Report Writing

Some basic guidelines

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Every group will submit one report for the three applied exercises in magnetics, geoelectrics, and seismics. Writing good reports is difficult. On the one hand you want that the reader can follow every step and is never caught by surprise (which is fundamentally different from fictional writing). On the other hand you have to be concise and outsource non-relevant information. Finding the correct balance for a wide range of readers can take years of practice.

This document outlines some of the expectations that your report should fulfill including (1) a concise and logical structure & layout, (2) clear take-away messages, and (3) reproducibility of the survey and related inferences.

Structure & Layout

Structuring your report is important, as it enables the reader to quickly zoom in on subsections of specific interests: An experienced geophysicists may skip the methods and focus exclusively on the results. Your client (who knows nothing about geophysics and hence hired you) may desperately look for the one take-away message and skip all the rest. It is nerve-racking to find the relevant information in a long, narrative and unstructured report.

A classic structure contains the following five subsections:

- *Introduction:* Lay out the goal of this report (e.g., phrased as a question) and provide general context required for the reader to understand the following sections. Often this includes a figure of the survey area.

- *Methods:* State the core geophysical principles, the instruments used, related uncertainties and processing strategies. Outline the expectations based on the geophysical theory and available site information.

- *Results:* Exclusively summarize the findings of the survey including informative figures. This section can be comparatively short as all interpretation is held back at this stage and only appears in the discussions.

- *Discussions:* Balance different scenarios explaining your results. Often the results are unambiguous (e.g, a magnetic anomaly curve), but related interpretations (e.g., the magnetic anomaly is caused by an object at a specific depth) differ from operator to operator. Contrast your results to your expectations outlined previously. Celebrate differences, don't try to oversimplify.

- *Conclusions:* Reiterate the original motivation from the introduction and then provide take-away messages that are synthesized from the results and related discussions. This is often the most-read section.

Make sure that the layout of the report is formally correct which includes (but is not limited to) readable labels on figures and adequate internal and external referencing. Sloppy figures and a poor design invoke an unprofessional impression biasing your reader towards questioning the results.

Take-away messages

From reading your report a number of take-away messages should crystallize that differentiate important findings from arguably less important details. Those are typically the one to three things that a reader would still remember a few weeks after reading the report.

Reproducibility

Your report should enable the reader to cross check your data and findings if required. This, for example, 7 includes provision of the raw data so that the processing schemes mentioned in the *Methods* can be repeated. It also includes location and timing of the measurements and any other additional information required to repeat the survey. Some of this information (e.g., data tables) can be attached to the main report in form of an *Appendix*.