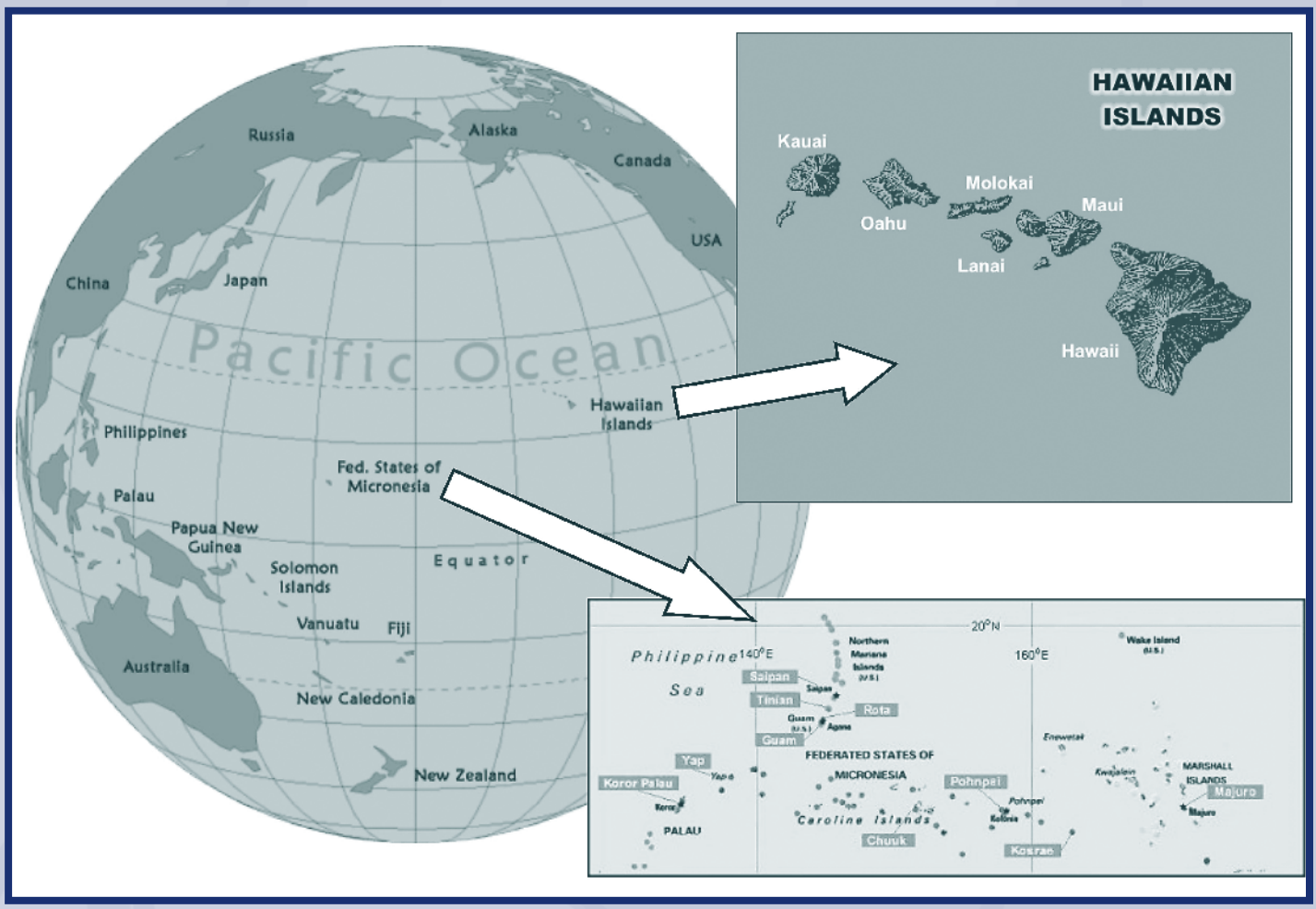
Welcome

to the Hawai'i-Pacific Islands edition of the *Natural Inquirer*!

Sitting in the tropical zone of the Pacific Ocean, Hawai'i and the Pacific Islands are special places. Because these islands lie close to the equator, their coastal climate is warm all year. The youngest islands were created by volcanoes and have mountains that sometimes get snow! Take a look at the map below to locate the Hawaiian Islands and the Federated States of Micronesia (FSM). Find the largest of the Hawaiian Islands. The entire State of Hawai'i takes its name from this largest island. Five of the articles in this *Natural Inquirer* describe research that scientists did on the island of Hawai'i. One article describes research done on two islands in the FSM. The FSM is an independent country made up of hundreds of small islands.

The research you will read about in this *Natural Inquirer* was conducted by scientists working at the Institute of Pacific Islands Forestry, or IPIF. Located in Hilo, HI, scientists at IPIF study a range of environmental topics in Hawai'i and the Pacific Islands.



The Pacific Ocean and the Pacific Islands. **Images courtesy of http://free-extras.com/images/pacific_ocean_globe-12033.htm, http://www.chachasconeyisland.com; and the National Oceanic and Atmospheric Administration.**

The Hawaiian Language

Occasionally, you will come across Hawaiian words in this Natural Inquirer. Hawaiian words are in italics. For more information about the Hawaiian language and for a glossary and pronunciation of these words, see page 106.

This *Natural Inquirer* was created with the help of two Native Hawaiian AmeriCorps volunteers. AmeriCorps is a group of U.S. Federal job programs. AmeriCorps gives adults of all ages the opportunity to address important needs by working within communities. James Akau and Leila Kekuewa worked with middle school students at *Laupahoehoe* High and Elementary School, did research, and wrote sections of this journal. All of this was done as a part of their AmeriCorps experience.

The Hawaiian Islands

Let's learn about the Hawaiian Islands. These islands are the most remote group of human-populated islands in the world. Hawai'i is 3,857 kilometers (2,397 miles) from California and 6,195 kilometers (3,850 miles) from Japan. The Hawaiian Islands extend more than 2,413 kilometers (1,500 miles) across the Pacific Ocean. Because the Hawaiian Islands are so remote, many of the **native** plants and animals living there are unique. These plants and animals arrived on their own, traveling by wind, wings, or waves. Over hundreds of thousands of years, these plants and animals evolved into **species** found nowhere else on Earth. More than 90 percent of Hawaiian native species are found only in Hawai'i. For example, the State bird of

James Akau is an expert in Hawaiian plants and Native Hawaiian culture.

Leila Kekuewa is giving the shaka hand signal while caring for plants in a greenhouse. In Hawai'i, this signal means, "Hello. Everything is good. Take care of yourself."

Hawai'i, the *nēnē* goose, may have evolved from Canada geese that landed in Hawai'i thousands of years ago.

The nēnē goose is the State bird of Hawai'i. A Canada goose is shown in the inset. Photos courtesy of the U. S. Fish and Wildlife Service.

Polynesians were the first settlers of the Hawaiian Islands. The Polynesians brought plants and animals with them to the islands. Other people coming from all over the world also brought plants and animals with them. Today, many of these nonnative plants and animals are causing problems for the native **ecosystems** of Hawai'i. You will learn about many of these problems in this *Natural Inquirer*.

The island of Hawai'i is larger than all of the other Hawaiian Islands combined. The youngest of the Hawaiian Islands, Hawai'i has two active volcanoes. *Kīlauea* volcano is the world's most active volcano.

Near the coast on the island of Hawai'i, the temperature is warm all year. In the higher areas near the volcano **summits**, the temperature is cooler. Snow sometimes falls on the summit of *Mauna Kea* volcano. Because it is warm and cool, wet and dry, and coastal and mountainous, the island of Hawai'i has a wide variety of ecosystems. It is so diverse that no other place on Earth is like it. At least one-half of the ecosystems in Hawai'i are in danger today from changes caused by humans. Of the plant and animal species already lost forever in the United States, about 75 percent are from Hawai'i. Of all plant and animal species in danger of being lost in the United States today, about 25 percent are in Hawai'i.

Hawaiian citizens today represent a wide variety of races and ethnic backgrounds. Native Hawaiians and other Pacific Islanders make up only about 10 percent of the population. You will learn, however, that Hawaiians have made a commitment to preserve native Hawaiian culture and many of its customs. At the end of each article, you will read about how many of today's Hawaiians keep traditional Hawaiian culture alive.

Like other early cultures, early Hawaiians felt a special connection to the land. They held the land in deep **reverence** and developed practices to express this reverence and respect. Early Hawaiians understood that although they may be only one individual, they were also a part of the human and natural community. This spiritual connection was often expressed by chanting *(oli)*. Chanting was used to express *'ihi* (respect), *mililani*

Kīlauea volcano caldera. Photo by Babs McDonald.

(praise), *mahalo* (thanksgiving), *aloha* (love), *ʻohana* (family connections and kinship with other life forms), *haʻahaʻa* (humility), and *kupono* (righteousness). Today, many Hawaiians keep the practice of chanting alive, and by doing so acknowledge these values in their lives.

Federated States of Micronesia

The Federated States of Micronesia (FSM) form a nation made up of more than 600 islands. Only 65 of these islands are **inhabited.** The FSM has four states, similar in many ways to the States within the United States. Each state, for example, has its own government. These states are Yap, Chuuk, Pohnpei, and Kosrae. The FSM is located just north of the equator. Its temperature rarely changes throughout the year, with an average temperature of 27 degrees Celsius (°C) (80 degrees Fahrenheit (°F)). Daily highs are about 31°C (88°F) and daily lows are about 25°C (77°F). Rainfall is heaviest in the summer. The FSM may be one of the wettest places on Earth. Some areas of FSM receive about 838 centimeters (330 inches) of rain every year! (On the average, about how much rain do these areas receive every day? How does this compare with the amount of rainfall in your area?)

The total land area of the FSM is not large, totaling only 702 square kilometers (271 square miles, or a little larger than Washington, DC, and the State of Delaware combined). The 607 islands, however, cover about 2,589,000 square kilometers (1,000,000 square miles) of ocean. Formed millions of years ago by volcanoes, the environment of the FSM includes mountains, river valleys, hills, grasslands, and sandy beaches. One of the special environments in the FSM that you will learn about is mangrove forests. These forests are found along the coast where they thrive in salt water.

Like in Hawaiʻi, nonnative (**invasive**) species have become a problem in FSM. Recently, scientists have begun to identify invasive species and suggest what should be done to control or eliminate them.

At least nine languages, including English, are spoken throughout the FSM. Because so many ocean miles separate the four states, each state has a different culture. Although modern in many aspects, the FSM has also maintained its **traditional** ways of life. Farming and fishing are the main occupations of people living in the FSM.

The Pacific Islands may be far away from your community. As you read about Hawaiʻi and the FSM in this *Natural Inquirer*, however, think of how your own community is similar to the Pacific Islands and how it is different.

Glossary

Caldera (kal **der** ə): A cauldron-like feature created when land collapses following a volcanic eruption.

Ecosystem (ē kō sis təm): A system made up of an ecological community of living things interacting with their environment, especially under natural conditions.

Inhabited (in **ha** bə təd): Occupied or lived-in.

Invasive (in **vā** siv): Tending to spread.

Native (**nā** tiv): Living or growing naturally in a particular region.

Reverence (**rev** (ə) rən(ts)s): Honor or respect felt or shown.

Species (**spē** sēs): A class of individuals having common attributes and designated by a common name.

Summit (**sə** mət): The highest point.

Traditional (trə **di** shən nəl): Being established or customary.