

# LAB 4 – PRINCIPLES OF MAP DESIGN

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**What you'll Learn:** The application of key principles and rules in cartography and map design, as well as how to implement those in QGIS.

**Data:** 1) Zipped file, downloaded at the beginning of Step 1, containing necessary vector and raster layers, and 2) raster file downloaded from Canvas.

**What You'll Submit:** Via Canvas, 1) a Word document containing answers to the questions listed throughout, 2) a pretty and well-designed map in PDF format of Alaska's geomorphology, and 3) another map in the same format that is hideous, ugly, and by no measure fun to look at.

**Lab naming conventions:** Tools that you click will be bolded, e.g., **QGIS Menu** > **File** > **New** to create a new QGIS project file. Text that you'll type will have quotes around it, such as "MyNewProject.qgs" and names of existing datasets and directories will be *italicized*, e.g., *DataToUse.zip*. Key terms will be underlined. **Important tips and key instructions will be in bold red font.**

**Note:** This lab heavily follows Chapters 3 and 4 (pp. 85 – pp. 137) of your *Learn QGIS* textbook. Also be aware that questions are posted throughout this lab, and not just at the end of the document. It might be useful to read them in advance.

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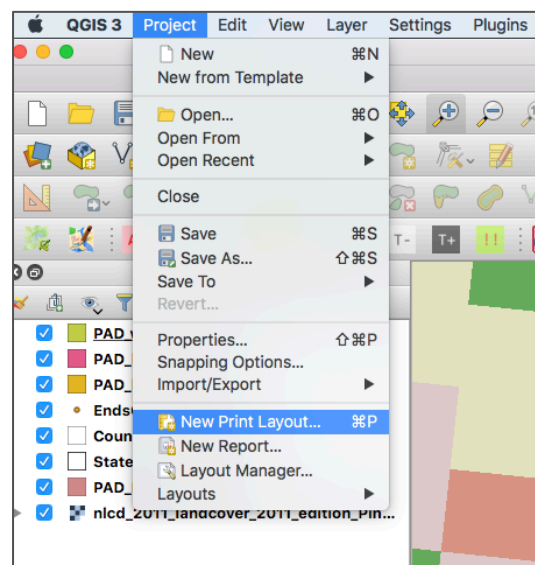
## STEP 1: STYLING ALASKA'S GEOMORPHOLOGY

It goes without saying that you should begin with setting up your workspace. 😊

By following the instructions in Chapters 3 and 4 of your *Learn QGIS* textbook, you will 1) load and style data in QGIS using the **Processing Toolbox** and 2) produce a fully formatted map using the **Print Composer** interface.

At this point you are familiar with the Processing Toolbox. The Print Composer is a tool in QGIS that allows you to selectively add data layers to a finished map document. You can find it in **Project > New Print Layout...** You should begin by downloading the data from <https://qgis.org/downloads/data/>. Select "qgis\_sample\_data.zip".

**You may have already downloaded this data for previous labs.**



First, unzip the data in a designated data folder within your Lab 4 workspace. You should then navigate to the following datasets, adding them to a new map document:

- Shapefiles > Alaska
- Shapefiles > Airports
- Shapefiles > Major rivers
- Shapefiles > Lakes
- Shapefiles > Trees
- Raster > Landcover
- Raster > SR\_50M\_alaska\_nad.tif
- \*\*\*RGB\_LandsatARD.tif (**this file is posted to Canvas**)

Once the data has been added, proceed with the instructions in the textbook, beginning with the section in Chapter 3 on “Styling raster layers” (p. 85) and concluding on p. 114. Chapter 3 will walk you through the process of styling selected raster and vector layers in QGIS. You may want to change the visibility of the layers you just added as you go through different parts of the lab.

**QUESTION 1:** At the end of Chapter 3, take a screenshot of the layers you have styled and paste it into a Word document entitled “[YourName]\_Lab4”. All of the relevant layers should be made visible. This includes: hillshade, land cover, airports, rivers, lakes, trees, and Alaska. **This should be a screenshot – NOT a photo – and it should include the whole screen.**

**QUESTION 2:** In 3-4 sentences, consider the goals of design described in the Tyner reading (pp. 19-23). Which of these design goals do you think the map you’ve screenshotted demonstrates well? Why? Conversely, which design goal could be improved? Why?

As you work through the lab, consider the following tips:

- On pp. 87-88, when you change the layer “SR\_50M\_alaska\_nad” to **Single-band pseudo-color**, you may need to click **Classify** to make values reappear.
- On p. 91, instead of selecting **Min / max** under **Min / Max value settings**, select **User defined** and manually type the mins/maxes as they are seen in the textbook.

## STEP 2: WELCOME TO THE PRINT COMPOSER

Chapter 4 will detail the processes of adding and editing your freshly styled layers in the Print Composer interface. Follow along with the instructions,

beginning with the section on “Labeling” (p. 116), and finishing with the section called “Add a title (or any text),” which concludes on p. 137.

By p. 137, you should have a well-designed and traditionally formatted map composition in QGIS’ Print Composer. Give it some finishing touches by 1) adding a meaningful title, 2) cleaning up unhelpful info within the legend (e.g., do we need an entry for “Alaska”? are those hillshade values useful for the audience?), and 3) adding your name and the date you created the map. Then, select **Layout > Export as PDF**, save it as “[YourName]\_lab4-pretty-map”, and upload this map to Canvas with the rest of your Lab 4 submission documents.

**QUESTION 3:** In 2-3 sentences, explain 1) what the purpose of the **Dissolve** tool is and 2) why you ran it on the major rivers layer. If you reference any other materials, remember to cite your sources.

### STEP 3: MAKE IT UGLY

Now that you’ve got the hang of Print Composer, and you have a good handle on styling layers, I have a final command: **do everything in your power to make this map as ugly as possible**. Explode the scale bar; ruin the colors; flip Alaska upside down and just *make the dang thing heinous to look at*. Once you’re done, export the map as a PDF with the title “[YourName]\_lab4-ugly-map” and upload it with the rest of your Lab 4 submission documents.

**QUESTION 4:** In 3-4 sentences, consider why the map is so utterly gross. What strategies did you take to screw up the map? What elements of design (again, see Tyner) did you intentionally not follow in order to produce this ugly masterpiece?

### STEP 4: REVIEW & SUBMIT

You should submit completed materials for Lab 4 via Canvas by Monday, 2/17 at 11:59pm.

The completed materials include:

- The Word document containing answers to the questions posed throughout these lab instructions and any relevant screenshots
- Two maps – a pretty map and an ugly map – both in PDF format

Be in touch if you have any questions!