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United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-272020

June 21, 1996

The Honorable Peter G. Torkildsen
Chairman, Subcommittee on
Government Programs
Committee on Small Business
House of Representatives

Dear Mr. Chairman:

Many communities face considerable costs as they try to meet environmental requirements and other federal mandates. Treating municipal wastewater and implementing other pollution controls, as required under the Clean Water Act, account for a major share of these costs. To comply with the act, communities may need to construct or upgrade wastewater treatment facilities, improve sewer systems, and construct facilities or take other measures to control pollutants in storm water runoff.

Concerned about the costs facing coastal communities, you asked us to provide information on (1) the estimated costs of meeting wastewater treatment needs[1] nationwide and in marine coastal states; (2) the differences, and the reasons for the differences, in the estimated costs of coastal and inland wastewater treatment projects; and (3) the extent to which federal funding is expected to help meet identified needs.

In summary, the costs of meeting the nation's wastewater treatment needs will total at least $110 billion over a 20-year period beginning in 1992, according to the Environmental Protection Agency's (EPA) most recent compilation of

[1]The Environmental Protection Agency periodically collects data from the states to determine wastewater treatment needs along with other water quality needs. These include needs for constructing or upgrading various types of treatment facilities and sewer-related projects, as well as for controlling storm water runoff and other sources of water pollution and performing certain other activities. For the sake of brevity, we have used the term "wastewater treatment needs" to denote all categories of needs.

states' estimates. Needs in the 23 marine coastal states–those that border the Atlantic or Pacific Ocean or the Gulf of Mexico–account for about 72 percent of the national total. In addition, our analysis of data from three states–Connecticut, Massachusetts, and North Carolina, which we selected because they present different conditions that could affect costs–indicates that coastal projects are generally more costly than inland projects–in terms of both the cost per project and the cost per person. There are several reasons for the higher costs, including the need to serve the typically larger populations found in coastal areas and the need to protect facilities against coastal conditions, such as the corrosive effects of salt. Finally, according to a survey of large metropolitan areas, federal funding is expected to meet about 15 percent of the costs of projects, and, when all communities are included, EPA estimates that federal sources will pay for about one-third of the costs nationwide. (The enclosure presents the results of our work on wastewater treatment costs and funding, as provided in a briefing to your office.)

ESTIMATED COSTS OF MEETING WASTEWATER TREATMENT NEEDS ARE LARGE

Constructing and expanding wastewater treatment projects and implementing other water quality improvements to meet the Clean Water Act's standards will cost at least $110 billion nationwide over the 20-year period beginning in 1992, according to EPA's most recent compilation of states' estimates.[2] Our analysis of EPA's survey data shows that the 23 coastal states account for about 72 percent of the national total and that 10 coastal states are among the 14 states with $2 billion or more in documented needs. Among these are Massachusetts, with $7.7 billion in needs; North Carolina, with $4.0 billion; and Connecticut, with $2.2 billion.

The actual costs of meeting the nation's wastewater treatment needs will likely exceed the states' estimates. Because the states' information for some categories of projects was incomplete and the states' estimates were therefore

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[2]We used data from EPA's *1992 Needs Survey: Report to Congress*. For the most part, the types of projects identified in the survey fall into four major categories: sewer-related improvements ($38.0 billion), secondary treatment facilities ($30.6 billion), combined sewer overflows ($22.3 billion), and advanced treatment facilities ($15.3 billion). The $110 billion figure includes needs for the 50 states but does not include about $2 billion in needs for American Samoa, the District of Columbia, Guam, the Northern Marianas, Puerto Rico, the Virgin Islands, and the Trust Territories.

understated, EPA developed more comprehensive estimates, which indicated that wastewater treatment and other water quality projects could cost over $137 billion nationwide. In addition, according to EPA, the states understated their needs for other types of projects, such as those for managing sludge and for installing the advanced treatment facilities required to meet more stringent standards for water quality. However, EPA did not attempt to estimate the costs of meeting these needs.

TREATMENT FACILITIES GENERALLY COST MORE IN COASTAL AREAS

Our analysis of data from three states–Connecticut, Massachusetts, and North Carolina–indicates that wastewater treatment projects in coastal areas[3] are larger and therefore more costly, on average, than projects in inland areas. This is due, in part, to the higher population densities in coastal areas and the need for larger projects to serve those populations.[4] In Connecticut and Massachusetts–where most of the population resides near the coast–the average cost for a coastal project was at least twice as high as for an inland project, while in North Carolina–where most of the population resides inland–the average cost for an inland project was somewhat higher. According to officials from EPA, the three states, and two large engineering firms with extensive experience in constructing wastewater treatment projects in both coastal and inland areas, other factors associated with densely populated areas can also increase the cost of wastewater treatment projects, such as higher wage rates and the need to provide enhanced odor control and other aesthetic features. In addition, resort communities may require greater capacity to handle larger populations during peak seasons.

When we computed the average cost of the projects in each of the three states on a per capita basis, we found that the cost of a coastal project exceeded that of an inland project by at least 50 percent in all three states. Factors associated with coastal locations that can increase costs include the need to protect facilities against the corrosive effects of salt and the need to add features to buildings in areas with a high water table, which is more common in coastal areas.

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[3]For the purpose of this analysis, we defined coastal projects as those located directly on the coast or on a tidal estuary.

[4]According to the *Statistical Abstract of the United States*, from 1960 to 1994, the population density in coastal counties was more than 3 times higher than in inland counties.

FEDERAL FUNDING FOR WASTEWATER TREATMENT PROJECTS IS LIMITED

Federal assistance programs are expected to provide funding for about 15 percent of the costs of wastewater treatment projects in metropolitan areas, according to a 1993 survey of the financing for planned projects.[5] EPA estimates that the federal contribution is much greater when communities of all sizes are considered. According to officials in EPA's State Revolving Fund Branch, federal assistance programs pay for over one-third of the costs of wastewater treatment projects nationwide, with EPA's financial assistance accounting for about 26 percent of the total costs. Some states have grant and/or loan programs to supplement the federal financial assistance, but local communities must provide the major share of the funding for their wastewater treatment projects.

State revolving loan funds (SRF), established under the Clean Water Act, are the major source of the federal financial assistance available for wastewater treatment projects. Under the SRF program, each state receives an annual federal capitalization grant[6] ($11.3 billion to the 50 states through fiscal year 1996), to which it must add matching funds of 20 percent; some states also borrow funds to augment their SRFs. Through the SRFs, the states provide loans to local governments. As the loans are repaid, the funds are replenished, and additional loans can be made. As we reported in 1992, when the Congress authorized the SRF program, it anticipated that the federal capitalization grants and the state matching funds would allow the SRFs to be self-sustaining.[7] At

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[5]In 1993, the Association of Metropolitan Sewerage Agencies surveyed its members on financing for wastewater treatment projects. Responses to the survey were received from 110 agencies, serving 86 million people. Ninety-nine agencies responded to the question on revenues to fund capital improvements between 1993 and 1998. The 99 agencies planned to spend $29.5 billion during that period. See *The AMSA Financial Survey, 1993: A National Survey of Municipal Wastewater Management Financing*, Association of Metropolitan Sewerage Agencies (Washington, D.C.: 1993).

[6]SRF grants are apportioned among the states, generally according to percentages specified in the 1987 amendments to the Clean Water Act.

[7]For additional information on state revolving funds, see *Clean Water Act: Use of State Revolving Funds Varies* (GAO/T-RCED-96-140, Apr. 16, 1996) and *Water Pollution: State Revolving Funds Insufficient to Meet Wastewater Treatment Needs* (GAO/RCED-92-35, Jan. 27, 1992).

that time, we noted that because the gap between the needs and the available resources was so large, the SRFs would meet only a small percentage of the states' wastewater needs. While the SRF program was never expected to meet all such needs, EPA believes that the SRFs have helped accelerate the pace of constructing needed treatment facilities as well as efforts to address other water quality problems.

Other federal assistance is also available to help fund local wastewater treatment projects. For example, the Congress has earmarked funds for special grants for wastewater treatment projects in certain communities. In addition, as we reported in 1995, there are 17 programs, administered by 8 federal agencies, that are designed specifically for, or that may be used by, rural areas for constructing, expanding, or repairing water and wastewater treatment facilities.[8]

To obtain more information on the amount of federal funding available relative to the documented needs for wastewater treatment and other water quality projects, we focused on states' SRF capitalization grants, the largest single source of federal assistance. For each state, we calculated the ratio of SRF grants to wastewater treatment needs and found that 10 of the 13 states with the lowest ratios are marine coastal states.[9] The differences among the states are due, in part, to changes in the states' relative needs and populations in recent years. According to an EPA official, the percentages specified in the 1987 amendments, which are still used in apportioning funds, were based on several factors, including the states' respective wastewater treatment needs, as reflected in EPA's 1976 and 1980 needs surveys, and 1976 population data. In addition, each state must receive a minimum allocation of just under 0.5 percent of the annual appropriation for capitalization grants.

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[8]See *Rural Development: Patchwork of Federal Water and Sewer Programs Is Difficult to Use* (GAO/RCED-95-160BR, Apr. 13, 1995).

[9]For data on SRF grants, we used data from EPA through fiscal year 1996; for data on needs, we used EPA's 1992 survey. It should be noted that the amount of the capitalization grants does not reflect the true "purchasing power" of the funds because of the revolving nature of the SRF program. According to EPA, every $1 in capitalization grant funds can provide about $4 in loan assistance over a 20-year period.

AGENCY COMMENTS

We provided a draft of this report to EPA for review and comment. In commenting on the draft, officials from EPA's Office of Wastewater Management, including the Chief, Municipal Technology Branch, and the Chief, State Revolving Fund Branch, generally agreed with the facts presented. However, they asked that we include information on EPA's analysis of funding for wastewater treatment projects and recognize in our report that, in addition to the SRF capitalization grants awarded to the states, the Congress has earmarked special grants for wastewater treatment projects in certain communities. EPA officials also asked that we recognize the revolving nature of the SRF program and its impact on the level of federal financial assistance for wastewater treatment needs. We revised the draft to incorporate these comments and suggested technical corrections.

SCOPE AND METHODOLOGY

To identify the estimated costs of meeting wastewater treatment needs, we relied on EPA's 1992 survey report. We extracted information on the documented needs for all 50 states, by type of-project. We also reviewed documents related to the needs survey and interviewed EPA officials responsible for compiling and maintaining the underlying database.

To determine the differences in the costs for coastal and inland wastewater treatment projects, we selected three states–Connecticut, Massachusetts, and North Carolina–with different conditions that could affect the cost of wastewater treatment projects in coastal areas. (These states are not necessarily representative of all marine coastal states.) Each of the three states uses somewhat different criteria to define coastal facilities. To ensure consistency, we selected one definition and obtained agreement on its acceptability from EPA and the three states. We obtained the detailed cost estimates for the states' documented wastewater treatment needs from the database containing the results of EPA's 1992 survey, and we contacted officials within each state's coastal zone management and wastewater treatment program to determine which facilities met our definition of coastal projects. We then computed the average cost and the average per capita cost for coastal and inland facilities in each state. To obtain information on the factors that can influence costs in coastal areas, we interviewed officials from EPA's regional offices in Boston, Massachusetts, and Atlanta, Georgia; state wastewater treatment programs in Connecticut, Massachusetts, and North Carolina; and two large engineering firms.

For information on federal funding for wastewater treatment projects, we relied on a study by the Association of Metropolitan Sewerage Agencies and on prior GAO reports. We also discussed the availability of funding with EPA and state program managers.

We performed our work from October 1995 through June 1996 in accordance with generally accepted government auditing standards. We did not verify the accuracy of the data EPA collected in its 1992 needs survey or of the data the Association of Metropolitan Sewerage Agencies collected in its 1993 survey.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days after the date of this letter. At that time, we will send copies to the Administrator of EPA. We will also make copies available to others on request.

Please call me at (202) 512-6112 if you or your staff have any questions about this report. Major contributors to this report were Charles M. Adams, Ellen M. Crocker, Gerald L. Laudermilk, Stephen J. Licari, and Derek D. Updegraff.

Sincerely yours,

Peter F. Guerrero
Director, Environmental
Protection Issues

Enclosure

ENCLOSURE I

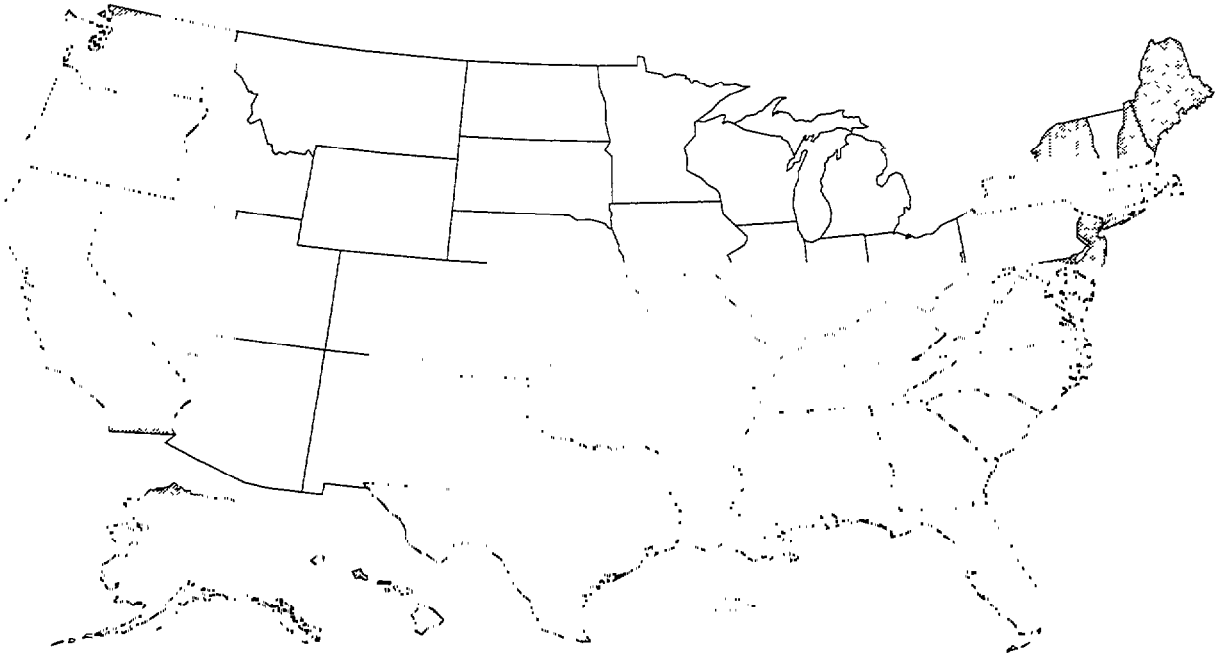
GAO Coastal Areas' Wastewater Treatment Needs: Objectives

- What are the estimated costs of meeting wastewater treatment needs nationwide and in marine coastal states?
- Are wastewater projects more expensive in coastal areas than inland? If so, why?
- To what extent is federal funding sufficient to finance these projects?

GAO Coastal Areas' Wastewater Treatment Needs: Summary

- States estimate that $110 billion will be needed to meet wastewater treatment needs over 20 years. Marine coastal states account for 72 percent of the total.
- Wastewater treatment projects generally cost more in coastal areas than inland. Population density is one reason.
- Federal funds are expected to finance about 15 percent of construction costs in metropolitan areas in 1993-98.

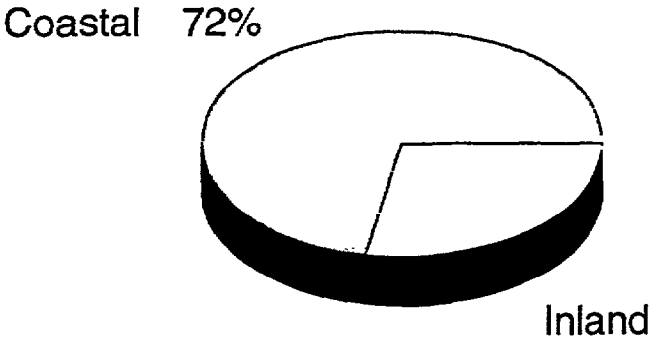
GAO There Are 23 Marine Coastal States



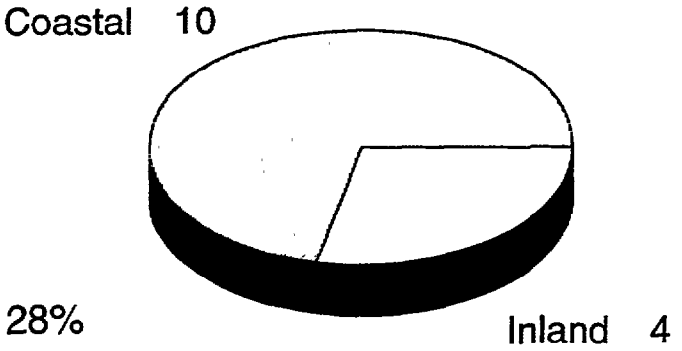
Coastal states Inland states

GAO Marine Coastal States Account for a Large Share of Needs

23 coastal states account for 72 percent of needs



Of the 14 states with $2 billion or more in needs, 10 are coastal



Source: GAO's analysis of data from EPA's 1992 needs survey.

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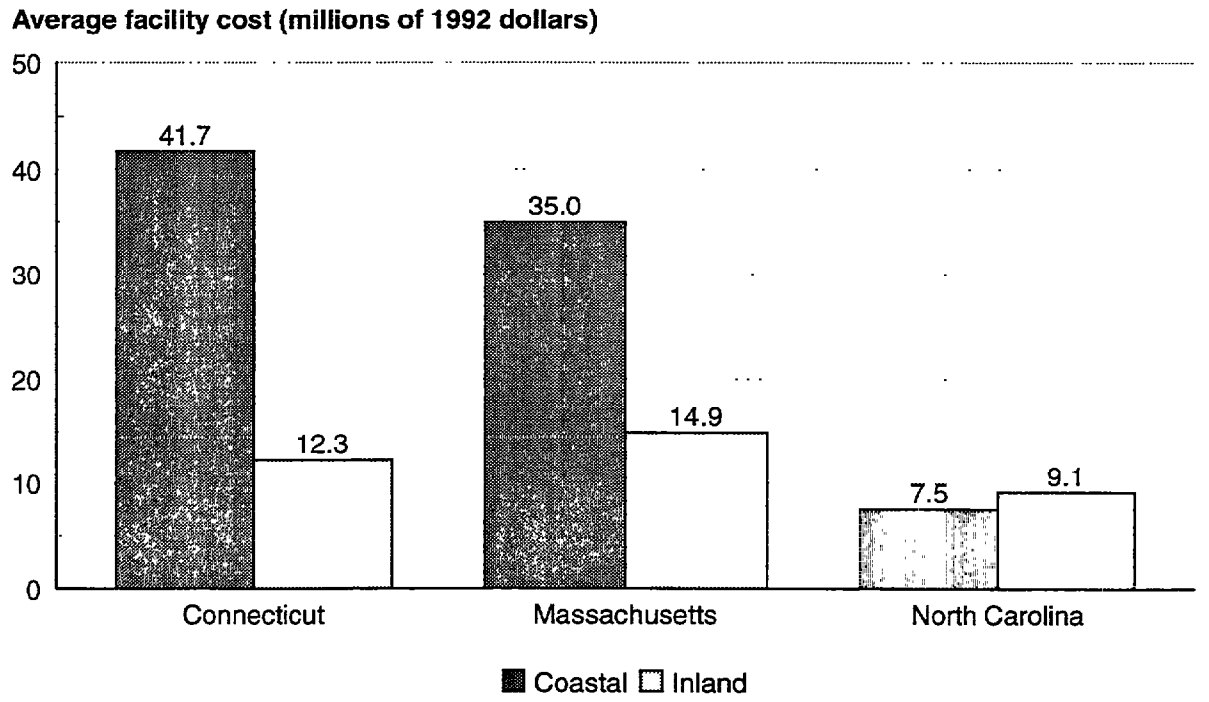
Coastal Projects Are Generally More Expensive Than Inland Projects

- Coastal areas tend to be more densely populated than inland areas. This can result in
  - the need for larger capacity, especially in resort communities, to handle peak populations;
  - higher wage rates; and
  - the need for enhanced odor control and other aesthetic features.

GAO Coastal Projects Are Generally More Expensive for Other Reasons

- Factors that are associated with coastal locations and that can increase costs include
  - the need for added protection against the corrosive effects of salt and
  - extra costs to build projects in areas with a high water table, which is more common in coastal areas.

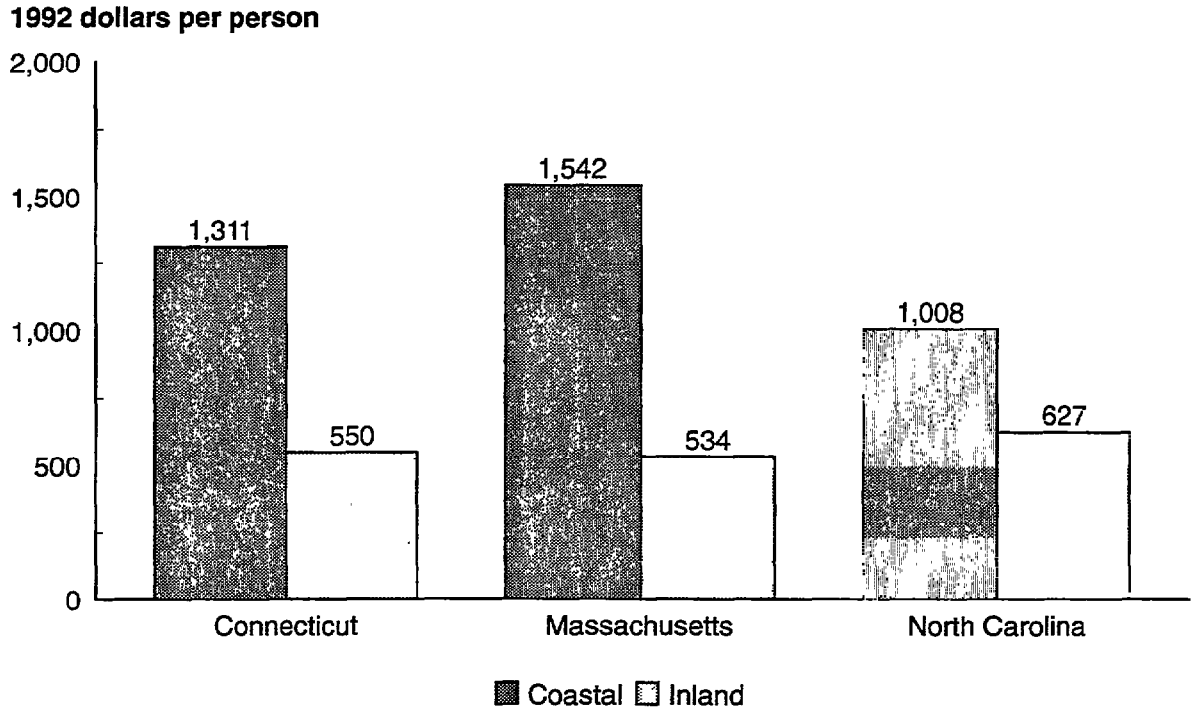
GAO Coastal Projects Will Cost More Than Inland Projects in Two of Three States



Note: Reflects data for 30 coastal and 49 inland facilities in Connecticut, 47 coastal and 100 inland facilities in Massachusetts (excluding the high-cost Deer Island project), and 50 coastal and 281 inland facilities in North Carolina.

Source: GAO's analysis of data from EPA's 1992 needs survey.

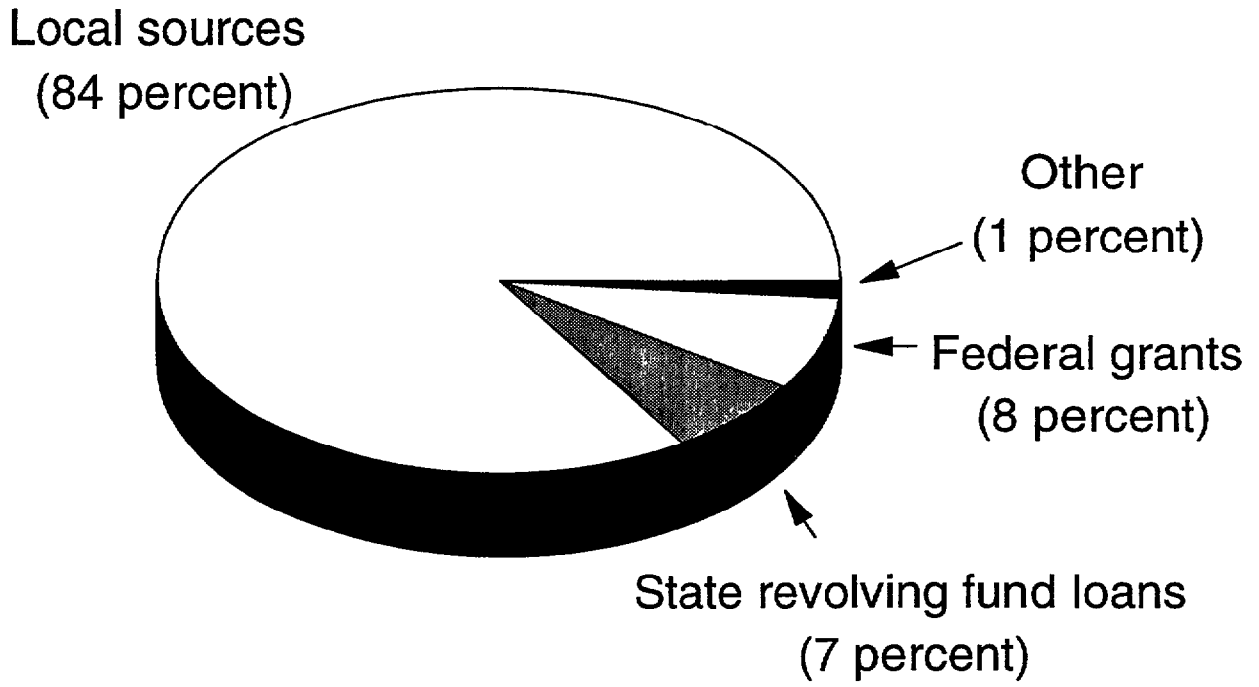
GAO Coastal Projects Will Cost More Per Person in All Three States



Note: Reflects data for 30 coastal and 49 inland facilities in Connecticut, 47 coastal and 100 inland facilities in Massachusetts (excluding the high-cost Deer Island project), and 50 coastal and 281 inland facilities in North Carolina. The per capita cost is based on the average cost of a facility divided by the average number of residents projected to receive services.

Source: GAO's analysis of data from EPA's 1992 needs survey.

GAO Estimates of Assistance for Local Wastewater Treatment Projects



Notes: Reflects sources expected to be used to fund projects in 99 metropolitan areas, 1993-98. EPA estimates that when communities of all sizes are considered, EPA and other federal agencies contribute about one-third of project costs, on average.

State revolving funds include funds from EPA, the state, and sometimes other sources. Other funds include funds from other state programs and miscellaneous sources.

Source: Association of Metropolitan Sewerage Agencies.

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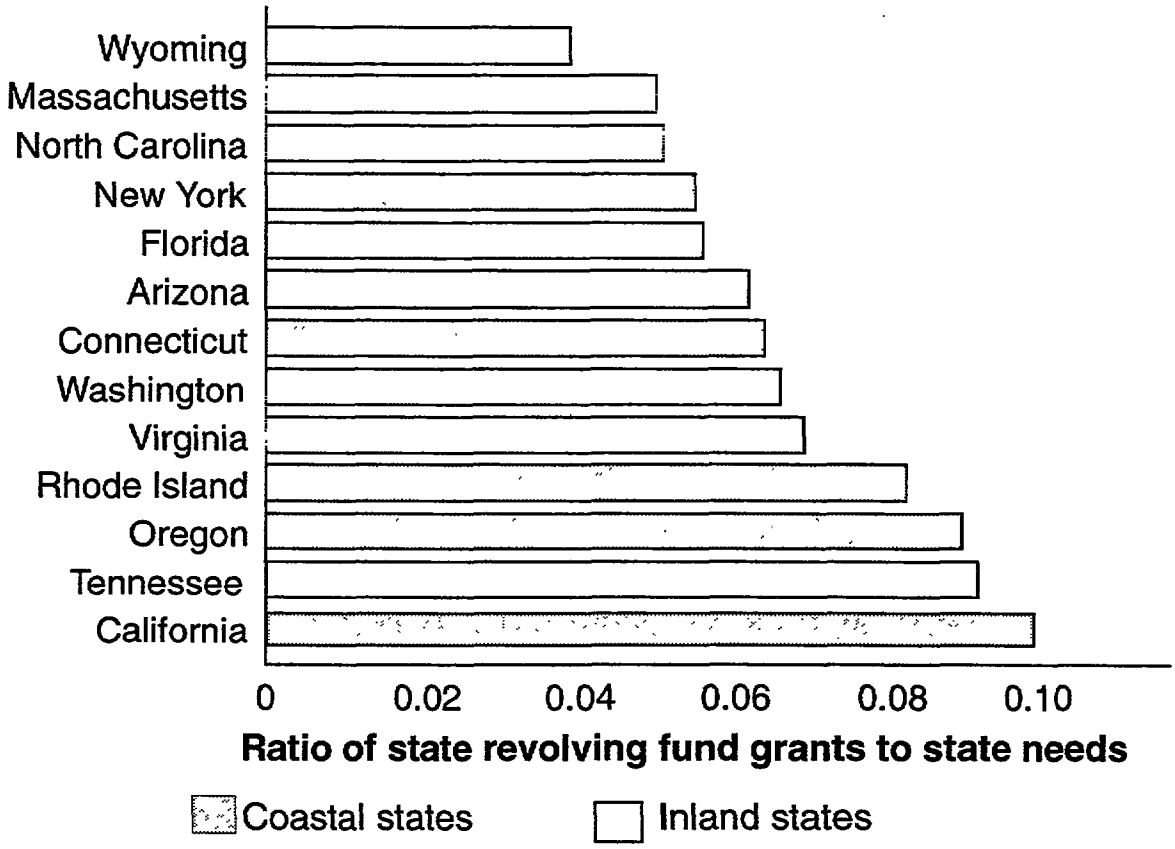
Of 13 States With Lowest Grants-to-Needs Ratios, 10 Are Marine Coastal



Note: The ratio represents the state revolving fund grants available for fiscal years 1989-96 divided by the needs for 1992-2012 for each state. In addition to the SRF capitalization grants awarded to the states, some communities receive special grants for their wastewater treatment projects. For example, during 1989-95, Boston received $614.2 million, New York City received $280.0 million, and Los Angeles received $265.0 million.

Source: GAO's analysis of EPA's data on state revolving fund capitalization grants and EPA's 1992 needs survey.

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