

# Let's talk



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Based on a work at <https://github.com/hadley/data-science-in-tidyverse>

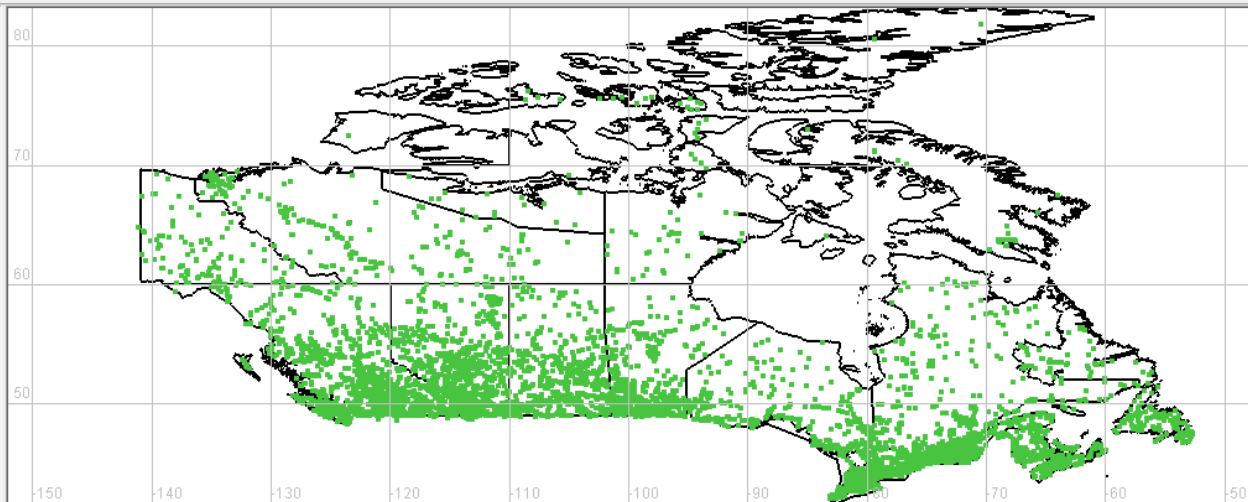
What you used to do



## Stations

## Base Maps

- ☒ PoliticalBoundaries
- ☐ RiversAndLakes\_7.5m
- ☐ Cities\_7.5m
- ☐ RiversAndLakes\_1m
- ☐ Cities\_1m
- ☐ Roads\_1m
- ☐ MajorDrainageBasins
- ☐ SubDrainageBasins
- ☐ SubSubDrainageBasins



Station Number  Hyd Status  Data Period 1850 to 2016 ☐ Has Flow ☐ Favourites  
☐ Has Level ☐ Has Sed ☐ Is Real Time ☐ Is RHBN    
 Station Name  Regulation  Total Years  0  
 Province  Oper Sched  Drainage Area  0  7791/7791

Station	Fav	StationName	HydStatus	Prov	Latitude	Longitude	DrainageArea	Years	From	To	Reg.	Flow	Level	Sed	OperSched	RealTime
01AA002		DAAQUAM (RIVIERE) EN AVAL DE LA RIVIERE SHIDGEL	Discontinued	QC	46.5575	-70.08111	598	11	1967	1977		Yes			Continuous	
01AD001		MADAWASKA (RIVIER) EN AVAL DU BARRAGE TEMISC...	Discontinued	QC	47.54833	-68.63639	2690	80	1918	1997	Yes	Yes			Continuous	
01AD002		SAINT JOHN RIVER AT FORT KENT	Active	ME	47.25806	-68.59583	14700	89	1926	2014		Yes			Continuous	Yes
01AD003		ST. FRANCIS RIVER AT OUTLET OF GLASIER LAKE	Active	NB	47.20661	-68.95694	1350	65	1951	2015		Yes	Yes		Continuous	Yes
01AD004		SAINT JOHN RIVER AT EDMUNDSTON	Active	NB	47.36078	-68.32489	15500	30	1968	2014		Yes	Yes		Continuous	Yes
01AD005		MADAWASKA (RIVIERE) AU RESERVOIR TEMISCOUATA	Discontinued	QC	47.57056	-68.64306	2590	9	1966	1974	Yes		Yes		Continuous	
01AD008		LONG (LAC) PRES DE LES ETROITS	Discontinued	QC	47.39083	-68.89833	108	3	1972	1974			Yes		Continuous	

Station: 08MF005 ▾

Data Type: Real-Time ▾

Apply

Filter items

Showing 1 to 20 of 2,103 entries | Show 20 ▾ entries

This table provides real-time data in tabular format.























Date (PST) ↑↓	Primary water level (m) ↑↓	Discharge (m <sup>3</sup> /s) ↑↓
2018-05-03 07:10:00	7.097	6.070
2018-05-03 07:05:00	7.094	6.060
2018-05-03 07:00:00	7.086	6.040
2018-05-03 06:55:00	7.086	6.040
2018-05-03 06:50:00	7.079	6.030
2018-05-03 06:45:00	7.099	6.070
2018-05-03 06:40:00	7.098	6.070
2018-05-03 06:35:00	7.075	6.020
2018-05-03 06:30:00	7.066	6.010
2018-05-03 06:25:00	7.115	6.100
2018-05-03 06:20:00	7.099	6.070
2018-05-03 06:15:00	7.090	6.050
2018-05-03 06:10:00	7.060	6.000
2018-05-03 06:05:00	7.044	5.970
2018-05-03 06:00:00	7.114	6.100
2018-05-03 05:55:00	7.080	6.030
2018-05-03 05:50:00	7.097	6.070
2018-05-03 05:45:00	7.091	6.050

# Results

Becomes a file storage issue

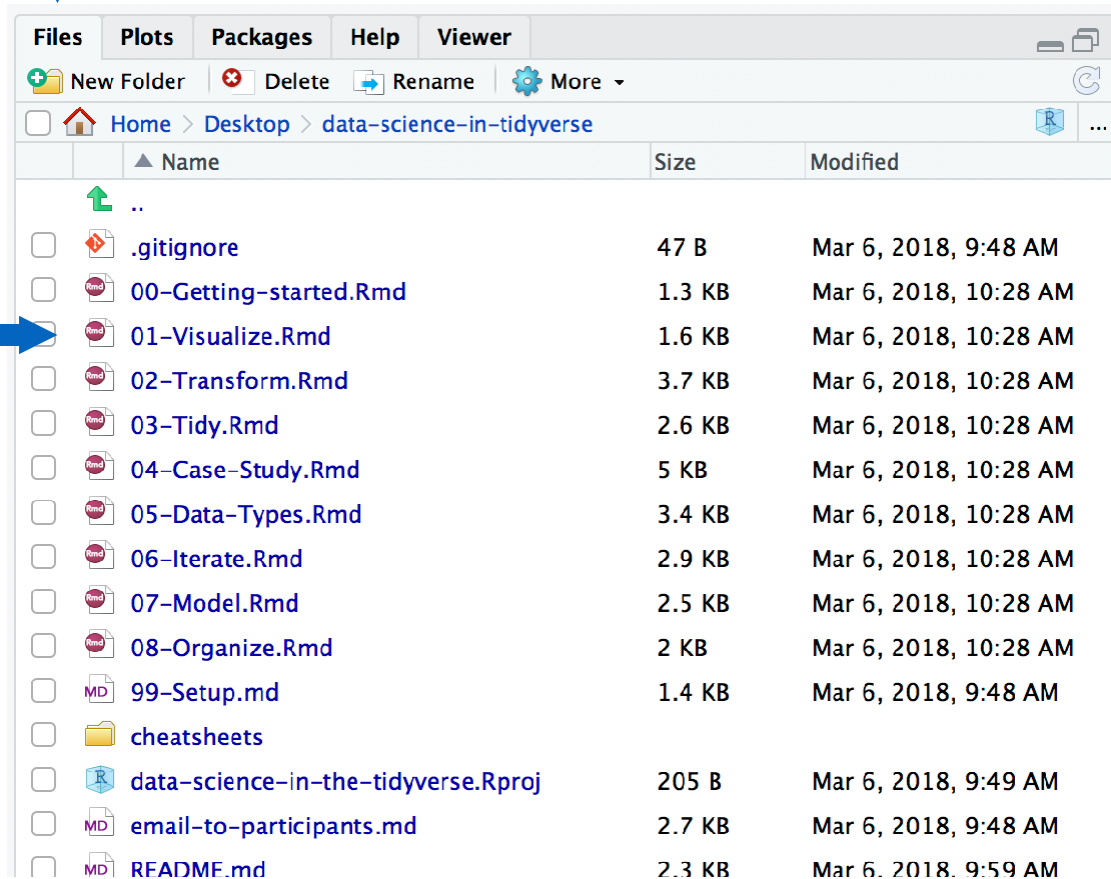
Not reproducible

Too many clicks!

 08hb048_1972_15min.xls	2018-02-22 10:41 ...
 08HB048_1973_15MIN.xls	2018-02-22 10:41 ...
 08hb048_1974_15min.xls	2018-02-22 10:41 ...
 08hb048_1975_15min.xls	2018-02-22 10:41 ...
 08hb048_1976_15min.xls	2018-02-22 10:41 ...
 08hb048_1977_15min.xls	2018-02-22 11:02 ...
 08hb048_1978_15min.xls	2018-02-22 11:02 ...
 08hb048_1979_15min.xls	2018-02-22 11:02 ...
 08hb048_1980_15min.xls	2018-02-22 11:02 ...
 08hb048_1981_15min.xls	2018-02-22 1:47 PM
 08hb048_1982_15min.xls	2018-02-22 1:47 PM
 08hb048_1983_15min.xls	2018-02-22 1:47 PM
 08hb048_1984_15min.xls	2018-02-22 1:47 PM
 08hb048_1986_15min.xls	2018-02-22 2:19 PM
 08hb048_1987_15min.xls	2018-02-22 2:19 PM
 08hb048_1988_15min.xls	2018-02-22 2:19 PM
 08hb048_1989_15min.xls	2018-02-22 2:19 PM
 08hb048_1990_15min.xls	2018-02-22 2:22 PM
 08hb048_1991_15min.xls	2018-02-22 2:22 PM
 08hb048_1992_15min.xls	2018-02-22 2:22 PM
 08hb048_1993_15min.xls	2018-02-22 2:22 PM
 08HB048_1994_15MIN.xls	2018-02-22 2:33 PM

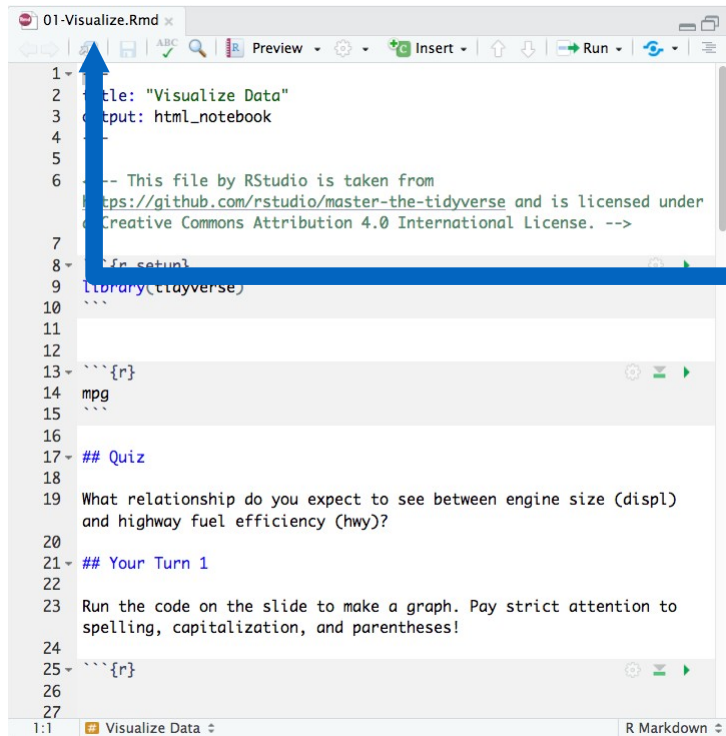
# Your turn

Open up 01-tidyhydat-intro.Rmd



# If you get lost or need to restart

Check you are in  
the right file

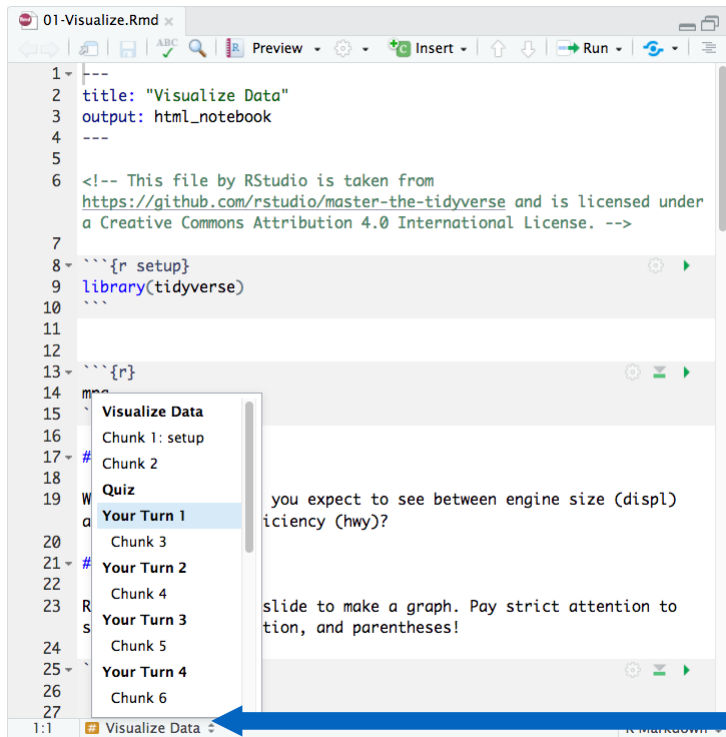
A screenshot of the RStudio interface showing an R Markdown file named '01-Visualize.Rmd'. The file content includes a title 'Visualize Data', output format 'html\_notebook', a license notice, library loading for 'tidyverse', and a quiz section. A blue arrow points from the text 'Check you are in the right file' to the file name in the top-left tab.

```
1 title: "Visualize Data"
2 output: html_notebook
3
4
5
6 --- This file by RStudio is taken from
7 https://github.com/rstudio/master-the-tidyverse and is licensed under
8 Creative Commons Attribution 4.0 International License. -->
9
10 for setup}
11 library(tidyverse)
12
13 {r}
14 mpg
15
16
17 ## Quiz
18
19 What relationship do you expect to see between engine size (displ)
20 and highway fuel efficiency (hwy)?
21
22 ## Your Turn 1
23
24 Run the code on the slide to make a graph. Pay strict attention to
25 spelling, capitalization, and parentheses!
26
27 {r}
```



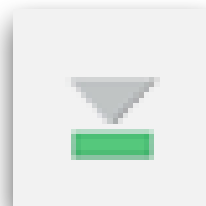
# If you get lost or need to restart

Use the section browser to quickly navigate to the right *Your Turn*



# If you get lost or need to restart

Click to run all  
chunks before  
this one.

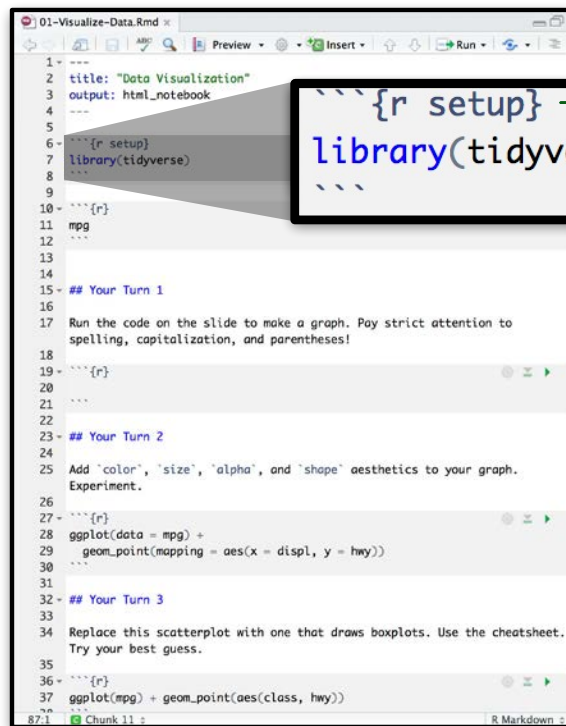


You should be  
ready to go.

```
15 ***
16
17 ## Quiz
18
19 What relationship do you expect to see between engine size (displ)
20 and highway fuel efficiency (hwy)?
21
22 ## Your Turn 1
23 Run the code on the slide to make a graph. Pay strict attention to
24 spelling, capitalization, and parentheses!
25 ```{r}
26
27
28 ***
29
30 ## Your Turn 2
31
32 Add `color`, `size`, `alpha`, and `shape` aesthetics to your graph.
33 Experiment.
34 ```{r}
35 ggplot(data = mpg) +
36   geom_point(mapping = aes(x = displ, y = hwy))
37 ```
38
39 ## Your Turn 3
40
41 Replace this scatterplot with one that draws boxplots. Use the
42 cheatsheet. Try your best guess.
```

# Setup

The setup chunk is always run once before anything else



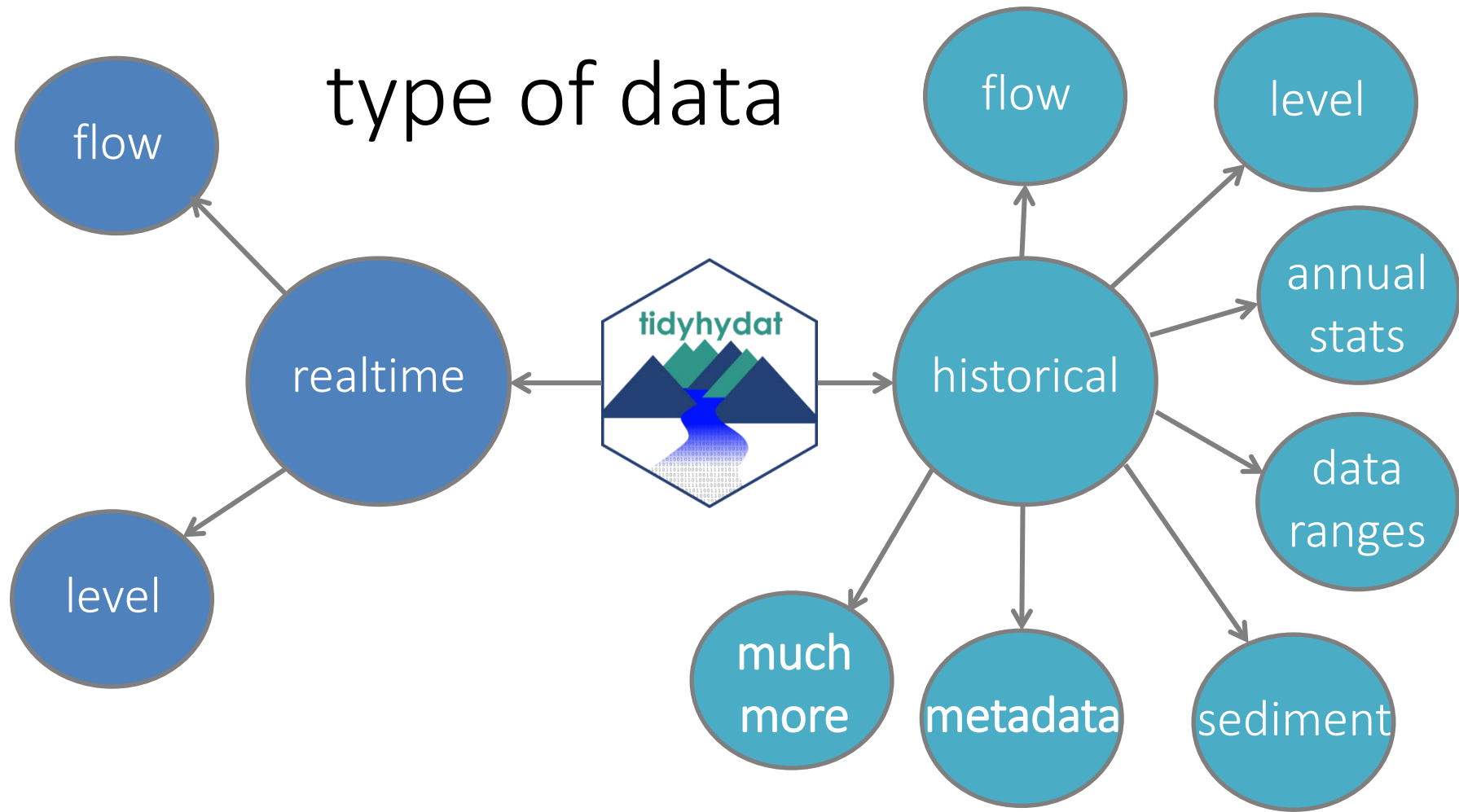
```
1 ---
2 title: "Data Visualization"
3 output: html_notebook
4 ---
5
6 ```{r setup}
7 library(tidyverse)
8 ```
9
10 ```{r}
11 mpg
12 ```
13
14
15 ## Your Turn 1
16
17 Run the code on the slide to make a graph. Pay strict attention to
18 spelling, capitalization, and parentheses!
19
20 ```{r}
21
22 ```
23
24 ## Your Turn 2
25
26 Add 'color', 'size', 'alpha', and 'shape' aesthetics to your graph.
27 Experiment.
28
29 ```{r}
30 ggplot(data = mpg) +
31   geom_point(mapping = aes(x = displ, y = hwy))
32 ```
33
34 ## Your Turn 3
35
36 Replace this scatterplot with one that draws boxplots. Use the cheatsheet.
37 Try your best guess.
38
39 ```{r}
40 ggplot(mpg) + geom_boxplot(aes(class, hwy))
41 ```
```

```
```{r setup}
library(tidyverse)
```
```

(optional) label  
for chunk

# Steps for tidyhydat

# type of data



# Anatomy of an R function

```
fraser <- hy_daily_flows(station_number = "08MF005")
```



Object

Function

Argument

Value

Realtime – functions with a `realtime` prefix

Historical – functions with a `hy` prefix

# Getting help

- To find all the functions in a package we can input this line:

```
help(package = "tidyhydat")
```

- To seek out help for an individual function type

```
?function_name:
```

```
?hy_daily_levels
```

# Your turn

- Try grabbing daily flow data for the following stations: 07EF001, 02HA013
- Give each resulting object a unique name
- Inspect the results



# What stations are you interested in?

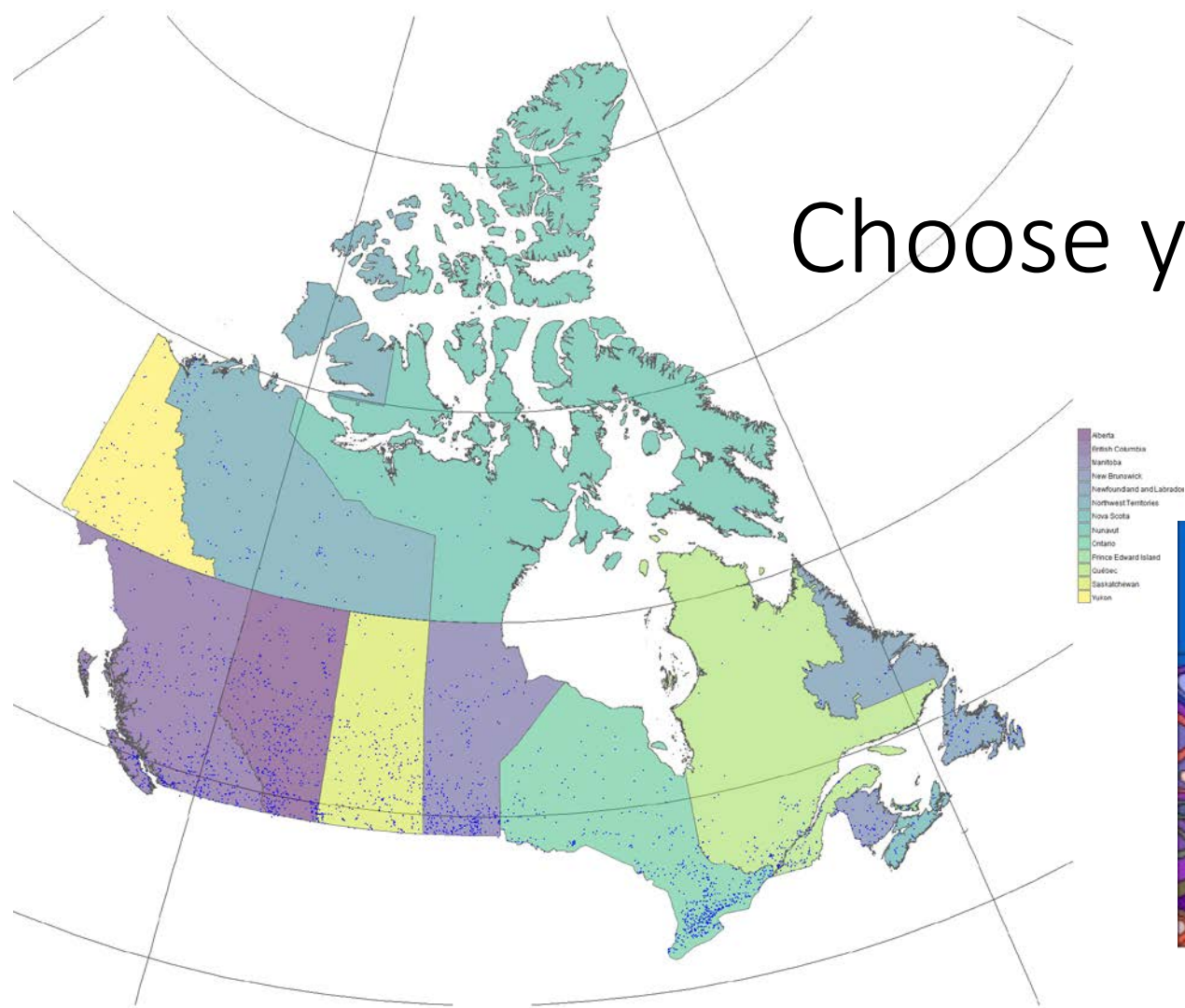
One station:

```
stns <- "07EF001"
```

Two or more stations:

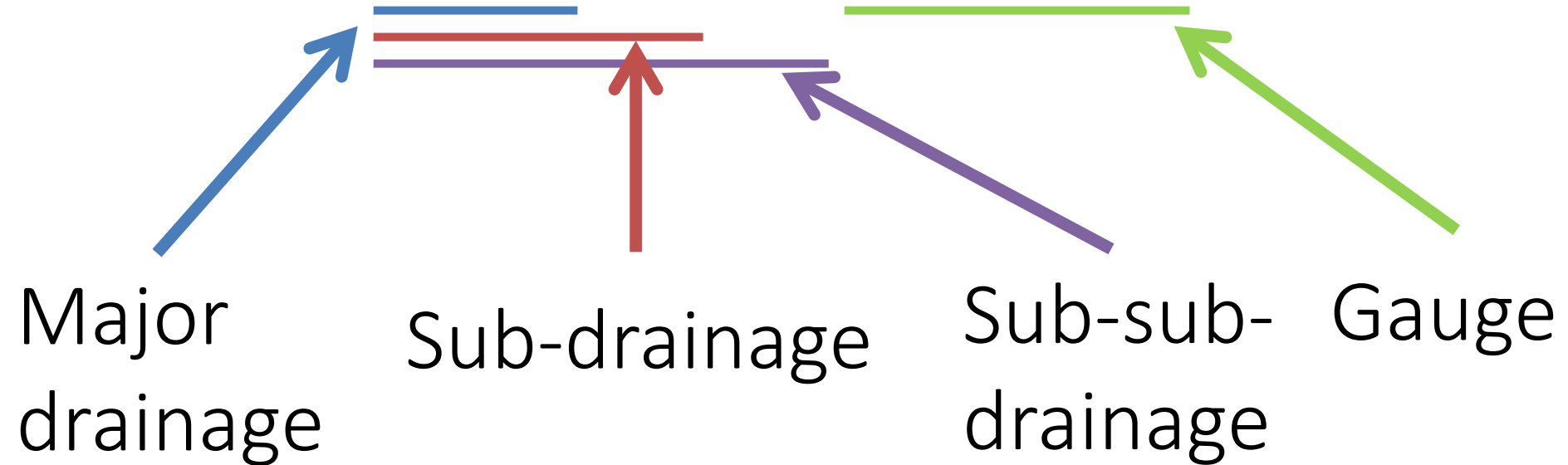
```
stns <- c("07EF001", "02HA013")
```

# Choose your station



# Anatomy of a WSC station number

08MF005



# Your turn

- Create a vector using `c()` called `my_vector`
- Construct a data.frame object with `hy_daily_flows` that includes both stations
- Inspect that data.frame