

FEMA data for Improving Disaster Resilience project

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CODE AND DATA WORKFLOW: Initial findings in Oct 2022

R Notebook:

censusFEMA_distributions_v4.rmd

Goal: answer whether disasters are increasing faster than a county's ability to respond

Data Input: Census API feed

Population (B01001_001) by county

Median income (B19013_001) by county

Data Input: Consumer price index

Consumer price index file downloaded from:
<https://www.bls.gov/cpi/data.htm>

Data Input: FEMA Disaster Declarations

<https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries?>"

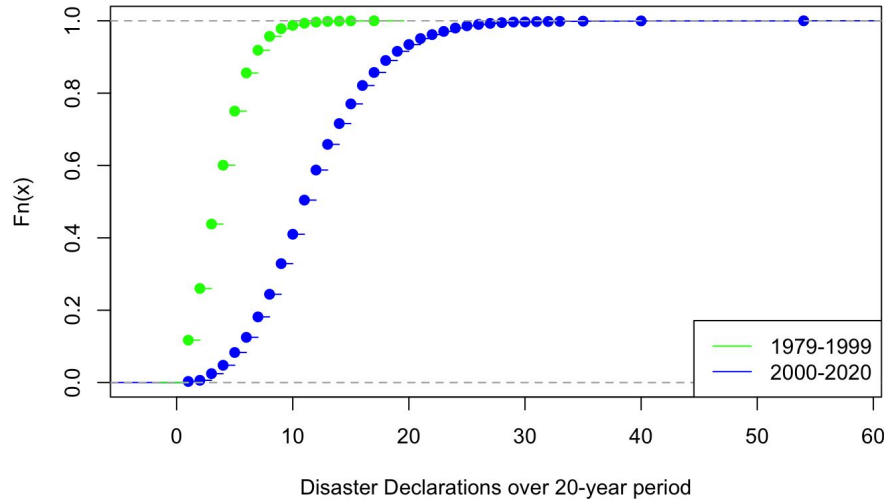
Data Output

Comparing disaster declaration and normalized median income from 1979 - 2000 versus 2001 -2021. Median income within a county has been relatively stable with a statistical difference in higher disaster declaration counts by county across those two decades.

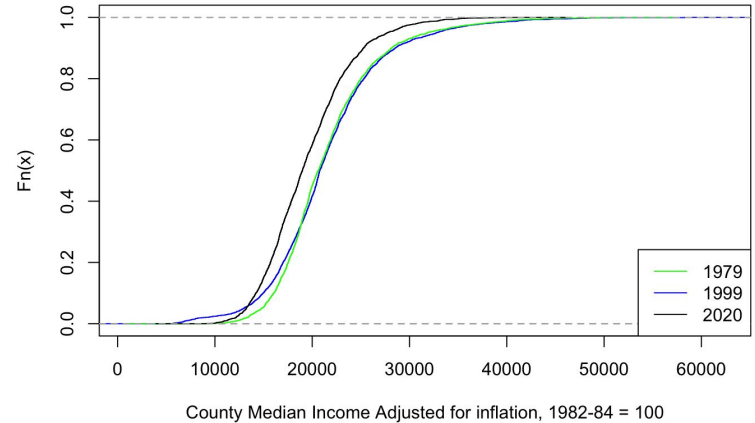
More disaster declarations not more income* per county

Comparing two decades: before and after 2000

Cumulative Distribution Function - Disaster Declaration count by US county



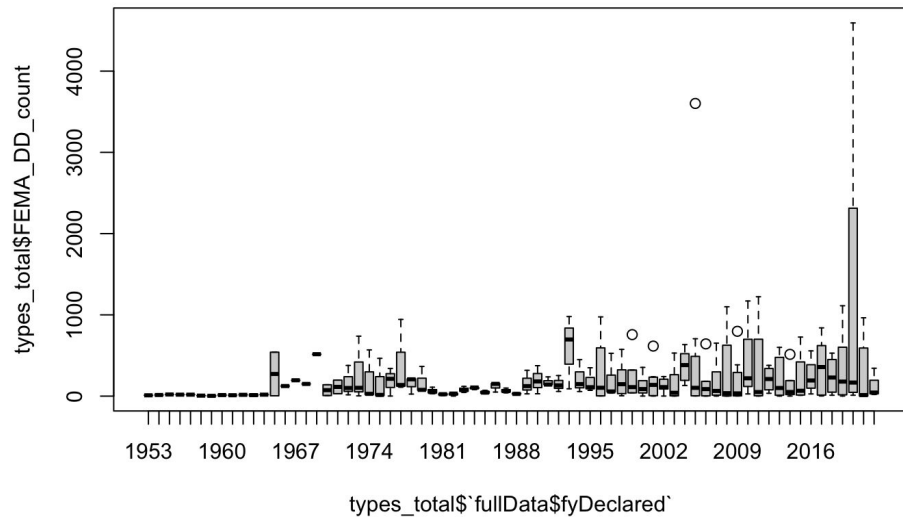
Cumulative Distribution Function - Median Income by US county



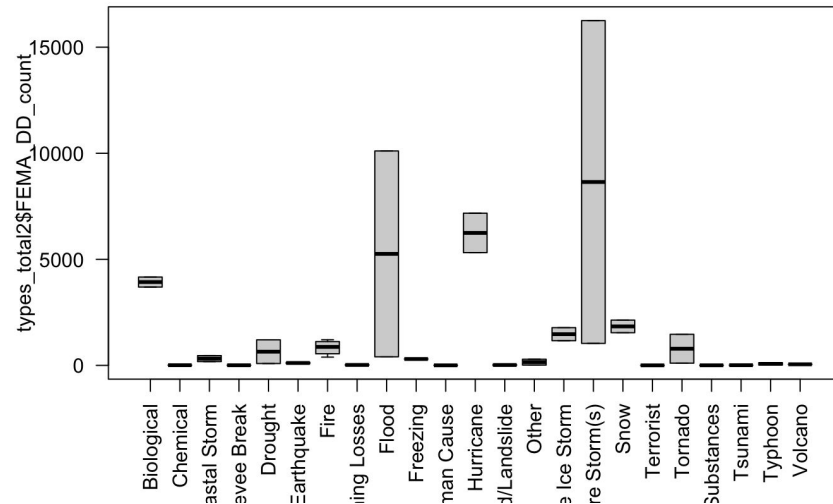
*inflation adjusted median income per county

Example output

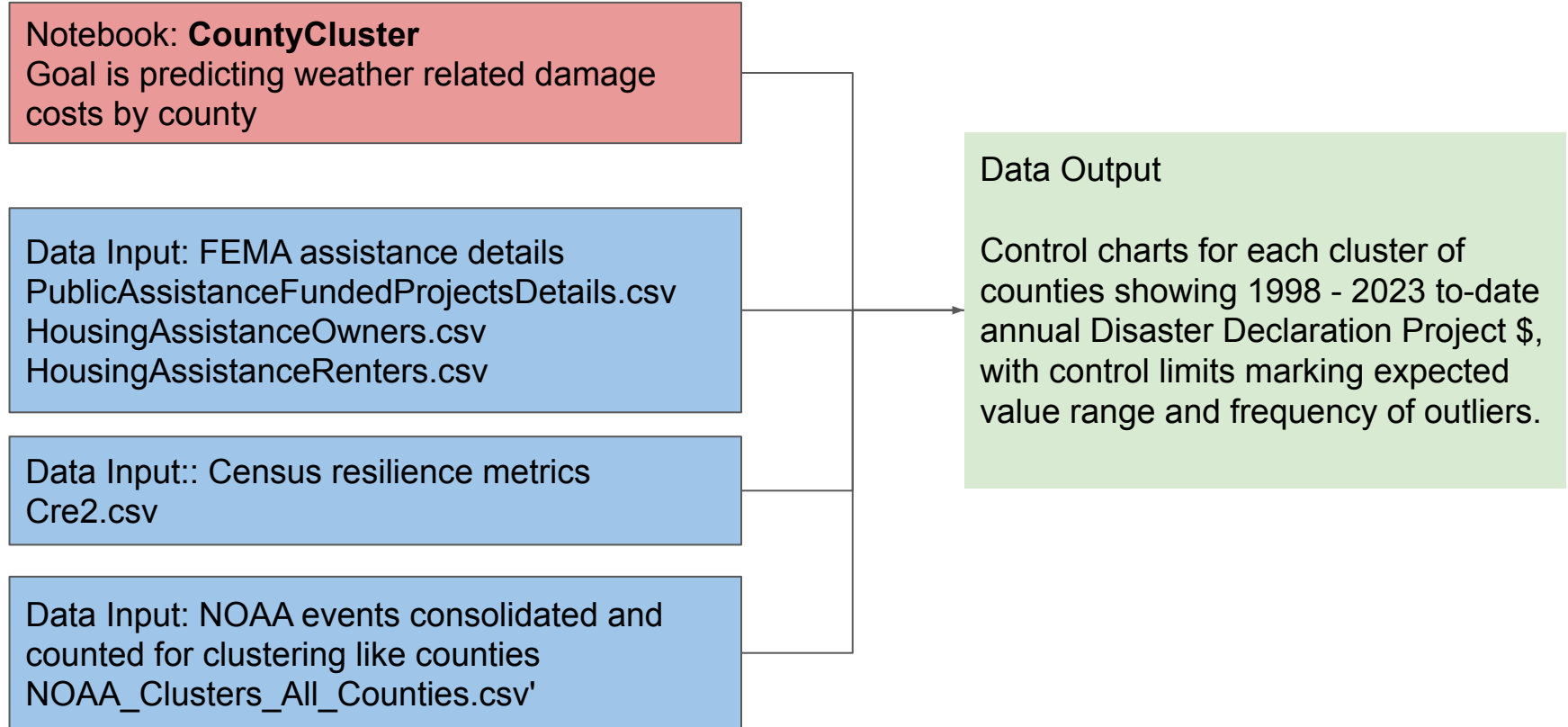
Disaster Declarations by year



Disaster Declarations by Incident Type

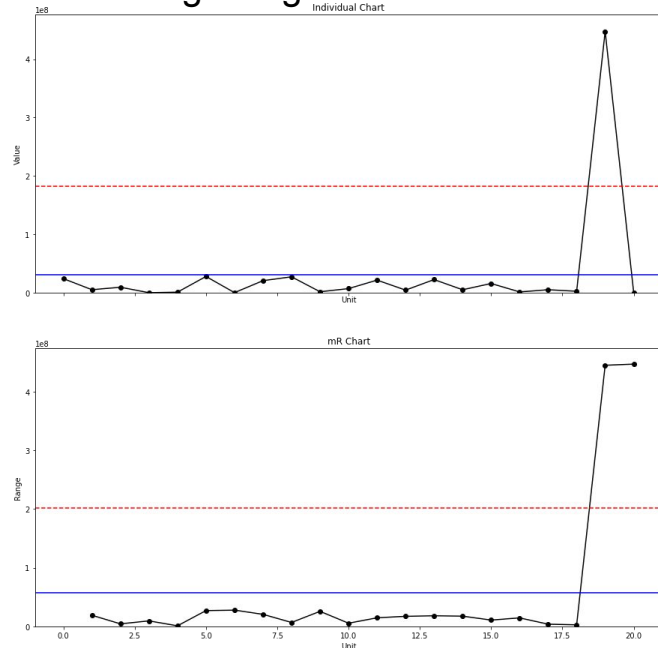


CODE AND DATA WORKFLOW: Applies clusters to quantify expected disaster \$ costs

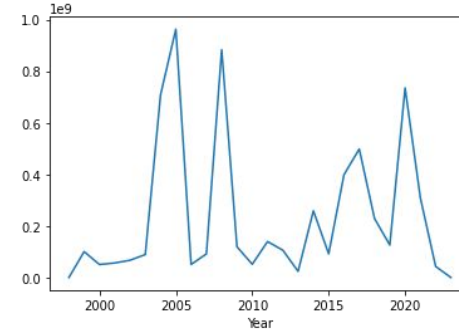


Using clusters to estimate annual county level disaster costs

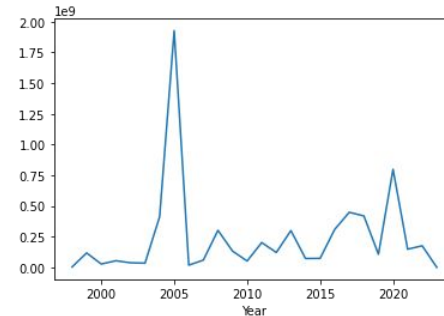
Cluster 4 using Individual & Moving Range Control Chart



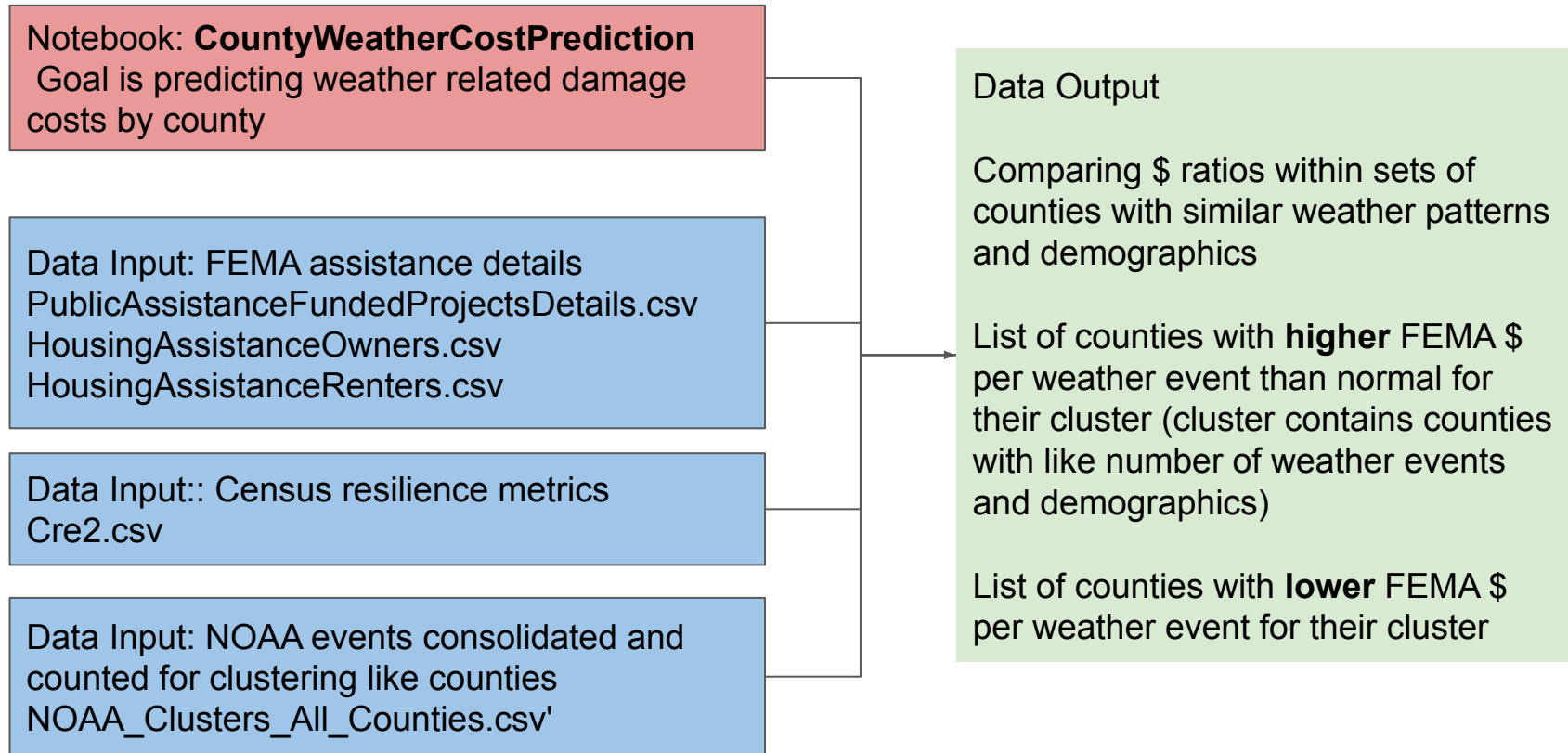
Cluster 10: includes Bartholomew County, IN



Cluster 5: includes Monroe County, IN



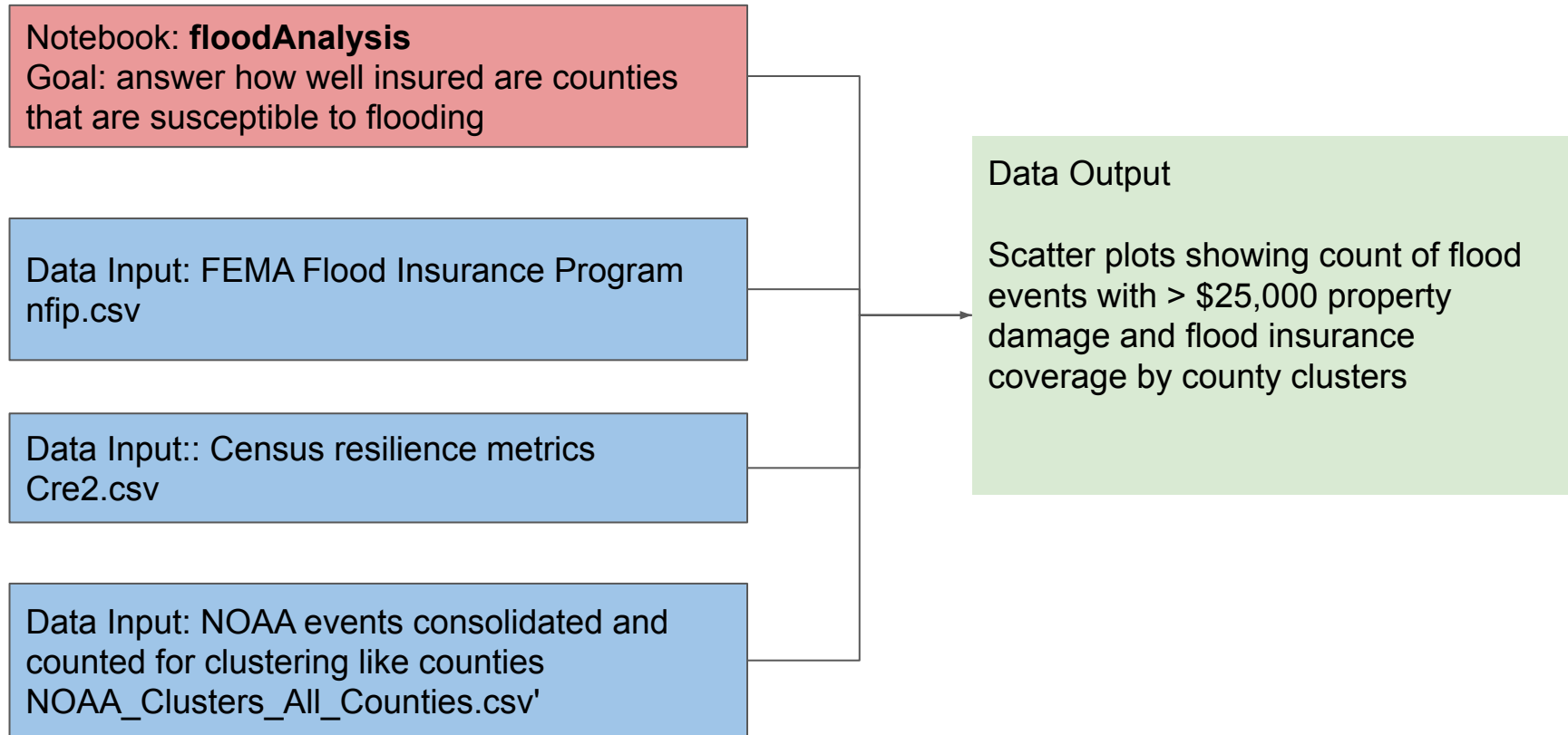
CODE AND DATA WORKFLOW: Using cluster averages to examine outliers



Example counties with FEMA \$ higher
than their cluster average

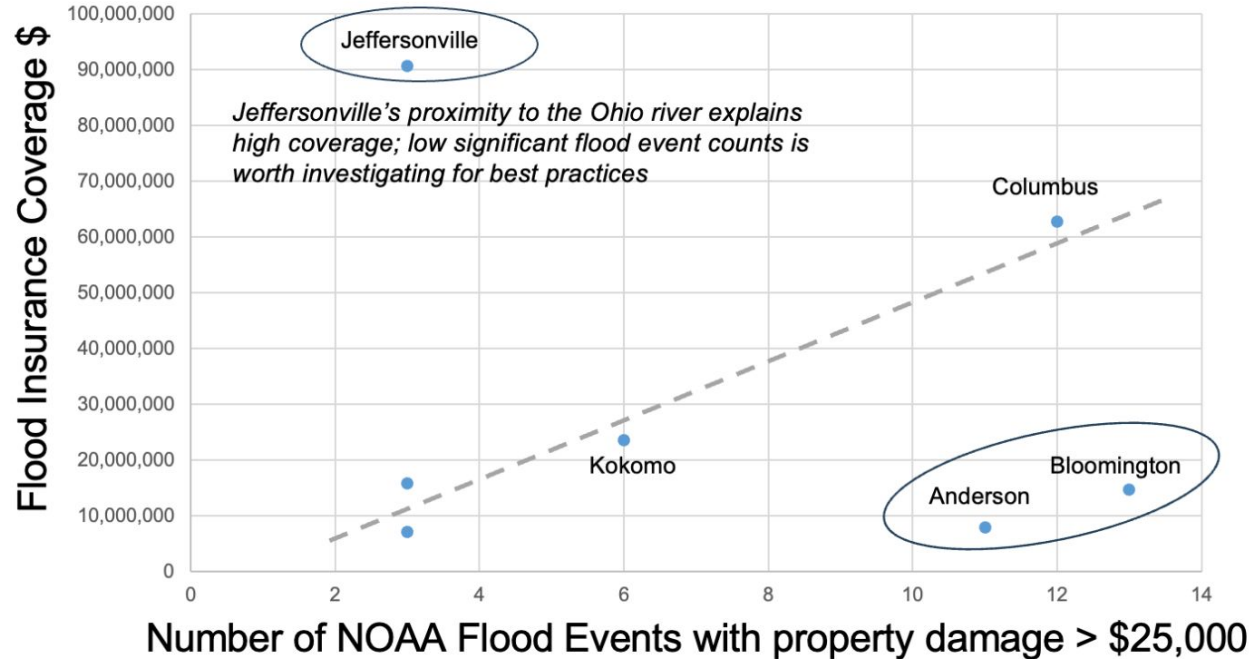
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{ 'ANDROSCOGGIN, MAINE',  
  'ARLINGTON, VIRGINIA',  
  'BREMER, IOWA',  
  'BURLEIGH, NORTH DAKOTA',  
  'CASS, NEBRASKA',  
  'CATTARAUGUS, NEW YORK',  
  'CHENANGO, NEW YORK',  
  'CHITTENDEN, VERMONT',  
  'DELAWARE, NEW YORK',  
  'DICKINSON, KANSAS',  
  'DODGE, NEBRASKA',  
  'DOUGLAS, NEBRASKA',  
  'FRANKLIN, ALABAMA',  
  'GUILFORD, NORTH CAROLINA',  
  'HAMILTON, TENNESSEE',  
  'HENNEPIN, MINNESOTA',  
  'JOHNSON, IOWA',  
  'JOHNSON, KENTUCKY',  
  'KENNEBEC, MAINE',  
  'LEHIGH, PENNSYLVANIA',  
  'LUZERNE, PENNSYLVANIA',  
  'MADISON, ILLINOIS',  
  'MILWAUKEE, WISCONSIN',  
  'MONROE, NEW YORK',  
  'MONTGOMERY, OHIO',  
  'MORRIS, NEW JERSEY',  
  'NICHOLAS, WEST VIRGINIA',  
  'ONONDAGA, NEW YORK',  
  'ORANGE, NEW YORK',  
  'OTSEGO, NEW YORK',  
  'PLATTE, NEBRASKA',  
  'POTTAWATTAMIE, IOWA',
```


CODE AND DATA WORKFLOW: Using clusters to find vulnerabilities

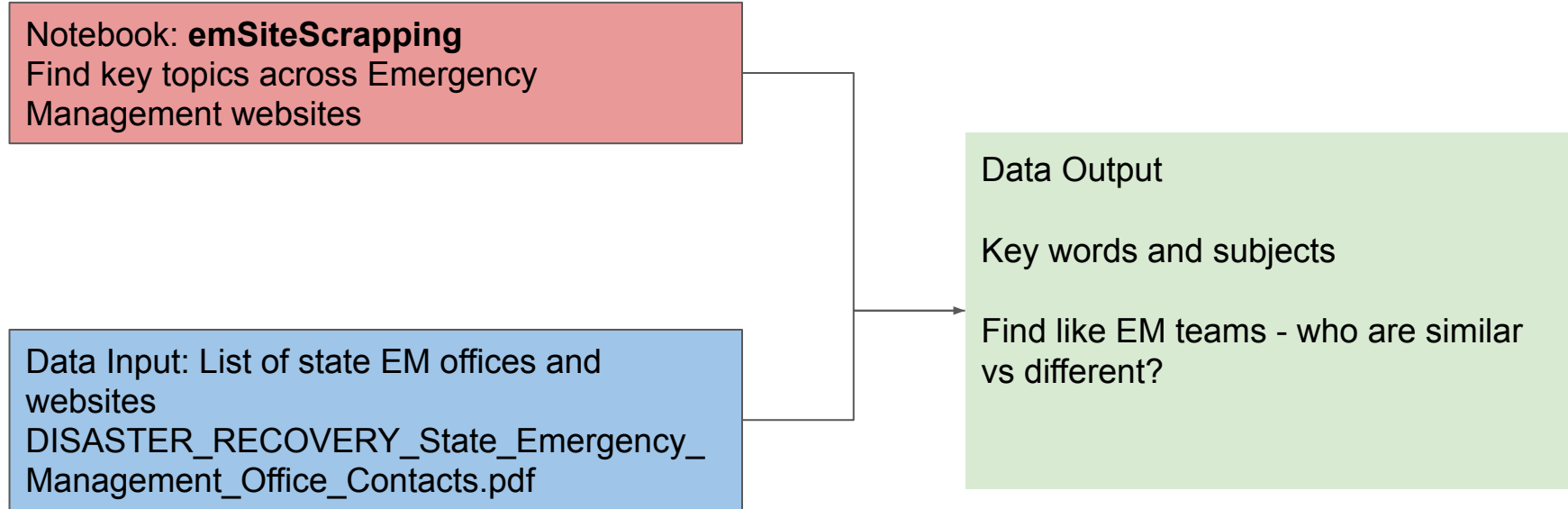


What's expected flood coverage for a city?

NOAA flood events by FEMA flood insurance coverage per city



CODE AND DATA WORKFLOW: How do county EM websites and communication tools compare to peers?



Emergency Management website topics

- Tools (webeoc) & procedures
- Streaming information on emerging events
- Sign up for updates
- Safety courses & information links
- Operations management planning
- Legal navigation & justice issues

- Funding opportunities
- Feedback
- Exercises
- Disaster declarations
- Customer and end user focus areas
- Crime prevention

AI generated
topics with words
(using NMF)

Tools (webeoc) & procedures	id	technical	procedures	committee	materials	section	communities	webeoc	threat	tribal
Streaming information on emerging events	tools	severe	emergencies	follow	tornadoes	stream	drought	endstream	obj	endobj
Sign up for updates	address	used	number	sign	statement	updates	message	preferences	photos	instagram
Safety courses & information links	safe	hurricane	force	links	severe	courses	storm	line	task	power
Operations management planning	management	report	mitigation	national	recovery	response	planning	local	federal	operations
Legal navigation	court	united	courts	systems	authority	bureau	staff	administrative	labor	navigation
Justice issues	main	renew	justice	read	number	contacts	systems	issues	informed	alert
Funding opportunities	small	manage	counties	week	areas	watch	wildfire	eligible	sba	secure
Feedback	mobile	phone	green	date	transportation	regulations	foia	feedback	youth	text
Exercises	mobile	app	cookies	blog	relations	customer	life	case	exercises	join
Disaster declarations	june	declaration	major	september	october	cases	march	december	november	february
Customer and end user focus areas	employees	quality	disabilities	veterans	environmental	energy	professional	care	housing	families
Crime prevention	highway	questions	mission	annual	dps	criminal	conference	prevention	history	crime

CODE AND DATA WORKFLOW:

