

Chapter 1

Introduction to Geography

> "...if a phenomenon can be mapped, it has some kind of relationship to geography."

What is Geography?

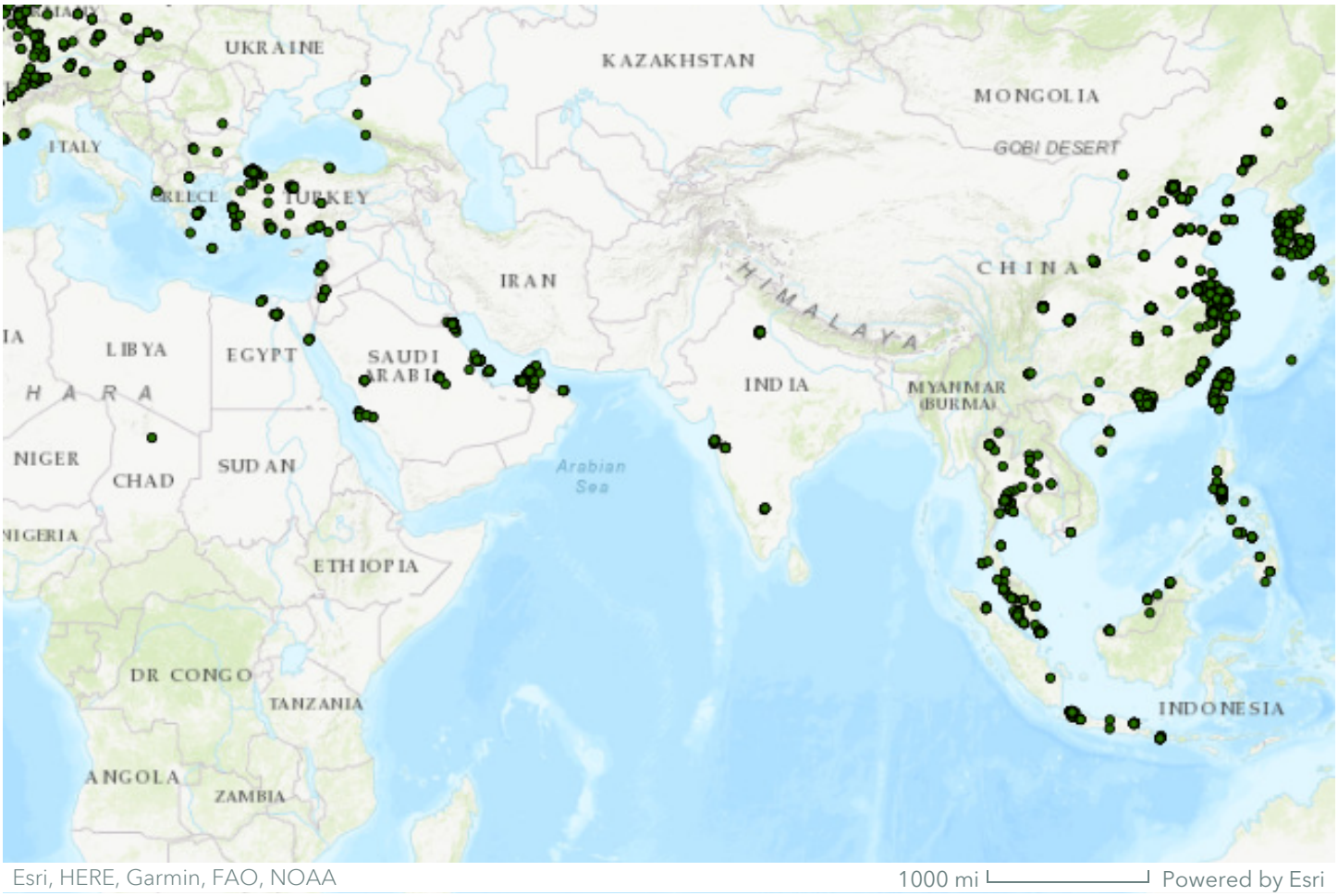
The study of phenomena that can be displayed on a map, is also known as the **spatial perspective**. Asking **what** is **where** and **why**.



Physical Geography:

Study of the locations of natural phenomena (e.g. plants, animals, hurricanes).

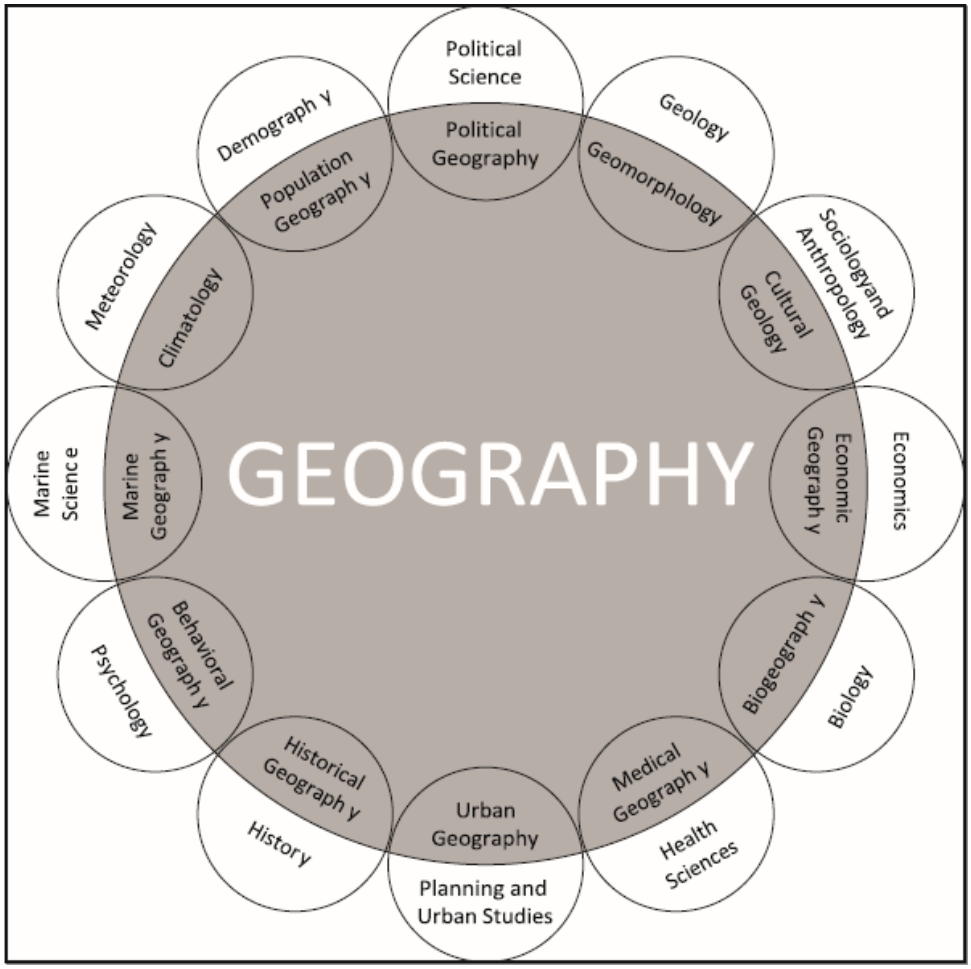
Right: Map of 4.5+ earthquake locations that occurred between 2021-08-14 00:00:00 (UTC) and 2021-08-21 23:59:59 (UTC) (Data source: USGS)



Human Geography:

Study of the locations of social phenomena (e.g. locations of businesses, languages) and how they may affect people's livelihoods and the environment over time.

Right: Map of locations of Starbucks in the world as of 5/6/2014. In what ways may a transnational corporation like Starbucks affect the global environment? (Data source: ArcGIS Online)



Subfields of Geography:

Geographers (e.g. biogeographer) work with other disciplines (e.g. biology) to understand the **locations** of different phenomena (e.g. plants, animals).

(Source: Corey Parson, Original Work, CC BY-SA 4.0)

Subfields of Geography:

An urban geographer works with police officers and city planners to map and understand the locations of different types of traffic collision over time.

Right: Map of different types of traffic collisions in Carlsbad, Vista, and surrounding areas between January 2018 and December 2018 (see interactive map at https://arcg.is/0jCPjf0) (Data source: UC Berkeley Transportation Injury Mapping System)

Describing your Location

There are different ways to describe your location, which include the use of:

1. Street address

2. Geographic coordinate grid

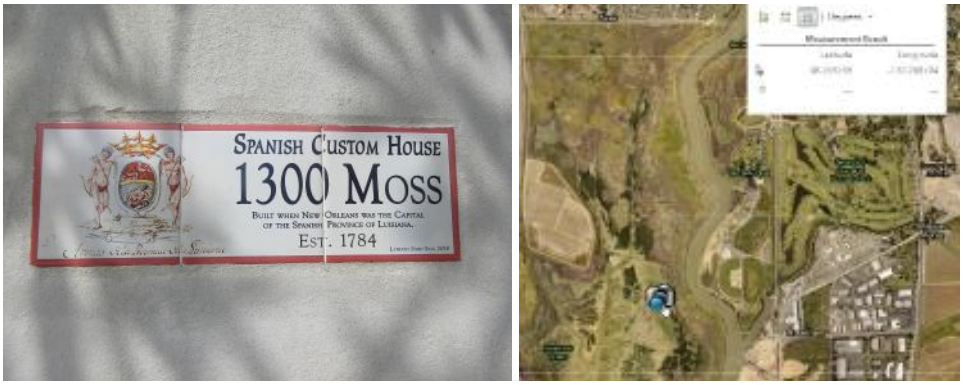
-Lines going from north to south are known as ***meridians,*** *the* ***prime meridian***

is a meridian that has a longitude measurement of 0 degree.

-Lines going from east to west are known as ***parallels,*** *the* ***equator***

is a parallel that has a latitude measurement of 0 degree.

-Any location can be described by its distance from the prime meridian (its ***longitude****) and its distance from the equator (its* ***latitude****).*



Locations can be described using addresses (left) or geographic coordinates (right) (Source: Information of New Orleans, CC BY-SA 4.0, via Wikimedia Commons)

3. Site is based on the physical characteristics (terrain, climate) of your location.

4. Situation is describing how your location relates to nearby cultural (cities) or physical (rivers) features.

> "Napa Valley is a valley in California and has an elevation of 7 feet. Napa Valley is situated nearby to Rocktram, close to Tulucay Creek." (Mapcarta)

Mapping the World

The spherical earth (or technically oblate spheroid) is flattened and shown on our flat maps in a process known as **projection**.

But this process of projection will create size, shape, distance, and directional distortions. Learn why in the video below.



Learn why all world maps are "wrong". (Source: Vox)

The **scale** of a map tells you what do the distances in the map mean in the real world.

See how the scale bar (in the lower right corner) in the map below tells you this information, and how it changes as you zoom in and out within the map.

Use your mouse to position the scalebar on the swimming pool and measure its width. Notice how the scalebar changes as you zoom in and out within the map.

Geospatial Technologies

Geographic Information Systems (GIS): Computer mapping system used to manage, display, and analyze spatial and attribute data used by archaeologists, city planners, environmental scientists, wastewater managers, and many other professionals. See how law enforcement agencies use GIS to analyze crime data and share them with the public below.

CrimeMapping.com - Helping You Build ...

We extract data from the existing records system at each participating law enforcement agency throug...

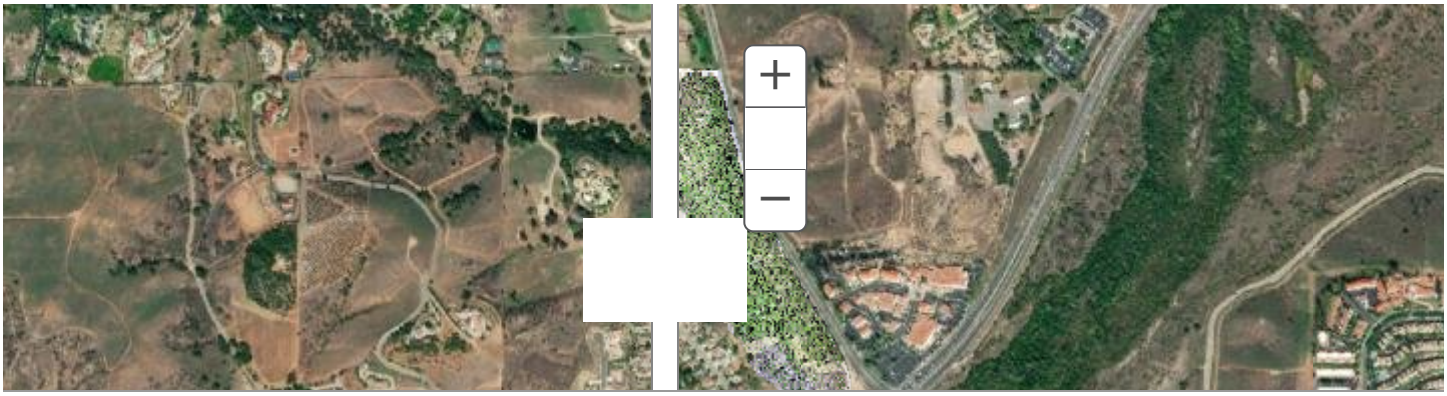
https://www.crimemapping.com/

Remote sensing: The acquisition of data from satellites, planes, or drones for the purpose of studying certain objects or phenomena without directly coming into contact with those objects or phenomena. It provides data that can be used in a GIS.

Lilac Fire's Impact on the Bonsall Reserve

Story Map

Before and after the Lilac fire which started on December 7, 2017 and destroyed 157 buildings.



1 Overview

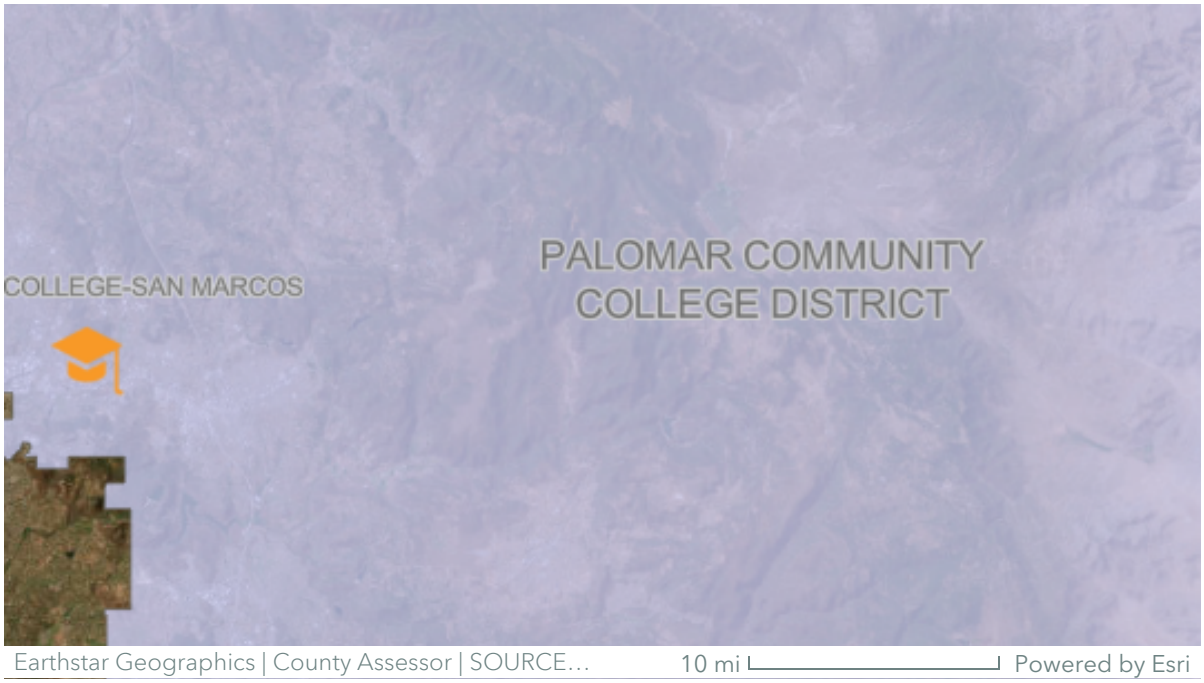
This is a side-by-side comparison of the physical qualities of the Bonsall Reserve before and after a fire that swept through the area.

Use the swipe tool in the center of the screen to see photos from a drone survey of the Bonsall Preserve in the aftermath of the Lilac Fire that started on December 7, 2017.

Cultural Regions

One way to generalize the complex world so patterns and trends can be discovered is by grouping places with certain things in common into a **region**.

Functional regions are made up of places that are connected to or governed by a **node** or central point.



Functional culture region of Palomar Community College District with the San Marcos campus as its core. (Data source: SANDAG)

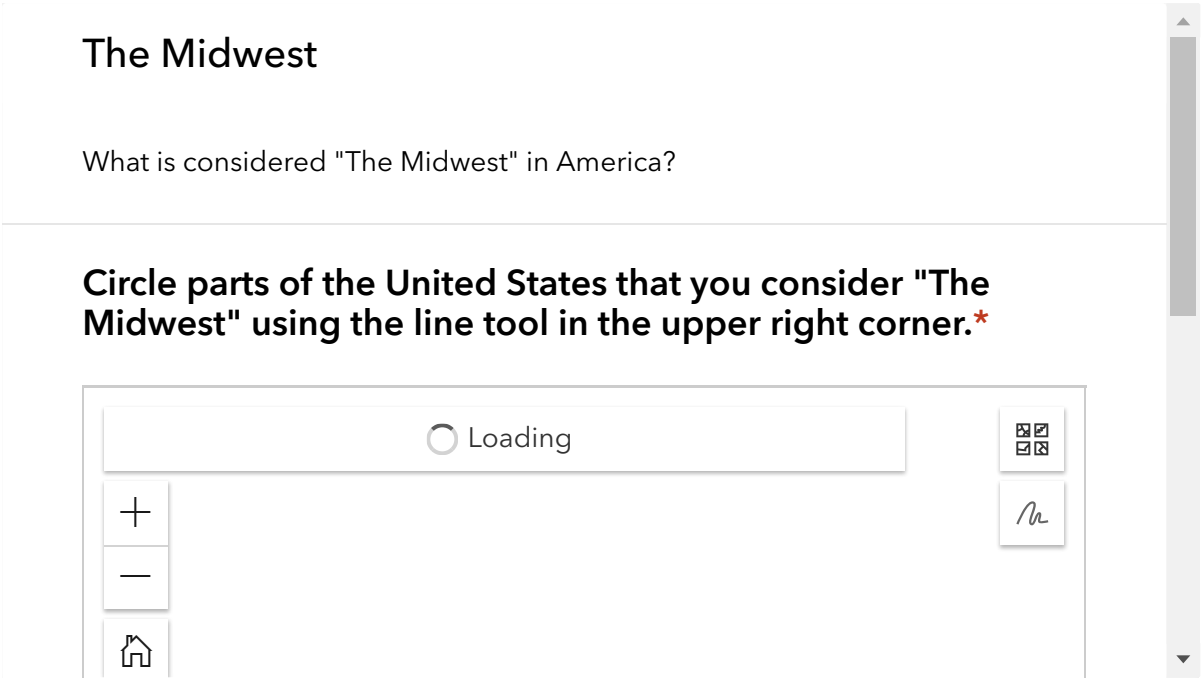
Formal regions are made up of places with one or more things in common.



Formal culture region of San Diego County with all areas of the region sharing a similar Mediterranean climate (hot and dry summers, and cooler and wetter winters). (Data source: SANDAG)

Vernacular regions are made up of places that share similar characteristics in people's minds, but may not be true and can

vary from one person to the next.



Complete the activity above using the line tool icon in the upper right corner, and I will share the results with everyone in my weekly announcement.

Cultural Diffusion

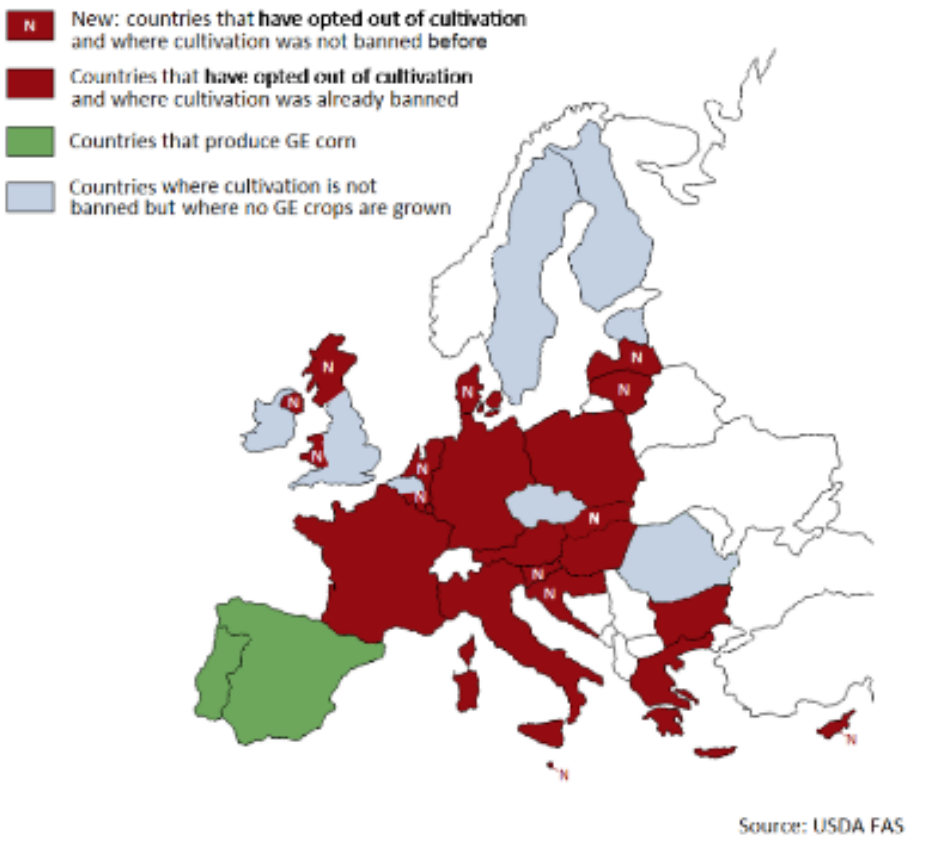
The spread of ideas, objects, inventions, and other practices to different places.

- **Relocation diffusion**: people bring ideas, objects, and inventions with them as they migrate or travel.
- **Contagious expansion diffusion**: the contagious spread of ideas, objects, and inventions to neighboring people or areas from a core area or epicenter.
- **Hierarchical expansion diffusion**: the spread of ideas, objects, and inventions in a leapfrog (skipping around) or stratified/ordered manner (from bigger cities to smaller cities).
- **Stimulus expansion diffusion**: some parts of an idea, object, or invention may successfully spread to a new area,

but other parts of it are simultaneously rejected due to cultural or environmental limitations in the new area.

At the neighborhood or city scale, COVID-19 may have spread from person to person through contagious expansion diffusion. But at the global scale, the spread of COVID-19 followed a hierarchical expansion diffusion pattern as seen in the video of cumulative COVID cases over time, where mainly populous countries with many travelers to/from China first experienced COVID outbreaks (e.g. USA, Canada, Australia) before other countries (e.g. Tanzania, Namibia, Congo). (Source: Johns Hopkins Coronavirus Resource Center)

Ideas, objects, and inventions are usually readily accepted in areas closest to the birthplaces where they were invented, but the rate of acceptance will most likely decrease in areas far away from the birthplaces and with the passing of time. This is known as **time-distance decay**.



*Some countries in the European Union (EU) (e.g. France) have laws that **completely** ban any genetically modified (GM) crops on their lands (example of **absorbing barriers**). Other EU countries (e.g. Spain) **partially** allow GM crops, but only the cultivation of a specific crop or tiny amounts (example of **permeable barriers**). (Source: USDA)*

Barriers to cultural diffusion can be complete/absolute in the case of **absorbing barriers**, or they can be partial in the case of **permeable barriers**.

Cultural Ecology: People and the Environment

Are people and cultures completely shaped and created by the physical environment as supporters of **environmental determinism** would have you believe?



Are all Hawaiians good swimmers and surfers because they grew up on islands surrounded by water? A surfer navigating a wave at Banzai Pipeline, North Shore of Oahu, Hawaii. (Source: Mandolin Davis, CC BY-SA 2.0, via Wikimedia Commons)

Or are people shaped by a combination of cultural forces (e.g. their religions, diets, traditions) and the environment as supporters of **possibilism** would argue? In other words, people can invent and use technologies to change the environment to some degree to provide for their needs.



Use the swipe tool in the center of the screen to see how Dubai's coastline changed in the 1990 satellite image (left) and the 2010 satellite image. You can learn more about these developments at Palm Jumeirah and The World. (Data source: Google Earth)

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

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Chapter 2

Population and Health

How Many of Us Are There?

You can see the US and World population figures in the figure below. In addition, pay attention to the **birth and death rates** in the US, and the list of the **10 most populous countries** in the world. Specifically, answer the following question:

- *Which two countries in the world have the most people? (Be sure to click the World Population tab)*
- *What are some of the things these countries have in common? (e.g. gender roles, economic development, size, location)*

U.S. Census Bureau Current Population

- U.S. Population
- World Population

Jan 08, 2023 01:50 UTC (+8)

Learn More | Download and Share

U.S. Population



The US Census Bureau population clock for the US and the world. (Source: US Census Bureau)

Lots of People, But Fewer Babies

China and India have over 1/3 of the world's population, but couples in these countries (and many other countries in the world) are having fewer babies compared to previous generations. Watch the following video to find out why.

China's economy: what's its weak spot?

The number of working-age people in China is shrinking. Could this threaten the country's rise as...

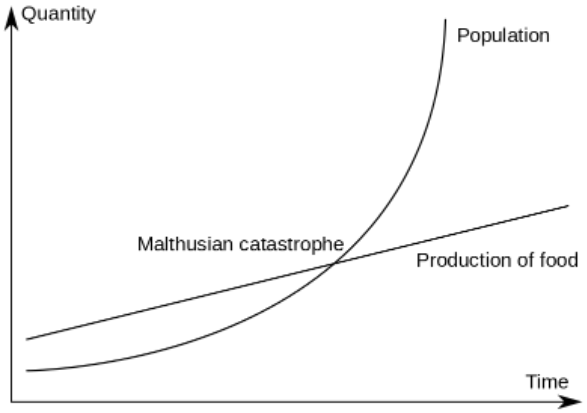
https://www.youtube.com/watch?v=zgDLl1tXd0s

The Population Debate

Do we have too many people on the planet?

> *"Population, when unchecked, increases in a geometrical ratio."* -Thomas Malthus





(Left) Thomas Malthus portrait, 1834. (Right) Malthus posited that the population will grow much faster than food production, eventually leading to starvation, wars, and diseases. (Source: John Linnell , CC BY 4.0, via Wikimedia Commons; Malthus_PL.svg: Kravietz derivative work (translation): Jarry1250, CC BY-SA 3.0, via Wikimedia Commons)

Why is Thomas Malthus' prediction wrong SO FAR?

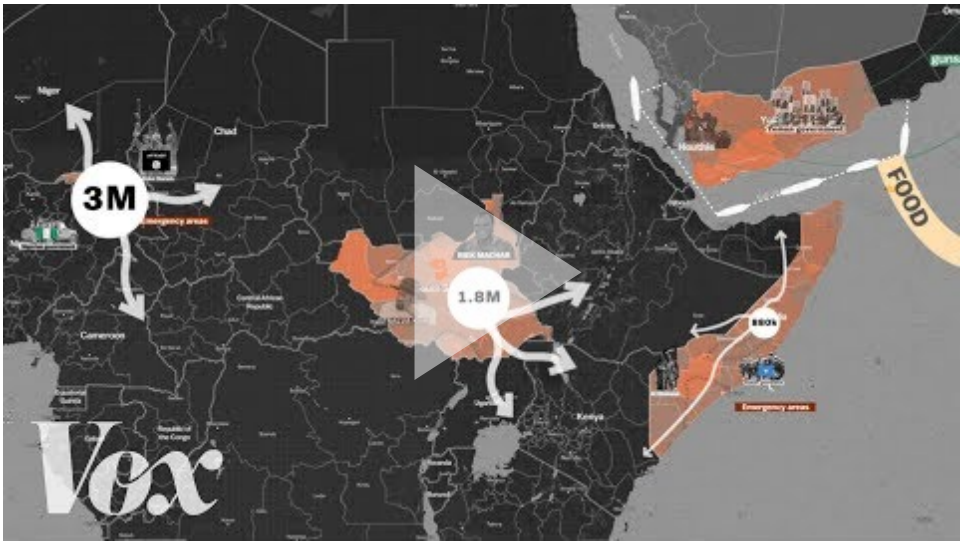
1. Birth rates fall as societies industrialize

- Children incur expenses (education, food) rather than generate income
- Social safety nets (social security) will take care of retirees rather than grown children
- More children will live to adulthood as the infant mortality rate decreases

2. Advances in farming and distribution technologies increase productivity and reduce spoilage

- Genetic engineering, synthetic fertilizers, pesticides
- Food transport, storage (refrigeration), distribution (canning)

Why do we still hear about famines today?



Wars in South Sudan, Nigeria, Somalia, and Yemen are threatening to starve 20 million people. In all four countries, it's war that's threatened to put 20 million people at risk of starvation. (Source: Vox)

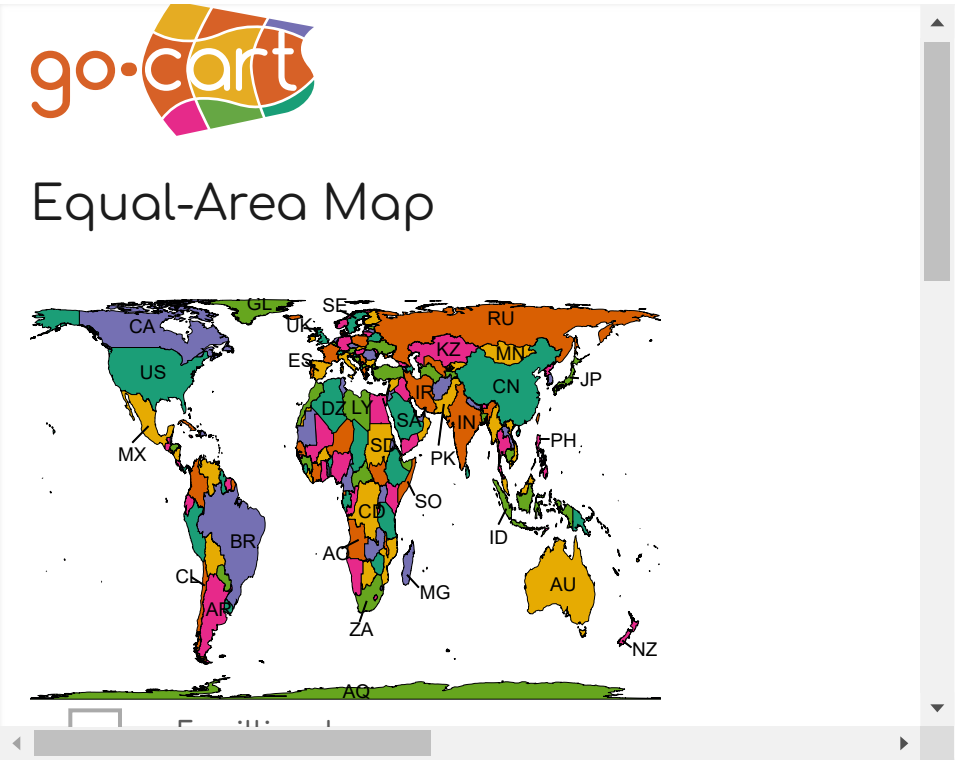
1. Countries/regions cannot produce enough food

- Lack of resources (quality land, water)
- Political instability

2. AND/OR cannot buy or receive much needed food

- Lack of money or political will
- Lack of infrastructure to deliver or receive food aid
- Political instability

Overpopulation results when a place or country fails to generate enough resources to support its population. Compare the size of different countries in the world with the number of people that they hold in the maps below. Note that some relatively smaller countries (e.g. India) have much larger populations than much larger countries (e.g. Australia).



A comparison of the average world map (left) where each country is drawn based on the size of its landmass, with a cartogram (right) where each country is drawn based on its relative population size.

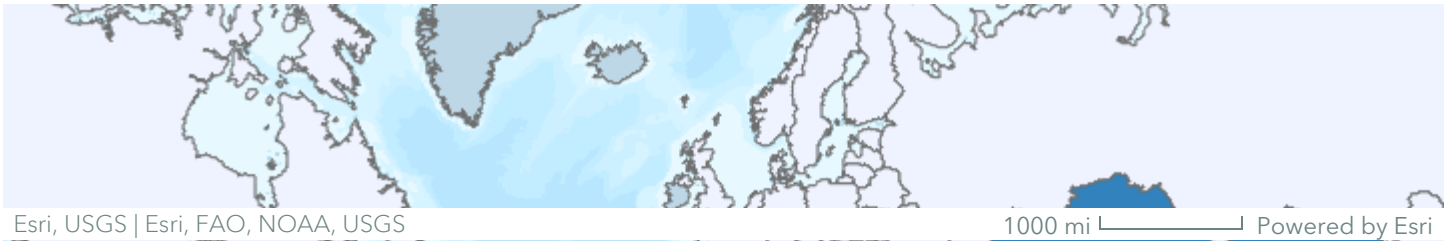
Measuring Population

The growth in the world's population has slowed over the years, but more so in some places relative to others. What does this mean for us?

Birth rate, crude (per 1,000 people)



Crude birth rate is the number of births per 1000 people in the world (or any place) in a given year. See how this rate has declined dramatically between the 1960s and today. (Source: The World Bank)



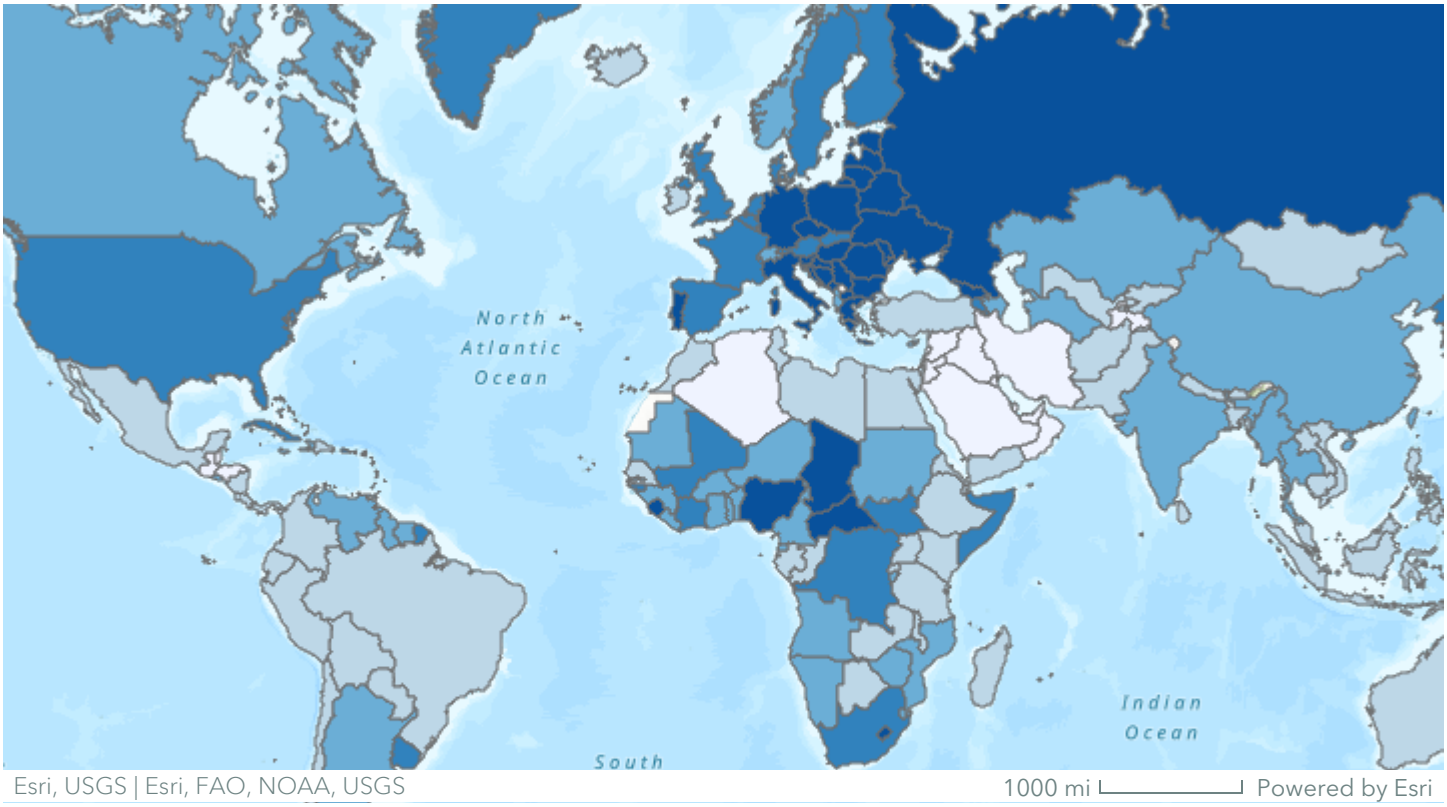
Look at the map of **crude birth rate** for different countries. Click on a country in the map to see its crude birth rate. (Data source: The World Bank)

Which continent in the world has the most countries with the highest crude birth rates?

Death rate, crude (per 1,000 people)



Crude death rate is the number of deaths per 1000 people in the world (or any place) in a given year. Much like crude birth rate, crude death rate has declined dramatically between the 1960's and today. (Source: The World Bank)



Look at this map of **crude death rate** in the world. Click on a country in the map to see its crude death rate. (Source: The World Bank)

Are the countries with high crude death rates the same as those with high crude birth rates?



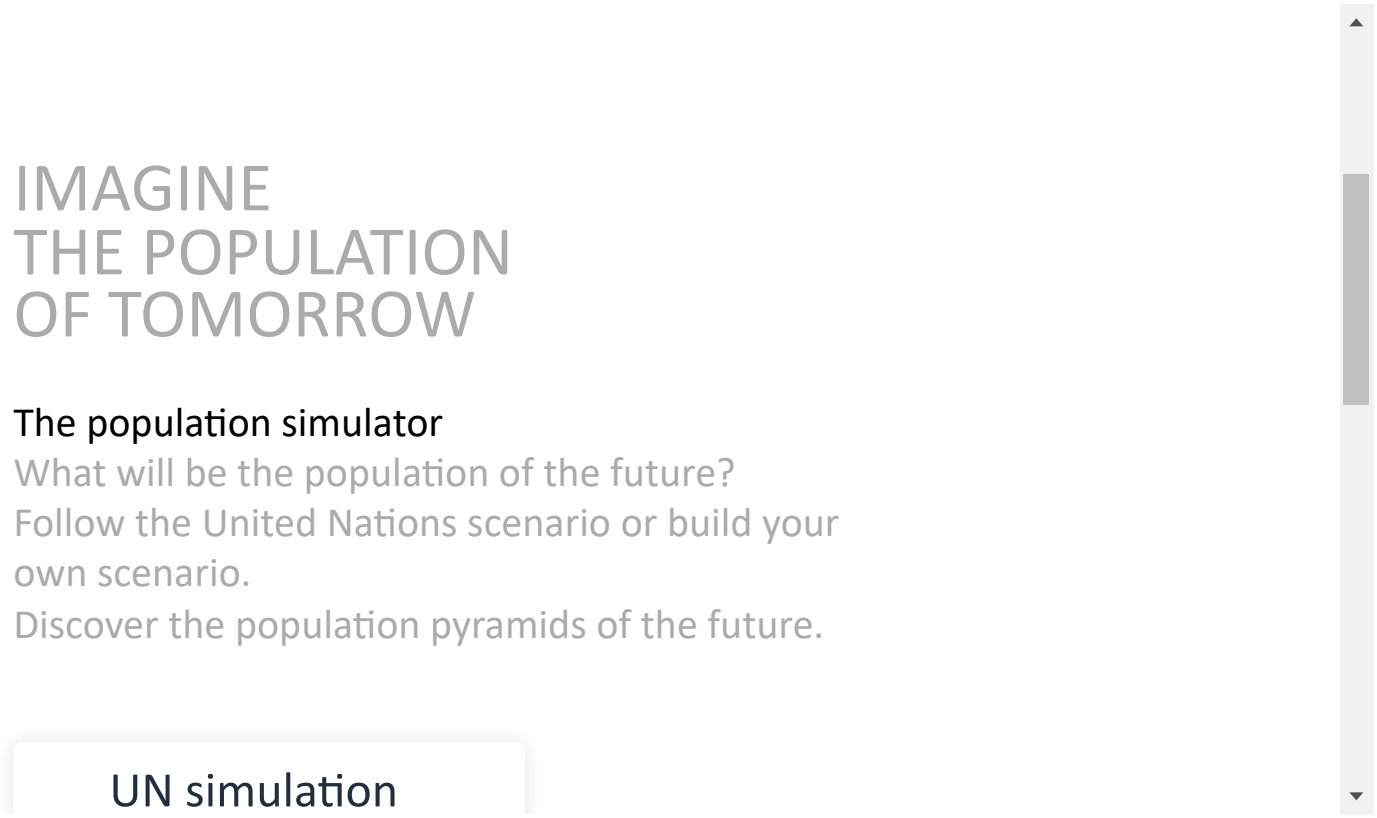
Infant mortality rate is the number of deaths that occurred in the first year of life per 1000 people in a country (or any place) in a given year. Countries with a high infant mortality rate tend to be underdeveloped, as they may not have the food, clean water, and healthcare to prevent the deaths of vulnerable infants. (Source: The World Bank)

Notice how countries with high infant mortality rates also tend to have high crude birth rates (see earlier map). Do countries with high infant mortality rates also have high crude death rates?

The **fertility rate** is the average number of children a woman has in her reproductive life (15-49 years old), but does not account for migration.

- *Economic or political instabilities may lead to higher fertility rates*
- *Having more educated and empowered women in the population may lead to lower fertility rates*

A population with a **fertility rate of 2.1** is considered to be at replacement level (stable).



*Click **Free simulation**, adjust the **Number of children per woman slider** (i.e. fertility rate), and click **START SIMULATION** to see how the total population of the world changes with different fertility rates. (Source: The Institut National d'Etudes Démographiques)*

The simulation above used a **population pyramid** to show the total population of a place, the population broken down by age groups and gender.

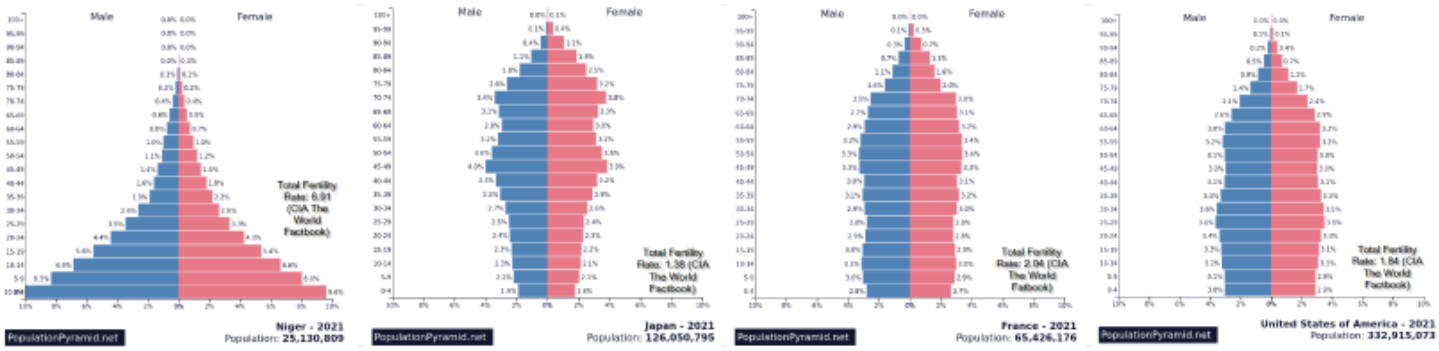
- High fertility rates (above the replacement level) will have pyramids with wide bases (Niger)
- Low fertility rates (below the replacement level) will have pyramids with narrow bases (Japan)
- Fertility rates near the replacement level will have pyramids that look like columns (France, United States)

Positive Population Momentum:

- Countries with pyramids with wide bases (Niger)
- Lots of young people
- Their populations will **continue to grow** in the future

Negative Population Momentum:

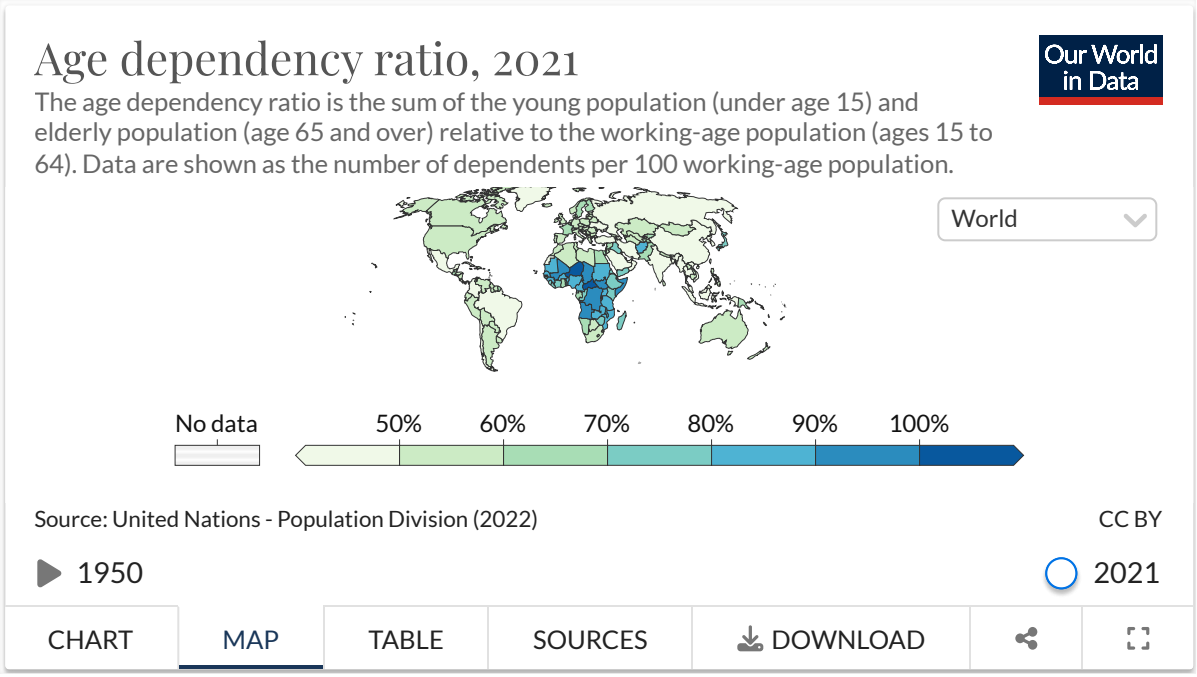
- Countries with pyramids with narrow bases (Japan)
- More elderly than youths
- Their populations will **continue to shrink** in the future



Comparison of the population pyramids of countries with positive population momentum (Niger), negative population momentum (Japan), and relatively stable population (France, United States). (Source: PopulationPyramid.net)

Age dependency ratio

- Comparison of the number of working people in a population (aged 15-64) versus non-working people (under 15, over 65)
- This ratio can help indicate if workers or social services (schools, retirement homes) are overburdened.
- This ratio may be unreliable because not all children necessarily attend schools, and not all elderly stop working at 65 years of age.



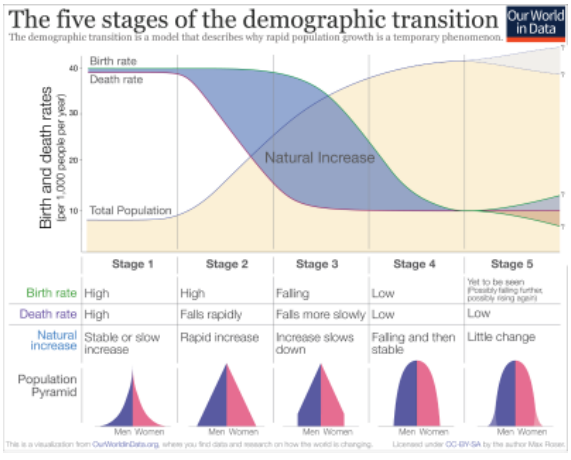
Click the play button at the bottom to see how the dependency ratio value changed across the world between 1960 and 2020 (Source: United Nations)

Population Through Time

The history of population change in most countries can be summed up in *five stages* of the **demographic transition model**:

- **I. Stage one** (*Pre-industrialization*):
- High birth, high death
- Farm labor, limited healthcare
- Stable population

- **II. Stage two** (*Early-industrialization*):
- High birth, decreasing death
- Better access to food, medicine, and sanitation
- Rapid growth in population



The five stages of the demographic transition summarized (Source: Our World in Data)

- **III. Stage three** (*Mature-industrialization*):
- Decreasing birth, decreasing death
- Rising cost of childcare in cities

- Slow growth in population

- **IV. Stage Four** (*Late-industrialization*):
- Low birth, low death
- Stable population

- **V. Stage Five** (*Post-industrialization*):
- Unknown birth (country dependent), low death
- Stable population

Describing People's Impact on the Environment

The **ecological footprint** is the amount of natural resources (e.g. farms, fishing grounds, built-up land) needed to support a population.

Carrying capacity or how many people can be supported by a place depends on:

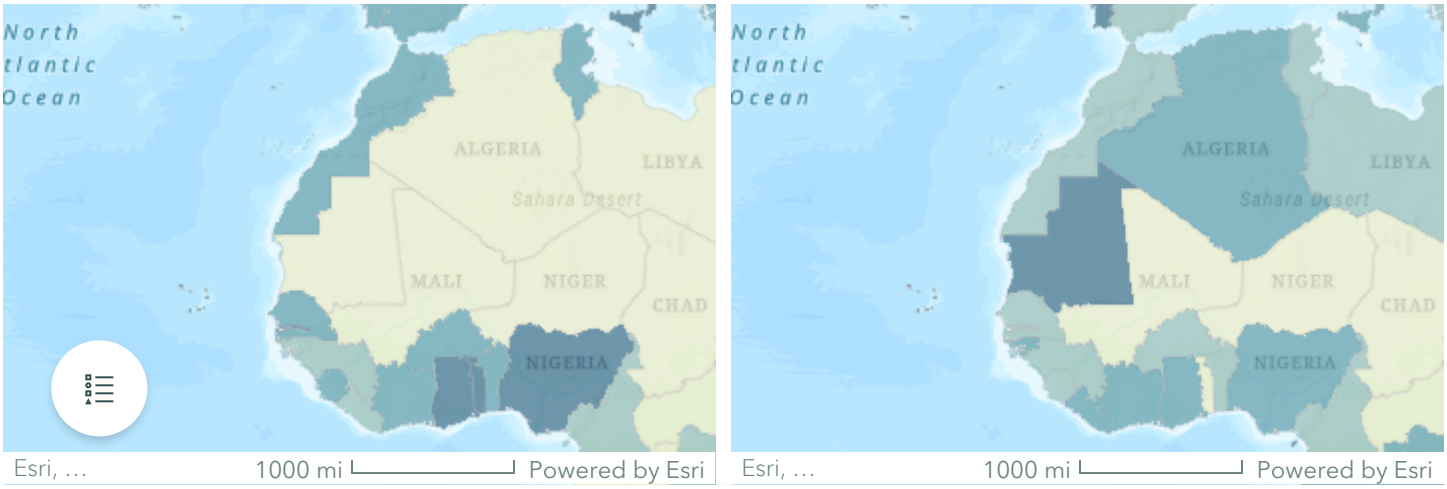
1. each person's ecological footprint,
2. the natural resources available at that place, and
3. the technology that allows one to stretch limited resources available.

> **How many planets does it take to sustain...**
>
> What is your Ecological Footprint? How many planets does it take to support your lifestyle? Take...
>
> https://www.footprintcalculator.org/home/en

Population density (arithmetic density) is the number of people in a country (or place) divided by the country's land area.

- The world's population density is about 59.7 people per square kilometer (World Bank, 2020).
- Does high population density always lead to environmental destruction?

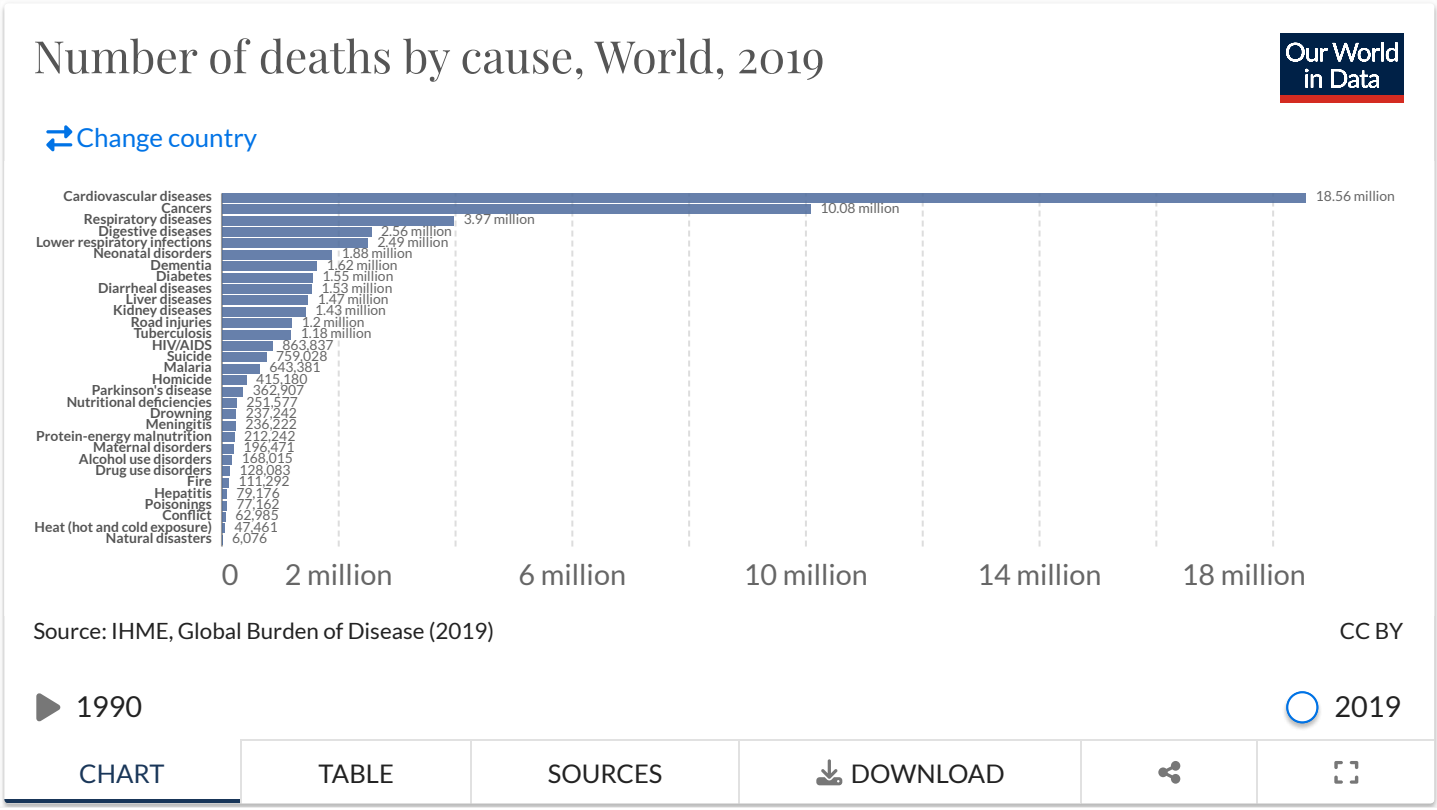
Physiological density is the number of people in a country (or place) divided by the country's arable (farmable) area (i.e. excludes deserts, and lakes).



Swipe to compare each country's arithmetic density (left map) with its physiological density (right map). Click on a country to learn more. (Data source: The World Bank)

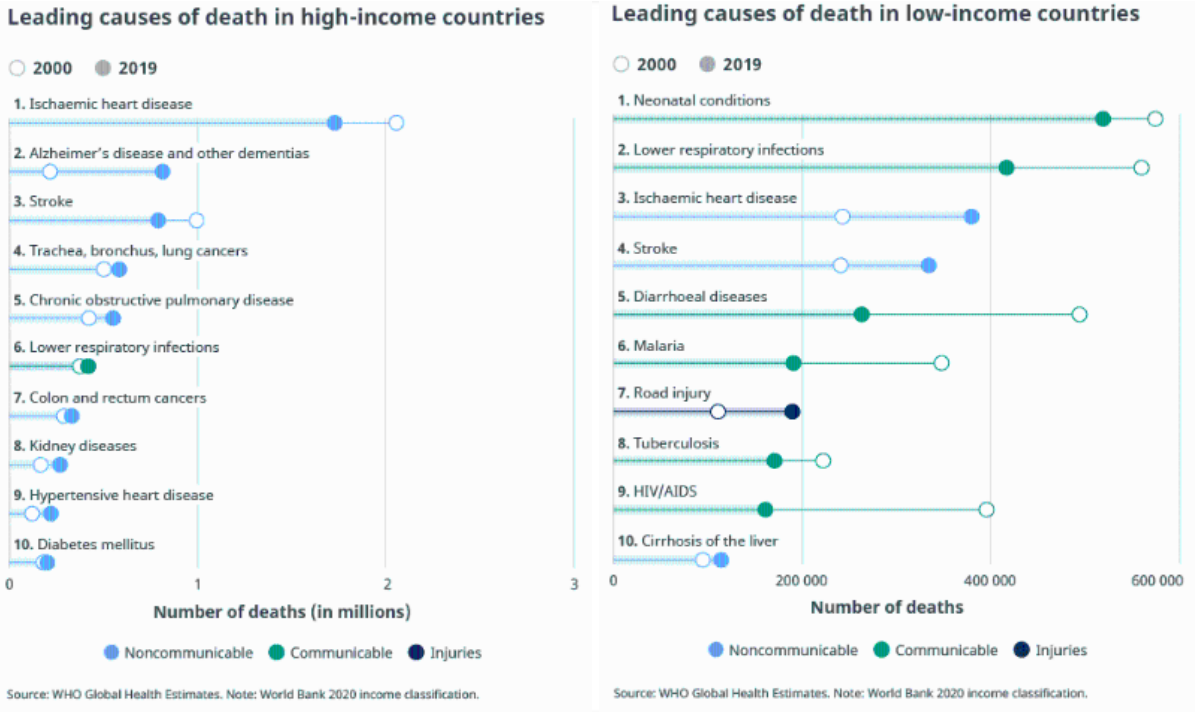
Geography of Health

Medical Geography is the study of sickness or health across space, as sickness can throw off population projections or dramatically change a population's size.



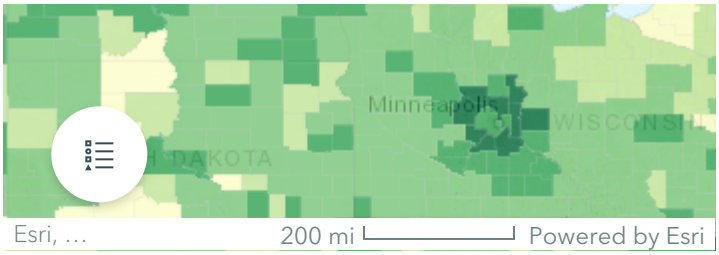
Click the play button at the bottom to see how the leading causes of deaths in the world changed between 1990 and 2017. (Source: Our World in Data)

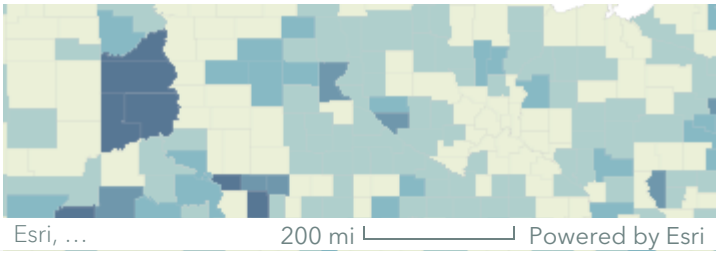
Leading causes of death in **lower-income countries** tends to be infectious or communicable diseases (e.g. respiratory infection), whereas non-communicable conditions that are not passed from person to person are the leading causes of death in **higher-income countries** (e.g. heart disease).



Compare the leading causes of death in high-income versus low-income countries. What may they tell us about their medical infrastructure and their impacts on their populations' life expectancy?

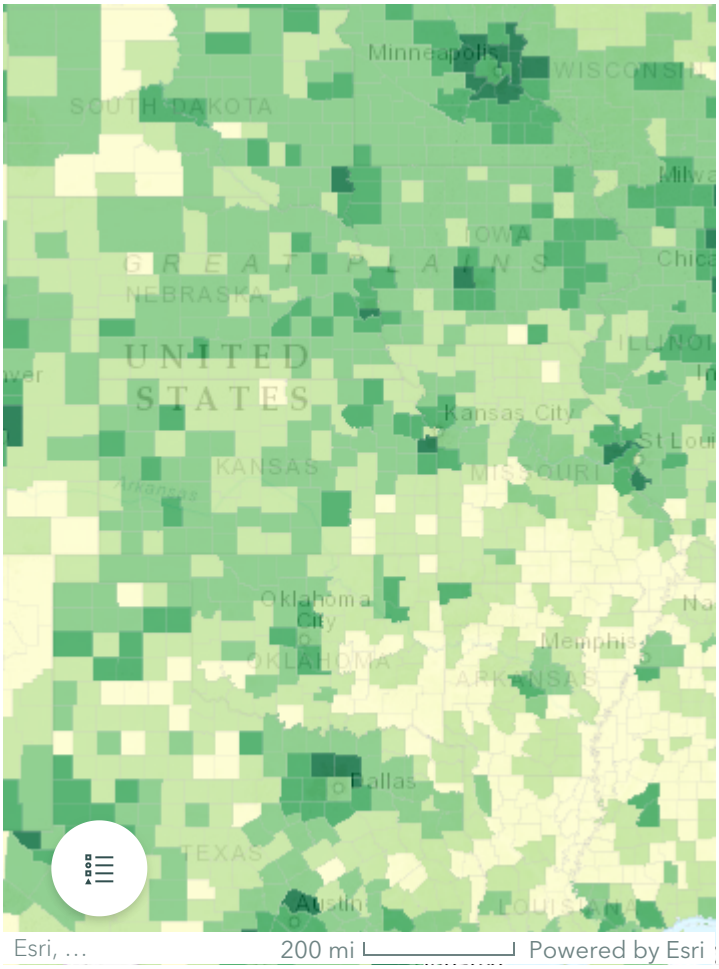
Even at the scale of a single country (the U.S. specifically), we can see health disparities and clear differences in **morbidity** rates (e.g. **rate of diseases** like diabetes) and **mortality** rates (e.g. **rate of deaths** from COVID-19) amongst counties with low median household incomes compared to those with high median household incomes.





DIABETES : A *morbidity* example

Use the legend icon in the lower left corner and the swipe tool to examine the relationship between **median household income (left map)** and the **percentage of adults diagnosed with diabetes (right map)** in various U.S. counties. Click on each county to learn more. (Data source: CDC, USA Facts)

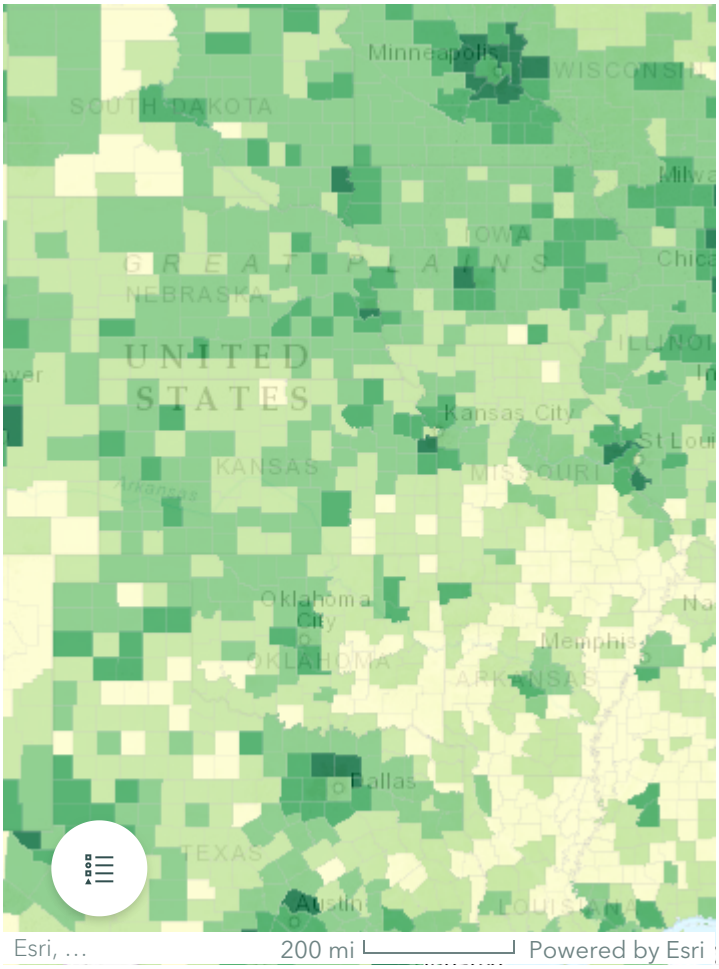


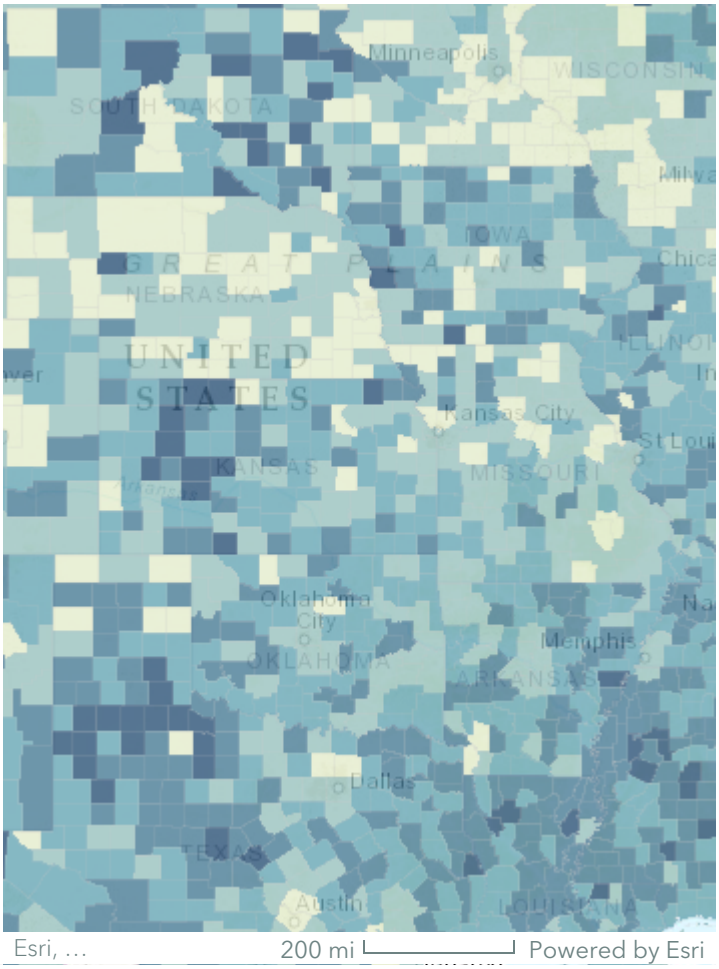


COVID-19 CASES: A *morbidity* example

Use the legend icon in the lower left corner and the swipe tool to examine the relationship between **median household income (left map)** and the **percentage of adults that have been diagnosed with COVID-19 (right map)** in various U.S.

counties. Click on each county to learn more. (Data source: CDC, USA Facts)





COVID-19 DEATHS: A *mortality* example

Use the legend icon in the lower left corner and the swipe tool to examine the relationship between **median household income (left map)** and the **percentage of adults in each county that have died from COVID-19 (right map)**. Click on each county to learn more. (Data source: CDC, USA Facts)

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

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Chapter 3

Migration

Migration: Past and Present

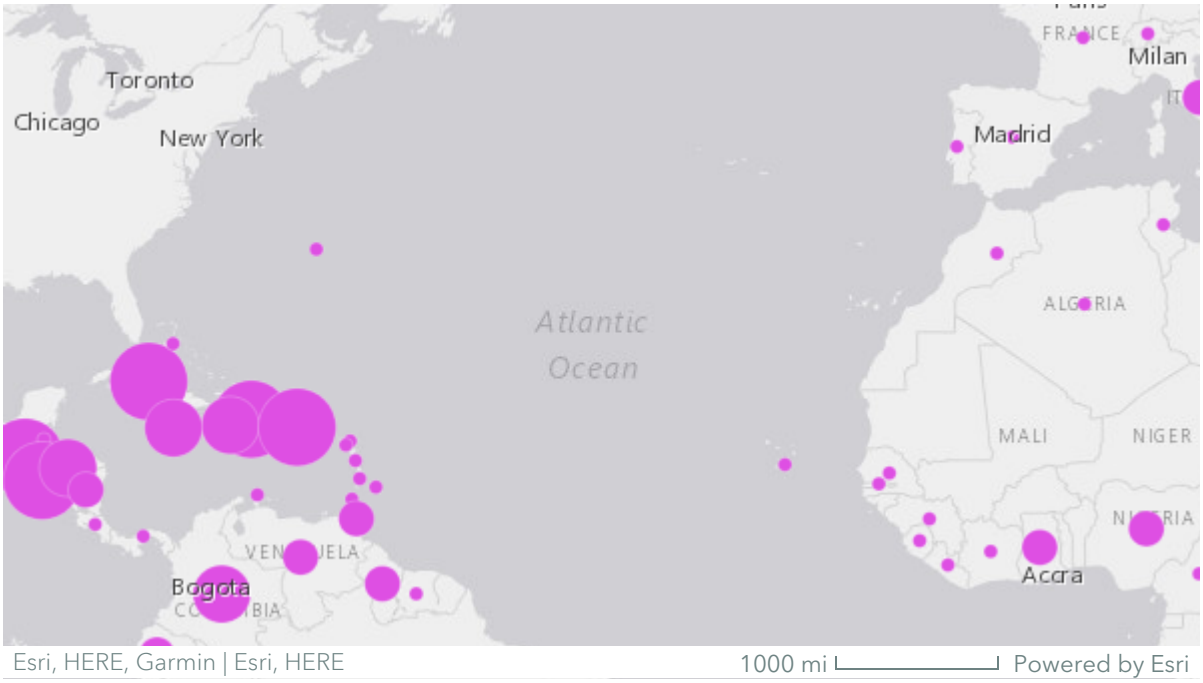
Migration is a permanent move to a new place. This process can create two groups of people:

- **Immigrants**: those who are moving into a new region or country
- **Emigrants**: those who are moving out of their home regions or countries

The earliest migrants originated from Eastern Africa, but exactly when migrants reached North America is still debated. There is evidence of early human remains in North America about 13,000 years ago, but potential cultural artifacts (i.e. stone tools) from 33,000 years ago have also been recently discovered.

Today, many countries such as the United States, receive many immigrants from other countries. However, these countries may also be countries of emigration, as retirees decide to

leave their birth countries to take advantage of the lower cost of living elsewhere, or as long-term migrants decide to return to their birth countries after retirement.



Migration to the U.S. by country of origin (mid-2020) (Data source: Migration Policy Institute, United Nations)

Migrating for Different Reasons

Today's migrants made the decision to leave their home countries for a variety of political, economic, or religious reasons, to name a few. This creates the following sample categories of migrants:

- **Guest workers:** migrants who move to a country legally for a specific job and/or specific length of time. These guest workers often send part of their paychecks back to support family members in their home countries, known as **remittances**.
- **Asylum seekers:** migrants who move to a country to escape political, religious, ethnic, or gender persecution in their home countries.
- **Refugees**: asylum seekers who have satisfactorily proved their claims of persecution in court, and received legal

protection against deportation in return.
- **Undocumented migrants:** migrants who move to a country without proof of residency.
- **Return migrants:** migrants who return to their home country due to discrimination, lack of opportunities, or other reasons abroad.
- **Highly skilled migrants:** migrants with in-demand skill sets (e.g. computer programming) who may be given priority when their applications are reviewed by countries with a **points system** for immigration (e.g. Canada, Australia).

New Zealand's Points Indicator for Skille...

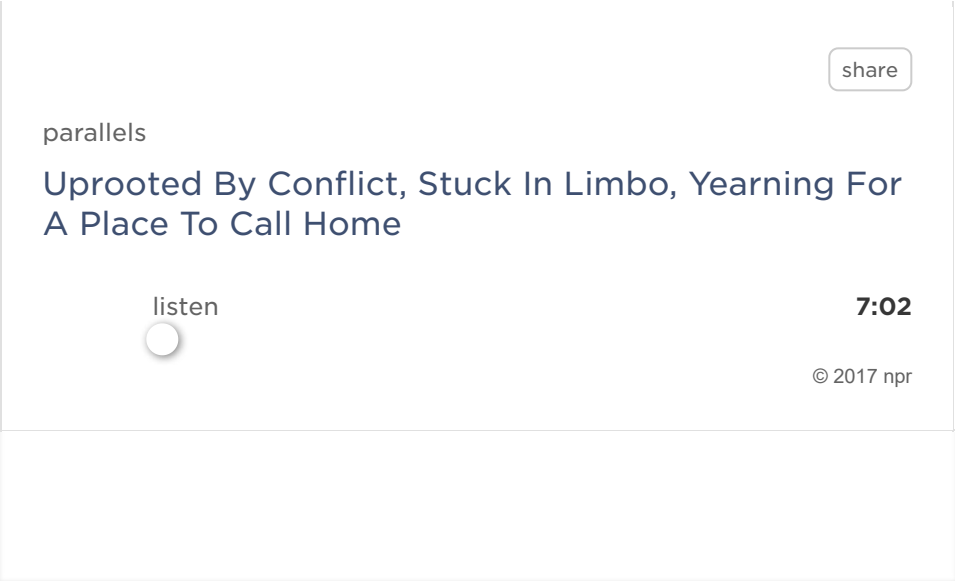
Use this points indicator to estimate if you will qualify as a skilled migrant under New Zealand's...

https://www.immigration.govt.nz/new-zealand-visas/apply-for-a-visa/tools-and-information/tools/points-indicator-smc-28aug

Factors such as natural disasters, famine, persecution, and wars that force people from their home countries are **push factors**.

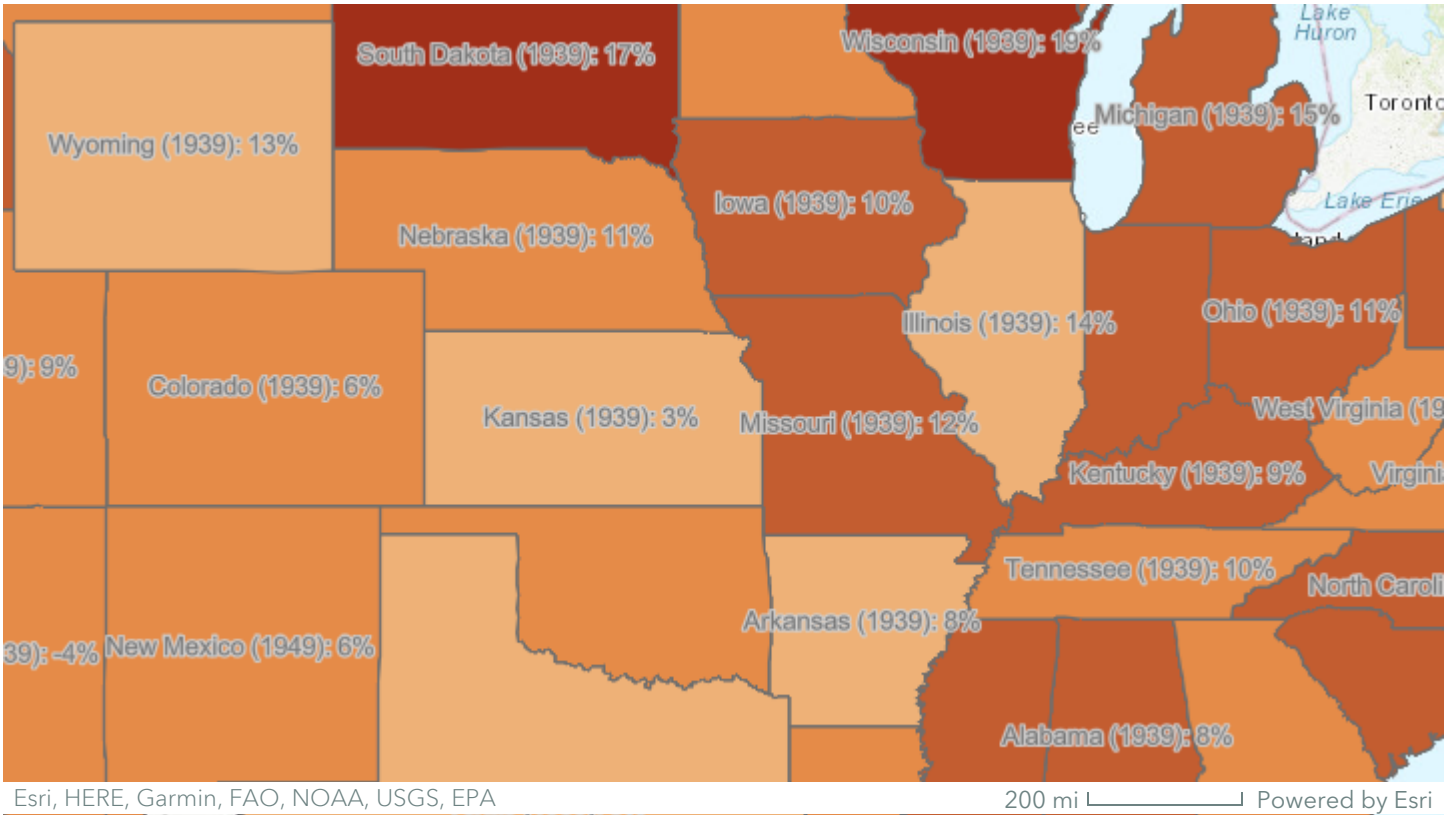
Pull factors are any factors ranging from favorable climates to economic conditions that attract immigrants to a country.

Push factors can create international migrants, but they can also create **internally displaced people (IDP)**. IDPs are people who are forced to leave their homes for fear of their safety, but are unable to leave their countries of origin due to economic, cultural, or other reasons.



Uprooted By Conflict, Stuck In Limbo, IDPs in Georgia Yearn For A Place To Call Home (Source: NPR)

The phenomenon known as **brain drain** occurs when qualified and educated workers are poached away from poorer regions to wealthier ones. For example, nearly 85% of the nurses who were trained in the Philippines have left for countries (mostly in the Middle East and North America) with better working conditions.



Brain drain does not have to take place across international borders. A look at brain drain across different parts of the United States from 1940-2020. This map shows the percentage of highly educated workers aged between 31 and 40 that migrated from their birth state in search of new opportunities. (Data source: US Census)

Regional Migration Patterns

Aspects of globalization (better access to information, transportation, and telecommunication) accelerated international migration in recent years. This in turn accelerated the diffusion of traits such as ideas, genetic footprints, diseases, cooking styles, and sports across the globe.

In Europe, movement within and to the European Union (EU) accelerated in recent decades for two reasons:

1. **Intergovernmental organizations** like the EU require countries to cooperate on matters such as the economy, human rights, and the environment in order to become and remain EU members. Specifically, some EU members are also signatories of the **Schengen Agreement,** which enables

people, goods, and services to move across international borders without regular security checks.



Ukrainian refugees in Poland and return migration to Ukraine (Source: VOA)

2. Migrants from elsewhere in Europe (e.g. Ukraine), Africa (e.g. Morocco), and the Middle East (e.g. Syria) sought to enter Europe to escape conflicts back home or to find better jobs or educational opportunities. However, these migrants often face the risk of arrest or even death on their dangerous journeys.



Migrants flee Africa and the Middle East to seek jobs, medical services, and safety in Europe (Source: VOA)

In North America, about 13.5% of the United States' population is foreign-born as of 2020. In comparison, about 21% of Canada's population was foreign-born in 2019, and only about 1% of Mexico's population was foreign-born in 2020.

Immigration in the United States can be summarized into four phases:

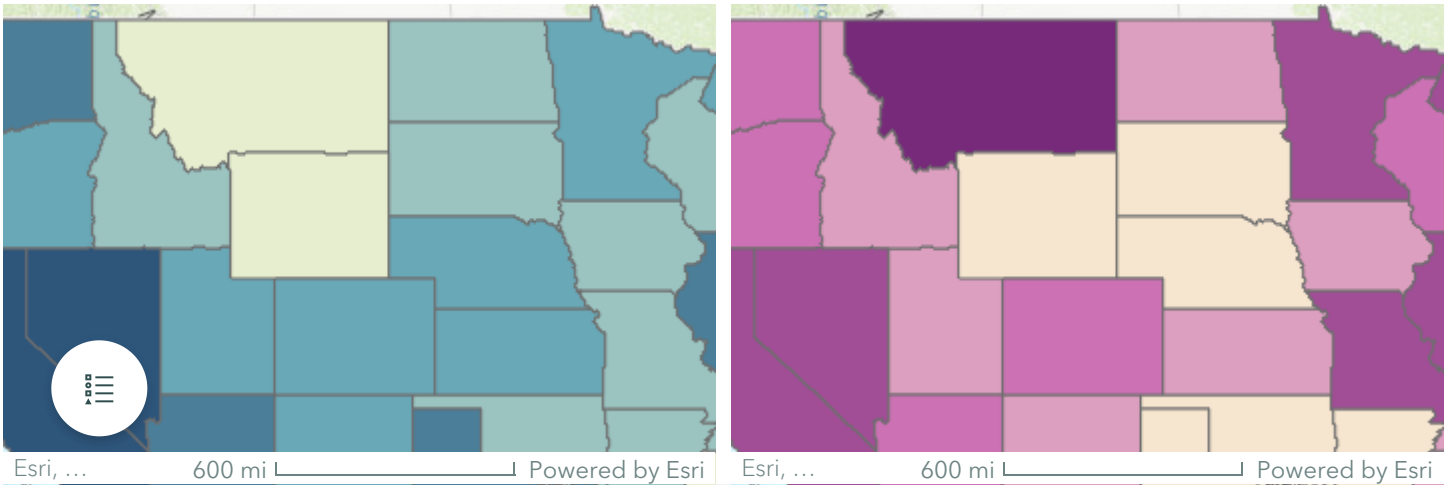
1. **Phase 1: (1820-1880)** Migrants immigrated to the US mainly from Northern and Western Europe. Many new and existing residents migrated to the western states in search of cheap, good farmlands. **The Homestead Act of 1862** offered 160 acres of land to citizens and prospective citizens who



The racist history of US immigration policy (Source: Vox)

will live and farm on the land for at least five years.

2. **Phase 2: (1880-1910)** Migrants originated mostly from Southern and Eastern Europe, and worked in coal mines, steel mills, construction, and factories. **The Chinese Exclusion Act of 1882** was enacted to prevent the immigration and naturalization of anyone of Chinese descent.
3. **Phase 3: (1910-1965)** Immigration was severely limited by the establishment of a quota system that favored immigrants from Northern and Western European countries over those from Southern and Eastern Europe. Immigrants from all other countries (e.g. Asian countries) were virtually eliminated.
4. **Phase 4: (1965-now)** Past immigration quotas and exclusionary policies were replaced by an immigration system that favors skilled and educated migrants, and the migration of immediate relatives of existing citizens (i.e. family reunification). This led to huge growth in immigration, with most migrants coming from Asia, Latin America, and a greater diversity of countries than ever before.



Comparison of percentage of each state's population that is foreign-born (left), and each state's foreign-born population that are naturalized US citizens (right). Do states with a greater number of foreign-born residents have higher or lower percentages of their foreign-born residents becoming naturalized US citizens? Is there a connection? (Data source: US Census)

In Asia, the number of foreign migrants to the region's two largest countries (China, India) is relatively few compared to countries within Europe and North America.

While Asia is one of the main sources of emigrants to other countries in the world, migrants from foreign countries to Asia are often discouraged by local laws that do not allow for permanent immigration. Instead, most migration taking place in countries like China and India involves rural farmers moving from the countryside into cities in search of better employment and educational opportunities.



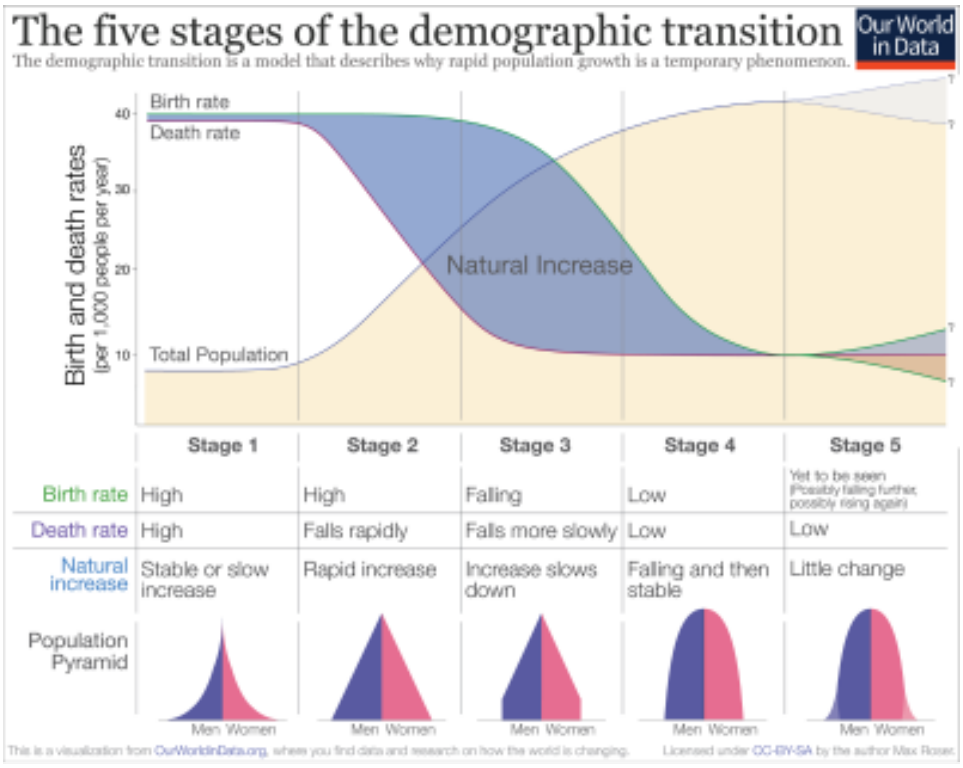
Farmer Protests Highlight Growing Rural Distress in India (Source: VOA)

Demographic Transition and Migration

Countries that generate many emigrants are likely to be in stages 2 and 3 of the demographic transition (see graphic below), because the large natural increase in population (blue) meant an "oversupply" of laborers in those countries that may need to migrate and seek employment elsewhere.

Countries that are seeking immigrants are likely to be in stages 4 and 5 of the demographic transition, as low fertility in

those countries means insufficient workers entering the workforce and a need for foreign laborers.



Review of the five stages of the demographic transition model (Source: Max Roser, CC BY-SA 4.0 , via Wikimedia Commons)

Migration in the Age of Globalization

According to the Pew Charitable Trusts, an unprecedented number of people now live outside of their birth country. This is made possible by **globalization**, or the idea that countries are becoming more alike and interconnected due to (1) faster and more reliable transportation options, and (2) advances in telecommunication technologies (e.g. internet, social media).

These advances in transportation and telecommunication also mean today's migrants are more **transnational** in nature. They are able to stay connected to friends, family, and news from their birth countries, as well as with others who may have moved to other different countries. In other words, a transnational migrant may have family in different countries,

speak different languages, own assets in different countries, and may even be a citizen of multiple countries.

Take a look at the link below to see which countries in the world allow citizens to hold multiple citizenships.

Countries That Allow Dual Citizenship 20...

Click here to see which countries in the world allow a person to be a citizen of more than one country.

https://worldpopulationreview.com/country-rankings/countries-that-allow-dual-citizenship

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

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Chapter 4

Folk and Popular Culture

Defining Culture

Culture consists of **learned** human behaviors, such as languages, prejudices, traditions, and values, shared by a group of people. Humans are constantly creating and changing their culture, as well as sharing it by teaching it to other people.



Stilt houses in the village of Tai O, Hong Kong, where the folk culture and fishing lifestyle of the Tanka ethnic group (commonly referred to as the "boat people") once dominated.

Folk culture tends to be stable and is found among small, isolated groups with strong family ties and interpersonal relationships. Almost everyone in the same group shares the same custom and race. Food, medicine, and other goods are usually handmade with local ingredients.

Popular culture tends to dominate large, diverse societies with weak interpersonal ties. It changes constantly and

encourages individualism and innovation.

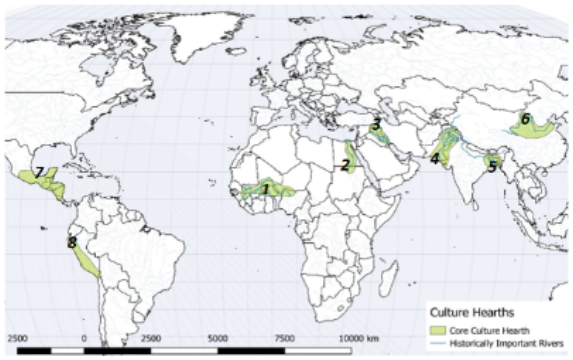


High rise buildings lining Victoria Habour, Hong Kong. Hong Kong is a major global financial center, and is heavily influenced by popular culture from the Eastern and the Western hemispheres.

Culture Hearths

The birthplaces of important cultural innovations are known as **culture hearths**. While different innovations originated (and subsequently spread) from different hearths, the hearths below are especially important since they are the ancient birthplaces of multiple major cultural innovations (e.g. languages, religions, agriculture).

1. West Africa
2. The Nile Valley
3. Mesopotamia
4. The Indus Valley
5. The Ganges Delta
6. The Huang He (Yellow River) Valley
7. Mesoamerica (Central America)
8. Andean America



Culture hearths and their associated rivers (Source: David Dorrell)

Cultural Landscape

The different types of cultural landscapes created by the interactions between people and the physical environments are known as **cultural ecology**.

The environment by itself does not necessarily produce a particular type of cultural landscape or people. Rather, the idea of **possiblism** says that the environment presents people with limited resources that can be used to create a finite set of cultural landscapes based on the population's preferences, needs, and circumstances.

Look carefully at different cultural landscapes and you may be able to find clues about the history, power, wealth, and values of those places.



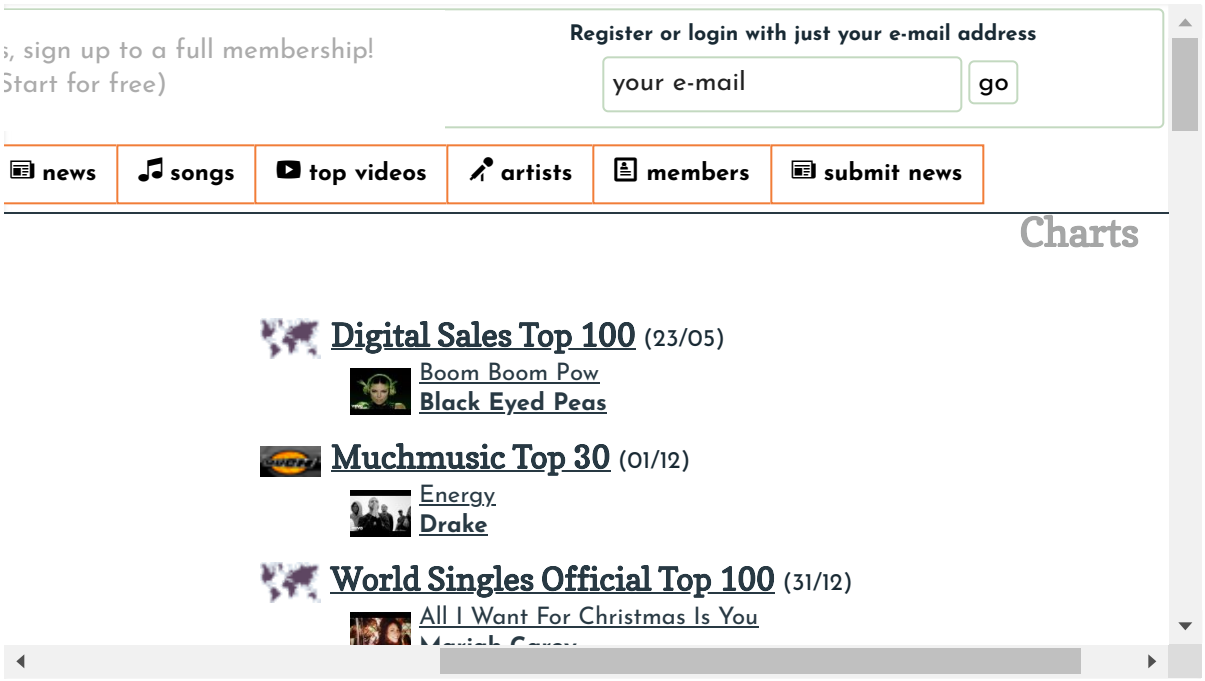
What do Rio de Janeiro's favelas in Brazil tell you about the history, wealth, and values of their inhabitants? (Source: Vox)

Popular Culture

Artifacts of popular culture include food, clothing, music, movies, and anything that can be purchased with money. The latest trends (i.e. fads) in popular culture usually start in major cities, and slowly spread to smaller towns and villages through **hierarchical diffusion**. Popular culture artifacts often share the characteristics below:

- Look/sound similar regardless of where you may find them in the world.
- Made with raw materials from far away and sold in distant markets.
- Sales are driven by advertisements and marketing.

> "Popular culture is culture that is bought."



Top40-Charts.com provides music charts with hot hits from all over the world. Compare the "Top 20" or "Top 40" charts between different countries to see how hits from major countries like the USA are readily found in charts around the world. (Source: Top40-Charts.com)

When Global Meets Local

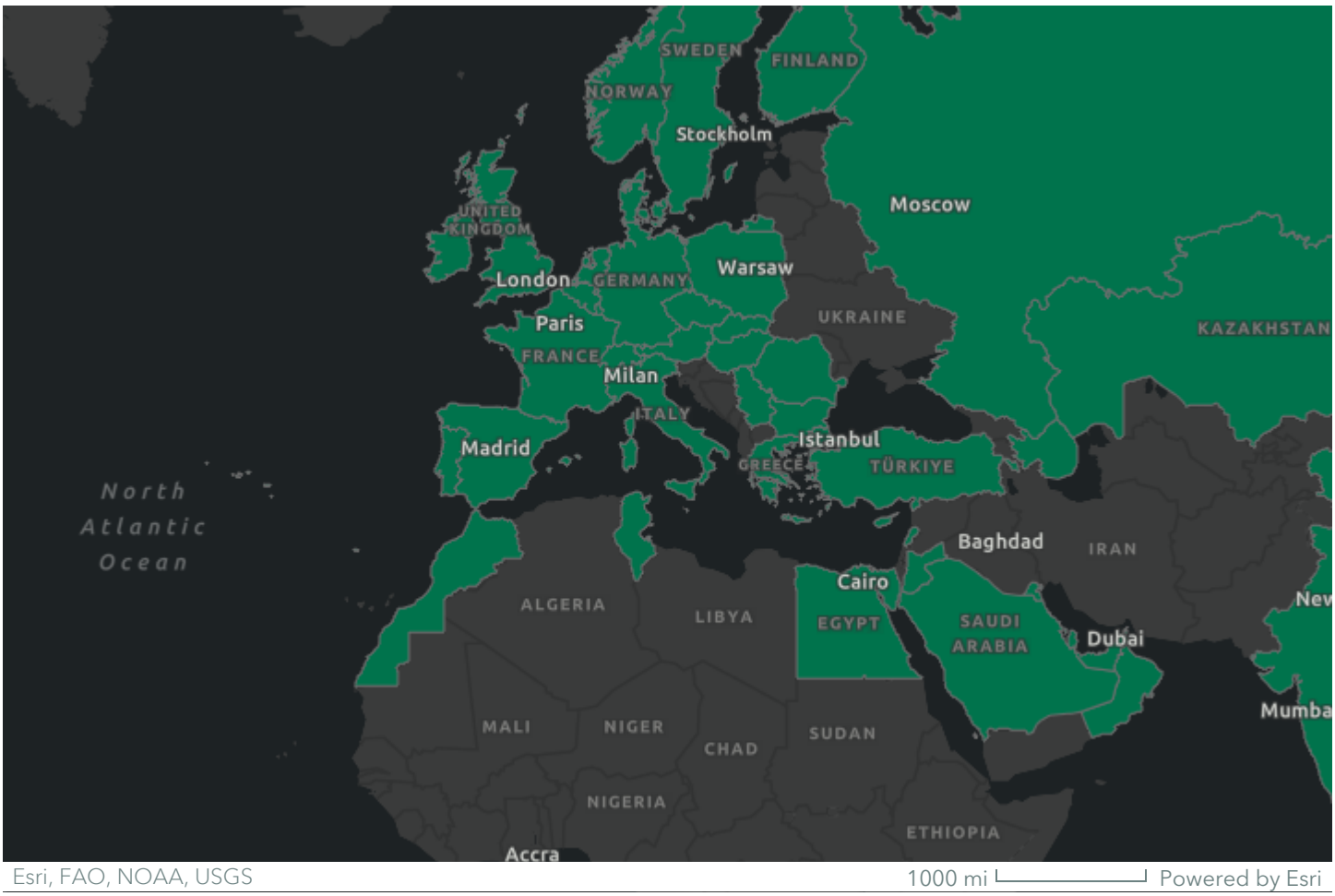
Local culture may be changed or may eventually be replaced by mass-marketed products that will sell and generate profits in the global marketplace. Think about how the authenticity of Chinese cuisine is discarded by Panda Express, and replaced with food items of a new culture (e.g. spices, ingredients) that drive sales locally and globally. This new culture is called **global culture**.

In a globalized world where people and cultures are becoming more interconnected and similar, local specialties (e.g. music, movies, clothes, foods) are quickly replacing their local flavors with the global culture to appeal to the international market.



Eleven countries worldwide have **Panda Express** locations as of 2022 (operation in Russia is suspended at the moment this dataset was created)

(Data source: Wikipedia)



Eighty countries (plus Taiwan and Hong Kong) worldwide has **Starbucks** locations as of 2022 (operation in Russia is suspended at the moment this dataset was created)

(Data source: Wikipedia)





Use the swipe tool to compare countries with **Panda Express** and/or **Starbucks**. Think about the following:

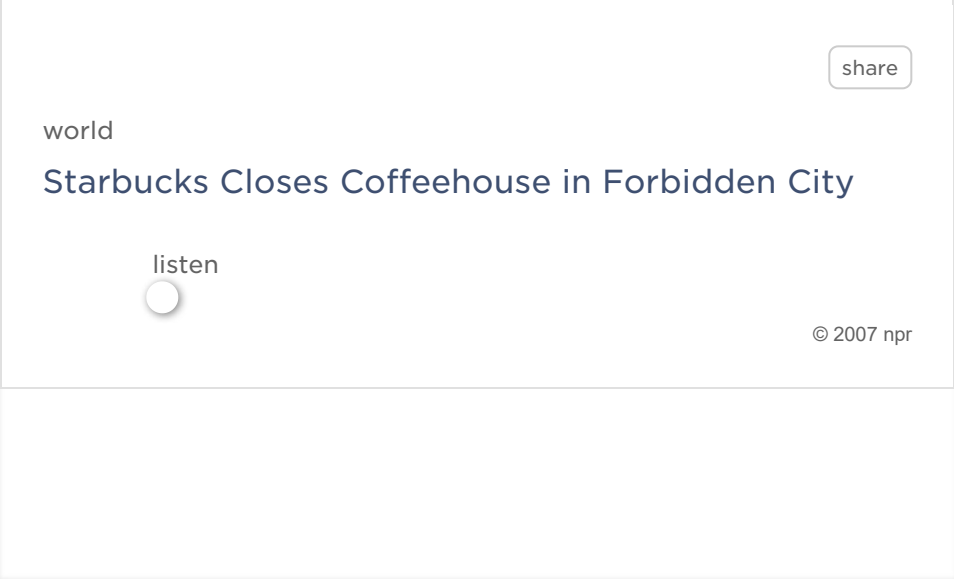
-What do the countries that lack Starbucks and Panda Express have in common?

-Do local culture and dietary preferences play a role in determining the locations of Starbucks or Panda Express?

Although they are part of our everyday life, global culture and globalization have their critics.

This includes people who perceive globalization as the Western countries' attempt to secularize, corrupt, and/or threaten their cultures. As a result, companies or governments may pursue the compromising strategy of **glocalization**, where they acknowledge and integrate elements of the local culture as they expand into new countries. Examples of these attempts include the introduction of the Sakura-flavored Frappuccinos by Starbucks in recognition of Japan's fondness of cherry blossom (sakura), and the introduction of the kiwiburger by McDonald's in New Zealand in honor of the country's national icon (Kiwi bird).

However, these compromises may not work every time. In particular, the opposition may be especially fierce when globalization is perceived to threaten national icons and cultural identities, as you can hear in the news story below:



Starbucks closes coffeehouse in Forbidden City (Source: NPR)

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

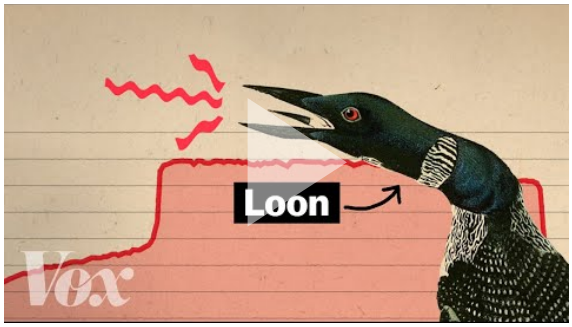
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Chapter 5

The Geography of Language

What is Language?



Why Hollywood loves this creepy bird call and how do loons really use it to communicate with each other (Source: Vox)

It is a verbal and nonverbal (e.g. written, body language) tool that we **learned** and used to communicate our thoughts and values, document our lives, and express our cultural identities.

A language is used by members of the same culture group or speech community to **share complex emotions and ideas**, something that may not be doable with non-human languages used by other lifeforms (e.g. birds, dolphins, bees).

Language and Culture

People may use language for a variety of reasons, such as to share information, question somebody, make promises, or greet others. Regardless of the reason, cultural norms such as the relationship between the participants (e.g. strangers, family, close friends), the setting (e.g. home, work, park), and the topic (e.g. casual, confidential) will determine what is considered appropriate for the conversation.

Moreover, given that cultural norms shapes our language, researchers have been asking whether different languages may cause people to perceive reality differently and have different norms.

For example, in the Guugu Yimithirr language spoken by a remote community in Australia, *"it doesn't have terms like "left" and "right." Instead, words like "north," "south," "east," and "west" are used to describe locations and directions. So if you ask where something is, the answer might be that it's to the southwest of X, which requires speakers to have spectacular spatial orientation."*

How language shapes our perception of ...

Read this article to see other examples of how languages might change the way different people...

https://www.fastcompany.com/40585591/how-language-shapes-our-perception-of-reality

Lastly, people may have different opinions and beliefs about a particular language regardless of the conversation or the speakers involved, such as:

- "Language X is difficult to learn."
- "You need to know Language Y to get ahead in the global marketplace."



An unofficial list of the five hardest languages to learn in the world by one YoutTube user. (Source: Curious Minds on Youtube, CC-BY https://www.youtube.com/watch?v=nsEsWDfe7Xg)

Classification and Distribution of Languages

> *"In reality, languages borrow bits and pieces from other languages continuously."*

Diffusion of languages

Languages move from their hearths to other places and find new speakers through:

- **Relocation diffusion** (e.g. migrants bring their native language with them to the new country; conquerors force the conquered people to speak a new language).
- **Hierarchical diffusion** (e.g. inhabitants in major cities may first invent and adopt a new slang or expression, before it is introduced in smaller towns)
- **Contagious diffusion** (e.g. the use of a new slang may be popularized in a school as friends copy each other in their speech).

As languages are introduced in new locations, they may borrow words and expressions from the native language(s) they are replacing, and vice versa.

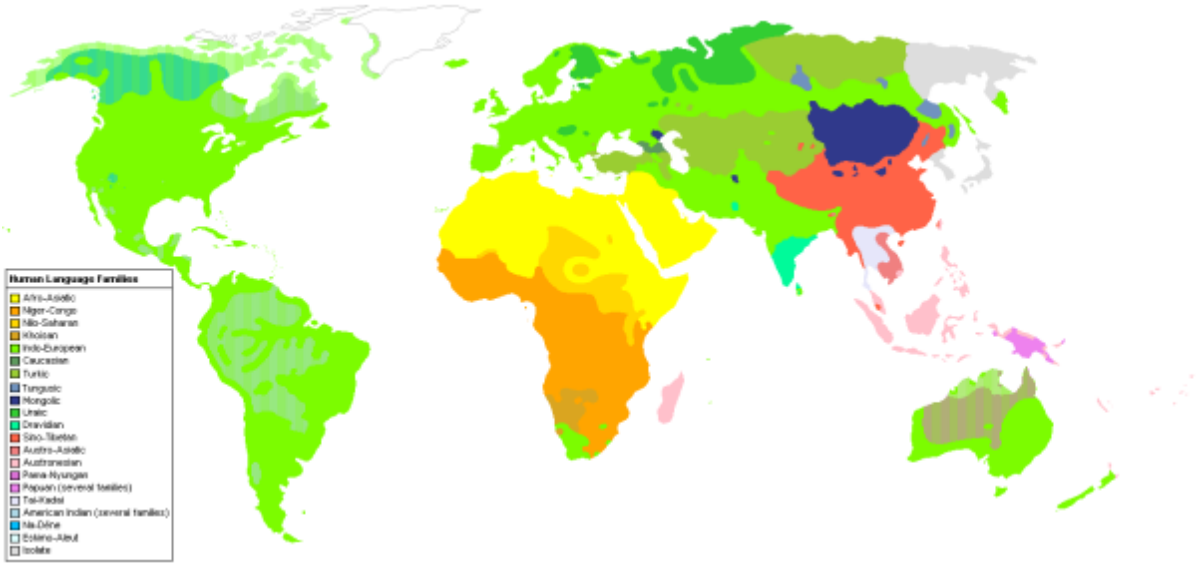
Classification of Languages

To organize today's 5,000-7,000 different languages, linguists group related languages with similar pronunciation, vocabulary, grammar, history, and literary heritage into the same **language family** in a language tree.

> **A language family tree illustrated**
>
> Minna Sundberg's illustration shows the development of the Indo-European language famil...
>
> https://www.theguardian.com/education/gallery/2015/jan/23/a-language-family-tree-in-pictures#img-1

Some of the world's major language families are:

- Indo-European
- Sino-Tibetan
- Afro-Asiatic
- Niger-Congo
- Austronesian
- Uralic
- Austro-Asiatic



Location of the world's major language families (Source: Wikimedia Commons)

Languages within the same family that have a similar origin, vocabulary, and grammar relative to other members of the family may be further grouped into the same **language subfamily**. Below, take a look at some of the subfamilies within the ***Indo-European*** language family. The Indo-European language family has the largest number of speakers today. Keep in mind that many **lingua franca**, official languages used across a wide area by many people who are not necessarily native speakers of them, of the past (e.g. Latin, French) and present (e.g. English) also came from the Indo-European language family.

- ***Germanic*** subfamily (e.g. English, German, Swedish)
- ***Romance*** subfamily (e.g. French, Spanish, Italian)
- ***Slavic*** subfamily (e.g. Russian, Polish, Bulgarian)
- ***Indic*** *(or Indo-Aryan)* subfamily (e.g. Hindi, Sinhalese, Bengali)
- ***Iranian*** subfamily (e.g. Persian, Kurdish, Pashto)



Map of the main Indo-European languages in Eurasia (Source: Wikimedia Commons)

Aside from today's internationally-recognized languages (e.g. English, Chinese), there are also language variants that have developed over time as different language speakers come into contact with each other. They include:

Dialects: mutually intelligible variants of the same language used by people of different nationalities or ethnicity that may have differences in pronunciation, vocabulary, and/or sentence structure (e.g. British English, American English, African-American Vernacular English).

Pidgin: language invented by speakers of distinct languages who need a common language to talk about trade. Pidgin tends to have a simplified grammar, and a limited vocabulary with many borrowed words from the native languages of its inventors (e.g. Chinese Pidgin English).

Creole: a more developed form of pidgin with a more complex vocabulary and grammar. Unlike pidgin, a creole may be the native language or mother tongue of a population (e.g. Hawai‘i Creole English).

Slang: words or expressions that are not part of a standard language, but are invented, used, and understood by some speakers who may be from a particular subculture (e.g. teenagers, surfers).

Vox Sambou: funk, reggae and hip-hop f...

Join me in watching this concert masterfully performed by Vox Sambou, who performs in Hatia...

https://www.npr.org/2021/01/23/959672289/vox-sambou-tiny-desk-home-concert?jwsource=cl

Loss of Languages

Heading for extinction?

As the international language of business, English is the world's most commonly studied language today. While this may be helpful to some in today's increasingly globalized and interconnected world, others worry that the dominance of English will lead to the extinction of some languages as suggested by the statistics below:

- There are 5,000-7,000 languages in the world, but 66% of the world's population speaks only 12 of the major languages.
- About 2,000 languages have less than 1,000 native speakers.
- Half of the world's spoken languages will disappear by the end of this century.

In many countries, parents are teaching their children the national or official language rather than their indigenous languages. As one mother in Nepal explains:

> *"I thought they [her children] should learn Nepali because it is useful. People would make fun of our language, and say it wasn't normal. Kusunda speakers faced a lot of stigma. But now I feel regretful that I can't converse with my own children in our own language."*

The language that has no words for 'yes' ...

Learn about the Kusunda language, and how language loss may damage self-worth in indigenou...

https://www.bbc.com/future/article/20220804-kusunda-the-language-isolate-with-no-word-for-no?utm_source=bbc-news&utm_medium=right-hand-slot

Languages in the US

Although English is the most commonly used language in the United States, English is not the **official language** of the United States despite repeated attempts by supporters of the English-only Movement to change that over the past decades.

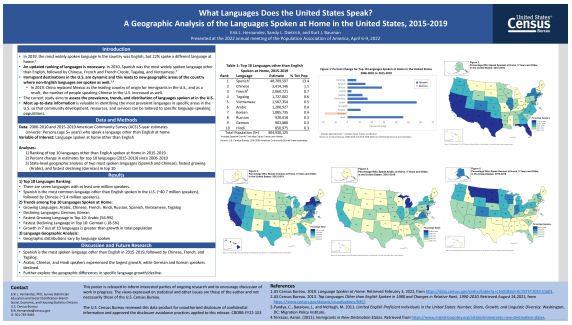
American Dialects : Dialect map of Ameri...

American English speakers do not all speak the same way. English can be subdivided into dialects...

http://robertspage.com/dialects.html

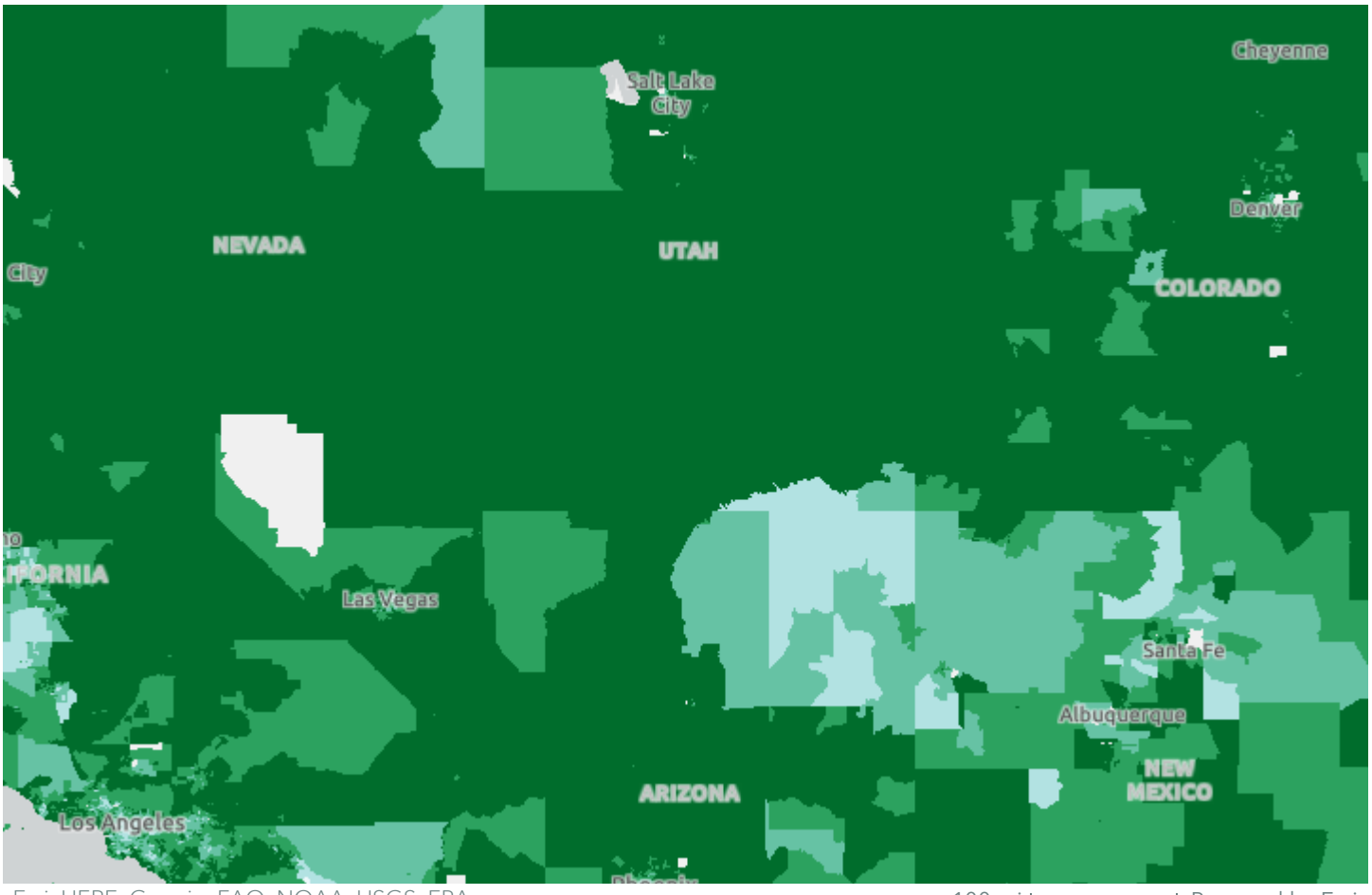
However, even within the US, scholars such as Robert Delaney have identified and mapped (see the link above) more than 25 different English dialects that are in use based on differences in their pronunciation, vocabulary, grammar, settlement history, and other factors.

The US has a rich diversity of languages even before the arrival of the European settlers and the introduction of Indo-European languages to North America. It was estimated that 500 to 1,000 Native American languages were spoken in the US in the fifteenth century.



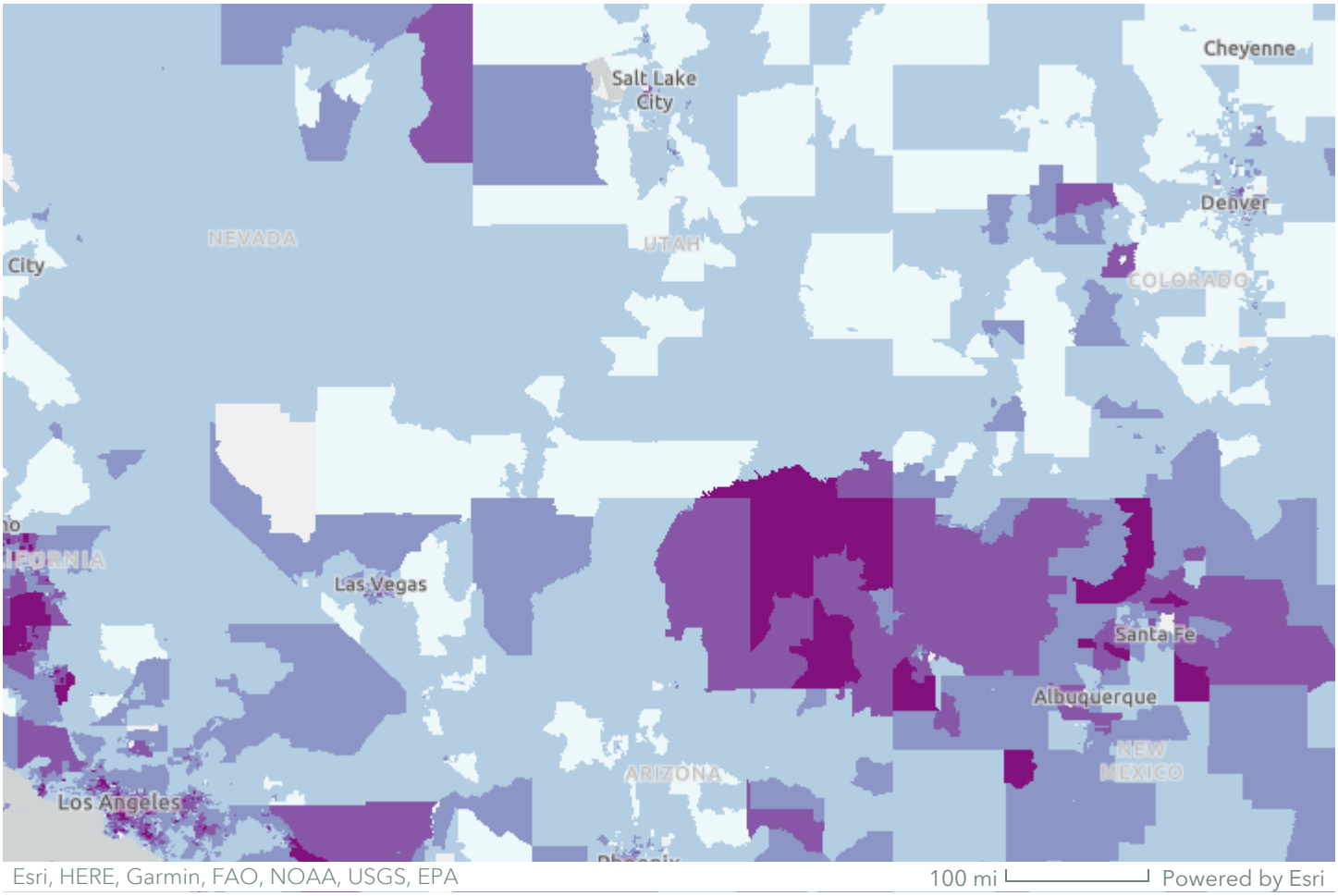
A geographical analysis of languages spoken at home (2015-2019) (Source: US Census Bureau)

Today, immigrants from Asia, Latin America, and other parts of the world contribute to the evolution of the country's linguistic landscape. According to the US Census Bureau, the top five languages other than English spoken at home (see the poster on the right) are Spanish, Chinese, French, Tagalog, and Vietnamese.

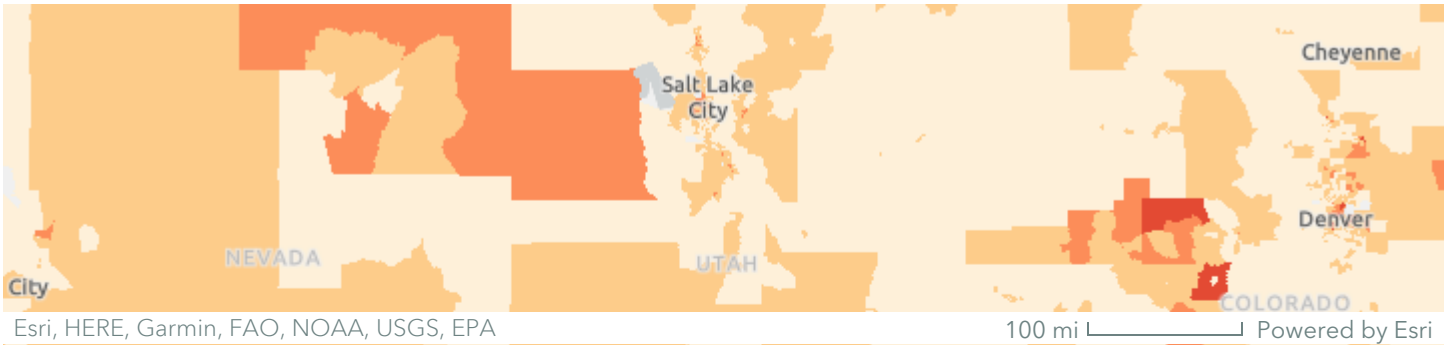


This map shows the percentage of people (over 5 years old) within a census tract who speaks only **English** at home

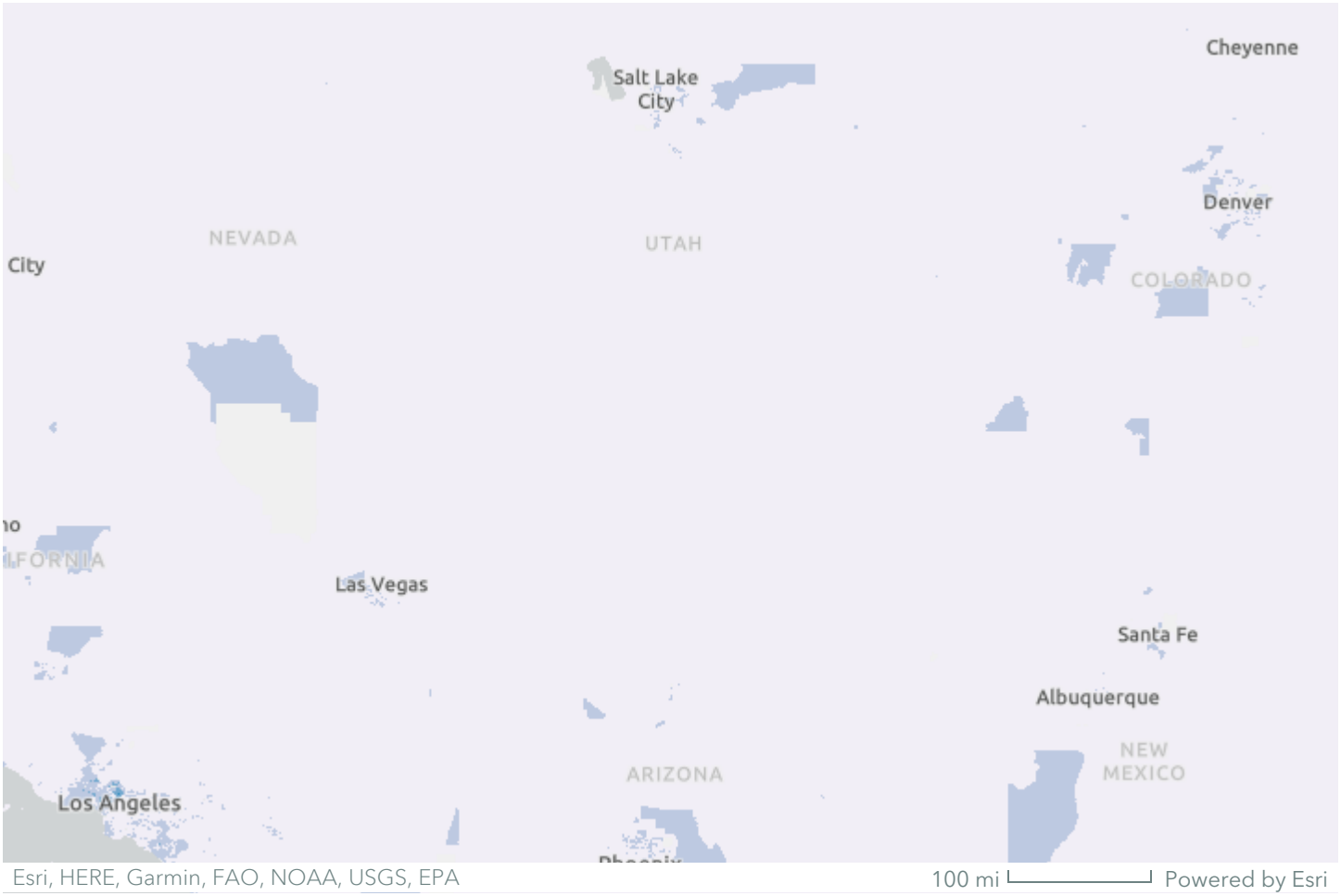
according to the US Census Bureau's American Community Survey 5-year estimate (2020)



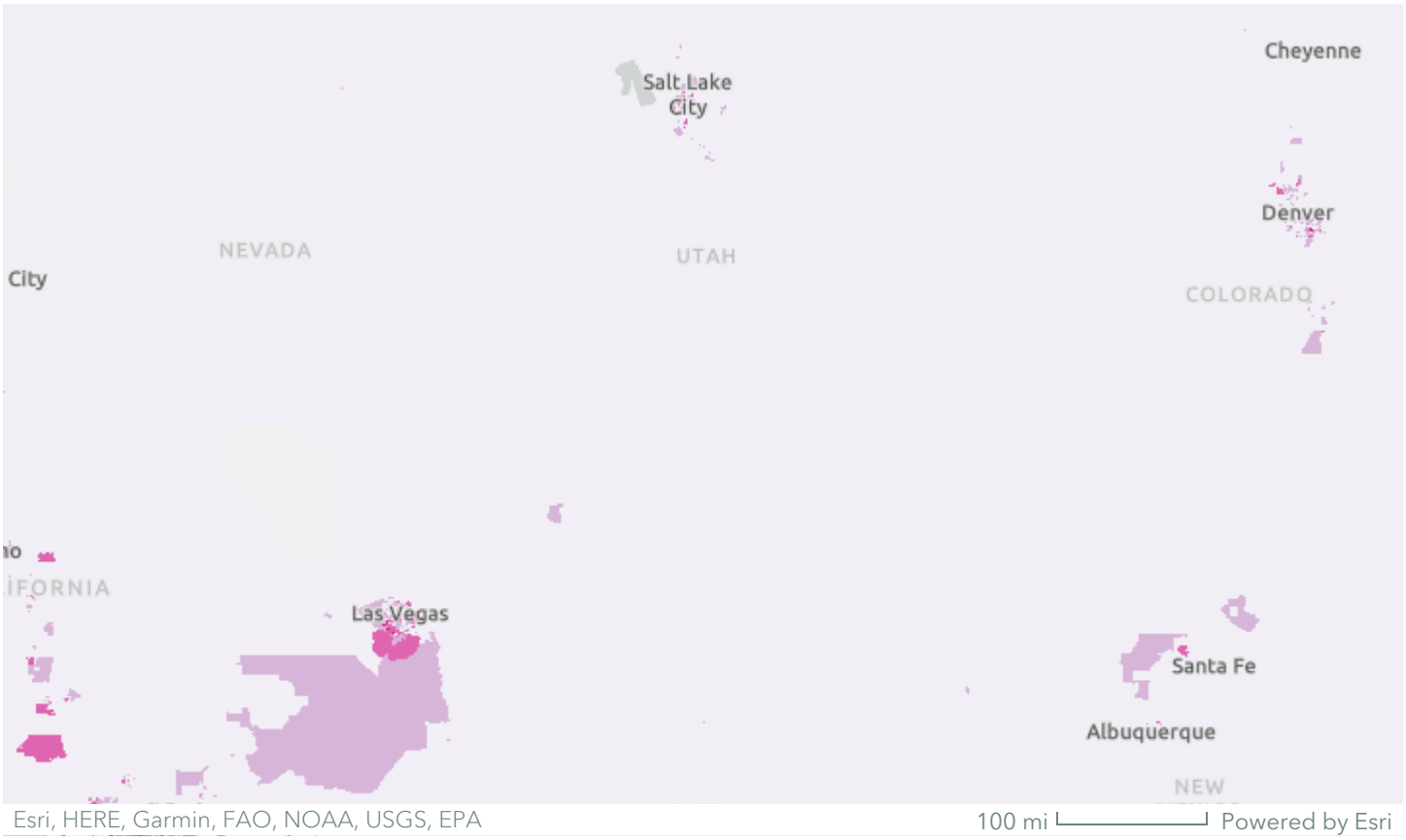
This map shows the percentage of people (over 5 years old) within a census tract who speaks **a language other than English** at home according to the US Census Bureau's American Community Survey 5-year estimate (2020)



This map shows the percentage of people (over 5 years old) within a census tract who speaks **Spanish** at home according to the US Census Bureau's American Community Survey 5-year estimate (2020)



This map shows the percentage of people (over 5 years old) within a census tract who speaks **an Indo-European language other than Spanish** at home according to the US Census Bureau's American Community Survey 5-year estimate (2020)



This map shows the percentage of people (over 5 years old) within a census tract who speaks **an Asian or Pacific Island language** at home according to the US Census Bureau's American Community Survey 5-year estimate (2020)



This map shows the percentage of people (over 5 years old) within a census tract who speaks **a language that is neither in the Indo-European family nor an Asian or Pacific Island language** at home according to the US Census Bureau's American Community Survey 5-year estimate (2020)

Languages in the Physical and Digital Worlds

Place names or **toponyms** can provide clues on the history and beliefs of the people who named (or renamed) those physical places. For example, the name of New York replaced its earlier name of New Amsterdam when the English conquered the land from the Dutch, and decided to name it New York in honor of the Duke of York (a historic city in northern England).

> **Why Did Swaziland Changed its Name?**
>
> Africa's last absolute monarch has marked his country's 50th birthday by changing the country's...
>
> https://www.npr.org/sections/thetwo-way/2018/04/20/604000612/swaziland-gets-a-name-change-call-it-eswatini-now

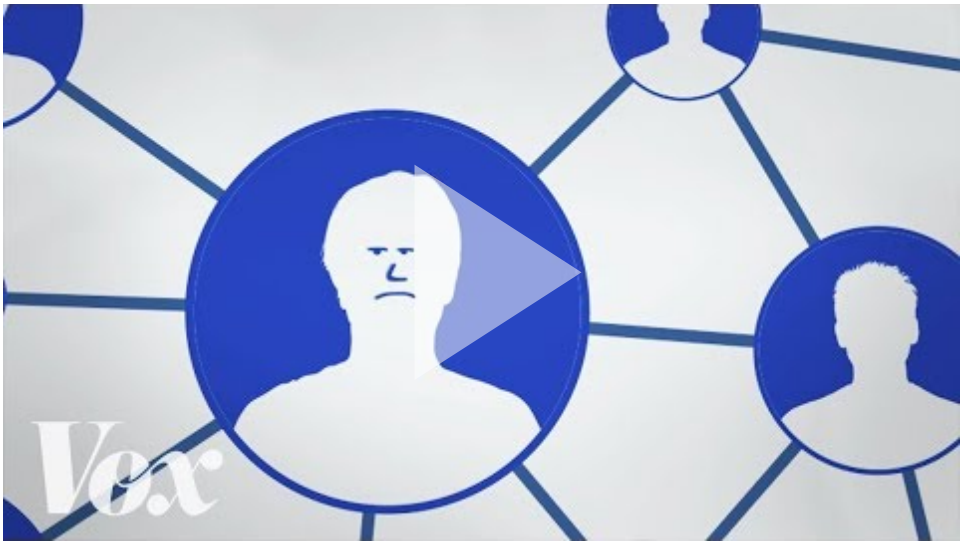
In the digital world, social media enabled users worldwide to create and exchange information and ideas through blogs, forums, product reviews, social gaming, and video-sharing websites. Researchers have found that "nearly 80 percent of American adults are online and nearly 60 percent of them use social media."

With so many people relying on social media for everything from friendship to getting the news, it is no surprise that our language has been changed by social media as well. For

example, users often use acronyms in their digital speech (e.g. LOL - Laughing out loud), use a symbol to replace part of a word in a technique known as **rebus writing** (e.g. gr8 - great), or use symbols such as emoticons (e.g. 🤗) to convey entire words, ideas, or emotions.

> **List of emoticons - Wikipedia**
>
> Did you know that people from different parts of the world have and use different styles of emoticons?
>
> https://en.wikipedia.org/wiki/List_of_emoticons

While social media allows many users to share memories and interact almost simultaneously across space and time, there are increasing concerns about data privacy, information overload, misinformation, its effects on mental health, and the occurrence of online harassment and cyberbullying.



Why you keep using Facebook, even if you hate it (Source: Vox)

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

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Chapter 6

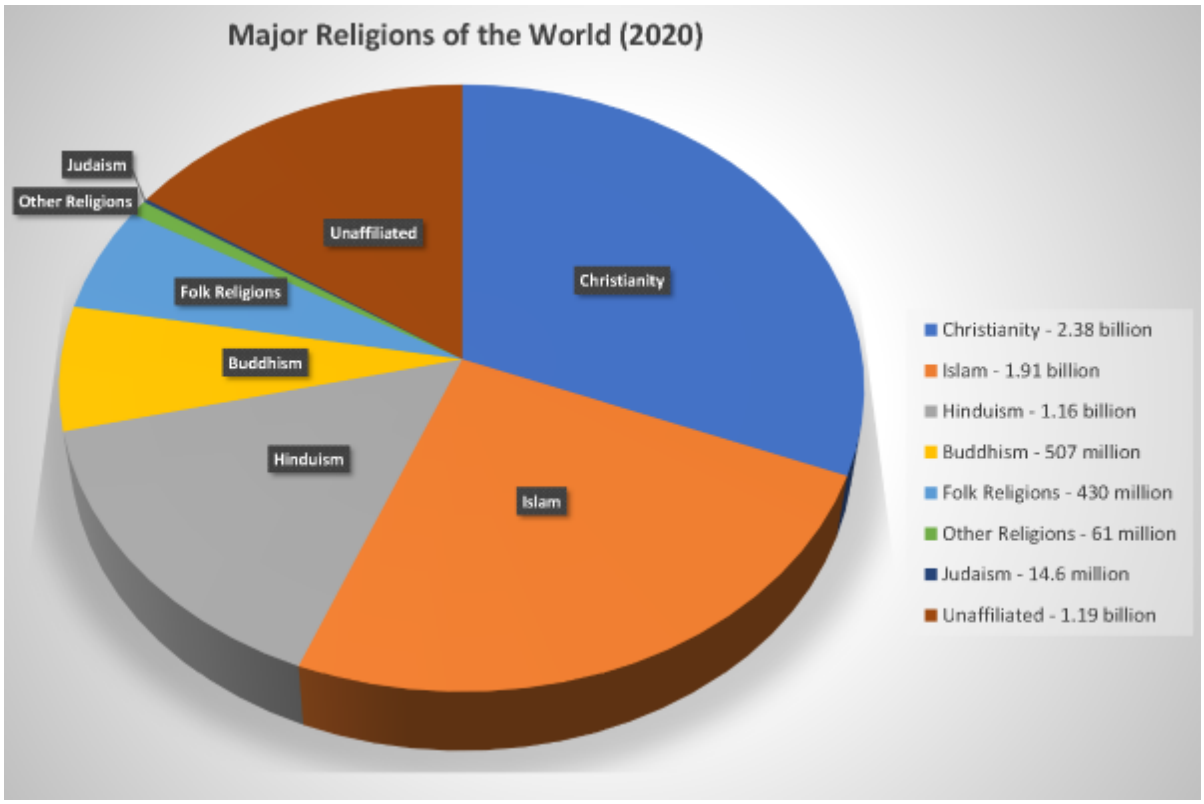
The Geography of Religion

Today's Religions

Religion is a "core component of an individual's identity" that can influence one's behaviors (e.g. dress, diet), social interactions (e.g. gender roles, employment), and moral standards. It can also cause perpetual conflicts, persecution, and political instability.

According to the World Population Review, about 85% of the world's population identify with a religion in 2020. The two religions with the largest number of followers are **Christianity** and **Islam**. **Folk religions** include ancestor worship in China, indigenous religions practiced by Native Americans and Aboriginal Australians, and animist practices found in Africa, for example. **Other religions** include newer religions such as Scientology, as well as smaller faiths with long histories such as Taoism and Jainism. There are also nearly 1.2 billion people who are in the unaffiliated category, which includes those who are **atheistic** (do not believe in god)

and those who are **agnostic** (do not confirm or deny the existence of god).

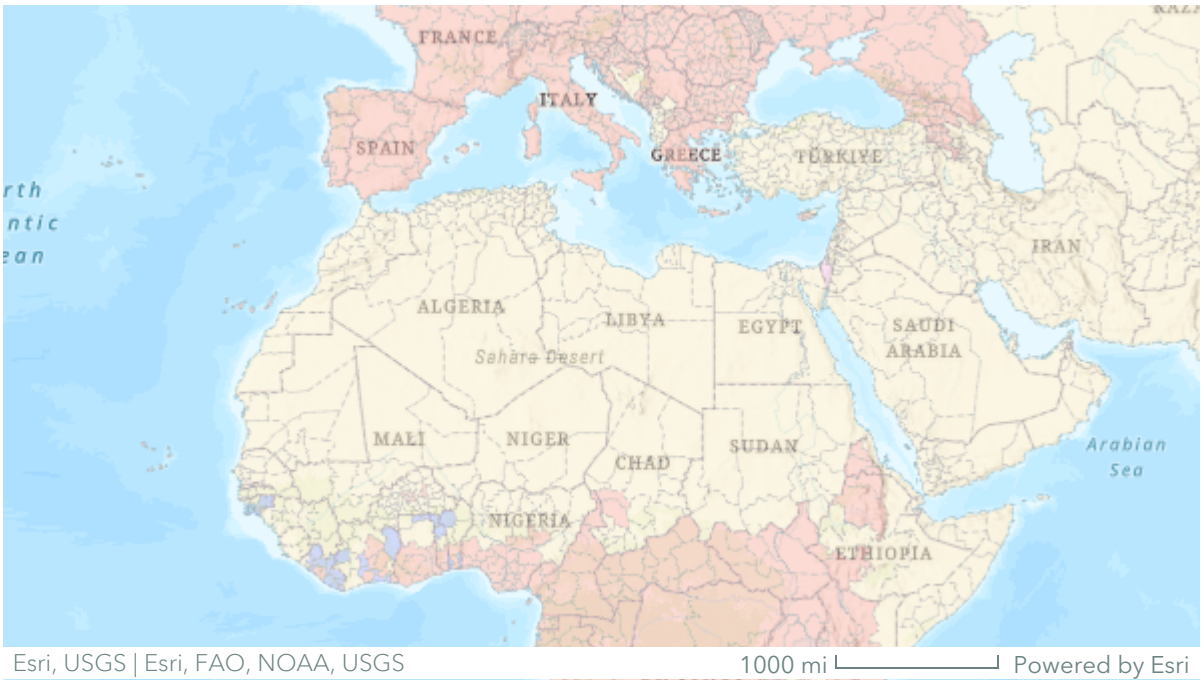


Major religions of the world and their approximate number of followers as of 2020 (Data source: World Population Review).

Analysis by the Pew Research Center found that more than one in five countries (22%) have an official **state religion** that is specified in the law of the country. It also found that countries with official state religions are most likely to be found in the Middle East and North Africa region. An example of a country with an official state religion is Afghanistan, where Islam is stated as the official state religion in its constitution.

A country that is entirely controlled by religious leaders and religious law is known as a **theocracy**. It is important to note that just because a country (e.g. United Kingdom) has an official state religion, it does not necessarily make it a theocracy. Most countries in today's developed world have a clear separation between religion and politics, the

governments of these countries are described as being non-religious or **secular**.



The map shows the predominant religious adherents in different provinces/states around the world. Please note that the minority religious adherents of each province/state are not shown on this map. (Data source: World Religion Database and the National Geospatial Intelligence Agency)

Classification of Religions

Given the number of different religions in the world, we can group religions that share one or more characteristics (as described below) into the same general category.

1. Ethnic and proselytic religions

Ethnic religions are those that are associated with an ethnic group of people, and people are associated with them by birth rather than through conversion. An example is Judaism, which requires a follower to have a Jewish mother.

Proselytic religions, also known as universalizing religions, are those (e.g. Christianity) that actively seek converts from all ethnic groups. For this reason, proselytic religions tend to have more followers than ethnic religions.

2. Polytheistic, monotheistic, and syncretic religions

Monotheistic religions such as Islam believes in only one god, and prevent their followers from worshiping other gods. Whereas, **polytheistic** religions such as many African folk religions believe in and worship many gods or spirits.

Syncretic religions are those that combine elements of two or more religions. This may occur when a religion evolves over time with its followers voluntarily accepting new beliefs. However, it may also occur as conquerors impose their religions on the conquered population, forcing the conquered to blend their native religions (e.g. Native American folk religions, West African animism) with the symbols, icons, and beliefs of the conquerors' religion (e.g. Catholicism) to avoid persecution. An example would be **voodoo** in the French Caribbean and New Orleans, which consists of elements of West African animism that were brought to North America by slaves, and the Catholic beliefs and rituals of many European landowners.

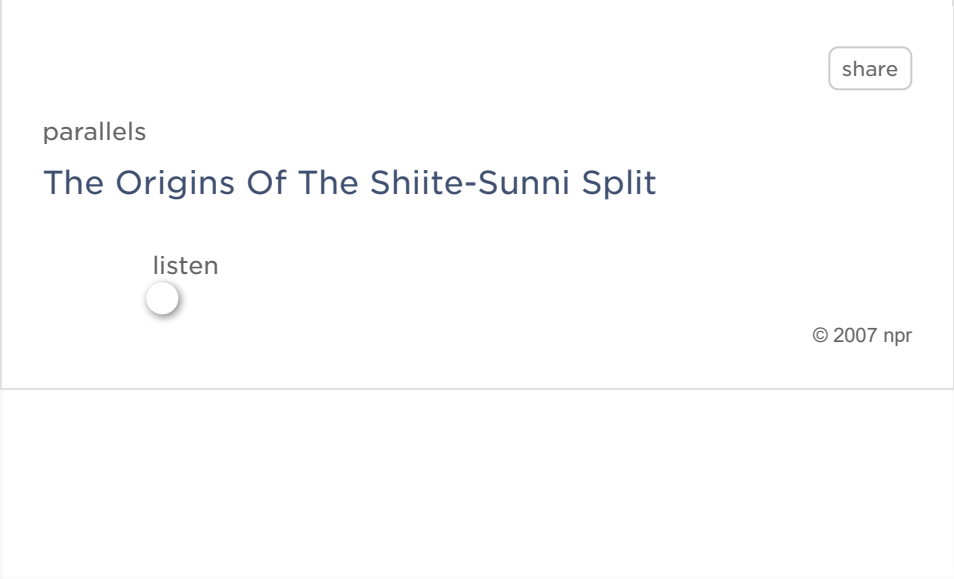
Highlights of Today's Major Religions

Christianity

- **Monotheistic** religion centered on the teachings of **Jesus** of Nazareth.
- Derived from Judaism, includes the Hebrew Bible as part of its holy book (i.e. Old Testament)
- Split into three major branches: **Orthodox** (covering mainly Russia, Eastern and Southern Europe), **Catholic** (covering mainly Western Europe and former European colonies), and **Protestant** (covering mainly Northern Europe and former European colonies)

Islam

- **Monotheistic** religion centered on the teachings of **Muhammad**.
- Derived from Judaism, partly shares common scriptures and holy figures (e.g. Moses, Jesus) with Christianity and Judaism.
- Split into two main branches over who should succeed the Islamic Empire left behind by the Prophet Muhammad: **Sunni** (over 80% of Muslims worldwide are Sunni) and **Shia** (majority of Muslims in Iran, Iraq, Bahrain, and Azerbaijan are Shia)



A podcast explaining the 1400 years that split Islam between Sunni and Shia. (Source: NPR)

Hinduism

- **Polytheistic** religion with the many manifestations of one supreme god, **Brahman**, being worshiped. (e.g. Vishnu-god of preservation, Shiva-god of destruction, Ganesha-god of wisdom)
- It preaches four goals of human life: **(1) dharma** (ethics/duties for each **caste** or social class in the society), **(2)**



A look at the life and discrimination faced by members of the lowest social class in India's caste system (Source: Vox)

artha (prosperity/work), **(3) kama** (desires/passions), and **(4) moksha** (liberation from samsara or the cycle of life and death).

Buddhism

- **Polytheistic** religion centered on the teachings of **Siddhartha** Gautama, also known as The Buddha.
- Derived from Hinduism, and shares some similar beliefs such as liberation from cycles of rebirth (i.e. samsara).
- Split into three main branches: **Theravada** (found mainly in Southeast Asia, and stays closest to Buddhism's original form), **Mahayana** (found mainly in China and Japan, and fused with native religions in those places), and **Vajrayana** (found mainly in Tibet and Mongolia).

Judaism

- **Monotheistic** religion that worships **Yahew**, the national god of ancient Israel.
- The oldest of the three **Abrahamic religions**, which are Judaism, Christianity, and Islam.
- Split into three branches based on the degree that followers adhere to Jewish customs: **Orthodox** (strictest, will not use electricity or operate a car at all on Shabbat or the Jewish day of rest), **Conservative** (less strict, will use electricity or a car only for purposes related to worship on Shabbat), **Reform** (least strict, will drive a car and use electronic devices for any reasons on Shabbat)

Diffusion of Religions

Religions may spread to places far from their birthplaces through all forms of diffusion. For example, a religion may spread to other continents through missionary activities, but it may be simultaneously replaced by a new religion at its birthplace as recent immigrants bring new ideas to the region.

For example, Buddhism originated near the current Nepalese-Indian border, and spread to North America through **relocation diffusion** as immigrants moved from Vietnam to the United States.

As another example, Christianity was founded in the eastern Mediterranean, but its early followers were persecuted for more than 300 years. It underwent **hierarchical diffusion** in the Roman Empire starting with Emperor Constantine I's (280-337AD) conversion to Christianity, followed by its legalization and adoption by other Roman leaders and citizens.

As the last example, Islam originated in Mecca, Saudi Arabia, and it spread throughout the Arabian Peninsula by **contagious diffusion** as the Prophet Muhammad converted and conquered neighboring tribes during his lifetime.

Religious Landscapes

Different religions preach different values, which in turn often leave very different marks on the landscape. For example, it is reported that there are more than five million stray "street cows" wandering in the streets of major cities and the fields of villages in India because cows are sacred animals in Hinduism (nearly 80% of India's population are Hindus). As another example, the churches and cemeteries of Protestant Christians, who value efficiency and thrift, tend to be much more modest in appearance compared to the colors and decorations found in many Catholic churches and cemeteries.



Compare the level of decoration and details between cemeteries found in a predominantly Catholic country like Mexico on the left (i.e. Izamal, Yucatán, Mexico) and a predominantly Protestant country like the US on the right (i.e. Butler, Ohio, US). (Source: Photo by Adam Jones on Wikimedia CC-BY-SA-3.0; Hannah Wernecke on Unsplash)

Cemeteries, places of worship, and any natural or human-made places that carry religious meaning for worshipers are known as **sacred spaces**. Some religions may require their followers to undertake **pilgrimages** or religious journeys to sacred spaces that are of great importance to those religions. For example, one of the five pillars of Islam requires followers to undertake the **Hajj**, a holy pilgrimage to the holy city of Mecca, Saudi Arabia at least once in their lifetime.

A look at the scale of the hajj in Mecca and past incidents during the hajj (Source: VOA News)

Religious Conflicts

Religion-related conflicts can take different forms. One form is **sectarian violence** between followers of the same religion with different beliefs (e.g. Sunni vs Shia Muslims, Catholic vs Protestant Christians). Some of this violence may be perpetuated by religious **fundamentalists**, who may be tolerant of other religions, but seek to encourage their coreligionists to strictly follow the founding principles of their religion, and purify their religion of followers that they consider not pious enough.

Another form of religion-related conflict is **inter-religious conflicts** between followers of different religions (e.g. Jews vs Muslims in Israel-Palestine, Muslims vs Hindus in India). However, it is important to remember that many of these conflicts are caused by other factors including ethnic differences, power struggles, or economic competition.



A brief, simple history of the Israel-Palestine conflict, and its political, economic, and religious roots. (Source: Vox)

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

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Chapter 7

Ethnicity and Race

Ethnicity or Race?

Ethnicity refers to a set of learned behaviors or cultural characteristics (e.g. language, religion, history, origin) shared by a group of people who are in the same **ethnic group** or **nation**. An example would be the Luiseño Indian Nation, whose members share the same language and religion, and settled in the areas between Southern Los Angeles to Northern San Diego County.

Race is a social construct that may be defined differently by different people using different methods at different times. Some may group people into different races based on genetic differences and ancestry, while others may group people into different races based on phenotypic (appearance) differences.

Defining race with the "Pencil Test" in S. ...

Learn more about the "Pencil Test" which was used in South Africa until 1994 to determine someone's...

https://www.youtube.com/watch?v=b7xy9YE3InY

The changing definition/perception of ethnic groups and races in the United State can be readily seen in the race/ethnicity questions found in the US census dating back to the 1790s. For example, Mexican was considered a race rather than an ethnic group in the 1930 census. As another example, Hawaiians and Pacific Islanders were grouped with the Asian race between 1960 and 1990, they did not get their own race category until the 2000 census.

Explore the different race, ethnicity and origin categories used in the U.S. decennial census, from the first one in 1790 to the latest count in 2020. The category names often changed in a reflection of current politics, science and public attitudes. For example, “colored” became “black,” with “Negro” and “African American” added later. The term “Negro” was dropped for the 2020 census. Through 1950, census-takers commonly determined the race of the people they counted. From 1960 on, Americans could choose their own race. Starting in 2000, Americans could include themselves in more than one racial category. Before that, many multiracial people were counted in only one racial category. See this related blog post for more information

Years

Click on a year column to see how the race/ethnicity categories for a particular census compare to the 2020 census. (Source: Pew Research Center)

Race and Ethnic Issues in the US

History of division

The history of slavery in the United States laid the foundation for a racially divided society in America. As seen in the

race/ethnicity questions from the 1790 to 1860 census, census-takers were not only determining respondents' race (e.g. white, black, mulatto), but also whether they are free or slaves. Self-reporting in the census did not take place until 1960.

In this historically divided country, white individuals of English descent were known as the **charter group**, or the majority group of people in a country who promoted their own language (English), religion (Protestant Christianity), and system of governance. Anyone who does not align with the cultural characteristics of the majority group (i.e. minority group) is pressured politically (e.g. restricting the use of non-English instruction in schools), socially (e.g. excluding non-whites from schools or certain neighborhoods), and economically (e.g. refusing to provide employment or loans to non-whites) to act more like members of the charter group in their speech, dress, and behaviors.

Fitting-in

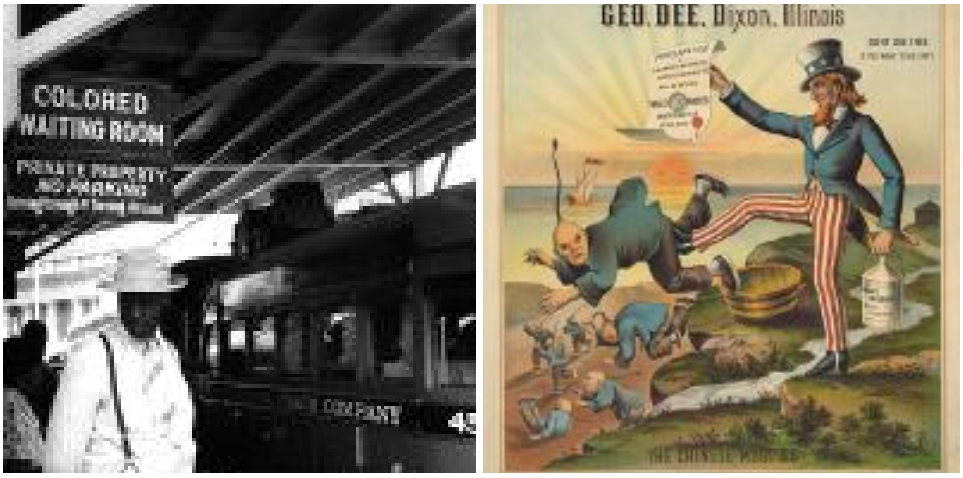
Over time, members of minority groups and their cultures may undergo the following changes due to interactions and pressures exerted by the majority group.

- **Amalgamation**: the cultural characteristics of the majority and minority groups melt together and form a new ethnicity.
- **Acculturation**: this often involves the minority group's adoption of the majority group's cultural characteristics to a limited extent in order to function economically and socially in the host society.
- **Assimilation**: the minority group mostly replaced its distinct cultural characteristics with that of the majority group.

Racism in the US

The US Equal Employment Opportunity Commission defines race discrimination or racism as "treating someone unfavorably because he/she is of a certain race or because of personal characteristics associated with race (such as hair texture, skin color, or certain facial features)".

Even after the Civil War and the ratification of the Equal Protection Clause in the 14th amendment of the constitution, the United States has used tests and laws such as the "Brown Paper Bag Test" (comparing one's skin color to a paper bag), one-drop rule (singling out individuals with any black ancestry), and Jim Crow laws (state and local laws that legalized racial segregation) to deny African Americans access to employment, education, housing, and the right to vote. Other racial groups have been subjected to similar laws and legal rulings (e.g. People v. Hall) that deprived those groups (e.g. Asian Americans, Native Americans) of fundamental rights in the US.



(Left) At the racially segregated bus station in Durham, North Carolina. May 1940. (Right) Advertisement showing Uncle Sam kicking a Chinese man off a cliff as others flee to the sea with captions "The Chinese Must Go". 1886 (Source: Jack Delano for the US Farm Security Administration on Wikimedia Commons; The George Dee Magic Washing Machine Company on Wikimedia Commons)

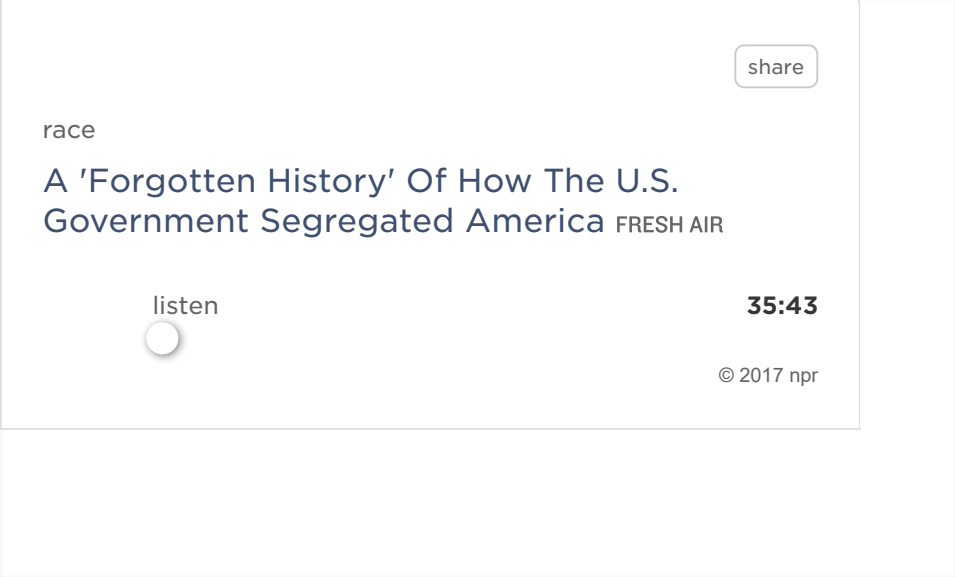
Ongoing racial inequities

Housing

Today, many race and ethnic groups choose to live close together either voluntarily or involuntarily in neighborhoods known as **ethnic enclaves** (e.g. Chinatown, Little Italy)**.**

Members of the same ethnic group may **voluntarily** live in ethnic enclaves because they may:

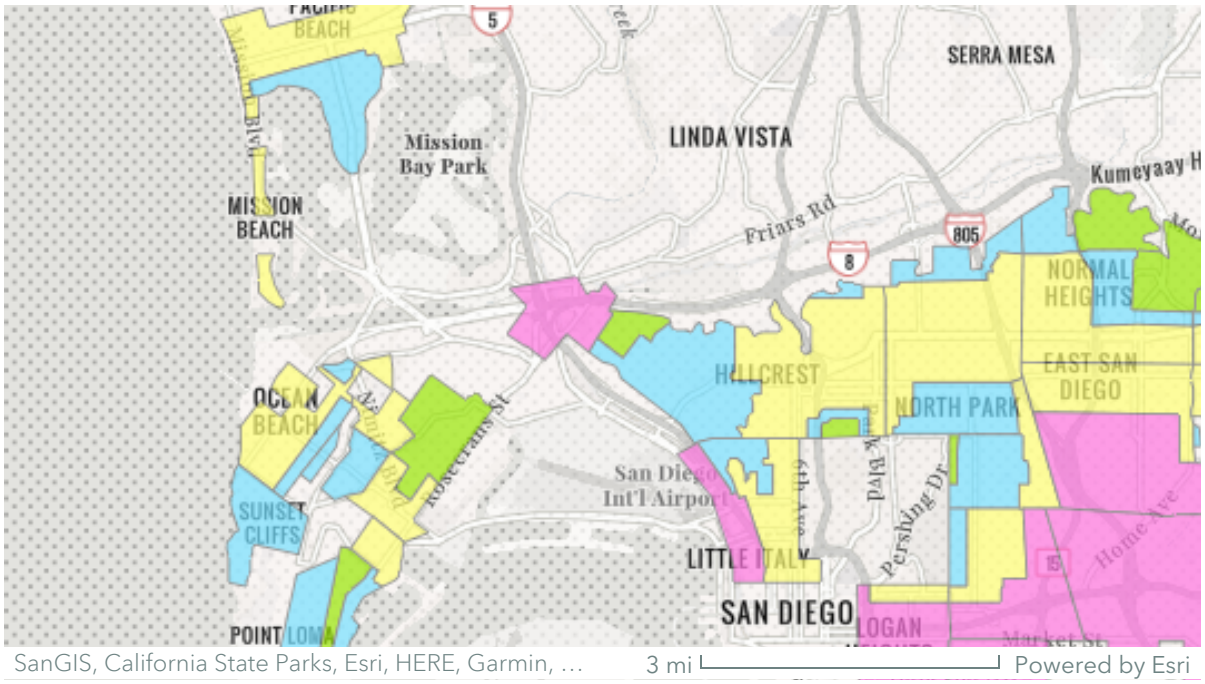
- share similar experiences and cultural characteristics (language, religion, immigration experience),
- rely on similar businesses or services for employment, daily living, recreation, and connecting with relatives in their home countries,
- feel safer living among members of the same ethnic group who are less likely to discriminate against them on the basis of race or other personal characteristics.



Listen to learn how did the U.S. government's practice of redlining led to the involuntary segregation in housing in America. (Source: NPR)

In other cases, ethnic enclaves may form **involuntarily** as discriminatory laws (e.g. Jim Crow laws) or racist behaviors prevent members of a certain race and ethnic group from living outside of certain areas. An example of this is **redlining**, a practice that is now illegal, but was widely used in the past to deny African Americans (and immigrants) access to loans

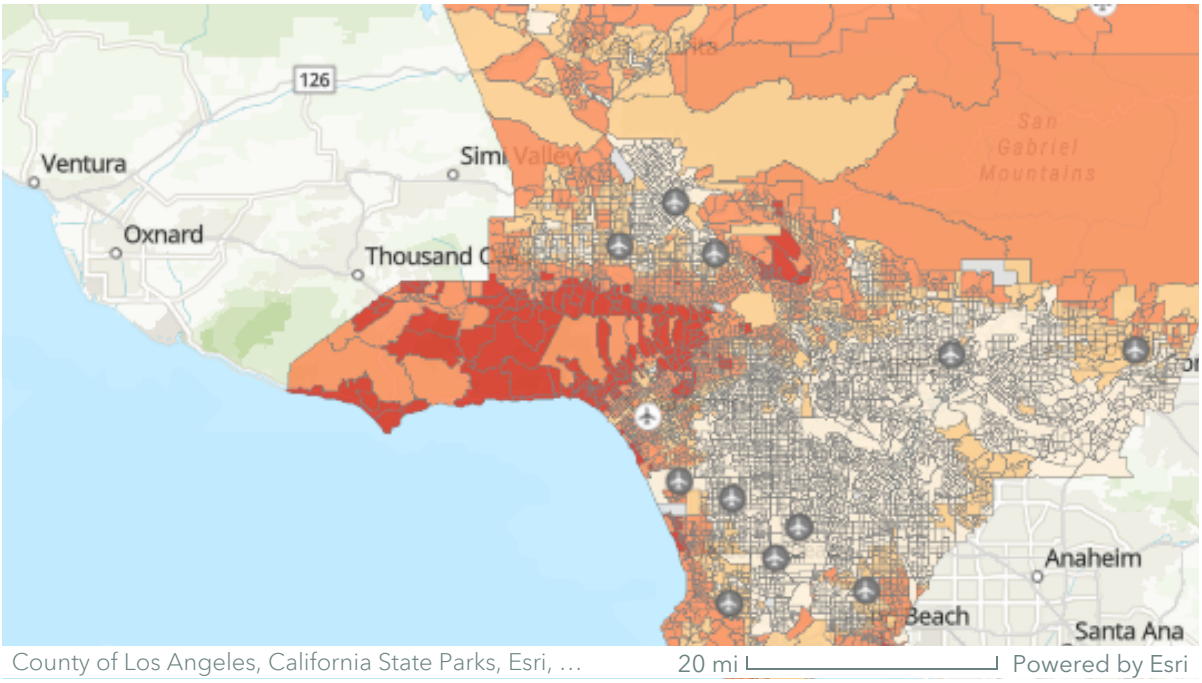
and insurance needed for home purchases in predominantly white suburbs.



The US federal government's Home Owners' Loan Corporation (HOLC) created these maps to inform banks of the risk of issuing home loans to potential home buyers in different neighborhoods in the country. The risk or "grade" was calculated based on the neighborhood's quality of housing, the recent history of sale and rent values, the racial and ethnic identity, and the social class of the residents. It is nearly impossible for home buyers to secure loans to purchase homes in lower-grade neighborhoods (i.e. the redlined neighborhoods) because banks wish to minimize risks. At the same time, African Americans and immigrants wishing to purchase homes in higher-grade neighborhoods were also prevented from doing so by the banks, because it was believed (inaccurately) that the "infiltration" of those groups in White, higher-grade neighborhoods will depress the property value and desirability of those neighborhoods. (Data source: Mapping Inequity Project at the University of Richmond's Digital Scholarship Lab)

Environmental justice

In looking at the locations of less desirable economic activities (e.g. heavy industry and manufacturing) and environmental hazards (e.g. landfills, airports), it may become clear that those undesirable facilities and hazards tend to be concentrated in the neighborhoods of less-powerful groups (e.g. minorities, economically disadvantaged groups). The **environmental justice** movement seeks to remedy this inequity by making sure that all groups have equal access to decent and healthy places to live.

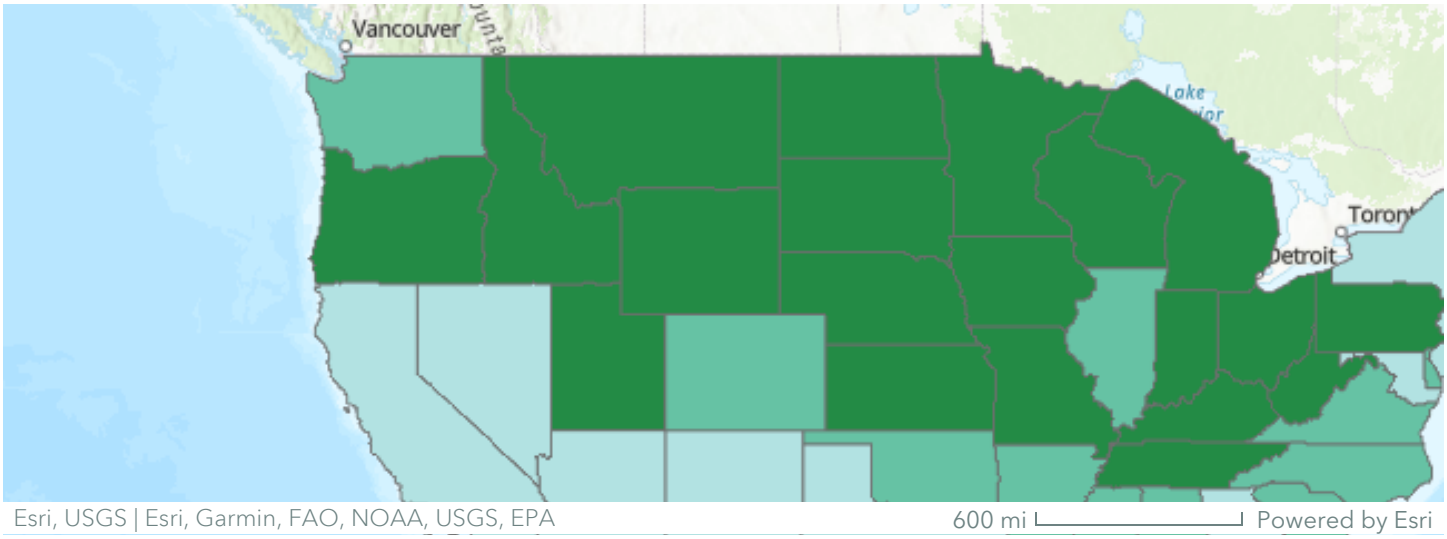


This map compares the location of airports in Los Angeles County with the percentage of people who self-identified as White Alone in each Los Angeles County block group in the 2020 US census. Research has found that residents near airports are exposed to higher levels of carbon monoxide, and have higher levels of asthma and heart problems. Only 6 of LA county's 22 airports (27%) are in predominantly white block groups (i.e. over 50% of their population self-identified as White Alone). (Data source: US Census Bureau, Federal Aviation Administration)

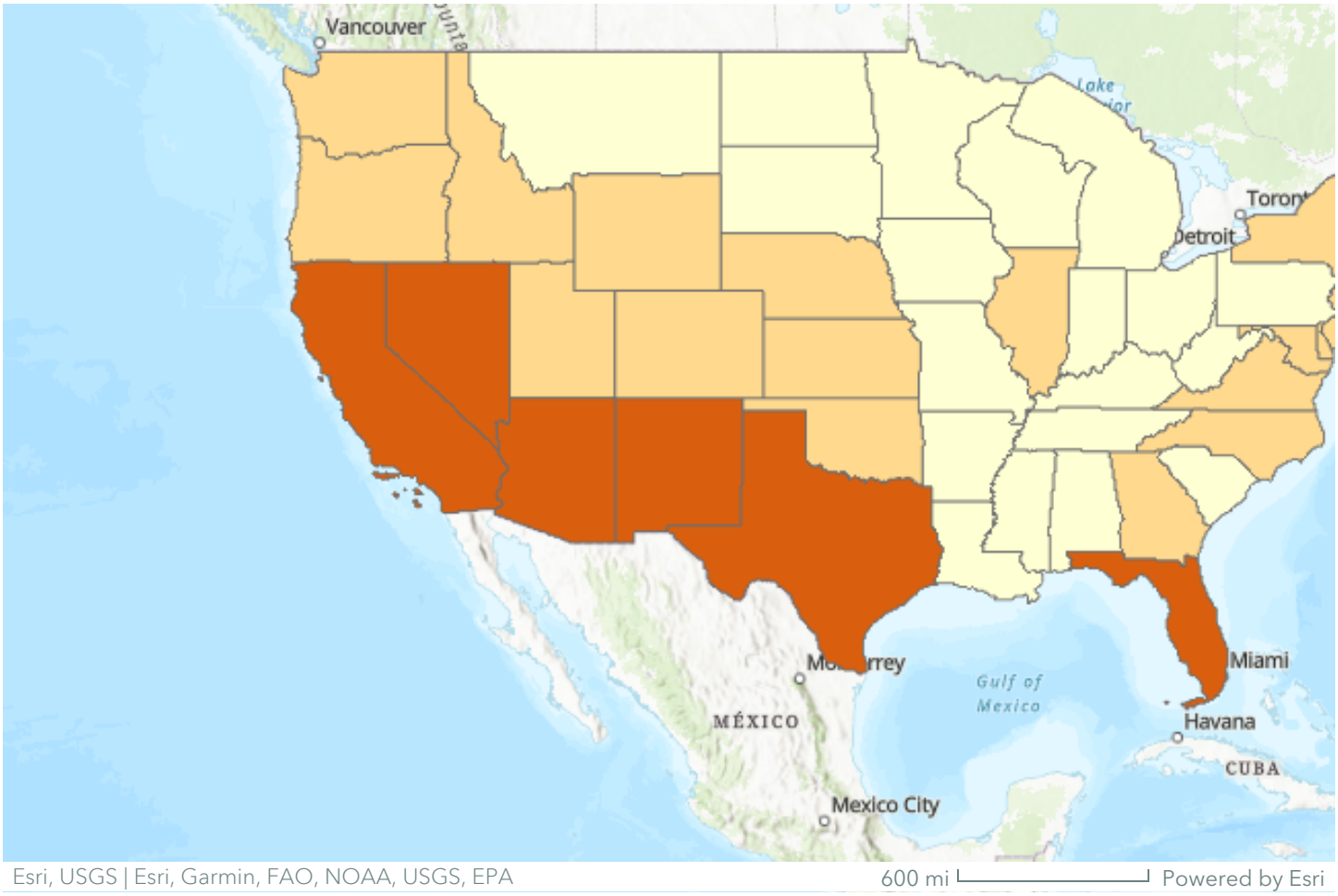
Snapshot of Ethnicities in the US

The distribution of different race and ethnic groups in the US today is shaped by migrants from within and outside the country, as well as historical events that displaced certain groups in favor of others.

Take a look at the series of maps below and see if you can identify any spatial patterns where different race and ethnic groups can be found today.

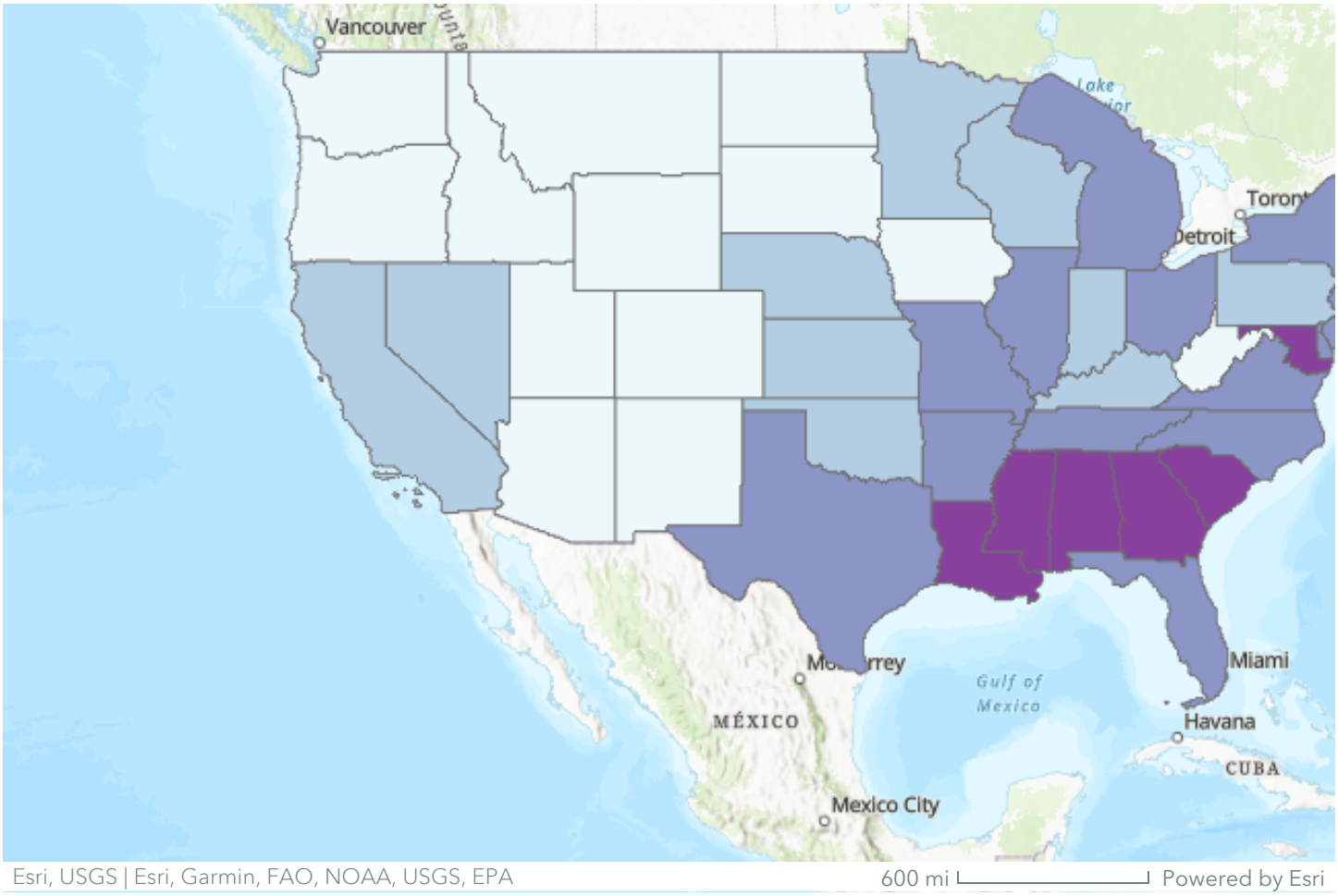


Spatial distribution of people who self-identify as **White Alone** in the 2020 US Census. There are about 192 million people who self-identify as White Alone in the US. (Data source: US Census Bureau)



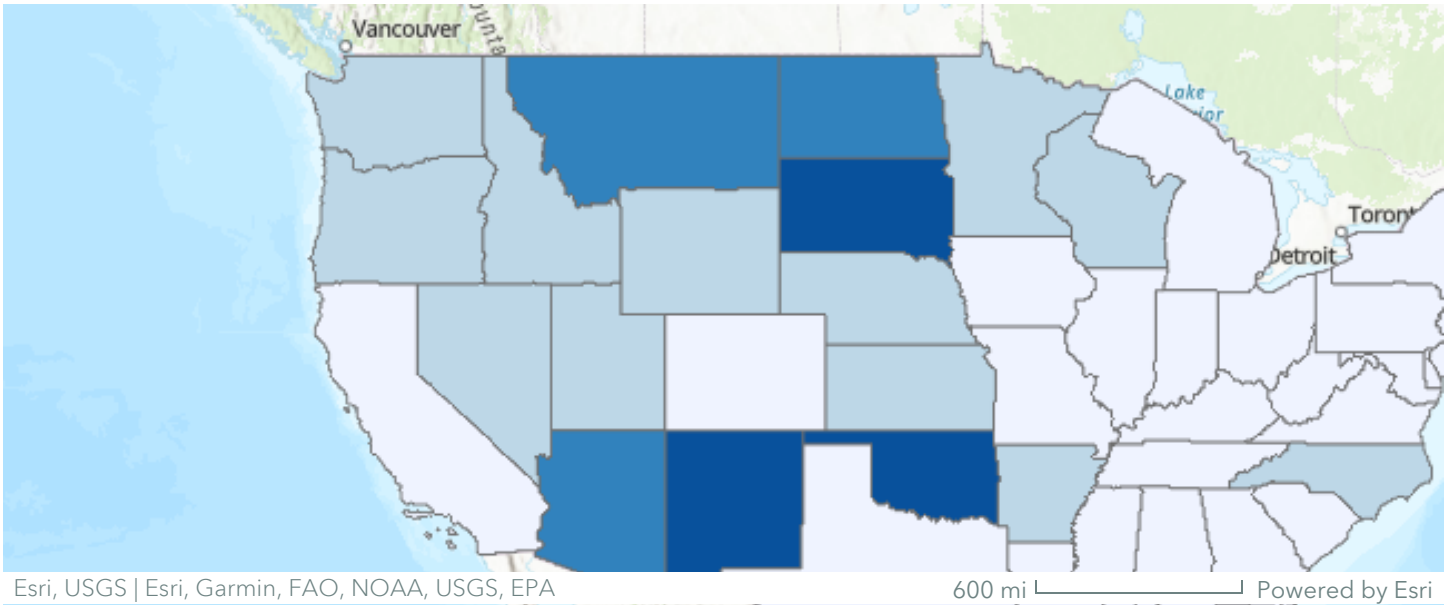
Hispanics or Latinos are mainly found in US states closest to Mexico and Caribbean countries such as Cuba.

There are about 62 million people who self-identify as Hispanic or Latino in the US in 2020. (Data source: US Census Bureau)



Blacks or African Americans are mostly found in Southern states due to the history of slavery. Some started to migrate to other regions in the early 1900's, but many have recently returned to the South.

There are about 40 million people who self-identify as Black or African American Alone in the US in 2020. (Data source: US Census Bureau)



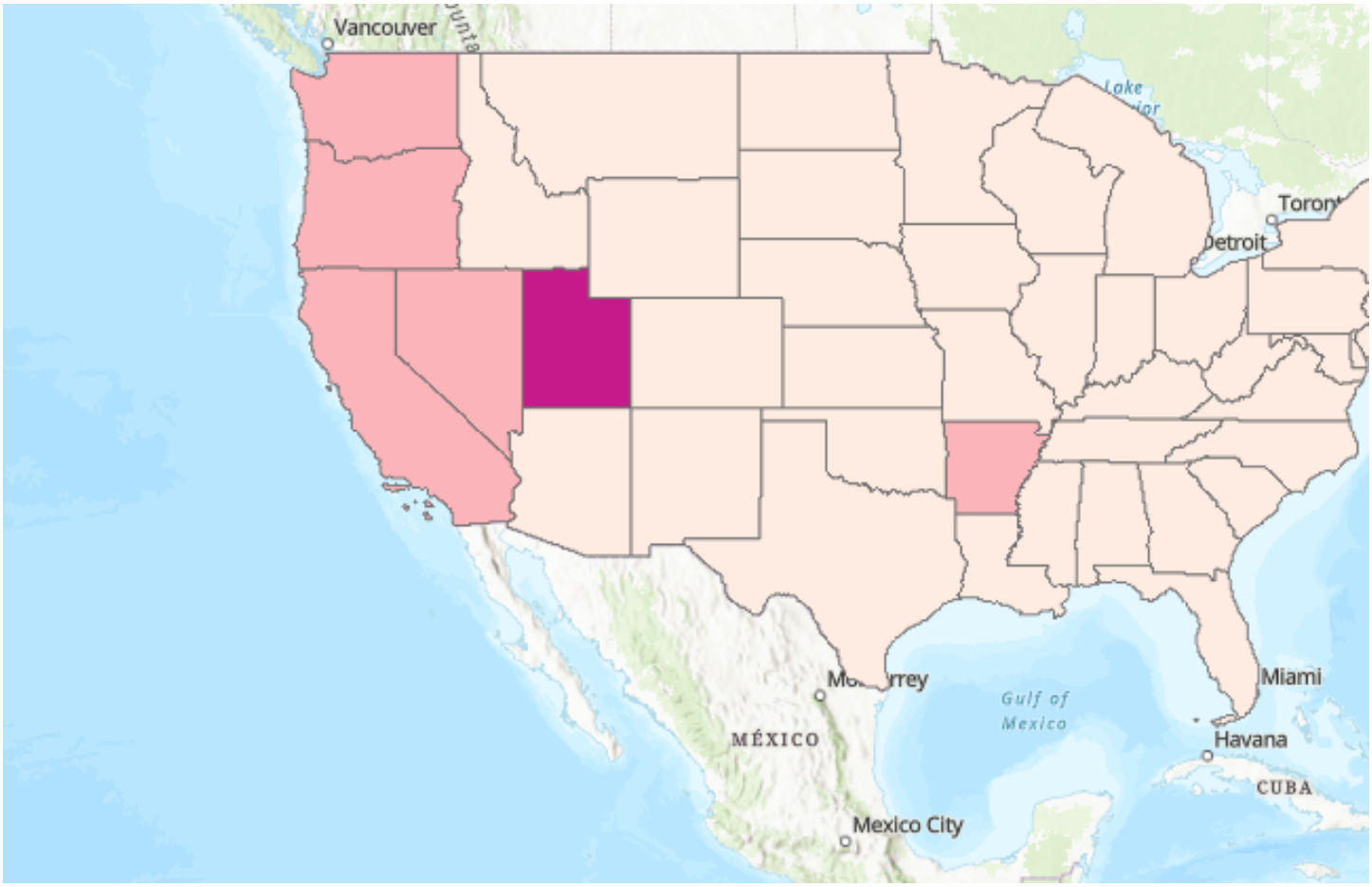
American Indians and Alaskan Natives are mostly found in states that had or have sizable territories set aside for indigenous reservations, even though most of this population do not live on reservations today.

There are about 2 million people who self-identify as American Indian and Alaskan Native Alone in the US in 2020. (Data source: US Census Bureau)

Esri, USGS | Esri, Garmin, FAO, NOAA, USGS, EPA 600 mi Powered by Esri

Asians are found mostly in the Western US and Hawaii. There is also rapid growth in Asian population in New York and New Jersey.

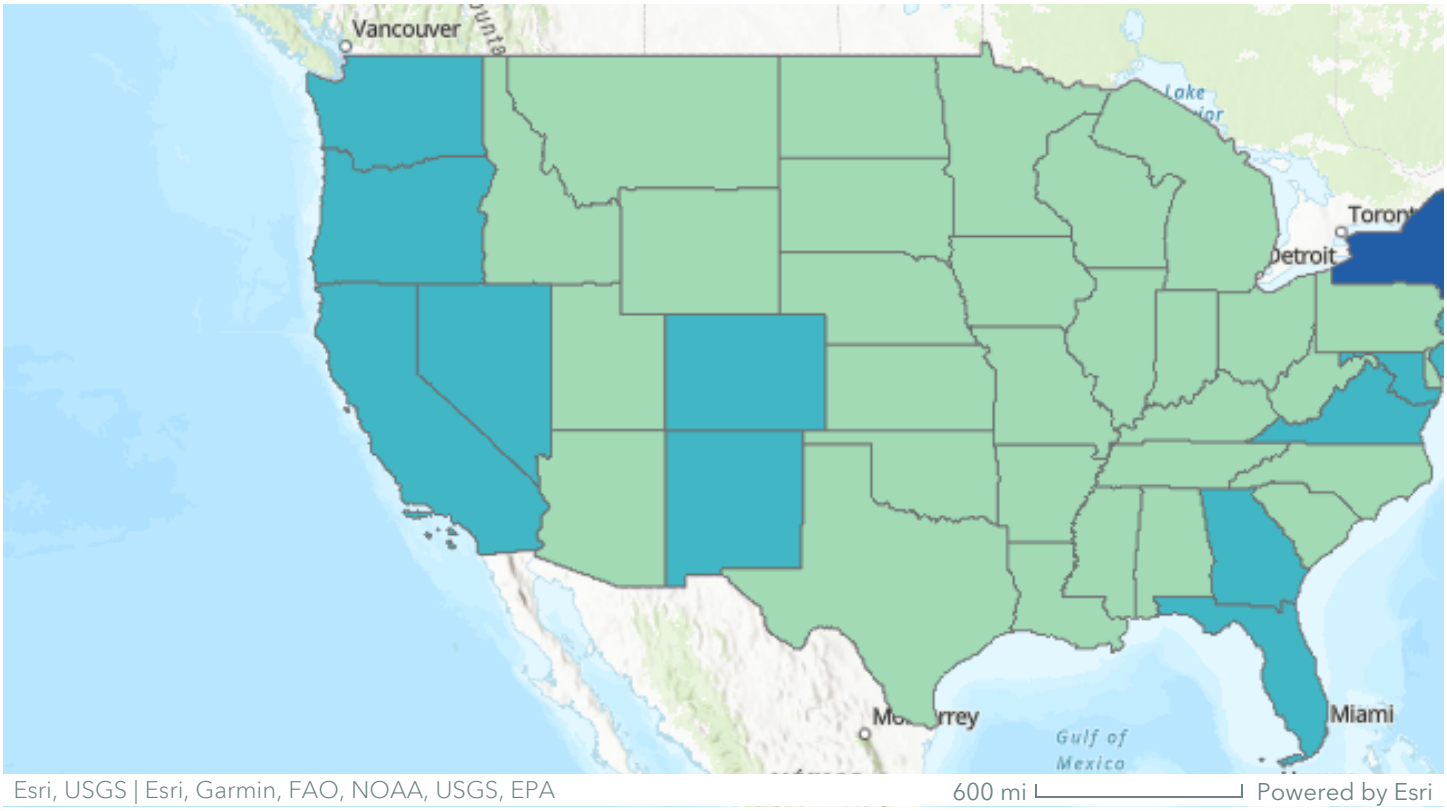
There are about 20 million people who self-identify as Asian Alone in the US in 2020. (Data source: US Census Bureau)



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Native Hawaiians and Other Pacific Islanders are dispersed throughout the mainland US. Many of them settled in Utah due to the long history of missionary activities by the Mormon Church in the South Pacific.

There are about 0.6 million people who self-identify as Native Hawaiian and Other Pacific Islander Alone in the US in 2020. (Data source: US Census Bureau)



Spatial distribution of people who self-identify as **Some Other Race Alone** in the 2020 US Census. There are about 2 million people who self-identify as Some Other Race Alone in the US. (Data source: US Census Bureau)

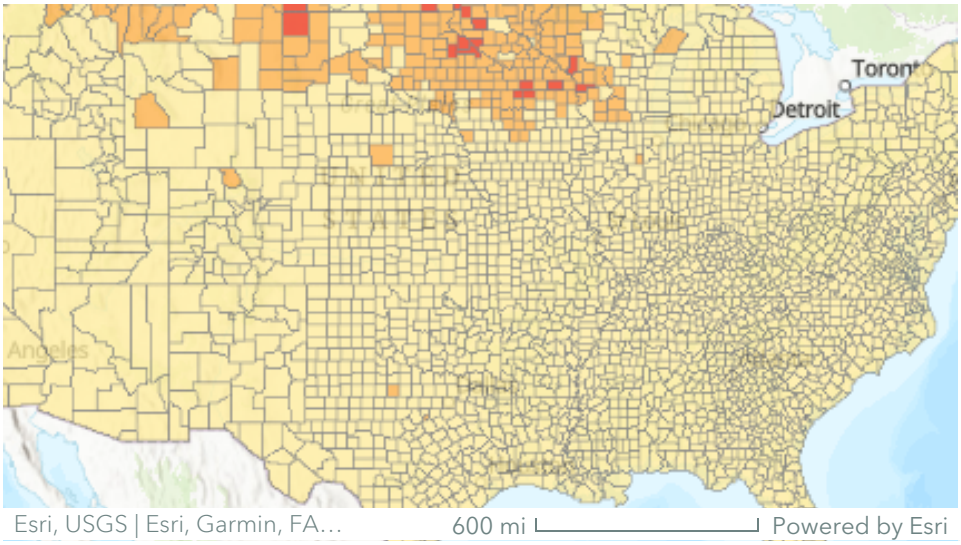
Esri, USGS | Esri, Garmin, FAO, NOAA, USGS, EPA 600 mi Powered by Esri

Spatial distribution of people who self-identify as **population of two or more races** in the 2020 US Census. There are about 14 million people who self-identify as population of two or more races in the US. (Data source: US Census Bureau)

Ethnic Landscapes

The character of a region that has been settled by ethnic minorities may change over time, creating the following types of ethnic landscapes:

1. **Ethnic homelands**: Large areas that have been settled by an ethnic minority for a long time. These areas may have some kind of political autonomy, landmarks, symbols, and signs in the minority's language that marks its history and attachment to the area. An example is the French-Canadian homeland in Quebec.
2. **Ethnic substrate**: An area that is no longer an ethnic homeland because its ethnic residents were assimilated into the majority culture. However, this area may still have ethnic restaurants and place names, and celebrate ethnic festivals, even though its current residents may not be familiar with the language or the history of those things. An example would be the upper Midwest, which has a large number of people of Norwegian descent, and has annual celebrations of Norway's declaration of independence (see map below).
3. **Ethnic enclaves**: As mentioned previously in this chapter, these are areas with a high concentration of ethnic residents, and consist of specialized amenities (e.g. places of worship, stores) catered to particular ethnic groups. Ethnic enclaves found in urban areas, close to city centers, are referred to as **ethnic neighborhoods**. Ethnic enclaves found in the suburbs, made up of more established and affluent residents are called **ethnoburbs**.



This map shows the percentage of each county's population who reported that they are of Norwegian-only descent in the 2020 US Census. Click on a county to see the exact percentage. (Data source: US Census Bureau)

Survey of Race and Ethnic Issues in Other Countries

- **Canada**: Over the last 150 years, 150,000 Indigenous children were taken from their parents and forced into Catholic residential schools to assimilate them into the Canadian culture. Thousands of Indigenous children were abused and died in these schools.
- **Rwanda**: The Hutu ethnic majority tried to ethnically cleanse or eliminate traces of the Tutsi minority from the country in the Rwandan Genocide of 1994.
- **India**: The killing of ethnic Kashmiri Hindus (i.e. Pandits) in the predominantly Muslim Indian-administered Kashmir province has forced Pandits to flee their ethnic homelands for safety, only to be prevented from leaving by Indian authorities.
- **Sweden**: Previously lax immigration policies led to the doubling of foreign-born residents in the last two decades. This prompted some Swedish politicians to blame immigrants for the rise in crime that occurred during the same time period.
- **Brazil**: Land conflicts between ranchers, loggers, miners, and indigenous tribes often led to death threats and

violence, and even the genocide of an indigenous tribe.



Targeted Killings of Minority Hindu in Indian Kashmir (Source: VOA News)

By: Wing Cheung, Palomar College

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Chapter 8

Political Geography

Introduction

The world's land and resources are divided between different countries, also known as **states**. Today, there are 193 internationally recognized states (i.e. countries) in the United Nations (UN), but different events (e.g. wars, revolts) may change this number as states are created or dissolved. It is important to remember that the term "**states"** in this chapter refers to countries, and not the states or provinces that make up a country.



Map showing 193 UN members states in blue, 2 observer states in green (Palestine, Vatican), and 17 non-self-governing territories in grey (Source: Newfraferz87, CC BY-SA 4.0 , via Wikimedia Commons)

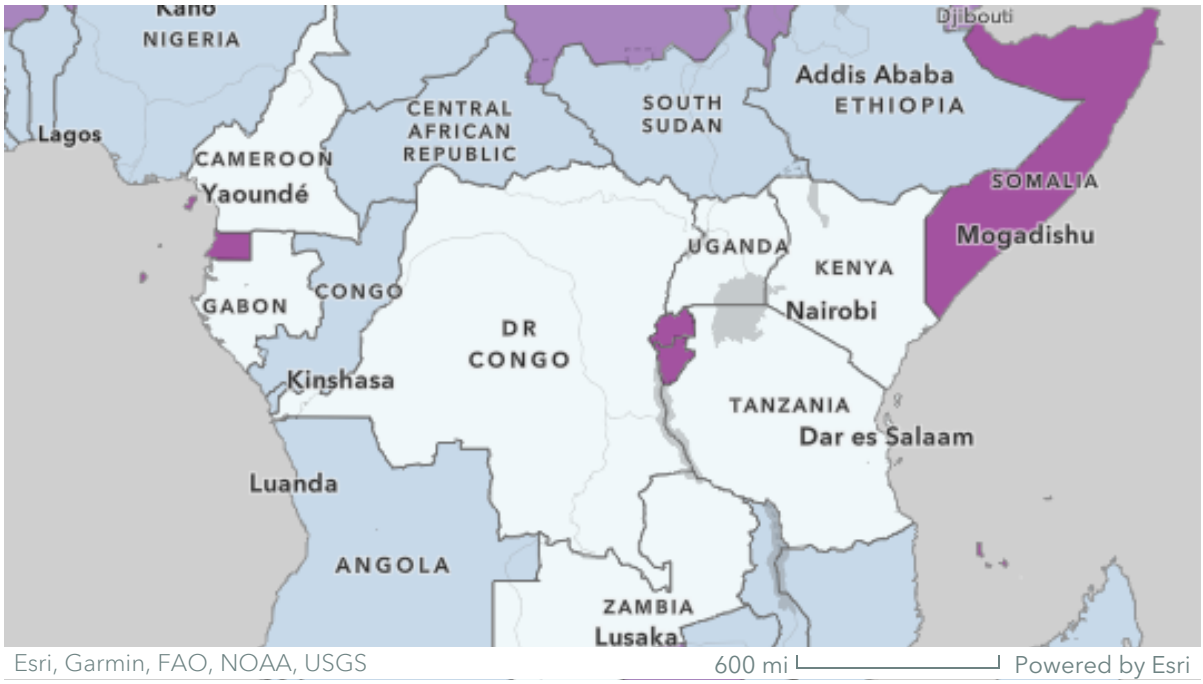
Listed below are several categories of states in the world. Keep in mind that a state can belong to more than one category (e.g. US is a sovereign state and a multinational state), and a state may change from one category to another over time (e.g. Tibet went from a sovereign state to a stateless nation when China annexed it in 1951 and eventually abolished its government).



Learn how ethnic Kurds in Syria seek to go from a stateless nation to a nation-state. (Source: Vox)

1. **Sovereign State** (or State)- A country with its own **sovereignty**, or the authority to control its own social, political, and economic affairs within its borders.
2. **Nation-State**- A country that is generally homogeneous (e.g. same language, religion, customs) and dominated by one ethnic group.
3. **Multinational State**- A country that is made up of more than one ethnic group. These ethnic groups may have arrived through immigration, or already lived in the state before its borders were arbitrarily drawn.
4. **Stateless Nation**- This is not a type of state, but rather an ethnic group (also known as a **nation**) that desires to have a country to call their own. An example of a nation is the

Kurdish people in the Middle East, who have been seeking their own state in the region for centuries.



This map shows the percentage of each African country's population that is in that country's dominant ethnic group. Countries with a very high percentage of their population in the dominant ethnic group are known as nation states. (Data source: CIA World Fact Book, Encyclopedia Britannica).

The Making of a State

Given the competing interests (e.g. different ethnic groups) within some states, some states may fail and break up if it is overwhelmed by **centrifugal forces** (i.e. forces that pit their citizens against each other), such as political conflicts and religious differences. In contrast, **centripetal forces** (e.g. nationalism, common ethnic identity) can unite a state's citizens and reinforce the state's unity.

Even the shape or geometry of a state can influence the unity of a state. Specifically, the ideal state geometry is one that is **compact** and roughly circular, where the distance from the center of the state (ideally the site of the capital) to any border is almost equal. This ideal geometry is believed to allow all parts of the country to feel equally connected to the capital,

which is more likely to foster a stronger sense of nationalism and unity.

The least ideal state geometry is one that is **fragmented**, where some parts of the country may be isolated from the capital by long distances or physical barriers (e.g. oceans, mountain ranges). This makes it difficult for the capital to provide services or exert its authority in these remote regions, which may in turn cause the residents of these remote regions to feel neglected and alienated from the central government.

Keep in mind that state geometry is only one factor in determining a state's unity and stability. In fact, there are states with ideal state geometries (e.g. Polish-Lithuanian Commonwealth) that have dissolved in the past due to external threats (e.g. invasions).



The partition and dissolution of the compactly-shaped Polish-Lithuanian Commonwealth by its neighbors between 1772 and 1795. (Source: Esemono, Public domain, via Wikimedia Commons)

State Boundaries

Neighboring states that are on bad terms and suspicious of one another may be separated by heavily fortified and visible boundaries (e.g. North Korea and South Korea). Whereas, boundaries between friendly neighboring states may be lightly guarded and hardly noticeable (e.g. US and Canada).

There are three main types of boundaries that states use to demarcate their sovereignty, or the areas in which they have authority.

1. **Physical boundaries**: borders separating states which are based on some natural features (e.g. river, mountain) in the landscape. An example of this is the Rio Grande River separating the US and Mexico.
2. **Ethnographic boundaries**: border that separates states based on ethnic characteristics (e.g. religion, language). An example is the border separating Spanish-speaking Bolivia and Portuguese-speaking Brazil.
3. **Geometric boundaries:** border that is often a straight line that was arbitrarily drawn to separate states. It may cause one ethnic group to be split into the jurisdictions of two or more states. This can lead to **irredentism,** as members of the split ethnic group in one country secede in order to join their ethnic counterparts on the other side of the border. This problem is especially acute in Africa, which has at least 177 ethnic groups that are split between two or more states. The borders of many of these African states were arbitrarily drawn by European colonial powers more than a century ago,

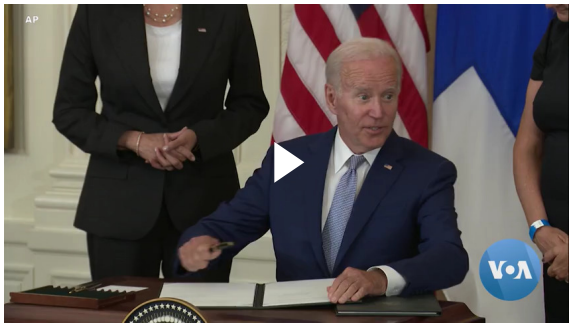
Beyond the State

To obtain more trade or protection from foreign powers, states may voluntarily give up some of their authority or sovereignty and contribute resources (e.g. soldiers, money) to a **supranational organization** created for a specific purpose. We will look at some purpose-driven supranational organizations below.

Military supranational organization

NATO (North Atlantic Treaty Organization): Created after World War II to offer its 30 member states (28 states in

Europe, the US, and Canada) mutual protection against external invaders. Members are required to contribute money and resources to sustain NATO's mission. The expansion of NATO in recent decades has increased the West's tension with Russia, which will likely worsen as Finland and Sweden sought to join NATO.



US Moves Finland's, Sweden's Accession to NATO a Step Closer (Source: VOA News)



Map of Mercosur full and associate member state in green, suspended members in red, and observer members in blue. (Source: VevekVek, CC BY-SA 4.0 , via Wikimedia Commons)

Economic supranational organization

Mercosur (Mercado Común del Sur): A trade bloc or trade association consisting of 11 full and associate member states (and 1 suspended member) from South America. Its main mission is to boost the region's economy by streamlining the movement of goods, workers, and capital among member states.

Environmental supranational organization

IFAS (International Fund for Saving the Aral Sea): Established in 1992 in response to the ecological crisis caused by the decades of misuse of water resources in the Aral Sea region. The four Central Asian states (Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, and Tajikistan) who are members of this organization pledge to manage their water use in order to protect the environment and decrease the impacts of the ongoing ecological crisis.



A quick clip showing the destruction of the Aral Sea and its impacts on human health, the economy, and the environment. (Source: Vox)

Multipurpose supranational organization

AU (African Union): Launched in 2022, AU consists of 55 member states who contribute to it financially. It serves multiple purposes, including defending the sovereignty of its member states, protecting human rights in the continent, coordinating policies between member states to promote economic growth, and prioritizing sustainable development.

The Politics of Election

In democracies such as the US, the political group or party in power may be charged with the drawing or revision of voting district boundaries. These boundaries may be drawn in such a way that favors one political party over another in a practice known as **gerrymandering**, and may result in odd-looking districts. Specifically, the two techniques used in gerrymandering are cracking and packing.

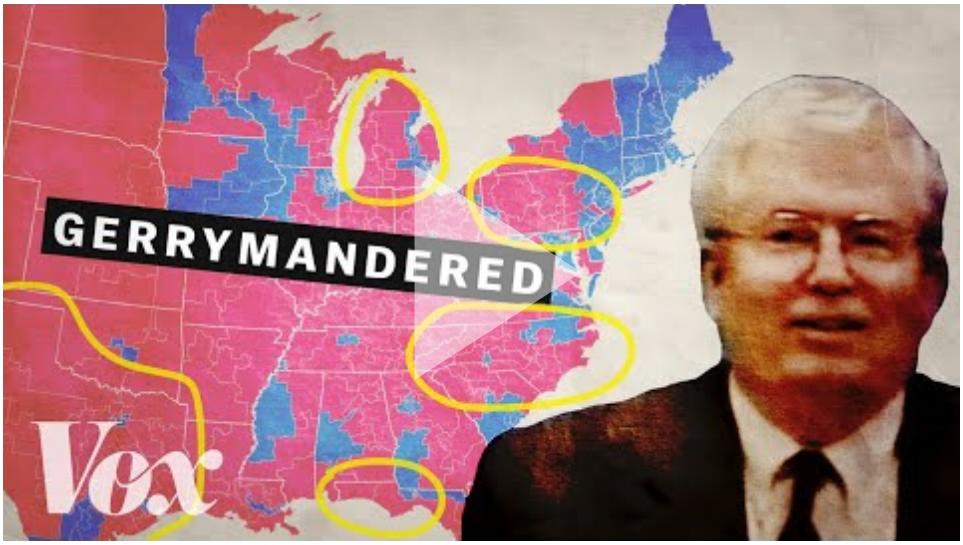
- **Cracking**: Voters affiliated with the opposition party are split or 'cracked' across multiple districts, so they struggle

to elect their desired candidate since their voting strength is divided.

- **Packing**: Voters affiliated with the opposition party are crammed or 'packed' into as few districts as possible, thereby allowing the opposition to win only a few districts while the party in power wins a majority of the districts.

> **Gerrymander - a voting district game**
>
> Try your hand at this simple puzzle game to see if you can draw voting districts to favor your party...
>
> http://gametheorytest.com/gerry/game/

While Chief Justice Roberts of the US Supreme Court admitted that gerrymandering "leads to results that reasonably seem unjust [and] is incompatible with democratic principles," the Court's 2019 decision in Rucho v. Common Cause ruled that federal courts cannot judge if gerrymandering is illegal or if it violated the Constitution.



Learn the techniques used in gerrymandering to favor one political party over another. (Source: Vox)

By: Wing Cheung, Palomar College

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Chapter 9

Development and Wealth

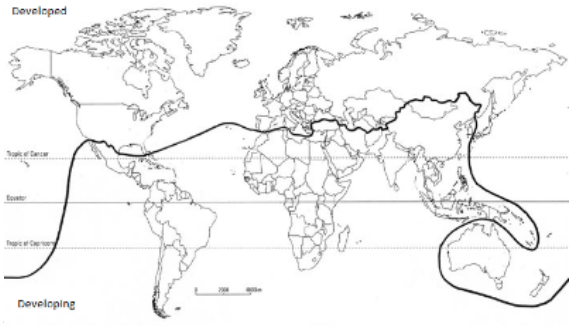
Introduction

States/Countries in the world can be categorized based on their level of technology, infrastructure, wealth, and development.

Development refers to the process that enables a country's people to have a higher standard of living, as well as greater access to resources and quality social services (e.g. healthcare, and education).

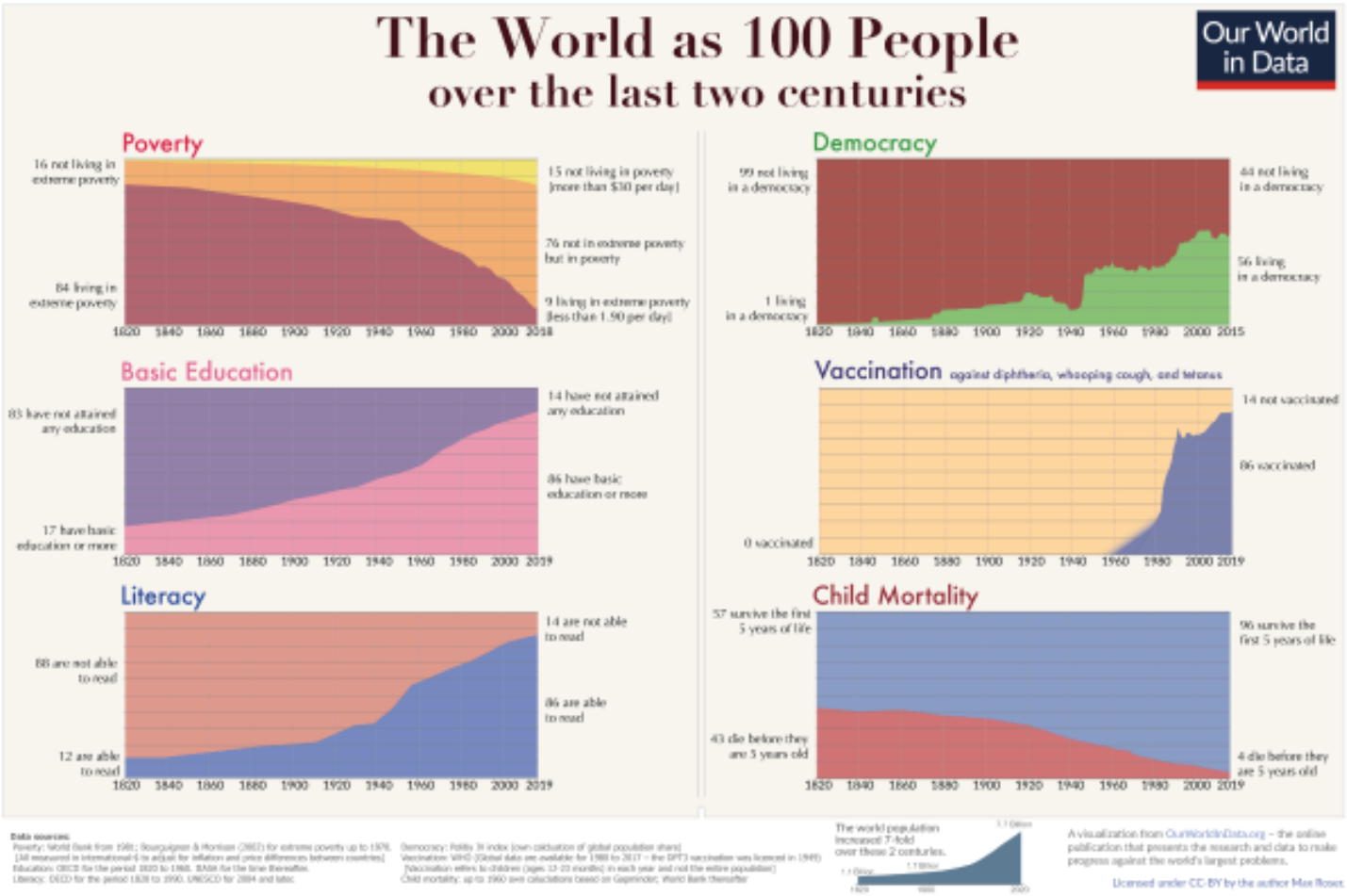
There are **three general patterns** of development and wealth that can be seen in the world in the 21st century:

1. Countries in the northern hemisphere (in addition to Australia and New Zealand) tend to have more wealth and higher quality of life compared to those in the southern hemisphere.



Countries in the northern hemisphere (north of the dark Brandt Line in the map) tend to be more developed than those in the south (Source: Jovan.gec, CC BY-SA 4.0 , via Wikimedia Commons)

2. Majority of people today have a higher standard of living and live longer than people from previous time periods.
3. The wealth gap between the wealthiest and the poorest is greater than it has ever been in history.

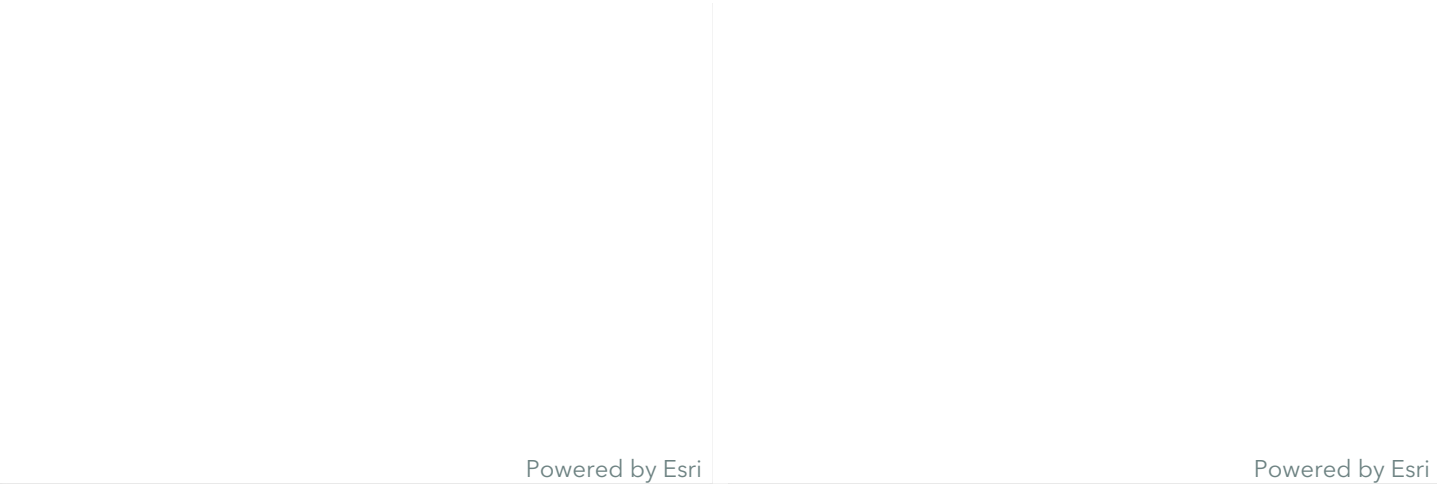


Different contributors to standard of living have generally trended up in the last two centuries despite the growth in world population in the same time period. (Source: Our World in Data)

Measuring Wealth

The countries with higher incomes, more advanced technology, better infrastructure (e.g. roads, sewer lines), and life expectancy are in the **more developed country** category. Whereas, countries with lower incomes and other indicators are in the **less developed country** category. To describe and compare different countries' income levels, economists use the following measures:

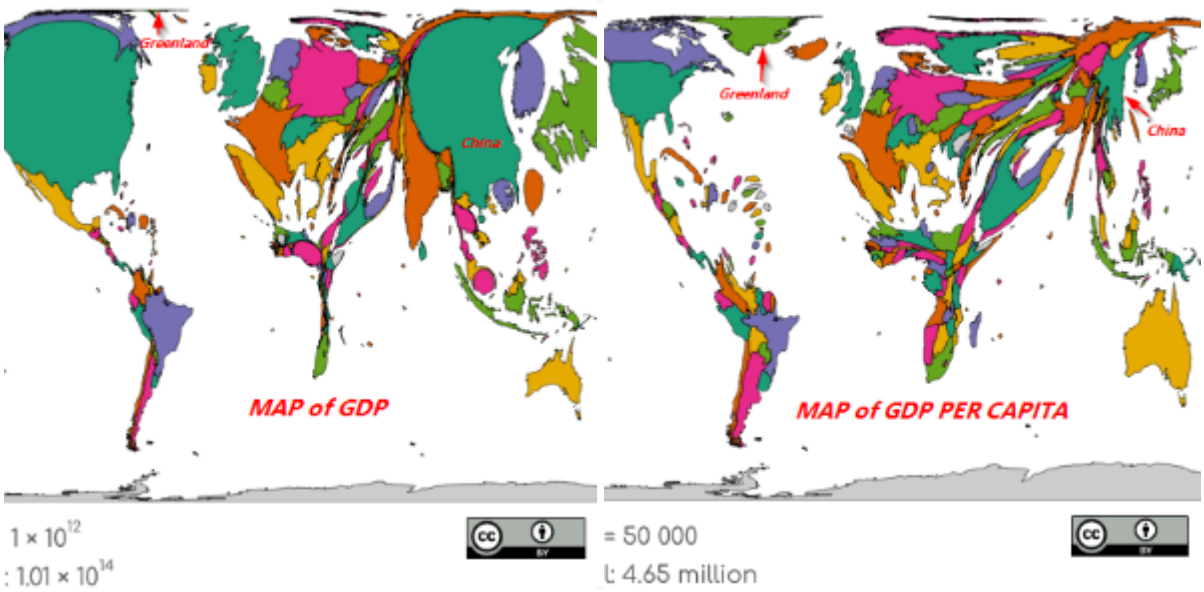
- **Gross national income (GNI):** The value of all goods and services *only produced by companies that are based in country X*. This includes the values of things that may be produced outside country X as long as the companies producing them are based in country X.
- **Gross domestic product (GDP):** The value of all goods and services *produced within country Y* regardless of where the companies are based. In other words, this includes the value of things produced by domestic and foreign corporations (headquartered outside of country Y) as long as the goods and services are produced within country Y.



Use the swipe tool to compare the GNI (left) and GDP (right) of different countries in 2020. A country with a GNI greater than its GDP (e.g. Saudi Arabia) means there is a net inflow of income through its companies' overseas operations. In other words, the country is getting more income from the work that its businesses are doing overseas relative to the income earned from the foreign firms that are operating in the country.

- **--per capita**: This means per person, and it can be used to normalize any economic measure. For example, GDP per capita can be calculated by dividing the country's GDP by its population, so we can know how much income would each person receive if the country's income (i.e. GDP) is distributed equally among the country's population.
- **Purchasing Power Parity (PPP)**: This tells us how far does a dollar go in a given country taking into account its cost of living. For example, a $100 per day travel budget in (most parts of) Mexico will go a lot farther than the same $100 in the United States, since the cost of living in Mexico is lower

than in the US. Thus, since a dollar in one country may be worth more (i.e. go farther) than the same dollar in another country, economic measures (e.g. GDP, GNI) often need to be adjusted by PPP to give us an accurate comparison of two countries' economies.



*Compare the cartogram on the left, where the size of each country is dependent on its **GDP**, with the cartogram on the right, where the size of each country is dependent on its **GDP per capita**. While countries like China have large GDPs (left), its GDP per capita (right) is small due to its large population. In contrast, while Greenland has a small GDP (left), its GDP per capita (right) is quite large due to its small population and subsidies from Denmark.*

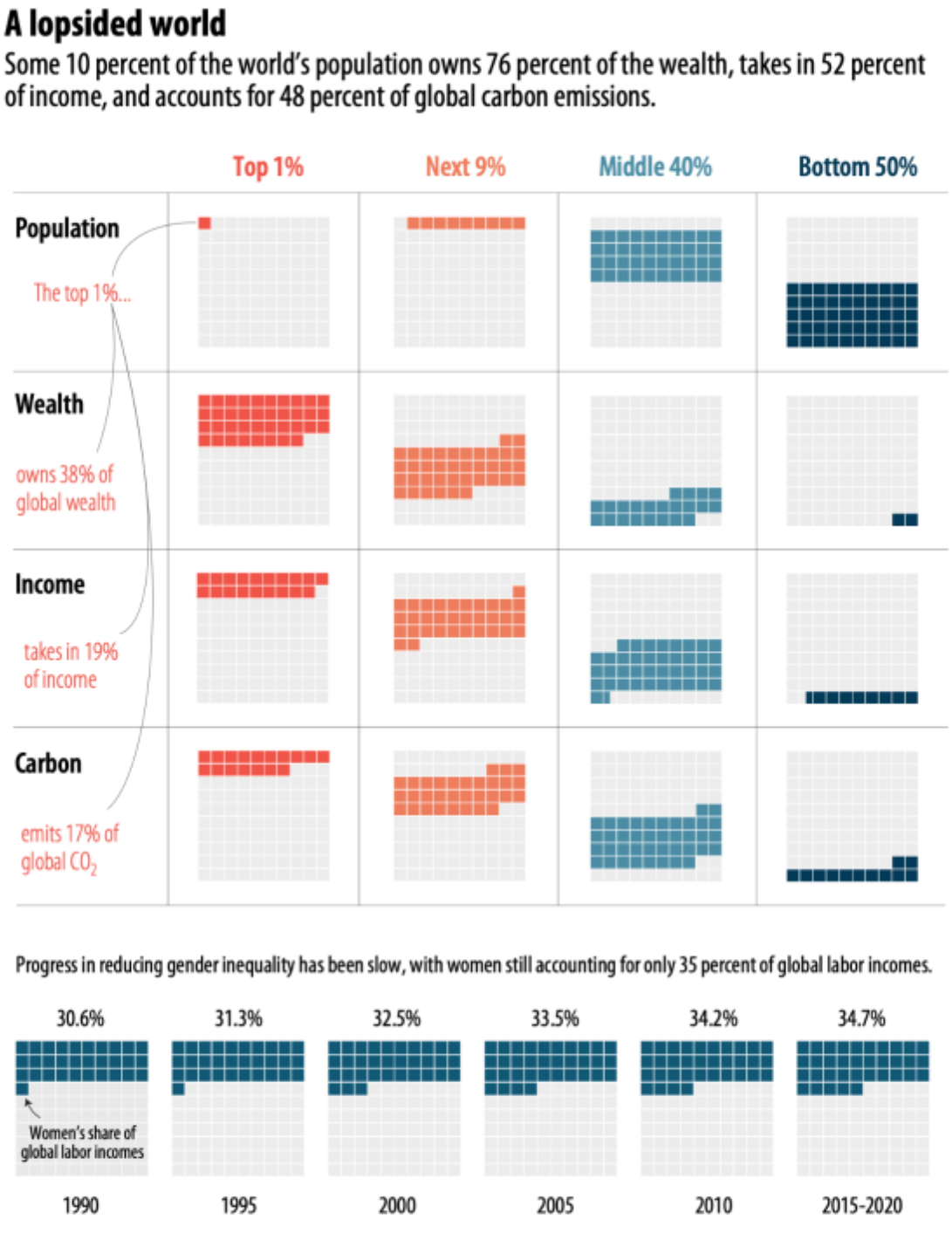
Economic Development

The Global Wealth Gap

More people are now connected to the global economy than ever before, and the global economy has grown consistently since the 1960s. However, this global wealth has not been distributed equally among all countries or all people. According to the World Inequality Report 2022 by the World Inequality Lab:

- The richest 1% of the world's population owns 38% of the world's wealth, while the poorest 50% of the world's population owns 2% of the world's wealth.

- The richest 1% of the world's population emits 17% of the world's carbon dioxide, while the poorest 50% of the world's population emits 12% of the world's carbon dioxide.



As of 2021, the United Nations included 46 countries in its **least developed countries** category because of their vulnerability to economic and environmental shocks. In the map below, you will find all 46 countries as well as other developing countries in the southern hemisphere (or Global South), while **more developed countries** are almost entirely found in the northern hemisphere (or Global North).

In recent decades, many former developing countries that have shifted their economies' focus from agriculture to the service and information system industries came to be labeled as **newly industrialized countries (NICs)**. An example of NICs is the so-called **Asian Tigers** (Singapore, South Korea, Hong Kong, Taiwan), which were able to move from the developing category into the developed category in a relatively short time thanks to foreign and domestic investments in their economies, educational systems, and infrastructures.



Map of the developed and developing countries of the world as classified by the United Nations in May 2022.

Strategies to Close the Wealth Gap

There are different models or strategies that have been proposed to help countries (and hopefully their citizens) become more prosperous.

- **International trade model**: This strategy preaches free trade, open borders, and limited controls (e.g. taxes, price caps) on the exchange of goods between countries. While some specialized industries (e.g. automakers) may improve over time in order to compete in the global marketplace without government protection, the lack of government protection may subject local consumers to price shocks in the global market, and local industries that fail to keep up may be forced to close and fire its workers.
- **The protectionist model**: This philosophy believes that countries should sustain themselves without foreign labor, products, services, or trade. While this allows governments to control their own industries and the price of goods, it tends to lead to corruption, inefficiency, and lack of creativity as local industries are protected from global competition by the government.



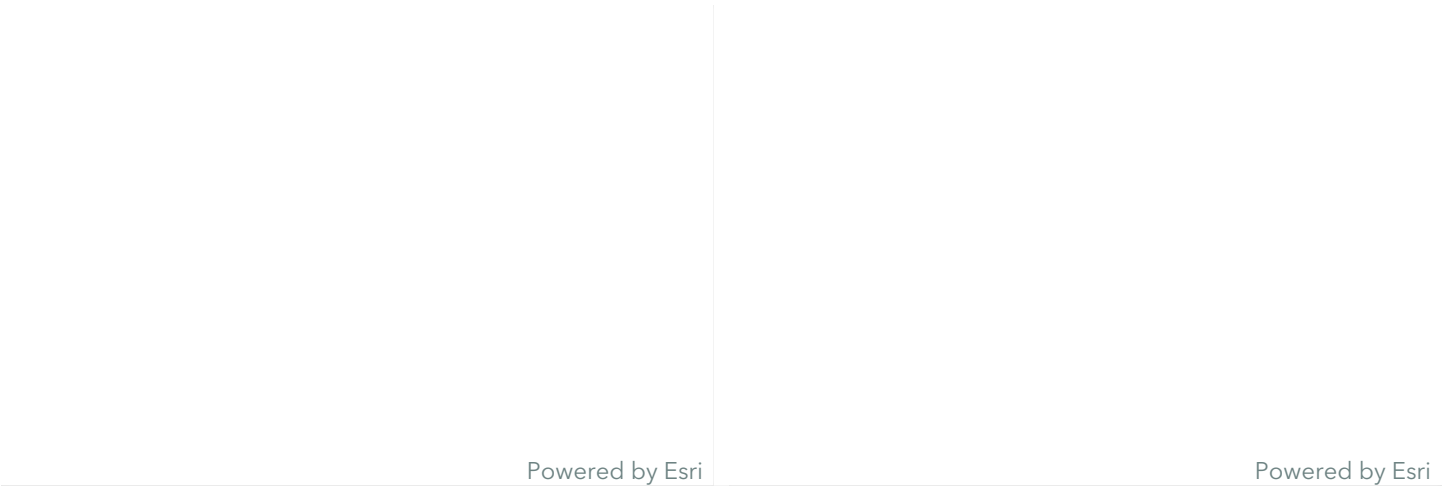
Learn how an international trade agreement, the US-Mexico-Canada Agreement (USMCA) protects the three countries against foreign competition. (Source: Vox)

Beyond Economic Development

By the 1990s, the United Nations acknowledged that it is insufficient to gauge a country's development and living conditions solely based on economic measures. This led to the development of the **Human Development Index (HDI)**, which takes into account:

- Life expectancy
- Adult literacy
- School enrollment
- Income

As shown in the maps below, a comparison of the HDI from the year 2000 (left) with the year 2017 (right) reveals that nearly every country improved its HDI within the past 17 years.

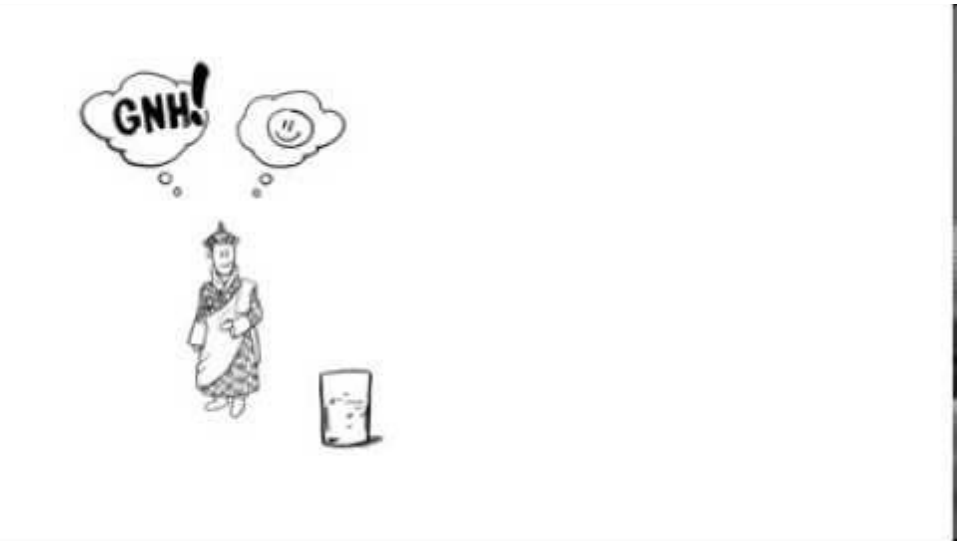


Use the swipe tool to compare the Human Development Index for different countries between 2000 (left) and 2017 (right). Did more developed countries or least developed countries experience significant increases in HDI over this time period?

However, neither economic measures (GDP, GNI) nor social measures (HDI) covered in this chapter take into account the well-being of the environment nor sustainable development. **Sustainable development** was defined by the United Nations as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs." This prompted countries such as Bhutan to come up with their own index, known as gross national happiness.

Gross National Happiness is used to measure the happiness and well-being of a country, and countries are scored on non-economic indicators such as their:

- Sustainable and equitable socio-economic development
- Environmental conservation
- Preservation and promotion of culture
- Good governance



Learn more about the background that led to the development of Bhutan's Gross National Happiness index (Source: Yelha Bhutan Tours & Travels, Creative Commons Attribution license (reuse allowed), via YouTube)

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Chapter 10

Agriculture and Food

> *"Agriculture refers to the cultivation of crops and the raising of livestock for both sustenance and economic gain."*

History of Agriculture

For much of human history, people led a nomadic existence (moving constantly) and got their food and daily goods from **hunting and gathering**. Then around 12,000 to 10,000 years ago, people started to become sedentary (settle down in one place) and got their food and goods by domesticating plants and animals. This marked the beginning of the **First Agricultural Revolution**, as people in different regions of the world independently invented the idea of animal and plant domestication. Evidence of earliest domestication activities has been found in the so-called **Fertile Crescent** region, which intersects nearly all of the countries (i.e. Iraq, Iran,

Turkey, Syria, Lebanon, Israel, Palestine, Jordan, and Egypt) in the Middle East.



Map of the Fertile Crescent region. (Source: Nafsadh, CC BY-SA 4.0, via Wikimedia Commons)

The **Second Agricultural Revolution** took place mainly in Britain around 1700, where it saw an unprecedented increase in land productivity thanks to new crop rotation techniques that improved soil fertility. This increase in productivity and output led to rapid population growth, which provided the workforce needed for the industrial revolution.

By the 1950s, economists and scientists were warning about global hunger and widespread famines in countries with rapid population growth such as India. This prompted the **Green Revolution**, which included the invention of high-yielding varieties of wheat and rice by American biologist Norman Borlaug, the adoption of fertilizers and pesticides, and new investments in irrigation and machinery to boost agricultural output worldwide.



Should We Be Worried About GMOs? (Source: Vox)

Events such as the Ethiopia Famine of 1983-1985 which killed 1.2 million people brought poverty and starvation to the world's attention once again in the 198s. This led to the **Second Green Revolution**, which entails the use of genetic engineering to produce genetically modified (GM) crops that have a higher yield, nutrition, and resistance (against drought, floods, diseases, and pests). For example, genes may be taken from one plant (e.g. daffodil) and transferred to another plant of interest (e.g. rice), so the genetically engineered plant (e.g. "Golden Rice") can produce compounds (e.g. beta-carotene) or vitamins (e.g. vitamin A) that are not normally found in that plant. Given the recency of GM foods, there are concerns about their long-term health and environmental impacts.

Beginning of time

Hunting and gathering



10,000 BC

First Agricultural Revolution



1700 - 1800

Second Agricultural Revolution

1950 - 1960 CE

Green Revolution



1980 - Present

Second Green Revolution (Biorevolution)



Different Agricultural Practices

Farming practices can be classified into two broad categories:

- **Subsistence**: Growing food to sustain the farmers and their families, with little to no surplus for sale in the market. These farms tend to be small in size (2-5 acres) and less mechanized.
- **Commercial**: Growing food primarily for sale to markets and food processing companies, rather than self-consumption. These farms tend to be huge (193 acres), heavily mechanized, and rely on advanced technology (GPS, drones) in their operation.

Extensive agricultural practices

Extensive agricultural practices are usually subsistence in nature, and take place in areas with marginal productivity due to poor soils or low rainfall. They require relatively little manpower or capital but require lots (or extensive amounts) of land.

- **Shifting cultivation:** Also known as **slash-and-burn agriculture.** It has been practiced since the start of the First Agricultural Revolution. It is mostly found in tropical areas, where dense vegetation needs to be cut down (slashed) and burned to create space and fertilizer (in the form of ashes) needed for cultivation. The fields created in this manner can only be sustainably used for three to five years before their nutrients are depleted. Farmers must give the used fields five to twenty years to replenish themselves while repeating the process and farming in new areas.
- **Pastoralism**: This involves the breeding and herding of animals. It is mainly found in very cold or dry climates (e.g. deserts, tundras) where other agricultural practices are not possible. Three types of pastoralism are **sedentary pastoralism** (farmers live in villages and herd animals in

nearby pastures), **nomadic pastoralism** (pastoralists live in tents and constantly travel with their animals over long distances to no particular destination), and **transhumance** (herders with permanent homes who undertake seasonal migrations with their livestock to find pastures or water).

Study the map below to learn the distribution of the extensive and intensive agricultural practices that we are discussing in this section:

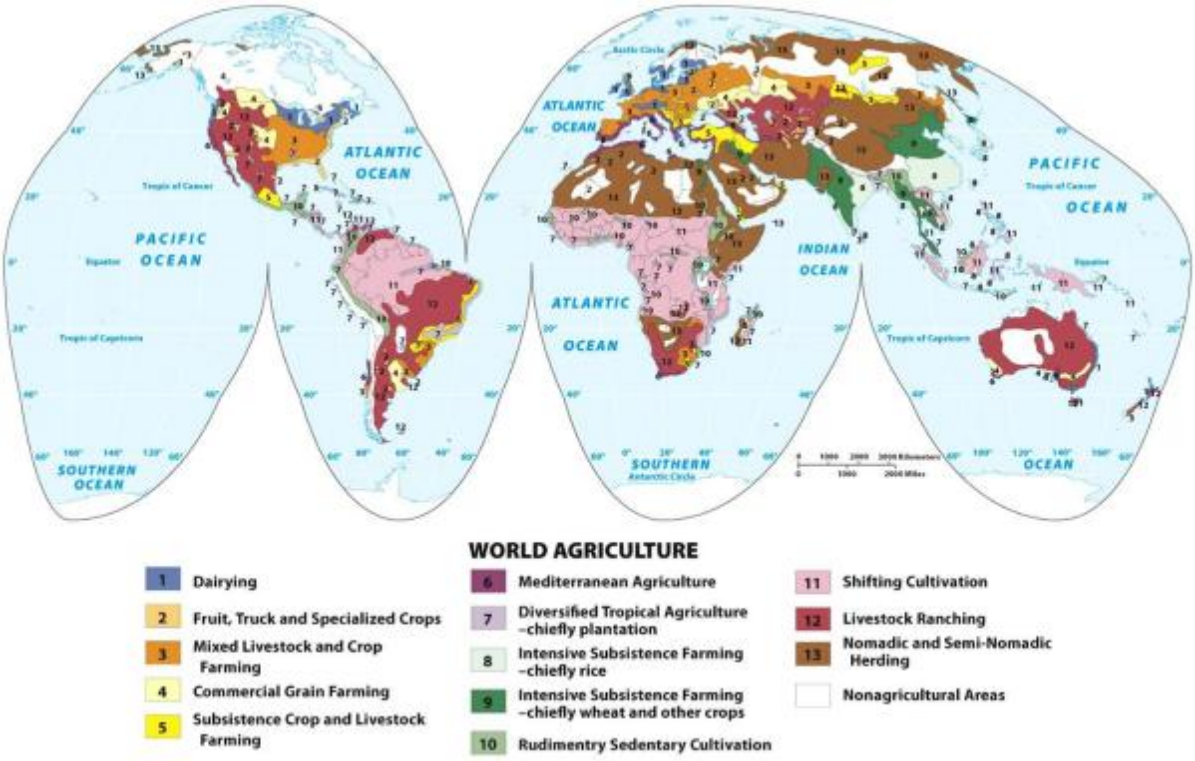
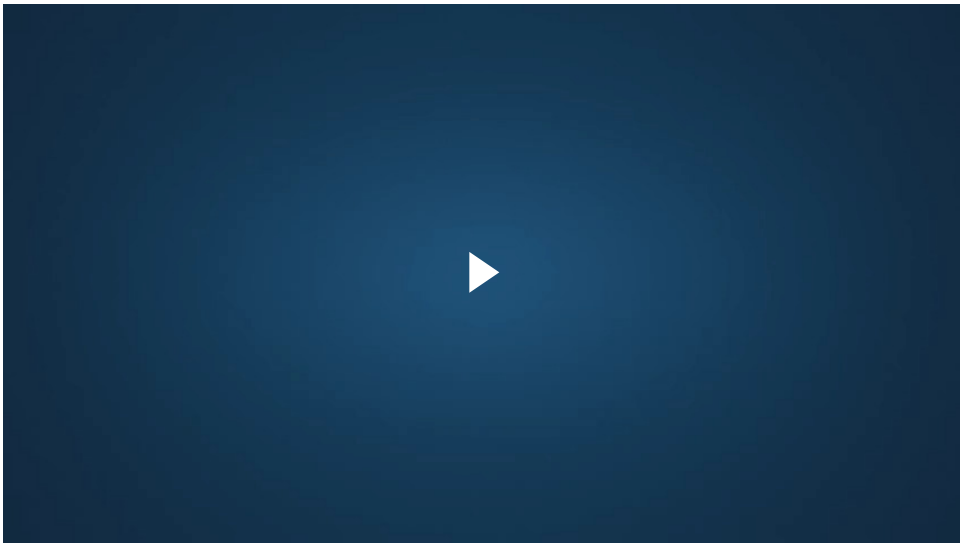


Figure 11.18
© John Wiley & Sons, Inc. All rights reserved. Adapted with permission from: Hammond, Inc., 1977.

Intensive agricultural practices

Most commercial agricultural practices are examples of **intensive agriculture.** Compared to extensive agriculture, intensive agriculture requires more capital (i.e. to buy machinery and fertilizers) and labor, but it also yields more crops per unit of farmland.



Have a look at self-driving tractors and their supposed benefits. Who will most likely have access to and benefit from these advanced farming technologies? (Source: VOA News)

- **Mixed crop and livestock farming:** Different crops are cultivated in a crop rotation (e.g. plant broccoli in late summer, wheat in late fall, and sweet corn in the spring) on the same field to use space efficiently and add diversity to the farm. Some livestock and poultry may also be raised on the same farm.
- **Commercial grain farming:** These farms can be found in areas that are too dry for mixed crop and livestock farming. They are typically very large (up to 40,000 acres), and are found in areas where land is cheap. The most important crop in grain farming is wheat, which is used to produce flour.
- **Dairy farming:** The long-term and large-scale production of milk for sale at domestic markets and abroad. These farms or dairy plants are often heavily mechanized and located near urban areas (where the milk is sold) to minimize spoilage.



Learn how livestock ranching, dairy farming, and our diet are contributing to climate change. (Source: Vox)

- **Livestock ranching**: The grazing of many livestock (e.g. pigs, cows, sheep) over large areas (open land and confined feedlots), mainly for their meats and dairy products. They are mostly found in arid areas or areas with soils that are unsuitable for cultivating crops.
- **Commercial gardening and fruit farming:** These farms tend to be smaller (no larger than 100 acres). Some of the crops grown on these farms include traditional fruits and vegetables such as tomatoes, lettuce, and onion, as well as nontraditional crops that are increasingly popular, such as asparagus and kale.
- **Mediterranean agriculture:** This agricultural practice is found in world regions that have a Mediterranean climate, which is characterized by hot and dry summers, and moist and mild winters. These regions are found around the Mediterranean Sea, California, Central Chile, Southern South Africa, and Southern Australia. The main crops produced on these farms include citrus, olives, figs, dates, and grapes.
- **Plantation farming:** These large landholdings (i.e. plantations) are mostly found in developing countries in the tropical and subtropical regions of the world. They usually specialize in the large-scale production of one crop (e.g. coffee, banana, palm oil) for export purposes. Most of

them are owned and operated by corporations that are headquartered in developed countries.

Take a look at the series of maps below to understand where different intensive agricultural practices can be found in the world today. (Data source: Food and Agriculture Organization of the United Nations)

Powered by Esri

Commercial grain farming example

Annual Average ***Wheat*** Production (2000-2020)

Powered by Esri

Commercial grain farming example

Annual Average ***Maize*** Production (2000-2020)

Powered by Esri

Dairy farming example

Annual Average ***Cheese*** Production (2000-2020)

Powered by Esri

Dairy farming example

Annual Average ***Butter*** Production (2000-2020)

Powered by Esri

Livestock ranching example

Annual Average ***Pork*** Production (2000-2020)

Powered by Esri

Livestock ranching example

Annual Average ***Cattle Meat*** Production (2000-2020)

Powered by Esri

Commercial gardening and fruit farming example

Annual Average ***Strawberry*** Production (2000-2020)

Powered by Esri

Commercial gardening and fruit farming example

Annual Average ***Tomato*** Production (2000-2020)

Powered by Esri

Mediterranean agriculture example

Annual Average ***Olive*** Production (2000-2020)

Powered by Esri

Mediterranean agriculture example

Annual Average ***Orange*** Production (2000-2020)



Plantation farming example

Annual Average ***Coffee*** Production (2000-2020)

Powered by Esri

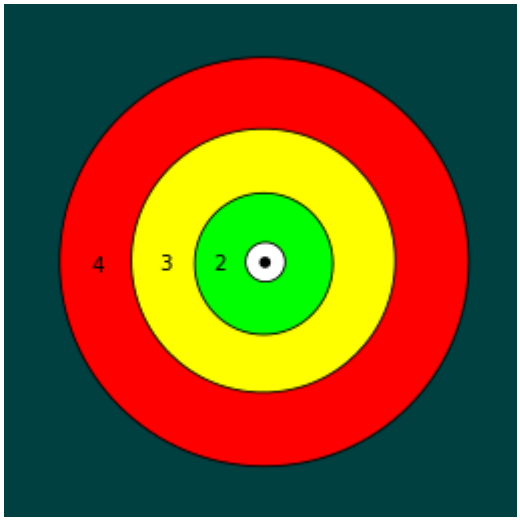
Plantation farming example

Annual Average ***Palm Oil*** Production (2000-2020)

Geography of Food Production

According to the US Department of Agriculture, family farms produced a majority of the country's agricultural goods (88%) as of 2019. Some of the goods produced by these family farms include poultry, grains, and dairy. Meanwhile, farms that are owned and operated by corporations (also known as **agribusinesses**) produced 12% of the country's agricultural goods, including products such as beef, vegetables, and fruits. This trend is similar worldwide, where a majority (70%-80%) of the world's agricultural lands are managed by family farms according to the United Nations.

On commercial farms operated by families or corporations, the choice of farm goods to produce is directly related to their distances from the market or intended customers. This relationship is described in the **Von Thünen Model**, which posits that farms producing highly perishable goods (milk, cheese, fruits) will be closest to the market to minimize spoilage and transportation costs, while farms producing less perishable items (grains, livestock) will be located



The Von Thünen Model: *The dot in the center is the market. The white area closest to it (1) produces perishable goods from dairying and commercial gardening; 2) (green) is the forest for fuel; 3) (yellow)*

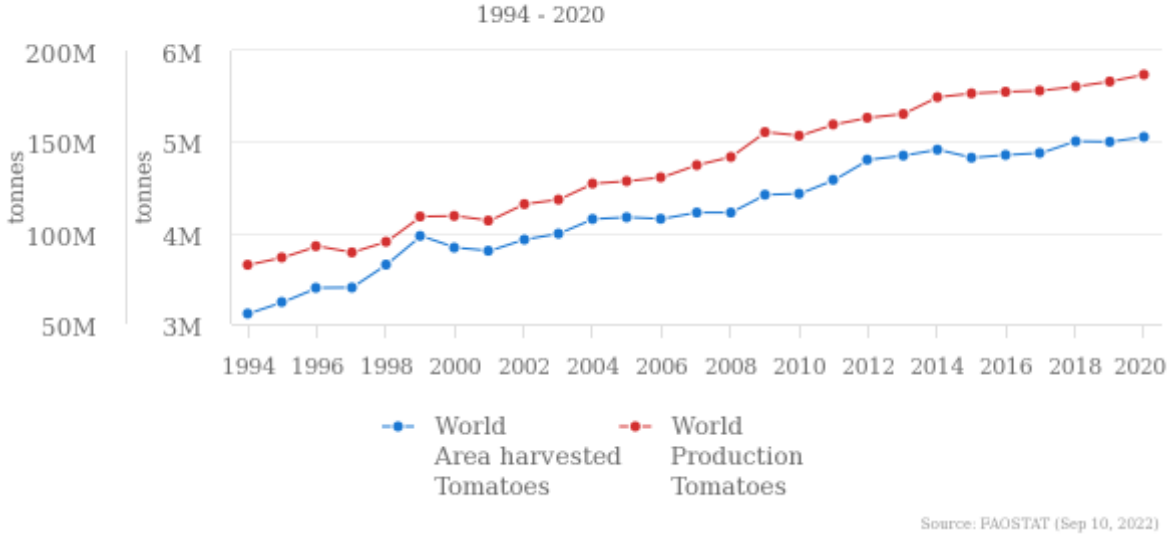
farther from the market to take advantage of the lower land rent away from the center.

grows grains; 4) (red) raises livestock; and the outer (dark green) region is the non-agricultural wilderness. (Source: Erin Silversmith, Public domain, via Wikimedia Commons)

Food Security And Access

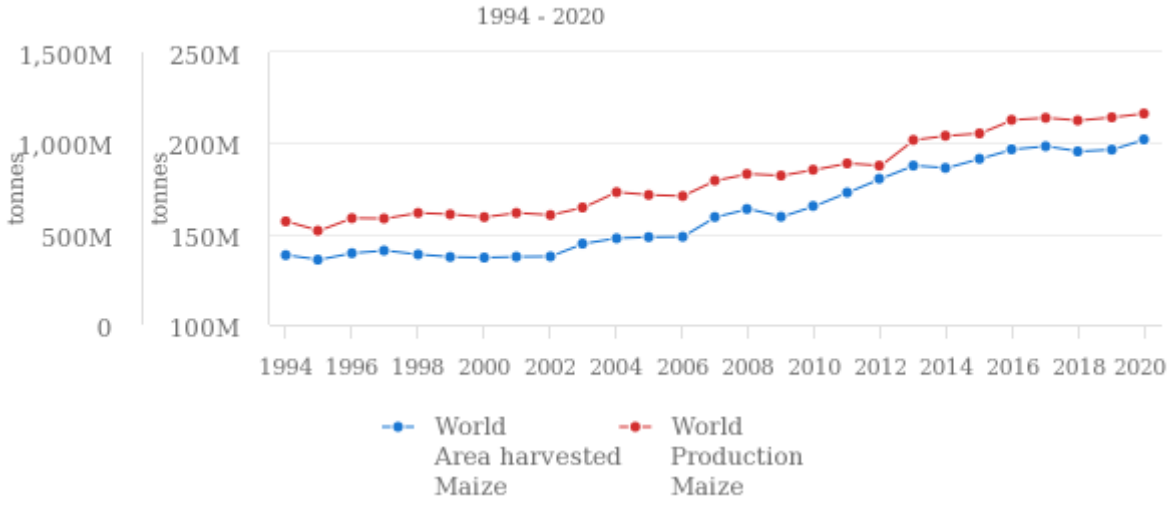
Food production has increased in the past decades as a result of the Green Revolution and Second Green Revolution, but food is unevenly distributed in the world, leaving some people without sufficient access to it.

Production/Yield quantities of Tomatoes in World + (Total)



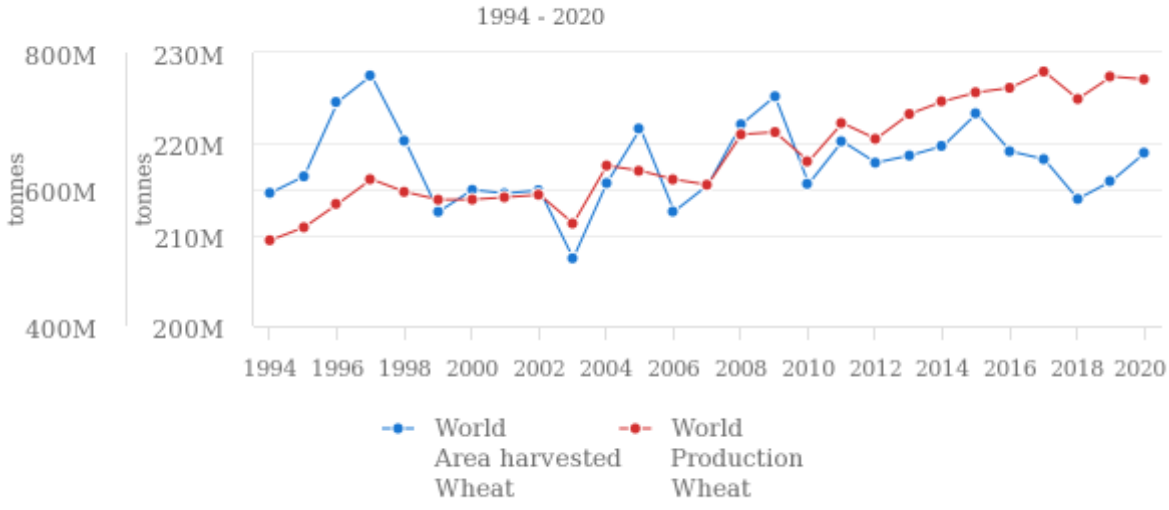
Source: FAOSTAT (Sep 10, 2022)

Production/Yield quantities of Maize in World + (Total)

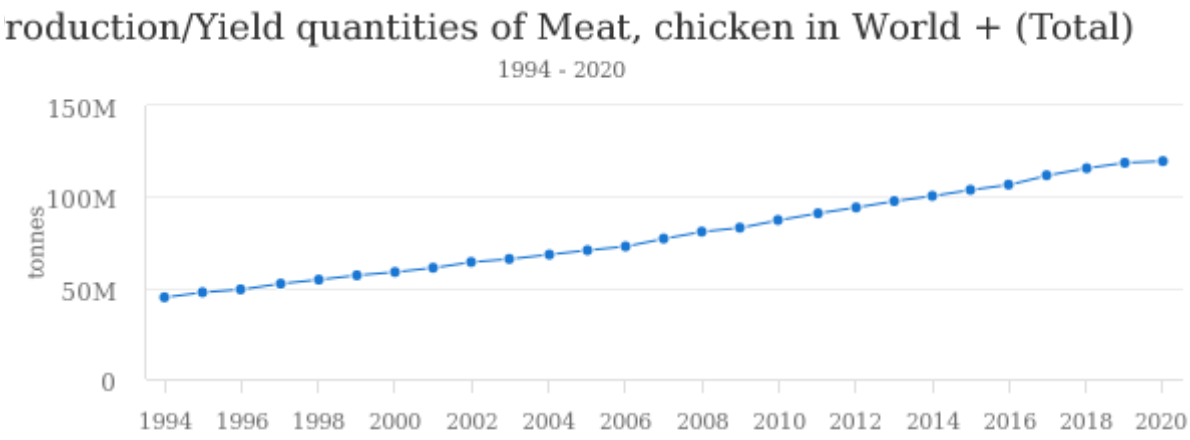


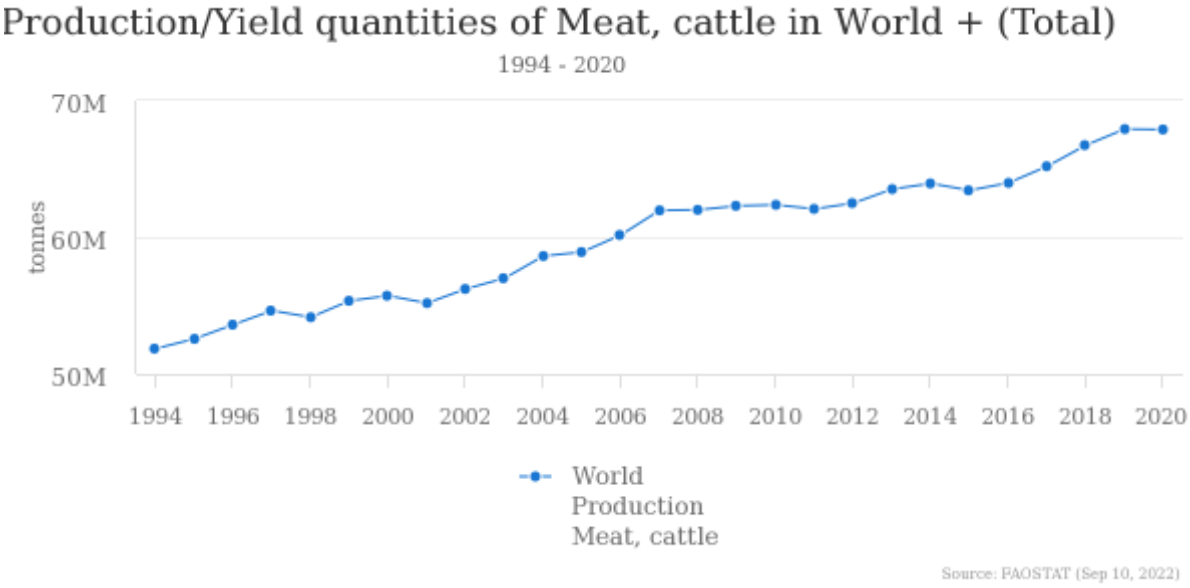
Source: FAOSTAT (Sep 10, 2022)

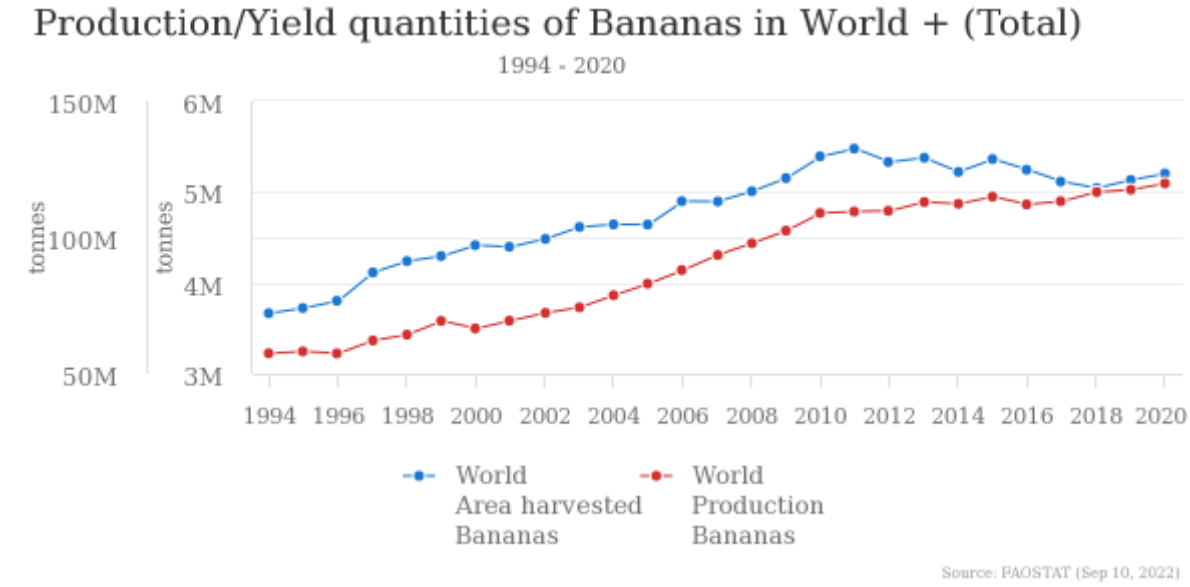
Production/Yield quantities of Wheat in World + (Total)



Source: FAOSTAT (Sep 10, 2022)







Statistics from the Food and Agriculture Organization of the United Nations show that world production for most agricultural commodities has increased over the past decades. (Source: Food and Agriculture Organization of the United Nations)

As of 2019, the world's average caloric supply is 2,940 kcal/day. In terms of world region, North America leads the world in caloric supply at 3,519 kcal/day in 2019, and Africa trails at 2,586 kcal/day. In terms of country, the US leads the world in caloric supply at 3,862 kcal/day in 2019 (a 34% increase from 1961), while Zimbabwe trails at 1,707 kcal/day (a 19% decrease from 1961).

Per capita kilocaloric supply by world region between 1961 and 2019. (Source: Food and Agriculture Organization of the United Nations)

Per capita kilocaloric supply by country between 1961 and 2019. (Source: Food and Agriculture Organization of the United Nations)

The Food and Agriculture Organization of the United Nations (FAO) estimated that between 702 and 828 million people in the world faced **chronic hunger** (i.e. not able to get enough food to maintain a normal, active, and healthy life for one year or longer) in 2021. But it is important to recognize that due to the uneven access to food, even in countries with the highest daily caloric intake (i.e. the US), 10.5% of its population (about 13 million households) experienced **food insecurity** at some point in the year 2020, meaning that "they lack regular access to enough safe and nutritious food for normal growth and development and an active and healthy life."

Take a look at other key hunger and food insecurity statistics from the FAO's The State of Food Security and Nutrition in the World 2022 report in the interactive slideshow below:

FAO - A tale of empty plates (Source: Food and Agriculture Organization of the United Nations)

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

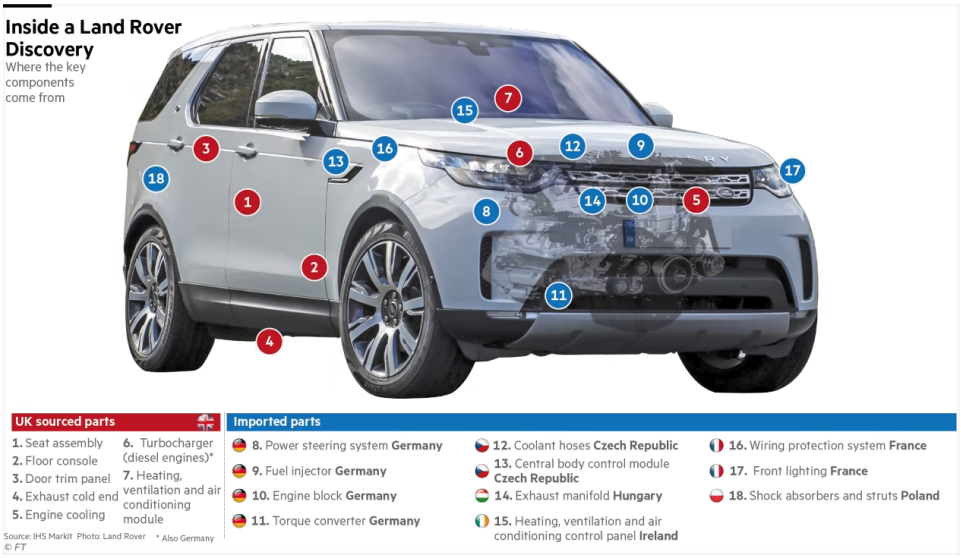
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Chapter 11

Industry

Introduction



A look at the many different countries that supplied components needed to manufacture a car. (Source: Financial Times)

A Short History of Industrialization

The Industrial Revolution began in England in the late 1700s. It mainly replaced expensive handmade goods with low-cost machine-made goods by taking advantage of:

- **Inanimate power**: using readily available resources like water, steam, and coal to power machines to produce textiles (and eventually other goods) rather than doing everything by hand.
- **Simplified production process**: straightforward steps to produce goods that can be done by low-skill laborers using standardized parts and machines in the assembly line.
- **Mass production**: producing large numbers of the same thing to reduce per-unit production cost.

As a result of industrialization, people were able to afford more goods and food because they can now be mass-produced cheaply, but it also led to environmental degradation, poor working conditions, and a widening wealth gap between the wealthy (e.g. factory owners) and the poor (e.g. factory workers).



Origins and impacts of the Industrial Revolution (Source: OER Project, Creative Commons Attribution license-reuse allowed, via Youtube)

Since the 1980s the U.S. and other developed countries have undergone **de-industrialization**, where the importance of the manufacturing industry in the labor market and the economy

has been in decline. This decline is caused by three main factors:

1. **Automation**: formerly manual tasks are done by software and robots.
2. **Relocation**: factories moving to less developed countries to take advantage of lower wages and lax environmental regulations.
3. **Decrease in demand**: certain items that used to be made by developed countries are no longer in demand.

Today, many companies around the world operate as **transnational corporations (TNCs)**, with the ability to control production and sales in different countries. Some of the reasons that TNCs have provided for operating across different countries include: reducing labor costs, moving closer to the markets where the final products will be sold to reduce shipping costs, creating manufacturing jobs, and reducing poverty in developing countries.

Location, Location, Location

Deciding where to locate a factory requires one to balance interrelated costs such as:

- **Capital**: cost of rent, facilities, and machines
- **Material**: cost of fuel and raw materials
- **Labor**: cost of workers
- **Market**: distance to market and transportation costs

Moving the factory to reduce one cost (e.g. capital cost or rent) may lead to a rise in another interrelated cost (e.g. market cost or the cost to transport finished products to customers). The ultimate goal is to find the location that will balance the factors above and produce the lowest cost of production.

The location of some industrial activities such as those in the **primary industry**, which involves the extraction and production of raw materials through activities like farming, logging, fishing, or mining, are determined by site. The **site** refers to the physical/natural characteristic of a location. For example, a coffee plantation must be located on a site with farmable land. As another example, a logging company needs to be located on a site with trees to cut down.



Many textile mills were powered by the water of the River Dane, England. In this photo, the Congleton Upper Washford Mill has an exterior breastshot water wheel and an internal 10hp turbine. (Source: Clem Rutter, Rochester, Kent., CC BY 3.0, via Wikimedia Commons)

The location of other industrial activities such as those in the **secondary industry**, which takes raw materials and manufactures them into finished products (e.g. fish cannery, car factory, textile mill), are more dependent on their situation. **Situation** describes a location based on its relations to surrounding natural or man-made features. For example, a car factory may be situated just south of the U.S. border in Mexico, in order to take advantage of the lower labor cost in Mexico without incurring significant expenses to send the finished goods back to stores in the U.S. market. As another example, a textile mill may be situated next to a river in order to use its water turbines to generate electricity for its machines.

While the economies of many developing countries are dominated by primary and secondary industries, the economies of most developed countries are dominated by **tertiary industries** or service industries. Activities in the tertiary industry focus on providing services, including public services provided by the government (e.g. public utilities, schools), business services provided to other businesses (e.g. shipping, business loans), and consumer services provided to ordinary citizens (e.g. supermarkets, movie theaters).



*An example of secondary industries is the **Maquiladoras** which are situated just south of the U.S. border in Mexico. These factories manufacture all kinds of finished goods that are bound for sale in the U.S. (Source: KPBS)*

In many cases, similar businesses may be intentionally locating themselves next to their competitors (e.g. auto mall, food court) in what is known as **agglomeration**. Taking the example of an auto mall such as Carlsbad Car Country, agglomeration allows a customer to shop from multiple car dealers at the same time, and potentially buy from a car dealer that the customer did not originally intend to buy from. Furthermore, all the car dealers may require similar services (e.g. marketing), and they can split the costs of the services since they are clustered in the same general location.

Costs of Production

The goal of most companies is to minimize their production costs, so that their profits can be maximized. We will look at some of the costs that go into production below.

Land, material, energy

Factories may be located in suburban or rural areas to take advantage of cheaper rent in areas where open lands are in abundance.

Raw materials needed to manufacture finished products are sourced from any location in the world that can provide them at the lowest cost, taking into account the cost of shipping the raw materials to the factory.

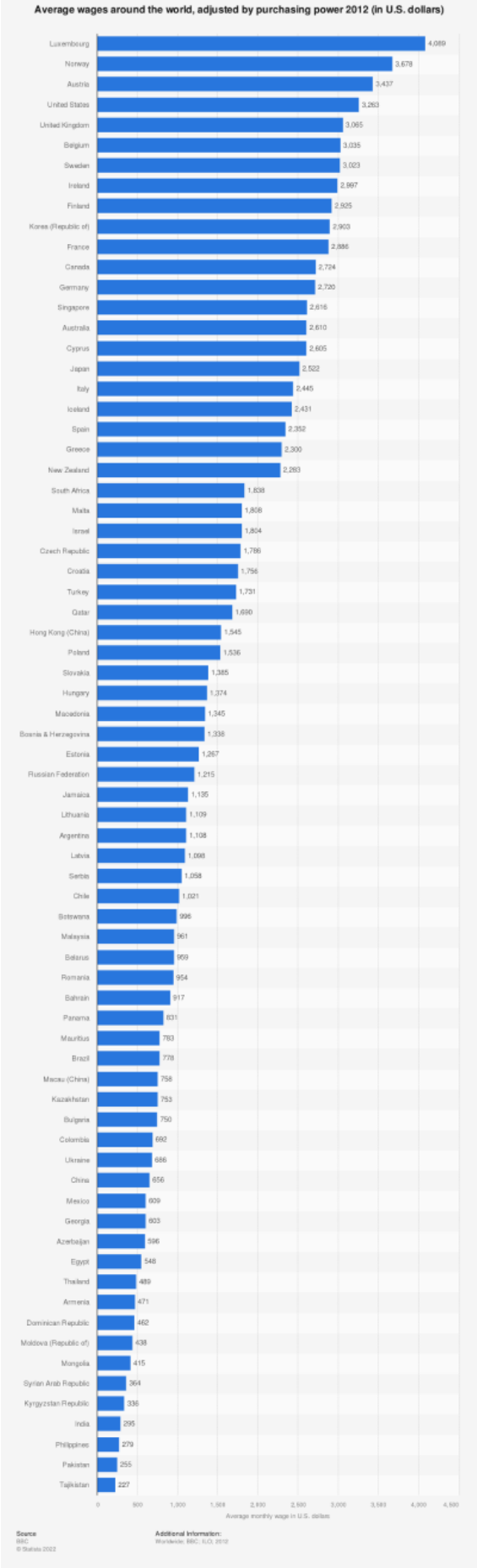
Energy-intensive industries (e.g. steel production) may be attracted by any location in the world with cheap energy sources (e.g. China).

Labor

Since workers are often unhappy with wage cuts, companies wishing to decrease labor costs may send jobs to countries where people are willing to work for less, or (if possible) replace workers with machines (i.e. automation) altogether. However, the savings in labor costs may be outweighed by the cost to transport the finished products to the market, so companies must balance their labor savings with potentially higher shipping costs.

Transportation

According to the German economist, Alfred Weber, the different costs to transport different types of goods need to be considered when determining the location of an industry. Some types of goods include:



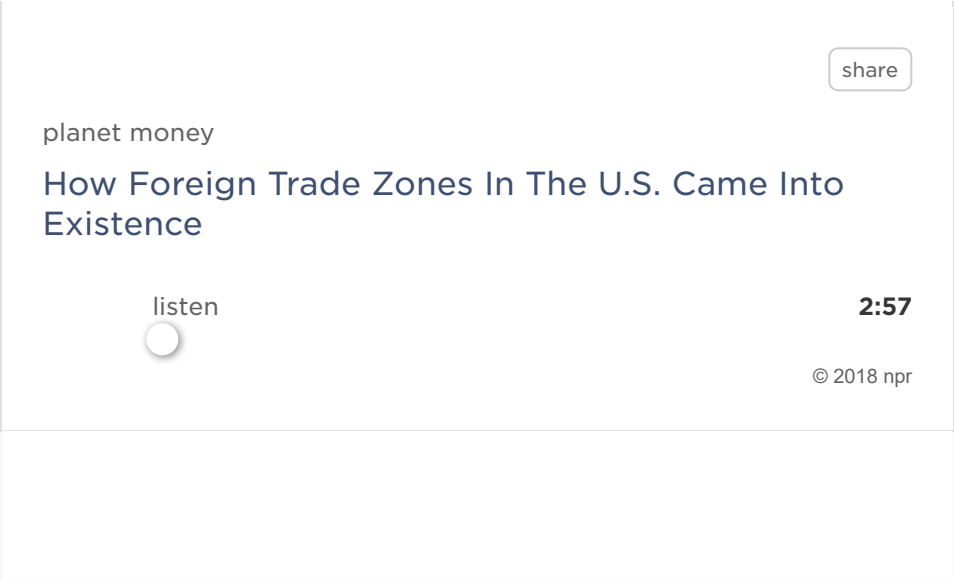
Take a look at the cost of labor in different countries as of 2012. What may be some factors that discourage

industries from moving to countries with the lowest labor cost? (Source: Statista)

- **Ubiquitous raw materials**: These are raw materials that can be found in many places (e.g. clean water). Industries (e.g. breweries) that use a lot of these resources can worry less about locating themselves close to the sources of these raw materials, and situate themselves close to their markets and customers in order to reduce transportation costs.
- **Local raw materials:** These are raw materials that are found in specific locations (e.g. forests). For raw materials that can be compacted and take up less space (i.e. **bulk-reducing**) in their processed form (e.g. trees to logs), the factories to process these raw materials will be located close to their extraction site in order to reduce transportation costs. Conversely, for goods that will take up more space (i.e. **bulk-gaining**) in their finished form (e.g. logs to furniture), the factories that produce these finished goods will be located close to their markets to reduce transportation costs.

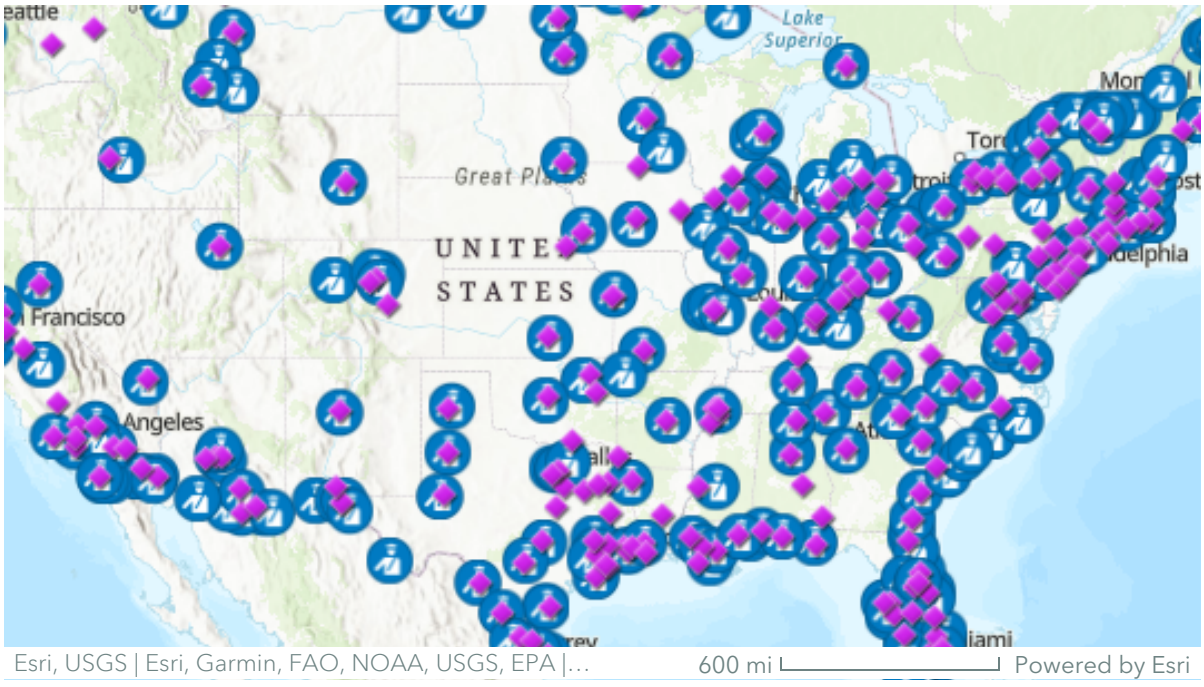
Capital costs and risks

Countries and states may be able to artificially make themselves more attractive to industries by offering tax breaks and other financial incentives, such as tariff (i.e. a tax or custom one pays when importing or exporting something) forgiveness, construction allowance, cash, and free healthcare for employees. An example is the United States, which established a number of **Foreign Trade Zones** (FTZs) in the country. These FTZs allow companies to import raw materials and parts (e.g. car parts) to their factories in the FTZs without paying tariffs that are normally due, assemble finished products (e.g. cars) in the FTZs from the raw materials and parts, and export the finished products from the FTZs to markets outside of the U.S. (e.g. car dealerships in Canada or elsewhere) without paying any tariffs.



Learn How Foreign Trade Zones In The U.S. Came Into Existence (Source: NPR)

Industries may also be tempted to introduce new technology, build factories, and train workers (all examples of **foreign direct investment**) in countries with lax environmental or labor regulations, since they may be able to reduce the cost of production. However, some of those same countries may also have high levels of corruption and political instability or inadequate infrastructure (e.g. power lines, roads), which may drive industries away due to the risk to their investments.



Explore this map to find the foreign trade zone and port of entry near you. Click on a point to learn more.

Recent Global Trends

According to Karl Marx's discussion of the **tendency of the rate of profit to fall** theory, the original inventor of a new product (e.g. iPhone smartphones-2007) is the only maker of the product and can profit greatly from the invention initially. But over time, competitors will provide similar products at a lower price (e.g. Android smartphones-2008), leading to a race between the original inventor and its competitors to cut production costs in order to maximize profits. This cut may take the form of replacing workers with robots (i.e. automation), reducing wages for existing workers, or moving factories from one country to another (e.g. from the U.S. to China to Vietnam) with lower wages or tariffs.

The U.S.-China trade war and worries about tariffs are pushing factories to move from China to other countries with lower wages. (Source: VOA News)

As some factories leave wealthier developed countries for developing countries to cut production costs, the economies of many developed countries shifted from the secondary industry to the tertiary/service industry that was already discussed above. However, a relatively new type of service job has been called the **gig economy**, where most gig workers (e.g. Instacart shoppers, and Uber drivers) work on their own schedules, at their desired locations, and often without employer-paid benefits.

The State of Gig Work in 2021

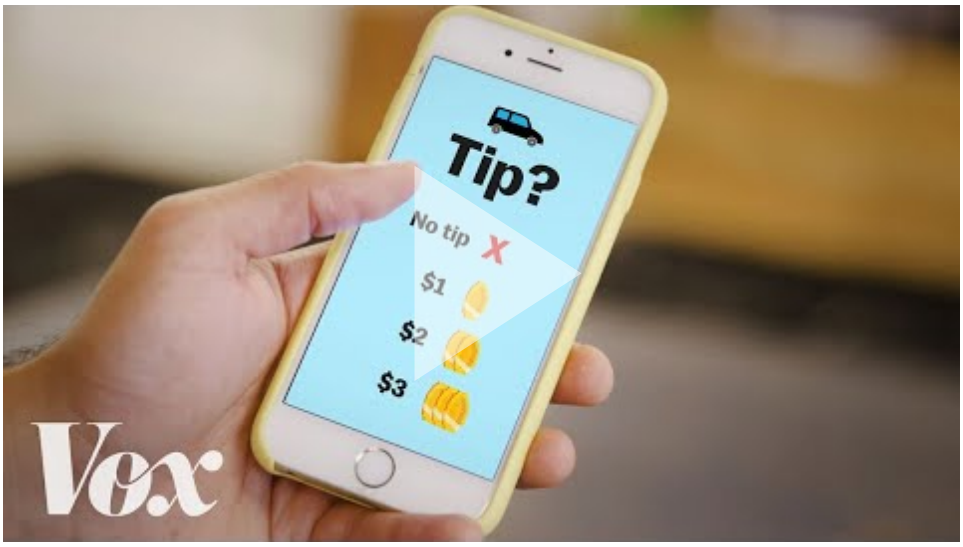
16% of Americans have done gig work. 35% of them said they have felt unsafe on the job. Learn more t...

https://www.pewresearch.org/internet/2021/12/08/the-state-of-gig-work-in-2021/

A brief assessment of recent trends

Reflecting on the trends discussed above and deciding who may be the "winners" or "losers", some questions to consider are:

- **Automation**: Can everyone whose jobs were replaced by machines and robots learn new skills in time to start a new career? If not, what happens to those displaced workers?
- **Factories**: How may factories that moved to developing countries impact the long-term welfare of the people and environment of those countries?
- **Gig Economy**: Is the gig economy eroding laws that have historically protected workers against unsafe work conditions (e.g. pressured to work long hours or lower wages)?



Are you supposed to tip an Uber driver? (Source: Vox)

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

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Chapter 12

Human Settlements

Introduction

According to the United Nations, 57% of the world's population lives in urban areas (2021), compared to just 34% in 1961.

Urban population (% of total population)



Percentage of the world's population living in urban areas (Source: The World Bank)

In **developed** countries, de-industrialization in major cities made room for new residential and commercial urban developments. Meanwhile, rapid urban expansion in **developing** countries is due to population growth and jobs created by the industries that recently relocated to those areas. This rapid expansion may overwhelm the limited housing and infrastructure in those areas, leading to the creation of slums and squatters in the city.

In comparing urbanization trends in developed and developing countries, there are some notable differences:

- The percentage of people living in urban areas in developed countries (79.2% in 2020) is higher than the percentage in developing countries (51.6% in 2020).
- The number of large cities in the world continues to increase, but an increasing number of these large cities are found in developing countries rather than developed countries.
- Due to high birth rates, cities in developing countries are growing much faster than cities in developed countries, with many of them becoming so-called **"megacities"** or cities with more than 10 million residents. Learn more about the rise of megacities in the world by watching the one-minute video below.

Urbanisation and the rise of the megacity

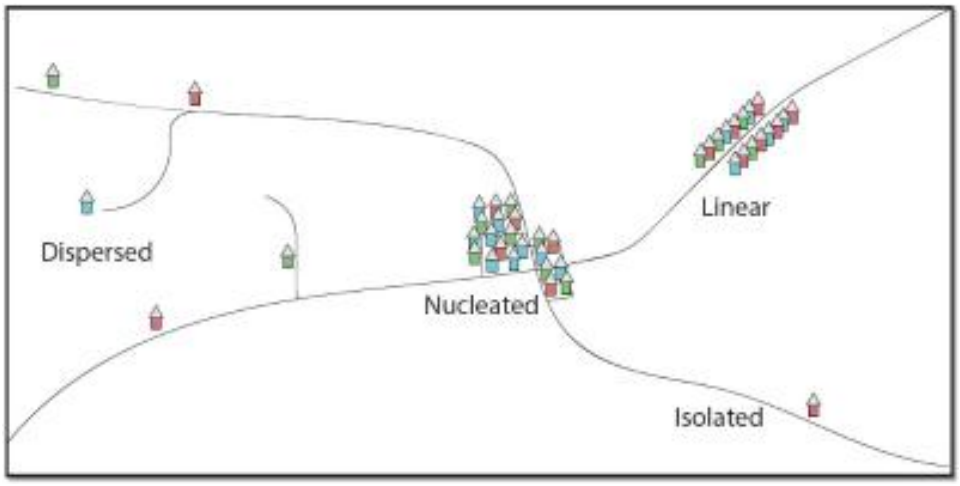
A short video on the history of megacities and recent urbanization trends.

https://www.youtube.com/watch?v=JDS_BqDeZ4k

Rural Settlement Patterns

Given that nearly half of the world's population still lives in rural areas, we will discuss the general patterns in which

rural settlements are organized around the world.



A comparison of dispersed, nucleated, linear, and isolated rural settlements (Source: Corey Parson, CC BY-SA 4.0, via Wikimedia Commons)

Clustered/Nucleated settlements

These are rural settlements where a number of families live close to each other, resulting in a collection of buildings and fields being concentrated in a defined area. Below are some examples of clustered settlement patterns.



A compact village in Kodaikanal, India (Source: Parthan, CC BY-SA 2.0, via Wikimedia Commons)

- **Compact settlement**: A town center consisting of bank(s), school(s), and market(s) is surrounded by houses and farmlands. The houses are in turn surrounded by small garden plots, large cultivated areas, pastures, and woodlands in successive rings.
- **Linear settlement**: Buildings are found along a road, river, or coastline, and agricultural lands are found behind the buildings.
- **Circular settlement:** A central open space is surrounded by structures such as houses, stables, and barns.



(Left) A linear settlement in Outlane, England. (Right) A circular settlement in Charlottenburg, Romania.

Dispersed settlements

These rural settlements have much lower density relative to nucleated settlements. Examples of dispersed settlements include scattered and isolated settlements, which differ mainly in their degree of separation from other fields or dwellings.

- **Scattered settlement**: Small fields and dwellings that can be found in a variety of terrains, including hill slopes, forests, foothills, and others. The dwellings in the same settlement may be separated by relatively large distances.
- **Isolated settlement**: Farmers live on individual farms in their own settlements isolated from other farmers. This type of settlement is only possible in areas where undeveloped land is plentiful, as was the case in the American Midwest.



(Left) A scattered settlement in Brigham, WI, US. (Right) An isolated settlement in Berlin, US.

Urbanization Through Time

As people in different world regions transitioned from hunting and gathering to farming and raising livestock, the world's earliest cities came into existence in these regions, which are referred to as the **hearths** or birthplaces of urbanization.

The five hearths of urbanization (in the order of oldest to most recent) are:

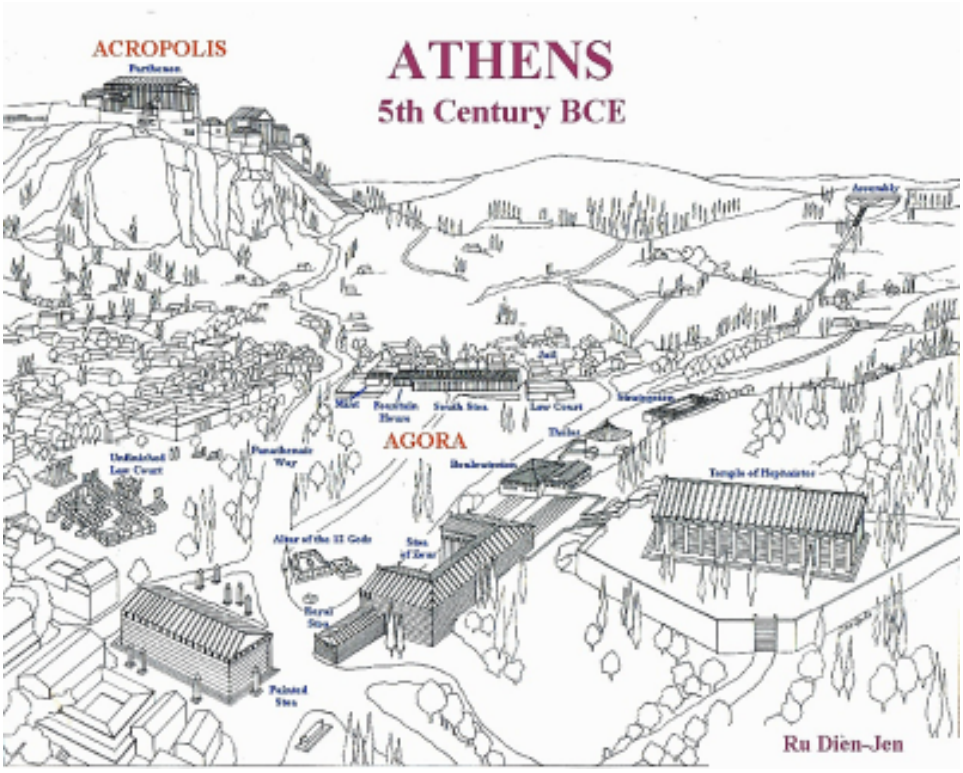
1. **Mesopotamia**-Iraq (founded 3500 B.C.)
2. **Nile Valley**-Egypt (founded 3200 B.C.)
3. **Indus Valley**-Pakistan (founded 2200 B.C.)
4. **Yellow River** (Huang Ho)-China (founded 1500 B.C.)
5. **Mesoamerica**-Mexico (founded 200 B.C.)



The five hearths of urbanization where the world's earliest cities can be found. (Source: Canuckguy and Corey Parson, CC BY-SA 4.0, via Wikimedia Commons)

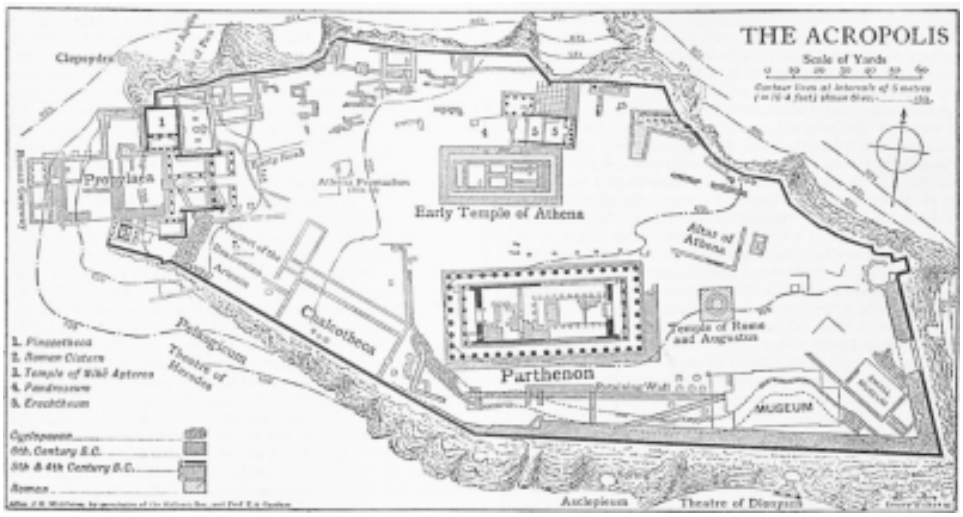
Ancient Greek cities

From the earliest urbanization hearths in Mesopotamia and the Nile Valley, the idea of urbanization spread to the area around the Mediterranean Sea and led to the creation of various Greek cities (e.g. Athens, Sparta) by 800 B.C.



The city plan of classical Athens including the locations of the agora and acropolis districts. (Source: Drawing by Ru Dien-Jen from http://socrates.clarke.edu/athens.gif.)

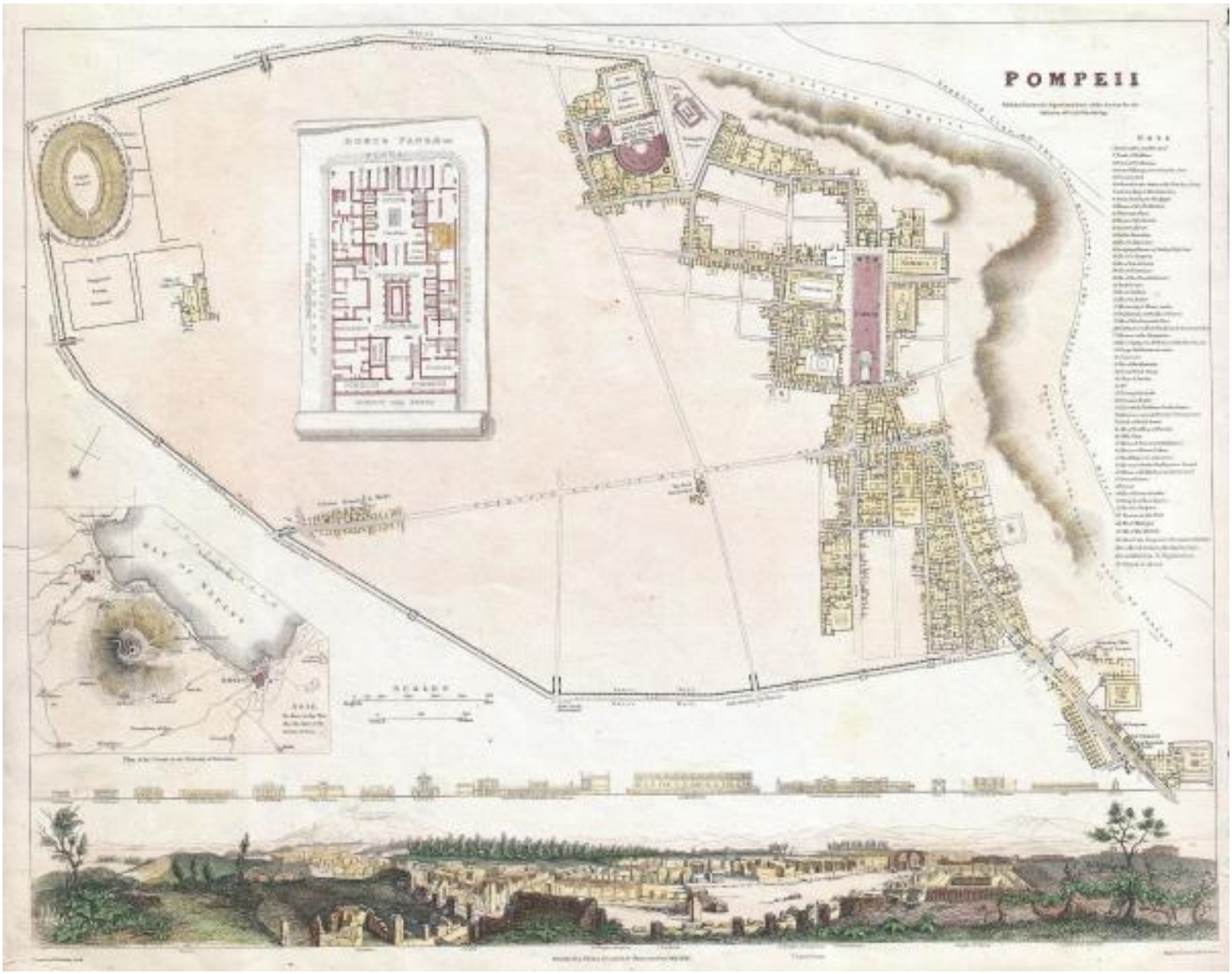
Some common features found in Greek cities include an **(1) acropolis**, which is usually found on the city's highest ground (e.g. hilltop) and contains religious and military structures; and the **(2) agora**, where one can find buildings that serve athletic, artistic, business, spiritual, and social purposes.



The Acropolis of classical Athens (Source: Encyclopedia Britannica, 1911, Public domain, via Wikimedia Commons)

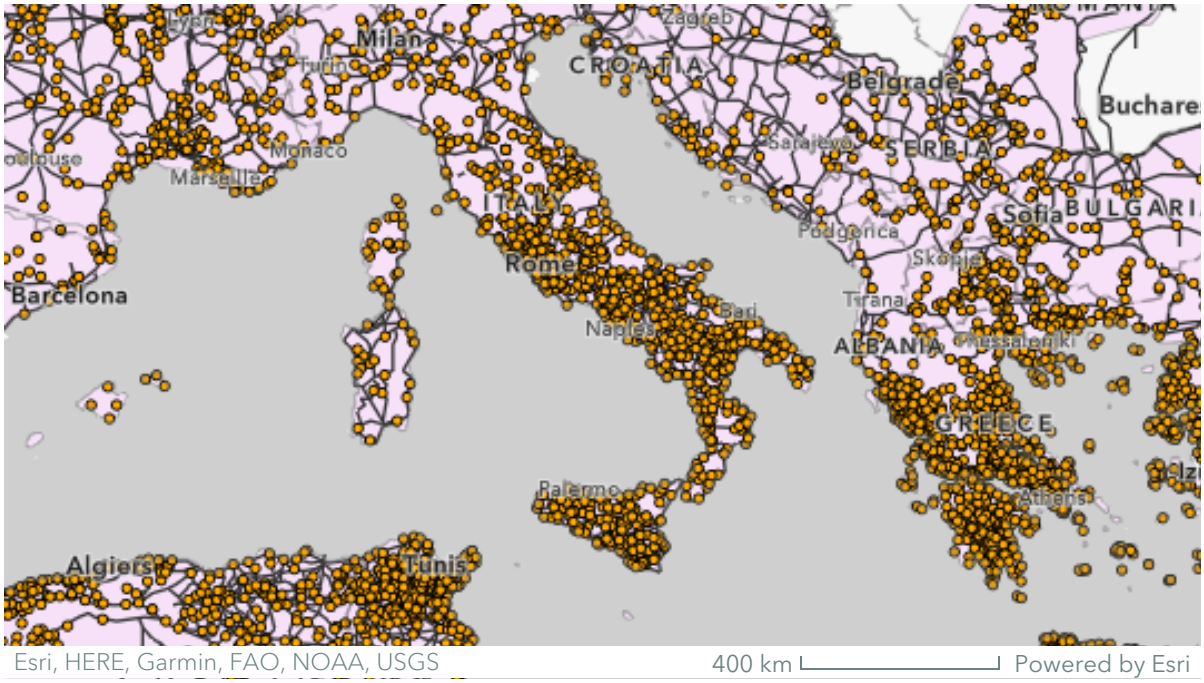
Roman cities

By around mid-100 B.C., most of the Greek city-states have been conquered by the Romans. Unlike independent self-sufficient Greek city-states, Roman cities are interconnected and connected to the capital city of Rome through its extensive network of roads. Within each Roman city, one can find paved streets organized in a grid pattern, water and sewage systems, and the center of the city's political and commercial activities in the **forum**.



The city plan of Pompeii including the location of the forum. What are some of the buildings that are found in the forum? (Source: William Barnard Clarke , Public domain, via Wikimedia Commons)

After the collapse of the Western Roman Empire in A.D. 476, the once extensive road network of the empire fell into disrepair, and Europe entered the **Dark Ages** (A.D. 476-1000). During this period, Roman cities were abandoned and trade declined in Europe, while urban life continued to flourish in other parts of the world.



Selected Roman settlements and major roads in A.D. 117. Note how nearly all settlements are connected to Rome by the empire's road network. (Data source: Ancient World Mapping Center at the University of North Carolina at Chapel Hill)

Medieval and renaissance cities



A statue of Antonio José de Sucre (second President of Bolivia) in the Plaza 25 de Mayo in the city of Sucre, which was founded by the Spanish in 1538 as Ciudad de la Plata de la Nueva Toledo. (Source: Dan Lundberg, CC BY-SA 2.0, via Wikimedia Commons)

Emerging from the Dark Ages, the medieval (1000-1500 A.D.) and the Renaissance periods (1500-1600 A.D.) saw the restoration of local and long-distance trade, and the creation of new cities (over 2,500 cities were created in Germany alone during this time). A city of this time period generally contained **walls** that separated the city from the countryside, a **marketplace** that often also housed the city's town hall, and a **cathedral** that was usually the dominant feature of the city. In addition, many European cities of the Renaissance period also has **large, open town squares** (i.e. plazas) where the city's wealthy inhabitants socialize. This feature was introduced by Spanish and Portuguese settlers to Latin America, and it is still found in many of the region's cities today.



Use the swipe tool to compare the aerial photo of modern Chichester, England (left) with John Speed's engraved map of medieval Chichester from 1610 (right) (Source: John Speed, Public domain, via Wikimedia Commons). Note the dominance of the cathedral in the city center, which still features prominently in the city today.

Industrial cities

The industrial revolution that started in England in the late 1700s introduced new transportation technologies such as railroads and the steam engine. These technologies made it easier for people to move from rural areas into cities, primarily because cities promised higher wages and more opportunities. As a result, many once-small towns boomed into major population centers over the span of one century. One example is Chicago, which had 4,200 residents in 1837, and 3.3 million residents in 1930. Many of these cities continue to grow rapidly and assumed the status of a **primate city**, which is defined as the culturally, politically, and economically dominant city in a country with at least twice as many residents as the next largest city in the country. Have a look at some examples of primate cities from around the world on the map below.



1 Dili, East Timor



Dili (population: 235,000) is the primate city of East Timor, which is **15.7 times larger** than the next biggest city in the country, Baucau (population: 15,000).

2 Apia, Samoa



Apia (population: 36,000) is the primate city of Samoa, which is **20.6 times larger** than the next biggest city in the country, Afega (population: 1,700).

3 San Jose, Costa Rica



San Jose (population: 2,100,000) is the primate city of Costa Rica, which is **36.9 times larger** than the next biggest city in the country, Puerto Limon (population: 58,000).

4 Montevideo, Uruguay



Montevideo (population: 1,900,000) is the primate city of Uruguay, which is **18.7 times larger** than the next biggest city in the country, Salto (population: 100,000).

5 Monrovia, Liberia



Monrovia (population: 1,100,000) is the primate city of Liberia, which is **26.8 times larger** than the next biggest city in the country, Ganta (population: 41,000).

6 Budapest, Hungary



Budapest (population: 3,300,000) is the primate city of Hungary, which is **13.9 times larger** than the next biggest city in the country, Debrecen (population: 230,000).

As you can see in the map above, a primate city is not necessarily the most populated or the most significant city in the world, it is just a disproportionately large city in a country. Some primate cities are actually quite small and remote (e.g. Apia, Samoa with a population of 36,735).

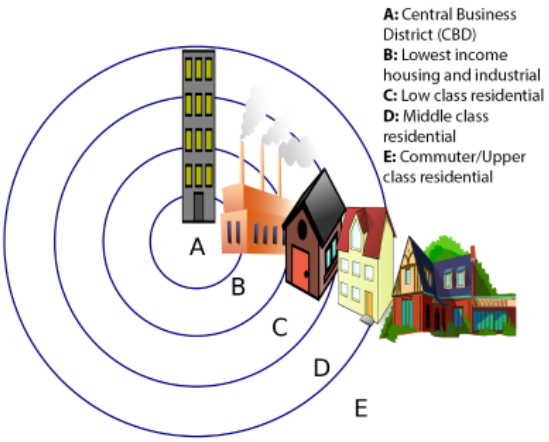
Keep in mind that not every country in the world will have these disproportionately large cities or primate cities in them. For example, Australia does not have a primate city, since its largest city, Sydney (5.4 million people), is only slighter larger than its next largest city, Melbourne (5.1 million people).

A city that plays a key role in the global financial market is referred to as a **world city**. Some examples of world cities are London, New York, and Tokyo.

Organization of North American Cities

Concentric zone model

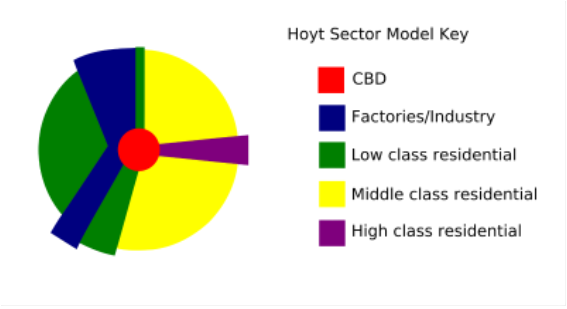
During the first half of the 20th century, a city's **central business district** (CBD) (i.e. downtown) is the oldest part of the city and the region's transportation hub. It offers a diversity of services and has a variety of commercial and industrial buildings. The arrangement of different land use during this time period is idealized in the **concentric zone model**, where the lower-class residents tend to live closer to the CBD in order to be close to their workplaces, and the upper-class residents live farther away from the CBD since they can use their cars to commute to work in the CBD.



*Ernest Burgess' **concentric zone model** showing the location of a city's different types of land use (Source: Zeimusu, Public domain, via Wikimedia Commons with author's modifications)*

Other models

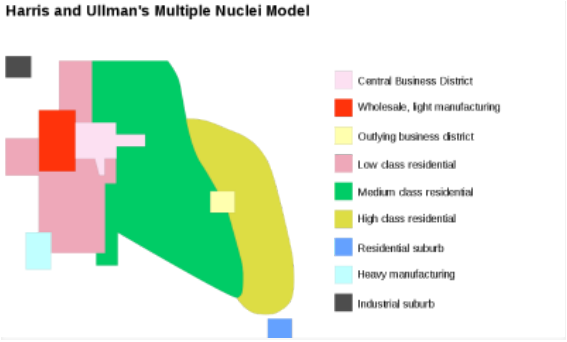
In addition to the concentric zone model, other models that have been created to describe land use types within a North American city are the sector model and the multiple-nuclei model.



*Homer Hoyt's **sector model** showing the location of a city's different types of land use (Source: Cieran91, Public domain, via Wikimedia Commons)*

The **sector model** emphasizes that residents of different socioeconomic classes will settle in different wedge-shaped sectors (rather than rings) that extend from the CBD. For example, the upper-class sector will be found in areas with characteristics desired by the wealthy (e.g. high ground, waterfront, easy access to the CBD, lots of open space, and privacy).

The **multiple-nuclei model** argues that the CBD is not the only focal point in a city. Specifically, a city may grow from multiple focal points because different land uses have distinct needs. For example, a cluster or agglomeration of furniture stores may grow around a highway to provide easy access for customers, but far from the expensive CBD to minimize rent for the extensive space needed for storage and showcase.

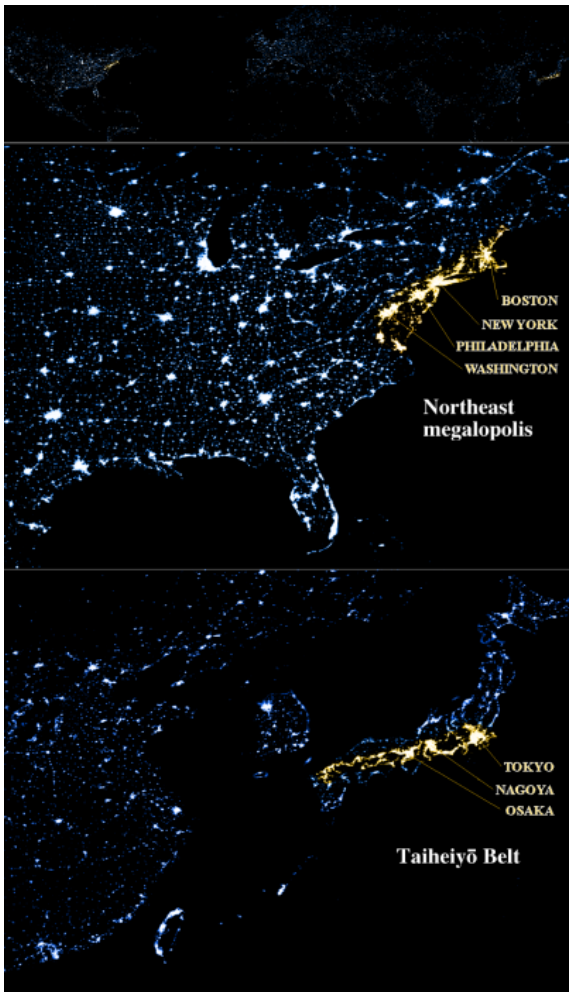


*Chauncey Harris and Edward Ullman's **multiple nuclei model** showing the locations of different land use types may not only be related to their positions relative to the CBD (Source: Cieran91, Public domain, via Wikimedia Commons)*

Issues in Urbanization

Decentralization and urban sprawl

With the increasing availability of cars and highway construction in the second half of the 20th century, **urban sprawl** became a common problem as residents moved from the CBD into the relatively cheaper, purely residential **suburbs** built on lands once used for agriculture. These residents were soon joined by shops, supermarkets, movie theaters, and other businesses which want to be closer to their customers. This led to the creation of the so-called **edge cities**, which contain residential districts and commercial districts far from the CBD. Over time, some of these edge cities turn into major urban centers, and combine with neighboring urban centers to form a gigantic urban region with major economic and



political powers known as a **megalopolis**.

Two examples of megalopolises in the world are the Northeast megalopolis (also known as BosWash since it extends from Boston to Washington D.C.) and the Taiheiyō Belt megalopolis. Note how both megalopolises cover large continuous stretches of urban and suburban areas and include a number of the country's major cities. (Source: NASA, Public domain, via Wikimedia Commons)

For those residents who live in the suburbs or edge cities and work in the CBD, they face the problems of automobile dependence and traffic congestion, increased commute time and gasoline use, air pollution, and related health problems. At the same time, the once vibrant CBD becomes **decentralized** as residents and businesses move away, leaving behind empty homes and commercial buildings in the CBD, depressing property values, and depriving the city of the property tax that is needed to fund essential services (e.g. schools, police).

Gentrification and displacement

Since the 1970s, many cities have tried to attract housing developers and residents back to the abandoned CBD with new amenities (stadiums, roads, bus lines), tax incentives, and lower rents (since there are so many abandoned former factory buildings).

As White, wealthier, and more educated people from the suburbs/edge cities moved back to the CBD. The newcomers brought with them their wealth and attracted new businesses (e.g. coffee shops, breweries, yoga studios) that increased property values. This led to not only a revitalized CBD with new housing and businesses, but also higher property values and rent hikes that **displaced** the poorer longtime, ethnic residents in a process known as **gentrification**.



Black families in Portland, Oregon have been displaced by gentrification since the 1970s. Can this program help them return to their longtime residences? (Source: PBS NewsHour via YouTube. Used with permission.)

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

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Chapter 13

Environment and Resources

Geography and the Environment

It is important to remember that the topics previously covered in this book are related to each other, and they can all impact the physical environment. For example, rapid population growth increased our demand for resources such as fuel and food (chapter 2), this caused developing countries to extract more of their resources to sell in the global economy (chapter 9), leading to negative consequences for the welfare of their people (e.g. food insecurity) (chapter 10) and the global environment (e.g. deforestation, air pollution).

Fuel and Energy Resources

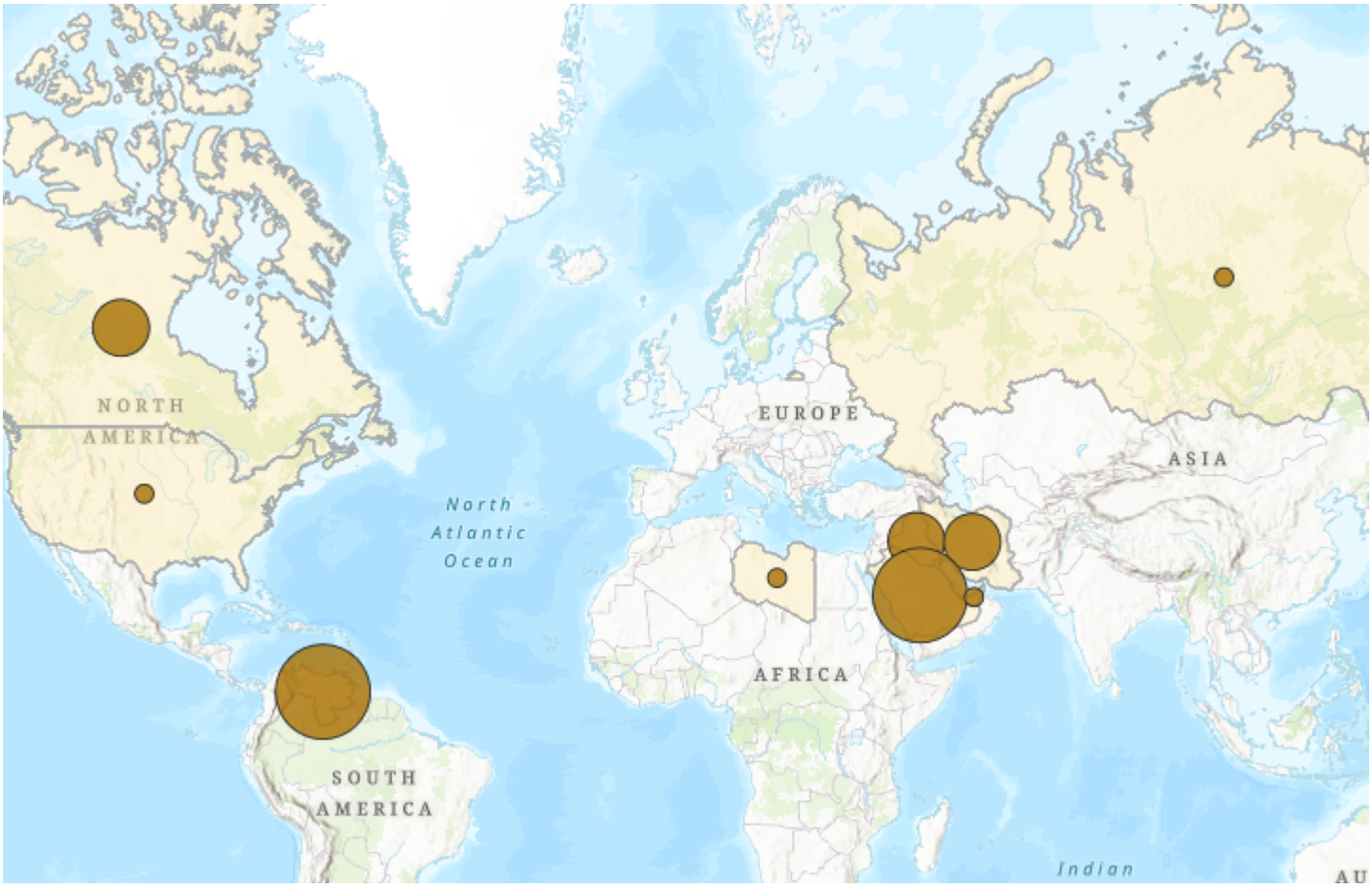
Fossil fuels

Fossil fuels refer to mainly coal, oil, and natural gas. They are created by the decomposition of ancient living matter (plants, microorganisms) which are in finite supply, hence they are a

prime example of **non-renewable resources** that we can exhaust one day.

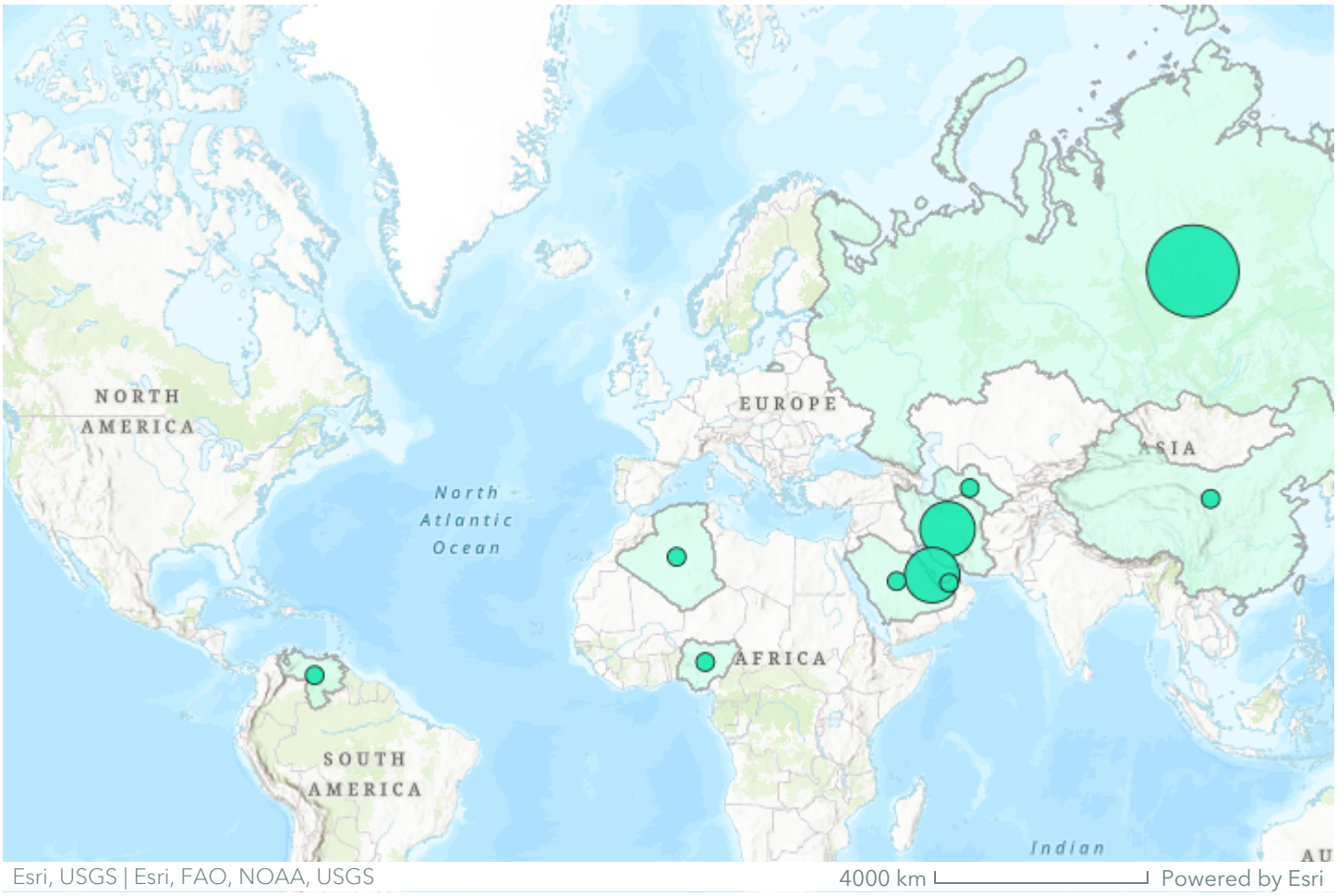
> **What Are Fossil Fuels?**
>
> Fossil fuels are made of decomposed ancient plant and animal remnants. Learn about their uses in ou...
>
> https://ocean.si.edu/conservation/gulf-oil-spill/what-are-fossil-fuels

The spatial distribution of fossil fuels is not even. In other words, some countries in the world (e.g. Russia, the U.S., Venezuela, Middle East) have a larger share of the world's **proven reserves**, or fossil fuel deposits that can be recovered with some certainty, compared to others. Have a look at the maps below to see where the earth's proven reserves can be found.



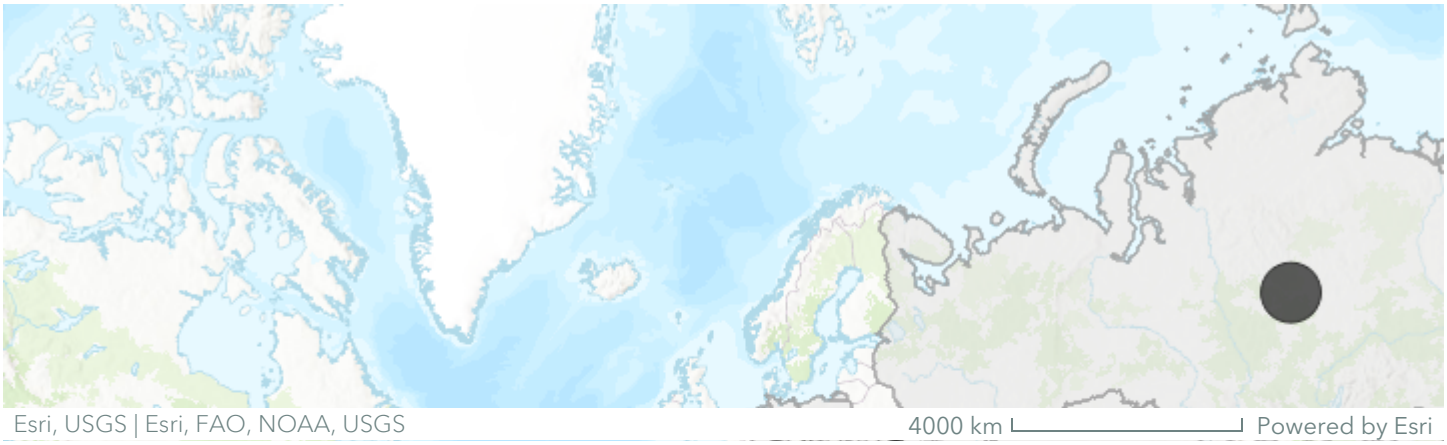
Ten countries with the most **oil** reserves in the world as of 2020.

(Data source: U.S. Energy Information Administration)



Ten countries with the most **natural gas** reserves in the world as of 2021.

(Data source: U.S. Energy Information Administration)



Ten countries with the most **coal** reserves in the world as of 2019.

(Data source: U.S. Energy Information Administration)

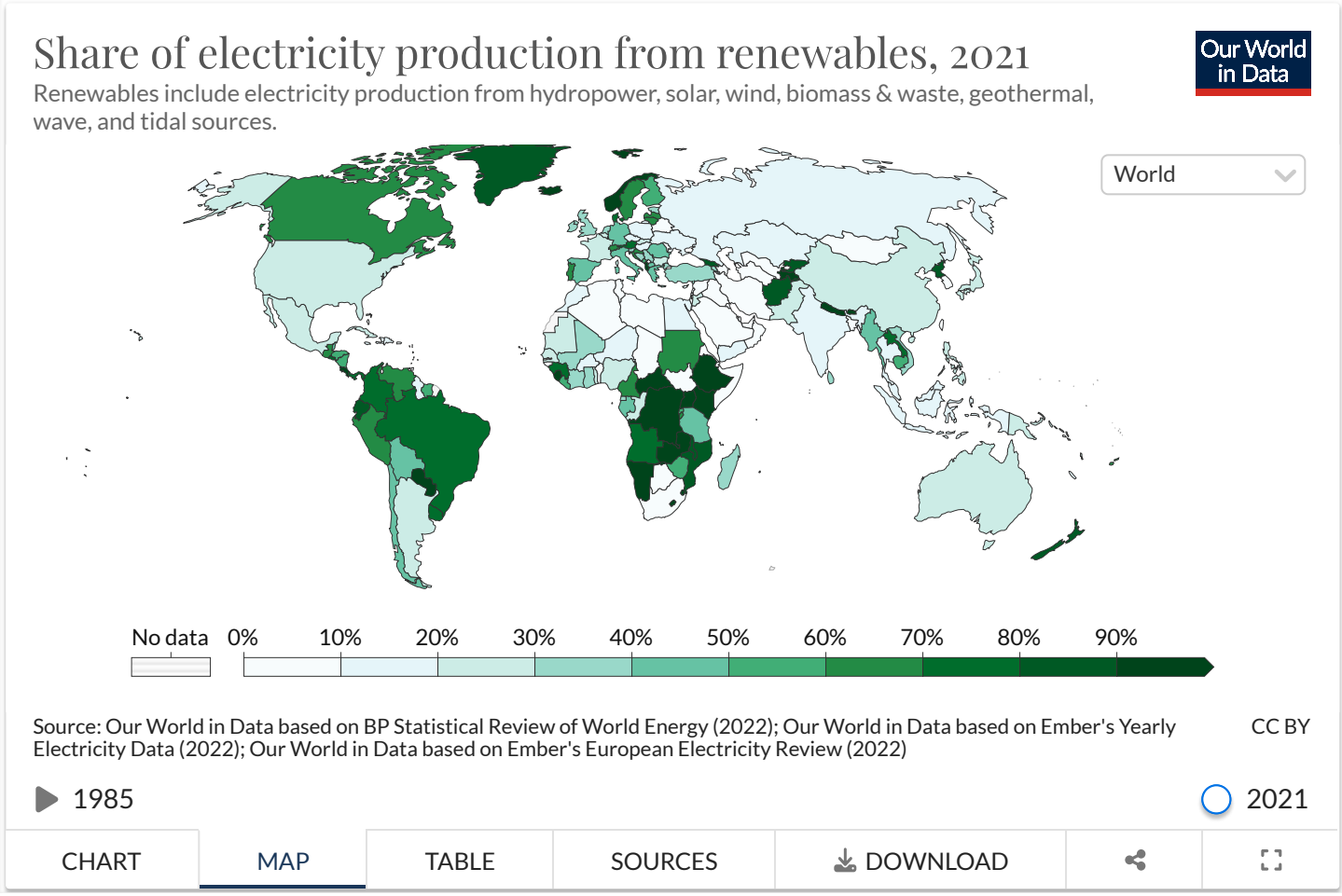
Keep in mind that just because a country has a large reserve of fossil fuel, it may not necessarily be extracting it or putting it in **production**. For example, Venezuela has roughly 300 billion barrels of oil reserves, but it is only producing 500,000 barrels per day (in 2020) due to political factors like mismanagement and corruption.

Renewable energy sources

Renewable resources are things that can replenish themselves over time even as they are used. In the context of energy, a **renewable energy source** can keep replacing the energy that has been used. Examples of renewable energy include solar (from the sun), wind (from wind), hydropower (from running water), biofuels (from crops), and geothermal energy (from heat within the earth).

While the two biggest emitters of carbon dioxide (i.e. a contributor to global warming), China and the U.S., have invested heavily in renewable energy in recent decades, only a minority (20-30%) of their electricity comes from renewable sources. Meanwhile, many countries in the sub-Saharan Africa region get as much as 70-90% of their energy from renewable sources.

Take a look at the slideshow below to see how the amount of renewable energy overall and the specific types of renewable energy (solar, hydropower, wind, geothermal, biofuel) generated in different countries changed over time.

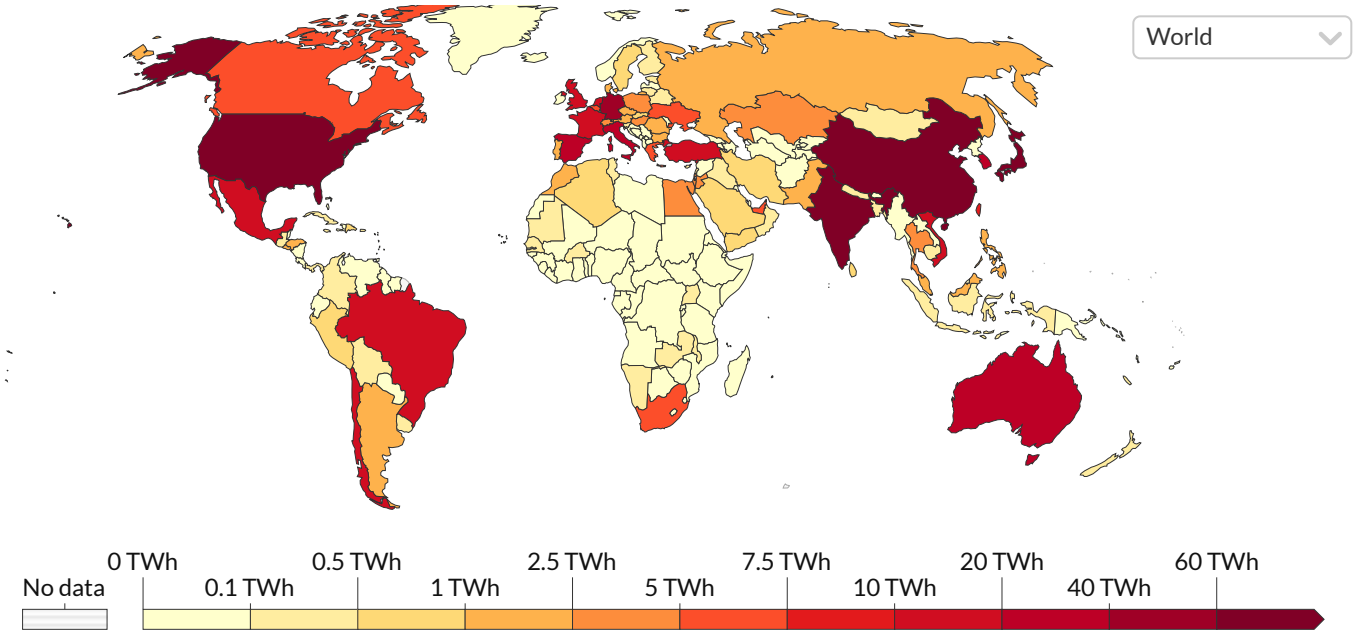


Solar power generation, 2021

Electricity generation from solar, measured in terawatt-hours (TWh) per year.

Our World in Data

World



Source: Our World in Data based on BP Statistical Review of World Energy & Ember

CC BY

▶ 1965

2021

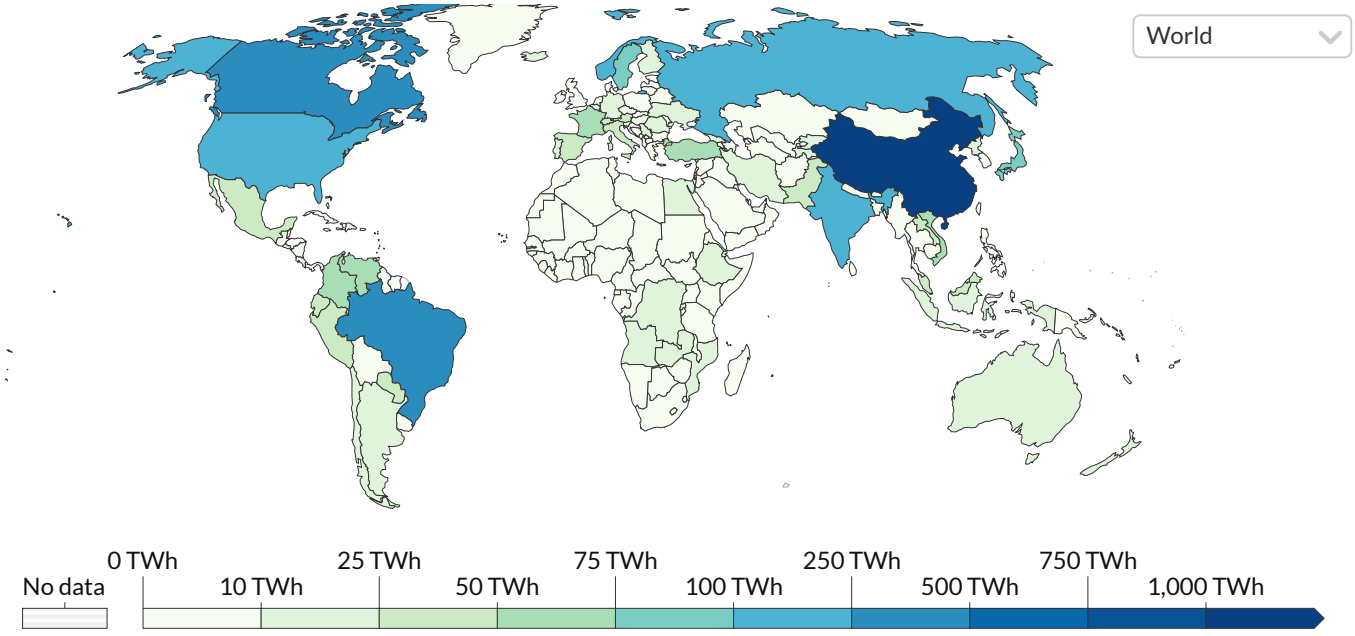
CHART | MAP | TABLE | SOURCES | DOWNLOAD

Hydropower generation, 2021

Annual hydropower generation is measured in terawatt-hours (TWh).

Our World in Data

World



Source: Our World in Data based on BP Statistical Review of World Energy & Ember

CC BY

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2021

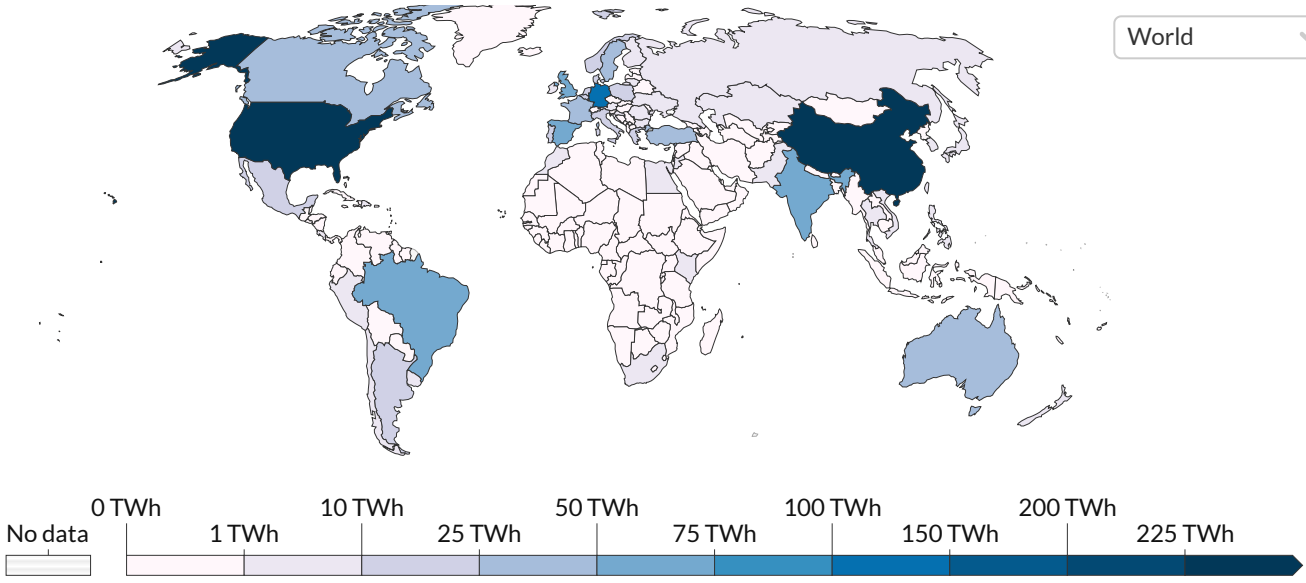
CHART | MAP | TABLE | SOURCES | DOWNLOAD

Wind power generation, 2021

Annual electricity generation from wind is measured in terawatt-hours (TWh) per year. This includes both onshore and offshore wind sources.

Our World in Data

World



Source: Our World in Data based on BP Statistical Review of World Energy (2022); Our World in Data based on Ember's Yearly Electricity Data (2022); Our World in Data based on Ember's European Electricity Review (2022)

CC BY

▶ 1965

2021

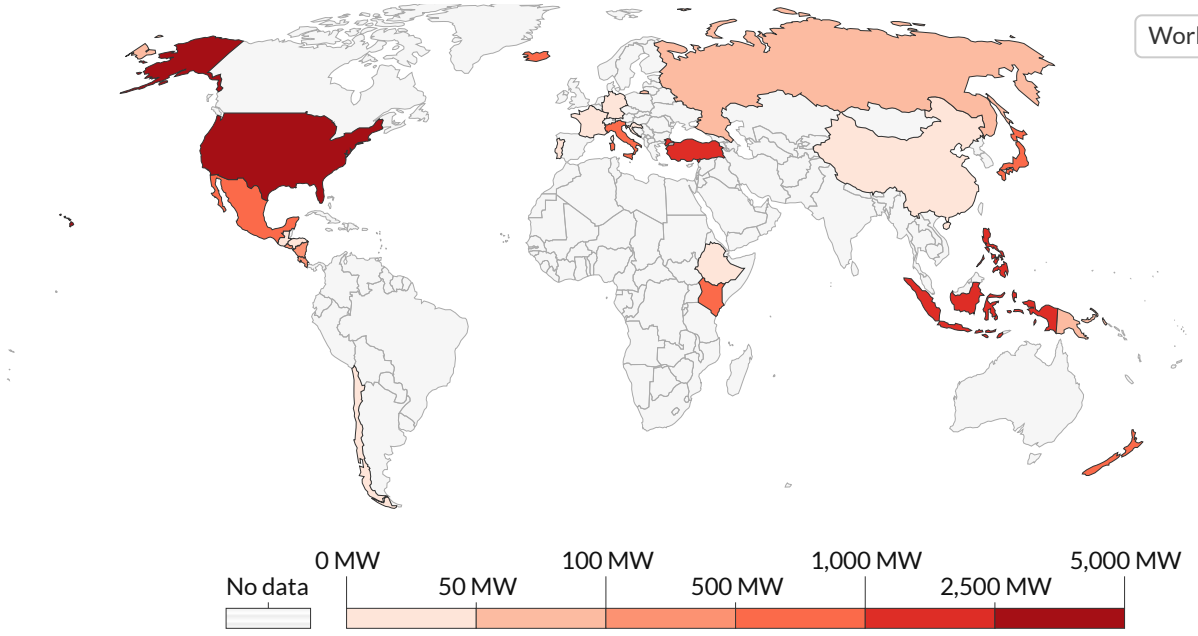
CHART | MAP | TABLE | SOURCES | DOWNLOAD

Installed geothermal energy capacity, 2020

Cumulative installed capacity of geothermal energy, measured in megawatts.

Our World in Data

World



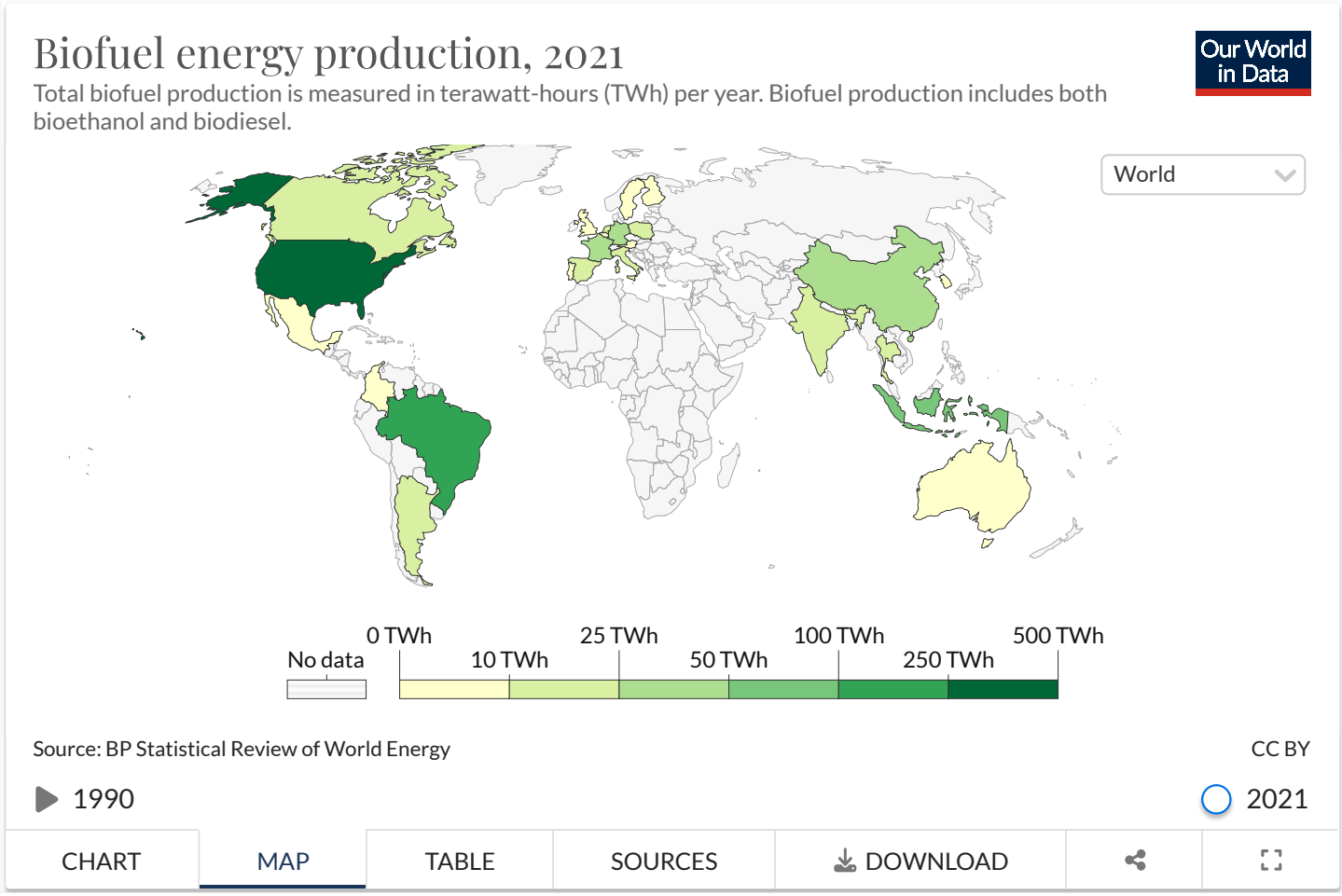
Source: Statistical Review of World Energy - BP (2021)

CC BY

▶ 1990

2020

CHART | MAP | TABLE | SOURCES | DOWNLOAD



Environmental Issues

Climate change

The earth's climate has been changing naturally for thousands of years due to natural factors such as changes in the sun's energy output and larger volcanic eruptions that change the composition of the atmosphere. However, since the Industrial Revolution in the late 1700s, **anthropogenic** or human activities, such as burning fossil fuels to power machines and raising livestock to feed a growing population, have increased the levels of **greenhouse gases** such as carbon dioxide (CO_2) and methane (CH_4) in the atmosphere.



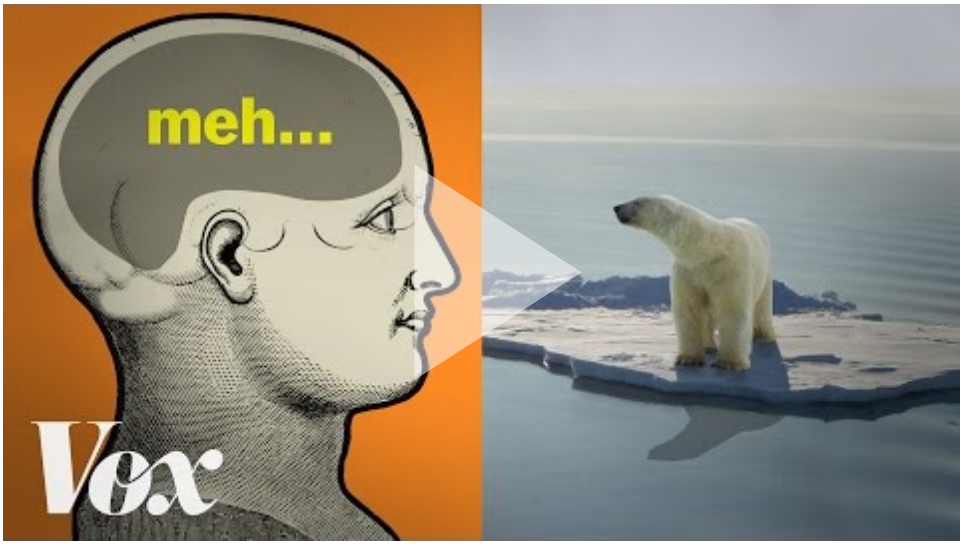
Global carbon dioxide emissions between 1990 and 2019 (Source: The World Bank, CC BY-NC 4.0)

Greenhouse gases have been in the atmosphere long before the Industrial Revolution. These gases kept the earth warm enough for life through the natural process known as the **greenhouse effect**, whereby the sun's energy/heat that was reflected by the Earth's surfaces (e.g. buildings, roads, ground) were absorbed and re-radiated by these gases. However, with greenhouses gases added to the atmosphere by anthropogenic activities, the greenhouse effect went into overdrive and trapped additional heat, leading to additional warming of the earth, melting sea ice, rising sea levels, and an increase in the frequency and intensity of storms and droughts, to name a few.



What are NASA's satellites telling us about the impacts of climate change (Source: NASA)

While there are international meetings (e.g. United Nations Climate Change Conference) and pledges/agreements by countries (e.g. The Paris Agreement) to reduce their greenhouse gas emissions, there are no supranational organizations to monitor or enforce these agreements. As a result, the successes of these international efforts are limited since individual countries are responsible for the implementation of these agreements with minimal oversight.



Why humans are so bad at thinking about climate change? (Source: Vox)

Water pollution

The demand for freshwater is increasing in urban centers due to the migration of people to cities, and it is similarly increasing in rural areas due to the demand for more water to grow more food for the world's expanding population.

Despite the increased demand for freshwater, freshwater supply in specific regions is actually decreasing due to natural factors like periodic droughts as well as anthropogenic factors like water pollution.



Use this slider tool to compare the drought situation across the United States on two different dates (Source: National Drought Mitigation Center at the University of Nebraska-Lincoln)

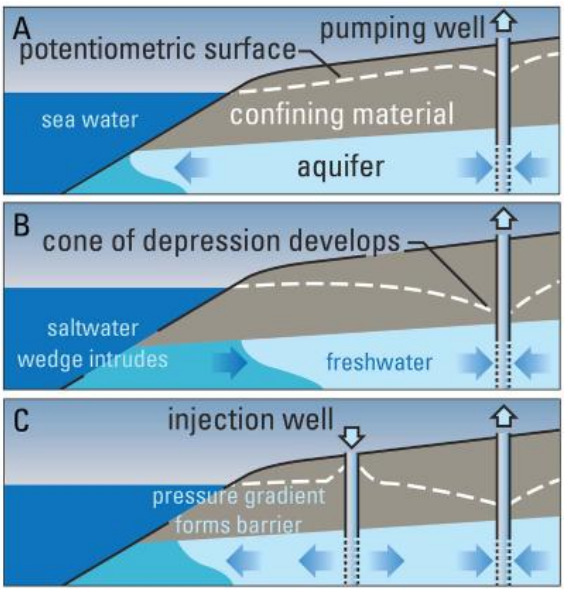
Ground and surface waters (e.g. water in rivers and lakes) can be polluted by agricultural and industrial chemicals, runoff from roads and other urban surfaces (parking lots and roofs), and untreated sewage. In addition to reducing the freshwater supply that is suitable for human consumption, water pollution can also harm aquatic life. One example of this is the process of **eutrophication**, which ultimately leads to suffocation and extensive fish kills in a four-step process.

1. Agricultural chemicals (i.e. fertilizers) are washed into a lake or similar water body by rainfall or irrigation.

2. Massive growth of algae in the lake due to the added nutrients (nitrogen, phosphorus) provided by the fertilizers.
3. Massive growth of algae eventually blocks sunlight needed for photosynthesis and lead to massive die-off of algae.
4. Bacterial decomposition of dead algae use up oxygen in the lake, leading to the suffocation of aquatic life and fish kills.

A one-minute explanation of eutrophication (Source: NOAA)

In coastal regions, the overuse of groundwater led to the problem of **seawater intrusion**. Specifically, the lowering of water level due to the overuse or over-pumping of groundwater causes seawater to be drawn towards and intrude upon the freshwater supplies (see graphic B in the image on the right), resulting in the degradation of water quality that is no longer suitable for drinking nor agriculture.

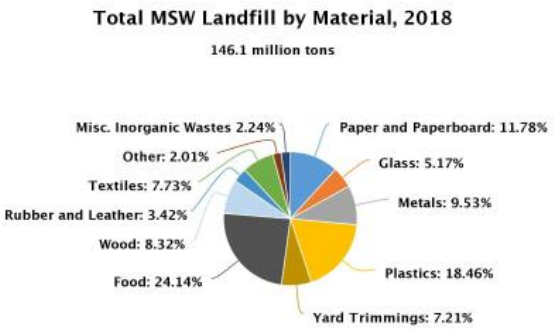


(A) Freshwater moving seaward keeps seawater out of the freshwater supply in the aquifer. (B) Over-pumping of freshwater from the aquifer allows seawater to intrude upon the freshwater supply. (C) Use of an injection well to pump freshwater into the ground in order to keep seawater out of the freshwater supply. (Source: USGS)

Solid waste

Solid waste that is improperly disposed of can cause land, water, and air pollution.

Waste (e.g. batteries) that are buried in the ground can decay over time and release toxic substances (e.g. mercury, cadmium, lead). Some of these toxic substances may stay in the soil, while others may be picked up by water that is percolating downward and ultimately polluting the groundwater supplies.



A breakdown of total municipal waste that was sent to landfill by material as of 2018 (Source: EPA)

In other cases, in many developing and developed countries that lack adequate infrastructure due to urban sprawl, residents may resort to illegally dumping their trash in open spaces or burning their trash due to the lack of reliable trash services. The improper burning of trash can release toxic air contaminants like dioxins, which can cause cancer as well as productive and developmental problems.

Even with reliable trash services and the disposal of trash in designated landfills, there are growing concerns about the types of trash entering these landfills and the emissions from these landfills. For example, according to the U.S. Environmental Protection Agency (EPA), of the 146.1 million tons of municipal solid waste that were sent to landfills, 24.14% of it was food waste.

The decomposition of food waste leads to the emission of greenhouse gases such as carbon dioxide and methane, further contributing to the problem of climate change.



Promotional flyer created by California's Department of Resources Recycling and Recovery (CalRecycle) to educate the public about the purpose of Senate Bill 1383 (Source: CalRecycle)

In response to this concern, states such as California passed regulations (i.e. State Senate Bill 1383) that require residents and businesses to properly dispose of organic waste (e.g. food scraps, yard waste) by composting them.

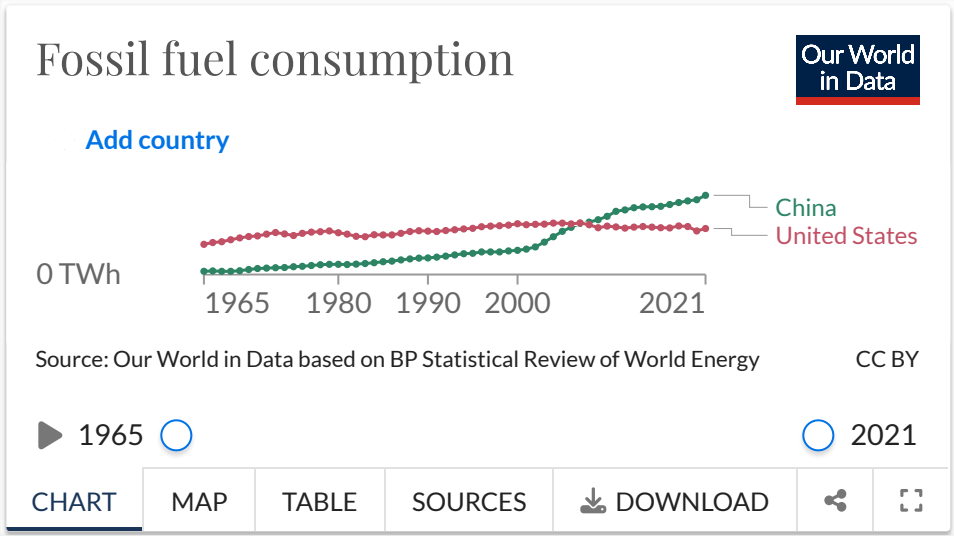
Learn how food waste became a climate change issue (Source: VOA News)

A Sustainable Future

According to the United Nations, "**sustainable development** has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This goal is increasingly difficult to achieve due to a growing population and the exploitation of natural resources. However, sustainable development is still achievable in the coming decades by tackling some of the root causes of environmental destruction, which include mass consumption and global poverty.

Mass consumption

As people in developing countries become more affluent, their consumption patterns become increasingly similar to the excessive mass consumption already seen in developed countries. For example, China is now experiencing the same trend of decentralization and urban sprawl that many developed countries have been experiencing. As more Chinese families move to the suburbs and commute to work in the city, the consumption of fossil fuels in China increased nearly 25 times between 1965 and 2021.



A comparison of fossil fuel consumption between China and the U.S. between 1965 and 2021 (Source: Global Change Data Lab, CC BY)

To **conserve** fossil fuel (i.e. use a resource sustainably so they will be available for future generations) and **preserve** land

(i.e. keep natural areas in their native state), some countries have promoted the idea of "**smart growth**", which concentrates residents in higher density living spaces with walkable access to a variety of services and transit options.

Global poverty

In the book *Our Common Future*, published by the United Nations' Brundtland Commission, one of the key findings is the negative impact that poverty has on sustainability and the exploitation of environmental resources. This prompted calls to lift countries out of poverty and promote economic development. However, as seen in the previous section, if not carefully structured, rising affluence and economic development may actually encourage mass consumption and lead to further environmental damage.



Indigenous knowledge meets science to take on climate change | Hindou Oumarou Ibrahim (Source: TED via YouTube, CC BY–NC–ND 4.0)

Instead of solely focusing on promoting economic growth, experts are now suggesting that these efforts need to be targeted at the local level across the globe. Specifically, efforts aimed at lifting local communities out of poverty need to be informed by local/indigenous knowledge and local concerns, rather than the needs of transnational corporations.

Conclusion

There are many environmental issues in our world today. These issues are not insurmountable, but the solutions to these issues are beyond the capacity of a single country or even a group of countries. Instead, according to the United Nations Secretary-General, Antonio Guterres, sustainable development and "fair globalization" requires global action, local action, and people action.

Global action requires the international community and the private sector to provide technological and financial assistance to countries most at risk, so they can provide essential goods and services to lift local communities out of poverty.



Learn about the United Nations' 17 sustainable development goals (adopted by all member states in 2015) that aim to "provide a shared blueprint for peace and prosperity for people and the planet (Source: United Nations)

Local action focuses on crafting domestic policies and working with local authorities to protect human rights, fight climate change, and other efforts to improve people's lives.

People action calls on nonprofit organizations, the private sector, academia, and their partners to come together and create new technologies and business models that can ensure more equitable access to information and the world's resources.

Environmental issues of today have been decades or centuries in the making, and it requires the collective efforts of people across state borders at the global and local levels to address these issues. To do nothing will only lead to environmental problems that will be felt across the globe in the current generation and for many generations to come.

By: Wing Cheung, Palomar College

Keeping the world interesting one map at a time

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