

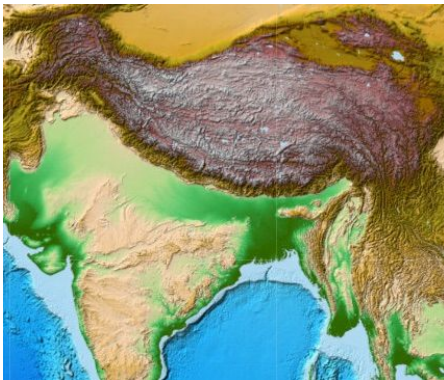
Case # 1: Mt. Everest, Himalayan Mountains



Geographical Information

Specific Location
Mt. Everest (Nepal)

Neighboring Countries
China, India, Nepal, Bhutan, Pakistan



Seismic Facts

- 17 magnitude 6.0 or greater earthquakes have occurred in Nepal since records have been kept.
- No volcanic activity in this region.

About the Himalayas

The Himalayas stretch across 1,500 miles of central Asia. The mountains consist of a large set of parallel mountain ranges that are separated by large canyons and gorges. These mountains are home to 9 of the 10 tallest mountains peaks in the world, including Mt. Everest which is 29,029 ft in elevation. Though these mountains have been around for as long as people can remember, the Himalayas are considered one of the youngest mountain ranges on Earth, at less than 40-50 million years old. By contrast, the Appalachian Mountains are estimated at more than 480 million years old.

With such extreme elevation, much of the Himalayas are above the permanent snowline, meaning that all precipitation in the region falls as snow or ice. As a result, the mountain range is home to some of the largest glaciers outside of the Arctic and Antarctica.

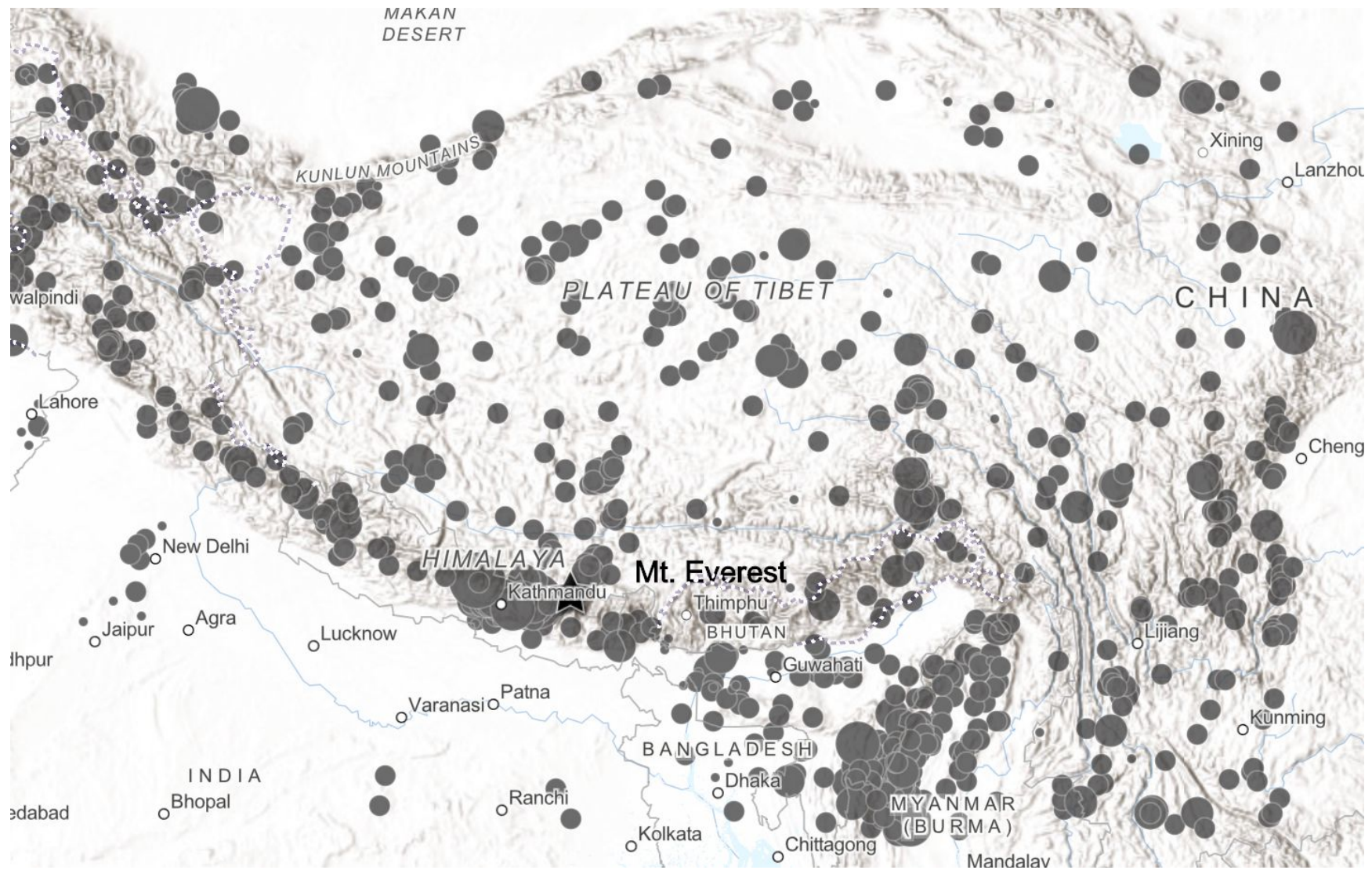


Local Connections

With the Himalayas spanning a large part of Central Asia, a range of cultures are reflected in the ways people adapt to and live in the mountains. The mountains are a rich source of medicinal herbs and precious stones, and are also home to some of the most desirable tourist locations in the world. Throughout the mountain range are many ancient Buddhist, Hindu, and Sikh temples. Higher into the mountains, climbers can be found ascending the peaks of the world's tallest mountains, including Mt. Everest.



Case # 1: Himalayas and Earthquake Activity



Case #2: Mt. Aconcagua, Andes Mountains



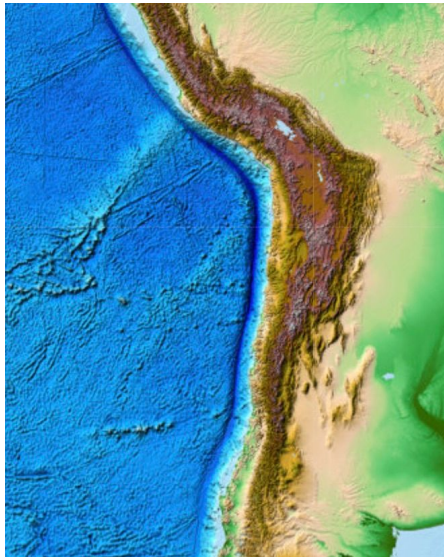
Geographical Information

Specific Location

Mt. Aconcagua (Chile/Argentina)

Neighboring Countries

Venezuela, Colombia, Ecuador, Peru, Bolivia, Chile, Argentina

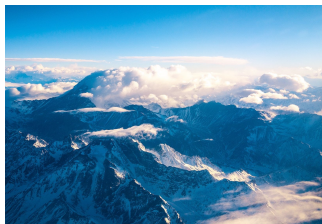


About the Andes

The Andes Mountains consist of long chains of mountains that stretch over 4,500 miles along the west coast of South America. This large and long chain of mountains are separated by steep valleys and plateaus. The highest peak in the Andes is Mt. Aconcagua at 22,841 ft in elevation. Most peaks in the Andes Mountains are active volcanoes, with the highest active volcano in the world, Ojos del Salado, located here. Mt. Aconcagua was once an active volcano, but is no longer active. The Andes are a fairly “young” mountain range, at only 50 millions years old, unlike the Ural Mountains of Russia which are approximately 300 million years old.

The Andes are home to some of the most extreme places on Earth:

- Longest mountain range in the world.
- Highest lake in the world.
- Largest salt flats in the world.
- Largest copper mine in the world.
- Headwaters to the Amazon Rainforest, the largest rainforest in the world.



Local Connections

The Andes name comes from Quechua (indigenous language of Peruvian Andes region) term *Ackon Cahuak*, meaning “Sentinel of Stone.” It is the historic home of the Incan Empire. Many settlements, such as Machu Picchu and Cusco, were located high in the mountains. Cusco was the historic capital of the Incan Empire and is a UNESCO World Heritage Site, with over 2 million tourists a year.



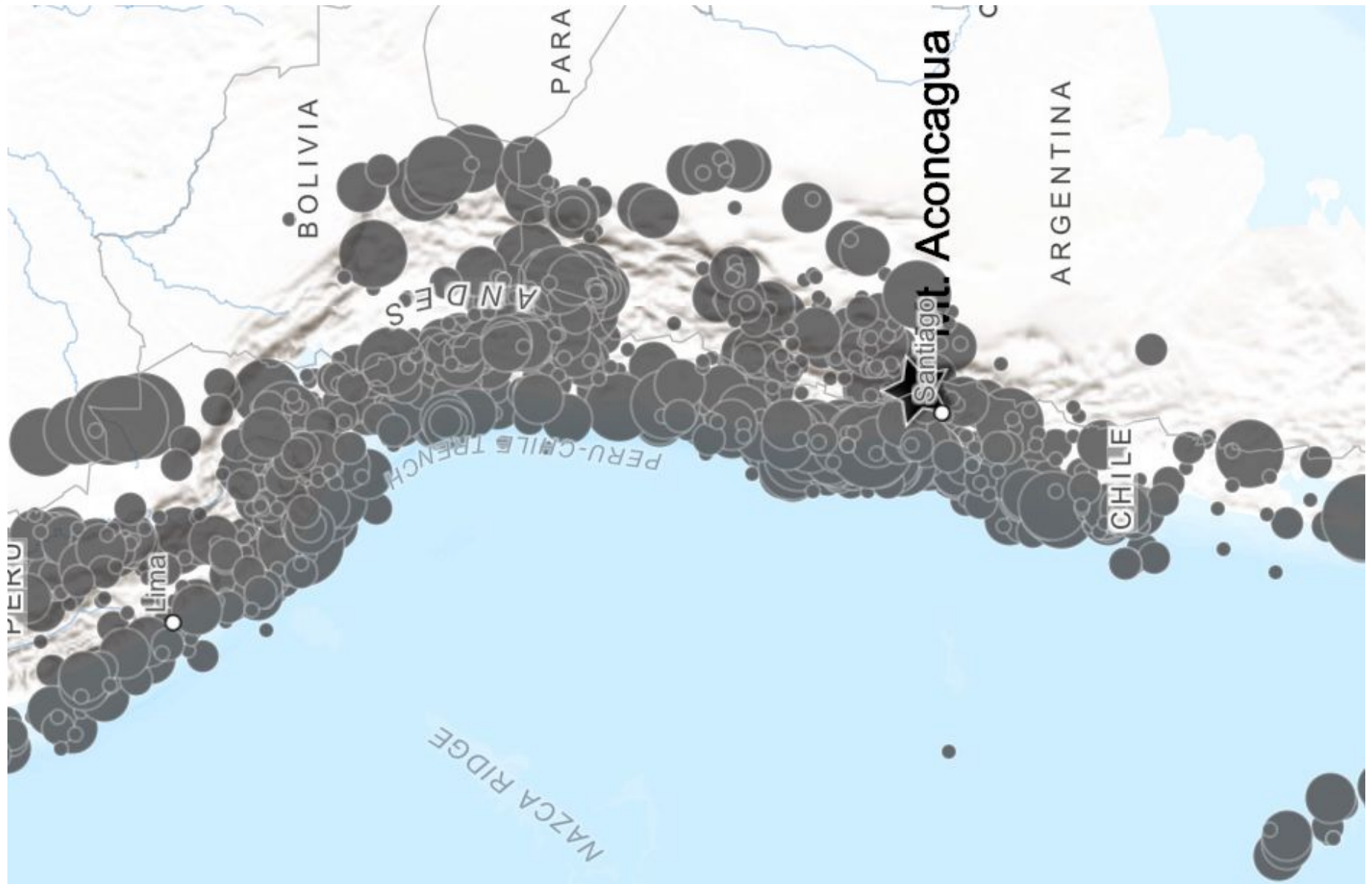
The Andes region is now home to over 85 million people who live in or near the mountains.



Seismic Facts

- Over 150 active volcanoes.
- Thousands of earthquakes each year.
- The strongest earthquake recorded was a 9.5 magnitude earthquake in Chile, 1960.

Case #2: Mt. Aconcagua, Andes Mountains



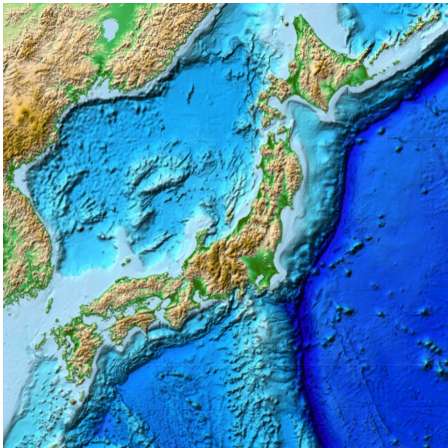
Case #3: Mt. Fuji, Japan



Geographical Information

Specific Location
Mt. Fuji (Japan)

Neighboring Countries
China, Russia, Korea



About Japan

The Japanese Islands are a large chain of volcanic islands, called a volcanic arc, that run off the eastern coast of Asia. There are five main islands in Japan, but over 6,800 total islands in the region. Most are inhabited by people, but 480 islands are not. The newest island in Japan is Niijima, which has now combined with a neighboring island, Nishino Shima. These islands are forming from underwater volcanoes that rise to the surface as they grow.

There are many iconic and sacred mountains in Japan. Mt. Fuji is one of the most popular volcanoes, just 60 miles from Tokyo and stands 12,380 ft in elevation. While it is currently dormant, the last time it erupted was in 1708 and ash fell over Tokyo.



Local Connections

There is archeological evidence that the islands of Japan had Stone Age inhabitants up to 39 million years ago. Today, over 125 million people live in Japan and almost all are ethnically Japanese.



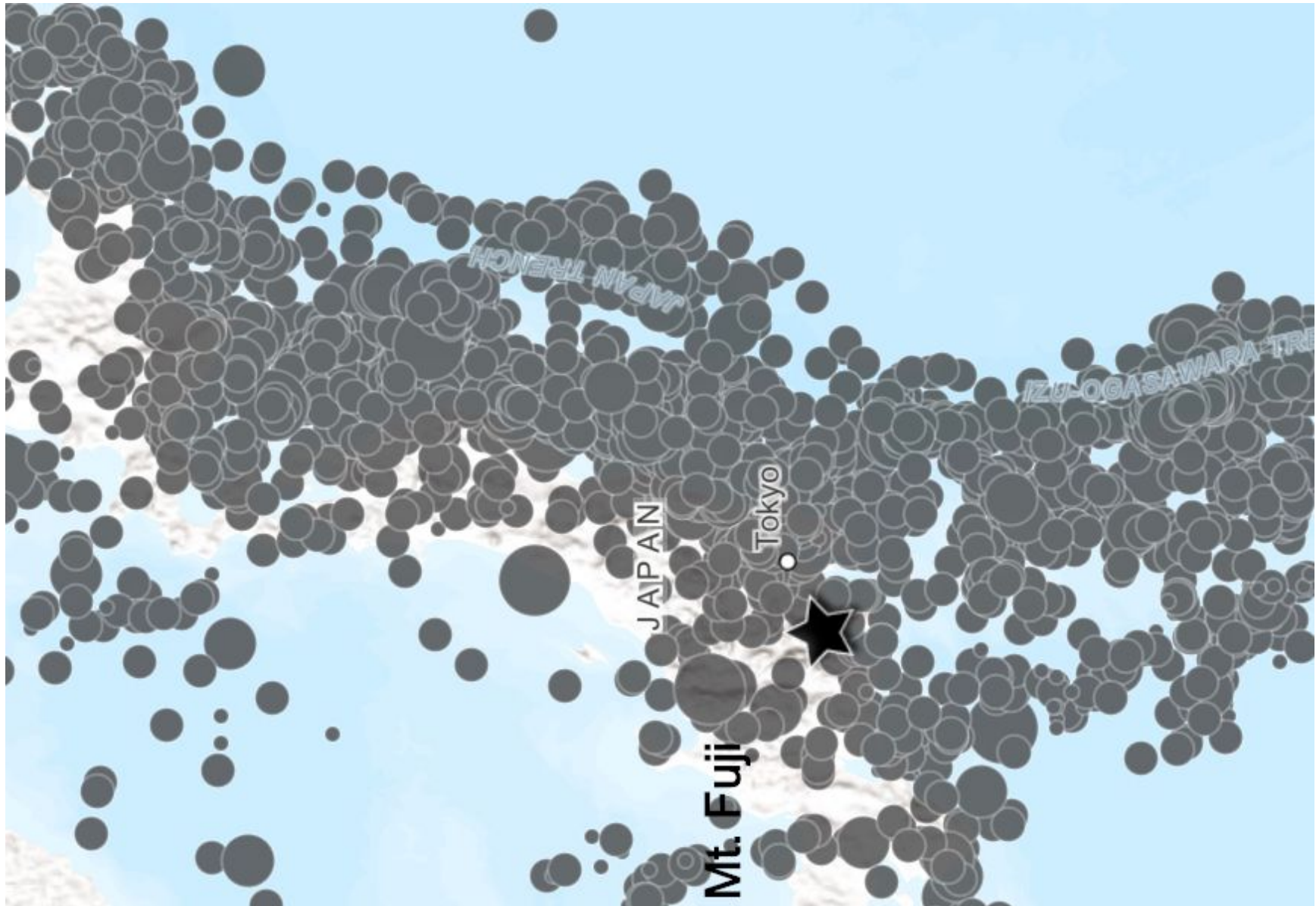
Mt. Fuji is sacred to the Shinto faith of Japan. It is said to be the *kami*, or spirit, of an ancient princess. The volcano has many Shinto shrines and it is a site of worldwide pilgrimage and mountain climbing, with over 300,000 visitors each year. Mt. Fuji is a UNESCO World Heritage Site.



Seismic Facts

- 4,860 (magnitude 3 or higher) earthquakes occur in Japan every year.
- More than 1,000 smaller earthquakes (magnitude 3 or less) occur every day.
- Japan has more than 100 active volcanoes, and 10% of all the active volcanoes in the world.

Case # 3: Mt. Fuji, Japan



Case # 4: Vatnajökull, Iceland



Geographical Information

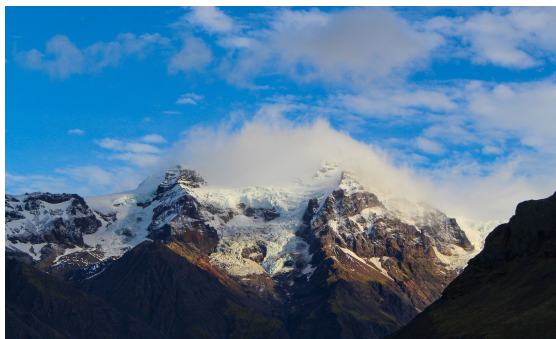
Specific Location
Vatnajökull (Iceland)

Neighboring Countries
Greenland, Ireland, United Kingdom



About Iceland

Iceland is an island in the north Atlantic Ocean approximately 2,700 miles from New York City. It is known for its volcanoes, geysers, and glaciers. There are over 20 active geysers and 30 active volcanoes (with another 100 volcanoes that are not currently active). There are also many glaciers, such as Vatnajökull, which is a large glacier covering 8% of the land. The highest point in Iceland is Hvannadalshnúkur, the peak of the Öræfajökull Volcano on the southern edge of the island.



In 2010, the volcano Eyjafjallajökull erupted in Iceland and created an ash cloud that traveled over 5 miles into the atmosphere and then stretched all the way to Europe.



Local Connection

Iceland's electricity comes from about 26% of geothermal power and 74% of hydroelectric power. The same source of geothermal energy also gives rise to hundreds of hot springs that dot the island, one of the most famous being the Blue Lagoon.

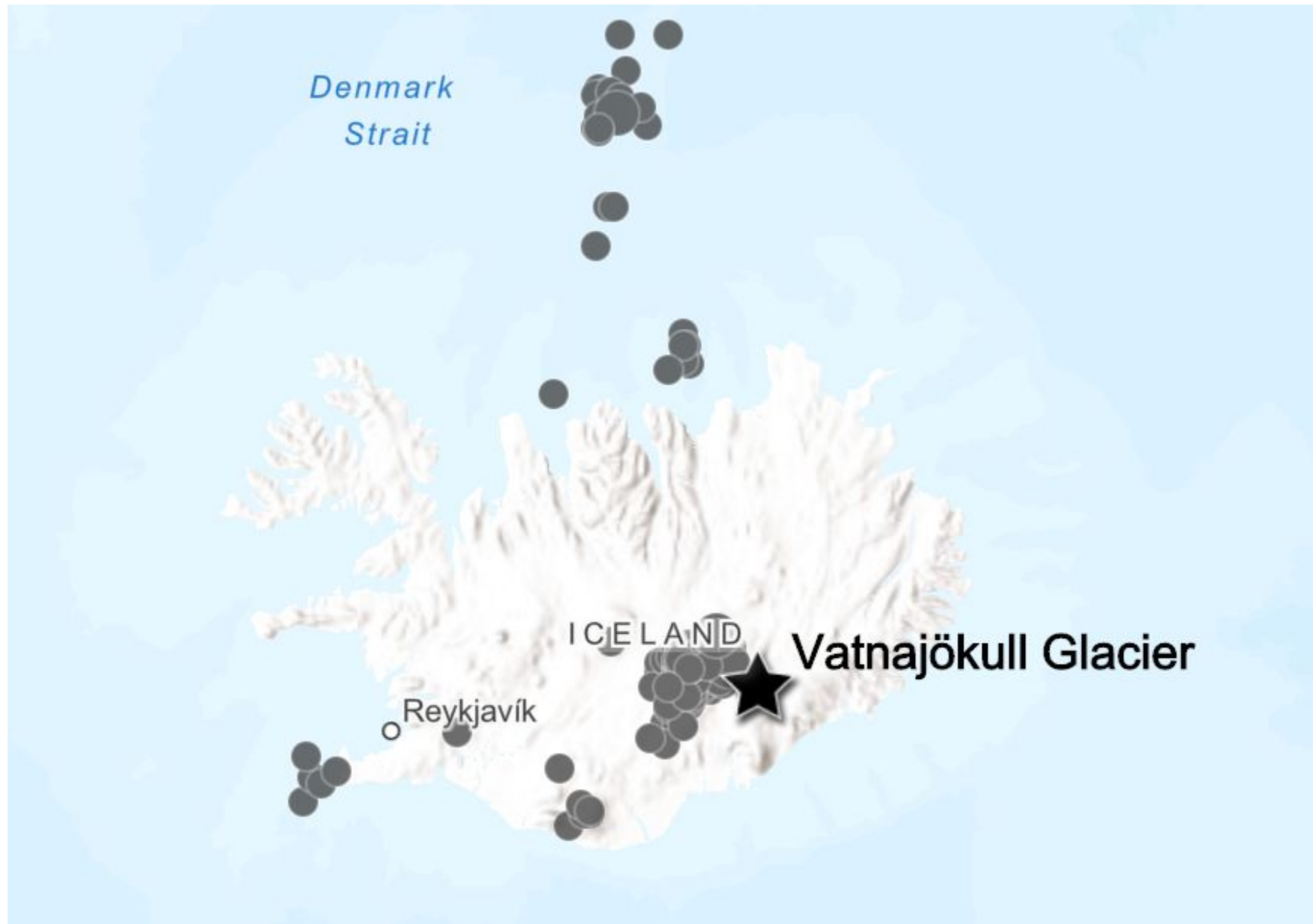


Iceland was settled in the 800s AD with early Norse voyages into the Atlantic Ocean, and today the island is home to over 360,000 people. However, over 2 million tourists visit Iceland each year, of which about 700,000 are from the United States.

Seismic Facts

- On average, there are 500 earthquakes per week in Iceland (most are small and not felt by people).
- There are over 130 volcanoes in Iceland, including 30 active volcanoes.
- When a volcano is active in Iceland, there are over 1,000 earthquakes detected per week.

Case #4: Vatnajökull, Iceland



Case #5: Mid-Atlantic Ridge, near the Azores Islands



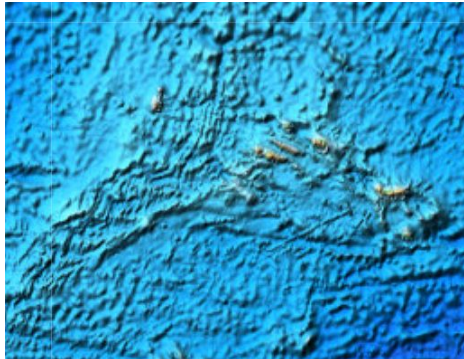
Geographical Information

Specific Location

Mid-Atlantic Ridge (near Azores Islands)

Neighboring Countries

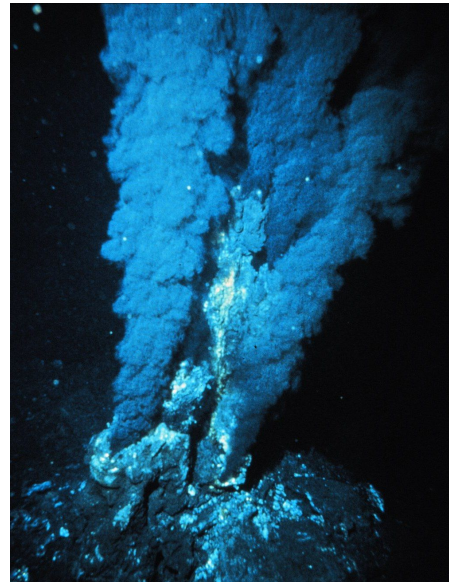
Portugal, Spain



About the Mid-Atlantic Ridge

The Mid-Atlantic Ridge (MAR) is a raised region of mountains, valleys, and ridges on the floor of the Atlantic Ocean. While most of the MAR is underwater, there are many islands, like Iceland and the Azores, that are part of this raised region that runs from just south of the north pole to Bourvet Island near Antarctica in the southern hemisphere.

The MAR is dotted with small volcanoes and thermal vents that release heat from below Earth's crust. Interesting marine life have been studied around the hydrothermal vents in this region, as it is a unique ecosystem of very hot temperatures and high mineral content in the water and rock. This region is known to have lots of very small earthquakes too.



Local Connections

The MAR was discovered in the late 1800s while the HMS Challenger was scouting potential sites for the trans-Atlantic telegraph system. Existence of the ridge was later confirmed by sonar in the 1920s.

In more recent years, scientists have been studying the marine life that can exist in the hot vents associated with the ridges. These creatures live in very dark conditions with water temperatures near 600-700°F and get their energy from hydrogen sulfide rather than sunlight! Other creatures, such as eyeless shrimp, swarm these vents and use photoreceptors on their backs to detect the very lowest levels of light.

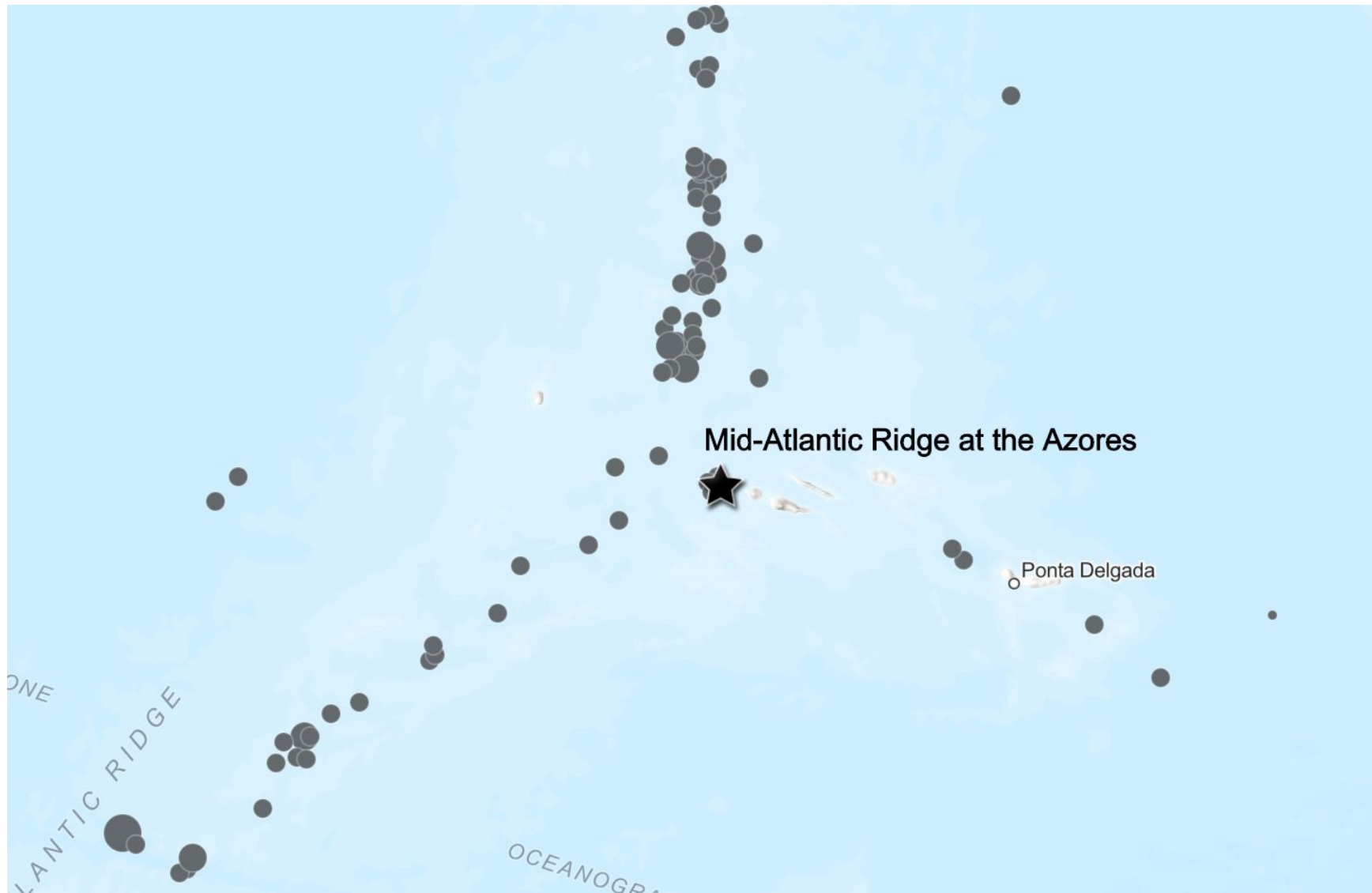


Seismic Facts

- New seafloor is made all the time at the MAR.
- The age of the new seafloor that has solidified is anywhere from 10,000 to 300,000 years old.
- Most earthquakes are shallow and have low magnitudes.

These vents also have very high mineral content, such as copper or gold, leading some mining companies to begin deep-water mining activities.

Case # 5: Mid-Atlantic Ridge, near the Azores Islands



Case #6: Lake Baikal, Baikal Rift Valley



Geographical Information

Specific Location
Lake Baikal (Russia)

Neighboring Countries
Mongolia, China



About Lake Baikal

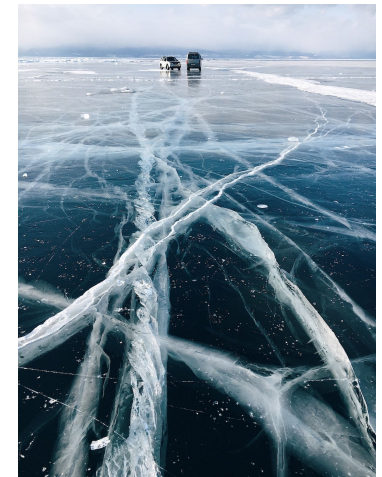
Lake Baikal is the oldest and deepest lake on Earth. It is over 5,000 feet deep, of which 4,000 feet is below sea level. It is also the world's largest freshwater lake in terms of the volume of water it holds. The lake is located in a large rift valley that is about 25 million years old. It gets 2 cm wider each year. It is surrounded by hills and mountains.

This region has mostly minor earthquakes, but every few years there are stronger earthquakes, registering a magnitude of 6. The bottom of the lake has thermal vents, which create a unique ecosystem for life deep below the surface.



Local Connections

The lake is known for having very clear water, sometimes being able to see up to 100 feet below the surface in the winter. During this time, the lake can also be frozen with ice reaching up to 4-5 feet thick. Often tourists can drive out onto the lake in winter.

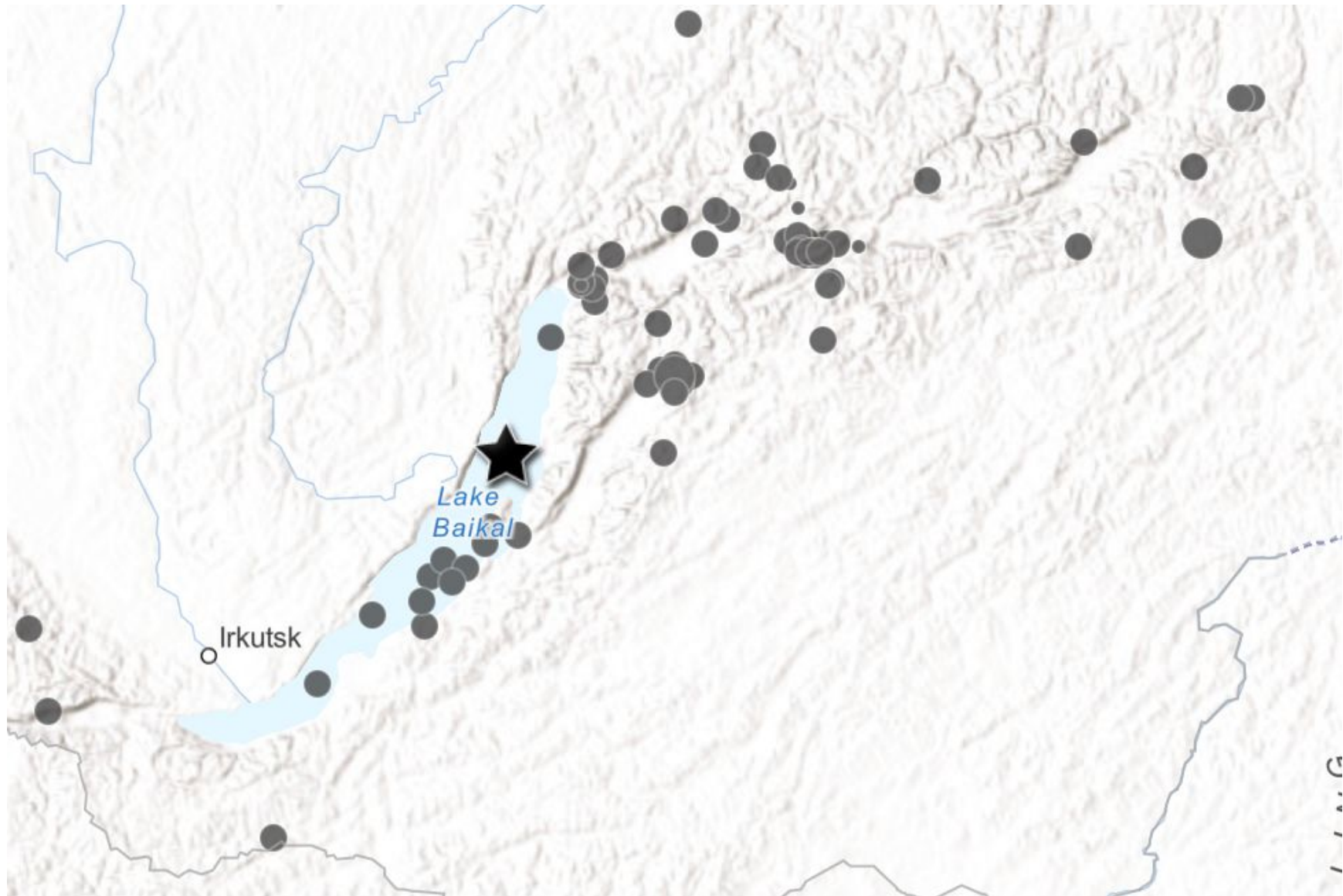


The area has a high amount of biodiversity with over 1,000 species of plants and over 2,500 species of animals living in the region.

Seismic Facts

- Mostly minor earthquakes that cannot be felt.
- Occasional strong earthquakes.
- The bottom has hydrothermal vents.

Case #6: Lake Baikal, Baikal Rift Valley



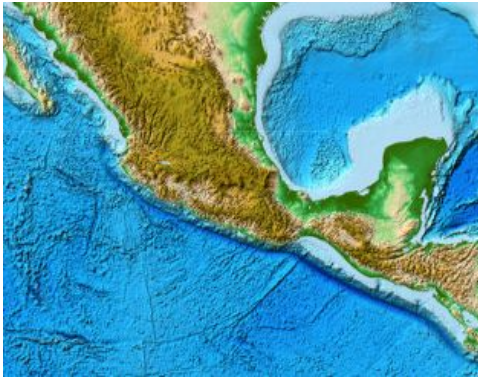
Case #7: Colima, Mexico



Geographical Information

Specific Location
Colima (Mexico)

Neighboring Countries
United States, Guatemala



Seismic Facts:

- Typically experiences stronger earthquakes with magnitudes of 6-8, which can be felt by people and also cause damage.
- There are 48 active volcanoes in Mexico.

About Mexico

Mexico experiences many earthquakes a year, many of which can be devastating if the magnitude of the earthquake is high enough. Along with earthquakes, there are 48 active volcanoes today with many more that are not considered active. These volcanoes occur across the country in the Sierra Madre mountain ranges along the western, eastern, and southern coasts.

The Colima Volcano is particularly active, with near constant eruptions since the early 2000s, sometimes sending ash clouds over 13,000 feet into the sky.



The largest earthquake ever recorded in Mexico was an 8.6 magnitude earthquake in 1787; the most recent and strongest earthquake occurred in Chiapas, a state of Mexico, and was a magnitude of 8.2.

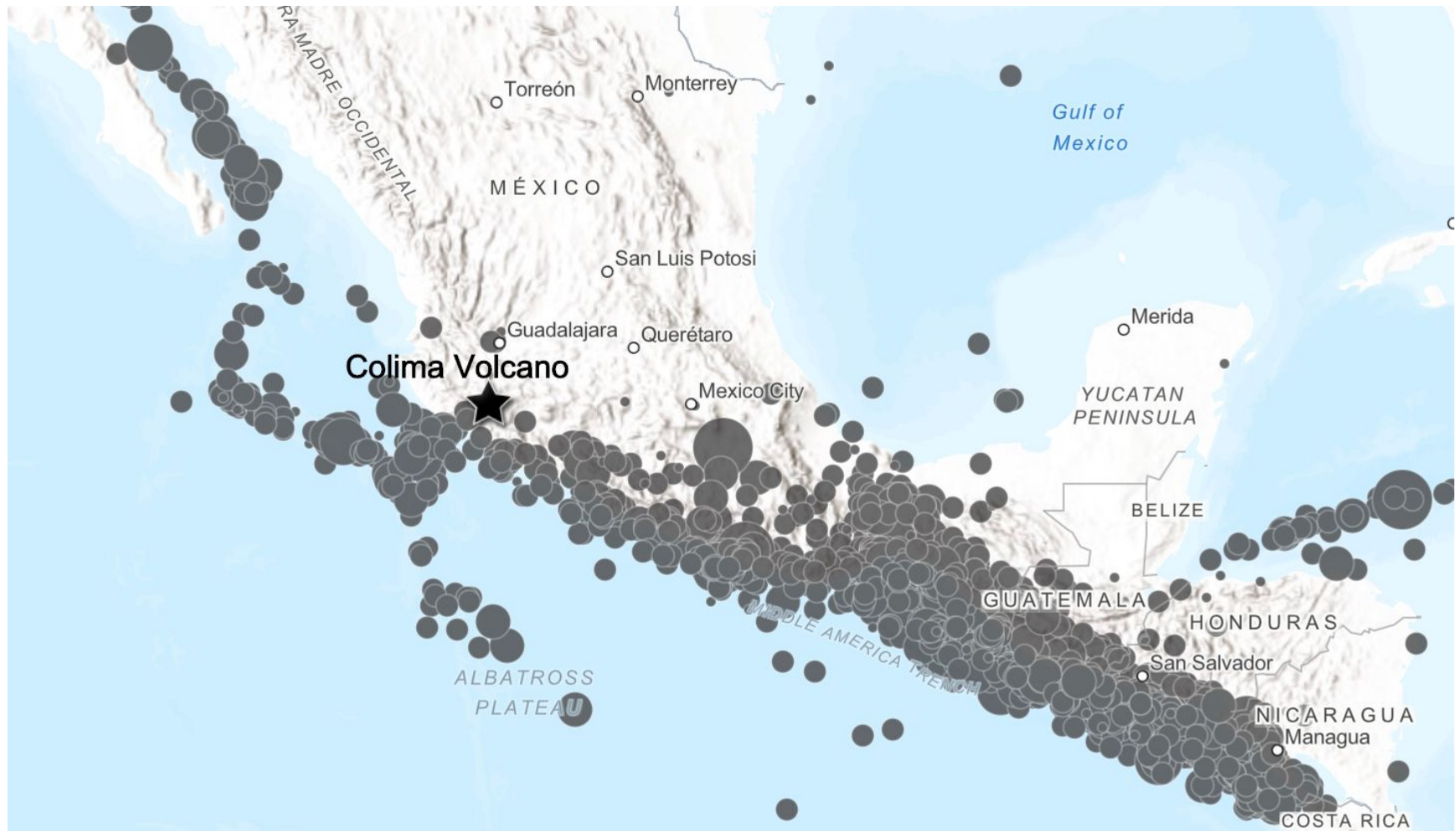
Local Connections

Volcanoes are located throughout Mexico and their active eruptions are part of daily life for people who live nearby. Volcanoes Popocatepetl and Iztaccíhuatl are found just above the Valley of Mexico, which was once the center of the Aztec Empire. Aztec legends say the volcanoes were once an Aztec warrior and princess.



Today the volcanoes are located near one of the most populated metropolitan areas in the world, Mexico City. Mexico City is the third most populous metro area in the world, home to over 20 million people. It is built on the sediment of an old lake bed, making it more prone to shaking during earthquakes than places built directly on bedrock.

Case #7: Colima, Mexico



Case #8: Gareloi Island & Volcano, Aleutian Islands, U.S.



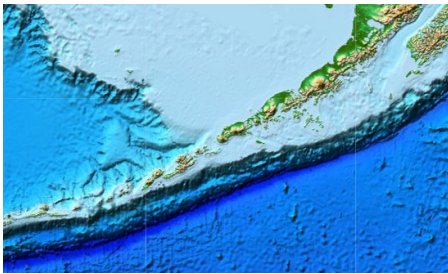
Geographical Information

Specific Location

Gareloi Island (Alaska, U.S.)

Neighboring Countries

Russia, Canada



About the Aleutians

The Aleutian Islands are a volcanic arc of islands off the southwest coast of Alaska. The islands are 1,200 miles long, spanning all the way to Russia, and they consist of 80 total volcanoes, of which 41 are active. The Aleutians consists of 14 large islands, 55 small islands, and even more islets (very small islands).

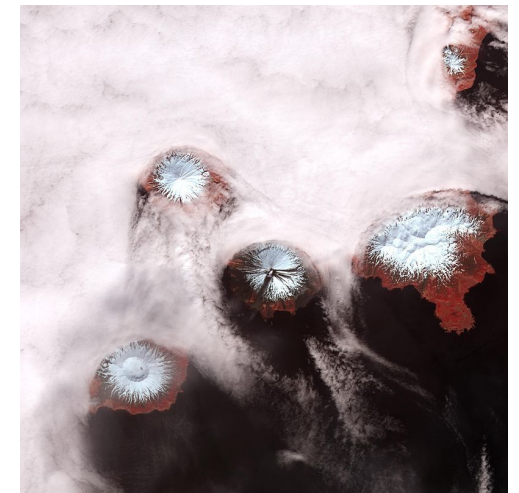
The Aleutians are prone to strong earthquakes, with the largest recorded in 1946 at a magnitude of 8.6. Because of the strong earthquake activity in this region, these islands are also at risk for tsunamis, or large ocean waves that form when large amounts of water are displaced during an earthquake. Just to the east of the Aleutians, the strongest earthquake in U.S. history was recorded in Prince William Sound in 1964 at a magnitude of 9.2 (this is the second strongest earthquake ever recorded in the world).



Local Connections

The indigenous inhabitants of the Aleutian islands were settled there for over 8,000 years before Russia began exploring the islands in the 1700s. The islands were then sold to the United States in 1867 during the Alaskan Purchase.

Today only a little over 8,000 people live in the Aleutians. Transportation around the islands is done through a ferry system or by air, as there is no road connecting the islands to one another or mainland Alaska. The average annual temperatures are about 38°F and there are 250 rainy days a year!



Seismic Facts

- Alaska has averaged 30,000 earthquakes per year for the past five years.
- 75% of the earthquakes in the U.S. with a magnitude 5.0 or greater, occur in Alaska.
- Alaska has over 90 volcanoes that have been active in the past 10,000 years.
- 75% of active volcanoes in the U.S. in the past 200 years are located in Alaska.

Case # 8: Gareloi Island & Volcano, Aleutian Islands, U.S.

