ENV 316: R Markdown Tutorial

Howdy!

We understand that virtual classes may not have been what you had in mind when you signed up for a course titled *Laboratory and Field Methods in Environmental Science*, but it does provide us with a great oppertunity to really dive into what seperates science from a walk in the woods: writting stuff down! As you've probably already heard, the ENV 316 course will make prodigious use of R and RStudio as we explore concepts of environmental chemistry and ecology. Since you're already using R and RStudio for your data analysis and manipulations, we're encouraging you to submit your work in R Markdown.

The aim of this document is to briefly explain what R Markdown is, why you should use it (hint: it'll make everyone's lives easier), and how to create simple documents for this course.

First off, what is R Markdown?

In a nutshell, R Markdown allows you to analyse your data with R and write your report in the same place (this document writen with R Markdown). This has loads of benefits including increased reproducibility, and streamlined thinking. No more flipping back and forth between code and writing to figure out what's going on. For example,

```
# Look at me go mom
x <- 2+2
x
```

```
## [1] 4
```

What we've done here is write a snippet of R code, ran it, and printed the results. While the above code isn't anything special, we can extend this concept to include any data, figures or plots

```
library(tidyverse)
library(knitr)
airPol <- read_csv("./data/Toronto_60433_2018_Jan2to8.csv",
                   na = "-999")
kable(airPol[1:5, ], caption = "Example table of airborn pullutant levels used for Figure 1.")
```

Table 1: Example table of airborn pullutant levels used for Figure 1.

temperature	pollutant	concentration	date
-11.7	NO2	41	2018-01-01 19:00:00
-11.7	O3	2	2018-01-01 19:00:00
-11.3	NO2	28	2018-01-01 20:00:00
-11.3	O3	14	2018-01-01 20:00:00
-11.6	NO2	20	2018-01-01 20:59:59

```
ggplot(airPol, aes(date, concentration, colour = pollutant)) +
  geom_line() +
  theme_classic()
```

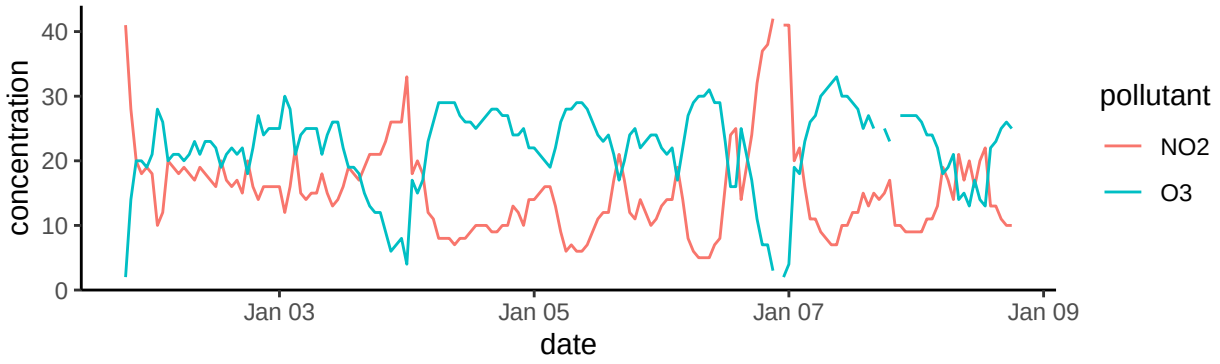

Figure 1: Time series of 2018 ambient O_3 and NO_2 concentrations (ppb) in downtown Toronto