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ALASKA NATIVE VILLAGES

Most Are Affected by Flooding and Erosion, but Few Qualify for Federal Assistance



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Highlights

Highlights of [GAO-04-142](#), a report to the Senate and House Committees on Appropriations

Why GAO Did This Study

Approximately 6,600 miles of Alaska's coastline and many of the low-lying areas along the state's rivers are subject to severe flooding and erosion. Most of Alaska's Native villages are located on the coast or on riverbanks. In addition to the many federal and Alaska state agencies that respond to flooding and erosion, Congress established the Denali Commission in 1998 to, among other things, provide economic development services and to meet infrastructure needs in rural Alaska communities.

Congress directed GAO to study Alaska Native villages affected by flooding and erosion and to 1) determine the extent to which these villages are affected, 2) identify federal and state flooding and erosion programs, 3) determine the current status of efforts to respond to flooding and erosion in nine villages, and 4) identify alternatives that Congress may wish to consider when providing assistance for flooding and erosion.

What GAO Recommends

GAO presents to Congress a matter for consideration that directs federal agencies and the Denali Commission to assess the feasibility of alternatives for responding to flooding and erosion. In addition, GAO recommends that the Denali Commission adopt a policy to guide future infrastructure investments in Alaska Native villages affected by flooding and erosion.

www.gao.gov/cgi-bin/getrpt?GAO-04-142.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Anu Mittal at (202) 512-3841 or mittala@gao.gov.

ALASKA NATIVE VILLAGES

Most Are Affected by Flooding and Erosion, but Few Qualify for Federal Assistance

What GAO Found

Flooding and erosion affects 184 out of 213, or 86 percent, of Alaska Native villages to some extent. While many of the problems are long-standing, various studies indicate that coastal villages are becoming more susceptible to flooding and erosion due in part to rising temperatures.

The Corps of Engineers and the Natural Resources Conservation Service administer key programs for constructing flooding and erosion control projects. However, small and remote Alaska Native villages often fail to qualify for assistance under these programs—largely because of agency requirements that the expected costs of the project not exceed its benefits. Even villages that do meet the cost/benefit criteria may still not receive assistance if they cannot meet the cost-share requirement for the project.

Of the nine villages we were directed to review, four—Kivalina, Koyukuk, Newtok, and Shishmaref—are in imminent danger from flooding and erosion and are planning to relocate, while the remaining five are in various stages of responding to these problems. Costs for relocating are expected to be high. For example, the cost estimates for relocating Kivalina range from \$100 million to over \$400 million. Relocation is a daunting process that may take several years to accomplish. During that process, federal agencies must make wise investment decisions, yet GAO found instances where federal agencies invested in infrastructure at the villages' existing sites without knowledge of their plans to relocate.

GAO, federal and state officials, and village representatives identified some alternatives that could increase service delivery for Alaska Native villages, although many important factors must first be considered:

- Expand the role of the Denali Commission.
- Direct federal agencies to consider social and environmental factors in their cost/benefit analyses.
- Waive the federal cost-sharing requirement for these projects.
- Authorize the "bundling" of funds from various federal agencies.

Bluff Erosion at Shishmaref



Source: GAO.



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

December 12, 2003

The Honorable Ted Stevens
Chairman
The Honorable Robert C. Byrd
Ranking Minority Member
Committee on Appropriations
United States Senate

The Honorable C.W. Bill Young
Chairman
The Honorable David R. Obey
Ranking Minority Member
Committee on Appropriations
House of Representatives

Alaska's shoreline is subject to periodic, yet severe, erosion. During these episodes, over 100 feet of land can be lost in a single storm. The state also has thousands of miles of riverbanks that are prone to annual flooding during the spring thaw. These shorelines and riverbanks serve as home to over 200 Native villages whose inhabitants hunt and fish for subsistence. Coastal and river flooding and erosion cause millions of dollars of property damage in Alaska Native villages, damaging or destroying homes, public buildings, and airport runways. Because Alaska Native villages are often in remote areas not accessible by roads, village airport runways are lifelines for many villages, and any threat to the runways either from flooding or erosion may be a threat to the villages' survival. Flooding and erosion can also destroy meat drying racks and damage food cellars, threatening the winter food supply and the traditional subsistence lifestyle of Alaska Natives.

Since 1977, the state, and in some cases the federal government, has responded to more than 190 disaster emergencies in Alaska, many in response to these problems. Several federal and state agencies are directly or indirectly involved in providing assistance for flooding and erosion in Alaska. In addition, the Denali Commission, created by Congress in 1998, while not directly responsible for responding to flooding and erosion, is charged with addressing crucial needs of rural Alaska communities,

particularly isolated Alaska Native villages.¹ The commission is composed of a federal and a state cochair and representatives from local agencies, as well as Alaska Native, public, and private entities. For fiscal year 2003, the commission was provided with almost \$99 million in federal funds to carry out its mission. The purpose of the commission is to (1) deliver the services of the federal government in the most cost-effective manner practicable; (2) provide job training and other economic development services in rural communities; and (3) promote rural development and provide infrastructure such as water, sewer, and communication systems.

The fiscal year 2003 Conference Report for the military construction appropriation bill directed GAO to study Alaska Native villages affected by flooding and erosion.² In response to this direction and subsequent discussions with your staff, we (1) determined the extent to which Alaska Native villages are affected by flooding and erosion; (2) identified federal and Alaska state programs that provide assistance for flooding and erosion and assessed the extent to which federal assistance has been provided to Alaska Native villages; (3) determined the status of efforts, including cost estimates, to respond to flooding and erosion in select villages seriously affected by flooding and erosion; and (4) identified alternatives that Congress may wish to consider when providing assistance for flooding and erosion of Alaska Native villages.

To address the objectives for this report, we reviewed federal and state flooding and erosion studies and project documents and interviewed federal and state agency officials and representatives from each of the nine villages. We also visited four of the nine villages. While the committee directed us to include at least six villages in our study—Barrow, Bethel, Kaktovik, Kivalina, Point Hope, and Unalakleet—we added three more—Koyukuk, Newtok, and Shishmaref—based on discussions with congressional staff and with federal and Alaska state officials familiar with flooding and erosion problems. Appendix I provides further details about the scope and methodology of our review.

Results in Brief

According to federal and state officials in Alaska, 184 out of 213, or 86.4 percent of Alaska Native villages experience some level of flooding and

¹Pub. L. No. 105-277, tit. III, 112 Stat. 2681 (1998).

²H. R. Conf. Rep. No. 107-731, at 15 (2002).

erosion, but it is difficult to assess the severity of the problem because quantifiable data are not available for remote locations. Native villages on the coast or along rivers are subject to both annual and episodic flooding and erosion. Various studies and reports indicate that coastal villages in Alaska are becoming more susceptible to flooding and erosion in part because rising temperatures cause protective shore ice to form later in the year, leaving the villages vulnerable to fall storms. For example, the barrier island village of Shishmaref, which is less than 1,320 feet wide, lost 125 feet of beach to erosion during an October 1997 storm. In addition, villages in low-lying areas along riverbanks or in river deltas are susceptible to flooding and erosion caused by ice jams, snow and glacial melts, rising sea levels, and heavy rainfall. For many villages, ice jams that form in the Kuskokwim and Yukon Rivers during the spring ice breakup cause the most frequent and severe floods by creating a buildup of water behind the jam. The resulting accumulation of water can flood entire villages. While flooding and erosion affect most Alaska Native villages, federal and state officials noted that Alaska has significant data gaps because of a lack of monitoring equipment in remote locations. This lack of baseline data makes it difficult to assess the severity of the problem.

The Continuing Authorities Program, administered by the U.S. Army Corps of Engineers, and the Watershed Protection and Flood Prevention Program, administered by the Department of Agriculture's Natural Resources Conservation Service, are the principal federal programs that provide assistance for the prevention or control of flooding and erosion. However, small and remote Alaska Native villages often fail to qualify for assistance under these programs because they do not meet program criteria. For example, according to the Corps' guidelines for evaluating water resource projects, the Corps generally cannot undertake a project when the economic costs exceed the expected benefits. With few exceptions, Alaska Native villages' requests for assistance under this program are denied because the project costs usually outweigh expected benefits. Even villages that meet the Corps' cost/benefit criteria may still fail to qualify if they cannot meet cost-share requirements for the project. The Department of Agriculture's Natural Resources Conservation Service's Watershed Protection and Flood Prevention Program also requires a cost/benefit analysis similar to that of the Corps. As a result, few Alaska Native villages qualify for assistance under this program. However, the Natural Resources Conservation Service has other programs that have provided limited assistance to these villages—in part because these programs consider additional social and environmental factors in developing their cost/benefit analysis. Besides programs administered by the Corps of Engineers and the

Natural Resources Conservation Service, there are several other federal and state programs that offer limited assistance to Alaska Native villages in responding to flooding and erosion. For example, the Federal Aviation Administration can assist with rebuilding or repairing airstrips that are affected by flooding and erosion, and the Alaska Department of Community and Economic Development provides coordination and technical assistance to communities to help reduce losses and damage from flooding and erosion. However, these programs are generally not prevention programs, but are available to assist communities in preparing for or responding to the consequences of flooding and erosion.

Of the nine villages we were directed to review, four—Kivalina, Koyukuk, Newtok, and Shishmaref—are in imminent danger from flooding and erosion and are making plans to relocate; the remaining villages are taking other actions. Kivalina, Newtok, and Shishmaref are working with relevant federal agencies to determine the suitability of possible relocation sites, while Koyukuk is in the early stages of planning for relocation. Because of the high cost of materials and transportation in remote parts of Alaska, the cost of relocation for these villages is expected to be high. For example, the Corps estimates that the cost to relocate Kivalina, which has a population of about 385, could range from \$100 million for design and construction of infrastructure, including a gravel pad, at one site and up to \$400 million for just the cost of building a gravel pad at another site. Cost estimates for relocating the other three villages are not yet available. The five villages not planning to relocate—Barrow, Bethel, Kaktovik, Point Hope, and Unalakleet—are in various stages of responding to their flooding and erosion problems. For example, two of these villages, Kaktovik and Point Hope, are studying ways to prevent flooding of specific infrastructure, such as the airport runway. In addition, Bethel, a regional hub in southwest Alaska with a population of about 5,471, has a project under way to stop erosion of its riverbank. The project involves repairing an existing seawall and extending it 1,200 feet to protect the entrance to the village's small boat harbor, at an initial cost estimate of more than \$4.7 million and average annual costs of \$374,000.

During our review of the nine villages, we found instances where federal agencies invested in infrastructure projects without knowledge of the villages' plans to relocate. For example, the Denali Commission and the Department of Housing and Urban Development were unaware of Newtok's relocation plans when they decided to jointly fund a new health clinic in the village for \$1.1 million (using fiscal year 2002 and 2003 funds). While we recognize that development and maintenance of critical

infrastructure, such as health clinics and runways, are necessary as villages find ways to respond to flooding and erosion, we question whether limited federal funds for these projects are being expended in the most effective and efficient manner. Had the agencies known of the village's relocation plans they could have explored other, potentially less costly, options for meeting the village's needs, until it is able to relocate. The Denali Commission has recognized this issue as a concern and is working on a policy to ensure that investments are made in a conscientious and sustainable manner for villages threatened by flooding and erosion. Successful implementation of such a policy will depend in part on its adoption by individual federal agencies that also fund infrastructure development in Alaska Native villages. We are recommending that the Denali Commission adopt a policy that will guide future infrastructure investments and project designs in villages affected by flooding and erosion.

The unique circumstances of Alaska Native villages and their inability to qualify for assistance under a variety of federal flooding and erosion programs may require special measures to ensure that they receive certain needed services. Federal and Alaska state officials and Alaska Native village representatives that we spoke with identified several alternatives that could help mitigate the barriers that villages face in obtaining federal services. The alternatives discussed below may be considered individually or in combination. However, adopting some of these alternatives will require consideration of a number of important factors including the potential to set a precedent for other communities and programs as well as resulting budgetary implications.

- Expand the role of the Denali Commission to include responsibility for managing a flooding and erosion assistance program, which it currently does not have.
- Direct the Corps and the Natural Resources Conservation Service to consider social and environmental factors in their cost benefit analyses for projects requested by Alaska Native villages.
- Waive the federal cost-sharing requirement for flooding and erosion programs for Alaska Native villages.

In addition, as a fourth alternative, GAO identified the bundling of funds from various agencies to address flooding and erosion problems in Alaska Native villages. While we did not determine the cost or the national policy

implications associated with any of these alternatives, these costs and implications are important considerations in determining the appropriate level of federal services that should be available to respond to flooding and erosion in Alaska Native villages. Consequently, we are providing Congress with a matter for consideration that it direct relevant executive agencies and the Denali Commission to assess the feasibility of each of the alternatives, as appropriate. In addition, the Denali Commission may want to comment on the implications of expanding its role.

Background

Alaska encompasses an area of about 365 million acres, more than the combined area of the next three largest states—Texas, California, and Montana. The state is bound on three sides by water, and its coastline, which stretches about 6,600 miles (excluding island shorelines, bays and fjords) and accounts for more than half of the entire U.S. coastline, varies from rocky shores, sandy beaches, and high cliffs to river deltas, mud flats, and barrier islands. The coastline constantly changes due to wave action, ocean currents, storms, and river deposits and is subject to periodic, yet severe, erosion. Alaska also has more than 12,000 rivers, including three of the ten largest in the country—the Yukon, Kuskokwim, and Copper Rivers.³ (See fig. 1.) While these and other rivers provide food, transportation, and recreation for people, as well as habitat for fish and wildlife, their waters also shape the landscape. In particular, ice jams on rivers and flooding of riverbanks during spring breakup change the contour of valleys, wetlands, and human settlements.

³The size is determined by the average rate of flow (discharge at the mouth).