Quick Response Report #123

'THERE'S A BIG WIND A COMIN': A PROFILE OF SURVIVAL AND THE CULTURE OF RESPONSE AFTER HURRICANE MITCH ON ISLA GUANAJA, HONDURAS

Gerald Krausse
Department of Marine Affairs
Washburn Hall Room #303
University of Rhode Island
Kingston, RI 02882
(401) 874-4043
and
Christopher L. Dyer
Department of Marine Affairs
Washburn Hall Room #304
University of Rhode Island
Kingston, RI 02882
(401) 874-4042

2000

[Return to Hazards Center Home Page]

[Return to Quick Response Paper Index]

This material is based upon work supported by the National Science Foundation under Grant No. CMS-9632458. Any opinions, findings, and conclusions or

recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

'THERE'S A BIG WIND A COMIN': A PROFILE OF SURVIVAL AND THE CULTURE OF RESPONSE AFTER HURRICANE MITCH ON ISLA GUANAJA, HONDURAS

Mitch came down, raised the rain
The people run from house to house
With heavy screams, they fell on their knees
And said, "Dear Lord, please end this rain and breeze!"
Lord said, "No! No! No!," and
He run it for three more days.

Now that five months have passed,
All they do is drink and blast.
The fellows sleep with a troubled brain,
Determined they are livin' on a hell-bound train.

Orin Ebnks (Mangrove Bight)

INTRODUCTION

The frequency and destructive power of severe weather events is demonstrating a globally upward trend, and Hurricane Mitch was an example of this trend. Mitch began as a small tropical atmospheric disturbance off of east Africa and by October 21, 1998 had become a tropical depression. By the next day, winds had increased to about 45 miles per hour when the U.S. National Hurricane Center upgraded this weather system to a tropical storm. On October 24, Mitch was elevated to a full-blown hurricane with winds of up to 90 miles per hour heading toward Cuba and Jamaica. The following day, the storm veered westward toward the Yucatan Peninsula, threatening the coast of Belize and Mexico. By Monday, October 26, Mitch had become a true monster with 180 mph winds, and the eye of the storm was located just 100 miles off the coast of Honduras. The barometric pressure at the center - a measure of intensity - fell to 905 millibars, tying it with Camille in 1969 for the fourth strongest Atlantic hurricane on record. The U.S. National Weather Service labeled Mitch "a Category 5 storm, joining Gilbert of 1988,

Allen of 1980, and the unnamed Labor Day hurricane of 1935 as the strongest Atlantic storms of the century" (*The Boston Globe*, 1998).

As Mitch crashed into Central America, it became the deadliest western-hemispheric weather event of the century, resulting in over ten thousand casualties in the Central American countries of Honduras, Nicaragua, Guatemala and surrounding areas (Fig. 1). Many of the casualties werer due to mudslides induced by torrential rains. Additional tens of thousands died weeks and months after the event from disease and malnutrition, particularly in rural hinterland areas of Honduras cut off from adequate food, water, and medical supplies (*Oliver-Smith, 1999*). One of the areas hardest hit by the hurricane was the Island of Guanaja off the north coast of Honduras. Based on our observations of the island's damaged infrastructure and the importance of fishing and tourism, we decided to conduct more extensive field work in Guanaja and, more specifically, in the community of Mangrove Bight. While the nearby islands of Utila and Roatan went virtually untouched, Guanaja experienced winds of 200 mph for an unusual 45 hours directly over the island. This report describes the impacts, survival, and the culture of response to Mitch and its aftermath for Guanaja. We also propose that recovery from this event illustrates the Phoenix Effect in that a strong relationship of island folks with the Seventh Day Adventist church tied them into an international recovery network that allowed for an effective recovery process (*Dyer, 1996; Dyer, 1999*).

RESEARCH METHODS

The goal of our field research was to document the impacts of Mitch on the coastal population, local marine resources, and tourism infrastructure. We conducted interviews with various groups, among them coastal residents, fishermen, local government officials, aid workers, and recreational business operators. We also designed a brief questionnaire in both Spanish and English that covered pre- and post-hurricane conditions of residents in the village of Mangrove Bight, Guanaja. This questionnaire was distributed to 165 families in the community. Interviews were conducted at the local schoolhouse, which remained standing after the storm. The survey identified socioeconomic and demographic data, residential characteristics, the nature of damage caused by the storm, sources of assistance, people's perceptions of the event, as well as psychological harm inflicted upon individuals. Some preliminary aggregations of the data are presented in this report. Recordings of key respondents have been transcribed and appropriate quotations are inserted in the text. In addition, photographs, video footage, and mapping techniques were used to document the changes and transformations caused by the hurricane. A 20-minute video on *Mitch Over Guanaja* will be made available early in 2000 to the Natural Hazards Research and Applications Information Center. Local newspaper articles, conversations with aid agencies, and internet data bases served to supplement the information collected on site.

OVERVIEW AND ITINERARY

Initial contacts were made in San Pedro Sula, the largest municipality close to the northern coast. Locally, the hurricane brought severe flooding from nearby mountains. The airport was under eight feet of water at the height of the flooding, and many homes and businesses in the city were destroyed from overflowing rivers. From San Pedro, we took the coastal road to Puerto Cortez, the major commercial port of the country near the border with Guatemala. In March 1999, most of the areas around Puerto Cortez could be described as "recovered." However, along the road west of Puerto Cortez to Omoa and Masca virtually every bridge had been completely or partially destroyed, and banana plantations remained unproductive. Much the same situation revealed itself on route east to La Ceiba. Fortunately, loss of life and other impacts from the hurricane were much less severe on the coast than in the interior of the country.

Puerto Cortez is the transshipment port for the country's pineapple, banana, palm crop and other agricultural products. Loss of 90% of the annual crops through flooding had destroyed this commerce, and many empty trucks and their flatbeds cluttered the port area. Truck drivers for Chiquita and Dole hung out at local boarding houses with no prospects for the season. There was only light traffic on the roads to the port, which is usually crowded with major commercial transport. For smaller towns along the rivers, bridge washouts and channelization threatened commerce and destroyed structures in the floodplain. Cattle and other livestock were washed away, and people could not get to areas across swollen rivers for several weeks. In selected areas, repairs were underway, not with government or foreign aid, but with the help of regional construction companies from San Pedro Sula.

In La Ceiba, the major coastal city to the east in the Departmento de Atlantida, a major bridge, built in 1910 by the United Fruit Company, was washed out, cutting La Ceiba off from towns and commerce with Truillo and from areas farther east including the Departamentos de Colon and Gracias de Dios. People desperate for news of family across the river tried to cross, but were turned back by the swollen torrent. One man was washed away in his attempts to forge the river. Eventually, a rope bridge was strung across, allowing passage of people and food stuffs from one side to the other. As of March 1999 when we arrived, the bridge remained unrepaired. In the Departmaneto de Colon east of the bridge, some coastal Garifina settlements were reportedly buried under mud, and in Gracias de Dios settlements of Miskito Indians were cut off and stranded in the labyrinth of coastal wetlands and winding rivers.

THE ISLAND OF GUANAJA: THE RESEARCH SITE

After this reconnaissance of coastal Honduras, we set off by plane from La Ceiba to Guanaja, reported to be the site of major impacts from Mitch. Guanaja was also selected because of its draw as a major tourist destination and commercial fishing center. Guanaja is an island some 55.6 km square; it has a population of nearly 10,000 people living in several villages, the major ones being The Key, followed by Savannah Bight and Mangrove Bight. The island became a municipality in 1887; however, its inhabitants mark at least three hundred years of occupation. Islanders represent an ethnic mix of descendents of English sailors, mestizos, Garifina, and the Carib Indians. This mix can be seen in the diversity of hair, skin, and eye colors, with both dialect English and Spanish widely spoken by many people.

Guanaja is also the home of a vibrant fishing industry which, together with tourism, makes up the mainstay of the local economy. The Key (also known as the town of Bonacca) is a community built on coral cays; it is the commercial hub of the island and has grown to a population of close to 6,000. It is the port for a deep-water fleet of around 50 vessels that target lobster, finfish such as snapper and sea bass, and shrimp. One observer describes the fishing industry this way:

> Demands of the people have gravitated towards the sea, towards fishing . . . The golden days were the early 50s. That was when some of the first generators came out here - shrimp boats, and ice-packing plant, that kind of thing. It's still looking at fishing; they're waiting for that next big catch that's going to take everybody out of debt so they can pay off their boats. Tourism is second fiddle.

Fishermen target nearshore stocks with smaller (25-foot) vessels, but larger vessels go far out to sea on trips that can last one or more weeks and may travel many hundreds of miles from Guanaja looking for lobster, fish, and shrimp. Most of the fleet was out at sea when the storm hit, and, as such, only two vessels in The Key were lost. Other impacts on the fishery included damage to piers and fishing boats in the nearby communities of Savannah Bight and Mangrove Bight. More importantly, fishery impacts associated with Mitch included hefty licensing and inspection fees, which were due right after the storm event. This was a hardship when one considers that virtually all fishermen were unable to go fishing for months, and, instead, they had to spend money in order to have their vessels repaired. In Mangrove Bight, all of the commercial vessels experienced some damage, in some cases enough to require major repairs. For example, two vessels had fiberglass hull and deck damage that required months to repair. Those vessels considered sea worthy are currently being used to ferry people and supplies to and from the Key and the airport.

TOURISM ON GUANAJA

Every visitor destination possesses recreational resources that become the catalyst for the development of a tourist industry. In Guanaja, the main attraction is an extensive but discontinuous barrier reef system which rings the island (Fig. 2). Scuba diving and spear fishing consequently have become the single most important visitor activity promoted by resorts ideally positioned near the best dive sites. A quasi-marine-protected area has been established as well, in an effort to develop some sort of stewardship for those critical marine resources on which the industry now depends. Within the 45 km of shoreline, however, Guanaja is not blessed with wide, sandy beaches suitable for swimming and sunbathing. According to one source, only 10% are classified as high-quality recreation beaches (*Sorensen, 1992, p. 14*).

On the terrestrial side, the island biota has a great deal to offer to visitors who are not marine oriented. The highlands are accessible by a 35-mile trail system that reaches Michael Rock Peak (1,370 ft.), the highest elevation on Guanaja. The upland vegetation includes pine savannah and semitropical dry forests on the lower slopes. In the coastal zone, mangrove stands, palms, and gumbo-limbo trees can be seen from the hiking and riding trails. During the wet season, the

island biota is further enhanced by several endemic species of orchids, small reptiles, and amphibians.

According to the official travel guide of 1999, Guanaja has about 20 visitor accommodations, the largest of which provides full services for dive tourism. In all, there are 170 rooms available on the island, primarily located in The Key, where the only shopping and communication facilities are available as well. The two upscale resorts, Bayman Bay Club and Posada del Sol, provide a wide variety of water-dependent activities, while some of the smaller hotels may offer horseback riding, water taxis, and nature tours. Finally, the only regular service available to tourists arriving on the island is by domestic air service. From the landing strip, water taxis will transport visitors to their destinations; there are no cars on Guanaja.

EFFECTS OF HURRICANE MITCH ON TOURISM RESOURCES

Marine Resources

The impacts on the marine environment due to the storm have been extensive, but to what degree specific sites or resources have suffered is difficult to measure. Fishermen, dive instructors, and water taxi operators all have their own opinions, often contradictory. Collectively, these observations, together with our own site inspection, allowed us to reconstruct a general assessment of the changes in fish and coral conditions in nearshore waters.

No coral reef structure around the island of Guanaja has entirely eluded the forces of Hurricane Mitch. Factors such as depth, exposure to wave action, and type of coral are often responsible for the degree of destruction. It should also be pointed out that some of the reef damage is not "fresh" and may, in fact, be the result of heavy dive pressure over time. As such, it would require a greater in-depth inspection and knowledge of pre-hurricane conditions in order to determine the full extent of marine resource damage.

A rapid assessment of selected reef sites on the leeward side of the island indicates that for massive formations, scoured and scared surfaces appear to be the most common feature. Hard coral species, such as brain or star coral, were bleached in patches ranging in coverage from 50% to 80% where the storm approached the island. Violent groundswells caused by Mitch also stirred up tremendous amounts of sand and silt, which remains in suspension and may have settled in areas of healthy coral cover. Soft Gorgonian species in shallow waters, particularly on the windward side, have been ripped off from their substrata and deposited on beaches in notable quantities. Breakage of coral heads and pinnacles has been reported by divers in water of 25 feet or less. In these waters, six out of eight mooring buoys were damaged or destroyed by a storm surge that, according to witnesses, rose 15-20 feet above sea level.

When asked about the current status of reef and fish habitats, fishermen refer to them as "cleaner" than before the hurricane. Our search for an explanation of such observations revealed

a decrease in seagrass beds and algae cover. This reduction in food sources and habitat cover corresponds well with the absence of fish in general. However, some species reportedly have increased, and their size is larger, according to some respondents. It is certainly possible that changes in habitat can lead to subsequent changes in the composition and diversity of species. It is likely that the "larger" individuals may have colonized reefs after being displaced from similar habitats by the storm.

Terrestrial Resources

The persistently strong winds of Hurricane Mitch stripped the island of much of its vegetation cover, which caused severe erosion and landslides on steeper slopes. Whatever foliage remained was ultimately killed by saltspray or leaf damage. Across the interior highlands, the Caribbean Pine stands described by Columbus in 1502 as "incredibly green and fertile" (*Jacobson, 1992, p. 12*) were heavily damaged, uprooted, and predominantly brown in color. Residents who frequently walk between Mangrove Bight and Savannah Bight reported seeing no birds, insects, or small mammals in the aftermath of the hurricane. Sections of the hiking trails are still impassible because of fallen trees and soil erosion and may require extensive repairs. There are, however, signs of recovery in the vegetation cover. Three months after Mitch, deciduous and coniferous trees showed some regrowth, and palms are putting out new fronts. On the ground, the additional sunlight has encouraged pioneering species to invade the forest floor. Yet, the mangrove forests in the coastal margin have shown very little recovery even six months after the disaster. Long-term defoliation may have significant ecological effects on commercially valuable fish species in the nearshore environment.

COMMUNITY IMPACTS WITH EMPHASIS ON MANGROVE BIGHT

When the hurricane was reported heading towards Guanaja, most residents stayed, mainly because there was no time to leave, there was no efficient means to get off the island, and the experience of islanders lead them to believe they could survive the storm. Given the force and duration of the winds, it was surprising that only eight people died on the island. In Mangrove Bight, not a single individual was killed, but the community was essentially destroyed by a thirty-foot storm surge. Residents described the event as unusual in its power and duration:

> The winds were way over 200 miles an hour, and the weather bureau in Miami claim no. But we had two wind gauges out here - one of them was clocking 265 when it broke. The other one was on a shrimp boat and that broke around 200 and something. The radar on that shrimp boat was just spinning around. That's hard to turn against those gears. That thing was spinning. They said it was just 195. Well, they wasn't here!

In Mangrove Bight, the storm struck quickly. By 10:00 a.m. on the 27th the tidal surge had started to take out structures:

> We were livin' in my sister-in-law's house, and the water just started a comin' in. But it didn't give us time to save anything. We had to move real fast, and the waves just took the house right out. Water was coming in the front when we was going out the back. We had to run up that hill there, but we moved real fast. We ran down the road towards the airport, and laid down in the field. People was blowin' around in the field. My sisters boy had his school pack on, and the wind picked him up and blew him towards a barb wire fence. The pack flipped off just then, and he was saved. We ended up huddled in a little A-frame under some trees . . . Some of us tried to leave and get to Savannah Bight, but the wind, he just pushed us right down, and we lay flat most the night right up in that field - no food or water. There was two pregnant women blowin' around in that field - both our babies survived, but five others staying in houses had miscarriages. Nobody died in that field. My baby boy - that is why I call him little Mitch.

Thirty people survived the hurricane, exposed on an abandoned airfield between Savannah and Mangrove Bight, and despite the overall destruction, miraculously no one was killed in the community. People ran from one home to another on the waterfront, and all of them moved to the more permanent structures on the shore. One large house owned by a Canadian and perched up on a hill away from the beach became a safe haven for many. People traveled from Mangrove Bight by holding onto palm trees and running between the strong gusts from tree to tree. Over three hundred of the local residents ended up in this large, open house. They stayed there through the next day, standing room only, in the dark, with nothing but crackers to eat and water from plastic jugs to drink.

Others survived in the kindergarten and in the few remaining houses back from the beach not taken out by the storm, and five people made it through in a drainage pipe near the school. Seven families rode out the storm in their fishing boats on the canal that bisects the island:

> We took our boat with others up into the canal to ride out the storm. The wind was blowin' real bad, and the surge lifted us up and down in the canal. We was tied off in the middle of the canal, but one of the boats got hung up in the mangrove there. It was real, real bad, and I prayed to Jesus to help us. But after the storm we felt lucky, because we had food and supplies on the boat. When we got back to the Mangrove Bight, we could see that nobody had anything left - at least we were lucky that way.

Of the 173 structures present before the hurricane in the community of Mangrove Bight, only 27 survived, and all of these experienced some degree of damage. The majority were washed out to sea, or smashed onto shore, by the advancing storm surge that left Mangrove Bight buried in a twenty-foot wide debris field. Remaining structures were those built out of brick and cement (Fig. 3). All other wooden homes built on pylons over the water were totally destroyed, prompting a post-hurricane government regulation forbidding construction over the water. Nonresidential buildings destroyed or partially destroyed included a bar/dance hall, stores, a power plant, the kindergarten, the school cafeteria, a public primary school, the Seventh Day Adventist Church, warehouses, and a dive shop.

The average value of destroyed buildings was estimated at $11,000 U.S., while the total estimated value of destruction and damage to Mangrove Bight as a whole was approximately $2 million. Seventeen homes survived complete destruction, and of these all had partially damaged roofs or walls. Surviving homes in Mangrove Bight housed 7% of a total of 526 residents, leaving 83% homeless after the storm.

When Mitch moved onto the mainland by mid-day on October 28, residents of Mangrove Bight and elsewhere throughout Guanaja faced a bleak landscape of utter destruction. People were in shock when they first saw what had happened, and didn't know what to do:

> When we first came out, it was terrible to see. There was nothing left of the village. The remains were piled high all along the beach there, and it was dangerous just walking around because of nails and such. People started to look for things left from their houses, but it was a big mess - a lot of the houses had just disappeared - the sea took them. We had to walk up and down the piles just to get around. And all the beauty and green was gone - that was really shocking - all the trees gone and nothing left. See up on that hill, you can see the rock exposed there. Before Mitch you couldn't see that - it was all covered with trees. But we felt we were blessed - praise to God - nobody was killed - not a single soul lost here in Mangrove Bight - so you could say we were lucky.
>
> What was a real shock was to see all your friends' houses gone. If there's any joy that we should have in out hearts at this point is that we didn't have many people injured, and certainly very few dead.

As mentioned earlier, a household survey was conducted in Mangrove Bight in order to assess the cumulative effect and perception of people regarding specific characteristics of the hurricane event. In order to minimize damage and loss of life, communities need to be alerted as early as possible of the approaching calamity. For a remote island society, it was particularly important to receive advanced warning so that adequate preparation could be made. The survey indicates that the most inexpensive and convenient forms of communication were radio and contacts with friends and family (Table I). It also became clear from the contacts and conversations we had with other people that the event was the worst they ever experienced and that everyone, particularly children, was significantly traumatized by it. The results of inquiries regarding their worst fears about the effects of Hurricane Mitch are shown in Table II. As is evident, the people experienced multiple anxieties, especially those generated by forces of the storm and the consequences related to property damage. Numerous respondents indicated that children continue to have nightmares, and any inclement weather is seen as another hurricane. As far as can be determined, there is no assistance available on the island for people to deal with psychological scars brought about by Hurricane Mitch. In fact, the only medical assistance of any significance was provided by a British cruiser, the Sheffield, and a rescue mission from the Cayman Islands.

As to the general perception of their lives before and after the hurricane, we asked respondents to judge their conditions on a scale of 1 to 10 (where 1 is the worst, and 10 the best condition). The

findings indicate a dramatic decline in their perceived and actual standard of living as people experienced the effects of this calamity over a year's period (Table III).

CULTURE OF RESPONSE

The study of disaster response has generally focused outward on human responses to disaster events, vulnerability, and power in disaster impacts on marginal peoples and social and psychological recovery processes (*Oliver-Smith, 1996*).

Another aspect that is revealed by disaster is the influence of the political ecology on disaster response, which can determine when, where, and how much aid is directed to a particular area, population, subculture, or minority group.

Political ecology also engages competing interests in contested interpretations of power (control of resources). Disaster events bring to the fore the struggles of communities to maintain power. Power relationships work themselves out within the place and space - the territories - of communities. Communities whose culture primarily depends on natural resources for survival are ecosystem linked, meaning the health and sustainability of economy or community power is linked to the renewability of the natural resource base. This is the case in Guanaja, where fishing resources provide the primary form of subsistence. Tourism is a secondary resource for the communities on the island, and recovery of local marine and terrestrial resources is crucial for tourism.

Territorialization of community space seldom follows the natural contours of ecosystems, political entities often do not control key elements or parts of ecosystems upon which they depend. If an ecosystem is pulverized by a disaster event, as Guanaja was, the territorial (community) space can lose both economic and ecological viability, and recovery can be difficult or impossible without external assistance. Thus, response to disasters involves the political ecology and ethnohistory of human populations under disaster conditions and is impacted by social and economic factors which combine to create what is identified as the "culture of response."

The culture of response emerges from underlying traditional structures that have evolved as adaptations to disaster. Torry (1978) points out that many adaptations - or maladaptations - of the culture of response can influence the recovery process. Examples include administrative inefficiency, which retards recovery (*Baldassaro, 1975; Levine, 1995*), fatalistic belief systems that jeopardize life (*Sims and Bauman, 1972; Kates, 1971*), and alien technology introduced to regulate hazards that pose new sources of danger (*Flannery, 1972; Lees, 1975; Reidinger, 1974; Obeng, 1977; Torry, 1979*).

The culture of response is also tempered by economics when power relationships dictate access to disaster recovery resources. Regarding vulnerability to disasters in Honduras, Guanaja is politically marginal and thus on the fringe of access to resources. The non-Catholic, Seventh Day Adventist, non-Spanish heritage of many islanders was also cited by several key informants as a

disadvantage when seeking help from the mostly Spanish-Catholic central government. This marginalization makes island residents extremely vulnerable to disasters such as Mitch, which overwhelm the ability of local recovery systems to respond to the basic and immediate needs of victims.

The ability of communities to independently rebound from a disaster has been identified as the phenomena of "amplified rebound." Amplified rebound or "Phoenix Effect" outcomes are most difficult to achieve if impacted communities lack resources and have a high number of lower- to middle-income residents. This scenario fits Guanaja, where most residents survive through fishing or tourism, and where most are not above lower-middle-income conditions, and put at risk because of the uncertainty involved in fishing and a general lack of government services such as health care or insurance of any kind. The Phoenix Effect is formally defined as:

> a sustainable improvement in the social and economic condition of a community or organization arising from the strategic investment of capital resources after a disaster event. (*Dyer, 1996, p. 35*)

To achieve this effect, the recovery projects chosen for funding must provide long-term social and economic benefits that have the potential to rebuild and restructure the local economy in ways that, prior to the disaster, might not have happened as quickly or at all. Hurricane Mitch devastated much of the Island of Guanaja, and little aid was forthcoming from the Honduran government for recovery (see Table IV).

The fishing families of Guanaja had no backup, no forms of insurance, and no direct means to replace the lost personal items, houses, and community infrastructure destroyed by Mitch. In a previous case study of the Phoenix Effect after Hurricane Andrew (*Dyer, 1999*), external aid came to communities in south Florida from established government agencies, such as the Federal Emergency Management Agency and the Economic Development Administration, that were mandated to provide such assistance. In Guanaja, the Honduran government operated under no such mandate, and provided little aid for recovery after Hurricane Mitch. The aid they did provide consisted of stipends for residents to remove the post-hurricane debris field in their own community, and of several teams of masons who brought their brick and cement working skills to help in the reconstruction of local schools. Further aid came from the government six months later, when a land grant provided 30 house lots to residents left homeless in Mangrove Bight.

We have documented other efforts of recovery from this event, particularly for Mangrove Bight, which lost 83% of its buildings and all of its social services. In fact, the houses being constructed by the volunteer church organizations are in some cases better than before. For example, houses are being constructed off the water, and a new housing area will give residents land and housing who before had no title to land and were in effect squatters over the water.

One key respondent was very involved in helping the U.S. recovery teams with logistics, such as food preparation and clothes washing for over a hundred youth volunteers who worked on site during July and August. Her efforts were rewarded by the construction of a house for her family out of sequence from the designated community reconstruction list agreed upon by residents. Before Mitch, her family lived on the water in the house of her sister-in-law; thus, she had no

place of her own. Her house now sits on a bluff near the northern end of the community with a scenic view of the bay below.

Mangrove Bight's remarkable recovery of infrastructure can only be explained by contacts with a network of church aid organizations, particularly the Cayman Island Mission of Seventh-Day Adventists and Global Challenge, Bozeman, Montana (U.S.), which is a cooperative group of church-related construction and contracting experts who donated labor, time, tools, and supplies to assist communities worldwide impacted by calamity. Thus, the connection of Mangrove Bight to this church organization (nongovernmental organization - NGO) resulted in a culture of response that mirrored what has been accomplished elsewhere with governmental funds. This means that by being affiliated with the Seventh Day Adventist Church, Guanaja residents were automatically perceived as members of a wider "family" from the resource-rich U.S. who had as a mandate the assistance of fellow church communities in the face of disaster anywhere in the world. The outcome is that the Phoenix Effect has been achieved in Guanaja not through government aid organizations, but through a religious aid organization. If Guanaja had been mostly Catholic and Spanish, without the 92% reported Adventists population, we hypothesize that they may not have received the infrastructure aid that they have.

We also hypothesize that Guanaja's non-Catholic and non-Spanish roots put the island residents in the class of a minority within one of the poorest countries in Latin America. Despite this, their personal toughness and their more direct connection to a wider religious network outside Honduras puts them ahead of less-fortunate, mainland agricultural communities in the recovery process, some of which are still without significant aid in the disaster landscape of post-Mitch Honduras.

CONCLUSIONS AND IMPLICATIONS FOR THE U.S.

Upcoming decades do not portend a lessening of the impact of hurricanes on island societies of the Caribbean and associated coastal areas of the U.S. Learning from the human responses to such events is critical to the future design and success of disaster recovery and mitigation of island and coastal areas. Surprisingly, Guanaja, Honduras, is recovering its infrastructure and tourist economy in a robust fashion, and the fisheries seem to have been minimally impacted by Mitch. Surprising because aid received from official government agencies has been slow or nonexistent. We speculated that the relationship of the island population with the Seventh Day Adventist Church allows for recovery via a strong church-related recovery agency. Without the connection to this agency, recovery of households and town infrastructure in villages such as Mangrove Bight would have proceeded very slowly, if at all. This example of the Phoenix Effect (*Dyer, 1999*) is unique because it illustrates how a nongovernmental organization (a church aid organization) can effect significant recovery from disasters; NGOs rarely have central roles in the recovery process in cases of widespread disaster such as that created by Hurricane Mitch. Moreover, this example shows the significance of extra-communal networks to the recovery process. Networks provide means to access extra-communal resources in the face of disaster. In Guanaja, we also see that participation by residents in their own recovery, from hauling bricks and clearing debris to rebuilding homes and businesses can be an opportunity for teaching and

learning new skills. External aid networks become crucial to disaster victims not well connected with local governments (as with Guanaja) or having weak central governments incapable of effective assistance.

Recent visitors, repeat visitors, or those who have settled in Guanaja from other countries have provided important links and initiatives for outside assistance and relief efforts as well. Inquiries have been received by the Guanaja Tourism Association from individuals in the U.S. requesting instructions as to how they can be helpful in providing support for the disaster victims. The Elderhostel is a nonprofit organization providing educational adventure to adults worldwide, and during hurricane Mitch it had groups on the island. Their academic itinerary allowed them to get a personal, intimate look at the disaster event and, at the same time, kept some tourist facilities operating in the wake of tourism slowdown after Mitch. Both of the largest resorts on Guanaja (Bayman Bay Club and Posada Del Sol) launched relief efforts for local villages by using their communication facilities to request donations from overseas. The people of Guanaja have shown great fortitude and self-reliance in dealing with the after effects of the hurricane and are looking to the U.S. not for handouts, but for the trust and commitment of the travel and tourist industry. They stand ready to offer the visitor their hospitality that, together with the travel industry in the U.S., can forge a partnership.

IMPORTANT LESSONS LEARNED FROM THIS DISASTER INCLUDE:

- Effective use of locals in their own recovery process gives them a sense of control important in the social and psychological adjustments to loss.
- Supporting external (nongovernmental) networks, if available, can lead to an improved recovery process on an appropriate (community-based) scale.
- Tourist resources can recover quickly from disasters if their base appeal (in this case, coral reef diving) is not significantly compromised, even if actual facilities may be seriously damaged.
- Establishing proactive ties to external support networks can act as a buffer towards potential future calamity.
- Paying for and training locals in basic construction skills and organizing them as construction and repair teams will speed recovery and create sustainable skills that can be used to generate income in the postdisaster economy.
- Tourist facilties in coastal areas could be designed to serve as disaster refuges for coastal inhabitants who have lost their permanent dwellings.
- Island governments should be linked to international aid networks, and those receiving recovery experience and aid at one site can be organized to respond to and aid others in the region when they experience a similar disaster.

ACKNOWLEDGEMENTS

We would like to express our gratitude to those who helped us by giving us direction, information, and assistance in getting around the island of Guanaja. Our special thanks goes to the people of Mangrove Bight and those who provided recovery assistance in times of greatest needs. Bill Smith (Global Challenge), Rosario de Bodden (Hotel Rosario), El Famosa Capt. Al (Hotel Airport), Sherlyn Jackson (surveys), Julius Rensch and Silvia Parchmon (tourism), Roberto Pino (Planning and Real Estate), Colonel Simpson (British Vessel, Sheffield), Elvia Wood Elvin (school teacher). Finally, we would like to acknowledge the support from the Natural Hazards Research and Applications Information Center, University of Colorado. Without their assistance, this research project could not have been carried out.

TABLES

Table I

Sources of Information About Hurricane Mitch

Sources*	N	%
National Radio	113	42.6
Friends/Family	75	28.3
Television	59	22.2
Newspaper	9	3.4
National Disaster Alert	4	1.5
Local Churches	3	1.2
Just Instinct	2	0.8
TOTAL	265	100.0%

*Respondents gave more than one answer.

Table II

Fears Experienced During Hurricane Mitch

Types of Fears*	N	%
Hurricane Winds	109	18.0
Torrential Rains	98	16.2
Flying Objects	85	14.0
High Tides	80	13.2
Garbage/Debris	71	11.7
Mud Slides	61	10.1
Erosion/Flooding	31	5.1
Other than the above	70	11.7
TOTAL	605	100.0%

*Respondents gave multiple answers.

Table III

Perception of Living Conditions Before and After Hurricane Mitch*

One year before Mitch	7.82	
Immediately before Mitch	7.96	
Immediately after Mitch		1.48
Five months after Mitch		4.43
One year after Mitch	7.19	

*Data is based on 165 respondents.

Table IV

Sources of Assistance Received

Sources*	N	%
Close friends	61	25.8
International Help	45	19.0
Family Members	39	16.5
Neighbors	37	15.6
Churches	32	13.6
Nobody	15	6.4
National Government	5	2.2
Local Government	2	0.9
Total	236	100.0

*Respondents had more than one answer

REFERENCES

Baldassaro, L. (1975). "Sicily's Earthquake Zone: Waiting in the Wreckage." *Nation*, September 13: 239-242.

The Boston Globe (1998). October 29, p. A22.

Dyer, C. (1996). *Assessment of the Economic Development Administration's Post-Disaster Recovery Program After Hurricane Andrew*. Bethesda, Maryland: Aquirre International.

Dyer, C. (1999). "Tell Them We're Hurting: Hurricane Andrew, The Culture of Response and the Fishing Peoples of South Florida and Louisana." In *The Angry Earth: Disaster in Anthropological Perspective*. New York: Routledge.

Flannery, K. (1972). "The Cultural Evolution of Civilization." *Annual Review of Ecology and Systematics* 3: 399-426.

Jacobson, S.K. (1992). *The Bay Islands: Nature and People*. Roatan, Honduras: Bay Islands' Conservation Association.

Kates, R. (1971). "Natural Hazard in Human Ecological Perspective: Hypotheses and Models." *Economic Geography* 47: 438-451.

Lees, S. (1975). "Oaxacc's Spiraling Race for Water." *Natural History*, April 1, 30-39.

Levine, I. (1995). "A View From the Field: Operation Lifeline Sudan." In *Retrospective DHA 1995: Coordination of Humanitarian Assistance*. New York: United Nations Department of Humanitarian Affairs.

Ministry of Tourism (1999). *Honduras Tips: The Official Travel Guide of Honduras* 6(1), Spring-Summer.

Obeny, L. (1977). "Should Dams be Built? The Volta Lake Example." *Ambio* 6(1): 41-50.

Oliver-Smith, A. (1999). Personal Communication.

Oliver-Smith, A. (1996). "Anthropological Research on Hazards and Disasters." Pp. 303-328 in *Annual Reviews in Anthropology*. Palo Alto, California: Annual Reviews Inc.

Reidinger, R. (1974). "Institutional Rationing of Canal Water in Northern India: Conflict Between Traditional Patterns and Modern Needs." *Economic Development and Cultural Change* 23(1): 79-104.

Sims, J. and D. Baumann (1972). "The Tornado Threat: Coping Styles of the North and South." *Science* 176 (June 30): 1386-1392.

Sorensen, J.C. (1992). *A Plan to Establish, Develop, and Manage the Bay Islands National Marine Park* (Final Report).

Torry, W. (1978). "Natural Disasters, Social Structure, and Change in Traditional Societies." *Journal of Asian and African Studies* 13: 167-183.

Return to Hazards Center Home Page

February 18, 2000

hazctr@colorado.edu