

# Addressing Challenges to Public Health Data Connectivity in Disaster Research

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# Why is a new approach needed?

## Typical approach to disaster research

- Disaster-specific case studies with small sample sizes
- Lack standard variables that can be compared across disasters, over time and in different geographic locations
- Data collection can be expensive, time consuming, and place burdens on individuals / systems during response and recovery
- Limited ability to enhance resilience to future disasters of a different type, scale, or location

## Stronger, more frequent storms



Rank	mm	in	Storm (Year)	Location
1	1538.7	60.58	Harvey (2017)	Texas
2	1321	52.02	Lane (2018)	Hawaii
4	1096	43.15	Imelda (2019)	Texas
8	912.6	35.93	Florence (2018)	N. Carolina

## Inequitable impacts



Residents of environmental justice neighborhoods have excess risks of exposure to chronic pollution, emergency spills, and high-impact natural disasters.

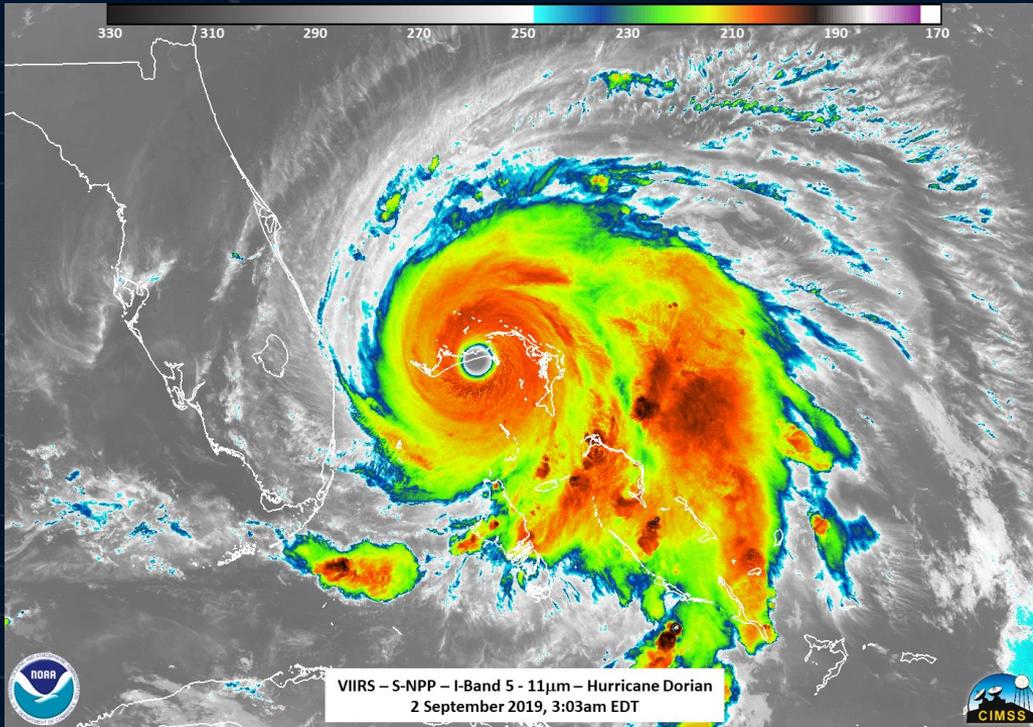
## Limitations of Health Data in Disaster Research

Timeliness	Completeness	Data Quality
<p>Emergency Room Data from GA:</p> <ul style="list-style-type: none"><li>• Triage to reporting 33 – 45 hours</li></ul>	<p>Public health communicable disease data in Texas</p> <ul style="list-style-type: none"><li>• 19% - 27% complete on first submission following surge capacity funding and staffing</li></ul>	<ul style="list-style-type: none"><li>• More “open” data</li><li>• Less frequently hyperlinked to other data sources for context</li><li>• Lack metadata needed to evaluate datasets</li></ul>

## Limitations of Health Data in Disaster Research

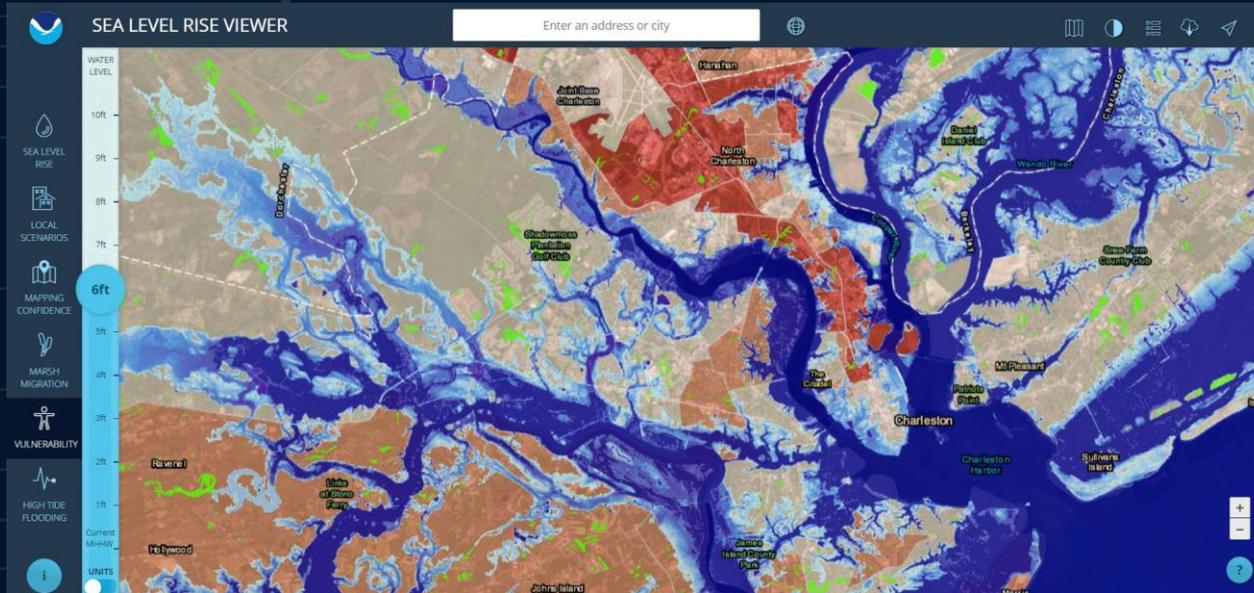
Data Stovepipes	Data Protections	Lack of Interdisciplinary Understanding of Data
<p>Time to linkage for national and state data to clinical registry data</p> <ul style="list-style-type: none"><li>• &gt; 2 years for most state datasets in Australia</li></ul>	<p>Precision Medicine Initiative (PMI)</p> <ul style="list-style-type: none"><li>• Links data on genes, the environment, and lifestyle to disease prevention and treatment while protecting privacy</li><li>• + targeted therapeutics</li><li>• - privacy concerns</li></ul>	<ul style="list-style-type: none"><li>• Algal blooms detection through remote sensing can prevent 400 gastrointestinal illnesses</li><li>• Understanding Chicago's Urban Heat Island</li></ul>

## Exposure Data



- Satellite-based tropical cyclone intensity
- These types of data are agnostic to other vulnerabilities...

## Exposure Data



## Sea Level Rise

- Also agnostic to other vulnerabilities
- More value when viewed in combination / spatial layers (industrial land use, land cover, or social vulnerabilities)

## Baseline Data

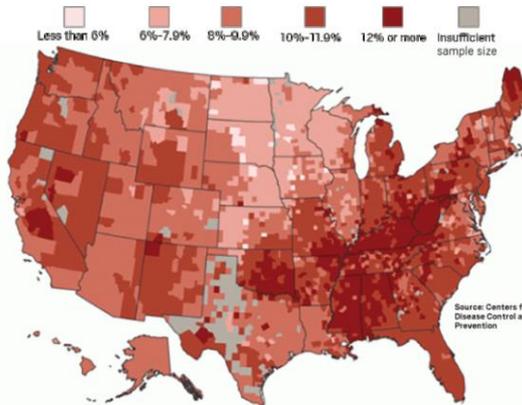
### National Status and Trends Program Deep Water Horizon oil spill response

- Water Chemistry
  - PAHs
  - Alkanes
  - VOCs
- Sediment Chemistry
- Sediment Bioeffects
  - Infauna
- Oyster Chemistry
- Oyster Histopathology

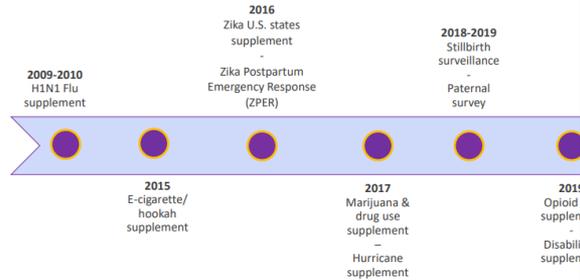


### Mental distress by county

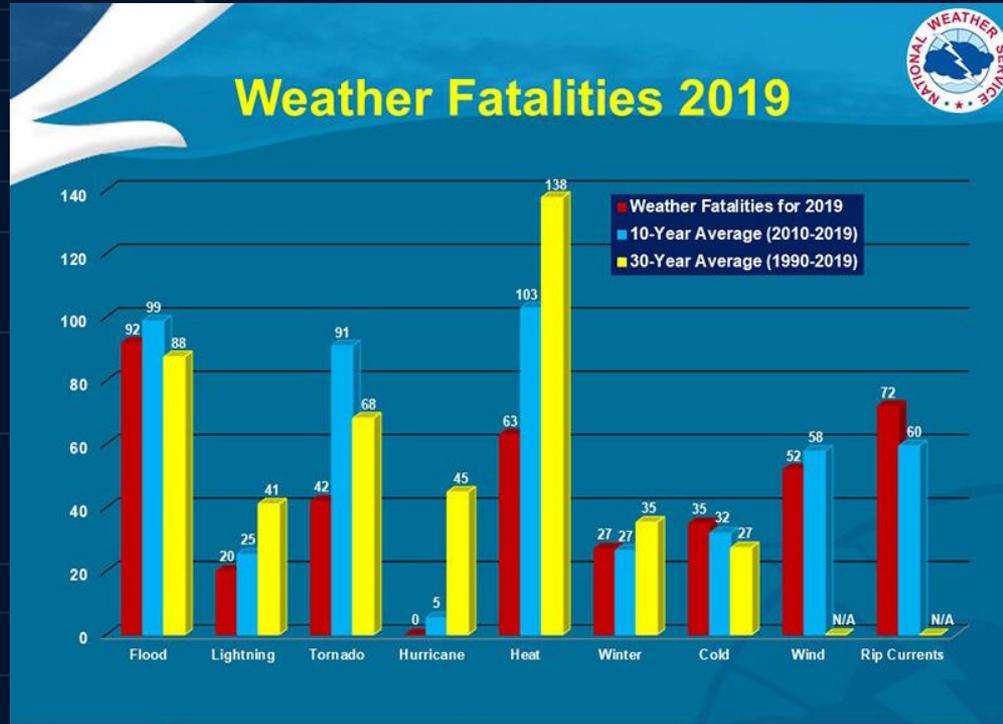
The map below presents estimates of the number of those who report frequent mental distress (14 to 30 mentally unhealthy days in the past 30 days). Figures are the most recent available, aggregated over 2003-2009.



### Addressing Emerging Issues with PRAMS



## Outcome Data



- To improve understanding of the causes and circumstances of deaths and injuries
- May not be reportable conditions

## Study Design



- Use designations like the NOAA Coastal Hazard Zone to select “treated” counties
- Compare resident perceptions of resilience in counties impacted by a disaster and compare to those not impacted

## The need to add rapid response...

- Research protocols in place (IRB)
- Baseline data to accurately attribute impacts to disasters
- Mutually beneficial partnerships that include stakeholders, residents, researchers, and practice partners
- Interdisciplinary understanding of data

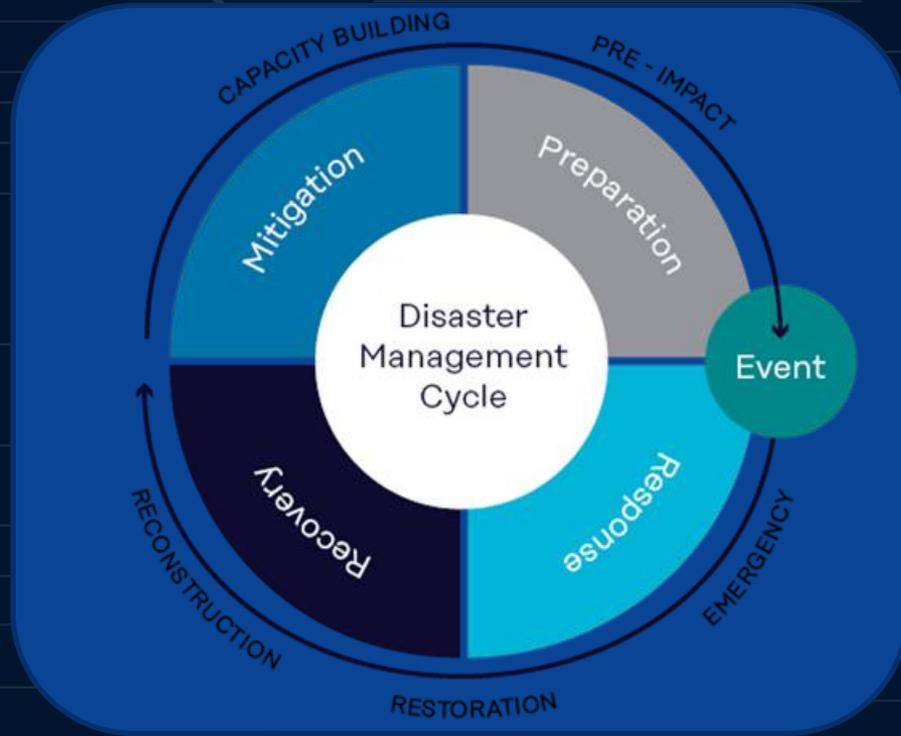
## Northeast Neighborhood, Wilmington, DE



- Site Inventories
- Participatory Design Workshops
- Development of Plans that Retrofit Vacant Lots
- Performance Evaluation: How much is the environmental and public health improved?



## Foster trust, translate research, build resilience to future disasters



- Foster trust through community engagement by valuing local knowledge with “data”
  - Resilience is one aspect – economic development, recreation, value of sense of place / oral history
- Across all phases of the disaster cycle (i.e., preparedness, response, and recovery)
- Building community capacity and resilience to future disasters

## Challenges remain



- Demonstrating return on investment to build out solutions (not just models)
- Finding funding for research translation and implementation
- Concerns about green gentrification

## Questions?

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