

Finding a Piece of Quiet: Comparing Ecotourism in Iceland and the Galapagos Geoinquiry

STUDENT GUIDE

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Software Requirements: Esri's ArcGIS Online



Instructions: Follow the instructions and use the webmap url below to work through this advanced geoinquiry exploring different factors related to ecotourism in the Galapagos Islands of Ecuador and the country of Iceland. As you go through the different symbols will help guide you through the numerous stages of the exercise. A ? signifies a question that will need to be answered in the space provided. An ► signifies a set of instructions for you to follow in ArcGIS. And a ⓘ signifies a piece of contextual information to help guide you in the next portions.

Map URL: <https://arcg.is/0PGqvn>

Ask: What are the physical and human characteristics of ecotourism?

? What is ecotourism?

? What areas of the world would you expect to experience ecotourism?

► Open the webmap using the link above.

► Click on the **Bookmarks** option in the top bar on the right-hand side and select the *Galápagos Islands* bookmark.

? What types of geographic characteristics do you notice?

► Zoom in and out using the + and - buttons in the top left of the map.

? What are features about the Galápagos that become apparent at different scales?

► Click on the **Bookmarks** option in the top bar on the right-hand side and select the *Iceland* bookmark.

? What types of geographic characteristics do you notice about Iceland?

► Zoom in and out using the + and - buttons in the top left of the map.

? What are features about Iceland that become apparent at different scales?



Acquire: What role does physical location have on the number of tourists?

? What factors are going to contribute to the number of tourists who visit an area?

i The World Bank lists the countries of China/Hong Kong, Germany, the United States, the United Kingdom, and the Russian Federation as the source of the most international departures for tourism in 2018

◆ Use the **Measure** tool located in the top right of the tool bar, to measure the distance from the major city or capital of each of the places in the World Bank’s list to the Galápagos and then also to Iceland (to Reykjavik)

? Which tourism location (Iceland or the Galápagos) location is closest to all of the top tourism departure points?

i The distance lines curve due to the “great circle” and the fact that our planet is spherical

? Based on this information which location would you expect to have more difficulty attracting tourists?

◆ Change the basemap to **Dark Gray Canvas** by selecting the **Basemap** option along the top bar

◆ Turn on the layers *Top 20 Tourists to the Galápagos (2017)*, *Top 20 Visitors through Keflavik Airport (2019)*, and *Popular Flight Routes* by clicking the check boxes next to each of the layers in the **Content** menu.

? Click on some of the different icons that come up to determine the top 3 countries who send visitors to Iceland? and the Galápagos?

? IcelandAir offers an option for passengers flying from Europe to North America to extend their layover in Iceland for up to seven days. Why would a similar program not be an option for the Galápagos? [

Explore: What is the connection between economic development and ecotourism?

? What are some trends you notice about the main groups of tourists going to Iceland vs. the groups going to the Galápagos?

? What types of goods, services, and infrastructure does a country need to support tourism?

◆ Turn off all of the layers currently on in the **Content** menu.

◆ Sign in to ArcGIS by selecting the option in the top right corner of the map screen

◆ Add the layer *Gross National Income by country, 2014* from the Living Atlas. Instructions for adding layers from the living atlas are located in the How To box on the last page of this document.



► Explore the Gross National Income (GNI) of different countries by clicking on them on the map. Use the search bar in the upper-right side of the map to search specific countries

? What was the GNI of Iceland in 2014?

? What was the GNI of Ecuador in 2014?

? Which country is going to better be able to build infrastructure to handle large amounts of tourists?

? Why is GNI a good indicator for Ecotourism?

Analyze: What are the spatial relationships between Ecotourism sites and other locations?

i Instead of using the measurement tool ArcGIS has geospatial analysis tools to increase speed and accuracy of spatial analysis

► Add a filter to the GNI layer by hovering your mouse over the layer's name in the **Content** menu and selecting the **Filter** option.

► Edit the Filter already in place and Add the expression **Gross National Income per Capita, PPP is greater than 30,000** and then choose the option to **Apply Filter**.

► Follow the directions in the How to box on the next page to perform a **Centroid Analysis** for the filtered Gross National Income by country, 2014 layer. Name your new Layer **GNI_Centroid_YourName**

► Once it is completed, turn off the *Gross National Income by country, 2014* layer in the **Content** menu.

? Just based on visual analysis, what percentage of centroids appear closer to Iceland than the Galápagos?

► Add pins to the Galápagos Islands and Iceland by selecting the **Add** option along the top bar and choosing the **Add Map Notes** option from the drop-down menu. Title the new layer *Ecotourism Sites*. Center on Iceland by typing it into the search bar in the top right. Place a pushpin as close to the center of the country as possible and title the pin Iceland. Follow the same steps to place a pin in the Galápagos Islands.

► To do a proximity analysis, open up the **Analysis** menu and expand the **Use Proximity** option in the top bar. Select the **Find Nearest** option from the drop-down menu. Make sure that your *GNI_Centroid_YourName* layer is selected for option on and your *Ecotourism Sites (Points)* layer is selected for **option 2**. Keep the limit to 1 nearest location for **option 4** but deselect the checkbox that limits the search range. Change the resulting layer name to *Closest_Ecotourism_Site_YourName*. Before running the analysis uncheck the **Use current map extent** box then select **Run Analysis**.

? What is the only country' centroid that is closer to the Galápagos than to Iceland?



Act: How can geospatial data be used to make decisions?

? Given the geographic data, what are some things that Ecuador can do to increase tourism to the Galápagos?

? Why might the Galápagos not want to increase tourism?

? How can Iceland work to protect the environment while still supporting tourism?

? How can individuals use Ecotourism to support conservation of the world's pristine locations?

How To Boxes

Adding a Layer from the Living Atlas

- Open up the drop-down menu by selecting the **Add** option along the top bar
- Select the **Browse Living Atlas Layers** option to search layers in the Living Atlas
- Type in keywords of the type of information you are looking for into the search bar to bring up authoritative layers related to the topic

Create Centroids for Areas

- Open up the Analysis menu in the top bar
- Open the **Find Locations** drop down and then select the **Find Centroids** option
- Select the appropriate layer you want to perform the analysis on for option 1
- Change the resulting layer name to something you can easily identify
- Mind the Use current map extent box

Necessary Vocabulary:

Commercial Tourism: Visiting new places for the purpose of leisure. Encouraged by businesses for the influx of money from outside sources.

Ecotourism: Tourism to endangered/exotic natural areas with the intent to experience the natural environment and support conservation efforts.

Great Circle: Shortest distance to travel between two points on a spherical planet.

Gross National Income (GNI): The total amount of money earned by the population of an area. Calculated by combining Gross Domestic Product (GDP) and foreign income, and then dividing that by the population (known as *per capita*).

