



Introduction to Point Data in QGIS - Instructor Guide

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Activity Summary

In this lesson, students will learn foundational skills for viewing and editing geospatial data using real-world examples. Using the colony locations of the thick-billed murre, a culturally important arctic bird, students will learn how to view point data, access and interpret the attribute table, and add new data points with attributes.

Learning Goals and Outcomes

Students will...

- Understand that data visualization helps people interpret the past and present.
- Develop an initial model that describes thick-billed murre data from Greenland.
- Be able to: Turn data layers on/off, access and interpret a vector attribute table, and create new data by adding a point.

Context for Use

Topic	Biology
Course Type	Curriculum
Audience	Middle/High School, Undergraduate
Instructional Time	60 minutes
Context	This lesson can act as a two-part stand-alone lesson for a middle or high school class, or as a singular introductory activity in a more comprehensive GIS class in an undergraduate setting. Students require little background knowledge beyond basic computer literacy.
Materials	Computers that have QGIS and QGreenland installed. See requirements at www.qgis.org . Students may work at a computer individually or in pairs.
Materials Prep	Instructor should be familiar with how to complete the QGIS exercises in the lab.

Description and Materials

Part 1

Warm-up and Introduction (15-20 minutes)



1. Prior to class, ask students to find produce or a food item that has a label showing where the food is from. They should bring that information to class with them. Be prepared with additional items or food packaging for students who do not have those items.
2. Ask students to add their location to a class list on a whiteboard or projected where every student can see. In groups of 2-3 students should then answer the question: what is the average “food miles” of the class (or the distance that our food has travelled from where it is grown to when we eat it)? Students should not use calculators, maps, or the internet to answer this question, only the list.
3. Ask students to now add their food location as a point to a class map of where their food item came from. Note: You can use a projected map of the Earth on a whiteboard for this or QGIS.
4. In small groups, ask students again to make a claim about what is the average “food miles” of the class, or the distance that our food has travelled from where it is grown to when we eat it. They should also answer the additional questions:
 - a. Make a claim: What is the average “food miles” of the class?
 - b. How do you know that? What is your evidence?
 - c. Did the list of places on the map make it easier to answer the question?
 - d. What is the average “food miles” of the class (or the distance that our food has travelled from where it is grown to when we eat it)?
5. Introduce the seabird species Murres to students and explain their importance to Arctic peoples. Murres are among the most abundant seabirds in the Northern Hemisphere, but populations have shown declines over the past three decades. The thick-billed Murres are the northernmost species of Murres, and climate change and reductions in sea ice are predicted to affect the populations of Murres.

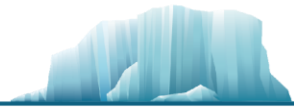
Part 2

Lab exercises (50 minutes total)

What are data visualizations for?

Note: These exercises can be split into separate activities for younger students.

1. Explain what geospatial data is to students, and share that the location points we created on our map are just one type of geospatial data. Other common types of geospatial data they may have encountered are satellite imagery, weather data, or street maps.
2. Introduce QGIS as a tool and QGreenland as a resource for interpreting Greenland data by showing the [Beginner's Tutorial Series Videos 1 and 2](#).
3. Exercise 1: Demonstrate and explain the following functions for students, then have students try the exercise on their own or in partner groups while completing the student guide.
 - a. How to open QGIS and QGreenland
 - b. How to turn layers on and off
 - c. Indicators of a point layer and what that means
 - d. Turn on the biology group then turn on the thick billed murre layer
 - e. Examine the dots that show up on the map



- f. Open the attributes table
 - g. Interpret the data in the attribute table
4. Exercise 2: Add Data. Demonstrate the following functions for students before asking them to try on their own or in partner groups.
 - a. Toggle editing on/off
 - b. Add a new fictional point to the thick-billed murre colonies layer with appropriate attributes in the table
 - c. Save edits
 - d. View and select the colony you added

Closing

Exit ticket (10 minutes)

Please see the exit ticket that is attached to the [student guide](#).

Teaching Notes and Tips

The student guide, linked below, contains two exercises. Each exercise is followed by questions that are written for students to work with other students and find answers together. The first exercise is focused on exploring what data and additional associated information (e.g., metadata) is stored in attribute tables that are connected to coordinate/spatial information for a point (or series of points) in QGIS. The second exercise gives students a hands-on lesson on how to add a point in QGIS. This exercise lends itself to a lesson on the importance of adding useful data and context to a GIS point so that the geographic point carries meaning.

Assessment

The end product your student should have is a point added to a map, which shows skill acquisition. The [student guide](#) contains an exit ticket with four questions that asks both comprehension- and reflection-style questions.

References and Resources

- Gandhi, U. (2019) *Working with Attributes (QGIS3)*. Available at: https://www.qgistutorials.com/en/docs/3/working_with_attributes.html (Accessed: 4 September 2026).
- QGreenland (2022) *QGreenland Beginner's Tutorial Series*. Available at: <https://www.youtube.com/playlist?list=PLSRiyMridUCwyu-vqpAFtm8bVERgTvs7q> (Accessed: 4 September 2026).
- The Wildlife Degree - University of Suffolk (5 May 2021) *QGIS - Adding data to points in the attributes table*. Available at: <https://www.youtube.com/watch?v=6hRBf1I2meU> (Accessed 4 September 2026).