

BRAV-ABM: Agent-based integrated approach to study fishery practices environmental impact from the bottom-up

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Abstract

Context: Amazonian floodplains are the most populated rural areas in central Amazonia. There are one of the richest biodiversity hosts on earth, while being historically associated with human settlements practicing subsistence agriculture supplemented by fishing and hunting. Over the past several decades, commercial jute cultivation, commercial fisheries, and the expansion of cattle ranching have disrupted traditional patterns of resource use. In coming years, they will be increasingly threatened by development projects and agricultural expansion, as well as by climate changes.

Problematic: One of the main goals of the BONDS project is to provide insight on floodplains management to design development strategies that consider biodiversity issues and socio-ecological dynamics together. Our primary objective is to engage stakeholders at looking for solutions in fisheries management and land use strategies, enabling preservation of biodiversity and fundamental ecosystem services, such as food security, water quality or carbon storage in Amazon floodplain environments under different hydroclimatic scenarios.

Methods: Participatory role-playing game sessions will be implemented to reinforce social learning and capacity building as well as forging a mutual understanding of stakeholders' strategies and points of view on the resource. This will enable the design from the bottom-up of an agent-based model of broader scope and scale to study prospective floodplain biodiversity and ecosystemic services.

Proposal: Knowledge about social and natural dynamics of the floodplain will be shared among researchers and local actors through participatory agent-based. Produced qualitative and quantitative data will be used to feed an autonomous, data intensive, large scale agent-based model of the overall floodplain dynamic, including stakeholders, policy makers, hydrological processes and fish population dynamic. In this communication we will describe first the material, protocol and software involved in the participatory modeling phase; detail the data processing step to feed the autonomous version of the agent-based simulation model. Lastly, we report on the validation and calibration perspectives we engage in using land use/cover changes of the Varzea de Curuai floodplain on the past 30 years.

Additional material

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