



The Environmental and  
Engineering Geophysical Society

# Scientific Writing Workshop: How to Publish your Findings

Dale Rucker  
Editor, JEEG

# *Overview of Workshop*

- The inner workings of a scientific journal
- Your role as a scientist
- How to get your work to print
- Structuring your paper
- Where to publish (JEEG, of course!, jk-but it would be nice if you did)

# Journal of Environmental & Engineering Geophysics

March 2007 Volume 12 Issue 1

SPECIAL ISSUE

The Geophysics of Glacial and Frozen Materials

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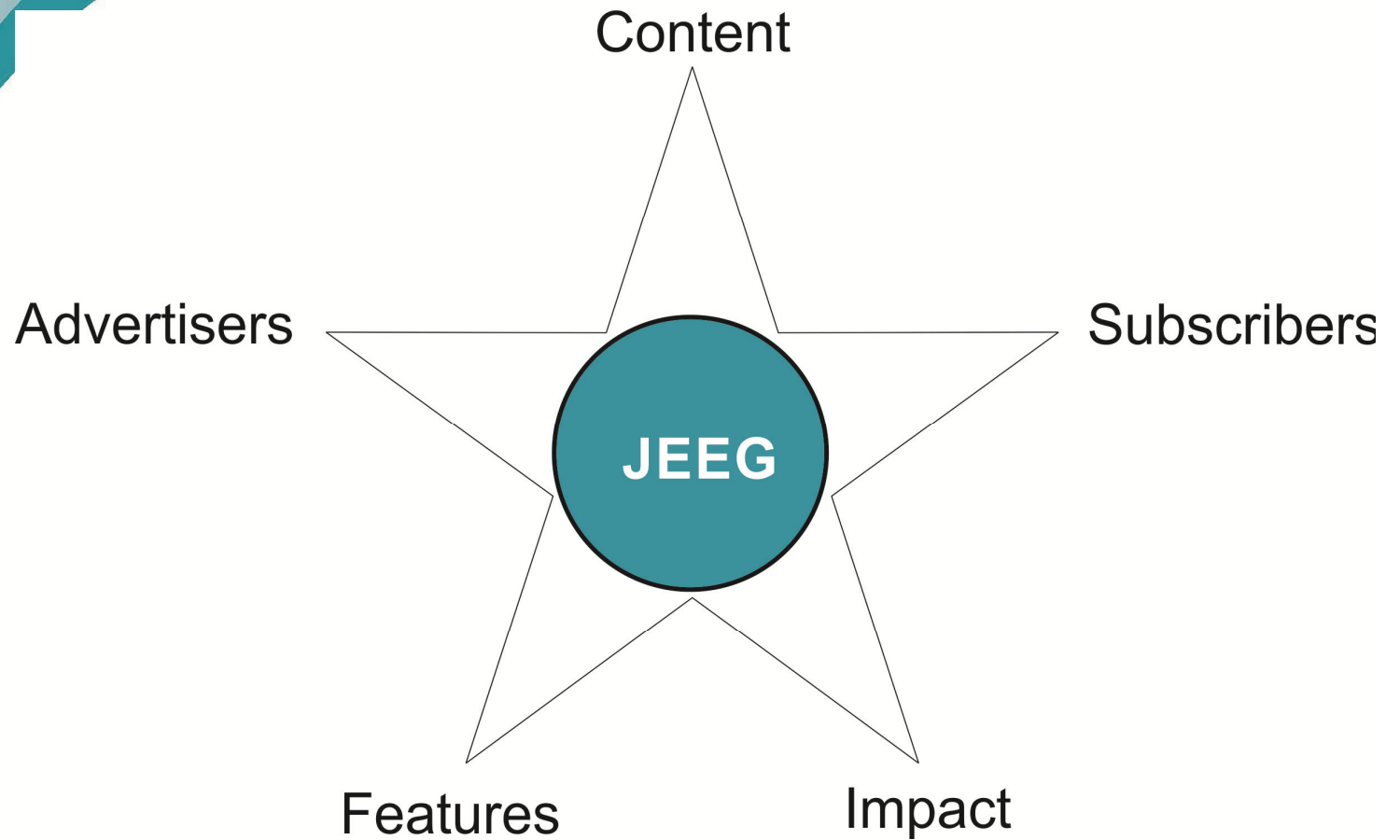
# ***JEEG***

- Published quarterly since 1995
- Papers issued in 2017 are for volume 22
- Some issues are dedicated to special topics (radar, EM, airborne, etc.)
- Two article types:
  - Research article
  - Near Surface Geophysical Letter (NSGL)

# ***JEEG Structure***

- Editor-in-Chief = Dale Rucker, PhD
- 14 Associate Editors
- Manuscript submission and printing through Allen Press ([jeeg.allentrack.net](http://jeeg.allentrack.net))
- Major support from Jackie Jacoby
- Articles available for download through
  - SEG
  - Geoscience World

# ***What makes a journal?***



# *Rich Content*

- A specific type of content (submissions) gives a journal purpose
- I rely on high quality submissions from you
- From all of the submissions, I have to choose which ones to print
- Last year (2016) I received 79 submissions.
  - I rejected 21 without review.
  - 17 were incomplete.
  - 20 papers were printed (overlap between 2014, 2015, and 2016)

# *Subscribers/Readers*

- We print content for you.
  - To allow you to keep up with the latest research
  - To help with your own research
  - For inspiration and validation
  - For criticism and debate
- If you don't like what you see, let us know.



# *Advertisers*

- Publishing costs money and we rely on advertisers to offset some of those costs
- AllenPress charges between \$50-100 / copy depending on the number of color figures
- We print 100 copies per run

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at [www.mountsopris.com](http://www.mountsopris.com)

# *Features*

- The nice little things that make publishing richer
- Features to the JEEG
  - Free to publish (for grayscale figures)
  - Optional article types (full research, NSGL)
  - Online distribution
  - Lenient attitude towards sharing content
- A few initiatives I have taken in the last year:
  - Best Paper Award
  - Resources on the EEGS website
  - Google Earth Spatial Database
  - Outreach (this workshop, weekly blog on ResearchGate, personal emails, etc.)

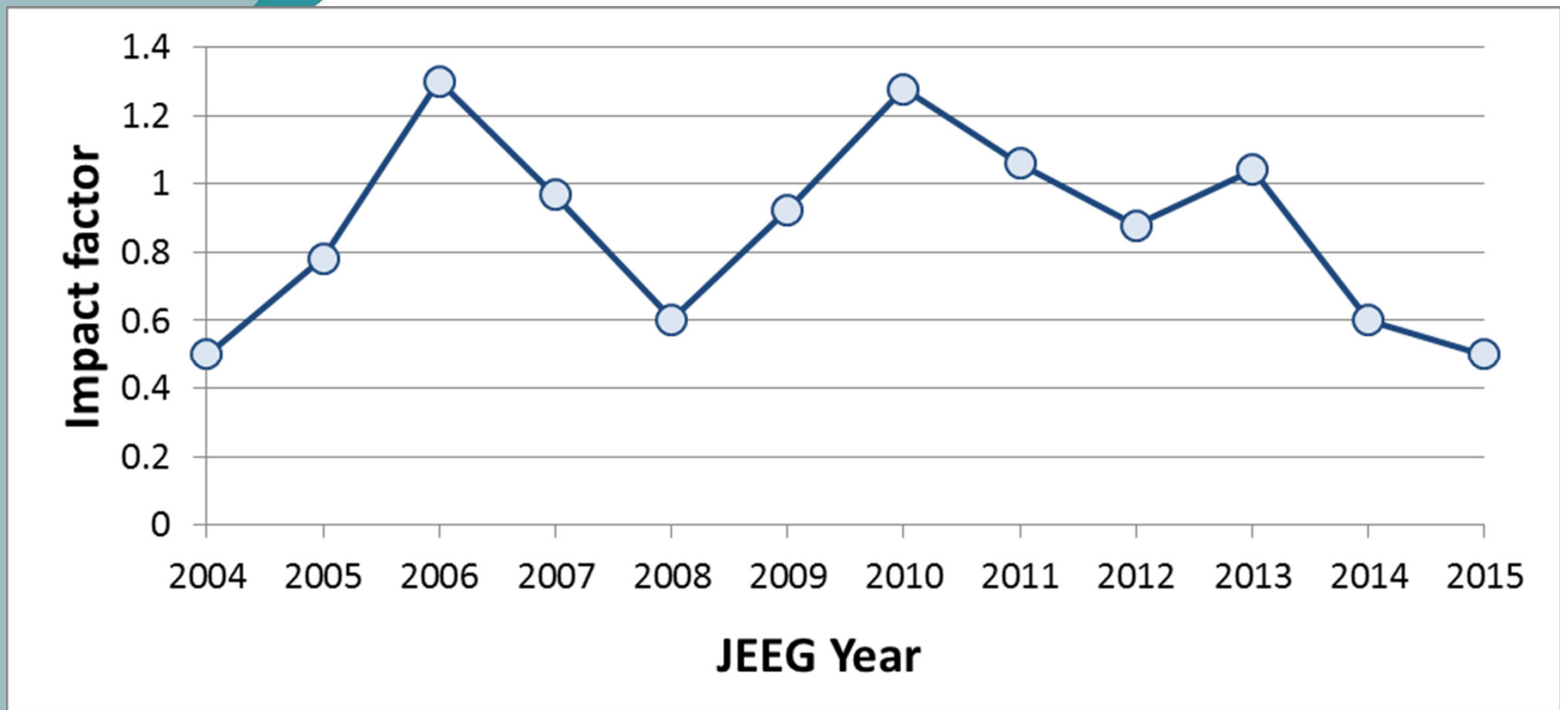
# ***Impact***

- The impact factor is a quantitative measure for ranking journals
- It is often used by authors to help decide where to publish
- The Impact Factor is calculated by dividing the number of citations in the JCR year by the total number of articles published in the two previous years.

# Impact

Rank	Title	H index	Total Docs. (2015)	Total Docs. (3years)	Total Refs.	Total Cites (3years)	Citable Docs. (3years)	Cites / Doc. (2years)	Ref. / Doc.
1	Reviews of Geophysics	107	31	65	7005	857	58	12.42	225.97
2	Geophysical Research Letters	185	1493	3334	51508	13613	3227	4.06	34.5
3	Surveys in Geophysics	47	36	155	2116	532	146	3.41	58.78
4	Journal of Geophysical Research	263	3806	8639	160949	28504	8426	3.16	42.29
5	Geochemistry, Geophysics, Geosystems	91	371	921	20304	2808	898	2.94	54.73
6	Geophysical Journal International	119	315	1477	16461	3461	1438	2.28	52.26
7	Geophysical Prospecting	51	128	316	3430	575	312	1.84	26.8
8	Geophysics	108	297	1075	10254	2007	1040	1.64	34.53
9	Journal of Applied Geophysics	57	247	585	8691	922	571	1.5	35.19
10	Nonlinear Processes in Geophysics	44	53	227	2318	344	223	1.5	43.74
11	Near Surface Geophysics	23	55	185	1952	254	178	1.38	35.49
12	Acta Geophysica Sinica	38	394	945	14370	1174	945	1.3	36.47
13	Pure and Applied Geophysics	61	181	516	8598	605	504	1.2	47.5
14	Russian Geology and Geophysics	24	126	355	6730	396	350	1.13	53.41
15	Applied Geophysics	13	60	150	1465	147	150	1.07	24.42
16	Journal of Geophysics and Engineering	21	93	259	2918	234	254	0.85	31.38
17	Exploration Geophysics	12	44	95	1109	80	93	0.85	25.2
18	Acta Geophysica	21	69	268	2280	250	252	0.79	33.04
19	Annals of Geophysics	35	63	301	2360	334	289	0.68	37.46
20	Journal of Environmental and Engineering Geophysics	23	19	40	585	24	37	0.5	30.79
21	First Break	27	60	317	532	157	313	0.44	8.87
22	Geophysica	16	4	16	142	10	15	0.44	35.5
23	International Journal of Geophysics	8	12	127	353	82	119	0.39	29.42
24	Geofisica International	20	23	91	763	33	91	0.32	33.17

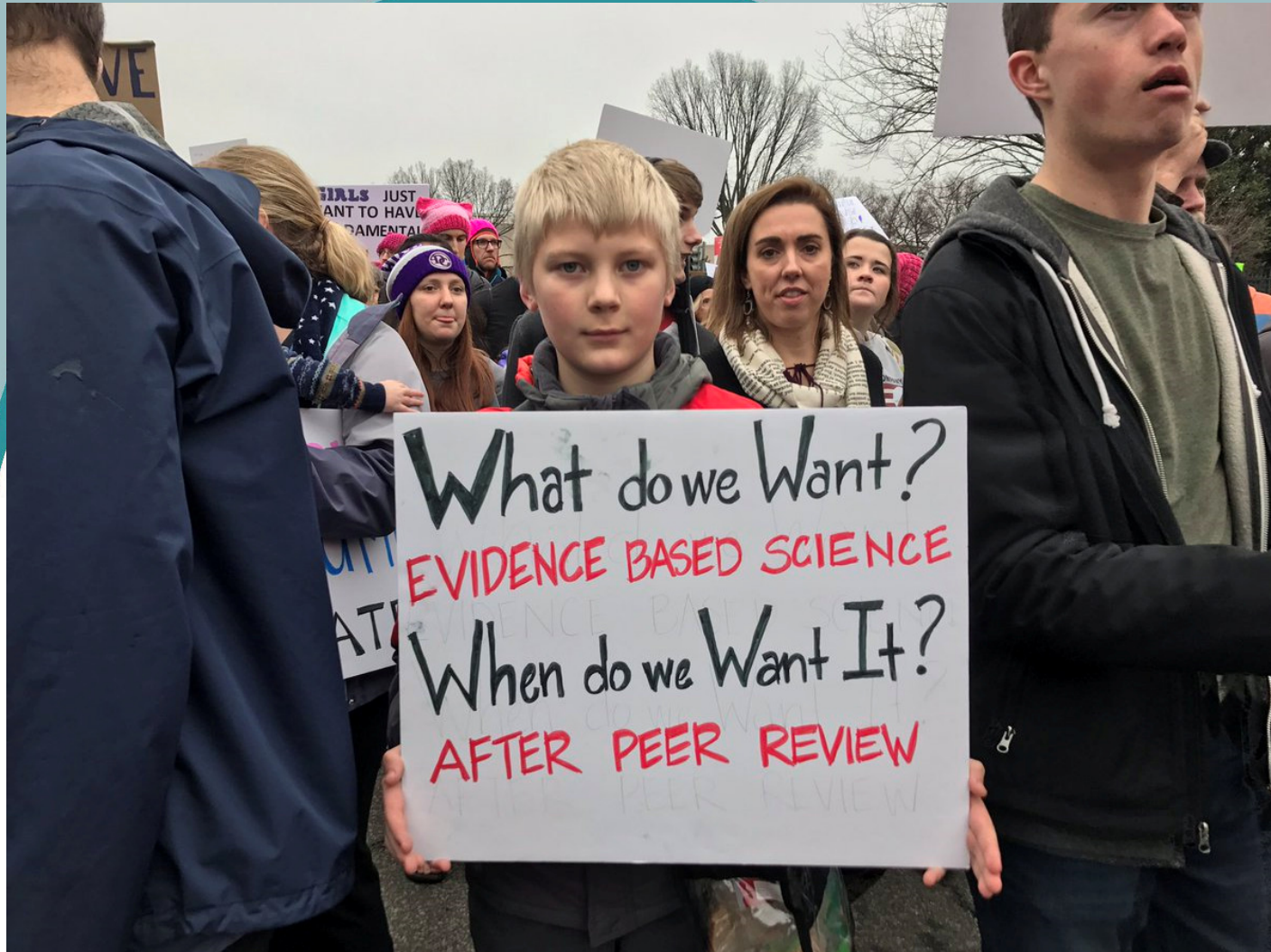
# *Journal Stats – Impact factor*



# ***Your submission to JEEG***

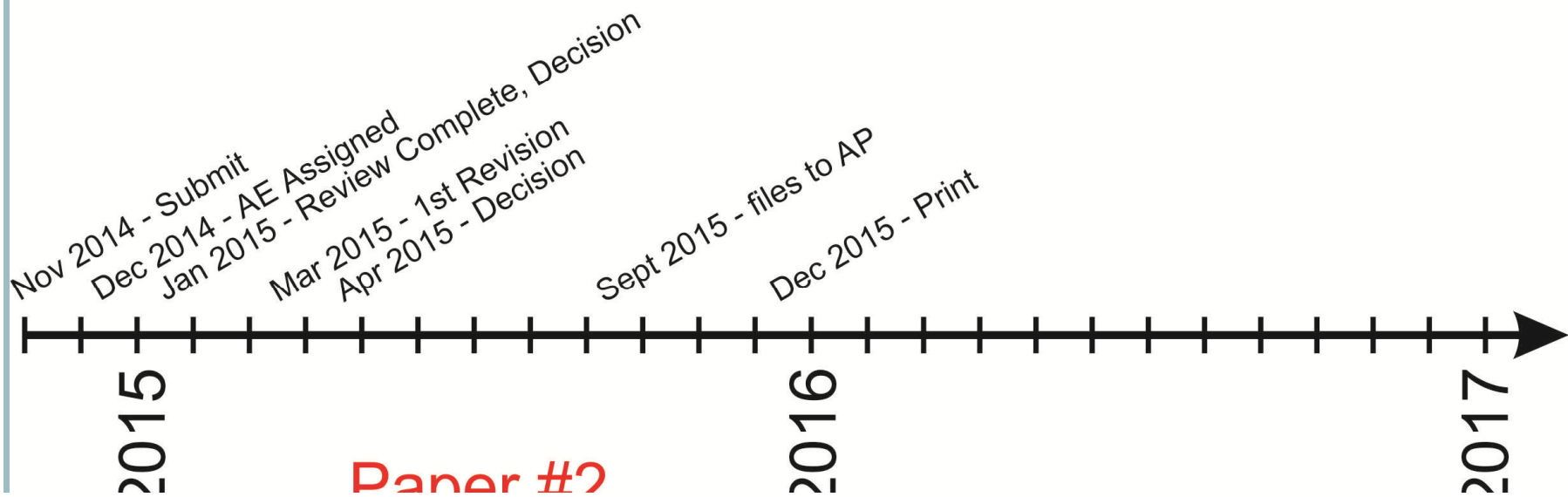
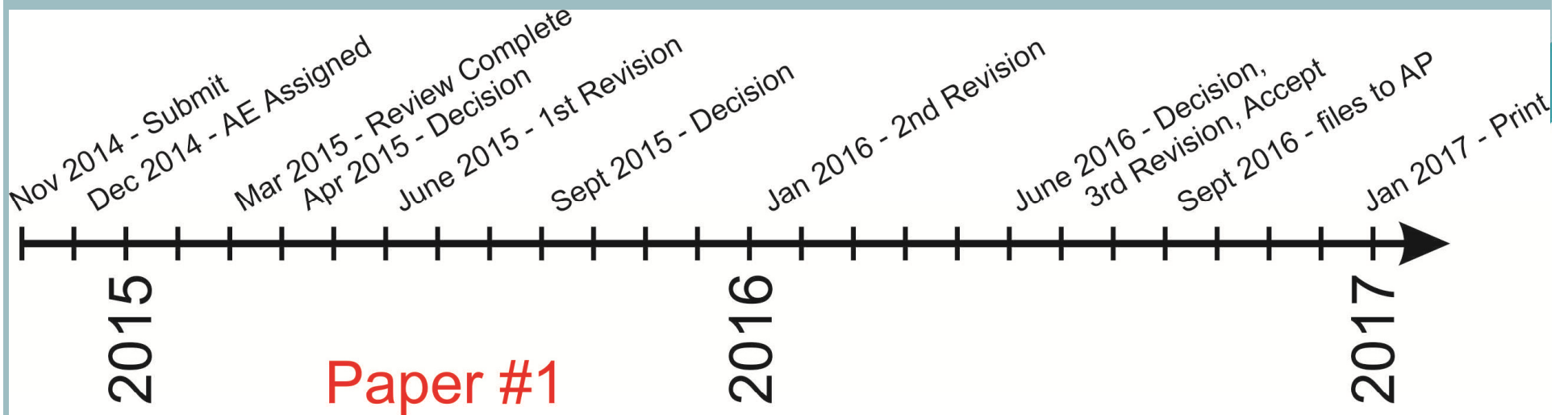
- Once a submission is received, I assign it to a volunteer associate editor
- They then assign reviewers
- Comments and recommendations are then given to the authors to improve their submission
- The cycle repeats until I am satisfied that it meets the journal's standards
- The cycle time can vary between months to a couple of years

# *From Women's March – Jan 21*

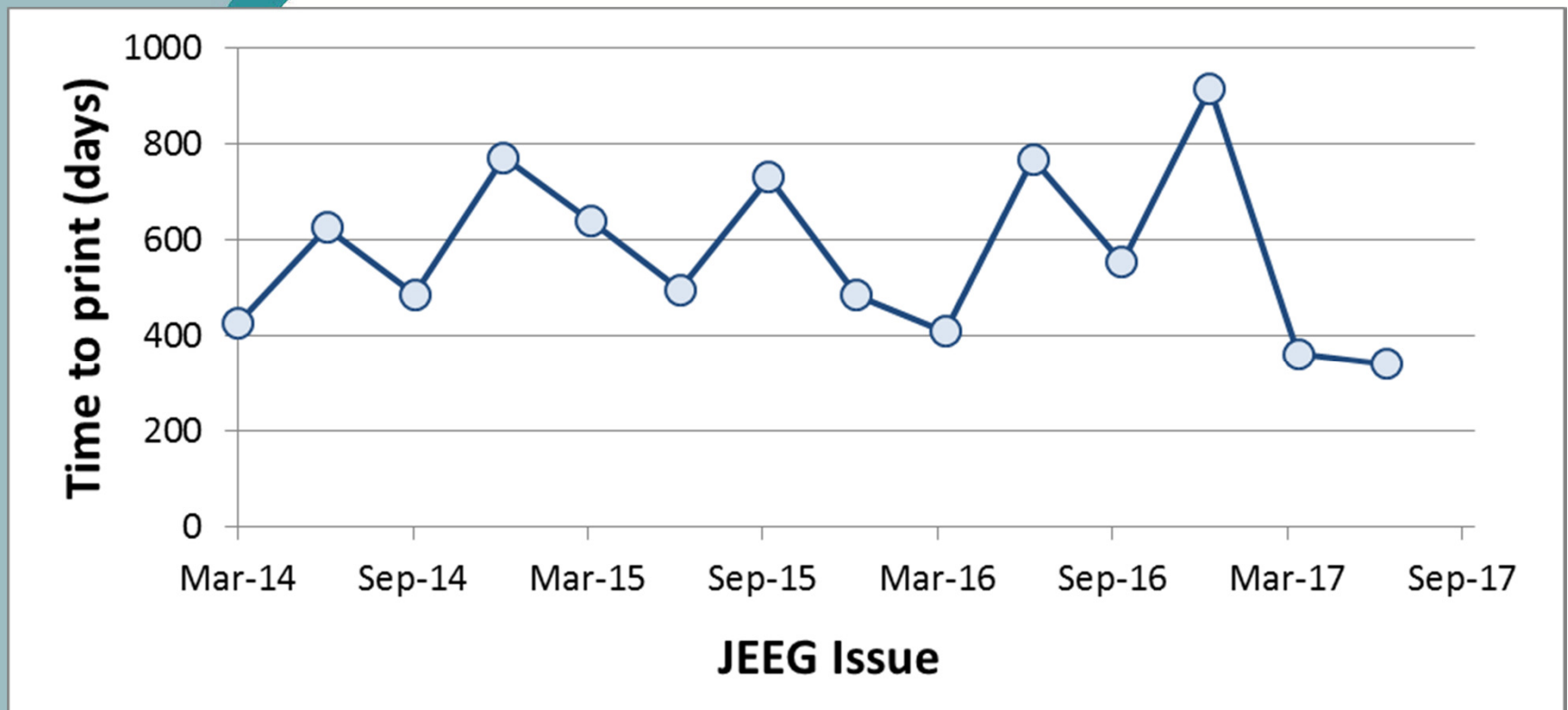




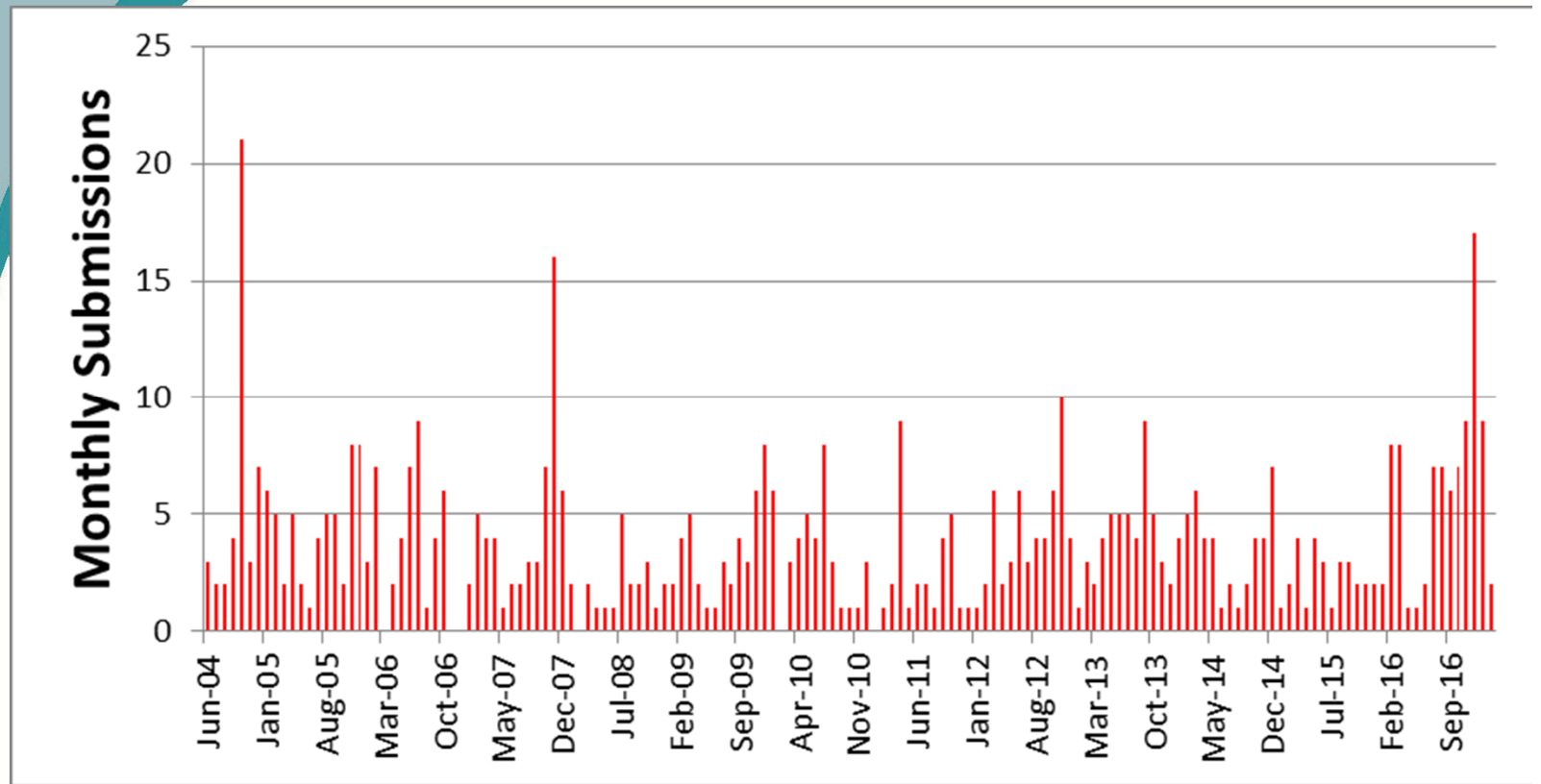
# Time Line for 2 Papers



# *Journal Stats – Average time to print for each JEEG issue*



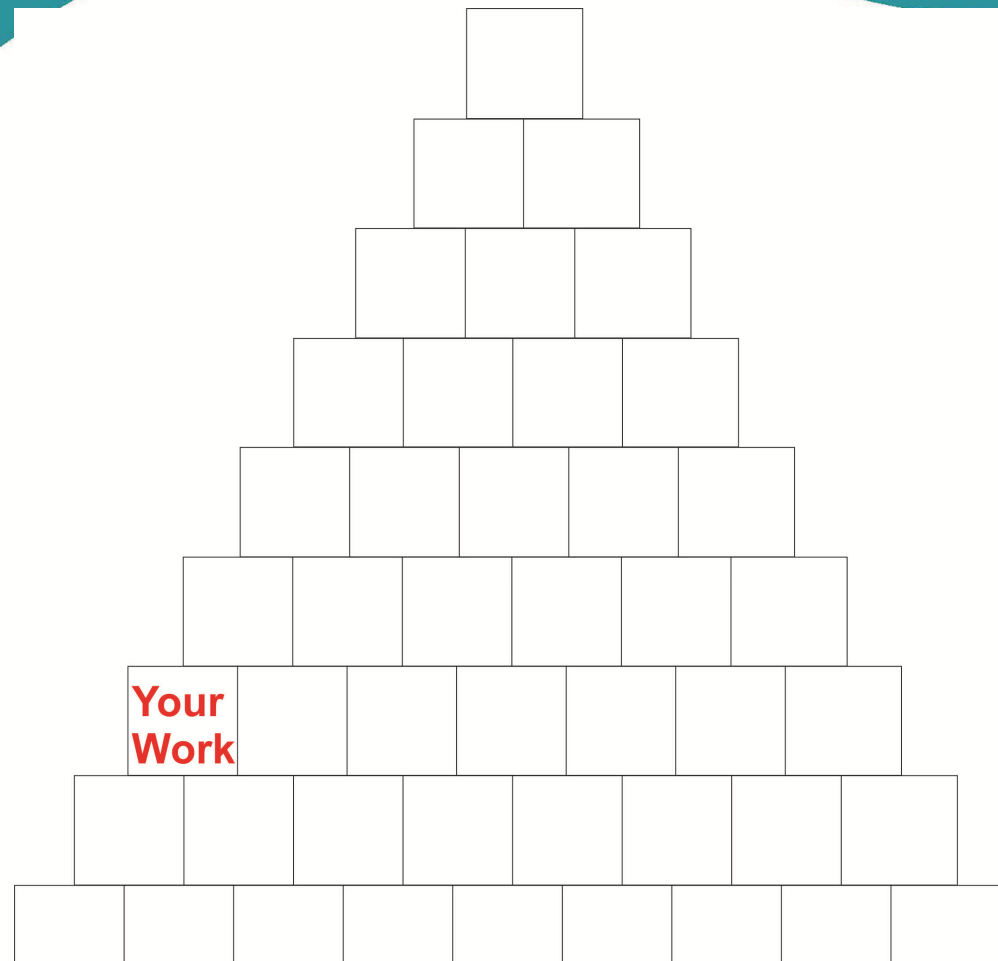
# *Journal Stats – Submissions*



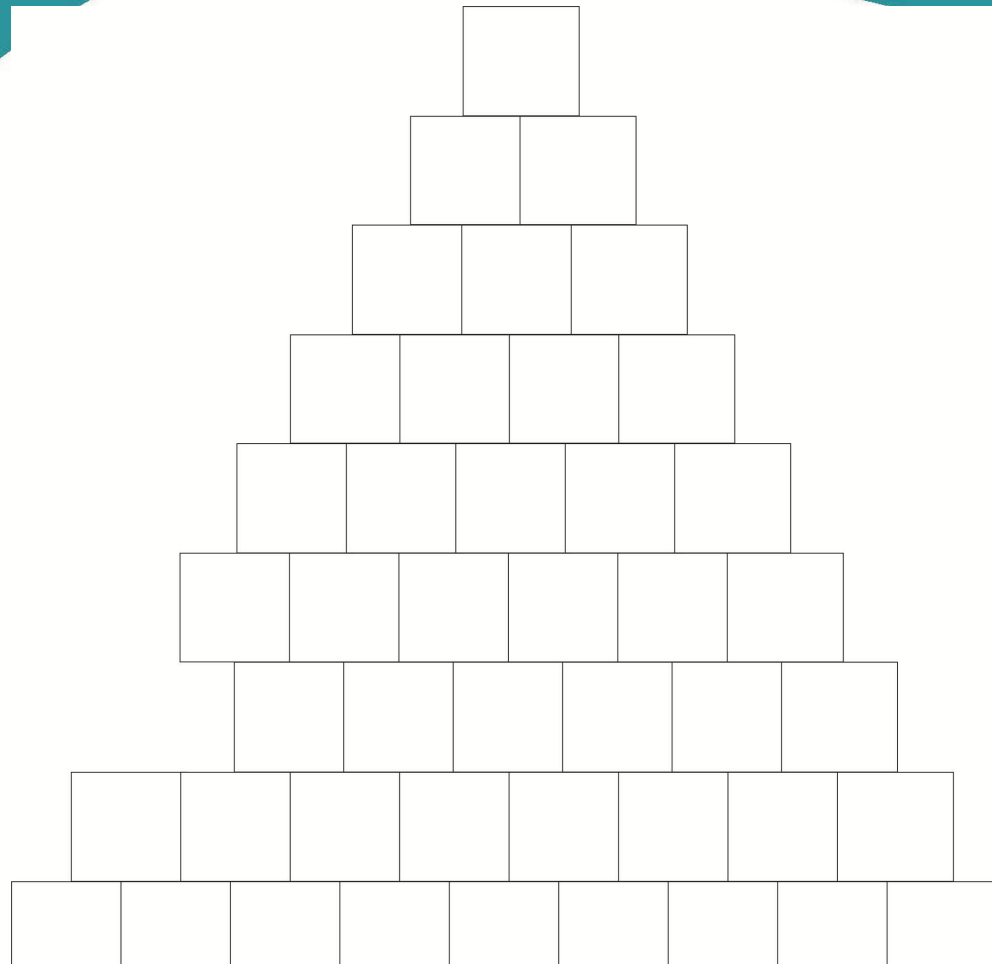
# *Where do you fit in?*

- Everyone in this room is a scientist with an ongoing or past project
- Geophysics is most often a scientific endeavor
- Everyone ~~could~~ needs to learn from your approach
- Your work + JEEG = publication
- In some instances, publication is compulsory

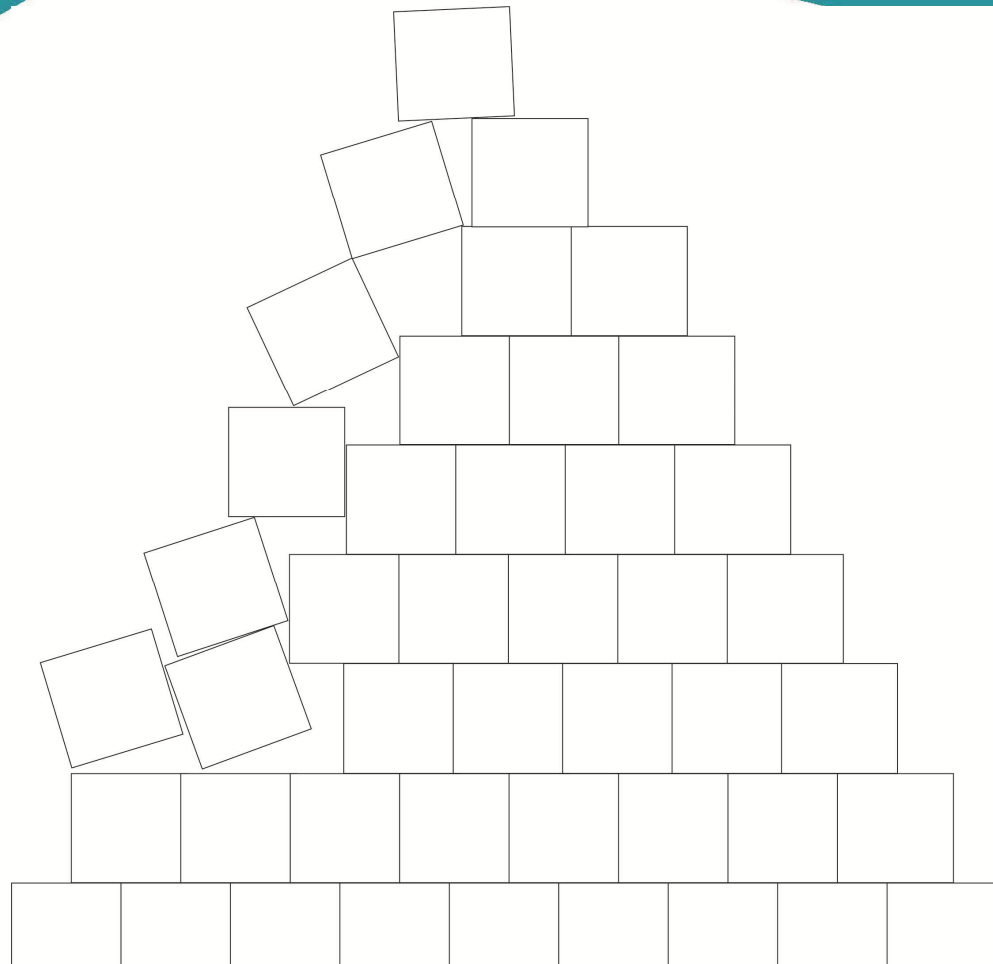
# ***Scientific Contributions***



# ***Scientific Contributions***



# ***Scientific Contributions***



# ***How to write your paper***

- The idea of writing may appear daunting to novice writers
- Writing is a skill that requires training and practice
- There are resources available to help
- Fortunately, writing a scientific article is formulaic, so all you need is content



# ***What get's a paper published?***

- Novelty
- It's well written
- Clear objectives
- Interesting results

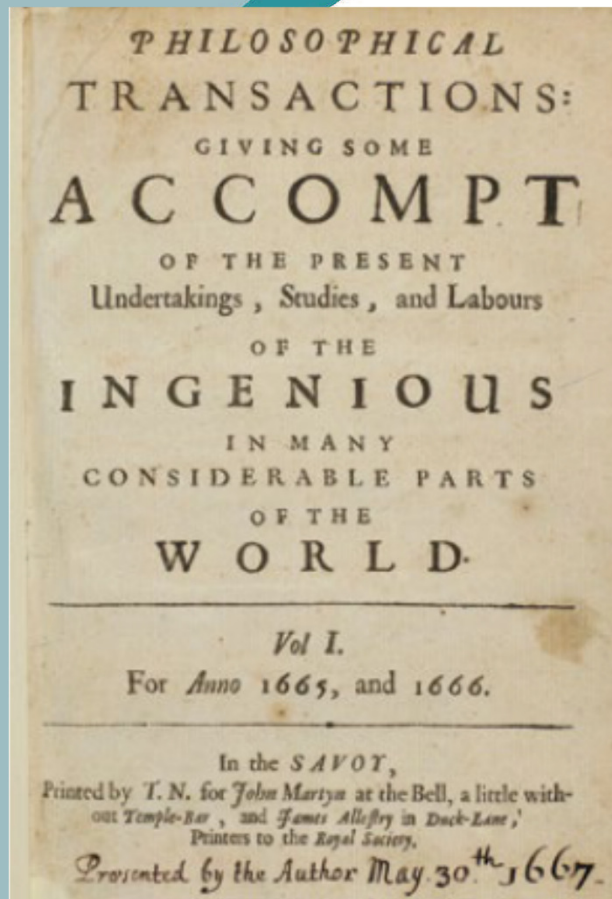
# *IMRaD*

- Many journals expect scientific research papers to be written in the traditional format, which is often known as the IMRaD format (Introduction, Materials/methods, Results, and Discussion).
- Other sections can also be included to add richness (e.g., theory, location, etc.)

# *What's in a paper?*

- A coherent title
- A concise abstract
- An enthusiastic introduction
- An descriptive methodology
- Groundbreaking results
- An informative discussion
- A succinct set of conclusions
- Historical context through references

# A Paper's Structure



- 350 years ago, the Royal Society published the first scientific philosophical transactions and proceedings
- Two main issues that plagued the journal:
  - Referees
  - Profitability

# *Tips for a Title*

- Most search engines use title, abstract, and keywords to find papers
- Condenses the paper's content in a few words that captures the readers' attention.

Good: Automated monitoring of coastal aquifers with electrical resistivity tomography

Needs Improvement: Characterization of crystalline basement aquifers with MRS: comparison with boreholes and pumping tests data in Burkina Faso

## *Example from My Latest Work*

- I conducted 3D IP in my back yard.
- I got some interesting results, so I'll try to share with the community
- Title: **Three-dimensional time-domain induced polarization of a desert aridisol for septic design**

# *Abstracts*

- An abstract should work like a marketing tool. It should help the reader decide whether there is something in the body of the paper worth reading by providing a quick and accurate summary of the entire paper
- Write it last!
- Make sure that the abstract is self-contained and does not include the following:
  - Information not present in the paper
  - Figures and tables
  - Abbreviations
  - Literature review or reference citations
- Detailed help can be found:  
<http://www.editage.com/insights/how-to-write-an-effective-title-and-abstract-and-choose-appropriate-keywords>

# ***Introduction***

- The introduction is where you can identify the **novelty**
- Elements of an Introduction
  - Set the stage for the general problem
  - What has been done to solve this problem
  - What has not been done to solve this problem / what are the deficiencies
  - **Objectives** that tackle the deficiencies



# *Novelty*

- Science is about advancement of ideas – not rehashing stale ones
- Establishing novelty is how you show that your idea is unique and not been published
- Some work is obviously novel (new methods, new theory, new equipment)
- Case studies are the most difficult to establish novelty

# *Back to My Example*

- 3D IP of my backyard - how can I set the stage for novelty
  - Field IP of a desert soil
  - My backyard has both caliche and a paleochannel with clays
  - I am going to start a construction project, which earthwork will take place

# *Objectives*

- Specific statements indicating the key issues to be focused on in a manuscript.
- Usually a manuscript will have several specific research objectives
- Objectives are usually headed by infinitive verbs such as:

• To identify	• To determine	• To compare
• To establish	• To estimate	• To analyze
• To describe	• To develop	• To collect

# Objectives from My Example

- **The specific objective of this work was to demonstrate the use of the electrical resistivity and IP methods in order to site a residential septic leach field in the desert southwestern United States.** The electrical data were collected with a low powered resistivity system using a multi-core unshielded cable. The data acquisition included eight parallel lines, with many of the lines in full three dimensional acquisition mode. **Another side objective of the work was to evaluate optimal operating parameters for geophysical data acquisition by testing array types, window lengths, and electrode polarization and charge-up effects during transmitting and receiving of electrical signals.** The soil conditions at the site were formally investigated with test pits and informally through other construction activities. The geophysical dataset helped narrow the placement of the leach field, which showed that moderate resistivity and low chargeability values were best for meeting the requirements for drainage.

# Methodology

- Whereas the introduction sets the stage for **WHY**, the methodology says **HOW**
- It is a clear and concise description of your work flow (can others replicate it?)
- Also include how the results were analyzed
- Most often in past tense
- Figures help aid the description

# *Results*

- Personally, I start a paper with results
  - I have figures
  - A loose understanding of what they mean
  - Relative importance to others' works
  - But, I need to write it up formally after I have the context of other sections I have written

# *Results*

- Do not include all of your results, only those that address your objective
- Determine how best to present the results (written, figure, or table)
- Describe results clearly, and without being redundant.

# *Figures*

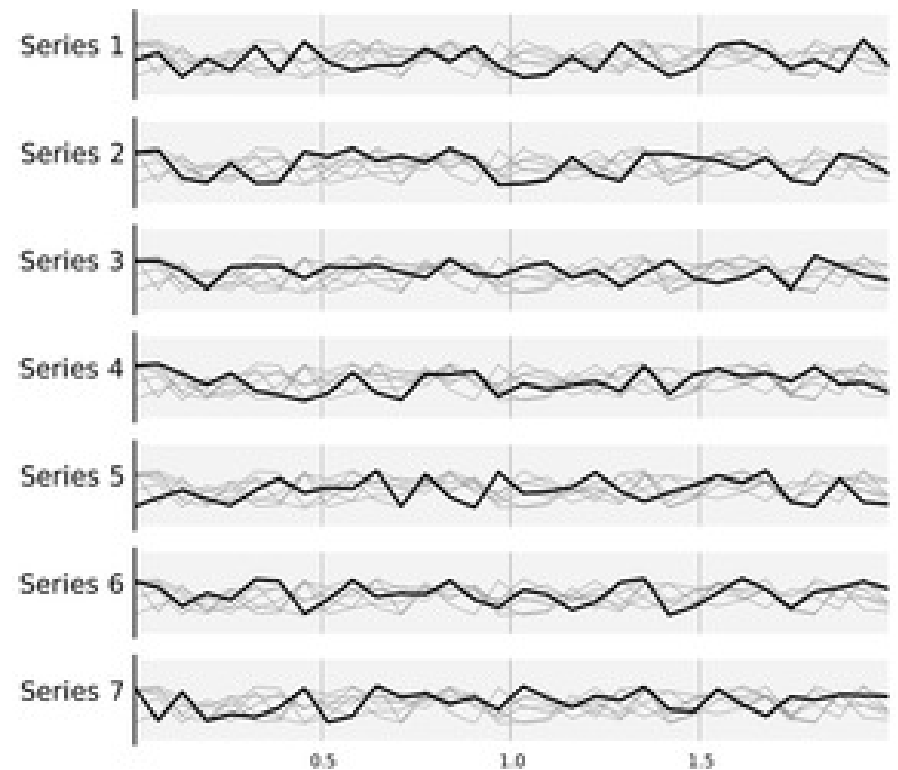
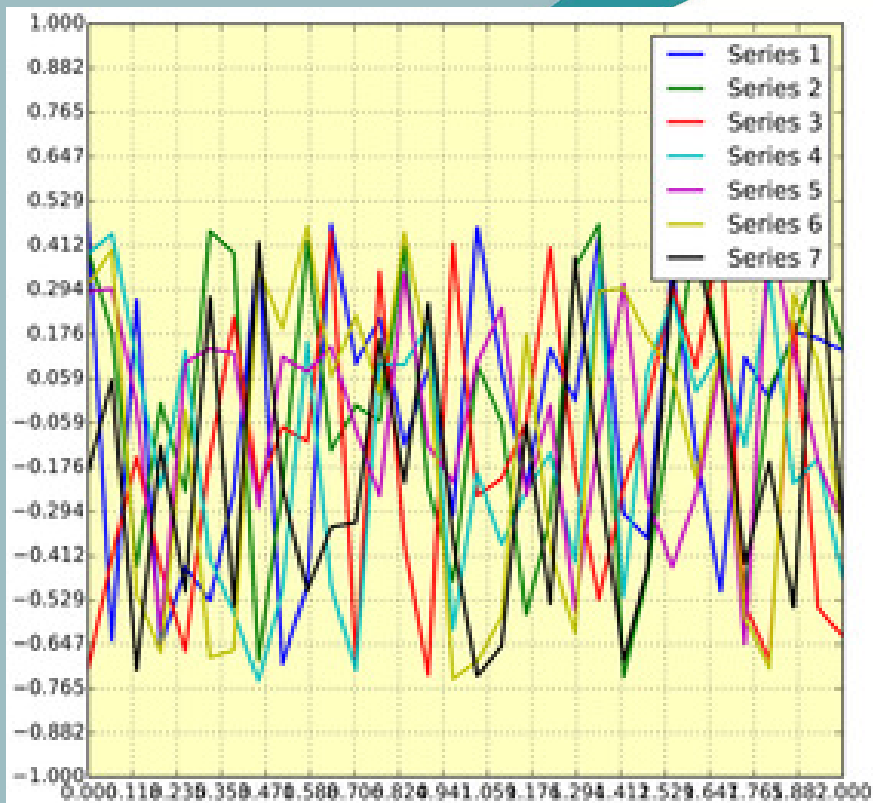
- The results section is likely where you will have most of the figures
- Creating effective graphics is an art form, so let your inner artist take over
- Make sure the figures are clear, readable, include scales and legends
- Not all figures need color. Use color effectively (e.g., for highlighting).
- Annotate



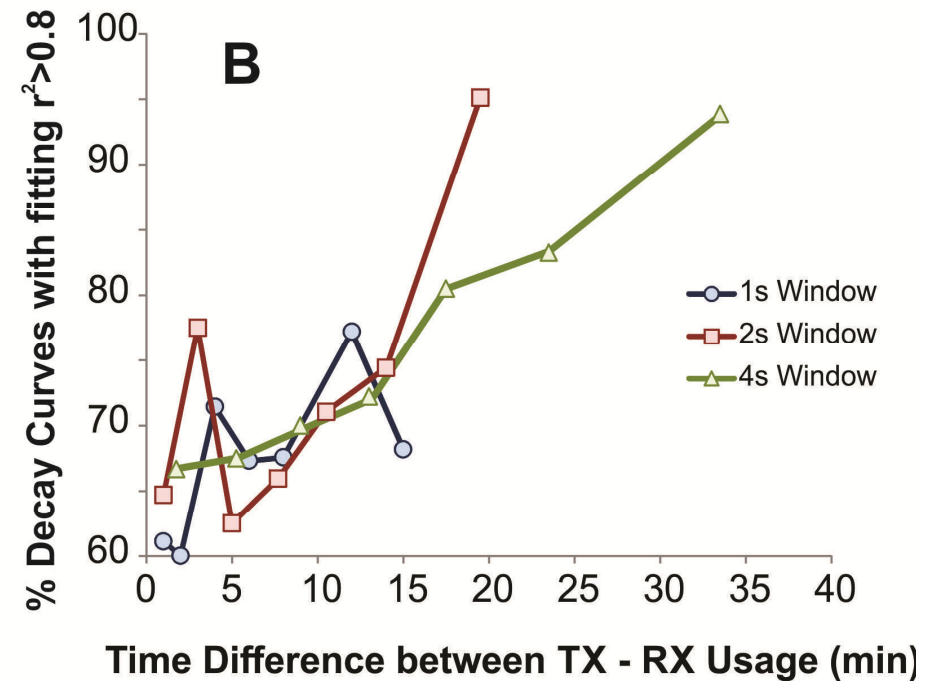
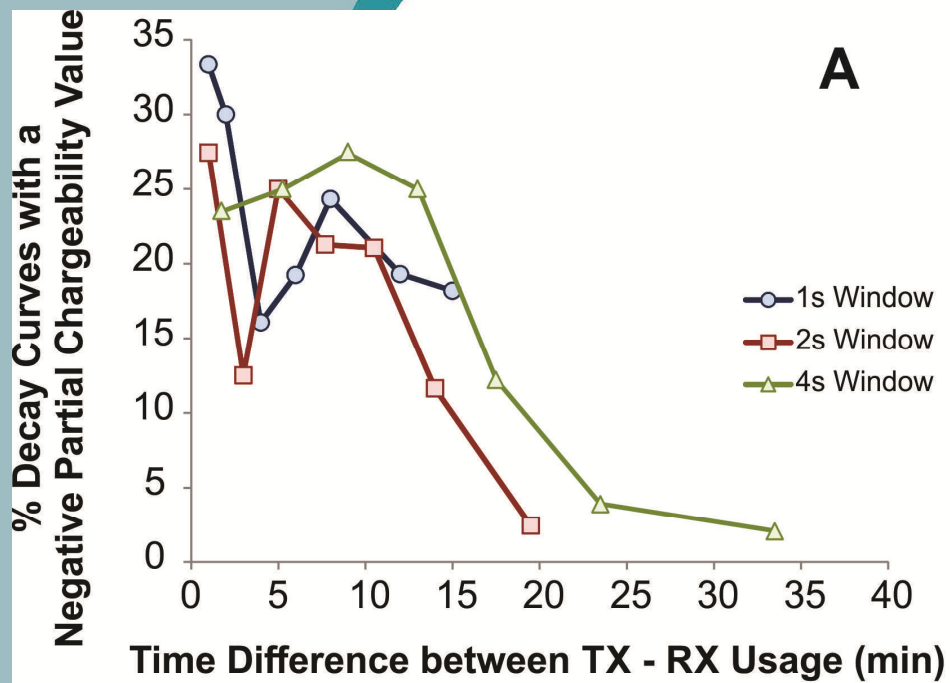
# *Figures*

- Figures should be stand alone products
- Figure captions: there is a balance
- Other considerations
  - Don't use program defaults
  - Tick marks (size, number)
  - Line thickness
  - Figure resolution (300 dpi or greater)
  - Font size
  - Don't use figures from equipment or manufacturer's software. Replot data
  - Avoid dark backgrounds

# Figures - Example



# From My Paper



# *Discussion*

- **This section is often considered the most important part of your research paper:**
- Most effectively demonstrates your ability to think critically, to develop creative solutions to problems, and to formulate a deeper understanding of problem.
- Present the underlying meaning of your research, note possible implications in other areas of study, and explore possible improvements.
- Highlight the importance of your study and how it may be able to contribute to and/or help fill existing gaps in the field.
- Engage the reader in thinking critically about issues based upon an evidence-based interpretation of findings; it is not governed strictly by objective reporting of information.

# *Conclusions*

- Restate the topic. You should briefly restate the topic as well as explaining why it is important.
- Briefly summarize your main points from results and discussion.
- Do not introduce new points
- No figures or tables
- Tie your research paper together by directly linking your introduction with your conclusion

# *References and Citations*

- Give credit where credit is due
- I like to see lots of references
- Make sure they fit the journal's format
- Use newer references where possible
- Avoid seminal work from the 1800s (e.g., Maxwell, Darcy, etc.)

# *Last thoughts on building a paper*

- Include co-authors (they can take some of the writing responsibility)
- Be open to critique, especially during review process
- Be quick with revisions
- Make sure the manuscript is written well
- Format the paper according to the journal's style

# *Other features and duties of an author*

- Accept reviewer responsibilities
  - On the JEEG website is a page for reviewers
  - Consider that every article you submit is reviewed on average 6 times
- Use online tools and sites for imaginary internet points
  - ResearchGate
  - Publons
- Keep track of your author score, i.e., Impact
  - H Factor (Google Scholar, Scopus, Web of Science)



# Google Scholar

The screenshot displays a Google Scholar profile for Dale Rucker. The profile includes a profile picture, a bio, and a list of publications. The publications list shows titles, authors, journal names, and citation counts. To the right of the publications list, there are sections for 'Citation indices' (showing Citations, h-index, and i10-index) and a bar chart showing the number of citations per year from 2009 to 2017. Below the bar chart is a section for 'Add co-authors' with a list of names and plus-minus icons. At the bottom right, there is a section for 'Co-authors' with an 'Edit...' link and a note that there are no co-authors.

**Dale Rucker**  
hydrogeophysics  
geophysics, hydrology  
Verified email at hgjworld.com - Homepage  
My profile is public

**Google Scholar**

Citation indices	All	Since 2012
Citations	913	564
h-index	15	11
i10-index	23	11

Year	Citations
2009	1
2010	2
2011	3
2012	4
2013	5
2014	6
2015	7
2016	8
2017	9

Title	Authors	Cited by	Year
Recent developments in the direct-current geoelectrical imaging method	MH Loke, JE Chambers, DF Rucker, O Kuras, PB Wilkinson	182	2013
Environmental studies with the sensor web: Principles and practice	KA Delin, SP Jackson, DW Johnson, SC Burleigh, RR Woodrow, ...	103	2005
Parameter estimation for soil hydraulic properties using zero-offset borehole radar	DF Rucker, T Ferré	45	2004
Three-dimensional electrical resistivity model of a nuclear waste disposal site	DF Rucker, MT Levitt, WJ Greenwood	42	2009
Electrical-resistivity characterization of an industrial site using long electrodes	DF Rucker, MH Loke, MT Levitt, GE Noonan	40	2010
Near-surface water content estimation with borehole ground penetrating radar using critically refracted waves	DF Rucker, T Ferré	34	2003
Environmental monitoring of leaks using time-lapsed long electrode electrical resistivity	DF Rucker, JB Fink, MH Loke	32	2011
Electrical resistivity in support of geological mapping along the Panama Canal	DF Rucker, GE Noonan, WJ Greenwood	32	2011
Correcting water content measurement errors associated with critically			

**Add co-authors**

- Ty Ferre + -
- Victor R. Baker + -
- James B Fink + -
- Jonathan E. Chambers + -
- Oliver Kuras + -
- Mark Sweeney + -
- Torleif Dahlin + -
- steve chien + -
- James Callegary + -
- Anderson Ward + -

**Co-authors** Edit...  
No co-authors