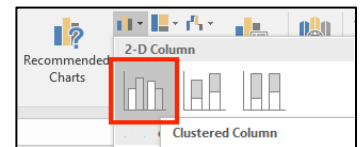
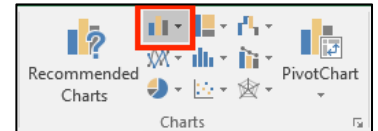


Producing a Hydrograph in Excel 2016

Save a copy of the **Boscastle Flood Data Spreadsheet** (find it at the web address in the header – go into the Geography section) and use this to work through your chart production.

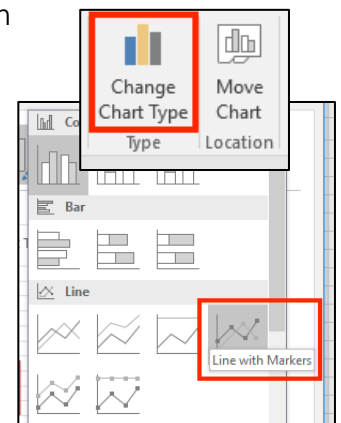
Step 1 – Basic column chart

1. **Highlight** cells A5 to C22
2. Click **Insert** and choose **Column** from the Charts section on the ribbon.
3. Choose a normal **2D Clustered Column** chart from the selection of charts (you really don't want to be using 3D charts...)



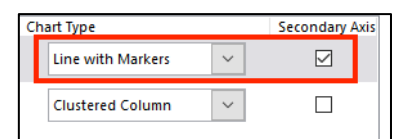
This will produce a set of bar charts. Now let's get a line for the discharge

4. Click one of the **discharge** columns to select them. You'll see them get selected.
5. Click **Change Chart Type** on the **Design** tab of the ribbon (on the right)
6. Use the drop down menus at the bottom to change the **Discharge chart type** to **Line with Markers**
7. Tick the **Secondary axis box** next to the Discharge drop down.
8. Click **OK**



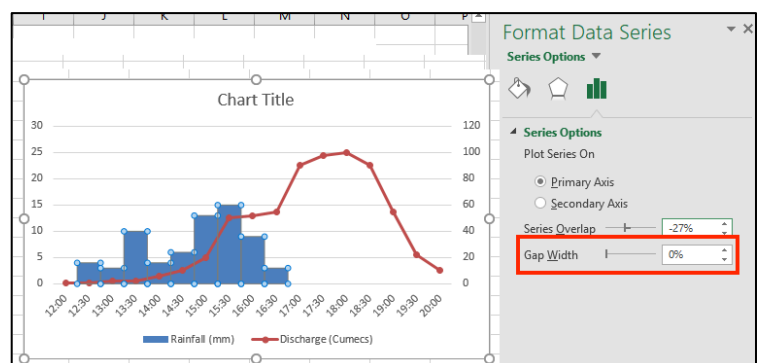
The discharge will now be shown as a line.

Note: you don't seem to be able to get a **smooth line** – it won't work with the time on the X axis as far as I can tell.



To join up the rainfall bars (like you usually see on a flood hydrograph):

1. **Click** on one of the rainfall bars to select them all
2. **Right click > Format Data Series** – a sidebar appears on the right
3. Set the **Gap Width** to **0%** and close down the sidebar



Step 2 – Titles and Labels

The chart title will be a placeholder. Click to change this to something like **Flood Hydrograph for Boscastle, 16 August 2004**.

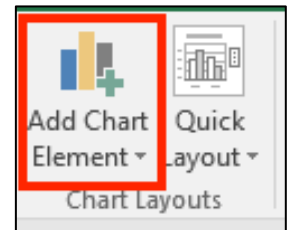
Click the **Design** tab and find the **Add Chart Element** button on the left.

Using this you can add labels and so on to the chart.

I'd suggest adding:

- Axis titles > Primary Horizontal: Time
- Axis Titles > Primary Vertical: Precipitation (mm) (or Rainfall)
- Axis Titles > Secondary Vertical: Discharge (Cumeecs)

Remember: a Cumeec is 1 cubic metre per second of water flowing through a point in the river. Sometimes it's shown as m³/sec.

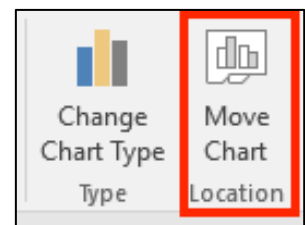


Step 3 – Put the chart on its own page

You don't **have** to do this, but personally I prefer it.

1. Click the **Design** tab
2. Choose **Move Chart** on the right and select a **New Sheet > OK**

If you don't want the chart on it's own page then you might need to resize it at some point.



Step 4 – Showing the data table

You might need to show the actual climate data underneath the chart. This is easy to do.

1. Click the **Design** tab
2. Choose **Add Chart Element** (on the left) > **Data Table**

You probably don't want to choose the Show Data Table with Legend Keys option.

You might find the data is a little tricky to read. This is where a full page chart becomes much easier to cope with.

Step 5 – Formatting Axes

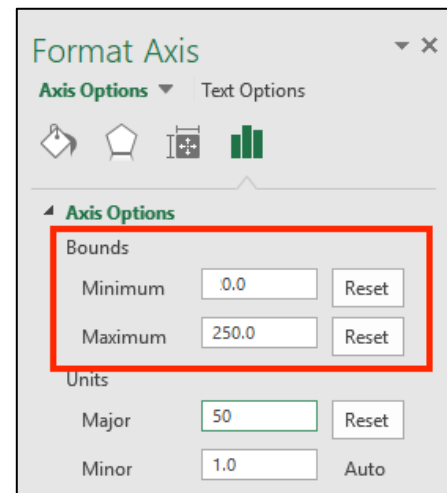
You may need to change the maximum and minimum values on the axes of the graphs. It is particularly useful to change the axes for the rainfall.

In this case I set the maximum value (bound) for the rainfall to 60mm with a major unit of 5mm. I didn't want the rainfall bars to be too massive and the gridlines seemed to match up nicely as well.

To do this:

1. **Right click** on the axis you want to change (it's easiest to click on one of the numbers)
2. Choose **Format Axis** – a sidebar pops up on the right
3. In the **Bounds** section, change the values you need as the maximum or minimum. You can also deal with the major and minor units at this point - these determine where gridlines appear.

You can do this on both vertical axes – you may need to do it on the temperature axis to get the line in the right sort of place.



Step 6 – Remove Gridlines

On the **Designs** tab click the **Add Chart Element** button on left of the ribbon

Choose **Gridlines** and remove (or add) any gridlines you want.