

The effect of water stress on the soil carbon storage: a Mediterranean forest case study.

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Soil is one of the main terrestrial climatic buffers, either by being the source of the CO₂ emission to the atmosphere or functioning as a reservoir of carbon. Recent climatic models predict for Mediterranean region an increase of the temperature (2 to 5°C) and a reduction in rainfall events (up to -30%) and changes in its patterns, until the end of this century. As result, not only the water deficit during summer period will be intensified but also extended, aggravating the water stress in forest, with important consequences for wood and litter production, litter decomposition and then carbon storage. In here, we assess the storage capacity of 3 main Mediterranean forests equipped with a rain exclusion device in the south of France: downy oak (*Quercus pubescens*) in Observatory Haute Provence, holm oak (*Quercus ilex*) in Puechabon and pine forest (*Pinus halepensis*) in Fontblanche. In order to evaluate the effects of rainfall reduction on soil carbon storage we took 15 random soil samples (12 cm depth) from each plot (control and rain exclusion) for each forest site. Our results showed that there are significant differences between different soil layers (OL, A, S) but there aren't between treatments, meaning that the reduction of rain projected by the models might not have a great influence in soil carbon storage for these 3 forest types, at least for a period of 31 years (oldest rainfall exclusion tested, in Puechabon forest).