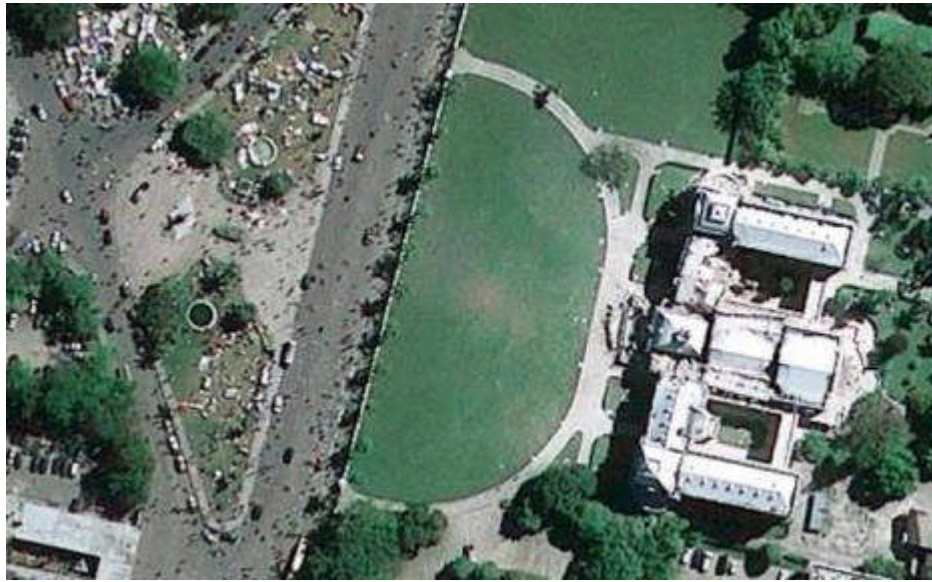


# Satellites to the rescue

Posted: Thursday, January 14, 2010 7:42 PM by Alan Boyle



GeoEye Satellite Image

[Click for zoomable image](#): Satellite imagery captured on Wednesday, the day after Haiti's earthquake, shows the ruined National Palace surrounded by people and debris. Click on the image to explore the scene with HDView (plug-in required).

In the wake of [Haiti's earthquake](#), satellites are helping rescuers pinpoint where the need is greatest - and reconnecting the ruined nation with the outside world.

Emergency responders and military personnel - [plus journalists, of course](#) - are scrambling to get into Port-au-Prince, where hundreds of thousands of Haitians have been in need of assistance since Tuesday's magnitude-7 shock. At the same time, satellite operators are scrambling to get a better look at the devastation, and provide the support for aid organizations on the ground.

The amount of data streams beaming up from Haiti to Inmarsat's telecom satellites has already skyrocketed, said Jack Deasy, director for civil government programs at [Inmarsat Government Services](#). "While it's not as intense as Afghanistan, it is a number of times up from anything normal in that region," he told me today.

Mark Brender, vice president of communications for [GeoEye](#), said satellite imagery serves as "virtual truth serum, and provides governments and relief organizations with an instant snapshot of the lay of the land."

"Our imagery over Haiti, for example, showed how many people went to sports stadiums and open areas," he told me. "Well, that's knowledge. Maybe that's where you ought to provide food and water first."

[Wednesday's imagery from the GeoEye-1 satellite](#) can be compared with "before" imagery, such as an Ikonos satellite view from 2008 ([7MB version](#)), to determine which areas of the Haitian capital suffered the most damage. The post-quake picture shows a flattened presidential palace ... a ruined cathedral ... crumbled military barracks ... and tumbled-over cargo containers in Port-au-Prince's port. ([This New York Times interactive](#) cleverly blends the before-and-after views.)

GeoEye is by no means the only satellite operator on the case. A whole fleet of eyes in the sky are focusing on Haiti: DigitalGlobe's [WorldView-1](#) and [QuickBird](#). France's [Spot-5](#), Japan's [ALOS](#), the [European Space Agency's](#) ERS-2 and Envisat, and Canada's [RadarSat-2](#).

In the early stages of a relief operation, satellite maps can show rescuers the worst-hit places in a disaster zone, or the best place to set up headquarters. Radar imagery can be used to monitor the region even when it's covered with clouds, and even detect the surface deformations that may signal aftershocks or landslides to come.

### **Reconnecting to the world**

When the rescuers arrive, one of the most immediate needs beyond food, water and medicine is the need to communicate. The quake dealt a heavy blow to Haiti's [standard communication links](#).

"Without communication, it's incredibly hard to talk about what's needed in terms of shelter, food, medical supplies and so forth," said Bill Brindley, chief executive officer of [NetHope](#), a consortium of 28 nongovernmental relief organizations.

Here again, satellites are coming to the rescue. [Telecoms Sans Frontieres](#), a French-based international relief organization, was among the first on the scene with [BGAN terminals](#). (The acronym, pronounced "bee-gan", stands for broadband global area network.)

The BGAN devices are about as big as a netbook or laptop computer, and cost from \$1,000 to \$4,000 each. They provide a mobile hookup for phone or data communication (wireless or wired) through the Inmarsat satellite network, at rates that are structured like cell-phone plans (but more expensive).

Telecoms Sans Frontieres is hooking up terminals to facilitate communications for U.N. relief workers in Haiti, and will eventually let Haitians make free two-minute phone calls to anywhere in the world. The group's U.S. representative, Paul Margie, said the biggest challenge isn't technology but security. "The security and logistics situation on the ground is pretty bad, so finding secure locations to do these things is hard," he told me.



Hughes

A Broadband Global Area Network terminal, or BGAN, is about the size of a laptop computer and connects with a satellite network to transmit voice or data.

Inmarsat's Deasy said the data traffic is rising rapidly as teams from around the world converge on Haiti, bringing tens or scores of the BGAN terminals with them.

"We expect that demand to go up as more teams arrive, and we expect to be able to accommodate that demand," he said. "Then it becomes a question of the details of how people go into the country."

The next stage involves putting down small satellite dishes (known as [VSATs](#), or very small aperture terminals) to beef up the communications networks.

Governmental relief operations are already getting VSATs on the scene, and relying upon satellite services donated by satellite operators such as SES World Skies. "Satellite networks play a quintessential role in disaster recovery, when speed is of the essence," Rob Bednarek, the company's president and chief executive officer, [said in a statement](#).

As the Haiti crisis unfolds, Telecoms Sans Frontieres plans to transition from the BGAN terminals to high-frequency and VHF communication links, supplemented by VSATs, Margie said.

Like many relief agencies, Telecoms Sans Frontieres has been on the scene for a series of disasters, ranging from Caribbean hurricanes to Asian earthquakes. "Every emergency is very different from the last," Margie said. "The challenge of yesterday's emergency is not the challenge of the next one."

### **A net of connectivity**

Every crisis brings new innovations as well: For example, [NetHope](#) is putting together a novel combination of VSAT dishes and [WiMax](#) wireless networks to cover Port-au-Prince with a net of connectivity.

"It will create a 10-megabit-per-second network that can be used for two purposes," NetHope's Brindley told me. "First, phone connectivity for setting up voice over Internet, so [relief workers] can begin to communicate. The second thing will be Internet connectivity. That will allow for GIS mapping, it will allow for FTP for photos, it will allow for video. ... It provides a full stack of communication technologies for allowing the teams to coordinate and for assessments to be done."

More than 20 of NetHope's members are involved in Haiti disaster relief - and coordinating all that activity can be a complicated and expensive proposition. NetHope says its VSAT/WiMax telecom system will cost [\\$25,000](#), and it's currently raising the money to cover that expense.

Fortunately, millions of dollars are streaming in from mobile phone users around the world to help Haiti - and [support is streaming in](#) as well for the work being done by NetHope, Telecoms Sans Frontieres and other gearhead do-gooders. "We've really seen a tremendous response from the corporate world, primarily the high-tech companies that are partnering with us, as well as individuals," Brindley said.

When the crisis eases, Brindley expects that NetHope will hand the system over to the Haitians themselves. But at this point, no one can predict how long the crisis will last. At this point, keeping up the communication links amid Haiti's chaos is challenge enough.

"We'll be used in Haiti for a year, there's no question," Inmarsat's Deasy said. "But our unique value in this area is that first 24 to 48 hours."

**Update for 9:30 p.m.:** NASA has put up [several images](#) from its Shuttle Radar Topography Mission in 2000 that show Haiti's highs and lows, including the seismic fault that gave way during this week's quake.