

Lecture 1 Outline:

1. Welcome to scientific writing in English
2. Instructor introduction
 - a. Dr. Peter Bouwma
 - b. Trained as marine behavioral ecologist at Florida State University
 - c. Work on antipredation strategies in marine organisms, specifically spiny lobsters
 - d. Research story - part 1
3. What is scientific communication?
 - a. This is the story you tell about your research
 - b. It is important to have a powerful story about your research that other scientists can connect with, regardless of the medium in which you are trying to communicate.
 - c. Several different ways to communicate your research story
 - i. Peer reviewed publications
 - ii. Scientific presentations
 - iii. Other written or oral means
 - d. We will be working with your written communication skills
4. What is a scientific story?
 - a. Similar to the plot of a regular story
 - b. Diagram of a typical plot, Freytag's Pyramid - exposition, rising action, climax, falling action, resolution.
 - c. A scientific story follows a similar line
 - i. First part of your intro is the exposition - setting the stage
 - ii. Second part of your intro is the rising action - introduction of the general problem, the characters (organisms, chemicals, rocks, particles)
 - iii. Turning point - your specific questions, hypotheses, and objectives
 - iv. Falling action - your methods lay out how you will resolve the main questions of your study.
 - v. Resolution - your results and discussion tell your reader what the answer is and what it all means as well as what there is left to do.
 - d. Common scientific narratives
 - i. Scientific stories tend to fall into several established categories. Here are some examples of strong narratives.
 1. **Discovery** - documenting something or some place that is totally new to science, *e.g.*, deep sea vents, mars rover, new caves, *etc.*
 2. **Challenging Paradigms** - Challenging an established theory or hypothesis about how the world works.

e.g. "We always thought that ____ worked in a certain way; now it looks like we were wrong."

3. **Gaps in Knowledge** - There are nearly always gaps in our knowledge of any subject.

e.g. "We know nothing/very little about _____." or "We have suspected/predicted _____, but didn't know why/where/how/when. . ." or "We know a lot about _____, but virtually nothing about _____."

4. **Evidence for or against theory** - your study supports or doesn't support a particular theory. Or you are trying to determine which theory applies.
e.g. "Current theory suggests that _____ happens, here we show that it does/does not in this natural/theoretical system."

5. **Improved Methods, Better Results** - Technology or new methods means we can better address a particular question.

- ii. Weak narratives - best to avoid these.

1. **Yet another example** - you are giving yet another example of support for a theory, etc. If too many people have done studies like this before, this is not a particularly strong narrative.
2. **Pathetic gaps** - some gaps in knowledge aren't all that important.

- iii. Although there may be some overlap, you should choose a primary narrative and stick with it.

- e. Stick with your narrative - don't throw off your readers.

- i. If you start a story or part of a story, be sure to finish it
- ii. Your intro, methods, results, and discussion should follow the story.
- iii. If a figure, table, paragraph doesn't contribute, you may need to cut it out - even if it is really good data, interesting stuff.

5. How to communicate your story in written form

- a. Determine context - Which story do you tell?

- i. Which journal are you writing the paper for?
- ii. Does your story fit?

1. Have they published a paper like yours before?
2. Which story do you tell?
3. What level of detail do you use?
4. What references do you need to do?
5. Word limits?

- iii. Examples: Spiny lobster research.

- b. Determine content - what do you include in your paper?

- i. Figure out your basic narrative.
- ii. What kinds of questions do you address?
 1. Exploratory, proximate, ultimate, or some combination.
- iii. What kind of study/studies did you use to address these questions?
 1. Observational, experimental, or both
- iv. Figures and tables - best way to lay out your paper, tell the most basic story.
- v. Text comes after you get the figures sorted out.
 1. Text is only to introduce, explain, clarify, and discuss. Your figures should be your primary source for your most important information
- vi. Preparing your figures
 1. Start with publication quality - needs to be vector-based graphics
 2. Figure Style
 - a. Check recent papers in your journal to choose a graph style
 - b. Best to do this before you even start making your graphs
 3. Choose distinct colors/shades of gray/patterns for your graphs.
 - a. Elements should clearly stand out from each other
 - b. Be consistent with colors and arrangement
 4. Make the elements of your figure/table large enough
 - a. Needs to be legible when shrunk in size
 5. Photos
 - a. Use publication quality photos
 - b. Keep original saved in a lossless format (not jpg) such as TIFF, PNG, or RAW (submitted file will most likely be TIFF).
 - i. Photos should be at least 300 dpi.
 - ii. Look at photo info to determine number of pixels
 - iii. Divide this by size to get dpi
 - c. Don't increase above it's original size.
 - d. Don't mess with your photos beyond some basic color, contrast, or saturation adjustments.
 6. Tables
 - a. Pick a style
 - i. Look at what others are doing in your journal for similar types of data

- b. Simplify as much as possible
 - i. Do I really need this column?
 - ii. Can I put this information in the text?
 - c. Publication quality
 - i. Not as much of a problem here, just make your tables in your word processor
7. Multi-part figures: Best for making comparisons or showing similarities between data.
- a. Graphs should be combined if there is a comparison to make
 - i. Don't know how the journal will lay out your paper
 - b. Ordering your sections (e.g. a., b., etc.)
 - i. Consistent – same as you refer to them in the text and other figures
8. How many?
9. Not too simple, not too complex
10. Order them
11. Is there anything missing?
12. Example: lobster navigation