THE FUTURE OF THE U.S. FOREST CARBON SINK

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Abstract—For more than a decade, the U.S. forest carbon sink including carbon in harvested wood products has been persistently removing more than 200 million tons of carbon from the atmosphere, enough to offset 16% of CO_2 emissions from fossil fuel use. Maintaining or increasing this valuable benefit of forests is an important element of the U.S. strategy to reduce net greenhouse gas emissions as part of the national commitment to the next global climate accord. Yet, doubts have been raised about the future of the U.S. forest carbon sink which is threatened by deforestation, increasing demand for bioenergy, aging forests, natural disturbances, and climate change. Resources Planning Act (RPA) projections, which reflect mainly the first 3 factors, suggest a rapidly decreasing carbon sink. In contrast, projections from an ecosystem process model that reflect mainly the last 3 factors plus CO_2 fertilization and N deposition, indicate that the forest carbon sink may persist for many more decades before saturating. On top of these contrasting baselines, there are opportunities for land management changes to help sustain or increase the U.S. forest carbon sink. Here we analyze the influence of past drivers of change in U.S. forest carbon stocks, compare future baselines from different modeling approaches, and assess the prospects of land management to change the projected baselines. All of the results presented are based on modeling and analysis tools that are well calibrated to FIA standards and reported historical estimates, so that this information can be readily assimilated into policy considerations. Suggestions for improving analysis capabilities in future assessments are included.

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