Crafting a superb conference presentation or poster

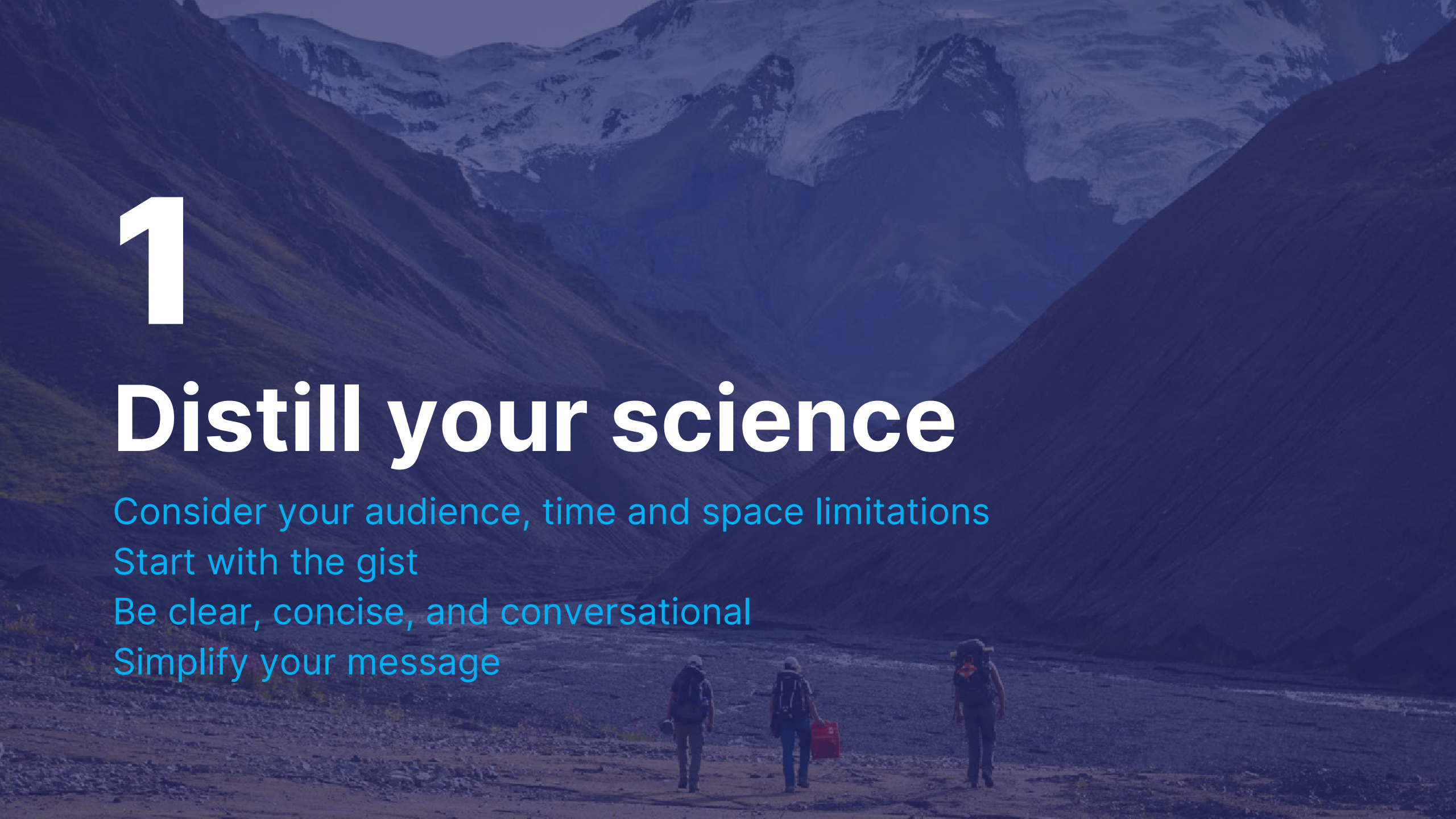
Lauren Lipuma, CIRES Communications

November 7, 2023

Agenda

Content and design

1. Distill your science
2. Draw in an audience outside your field
3. Use visuals effectively
4. Create a clean and compelling design
5. Examples and resources



1

Distill your science

Consider your audience, time and space limitations
Start with the gist
Be clear, concise, and conversational
Simplify your message

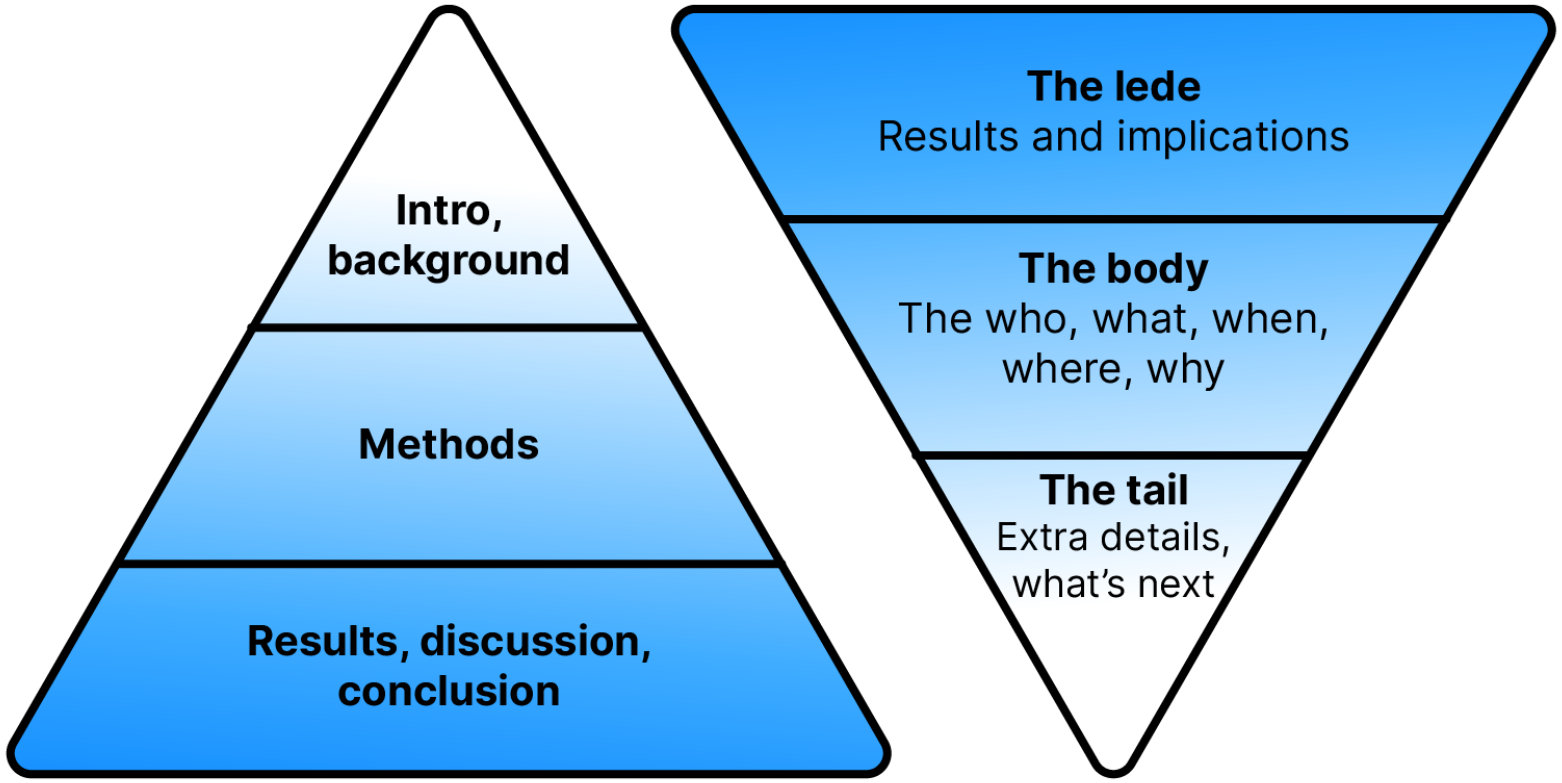
Audience, time, and space

Who is your audience?

What can they reasonably absorb in the time you're allotted?

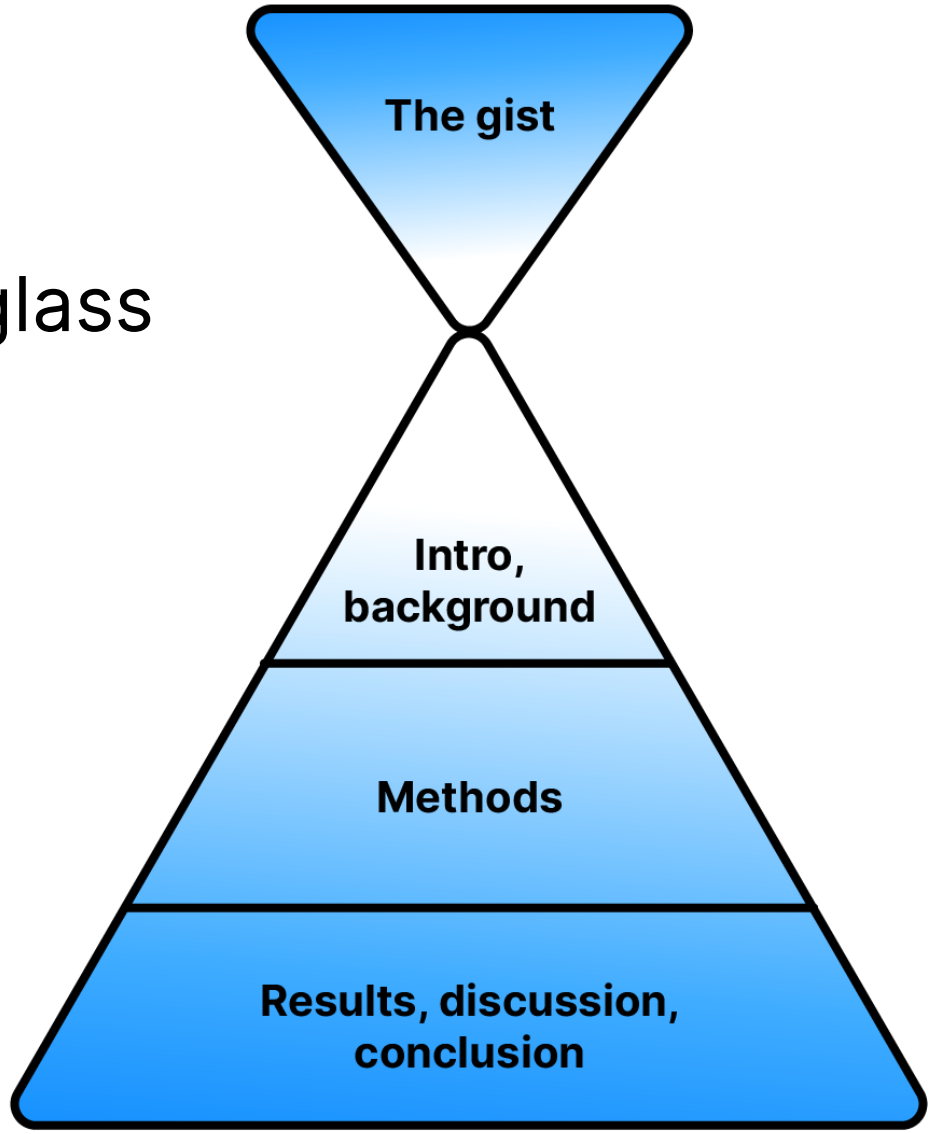
Start with the gist

Academic style vs. news style



Start with the gist

Try the hourglass



Start with the gist

An observationally-based spatial SWE model for the western United States and Alaska

Aaron Heldmyer[1], Ben Livneh[1,2], William Farmer[3], Jessica Driscoll[3], Noah Molotch[4,5,6]

[1]University of Colorado Department of Civil, Environmental and Architectural Engineering, [2]Cooperative Institute for Research in Environmental Sciences (CIRES), [3]U.S. Geological Survey Denver Federal Center, [4]Department of Geography, University of Colorado Boulder, [5]Institute of Arctic and Alpine Research, University of Colorado Boulder, [6]NASA Jet Propulsion Laboratory

Introduction

- **Snow-Water Equivalent (SWE)** describes the amount of water contained within the snowpack.
- Understanding SWE is **crucial for water resources**, particularly in the Western U.S.
- Unfortunately, gages that observe SWE are **sparsely distributed** and often poorly sited.
- Lesser quality remotely sensed **Snow-Covered Area (SCA)** data, which simply describe snow presence, are available almost everywhere.
- The annual **Date of Snow Disappearance (DSD)** can be obtained from a SCA time series.
- **Successfully relating peak SWE and DSD** may yield spatially-continuous, quality SWE data.

Methods

- Compute this log-linear relationship at each gage:

$$\log_{10} SWE_{peak} = \beta_0 + \beta_1(s)DSD + \varepsilon(s,t)$$

where SWE_{peak} is **peak SWE from gage data**, DSD is the **date of snow disappearance from satellite data**, β_0 is an empirically-based intercept, $\beta_1(s)$ is a spatially-varying coefficient, and $\varepsilon(s,t)$ is a spatially-varying annual residual time-series.

- Develop a theoretical variogram for $\beta_1(s)$ and yearly $\varepsilon(s,t)$ from each gage location to describe their spatial continuities.
- Interpolate with a universal Kriging approach, adding **elevation** as an additional predictor.
- Re-combine the intercept, β_0 , interpolated coefficient, $\beta_1(s)$, and each year's interpolated residual, $\varepsilon(s)$. Back-transform from log scale to obtain a spatially-continuous **estimate of peak SWE for each year across the modeled area.**

Results

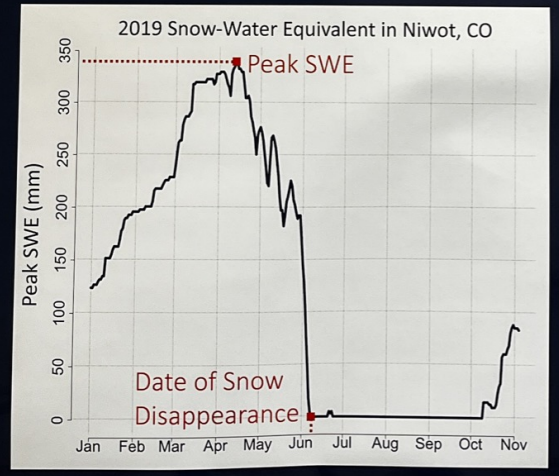
- Across 647 gages, Peak SWE and DSD show a relatively strong relationship (**median R^2 = 0.51**).
- The median relative difference between model and observation is **23.2% (106.2 mm)** for gages in the 5 study domains.

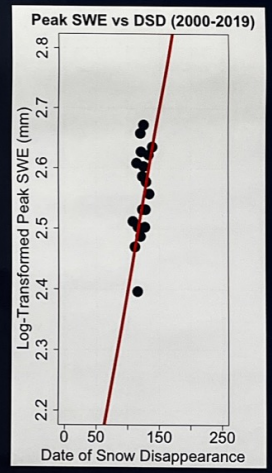
Discussion

- This computationally-efficient model offers a **relatively accurate prediction of peak SWE** using only 3 observational datasets.
- These methods could be used to supplement observations in **sparsely-gaged areas** like Alaska.
- Adding additional data, such as vegetation and meteorology, will be examined in the future.

CIRES

Annual date of **snow disappearance** has the potential to estimate **peak SWE.**





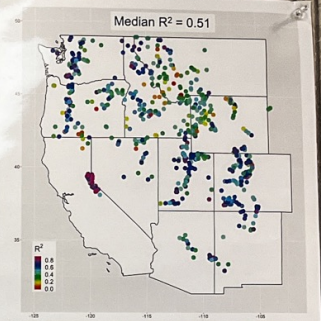


Fig 1: A spatial map displaying the correlation coefficient (R^2) for the fit between the log-transformed peak SWE and date of snow disappearance. Median R^2 is approximately 0.51.

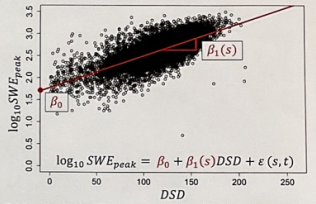


Fig 2: A plot of every gage-year DSD vs $\log_{10}$-transformed peak SWE relationship across all sites shown in Figure 1, using MODIS DSD and SNOTEL peak SWE data. The y-intercept from the right plot (approximately 1.8), was used for β_0. Individual $\beta_1(s)$ were developed for each gage, along with residuals, $\varepsilon(s,t)$.

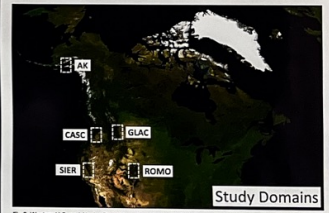


Fig 3: Western U.S. and Alaska Study Domains: Alaska (AK), Cascades (CASC), Sierras (SIER), Glacier (GLAC), and Rocky Mountains (ROMO). Each domain represents a unique, hydrologically-significant zone.

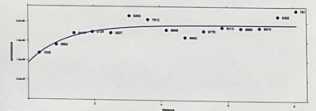


Fig 4: The covariance between each point-pair is plotted based on distance between the pair to create an empirical variogram, describing the spatial continuity of β_1. A theoretical exponential variogram is then fit. This process is repeated for each year's residuals. This variogram, combined with elevation data, comprises the spatial model in the second hierarchy.

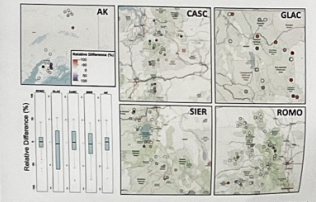


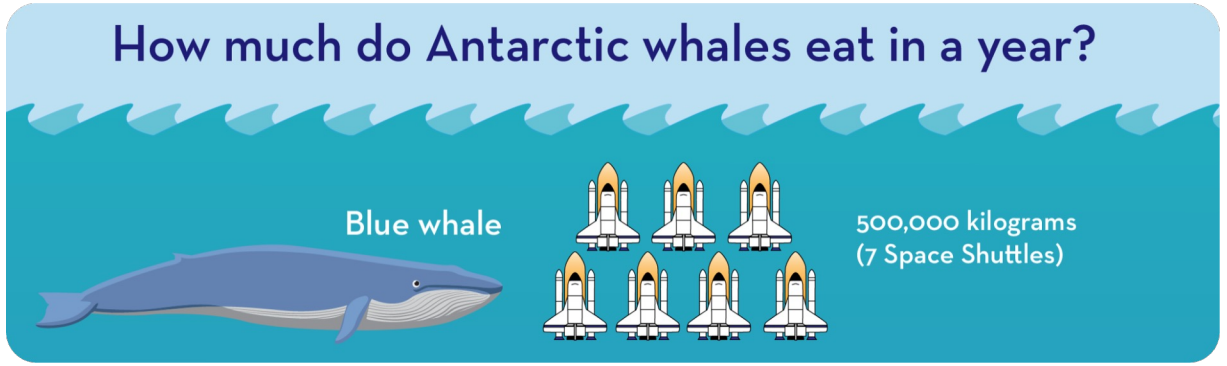
Fig 5: The relative difference between predicted SWE from a *Leave-One-Out-Cross-Validation (LOOCV)* and observed SWE across 161 gages for the five study domains. In a LOOCV, the function approximator is trained on all data except for one point, and then a prediction is made for that point. This was systematically repeated for all points.

Be clear, concise, and conversational


SCIENTIFIC AMERICAN

Even Lawyers Don't Understand Legalese, New Study Shows

Lawyers and nonlawyers alike prefer contracts written in plain English



Use plain language

Avoid jargon and acronyms

Use metaphors, examples, anecdotes, social math

Don't get bogged down in the weeds

Simplify your message

Start with the basics

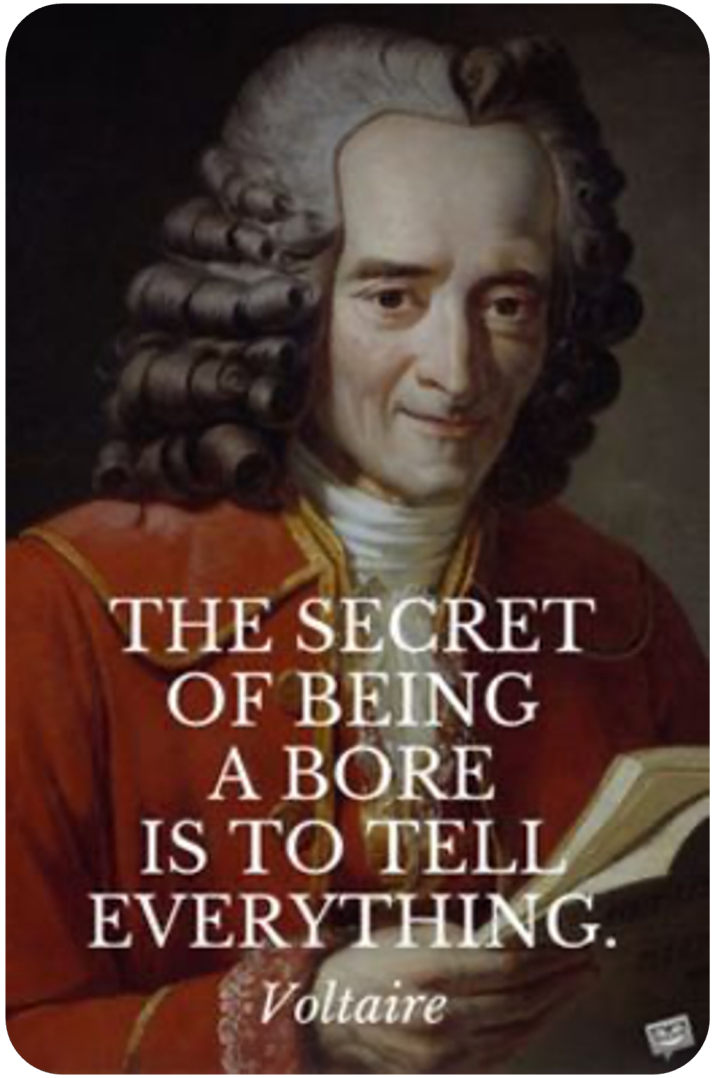
What did you do, what did you find and why does it matter?

Or: What we know, what is new, why it matters

What is the information the audience absolutely needs to know?

Sum up your presentation in one sentence

Include only the most relevant information



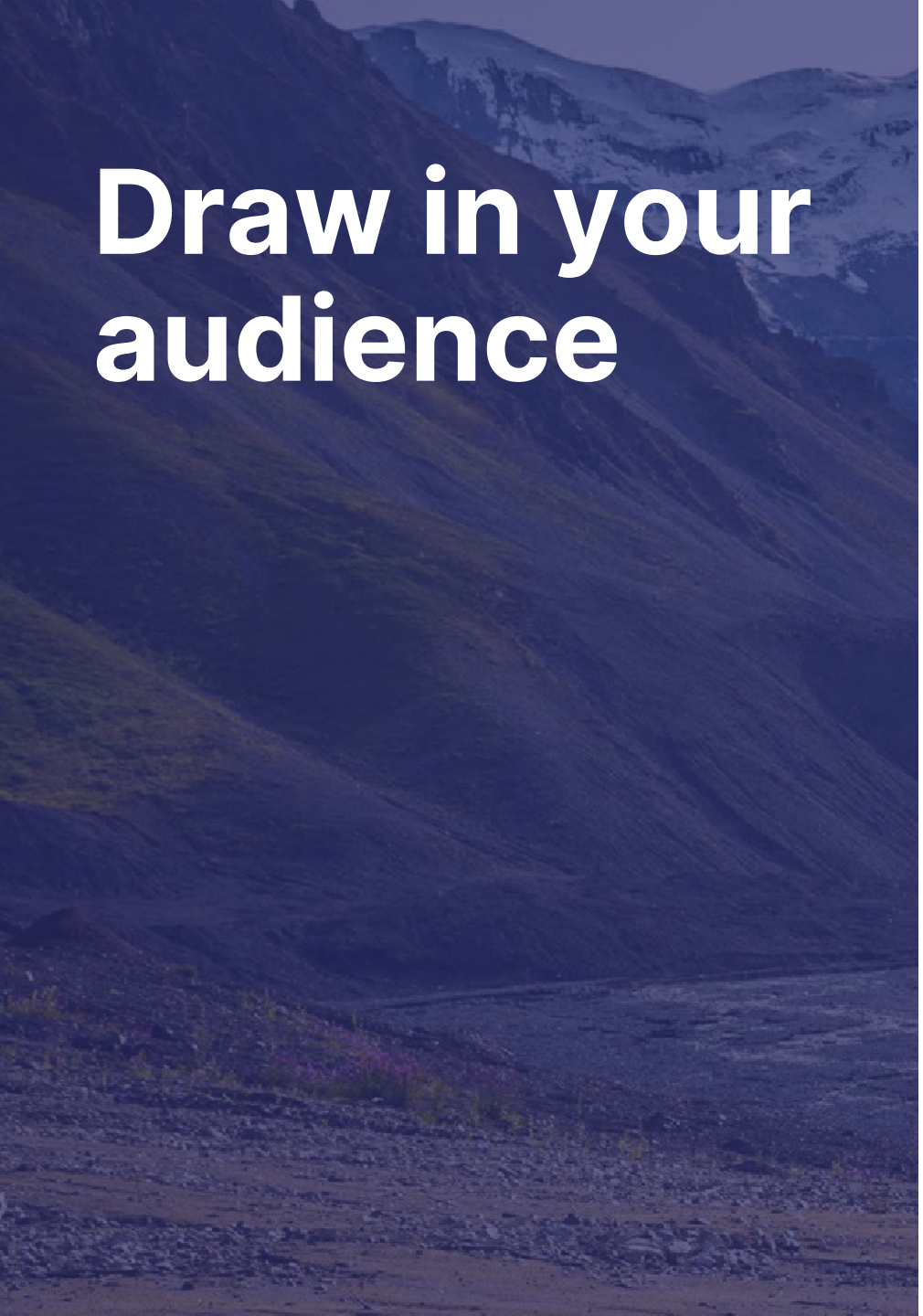
2

Draw in an audience outside your field

Focus on meaning rather than detail

Show why we should care

Make it fun



Draw in your audience

Focus on meaning rather than detail

Think product overview vs. tech specs

Provide context

Use keywords to demonstrate the importance or impact of your work

Show why we should care

Emphasize the value of your work

Make it fun

Add some personality

Questions to ask yourself

Who is your audience? How much time do you have with them?

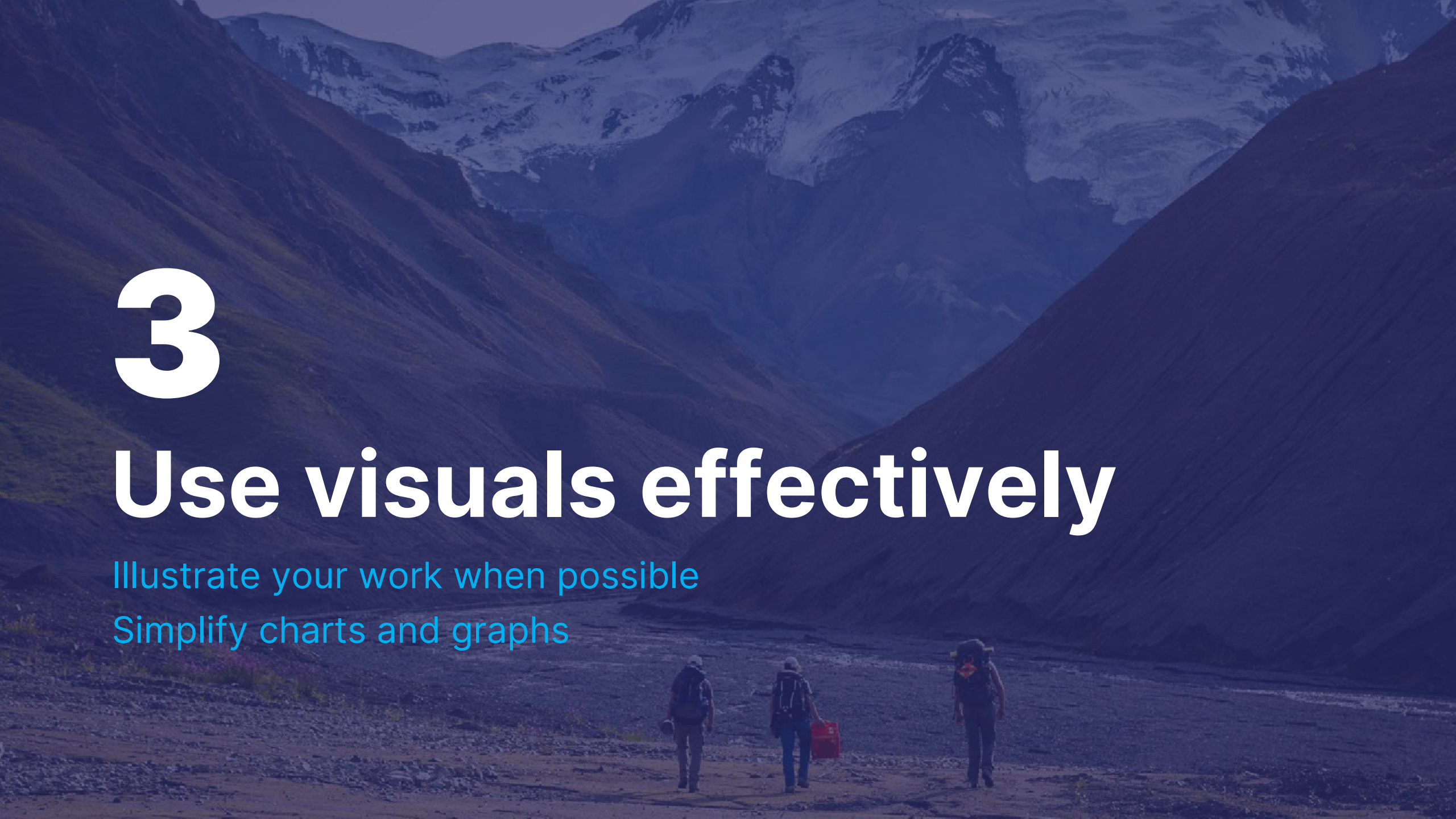
What are the 1-3 things you want your audience to take away from your presentation?

What's the take-home message of what you're presenting?

Can you give a compelling number or example to illustrate your science's impact? Can you make any numbers more digestible with social math?

What are 1-3 benefits of your science to your field, community, or to society at large?

Do you have an example, anecdote, story, or metaphor to explain your work?



3

Use visuals effectively

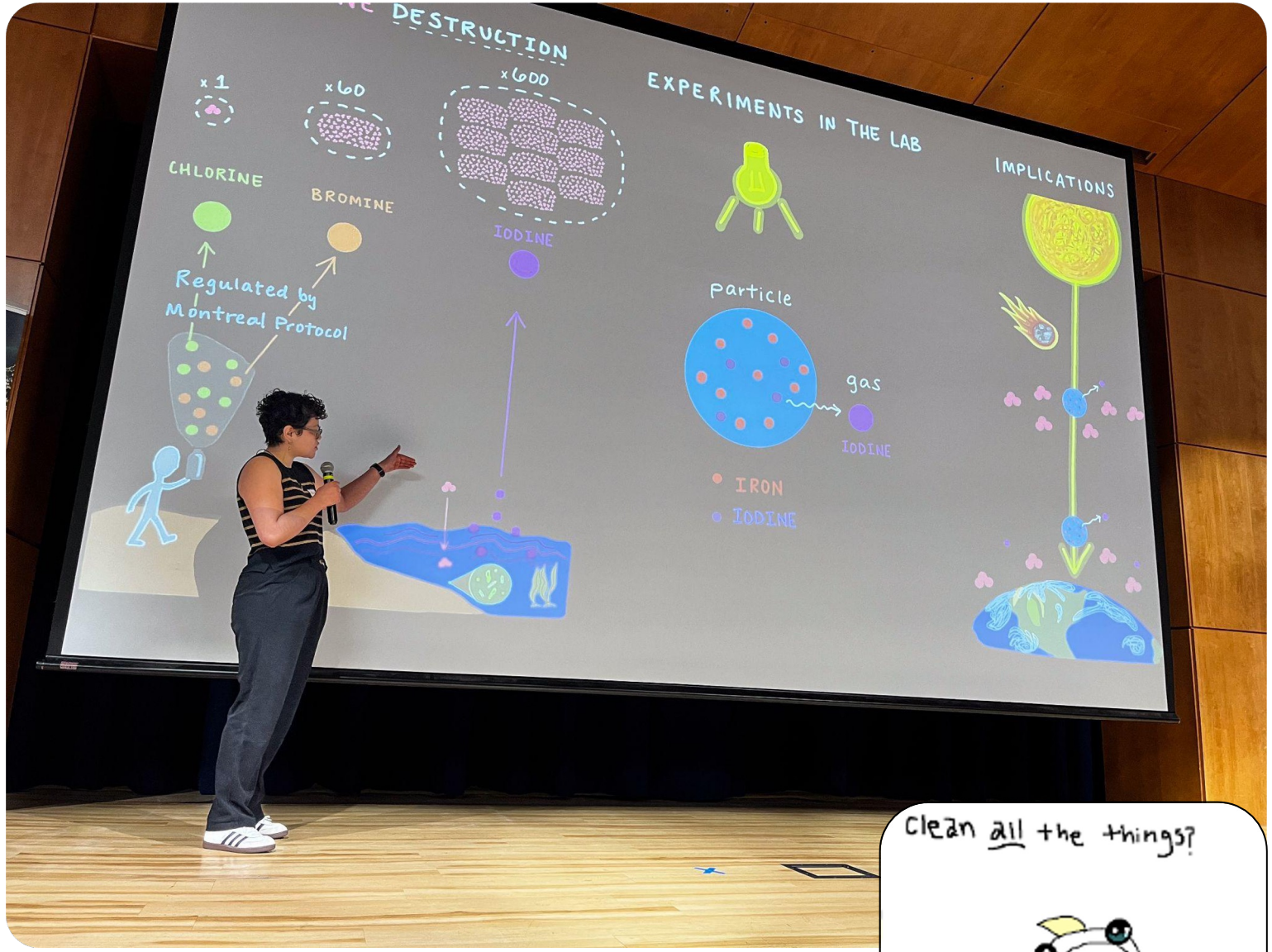
Illustrate your work when possible

Simplify charts and graphs

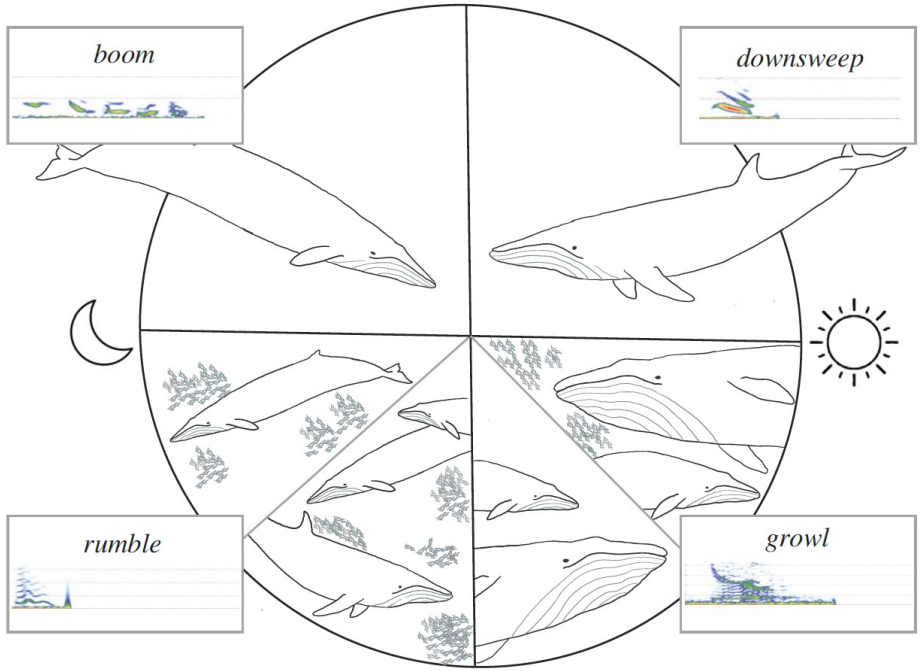
Illustrate your work

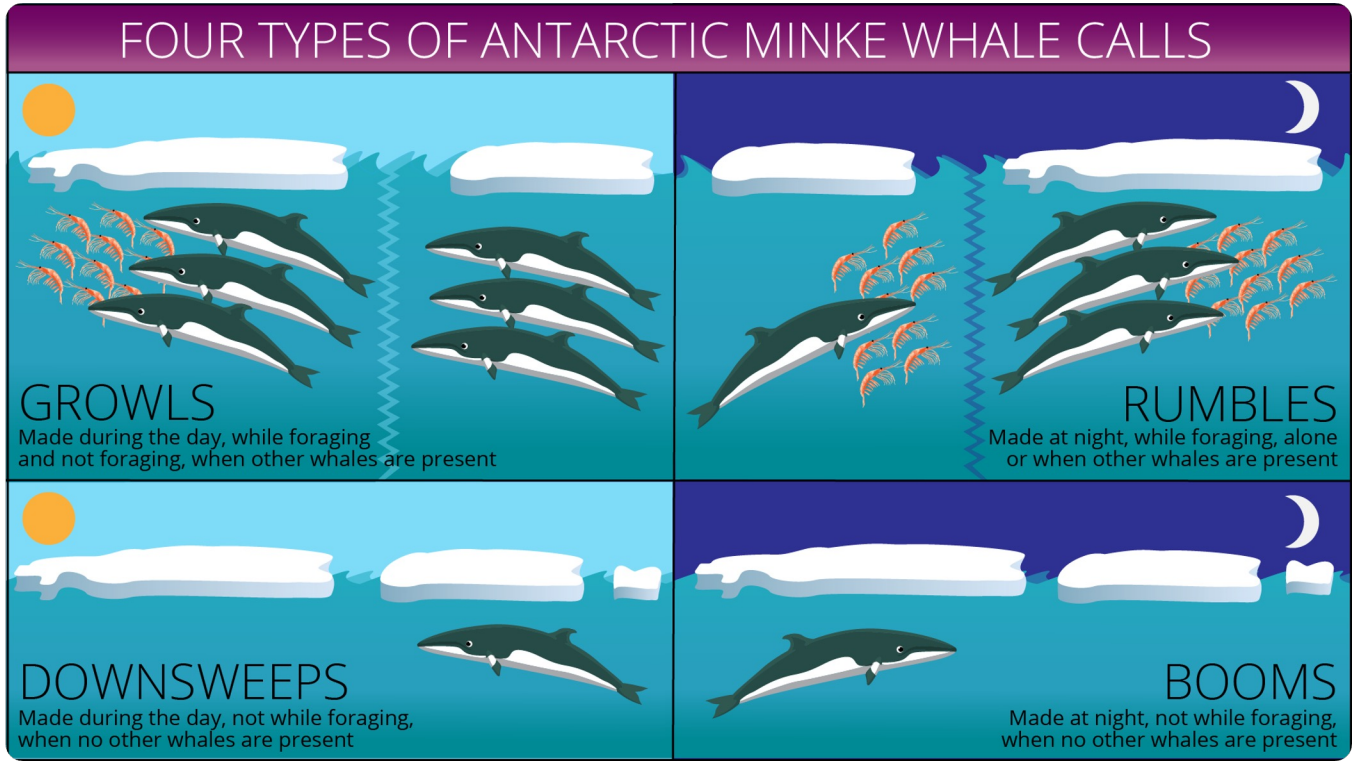
Use photos, videos, infographics, sound clips, illustrations, etc.

(But don't overwhelm the audience with visuals)



Infographics





Simplify charts and graphs

Don’t make your audience do the work!!

JOURNAL ARTICLE

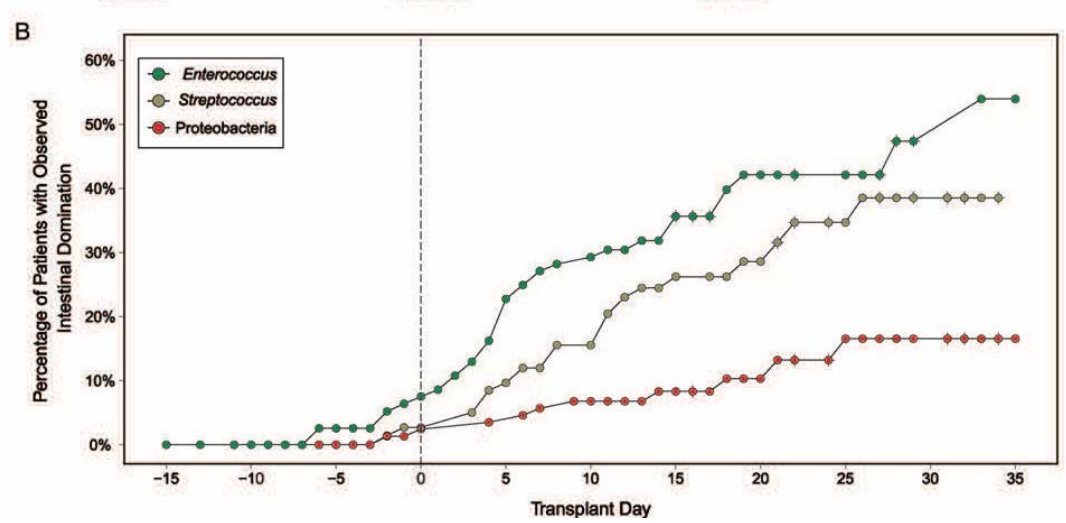
Intestinal Domination and the Risk of Bacteremia in Patients Undergoing Allogeneic Hematopoietic Stem Cell Transplantation FREE

Ying Taur ✉, Joao B. Xavier, Lauren Lipuma, Carles Ubeda, Jenna Goldberg, Asia Gobourne, Yeon Joo Lee, Krista A. Dubin, Nicholas D. Socci, Agnes Viale ... Show more

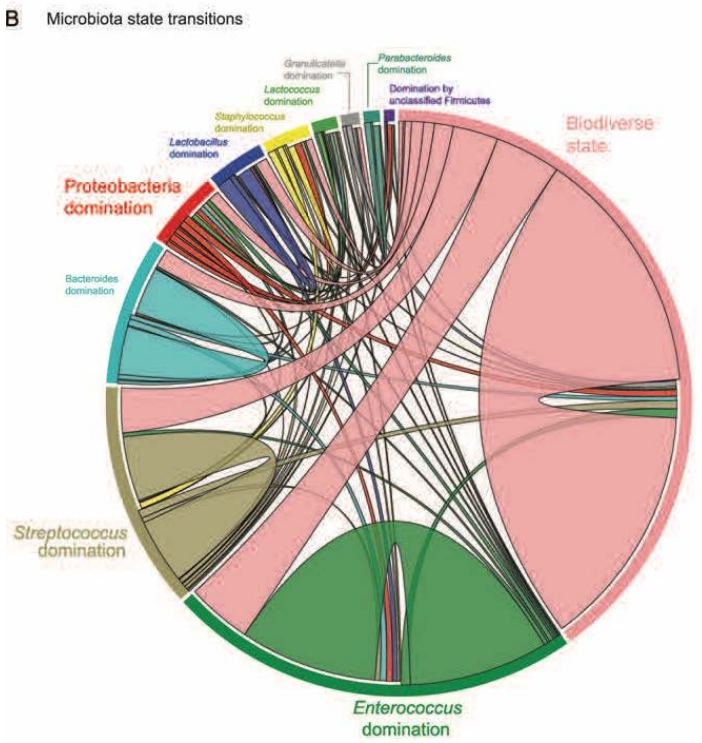
Clinical Infectious Diseases, Volume 55, Issue 7, 1 October 2012, Pages 905–914, https://doi.org/10.1093/cid/cis580

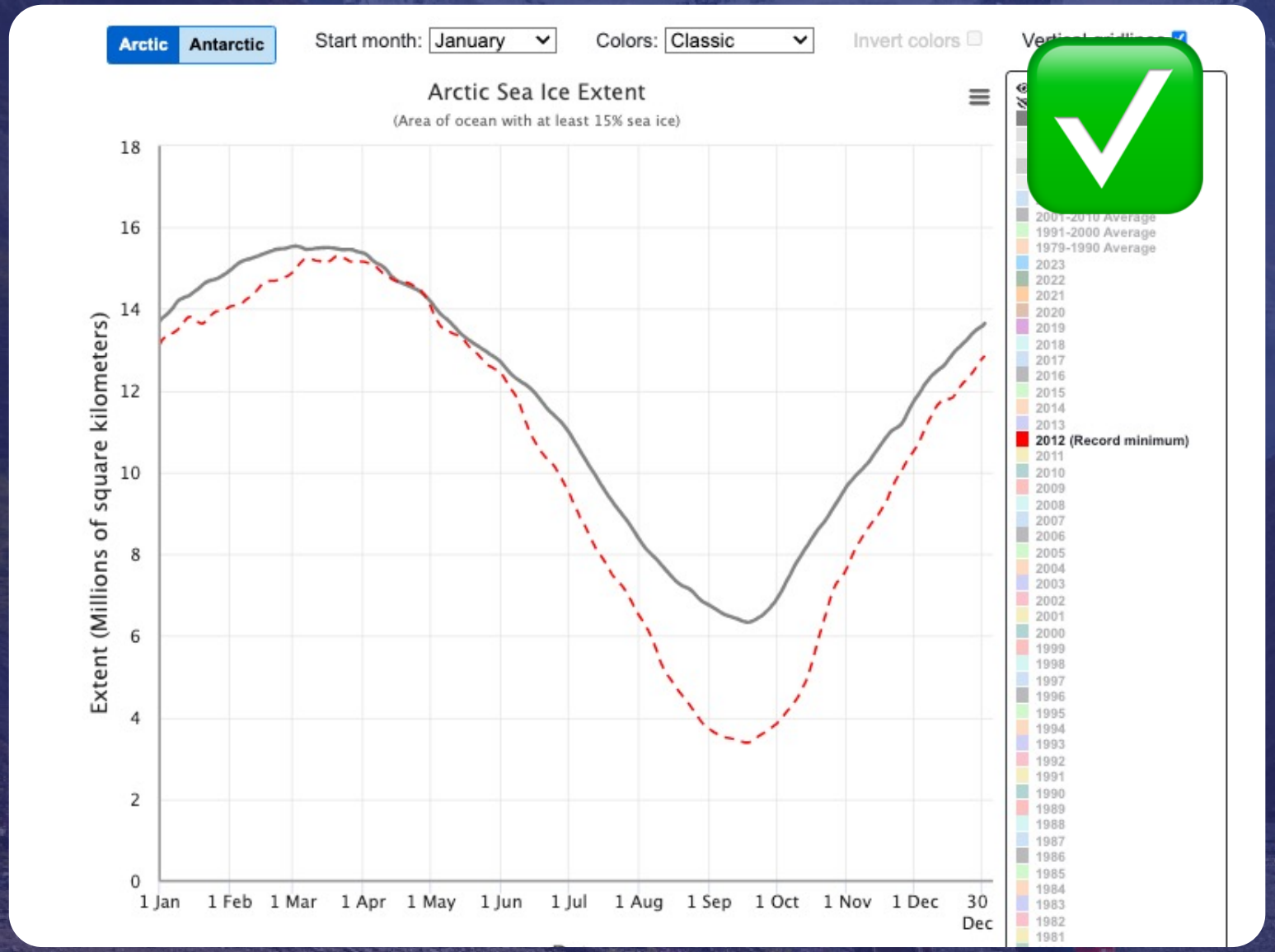
Published: 20 June 2012 **Article history** ▾

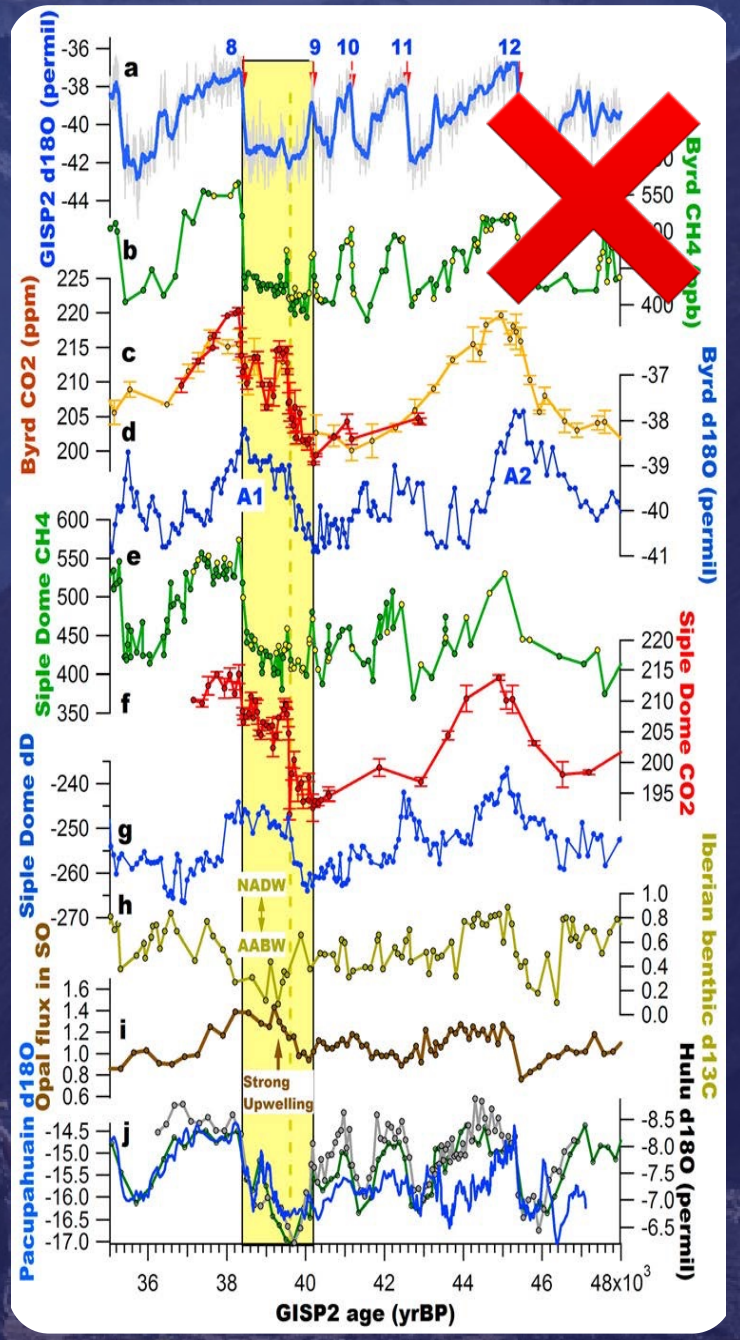
✅



❌

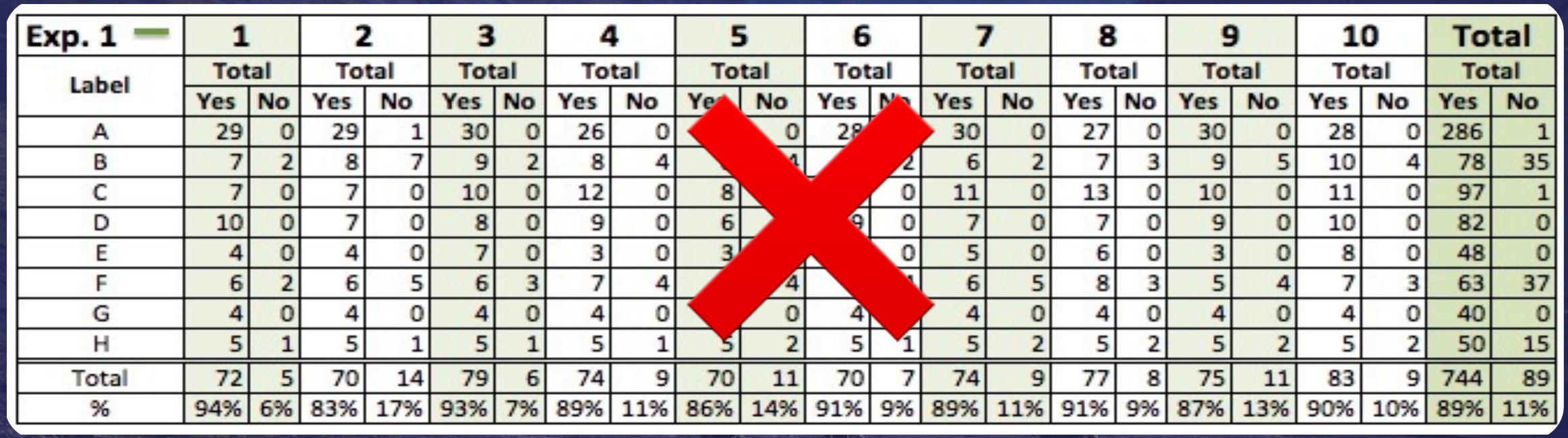



Arctic
Antarctic
Start month: January
Colors: Classic
Invert colors
Arctic Sea Ice Extent
(Area of ocean with at least 15% sea ice)
Extent (Millions of square kilometers)
18
16
14
12
10
8
6
4
2
0
1 Jan
1 Feb
1 Mar
1 Apr
1 May
1 Jun
1 Jul
1 Aug
1 Sep
1 Oct
1 Nov
1 Dec
30 Dec
2001-2010 Average
1991-2000 Average
1979-1990 Average
2023
2022
2021
2020
2019
2018
2017
2016
2015
2014
2013
2012 (Record minimum)
2011
2010
2009
2008
2007
2006
2005
2004
2003
2002
2001
2000
1999
1998
1997
1996
1995
1994
1993
1992
1991
1990
1989
1988
1987
1986
1985
1984
1983
1982
1981


GISP2 d18O (permil)
Byrd CH4 (ppb)
Byrd CO2 (ppm)
Byrd d18O (permil)
Siple Dome CH4
Siple Dome CO2
Siple Dome dD
Iberian benthic d13C
Pacupahuain d18O
Opal flux in SO
Hulu d18O (permil)
8
9
10
11
12
A1
A2
NADW
AABW
Strong Upwelling
GISP2 age (yrBP)
48x10^3

Simplify charts and graphs

Avoid tables



Exp. 1	1		2		3		4		5		6		7		8		9		10		Total	
Label	Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
A	29	0	29	1	30	0	26	0		0	28		30	0	27	0	30	0	28	0	286	1
B	7	2	8	7	9	2	8	4				2	6	2	7	3	9	5	10	4	78	35
C	7	0	7	0	10	0	12	0	8			0	11	0	13	0	10	0	11	0	97	1
D	10	0	7	0	8	0	9	0	6		9	0	7	0	7	0	9	0	10	0	82	0
E	4	0	4	0	7	0	3	0	3			0	5	0	6	0	3	0	8	0	48	0
F	6	2	6	5	6	3	7	4		4			6	5	8	3	5	4	7	3	63	37
G	4	0	4	0	4	0	4	0		0	4		4	0	4	0	4	0	4	0	40	0
H	5	1	5	1	5	1	5	1	5	2	5	1	5	2	5	2	5	2	5	2	50	15
Total	72	5	70	14	79	6	74	9	70	11	70	7	74	9	77	8	75	11	83	9	744	89
%	94%	6%	83%	17%	93%	7%	89%	11%	86%	14%	91%	9%	89%	11%	91%	9%	87%	13%	90%	10%	89%	11%

4

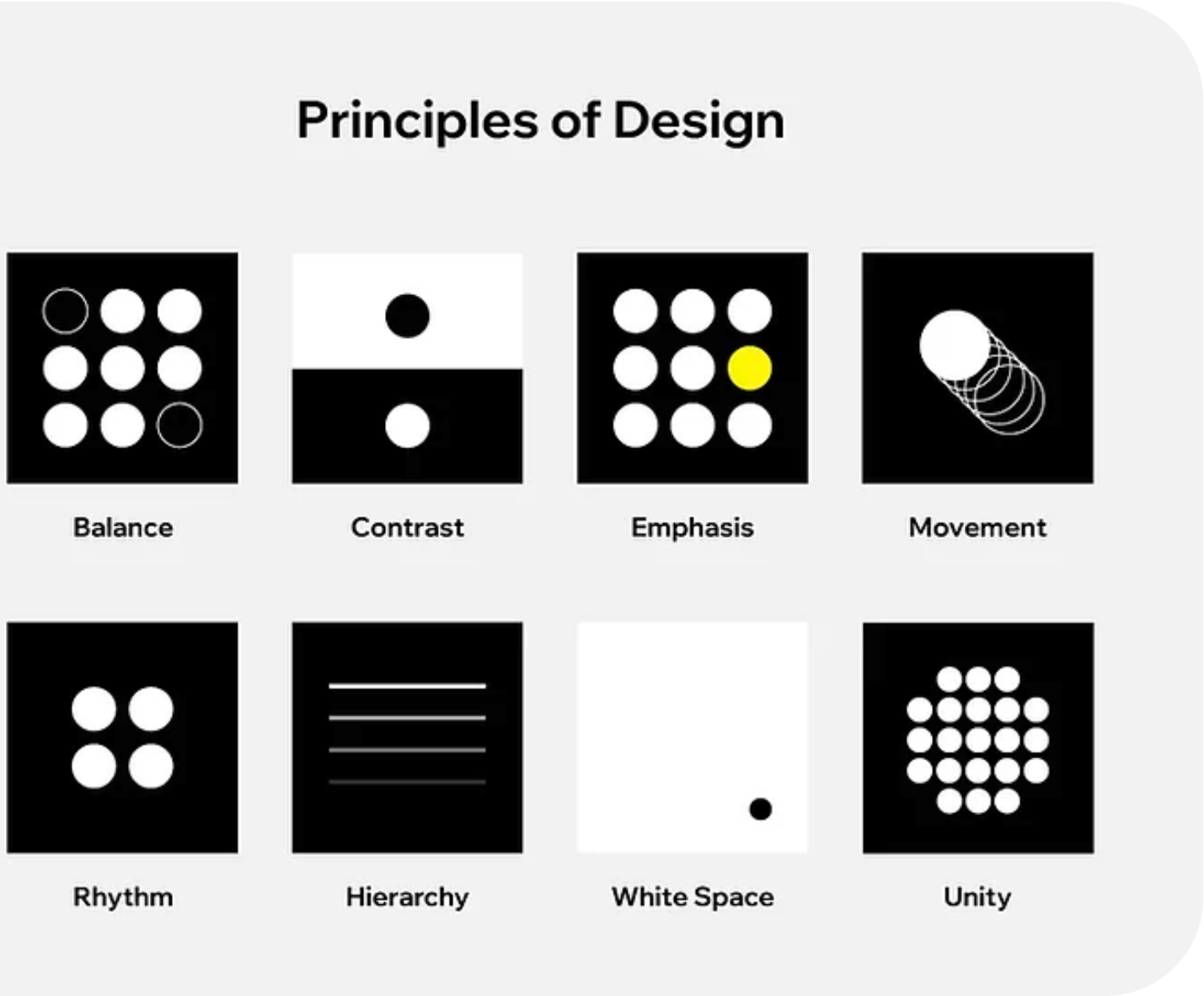
Create a clean and compelling design

Learn the basic principles of design

Embrace minimalism

Resist the urge to collage

Basic design principles



Embrace minimalism

Use a simple color scheme

Make sure your text and background have high contrast

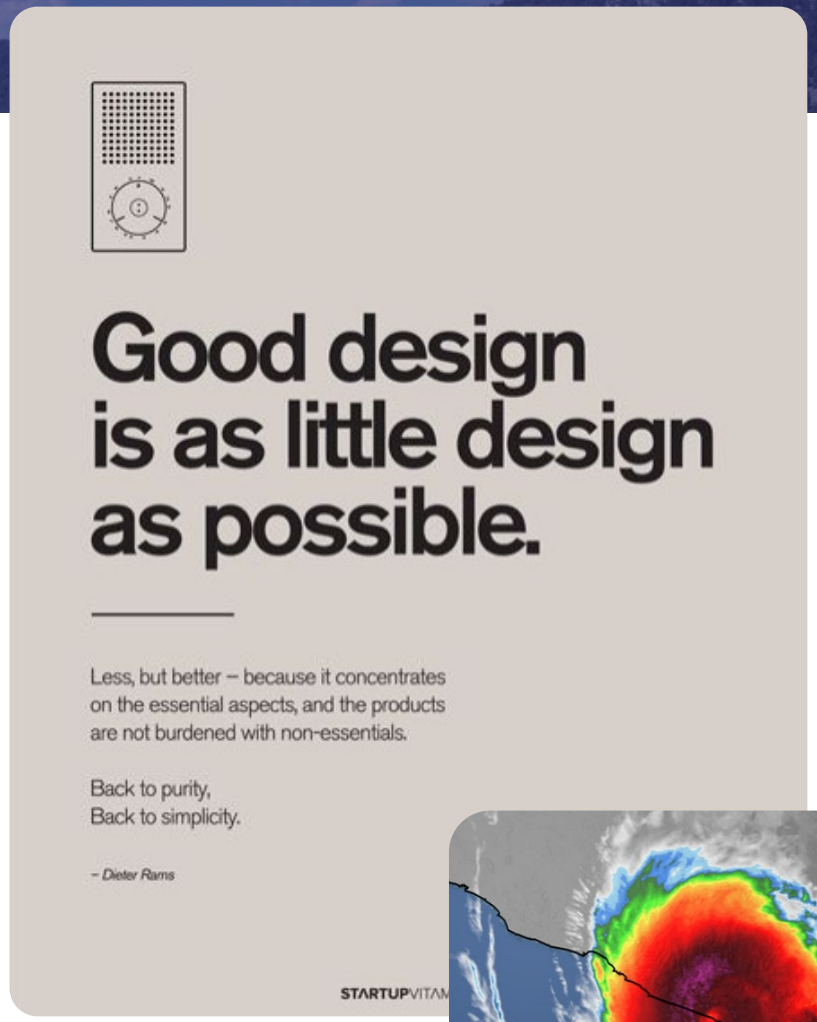
Avoid busy backgrounds

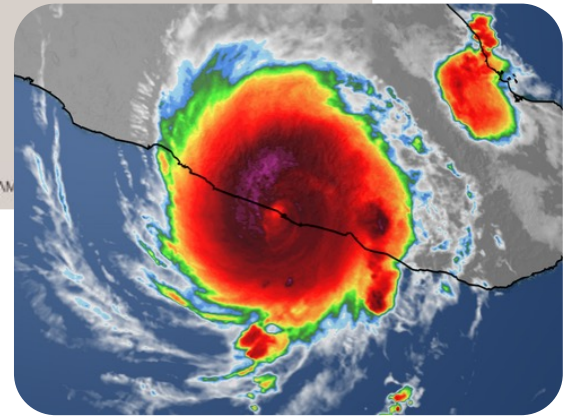
Keep it light on text

Use negative space

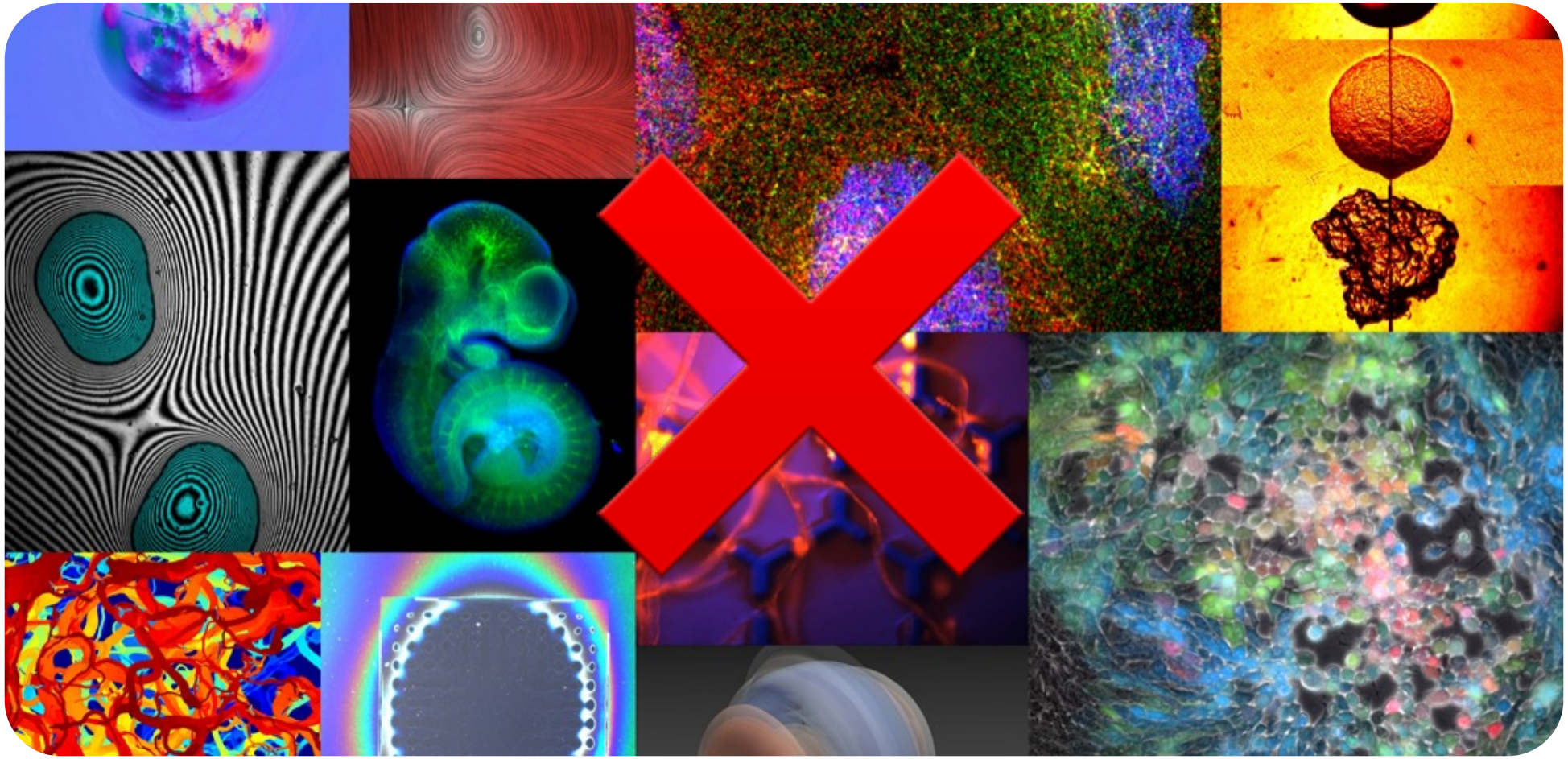
Try using shades of color

Avoid typefaces that are very artistic or mimic human handwriting



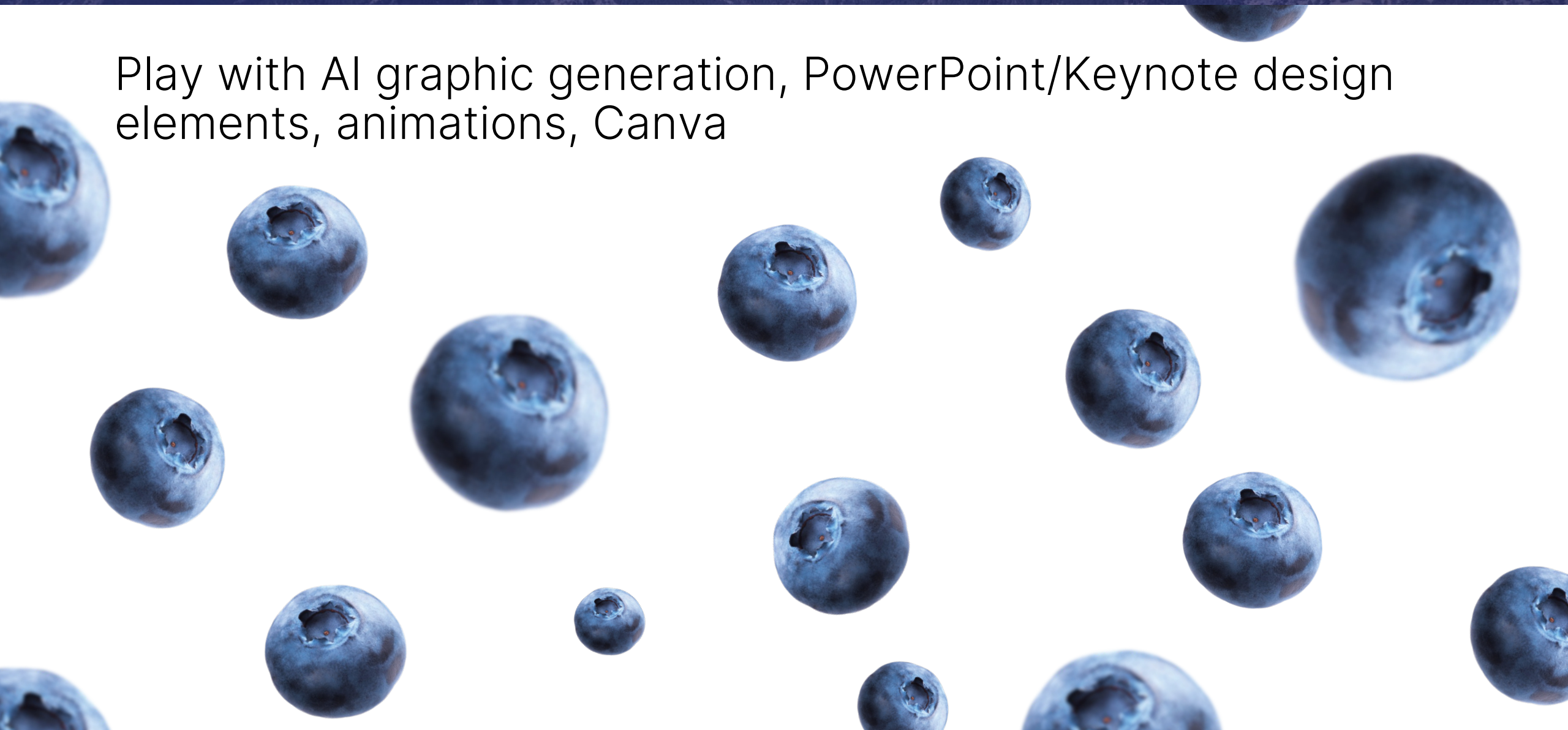


Resist the urge to collage



Up your presentation game!

Play with AI graphic generation, PowerPoint/Keynote design elements, animations, Canva



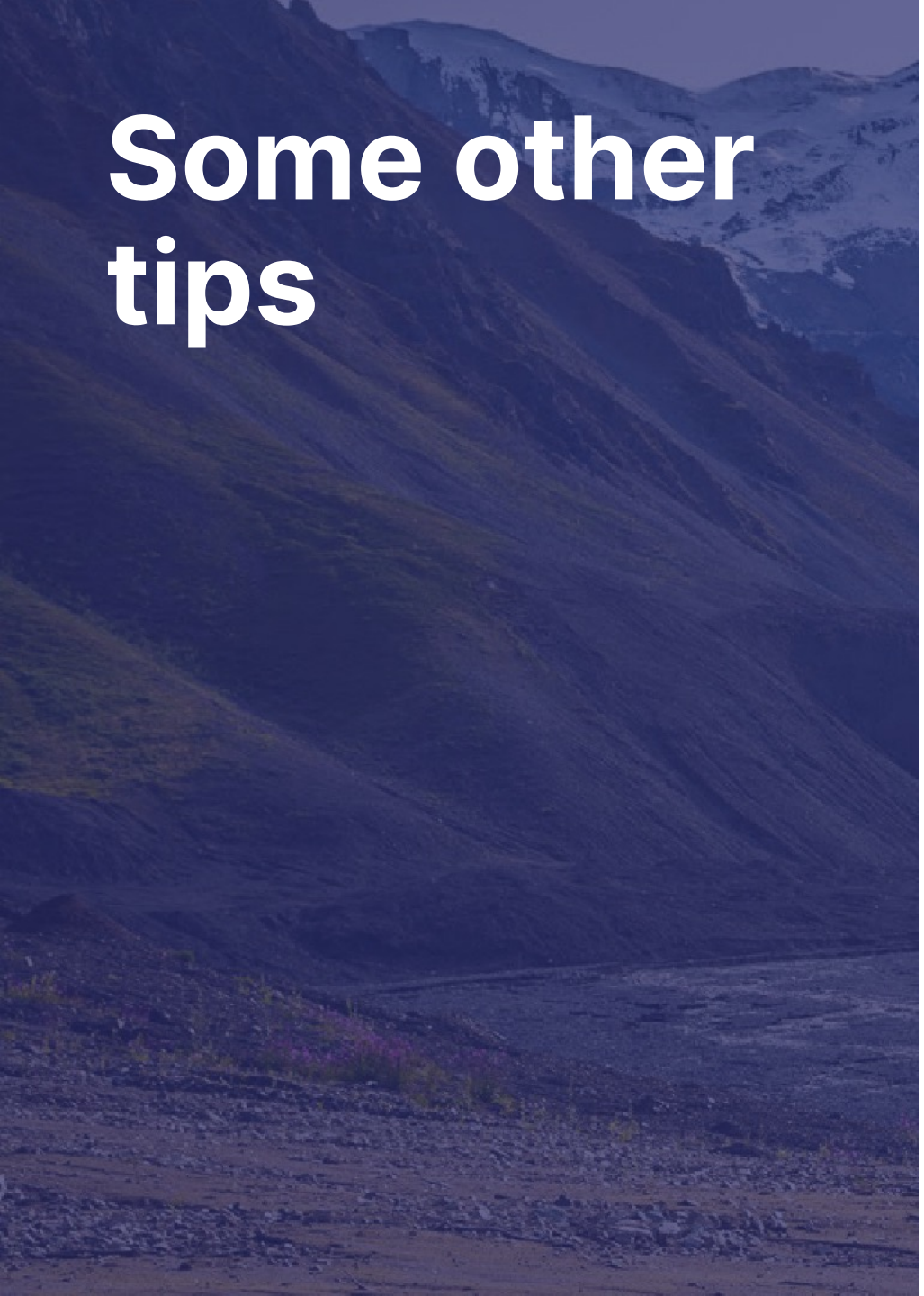
Up your presentation game!

Play with AI graphic generation, PowerPoint/Keynote design elements, animations, Canva

5

Examples and resources

And more!



Some other tips

Oral presentations

Run it by someone who’s not a scientist or is outside your field

Try to have one slide per minute of speaking time

Rehearse!

Include an agenda or outline (numbers help)

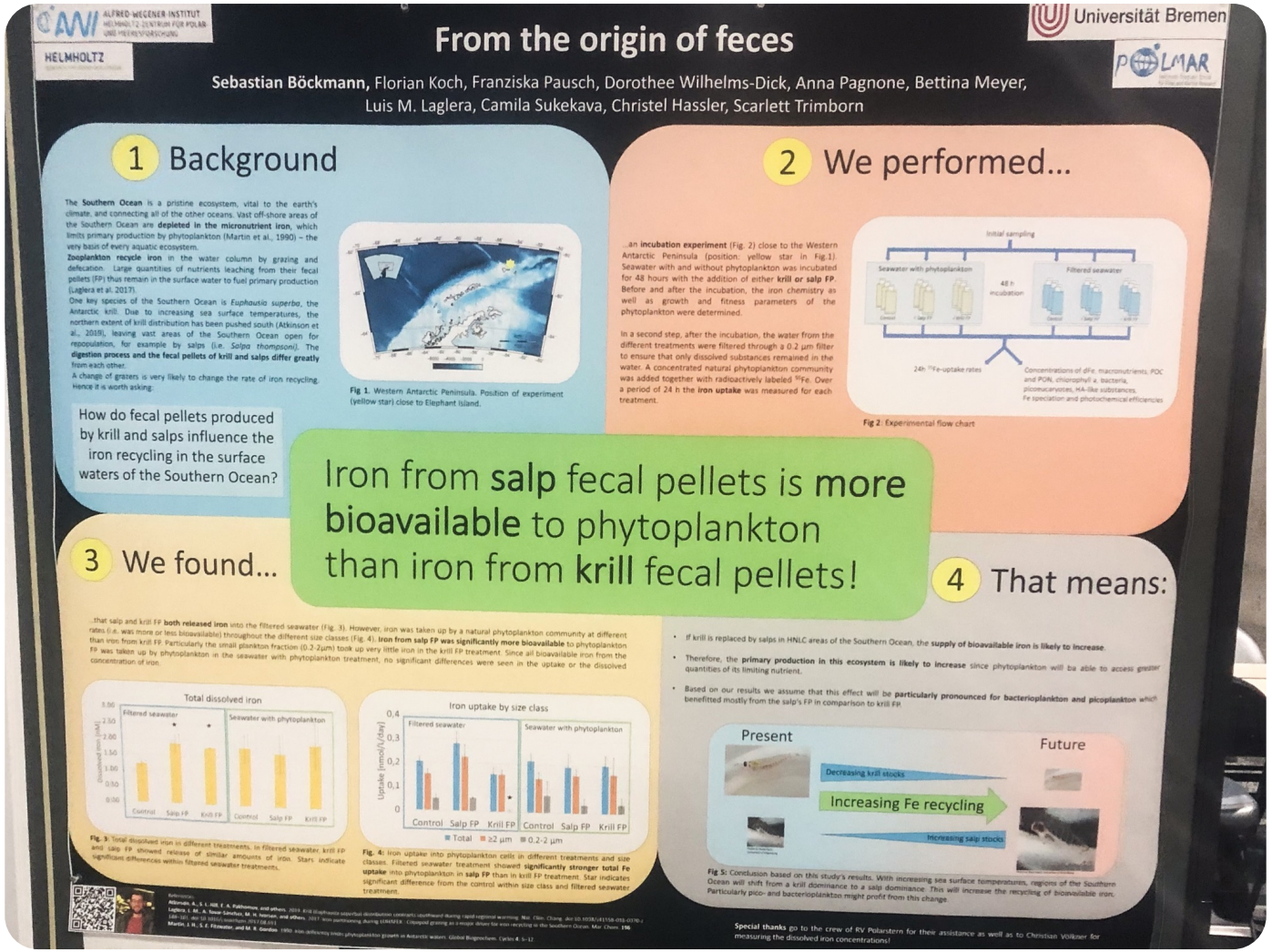
Posters

Have a one-pager handout or QR code

Think about how you could start a convo with a visitor to your poster

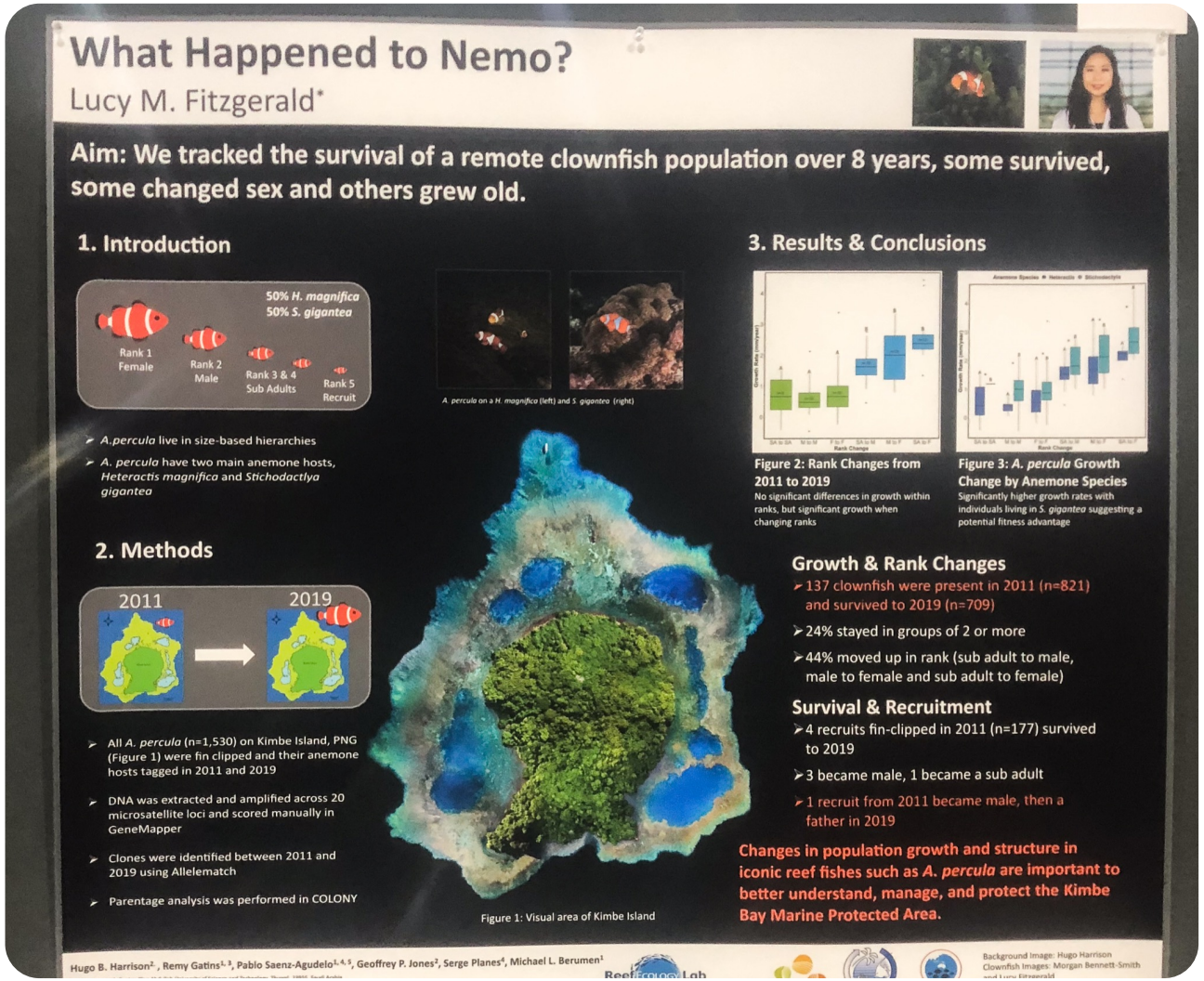
Separate information into discrete sections that the eye can easily follow (numbering helps)

Poster examples



Poster examples

Poster examples



What Happened to Nemo?

Lucy M. Fitzgerald*

Aim: We tracked the survival of a remote clownfish population over 8 years, some survived, some changed sex and others grew old.

1. Introduction

A. percula on a H. magnifica (left) and S. gigantea (right)

- *A.percula* live in size-based hierarchies
- *A. percula* have two main anemone hosts, *Heteractis magnifica* and *Stichodactlya gigantea*

2. Methods

- All *A. percula* (n=1,530) on Kimbe Island, PNG (Figure 1) were fin clipped and their anemone hosts tagged in 2011 and 2019
- DNA was extracted and amplified across 20 microsatellite loci and scored manually in GeneMapper
- Clones were identified between 2011 and 2019 using Allelematch
- Parentage analysis was performed in COLONY

Figure 1: Visual area of Kimbe Island

3. Results & Conclusions

Figure 2: Rank Changes from 2011 to 2019
No significant differences in growth within ranks, but significant growth when changing ranks

Figure 3: *A. percula* Growth Change by Anemone Species
Significantly higher growth rates with individuals living in *S. gigantea* suggesting a potential fitness advantage

Growth & Rank Changes

- 137 clownfish were present in 2011 (n=821) and survived to 2019 (n=709)
- 24% stayed in groups of 2 or more
- 44% moved up in rank (sub adult to male, male to female and sub adult to female)

Survival & Recruitment

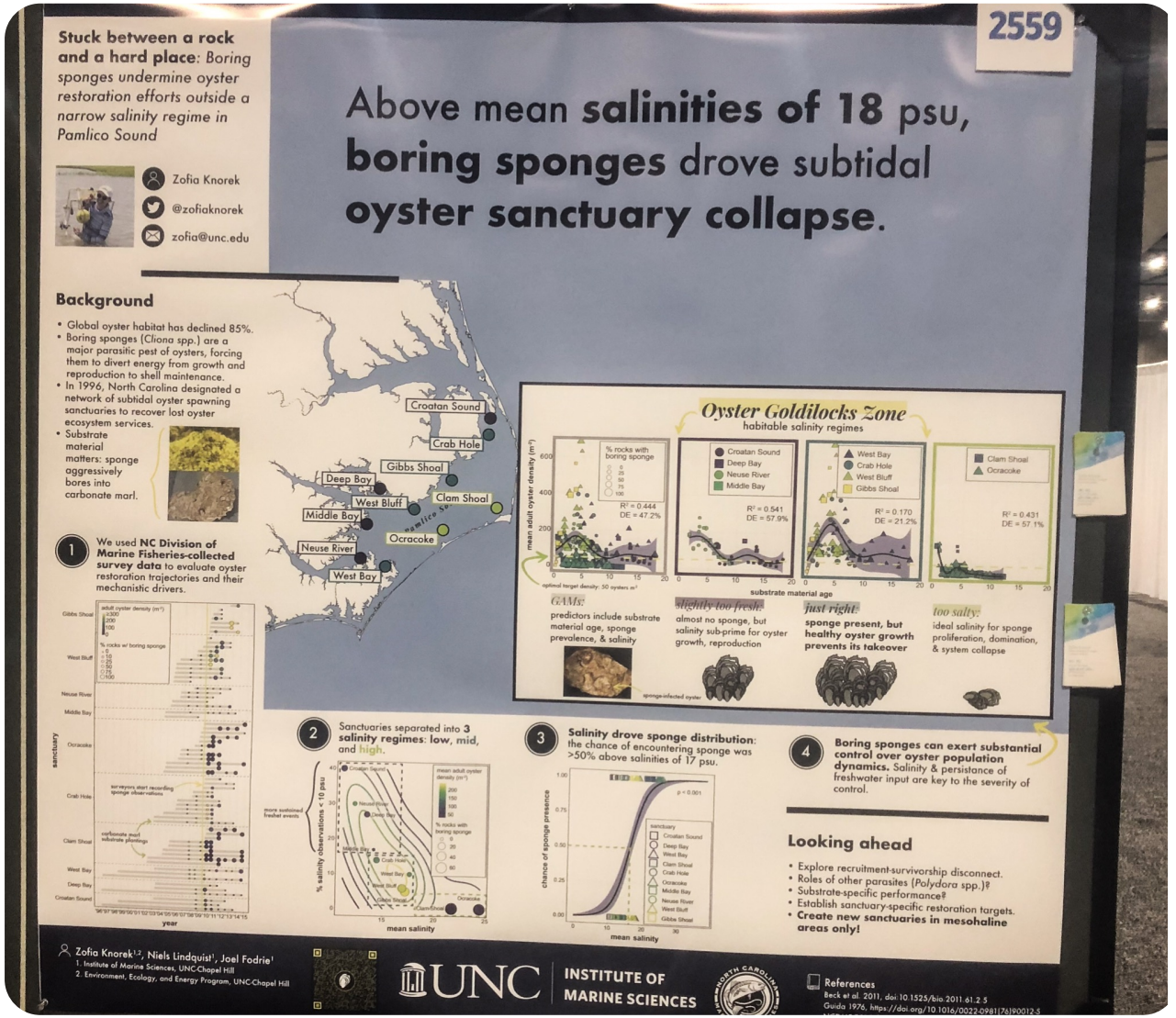
- 4 recruits fin-clipped in 2011 (n=177) survived to 2019
- 3 became male, 1 became a sub adult
- 1 recruit from 2011 became male, then a father in 2019

Changes in population growth and structure in iconic reef fishes such as *A. percula* are important to better understand, manage, and protect the Kimbe Bay Marine Protected Area.

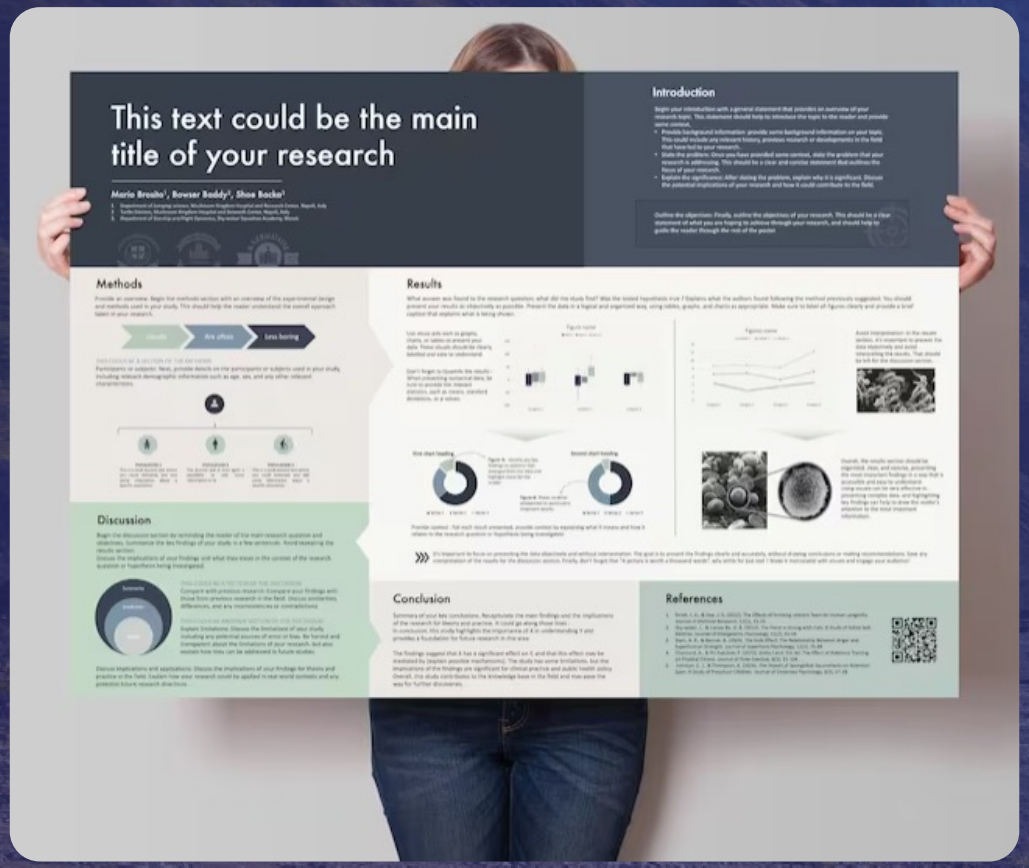
Hugo B. Harrison[2], Remy Gatins[1, 3], Pablo Saenz-Agudelo[1, 4, 5], Geoffrey P. Jones[2], Serge Planes[4], Michael L. Berumen[1]

Background Image: Hugo Harrison
Clownfish Images: Morgan Bennett-Smith

Poster examples



Resources



Online tools

The Measure of Things: Social math tool

Canva: free, easy graphic design tool

Headliner: free video editing software

WebAIM contrast checker

TikTok-ers: #PowerPoint

InsideCIRES: PPT templates, logos and more

Etsy: Poster examples

Color Brewer: color guides for maps and other graphics

The Functional art: books about data viz

The CIRES comms team!

ciresnews@colorado.edu

Thank you!

Questions??