

Literature Review Exercise

Assignment Overview

In this assignment you will review some of the scientific literature that covers the environmental science question you have identified in your Observations Exercise. You are required to prepare an annotated bibliography with attached synopsis as a means of summarizing a body of literature pertinent to your chosen question. Along the way you will submit a list of literature you have identified for use so that your instructor can provide feedback before you begin writing your annotated bibliography.

Step 1: Submitting Your Literature Review Topic for Approval

Following the small group meetings on October 17, you should decide on a question for use in your literature review. It should be a question that you are interested in and appears likely to have some substantive literature available on the topic. You should do a preliminary search of the library sources to clarify this before submitting your question (though Rob Estes, UWB Science Librarian, will cover more in-depth literature search strategies on October 26 in class). This question is due before class on October 24, but you are strongly encouraged to submit it (via E-submit) before that (the earlier you get feedback from me, the sooner you can get going ñ waiting until the Oct. 24 will likely mean you may not have feedback until October 31).

Your submission should simply include your name, date, class, assignment title, observation, question, and two alternative hypotheses (as laid out in Step 2 of the observations exercise). If you have a list of preliminary literature you are welcome to list 3-5 sources, but this is not required. I will try to return these by Oct. 31 at the latest with an approval / suggestions so you can get started. If I am not convinced it is a good question for use in this exercise, I may make alternative suggestions.

Step 2: Reviewing the Literature

You are required to review some scientific literature on what is known about your question. In a real literature this can be a daunting task for some topics, with thousands of sources. You will be restricted in the number of sources that you are to use in order to make this assignment feasible. Your preliminary source list (step 3 below) and final paper (step 4 below) should both contain seven distinct literature sources. For our purposes you should restrict yourself to these numbers of sources (by source type):

Primary research papers (peer reviewed): 4 - 7

Review papers or chapters in edited scholarly books: 0 - 2

Textbooks: 0 - 1

Web sources: 0 ñ 2 (web sites ñ not including .pdf files of published papers)

Thus, you must include at least 4 primary research papers (a paper reporting on original research carried out by the author(s)) and no more than 2 web site sources. Overall you should have 7 sources ñ no more, no less!

Because of these restrictions in numbers of sources, you should select the sources you use wisely, so that you can paint an effective picture about the things known pertaining to your question. In other words, do not select sources almost all of which concentrate on one sub-area of your topic, leaving other areas unexplored. See your instructor if these source limitations become too burdensome.

Your ultimate goal in reviewing the literature is to produce a summative annotated bibliography and a synthesis of what you have found. Your main purpose is to basically answer ñ ì What is known about

my chosen question?" This purpose and your end product should be kept in mind when reading the literature and selecting from it. Take effective notes so that they will facilitate the development of your final product. Your hypothetical audience in writing the final paper should be your class peers.

It is very important to **START IMMEDIATELY!** Searching for and collecting literature takes time, especially if you have to order articles through document delivery (or even get sources through interlibrary loan).

Getting Started in Reviewing the Literature – some important tips

1. Understand your topic

You may find it beneficial to review some basic information about the underlying principles of your topic BEFORE you review the specific literature. For instance, if you question dealt with how PCBs in fish affect fetal development, you might wish to first read some general material on both PCBs and on fetal development. This could be found in general environmental chemistry and human biology textbooks (or on the web). You should feel free to consult your instructor or Rob Estes, the science librarian, for help in this regard.

2. Modifying the Scope of your topic

You may find from your initial literature search that you need to broaden or narrow the scope of your topic. Do not hesitate to consult with your instructor and/or Rob Estes about this. Consult with us early on ñ before you get frustrated in your search!

Step 3: Literature Review Source List

Before class on November 21 you are required to hand in (E-submit) a list of **seven** sources that you propose to use for your literature review. They should be classified as to the type of source in the categories described above (in Step 2). Present this list in an alphabetized, formal literature cited list as you would find in a scientific paper. You should use the CBE style manual for your source list and for citing sources within your synthesis section. For good information on citing sources using the CBE style (acceptable for this class) see the links on the course web site:

See the paper that we discussed in class in late October for an example of how a Literature Cited section of a paper is assembled. There are two CBE styles for source citation; you should use the i name-yearî style in this assignment.

I will not expect that the seven sources listed in this submission will necessarily be the same seven you use in your final paper. This will give me a chance to advise you on the sources you propose to use and you may consequently decide to change some of the sources for the final paper (Step 4).

Step 4: Literature Review Report

Your final literature review written report **to be handed in (via E-submit) before class on Dec 7** will not be akin to a traditional literature review, which is usually presented as an often-lengthy text document. Rather, I will expect you to provide your literature review in the form of a **summative annotated bibliography with an accompanying synthesis text** relating the literature specifically to your question and hypotheses.

An annotated bibliography is essentially a list of sources, with each source being accompanied by a brief summary. In the case of a summative annotated bibliography, the summary paragraph simply summarizes the main points of the source. An evaluative annotated bibliography includes critical review as well as the main points in the accompanying summary. **Your assignment is to focus on a summative annotated bibliography**, with your summaries highlighting the main points of each source. This is very important ñ you should be summarizing the main findings of the research, describing methodology only if relevant for the reader to understand the main findings. Each annotation should be a small paragraph (from 100 ñ 200 words ñ points will be deducted for annotations outside of those bounds, without prior instructor approval of exceptions).

The UWB library has an excellent description of summative (as opposed to evaluative) annotated bibliographies: <http://www.bothell.washington.edu/library/guides/annotations.html>

DANGER: You must be very careful not to simply use the abstract (or summary) or sections of the abstract as your annotation. I am looking for YOUR summary of each source, with an emphasis on things relevant to your question. If I find you using published material (or such with only minor changes), I will consider this a serious case of academic misconduct. See the class handout on Academic Honesty for further details. **NO QUOTATIONS ARE ACCEPTABLE** in this assignment ñ you MUST synthesize things in your own words!

I will post an example of a good (not ìperfectî) student submission of such an annotated bibliography later in the quarter.

Submission:

1. Cover Page (or first page)

Include your name, course number and academic term, assignment title, observation, question

2. Annotated Bibliography

List sources alphabetically as in the Literature Cited section of a published paper (see comments on style below). Each source can be listed single-spaced, while the accompanying annotation must be indented and double-spaced. Use a hanging paragraph format to make the first author of each source listed stand out clearly. For example (*example for format only ñ not representative of expected depth of content*):

Smith AJ, Martin RF. 1996. Western red cedar response to light gaps in a lowland old growth forest. Northwest Science 22:123-128.

Western red cedar showed greater reproductive allocation in forest gaps than in the understory. However, the survival of first-year seedlings was lower in gaps. Saplings (>1 years old) survived better in gaps than in the understory. Overall reproductive success is

tied closely to light energy availability except in young seedlings, where water stress becomes a significant source of mortality under high light.

3. Synthesis

You should attach a 2-3 page (double-spaced, 12-pt font, 1" margins) synthesis of the body of literature you have reviewed **specifically as to how it pertains to your original observation and question**. You should strive to answer the question of what is known about your question in a synthetic and meaningful way. This section (as opposed to the annotations) should contain critical analysis of the literature and studies reviewed. However, be sure that your analysis is focused very directly on the connection between the literature and the question. For example, it would not be appropriate to include criticism of small sample sizes in some study unless you bring out how this study design limitation restricts your ability to extrapolate from those results to your question.

In your synthesis you must cite your sources in the same formal way in which they are cited in scientific papers. To see how sources are cited look at the paper that was used for class discussion of scientific writing and reading (available on electronic reserve). We will discuss how citation in the text is done in class as well. The research papers that you are using for this assignment should provide further examples. The section below provides even more guidance on this.

Citing Literature in the Text of Your Paper

The papers you utilize as sources should be cited at appropriate locations within the text (where you are using that information). The papers should be cited parenthetically **if possible**. In other words, make your main point and then cite the paper in parentheses afterward rather than directly referring to the paper. You should see papers we used in class or those in the journals *Ecological Applications* or *Ecology*. These are available in the UWB library. For example:

Use:

Large woody debris in lowland old growth forests has been shown to provide sustained levels of inorganic nitrogen to streams throughout the summer and winter months (Burke et al. 1997).

Rather than:

Burke and others (1997) did a study that showed large woody debris is important in providing inorganic nitrogen to streams throughout the entire year.

Direct references to authors is not forbidden, just try to use such construction less frequently. When citing a paper, you should list the authors and the year of publication and nothing else (no page numbers, etc.!) The CBE style manual material referenced above (.pdf file on the UWB library web site) also has guidance on how materials should be cited in the CBE style. For one author list the last name and year; for two authors list both names and the year; for three or more authors list the last name of the first author and use the Latin abbreviation *et al.* to indicate *and others* as shown in the example above. The abbreviation *et al.* is NOT appropriate in the Literature Cited section (there all authors must be written out). Multiple sources should be cited within parentheses in chronological order (from oldest to newest – see example below). Also note that only last names are used in citations within the text – no initials.

Examples:

Low temperatures were shown to limit reproduction in marmots in the Rocky Mountains (Allen 1998).

Log decomposition greatly accelerated soil development in a lowland old growth forest of southwestern Oregon (Barnes and Lask 1995).

Human trampling is most evident in stressful ecosystems (Newman 1968; Barnes 1984; Daly and Smith 1992; Poldt et al. 1998).

4. Original Sources

Most of the seven sources that you use in your paper should be available to me in the archived literature. If you utilize something not generally and easily available, you will need to hand in a copy of it for me to use. In any case, you will need to have copies of your sources at hand if I should request them while grading your assignments. Any web site that you use falls into this category: you will need to submit copies of the relevant web pages. Another acceptable way to do this is to include (E-submit) a .pdf file if you obtained material in that fashion.

Style:

You should use the CBE style manual for your source list and for citing sources within your synthesis section. The name-date style of citation will be used in this assignment. For good summary information on citing sources using the CBE style (acceptable for this class) see the links on the course web page.

Remember, that Latin names of species must always be in italics!

GRADING of Step 4

This final written submission will be graded on a 100-pt scale. The following breakdown will be used in evaluating your paper:

1. General paper Format (10 Points)

This includes an assessment of your report structure and how well you followed the guidelines laid out in the handout (e.g., for citations, annotations, synthesis, etc.)

2. Presentation (10 Points)

This includes an assessment of your paper's clarity, grammar, spelling, and related factors.

3. Content (80 Points)

This includes an assessment of the informational content of your paper (both quantity and quality), as well as your analysis of that information (annotated bibliography = 50 pts and synthesis = 30 pts).