

Proposal Writing ~ Creating Your Own Adventure.....

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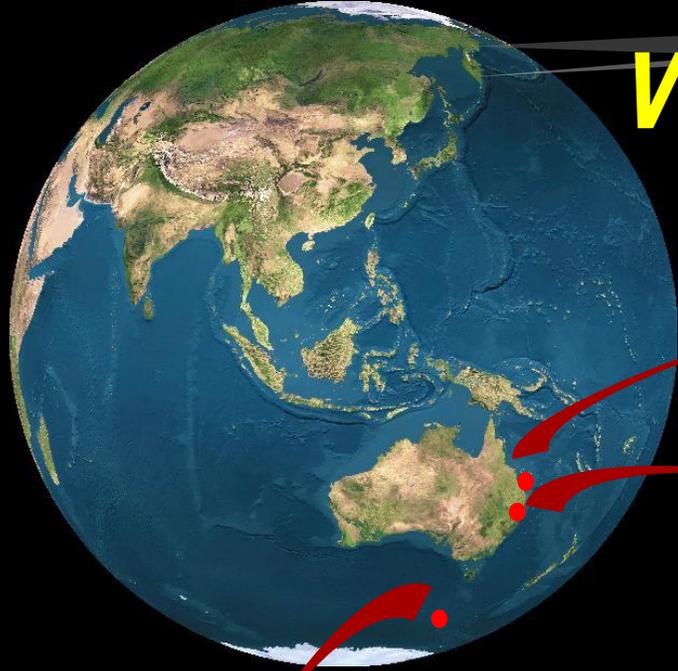
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Today:

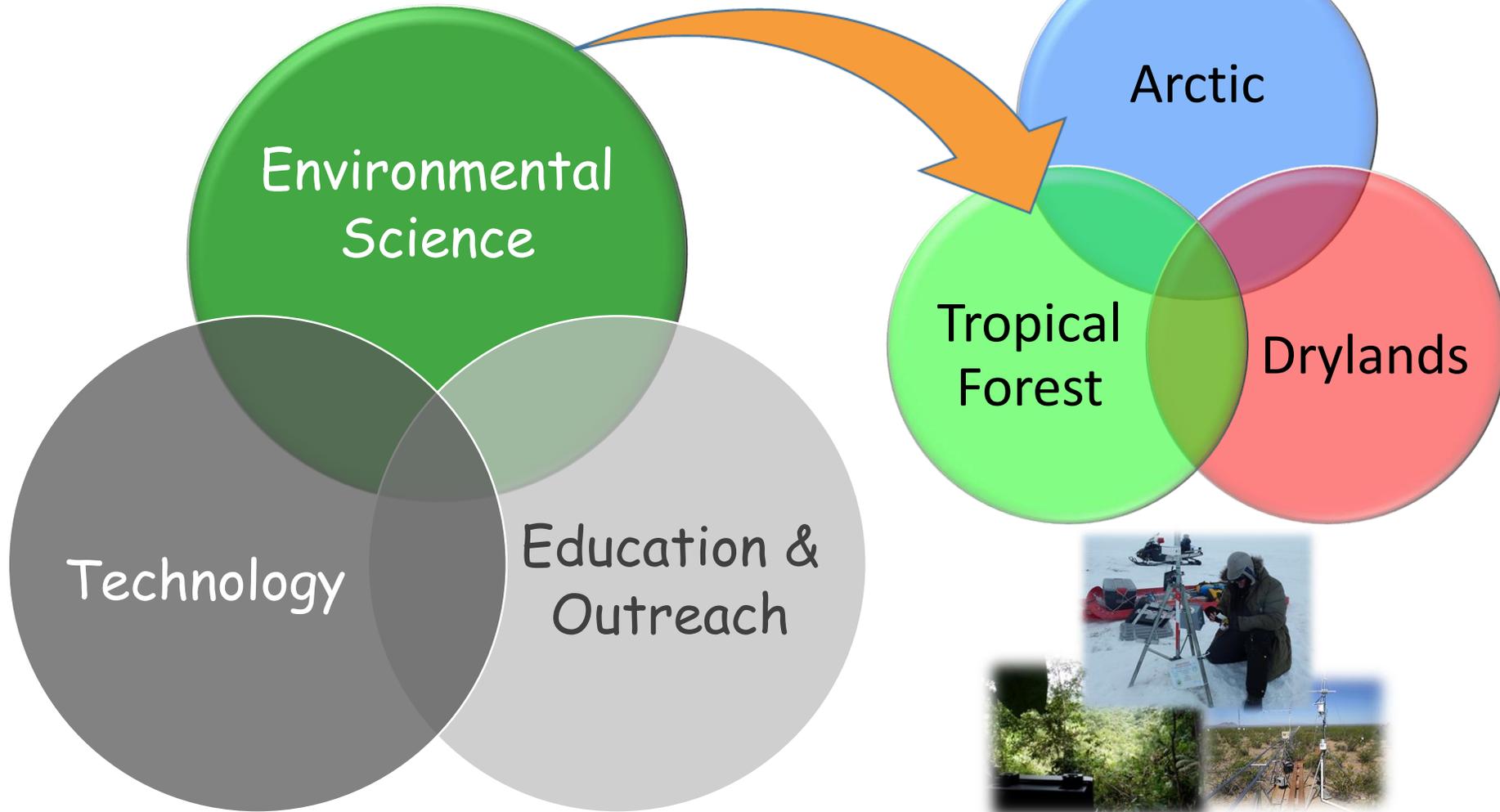
- Who am I
- Precautionary notes
- Why write a proposal
- Knowing your target and audience
- What gets proposals funded
- Developing a plan and road map
- Writing and inspiration ~ tips and tricks

Who am I?





The Systems Ecology Lab (SEL) works across multiple fields of science and engineering to solve urgent environmental questions and challenges.



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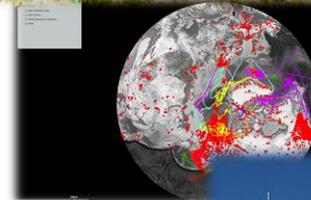
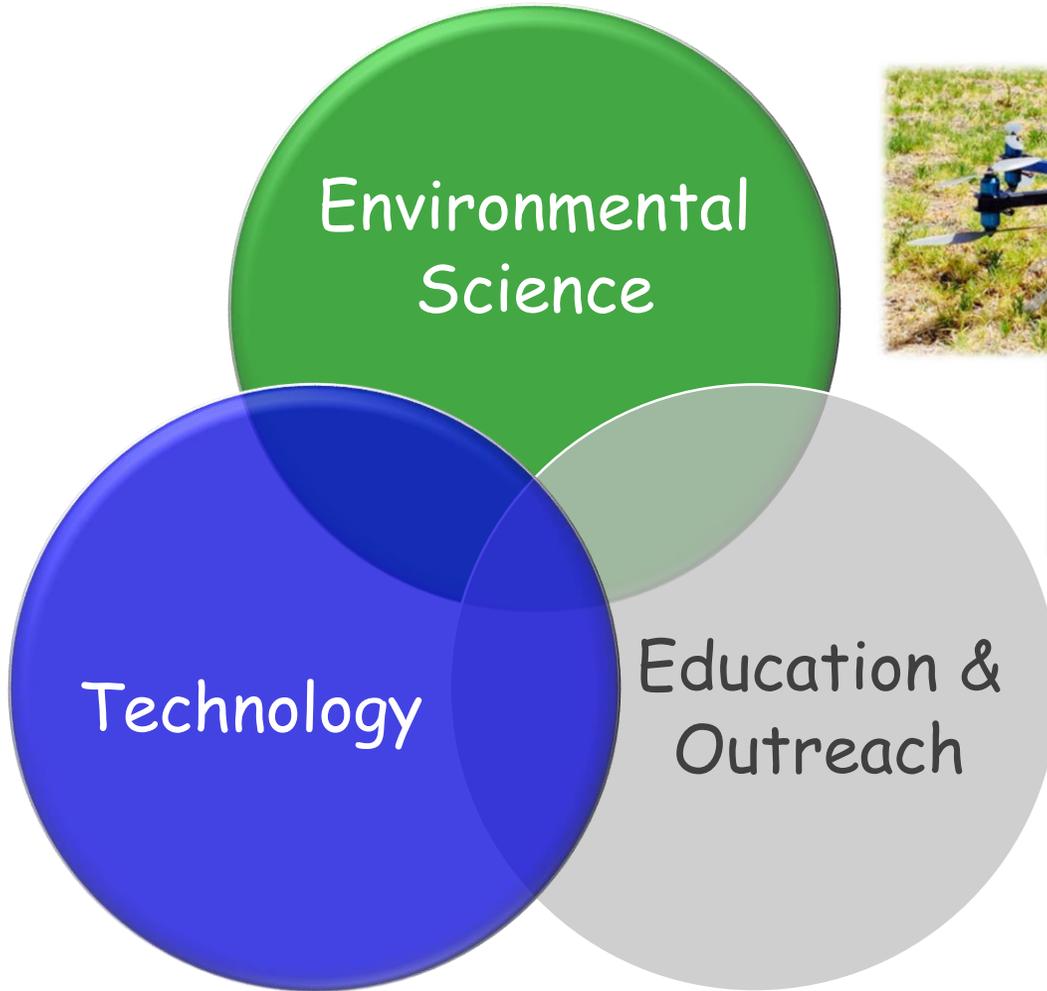


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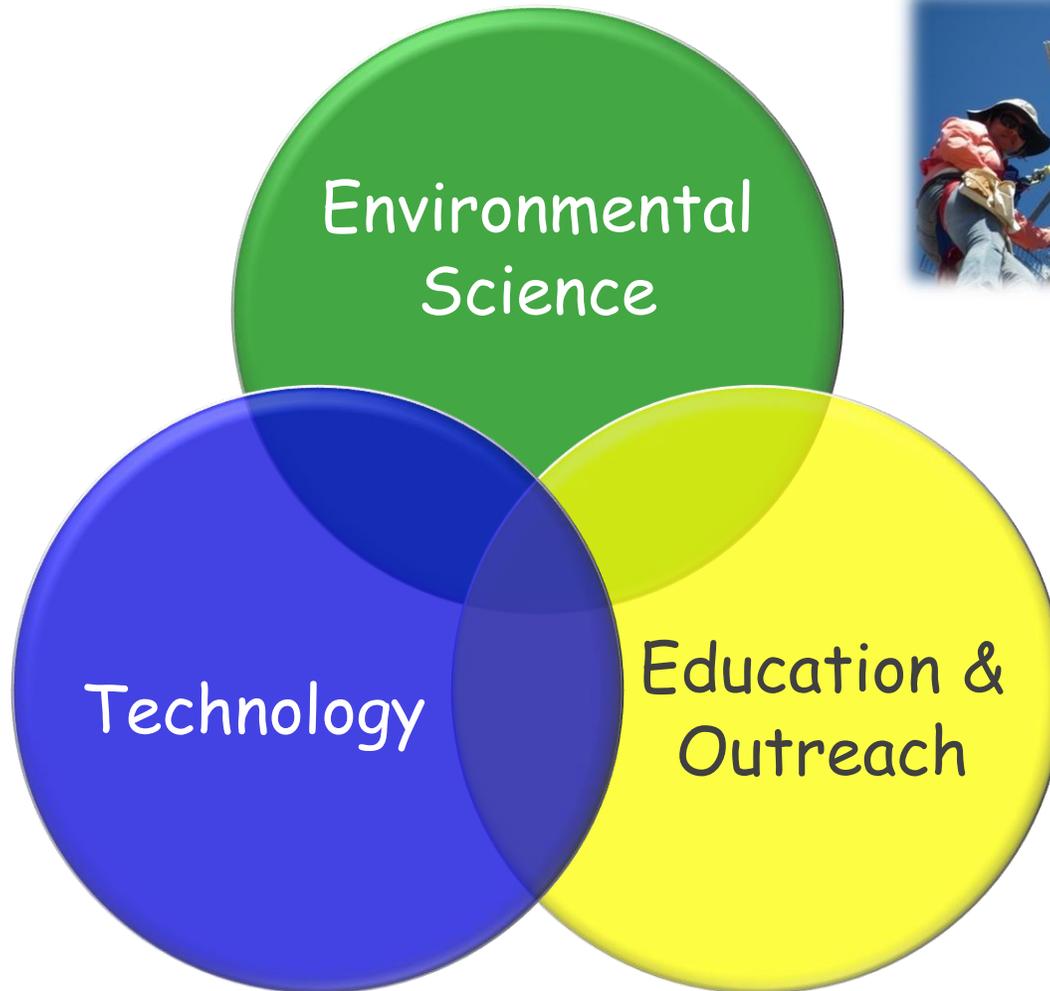


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Graduate Programs:

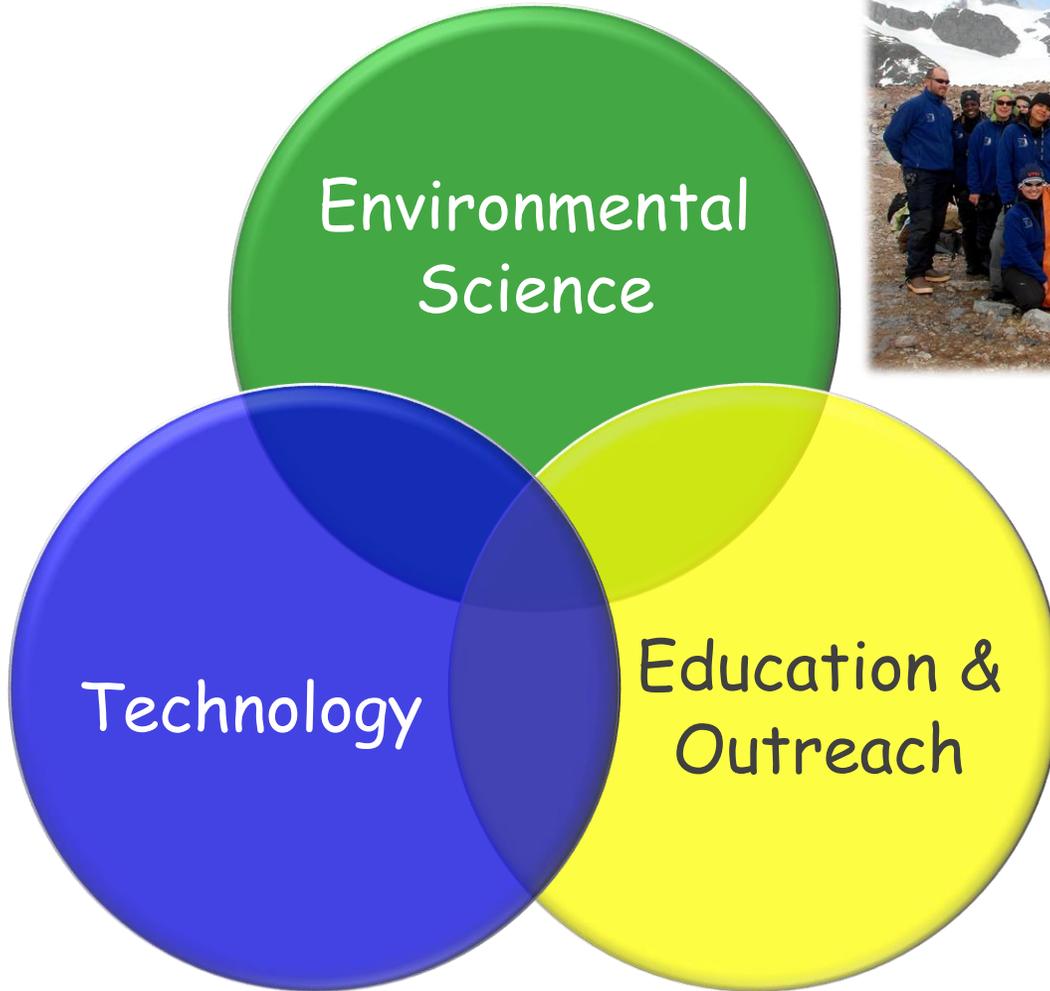
- Bioinf. MSc
- Biol MSc
- Comp. Sci. MSc
- Comp. Sci. PhD
- Comput. Sci. PhD
- Eco. & Evo. Biol. PhD
- Elect. Comp. Eng. MSc
- Env. Sci. MSc
- Env. Sci. & Eng. PhD.

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Precautionary Notes:

- Be aware of my funding bias ~ NSF, NASA, NOAA, DHS, USDA, BOEM,
- This talk will not offer links to funding opportunities ~ use google
- Focus will be concepts common to all proposals ~ skills development
- Every grant, agency, and opportunity is different – adaptation!
- Everyone develops their own style over time and following mistakes ~ seek productive people, ask questions, work hard, request peer reviews
- Questions welcomed throughout

Why Write a Proposal:

- Pass comprehensive exam
- Appeal to top advisors/ committee members
- Organize thoughts
- Fund your own research
- Fund new opportunities
- Travel to a new location/ meeting
- Seek peer input on ideas and strategies
- Improve CV and career opportunities
- Choose your own career adventure!

Know your Target Agency and Audience:

- What is their mission
- What are their priorities
- Have they funded similar work previously
- Why is this agency a good/bad fit
- How are proposals evaluated
- What are the requirements for proposals

- Read and re-read proposal guidelines!

What gets Proposals Funded:

- Transformability – scientific, technological, operational, social impact
- Feasibility – time line, budget, experience, ethics
- Opportunity – coinciding and synegetic events or phenomenon
- Urgency – why this year and not next year
- Clarity – storyline, writing, attention to detail
- Accuracy – proposal guidelines, modern

- Turning weaknesses into strengths – equipment, experience, techniques etc

Developing a Plan:

- Start early, plan for short and intense work sessions
- Draft outline and create a road map and place to hold and sort ideas
- Read, discuss, read, draw, innovate, read some more, repeat
- Record all ideas by mapping them to the most relevant section of your outline
- Do not write in perfect English etc – aim for recording bullet points
- Periodically organize bullet points under potential topic sentences
- When sufficient ideas are in place, turn into good English
- Seek peer review and expert opinion periodically
- Expect development to be iterative with many dead ends and a lot of reworking
- 90% of time for ideas, 10% writing

Proposal Outline (~Dissertation Defense):

- Project title [7] ~ 10 words
- Project Summary [10] ~ 1 page
- Background and rational/motivation [6] ~ 1-2 pages
- *Goals and Objectives [1] ~ 0.5 pages
- Study area/site [2] ~ 1 page
- Proposed activities [3] ~ 1.5-2 pages per objective
- Time line [4] ~ 0.5 pages
- Management plan [5] ~ 0.5 pages
- *Budget justification [5?] ~ 1 page
- *Intellectual merit [8] ~ 0.5 pages
- *Broader impacts [9] ~ 0.5 pages
- References [0 – reference manager]
- Miscellaneous notes/ideas [-]
- ~ Figures and tables as needed

Goals and Objectives:

Goal:

- Arguably not achievable but highlights the scope, discipline/s and sometimes the key purpose of the work.

Objectives/Questions:

- Must define explicit and testable research hypotheses/ objectives/ questions.
- Collectively these must be able to address the overarching goal of the proposal.
- Typically define key research activities – sometimes helps to think of these as one key research paper per objective etc.

IPY Back to the Future (BTF): Re-sampling research sites established more than 25 years ago to assess future trajectories of change in high latitude terrestrial ecosystem structure and function

The primary goal of this three-year award is to determine how key structural and functional characteristics of arctic terrestrial ecosystems have changed over the past 25 or more years and if such trajectories of change are likely to continue in the future. Specifically, the following themes and questions will be targeted and addressed through the proposed activities outlined below:

- ***Sensitivity and vulnerability to change*** - Why are/aren't certain high latitude plant communities more sensitive and/or vulnerable to change than others and can the sensitivity and vulnerability of tundra plant communities be predicted?
- ***Patterns of plant community change*** – Where are/aren't tundra plant communities changing and how are these patterns associated with different drivers of change?
- ***Drivers of change*** – What climatic, successional, heterotrophic, and anthropogenic processes are/aren't driving changes in high latitude ecosystems and is there evidence that these manifest as cumulative impacts?
- ***Implications of plant community change to ecosystem function*** – Has the carbon fixing potential and/or greenhouse warming potential of high latitude ecosystems likely to have changed and does this assessment validate output from remote sensing and modeling studies?

Intellectual Merit:

The following are things a reviewer will be asking themselves when they review your proposal for intellectual merit:

- How important is the proposed activity to advancing the field or bridging different fields?
- How well qualified is the researcher/s to conduct the project?
- To what extent does the proposed activity suggest and explore creative and original concepts?
- How well conceived and organized is the proposed activity?
- Is there sufficient access to resources to complete the project as proposed?
- Are the proposed activities novel and innovative?

Broader Impacts:

- Broader impacts are activities that expand the longevity and impact of the proposed research activities.
- Central to demonstrating broader impacts are:
 1. Integrating education and outreach with the proposed activities
 2. Integrating diversity with the proposed activities
 3. Establishing a legacy for your research activities such as submitting data to archives, museum specimens, herbariums, web sites, publishing papers etc.

Broader Impacts:

- Key questions often asked by reviewers:
 - How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
 - How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?
 - To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
 - Will the results be disseminated broadly to enhance scientific and technological understanding?
 - What may be the benefits of the proposed activity to society?
- Broader impacts should not be add-on activities. Instead, they need to be integrated within the proposed research activity such that successful execution of the proposal requires success in attaining broader impact.

Budget and Justification:

-Acquire or leverage resources to ensure feasibility and effectiveness
- What equipment will you need to achieve the goals of your project?
- What logistical arrangements will you need to achieve the goals of your project?
- What personnel will you need to achieve the goals of your project?
-begin compiling a list of resources as you write your proposal!!!

- Rationalize and justify your equipment, logistic and personnel needs

- Mean NSF award funded at \$161,250/yr, median US household tax paid on income ~ \$6,000 -

Appended word document:

- Example outline
- Geared to a thesis/dissertation proposal
- Includes most elements that apply to foundations and agencies
- Use only as a guide and build in your own style
- Match expectations within your discipline
- Abide by guidelines specified by the respective application/ funding opportunity

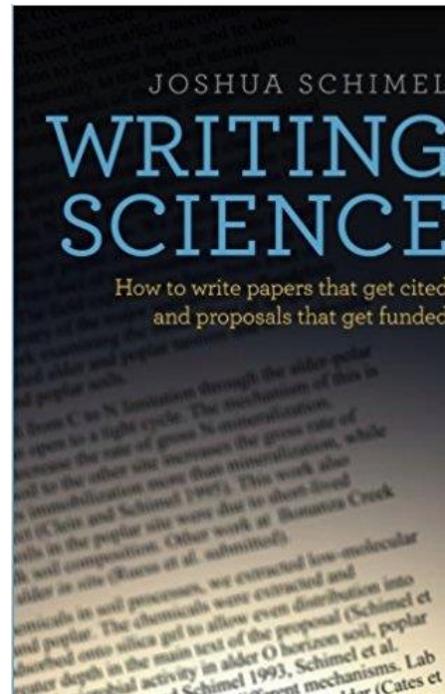
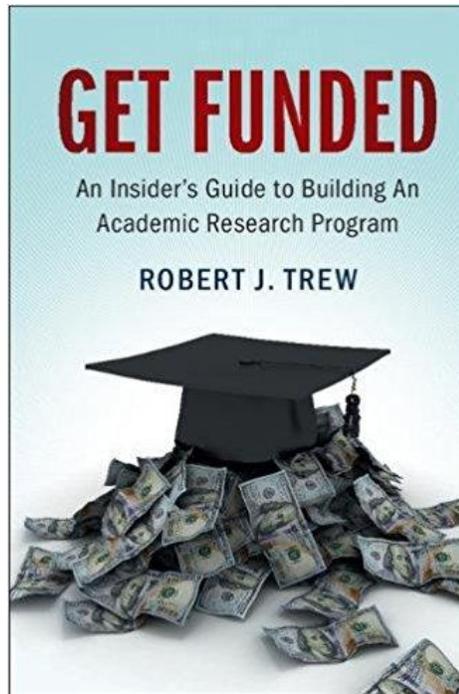
Invaluable writing-related references

- Get Funded by Robert Trew

https://www.amazon.com/Get-Funded-Insiders-Building-Academic/dp/1107657199/ref=sr_1_2?ie=UTF8&qid=1517988971&sr=8-2&keywords=get+funded

- Writing Science by Josh Schimel

https://www.amazon.com/Writing-Science-Papers-Proposals-Funded/dp/0199760241/ref=sr_1_4?ie=UTF8&qid=1517988971&sr=8-4&keywords=get+funded



Bad writing habits:

- Waiting till you have time
- Writing with no structure
- Writing and not simultaneously reading
- Thinking you can write 10hrs per day
- Not writing to a purpose
- Worrying about spell check and grammar
- Not paying attention to style and story telling when reading
- Not being habitual and immersing yourself in opportunity for writing
- Letting your brain convince you that writing is hard or not your thing
- Thinking you will get it right the first time
- Not allowing time for iteration
- Writing in intellectual isolation
- Using writers block as an excuse

Develop a writing attitude:

- Understand writing is an extreme sport that requires training ~ practice makes perfect; brain and braun; no pain no gain....
- Writing is story telling – structure, strategy, elegance, emphasis... when you see this in other literature and in other ways of story telling you are on the right track
- Don't procrastinate – utilize every 5min opportunity you get. Remember – if you get 2 sentences per day you are rocking!

Develop a writing attitude:

- Create immersive opportunities for writing:
 - Always have a way of recording ideas
 - Keep a word doc open on your PC at ALL times
 - Make writing social
 - Become addicted to identifying and appreciating how stories are told
 - Make writing habitual
- Failure is doing nothing and not wanting to learn or learning from the past
- Realize writing is 80% inspiration and idea generation and organization, 15% grammar etc, 5% editing

Writing habits and tricks:

- Read and read some more
- Create a purpose and create a hierarchical structure
- Create versions of your writing – tag file names, github etc
- Where possible, leave writing for 2-3 weeks before revisiting and editing
- Always write the easiest sections of work first and add to the ideas list for how to address the harder sections as you do this
- Realize your brain needs processing time – forthcoming lecture
- Try and use software and other tools – make machines work

Writing habits and tricks:

- Create deadlines by committing to others – always deliver something and understand polished writing is what people see at the end, not the middle.
- Proof read work for others – advisor, mentor, mentee, peer
- Embed yourself in a collaborative writing group – proposal, presentation, paper, project report etc

When you get stuck:

- “Have a cuppa tea”
- Look up a list of ideas for inspiration – read, tell a story in a different media, watch a movie, change of scene, nap, exercise.... Experiment!
- Read over writing you did 3 weeks ago and edit
- Look for new literature
- Visit your *“to do when feeling dumb”* jobs list
- Socialize professionally – writing buddy
- Document why you are feeling stuck – overcome mind games!
- Visit your project management software – forthcoming lecture
- Plan your time for the next days/week to compensate
- Don’t dwell – move on!
- Read literature, blogs etc on writing and writing techniques – writing can be learned and some of the biggest gains can be had when you are having the hardest of times!
- Peruse alternate media but record ideas that are provoked – media, youtube, documentaries, ted talks etc