



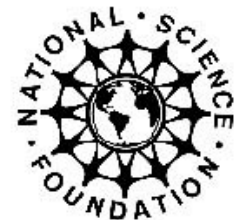
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Media Coverage

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Evaluation of Media Coverage of an Environmental Issue

NCSR curriculum modules are designed as comprehensive instructions for students and supporting materials for faculty. The student instructions are structured in a "generic format" designed to facilitate adaptation in a variety of settings. Where appropriate, the generic version is augmented by a specific instructional module taught in the Pacific Northwest. The purpose of these specific versions is to provide those who are adapting modules greater insight into how the materials are used in a teaching/learning environment. In addition to the instructional materials for students, the modules contain separate supporting information in the "Notes to Instructors" section. The modules may also contain other sections which contain additional supporting information.

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Module Description

This module provides students with some skills and practice in evaluating claims made in written accounts of environmental issues. Students select an article on a current environmental topic and conduct an evaluation of that article using a series of questions such as:

- What do we accept as evidence?
- What is the source of the evidence?
- What is the relationship between "claims" and "evidence"?
- What is bias and how can it be recognized?

Students then discuss the articles and their evaluation in small groups.

Evaluation of Media Coverage of an Environmental Issue

Introduction

The “Information Age” has brought with it access to a tremendous volume of accounts that address environmental issues. These accounts appear routinely in the popular and scientific media. Newspapers, magazines, books, web sites, radio and TV broadcasts all attempt to present information, which the public generally accepts as objective and factual. However, reports are frequently sensationalized or exaggerated and there is often reason to suspect bias. Students in natural resource and environmental science programs, in particular, should learn to critically evaluate these reports and to use them to enhance their understanding of these issues. This activity is designed to provide the opportunity to develop and practice those skills required to evaluate claims made in written accounts relating to environmental issues.

In general, students will gain the most useful information from published reports by:

- Reading critically and expecting logical thought processes
- Consulting a number of sources on the same issue rather than relying on a single source
- Recognizing bias and hidden agendas
- Making decisions that are consistent with their own set of values after an evaluation of the report(s)

Objectives

Upon successful completion of this module, students should be able to:

1. Critically evaluate an article on an environmental issue
2. Recognize some common types of bias in an article

Procedure

1. Instructor selects any environmental issue as a topic for evaluation. Topics that are contentious, well-publicized and for which there is a legitimate degree of scientific uncertainty seem to work best for this activity (e.g., the relationship between global warming and hurricanes, large predator control, forest fire management).
2. Instructor directs students towards resources for article. Internet and/or print sources such as environmental organizations, government agencies, and journals should be identified that are likely sources for information on the assigned topic. Alternatively, the instructor may select the articles for review and hand these out to students.
3. Instructor establishes criteria for article. Articles of sufficient length (two or more pages) are required. Shorter articles generally lack sufficient detail to evaluate. Articles with a particular viewpoint seem to work best, rather than those that attempt to take a balanced approach.

4. Allow students approximately one week to find and evaluate their article by responding to the questions below.
5. Students meet in small groups (3-4 students) to discuss their evaluations (approximately one hour).
6. Instructor de-briefs groups to report on their evaluations.

Evaluation of Media Coverage of Forest Fires

Background

The following pages provide a detailed description of this activity using the issue of forest fires and the Healthy Forest Restoration Act as a case study. I have chosen this topic for the following reasons:

- A number of different “camps” have become established, each with its own vested interest in how forests and forest fires are managed
- The science of forest fire ecology is complex and an active area of research
- There is no scientific consensus on pre- and post-fire manipulations
- The issue has regional importance and students probably have at least a casual familiarity with the issue

Introduction

Reports of forest fires in western U.S. commonly appeared in the national media during the summers of 2002 and 2003. Sensational accounts of fires in Colorado, Arizona and Oregon were widely publicized. Some blamed the fires on federal forest policy, others on environmental protection. Spirited debates have ensued that relate to forest management, the role of fire in ecosystems, challenges to forest management activities by environmental groups and environmental law. The White House proposed a "Healthy Forests Initiative" to address the issue which later became law as the "Healthy Forests Restoration Act".

Procedure

- A. Find a published report that offers an opinion on the management of forest fires, the "Healthy Forests Restoration Act" or the debates that followed its passage. **Articles from sources that would be expected to have a certain viewpoint on the issue will be the most useful for this activity** (as opposed to sources that attempt to present a balanced approach).

Each of the following, for example, have stated opinions on the forest fires or the "Healthy Forests Restoration Act":

Oregon Natural Resources Council
Sierra Club
Capital Press, a regional agricultural newspaper
Oregon Forest Resources Institute
USDA Forest Service

American Forest Resource Council
American Forest and Paper Association
The Wilderness Society
Western Wood Products Association
Society of American Foresters

- B. Bring your article along with the following completed analysis to class.
- C. Prior to class, evaluate your article using the guidelines that follow:
1. Different media carry with them different degrees of credibility. A scientific journal article, for example, is likely to be more credible than a newspaper report which is likely to have higher credibility than a tabloid article. In what **type of publication** does your report appear?
 2. Is the **author** of the report given? Who is it? Is it an "individual" or an "organization"?
 3. If an organization has produced the report, determine the **mission** of the organization. If an individual has produced the report, what credentials or affiliations does he/she have?
 4. Does the report attempt to **persuade, advocate** or **inform**? Explain.
 5. What **information** was used to prepare the report? Circle those that were used and add others if necessary.
 - a. Some possibilities include:
 - observation of actual occurrences
 - consultation with experts
 - discussion with non-experts
 - reports in scientific journals
 - reports or findings from a particular organization (scientific or other)
 - sources are not stated in article

b. Is this information **properly referenced** so that you could check it out if you wanted to?

6. What is the date of publication? Is the information in the report (or the report itself) reasonably up-to-date? The importance of having recent information will vary with the topic under consideration.

7. **Claims** are positions or conclusions that are stated in the article. They should be supported by some kind of **evidence** - specific observations or data that are used to support a given claim. For example, the claim that a fish kill was caused by a spill of sulfuric acid into a river might be supported by the following evidence:

- an accident involving a tanker truck containing 1000 gallons of sulfuric acid occurred upstream of the fish kill
- 500 dead fish were counted downstream from the accident site by a fisheries biologist the day after the accident
- no dead fish were found upstream of the accident
- water samples taken downstream from the accident by the biologist indicated a pH measurement of 4.0
- previous studies have found that pH measurements of less than 4.5 are toxic to most fish

What claims are made in your article? What evidence is used to support those claims? List the claims and the specific evidence supporting them in the space below:

Claim	Evidence

Do the claims in the report follow logically from the evidence given or are "leaps in logic" required to reach the same conclusions as the authors? Could alternative claims be made from the same evidence?

8. Is there a basis for suspecting bias on the part of the sources, the author of the report, or yourself? If so, circle those that you detect from the list of common biases below:

- the author or source has a clear stake in the issue and will benefit in some way from the claims that are being made
- only selected information is being reported (Are you aware of other information that would refute the claims being made?)
- you reject the claims of the article because you disagree with them or you accept them because the claim happens to agree with your opinion
- the publication has a well-known or suspected position on the issue

For each of the biases you have detected, explain where in the article it appears.

9. Does the report appear to be objective or does there appear to be a particular agenda being promoted? Explain.

10. Is there anything in the article that you consider to be "unnecessarily sensationalized" to make a point or to stimulate some emotion. Examples may include misleading or exaggerated titles, phrases that are meant to appeal to our emotions or accompanying photographs.

- D. Discuss your evaluation with your group. Keep in mind that other members of the group have probably not read your article.

I suggest the following format for your discussion:

- What is the title of the report?
- Where and when was the report published?
- Briefly describe the content of the report.
- Critically evaluate the report using items #1-10 on this handout as a guide

- E. Staple your evaluation to the front of your article and turn them both in at the conclusion of class.

Assessment

Student assessment for this activity is based on the completion of questions #1 – 10 on pages 10-12. Although students will discuss the evaluation of their articles in small groups, responding to questions is an individual effort. For simplicity, I award a single point per question, although some instructors may wish to assign different weights to different questions. Acceptable responses will vary tremendously depending upon the characteristics of the article a student selects for evaluation. It is therefore important that the instructor evaluate the adequacy of answers relative to the article that the student has selected.

Students can severely limit themselves in this activity by choosing an article that is too brief, too bland or off topic. For this reason, it is important to establish some guidelines for article selection when this activity is introduced (see “Procedure”).

Notes to Instructors

The critical evaluation of natural resource and environmental issues is a common learning outcome for courses in these disciplines. This activity is designed to fine tune some skills that students should already have. For courses that emphasize the scientific basis of natural resource issues, the activity is probably most appropriate early in the term where it could be used to complement lectures that introduce "science as a way of knowing".

The activity can be introduced by directing a discussion around the following questions and considerations in this critical evaluation:

1. Consider the source. Where was the article published?

Try to get as close to the original source of information as possible. Although there are many pathways for environmental information to reach the general public, a common sequence looks like this:

- Scientific study appears in a peer-reviewed science journal (e.g., *Science*, *Nature*). This information is usually reliable but often inaccessible to the general reader due to the technical nature of the writing.
- Summary of scientific study (or studies) is prepared by a science writer and appears in a journal designed for a more general reader (e.g., *Science News*, *Discover*, *Environment*, *Scientific American*). This information is usually reliable but less detailed and is usually more accessible to the average reader.
- Newspaper or popular magazine (e.g., *Time*, *Newsweek*, *New York Times*) account of a scientific finding. The author may or may not have any particular expertise on the topic and each author places his/her own particular interpretation of the findings into their work. Also, space limitations often necessitate shortening and perhaps over-simplification of the findings. As a result, reliability may be somewhat diminished.

- Newspaper or magazine accounts of scientific findings may be used as a source for a radio talk show broadcast, internet web site, or another written article. For all of the reasons indicated above, reliability may be further compromised.
- Selected information from any of the above is used to produce an article that supports a particular agenda or viewpoint. Only information that supports that view is reported and conflicting information is omitted or discredited. This report may take the form of an editorial, promotional brochure or a tabloid article.

Note that the reliability of information fades as one gets further and further from the original source.

Students should also be aware that journalists in the popular media (unlike scientists) are trained to present both sides of a contentious issue. The viewpoints of individuals or groups that represent these sides are generally described in an effort to present a “fair and balanced” account. This may be done, even when the preponderance of scientific evidence supports one viewpoint over another. However, viewpoints rather than evidence are emphasized and the uninformed reader may be left with the understanding that there is a legitimate debate when, in fact, none exists. This “false dichotomy” is frequently seen in reports on environmental issues and students should be aware of its existence especially when resources in the popular media are consulted. See Bykoff and Bykoff, 2004 for a detailed discussion of how this has played out in the global warming issue.

2. What advantages and disadvantages does the Internet present as a source of information?

While most traditional sources of information such as books or journal articles have to run through some filters before publication, this may not be the case for much of what students encounter on-line. With an increasing reliance on the Internet as a source of information, students’ ability to critically evaluate reports becomes even more important. Reliable sources are frequently intermingled with those that are less reliable and students need to learn to be able to tell the difference.

Although there is no fool-proof method to assure that students are accessing the best information on-line here are some suggestions:

- Domain names (the suffix of the URL) give some indication of the source of information and the motive for posting the information. Educational (.edu) and governmental (.gov) sites, for example, generally provide more reliable information than commercial (.com) sites, which may have a motivation other than providing useful information. Web sites sponsored by organizations (.org) are a mixed bag. Many are excellent sources of unbiased information while others clearly have a particular agenda.
- To be sure that you are not getting outdated information, examine the “last updated or modified” note at the bottom of the first page.
- The appearance of poor grammar, misspellings, and other errors should be seen as an indication of lack of editorial control. Thus, any sites that exhibit these characteristics

should be looked upon with suspicion.

- There is strength in numbers. If several different sites have the same information, its credibility should probably be elevated.

3. What type of information was used to prepare the report? What should we accept as “evidence”?

Expect complete information to be used in the preparation of the report. If only selected information that supports a particular point of view is presented, the claims should be looked upon with suspicion. Also, be aware of the manner in which the information is presented. A common strategy is to present data by reporting only the extremes. Phrases such as, “as many as”, or “as few as” should serve as red flags indicating that the author is reporting extreme values to make a point. A more credible report would report numbers as a mean with some indication of variation around that mean (i.e., range, standard deviation or confidence interval).

Different types of evidence carry with them different levels of credibility. Consider the following hierarchy, ranked in increasing order of credibility:

- opinion
- single anecdote
- collection of anecdotes
- single scientific study
- group of independent studies

Beware of anecdotal information. Single accounts of isolated incidents are inherently unreliable. Many people rely solely on anecdotal information to formulate opinions. For example:

- At the height of the "spotted owl controversy" in the Pacific Northwest a Northern spotted owl was seen roosting on a grocery store sign in Roseburg, Oregon (a single anecdote). This observation received much media attention and was frequently cited as evidence that the species could live anywhere and certainly did not require old growth forest habitat. The results of numerous scientific studies that examined spotted owl habitat use suggested otherwise.
- The summer of 2001 was dubbed by the media as the "Summer of the Shark" as several high profile attacks occurred along the East Coast (a collection of anecdotes). The public interpreted these accounts as an unusually high rate of attacks when in reality those who keep shark attack statistics confirmed that it was a rather average year.

A **peer-reviewed** (or “refereed”) article is one that has been scrutinized by experts in the field prior to publication. As a result, such articles carry more weight than one that is not peer-reviewed. However, not all scientific studies carry the same degree of reliability. For example, the results from a “preliminary observational study” may not be as reliable as a “controlled experimental study”, even though both are published in peer-reviewed journals. Reliability is also influenced by factors such as sample size, length of the study and even researcher bias.

A claim gains credibility when it is confirmed by several independent studies, particularly when different methods are used by each study.

4. Do the conclusions or claims follow logically from the evidence or does the author appear to be “shooting from the hip”?

Expect the connection between "the evidence" and "the conclusions" (or "claims") to be logical and straight-forward. If the connection is convoluted or illogical, less credence should be bestowed upon the claims.

5. Beware of bias and hidden (or sometimes not so hidden) agendas (including your own!)

Bias is defined as a mental leaning or inclination, partiality or prejudice. When we exhibit bias, conclusions are based on preconceived notions rather than a critical evaluation of the evidence.

Consider the following statement:

Hunting and trapping regulations on cougar and bear should be relaxed because these predators pose a threat to humans and livestock.

Suppose that while deciding whether you agree or disagree with this statement, you consult the following sources:

- Partnership for the Ethical Treatment of Animals (PETA)
- National Rifle Association (NRA)
- U.S. Fish and Wildlife Service (USFWS)

The first two sources clearly would present a biased view of this issue. The first promotes animal rights, vegetarianism and supports anti-hunting and anti-trapping legislation. The second promotes the right to bear arms, hunter education and pro-hunting legislation. Although it might be interesting to see how each of these groups approaches the issue, neither should be used as the sole source of information. The U.S. Fish and Wildlife Service is a federal agency responsible for wildlife management on national wildlife refuges and endangered species management. The agency employs professional wildlife biologists and other scientists who conduct scientific studies of wildlife populations and evaluate the results of studies conducted by others. Although individuals within the agency may exhibit biases, the agency itself (ideally, at least) draws conclusions, establishes policy and takes action based on an objective evaluation of the information at hand. As a result, the agency is a less biased source of information on this particular issue.

Follow-Up Activity

After students have completed the activity and their evaluations have been graded, a brief follow-up is usually warranted to illustrate common pitfalls and to re-emphasize important points.

1. Why do you think this topic was selected?

It is current, well-publicized and controversial. Students have certainly heard recent news reports relating to the issue but may not yet be aware of the positions of the various stakeholders. Additionally, the science that relates to the issue is relatively new and an area of active research. This provides a good opportunity to begin discussions concerning the role of science in establishing environmental policy.

2. Students frequently have difficulty identifying "claims" in an article and the "evidence" that is used to support these claims.

Claims are positions or conclusions that are stated in the article.

Evidence usually takes the form of specific observations or data that are used to support a given claim. As a result, look for **numbers** in the article. Convincing evidence should at least partially answer the question, "How do we know that?".

An example from the forest fire issue:

Claim - Fuel reduction projects (thinning) proposed by the U.S. Forest Service are not frequently stalled by appeals and lawsuits.

Evidence - The General Accounting Office examined all USFS fuel reduction projects and found that approximately 1% had been appealed.

Another example:

Claim - Most of my students are Republicans.

Evidence:

- *I spoke to two students after class and they said they were Republicans.*
- *I surveyed the class and 70% supported the Healthy Forest Initiative, a proposal from the Republican White House.*
- *I surveyed the class and 60% claimed to be Republicans.*

Note the relationship between the type of evidence and the validity of the claim. Also, people or organizations can be **sources** of evidence but they cannot be the evidence themselves.

Another example from recent events:

In September of 2002, a fish kill occurred on the Klamath River in southern Oregon resulting in the death of over 30,000 chinook and coho salmon. The river has been the focus of a recent controversy concerning the allocation of water for agricultural interests, endangered fish species and wildlife refuges. What caused the fish kill?

Claim - Increased temperatures caused by decreased water flows in the Klamath River due to agricultural diversions have caused the fish kill.

Evidence:

- *water temperatures reached a maximum of 72° F this summer*
- *extended exposure to temperatures above 64° F is known to have lethal effects on these species*
- *water was retained for agricultural use this summer resulting in reduced flows in the river*
- *preliminary cause of death was found to be a fungal infection that attacks the gills of fish*

Discuss the validity of this claim based on this evidence.

Scientific research continues to further investigate the cause of the fish kill.

3. Be sure to completely convey your thinking in your answers. Do not expect that the reader will “read between the lines.”
4. Your own (student) bias is perhaps most difficult to identify. It is not at all uncommon for **no one** in class to identify this as a bias although certainly it exists. Consider the following quote:

“When we confuse what we would like to believe with what we have evidence to believe, we have a weak basis for making critical environmental decisions – decisions that could have far-reaching and serious consequences.”

Botkin and Keller, 2005

Resources

Most environmental science texts now include a chapter or portion of a chapter that discusses critical thinking on environmental issues. Instructors may also find the following useful.

Botkin, D.B. and E.A. Keller. 2005. *Environmental Science: Earth as a Living Planet*. 5th ed. John Wiley & Sons, Inc. 664 pp.

Bykoff, J. and M. Bykoff. 2004. Journalistic balance as global warming bias.
www.fair.org

Fairness and Accuracy in Reporting (FAIR) is a national media watch group that advocates for greater diversity in the press and fights media bias and censorship. Their web site includes an archive of interesting articles on media coverage that are categorized by subject area including the environment. This article uses the global warming issue to illustrate how the attempt to present opposing viewpoints in journalism can result in bias.

Chiras, D. D. 1992. Teaching critical thinking skills in the biology and environmental science classrooms. *Am. Bio. Teacher*. 54(8):464-468.

Etkina, E. and D. Ehrenfeld. 2000. Helping ecology students to read: The use of reading reports. *BioScience* 50(7):602-608.

Ford, R. 1998. Critically evaluating scientific claims in the popular press. *The American Biology Teacher* 60(3):174-180.