Damage From Hurricane Winds and Storm-Related Flooding: Expected Costs and Implications for Federal Spending

Congressional Research Service Seminar
Expected Costs From Storms: Implications for Disaster Mitigation, the National Flood Insurance Program, and Policy Options

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CBO has three recent studies on expected costs of storms and their implications for the federal budget:

- *Potential Increases in Hurricane Damage in the United States: Implications for the Federal Budget*

- *The National Flood Insurance Program: Financial Soundness and Affordability*

- *Expected Costs of Damage From Hurricane Winds and Storm-Related Flooding (today’s focus)*
CBO estimates that expected economic losses total $54 billion for most types of damage caused by storm surges, hurricane winds, and heavy precipitation.
Expected Annual Economic Losses From Hurricane Winds and Storm-Related Flooding Under Current Conditions, by Sector and Source of Damage

- **Residential Sector**: 63% of total damage, $34 Billion
- **Commercial Sector**: 16% of total damage, $9 Billion
- **Public Sector**: 22% of total damage, $12 Billion
In CBO’s estimate, expected economic losses represent long-run average annual costs based on current conditions, including sea levels and property in areas at risk of severe storms.

CBO estimated those expected losses on the basis of:

- Large-scale commercial models that simulate hundreds of thousands of potential storms that might occur under current conditions, along with their probability of occurring, and

- Data on 58 storms that occurred between 2005 and 2016.
Estimates of expected costs are inherently uncertain. Because of data limitations, CBO’s estimates exclude some types of costs, such as:

- Losses to assets that the federal government would not fully repair,
- Losses to parts of the private sector, such as the energy, agricultural, and industrial sectors, and
- Nonmonetary losses, such as emotional cost of losing a home.
Roughly two-thirds of households’ expected losses from flooding and one-fifth of households’ expected losses from wind are uncompensated.
Expected Annual Economic Losses to the Residential Sector Under Current Conditions, by Sources of Damage and Compensation

- **Wind Damage**: $14 Billion
- **Flood Damage**: $20 Billion
- **Total**: $34 Billion

Uncompensated Losses: 22%
- Federal Disaster Assistance: 2%
- Insurance Claim Payments: 77%

Uncompensated Losses: 66%
- Federal Disaster Assistance: 17%
- National Flood Insurance Program Claim Payments: 16%
Expected Annual Economic Losses to the Residential Sector Under Current Conditions, by Insurance Status of Households

<table>
<thead>
<tr>
<th></th>
<th>Insured Households</th>
<th>Uninsured Households</th>
<th>All Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Losses From Flooding</td>
<td>4</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Losses From Wind</td>
<td>12</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Total Losses</td>
<td>16</td>
<td>18</td>
<td>34</td>
</tr>
</tbody>
</table>
CBO estimates that expected annual federal spending in response to hurricane winds and storm-related flooding totals $17 billion.
a. CBO estimated in 2017 that the National Flood Insurance Program had a one-year expected shortfall of $1.4 billion.
Expected Annual Federal Spending on Disaster Assistance for Residential Flood Losses, by Source

Total = $3.4 billion

- 0.1 billion for Small Business Administration Disaster Loan Program
- 1.5 billion for Federal Emergency Management Agency Disaster Relief Fund
- 1.8 billion for Department of Housing and Urban Development Community Development Block Grant–Disaster Recovery

Total expected federal disaster assistance to households includes $0.2 billion in assistance for residential wind losses in addition to the $3.4 billion for residential flood losses.
Expected federal spending includes $1.4 billion in implicit federal subsidies for the National Flood Insurance Program (NFIP). The estimate is based on CBO’s 2017 report.

- CBO estimated a $1.4 billion gap between the NFIP’s expected annual payments and its expected income from premiums.

- CBO assumed that the shortfall would be financed by borrowing from the Treasury.
One-Year Expected Costs and Premiums for the National Flood Insurance Program

<table>
<thead>
<tr>
<th>Billions of Dollars</th>
<th>Expected Costs</th>
<th>Premiums</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Costs Associated With Writing and Servicing Policies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expected claims</td>
<td>Rate-Based Receipts</td>
</tr>
<tr>
<td></td>
<td>Payments to companies selling and servicing policies</td>
<td>Additional Charges</td>
</tr>
<tr>
<td></td>
<td>Salaries and operating expenses</td>
<td>Reserve fund assessment</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>Surcharges</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Federal policy fee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subtotal</td>
</tr>
<tr>
<td></td>
<td>Additional Costs</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Floodplain mapping and management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mitigation assistance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interest on debt</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>
One-Year Premiums, Expected Costs, and Shortfall or Surplus, by Location, for the National Flood Insurance Program
Expected outlays to address losses to the public sector total $11 billion, accounting for 65 percent of estimated federal spending.

CBO’s estimate of $11 billion is based on:

- Expected residential flood losses and

- The ratio of federal spending on public sector losses to residential flood losses for the 58 storms that CBO examined.
Spending on repair and replacement accounted for the largest share of federal spending in response to hurricanes winds and storm-related flooding between 2005 and 2016.
## Estimated Federal Spending in Response to Damage From Hurricane Winds and Storm-Related Flooding That Occurred Between 2005 and 2016, by Use of Funds and Sector of the Economy

<table>
<thead>
<tr>
<th>Category of Spending</th>
<th>Outlays in Billions of 2017</th>
<th>Percentage of Total Outlays</th>
<th>Outlays by Sector of the Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair and Replacement</td>
<td>90</td>
<td>44</td>
<td>$58 billion on public sector losses and $31 billion on residential sector losses*</td>
</tr>
<tr>
<td>Mitigation, Relocation, and Buyouts</td>
<td>37</td>
<td>18</td>
<td>$33 billion on public sector losses and $4 billion on residential sector losses</td>
</tr>
<tr>
<td>Emergency Services</td>
<td>36</td>
<td>18</td>
<td>$28 billion on public sector losses and $8 billion on residential sector losses</td>
</tr>
<tr>
<td>Recovery</td>
<td>10</td>
<td>5</td>
<td>$10 billion on public sector losses*</td>
</tr>
<tr>
<td>Health Facilities and Services</td>
<td>5</td>
<td>2</td>
<td>$5 billion on public sector losses**</td>
</tr>
<tr>
<td>Administrative Costs</td>
<td>16</td>
<td>8</td>
<td>n.a.</td>
</tr>
<tr>
<td>Other Spending</td>
<td>10</td>
<td>5</td>
<td>Almost entirely on public sector losses</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>203</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

* = and less than $0.5 billion on commercial sector losses; ** = and less than $0.5 billion on residential sector losses; n.a. = not applicable.
Of the $203 billion of federal spending, $153 billion went to address public sector losses. That spending occurred through many agencies and programs.
Estimated Spending From FEMA’s Disaster Relief Fund Public Assistance Program to Address Damage From Hurricane Winds and Storm-Related Flooding That Occurred Between 2005 and 2016

Total = $59 Billion
($52 Billion for Public-Sector Assistance and $8 Billion for Administrative Costs)
Estimated Spending on Public-Sector Assistance From HUD’s Community Development Block Grant Disaster Recovery Program to Address Damage From Hurricane Winds and Storm-Related Flooding That Occurred Between 2005 and 2016

- Rehabilitation or Construction of Affordable Rental Housing: 21%
- Rehabilitation or Construction of Public Infrastructure: 20%
- Economic Development, Public Services, and Planning: 19%
- Rehabilitation or Construction of Public Facilities: 18%
- Other Spending: 3%
- Administrative Costs: 3%
Estimated Spending on Efforts Led by the Federal Government to Address the Public-Sector Costs of Damage From Hurricane Winds and Storm-Related Flooding That Occurred Between 2005 and 2016

Total = $72 Billion
Without policy changes, storm-related costs are likely to rise in the future because of climate change and development in risky areas.
For additional information, see these CBO reports:

*Expected Costs of Damage From Hurricane Winds and Storm-Related Flooding,*
www.cbo.gov/publication/55019

*The National Flood Insurance Program: Financial Soundness and Affordability,*
www.cbo.gov/publication/53028

*Potential Increases in Hurricane Damage in the United States: Implications for the Federal Budget,*
www.cbo.gov/publication/51518