

# **Humanitarian Operations in an Urban Environment: Hurricane Andrew, August-October 1992**

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In the early morning hours of 18 August 1992, a WC-130 of the U.S. Air Force Reserve's 815th Weather Flight, the "Storm Trackers," took off from Keesler Air Force Base (AFB), Mississippi, to gather data on an as yet unnamed tropical storm in the mid-Atlantic 1,000 miles east of the U.S. mainland. The National Hurricane Center (NHC) at Coral Gables, Florida, requested the mission to learn more about a growing storm then moving westward across longitude 55 degrees west.<sup>1</sup> The center named the storm, the first hurricane of the 1992 season, "Andrew." Hurricane Andrew became the most destructive and costly natural phenomenon in U.S. history. The U.S. military response to Andrew was the most extensive humanitarian and relief operation in a long history of providing comfort and assistance to the American people in times of need.

The Storm Trackers' mission on that August morning was only the first of more than two dozen missions into the eye of the storm. The trackers flew continuous missions, twenty-four hours a day, watching the storm grow in intensity and tracking Andrew's progress from the Lesser Antilles, across the southern tip of Florida, over the Gulf of Mexico, until it finally made landfall on the Louisiana coast, not far from Keesler AFB where the first mission originated. Each mission lasted ten to thirteen hours. The 815th first established a forward operating base on Antigua in the West Indies to be closer to the storm, then moved to Charleston, South Carolina. Personnel from the 403d Maintenance Squadron at Keesler struggled to keep the 815th aircraft in the air, working twelve-hour shifts without a break while their families in Biloxi prepared for the storm bearing down on their community.<sup>2</sup>

The timely and accurate information the trackers provided allowed authorities to make critical early decisions that undoubtedly saved many lives. A full twenty-four hours before Andrew made landfall in Dade County, just south of Miami, Florida's governor declared an emergency, initiated the first steps of an evacuation of the area in the

storm's path, and called up the first contingent of Florida National Guardsmen. Some of these 600 guardsmen would remain on duty for weeks, dealing with the aftermath of Andrew's rage.<sup>3</sup> The Guard performed yeoman duty assisting civil authorities in a variety of tasks, but most important, it performed a law enforcement role. The guardsmen patrolled neighborhoods ravaged by Andrew's 160-mile-per-hour (mph) winds, detained looters and other suspected criminals, directed traffic, and guided follow-on military units to critical locations. The Florida National Guard's training and knowledge were critical in dealing with the chaos Andrew created in more than half a dozen communities of south Dade County. The arriving Florida National Guard units, however, were merely the first act of a massive U.S. military response to the devastation Andrew left behind as it moved across south Florida.

Hurricane Andrew was the most destructive natural disaster ever to strike the United States. Cutler Ridge, Perrine, Kendall, Old Cutler, Country Walk, Homestead, and Florida City were in the 100-square-mile area in south Dade County that Andrew completely leveled. Another 200 square miles, including the cities of Miami and Miami Beach, suffered significant damage. Two dozen south Floridians lost their lives, and property damage rose to an estimated \$1 billion, although the total cost can never be accurately determined. Lost wages and earnings, business income, tax collections, tourist trade, and personal assets are incalculable. Perhaps more important, the psychological and spiritual damage to the residents of the stricken area who lived through the terrifying hours of the storm and its aftermath will require years, if not decades, to heal. Into this area of destruction where all public services had ceased to exist, U.S. military forces deployed hundreds, then thousands, of troops and vast quantities of equipment to deal with the crisis. The U.S. military response in south Florida in the days and weeks after Hurricane Andrew became the most extensive urban rescue and humanitarian operations in American history.

The primary responsibility for dealing with local crises and disasters in the United States, whether natural or man-made, historically fell on local authorities.<sup>4</sup> In all too many instances, however, local governments were unequipped to deal with other than minor situations. Local authorities were either too poorly organized, lacked adequate resources, or were simply overwhelmed by the magnitude of the disaster. Thus, state and local governments frequently turned to the militia and, later, the National Guard as the organizations most capable of handling large-scale emergencies. On some occasions, however, disasters were even beyond the National Guard's resources and abilities to deal with

the loss of life and disrupted public services. On those occasions when crises overwhelmed state Guard units, governors called upon the president to provide federal resources and manpower to assist local authorities or assume full responsibility for managing the crisis. Throughout the nation's history, the Regular U.S. Army troops responded to these calls for assistance and contributed both directly and indirectly to operations involving rescue, relief, security, and restoration of public services.

On numerous occasions in the nineteenth and twentieth centuries, the Regular Army answered the summons to assist or take control of humanitarian and disaster relief operations. For a number of reasons, military forces are better suited to deal with natural disasters and their consequences than are other government agencies. Among these reasons are leadership, experience, organization, equipment, a trained and disciplined force, and resources that are generally not available even to government agencies specifically created to deal with both natural and man-made disasters.

### **The Chicago Fire**

Perhaps the best-known natural disasters in the last 150 years of American history are the great Chicago fire of 1871, the Johnstown flood of 1889, and the San Francisco earthquake of 1906. In each of these cases, the government responded differently, depending on the presence of military units in the area and local commanders' leadership initiatives. A brief look at each of the disasters will demonstrate the absence of planning and preparations to deal with civil catastrophes.

By the middle of the nineteenth century, Chicago, with a population of 300,000, was a major business, communications, meatpacking, and manufacturing center. Ten railroads converged in Chicago, making it one of the nation's leading transportation hubs. Like most nineteenth-century American cities, Chicago's dwellings and many public buildings were wooden-frame, clapboard, shingle-roof construction. The city's fire department was barely adequate and struggled to keep up with the growth of an expanding metropolitan area. The fire that broke out on Sunday evening, 8 October 1871, in a cow shed behind a residence on Chicago's DeKoven Street spread quickly in the tinder-dry neighborhood of wood-frame buildings.<sup>5</sup> Within hours, the flames engulfed a vast area near the city's center. Lieutenant General Philip Sheridan, commander of the Division of the Missouri, whose headquarters, located across the street from Chicago's courthouse, was

destroyed early in the conflagration, responded quickly. He ordered troops at the local garrison to begin demolishing buildings in the fire's path to create a firebreak, keeping the fire to the north and saving the area south of Harrison and Wabash streets. The Army's work, however, had just begun.

By Tuesday, the fire had destroyed three and a half square miles of Chicago, killed several hundred residents, and left more than 100,000 people homeless and destitute. Thousands of hapless Chicagoans roamed the devastated city looking for food, shelter, and anything of value. Widespread looting and the near outbreak of riots prompted Chicago's mayor, Roswell B. Mason, to proclaim martial law on Wednesday and ask Sheridan to take charge of reestablishing civil order. Sheridan readily accepted the responsibility. He mustered a force of Regulars and local militia, subsequently called "Sheridan Guards," to bring order to the city and begin providing relief for the thousands of dispossessed. He ordered six infantry companies from Nebraska and Kansas to Chicago to patrol the city and set up relief centers. When this number proved inadequate, he ordered six more companies to the city, some coming from as far away as Kentucky. Sherman also provided hundreds of thousands of Army rations and thousands of tents and blankets to those in need of food and shelter.

Sheridan not only ordered his troops to arrest and detain looters and cutthroats but also cracked down on profiteers and others attempting to take advantage of the displaced population. Although martial law ended in Chicago on 23 October, fifteen days after the fire started, the Army continued to provide relief services for a considerable period thereafter. Despite the fact that Sheridan had initially acted on his own authority, his superiors, Commanding General of the Army William T. Sherman and President Ulysses S. Grant, fully supported his actions and authorized whatever military resources necessary to provide relief for the inhabitants of the burned-out areas.

### **The Johnstown Flood**

The story of the Johnstown flood offers a different perspective on the military's role in local disaster relief. On Thursday evening, 30 May 1889, a massive storm front moved eastward over the Allegheny Mountains and began to dump huge quantities of rain on an area from those mountains to New York City to the mouth of the Potomac in the east to the southern boundary of Virginia. By Friday, an average of 6 to 8 inches of rain had fallen on this vast area. Not a single community or

acre of ground was spared. Central and western Pennsylvania received the heaviest downpours. In some areas, the rain had fallen steadily at the rate of an inch an hour. One source estimated that 4.32 billion tons of water fell on 1,200 square miles of western Pennsylvania in less than thirty-six hours. With such a quantity of water, local flooding was predictable. As events were to prove, however, the consequence of so much water was the most disastrous and devastating flood in U.S. history.<sup>6</sup>

By Friday evening, many towns and villages along the Susquehanna River's tributaries, the West Branch, the Juniata, and the North Branch, were already inundated. Clearfield, Renovo, Lock Haven, Williamsport, and Montgomery, to name just a few of the towns along the Susquehanna system, measured high water above any previous flood levels. By Saturday morning, 1 June, most towns along the upper Susquehanna experienced flooding or effects of the rising water. Generally speaking, these towns and cities coped with the situation on their own. Few outsiders came to help them.

To the west of the Allegheny divide, a number of small tributaries converge to form the Allegheny River. The Allegheny flows westward to meet the Monongahela at Pittsburgh where the two rivers form the Ohio. Along the Allegheny's upper tributaries, scores of small cities and towns lie in the valleys and hug the steep riverbanks. The largest, and perhaps the most important, of the urban centers on the Conemaugh, one of three primary Allegheny tributaries, is the city of Johnstown. Located at the mouth of Stony Creek, Johnstown is the financial and cultural center of the area. At least a dozen other boroughs and incorporated communities along the Conemaugh and Stony Creek, including Cambria, Geistown, Millville, Prospect, Woodvale, Moxham, and Morrellville, are generally identified as part of Johnstown. In the 1880s, small factories, logging operations, mills, iron works, and rail yards sustained the region's population.

A half-century earlier the state of Pennsylvania had built a large earthen dam 16 miles upstream from Johnstown on the South Fork, another tributary of the Conemaugh, to supply water for the series of canals then used to move natural resources and finished goods between Pittsburgh and Philadelphia. The South Fork dam was 931 feet long, 272 feet wide at its base, 72 feet high in the center, and 20 feet across at the top. The dam compounded a reservoir of over 400 acres. In 1854, the first train crossed the Alleghenies on the newly opened Pennsylvania Railroad system between Philadelphia and Pittsburgh. Thereafter, the canal system declined, and the state increasingly

neglected to maintain the dam. The Pennsylvania Railroad purchased the dam in 1857 but performed little maintenance on it. The dam broke for the first time in 1862 but caused little damage downstream because the reservoir was only half full at the time. The dam was repaired, and the lake it formed served as a recreational area for summer visitors to the area. Twenty-seven years later the tale would have a very different end.

By noon on Friday, 31 May, several towns on the rail line along the Conemaugh and South Fork were flooded, and water was in some cellars and streets of Johnstown proper. The rain that was swamping towns and communities east of the mountains was also soaking the ridges and valleys to the west. The drainage into the South Fork reservoir was quickly overwhelming the dam's spillway, 9 feet below the crest of the dam. In spite of the fact that 6,000 cubic feet of water was going over the spillway every *second*, the water behind the dam rose at a rate of *10 inches per hour*. The pressure was too much. Just before 1500, the center of the dam gave way, and 20 million tons of water poured through a 430-foot-wide gap in the dam.

The distance from the South Fork dam to the Johnstown bridge is 16 miles, and the elevation drop over this distance is 400 feet. Down the narrow valley of the South Fork into the Conemaugh, a massive wall of water, estimated at 40 feet high, gathered speed and rushed headlong, breaking up and carrying away every man-made and natural obstacle that stood in its path. Trees, buildings, bridges, animals, locomotives, and human beings were swept along in the unimaginable torrent. Entire towns and villages disappeared. By the time the wall of water reached Johnstown, it had been reduced to perhaps 20 feet high. Nevertheless, the wave still contained enough energy that, as it washed through the city, it carried nearly everything in its path with it. It left only death and destruction behind.

Most of the 12,000 residents of Johnstown, completely disoriented and in shock, spent Saturday and Sunday searching the debris for the living and the dead, and trying to come to grips with the enormity of the disaster. Not until Sunday evening, 2 June, did the local sheriff appeal to the governor of Pennsylvania for troops. The next day, 3 June, the 14th Regiment, Pennsylvania National Guard, was ordered to Johnstown. Five hundred fifty guardsmen of the 14th eventually arrived in the Johnstown area. They provided security details to protect property; set up tent villages for survivors; fed up to 30,000 people per day (including thousands of civilian laborers who came into the area); and supervised the clearing of streets, repair of public buildings, and

reopening of the railroads. The 14th Regiment remained in Johnstown until 13 July when all but one company departed the area. The remaining company stayed in Johnstown throughout the summer.

Unlike Chicago, no Regular U.S. military units were stationed near Johnstown. Response to and relief of Johnstown arose largely from local and state committees and agencies. Businesses and industries, especially the railroads, that operated in the devastated area provided most of the resources for clearing roads, streets, and the remaining bridges and brought in food, clothing, and other necessary relief supplies at their own expense. The federal government provided little other than its good offices and offers of moral support to the relief effort.

### **The San Francisco Earthquake**

A third example of the U.S. Army's response to an urban crisis was the San Francisco earthquake and fire of 1906. The Army's role in the San Francisco disaster left a legacy of controversy.<sup>7</sup> To some, Brigadier General Frederick Funston was a hero for his quick and timely reaction to the geological upheaval that engulfed San Francisco a little after 0500 on Wednesday, 18 April 1906. During the following days, Funston created a reputation among many Americans for decisive decisions and inexhaustible leadership under pressure that established him as one of America's leading soldiers. To others, Funston far exceeded his position or authority and unleashed on the citizens of San Francisco bands of undisciplined, untrained, poorly led troops who harassed and murdered innocent people going about their legitimate tasks. The truth may, perhaps, lie somewhere between these two positions, but the alternative to Funston's action was inaction and chaos.

The city of San Francisco occupies one of the most beautiful pieces of terrain in North America. Situated on the west littoral of San Francisco Bay, San Francisco was the largest U.S. city west of the Mississippi River in 1900. The San Andreas fault (actually not a single fault line but a zone of faults) extends from the north-central California coast about 200 miles north of San Francisco, through the San Francisco peninsula, southeast to the Gulf of California. Frequent activity (at least in geological time) along the San Andreas line has shaped and reshaped the California coastline for millions of years. In the early morning hours of 18 April 1906, movement of the great plates hundreds of feet below the surface of the earth sent a tremor of enormous magnitude racing along the fault line from north to south at more than 7,000 mph. In the

few seconds the shock wave passed through San Francisco, scores of buildings collapsed or were shaken from their foundations, and water and gas mains under the city streets were wrenched apart, twisted, and broken. Ten seconds later a second shock wave of nearly equal force shook the foundations of the city again.

The unsuspecting city lay devastated. Thousands of terrified and stunned citizens fled their homes for the safety of the streets. An unknown number of men, women, and children died in their beds or while trying to escape disintegrating structures. The city's fire chief was among the first casualties of the disaster. He was perhaps the only man in San Francisco who had an idea how to fight a major fire in the city. His loss was a catastrophe in itself. His knowledge and experience were irreplaceable in the coming battle to save San Francisco.

The disruption of city utilities had two almost simultaneous consequences. First, vast quantities of gas escaping from ruptured gas mains turned a number of small fires into roaring conflagrations. Second, the disruption of the water system left firefighters responding to the emergency without their primary means of dealing with the rapidly expanding sea of flames. Thus, as the fire grew in intensity by the minute, the means to slow or stop the fire was quickly vanishing.

Surveying the extent of the damage and the spreading fires from his residence on Nob Hill overlooking the city below, Funston quickly determined that immediate action was necessary if the city was to be saved. Funston, a war hero and Medal of Honor winner, was acting commander of the Presidio garrison and several other military units in the area. Within an hour of the first tremor and without informing his superiors or receiving higher authorization, Funston ordered the troops at Fort Mason and the Presidio to move. In less than two hours after the shock wave left much of San Francisco in disarray, U.S. Army troops were marching into the city. They would play a key, but controversial, role in the battle to stop the fires and secure both public and private property in the ravaged city over the next seventy-two hours.

Around 0800, with troops already in the city, Funston sent a hasty telegram to Secretary of War William Howard Taft. The message briefly outlined the situation in San Francisco and requested authorization for Funston to take whatever actions necessary to deal with the disaster. Of course, Funston had already initiated steps without authority, and he would soon be issuing additional orders without waiting for a response to his telegram to Taft. After a short meeting with San Francisco's mayor, Eugene Schmitz, and police chief, Jeremiah Dinan, at which Funston agreed that the troops would work under Dinan's "guid-

ance,” Funston ordered units from Fort Baker, Alcatraz Island, the Presidio at Monterey, and Vancouver Barracks (Portland, Oregon, more than 500 miles to the north) to San Francisco. These units would arrive over the next several days. The governor sent California National Guard units, and Mayor Schmitz requested U.S. Marines and Navy vessels from Mare Island Naval Station. San Francisco was soon under de facto martial law.

The troops now entering San Francisco were detailed to a number of tasks. Patrols controlled access to the main thoroughfares into the fire area and provided security against looters and rioters; medical units set up hospitals to treat the injured and sick; support units set up tents and shelters for the city’s refugees; and demolition squads with dynamite proceeded to blow up buildings in an attempt to stop the fire’s spread by depriving it of fuel. Funston lacked any legal basis for some of these activities; other measures, such as the humanitarian activities, were well intentioned, and higher authority would certainly approve them eventually.

None of the officers or men detailed to the disaster areas had been trained to deal with civil upheaval, and there was little opportunity for adequate briefing for the assigned missions between the time Funston alerted the units and their deployment. Reports circulated widely that patrols shot suspected looters without appropriate warnings and, in at least a few cases, held drumhead courts-martial and executed miscreants summarily. (A proclamation Mayor Schmitz issued authorizing such actions was ill-advised and certainly unconstitutional.) Other soldiers were accused of looting or stealing private property, some were seen to be drunk on duty (from pilfered liquor), and yet others abused citizens who were doing nothing more than trying to protect or enter their own property.

The demolition squads proceeded with little or no knowledge of or experience with explosives. They destroyed numerous buildings that were not in danger of combusting; they demolished some buildings that, rather than denying fuel to the great fire, added to that fuel; and they wasted valuable explosives by failing to bring down a number of structures. No doubt the temporary housing, mess facilities, and medical treatment provided for thousands of homeless and desperate San Francisco citizens proved invaluable in the crisis, but whatever good the military did during and after the earthquake and fire cannot condone or excuse the indiscipline, poor leadership, lack of oversight, and misuse of soldiers in jobs they were not qualified to perform. Although his actions during the crisis added measurably to Funston’s

reputation, the U.S. Army could hardly be proud of its overall performance.<sup>8</sup>

At the beginning of the twentieth century, the U.S. Army was clearly unprepared to step into civil relief-humanitarian operations, although it had done so frequently during the nineteenth century. Whenever a civil or natural disaster occurred, the Army's response was always ad hoc. The type of response and amount of assistance provided depended on location, proximity of military units, resources readily available, and local military commanders' willingness to commit their troops and resources. The Army had no standard procedures, no special training, and no predetermined lines of authority to deal with natural or man-made disasters. And, perhaps most important, the Army had no institutional mechanism to document and capture the lessons learned in these incidents. The Army was better prepared to respond to civil disturbances such as riots and labor disputes, but the training and procedures for those events hardly met the needs for assistance during and after disasters.

## **Hurricanes**

Hurricanes are the most awesome and destructive natural phenomena on earth.<sup>9</sup> Only wars kill more people and destroy more property than hurricanes. Some types of storms—tornadoes and microbursts, for example—may release more energy in a given time period than a hurricane, but they are of very short duration compared with hurricanes. Although hurricanes originate in the tropical and subtropical waters of the world's oceans where they present a serious threat to shipping, most hurricane damage occurs over land. Once hurricanes arrive over inhabited areas, they may persist, often for several days, and cover hundreds, sometimes thousands, of miles. Hurricanes may move as far as 800 miles inland before their energy dissipates.

Hurricanes occur in all oceans, although they may be known by different names. The storms we call hurricanes in the United States originate in the mid-Atlantic and generally visit most of their destructive power on the islands of the Caribbean and the south Atlantic and Gulf coasts of the United States. Hurricanes are seasonal. As a rule, Atlantic hurricanes occur in the late summer or early fall. In the Pacific, west of the international date line, hurricane-type storms are known as typhoons. Typhoons can occur anytime but most frequently develop in the summer. In the Indian Ocean, these types of storms are called tropical cyclones. Tropical cyclones generally occur during the

monsoon season. In the Southern Hemisphere, similar storms occur during the opposite seasons from those in the Northern Hemisphere. Nevertheless, all of these great storms are related, and all of them result in considerable loss of human life and cause tremendous damage to property.

All hurricanes require certain specific conditions to form in mid-ocean. These conditions include surface water temperature, atmospheric pressure, wind shear, and the air's moisture content. Atlantic hurricanes normally develop in the area north of 5° N—they rarely form on the equator. When conditions are favorable, vast quantities of warm surface water (usually above 80 degrees Fahrenheit) evaporate and rise quickly in the warm tropical air. The rising moist air creates a low-pressure area at the surface that picks up even more surface evaporation. The more moist air that rises, the greater the low-pressure area formed beneath the developing storm. When there is little wind shear (different wind speeds and directions at various altitudes), the surrounding air is also drawn into the low-pressure area and begins to move around it in a circular fashion. The more uniform the winds around the core, the stronger the storm will become. The storm's core will become its "eye" (the area of lowest barometric pressure) and continue to suck up ever greater quantities of warm surface water. At first classified as a tropical depression, when the winds around the eye—the "eyewall"—reach 74 mph, it is reclassified as a hurricane.

Hurricanes are tracked by the movement of their eyes. Most Atlantic hurricanes move west, then north, or northwest, until they reach landfall. The hurricane itself may have a diameter of as much as 250 miles, and the eye may have a diameter of 20 to 30 miles. Once it begins to move, the hurricane's rate of progress will be between 5 and 20 mph; 15 mph is normal. It may cover as much as 4,000 miles over a period of two weeks or more before it dies out, and the path is unpredictable. Some hurricanes proceed into the Gulf of Mexico where they may actually pick up additional strength from the warm Gulf waters; others move north along the U.S. Atlantic coast, causing destruction as far north as Newfoundland. Predicting the movement of hurricanes is a daunting task.

The NHC in Dade County, Florida, identifies and tracks hurricanes that originate in the mid-Atlantic. Atlantic storms are named alphabetically, beginning anew each hurricane season. The first storm, for example, will begin with the letter A, the second with the letter B, and so on. At one time, storms were assigned only female names, but

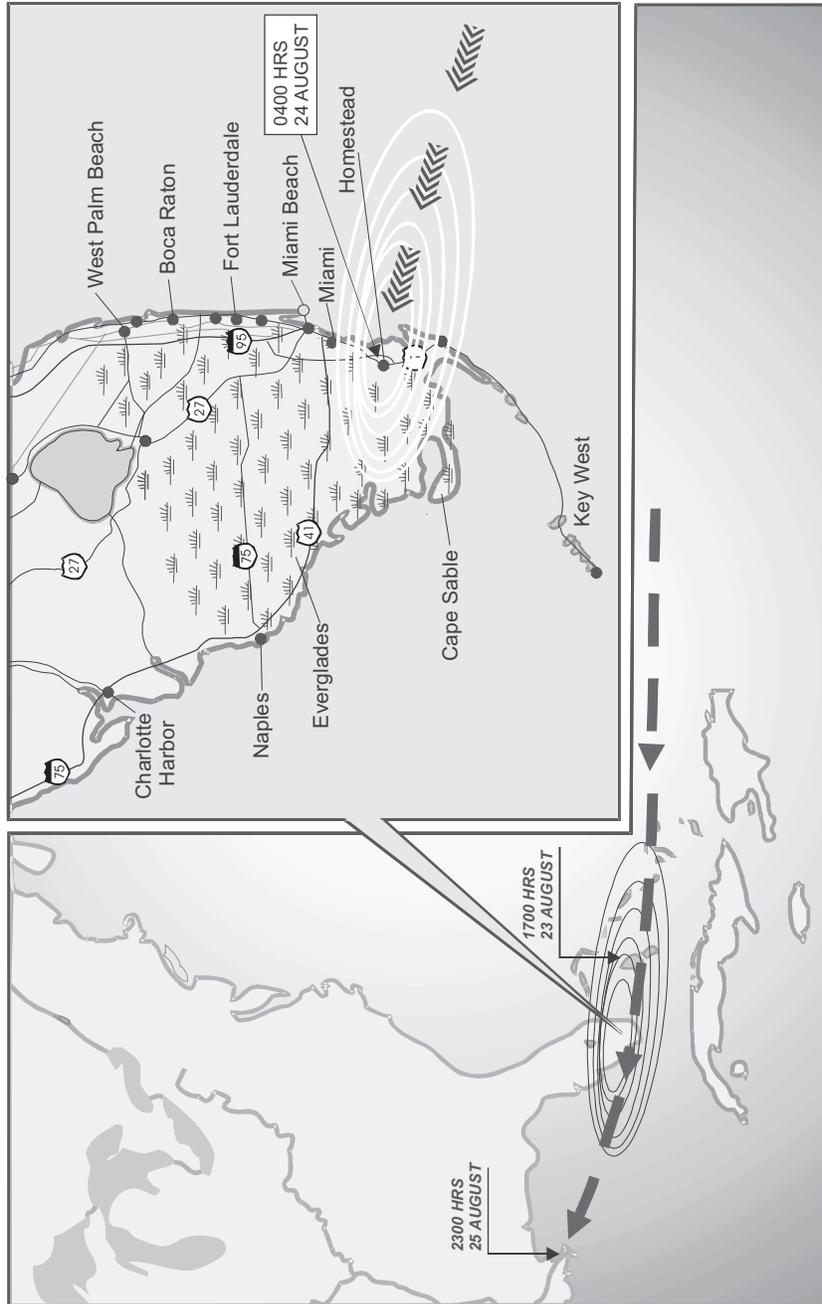
bowing to protests of gender bias, the NHC began using male names as well. Names may be used many times, but names associated with particularly disastrous hurricanes, such as Hurricane Camille in 1969 or Hurricane Fifi in 1974, will be retired and not used again.

Hurricane damage is caused by the effects of high winds, especially the wind close to the eyewall; by heavy rain the hurricane drops, often measured in feet, not inches; and by strong tidal floods along coastal areas that inundate land normally above the highest high tides. Inland, flooding often causes more damage and takes more lives than the devastation the high winds cause. Hurricanes frequently spawn tornadoes that add more destruction to already severely damaged communities. Hurricanes are classified according to the Saffir-Simpson scale of hurricane intensity.<sup>10</sup> The scale is based on wind speed and storm surge or the height of the sea level above normal high tide resulting from the storm's force (see the table). The first hurricane of the 1992 season, designated Hurricane Andrew, was a category 5 storm.

### **Hurricane Andrew**

In the early morning hours of 24 August, Hurricane Andrew came ashore along the south Florida coast. Over the next eight hours, the storm tore a swath of destruction across south Florida. By early evening, the storm had moved across the Florida peninsula and into the Gulf of Mexico. As the storm moved on, it left behind an area of Dade County south of Miami that looked more like a vast salvage yard than a thriving urban area with a vigorous population. Dade's 1,945 square miles (one-third of which is water) supports nearly 2 million people in ninety cities and towns, many unincorporated or attached to larger urban communities.<sup>11</sup> To the north lies Broward County, another heavily populated county, with the cities of Hollywood and Fort Lauderdale. With the Atlantic Ocean on the east and the sparsely populated Everglades National Park to the west and south, Dade County is itself virtually a peninsula on the Florida peninsula.

Dade County has a racially mixed population—white, 75 percent; black, 20 percent; and Asian and Indian, 5 percent—with 45 percent of it being foreign-born. More than 57 percent of Dade's population speaks a first language other than English, primarily Spanish, and 49 percent claim Hispanic ethnic heritage. Miami is the principal city in Dade County, with one-quarter of the county's population. Another quarter of the population lives in communities in the southern third of the county: Homestead, Florida City, Cutler Ridge, Perrine, and a host



of smaller towns that share common boundaries. This is the area Andrew hit hardest. The populations of these towns range from 27,000 for Homestead to a few hundred for the smallest named communities. Generally speaking, the people of this area are middle- and lower middle-class wage earners, with a higher percentage of whites than north Dade County's towns and cities. Unemployment in 1990 was 7.7 percent.

At the time Andrew struck, the homes and buildings of south Dade County were typical of most suburban communities in the United States. A large percentage of the population lived in single-family dwellings, 51 percent of which were owner occupied. Low-rise office buildings and apartment houses were common, but there were few of the high-rise structures seen farther north in Miami or Miami Beach. Most of the single-family homes were frame construction, although masonry, concrete, reinforced concrete, and concrete block were the preferred construction materials for newer buildings. Like most American cities, power, telephone, and cable lines were overhead, not underground. These were the precise urban conditions most vulnerable to a catastrophic storm.

Those who emerged from their shelters and destroyed houses just before noon on 24 August could barely recognize what they beheld. Many looked around in disbelief at the panorama of destruction, wondering if they were really in some kind of bad dream.<sup>12</sup> There was little that anyone could do that first afternoon. Shock and bewilderment prevailed.

Although many tens of thousands of south Floridians and tourists who had been in the area moved north upon receiving the governor's general evacuation order, thousands of others either chose to stay in the area or had no way to leave. For those who stayed, the night brought fear, anxiety, and sheer terror. Each one has a story to tell, and each story is different. One theme that runs through all of the stories, however, is the increasing uncertainty that they would live through that night. Some of them did not.

As Andrew grew in intensity, everything around the people in Andrew's path seemed to be coming apart. Even the best hurricane preventive measures failed to provide protection against Andrew's fury. In 2000, Dade County building codes required residential construction capable of withstanding 109- to 120-mph winds.<sup>13</sup> Of course, like all building codes, these standards applied only to new construction. Older buildings were often of substantially poorer quality construction and could not be brought up to code because of original

### Saffir-Simpson Scale of Hurricane Intensity

Hurricane Level	Wind Speed	Storm Surge	Effects
Level 1 (weak)	74-95 mph	4-5 feet	Minimal damage
Level 2 (moderate)	96-110 mph	6-8 feet	Damage to trees and roofs
Level 3 (strong)	111-130 mph	9-12 feet	Trees down; mobile homes destroyed; buildings damaged
Level 4 (very strong)	131-155 mph	13-18 feet	Extensive damage to buildings; flooding
Level 5 (devastating)	156 ≥ mph	19 feet	Severe structural damage to buildings; heavy flooding

designs or could only be upgraded incrementally. And few owners of older properties had either the resources or the inclination to conform to more recent codes.

Some property owners and residents of south Florida, however, prepared for even more severe hurricane conditions than building codes required. They constructed their dwellings and commercial buildings with heavy beam trusses, concrete and cinder block walls, layered sheathing under glued and nailed shingle or tile roofs, steel bolts, and “hurricane strap” reinforcements of joints and corners. They installed heavy steel doors, emergency lighting systems, and sump pumps. They brought in emergency stores of food, water, fuel, and batteries and had gasoline-powered generators on hand to provide electric power until public service was restored. Nevertheless, all of these heroic measures proved fruitless in the face of Andrew’s winds that exceeded 165 mph. (The actual force at the eyewall may have been even stronger, but the official wind gauge broke at 165 mph. At least one source estimated top wind speed at 200 mph.)<sup>14</sup> In a matter of hours, Andrew dismantled homes whose owners had devoted years of preparation to resist just such a storm.<sup>15</sup>

Some coastal residents who initially stayed in the area eventually sought safety farther inland. Even a few miles inland and a few feet higher above sea level seemed to offer some greater degree of security as the winds increased and the surf crashed over the sea walls and around buildings and houses along the shore. This trek inland, however, in addition to being somewhat dangerous, proved to be of little value. The wind did not discriminate as it moved across the Florida peninsula. Buildings along the shore and those inland met identical fates as roofs

tore away and walls collapsed. The storm surge was sufficiently high that as far as 5 miles inland buildings flooded or were washed off their foundations. Thus, the seeming safety inland, like the hurricane-proof construction techniques that offered a pseudo peace of mind to some homeowners, turned out to be an illusion.

Perhaps no place in the path of Andrew was hit harder or was the story of survival more dramatic than at Homestead AFB.<sup>16</sup> Homestead had been through hurricanes before, and each time had picked itself up, rebuilt its facilities, and continued operating. But the base had never sustained so much damage that its future would be in doubt. Andrew would change all of that.

During the forty-eight hours before Andrew struck, most of the personnel, dependents, and aircraft of the 31st Fighter Wing at Homestead were evacuated to Air Force facilities to the north. Colonel Stephen B. Plummer, commander of the 31st, selected seventeen officers and airmen to remain with him at Homestead to look after base facilities and two F-16s that could not be flown to safety. Plummer elected to ride out the storm in the base's "hurricane-proof" alert facility, a hardened building that included crew quarters and bays for aircraft. The designation "hurricane-proof" turned out to be a misnomer.

The early morning hours of 24 August were as frightening and terrifying as any the men in Plummer's group, some of them combat veterans from DESERT STORM, had ever experienced. By 0400, the building was coming apart. The wind forced the great hangar doors off their tracks, entered the bays, and picked up the F-16s, twisted them around and smashed them into walls, and then began to disassemble the interior of the alert facility. The airmen scrambled to secure loose items of equipment and tie interior doors shut with bed sheets when a steel hatch came open on the roof, creating a vacuum that threatened to collapse the entire building. One of the airmen, Staff Sergeant Steve Wilensky, volunteered to climb a ladder to close the hatch, thus saving the building and the men inside. The only worry then was whether the roof would remain on the building as it began to dip and sway under the weight of the storm. Andrew did pass, however, and when the eighteen men emerged from the battered alert facility in the morning light, they saw that few other structures remained standing on the once active and thriving base.

For the other military personnel in the storm area, mostly National Guardsmen who had come to evacuate civilians earlier, the hours of darkness were just as trying as for Colonel Plummer's group. The guardsmen sought shelter in a variety of locations. They not only had to

cope with the storm raging around them but also were worried about their own homes and families in surrounding communities.<sup>17</sup> For a time after the storm passed, these men shouldered the burden of rescuing trapped and injured victims, recovering the dead, providing assistance to survivors, identifying and opening roads and communications, and supplementing local law enforcement agencies to secure property and deal with looters. The arrival of fresh units with critically needed supplies and equipment brought respite to these tired and weary men.

That Andrew was coming was not a surprise—the Air Force had been tracking the storm for a week, and the Army Operations Center in the Pentagon had already set up a special task force to coordinate anticipated requests for relief supplies. What was a surprise was just how strong Andrew was and how much damage it caused. The aftermath of Andrew's rampage across southern Florida was unlike anything anyone in the United States had seen before. Hardly a single above-ground structure had escaped damage. More than 135,000 homes were destroyed or significantly damaged, most beyond repair. The contents of these buildings and homes were spread over 100 square miles. Hundreds of private boats had washed or been blown ashore from the numerous marinas that dotted the coast, and scores of small aircraft were strewn about the landscape from airports in the area. Public services, including electric power, sewers, telephone communications, water, cable television, and police and fire protection, had generally ceased to exist. An unknown number of dead lay among the wreckage. Most of the deaths resulted from collapsed buildings or flooded areas where victims had sought shelter.<sup>18</sup> Little or no potable water or edible food was available. Medical supplies were in critically short supply. The extent of the disaster was clearly beyond the ability of local and state emergency facilities and resources. Nothing less than the resources of the entire nation would be necessary to respond to a disaster of Andrew's magnitude.

The agency responsible for coordinating the activities of all federal agencies, including the Department of Defense (DOD), during a declared disaster is the Federal Emergency Management Administration (FEMA), which President Jimmy Carter's administration established in 1979. FEMA's purpose is to consolidate federal services during disasters, plan for national emergencies, train civil emergency workers, and pay the federal share of relief operations. Upon declaration of a disaster, FEMA is to implement the Federal Response Plan and determine how federal resources will be used to meet requirements each state identifies. FEMA, like many federal agencies, works adequately in

normal operations and even in most emergencies, but it is rarely put to the extreme test. In the extreme test, however, all of the small faults and imperfections in bureaucratic structures have a tendency to appear.

In the first hours after Andrew passed over south Florida and moved into the Gulf of Mexico, FEMA's response was rather lethargic. FEMA's slow action prompted some harsh criticisms. One source claimed that FEMA was "brain dead," and Senator Ernest Hollings of South Carolina said that FEMA was "the sorriest bunch of bureaucratic jackasses I've ever seen."<sup>19</sup> Aspersions aside, some valid reasons may explain FEMA's inability to step in more quickly and launch earlier relief operations. For example, for the first 24 to 48 hours after Andrew, there was general confusion about the true situation in the area. Even the office of Florida's governor, Lawton Chiles, could not provide accurate information about the extent of physical damage or the number of casualties in southern Dade County. Most of the early estimates significantly *understated* the damage to private property and the disruption to public services in the disaster area. Furthermore, the Federal Response Plan, the blueprint for the federal government to mobilize resources and conduct activities to support state and local governments in major disasters, turned out to be almost totally inadequate. While FEMA experienced some difficulties, just before Andrew struck, it succeeded in activating its emergency operations center and notified twenty-six other federal agencies and the American Red Cross of the pending disaster. Although an analysis and critique of FEMA is beyond the scope of this study, it is important to remember that any DOD forces committed to disaster relief operations must work under and coordinate with FEMA.

President George Bush arrived in Miami at 1800 on Monday evening. After touring the area with Governor Chiles, Bush promised that Homestead AFB would be rebuilt, and he ordered the commitment of U.S. military forces to relief operations in south Florida. Bush's first promise was perhaps premature. Congress would eventually decide the future of Homestead. His second promise, however, was quickly translated into one of the largest humanitarian relief efforts in U.S. history.

DOD passed the mission to the Department of the Army (DA), which quickly charged the U.S. Army Forces Command (FORSCOM) to coordinate the deployment and employment of military forces and resources in the disaster area. FORSCOM subsequently directed Lieutenant General Samuel E. Ebbesen, commanding general of the Second Continental Army, to establish Joint Task Force Andrew

(JTFA) to exercise operational control over all military forces involved in relief operations in south Florida. JTFA, officially established on 28 August 1992, was a joint, multinational effort. Its mission was “to provide humanitarian support by establishing field feeding sites, storage/distribution warehousing, cargo transfer operations, local/line haul transportation operations, and other logistical support to the local population.” Expanding on this mission statement, the JTFA commander provided his intent and additional guidance:

Immediately begin to operate feeding and water facilities; priority to the cities of Homestead and Florida City, and the Cutler Ridge area. After a more detailed assessment, expand operations throughout the affected area. Provide assistance to other Federal agencies, state and local governments, and organizations in receipt, storage, and distribution of supplies and equipment. DO NOT engage in law enforcement actions or operations without approval of CG, JTFA. End state is to get life support systems in place and relieve initial hardships until non-DOD, State and local agencies can reestablish normal operations throughout the AO.<sup>20</sup>

DOD committed more than 22,000 military personnel to JTFA. Most were Army troops, including a brigade from the 82d Airborne Division from Fort Bragg, North Carolina; a headquarters staff element from the XVIII Airborne Corps; units from the 10th Mountain Division from Fort Drum, New York; and elements of the 1st Corps Support Command. U.S. Air Force, Navy, Coast Guard, and Marine units and Canadian Forces engineer units also participated in the Hurricane Andrew relief effort in the coming weeks. Florida National Guardsmen already in the area and additional Florida Guard units alerted to deploy to the area remained under state control.<sup>21</sup>

There was, however, no headlong rush of military units into the disaster area. The deployment of military units to south Florida and assignment of specific missions required an estimate of needs and a clearer picture of the general situation in the disaster area and close coordination with FEMA and other relief agencies. By statute, a defense coordinating officer (DCO) serves as liaison between the DOD (JTF) and FEMA. Second U.S. Army had earlier appointed a DCO and, on 23 August, the DCO and his team were in Tallahassee assessing the situation and working with his FEMA counterpart, the federal coordinating officer (FCO). Thus, when JTFA officially came into being, much of the structure was already in place, and the designated personnel were working closely together.

The spirit of cooperation established early between the DCO and FCO set the general tone for cooperation down the chain of command. To some extent, the degree and ease of cooperation depended on personalities, local circumstances, and the types of units. Medical units, for instance, seem to have had more difficulty establishing good working relationships than other types of units. One of the most significant problems that plagued the interface between civilian and military organizations was the mutual lack of familiarity and knowledge of respective capabilities, procedures, and equipment. The result was some loss of time and friction. Nevertheless, for the most part, military units under JTFA worked exceptionally well with FEMA representatives and other civilian organizations operating in the disaster area.<sup>22</sup>

Some units, of course, were already operating in south Florida before JTFA stood up. In the immediate aftermath of Andrew, one of the most important tasks was to search for living victims trapped in collapsed buildings or under the rubble. Although large numbers of residents and tourists complied with the governor's evacuation order and moved north, thus reducing the number of potential victims, an unknown number of people remained in the area. The National Guardsmen already in the disaster area were conducting some search and rescue missions, but the task was clearly beyond their limited capabilities. Help arrived. The 301st Rescue Squadron, an HH-60 helicopter reserve unit located at Homestead AFB (and now without a home), established a temporary operations center at Kendall-Tamiami Airport. Joined by the 939th Rescue Wing, Portland, Oregon, the reservists set up a field hospital to treat the injured and flew in pararescue teams with dogs to search collapsed buildings for victims. Coast Guardsmen from the U.S. Coast Guard Air Station at Miami also joined the search and rescue effort. While it is impossible to count the precise number, the early efforts of the Florida National Guard units in the area and the timely arrival of trained and experienced search and rescue units certainly saved numerous lives.<sup>23</sup>

Units alerted for deployment to the disaster area conducted their planning and preparations with the same high level of efficiency normally associated with deployments for other domestic and foreign operations. Training, established procedures, and experience served these units well. Staffs clarified specific unit missions, briefed senior and subordinate commanders, and prepared orders. Reconnaissance teams preceded the main elements to the disaster area to gather firsthand information about local conditions, to identify access routes, and to make initial arrangements for locating troop units. Military units

deploying to south Florida moved by air, road, and water. The lead battalion of the 82d Airborne Division left Fort Bragg on Air Force transports less than nine hours after being alerted. Within forty-eight hours, the first elements of a Marine Corps task force departed Cherry Point, North Carolina, by air, and a leadership group from the 10th Mountain Division, Fort Drum, New York, left Griffiss AFB for south Florida. Other units from the 82d Airborne Division moved southward by road. Navy repair and supply vessels sailed from several Atlantic coast ports for south Florida destinations with valuable relief supplies and Seabee personnel.<sup>24</sup>

The tasks assigned to Regular Army units arriving in the first two weeks (phase I) focused on the immediate needs of Andrew's survivors as the JTFA commander's guidance designated (previously noted): to provide food, water, and shelter; to distribute relief supplies such as clothing, personal hygiene items, and health-related items; and to provide security. Once these services were established, Army units expanded their role (phase II) to assist in restoring public services (power, sewage, and so forth), clearing and opening streets and roads, and cleaning up and removing obstructing and dangerous debris. Until their withdrawal (phase III), Army units continued to provide basic services, assist in reestablishing public utilities, and strive to turn over to non-DOD agencies—federal, state, and local governments—responsibility for reconstitution and reconstruction in the disaster area.

As units arrived in the disaster area, they immediately set up operational bases and began to deal with the priority tasks. Other than the search for victims, the most important need was to feed a population that had no means of providing for itself. The Army had already anticipated this need and began to move mobile kitchen trailers into the disaster area during the first few hours after Andrew passed. Within seven days, the Army was operating thirty mobile kitchen trailers at twenty-four sites, serving more than 21,000 meals each day. Over the succeeding two weeks, feeding operations expanded. Mess units prepared meals around the clock and served 35,000 meals per day at the height of the relief effort. The Army served more than one-half million meals in the first thirty days and nearly 900,000 meals before the operation ended.<sup>25</sup> No other military activity directly affected more people than the kitchens did.

Many of the displaced families found temporary shelter in "life support centers," or tent cities, the Army set up.<sup>26</sup> The American Red Cross administered the centers, provided operational guidance, screened victims, and assigned housing space to families. The Army

maintained the tents and provided the meals. The centers became more than just living quarters; they became communities, points for distributing all sorts of public and privately donated items, comfort stations where one could get a hot shower and fresh drinking water, day care centers for children, and administrative centers where people could meet with assistance agencies and relief officials. The life support centers were never intended as a permanent solution to the displaced population's problems; the objective was to move people into more substantial quarters and to restore normal community activities, such as schools, as quickly as possible.

Equally as important as providing for the population's physical needs was the need to provide security for both people and property in the disaster area. A common problem in the wake of any urban disaster is looting and pillaging. In the days after Hurricane Andrew, the problem of dealing with looters was compounded by the activities of Miami street gangs. The gangs roamed the devastated areas, taking anything of value they could carry off and threatening residents, relief workers, and military personnel. Many local residents took it upon themselves to defend their property. Armed homeowners confronted looters and forced them to leave the area empty-handed or made citizens' arrests until police could be summoned.

Some units reported incidents involving looters, gang members, and other criminal elements, but such cases did not seriously affect the troops' ability to carry out their missions. Except for military police (MP), regular U.S. Army troops were not issued live ammunition for their weapons. MPs responded to some calls for assistance, and they detained a number of suspects until they could be turned over to the appropriate authorities. As a rule, however, the National Guard assumed the law enforcement role and assisted local police agencies in establishing security, patrolling the area, and dealing with looters and other criminal elements while regular units concentrated on relief and recovery missions. This division of responsibility is based in law and organization. In the first place, the Posse Comitatus Act prohibits regular military forces from participating in law enforcement activities.<sup>27</sup> Governors can endow their National Guard units with law enforcement authority. And National Guard units receive considerably more training in civil control than do regular units. Thus, by not federalizing the Florida National Guard during the crisis, each force was able to concentrate on separate but mutually supporting roles in the Hurricane Andrew humanitarian operation.

Throughout the period of relief operations in south Florida, all military personnel performed their duties to the highest professional standards. Discipline problems were negligible, and complaints about the long hours, the lack of personal comforts, and the extended separation from families were rare. Perhaps this was because here was a case of Americans helping Americans. Every serviceman could see for himself how much the people of the area had lost and how much work was necessary to put things back together. Nowhere, however, was the dedication and professionalism of the military forces more evident than at Homestead AFB. The men and women of Homestead contributed significantly to the relief effort; they had to deal with their own losses as well.

When Colonel Plummer and the seventeen officers and men who had spent the harrowing night in the “hurricane-proof” alert facility at Homestead emerged late on the morning of 24 August, they beheld a scene of utter devastation.<sup>28</sup> Almost nothing was standing as far as they could see. Andrew hit the work areas and the living quarters at Homestead equally hard. Fortunately, other than the small group with Plummer, Homestead’s military personnel and dependents had been evacuated earlier. Most of its civilian work force had also moved out of the area along with the general evacuation to the north. Although the Air Force at first announced that Homestead would reopen, the decision on Homestead’s future would come later. Nevertheless, the landing facilities at Homestead would play a critical role in the Andrew relief operations, and it was imperative that the runways be made usable.

Even before Andrew came ashore, Air Force planners were preparing for the crisis. The Air Combat Command, Langley AFB, Virginia, directed the Air Force’s “total force effort” to deal with Andrew’s aftermath. The Air Force focused on two primary missions. The first priority was to make Homestead’s runways serviceable so that airlifters could bring men, emergency equipment, and relief supplies into the disaster area. Homestead was soon receiving aircraft. Within the first nine days of the emergency, the Air Mobility Command, Scott AFB, Illinois, flew 529 airlift missions into south Florida, delivering more than 7,000 military and civilian passengers and nearly 11,500 tons of equipment and supplies. This was the largest domestic operation in the Air Mobility Command’s history and rivaled the first ten days of tonnage moved to the Persian Gulf in Operation DESERT SHIELD.

Moving large quantities of cargo into Homestead was relatively easy, but Homestead was not designed as a logistics center. Offloading the cargo with the few available forklifts, breaking it down into

movable loads by hand, and distributing the supplies to surrounding communities in borrowed deuce-and-a-halves was exhausting work. Members of the 23d Air Support Group, Fort Bragg, arrived to assist the airmen working around the clock. Teams of specialists in recovery and salvage, and medical units from as far away as Grand Forks AFB, North Dakota, and Mountain Home AFB, Idaho, deployed to Homestead. The base itself, although severely damaged, was transformed into a major logistics center for conducting the relief effort in the surrounding communities.<sup>29</sup>

The second, but not secondary, mission for Homestead was to take care of the thousands of officers, airmen, and their families who called the base home, many of whom had already evacuated the area and had lost virtually everything they owned. Although some of the airmen with critical specialties stationed at Homestead were brought back to assist in the relief effort, more than 2,300 officers and enlisted personnel were reassigned to other AFBs. Special teams went to Homestead to collect medical and financial records and to assess and compile damage reports so that families could be compensated for their personal property loss. A representative of the 1st Mission Support Squadron from Langley arrived at Homestead with Air Force Aid Society funds to provide money for both married and single airmen to purchase the necessary health and hygiene items they lost in the storm. Within one month, the Air Force Aid Society provided \$860,000 in loans and grants to Homestead's airmen and their families. Family support centers at AFBs around the United States collected nonperishable food, supplies, clothing, and personal use items for displaced Homestead families.<sup>30</sup> The Air Force's response to the needs of its people at Homestead is an outstanding example for other services to follow if similar disasters occur in the future.

The military presence in the disaster area contributed substantially to establishing a stable, safe environment and meeting the basic needs of most of the residents remaining in or returning to the area. By the middle of September, three weeks after Hurricane Andrew struck south Florida, more than 22,000 soldiers, airmen, marines, and sailors were working for JTFA. The Air Force had brought in thousands of tons of relief supplies, personnel, and equipment while soldiers and marines were feeding and housing thousands of families. Florida National Guardsmen had established a safe and reasonably secure environment so residents could return to their home sites to recover what personal possessions could be salvaged. Army engineers, joined by Navy Seabees and a Canadian Forces engineer battalion, had moved in with

everything from chain saws to bulldozers to clear streets and roads, repair and reopen public buildings, and begin the monumental task of restoring power and communications. Army chaplains were performing church services. Army medical teams were providing emergency and routine medical care for anyone in need. Army psychologists were working with civilian mental health teams to help Andrew's victims cope with the post-traumatic stress resulting from the disaster. Army technicians set up and were operating a multilingual radio station to keep residents informed and had distributed 15,000 battery-operated radios throughout the area. Perhaps the single most important indicator of JTFA's success was that, on 14 September, all but 4 percent of the 278 primary, middle, and high schools in the affected area reopened for classes.<sup>31</sup>

Two months after Hurricane Andrew swept through south Florida, JTFA's mission was nearly complete. By 25 October, most of the military units assigned to JTFA had returned home, and the few remaining units were packing up and loading their equipment for the return home. FEMA, which had experienced some initial difficulties during the first days of the disaster, was now fully functioning. FEMA was bringing temporary modular housing units into the area and moving families out of the tents. Public, private, and church-related humanitarian organizations were busy providing every sort of assistance to individuals and families still in need. The Army Corps of Engineers was working with local and state government agencies to rebuild infrastructure. A host of contractors, builders, and tradesmen had swarmed into the area and were at work repairing or rebuilding public buildings and private residences. The people of the area were slowly resuming their lives. Nevertheless, years of hard work lay ahead before the towns and communities south of Miami could return to their normal existence.

Hurricane Andrew struck south Florida in the early morning hours of 24 August 1992 with unprecedented fury. Andrew left behind an unbelievable scene of destruction. When disasters of such magnitude occur—whether the damage is the result of natural or man-made phenomena—local and state resources will inevitably be overwhelmed. This has been the case throughout the nation's history. Even the federal agencies and departments recently created to manage large-scale catastrophes do not possess the manpower, equipment, material, knowledge, and experience to respond adequately in such crises. When overwhelming events befall communities and overwhelm local and state resources, only the military can quickly bring together the human and

material resources necessary to save lives, relieve suffering, and protect public and private property until civil authorities are prepared to resume their normal functions.

In many ways, the Army's response to Hurricane Andrew was one more instance of the Army answering the call for assistance from fellow countrymen in need. Just as it responded quickly and unhesitatingly during the Chicago fire and the San Francisco earthquake, the Army moved quickly and deliberately to assist the people of south Florida after Andrew passed. As in previous disaster-relief operations, the Army stayed until the immediate crisis was over and the local situation was stable and under control. In the eighteenth and nineteenth centuries, however, commanders at or near the scene reacted, often without first consulting their superiors, to the crisis; took whatever steps they perceived necessary; and employed locally available resources to save lives, protect property, and restore public order. These commanders then sought authority, approval, or confirmation for their actions as communications and circumstances allowed.

Since World War II, the U.S. Army has participated in numerous humanitarian relief operations. The Army's response to Andrew, however, was more than just a reprise of earlier humanitarian relief operations. The Army's involvement in recent relief operations, and Andrew particularly, has clearly demonstrated that a modern, well-trained, adequately equipped, disciplined military force not only can respond quickly and appropriately to any type of crisis, foreign or domestic, in war or peace, but also is the best-suited force for such missions.

The response to Hurricane Andrew was a Total Army effort to which Regular, Reserve, and National Guard units contributed. The qualities that have led to U.S. Army successes in a variety of war and peace operations around the world—excellent leadership at every level, a wide range of highly developed skills, a positive attitude, dedication to duty, and professionalism—are the very qualities that officers and soldiers demonstrated during their service in the Andrew relief operation. Even those Americans who are critical of or know little about military values and ethics must admit that the men and women who embrace those values and ethics served the nation admirably in the Andrew relief effort. JTFA was also a joint and multinational military effort that worked closely with a number of government and civilian relief organizations. All of the units that made up JTFA were focused on a common objective. Interservice differences and rivalries that plagued

many joint operations throughout much of our history played no part in JTFA.

This is not to conclude that the response to Hurricane Andrew was flawless. A number of problems plagued the relief effort. Perhaps the most obvious problem was the unnecessary delay in moving equipment, supplies, and personnel into the most heavily damaged area in the first seventy-two hours of the emergency. This failure was the result of poor damage assessments and lack of an adequate Federal Response Plan. Most participants in the relief effort, military and civilian, were unfamiliar with other agencies' equipment, procedures, and capabilities and with the Federal Response Plan. The Army lacked appropriate doctrine for humanitarian relief operations and, except for Second Army, commanders had relegated training for humanitarian operations to the lowest priority. Mutual training and cooperative planning among the various federal and state agencies responsible for disaster relief, including the U.S. Army, had been almost nonexistent.<sup>32</sup> To avoid these problems and be better prepared for future disasters will require extensive cooperation among all of the agencies involved.

Much of JTFA's success can be attributed to the Army's experience in conducting humanitarian relief operations and the process of learning from those experiences. In the eighteenth and nineteenth centuries, field commanders wrote reports on military actions, and higher-level commanders submitted official annual reports to the War Department on their department and division activities. Most of these reports were narratives whose purpose was to explain or justify a commander's actions. The reports were often self-serving and were rarely critically reviewed for factual accuracy, tone, or content. Furthermore, the Army had no established method to sift through, distill, and disseminate lessons that might be contained in reports. Such reports, therefore, had limited value as instructional material for the Army as it planned and trained for future operations. Thus, the Army learned little from the Great Chicago Fire of 1871, the Johnstown flood of 1889, or the San Francisco earthquake of 1906 that was useful to leaders other than those who were directly involved.<sup>33</sup>

Over the past century, the Army has worked diligently to learn from its experiences to improve leadership, doctrine, command and control, equipment, and training procedures for future operations. With the creation of a General Staff and the establishment of the U.S. Army War College in 1903, the Army carefully began to document and study its own operations. This process has now matured. The current Joint Universal Lessons Learned System (JULLS) provides commanders,

planners, trainers, and doctrine writers with a solid pair of shoulders to stand on when looking into the future. Perhaps the U.S. Army's single most important accomplishment of the twentieth century was developing an institutionalized system of critical self-analysis—the after-action review.

JTFA has produced a wealth of studies, reports, and after-action reviews.<sup>34</sup> Each of the units and headquarters that participated in JTFA, including FORSCOM and the Second U.S. Army, conducted internal reviews and completed reports. JTFA staff members then reviewed these reports and included pertinent details and lessons from each in the JTF after-action review. The reports and summaries of JTFA, available from the Center for Army Lessons Learned, Fort Leavenworth, Kansas, are a rich source of insights, ideas, recommendations, and guidance for doctrine preparation, planning, training, and implementation of future humanitarian operations in urban environments. JTFA stands as an example of how well JTFs can operate when the objectives are clear and people and resources are focused.

The U.S. Army's participation in Joint Task Force Andrew marks one of the most successful chapters in the Army's long history of urban humanitarian operations. All of the military personnel returning home from service in south Florida can be proud to have served their fellow Americans in this critical time of need.

## Notes

1. Josie Fernandez, "Looking Andrew in the 'Eye,'" *Citizen Airman* (October 1992), 21, and Chris King, "Eye to Eye: Viewing a Monster First-hand," *Citizen Airman* (October 1992), 25-26.
2. Robert Van Elsberg, "The Force Responds," *Citizen Airman* (October 1992), 21-22.
3. W.D. McGlasson, "To the Rescue," *National Guard* (July 1993), 32-34.
4. According to current federal law, local authorities are still primarily responsible for disaster relief. Only after local and state authorities have declared the nature of the disaster and requested federal assistance can federal agencies move into a disaster area. See Robert T. Stafford Disaster Relief and Emergency Assistance Act (Disaster Relief Act of 1974): 88 Stat. 143 [Pub. 93-288, 22 May 1974], as amended in 1977, 1980, 1990, 1992, 1993, 1994, 1995, and 2001.
5. On the Chicago fire of 1871, see Herman Kogan and Robert Cromie, *The Great Fire: Chicago 1871* (NY: G.P. Putnam's Sons, 1971); Paul Andrew Hutton, *Phil Sheridan and His Army* (Lincoln, NE: University of Nebraska Press, 1985), 209-12; and Roy Morris, Jr., *Sheridan: The Life and Wars of General Phil Sheridan* (NY: Crown Publishers, 1922), 334-39.
6. On the Johnstown flood, see Federal Writers' Project, *The Floods of Johnstown* (Johnstown, PA: Mayor's Committee, 1939), and John Bach McMaster, "The Johnstown Flood," *The Pennsylvania Magazine of History and Biography* (1933), 209-43, 316-54.
7. On the San Francisco earthquake, see Gordon Thomas and Max Morgan Witts, *The San Francisco Earthquake* (NY: Stein and Day, 1971).
8. Funston's biographers agree that his reputation was greatly enhanced by his actions during the San Francisco earthquake, but they do not address the controversial nature of some of Funston's decisions during the emergency. See Thomas W. Crouch, *A Yankee Guerrillero: Frederick Funston and the Cuban Insurrection* (Memphis, TN: Memphis State University Press, 1975), 4; John B.B. Trussell, Jr., "The Man Destiny Just Missed," *Military Review* (June 1973), 67-68.
9. On hurricanes, see David E. Fisher, *The Scariest Place on Earth: Eye to Eye With Hurricanes* (NY: Random House, 1994), and Robert H. Simpson and Herbert Riehl, *The Hurricane and Its Impact* (Baton Rouge, LA: Louisiana State University Press, 1981).
10. Gary Barnes, "Hurricane," *The World Book Encyclopedia*, Vol. 9 (Chicago: World Book, 1999), 456.
11. For record-keeping purposes, the U.S. Bureau of the Census designates Dade County as the Hialeah Metropolitan Statistical Area. See U.S.

Bureau of the Census, *County and City Data Book: 1994* (Washington, DC: U.S. Government Printing Office [GPO], 1994), and *The Sourcebook of Zip Code Demographics: Census Edition*, Vol. 1 (Washington, DC: CACI, 1991).

12. Pictures describe the devastation Andrew left better than words. Two excellent photo essays are *The Big One: Hurricane Andrew: Photographs by the Staff of the Miami Herald and el Nuevo Herald*, Roman Lyskowski and Steve Rice, eds. (Kansas City, MO: Andrews McMeel Publishing, November 1992), and Rick Gore, "Andrew Aftermath," *National Geographic* (April 1993), 2-37.

13. See South Florida Building Code (Dade County Edition), Office of Building Code Compliance, Dade County, Florida. In March 2002, Florida promulgated a statewide building code that superseded all local codes. Among the provisions in the new code were revised standards to calculate wind pressure on masonry and wood supporting walls, engineering specifications for roof trusses, requirements for pressure-resistant windows, and prohibition of gambrel roofs. When one considers that Andrew damaged or destroyed even the best constructed buildings in its path, the question arises whether any building codes that are not cost prohibitive can be effective.

14. Gore, 15.

15. Bob Lamm, a resident of Redland, Florida, observed that it took Andrew two hours to tear apart the house he spent five years constructing to withstand a major hurricane. James LeMoyne, "In the Storm," *The New Yorker* (5 October 1992), 85.

16. See Michael J. Haggert, "Andrew's Wrath . . . Wake of the Storm," *Airman* (November 1992), 2-7, and Doug Gillert, "Homestead Sagas," *Air Force Times* (14 September 1992), 12-15.

17. After the storm, about 100 Florida National Guardsmen were released from duty to return home and take care of their families. W.D. McGlasson, "To the Rescue," *National Guard* (July 1993), 33. For an account of a guardsman who moved into the area with his unit to find his home destroyed, see John Daigle, Jr., Bob Hart, Maria LoVasco Jonkers, and Kristi Moon, "Andrew's Wrath Mobilizes the National Guard," *National Guard* (October 1992), 20-23.

18. The death toll was fifteen, relatively low considering the extensive property damage. The dead included a 12-year-old child and a 78-year-old man and ages in between. For accounts of victims as well as survivors' stories, see Gore, 23.

19. Tom Mathews et al., "What Went Wrong," *Newsweek* (7 September 1992), 24.

20. Joint Task Force Andrew After-Action Review (AAR), Overview Executive Summary, U.S. Army Center for Army Lessons Learned (CALL), hereafter JTFA AAR, Fort Leavenworth, Kansas.

21. Ibid., and Gordon R. Sullivan, "Hurricane Andrew: An After-Action Report," *Army* (January 1993), 16-22.

22. FEMA and Hurricane Andrew Disaster Relief: JULLS, CALL Unclassified Restricted Database/Operations Other Than War—Domestic filerom: Filerom Folder: HURRICANES, TORNADOS, TYPHOONS/HURRICANE ANDREW, Fort Leavenworth, Kansas, and JTFA AAR.

23. "Reserve on Top of Storm," *The Officer* (October 1992), 18-20.

24. Peter Madsen and Wayne Whiteman, "Responding to Hurricane Andrew: 10th Mountain Deploys to Florida," *Engineer* (February 1993), 2-4; James T. Palmer and Charles R. Rash, "Operation Hurricane Andrew Relief: Humanitarian Assistance, Redleg Style," *Field Artillery* (October 1993), 31-35. The 1/7 Field Artillery (FA) and 2/7 FA deployed from a field training exercise at Fort Drum to disaster relief in south Florida.

25. JTFA AAR and Sullivan.

26. FEMA and Hurricane Andrew Disaster Relief: JULLS.

27. 18 *United States Code* 1385.

28. Doug Gillert, "Hurricane: Homestead AFB is Just History Now," *Air Force Times* (7 September 1992), and Vickie M. Graham, "Two Years After a Hurricane Demolished Homestead AFB, Airmen are Still Picking Up After Andrew," *Airman* (August 1994), 2-9.

29. "Reserve on Top of Storm," *The Officer* (October 1992), 18-20, and Haggert, 4-6.

30. Ibid., 6-7; Randy Newcomb, Janet Young, and Dan Cappabianca, "Hurricane Andrew—Ridin' the Storm Out," *The Air Force Comptroller* (January 1993), 17-19; and Doug Gillert, "Homestead Evacuees Got Early Support, Help," *Air Force Times* (12 October 1992), 30.

31. JTFA AAR; FEMA and Hurricane Andrew Disaster Relief: JULLS; Sullivan; Keith Butler, "SOF Support for Hurricane Andrew Recovery," *Special Warfare* (July 1993), 12-17; and James Mauro, "Hurricane Andrew's Other Legacy," *Psychology Today* (November/December 1992), 45.

32. JTFA AAR.

33. Neither General Sheridan nor Funston mentioned the disasters that occurred in their respective departments in their annual reports. See Report of Lieutenant General Sheridan in *Report of the General of the Army, Report of the Secretary of War*, Vol. I (Washington, DC: GPO, 1871), 23-24; and Report of the Department of California, Reports of Division and Department Commanders, *Annual Reports of the War Department for the Fiscal Year Ending June 30, 1906*, Vol. II (Washington, DC: GPO, 1906), 179-91.

34. A CALL search produced more than 450 AARs, JULLS, concept plans, SMARTbooks, and other documents generated by units from battalion to JTFA involved in JTFA. See CALL Database Filerom: Operations Other Than War—Domestic: Hurricanes, Tornados, Typhoons (filecabinet):

Hurricane Andrew: Joint Task Force—August 1992 (filedrawer), CALL, Fort Leavenworth, Kansas.