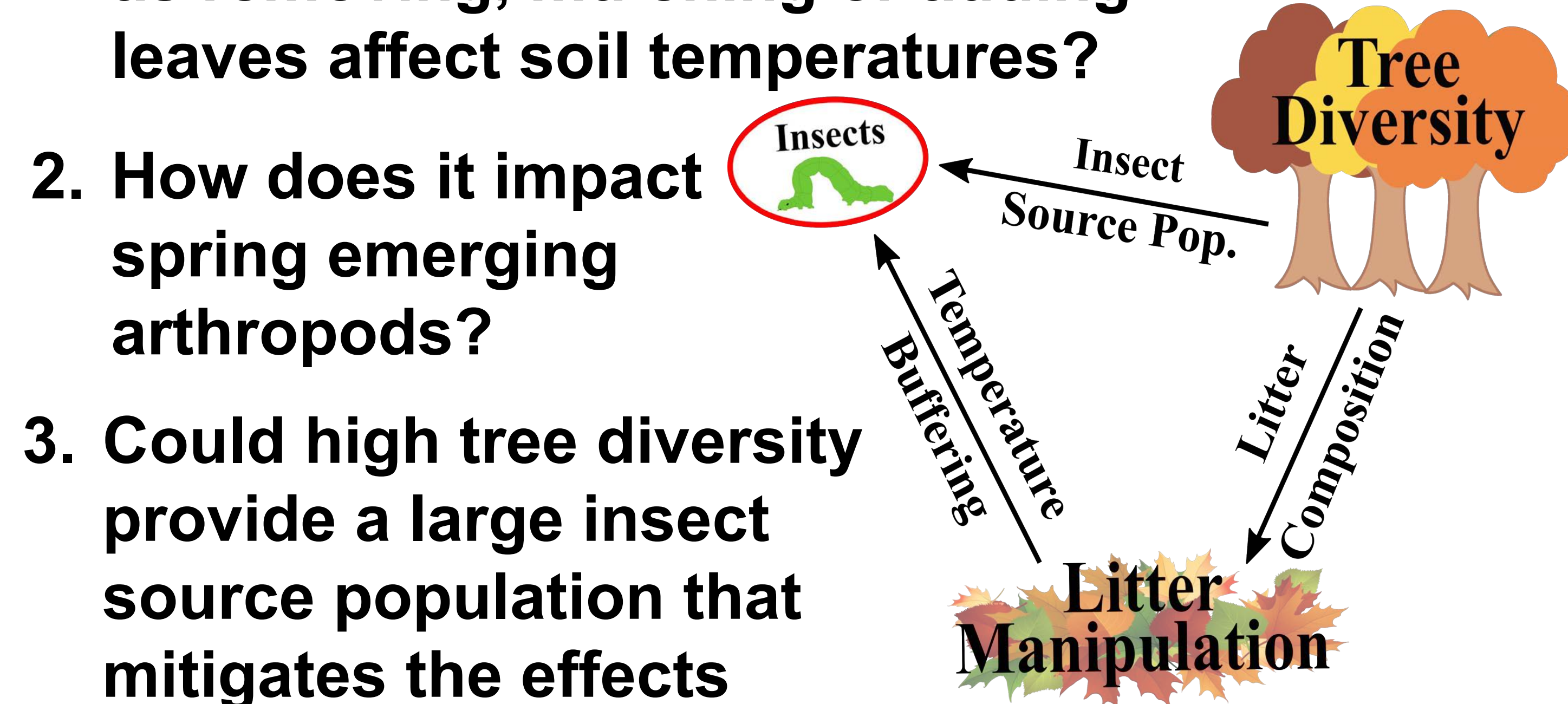


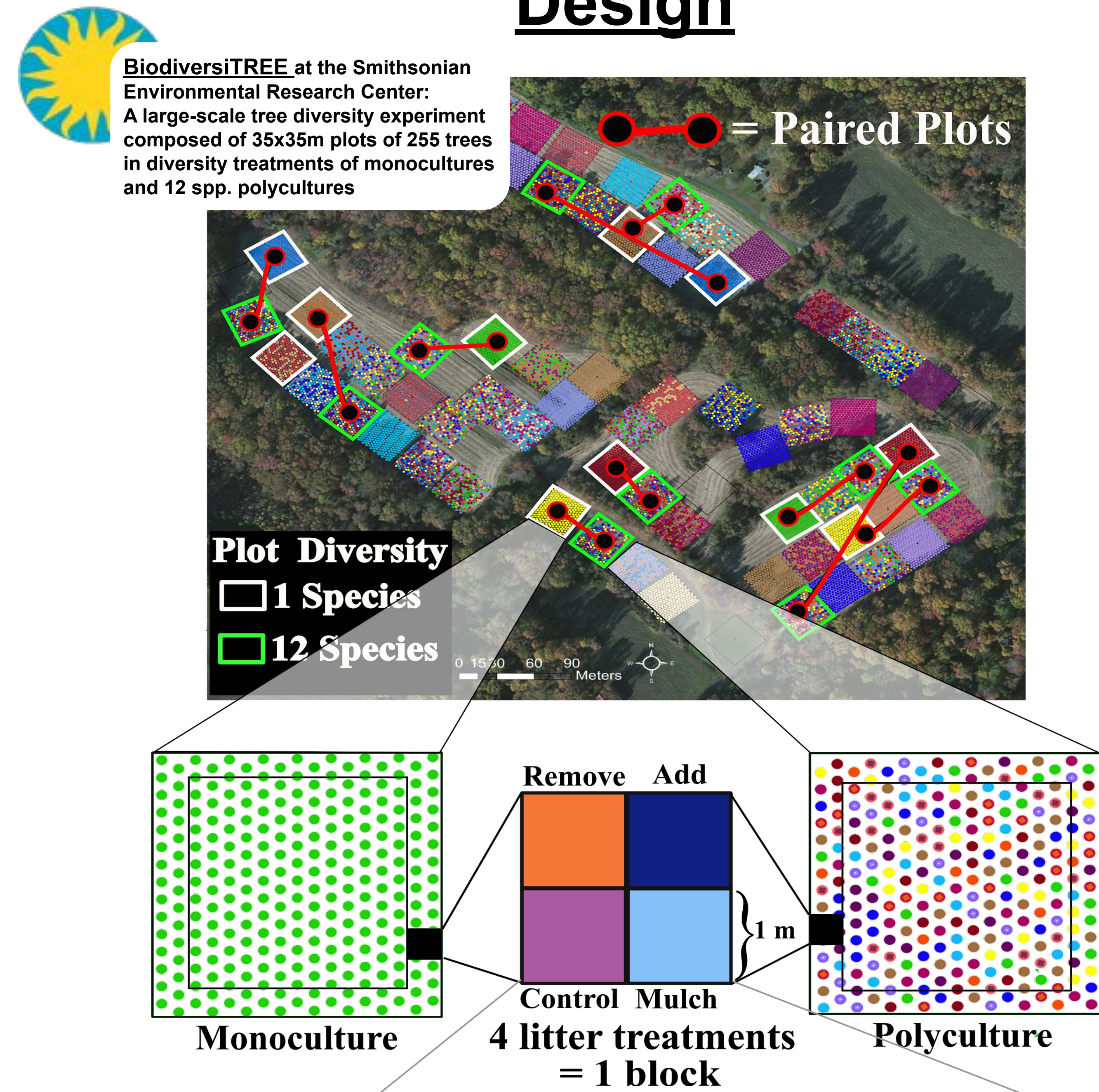
Each year, more than 8.5 million tons of leaf litter are removed from residential lawns in the USA.<sup>1</sup> Little is known about the ecological impacts of this management practice.

## Questions

1. How does litter manipulation such as removing, mulching or adding leaves affect soil temperatures?
2. How does it impact spring emerging arthropods?
3. Could high tree diversity provide a large insect source population that mitigates the effects of litter disturbance?

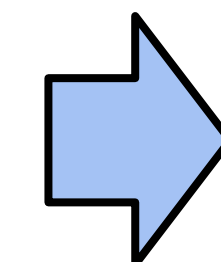
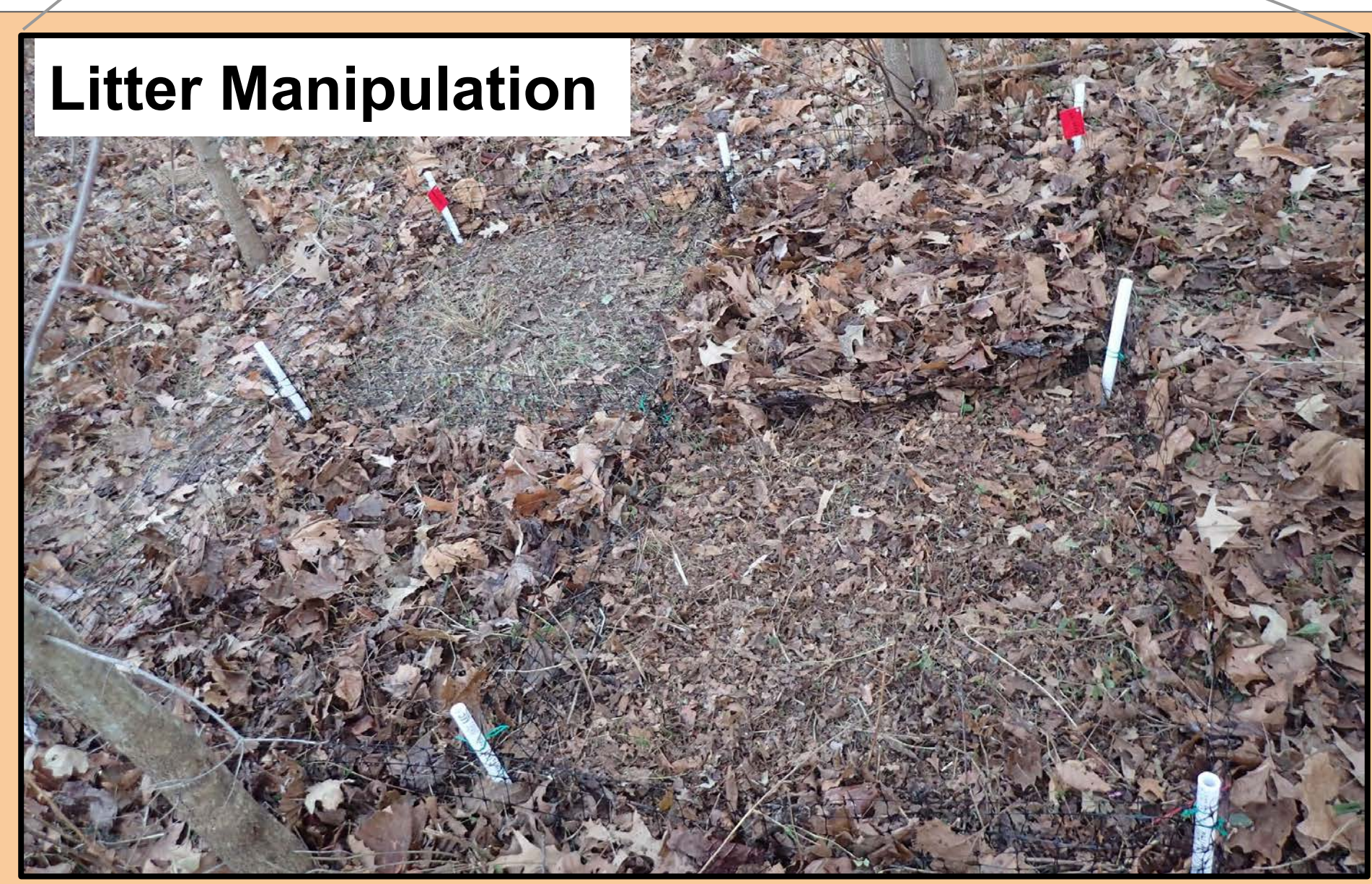


## Design

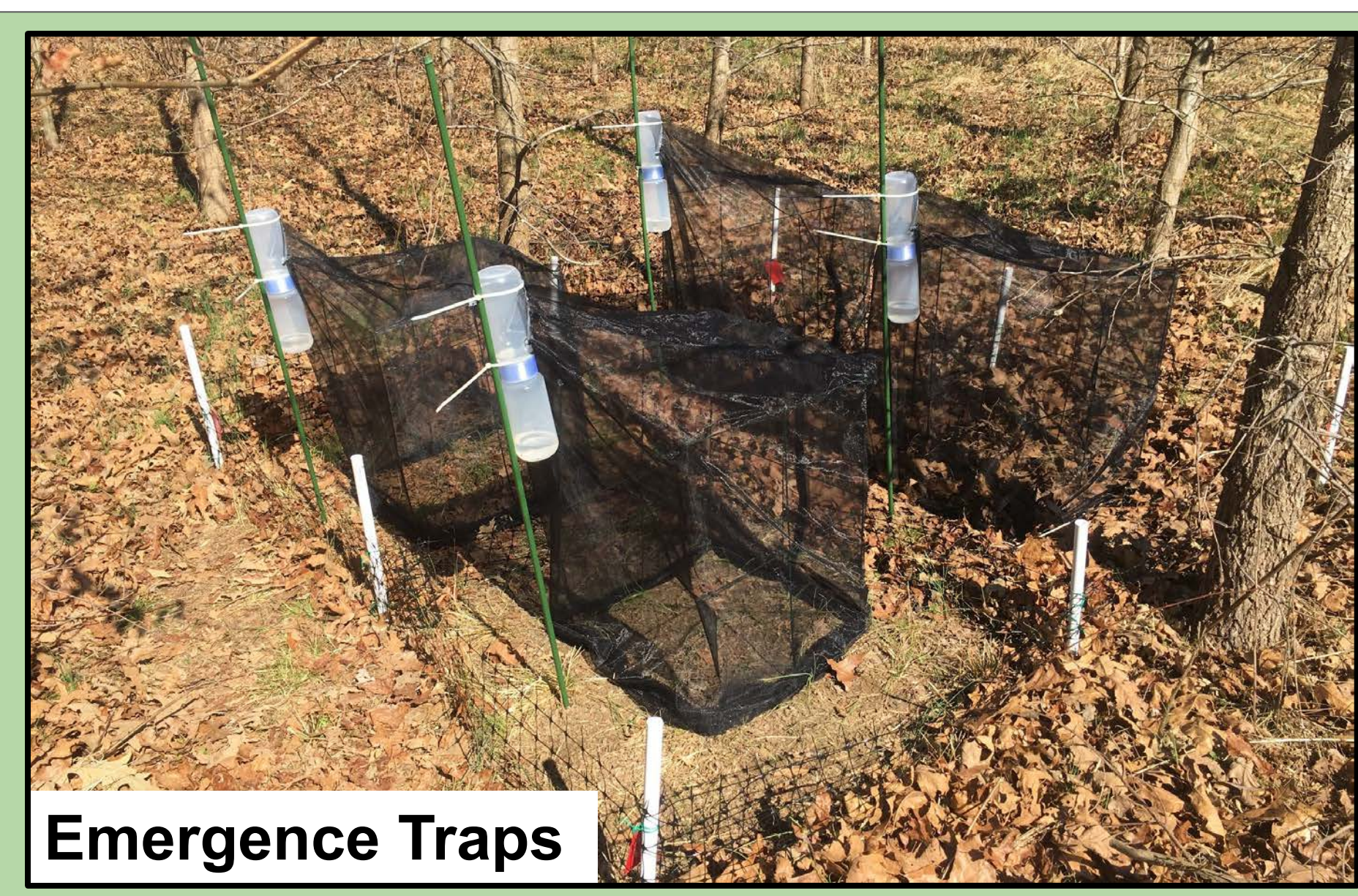


Sources  
 1) Facts & Fig: Yard Waste (2015). EPA.

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# Assessing the impacts of seasonal leaf litter disturbance on overwintering pollinators and natural enemies

Max H. Ferlauto<sup>1</sup>, Karin T. Burghardt<sup>1,2</sup>, and John Parker<sup>2</sup>

(1) Entomology, University of Maryland, College Park, MD, (2) Smithsonian Environmental Research Center, Edgewater, MD

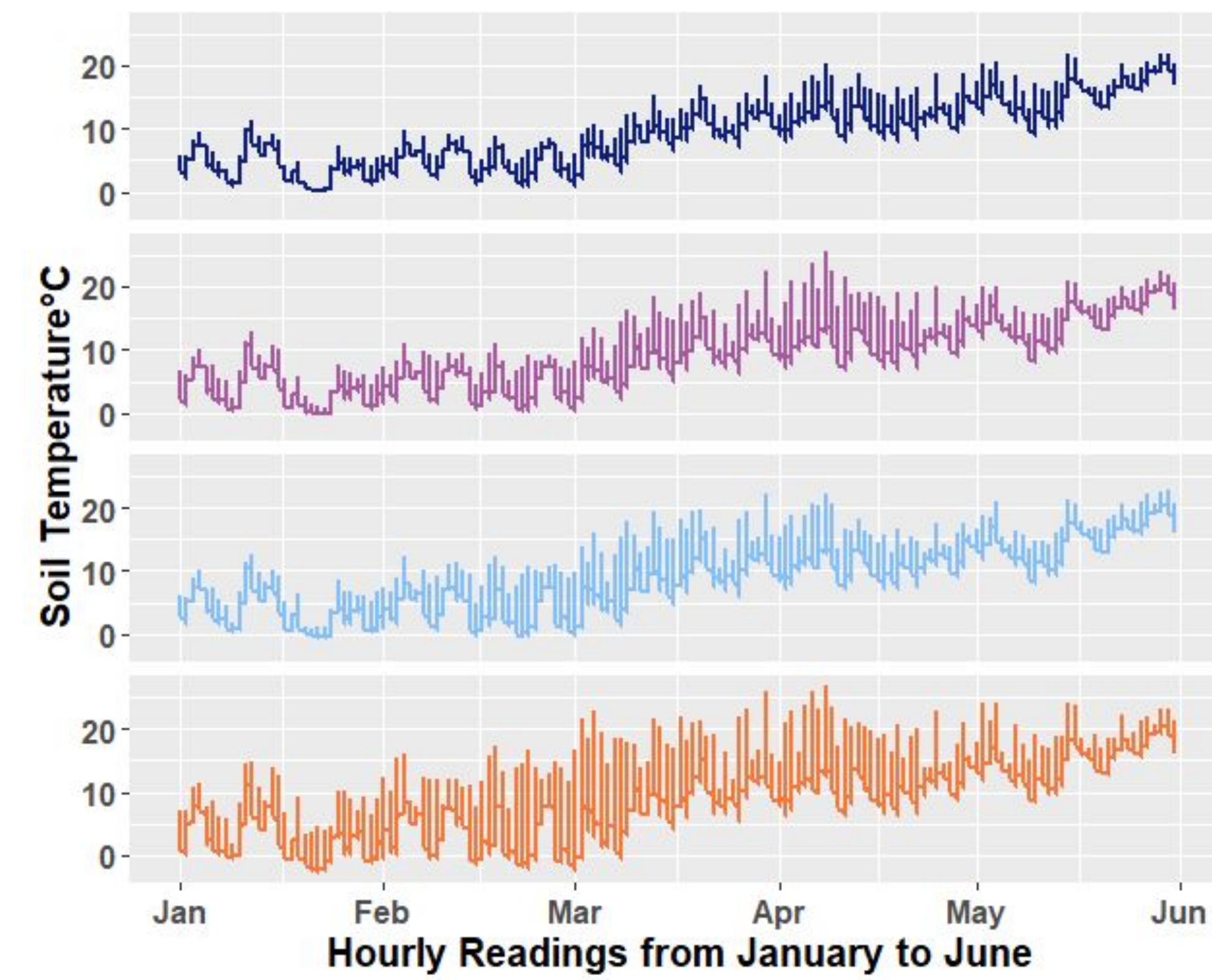
## Funding and Acknowledgments



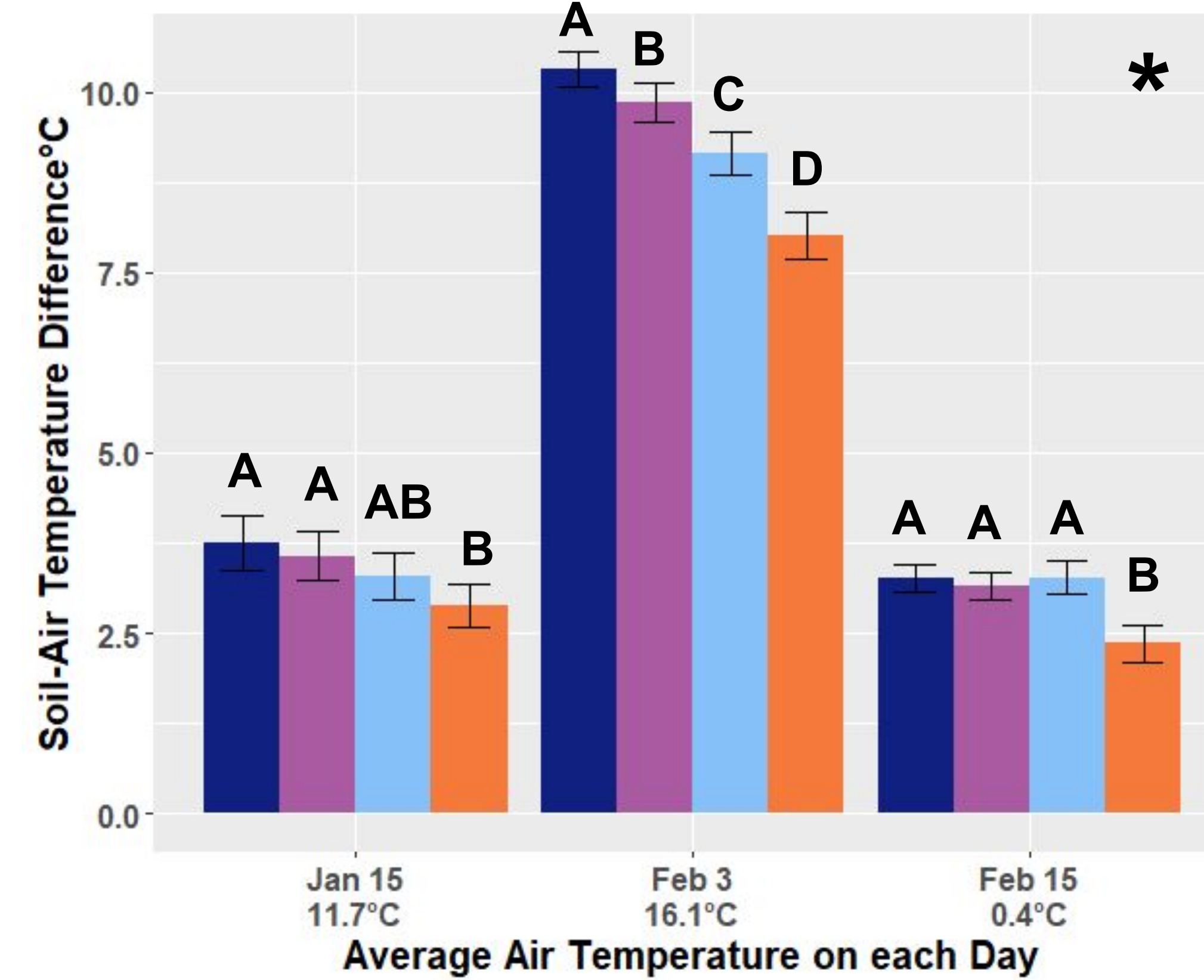
Thank you to John Parker, Jamie Pullen, Kelsey McGurrin, Kristin Jayd, Elizabeth Butz, and Kendra Bierman for helping with logistics and fieldwork

1. Soil temperature varied most in litter removal treatments. On both both warm and cold days litter removal treatments buffered the soil against temperature changes the least.

Temperature probe within one block



Three sample days across all blocks



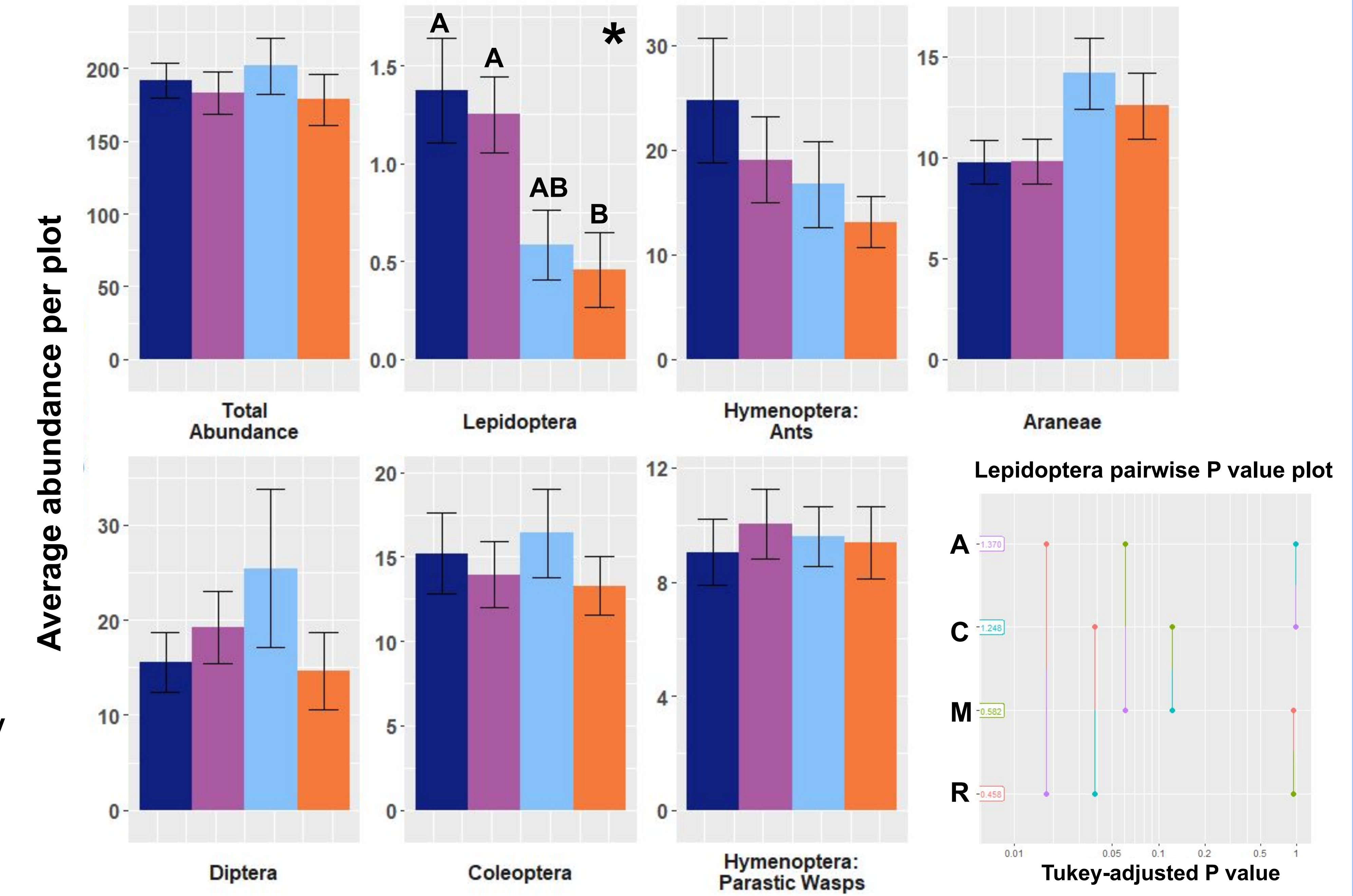
Litter Treatment

■ Addition ■ Control ■ Mulch ■ Removal

\*Main effect statistically significant

2. Litter manipulation significantly reduced Lepidoptera abundance.

Collection spanning 5/21/20-6/4/20



Statistical Models <-GLMM (Abundance~ Litter Treatment \* Diversity + (1|Block), family= negative binomial)

x 24 blocks over 8 two-week collection periods

- 63% fewer Lepidoptera emerged in litter removal treatments than control treatments.

3. Canopy tree diversity did not mitigate the effects of litter treatment, nor did it have any significant effect.

## Conclusions

- Removing leaf litter reduces the soil's ability to buffer temperature changes which may cause Lepidoptera mortality or interfere with their emergence patterns.
- Litter removal reduces Lepidoptera abundance but does not affect predator species. This may lead to further strain on Lepidoptera populations.
- Planting a diverse tree canopy does not mitigate the effects of litter removal.
- Next steps: Do these results vary over collection periods? Is plant cover an important factor? Do these effects occur in residential landscapes where litter removal is widespread?