



## The effect of harvesting on national forest carbon sinks up to 2050 simulated by the CBM-CFS3 model: a case study from Slovenia

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With the advent of global warming, forests are becoming an increasingly important carbon sink that can mitigate the negative effects of climate change. An understanding of the carbon dynamics of forests is, therefore, crucial to implement appropriate forest management strategies and to meet the expectations of the Paris Agreement with respect to international reporting schemes. One of the most frequently used models for simulating the dynamics of carbon stocks in forests is the Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3). We applied this model in our study to evaluate the effects of harvesting on the carbon sink dynamics in Slovenian forests. Five harvesting scenarios were defined: (1) business as usual (BAU), (2) harvesting in line with current forest management plans (PLAN), (3) more frequent natural hazards (HAZ), (4) high harvest (HH) and (5) low harvest (LH). The simulated forest carbon dynamics revealed important differences between the harvesting scenarios. Relative to the base year of 2014, by 2050 the carbon stock in above-ground biomass is projected to increase by 28.4% (LH), 19% (BAU), 10% (PLAN), 6.5% (HAZ) and 1.2% (HH). Slovenian forests can be expected to be a carbon sink until harvesting exceeds approximately 9 million m<sup>3</sup> annually, which is close to the calculated total annual volume increase. Our results are also important in terms of Forest Reference Levels (FRL), which will take place in European Union (EU) member states in the period 2021-2025. For Slovenia, the FRL was set to -3270.2 Gg CO<sub>2</sub> eq/year, meaning that the total timber harvested should not exceed 6 million m<sup>3</sup> annually.