September 1, 2023

GES RESEARCH THESIS PROPOSAL

TO: Dr. Michael Guidry
               Chair, Global Environmental Science Program

FROM: Jane Doe and Dr. Richard Poe
               Associate Professor, Department of Oceanography

This is to inform you of my intent to execute my GES research project titled: Can agricultural intensification explain unexpected cooling of extreme heat in the Midwestern United States?

The goal of my GES thesis is to find the correlation between agricultural production trends and extreme heating trends specifically in the warming hole of the midwestern United States using historical data and discuss its implications to the American food system. I will test the hypothesis, motivated by the research of Mueller, Butler, McKinnon, et.al., that the unusual cooling is a result of changes in agriculture.

The intellectual merit of my thesis will be the new knowledge gained in specifying the effects of different types of agricultural change on surface temperature via modeling. The decrease in the amount of extreme heat events in the Midwestern United States has been proven and unexpectedly contrary to the well-established climate models of global warming. There has been some discussion on possible explanations for this phenomenon, however none attributing it to agricultural changes with this level of specificity. If this phenomenon had not occurred, crop yields and hence the agriculture economy would've been negatively affected, hence the importance of this study.

I expect to complete and submit my thesis in Fall 2024.

To achieve this goal, I propose to execute the following specific tasks within this timeline:

Tasks needed to accomplish goal	Resource(s) needed	Timeframe
1. Literature review, identify agricultural variables	Library, computer	September 2023 – December 2023
2. Write Introduction	Computer	September 2023 – December 2023
3. Find data from USDA, Schlenker, etc.	Computer, open-source data, RStudio	September 2023 – March 2024
4. Regress, think about incorporation of agricultural variables	Computer, RStudio	January 2024 – March 2024

5. Write Methods	Computer	January 2024 – March 2024
6. Model temperature based on agricultural variables	Computer, RStudio	January 2024 – March 2024
7. Analyze results	Computer, RStudio	January 2024 – June 2024
8. Start Results & Discussion	Computer	March 2024 – June 2024
9. Start Conclusion	Computer, RStudio	June 2024 – September 2024
10. Review thesis with mentor	Computer	September 2024
11. Submit draft including Table of Contents, List of Tables, Introduction, Methods, Results		Early October 2024
12. Submit fully-formatted and mentor-approved complete draft to GES program for external review		Late October 2024
13. Submit mentor-approved final draft to GES program		Finals week

As mentor, I Richard Poe, agree to mentor Jane Doe on the project as described above inclusive of providing the listed resources. This is contingent upon the tasks and timeline being adhered as described above. If significant deviations occur in either it is understood that my commitment cannot be assumed and must be renegotiated.

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Student Signature   Date   Faculty Mentor Signature   Date

Cc Lentina Villa, GES Student Services Specialist