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Update on Purchasing a Server for Developing a Spatially-Explicit Agent-Based Model of Impacts from Climate Change on Louisiana Agriculture

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The long-term goal of this research partnership is to develop a spatially explicit agent-based model to determine the impacts of climate change and extreme weather events on agriculture in Louisiana. We have added a collaborator, T. Eric McConnell, and will begin using our server for modeling as soon as possible.

As an intermediate step, to learn about machine learning and county level modeling of agricultural activities we are working on an assessment of the potential impacts to producers and consumers of corn, soybeans, wheat, rice, and peanuts as wild pigs continue to spread north. The assessment uses a random forest machine learning model to determine the probability of invasion in a given county in three time periods. The probability of invasion is then compared to a randomly generated number to determine if the county is actually invaded in a given simulation. Damage is inflicted on newly invaded counties and an economic model is used to estimate the economic costs.

This process, which is substantially less complicated than our end goal, currently takes approximately 17 hours at a cost of approximately $0.03 per minute for a considerably less capable machine than we are purchasing. We hope to save time and be able to build increasingly complex and impactful simulations without the need to pay for server time from third-parties.