

Addendum 1: Graduate Student Term Paper

Objective

The objective of this paper is to conduct a review and synthesis of a specific anthropogenic disturbance to a limnological ecosystem.

Pick a specific aquatic ecosystem or aquatic organism you are interested in learning about. Then, pick a major disturbance that is currently occurring in limnological ecosystems. Possible disturbances can include:

- Impact of a specific invasive species
- Extinction of a specific species or group of species
- Human alteration of flow in streams or wetlands (via dams or water withdrawal)
- Sporadic or intense pollutant influxes (via spills or industrial expansion)
- Specific pollutants (e.g., oil, organic compounds, etc.)
- Nutrient influxes (via agriculture)
- Reservoir effects on stream geomorphology and temperature
- Aquifer depletion
- Wetland drainage and loss
- Climate change
- Human influences on flood frequency and intensity
- Pollution and sediment loads in rivers
- Eutrophication of lakes
- Biomagnification
- Acidification
- Biotic homogenization
- Lake turbidity
- Disease outbreaks

These are general ideas to get you thinking. Start with the list above or come up with your own general idea. Either way, you will need to get more specific. For example, I list “wetland drainage or loss” as a possible idea, but if you picked that idea, you will need to focus your review on a more specific aspect of that idea. You could write about the effects of wetland loss as a storm buffer or as a filter for excess nutrients, or its effects on a specific group of organisms. Find something that interests you. The material presented in the course and textbook only lightly addresses each concept, while you will be expected to present in-depth analysis of the current research and possible future directions concerning this concept.

Once you have picked a specific anthropogenic disturbance, cover the following points in your paper:

- Introduce the problem, give a brief history of the disturbance, explaining how it developed. Explain why the disturbance is a problem for the ecosystem and ultimately for humanity in general.
- Explain the major events, if any, which have occurred concerning this disturbance. Where and when did it spread? What are the means of dispersal?

- Highlight how public view concerning the disturbance has changed over the course of time.
- Compare and contrast the major developments used to mitigate or reverse the disturbance. Highlight the strengths and potential weaknesses of these efforts. Have they succeeded? Why or why not?
- Develop a conclusion where you highlight the most interesting aspects of the this work
- Review the possible future actions suggested by the authors of the papers you read. Do you think they are adequate and or attainable?
- Suggest you own future research possibilities

Paper Structure

Abstract – The abstract should be 250-300 words long and succinctly summarize the introduction, review, and conclusion sections of the paper

Introduction – For a review or synthesis paper, your introduction should introduce the reader to the disturbance and state clearly the objectives of the paper

Review and Synthesis – Review major developments concerning your disturbance. Give a brief history and current research and mitigation efforts. Highlight the successes or failures of such efforts. Include graphs and tables from your cited papers to support your text.

Conclusions – Address your objectives of the paper and highlight the most important parts of your review/synthesis. What conclusions do you want your reader to make and what are the next important steps science needs to make progress concerning your subject?

Literature Cited – include all citations in the text, formatted according to the guidelines found in the journal *Freshwater Biology*

Paper Format

A title page – including name, date

Double-spaced, 12 point font, Times New Roman font, one space between paragraphs

15 pages of text, not including figures and tables

Pages numbered with 1 inch margins

Citations formatted according to the guidelines found in the journal *Freshwater Biology*.

Example of in-text citations: (Pyne et al. 2007) (use *et al.* if 3 or more authors)

Example of bibliography citation: Pyne, M. I., R. B. Rader, and W. F. Christensen.

(2007) Predicting local biological characteristics in streams: a comparison of landscape classifications. *Freshwater Biology* 52:1302-1321.

Include at least 3 tables or figures in your report form the paper you review

Figures and tables fully labeled and referred to in the text (if figures are taken from an article, cite them in the label)

At least 10 references from peer-reviewed scientific journals

The grading rubric I will use:

Name: _____

Criteria	Points Possible	Points Earned
Formatting		
Title page with name, address, date	1	_____
Paper structured into abstract, introduction, review, and conclusion	1	_____
Double-spaced, 12 point font, one space between paragraphs	1	_____
Pages numbered with 1 inch margins	1	_____
15 pages of text without figures and tables	3	_____
Spelling and grammar are correct	3	_____
Abstract		
250-300 words long	1	_____
Summarizes introduction, review, and conclusions	3	_____
Introduction		
Explain why the disturbance is a problem	2	_____
Clearly stated objectives of paper	1	_____
Review and Synthesis		
Give a history of the disturbance	4	_____
Highlight public viewpoints	1	_____
Review major efforts to mitigate or reverse disturbance	7	_____
Strength and weaknesses of mitigation/restoration efforts	3	_____
Conclusions		
Adequately address your objectives in the introduction	1	_____
Highlight the most important or interesting parts in review	3	_____
Review what the papers suggest as future management possibilities	2	_____
Give your own suggests on how to solve this problem	2	_____
Tables and Figures		
Labels and descriptions accompany each figure	3	_____
If labels are taken from a published article, they are cited in the label	1	_____
Each label and figure referred to in the text	2	_____
References		
At least 10 references from peer-reviewed journal articles	2	_____
Citations formatted according to stated guidelines	2	_____
Total:	50	_____