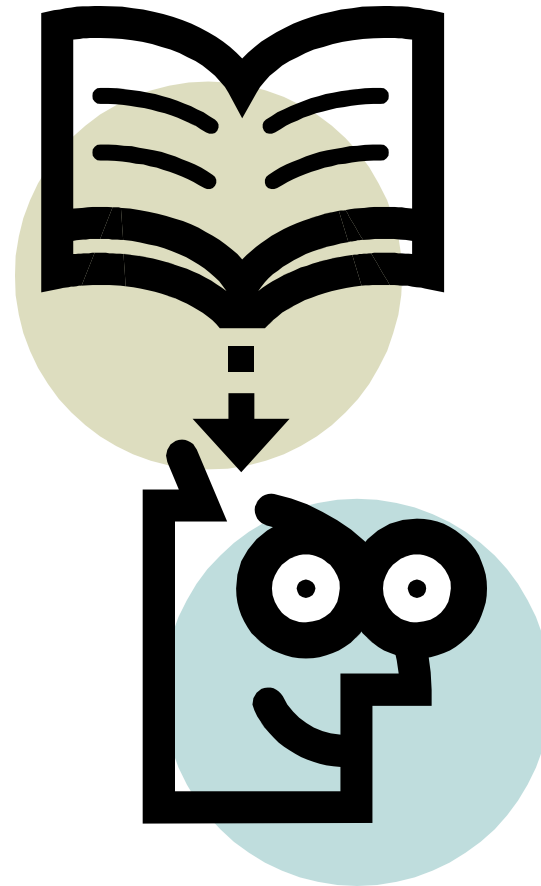


How to write a journal paper



Jeff McDonnell, Oregon State University



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Outline

- **The topdown approach to paper writing**
- **Components of the paper**
- **How journals “work”**

Don Siegel



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These ideas influenced by

- My own experiences with paper writing
- My post docs and graduate students and helping them to write their papers
- My work with journals:
 - *Editorial Board, Ecohydrology, John Wiley and Sons.*
 - *Editorial Board, Geography Compass, Blackwell Publishers*
 - *Associate Editor, Hydrology and Earth System Science, EGU*
 - *Editorial Board, Korean Journal of Forestry, Korean Forestry Association.*
 - *Associate Editor, Journal of Hydrologic Engineering, ASCE*
 - *Editor-in-Chief, Benchmark Papers in Hydrology Series, IAHS Press.*
 - *Senior Advisory Editor and AE, Encyclopedia of Hydrology, John Wiley and Sons.*
 - *Editor, Hydrological Processes, HPToday, John Wiley and Sons.*
 - *Associate Editor, Hydrological Sciences Journal, IAHS Press.*
 - *Editorial Advisory Board, Progress in Environmental Science, Edward Arnold.*
 - *Associate Editor, Journal of Hydrology, Elsevier Science Publishers.*
 - *Associate Editor, Water Resources Research, American Geophysical Union .*
 - *Editorial Board Member, Hydrological Processes, John Wiley and Sons.*



The facts



WRR rejects 70% of papers submitted (although have of those re-submit)

Journal of Hydrology and HP reject 40%

Quantity and quality of papers is our academic bottom line and the basis for judgment inside and outside our institutions



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More facts



- Most papers are never cited!
- A good paper in hydrology is cited 25 times
- A great paper is cited 50 times
- A benchmark paper is cited 100+ times
- Halflife, H-Index and other metrics

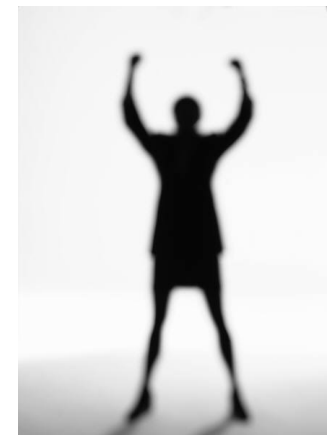


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The goal of scientific publishing

- You want to **write a paper that is cited**
- You want your **ideas to influence others**
- The very best papers impact other fields (but this is very rare)
- To do this:
 - Publish in the best possible journal (check out ISI listings in your area)
 - Write the best darn paper possible
 - Do not give up if rejected!!!!
 - The Beven and Kirkby paper was rejected from JoH in 1978 as being “only of local interest”!



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A Scientific Paper Tells a Story!!

- You need a problem or something to catch the reader's attention
- You need a plot
- You need resolution of the problem at the end of the story.



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A topdown approach to writing the paper

- Start with a story board approach much like a Hollywood writer would pitch a movie script to a director/producer
- Develop an outline with headings and subheadings
- Iterate on this many times, adding sub-sub-headings
- Identify key figures to tell the story
- Fill in the outline further
- Make writing assignments to co-authors
 - A divide and conquer approach



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An example

- Title options: The streamflow-residence time paradox; Baseflow residence times from hydrographs; Does MRT have anything to with flow

- Introduction

- Importance of MRT
- Inability to measure
- Few studies to date (cite large and small rivers)
- New discoveries in MRT: L/G, soil controls as per Aberdeen workshop
- The Vitvar et al . technique
 - Untested
 - But if it could work.....
- Objectives
 - Test recession analysis vs MRT
 - Advantage of HJA multiple MRT, common soil char, extreme seasonality

- Study Site

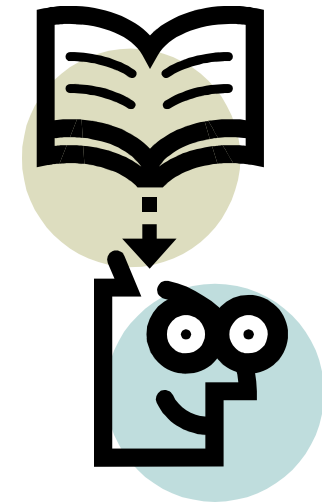
- Site and Characteristics
- DEM, Soils, flow
- MRT from previous isotope-based work



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- **Methods**
 - The Vitvar et al. method revisited; what we did differently
- **Results**
 - Vitvar stats
 - Recession curves
 - Bar chart
- **Discussion**
 - Sensitivity to alpha (simple +/- 10% analysis)
 - MRC tool of Lamb and Beven
 - Recession work of Alley-find
 - Applicability of this approach
 - Why so good at HJA
 - Where this may be good or not
 - Correlation to soil depth and the flow-soil z paradox
 - Lack of correlation between MRT and mean specific Q but obvious strong correlation between delta Q and MRT (convolved through the Vitvar technique)
 - Next steps
 - Storm vs seasonal



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- **Conclusions**

- Figures
 - HJA location (McGuire)
 - Shank map analysis (Vache)
 - MRT bar chart (James)
 - Flow hydrograph with fit (all on one page if possible)
 - Soil depth vs MRT-derived flow volumes (Vache)

Table. Vitvar method catchment stats:

Table 1. Sensitivity analysis numbers

Table 2. Soil depth stuff?

Paper structure and relative level of writing difficulty

- Title (difficult)
- Abstract (difficult)
- Introduction (Most difficult)
- Study Area or Background (easy)
- Methods (easy)
- Results (easy—just the facts)
- Discussion (Second-most difficult)
- Conclusions (easy)



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Title



- Make the title short and interesting
- Downloads are often influenced most by title.
- TOP downloads of 2002-2004 have (mostly) interesting titles
 - Check out HP and JOH web sites for this
- **Final title from our outline: *Can stream hydrographs be used to estimate how long water resides in the catchment?***



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The INTRODUCTION: Explains the problem..

- Needs a “snappy” lead sentence to catch the reader’s attention. **Runoff processes on tile drained fields are poorly known.**
- Need to state up front what is the status quo, then what’s wrong with the status quo and then how your questions posed are the obvious way forward to go beyond the status quo
- Another way is to think of defining what we know, what we think we know, what we need to know.



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Introduction 'cont

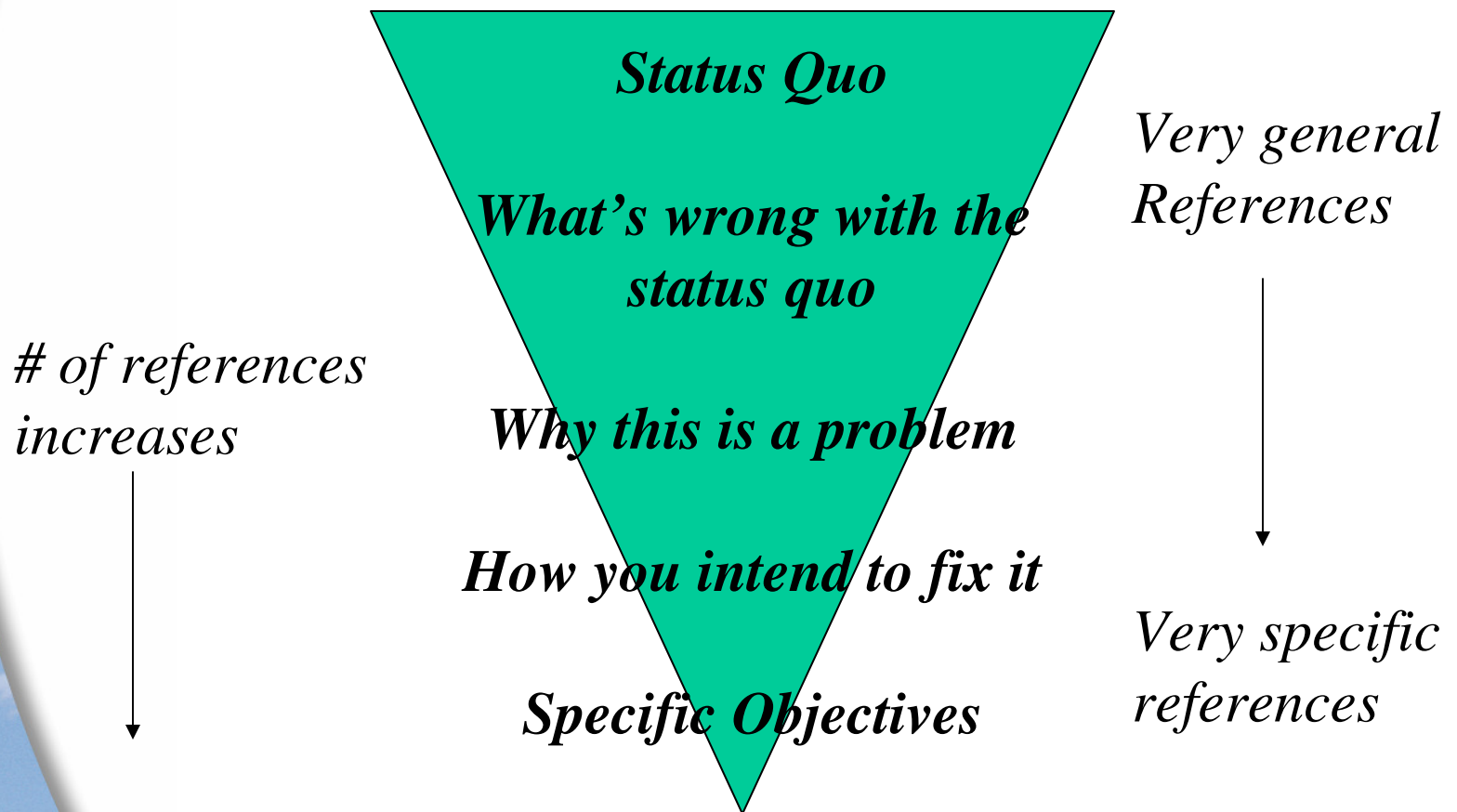
- Very important to tie to the literature
- Use past studies as set-up for your work
- Objectives must flow from the set-up
- Reader must believe that these are THE obvious questions to ask for this point in time for the sub-discipline



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Introduction as an inverted pyramid



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Results

- **Presents the “what” and “where” of the Story, not the “why” or “how.”**
- **Does not interpret the data.**
- Select the key 6 figures or so and write the results around these
- **Most effective if results can follow same points in objectives or hypotheses**
- Difficult balancing act between too much detail and too little text treatment of figures
- **The reader should know why each figure is critical to the logical progression of ideas**



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DISCUSSION

- **Presents the “WHY” and “HOW” of the story**
- **Includes how work agrees (or disagrees) with work of others.**
- **Easiest if structured around questions (as sub-headings)**



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WRITING STYLE

- 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...”



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Other points..

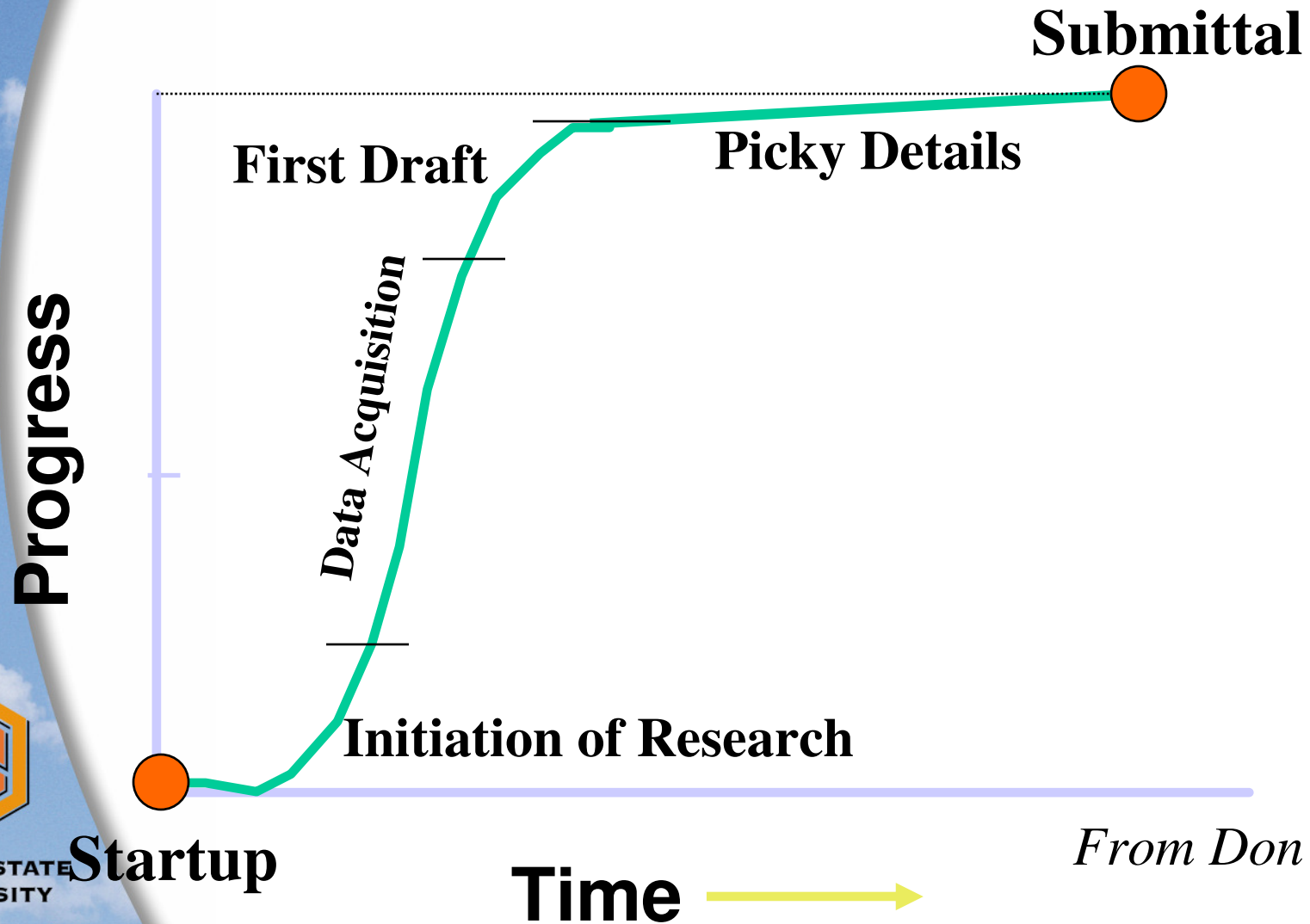
- You can use personal pronouns: "We analyzed for barium.." instead of "Barium was analyzed as part of the study."
- Avoid the following phrases: "We conducted or performed xyz...(Musicians perform and conduct.)".."The xyz experienced..."(Humans experience things, not rivers and so on).



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The Research Breakthrough Curve



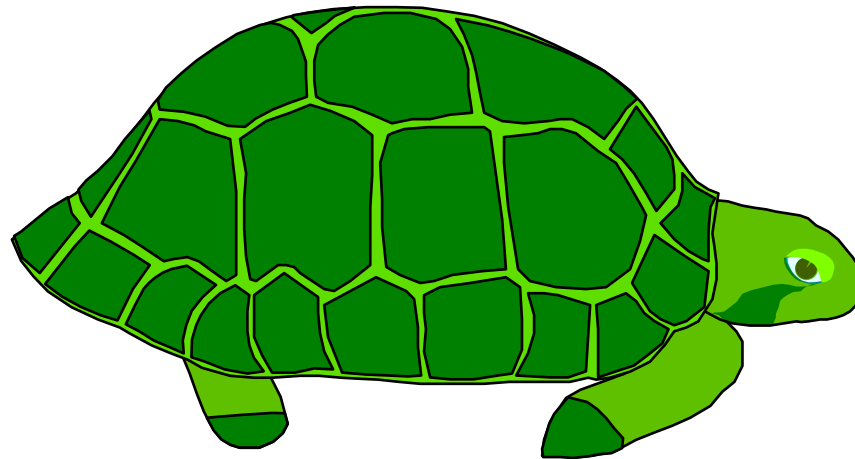
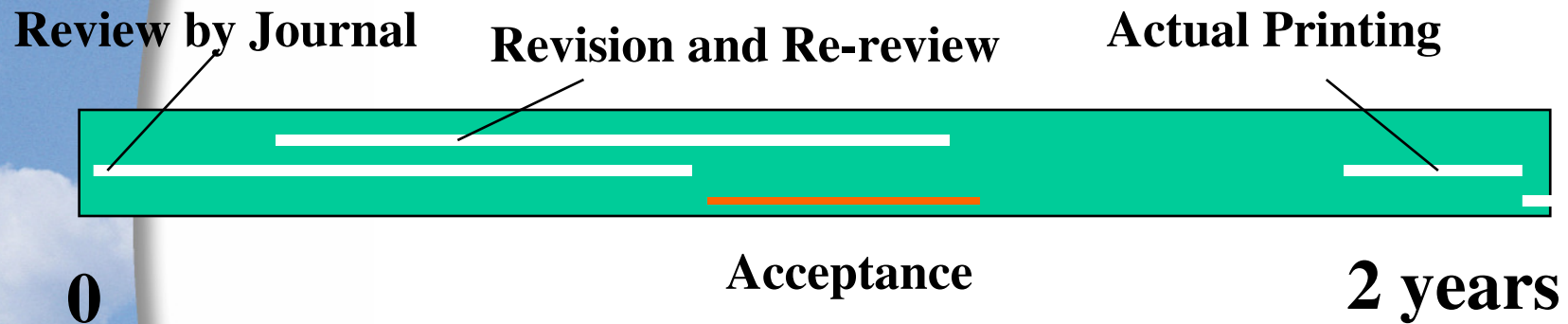
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The Publishing Time-Line After Submittal



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How Hydrology journals work

- WRR
- Journal of Hydrology
- Hydrological Processes



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The Reviewer

- A busy scientist with too many demands on her/his time.
- Will compare yours with the 2 or 3 others that they have been asked to review
- Will read it in 60 min or less
- Will compose her review in less than 30 min



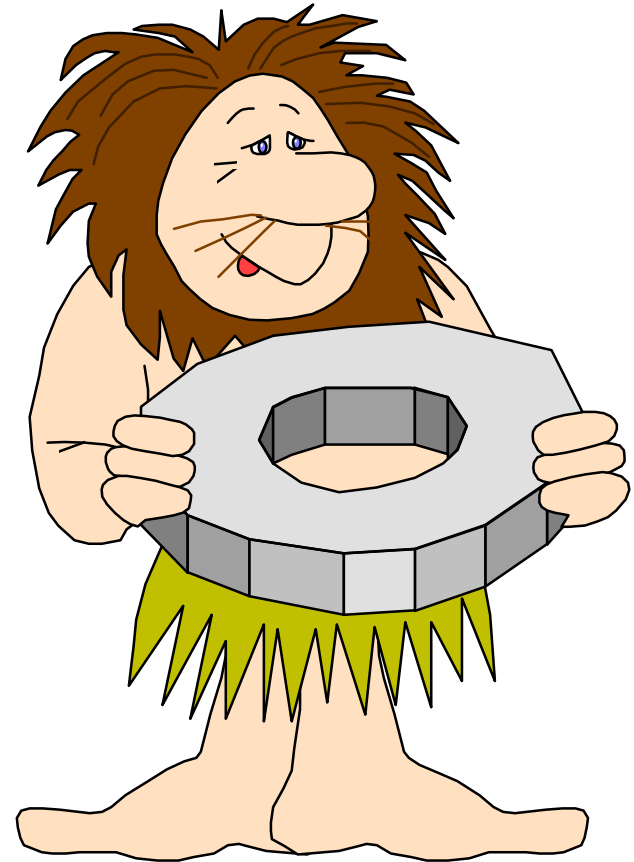
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Therefore, the paper must be extraordinarily well written

The Editor

- Will ALWAYS side with the most critical review



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The Reviews

- **At best, minor revision required**
- **Usually, more major revision**
 - Sometimes a re-review, sometimes a rejection
 - Don't give up!
- **Sometimes outright rejection**
 - Don't give up!
- **Write a polite, appreciative letter back to the editor outlining the changes made**
- **Speed and detail in responding to review comments directly proportional to ultimate acceptance**



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Most of all...

- **Your success in academia will be based mostly on your published record.**
- **It's the only thing that is transferable from University to University.**
- **If rejected—rewrite and resubmit.**
- **Again and again.**



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If you find that a paper/topic just doesn't want to get published

- Try something else
- Don't beat your head against a wall
- There are lots of problems to explore
- Work different angles
- Try another journal

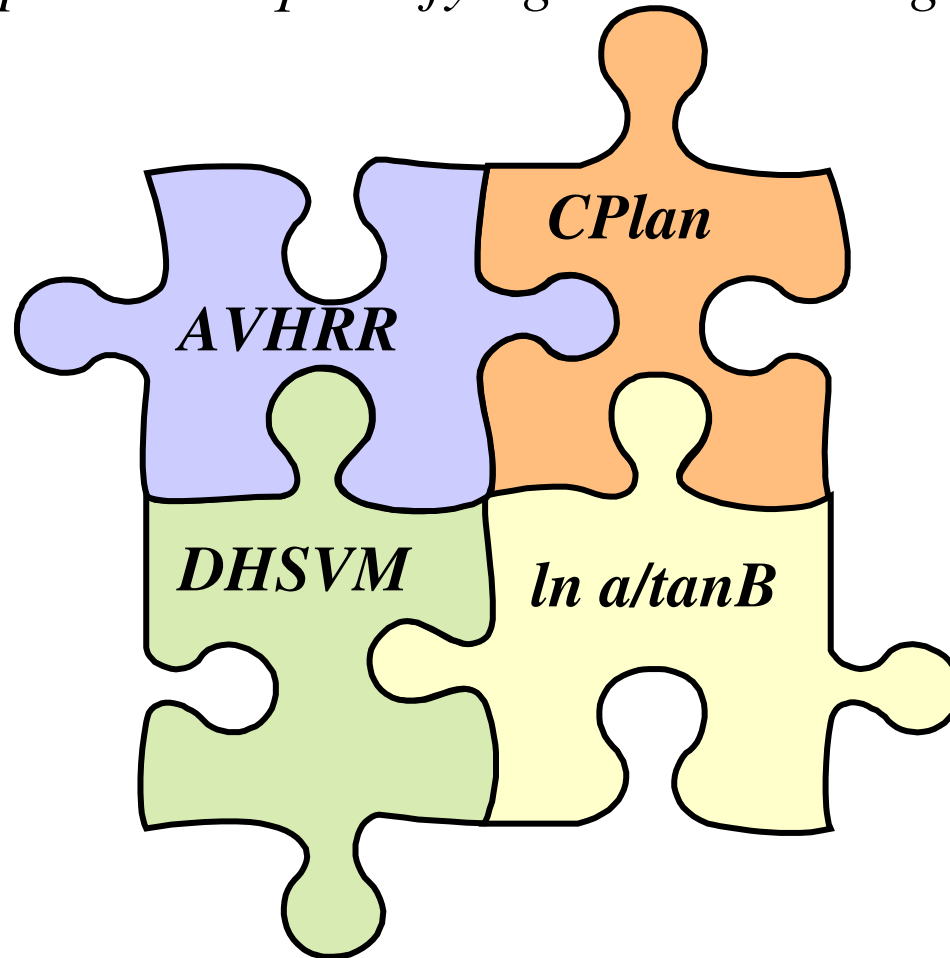


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Bring together sub-fields not yet integrated

A new approach to quantifying landuse change in watersheds

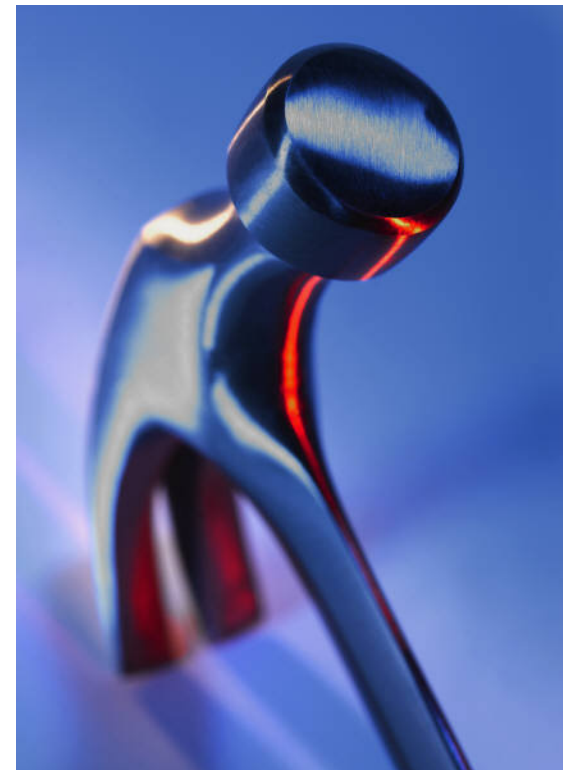


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Propose a new way forward on a problem where field is stuck

- Spectral analysis
- Isotope analysis
- Analytical Hierarchy Model
- Visualization
- New geophysical tool
- Data mining
- Portable weather radar



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Expected Results and Significance

- Demonstrate how you have thought about how your findings will be used
- How findings will influence other fields
- How findings will challenge existing paradigm
- How findings will challenge existing model



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On graduate work and publishing

- Enter all new research with paper clearly in mind Think of your research in paper units
- Develop an outline early and think about the key figures necessary to tell the story
 - This will keep things focused and on track
- Know the literature!
 - To the point where you have read everything related to your sub-topic and eagerly await the next issue of the 5 top journals in your field for any sightings of new papers in your area!
- Do the thesis as a collection of papers
 - PhD, 3 papers; MS 1 paper (expected minimum)
- There is a strong positive correlation between publishing success out of your PhD and long term publication record and research success.
- Submit all the papers before you defend if at all possible
 - You would *not believe* how this will help you afterwards

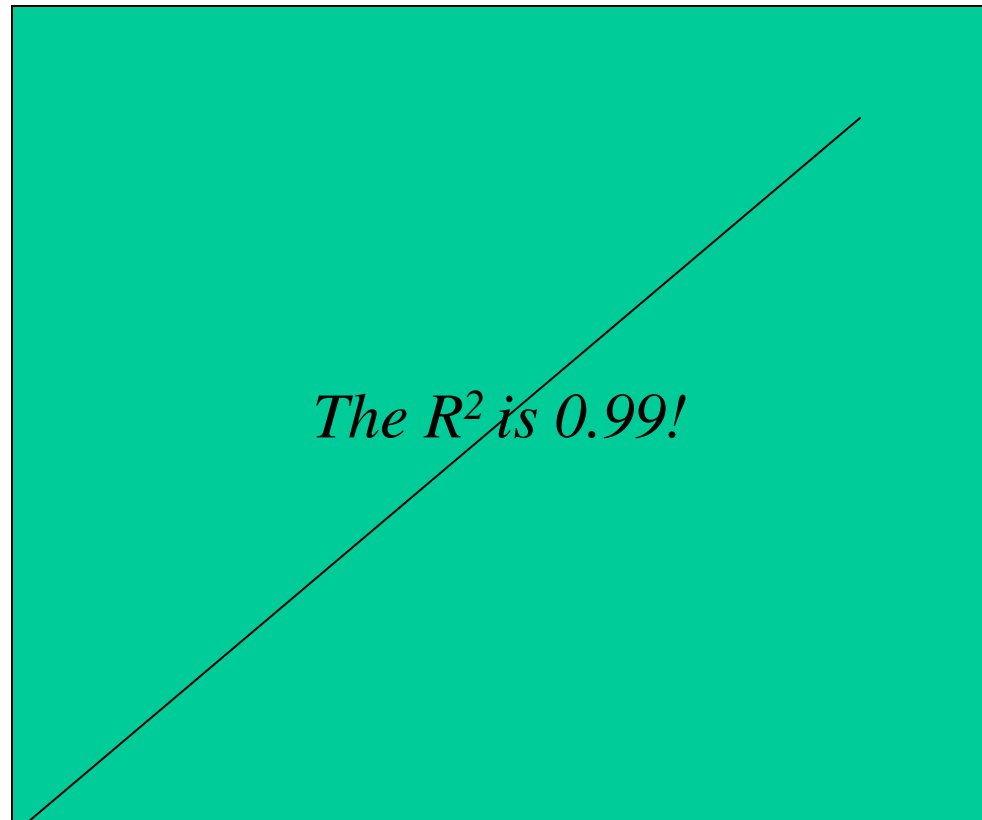


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The reading-publishing connection

Familiarity with literature



*Ease and speed of writing
Impact of paper published
Citeability*



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Conclusions

- Go for it, it's not that bad
- Follow the topdown formula and it will make life much easier
- Practice helps a lot (your 3rd paper from your PhD thesis always has less redmarks than the first)
- Write when you feel inspired—don't force it. In those time, work on graphs, calculations, or something else



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