

Essay 2 – Violent Earth

Please review the first essay assignment on this topic, and review your essay.

Carefully, brainstorm through the concepts and events discussed in this course and begin identifying *particularly how* your previous knowledge has been expanded, changed, or strengthened.

Your essay should be no more than two pages of text, single spaced, in paragraph style with clear overall thesis, topic sentences, and good transition through topics to support your conclusions. 1 pg minimum.

Your task here is to convey to someone (not me, like your grandma or someone who may know near to nothing about Earth Systems science) what the past record of this planet shows us about the chaos-yet-harmony between the Systems of this planet. You should use *specific examples* from the lecture material to support your claims.

Exercise precision by using dates, geologic nomenclature, and names associated with the event.

Example: Our recent understanding of planetary motion and orbits showcases the harmony between the Helio-, Atmo-, Hydro-, and Geospheres to produce an Ice-Age or Hot-house conditions on our planet. Known as the Milancovitch cycles, the planet Earth is tilted on its axis, orbits in an elliptical orbit, and has a wobble-like motion that all change the amount of solar radiation that interacts with the Atmo-Hydro-Geosphere. This results in long, thousand to hundred-thousand year cycles of low radiation that may freeze the hydrosphere as glacial- or sea- ice. The atmosphere buffers the dramatic cooling with carbon dioxide as a green-house gas to trap the solar radiation more effectively. But too much may counter-act the buffering to actually cause warming. The hydrosphere then acts as a buffer to hold carbon dioxide or release it accordingly. The Geosphere is involved as the ultimate carbon dioxide sink and source, deposited as limestone or released through volcanism. Only a few times in Earth's history have the three Earth-based systems not regulated effectively leading to catastrophic events: Snowball Earth (not enough carbon dioxide) approximately 700 million years ago and the Permian Mass Extinction (too much carbon dioxide) 250 million years ago. Both of these events led to a major systematic change in the biosphere. After the Snowball event, the biosphere expanded to be a more key player in the role of carbon sequestration. After the Permian Mass Extinction, the biosphere adjusted into new ecological roles of the Mesozoic overall becoming more resilient. In this way, the five Earth Systems interact together.

This is just an example of one paragraph of your essay.

Please upload as PDF or .doc.

Recall: Essay 1 – Violent Earth

In the first lecture, I reviewed the Earth Systems and the 5 Bigger Ideas.

In 450 words, write a narrative weaving each of these systems together focusing on the first two big ideas (1-Earth is a system of systems and 2-The flow of energy drives the cycling of matter).

Demonstrate your understanding that the Earth Systems are all connected: The Atmosphere is connected to the Hydrosphere by the meteorologic system of weather. The Geosphere is connected to the Atmosphere by the outgassing of volcanoes and sequestration of atmospheric carbon as limestone. Be as specific as you can, though I realize your exposure to all of these details may be limited. You will not be graded on breadth, but on the connections you draw.

Do not write one blurb and submit. Please write and edit several times to make sure this document is a good representation of your level of understanding of this concept. If you would rather verbalize your understanding in video form, you are welcome to do so but please also submit some writing. Notice this is not due until the end of week 2, leaving you time to submit your best work.

The last assignment of this course is the same, but I will be looking to see you have improved your level of detail presented and use examples learned through the course.

Lastly, have fun with this. The stakes are low so do not be stressed. :)