

UNCW

Graduate School

**Electronic Thesis and
Dissertation (ETD) Manual**

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ELECTRONIC THESIS AND DISSERTATION (ETD)

ETD INFORMATION

An electronic thesis and dissertation is an electronic document that is similar to the hard copy thesis. The electronic formatting may be similar but provides: more access to research, less expense to authors and libraries, better presentation of research, and environmental sustainability. Thesis and dissertation formatting will be similar to [Virginia Tech ETD samples](#). The thesis/dissertation committee and the program will be the responsible parties for determining what is acceptable for your thesis.

Electronic thesis and dissertation submission has been required since Spring 2003. **Total electronic thesis and dissertation submission** is required starting Spring 2008. Students may also submit material that cannot be incorporated in an electronic document as part of the thesis or dissertation (as an example - a piece of sculpture for a studio art degree).

COPYRIGHT INFORMATION

You own the copyright to your ETD without taking any formal action. You also have the option of formally registering your copyright for \$30 directly with the U.S. Copyright Office. Dissertation authors have the option of having UMI/ProQuest register the dissertation for \$45.

THESIS AND DISSERTATION INFORMATION

The graduate school now requires an electronic searchable PDF version of your thesis or dissertation. The graduate school **DOES NOT** require hard copies of your thesis or dissertation; however your program may require a hard copy for program purposes.

Thesis/Dissertation steps:

1. Have your Thesis or Dissertation draft assessed by your advisor and committee.

2. Submit the committee approved electronic draft, as a PDF, to Nancy Holland (hollandn@uncw.edu). Fill out and submit the [Format Approval Sheet](#) signed by your faculty advisor to Nancy Holland in the Graduate School.
3. Defend your thesis or dissertation.
4. Submit a paper title page, on plain paper, signed by your committee members to Nancy Holland in the Graduate School.
5. Submit your final electronic thesis or dissertation, as a PDF, to Nancy Holland (hollandn@uncw.edu).
6. Fill out and submit the [Electronic Thesis and Dissertation \(ETD\) Submission Form](#) to Nancy Holland in the Graduate School.

For more information about thesis and dissertation requirements, please read below.

THESIS AND DISSERTATION FORMAT GUIDE

INTRODUCTION

The thesis or dissertation culminates an important stage of your graduate career. In preparing and defending this document, you prove that you have acquired essential skills of research or scholarship as well as the ability to effectively communicate the results of your inquiry to the academic community.

To assist you and your advisory committee in this process, the Graduate School has prepared an ETD Format Manual, one that deals with basic formatting and illustration preparation. Our goal is to help you produce a thesis that looks professional and makes the findings accessible to readers. We also hope that the thesis format recommended in this guide will facilitate publication of the work in a professional journal appropriate to the discipline.

STYLE

The requirements described in the *Manual* are derived from standard practice among American universities, libraries, and publishers. We encourage you to become familiar with the *Manual* upon beginning your first draft. Following this *Manual* from the beginning will help you anticipate and avoid problems, locate answers to your questions, and spend less time making corrections.

The Graduate School requires that students follow this guide in producing their thesis, unless they are students in the Departments of English, History or Creative Writing. Students in the Department of English follow the format of *Publications of the Modern Language Association of America*, and the Department of History the format of *American Historical Review*. In the Department of Creative Writing, where novels, short story and poetry collections rely on the publication format norms of their respective genres, the choice is up to you and your committee.

PERSON

The thesis represents the culmination of an individual's research program. Although thesis advisors and committee members play an important role in the development, guidance and final evaluation of the overall project, an individual and not a group of persons author the thesis. While the Graduate School recognizes the important input that advisors or committee members often make in a person's thesis, they are not co-authors. Consequently, the thesis should not be written in the first person plural (*we*). *We* is a plural pronoun that refers to more than one individual. Theses should be written either in the first person singular (*I*) or in the third person. The third person is probably the best way to write a thesis in some areas but may not be appropriate for all areas. Individuals who provide assistance in the research project should be mentioned in the acknowledgments. Obviously, if the work is published, co-authorship is often necessary and appropriate.

RESPONSIBILITIES

When you submit your thesis for formal evaluation, the Graduate School will see that it meets the requirements described in this *Manual* or follows the style guide you have chosen if you are from one of the departments mentioned above. You and your committee are responsible for the content and quality of your thesis. When you have questions concerning the substance of your work (e.g., the arrangement of tables or whether material belongs in an appendix), turn first to your committee chair, or to other members of your committee. They will be most familiar with your work and will know the standards in your field. A format advisor in the Graduate School can assist you in interpreting this *Manual* or your style guide, but your committee is the best resource for advice about writing and organizing your work. Except for those few aspects of your paper that the format advisor will evaluate, committee members are the final judges of your paper. Do not use

another thesis as a model for your work as a particular style or example in a previous work may be incorrect or out-of-date.

FORMAT EVALUATION

When your committee agrees that you have produced a complete, nearly final copy of your manuscript, you must email the draft to Nancy Holland (hollandn@uncw.edu). You must fill out and submit the [Thesis Format Approval Sheet](#) to the Graduate School and it must be signed by the chair of your committee. The Graduate School will not review your work without the signed format approval sheet. Do not schedule your oral defense until the Graduate School has approved your thesis formatting.

The Format of your manuscript will be reviewed by a format advisor in the Graduate School and also by an outside reader. The advisor checks your work against Graduate School requirements and the requirements of your style guide if appropriate. The outsider reader, along with the format advisor, spot-checks for misspellings and grammatical problems. This evaluation usually requires two to four working days; however, when deadlines are approaching, format evaluation may take a bit longer. Most students must make a few corrections or changes. The student should leave a telephone number or an e-mail address where he/she can be reached. If corrections need to be made, the Graduate School will ask to see a revised copy before granting approval to schedule the thesis defense.

FINAL ELECTRONIC COPY

A note before submitting your final copy.

The ease of access to ETD's may create issues with prior publication for journals or publishing houses, and for the prosecution of patents. Check with your advisor before you submit your thesis or dissertation so you can choose the most appropriate release option for your work. There are access restrictions that may be placed on a thesis or dissertation when it is submitted to the Graduate School. To address these publication issues check the [Electronic Thesis and Dissertation \(ETD\) Submission Form](#) or with the [Graduate School](#) for more information, **before submitting your final copy**. The following are options on the Electronic Thesis and Dissertation Submission Form:

- Release the entire work immediately for access worldwide.

- Release the entire work for UNCW access only for: one year, three years, or indefinitely.
- Release the entire work for UNCW access only, while at the same time releasing only the following parts of the work (e.g., because other parts relate to publications) for worldwide access (separate files must be submitted to use this option) for: one year, three years, or indefinitely.
- Delay the release for a period of no more than one year for purposes of patent protection.

After the selected time has passed the ETD will be released worldwide.

Assuming the oral defense is successful, the student should make any changes or corrections requested by the committee and prepare a final copy for submission to the Graduate School. The Graduate School requires that each student submit his/her thesis electronically to the Graduate School as an e-mail attachment. This copy of the thesis must be in searchable PDF format. **One hardcopy title page, on plain paper, is required and should contain the signatures of all members of the thesis committee. The title page of the electronic thesis DOES NOT need to be signed but should have the names of the committee typed in the appropriate underlined spaces and a blank underlined space should be left for the Dean's electronic signature.** An [Electronic Thesis and Dissertation \(ETD\) Submission Form](#) must be filled out and submitted to the Graduate School along with your Thesis or Dissertation. The electronic copy is forwarded to the Archivist, Randall Library, where it is catalogued and archived. Check with your department or program, as they may require a printed thesis or dissertation.

If a hard copy is required by your program, you should follow the [Guideline for Department Required Hardcopy](#) for formatting of the program copy. Check with your program graduate coordinator for binding information. The University will cover the cost of binding this copy. Binding of personal copies (for the committee and others) is your responsibility. Additional information about personal copies can be found [here](#).

ORGANIZATION AND REQUIREMENTS

Theses are organized into three sections that appear in sequence as follows:

1. Front matter (including title and approval pages, the table of contents, list of tables, etc.)
2. Text (introduction, chapters, figures and tables)
3. Back matter (including notes, references or bibliography, appendices, and biographical sketch).

The graduate student and the advisory committee work together to determine what parts are to be included in the thesis. While some requirements apply to the entire text, others differ for these three sections and are described below. In the appendix are examples of each of the previous sections.

FRONT MATTER: REQUIREMENTS

The front matter consists of the:

1. Title Page
 2. Journal Page
 3. Table of Contents
 4. Abstract
 5. Acknowledgments (optional)
 6. Dedication (optional)
 7. List of Tables
 8. List of Figures
 9. Other lists such as nomenclature or symbols, when necessary.
- Front pages are paginated separately from the rest of the text using lower-case Roman numerals at the bottom of these pages.
 - The Title page is page i but is not numbered. It should not be included in the Table of Contents.
 - Begin numbering with the Table of Contents, page iii. Continue using the lower-case Roman numerals up to the first page of the text (page 1 of Chapter 1 or Introduction). Specific requirements and examples for each part of the front matter follow.
 - How to set tab leaders in Microsoft Word:
 - Format Tabs:

- Set tab position at 0", alignment left, leader #1 (none), click Set
- Set tab position at 6", alignment right, leader #2 (dots), click Set

Title Page ([see examples](#))

Follow exactly the sample Title Page in the appendix. Proper spacing and arrangement are clearly indicated.

- Margins: left, right, top, and bottom 1"
- Typeface and size: consistent with text
- No underlining, boldface, or italics (exception: names of species, genera, or book titles; may be underlined or italicized)
- Center material between the proper margins
- Thesis title (line 3): ALL CAPS, single-spaced
- Title length: 15 words or fewer (105 characters or fewer)
- Only approved abbreviations are allowed in the title (consult the Graduate School)
- Name (line 8): capitalize as shown
- Statement: see example in the appendix for wording; begin first line of statement on line 13; capitalize as shown; do not alter words per line
- Department (line 19): capitalize as shown
- UNCW (line 21): capitalize as shown
- Year (line 23)
- Approved by (line 26): capitalize as shown
- Advisory committee (line 29): capitalize as shown
- Signature lines: begin on line 32; flush first line with left margin (about 30 spaces); second line, equal with the right margin. All Signature lines should be the same length, 2.5 inches long.
- Accepted by (line 39): capitalize as shown
- Signature line for dean (line 42): center "Dean, Graduate School" directly under signature line; capitalize as shown
- Committee members names should be typed and underlined
- If you have four or more committee members, please contact the Graduate School for guidance in formatting the signature lines
- **Do not** paginate the title page
- **Do not** include line numbers, on submitted copies

Table of Contents ([see example](#))

The Table of Contents introduces the reader to your text, indicating its contents, organization, and progression. This key to your paper should make access easy, not overwhelm the reader with a detailed index of the contents. The arrangement shown in the sample Table of Contents works well for most theses, with minor adjustments for the style of chapter numbers or heading levels. All theses require a Table of Contents. The following list of requirements is very important- -the format advisor will check carefully to see that you have met each of them.

- Margins: left, right, top, and bottom 1"
- Typeface, size and style: consistent with text
- No underlining, boldface, or italics (exception: names of species, genera, or book titles; may be underlined or italicized)
- Entries need not be made for every heading in your text: decide which headings (e.g., chapter titles, 1st, and 2nd level headings) will convey the structure and contents of your paper, then follow your scheme consistently for each chapter.
- Most students include the first 3 levels of headings. Note: if you choose to include a level, you must list every heading at that level in the Table of Contents.
- Entries must be consistent, in both style and substance, with headings as they appear in the text (wording, capitalization, style of numerals, etc.)
- Abbreviation: you may abbreviate a lengthy heading for its entry here, but do not paraphrase it; the entry must match the heading exactly up to the point where you abbreviate
- Length: may run more than one page; do not type "continued" at the top of second page each entry should have tab leaders with numbers aligned correctly
- Page Number: iii (and iv, if the Table of Contents runs to 2 pages), centered at $\frac{1}{2}$ inch from the bottom of the page

Abstract ([see examples](#))

- The abstract should be a succinct summary of the aims, methods, conclusions or results, and significance of your study. The sample abstracts provide models for format and style.

- Margins: left, right, top, and bottom 1"
- Typeface and size: consistent with text
- No underlining, boldface, or italics (exception: names of species, genera, or book titles may be underlined or italicized)
- Center the word Abstract between the proper margins
- Double-space
- Length: 350 words, maximum (some abstracts within the limit will still run to two pages)
- Do not include citations or references
- Page number: iv, centered $\frac{1}{2}$ " from the bottom of the page (and v, if the abstract runs to 2 pages)

Acknowledgments and Dedication ([see examples](#))

These are optional pages, although most theses include a brief paragraph acknowledging the contributions of committee members and others who helped the student complete the research. The Dedication and the Acknowledgments should be separate, single pages. If you decide to include these pages, you must maintain a professional tone.

- Margins: left, right, top, and bottom 1"
- Typeface and size: consistent with text
- No underlining, boldface, or italics
- Double-space
- Page number: place the lower case Roman numerals $\frac{1}{2}$ " from the bottom of the page. If the last page of the Abstract is iv, the Acknowledgments page will be v and the Dedication page vi.

List of Tables and Figures ([see examples](#))

Obviously, only theses that use tables and figures require these lists. Both lists follow essentially the same format, which resembles the Table of Contents. Again, the following samples provide models that are easy to read and work well for any thesis.

- Margins: left, right, top, and bottom 1"

- Typeface and size: consistent with text
- No underlining, boldface, or italics (exception: names of species, genera, statistical abbreviations, or book titles may be underlined or italicized)
- Order: the List of Tables precedes the List of Figures
- Make entries for every table title and figure caption
- Entries must be consistent, both in style and in substance, with the titles and captions as they appear in the text (wording, capitalization, style of numerals, etc.)
- Abbreviation: you may abbreviate lengthy titles or captions, but do not paraphrase them; the entry must match the title or caption exactly up to the point where you abbreviate
- Length: either list may run to several pages; do not type "continued" at the top of second and subsequent pages
- Page number(s): number consecutively from the last page of the Acknowledgements or Dedication (if present), centering between the proper margins the Roman numerals $\frac{1}{2}$ " from the bottom of the page

Other Lists

Lists other than the Table of Contents, List of Tables, and List of Figures may include the Nomenclature, List of Symbols, Definitions or Glossary, or similar lists. Discuss with your committee the need for such lists, decide upon the proper title, and then choose a clearly organized format. Once the format is chosen, follow it consistently.

TEXT: REQUIREMENTS

The text of the thesis should be organized logically according to the nature and range of the research being reported. In general, theses begin with the Introduction or Preface, which includes a clear explanation of the goals of the project. The student should include a review of previous research, a record of the results obtained, and interpretive discussion of the results. The organization of the thesis argument will vary with the discipline, but the argument must be logically presented and supported with facts. A summary of the significant findings of the study should also appear within the text of the thesis.

- The format for the body of your thesis/dissertation should be determined by your department/program and thesis/dissertation committee.
- Additional approved media file types such as video, animations, audio, or other enhancements are allowable and, in fact, encouraged as appropriate. **Hyperlinks to external URLs are not allowed** since links may not always be active in the future.
- The thesis or dissertation may utilize the range of capabilities afforded by the electronic medium - e.g., audio and video files, animations, etc.
- A list of approved file formats (other than pdf) is listed below.

Full Text of ETD

- **PDF (.pdf)**

PDF stands for Portable Document Format. The latest version of Acrobat Reader can be downloaded from:

<http://www.adobe.com/products/acrobat/readstep.html>

Illustrations

The introduction of computer graphics for illustration has enhanced the ability of persons to prepare illustrations. Computer programs allow someone with little drafting ability to prepare high-quality illustrations. However, illustrations (Tables and Figures) must serve the reader, support the text, and conform to standards in your field. Each table and figure follows its reference in the text.

Style guides often provide clear guidelines for the arrangement of data in tables or the creation of useful illustrative materials. Plan your tables and figures with these requirements in mind, remembering that margin requirements apply to every page of your text. Table titles and figure captions must be carefully coordinated with the List of Tables and List of Figures. Creating and maintaining these lists early in your work on the manuscript will help you control the numbering and progression of tables and figures. The following section answers common questions and resolves typical problems.

- **Tables ([see examples](#))** - "Good tables are essential to..." theses, reports or papers "...because some information is presented best in tabular form." Simple tables generally are more effective than complex ones.

A table should deal with a single subject or bring together related information for comparison. Several small tables generally are better than one big one.

Table too wide for margins. Type it the length of the page (or use landscape printing). The title should appear along the left margin. The page number still appears as usual at the bottom of the page. See appendix for example.

Table too long for one page. Continue the table onto the next page, using usual margins. Don't repeat the title on the second (or subsequent) pages. Instead, center "Table ## cont." at the top of each succeeding page until the table is completed.

Oversized table. Consider redesigning the table to fit the page or reapportioning the data between two tables

- **Figures ([see examples](#))** - Figures are diagrams, designs or patterns that provide illustration. Common figures include maps and cross-sections, graphs, photographs, drawings, etc. Text figures should be carefully planned to ensure the most effective communication possible. Illustrations serve to demonstrate relations that cannot be described as clearly by written word or to relate more detail than words can effectively portray. Figures can be in black and white or color, or mixed in a thesis. Remember that designing your illustrations early using the vertical and horizontal spatial dimensions of the page, minus the margins, will result in a better illustration. If you have trouble showing everything in portrait format, you can use landscape format. A single figure stands alone on a page, i.e., you are not allowed to mix two or more figures on the same page. In some cases this may result in figures only occupying small areas of individual pages and looking awkward. Sometimes, figures can be combined on a single page and identified with different letters, such as a, b, c, and d. Below are answers to specific problems you may encounter in preparing figures.

Oversized figure. You may be able to redesign the figure to meet margin requirements.

Multiple-image figure. Consider this as one figure, giving it a logical and inclusive common caption. You may label the components a), b), c), and so on, but do not use a combination of figure number and letter on the component itself (i.e., "3a") appearing on component a) of Figure 3. See example for the proper arrangement of such figures.

Facing-page caption. Some figures remain within margin requirements but leave no room for the caption. For such figures, create a facing-page caption. The figure appears on the page behind the caption ([see example](#)). Margins on the caption page are reversed, so the wider margin is on the right, allowing for the binding (as you usually have allowed for it on the left). The page number appears centered at the bottom. The style of the caption should conform to your style guide or journal, just as your other captions do.

Images

Some formats are better for different data and presentation. If your image needs to be printed go for a format that produces a larger file size. For example, images that are only intended to be viewed on screen, a resolution of 72 or 75 dpi will result in a small file that can be easily downloaded. A resolution of 600 dpi is recommended for images that are intended to be printed.

- **PDF (.pdf)** - good for line drawings with searchable text, e.g., maps.

PDF is best used to store vector-based graphics (i.e., graphics drawn using lines and curves rather than pixels). Vector graphics stored in PDF format will be much smaller, will read more cleanly, and any included text will be searchable. Equations, charts, and diagrams that combine text with vector-graphics are particularly appropriate to store in PDF format.

- **JPEG (.jpg)** - better for photographs

The JPEG format is primarily used to store photographs. JPEG is a "lossy" format, meaning that some image quality is sacrificed in order to produce much smaller files. Images of higher quality should be stored in TIFF format instead (see below). Non-photographic images such as graphs and charts will be smaller if stored in GIF format instead (see below).

- **GIF (.gif)** - better for images other than photos, e.g., drawings.

The GIF format, developed by CompuServe, is best used to store screen-quality images that do not contain many colors. GIF files are typically very small, but cannot reproduce the range of colors necessary to reproduce photographic images (use the JPEG format instead -- see above).

- **TIFF (.tiff)** - for archival images these files are the largest. More info is stored.

The TIFF format is an archival format, meaning that it does not sacrifice image quality in order to reduce file sizes. TIFF images are excellent for storing detailed, high quality images. However, TIFF files tend to be much larger than either JPEG or GIF images, and cannot be opened using most web browsers without installing and configuring additional viewing software or plug-ins.

- **PNG (.png)** - created to replace gif format and is acceptable for photos

The PNG format is an open standard developed to replace the CompuServe GIF format. Like GIF files, low-color images stored in PNG format are typically quite small. Unlike the GIF format, the PNG format can also be used to store high-color images, which means it is also suitable for storing photographic content.

Video:

- **MPEG (.mpg)**

The MPEG format is the oldest and most widely supported format for movies. There is a wide range of viewers available for all platforms. The MPEG format is commonly used as an output format from UNIX utilities that generate video content.

- **QuickTime (.mov, .qt)**

The QuickTime format was originally more of a Macintosh-specific format. These days, support for QuickTime movies is good on both the Macintosh and Windows, but not as good on UNIX.

- **Audio Video Interleaved (.avi)**

The AVI format is more of a Windows-specific format used by Microsoft, and is not as well supported on other platforms. AVI supports both audio and video.

- **Suggestions Regarding Video Content**

Video is one of the most resource-intensive types of multimedia. Unfortunately, video content that is of even half broadcast quality is often too large to download from home. Consider including lower quality versions of video content in addition to high quality originals.

Audio:

- **WAV (.wav)**

The default standard for Windows sound files is also supported by most other platforms.

- **AIFF (.aif)**

The AIFF format is a Macintosh-specific equivalent of the WAV format. It is not as well supported on all platforms as the WAV format.

- **MPEG-3 (.mp3)**

MPEG-3 (or MP3) format eliminates sound data that is not as strongly perceived by the human ear and brain, and, as such, creates files of reasonable quality that are as much as 10 times smaller than the raw data. MP3 files are good for storing long passages of sound content where high quality is not required.

- **Suggestions Regarding Sound**

The quality used to store sound in electronic format reflects the quality of the original recording source. There is very little reason to store low fidelity recordings of speech content in a very high-quality format, as the added file size would not result in any increase in quality. Conversely, high-fidelity recordings should be stored at high-quality.

Other Formats

If you have content that has been created in a proprietary format, it is recommended that you include a copy of the content in both the proprietary format and in a more common format as well. If you have multimedia content that is too large to be downloaded via the web, it is recommended that you include a copy, on CD, of the content stored at the original quality. The use of multimedia other than listed in the Manual must be approved by the Graduate School.

- **PPT (.ppt)**

Microsoft PowerPoint presentations may be included, but should be avoided if possible.

Headings

Up to three levels of headings are allowed in a thesis. Headings are designated 1st order, 2nd order or 3rd order. Below instructions for their use are listed.

- 1st Order Headings - are centered with all words capitalized
- 2nd Order Headings - are flush with the left margin with only the first letter of each word capitalized, excluding articles, prepositions, etc.
- 3rd Order Headings - are indented five spaces from the left margin, with the first letter of each word capitalized, excluding articles, prepositions, etc.; text begins on the next line.

Main headings within the text should be consistent in style with the Table of Contents.

EXAMPLE OF HEADINGS

PROJECT DESCRIPTION (1st Order)

Background (2nd Order)

The Cape Fear River between Wilmington and Cape Fear is located on the approximate axis of the Cape Fear Arch. Although the river occupies Holocene sediments, from the area of about Wilmington south to Bald Head Island, the channel cuts through the Holocene into sediments and rocks ranging in age from Cretaceous to Oligocene. Cretaceous units are discussed below.

Cape Fear Formation (3rd Order)

The Cape Fear Formation is the oldest Cretaceous unit to crop out in the North Carolina Coastal Plain. It is best exposed along the Cape Fear River and its tributaries in the inner Coastal Plain in the vicinity of Fayetteville, NC. The Cape.....

Margins

As noted throughout this manual, you must maintain margins of 1" on the left, right, top, and bottom of the page. You may sometimes allow more than 1" at the bottom of a page if adhering strictly to the 1" margin causes an "orphan" line (the last line or few words of a paragraph) to appear on the following page. Similarly, if only a heading or first line of a new paragraph fits onto the page keeping a 1" margin ("widow" line), you should go to the next page to begin the new paragraph or section. All material, including appendices, must meet margin requirements. Material in the appendices must often be reduced

Margin Requirements

Right Margin - 1 inch

Left Margin - 1 inch

Table titles, figure captions, and page numbers must always remain the same size as regular text. *Right-justification:* Justifying the right margin is not recommended.

Paragraphs and Indentation

All paragraphs of the text should be indented as indicated three to five spaces. Indent consistently throughout your paper.

Spacing

Double-space:

- Abstract
- Acknowledgments
- Biographical Sketch
- Entire text.

The following may be single-spaced:

- Tables
- Appendices
- Individual footnotes
- Reference entries
- Block quotations
- Figure and Table Captions

The Title and Journal Pages should be spaced according to the samples provided. Spacing in the Table of Contents, List of Tables, and List of Figures should conform closely to the samples, adapted to your paper's needs (always aim for logical arrangement and legibility).

Pagination

The text, beginning with the second page of the Introduction or Chapter 1, is numbered consecutively with Arabic numerals. The first page of the text and the first page of each chapter are counted, but not numbered. The first page of text will thus be counted as page 1, and numbering will begin with page 2. Page numbers should be placed at $\frac{1}{2}$ " from the bottom of the page and centered. When a caption or illustration appears on a facing page (discussed below), the page should bear a sequential page number printed on the facing page.

Typeface and Size

The typeface and size of your paper should be consistent throughout. We recommend that you use 12 point, but 10 point is acceptable. Use a font that is easy to read. We recommend Times New Roman.

BACK MATTER: REQUIREMENTS

The back matter of your thesis consists of the Notes (if you have chosen to group your footnotes at the end of the paper), the References (Bibliography or Literature Cited), Appendices, and the Biographical Sketch (optional). The back matter is paginated consecutively from the last page of the text. The back matter, including the appendices, must meet the same margin requirements as the rest of the thesis.

Notes

If you use footnotes, you may (1) place them at the bottom of the page, (2) group them at the end of each chapter, or (3) group them at the end of the thesis, before your Bibliography. If you choose to group them at the end of each chapter, begin the Notes on a new page, which is counted but not numbered. Following the first page of notes, number the rest of the pages. If you choose to group the Notes at the end of your paper, begin them on a new page, which will be counted but not numbered. Number the subsequent pages. Follow your style guide or journal for the numbering and format of footnotes. Although your guide may advise you to double-space the note, you may single-space within each note, double-spacing between them. Footnotes are indicated in the text and in the notes with superscript numbers. The number should appear at the end of the last word in the sentence. If you use footnotes, you must choose a computer software package, which prints superscripts.

References

Style guides and journals vary widely in the treatment of references cited. Your comprehensive list of references may be called "Literature Cited," "References," or "Bibliography," but certain requirements apply to the list of references no matter what it is called. You must become thoroughly familiar with the style of citations and references used by your journal or style guide, ensuring that your thesis conforms exactly to requirements. When you submit your thesis for format evaluation, the advisor will check carefully the format of your citations and the reference list (i.e., that every work cited in the text appears in the references), the order of references, and the completeness of entries. The first page of the references, like the first page of each chapter, is counted but not numbered.

World Wide Web Citations

Students in some cases may use sources in their research that include scholarly projects, reference databases, the texts of books, articles in periodicals, and professional and personal sites from the World Wide Web. Sources cited from the Web, like citation of printed work, must appear as an entry in the "Literature Cited," "References," or "Bibliography" and include the same information that would be provided for a printed source. An additional requirement, however, is retrieval information placed at the end of the reference. Retrieval information must include the date of retrieval because documents on the Web may change in content or site location. Guidelines for citing electronic resources located on the World Wide Web are available from the [University Learning Center](#) (Westside Hall, WE 1056). The site [American Psychological Association](#) provides detailed information on how to cite information from the World Wide Web, Email, Web discussions, Listserv messages, Newsgroup messages, Real-time communication, Telnet, FTP and gopher sites. The [Modern Language Association of America](#) provides information about documenting sources from the Internet. If citation questions arise that the Writing Center or the Web sites above do not address, consult your thesis advisor or the Graduate School.

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Discuss with your committee the need for appendices, carefully considering the value of the material you propose to include. How does the material relate to the rest of your text? Would it be more useful to readers somewhere within the text? Does including the material violate any copyright? Some material often included in appendices may be so lengthy that placing it in the text would disrupt the reader's comprehension of your material.

To provide a clear break between appendices, designate each with a letter (Appendix A) and a title. The first page of the appendix is counted but not numbered. Subsequent pages are numbered as usual. The appendix is listed in the Table of Contents. The separate appendices do not have to be listed. All material in the appendices must meet the usual margin requirements.

Biographical Sketch

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Additional information can be found on the Thesis and Dissertation FAQ webpage.

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THE ECOLOGY OF MARSH GRASSES IN THE ESTUARIES
OF THE CAPE FEAR RIVER

Pat T. Student

A Dissertation Submitted to the
University of North Carolina Wilmington in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy

Department of Biology and Marine Biology
University of North Carolina Wilmington

2007

Approved by

Advisory Committee

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Accepted by

Dean, Graduate School

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ABSTRACT

The thermal significance of coloration was investigated in two species of Sonoran Desert tenebrionid beetles. Body temperatures and heat flux of a black beetle (*Eleodes armata*) and a beetle with white elytra (*Cryptoglossa verrucosa*) were compared in a wind tunnel in the laboratory. The effects of visible radiation, infrared radiation, conduction, convection, beetle color, and substratum color on body temperature were analyzed. Results showed that body color has no overall effect on body temperature. Black elytra are warmed more by visible radiation, but color is not relevant to heat loss by convection, or to heat flux between a beetle and a heated sand substratum whether by emitted radiation or reflected visible radiation. *C. verrucosa* absorbs more heat by conduction and free convection from a heated substratum but differences in shape between the two species may explain this effect. When temperature differences occur between black and white beetles in the field, these differences are generally less than 3.5 °C. These differences are small when compared with the range of body temperatures experienced by active beetles in the field. It is concluded that coloration does not have adaptive value in terms of the thermal biology of these desert beetles.

ABSTRACT

I write poems in an attempt to shed new light on common experiences, or to view aspects of the world through a different lens. My intention is for the poems in this collection to vivify both the beauties and horrors of our human existence.

The poems in this collection range a wide variety of subjects, from live oaks to grandfathers to the Egyptian desert. I have arranged the poems in four sections, one of which is a sequence of poems based on my experiences in Egypt. The other sections follow an internal logic, but do not focus on a particular theme. Some of the themes which run through the collection are: my family history; childhood and adulthood; love, relationships and sexuality; death and its impact on the living; the dark underside of life; the relationship between self and place; the possibilities and limitations of language as a means of communication; movement and stillness; nature; and spirituality.

Most of these poems are autobiographical, to the extent that they reflect and address my personal experiences. However, there are also a number of poems which are not autobiographical, but which present my interpretation of someone else's experience –either a historical or fictional character or a member of my family. In either case, my ultimate goal is for the poems to reach my readers in the deepest way possible.

ACKNOWLEDGMENTS

My thanks go to Tom Patch whose enthusiasm about and introduction to the life sciences got me started. I am especially grateful to Dr. Martin Trinkle who introduced me to the exciting field of evolutionary biology and whose endless ideas and encouragement led to this and most other studies in which I have been involved. I would like to thank Laurie Mason for hours of discussion about reptilian biology and my introduction to field biology in Kansas.

My field research in the Chiricahua Mountains would have lacked some of its joy without the presence and assistance of Sandy and Michael Malcom. Dr. Ray Callinger allowed me access to unpublished data, his study areas, and to his cabin at the Cave Creek Motel. The many evenings discussing biology and the happy days in the field will long be remembered.

Special thanks go to my parents, brothers, and sister who helped me along the way. I am sure they suspected it was endless. Also, special thanks to the Alexander Box family for their assistance and friendship.

The Department of Zoology, the Graduate School and the National Science Foundation provided financial support for my research and studies.

Finally, I would like to thank my committee for their guidance, equipment, financial support, and assistance throughout my studies.

DEDICATION

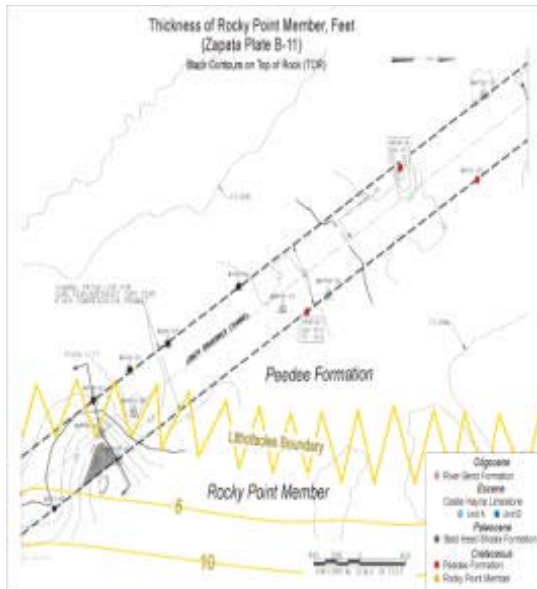
I would like to dedicate this thesis to my grandmother, Anna Mae, whose continued support and encouragement along the way have meant more to me than she will ever know.

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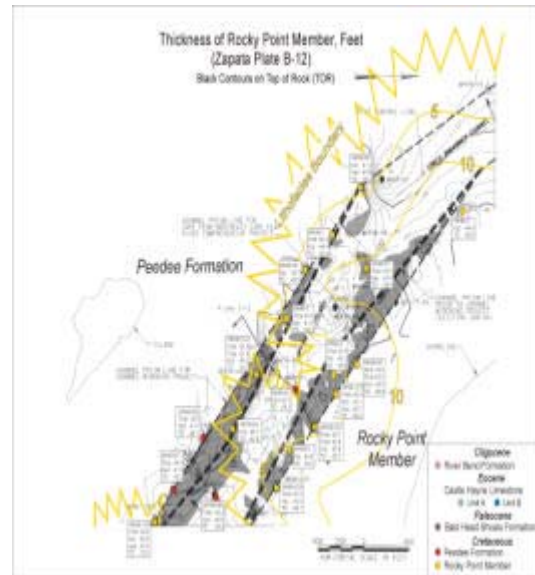
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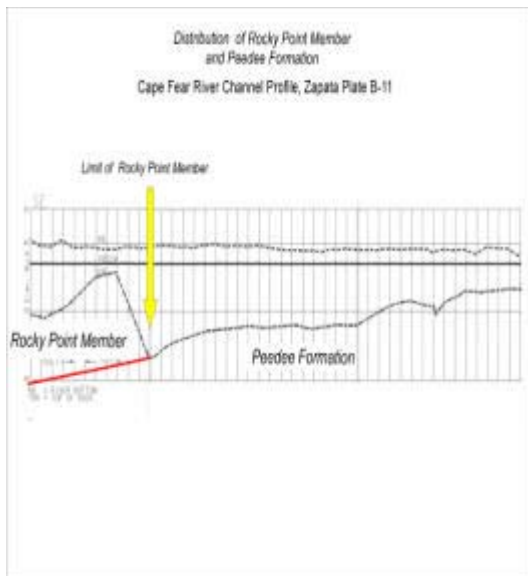
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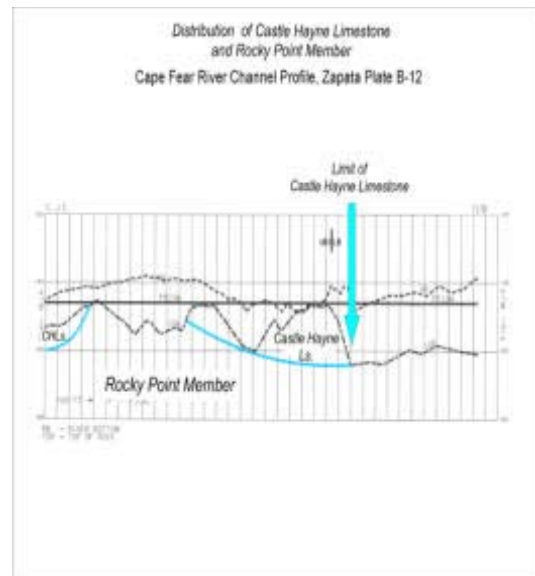
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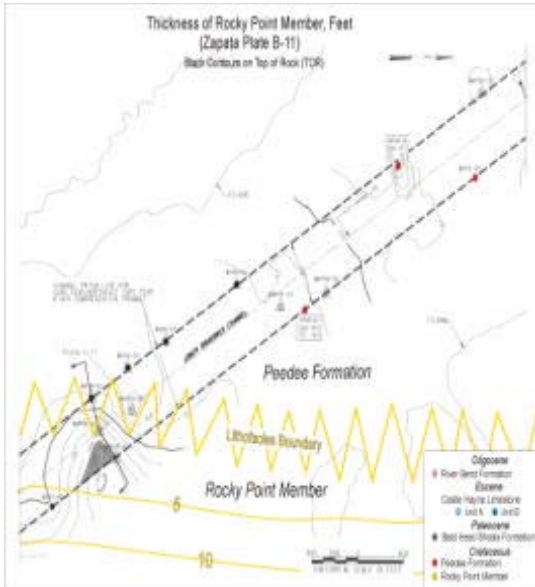


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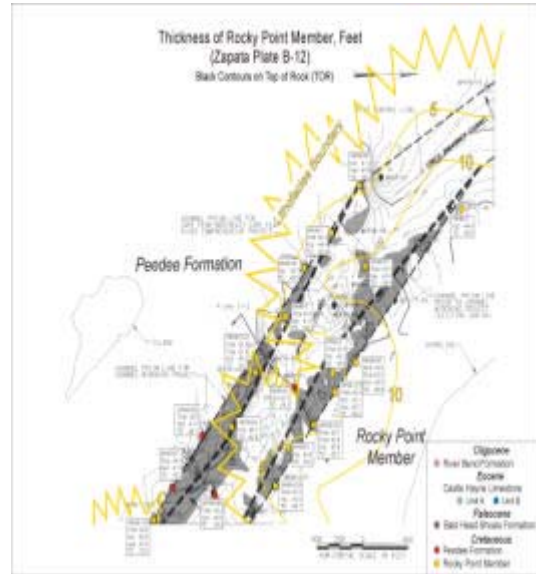
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c., d.) Cape Fear River Channel profiles.

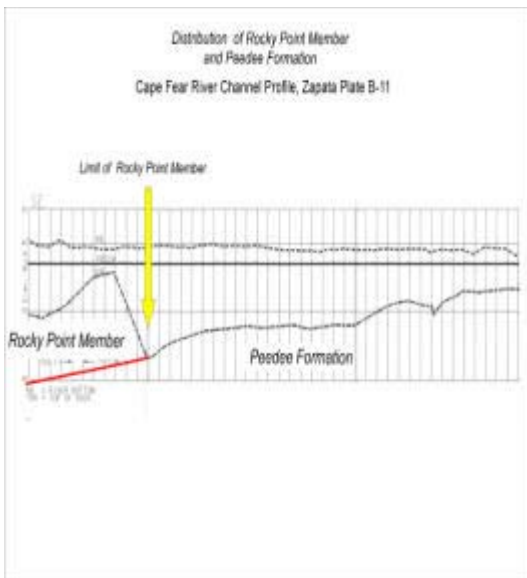
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Cape Fear River.
c., d.) Cape Fear River Channel profiles.



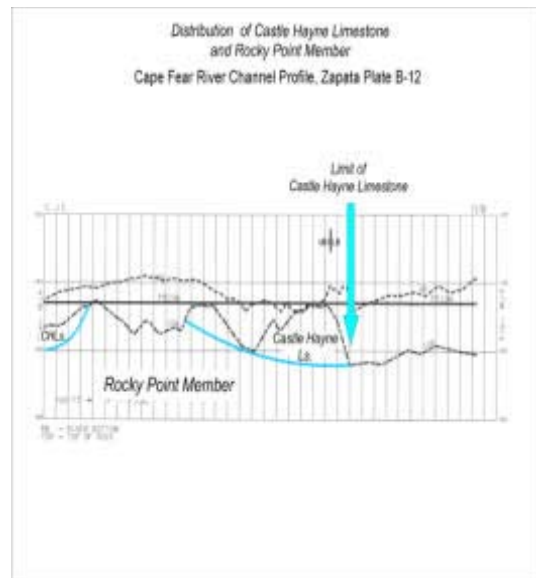
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d.

SAMPLE	Quartz	Feldspar	Muscovite	Chlorite	Glaucony	Pyrite	Phosphorite	Other Detrital	Bioclasts	Dolomite	Micrite/Matrix	Porosity
ICQ-KD1	27	1	<1	1	<1	2	<1	-	6	10	37	15
ICQ-KD2	29	1	<1	1	2	1	<1	-	4	16	35	12
RL314	23	1	<1	1	1	1	-	-	3	21	30	18
D86003	32	1	Tr	<1	1	1	-	-	-	23	27	16
H8528	19	1	Tr	<1	<1	1	-	-	Tr	35	26	19
H8527	10	<1	<1	Tr	<1	<1	-	-	-	53	13	23
95-IQ-5	24	1	Tr	1	<1	<1	-	-	-	26	20	27
95-IQ-4	23	2	Tr	Tr	1	1	-	-	-	35	21	17
95-IQ-3	24	2	Tr	1	1	1	<1	-	Tr	42	15	14
95-IQ-2	33	2	<1	<1	1	1	<1	-	-	30	14	17
97-HP-4	25	<1	Tr	1	1	<1	Tr	-	3	19	68	36
97-HP-3	28	2	<1	1	1	1	<1	-	10	8	55	22
97-HP-2	26	<1	<1	<1	2	1	Tr	-	13	<1	55	17
97-HP-1	29	<1	1	Tr	1	2	<1	-	5	2	51	20

Table 1. Sample numbers are referenced to location in Methods section of manuscript.

Table 2. Sample numbers are referenced to location in Methods section of manuscript.

SAMPLE	Quartz	Feldspar	Muscovite	Chlorite	Glaucony	Pyrite	Phosphorite	Other Detrital	Bioclasts	Dolomite	Micrite/Matrix	Porosity
ICQ-KD1	27	1	<1	1	<1	2	<1	.	6	10	37	15
ICQ-KD2	29	1	<1	1	2	1	<1	.	4	16	35	12
RL314	23	1	<1	1	1	1	-	.	3	21	30	18
D86003	32	1	Tr	<1	1	1	-	.	-	23	27	16
H8528	19	1	Tr	<1	<1	1	-	.	Tr	35	26	19
H8527	10	<1	<1	Tr	<1	<1	-	.	-	53	13	23
95-IQ-5	24	1	Tr	1	<1	<1	-	.	-	26	20	27
95-IQ-4	23	2	Tr	Tr	1	1	-	.	-	35	21	17
95-IQ-3	24	2	Tr	1	1	1	<1	.	Tr	42	15	14
95-IQ-2	33	2	<1	<1	1	1	<1	.	-	30	14	17
97-HP-4	25	<1	Tr	1	1	<1	Tr	.	3	19	68	36
97-HP-3	28	2	<1	1	1	1	<1	.	10	8	55	22
97-HP-2	26	<1	<1	<1	2	1	Tr	.	13	<1	55	17
97-HP-1	29	<1	1	Tr	1	2	<1	.	5	2	51	20

PROGRAM	1996			1997			1998			1999		
	Total Minority Applications	Total Minorities Accepted	Total Minorities Enrolled	Total Minority Applications	Total Minorities Accepted	Total Minorities Enrolled	Total Minority Applications	Total Minorities Accepted	Total Minorities Enrolled	Total Minority Applications	Total Minorities Accepted	Total Minorities Enrolled
<i>Business</i>												
MBA	24	10	8	17	8	7	13	3	3	11	7	6
MSAcg	5	3	3	9	5	4	9	5	4	9	6	6
Subtotal	29	13	11	26	13	11	22	8	7	20	13	12
<i>Education</i>												
MED	10	8	7	16	12	11	12	10	10	20	19	15
MSA	7	4	2	4	3	3	6	4	4	10	9	8
MAT	1	0	0	2	1	1	2	1	1	2	1	0
Subtotal	18	12	9	22	16	15	20	15	15	32	29	23
<i>Arts & Sciences</i>												
BIO	4	1	0	4	1	0	3	1	0	1	1	1
CHEM	6	3	3	10	4	0	8	1	1	7	2	1
CRW	0	0	0	1	0	0	9	1	0	6	3	1
ENG	0	0	0	0	0	0	4	3	3	4	1	1
GRN										1	1	1
GLY	3	3	2	0	0	0	0	0	0	0	0	0
HST	0	0	0	2	1	0	2	0	0	4	3	1
LS										1	1	1
MATH	10	9	4	8	8	2	5	4	4	8	8	3
MMB	8	2	2	7	1	1	6	1	1	3	0	0
MS										2	1	0
PSY	5	1	0	5	1	0	8	1	1	9	1	0
Subtotal	36	19	11	37	16	3	45	12	10	46	22	10
<i>Nursing</i>												
NUR							5	2	2	5	2	1
Subtotal							5	2	2	5	2	1
TOTAL	83	44	31	85	45	29	92	37	34	103	66	46

Table 3. Minority Enrollment Patterns, 1996-1999.

APPENDIX

Appendix A. Procedure used to extract lipids from trout liver.

1. The tissue (1 g) was homogenized with methanol (10 ml) for 1 minute in a blender.
2. Chloroform (20 ml) was added and the homogenization continued for 2 minutes more.
3. The mixture was filtered, and the solid remaining was re-suspended in chloroform-methanol (2:1 by volume, 30 ml) and homogenized for 3 minutes.
4. The solid was filtered again and re-washed with fresh solvent.
5. The combined filtrates were transferred to a measuring cylinder, one fourth of the total volume of 0.88 % potassium chloride in water was added, and the mixture was shaken thoroughly before being allowed to settle.
6. The aqueous (upper) layer was drawn off by aspiration, one fourth of the volume of the lower layer of methanol-saline solution (1: 1, v/v) was added and the washing procedure was repeated.
7. The bottom layer containing the purified lipid was filtered before the solvent was removed on a rotary film evaporator.
8. The lipid was stored in a small volume of chloroform at -20 C until it was ready to be analyzed.

Appendix B. Variables used to construct a yearly maintenance energy budget.

<u>Month</u>	<u>Hours</u>	<u>Temp</u> (°C)	<u>MI O₂ g⁻¹ hr⁻¹</u>
May – August	15 inact	20	0.096
	9 act	30	0.345
September	16 inact	20	0.096
	8 act	30	0.345
October	16 inact	20	0.096
	8 act	30	0.240
November – April	16 inact	10	0.020
	8 act	30	0.240
December – March	20 inact	10	0.020
	4 act	30	0.240