Field Operations Safety Manual

University of California, Office of the President

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Contents

UC Field Operations Manual

This manual provides guidelines and resources to lead safe, successful field courses and research trips. The content focuses on risk management issues that are relevant for California-based field courses and research, international trips, research expeditions, and other outdoor excursions. Field sites may include field stations, natural reserves, public lands or parks, wilderness areas, coastline or waterways, or more controlled sites such as construction areas, excavations, or mines. The Field Operations Manual was developed to serve as a reference document and teaching tool as well as to highlight applicable UC policies and State/Federal laws. The manual is organized into key sections on **planning, training, incident response, best practices for trip leaders, and appendices on common field hazards and local campus resources.**

Integration of field safety planning into routine instruction and training will meet key objectives and regulatory requirements of your Campus or Department's Injury and Illness Prevention Plan (IIPP). The IIPP is a written safety program to protect employees from illnesses and injuries per the California Code of Regulations Title 8, Section 3203, by establishing a safety management framework for identifying and correcting workplace hazards, ensuring employee training and compliance, and communicating information related to safety and health issues. Faculty, staff and students, including student employees and volunteers, are accountable for health and safety rules and following safe work practices, including:

- obtaining appropriate training for designated activities
- using personal protective equipment (PPE) and safety equipment as required and directed,
- reporting unsafe conditions, malfunctioning equipment, and other safety concerns,
- reporting all injuries and incidents, and
- understanding what to do in the event of an emergency.

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Introduction

Risk, and recognizing the possibility of loss or injury, is integral to experiential learning and is inherent in field environments where we teach and conduct research. A field instructor or researcher must also be an effective risk manager who understands and anticipates risks and acts appropriately to reduce the likelihood of negative consequences. Accidents often result from a combination of challenging conditions, inadequate preparation and poor communication. For this reason, an effective trip leader must incorporate many attributes of leadership including preparation, competency, effective communication, appropriate judgment, self and group awareness, and tolerance for adversity and uncertainty (adapted from the National Outdoor Leadership School Educator Notebook).

Chapter 1

Planning

1.1 Assess Potential Field Hazards

Hazard assessment for field activities may be triggered by various entities, such as via animal protocol review, as part of the research/lab safety program at your campus, or through department procedures. The field hazard assessment tool below provides an overview of resources and hazard mitigation steps for common UC field activities.

All fieldwork warrants a pre-trip discussion regarding foreseen hazards, appropriate precautions, communication options, and emergency procedures. Additional actions are listed below.

1. Label the heading: `# Hello world {#nice-label}`.
    - Leave the label off if you like the automated heading generated based on your heading title: for example, `# Hello world` = `# Hello world {#hello-world}`.
    - To label an un-numbered heading, use: `# Hello world {-#nice-label}` or `{# Hello world .unnumbered}`.
2. Next, reference the labeled heading anywhere in the text using `\@ref(nice-label)`; for example, please see Chapter .
    - If you prefer text as the link instead of a numbered reference use: .

1.2 Captioned figures and tables

Figures and tables *with captions* can also be cross-referenced from elsewhere in your book using `\@ref(fig:chunk-label)` and `\@ref(tab:chunk-label)`, respectively.

Don't miss Table 1.1.

Table 1.1: Here is a nice table!

temperature	pressure
0	0.0002
20	0.0012
40	0.0060
60	0.0300
80	0.0900
100	0.2700
120	0.7500
140	1.8500
160	4.2000
180	8.8000

```
knitr::kable(
  head(pressure, 10), caption = 'Here is a nice table!',
  booktabs = TRUE
)
```

Chapter 2

Parts

You can add parts to organize one or more book chapters together. Parts can be inserted at the top of an .Rmd file, before the first-level chapter heading in that same file.

Add a numbered part: `# (PART) Act one {-}` (followed by `# A chapter`)

Add an unnumbered part: `# (PART\*) Act one {-}` (followed by `# A chapter`)

Add an appendix as a special kind of un-numbered part: `# (APPENDIX) Other stuff {-}` (followed by `# A chapter`). Chapters in an appendix are prepended with letters instead of numbers.

Chapter 3

Footnotes and citations

3.1 Footnotes

Footnotes are put inside the square brackets after a caret `^[]`. Like this one [1].

3.2 Citations

Reference items in your bibliography file(s) using `@key`.

For example, we are using the **bookdown** package [Xie, 2021] (check out the last code chunk in index.Rmd to see how this citation key was added) in this sample book, which was built on top of R Markdown and **knitr** [Xie, 2015] (this citation was added manually in an external file book.bib). Note that the `.bib` files need to be listed in the index.Rmd with the YAML `bibliography` key.

The RStudio Visual Markdown Editor can also make it easier to insert citations: https://rstudio.github.io/visual-markdown-editing/#/citations

[1] This is a footnote.

Chapter 4

Blocks

4.1 Equations

Here is an equation.

$$f(k) = \binom{n}{k} p^k (1-p)^{n-k} \tag{4.1}$$

You may refer to using `\@ref(eq:binom)`, like see Equation (4.1).

4.2 Theorems and proofs

4.3 Callout blocks

The R Markdown Cookbook provides more help on how to use custom blocks to design your own callouts: https://bookdown.org/yihui/rmarkdown-cookbook/custom-blocks.html

Chapter 5

Sharing your book

5.1 Publishing

HTML books can be published online, see: https://bookdown.org/yihui/bookdown/publishing.html

5.2 404 pages

By default, users will be directed to a 404 page if they try to access a webpage that cannot be found. If you'd like to customize your 404 page instead of using the default, you may add either a `_404.Rmd` or `_404.md` file to your project root and use code and/or Markdown syntax.

5.3 Metadata for sharing

Bookdown HTML books will provide HTML metadata for social sharing on platforms like Twitter, Facebook, and LinkedIn, using information you provide in the `index.Rmd` YAML. To setup, set the `url` for your book and the path to your `cover-image` file. Your book's `title` and `description` are also used.

This `gitbook` uses the same social sharing data across all chapters in your book- all links shared will look the same.

Specify your book's source repository on GitHub using the `edit` key under the configuration options in the `_output.yml` file, which allows users to suggest an edit by linking to a chapter's source file.

Read more about the features of this output format here:

https://pkgs.rstudio.com/bookdown/reference/gitbook.html

Or use:

```
?bookdown::gitbook
```

Bibliography

Yihui Xie. *Dynamic Documents with R and knitr*. Chapman and Hall/CRC, Boca Raton, Florida, 2nd edition, 2015. URL http://yihui.org/knitr/. ISBN 978-1498716963.

Yihui Xie. *bookdown: Authoring Books and Technical Documents with R Markdown*, 2021. URL https://CRAN.R-project.org/package=bookdown. R package version 0.24.