# Poster Design

# Your Title Should Fit On One Line, size 105

Name and Institution, size 63
Contact Information

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

## Introduction, size 68

Before you start designing your poster, consider your goal. Is your goal to provide information, to raise awareness of an issue, to change an opinion, or something else? What is the desired message effect? Knowing this will help guide your poster to depict what information is most important.

Your message effect is impacted by your audience, the environment in which it is delivered, and its message features (or design choices). Consider your audience. Are you presenting to experts? Or a mixed audience? Make sure your poster content is appropriately tailored.

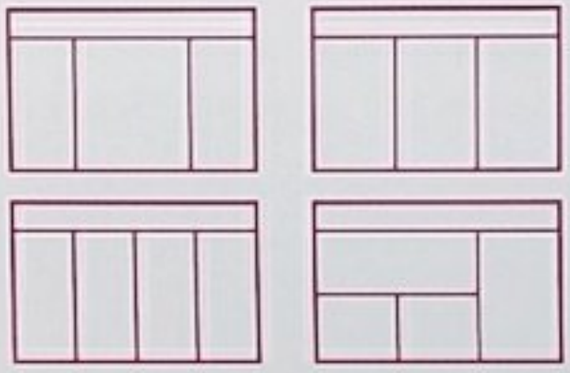

Also consider the environment. Will your poster be one in ten or one in fifty? How much do you need to stand out? Will you be standing by your poster to explain in person? Or will it stand alone?

## Layout

There are many different options for poster layout. Keep in mind your goal. The most important information should stand out. Consider using bullet points instead of paragraphs, or schematics instead of wordy explanations.

Keep in mind that people read left to right and top to bottom. That means the most important information and take-home points should be in the top left corner or bottom right corner.

Layout ideas:



## Design Principles

### Contrast, size 36

This is size 33. This font is called Times and its a serif font. What is contrast? Avoiding elements that are weakly similar by making them strongly different.

- Consider using a contrasting font for your header. Mix serif fonts with san-serif fonts.
- Beyond font, you can use size, italics, bolding, and color coding to increase contrast.
- Avoid using black type on colored backgrounds.

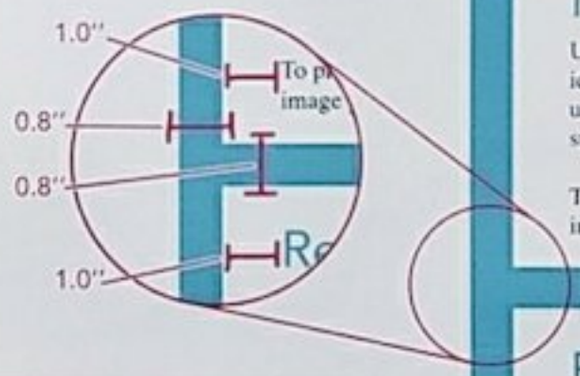
### Repetition

Repeat visual elements such as color, shapes, textures, borders, and fonts to unify the poster.

- Make sure all headers are the same font size.
- Make sure spacing in between elements is consistent.

### Alignment

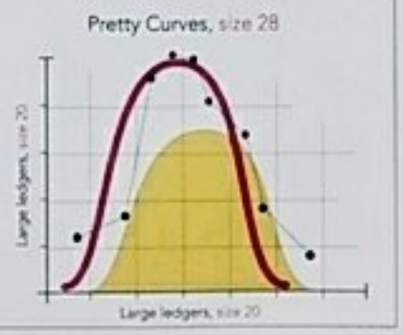
Check for horizontal and vertical alignment. Make sure to zoom into 100% or more. Check margins as well as inter-marginal space. White padding around text helps make it easier to read.




### Proximity

Placing elements close together creates a relationship between the elements. Try to create visual units using proximity. For example the image above goes with 'Alignment' not 'Proximity' because it is slightly closer to the alignment text.

Enclosures also help create relationships. If you have a lot of information consider adding white boxes or outlines to delineate information. Proximity is especially important for graphs. Make sure you give graphs and charts enough space above and below them.




## Software Options

**Adobe InDesign**
If you have time, learn it! InDesign is the best for layout, text and image handling.

**Adobe Illustrator**
A good alternative to InDesign. Illustrator has great alignment tools and working with layers makes designing posters much easier.

**PowerPoint / Google Slides / Keynote**
You can do a lot with slides. Keep in mind there are no alignment tools!

## Images

Use good quality images - ideally 300dpi or larger. If you use other people's image make sure to cite the source.

To proportionately scale an image press and hold shift.

## Resources

This is size 18. It's okay for citing your resources but don't use this size font for anything else!

- **DesignLab resources:** https://designlab.wisc.edu/toolkit
- **Designing conference posters - blog post by Colin Purrington:** http://colinpurrington.com/tips/poster-design

## Acknowledgments

If you need any help with your poster - from concept to final revisions - make sure you stop in to DesignLab!

DesignLab
University of Wisconsin-Madison

# HOW TO DESIGN AN AWARD-WINNING CONFERENCE POSTER

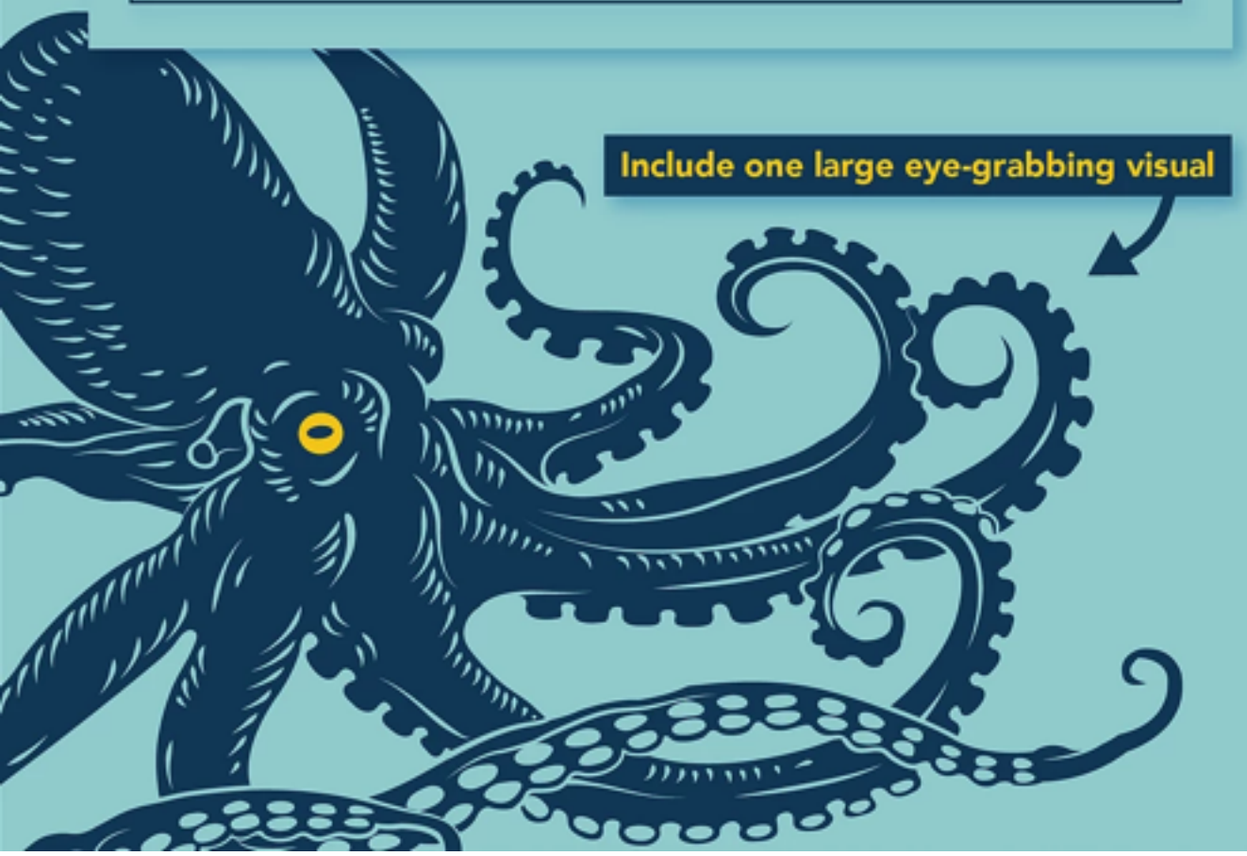
Dr. Tullio Rossi

ANIMATE YOUR SCIENCE
www.animate-science.com

## #1 SCRIPTING

- YES to bullet points - NO to long paragraphs.
- Use sections with HEADERS.
- Maximum 250 words! Possibly <150.
- Don't forget your contact information.
- Make sure your poster is telling a story that includes:

**Background** **Question** **Methods** **Results** **Conclusions**




## #2 DESIGN

- Decide a layout before you start designing.
- Negative space is your friend. 40% should be blank.
- Use 3 to 5 colors.
- Use 1 **accent color** to draw attention.
- NO to images and patterns as background.
- Use 1 to 2 fonts - readable from 1 m.
- Feel: More like an infographic less like a scientific poster.

## #3 DATA

- Display only the essential.
- Simplify graphs to make them easier to read.
- Apply the color scheme to the graphs for consistency.

*Ask yourself*

# WHO IS YOUR AUDIENCE?

FEWER WORDS

MORE SPACE

# USE BULLETS

USE SECTIONS

# USE HEADERS

ONLY INCLUDE

# ESSENTIAL

# GRAPHS

Created by Kaleo
from Noun Project

USE THREE

TO FIVE

COLORS

LARGE

# CLEAR

# FONTS

# COASTAL CRAZINESS

## factors that regulate an invasive ant in a coastal tallgrass prairie

## HYPOTHESES

$H_1$

**Nylanderia fulva's** abundance will be much larger in micro-nutrient fertilized treatments, specifically with calcium, due to the known greater abundance of preferred prey.

$H_2$

**Nylanderia fulva** will be co-limited by the combination of macro and micronutrients. This will increase the amount of prey and the size of the available habitat.

$H_3$

**Nylanderia fulva** will have negative effects on overall arthropod abunance. This could cause serious damage to native biodiversity and the tallgrass prairie ecosystem.

**Nylanderia fulva** or Raspberry Crazy Ant is an invasive species that can reach extremely high densities, reduce native ant and other arthropods population, and has the **ability to devastate what is left of a natural ecosystem.**

The objective of this research was to determine the relative importance of **biotic and abiotic factors that contribute to the success of Nylanderia fulva** in a coastal tallgrass prairie. Data was collected near Houston, Texas.

### NYLANDERIA FULVA ABUNDANCE IN NUTRIENT TREATMENTS:


### PERCENT CHANGE OF NYLANDERIA FULVA TO NUTRIENT TREATMENTS:


### NYLANDERIA FULVA ABUNDANCE V.S. OTHER ARTHROPODS:

OTHER ARTHROPODS



**DEPARTMENT OF BIOLOGY UNIVERSITY OF DAYTON:**

Research By: Ryan W. Reihart & Dr. Chelse Prather

Advising: Misty Thomas-Trout & Dr. Chelse Prather

Designed By: John Gruber


Insect Ecology Lab

NSF

UNIVERSITY of DAYTON


**ACKNOWLEDGEMENTS**

This work is supported by NSF grants DEB 1457114 & 1724663. Ideas and field work for this project were aided by many, particularly Drs. Steve Pennings & Angela Laws, Jack Cuellar, & Tim Becker. The University of Dayton, Radford University, and University of Houston supported CMP.

# The Mexican Bird Resurvey Project: comparing specimens and field notes to modern citizen science records to assess a century of change to bird diversity

James Maley, Whitney Tsai, Betty Du** and John McCormack

**undergraduate author

Moore Lab of Zoology
Occidental College
The largest Mexican bird collection in the world
@MLZbirds

NSF
DEB -1652979

Results of species change at one site in Mexico from the 1940s to present

Great-tailed Grackle
*Quiscalus mexicanus*
Probably a new arrival since Lamb's collecting

Species recorded at El Naranjo, San Luis Potosí only in modern eBird checklists

145

85

15

Species seen and collected at El Naranjo, San Luis Potosí only by Chester Lamb, not in modern eBird lists

Canyon Wren
*Catherpes mexicanus*

Bicolored Hawk
*Accipiter bicolor*

Collared Forest-Falcon
*Micrastur semitorquatus*

Green Jay
*Cyanocorax yncas*
Probably missed by Lamb during his visits

Crested Guan
*Penelope purpurascens*

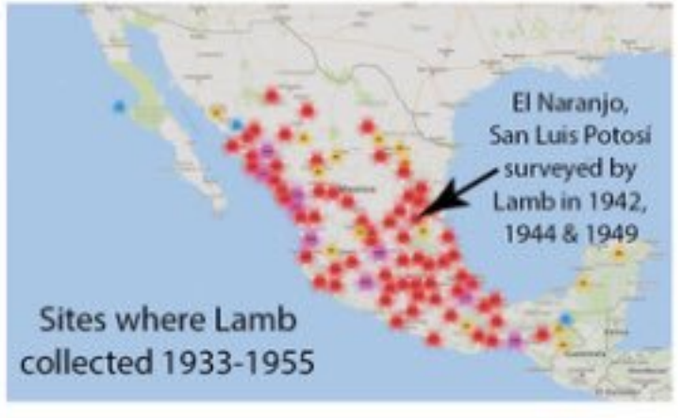
Species recorded at El Naranjo, San Luis Potosí both by Lamb & in modern eBird checklists

Brown Jay
*Psilorhinus morio*

Blue-crowned Motmot
*Momotus coeruliceps*

## Background

Unknown to many, one of the most ambitious efforts ever to catalog a country's birdlife was begun in Mexico in the 1930s when Robert T. Moore – a poet, mountain-climber, businessman, and ornithologist – set out to describe the birds of Mexico. From 1933 to 1955, he employed Chester C. Lamb to traverse Mexico collecting birds. By the time he was finished, Lamb had collected 39,000 birds for Moore from 300 localities. The Mexican Bird Resurvey Project seeks to use Lamb's efforts as a baseline of what bird diversity looked like before a period of major habitat alteration in the 1960s - 1980s.




## Mexican Bird Resurvey Method

Use Lamb's specimens and field notes to assess a baseline of bird diversity at 300+ sites

Draw a buffer around Lamb's site and draw in eBird records from within buffer zone

Assess change to bird distributions by comparing Lamb's records to modern eBird checklists

WE NEED YOUR HELP

Encourage efforts to resurvey Lamb's sites

Take into account errors resulting from observer time bias

Land conversion near El Naranjo San Luis Potosí

Popular falls near El Naranjo San Luis Potosí

# REWRITING THE TEXTBOOKS:

## Is there co-limitation of arthropods by macronutrients and micronutrients?

## BACKGROUND

**CO-LIMITATION**
Restriction of growth

**MACRONUTRIENTS**
Any of the nutritional components of the diet that are required in relatively large amounts: protein, carbohydrate, fat, and the macrominerals.

**MICRONUTRIENTS**
A substance that is essential in small amounts for the proper growth and metabolism of a living organism: vitamins & minerals

**MAJOR QUESTION** Does the presence of micronutrients affect grassland arthropod communities? Does this effect change with macronutrient abundance?

Macronutrients on land has been greatly elevated by humans for the past century due to fertilizing croplands. Macronutrients, such as nitrogen and phosphorous, are important limiting factors in grassland ecosystems; however, little is known about micronutrients limiting effects to plants and animals. Previous studies have shown possible co-limitation of plants and arthropods by macronutrients.

## METHODS

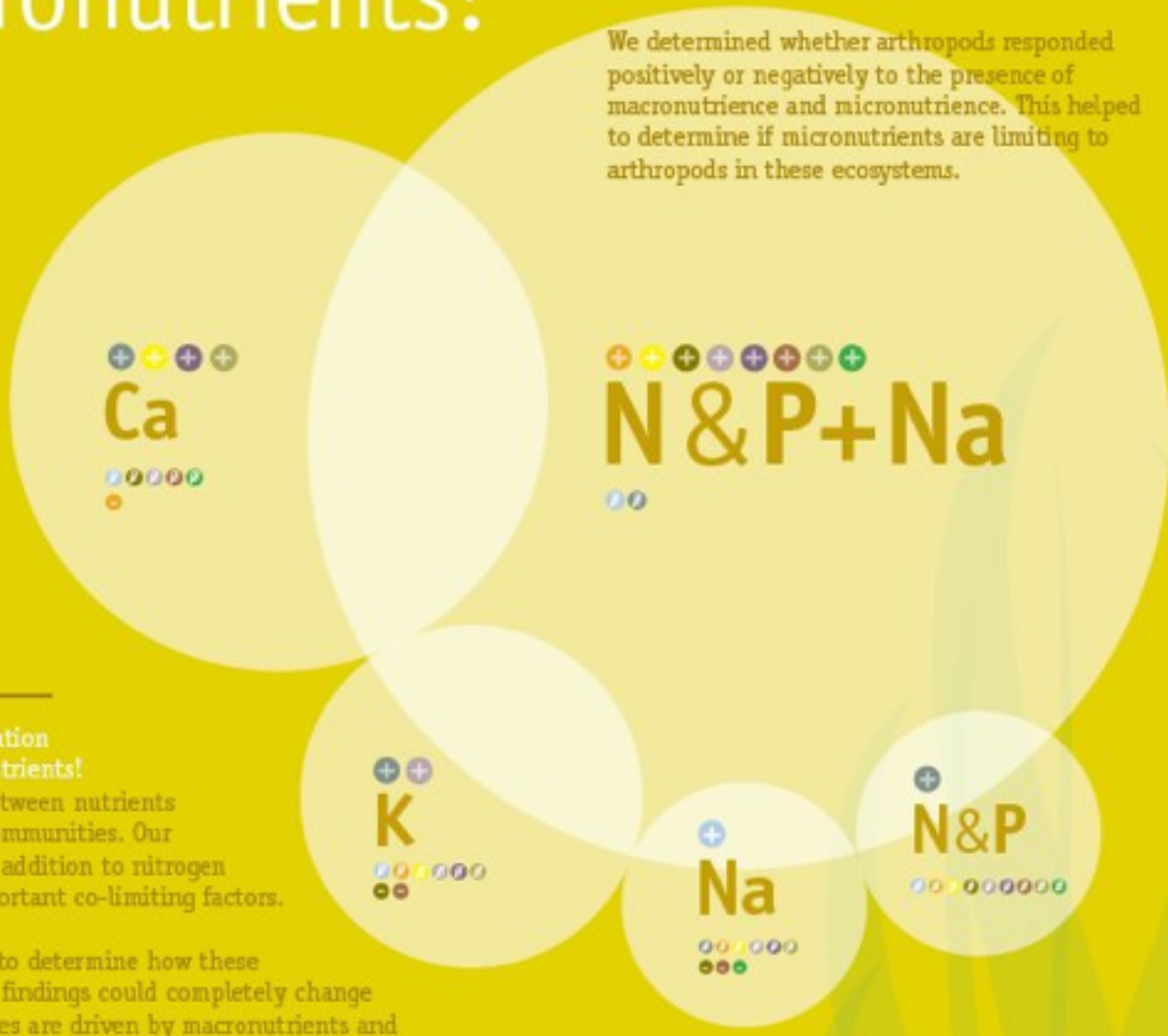
1 We conducted a large fertilization experiment in a coastal tallgrass prairie in Texas were we manipulated nitrogen, phosphorous, calcium, potassium, and sodium in every possible combination (16 total treatments — each replicated 8 times for a total of 128 plots)
2 Soil characteristics were measured (pH, conductivity, soil moisture, root moisture, and percent roots).
3 Arthropods were collected by sweep-netting in experimental plots in June of 2016, and individuals were identified to order.

**ARTHROPODS TESTED**

- ACARI (MITES)
- ARANEAE (SPIDERS)
- COLEOPTERA (BEETLES)
- DIPTERA (FLIES)
- HEMIPTERA (TRUE BUGS)
- HYMENOPTERA (BEES, WASPS)
- THYSANOPTEREA (THRIPS)
- TOTAL
- RASPBERRY CRAZY ANTS
- TOTAL WITHOUT ANTS

Ca: Calcium K: Potassium
Na: Sodium N: Nitrogen
P: Phosphorus

We determined whether arthropods responded positively or negatively to the presence of macronutrience and micronutrience. This helped to determine if micronutrients are limiting to arthropods in these ecosystems.




## CONCLUSION

**There is evidence of co-limitation by macronutrients & micronutrients!**
There may be interactions between nutrients that are essential to these communities. Our results show that sodium, in addition to nitrogen and phosphorus, may be important co-limiting factors.

More work needs to be done to determine how these nutrients interact, but these findings could completely change our views on how communities are driven by macronutrients and micronutrients. It may also change how we fertilize our land.


**DEPARTMENT OF BIOLOGY: UNIVERSITY OF DAYTON**

RESEARCH BY Amanda Rinke & Mackenzie Ryan
*with assistance from Ekenias Angelus, Madison Dembrosky, Caitlin Gaskins, Shanta Hunt, Madeline Norman, & Ryan Rathut*
FACULTY ADVISING Dr. Chelse Prather & Misty Thomas-Trout
DESIGN BY Megan Bollheimer



**ACKNOWLEDGMENTS**

This work is supported by NSF grants DEB 1457114 & 1724663. Ideas and field work for this project were aided by many, particularly Drs. Steve Pennings and Angela Laws, Jack Cuellar, and Tim Becker. The University of Dayton, Radford University, and University of Houston supported Chelse Prather for part of this work.


UNIVERSITY of DAYTON

# FEAR NO WEEVIL

## INSECT COMMUNITIES AS INDICATORS OF RESTORATION IN AN URBAN PRAIRIE NETWORK

AMANDA FINKE | DEPARTMENT OF BIOLOGY, UNIVERSITY OF DAYTON


Conservationists have been protecting the remaining prairies, restoring remnant prairies, and constructing new ones.

Compared to natural prairies, these restored prairies may not support the same ecosystem services and biodiversity, most of which is made up of arthropods.

**IS THERE A SIGNIFICANT DIFFERENCE IN THE INSECT COMMUNITIES IN DIFFERENT TYPES OF PRAIRIES? IF SO, *WHAT IS DRIVING THESE DIFFERENCES?***

## AREA OF STUDY


## MATERIALS & METHODS

AT EACH OF THE 14 sites
4 old fields, 5 constructed, 5 remnant
4 samples of arthropods were collected by sweepnetting 25 times each, pooling samples, and identifying all individuals to order. Plant and soil community characteristics were also sampled.

## IT MAY BE POSSIBLE....

That certain beetle species could be indicators of restoration.

That these constructed prairies are not yet fully colonized by natural prairie insect communities. They may still be exhibiting succession, thus being dominated by a few species that may not occur later on in succession.

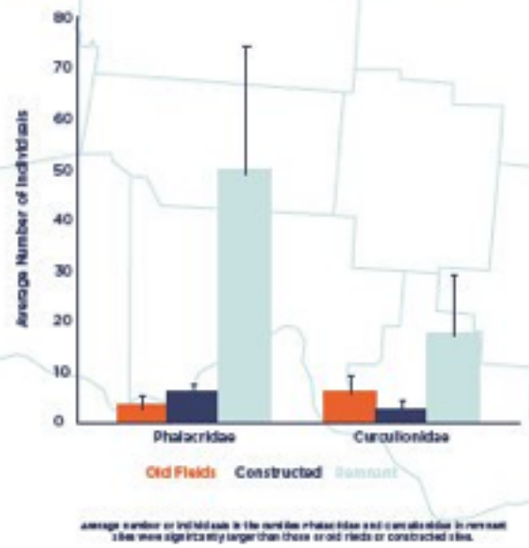
## FUTURE DIRECTIONS

Are certain species of beetles good indicators of restoration? Could land management be a factor in determining the role of succession? Depending on what the results show, this could change the way that prairies in the Dayton area are repaired and constructed.

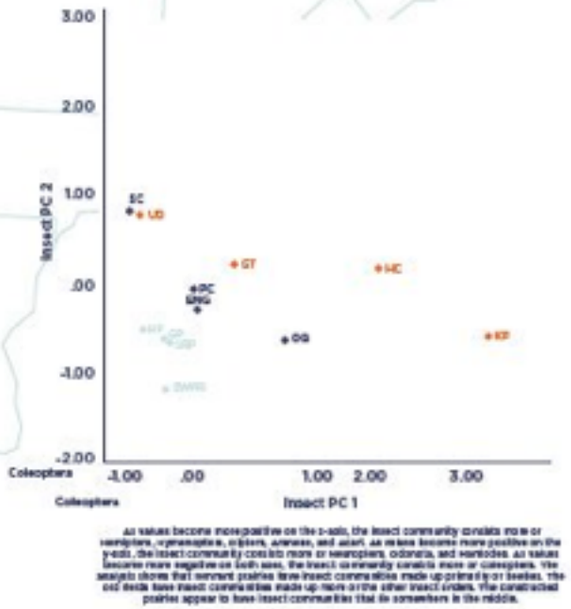
## RESULTS

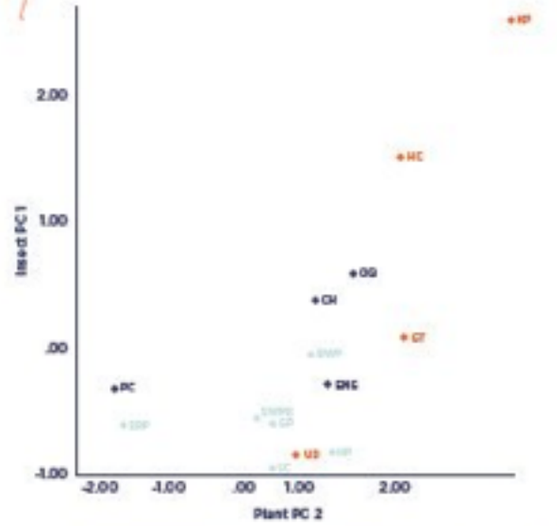
The number of Coleoptera (beetles) was significantly different between the different prairie types.

The number of Phalacridae (shining flower beetles) and Curculionidae (weevils) were different between prairie types.




Average number of individuals in the families Phalacridae and Curculionidae in remnant sites were significantly larger than those in old fields or constructed sites.




Support for this project was provided by Dr. Chalise Prather, Erin Butrico, Kathleen Kangl, the University of Dayton, Dean of the College of Arts and Sciences Summer Fellowship, Greene County Parks and Trails, Five Rivers Metroparks, Miami County Park District, and Wright-Patterson Air Force Base Natural Resources Program.

Resources: Shaeffer, Michael Drew. "Parasitoid Communities of Remnant and Constructed Prairie Fragments in Western Ohio" (2016). Browse all Theses and Dissertations. 1524.

# INVASIONAL MELTDOWN

## ON THE TEXAS COAST?

**POSITIVE INTERACTIONS BETWEEN INVADERS OF AN ENDANGERED COASTAL TALLGRASS PRAIRIE**

EMILY JONES & CHELSE PRATHER, DEPARTMENT OF BIOLOGY
KATHY KAROL & EMMA KAUFMAN, DEPARTMENT OF ART & DESIGN

### I. INVASIVE SPECIES INTERACT?

Yes! Invasive species may even facilitate each other's success – leading to a scenario known as an "INVASIONAL MELTDOWN." In response to herbivory by Caloptilia moth larvae, Chinese tallow may produce EXTRAFLORAL NECTAR (EFN) – a sugary reward – to attract predaceous insects, such as the tawny crazy ant. Both the tree and moth may benefit from ant defense, and the EFN may supply ants with vital carbohydrates.

### II. ECOLOGICIAL IMPLICATIONS

These species already decrease the biological diversity of multiple ecosystems. Positive interactions could AMPLIFY THEIR NEGATIVE EFFECTS across the Gulf Coast.

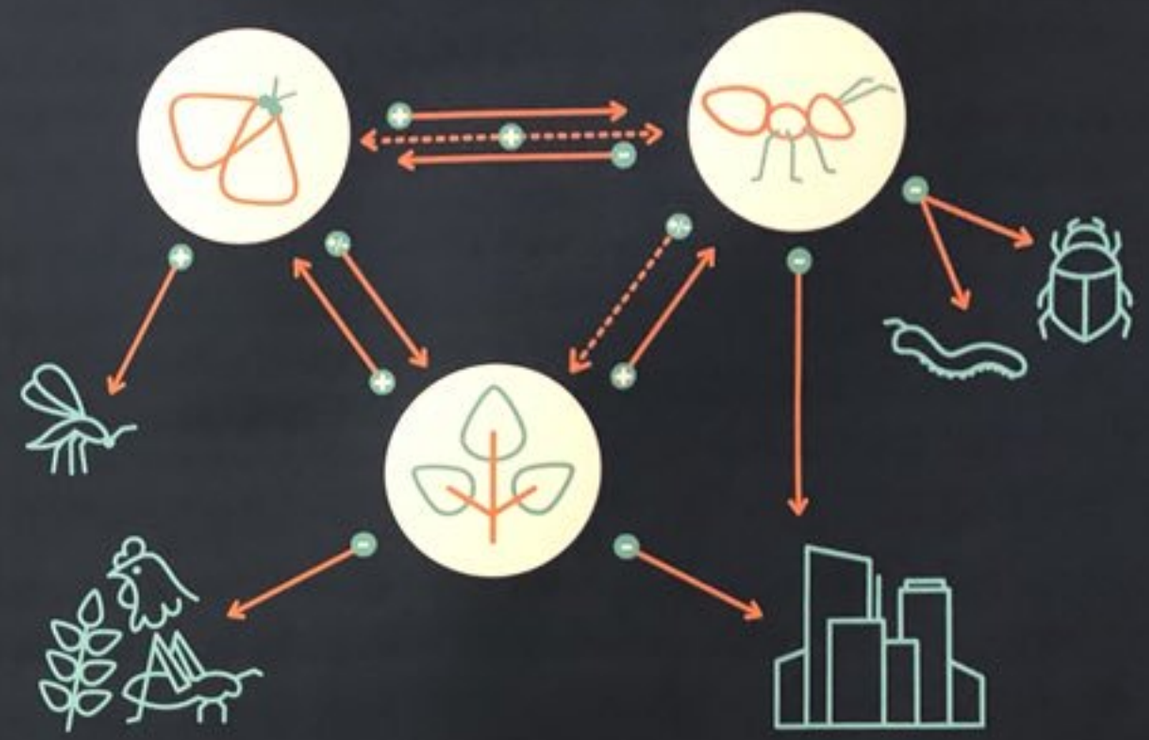


FIGURE 1 Invasional Meltdown: predicted positive interactions between three coastal prairie invaders and their negative effects.

### RESEARCH OBJECTIVES

Determine if POSITIVE INTERACTIONS exist between co-occuring ecological invaders of a coastal tallgrass prairie.

INVASIVE CHINESE TALLOW TREE

EXOTIC MOTH *CALOPTILIA TRIADICAE*

INVASIVE TAWNY CRAZY ANTS

### RESEARCH QUESTIONS

1. DO MOTH LARVAE INDUCE EFN PRODUCTION IN CHINESE TALLOW?
2. DOES THE TENDING OF TALLOW EFN BY TAWNY CRAZY ANTS DEPEND ON MOTH DENSITY?
3. DO THE ANTS CONSUME MOTH LARVAE? DO THE ANTS PREFER EFN?
4. DO THE ANTS EXCLUDE THE MOTH'S PREDATORS, THEREBY AFFECTING CHINESE TALLOW?

### METHODS SUMMER 2018

Field and lab experiments will be conducted on 300 acres of coastal tallgrass prairie in Texas.

**EXPERIMENTS WILL INVOLVE**

- **INFESTATION** – CONTROLLED CALOPTILIA INFESTATION OF SAPLINGS
- **COLLECTION** – EFN COLLECTION AND MEASUREMENT
- **ACCESS** – CONTROLLED ANT ACCESS TO TALLOW SAPLINGS
- **FEEDING** – ANT FEEDING TRIALS WITH CALOPTILIA AND EFN
- **EXCLUSION** – ANT EXCLUSION FROM NATURALLY RECRUITED TREES

UNIVERSITY of HOUSTON

# Title

*Authors*

## Intro

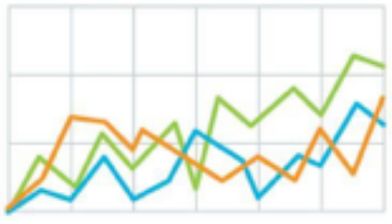
H1

H2

## Methods

1.
2.
3.
4.

## Results



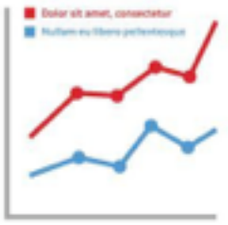
## Discussion

*More research is needed, but...*

**Main finding** goes here, translated into **plain english**. **Emphasize** the important words.

## Extra Tables & Figures





# How Are You Feeling Today, Dave?

## Using IBM's Watson Supercomputer to Extract Emotions from Natural Language

**Mike** A. Morrison

**INTRO**

- **IBM Watson** is a supercomputer able to process naturally written language. It can reportedly read a body of text, and extract from that the emotions that the author was feeling when they wrote it.
- **This study** compared Watson's ratings of emotional tone in text to self-report ratings, using a sample of crew members participating in NASA analog science mission in Antarctica.

**METHODS**

- **Participants:** N = 6 crew members participating in a NASA Science Mission in Antarctica. T = 42 (average) mission days per crew member
- **Diaries:** Crew members **wrote freeform** in **daily diaries** each day . Diaries typically discuss activities from the day, and other crew members.
- **Self-Reports:** Crew members completed self-report measures of psychological distress, happiness, conflict management, and physical activity.
- Using Watson's Alchemy Language service, **Watson analyzed diary text** and reported estimates of Fear, Joy, Sadness, Anger, and Disgust in each diary entry.
- **Analysis:** I tested for significant correlations between Watson's measures of Fear, Joy, Sadness, Anger, and Disgust against a battery of self-report measures of daily attitudes.

**RESULTS**

- Watson's estimates of happiness and sadness correlate significantly with related self-report measures, but Watson's estimates of disgust, fear, and anger showed no significant correlations.

MICHIGAN STATE UNIVERSITY

**IBM Watson can** accurately **detect joy** and **sadness** in samples of **written language.**

| | Watson **Happiness** | Watson **Sadness** |
|---|---|---|
| Self-report **Happiness** | .21** | -.22** |
| Self-report **Distress** | ns | .19* |
| Self-report **Conflict Management** | ns | -.24* |
| Self-report **Physical Activity** | .19** | -.25** |

Participants:

- **N = 6** crew members participating in a Science Mission in Antarctica
- **T = 42** (average) mission days per crew member

### How do Natural Language Processors Like IBM Watson Work?

1. A software algorithm reads-in a body of text (in this case, a diary entry).
2. The text is converted into features (e.g., frequency of specific words, punctuation usage, sentence length).
3. An algorithm identifies which features in the text are associated with scores on a 'known' criteria (e.g, self-reported happiness, or other-rated emotional tone).
4. Machine learning algorithms create a set of combined language features that reliably predict scores on the criteria of interest in the test data.
5. The 'trained' algorithm looks for these special features in new bodies of text, and outputs an estimate of the criteria.

## *Changing cyanobacteria blooms despite constant nutrient loads*

Larsen, **Venkiteswaran**, Baulch, Schiff, Higgins

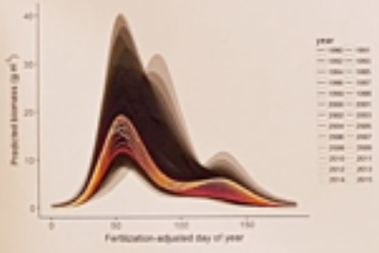
**INTRO**

- Blooms impair water quality and threaten our use of lakes
- More bloom now than many years ago
- Do annual blooms in lakes change year-after-year?

**METHODS**

1. Lake 227 @ IISD-Experimental Lakes Area fertilized since 1969
2. Phosphorus-only fertilization since 1990
3. Phytoplankton counts every two weeks
4. Generalised additive models to ask questions about bloom topology

**RESULTS**



**DISCUSSION**

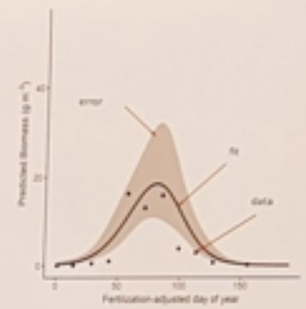
- Bloom biomass starts earlier and lasts longer than 25 years ago.
- Bloom has shifted from one mid-summer peak to an early summer peak and a diverse late-summer peak.
- Two-week longer open-water season driven my later ice-on in fall.

FORM BLOOM

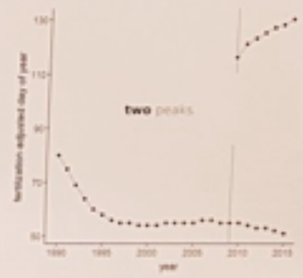
# Cyanobacteria blooms change even when **nutrients do not.**

*More nutrients cause more blooms.*

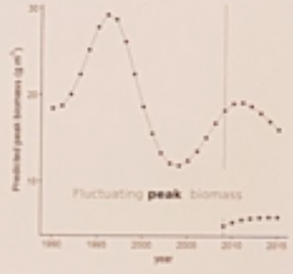
*Climate changes makes this worse.*




GAM fit for 1990 captures seasonal variability in cyanobacteria biomass




GAM fit for 1990-2015 tells us there was 1 peak & now there are 2




GAM fit for 1990-2015 tells us peak biomass fluctuates despite constant nutrient loading

ELA 50
IISD Experimental Lakes Area

A poster is a

# CONVERSATION STARTER

# How to create a better research poster in less time

**Jesse Mu**
@jayelmnop

I think there much better options for conference posters than “paste the paper in the poster” and “make one sentence 4000pt font, then paste the paper in the margins of the poster” #betterposter

Make **better posters** with RMarkdown + **posterdown**.

Transition from **poster** to **manuscript** with ease!

# A Better Reproducible Poster Title

W. Brent Thorne [1,*]
@brentthorne18
bthorne2@brocku.ca

Another G. Contributor [2] Person Three [3] Person Four [3] Person Five [3] Person Six [3] A. Seventh Author [2]

[1] Department of Earth Science, Brock University
[2] Department of Graphics and Layouts, University of Posters, Canada
[3] Another Institute of a place where work gets done, Earth, Milky Way

## Introduction

This is the `posterdown_betterland` template for the {posterdown} package! I was inspired by the twitter thread of Mike Morrison and wanted to apply the #betterposter concept to the reproducible (yet simple to use) functionality of the {posterdown} package (Thorne 2019). If you are not an R user don't sweat as you do **NOT** need to use it at all! Feel free to use only the Markdown functionality of this package :)

HTML documents such as this allow for "live" posters (aka GIFs or embeded videos etc), see Figure 1 bellow for an example of a study site map made using the {ggspatial} or Figure 2 for an example using the {gganimate} package by (Pedersen and Robinson 2017). I can even change the order of the figures in the poster and {posterdown} will take care of the formatting of Figure numbers for you, see Figure 1.

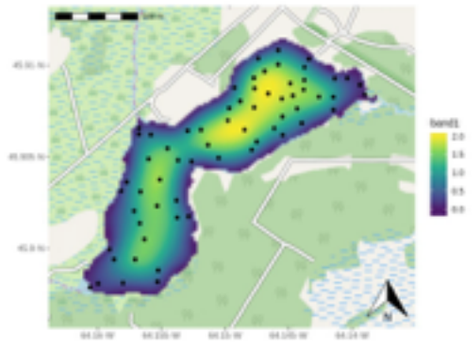



*Figure 1: Map of Long Lake sample from the ggspatial package (Dunnington, n.d.)*

## Methods

1. Install R and `posterdown`, see github
2. Open the `posterdown_betterland` template
3. Make all your poster dreams come true!

## Results

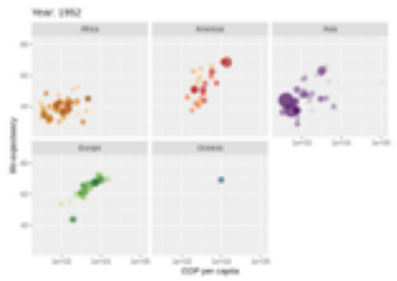



*Figure 2: WOW THIS IS AN AWESOME GIF!*

```
library(tidyverse)
library(patchwork)
library(ggthemes)

theme_set(theme_gray() + theme_tufte() +
          theme(legend.position = "none"))

base <- ggplot(iris, aes(x = Sepal.Length,
                         y = Sepal.Width,
                         colour = Species))

p_point <- base + geom_point()
p_line  <- base + geom_line()
p_area  <- base + geom_area()
p_box1  <- ggplot(iris) +
  geom_boxplot(aes(x = Species,
                   y = Sepal.Length,
                   fill = Species))

p_box2  <- ggplot(iris) +
  geom_boxplot(aes(x = Species,
                   y = Sepal.Width,
                   fill = Species))

p_line +
  (p_point + p_box1) +
  plot_layout(ncol = 1) +
  plot_annotation(tag_levels = "a",
                  tag_prefix = "(",
                  tag_suffix = ")")
```


*Figure 3: Using {ggplot} and {patchwork} to generate a layout of multiple plots in one figure (Pedersen 2017)*

## More Figures and Tables

*Table 1: Here is a caption for the table made with the {kableExtra} package (Zhu 2019)*

| | Sepal W | Sepal L | Pedal W | Pedal L | Species |
|---|---|---|---|---|---|
| 1 | 5.1 | 3.5 | 1.4 | 0.2 | setosa |
| 2 | 4.9 | 3.0 | 1.4 | 0.2 | setosa |
| 50 | 5.0 | 3.3 | 1.4 | 0.2 | setosa |
| 51 | 7.0 | 3.2 | 4.7 | 1.4 | versicolor |
| 101 | 6.3 | 3.3 | 6.0 | 2.5 | virginica |
| 102 | 5.8 | 2.7 | 5.1 | 1.9 | virginica |

A **BIG** thank you to Romain Leasur and Yihui Xie for their wonderfull work on {pagedown} which had made this poster possible (Xie and Lesur, n.d.)!

## References

Dunnington, Dewey n.d. *Ggspatial: Spatial Data Framework for Ggplot2*. https://github.com/paleolimbot/ggspatial.

Pedersen, Thomas Lin. 2017. *Patchwork: The Composer of Ggplots*. https://github.com/thomasp85/patchwork.

Pedersen, Thomas Lin, and David Robinson. 2017. *Gganimate: A Grammar of Animated Graphics*. http://github.com/thomasp85/gganimate.

Thorne, W. Brent. 2019. *Posterdown: An R Package Built to Generate Reproducible Conference Posters for the Academic and Professional World Here Powerpoint and Paper Just Won't Cut It*. Vol. v1.1.1. https://github.com/brentthorne/posterdown.

Xie, Yihui, and Romain Lesur. n.d. *Pagedown: Paginate the Html Output of R Markdown with Css for Print*. https://github.com/rstudio/pagedown.

Zhu, Hao. 2019. *Kableextra: Construct Complex Table with 'Kable' and Pipe Syntax*. https://CRAN.R-project.org/package=kableExtra.

posterdown

posterdown