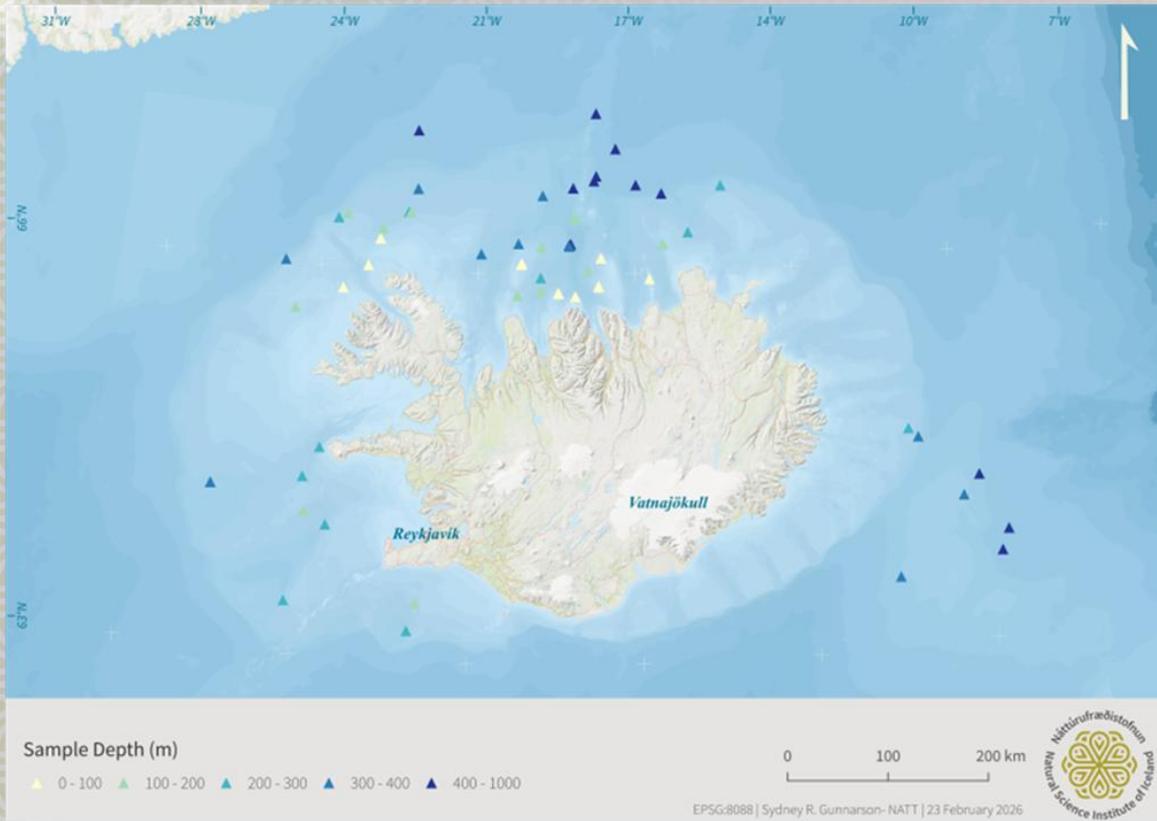




## WORKSHOP: Basic Vector analysis and map creation



We will create this map, a distribution of samples of the species '*Aquiloniella paenulata*' from the BIOICE campaign in March 2020.

*Instructions will be provided in the following slides and as a pdf.*

The data has been downloaded from the NATT gagnagrunnur and converted into a csv file with only one species for simplicity for this exercise.

Full dataset reference:

<https://doi.org/10.5281/zenodo.3728257>

The BIOICE station and sample list: revised compilation, March 2020.

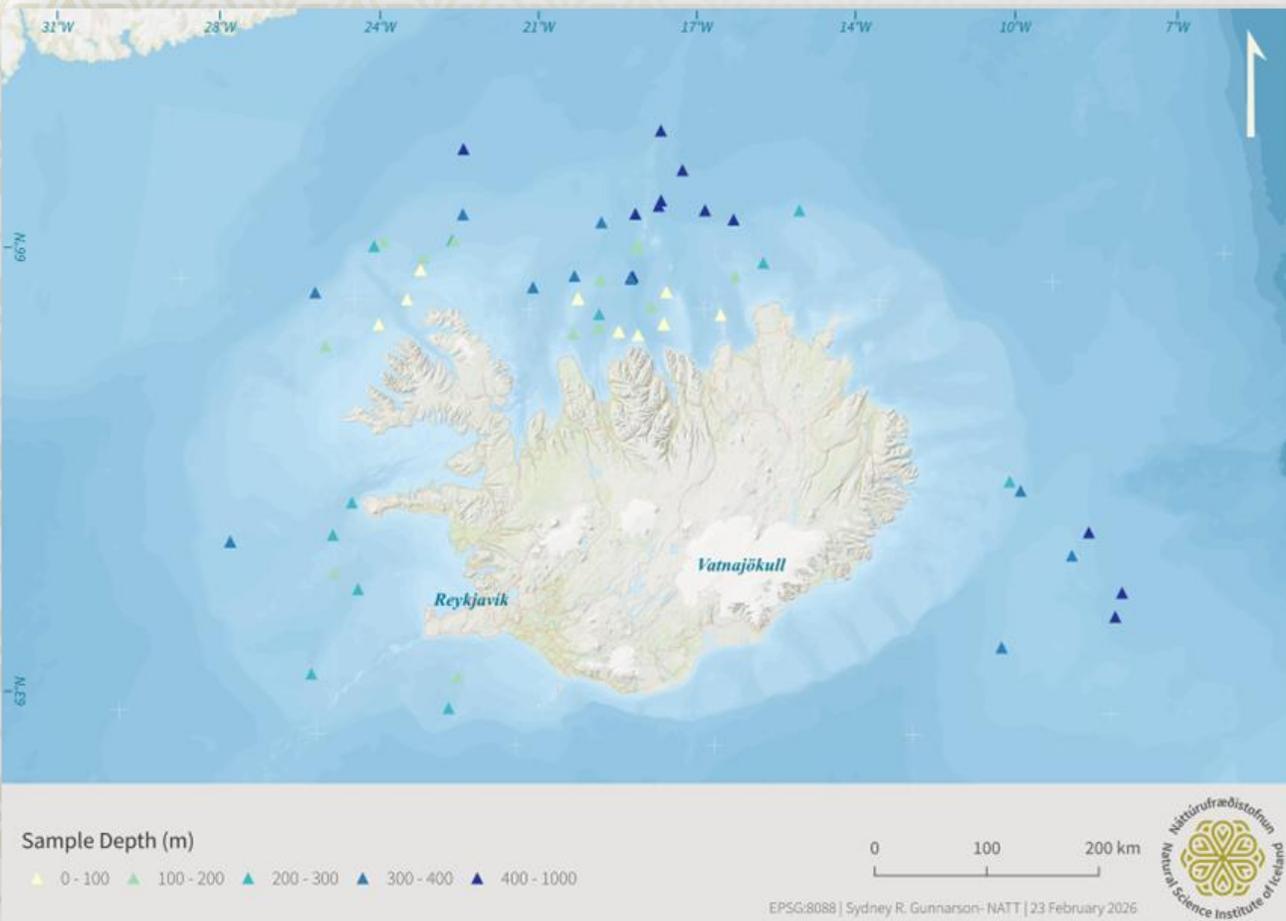


## WORKSHOP: Basic Vector analysis and map creation

### Best practices with map creation

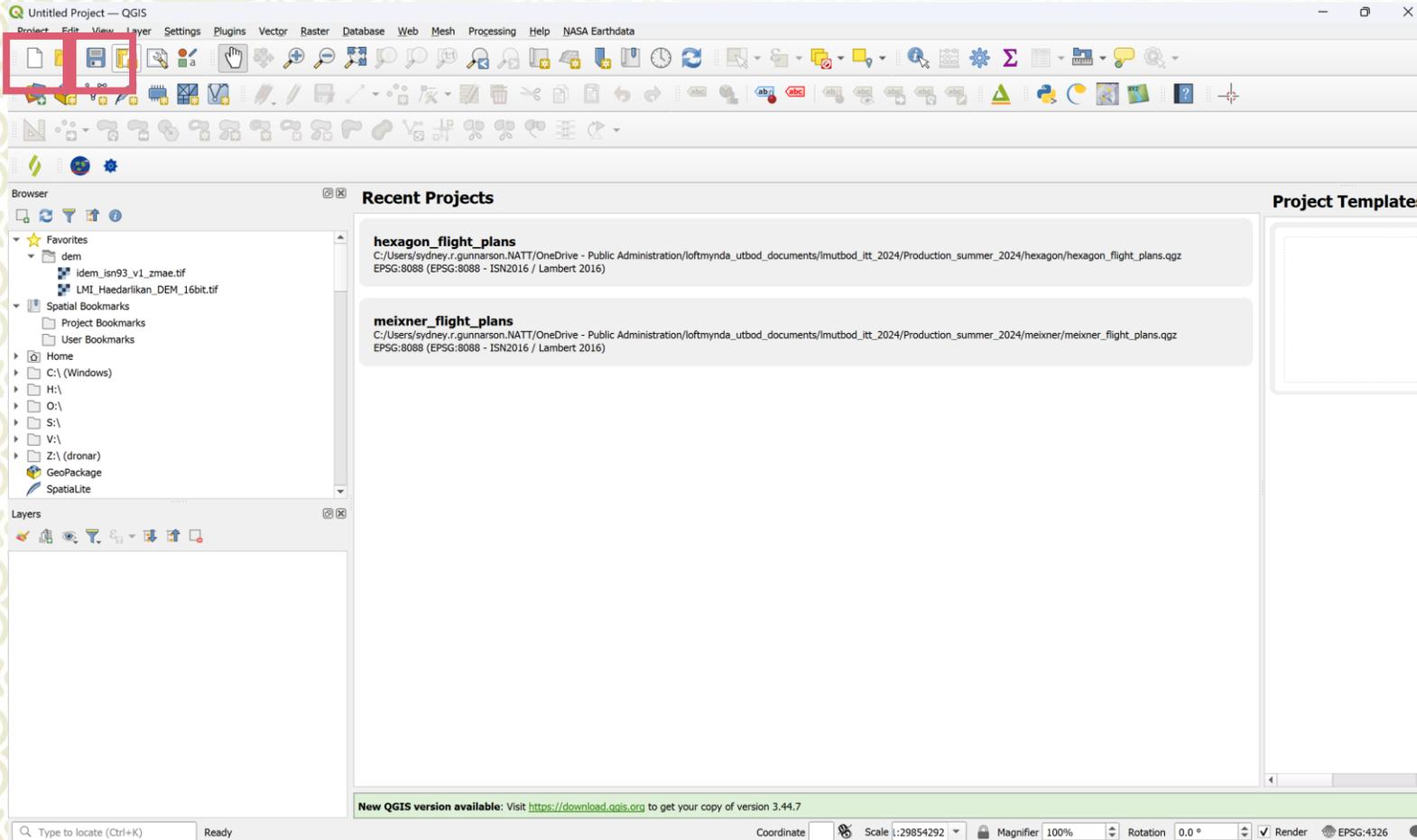
*Subject to change based on personal style and use case (e.g. report vs. scientific article vs. internal distribution)*

1. Scale bar
2. Basemap OR inset map for context
3. Labels to help with understanding
4. North Arrow
5. Legend
6. Grid for coordinate system (outside border)
7. Name / Coordinate reference system/  
Affiliations (NOT for scientific articles)
8. Figure caption: Title, description of what map shows, reference to basemap (e.g. Náttúrufræðistofnun, 2025).





# WORKSHOP: Basic Vector analysis and map creation



1. Start a new project
2. Download, unzip and save `natt_qgis_training_2026-02-26` somewhere locally (e.g. in Documents or similar)
3. Save this QGIS project in the same folder
4. We will use this project in future lectures so keep it



## WORKSHOP: Basic Vector analysis and map creation

**Project Properties — CRS**

**Project Coordinate Reference System (CRS)**

No CRS (or unknown/non-Earth projection)

Filter

**Recently Used Coordinate Reference Systems**

Coordinate Reference System	Authority ID
-----------------------------	--------------

**Predefined Coordinate Reference Systems**  Hide deprecated CRSs

Coordinate Reference System	Authority ID
<b>Projected</b>	
▶ <i>Albers Equal Area</i>	
▶ <i>Lambert Azimuthal Equal Area</i>	
▼ <i>Lambert Conformal Conic</i>	
ISN2016 / Lambert 2016	EPSG:8088

**ISN2016 / Lambert 2016**

**Properties**

- Units: meters
- Static (relies on a datum which is plate-fixed)
- Celestial body: Earth
- Method: Lambert Conformal Conic

**WKT**

```
PROJCRS["ISN2016 / Lambert 2016",  
  BASEGEOGCRS["ISN2016",  
    DATUM["Islands Net 2016",  
      ELLIPSOID["GRS 1980",  
        6378137,298.257222101,  
        LENGTHUNIT["metre",1]],
```

OK Cancel Apply Help

Change the project Coordinate reference system to ISN2016 (EPSG:8088)

No CRS (or unknown/non-Earth projection)

Filter

**Recently Used Coordinate Reference Systems**

Coordinate Reference System	Authority ID
-----------------------------	--------------

▶ *Lambert Azimuthal Equal Area*

▼ *Lambert Conformal Conic*

ISN2016 / Lambert 2016

0.0 °  Render EPSG:4326



Data Source Manager | WMS/WMTS

Layers Layer Order Tilesets

Umbrótasjá

Connect **New** Edit

ID	Name	Title
----	------	-------

**Image Encoding**

**Options**

Tile size:

Request step size:

Maximum number of GetFeatureInfo results:

Coordinate Reference System:

Use contextual WMS Legend

Layer name:

Load as separate layers

Select layer(s):

Browser

- Vector
- Raster
- Mesh
- Point Cloud
- Delimited Text
- GeoPackage
- GPS
- SpatialLite
- PostgreSQL
- MS SQL Server
- Oracle
- Virtual Layer
- SAP HANA
- WMS/WMTS**
- WFS / OGC API - Features
- WCS
- XYZ
- Vector Tile
- Scene
- ArcGIS REST Server
- SensorThings

Create a New WMS/WMTS Connection

Connection Details

Name:

URL:

Authentication

Configurations Basic

Choose or create an authentication configuration

No Authentication

Configurations store encrypted credentials in the QGIS authentication database.

HTTP Headers

Referer:

Advanced

WMS/WMTS Options

WMS DPI-Mode:

WMTS server-side tile pixel ratio:

- Ignore GetMap/GetTile/GetLegendGraphic URI reported in capabilities
- Ignore GetFeatureInfo URI reported in capabilities
- Ignore reported layer extents
- Ignore axis orientation (WMS 1.3/WMTS)
- Invert axis orientation
- Smooth pixmap transform

## and map creation

### Import a basemap via WMS in ISN2016

- In this case, we will use a basic basemap from Natt
- We will get it from the Natt WMS service:

<https://gis.natt.is/mapcache/isn2016/wms>



# WORKSHOP: Basic Vector analysis and map creation

Create a New WMS/WMTS Connection

Connection Details

Name

URL

Authentication

Configurations Basic

Choose or create an authentication configuration

No Authentication

Configurations store encrypted credentials in the QGIS authentication database.

HTTP Headers

Referer

Advanced

WMS/WMTS Options

WMS DPI-Mode

WMTS server-side tile pixel ratio

Ignore GetMap/GetTile/GetLegendGraphic URI reported in capabilities

Ignore GetFeatureInfo URI reported in capabilities

Ignore reported layer extents

Ignore axis orientation (WMS 1.3/WMTS)

Invert axis orientation

Smooth pixmap transform

Give it a name. E.g.:

NATT WMS ISN2016

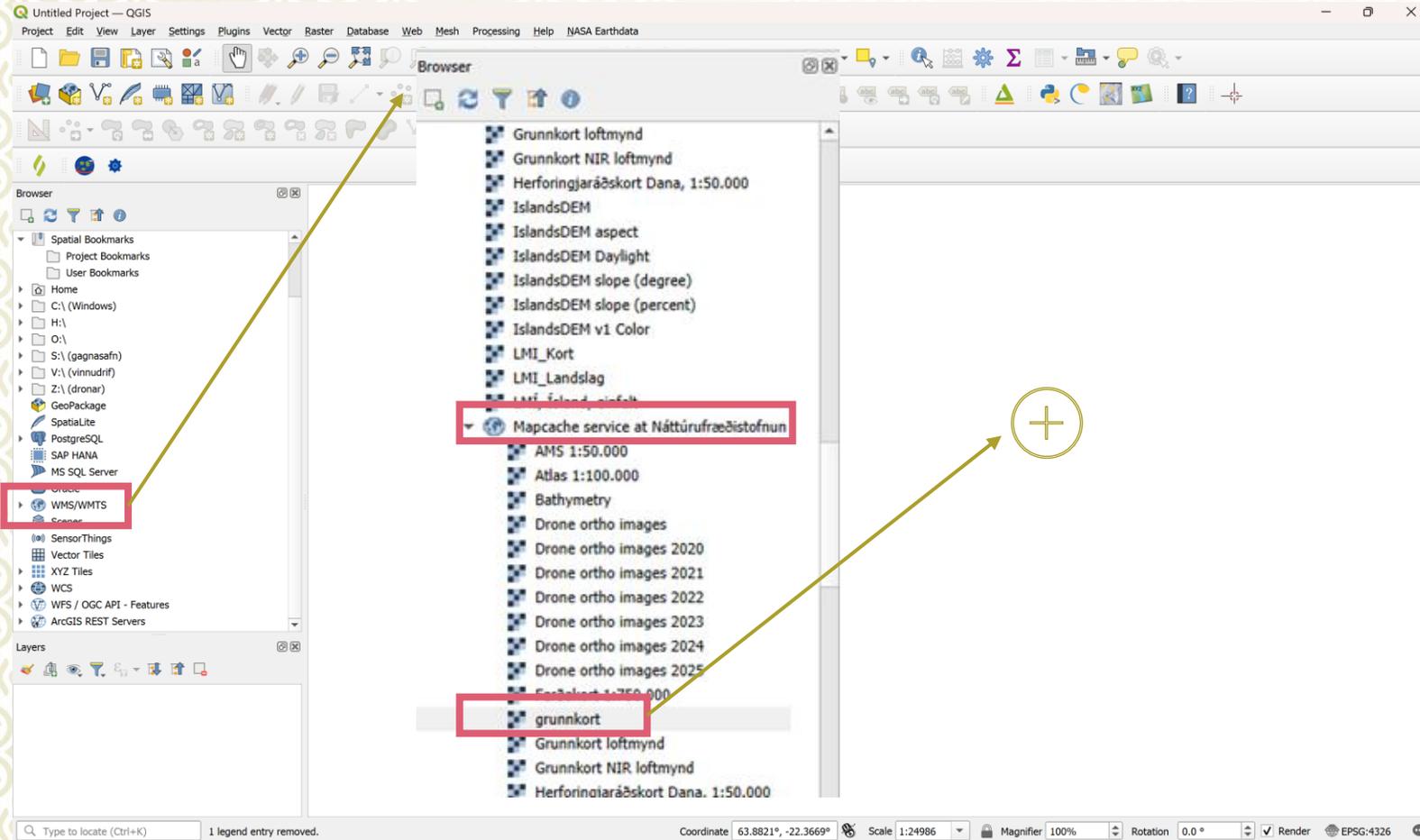
Copy and paste the link here:

<https://gis.natt.is/mapcache/isn2016/wms>

No authentication needed



## WORKSHOP: Basic Vector analysis and map creation

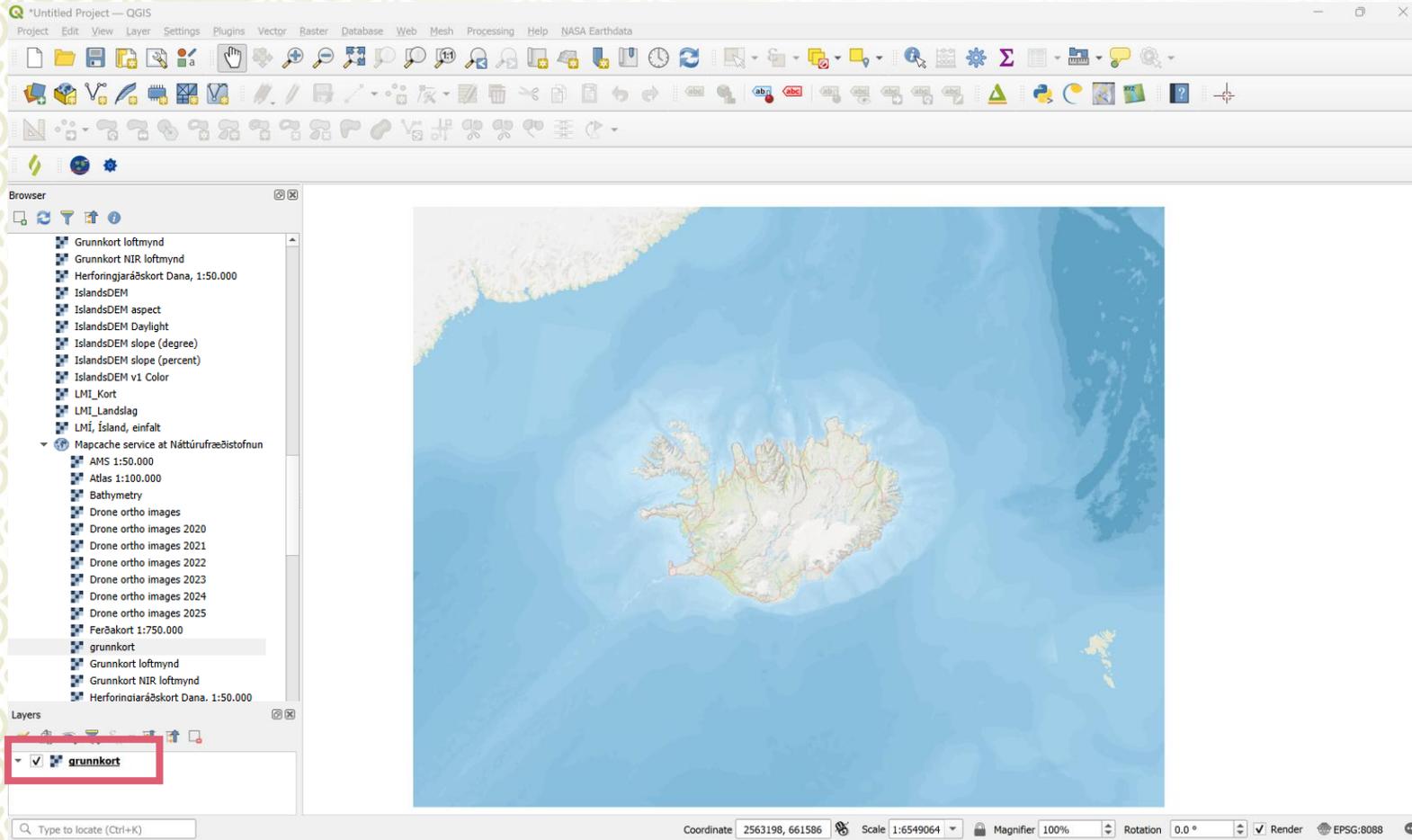


Import a basemap via WMS in ISN2016

- Expand layers in WMS in Browser
- Click and drag “grunnkort” into the map



## WORKSHOP: Basic Vector analysis and map creation



Import a basemap via WMS in ISN2016

- Map shows up in the layers tab
- There are many other basemaps available in NATT WMS such as:
  - DEM
  - Basic outline of Iceland
  - Aerial imagery
  - Bathymetry
  - Atlas



## WORKSHOP: Basic Vector analysis and map creation

File name: C:\Users\sydney.r.gunnarson.NATT\OneDrive - Public Administration\WORK\_IN\_PROGRESS\natt\_qgis\_training\_bioice\_aquiloniella\_paenulata.csv

Layer name: natt\_qgis\_training\_bioice\_aquiloniella\_paenulata Encoding: UTF-8

**File Format**

- CSV (comma separated values)
- Regular expression delimiter
- Custom delimiters

**Record and Fields Options**

Number of header lines to discard: 0

- First record has field names
- Detect field types
- Decimal separator is comma
- Trim fields
- Discard empty fields

**Custom boolean literals**

True:  False:

**Geometry Definition**

- Point coordinates X field: lon Z field:
- Well known text (WKT) Y field: lat M field:
- DMS coordinates
- No geometry (attribute only table) Geometry CRS: EPSG:4326 - WGS 84

**Layer Settings**

- Use spatial index
- Use subset index
- Watch file

**Sample Data**

	fid	species	sample	lat	lon	depth	temp	
	123 Integer (32 bit)	abc Text (string)	123 Integer (32 bit)	1.2 Decimal (double)	1.2 Decimal (double)	123 Integer (32 bit)	1.2 Decimal (double)	1.2 Dec
1	1	Aquiloniella paenulata	2056	66.2844	-18.8236	120	5.25	34.26
2	2	Aquiloniella paenulata	2086	67.2756	-17.4272	755	-0.41	34.86
3	3	Aquiloniella paenulata	2097	66.6256	-18.245	110	4.88	34.89
4	4	Aquiloniella paenulata	2099	66.6258	-18.2475	112	4.88	34.89
5	5	Aquiloniella paenulata	2122	67.1858	-19.5672	346	0.15	34.84

Import vector Bioice data as .csv file

- Import the .csv file 'natt\_qgis\_training\_bioice\_aquiloniella\_paenulata.csv'



## WORKSHOP: Basic Vector analysis and map creation

**File name:** C:\Users\sydney.r.gunnarson.NATT\OneDrive - Public Administration\WORK\_IN\_PROGRESS\natt\_qgis\_training\_bioice\_aquiloniella\_paenulata.csv

**Layer name:** natt\_qgis\_training\_bioice\_aquiloniella\_paenulata

**Encoding:** UTF-8

**File Format:**  CSV (comma separated values)

**Record and Fields Options:**  First record has field names,  Detect field types

**Geometry Definition:**  Point coordinates, X field: lon, Y field: lat, Geometry CRS: EPSG:4326 - WGS 84

**Sample Data:**

	fid	species	sample	lat	lon	depth	temp	
	123 Integer (32 bit)	abc Text (string)	123 Integer (32 bit)	1.2 Decimal (double)	1.2 Decimal (double)	22 Integer (32 bit)	1.2 Decimal (double)	1.2 Dec
1	1	Aquiloniella paenulata	2056	66.2844	-18.8236	20	5.25	3-26
2	2	Aquiloniella paenulata	2086	67.2756	-17.4272	55	-0.41	3-86
3	3	Aquiloniella paenulata	2097	66.6256	-18.245	10	4.88	3-89
4	4	Aquiloniella paenulata	2099	66.6258	-18.2475	12	4.88	3-89
5	5	Aquiloniella paenulata	2122	67.1858	-19.5672	46	0.15	3-84

Import vector BioIce data as .csv file

- Encoding (utf-8 default)  
For files with Icelandic characters, use: [ISO/IEC 8859-15](#)

- Csv format

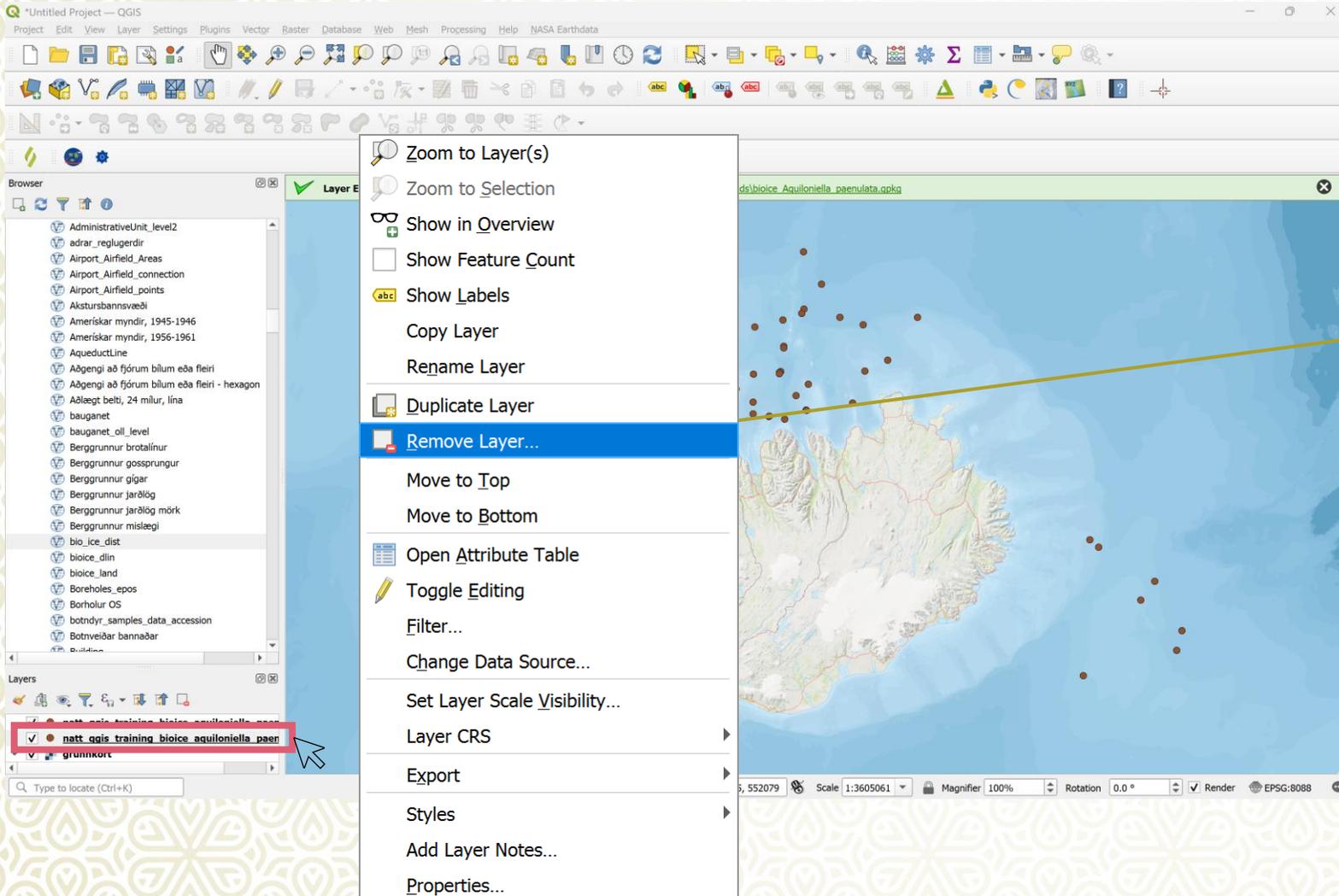
- The table has headers

- Lat/Long coordinates

- Here we can see a sample of the data. You can see the data is in Lat/long and therefore should be imported in WGS84



## WORKSHOP: Basic Vector analysis and map creation

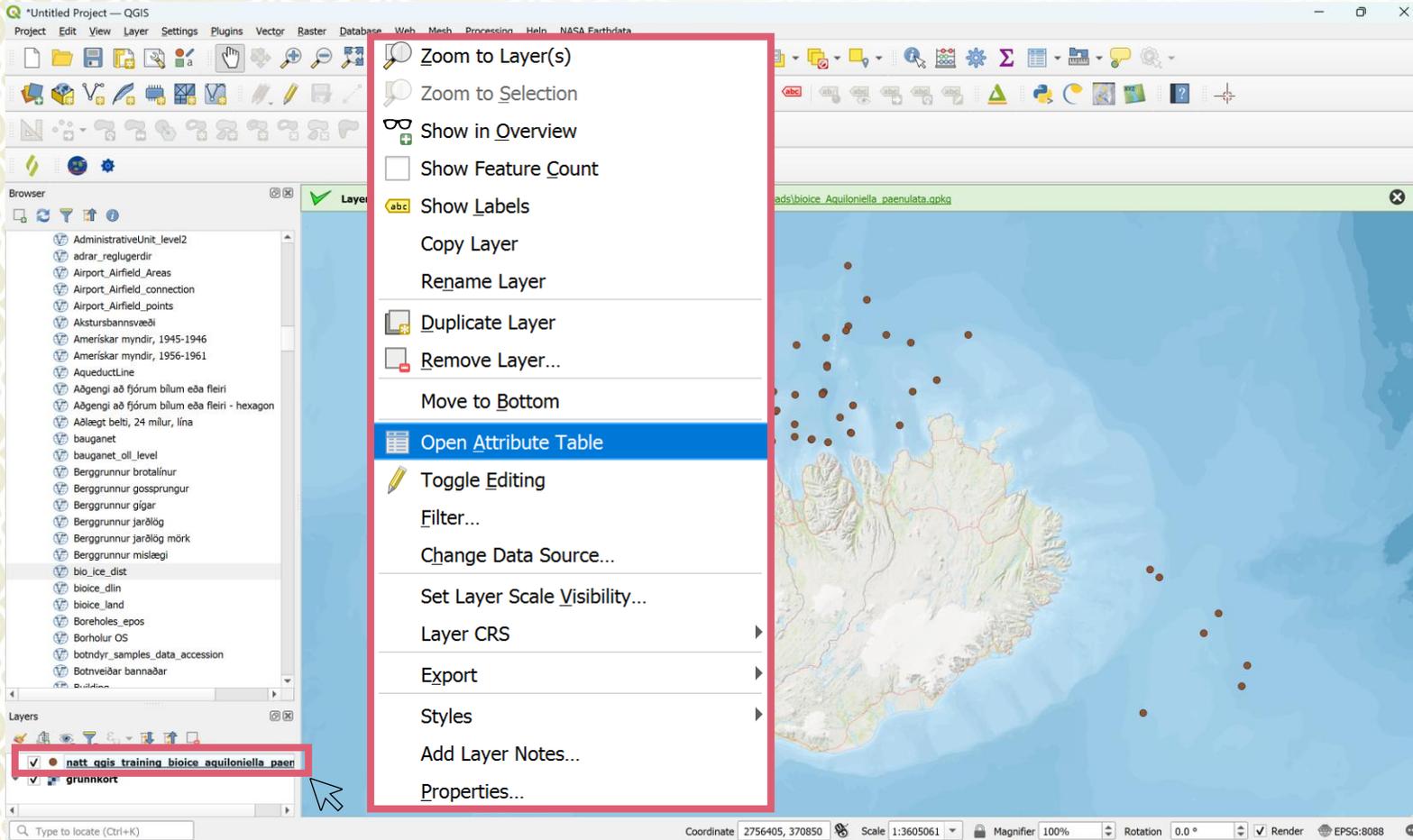


Import vector Bioice data as .csv file

- Close the Toolbox for now
- Remove the old .csv file: Right click on the layer below the new geopackage layer, and 'Remove layer...'
- Leave only the new geopackage in ISN2016



## WORKSHOP: Basic Vector analysis and map creation



Style the vector layer by Attribute  
Part One: What Attributes to use?

Right click on the layer, select  
'Open Attribute Table'



## WORKSHOP: Basic Vector analysis and map creation

### Style the vector layer by Attribute Part One: What are my Attributes?

- Here you can see all the information stored behind each point in the layer
- Take a look at 'depth', 'temp' and 'salinity'. Since these are values that work on a scale, we can style the layer with a graded color scale.
- Choose one of these three categories to style your layer and look at the values. You can sort the values from biggest to smallest or vice versa by clicking on the attribute column name
- Close or minimize the attribute table when you're done.

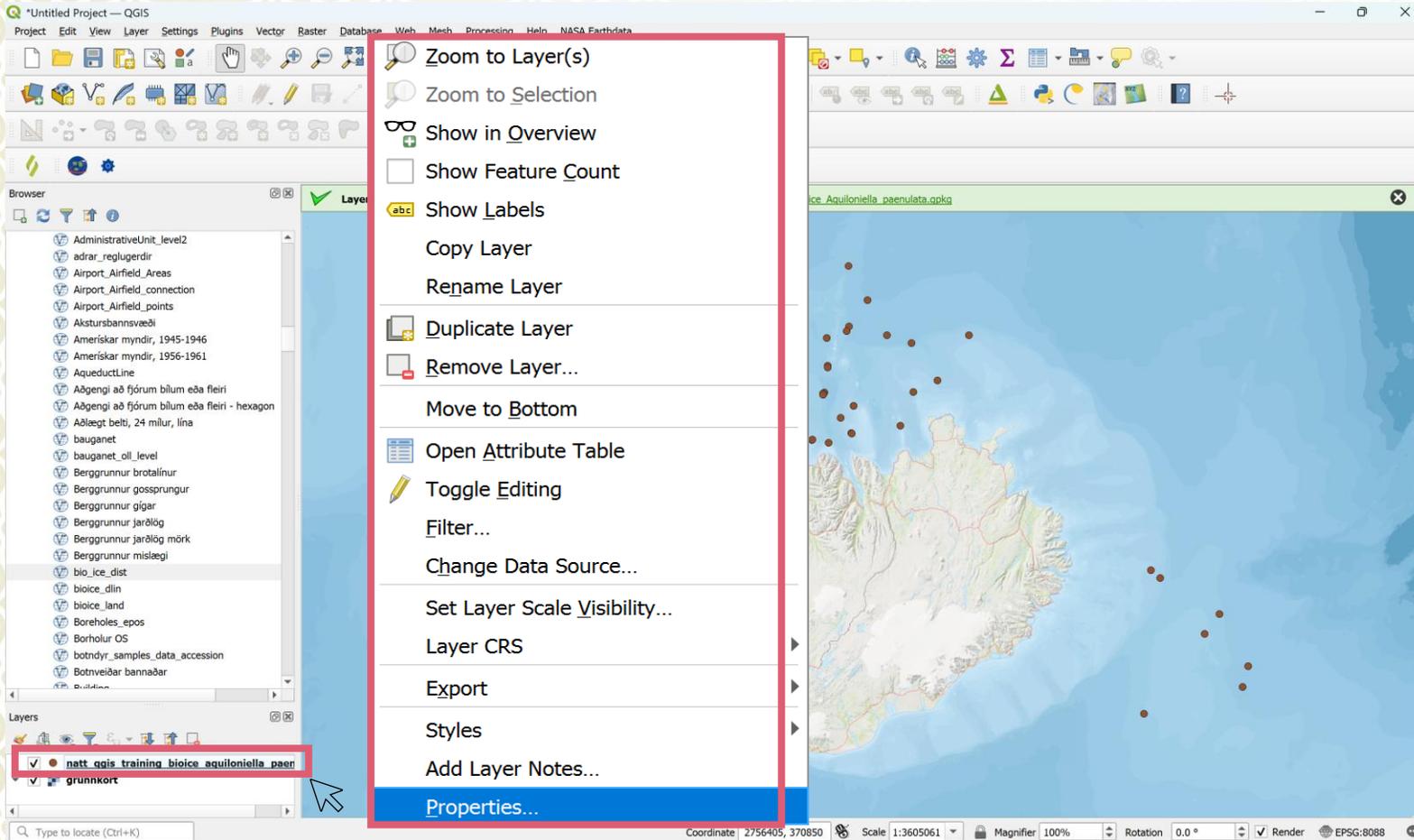
natt\_qgis\_training\_bioice\_aquiloniella\_paenulata — Features Total: 123, Filtered: 123, Selected: 0

fid	species	sample	lat	lon	depth	temp	salinity	accession	gear_method	date_of_entry	insert_time	web_path
1	Aquiloniella paenulata	2056	66.2844	-18.8236	120	5.25	34.26	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
2	Aquiloniella paenulata	2086	67.2756	-17.4272	755	-0.41	34.86	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
3	Aquiloniella paenulata	2097	66.6256	-18.245	110	4.88	34.89	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
4	Aquiloniella paenulata	2099	66.6258	-18.2475	112	4.88	34.89	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
5	Aquiloniella paenulata	2122	67.1858	-19.5672	346	0.15	34.84	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
6	Aquiloniella paenulata	2126	66.9975	-18.8394	208	2.7	34.86	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
7	Aquiloniella paenulata	2128	66.9839	-18.8436	203	2.7	34.86	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
8	Aquiloniella paenulata	2132	66.7514	-18.925	492	0.12	34.85	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
9	Aquiloniella paenulata	2135	66.7436	-18.9589	418	0.58	34.83	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
10	Aquiloniella paenulata	2136	66.7322	-18.9556	417	0.58	34.83	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
11	Aquiloniella paenulata	2142	66.7228	-19.5883	207	4.71	34.95	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
12	Aquiloniella paenulata	2147	66.7531	-20.1047	300	3	34.86	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
13	Aquiloniella paenulata	2154	66.5672	-20.0397	100	2.18	34.85	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
14	Aquiloniella paenulata	2156	66.5764	-20.0197	97	2.18	34.85	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
15	Aquiloniella paenulata	2161	66.2903	-20.1092	130	5.3	34.78	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
16	Aquiloniella paenulata	2162	66.45	-19.5969	294	4.51	34.93	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
17	Aquiloniella paenulata	2167	66.3367	-19.5953	183	5.07	34.93	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
18	Aquiloniella paenulata	2168	66.3097	-19.2083	86	5.37	34.9	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
19	Aquiloniella paenulata	2170	66.3142	-19.2	88	5.37	34.9	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
20	Aquiloniella paenulata	2177	66.5139	-18.5422	201	4.63	34.94	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
21	Aquiloniella paenulata	2178	66.3758	-18.3069	100	5.5	34.82	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
22	Aquiloniella paenulata	2180	66.3675	-18.2981	99	5.5	34.82	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
23	Aquiloniella paenulata	2213	64.1583	-23.9744	260	7.04	35.1	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
24	Aquiloniella paenulata	2215	64.2689	-24.4347	213	6.85	35.1	BIOICE	RP sledge	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
25	Aquiloniella paenulata	2236	63.4506	-24.6886	293	6.92	35.11	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
26	Aquiloniella paenulata	2321	63.9333	-10	639	NULL	NULL	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>
27	Aquiloniella paenulata	2324	63.75	-10.1833	554	NULL	NULL	BIOICE	detr. sledge (Snelli)	22:14.5	30:38.0	<a href="https://www.ni.is...">https://www.ni.is...</a>

Show All Features



## WORKSHOP: Basic Vector analysis and map creation

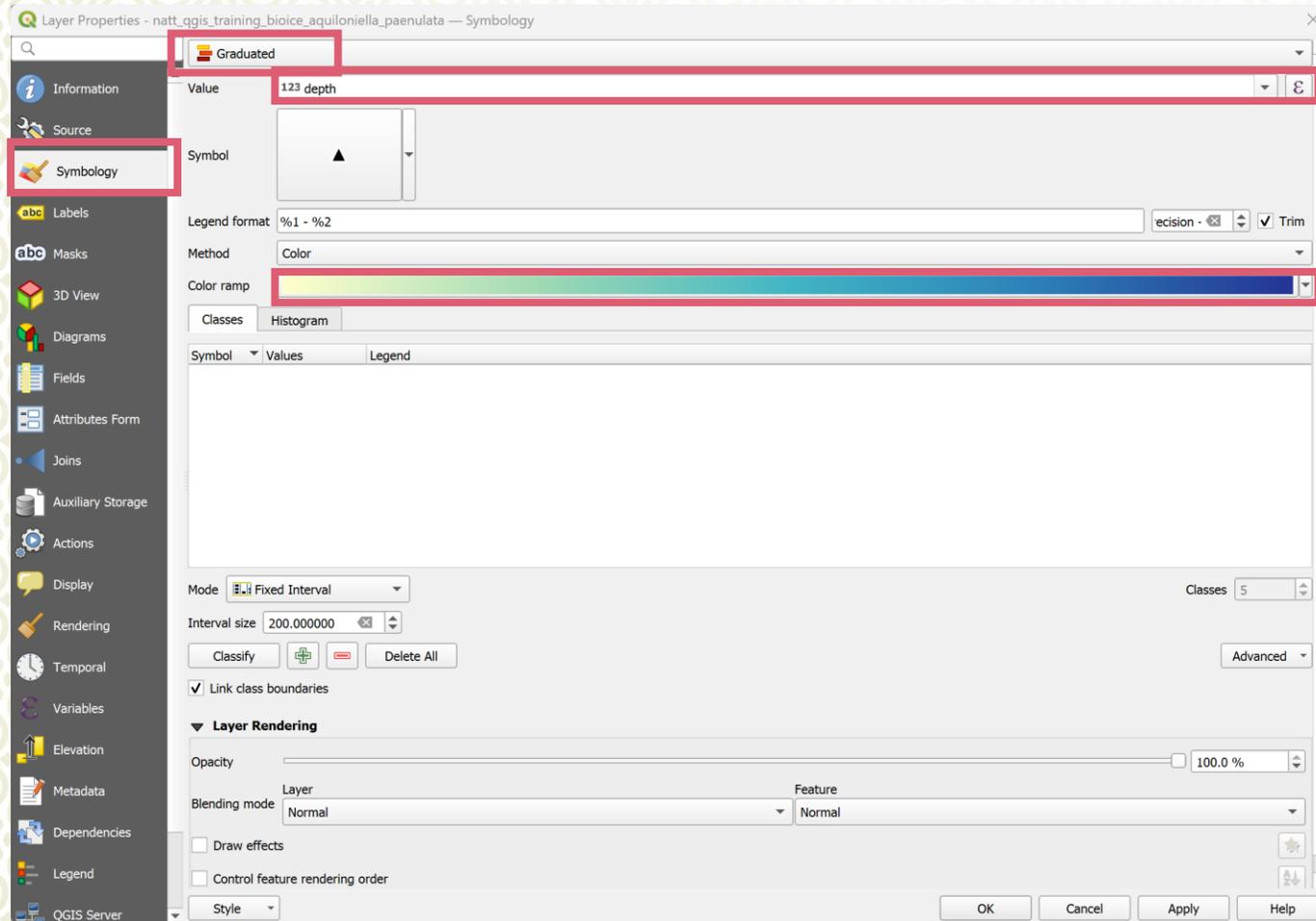


Style the vector layer by Attribute  
Part two: Style by attribute

Right click on the layer, select  
'Properties'



## WORKSHOP: Basic Vector analysis and map creation



### Style the vector layer by Attribute Part two: Style by attribute

- Open 'Symbology'
- Change type to 'Graduated'
- Choose a value to categorize, either 'depth', 'salinity' or 'temp'
- Change color ramp to something you like



## WORKSHOP: Basic Vector analysis and map creation

The screenshot shows the QGIS interface with two dialog boxes open. The 'Layer Properties' dialog is on the left, and the 'Symbol Settings' dialog is on the right. Both are highlighted with a red border.

**Layer Properties - natt\_qgis\_training\_bioice\_aquiloniella\_paenulata — Symbology**

- Value: 123 depth
- Symbol: Simple Marker
- Legend format: %1 - %2
- Method: Color
- Color ramp: [Color ramp]
- Classes: Histogram
- Symbol: Values Legend
- Mode: Fixed Interval
- Interval size: 200.000000
- Buttons: Classify, Delete All
- Link class boundaries
- Layer Rendering**
- Opacity: [Slider]
- Blending mode: Normal
- Draw effects
- Control feature rendering order
- Style: [Dropdown]

**Symbol Settings**

- Marker: Simple Marker
- Color: [Color picker]
- Opacity: 100.0 %
- Size: 2.80000 Millimeters
- Rotation: 0.00 °
- Search: All Symbols
- Grid of symbols: gray 2 dot, gray 3 dot, gray 4 dot, honeycomb faux 3d, shield disability, topo airport, topo camp, topo hospital, topo pop capital, topo pop city, topo pop house, topo pop village, triangle blue, triangle green, triangle red
- Buttons: Save Symbol..., Advanced
- Buttons: OK, Cancel, Help

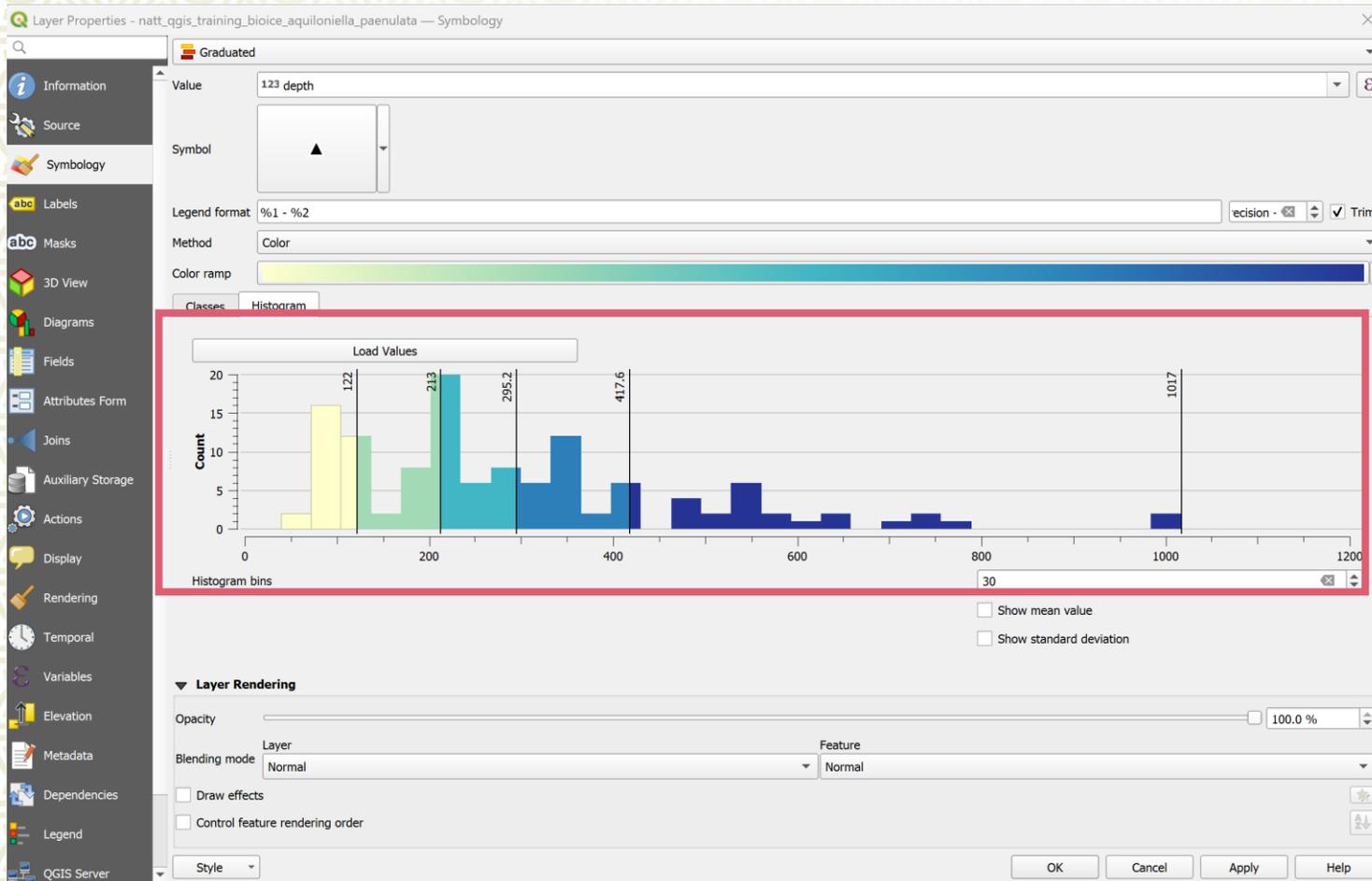
Style the vector layer by Attribute  
Part two: Style by attribute

- Click to change the symbol type here





## WORKSHOP: Basic Vector analysis and map creation

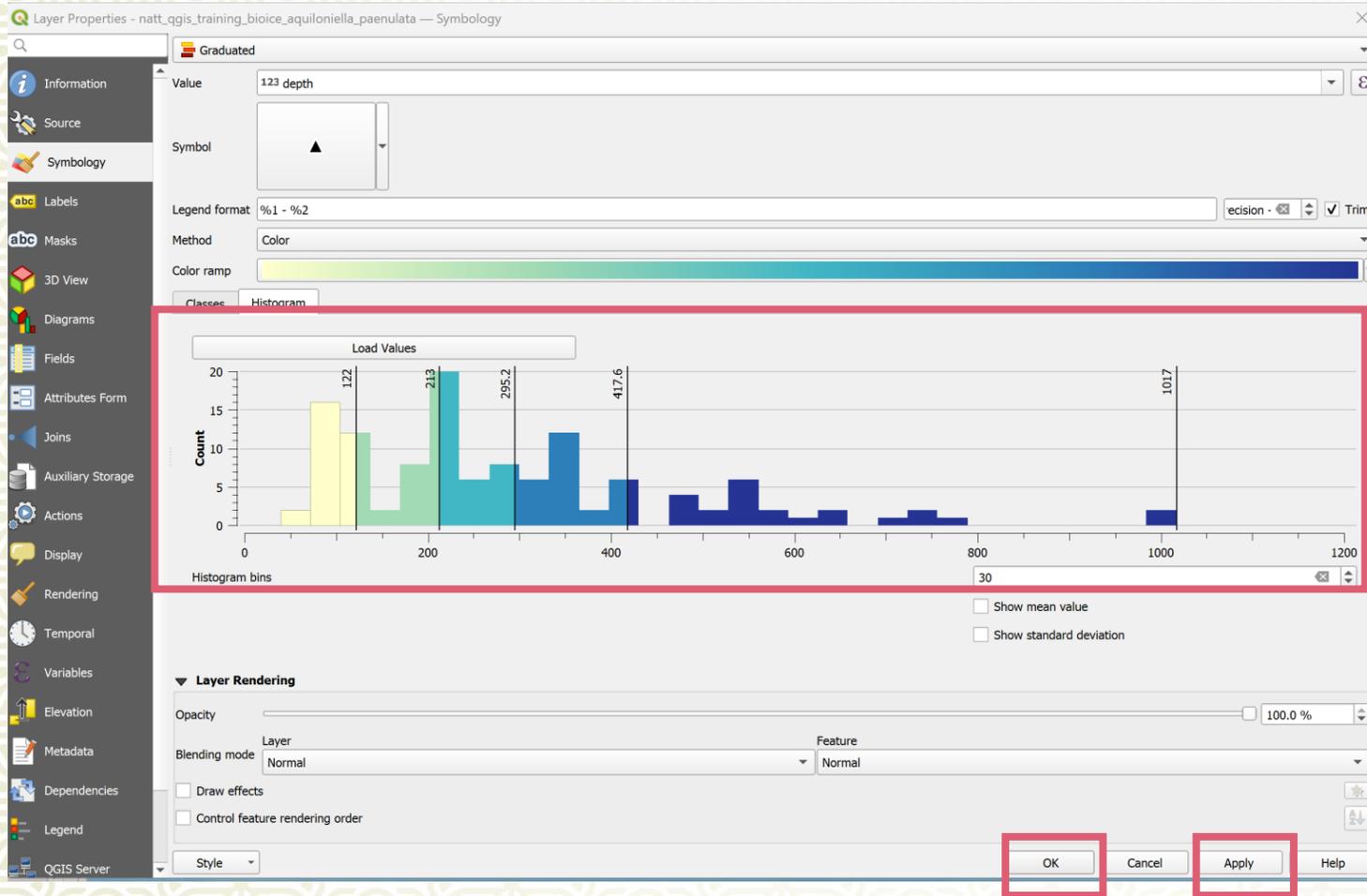


### Style the vector layer by Attribute Part two: Style by attribute

- In the histogram tab, you can see how the data is binned
- Can be useful to see how data is distributed
- You can click and drag to change the bin value cutoffs



## WORKSHOP: Basic Vector analysis and map creation



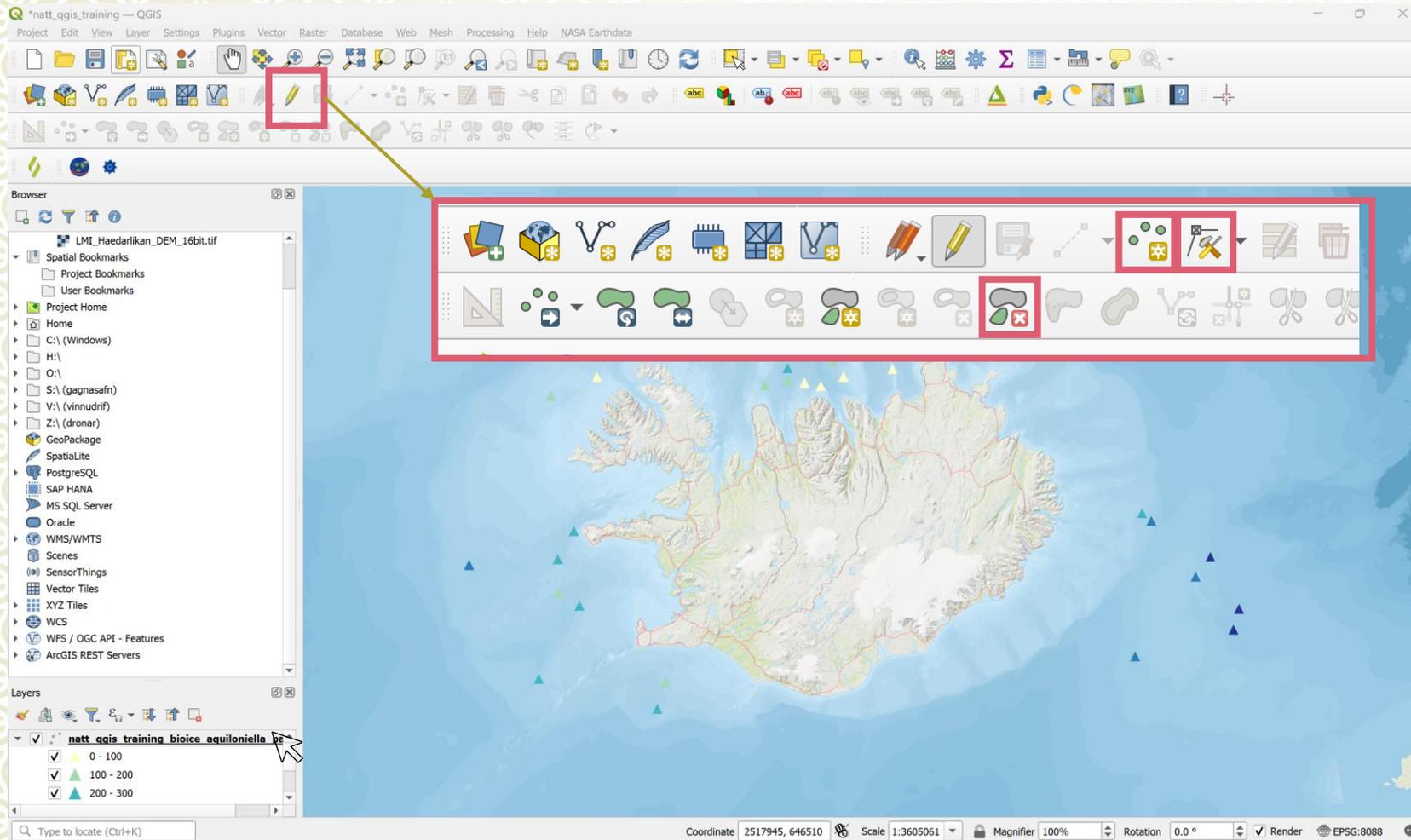
### Style the vector layer by Attribute Part two: Style by attribute

- In the histogram tab, you can see how the data is binned
- Can be useful to see how data is distributed
- You can click and drag to change the bin value cutoffs
- Click 'OK' to apply and close, or 'Apply' to apply changes



## WORKSHOP: Basic Vector analysis and map creation

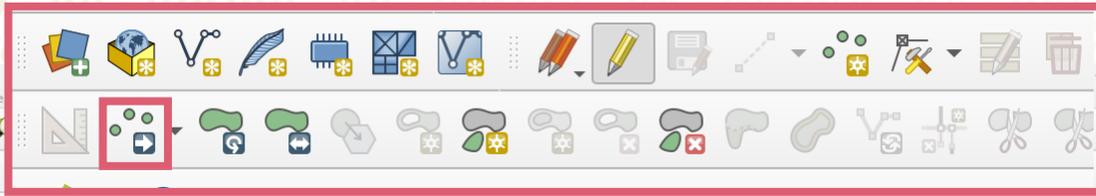
### Style the vector layer by Attribute Part three: Editing vectors



- Your map should look something like this now
- Let's say there is a missing point in the data or you need to remove a data point.
- Left click the layer in the 'Layers' window and click the pencil icon to edit it.
- On the toolbar, you will now be able to:
  - Add a feature
  - Remove a feature
  - Move a feature

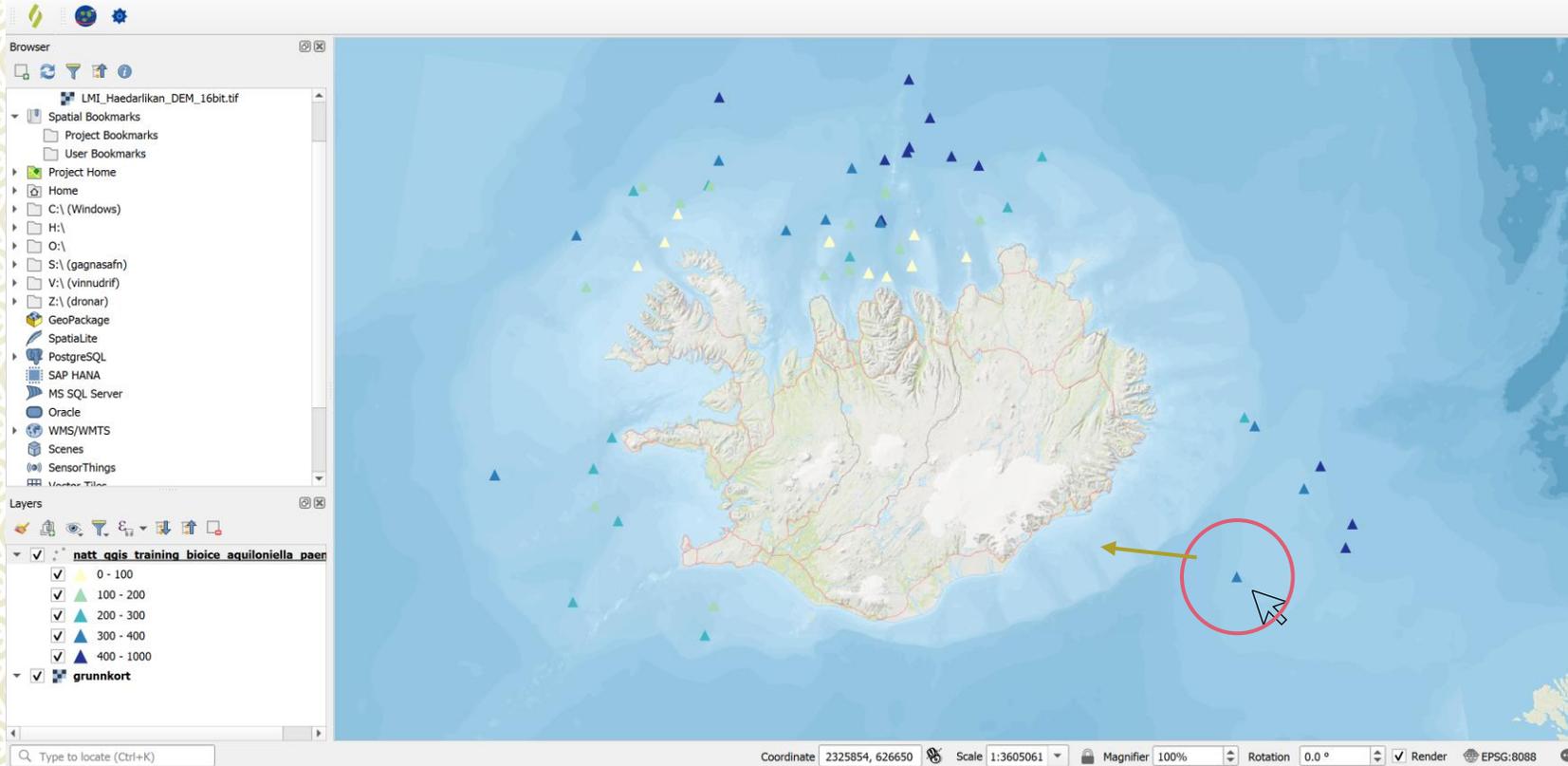


## WORKSHOP: Basic Vector analysis and map creation



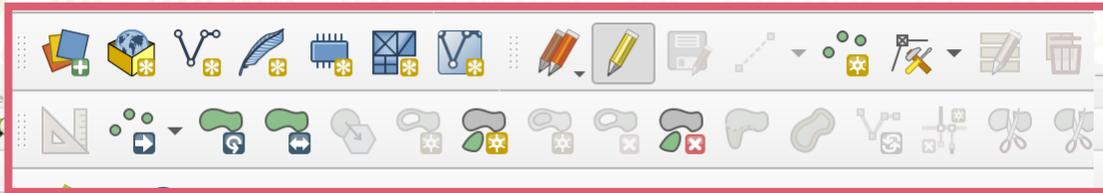
Style the vector layer by Attribute  
Part three: Moving a feature

- Let's say we need to move a point because it's in the wrong spot.
- Click the 'move feature' button, and click somewhere on the map to add a new point



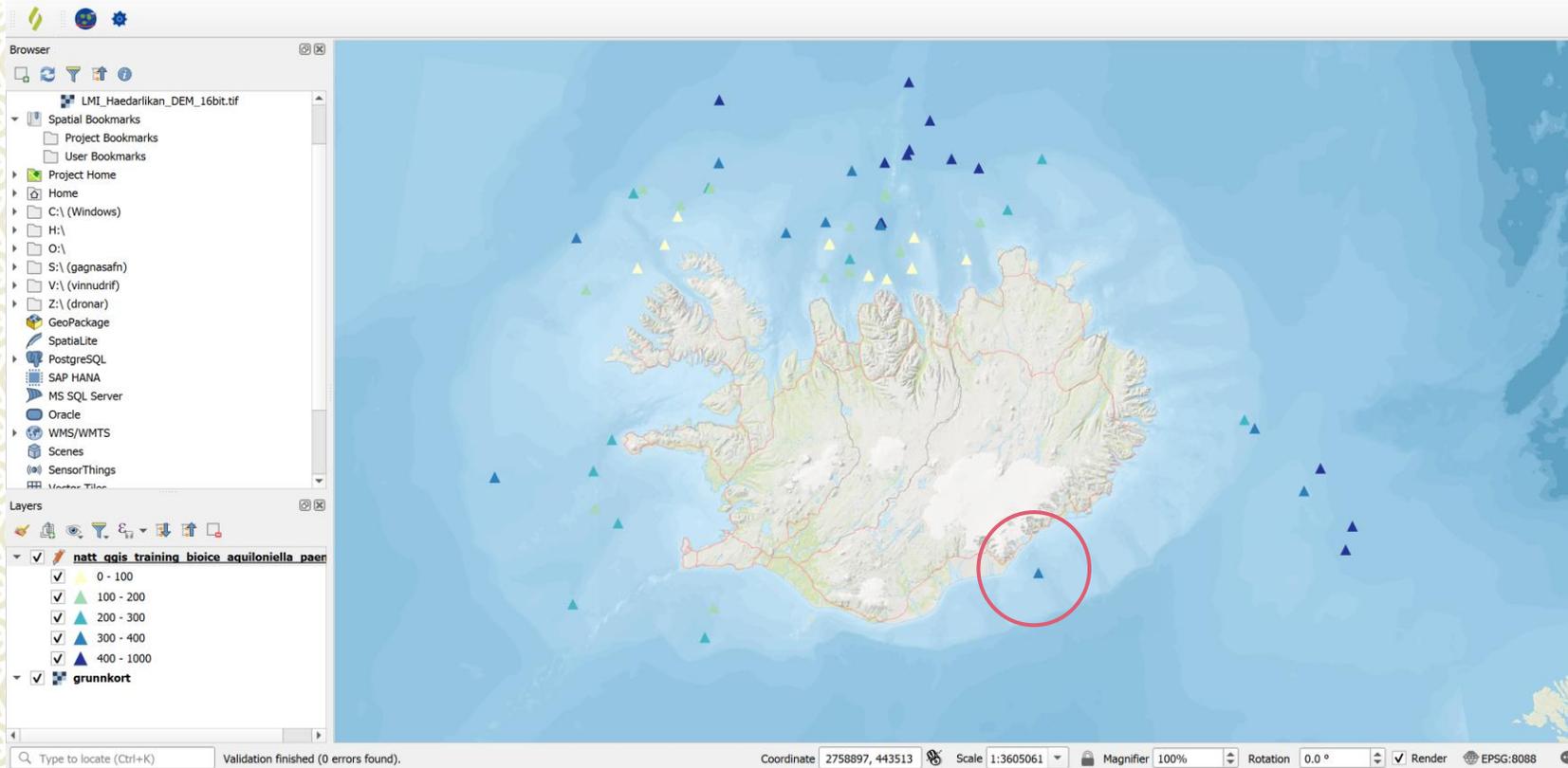


# WORKSHOP: Basic Vector analysis and map creation



Style the vector layer by Attribute  
Part three: Moving a feature

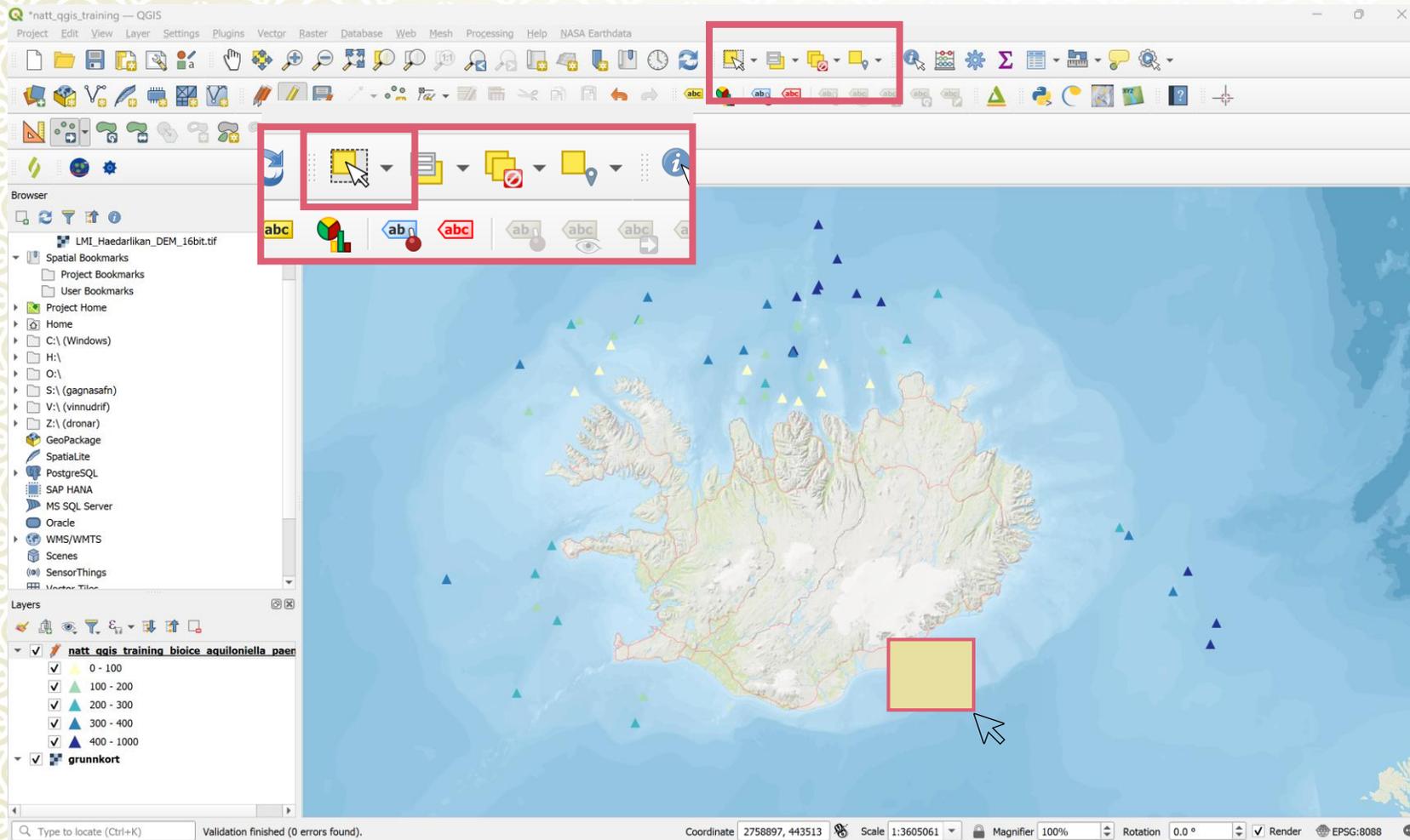
- The point now appears in the correct spot





# WORKSHOP: Basic Vector analysis and map creation

## Style the vector layer by Attribute Part three: Deleting a feature



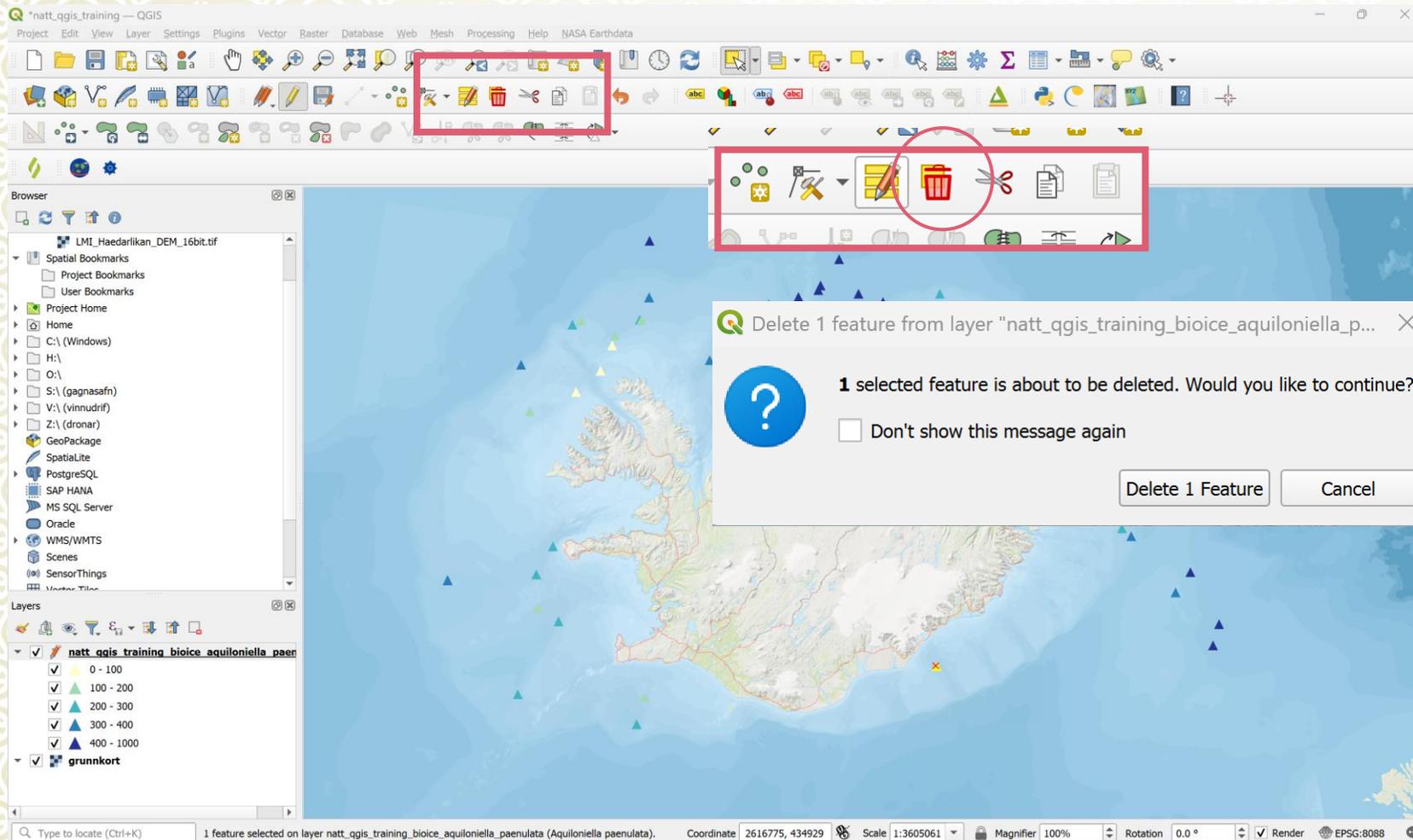
- Let's say this point is wrong and we need to delete it
- With the editing toolbar still activated, click on the select tool
- Click and drag a box around the point to select it



## WORKSHOP: Basic Vector analysis and map creation

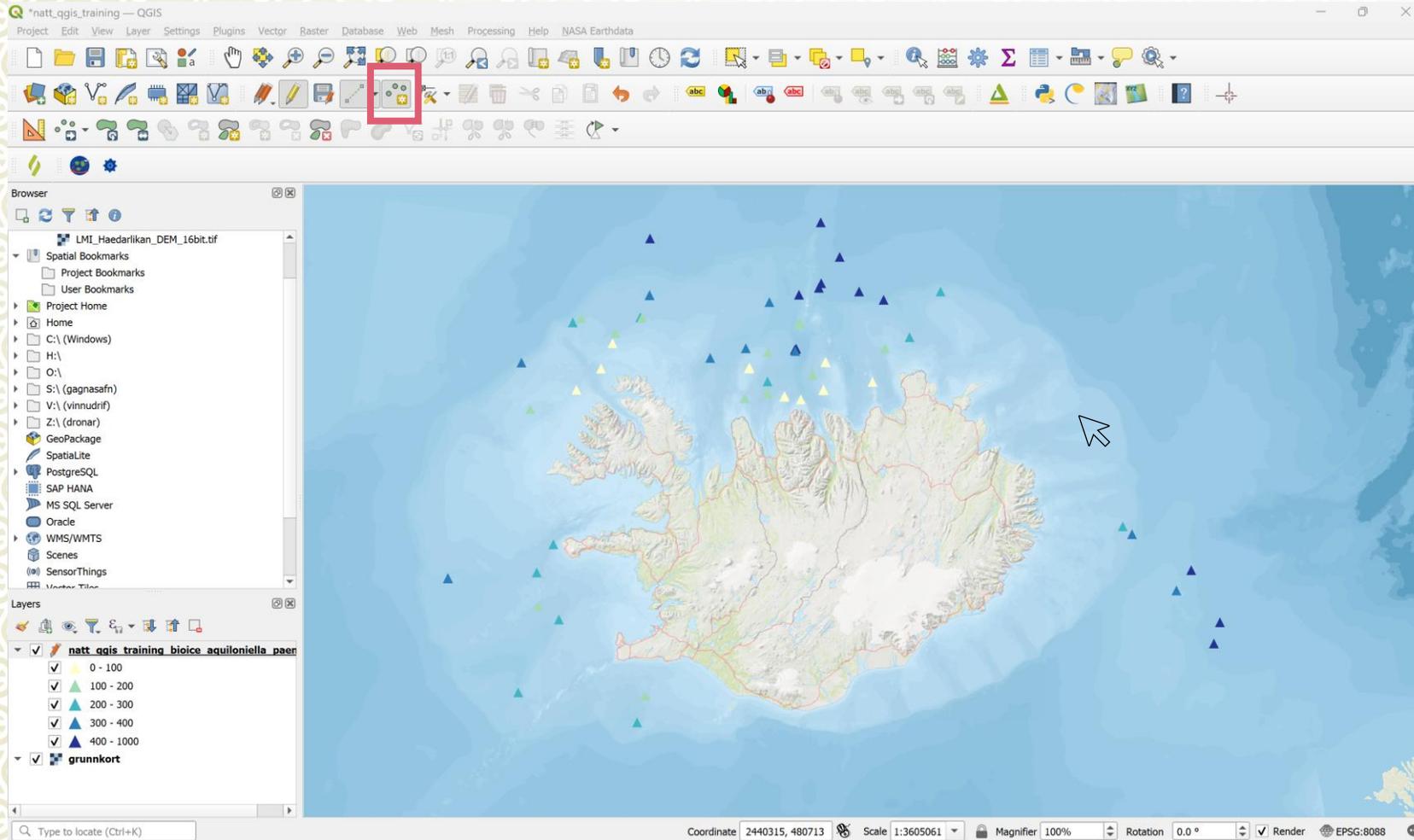
### Style the vector layer by Attribute Part three: Deleting a feature

- Now the point is selected (in yellow)
- Click the trash can icon to delete it
- Confirm when then popup window comes up





# WORKSHOP: Basic Vector analysis and map creation

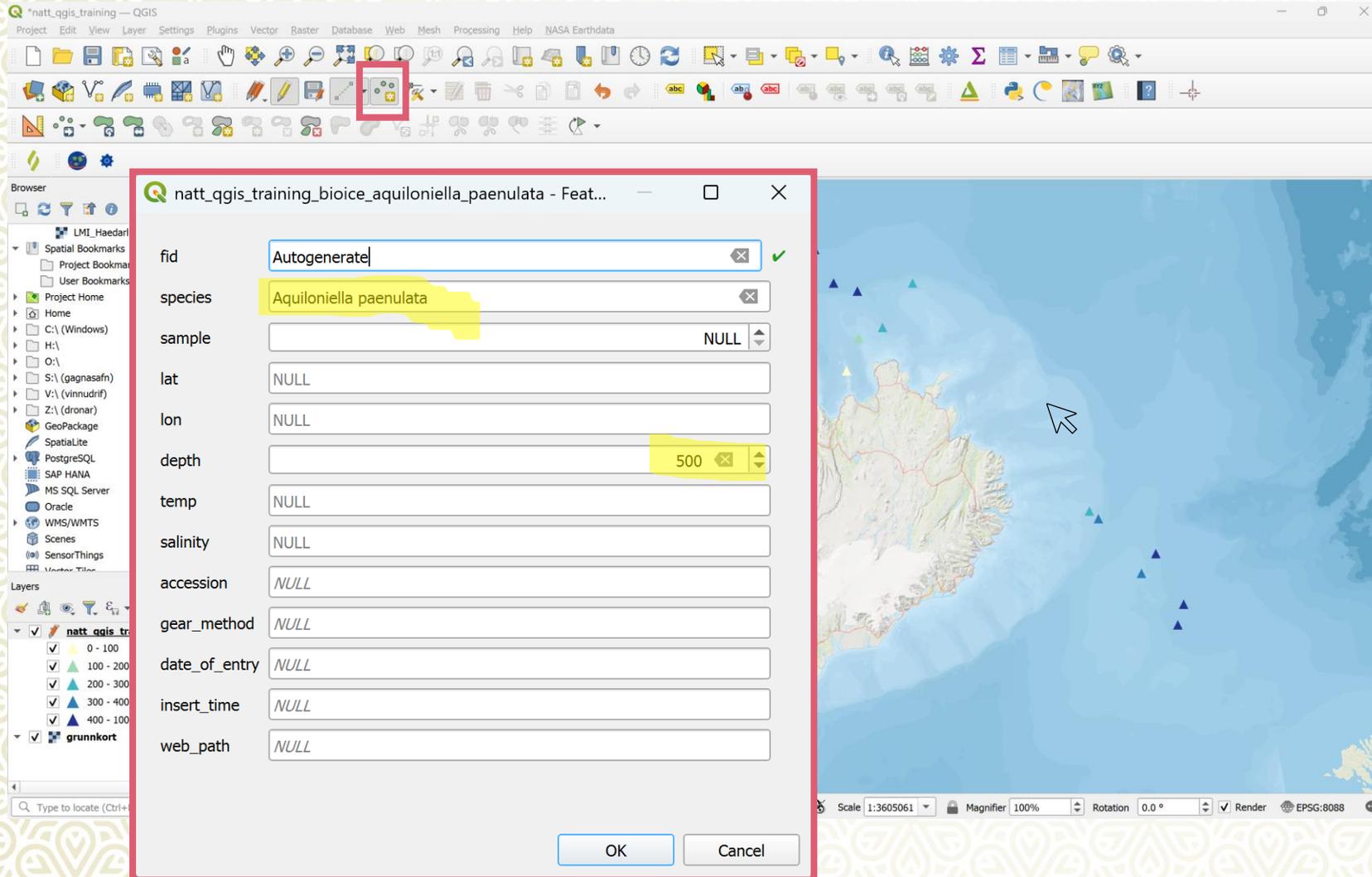


## Style the vector layer by Attribute Part three: Adding a feature

- Let ´s say now there is a point missing from the map that we need to add
- Click on the ‘Add Point Feature’ button
- Click somewhere on the map to add a point



## WORKSHOP: Basic Vector analysis and map creation

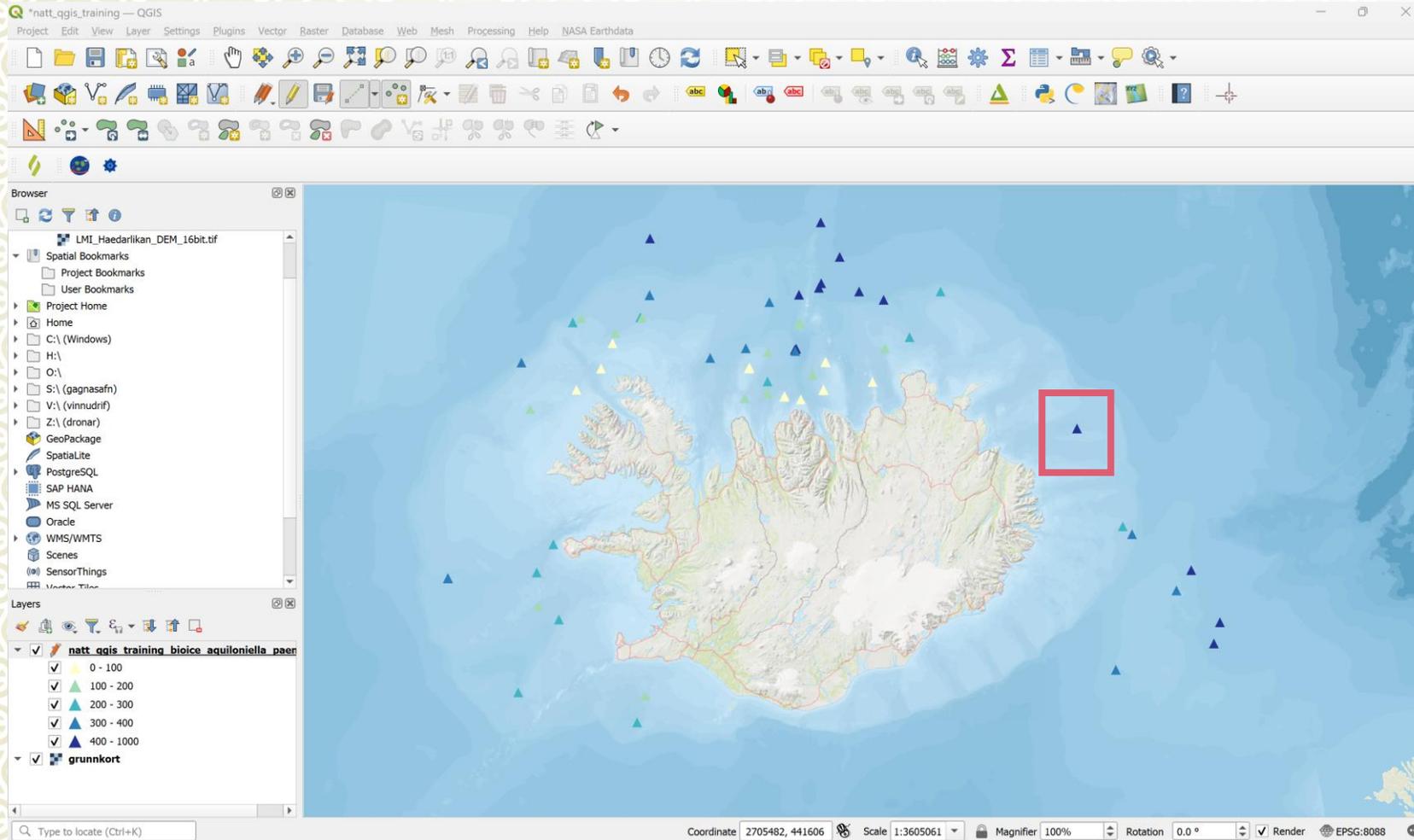


### Style the vector layer by Attribute Part three: Adding a feature

- A window will pop up to fill out attributes to the feature
- In order to have symbology on the map correct, these would need to be filled out with the correct data
- For this exercise, we can add a depth in order for it to appear on the map in the correct color scheme



# WORKSHOP: Basic Vector analysis and map creation

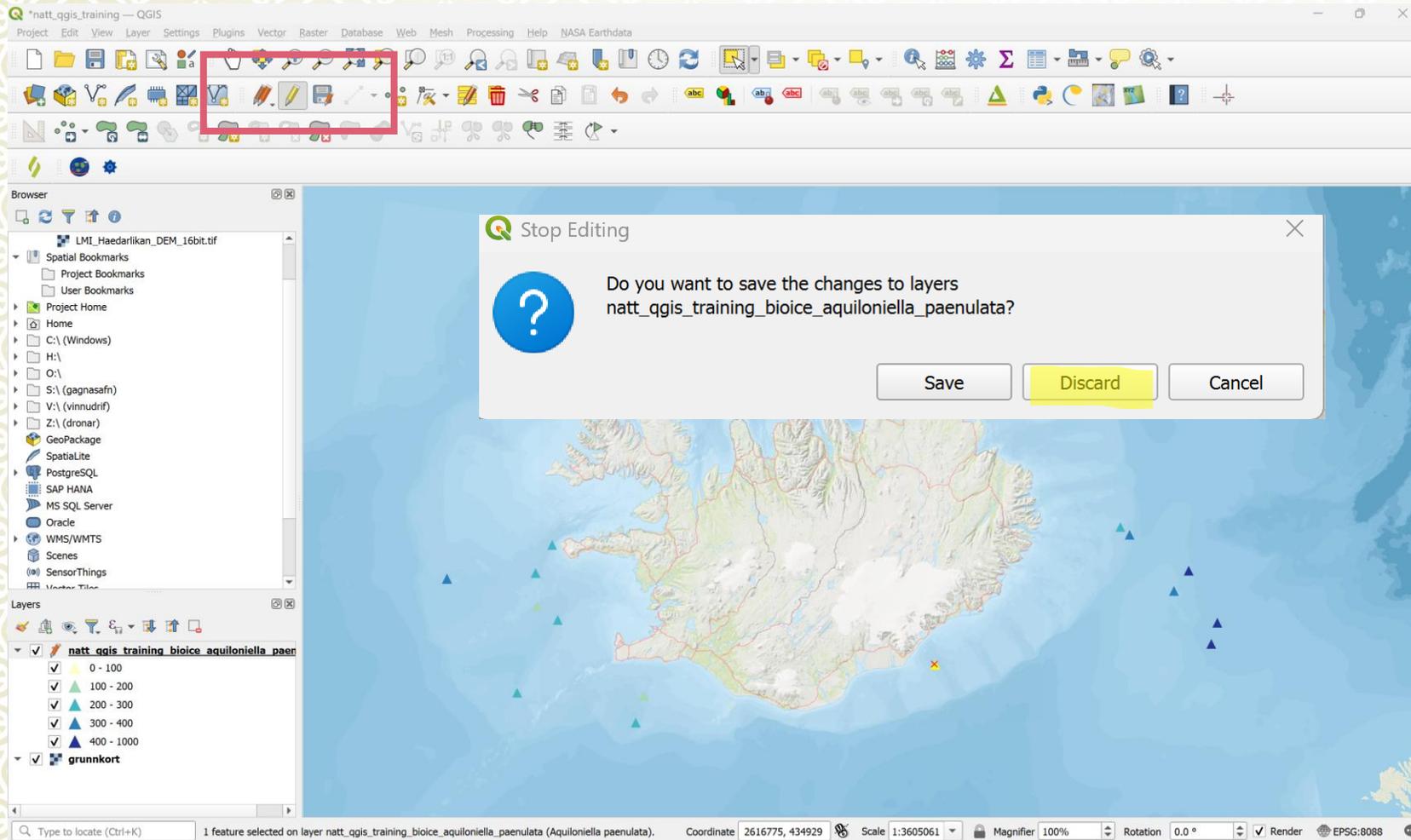


## Style the vector layer by Attribute Part three: Adding a feature

- The new point now appears on our map in the correct color scale for depth



## WORKSHOP: Basic Vector analysis and map creation

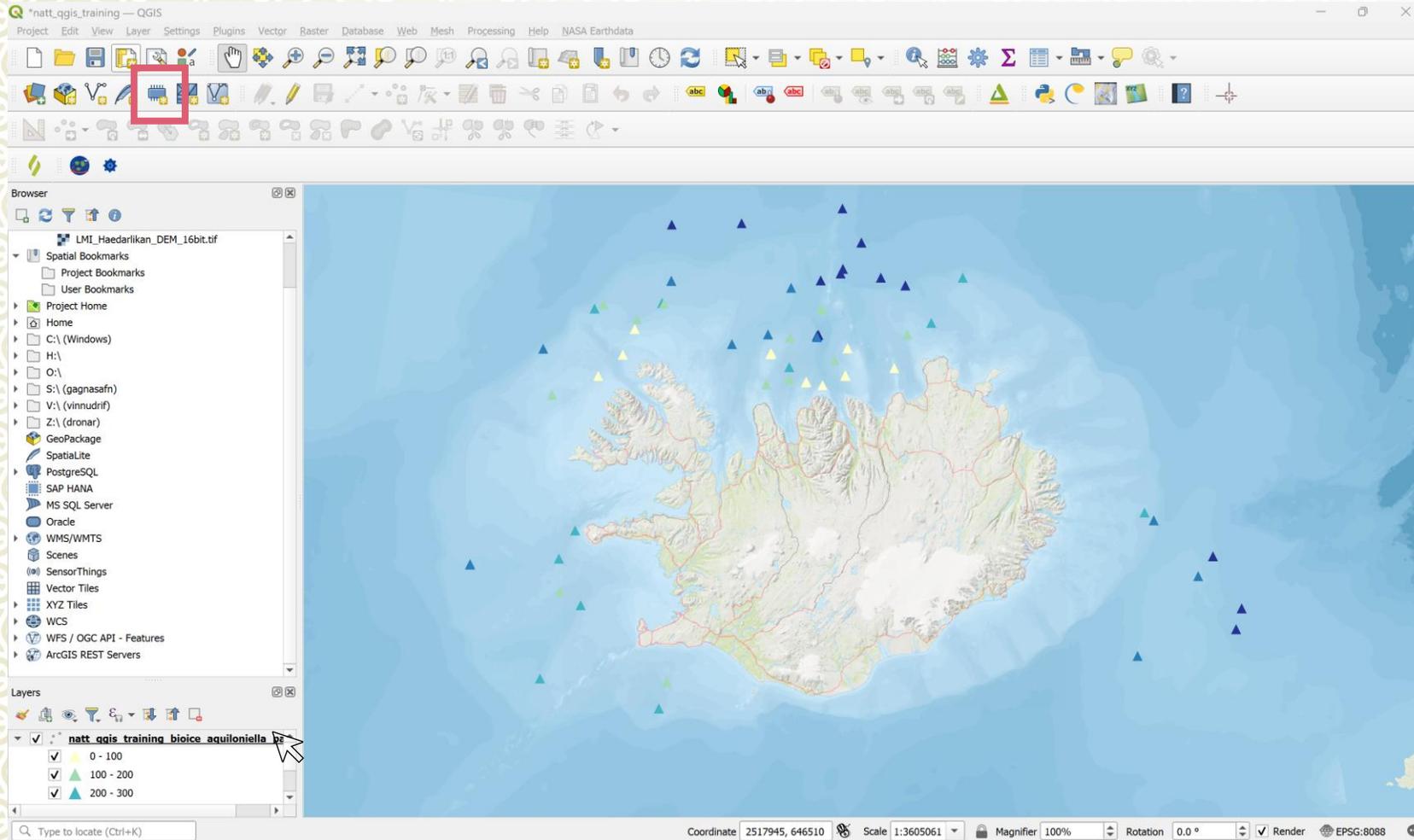


### Style the vector layer by Attribute Part three: Editing vectors

- To stop editing the layer, click on the pencil icon again
- You can save or discard your changes. In this case we will discard changes since this was just a practice.



# WORKSHOP: Basic Vector analysis and map creation



## Style the vector layer by Attribute Part three: Label by attribute

- Now let's say we want to add some features to make the map more readable
- Let's add a label for 'Vatnajökull' and 'Reykjavík' to help readers understand the map
- Click on the 'New Temporary Scratch Layer' icon in the toolbar.



## WORKSHOP: Basic Vector analysis and map creation

New Temporary Scratch Layer

Layer name: place\_names

Geometry type: MultiPoint

Project CRS: EPSG:8088 - ISN2016 / Lambert 2016

**New Field**

Name: name

Type: abc Text (string)

Length: 0 Precision:

Add to Fields List

**Fields List**

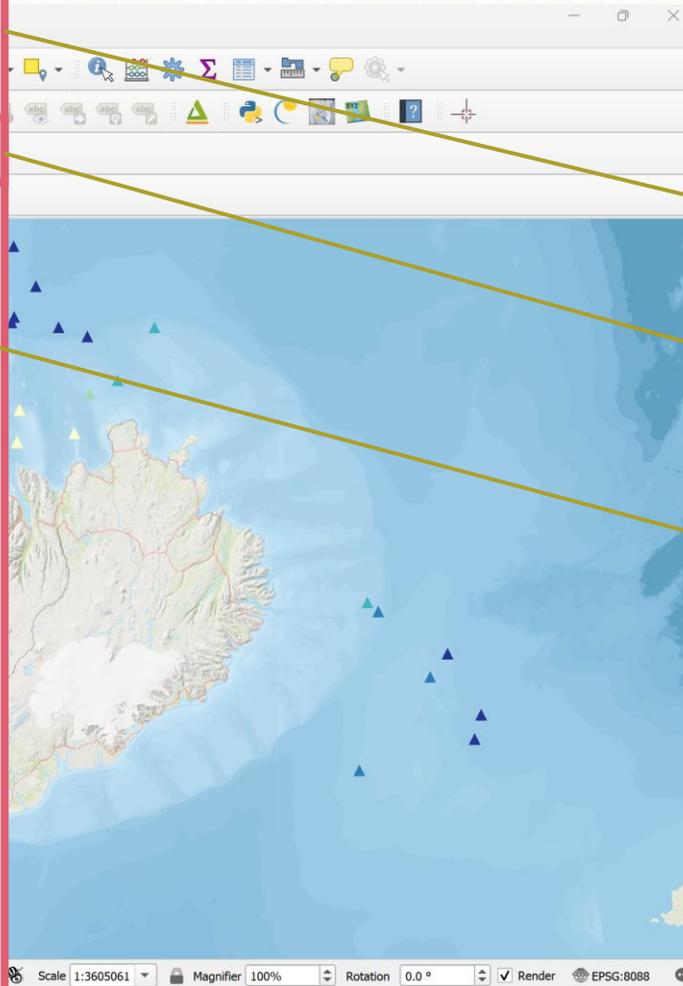
Name	Type	Length	Precision
------	------	--------	-----------

Warning: Temporary scratch layers are not saved and will be discarded when QGIS is closed.

OK Cancel Help

Style the vector layer by Attribute  
Part three: Label by attribute

- We will create a multipoint layer for the places we want to label
- Coordinate system same as map system (ISN2016)
- We want to create an attribute for name so that we can label them
  - This is type 'Text (string)'
  - Put length '0' to have unlimited length
  - Add to fields list, click ok to create

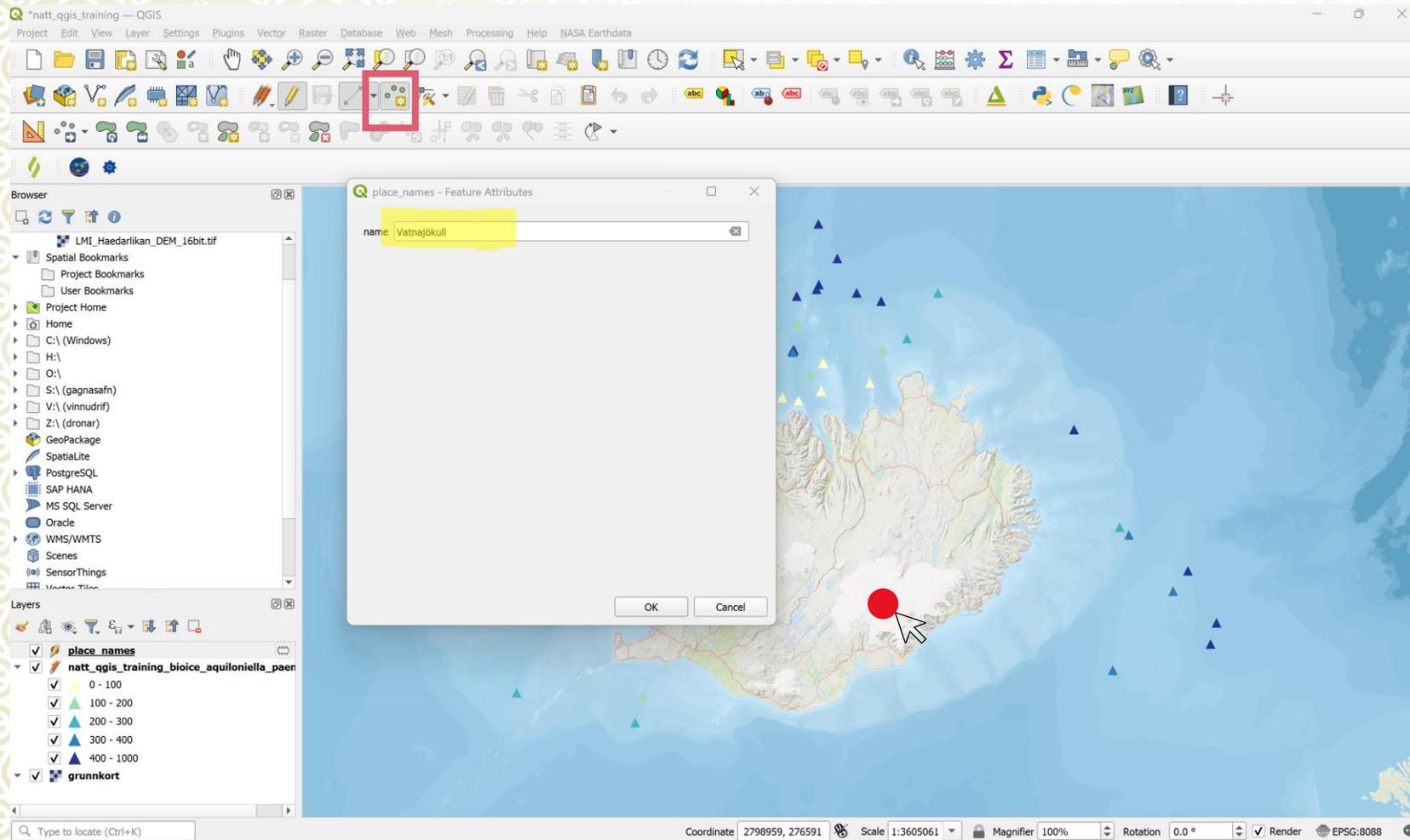




# WORKSHOP: Basic Vector analysis and map creation

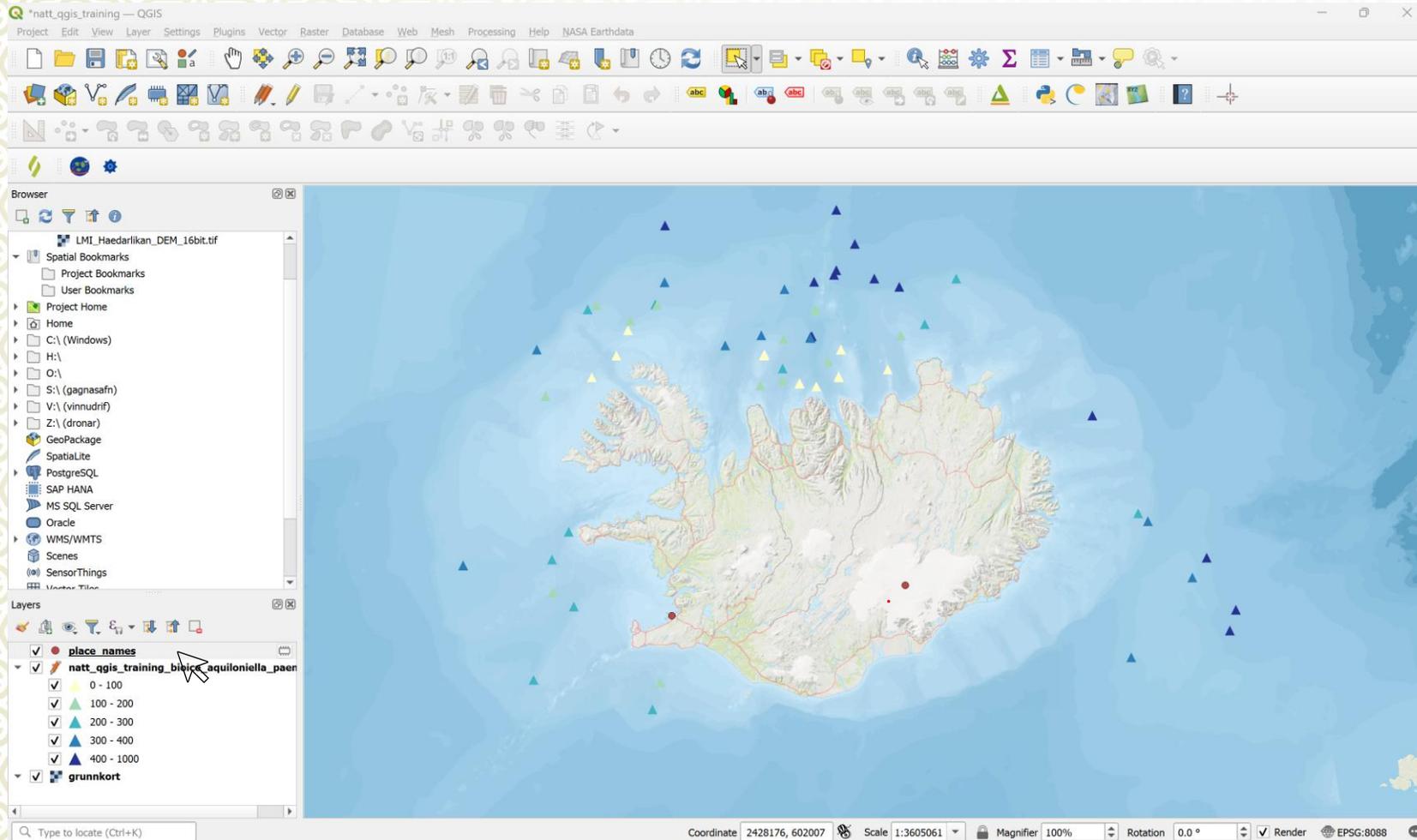
## Style the vector layer by Attribute Part three: Label by attribute

- Editing will automatically be enabled for this new layer
- Now, click on 'Add New Point Feature' again and click on the center of Vatnajökull
- In the pop up window, write the name exactly as you want it to appear in the label
- Click OK to create the point
- Repeat for Reykjavík or any other place of interest
- Save the layer and stop editing





# WORKSHOP: Basic Vector analysis and map creation

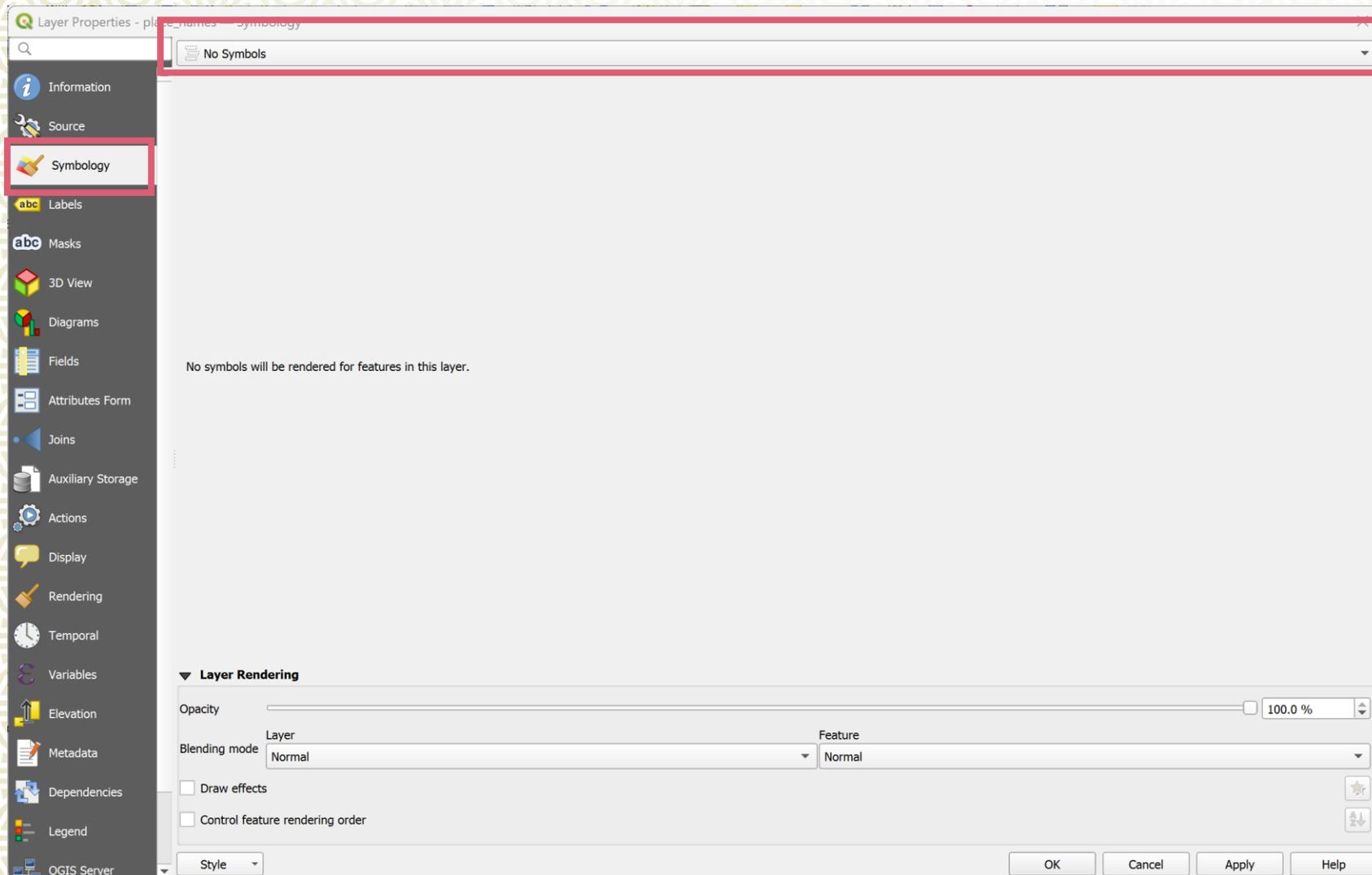


## Style the vector layer by Attribute Part three: Label by attribute

- Your map now looks like this, with points added at the locations you created
- Now we want to display ONLY the labels, not the points:
- Right click on the place\_names layer in the layers window and go to properties



## WORKSHOP: Basic Vector analysis and map creation

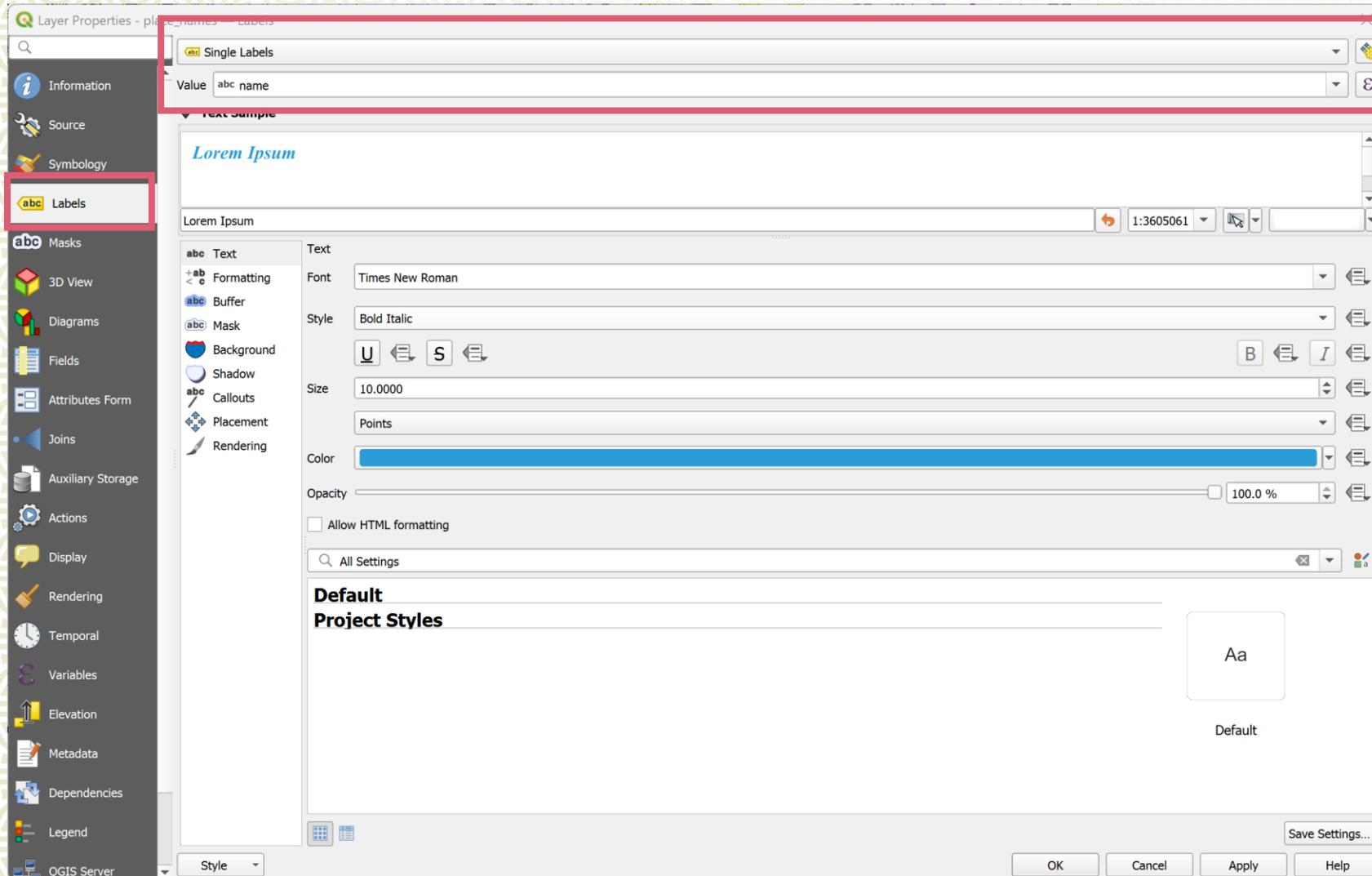


### Style the vector layer by Attribute Part three: Label by attribute

- First of all, we don't want a dot to appear where the label is.
- To do this, open the symbology tab and select 'No Symbols' from the dropdown



## WORKSHOP: Basic Vector analysis and map creation



### Style the vector layer by Attribute Part three: Label by attribute

- Next, open the 'Labels' tab
- Open the dropdown menu and choose 'Single Labels' and 'Name' as the value.
- Style the labels as you want. In this example, a bold italic style was chosen with blue color text
- Click 'Apply' to see how it looks on the map



## WORKSHOP: Basic Vector analysis and map creation

### Style the vector layer by Attribute Part three: Label by attribute

- Labels can be styled in many ways
- In this example, we open the 'Placement' tab and create labels 'Offset from Point' then Quadrant center
- This creates a label directly over the point we drew
- These are a personal style choice

Layer Properties - place\_names — Labels

Single Labels

Value: abc name

**Text Sample**

Lorem Ipsum

1:3605061

**Placement**

**General Settings**

The Placement Mode option controls the overall placement of labels relative to their corresponding features.

Mode: Offset from Point

Arranges label candidates directly over the feature or at a preset offset from the feature.

Quadrant: Center

Offset X,Y: 0.0000 0.0000

Millimeters

Rotation: 0.00°

**Geometry Generator**

Data defined

Coordinate X Y

Point

Alignment: horizontal vertical

Rotation: degrees

Preserve data rotation values

OK Cancel Apply Help



## WORKSHOP: Basic Vector analysis and map creation

Save Scratch Layer

Format: GeoPackage

File name: hanson.NATT\OneDrive - Public Administration\WORK\_IN\_PROGRESS\place\_names.gpkg

Layer name: place\_names

Encoding: UTF-8

**Layer Options**

DESCRIPTION:

FID: fid

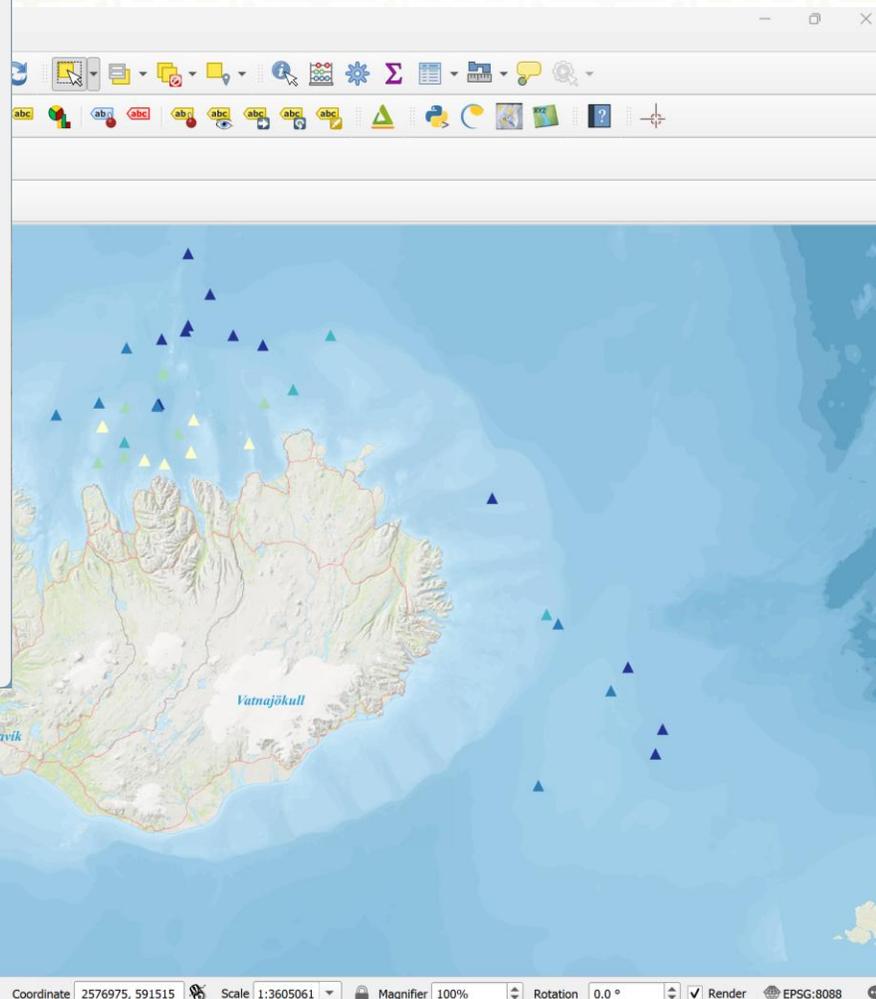
GEOMETRY\_NAME: geom

IDENTIFIER:

SPATIAL\_INDEX: YES

**Custom Options**

OK Cancel Help



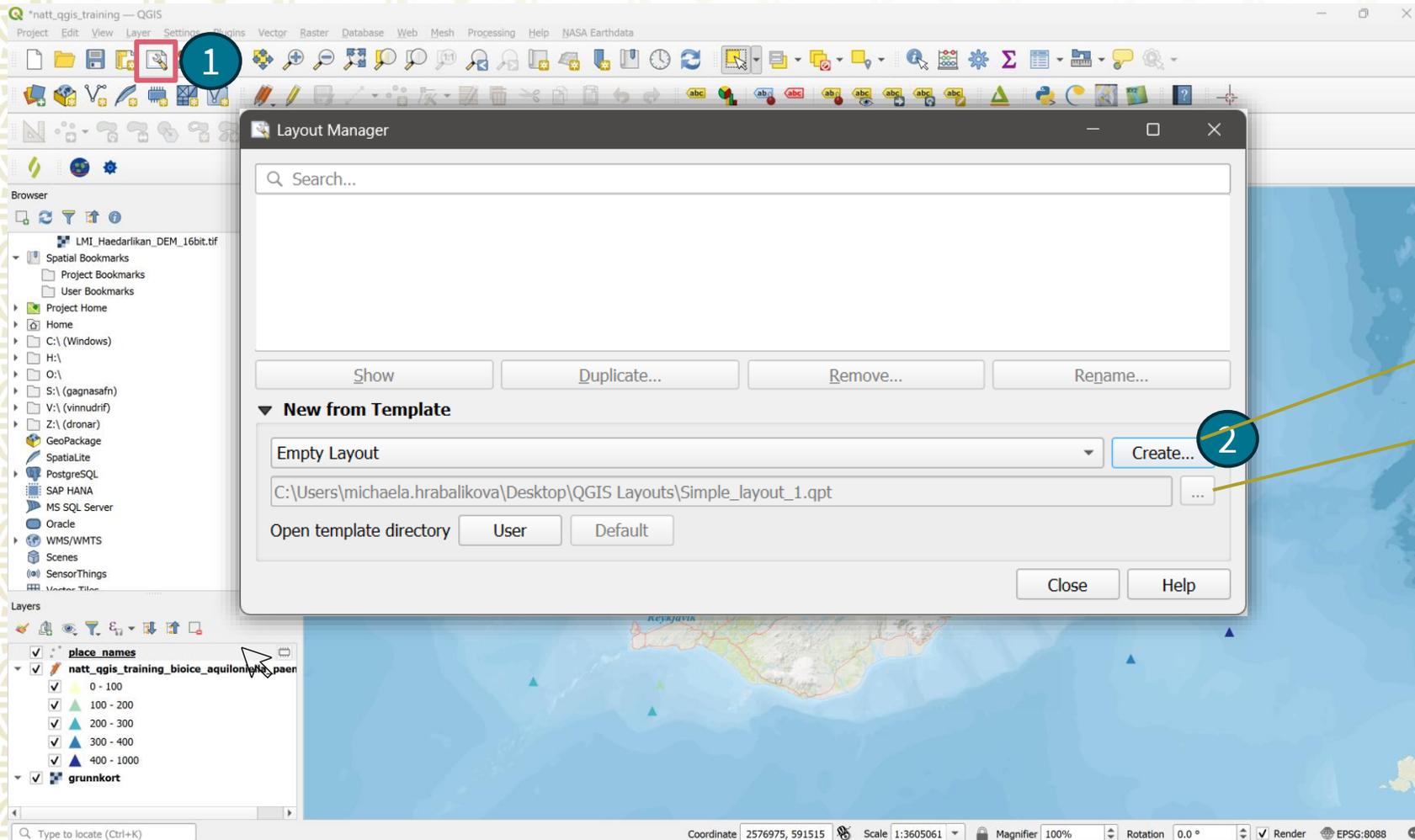
### Style the vector layer by Attribute Part three: Label by attribute

- You should now have a map with labels and stylized vectors
- If you like your label file, it is a good idea to save it in your working folder. Since it is a scratch layer, it will not be saved if you close the project.
- Right click on the layer, and select 'Make Permanent'.
- Save as a geopackage layer. Give it a name and save it in your working folder.



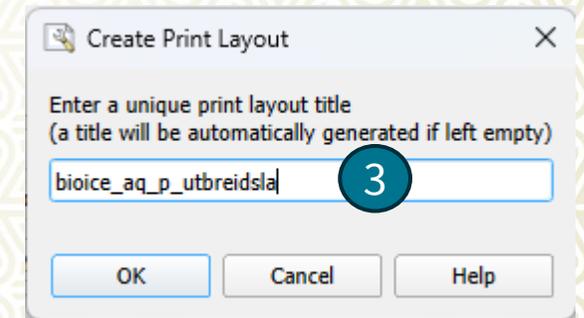
# WORKSHOP: Basic Vector analysis and map creation

## Layout Manager



Create a map  
Part one: open the Layout Manager

- Open the layout manager
- For this exercise, we will create a new layout by clicking here
- You can import a template here (future exercise)
- Give your print layout a name:

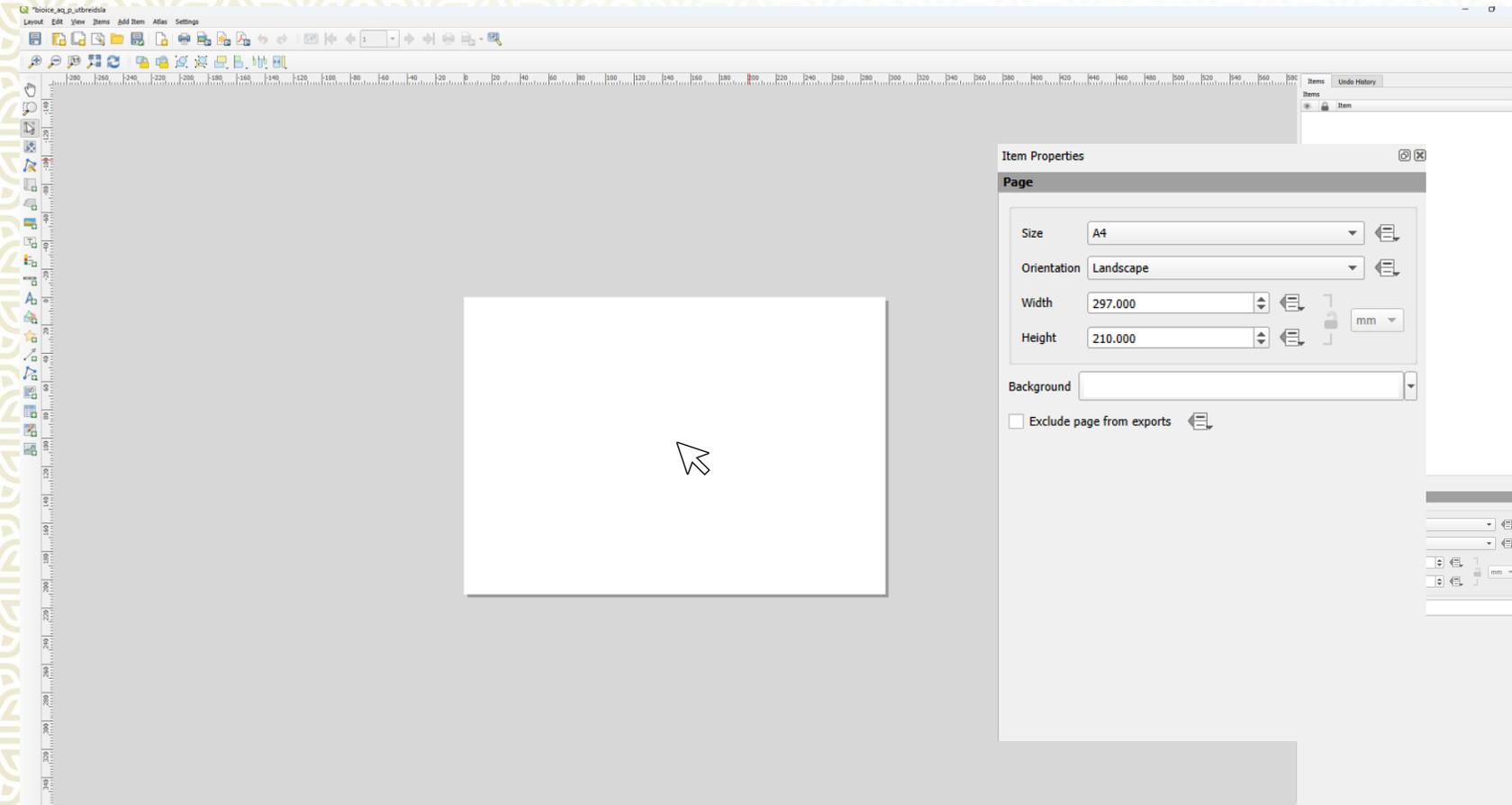




# WORKSHOP: Basic Vector analysis and map creation

## Create a map Part two: change map layout

- Right click on the empty map
- Choose the size and orientation.
- A5 is good for small figures in articles or reports – makes sure fonts are correct size
- A4 is a pretty typical size for full page figures
- A0 is good for posters or large format prints
- Portrait or Landscape, background color, etc

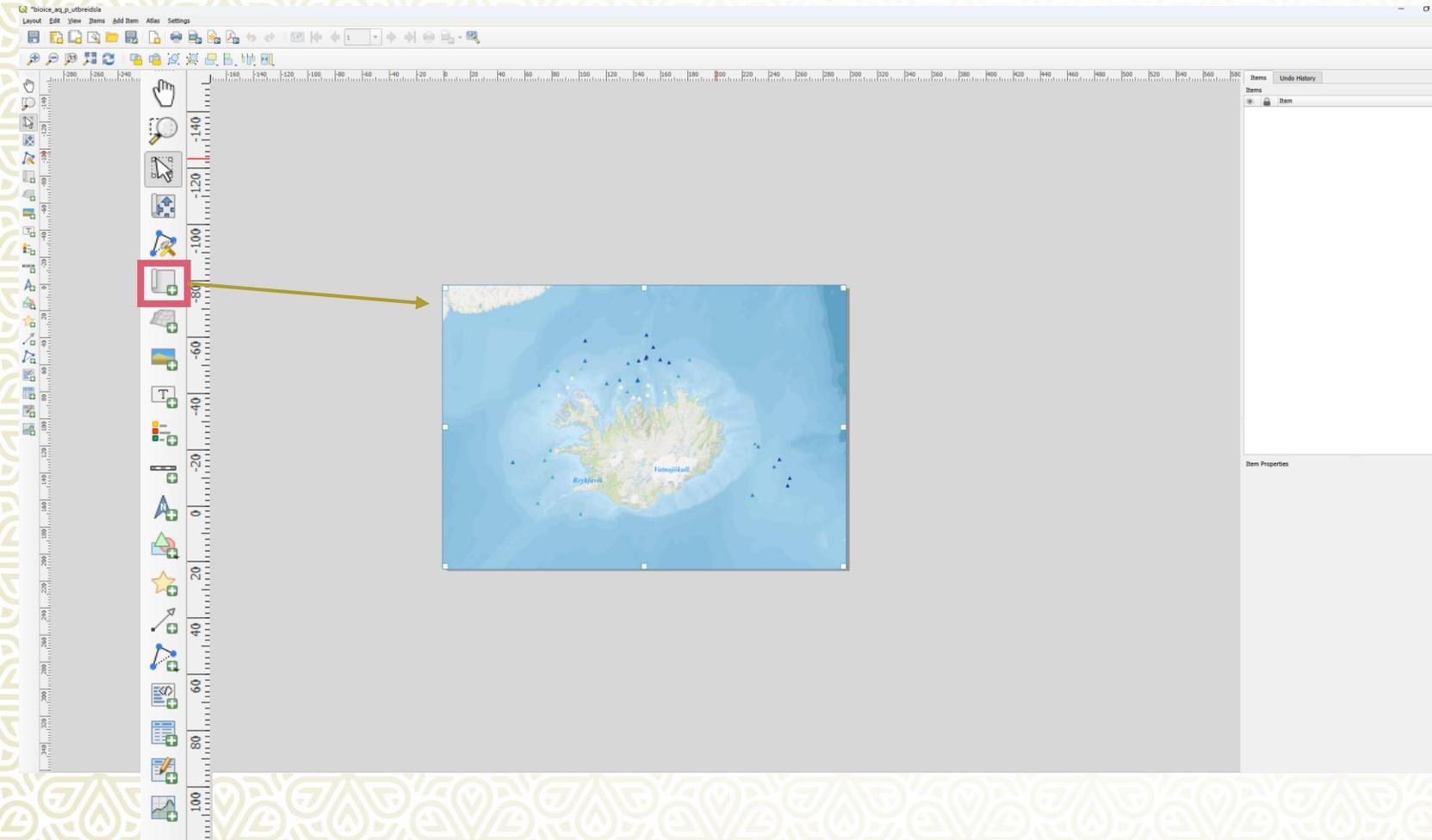




# WORKSHOP: Basic Vector analysis and map creation

## Create a map Part two: create a map layout

- Click on the add map symbol here
- Click and drag over the map layout to add the current view as the map

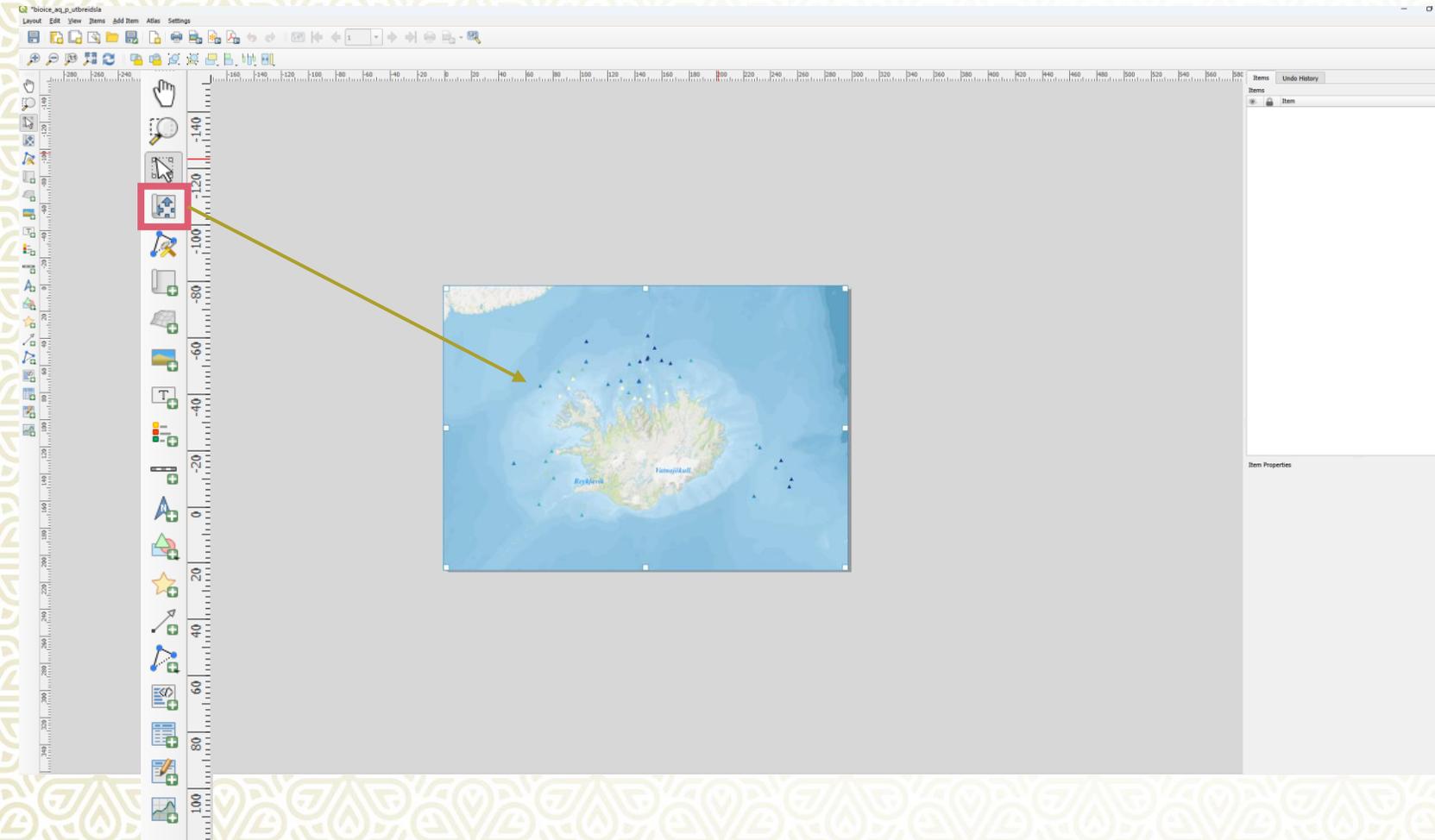




# WORKSHOP: Basic Vector analysis and map creation

Create a map  
Part two: create a map layout

- Move the map up, down, left right
- Zoom in or out

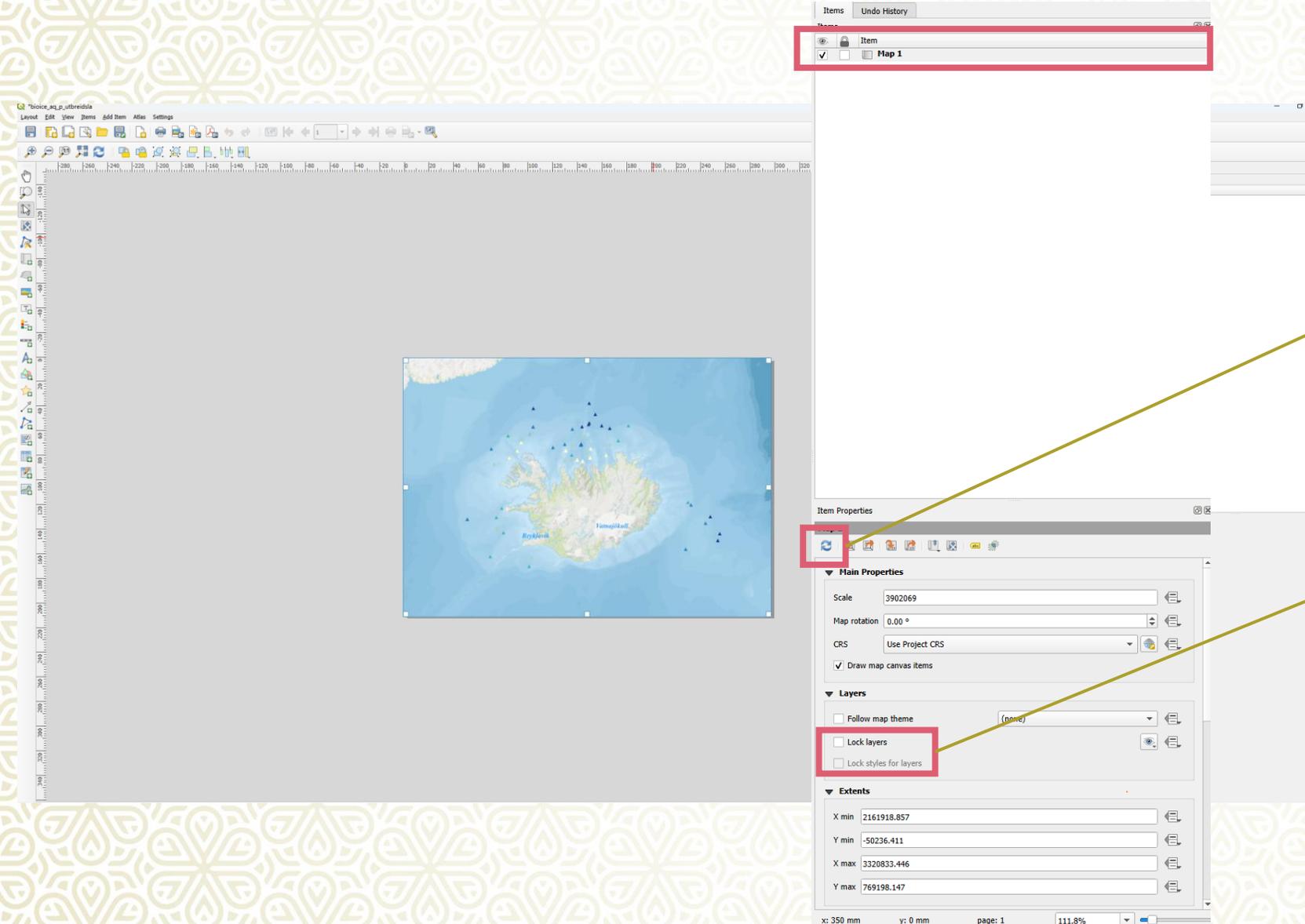




# WORKSHOP: Basic Vector analysis and map creation

Create a map  
Part two: create a map layout

- After selecting your map, in item properties (right panel), click this button to refresh the map – use this if you make changes in the canvas that you want to update
- If you don't want the map to change even while you work in the canvas, lock the layer(s) here

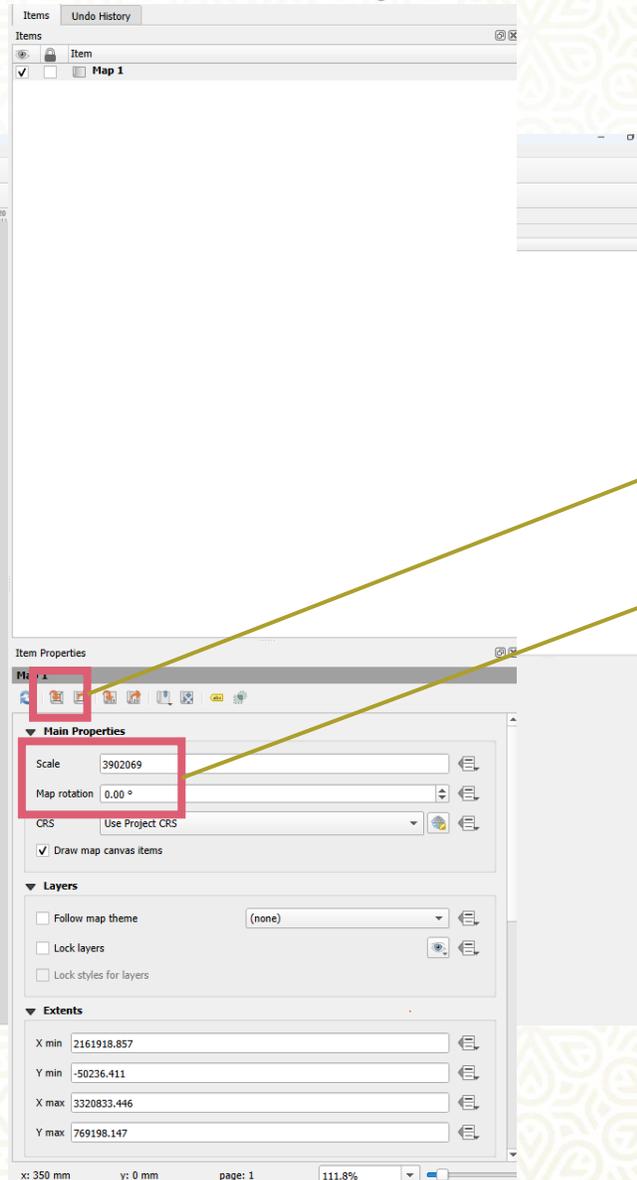
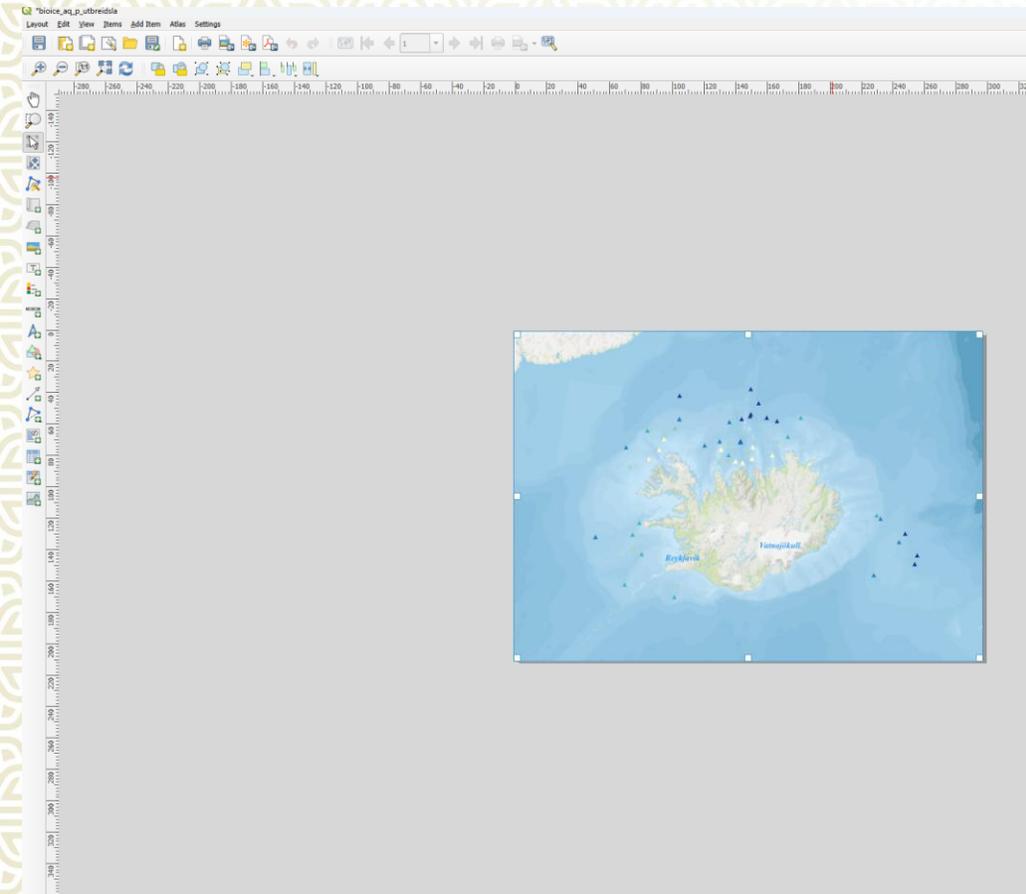




# WORKSHOP: Basic Vector analysis and map creation

Create a map  
Part two: create a map layout

- Use this button to grab the current canvas for the map
- Set scale or rotation (optional)





# WORKSHOP: Basic Vector analysis and map creation

## Create a map Part three: add scale bar

The screenshot shows the QGIS interface with a map of Iceland. A scale bar is visible in the bottom right corner of the map. The 'Item Properties' dialog box is open, showing the 'Scalebar' settings. The 'Map' dropdown menu is highlighted with a red box and set to 'Map 1'. The 'Scalebar units' are set to 'Kilometers', the 'Label unit multiplier' is '1.000000', and the 'Label for units' is 'km'. The 'Method' is set to 'Calculate along Middle of Map'. The 'Segments' section shows 'left 0', 'right 2', and '100.000000 units'. The 'Height' is set to '3.00 mm' and 'Right segments subdivisions' is '1'. The 'Subdivisions height' is '1.50 mm'. The 'Appearance' section is expanded, showing 'Position and Size', 'Rotation', 'Frame', and 'Background' options. The 'Variables' section is also expanded, showing a 'Global' variable.

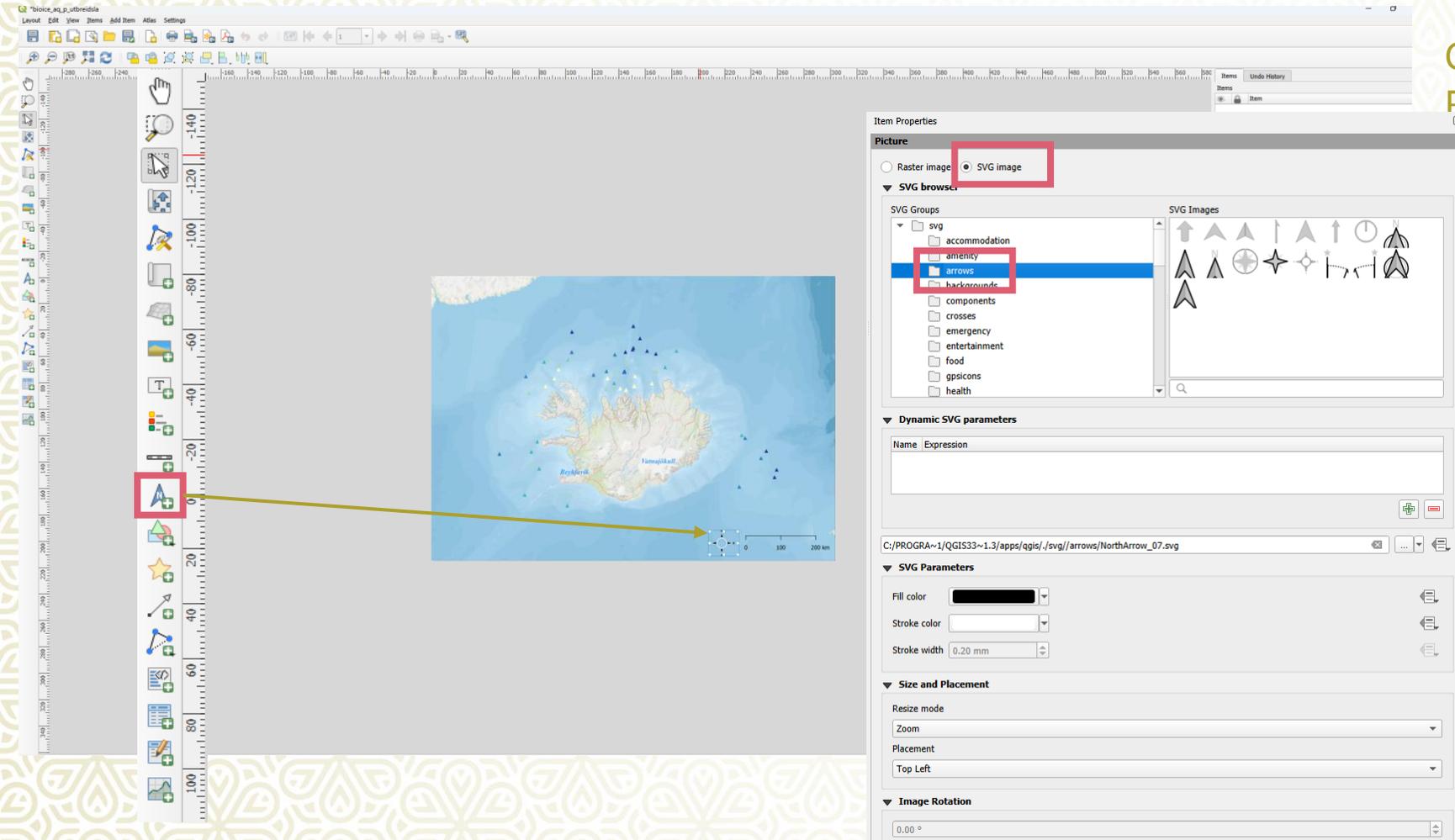
- When you click on your newly created scale bar, it will pull up item properties. Make sure your scale bar is linked to your map (Map1)
- In item properties bar on the right, you can choose:
  - Style
  - Units
  - Label /number format
  - Appearance/ color, etc
- Play around with these until you find a map you like.



# WORKSHOP: Basic Vector analysis and map creation

## Create a map Part four: add north arrow

- Click on the add north arrow button and click on the map where you want to create it
- If you click on 'Picture' – 'svg img', QGIS has several useful north arrows that you can choose from, choose one you like.
- Select your newly created arrow, and you can choose the style in the right-hand item properties panel





## WORKSHOP: Basic Vector analysis and map creation

### Create a map Part five: add legend

- Click on the add legend button and click on the map where you want to create it
- In properties, you can give it a name (optional)
- Uncheck 'Auto Update' from Legend items, and use the Plus and minus buttons to add or remove items from the list
- Play around with the style until you like it



## WORKSHOP: Basic Vector analysis and map creation

### Create a map Part five: add legend

- To change the ugly name 'natt\_qgis\_training\_bioice\_...', double click on it and it will open a new box where you can change it
- In this example, Depth was used as the category for styling the layer, so here you would label it 'Depth (m)'

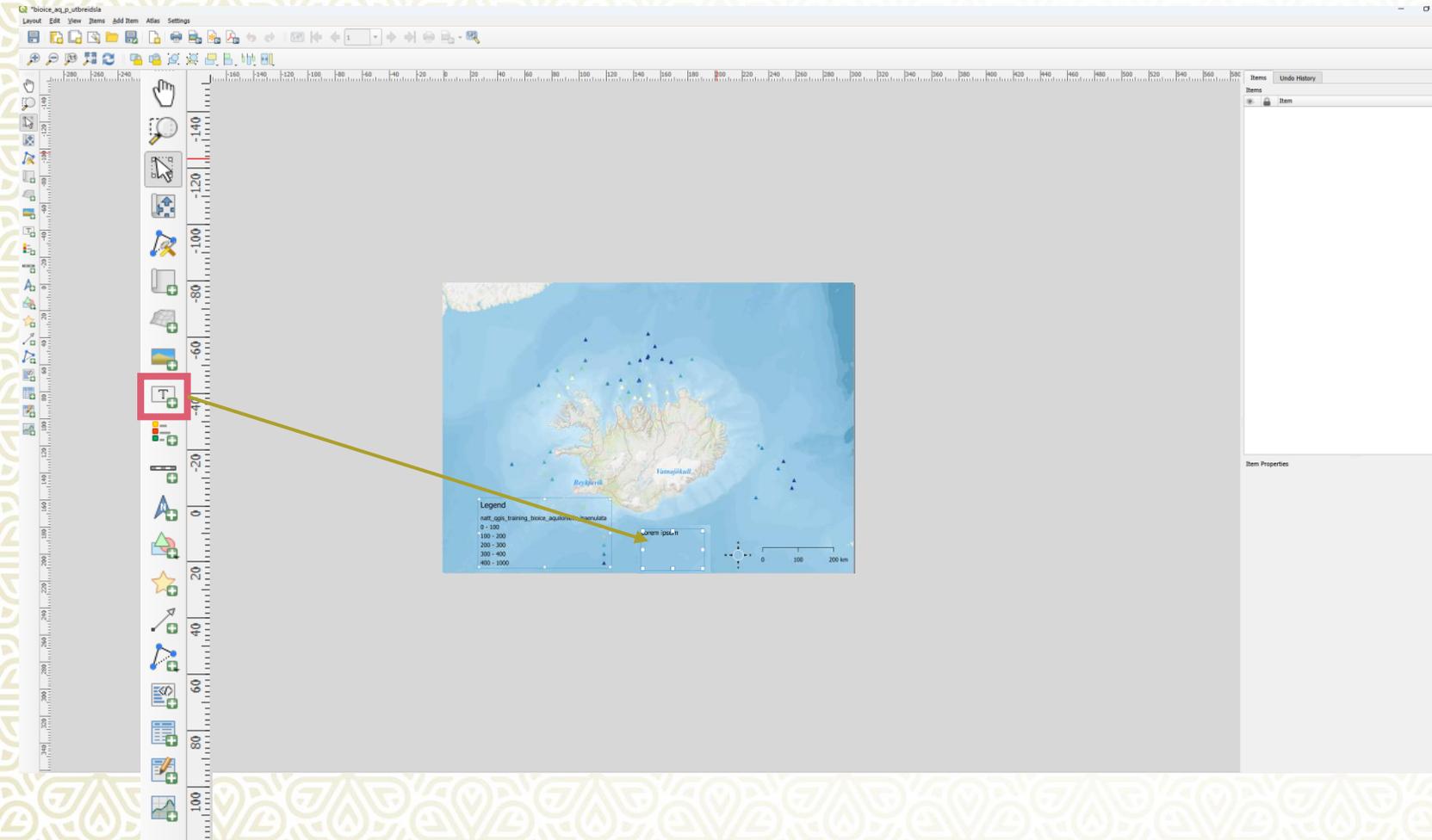
The screenshot displays the QGIS interface with the Legend Item Properties dialog box open. The dialog is split into two panes. The left pane, titled 'Legend Item Properties', shows the 'Label' field with the text 'Depth (m)'. The right pane, titled 'Legend', shows the 'Main Properties' section with 'Title' set to 'Legend' and 'Map' set to 'Map 1'. The 'Legend Items' section shows a list of items, with the selected item 'natt\_qgis\_training\_bioice\_aquilioniella\_paenulata' highlighted in a red box. A yellow arrow points from the 'Depth (m)' label in the left pane to the selected item in the right pane. The background shows a map with a depth scale from -140 to 100 meters.



## WORKSHOP: Basic Vector analysis and map creation

### Create a map Part six: add map information

- Click 'add label' button and click somewhere to add the relevant information to your map. What info you put, if any at all, will depend on the purpose of the map
- In this example, we will use CRS, name, and date.





## WORKSHOP: Basic Vector analysis and map creation

### Create a map Part six: add map information

- When your new text box is created, you can change it in item properties
- You can either manually type in the information OR you can add Dynamic Text dropdown (automatically updates/adds info)
- In this example, we added:  
**‘Dynamic text- Map properties – Map1 -- CRS Identifier (EPSG:8088) and ‘Dynamic text – Project Author’ and ‘Dynamic text – Current date’, but reformatted to dd MMMM yyyy**

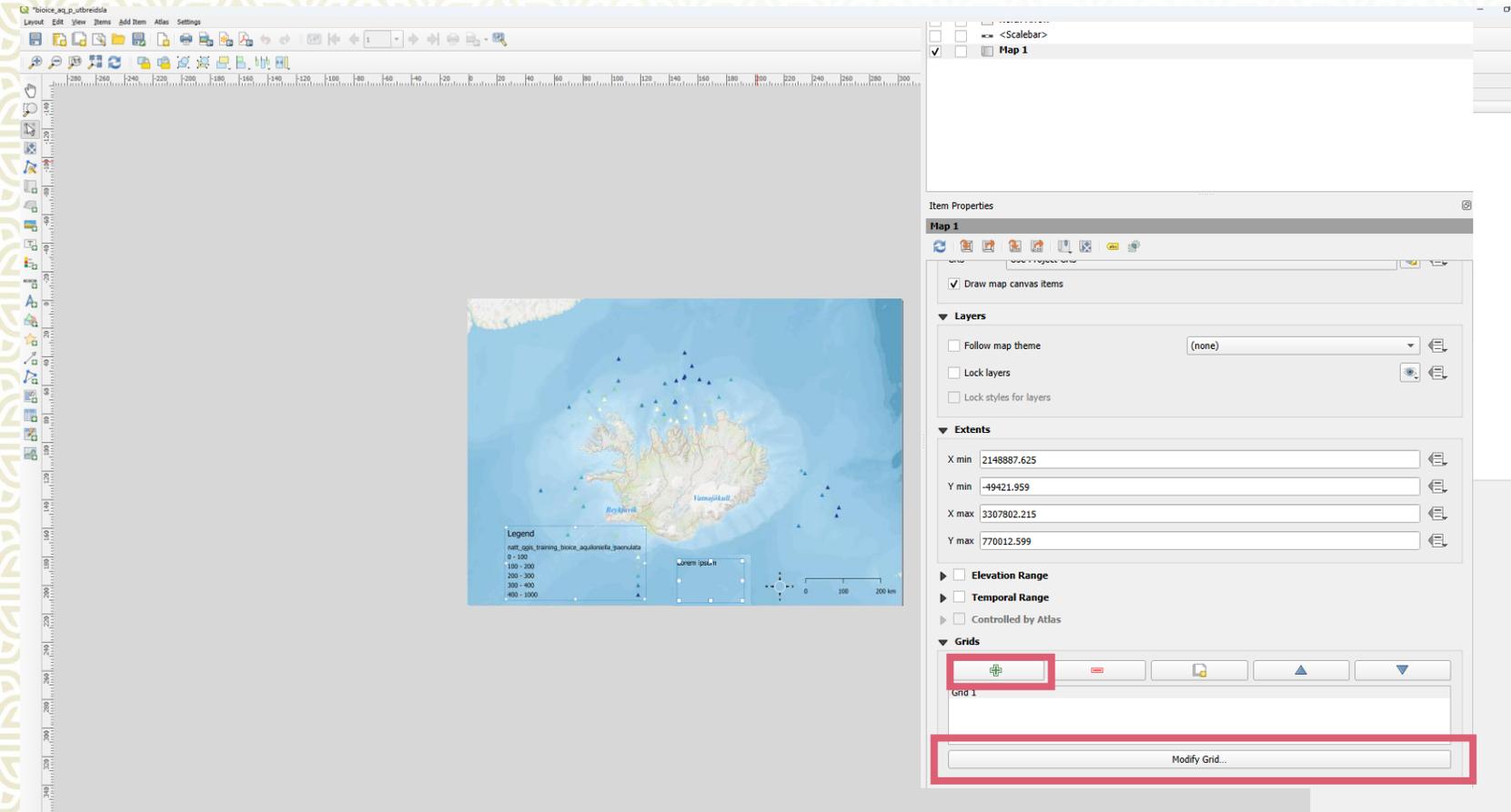
The screenshot displays the QGIS interface. On the left, a toolbar contains various icons, with the 'Text' icon (a 'T' in a box) highlighted by a red box. A yellow arrow points from this icon to a text box on a map of Iceland. The map shows a legend with categories like 'nátt. ogk. training\_basics\_áskorunir\_áherslur' and 'Lærari ísland'. On the right, the 'Item Properties' panel is open, showing the 'Label' section. The 'Main Properties' section contains a text box with the following expression: `[%item_variables('Map 1')['map_crs']%] | [%@project_author%][%array_to_string(map_credits())%] | [%format_date(now(), 'dd MMMM yyyy')%]`. Below this, the 'Dynamic Text' dropdown is selected and highlighted with a red box. The 'Appearance' section shows settings for font, margins, and alignment.



## WORKSHOP: Basic Vector analysis and map creation

### Create a map Part seven: add grid lines

- Last, you'll want to add gridlines to help the reader get context
- Select your map (Map1) then find 'Grids' dropdown menu.
- Click on the green plus to add a grid, then click 'Modify Grid..'





## WORKSHOP: Basic Vector analysis and map creation

Enable grid

▼ Appearance

Grid type: Cross

CRS: EPSG:4326 - WGS 84

Interval: Map Units

X: 7.000000000000

Y: 3.000000000000

Offset: X 0.000000000000, Y 0.000000000000

Cross width: 2.00 mm

Line style: [empty]

Blend mode: Normal

▼ Frame

Frame style: Interior Ticks

Frame size: 2.00 mm

Frame margin: 0.50 mm

Frame line thickness: 0.30 mm

Frame fill colors: [empty]

Left divisions: Latitude/Y Only

Right divisions: Latitude/Y Only

Top divisions: Longitude/X Only

Bottom divisions: Longitude/X Only

Left side  Right side

Top side  Bottom side

Follow grid rotation

Ticks alignment: Orthogonal

Skip below angle: 13.00 °

Margin from map corner: 99.99 mm

### Create a map Part seven: add grid lines

▼  Draw Coordinates

Format: Decimal with Suffix

Left: Show Latitude/Y Only

Inside Frame

Vertical Ascending

Right: Disabled

Outside Frame

Horizontal

Top: Show Longitude/X Only

Inside Frame

Horizontal

Bottom: Disabled

Outside Frame

Horizontal

Font: [empty]

Distance to map frame: 1.00 mm

Coordinate precision: 1

Follow grid rotation

- There are many ways to set up a grid, but generally you will want your grid labels to be in Lat/long (EPSG 4326)
  - This is standard for cartography
- Try setting your grid up the way it is set up here, but you can play around with the style if you want later



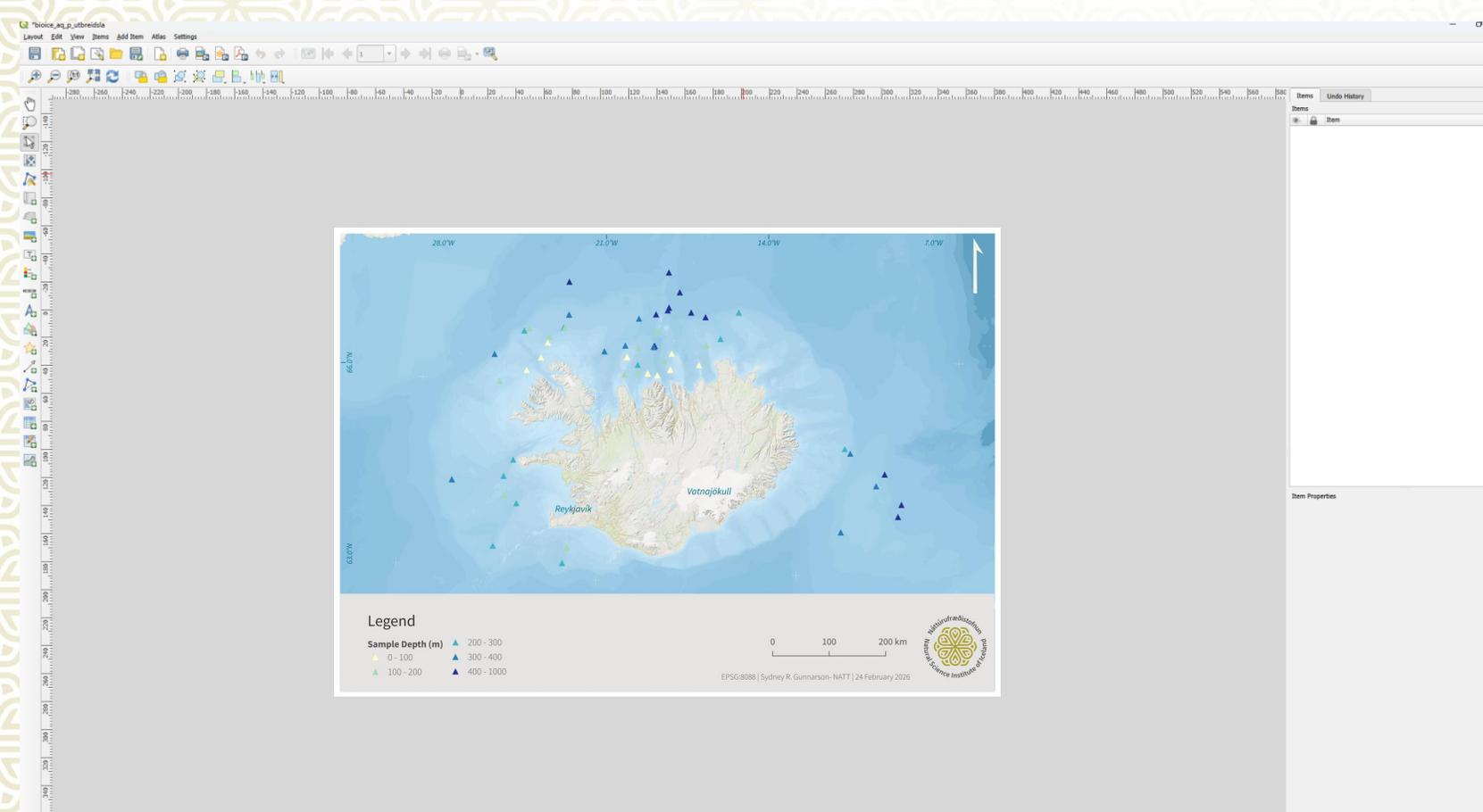
## WORKSHOP: Basic Vector analysis and map creation

### Create a map Part eight: make it beautiful

- Last, you can play around with the location of the items and map, fonts, sizes, etc.
- You can also add shapes with the add shape button on the left to create a box for your legend or information
- This is often up to personal choice. Choose a style that works for you

Some inspiration:

[https://hub.qgis.org/map-gallery/?page=3&sort=upload\\_date&order=desc](https://hub.qgis.org/map-gallery/?page=3&sort=upload_date&order=desc)

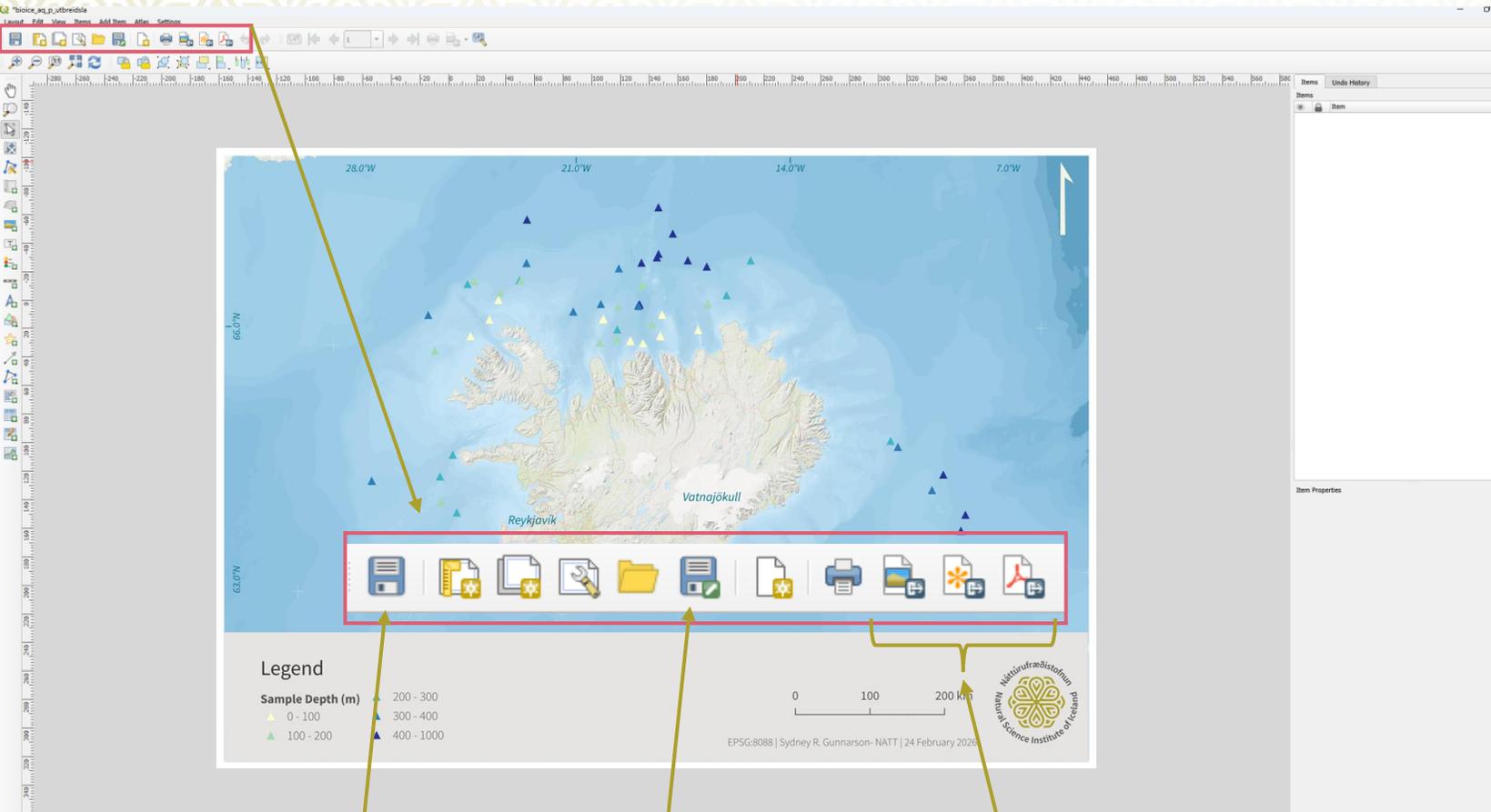




## WORKSHOP: Basic Vector analysis and map creation

### Create a map Part nine: Export the map

- Don't forget to save your map layout if you want to keep working on it (save button)
- You can also save this map layout as a template (save template button)
- You can export your map with one of these three buttons (PNG, SVG, PDF)



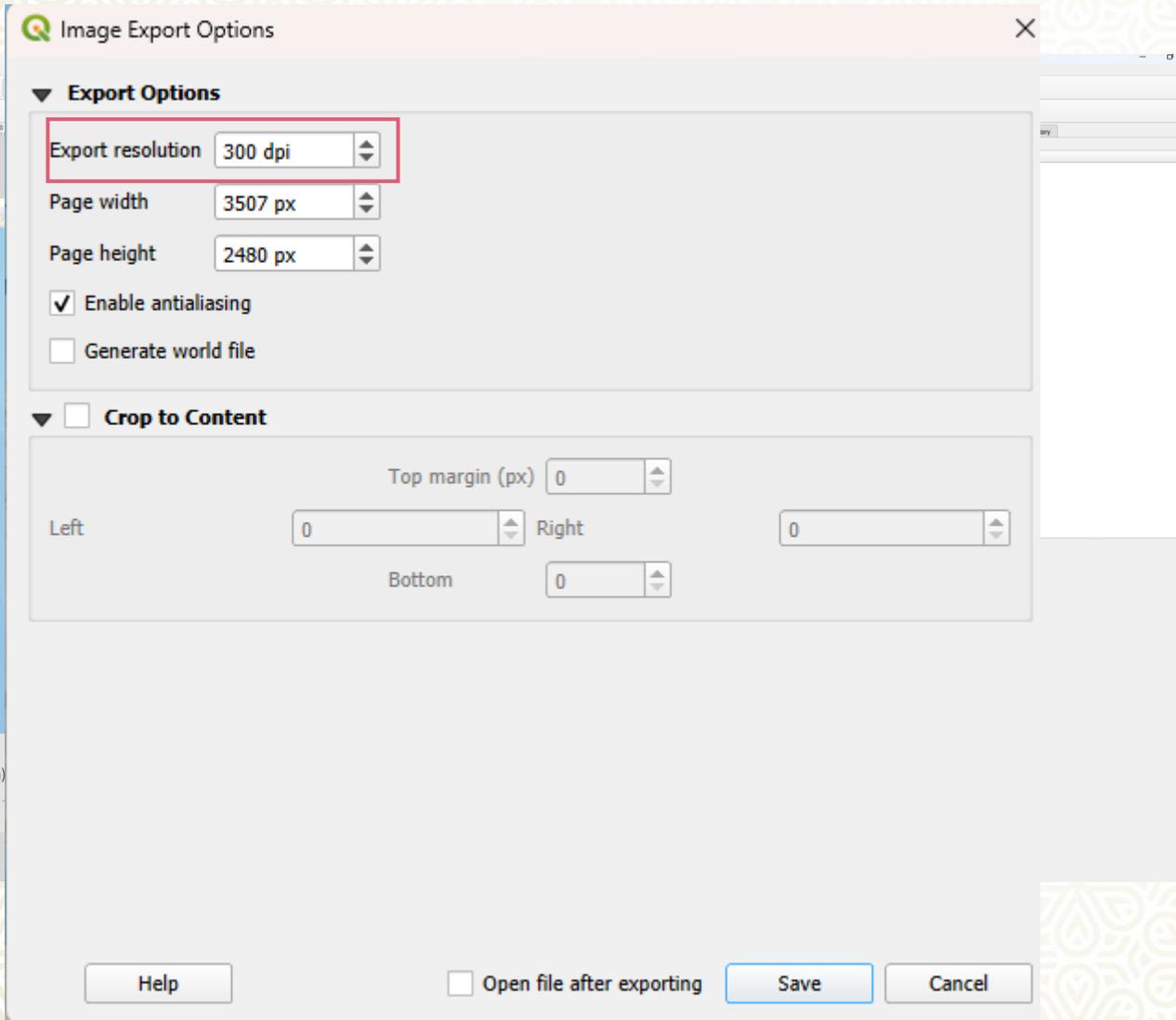
Save print  
layout

Save as  
template

Export map



# WORKSHOP: Basic Vector analysis and map creation

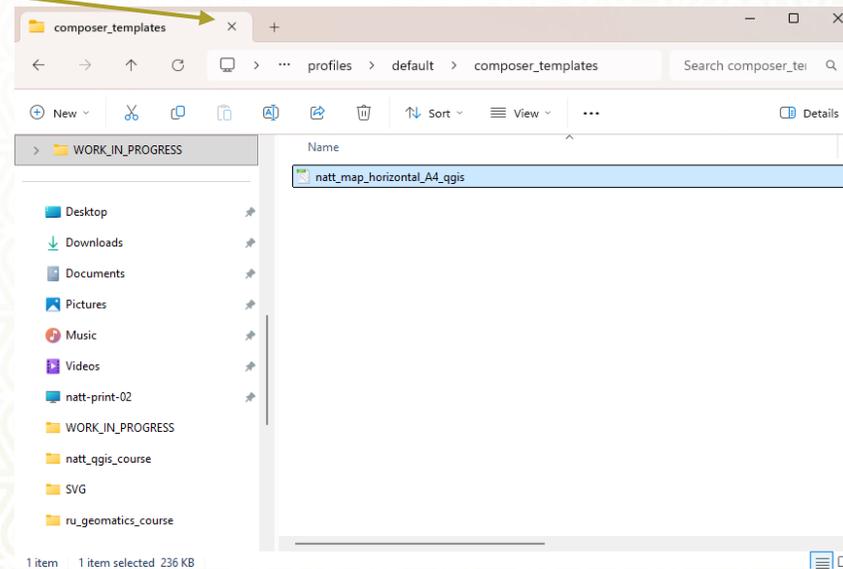
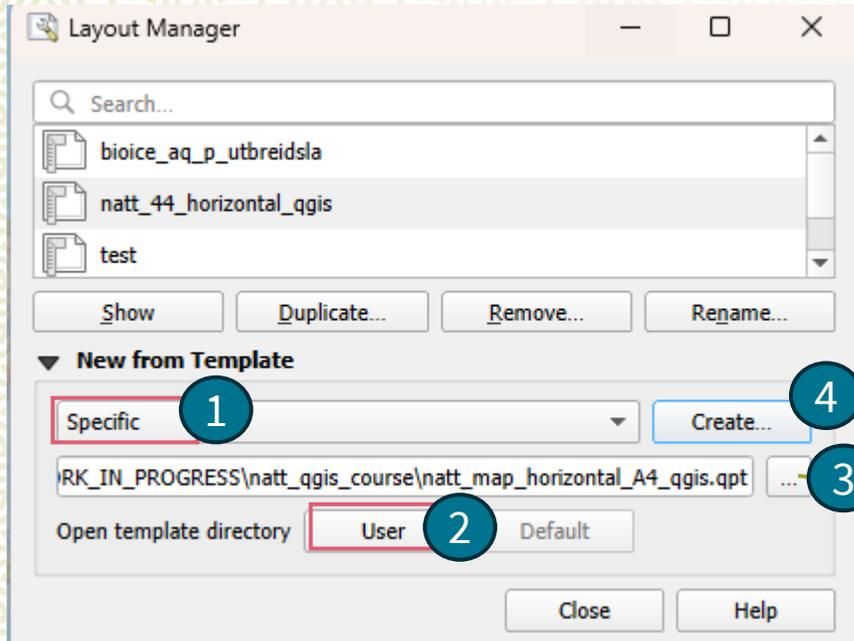


## Create a map Part nine: Export the map

- **Click export as PNG. Give the file a name. For this exercise export at 300 dpi.**
- For a figure in a report: Png, 300+ DPI, A5 format
- Scientific article: Varies, check journal requirements
- Powerpoint: PNG, A5 and 150 dpi
- Website/online: A4 or A5 and 90 dpi
- Full-page map
  - PNG or PDF, 600+ DPI, A4



## WORKSHOP: Basic Vector analysis and map creation

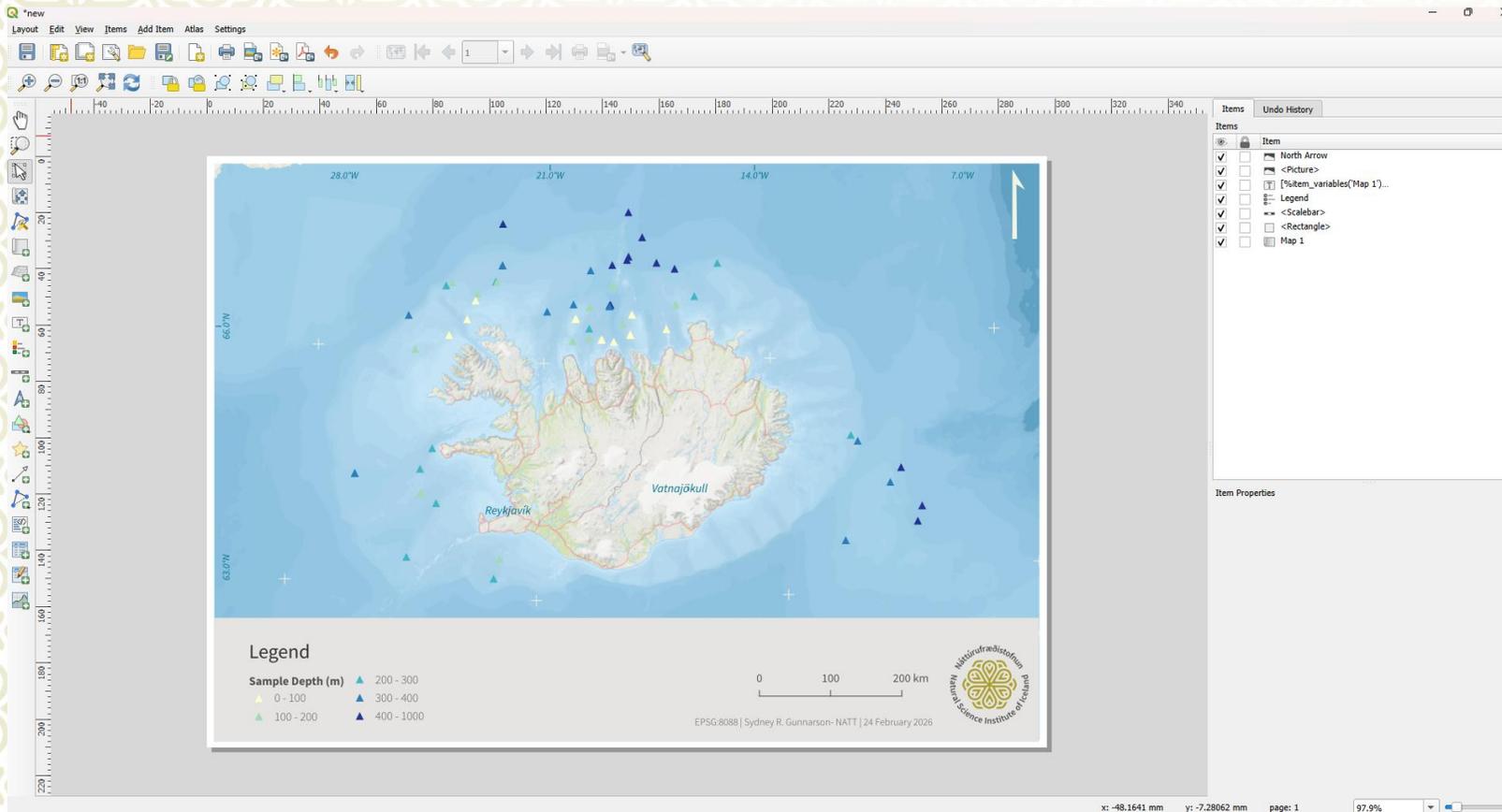


Create a map  
Part ten: Now try with a template

- Open print layout Manager again in the map canvas
- Under 'New from template' change type to 'specific'.
- Click 'User' to find your template directory. Copy and paste the style 'natt\_map\_horizontal\_A4.qpt' into this directory
- Now you should be able to open the style by clicking ... and selecting the template
- In the future, you can keep templates you make here



## WORKSHOP: Basic Vector analysis and map creation

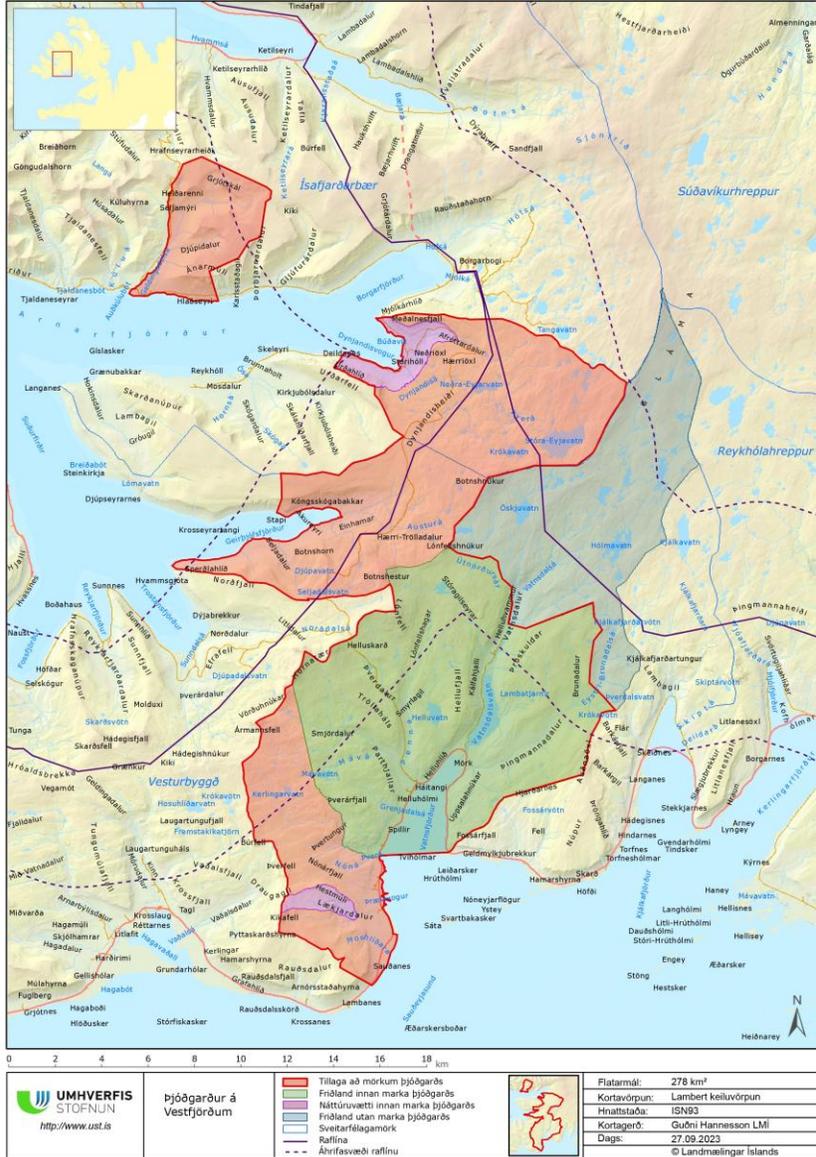


### Create a map Part ten: Now try with a template

- The Dynamic text updates automatically with the CRS, name, and date. The logo, grid, and scale bar are automatically included at the correct scale.
- Now re-style the map and legend using your new map template.
- Export your map as you did in step nine
- Compare the two maps together
- If you make the same type of maps often, templates can save a lot of time!



# WORKSHOP: Basic Vector analysis and map creation



Example map created for a client

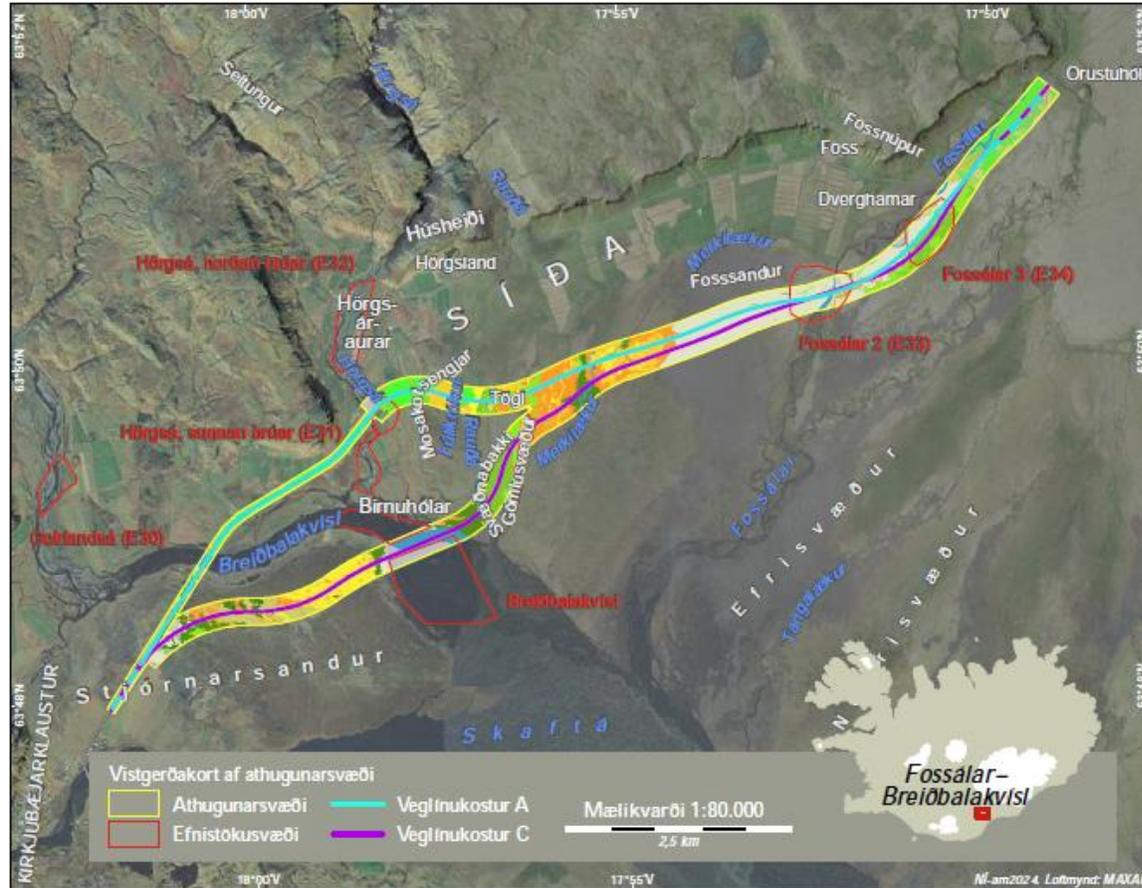
G. Hannesson, Nátt



# WORKSHOP: Basic Vector analysis and map creation

NÁTTÚRUFRÆÐISTOFNUN ÍSLANDS 2024

Úttekt á gróðri og fuglalífi vegna fyrirhugaðrar færslu  
Hringvegjar um Fossála og Breiðbalakvísl á Síðu



3. kort. Vistgerðarkort af athugunarsvæði veglína A og C um Fossála og Breiðbalakvísl. Svæðið miðast við 150 m belti út frá miðlinu vegstæðis (alls 300 m), nema þar sem línur fylgja Hringvegi en þar var 50

Example map created for an article

A. T. Meier, Nátt.