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**Global Change Graduate Interdisciplinary Program, PhD minor**

**Gruener Research Travel Award Report**

The Raphael and Jolene Gruener Research Travel Award enabled my week-long research trip in June to an active agrivoltaic site in Colorado. This fieldwork formed a key part of my PhD dissertation, allowing me to validate my predictive heat stress model through direct wet bulb globe temperature (WBGT) measurements and complete a set of farmworker interviews I have been eager to conduct.

I successfully installed equipment to collect WBGT measurements for model validation, and through collaborating with a team member at the Colorado site, we were able to extend the data collection period, allowing me to gather a much more comprehensive validation dataset than originally anticipated. I also conducted interviews with all available farmworkers at the site.

These interviews proved to be extremely valuable, allowing me to bridge my physical science research with social science approaches that align with my interdisciplinary career goals. The conversations provided insights that instrumentation alone could not capture, revealing important nuances in how farmworkers experience heat stress in agrivoltaic versus traditional agricultural settings. The interview data has opened new analytical pathways that will strengthen my research methodology and sparked my interest in expanding this work to other regions and system designs.

The Colorado WBGT measurements show distinct patterns compared to our Arizona data while supporting the broader conclusion that well-designed agrivoltaic systems can effectively reduce heat stress for agricultural workers. This dataset also validates the broader applicability of my statistical model across more diverse agricultural landscapes, a critical requirement for the model's scientific value and potential impact.

Successfully integrating both quantitative measurements and qualitative interviews has strengthened my confidence in interdisciplinary research methods, which will be essential as I work towards developing practical climate adaptation strategies that protect at-risk populations. I am currently further analyzing the data and insights gathered, which will form the foundation of a key dissertation chapter that I expect to complete by December 2025.



*Figure 1: Jack's Solar Garden, Longmont, CO; the site I completed my fieldwork. Crops can be seen to grow between solar panels.*



Figure 2: A sensor showing the Wet Bulb Globe Temperature in the shade created by the solar panels at 11am at Jack's Solar Garden, Longmont, CO



Figure 3: A sensor showing the Wet Bulb Globe Temperature in the full sun (traditional open field agriculture) at 11am at Jack's Solar Garden, Longmont, CO





*Figure 4: A Heat stress sensor measuring Wet Bulb Globe Temperature in the full sun (traditional open field agriculture) at Jack's Solar Garden, Longmont, CO*





*Figure 5: Rows of crops growing between rows of solar panels at Jack's Solar Garden, Longmont, CO*