

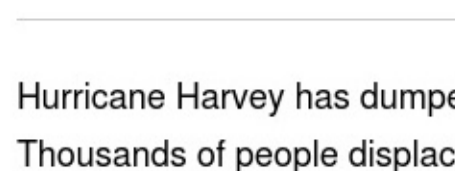
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IDG CONTRIBUTOR NETWORK Want to Join? IOT MATTERS By Deepak Puri Advisor, Contributor, Network World SEP 5, 2017 7:15 AM PT

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Tech enabled disaster response to Hurricane Harvey

Here's how Esri Disaster Response Program is helping first responders and the Texas Division of Emergency Management. Information on local conditions such as water levels, flood gauges, road closures and traffic conditions are essential to coordinate relief efforts.



Hurricane Harvey has dumped over 50 inches of water across Texas. Thousands of people displaced. Roads flooded. Communication channels disrupted.

How are relief efforts coordinated? How are emergency personnel given the information they need? How can data be collected with broken communication channels and little cellular coverage? How can information from multiple sources be aggregated and presented in an actionable form?

Here's how Esri [Disaster Response Program](#) is helping first responders and the Texas Division of Emergency Management. Information on local conditions such as water levels, flood gauges, road closures and traffic conditions are essential to coordinate relief efforts.

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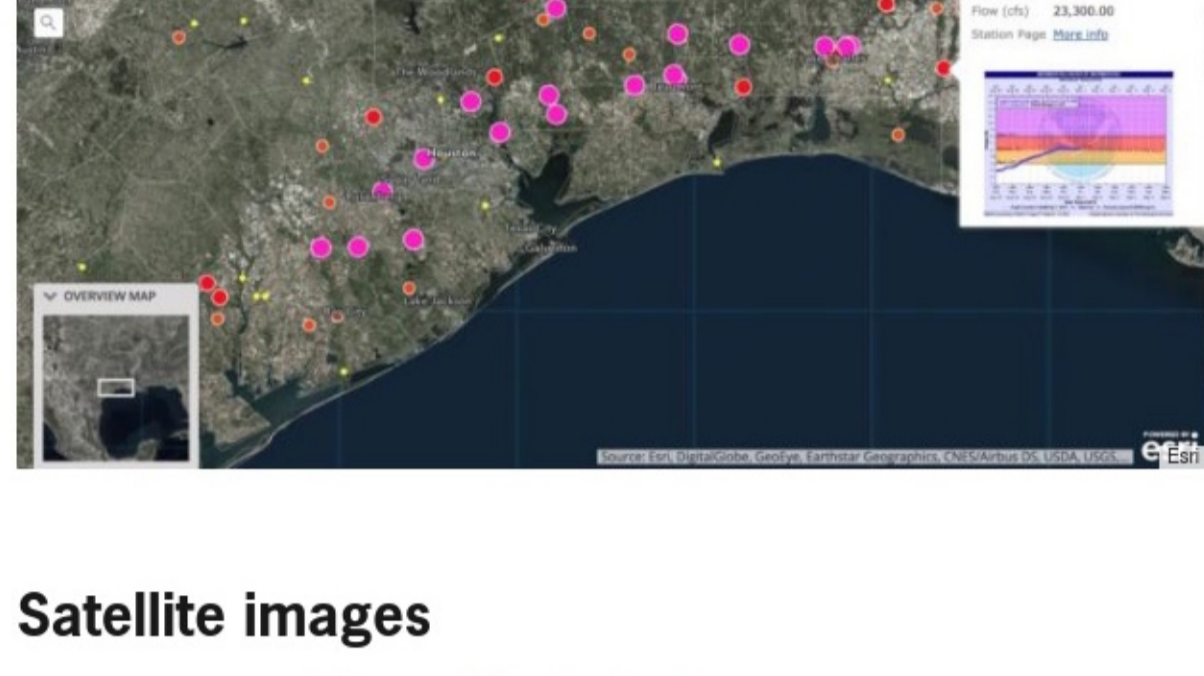
VIDEO What is IIoT?

Consolidating multiple data streams for actionable insights

Relief workers do better with real-time visual information. In response to Hurricane Harvey, Esri developed the [Harvey: Current Conditions](#) storymap with its Geographic Information Systems (GIS). It combines multiple data sources to provide relief workers with the information they need to streamline their efforts and better serve the public.

Flood gauge sensors

To continuously track water levels at different levies. Such sensors are similar to IFC-designed [ultrasonic sensor](#) that measures the water level every 15 minutes and transmits the readings to a database at the Flood Center. They are [solar powered](#) with a built-in cellphone modem and cost about \$3,500. The public can access these readings through the [Iowa Flood Information System](#) for real-time stream level updates.



Satellite images

So that conditions [before and after the flood](#) can be easily compared. Emergency response personnel can slide the cursor down the middle of the image to one side to compare the before-and-after view of the same location. This helps identify homes, infrastructure and businesses impacted the most.



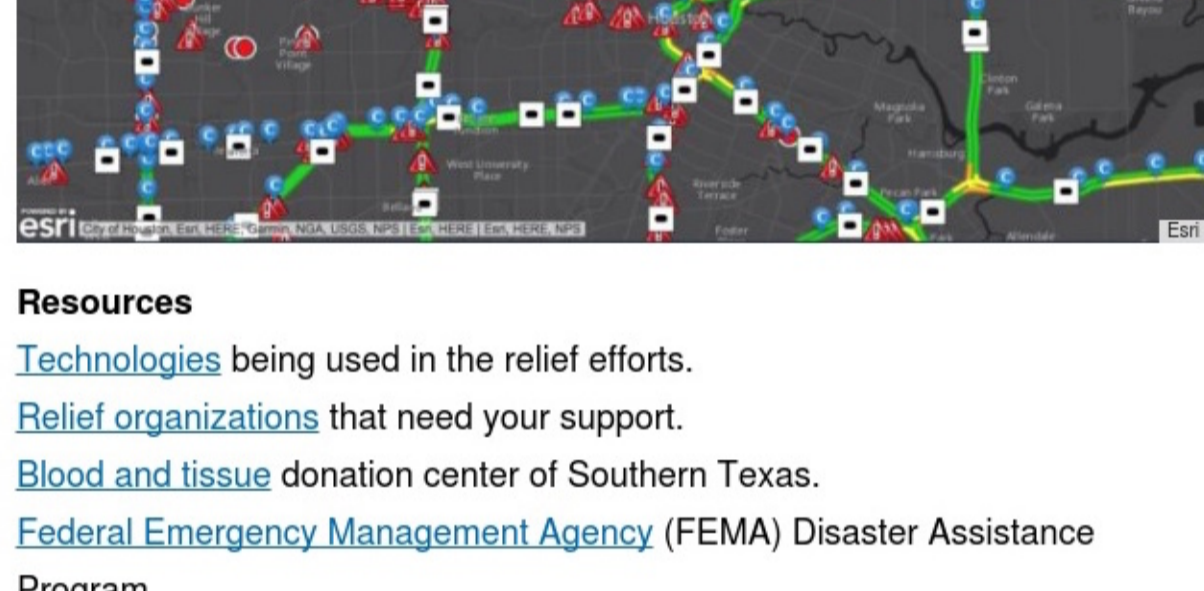
Drones

Footage from drones creates 2D and 3D maps of areas that are hard to access or fully cover because of their size. Raw still imagery from drones is converted into a usable form with Drone2Map for ArcGIS.

A team at [Iowa Flood Center](#) (IFC), led by UI Professor George Constantinescu, has pioneered 3-D non-hydrostatic flood models to simulate flood wave propagation and the interaction between the flood wave and large obstacles such as dams or floodplain walls. These 3-D models are used to assess and improve the predictive capabilities of the 2-D models that government agencies and consulting companies use for predicting how floods will spread and the associated risks and hazards.

Traffic conditions

Drivers share local traffic conditions with their [Waze](#) mobile app. The information collected enables authorities to route traffic and plan road closures. Waze, reports that their feeds have been added for all of Louisiana. This means all the crowdsourced info is synced up with Esri ArcGIS to provide real time information for the government agencies, responders and Wazers. There have been 1.8 million views and over 10,000 road closures reported. This situational awareness can be used in search rescue missions and other types of transportation problems. This assists other Waze users ("Wazers") as their maps are updated in real-time with changing conditions. Government workers connect Waze data streams into their ArcGIS apps for two-way communication between Wazers and emergency response



Resources
[Technologies](#) being used in the relief efforts.
[Relief organizations](#) that need your support.
[Blood and tissue](#) donation center of Southern Texas.
[Federal Emergency Management Agency](#) (FEMA) Disaster Assistance Program.

Recovering from Hurricane Harvey will take years. Thanks to ESRI, local relief organization have real-time intelligence so that they can help more people.

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Deepak Puri is the founder of [SkilledAnalysts](#), an IoT consulting firm based in San Francisco. Formerly he held executive positions at Oracle, Netscape and VMware. Deepak co-founded [Democracy Labs](#), a non-profit hub that applies innovative technologies and expertise with progressive causes and campaigns. He also serves on the board of the [Tides Foundation](#).

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