

# Lake Clark

## *Qizhjuh Vena*

National Park Service  
U.S. Department of the Interior

National Park and Preserve  
Alaska



# Volcanoes

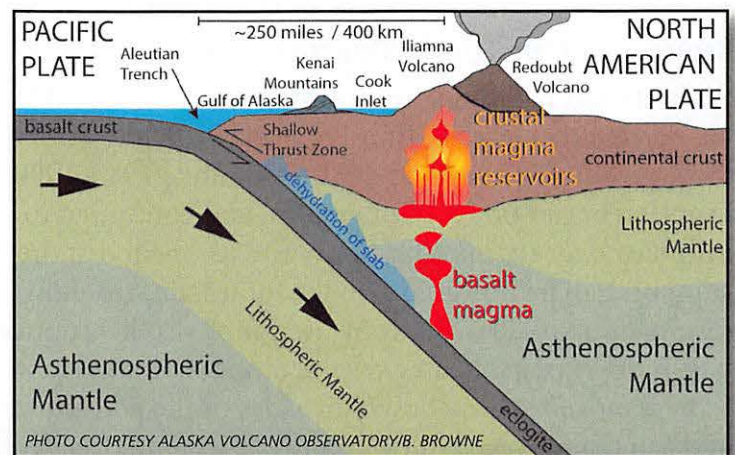


NPS PHOTO/K. LEWANDOWSKI

Lake Clark National Park and Preserve is a place with dynamic and active geology. Two active volcanoes, Redoubt and Iliamna, rise from sea level to over 10,000 feet and dominate the landscape.

## Why Are There Volcanoes Here?

Lake Clark National Park is located along the Ring of Fire, which is home to most of the world's greatest earthquakes and active volcanoes. Redoubt and Iliamna sit on the Alaska-Aleutian subduction zone. Here, the dense oceanic crust of the Pacific Plate slides beneath the lighter continental crust of the North American Plate. The plates move about 2.6 inches per year. Beneath the surface of the Kenai Mountains, the Pacific Plate dives abruptly at the western edge of Cook Inlet. The crust of the Pacific Plate can reach a depth of more than 60 miles beneath the Chigmit Mountains. The intense heat and pressure melts rocks, creating magma. This magma then gets pushed up through volcanoes on the Earth's surface.



Lake Clark's two volcanoes sit on the Alaska-Aleutian subduction zone along with more than 50 other historically active volcanoes.

## Dangerous Beauty

Eruptions from Redoubt and Iliamna are not likely to flow effusively, and with ease, like those of the Hawaiian volcanoes. In effusive eruptions, magma is runny and gases can bubble out easily like in a pot of boiling chili. Instead, the lava from the park's volcanoes is thick, sticky, and flows like cold honey. Trapped gases in the lava can cause dramatic eruptions. These violent eruptions break the magma into solid pieces, known as pyroclasts. Pyroclasts can be many different sizes, ranging from boulders to ash.

Stratovolcano eruptions are like popcorn popping - different sized pyroclasts travel differently resulting in a tall, conical shaped plume

Smaller, lighter particles travel further away

A stratovolcano, or composite volcano, is cone-shaped with steep slopes and is formed by a set of eruptions

Larger, heavier particles fall closer to the volcano's vent

PHOTO COURTESY USGS/RJ. CLUCAS





Ch'naqal'in | Iliamna  
is located west of the Kenai  
Peninsula across Cook Inlet.

NPS Photo/T. Vaughn

## Cultural Connections

These landforms have deep meanings to many people who live in the nearby region. The Dena'ina people have lived in Lake Clark for thousands of years and have descriptive place names that help us understand more about these mighty volcanoes. Read more about them below.

### Bentuggezh K'enulgheli | 'One with a notched forehead'

Redoubt has had more eruptions than Iliamna, and has erupted at least 30 times in the last 10,000 years - most recently in 1989 and 2009. Redoubt's 1989-1990 eruption began on December 14th, and continued to erupt for over six months. Snow and ice melted at the summit. Lahars flowed down the mountain, reaching distances up to 20 miles away! Redoubt's 2009 eruption began on March 22, after several months of unrest. Lahars moved swiftly down the sides of the volcano and ash clouds reached thousands of feet into the sky. The final event occurred on April 4th, along with an ash cloud reaching 50,000 ft (9 miles) high. Ash was carried to the southeast, depositing ash in Homer, Anchor Point, and Seldovia.

Iliamna and Redoubt are both active stratovolcanoes, designated as National Natural Landmarks in 1976



NPS PHOTO/M. RICHOTTE

Bentuggezh K'enulgheli (Redoubt Volcano) means 'one that has a notched forehead' in the Dena'ina language. Bentuggezh K'enulgheli is 10,197 feet tall.

## Mighty Volcanoes

Scientists continue to monitor the landscape. No one can say when the next eruption will occur, only that it will. The lengthy warnings of volcanic unrest prior to Redoubt's eruptions have given scientists a chance to better understand the warning signs and events leading to volcanic eruptions.

### Ch'naqal'in | 'One that stands above'

Iliamna is an active stratovolcano that rises to 10,016 feet tall in the Chigmit Mountains located in Lake Clark National Park and Preserve. Glaciers cover most of the volcano. Iliamna regularly emits plumes of steam, but has not had a confirmed eruption in recorded history. Eruptions from Iliamna have been dated back to about 300 and 140 years ago. The Alaska Volcano Observatory monitors Iliamna along with more than 50 other active volcanoes in the state. Most of Iliamna volcano is covered by perennial snow and ice and numerous glaciers near the summit area. In the past 10,000 years, Iliamna has produced several big eruptions - erupting at least 28 times since the 1740s.



PHOTO COURTESY AVO/USGS DENNIS ANDERSON

Ch'naqal'in (Iliamna Volcano) translates to 'one that stands above' in the Dena'ina language. Ch'naqal'in rises above the Lake Clark landscape at 10,016 feet tall.