

GAO Highlights

Highlights of [GAO-19-319](#), a report to congressional requesters

Why GAO Did This Study

The Corps constructs water resources projects to reduce risks to coastal communities from storm damage, among other things. These projects can involve building hard structures, such as seawalls, to protect against flooding and wave damage. The Corps and some state and local agencies are increasingly considering using natural infrastructure, such as wetlands, to reduce risks from coastal storms and flooding.

GAO was asked to review the uses, costs, and benefits of natural coastal infrastructure for the Corps' coastal storm and flood risk management projects. This report describes (1) how the Corps considered costs and benefits for selected projects that used natural infrastructure and (2) challenges the Corps faces in developing cost and benefit information for using natural infrastructure and steps taken to address them.

GAO reviewed Corps guidance; obtained information on projects that used natural infrastructure and received funding from fiscal years 2012 through 2017; randomly selected eight coastal storm and flood risk reduction projects from the Atlantic, Gulf, and Pacific coasts; and reviewed each project's planning documentation and economic analyses. Findings from these projects are not generalizable to all Corps' projects. GAO also reviewed economic literature, reviewed Corps documents related to the use of natural infrastructure, and interviewed Corps officials and stakeholders with experience in using natural infrastructure.

View [GAO-19-319](#). For more information, contact Anne-Marie Fennell at (202) 512-3841 or fennella@gao.gov.

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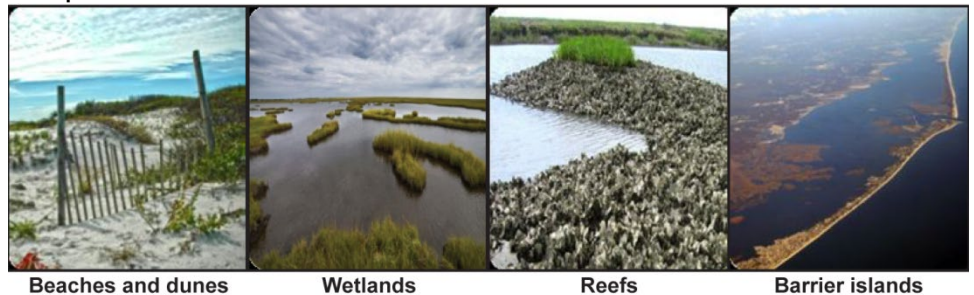
ARMY CORPS OF ENGINEERS

Consideration of Project Costs and Benefits in Using Natural Coastal Infrastructure and Associated Challenges

What GAO Found

The U.S. Army Corps of Engineers (Corps) typically identified project costs and damage reduction benefits for the eight projects using natural infrastructure that GAO reviewed. In selecting projects, the Corps is to conduct economic analyses of project alternatives, which may include hard structures, natural infrastructure, or a combination, to compare their costs and benefits. Corps guidance states that for coastal storm and flood risk management projects it is to select the alternative determined to have the maximum net benefits (benefits minus project costs). The Corps calculated project costs for the eight projects, such as planning, design, construction, and maintenance costs. It calculated damage reduction benefits for seven projects by estimating reduced damages to existing structures in the project area, including to homes and commercial buildings. Corps guidance allows the economic analysis to also include incidental benefits of a project, and four projects incorporated recreational benefits of alternatives, such as increases in recreational visits because beaches would be larger. The Corps did not include other types of incidental benefits, such as environmental or other social benefits, for the eight projects. Corps documentation for one project identified environmental benefits of constructing wetlands as part of the project, such as improving ecosystems and filtering water. However, Corps officials said they did not incorporate these benefits into the economic analysis because the benefits could not be monetized.

Examples of Natural Coastal Infrastructure



Source: U.S. Army Corps of Engineers. | GAO-19-319

The Corps faces challenges in developing cost and benefit information for some types of natural infrastructure and has initiated steps to address this. For example, a 2015 Corps report identified knowledge gaps in understanding how natural coastal infrastructure, such as wetlands, may perform during coastal storms. These knowledge gaps make it challenging for the Corps to develop cost and benefit information for some natural infrastructure alternatives and compare them to other alternatives, such as those that use hard infrastructure. The Corps recognizes the need to obtain additional data to better develop cost and benefit information and has begun taking steps to do so. For example, in 2018, the Corps initiated a project to help identify natural infrastructure knowledge gaps and prioritize key areas for research. The Corps plans to incorporate information gathered from this project into a strategic plan that is intended to help inform research funding decisions for fiscal year 2020, according to a Corps official.