

Lecture-Level learning goals for *Impacts*
UBC EOSC 114, *The Catastrophic Earth-Natural Disasters*

TOPIC 1: Extinctions

1. Concept of a biosphere`
 - a. Understand the concept of a biosphere and Earth System Science and that the biosphere has evolved over time

2. Principles of Stratigraphy
 - a. Distinguish between the oldest and youngest portion of a geological section using principles of superposition, original horizontality and cross cutting relationships

3. Biostratigraphy
 - a. Describe the concept of faunal succession and the use of fossils in correlation and in the subdivision of Earth history
 - b. Recognize the qualities that make fossils useful in biostratigraphy

4. Historical Figures
 - a. Identify important historical figures in the development of stratigraphy and biostratigraphy

5. The concept of deep time
 - a. Appreciate the scale of changes that can occur over geological time scales
 - b. List some of the major subdivisions /ages of the geological time scale and appreciate the relative scale between the Phanerozoic and the Precambrian
 - c. Understand how extinction events are linked to the structure of the geological time scale

6. Mass extinction events
 - a. Define the characteristics of a mass extinction
 - b. List the 'big 5' mass extinction events and their order through time
 - c. Distinguish between broad extinction producing phenomena.
 - d. Describe the late Ordovician and Permo-Triassic extinction

TOPIC 2: Case study, the K/T extinction

1. K/T Extinction
 - a. Describe the character of extinctions at the K/T boundary
 - b. Discuss the evidence used to support the K/T impact
 - c. Describe the location and probable nature of the K/T impactor
 - d. Describe the initial and long-term effects of the impact and their environmental consequences
 - e. Consider other potential causes of the K/T environmental collapse

TOPIC 3: Impacts

1. Our place in the solar system / galaxy
 - a. Describe the type and location of potential impactors and rate of meteoroid influx
2. History of impacts
 - a. List some of the major impact features preserved on the Earth's surface and explain why impact craters appear to be rare on Earth
3. Periodicity of mass extinctions and possible ET driving mechanisms
 - a. Describe the hypothesis proposed by Raup and Sepkoski
4. Recent history of impacts and risk assessment
 - a. List and describe some recent impacts and "near misses"
5. Impact risk and mitigation
 - a. Understand the risk associated with an impact hazard
 - b. List possible mitigation strategies and appraise their relative effectiveness

From the textbook Readings:

- a. List some of the major developments in the history of life on Earth
- b. Describe some of the features and processes of crater formation
- c. Provide examples of Canadian Impact Craters