How to write a scientific paper in Hydrology

short course organized by

YOUNG HYDROLOGIC SOCIETY
A NETWORK FOR YOUNG HYDROLOGISTS

Bettina Schaefli
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About myself

• 38 years old, 1 child

• Career:
  • 1996-2001: MSc. in Rural Engineering, EPFL, Switzerland
  • 2001 – 2005: Dr. ès sciences, Hydrology, EPFL
  • 2005 – 2007: Postdoc Uni Potsdam, Urbana-Champaign, visitor University of Bologna
  • 2007 - 2010: Assistant professor TU Delft
  • 2010 - today : Senior research associate EPFL, with affiliation at TU Delft
What I published during my PhD

- 3 first author papers
- One paper with my MSc student (cited 81 times)

My publication record is ...

- Number of papers (21): could be higher
- Number of citations: reflects my impact on and contribution to the community

What my students appreciate:

- Detailed, constructive comments on their papers / reports at all stages
About myself

• A really important advice I got during my career
  • Do not expect immediate payback for everything you do

• What I think about current publication imperatives
  • We will (have to) become science prosumers who share their work (Collaborative Commons)
Introduction

• For whom do I publish papers?
  → Your university / funding agency
  → Your supervisor
  → Your PhD thesis
  → Your H-index (your career!)
  → …
  → The society you live in
• For whom do I publish papers?
  → Your university
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  → Your PhD thesis
  → Your H-index
  → ..

Correct affiliations (abbreviations) for indexing

Correct acknowledgements

Ease of collaboration (joint writing), quality of your paper (content, results), journal impact factor, number of citations per paper
For whom do I publish papers?

→ Your university

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→ Your PhD thesis

→ Your H-index

→ ..

+ speed of review and publication, sequential publishing

Your citation index:
Visibility of your papers and other work (!), visibility of yourself
• Other stakeholders

→ **Publisher:** $$$

→ **Editor(-in-chief):** journal’s reputation & impact factor, length publication process etc

→ **(Associate) editors:** appoint reviewers, take (almost) final decisions on papers

→ **Media:** media office of your university?
What is a good paper?

- Enjoyable to read: well written
- Clear message, intelligible from the abstract
- Good science, conclusions supported by data/analysis
- Has an attractive title!
  - Invites others to click on the link in journal newsletters
  - Hint from J. McDonnell: check out the most downloaded papers from top hydro journals
• **Think about the story you want to tell**
  • And know its end: what are the conclusions / key messages?
  • What results do you need for this?
• **Transcribe the story in an outline (bullet points + key figures)**
  • Important: Introduction (literature!) is key part of the story
  • Methods / case study: straightforward
• **When to start writing?**
  • Have a good outline before writing
  • And a clear idea of necessary figures
  • Fill in the parts in the order you prefer (start with conclusions?)
• **Choose a reference software to manage references**

• **If you know the journal in advance**
  • Go to web page, read instructions, download paper template (latex!)

• **If you do not know the journal**
  • Instructions and template e.g. from HESS or WRR
  • Adapt template before submission, special care for:
    • Citation instructions
      • Advances in Water Resources uses numbers
      • WRR does not allow referencing submitted work
    • Figure instructions
    • How to handle (web only) supplementary material
• Every paper has a story to tell
• You write for the reader (and the reviewers!)
  • How to catch / keep her attention?
• What are the key messages?
  • Can “average” colleagues understand them?
• **Final readership**
  • Experts in your very topic
  • Other hydrologists!

• **Initial readership: reviewers**
  • Make them the task as enjoyable and easy as possible
  • Do not be afraid of saying apparently obvious things
    • Do not omit necessary steps of reasoning
    • The less expert readers will be grateful
  • **Review papers yourself!**
    • To get a feeling for what is annoying / difficult to read
• **Old or recent papers?**
  
  • Editor’s viewpoint:
    • cite only recent papers (<2 years) of my own journal to increase it’s impact factor
  
  • Reader’s viewpoint:
    • Cite key papers that shaped the field and recent work

• **Common knowledge, no reference required?**
  
  • **Hydrology is young: almost everything requires a reference**
    • E.g. no reference required: Hortonian overland flow
    • But reference required: Dunne overland flow (Dunne, 1970), Nash and Sutcliffe, 1970
• **Textbooks?**
  - For common tools in other fields (mathematics, statistics etc.)
  - If it is really useful for the interested reader
  - If you do not find an appropriate paper

• **Thesis?**
  - Add a reference to the thesis if it contains additional info
  - **BUT:** always cite the resulting papers (H-index of your young colleagues)
• **Grey literature**
  • Cite if no other direct reference is available
  • Try to make the content of the reference available for the interested reader (e.g. internal reports of your MetOffice)

• **Data sets**
  • Always use formal references as far as possible (papers, reports etc)

• **Codes**
  • Formal reference; mention if open source
  • Publish your own codes?
• **Adopt consistent math notations for all papers**
  • Even if you have a single equation

• **Read [HESS recommendations](#)**
  • Manuscript preparation / Textual and Visual Conventions/Symbols and Equations:
    • E.g. Multi-letter variables should be avoided
• No special typefaces (i.e., italics, boldface) for emphasis
• No footnotes
• See journal-specific requirements (figures etc.)
• Acknowledgements:
  • Funding
  • Data sources (GIS, meteo, hydro, etc)
  • (Non-)anonymous reviewers (editor)
  • People who substantially contributed without being co-authors (discussions, field work)
• From McDonnell, 2009 (citing in turn Don Siegel)
  (http://static2.egu.eu/media/filer_public/2013/03/19/mcdonnel-publish.pdf)
• Write in the active tense instead of passive tense:
  “We collected samples of blah...” instead of
  “Samples of blah were collected...”
• Avoid all jargon if at all possible. Never assume the reader knows any jargon.
• Write in simple sentences
• Subject and verb up-front in all sentences
• You can use personal pronouns: “We sampled...”

From Don Siegel
• **AGU Grammar and Style Guide**
  - Read also the **AGU Editorial Style Guide for Authors**
    http://www.agu.org/pubs/style_guide_intro.shtml
    - Mentions the most frequent editorial changes
• **AGU reference style**
THE AUTHOR LIST: GIVING CREDIT WHERE CREDIT IS DUE

The first author
Senior grad student on the project. Made the figures.

The second author
Grad student in the lab that has nothing to do with this project, but was included because he/she hung around the group meetings (usually for the food).

The middle authors
Author names nobody really reads. Reserved for undergrads and technical staff.

The last author
The head honcho. Hasn’t even read the paper but, hey, he got the funding, and his famous name will get the paper accepted.

The second-to-last author
Ambitious assistant professor or post-doc who instigated the paper.

The third author
First year student who actually did the experiments, performed the analysis and wrote the whole paper. Thinks being third author is “fair”.

• Direct collaborators, supervisors
  • Who did what?
  • Without whom the paper would not exist?
• Co-authors who produced the data
  • Can be controversial (old/recent data?)
• Co-authors imposed by supervisor
• Who not
  • Do not submit papers with co-authors who never gave any feedback on the paper / formal agreement for submission
  • If high number of co-authors: try to fix in advance a decently quick collaboration process
    • Who reads draft at which stage
• **What to do in case of controversy?**
  - Find out why someone is included/excluded (be diplomatic, active listening)
  - Try to get constructive feedback from a co-author who is included but did not contribute much (“win-win” instead of “bad feeling-win” situation)
  - Discuss with other senior colleagues

• **Advice: be inclusive!**
  - Avoid conflicts
  - Avoid circulating drafts with incomplete author list
• **If you did most of the work / took the lead in writing: 1st**
  • Shared co-authorship (Nature group)

• **If not:**
  • If you did a lot of the work: 2nd
  • If your Master student: you 2nd
  • If your PhD: you 2nd or last

• **Important:**
  • Not all disciplines have the “last author” implicit rule
  • Hydrology: order of importance or last author rule exists

• **Annotate your publication list**
  • E.g. “first author supervised Master student”
• In case of controversy

  • First author
    • Do not underestimate your contribution
    • Try to find out why

  • Author order: let the order open till submission / revised version
    (who contributed during the writing / revision?)
• **Topical considerations**
  • **Open access? (!!)**
    • Costs involved?

• **Publication process**
  • Two-stage (HESS)?
  • Open review?
  • Journal with double-blind review (Nature group)
  • Immediate publication after acceptance?
  • New publication types: http://www.frontiersin.org/
• **Publication of data sets ?**
  • No personal experience

• **Publication of code ?**
  • e.g. Geosciences Model Development (Discussions)
• **Pre-/ prior publication**
  - Check previous publication rules of selected journal
  - E.g. AGU Author resources / publication policies / Prior publications

  “AGU prohibits the submission of material (..) that has been previously published in any form (..). Specifically, any document that is accessible to a library user, who does not have special access or privileges,(..), except as noted below.

  Previously published explicitly does not include oral or poster presentations, meeting abstracts or student theses/dissertations. Posting of a preprint (..) does not constitute prior publication unless with a service which provides archiving (..). In the latter case removal of the preprint from the archive will be sufficient.”

**Conclusion:** rejected HESSD papers can **NOT be submitted** to WRR!
• Be careful
  • Do not copy text from other papers during your writing process
• Do not copy your own text literally
• Literal plagiarism, intelligent plagiarism
• Plagiarism by omission / mistake
  • Re-reading your badly referenced notes after a few weeks, you might adopt someone’s idea as your own
• For every statement it should be clear whether

• General knowledge
  • “Part of soil water leaves system through transpiration”

• Reasoning of someone else (not yet common knowledge)
  • “Savenije (2004) suggested to stop using the term evapotranspiration, namely because of the different involved time scales”
  • Rather than: “The term evapotranspiration should be avoided, due namely to the different involved time scales (Savenije, 2004).”

• Your own idea
  • “Accordingly, we propose here a new method to xxx” rather than “… accordingly, a new method should be proposed”
Report #1
Submitted on 17 Feb 2014
Referee #1: Dr. Bettina Schaeffi, bettina.schaeffi@epfl.ch

Anonymous: Yes No

Formal Manuscript Rating and Recommendation to the Editor (non-public)

1) Scientific Significance
Does the manuscript represent a substantial contribution to scientific progress within the scope of this journal (substantial new concepts, ideas, methods, or data)?

2) Scientific Quality
Are the scientific approach and applied methods valid? Are the results discussed in an appropriate and balanced way (consideration of related work, including appropriate references)?

3) Presentation Quality
Are the scientific results and conclusions presented in a clear, concise, and well structured way (number and quality of figures/tables, appropriate use of English language)?

For final publication, the manuscript should be
accepted as is
accepted subject to technical corrections
accepted subject to minor revisions
reconsidered after major revisions
I would like to review the revised paper
I would NOT be willing to review the revised paper
rejected

Please note that this rating only refers to this version of the manuscript!
Addressing reviewer comments

Addressing Reviewer Comments

BAD REVIEWS ON YOUR PAPER? FOLLOW THESE GUIDELINES AND YOU MAY YET GET IT PAST THE EDITOR:

Reviewer comment:
“The method/device/paradigm the authors propose is clearly wrong.”

How NOT to respond:
× “Yes, we know. We thought we could still get a paper out of it. Sorry.”

Correct response:
✓ “The reviewer raises an interesting concern. However, as the focus of this work is exploratory and not performance-based, validation was not found to be of critical importance to the contribution of the paper.”

Reviewer comment:
“The authors fail to reference the work of Smith et al., who solved the same problem 20 years ago.”

How NOT to respond:
× “Huh. We didn’t think anybody had read that. Actually, their solution is better than ours.”

Correct response:
✓ “The reviewer raises an interesting concern. However, our work is based on completely different first principles (we use different variable names), and has a much more attractive graphical user interface.”

Reviewer comment:
“This paper is poorly written and scientifically unsound. I do not recommend it for publication.”

How NOT to respond:
× “You #&@% reviewer! I know who you are! I’m gonna get you when it’s my turn to review!”

Correct response:
✓ “The reviewer raises an interesting concern. However, we feel the reviewer did not fully comprehend the scope of the work, and misjudged the results based on incorrect assumptions.”

www.phdcomics.com

http://phdcomics.com
Addressing reviewer comments

- Reviews are written by colleagues under time constraints:
  - Rarely formulated in a positive way
- Give yourself time to digest the reviews
Addressing reviewer comments

• **Content / formulations**
  - Ask your colleagues for rebuttal examples
  - Read responses on HESSD [http://www.hydrol-earth-syst-sci-discuss.net/](http://www.hydrol-earth-syst-sci-discuss.net/)

• **Formal requirements:**
  - **Instructions from the editor / publisher?**
    - Need to submit version with track changes?
  - **Otherwise:**
    - Introduction (thank the reviewers, explain new paper structure, general modifs etc.)
    - Copy each original comment, highlight as original comment
    - Write detailed answer below each comment
    - Indicate clearly changes to the manuscript (re-review!)
    - Generic answer for grammar issues (“addressed”)

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• Accepted: follow publishers’ instruction for final steps
• Rejected:
  • After initial screening: journal target, formal requirements?
  • After initial review
    • Re-submission of considerably revised version to same or other journal (“invitation to re-submit”)
    • If high publication costs: ask for free re-submission?
  • After re-review
    • If new journal: consider including summary of initial submission / review in a letter to the editor
• **From Jeff McDonnell:**
  (http://static2.egu.eu/media/filer_public/2013/03/19/mcdonnel-publish.pdf)

• **The publication list is**
  - It’s your only portable currency
  - Key prerequisite for getting a job
  - Main factor in promotion and tenure decisions

• **Write PhD papers sequentially**

• **Consider writing a review paper as part of your set of PhD papers**
  (can yield very high citation stats)

• **Do comment/reply on something recently published**

• **Be careful about special issues**

• **Publish in the best journals possible where work will be recognized and read**

• **Develop a PhD brand identity**
Very final recommendation

• **Think about your scientific name (and don’t change it!)**
  • My „scientific“ name: Schaefli, B.
  • Number of other researchers with this name: 1

• **Especially if your name is very frequent:**
  • Create your account on Web of Science
  • Keep your own web page with publications up-to-date
• You write papers for you and your career
  .... and to change the world

• Counting just number of papers per researcher is passé
  • Consider using annotated publication lists
  • Do not publish always with the same author list (after PhD)

• Think about other ways to make you/your work known
  • To get citations!
• **Recommended reading**


  • G. Blöschl, A. Bárdossy, D. Koutsoyiannis, Z. W. Kundzewicz, I. Littlewood, A. Montanari, and H. Savenije: Joint Editorial "*On the future of journal publications in hydrology*“ (e.g. HESSD)
• http://younghs.com

YOUNG HYDROLOGIC SOCIETY
A NETWORK FOR YOUNG HYDROLOGISTS

• SPM1.23: Getting in touch with the Young Hydrologic Society (public) Thu, 01 May, 17:30–19:00 / Room R10