NATURAL DISASTERS

Cyclone, Hurricane, Typhoon, Tornado and Tsunami (Update)

A tropical cyclone is the generic term for a non-frontal synoptic scale low-pressure system over tropical or sub-tropical waters with organized convection (i.e. thunderstorm activity) and definite cyclonic surface wind circulation. The terms "hurricane" and "typhoon" are regionally specific names for a strong "tropical cyclone".

Tropical cyclones with maximum sustained surface winds of less than 17 meters per second are called "tropical depressions". Once the tropical cyclone reaches winds of at least 17 meters per second they are typically called a tropical storm and assigned a name. If winds reach 33 meters per second then they are called by the following terms depending on their location.

- **"hurricane"** (the North Atlantic Ocean, the Northeast Pacific Ocean east of the dateline, or the South Pacific Ocean east of 160E). Few things in nature can compare to the destructive force of a hurricane. A hurricane is capable of destroying coastal areas with sustained winds of 200kmph or higher and intense rainfall and a storm surge. During its life cycle a hurricane can apply as much energy as 10,000 nuclear bombs. The word hurricane is derived from Huracan, a god of evil recognized by the Tainos, an ancient aborigines Central American tribe. Hurricanes start over the oceans as a collection of storms in the tropics. The deepening low-pressure center takes in moist air and thermal energy from the ocean surface, convection lifts the air, and high pressure higher in the atmosphere pushes it outward. Rotation of the currents tends to spin the clouds into a tight curl; as the winds reach gale force, the depression becomes a tropical storm. The mature hurricane is nearly circularly symmetrical, and its influence often extends over an area 800 km in diameter.

- **"typhoon"** (the Northwest Pacific Ocean west of the dateline). The word typhoon is derived form the Cantonese word tai-fung, meaning great wind. Typhoons are one of the worlds most violent and destructive storm systems. Around 17 typhoons form annually in the West Pacific. They are giant whirlwinds, with air circulating around an area of low pressure, and high winds extending about 100km from the centre. Most typhoons form between 5-30 degrees latitude, and 110-180 degrees longitude. Typhoons that form in the east of this region can travel for long distances without being affected by landmasses. This gives them plenty of time to build up their strength. Hence, the very strong and long lasting supertyphoons tend to form closer to the date line.

- **"severe tropical cyclone"** (the Southwest Pacific Ocean west of 160E or Southeast Indian Ocean east of 90E)

- **"severe cyclonic storm"** (the North Indian Ocean)

- **"tropical cyclone"** (the Southwest Indian Ocean)

Tornado

A tornado is a violent whirlwind-a rotating funnel of air that extends from a cloud to the ground. Tornadoes can travel for many kilometres at speeds of 400 kilometers per hour or more. These storms change direction without warning, randomly destroying homes and power lines, uprooting trees, and even throwing large objects such as automobiles over long distances.

Tornadoes that occur over oceans and lakes are called *waterspouts*. Because they rotate less vigorously and affect less-populated areas, waterspouts are usually not as destructive as tornadoes; however, waterspouts can move inland and become tornadoes. The most destructive force in a tornado is the updraft in the funnel. As this unstable air moves upward at high speed, it can suction up houses and trees and move them hundreds of feet.

When unseasonably warm humid air collides with a cold front, intense thunderstorm clouds form and tornadoes may develop. As warm air rises within the storm clouds, cooler air rushes in from the sides, creating a whirling wind that draws surrounding air toward its center. An area of strong rotation develops, 3 to 9 kilometers wide. Next to appear is a dark, low cloud base called a rotating wall cloud. Moments later, as rotation becomes even stronger, a funnel develops.

Whenever and wherever conditions are right, tornadoes are possible, but they are most common in the central plains of North America, east of the Rocky Mountains and west of the Appalachian Mountains. They occur mostly during the spring and summer; the tornado season comes early in the south and later in the north because spring comes later in the year as one moves northward. They usually occur during the late afternoon and early evening. However, they have been known to occur in every state in the United States, on any day of the year, and at any hour. They also occur in many other parts of the world, including Australia, Europe, Africa, Asia, and South America.

Tsunami

"Tsunami" is a Japanese word meaning "harbor wave" and is now being used internationally to refer to a series of waves traveling across the ocean with extremely long wavelengths resulting from seismic or volcanic activity in the ocean floor. When these waves approach shore, the speed of the wave decreases as they begin to touch the bottom of the sea. At this stage the height of the wave drastically increases. As the waves strike shore they may inundate low-lying coastal areas resulting in mass destruction and in many instances loss of life. Often a tsunami is incorrectly referred to as a tidal wave. Tidal waves are simply the periodic movement of water associated with the rise and fall of the tides produced by the gravitational attraction of the sun and moon. Tsunamis have no connection with the weather or with tides.

Tsunamis are sometimes referred to as seismic sea waves as they are usually the result of a sudden rise or fall of a section of the earth's crust under or near the ocean. A seismic disturbance can displace the water column, creating a rise or fall in the level of the ocean above. This rise or fall in sea level leads to the

formation of a tsunami wave. The magnitude of the disturbance causing the tsunami is the primary factor influencing the size and strength of the waves. The distance between successive wave crests or the wavelength is much larger than that of a normal wave and may be hundreds of kilometers apart. Depending on the depth of the water in which the tsunami is traveling, it may attain speeds of up to 800 kilometers an hour.

Tsunamis have been recorded in all the major oceans of the world. However, this phenomenon is mainly restricted to the Pacific basin, an area surrounded by volcanic island arcs, mountain chains and subduction zones. The Indian and Atlantic oceans are far less geologically active, with some exceptions, and therefore the occurrence of tsunamis is rare.