

Tropical Revolving Storms: Cuba 2008

By The British Geographer

Place Context

The Republic of Cuba is located in the northern tropics within an island chain of the Caribbean. It is made up of one large island, Cuba, as well as the Isla de la Juventud and several other archipelagos.



Figure 1: Wikipedia

Climate Characteristics

Cuba has a Tropical Wet Dry Climate whereby its dry season dominates between November to April and its wet season from May to October. The wet season also coincides with the Hurricane season. The map below shows the hurricane tracks within the region of Cuba for a 110-year period up to 2006.

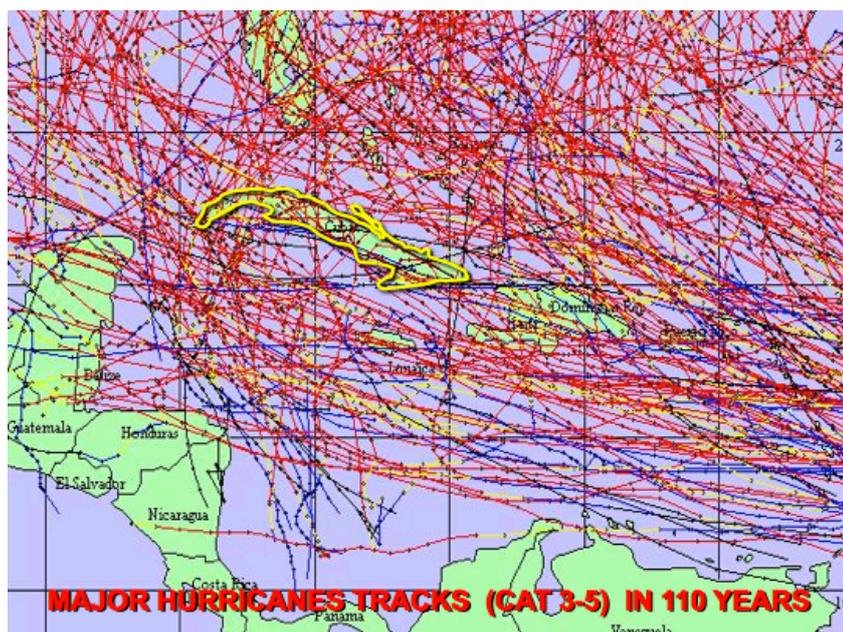


Figure 2: Instituto de Meteorología, Cuba

Hurricane Gustav and Ike– 2008

Hurricanes Gustav and Ike hit Cuba in August and September 2008 respectively. Hurricane Gustav was a category 4 hurricane with sustained wind speeds of over 140 miles per hour (220 km). It made land contact with Cuba on August 30. 10 days later Hurricane Ike, a category 3 hurricane ripped across the country, making landfall twice with sustained wind speeds of 120 miles per hour (190km). Its second landfall crosses the track of Hurricane Gustav at Pinar Del Rio. Figure 3 below shows their tracks.

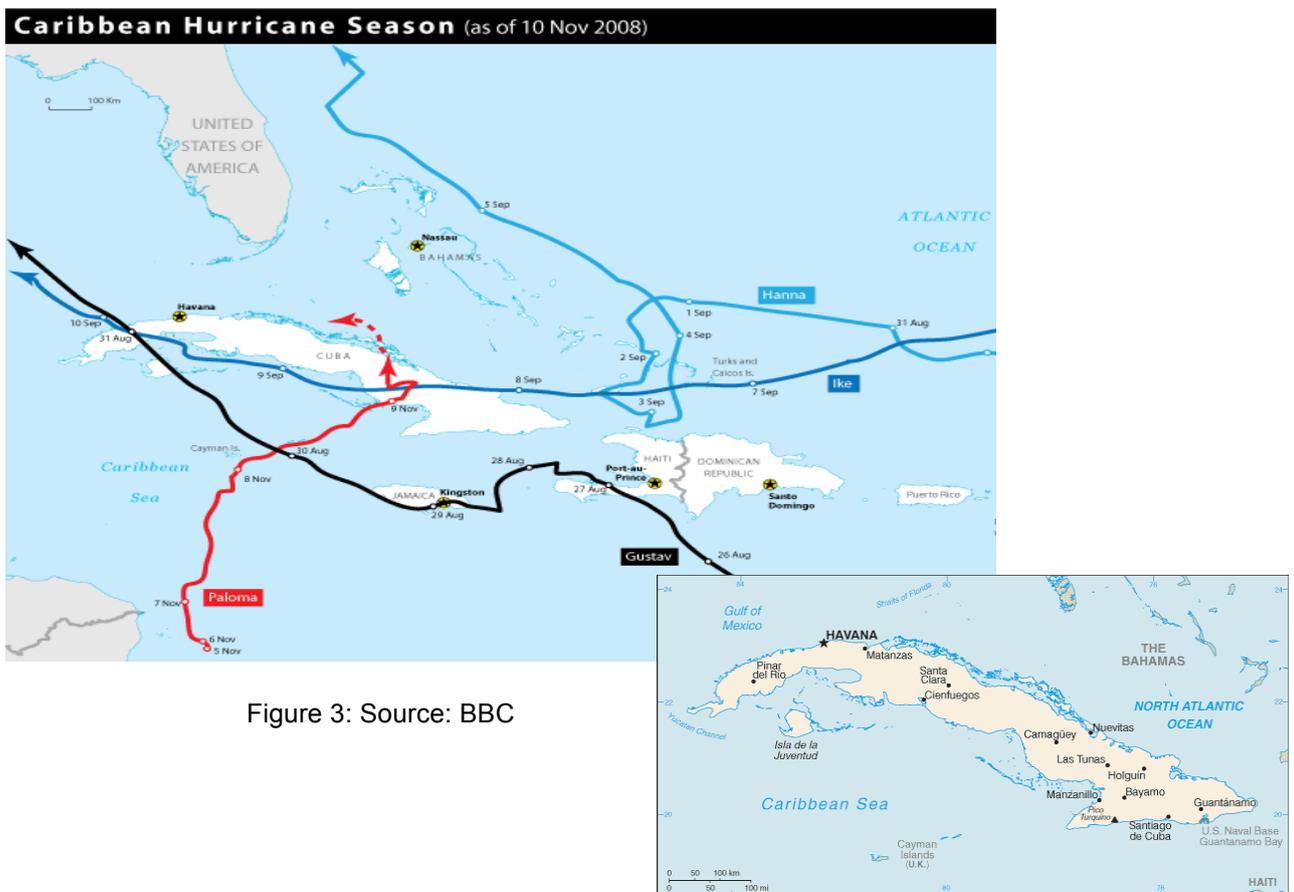


Figure 3: Source: BBC

Severity of Storms

Hurricane Gustav was a category 4 storm with sustained wind speeds of 140 miles per hour. Wind speeds were recorded to reach 155 miles per hour. Highest winds speeds recorded were 211 miles per hour.

Hurricane Ike was a category 3 hurricane and made landfall on September 8 on the north coast of eastern Cuba in the province of Holguín near Puerto de Sama, with sustained winds of about 120 mph (193 km/h), causing widespread flooding and damage to the eastern provinces. It passed across the central provinces of Holguín, Las Tunas, and Camagüey, emerging over the sea to the south of Cuba during September 8. Ike had dropped to a Category One by the time it crossed the island. It then followed the southern

coast of Cuba and crossed the western end of the island in Pinar del Río Province close to the path taken by Hurricane Gustav ten days previously. Another 1.6 million people had evacuated in advance of its second landfall. The western areas of Cuba, already devastated by Hurricane Gustav just 10 days before Ike hit, suffered additional major flooding from the rain and storm surge, which ranged from 7- 12 meters in different places.

Source: Wikipedia

It caused immense widespread damage due to its size. Ike was a system over 600 miles in diameter.

Impacts

Gustav at the time was believed to be the costliest hurricane to hit Cuba for 50 years. Over 7000 homes were left roofless and more than 100 000 homes damaged. In total 80 electric towers and 600 electric posts fell. Cuba's electric company indicated that a total of 136 electric towers toppled over and that the electrical grid on Isla de la Juventud was 100% damaged. 3,306 tobacco houses were destroyed and 130 km² of crops were ruined, including 7,239 acres (29.30 km²) of grain and nearly 1,500 of fruit. 42,000 cans of coffee were destroyed, and 3,100 tons of grapefruit lost. 930,000 chickens had to be euthanized. In total, damage from Hurricane Gustav amounted to \$2.1 billion. This level of economic impact to what is effectively a rural-agricultural dominated economy will take many years to recover.

Unfortunately for Cuba Hurricane Ike shadowed Gustav in regard to impacts, not because it was a stronger system but rather due to its size. Its total cost was reported between \$4 billion and \$7.3 billion. Like with Gustav, Hurricane Ike damaged all buildings on its track with numbers into the hundreds of thousands, there was widespread flooding and damage to farmland including 3 400 km² of sugarcane destroyed.

In total 7 people died in Cuba as a result of Hurricane Ike with no fatalities recorded for Hurricane Gustav. To put this in perspective the same storms killed 82 and 53 people in the USA respectively. Cuba's ability to restrict fatalities and protect its people despite the severity of the storm owes itself largely to its political organization and autonomy. The following section of the case study will examine how Cuba manages the threat of Hurricanes so effectively.

The Management of Hurricanes

There are three key pillars supporting Cuban hurricane management, Education, the Civil Defense and the Meteorological Institute.

Education is possibly the most important pillar. Disaster preparedness, prevention and response are part of the general education of all Cubans. People in schools, universities and workplaces are continuously informed and trained to cope with hurricanes. From an early age, all Cubans are taught every year, a two-day training session in risk reduction for hurricanes,

complete with simulation exercises and preparation actions. This training facilitates the mobilization of communities at the local level when a hurricane hits Cuba. Every individual has a role to play at the community level. Local authorities know who needs special care and how to assist the most vulnerable. This is contrasted with the recent management of Hurricane Sandy in the USA where many of the victims were vulnerable elderly. In Cuba, schools and hospitals are converted into shelters and transport is immediately organized. Cuba provides an example that the vulnerability of people can effectively be reduced with low-cost measures – and strong determination. However, this is largely possible only because the state is in a position to dedicate 100 percent of its resources to this end. It is a clear example though of Cuba placing the human welfare of its citizens ahead of any economic gains. Something that is possible only in an authoritarian communist state.

The second pillar is the Civil Defense. They are responsible for coordinating the civil responses and mobilizing a multi-agency response to an incoming threat of hurricane. Military, Police, other emergency services and voluntary groups all work together to implement the emergency plan, and measures such as massive evacuation are taken. In many cases not only people are evacuated but valuable goods as well.

The third pillar is the Meteorological Institute who manage the communication strategy within the Cuban hurricane risk management system. The MI uses a number of sophisticated technologies to collect and accurately interpret atmospheric data to provide reliable and accurate forecasts. They use satellites, radars, weather stations, sounding ships, buoys and aircraft as well as numerical modeling to predict hurricane tracks and severity. This data then feeds into the forecast. Figure 4 below shows how probabilistic cones are used to remove uncertainty.



Figure 4

The next step is to communicate that via television, radio, telephone and Internet. Radio has over 93 percent coverage of Cuba and television over 96 percent. This in turn triggers the response action of the Civil Defense.

The MI have developed a graduated early warning system, The public first receive information on a potential threatening hurricane 3-5 days before it arrival. As the threat increases so too does the media coverage. The communist state has such powers that it can broadcast live from the national forecast centre from 48-24 hours before the hurricane's arrival. In these broadcasts people are reminded of risks, e.g. that hurricanes are not points but cover a vast areas and that the mains risks are winds and floods. This I reinforced by the use of satellite imagery on TV like that shown below in figure 5. With this a perception of risk is gradually heightened as the system approaches.



Figure 5

In the case of Hurricane Gustav and Ike, once again Cuba can be seen to be managing hurricanes superbly. For Gustav over 300 000 people were successfully evacuated ahead of the hurricane. For Ike over 1 million people were evacuated ahead of it first landfall. A further 1.6 million people were evacuated ahead of the second landfall at Pinar Del Rio. In total only 7 people died in Cuba as a consequence of these two systems. When put into a larger time frame, between 1996 and 2004 Cuba evacuated over 5 million people with fatalities amounting to just 18 people. In contrast, according to Goklany 2009, the USA experiences an average of 133 deaths a year between 1999 and 2006. Without wanting to criticize the efforts of the USA, the achievements of Cuba clearly need to be recognised as exemplary. Sure, Cuba boasts the unusual position of being a communist state that is in a position to mobilize 100 percent of its resources to combat the threat of

hurricanes. This in itself is beyond most democracies. The most important point however, is not really to do with an authoritarian state's control but rather an empowered and informed public response. Once provided with information people have a role to play in safeguarding lives. The MI and media provide a heightened perception of risk and the Civil Defense and multi-agency approach mobilize the public so that huge numbers of people, including the most vulnerable are evacuated. This cost effective method that places social welfare ahead of economic welfare provides a model for all countries to learn from.