

NORTH AMERICA | CLIMATE RESILIENCE

Leveraging Private Sector Relationships to Scale Mission- Driven Work

Rebuild by Design (Rebuild) uses collaborative, design-driven problem-solving to help communities and cities build resilience. Working with APTIM and iParametrics, Rebuild published an accessible compendium of county-by-county climate impacts.



 NORTH AMERICA



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Investing in Infrastructure to Manage Worsening Climate Change

As our days become hotter, storms more severe and sea levels higher, communities will dramatically rethink their relationships to the built and natural environments around them. Much like the COVID-19 pandemic, disasters reveal time and again how vulnerable and inequitable our systems are when stressed. As the financial cost of disasters continues to rise, there are also countless unaccounted for losses that exacerbate existing vulnerabilities such as increased mental health struggles and the destruction of community ties.

As a response, climate change adaptation practices are advancing at all scales across the globe—from the individual to the intergovernmental level. Simultaneously, advancements in climate science are revealing a more formidable future and a corresponding need for urgent action. Planning and building infrastructure that can better prepare us for climate change can lessen the ramifications of high-

impact climate events before they strike. Such infrastructure can aid in addressing extreme heat or flooding, or moving communities out of harm's way.

In order to address the worsening impacts of climate change and head off future damages, governments must work alongside communities and cross-sector partners to identify infrastructure investments that will drive physical, social and ecological co-benefits, and create hundreds of thousands of middle-class jobs—before climate events strike, not after communities have suffered. This will necessitate billions of dollars to create infrastructure that adapts our communities to the impending climate risk. The current reality, however, is that a vast majority of the money that a state government receives to improve its infrastructure, often only comes after a disaster.

Rebuild by Design (Rebuild) has been working at the forefront of climate adaptation issues

for the past decade, bringing innovative public-private partnerships to regional design challenges, as well as national and international place-based engagements. The organisation matches local communities and governments with global expertise to reimagine, design and build large-scale infrastructure that can help communities adapt to climate change.

Whilst working with communities and local governments around the world to design and plan for new climate infrastructure, we also realised that until the issue of a lack of predictable pre-disaster funding is addressed, communities will not get the protection they need. To address this gap, Rebuild began working towards the development of Resilient Infrastructure Funding at the local and regional levels to raise the money needed to address climate adaptation challenges, and to put communities at the forefront of decision-making.

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This report is the culmination of the work Rebuild has done through partnerships with the public and private sector, non-profits, universities and the most impacted communities, over the past 10 years.

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Laying the Foundation: The New York State Environmental Bond Act

The effort to create resilient infrastructure funding solutions first began in 2019 when Rebuild piloted the idea of creating a ballot measure to fund billions of dollars of needed climate infrastructure in the state of New York; the state that had experienced 16 climate disasters during the former governor's first 9 years in office.

Rebuild created the research, strategy and coalition to convince the State government to propose a ballot measure to set aside a new funding source for climate-forward infrastructure. Part of that work was to educate and leverage entities that were not yet prioritising climate adaptation, but who were powerful in the halls of the State legislature and who had access to decision makers.

Rebuild created an advisory board that included local government associations, building and construction trade labor unions, builders and construction associations, and statewide and national environmental organisations, who were in a position to activate their members and speak directly to the governor and legislature. By creating a unified voice of vastly different interests, we provided the political support to introduce this bold initiative.

In January 2020, the Governor of New York introduced the bond measure, which became the foundation for the US\$4.2 Billion Environmental Bond Act for New York State—approved by voters in November 2022.

Scaling the Model Nationwide

Rebuild's work to develop the Bond Act for New York State became a replicable model that provided insights into how to build cross-sector partnerships for effective convincing of key officials to invest in climate adaptation. As soon as the measure was introduced, Rebuild mobilised to replicate a similar approach for other states. To manage this scale of work, we knew that it would be necessary to bring in additional help.

Rebuild sought the partnership of APTIM, a global engineering firm, who shared our vision for more resilient communities. After a few months of scoping the work and realising that there were many new directions it could take, we decided that we would need additional technical expertise. APTIM then suggested to bring in the services of iParametrics who had deep understanding of past climate events and access to the Federal Government's data in a format easier to organise than the public website. Having the services of these two firms, who were deeply committed to climate-forward planning and infrastructure, allowed us to expand our data analysis and produce additional maps for each of the 50 states.

APTIM and iParametrics generously resourced the project with an incredible team of engineers, researchers, finance experts, data managers, and volunteers who were deeply committed to identifying, analysing, and synthesising different data sets and ideas into an actionable agenda. Through the local knowledge of their nationwide staff, our team also gained a national perspective and deeper understanding of specific states.



Atlas of Disaster Report.
Image: Rebuild by Design

Atlas of Disaster

Through this 1.5-year partnership, we released Atlas of Disaster, a 670-page report that includes over 300 maps that provide information on: county-by-county federal spending, where the most socially vulnerable populations reside, the energy reliability by utility area, and where compounding physical and social risks indicate a potential high return on investment. The report notably found that 90% of U.S. Counties had a federally declared climate disaster between 2021 and 2022—signaling that climate change is already here.

This report is the culmination of the work Rebuild has done through partnerships with the public and private sector, non-profits, universities and the most impacted communities, over the past 10 years. In addition to a number of policy changes, the report calls for three transformations from current policy:

1. Co-creation

The report is designed to be a blueprint for equitable planning, and to enable better decision-making for government, the private sector, philanthropy and finance. It acts as a “how-to” guide for states to develop their own collaborative planning programs to design and prioritise climate infrastructure. Using a co-creation process with stakeholders, governments can deliver new, upgraded, innovative and climate-ready infrastructure that: protects communities in the face of climate vulnerabilities; works to make existing investments more resilient; and which opens the way for additional federal funding opportunities.

2. Infrastructure funding

The report calls for each state to develop a Resilient Infrastructure Fund, capitalised by a modest insurance surcharge, or voter approved bond measure that supports climate investments and provides the local match for federal infrastructure dollars. Investing in large-scale infrastructure to address climate events will lower overall risk and the need for higher insurance payout. Just a 2% surcharge on certain types of insurance could leverage from US\$600 million to over US\$27 billion in each state, or US\$287 billion across the United States. Also included in the report is data on voter approved bond measures that have been successful in recent years, demonstrating that voters are voting to support climate infrastructure funding.

3. Better preparedness for the future

Our state-by-state information provides local entities with the data they need to advocate for new policies, programmes and funding sources on the state level, as well reforming benefit-cost analyses to choose better projects to implement. It also calls for a major shift in federal disaster policy to move the bulk of post-disaster funding to mitigation, and refinancing traditional disaster policies that are now out of date such as measuring a disaster by its economic loss, not its human loss.

FEDERAL ASSISTANCE 2011-2021

POST-DISASTER PUBLIC ASSISTANCE AND HAZARD MITIGATION FUNDS
OBLIGATED BY COUNTY FOR CLIMATE DISASTERS



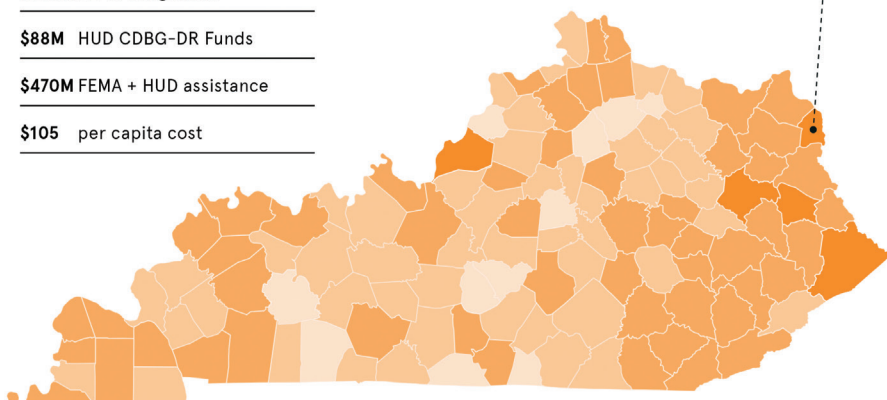
Boyd County has received the most post-disaster FEMA funds in the state: \$12.4 million.

\$382M FEMA obligations

\$88M HUD CDBG-DR Funds

\$470M FEMA + HUD assistance

\$105 per capita cost



FEMA Public Assistance and Hazard Mitigation
Federal Share Obligated (2011-2021)

- \$0 to \$100K
- \$100K to \$1M
- \$1M to \$10M
- \$10M to \$50M
- \$50M to \$100M
- \$100M to \$1B
- \$1B to \$9B

Source: FEMA 2021
Maps courtesy of iParametrics

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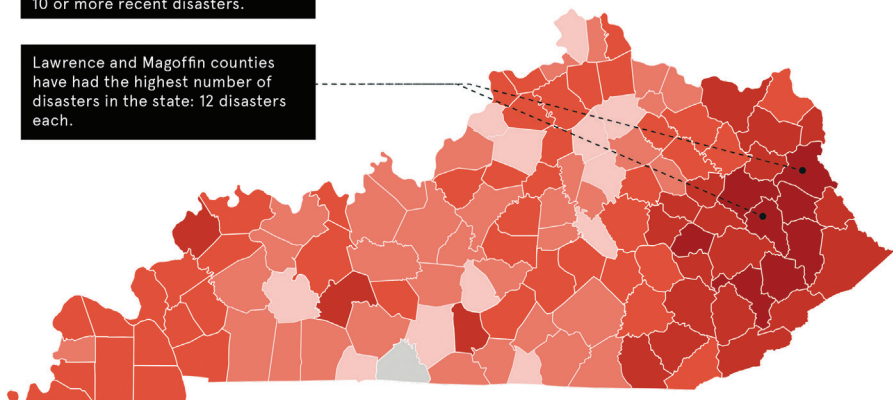
DISASTER OCCURRENCES 2011-2021

FEDERALLY DECLARED MAJOR DISASTERS BY COUNTY



Eight counties in Kentucky have had 10 or more recent disasters.

Lawrence and Magoffin counties have had the highest number of disasters in the state: 12 disasters each.



Number of Disaster Events
Major Disaster Declarations (2011-2021)

- 0 occurrences
- 1 occurrence
- 2-3 occurrences
- 4-6 occurrences
- 7-9 occurrences
- 10+ occurrences

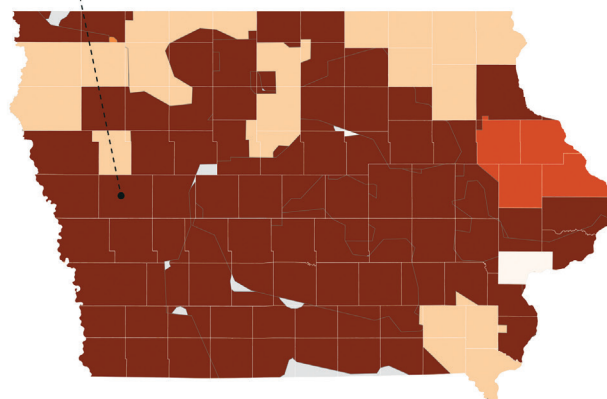
Source: FEMA 2021
Maps courtesy of iParametrics

Report analysis for the state of Kentucky. Data and map from iParametrics.
Image: Rebuild by Design

ENERGY RELIABILITY 2011-2021

COUNTIES AT GREATEST RISK OF POWER OUTAGES

Crawford County has high social vulnerability and low energy reliability.



Aggregated Annual Electric Outage Duration
Including major events - SAIDI_W_MED

missing electric outage data
 0 - 60 minutes
 60 - 120 minutes
 120 - 240 minutes
 240 - 456 minutes
 456 - 7,700 minutes

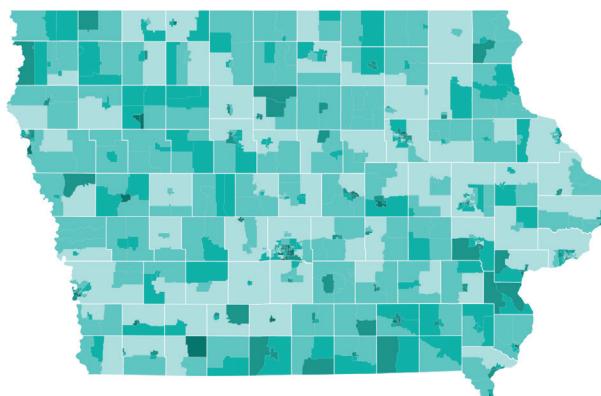
Source: U.S. Energy Information
Administration
Maps courtesy of APTIM

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SOCIAL VULNERABILITY INDEX 2011-2021

AREAS OF GREATEST SOCIAL VULNERABILITY

Ringgold, Lee, Decatur, Johnson, and Wayne counties have high poverty rates, high diversity of hazard risks, and low investments from previous disasters.



Social Vulnerability Index

CDC (2018)
 No Value
 0.0 - 0.2
 0.2 - 0.4
 0.4 - 0.6
 0.6 - 0.8
 0.8 - 1.0

Source: CDC/ATSDR 2018 Social
Vulnerability Index
Maps courtesy of iParameters

CASCADING IMPACTS OF CLIMATE EVENTS

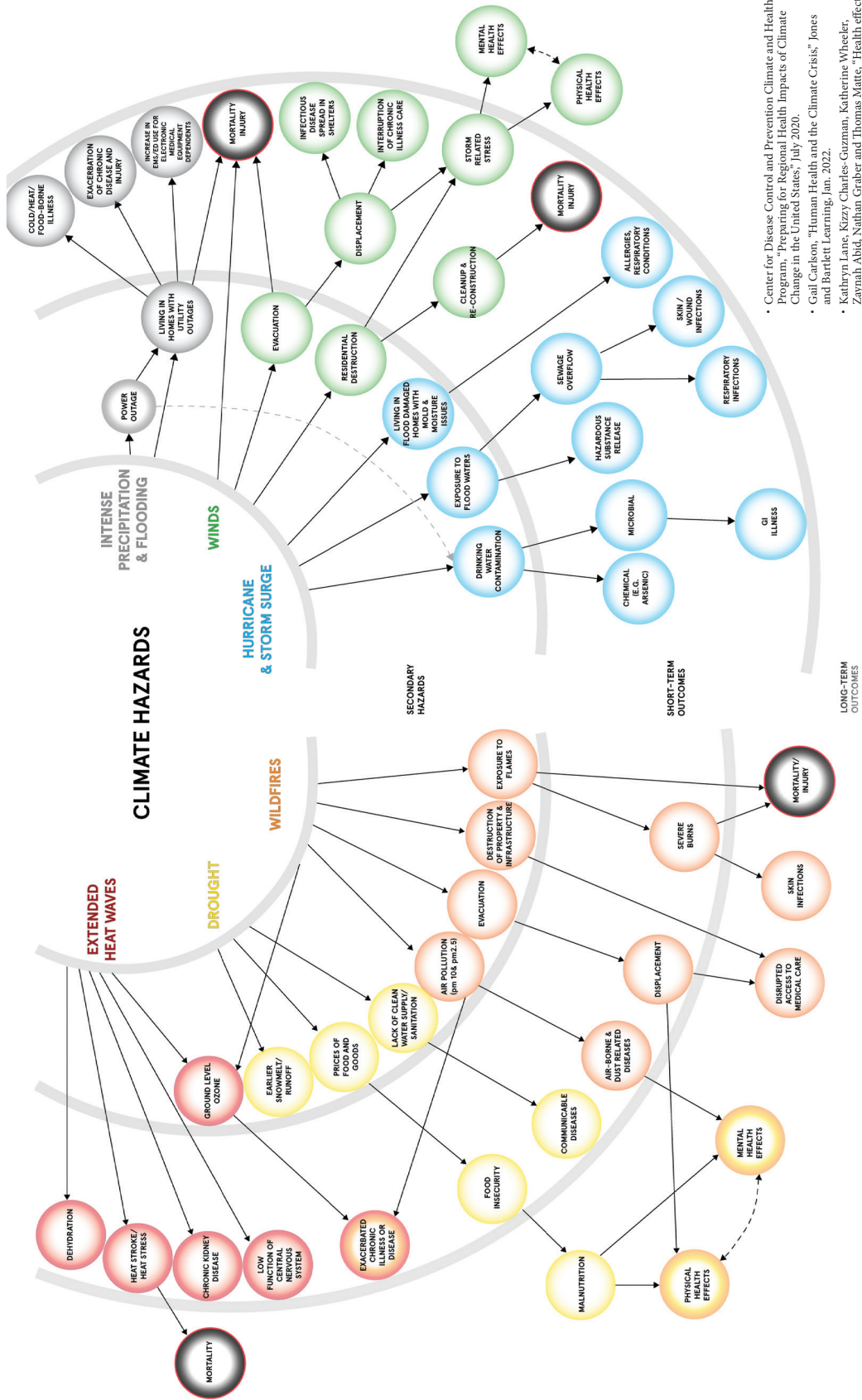


Illustration: Geethanjali MR

Report spread that describes the short, medium and long term impact of climate disasters.
Image: Rebuild by Design

Our Key Takeaways

Our report has received local, national and international attention, and represents a win-win outcome for ourselves and our partners. The effort leveraged initial investments from the philanthropic and private sector in an order of magnitude that cannot be measured. As a small non-profit, we were able to access a team of incredible thinkers who deeply understood how extreme climate events affect communities.

The resulting report quickly made us national experts in federal government policy reform. In return, the private sector got to work on something that they were passionate about—both within the scope of their client base, and to a greater extent—their footprint in this field.

Lessons learned from this model:

- Leverage each other's knowledge and network. Each partner brought a unique depth of understanding to this work. Together, this enabled us to develop a greater understanding of all the challenges;
- Choose partners whose passion will extend beyond the current task. Though you are committing to a defined activity, there will be needs that extend beyond that

initial partnership such as follow-up presentations and inquiries. Ensuring that there is not a hard stop to the partnership will enable both sides to take advantage of opportunities that arise. At the same time, you should also be mindful that a pro bono project has a limit that should be respected;

- Ensure partners get credit for their inclusion. Look for ways to highlight the work of each partner to demonstrate to other private sector companies the benefits of working with a mission-driven non-profit; and
- If you are a non-profit in a position to ask for pro bono support, make the ask. Rebuild by Design's leveraging of partnerships over the years has enabled us to do work that we would not otherwise be able to do. Work with your partner to understand how the collaboration might help them too. We do not always get a yes, but often times we do. 😊



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