

MESSAGE Final Technical Report Guidelines

Target audience:

There is no charade here; the report is just what it appears: a formal internal report to your supervisors. Your target audience is your internship mentor and reading committee.

What to include:

Your report should have a clear statement of the problem you are addressing, and the motivation for addressing the problem. In simplest terms, you need to answer: What is the issue? Who cares? and Why bother? Answers to these questions go up front, in the Introduction. (Although there is also an underlying educational motivation for the investigation – to help you learn how to conduct and report on an investigation– you should write about the scientific and technical reasons for undertaking the work.)

You also must give the geologic and scientific context for the work. Where is the study area and what is the relevant geologic context? What prior work has been done on similar problems in the study area? Are there other studies from other places that have addressed the same questions you address? This information goes in the Background section of the report. Keep the Background concise and relevant to your project, but also complete enough to give other geologists the necessary context. As a rule of thumb, two-to-four pages of text are usually sufficient.

The central purpose of a scientific report is not simply to state your findings. You must also provide enough information that someone else could reproduce the same analysis on the same data, and *get the same results*. This concept of reproducibility is central to the practice of science, and a core responsibility in reporting your work. Be explicit and transparent about data sources, methods of analysis, and criteria for classification. Imagine a future MESSAGE student tasked with repeating your study. Could this person read your report and know where to go, what to look for, and what to do? Is it clear what decisions you made, and why? Why sample here and not there? Why choose this value and not that one? What led you to select some features but reject others? (These are great questions to pose to each other in peer review.)

Finally, the report should close with a Discussion of your findings, with reference to the Problem you stated in the introduction. Did you answer the question? It is not uncommon that you have only a partial answer or some intriguing new information that suggests a different question. Be straightforward about what you actually learned and the limitations of your data and analysis. Resist the temptation to overstate your findings, but also do not underplay what you have learned. Rather than “I have the answer!” or “I don’t really know,” try “These new data suggest that…” or “Within the limitations discussed above, it is possible to conclude that…” Where possible, draw comparisons to prior work: “These findings are consistent with the work of Walters and Brown (2014),” or “In contrast to Crider (1996), I find that…” It is also common in the Discussion to recommend additional investigations that could provide data to test your interpretations.

Report structure:

The MESSAGE final technical reports follow a standard structure, outlined below. Each section described should start on a new page.

Cover page

The cover page is a modified version of the Masters thesis cover page required by the UW graduate school. For MESSAGE, we would like uniformity of content on the cover page, although we do not require uniformity in style. The cover page should include: title, name, degree, program, date, mentor, coordinator, reading committee and report number. Please see attached examples at the end of this document. Ask the Program Director (Juliet) for a report number.

You should select a title that is specific and reflects your central contribution. Not “Glacial deposits in the Puget Lowland,” but “Grain size distribution of the Esperance Sand in coastal bluffs at Discovery Park, Seattle, Washington.”

Copyright statement (optional)

Since these reports will be in a public archive, include a copyright page to claim ownership of your work. See <http://www.grad.washington.edu/students/etd/sample-copyright.pdf>

Executive Summary or Abstract

The executive summary is a one-page overview of the problem, approach, and findings. For more academically-oriented projects, you may choose to produce a one-paragraph abstract, instead. If you are uncertain which to do, seek advice from your reading committee.

Table of contents

Contents include all the sections and the major headings of the body of the report. The cover page is page 0. All material that comes before the body of the report should be numbered in lower-case Roman numerals (i, ii, iii, iv, v, etc.) including: Copyright statement, Executive Summary, List of Figures, List of Tables, and Acknowledgements. The body of the report begins on page 1, with the introduction or statement of the problem. References and Figures should also be paginated, consistent with the body of the report. Appendixes may continue the page numbers, or you may paginate separately within each appendix (pages A1, A2, A3, etc. for Appendix A; pages B1, B2, B3, etc. for Appendix B). Number each page, except for the cover page.

List of Figures

List all the figures from the body of the report and their titles and give the page number. It is not necessary to list figures that are a part of appendices, but you may.

	page
Figure 1. Geographic location of the study area.....	25
Figure 2. Regional geologic map.....	26
Figure 3. Study area boundaries.....	27
...	
Figure A1. Sketch map and photograph for survey monument 27.....	A3
Figure A2. Sketch map and photograph of survey monument 36.....	A4

List of Tables

List all the tables from the body of the report with their titles, and give the page number. It is not necessary to list the tables that are part of appendices, but you may.

	page
Table 1. Laboratory measured friction values	32
Table 2. Input parameters for slope stability model.....	33
...	

Table B1. Geochemical analyses from well Q21F.....	B3
Table B2. Geochemical analyses from well WX37.....	B4

Acknowledgements (optional)

Use this section to acknowledge funding sources, field assistants, equipment loans, analyses done by others, and other contributions directly relevant to the completion of the internship project and this report. Your mentor, readers and internship coordinator are already acknowledged on the cover page, but you may also mention them in the acknowledgements, if you wish.

Body of the report

The report should be divided in sections, with headers that will typically include most of the following:

- Introduction/Statement of Problem
- Scope of Work
- Background/Prior work
- Geologic/Geotechnical setting
- Methods and Assumptions
- Observations
- Analysis
- Discussion
- Findings/Recommendations
- Limitations

You may number the sections, or not, as you choose, and you may vary the title of the sections as is appropriate to your study. You may add or omit sections, as required for your particular project. Each section header should be listed in the Table of Contents. In the body of the text ensure that the section headers stay with their paragraphs. In MS Word, use *Format: Paragraph: Keep-with-Next* for each header to prevent a page break between the header and its text.

If your investigation included several different approaches, consider presenting the methods, observations, and analysis together for each approach. For example, if your investigation included analysis of topography with GIS and geochemical analysis of groundwater, you might have sections that look like this:

- GIS Methods, Assumptions and Data Sources
- GIS Analysis
- Limitations of the GIS Analysis
- Groundwater Methods and Assumptions
- Groundwater Data and Observations
- Groundwater Analysis
- Limitations of the Groundwater Analysis

Your findings from each method should then be integrated into a *single* Discussion in which you interpret these results and their implications in the context of the Problem that you presented in the introduction.

References cited

Be very clear and very explicit about where you have gotten your information. Give a citation for each factual statement (sentence by sentence) that is not your original

observation or result of your original analysis. In the text, give the author's name and the year of publication in parentheses. If there are two authors, list both; if there are more than two authors use "et al.", like this: (Troost, 2009; Duvall and Crider, 2015; Collins et al. 2012). Personal communications (someone told you something or sent you unpublished data) are cited in the text, but not included in the bibliography, like this: (Tom Badger, Washington Department of Transportation, written communication, 2013). These are not included in the bibliography, because there is no archived document to reference. Do not cite class lectures; find the proper published reference.

Start your bibliography on a new page at the end of the main body of the report. List references alphabetically by the last name of the author. In the reference list, do not use "et al.", but list each author in a multi-authored publication. Use a standard format and be consistent. A recommended example is the format for the journal *Environmental & Engineering Geosciences*:

http://eeg.allentrack.net/cgi-bin/main.plex?form_type=display_auth_instructions

Figures, with descriptive captions

Keep the formatting simple: put all the figures after the text and references, one figure per page. In MS Word, insert a page break between figures to keep them separate. Each figure should have a title and a descriptive caption. Figures may have subsections, lettered a, b, c, etc., if you want to show related features or make comparisons. If you have a figure that is longer than it is wide, in MS Word, insert a section break and format the document so that section of the document is "landscape" orientation.

You do not need to include a header that says "Figures" before Figure 1. The figure captions serve this purpose.

Figure captions should go below the figure. If the figure relies on a base image or data from outside sources, include a reference in the figure caption, and ensure that this reference appears in your bibliography. The figure captions should be descriptive: an objective statement of what is shown in the figure. (Someone who reads the caption without the image should know what the figure is generally about.) Interpretations of the image or data should go in the main body of the text, not in the caption.

Figure 3. Digital shaded relief map of the study area. Created using LiDAR elevation data (PSLC, accessed 09/23/2012). Resolution: 0.5 m.

Figure 5. Photographs of sampling sites 7 and 8. **A)** Sampling site 7, view to NE, shovel for scale. Note truncation of bedding at the contact above the shovel. Wood sample taken from lower left, as indicated by the arrow. **B)** Sampling site 8, view SE, person for scale. Hemlock needle collected from center of exposure, at location circled.

Tables, with descriptive titles

You may choose to embed summary tables in the text or put them after the figures (much simpler). Tables should have titles *above* the table and can have footnotes at the bottom, if necessary to clarify certain table entries. Voluminous or repetitive data tables should be placed in an appendix.

Appendices (optional)

Appendices can be used as a repository of important new observations relevant to the findings of the report. This may include lab data, core logs, outcrop descriptions, key images, model output, etc. They may be in the form of photographs, sketches, maps or tables. Any material in the appendices must support findings presented in the body of the report, but if included individually could detract from the readability. If you are uncertain whether something belongs in the body of the report or in an Appendix, get advice from your reading committee. All appendix material should be organized and annotated, with descriptive titles and captions. An appendix is not a raw data dump: do not print out pages of Excel tables, or dozens of site photos. Use the appendix to archive information that will be useful to others and cannot be found elsewhere. If you have sets of different data (say geochemical analyses and slope stability model outputs), organized these in different appendices. Give each appendix a descriptive title, and include this in the Table of Contents.

Appendix A: Location and description of survey monuments.....A1

Appendix B: Geochemical analysesB1

Other formatting and style issues

Margins should be at least one-inch all around, and up to 1.5 inches on the left margin, to accommodate binding. Choose a professional looking font. Keep the font size 11 or 12 points. Use page numbers. Text should be black ink. Use color as needed for figures. Graphs should have a white background.

Units should be consistently metric or English. If both are needed, consistently give one first and the other in parentheses.

It is OK to use the first-person singular (“I”) when describing work that you did yourself and when presenting your findings. This can be an especially effective way to highlight your original contribution: “It is my interpretation that...” or, “Based on these analyses, I recommend the following....”

What to turn in:

By the stated deadline (usually early in finals week), submit an absolute final draft: one in .pdf form and an identical paper copy. We will archive an electronic copy in .pdf form with the UW library and a paper copy in Johnson Hall.

The paper copy should be on 3-hole punch paper. For reports longer than 20 pages, double sided printing is encouraged. Submit the paper copy to the Program Director (or to her mailbox). We will put the reports in standard binders.

For the electronic copy we need a .pdf of the full document and a .txt file of the contents of the cover sheet and executive summary/abstract. Submit these electronic documents to an electronic dropbox, as directed by the Program Director.

Other questions?

Contact the Program Director, Juliet Crider.

Title page for MESSAGE Final Technical Reports

Adapted from UW Graduate School Guidelines for MS Theses

Fill in information in brackets. Ask Program Director for report number.

Do not include any text in blue.

[Title of the Technical Report]

[Student Name]

A report prepared in partial fulfillment of
the requirements for the degree of

Master of Science
Earth and Space Sciences: Applied Geosciences

University of Washington

[Month, Year]

Project mentor:

[Mentor name, affiliation]

If you did not have an off campus mentor for this project, omit these lines.

Internship coordinator:

[Coordinator name]

If your report is not related to an internship and did not involve the program coordinator, omit these lines.

Reading committee:

[Committee member name]

[Committee member name]

If one person has played more than one role (e.g. Mentor and Reading committee member), list that person in both places. Do not include titles (Prof., Dr., Ms., Ph.D, L.E.G., etc.).

MESSAGE Technical Report Number: [000]

Ask the MESSAGE Program Director for report number.

You may change the style, the font, the spacing and the justification, but please include the same information in the same order. Here's a completed example:

Evaluation of Earthquake-Related Lineaments
Using Bare-Earth LiDAR Topographic Data
Near Ridley Island, British Columbia

Nicholas Novoa

A report prepared in partial fulfillment of
the requirements for the degree of

Master of Science
Earth and Space Sciences: Applied Geosciences

University of Washington

December 2013

Project mentor:
Mark Molinari, URS Corp.

Internship coordinator:
Kathy Troost

Reading committee:
Juliet Crider
Alison Duvall