Today's Objectives

- ***Posters***: Evaluating and Creating Effective Presentations

- *In-class exercise: Hallway Poster Critique*

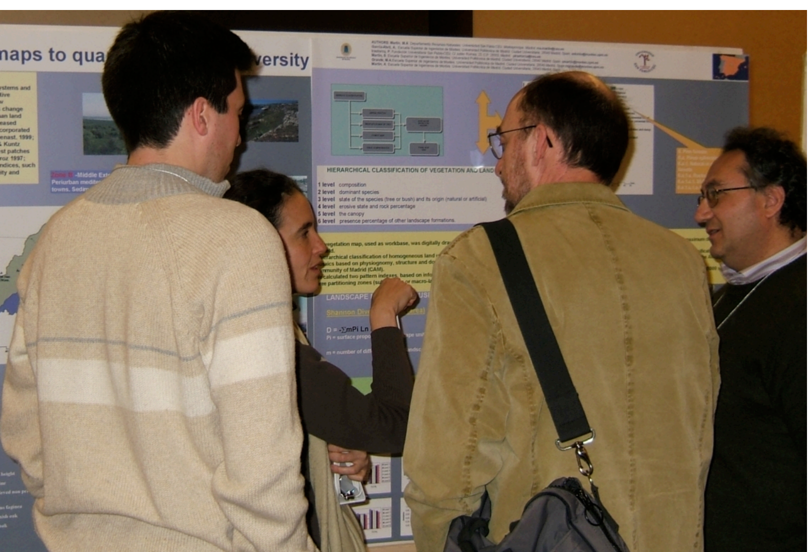
- *This slide presentation is modified after:*

Hess, G.R., K. Tosney, and L. Liegel. 2010. Creating Effective Poster Presentations. URL=http://www.ncsu.edu/project/posters

by Kate Huntington & colleagues at the U of Washington for the course ESS 418, Geoscience Communication

What is a poster?

- A visual communication tool
- Cross between a written research paper and an oral presentation → elements of each but distinct from both
- An effective poster will help you …



… engage colleagues in conversation.

What is a poster?

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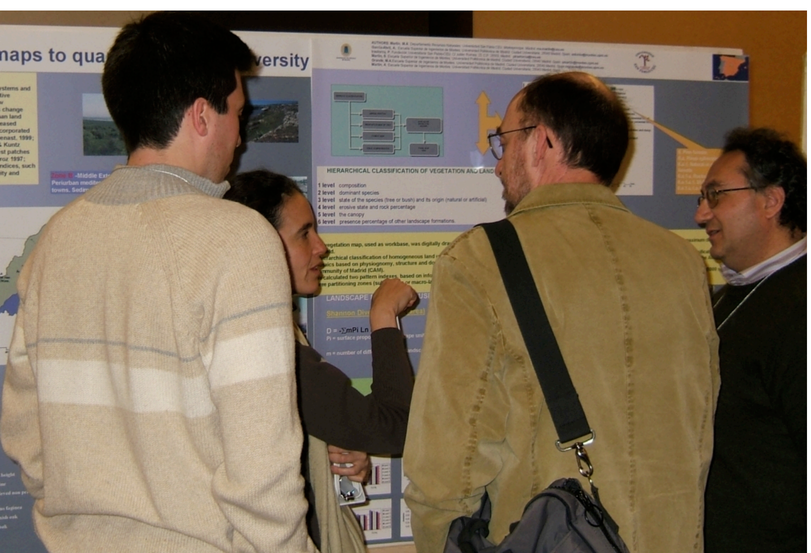
- Cross between a written research paper and an oral presentation → elements of each but distinct from both

- An effective poster will help you …



… get your main point across to as many people as possible.

An *effective* poster …

- **delivers** a *clear message*
- is *highly visual* → **LESS text, MORE figures**
- is *easily read* from 1-2 meters away

Effective Poster Presentations

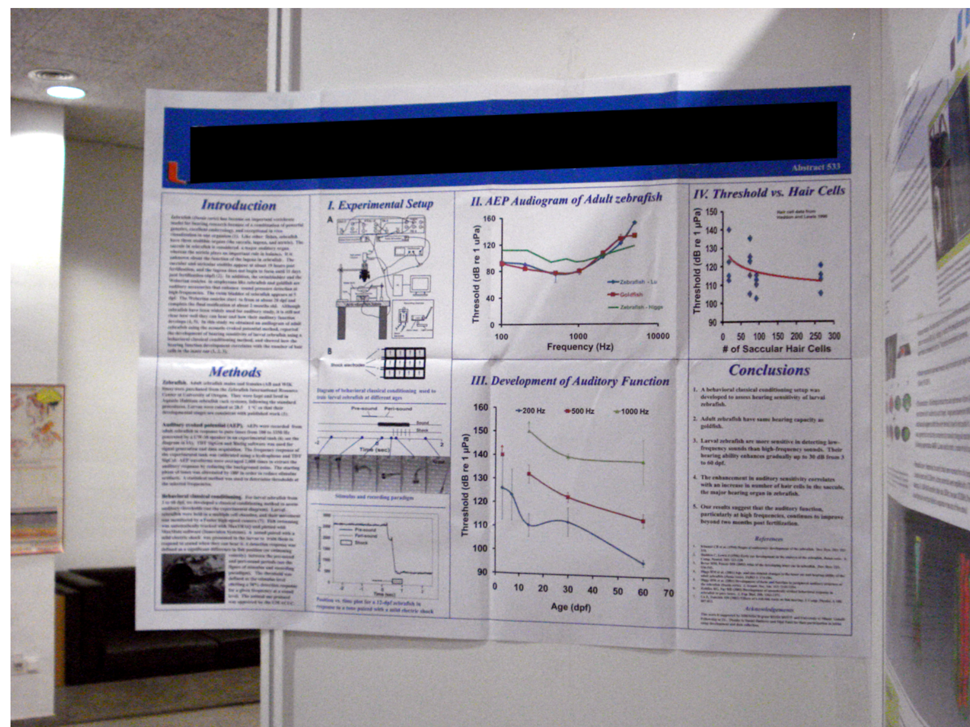
- **Focused** – single message
- **Graphic** – lets graphs and images tell story
- **Ordered** – sequence well ordered and obvious

Hess, G.R., K. Tosney, and L. Liegel. 2010. Creating Effective Poster Presentations. URL=http://www.ncsu.edu/project/posters

Planning a poster

- **Define "take-home" message**
- **Define space and layout requirements**
- **Start early!**

KNOW YOUR AUDIENCE!!!



Planning *a poster*

***General* components**

- Define your message

- 1-2 sentences (bullet points!) **stating the importance and objectives** of work

- 1-3 sentences for **results, conclusions and recommendations/future work**

Planning *a poster*

Specific **components**

(1) FOCUS

- Stay focused on the **"take-home" message**
- **Reemphasize the message** throughout poster
- **Keep it simple**

Planning *a poster*

***Specific* components**

(2) LAYOUT

- **Headings** identify key sections
- **Mix text and graphics** throughout poster
- Use **white space** creatively
- Use a **column format** → posters are *W I D E ! !*

EXAMPLE

Poster with Horizontal Layout: Title of Poster in Arial, Bold, 60-80 Points

Sponsor Logo

Names of Authors in Arial, 44 Points, Bold
Department in 40 points bold
Institution in 40 points bold

Institution Logo

Heading (Arial: 44 Points, Bold)

The first section of the poster should define the topic and show its importance. A good test is whether the poster can orient the audience to these two aspects in 20 seconds. Shown in Figure 1 are two possible layouts for a poster. This section was set in Arial, boldface, 36 points.

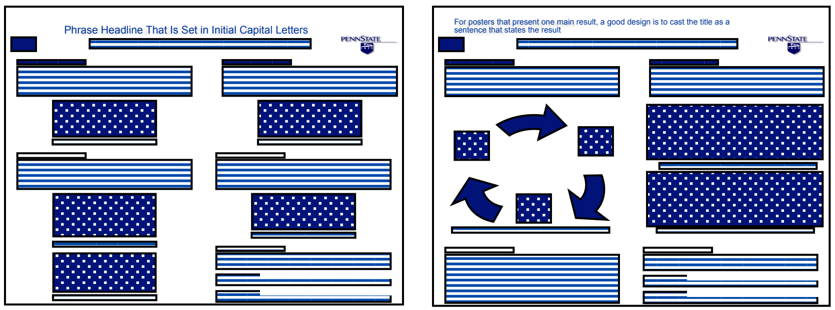


Figure 1. Two possible layouts for poster (caption: 32 points, bold).

Heading (Arial: 44 Points, Bold)

The second section of the poster might serve a number of purposes: background information, methods, or system design. An important point with posters is to rely on visuals rather than longs blocks of text to communicate. Figure 2 shows two more possible layouts for posters. This section was set in Arial, boldface, 36 points.

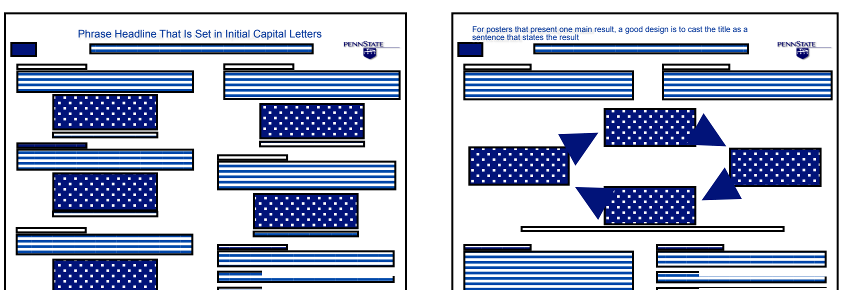


Figure 2. Two other possible layouts for poster (caption: 32 points, bold).

Heading (Arial: 44 Points, Bold)

One section of a poster should present the results. Often the results can be depicted with graphs, such as for an experiment, or with drawings such as with a design.

Shown in Figure 3 are two more possible layouts for a poster. This section was set in Arial, boldface, 36 points. Note that the amount of type in the sections affects the choice, size, and boldfacing of the typeface. No matter the type that you select for the sections, you should still use a bold sans serif for the headings.

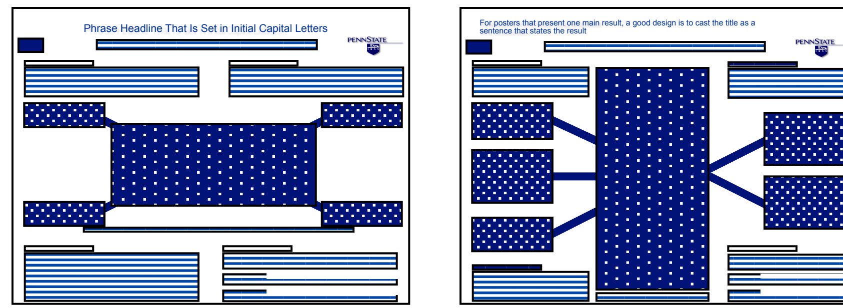


Figure 3. Two more possible layouts for poster (caption: 32 points, bold).

Heading (Arial 44 Points)

The final section of the poster generally provides conclusions and recommendations. This section was set in Arial, boldface, 36 points. As with the first section, this section is read by most passers-by.

Acknowledgments (Arial, 36 points, bold)

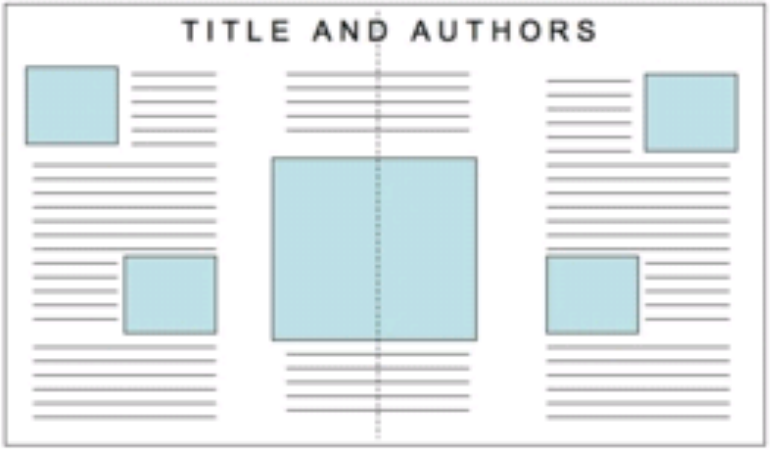
In this template, acknowledgments are set in Arial, 32 points. Try to keep the acknowledgments to one or two lines.

References (Arial, 36 points, bold)

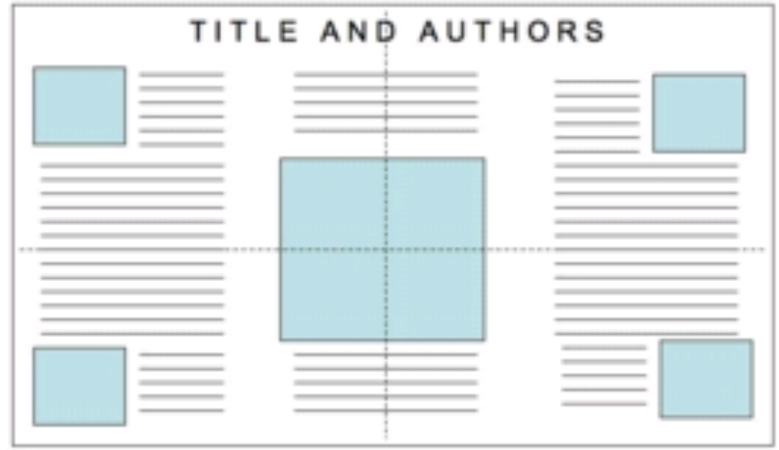
First reference in Arial, 32 points, with reverse indent: alphabetical or numerical order.

Second reference in Arial, 32 points, with reverse indent: alphabetical or numerical order.

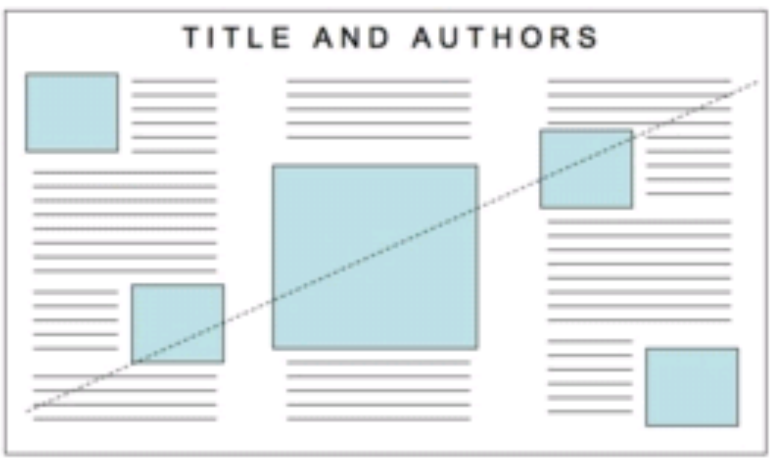
COMMON Poster Layouts



Horizontal Symmetry



Horizontal and Vertical Symmetry



Diagonal Symmetry

Asymmetry

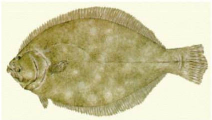
Planning *a poster*

***Specific* components**

(3) TEXT

- Keep text elements short but use complete sentences
- Use active voice
- Use serif font for text; sans-serif OK for title/headings
- Text *at least* 24 point for body, 36 for headings, and larger for title

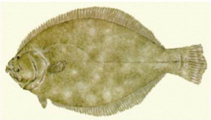
NC STATE UNIVERSITY



Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach*, John Godwin and Russell Borski

Department of Zoology, Box 7617, North Carolina State University, Raleigh, NC 27695



Introduction

Southern flounder (*Paralichthys lethostigma)* support valuable fisheries and show great promise for aquaculture. Female flounder are known to grow faster and reach larger adult sizes than males. Therefore, information on sex determination that might increase the ratio of female flounder is important for aquaculture.

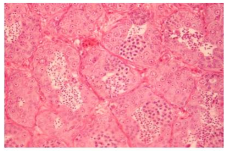
Objective

This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

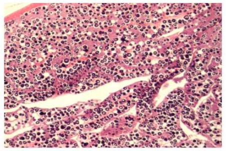
Methods

- Southern flounder broodstock were strip spawned to collect eggs and sperm for *in vitro* fertilization.
- Hatched larvae were weaned from a natural diet (rotifers/*Artemia*) to high protein pelleted feed and fed until satiation at least twice daily.
- Upon reaching a mean total length of 40 mm, the juvenile flounder were stocked at equal densities into one of three temperatures 18, 23, or 28°C for 245 days.
- Gonads were preserved and later sectioned at 2-6 microns.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (oogenesis).

Histological Analysis

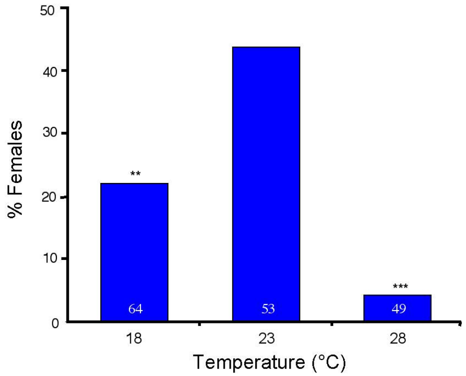


Male Differentiation



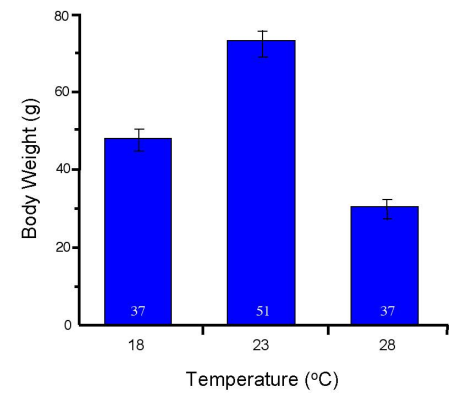
Female Differentiation

Temperature Affects Sex Determination

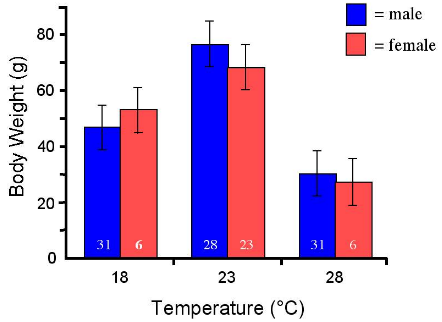


(**P < 0.01 and ***P < 0.001 represent significant deviations from a 1:1 male:female sex ratio)

Rearing Temperature Affects Growth



Growth Does Not Differ by Sex



Results

- Sex was discernible in most fish greater than 120 mm long.
- High (28ºC) temperature produced 4% females.
- Low (18ºC) temperature produced 22% females.
- Mid-range (23ºC) temperature produced 44% females.
- Fish raised at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days, no differences in growth existed between sexes.

Conclusions

- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 (< 1 year) southern flounder.

Acknowledgements

The authors acknowledge the Salstonstall-Kennedy Program of the National Marine Fisheries Service and the University of North Carolina Sea Grant College Program for funding this research. Special thanks to Lea Ware and Beth Shimps for help with the work.

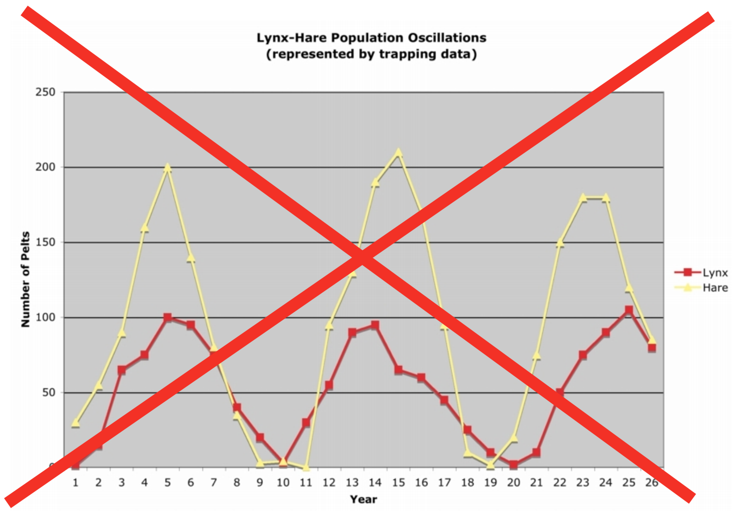
Planning a poster

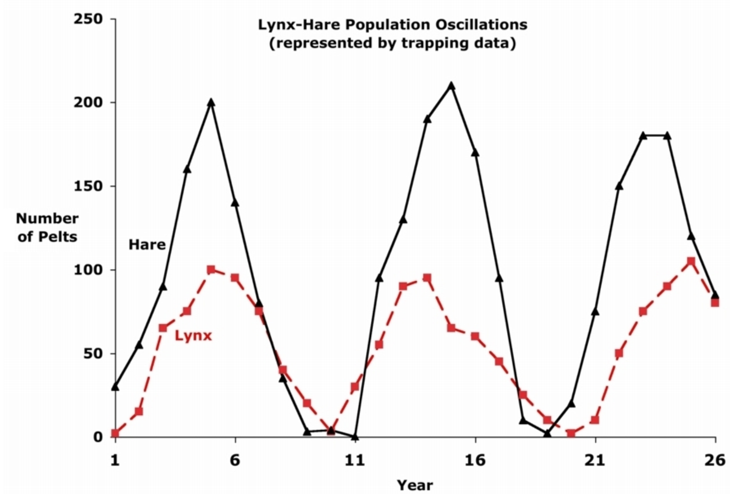
***Specific* components**

(4) GRAPHS

- Keep them simple and clean

- Avoid 3D graphs unless you're showing 3D data





Planning *a poster*

***Specific* components**

(5) COLOR

- Avoid light text on dark background
- Avoid “loud” colors
- Be conscious of those who have problems differentiating colors

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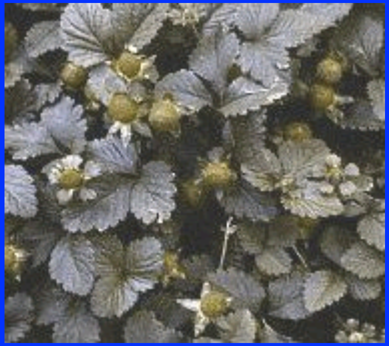

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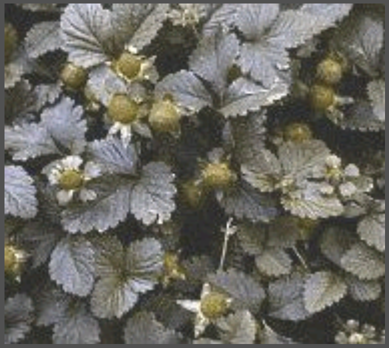


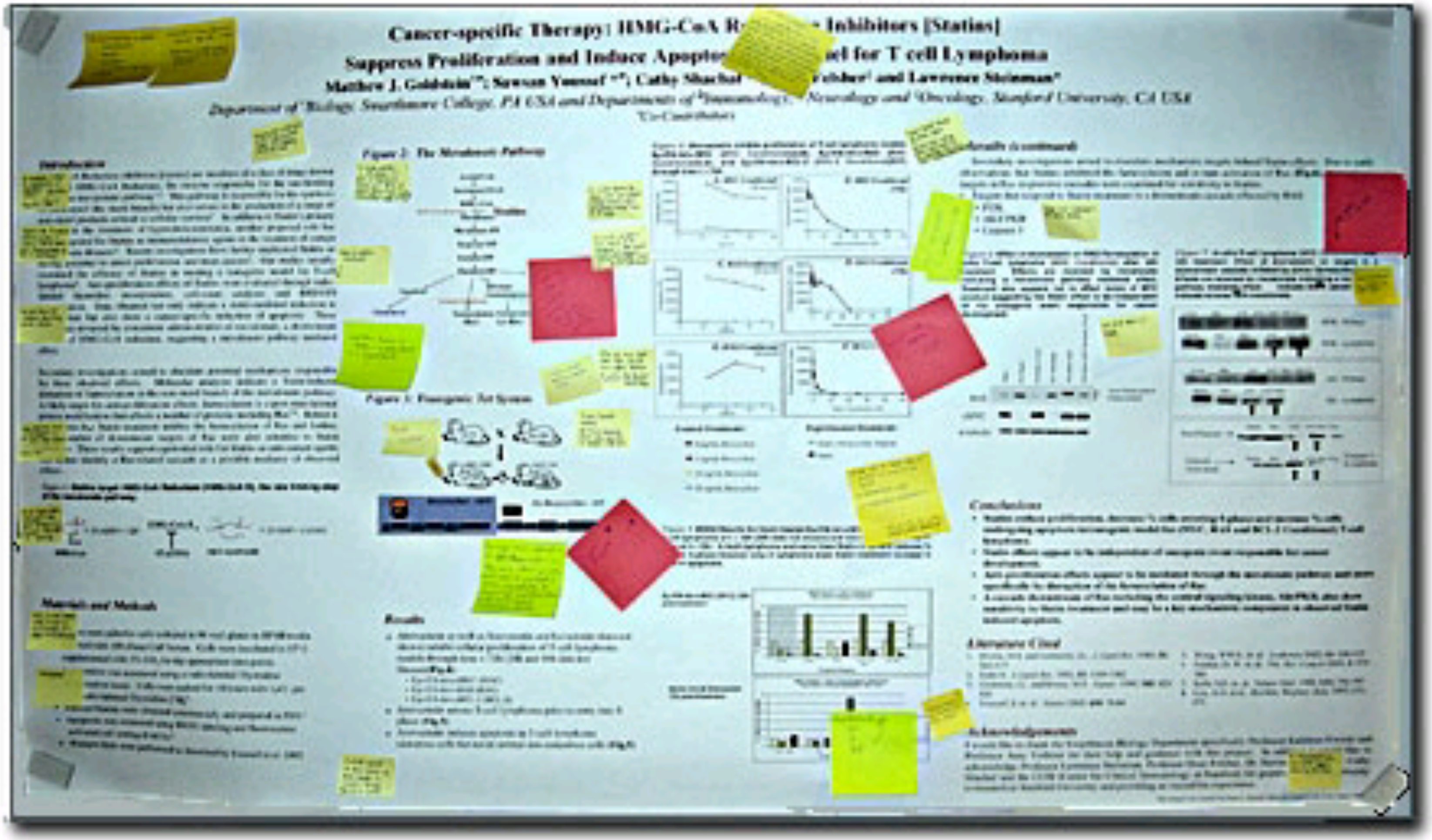
Planning *a poster*

***Specific* components**

(6) REFERENCES

- Needed to provide background info.
- Discuss work you are building from
- Recognize others in your field (they may be at your poster!!)

After making your poster …..   ***EDIT!!!***



After making your poster ….. ***PRACTICE!!!***

- **Elevator pitch**
  (~ 30 second version)

- **Longer story**
  (~ 5 – 10 minutes)

Rapid long-term erosion in the rain shadow of the Shillong Plateau, NE Indian Himalaya

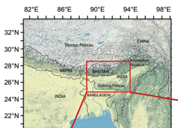
A41D-0116
Session A-37

Katharine W. Huntington[1] (kate1@uw.edu), Vikas Adlakha[2], Karl A. Lang[1], R.C. Patel[2], Paramjeet Singh[2], Nand Lal[2]
[1] Dept. of Earth & Space Sciences, University of Washington, USA, [2] Dept. of Geophysics, Kurukshetra University, India

ABSTRACT

- High topography causes steep precipitation gradients [1], which are hypothesized to profoundly influence spatial patterns of erosion and deformation in active mountain ranges [2]. Miocene uplift [3,4] of the Shillong plateau in northeast India created a 1600 m-high orographic barrier that drastically reduced monsoonal rainfall in the Himalayan range downwind [5,6].
- The resulting precipitation gradient is thought to cause a twofold gradient in long-term erosion rates, suggesting a strong climatic control on the region's geomorphic and tectonic evolution [3,6]. However, 53 new apatite and zircon fission-track ages from deep within the rain shadow of the Shillong Plateau in Arunachal Pradesh, India, challenge this interpretation.
- We present thermochronologic data and modeling that demonstrate spatial gradients in precipitation do not correlate with variations in erosion and crustal strain as predicted by geodynamic models [7-9]. Instead, erosion varies in response to fault-controlled rock uplift and latest-Miocene onset of out-of-sequence thrusting near the Main Central thrust.
- Our findings show that local tectonic boundary conditions can exert the dominant control on long-term erosion in a rapidly deforming area, despite a dramatic precipitation gradient. This result suggests either an incomplete understanding of how erosive processes scale with precipitation or a fundamental disconnect between the predictions of orogen-scale geodynamic models and the relationship between erosion and tectonics at the regional scale.

1. Climate-erosion link in the Eastern Himalaya?



Apatite fission-track (AFT) data from Bhutan suggest a correlation between long-term erosion rates and steep rainfall gradients [6].

Arunachal Pradesh: expect ages the same as or older than ages observed in eastern Bhutan.

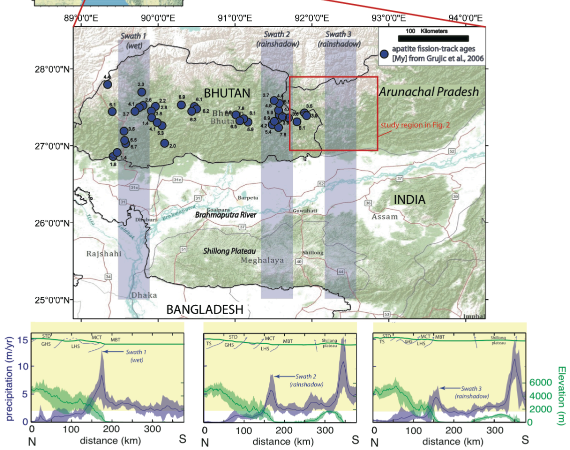
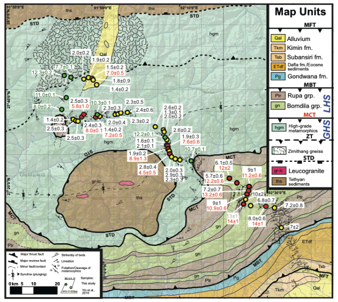


Fig 1. (Above) Map of study area with data from [6]. (Below) Swath profiles of 1-km TRMM data [10] & elevation.

2. Rapid Long-term erosion in the rain shadow



GHS ages in rain shadow are just as young as the youngest ages in western Bhutan (1.3±0.1 Ma, AFT).

LHS rocks in footwall are much older, reflecting slower cooling: 5.7-9.7 Ma (AFT); 10.9-14.1 Ma (ZFT).

GHS and LHS rocks now juxtaposed at the surface differed by at least 50°C and probably >100°C just 2.5 Ma.

- MAr data, Yin et al., 2010
- ZFT data, AFT data, this study
- AFT data, this study

Fig 2. Geologic map and MAr data from [14]. AFT and ZFT data from this study (all 1σ errors).

3. Does age pattern reflect faulting?

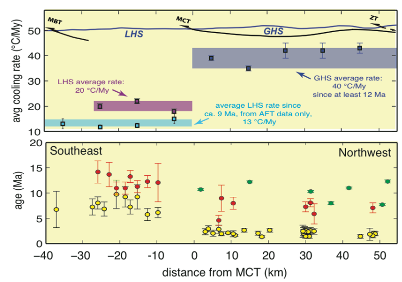


Fig 3. (top) Schematic cross section and cooling rates (calculated for 10-km bins using a least squares linear regression of cooling age-closure temperature data) vs. distance. (bottom) Cooling age vs. distance.

4. Predict ages - Thermal-kinematic modeling

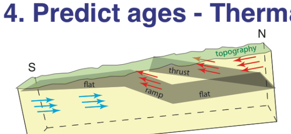
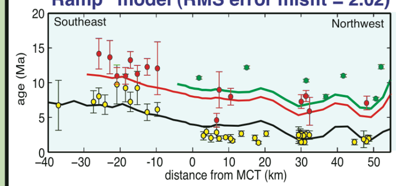


Fig 4. Cartoon of model kinematics. We explore the cause of the offset in cooling ages and rates near the MCT using the Pecube finite element code [12,13,14].

We simulate end-member kinematic scenarios that differ in their predictions of which surface-breaking faults drive rapid cooling in the GHS through time. Models assume: steady-state topography; thermal model parameters for eastern Bhutan [29]; sub-surface geometry based on published maps, cross-sections and models [14,29]; 21 mm/yr total shortening on the MHT, e.g., [15].

5. Exhumation is kinematically controlled

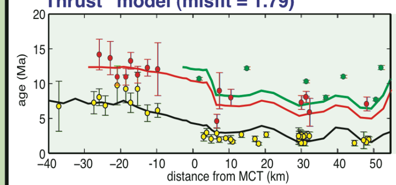
"Ramp" model (RMS error misfit = 2.02)



- All shortening on the MFT, with cooling driven by exhumation above a crustal-scale ramp

- All predicted ages are too young in the hanging wall of MCT

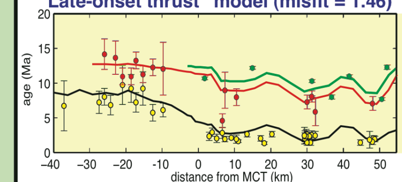
"Thrust" model (misfit = 1.79)



- Overthrusting partitioned between the MFT and a surface-breaking thrust at the position of the MCT

- A wide range of subsurface geometries predict the AFT and ZFT data well, but "thrust" models still underpredict most MAr ages.

"Late-onset thrust" model (misfit = 1.46)



- Two-step scenario with delayed activation of out-of-sequence thrust.

- Activation timing constrained by independent data to ca. 6-7 Ma [11]

- Models capture AFT, ZFT and MAr data, suggesting a direct influence of fault-controlled kinematics on exhumation.

Fig 5. Summary of preferred thermal model results for each end-member kinematic scenario (out of ~475 total models so far). Data are same as in Fig 3. Bold lines are lowest-misfit model results, and shaded region behind each line shows variability in model predicted ages due to varying fault geometry.

TAKE HOME: Here, orographic precipitation does not control long-term erosion & deformation

Erosion varies in response to fault-controlled rock uplift and latest-Miocene onset of out-of-sequence thrusting - suggesting that local tectonic boundary conditions can exert the dominant control on long-term erosion in a rapidly deforming area, despite a dramatic precipitation gradient.

This result suggests either an incomplete understanding of how erosive processes scale with precipitation or a fundamental disconnect between the predictions of orogen-scale geodynamic models and the relationship between erosion and tectonics at the regional scale.

REFERENCES:

[1] Roe, G. H., Ann. Rev. of Earth and Planetary Sci. 33, 645-671, doi:10.1146/annurev.earth.33.092203.122541 (2005). [2] Whipple, K. X., Nature Geosci. 2, 97-104 (2009). [3] Biswas, S. et al.,Tectonics 26, TC6013, doi:10.1029/2007TC002125 (2007). [4] Clark, M. K. & Bilham, R., EPSL 269, 337-351, doi:10.1016/j.epsl.2008.01.045 (2008). [5] Bookhagen, B., Theide, R. C. & Strecker, M., EPSL 231, 131-146 (2005). [6] Grujic, D. et al., Geology 34, 801-804, doi:10.1130/G22648.1 (2006). [7] Koons, P. O., American J of Sci. 289, 1041-1069 (1989). [8] Willett, S. D., JGR 104, 28957-28981 (1999). [9] Beaumont, C., Jamieson, R. A., Nguyen, M. H. & Lee, B., Nature 414, 738-742 (2001). [10] Bookhagen, B. Burbank, D.W., GRL 33, L08405, doi:10.1029/2006GL026037 (2006). [11] Yin, A. et al. GSAB 122, 360-395, doi:10.1130/B26461.1 (2010). [12] Braun, J., Computers and Geosci. 29, 787–794, doi:10.1016/S0098-3004(03)00052-9 (2003). [13] Robert, X., van der Beek, P., Braun, J., Perry, C. & Mugnier, J.-L., GRL 116, B05202, doi:10.1029/2010JB007893 (2011). [14] Herman, F. & al., JGR 115, B06407, doi:10.1029/2008JB006126 (2010). [15] DeCelles et al. Tectonics 20, 487-509.

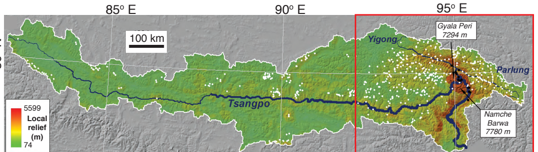
Erosion of the Tsangpo Gorge by Megafloods, Eastern Himalaya

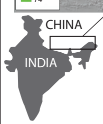
Katharine W. Huntington (kate1@uw.edu) and Karl A. Lang (karllang@uw.edu)
Dept. of Earth & Space Sciences, University of Washington

1. Introduction: Impact of megafloods on fluvial erosion & deposition

- In the Eastern Himalaya, rapid rock uplift and erosion have exhumed mid-crustal material over Pliocene time at rates as high as 7-10 km/My in a highly focused ~1200 km² zone around the Tsangpo gorge [1,2,3], impacting the sediment load of the Brahmaputra River system downstream [4,5].
- The steep river gradient and high discharge though the gorge today produce bed stresses that may have the erosional capability to match long-term rock uplift rates [6,7]. However, Holocene glacial dams episodically blocked the upstream drainage, leading to variable discharge in the past, and it is hypothesized that the dams impede bedrock river incision into the Tibetan plateau upstream and that catastrophic dam failures and megafloods focus erosion in the gorge below [8,9,10].
- To assess the impact of such events on long-term erosion in the gorge and on the sedimentary record downstream, we:
  - Report the *first observations of megaflood deposits downstream of the gorge*
  - Use detrital zircon U-Pb and petrographic data to fingerprint the sources of the *ancient deposits, modern river sediments, and deposits of a smaller-magnitude historical landslide-dam flood*.

2. Background: Tsangpo River drainage and dams

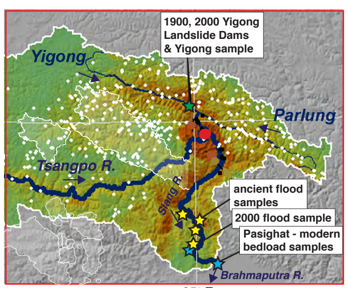




Above: Tsangpo-Siang-Brahmaputra river drainage upstream of the rangefront from [9]. Shaded topography with color-coded local relief (10-km radius). White dots are glacial dams, black dots landslide dams. Zone of highest relief coincides with bulls eye of rapid rock uplift and exhumation around the Tsangpo gorge.

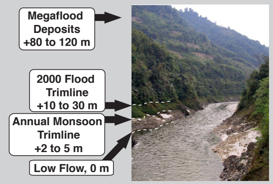
Right: Closeup of area in red box above showing location of 2000 Yigong landslide dam and sample locations.

Red dot indicates gorge. Surrounding region is the source of Himalayan zircons (>300 Ma, with 500 Ma peak)

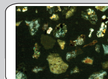


3. Which events dominate erosion in the gorge? Petrography, zircon U-Pb fingerprint sed source

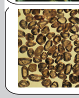
METHODS



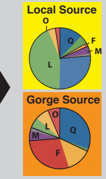
sample modern monsoon, 2000 flood & megaflood seds

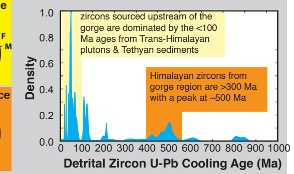


Petrographic analysis (point counting [11,12]) to constrain sediment provenance



Detrital zircon LA-ICPMS U-Pb dating to discriminate proportion of sediment derived from Himalayan bedrock in the gorge region from that transported through the gorge



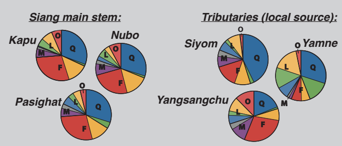


RESULTS

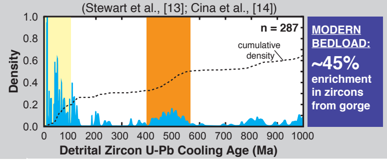
Big: Annual monsoon discharge

Left: Monsoon sand bedforms.

Below: Petrographic point-counting data for modern tributary detritus fingerprint local sources in the Lesser Himalaya south of the gorge.

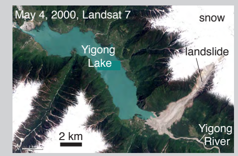


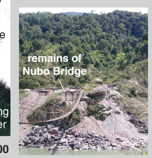
Modern river bedload at range front
(Stewart et al., [13]; Cina et al., [14])

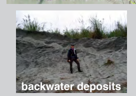


MODERN BEDLOAD: ~45% enrichment in zircons from gorge

Bigger: Historical flood (2000)

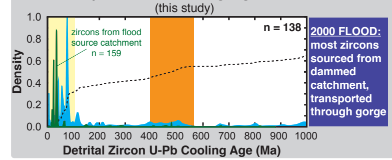






Above: Landslide dam and lake from 2000 Yigong event. The ~105 Mm³ landslide occurred April 9, impounding a 2-3 Gm³ lake. Dam failed 62 days later, causing discharge 36x greater than the normal river flood [e.g. 15,16], destroying villages and bridges (Top Right), and depositing flood sands (Bottom Right) downstream.

Deposits from 2000 Yigong Flood
(this study)



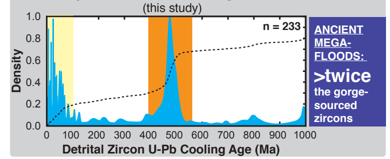
2000 FLOOD: most zircons sourced from dammed catchment, transported through gorge

Biggest: Glacial-dam megaflood

Upper Left, Middle: Ancient megaflood deposits are preserved high above the modern channel in local paleotopographic lows. Multiple flood deposits separated by paleosols are preserved in tributary backwaters (Right).

Below: Megaflood deposits are more than twice as enriched in gorge-derived Himalayan zircons than both the modern monsoon and 2000 flood sediments, suggesting a threshold flood magnitude necessary for gorge excavation.

Deposits from ancient Megafloods
(this study)

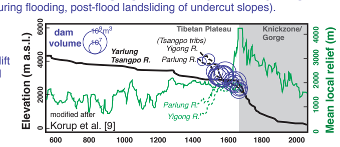


ANCIENT MEGA-FLOODS: >twice the gorge-sourced zircons

4. Take Home:

Over long term, most erosion in the gorge is accomplished by megafloods
(via direct bed incision during flooding, post-flood landsliding of undercut slopes).

Right: process may help
- keep pace with rock uplift
- maintain knickpoint and inhibit plateau incision.



Megaflood frequency varies with glacial advances
- direct impact of climate on erosion in the gorge
- proximal basin deposits may show glacial-interglacial variability
- distal deposits that integrate annual monsoon & megafloods, may look more like glacial than modern river sediments

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EXERCISE: Critique of posters in the hall

Evaluation RUBRIC

- **(1) Title quickly orients reader**
  - Location and typeset
  - Easily understandable
  - Communicates context
  - Communicates main message and result
- **(2) Poster quickly orients audience to subject & purpose**
  - 20 seconds
  - Images
  - Type large enough
  - Contrast colors
- **(3) Specific sections are easy to locate**
  - Easy to read from beginning to end
  - Easy to find individual sections like intro, methods, results
- **(4) Individual sections can be read quickly**
  - No large blocks of text
  - Sentences are short
  - Images (photos, drawings, graphs) anchor the sections

EXERCISE: Critique of posters in the hall

What you will DO

- **1st poster critique**
  - Get in group of 3-4 students
  - Find a poster on 3rd floor Johnson hall to critique. Read poster and *fill out rubric individually*. THEN, Compare notes with group. *Reach consensus and fill out poster critique #1 (one per group)*.

- **2nd poster critique**
  - Find a second poster in Johnson hall to critique with your same group
  - Read the poster and *fill out rubric individually*. Compare notes with group. *Reach consensus and fill out poster critique #2 (one per group).*

- **Turn in critique #1 and critique #2**
  - Turn in individual rubrics and group critiques *TO TA AT THE END OF CLASS TODAY*

Excellent Poster Resource

www.ncsu.edu/project/posters/

BE AWARE: You will find some conflicting information among generally good websites that describe the "proper" way to do a poster