

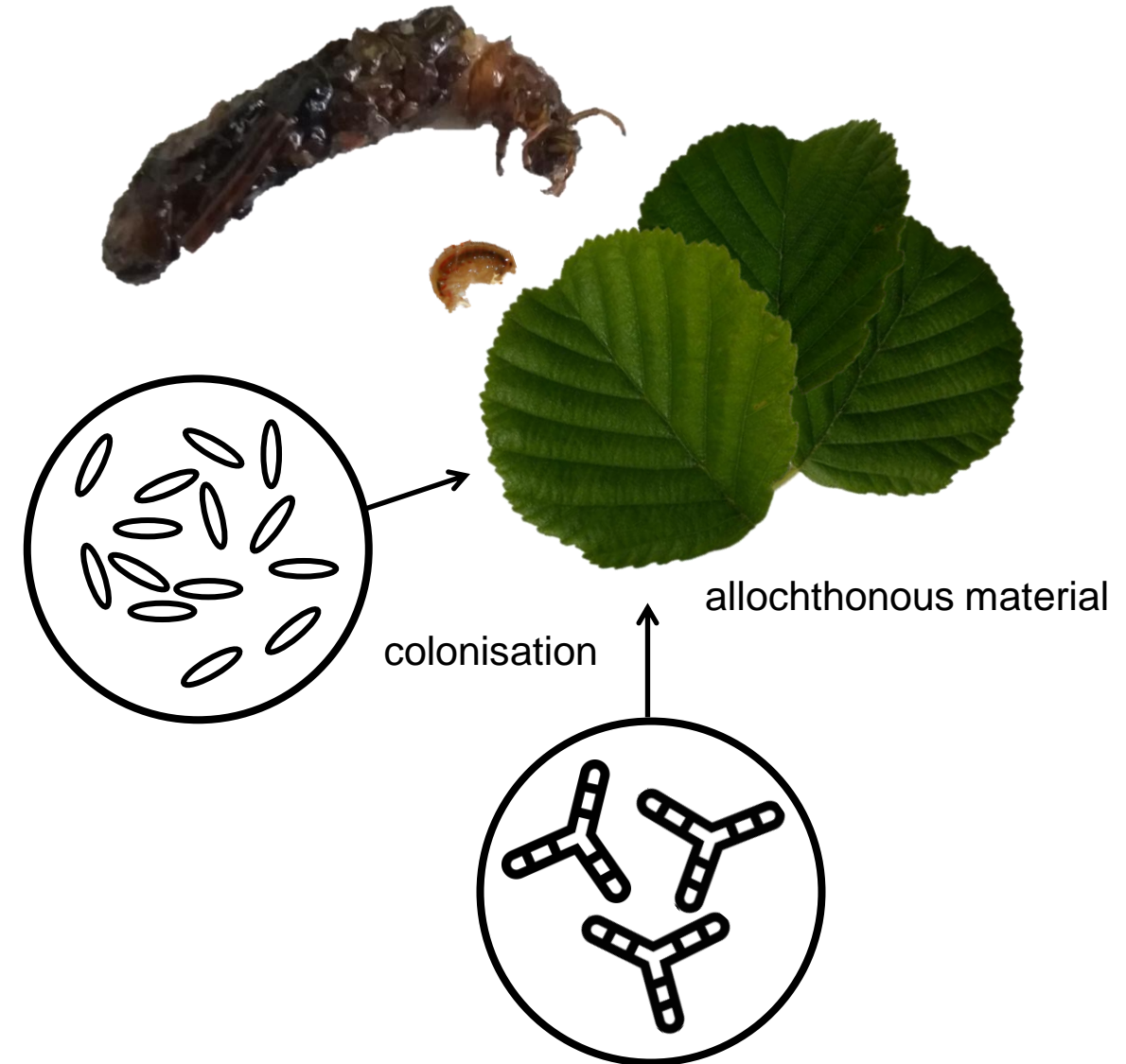
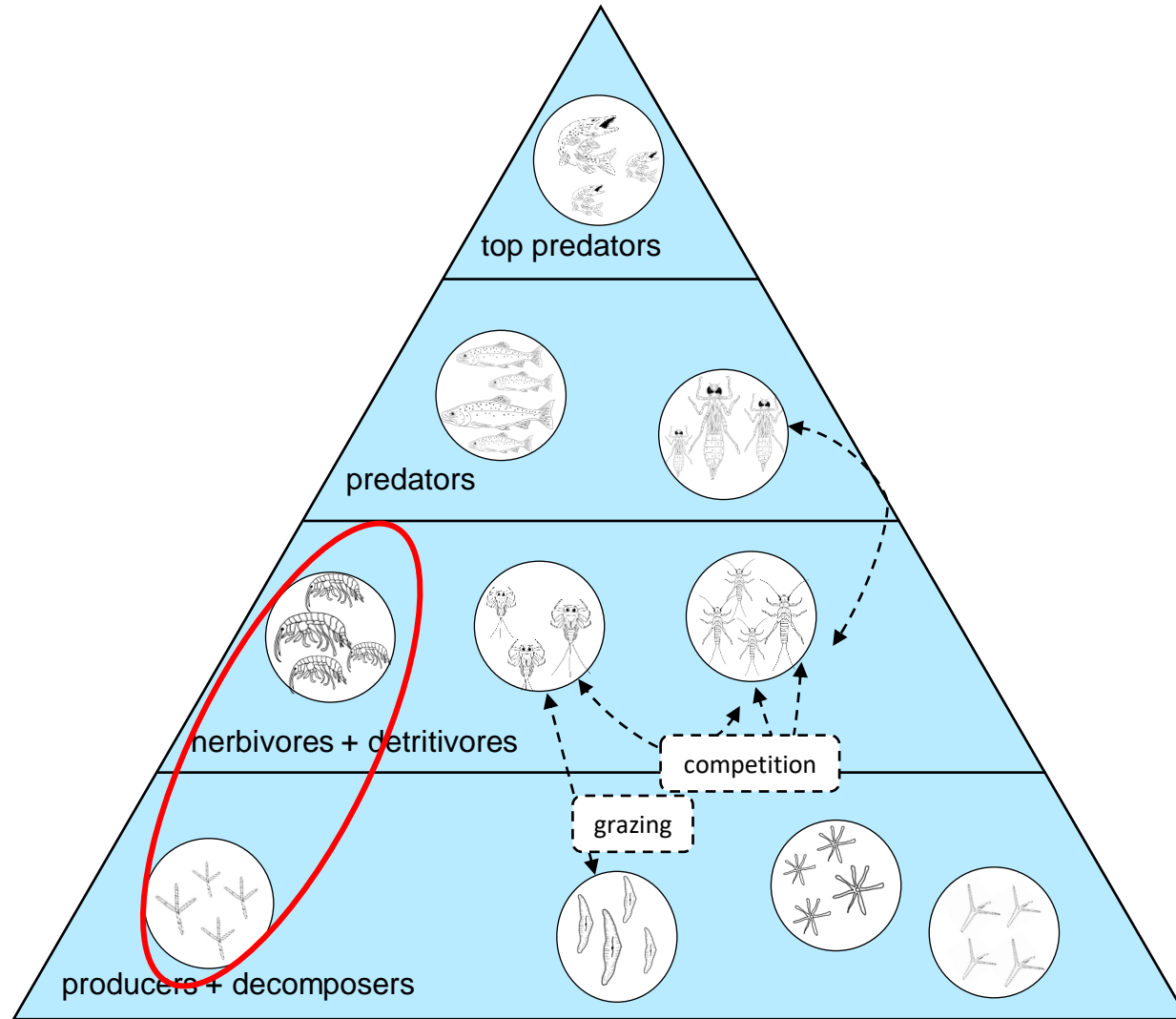
QUARTO in R

Theoretical Ecotoxicology

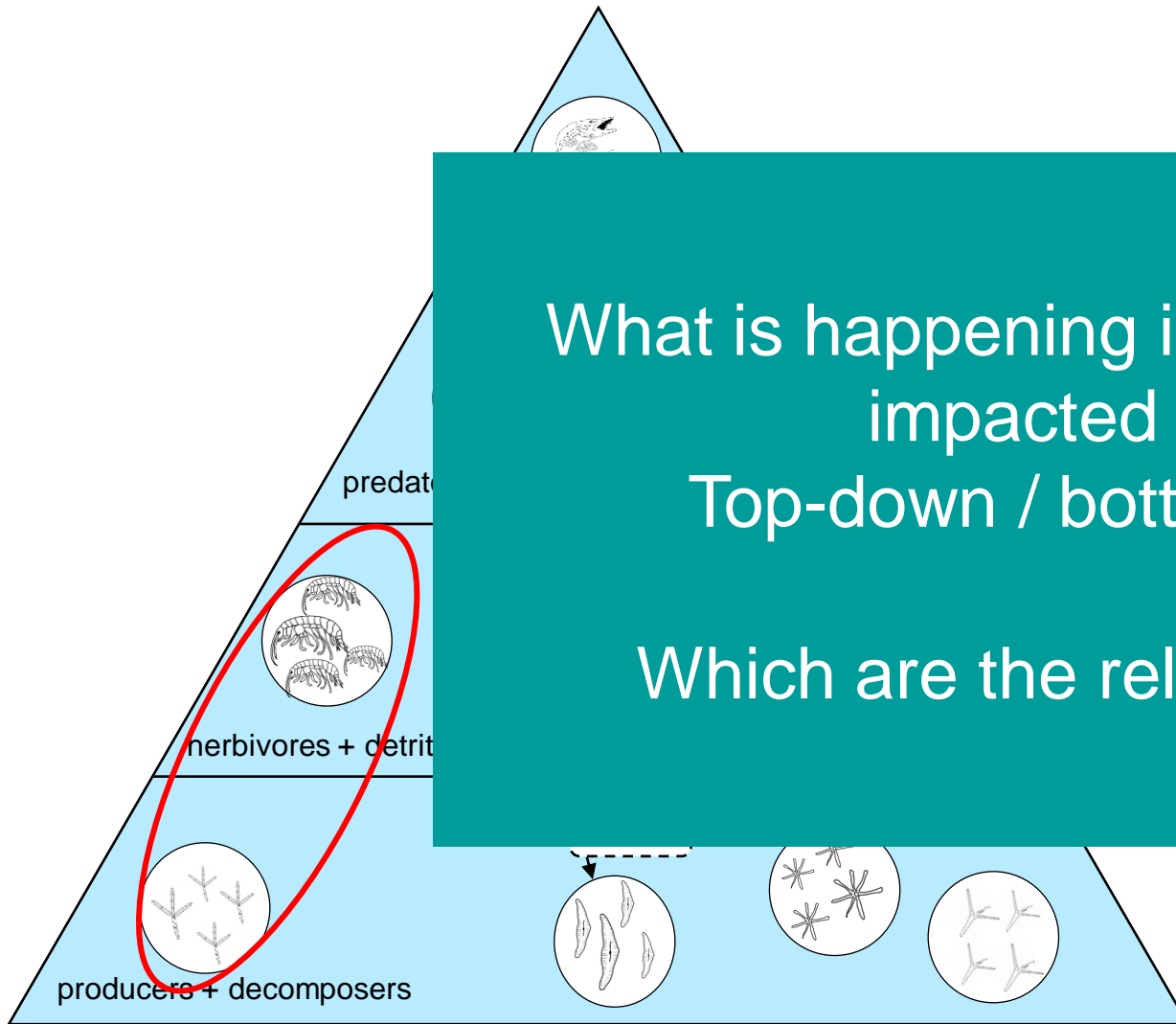
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My Research



My Research



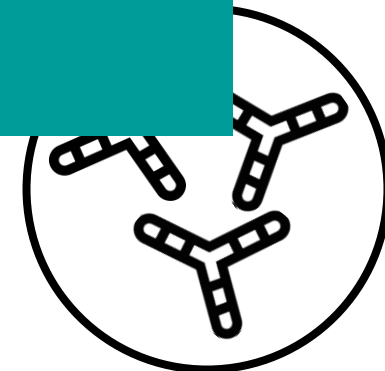
What is happening in anthropogenically impacted streams?

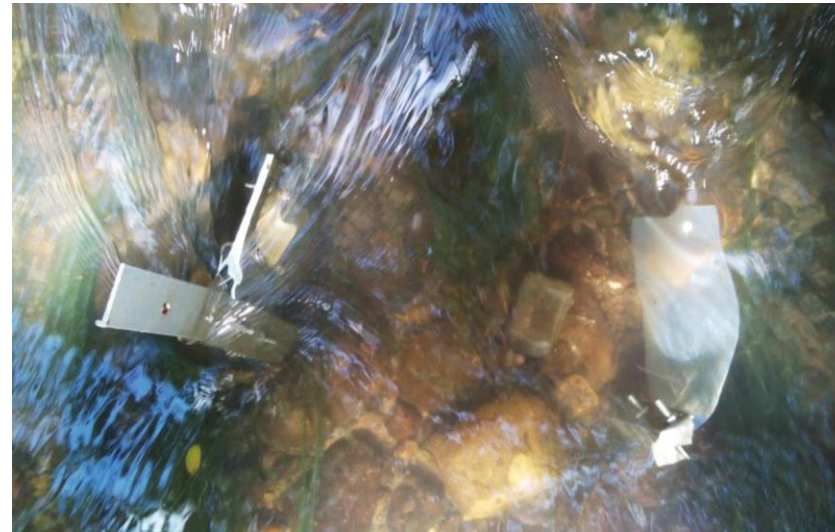
Top-down / bottom-up effects?

Which are the relevant stressors?



allochthonous material





Normal R script

- Code and text are not separated
 - Only one level of dividers possible
 - Text with inline code not possible
 - Script and results are separated
- ➔ Information are easily lost!

R Quarto

- Code (in chunks) and text are separated
- Entering of headlines, tables etc. is possible
- TOC in code visible
- Text with in-line code (also Latex) possible
- (Beautiful) outcome where script and results are together
- Easier to recap and publish script + results!

Normal R script

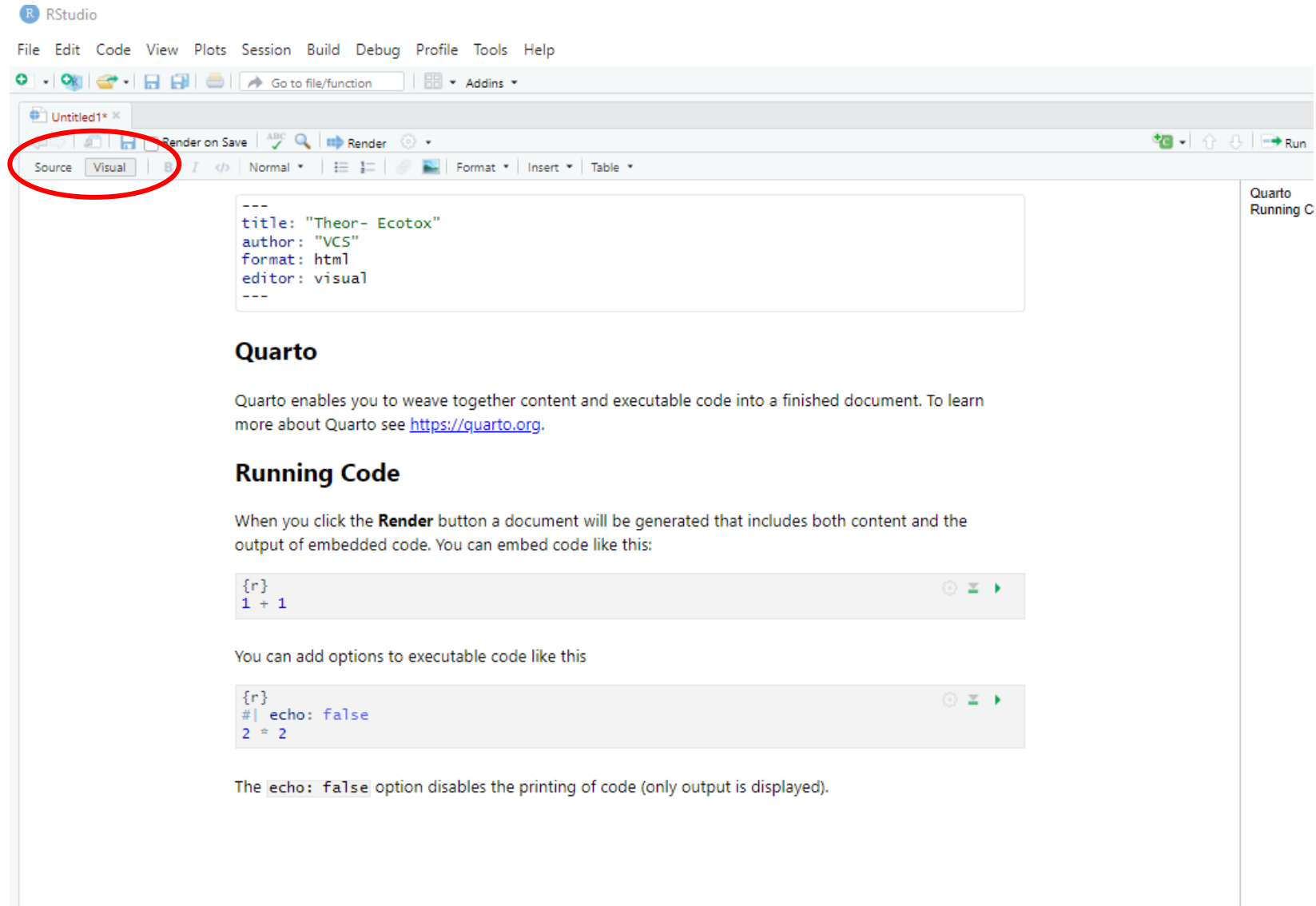
- Code and text are not separated
- Only one layout possible
- Text with inline code
- Script and results are mixed together
- ➔ Information are easily lost!

R Quarto

- Code (in chunks) and text are separated
- Results (plots, tables etc. is possible)
- Can be used with R (also Latex)
- Can be used to create websites, presentations etc.
- Easier to recap and publish script + results!

Additional benefits:
Quarto can also be used with Python, Julia
etc.

Create Websites, presentations etc.



RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

Render on Save Render

Source Visual

```
---
title: "Theor- Ecotox"
author: "VCS"
format: html
editor: visual
---
```

Quarto

Quarto enables you to weave together content and executable code into a finished document. To learn more about Quarto see <https://quarto.org>.

Running Code

When you click the **Render** button a document will be generated that includes both content and the output of embedded code. You can embed code like this:

```
{r}
1 + 1
```

You can add options to executable code like this

```
{r}
#| echo: false
2 * 2
```

The `echo: false` option disables the printing of code (only output is displayed).

Quarto Running C

Overview over Quarto in R

Use Source version to have more control

The screenshot shows the Quarto R IDE interface. The top menu bar includes File, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu bar is a toolbar with icons for opening files, saving, and navigating. The main editor area is divided into two panes: 'Source' and 'Visual'. The 'Source' pane shows the following code:

```
1 ---
2 title: "Theor- Ecotox"
3 author: "VCS"
4 format: html
5 editor: visual
6
7
8 ## Quarto
9
10 Quarto enables you to weave together content and executable code into a finished document. To learn more about Quarto see
11 <https://quarto.org>.
12
13 ## Running Code
14 When you click the Render button a document will be generated that includes both content and the output of embedded code.
15 You can embed code like this:
16
17 ```{r}
18 1 + 1
19 ```
20
21 You can add options to executable code like this
22
23 ```{r}
24 #| echo: false
25 2 * 2
26 ```
27
28 The echo: false option disables the printing of code (only output is displayed).
```

The 'Visual' pane shows the rendered output of the code, including the title, author, and the results of the R code chunks. The right sidebar contains the 'Quarto Running Code' panel, which shows the execution progress of the code chunks.

Annotations on the image include:

- Final step → render**: A red box pointing to the 'Render' button in the top toolbar.
- Header for formatting whole document**: A red box pointing to the YAML header (lines 1-5) in the source code.
- Headline**: A red box pointing to the '## Running Code' section header in the source code.
- Code chunk**: A red box pointing to the first R code chunk (lines 16-19) in the source code.
- Run current chunk**: A red box pointing to the 'Run' button (a green play icon) in the right sidebar.
- Run all previous chunks**: A red box pointing to the 'Run All' button (a green play icon with a downward arrow) in the right sidebar.
- text section**: A red box pointing to the text content (lines 10-13) in the source code.


```

---

title: "Theor- Ecotox"

author: "VCS"

format: html

editor: visual

toc: true

toc-depth: 4

number-sections: true

editor_options:
  chunk_output_type: console
---

```

Title of script

Author of script

Type of output, pdf also possible

Table of content

Number of levels displayed

Levels numbered?

Where to display output while coding,
alternative: inline

- Have different levels of headlines

Headline A
Headline B

1 Headline A
1.1 Headline B

- Enter text in italics or bold

- For italics use one * or _
- For bold use two * or _

italics or _italics_
bold or __bold__

italics or *italics*
bold or **bold**

- Use superscripts or subscripts

- For superscripts framed by ^
- For subscripts framed by ~

H⁺⁺
H~2~O

H⁺
H₂O

- Enter links
 - enter links in `< >`
 - setting word in `[]` and the link in `()`

```
https://www.uni-due.de/  
<https://www.uni-due.de/>  
[Uni] (https://www.uni-due.de/)
```

```
https://www.uni-due.de/  
https://www.uni-due.de/  
Uni
```

- Enter tables

```
First column | Second column  
-|-  
First row | First row  
Second row | Second row
```

First column	Second column
First row	First row
Second row	Second row

- New line: use two spaces or empty line

- Enter unordered lists

```
* unordered list (or + / -)
      * level 1.1
* Level 2
```

- unordered list
 - level 1.1
- level 2

For new level use 2 tap stops

- Enter ordered lists

```
1. ordered list level 1
1.1 ordered list level 1.1
2. ordered list level 2
```

1. ordered list level 1
 - 1.1 ordered list level 1.1
2. ordered list level 2

- When writing code in ``r`` sections you can enter R code outside of chunks, here some examples:

- Entering date

```
`r format(Sys.time(), "%d.%m.%Y")` 09.04.2025
```

- Enter calculations

```
2 + 2 = `r 2+2` 2 + 2 = 4
```

- Refer to your dataframe

```
`r nrow(mtcars)` 32  
`r ncol(mtcars)` 11
```

- You can enter in-line Latex code by setting it in \$ \$, here some examples:

- Entering special characters

`α`

α

`β`

β

- Enter in-line equations

`$y = x^2$`

$y=x^2$

- You can also enter full equations in separate lines, set these in \$\$ \$\$

`$$ k_{OW} = \log \left(\frac{c_{1-octanol}}{c_{water}} \right) $$`

$k_{OW} = \log \left(\frac{c_{1-octanol}}{c_{water}} \right)$

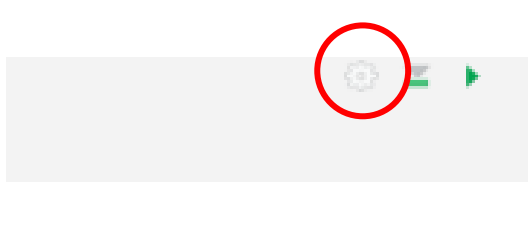
- Use “Ctrl + Alt + I” (Windows)
“Cmd + Option + I “ (Apple)
to enter code chunks



```
```{r}  
```
```

- The code inside chunks is a usual R-script

Code Chunk Options



Chunk Name:

Output:

☐ Show warnings

☐ Show messages

☐ Use paged tables

☐ Use custom figure size

[? Chunk options](#)

Chunk Name:

Output:

☐ Show warnings

☐ Show messages

☐ Use paged tables

☐ Use custom figure size

[? Chunk options](#)

(Use document default)
Show output only
Show code and output
Show nothing (run code)
Show nothing (don't run code)

Some Useful Links

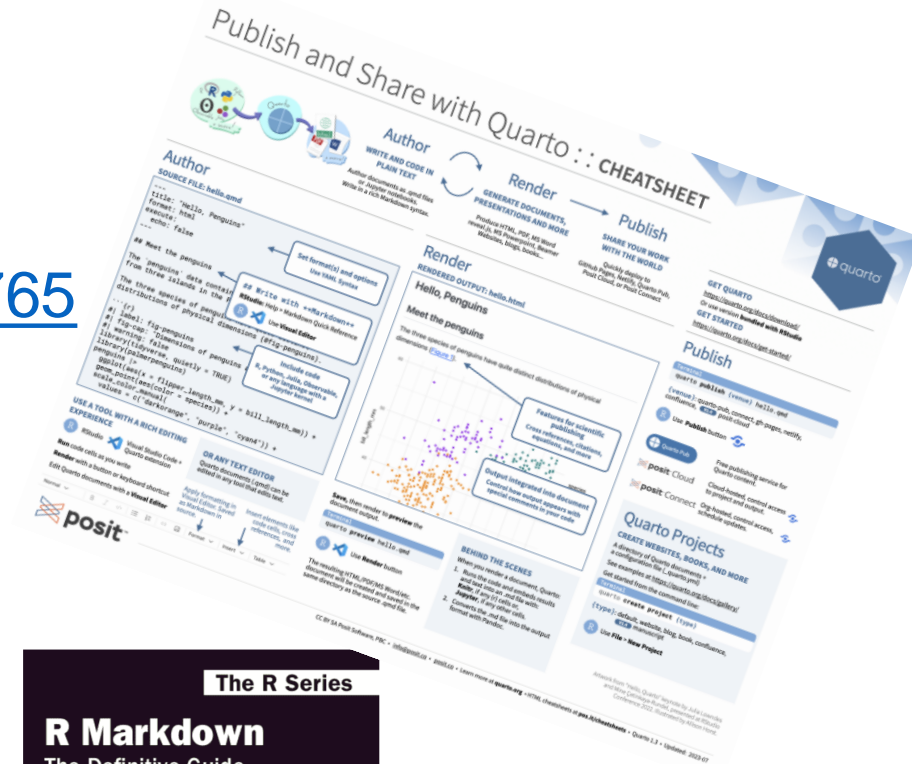
<https://rstudio.github.io/cheatsheets/html/quarto.html>

https://media.datacamp.com/legacy/image/upload/v1676540721/Marketing/Blog/Quarto_Cheat_Sheet.pdf

<https://quarto.org/docs/guide/>

Since many things did not change with switch from Markdown to Quarto:

<https://bookdown.org/yihui/rmarkdown/>



- Create this function + corresponding text in R Quarto:

$$sumTU = \log_{10} \left(\sum_{i=1}^n \frac{c_i}{EC_{50i}} \right)$$

where c_i is the concentration of the pesticide i and EC_{50i} is the concentration of pesticide i at which 50 % of the test organisms (*Daphnia magna*) were affected.

Good luck with using Quarto in the future!
