

Oceanography



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Abstract

Oceanography is the scientific study of the ocean. It as an earth scientific unit normally referred to as marine science that deals with all aspects concerning the ocean. The ocean covers a great margin of topics, which include the marine organisms, the ocean currents, the dynamics of the ocean ecosystem, the waves, the geology of the ocean floor and the plate tectonics, and the fluxes of the various physical and chemical substances within the ocean and its environs.

The variety of the topics provides the researchers and the oceanographers with the choice and chance to major or specialize in a field of their choice as they explore what oceans really hold. To understand the main components of the ocean and the process involved, one is required to have vast knowledge in such fields as geography, physics, chemistry as well as geology and meteorology.

Introduction

Conventionally, more than 75% of the earth's surface is covered by water. This is to imply that water controls a great portion of our normal activities either directly or indirectly. Hurricanes occur due to pressure difference in the ocean and alteration in the tectonic plates. Research shows that they cannot be avoided but caution should be taken because they are very severe when they occur.

Body

A hurricane is also called a typhoon or a stern tropical cyclone. It is the strongest known storm on earth with the greatest intensity and impact of damages and losses. It is a cyclonic or rotary storm, which usually gets the energy from cloud formation and rainfall. It should be differentiated from mid-latitude storms, which derive their energy from a temperature gradient. The strongest hurricanes release energy that is equivalent of one 10-megaton nuclear bomb exploding every 20 minutes. This shows how strong and severe they are and how brutal they can be on the surfaces. Dennis Grith.

A hurricane has varied names depending on the location and strength, the nature of effects as well as the period at which it takes place. A hurricane is normally referred to by many other names, such as tropical cyclone, typhoon, cyclonic storm, tropical depression, tropical storm, or simply cyclone. Russ Rowlett.

The term tropical is used to refer to both the geographic origin of these systems, which form almost entirely in tropical areas, and the nature of formation. The term cyclone refers to such storms, which are of cyclonic nature. With a rotation that is counterclockwise north of the equator and clockwise south of the equator. A tropical cyclone is a storm system characterized by a large low-pressure centre and several thunderstorms which that produce violent winds and rain. Tropical cyclones feed on heat released when moist air rises, resulting in condensation of the vapor contained in the moist air.

Hurricanes occur in different places and the intensity at which they occur vary. The places that are most prone to hurricanes are called hurricane prone areas. Such areas include the South Pacific areas, the North Atlantic areas as well as the South Indian shores. On the other hand, tropical cyclones and storms are more common in the Atlantic, East, Central and Northwest Pacific, in the South Indian Ocean, and in the Arabian Sea. Dennis Grith.

Development of a hurricane

Development of a hurricane follows a process, which normally starts with the development of a tidal wave, which gains energy from the wind and other factors to advance into a hurricane. Hurricanes occur in the oceans when a tropical tidal wave starts and progresses to a strong wave. A hurricane takes a specific process to progress and happen. A three-stage process leads to the development of hurricanes.

The three stages involved are tropical depression, tropical storm and finally a hurricane. The first sign that a hurricane may be in the making is the appearance of an organized cluster of thunderclouds over tropical seas. This region of convective activity is labeled a tropical disturbance if a center of low pressure is detectable at the surface. A Tropical depression has a highest wind speed of 38 miles per hour (33 knots), with some rotary circulation and one or more closed isobars. Russ Rowlett.

When one views tropical depressions from a satellite, they appear to have little or no organization. However, the slightest amount of rotation can usually be perceived when looking at a series of satellite images. Instead of a

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circular appearance similar to hurricanes, tropical depressions look like individual thunderstorms that are grouped together. Chances are that the tropical depression was triggered by the International Tropical Convergence Zone (ITCZ), by a trough in the westerlies winds intruding into the tropics from midlatitudes, or by a wave or ripple in the easterly trade winds, commonly called the easterly wind. Dennis Grith. (1996),

As stated earlier, a hurricane starts as a tropical depression with a sustained wind speed of less than 39 mph (35 knots that translates to about 63 km/hr). As the system strengthens due to stronger winds and favoring factors, it becomes a tropical storm with winds from 39 to 73 mph (35-63 knots about 63-118 km/hr). When the winds are sustained, basing it on a one-minute average at 74 mph, (64 knots about 119 km/hr), the storm becomes a hurricane. Russ Rowlett. (2000),

The names assigned to a hurricane depend on the location. In the Atlantic Ocean, East Pacific, Central Pacific (east of the International Dateline) and Southeast Pacific (east of 160°E), it is referred to as a Hurricane. A typhoon is the term used in the Northwest Pacific (west of the International Dateline) while in the Southwest Pacific (west of 160°E) and Southeast Indian Ocean (east of 90°E) it is called a Severe Tropical Cyclone. In the North Indian Ocean, they call it a Severe Cyclonic Storm and in the Southwest Indian Ocean, (west of 90°E) it is referred to as a Tropical Cyclone. Dennis Grith. (1996),

Effects of Hurricanes

Hurricanes are very captivating to follow and to view on the satellites. However, though, there are negative parts associated with the hurricanes. Hurricanes are among the most powerful and deadliest forces in nature, which bring various kinds of effects to the area it makes landfall over. Some of the effects such as profuse amounts of rain can be beneficial during a dry spell, but most of the time these effects are of negative impacts. Dennis Grith.

The effects of hurricanes include:

- a) Storm surge and tidal flooding: -This is the most devastating and destructive effect from a hurricane. Storm surge is the rising wall of water, which comes ashore with a land falling hurricane, and is responsible for the greater proportion of hurricane destruction and deaths.
- b) High Winds: - This is the most important effect of a hurricane since it determines how powerful the storm is, and how much storm surge and damage it can cause. Winds in a hurricane can reach up to 200 mph depending on the intensity.
- c) Tornadoes: -This is probably the least thought of effect of a hurricane though they occur in rare occasions. They occur due to the energy flux and instability created when a hurricane makes landfall. The small energy involved however makes them not to be strong.
- d) Heavy rain and flooding: -This is the effect of a hurricane that is usually ignored. After hurricanes make landfall, their winds decline and this is followed by the tremendous amounts of rainfall, which may become a major

factor, and can cause significant flooding as with Hurricane Floyd of 2008. Dennis Grith.

Measurement of Hurricanes

In order to measure and record hurricanes, a new technique; Vortex Objective Radar Tracking and Circulation, was developed by the National Center. Aircraft also play a key role in collecting data, either through on-board computers. The aircraft most commonly used is the Lockheed WC-130 Hercules flown by the US Air Force Reserve from Keesler AFB, Mississippi. Russ Rowlett.

The central pressure of a hurricane may be described using inches of water, millimeters of mercury or other units of pressure commonly used to describe atmospheric pressure. Basing on the level or intensity of damage, they are categorized as minimal, moderate, extensive or catastrophic. Dennis Grith.

Conclusion

It is therefore evident that hurricanes are dangerous and have severe effects both on human life as well the natural environment. Though they cannot be controlled, people should avoid living in the prone areas. As a branch of oceanography, hurricanes are based on water masses alone; hence form a unit of ocean processes.