



June 17, 2019

# **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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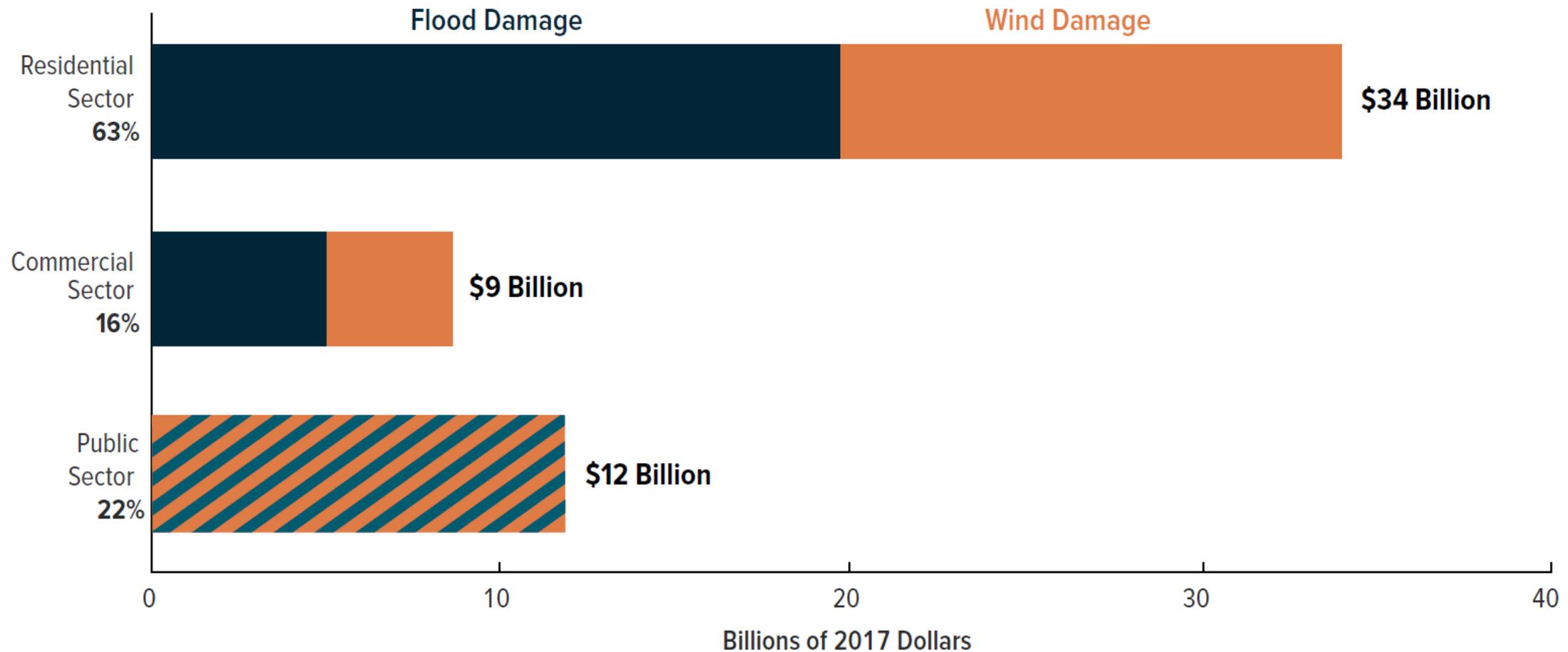
Microeconomic Studies Division

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



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:

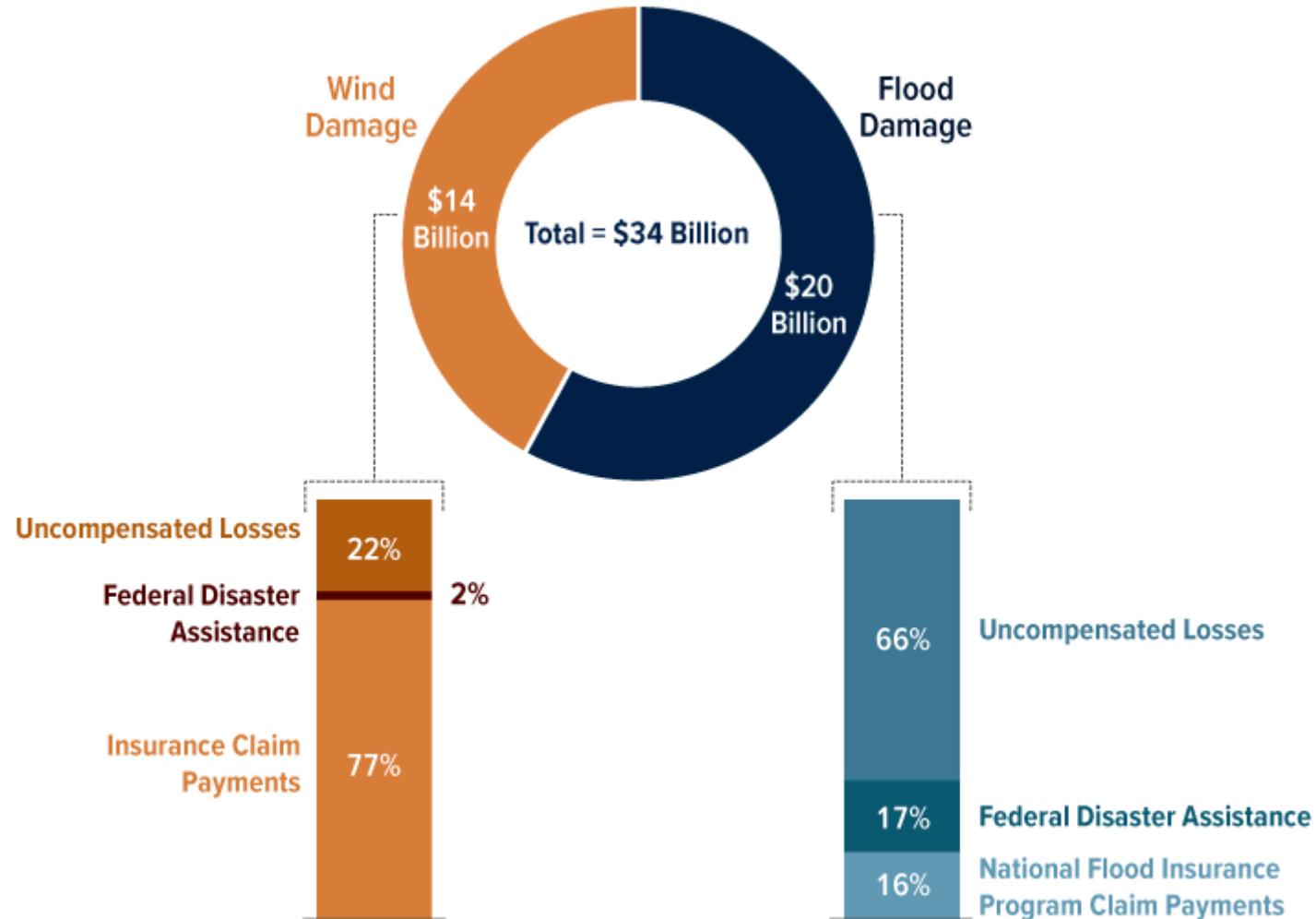
- Large-scale commercial models that simulate hundreds of thousands of potential storms that might occur under current conditions, along with their probability of occurring, and
- Data on 58 storms that occurred between 2005 and 2016.

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



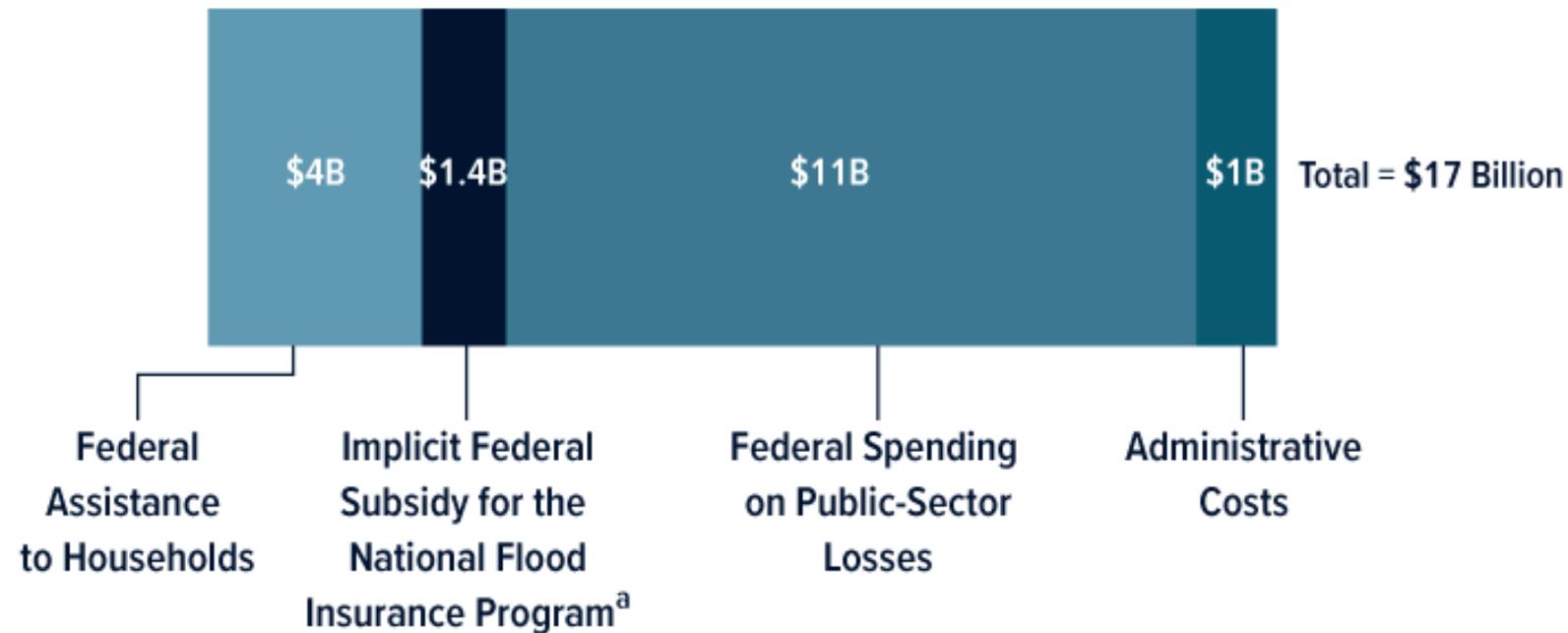
## Expected Annual Economic Losses to the Residential Sector Under Current Conditions, by Insurance Status of Households

Billions of 2017 Dollars

	Insured Households	Uninsured Households	All Households
Losses From Flooding	4	16	20
Losses From Wind	12	2	14
<b>Total Losses</b>	<b>16</b>	<b>18</b>	<b>34</b>

CBO estimates that expected annual federal spending in response to hurricane winds and storm-related flooding totals \$17 billion.

# Expected Annual Federal Spending in Response to Damage From Hurricane Winds and Storm-Related Flooding Under Current Conditions



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



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.

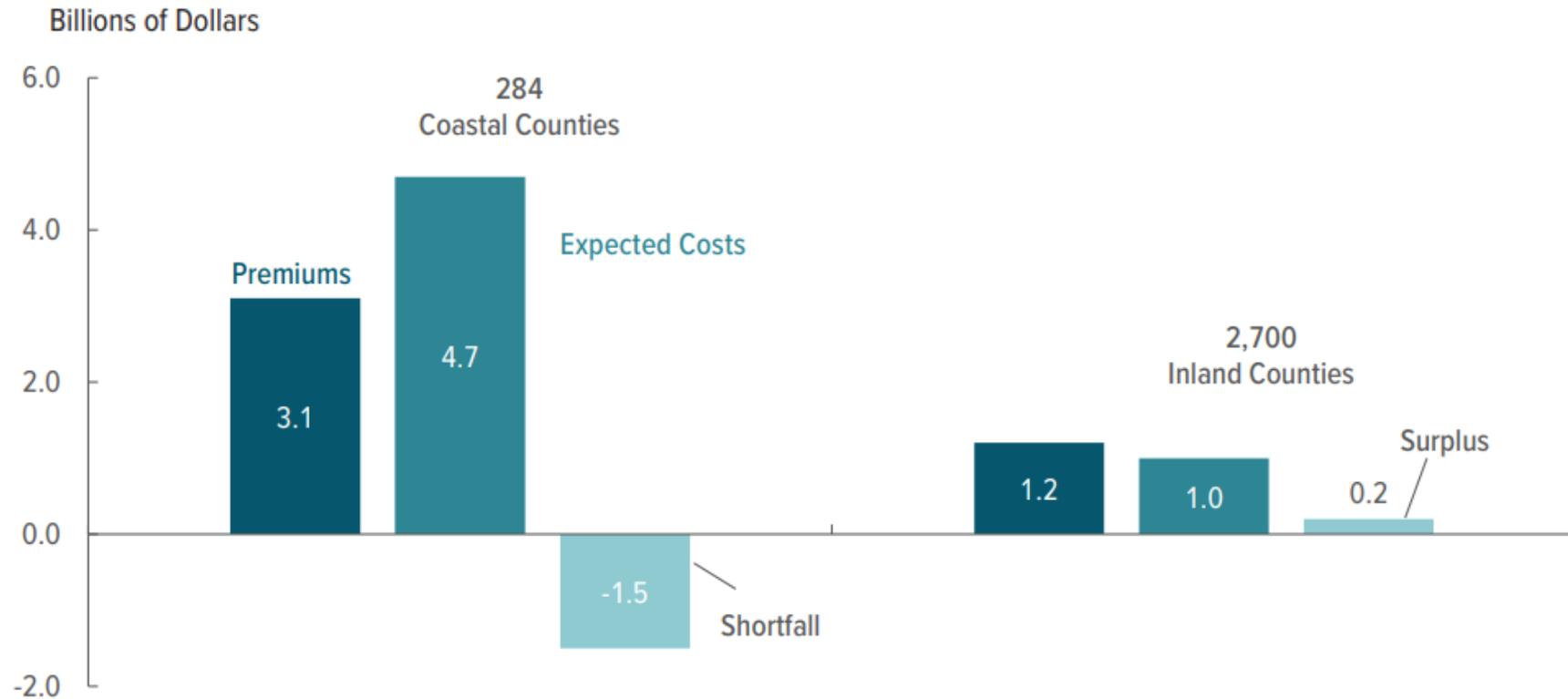
Expected federal spending includes \$1.4 billion in implicit federal subsidies for the National Flood Insurance Program (NFIP). The estimate is based on CBO's 2017 report.

- 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

Billions of Dollars		Billions of Dollars	
Expected Costs		Premiums	
Costs Associated With Writing and Servicing Policies		Rate-Based Receipts	3.3
Expected claims	3.7	Additional Charges	
Payments to companies selling and servicing policies	1.1	Reserve fund assessment	0.5
Salaries and operating expenses	<u>0.2</u>	Surcharges	0.4
Subtotal	5.0	Federal policy fee	<u>0.2</u>
Additional Costs		Subtotal	1.1
Floodplain mapping and management	0.2	<b>Total</b>	<b>4.3</b>
Mitigation assistance	0.2		
Interest on debt	<u>0.3</u>		
Subtotal	0.7		
<b>Total</b>	<b>5.7</b>		

# 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.

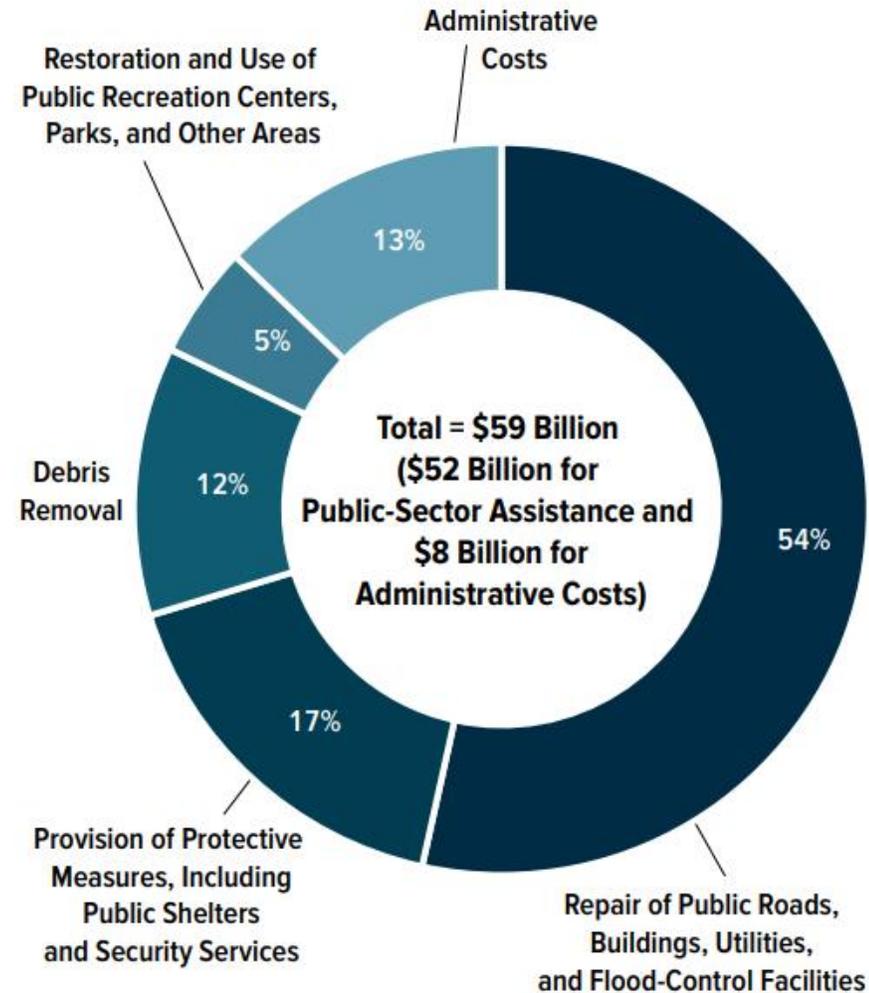
# Estimated Federal Spending in Response to Damage From Hurricane Winds and Storm-Related Flooding That Occurred Between 2005 and 2016, by Use of Funds and Sector of the Economy

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

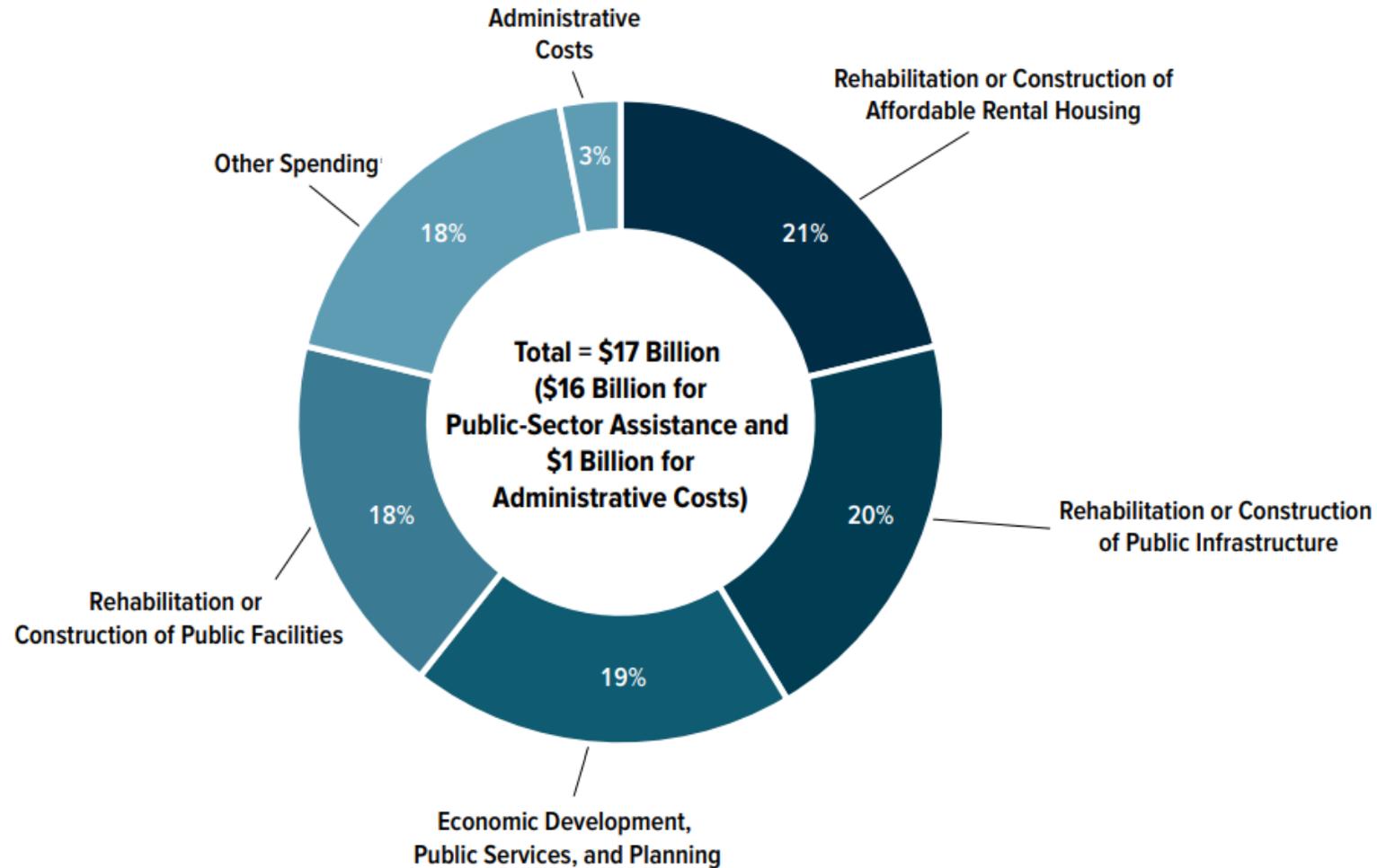
\* = and less than \$0.5 billion on commercial sector losses; \*\* = and less than \$0.5 billion on residential sector losses; n.a. = not applicable.

Of the \$203 billion of federal spending, \$153 billion went to address public sector losses. That spending occurred through many agencies and programs.

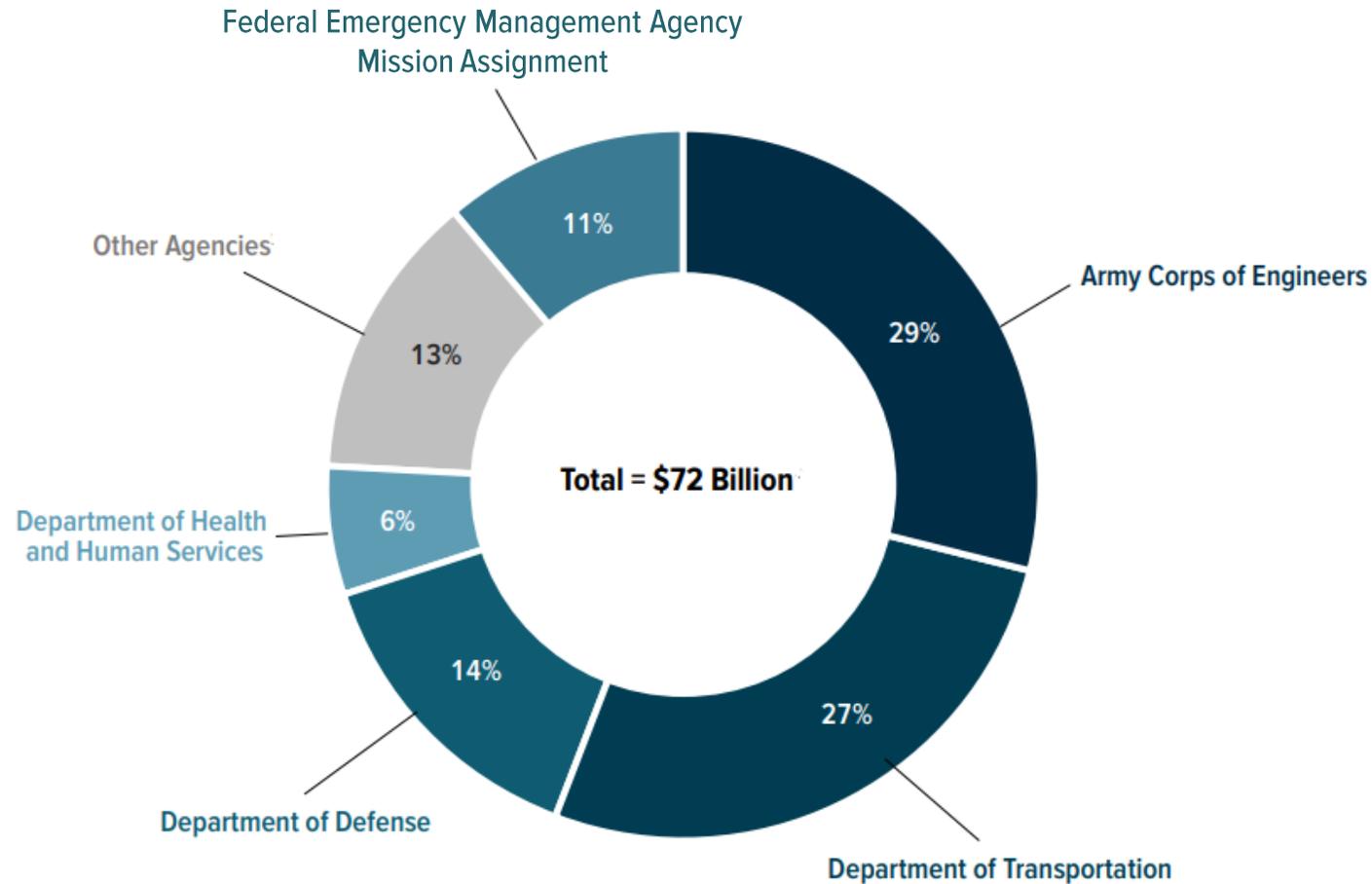
# Estimated Spending From FEMA's Disaster Relief Fund Public Assistance Program to Address Damage From Hurricane Winds and Storm-Related Flooding That Occurred Between 2005 and 2016



# 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



# 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



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](http://www.cbo.gov/publication/55019)

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

[www.cbo.gov/publication/53028](http://www.cbo.gov/publication/53028)

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

[www.cbo.gov/publication/51518](http://www.cbo.gov/publication/51518)