

A STUDY ON EARTH SCIENCE

M.Lokeswaran,

B.Sc(Computer Technology),
Department of Computer Science,
Sri Krishna Adithya College of Arts And Science,
Coimbatore-641042, Tamilnadu,India.

P. Saiman

B.Sc(Computer Technology),
Department of Computer Science,
Sri Krishna Adithya College of Arts and Science,
Coimbatore-641042, Tamilnadu,India.

G.Naveen

B.Sc(Computer Technology),
Department of Computer Science,
Sri Krishna Adithya College Of Arts And Science,
Coimbatore-641042,Tamilnadu,India.

Abstract: Earth science is a study on the earth is given followed by a description of the dynamic forces that are changing the face of the earth to day, and a study of the material composition of the earth. For the sake of familiarity the land is first surveyed the author then proceeding to describe the earth's relations in space, the seasons, latitude, longitude, the atmosphere and associated phenomena like weather and climate. The book is rounded off with a study of the sea, special emphasis being placed on harbours. An interesting feature is the inclusion of a completion summary at the end of each chapter.

Keywords: Earth, crust, core, earth shake, earth quake, waves, petrology, limnology, topography, seismology, soil science.

I. INTRODUCTION

Everything that exists from the galactic super clusters, as for the age of universe scientists agree that it is about 11-17 billion years. The universe comprises that are huge congregation of stars held together by the force of gravity. Galaxy occur in three structural forms spiral, elliptical and irregular. The astronomical unit is the average distance between the sun and the earth. Its value is 149,597,870km. The sun accounts for 99.85% of mass of the solar system. The glowing surface of the sun, that we see, is called as photosphere. Above the photosphere there is the red coloured chromosphere and beyond it is the magnificent corona, which is visible during eclipse. The earth moon revolves around the moon in 27days 7hours 43minutes and 11.47seconds and rotates on its own axis in exactly the same time. The study of earth and about the planet is said to Geography.

And particularly speaking about Earth and the process structure of earth is known as Earth science. Earth is the blue planet, which is called so because of the presence of water. It is the third planet from the sun and the fifth in size. It is the densest of all and it is unique for the presence of higher forms of life. Various scientists have attempted to calculate the age of the earth on the basis of different scientific basis, experimental researches and logical arguments but their findings, results and conclusions are so varied and contrasting that it becomes very difficult to arrive at convincing conclusion which may be acceptable to the majority of scientific community. It may be argued that geological processes work slowly that no one can observe them fully during ones lifetime.

In fact the dating of the past geological events is 'wild catting' as there is no vestige of a beginning, no prospect of an end (James Hutton). It is therefore, desirable to discuss some of the prevalent concepts and method to have some generalized understanding of the chronological sequences

are as follows. On the basis of oceanic salinity, The true form of earth resembles a sphere that has been compressed along the polar axis and made to bulge slightly around the equator

Title of earth axis

The earth axis is inclined to the plane of elliptic at the angle of $66\frac{1}{2}^\circ$, giving rise to different seasons and varying lengths of day and night. The sun is vertically overhead at the equator on two days each year on March 21st and September 23rd. These days are called equinoxes meaning 'equal nights' because on these two days all places on earth have equal day and nights

Movement of earth

The earth moves in space in two different ways. It rotates on its own axis from west to east once in every 24 hours causing day and night. It also revolves around a sun in a orbit once in every $365\frac{1}{4}$ days causing seasons and days. The earth revolves around the sun in an elliptical orbit at a speed of 18.5 miles per second. A normal year is taken to be 365 days, and an extra day is added every four year as a leap year because $\frac{1}{4}$ th day of every year becomes 1 day

The crust

It is the outermost solid layer of the earth. It is brittle in nature. The thickness of the crust varies under the oceanic and continental areas. The mean thickness of an oceanic crust is 5km whereas that of the continental is around 30km. The crust which is made up of heavier rocks having density of 3g/cm^3 and the mean density of material in oceanic crust is 2.7g/cm^3 . This type of rock found in the oceanic crust is basalt. The main mineral constituents are silica and alumina so it is collectively referred to as the SIAL. It has an average density of 2.7. The lower part is a continuous zone of denser **basaltic rocks** forming the ocean floors, comprising mainly silica, iron and magnesium.

The core

As indicated earlier, the earthquake wave velocities helped in understanding the existence of the core of the earth. The core-mantle boundary located at the depth of 2,900 kms. The

density of material at the mantle core boundary is around 5g/cm³ at the centre of the earth at 6,300km, the density value is around 13g/cm³. The core is made of very heavy material mostly constituted by nickel and iron. It is sometimes referred to as the NIFE layer. The temperature here is estimated to be as high as 3,500F, and the core is subject to extremely high pressure

II. WHY DOES EARTH SHAKE?

The release of energy occurs along a fault. A fault is a sharp break in the crustal rocks. Rocks along a fault tend to move in opposite directions. The point where the energy is released is called the focus on the earthquake, alternatively, is its called the as **hypocenter**. The energy waves travelling in a different directions reach the surface. The point on the surface nearest to the focus is called **epicentre**. It is the first one to experience the waves. It is a point directly above the focus.

III. EARTHQUAKE WAVES

Lithosphere refers to the portion of depth up to 200km from the surface of the earth. An instrument called "**seismograph**" records the waves reaching the surface. Earthquake waves are basically of two types "**body waves and the surface waves**". There are two types of body waves. They are called P and S-waves.

P-waves move faster and the first to arrive at the surface. These are also called **primary waves**. These waves are similar to sound waves. They travel through gaseous, liquid and solid materials. **S-waves** arrive at the surface with some time lag. These are called **secondary waves**. These waves can travel only through solid materials.

IV. MEASURING EARTHQUAKES

The earthquake events are scaled either according to the magnitude or intensity of the shock. The **magnitude scale** is known as the **Richter scale**. The magnitude relates to the energy release during the quake. The magnitude is expressed in **absolute numbers, 0-10**. The intensity scale is named after **Mercalli, an Italian seismologist**.

V. EFFECTS OF EARTHQUAKE

Earthquake is a natural hazard. The following are the immediate hazardous effects of the earthquake.

- Ground shaking
- Differential ground settlement
- Land and mud slides
- Soil liquefaction
- Ground lurching
- Avalanches
- Ground displacement
- Floods from dam and levee failures
- Fires
- Structural collapse
- Falling objects
- Tsunami
- Tsunami are the waves generated by the tremors and not an earthquake in itself.

Identifying and resolving or finding the solution for such disasters happened by natural calamities is said to be the

study of Earth and also about its happenings in Earth parts. The science which applies all over the earth and also it is a king to rule the world.

VI. IMPORTANT FACTS ABOUT EARTH'S INTERIOR

- ◆ **Temperature** inside the Earth increases the depth
- ◆ Experiments have confirmed that the temperature increases at the rate of 1 degree Celsius for every 32 meters
- ◆ In the outer core, however the pressure is lesser and the matter is in a liquid state.
- ◆ The Core and the mantle are separated by the **Gutenberg discontinuity**, while the **Mohorovicic discontinuity** separates the Mantle from the crust.
- ◆ Besides the upper granitic and the lower basaltic layers of the crust are separated by a seismically determinable boundary called **Conrad discontinuity**.
- ◆ The upper portion of the mantle on which the crust rests is **rigid**.
- ◆ The crust and this solid upper most mantle are together called **lithosphere**, the sphere of the rocks.
- ◆ Below the lithosphere the upper mantle becomes so hot that it resembles hot plastic, this soft plastic layer in the upper mantle is called the **asthenosphere**.
- The Earth science is closely linked which major core like soil, water and also some more things which is essential for that

- ◆ **HISTORY OF SOIL SCIENCE** –History of the study of the soil as a natural resources on the surface of the Earth including soil information, classification and mapping.

- ◆ **HISTORY OF OCEANOLOGY** –History of the branch of Earth science that studies the ocean

- ◆ **HISTORY OF CLIMATOLOGY** –History of the study of the climate, scientifically defined as weather conditions over a period of time

VII. EARTH SCIENCE

- All embracing term for the sciences related to the **planet Earth**. It is also known as **geo-science** the geo-science or the Earth sciences and is arguably a special case in **planetary science**.
- Mythologies vary depending on the nature of the subjects being studied.
- A foundation idea within the study Earth science is the notion of uniformities.
- Uniformitarianism dictates that '**ancient geologic features are interpreted by understanding active processes that readily observed**'. Earth's magnetic field
- An electromagnet is a magnet that is created by an electric current. The earth has a solid iron inner core surrounded by fluid outer core that convects; therefore the earth is an electromagnet. The motion of fluid convection sustains the earth's magnetic field.

HISTORY OF PETROLOGY: History of the branch of geology that studies the origin, composition, distribution and structure of rocks

HISTORY OF LIMNOLOGY: History of study of inland waters

HISTORY OF SEISMOLOGY: History of the scientific study of earthquakes and the propagation of elastic waves through the earth or through the other planet.

HISTORY OF TOPOGRAPHY: history of the shape of the surface shape and features of the earth and other observable astronomical objects including planets, moon, asteroid.

HISTORY OF ENVIRONMENTAL SOIL SCIENCE: it is a study of the interaction of humans with the pedosphere as well as critical aspects of the biosphere, the lithosphere, the hydrosphere and the atmosphere.

VIII.CONCLUSION

To access global change quantitatively, synoptic data sets with long time series are required. The value of the data increases significantly with seamless and intercalibrated time series, which highlight the benefits of follow on missions. Further as these time series lengthen, historical data sets often increase in scientific and societal value.

IX.REFERENCES

- [1]. www.wikipedia.com
- [2]. www.nature.com
- [3]. www.geology.com
- [4]. www.livescience.com
- [5]. www.nap.edu

