CLEAN WATER

Revolving Fund Grant Formula Could Better Reflect Infrastructure Needs, and EPA Could Improve Needs Estimate

Report to the Committee on Environment and Public Works, U.S. Senate

July 2024
GAO-24-106251
United States Government Accountability Office

Accessible Version

GAO Highlights

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Highlights of GAO-24-106251, a report to the Committee on Environment and Public Works, U.S. Senate
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Revolving Fund Grant Formula Could Better Reflect Infrastructure Needs, and EPA Could Improve Needs Estimate

Why GAO Did This Study

EPA estimates more than $630 billion is needed to repair and replace clean water and wastewater infrastructure nationwide over the next 20 years. To estimate clean water needs, EPA uses a survey of states' planned costs to build or replace infrastructure.

EPA awards grants through the Clean Water SRF program to states, which use them to establish their own SRFs to fund eligible activities. The amount of each state's clean water SRF grant—or allotment—is determined by a statutory formula enacted in 1987.

GAO was asked to review options for the program's allotment formula. This report (1) describes the current formula and how states distribute funds; (2) discusses an expert panel's views on a new formula it developed, and examines the effects on allotments; and (3) examines the extent to which EPA has estimated states' needs. GAO reviewed laws, regulations, and agency documents; analyzed EPA and U.S. Census data; and interviewed EPA officials, state organizations, and officials from eight states selected based on geographic and other factors. GAO also convened a panel of seven experts to develop a formula using a multi-step process.

What GAO Recommends

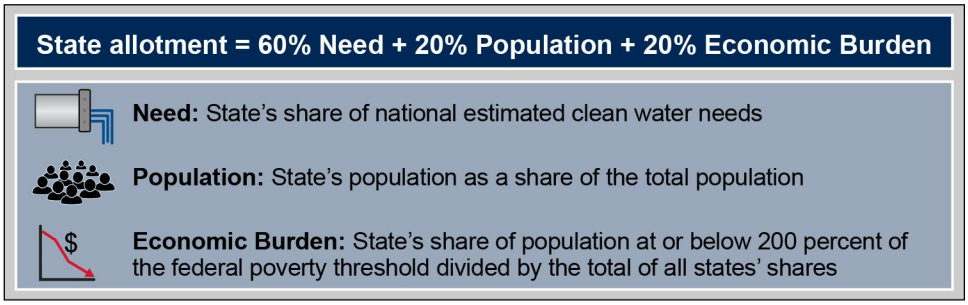
Congress should consider revising the Clean Water SRF allotment formula to align with the goals of the program. GAO is making three recommendations to EPA, including that it work with certain states to assess their needs for the next Clean Watersheds Needs Survey. EPA agreed with the recommendations.

What GAO Found

Under the current Clean Water State Revolving Fund (SRF) program grant formula, the Environmental Protection Agency (EPA) allots a fixed percentage of annual appropriations to each state. From 2019 through 2023, states received annual grants averaging from $6 million to $208 million. States used most of their Clean Water SRF funding for wastewater infrastructure, such as treatment plants and sewer pipes.

A panel of experts convened by GAO agreed on a new formula that emphasizes clean water needs and includes population and economic burden. The experts used GAO's multi-step formula development process to consider how these and other variables align with program goals, including water quality and affordability.

Formula GAO's Expert Panel Developed to Allot Grants for the Clean Water State Revolving Fund Program



Source: GAO; GAO (icons). | GAO-24-106251

Experts also stated that EPA should periodically update the allotment percentages based on current data to reflect changing conditions. However, the law would need to be changed to allow this. Using the expert-developed formula with 2022 data, 31 states would receive the same or higher allotment, up to a 260 percent increase. The remaining 19 states would receive a lower allotment, as much as a 53 percent reduction. According to a 2003 National Research Council report, a formula should be transparent and achieve the goals of the program. Changing the law to require EPA to use a transparent formula that reflects program goals and uses current data could ensure the Clean Water SRF state allotments are and remain aligned with program goals.

While the expert-developed formula would allot a majority of funding based on need, EPA's Clean Watersheds Needs Survey does not fully estimate states' clean water needs. For example, the survey provides incomplete data for projects such as stormwater and nonpoint sources (e.g., those that manage runoff from agricultural lands and lawns). EPA officials told GAO that states do not always have the information to assess these categories of needs. For its 2022 survey, EPA provided tools to help states estimate such needs. For example, states could use the Agriculture Cropland Tool to estimate costs to address polluted water near cropland. However, EPA did not receive estimates for one or more of these categories of need from nine states and the District of Columbia. Targeting help to states that have not provided such estimates could result in more complete estimates.

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Abbreviations

EPA	Environmental Protection Agency
SRF	State Revolving Fund

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

July 19, 2024

The Honorable Thomas R. Carper
Chairman
The Honorable Shelley Moore Capito
Ranking Member
Committee on Environment and Public Works
United States Senate

The Environmental Protection Agency (EPA) estimates that more than $630 billion will be needed nationwide to repair and install clean water and wastewater infrastructure over the next 20 years.[1] For example, these funds will go toward building wastewater treatment plants, replacing sewer lines, and managing stormwater. Maintaining the U.S.'s clean water infrastructure helps protect access to clean water and the quality of the nation's rivers, streams, lakes, and other water bodies.

To help finance these efforts, EPA awards grants to states for the Clean Water State Revolving Fund (SRF) program, which was established in 1987 by amendments to the Clean Water Act.[2] The Clean Water SRF program seeks to achieve the greatest environmental and public health results by improving water quality while ensuring that the SRF funds are used efficiently and maintained in perpetuity, according to EPA.[3]

The Clean Water SRF program is a formula grant program; that is, the grant amount EPA awards each state is determined by a formula, codified in statute.[4] States use this grant, along with a required minimum 20 percent match, to establish a state revolving fund. From the revolving fund, states can make low-interest loans or grants to local communities and utilities. States use these funds to address various clean water needs, such as building or replacing wastewater infrastructure. Loan repayments and interest payments by communities, utilities, and other borrowers to a state's SRF can provide a sustainable source of capital for infrastructure investments (see fig. 1).[5] Since the program's establishment, EPA has awarded about $52 billion in clean water SRF grants, and states have distributed about $172 billion from their revolving funds.

[1]Environmental Protection Agency, *2022 Clean Watersheds Needs Survey, Report to Congress,* EPA-832-R-24-002 (Washington, D.C.: April 2024).

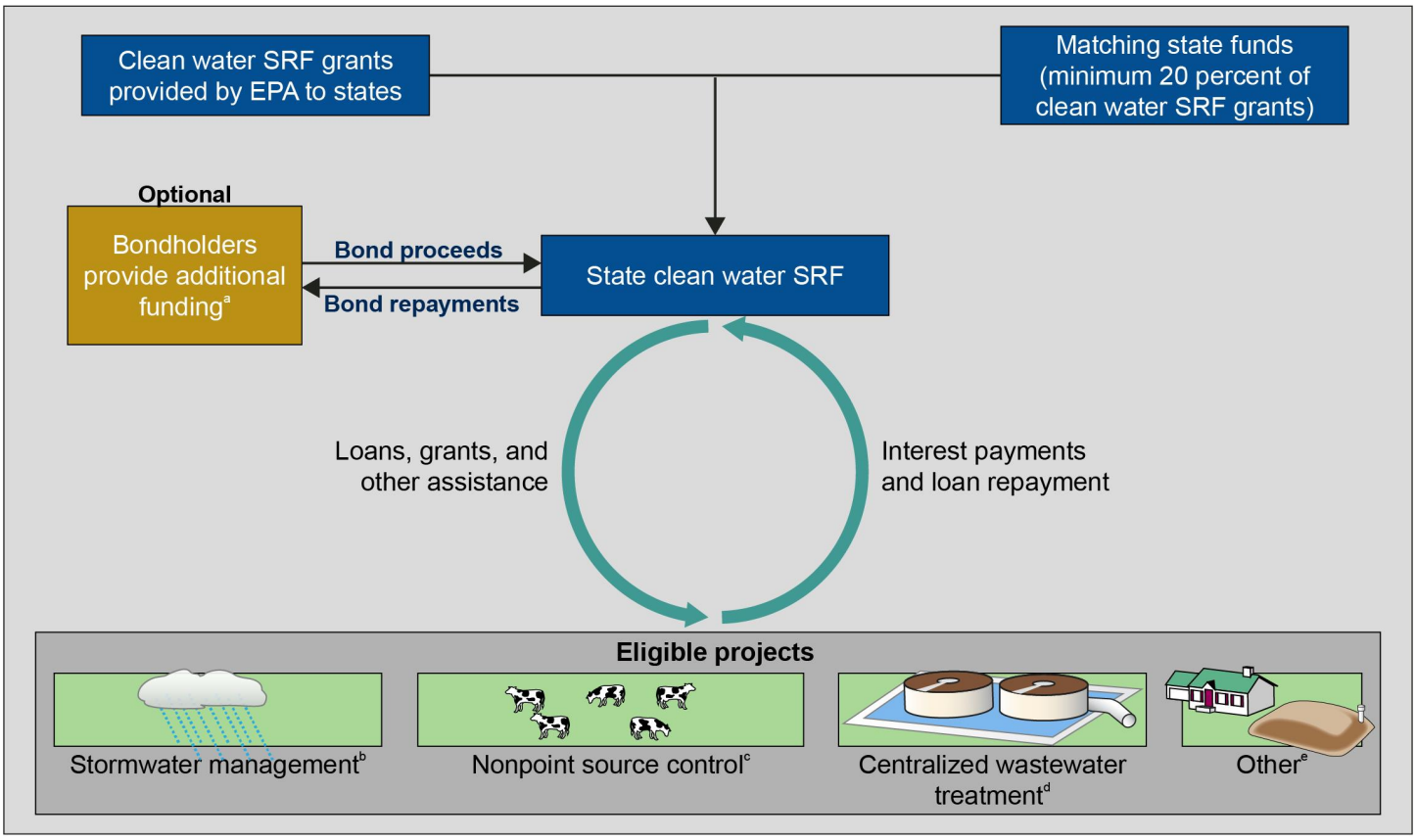
[2]Water Quality Act of 1987, Pub. L. No. 100-4, § 212(a), 101 Stat. 7, 22 (codified as amended at 33 U.S.C. §§ 1381-1387).

[3]Environmental Protection Agency, *SRF Fund Management Handbook*, EPA-830-K-17-004 (March 2018).

[4]Pub. L. No. 100-4, tit. II, § 206(a)(2), 101 Stat. 7, 19-20 (1987) (codified at 33 U.S.C. § 1285(c)(3)).

[5]As we previously reported, the defining feature of a revolving fund is its ability to retain and use ongoing receipts after the initial capitalization. See GAO, *Revolving Funds: Key Features*, GAO-24-107270 (Washington, D.C.: Jan. 17, 2024). Since its inception, annual appropriations have been made for clean water SRF grants. In addition, we reported in 2015 that states use some SRF funds to subsidize borrowing costs, which permanently removes them from a state's program. See *State Revolving Funds: Improved Financial Indicators Could Strengthen EPA Oversight*, GAO-15-567 (Washington, D.C.: Aug. 5, 2015).

Figure 1: Overview of EPA's Clean Water SRF Program



Source: GAO analysis of Environmental Protection Agency (EPA) data and GAO-06-579; GAO (icons). | GAO-24-106251

Note: Loans, grants, and other assistance to eligible projects include low- and no-interest loans and additional subsidies (e.g., principal forgiveness and grants).

[a]As of 2023, 30 states have leveraged their clean water State Revolving Fund (SRF) grants and state matching funds to borrow additional money in the public bond market. Nationally, about 33 percent of the funding in the clean water SRFs is leveraged bonds and 47 percent is loan repayments.

[b]33 U.S.C. § 1383(c)(5). Stormwater management includes gray infrastructure such as construction of stormwater pipes and green infrastructure such as constructed wetlands.

[c]33 U.S.C. § 1383(c)(2). Nonpoint source control includes practices that reduce runoff of pollutants into waterways such as agricultural grazing management and pollution prevention measures for lawns and gardens.

[d]33 U.S.C. § 1383(c)(1). Centralized wastewater infrastructure includes wastewater treatment systems and sewer pipes.

[e]Other includes decentralized wastewater treatment systems. Eligible projects are identified in 33 U.S.C. § 1383(c).

Amendments to the Clean Water Act in 1987 specified the percentage of Clean Water SRF appropriations that each state receives as a clean water SRF grant, known as an allotment. These allotment percentages, which

provide a minimum share of 0.5 percent to each state, have not changed since the program was established, except for minor adjustments by EPA.[6]

State officials and experts, including academics, have stated that the current allotments do not reflect significant changes in clean water needs that have occurred since the program's establishment or help address gaps between needs and communities' ability to pay. Since the Clean Water SRF program was established, state populations and clean water infrastructure needs have grown and shifted. From 1988 through 2022, EPA periodically estimated clean water needs by conducting a state-level survey of communities, wastewater utilities, and other entities for their planned costs to build or replace infrastructure.[7] EPA requested information on large and small communities' needs. We have previously reported that EPA's survey is not required to be a comprehensive estimate of clean water needs and it does not include all projects that address such needs.[8] In November 2021, the Infrastructure Investment and Jobs Act amended the Clean Water Act to establish a new requirement for a broader survey of state clean water needs.[9]

You asked us to review options for an allotment formula for the Clean Water SRF program grants. This report (1) describes the current formula for allotting clean water SRF grants, and how states distribute their SRF funds; (2) discusses the views of an expert panel on a new allotment formula it developed, and examines how using this formula would affect state allotments; and (3) examines the extent to which EPA has estimated states' clean water needs.

To describe the current formula for allotting clean water SRF grants, we reviewed the Clean Water Act, as amended, Congressional Research Service reports, and EPA documents. Using information in a Congressional Research Service report about the current allotment formula, we analyzed the range of potential effects on state allotment percentages if either 2022 EPA or U.S. Census Bureau data were used as the basis of allotments. To describe how states distributed their SRF funds, we reviewed our prior reports and EPA guidance, identified EPA national and state-level data on the Clean Water SRF program, obtained the most recently available data (either the most recent 3 years or most recent 5 years), and calculated state and national averages. We determined the EPA and U.S. Census Bureau data were sufficiently reliable for

[6]According to EPA, beginning in fiscal year 2000, the Pacific Trust Territories were no longer eligible for clean water SRF grants due to a change in their governing status. As a result, since fiscal year 2000, EPA has adjusted the allotments for states and the other territories to distribute the percentage allotted to the Pacific Trust Territories in section 206(a)(2) of the Water Quality Act of 1987. In addition, annual appropriations acts since fiscal year 2010 have generally increased the total allotment for the territories of American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands from the allotments for each of those territories in section 206(a)(2). As a result, EPA has adjusted the allotments for states and territories to accommodate this increased percentage for the territories but will use the allotments in section 206(a)(2) if annual appropriations acts do not increase the total allotment to the territories.

[7]The Clean Water Act, as amended, requires EPA, in cooperation with states, to biennially revise a detailed estimate of the cost of construction of all needed publicly owned treatment works in each of and all states. 33 U.S.C. § 1375(b)(1)(B). EPA last conducted this survey in 2012 but did not provide estimates until 2022 because of lack of resources, according to EPA officials.

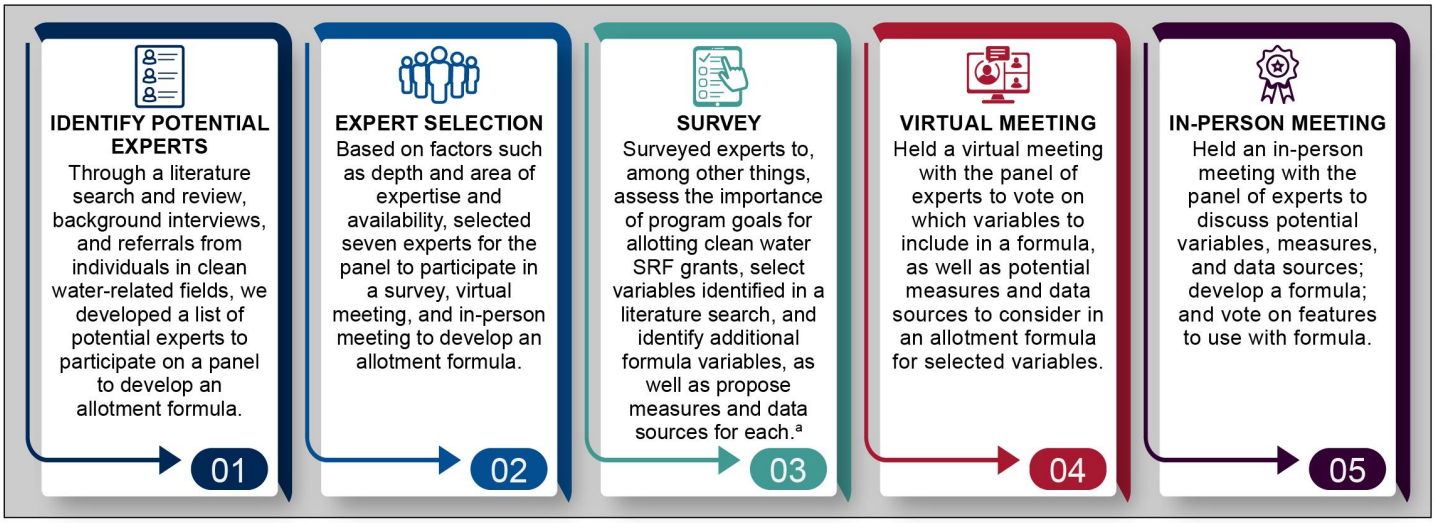
[8]GAO, *Drinking Water and Wastewater Infrastructure: Information on Identified Needs, Planning for Future Conditions, and Coordination of Project Funding*, GAO-17-559 (Washington, D.C.: Sept. 20, 2017).

[9]Specifically, the amendment requires EPA to conduct and complete an assessment of capital improvement needs for all projects eligible to be funded by the Clean Water SRF program and issue a report to Congress on the assessment by November 15, 2023, and then not less frequently than once every 4 years. Pub. L. No. 117-58, div. E, tit. II, § 50220, 135 Stat. 429, 1180 (2021) (codified at 33 U.S.C. § 1389(a)). EPA conducted this Clean Watersheds Needs Survey in 2022 and issued the report to Congress in 2024.

illustrating potential changes to the current allotment formula and EPA's data were sufficiently reliable for the purpose of describing states' distribution of their SRFs.

For our second objective, we conducted a literature search and review and engaged in a multi-step process with a panel of seven experts in formula grants, clean or drinking water, and funding equity. Specifically, we selected a panel of experts, surveyed them, and held two meetings with them to develop an allotment formula. Figure 2 explains the process we used to identify and work with the experts in our panel.

Figure 2: GAO's Process for Working with Experts to Develop an Allotment Formula for the Clean Water State Revolving Fund (SRF) Program



Source: GAO; GAO (icons); Hafiyyasyafa/stock.adobe.com (background). | GAO-24-106251

[a]For the purposes of formula development, a variable is a state-level characteristic or action that a formula takes into account; a measure is an observable indicator used in place of a variable in a mathematical calculation or formula, such as total population or population density; and a data source is specific information that may be selected for the measure.

To examine how using the formula developed by the expert panel would affect state allotments, we calculated allotment percentages using EPA and U.S. Census Bureau data from 2022 and 2012—the years of EPA's two most recent clean water surveys. We assessed the reliability of these data for the purpose of analyzing the effect the expert-developed formula would have on state allotments.

To examine the extent to which EPA has estimated states' clean water needs, we reviewed EPA documents related to the 2022 Clean Watersheds Needs Survey and documents from organizations representing states. We also interviewed EPA officials and officials from a nongeneralizable sample of eight states that participated in the 2022 survey, which we selected based on geographic diversity and other factors.[10] Appendix I describes our objectives, scope, and methodology in more detail.

We conducted this performance audit from September 2022 to July 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our

[10]The eight states are Connecticut, Florida, Missouri, Nevada, Oklahoma, Pennsylvania, Washington, and Wisconsin.

audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Uses of Clean Water SRF Funds

States primarily distribute their clean water SRF funds as loans to local communities and utilities for a variety of clean water infrastructure projects. EPA groups these projects into four infrastructure types: (1) wastewater, (2) stormwater, (3) nonpoint source, and (4) decentralized wastewater treatment. For the purpose of analyzing distribution of SRF funds and estimates of needs, we grouped clean water infrastructure projects into centralized and noncentralized clean water infrastructure.

For purposes of this report, centralized clean water infrastructure projects include building or repairing wastewater treatment facilities, as shown in figure 3 below, and infrastructure, such as sewer pipes and pumps, to convey wastewater to treatment facilities and address combined sewer overflow.[11] Centralized clean water infrastructure also includes desalination and water reuse, which can include conveying treated wastewater to use for beneficial purposes, such as irrigation.

[11]In 2023, we reported that combined sewer systems use a single sewer pipeline system to transport wastewater and stormwater to a treatment facility, see *Clean Water Act: EPA Should Track Control of Combined Sewer Overflows and Water Quality Improvements*, GAO-23-105285 (Washington, D.C.: Jan. 25, 2023). Combined sewer overflow refers to the discharge of mixed stormwater and untreated wastewater during storms when the capacity of a sewer system is exceeded.

Figure 3: Example of a Wastewater Treatment Plant

Aerial view of Wards Island Wastewater Treatment Plant in New York City.

Source: Tierney/stock.adobe.com. | GAO-24-106251

For purposes of this report, noncentralized clean water infrastructure projects include stormwater management, such as bioswales, as shown in figure 4 below, and control of nonpoint sources, which includes activities such as riparian buffers to manage or reduce polluted runoff from agriculture.[12] Noncentralized clean water infrastructure also includes building or repairing decentralized wastewater treatment systems such as septic tanks.

[12]Riparian buffers are vegetative areas along stream banks that can absorb excess nutrients before they enter water bodies. Nonpoint source control can include other agricultural best management practices such as fencing to exclude cattle from water bodies. See *Clean Water Act: Changes Needed If Key EPA Program Is to Help Fulfill the Nation's Water Quality Goals*, GAO-14-80 (Washington, D.C.: Dec. 5, 2013).

Figure 4: Example of a Bioswale Used for Stormwater Management

Source: Environmental Protection Agency (photo). | GAO-24-106251

Note: Bioswales drain runoff into vegetated areas that slow and filter stormwater.

States may also distribute their SRF funds in other ways, such as to cover reasonable costs of administering the SRF, increase security at wastewater treatment facilities, and provide additional subsidies.[13] Additional subsidies can include loan forgiveness, grants, or negative interest loans and refinancing or restructuring local debts.

Goals of the Clean Water SRF Program

Based on our analysis of the Clean Water Act, federal policies, and EPA regulations and guidance, the Clean Water SRF program has four goals:

1. **Water quality.** The overall objective of the Clean Water Act, as amended, is to restore and maintain the chemical, physical, and biological integrity of the nation's waters.[14] To advance this objective, among other things, it established the Clean Water SRF program to provide low-cost loans or grants for eligible

[13]The Clean Water Act, as amended, authorizes states to use SRFs for reasonable costs of administering the fund and conducting SRF activities but caps the amount that may be used. The cap is the greater of 4 percent of all clean water SRF grants, $400,000 per year, or 0.2 percent of the current value of the SRF. In addition, states can also use the amount of any fees collected by the state for administration of the SRF. 33 U.S.C. § 1383(d)(7).

[14]33 U.S.C. § 1251(a).

projects and activities, including for constructing wastewater facilities and decentralized wastewater treatments, managing stormwater, and controlling nonpoint sources.

2. **Performance.** The Clean Water Act, as amended, requires states to maintain and invest their clean water SRFs such that the fund balance will be available in perpetuity for eligible projects and activities.[15] EPA regulations say that the program is to provide states with flexibility to meet their unique needs and ensure that states operate their SRFs to support eligible activities in perpetuity.[16] EPA guidance notes that clean water SRFs are to achieve the greatest environmental and public health results by improving water quality while using the funds efficiently.

3. **Affordability.** The Clean Water Act, as amended, authorizes states to use a portion of their clean water SRF grants to provide additional subsidies in certain circumstances to hardship communities, among other eligible recipients. Hardship communities are those that would experience significant hardship raising revenue necessary to finance an eligible project if additional subsidization is not provided.[17] The Infrastructure Investment and Jobs Act amended the Clean Water Act to require states to use not more than 30 percent and not less than 10 percent of their clean water SRF grants for these additional subsidies, provided there are sufficient applications.[18] In addition, EPA appropriations for clean water SRF grants have also included requirements for states to provide additional subsidies to any recipient, including hardship communities.[19]

4. **Equity.** Known as Justice40, in 2021 an Executive Order established the goal that 40 percent of the overall benefits of certain federal investments, including clean water infrastructure, are to flow to disadvantaged communities.[20]

Clean Watersheds Needs Survey

The Clean Water Act, as amended, requires EPA to collect and report information on nationwide capital improvement needs for projects that are eligible for the Clean Water SRF program.[21] EPA collects this information from states, territories, and the District of Columbia, which are to report capital improvement costs, or needs, of projects to construct, repair, replace, and upgrade centralized and noncentralized clean water

[15]33 U.S.C. § 1382(b)(11).

[16]40 C.F.R. § 35.3100(a).

[17]33 U.S.C. § 1383(i)(1)(A)(i), (2)(A)(i). If the total amount appropriated for clean water SRF grants in a fiscal year exceeds $1 billion, the Clean Water Act, as amended, authorizes states to provide additional subsidization to certain recipients, including hardship communities. 33 U.S.C. § 1383(i)(3)(A). Hardship communities are municipalities that meet state-established affordability criteria based on income and unemployment data, populations trends, and other data determined to be relevant by the state. 33 U.S.C. § 1383(i)(2)(A).

[18]33 U.S.C. § 1383(i)(3)(B)(i).

[19]Since fiscal year 2010, EPA's annual appropriations acts have generally required states to use a portion of their clean water SRF grant to provide additional subsidies to any recipient. In 2021, the Infrastructure Investment and Jobs Act appropriated approximately $11.7 billion to EPA for clean water SRF grants and required 49 percent of these grants made to states to be used to provide additional subsidy to any recipient. Pub. L. No. 117-58, div. J, tit. VI, 135 Stat. 429, 1399 (2021).

[20]Exec. Order No. 14008, § 223, 86 Fed. Reg. 7619, 7631-7632 (Feb. 1, 2021). The Executive Order did not define the term "disadvantaged communities," but stated it was the policy of the administration to secure environmental justice and spur economic opportunity for disadvantaged communities that have been historically marginalized and overburdened by pollution and underinvestment in housing, transportation, water and wastewater infrastructure, and health care.

[21]33 U.S.C. § 1389(a).

infrastructure over the next 20 years. EPA requests that states report needs by several categories. For the 2022 Clean Watersheds Needs Survey, there were 10 categories of need.[22]

According to EPA, the purpose of the survey is to provide a comprehensive assessment of infrastructure needed to meet the water quality goals of the Clean Water Act and address water quality and related public health concerns. The data are to be used to help Congress and state legislatures in their budgeting efforts and local and state governments in implementing water quality programs, measure environmental progress, contribute to academic research, and provide information to the public, according to EPA.

Federal Formula Grant Programs

The Clean Water SRF program is a formula grant program—a noncompetitive grant awarded based on a formula prescribed by law. We have previously reported that Congress can use formula grants to target funds to achieve program objectives by including specific variables in these formulas that relate to the programs' objectives.[23] According to a 2003 National Research Council report, in contrast to possibly arbitrary specification of amounts given to recipients, formulas facilitate informed debate and transparency about the allocation process by documenting assumptions and computations.[24] Based on our analysis and review of literature, we identified three elements of such formulas:

1. **Variable.** A state-level characteristic or action that a formula takes into account.
2. **Measure.** An observable indicator for a variable that can be used in a mathematical calculation or formula.
3. **Data source.** Specific information that may be selected for the measure.

We analyzed statutes, regulations, and federal agency information to identify and categorize formulas of other federal grants for infrastructure programs into these three elements. For example, we categorized EPA's Drinking Water SRF program and Sewer Overflow and Stormwater Reuse formula grant program as follows.

- The Drinking Water SRF program provides grants based on a single variable—need—and the amount of EPA's Drinking Water SRF appropriations.[25] The program uses a needs survey as the measure, and the most recent Drinking Water Infrastructure Needs Survey and Assessment as the data source.

[22]These categories of need were: (1) secondary wastewater treatment, (2) advanced wastewater treatment, (3) conveyance system repair, (4) new conveyance systems, (5) combined sewer overflow correction, (6) stormwater management, (7) nonpoint source control, (8) water reuse, (9) decentralized wastewater treatment systems, and (10) desalination.

[23]GAO, *Formula Grants: Funding for the Largest Federal Assistance Programs Is Based on Census-Related Data and Other Factors*, GAO-10-263 (Washington, D.C.: Dec. 15, 2009).

[24]National Research Council, *Statistical Issues in Allocating Funds by Formula* (Panel on Formula Allocations), Thomas A. Louis, Thomas B. Jabine, and Marisa A. Gerstein, editors, Committee on National Statistics, Division of Behavioral and Social Sciences and Education, the National Academies Press; Washington, D.C.: 2003.

[25]42 U.S.C. § 300j-12(a)(1)(D)(ii). The Safe Drinking Water Act, as amended, requires EPA to allot drinking water SRF grants to states in accordance with a formula that allocates to each state its proportional share of the state needs identified in the most recent Drinking Water Infrastructure Needs Survey and Assessment with a minimum proportionate share.

- According to our analysis, EPA's Sewer Overflow and Storm Reuse formula grant program uses four factors that characterize states' need, which is the variable in the formula.[26] These are clean water needs specified in statute and annual average precipitation, total population, and urban population as surrogate measures for need.[27] The data source for clean water needs is the most recent Clean Watersheds Needs Survey; specifically, three categories of need (combined sewer overflow, sanitary sewer overflow, and stormwater needs). For annual average precipitation, EPA uses the National Oceanic and Atmospheric Administration's statewide climate data, among other sources. The data source for the population measures is the U.S. Census, among other sources.

Appendix II provides additional examples of formula elements of federal infrastructure programs we identified.

The Current Formula Allots Grants Based on Fixed Percentages of the Program's Appropriations

The Current Formula, Based on Each State's Percentage of Appropriations, Allotted $6 Million to $208 Million Across States

The Clean Water SRF formula allots grants using a fixed percentage for each state, multiplied by the amount of appropriations for the program (see app. III for allotment percentages). The current allotment percentages range from a minimum of 0.5 percent to 11.2 percent. From 2019 through 2023, EPA awarded grants that, on average, ranged from $6 million to $208 million across states based on average appropriations of about $1.9 billion for the Clean Water SRF program, according to EPA data.[28]

The specific formula elements Congress considered to establish the allotment percentages for each state are not known. According to the Congressional Research Service, Congress considered formulas that included variables such as need and population, but there is no record of how these were combined to create the state allotments in the 1987 amendments to the Clean Water Act.[29]

[26]The Clean Water Act, as amended, requires EPA to make sewer overflow and stormwater reuse grants to states in accordance with a formula established by the EPA Administrator that allocates to each state a proportional share based on the total needs of the state for municipal combined sewer overflow controls, sanitary sewer overflow controls, and stormwater identified in the most recent Clean Watersheds Needs Survey and any other information the Administrator considers appropriate. 33 U.S.C. § 1301(g)(2). The allocation formula the EPA Administrator established includes the three needs specified in the statute as well as annual average precipitation, total population, and urban population. 86 Fed. Reg. 11287, 11287 (Feb. 24, 2021).

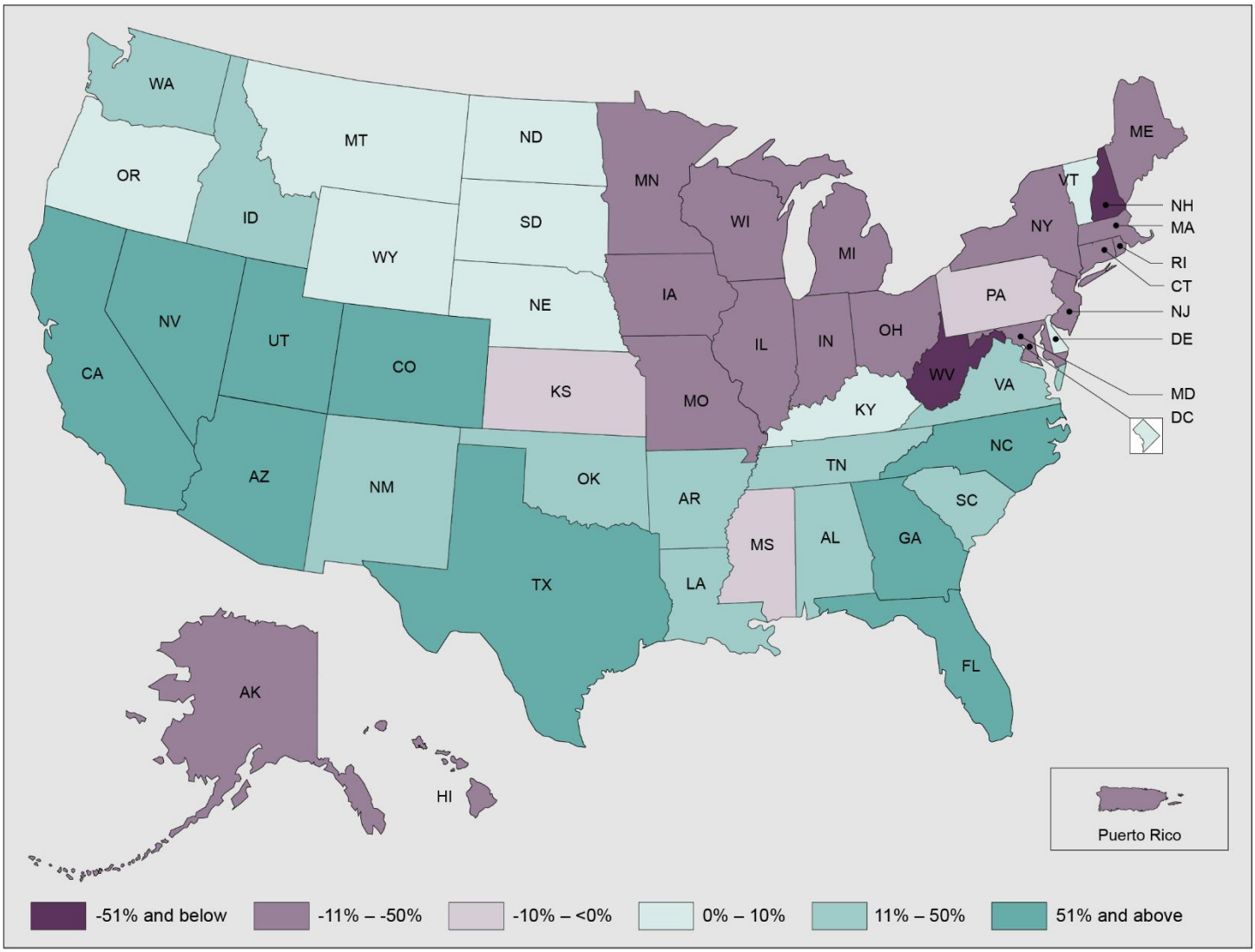
[27]Our analysis categorizes population as a variable, and total population and urban population as measures. The formula uses the needs specified in statute—total needs identified in the most recent Clean Watersheds Needs Survey for municipal combined sewer overflow controls, sanitary sewer overflow controls, and stormwater—and three additional factors: annual average precipitation, total population, and urban population. These three factors serve as surrogates for combined sewer overflow, storm sewer overflow, and stormwater infrastructure needs to fully characterize those needs because the 2012 Clean Watersheds Needs Survey did not include complete needs for every state and territory. 86 Fed. Reg. 11287, 11287 (Feb. 24, 2021).

[28]EPA does not obligate the entire Clean Water SRF appropriation in the same fiscal year the agency receives it because the appropriation does not expire and states have 2 years to obligate the amount allotted to them. In addition, in fiscal years 2022, 2023, and 2024 some of the Clean Water SRF appropriation was for specific recipients and projects, known as congressionally directed funding or community project funding, and not subject to allocation to the states.

[29]Congressional Research Service, *Clean Water State Revolving Fund Allotment Formula: Background and Options*, R47474 (Mar. 15, 2023). The formula has not changed since the program was established, except for changes related to U.S. territories.

In 2016, EPA reported that the current allotments are not adequate because they do not award grants to states in proportion to (1) their population size or (2) the results of the most recent Clean Watersheds Needs Survey. For example, determining allotments using the most recent data on population would result in significant changes to the allotment percentages of some states (see fig. 5).

Figure 5: Changes to Current Allotment Percentages of Clean Water SRF Grants, If Based on 2022 Estimates for Population

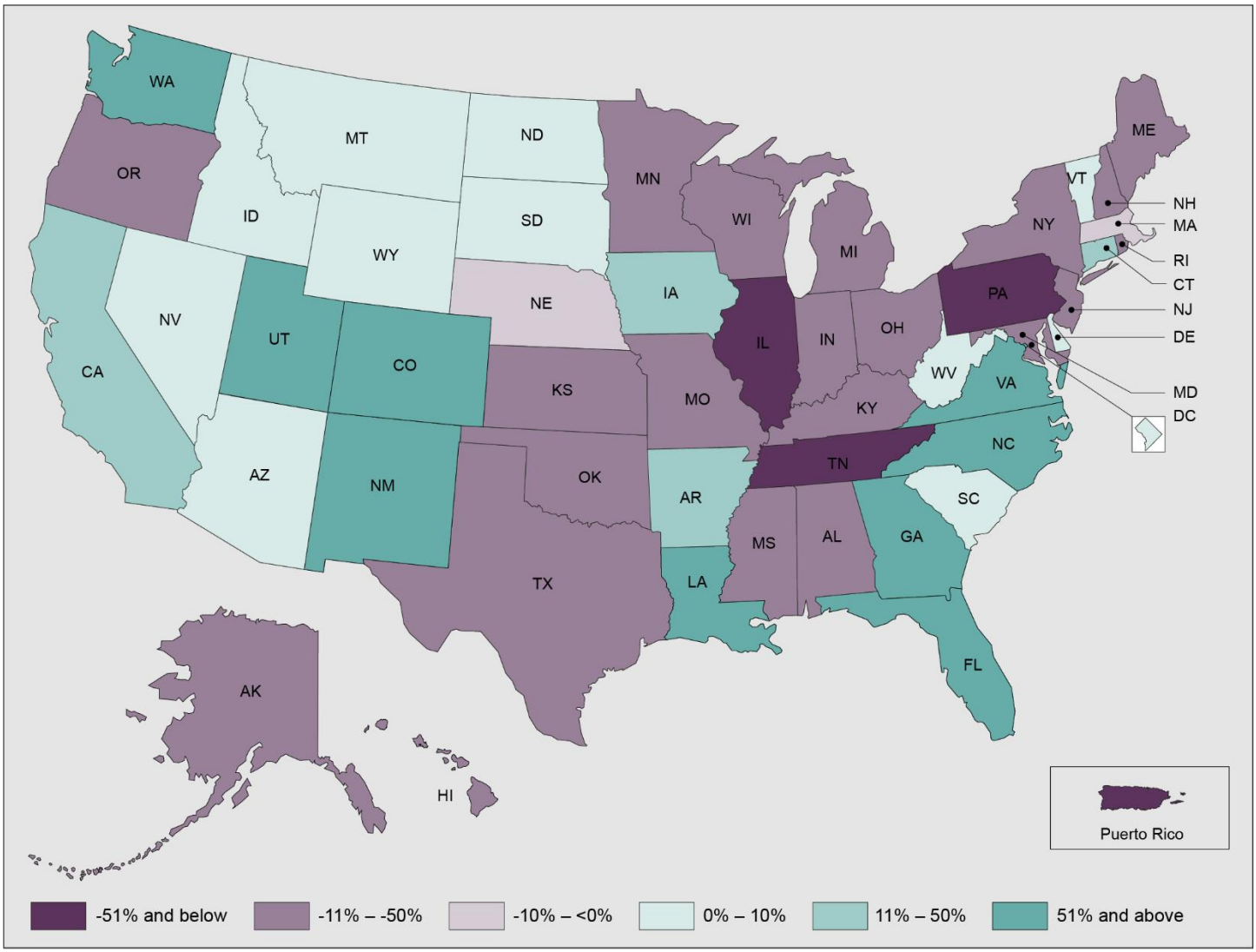


Source: GAO analysis of U.S. Census Bureau data; Map Resources (Map). | GAO-24-106251

Note: The elements of the allotment formula are not known, but, according to the Congressional Research Service, Congress considered formulas that included population. We determined each state's allotment percentage of clean water State Revolving Fund (SRF) grants based on its share of population from the 2022 U.S. Census Bureau's 1-year estimate in the American Community Survey compared with the national totals. We then determined the percent change by comparing each state's share to its current allotment percentage. We maintained the minimum allotment of 0.5 percent for each state in our analysis.

Similarly, determining allotments using the most recent data on clean water needs would also significantly change the allotment percentage of some states (see fig. 6).

Figure 6: Changes to Current Allotment Percentages of Clean Water SRF Grants, If Based on 2022 Estimates for Clean Water Needs



Source: GAO analysis of Environmental Protection Agency (EPA) data; Map Resources (Map). | GAO-24-106251

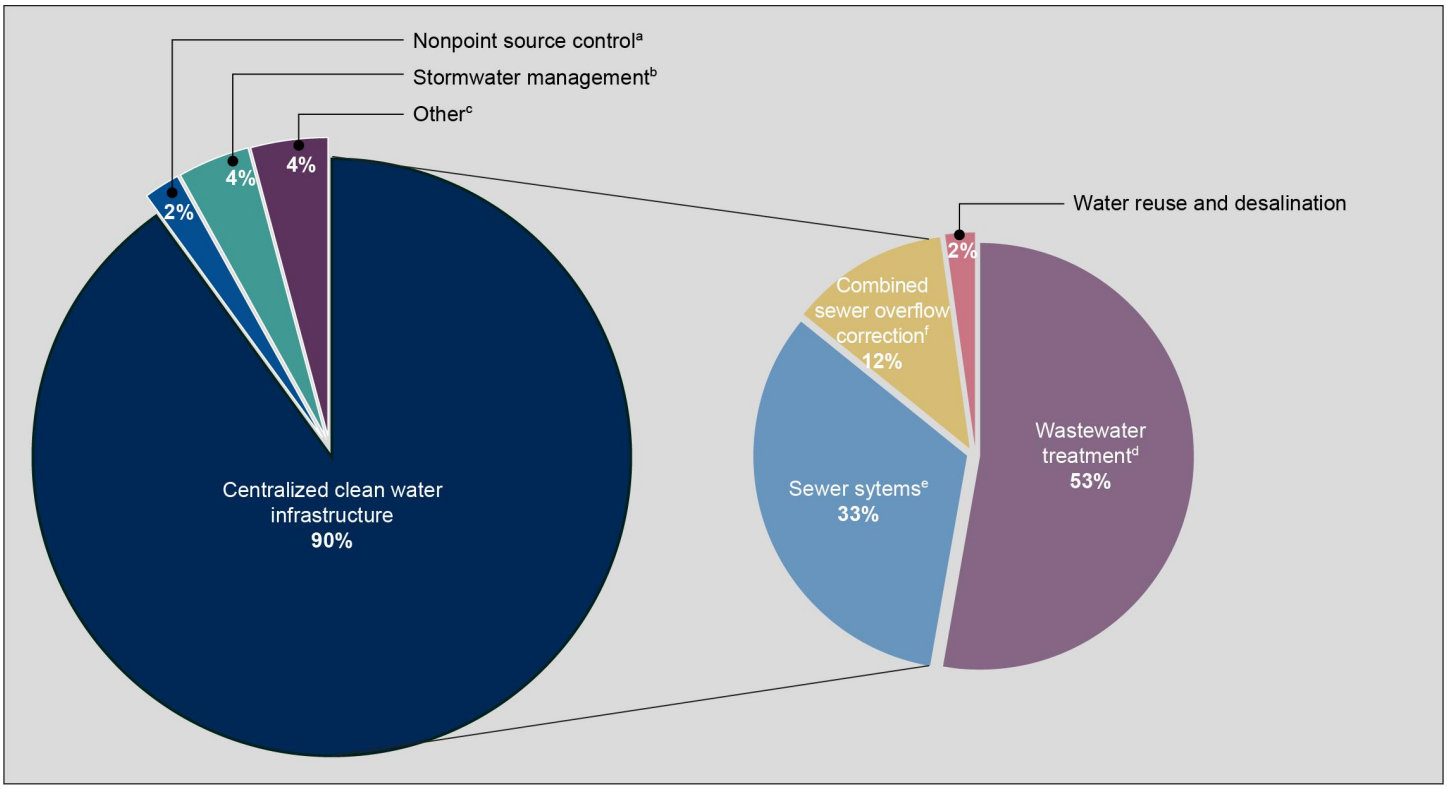
Note: The elements of the allotment formula are not known, but, according to the Congressional Research Service, Congress considered formulas that included clean water needs. We determined each state's allotment percentage of clean water State Revolving Fund (SRF) grants based on its share of clean water needs from EPA's 2022 Clean Watersheds Needs Survey compared with the national totals. We then determined the percent change by comparing each state's share to its current allotment percentage. We maintained the minimum allotment of 0.5 percent for each state in our analysis.

States Distributed Their SRF Funds Primarily for Centralized Infrastructure; A Majority Used Their Funds Efficiently and Helped Hardship Communities

States distributed most of their clean water SRF funds to centralized clean water infrastructure; a majority used their funds efficiently, according to our analysis and EPA's guidance, and provided additional subsidies to hardship communities. For the allotments of each state's clean water SRF grant and distributions from their clean water SRFs, see appendix IV.

On average annually, from 2019 through 2023, we found that states distributed 90 percent of their clean water SRF funds for projects related to centralized clean water infrastructure, such as construction of wastewater treatment plants (see fig. 7), according to EPA data.

Figure 7: Funding Distribution of Clean Water State Revolving Funds, by Categories of Need, 5-Year Average, 2019–2023



Source: GAO analysis of Environmental Protection Agency data. | GAO-24-106251

Accessible Data for Figure 7: Funding Distribution of Clean Water State Revolving Funds, by Categories of Need, 5-Year Average, 2019–2023

Category	Percentage
Nonpoint source management[a]	2%
Stormwater management[b]	4%
Other[c]	4%
Centralized clean water infrastructure	90%
• Wastewater treatment[d]	• 53%
• Sewer systems[e]	• 33%
• Combined sewer overflow[f]	• 12%
• Water reuse and desalination	• 2%

Source: GAO analysis of Environmental Protection Agency data. I GAO-24-106251

Note: Data are provided in reporting year basis of July 1 through June 30.

[a]Nonpoint source control includes practices that reduce runoff of pollutants into waterways such as riparian buffers and pollution prevention measures for lawns and gardens.

[b]Stormwater management includes gray infrastructure such as construction of stormwater pipes and green infrastructure such as bioswales, which drain runoff into vegetated areas that slow and filter stormwater.

[c]Other includes decentralized wastewater treatment.

[d]Wastewater treatment includes activities that help facilities meet or exceed required reduction levels for pollutants.

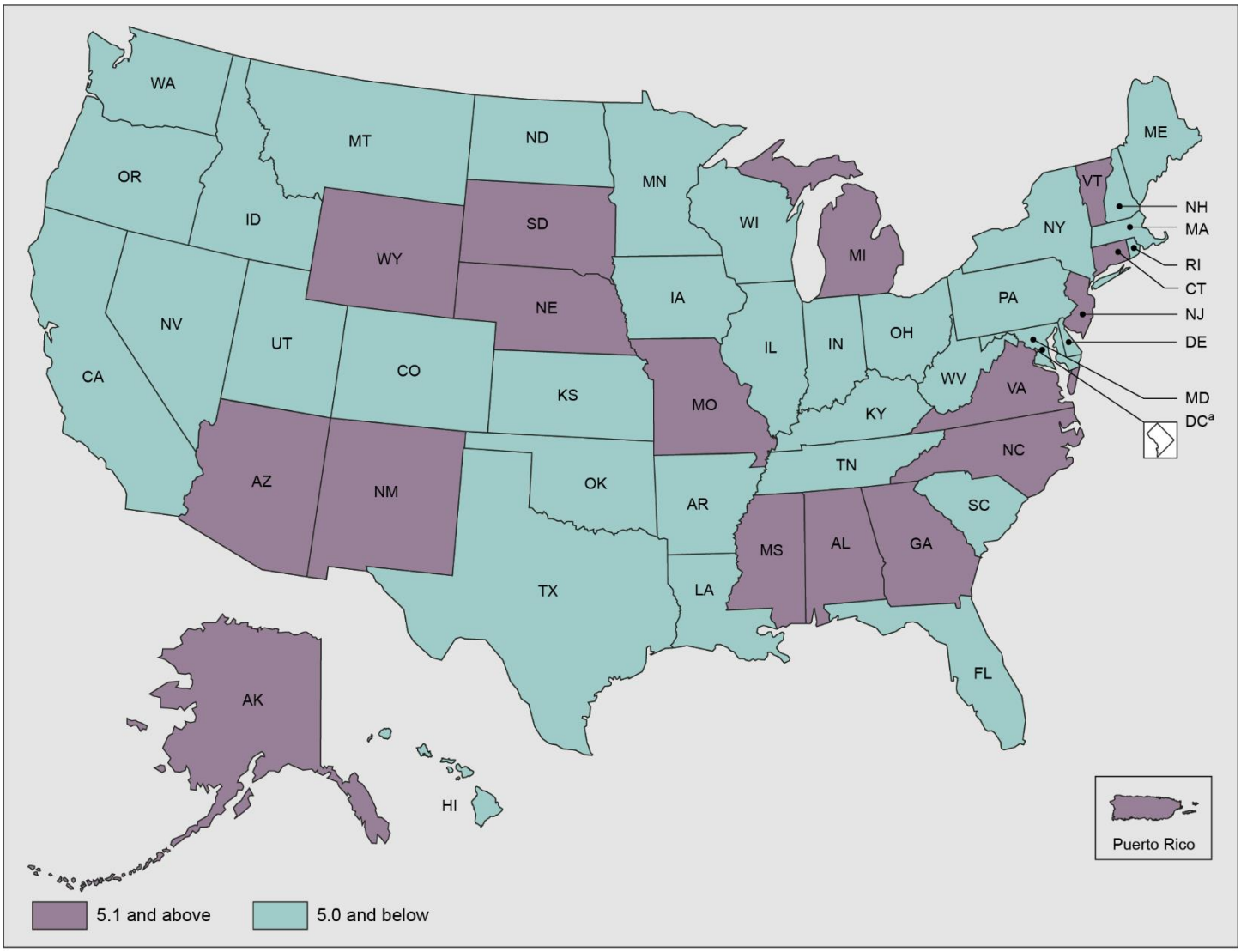
[e]Sewer systems include rehabilitation and construction of new sewers.

[f]Combined sewer overflow correction includes measures that help prevent or control periodic discharges of a mixture of stormwater and untreated wastewater.

In 2024, EPA established a target for states to have an undisbursed balance ratio of 2 years or less, which EPA considers an indicator of efficiency.[30] This ratio is the cash balance in each SRF compared with its average annual disbursement for projects. EPA noted that tracking disbursements is critical to understanding the performance of each state's SRF. On average, from 2019 through 2023, state SRFs had undisbursed balance ratios from 0.3 to 29.9 years. EPA views undisbursed balance ratios below 1 to be exceptional performance and above 5 years to indicate unacceptable performance. EPA stated that it requires its regional offices to provide additional oversight to states with undisbursed balance ratios above the threshold of 5 years, including an emphasis on committing all funds in signed agreements within 1 year of receipt. As of 2023, about two-thirds of the states (34 states) met EPA's threshold of having an undisbursed balance ratio of 5 years or less (see fig. 8).

[30]EPA, *Memorandum: Maximizing Water Quality and Public Health Benefits by Ensuring Expeditious and Timely Use of All State Revolving Fund Resources* (Washington, D.C.: Jan. 31, 2024). Disbursement refers to the amount paid in cash or cash equivalents.

Figure 8: Undisbursed Balances of States' Clean Water SRFs, Based on EPA's Threshold of 5 Years or Less, 5-Year Average, 2019–2023



Source: GAO analysis of Environmental Protection Agency (EPA) data; Map Resources (Map). | GAO-24-106251

Notes: Undisbursed balance ratio compares cash balances that states' clean water State Revolving Funds (SRF) have with their average annual disbursement (amount paid in cash or cash equivalents) for projects.

Data are provided in reporting year basis of July 1 through June 30.

[a]EPA does not report an undisbursed balance ratio for the District of Columbia because it does not have an SRF.

The Clean Water Act, as amended, authorizes states to use a percentage of the clean water SRF grants for additional subsidies (e.g., grants or principal forgiveness) to certain recipients in certain circumstances.[31] These include hardship communities, which are those that meet state-established affordability criteria.[32]

The Clean Water Act, as amended, required states to develop affordability criteria by September 30, 2015.[33] EPA started tracking states' distribution of additional subsidies to hardship communities in 2021, according to EPA officials. This can help identify progress toward goals under Justice40 and additional subsidies required by the Infrastructure Investment and Jobs Act.[34] On average, from 2021 through 2023, SRFs distributed from 0 percent to 76 percent of their clean water SRF grants as additional subsidies to hardship communities, with 11 states distributing above 30 percent of their grants for this purpose, as shown in figure 9.[35]

[31]33 U.S.C. § 1383(i)(1). If the total amount appropriated for clean water SRF grants exceeds $1 billion in any fiscal year, the Clean Water Act, as amended, authorizes states to provide additional subsidization to certain recipients, including hardship communities. 33 U.S.C. § 1383(i)(3)(A).

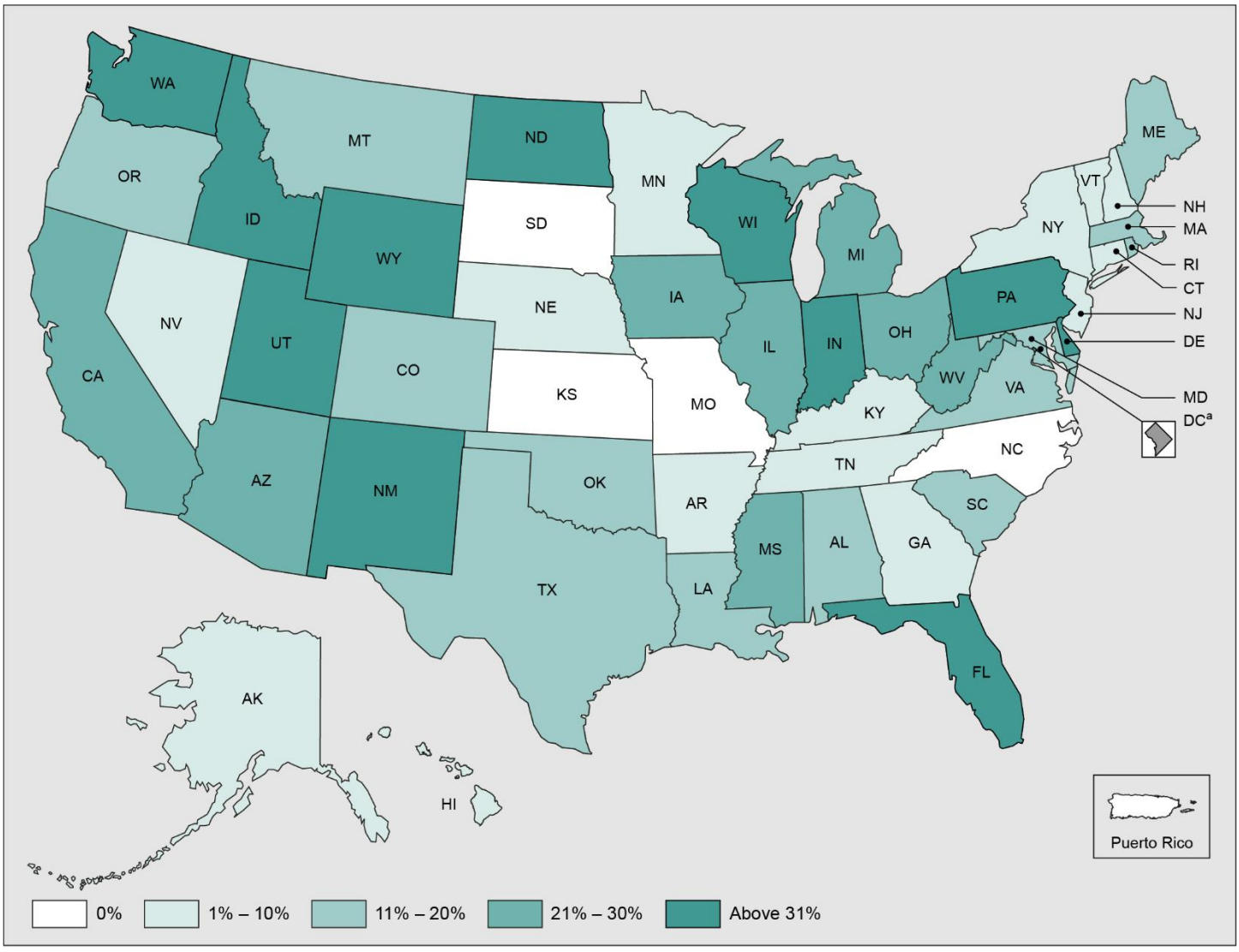
[32]33 U.S.C. § 1383(i)(2)(A). Hardship communities are municipalities that meet state-established affordability criteria, which are based on income and unemployment data, population trends, and other data determined to be relevant by the state.

[33]33 U.S.C. § 1383(i)(2)(A)(i).

[34]The Infrastructure Investment and Jobs Act appropriated approximately $11.7 billion to EPA for clean water SRF grants and requires 49 percent of the clean water SRF grants states receive from this appropriation to be used to provide additional subsidies to any recipient in the form of grants, loans with 100 percent loan principal forgiveness, or both. Pub. L. No. 117-58, div. J, tit. VI, 135 Stat. 429, 1399 (2021).

[35]EPA officials noted that states have more than 1 year to obligate additional subsidies, so the percentage they report may reflect the additional subsidies provided with multiple clean water SRF grants.

Figure 9: Percent of Clean Water State Revolving Fund Grants that States Distributed as Additional Subsidies to Hardship Communities, 3-Year Average, 2021–2023



Source: GAO analysis of Environmental Protection Agency (EPA); Map Resources (Map). | GAO-24-106251

Notes: Data are provided in reporting year basis of July 1 through June 30.

Additional subsidies include grants or principal forgiveness, which states may distribute to hardship communities—those that meet state-established affordability criteria—as well as to other eligible recipients. EPA officials told us that states that did not distribute additional subsidies to hardship communities may have distributed additional subsidies to other eligible recipients.

[a]EPA does not report on additional subsidies that the District of Columbia distributes because it does not have an SRF.

Recently, states have made additional changes in response to EPA guidance related to equity. In 2022, EPA issued guidance to assist states in evaluating and revising their affordability criteria to ensure they are

compliant with the Clean Water Act, as amended, and meet their community affordability needs.[36] Officials from three of the eight states we interviewed told us they recently adjusted their affordability criteria to take into account EPA's guidance. Further, in its annual review of states' clean water SRFs, EPA noted that another state revised its definition of hardship communities to include communities designated as disadvantaged under Justice40.[37]

Experts Developed a Formula Largely Based on Clean Water Needs That Would Maintain or Increase Allotments for a Majority of States

Experts Developed a Formula Composed of States' Need, Population, and Economic Burden

The panel of seven experts we convened came to consensus on a single formula that includes three variables: (1) need, (2) population, and (3) economic burden. To reach agreement, the experts discussed their views on elements of a formula, including potential variables we identified in our literature review to use in an allotment formula. For each of the three variables they selected, experts considered and reached a consensus on a weight (i.e., a percentage) and discussed and selected specific measures and related data sources to use in the formula (see fig. 10).

Figure 10: Formula Developed by Expert Panel to Allot EPA's Clean Water State Revolving Fund Grants

State allotment = 60% Need + 20% Population + 20% Economic Burden

Need:	State's share of national estimated clean water needs with data from the Environmental Protection Agency's most recent survey of states' clean water needs
Population:	State's population as a share of the total population with data from the U.S. Census Bureau's Decennial Census or American Community Survey, whichever is more recent when the allotment percentages are updated[a]
Economic Burden:	State's share of population at or below 200 percent of the federal poverty threshold divided by the total of all states' shares with data from the U.S. Census Bureau's most recent American Community Survey[b]

Source: GAO. | GAO-24-106251

[a]State population is the total population in the 50 states, Puerto Rico, and the District of Columbia.

[36]Although the Clean Water Act, as amended, does not require states to provide additional subsidies only to communities that meet the state's affordability criteria, EPA's guidance strongly encourages states to use Infrastructure Investment and Jobs Act funds for communities or subsets of communities that are most in need. Further, EPA stated that the funding provided under the Infrastructure Investment and Jobs Act can help EPA and the SRF programs make progress towards Justice40. EPA, *Implementation of the Clean Water and Drinking Water State Revolving Fund Provisions of the Bipartisan Infrastructure Law* (Washington, D.C.: Mar. 8, 2022).

[37]Specifically, these are communities designated as disadvantaged by the Climate and Economic Justice Screening Tool. Guidance from the Council on Environmental Quality defines these communities as those in census tracts that meet the thresholds for at least one of the categories of burden—climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development—or if they are on lands within the boundaries of federally recognized Tribes.

[b]Poverty rate is determined for certain individuals (e.g., excluding children) and varies based on household sizes and other factors.

The experts all agreed that this formula would be highly likely to meet the goals of the Clean Water SRF program, including the three goals that a majority of the experts rated as very important: water quality, affordability, and equity. Examples of the reasons experts provided for including the three variables to use in the allotment formula, based on our analysis of their survey responses, are as follows:

- **Need.** This variable most closely aligns with the intent of the Clean Water Act to improve water quality by funding clean water infrastructure needed to achieve water quality goals.
- **Population.** More populous areas are likely to have greater point source and nonpoint source pollution, leading to greater clean water infrastructure need. Population is a driver of need over the long term.
- **Economic burden.** Funding could be directed to communities that are affected disproportionately by economic, social, or environmental stressors. Such communities may have fewer resources to fund their infrastructure needs.

Experts considered various weights for each of these three variables and reached consensus on a single set of weights. For example, two experts first weighted needs more heavily (up to 70 percent) and provided less weight to population or economic burden, while one expert weighted needs less heavily. Some experts indicated that population is a proxy for needs and could compensate for incomplete data in the Clean Watersheds Needs Survey. Some experts stated that the formula could weigh population less as the Clean Watersheds Needs Survey is improved. However, two experts noted that population should be included in the formula, even if the survey more fully captures needs. Need is a lagging indicator, as it takes time for states to identify their needs. In contrast, population is a leading indicator, which also captures how many people are being exposed to pollution, among other things.

As they selected the three variables to include in their formula, the experts also considered and voted to exclude seven other variables. A majority of the experts indicated in the survey they did not want to include three variables in their formula consideration and voted to exclude the other four during the virtual meeting.[38] For example, experts noted that including utilization in the allotment formula could encourage states to use more of their funds on infrastructure projects, which would help meet program goals, but may result in states funding projects without adequate planning. As another example, an expert suggested waterway impairment as a potential variable because it can directly show how well states are meeting the goals of the Clean Water SRF program. However, experts noted that reliable and nationally comparable water quality data may not be available.[39] Appendix V provides selected views from the experts on the formula elements they considered.

[38]The seven variables a majority of experts did not select include six we identified in our review of literature and defined as: (1) fiscal capacity or ability to pay, which is the ability of a state to raise revenue to meet its needs; (2) effort, which is the amount of a state's available resources spent on providing services or meeting needs under the Clean Water SRF program; (3) cost, which is the variation in input prices across states for infrastructure construction; (4) debt, which is the amount of outstanding borrowing by a state government; (5) utilization, which is the extent to which a state uses its clean water SRF to fund projects; and (6) effectiveness, which is the extent to which a state is meeting Clean Water Act goals and requirements. The seventh variable was waterway impairment and was proposed in the survey by an expert. The expert described this variable as using a measure of actual impaired waterways, such as the number or percentage of waterways that are classified as severely impaired.

[39]In 2021, we found that EPA's ability to measure water quality improvement is limited and made a recommendation to improve EPA's ability to track reductions in discharges of pollutants from certain permitted facilities. EPA generally agreed with our recommendation, but, as of July 2024, had not implemented it. See GAO, *Clean Water Act: EPA Needs to Better Assess and Disclose Quality of Compliance and Enforcement Data*, GAO-21-290 (Washington, D.C.: July 12, 2021).

In addition to the elements of a formula above, our analysis of literature showed that features can be used with formulas to achieve various goals, such as facilitating the transition to a new formula or covering program operation costs. Experts discussed the eight features we identified in our literature review, and a majority agreed that five of them should be considered for use with the Clean Water SRF formula they developed.[40] These features include two temporary features to facilitate the transition to the new formula, two features that already exist in the Clean Water SRF program, and a new permanent feature.

- During our in-person meeting, some of the experts noted that a new formula could disrupt states' planning by causing large changes in their allotments. A majority of the experts agreed to two temporary features for the first 4 years after a new formula is adopted. These two features would (1) limit the decrease in each state's allotment percentage to no more than 25 percent of the prior year's allotment and (2) limit the increase in each state's allotment percentage to no more than 200 percent of the prior year's allotment.
- A majority of experts also agreed to include two existing features: (1) a 0.5 percent minimum allotment for states and (2) a minimum 20 percent state match. The experts noted that maintaining the match can ensure states are invested in the program.
- The experts noted that EPA and states have limited resources to manage the Clean Watersheds Needs Survey and provide technical assistance to communities responding to the survey. A majority of the experts agreed that a new feature should be considered for use with the new formula for the Clean Water SRF program: a set-aside, which we defined as dedicated or authorized funding for a specific purpose. A set-aside from the Clean Water SRF appropriation could provide dedicated funding for EPA to administer the survey, and amending the Clean Water Act could authorize states to use a portion of their clean water SRF grants to administer the Clean Watersheds Needs Survey and provide technical assistance. The experts noted that this funding would allow EPA to conduct more field work and provide greater assistance to states and communities to help ensure the completeness and reliability of the data.[41] In addition, allowing states to direct a portion of their clean water SRF grant to help administer the survey could enable them to increase staffing and acquire other resources to improve the data they provide to EPA.

During their discussions about a formula for allotting clean water SRF grants to states, the experts identified information that, in their view, would help the EPA manage the Clean Water SRF program more effectively, but for which data are limited, of poor quality, or unavailable. The experts presented their views on actions that EPA could take to improve data availability and quality in four areas (see app. VI).

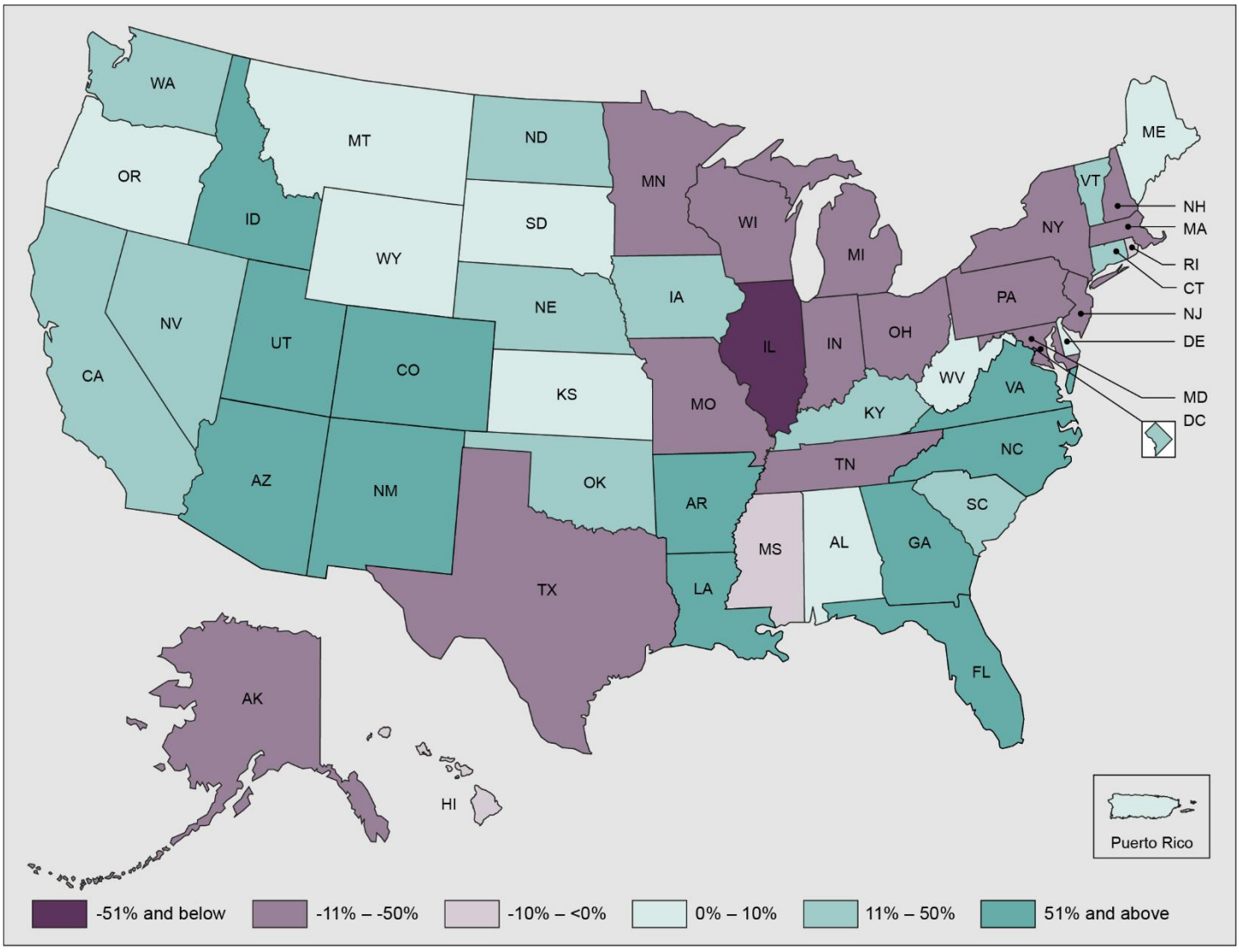
Using the Formula Experts Developed, a Majority of States Would Receive the Same or Higher Allotment as They Do Currently

Using the formula developed by the expert panel for our review and the most recently available data, almost two-thirds of states would receive the same or higher allotments, compared with their current allotment percentages (see fig. 11).

[40]The three features that a majority of the experts did not agree on were maximum allotment, bonus, and penalty.

[41]EPA requested and received a $1.5 million appropriation for the Clean Watersheds Needs Survey for fiscal years 2022 through 2024.

Figure 11: Effects on EPA's Allotment of Clean Water State Revolving Fund Grants Using the Formula Developed by Expert Panel and 2022 Data, by State

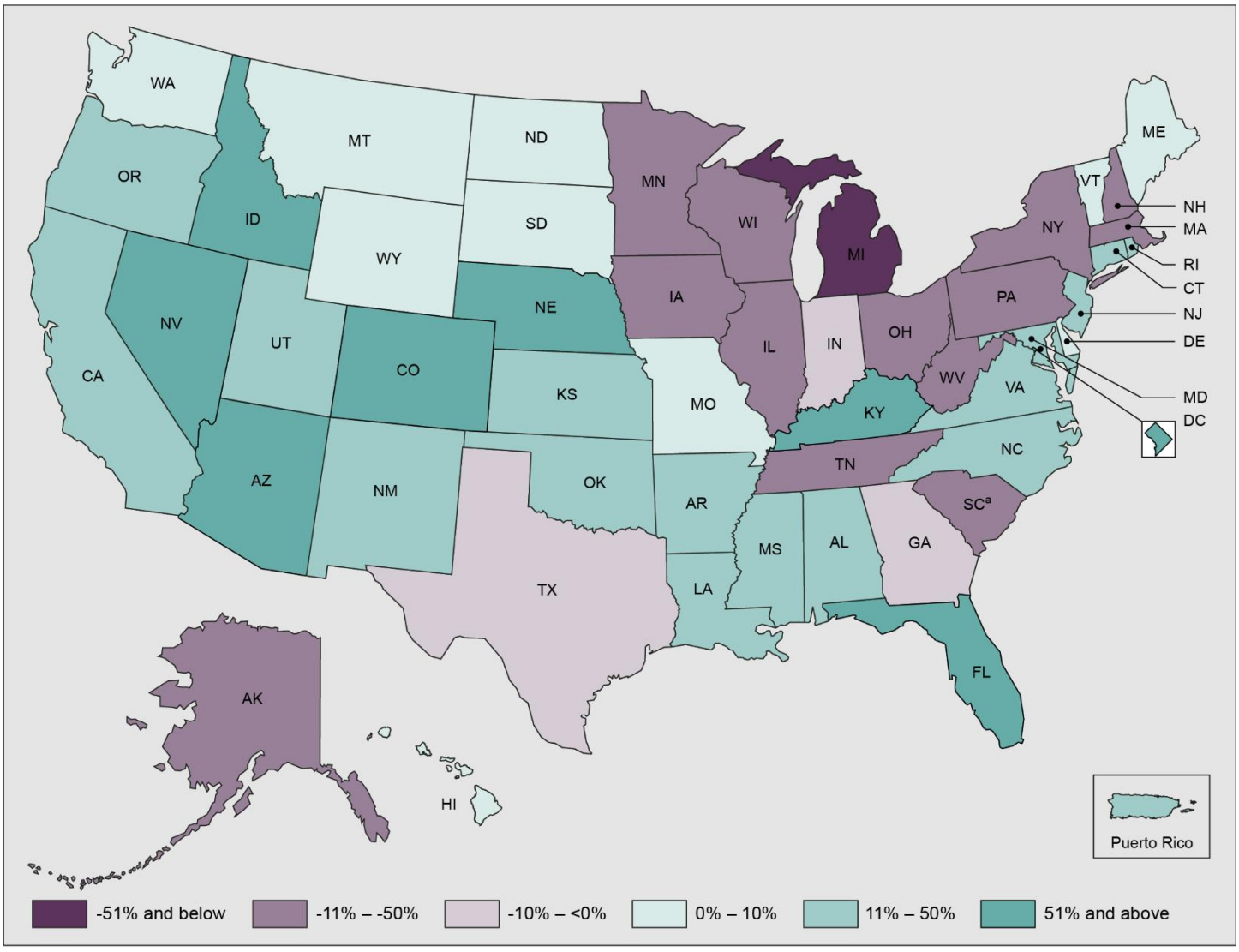


Source: GAO analysis of Environmental Protection Agency (EPA) and U.S. Census Bureau data; Map Resources (Map). | GAO-24-106251

Note: We analyzed the effects of the expert-developed formula on state allotments using data from EPA's 2022 Clean Watersheds Needs Survey and 1-year estimates of population and poverty from the 2022 U.S. Census Bureau's American Community Survey.

Experts stated that the allotments should be periodically calculated using the formula with the most current data so that they reflect the most current needs, population, and economic burden of the states. For example, using the formula to calculate allotment percentages with 2012 data would, like using the 2022 data, have resulted in about two-thirds of states receiving the same or higher allotment percentages. However, some of the states that would receive the same or higher allotment percentages would be different (see fig. 12).

Figure 12: Effects on EPA's Allotment of Clean Water State Revolving Fund Grants, Using the Formula Developed by Expert Panel and 2012 Data, by State



Source: GAO analysis of Environmental Protection Agency (EPA) and U.S. Census Bureau data; Map Resources (Map). | GAO-24-106251

Note: We analyzed the effects of the expert-developed formula on state allotments using data from EPA's 2012 Clean Watersheds Needs Survey, including decentralized wastewater treatment needs, which were not reported by EPA, and 1-year estimates of population and poverty from the 2012 U.S. Census Bureau's American Community Survey. According to EPA officials, states varied in the data they had available to estimate needs in categories that EPA did not report.

[a]In 2012, South Carolina did not provide estimates for EPA's Clean Watersheds Needs Survey, which would negatively affect its calculated allotment percentage.

In both cases, using 2022 or 2012 data, the allotment percentages of four states—Arizona, Colorado, Florida, and Idaho—would increase by more than 50 percent compared with their current allotment percentages. While the exact causes cannot be known because the elements of the current formula are unknown, these increases most likely reflect changes in population and needs that have happened in these states since 1987, when the formula was established. The allotment percentages of other states, such as Louisiana, Utah, and Nevada, would increase by more than 50 percent using either the 2022 or 2012 datasets, but not both. The allotment

percentages for 19 states using 2022 data, or 17 states using 2012 data, would decrease, in some cases close to 50 percent. For example, using 2022 data, Illinois' allotment percentage would decrease by 53 percent, and Michigan's would decrease by 62 percent using 2012 data.

Appendix VII shows the percentage change in the allotment percentage for each state under the formula the experts developed using either 2022 or 2012 data.

As noted above, according to the Congressional Research Service, the elements used to calculate the current allotment percentages are unknown, although the formula was likely based primarily on states' population and needs at the time. Further, the formula does not contain a mechanism to update the allotment percentages based on current data, such as those for needs and population, both of which have changed since the formula was established.

In its 2003 report, the National Research Council states that using an allotment formula can help programs link their goals to the assistance being provided. The 2003 report also states that an allotment formula should be transparent and include documented assumptions and computations, to allow for informed debate and build consensus and credibility for the program. Further, the report notes that providing a mechanism for addressing changes in formula elements can help formulas achieve their intended goals over time without Congress having to intervene.

The experts we convened agreed that considering needs, population, and economic burden to calculate allotments is important for meeting the goals of the program. The experts also agreed that EPA should periodically update the data being used in the formula so that the allotments calculated by the formula reflect the most current need, population, and economic burden of the states. Experts suggested that EPA determine how frequently allotment percentages should be calculated using the formula and current data, while also referring to the 4-year updates used in the Drinking Water SRF program.[42]

Under the current allotment formula used by the Clean Water SRF program, which has continued relatively unchanged for decades, states receive a set percentage of the appropriations each year. There is no documentation of the elements of the current formula and the set allotment percentages can only be changed by statutory amendment. As a result, it is uncertain what goals the current formula—or the allotment percentages it established—were designed to achieve. Further, the statute does not provide a mechanism for EPA to calculate the allotment percentages using updated data. Without information on the elements of the formula or an ability to update it, it is unlikely that the formula and allotment percentages are currently meeting the goals of the program given changing conditions. A statutory amendment that clearly links the formula and allotments to program goals and requires periodic updates using current data could better ensure that the Clean Water SRF program allotments are transparent and can adjust over time to remain aligned with the goals of the program.

[42]The Drinking Water SRF program allots grants to states based on each state's proportional share of total needs as identified in the most recent Drinking Water Infrastructure Needs Survey and Assessment, which EPA is required to conduct and report to Congress on every 4 years.

EPA Survey Does Not Yet Fully Estimate States' Clean Water Needs, Particularly for Small Communities

EPA Has Incomplete Data on Centralized Clean Water Needs of Small Communities

Officials from some of the states with whom we spoke told us that it is difficult to get information from small communities about their centralized infrastructure needs and that small communities are less likely to have the required documentation.[43] For the 2022 Clean Watersheds Needs Survey, EPA developed a form for small communities to report needs as an alternative to the standard documentation required by the survey. However, according to EPA officials, the response rate for this form was low. EPA officials told us that they provided training and technical support to state coordinators on how to assist communities completing the form. The officials said that EPA did not provide the assistance directly to small communities because they expected states to do that.

State officials with whom we spoke said the low response rate may be because small communities do not have the capacity to assess their centralized clean water needs, and therefore could not provide the information needed to complete the form. Specifically, small communities are typically understaffed, lack the technical expertise, and have too many competing priorities to assess their centralized clean water needs and develop documentation for the Clean Watersheds Needs Survey. For example, officials from one state told us they were only able to obtain needs information from approximately 17 percent of small communities in their state, compared with 95 percent of large communities. EPA officials and officials from some states we interviewed told us that communities may not see the value in responding to the survey because it does not benefit them under the current allotment formula. However, they said that might change if the allotment formula for the clean water SRF grants used the results of the survey.

EPA guidance on information quality states that EPA is to collect and disseminate information that is accurate, complete, and useful to its intended users.[44] EPA officials told us they have considered using a sampling approach to obtain more complete estimates for systems serving small communities and assisting communities in the sample with estimating their needs. However, EPA officials stated that they would need to obtain the approval of the Office of Management and Budget, which has guidelines for agencies to document the level of quality and effort in statistical activities.[45] EPA officials told us that they encountered challenges with developing a sampling approach consistent with these guidelines because the total number of centralized clean water systems serving small communities is not known and, without that information, they could not

[43]For the purpose of the Clean Watersheds Needs Survey, EPA refers to communities of 10,000 people or more as large and those of fewer than 10,000 people as small.

[44]Environmental Protection Agency, *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by EPA* (October 2002).

[45]Office of Management and Budget, *Standards and Guidelines for Statistical Surveys* (September 2006). For example, this guidance directs agencies to design the data collection with the level of detail and precision required to make estimates. It also directs agencies to assess and disclose limitations, which allows users to interpret results and helps focus improvement efforts for future collections. Limitations and disclosures may include errors that occur when a sample is selected from data that are incomplete or inaccurate, when only a subset of the data is collected due to sampling, or there are differences between respondents and nonrespondents.

develop a sample to estimate needs. Further, variability in wastewater discharge standards across system sizes and locations adds additional complexity to generalizing needs to all small communities.

However, EPA may have some information to start developing a sample of systems serving small communities. For example, EPA's databases have information about location, population, and average amount of wastewater flow that systems submit when applying for a National Pollutant Discharge Elimination System permit, which can be used to identify small communities with centralized wastewater systems.[46] EPA could supplement these data by obtaining information about small communities from the states. Collecting this information would be a first step in developing a sampling approach that would provide EPA with more complete data on the centralized clean water needs of small communities.

EPA's Estimates of Centralized Clean Water Needs for Large Communities Are Incomplete

Estimates of centralized clean water needs for large communities are more complete than for small communities, but still provide an incomplete picture because of the range of time frames represented. Specifically, states that submit estimates covering fewer years could appear to have fewer needs than those that provide estimates covering more years. According to EPA guidance, states can submit estimates of up to 20 years of clean water needs, but the guidance does not direct states to identify a minimum time frame for those estimates.

According to officials from EPA and some of the states with whom we spoke, large communities typically document their centralized clean water needs with capital improvement plans. These plans document projects to rehabilitate, replace, or install new infrastructure. According to EPA, the needs documented in capital improvement plans only include projects that can be accomplished within the municipalities' budgets, which typically cover 3 to 5 years. Officials from one state with whom we spoke told us that in some cases their estimates of systems serving large communities can be as short as 1 year. One exception is for communities with combined sewer overflows, which are required to have long-term control plans in certain circumstances.[47]

Specifying a minimum time frame for estimates of needs could help make such estimates more complete because they would include projects covering more years as well as make estimates among states more comparable. In addition, officials from one state told us that if EPA were to use estimates of needs as the basis for an allotment, it would be important to ensure states use the same time frames to help put all states on equal footing.

According to EPA's asset management guidance and the American Water Works Association, a good practice for water utilities should be to assess their infrastructure needs for a minimum of 5 years, but assessments can

[46]According to EPA officials, there are data limitations to using the database that contains information about National Pollutant Discharge Elimination System permits and permit holders. We have previously reported on the data EPA collects in this database and have made recommendations to improve their accuracy and completeness. See GAO-21-290. Further, EPA is currently redesigning the database as part of the implementation of the National Pollutant Discharge Elimination System electronic reporting rule. According to EPA, this rule is to modernize Clean Water Act reporting for states and National Pollutant Discharge Elimination permittees by replacing most paper-based reporting requirements with electronic reporting. The deadline for implementing the second phase of this rule is December 21, 2025, but EPA may extend that deadline to no later than December 21, 2028, in certain circumstances.

[47]Municipalities with combined sewer overflows are in 30 states, the District of Columbia, and Puerto Rico.

be for longer time frames because the infrastructure is long-lived.[48] EPA has considered revisiting the time frames over which needs are estimated, but continues to request that states submit their estimates for up to 20 years given the long-term nature of water infrastructure, and to keep the guidance on collecting data consistent. EPA officials did not provide a reason why they did not specify minimum time frames. Establishing a minimum period for estimates of centralized clean water needs from large communities could assist EPA in obtaining and providing more complete needs estimates across the U.S.

EPA Offers Tools to States to Help Them Estimate Noncentralized Clean Water Needs, but Data Continue to Be Incomplete

EPA has approved and developed tools to help states estimate noncentralized clean water needs for both small and large communities, but data continue to be incomplete. According to EPA officials, such needs are not as well documented as centralized needs. For the 2022 Clean Watersheds Needs Survey, EPA provided cost-estimating tools to assist state agencies in obtaining estimates of noncentralized needs in their states. In addition, EPA gave states an option to develop a state-specific approach, which estimates needs based on the unique conditions and information available within each state. For example, officials from one state we interviewed developed a state-specific approach to estimate stormwater management needs based on an assessment of impervious surfaces, such as roads and other paved surfaces.

According to EPA, state-specific approaches were used extensively for generating estimates of noncentralized needs for the 2022 Clean Watersheds Needs Survey, with EPA approving 78 state-specific approaches from 37 states, including 33 for decentralized wastewater treatment, 30 for nonpoint source control, and 13 for stormwater management. To encourage knowledge sharing, EPA provided states access to all state-specific approaches it approved to help them develop their own estimates of noncentralized needs. According to EPA officials, most of the state-specific approaches EPA approved in the stormwater management and decentralized wastewater treatment categories were variations on the first few approaches that states submitted. However, EPA officials told us that some of the states did not have enough information or resources to estimate their needs, and, as a result, were not able to develop state-specific approaches.

In addition to state-specific approaches, EPA provided states with cost-estimating tools to help states document their noncentralized needs. According to EPA, the goal of these cost-estimating tools is to provide a simple, transparent, and accurate way for states to estimate an average cost of typical eligible infrastructure. Two cost-estimating tools were used by a majority of states. Twenty-nine states used the Agriculture Cropland Tool, and 26 states used the Decentralized Wastewater Treatment Tool, according to EPA.[49]

[48]Environmental Protection Agency, *Reference Guide for Asset Management Tools: Asset Management Plan Components and Implementation Tools for Small and Medium Sized Drinking Water and Wastewater Systems,* June 2020. This reference guide is for small- and medium-sized drinking water and wastewater facilities; however, according to EPA officials, this guidance also applies to large facilities. *M29: Water Utility Capital Financing, Fourth Edition,* Copyright © 2014 American Water Works Association. All rights reserved. This manual provides an overview of best practices that water utility managers should use when assessing and managing their assets.

[49]The Agriculture Cropland Tool provides states with the average cost to implement a representative suite of best management practices for addressing agriculture-related impairments on cropland. The tool requires states to input the total harvestable acres. The state then has the option to either specify the number of impaired harvestable acres or have EPA estimate the number. The Decentralized Wastewater Treatment Tool multiplies the number of new septic systems and the number of systems in need of repair by county by an EPA-provided average cost, adjusted for location. According to EPA, states used this tool to estimate 80 percent of decentralized needs they reported for the 2022 Clean Watersheds Needs Survey.

Officials we interviewed from the eight selected states told us that they provided EPA with limited estimates of their noncentralized clean water infrastructure needs, such as stormwater management, nonpoint source control, and decentralized wastewater treatment. Officials from one state told us that despite using EPA's cost-estimating tools they were not able to estimate most nonpoint source control and decentralized wastewater treatment needs. States often have limited access to the data required to estimate needs. For example, EPA officials told us that in many cases, the states' impaired waters list does not contain sufficient information on the cause of the impairments.[50] This information would be needed to make a defensible, documentable link between the impairment and estimates of needs for nonpoint source control.

Furthermore, in addition to states' incomplete estimates, according to EPA data, nine states and the District of Columbia provided no estimates of one or more categories of noncentralized needs.[51] For example, officials from two states told us they did not develop an estimate of decentralized wastewater needs because they do not have data on the number of these systems.

EPA guidance on information quality states that EPA is to collect and disseminate information that is accurate, complete, and useful to its intended users. To collect more complete and accurate information, EPA officials told us they plan to expand the availability and coverage of tools for noncentralized needs in the next survey. However, states that lack expertise or data may still struggle to use these tools or find data to use them. Targeting help to states that have not provided estimates of their noncentralized clean water needs may help direct assistance where it is most needed and could result in more complete estimates. In particular, working with the nine states and the District of Columbia that did not report one or more categories of noncentralized needs for the 2022 survey may help EPA collect more complete estimates.

Conclusions

Since 1987, EPA has awarded billions of dollars to states to address critical clean water infrastructure needs under the current allotment formula for the Clean Water SRF program. However, the extent to which the current formula aligns with program goals is not known, and allotment percentages cannot adjust to reflect underlying conditions, such as changes to population and clean water needs, without a statutory amendment. Our panel of experts developed a formula that serves as a model, showing that a formula can be developed that is transparent and could help ensure state allotments are and remain aligned with program goals. If EPA could implement this type of formula, the agency would have better assurance that more states' allotment percentages are aligned with their clean water needs and account for changing populations. Further, implementing the types of features selected by the expert panel could help facilitate the transition from the current formula to a new formula and help limit disruptions to states' planning.

The experts agreed that clean water need should be an important element of determining grant allotments, assigning it a majority of the weight in the formula they developed. EPA and officials from some states we interviewed agreed that using the estimates from the Clean Watersheds Needs Survey in the formula would help improve the completeness and accuracy of the survey results over time. However, specific actions related

[50]Under section 303(d) of the Clean Water Act, states are required to submit their list of impaired and threatened waters (e.g., lakes and segments of streams and rivers) for EPA's approval every 2 years. 40 C.F.R. § 130.7(d)(1). For each water body on the list, states are to identify the pollutant causing the impairment, when known.

[51]These states are Arizona, Colorado, Delaware, Hawaii, Idaho, Illinois, Mississippi, Nebraska, and South Dakota.

to data collection could help ensure that the survey—and any new allotment formula that uses it—fully reflects the clean water needs of states:

- If EPA used a sampling approach consistent with the Office of Management and Budget's survey guidance, the agency could ensure that data on needs are more complete and accurate and also assist small communities in understanding their centralized clean water needs.
- If EPA established a minimum time frame for reporting large communities' centralized clean water needs, the agency could get a more complete and comparable picture of the infrastructure needs of large communities across states.
- If EPA targeted assistance to states struggling to assess their noncentralized needs, it may collect more complete estimates and enhance its understanding of states' planned costs to build or replace infrastructure.

Matter for Congressional Consideration

Congress should consider revising the allotment formula for the Clean Water SRF program to clearly align with the program's goals and requiring EPA to periodically calculate allotment percentages using the most recent data. For example, in developing a new formula, Congress should consider the types of variables, weights, and data sources used in the expert panel's formula in this report. (Matter for Consideration 1)

Recommendations for Executive Action

We are making the following three recommendations to EPA:

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management directly collects data on centralized clean water infrastructure needs from a sample of small communities, using an approach that is consistent with Office of Management and Budget survey guidance. (Recommendation 1)

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management provides guidance to states to submit estimates of large communities' centralized clean water infrastructure needs for a minimum time frame, such as 5 years. (Recommendation 2)

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management works with states that did not report any needs in one or more of the noncentralized clean water infrastructure need categories to use cost estimating tools and state-specific approaches to assess these needs for the next Clean Watersheds Needs Survey. (Recommendation 3)

Agency Comments

We provided a draft of this report to EPA for review and comment. In its written comments, reproduced in appendix VIII, EPA agreed with our findings, conclusions, and recommendations and described the actions it is undertaking to address them. Regarding working with states that did not report any needs in one or more categories of noncentralized clean water infrastructure, EPA noted that national-level data sets required to

build cost estimates for all such categories may not be available for all states. However, EPA stated that it will work with states to ensure they can report needs in all categories including by extending its efforts to assist states that have not reported needs in noncentralized clean water infrastructure categories in future surveys.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Administrator of the Environmental Protection Agency, and other interested parties. In addition, the report will be available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or gomezj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IX.

J. Alfredo Gómez
Director, Natural Resources and Environment

Appendix I: Objectives, Scope, and Methodology

This report (1) describes the current formula for allotting clean water State Revolving Fund (SRF) grants, and how states distribute their SRF funds; (2) discusses the views of an expert panel on a new allotment formula it developed, and examines how using this formula would affect state allotments; and (3) examines the extent to which the Environmental Protection Agency (EPA) has estimated states' clean water needs.

To describe the current formula for allotting clean water SRF grants, we reviewed the Clean Water Act, as amended, and Congressional Research Service and EPA documents.[1] Using information in a Congressional Research Service report about the current allotment formula, we also analyzed the range of potential effects on state allotment percentages if either 2022 EPA or U.S. Census Bureau data were used as the basis of allotments. For the purpose of our review, we reviewed the allotment percentages EPA uses for the 50 states, the District of Columbia, and Puerto Rico.[2] An independent analyst verified the code we used in this analysis.

To describe states' distribution of their SRF funds, we reviewed the Clean Water Act, as amended, EPA appropriations acts from 2000 to 2023, EPA regulations and guidance, and documents related to the Justice40 Initiative, which includes the Clean Water SRF program.[3] Based on this review, we also identified four goals for the Clean Water SRF program: (1) water quality, (2) performance, (3) affordability, and (4) equity, which we used to identify relevant data fields from EPA's SRF data system.

To report national- and state-level information, we analyzed financial data from EPA's SRF data system and its documentation. We also reviewed our prior reports that assessed data from this system, which was previously known as the National Information Management System.[4] The data we reviewed and reported include the amount of clean water SRF grants, distribution of SRF funds by categories of need, additional subsidies to hardship communities, and financial performance.[5] For the purpose of our review of state distribution of their

[1]Congressional Research Service, *Clean Water State Revolving Fund Allotment Formula: Background and Options*, R47474 (Mar. 15, 2023) and Environmental Protection Agency, *Review of the Allotment of the Clean Water State Revolving Fund (CWSRF)*, Report to Congress, EPA-830-R-16-001 (May 2016).

[2]The Clean Water SRF appropriation generally includes a set-aside for EPA to use to make grants to Indian Tribes and U.S. territories other than Puerto Rico for wastewater infrastructure. We did not review the set-aside for Tribes or other U.S. territories as part of this report. For more information on tribal water infrastructure, see GAO, *Drinking Water and Wastewater Infrastructure: Opportunities Exist to Enhance Federal Agency Needs Assessment and Coordination on Tribal Projects,* GAO-18-309 (Washington, D.C.: May 15, 2018).

[3]Exec. Order No. 14008, § 223, 86 Fed. Reg. 7619, 7631 (Feb. 1, 2021). Office of Management and Budget, M-21-28*, Interim Implementation Guidance for the Justice40 Initiative* (Washington, D.C.: July 20, 2021) and M-23-09, *Addendum to the Interim Implementation Guidance for the Justice40 Initiative, M-21-28, on using the Climate and Economic Justice Screening Tool* (Washington, D.C.: Jan. 27, 2023).

[4]GAO, *State Revolving Funds: Improved Financial Indicators Could Strengthen EPA Oversight*, GAO-15-567 (Washington, D.C.: Aug. 5, 2015) and *Clean Water: How States Allocate Revolving Loan Funds and Measure Their Benefits*, GAO-06-579 (Washington, D.C.: June 5, 2006).

[5]The Clean Watersheds Needs Survey organizes data on capital investment needs into categories. For reporting purposes, we consolidated these categories into centralized clean water infrastructure and noncentralized clean water infrastructure, which includes stormwater management, nonpoint source control, and decentralized wastewater treatment. The Clean Water Act, as amended, requires states to use its clean water SRF grants for additional subsidies, such as loan forgiveness, grants, or negative interest loans, to certain recipients under certain circumstances, including to "hardship communities" (i.e., those that meet state-established affordability criteria). 33 U.S.C. § 1383(i)(1)(A), (2)(A)(i).

SRF funds, we reported data on the 50 states and Puerto Rico. We did not report data on the District of Columbia because it does not have an SRF. We reported averages of 5 years for all but one set of data. In the case of additional subsidies to hardship communities, we reported averages of 3 years because EPA began collecting these data in 2021. In all cases, we reported data from July 1 through June 30 of each year, because that is the reporting basis EPA generally uses in its data system.

To assess the reliability of EPA's data, we performed electronic and manual testing for obvious errors in accuracy and completeness; reviewed related documentation; and interviewed agency officials to understand their process for ensuring the accuracy of the data. When we found apparent discrepancies (such as negative data values), we brought them to EPA officials' attention and confirmed that they were within expected ranges. To assess the reliability of the Census Bureau's data, we performed electronic testing for obvious errors in accuracy and completeness and reviewed related documentation. To help ensure the accuracy of our calculations, an independent analyst verified the code we used for them. We determined the EPA and U.S. Census Bureau data were sufficiently reliable for the purpose of illustrating potential changes to the current formula for allotting clean water SRF grants and EPA's data were sufficiently reliable for the purpose of describing states' distribution of their SRF funds.

To discuss the views of an expert panel on a new allotment formula it developed, and examine its effects on the allotments to states, we convened a panel of experts, used a multi-step process to consider various formula elements, and analyzed the effects of the expert-developed formula using data from EPA and U.S. Census Bureau. To achieve this outcome, the experts considered and came to agreement on whether to include or exclude the following elements: (1) variables that could go into a formula, (2) measures associated with the agreed-upon variables, and (3) data sources for those measures.[6] The final step of the process was an in-person discussion to finalize agreement on all the elements, and develop and agree to formula options using those elements.[7]

The multi-step process, described in more detail below, progressively narrowed the scope of the formula elements and options experts considered, enabled an efficient and meaningful discussion among the experts, and concluded with consensus on a single allotment formula.

- **Literature search and review.** We conducted a literature search and review to identify specific content for experts to consider, as well as names of potential experts for our panel.
    - For the literature search, we used search terms such as "revolving funds," "grant formula," "grant allocation," and "infrastructure funding." We conducted the search in databases included in Dialog Professional Platform, ProQuest, EBSCOhost Research Platform, Harvard Think Tank, and Westlaw's Journal Collection.
    - Through our literature review, we identified nine potential variables and eight features that could be used with a formula, such as minimum allotment percentages or limits on increases or decreases of

[6]For the purposes of formula development, we considered a variable to be a state-level characteristic or action that a formula takes into account, a measure to be an observable indicator used in place of a variable in a mathematical calculation or formula, and a data source to be specific information that may be selected for the measure.

[7]Given the number of individual elements that the experts needed to consider and agree on to get to the final outcome, we used a majority agreement approach, whereby something was either included or excluded if at least four of the seven experts agreed.

allotment percentages.[8] A description of all of the variables and features we identified, the measures and data sources considered for each of the variables experts included in the formula, and examples of the experts' views on these formula elements are in appendix V.

- As part of our literature search and review, we also identified authors whom we considered as potential candidates in our search for experts.

- **Identification and selection of experts.** We started with a list of 55 candidates for our expert panel by identifying authors from our literature review, from recommendations from various experts and stakeholders, and from our review of relevant documents from prior GAO work. To select experts, we interviewed candidates and reviewed their publications, background, training, and experience to ensure they had the requisite expertise to serve on the panel. We looked for expertise in one or more of the following areas: (1) formula grants, (2) clean or drinking water formulas, (3) datasets or variables, (4) data and modeling, (5) clean or drinking water, and (6) equity issues. Through reviews of the experts' publications and background, we selected 21 experts from the initial list of 55 candidates. Of the 21 experts, 12 agreed and were qualified to serve in the expert panel, and seven experts—who collectively had expertise across all relevant areas—were able to participate in the panel.[9] The names, titles, and affiliations of the seven experts who served on the panel are listed in table 1 below.[10]

Table 1: Names, Titles, and Affiliations of the Experts Who Served on Our Panel

Name	Title	Affiliation
Claudia Copeland	Specialist in Resources and Environmental Policy (retired)	Congressional Research Service
Dorothy Daley	Professor	University of Kansas, School of Public Affairs and Administration
Rebecca Hammer	Senior Attorney and Deputy Director of Federal Water Policy	Natural Resources Defense Council
Heather Himmelberger	Director	Southwest Environmental Finance Center
John Morris	Professor	Auburn University, Department of Political Science
Megan Mullin	Professor	University of California Los Angeles, Luskin School of Public Affairs
Peter Shanaghan	Principal Senior Environmental Engineer (retired)	The Cadmus Group Environmental Protection Agency

Source: GAO. | GAO-24-106251

- **Expert survey.** From May to June 2023, we conducted a web-based survey of the experts to gather their initial views on program goals and the elements of a formula we had identified and assess areas of agreement and disagreement. We pre-tested the survey with two experts, made changes based on the

[8]The nine variables included fiscal capacity, burden, cost, effort, need, population, utilization, effectiveness, and debt. The eight features included minimum allotment, maximum allotment, maximum allotment decrease, maximum allotment increase, bonus, penalty, matching, and set-aside. Features can be used with formulas to achieve various goals, such as facilitating the transition to a new formula or covering program operation costs.

[9]We asked experts to provide responses to a conflict-of-interest questionnaire, which asked about their sources of funding and any advocacy activities, among other things. Based on our review of their responses, we did not exclude any experts from our selection. However, we eliminated one candidate from consideration because she had taken a position with EPA's Office of Water.

[10]All seven experts participated in all steps of our process: survey, virtual meeting, and in-person meeting.

results, obtained an independent review by a GAO survey specialist, and programmed the final survey in Qualtrics. All seven experts completed the survey, which asked them to provide input as follows:

- Rate the importance of each of the goals we identified for the Clean Water SRF program.
- Consider each of the nine variables we identified from the literature review and indicate whether it should be included in an allotment formula. If so, we asked experts which of the program goals the variable would meet, the strengths and limitations of the variable, and what measures and data sources they would suggest for that variable.
- Identify any additional variables that should be considered in an allotment formula. For each variable they suggested, we asked the same questions about goals, strengths and limitations, measures, and data sources.

We analyzed the results of the survey and found that, of the nine variables, four or more experts agreed (majority agreement) that three be included in an allotment formula and three not be included. For three remaining variables there was not majority agreement to either include them in a formula or not.[11] In addition, experts suggested three additional variables. These six variables were discussed in the virtual meeting detailed below. For the variables experts indicated should be included, they suggested a range of measures and data sources.

- **Virtual meeting.** In June 2023, we held a 3-hour virtual meeting with the panel of experts to share survey results, have experts discuss and vote on the variables where four or more experts did not indicate they would include or exclude the variable from the survey, and discuss and vote on measures and data sources for the variables a majority of the experts selected for inclusion.[12] In preparation for the meeting, we emailed background information to the experts about the federal composite indices that were proposed in the survey.[13] To guide the meeting, we prepared a script and slides and presented a summary of the survey results. We conducted the meeting as follows:
  - We asked the experts to discuss the three variables that did not receive majority agreement (four or more experts agreeing) to include or not to include in a formula. Specifically, we asked the experts to describe their positions on either including or excluding each of the three variables that did not receive majority agreement. We then had the experts discuss and vote on whether to include or exclude each for further consideration. The experts voted to exclude them from further consideration for formula development. In addition, we discussed with the experts the additional variables they suggested in the survey to determine if they were unique variables or measures for one of the variables in the original list we presented. From this discussion, the experts concluded that two were measures of one of the nine variables we originally presented, and they voted to exclude the third, so we did not add new variables for further consideration.
  - We then asked the experts to (1) discuss measures for each of the three variables they selected from the survey to include in a formula and (2) vote on whether to include or exclude each from further discussion during the in-person meeting. The experts proposed six measures for need and, after

[11]For example, experts could select “maybe,” which could result in fewer than four experts choosing to include or not include a variable.

[12]We conducted the virtual meeting using video, and recorded and transcribed the discussion.

[13]We provided summary information to the experts about EPA’s 2022 Clean Watersheds Needs Survey and Environmental Justice Screening and Mapping tool, the Centers for Disease Control and Prevention Agency for Toxic Substances and Disease Registry’s Social Vulnerability Index, and the Council on Environmental Quality’s Climate and Economic Justice Screening Tool. We collectively refer to these tools and index as “federal composite indices.”

discussing them, determined that five were either duplicative or should not be included, leaving one measure—categories from the Clean Watersheds Needs Survey. All seven experts indicated that need should be included in the survey, so it was not voted on. The experts discussed two measures for population and voted to consider one of them during the in-person meeting—population in urbanized areas.[14] A second measure for population was not discussed or voted on because a majority of the experts indicated that it should be included in the survey—total population. The experts discussed four measures for the economic burden variable and voted to consider three of them during the in-person meeting—federal composite indices such as EPA's Environmental Justice Screening and Mapping Tool, race, and poverty rate.[15]

- The experts also discussed the data sources that they proposed for the five measures they agreed to include for further consideration.

- **In-person meeting.** In August 2023, we held an in-person meeting with the panel of experts to conclude discussions on the key elements and to develop and agree on a final allotment formula or formulas.[16] We conducted the meeting as follows:

  - The experts continued to discuss the data sources for the three variables and six measures that a majority agreed should be considered for formula development.

  - The experts individually developed potential allotment formulas. Experts took turns presenting their proposed formulas and their rationales behind them. Through discussion, the experts came to consensus on one formula, including the weights associated with each variable.

  - The experts discussed the eight potential features we identified and provided to them ahead of the meeting. The experts then voted on which should be used with the formula they developed. As a result of this vote, a majority of experts selected five of the eight features, including temporary features to help states transition to the new formula and continuing existing features such as the minimum allotment percentage.

  - The experts also discussed and jointly developed ideas to improve EPA's management of the Clean Water SRF program (see app. VI).

Following both virtual and in-person meetings, we analyzed a transcript of the discussion the experts held for their views.

To examine how using the formula experts developed would affect the allotment of clean water SRF grants to states, we modeled the percentage change in clean water SRF grant allotment percentages for each state compared with its current allotment percentage, using 2022 and 2012 data from the U.S. Census Bureau's American Community Survey 1-year estimates and EPA's Clean Watersheds Needs Survey.

To calculate state allotment percentages based on the formula experts developed, we used an iterative process to ensure that each state's allotment percentage was not lower than the minimum of 0.5 percent and

[14]The measure the experts excluded from further consideration was population density.

[15]The measure the experts excluded from further consideration was unemployment rate.

[16]To prepare for the in-person meeting, a week prior we sent the experts information on: the variables, measures, and data sources still under consideration after the virtual meeting; goals of the Clean Water SRF program we analyzed; categories of need from the 2022 and 2012 Clean Watersheds Needs Surveys; federal composite indices and National Academies of Sciences' review of environmental screening tools such as federal composite indices; examples of formulas for federal formula grant programs we identified through legal research and review of federal agency documents; and features we identified through a literature search.

the annual change for the first 4 years did not exceed the maximum increase or decrease selected by the experts. To do so, we took the following steps:

1. We calculated state allotment percentages based on the formula experts developed without including any features. We set any state allotment percentage that fell below the minimum equal to the minimum and adjusted the remaining states' allotment percentages proportionately to ensure that the total remained equal to 100 percent.
2. We calculated the percent change of each state's allotment percentage from the previous year. If that percent change was greater than the experts' recommended maximum decrease of 25 percent or increase of 200 percent, we set the state's allotment percentage such that the percent change was within the limit experts suggested. For example, if a state's calculated allotment would be a 40 percent decrease from its previous year's allotment percentage based on the formula alone, we set its allotment percentage decrease to 25 percent.
3. Once we made these changes, we adjusted the allotment percentages in the remaining states (those receiving more than the minimum and with allotment percentages based on the formula that did not have a change from the previous year that exceeded the expert-suggested minimum or maximum) to make the total equal 100 percent. Because this process involved changing allotment percentages, it was possible that a state's allotment percentage after adjustment would no longer satisfy the formula feature constraints, so we repeated the process until all state allotment percentages were greater than or equal to the minimum and did not have a change between years that exceeded the maximums experts suggested. To ensure the accuracy of the model's calculations, an independent analyst verified its code.

To assess the reliability of data we used to model the effects of the expert formula, we reviewed documentation from EPA and U.S. Census Bureau and conducted data tests and looked for anomalies or missing values. For the EPA data, we also interviewed EPA and state officials about steps they take to verify the quality of Clean Watersheds Needs Survey data. As a result of the steps above, we found the data we reported to be sufficiently reliable for the purpose of analyzing the effect the expert-developed formula would have on state allotments.

To examine the extent to which EPA estimates states' clean water needs, we reviewed EPA's 2022 and 2012 Clean Watersheds Needs Survey reports—the two most recently available—and related documents.[17] We examined data from two time periods to illustrate the potential changes in the allotments over time. We reviewed documents that guide collection of information on infrastructure needs: EPA's guidelines on information and data quality and standards assessing the infrastructure needs of small- and medium-sized utilities.[18] In addition, we reviewed the American Water Works Association's manual on best practices that water utility managers should use when assessing and managing their assets.[19]

[17]The Clean Water Act, as amended, requires EPA, in cooperation with states, to biennially revise a detailed estimate of the cost of construction of all needed publicly owned treatment works in each of and all states. 33 U.S.C. § 1375(b)(1)(B). EPA last conducted this survey in 2012 but did not provide estimates until 2022 because of lack of resources, according to EPA officials.

[18]Environmental Protection Agency, *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by EPA* (October 2002), and *Reference Guide for Asset Management Tools Asset Management Plan Components and Implementation Tools for Small and Medium Sized Drinking Water and Wastewater Systems* (June 2020).

[19]*M29: Water Utility Capital Financing, Fourth Edition*, Copyright © 2014 American Water Works Association. All rights reserved.

We interviewed EPA officials responsible for conducting the 2022 Clean Watersheds Needs Survey. We discussed data collection, data quality, and challenges that EPA and the states face when collecting data for the Clean Watersheds Needs Survey.

To identify some of the known challenges of assessing clean water infrastructure needs, we interviewed and reviewed congressional testimony on the Clean Water SRF allotment formula from three organizations representing state agencies: the Council of Infrastructure Financing Authorities, Environmental Council of the States, and National Association of Clean Water Agencies. We chose these organizations because they represent relevant state agencies and have expressed views on the development of an allotment formula for the Clean Water SRF program.

To illustrate states' challenges with estimating their clean water needs, we interviewed a nongeneralizable sample of officials from agencies in eight states that participated in EPA's Clean Watersheds Needs Survey. To capture a broad range of viewpoints, we selected states according to location, population density, and the percent of additional subsidies each state's clean water SRF provided annually to hardship communities. We started the selection by first identifying which of the four U.S. Census regions each of the 50 states belonged: Northeast, South, Midwest, and West. We then selected the states with the highest and lowest population density and the states with highest and lowest percent of additional subsidies to hardship communities in each of the four regions. Because some regions had multiple states that documented zero additional subsides for hardship communities, we ended up selecting 23 states.

To select from this list, we judgmentally selected eight states from the list of 23: two in each region. To maximize geographic diversity, we did not pick states that shared a border in the same region. For our final selection we chose the following two states from each region: Missouri and Wisconsin (Midwest), Connecticut and Pennsylvania (Northeast), Florida and Oklahoma (South), and Nevada and Washington (West). During the interviews with officials from these selected states, we asked about the process for assessing and documenting their state's needs, the challenges they faced collecting different categories of needs, and the factors that influenced their ability to assess their needs, among other things. As a result of our selection process, the information received from the states cannot be generalized to the other states with whom we did not speak. Instead, we used the interviews and the documents we received from states to illustrate challenges of assessing needs for the Clean Watersheds Needs Survey.

We conducted this performance audit from September 2022 to July 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Examples of Elements of Federal Formula Grants for Infrastructure Programs

Based on our analysis of literature, statutes, regulations, and federal agency information, we identified examples of federal formula grant programs that fund infrastructure.[1] We then analyzed their elements for the purpose of illustrating such elements in formula grants that provide funding for infrastructure programs. The programs listed in table 2 provide examples of three formula elements our analysis identified: variables, measures, and data sources.[2]

Table 2: Examples of Elements of Federal Formula Grants for Infrastructure Programs

Agency	Program name	Variable	Measure	Data source
Department of Agriculture, National Institute of Food and Agriculture	Agricultural Experiment Stations Grants	Population	Farm population	U.S. Census (Decennial Census)
Department of Agriculture, National Institute of Food and Agriculture	Agricultural Experiment Stations Grants	Population	Rural population	U.S. Census (Decennial Census)
Department of Commerce, National Telecommunications and Information Administration	Broadband Equity, Access, and Deployment Program	Need	Number of unserved locations	Federal Communication Commission's Broadband DATA Maps
Department of Commerce, National Telecommunications and Information Administration	Broadband Equity, Access, and Deployment Program	Cost	Number of unserved locations in high-cost areas	Cost model developed by National Telecommunications and Information Administration,[a] U.S. Census Bureau's census blocks
Department of Commerce, National Telecommunications and Information Administration	State Digital Equity Capacity Grant Program	Burden	Covered population[b]	U.S. Census Bureau's American Community Survey 1- and 5-year files and U.S. Department of Education's National Center for Education Statistics data on adult literacy skills
Department of Commerce, National Telecommunications and Information Administration	State Digital Equity Capacity Grant Program	Need	Lack of availability or adoption of broadband	Federal Communications Commission's Broadband Deployment Report, U.S. Census Bureau's American Community Survey 1-year file and monthly Current Population Survey
Department of Commerce, National Telecommunications and Information Administration	State Digital Equity Capacity Grant Program	Population	Total population	U.S. Census (Decennial Census)

[1]This table provides selected elements of the grant programs we analyzed; it does not present the statutory or regulatory formulas for those programs.

[2]Based on our analysis, we define a variable to be a state-level characteristic or action that a formula takes into account, a measure to be an observable indicator used in place of a variable in a mathematical calculation or formula, and a data source to be specific information that may be selected for the measure.

Agency	Program name	Variable	Measure	Data source
Department of Treasury	Capital Projects Fund	Economic burden	Population below 150 percent of poverty line	U.S. Census Bureau's American Community Survey 1-year file
Department of Treasury	Capital Projects Fund	Population	Total population	U.S. Census (Decennial Census)
Department of Treasury	Capital Projects Fund	Population	Rural population	U.S. Census Bureau's American Community Survey 1-year file

Source: GAO analysis of literature and agency information. | GAO-24-106251

Note: We analyzed literature and federal agency information and judgmentally categorized the elements of their formula grants into variable, measure, and data source. This table does not present the statutory or regulatory formulas for these programs.

[a]Cost model uses the following factors: remoteness, population density, topography, and poverty rates.

[b]Covered populations are individuals who live in a household at or below 150 percent of federal poverty rate; individuals 60 years or older; certain incarcerated individuals; veterans; individuals with disabilities; individuals with a language barrier; individuals who are members of a racial or ethnic minority group; and individuals who primarily reside in rural areas. 47 U.S.C. § 1721(8).

Appendix III: Clean Water State Revolving Fund Allotment Percentages

The 1987 amendments to the Clean Water Act established the formula for allotting clean water State Revolving Fund (SRF) grants to states, which allots grants using a fixed percentage of program appropriations for each state.[1] Since then, the Environmental Protection Agency (EPA) made minor adjustments to the allotment percentages to reflect changes related to certain U.S. territories (see table 3 for the allotment percentage established in the 1987 amendments and the percentage EPA used in fiscal year 2024).[2]

Table 3: Allotment Percentages for the Clean Water SRF Formula

In percent

State	1987 Clean Water Act Amendment allotment	Fiscal year 2024 allotment
Alabama	1.13	1.14
Alaska	0.61	0.61
Arizona	0.68	0.69
Arkansas	0.66	0.66
California	7.23	7.26
Colorado	0.81	0.81
Connecticut	1.24	1.24
Delaware	0.50	0.50
District of Columbia	0.50	0.50
Florida	3.41	3.43
Georgia	1.71	1.72
Hawaii	0.78	0.79
Idaho	0.50	0.50
Illinois	4.57	4.59
Indiana	2.44	2.45
Iowa	1.37	1.37
Kansas	0.91	0.92
Kentucky	1.29	1.29
Louisiana	1.11	1.12

[1]Pub. L. No. 100-4, tit. II, § 206(a)(2), 101 Stat. 7, 19-20 (1987) (codified at 33 U.S.C. § 1285(c)(3)).

[2]According to EPA, beginning in fiscal year 2000, the Pacific Trust Territories were no longer eligible for clean water SRF grants due to a change in their governing status. As a result, since fiscal year 2000, EPA has adjusted the allotment for states and the other territories to distribute the percentage allotted to the Pacific Trust Territories in section 206(a)(2) of the Water Quality Act of 1987. In addition, annual appropriations acts since fiscal year 2010 have generally increased the total allotment percentage for the territories of American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands from the allotment percentage for each of those territories in section 206(a)(2). As a result, EPA has adjusted the allotment for states and territories to accommodate this increased percentage for the territories but will use the allotment percentages in section 206(a)(2) if annual appropriations acts do not increase the total allotment percentages to the territories.

State	1987 Clean Water Act Amendment allotment	Fiscal year 2024 allotment
Maine	0.78	0.79
Maryland	2.45	2.46
Massachusetts	3.43	3.45
Michigan	4.35	4.37
Minnesota	1.86	1.87
Mississippi	0.91	0.91
Missouri	2.80	2.81
Montana	0.50	0.50
Nebraska	0.52	0.52
Nevada	0.50	0.50
New Hampshire	1.01	1.01
New Jersey	4.13	4.15
New Mexico	0.50	0.50
New York	11.16	11.21
North Carolina	1.83	1.83
North Dakota	0.50	0.50
Ohio	5.69	5.72
Oklahoma	0.82	0.82
Oregon	1.14	1.15
Pennsylvania	4.01	4.02
Puerto Rico	1.32	1.32
Rhode Island	0.68	0.68
South Carolina	1.04	1.04
South Dakota	0.50	0.50
Tennessee	1.47	1.47
Texas	4.62	4.64
Utah	0.53	0.53
Vermont	0.50	0.50
Virginia	2.07	2.08
Washington	1.76	1.77
West Virginia	1.58	1.58
Wisconsin	2.73	2.74
Wyoming	0.50	0.50
Total	**99.6[a]**	**100**

Source: GAO analysis of 33 U.S.C. § 1285(c)(3) and Environmental Protection Agency (EPA) data. | GAO-24-106251

Notes: According to EPA, beginning in fiscal year 2000, the Pacific Trust Territories were no longer eligible for clean water State Revolving Fund (SRF) grants due to a change in their governing status. Since fiscal year 2010, annual appropriations acts have generally set aside a percentage for American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands that is higher than their total allotment percentage in the Water Quality Act of 1987. As a result of these changes, EPA has adjusted the other allotment percentages to sum up to 100. The set-aside for territories is a percentage of the Clean Water SRF appropriation minus the set-aside for Indian tribes and is taken before the allotment to states.

Percentages in this table are rounded to two decimal places.

[a]The Water Quality Act of 1987 allotted 0.4 percent for American Samoa, Guam, the Northern Mariana Islands, Pacific Trust Territories, and U.S. Virgin Islands.

Appendix IV: Amount of Clean Water State Revolving Fund Grants and Distribution of States' Revolving Funds

The amount of clean water State Revolving Fund (SRF) grants the Environmental Protection Agency (EPA) awards to states is determined by each state's allotment percentage and the amount of the Clean Water SRF appropriation. On average from 2019 through 2023, states' grants ranged from $6 million to $208 million. The amount each state's SRF distributes to projects and otherwise uses depends on various factors, such as the amount of federal grant funding each state receives and the extent to which states leverage their SRFs. As shown in table 4 below, states distributed varying amounts, averaging from about $14 million to $764 million annually from 2019 through 2023.

Table 4: Clean Water SRF Grants and State Distribution of Clean Water SRF Funds, 5-Year Average, 2019–2023

Dollars in millions

State	Clean water SRF grants	Clean water SRF distribution
New York	208	584
California	133	764
Ohio	105	662
Texas	85	487
Illinois	84	393
Michigan	81	257
Pennsylvania	74	200
Florida	66	253
Massachusetts	63	346
New Jersey	63	312
Missouri	52	112
Wisconsin	50	239
Maryland	45	163
Indiana	45	414
Virginia	38	169
North Carolina	37	112
Minnesota	34	163
Washington	32	183
Georgia	32	207
West Virginia	29	46
Puerto Rico	28	49
Tennessee	27	88
Iowa	25	278
Kentucky	24	63

State	Clean water SRF grants	Clean water SRF distribution
Connecticut	23	89
South Carolina	22	91
Alabama	21	71
New Hampshire	19	55
Oregon	17	56
Kansas	17	47
Mississippi	17	45
Louisiana	17	40
Oklahoma	15	167
Colorado	15	72
Maine	15	50
Hawaii	14	77
Arizona	13	37
Rhode Island	13	50
Arkansas	12	65
Utah	10	48
Nebraska	10	58
Delaware	9	35
Vermont	9	16
Idaho	9	42
Montana	9	33
Nevada	9	31
New Mexico	9	23
North Dakota	9	69
South Dakota	9	115
Alaska	9	14
Wyoming	6	22
Total[a]	**1,820**	**8,065**

Source: GAO analysis of Environmental Protection Agency (EPA) data. | GAO-24-106251

Note: Data are provided in reporting year basis of July 1 through June 30.

[a]In addition, the District of Columbia receives 0.5 percent of the Clean Water State Revolving Fund (SRF) appropriation, which it uses for its Clean Water Construction grant program.

On average, states distributed about 90 percent of their clean water SRF on centralized clean water infrastructure from 2019 through 2023. EPA and state officials told us states prioritize centralized clean water infrastructure projects for various reasons. According to these officials, these include state laws prohibiting the use of the clean water SRF on projects other than centralized clean water infrastructure, the higher cost of these projects, and states' need for these projects to comply with permit requirements. However, as shown in table 5, 23 states distributed more than 10 percent of their SRFs on noncentralized clean water infrastructure, including on projects that address stormwater management and nonpoint source control.

Table 5: Distribution of Clean Water SRF Funds, by Categories of Need, 5-Year Average, 2019–2023

Percent

State	Centralized clean water infrastructure	Noncentralized clean water infrastructure: Stormwater management	Noncentralized clean water infrastructure: Nonpoint source control	Noncentralized clean water infrastructure: Other[a]
Vermont	55.0	4.8	23.6	16.5
Maryland	64.8	14.6	0.4	20.1
Louisiana	65.5	-0.3[b]	0.0	34.8
Wyoming	66.6	-0.2	33.4	0.2
Delaware	71.5	21.9	4.4	2.2
North Dakota	72.4	25.9	1.5	0.2
New Jersey	74.5	10.2	9.4	5.9
Arizona	75.1	14.2	4.2	6.5
Oklahoma	78.4	4.4	2.2	15.1
New Mexico	80.3	8.9	0.6	10.2
Pennsylvania	82.2	9.5	7.5	0.8
Maine	82.2	6.8	9.3	1.7
Colorado	83.9	8.4	0.2	7.5
Alaska	84.6	0.0	3.5	11.9
California	85.1	0.6	0.2	14.1
Puerto Rico	85.3	3.4	3.2	8.1
Minnesota	86.3	0.6	7.9	5.3
Iowa	86.8	0.8	5.7	6.8
Illinois	88.3	11.7	0.0	0.0
Georgia	89.0	3.7	1.7	5.6
Texas	89.0	6.9	0.1	3.9
Hawaii	89.1	0.4	10.4	0.0
Oregon	89.6	4.7	4.6	1.1
South Dakota	92.2	5.9	1.7	0.2
Rhode Island	92.3	3.4	2.0	2.3
Alabama	92.4	5.1	0.0	2.5
Montana	93.1	3.2	3.7	0.0
West Virginia	93.1	0.0	0.0	6.9
Virginia	93.3	0.9	5.2	0.5
New Hampshire	93.6	2.3	0.0	4.1
Ohio	94.1	1.6	2.2	2.0
Washington	94.2	0.9	2.2	2.7
Indiana	94.6	4.4	1.0	0.0
Florida	94.8	3.9	0.3	1.1
Missouri	95.6	0.0	4.3	0.1
Massachusetts	96.0	1.3	0.2	2.4

State	Centralized clean water infrastructure	Noncentralized clean water infrastructure: Stormwater management	Noncentralized clean water infrastructure: Nonpoint source control	Noncentralized clean water infrastructure: Other[a]
Michigan	97.1	2.8	0.1	0.0
New York	97.1	1.1	0.2	1.6
Kentucky	97.5	0.1	0.0	2.4
Arkansas	98.1	0.0	1.2	0.7
South Carolina	98.2	1.6	0.0	0.3
Kansas	98.5	0.0	1.5	0.0
Wisconsin	98.5	0.2	0.1	1.2
Tennessee	99.0	0.1	0.0	0.9
Connecticut	99.3	0.8	0.0	-0.1
Idaho	99.4	0.0	0.1	0.5
Nebraska	99.8	-0.2	0.1	0.3
Utah	100.0	0.0	0.0	0.0
Nevada	100.0	0.0	0.0	0.0
Mississippi	100.0	0.0	0.0	0.0
North Carolina	100.4	-0.4	0.0	0.0
National average	90.1	3.7	2.0	4.1

Source: GAO analysis of Environmental Protection Agency (EPA) data. | GAO-24-106251

Note: Percentages may not total to 100 because of rounding. Data are provided in reporting year basis of July 1 through June 30.

[a]Other includes decentralized wastewater treatment.

[b]According to EPA officials, a negative percentage is the result of de-obligation of a previously funded project by the state's clean water State Revolving Fund (SRF).

EPA has set a threshold of efficiency for clean water SRFs to have undisbursed balance ratios of 5 years or less. Officials from states we interviewed cited various reasons for high undisbursed balance ratios, including timing of bond issuance for states that leverage bonds, delays in project approvals due to COVID and retirements, lack of interest in the program due to burdensome requirements for the loans and availability of grants through other programs, and early repayments when interest rates were low. As seen in table 6 below, 16 states and Puerto Rico had higher balances on average than EPA's threshold.

Table 6: Average Annual Undisbursed Balance Ratios, by Clean Water SRF, 2019–2023

State	Undisbursed balance ratio[a]
Puerto Rico	29.9
Arizona	16.5
Michigan	13.2
New Mexico	9.6
Wyoming	8.7
Vermont	8.5
Mississippi	8.4
Alaska	8.1
Georgia	6.7

State	Undisbursed balance ratio[a]
Alabama	6.7
New Jersey	6.6
Nebraska	6.2
Virginia	5.7
North Carolina	5.6
Missouri	5.4
Connecticut	5.3
South Dakota	5.1
Rhode Island	5.0
Pennsylvania	5.0
Oregon	4.4
Kansas	4.3
South Carolina	4.3
Louisiana	4.2
Colorado	3.9
Wisconsin	3.9
Kentucky	3.8
New Hampshire	3.7
Tennessee	3.7
Maine	3.7
Idaho	3.6
Delaware	3.5
West Virginia	3.4
Arkansas	2.9
Washington	2.8
Nevada	2.8
Florida	2.6
Minnesota	2.5
Oklahoma	2.4
New York	2.2
Utah	2.2
Massachusetts	2.2
North Dakota	2.1
Hawaii	2.0
Ohio	1.9
Iowa	1.7
California	1.6
Texas	1.5
Illinois	1.2
Maryland	1.1
Indiana	0.6

State	Undisbursed balance ratio[a]
Montana	0.3
National average	3.0

Source: GAO analysis of Environmental Protection Agency (EPA) data. | GAO-24-106251

Note: Data are provided in reporting year basis of July 1 through June 30.

[a]Undisbursed balance ratio compares cash balances that states' clean water State Revolving Funds (SRF) have with their average annual disbursement (amount paid in cash or cash equivalents) for projects, according to EPA.

States have used, on average from 2021 through 2023, up to 76 percent of their clean water SRF grants for additional subsidies to hardship communities, but some states have not provided any additional subsidies to these communities. EPA officials said that states that did not provide additional subsidies to hardship communities may have chosen to direct additional subsidies to other eligible recipients. Table 7 shows the percent of clean water SRF grants states distributed as additional subsidies to hardship communities from 2021 through 2023.

Table 7: Percent of Clean Water State Revolving Fund (SRF) Grants States Distributed as Additional Subsidies to Hardship Communities, 3-Year Average, 2021–2023

State	Additional subsidies to hardship communities, percent of clean water SRF grants
Wyoming	76.5
New Mexico	54.0
Indiana	50.2
Pennsylvania	41.5
Idaho	40.7
Florida	38.4
Delaware	38.1
Washington	37.0
Utah	35.6
Wisconsin	32.8
North Dakota	32.0
Iowa	27.2
California	27.0
West Virginia	25.8
Arizona	25.4
Illinois	24.2
Mississippi	23.8
Michigan	23.5
Ohio	20.8
Alabama	20.0
Louisiana	17.8
Maine	17.4
Oklahoma	14.8
Texas	14.7
Montana	13.8

State	Additional subsidies to hardship communities, percent of clean water SRF grants
South Carolina	13.4
Oregon	12.9
Virginia	12.4
Colorado	12.2
Rhode Island	11.8
Maryland	11.6
Massachusetts	11.1
Nevada	9.9
Vermont	9.6
Alaska	8.4
Hawaii	8.2
New Jersey	8.0
New York	7.3
Kentucky	7.1
Connecticut	6.7
Minnesota	6.4
Tennessee	6.2
Nebraska	5.9
New Hampshire	3.0
Arkansas	2.7
Georgia	2.3
Missouri	0.3
Kansas	0.0
North Carolina	0.0
Puerto Rico	0.0
South Dakota	0.0
National average	18.4

Source: GAO analysis of Environmental Protection Agency (EPA) data. | GAO-24-106251

Notes: Data are provided in reporting year basis of July 1 through June 30.

Additional subsidies include grants or principal forgiveness, which states may distribute to hardship communities—those that meet state-established affordability criteria—as well as to other eligible recipients. EPA officials told us that states that did not distribute additional subsidies to hardship communities may have distributed additional subsidies to other eligible recipients.

Appendix V: Selected Views on Formula Elements and Features from Our Expert Panel

Experts Expressed Their Views on the Variables, Measures, Data Sources, and Weights They Considered for Inclusion in a Formula

Through our literature review and analysis of articles, we identified nine potential variables with example measures for experts to consider including in a formula: need, population, economic burden, fiscal capacity, cost, effort, utilization, effectiveness, and debt. Through a survey and two meetings, a majority of the experts selected three variables—need, population, and economic burden—to include in a formula and suggested associated measures and data sources for these variables.[1] Selected examples of their views on these elements are included below.

Need

Based on our analysis, we defined need as the funding that states estimate is needed for projects to meet the water quality goals of the Clean Water Act in each state. The experts identified clean water needs as the measure for this variable and the Clean Watersheds Needs Survey as the data source. Table 8 provides examples of views that experts expressed about the need variable and its associated measure in the survey and during their discussions in the virtual and in-person meetings.

Table 8: Examples of Views from Our Expert Panel for the Need Variable and An Associated Measure

Experts' views on the variable	Measure	Experts' views on the measure
• Need is the variable that is aligned most closely with the intent of the Clean Water Act to improve water quality by funding clean water infrastructure needed to achieve water quality goals. • Using need could create an incentive for states to overstate their needs. • Some states have limited capacity to determine their clean water needs.	Clean Watersheds Needs Survey	• The needs survey reflects the infrastructure needed to improve water quality and needs of states with declining populations. • The formula should fund the infrastructure needed to improve water quality, which is reflected in the needs survey. • Currently, the data from the needs survey are unreliable and incomplete and this measure would incentivize states to improve their needs estimates.

Source: GAO. | GAO-24-106251

[1]For the purposes of formula development, we considered a variable to be a state-level characteristic or action that a formula takes into account, a measure to be an observable indicator used in place of a variable in a mathematical calculation or formula, and a data source to be specific information that may be selected for the measure.

Population

Based on our analysis, we defined population as the number of people living in an area. The experts identified total population, population in urbanized areas, and population density as potential measures for this variable and selected total population as the measure to use. For this measure, the experts identified and selected two data sources: the Decennial Census or 1-year estimate from the American Community Survey, whichever is most recent. Table 9 provides examples of views that experts expressed about the population variable and its associated measures in the survey and during their discussion in the virtual and in-person meetings.

Table 9: Examples of Views from Our Expert Panel for the Population Variable and Associated Measures

Experts' views on the variable	Measures	Experts' views on the measures
• Population is a driver of infrastructure needs over the long term and can serve as a proxy for clean water need. • Population has objective measures that are correlated with clean water need. • Population has reliable data and this can compensate for data limitations in the Clean Watersheds Needs Survey. • Population serves as a leading indicator of need, as population data are updated regularly, while the needs survey is a lagging indicator because it takes time for states to identify their needs.	Total population (selected by experts)	• States with larger populations are more likely to have both point source and nonpoint source pollution. • States with larger populations may have greater capacity to fund infrastructure projects with less federal assistance than less populated states. • Using population could direct funds to benefit as many people as possible. • Utilities use total population to determine capital investment needs.
• Population is a driver of infrastructure needs over the long term and can serve as a proxy for clean water need. • Population has objective measures that are correlated with clean water need. • Population has reliable data and this can compensate for data limitations in the Clean Watersheds Needs Survey. • Population serves as a leading indicator of need, as population data are updated regularly, while the needs survey is a lagging indicator because it takes time for states to identify their needs.	Population in urbanized areas	• Large infrastructure projects in urban areas benefit more people per dollar. • Rural areas may have lower capacity than urban areas to fund infrastructure projects and could benefit from additional funding. • Infrastructure needs that are more common in urban areas, such as wastewater treatment, could be favored over those more common in rural areas, such as nonpoint source control.
• Population is a driver of infrastructure needs over the long term and can serve as a proxy for clean water need. • Population has objective measures that are correlated with clean water need. • Population has reliable data and this can compensate for data limitations in the Clean Watersheds Needs Survey. • Population serves as a leading indicator of need, as population data are updated regularly, while the needs survey is a lagging indicator because it takes time for states to identify their needs.	Population density	Areas with higher population density may have greater infrastructure needs due to greater amounts of wastewater or they may have less clean water need than less populated ones due to their use of more efficient centralized wastewater treatment facilities. Conversely, areas with lower population density may have more nonpoint sources of pollution, with higher cost per person for wastewater infrastructure.

Source: GAO. | GAO-24-106251

Economic Burden

Based on our analysis, we defined economic burden as the extent to which communities are affected disproportionately by economic stressors. The experts identified poverty rate, racial demographics, and federal composite indices such as the Social Vulnerability Index as potential associated measures.[2] Experts selected poverty rate as the measure to use and chose the most recent 1-year estimate from the American Community Survey as the data source. Table 10 provides examples of views that experts expressed about the economic burden variable and its associated measures in the survey and during their discussion in the virtual and in-person meetings.

Table 10: Examples of Views from Our Expert Panel for the Economic Burden Variable and Associated Measures

Experts' views on the variable	Measures considered	Experts' views on the measures
• Burden could direct funding to disadvantaged communities, such as those that are affected disproportionately by economic, social, or environmental stressors. These communities may have fewer resources to fund their infrastructure needs. • Burden could direct funding to states with less capacity to raise funds for infrastructure projects. • Burden could direct funding to states that could benefit the most in terms of environmental and health impacts.	Poverty rate (selected by experts)	• Poverty rate is an indicator of a state's capacity to fund infrastructure, correlates with race, and reflects the racial wealth gap. • Poverty rate is a well-established measure to determine the percentage of population that needs assistance for many federal programs and is consistent with statutory provisions for additional subsidies for hardship communities.
• Burden could direct funding to disadvantaged communities, such as those that are affected disproportionately by economic, social, or environmental stressors. These communities may have fewer resources to fund their infrastructure needs. • Burden could direct funding to states with less capacity to raise funds for infrastructure projects. • Burden could direct funding to states that could benefit the most in terms of environmental and health impacts.	Race	• Racial demographics reflect the racial wealth gap, but poverty rate is correlated so can be used instead. • Racial demographics could be challenged as a basis to allot funds.

[2]For the purpose of formula development, we defined a federal composite index as a tool combining socioeconomic and environmental data to measure and compare disadvantage, burden, or vulnerability in communities. We identified two federal composite indices as examples: the Council on Environmental Quality's Climate and Economic Justice Screening Tool and EPA's Environmental Justice Screening and Mapping tool.

Experts' views on the variable	Measures considered	Experts' views on the measures
• Burden could direct funding to disadvantaged communities, such as those that are affected disproportionately by economic, social, or environmental stressors. These communities may have fewer resources to fund their infrastructure needs. • Burden could direct funding to states with less capacity to raise funds for infrastructure projects. • Burden could direct funding to states that could benefit the most in terms of environmental and health impacts.	Federal composite indices[a]	• Federal composite indices incorporate many different socioeconomic and environmental measures to identify disadvantaged communities. • Federal composite indices were created for specific purposes so may have measures that are not relevant to the Clean Water State Revolving Fund program. • Federal composite indices may not be updated with new data, and the measures and methodologies used to identify disadvantaged communities may change over time or be discontinued.

Source: GAO. | GAO-24-106251

[a]For the purpose of formula development, we defined a federal composite index as a tool combining socioeconomic and environmental data to measure and compare disadvantage, burden, or vulnerability in communities. We identified two federal composite indices as examples: the Council on Environmental Quality's Climate and Economic Justice Screening Tool and the Environmental Protection Agency's Environmental Justice Screening and Mapping tool.

Formula Weights

During the in-person meeting, we asked the experts to individually propose a formula using one or more of these three variables. All of the experts agreed that need should get the greatest weight. Reasons why experts chose to give the greatest weight to need include that need is the best measure of program goals and that the formula should fund infrastructure needed to improve water quality. They all also agreed that population and economic burden should be included, but with lower weights. Three of the experts proposed a formula consisting of 60 percent need, 20 percent population, and 20 percent economic burden. The other four experts initially proposed different weights, ranging from 50 percent to 70 percent for need, 10 percent to 35 percent for population, and 10 percent to 20 percent for economic burden.[3]

Experts Expressed Their Views on the Seven Variables They Did Not Select

Experts considered and did not select seven additional variables. Table 11 below lists each variable and provides examples of views that experts expressed about each variable in the survey and during their discussion in the virtual and in-person meetings.

[3]One of these four experts also proposed using two different measures for population: 20 percent for total population and 10 percent for urban population. All other experts used total population as the only measure for population in their individual formulas.

Table 11: Examples of Views from Our Expert Panel for the Variables They Did Not Select

Variable and definition	Experts' views on the variable
Fiscal capacity or ability to pay: Ability of a state to raise revenue to meet its needs from state, local, or private funds	• Fiscal capacity could target funds to states with less capacity to fund infrastructure projects. • Median or average fiscal capacity or ability to pay across a state could obscure differences among communities in a state. • Fiscal capacity could incentivize states to raise less revenue and penalize those that do a better job at raising revenue.
Cost: Variation in input prices across states	• Cost reflects variations in costs across states but this should be reflected in states' needs. • Costs can change quickly, making it difficult to update the allotment percentage calculations with updated data rapidly enough to keep up.
Effort: Amount of a state's available resources spent on providing services or meeting needs under the Clean Water State Revolving Fund (SRF) program	• Effort could reward states that have leveraged their SRFs and encourage others to leverage their SRFs. • Effort could result in funding going to states with greater resources that may not need it. • Effort could punish states investing their own funds or incentivize them to reduce the amount of their funds that they invest.
Utilization: Extent to which a state uses its clean water SRF to fund projects	• Utilization in the allotment formula could encourage states to use more of their funds on infrastructure projects, which is the goal of the program. • Utilization could reduce funding to states that are not allocating funds because they have not identified projects that are able to use SRF funds. • Utilization could reduce funding to states and local jurisdictions with lower capacity to identify needs or apply for the funds. • Utilization could encourage states to spend funds on projects without adequate planning.
Effectiveness: Extent to which a state is meeting Clean Water Act goals and requirements	• Depending on how it is used in a formula, effectiveness could penalize states that are effectively administering their clean water SRF program to meet Clean Water Act requirements or penalize states that may need more funding to address the problems. • Effectiveness could be a good direct measure of how well states are reducing waterway impairment. • Effectiveness would be difficult to measure as water quality measures such as waterway impairment do not have complete and accurate data available.
Debt: Amount of outstanding borrowing by a state government	• Debt changes constantly, making it difficult to update the allotment calculations with current data. • Debt can be driven by factors beyond states' control and states that have debt may still have clean water infrastructure needs.
Waterway impairment: Uses a measure of actual impaired waterways, such as the number or percentage of waterways that are classified as severely impaired	• Waterway impairment can directly show how well states are meeting the goals of the Clean Water SRF program. • Reliable and nationally comparable water quality data may not be available to use with the waterway impairment variable.

Source: GAO analysis of expert information and literature identified in our literature review. | GAO-24-106251

Experts Expressed Their Views on the Five Features They Selected

Through our literature review, we identified eight features for experts to consider for use with the formula: minimum allotment, maximum allotment, maximum allotment decrease, maximum allotment increase, bonus, penalty, matching, and set-aside. Based on our literature review, we defined a feature as a constraint on grant

funding to achieve various goals, such as facilitating the transition to a new formula or covering program operations' costs. A majority of the experts selected two features to use during the transition to a new formula. These features are a maximum percent that each state's allotment percentage can increase and a maximum percent that each state's allotment percentage can decrease each year during the transition to the new formula.

A majority of the experts also selected two existing features and one new feature for ongoing use with the new formula: a minimum allotment percentage, a requirement for state matching, and set-asides for specific purposes. None of the experts suggested other features. Table 12 provides examples of views that experts expressed about the features they selected from their discussion during the in-person meeting.

Table 12: Examples of Views from Our Expert Panel on Features They Selected

Feature	Definition	Experts' views of feature
Maximum decrease of allotment percentage or amount	A limit in the amount of decrease in a state's percentage or dollar amount	• Large changes in allotments could disrupt states' planning and caps on allotment changes could help states transition to the changes in allotments based on a new formula. • After the transition period, these provisions should be eliminated so they no longer limit the intended effect of the variables in the formula.
Maximum increase of allotment percentage or amount	A limit in the amount of increase in a state's percentage or dollar amount	• Large changes in allotments could disrupt states' planning and caps on allotment changes could help states transition to the changes in allotments based on a new formula. • After the transition period, these provisions should be eliminated so they no longer limit the intended effect of the variables in the formula.
Minimum allotment percentage or amount	The lowest percentage or dollar amount that a state may receive	• The program currently has a minimum allotment and continuing it maintains current policy. • States receiving the minimum allotment have no incentive to provide data for the Clean Watersheds Needs Survey. • The goal of the Clean Water State Revolving Fund (SRF) program is for the funds to become self-sustaining; however, a minimum allotment could result in grants going to SRFs that are already fully capitalized.
Matching	Requirement for a state to provide a matching dollar amount or percentage to their fund	• Matching can ensure states are invested in the program. • Matching is currently a Clean Water SRF program requirement.

Feature	Definition	Experts' views of feature
Set-asides	Dedicated or authorized funding for a specific purpose	• The Environmental Protection Agency (EPA) and states have limited resources to manage the Clean Watersheds Needs Survey and provide technical assistance to communities to respond to the needs survey. • With dedicated funding, EPA could conduct more field work and provide greater assistance to help ensure the completeness and reliability of the data. • States could use a portion of their clean water SRF grants to administer the Clean Watersheds Needs Survey, which could improve the quality of the data they provide to EPA. For example, states could increase staffing and other resources to administer the Clean Watersheds Needs Survey and provide technical assistance to communities.

Source: GAO analysis of expert information and literature identified in our literature review. | GAO-24-106251

Experts Expressed Their Views on the Three Features They Did Not Select

Experts also considered three features that a majority did not select for the formula they developed. Table 13 provides examples of views that experts expressed about the features they did not select from their discussion during the in-person meeting.

Table 13: Examples of Views from Our Expert Panel on Features They Did Not Select

Feature	Definition	Experts' views of feature
Maximum allotment or amount	The highest percentage or amount that a state may receive.	A maximum allotment could significantly limit how much allotments each state receives if the Environmental Protection Agency's appropriation for the Clean Water State Revolving Fund (SRF) program greatly increases.
Bonus	Provides additional funding to a state that meets particular desired behaviors	Bonuses or penalties could be difficult to apply since the desired behaviors are not clearly defined and there are limited data about how well states are meeting the goals of the Clean Water SRF program.
Penalty	Reduces funding to a state that does not meet particular desired behaviors	Bonuses or penalties could be difficult to apply since the desired behaviors are not clearly defined and there are limited data about how well states are meeting the goals of the Clean Water SRF program.

Source: GAO analysis of expert information and literature identified in our literature review. | GAO-24-106251

Appendix VI: Our Expert Panel's Views on Improving the Management of the Clean Water State Revolving Fund Program

During their discussions about a formula for allotting clean water State Revolving Fund (SRF) grants to states, the experts identified information that, in their view, would help the Environmental Protection Agency (EPA) manage the Clean Water SRF program more effectively, but for which data are limited, of poor quality, or unavailable. The experts presented their views on actions that EPA could take to improve data availability and quality in four areas.

1. Work with the states to collect and report better water quality data to help determine how well the Clean Water SRF program is working to address goals of the Clean Water Act.

The experts considered using effectiveness as a variable in an allotment formula, with related measures of how well states are meeting Clean Water Act requirements. The experts discussed potential data sources, including EPA's Assessment and Total Maximum Daily Load Tracking and Implementation System and Enforcement and Compliance History Online for the effectiveness variable. However, they decided the data were not reliable, complete, or comparable across states.[1] Experts also indicated that, without reliable data on water quality, it is uncertain if the Clean Water Act has been effective in improving the nation's waterways. EPA officials told us that states have discretion in setting water quality standards and determining what measures of water quality they monitor. They agreed that they do not have data to show water quality improvement across states.

2. Work with the states to collect and report information on boundaries of wastewater utilities' service areas.

The experts pointed out that much of the available data for a formula, such as population and poverty, are based on Census tracts or blocks but that these divisions do not correspond to the boundaries of wastewater utilities' service areas. Wastewater utilities can also cover more than one municipality. However, the experts indicated that there are no national data available showing which municipalities are served by each utility. They said this makes it difficult to determine how many people served by utilities live in disadvantaged communities and cannot afford higher rates for wastewater services. They indicated that such information, if available, could help states target their SRF loans to utilities providing services to customers with less ability to pay higher rates to cover the costs of infrastructure needs. EPA officials indicated that they do not collect information about utilities' service areas, although they agreed with the experts that it would be helpful for managing the Clean Water SRF program by identifying utilities that serve disadvantaged communities.

[1]These are online systems that provide access to state-reported information, such as surface water conditions and facilities' compliance with environmental regulations in the United States. In 2021, GAO reported that compliance data in EPA's Enforcement and Compliance History Online system is incomplete and inaccurate. See *Clean Water Act: EPA Needs to Better Assess and Disclose Quality of Compliance and Enforcement Data*, GAO-21-290 (Washington, D.C.: July 12, 2021).

3. Study the factors that affect use of clean water SRFs among states (i.e., undisbursed funds, acceleration of fund use, and balance of state funds) and develop policy options to address its findings.

The experts noted states vary in their use of clean water SRFs and that the reasons for the variation are unknown. They discussed some potential factors that could cause this variation, such as differences in state outreach efforts to communities to assist them in identifying infrastructure needs or funding from other sources that address states' infrastructure needs. The experts suggested that instead of including a variable on the extent to which states use their clean water SRFs efficiently, EPA could study and address why some states do not use their SRFs as efficiently as others.

4. Study why communities seek clean water SRF assistance to meet their clean water investment needs or seek financing in other ways or not at all.

The experts noted that other factors that affect states' use of their SRFs may include differences in communities' capacity to evaluate their needs or to take out loans, access to alternative funding through other sources, and awareness of the program or how it operates. They suggested that communities might have reasons for not seeking SRF funds and that better information about these factors could help EPA and states address them and improve states' distribution of their SRF funds.

Appendix VII: Transitioning to Using the Experts' Formula for Allotting Clean Water State Revolving Fund Grants

To facilitate the transition to a new formula, the experts in our panel suggested limiting the decrease in each state's allotment percentage to no more than 25 percent from the prior year's allotment percentage and the increase in each state's allotment percentage to no more than 200 percent of the prior year's allotment percentage. They also said that these limits should apply within the first 4 years after enacting a new formula. Experts noted that states plan for their State Revolving Funds (SRF) several years ahead of time and that changing the amount abruptly could cause a shortfall of funding for eligible projects. Our analysis shows that this would be particularly true for states that would experience a significant reduction in their allotment percentage based on the new formula. Table 14 shows the allotment percentage of the clean water SRF grants each state would receive while transitioning in the first 4 years to the formula experts developed, using 2022 data.

Table 14: Changes to Percent of Clean Water State Revolving Fund Appropriations Allotted to States in the 4 Years Following Implementation of the Formula Our Panel of Experts Developed, 2022 Data

In percent

State	Current allotment	Allotment each year, applying experts' selected limits: Year 1	Allotment each year, applying experts' selected limits: Year 2	Allotment each year, applying experts' selected limits: Year 3	Allotment each year, applying experts' selected limits: Year 4	Change between current allotment and year 4
New Mexico	0.50	1.50	1.78	1.79	1.79	259.5
Colorado	0.81	2.44	2.45	2.47	2.47	204.2
Louisiana	1.12	2.98	3.33	3.35	3.35	200.0
Utah	0.53	1.27	1.42	1.43	1.43	167.3
Virginia	2.08	4.63	5.16	5.19	5.19	150.0
Georgia	1.72	3.11	3.46	3.48	3.48	103.0
Arizona	0.69	1.15	1.28	1.29	1.29	87.4
Arkansas	0.66	1.07	1.20	1.20	1.20	81.3
Florida	3.43	5.49	6.12	6.16	6.16	79.8
North Carolina	1.83	2.72	3.03	3.05	3.05	66.5
Idaho	0.50	0.67	0.75	0.75	0.75	50.5
Nebraska	0.52	0.69	0.77	0.77	0.77	48.8
Washington	1.77	2.26	2.52	2.54	2.54	43.6
South Carolina	1.04	1.28	1.43	1.44	1.44	38.2
Nevada	0.50	0.57	0.64	0.64	0.64	29.0
Oklahoma	0.82	0.93	1.04	1.05	1.05	27.6
Iowa	1.37	1.53	1.70	1.71	1.71	24.7
North Dakota	0.50	0.55	0.62	0.62	0.62	24.3

State	Current allotment	Allotment each year, applying experts' selected limits: Year 1	Allotment each year, applying experts' selected limits: Year 2	Allotment each year, applying experts' selected limits: Year 3	Allotment each year, applying experts' selected limits: Year 4	Change between current allotment and year 4
California	7.26	7.96	8.87	8.93	8.93	23.0
Connecticut	1.24	1.29	1.43	1.44	1.44	16.1
Vermont	0.50	0.50	0.56	0.57	0.57	13.6
Kentucky	1.29	1.29	1.44	1.45	1.45	12.4
District of Columbia	0.50	0.50	0.55	0.56	0.56	12.1
South Dakota	0.50	0.50	0.52	0.53	0.53	5.5
West Virginia	1.58	1.48	1.65	1.66	1.66	4.9
Puerto Rico	1.32	1.23	1.37	1.38	1.38	4.4
Kansas	0.92	0.85	0.95	0.96	0.96	4.4
Maine	0.79	0.72	0.81	0.81	0.81	3.1
Alabama	1.14	1.02	1.14	1.15	1.15	1.3
Wyoming	0.50	0.50	0.50	0.50	0.50	0.3
Delaware	0.50	0.50	0.50	0.50	0.50	0.3
Montana	0.50	0.50	0.50	0.50	0.50	0.3
Oregon	1.15	1.02	1.14	1.15	1.15	0.1
Mississippi	0.91	0.80	0.89	0.89	0.89	-2.3
Hawaii	0.79	0.63	0.71	0.71	0.71	-9.4
Rhode Island	0.68	0.55	0.61	0.62	0.62	-9.4
Texas	4.64	3.57	3.98	4.01	4.01	-13.7
Alaska	0.61	0.50	0.50	0.50	0.50	-17.7
Tennessee	1.47	1.11	1.20	1.20	1.20	-18.3
Massachusetts	3.45	2.59	2.75	2.77	2.77	-19.6
New Hampshire	1.01	0.76	0.73	0.73	0.73	-27.6
Indiana	2.45	1.84	1.75	1.76	1.76	-27.9
Minnesota	1.87	1.40	1.27	1.28	1.28	-31.7
Maryland	2.46	1.84	1.66	1.67	1.67	-31.8
Wisconsin	2.74	2.06	1.82	1.83	1.83	-33.2
New Jersey	4.15	3.11	2.66	2.68	2.68	-35.4
New York	11.21	8.40	6.64	6.69	6.69	-40.3
Pennsylvania	4.02	3.02	2.32	2.34	2.34	-41.8
Missouri	2.81	2.11	1.62	1.63	1.63	-41.9
Michigan	4.37	3.27	2.46	2.42	2.42	-44.5
Ohio	5.72	4.29	3.21	3.05	3.05	-46.7
Illinois	4.59	3.44	2.58	2.18	2.18	-52.5

Source: GAO analysis of Environmental Protection Agency (EPA) and U.S. Census Bureau data. | GAO-24-106251

Notes: States that experience overall decreases or increases in their allotment percentage may have year-to-year fluctuations because of limits on minimum allotment percentage and increases and decreases. Specifically, such limits may increase or decrease allotments to other states because percentages across all states must equal 100 percent.

We analyzed the effects of the expert-developed formula on state allotments using data from EPA's 2022 Clean Watersheds Needs Survey and 1-year estimates of population and poverty from the 2022 U.S. Census Bureau's American Community Survey.

For comparison, table 15 shows the changes to the percent of the clean water SRF grants that each state would receive in the first 4 years while transitioning to the formula experts developed using 2012 data.

Table 15: Changes to Percent of Clean Water State Revolving Fund Appropriations Allotted to States in the 4 Years Following Implementation of the Formula Our Panel of Experts Developed, 2012 Data

In percent

State	Current allotment	Allotment in each year, applying experts' selected limits: Year 1	Allotment in each year, applying experts' selected limits: Year 2	Allotment in each year, applying experts' selected limits: Year 3	Allotment in each year, applying experts' selected limits: Year 4	Change between current allotment and year 4
Arizona	0.69	2.06	2.21	2.22	2.23	225.0
Nevada	0.50	1.15	1.20	1.21	1.22	143.8
Colorado	0.81	1.60	1.67	1.68	1.68	107.5
District of Columbia	0.50	0.92	0.96	0.97	0.97	94.3
Florida	3.43	6.20	6.47	6.52	6.53	90.6
Nebraska	0.52	0.94	0.98	0.99	0.99	90.4
Idaho	0.50	0.78	0.81	0.82	0.82	64.3
Kentucky	1.29	1.89	1.97	1.99	1.99	54.0
Louisiana	1.12	1.58	1.65	1.66	1.67	49.2
Kansas	0.92	1.25	1.30	1.31	1.31	43.3
Oklahoma	0.82	1.10	1.15	1.16	1.16	41.3
Virginia	2.08	2.70	2.82	2.84	2.84	36.8
Utah	0.53	0.69	0.72	0.72	0.72	35.3
New Mexico	0.50	0.64	0.66	0.67	0.67	34.5
Maryland	2.46	2.99	3.12	3.14	3.15	28.1
Mississippi	0.91	1.11	1.16	1.17	1.17	28.0
Oregon	1.15	1.37	1.43	1.44	1.44	26.0
Puerto Rico	1.32	1.57	1.64	1.65	1.65	24.9
Alabama	1.14	1.30	1.36	1.37	1.37	21.0
Arkansas	0.66	0.76	0.79	0.80	0.80	20.6
Connecticut	1.24	1.39	1.46	1.47	1.47	18.1
Rhode Island	0.68	0.75	0.79	0.79	0.79	16.4
New Jersey	4.15	4.57	4.76	4.80	4.81	16.0
North Carolina	1.83	2.02	2.10	2.12	2.12	15.9
California	7.26	7.72	8.06	8.12	8.14	12.1
Montana	0.50	0.52	0.54	0.54	0.55	9.5
Maine	0.79	0.81	0.85	0.86	0.86	9.0
Hawaii	0.79	0.78	0.82	0.82	0.82	4.7
Missouri	2.81	2.74	2.86	2.88	2.89	2.5
Washington	1.77	1.71	1.78	1.80	1.80	2.1
South Dakota	0.50	0.50	0.50	0.50	0.50	0.3
North Dakota	0.50	0.50	0.50	0.50	0.50	0.3
Vermont	0.50	0.50	0.50	0.50	0.50	0.3

State	Current allotment	Allotment in each year, applying experts' selected limits: Year 1	Allotment in each year, applying experts' selected limits: Year 2	Allotment in each year, applying experts' selected limits: Year 3	Allotment in each year, applying experts' selected limits: Year 4	Change between current allotment and year 4
Delaware	0.50	0.50	0.50	0.50	0.50	0.3
Wyoming	0.50	0.50	0.50	0.50	0.50	0.3
Texas	4.64	4.25	4.43	4.47	4.48	-3.6
Indiana	2.45	2.23	2.33	2.34	2.35	-4.0
Georgia	1.72	1.53	1.60	1.61	1.61	-6.0
Alaska	0.61	0.50	0.50	0.50	0.50	-17.7
West Virginia	1.58	1.22	1.28	1.29	1.29	-18.5
Tennessee	1.47	1.13	1.18	1.19	1.19	-19.2
Ohio	5.72	4.29	4.45	4.48	4.49	-21.5
Iowa	1.37	1.03	1.01	1.02	1.02	-25.5
New Hampshire	1.01	0.76	0.74	0.75	0.75	-26.3
Massachusetts	3.45	2.59	2.48	2.50	2.50	-27.3
Wisconsin	2.74	2.06	1.97	1.98	1.99	-27.6
New York	11.21	8.40	8.02	8.09	8.10	-27.7
South Carolina[a]	1.04	0.78	0.73	0.74	0.74	-28.8
Pennsylvania	4.02	3.02	2.55	2.57	2.58	-35.9
Minnesota	1.87	1.40	1.11	1.12	1.12	-40.1
Illinois	4.59	3.44	2.58	2.49	2.49	-45.7
Michigan	4.37	3.27	2.46	1.84	1.65	-62.1

Source: GAO analysis of Environmental Protection Agency (EPA) and U.S. Census Bureau data. | GAO-24-106251

Notes: States that experience overall decreases or increases in their allotment percentage may have year-to-year fluctuations because of limits on minimum allotment percentage and increases and decreases of allotment percentages. Specifically, such limits may increase or decrease allotment percentages to other states because percentages across all states and territories must equal 100.

We analyzed the effects of the expert-developed formula on state allotments using data from EPA's 2012 Clean Watersheds Needs Survey, including decentralized wastewater treatment needs, which were not reported by EPA, and 1-year estimates of population and poverty from the 2012 U.S. Census Bureau's American Community Survey. According to EPA officials, states varied in the data they had available to estimate needs in categories that EPA did not report.

[a]In 2012, South Carolina did not provide estimates for EPA's Clean Watersheds Needs Survey, which would negatively affect its allotment.

Appendix VIII: Comments from the Environmental Protection Agency

OFFICE OF WATER
WASHINGTON, D.C. 20460

Mr. Alfredo Gomez
Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Mr. Gomez:

Thank you for the opportunity to review and comment on the General Accountability Office's draft report, "Clean Water: Revolving Fund Grant Formula Could Better Reflect Infrastructure Needs, and EPA Could Improve Needs Estimate," GAO-24-106251.

The purpose of this letter is to provide the U.S. Environmental Protection Agency's response to the draft report's findings, conclusions, and recommendations. The EPA generally agrees with the GAO's findings, conclusions, and recommendations.

The GAO found that the current allotment of the Clean Water State Revolving Fund appropriations might not align with current needs and that Congress should consider revising the formula for allotment. The GAO recommended that, once revised, the proposed formula should be updated periodically based on the results of the Clean Watersheds Needs Survey, state population, and economic burden.

The EPA generally agrees with the GAO that the CWSRF allotment formula should be updated. In order to base the new allotment on the results of the Clean Watersheds Needs Survey, it would require improvements to data collection and state reporting. Gathering the required data on eligible CWSRF needs will be a significant effort and will likely require funding and support at both the federal and state levels to ensure that all states and territories are able to report their needs across all categories.

The EPA has provided responses to the recommendations contained in the report as follows:

GAO Recommendation 1

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management directly collects data on centralized clean water infrastructure needs from a sample of small communities, using an approach that is consistent with Office of Management and Budget survey guidance.

EPA Response:

- The EPA agrees that a sampling approach to characterize centralized clean water infrastructure needs for small communities is needed due to the resource and information limitation disproportionately experienced by communities with populations of 10,000 or fewer. Out of the four infrastructure categories, wastewater infrastructure is the most standardized in terms of available data and would benefit the most from a statistical approach. The EPA believes additional years of data with continued 100 percent participation from all states and territories would be required before extending this approach to other facility or community sizes (i.e., non-small communities).

- The EPA is drafting a statistical sampling proposal to send to the Office of Management and Budget as part of the Information Collection Request renewal for the next Clean Watersheds Need Survey. This is the first step towards incorporating some amount of statistical sampling in the next survey, but does not mean that the proposal will be accepted by the Office of Management and Budget. The second *Federal Register* Notice that will include this proposal is to be submitted for review in late June 2024.

GAO Recommendation 2

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management provides guidance to states to submit estimates of large communities' centralized clean water infrastructure needs for a minimum time frame, such as 5 years.

EPA Response:

- The EPA generally agrees with this recommendation. The information that states submit to the agency is dependent on the information that they can gather from applicable entities. The EPA does not dictate how states choose to allocate their data collection efforts and resources, but expects that states would prioritize data collection of large facilities for the greatest period available to maximize their reportable needs if the allocation formula were to be updated according to GAO's recommendation.

- The EPA is considering updating the data entry portal to allow states to indicate the timeframe over which the needs they submit will be implemented so that the agency can make more accurate statements about differences between near-term and long-term needs. This information would be helpful since many municipal planning documents are for five years (i.e., Capital Improvement Plans).

GAO Recommendation 3

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management works with states that did not report any needs in one or more of the noncentralized clean water infrastructure need categories to use cost estimating tools and state-specific approaches to assess these needs for the next Clean Watersheds Needs Survey.

EPA Response:

- The EPA generally agrees with this recommendation and will work with states that did not report any needs in one or more of the noncentralized categories to ensure that they can gather data and report needs in all categories. However, the agency is concerned that the national level data sets required to build cost estimation tools that are applicable for all states to report noncentralized clean water infrastructure needs do not exist for all infrastructure types.
    - For example, multiple states do not have a statewide electronic database of septic system permits (for decentralized systems) and lack the data to calculate an estimate of how many septic systems need to be replaced or repaired over the 20-year survey period. Without this information, a state cannot use the decentralized cost estimation tool.
- The EPA is currently documenting and archiving all survey documents, including submitted and approved state-specific approaches, to allow them to be available for states to use in the next survey. From this library, state coordinators will be able to view and adapt those existing approaches based on the data available in their own state. In the last few months of data collection for the 2022 Clean Watersheds Need Survey, the national coordinators worked closely with states that had not yet reported needs in non-centralized infrastructure categories. This included training sessions, assistance with identifying applicable state-specific approaches being used by other states, and a two-month extension for data entry. Much of this EPA support will continue in future surveys.

The EPA generally agrees with the findings and recommendations in this report and looks forward to working with our state partners on future surveys to fully capture existing CWSRF-eligible needs nationwide.

Again, the EPA appreciates the opportunity to review your draft report. If you have any questions or need further information, please contact Colin Jones, OW's GAO Audit Follow-up Coordinator, at (202) 564-2959 or jones.colin@epa.gov.

Sincerely,

For: Best-Wong, Benita
Digitally signed by Best-Wong, Benita
Date: 2024.06.20 16:55:20 -04'00'
Bruno Pigott
Acting Assistant Administrator

cc: Andrew Sawyers, OW/OWM
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Accessible Text for Appendix VIII: Comments from the Environmental Protection Agency

Mr. Alfredo Gomez
Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Mr. Gomez:

Thank you for the opportunity to review and comment on the General Accountability Office's draft report, "Clean Water: Revolving Fund Grant Formula Could Better Reflect Infrastructure Needs, and EPA Could Improve Needs Estimate," GAO-24-106251.

The purpose of this letter is to provide the U.S. Environmental Protection Agency's response to the draft report's findings, conclusions, and recommendations. The EPA generally agrees with the GAO's findings, conclusions, and recommendations.

The GAO found that the current allotment of the Clean Water State Revolving Fund appropriations might not align with current needs and that Congress should consider revising the formula for allotment. The GAO recommended that, once revised, the proposed formula should be updated periodically based on the results of the Clean Watersheds Needs Survey, state population, and economic burden.

The EPA generally agrees with the GAO that the CWSRF allotment formula should be updated. In order to base the new allotment on the results of the Clean Watersheds Needs Survey, it would require improvements to data collection and state reporting. Gathering the required data on eligible CWSRF needs will be a significant effort and will likely require funding and support at both the federal and state levels to ensure that all states and territories are able to report their needs across all categories.

The EPA has provided responses to the recommendations contained in the report as follows:

GAO Recommendation 1

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management directly collects data on centralized clean water infrastructure needs from a sample of small communities, using an approach that is consistent with Office of Management and Budget survey guidance.

EPA Response:

- The EPA agrees that a sampling approach to characterize centralized clean water infrastructure needs for small communities is needed due to the resource and information limitation disproportionately experienced by communities with populations of 10,000 or fewer. Out of the four infrastructure categories, wastewater infrastructure is the most standardized in terms of available data and would benefit the most from a

statistical approach. The EPA believes additional years of data with continued 100 percent participation from all states and territories would be required before extending this approach to other facility or community sizes (i.e., non-small communities).

- The EPA is drafting a statistical sampling proposal to send to the Office of Management and Budget as part of the Information Collection Request renewal for the next Clean Watersheds Need Survey. This is the first step towards incorporating some amount of statistical sampling in the next survey, but does not mean that the proposal will be accepted by the Office of Management and Budget. The second Federal Register Notice that will include this proposal is to be submitted for review in late June 2024.

GAO Recommendation 2

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management provides guidance to states to submit estimates of large communities' centralized clean water infrastructure needs for a minimum time frame, such as 5 years.

EPA Response:

- The EPA generally agrees with this recommendation. The information that states submit to the agency is dependent on the information that they can gather from applicable entities. The EPA does not dictate how states choose to allocate their data collection efforts and resources, but expects that states would prioritize data collection of large facilities for the greatest period available to maximize their reportable needs if the allocation formula were to be updated according to GAO's recommendation.
- The EPA is considering updating the data entry portal to allow states to indicate the timeframe over which the needs they submit will be implemented so that the agency can make more accurate statements about differences between near-term and long-term needs. This information would be helpful since many municipal planning documents are for five years (i.e., Capital Improvement Plans).

GAO Recommendation 3

The Administrator of EPA should ensure that the Director of the Office of Wastewater Management works with states that did not report any needs in one or more of the noncentralized clean water infrastructure need categories to use cost estimating tools and state-specific approaches to assess these needs for the next Clean Watersheds Needs Survey.

EPA Response:

- The EPA generally agrees with this recommendation and will work with states that did not report any needs in one or more of the noncentralized categories to ensure that they can gather data and report needs in all categories. However, the agency is concerned that the national level data sets required to build cost estimation tools that are applicable for all states to report noncentralized clean water infrastructure needs do not exist for all infrastructure types.
    - For example, multiple states do not have a statewide electronic database of septic system permits (for decentralized systems) and lack the data to calculate an estimate of how many septic systems need to be replaced or repaired over the 20- year survey period. Without this information, a state cannot use the decentralized cost estimation tool.

- The EPA is currently documenting and archiving all survey documents, including submitted and approved state-specific approaches, to allow them to be available for states to use in the next survey. From this library, state coordinators will be able to view and adapt those existing approaches based on the data available in their own state. In the last few months of data collection for the 2022 Clean Watersheds Need Survey, the national coordinators worked closely with states that had not yet reported needs in non-centralized infrastructure categories. This included training sessions, assistance with identifying applicable state- specific approaches being used by other states, and a two-month extension for data entry. Much of this EPA support will continue in future surveys.

The EPA generally agrees with the findings and recommendations in this report and looks forward to working with our state partners on future surveys to fully capture existing CWSRF-eligible needs nationwide.

Again, the EPA appreciates the opportunity to review your draft report. If you have any questions or need further information, please contact Colin Jones, OW's GAO Audit Follow-up Coordinator, at (202) 564-2959 or jones.colin@epa.gov.

Sincerely,

For: Best-Wong,
Benita
Bruno Pigott
Acting Assistant Administrator

Digitally signed by Best- Wong, Benita
Date: 2024.06.20
16:55:20 -04'00'

cc: Andrew Sawyers, OW/OWM
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Appendix IX: GAO Contact and Staff Acknowledgments

GAO Contact

J. Alfredo Gómez at (202) 512-3841 or gomezj@gao.gov.

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In addition to the contact above, Susan Iott (Assistant Director), Ruth Solomon (Analyst in Charge), Luqman Abdullah, Adrian Apodaca, Namita Bhatia Sabharwal, Colleen Candrl, Lee Carroll, Karen Chen, Caitlin Cusati, Cindy Gilbert, Thomas M. James, Colson Ricciardi, Caitlin Scoville, Jeanette Soares, Maria Stattel, Jason Trentacoste, Lisa Van Arsdale, Sonya Vartivarian, and Brennan Williams also made important contributions to this report.

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