

## 12. *Tables and Figures*

- 12.1** Because the information that is given in tables and figures usually constitutes the heart of a scientific paper, it needs to be presented in as precise and accessible a way as possible.

### TABLES

A sample table illustrating many of the points discussed below appears in Example A at the end of this chapter.

#### Caption

- 12.2** The first sentence should state the contents of the table in a general way; although many authors simply repeat the column headings in the first sentence, this is not very informative and should be avoided whenever possible. The first sentence does not have to be a complete sentence.

Subsequent sentences, which do have to be complete, should present other information that is pertinent to the table as a whole. Although AFS style no longer requires that tables be essentially self-standing (i.e., intelligible apart from the text), captions should provide enough information that readers can easily perceive the purpose and structure of each table. Where relevant, this will include

- the particular species involved and their gender(s) and age(s)
- the body of water or laboratory at which the data were obtained (but not the state, province, or country)
- the method by which the specimens were collected (e.g., electroshocking)
- the year and month or season in which the specimens were collected or the experiments carried out
- the statistical tests and significance levels used
- definitions and explanations that apply to the entire table

The following caption, which shows the general format for captions, is a good model:

TABLE 1. Seasonal growth and survival (90-d means  $\pm$  SDs) of age-1 Sockeye Salmon that were tagged with one of three devices and released into floating net-pens in Lake Genoa, 1987–1988. Asterisks denote significant differences from unmarked controls (*t*-test;  $P \leq 0.05$ ).

#### EXCEPTION

A complete description of the study need not be repeated in the captions to subsequent tables, provided that the context is clear. For instance, the caption to the table following the one in the example above could be simply

TABLE 2. Relative weights (90-d means  $\pm$  SDs) of age-1 Sockeye Salmon in tagging experiments.

#### 12.3 To prevent a caption from becoming unwieldy,

- Move units of measure to the straddle, column, or row headings whenever possible (see sections 12.5–12.7)
- Put narrowly focused definitions and explanations in footnotes
- Do not define terms and abbreviations that are well known and defined in the text (e.g., LWD [large woody debris])
- When definitions and explanations are lengthy and have been given in a previously mentioned table or figure, refer the reader to that table or figure rather than repeating the information
- When symbol definitions or detailed explanations are readily located in the text, refer the reader to the text

#### SIGNIFICANCE LEVELS AND STANDARD DEVIATIONS

#### 12.4 If there is one level of significance in a table, it may be noted as in the sample caption above. Different levels of significance are usually indicated by different numbers of asterisks, with an explanation such as the following at the end of the caption:

...;  $P \leq 0.05^*$ ,  $P \leq 0.01^{**}$ . or ... ( $P \leq 0.05^*$ ,  $P \leq 0.01^{**}$ ).

Note that a symbol such as *P* may not begin a sentence.

The way in which standard deviations, standard errors, and confidence intervals are presented may be explained in the caption or the row and column headings, whichever is appropriate. The form of the explanation

should follow that of the presentation. For example, when the data are presented in the form “9.5 ± 0.7,” the explanation should be of the form

mean ± SD

When the data are presented in the form “9.5 (0.7),” the explanation should be of the form

mean (SD) *or* mean (SDs in parentheses)

## Headings

- 12.5** Column headings may be individual (such as “Age-class” in Example A) or grouped under a straddle heading (such as “Total weight [g]”), as appropriate. Note that a straddle heading describes the items immediately below it, not the data in the columns.

Column headings must indicate all of the information that appears beneath them. When more than one type of information is given, this must be reflected in the heading. For example, if the first column contains the names of various locations and species of fish for which data are presented, the column heading should read “Location and species.”

*There should be only one set of column headings per table.* To avoid having more than one set, rearrange the table (such as by switching the rows and columns) or split it into two or more tables.

- 12.6** Row headings need not be repeated when they apply to more than one row. Subheadings should be indented the length of one em dash from the main headings.

Bold centered headings (e.g., “Females” and “Males” in Example A) may be used to distinguish different types of data. These headings must be distinct from the row headings (i.e., they must not represent larger aggregations of the items in the row headings), and they must not conflict with the column headings.

- 12.7** If all of the data in the table have the same unit of measure, indicate it in the caption. If different units of measure are involved, indicate them in the appropriate column, straddle, or row headings.

- 12.8** When the names of months are used in headings, they should be abbreviated to their first three letters; years should be given in their entirety. Date designations such as “6/21/06” are not permitted; use “Jun 21, 2006” instead.

- 12.9** Special rules apply to the capitalization of terms beginning with a number or symbol when they are used in headings.

Capitalize the first word of a hyphenated term unless it involves a unit of measure:

$\alpha$ -Testosterone L-Thyroxine *but* 3-year-old fish 6-week analysis

Do not capitalize the first word of an unhyphenated term or one in which capitalization would be apt to cause confusion:

1998 year-class % of mean *t*-test

## Body

The entries in the body of a table should be arranged so that they are as easy to read as possible. To this end, the press automatically formats these entries according to certain rules. However, there are a few formatting matters for which authors are responsible.

- 12.10** The press aligns numerical entries on a decimal point (which may not be shown explicitly), an en dash, or a plus/minus symbol ( $\pm$ ), depending on the particular form of the data.
- 12.11** Authors should insert blank lines to divide rows of data into logical groups. Blank lines may also be used to break up long columns of data.
- 12.12** Authors are also responsible for the correct placement of the lowercase letters that indicate the statistical equivalence or nonequivalence of values within a row or column (z, y, x, . . .); such letters should be put on the same lines as the values to which they refer and be separated from them by single spaces.

Note that the letter z may indicate either the largest or the smallest value(s) but that the other letters must then follow suit (e.g., if z indicates the largest value(s), y must indicate the next largest, and so forth). Do not use the sequence a, b, c, . . . in statistical comparisons because these letters are reserved for footnotes.

If all of the values in a table are statistically equivalent, note that in the caption rather than by letters. Otherwise, each value in a comparison must be accompanied by a letter; do not use the absence of letters to indicate equivalence.

## Footnotes

- 12.13** Footnotes should be indicated by superscripts starting with the lowercase letter “a.” They do not need to be complete sentences but must end with periods. Avoid using footnotes in captions.

## Extensions and Continuations

- 12.14** If a table is too wide to fit on one page, the press will “extend” it onto a facing page, so that column  $m$  on the left-hand page is followed by column  $m + 1$  on the right-hand page. For clarity, the row headings are repeated on the right-hand page. Alternatively, the author may be asked to condense the table.
- 12.15** If a table is too long to fit on one page, the press will “continue” it onto a facing page, so that row  $n$  on the left-hand page is followed by row  $n + 1$  on the right-hand page. The column headings are repeated on the right-hand page; the row headings may also be repeated if necessary for clarity.

## Appendix and Supplementary Tables

In addition to the standard elements of a paper, authors may submit certain supplementary material, such as additional data or results, the derivations of equations, computer code, and so forth. For publication purposes, such material will be treated either as an *appendix* (which will appear with the article in both the print and online versions) or as a *supplement* (which will appear only in the online version). In terms of format, appendices should be regarded as extensions of articles and thus follow AFS style strictly. Supplements, by contrast, may be in any format that is suitable for their contents; however, (1) there should be consistency between the symbols, abbreviations, and so forth used in the supplement and those used in the article and (2) either the title of the supplement or the first paragraph should make clear how it relates to the article.

- 12.16** There is only one difference between the treatment of tables that appear in appendices and that of those that appear in the text, namely, that the number is preceded by the letter A and a period:

TABLE A.1. . . .

If there is more than one appendix, they should be numbered A.1, A.2, and so forth and the tables within them A.1.1, A.1.2, . . . , A.2.1, and so forth. All appendices should begin with centered headings in bold, even those that only contain tables.

The treatment of supplementary tables is the same as that of appendix tables except that the letter S replaces the letter A in the table designations (e.g., Table S.1).

## FIGURES

Figures include visual materials such as graphs, maps, diagrams, and photographs. Like tables, they may appear in the text, one or more appendices, or one or more supplements. This section outlines the stylistic requirements for figures; authors should also consult the guidelines for the individual AFS publications for specific technical requirements (e.g., electronic format).

The primary responsibility for correct figure design and formatting rests with authors. Although the press has the ability to make minor changes, figures will be returned to authors for major changes, possibly delaying publication.

At the most fundamental level, figure design should follow certain commonsense principles: figures should be as simple and straightforward as possible, have a high enough resolution to be easily readable, and be consistent in the use of lettering, line widths, and other graphic elements. They also need to conform to AFS style.

It is particularly important to remember that many figures will be reduced by 35–50% when printed and thus need to be designed with this in mind. Some of the guidelines that follow address this issue, but as a safeguard we urge authors to use a copier to reduce each figure to the width of one or two printed columns and the appropriate height (for the four print journals, the single- and double-column widths are approximately 2.75 and 5.62 in, respectively, and the height is 7.25 in; for other AFS publications (e.g., books and *Fisheries*), consult the specific guidelines for those publications). Every element should still be legible and all symbols, shadings, and so forth distinct after reduction.

### 12.17 Captions

Place each figure caption immediately below the figure to which it pertains. Figures that appear in appendices and supplements should be numbered like appendix and supplementary tables.

Like the captions for tables (sections 12.2–12.4), those for figures should generally be comprehensive enough to enable the reader to understand the figures without reference to the text. However, to the extent possible, include full variable names, units of measure, panel descriptions, legends, and so forth in the figure itself rather than in the caption. Identify abbreviations and nonstandard symbols in the caption.

If symbols such as “A” and “B” are used to designate different panels within a figure, in the caption (1) the letters should be in parentheses, (2) both the letter and the parentheses should be in bold the first time they occur, and (3) the letter should come before the description of the item to which it refers. Capital letters are strongly preferred, but in any case the letters should be exactly the same in the figure and caption (e.g., if the figure uses “a” and “b” rather than “A” and “B,” the caption should too).

### 12.18 Size and Layout

As a rule, figures should be rectangular with a height : width ratio of 2 : 3 or 3 : 4 (unless such a ratio distorts the data). The scale should be chosen so that the representation of the data fills the space allotted to it as completely as possible.

Do not use borders around figures. In figures portraying the  $(x, y)$  plane, show only those two axes unless data are also arrayed along a  $y$ -axis on the right.

Place tick marks on the outside of the axes (i.e., to the left of the  $y$ -axis and below the  $x$ -axis).

Place axis labels close to the axes but not so close that they obscure the scale. If an axis label applies to more than one panel above or to the right, it need be given only once (centered with respect to the panels in question).

If the  $x$ -axis shows months or years, include the word “Month” or “Year” under the months or years named. Abbreviate months by their first three letters; give all four digits for years.

Place multiple panels close together but do not crowd them. Whenever possible, give them substantive labels (e.g., “Above dam” and “Below dam”) rather than “A” and “B.”

Place other elements, such as legends (typically used to explain the symbols, line formats, or shading representing different phenomena), scale bars, and compass roses within the margins of the figure; if an element applies to more than one panel, it need be given only once, preferably in the first panel.

Individual lines within a graph may be labeled (such as by an arrow and text, an equation, or statistical information) as long as the graph does not become too cluttered.

Whenever possible, use distinct patterns (e.g., hatch marks) rather than shading to distinguish different phenomena in bar and pie charts; if shading is used, keep it in the range of 30–70% of black and make sure that the different shadings are clearly discernable.

In the print version of the journal, all figures will be reproduced in black and white unless authors have made specific arrangements with the Journals Department to cover the extra costs of color printing. (In the online version, color figures will be reproduced in color at no additional charge.) Because color printing is expensive, authors are advised not to use color to distinguish phenomena when other means (different shading, symbols, and so forth) are adequate. If you have to use color in a figure, avoid using similar colors or shades that may be difficult for readers to distinguish. Also, in deference to readers with color blindness, avoid using red and green in the same figure.

Maps should include a scale and a compass rose indicating which way is north. Highly localized maps should be accompanied by a broader-scale map showing the regional location.

The scale should be given for photomicrographs and, when relevant, for photographs.

## 12.19 Lines and Lettering

The axis and other lines appearing in a figure should be wide enough to accommodate reduction, but not so wide as to dominate the figure. Different widths may be used to distinguish different items (e.g., axes versus curves), but the same width should be used for analogous items. Special care should be taken with dashed lines (which may appear continuous after reduction) and dotted lines (which may no longer be visible).

Use the font Times Roman for all axis labels; the font size should be 6–9 points after reduction and not bold or italic. Other fonts may be used for other items as long as (1) the same font is used for analogous items and (2) the font size is no larger than that used for the axis labels (but at least 6 points).

A bold sans serif font (e.g., Arial) may be used for the letters that distinguish different panels (A, B, etc.). Otherwise avoid bold type, as it tends to fill in when reduced. Also avoid italic type, as it tends to wash out.

Capitalize the first word in all labels as well as any proper nouns and adjectives; do not capitalize other words.

## CALL-OUTS

**12.20** Call-outs are references to tables, figures, appendices, and supplements that occur within the main text and direct the reader to those items:

Survival was greater in tank 1 than in tank 2 (Table 1).

All of the tables and figures that appear with the main text should be called out in numerical order. Call-outs to material in appendices and supplements may be more general as long as the reader is made aware of them:

(For additional results, refer to Appendix A.1)

Call-outs need not be repeated for every result provided that it is clear in which table/figure they may be found:

Survival was greater in tank 1 than in tank 2 (Table 1). However, the fish in tank 2 attained greater weight.



## Example A

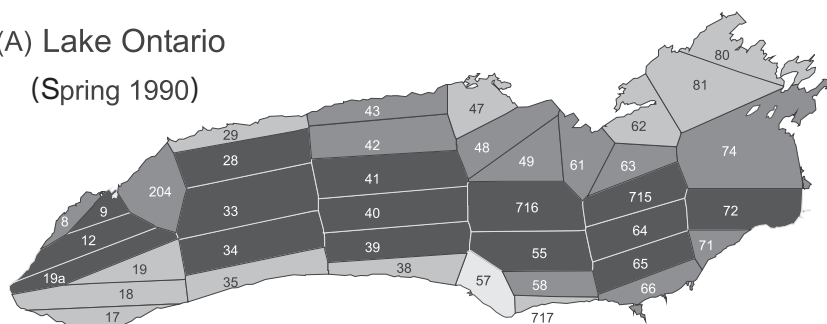
TABLE 5.—Age, weight, and length statistics for female and male Alabama shad collected in the Choctawhatchee River. Data for years 1994, 1995, 1999, and 2000 are combined.

Age-class	Sample size	Total weight (g)		Total length (mm)		
		Range	Mean	Range	Actual mean	Model mean <sup>a</sup>
<b>Females</b>						
2	51	393–990	637	365–438	397	395
3	53	327–1,202	702	365–445	404	408
4	44	360–1,265	772	373–467	418	418
5	13	574–1,118	841	409–455	433	425
6	6	626–963	837	400–440	425	431
<b>Males</b>						
1	11	48–222	109	90–288	213	207
2	104	48–662	411	188–390	353	357
3	67	80–722	457	222–418	362	370
4	21	313–707	461	344–415	373	371
5	3	409–454	432	362–388	372	371

<sup>a</sup> Model mean is based on the following von Bertalanffy growth models, where  $L(t)$  = total length at time  $t$  in years. Females:  $L(t) = 447(1 - e^{-0.289(t - 5.424)})$ ; males:  $L(t) = 371(1 - e^{-2.437(t - 0.664)})$ .

## Example B

(A) Lake Ontario  
(Spring 1990)



(B) Lake Erie  
(Spring 1994)

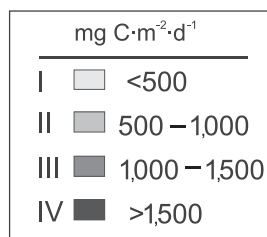
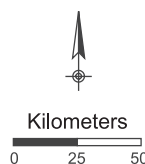
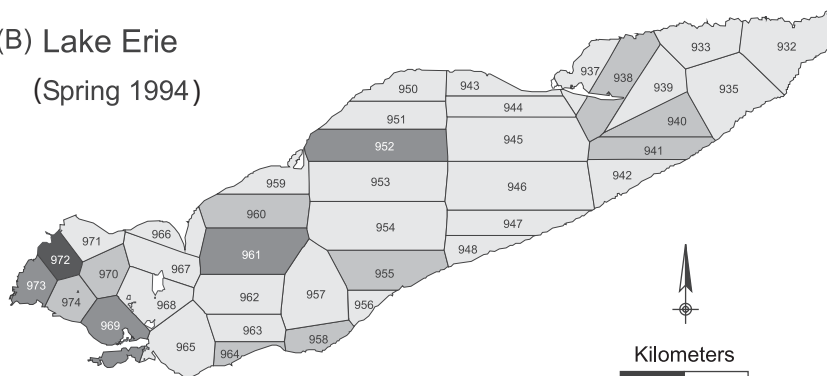


FIGURE 1.—Maps of (A) Lake Ontario and (B) Lake Erie showing the stations (numbers) sampled on selected synoptic cruises in the springs of 1990 and 1994, respectively; the Thiessen polygons assigned to each station; and the polygons classified according to the level of daily areal phytoplankton photosynthesis computed with cloudless irradiance (mg C·m<sup>-2</sup>·d<sup>-1</sup>).

## Example C

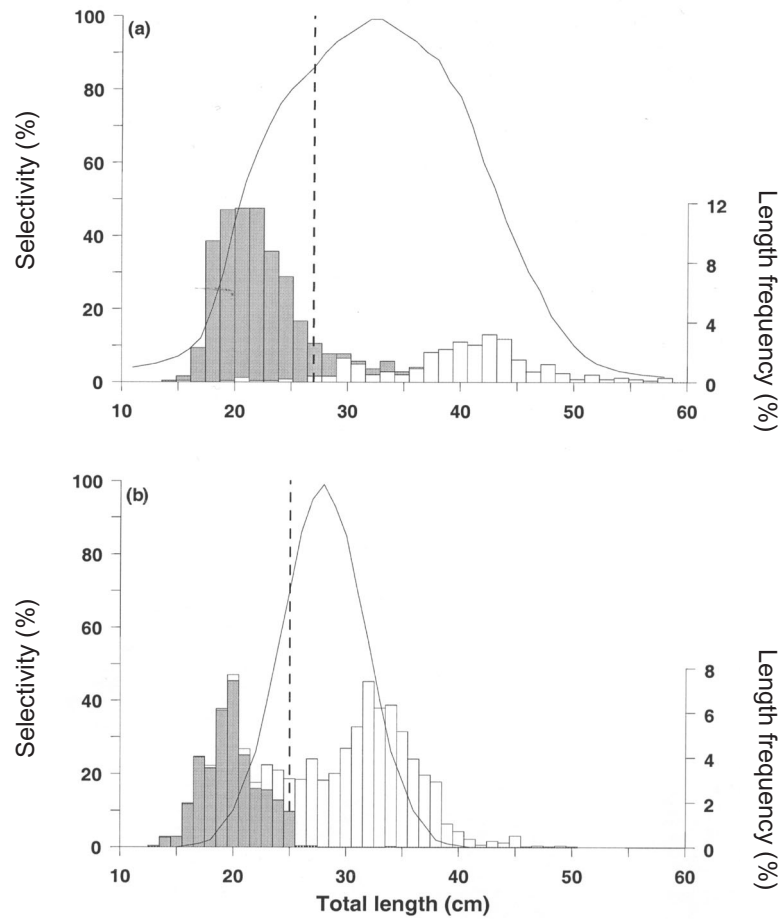


FIGURE 4.—The theoretical overall selection curve for (a) *T. toli* from Sarawak and (b) *T. macrura* in Sumatra when the selectivity curves for the similarly shaped *T. ilisha* are applied to the mesh sizes used in each fishery. The length frequencies of males (shaded bars) and females (white bars) in the commercial catch and the minimum length at sexual maturity (vertical dashed line) are also shown. Data are from the studies of Blaber et al. (1996, 1999).