Environmental Issues in East Asia

EA30e Spring 2021

March 29, 2021

Contents

Preface

0.1 Guiding Principles

In this project, the EA030 class in 2021 has written a textbook that highlights examples of environmental processes.

Each student contributes to one theme, composed of two examples that highlight environmental issues of East Asia. However, our goal is not to call out environmental issues in East Asia, but to point to linkages of how a range of globalized economy contribute to these environmental problems.

In the end, it would be useful for us to acknowledge we have some capacity to address these how these global linkages could be modified to reduce these environmental issues.

0.1.1 Goals

Processes across horizontal boundaries define many environmental patterns that frame human interactions with the environment. How do humans impact processes that cross these boundaries and how do humans influence these ecosystem interface?

0.1.2 Rationale

0.1.3 Activity

Each group will be composed of two students, that will become experts and teach their classmates on the topic.

0.2 East Asia and the World

0.3 Acknowledgments

Everyone in the world!

Author Guide

0.3.1 Why Learn LaTeX?

0.3.2 How to Learn LaTeX?

0.3.3 Noting Your Contribution

Because this is an ongoing project, you should record your contribution to each chapter – but also let go of these contributions at some point; Others might revise and their authorship might take some precedence, so you should both invest in the product but also be willing to detach from the final outcome as others contribute. This will feel uncomfortable at times, but please note from the beginning this is a social process and as such subject to negotiation. Please be generous to the authors that laid the foundation and be respectful of those that follow.

0.4 Setting Up Book Project–Type Setting w/ LaTeX

0.4.1 The Standard Latex Book Class

Currently, the text is written using the standard book class. However, in 2019, I (Los Huertos) will convert the format to a Tufte book class.

0.4.2 Structuring the Text with Nested Hierarchies

Contributors divide their contributions into sections and subsections. This format allows a consistent approach to structuring the text and forcing themes to be organized in blocks that can be used to organize the overall text. We use section, subsection, and subsubsection to break up the topic into bite sizes.

To accomplish this, contributors use the `\section{Section}` command for major sections, and the `\subsection{Subsection}` command for subsections, and a similar approach for subsubsections.

NOTE: for each nested level, it MUST be followed by the lowest level in the section before a paragraph is started – in contrast to what is shown above!

NOTE: We may dispense with subsubsections in the future to provide a less blocky structure, but for now they remain useful.

0.4.3 Font Changes

We can use various methods to alter the typeset: *Emphasize*, **Bold**, *Italics*, and *Slanted*. We can also typeset Roman, Sans Serif, Small Caps, and `Typewriter` texts. Look online to see the commands to accomplish these changes.

You can also apply the special, mathematics only commands $\mathbb{BLACKBOARD\ BOLD}$, $\mathcal{CALLIGRAPHIC}$, and $\mathfrak{fraktur}$. Note that blackboard bold and calligraphic are correct only when applied to uppercase letters A through Z.

You can apply the size tags – Format menu, Font size submenu – tiny, scriptsize, footnotesize, small, normalsize, large, Large, LARGE, huge and Huge.

You can use the `\begin{quote} etc. \end{quote}` environment for typesetting short quotations. Select the text then click on Insert, Quotations, Short Quotations:

> The buck stops here. *Harry Truman*
>
> Ask not what your country can do for you; ask what you can do for your country. *John F Kennedy*
>
> I am not a crook. *Richard Nixon*
>
> I did not have sexual relations with that woman, Miss Lewinsky. *Bill Clinton*

The Quotation environment is used for quotations of more than one paragraph. Following is the beginning of *The Jungle Books* by Rudyard Kipling. (You should select the text first then click on Insert, Quotations, Quotation):

> It was seven o'clock of a very warm evening in the Seeonee Hills when Father Wolf woke up from his day's rest, scratched himself, yawned and spread out his paws one after the other to get rid of sleepy feeling in their tips.
>
> Mother Wolf lay with her big gray nose dropped across her four tumbling, squealing cubs, and the moon shone into the mouth of the cave where they all lived. "*Augrh*" said Father Wolf, "it is time to hunt again." And he was going to spring down hill when a little shadow with a bushy tail crossed the threshold and whined: "Good luck go with you, O Chief of the Wolves; and good luck and strong white teeth go with the noble children, that they may never forget the hungry in this world."

Use the Verbatim environment if you want LaTeX to preserve spacing, perhaps when including a fragment from a program such as:

```
#include <iostream>         // < > is used for standard libraries.
void main(void)             // ''main'' method always called first.
{
 cout << ''This is a message.'';
                            // Send to output stream.
}
```

(After selecting the text click on Insert, Code Environments, Code.)

0.4.4 Mathematics and Text

Warning: Special Characters

When you use percent and ampersand symbols, hash tags, and other non-standard ASCII characters, LaTeXwill be very uncooperative. So, do yourself a favor and make sure you understand that these are used for special typesetting functions. To use them you have to "escape" and use commands to get them to do what you might usually expect! % # & è ñ " and " to show a few that do not reflect the key stroke you might expect.

LaTeXdoesn't like a range of characters or they reserved for special behavior...

For example, the # is used for tabs in a table environment. % is used to make comments, thus stuff behind a % is ignored. There are lots of others, but these come up the most.

Creating equations

One of the most powerful parts of LaTeXis how it can be used to write complex equations, with all those symbols and Greek letters! This can be done inline $y = mx + b + \epsilon$ for fairly simple equations, or set apart for more complex equations:

$$\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2} \tag{1}$$

Theorems, etc

Theorem 1 *(The Currant minimax principle.) Let T be completely continuous selfadjoint operator in a Hilbert space H. Let n be an arbitrary integer and let $u_1, \ldots, u_{n-1}$ be an arbitrary system of $n-1$ linearly independent elements of H. Denote*

$$\max_{\substack{v \in H, v \neq 0 \\ (v,u_1)=0,\ldots,(v,u_n)=0}} \frac{(Tv, v)}{(v, v)} = m(u_1, \ldots, u_{n-1}) \tag{2}$$

Then the n-th eigenvalue of T is equal to the minimum of these maxima, when minimizing over all linearly independent systems $u_1, \ldots u_{n-1}$ in H,

$$\mu_n = \min_{u_1,\ldots,u_{n-1} \in H} m(u_1, \ldots, u_{n-1}) \tag{3}$$

The above equations are automatically numbered as equation (2) and (3).

0.4.5 Lists Environments: Making bulletted, numbered, description lists

We use special commands to create an itemized list.

You can create numbered, bulleted, and description lists (Use the Itemization or Enumeration buttons, or click on the Insert menu then chose an item from the Enumeration submenu):

1. List item 1
2. List item 2
   (a) A list item under a list item.
   (b) Just another list item under a list item.
      i. Third level list item under a list item.
         A. Fourth and final level of list items allowed.

- Bullet item 1
- Bullet item 2
  – Second level bullet item.

Figure 1: My plot's caption is here!

- Third level bullet item.
  - Fourth (and final) level bullet item.

Description List Each description list item has a term followed by the description of that term.

Bunyip Mythical beast of Australian Aboriginal legends.

0.4.6 Theorem-Like Environments

The following theorem-like environments (in alphabetical order) are available in this style.

Example 2 *This is an example*

Exercise 3 *This is an exercise*

Theorem 4 *This is a theorem*

0.4.7 Peer Review Commenting

You can put your comments in square brackets and in color for things that need help. [This section is confusing, I am not sure what commenting means.]

0.4.8 Adding Figures, etc

0.4.9 Using Rnw Files – Deprecated

Originally, I used R and Rnw files that were converted to tex files, in Rstudio. However, this step was too complicated for students, so I now recommend the use of tex files and use Rstudio to create figure files as a separate process. Thus, I will no longer explain the process in this document.

0.4.10 Creating a floating figure

This is my floating figure (Figure 1).

0.4.11 Using Boxes

0.4.12 minibox X

Some text

0.4.13 Creating References, Indicies, and Glossaries

Bibliography generation

This document was produced in RStudio using the knitr package (**?**) by `http://texblog.org`.

Also try **?** to create an author title.

Currently, we are using the ecology.bst, but it has trouble with misc type of references, so I will changing this in 2019.

Creating glossary words

Definition 5 *This is a definition and the word is use in an glossary, e.g.* **Peat**. **Peat** *is when you want to capitalize the defined word without having to re-define a capitalized version, the only downside of case sensitivity in LaTeX.*

Title

Chapter Author Name

[1]

0.5 Section Heading

0.5.1 Subsection Headings

Some text here... if you cut and paste, be sure to make sure you don't include formatted characters outside the ASCII values. See Author Guide0.3.

Optional Subsubsection Headings

some text here....

0.6 Goals of this template

This template will NOT teach you how to use LaTeX! To accomplish that, we'll rely on some great online resources that you can find on in Chapter 0.3.

Instead this section of the document is designed to demonstrate how our textbook will look, feel, and ultimately how we contribute to the project.

This document also compiles all of our projects into a single PDF, where each chapter is composed of a input tex file.

0.7 Here's figure

0.7.1 R Created Figures

First we create an R chunk and add some code. In this case, I created a floating figure which can be referenced (Figure 2)!

[1] Statement of Contributions– For example, "The chapter was first drafted by Marc Los Huertos (2021). The author recieved valuable feedback from X, and Y and Z to improve the chapter. Slater revised the chapter in 2022 with suggestions from Cater." Note: I am still working on the formatting for this to improve it.

```
plot(pressure)
```

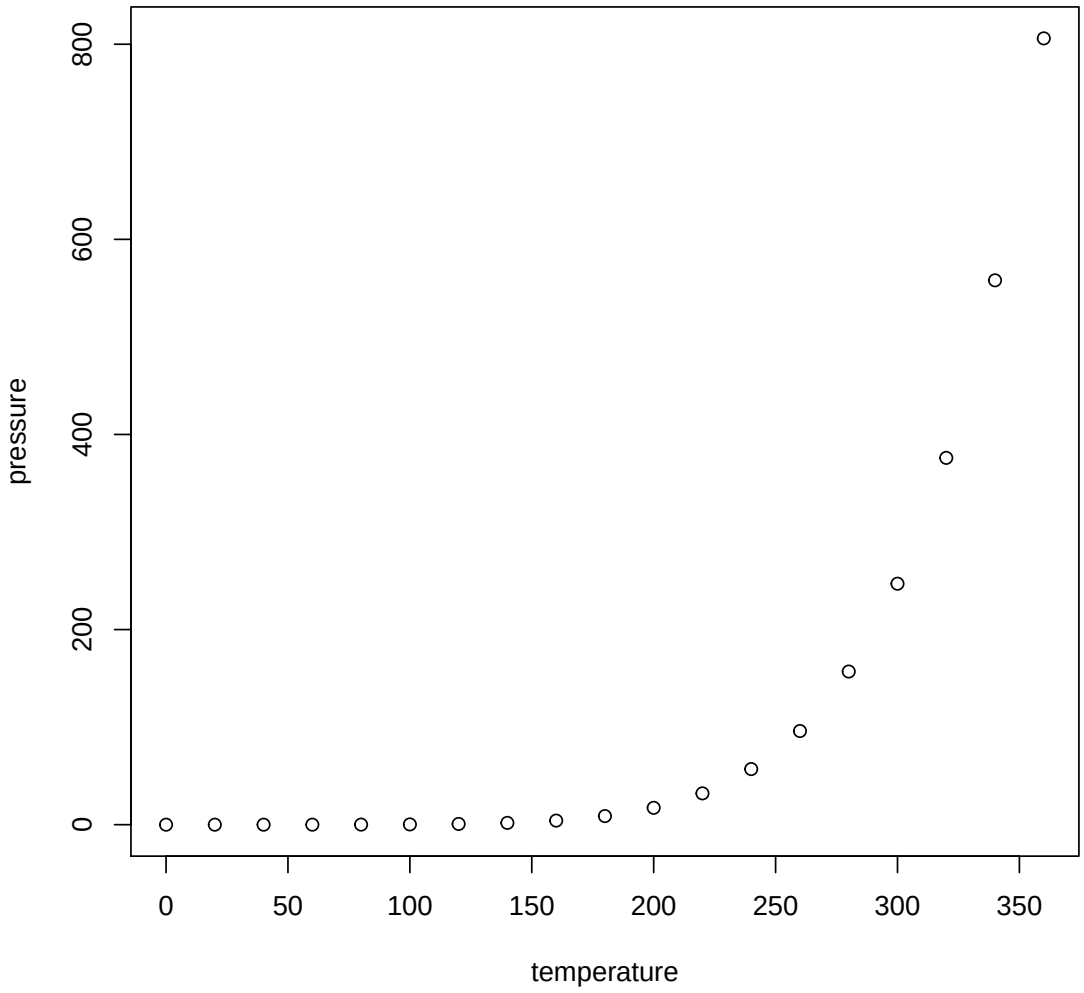

Figure 2: Figure Caption...we should turn "echo=False" in the R chunk options, but I left it true for now. (source: ??)

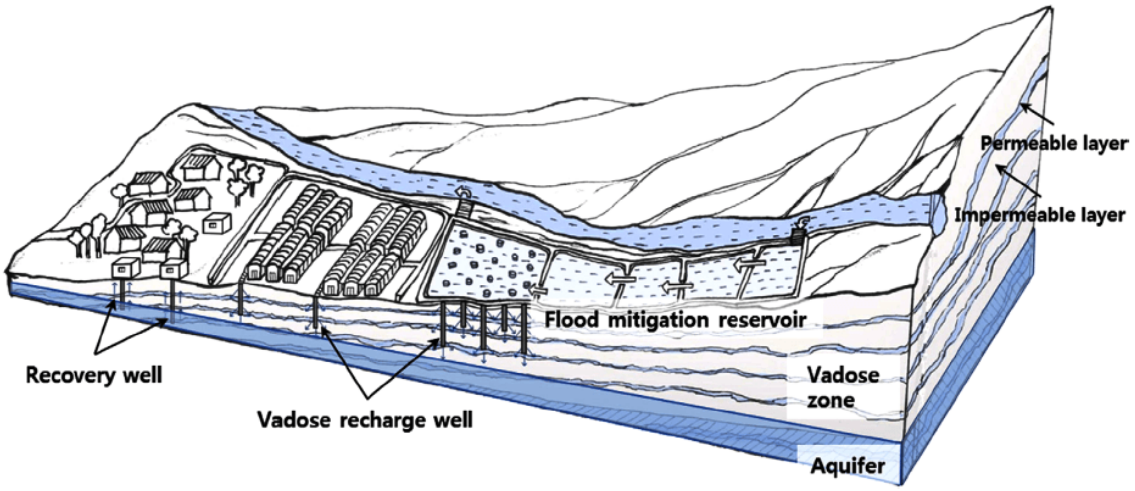

Figure 3: Vadose zone is neato

0.7.2 Imported Figures

All figures and images that are imported should be put into the "images" sudirectory to keep stuff organized. Even better to create a subdirectory with your images, but we can naviagate as we go.

Figure 3 is a good example of this.

In this case, I had to specify the width so it would fit on the page! See the Rnw file for the code. Notice, I was also abel to "reference" the figure in the text.

Chapter 1

Critical Zone

Marc Los Huertos

Acknowledgement 6 *The chapter was first drafted by Marc Los Huertos (2021). The author recieved valuable feedback from X, and Y and Z to improve the chapter. Slater revised the chapter in 2022 with suggestions from Cater.*

The crticical zone refers the the portion of the Earth's skin where the zone where rock meets life. The Critical Zone supports all terrestrial life.

The critical zone includes the following:

- A permeable layer from the tops of the trees to the bottom of the groundwater.

- An environment where rock, soil, water, air, and living organisms interact and shape the Earth's surface.

- Water and atmospheric gases move through the porous Critical Zone, and living systems thrive in its surface and subsurface environments, shaped over time by biota, geology, and climate.

All this activity transforms rock and biomass into the central component of the Critical Zone - soil; it also creates one of the most heterogenous and complex regions on Earth.

Its complex interactions regulate the natural habitat and determine the availability of life-sustaining resources, such as food production and water quality.

These are but two of the many benefits or services provided by the Critical Zone. Such 'Critical-Zone Services' expand upon the benefits provided by ecosystems to also include the coupled hydrologic, geochemical, and geomorphic processes that underpin those ecosystems.

1.0.3 What are the environmental implications of the Critical Zone?

The critical zone as a concept and as a material space pushes us to think of the porousity of the Earth's surface — the gas and fluid flows through rocks, soils, and plants. We can begin to appreciate the complexity of the transport and fate of chemical pollutants as they enter the soil and become part of the vadose zone and perhaps the ground water table – moving with water and diffusing through the water, simultaneously.

1.1 The Vadose Zone

Jeji is a volcanic island is located some XX km south of the Korean Penisula. Water runs off the steep slopes quickly and water supplies are limited on the island. To adddress this...[@lee2017fifty].

Chapter 2

Air Pollution

Part I

Backmatter

The back matter often includes one or more of an index, an afterword, acknowledgments, a bibliography, a colophon, or any other similar item. In the back matter, chapters do not produce a chapter number, but they are entered in the table of contents. If you are not using anything in the back matter, you can delete the back matter TeX field and everything that follows it.