

Katrinomics  
hiroshima nuclear  
bombs, making more  
further dangerous.



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KatrinomicsAbstractThe case study is about the hurricane Katrina occurred in 2005 in USA. It is one of the lethal and costliest hurricane to ever hit United States. It happened on the 29th August, which passed through the Gulfport, Mississippi, New Orleans, Louisiana, and other regions between them. The storm impacted the low-lying coastal plain the most and survey exhibits that the lower floors of well-planned buildings were harmed by the combined surge of seawater and related wave activity, while the upper floors carried a very little amount of wind damage. Over its lifetime, one of these massive storms have very high potential and can emit as much energy as a million Hiroshima nuclear bombs, making more further dangerous. The brutality of each annual hurricane season changes according to decadal variation and becomes very difficult to predict its accuracy and level of impact.

With the patterns observed, there is now strong evidence to suggest global warming could be making hurricanes more frequent and unpredictable. Hurricane Katrina affected over 15 million people in different ways varying from having to evacuate their homes, rising gas prices, and the economy suffering. Since disasters tend to quicken existing financial, social, and political patterns, the huge losses in lodging, population, and business after Katrina are likely to continue and, at best, as it somewhat been recover. With the increasing population and economics along the coastal region, the damage caused by these storm increasing.

1. Introduction  
In 2005, storm Katrina had a devastating effect on the Gulf Coast of the US, taking off a catastrophe zone of 230,000 square kilometers in its wake and causing harm evaluated at \$75 billion. Katrina whipped up maintained winds of 225 kilometers per hour and a 5 to 9 meter-high

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storm surge of ocean water 2. Indeed the Hurricane Katrina was the costliest natural disaster in the American history and one of the top five deadliest hurricanes in the United States. 1.

1. Evolution: Hurricane The evolution step for storm arrangement is a cluster of rain storms over warm tropical waters. After the formation, the storms will be formed and develop when sea-surface temperature goes beyond 27°C and the encompassing air is calm. For the northern half of the globe these necessities are met between June and November. Under these conditions, large quantities of water evaporate and condense, which ultimately leads to the evolution of clouds and heavy rain. These processes will release heat in the process. When this released heat energy combined with the rotation of the earth, it will eventually form the hurricane. The low pressure is caused when the warm column of the air from the sea surface first begins to rise.

This event will cause the heavy motion on the wind and due to high deflection, the direction of the air will change and it will draw into the area. This wind draws up more moisture-laden air from the sea surface in a positive feedback process that swells the storm. This will result in backing of the cold air outside the storm and directs it to the surface of the ocean.

The tropical depression is caused as the wind speed travels at 37 kilometers per hour, leads in the formation of the mild, and wet and grey weather systems 3. Eventually when the hurricane hits the land it transfers all the energy to the land and it loses its source of energy, and gradually it becomes weak and it perishes. On 23rd August 2005, Hurricane Katrina formed in this way over the south-eastern Bahamas and was labelled tropical depression 12

of that year. Over the next two days the weather system gathered strength, Hurricane Katrina started to gather massive force and initiate the cause of devastation resulting in landfall between Miami and Fort Lauderdale, Florida, as a category 1 hurricane. If this formation took place away from the equator, then this could lead to massive spinning in the weather system due to the formation of Coriolis force, which is attached to the rotation of the earth.

On the next day, the temperature of the sea rises substantially, which causes the storm to move north westerly Florida. Katrina was the 11th tropical storm of the 2005 hurricane season at that time. The storm spent less than eight hours over land. It quickly intensified when it reached the warm waters of the Gulf of Mexico. Katrina only spent about 6 hours over land and was in the Gulf of Mexico early on August 26th. Katrina underwent to periods of rapid intensification, between August 26 and 28. On August 27th, Hurricane Katrina intensify to a category 3 hurricane, causing its top wind to exceed beyond 115 miles per hour and the area covered was increased, nearly the entire Gulf of Mexico intensity its impact, making it more dreadful. Early on August 28 Katrina underwent a second rapid intensification, strengthening from a Category 3 storm to a Category 5 storm with peak winds of 172 miles per hour.

It had become one of the most powerful Atlantic storms on record. On the morning of August 29, the storm became more dangerous and increased its impact and made a landfall as a category 4 hurricane at Plaquemines Parish, Louisiana, approximately 45 miles southeast of New Orleans. It continued on a course to the northeast. Later that morning it made another landfall crossing the Mississippi Sound near the mouth of the Pearl River 4. <https://assignbuster.com/katrinomics-hiroshima-nuclear-bombs-making-more-further-dangerous/>

Additionally, 8-10 inches of rain or more fell across large parts of Mississippi and Louisiana along and to the west of the track.

Fig1: Impacted areas by Hurricane Katrina 1. 2. Impact: The majority of hurricane damage leads to wind induced failure such as launching of debris, removal of roof tops and breaking door and windows. US hurricanes are categorized by wind speed according to Saffir Simpson Scale.

The worst scale is category of 5. The category 5 storm causes complete removal of roof top and extensive shattering of glasses and windows. This is very dangerous as it can also cause shrubs and trees to blow down and all signs are down. The minimal damage is caused when the storm hit with category 1. In this case there are no real damage to building but there can be damage to poorly constructed building 5. The impacts can be identified as:

- 1.

2. 1 Economic Impact: The 2005 hurricane season set new records as the busiest, the hurricane in US made greatest impact on the economic. The department evaluated and came out with all figures, which indicated with 28 named hurricanes and tropical storms, and most devastating, with more than \$61 billion in insured losses. Hurricane Katrina caused the greatest amount of the devastation and loss. According to the Insurance Information Institute, it is estimated that hurricane Katrina had caused the loss of about more than \$40 billion. The Congressional Budget Office estimated and calculated that the total value of energy infrastructure destroyed or devastated was about \$18 to \$21 billion. The other industry infrastructure was between \$16

and \$32 billion, and government structures and equipment, between \$13 and \$25 billion.

The hurricane Katrina had made greatest effect on employment of the people. Due to storm people encountered lot of hard ship in their daily routine. As per Labor division around 600 thousand individuals have lost occupations from the tropical storms Katrina, Rita and Wilma. The storm also shut down refineries throughout the region. Seven of the nine facilities that can refine up to 1.5 million barrels of crude oil a day were up and running by November 2005. The hurricane Katrina caused lot of economic disaster in its path to US 6.

Fig2: Economic of

Disaster

Fig 3: Katrina as most expensive

hurricanes 1.

2.2 Environmental Impact: The US Geological Survey has estimated 217 square miles of land was transformed to water by the hurricanes Katrina and Rita. It has caused complete devastation at the coastal sites and these leads to beach erosion which spread along greater areas of Gulf Coast. The hurricane caused the land unfertile which ultimately lost its breeding grounds. It caused lot of death of sea animals. Due to the major devastation and keeping in mind the danger of barren land, it forced the closure of 16 National Wildlife Refuges, in other words the deprivation of the shelters of the animals.

The impact of the storm made over 7 million U. S. gallons of oil being leaked, which gradually turns to be dangerous environmental effect and leads to spreading of dangerous diseases. It was reported the maximum fish dying because the water was contaminated and became very dangerous due

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tomixture of raw sewage, bacteria, heavymetals, pesticides, toxic chemicals, and oil. Taking in consideration of thiscase, clean water was provided by pumping the flood water from New Orleans intoLake Pontchartrain.

This process that took 43 days to complete. 1. 2. 3 Social Impact: The hurricane Katrina causedmajor social reforms. It lead toredistributed over one million people from the central Gulf coast elsewhereacross the United States.

With the fear and the devastation causedby Katrina the population in New Orleans was reduce by half of its amount as itwas estimated at pre-storm population. By late January 2006, the population ofNew Orleans was about 200, 000 people. The devastation was on the large scale.

It took time for people to set back to the routine as all their property wasstill under construction and for them it was very difficult to rehabilitee onceagain. According to U. S Census Bureau the new population estimated, by July 1, 2006, for the state of Louisiana showed a population decline of 219, 563, or4. 87%. Many people were totally traumatized by the devastating effect ofhurricane Katrina. 2. Methodology: The detection of Hurricane was extremely important as it helps to makethe mitigation plan stronger. Therefore, tracking the pattern and movement ofthe tropical cyclones is a constantly evolving science.

For a hurricane'spossible trajectory or the path it will follow is usually represented as acone, which reduces over time as the error in the prediction decreases. Meteorologistscan use many different models to predict the path <https://assignbuster.com/katrinomics-hiroshima-nuclear-bombs-making-more-further-dangerous/>

of the hurricane and impact can be caused in its upcoming. The original best model was CLIPER (Climate and Persistence). It is designed and molded with combination of statistical regression equation based on historical data and present climatological data. Till 1980's, this was primary support and only model used for the major forecasting.

Hence all the major decision and the action was relied on this model. But today, this model has become the base and it is used primarily for testing and comparing new models. NHC90 and BAM (Beta and Advection Model) are two models based on data gathered by planes. The other different methods include using satellites and radar, and reconnaissance aircraft.

The observations with the aid of above method across the Caribbean also greatly assist in tracking tropical cyclones.

- 1) Satellites: Before the use of technology and launching the satellite for the determination of the hurricane, it was really hard task for meteorologists to determine just where tropical cyclones were forming. The only reliable source before technology was the information from tropical island weather observations and coastal radars. Hence the accurate prediction was not possible and this was not efficient way for predicting the upcomings. Satellite images are very important to forecasters because by putting into motion several hours of satellite pictures, they can gather information about the track and development of the tropical cyclone. Therefore for the meteorologist the satellite became excellent way to communicate the forecast and predict the outcomes by the periodic observation send by the satellite. The images sent by the satellite are very critical to forecasters.



The main reason is by putting into motion several hours of satellite pictures, they can gather information about the track and development of the tropical cyclone. 2. 2) Doppler Radar: The main purpose of Doppler radar is to forecast the amount of rain associated with the cyclone. The most up to date era of Doppler radar gives forecasters with progressed information and with the upgraded information such as amount of precipitation concentrated, the development of tropical tornados, tornado action that can go with a tropical tornado, and gauges of wind speed inside a tropical violent wind and also the estimated duration of the action.

The Doppler radar covers about 200-250 miles of the rains, considering the location of the radar and also helps to calculate the amount of precipitation.

2. 3) Reconnaissance Aircraft: The reconnaissance aircraft are critical in gathering of the tropical cyclone information, including pressure, the eye location, wind speeds within a 105 nautical mile radius of the eye, and storm size. The Chief, Aerial Reconnaissance Coordination, All Hurricanes (CARCAH) coordinates tropical cyclone reconnaissance flights.

The next step involves forecasting the process which involves analyzing all of the data gathered by the various observational platforms such as satellite, radar, ASOS and many more. The different units within the NHC are present in the forecast process, including the Tropical Analysis and Forecast Branch (TAFB), Hurricane Specialists Unit (HSU), and Hurricane Liaison Team (HLT). The coordination and the proper communication between the national centers and local forecast offices are done with aid of Tropical cyclone forecasts. After the NHC issues a forecast, local NWS Weather Forecast

Offices (WFOs) use the information. The final decision are taken by  
Emergency managers 8.