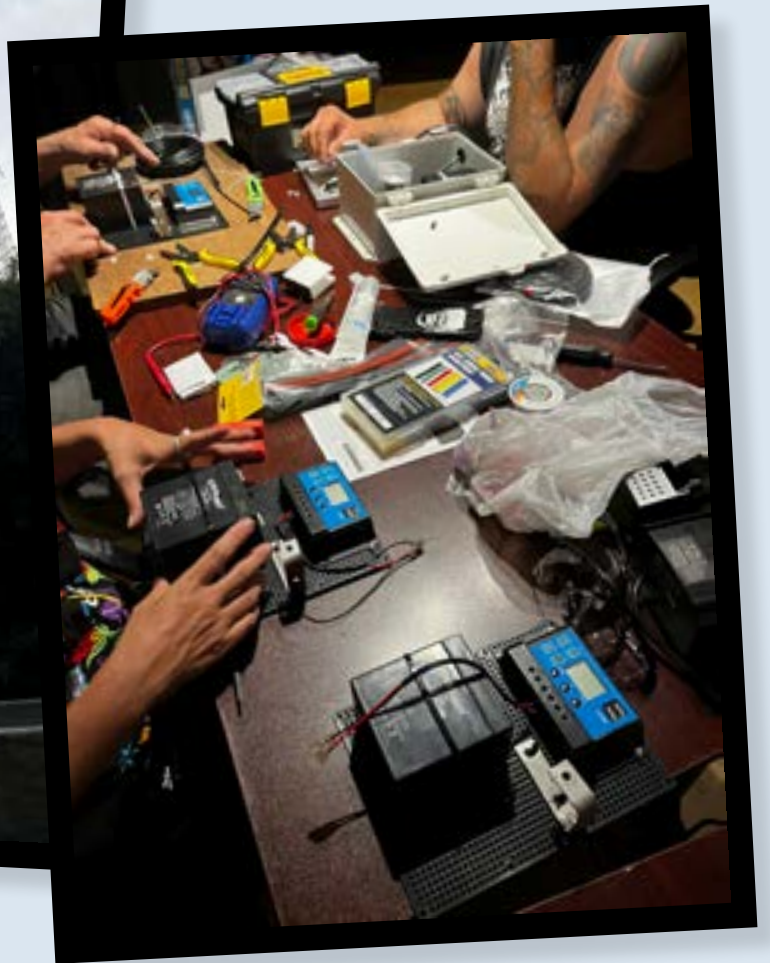


A TALE OF THREE STORMS: COMMUNITY NETWORKS IN AN ERA OF CLIMATE INSTABILITY

Jen Liu and Monique Verdin



Introduction

Late spring in New Orleans is a time of transition in the city. The smell of nighttime jasmine wanes as elderflowers begin to bloom. The balmy summer heat settles in as tourists empty out. It is also the beginning of hurricane season. Here in the Gulf South at the end of the Mississippi river, this season brings a routine sense of underlying uncertainty when residents spend the next six months tracking storm paths, restocking supplies and reviewing evacuation routes. Yet, often left out of emergency preparedness guidance from the state and federal officials is what happens when digital communications go out.

In the aftermath of a disaster, communication plays a key role in coordinating response and recovery on the ground. Yet the infrastructures that enable contemporary communication are often among the first systems to falter during major storms. When these networks fail, communities become disconnected and cut off from the support that shapes who receives care and visibility in the aftermath. As climate change intensifies storms and extends the duration of recovery, these communication failures have become recurring and prolonged challenges rather than isolated incidents.

It was from this context that we began our work as SwampNet in 2023. We started as a collaborative project to build alternative communication systems to support mutual aid resource distribution in New Orleans in times of emergency. Yet as we continued learning more about the wireless networks that we work with, we realised that our project was part of a much longer history of community-based networking initiatives that emerged through earlier moments of compounding disasters and infrastructural failures.

This story unfolds across three hurricanes: Hurricane Katrina in 2005, Hurricane Sandy in 2012 and Hurricane Ida in 2021. Tracing this history reveals that these community-based networks are not just emergency backups when dominant communication systems fail. Instead, they are moments in seeing how infrastructures themselves might be organised differently. By examining the networks that emerged after these three storms, we see how communities imagine and enact other technological futures in an era of climate instability.

Hurricane Katrina

Hurricane Katrina made landfall in southeast Louisiana on 29 August 2005. This storm remains a defining moment in how emergency response depends on working communication systems. The storm and the subsequent levee failures devastated New Orleans and large portions of the Gulf Coast, causing widespread infrastructural collapse. Strong winds had knocked down telephone lines and utility poles, while flooding overwhelmed central offices that held communication and routing equipment. Networks collapsed in the aftermath of the storm, with no viable alternatives in place. The severity of the breakdown of communication infrastructure became apparent in the days that followed. Emergency response and coordination across federal, state and local governments were hampered by an inability to share information, assess conditions on the ground, or communication across jurisdictions. These delays had a disproportionate impact on elderly, Black, and low-income residents, many who were unable to evacuate ahead of the storm.

While official aid faltered as agencies struggled with coordinating information across broken platforms, other communication systems were being constructed by volunteers, relief workers and local communities across the region. What began as a local effort quickly grew into a wider coalition of volunteers as network operators and technologists across the country began to donate equipment, expertise and labour. Within a short time, this informal network of volunteers had evolved into the Community Wireless Response Initiative, a group dedicated to restoring communications in some of the hardest-hit areas of the Gulf Coast.

This work included several locations in Hancock County, Mississippi, where volunteers from Radio Response, one of the groups working with the Community Wireless Response Initiative, were based for close to three months. In the first few weeks, they managed to set up a network using donated bandwidth from telecoms that connected community centres, camps and medical facilities across Bay St. Louis, Waveland and Gulfport. At the same time, volunteers involved in wireless networking and low-power FM radio were working in New Orleans. Collaborations included working with the newly formed Common Ground Collective, comprising residents and out-of-town relief workers in the Algiers neighbourhood, to transform their space into a communication hub. A roof antenna broadcast local news and information about access to resources, while visitors could use laptops to communicate with family and friends.

By the beginning of 2006, many of the volunteers who had travelled to the Gulf Coast to aid in relief projects had returned home. Yet the temporary networks they helped construct resonated in later work. People documented their experiences in reports, articles and testimonies, reflecting on both the successes and limitations of their work. Across these accounts, a common thread emerged where disaster communications could not rely solely on provisional responses after an emergency. They argued that effective communication systems required preparation in the form of equipment caches and established nodes to be able to maintain infrastructure before disasters occurred.

Experiences from Hurricane Katrina, alongside growing concerns about internet censorship and state-imposed network shutdowns in countries such as Egypt and Tunisia during the Arab Spring, generated renewed interest in decentralised communication infrastructures. One response was the development of Commotion Wireless, an open-source mesh networking platform from the Open Technology Institute (OTI) at the New America Foundation. Developed in the early 2010s, Commotion was built around a model of “device-as-infrastructure”, so that Wi-Fi-enabled devices could connect directly to one another and form decentralised peer-to-peer networks. Rather than rely on centralised telecommunications providers, connectivity emerged through relationships among devices distributed across a community.

The development of Commotion Wireless reflected lessons learned from Katrina that networks need to be in place before breakdowns occurred as communications remained contingent upon systems that communities themselves rarely controlled. Although technologists and activists had begun imagining alternatives to centralised communication infrastructures, these ideas remained largely speculative. It would be necessary to test and implement these networks under the conditions they were designed for.

Hurricane Sandy

Seven years after Katrina, Hurricane Sandy struck the northeastern United States in October 2012. Similarly, Sandy also exposed vulnerabilities embedded within contemporary communication infrastructures. Across New York and New Jersey, flooding and prolonged power outages disrupted cellular service, internet access and electrical grids, leaving millions navigating recovery with limited means of communication. As with Katrina, the failure of communication systems revealed how deeply everyday life had become dependent upon infrastructures that often remained invisible until they ceased functioning.

One of the neighbourhoods hardest hit by the storm was Red Hook in Brooklyn. Located on a low-lying peninsula extending into New York Harbor, Red Hook experienced extensive flooding as storm surge pushed onto streets, businesses and residential buildings. The Red Hook Houses, the largest public housing development in Brooklyn and home to thousands of residents, lost power, heating and running water for weeks.

Yet amid widespread communications failures, one network remained operational. A connection was still up at Red Hook Initiative (RHI), a community centre that had set up a wireless mesh network the year before. While modest in scale, the network became an access point where residents could charge their devices and connect to the internet to share information and coordinate relief efforts over social media.

The presence of this network was not accidental. Red Hook Initiative had become interested in the possibilities of community-owned communications infrastructure through its involvement with OTI. One of the earliest organisations to experiment with the OTI's Commotion project was Allied Media Projects in Detroit as a bottom-up approach to addressing the uneven landscape of internet infrastructure in the city along lines of race and class. Organisers quickly recognised that the challenges of building community networks required not just equipment and software, but also people who could maintain and teach others how the system worked. To address this, they developed the Digital Stewards programme to train local residents in installing, deploying and maintaining wireless networks across the city. Building the network became not just a process of putting up antennas and routers, but sustaining the ability for the network to be cared for over time. Organisers at RHI adapted this programme to their neighbourhood, training local youth to install antennas and maintain the equipment. By the time Sandy made landfall, Red Hook had both a mesh network and a community of stewards.

What Sandy revealed was that the success of communication infrastructures cannot be measured solely by whether networks remained operational during and after a disaster. These networks require a community of people to care for them. In the years following Sandy, Red Hook WiFi was frequently cited as a model for community-based disaster preparedness. Municipal agencies and technology advocates pointed to the project as evidence that decentralised communications infrastructure could strengthen neighbourhood recovery during future emergencies. Funding flowed into efforts to expand mesh networking across other low-lying and historically underserved neighbourhoods in New York City. Yet sustaining these projects proved more difficult than launching them. As public attention shifted away from Sandy and grant funding diminished, many community networking initiatives struggled to support the costs of running a network. The vulnerabilities they sought to address, however, still remained unresolved.

Hurricane Ida

In August 2021, 16 years to the day after Katrina, Hurricane Ida made landfall in southeast Louisiana as one of the strongest storms ever recorded to strike the state. Despite large federal and state investments in communications infrastructure post-Katrina, the storm once again exposed the fragility of these networks. Over one million people lost power, and with it internet access, while cellular networks became unreliable as towers went offline. This storm also coincided with the COVID-19 pandemic, when many aspects of daily life had become dependent upon digital communications.

In the months that followed, a growing network of mutual aid groups began convening to share lessons learned from Ida and how to prepare for the next hurricane season. Across these discussions, one question that surfaced repeatedly was how to remain connected when the infrastructures that made coordination possible fail. These dependencies became particularly visible in the days following the storm. Residents recalled receiving text messages hours late and out of order, while mapping and coordination platforms became inaccessible without cellular service or Wi-Fi. As with Katrina, communication failures constrained the ability of communities to respond to rapidly changing conditions on the ground.

In response, we began experimenting with alternative communication systems that could connect mutual aid hubs across the city. Since Katrina, wireless networking technologies had expanded to a range of hardware and software that were more affordable and accessible. Our initial efforts focused on working with open source software running on LoRa radios, which could transmit low-bandwidth messages across long distances while requiring relatively little power. With members of the mutual aid community, we were able to assemble and maintain a functioning system using online forums and instructional videos for troubleshooting.

As part of this work as SwampNet, we were interested in how these networks could be woven into places and communities that we worked alongside. We conducted range testing exercises across different neighbourhoods to understand how signals travelled throughout the city, using this as an opportunity for mutual aid members to experiment with sending messages across the network. We also organised workshops and other events that focused on assembling devices and learning basic troubleshooting skills. Through these events, a community began to form around how these networks could be stewarded across the city.

While our LoRa mesh offered one approach, we remained interested in other ways of organising networks. This curiosity led us to a Portable Network Kit (PNK) workshop facilitated by Community Tech NY in late 2023. The PNK had been developed by former members of the OTI initially as a repair and test kit for Commotion networks. It became a way of enabling people to rapidly deploy wireless communications resources hosted on a local standalone server. By the time we encountered the kit, it reflected years of experimentation within community networking movements.

Our work as SwampNet thus represents less a new beginning than a return to an unfolding story. Bringing the kit back to New Orleans carried a particular significance where many of the networking practices embedded within it could be traced to lessons first articulated in the aftermath of Katrina. Yet those ideas had not remained solely along the Gulf Coast. They travelled and evolved through different projects, geographies and communities, where these practices became refined and adapted before returning nearly two decades later.

At the same time, the conditions that inspired these efforts have not disappeared and if anything, have intensified. Although our region has not experienced a major hurricane since Ida, we see this as reprieve rather than reassurance from the next storm. In 2024, Hurricane Helene struck southern Appalachia, while in 2025, Hurricane Melissa impacted Jamaica, reinforcing the sense that these disruptions to infrastructures are becoming inevitable. Additionally, recent increased presence of federal policing, including the National Guard and the US Immigration and Customs Enforcement (ICE), have underscored the importance of having longer term networks that can keep community members safe while sharing vital information. Building and sustaining community networks have become less about preparing for the next storm, and more about creating communications infrastructures rooted in supporting longer-term visions of shared liberation and just futures.

Conclusion

What does the repeated reappearance of community networking following storms tell us about communication infrastructure in a time marked by ecological and climate crises?

As we gear up for another hurricane season in southeast Louisiana, we are continuing our work. We have installed nodes at community-run spaces and support a growing network of stewards. The histories we traced here suggest that communications deserves a more central place within conversations not only about emergency preparedness, but about how we want to live along a changing coastline.

These stories also complicate celebratory narratives of resilience. Community networks emerge because existing communication infrastructures have repeatedly failed to meet the needs of people. Following Katrina, volunteer relief workers argued that community-based communications infrastructures had to exist before storm landfall. After Sandy, practitioners demonstrated that networks required communities of dedicated stewards to maintain networks over time. After Ida, we rediscovered these lessons as mutual aid organisers confronted many of the issues that had already been repeatedly raised.

Across these three storms, the development of community networks appears as both empowering narratives and also a reminder of the recurring responses to unresolved structural issues. These projects reveal the limits of our current communication infrastructure landscape that have shown they are prone and break down again and again, storm after storm. At the same time, community networks demonstrate how alternative arrangements are possible. As climate disasters become more frequent and severe, the challenge is not just how to build networks that can weather the next storm. Instead, it is about cultivating community networks that are ongoing experiments in how infrastructures that might be built, maintained and governed by the communities that depend on them.



Caption IMG_7067: Installing an antenna for a network range test at a community farm in New Orleans.



Caption IMG_8531: SwampNet members building solar-powered nodes for community partners.

BIOS

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SwampNet is a collaborative experiment with autonomous and alternative digital infrastructures that operates as archives and channels for emergency community communications. They began their work in 2023 to design, develop and steward community and place-based technologies in Bvlbancha/New Orleans and across the Gulf South area of the United States.

All authors were consulted regarding the use of AI, following APC policy on AI-generated content guidelines, which prioritise transparency. The authors of this work reported that “AI was not used directly for this piece – indirect use came from the AI overviews from search engines (Google, DuckDuckGo) during research for this piece”.

About the Call for Narratives

The [Call for Narratives on community-centred connectivity initiatives and environmental justice](#) brings together proposals from different regions and countries around the world, featuring a variety of community environmental concerns to address the ways in which CCCIs are facing climate change, caring for the environmental issues affecting their territories and developing strategies to act in their different contexts. Find all the selected proposals [here](#).

This call was launched in the framework of the COP30. In that context, the LocNet initiative developed a series of activities to highlight the intersection of community-centred connectivity and socio-environmental justice - recognizing that communities are often at the front line of both the territorial and environmental impacts of technology, as well as the consequences of climate change. Learn more about this initiative [here](#).

The LocNet initiative is a collective effort led by APC and Rhizomatica in partnership with grassroots communities and support organisations in Africa, Asia and Latin America and the Caribbean. This call is part of its “Meaningful community-centred connectivity” project implemented with financial support from the Swedish International Development Cooperation Agency (Sida) and UK International Development from the UK Government through its Digital Access Programme. The views expressed here do not necessarily reflect the supporters’ view, but that does not make them any less valuable.



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