

Climatology essay example

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Question 1

Some of the variables that are included in the normal ground measurement include the following:

i. Atmospheric Pressure

Pressure simply means the force exerted by the weight of the atmospheric air into a surface. As one of the elements of weather, pressure is used as a variable when measuring precipitation. Whereas low pressure areas have a low atmospheric mass, the higher areas have more atmospheric mass slightly above their location.

ii. Temperature

This is the degree of hotness or coldness in an environment. It makes them become cold, warm or hot. It is one of the major variables used when measuring precipitation. This is because it is one of the factors influencing precipitation.

iii. Humidity

The term humidity means the amount of water vapor in the air. As one of the major elements of weather, it is one of the most important variables used in the measurement of precipitation. This is because it indicates the likelihood of the occurrence of precipitation in the atmosphere. The higher the humidity, the more likely is the occurrence of fog, dew or precipitation. Hence, it can help in estimating the heat index when calculating precipitation.

iv. Precipitation

Precipitation is the amount of water vapor in the air. It can be measured using the rain gauge to determine if the field has been receiving what

amount or rainfall within a given period of time.

v. Wind

Wind is a moving air. Its direction and speed should be considered when measuring the ground to help ascertain its where it comes from and how fast it is.

vi. Visibility

This refers to how far an individual can see in terms of a distance from the place where the measurement is done. The longer the distance, the better the field is.

The following are some of the errors that can be found in the measurement of precipitations:

i. Systematic errors

i. Random errors

All these can be overcome by a thorough evaluation, correction of the parameter, repetition and right calibration of the used apparatus. This will help to eliminate the possible occurrence of such errors in subsequent measurements.

Question 2

Main considerations in designing the TOGA field measurement

According to the Tropical Ocean Global Atmosphere program (TOGA), some of the factors considered when designing a field measurement are topography, proximity, use and history of the site. Meaning, it is very important to know how the field is looking like so that the measurement operations can be carried out without any problem. For instance, the terrain

chosen should be easier to work with without causing unnecessary challenges to the concerned people.

Proximity to the available means of transport will also be useful in helping those carrying out the measurement to access the location without many problems. This will actually help in the smooth carrying out of the measurement activities. On the other hand, knowing about the history of the location will help in understanding the climatically concerns in the field chosen. This can be useful in addressing cases like El Nino and La Nina as can be found in the ENSO web site. Such climatically conditions greatly affect the field's activities like agriculture, disease out breaks and the availability of water (Schwartz, M. D., 2005).

Question 3

Autocorrelation function refers to the similarity between observations and time separation functions. It is used to finding repeating patterns or identifying missing fundamental frequency and analyzing series of values like time domain signals. The non- stationarity has been removed from figures 3. 2 and 3. 5.

Some of the major applications of Autocorrelation function are:

- i. Measurement of very short duration light pulses and optical spectra produced by the lasers. This is done by the use of optical autocorrelators.
- ii. Analyzing of the Dynamic light scattering data to assist in the determination of the fluid suspensions called micelles or particle size distributions of particles as small as the nanometer.

Q 4. Write the water balance equations for ocean and atmosphere over

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ocean. Give definitions and values for each variable in the equations

Water balance equation is a description of the flow of water in and out of the hydrological domains such as a drainage basin or column of soil. It can also be used to describe the ways in which an organism maintains water in hot or dry conditions. The organisms used here include the arthropods or plants because they possess a variety of mechanisms for retaining water in their bodies like a semi permeable waxy coating. It is used to manage water supply and predict any possible shortage.

Generally, the water retention balance is denoted by:

Where

Refers to precipitation

Refers to run off

Refers to everpotranspiration

Refers to change in storage (that occurs in soil or the bedrock)

Definition of terms

Precipitation, a class of hydrometeors, refers to the products of condensation of the atmospheric water vapor that falls as a result of the force of gravity. It can fall in the form of mist, snow, hail or rain when the atmosphere gets saturated with water vapors.

Run off is the flow of excess water as a result of the full infiltration of soil. It is both an agent of water erosion and a major component of a water cycle.

Everpotranspiration is the sum of plant transpiration and evaporation from the earth's surface to the atmosphere.

Question 5

There is an uneven distribution of latitudes in this figure. The latitudinal

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concentration is found in this table, but only in some areas. However, other areas have differing latitudinal patterns in particular areas. These characteristics show a spatial distribution of latitudes in the figure. So, the precipitation distribution in this figure can be known by using the appropriate measures. It seems that there is an irregular patterns in the evaporation and precipitation in the place represented by this figure.

Works cited

Schwartz, M. D. (2005). Detecting Structural Climate Change: An Air Mass-Based Approach in the North

Central United States, 1958–1992. *Annals of the Association of American Geographers* 85 (3):

553–568.