# Data is beautiful

At this point, you might be asking yourself: What makes a good visualization? Is it the data you use? Or maybe it is the story that it tells? In this reading, you are going to learn more about what makes data visualizations successful by exploring David McCandless' elements of successful data visualization and evaluating three examples based on those elements. Data visualization can change our perspective and allow us to notice data in new, beautiful ways. A picture is worth a thousand words—that's true in data too! You will have the option to save all of the data visualization examples that are used throughout this reading; these are great examples of successful data visualization that you can use for future inspiration.
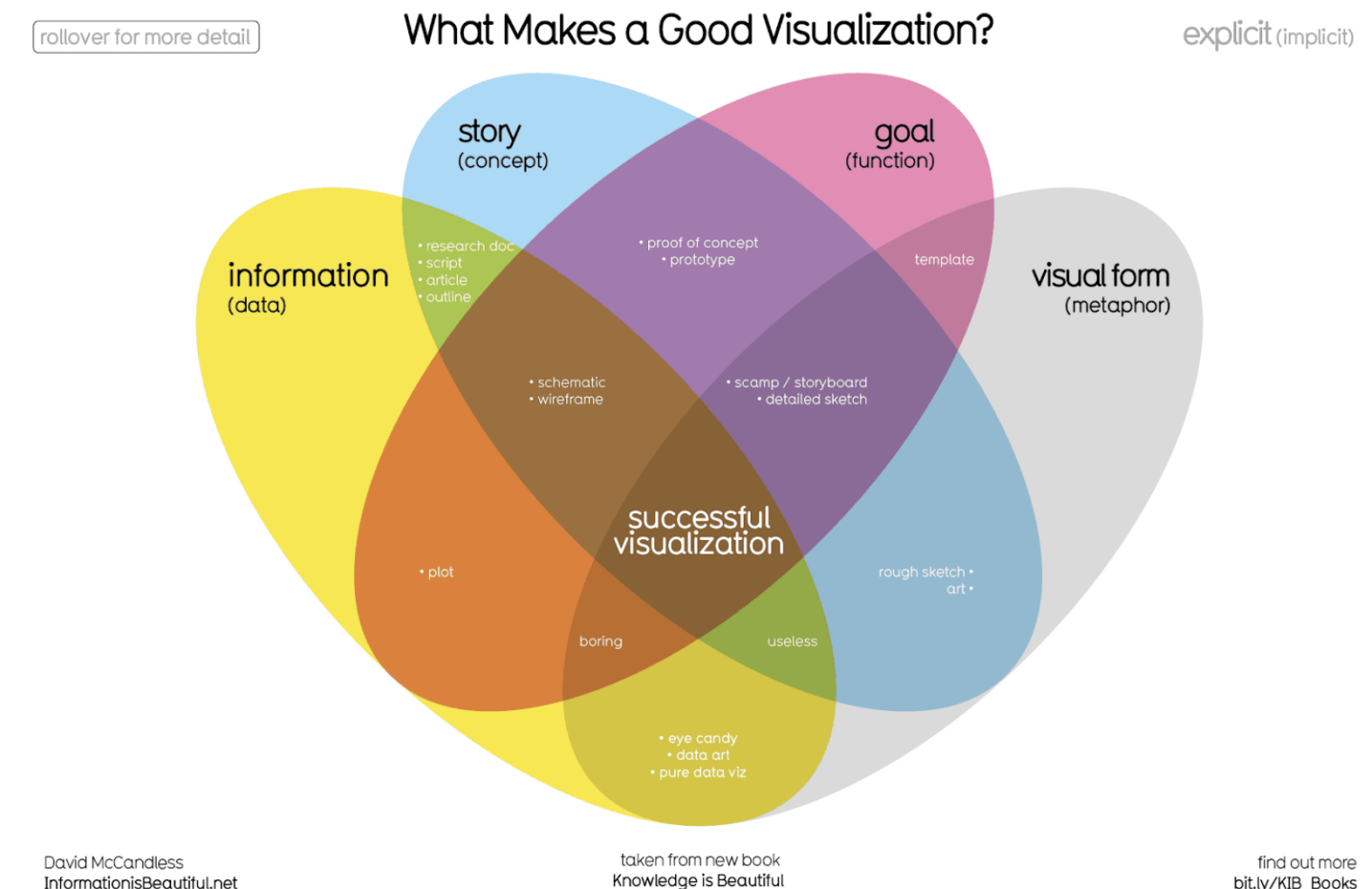
You can also access a PDF version of this visualization and save it for your own reference by clicking the file below:

WEB_What-Makes-a-Good-Infoviz.pdf
PDF File

Four elements of successful visualizations

The Venn diagram by David McCandless identifies four elements of successful visualizations:

- **Information (data):** The information or data that you are trying to convey is a key building block for your data visualization. Without information or data, you cannot communicate your findings successfully.

- **Story (concept):** Story allows you to share your data in meaningful and interesting ways. Without a story, your visualization is informative, but not really inspiring.

- **Goal (function):** The goal of your data visualization makes the data useful and usable. This is what you are trying to achieve with your visualization. Without a goal, your visualization might still be informative, but can't generate actionable insights.

- **Visual form (metaphor):** The visual form element is what gives your data visualization structure and makes it beautiful. Without visual form, your data is not visualized yet.

All four of these elements are important on their own, but a successful data visualization balances all four. For example, if your data visualization has only two elements, like the information and story, you have a rough outline. This can be really useful in your early planning stages, but is not polished or informative enough to share. Even three elements are not quite enough— you need to consider all four to create a successful data visualization.
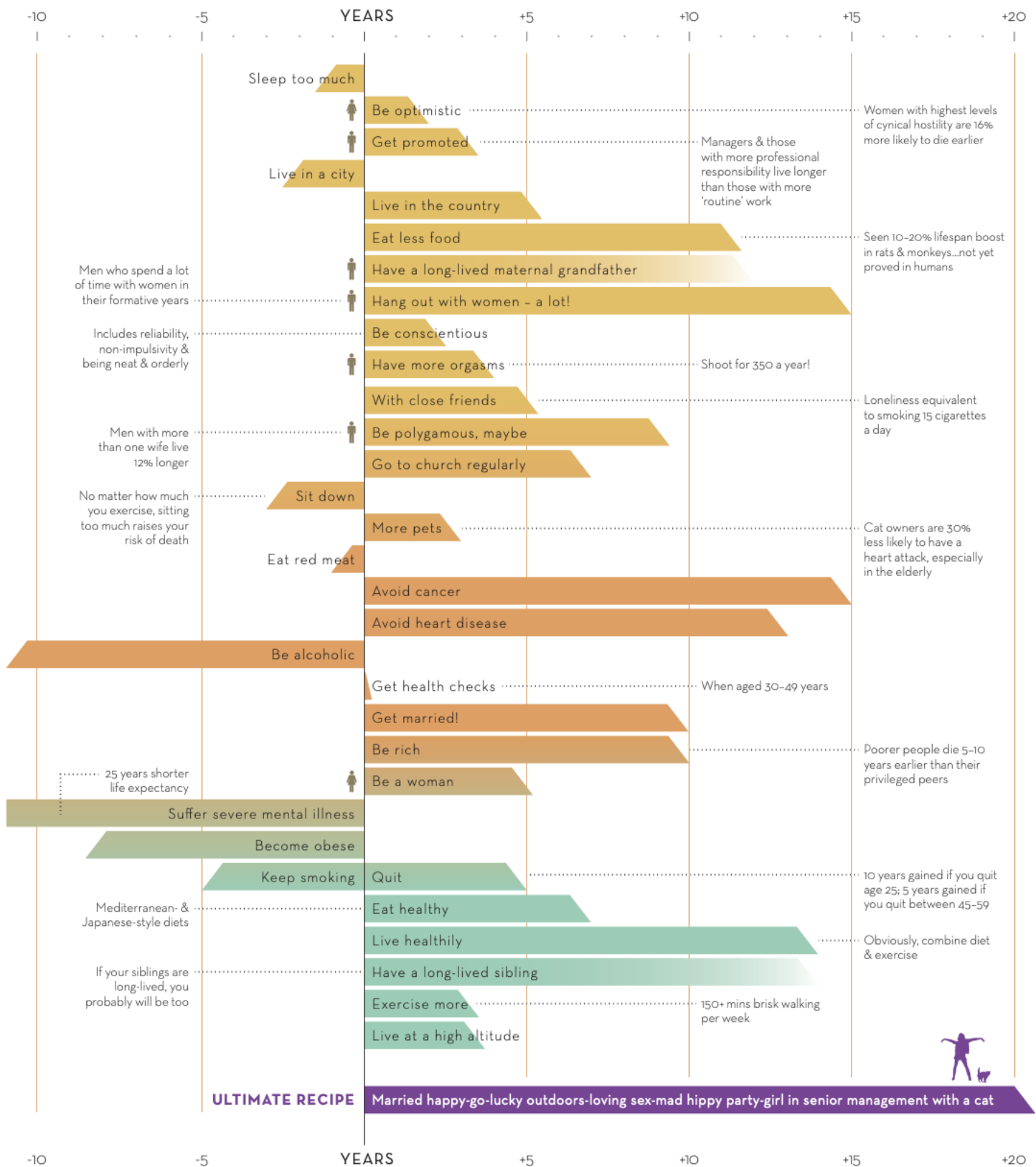
In the next part of this reading, you will use these elements to examine three data visualization examples and evaluate why they are successful.

Example 1: visualization of lifespan data

Live Long
What really extends lifespan?

YEARS

-10 · · · · -5 · · · · · · · · +5 · · · · +10 · · · · +15 · · · · +20

Sleep too much

Be optimistic — Women with highest levels of cynical hostility are 16% more likely to die earlier

Get promoted — Managers & those with more professional responsibility live longer than those with more 'routine' work

Live in a city

Live in the country

Eat less food — Seen 10–20% lifespan boost in rats & monkeys...not yet proved in humans

Men who spend a lot of time with women in their formative years — Have a long-lived maternal grandfather

Hang out with women – a lot!

Includes reliability, non-impulsivity & being neat & orderly — Be conscientious

Have more orgasms — Shoot for 350 a year!

With close friends — Loneliness equivalent to smoking 15 cigarettes a day

Men with more than one wife live 12% longer — Be polygamous, maybe

Go to church regularly

No matter how much you exercise, sitting too much raises your risk of death — Sit down

More pets — Cat owners are 30% less likely to have a heart attack, especially in the elderly

Eat red meat

Avoid cancer

Avoid heart disease

Be alcoholic

Get health checks — When aged 30–49 years

Get married!

Be rich — Poorer people die 5–10 years earlier than their privileged peers

Be a woman

25 years shorter life expectancy — Suffer severe mental illness

Become obese

Keep smoking — Quit — 10 years gained if you quit age 25; 5 years gained if you quit between 45–59

Mediterranean- & Japanese-style diets — Eat healthy

Live healthily — Obviously, combine diet & exercise

If your siblings are long-lived, you probably will be too — Have a long-lived sibling

Exercise more — 150+ mins brisk walking per week

Live at a high altitude

ULTIMATE RECIPE — Married happy-go-lucky outdoors-loving sex-mad hippy party-girl in senior management with a cat

YEARS

-10 · · · · -5 · · · · · · · · +5 · · · · +10 · · · · +15 · · · · +20

Save this data visualization as a PDF by clicking the file below:

> **IIB-LiveLong.pdf**
> PDF File ↗

View the data

The Live Long visualization uses data from multiple sources to examine what choices can add or subtract years to our lifespans. The data has been compiled for public access in a spreadsheet. Click the link below and select "Use Template" to view the data.

Link to the template: [KIB - Live Long & Prosper](#)

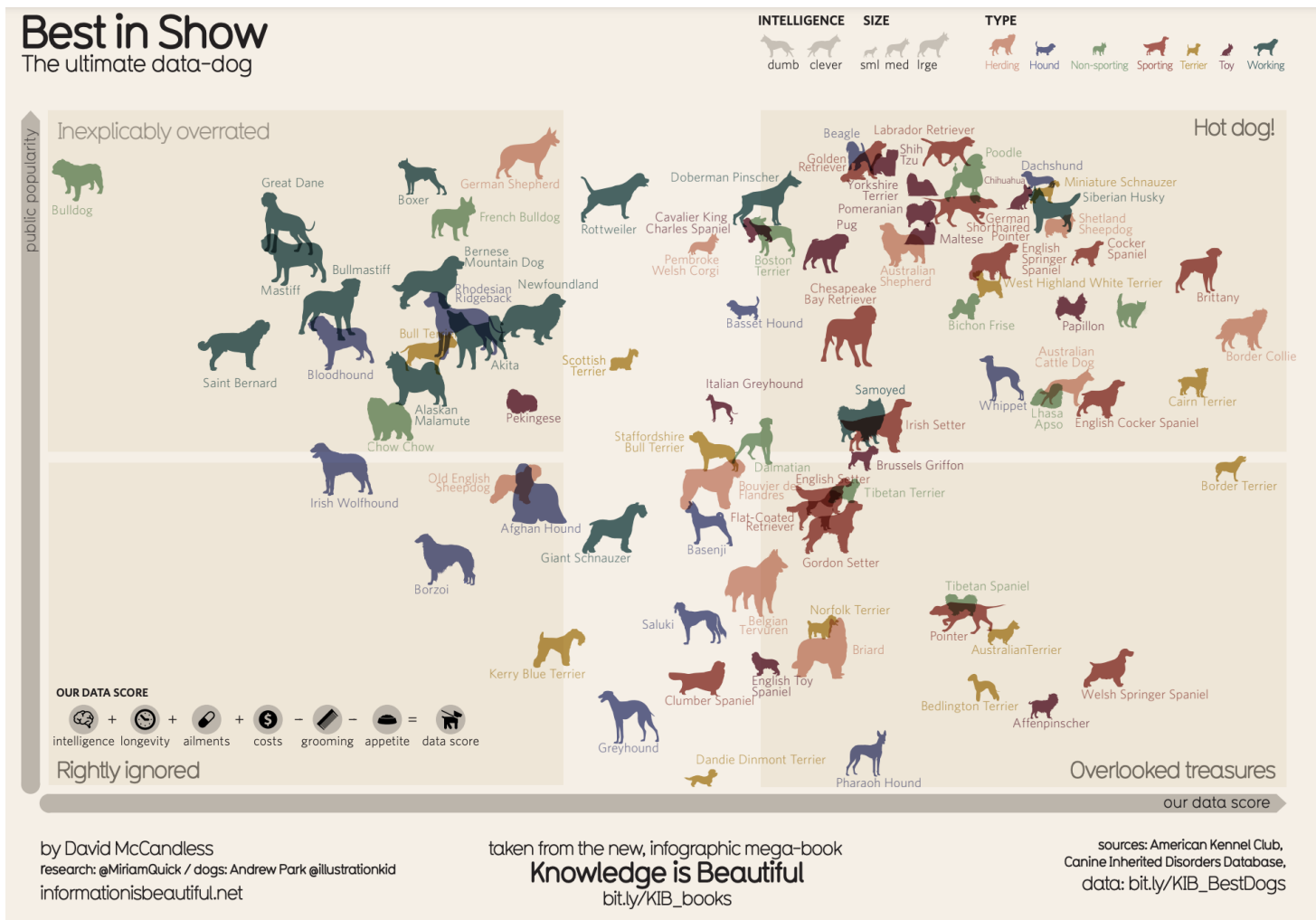Or, if you don't have a Google account, download the file below:

> KIB - Live Long & Prosper (public).xlsx

Examine the four elements

This data visualization uses all four elements that were previously introduced. Here is how they are all working together to make the visualization successful:

- **Information (data):** The data is organized and outlined in the visualization, so this visualization clearly is based on plenty of information or data.

- **Story (concept):** The concept behind this data visualization is clearly stated in the title: finding out what really extends a lifespan. But, the visualization also uses the data gathered and presented earlier to put together the ultimate recipe for a long life, which is a nice ending to the overarching story being told in this visualization.

- **Goal (function):** The goal of this data visualization is also pretty clear from the title: It is trying to find out what can extend someone's lifespan, which might help people make better choices about their own lives.

- **Visual form (metaphor):** The data visualization uses a lot of visual components to help structure the information. First, it has been organized as a horizontal bar chart and has both years lost and years gained as a result of particular choices. This makes it easier to read each choice and the commentary. It also draws your eye downward so that you have to read all of the elements before you get to the ultimate recipe at the end. This data visualization also uses color to communicate how strong the science behind each finding was, which makes this data visualization beautiful and informative.

Example 2: visualization of dog breed comparison

Best in Show — The ultimate data-dog

Save this data visualization as a PDF by clicking the file below:

📄 **IIB-LICENSED_Best-in-Show.pdf** PDF File	↗

View the data

The Best in Show visualization uses data about different dog breeds from the American Kennel Club. The data has been compiled in a spreadsheet. Click the link below and select "Use Template" to view the data.

Link to the template: KIB - Best in Show

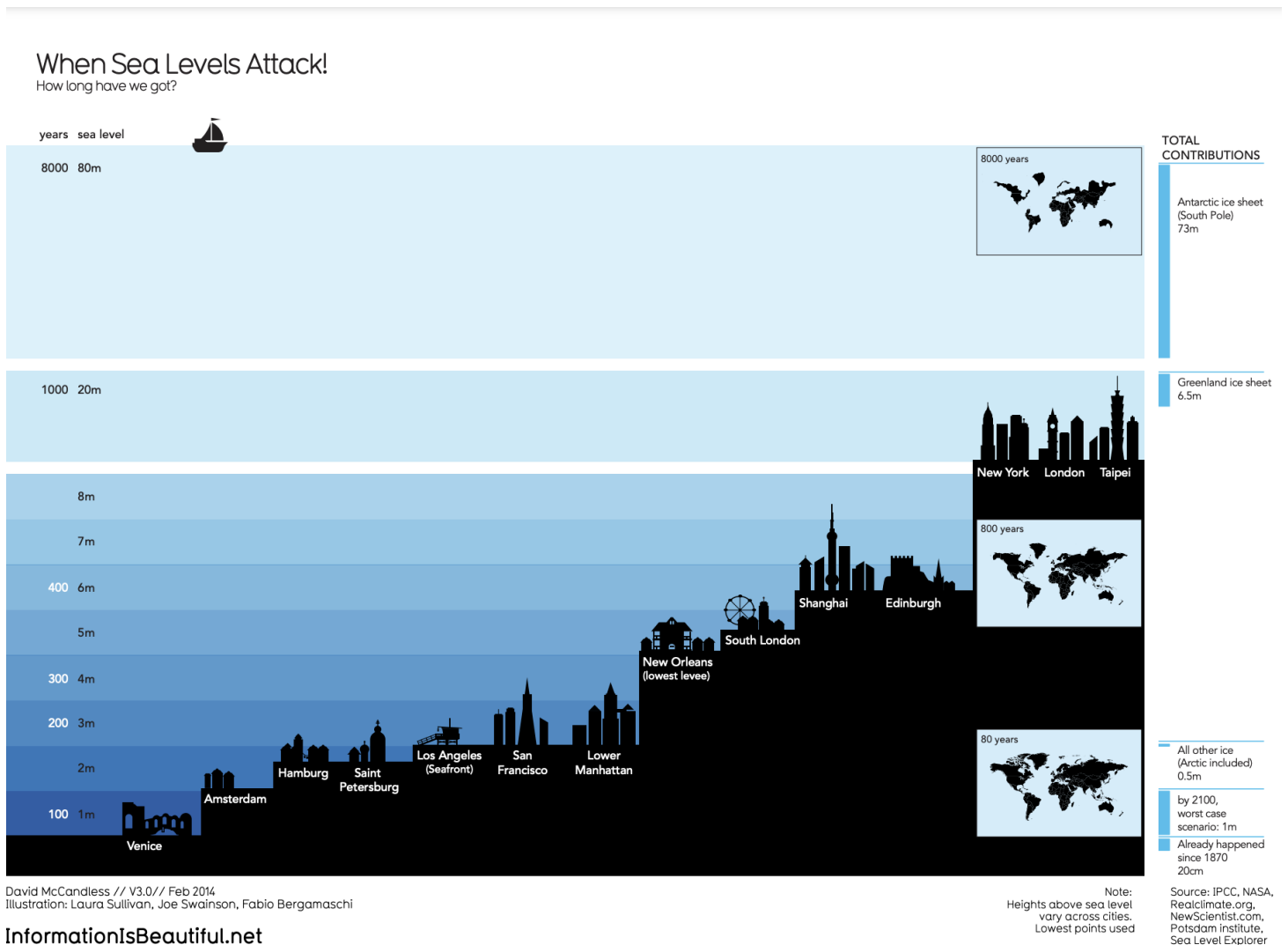Or, if you don't have a Google account, download the file below.

KIB - Best in Show (public).xlsx

Examine the four elements

This visualization compares the popularity of different dog breeds to a more objective data score. Consider how it uses the elements of successful data visualization:

- **Information (data):** If you view the data, you can explore the metrics being illustrated in the visualization.

- **Story (concept):** The visualization shows which dogs are overrated, which are rightly ignored, and those that are really hot dogs! And, the visualization reveals some overlooked treasures you may not have known about previously.

- **Goal (function):** The visualization is interested in exploring the relationship between popularity and the objective data scores for different dog breeds. By comparing these data points, you can learn more about how different dog breeds are perceived.

- **Visual form (metaphor):** In addition to the actual four-square structure of this visualization, other visual cues are used to communicate information about the dataset. The most obvious is that the data points are represented as dog symbols. Further, the size of a dog symbol and the direction the dog symbol faces communicate other details about the data.

Example 3: visualization of rising sea levels

When Sea Levels Attack!
How long have we got?

years	sea level
8000	80m
1000	20m
	8m
	7m
400	6m
	5m
300	4m
200	3m
	2m
100	1m

8000 years

800 years

80 years

New York   London   Taipei

Shanghai   Edinburgh

South London

New Orleans
(lowest levee)

Los Angeles
(Seafront)   San
Francisco   Lower
Manhattan

Hamburg   Saint
Petersburg

Amsterdam

Venice

TOTAL CONTRIBUTIONS

Antarctic ice sheet
(South Pole)
73m

Greenland ice sheet
6.5m

All other ice
(Arctic included)
0.5m

by 2100,
worst case
scenario: 1m

Already happened
since 1870
20cm

David McCandless // V3.0// Feb 2014
Illustration: Laura Sullivan, Joe Swainson, Fabio Bergamaschi

InformationIsBeautiful.net

Note:
Heights above sea level
vary across cities.
Lowest points used

Source: IPCC, NASA,
Realclimate.org,
NewScientist.com,
Potsdam institute,
Sea Level Explorer

Save this data visualization as a PDF by clicking the file below:

📄 **IIB-LICENSED_Sea-Levels.pdf** PDF File	↗

Examine the four elements

This When Sea Levels Attack visualization illustrates how much sea levels are projected to rise over the course of 8,000 years. The silhouettes of different cities with different sea levels, rising from right to left, helps to drive home how much of the world will be affected as sea levels continue to rise. Here is how this data visualization stacks up using the four elements of successful visualization:

- **Information (data):** This visualization uses climate data on rising sea levels from a variety of sources, including NASA and the Intergovernmental Panel on Climate Change. In addition to that data, it also uses recorded sea levels from around the world to help illustrate how much rising sea levels will affect the world.

- **Story (concept):** The visualization tells a very clear story: Over the course of 8,000 years, much of the world as we know it will be underwater.

- **Goal (function):** The goal of this project is to demonstrate how soon rising sea levels are going to affect us on a global scale. Using both data and the visual form, this visualization makes rising sea levels feel more real to the audience.

- **Visual form (metaphor):** The city silhouettes in this visualization are a beautiful way to drive home the point of the visualization. It gives the audience a metaphor for how rising sea levels will affect the world around them in a way that showing just the raw numbers can't do. And for a more global perspective, the visualization also uses inset maps.

Key takeaways

Notice how all of these visualizations balance all four elements of successful visualization. They clearly incorporate data, use storytelling to make that data meaningful, focus on a specific goal, and structure the data with visual forms to make it beautiful and communicative. The more you practice thinking about these elements, the more you will be able to include them in your own data visualizations.