Guidelines for research projects

Earth Sciences – Earth and Economy – Hydrology

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Cover photograph: Example of a fossil in a reef.

Contents

Abstract

This guide describes all aspects of the planning and execution of e research project in the BSc and MSc Programmes of Earth Sciences, Earth and Economy and Hydrology. It informs you about the procedures, gives tips on on how to write a scientific report, provides a checklist against which you can check the quality of your work and gives information about the assessment procedure. The guide follows the structure of a scientific report and provides examples of how to write up certain aspects of your research project in LaTeX, or other writing software.

Chapter 1

Background

1.1 Introduction

Please read this manual carefully before you start writing your thesis. Adhering to the points and advice raised in this document will result in a better grade for your research project.

1.1.1 Learning goals

Our academic education system is characterised by three stages of education. The first stage is the bachelor education, which provides the basis of an academic education. The second stage is the master education, whereas the third and final stage is a PhD study. BSc programmes provide students with knowledge, skills and attitude such that they can enroll in a Master's programme, or start a professional career at an academic level. The objectives of an MSc study are *to impart to the students the knowledge, attitudes, skills, and insights that render the graduated master (1) capable of practicing his/her profession independently, or (2) qualified for continuing training in scientific research. Furthermore, the graduated master should be competitive in his/her field on the international labour market, both with respect to employment in trade and industry (including consultancy firms) or government bodies, and PhD-research programmes at (inter)national scientific institutions*. To achieve these objectives, the following primary objectives have been formulated for the VUAs Earth Science and Hydrology Masters programmes:

1. The graduate should have specific and fundamental theoretical and practical knowledge of earth scientific or hydrological phenomena.

2. The graduate should have experience in carrying out research independently. This experience is developed gradually within the programme through exposure to research and interaction with active researchers and, ultimately, through active participation in research. This occurs in such a way that it allows the student to consciously decide whether he/she prefers to continue

his/her studies in order to obtain a PhD degree or to take up a position outside the academic world.

3. The graduate should function in his/her discipline at an academic level, both mentally and in daily practice; the programme stimulates the social and personal development of the student by motivating societal awareness, independence, communicative behaviour and co-operation.

4. The graduate should recognise the need to continue his/her education by following relevant developments within the fields of earth sciences or hydrology to maintain a state-of-the-art knowledge basis, and is prepared to realise this.

5. The graduate should be able to start and successfully complete a PhD thesis or to successfully compete in the (inter)national labour market for positions at an academic level with government or government-related institutions, private companies, or elsewhere.

6. The graduate should gain insight into the broad historical, philosophical and social context of the discipline and aspects concerning the intellectual integrity and moral and ethical dimensions of scientific research and its applications.

These objectives have subsequently been translated into five very general final attainment levels in relation to the so-called Dublin descriptors, as formulated by the European Joint Quality Initiative:

1. Knowledge and understanding

2. Application of knowledge and understanding

3. Critical judgement

4. Communication

5. Learning focus

The MSc programme curriculum is such that a graduate meets these levels through the completion of all the programme courses. The final research project has a key role in demonstrating that a student has met these attainment levels, because it contributes to points 2–5 in the list shown above. A research project in earth sciences or hydrology often has the following elements, which contribute to different final attainment levels:

- Development of research proposal (hypothesis, objectives, planning, methodology, etc.)

- Literature study

- Field or laboratory data collection, analyses and processing
- Presenting of results in a written BSc or MSc thesis
- Oral presentation of the results

This document is a guide on how to successfully perform a BSc or MSc research project. The procedures for selection and execution of the project are described in the *Student Placement (Internship) and Research Project Regulations* that can be downloaded from the FALW web site (http://www.falw.vu.nl/ > Students > Regulations > Internship and literature study regulations). This document also includes the final project assessment form.

1.1.2 Procedure of research projects

There are several stages during selection, execution and finalization of a research project. BSc projects are 12–15 ECTS, whereas MSc projects are credited with 24–27 ECTS. For MSc projects there is also the possibility of extension with 12 ECTS, in consultation and after approval of the Examination Board. The whole procedure is described in detail in the *Internship and Literature Study Regulations*.

1. Project selection: You can find a research project by contacting the BSc or MSc project coordinator, who has a good overview of what projects are available or who to contact for a project on a specific subject. Projects are also advertised on dedicated Blackboard pages of the BSc or MSc programme.
2. Project formulation: When you have agreed upon a project, the *project agreements form* needs to be completed. This form lists important aspects of your projects regarding your personal details, contents of the project, facilities needed, planning and supervision, safety or confidentiality issues, and details about reporting and your presentation. This form is signed by you and the supervisors, and is then passed on to the BSc/MSc coordinator who checks the project for feasibility and content. After the coordinator has signed, you have to pass the form to the study secretariat for filing.
3. Subsidy: After the project agreement is completed, you can apply for subsidy (if appropriate). An web form will be available for this.
4. Start of project: In the first few weeks of your project, you will have to come up with a research proposal. This includes a literature review of the subject you are studying, discussion of the methodology, *etc*. You can consider this proposal as the introduction and methods chapters of your thesis. If this proposal fails, the project can be terminated by you or by the supervising staff. A poor attitude is also ground for termination of the project.
5. Logistics: A good planning is necessary for a speedy execution of your project. Make sure that the laboratory staff is aware of the timing of use

of laboratory or field work equipment, that field equipment is tested before use, etc. For MSc projects, funding should also be available for equipment use and laboratory sample analysis. Your primary supervisor should have arranged this.

6. Execution: After the go ahead is given, you can execute your project, do your measurements, processing and analysis and start reporting. Note that you have a limited time.

7. Project finalization: You have to write your MSc thesis based on your measurements and give an oral presentation. In general the primary supervisor will give you feedback and a preliminary grade for the draft version and an indication of a grade for the final version. You then have incorporate the feedback and present the final version to your supervisor for approval and grading. This final version will also be handed over to the second supervisor who will also grade it independently.

8. Grade registration: After this is done, the project supervisors will grade your project for methodology (30%), reporting (60%) and oral presentation (10%) using a project assessment form (see *Internship and Literature Study Regulations*) and will provide a written assessment of your performance on which the grade is based. The BSc/MSc coordinator will sign the assessment form, and send a scan to the study secretariat for grade registration.

1.1.3 Contents of a report

Let's start by saying that writing a good professional report, a research paper or journal article, or an MSc thesis is an art, which needs a lot of practising. During your fieldwork, laboratory or literature studies, you will collect a lot of information that needs to be published in a thesis, or a scientific paper. To make matters more complicated, a single research paper may often have to be written by several authors (the members of your research group), so that you need to learn how to work together to edit and prepare a coherent report. If you have experienced problems in the past with reporting, you should consider following the *Scientific Writing in English* course given by the VU Centre for Study and Career.

Writing a structured report requires that you think about the organization of your research. You will have to order your data and decide on the best way to describe your research results. This guide aims to help your to structure the process of writing your bachelor's or master's thesis and will give you tips on how to write a clear, well-written scientific report. Adhering to the guidelines that are given in this guide will be beneficial later in your life when you have to write professional reports in your working environment.

In general, a research project report, BSc or MSc thesis should conform to the following criteria:

- Texts should be clearly written in good English (or Dutch).

- In principle, research reports or Master's theses are individual. If it is really necessary to write a report with two or more authors, then their contributions should be merged to form a coherent report but it should be very clear as to what each author has contributed.
- The text should be *original*, that is that it is written in your own words. It is allowed to use very limited text from other sources as quotes with proper reference. You report will be checked for plagiarism.
- The thesis should be well structured in Chapters, Sections, etc.
- The thesis should contain a titlepage, abstract, introduction, site description and methods chapters
- Data (results) should be described in the text and be well-presented in tables or figures
- In the discussion, the results are discussed and compared to results from earlier studies
- Conclusions and recommendations should be concise and to the point
- Literature should be properly cited and references should appear in the final chapter of the thesis
- The report may contain appendices listing data, maps or theory

This guide is structured as a report and the following chapters will introduce you to different aspects of a scientific report or thesis. Text examples will be given throughout the report for clarification.

1.1.4 Plagiarism

Plagiarism is the copying/use of text, images or ideas from others, without proper citation of their work. This is considered as presenting the work of somebody else as your work, which is not acceptable. This means that you should always express concepts or statements derived from other sources in your own words and include one or more references to the source of the work. In the case of images, proper citation is also mandatory in the caption, and permission of use may have to be obtained from the copyright owner. When you hand in your report, it will be checked for plagiarism using an automatic tool available in Blackboard.

If plagiarism is detected, this will have to be reported to the Examination Board, who will proceed to take action. Please check the Education and Examination Regulations for more details.

Please note that the detection of plagiarism in your work leads to significant damage to your scientific reputation and has serious consequences for your career in science (or elsewhere). Case in point is the German minister who had to resign after plagiarism was detected in his PhD thesis.

1.2 General structure of a thesis

A scientific thesis has a more or less fixed structure as indicated below. Suggested titles for the chapters are indicated between brackets. These chapters, in turn, may be subdivided in several subsections where different results (*e.g.* hydrochemistry, geophysics, geology, geomorphology, groundwater, modelling, etc.) are discussed.

- Title page. According to the rules of our faculty, this page must contain

    1. Title of the report
    2. Name of author
    3. Names of supervisors
    4. Date of publication
    5. Course code and ECTS
    6. VU logo
    7. Optional: logo of collaborating institution (for instance RIVM, Deltares, Staatsbosbeheer)

- A summary (Summary). An extended summary in English is mandatory for reports written in Dutch.
- An introductory chapter (Introduction or Background)
- Chapter describing the research area (Description of research area or Site description): Only if relevant...
- Chapter describing the measurements and/or methods (Measurements and methods)
- Chapter presenting the data (Results)
- Chapter discussing the data and comparison to earlier studies (Discussion)
- Chapter presenting your conclusions and any recommendations for future activities (Conclusions and recommendations)
- Chapter with the acknowledgements (Acknowledgements)
- Chapter listing literature references (Literature or References)
- Appendices listing data, supporting information...

Table 1.1: Chemical properties of water samples collected from wells in the Vagos research area and averages and standard deviations (st.dev.)

Date	Time	Location	pH	EC μS cm^{-1}	Ca^{2+} mmol l^{-1}	Cl^{-} mmol l^{-1}
10 June 2005	13:15[1]	30°15’03”N, 1°34’31”W	6.80	314	1.45	13.25
10 June 2005	14:20	30°10’59”N, 1°32’34”W	7.10	261	2.64	6.96
11 June 2005	8:30	30°14’24”N, 0°32’54”W	5.50	30	1.62	0.68
12 June 2005	9:00	30°16’17”N, 1°33’54”W	3.65	780	0.64	3.46
15 June 2005	11:34	30°15’56”N, 1°32’01”W	8.12	1130	5.36	7.12
Average			7.43	510	2.78	6.04
St. dev.			1.80	256	1.04	2.45

[1]It was raining.

1.3 Common practices

There are some formats that you should generally adhere to. These are:

- Write your report in the past tense, as it reports on research that has been completed.
- In general, reports are written in the *third person* construction, so you would say ”The inclination was measured...” rather than ”We measured the inclination...”.
- Table of contents and chapters always start on an ODD-numbered page, which is the right hand page for double-sided printed reports. Leave an empty (EVEN-numbered) page if needed.
- Figure captions go below the figure and should give a good description what the figure shows. If you refer to a figure in the text, use Figure with a capital F. An example of a figure is shown in Figure 1.1.
- Table captions go above the table and should also give a good description of the data presented in the table. Refer to a table in the text using the word Table with a capital T, an example is given in Table 1.1. Table notes go below the table as in the example.
- Keep in mind that your report will be printed out in black and white, this means that you have to make your figures such that lines/bars/areas can be distinguished from each other irrespective of their colour (use different patterns)
- If you use Excel to make graphs, please make sure that the graphs have a white background instead of the standard grey

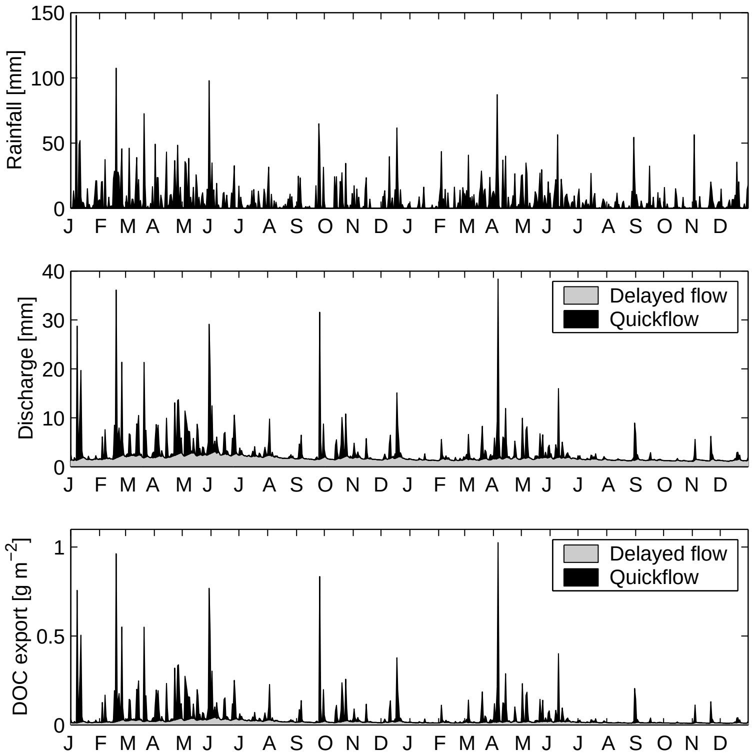

Figure 1.1: Rainfall, discharge and dissolved organic carbon (DOC) exports in 2002 and 2003 from the Vagos catchment. Contributions of quickflow and delayed flow components are separately shown in the discharge and DOC graphs.

- Use italics typesetting if you use latin words or names, for instance *Quercus robur* or *e.g.*

- If you use abbreviations, write them out the first time you use them: This report was made for the VU University Amsterdam (VUA). It is extremely nice to go to Portugal for a VUA field project.

- Do not use contractions (use ”do not” instead of ”don’t”), slang or childish expressions in your report, as it lowers the credibility of your work.

- Equations may be numbered and referenced to in the text: ...as given in Equation 1.1,...

$$Q = 0.0314H^{2.34} \tag{1.1}$$

- Make correct use of SI units in the text and also display them in graph and table titles! Units are normally abbreviated (10 m s^{-1} instead of 10 metre per second).

- If you need to work with chemical formulae, the *newcommand* statements can help you simplify this, as for H_2O or Na^+(see \\newcommand statements at top of template files).

- Literature references should be cited as follows:

  1. Single or two authors in text: (author, year). Example: Abdul Rahim and Baharuddin [1986] stated that..., or ... as observed in earlier studies in the area [Abbott et al., 1986, Borchert, 1998]).
  2. More than two authors use *et al.*. Example: Bowden et al. [1992] observed a tiny increase... or ... data published earlier [Chhabra et al., 1975, Elsenbeer et al., 1995])
  3. Papers should be referenced in full in the reference list in the Bibliography.

A literature database (hydrology), with many papers that you may need to cite, is available at http://hydrolib.watergeek.eu/. You can also add your own references to the database so that other people may use these in the future. You have to get a username and password to access the database. Contact Maarten Waterloo to get these.

1.3.1 Report quality check

A check list for verifying that your report meets the standards is provided in Appendix B. Read this list carefully before you start writing. Please check your report against the points in this list before you hand in the first draft version to your supervisor. A report that meets these standards will get a much better evaluation and it saves time!

Report LaTeX templates are provided at http://ecohydro.falw.vu.nl/latex. If you decide to use Word or other software (OpenOffice, etc.) copy the headers of these templates in your document to get the correct structure.

1.4 Tips for writing a single report as a group (not recommended, only with permission from the Examination Board)

If you work in a group, we advise you to discuss the report writing as early as possible and distribute the tasks between group members. Agree on eachothers contributions to the reports and start writing as soon as possible, even during the fieldwork when everything is still fresh in your memory. Each contributor should write his/her contributions such that they can easily be merged into the final report. Thus every contributor has to adhere to this structure very rigidly and write up the methods, results and discussions in separate sections. One or two persons person in the group, the editors, should at the end merge everything together to get a coherent report. All members should then read the report and make changes where necessary.

1.5 Technical aspects of thesis writing

Most students are familiar with Microsoft Word and and write all their documents with this program. Word is fine for small documents, without many figures, tables and references and text lay-outs. If documents become larger, though, it is our experience that Word can mess things up pretty bad and you lose a lot of time trying, for instance, to get a particular figure at a desired location. Then when you print the document, things may not be as they were on screen. This is very frustrating. In Word, you should also make sure yourself that chapters start on odd pages, that there are not much more than 80 characters on a line, and take care that paragraphs are indented or separated by empty lines (but not both mixed).

An easy-to-learn alternative is to use the LaTeX typesetting system. LaTeX texts can be written in ASCII in any editor and are then compiled to prepare a (PDF) document. All formatting, locations of figures and tables, automatic inclusion of citations in the bibliography, etc. is done by LaTeX according to typesetting standards. As such you can concentrate on the contents of your report, rather then on the formatting. This will save you a lot of time! The web site http://ecohydro.falw.vu.nl provides links, explanations and templates for LaTeX. We suggest that you download and install these programs (MikTeX and TeXnicCenter) and learn how to work with them because it makes life a lot easier... This document has also been written in LaTeX and serves as an example. See http://ecohydro.falw.vu.nl for more details.

We present examples on how you can write your data up and what should be presented in each chapter in the following chapters.

Chapter 2

Research area

If you have done field measurements, you should describe the research site. You should present general information about the research area that can be obtained from literature, maps, etc. You can skip this chapter if you have done laboratory or modelling studies because then it is not relevant. This includes:

1. Geographic locations, boundaries and topography (use a map displayed in a Figure)

2. Description of the geology and soils

3. Description of the vegetation and land use

4. Description of the climate

5. Description of the hydrology (*e.g.* river flow directions, drainage density, presence of lakes, information on aquifers, main use of water, etc.)

This section does not include any results of your own study yet. Some example paragraphs for location and climate are shown below and these could refer also refer to maps showing location and topography and or figures showing annual patterns of rainfall, temperature, evaporation, etc.

2.1 Background

The blackwater Igarapé Asu catchment (2°36'S, 60°12'W) covers an area of 6.8 km^2 in the Reserva Biológica do Cuieiras of the Instituto Nacional de Pesquisas da Amazônia (INPA). The site is about 70 km NNW of the city of Manaus (3°08'S, 60°00'W) in Central Amazonia. The area forms part of the Rio Negro Basin (686,810 km^2) where the rivers draining the rainforest areas are mostly of the blackwater type. [Sioli, 1950, Hedges et al., 1994, Moreira-Turcq et al., 2003, Kuchler et al., 2000]. The topography is undulating with differences in elevation of 40–50 m between valleys (about 40m a.s.l) and ridges (about 100 m a.s.l.). A map of the area is given in Annex A.

2.2 Climate

The climate of the region is tropical monsoonal (Köppen Am climate) with an annual average temperature of 26.7 °C and relative humidity of about 80% in Manaus. Wind speeds are low throughout the year and winds blow mainly from NE to SE directions. Average annual rainfall (1966–1992) at the Ducke rain forest reserve, about 75 km SE of the present site, amounts to 2442 mm, with a standard deviation of 306 mm. Although rainfall occurs throughout the year, seasonal variation exists with somewhat higher rainfall between November and May than in the period from June to October. Monthly evaporation totals vary between 100 mm and 150 mm.

Chapter 3

Methods

This chapter describes the measurements carried out in your study, the equipment you used and the methods applied to arrive at your results. It may also include theory behind the measurements, for instance a description of the sapflow method, or a description of the software used for interpreting geo-electric measurements according to the Schlumberger method. An example text describing the measurement of discharge in a small river is given below.

> To obtain discharge estimates from the half-hourly water level data a stage-discharge curve was developed. Salt dilution and velocity–area methods [Gregory and Walling, 1973] were used to measure discharge at a range of water levels (0.4–1.3 m). The higher stage was only exceeded on two occasions with the maximum water level recorded being 1.6 m. The salt dilution method involved injecting a 50 l salt solution with a known electrical conductivity into the river and recording the changes in the electrical conductivity in time at a downstream location where the solution was well-mixed with the river water. The mixing process was checked by injecting uranine, a non-toxic fluorescent indicator, into the stream to visually verify at what distance full mixing occurred. The electrical conductivity was measured with an EC-meter (WTW Cond 315i, Germany). The salt dilution method worked well as long as the stream remained within its banks. At stages above 0.94 m, bank overflow occurred and the streamflow velocity was then measured with a propeller-type current meter (Ott Hydrometrie, Germany) at 0.5 m intervals along a cross-section through the stream. These measurements also served to relate the mean streamflow velocity to the velocities measured by doppler sensors. Comparison between the two methods at stages below 0.94 m was good. The resulting stage–discharge curve, based on 58 measurements, is described by Equation 3.1 where the water level H is in m and the discharge Q in $\mathrm{m}^3\mathrm{s}^-1$. The error associated with the current method of measuring

discharge may be in the order of 10%.

$$Q = 0.919 * H^{4.256} \qquad (3.1)$$
$$r^2 = 0.99$$

Note that for the instruments it is common to include the brand name, model and country of fabrication. Example:

> The pH of river water was measured with an Argus pH meter (Sentron Europe BV, The Netherlands) with a standard ISFET electrode calibrated against buffers of 4.00 and 7.00 before any pH measurement was made.

Chapter 4

Results

4.1 Contents

Your results should be presented here. This includes descriptions and summaries of measured data (geophysics, hydrochemistry, water levels, etc) and some results from processed data (interpretation of vertical electrical soundings, calculation of evaporation from meteorology data. You can use different sections for the various results, so a section for geophysics, for hydrochemistry, etc. Data may be presented in tabular or graphical form, but must also be described in the text. An example:

4.1.1 Rainfall

Rainfall was observed on three days and amounted to 27.3 mm, 23.1 mm and 30.4 mm for the rain gauges located at Vagos, Boco and Miramar, respectively. Catchment average rainfall, as determined from the Thiessen polygons method, amounted to 25.2 mm. Rainfall showed an increase with distance from the coast. Rainfall fell in the afternoon on two days and at night on the third day. Intensities were low at 3-5 mm h^{-1}. An overview of the daily rainfall amounts is given in Table 4.1.

Table 4.1: Summary of observed daily rainfall totals in the Vagos catchment over the period 1 June until 27 June 2005.

Date	Vagos [mm]	Boco [mm]	Miramar [mm]
10 June 2005	10.1	7.3	6.8
17 June 2005	3.4	5.2	5.5
25 June 2005	13.8	10.6	18.1
Total	27.3	23.1	30.4

4.2 Distinguishing results from discussion

One of the most difficult things in report writing is to decide what should be presented in the Results chapter (Chapter 4) and what you should include in the Discussion chapter (Chapter 5). This is because there are various stages in the results coming from your data. As an example we can take geo-electric measurements.

1. Strictly speaking, your measurements are the first results. So for each measurement or set of measurements in a certain geological formation, you could describe the changes in measured resistances with electrode distance, measured ECs of groundwater and the formation factors.

2. The second step, *i.e.* interpretation of the measured data in the Schlumberger computer program, gives new results. Now you get models of the number, resistivity and thickness of layers that fits your measured data. You could summarize the new results in a table for each geological formation, for instance.

3. The third step would be to compare these different models and make interpretations about the spatial variation of layers from the different soundings that you have, and how these compare with observed geology and groundwater levels/salinities.

I would argue that the first two steps should be included in the Results chapter, whereas the last step goes to the Discussion chapter. This because in the last step you will combine data from different sources, including studies done by others that you need to reference, to generally discuss the geophysical, geological and hydrological properties of the research area.

Chapter 5

Discussion

This chapter can again be subdivided in different sections. You will now combine your own results, as presented in Chapter 4, with additional information obtained from earlier fieldwork campaigns, from the literature, or obtained from hydrological or meteorological services. An example for rainfall would be:

> ## 5.1 Rainfall
>
> The observed rainfall total was significantly below the long-term average measured at the meteorology station from the University of Aveiro (60$\pm$23 mm, [Reddy, 1989], located some 20 km to the North. Rainfall intensities, however, were normal. In 50% of the years, the number of rain days would exceed ten, whereas at present rainfall was observed on only three days. This could be explained by the typical weather situation at the time of measurements with a slow moving high pressure system located over the research area. The present situation was not exceptionally dry, though, with rainfall totals lower than 25 mm being recorded over the same period once every three years [Reddy, 1989].

Chapter 6

Conclusions and recommendations

6.1 Conclusions

Your conclusions summarise your main findings as presented in the Discussion chapter. Again an example:

> River water levels were exceptionally low in Vagos. Although rainfall was below the long-term average for the period, this was not an exceptional situation. Therefore, the steeply lowering of the river water levels cannot be completely attributed to below average rainfall and must also due to increased extraction of river water upstream for irrigation purposes.

6.2 Recommendations

And of course we include a recommendation here...

> River water extraction for irrigation seemed to have a pronounced effect on the river water levels at Vagos. During the present study no data were collected on such river water extractions because of time constraints. However, in view of the important impact on the river water levels in Vagos, we recommend that future studies include a quantification of the river water extraction in the Boco area, where most surface water pumping stations are located.

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Appendix A

Map of the catchment area

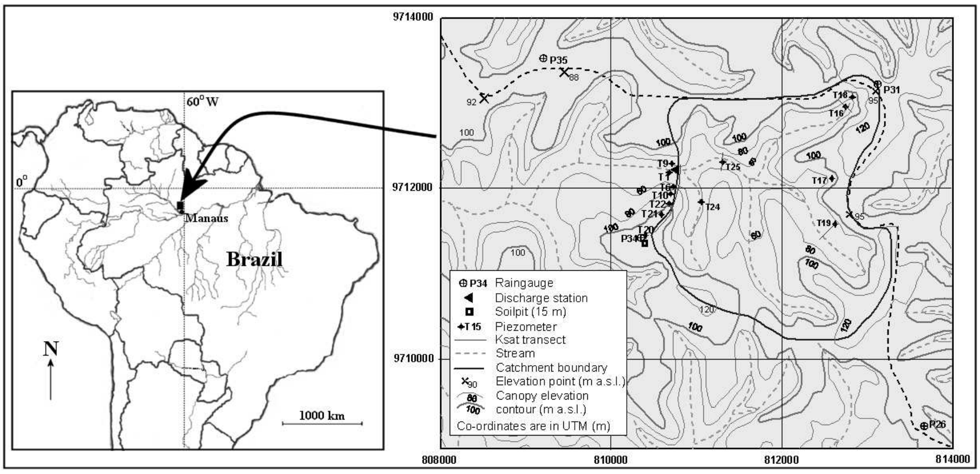

Figure A.1: Map of the catchment area showing the topography and locations of instrumentation.

Appendix B

Student BSc and MSc report checklist

This checklist aims to help you to avoid the most common problems that we encounter in correcting student reports and articles. It lists criteria upon which your report will be evaluated and graded. Please use this checklist to check your report before you hand in your report to the supervisors for evaluation.

B.1 Front matter

- ☐ Is the title informative and descriptive
- ☐ Author name (full name with initials, e.g. Joao M.C. Cao) indicated (for report on cover page)
- ☐ Supervisor names on cover page (for article style reports list supervisors as co-authors)
- ☐ Course code and number of ECTS on cover page (not for article style reports)
- ☐ Logo's on cover page (not for article style reports)
- ☐ Table of contents complete, correct and starts on odd page (not for article-style reports)
- ☐ English summary or abstract included (starts on new, odd page for reports)

B.2 Report content

B.2.1 Structure

- ☐ Report/article structure according to standards (introduction, [site description], methods, results, discussion, conclusions [and recommendations], acknowledgments, reference list, [appendices])

- ☐ All chapters in report start on odd pages
- ☐ Page numbering consistent

B.2.2 Content

- ☐ Problem definition, scope and literature overview in introduction
- ☐ Aims, objectives and hypothesis of your project stated explicitly in introduction
- ☐ Measurement instruments described in methods (brand, model, country)
- ☐ Results well presented and described (Tables, Figures)
- ☐ Discussion of results in broader context (e.g. comparison to other studies)
- ☐ Conclusions cover all aspects of your work and refer to research questions, recommendations included
- ☐ List of symbols with meaning and unit (optional, in Appendix)

B.2.3 Text and paragraphs

- ☐ Proper use of headers (chapters, sections, subsections, etc.) and paragraphs
- ☐ Line length about 80 characters (adjust font size to achieve this)
- ☐ Use formal language (did not instead of didn't) and write in past tense
- ☐ Proper references to chapters, sections or appendices in text (use capitals for Chapter, Section, Appendix), e.g. ... as listed in Section 2.3 ...
- ☐ Correct rounding of numbers (use of appropriate number of decimals), e.g. with a Ksat of 20 m d-1 ..., instead with a Ksat of of 20.3765437 m d-1
- ☐ Correct inclusion and use of SI units in text, table headers and figure labels. Consistency: m s-1 or m/s throughout the text, but not mixed.
- ☐ Non-English (e.g. latin) words or species names in italics, *e.g.* *versus* , *Pinus caribaea*

B.2.4 Tables, figures and maps

- ☐ All tables, figures or maps are referred to in the text
- ☐ Table captions are above table
- ☐ Figure or map captions are below figure/map

- ☐ Appropriate table cross-references used in text (Table, Figure or Map starts with capitals), e.g. ...as detailed in Table 1 and shown in Figure 3.
- ☐ Captions are complete and informative, they describe/explain table, figure or map contents such that table / figure / map can be understood without reading text in the document, they include source of the material if relevant.
- ☐ No titles in/above graphics, graphics description is in caption
- ☐ Use light coloured (white) graph background, certainly not the standard Excel grey!
- ☐ Tables, figures or maps are of the right size and easy to read - texts in graphs/tables are of similar font size as normal text
- ☐ Correct use of units in x- and y-labels of graphs or in table headers, e.g. Rainfall [mm]
- ☐ Maps should have a complete legend, scale bar and north arrow.
- ☐ In displaying graphics, take into account that most reports will be printed out in black/white, so use contrasting colours, patterns or shading to make graphics readable in black and white.

B.3 Bibliography

- ☐ Correct use of citations/quotes for statements in text that are made, based on work of others (plagiarism)
- ☐ Proper inclusion of citations in text, e.g. Hicks et al. (1945) observed that ..., or were observed (Jones, 2012; Smith et al., 2009).
- ☐ Citations in text all present in reference list and vice versa
- ☐ Citations in bibliography are complete. The citations include at least: names of all author(s), year of publication, title, journal/book title, volume, number and pages, *e.g.* D.R. Helsel and R.M. Hirsch, Techniques of Water-Resources Investigations. Book 4, Hydrologic Analysis and Interpretation, Chapter A3: Statistical Methods in Water Resources, U.S. Geological Survey, U.S. Department of the Interior, 2002, USA, September.
- ☐ Format of references is consistent throughout the list
- ☐ References are ordered alphabetically on first authors name (or numbered, with numbers appearing in text)