

Notable Catastrophes in Meteorology

I. Floods:

A. Mississippi Basin in 1993:

1. It all started in the autumn of 1992 when record rains saturated the soils, followed by a heavy snow pack. 400%- 750% of the usual rainfall in Iowa and Minnesota.
2. The ground eventually became saturated, water rose in the Missouri and Mississippi rivers and spread all over their floodplain.
3. Davenport, Iowa was inundated with 4 meters of water
4. 250,000 residents lost their drinking water in Des Moines, Iowa due to groundwater contamination from sewage and fertilizers released.
5. 14 meters above flood stage in St. Louis, Missouri.
6. Continued for 79 days. 50 people died; 40,000 km² were submerged and 55,000 homes were destroyed. \$12 billion in damage.

B. Florence Flood of 1966:

1. Heavy rains in the Apennine Mountains.
2. November 3rd, the dams upstream of the Arno River were overtopped and released 2000 m³/sec toward Florence Italy.
3. The boiling mass of water reached Florence traveling at 60 km/hr at 4:00 a.m.
4. 5,000 families were made homeless and 101 people died.
5. 14,000 pieces of valuable art and historical objects were lost or damaged.
6. 600,000 tons of mud, rubble and raw sewage filled basements and first floors of nearly every building.

C. Central China 1931.

1. 7 typhoons and heavy rainfall swelled the Yellow, Yangtze and the Huai rivers.
2. 4 million people died from the flood. 80,000 people were left homeless.

D. 1887 Yellow river flood:

1. Heavy rain falls collapsed dikes and flooded northern China.
2. 2 million people died of drowning and starvation.

E. 1938 Yellow river flood:

1. 700,000 dead after the Chinese Nationalist government opened the Huayuankou dike to stop the Japanese invasion.

F. Typhoon Nina caused the Banqiao Dam in China to fail in 1975:

1. 231,000 dead.

G. 1935 Yangtze River flood killed 145,000 people.

H. July 31, 1976 Big Thompson Canyon flood:

1. Rain poured down with 30 cm of rain in less than 4 hours. (75% of the total annual rainfall for the area).
2. Created a wall of water 6 meters high moving 31,200 ft³/s.
3. 144 people died, most buried in debris from the rocks and debris.
4. 52 businesses and 400 cars destroyed.

- I. August 12, 1997, a flash flood 3.3 meters high rushed down the Antelope Canyon in Arizona and killed 12 hikers.

II. Tornadoes:

- A. May 3 to 6, 1999:
 1. 140 were reported around Norman, Oklahoma .
 2. Caused \$2 billion in damage and killed 50 people. More than 2,000 homes were destroyed and another 9,000 were damaged.
 3. Mulhall in central Oklahoma were utterly destroyed.
 4. The Moore-Bridge Creek tornado was the biggest and most destructive. 484 km/hr or (381 mph) winds. 36 people had died, and more than 8000 homes had been lost or damaged, causing more than \$1.1 billion in destruction.
- B. The Great Kansas Cyclone in May 30, 1879:
 1. Killed 66 and injuring 60 in Irving, Kansas.
- C. May 25th, 1955 a tornado wiped out the town Udall, Kansas. Killing 83 and injuring more than 270 people.
 1. Same tornado had devastated the town of Blackwell, Oklahoma killing 20 and injuring 250.
- D. Tornadoes are also common in Bangladesh, where they kill almost 200 people a year, the deadliest annual toll from tornadoes in the world.
 1. Daultipur-Sulturia tornado on April 26, 1989 killed 1,300 people.
- E. The Super Outbreak of 1974:
 1. April 3, 1974, 148 tornadoes occurred in 13 states from Michigan to Alabama. Damaged 1,440 km² of land. There were 6 F₅ and 24 F₄ tornadoes. There were 15 active tornadoes on the ground simultaneously.
 2. Killed 335 people and hospitalized 1,200 more.
 3. More than 7,500 houses were destroyed and 6,000 more were damaged, including another 2,100 mobile homes destroyed and more than 4,00 farm buildings and 1,500 small businesses were destroyed. More than 27,600 families suffered significant losses with about \$3.5 billion.
- F. The Tri-State Tornado of 1925: March 18
 1. A path of several kilometers wide, moving northeast across Missouri at about 100 km/hr,
 2. leveled Annapolis, Missouri killing 11 crossed the Mississippi into Illinois. 234 people died in in Murphysboro.
 3. In DeSoto, Illinois 88 students died in the local school.
 4. In 40 minutes, the tornado had struck dozens of towns in southern Illinois, killed 541 people, and injured 1,423.
 5. The killer crossed the Wabash River into Indiana, where it leveled Griffin, Owensville and Princeton, killing another 71 people.
 6. More than 700 died, and more than 2,000 were injured. It hit nine schools in three different states and killed 69 students. 4 towns were obliterated and never rebuilt. Caused \$1.4 billion.

III. Hurricanes, Cyclones and Typhoons:

- A. The Hurricanes of 2005: From June 1 to November 1.
 1. There were a record of 28 large tropical storms and 15 of them became hurricanes. 4 reached a category 5 with wind speeds of 250 km/hr.
 2. In June, Arlene, Bret and Cindy dropped 133 mm of rain on Louisiana and Mississippi and killed 3 people.
 3. On July 5, Hurricane Dennis struck Cuba, Haiti, and Florida, killed 89 people and caused \$5 billion in damage.
 4. On July 11, Hurricane Emily hit southeastern Mexico Killing 14 people and causing \$400 million in damages.
 5. Mid-August, Katrina formed from a Category 4 to a Category 5 and hit Louisiana on August 29th. A huge 2 story tall storm surge poured inland. The water broke through dikes and levees of New Orleans in more than 50 places and releases a huge volume of pollution-laden water into the low-lying districts, flooding many houses to their rooftops, inundating 80% of the city.
 - a. Caused \$82 billion in damage. Killed at least 1,836 people with more than 700 still missing.
 6. September 2, Hurricane Maria turned into Iceland and Norway.
 7. Nate and Ophelia slammed into North Carolina and rolled up the coast, causing \$70 million in damage.
 8. September 21, Rita hit the Florida Keys and curved and hit the Texas-Louisiana border. It destroyed much of the oil infrastructure in the region and devastated the bayous of western Louisiana, killing at least 113 and causing \$10 billion in damage.
 9. October 2, Hurricane Stan struck the east coast of Mexico and caused intense flooding and mudslides, with more than 1,000 dead.
 10. October 5, Hurricane Tammy hit Florida causing heavy rainfall and flooding.
 11. Hurricane Vince struck Spain a few days later.
 12. October 17 Hurricane Wilma struck Cancun with 185 km/hr winds and 882 mb pressures. Caused 23 deaths and more than \$29 billion of damage.
 13. Tropical storm Alpha flooded Haiti and the Dominican Republic and killed 42 people.
 14. Hurricane Beta hit Nicaragua on October 26.
 15. Tropical storm Gamma killed 41 people in Honduras and Belize on November 28th.
 16. Epsilon and Zeta were the final two storms that ended on January 6, 2006.
- B. Galveston, Texas 1900: Leveled.
 1. Storm surge of 4.6 m tall formed and knocked most of the buildings off their foundations and reduced the wooden ones to splinters.
 2. Killed 12,000 people. \$20 million of damage in 1900 dollars.
- C. Supertyphoon Nina July 30, 1975:
 1. Dropped one meter of rain on the Hunan Province in China in 1 day.
 2. 62 dams on the Huai River failed.
 3. 170,000 people died from drowning and starvation. \$5 billion damage.
- D. 1881 typhoon hit Haiphong in northern Vietnam. Killed 300,000 people.

- E. Cyclone Nargis: May 2, 2008 reached the coast of Burma (Myanmar).
 - 1. Killed 1 million people died from drowning in a storm surge and starvation.
 - 2. 2-3 million people were left homeless.
 - 3. 95% of the buildings in the Irawaddy delta were destroyed, as well as more than 1,400 temples.
 - 4. Closed government and relief efforts were stalled until May 8th.
- F. The Bhola Cyclone of November 12-13, 1970:
 - 1. Swept over East Pakistan during high tide. Storm surge of 7m tall. Wind speeds of 255 km/hr.
 - 2. Water drowned 500,000 people. \$500 million.
 - 3. East Pakistan became Bangladesh.

IV. Blizzards:

- A. Winter of 1880-1881: Blizzard after blizzard killed hundreds of people in the Great Plains.
- B. The Great Die-Up: 1886-1888: Livestock disaster. Millions of Cattle froze. Great Plains.
- C. Schoolhouse Blizzard: January 12, 1888. Warm front turned into -40^oC temperatures in a matter of hours. Montana, Dakota and Nebraska. 500 people died of hypothermia trapped in the blizzard. The storm lingered for days.
- D. The Great White Hurricane: March 1888, the eastern U. S. was hit with a 1 meter of snow and 130 km/hr winds. Blowing snow 15 meter high in some places. Communication and Transportation was shut down. Subways were thought up.
- E. Superstorm of 1993: East Coast. March 12-14th.
 - 1. Winds of 160 km/hr and 30 inches of snow.
 - 2. 50 tornadoes in Florida and Cuba (45 people died).
 - 3. Total storm killed 300 people and more than 10 million people lost electricity for days.