

EVALUATING AND MAPPING INTERACTION AMONG MULTIPLE ECOSYSTEM SERVICES

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Growing concern for climate change due to atmospheric carbon dioxide concentrations has resulted in increased interest in afforestation and/or reforestation as instruments and strategies for climate change mitigation and adaptation. Moreover, the timber production from those programs provides substantial benefits to the economy. However, managing forests solely for carbon sequestration and/or timber production objectives might have negative effects on the provision of water due to high losses from evapotranspiration.

Therefore information on the interactions among these three ecosystems processes and how they are spatially bundled can provide useful insights for land management decision making. The study is using US Forest Services inventory dataset and computed LAI to quantify carbon sequestration, timber volume water yield for slash pine sites in North Florida, USA. Moreover, using a ranking classification approach of the quantified ecosystem services we determined spatially-explicit interactions among the three services as well as the effect of biophysical drivers such as stand age, site productivity, silvicultural treatments, land tenure and disturbance regime on the ecosystem service individually and on the resulted interactions (trade-off/synergy).

Results from the classification framework showed that around in 40% of the plots analyzed, there are synergic interactions, that is, at least 2 of the ecosystem functions services provide services at the same level, while in 60% of them the provision of one ecosystem service is dominant. Furthermore, statistical analysis of drivers indicates that management treatments, stand age site productivity were the most important drivers of the provision and interaction among the services.

Finally, this study provides a framework for assessing and managing natural ecosystems for optimal provision of services to people.

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