

INVITING DANGER

Supplemental Index

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BROOKINGS

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CONCEPTUAL FRAMEWORKS DATA KEY

Unless noted by a * funding data is from the Recovery Support Function Leadership Group, in appropriations for 2017-2019. Programs marked by an * were compiled from the sources below. If program is indicated by **, then it can, under certain circumstances, have resilience funding associated with it. For instance, as discussed in the main text, FEMA's PA grants can be used at FEMA's discretion for resilience activities. Given the paper scope, programs at the USDA for wilderness firefighting and management were not included, and programs earmarked for administration, operations, maintenance ext. were also not included.

Main Paper Data Sources:

RSFLG: <https://recovery.fema.gov/rsflg-monthly-data>

Climate Impact Lab: <http://www.impactlab.org/research/estimating-economic-damage-from-climate-change-in-the-united-states/>

Non-RSFLG Data Sources:

HUD-CDBG grants since 2017, including CDBG-MIT

<https://files.hudexchange.info/resources/documents/CDBG-DR-Grant-History-Report.pdf>

<https://www.hudexchange.info/programs/cdbg-mit/overview/>

FEMA Mitigation Programs (the RSFLG data does not report sub-grant mitigation program breakouts for FEMA appropriations, as such data was used from 2014-2018)

<https://www.gao.gov/assets/710/707821.pdf>

<https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

National Flood Insurance Program (data for amount borrowed and debt cancelled 2017-2019)

<https://crsreports.congress.gov/product/pdf/IN/IN10784>

Federal Crop Insurance Program (data for total combined business subsidies from 2017-2019)

https://www3.rma.usda.gov/apps/sob/current_week/sobrpt2017-2020.pdf

SI TABLE 1: CONCEPTUAL FRAMEWORK ACCOUNTING METHOD 1 (UTILIZED IN REPORT)

This is the accounting method we utilize in the main report, where resilience is accounted for by program name, or main program purpose based on what was easily publicly available (i.e. looking at program name and description on a programs website). Here we include in resilience funding the authorized programs at USDA and FEMA, as well as the HUD-MIT grants that were announced in 2018.

Recovery to resilience ratio = .145

TYPES OF FEDERAL AID	Disaster Response	Federal \$	Infrastructure	Federal \$2	Subsidized Insurance	Federal \$3
RECOVERY						
Total Recovery	**SBA Disaster Recovery Loans	\$1,259,000,000.00	**Public Assistance (FEMA)	\$21,128,667,582.01	*National Flood Insurance Program (outstanding debt since 2017 including canceled debt)	\$29,525,000,000.00
\$136,460,348,071.33	Individual Assistance (FEMA)	\$8,325,101,220.52	**Federal Highway Administration Emergency Relief (DOT)	\$3,024,000,000.00	*Federal Crop Insurance Program (total subsidies since 2017)	\$18,989,556,000.00
	Wildfire and Hurricane Indemnity Program (USDA) (in obligation)	\$1,974,852,844.88	**Federal Transit Administration Public Transportation Emergency Relief (DOT)	\$340,542,000.00	Rural Housing Insurance Fund (USDA)	\$15,508,488.63
	Commodity Assistance (USDA)	\$24,000,000.00	*Community Development Block Grant- Disaster Relief (HUD, data in grant allocations)**	\$23,430,967,000.00		
	Emergency Conservation Program (USDA)	\$958,000,000.00	Economic Development Disaster Assistance (DOC)	\$1,174,000,000.00		
	SNAP (USDA)	\$14,000,000.00	**Army Corp of Engineers (USACE)	\$19,120,000,000.00		
	Emergency Forest Restoration Program (USDA)	\$480,000,000.00	Rural Development Grants: Community Facilities and Water and Waste Disposal (USDA)	\$315,475,000.00		
	Disaster Education Recovery (ED)	\$2,855,000,000.00	Airport Trust Fund	\$79,589,000.00		
	College Housing and Academic Facilities Loan Program Account (ED)	\$71,076,099.00	Economic Development Fisheries Assistance (ED)	\$350,000,000.00		
	Military Construction (DOD)	\$551,076,099.00	Construction and Resource Support programs (DOI)	\$599,129,000.00		
	Health Resources and health Support programs(HHS)	\$1,146,000,000.00				
	Community Disaster Loans (FEMA)	\$709,807,737.29				
	Total	\$18,367,914,000.69	Total	\$69,562,369,582.01	Total	\$48,530,064,488.63
RESILIENCE						
Total Resilience	*Pre Disaster Mitigation Grants (FEMA pre-2018, data in obligation for 2014-2018)	\$293,000,000.00	*Community Development Block Grant- MIT (HUD, est 2018 and in obligations)	\$16,000,000,000.00	*Flood Mitigation Assistance (FEMA, data in obligations for 2014-2018)	\$580,000,000.00
\$19,749,000,000.00	Watershed and Flood Prevention Operations (USDA)	\$976,000,000.00	*Building Resilient Infrastructure and Communities (FEMA, data in obligations est 2018, announced 2020)	\$500,000,000.00		
	*Hazard Mitigation Grant Program (FEMA, data in obligations for 2014-2018)	\$1,400,000,000.00				

SI TABLE 2: CONCEPTUAL FRAMEWORK ACCOUNTING METHOD 2

This method only utilizes the authorized programs at USDA and FEMA for resilience and reports the HUD grants by total RSFLG appropriation, without the further breakdown into grant allocation that necessitated further grant identification from the original dataset.

Recovery to resilience ratio = .025

TYPES OF FEDERAL AID	Disaster Response	Federal \$	Infrastructure	Federal \$2	Subsidized Insurance	Federal \$3
Recovery						
Total Recovery	**SBA Disaster Recovery Loans	\$1,259,000,000.00	**Public Assistance (FEMA)	\$21,128,667,582.01	*National Flood Insurance Program (outstanding debt)	\$29,525,000,000.00
\$152,521,881,071.33	Individual Assistance (FEMA)	\$8,325,101,220.52	Federal Highway Administration Emergency Relief (DOT)	\$3,024,000,000.00	*Federal Crop Insurance Program (total subsidies)	\$18,989,556,000.00
	Wildfire and Hurricane Indemnity Program (USDA) (in obligation)	\$1,974,852,844.88	Federal Transit Administration Public Transportation Emergency Relief (DOT)	\$340,542,000.00	Rural Housing Insurance Fund (USDA)	\$15,508,488.63
	Commodity Assistance (USDA)	\$24,000,000.00	Community Development Fund and Community Development and Planning (HUD)	\$39,492,500,000.00		
	Emergency Conservation Program (USDA)	\$958,000,000.00	Economic Development Disaster Assistance (DOC)	\$1,174,000,000.00		
	SNAP (USDA)	\$14,000,000.00	**Army Corp of Engineers (USACE)	\$19,120,000,000.00		
	Emergency Forest Restoration Program (USDA)	\$480,000,000.00	Rural Development Grants: Community Facilities and Water and Waste Disposal (USDA)	\$315,475,000.00		
	Disaster Education Recovery (ED)	\$2,855,000,000.00	Airport Trust Fund (DOT)	\$79,589,000.00		
	College Housing and Academic Facilities Loan Program Account (ED)	\$71,076,099.00	Economic Development Fisheries Assistance (ED)	\$350,000,000.00		
	Military Construction (DOD)	\$551,076,099.00	Construction and Resource Support programs (DOI)	\$599,129,000.00		
	Health Resources and health Support programs (HHS)	\$1,146,000,000.00				
	Community Disaster Loans (FEMA)	\$709,807,737.29				
	Total	\$18,367,914,000.69	Total	\$85,623,902,582.01	Total	\$48,530,064,488.63
RESILIENCE						
Total Resilience	*Pre Disaster Mitigation Grants (FEMA pre-2018, data in obligation for 2014-2018)	\$293,000,000.00	Building Resilient Infrastructure and Communities (FEMA, data in obligations est 2018, announced 2020)	\$500,000,000.00	Flood Mitigation Assistance (FEMA, data in obligations for 2014-2018)	\$580,000,000.00
\$3,749,000,000.00	Watershed and Flood Prevention Operations (USDA)	\$976,000,000.00				
	*Hazard Mitigation Grant Program (FEMA, data in obligations for 2014-2018)	\$1,400,000,000.00				
	Total	\$2,669,000,000.00	Total	\$500,000,000.00	Total	\$580,000,000.00

SI TABLE 3: CONCEPTUAL FRAMEWORK ACCOUNTING METHOD 3

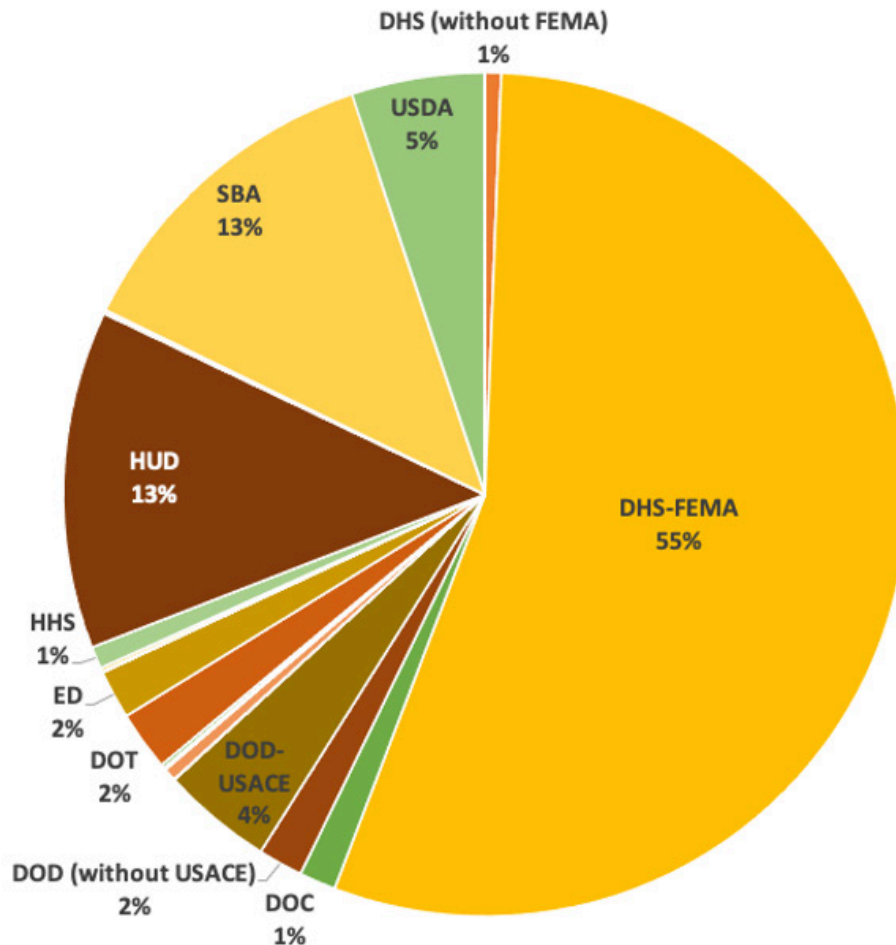
This method is the most generous resilience accounting method, and reports resilience by the authorized programs at USDA and FEMA, 2018 legislation that mandated flood damage reduction requirements in the USACE construction account¹, and also includes the 2018 HUD-MIT grant.

Recovery to resilience ratio = .286

TYPES OF FEDERAL AID	Disaster Response	Federal \$	Infrastructure	Federal \$2	Insurance	Federal \$3
Recovery						
Total Recovery	**SBA Disaster Recovery Loans	\$1,259,000,000.00	**Public Assistance (FEMA)	\$21,128,667,582.01	*National Flood Insurance Program (outstanding debt)	\$29,525,000,000.00
\$121,460,348,071.33	Individual Assistance (FEMA)	\$8,325,101,220.52	Federal Highway Administration Emergency Relief (DOT)	\$3,024,000,000.00	*Federal Crop Insurance Program (total subsidies)	\$18,989,556,000.00
	Wildfire and Hurricane Indemnity Program (USDA) (in obligation)	\$1,974,852,844.88	Federal Transit Administration Public Transportation Emergency Relief (DOT)	\$340,542,000.00	Rural Housing Insurance Fund (USDA)	\$15,508,488.63
	Commodity Assistance (USDA)	\$24,000,000.00	*Community Development Block Grant- Disaster Relief (HUD, data in grant allocations)**	\$23,430,967,000.00		
	Emergency Conservation Program (USDA)	\$958,000,000.00	Economic Development Disaster Assistance (DOC)	\$1,174,000,000.00		
	SNAP (USDA)	\$14,000,000.00	**Army Corp of Engineers (USACE)	\$4,120,000,000.00		
	Emergency Forest Restoration Program (USDA)	\$480,000,000.00	Rural Development Grants: Community Facilities and Water and Waste Disposal (USDA)	\$315,475,000.00		
	Disaster Education Recovery (ED)	\$2,855,000,000.00	Airport Trust Fund (DOT)	\$79,589,000.00		
	College Housing and Academic Facilities Loan Program Account (ED)	\$71,076,099.00	Economic Development Fisheries Assistance (ED)	\$350,000,000.00		
	Military Construction (DOD)	\$551,076,099.00	Construction and Resource Support programs (DOI)	\$599,129,000.00		
	Health Resources and health Support programs (HHS)	\$1,146,000,000.00				
	Community Disaster Loans (FEMA)	\$709,807,737.29				
	Total	\$18,367,914,000.69	Total	\$54,562,369,582.01	Total	\$48,530,064,488.63
RESILIENCE						
Total Resilience	*Pre Disaster Mitigation Grants (FEMA pre-2018, data in obligation for 2014-2018)	\$293,000,000.00	*Community Development Block Grant- MIT (HUD, est 2018 and in obligations)	\$16,000,000,000.00	Flood Mitigation Assistance (FEMA, data in obligations for 2014-2018)	\$580,000,000.00
\$34,749,000,000.00	Watershed and Flood Prevention Operations (USDA)	\$976,000,000.00	Building Resilient Infrastructure and Communities (FEMA, data in obligations est 2020)	\$500,000,000.00		
	*Hazard Mitigation Grant Program (FEMA, data in obligations for 2014-2018)	\$1,400,000,000.00	Army Corp flood reduction funds from 2018 legislation	\$15,000,000,000.00		
	Total	\$2,669,000,000.00	Total	\$31,500,000,000.00	Total	\$580,000,000.00

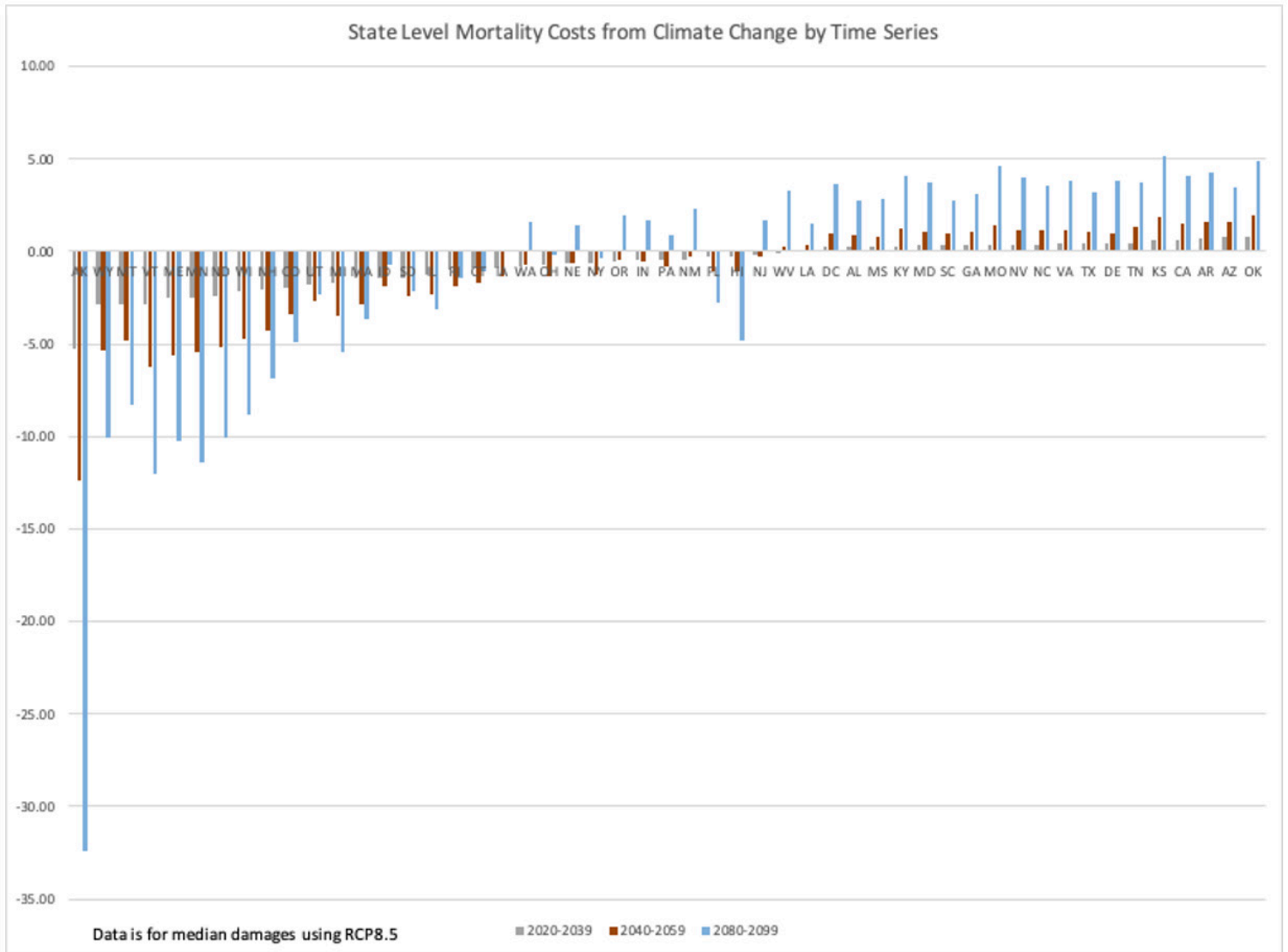
¹For more on the 2018 USACE appropriations, see <https://www.congress.gov/115/plaws/publ123/PLAW-115publ123.pdf>

SI FIGURE 1: RECOVERY SUPPORT FUNCTION LEADERSHIP GROUP DATA BY AGENCY OBLIGATION



Here we show the same figure (Fig 1) first introduced in the main text, but instead of agency spending by federal appropriations (which are essentially political statements) we use obligations (which are actual legally assigned dollars). While the picture is roughly the same, the percentages of some agencies do change. This is especially true for the Department of Housing and Urban Development (HUD), the Small Business Association (SBA) and the Army Corp (USACE), who see their percentages shrink in the case of HUD and the USACE and expand in the case of the SBA. Reasons for this vary, but large appropriations after disasters to established programs like the Army Corp could be viewed as appearing responsive to constituents needs, skewing appropriations data toward big sums in name brand programs. The obligations process on the other hand is lengthy and complex and often the large sums of money appropriated do not end being entirely obligated.

SI FIGURE 2: CLIMATE IMPACT LAB DAMAGE ESTIMATES BY TIME SERIES



Here we show state level mortality costs estimated by the CIL for each roughly 20-year time series they report. Mortality costs are assessed using value of a statistical life (VSL), and the vertical axis represents the percent change in GDP due to mortality costs measured in share of 2012 income. Negative values represent gains. The estimated mathematical function that fits the curves between time series is quadratic, indicating that future economic damages from climate change both accelerate and increase over time.