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Making Maps in QGIS with the Print Layout (Part 1)

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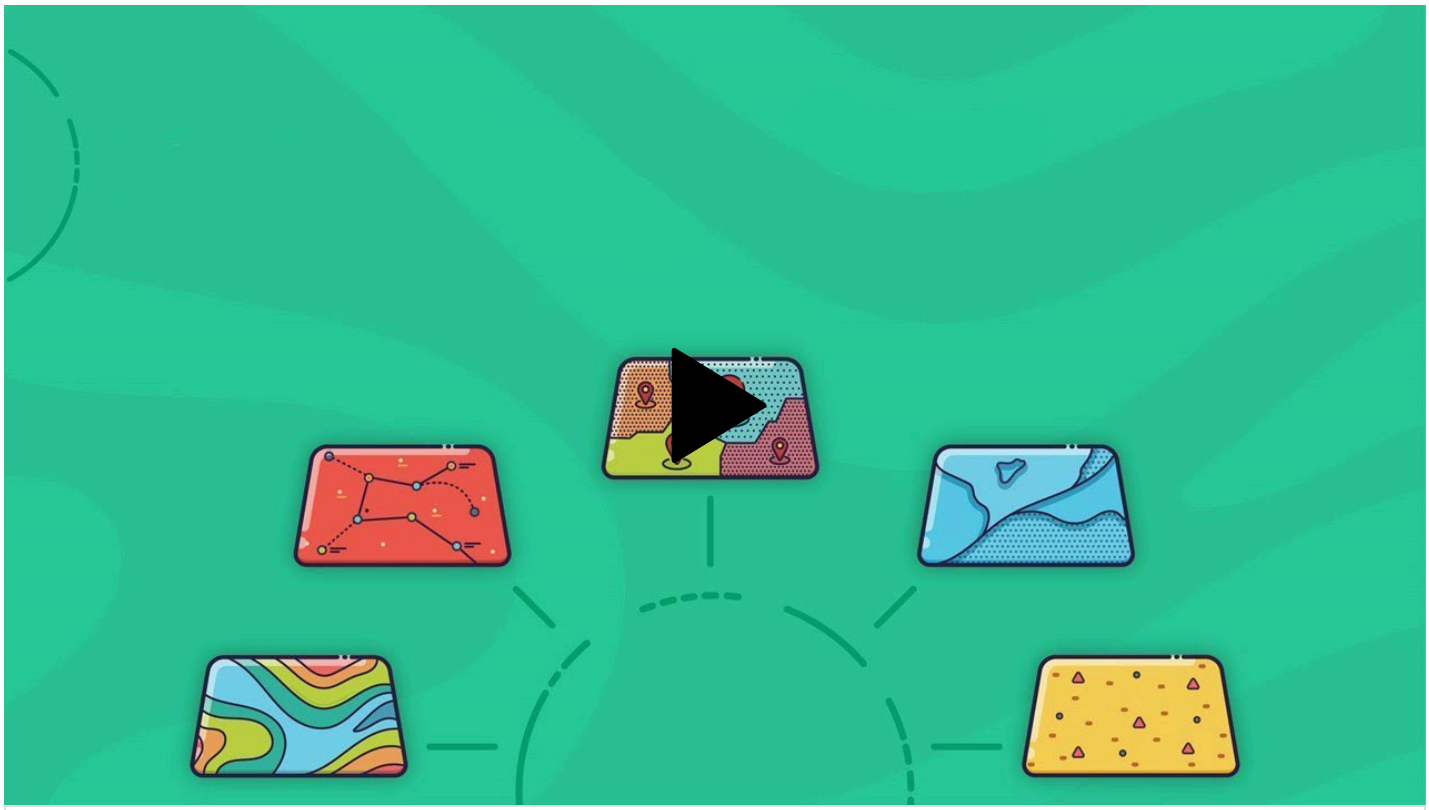

▼ Making Maps in QGIS with the Print Layout (Part 1) - Video transcript

(The Statistics Canada symbol and Canada wordmark appear on screen with the title: "Making Maps in QGIS with the Print Layout (Part 1)")

Hello everyone. Today we'll learn how to create maps in QGIS using the Print Layout– which is a separate window from the main interface used for mapping. Specifically we'll cover navigating the window, and using its tools and panels; adding map items, and distinguishing those that are mandatory versus optional; and saving and exporting a map.

Cartography, or map-making, blends the science and art of GIS. Maps are powerful tools for conveying information to a wide audience. The creator chooses which features are included, how they are visualized and how to best convey the information. Maps should be intuitive and readily interpretable. Important factors to consider are similar to those introduced in the vector visualization tutorials, including:

What is the main theme or message of the map and who is the target audience?

This helps define essential layers for the map. And generally you should exclude peripheral layers that may overcrowd your map or message.

Second, is the visualization logical and facilitate the distinction of layers or features?

And similarly, is the level of detail or generalization within the layers suited to the map scale?

Finally, have you selected an appropriate projection for the location of your map?

With the joined division and aggregated provincial layers from the one-to-one join by attributes demo loaded in the Layers Panel, division features in Manitoba were selected and subset to a new layer – JMBCDPop - which will be our main map. Selected features were also run through the Dissolve tool using the province name field to create the MB outline layer, which was grouped with the province layer to create the Inset Map. So inset maps just show the broader geographic location and context of a main map. The groups in the Layers Panel will help us add our two maps separately within the Print Layout, important since the Layout is actively tied to the Canvas in the main interface.

So with the map layers created and grouped, we now need to establish our visualizations. Instead of using the Layer Properties Box, today we'll use the Layer Styling panel, right-clicking on an empty toolbar area and selecting it from the drop-down. The panel contains the main

visualization tabs from the Layer Property Box, and layers can also be selected from the drop-down at the top – enabling the rapid visualization of multiple layers.

So we'll apply a graduated symbology to the Pop Percent Change field, using the Spectral Colour ramp, Pretty Breaks as the Mode and 8 classes. We'll also change the precision to 1. Then in the Labels tab, we'll once again specify the Percent Population Change field to use for labelling. And in the Formatting subtab check Formatted Numbers and change the decimal places to 1. Since the visualized field includes negative values we could also check 'Show plus sign' if desired, but here we'll leave it unchecked.

We'll add a small text buffer around the labels using the default values. And for the Placement, we'll select Free (Slow). This will rotate the labels to fit them within the feature – but will still be interpretable since we have NEVER selected for show upside down labels in the Rendering tab. We'll also check only draw labels for fit completely within the feature and discourage labels from covering the feature's boundary. If you've noticed I haven't clicked Apply yet, because the Live Update box is checked, meaning the edits are being applied on-the-fly as they're being entered.

Now we'll select the Manitoba outline layer from the drop-down. Switch back to the Symbology tab. Click on Simple Fill and Fill Colour, which will alter the Opacity to 0% or fully transparent. Then we can change the stroke colour to a dark red and enter a width of 0.75 – creating the outline of the main map.

Closing the Styling Panel we'll copy and paste the style from our subset layer – selecting all categories – - to the aggregated province layer to ensure consistent visualization of population changes across

the two layers and levels. Now we can toggle off other layers leaving only the main map group. If a bookmark was created it can now be used, or in this case since our main map is one layer, the Zoom to Layer tool. And we can use other zoom tools to refine the scale of the Canvas as needed. The scale value at the bottom of the interface is approximately 1 in 7 million.

So to access the Print Layout window, click the New Print Layout icon on the Project Toolbar. The layout manager icon to the right can be used when there are existing layouts that you want to access for further use. Clicking on the New Layout icon we need to provide a name – which we'll call Making Maps in QGIS. Obviously a more specific title is helpful to distinguish different layouts once multiple maps have been created.

So the Print Layout appears as such. There are a variety of panels on the right-side of the window, the most important being the Item Properties Panel, where all items in the Layout are formatted – defaulting for the selected item. On the left-hand side are a variety of tools to add different map items to the Layout.

So the first mandatory component is the main map – so we'll click the Add New Map icon and then click and drag to place it within the Layout. There are two interaction icons. The Select/Move Item, enabled by default is used to move, place and resize items within the Layout, while the one below it, Move Item Content, applies to Map Items only and can be used to alter the Canvas location and scale from within the Print Layout. Map items may take a moment to update when the formatting parameters are changed.

So here we can specify the properties for Map 1, such as setting the scale to that of the Canvas, or entering a specific value for the scale in the Main Properties drop-down. However, the scale will adjust automatically if the map item is resized, which is not ideal. So to prevent this we can click on the data defined override box, select edit, and enter the desired scale in the expression box, in this case seven and a half million. Now we can adjust the size without it impacting the scale. Engaging the Move Item Content tool we'll move the canvas for our main map feature so that it is fully visible within the Layout. And we'll also enter -5.0 for the Map Rotation to remove the tilted appearance of Manitoba, which is tied to the applied map projection.

The Guides panel can help us place items within the Layout. So we can click the Plus Icon and specify a distance for indentation. The guides then appear as dotted red lines. In addition there are a variety of alignment and distribution tools on the Actions toolbar to facilitate laying out and distributing items to create an aesthetically pleasing, well balanced map.

The second mandatory item is the North Arrow, which can point towards true, magnetic or grid north – particularly relevant for mapping at higher latitudes. So we'll use the Add Arrow function. Left-clicking twice, to define the start and end of the arrow – drawing a vertical line – and then right-clicking to finish. The North Arrow does not automatically point towards North, so expand the Rotation drop-down and enter -5 to match the applied rotation to our Main Map. We'll add a label above it, replacing the default text with capital N. Clicking on the Font box we can alter the size to a more appropriate value, 20 in this case should suffice and the alignment to Center and Middle. Once again we'll rotate the label.

Dragging across the Layout we can select both items and group them using the Group tool on the Actions toolbar. Now we can resize and reposition them within the Layout. In the Items panel we can then toggle Items on and off, as well as lock their position within the Layout. So now clicking and dragging across the Layout only the main map is selected.

The third mandatory item is a scale-bar - enabling real-world distances between features to be approximated from the map. So click the scale-bar icon and click within the Print Layout. We can select the map to which it applies, and the format. Here we'll stick with the default style - single box. Depending upon the map scale we could change the desired units to use in the drop-down. However, for our map kilometers is most appropriate. We'll include 4 segments to the Right of 0, and replace 75 with more interpretable break values, entering 200 in this case. We can use the arrows on the keyboard to nudge items in a direction of interest within the layout to facilitate their positioning.

The fourth mandatory item is a legend to interpret and distinguish the mapped features. By default the legend includes all layers in the Layers Panel. We can include a generic legend title at the top if needed, but here we'll leave it blank. Then we'll uncheck the Auto-Update box to enable the editing functions and ensure formatting changes are retained. We can reorder legend entries with the arrows and use the minus icon to remove them. So here we'll remove the Manitoba outline and aggregated provincial layers. And right-click on our main map group title and select hidden to remove it from the Legend. We can also rename the layers in the Legend Entries drop-down by double left-clicking. So we'll rename JMBCDPop to Percent Changes. We can also edit value ranges from within the Layout by expanding the Layers drop-down and double left-clicking. Here we'll

change the upper and lower break values for the legend to less than -4.0 and greater than 14.0. We'll also remove its background and alter its placement to align with the scale-bar and the main map.

The fifth essential component is a title. It should be simple and quickly convey the map content, including the theme, location and level. So here we'll call it Percent Population Changes in Manitoba (2011-2016): Census Divisions. We'll change the font size to 34, specify the alignment and resize the text box accordingly.

So the final mandatory component are some additional text items that specify the map projection, creator and source references - particularly important when the map will be released as a stand-alone document. We can enter the information manually or use expressions to semi-automate the entry of this information. So we'll enter Prepared by: Insert Name or click the Insert Expression button and in the variables drop-down double-click user full name. Then type Projection colon, NAD83 Statistics Canada Lambert open-bracket. Reopening the expression box once again we can double-click project_CRS in the variables drop-down. So as shown, the manually entered information and expressions are being automatically formatted in the Item Properties panel. Then we need to specify the source references, typing datasets accessed from Statistics Canada. Finally, include an additional expression to include the date created and the program used. So we'll use the concat function and commas to separate the different components. So first - open single-quote and type Created on, colon, space close quote, then type todate with $now enclosed by brackets. Add another comma, reopen single quotes, space, type with QGIS, space, close quote and finally double-click @qgis_short_version in the variables drop-down.

So with map 1 formatted and all mandatory components added, we will select the main map and Lock the Layers and Layer Styles in the Item Properties panel so that changes in the main interface do not affect its format or scale in the Layout window. Now we can click the Save icons at the top. The first will save both the project in the main interface as well as the Layout, which we can then access with the Layout Manager for further edits. Conversely the second tool can be used to save a particular Layout as a Template for repeated use, which we'll cover in a follow up demo. So click the first Save Icon, which we'll then access to discuss optional map items in Part II.

(The words: "For comments or questions about this video, GIS tools or other Statistics Canada products or services, please contact us: statcan.sisagrequestssrsrequetesag.statcan@canada.ca" appear on screen.)

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