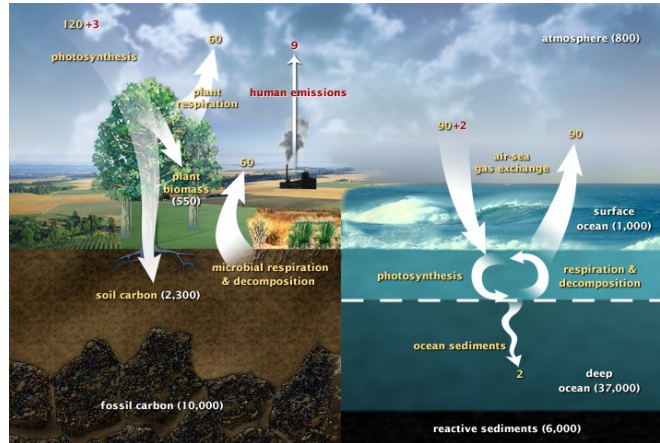


## Idealized modeling of the carbon cycle in the simplified model of an educational software.

Carbon is a key component of the Earth climate. It goes from a reservoir to another, on different timescales. It can be emitted by volcanoes and biosphere; then a part of the emissions is used by vegetation for photosynthesis, another part is stored in the soils, another one is absorbed by the ocean, another one is stored by rocks, etc. These reservoirs then release the carbon they stored by biomass fires, weathering, ocean release, etc. This constitutes the carbon cycle.



To the volcanoes and biosphere emissions are added the anthropogenic carbon emissions, which have been substantially rising since the industrialization. They do not only affect the atmosphere but also the ocean, the vegetation and the soils, via the carbon cycle mechanisms.

It is thus important to know how the various reservoirs react to changes in CO<sub>2</sub> emissions: how the emissions are distributed, after how long they are absorbed by a reservoir, and how the distribution between the reservoirs and their behavior change with global warming.

The internship is based on the highly simplified climate model from the educational software SimClimat. The software already offers a modeling of the carbon cycle, but it can be redesigned in order to be clearer with more physical sense, still keeping its simplicity.

For this internship, equations from literature will be used to re-compute the carbon cycle in a very simple way in the model of the SimClimat software.

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The main goal is to apply our software to the carbon cycle comprehension. Thanks to this internship, the student will firstly acquire a better knowing of the carbon cycle and of its modifications following a disruption. The student will also learn some aspects of climate modeling.

