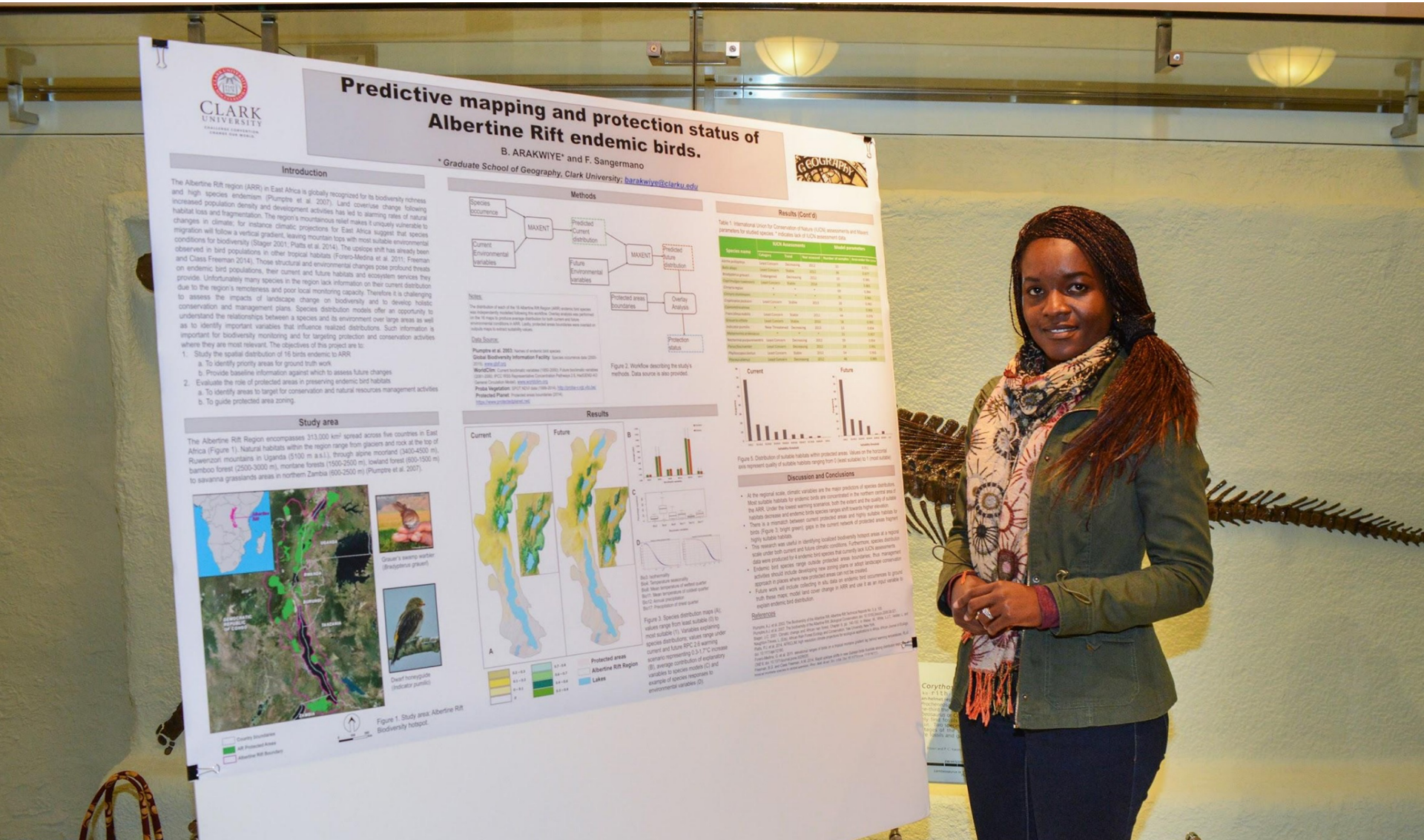
American Museum of Natural History
Center for Biodiversity and Conservation

Creating Scientific Posters

Nadav Gazit
Network of Conservation Educators and Practitioners

Adapted by Suzanne Macey

What is a scientific poster?



What is your story?

Beginning	Middle	End
Introduction & Methodology	Results	Conclusions
		Citations + Acknowledgements

Questions that might help you think about your story:

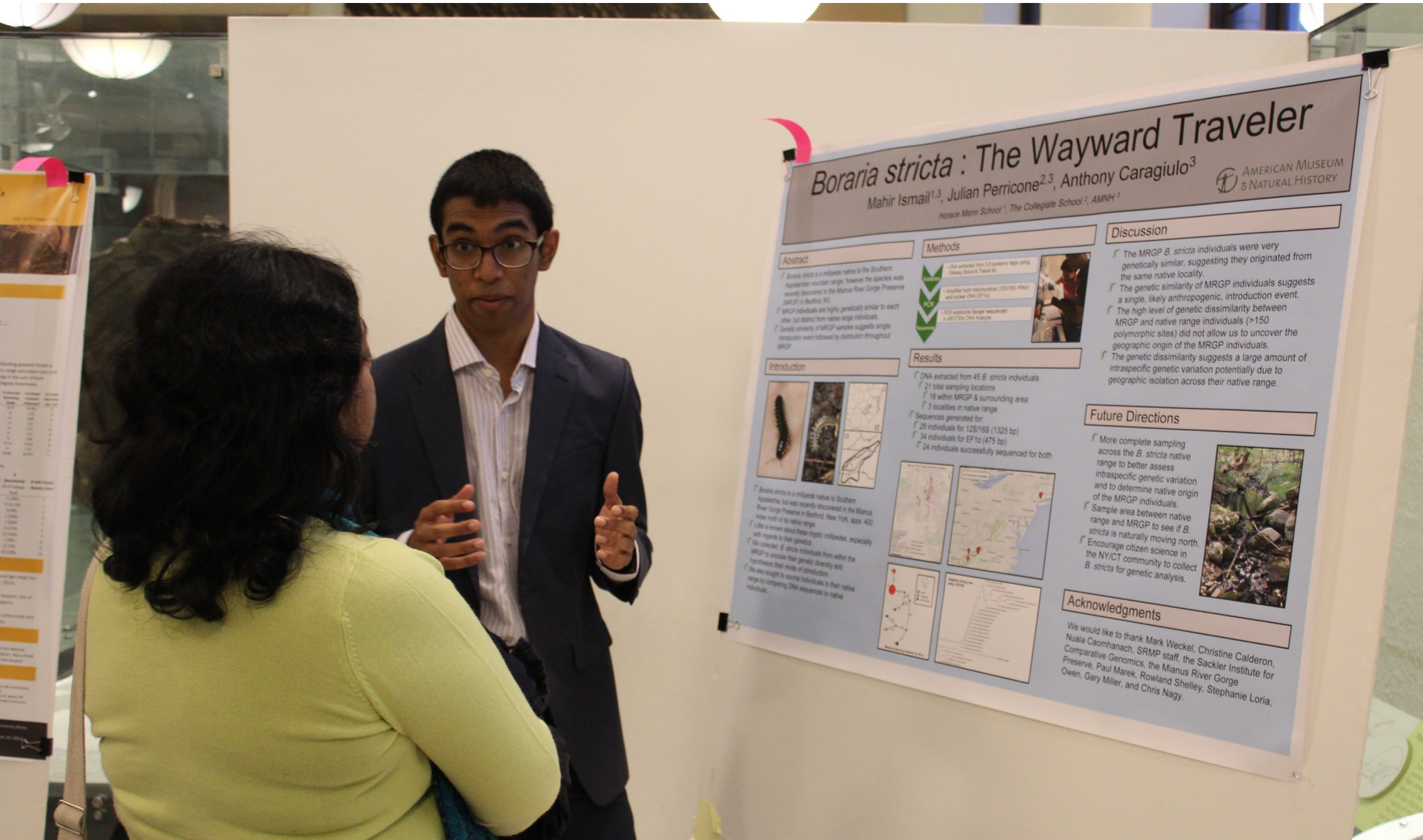
1. What question does your research answer?

2. What is it that you are trying to convey?

3. Why does this matter?

4. What are some key take-home messages you'd like people to leave with after reading your poster?

Who is your audience?



Questions to help you think about your audience:

1. Are there terms that I should explain, adapt, or perhaps not use at all?

2. Would it be more important to show the specific methods, or will that be too much information?

Poster layout

Title

Name

Affiliation

Introduction

Methods

Results

Results (continued)

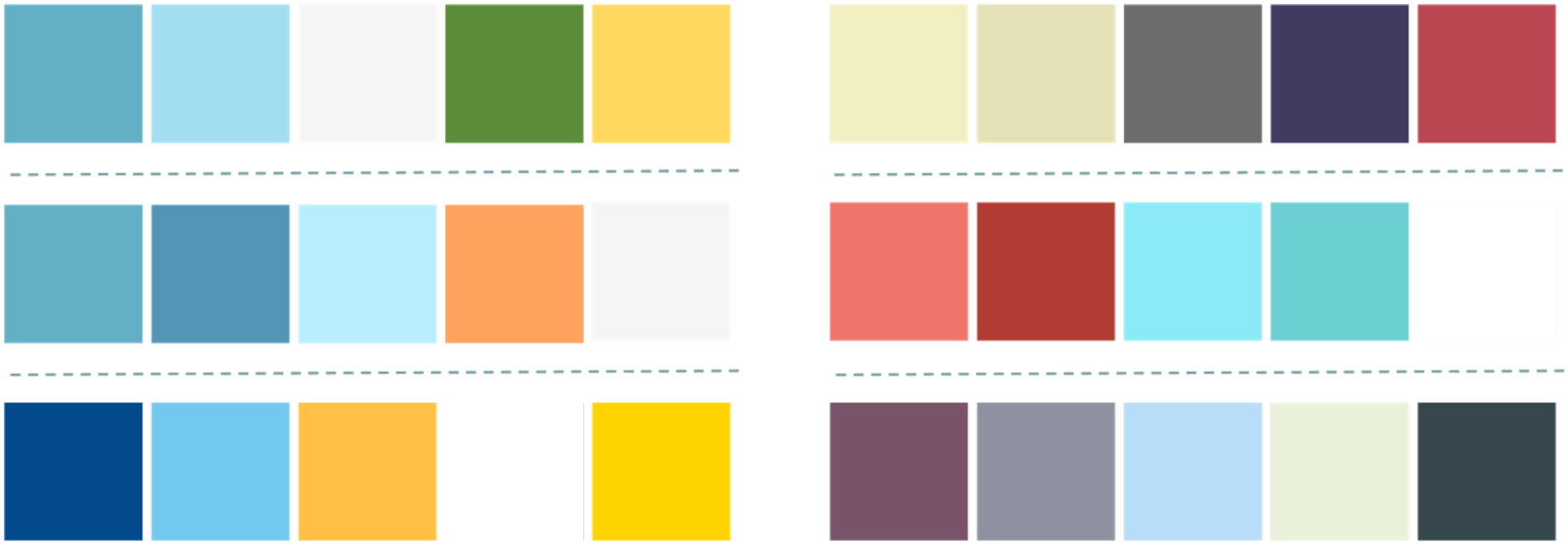
Conclusions

Citations +
Acknowledgements

Designing your poster

1. Font size is important.
2. Stick to 2-3 fonts, at most.
3. Less is more.
4. Prepare a short, 1-page handout.
5. Only show what is relevant to your topic and your take away message.
6. Make sure your text and boxes are aligned. That helps the reader.

Color!



Presenting figures and data

1. Does this figure tell my story? Does this tell the story for *this* audience?
2. Make sure you give your figures the space they need. Make them big and attractive. They usually are the centerpiece of your work and can really help you drive your key message home.
3. Make sure that labels will be easily readable.
4. Simplify complex / busy figures.
5. Avoid tables unless absolutely necessary.

Which photos should you use?

1. Only include what is relevant to your story and your audience.

2. If possible, do not use pixelated photos!

3. If you're displaying a photo that is essential to your story, make sure you explain what we're seeing (you can use a title and caption).

4. Don't use photos in a way that distracts or takes away attention from your work.

CRAP

Contrast

Repetition

Alignment

Proximity

PIGS IN SPACE: EFFECT OF ZERO GRAVITY AND AD LIBITUM FEEDING ON WEIGHT GAIN IN CAVIA PORCELLUS

Colin B. Purrington
6673 College Avenue, Swarthmore, PA 19081 USA

ABSTRACT:

One ignored benefit of space travel is a potential elimination of obesity, a chronic problem for a growing majority in many parts of the world. In theory, when an individual is in a condition of zero gravity, weight is eliminated. Indeed, in space one could conceivably follow ad libitum feeding and never even gain an gram, and the only side effect would be the need to upgrade one's stretchy pants("exercise pants"). But because many diet schemes start as very good theories only to be found to be rather harmful, we tested our predictions with a long-term experiment in a colony of Guinea pigs (Cavia porcellus) maintained on the International Space Station. Individuals were housed separately and given unlimited amounts of high-calorie food pellets. Fresh fruits and vegetables were not available in space so were not offered. Every 30 days, each Guinea pig was weighed. After 5 years, we found that individuals, on average, weighed nothing. In addition to weighing nothing, no weight appeared to be gained over the duration of the protocol. If space continues to be gravity-free, and we believe that assumption is sound, we believe that sending the overweight — and those at risk for overweight — to space would be a lasting cure.

INTRODUCTION:

The current obesity epidemic started in the early 1960s with the invention and proliferation of elastane and related stretchy fibers, which released wearers from the rigid constraints of clothes and permitted monthly weight gain without the need to buy new outfits. Indeed, exercise today for hundreds of million people involve only the act of wearing stretchy pants in public, presumably because the constrictive pressure forces fat molecules to adopt a more compact tertiary structure (Xavier 1965).

Luckily, at the same time that fabrics became stretchy, the race to the moon between the United States and Russia yielded a useful fact: gravity in outer space is minimal to nonexistent. When gravity is zero, objects cease to have weight. Indeed, early astronauts and cosmonauts had to secure themselves to their ships with seat belts and sticky boots. The potential application to weight loss was noted immediately, but at the time travel to space was prohibitively expensive and thus the issue was not seriously pursued. Now, however, multiple companies are developing cheap extra-orbital travel options for normal consumers, and potential travelers are also creating news ways to pay for products and services that they cannot actually afford. Together, these factors open the possibility that moving to space could cure overweight syndrome quickly and permanently for a large number of humans.

We studied this potential by following weight gain in Guinea pigs, known on Earth as fond of ad libitum feeding. Guinea pigs were long envisioned to be the "Guinea pigs" of space research, too, so they seemed like the obvious choice. Studies on humans are of course desirable, but we feel this current study will be critical in acquiring the attention of granting agencies.

MATERIALS AND METHODS:

One hundred male and one hundred female Guinea pigs (Cavia porcellus) were transported to the International Space Laboratory in 2010. Each pig was housed separately and deprived of exercise wheels and fresh fruits and vegetables for 48 months. Each month, pigs were individually weighed by duct-taping them to an electronic balance sensitive to 0.0001 grams. Back on Earth, an identical cohort was similarly maintained and weighed. Data was analyzed by statistics.

RESULTS:

Mean weight of pigs in space was 0.0000 +/- 0.0002 g. Some individuals weighed less than zero, some more, but these variations were due to reaction to the duct tape, we believe, which caused them to be alarmed push briefly against the force plate in the balance. Individuals on the Earth, the control cohort, gained about 240 g/month ($p = 0.0002$). Males and females gained a similar amount of weight on Earth (no main of effect of sex), and size at any point during the study was related to starting size (which was used as a covariate in the ANCOVA). Both Earth and space pigs developed substantial dewlaps (double chins) and were lethargic at the conclusion of the study.

CONCLUSIONS:

Our view that weight and weight gain would be zero in space was confirmed. Although we have not replicated this experiment on larger animals or primates, we are confident that our result would be mirrored in other model organisms. We are currently in the process of obtaining necessary human trial permissions, and should have our planned experiment initiated within 80 years, pending expedited review by local and Federal IRBs.

ACKNOWLEDGEMENTS:

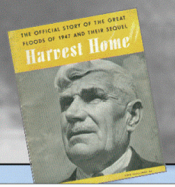
I am grateful for generous support from the National Research Foundation, Black Hole Diet Plans, and the High Fructose Sugar Association. Transport flights were funded by SPACE-EXES, the consortium of wives divorced from insanely wealthy space-flight startups. I am also grateful for comments on early drafts by Mañana Athletic Club, Corpus Christi, USA. Finally, sincere thanks to the Cuy Foundation for generously donating animal care after the conclusion of the study.

LITERATURE CITED:

NASA. 1982. Project STS-XX: Guinea Pigs. Leaked internal memo.
Sekulić, S.R., D. D. Lukač, and N. M. Naumović. 2005. The Fetus Cannot Exercise Like An Astronaut: Gravity Loading Is Necessary For The Physiological Development During Second Half Of Pregnancy. Medical Hypotheses. 64:221-228
Xavier, M. 1965. Elastane Purchases Accelerate Weight Gain In Case-control Study. Journal of Obesity. 2:23-40.

Ryedale Flood Research Group

Poster 4: Floods – have we never had it so bad?



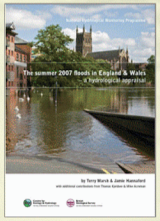
Flood histories – a national perspective

1998, 1999, 2000, 2001, 2003, 2004, 2007, 2008 ...and on and on and on. We seem to be living in a period of unprecedented flood risk, one related to climate change:

Prime Minister's Question Time on the 25th July 2007, immediately in the aftermath of the Central England flooding (Hansard, Volume 463, Part 130, Column 834) -

Sir Menzies Campbell: "The Prime Minister was responsible for the establishment of the Stern review, which he will recall pointed out the severe economic consequences of climate change. Is it not clear from the events of the past few weeks that we cannot afford not to take the necessary steps or indeed, not to spend the necessary money, in order to mitigate the effects of climate change?"

The Prime Minister: "The right hon. and learned Gentleman is right. The Stern report, which the Treasury commissioned, said that global warming is very likely to intensify the water cycle and increase the risk of floods. It is an accepted part of the Stern recommendations that we have to do more..."



Or are we?

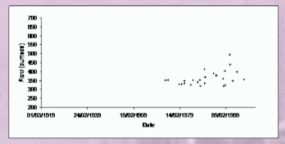
How does this stand up to scrutiny?

A day to remember: Pickering → 25th June, 2007. A boy surveys the flooding at the bottom of Park Street. Is this the worst it has ever been? And is climate change causing it?
(Photograph by Mike Haigh)

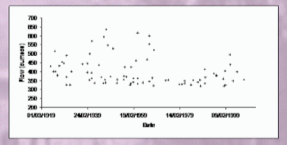
© Mike Haigh 2007, Jamison Drive, Pickering

Records from water recorders

The River Severn Record from 1965 to present suggests a rising trend →



The full River Severn Record - things were much worse before 1965 →



The data problem

The plots above illustrate a serious problem, which influences our perception of flooding and flood risk. Only c. 7% of our rain gauge records go back to before 1960. Our data are biased to a flood poor period. This is probably why the current wave of flooding seems so bad.

Evidence from other sources of data

The possibility that, until the late 1990s, we had become used to living in a flood poor period is supported by other evidence, such as historical accounts, if we allow them to be used in analyses. For instance, the British Hydrological Society has a register of historical flood events that runs into the 1940s, based upon reported flooding (e.g. in newspapers). These data suggest that we go through runs of flood rich periods and runs of flood poor periods.

This shows us that there are other dimensions to the story, such as those to be found in historical and contemporary accounts of what it was like to live with floods. In this respect, 1947 & 2007 make an interesting comparison in that they were both years when the nation, as opposed to regions or districts, experienced flood risk ...

1947 versus 2007: 60 years of social change

Looking back over this period, we find evidence of how our approach to floods has changed. In particular, two government publications, one called *Harvest Home*, published in 1947 by the then Ministry of Agriculture and Fisheries, the other from the Review of the 2007 flood events led by Sir Michael Pitt, serve to illustrate this →

Living with floods in 1947 Evidence from *Harvest Home*	Living with floods in 2007 Evidence from the Pitt Review
"Every stretch of floodbank is assigned two or three men who live near by – many of them volunteers – whose task is simply that of any patrol in a battle, to give warning of movement by the enemy."	"In 1947 were the last floods, and with modern technology there shouldn't be any floods round here..." (Householder, Doncaster)
"Not long after, the order went out "Patrol!". On every river bank the patrolmen set out from their homes, which some were not to see again for a couple of days or more"	"It's entirely the council's responsibility to prevent and deal with flooding." (Business, Hull)
"So there remained only the mess to clear up … Typical was the action of the W.V.S at Reading, which organized voluntary "flying squads of Mrs. Mops" to go rounds and help clean up the houses that had been flooded …."	"… what do I pay my council tax for? Why isn't someone actually doing this? Why do I, myself, have to do it, if there's nobody out there digging that brook deeper and draining it out? Why have I got to do it?" (Householder, Gloucester)

This shows how society has changed ... from one where, during what is widely known as 'Austerity Britain', flooding was something to be lived with by doing something personally, to one where technology should have stopped flooding and what flooding remains should be managed by other people.

Why do things seem to be bad?
1.We have had an unusually flood poor period from the 1960s to the 1990s
2.We are much less able and prepared to live with flood risk

Searching further back ...

We can search even further back to appreciate better our relationship with flooding. In this respect, besides what can be found in local histories, the British Hydrological Society's *'Chronology of British Hydrological Events'* provides a wealth of material:

A southern example, around Bath ...

1739 - major floods in Bristol and Bath; 1774 - major flood; 1809 - great areas of the city under water; 1840 - major flooding, including at the site of the new GWR station; 1875 - enormous summer storms over much of England; 1894 - major Autumn floods, hundreds of homes evacuated; 1932 - major floods in Wiltshire, Somerset, adjoining counties; 1947 - Bath flooded following the thaw after the severe Winter; 1960 - worst floods since 1947; 1968, 1979, 1993 and 2000 – major floods ...

A northern example, around Leeds ...

1768 - major floods, following heavy rains and snow; 1790 - major flood after a sudden thaw, rivers higher than in the great flood of 1775; 1822 - big flood, many roads inundated and properties damaged; 1866 - great flood, prompting the Town Council to replace the old bridge; 1900 - extraordinary summer thunderstorm, many lives lost and much property damaged; 1948 - a very wet summer, with major flooding, prompting worries about the capacity of the sewers and storm drainage; 1968 - great summer storm, with serious flooding; 2000 - major floods, as in much of the U.K. ...

In summary, national trends in flooding are not so tractable to expressions of 'the worst ever' as one might believe. In particular, we seem to have moved from a 'flood poor' period, roughly between 1960 and 1990, to a 'flood rich' period, but it is not clear that this is any worse than has been experienced in Britain over past centuries.

Backdrop: Pickering, floods in 1931, a car stranded in at the bottom of the Market Place; photograph by Sidney Smith, © Sidney Smith, by kind permission of the Beck Isle Museum, Pickering, joint custodians of the collection

American Museum of Natural History
Center for Biodiversity and Conservation

Expanding *Wallace* biodiversity modeling software to support biodiversity change indicator calculations for GEO BON assessment and reporting

Mary E. Blair[1], Robert P. Anderson[1,2,3], Jamie Kass[2,3], Gonzalo Pinilla[2,3], Matthew Aiello-Lammens[4], Cory Merow[5], Ned Horning[1], Peter Galante[1], Peter Ersts[1], Jorge Velásquez[6]

1. American Museum of Natural History, NY, USA 2. The Graduate Center, City University of New York, NY, USA 3. City College of New York, NY, USA 4. Pace University, NY, USA 5. Yale University, CT, USA 6. The Alexander von Humboldt Institute for Research on Biological Resources, Bogotá, CO

BACKGROUND: Effective policy responses to changes in biodiversity are only possible with adaptable analytic tools that leverage the influx of data from biodiversity observation systems. Such analytic tools must also be streamlined and readily mastered by researchers making scientific recommendations. In this project, we will create software to assess biodiversity change indicators by building on the recently developed software *Wallace* as a new GEO BON in a Box tool. *Wallace* is an open-source, R-based application with a graphical user interface[1] that supports species distribution modeling[2] (SDM) in a reproducible, flexible and extensible platform to facilitate a wide range of ecological analyses.

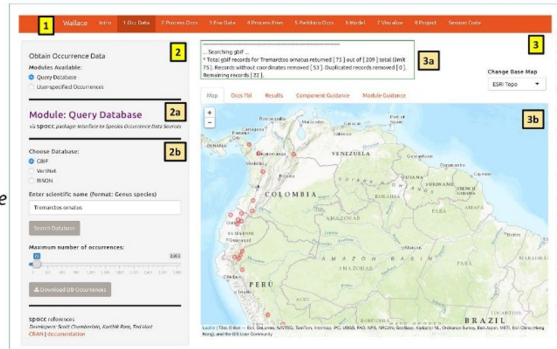
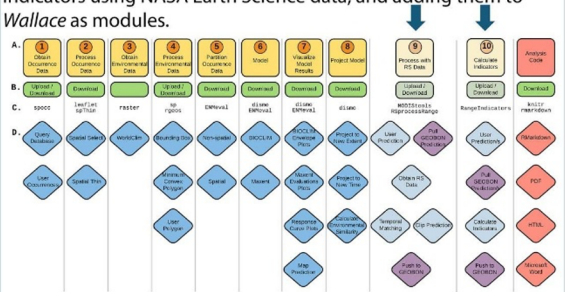


Fig 1. The *Wallace* interface: (1) Navigation bar with component tabs, (2) toolbar with component name and module selection, (2a) currently selected module name and description of featured R package/s, (2b) control panel for currently selected module, (3) visualization space, (3a) log window, (3b) visualization tabs.

We will expand *Wallace* as a BON in Box tool by:

1. Developing two new R packages to calculate biodiversity indicators using NASA Earth Science data, and adding them to *Wallace* as modules.



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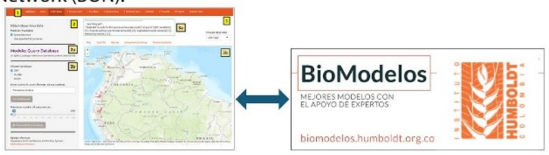

3. Creating interactive web-based training and workshop materials on best practices for using SDMs to contribute to biodiversity change indicator assessments for resource management and conservation decision-making.

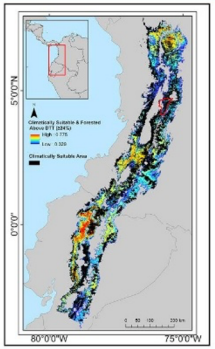

Fig 2. Use case: Estimating current ranges. Prediction of the current range of the olinguito (*Bassaricyon neblina*), based on processing of SDM output using NASA Earth Science data (MODIS-derived percent forest cover) and recent in situ observations of the species. Colored areas indicate climatically suitable areas that are still sufficiently forested. Black areas denote additional climatically suitable areas, but that now hold insufficient forest cover. Analyses indicate 51% range reduction across the range. Percent range reduction in Colombia was 54%, but the reduction for the Quindío Department in the heart of the country's coffee-growing region reached 81% (red outline).

REFERENCES

1. Chang et al. 2016. shiny: Web Application Framework for R. R package version 0.12.2.
2. Peterson et al. 2011. Ecological niches and geographic distributions. Princeton, New Jersey: Monographs in Population Biology, 49. Princeton University Press.

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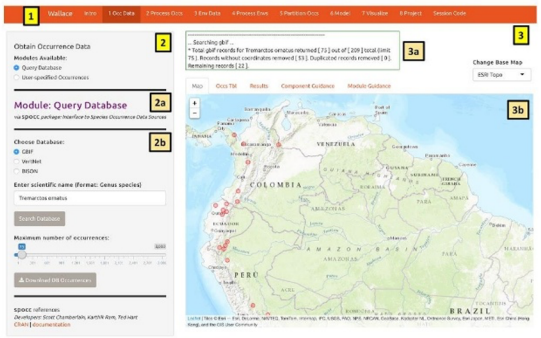

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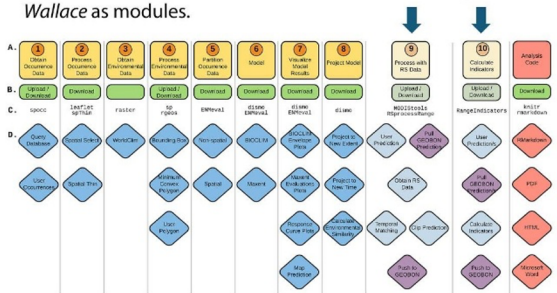

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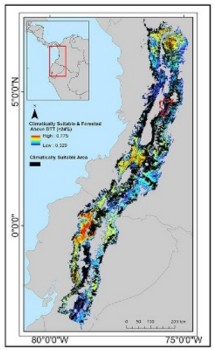

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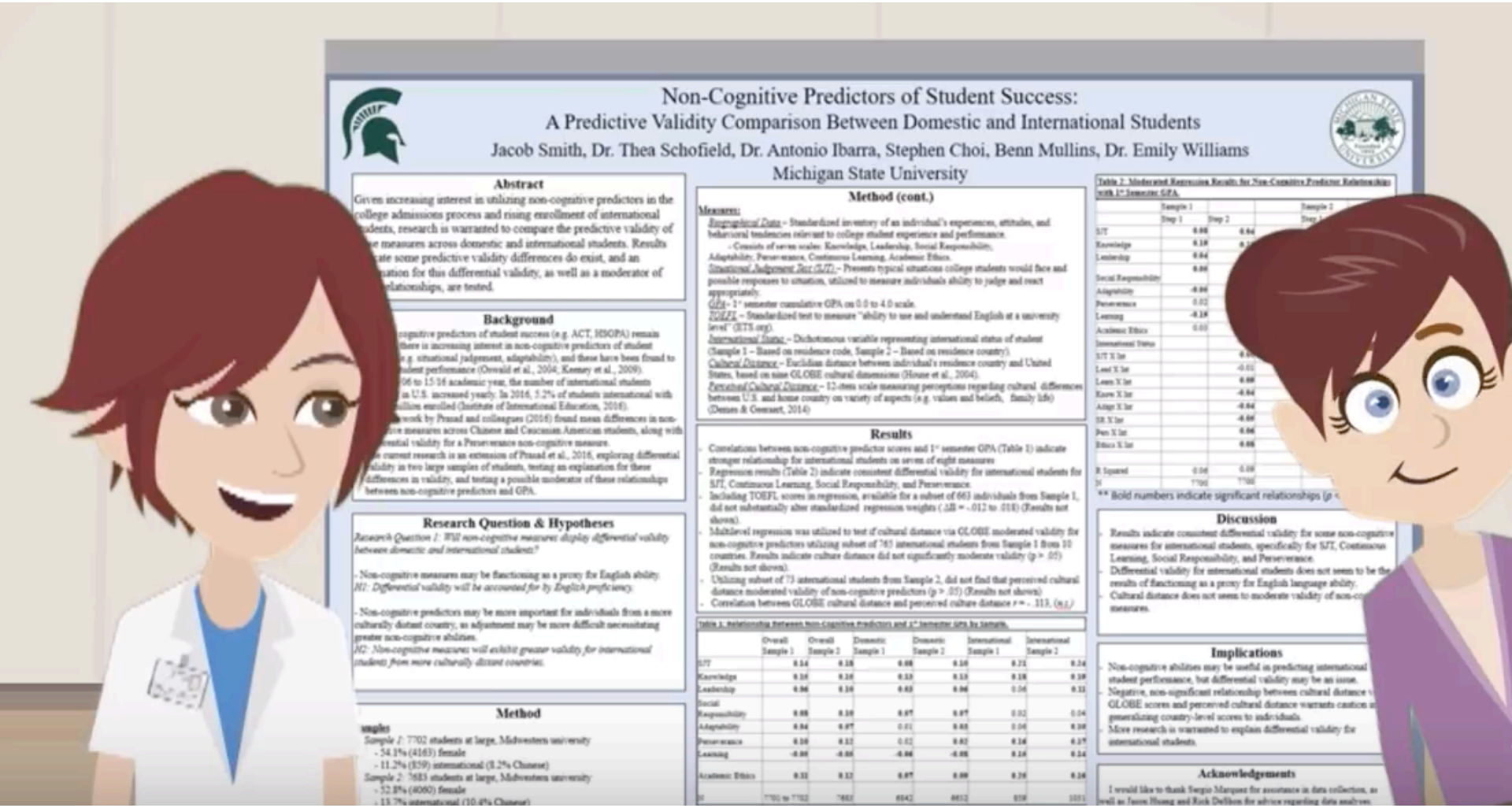
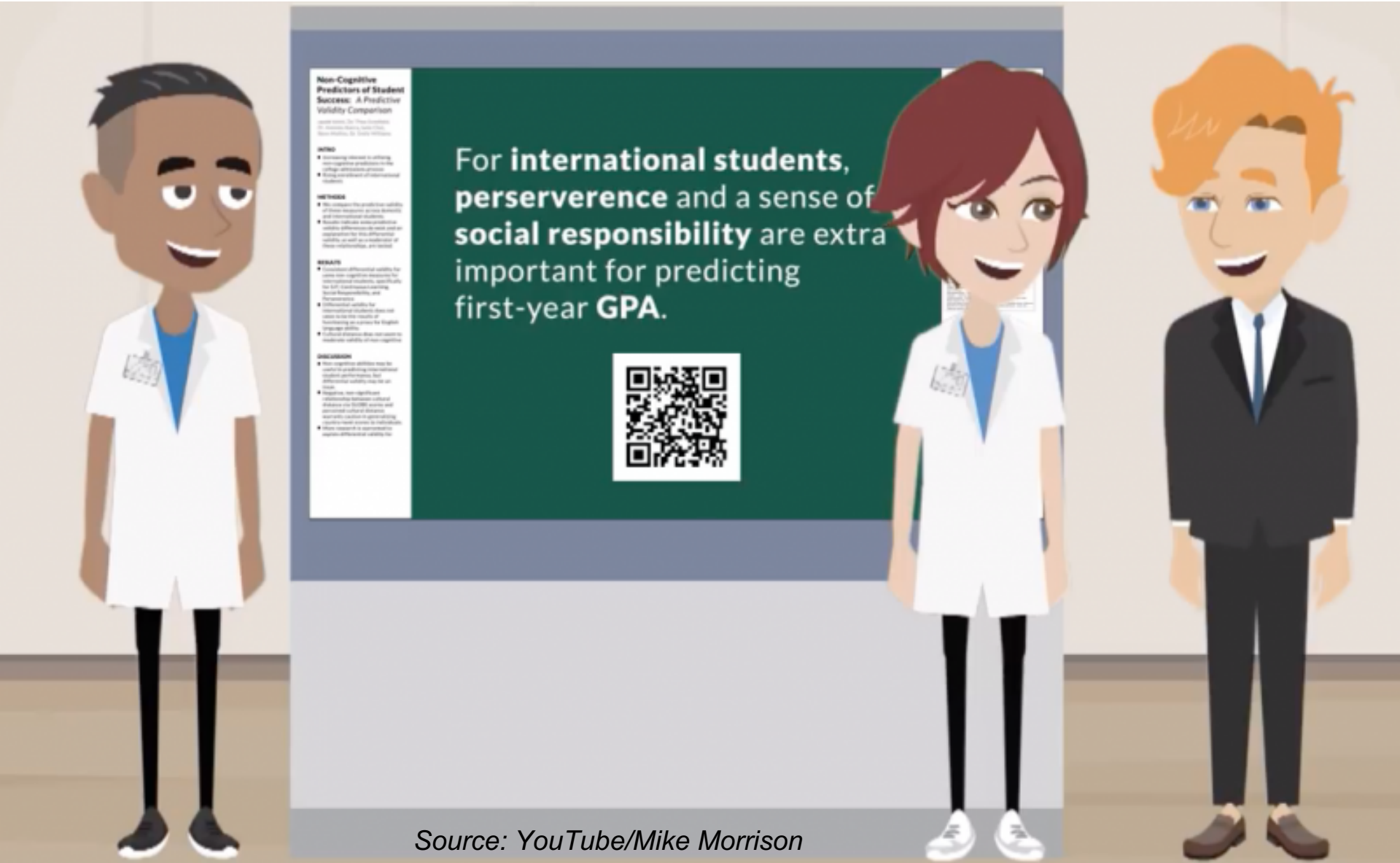
Times / Formats are changing!



Source: YouTube/Mike Morrison

Times / Formats are changing!



Source: YouTube/Mike Morrison

Title

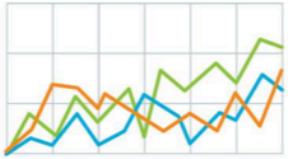
Authors

Intro

Methods

1.
2.
3.
4.

Results



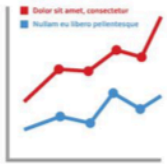
Discussion

More research is needed, but...

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

Take a picture to download the **full paper**

Extra Tables & Figures



Example of Rubric to Assess Posters

Rate on a scale from 1 (disagreement) to 5 (agreement).

- The title is informative and engaging
- Research questions are clear and well designed
- Selected methods are suitable to achieve objectives
- Conclusions follow from results, or preliminary predictions are logical
- Poster is well-organized, easy to follow, key information easy to extract
- Poster text is easy to read, colors and design are attractive
- Research presented is relevant to current issues and needs
- If the author is beside the poster, he/she answers questions effectively, with knowledge and professionalism.

Resource Links

http://www.visualmess.com/

https://www.wikihow.com/Make-a-Scientific-Poster

https://www.sciencedirect.com/science/article/pii/S2049080116301303

https://www.insidehighered.com/news/2019/06/24/theres-movement-better-scientific-posters-are-they-really-better

For selecting color from a color scheme, you can download this extension for Google:
https://chrome.google.com/webstore/detail/eye-dropper/hmdcmlfkchdmnmnmheododdhjedfccka?hl=en