ABSTRACT SUBMISSION

Title: Potential hydrologic impacts from deforestation in the southwestern Amazon

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Abstract

Three important river basins (Juruá, Purus and Madeira), situated across a tri-national frontier region in the southwestern Amazon are undergoing significant changes due to large infrastructure projects. These changes could lead to an increase in deforestation rates, which in turn, could influence river regimes. In order to understand the possible impacts from potential future deforestation, we simulated coupled climatic and hydrologic conditions under a set of deforestation scenarios: the end of deforestation by 2020 and a BAU (Business-as-usual) deforestation scenario by 2030 and 2050. As baseline, we adopted a landscape with no conspicuous anthropogenic changes and the historical climate between 1950 and 1999. We found a progressive reduction of the mean annual precipitation over the three basins as a result of increasing deforested area. The impacts on precipitation rates become more severe during the transition period between the dry and wet season (September, October, and November). During this period, the reduction of precipitation may reach more than 30% in the largest BAU deforested scenario in Juruá and Purus basins by 2050. The largest reduction in precipitation (~40%) between the BAU and the baseline scenario occurs in the three basins in September. Our results suggest that widespread deforestation may lead to an increase in the length of the dry season in the Juruá and Purus basins up to one additional month compared with the baseline simulation and to a decrease in the annual mean discharge of Juruá river up to 20% and 18% for the Purus river. For the Madeira river, the simulations indicate a potential small decrease in discharge under the end of deforestation scenario, and an increase of 12% in the BAU scenario due to the spatial variability in precipitation anomaly.

Approval Confirm

Affiliations
(1) Universidade Federal de Minas Gerais, n/a, Brazil
(2) The Woods Hole Research Center, n/a, USA
(3) Centro Federal de Educação Tecnológica Celso Suckow da Fonseca, n/a, Brazil
(4) Universidade Federal de Viçosa, n/a, Brazil

Authors

L. Lima	(1)	Presenting
M. Coe	(2)	
B. Soares Filho	(1)	
S. Cuadra	(3) (4)	
L. Dias	(4)	
M. Costa	(4)	

Presenter email leticialima@csr.ufmg.br

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