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CIAT

Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture



**Selected press articles about CIAT activities
relates to Hurricane Mitch**

**Nathan Russel, Tim Pratt, Andy Nelson, Grégoire Leclerc.
July 1999**

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Today's Feature

'Seeds of Hope' for Mitch-Battered Central America

Future Harvest helps replant a future for Honduras, Nicaragua

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The agricultural sector of Honduras and Nicaragua bore the brunt of Hurricane Mitch. Experts estimate the hurricane destroyed up to 70 percent of the countries' basic food crops

Hurricane Mitch was the worst natural disaster to hit Central America in this century, and the agricultural sector of Honduras and Nicaragua took the brunt of the storm. Experts estimate the hurricane destroyed up to 70 percent of the countries' basic food crops, robbing the people not only of daily foodstuffs, but also critical exports.

Today, scientists from four of the world's leading agricultural research centers are helping Honduran and Nicaraguan farmers in the wake of Hurricane Mitch.

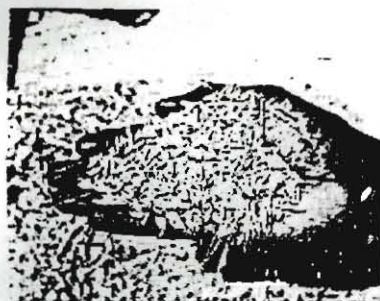
The two-year, \$2.5 million undertaking, dubbed *Seeds of Hope for Central America*, aims to restore the food-production capabilities of these largely agriculture-based countries. Featured in the most recent edition of *The Economist*, the effort is designed to restore critical seed stocks that were lost in the hurricane, and teach environmentally appropriate farming techniques that hold promise both for feeding the two countries over the long term and for reducing their vulnerability to natural disasters in the future.



"Emergency relief efforts, important as they are, will not restore capacity to the subsistence farmers of Nicaragua and Honduras," says Barbara Rose, director of operations for *Future Harvest*, an organization that educates the public about the importance of agricultural science to global peace, health, economic growth, and the environment. "The people in these countries need to know there will be food in the months and years ahead. *Seeds of Hope for Central America* will make major strides toward restoring smallholder agriculture in both countries using techniques and technologies that will protect the natural resource base, thus providing the security that millions have lost."

Four centers direct effort

Seeds of Hope for Central America aims to restore the food-production capabilities of these largely agriculture-based countries. The effort is designed to restore critical seed stocks and teach environmentally appropriate farming techniques that would reduce future vulnerability to natural disasters



Seeds of Hope for Central America builds on lessons learned from the successful *Seeds of Hope* program conducted in Rwanda in 1995 following the civil war that shattered crop production in that country

Four centers direct effort

Seeds of Hope for Central America builds on lessons learned from the successful *Seeds of Hope* program conducted in Rwanda in 1995 following the civil war that shattered crop production in that country. Rwanda's *Seeds of Hope* program successfully delivered modern seed technology to farmers, helped to restore domestic food security, and reintroduced crop diversity with unprecedented success.

Ultimately, *Seeds of Hope for Central America* aims to:

- Stabilize rural farming communities.
- Introduce environmentally sustainable agricultural and resource-management practices.
- Restore production of local varieties of beans, maize, plantains, and potatoes.
- Reintroduce sweet potatoes in Nicaragua.
- Reestablish crop biodiversity, and
- Reduce the need for external food aid.

The four research centers leading the effort are the International Center for Tropical Agriculture (CIAT) in Colombia, the International Maize and Wheat Improvement Center (CIMMYT) in Mexico, the International Potato Center (CIP) in Peru, and the International Plant Genetic Resources Institute (IPGRI) in Italy.

All four are part of a network of 16 international centers that is funded by the Consultative Group on International Agricultural Research (CGIAR). *Future Harvest* is an initiative of the CGIAR centers, which are supported by the World Bank.

Seeds of Hope for Central America, like the Rwanda effort, is also funded by a number of donor agencies around the world, including the Office of Foreign Disaster Assistance of the US Agency for International Development (USAID) and the Multilateral Programmes Branch of the Canadian International Development Agency (CIDA). It also relies on collaboration with a wide array of national and local partners.

Short Term Deadlines

The centers' first task is to work with national programs and other organizations in the region to find undamaged supplies of seeds.

These will be supplemented with seeds from center seed stocks that are adapted to conditions in Honduras and Nicaragua. These "foundation seeds" must be not only well-suited to the growing conditions and diets in Honduras and Nicaragua but also extremely high quality

and free of diseases. They will not be harvested for food. Instead, they were planted in January and then carefully multiplied to produce larger quantities of seeds for spring distribution to small, subsistence farmers. The farmers will then plant them to produce food, which they will harvest in August and September.

“Without rapid action to restore food production, Nicaragua and Honduras will face not only serious nutrition and health problems, but severe economic and social problems whose effects will be felt throughout the region,” says Grant Scobie, director general of CIAT.

“About half of the work force in these two countries is employed in the agricultural sector. The crop losses mean thousands of commercial farmers will lose their jobs, and hundreds of thousands of subsistence farmers may lose their livelihoods. Unless the agricultural sectors are quickly revived, thousands of farmers and their families will migrate to urban areas and nearby countries. Meanwhile, Nicaragua and Honduras will have to rely on external food and economic aid. *Seeds of Hope for Central America* is critical to sustainably reestablishing the food production of small farmers in Honduras and Nicaragua.”

Long Term Prevention

Over the long term, the centers will use geographical information systems (GIS) technology and field assessments to evaluate the overall environmental consequences of the hurricane and develop indicators to determine which areas are at greatest risk of further degradation. They will then help the citizens of those areas use modern agricultural techniques to improve their land management and their crop yields.

“This is the only way to prevent similar catastrophic results from recurring,” says Scobie of CIAT. “One reason natural disasters are so devastating to developing countries is that poverty and poor land management put pressure on the land. For example, when people deforest local hillsides, they increase the risk of mud slides in heavy rains. Already, we’re finding that in areas where the farmers in Nicaragua and Honduras were properly managing the land before the hurricane, the damage is less severe.”

Helpful Links: To learn more about *Future Harvest*, visit its website soon to appear at <http://www.futureharvest.org>

For more information on the CGIAR, go to <http://www.cgiar.org>

For more on the World Bank’s response to Hurricane Mitch, click here.

<http://www.worldbank.org/html/extdr/offrep/lac/mitch.htm>

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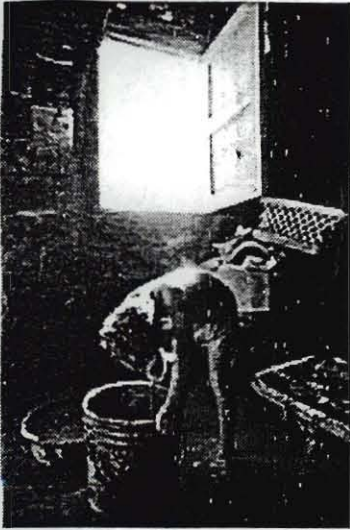
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👉 Today's Feature



A Honduran boy clears the mud off his house as he and his family start a new life after Hurricane Mitch



Hurricane Mitch swept through Central America in late October and early November (Above pictures used with permission from *La Prensa*, Honduras)

Honduras Redraws Map After Mitch Maps from Bank-supported center show devastation

Hurricane Mitch, which swept through Honduras in late October and early November, altered the landscape so much that the country is now planning to redraw its maps, news media reported Tuesday.

"The hurricane changed the course of rivers and disrupted the geographical situation of numerous highways, railways and the location of human settlements," Noe Pineda Portillo, director of the National Geographic Institute, is quoted as saying at a news conference in Tegucigalpa.

The true legacy of Mitch's destruction and Central America's reconstruction needs are slowly being pieced together.

Some clues recently emerged in maps produced by the staff of the International Center for Tropical Agriculture (CIAT). Based in Cali, Colombia, CIAT is one of the research centers supported by the Consultative Group for International Agricultural Research (CGIAR), which is in turn supported by the World Bank.

CIAT staff recently sought to find out exactly what kind of damage had been done to the infrastructure in countries affected by Mitch.

Using data from the internet, governments and newspapers about damage to roads and bridges, CIAT drafted the two maps below which show Honduras before and after Mitch. The colors show how long it takes Hondurans to travel to the nearest market town.

Accessibility to markets before Mitch

A deluge of information

CALI, COLOMBIA

ON THE face of it, computers would not seem to be of much use when it comes to disaster relief—certainly not when compared with such things as helicopters, emergency supplies or medical equipment. But when it comes to clearing up the mess, having vital information on tap can play a vital supporting role—as the current disaster in Honduras shows.

In October, a few days before the arrival of Hurricane Mitch, the finishing touches were put to a digital atlas of the country. Compiled by the International Centre for Tropical Agriculture (CIAT) in Cali, Colombia, it contains 90 layers of information gathered over four years, including details of soil type, crop distribution, climate, population and topography, along with every town, village, road, bridge, marketplace and water pump in Honduras. Originally, the idea was to use this information for agricultural and environmental planning. Instead, it may now play a key role in restoring the country's agricultural capacity, after the huge damage caused by the hurricane.

Restoring such capacity is vital, since 62% of the workforce is employed in farming, and over three-quarters of the daily calorific intake in Honduras comes from maize and beans, two crops that were devastated by flooding. Yet the digital atlas provided only the "before" pic-

ture. In order to generate the "after" picture, another layer of data was needed, showing the depth of the water.

This information has been provided by Radarsat, a Canadian satellite capable of detecting detailed water and land features through thick clouds, fog and rain using synthetic-aperture radar equipment. With this technology, the motion of the satellite is used to simulate the large antenna needed to take high-resolution images. Suitably massaged, the satellite data allowed an extra layer to be added to the digital atlas, showing the extent of the flooding. In addition, the database is being updated continuously to show which roads and bridges are impassable. The result has been dubbed the "real-time Mitch atlas".

By combining original atlas data (showing where crops are traditionally grown, and which villages have water pumps) with the most recent information about the state of roads and bridges, the Mitch atlas should make it easier to plan seed production and distribution in the coming months. Areas most suitable for growing seed crops will be identified, taking into account factors such as soil types



Pass the database

and local climate. The aim is to have seeds ready for the planting season next May.

According to Peter Jones, a CIAT scientist who worked on a similar project in Rwanda in 1995, this kind of technology is likely to play an increasingly important role in disaster relief in future. Next month, America's National Research Council will publish a report, "Reducing Disaster Losses Through Better Information", calling for the creation of an international disaster information network, to ensure that emergency managers have as much information as possible at their fingertips. Databases may not be as glamorous as helicopters, but they could be just as valuable in coping with disasters.

choosing to have your messages displayed on a small screen or read aloud by speech synthesiser. Rick Wagoner, president of General Motors, suggests that within a decade this technology will be standard—as common as the car-radio is today. Future systems will include navigation, paging, and even the ability to let passengers watch satellite-fed movies.

Unsurprisingly, the potential blending of car and computer technology has strong support in Silicon Valley, which senses a lucrative new market just around the corner. Netscape, Sun and IBM have formed a consortium to develop in-car computer systems. Microsoft is moving in as well, with an automotive adaptation of its lightweight Windows CE operating system. One consequence is that the mudslinging of the computer industry is spilling over into the car industry. GM's vice-chairman Harry Pearce recently took a shot at Microsoft when he declared that "we don't want a car that crashes twice a day." Car makers promise that information systems will, however, be isolated from crucial "heartbeat" systems such as the engine, transmission, brakes, and airbags.

As with home and office computer hardware, in-car technology is rapidly getting cheaper, though it is still pricey. Five years ago, on-board navigation systems cost \$3,500 or more, but prices on some systems have now fallen to \$1,500, and they are expected to keep dropping. And like the PC industry before it, the car industry has recognised that it can push costs down further by standardising its technology. Ford, GM, Toyota, DaimlerChrysler and Renault recently joined together as partners in the Automotive Multimedia Interface Consortium (AMIC), and most of the world's other car makers expect to sign up shortly. Within the next few years, the consortium will issue standards for both hardware and software.

These rules will affect not only in-car electronics, but also portable consumer goods, says GM's Dave Acton, who is helping to promote the AMIC project. He foresees a time, not very far off, when it will be possible to take a pager and slip it into a cradle, so that your car can automatically handle any messages. When one comes in, the computer translates it into speech, then sets up your mobile phone to call the per-

son trying to reach you.

Such a vision is, of course, typical of the sort of thing that computer makers have been promising for years. But as computers invade the car industry, bringing new opportunities, benefits and problems, they will no doubt bring the gee-whizz claims of the computer industry along too.

Sociobiology

A beauty contest

WHILE art historians agree that standards of beauty have changed over time—witness the plump shapes of Rubens, versus the svelte forms of Klimt—many scientists beg to differ. In particular, sociobiologists argue that aesthetic judgments, particularly about prospective mates, are deeply ingrained in human nature and are carried in our genes. But in this week's issue of *Nature*, Douglas Yu, a biologist at Imperial College, London, and Glenn Shepard, an anthropology student at the University of California, Berkeley, present findings


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 **Environment**



Satellites Help Hurricane Victims Rebuild

By Timothy Pratt

CALI, Colombia, November 12, 1998 (ENS) - Friday night two weeks ago, while media the world over were beginning to convey the tragedy of Hurricane Mitch with photos and on-the-ground reporting, a satellite 800 kilometers (500 miles) up in space was being reprogrammed to take radar images of Honduras and Nicaragua.

San Pedro Sulas, northern Honduras (pop. 300,000) in top left. Satellite image shows flooding of banana plantations bottom right. Area shown is 22 square kilometers.



This shift in the sky was part of a joint effort involving several international agencies and researchers already working in the two Central American countries most afflicted by the disaster.

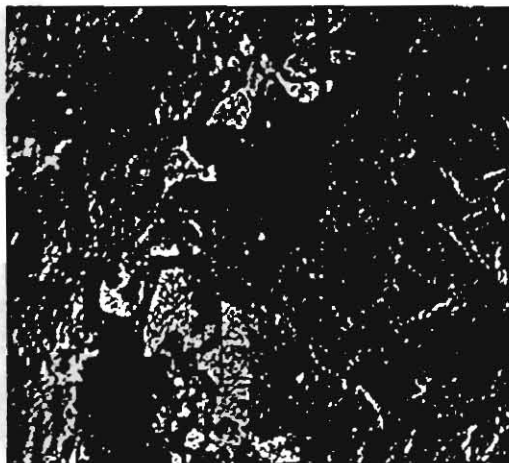
The idea behind the effort is to make use of scientific tools ranging from high tech Geographical Information Systems (GIS), to social technologies like farmer participatory research, to determine the extent of the hurricane's damage in environmental and agricultural terms. Once the damage is fully assessed, medium and long-term rebuilding will be set in motion.

The satellites "use radar that can penetrate clouds and darkness and also depict water very well," according to Scott Paterson, who works with Dendron Resource Surveys in Ottawa, Canada. Dendron received the radar images from the Canadian Space Agency, and transformed them into maps showing where the floods have hit hardest.

Canada got pulled into the picture by Gaston Grenier, a Canadian who has been working since last year in a natural resource management project in Honduras. Grenier also turned to the International Center for Tropical Agriculture (CIAT), based near Cali, Colombia. They have the world's most complete on-the-ground maps of the agricultural landscape for this part of Central America.

The governments of Nicaragua and Honduras, the United Nations, the

International Development Bank, and different relief agencies will be using these satellite images and maps. They hope to determine where crops have been wiped out, and other key issues such as which areas will have difficulties in getting seed for the next planting season in March of next year, and which farming communities are now cut off from their traditional marketplaces.



Southeast of San Pedro Sulas, at center the Ulua River, flooding the Sula Valley, where bananas grow.

Meanwhile, farms and crops in the aftermath of the disaster are also being dealt with on the land itself. Roland Bunch, long-time Honduran resident, agricultural expert, and author of "Two Ears of Corn," has called Hurricane Mitch "most likely the worst disaster that has occurred in the history of the Americas." Bunch lived through the earthquake in Guatemala in 1976, which left 23,000 dead. He points out that "earthquakes don't

tend to destroy crops, and are much cleaner in their damage."

In a telephone interview from Honduras, CIAT agronomist Miguel Ayarza agreed with Bunch's assessment. He estimates that 80 percent of the country's export crops of bananas and sugar were destroyed, while at least half of the common person's bean, corn, and rice crops may be lost.

The small farmer in Honduras and Nicaragua is mainly concerned with getting enough seed to plant in the next season, especially in the case of beans, which are not commonly available commercially. And beans are the principal source of protein for the rural poor in Central America.

As it turns out, CIAT began another project in this region several years ago which will now prove decisive in this aspect of recovery. Called farmer participatory research, it encourages farmers to wed technology to their own know-how, and use the scientific method to solve their own problems.

There are dozens of committees in Honduras exercising farmer participatory research, and several in Nicaragua. With international and Ministry of Agriculture support, they are now leading up efforts to choose sites with maximum yield potential and low risks, to begin producing seed. These farmers are also in a position to define which varieties of seed to produce.

Whether from the air or on the ground, in the coming months it will be important to focus international aid on longer-run agricultural and environmental needs in Nicaragua and Honduras. Relief efforts that mobilize canned food, potable water, clothes, and medicine are vital, but these are farming countries, and the campesino and his land urgently need help.

Science is in a unique position to provide that help.



Environmental Press Releases

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Documents & Resources:

"Canalización de los Rios de Tegucigalpa y Comayagua" (1979 river study)
Sir William Halcrow & Partners Ltd.
London, England
Tel: +(44 171) 602-7282
Fax: +(44 171) 603-0095

Roaring currents wiped out more than 100 bridges, including five of the seven that span the Choluteca. The principal water mains for Tegucigalpa's 1 million people, which spanned the bridges, were smashed as well.

Says Moisés Starkman, Honduras' secretary for international cooperation: "The infrastructure that was destroyed took 30 years to build."

In response to Mitch, the World Bank, Inter-American Development Bank (IDB), and other agencies and organizations are channeling as much money as possible into rebuilding infrastructure.

For example, the IDB has approved loans of \$ 246.8 million for recovery and reconstruction, reassigning an additional \$ 493.8 million of already approved loans to the cause.

But simply rebuilding is not enough. Equally important are the conservation practices that guide the recovery and subsequent development.

"When it rains for five days it should not destroy a country," says Zelaya. "What destroyed the country is that there are no longer any natural barriers to stop the effects of the rain."

— James Wilson and Fiona Ortiz

Mitch recovery efforts getting high-tech help

Cali, Colombia

There's no substitute for assessing a disaster on the ground, of course, but space has become a useful vantage point for viewing the destruction done by Hurricane Mitch.

In the wake of the hurricane, the Canadian Space Agency scanned Honduras and Nicaragua using the only commercial radar satellite with an adjustable field of view.

The satellite, launched in 1995, has been put to a variety of uses in its brief history, such as helping to guide ships through ice and taking the first complete, high-resolution snapshot of the Antarctic.

But in the aftermath of Mitch it's getting its first test in a large, developing world disaster. Since the satellite's radar penetrates thick clouds, experts employed it immediately in an effort to plan medium- and long-term agricultural aid.

The shots of Honduras were processed by Dendron Resource Surveys of Ottawa, and those of Nicaragua by the Geographic Information Systems Department of Texas A&M University.

These maps were then sent by e-mail to GIS specialist Gregoire Leclerc at the International Center for Tropical Agriculture, CIAT, near Cali, Colombia.

Since 1994, this research center has been compiling a digital atlas of Honduras to aid in agricultural planning and resource management; it also has been training a fledgling GIS department at Nicaragua's Ministry of Agriculture and Forests.

Made with Swiss development aid, the Honduras atlas comprises more than 90 layers of information on such subjects as climate, population, watersheds and crops.

At CIAT, Leclerc is organizing the radar

flood data and other information from official and media sources such as road and bridge damage. He is overlaying it on the Honduran atlas and also helping Nicaragua in a similar task.

The resulting "Mitch Atlas" will be used as a tool in bean, maize, and rice seed production and distribution. The atlas also will indicate where relief organizations are working, to avoid duplication of efforts.

Seeds are vital to recovery efforts—especially in the case of beans, whose seeds often are not commercially available.

According to the Honduran Agriculture and Livestock Secretariat, around 60% of the country's bean crop was lost; maize losses may be higher.

Now that the rainy season is over, there's doubt about how and where new seeds can be produced. There's also the issue of what kinds of seeds will be used—traditional or other varieties.

The Mitch Atlas will factor in such diverse data as soil type, crop systems and water-pump locations to help agencies and organizations answer such questions.

Organizations ranging from the United Nations and the IDB to Oxfam and World Neighbors will use the atlas.

IDB engineer Rolando Yon calls the atlas "very necessary for monitoring the hurricane's effects, since it will give us a before and after picture."

Leclerc says its creation as "a critical test of the ability of new technologies to quickly adapt to an emergency situation in Latin America and to deliver the right tool at the right time."

—Timothy Pratt

Hurricane Mitch was the most devastating natural disaster to hit Central America in the 20th century. The numbers of dead and missing in Honduras and Nicaragua reached into the thousands.

Roads, bridges, and other infrastructure were left in ruins. Roughly 80 percent of the export-oriented agriculture in the two countries was destroyed. And more than half of the basic food crops—beans, maize, and rice—were lost.

Only a few days before Mitch's torrential forces hit the ground, the final touches were put to a digital atlas of Honduras that contains more than 90 layers of information—details about soil type, climate, population, roads and bridges, market-places, and water pumps. Initially, the map, compiled by CIAT with Swiss government support, was intended to aid in agricultural and environmental

planning. Instead, it has become a central tool in overall disaster relief aid and recovery efforts.

More than 60 percent of the Honduran workforce is employed in farming, and 75 percent of the Honduran population's total caloric intake comes from maize and beans. Thus, restoring small farm production and regaining rural earning power became the top priorities. But to become really useful, the "before-Mitch" atlas profile of the Honduran countryside needed to be supplemented with some additional data about flooding that was available from Radarsat, a sophisticated Canadian satellite capable of detecting detailed water and land features even through rain and thick clouds.

Initially, the Radarsat data was combined with "after-Mitch" data on Honduras's rural infrastructure to create a "real-time Mitch atlas." This atlas helped the Honduran

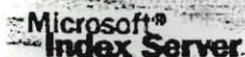
government and aid agencies to direct relief efforts to the neediest areas. It also made seed production and distribution, the key activities for agriculture's recovery in 1999, easier to plan.

Under the auspices of the CGIAR's Ecoregional Program for Tropical Latin America, four Centers—CIAT, CIMMYT, CIP, and IPGRI—have mounted an emergency effort to rebuild small farmers' seed systems and to regenerate agriculture in both Honduras and Nicaragua. This effort will draw on lessons from the successful Seeds of Hope program carried out in Rwanda after genocide and civil war shattered that country's crop production.

Given that many rural communities have been isolated by Mitch, seed distribution must be highly decentralized. Therefore, the CGIAR Centers will work with a wide range of national

institutions, local and international NGOs, and farmer groups. CIAT's digital atlas of Honduras, which contains extensive information about features of the rural landscape, is supplying a powerful tool for national, NGO, and community planners.



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Weather• Emergency Management In the Wake of a Disaster
TABLE OF CONTENTS GIS helps countries hit by Hurricane Mitch to rebuild and prepare for future
catastrophes.

By [<< Timothy Pratt >>](#), freelance writer;

E-mail: v.comunicaciones@cgiar.org.

In the days following Hurricane Mitch in October 1998, world media showed tons of cascading mud and water, followed by helicopters pulling children out of trees and soldiers unloading boxes of supplies. Within a few weeks, however, the reporters left. But if agricultural expert and longtime Honduran resident Roland Bunch is right, and Hurricane Mitch was "one of the worst disasters in the history of the Americas," it was after cameras left the scene when some of the hardest work began. A location map (left) showing the path of Hurricane Mitch.

Hurricane Mitch destroyed countless buildings and took more than 9,000 lives. Flooding such as this was common in the Central American countries hit by the storm.

Unexpectedly, and as never before seen in developing countries, GIS is playing a key role in the rebuilding and recovery stages after a major natural disaster. Bunch notes that an earthquake in Guatemala left 23,000 dead in 1976--compared with the 9,000-plus victims of Mitch--but earthquakes tend to be "cleaner in their damage." The hurricane and its floods caused infrastructure and agricultural destruction that may take up to 50 years to repair.

GIS Tools in Place

During the last several years, Honduras and Nicaragua--the countries hardest hit by the disaster--have acquired an array of GIS tools and qualified personnel that were once unusual for Central America and the developing world. According to GIS scientist Peter Jones, consultant with the International Center for Tropical Agriculture (CIAT) near Cali, Colombia, the move to GIS is a trend in these areas.

"The difficulty in using GIS for dealing with disasters in the developing world has been the lead time necessary," says Jones. "In the last five to 10 years, this has been changing."

CIAT has taken advantage of the technology, using Redlands, Calif.-based ESRI Inc.'s ArcView GIS software to prepare a first-ever Honduran Digital Atlas. The atlas has 90 information layers geared toward agricultural and natural resources planning. And, as fate would have it, the project was completed only weeks before Mitch struck. Now the atlas will help restore the Honduran bean crop, the source of 70% of the regional population's daily calories.

CIAT agronomist Carlos Arturo Quiroz is involved in a local effort dedicated to collecting, growing out and distributing 2,000 tons of bean seeds. He said the atlas will help identify where the poorest farmers in greatest need of seed are located as well as how to get to them.

A New Atlas

One of ESRI's distributors in the region is Ingenieria Gerencial. Its offices in the Honduran capital of Tegucigalpa now have become a sort of clearinghouse called the National Information Center. In early December 1998, personnel from ESRI and the U.S. Geological Survey (USGS) arrived to work on the second version of what's being called the "Digital Atlas of Central America," prepared in response to Hurricane Mitch.

A joint project of the U.S. government and private sector, the atlas will include information from CIAT efforts as well as contributions from at least six other major partners. Honduras' Minister of the Interior, Delmer Urbizo, who also heads his country's relief and recovery task force, requested the atlas.

Flooded areas extracted from radar imagery were superimposed on a radar image of Honduras' San Pedro Sula valley, showing that the country's most important banana growing region was almost completely wiped out by flood damage.

According to James Jancaitis, USGS systems expert and project leader, the atlas will be the first comprehensive GIS database done in real time in a developing world disaster. A look at its components may justify this description.

Several days after Mitch began, Gaston Grenier, a Canadian researcher in Honduras, called Dendron Resource Surveys in Ottawa, Ontario, Canada, about the possibility of taking RADARSAT satellite imagery during and after the hurricane. The request then was put to the Canadian Space Agency (CSA), which operates the satellite. RADARSAT is the world's only commercial, programmable "field-of-view" radar satellite. Launched toward the end of 1996, the satellite will prove vital for taking high-resolution images of tropical disasters in years to come, as it can penetrate darkness and cloud cover normally found in the region. The ability to shift its field of view allowed CSA to capture images within 24 hours of receiving the request.

Preliminary analysis of vegetation greenness, as illustrated by two Normalized Difference Vegetation Index scenes derived from satellite data taken before (top) and after (bottom) Hurricane Mitch, suggests the storm had widespread biological impact on Central America. Green indicates healthy vegetation; yellow and brown indicate vegetation stress or damage; and white is the return from clouds.

The resulting images offer a clear idea of the extent and location of flooding in the hurricane's wake, and they now form part of the USGS-led atlas. In addition, under the Open Skies Treaty, the U.S. Air Force underwrote five missions to take aerial photos of El Salvador, Honduras and Nicaragua, resulting in thousands of panoramic images, vertical mapping images and video frames that can be used to help locate landslides. The images were interpreted and integrated into the database at the National Information Center in Tegucigalpa, and now are available to private and public groups involved in reconstruction efforts.

Rounding out the project's remote sensing element, lights from night-time satellite images helped identify where power lines were down. To determine where vegetation was damaged, multispectral, 30-meter-resolution Landsat images picked up individual land plots, showing what crops are grown where and how the disaster changed the agricultural landscape. The latter images form a mosaic for all of Central America. Nearly 6GB of data were compressed into only 86MB, maintaining their resolution, using Seattle-based LizardTech Inc.'s MrSID wavelet compression technology, which Jancaitis called a "technical miracle."

More Models

As for "on-the-ground" modeling, the atlas includes such hydrologic data as drainage basins and average flow rates under normal and extreme precipitation. According to Jancaitis, the data can be used to help rebuild cities out of flood plains or reconstruct roads and bridges with conduits and structural supports. The former is an example of what Jancaitis calls "building out of harm's way," and the latter "building disaster-resilient communities." The atlas also includes landslide models, which should help predict future risk of landslides due to volcanoes, earthquakes and floods.

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Useful Themes

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The rapid response time was seen across the board. "I arrived on a Tuesday afternoon," says USGS GIS expert Bill Miller. "After unpacking our boxes with computer terminals, we had a GIS up and running within 30 minutes!"

Two satellite images show the nighttime lights of the Central American region before (top) and after (bottom) Hurricane Mitch. Examination of cloud-free areas like the Yucatan Peninsula seems to confirm that significant damage was done to the local power grid and associated infrastructure, confirming on-ground reports.

Miller also adds that the medium- and long-term rebuilding efforts would have begun earlier if not for the logistical difficulty in carrying out rescue and relief first. "We didn't want to get in their way," he says.

Another issue mentioned by those involved was data availability. "Finding out about, and getting release and use of data from academia, the government, Department of Defense and others went amazingly directly," notes Jancaitis. "Release and use of data from [national government organizations] that had in-country data was lengthy (because) no one anticipated the need to use the data in an emergency."

There also was a consensus that Central America, and the developing world in general, are acquiring more GIS tools and capacities every day, and taking advantage of GIS' capabilities as a planning aid in normal and exceptional circumstances. In the months and years to come, hundreds of thousands of rural and urban survivors of Hurricane Mitch in Honduras and neighboring countries slowly will rebuild their lives thanks to the timely use of geographically referenced information. In addition, the entire region will be better prepared in the future.

"National governments in Honduras and Nicaragua have learned from this experience." states Merrill Lyew, ESRI's regional manager for Latin America. "They now have more data and GIS tools on hand to allocate resources in the event of future disasters."

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Monday January 18, 1:33 am Eastern Time

Agro agency launches Central American crop program

By Maja Wallengren

MEXICO CITY, Jan 18 (Reuters) - A global agricultural agency said on Monday it had launched a \$2.5 million program aimed at restoring vital food crops in Honduras and Nicaragua following last year's devastation by Hurricane Mitch.

Future Harvest, which runs educational farming projects around the globe, said the two-year program was aimed at restoring critical seed stocks lost in the furious storm just over two months ago along ecologically friendly principles.

"Emergency relief efforts, important as they are, will not restore capacity to the subsistence farmers of Nicaragua and Honduras," said Barbara Rose, director of operations for the Washington-based Future Harvest.

Rose said the "Seeds of Hope for Central America" program would try to restore agriculture in Honduras and Nicaragua "using techniques and technologies that will protect the natural resource base".

Future Harvest said its agricultural experts estimated that Honduras and Nicaragua, the two countries hardest hit by Mitch, had lost up to 70 percent of their basic food crops, mainly beans and maize.

The group said in the five-page report on the food crop situation that Nicaragua had lost 60 percent of its bean crop and 40 percent of its corn crop, while Honduras lost 75 percent of its bean crop and about half of the maize crop.


Mitch, which left at least 9,000 people dead across Central America, ruined 27 million banana plants in Honduras, 90 percent of the industry's capacity, while between 20 and 30 percent of the two countries' coffee crops were lost, it said.

"Honduras and Nicaragua depend on domestic agriculture not only to feed their people but to fuel their economies. The hurricane wiped out about 80 percent of the commercial crops grown in Honduras and Nicaragua for sale abroad.

"Without rapid action to restore food production, Nicaragua and Honduras will face not only serious nutrition and health problems but severe economic and social problems whose effects will be felt throughout the region," said Future Harvest.

The group said the program would provide training in modern seed production techniques and had

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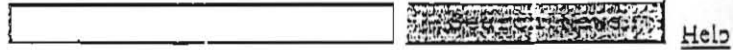
^DJI	0.00	+0.00
^IXIC	0.00	+0.00
^SPC	0.00	+0.00
^IIX	0.00	+0.00
^TSE	0.00	+0.00

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arranged for planting of seed sufficient to cover 35 percent of Nicaragua's need for its spring maize harvest. But seed supply was still scarce, it added.

With the help of satellite photos, Future Harvest had been able to "provide an extraordinarily detailed picture of the worst hit agricultural areas" which now was used as guidelines to where best spots for replanting were located.

"Center scientists and their partners will teach farmers to interplant sweet potatoes and corn in a single field, a practice that has proven successful in reducing soil erosion in China," said Future Harvest in the report.



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COVER HIGHLIGHT

As GIS becomes a core enterprise technology, forward-thinking companies must prepare their hardware infrastructure to handle data-intensive geospatial applications. This month's cover story, beginning on page 36, examines several popular hardware options.

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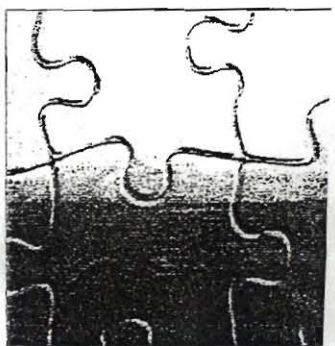
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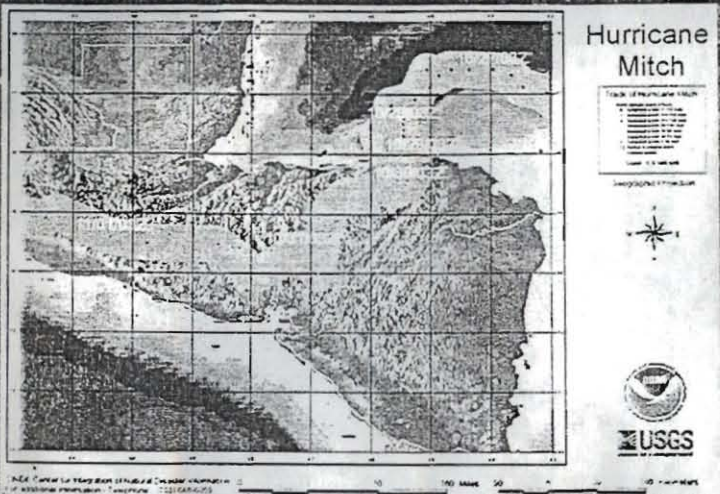


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Look for this logo next to material featured on GeoWorld's World Wide Web site at <http://www.geoplace.com/gw>.

GIS helps countries Rebuild after Hurricane Mitch



A location map (left) showing the path of Hurricane Mitch.



Andy Nelson

Hurricane Mitch destroyed countless buildings and took more than 9,000 lives. Flooding such as this was common in the Central American countries hit by the storm.

Andy Nelson

By Timothy Pratt, freelance writer.
E-mail: v.comunicaciones@cgiar.org.

In the days following Hurricane Mitch in October 1998, world media showed tons of cascading mud and water, followed by helicopters pulling children out of trees and soldiers unloading boxes of supplies. Within a few weeks, however, the reporters left. But if agricultural expert and longtime Honduran resident Roland Bunch is right, and Hurricane Mitch was "one of the worst disasters in the history of the Americas," it was after cameras left the scene when some of the hardest work began.

Unexpectedly, and as never before seen in developing countries, GIS is playing a key role in the rebuilding and recovery stages after a major natural disaster. Bunch notes that an earthquake in Guatemala left 23,000 dead in 1976—compared with the 9,000-plus victims of Mitch—but earthquakes tend to be "cleaner in their damage." The hurricane and its floods caused infrastructure and agricultural destruction that may take up to 50 years to repair.

GIS Tools in Place

During the last several years, Honduras and Nicaragua—the countries hardest hit by the disaster—have acquired an array of GIS tools and qualified personnel that were once

rates under normal and extreme precipitation. According to Jancaitis, the data can be used to help rebuild cities out of flood plains or reconstruct roads and bridges with conduits and structural supports. The former is an example of what Jancaitis calls "building out of harm's way," and the latter "building disaster-resilient communities." The atlas also includes landslide models, which should help predict future risk of landslides due to volcanoes, earthquakes and floods.

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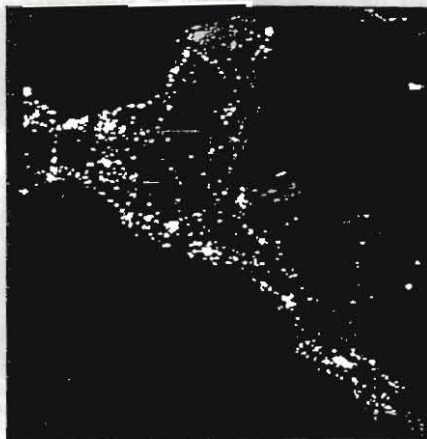
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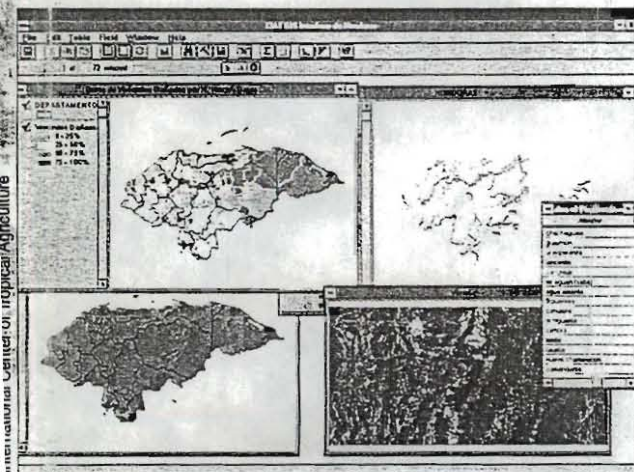
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NOAA (National Geophysical Data Center)

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The Digital Atlas of Central America interface shows some of the coverages related to Hurricane Mitch, including bridges destroyed, roads damaged, percentage homeless and flooded areas (derived from radar imagery).

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International Center for Tropical Agriculture

personnel from ESRI and the U.S. Geological Survey (USGS) arrived to work on the second version of what's being called the "Digital Atlas of Central America," prepared in response to Hurricane Mitch.

A joint project of the U.S. government and private sector, the atlas will include information from CIAT efforts as well as contributions from at least six other major partners. Honduras' Minister of the Interior, Delmer Urbizo, who also heads his country's relief and recovery task force, requested the atlas.

According to James Jancaitis, USGS systems expert and project leader, the atlas will be the first comprehensive GIS database done in real time in a developing world disaster. A look at its components may justify this description.

Several days after Mitch began, Gaston Grenier, a Canadian researcher in Honduras, called Dendron Resource Surveys in Ottawa, Ontario, Canada, about the possibility of taking RADARSAT satellite imagery during and after the

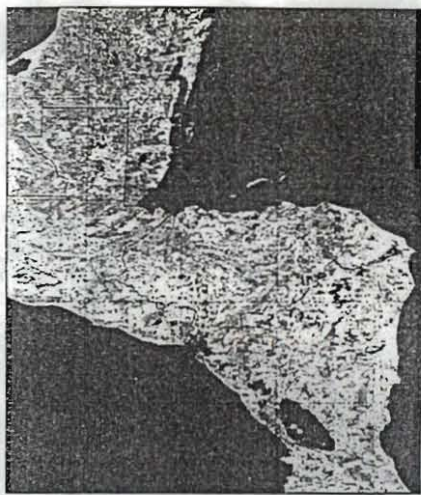
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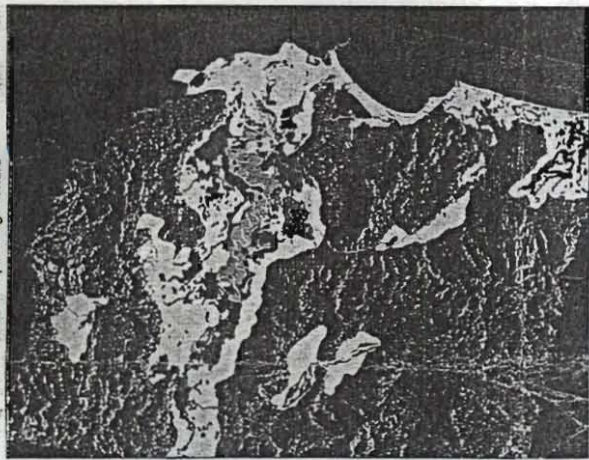
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Flooded areas extracted from radar imagery were superimposed on a radar image of Honduras' San Pedro Sula valley, showing that the country's most important banana growing region was almost completely wiped out by flood damage.

hurricane. The request then was put to the Canadian Space Agency (CSA), which operates the satellite. RADARSAT is the world's only commercial, programmable "field-of-view" radar satellite. Launched toward the end of 1996, the satellite will prove vital for taking high-resolution images of tropical disasters in years to come, as it can penetrate darkness and cloud cover normally found in the region. The ability to shift its field of view allowed CSA to capture images within 24 hours of receiving the request.

The resulting images offer a clear idea of the extent and

International Center of Tropical Agriculture

NOAA/USGS

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For further information, contact:
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INTERNATIONAL EFFORT LAUNCHED TO SUSTAINABLY RESTORE FOOD PRODUCTION IN HONDURAS AND NICARAGUA FOLLOWING HURRICANE MITCH

*World's Major Research Centers Announce "Seeds of Hope" Plan
To Replenish Seed Stocks, Teach Modern Farming Techniques*

Long-Term Relief Effort Modeled After Earlier Work in Rwanda

Washington, D.C. – January 18, 1999 – Scientists from four of the world's leading agricultural research centers today announced an international effort to support Honduran and Nicaraguan farmers in the wake of Hurricane Mitch. The two-year, multimillion-dollar undertaking, dubbed "Seeds of Hope for Central America," aims to restore the food-production capabilities of these largely agriculture-based countries, restore critical seed stocks that were lost in the hurricane, and teach environmentally appropriate farming techniques that hold promise both for feeding the two countries over the long term and for reducing their vulnerability to natural disasters in the future.

The four centers leading the effort are the International Center for Tropical Agriculture (CIAT) in Colombia, the International Maize and Wheat Improvement Center (CIMMYT) in Mexico, the International Potato Center (CIP) in Peru, and the International Plant Genetic Resources Institute (IPGRI) in Italy. All four are part of a network of 16 international centers that is funded by the Consultative Group on International Agricultural Research (CGIAR), and part of Future Harvest, an organization that educates the public about the importance of agricultural science to global peace, health, economic growth, and the environment.

Seeds of Hope for Central America builds on lessons learned from the successful Seeds of Hope program conducted in Rwanda in 1995 following the civil war that shattered crop production in that country. Rwanda's Seeds of Hope program, which involved the current effort's four research centers along with four others, successfully delivered modern seed technology to farmers, helped to restore domestic food security, and reintroduced crop diversity with unprecedented success.

-more-

Seeds of Hope for Central America, like the Rwanda effort, is funded by a number of donor agencies around the world, including the Office of Foreign Disaster Assistance of the U.S. Agency for International Development (USAID) and the Multilateral Programmes Branch of the Canadian International Development Agency (CIDA). It also relies on collaboration with a wide array of national and local partners.

"Emergency relief efforts, important as they are, will not restore capacity to the subsistence farmers of Nicaragua and Honduras," said Barbara Rose, director of operations for Future Harvest. "The people in these countries need to know there will be food in the months and years ahead. Seeds of Hope for Central America will make major strides toward restoring smallholder agriculture in both countries using techniques and technologies that will protect the natural resource base, thus providing the security that millions have lost."

Vast Agricultural Damage, Huge Implications

Hurricane Mitch was the worst natural disaster to hit Central America in this century, and the agricultural sector of Honduras and Nicaragua took the brunt of it. Experts estimate that the storm destroyed up to 70 percent of the countries' basic food crops, of which beans and maize are most important. Nicaragua lost about 60 percent of its bean crop and 40 percent of its maize crop. In Honduras, 75 percent of the bean crop and about half of the maize crop was lost. Other Honduran subsistence crops, including potatoes and plantains, also suffered considerable damage, and many crop varieties were destroyed. The storm also caused heavy damage to the natural resources that underpin agriculture. In many places Hurricane Mitch caused massive soil erosion, exposing subsoil and rocks and severely damaging the land's productive capacity. Siltation of rivers also jeopardized water supplies for irrigation and energy generation.

Honduras and Nicaragua depend on domestic agriculture not only to feed their people but to fuel their economies. Agriculture accounts for nearly 30 percent of the gross domestic product in Honduras and more than 25 percent in Nicaragua. The hurricane wiped out about 80 percent of the commercial crops grown in Honduras and Nicaragua for sale abroad. In Honduras alone, Mitch ruined approximately 27 million banana plants, decimating about 90 percent of the industry's productive capacity. The two nations lost 20-30 percent of their coffee crop. Also, rice, cotton, tobacco, sugar cane, sesame seed, pineapples, cantaloupes, honeydew, and other fruits and vegetables were badly damaged.

Most of the commercial agricultural sector will rely on private-sector resources to repair the damage, but small, subsistence farmers lack the resources to replenish their seed supplies. Working with a wide range of national institutions, nongovernment organizations, and grassroots organizations, Seeds of Hope for Central America focuses on helping these rural farmers restore their ability to produce the subsistence crops of beans, maize, plantain, and potatoes, and maintain the biodiversity of their seed supply.

New Technologies and Techniques Play Key Roles

The centers are using a powerful new technology – geographical information systems (GIS) – to maximize the relief effort's efficiency. Using these advanced computer tools and detailed satellite images, scientists are targeting the areas most in need of relief.

For four years, CIAT has been using GIS in Honduras and Nicaragua to support agricultural and environmental planning, gathering detailed information on topography, rivers, drainage, soils, crops, roads, bridges, and much more. Now CIAT scientists are combining these data with satellite images taken before and after the hurricane to develop a new digital atlas of Honduras. The result is frequently updated maps that provide an extraordinarily detailed picture of the worst hit agricultural areas. The data have been guiding the efforts of local and international relief organizations and will help guide national partners in determining which areas are most suitable for replanting.

Other technologies developed at the international research centers will be put to use by local partners and farmers to maximize crop yields and efficiency. For decades the centers have developed a wide array of seed varieties that resist diseases, pests, and other problems, and they have worked with national agricultural organizations to disseminate these varieties throughout Central America. In the wake of Hurricane Mitch, they are striving to increase use of these environmentally friendly varieties. CIMMYT and CIP are collaborating with national partners to introduce hybrid maize varieties in Nicaragua and reintroduce the sweet potato, which originated in what is now Nicaragua but is no longer grown there.

Center scientists and their partners will teach farmers to interplant sweet potatoes and corn in a single field, a practice that has proven successful in reducing soil erosion in China. Growing below ground, sweet potatoes anchor the soil in place. They also require little fertilizer while producing a high volume of crops per hectare. Because sweet potatoes provide an excellent source of vitamin A, the Nicaraguan government strongly supports their reintroduction into the country to improve nutrition.

In Honduras, CIP will help replace sweet potato varieties that were lost in the hurricane using an innovative new seed technology. Potatoes are typically grown from whole potatoes, not from seeds. However, in the wake of a natural disaster, transporting whole potatoes, which are bulky, perishable, and expensive, can present major problems. In response, CIP has developed a "true potato seed" as an alternative to planting the whole potato.

Farmers in Honduras were being trained to cultivate true potato seeds just before the hurricane. They embraced the new technique because it vastly reduces the cost of potato farming. To plant a hectare of the potato seeds costs just \$20-\$30, in contrast to *planting* a hectare of regular seed potatoes, which costs \$1,500. Although the storm destroyed the first planting, CIP is expanding efforts to distribute new seeds and training materials throughout Honduras.

-more-

"Without rapid action to restore food production, Nicaragua and Honduras will face not only serious nutrition and health problems, but severe economic and social problems whose effects will be felt throughout the region," said Grant Scobie, director general of CIAT. "About half of the work force in these two countries is employed in the agricultural sector. The crop losses mean thousands of commercial farmers will lose their jobs, and hundreds of thousands of subsistence farmers may lose their livelihoods. Unless the agricultural sectors are quickly revived, thousands of farmers and their families will migrate to urban areas and nearby countries. Meanwhile, Nicaragua and Honduras will have to rely on external food and economic aid. Seeds of Hope for Central America is critical to sustainably reestablishing the food production of small farmers in Honduras and Nicaragua."

Near Term: Steep Challenges, Tight Deadlines

The first priority is to work with national programs and other organizations in the region to find undamaged supplies of seeds. These will be supplemented with seeds from center seed stocks that are adapted to conditions in Honduras and Nicaragua. These "foundation seeds" must be not only well-suited to the growing conditions and diets in Honduras and Nicaragua but also extremely high quality and free of diseases. They will not be harvested for food. Instead, they will be planted in January and then carefully multiplied to produce larger quantities of seeds for spring distribution to small, subsistence farmers. The farmers will then plant them to produce food, which they will harvest in August and September.

CIAT and CIMMYT scientists have already scoured the region to find now-scarce bean and maize foundation seed. Much of the multiplication will occur at agricultural experiment stations or commercial farms with irrigation facilities, ample fertilizer supplies, and expertise in the best seed-production practices. In addition, the centers will work with national partner organizations to distribute the foundation seeds to thousands of small farmers whose fields were not ruined by the hurricane. Plans call for training these farmers, where necessary, in modern seed production techniques.

CIMMYT has sent maize seed from its stocks to Honduras and has arranged for the planting of enough seed to place Honduran maize production well along the path to recovery. For Nicaragua, CIMMYT has helped locate maize seed in the region and has arranged for enough planting to supply about 35 percent of the country's total maize area in the spring.

"Seeds of Hope for Central America shows the great value of scientific research in an emergency," said Ismail Serageldin, chairman of the CGIAR. "CGIAR scientists have worked for decades to gather and study plant genetic resources from around the world and advance sustainable farming techniques. Working with national partners in the region, these international scientists are uniquely prepared to help restore the smallholder agricultural base in Honduras and Nicaragua."

Long Term: Preventing Recurrence and Protecting the Environment

Over the long term, the centers will use GIS technology and field assessments to evaluate the overall environmental consequences of the hurricane and develop indicators to determine which areas are at greatest risk of further degradation. They will then help the citizens of those areas use modern agricultural techniques to improve their land management and their crop yields.

"This is the only way to prevent similar catastrophic results from recurring," said Scobie of CIAT. "One reason natural disasters are so devastating to developing countries is that poverty and poor land management put pressure on the land. For example, when people deforest local hillsides, they increase the risk of mud slides in heavy rains. Already, we're finding that in areas where the farmers in Nicaragua and Honduras were properly managing the land before the hurricane, the damage is less severe."

In another long-term effort, scientists from IPGRI will closely examine the hurricane's long-term impact on plant genetic diversity in Honduras and Nicaragua. To help preserve healthy agricultural diversity, they will coordinate a worldwide effort to replenish any traditional seed varieties that may have been lost or reduced during the hurricane and subsequent relief effort. For instance, IPGRI has long worked with Honduran breeders to produce improved disease-resistant banana and plantain varieties, which were starting to gain popularity before the hurricane. The center will now work with these and other growers to reintroduce these and other varieties.

Ultimately, Seeds of Hope for Central America will:

- Stabilize rural farming communities,
- Introduce environmentally sustainable agricultural and resource-management practices,
- Restore production of local varieties of beans, maize, plantains, and potatoes,
- Reintroduce sweet potatoes in Nicaragua,
- Reestablish crop biodiversity, and
- Reduce the need for external food aid.

Future Harvest builds public understanding of the role of agriculture in international issues through research and outreach on behalf of the 16 centers of the Consultative Group on International Agricultural Research.

###

Más apoyo científico para el agro

SIG, solución al desastre

Mapas 'inteligentes' ayudarán a recuperar la agricultura de países afectados por el huracán Mitch. Una alternativa para combatir las plagas y proteger el ambiente en Colombia y Latinoamérica.

Al tiempo que la ayuda humanitaria continúa llegando a Honduras y Nicaragua para aliviar las catastróficas consecuencias del huracán Mitch, los expertos agrícolas en estos países están aplicando herramientas de alta tecnología para recuperar la producción agrícola.

Se trata del Sistema de Información Geográfica, SIG, una poderosa herramienta con la cual los científicos están produciendo, a través de imágenes de satélite, mapas que ayudan a tomar decisiones.

Es así como por medio de un SIG se pueden extraer diferentes conjuntos de información de bases de datos electrónicas y combinarlos o sobreponerlos. El resultado se puede visualizar a manera de mapas con diversa información en una pantalla de computadora y además se puede imprimir.

Una de estas herramientas es el atlas digital Mitch, que está siendo desarrollado por el Centro Internacional de Agricultura Tropical, Ciat.

El atlas combina información acerca de la infraestructura vial, la topografía, los ríos, suelos, cultivos y otras características del ecosistema rural de los países afectados por el huracán Mitch, con mapas derivados de imágenes de satélite capta-

das antes y después del fenómeno.

"Con base en estos mapas se pueden determinar con precisión las áreas de cada país donde las inundaciones y los deslizamientos de tierra han destruido cultivos", explicó Gregoire Leclerc, especialista en SIG.

Igualmente, "se pueden identificar aquellas comunidades rurales que han quedado más aisladas por la destrucción del huracán", señaló Leclerc.

De esta manera, las instituciones locales e internacionales, orientarán, a través de los SIG, los esfuerzos para aumentar la oferta de semilla de los agricultores y para restaurar el acceso de sus productos a los mercados, para evitar una significativa escasez de alimentos en el presente año y más allá", afirmó Miguel Ayarza, agrónomo encargado de coordinar la labor del Ciat sobre agricultura de laderas.

Hacia ese fin, el Ciat y otros tres centros auspiciados por el Grupo Consultivo para la Investigación Agrícola Internacional, Geai, están montando un programa multimillonario de asistencia en el suministro de semilla.

Junto con instituciones nacionales, ONG y grupos de agricultores, el programa multiplicará rápidamente cantidades apropiadas de semilla de los principales alimentos básicos

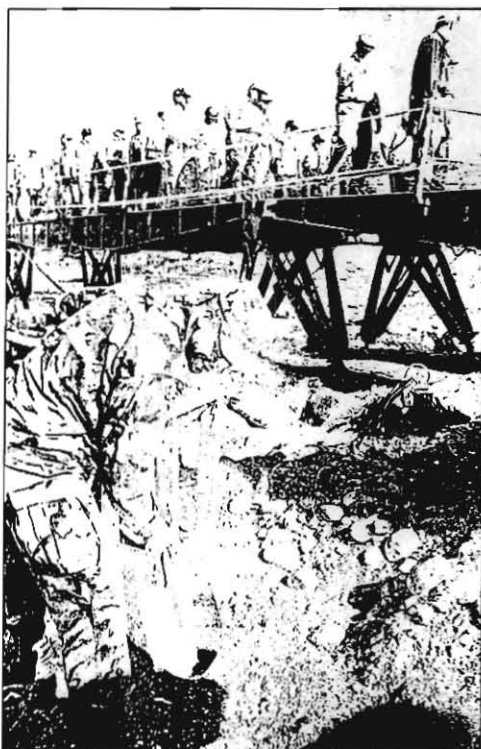


Foto AFP / EL PAIS

En países como Nicaragua, los SIG ayudarán a multiplicar rápidamente semillas de frijol y maíz, cultivos que se perdieron en más de un 50%.

como frijol y maíz, cultivos que se perdieron en más de un 50%.

Otros beneficios

El SIG también se convierte en una herramienta muy útil a la hora de prevenir grandes problemas de plagas en la agricultura.

Por ejemplo, en diferentes países de América Latina los agricultores se han visto afectados gravemente por la mosca blanca, la cual ha sido catalogada como 'la plaga del siglo', por su gran efecto devastador en

zonas tropicales y climas templados.

Un grupo de especialistas de SIG, entomólogos y virologos del Ciat, están ubicando los sitios donde se han reportado dichos ataques, para luego utilizar las técnicas del sistema introduciendo datos de clima, suelo y uso de la tierra.

Esto ayudará a identificar otras regiones con características similares y donde aún no ha atacado el insecto, a fin de prevenir su acción depredadora.



Foto / EL PAIS

En Colombia se calcula que resultarán 250 mapas computarizados, como indicadores socioeconómicos, urbanos, de recursos naturales y de gestión.

El Centro Internacional de Agricultura Tropical, Ciat, a través de geógrafos, ecólogos y otros especialistas, viene desarrollando en Colombia una detallada base de datos de Sistemas de Información Geográfica, SIG.

Estos tienen como principal objetivo ayudar a las instituciones gubernamentales y ONG a enfocar con más precisión el esfuerzo para aliviar la pobreza, proteger el medio ambiente y hacer un seguimiento del proceso de desarrollo en Colombia y América latina.

Estos mapas dan una visión de cientos de variables geográficas, climáticas, ecológicas, agrícolas, económicas y sociales, relaciona-

das con la pobreza y el medio ambiente.

Son mapas 'inteligentes' que ayudan a sobreponer diferentes niveles de información para establecer relaciones entre distintas características de la tierra y sus habitantes, permitiendo analizar y extrapolar datos según las necesidades, para tomar decisiones.

Se calcula que en Colombia resultarán alrededor de 250 mapas computarizados como indicadores socioeconómicos, urbanos, de recursos naturales y de gestión.

Esta información ayudará al Departamento Nacional de Planeación a tomar decisiones eficientes donde haya que intervenir.

Cruz Roja Centroamericana frente a la tragedia del Mitch

El Atlas nos ayudó mucho

La Cruz Roja Centroamericana desempeñó un papel importante a raíz de la catástrofe provocada por el huracán Mitch, especialmente en Honduras y Nicaragua.

Dentro de sus planes de ayuda humanitaria figuraba la entrega de semillas de frijol (uno de los cultivos básicos de la población) a 10,500 familias pobres. Sin embargo, la tarea de conseguir semilla comercial fue imposible. El huracán barrió con todo y dejó desabastecidos a esos dos países.

Cuando estaban en esa tarea, se enteraron del proyecto "Semillas de Esperanza", un esfuerzo conjunto de cuatro centros internacionales de investigación agrícola —el Centro Internacional de Agricultura Tropical (CIAT), el Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT), el Centro Internacional de la Papa (CIP) y el Instituto Internacional de Recursos Fitogenéticos (IPGRI)— y los institutos nacionales y ministerios de agricultura de Honduras y Nicaragua, con el apoyo financiero de la Agencia Canadiense para el Desarrollo Internacional (CIDA) y de la Agencia Estadounidense para el Desarrollo Internacional (USAID).

De inmediato la Cruz Roja Centroamericana se puso en contacto con el coordinador del proyecto y lograron obtener mil quintales para repartir entre los agricultores más pobres, los cuales fueron identificados de acuerdo con unos criterios previamente establecidos.

Andrew Pinney, quien fue coordinador del Programa de Regeneración Agrícola de esa institución, dice que buscaban ayudar a la gente más vulnerable. "Llegamos a comunidades donde, después de 5 meses del huracán, nadie había llegado a ayudarles", comenta.

Estando en esa tarea, detectaron un problema en el sur de Honduras, donde hay tierras por debajo de los 300 metros y donde sólo siembran una variedad de frijol conocida como *alacín*. "Fue imposible conseguir esa variedad para repartirla entre todos los agricultores de esa zona", recuerda Pinney. "Entonces recurrí al Atlas de Honduras desarrollado por el CIAT".

"Aprovechamos muy bien esa base de datos para saber dónde se podía distribuir frijol rojo, de la variedad conocida como *tío canela*, porque no pudimos conseguir alacín para todos. Con esa base identificamos la población que vive entre 100 y 300 metros".

"La gente del sur de Honduras, aunque no estaba acostumbrada a sembrar frijol rojo, pudo sembrar tío canela que aguanta la sequía... Lo distribuimos y pudimos aliviar el problema en esta área de tierras bajas y muy pobres".

"Yo tuve preguntas muy específicas y las obtuve del Atlas", anota Pinney. Y agrega:
"Andy Nelson, del CIAT, nos ayudó mucho. La gente en Honduras no tenía estrategias para ninguna de estas catástrofes".

PRESS RELEASES

FOR IMMEDIATE RELEASE

**Scientists Apply High-Tech Tools in Emergency Planning
for Rehabilitation of Agriculture in Honduras and Nicaragua**

CALI, Colombia - As massive quantities of humanitarian aid reach Central America in the aftermath of hurricane Mitch, agricultural experts in Honduras and Nicaragua are applying high-tech tools to prepare for the rehabilitation of crop production in these countries.

Their most powerful technological aid in this task is GIS, or geographical information systems. These consist of advanced computer tools and techniques for transforming complex data into forms that people can easily visualize. With a GIS users can draw different sets of information from electronic databases and then combine or overlay the data on maps.

One such tool is a digital atlas of Honduras, which was developed by the International Center for Tropical Agriculture (CIAT) with Swiss government support. It contains information about topography, drainage, soils, crops, roads, and other features of the nation's rural landscape.

With Canadian help, CIAT scientists are now incorporating new maps into the database that give a clearer picture of the hurricane's disastrous consequences for agriculture. The maps were derived from images provided by satellite radar, which can penetrate darkness and cloud cover, explains GIS specialist Gregoire Leclerc.

To capture images of Honduras and Nicaragua, the countries hit hardest by Mitch, the Canadian Space Agency reprogrammed one of its satellites on the Friday after the hurricane hit. A Canadian company then transformed the images into maps and provided them to CIAT scientists in Honduras.

Based on the GIS images, planners of relief efforts are pinpointing areas on a national basis where flooding and landslides have destroyed crops, says Leclerc. "They're also identifying the rural communities that have been most isolated by the hurricane's destruction," he adds.

"Our work on GIS forms part of research aimed at reducing poverty and improving the management of natural resources in Central America," says Jacqueline -Ashby, a research director at CIAT. "But clearly GIS is also of immeasurable value in an emergency like this one. We're making every effort to ensure that our national and international partners have the GIS tools they need to orient efforts for helping rural communities rebuild their lives."

"We need this kind of support more than ever," wrote Eduardo Marín, Director of Planning in Nicaragua's Ministry of Agriculture, in reply to an offer to install and provide training in the use of new GIS equipment.

"In the hands of local and international institutions, GIS will guide efforts to bolster farmers' seed supplies and restore access to markets for their produce before the next growing season," notes Miguel Ayarza, the agronomist who coordinates CIAT's work on hillside agriculture in Central America.

"Getting basic food production back on its feet is vital for avoiding major food shortages next year," Ayarza says. He estimates that as much as half of the country's maize, bean, and rice crops may have been lost.

Ayarza, Leclerc, and other CIAT scientists are taking part in emergency planning meetings, together with local organizations and international institutions, such as the Inter-American Development Bank (IDB), at the invitation of the Ministries of Agriculture in Honduras and Nicaragua.

One initiative being planned, Ayarza notes, will involve large-scale production of seed of major staples, principally beans and maize. The seed would then be distributed before next May to farmers whose crops were destroyed by wind and flooding. Seed multiplication would take place under irrigation during the dry season (from about December to March) at experiment stations in Honduras and neighboring countries.

CIAT coordinated a similar project, called Seeds of Hope, in Rwanda during 1995-96, after ethnic genocide, civil war, and the flight of refugees disrupted the harvest of beans, sorghum, and other food crops.

CIAT is a nonprofit, nongovernment research organization dedicated to alleviating hunger and poverty and to protecting natural resources in the tropics. It is one of 16 international centers sponsored by the Consultative Group on International Agricultural Research (CGIAR), an association of nations and international agencies that fund research for development.

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Instituciones de Honduras reciben Atlas CD para reparar estragos del huracán Mitch

Una versión actualizada y computarizada del Atlas de Honduras, donde se incluyen datos posteriores al desastre provocado por el Huracán Mitch, fue liberado a finales de enero pasado en Tegucigalpa y entregado a 15 instituciones locales que están trabajando en la restauración del país.

El Atlas CDrom, conocido como "Atlas Mitch", fue elaborado por el Centro Internacional de Agricultura Tropical (CIAT), con sede en Cali, Colombia, como respuesta a la alta demanda de información que generó el pasaje del huracán.

El CIAT, que viene trabajando desde hace varios años en diferentes proyectos con las comunidades rurales hondureñas, ya había lanzado una primera versión de este atlas en octubre de 1998. Tras la arremetida del huracán, los expertos en Sistemas de Información Geográfica (SIG) del CIAT agregaron a la información existente, datos relacionados con el estado de la infraestructura vial antes y después del Mitch, proyectos, lugares de ayuda y donantes, ubicación de hospitales, áreas pobladas destruidas, áreas de siembra afectadas, distribución de la pobreza.

"Ante la premura originada por las circunstancias, recurrimos a datos proporcionados por los medios de comunicación y por algunos socios del CIAT en Honduras", dijo Gregorio Leclerc, especialista en SIG. Algunos de los mapas incluidos en el Atlas se obtuvieron de imágenes proporcionadas por Radarsat, un satélite canadiense que toma imágenes de radar de la superficie terrestre, penetrando la oscuridad y la capa de nubes.

"Es una herramienta valiosa y un gran esfuerzo que tenemos que reconocer; será de gran ayuda para nuestro país", dijo Roberto Galeano, de la Secretaría de Recursos Naturales y del Ambiente de Honduras, que estuvo presente durante la entrega de esta nueva versión.

El Atlas Mitch será utilizado para el proyecto "Semillas de Esperanza para Centroamérica", promovido por el CIAT y otros centros auspiciados por el Grupo Consultivo para la Investigación Agrícola Internacional (GCAI).

Junto con instituciones nacionales, ONG y grupos de agricultores, el programa multiplicará cantidades apropiadas de semilla de los principales alimentos básicos, como frijol, maíz y papa. Antes de finalizar este trimestre se estará distribuyendo la primera semilla a los pequeños agricultores en aquellas áreas de Honduras y Nicaragua donde la agricultura fue más azotada.

"El Atlas ayudará a determinar la población objetivo y los lugares exactos donde irá la ayuda en semillas de maíz, frijol y papa", dijo Miguel Ayarza, ingeniero agrónomo que coordina el trabajo que realiza el CIAT sobre agricultura de laderas en América Central. "La recuperación de la producción de alimentos básicos es decisiva para evitar que haya una significativa escasez de alimentos en 1999 y más allá", advirtió.

El CIAT coordinó un proyecto similar, llamado Semillas de Esperanza, en Ruanda durante 1995 y 1996, después de que el genocidio étnico, la guerra civil y la fuga de los refugiados destruyeron la producción agrícola del país.

Los otros centros internacionales que están participando en Semillas de Esperanza para Honduras y Nicaragua son el Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT), el Centro Internacional de la Papa (CIP) y el Instituto Internacional de Recursos Fitogenéticos (IPGRI). Los cuatro centros son organizaciones de investigación no gubernamentales, sin ánimo de lucro, dedicadas al alivio del hambre y de la pobreza y a la protección de los recursos naturales en el trópico. Forman parte de los 16 centros internacionales auspiciados por el Grupo Consultivo para la Investigación Agrícola Internacional (GCAI), una asociación de naciones y de organismos internacionales que financia la investigación para el desarrollo.

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Seeds of Hope for Central America

An act of solidarity in the wake of hurricane Mitch

Central America will never be the same after the tragedy of hurricane Mitch. The disaster left scars on the land and in the memories of thousands of people, who witnessed nature's fury as it destroyed their hopes and dreams.

Humanitarian aid from around the world was not long in arriving. For weeks on end, the victims received food and shelter. Eventually, the emergency aid diminished, though, as the region returned to "normality." But widespread devastation in the countryside, especially in Honduras and Nicaragua, ensured that the following months would bring new and perhaps greater hardships. With the harvests of food crops partially destroyed--and with them much of the seed for the next planting--the specter of hunger lay in wait.

Emergency seed relief

To help ward off this threat, four CGIAR centers proposed an emergency seed relief project similar to that carried out in Rwanda after ethnic genocide, civil war, and a massive refugee exodus shattered the country's agricultural production in 1994. Under the Central American initiative, CIAT, the International Maize and Wheat Improvement Center (CIMMYT), the International Potato Center (CIP), and the International Plant Genetic Resources Institute (IPGRI) have joined forces with a wide array of government nongovernment, and grass roots organizations in the region.

The project is organized in three stages, the first two of which involve multiplication and targeted distribution of seed in 1999 through networks of national institutions, nongovernment organizations, and farmer groups. This work is being funded by the Office of Foreign Disaster Assistance of the US Agency for International Development (USAID) and by the Multilateral Programs Branch of the Canadian International Development Agency (CIDA). A third phase will involve longer term efforts to strengthen the informal seed systems of small farmers.

A digital Mitch atlas

Practically from the moment the disaster struck, specialists in geographic information systems (GIS) played an important role, offering tools of practical value to the many national and international organizations engaged in relief efforts.

In January of this year, CIAT scientists supplied a "Mitch Atlas" on CD-ROM to 15 institutions in Honduras. It built on a Honduras atlas that had already been released in October 1998. After the hurricane swept through the region, GIS experts at CIAT added new information indicating the condition of roads before and after Mitch, relief efforts under way in specific areas, locations of hospitals, damage to crops, the distribution of poverty, and other information pertinent to relief efforts.

“The Atlas is a valuable tool; we recognize the tremendous effort it represents,” says Roberto Galeano of the Honduran Secretariat for Natural Resources and the Environment. One immediate use of the Mitch Atlas will be to help target the distribution of seed supplies to the farming communities that need help most urgently.

Gathering momentum

As the project has gathered momentum in recent months, new partners have joined the effort. One of these is the Central American Red Cross, which is committed to distributing 45 tons of improved seed produced during the project's first stage to the poorest, most remote areas. “The assistance of Red Cross is especially valuable because of its wide coverage of the region,” says Guillermo Giraldo, coordinator of the Seeds of Hope Project in Central America.

In May, after seed supplies are delivered for the year's first planting season, hope will sprout again in hundreds of rural communities across Honduras and Nicaragua. And solidarity will be the fertilizer that helps it grow.

(Contact: j.sanz@cgiar.org)