On scientific writing

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Writing is translational.

- You know more than your audience does
- Your task: fix that
There are many technical styles.

- Tech writing includes proposals, memos, etc and these vary by discipline
- The workhorse style: IMRaD (Intro, Methods, Results & Discussion) -- probably, your MP
Technical writing is different.

• Aim: make the complicated seem simple
• Science: “Building on the shoulders of giants”
  – Citations establish context and credibility
• Strive for concise, precise, and compelling
Writing is craft.

• Practice!
• Outline or reverse-outline
• Edit mercilessly:
  – Is this the right word?
  – Is this sentence clear?
  – Is this paragraph tight?
  – Does this outline flow?
Problem areas in IMRaD
Scope

• Zoom, zoom:
  – Intro: start broad, establish context
  – Zoom in to the details of your case
  – Zoom out again to underscore broad significance
Flow

• Use an outline
  – One idea per line: each idea follows from the preceding, points to the next

• Use a reverse outline
  – Extract key sentence from each paragraph (assess as above)

• Cut & paste freely to explore alternate flows
Your personal role

- Intro is yours (establish ownership)
- Methods and Results are NOT yours
- Discussion and conclusions are yours
Attribution

• Citations establish:
  – Your own credibility on the subject
    • You know the key players and benchmark papers
    • You understand the context of your own work
  – Guidance to readers who want more info
    • You point to the most useful, pertinent sources
Illustrations
The Results narrative

Figure 1 shows the results of patch size analysis.

The number of patches shows a nonlinear relationship to the proportion of the landscape that is forested, reaching a maximum when 30% of the landscape is forested (figure 1).
The urban stream syndrome

Walsh & Meyer 2005

“Urban streams are under-connected to their riparian zones and over-connected to their catchments.”

(Emily Bernhardt)
Scale

“The problem of pattern and scale is the central problem in ecology, unifying population biology and ecosystems science, and marrying basic and applied ecology.” (Simon Levin, 1992)
Making our writing clear, concise, and compelling

Rebecca L. Vidra
Communicating with the 3Cs

• Clear
• Concise
• Compelling

First: Identify your audience. Keep your reader in mind.
Then: Figure out what you are writing for.
How can we make ideas and arguments accessible to readers?

• Lead them through the document.
  – Every piece of writing has a structure.
  – Use key phrases (guideposts) and formatting.
• Avoid walls of text.
• Make it compelling.
Connecting paragraphs

• The **first sentence** is much more than a topic sentence.

• How will you transition?
  – “Another example of...”
  – Snazzier moves possible.
Within a paragraph

- Don’t expect too much out of a single paragraph.
  - A good rule of thumb: a paragraph should encompass one main idea.
  - Avoid long paragraphs that translate to a wall of text in your finished document.
But what about the sentence?

1. Concise sentences need not require yoga.
2. Clear sentences are free of distraction.
3. Verbs don’t magically become nouns.
4. Nouns don’t look good in strings.
5. Subject and verbs like to be cozy.
6. Keep your commas and semi-colons straight.
Clear and Concise:

The final criterion was the consideration of any hazardous materials that may need to be dealt with and how they could potentially affect the surrounding environment.
Clear and Concise:

In an evaluation study, information about the activities, characteristics, and outcomes of a program is systematically collected and scrutinized to determine the impact of a program, demonstrate accountability and success to decision makers, improve program effectiveness, and/or inform decisions about future programming.
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Let verbs be verbs!

Instead of:
• requirement
• consideration
• approval
• recommendation
• application
• action

Use these:
• require
• consider
• approve
• recommend
• apply
• act
Eliminate noun strings.

- Break up noun strings with prepositions

We are proposing several transportation demand management strategies to reduce the number of single occupant vehicles on I-5.

strategies to manage transportation demand...
Keep subjects and verbs close.

- No habitats associated with listed threatened and endangered species possibly occurring in the project area would be affected by the proposed project.
- The proposed project would not affect the habitats of threatened and endangered species that may live in the project area.
Use commas wisely to give your reader a chance to pause.

• After introductory phrases, commas are used.
• Commas are also used when connecting two stand-alone sentences in a compound sentence, but be sure that you don’t use them to write grammatically correct but long, unwieldy sentences.
• Use commas to separate lists of items, phrases, and numbers.
Use semi-colons correctly.

• Only use semi-colons to separate two complete sentences that really need to go together; one of them should be short.
• Semi-colons can also be used to separate lists of phrases that are very long; often, commas will suffice.
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To avoid Plagiarism:

• Step 1- **understand** what it is
  – “Oh, I didn’t know **that** was plagiarism”
    
    **This is not an acceptable excuse.**

• Step 2- Keep track of your sources

• Step 3 - **repercussions**: Don’t underestimate who is reading your document, or what could happen
Information sources

You are expected to be familiar with this
http://library.duke.edu/research/plagiarism/

Suggestions:
An interactive tutorial
https://plagiarism.duke.edu/
Perdue’s online writing lab
http://owl.english.purdue.edu/
Indiana University Department of Education 2012.
https://www.indiana.edu/~istd/example1paraphrasing.html
Some ideas to keep track of sources

- Color coding text in drafts
  - Cut & pasted material from Christensen (2006)
  - My paraphrasing with citations (Christensen 2006)

- Keep all cut/pasted direct quotes in separate document.

- Using Word- comment function

- Endnote – organize your references
Modules this semester

http://www.nicholas.duke.edu/people/students/advising/professional-and-EndNote

**Citation for NS Students**
Margaret Swezey, Duke Writing Studio Tutor
Friday, Sept. 14, 2012 | 1:30 – 3:00 p.m. | A148 LSRC

Learn when and how to cite sources in your academic writing, how to properly quote and paraphrase material, and how to avoid plagiarism. Students will read and discuss writing samples and will get hands-on practice. This module is open to all NS students, but international students in particular are encouraged to attend. Max number: 16.

**EndNote for NS Professional Students** for NS Professional Students
October 5, and offered October 19
1:30 – 3:00 p.m. | 023 Bostock Library

Save research and writing time by learning EndNote, a powerful citation management tool. In this class, you will learn how to automatically enter citations from databases into EndNote and then use EndNote to easily format your citations into bibliographies. Class time will also be spent on how to and when to cite and on ways to avoid plagiarism.