



NOAA *Backgrounder*

NOAA's Top Global Weather, Water and Climate Events of the 20th Century

The nation's climatologists at the National Oceanic and Atmospheric Administration's National Climatic Data Center in Asheville, North Carolina, have selected some of the most notable floods, typhoons, hurricanes, droughts, heatwaves, tornadoes, winter storms and blizzards, and climate events of the 20th century. Factors taken into consideration included an event's magnitude, meteorological uniqueness, as well as its economic impact and death toll. Some of NOAA's top experts gave a perspective based on their areas of expertise. The events are found in no particular order, and the list is by no means exhaustive.

A WORD ABOUT NOAA. . .

The National Oceanic and Atmospheric Administration (NOAA) conducts research and gathers data about the global oceans, atmosphere, space, and sun, and applies this knowledge to science and service that touch the lives of all Americans.

NOAA warns of dangerous weather, charts our seas and skies, guides our use and protection of ocean and coastal resources, and conducts research to improve our understanding and stewardship of the environment which sustains us all.

A Commerce Department agency, NOAA provides these services through five major organizations: the National Weather Service, the National Ocean Service, the National Marine Fisheries Service, the National Environmental Satellite, Data and Information Service, and Office of Oceanic and Atmospheric Research; and numerous special program units. In addition, NOAA research and operational activities are supported by the Nation's seventh uniformed service, the NOAA Corps, a commissioned officer corps of men and women who operate NOAA ships and aircraft, and serve in scientific and administrative posts.

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Floods

Floods usually occur in the middle and lower reaches of the major rivers in China. These floods are experienced on a recurring basis along this and other river systems in China. The periodic severe flooding associated with these heavy rainfall events kill from several thousand to several hundred thousand people. During this century major flooding disasters occurred in 1900, 1911, 1915, 1931, 1935, 1950, 1954, 1959, 1991 and 1998 mainly in the Yangtze River Valley.

Yangtze River Flood, 1931. The summer flood along the Yangtze during July-August 1931 was the most severe, with over 51 million people affected (1/4 of China's population). 3.7 million people perished from this greatest disaster of the century due to disease, starvation or drowning. This flood was preceded by a prolonged drought in China during the 1928-1930 period.

Flood in Vietnam, 1971. Heavy rains caused severe flooding in North Vietnam, killing 100,000.

Great Iran Flood, 1954. A storm over Iran produced flooding rains resulting in approximately 10,000 casualties.

Many of the devastating floods that occur in parts of Southeast Asia are also associated with typhoons or tropical systems. See the typhoon section for more information.

In contrast, the U.S. Midwest Flood of 1993 reported 48 deaths.

Typhoons, Cyclones, Hurricanes

Deadly Typhoons: Killer Cyclones strike coastal areas

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along the Bay of Bengal with periodic frequency much like the floods along the Yangtze River in China. They historically have also devastated the China coast, Korea, Japan, the Philippines and Southeast Asia.

Bangladesh Cyclone, November 1970. The greatest tropical system disaster this century occurred in Bangladesh in November 1970. Winds coupled with a storm surge killed between 300,000- 500,000 people. These cyclones usually cause the most misery, loss of life, and suffering in low lying areas in Bangladesh and coastal India.

Bangladesh Cyclone 02B, April 1991. Another cyclone struck the Chittagong region in Bangladesh in 1991 killing over 138,000 people and causing damage in excess of 1.5 billion dollars. The tropical cyclone devastated the coastal area southeast of Dacca with winds in excess of 130kts and a 20 foot storm surge.

China Typhoons, Early Half of Century. Several typhoons also struck the eastern China coast during the early half of the century, causing great hardship with deaths from some of the storms reaching the tens of thousands. For example, Typhoons striking the China coast in August 1912 and August 1922 resulted in fatality counts of 50,000 and 60,000 respectively.

Hurricane Mitch, November 1998. One of the strongest late season hurricanes on record formed in the western Caribbean in October 1998. Although the system eventually weakened before landfall, its slow passage westward over the mountainous regions of Central America unleashed precipitation amounts estimated as high as 75 inches. The resulting floods devastated the entire infrastructure of Honduras and also severely impacted other countries in the area. The final estimated death toll was 11,000, the greatest loss of life from a tropical system in the western hemisphere since 1780.

Typhoon Vera, September 1958. This typhoon's passage over Japan in 1959 caused Japan's greatest storm disaster. The death toll reached nearly 5000, with 1.5 million homeless. Typhoon Vera dealt a staggering blow to Japan's economy with tremendous damage to roads, bridges and communications from wind, floods and landslides.

Typhoon Thelma, October 1991. Thelma was one of the most devastating tropical systems to affect the Philippines this century. Reports indicated that 6000 people died by catastrophic events including dam failure landslides and extensive flash flooding. The death toll exceeded that of the Mt. Pinatubo eruption. The highest casualties occurred on Leyte Island where widespread logging in recent years had stripped the

hills above the port city bare of vegetation.

Droughts, Famines and Heatwaves

Droughts, famines, and heatwaves are much harder to quantify. The effects are devastating and impacts can span just a couple months or stretch to a decade or more. Some historical drought/famines with loss of life include:

Asian Droughts.

Numerous drought related disasters have occurred over the Asian mainland this century. The most notable include:

- Indian Drought of 1900- 1/4 to 3 1/4 million die due to drought, starvation and disease
- Chinese Famine of 1907-Over 24 million perish from starvation
- Chinese Famine of 1928-1930- Over 3 million perish in northwest China
- Chinese Famine of 1936- 5 million Chinese die in what is called the "New Famine"
- Chinese Drought 1941-1942- Over 3 million perish from starvation
- Indian Drought of 1965-1967- Over 1.5 million perish in India
- Soviet Union (Ukraine and Volga regions) 1921-1922- ¼ to 5 million perish from drought

Sahel Drought, various years. Famines/droughts have occurred in the Sahel of Africa in 1910-1914, 1940-1944, 1970-1985. The drought in the Sahel claimed over 600,000 in 1972-1975 and again in 1984-1985.

Tornadoes

Severe and damaging tornadoes are mainly a U.S. phenomena. The U.S. is the "Tornado Capital of the World" and has more tornadoes annually than any country on the globe. Two notable outbreaks include: "Super Tornado Outbreak of 1974" (315 deaths) and the "Tri State Tornado of 1925" (695 deaths).

Winter Storms/Blizzards

Iran Blizzard, February 1972. A blizzard in Iran in Feb 1972 ended a four-year drought but the week long cold and snow caused the deaths of approximately 4,000 people.

Europe Storm Surge, 1953. One of Europe's greatest natural disasters occurred during the winter months of January and February 1953. Violent winter storms caused storm surges which caused flooding in areas

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of the Netherlands and the United Kingdom. Almost 2,000 people perished due to these storm surges.

Climate Links:

Pollution

The Great Smog of London, December 1952. Stagnant air due to an inversion combined with industrial and residential emissions to create an air pollution episode without parallel in this century. 4000 deaths were attributed to the poisonous air with 4000 additional fatalities due to related causes.

El Niño, La Niña

El Niño and La Niña events tend to alternate about every three to seven years. However, the time from one event to the next can vary from one to ten years.

1982 to 1983 El Niño. The economic impacts of the 1982-83 El Niño were huge. Along the west coast of South American, the losses exceeded the benefits. The fishing industries in Ecuador and Peru suffered heavily when their anchovy harvest failed and their sardines unexpectedly moved south into Chilean waters. Also, changed circulation patterns steered tropical systems

off their usual tracks to islands such as Hawaii and Tahiti, which are unaccustomed to such severe weather. They also caused the monsoon rains to fall over the central Pacific instead of the western Pacific. The lack of rain in the Western Pacific led to droughts and disastrous forest fires in Indonesia and Australia. Winter storms battered southern California and caused widespread flooding across the southern United States, while unusually mild weather and a lack of snow was evident across much of the central and northeastern portion of the U.S. Overall, the loss to the world economy in 1982-83 as a result of the changes to climate due to the El Niño amounted to over \$8 billion. The toll in terms of human suffering is much more difficult to estimate. (Reference- NOAA/OGP Our Changing Planet Spring 1994)

New York Times estimate \$ 21.0 billion 1997 USD or about \$ 13.0 billion in 1982-1983 dollars.

Note: NOAA/OGP survey of Global Impacts caused by the 1997-1998 ENSO warm event was \$ 25.0 - 33.0 billion

For more information, contact NOAA National Weather Service Public Affairs, Silver Spring, Md. (301-713-0622)