

"INSTANT MESSAGING TOUGH ENOUGH FOR BUSINESS: NO SERVER REQUIRED"

FREE WHITE PAPER >



Smart Sensors Find Floods



By [Brendan Borrell](#) | [Also by this reporter](#)

05:00 AM Oct. 24, 2006

One rainy day in 2004, a 10-foot wall of water moving at 40 miles per hour plowed through Boscastle in southern Britain, demolishing six buildings and sending 50 cars out to sea. Residents had little warning of the flood, as the town's rain gauges registered less than a half an inch of rainfall.

Today, what remains of [Boscastle](#) still lacks an adequate flood-warning system. And with scientists predicting more severe floods as a consequence of global warming, there's been a push for flashy supercomputers, like the \$50 million [NEC SX-8](#) at the [Met Office](#), to process meteorological data fed in from around Britain.

But some engineers at Lancaster University have opted for a more local approach. They've developed an intelligent [flood monitoring grid](#) made up of 10 to 20 tiny CPUs called [GumStix](#) that communicate wirelessly with each other to monitor rising water levels and minimize their own power consumption.

"We're trying to move functionality out of the lab and into the sensors," says computer scientist [Danny Hughes](#).

Water-depth sensors are typically stuck in places where solar power is the only option, and in cloudy north England, that isn't much of one. To conserve power, sensors collect data at long intervals and send it to the Met Office using cell phone networks. Back at Met, that supercomputer runs a flood model and eventually relays warnings to local residents. The downfall of Boscastle was that flooding was so local and so fast it was already over by the time Met realized what was happening.

The GumStix grid, known as GridStix, puts the processing power into the sensors themselves. During dry times sensors conserve power, but when the water starts flowing, they crank up their data stream. This involves waking up a bridge-mounted digital camera and shifting from Bluetooth to higher-bandwidth Wi-Fi so GridStix can take part in processing photos of the rising river.

By tracking ripples and flotsam, the network can estimate flow rates -- an economical alternative to ultrasound flow sensors -- and relay a single number back to Met along with an update to local residents.

Hughes says the team is working to set up its first prototype on a river about a half a mile above the nearest village. "What we like about it," he says with scientific candor, "is it floods very reliably."

Story Images

Click thumbnails for full-size image:



See Also

- [Sonic 'Lasers' Head to Flood Zone](#)
- [Flood Waters Can't Sink Net Link](#)
- [Taming the Wild River](#)
- [A Disaster Map 'Wiki' Is Born](#)
- [Games Tackle Disaster Training](#)
- [Disaster Warning System Endorsed](#)