How to write that research paper

you promised you would

… and not loose your hair over it

- No absolute truths, but workable recipes
- No alternative to practice, practice!
- Ability to take and learn from criticism
- The hardest paper is always the current one

Hannes Baumann, University of Connecticut

Don’t stare at an empty page/screen

Break down the process into pieces

But before you start …

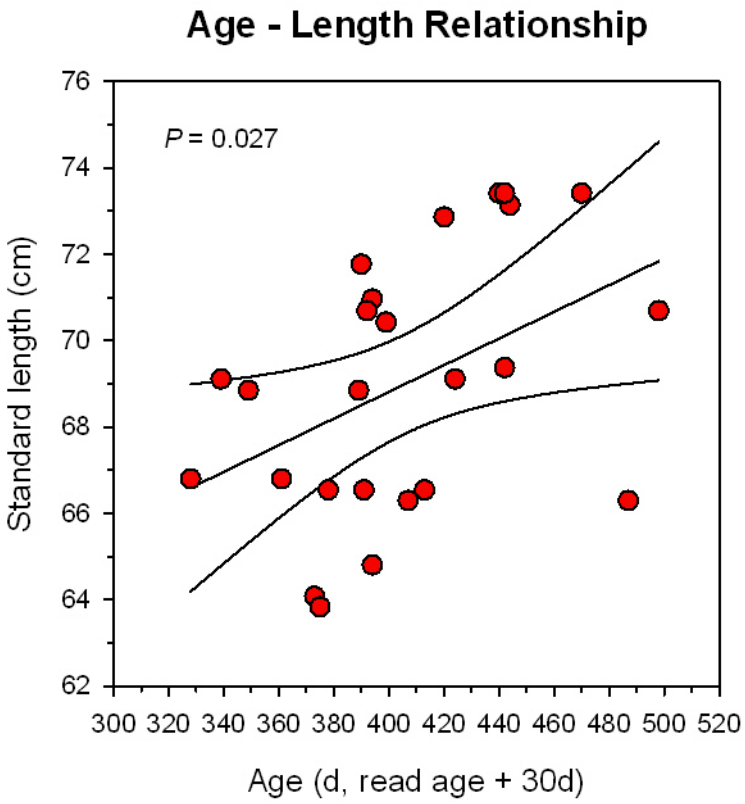
- Think about a journal and two alternatives
- Communicate early and clearly about co-authorships

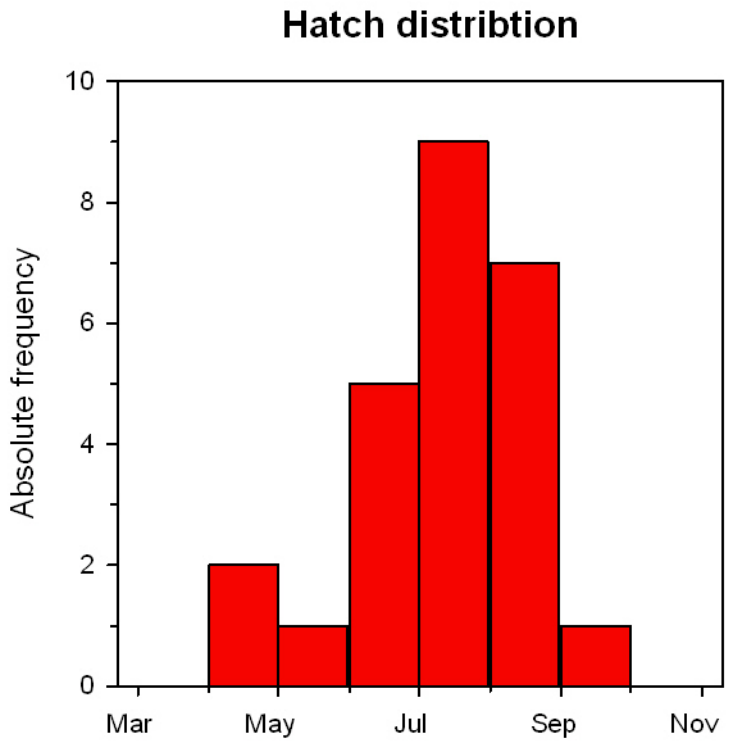
Here's my recipe …

1. Delve into your data, plot them in every which way, then consolidate
2. Material & Methods
3. Results
4. Discussion
5. Introduction
6. Abstract

1. Plot and plot and plot your data

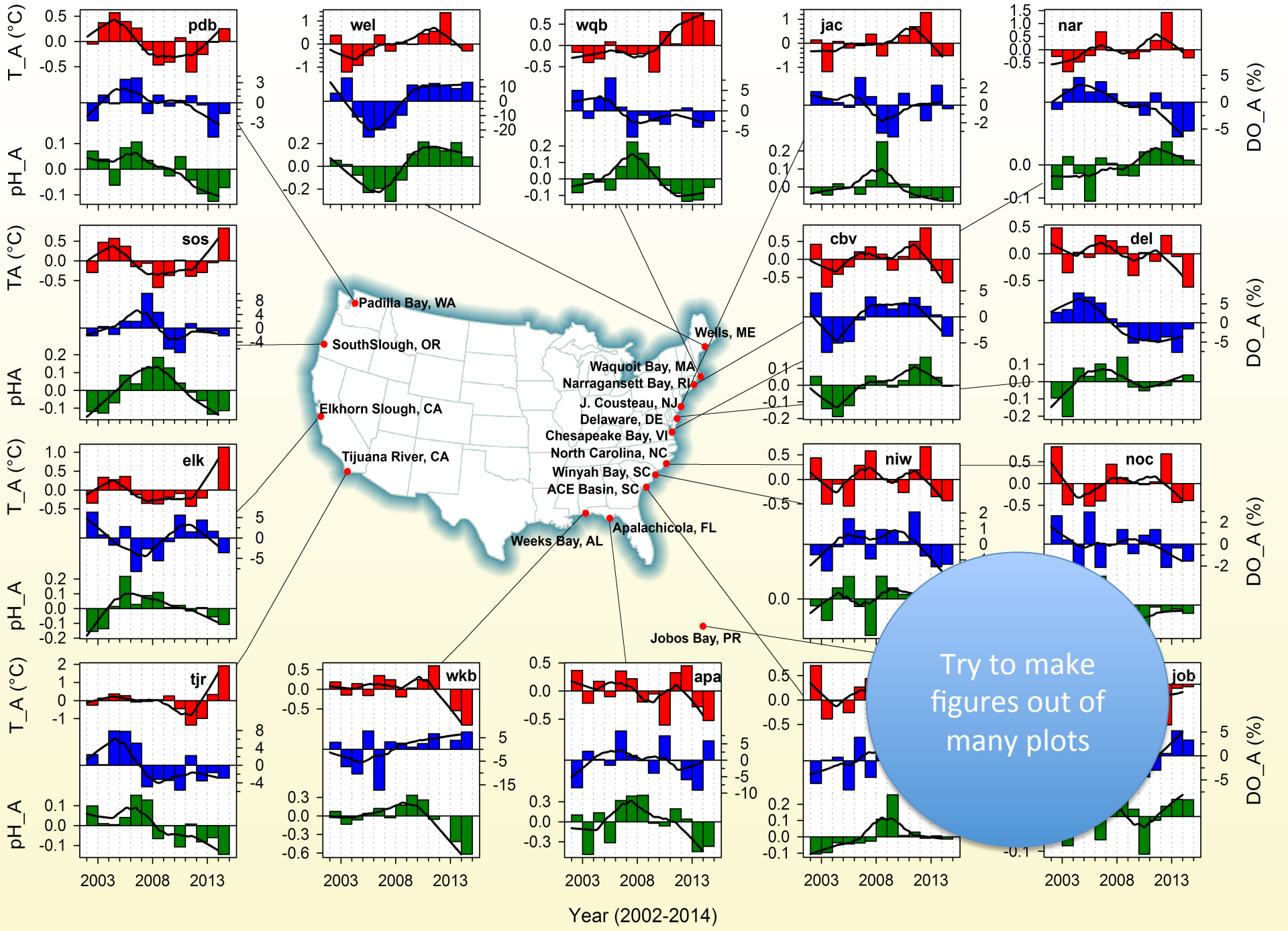
- Why? Patterns!
- The story forms, aids description of results
- The same data can be visualized in many different ways – find out which is best





A bit of basic info first. The age-length relations t (R^2 = 0.2), which is likely due to the small length ra ages range from 328 to almost 500, which transl ch-distribution between April and September, w back with literature, whether that is reasonable o that other age-length keys based on oto macrostruct se et al. used in Madigan et al. PNAS 2012, estimate these nths older, but Dan himself believes that these keys may not be perfectly represented for these young ages. But the discrepancy is there.

Make figures and put them with a caption in Powerpoint; add your observations of these patterns to communicate with co-authors


pdb
wel
wqb
jac
nar
sos
cbv
del
elk
niw
noc
tjr
wkb
apa
job
T_A (°C)
TA (°C)
pH_A
pHA
DO_A (%)
Padilla Bay, WA
SouthSlough, OR
Elkhorn Slough, CA
Tijuana River, CA
Wells, ME
Waquoit Bay, MA
Narragansett Bay, RI
J. Cousteau, NJ
Delaware, DE
Chesapeake Bay, VI
North Carolina, NC
Winyah Bay, SC
ACE Basin, SC
Apalachicola, FL
Weeks Bay, AL
Jobos Bay, PR
2003
2008
2013
Year (2002-2014)
Try to make figures out of many plots

2. Materials & Methods

The easiest, because most technical part

Write it immediately, some do it while still collecting the data!

Short sentences, logical order of methods

2. Materials & Methods

Passive voice? Active voice?

X

“… a filter was used for the water to be cleaned to allow for the samples not to be contaminated …”

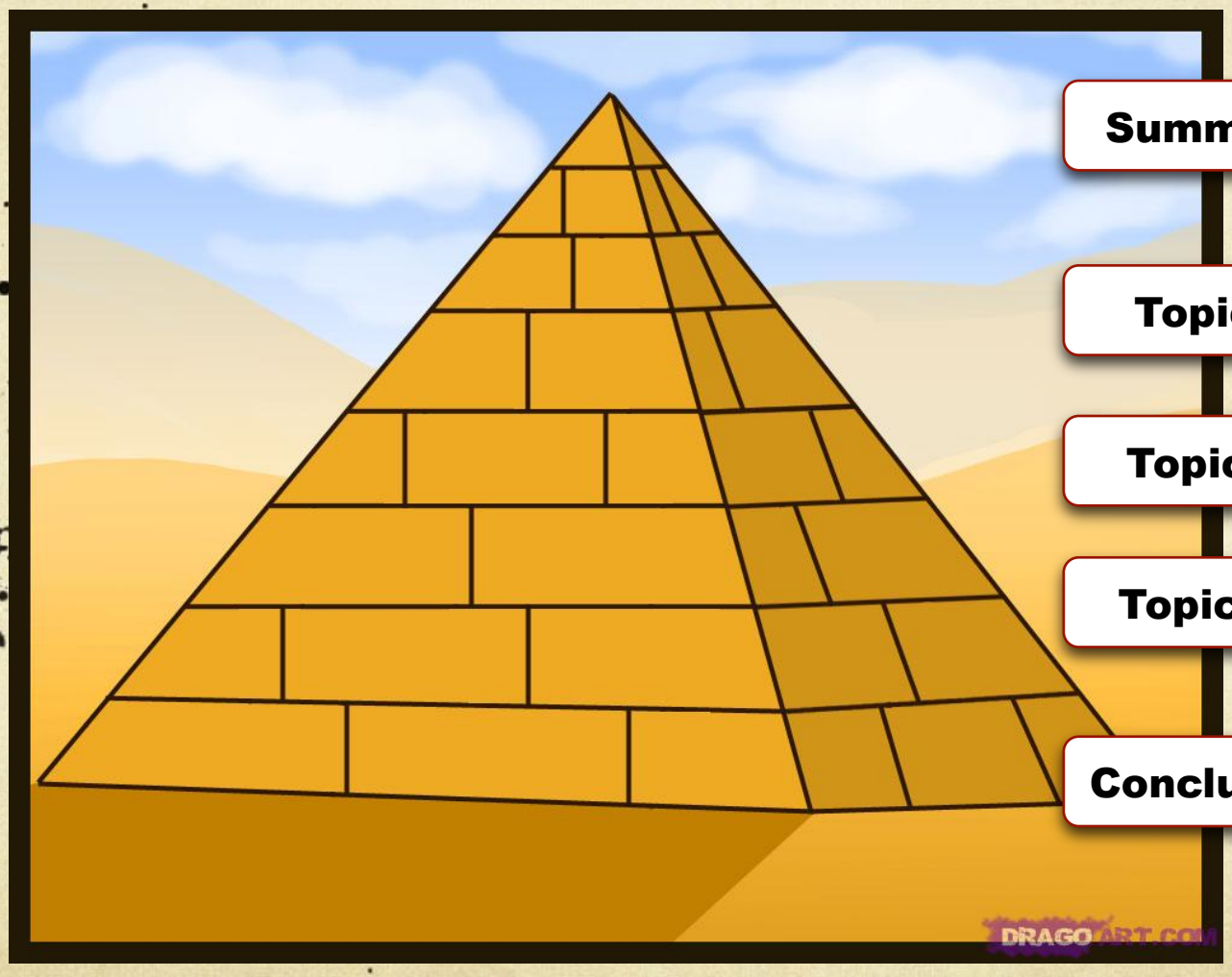
✔

“We filtered the water to avoid contamination …”

3. Results

- Just describe what you found. Nothing else.
- Short sentences. Consistent notation.
- Keep use of parentheses light, otherwise table
- Don’t discuss your findings
- Don’t repeat M&M
- Avoid excessive usage of acronyms, unimportant groups

4. Discussion – the pyramid



Summary of findings

Topic I discussion

Topic II discussion

Topic III discussion

Concluding paragraph

First, sketch out the paragraphs

A paragraph = the smallest logical unit of a text

~150 – 300 words,
~4 – 10 sentences

[Paragraph 3: effect of food quality on fish growth]

- I first want to say the differences were bigger between treatments than between individuals
- I then want to compare our results to … this study and … another study
- Then should come that …
- Shouldn't I put … this here already?

[Paragraph 4: method discussion]

- First I want to discuss sampling mortality
- Then …

5. Introduction – the upside-down pyramid

- Context of the study What needs to be better understood?
- Topic I introduction
- Topic II introduction
- Statement of hypothesis/goals
- Short summary of approach

Same paragraph rules, strategies as for discussion

6. Abstract

This is what 95% of reader ONLY read, but entice them to read the whole thing

The problem (1-2 sentences)
The approach (1-2 sentences)
The results (4-5 sentences, be specific)
The conclusion and overall importance (1-2 sentences)

X **"... our findings will be discussed ..."**

You have a first draft. Wait.

- Shorten, condense it.
- Saying something with less words is always better …
- Justify to yourself the necessity and order of each statement.
- Send it to co-authors

More concise, what does that mean?

Nouns to verbs!

"..., larvae exhibited a significant increase in growth rate ..."

Better:

"Larvae grew significantly faster ...

More concise, what does that mean?

Tautology

"Estuary-dependent fishes reside in estuaries ..."

"...diel-cycling hypoxia, whereby DO varies over a diel cycle ..."

More concise, what does that mean?

"Science-iness", jargon

"Natural and anthropogenic environmental alteration impacts ecosystem structure and functioning, disrupting natural biological and ecological processes at the community and species level." What does that mean?

"..., incredibly low survival ..." Improper evaluation?

"... this approach was quite useful" Jargon

"... there was an onslaught of criticism ..." Figure of speech

Where and how to ask for help

1. Your co-authors. Good editing is a serious contribution.
2. Other colleagues, trusted friends.
3. Writing workshops in your academic institution / library
4. Professional services by journals

"I just want it to be over now …"

1. Meticulous last check for consistency & typos ("… the high morality of fish")
2. Cover letter. Has somebody read it?
3. Journal citation/formatting style
4. Potential reviewers (!!!)


Good Luck