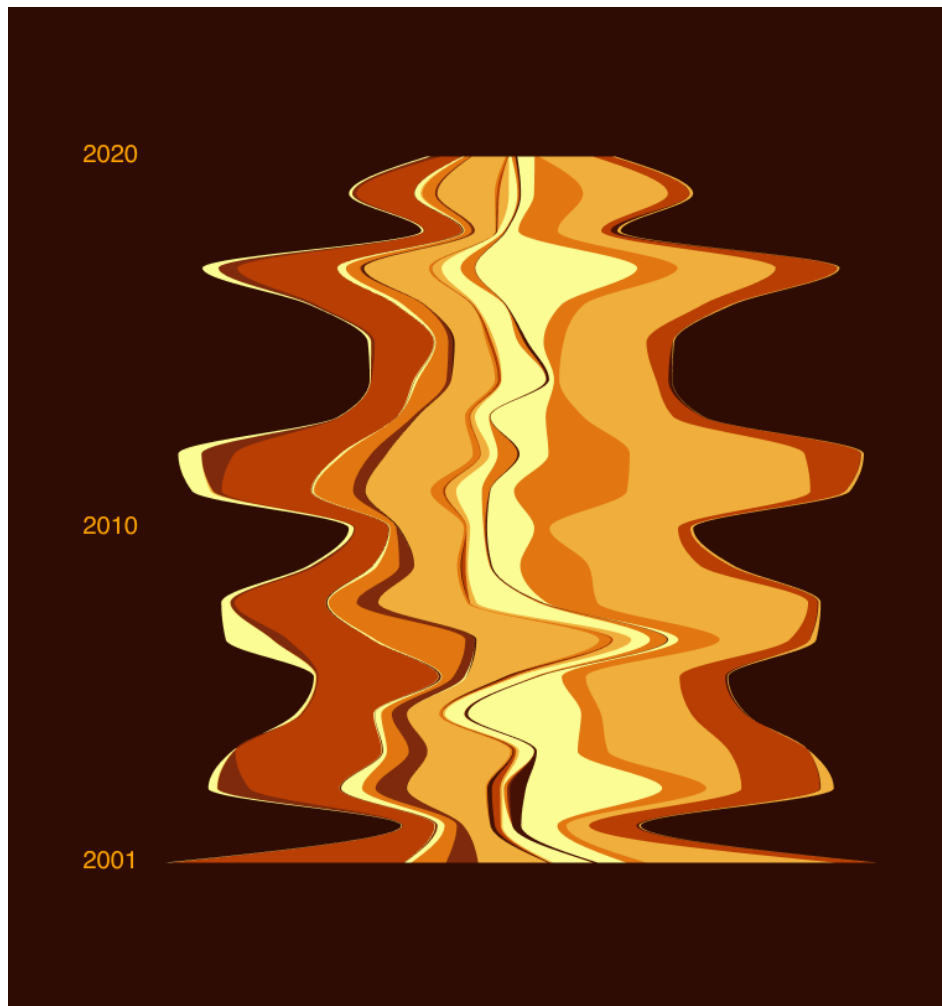# The Making Of: Fire Streamgraph

burned area in europe

2001 – 2020

The fire fingerprint uses data on burned area for Ireland from 2001 to 2020 to illustrate a stripe pattern read vertically from top to bottom. The height and shading of each rectangle represents the burned area of that year, as a proportion of the accumulated burned area across all years.

Hello fellow data visualizer!

This little tutorial will guide you through all necessary steps to reproduce the little picture "Fire Streamgraph" that is shown above. Depending on how experienced you are in the field of data visualisations we have produced individual step-by-step tutorials for several different platforms for you to choose from. Be advised that there is no strict right or wrong when visualising the data as long as the data itself and the message derived from it is not changed. Oh and please have fun on the way!

You will Need

A computer with internet access and depending on the tutorial you choose the installation of a vector editing software like open source Inkscape or commercially available Adobe Illustrator. If you go down the "programming charts" path you'll need to install a python and jupyter notebook environment or use a hosted environment like Google Colab or noteable.io .

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Where to get the data

1. Go to the site climate.esa.int/littlepictures. Find the "Greatest Hits" section. This is where you will find all the data you need.

2. Download FireStreamGraphData.csv for use in Python or FireStreamGraphDataForRawGraphs.csv for use in https://app.rawgraphs.io/ . Then open it up in a text editor of your choice. You will find rows representing years and columns representing countries. The file should roughly look like this. If it's looking a little different don't worry, most certainly your text editor just does not understand the separator for the columns.

year	Albania	Austria	Belgium	Bulgaria	Bosnia and Herzegovina	Belarus	Switzerland	Czech Republic	Germany	Denmark	Spain	Estonia	Finland	France	United Kingdom	Greece
2001	115110700.0	15992066.0	0.0	7601921500.0	134751970.0	721038400.0	0.0	5795782.0	0.0	0.0	1367429200.0	697640.0	8908331.0	235426850.0	56616212.0	121657790
2002	21895182.0	9391316.0	0.0	980024060.0	32628110.0	2961269800.0	0.0	26885992.0	2200249.0	0.0	1609886200.0	64075590.0	12128209.0	248682050.0	59836096.0	425882800
2003	306317900.0	14274798.0	6708083.0	2510969600.0	1103023500.0	1702243200.0	5098142.0	7942368.0	18192316.0	6117771.0	2677276400.0	32574446.0	27100644.0	725707260.0	457705920.0	457598600
2004	46205270.0	21358532.0	321988.0	4950672400.0	46527256.0	381985100.0	0.0	17548342.0	3595529.0	6064104.0	2652537000.0	15455419.0	19694928.0	132444380.0	36277304.0	760696600
2005	154876220.0	38155576.0	375652.0	2299370000.0	57689510.0	366690600.0	0.0	36116316.0	0.0	2414909.0	1785155100.0	0.0	8532679.0	223405970.0	24149094.0	370769150
2006	57152864.0	37296940.0	1019628.0	4037407200.0	53289004.0	1648471000.0	0.0	14543122.0	3541867.0	4668824.0	1551767400.0	45722284.0	42073090.0	30213200.0	34882020.0	389229800
2007	1626844300.0	6064106.0	4454167.0	2359581700.0	537827260.0	345224740.0	1878262.0	1502609.0	751305.0	1717269.0	638502140.0	2468574.0	2683231.0	116184000.0	227377150.0	314083170
2008	308303500.0	10035292.0	2414909.0	2693751600.0	136147230.0	286569280.0	0.0	5795783.0	11752560.0	965962.0	295370270.0	13147841.0	43897690.0	39336200.0	78833390.0	978950800
2009	145055580.0	0.0	0.0	1544093400.0	162764930.0	765794700.0	0.0	6708081.0	2253914.0	0.0	1010827600.0	8479014.0	7244728.0	161315970.0	146558190.0	747548740
2010	171404930.0	1287952.0	0.0	1075600900.0	48888504.0	255229120.0	0.0	1878262.0	6278765.0	0.0	402377600.0	1717268.0	18138656.0	32950100.0	100567570.0	208272560
2011	649396160.0	74915870.0	12825855.0	2655435000.0	301971040.0	118384240.0	0.0	22700150.0	26564006.0	0.0	1179066400.0	0.0	15455419.0	51464400.0	161423300.0	135492540
2012	811678100.0	2522239.0	0.0	2946995200.0	1143272100.0	646820200.0	4454166.0	9605971.0	0.0	0.0	1926722600.0	1073293.0	751304.0	118545250.0	95791410.0	958826600
2013	38531224.0	1663604.0	0.0	1886474000.0	35204016.0	122301750.0	0.0	12772188.0	2951556.0	0.0	981634050.0	2039257.0	5795781.0	3327209.0	29032576.0	531333820
2014	30481524.0	5473795.0	0.0	1432041600.0	26134688.0	1823257000.0	0.0	33755068.0	1931927.0	6278762.0	407153800.0	8908332.0	5956774.0	97347700.0	11269577.0	988664200
2015	111515160.0	4668825.0	0.0	1950388700.0	124287360.0	2134780300.0	0.0	19319276.0	5634789.0	0.0	879724860.0	5849447.0	5634789.0	35204016.0	43629364.0	432107840
2016	75828170.0	3166215.0	0.0	2623397000.0	180742600.0	175590750.0	0.0	8318021.0	1126958.0	0.0	944605440.0	6976406.0	6171436.0	238378450.0	103519130.0	709071200
2017	559883460.0	1770933.0	1019628.0	2708831200.0	662543900.0	253511860.0	0.0	8532679.0	1931927.0	321988.0	2139180800.0	0.0	5473791.0	286461980.0	79370030.0	500262000
2018	72500960.0	4829817.0	9337651.0	1254679800.0	32842768.0	193031780.0	643976.0	16153062.0	30857178.0	0.0	318714430.0	6332429.0	44970980.0	22002510.0	113983730.0	235212220
2019	111944460.0	4400502.0	1985592.0	1901929300.0	138776820.0	939453600.0	0.0	2844227.0	64558590.0	0.0	729571100.0	3488203.0	10840259.0	212726740.0	119081890.0	442035840
2020	138240160.0	0.0	0.0	572065300.0	362934100.0	1205201000.0	0.0	3273543.0	0.0	0.0	646927550.0	2522238.0	7083733.0	74540210.0	125253320.0	220132450

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Starting fresh? Try RawGraphs.io

Using tools like https://app.rawgraphs.io/ is a good and no-code way for getting into the topic of data visualisation. It is a free, browser-based tool that does not send your data to another server so it's privacy first. You will not need to install any additional software. Once finished creating your little picture you can export the results as images for use in other software.

1. Let's create a simple visualisation of the dataset in RawGraphs. Open up https://app.rawgraphs.io/ and click on "upload your data".

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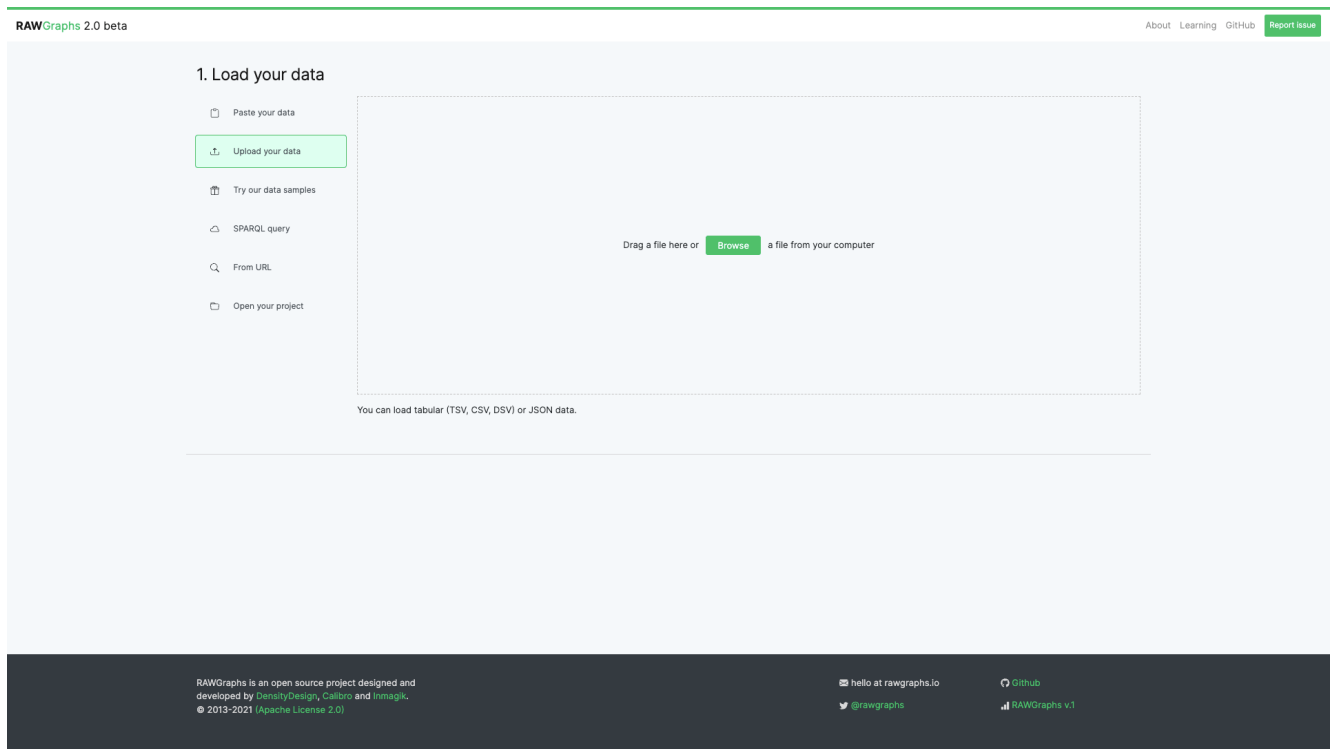
2. Drag and drop the csv file FireStreamGraphDataForRawGraphs.csv into the upload area. The data should be parsed correctly and look like this.

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3. Now you can select the chart type. RawGraphs.io does not offer a vertical streamgraph so we will create a horizontal one in this tutorial. Click on "Streamgraph (Area Chart)" and scroll down further.

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4. The next section of the tool is called "Mapping". Here you can drag and drop the green fields of your data table to different variables of the chart. For our example we use "year" as x-axis, "value" as size and "country" as stream. You will see the chart being created right after dragging the fields to the variables.

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5. Great, so you have a chart now. How about customizing it so that it looks a little better? Go through the settings and experiment with them. The chart changes directly so you can really try to be creative here. For our tutorial we use the settings "Sort Streams by: Inside Out", "Curve Type: Natural" and "Streams vertical alignment: Wiggle" to create the desired geometry. We also set the background color to black.

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6. Next change the colors and labels to more distinctive values. Set "Color Scale: Ordinal" and manually adjust the colors of the countries in a "flamy" color scale.

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7. You are almost finished with creating your little image. Scroll further down until you see the "Export" section. Choose "svg" if you want to work with the image in a vector editing software (see next tutorial) or just download the image as a png file.

<u>A few tips we found helpful:</u>

When mapping the columns to the chart variables you might encounter an error from time to time (displayed in a red bar below). Try mapping the columns in a different order then.

If you really want to explore the options go to https://www.rawgraphs.io/learning for more ideas on how to tweak and tune your chart.

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Like to code things? Use a Python Script!

The little image on the title of this document is using a chart type called streamgraph with the time on the vertical axis and the amount of area burned per year and country on the horizontal axis. We created a tutorial to recreate this chart in python. We also created a little tutorial on how to set-up a programming environment on your computer.

1. Download and open up the jupyter notebook provided for this little picture here: URL
    You should be able to start it on most hosted or local environments.

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2.   Place the csv file in the same folder where your notebook is running from. If you use a hosted version like Colab, upload the file to the main data folder. Use drag and drop to upload the file. If you use noteable.io you can upload all contents of the github repository directly.

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3.   The notebook uses the altair python library for creating and tweaking the charts. Depending on your environment (especially if you use a local one on your computer) you might have to install it first. Follow the instructions in the link above.

Depending on your environment there should be a menu option called "run all cells" or something named similar. Run the complete notebook and you should be able to see several charts in it. The notebook is using inline comments and markdown formatted cells to explain how the charts are created.

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4.	The altair library encodes different columns of your dataset into different aspects of your chart. If you are just getting started try to tweak the colors and parameters to your liking. Colors are presented in hex format which can be generated using a hex color picker.

5.	Once finished you can use the three-button menu to the top right of each generated chart to download your little picture as a svg or png. Note that altair is using the vega declarative visualisation language so you can open up the generated code in a separate editor if you like. The svg can be imported into a vector editing software if you want to touch up your little picture a little more.

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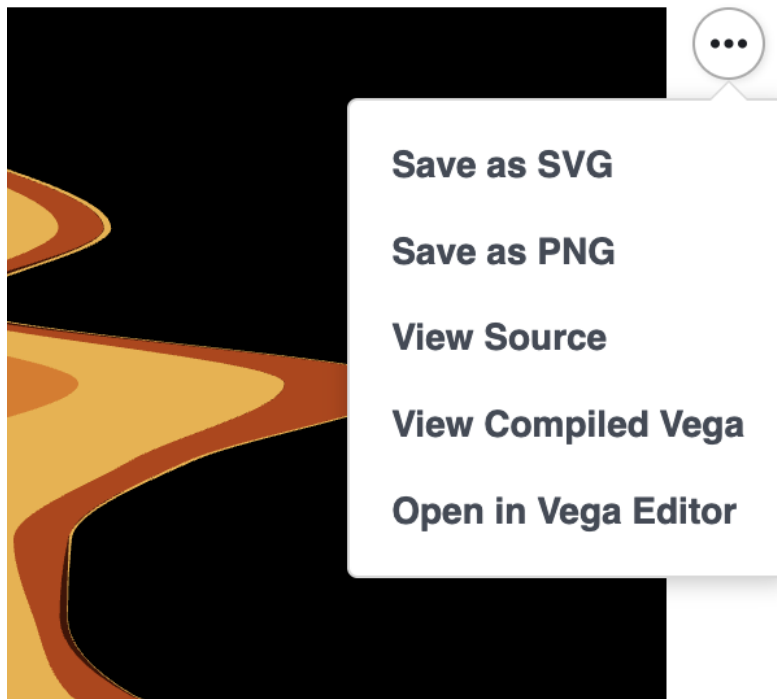
A few tips we found helpful:

\# Datawrapper sometimes might have issues with the order of the circles.
Try switching between colors and drag the elements of the color column until it looks right.

\# When choosing colors it's helpful to use the different color blind options presented below the chart on the "Visualize" tab.

\# If you really want to explore the options go to https://academy.datawrapper.de/ for more ideas on how to tweak and tune your chart.

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Want to spice things up a little?

Use vector design software!

Creating little pictures by scripting them using no-code hosted solutions like RawGraphs.io or a programming language is great but if you want to emotionally charge and polish your little picture a bit more it is helpful to use a vector editing software on top of your previous outputs. In the following steps we are writing down the steps agnostic to a specific software.

1. Open up your preferred vector editing software and start by dragging the .svg exported from the python script or https://app.rawgraphs.io/ in the last section into a new document or open/import the .svg.
   Extract the shapes by ungrouping all elements (Strg Shift G). If you added any text or other elements in python delete those unneeded shapes. The result should look like the picture below.

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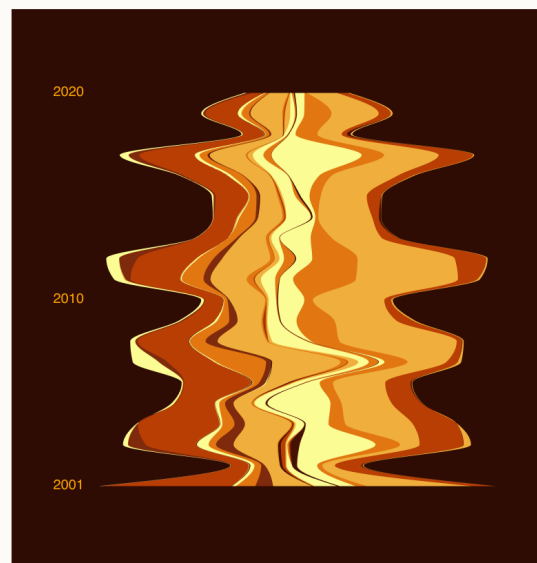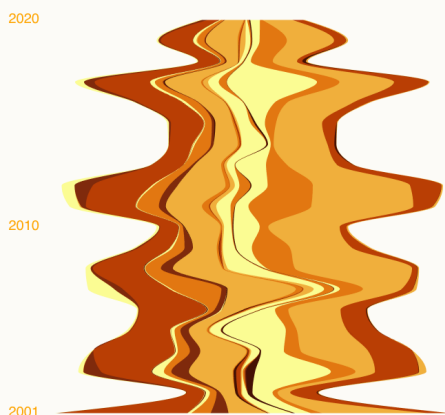
2. Now you are almost finished. It's helpful to add a title and some more info to the little image by adding a footer. For this you can open our template footer provided here. Open up the footer file, and drag the .svg file saved in the step before into the template. Change the title and subtitle and save the now complete little picture in a format of your choosing. Congratulations, you have successfully completed the tutorial!

A few tips we found helpful:

➔ Not every image fits your needs for the little picture .
   Try different options to see how the results might look like with different approaches.
➔ When you use an image as a reference for the colors, make sure that the colors you pick differentiate enough.

If you really want to explore the options go to https://academy.datawrapper.de/ for more ideas on how to tweak and tune your chart.

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