

Much of the technical writing you will do will be in the style of a journal article, characterized by its structured Introduction, Methods, Results and Discussion (IMRaD). Although you have been reading such papers for years, it is far too easy to overlook the standard formatting that characterizes them. A general overview of this format and some specific guidelines follow. Note that not all papers will include every section as itemized below. As a general rule, you should follow the formatting protocols of a key journal in your field. Journals vary in their idiosyncratic details; just choose a format and be consistent. As an environmental professional, you have tacitly agreed to adhere to your field's norms—so follow the rules.

Introduction

Introduce the topic and why we are interested in it. Specifically, what is the purpose and rationale for doing what you did? Include a clear statement of your objectives. In some cases, it might read better to phrase these as specific research questions. If you have several, it often works well to enumerate these as an inset list. Close the introduction by anticipating your main results somewhat—in effect enticing the reader to finish the paper! In this section, it is perfectly acceptable to write in the first person, active voice (but see Results, below). An Introduction typically will be front-loaded with a bunch of references that establish the legitimacy and importance of the issue (see References for details, below).

Background

You need not have a section titled “Background” but rather, this information might be tucked at the end of the Introduction or at the beginning of the Methods, as appropriate. Tell the reader what we already know, where the gaps or uncertainties are, and how what you have done will fit into this framework. This would normally include a concise and synthetic review of the relevant literature (“synthetic” means there is some interpretation and packaging provided by you). Cite key papers that have framed the current state of knowledge. This review and synthesis helps establish your credibility to the reader. This occurs in two ways: you must demonstrate that you know the literature and the key papers that define the intellectual arena in your area, and you need to tell the reader how your work fits into this larger context.

Methods

Present all of your methods, including the study area, data collection and processing, and analyses at a level of detail so that others could reproduce your study exactly. This is often the hardest section to write, as it demands precision and clarity without unnecessary detail. Subsections (Study Area, Model Development, Data

Semivariance is computed (Legendre and Fortin 1989):

(1)

where y_i and y_j are values measured at locations i and j , respectively, w_{ij} is an indicator function that takes on a value of 1 if the two samples are in the same distance class, else 0. Semivariance essentially describes how sa

they can be easily read. Note that if you are using Excel or some other low-level graphics package, the software might want to default to figures that do not match these specifications; please take the time to override the defaults (remove the title, scale the axes appropriately, choose useful tick intervals, change the line widths and styles, and so on).

Discussion

Recap the main results without simply repeating them (don't be redundant), and remind the reader why they are important: tie them back to the framework you developed in the Background, and to the larger issues you raised in the Introduction. The Discussion also is the place where you can speculate or rant, injecting your own personal spin on the results. If you switched to third person in the Results, you may revert to first person in the Discussion again.

Since your discussion might range far from your specific results, it might be appropriate to collect the main points and conclusions into a closing section or paragraph that "finishes" your report, bringing it back if possible to the objectives you itemized at the end of your Introduction. That is, we hope that once you've finished the paper you can answer the questions that motivated the effort in the first place.

References

Citation styles vary among journals and especially among disciplines. One thing most journals *do* agree on: do not use footnotes for references. In general, cite parenthetically in the text, by author's name and date (Urban 2002). Multi-authored papers are cited by lead author (O'Neill et al. 1988). If you cite several papers at the same time, arrange them chronologically and then alphabetically (Abbot 1993, Costello 2000, Zeta-Jones 2000).

Websites are citable *only* if they are archival; in the text, cite them by author and date (NCDC 2005). In the reference list, report the full name and URL:

National Climate Data Center (NCDC). <http://www.ncdc.noaa.gov/oa/ncdc.html>. (May 27, 2005).

Websites that are not archival should not be cited except as *public communications*. Material that