

The Heinz Center

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Report Brief

EVALUATION OF EROSION HAZARDS

A COLLABORATIVE RESEARCH PROJECT OF
THE H. JOHN HEINZ III CENTER FOR SCIENCE, ECONOMICS AND THE ENVIRONMENT

Driven by a rising sea level, large storms, flooding, and powerful ocean waves, erosion wears away the beaches and bluffs along the U.S. ocean and Great Lakes shores. Erosion undermines waterfront houses, businesses, and public facilities, eventually rendering them uninhabitable or unusable. By moving the shoreline inland, erosion also brings nearby structures ever closer to the water, often putting them at greater risk than either their owners or insurers recognize.

Over the next 60 years, erosion may claim one out of four houses within 500 feet of the U.S. shoreline. To the homeowners living within this narrow strip, the risk posed by erosion is comparable to the risk from flooding, especially in beach areas. The National Flood Insurance Program, however, does not map erosion hazard areas to inform homeowners of the risk they face, nor does it directly incorporate erosion risks into

its insurance ratemaking procedures. Both of these shortcomings can be remedied.

Congress debated erosion management legislation during the early 1990s, but could not reach agreement on a course of action. Deciding that more information was needed, Congress passed Section 577 of the National Flood Insurance Reform Act of 1994 (P.L. 103-325), which requested an analysis of a series of possible policy changes to address erosion hazards within federal programs

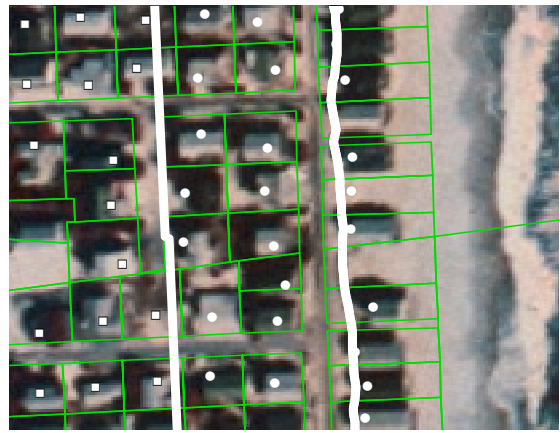
This report, by The H. John Heinz III Center for Science, Economics and the Environment, is a response to that mandate. The report analyzes the economic impacts of erosion, presents a range of policy options and evaluates the effectiveness of each option in reducing erosion losses, and makes two recommendations.

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FINDINGS

The report's findings are based upon detailed field measurements and mail survey information collected on a nationwide sample of 11,000 buildings in 18 counties, located within 500 feet of the shore. The main findings of the report follow:

- Along the Nation's coasts, property owners face as large a risk of damage from erosion as they do from coastal flooding. Information about the magnitude of this risk, which varies widely, is generally not available.
- Roughly 1,500 homes and the land on which they are built will be lost to erosion each year, on average, for the next several decades. Costs to coastal property owners will average \$530 million per year. Additional beach nourishment or structural protection might lead to lower losses; additional development in the most erosion prone areas will lead to higher losses.
- At current enrollment levels, the National Flood Insurance Program will pay \$80 million per year for erosion-related damage, about 5 percent of today's premiums. Total losses will rise with hoped-for enrollment increases.
- Most of the damage from erosion over the next 60 years will occur in low-lying areas also subject to the highest risk of flooding. Some additional damage will also occur along eroding coastal bluffs.
- Although certain types of erosion damage are not eligible under National Flood Insurance Program rules, most erosion-related losses sustained by policyholders is reimbursed by the program. However, erosion damage is not fully reflected in flood insurance rates; current rates are primarily based on flood risk alone. Thus erosion losses will be subsidized by policyholders in non-eroding areas or by taxpayers.



As shown on this aerial photo of South Bethany, Delaware, the beach is expected to erode inland 65 feet (from the white line on the right to the one on the left) over the next 60 years. Two to three rows of houses, marked with circles, are likely to be lost to erosion over this period.

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- To fully reflect risk, insurance rates in the highest risk coastal areas must be, on average, twice today's rates. Rate increases could be spread uniformly across the highest risk coastal areas or varied according to the risk of erosion-related damage. Based on results of a mail survey, these rate increases can be designed to be acceptable to a majority of current policyholders.
 - The cost of identifying, mapping, and disseminating information on erosion hazards nationwide is about \$5 million per year. This investment is likely to be worthwhile.
 - Development density in several of the high-risk coastal areas studied by The Heinz Center increased by more than 60 percent since 1980. The National Flood Insurance Program was a modest contributor to this growth, but at the same time, its building standards significantly reduced flood damage per house. Overall, for the growth after 1980, the program lowered damage by about 25 percent below the level that would have occurred without the program. Building standards are not as effective against erosion as they are against flooding, thus to further lower damage, other policy approaches are needed.

OPTIONS FOR CONGRESS

Nine federal policy options, or packages of options, were developed and analyzed. Options 1–5 are mutually exclusive policy packages; that is, only one can be chosen. These are ordered roughly from least to most extensive policy intervention. Any of options 6–9 could be added to any of the policy packages. Options 3–7 depend on the availability of detailed erosion hazard maps (option 2). Congress could instruct FEMA to implement one or more of the following:

1. Maintain the status quo (i.e., no change in policy)
2. Map the expected rate of erosion of the Nation’s shore and distribute this information widely
3. Create a coastal high hazard zone, including both high flood and erosion zones, and spread the cost of expected erosion losses evenly among all policyholders in this zone when setting flood insurance rates
4. Establish a mandatory erosion surcharge for flood insurance, charged only in those areas most susceptible to erosion.
5. Establish both a mandatory erosion surcharge and adopt regulatory or other restrictive measures to reduce damage
6. Require communities to adopt building standards appropriate to the flood conditions expected several decades from now
7. Offer erosion insurance in bluff areas susceptible to erosion but not flooding
8. Provide funds for relocation assistance and/or land acquisition within the areas most susceptible to erosion
9. Rethink policies for funding shoreline protection measures (i.e., nourishment, dune restoration, and structural measures) if any of options 3-8 are adopted

Based on the analyses presented in this report, The Heinz Center recommends that Congress take, at minimum, two actions, shown below. The Heinz Center believes that these two recommendations provide significant benefits, are cost effective, and are acceptable across most of the political spectrum.

Recommendations

Congress should instruct the Federal Emergency Management Agency to develop erosion hazard maps that display the location and extent of coastal areas subject to erosion. The erosion maps should be made widely available in both print and electronic formats.

Flood insurance rate maps do not inform current and prospective coastal property owners of erosion risks. Without such information, state and local decision makers and the general public are not fully aware of the coastal hazards they face, nor do they have this information available for land-use planning and erosion hazard mitigation. This expenditure is likely to be cost effective.

Congress should require the Federal Emergency Management Agency to include the cost of expected erosion losses when setting flood insurance rates along the coast.

Despite facing higher risk, homeowners in erosion-prone areas currently are paying the same amount for flood insurance as are policyholders in non-eroding areas. FEMA should incorporate the risk from erosion into the cost of insurance along the coasts. Otherwise, other National Flood Insurance Program policyholders or taxpayers will have to subsidize what is likely to become a substantial cost. Using maps such as those recommended above, rate increases could be confined to the highest-risk eroding regions. Alternatively, more modest rate increases could be spread across a larger “Coastal High Hazard Zone” that includes both the highest-risk flood and eroding regions.

Copies of this report may be obtained from:

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The report may also be obtained from and viewed on The Heinz Center's web site,
<http://www.heinzcenter.org>

About The Heinz Center

The H. John Heinz III Center for Science, Economics and the Environment, a non-profit institution, furthers the work of Senator John Heinz by improving the scientific and economic foundation for environmental policy. The Heinz Center's distinctive contribution is to foster collaboration among industry, environmental organizations, government, and academia. Each of these sectors plays an important role in solving environmental problems, and each must participate in developing robust solutions. The Heinz Center provides an institutionalized venue for these sectors to work together on an array of diverse environmental and natural resource problems.