



# Moving Mitigation Forward: Investing in Resilient Infrastructure and Communities

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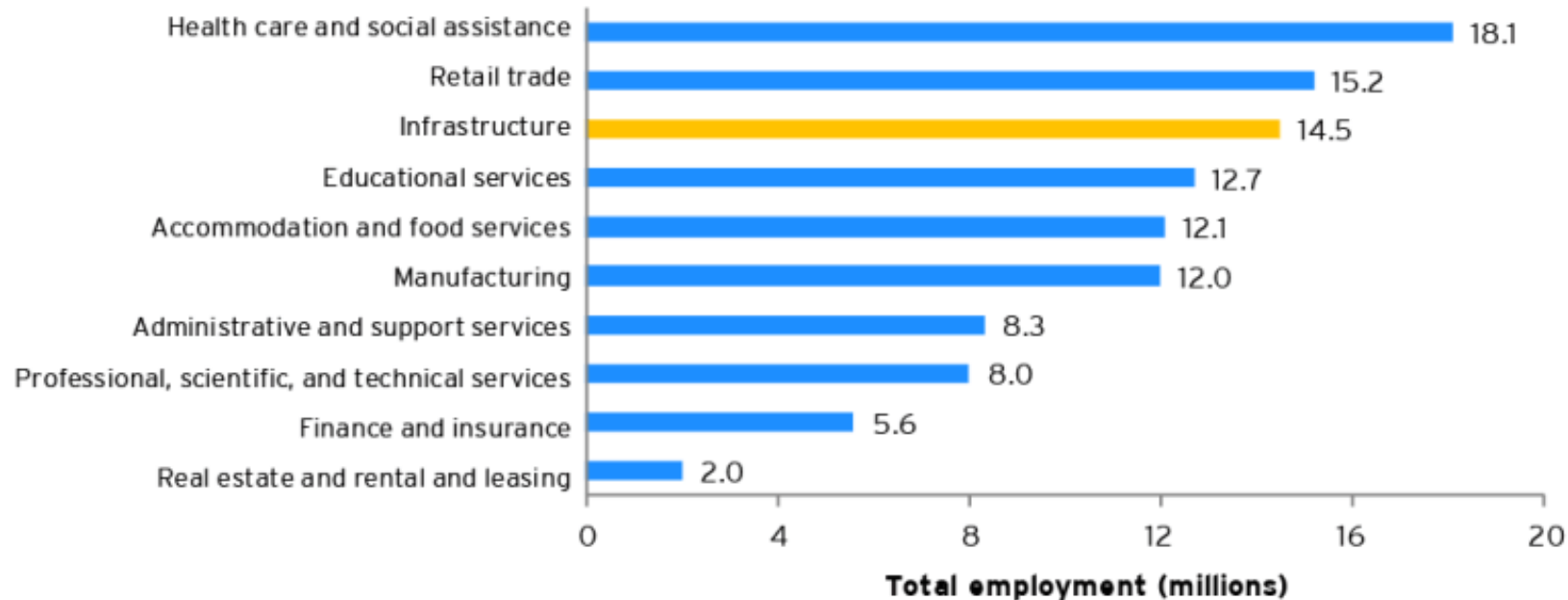


January 28, 2020

# US Infrastructure and the Economy

## Total employment, by selected industry sectors

2013



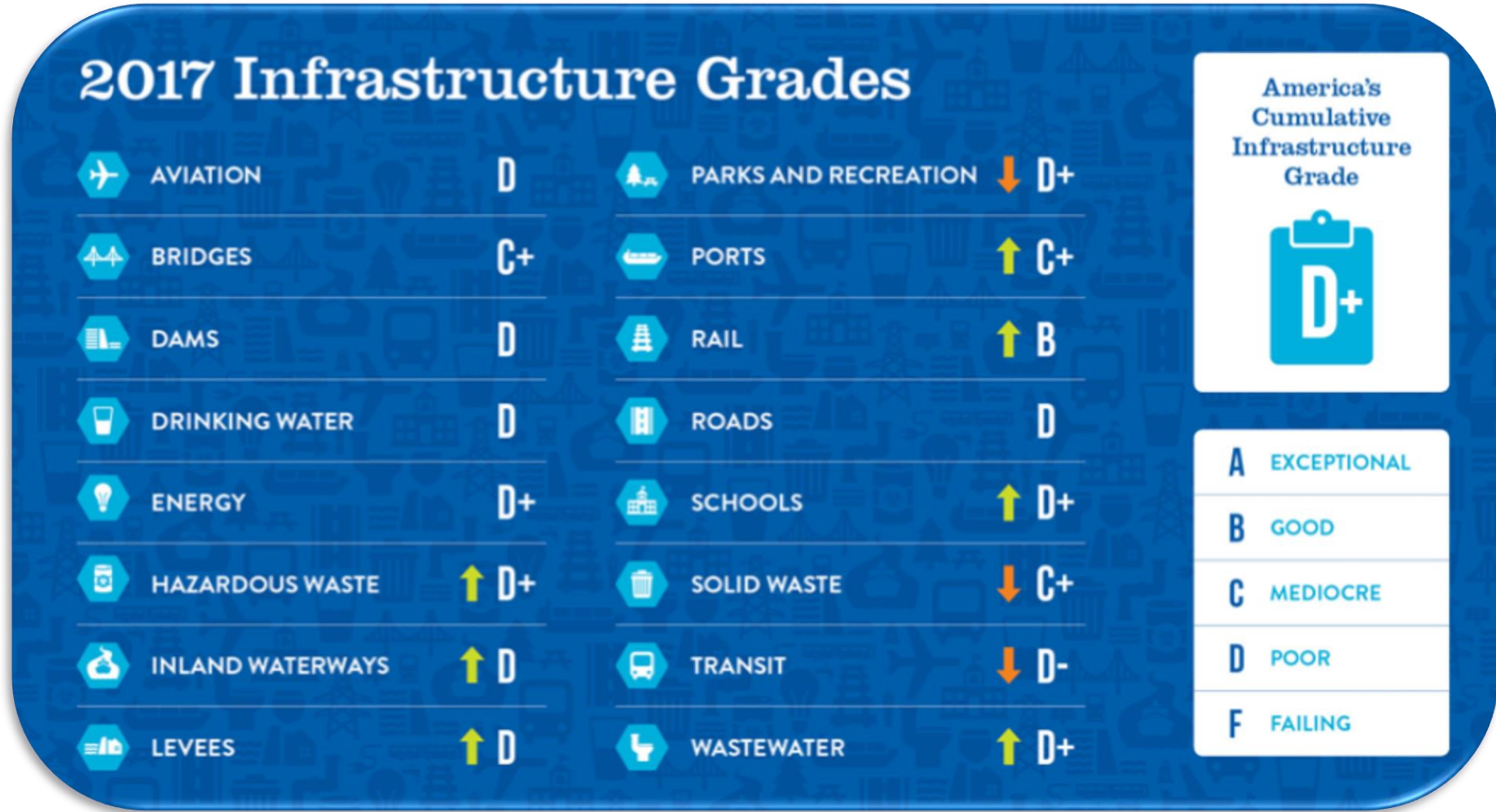
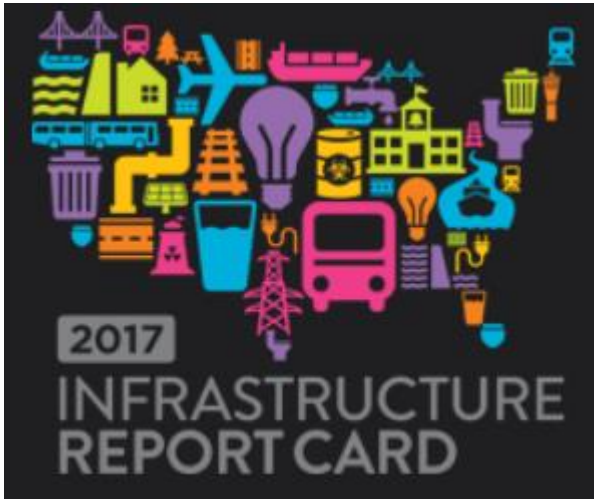
Note: Total infrastructure employment is based on an aggregation of occupational employment across several different industries, including utilities, heavy construction, information, and transportation and warehousing.

Source: Brookings analysis of BLS Occupational Employment Statistics

**B** Metropolitan Policy Program  
at BROOKINGS

<https://www.brookings.edu/research/expanding-opportunity-through-infrastructure-jobs/>

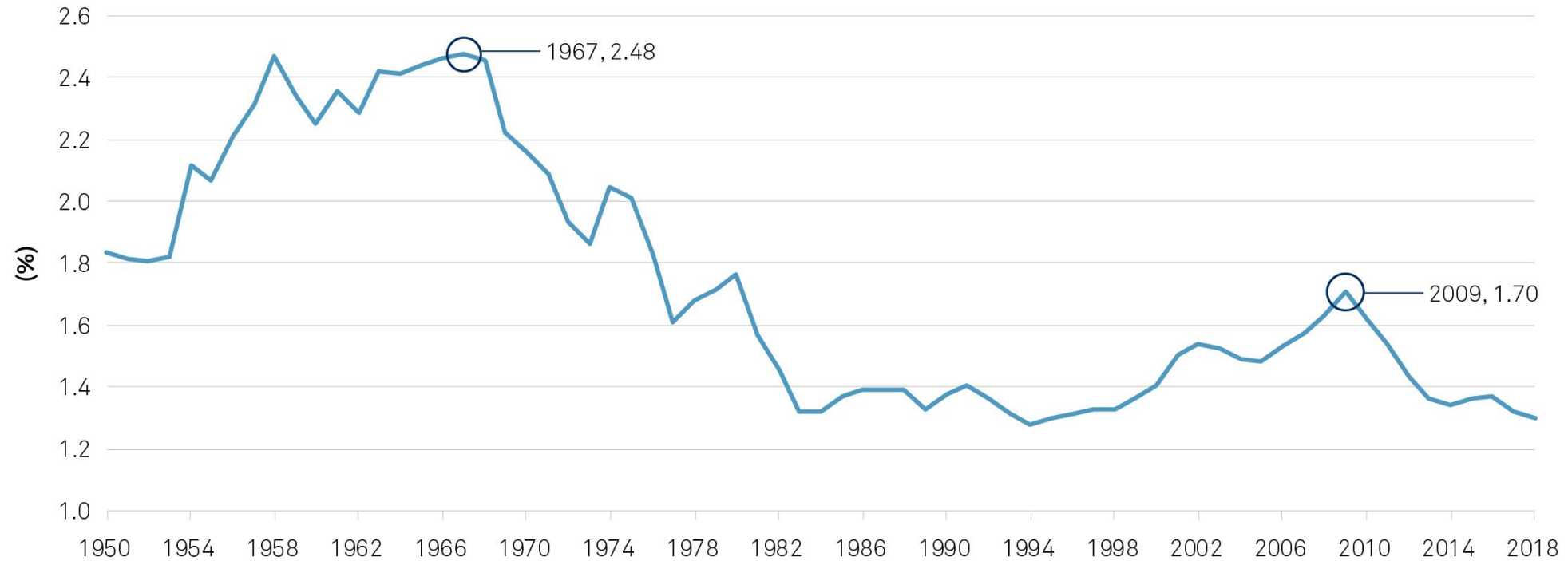
# American Society of Civil Engineers US Infrastructure Grades



<https://www.alvarezandmarsal.com/insights/us-infrastructure-earns-d-american-society-civil-engineers>

# Trends in Public Infrastructure Spending

Clipped Wings: Public Spending On Broad Infrastructure As % of GDP



Source: BEA, S&P Global Economics.  
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<https://www.spglobal.com/en/research-insights/featured/infrastructure-investment-as-an-elixir-for-ailing-u-s-productivity-growth>

# The Cost of Poor Infrastructure

## Cumulative Infrastructure Needs by System Based on Current Trends, Extended to 2025

ALL VALUES IN BILLIONS OF CONSTANT 2015 DOLLARS

Infrastructure Systems	Total Needs	Estimated Funding	Funding Gap
Surface Transportation <sup>1</sup>	\$2,042	\$941	\$1,101
Water/Wastewater Infrastructure <sup>1</sup>	\$150	\$45	\$105
Electricity <sup>1</sup>	\$934	\$757	\$177
Airports <sup>1</sup>	\$157	\$115	\$42
Inland Waterways & Marine Ports <sup>1</sup>	\$37	\$22	\$15
Dams <sup>2</sup>	\$45	\$5.6	\$39.4
Hazardous & Solid Waste <sup>3</sup>	\$7	\$4	\$3
Levees <sup>4</sup>	\$80	\$10	\$70
Public Parks & Recreation <sup>5</sup>	\$114.4	\$12.1	\$102.3
Rail <sup>6</sup>	\$154.1	\$124.7	\$29.4
Schools <sup>7</sup>	\$870	\$490	\$380
<b>TOTALS</b>	<b>\$4,590</b>	<b>\$2,526</b>	<b>\$2,064</b>

### COST TO U.S. GDP

**\$3.9**  
TRILLION BY 2025

### LOST JOBS

**2.5**  
MILLION JOBS IN 2025

### LOST BUSINESS SALES

**\$7**  
TRILLION BY 2025

### COST TO FAMILIES

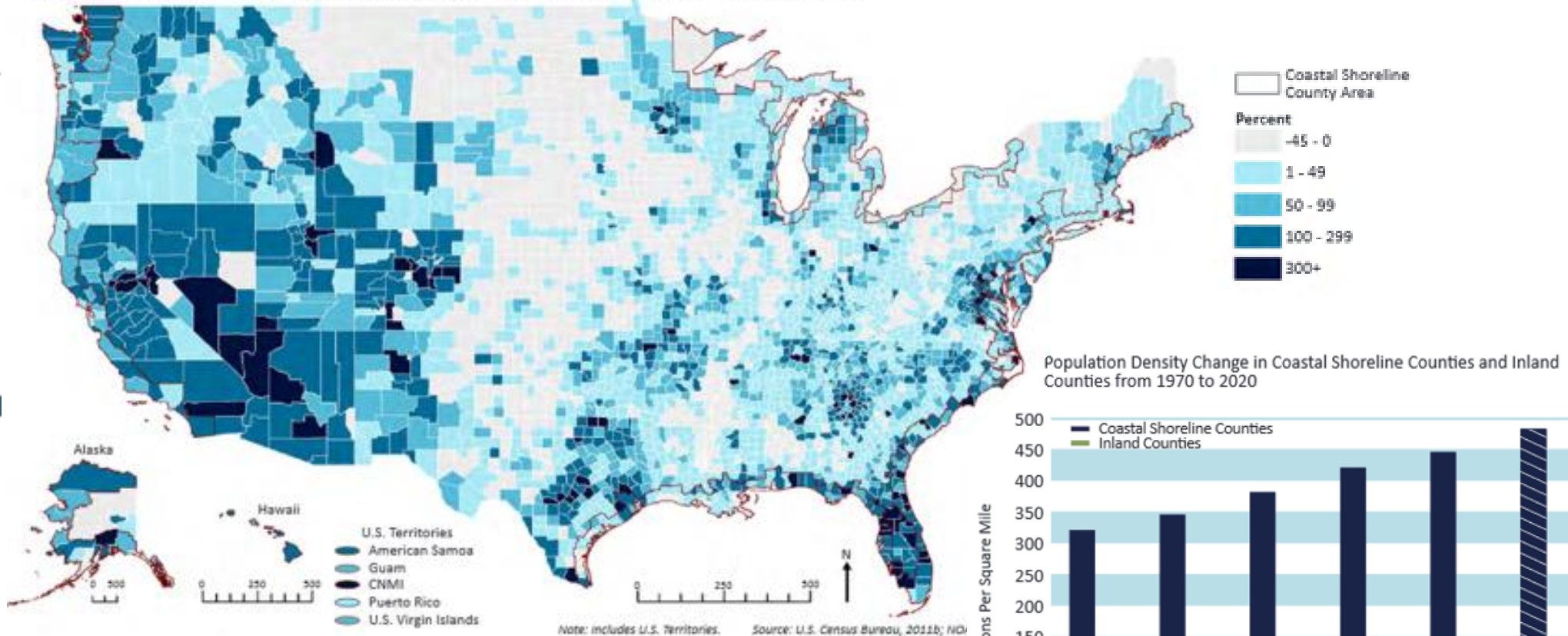
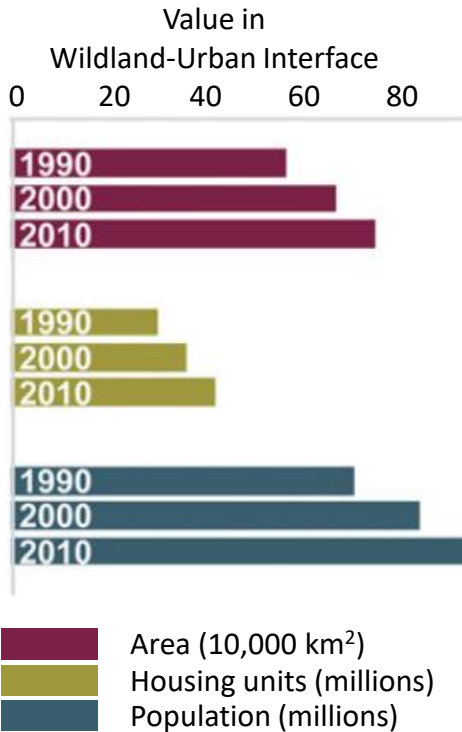
**\$3,400**  
PER YEAR

<https://www.infrastructurereportcard.org/the-impact/explore-infographics/failure-to-act/>

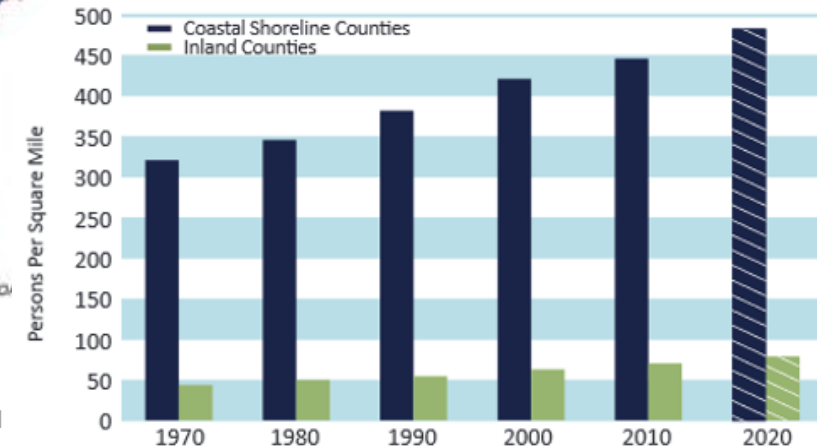
<https://www.infrastructurereportcard.org/wp-content/uploads/2017/04/2017-IRC-Executive-Summary-FINAL-FINAL.pdf>

# A Changing Landscape

Figure 4 | Percent Population Change in U.S. Counties, Highlighting Coastal Shoreline Counties: 1970-2010



Population Density Change in Coastal Shoreline Counties and Inland Counties from 1970 to 2020

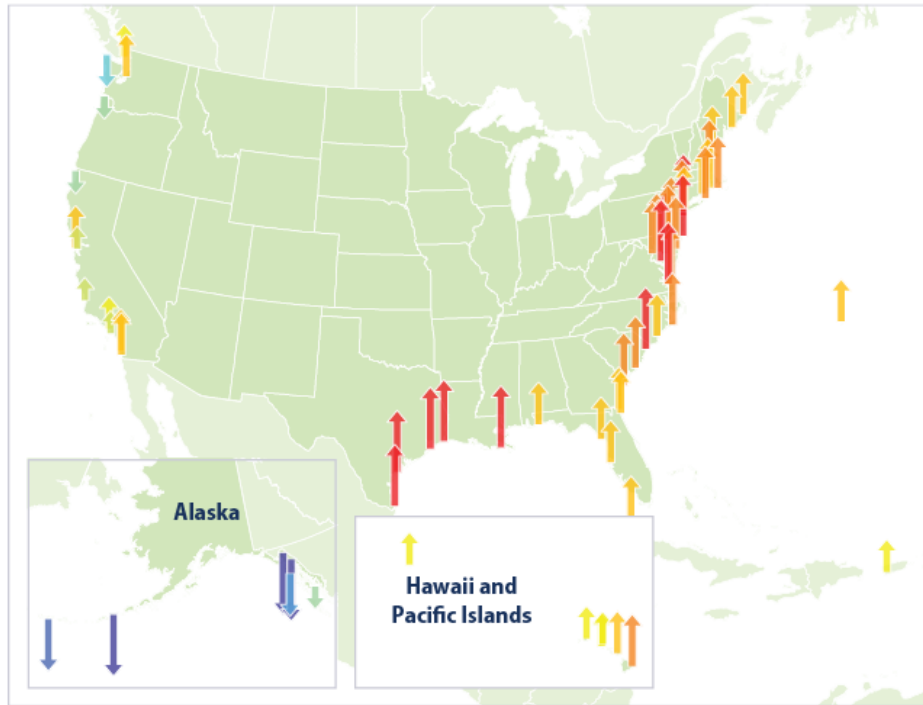


[https://www.fs.fed.us/nrs/pubs/jrnl/2018/nrs\\_2018\\_radeloff\\_001.pdf](https://www.fs.fed.us/nrs/pubs/jrnl/2018/nrs_2018_radeloff_001.pdf)

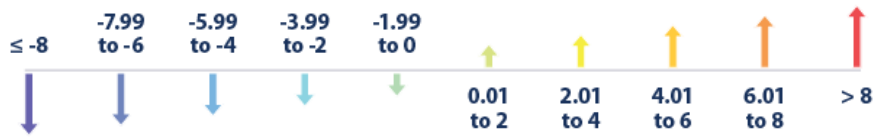
<https://coast.noaa.gov/digitalcoast/training/population-report.html>

# A Changing Climate

Relative Sea Level Change Along U.S. Coasts, 1960–2014

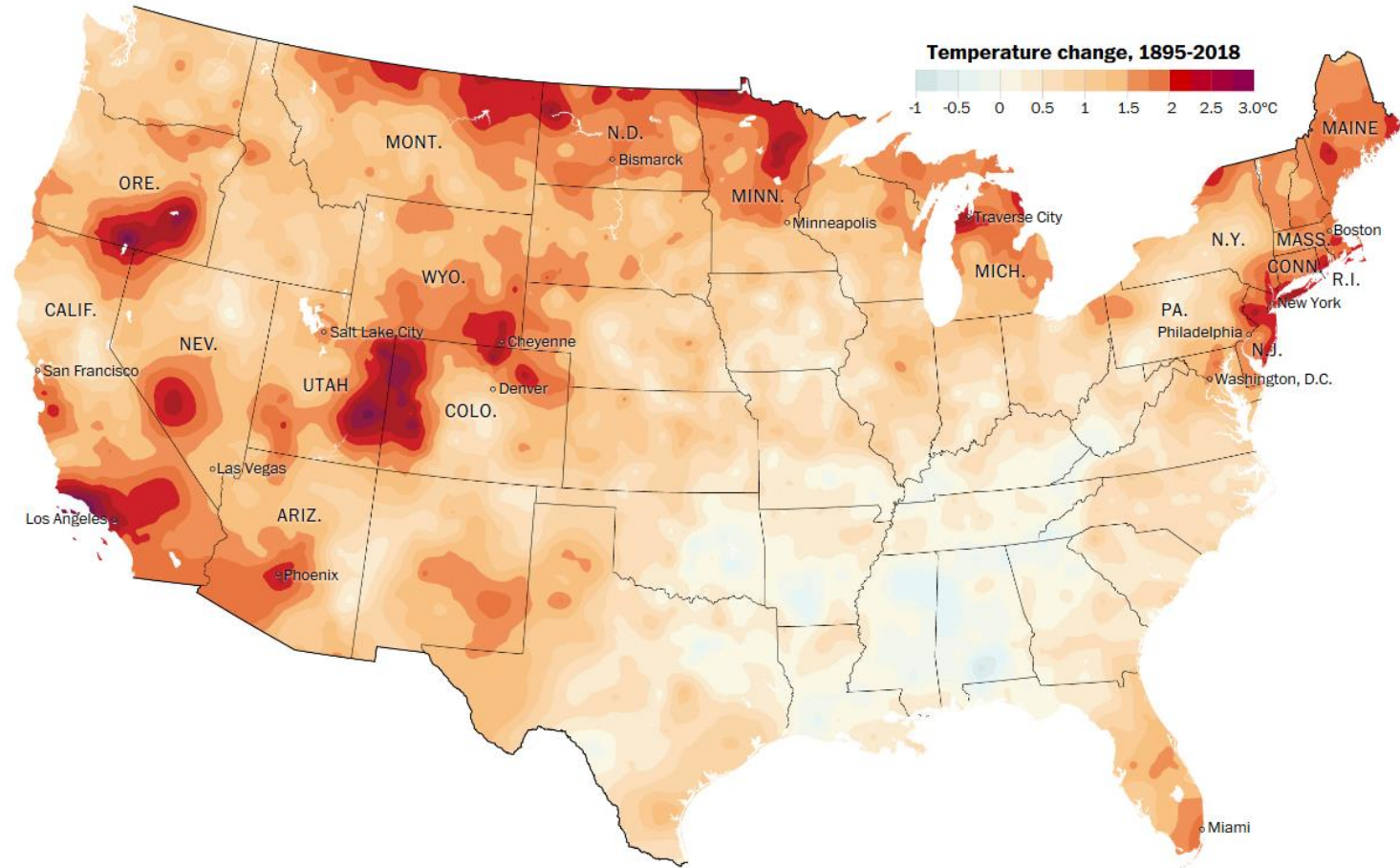


Relative sea level change (inches):



Data source: NOAA (National Oceanic and Atmospheric Administration). 2015 update to data originally published in: NOAA. 2009.

[https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-coastal-areas\\_.html](https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-coastal-areas_.html)

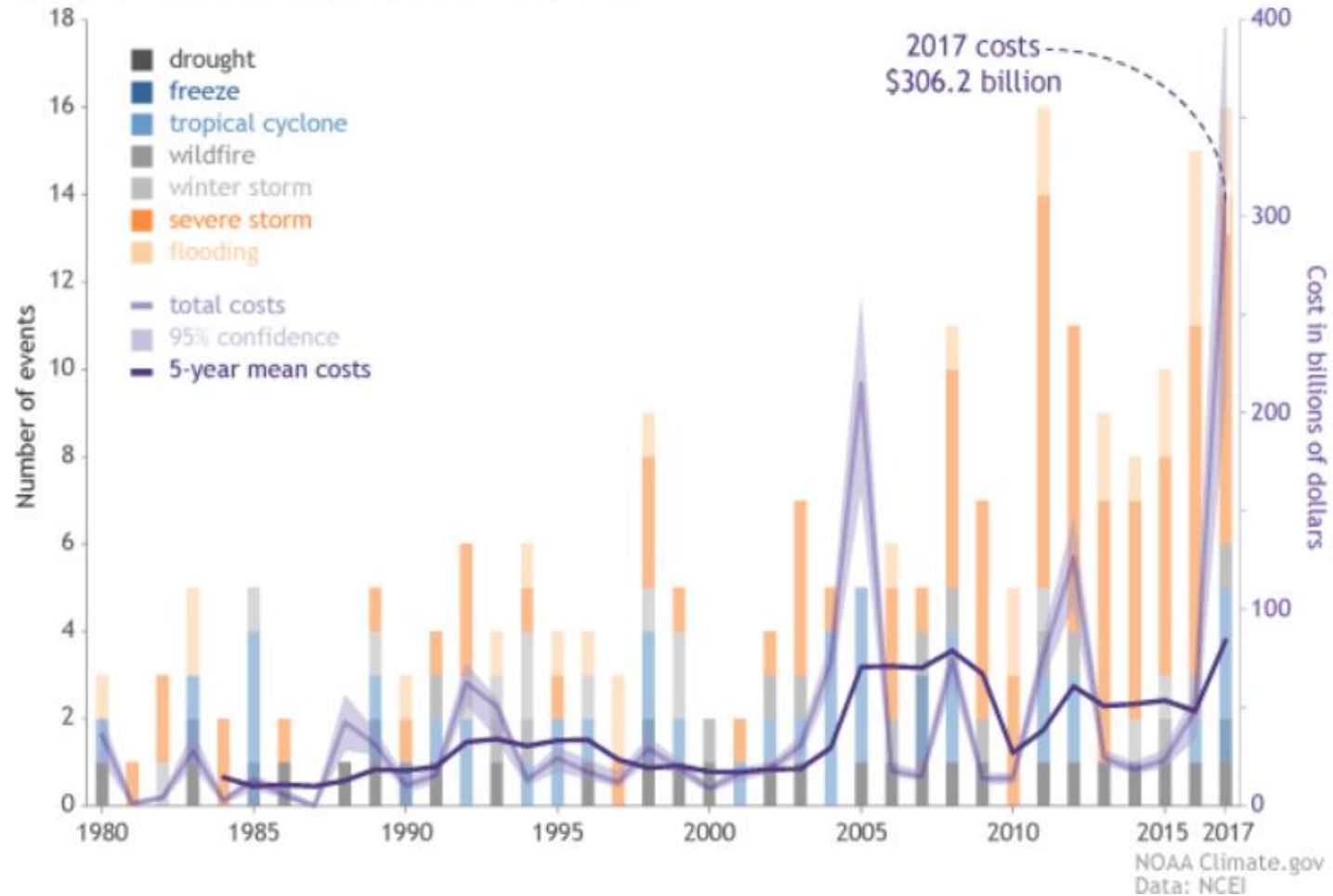


Temperature change, 1895-2018  
-1 -0.5 0 0.5 1 1.5 2 2.5 3.0°C

<https://www.washingtonpost.com/graphics/2019/national/climate-environment/climate-change-america/>

# Rise in Disaster Impacts

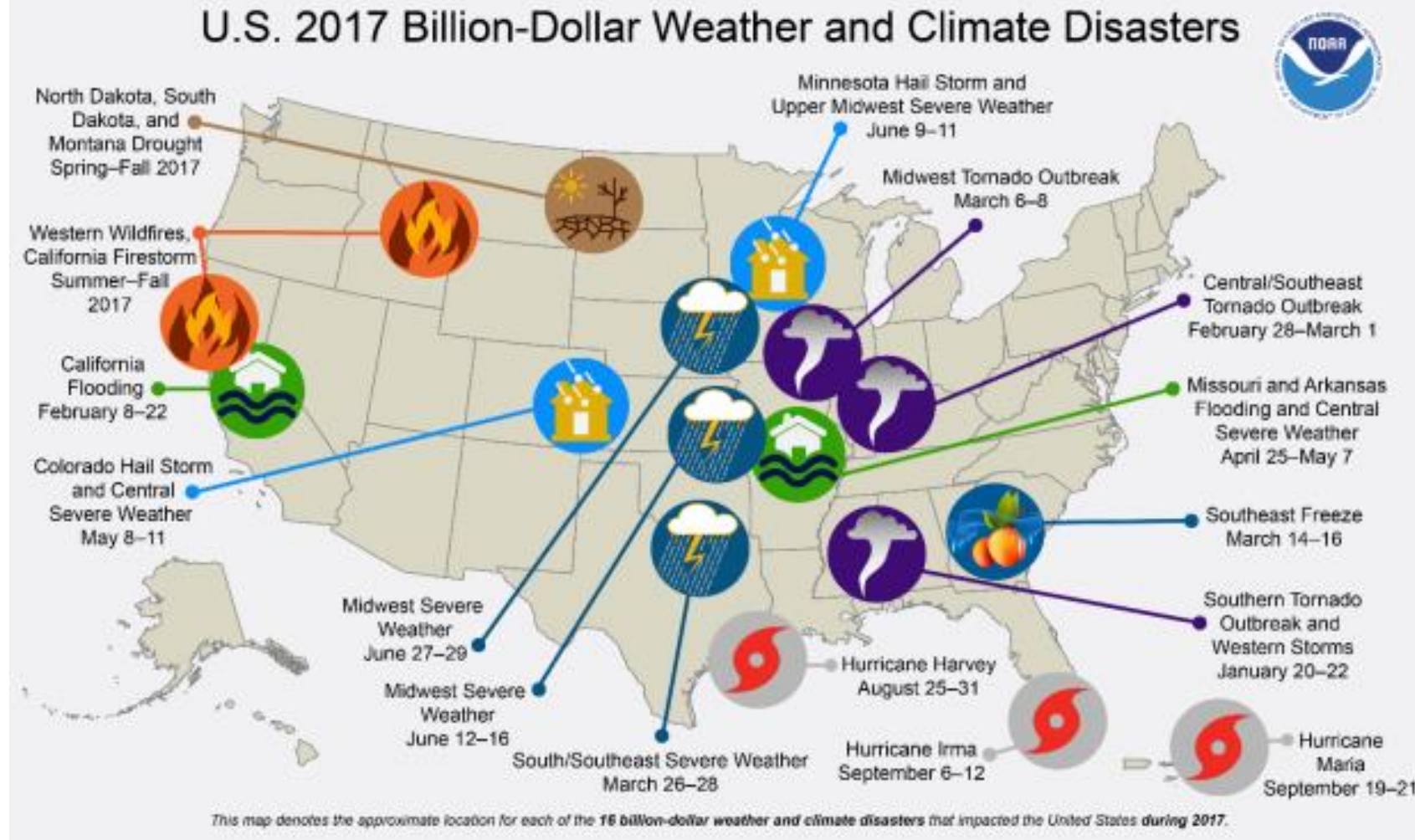
Billion-dollar disasters by type, from 1980-2017



<https://www.climate.gov/news-features/blogs/beyond-data/2017-us-billion-dollar-weather-and-climate-disasters-historic-year>



# 2017: Disasters from Coast to Coast

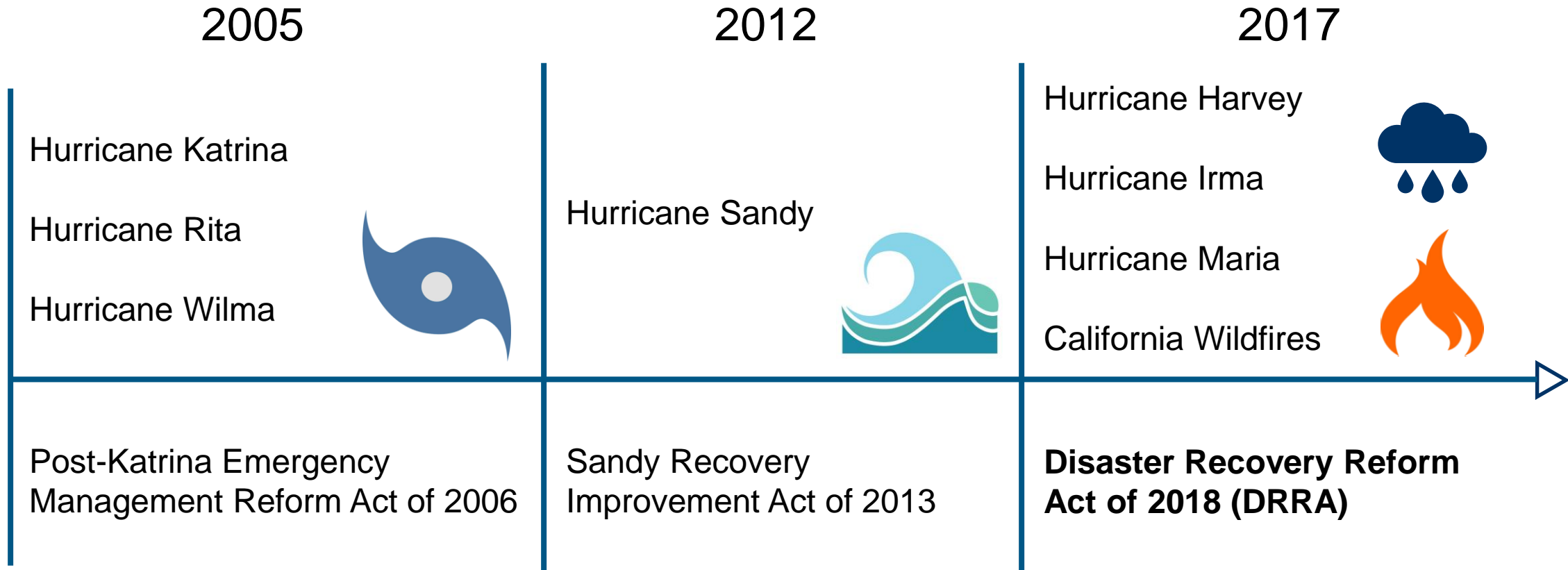


<https://www.ncdc.noaa.gov/billions/>

# 2017: Disasters from Coast to Coast



# Disaster Legislation Cycle








# Disaster Recovery Reform Act (DRRA)

## Section 1234

**Building Resilient Infrastructure and Communities (BRIC) is a new pre-disaster mitigation program resulting from Section 1234 of the DRRA that will support states, tribes, territories, and communities as they undertake mitigation projects that reduce the risks they face from disasters and natural hazards.**

### BRIC Guiding Principles

-  Support communities through capability & capacity building
-  Encourage and enable innovation
-  Promote partnerships
-  Enable large projects
-  Maintain flexibility
-  Provide consistency

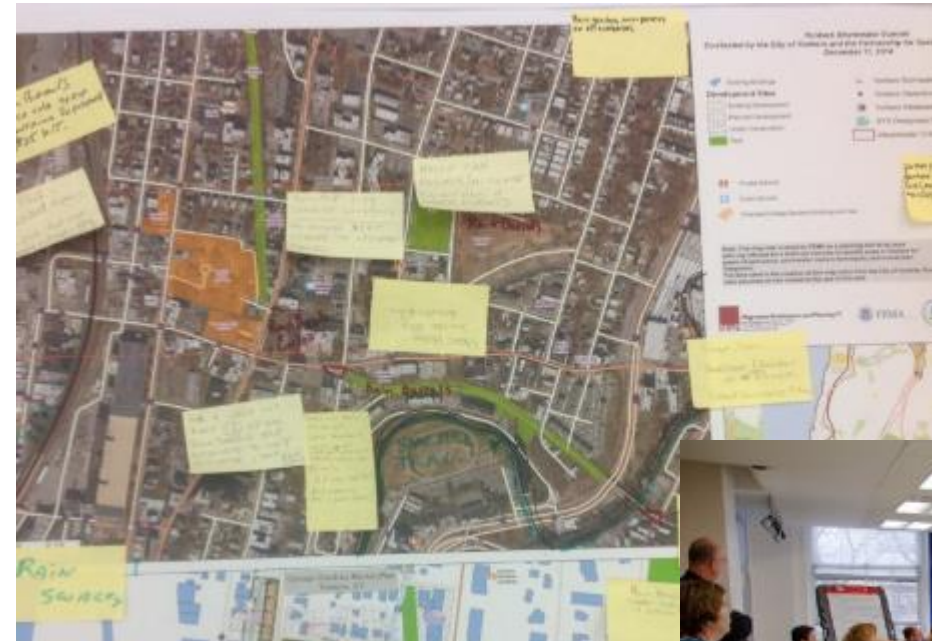
National Benefit-Cost Ratio (BCR) Per Peril <i>*BCR numbers in this study have been rounded</i>		Beyond Code Requirements	Federally Funded
<b>Overall Hazard Benefit-Cost Ratio</b>		<b>\$4:1</b>	<b>\$6:1</b>
	<b>Riverine Flood</b>	<b>\$5:1</b>	<b>\$7:1</b>
	<b>Hurricane Surge</b>	<b>\$7:1</b>	Too few grants
	<b>Wind</b>	<b>\$5:1</b>	<b>\$5:1</b>
	<b>Earthquake</b>	<b>\$4:1</b>	<b>\$3:1</b>
	<b>Wildland-Urban Interface Fire</b>	<b>\$4:1</b>	<b>\$3:1</b>

<https://www.nibs.org/page/mitigationsaves>

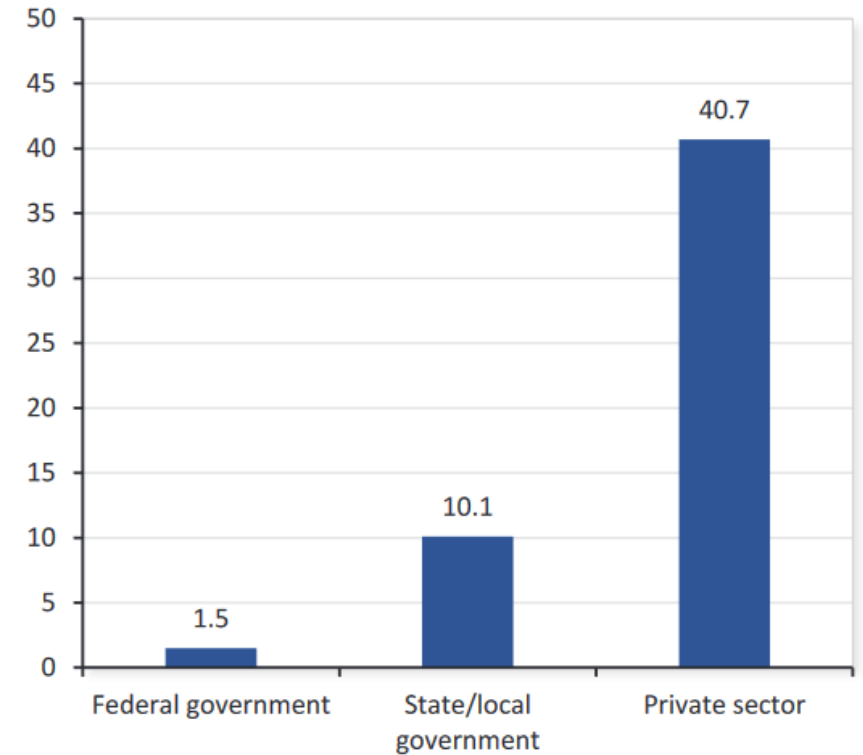
# Building Resilient Infrastructure



# Building Resilient Communities



Net Stock of Fixed Assets, 2015  
(trillions of dollars)



Source: U.S. Bureau of Economic Analysis. Excludes defense.

[https://www.fema.gov/media-library-data/1452548131751-b685ef6d5309978f751f93199053920a/CPCB\\_RS\\_F\\_YEARINREVIEW201506123\\_FINAL\\_508.pdf](https://www.fema.gov/media-library-data/1452548131751-b685ef6d5309978f751f93199053920a/CPCB_RS_F_YEARINREVIEW201506123_FINAL_508.pdf)

<https://www.cato.org/sites/cato.org/files/pubs/pdf/tbb-78-updated.pdf>



FEMA

**HMA**  
Hazard Mitigation  
Assistance

**Thank you!**

**Questions?**

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Mitigation Directorate | Federal Insurance and Mitigation Administration, FEMA