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# Biomass burial and storage to reduce atmospheric $CO_2$

N. Zeng

University of Maryland, Department of Atmospheric and Oceanic Science and Earth System Science Interdisciplinary Center, College Park, United States (zeng@atmos.umd.edu)

To mitigate global climate change, a portfolio of strategies will be needed to keep the atmospheric $CO_2$ concentration below a dangerous level. Here a carbon sequestration strategy is proposed in which certain dead or live trees are harvested via collection or selective cutting, then buried in trenches or stowed away in above-ground shelters. The largely anaerobic condition under a sufficiently thick layer of soil will prevent the decomposition of the buried wood. Because a large flux of $CO_2$ is constantly being assimilated into the world's forests via photosynthesis, cutting off its return pathway to the atmosphere forms an effective carbon sink.

It is estimated that a theoretical carbon sequestration potential for wood burial is $10 \pm 5$ GtC/y, but probably 1-3 GtC/y can be realized in practice. Burying wood has other benefits including minimizing $CO_2$ source from deforestation, extending the lifetime of reforestation carbon sink, and reducing fire danger. There are possible environmental impacts such as nutrient lock-up which nevertheless appears manageable, but other environmental concerns and factors will likely set a limit so that only part of the full potential can be realized.

Based on data from forest industry, the cost for wood burial is estimated to be \$14/t$CO_2$ (\$50/tC), lower than the typical cost for power plant $CO_2$ capture with geological storage. The low cost for carbon sequestration with wood burial is possible because the technique uses the natural process of photosynthesis to remove carbon from the atmosphere. The technique is low tech, distributed, safe, and can be stopped at any time, thus an attractive option for large-scale implementation in a world-wide carbon market.