

AGPOCALYPSE 2050: INTEGRATING RESEARCH, EXTENSION, AND EDUCATION TO ENHANCE UNDERSTANDING OF AGRICULTURAL SYSTEMS SUSTAINABILITY

DWFI-Supported Student Research

Each year DWFI leverages Robert B. Daugherty Foundation funds and additional donor funds to support graduate and undergraduate student research and creative activity. Funds are matched one-to-one by their DWFI Faculty Fellow advisors. This year we had to cancel our annual research forum, scheduled for April 2, and missed seeing the students present their work in person.

To celebrate the incredible research being done, students have shared a brief summary of their work and its impact. We're excited to share their work with you here. View more research from DWFI's supported students » <http://dwfi.us/Gx3150ze6F5>



Student: Luke Monhollon, for a M.S. in Biological Systems Engineering

Advisor: Deepak Keshwani, Associate Professor, Biological Systems Engineering, University of Nebraska–Lincoln

WHAT?

Improving agricultural sustainability is a complex and spatially dependent effort. Beneficial policies and farm operations are tied to local environments, transportation infrastructure, and available markets. Spatial modeling of environmental impacts will expand the understanding of sustainability in agricultural systems.

Connecting data driven models to an immersive videogame, Agpocalypse 2050 offers a unique educational experience for youth, improves perceptions of STEM careers relevant to Agriculture, and cultivates an understanding of the agricultural systems.

SO WHAT?

Harnessing UNL Extension resources shows agricultural sustainability needs to be understood at the field level. No single approach to reducing environmental impacts can be broadly applied. More intensive production practices had larger negative environmental impacts on a per acre basis but were similar to less intensive operations on a per bushel basis.

Beta-testing of Agpocalypse 2050 resulted in enhancements to the game, adding more intuitive features to guide players and embedding mini-games to maintain user engagement. Two educational scenarios related to pasture management and irrigation management were developed along with supporting curriculum. Additionally, adding “Career Characters” to the game were a priority, improving the user's understanding of different career options in agriculture and facilitating more engagement with the players to understand relevant scientific concepts.

NOW WHAT?

We are working on establishing extension resources, like crop-budgets, as a rich data source for estimating and understanding the spatial variability in environmental impacts. Rather than broad assumptions applied to thousands of acres, calculations are possible at the field level. Our next step is to integrate this crop-budget based approach into a life cycle analysis of agricultural-based products. We are currently planning a broad deployment of the educational scenarios and supporting curriculum in schools across Nebraska in the coming year. Assessment data will be collected to assess outcomes from immersive educational games.