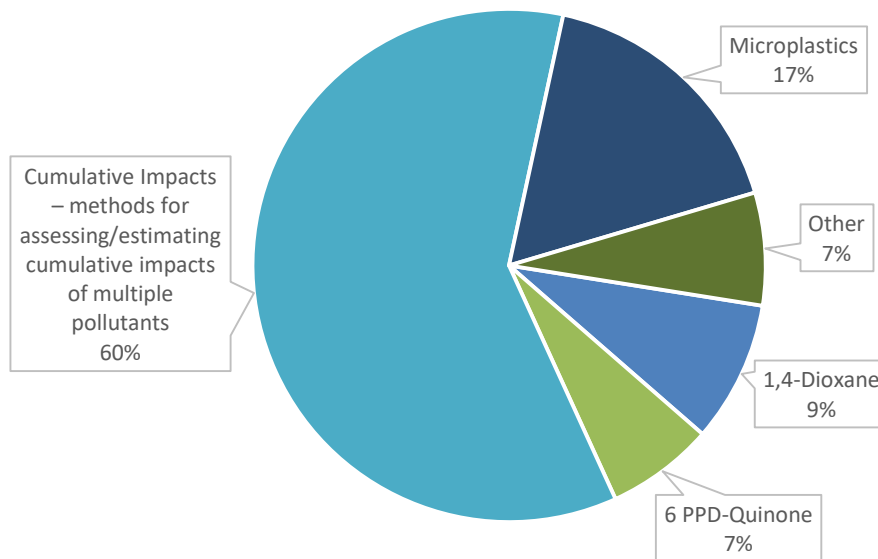


State Land & Materials Management Research Needs



For the Land & Materials Management question, the majority of states selected either *sustainable management of end-of-life clean energy sources (e.g., solar panels, wind turbines, batteries, etc.)* or *emerging landfill issues (e.g., managing methane emissions, elevated temperatures, PFAS air emissions and leachate, etc.)* as the most pressing research need. A territory that selected *emerging landfill issues* specifically noted their interest in incineration technologies for remote island landfills. No state selected the *other* category for this section of the survey.

State Chemicals & Contaminants Research Needs



The majority of state respondents selected *cumulative impacts – methods for assessing/estimating cumulative impacts of multiple pollutants* as the top research need in the Chemicals & Contaminants

section of the survey. 17 percent of states selected *microplastics*, while only nine percent and seven percent of states chose *1,4-Dioxane* and *6 PPD-Quinone*, respectively. Seven percent of states selected *other*, which they specified as needing research on produced water, PCBs in indoor air, and the risks of pollutants known to affect drinking water sources. One state indicated that they do not need additional research on chemicals and contaminants.

The next section of this report provides details from ECOS' conversations with state environmental agency staff, which aimed to gather more information on each of the priority areas ranked by their directors.

Details on PFAS Research Needs

As PFAS continues to be a significant issue for states, it was not included in the chemicals and contaminants question. Instead, it was addressed with its own question in the initial survey. In follow-up conversations, states identified numerous areas for additional research which are outlined below.

- States seek additional **PFAS detection resources** including:
 - Methods for identifying total PFAS in various media,
 - Methods for identifying total PFAS from different sources, including landfill gas emissions,
 - Methods for detecting ultrashort-chain PFAS,
 - Field test methods for PFAS in water, even if they only measure total PFAS,
 - Methods for detecting PFAS in porous, manmade materials like concrete,
 - Easy, efficient, and cost-effective methods for testing for PFAS in food packaging and consumer products,
 - Development of more reference doses and slope factors for the PFAS that are analyzed in methods like 1633,
 - Development of a screening standard for PFAS in biosolids and in soil.
- States request more research into **PFAS sources** including:
 - Quantification of the risks from PFAS in different products,
 - Information on industries that use PFAS, aimed at identifying usage levels and possible releases to the environment,
 - Identification of emissions sources, including sewage sludge incinerators,
 - Data on how much PFAS is sorbed into concrete or asphalt through firefighting training and similar activities,
 - Identification and quantification of PFAS emissions associated with burning lithium-ion or other PFAS-containing batteries in vehicle or other fires.
- States ask for more **toxicological information on PFAS** including:
 - The toxicology of short- and ultrashort-chain PFAS,
 - Environmental and human health impacts of the total PFAS,
 - Human health impacts of airborne exposure to PFAS,
 - The toxicity, fate, and transport of PFAS common in the oil and gas industry and their potential presence in drinking water sources.
- States seek research on **PFAS in private drinking water wells** including:
 - The rate of occurrence of PFAS in domestic use wells,
 - The effectiveness of point-of-use filters for private wells,
 - Whether PFAS found in drinking water wells originates from materials used to rehabilitate wells, the systems used to deliver water to the surface, or groundwater and surface water contamination.
- States would like additional information on **PFAS emissions** including:
 - The relative contributions of different sources of PFAS in air,
 - How to monitor PFAS in landfill gas, including which types of landfills are most likely to have PFAS in landfill gas emissions,
 - Where to monitor PFAS vapor intrusion,

- The impact of PFAS emissions on vulnerable communities.
- States request additional research on **PFAS management and destruction** including:
 - Removal and destruction methods for ultrashort-chain PFAS,
 - Treatment options for PFAS in biosolids,
 - Effective control technologies for PFAS air emissions at industrial facilities,
 - The efficacy of different PFAS destruction technologies,
 - The scalability of various PFAS management and destruction technologies,
 - Treatment options that destroy PFAS rather than converting them to shorter-chain PFAS,
 - Information on whether PFAS in landfill gas are transformed or destroyed when flared or burned at a landfill gas-to-energy facility.
- States ask for information related to other **landfill challenges related to PFAS** including:
 - Potential groundwater impacts from PFAS at legacy and unlined landfills,
 - Toxicity Characteristic Leaching Procedure (TCLP) analyses to help establish landfill leachate limits,
 - The amount of PFAS-contaminated granular activated carbon from drinking water treatment plants sent to landfills.
- States seek additional research related to **PFAS in biosolids** including:
 - The fate and transport of PFAS in land-applied biosolids,
 - How past biosolids applications impact PFAS in soil and groundwater,
 - The impact of biosolids application on the concentration of PFAS in soil,
 - The concentration of PFAS in soils and crops that causes adverse environmental or human health effects,
 - Development of additional data to assess alternative ways to handle and treat biosolids,
 - Whether drying and/or heating biosolids to reduce mass affects the concentration of PFAS in the biosolids, as well as the presence of PFAS in the water removed or air emitted during the process.
- States request research to understand the **PFAS impacts of land application** of various materials as nutrient sources including paper sludges, tannery waste, and other substances.
- States seek additional research on **PFAS uptake** by crops from soil and water, and by animals from crops and water.
- States would like assistance with **PFAS health risk messaging** for:
 - Home gardeners who might purchase compost made from biosolids, paper pulp, or other PFAS-containing materials,
 - Fish consumption advisories tied to low detections of PFAS that consider the general health benefits of fish consumption and the relative risks of the additional PFAS exposure.
- States request additional information on **alternatives to aqueous film-forming foam (AFFF)** including effective, low-cost, fluorine-free options, and on the persistence and toxicity of shorter-chain alternatives.

Details on Air, Adaptation, & Energy Research Needs

States would like additional research on air, adaptation, and energy-related topics, details for which are outlined below.

- States request additional research related to **wildfire smoke impacts on air quality** including:
 - The impacts of wildfire smoke on ozone levels,
 - Multipollutant smoke profiles for wildfires and prescribed burns,
 - The impacts of domestic and international wildfire smoke,
 - The variation of wildfire emissions composition due to fire intensity and whether the burned area is at the wildland-urban interface or in more remote wildlands.
- States would like research to assist them with **wildfire smoke measurements** including:
 - Identification of a meaningful proxy for wildfire smoke for calibrating particulate matter (PM) sensors,
 - In-depth accuracy analyses on federal reference method/federal equivalent method (FRM/FEM) instrumentation at high pollution levels,
 - Quantification of the interference of wildfire smoke with UV photometric ozone analyzers,
 - A data correction algorithm for the T640x PM monitor to better account for smoke bias, especially in airsheds that are heavily impacted by both prescribed fires and wildfires,
 - How to use remote sensing data to inform smoke forecasts including light detection and ranging (LiDAR) data, data from ceilometers, and doppler LiDAR wind measurements.
- States seek research related to **prescribed burns** including:
 - The differences in emissions between prescribed fires and wildfires,
 - The long-term, multi-year emissions changes from prescribed burns that help prevent future wildfires,
 - Potential public health impacts of prescribed burns that may not be identified through the National Ambient Air Quality Standards (NAAQS) because of the short duration of air quality impacts.
- States request assistance with **public communications related to smoke** including:
 - Why instantaneous high PM and ozone readings do not trigger NAAQS violations and the differing impacts of very-short-term and longer-term high pollution levels,
 - How to explain the differing impacts of prescribed fires and wildfires,
 - How to encourage consideration of multiple air pollutants from wildfires including formaldehyde and other toxics.
- States seek **defensible emissions estimates for wildfires** that can be used in exceptional event demonstrations.
- States request studies of how **carbon monoxide concentrations** vary with distance from wildfires to determine if recommended measures and clean air shelters protect the public from carbon monoxide during wildfire events.
- States would like additional research and development to support the **measurement of ozone precursors** including development of:

- A continuous formaldehyde monitoring sensor and approved method,
- A lower cost instrument that detects inorganic ions, especially ammonium nitrate and sulfate,
- A cost-effective, accurate method for collecting ultrafine PM data.
- States request research to improve **ozone modelling** including:
 - Changes to better reflect smoke impacts on ozone concentration and long-range transport of smoke from wildfires,
 - Characterization of the ozone reductions that occur as a result of VOC emissions reductions,
 - Studies of NO_x emissions around airports and warehouses to enhance emissions inventories used in ozone models,
 - Studies of formaldehyde emissions at industrial facilities to enhance emissions inventories used in ozone models,
 - Studies of solvent and other volatile chemicals emitted from products to enhance emissions inventories used in ozone models,
 - Better characterization of trans-Pacific ozone transport and changing emissions in Asian countries,
 - Predictions of how actions to address climate change, like carbon dioxide reductions, indirectly impact ozone concentrations,
 - Accounting for how events like wildfires and extreme heat impact ozone levels outside of exceptional events,
 - A review of the artificial dilution of NO_x from coarse resolution models that impact the prediction of VOC sensitivity in urban cores.
- States ask for additional research on the **chemistry of ozone formation** including:
 - Summertime ozone chemistry and sources,
 - The impact of carbon monoxide on ozone levels,
 - The chemistry of NO_x recycling to reactive nitrogen reservoirs, including organic and inorganic compounds.
- States would like additional research on **biogenic ozone** including:
 - Background biogenic ozone levels,
 - The impacts of increasing temperatures on biogenic emissions,
 - How biogenic VOCs, including terpenes and 2-methyl-3-buten-2-ol (MBO), impact ozone levels.
- States seek additional information on the **co-benefits** of NO_x and VOC reductions in reducing **regional haze**.
- States request research related to **solar panels** including:
 - Identification of best management practices (BMPs) for stormwater management at solar arrays and solar canopies,
 - Determination of the ideal slope of panels for water management,
 - Identification of any long-term impacts to soil health and the environment from siting solar arrays on farming soils, including any potential deposits of contaminants into the soils from solar panels,
 - Identification of any ecological or human health impacts due to the noise from solar inverters.
- States ask for additional studies related to **wind turbines** including:

- The environmental and human health and safety risks from offshore wind turbine blade failures, like what occurred at Martha’s Vineyard in 2024, including risks to shellfish,
- The impacts of offshore wind turbines on whales and how to mitigate those impacts.
- States seek Information on the proper management and disposal of **geothermal heat pump solutions**, especially those containing PFAS.
- States request research on how to put out **lithium-ion battery fires** with the least amount of environmental damage.
- States would like additional research on the **environmental and human health impacts of increasing low carbon energy generation** including:
 - Identification of avoided harm and how to link it to clean energy,
 - A comparison of siting solar arrays on brownfields and landfills versus other activities at those sites,
 - A comparison of the environmental impacts of waste-to-energy, composting, and landfilling,
 - Information on the ecological, environmental, and human health impacts of new nuclear generation, such as the impacts of thermal pollution from cooling water.
- States request research related to **flooding and coastal inundation** including:
 - Development of data and models for compound flooding impacts when there is both riverine flooding moving downstream and seawater being pushed upstream,
 - Development of models of standing water quantities and locations resulting from flooding events,
 - Studies of the ecological impacts of thin-layer beneficial use of dredge material, specifically whether this method can benefit ghost forests, similar to its use in raising marshes.
- States request the development of a new **integrated duty cycle test method for wood stoves** that avoids the issues identified with the current test method and includes correction factors for different woods, varying moisture content, different elevations, and varying ambient temperatures.
- States seek more information on air emission factors and estimates for **criteria pollutants and hazardous air pollutants** related to roads, including how to mitigate this pollution.
- States would like information to help them **address extreme heat** including:
 - How to prioritize siting of shade sources to best address urban heat island health impacts,
 - The trade-offs between increased energy consumption with additional air conditioning use and improved health outcomes from providing air conditioning in extreme heat.
- States seek additional studies and health impact data related to **uranium** mining/uranium ore in Gallup, New Mexico and **nuclear weapons**-related work in White Sands, New Mexico.

Details on Water Research Needs

States would like additional research on several water topics, details for which are outlined below.

- States request research on **wastewater treatment technologies to address sulfate, perchlorate, and chloride** including:
 - Cost-effective treatment options in both domestic and industrial wastewater systems,
 - Options for source reduction of chloride,
 - BMPs for managing solids when they cannot be discharged to surface water or injected into groundwater.
- States would like additional research on potential **mining impacts on wastewater treatment systems**.
- States seek information on **BMPs for nonpoint source nutrient reduction** including:
 - The impacts of intensifying rainfall events and other climate changes on the effectiveness of various BMPs,
 - Which BMPs are best in which situations,
 - Better models of regionally-appropriate BMP efficiencies,
 - BMP performance over time for better planning.
- States request the development of a **nutrient loading tool** that helps states connect ecosystem services and economics.
- States ask for research on the **impacts of nutrients on lake water quality** to inform their development of water quality standards.
- States seek additional support for **identifying harmful algal blooms (HABs)** including:
 - Development of real-time bloom prediction technologies with fine resolution that identifies less dense blooms,
 - Information on how states can better utilize satellite data and remote sensing technologies,
 - Creation of tools for assessing microcystin in larger lakes,
 - Information on the use of quantitative polymerase chain reaction (qPCR) to identify what algal species have the gene responsible for cyanotoxin production,
- States request information on **cyanotoxins** including:
 - A full risk assessment of various cyanotoxins including anatoxin-a,
 - More details on what causes algae to produce cyanotoxins,
- States would like additional information on the **management and mitigation of HABs** including:
 - How HABs are contributing to benthic loads in rivers and streams,
 - Time-effective methods for mitigating risks of HABs,
 - Factors, other than nutrients, that negatively impact bloom mitigation efforts.
- States request research on **wildfire impacts on drinking water sources** that provides information on the correlation between post-wildfire erosion and nutrients in downstream water bodies.

- States ask for the development of a **tool that predicts toxics in downstream drinking water resources** during or after a fire that impacts manmade structures, such as wildfires at the wildland-urban interface or fires in developed areas.
- States request research into **biosolids** including:
 - Identification of BMPs that consider microplastics mobilized from land-applied biosolids by rainfall and other events,
 - Development of a tool that considers the potential risks to groundwater and air from all biosolids constituents,
 - Development of life-cycle assessments of the different end-of-life options for biosolids that consider nutrients, microplastics, pharmaceuticals, PFAS, and other chemicals regularly found in biosolids.
- States seek additional tools, beyond microscopic particulate analysis, to assess the **influence of surface water** on a groundwater source to aid in efforts like spring construction.
- States request research into whether and how **produced water** from oil and gas activities can be used to augment water resources including:
 - Identifying likely constituents of concern in produced water and then conducting toxicity assessments,
 - Developing test methods for any constituents of concern in produced water.
- States would like additional research on the causes and impacts of the **rusting of rivers**.

Details on Land & Materials Management Research Needs

States would like additional research on the several land and materials management topics, details for which are outlined below.

- States request studies to assist in planning for the **recovery of critical minerals**, especially lithium and heavy metals, from end-of-life batteries, wind turbines, and solar panels.
- States would like studies to inform **management of solar panels** including:
 - Identification of any hazardous components,
 - Cost-effective recycling options,
 - Development of a database on solar panels to support materials management that includes manufacturer name, model number, type of solar panel, and materials composition,
 - Market share data for solar manufacturers to assist in allocating manufacturer liability for extended producer responsibility efforts.
- States request additional research to support **management of wind turbines** including:
 - Cost-effective recycling options,
 - Other options for disposal of blades besides landfills.
- States seek research related to the **management of lithium-ion batteries** including:
 - The environmental and human health risks associated with black mass from lithium-ion batteries,
 - Technologies to detect lithium-ion batteries in waste to keep them out of landfills.
- States request research on **emerging landfill issues** including:
 - The fate and transport of landfill gas and its precursors,
 - BMPs, including treatment methods, for landfill leachate,
 - Causes of elevated landfill temperatures,
 - BMPs for limiting reactions in landfills, including solidification of liquid waste streams,
 - Methods for the prevention and early detection of landfill fires, especially those caused by lithium-ion batteries.
- States would like information on how to **add liquids to landfills** to convert them to bioreactors.
- States seek information on **advanced chemical recycling of plastics** including:
 - The viability of depolymerization and repolymerization beyond bench scale,
 - The environmental and human health risks related to solvent depolymerization,
 - The value of advanced chemical recycling compared to traditional mechanical recycling methods.
- States request studies on the **pyrolysis of plastics** including:
 - An assessment of the thermodynamics of pyrolysis and whether or in what instances it produces more energy than it uses,
 - Research on environmental and human health risks of the pyrolysis of waste tires.
- States request research related to **processing medical waste through pyrolysis** including:

- Environmental and human health safety risks, including management of medical waste prior to pyrolysis,
- The potential for associated tar risks and how to monitor them,
- The economic viability of the pyrolysis process.
- States seek additional research related to **mine-impacted waters** including:
 - Effective passive treatment options for long-term, remote operations,
 - Remote water quality monitoring methods for metals and related geochemistry.
- States would like BMPs for inventorying and prioritizing **abandoned mine sites** based on risks to human health and the environment.
- States would like research related to **mining waste materials at mines** including:
 - Critical minerals and other materials that can be recovered from waste rock and tailings of new and old mines,
 - Environmental and human health risks of mining mill tailings.
- States request studies on **climate change and mining** including:
 - Impacts to mining reclamation,
 - Changing environmental and human health risks that could be addressed in permits.
- States request research on how **arctic conditions impact mine remediation** and management of mine-impacted waters.
- States would like studies to inform **specific limits and/or criteria levels for rare earth elements**, specifically praseodymium, lithium, neodymium, holmium, terbium, and dysprosium, as facilities look to mine them.
- States request studies on the **surface water impacts of mines on adjacent waters**, specifically the impacts of small, abandoned uranium mines.

Details on Chemicals & Contaminants Research Needs

States would like additional research on chemicals and other contaminants, details for which are outlined below.

- States request research to support **assessment of cumulative impacts** including:
 - The additive impact of exposure to multiple sources of the same pollutant,
 - Development of a model or framework that helps states consider the risks of exposure to mixtures of chemicals,
 - Methods for considering impacts from multiple media,
 - How to estimate the impacts of natural disasters and other emergencies,
 - How to estimate the impacts of permit limit exceedances.
- States seek studies on the **human health effects of multiple stressors** to identify:
 - Changes in dose response as a result of long-term exposure to multiple chemicals,
 - A method to assess non-chemical stressors in combination with chemical stressors,
 - How non-chemical stressors impact dose response.
- States would like research on **microplastics** including:
 - Additional environmental and human health toxicology on the impacts of microplastics considering variations in size and plastic type,
 - The fate and transport of microplastics across different ecosystems.
- States request studies to support **measurement and management of microplastics** including:
 - Development of consistent, comprehensive analytical methods for measuring microplastics across media,
 - Identification of control technologies for microplastics in wastewater and air emissions,
 - Development of information that quantifies microplastics escaping landfills into groundwater or nearby soil, through leachate, stormwater runoff, or methane emissions.
- States seek **microplastics exposure** research including:
 - The relative source contributions of different microplastics exposure routes,
 - Exposure from indoor air and dust,
 - Development of a comprehensive risk assessment tool for multiple exposure pathways,
 - Identification of any differences in microplastics in well water in rural areas due to the lack of municipal solid waste management.
- States request **research on 1,4-dioxane** including:
 - Development of a National Environmental Laboratory Accreditation Program (NELAP)-approved soil sampling method,
 - Development of methods for identifying plume boundaries at low concentrations,
 - Work to combine air dispersion and human health risk assessment models into a single model,
 - Assessment of whether 1,4-Dioxane should have a wastewater discharge mixing zone due to its bioaccumulation.
- States request **technical assistance to address 1,4-dioxane** including:

- On the use of standard methods, including EPA Method 8260, to measure 1,4-dioxane in the environment,
 - In support of setting site-specific limits,
 - In support of setting wastewater permit limits.
- States seek information on whether any of the following are **sources of 6 PPD-Quinone** contamination:
 - Large, abandoned tire sites,
 - Landfills with waste tires and their leachate,
 - Airplane tires,
 - Shredded tires used as mulch,
 - Waste tires used to build dams or stream crossings,
 - Waste tires used in asphalt to build roads,
 - Tire incineration.
- States request additional research on the **fate and transport of 6 PPD-Quinone** including:
 - The terrestrial impacts of air deposition,
 - Whether it accumulates in sediments,
 - Whether it accumulates in snow along roadways,
 - Whether 6 PPD or 6 PPD-Quinone react differently in Arctic conditions.
- States would like a simple, inexpensive **test method for 6 PPD-Quinone** in water.
- States request additional information on the **ecological impacts of 6 PPD-Quinone** including:
 - The toxicity of 6 PPD-Quinone on additional U.S. fish species, including cold water trout,
 - Information on whether 6 PPD-Quinone bioaccumulates or biomagnifies in fish,
 - Development of ecological health criteria and ambient water quality criteria for freshwater and saltwater.
- States would like information on the **management of 6 PPD-Quinone** including:
 - BMPs for 6 PPD-Quinone in stormwater runoff from roadways and bridges,
 - Methods for mitigating air deposition,
 - Details on the use of vegetative buffers, including optimal size and plant types, and whether the vegetation takes up 6 PPD-Quinone in a way that impacts the handling of the plant matter.
- States seek research on the toxicity of **metabolites of petroleum breakdown**, specifically more information on the breakdown products after volatile components evaporate.
- States request information on any human and environmental health concerns with **new refrigerants**.