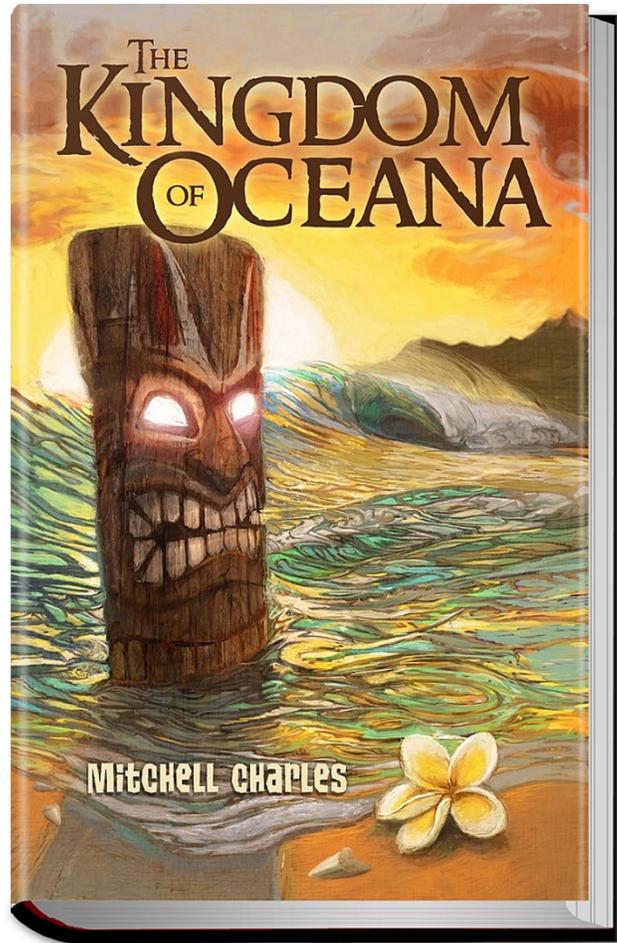


Study Guide



The Science Behind the Story

In this study guide, you'll learn about how the Hawaiian Islands came to be, and about the animals that inhabit *The Kingdom of Oceana*. The geography, climate, plants, and animals of the Hawaiian Islands are as essential to the story as Polynesian history and the novel's characters themselves.

I. The Hawaiian Islands

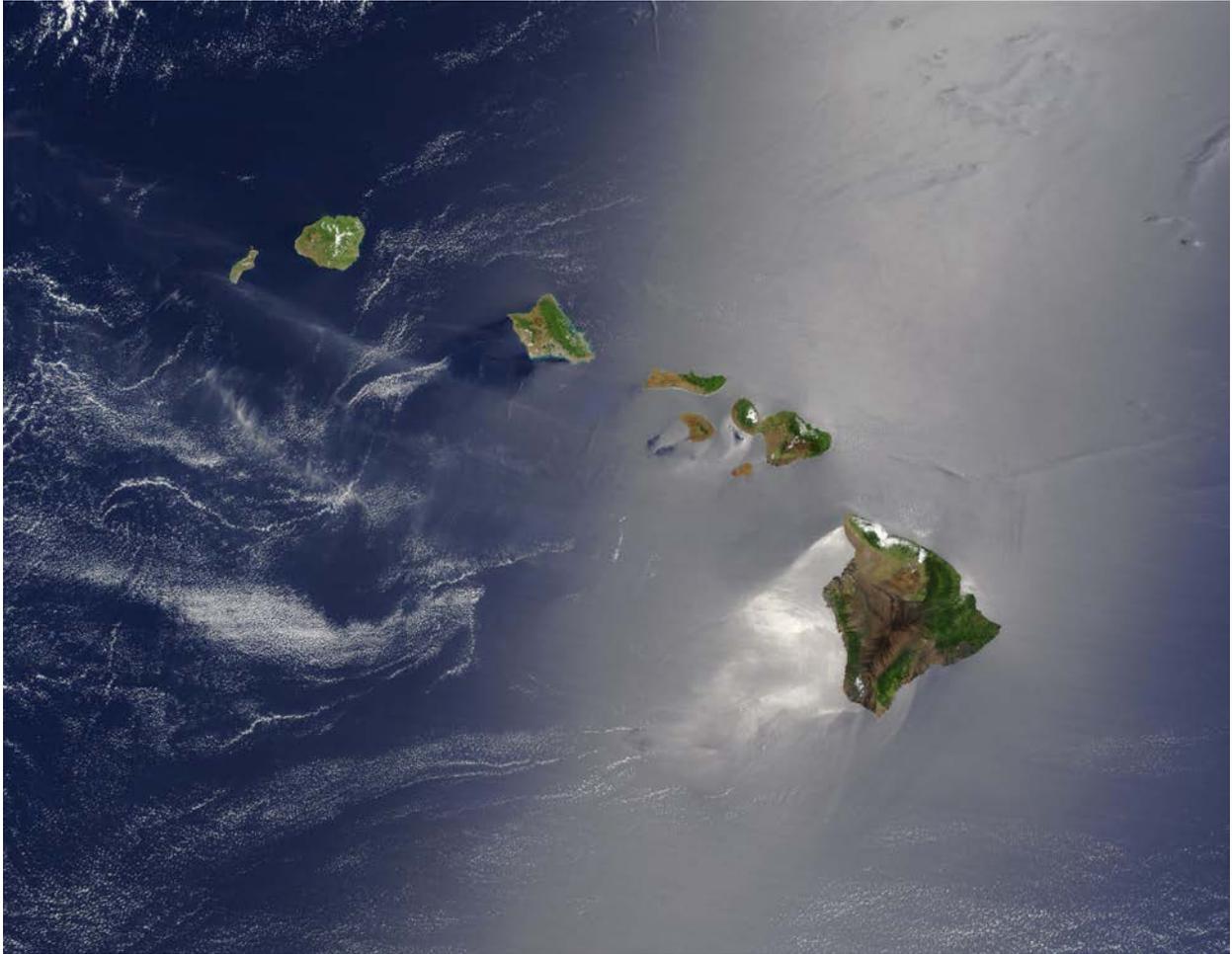


Figure 1: A satellite view of the Hawaiian Islands. Image: NASA

The Hawaiian Islands are geographically and geologically unique. This first islands in this **archipelago** were formed millions of years ago by ongoing volcanic activity, and island formation continues here today.

The Hawaiian Islands are some of the youngest land masses on Earth. Hawaii, also called the Big Island, is less than half a million years old, making it the youngest of the Hawaiian Islands. At 6 million years old, Kauai is the oldest of the Hawaiian Islands.

II. The Birth of the Islands



Figure 2: The volcano of Kilauea on the Big Island. Image: United States Geological Survey

The Hawaiian Islands are volcanic in origin. Volcanic activity on the islands is responsible for their unusual geology, as well as their varied climates and ecosystems.

Deep below the North Pacific, a hot spot in the **tectonic plates** of the earth's crust produces volcanoes. Most volcanoes form at points where tectonic plates meet; however, Hawaii is an exception. The volcanic activity in Hawaii is the result of a **hotspot**. A hotspot in the earth's crust is a point where **magma**, or liquid rock, escapes the tectonic plates to form volcanoes. The magma may be unusually hot in this particular spot, or the tectonic plate unusually thin. Over time, the volcanoes form new islands.

As the volcanoes erupt, the lava cools and it forms a larger and larger land mass. Eventually, plants begin to grow in the volcanic soil. The type of volcanoes that formed the Hawaiian Islands are called **shield volcanoes**. Shield volcanoes produce a relatively moderate lava

flow, rather than a violent eruption. This lava flow allows the volcano to form massive, gently sloping mountains.

III. Mauna Kea



Figure 3: Mauna Kea. <http://kingdomofoceana.com/the-magic-of-hawaii/>

Hawaii is home to some of the world's tallest mountains when measured from their base at the sea floor to their summit. Using this criteria, **Mauna Kea** is considered the tallest mountain on planet Earth.

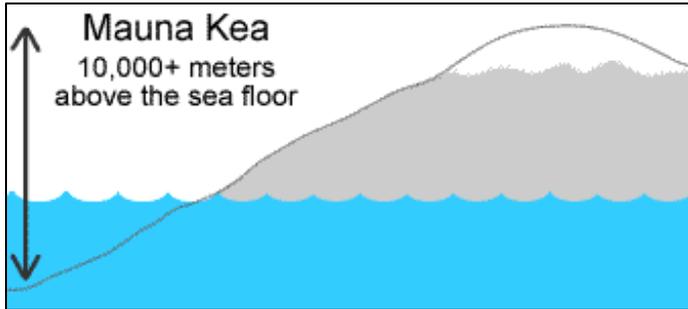


Figure 4: <https://olgavovk.files.wordpress.com>



Figure 5: <http://www.polynesiandays.com>

Hawaiian mythology and religion recognizes the importance of volcanoes. In *The Kingdom of Oceana*, the *Kahuna* tells Ailani that only **Pele** (the volcano and fire goddess) herself can burn with the heat generated by the torches on Pearl Island. Pele is said to live in the crater of **Kilauea**, one of the most active volcanoes on earth.

The islands to the northwest are much older, and the island of Hawaii (the Big Island), located at the southeastern end of the archipelago, is the youngest and with the most active volcanic activity. In total, there are more than 132 Hawaiian Islands, although only eight are considered the main islands. Some of the smaller islands may have once been parts of larger land masses that broke apart into smaller ones.



Figure 6: Principal Volcanoes of Hawaii. <https://www.soest.hawaii.edu/>

IV. Microclimates of Hawaii

Hawaii is home to about 10 of the world’s 14 different climate zones (depending on the source) in a remarkably small area. The Hawaiian Islands house climates ranging from humid and continuously wet to periglacial. In fact, three of the ten wettest spots on Earth are in the Hawaiian Islands. These are Kukui, Maui; Mount Waialeale, Kauai; and Big Bog, Maui—on the slopes of Haleakala Crater.

(source:<http://www.msn.com/en-nz/news/photos/top-10-wettest-places-on-earth/>)

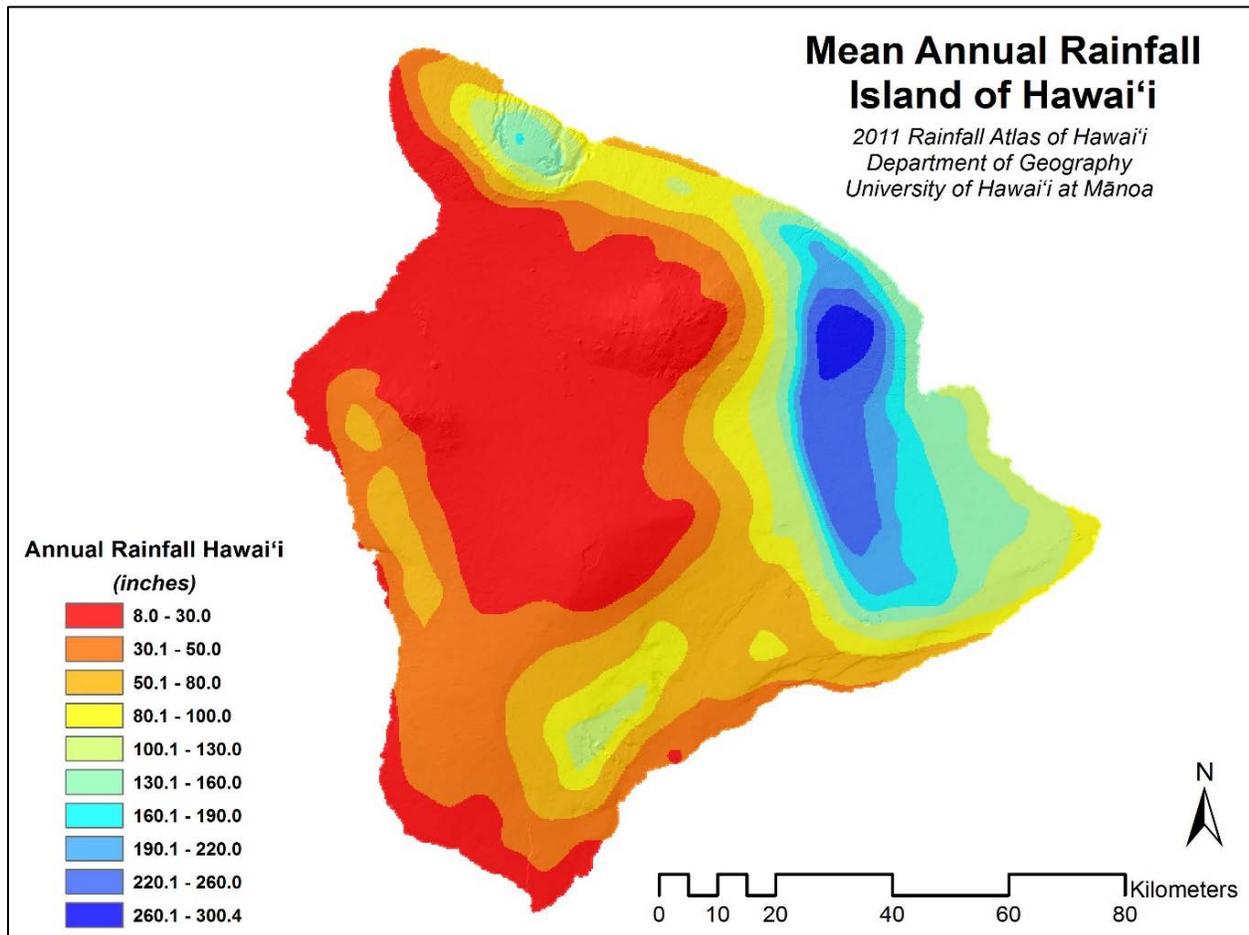


Figure 7: Annual rainfall in inches. <http://www.hiloagent.com/>

Humid Tropical Climates



Figure 8: Waimoku Falls, Maui. <http://kingdomofoceana.com/the-magic-of-hawaii/>

All humid tropical climates have average temperatures greater than 64°F and an annual precipitation greater than 60 inches. There are 3 sub-zones in this climate types and their designation is based on the rainfall distribution throughout the year. Continuously wet climates have no dry season and at least 2.4 inches of rainfall in the driest month. These are the greenest and wettest parts of Hawaii—known as **rain forests**. You'll find ample waterfalls in these regions, like Waimoku Falls, where Ailani toppled down while fighting with his brother Naho.

Monsoon climates have a short dry season but sufficient moisture to keep the ground wet throughout the year. They typically have prolonged periods of very heavy rainfall. Monsoon climates are uncommon in the Islands; however, a narrow strip of the Big Island on the Hamakua Coast has a monsoon climate.

Dry humid tropical climates experience at least one month of less than 2.4 inches of rainfall. This zone can be split in “summer-dry” and “winter-dry”, with the dry month occurring at different times of the year for each. Relatively small portions of the Islands qualify as dry; these are often used for farming, including Kona coffee. The Punalu'u black sand beach and the Ka'u district are examples of tropical dry climates.

Dry (Arid and Semi-arid) Climates

In this climate, the annual evaporation of rainfall and moisture exceeds annual precipitation. The best of Hawaii's beaches are found in these dry areas, making them warm and sunny.

Dry arid (desert) is a true desert climate where evaporation rates are at least twice as high as the precipitation rates. Deserts cover 12% of the Earth's land surface and support relatively little plant or animal life. In Hawaii, the *Kohala* Coast is an excellent example of a dry arid climate.

Dry semi-arid (**steppe**) is a grassland climate. It receives more precipitation than the desert climate and supports a wider range of plants and animals. This is a transitional climate, between the desert and wetter regions, and is found in a small area near the west coast of the island of Hawaii.

Temperate Climates

Average temperature of the coldest month in a temperate climate is between 64°F and 27°F and the average temperature of the warmest month is above 50°F. Temperate climates found in Hawaii include:

In a summer dry climate, at least three times as much rain falls in the wettest month of winter as in driest month of summer.

In a continuously wet temperate climate, more than one inch of rain falls in the driest month. Hawaii's temperate climates are found in the upland rainforests of the Islands.

Polar Climates

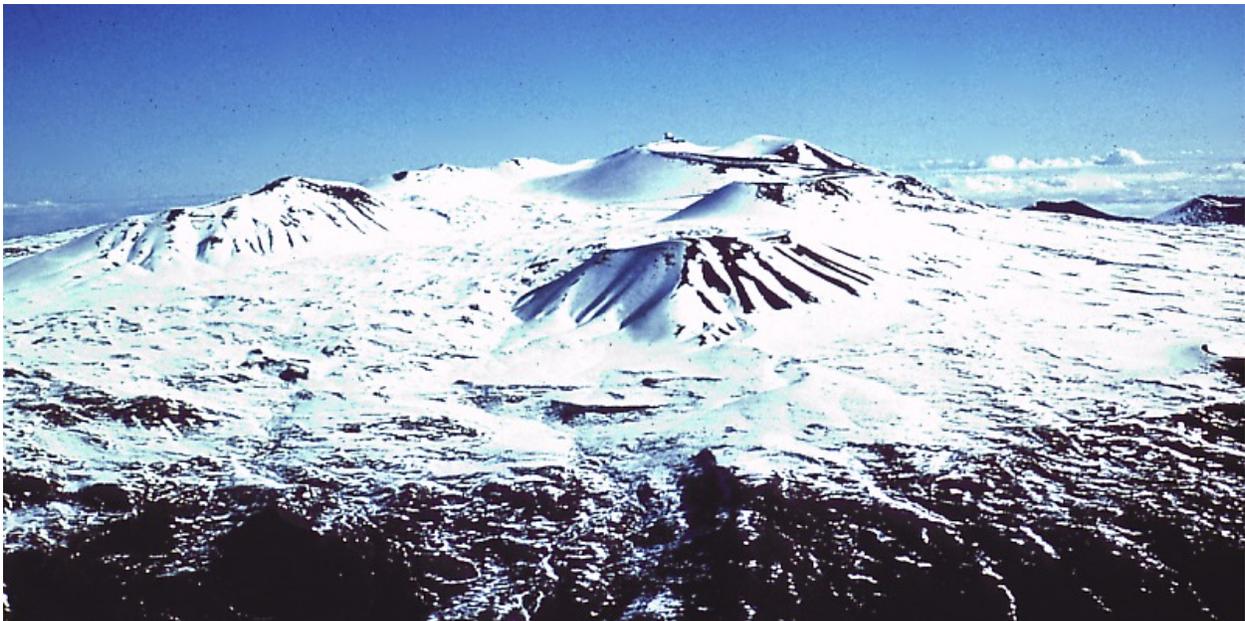


Figure 9: The snow-capped summit of Mauna Kea, the tallest and most sacred place on the island of Hawaii. Image: Wikipedia.

Polar climates are characterized by average temperatures below 50° F during every month of the year. Hawaii is home to one polar or periglacial climate zone, the **polar tundra**. Here, the soil is permanently frozen to depths of hundreds of meters with an average temperature between 32°F and 50°F during the warmest month of the year. Polar climates are found at the highest elevations of Mauna Kea and Mauna Loa.

V. The State of Hawaii

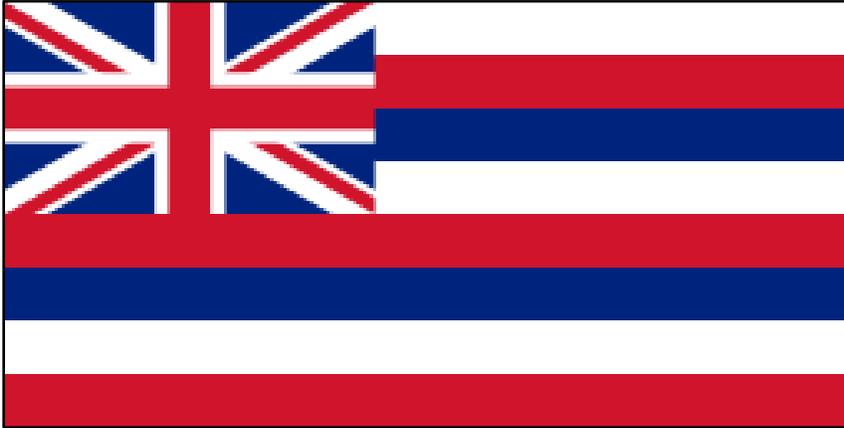


Figure 10: The flag of Hawaii. Image: Wikipedia.

Hawaii was the last state added to the United States on August 21, 1959.

Hawaii is composed of 132 islands - eight main islands, including Hawaii, Maui, Oahu, Kauai, Molokai, Lanai, Niihau and Kahoolawe, and 124 islets, reefs, and shoals. Hawaii is the only U.S. state composed solely of islands.

Hawaii is the southernmost state in the USA. From east to west, Hawaii is the second widest state in the United States (behind Alaska), measuring 1,523 miles (2,451 km) from the island of Niihau to the island of Hawaii.

Discussion Questions

Chapters 1-5

Forty years prior, my grandfather had conquered the seven neighboring island tribes and formed our kingdom, initiating an unprecedented reign of peace. Olohe was a hero of the great unification wars, and he looked every bit the aged soldier. Now he was tasked with training the next generation of *lua* warriors, with special attention to my brother and me. (Ch. 4, p. 25)

Why do you think it was difficult to maintain unity in the islands? How did the unique geography contribute to this difficulty?

Chapters 6-10

“Well, these oysters have been deceived. They’re implanted with a bead made out of shell. What you see is really just a few outer layers of pearl, but its essence, its nature, is nothing more than that bead.” (Ch. 7, p. 52)

What is the difference between true pearls and the cultivated pearls of Pearl Island? Why does it matter to the Kahuna and King Haga?

Chapters 11-15

Suddenly, the captain yelled out, “We’re taking on water! We must have sustained damage when we hit the reef. Dump all unnecessary rations overboard!”

“But we’re still five days’ sail from home,” protested Naho.

“The clouds will give us water to drink, and the sea will bless us with fish to eat,” said the Kahuna. (Ch. 12, p. 105)

How do you think the long distances between the Hawaiian Islands impacted the people of the Islands? How did they impact Ailani and his family?

Chapters 16-20

In that moment, I understood the heavy burden my father carried as king, and my heart went out to him. “Father, I’ll do anything to help you.”

“And I will do anything to help you, my son. Bring back the tiki head, Ailani. It is your *hopena*. When you do, we’ll halt this madness.” (Ch. 18, p. 170)

Naho and Ailani first encountered the *tiki* in the beginning of the book. Now, as the story reaches its climax, the importance of the *tiki* is again clear. How does the geography of the Island shape both of these scenes?

Chapters 21-25

“Since the moment we found this atop Waimoku Falls,” said Naho, hugging the tiki idol to his chest, “I was destined to follow in the original king’s footsteps. It’s time for a new reign, a return to the ancient ways. Master Olohe prepared me well.” (Ch. 21, p. 194)

Throughout the book, you discover sites that are of special importance, or especially dangerous. Why do you think these places were thought to be especially dangerous? Can you think of practical reasons?

Activities

1. Draw a map of the Hawaiian Islands. Include either (1) elevations or (2) climate zones on your map.
2. Research and plan a trip to the Hawaiian Islands. What would you like to see and do? For the purposes of this activity, you only have a week.

VI. Volcanoes



Figure 11: Collapse in Halema'uma'u on April 24, 2015. Image: National Park Service

You've already learned that the Hawaiian Islands formed as the result of extensive volcanic activity at a hot spot on the tectonic plates below the ocean. The volcanic origins of the islands have impacted their geology and geography, but they're also still a living, erupting part of the Hawaiian Islands.

The volcanoes of Hawaii began to form some 70 million years ago. Today, those first volcanoes are gone, lost to erosion over the centuries. The oldest volcanoes remaining in the chain of Hawaiian Islands are around 30 million years old.

The Big Island of Hawaii is home to five volcanoes, *Kohala*, *Mauna Kea*, *Hualalai*, *Mauna Loa*, and *Kilauea*. Other volcanoes make up the smaller islands in the chain. *Kohala* has not erupted in approximately 6,000 years and is considered extinct. *Mauna Kea* last erupted 3,600 years ago. *Mauna Kea* is dormant, but not considered extinct. *Hualalai*, *Mauna Loa*, and *Kilauea* are all active volcanoes.

- *Hualalai* last erupted around 1800 and 1801.

- Mauna Loa erupted in 1984.
- Kilauea been continually erupting since 1983.

Volcanic activity is still creating new islands in the Hawaiian archipelago. The *Loihi* seamount, located approximately 15 miles south of The Big Island, remains submerged in the ocean. It is currently 3,178 feet below sea level, and based on ongoing scientific studies, is erupting. In approximately 250,000 years, *Loihi* may rise above sea level and form a new island.

What Is Lava?

Lava originates as magma (liquid rock) deep below the earth's crust. The magma travels up through conduits in the volcano until it reaches a vent. The vents on the shield volcanoes predominantly lead to lava tubes that expel the lava into the ocean.

The lava is comprised of basalt. Hawaiian basalts contain about 50% silica, 10% each of iron, magnesium, calcium, about 15% aluminum, 2% titanium and 2% sodium.

Growing Islands

The volcanic activity on Hawaii is the cause of both the formation of the islands and for their continued growth.

The current eruption of Kilauea has caused the destruction of some structures, including some at the Hawaii Volcanoes National Park. When you think of a volcano erupting, you may think of a big explosion, like Mount St. Helens, or the explosion of Mount Vesuvius that destroyed the city of Pompeii. The eruption of Kilauea is much less dramatic—vents on Kilauea allow gases to escape reducing the explosive power of the ongoing eruption.

The current eruption rate of Kilauea volcano is 250,000-650,000 cubic yards/day (200,000-500,000 cubic meters/day). That's enough lava to coat 20 miles of a two-lane road! The eruption is consistent and ongoing.

Much of the lava from Kilauea is transported by lava tubes to the ocean. In the water, the lava fragments. This piles on layers of rubble to the undersea portion of the volcano.

Since Kilauea began erupting in 1983, the island of Hawaii has gained approximately 500 acres of new land as the result of the volcanic activity.

Discussion Questions

Chapters 1-5

I turned around, looking out over the green bamboo treetops. To my right, the towering snow-capped summit of Mauna Kea dominated the sky. It was the tallest and most sacred spot on the Great Island, and on rare occasions smoke and ash billowed from its peak, rising above the icy white snowdrifts. Fortunately, there had not been a major eruption or lava flow in many generations. (Ch. 1, p. 3)

In *The Kingdom of Oceana*, Mauna Kea stands over the island, and is often referenced. Why do you think Mauna Kea was of such great importance in the book and in traditional island culture?

Chapters 6-10

We reached a lush canyon at sunrise, an amber glow illuminating the horizon. Then we followed a stone pathway beside a rushing stream that circumvented the burial ground. At the bottom of the ravine, a sleepy village was concealed in the coconut trees. Further on was a sandy cove, protected by volcanic tide pools. (Ch. 10, p. 78)

One of the most distinctive features of the Hawaiian Islands is their unique volcanic geology. Here, you can see how the volcanoes have shaped tide pools and canyons. How does the volcanic geology of the Islands contribute to the story in *The Kingdom of Oceana*?

Chapters 11-15

I placed the conch pearl in my satchel and began the ascent. Patches of slippery moss fed by the misty spray of the waterfall made the climb treacherous. I veered to the right, away from the cascading water. About midway, the fog swirled in from above and smothered the island. Blinded, I clung to the cliffside. (Ch. 15, p. 134)

Lawehala's small island seems unusual. It has a high summit, and dense fog, as well as a lake at the base of the volcano. Most of the tiny, volcanic islands in the Hawaiian Islands are uninhabited—they're too small to support humans. Based on what you've learned about volcanoes, do you think Lawehala's island was very young or very old?

Chapters 16 to 20

Momi and I each put a sled over our shoulder and together we climbed the mountain alongside the he'e holua. When we reached the top, we stopped to rest.

“So, do we surf down the lava path?” Momi asked when we'd recovered our breath.

“Yes,” I replied. “But first, grab that container of kukui oil and pour it on the bottom runners. It will keep the sled from sticking.” (Ch. 16, p. 145)

Lava paths alter the landscape in significant ways. In this passage, you see Momi and Ailani using a lava path as a sled course. Based on what you've learned about lava paths, do you think they'll go in a straight line, or move in varied directions? Where do you think that they're likely to end up and why?

Chapters 21 to 25

Volcanoes don't play a role in the culmination of the story of *The Kingdom of Oceana*, but they are critical throughout the book. Name three ways volcanoes or volcanic activity shape the story or the setting of the story.

Activities

1. Use papier mache to make your own Hawaiian volcano. Think about lava paths, and the surrounding landscapes. Research volcanoes and choose a particular one as a model. When you've finished your volcano, you can make it erupt by combining vinegar and baking soda into a solution.
2. From a local store or online shop, purchase examples of volcanic rock and compare them to other types of rock native to your local area. Look at weight, texture, and strength.

VII. Beaches, Coral Reefs, and Seas

You've already learned that Hawaii has a variety of different ecosystems created by its volcanic activity and geography. You probably also know that Hawaii has beaches, coral reefs and, as a chain of islands, is surrounded by water. Let's learn a bit more about the sandy beaches, the living coral reefs, and the ocean ecosystems of the Hawaiian Islands.

The Beaches



Figure 12: Papakolea Beach. Image: [Flickr/SteveD.]

<https://www.flickr.com/photos/42507736@N02/5616927990/sizes/z/in/photostream/>

The beaches of Hawaii are warm and sandy, drawing visitors from all over the world. In *The Kingdom of Oceana*, the different beaches, including the variations in sand from beach to beach, play a key role. When Ailani and Nahoia spar *lua* on the beach, the texture of the sand plays a critical role in their fight. All of the Hawaiian Islands have beaches on their shores, but there is far more variety in the beaches than you might expect. Think beyond the gold or beige

colored sand you associate with sandboxes. You'll find golden beaches, but some that are far more unusual.

Black Sand Beaches



Figure 13: Black sand beach at Wai'anapanapa, Maui. <http://dlnr.hawaii.gov/dsp/parks/maui/waianapanapa-state-park/>

Black sand beaches in Hawaii are composed of lava or basalt; the black sand isn't really sand, but rather, the lava reached the water, solidified, and shattered into fine particles. Black sand beaches are especially warm, since the black sand retains heat. There are other types of black sand beaches, but Hawaii's are composed of lava. Punaluu is the best known of Hawaii's black sand beaches.

Sea turtles frequently nest on these beaches, since the additional warmth provides the heat needed to incubate the eggs.

Green Sand Beaches

There are only four green sand beaches in the world, and one is in Hawaii. Papakolea Beach on the Big Island gets its distinct green color from the presence of the mineral olivine. Olivine is heavier than other minerals that make up most types of sand, so remains while other sand particles are washed away. Papakolea Beach sits within a volcanic cinder cone, and is a bit hard to access, but provides a near once-in-a-lifetime beach experience.



Figure 14: Green sand beach at Punaluu By Madereugeneandrew - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=40183783>



Figure 15: By Tomintx - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=41097837>

Figure 16: https://commons.wikimedia.org/wiki/File:Papakolea_Beach_sand_low_mag_052915.JPG

Red Sand Beaches



Figure 10: Kaihalulu Beach, Maui. Image: Wikipedia.

There is a red sand beach at Kaihalulu, on the island of Maui. Like Papakolea Beach, it is found at the base of a volcanic cinder cone. The sand is a deep red-black color, contrasting with the blue water of the ocean. The red color of the sands is caused by its high iron content.

The Coral Reefs



Figure 18: The coral reefs support a range of life. Image: Wikipedia

Coral reefs are delicate ecosystems made up of a living animal, coral. Coral reefs are located near island shores, and serve a dual purpose. First, the coral reef provides a habitat for a diverse range of marine creatures. Additionally, the coral reef also helps to protect the islands from the ocean, by creating a barrier just below the water level.

Coral reefs make up less than one percent of the surface of the ocean, but these reefs provide a home for one-quarter of the fish in the world. The coral reef provides hiding places, shelter, and an ideal breeding ground and home for juveniles. Reefs are home to diverse populations of fish, shellfish, and invertebrates.

In *The Kingdom of Oceana*, the boys surf while visiting Pearl Island. Surfers rely on coral reefs to create some of the waves they ride.

Facts about Hawaii's Coral Reefs

- Coral reefs are the world's largest living structures! Australia's Great Barrier Reef measures some 92,000 square miles.
- Reefs often form in warm, shallow water around a volcanic island. Over time, the reef builds up and the volcano sinks down, creating a lagoon around the volcanic island. We call this an atoll.
- Hawaii offers the chance to see reefs in various stages of development. The older islands have more developed, larger and more mature reefs, while the reefs around the island of Hawaii are still developing.
- Hawaii's coral reefs began with only five different varieties of coral surviving the isolated waters around the volcanic islands. Today, evolution has provided a much wider variety from those original species.
- Around 25 percent of the corals found in the waters around Hawaii are found nowhere else in the world.

The Seas



Figure 12 A view of the seas around Hawaii. Image: James Watt

The Hawaiian Islands are located in the North Pacific Ocean, far away from other islands or land masses.

Winds move freely across much of the ocean in isolated regions; however, when those winds are blocked by high elevation islands, like the Hawaiian Islands, they can change. When the trade winds of the Pacific reach Hawaii, they change and shift, creating a wake in the winds. This wake eventually produces a counter-current, or current that runs opposite the winds, bringing warm waters from the Asian coastline to Hawaii.

The waters around the Hawaiian Islands are just as important culturally and ecologically as the islands themselves. The nearshore waters of Hawaii, or the waters directly around the islands, are home to 7,000 different marine species. Around one-quarter of those animals are unique to Hawaiian waters.

In 2006, the United States government created *Papahānaumokuākea* Marine National Monument. The name *Papahānaumokuākea* was inspired by the names of the Hawaiian creator goddess Papahānaumoku and her husband Wakea. This protected marine reserve around the northwestern islands includes some 140,000 square miles of oceans and atolls. Efforts are underway to expand the Marine National Monument, with the goal of adding an additional nearly 500,000 square miles of protected waters.

Discussion Questions

Chapters 1-5

“Yes, Ailani. It’s who we are. We’re sailors, explorers. No one builds faster, more seaworthy ships. I can lead my fleet to any island in Oceana by gazing at the stars. I can find land that’s two days’ sail away by watching how a coconut drifts in the current beside my longboat.”
(Ch. 3, p. 21-22)

Why was navigation so critically important to the people of Hawaii? How does this relate to their relationship to the seas surrounding the islands?

Chapters 6-10

He was pointing at the mountaintops jutting over the horizon. The storm passed as suddenly as it had come, and the sun pierced through the misty clouds to form an arching rainbow. Ahead, a long barrier reef unfolded before us with a few coral heads poking out of the water while others lurked just beneath the surface. It looked like a coral moat, a weather-beaten but nearly impenetrable sentry protecting Pearl Island. (Ch. 7, p. 49)

Why do you think the coral reefs around Pearl Island are so important to the Island?

Chapters 11-15

“How far is it to the Twin Atolls?” For generations, that is where our ancestors had met their spirit animals. (Ch. 12, p. 107)

An **atoll** is a ring shaped reef of coral, creating a lagoon. Why do you think that the Twin Atolls were so sacred to Ailani and his family?

Chapters 16 to 20

My *wa'a* was pinned against a coral head getting battered by the high seas. I had to get the boat away from the reef before it was smashed to pieces. With great difficulty, I raised the sail. Then I grabbed my paddle and pushed it against the reef to free myself from the coral heads. The trade winds carried me back out to the open sea. (Ch. 17, p. 152)

Momi and Ailani were attacked by the cursed *kaimoni* as they sailed in the waters around the Island. They escaped many different kinds of animals before crashing into the coral. What can you learn about coral reefs from this part of the book?

Chapters 21 to 25

With each crashing wave, the rising tide covered more and more of the exposed reef. As I hoisted my *leiomano* and moved toward Naha, I stepped on a bed of urchins, their spines piercing through the soles of my feet. Instead of recoiling, I ground them deeper into my flesh. Now spellbound by shadow magic, I feared not my brother, nor the *kaimoni* lurking in the waters surrounding me. (Ch. 22, p. 196)

Here, you see Ailani interacting with the reef directly. Why are the coral reefs so important in *The Kingdom of Oceana*?

Activities

1. Go to <http://geology.com/stories/13/sand/> and compare different types of sand. Which types of sand do you think are most likely to be found in Hawaii?
2. Research coral reefs using the internet or your local library. Write a one-page paper offering up solutions to protect and preserve coral reefs.

VIII. Geographic Isolation

Hawaii is the most isolated population center on the face of the earth. It sits 2,390 miles from California, 3,850 miles from Japan, 4,900 miles from China, and 5,280 miles from the Philippines. How did people get to the Hawaiian Islands in the first place, and how has the geographic isolation of the Islands impacted their development?

Physical Impact of Isolation

The isolation of the Hawaiian Islands has shaped the ecology of the island chain in a number of ways. Some of these have to do with the evolution of plants and animals in the environment—we will discuss the living world of the Hawaiian Islands a bit later. The isolation of the Islands has shaped them in other ways too.

- For centuries, Hawaii was free of many unwanted visitors, including mosquitos, various diseases, and some predatory or invasive species. Today, many of these organisms have entered the islands through trade, traffic and tourism.
- While isolation protected species for centuries, it also left them vulnerable. Today, native bird populations have been decimated by mosquito-borne illnesses.
- The mongoose, introduced by Europeans to manage rat populations brought on European ships, has caused significant damage to bird populations throughout the islands.

- Quarantine efforts to reduce the introduction of invasive species continue in Hawaii.
- Hawaiian islanders often fell victim to imported illnesses such as measles, when these were brought by European travelers.

Cultural Impact of Isolation

While the cultural of Hawaii isn't really part of earth science, the remarkable geographic isolation of the Islands has also dramatically impacted their cultural development.

Around 1,600 years ago, the first Polynesian settlers reached Hawaii, relying on traditional sea-faring and navigation. These first settlers, in double-hulled canoes, brought pigs and chickens, taro, sugar cane, and sweet potatoes to the Islands. Around 800 years ago, there was a second wave of migrations to the Islands, this time by Polynesians from the Society Islands. These new arrivals took on the role of the ruling class in the Islands.

Not long after this second wave of migration, for reasons unknown, communication and travel with other Polynesian islands and cultures ended entirely and Hawaii developed in true cultural isolation for the next 400 years. This isolation produced a number of unique beliefs and practices in the Islands.



Figure 20: Fish Ponds on Molokai, as they look today. <http://kingdomofoceana.com/the-magic-of-hawaii/>

Discussion Questions

Chapters 1-5

I followed the river through a grove of *koa* and mahogany trees to the Royal Fishponds. Long ago, our ancestors had built the elaborate rock-walled pools at the seashore. Here, fisherman cultivated algae in the shallows, attracting fish that became trapped and grew large within its confines. Puhi's family had meticulously tended to the Royal Fishponds for many generations, supplying the Royal Village with the bounty of mullet and milkfish that sustained our kingdom's seafaring traders. (Ch. 2, p. 9)

While native Hawaiians had access to a rich food source in the sea, man-made fish ponds provided an additional source of fish. Here, you see a description of the fish ponds. Who do you think used the fish ponds, and how do you think they developed?

Chapters 6-10

Our *wa'a* was one of the smaller crafts in the royal fleet and was designed for short voyages. Like all sailing vessels, it consisted of two pontoons of *wiliwili* wood connected by a sturdy *koa* frame, with a woven palm frond platform. The buoyant *wiliwili* logs enabled it to float above the waves and made it virtually unsinkable. Near the front, a tall mast secured a sail that was shaped like an inverted butterfly wing. The top portion of the sail was embroidered with a *kohala* tail, honoring Father's spirit animal. (Ch. 6, p. 34)

The Hawaiian Islands were settled by Polynesians who travelled long distances in seafaring crafts. Here, you see Ailani and Nahoia setting off on their journey on a traditional Hawaiian boat. How do you think technology developed differently in the Islands because of their isolation?

Chapters 11-15

"I've no intention of harming you," said Lawehala. "I certainly don't need the Young Prince's father invading my little island. But please deliver a message to my brother. Tell him I can help." (Ch. 15, p. 141)

The Hawaiian Islands were spread out over a large area of the Pacific Ocean; however, their inhabitants interacted in different ways. What does this passage suggest about how the Islands interacted?

Chapters 16 to 20

I felt a blast of heat on my neck, singeing my hair and searing my skin. I spun around and saw an outrigger sailing through the shallows behind us, spitting a column of foul-smelling fire. At once, I recognized the smell of burning whale oil. It was Lako and Kalaima's horrific weapon. I turned away, disgusted, and covered my face to avoid the nauseating smell of burning flesh mixed with the putrid whale oil. I looked to Father in horror. How could he allow such butchery?

“King Lako and I realized the *kaimoni* is our common enemy and we settled our differences,” said Father, sounding defeated. “You’ll understand once we dock the *wa’a*.” (Ch. 17, p. 154)

The Great Island (Hawaii) and Pearl Island (Tahiti) have allied themselves to fight the *kaimoni* using the whale blubber fuel. What do you think of this alliance and what it could mean for the people of The Great Island, including Ailani and his family?

Chapters 21 to 25

“Sadly, it’s man’s nature to always want more,” said the *Kahuna*. “More land, more power. And the consequences materialize so gradually that one barely notices. First, the signs are subtle. The ahi and lobsters we draw from the sea are smaller each year. The *koa* trees we cut for our ships seem farther from shore. Because they are. Then in time, there is not enough food, not enough land, and the distance between those who have and those who do not grows wider.” (Ch. 21, p. 189)

Think about how the Islands are affected by the demand for resources. How do you think the nature of the Islands and their isolation impacts the need for and use of different resources?

Activities

1. Many of the cultural practices in Hawaii are specific to the Islands. Choose one cultural practice, like a food, dance, or story, and share it with friends or classmates. Demonstrations are encouraged!
2. Imagine a culture that developed in isolation. Write a short story about your culture.

IX. The Wildlife of The Kingdom of Oceana

In *The Kingdom of Oceana*, the characters interact with **indigenous** (native) wildlife in a variety of ways. Some of these interactions are positive, while others are quite negative. Some of the most interesting wildlife in Hawaii featured in the novel include:



Figure 21: <http://kingdomofoceana.com/native-creatures-of-hawaii-2/>

Approximately 15,000 *kohala* or humpback whales migrate from Alaska to the Hawaiian Islands each winter. The waters around Hawaii are a primary breeding ground for these giant mammals. They swim non-stop for weeks in late pregnancy on the 6,000 mile journey before giving birth in the waters around Hawaii. Not all humpback whales make the same migration; the animals that migrate from Alaska to Hawaii are called the Central Stock. Other pods migrate to Baja Mexico or the Western Pacific, near Japan.

The humpback whale is a success story! Twenty years ago, there were only around 2,000 humpback whales left in the world. Today, there are more than 20,000. Whales were threatened largely by hunting—whale oil was once prized as a light source in many parts of the world.



Figure 22: <http://kingdomofoceana.com/native-creatures-of-hawaii-2/>

Hawaii is home to five different species of sea turtles, including the green sea turtle (**honu**), the olive ridley, the loggerhead, the leatherback, and the hawksbill. The olive ridley, loggerhead and leatherback are all deep sea turtles. The green sea turtle prefers shallow waters, so is often encountered by visitors and residents.

In *The Kingdom of Oceana*, the pearl oysters were threatened by the sudden appearance of octopi. Threats to animals exist today as well. Today, a disease that causes the growth of fleshy tumors is causing serious health issues for the green sea turtle.

Now a protected species, the *honu* was hunted to near extinction in the early and mid-20th Century. The *honu* nests on Hawaii's warm black sand beaches and on the northwestern islands.

Native Birds

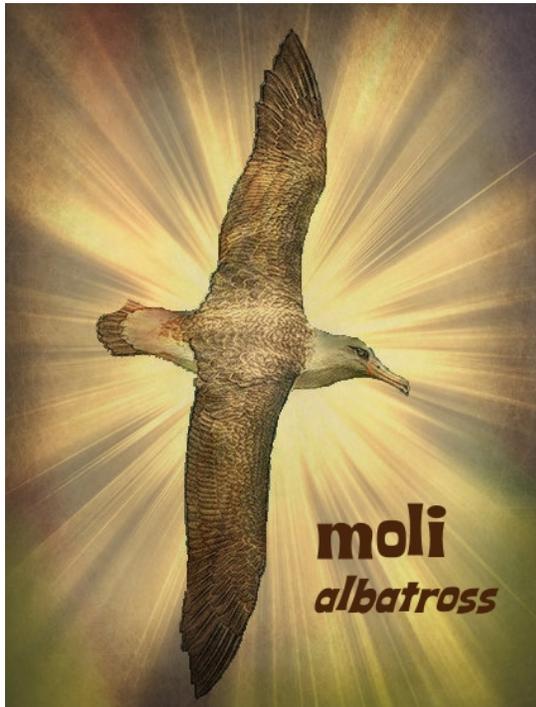


Figure 23: <http://kingdomofoceana.com/native-creatures-of-hawaii-2/>



Figure 24: <http://kingdomofoceana.com/native-creatures-of-hawaii-2/>

More than twenty species of ducks, geese, and shorebirds migrate to Hawaii each winter. The northern Hawaiian Islands in particular are home to millions of migratory birds. The *pueo* (owl) and *iolani* (sea hawk) play prominent roles in the novel.

There were once 142 different species of birds found only on the Hawaiian Islands. Today, only 44 of those remain, and around 10 have not been spotted or identified in many years. These birds have fallen victim to human interference and a variety of different diseases, including avian malaria.



Figure 25: <http://kingdomofoceana.com/native-creatures-of-hawaii-2/>

Monk seals are one of only two indigenous mammals to the Hawaiian Islands (other than dolphins and whales, the only other one is the Hawaiian hoary bat). The monk seal is the only tropical seal, and is endangered, with only around 1,100 individual animals remaining in the world today.

Monk seals eat a wide variety of marine animals, and live primarily in the water; however, they come to land to rest, to give birth, and to nurse their young. Protecting these sites is essential, as monk seals are sensitive to human interference and activity. Today, volunteers are enlisted to cordon off areas with monk seals to protect them.

Discussion Questions

Chapters 1-5

The *Kahunas* of the Great Island taught that our people had a magical bond with the creatures of Oceana. Those fortunate enough to experience this mystical connection would receive strength, guidance, and great wisdom. For countless generations, kings and spiritual leaders had relied on the counsel and prophecy of their spirit animals. (Ch. 2, p. 10)

In reading *The Kingdom of Oceana* and this study guide, you've probably realized that the people of Hawaii were closely connected to the animals that lived in the region. The passage above describes one form of connection. Can you think of others?

Chapters 6-10

We were approaching two small islands—really more like large rocks, overcrowded with monk seals basking in the early morning sun. A few played in the shallow channel that separated the islands, while others hunted for their morning meal. Suddenly, the beached seals grew distraught, barking a warning to their brothers and sisters in the water. (Ch. 6, p. 37)

Today, monk seals are critically endangered. Efforts are underway to protect their habitats from the residents of and visitors to Hawaii. Can you imagine how Ailani would have felt about the condition of the monk seals today? What do you think he would have done to help?

Chapters 11-15

We all walked downstairs to yet another room, which was dark and chilly, the air heavy with the unmistakable stench of decomposing blubber. “Look,” said Naho, pointing his torch to a large mound of palm fronds on the floor. He moved them aside to reveal two long strips of a whale’s carcass. (Ch. 11, p. 95)

Ailani, Momi and Naho find proof that Kalaima is killing humpback whales and using the blubber to produce a fuel source. This is in direct violation of the basic beliefs of the Hawaiian people, and is considered a deeply offensive act. Can you think of times in *The Kingdom of Oceana* when the sacred nature of the humpback whales was important? Why were the whales so important?

Chapters 16 to 20

“Well, Mother, I’m not Naho,” I replied. “Perhaps the *mo’olio* and the pilot whale weren’t destined to swim together.” (Ch. 18, p. 163)

Think about the two spirit animals linked to Prince Ailani and Prince Naho. How do you think these animals, the seahorse and the pilot whale, reflect each brother’s character?

Chapters 21 to 25

Naho’s eyes rolled back in his head. I watched in horror while my brother writhed in pain as his body transformed into a pilot whale. First, his skin turned rubbery and the midnight blue color of a marlin’s sail. Then, his legs fused together and his feet morphed into a tail. His arms withered until all that was left were two disfigured flippers that resembled oversized human hands, with thick webs of whale skin stretching to the first knuckle. (Ch. 25, p. 206)

As a punishment for his crimes, Naho is turned into his spirit animal. Given what you’ve learned about the beliefs and interactions between Hawaiians and animals, why do you think this was chosen as his punishment? Is it fair or unfair?

Activities

1. Bioluminescence is the production and emission of light by a living organism, most commonly marine vertebrates and invertebrates. Research what causes bioluminescence and which creatures in Hawaii are bioluminescent.
2. Choose one endangered species native to Hawaii to research and produce a presentation on to share with your class.

Questions

1. Which of Hawaii's volcanoes is the most active?
 - a. Kilauea
 - b. Mauna Kea
 - c. Mauna Loa
 - d. Loihi
2. When did Hawaii become a state?
 - a. 1954
 - b. 1957
 - c. 1959
 - d. 1961
3. Which of the following is closest to Hawaii?
 - a. Philippines
 - b. California
 - c. China
 - d. Japan
4. What are the two land mammals native to Hawaii?
 - a. The monk seal and pilot whale
 - b. The green sea turtle and monk seal
 - c. The monk seal and the hoary bat
 - d. The monk seal and the mongoose
5. Which of the following was brought by European traders?
 - a. Rats
 - b. Mongoose
 - c. Mosquitos
 - d. All of the above

6. What makes green sand beaches green?
 - a. Iron
 - b. Lava
 - c. Glass
 - d. Olivine

7. How many different marine species live in Hawaiian waters?
 - a. 7,000
 - b. 3,000
 - c. 1,500
 - d. 70,000

8. Lava is primarily composed of:
 - a. Iron
 - b. Titanium
 - c. Aluminum
 - d. Basalt

9. Hawaii is located in:
 - a. The South Pacific
 - b. The North Pacific
 - c. The South Atlantic
 - d. The North Atlantic

10. How many different climate zones are present in Hawaii?
 - a. 6-8
 - b. 8-10
 - c. 11-12
 - d. 12-14

Teachers and students with questions or comments, please contact the author at: mitch@kingdomofoceana.com

Answers

1. A
2. C
3. B
4. C
5. D
6. D
7. A
8. D
9. B
10. B