

BeaconRelief™

Improving Situational Awareness During Disaster Response



BeaconRelief improves situational awareness for disaster response by providing maps and real-time tracking of people and supplies in a self-contained, scalable, rugged, and cost-effective platform. The user-friendly interface allows relief workers to quickly and easily adapt BeaconRelief to any environment. With preconfigured sensors, BeaconRelief is easy to deploy in all-hazards environments.

The Opportunity

Recent civil unrest, disease outbreaks, and other natural events have led to large-scale disasters that require unprecedented delivery and provision of humanitarian support and logistics. Disaster relief experts have identified an urgent need for greater technological capabilities, including more accurate, real-time situational awareness; supply chain management; and active monitoring of individuals with health concerns.

Current disaster support and logistics systems are human-resource intensive, expensive, and technologically complex, which prevents their wide-scale use. Previously, low-cost, low-burden, and scalable approaches did not exist for humanitarian logistics. Therefore, responders must rely on personal ingenuity as well as flawed and incomplete information to make decisions. This approach undermines disaster preparedness, limits crisis policy evaluations, and impedes operational efficiency during initial response and ongoing disaster surveillance.

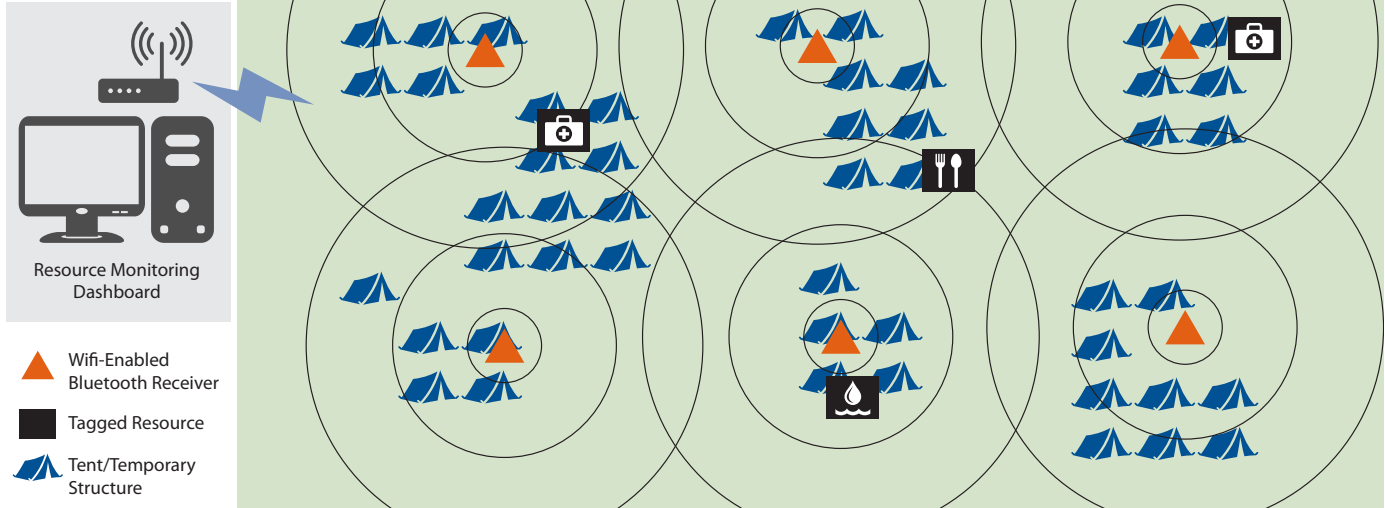
Technical Solution

BeaconRelief is a self-contained, highly scalable, affordable platform that can be deployed by disaster relief personnel with minimal effort to all-hazards environments. Our system addresses a clear market need: low-cost, low-burden, objective measurement of humanitarian

In a December 2015 World Economic Forum article, Raj Kumar, founding president and editor-in-chief of Devex, discussed how technology can aid humanitarian organizations in their responses to refugee crises. He also highlighted the importance of inter-organization collaboration and situational awareness. Mr. Kumar envisions a “just-in-time approach to logistics” and a way for “data to be stitched together automatically so that humanitarian agencies and governments could instantly see what’s happening and who is doing what.” BeaconRelief is a step toward this reality.

logistics operations that provides actionable data to stakeholders and that has the potential to be deployable at large scale. Our approach capitalizes on a burgeoning consumer-wearable device market that has resulted in a variety of affordable, Bluetooth-enabled devices. It also leverages low-cost wireless connectivity solutions (e.g., mobile 4G hotspots) in conjunction with open-source software and cost-effective computer platforms—such as Raspberry Pi—to create temporary local area networks through which data can be collected and uploaded to the cloud. A centralized database stores the positions and movements of the various camp resources in real time.

High-level schematic of the BeaconRelief approach



The basic components of BeaconRelief are

- A gridded network of receivers (Raspberry Pi units)
- Beacons (iBeacon or the Eddystone standard)
- High-throughput NoSQL database
- Communication application program interface (API)
- Streaming trilateration algorithms
- Web-based dashboard for monitoring and analytics.

The Need for BeaconRelief

Relief workers face varying challenges in different camps. The BeaconRelief interface offers a user-friendly interface that allows responders to quickly and easily adapt the solution to specific local contexts. Partnering with relief workers in the field will allow us to enhance the usability and effectiveness of BeaconRelief based on real data originating from existing deployments. These data will also serve as a guide for potential customers because customers can match their needs with existing use cases.

Presenters at the 2015 Humanitarian Technology conference highlighted the need for the “ability to map camp dynamics” and argued that “maps can serve as the graphical embodiment of SA [situational awareness].” They also stressed the fact that current technology does not provide this mapping and situational awareness capability. BeaconRelief provides such a solution.

More Information

James Rineer
Senior Manager,
Geospatial Science
& Technology
+1.919.990.8435
jrin@rti.org

Rainer Hilscher
Research Data Scientist,
Center for Data Science
+1.919.541.6440
rhilscher@rti.org

RTI International
3040 E. Cornwallis Road, PO Box 12194
Research Triangle Park, NC 27709-2194 USA

RTI 9904 0316