

Learn ArcGIS

Guided lessons based on real-world problems

Measuring Global Hunger

learn.arcgis.com/



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Lesson Title

Time: 30 minutes

Overview

There are arguments both for and against the cultivation of cash crops in Africa. On one hand, growing crops for international trade could help countries earn more and ultimately enter the global economy. On the other hand, the more land devoted to growing export crops, the less land is used to grow food crops for the country.

One of the outcomes of this practice is that farmers who left their traditional livelihoods of subsistence farming to grow cash crops are starving. Undernourishment is the condition of not consuming as many food calories as necessary to meet energy requirements for the population. As a measure of hunger, undernourishment is a medically measurable condition that is primarily observed in Africa and Southeast Asia. But these regions are far from the only that suffer from hunger. In this lesson, you'll use United Nations Sustainable Development Goal data to compare hunger in the forms of undernourishment and food insecurity for the world's population.

In this lesson you will learn to:

- Access data from the UN Sustainable Development Goals portal
- Add Living Atlas data to the map
- Perform a spatial join in ArcGIS Online
- Visually compare patterns and trends

Step 1: Add data on undernourishment

1. Go to Sustainable Development Goal 2.c.1 <http://www.sdg.org/datasets/indicator-2-1-1-prevalence-of-undernourishment-percent>
2. Under **About**, click **Create Web Map**.
3. Sign in to your ArcGIS Online account.

The gray circles are countries that haven't reported data. Because all the data here is self-reported by the countries to the UN, it may be incomplete.

For the countries that have data, the percentage of the population that is undernourished is shown with graduated symbols. The larger the circle, the more prevalent undernourishment is in the country.

****What countries look like they have the biggest problem with undernourishment?**

****What countries haven't reported data?**

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There are lots of overlapping points on the map, so it's difficult to tell what each is showing. The best way to show this data for each country is as polygon features with graduated colors. To show this data with polygons, you first need to add polygon data to the map. Then, you can connect the data to the geography using a join.

4. Click **Add** and choose **Browse Living Atlas Layers**.
5. Search for **Countries** and add **World Countries (generalized)**.
6. On the ribbon, click **Analysis**. Under **Summarize Data**, choose **Join Features**.

A join is a way to combine your data, in this case based on location. You're going to connect the data values from the undernourishment dataset to the polygon shapes of the country layer. To do this, you'll use a spatial join, which means that the data for each point will be added to the polygon it overlaps.

7. For **Choose target layer**, make sure the **Countries** layer is chosen.
8. For **Choose layer to join to target layer**, choose the undernourishment data.
9. For **Select the type of join**, choose **Spatial Relationship**, and choose **Completely Contains**.
10. For **Choose join operation**, choose **one to one**.
11. For **Result layer name**, change the layer name to Undernourishment and add your initials.

Each layer must have a unique name.

12. Uncheck **Use Current Extent**. Click **Run**.

When the tool is finished running, the layer will be added to the Contents pane.

13. Turn off all the other layers.
14. Hover over the **Undernourishment** layer and click **Change Style**.
15. For **choose an attribute to show**, choose **Latest Value**.

This field has the most current reported data value for each country. If you want to explore the reported data values for individual countries, you can open the Attribute Table and select the country.

Like you did before, you still want to use a graduated symbology scheme.

16. If necessary, choose **Counts and Amounts (Color)** and click **Done**.

Most of the continent has data reported, and other than a few countries in the northeast, you should be able to draw some conclusions from this data.

****Now what countries look like they suffer most from undernourishment?**

****Does this line up with what you've read about/learned in class about hunger?**

Food access isn't just a problem across the Southern Hemisphere, where it appears most prevalent. Just because a different metric is used doesn't mean that developed countries don't have problems with hunger.

****Have you heard about hunger being a problem in your community?**

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Step 2: Compare food insecurity

To look at hunger in developed countries, we're going to look at a SDG measuring food insecurity. Food insecurity is not having reliable access to affordable and nutritious food. Access to food can be limited by many social and economic factors, from not having a car to travel to the nearest grocery store to not having enough money to buy groceries.

From the UN SDG site, pull up <http://www.sdg.org/datasets/indicator-2-1-2-prevalence-of-severe-food-insecurity-in-the-adult-population-percent>.

****What do you see on this map? Which countries have the highest rates of food insecurity?**

****What do you think different countries use different measures for hunger?**

Notice that there is more reported data from the US and Europe.

****Why do you think this is?**

****Why do you think food insecurity is important to pay attention to?**

If you have time, add this layer to ArcGIS Online and follow the same process to join the data to the World Countries polygon layer and look at how the patterns change.

Conclusion

Hunger is a problem all over the world, though it varies in both severity and the way it's measured. Undernourishment is undoubtedly more severe, and stems from different socioeconomic factors that should be addressed differently than food insecurity. But whether you're dealing with issues with the global economy forcing the cultivation of cash crops or not having access to fresh fruits and vegetables, remember that hunger is a global issue.