

A man wearing a blue polo shirt and a black baseball cap stands on a grassy hillside, looking out over a valley towards a large, forested mountain peak. The sky is overcast with grey clouds. The man's shirt has a logo on the back that reads "EXPEDITION BALI" with a mountain icon and five stars above it. The text "THE COMPREHENSIVE MOUNT BATUR VOLCANO GUIDEBOOK" is overlaid in white serif font on the left side of the image.

# THE COMPREHENSIVE MOUNT BATUR VOLCANO GUIDEBOOK



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# Hello and “Selamat Datang”

Welcome to the land of active volcanoes! Southeast Asia is home to many fiery giants, and Indonesia has the highest number of active volcanoes in the world. Bali, the Island of the Gods, hosts several of these majestic natural wonders, with the most famous one being Mount Batur.

The volcanic activity in Bali has shaped its unique landscapes, enriched its soils, and contributed to the island's natural beauty and culture. To truly appreciate Bali, you need to understand its volcanos!

In this guidebook, we'll explore some essential volcano facts that every visitor needs to know before embarking on their Bali adventure. Then, we'll dive into the specifics of Mount Batur, uncovering the unique features and fascinating aspects that make this particular volcano such an awe-inspiring destination. Along the way, we'll touch on topics like eruption history, fun geological facts, and the cultural significance of these volcanic wonders.

Come along with us as we journey together to the land created by Mount Batur!



**“Mari mulai petetualangan!”**





# Volcano Types: A Quick Overview

Volcanos are classified based on their size, shape, and type of eruption. For our purposes, let's compare two main categories: shield volcanos, and stratovolcanoes.

**Shield volcanos**, like Hawaii's Mauna Loa, are expansive and gently sloping, formed by the eruption of free-flowing lava. They don't have the iconic appearance typically associated with volcanos however, they're massive giants (20 times wider than they are high) that dominate the landscape.

On the other hand, **stratovolcanoes**, such as Mount Batur and Mount Agung, are towering and steep, formed by the eruption of viscous lava that solidifies rapidly and builds up over time. These volcanos strike the iconic image most people think of when they hear the word 'volcano'.

Understanding a volcano's classification is crucial to comprehending its potential hazards and future behaviour patterns. To better understand Mount Batur, let's delve a little deeper into stratovolcanoes and discover how these volcanos can rise and sink over time, and what their eruptions look like.





# Stratovolcanoes: The Fire Mountains

Indonesia is known for its high concentration of stratovolcanoes. These volcanoes are characterised by steep-sided cones made up of layers of ash, lava, and volcanic rocks.

In addition to Bali's Mount Batur and Mount Agung, other notable examples of stratovolcanoes in Indonesia include: **Mount Merapi**, **Mount Bromo**, and **Mount Rinjani**.

**Mount Merapi** is located in Central Java, near Yogyakarta. It is one of Indonesia's most active and explosive volcanoes with a history of devastating eruptions, including the 2010 event that claimed over 300 lives and displaced thousands of residents.

**Mount Bromo** is very easily accessible to visitors, with concrete stairs leading to the summit. The constantly grumbling volcano can make you feel uneasy and vulnerable - a very visceral experience!

**Mount Rinjani** lies to the east of Bali, on Lombok Island, and is visible to those who take our 4x4 Vantage Point Private Tour.









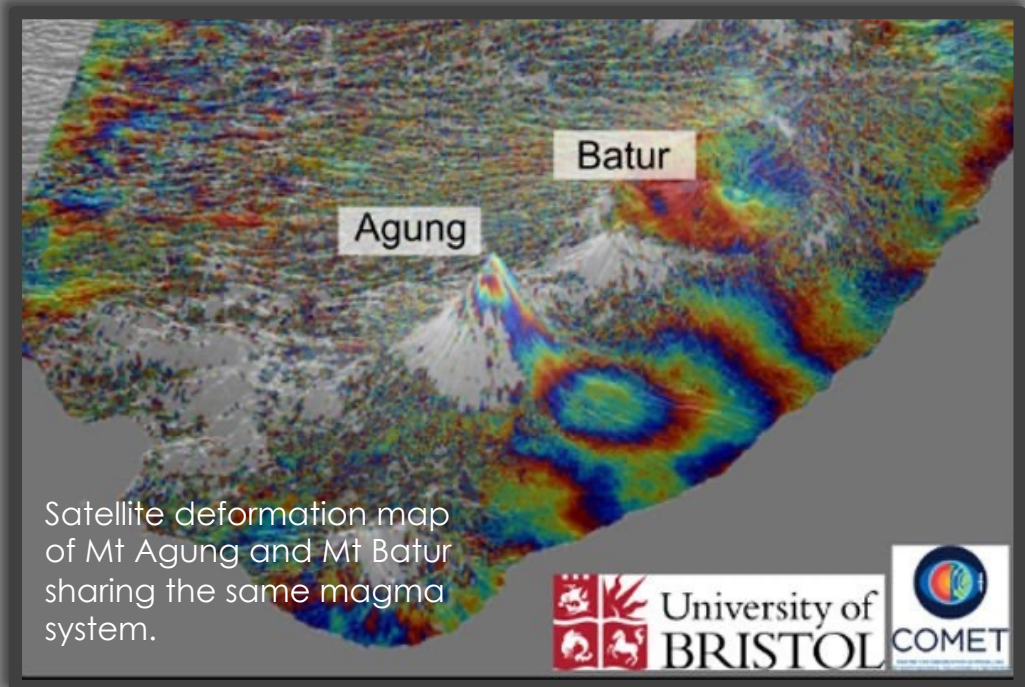
# Calderas: Nature's Cauldrons

While Bali's Mount Batur is an incredible example of a stratovolcano, the active part of the volcano you'll explore during your tour sits within a caldera, formed by its older and larger eruptions.

**Calderas** are often mistaken for craters. However, it's crucial to understand that calderas are more like sinkholes than traditional craters. During a major volcanic eruption, the ground above the magma chamber may collapse, causing the volcano to sink into itself. This event leads to the formation of a sunken bowl, known as a 'caldera.'

Indonesia is home to several active caldera-forming volcanoes, such as **Mount Tambora** and **Lake Toba**, which are infamous for their massive eruptions and devastating impacts on the environment and human populations.

The **Batur Caldera** was created by multiple major eruptions, the first of which occurred around 29,300 years ago. Before the caldera's formation, Mount Batur would have towered at an astonishing 4,000 meters (4 kilometers) high, dominating the landscape!





# Journey Inside the Batur Caldera

The Batur caldera, home to the Balinese region of Kintamani, is a captivating landscape filled with natural and cultural intrigue. Spanning an area of about 120 kilometres, it is encircled by peak ridges that rise over 700 metres in height, offering awe-inspiring panoramic views of Mount Batur, as well as its villages and lakes.

There are fifteen villages in the caldera, renowned for their rejuvenating hot springs, traditional dances, and local crafts. Here, you'll find some of the oldest Balinese communities that continue to embrace their rich and distinctive cultural traditions, such as the Terunyan village.

One of the area's highlights is the ancient burial rituals and customs still practiced at the Terunyan Wall; a rare and unique feature exclusive to the region, which we would be delighted to help you explore!

In the heart of the caldera lies Bali's largest lake, Lake Batur. This impressive crater lake, situated to the west of the volcano, demonstrates the incredible geological forces that have shaped this striking region over time.





# Lake Batur: The Crater Lake

Venturing further down into the caldera, one is easily captivated by the beauty and diversity of the landscape. Through the lush forests and across the lava fields, you'll eventually come to the shores of Lake Batur.

Lake Batur is an essential resource for the region. The lake irrigates the farming crops and is also used for fish farming. Additionally, it is a popular source of heated water for locals and attracts tourism in the form of naturally heated hot springs enjoyed by both visitors and residents alike.

Lake Batur Facts & Figures	
Maximum Length	2.5 kilometres (1.6 miles)
Maximum Width	7.5 kilometres (4.7 miles)
Surface Area	15.9 square kilometres (3,900 acres)
Maximum Depth	88 meters (289 feet)
Water Volume	814,098,012 cubic meters (660,00 acre-feet)
Surface Elevation	1,031 meters (3,383 feet)









# Eruptions: The Fiery History of Batur

Mount Batur is currently classed as an active volcano and has a long history of eruptions varying in form, from **lava flows** to **ash eruptions** and even ejections of incandescent volcanic material. Mount Batur has experienced it all.

In recent history, the period from 1994 to 1995 was dominated by what is known as **Strombolian eruptions**, while the period from 1997 to 1999 was characterised by predominantly gas and smoke eruptions.

Strombolian eruptions are characterised by relatively mild blasts of lava fragments, ash, and gas. The eruption is named after the Stromboli volcano off the coast of Italy, which has been erupting in a similar way for thousands of years.

Mount Batur's last eruption on 7<sup>th</sup> July 2000 was a Strombolian eruption that resulted in the death of a tourist who did not have a guide and failed to heed the warnings. Despite the relatively small and weak intensity of these eruptions, they can last for months, and visitors are advised to stay away from the centre of activity while they're happening.



1994 Mt. Batur Eruption (Strombolian type)  
Photo by Gambar Letusan on [ysi.esdm.go.id/](http://ysi.esdm.go.id/)



Unconfirmed photo of 1963 eruption



# Mount Batur: Facts & Figures

- **Height:** 1717 Metres (5633 ft)
- **Coordinates:** 8°14'20"S 115°22'39"E
- **Area:** Kintamani, Bali, Indonesia.
- **Volcano Type:** Stratovolcano.
- **Listing Type:** Spesial Ribu.
- **Classification:** Active.
- **Formed:** Approximately 27,300 BCE
- **First Documented Eruption:** 1804
- **Caldera Size:** 13.8 km x 10 km
- **UNESCO Status:** Mount Batur Caldera was awarded a place in the Global Geoparks Network on September 20<sup>th</sup>, 2012.





# Mount Batur: Eruption Timeline

Year	What Happened
1804	First recorded eruption - Eruption from the main crater.
1821	Eruption from the main crater.
1849	Eruption with lava flow to the lake.
1854	<b><i>Some have this eruption recorded, others do not. No information.</i></b>
1888	Fissure eruption on the south eastern slope, lava flowing south eastward to the lake.
1897	Eruption from the main crater.
1904	Parasitic eruptions to the west.
1905	Eruptions from Batur I, Batur II, and Batur III craters. Lava flows south and southwest.
1921	Eruption began on January 29 and ended on April 17. Lava flows to the southwest and south.
1922	August 30, eruption from the main crater.
1924	Ash eruption in March.
1925	Early January, ash eruption followed by incandescent lava for one day.
1926	Eruption began August 2 and ended September 21. Lava covered Batur Village. No casualties.
1963	Eruption began on September 5 and ended on May 10, 1964, with lava eruptions.





# Eruption Timeline Continued

Year	What Happened
1965	August 18, ash eruption.
1966	April 28, ash eruption.
1968	Eruption began on January 23 and ended on February 15, lava flowing south.
1970	At the end of January, very thin ash eruption reaching Kintamani.
1971	Starting March 11, ash eruption lasting until May.
1974	Eruption on March 12; lava flow on March 17.
1994	Eruption began on August 7. Ash eruption followed by ejection of incandescent material, resulting in a new crater (Kawah 1994).
1995	Eruption on May 6. Centre of eruption in the 1994 crater. Explosive eruptions accompanied by ejections of incandescent material.
1997	Eruption began on November 8. Eruption centre in the Batur III Crater. Release of bluish dry gas observed.
1998	Eruption began on June 2, creating a new crater (Crater 1998) between Batur III Crater and 1994 Crater. Eruptions characterised by bluish dry gas eruptions.
1999	Eruption began on February 1, producing a new crater (Kawah 1999). Volcanic activity in the form of eruption/blowing smoke. On March 15, the bund separating the 1998 and 1999 craters collapsed, merging the two craters.
2000	July 7, three eruptions from the 1999 crater. Smoke height reached a maximum of 300 metres above the crater rim.





# Smoke Signals: Ash & Steam Explained

On your visit to Mount Batur, you may notice "smoke" rising out of the craters and from the side vents along your hiking path. However, this "smoke" is not the same as the smoke produced by burning materials.

"Smoke" coming from the volcano's main vent is a combination of **volcanic ash**, **gas**, and **steam**, which vary in appearance based on its composition and the active state of the volcano. Thick shades of grey and black can often be associated with this type of "smoke".

In contrast, the "smoke" emanating from side vents typically consists of steam, which is primarily water vapor. It can also contain various amounts of volatile gases, such as hydrogen sulphide, which can give the volcano that "rotten egg" smell. These side vents, technically referred to as **fumaroles**, result from the interaction of groundwater with hot rocks beneath the surface, producing steam as the water is heated.



Water vapor from Batur crater  
Photo by [Daniel Quinn](#), September 2010



Ash cloud from Mount Agung







# Lava Lore: Uncovering What's Rocking

The lava fields and rocks around Mount Batur are primarily composed of **basalt**, a type of volcanic rock formed from cooled lava. These rocks are usually dark in colour and can be fine-grained or coarse-grained in texture. Visitors can easily see the small glimmering crystal minerals of **augite** and **olivine**, which are very common in basalt. The **mafic minerals** of basalt, consisting of **iron** and **magnesium**, are what give's Batur's lava it's dark shades of grey and black.

It's interesting to note that when you pick up lava rocks, some of them can be relatively lightweight. That's because they have small gas bubbles or vesicles trapped within the lava rocks. These bubbles are formed by gas escaping from the cooling lava, getting trapped within as the rock solidifies.

The rough and jagged texture of basalt is the result of the lava cooling quickly and forming a hardened crust on the surface.

Many of the smaller rocks are called **lapilli**. Lapilli translates from Latin for "little stones", they're the smaller bits of rock that were once airborne lava droplets during a volcanic eruption.





# Lava Fields: Hot Topics in Nature

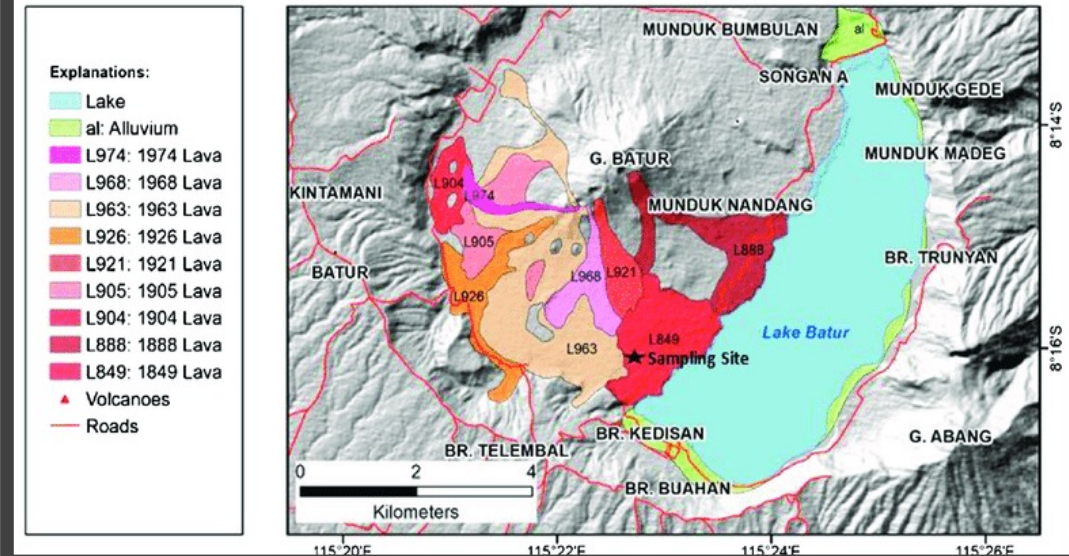
Basaltic lava that flows from both the summit and the flanking vents of Mount Batur have been known to reach the base of the caldera and the shores of Lake Batur throughout the volcano's history. Basalt is an extrusive igneous rock formed by the rapidly cooling, low viscosity lava that's rich in magnesium and iron. More than 90% of all volcanic rock on earth is Basalt.

The map to the right shows the lava flows from recent eruptions.

Comparing the photo to the right with the lava flows map above it, the blackened area is from a lava flow from 1963.

## An Interplanetary Connection:

Interestingly, basalt can be found on other planets in our solar system as well. For example, the vast plains of Venus, which cover more than 80% of the planet's surface, and Mars also has its fair share of Basalt flood plains as well.



Geological map of Batur lava flows (Sutawidjaja et al., 1992).  
Uploaded to [Researchgate](#) by Aditya Pratama





# Lava Tubes & Caves: Hidden Wonders

A **lava tube** is a natural tunnel or cave-like structure formed by the flow of molten lava during a volcanic eruption. As lava flows through a confined space, such as a narrow valley or a depression on the volcano's surface, it cools and solidifies on the outside while still flowing on the inside. As the eruption subsides and the lava flows out, a hollow tube is left behind. Fascinating, isn't it?

There are several lava tubes in the area around Mount Batur. One of the most famous is **Goa Gajah** (meaning "Elephant"), located about 3.5 kilometers east of the mountain. The cave was formed by a lava tube that was created during a volcanic eruption thousands of years ago. The cave contains various carvings and statues, and it is believed to have been used as a place of worship by Hindus and Buddhists in the past. There are also other smaller lava tubes in the area that can be explored.

## A Lost Treasure:

Goa Lava (Lava Cave), a place we used to take all our guests (pictured to the right) near Mount Batur, collapsed in late 2022 and is no longer safe to visit. It's essential to experience all of this area's beauty while you can.





# Volcano Trivia: 12 Fascinating Facts

1. Both the spelling of **volcanos** and **volcanoes** is correct for the plural of a volcano.
2. The word "volcano" comes from "Vulcano," an island in Italy named after **Vulcan**, the Roman god of fire.
3. Volcanos are often found where two tectonic plates meet, particularly along **convergent** and **divergent** boundaries.
4. About 350 million people live in the "**danger zone**" of active volcanoes around the world - that's 1 in 20 people on the planet today.
5. Volcanos can be found on land, on the ocean floor (**submarine volcanoes**), and even under ice caps (**subglacial volcanoes**).
6. The largest volcano on planet Earth is **Mauna Loa, Hawaii**, which stands at **4,169m high**.
7. The largest volcano in our solar system is **Olympus Mons on Mars**, which is almost three times the size of Mount Everest! This one might take more than a day trip to complete.
8. In 79 C.E. the Roman cities of **Pompeii** and **Herculaneum** were destroyed by **Mount Vesuvius**. The volcano is still active, and looms over the city of Naples, Italy.
9. There are about **1500 volcanos** on Earth considered active at this very moment.
10. The loudest sound recorded on Earth was made by Indonesia's **Krakatau** in 1883. With the power of 13,000 Hiroshima nuclear bombs, the sound of the eruption went around the world seven times over the course of five days.
11. The 1815 eruption of Indonesia's **Mount Tambora** was one of the most powerful eruptions in recorded history, causing a "**volcanic winter**" that led to the "Year Without a Summer" in 1816.
12. Volcanos can be classified as **active** (regular activity), **dormant** (recent activity but currently quiet or "sleeping"), and **extinct** (so long since the last eruption that it's unlikely to erupt again).









# Spesial Ribu: The Climbers' Quest

"**Spesial Ribu**" is a term used in Indonesia to classify mountains with an elevation of more than 1,000 meters (3,281 feet) above sea level. Mount Batur, with an elevation of 1,717 meters (5,633 feet), is one of the 115 volcanos across Indonesia classified as a Spesial Ribu mountain.

The term "Spesial Ribu" translates to "special thousand" in English. It is a classification for mountains that are considered special or unique, typically due to their cultural or historical significance, prominence, or other notable features.

The Spesial Ribu initiative provides an extensive list of Indonesia's highest peaks, complete with detailed information about each mountain. It encourages mountaineers and hikers to explore and appreciate the natural beauty of Indonesia while promoting responsible trekking and raising awareness about the importance of preserving these pristine landscapes.

"Ribu" means one thousand. Take a look at any Indonesian bank note, and you will see the word "Ribu". Interestingly the word "Ribu" is also used internationally among geologists to classify volcanos that stand over 1000 metres in height.





# Dewi Danu: The Goddess of the Lakes

In Bali, the cultural and historical significance of Mount Batur is closely tied to the local Balinese Hindu religion.

The volcano is believed to be the sacred home of **Dewi Danu**, the Goddess of Water, and is considered a holy site for Balinese Hindus. Pictured to the right is a statue of Dewi Danu, erected in late 2017 on Lake Batur.

According to local beliefs, Dewi Danu is also considered the Goddess of Lake Batur and is believed to be responsible for the fertility and prosperity of the local area. The Balinese people have a strong spiritual connection to the mountains and volcanos in their region, with many rituals and ceremonies being performed to honour and appease these deities.

Before hiking up Mount Batur, you may notice your guide burn incense as a form of spiritual preparation and an offering to the mountain and its deities. It's a way to show respect and ask for protection during the journey. Additionally, burning incense is believed to help purify the body and mind, bringing inner peace and clarity for the ascent.





# Meet Mount Batur's Monkeys

One of the most common species of monkeys in Bali is the **Crab-eating Macaque**, also known as the **long-tailed Macaque**. Despite their name, they don't usually eat crabs. Instead, they're opportunist omnivores, which many a tourist can attest to, as they will drink your water and steal your breakfast if you're not careful.

When not being fed by tourists or stealing packets of chips from Warungs, they eat a variety of animals and plants, with fruits (even durians) and seeds making up 60 – 90% of their diet. They also eat leaves, flowers, roots and even bark. Their meat intake consists of lizards, frogs and fish. The Indonesian version of these monkeys learned how to swim and dive for crabs, which is how they got their name.

Their body length is 38 to 55 cm, and the males can weigh anywhere between 5 and 9 kg, while females weigh as little as 3 to 6 kg. Both have tails longer than their bodies, typically 40 to 65 cm

The Balinese call these little guys “bojog.”





# Kintamani Bats: A Unique Encounter

During our first few tours, we weren't shown these bats. The locals don't think they're anything special. To our knowledge, no other tour company takes their guests to see these amazing little creatures. You might think that if you've seen one bat, you've seen them all, but these Kintamani Bats are a little different.

Most bats on the planet love to live in the darkness, so you rarely get to see them up close. We've been to several bat caves in Australia, Thailand, and Malaysia, and the only time you get to see a bat there is when you scare the bat with a torch (flashlight) in a ridiculously dark cave where you can't see your hand in front of your face. The bat flies past your face scaring you more than you scared it. You never really get a chance to see them.

The Kintamani Bats seemed to have adapted to living more on a cliffside rather than in a dark cave. There are plenty of other caves that the bats could live in, yet they choose to live here on the side of a cliff. You can see them clearly. We were amazed when we first witnessed them, so we added them to a couple of our tours.

We think you'll love these fascinating creatures, and the Balinese call these little guys "lelawah."





# Languages of Bali

Did you know there are two main languages spoken in Bali? Bahasa Indonesia and Basa Bali, or Balinese. **Bahasa Indonesia** derived from the Malaysian language and became the official language of Indonesia in 1945. **Balinese** is a Malayo-Polynesian language spoken in Bali. There are more than 700 different languages spoken throughout Indonesia.

## Words that visitors may like to know:

English	Bahasa Indonesian	Balinese
<b>Thank you</b>	Terima Kasih	Suksema
<b>Hello</b>	Halo	Om suastiastu
<b>Volcano</b>	Gunung berapi	Gunung
<b>Lava</b>	Lahar	Kawah
<b>Water</b>	Air	Yeh
<b>Bats</b>	Kelelawar	lelawah
<b>Monkey</b>	Monyet	bojog
<b>You're welcome</b>	Sama Sama	Suksema mewali











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Established in 2012, Expedition Bali Tours pioneered the exploration of Mount Batur's beauty with the introduction of the first 4x4 tours in the Kintamani region and the Mount Batur volcano.

Our guides are not only local to the Kintamani region they were also born and raised here. They possess firsthand knowledge of the area's customs and recent volcanic eruptions. Furthermore, they are the only guides in the region with certified first aid training.

We are proud to partner with fantastic travel agents who can extend our serves beyond English and Indonesian speaking clients. Tours of Mount Batur can be arranged in French, Russian, Italian and many other languages as well!

Our purpose-built Isuzu D-Max 4x4 3.0-liter turbo diesel vehicles are the most enjoyable, safe, and powerful mode of transportation for touring Kintamani and Mount Batur.

Our dedication and passion for what we do have earned us the Luxury Tour Guide Award for Service – ranking us number one among thousands of tour companies across Indonesia's 17,508 islands. With the longest-running tours, best local guides, safest and most powerful 4x4 vehicles, we know you'll have an amazing time!

Reach out to us today so we can begin your volcano adventure!

*"Professional, Personal, Comfortable, and Fun."* That's Expedition Bali Tours.



[www.expeditionbali.tours](http://www.expeditionbali.tours)





# A Heartfelt Thank You

We would like to extend our special thanks to Colin and Kerry Meyer (pictured on the right). Both Colin and Kerry were the first to do our tours after Covid-19 in May 2022.

Kerry is passionate about volcanos and has a master's in Volcanology from the University of Bristol. Together, she and Colin helped collaborate in the creation of this guidebook to better serve visitors and nature lovers to the Kintamani region and Mount Batur volcano.

There's a lot of misinformation, about Mount Batur, amongst tour agents, tour companies, and even the local tour guides. This guidebook aims to set the record straight while providing you with an excellent reference for the types of questions you may have while out exploring the volcano.

We hope this guidebook helps to demonstrate that we have the expertise and knowledge in providing the best volcano tour that you deserve. We look forward to providing you with a professional, personal, comfortable, and fun experience as you embark on your adventure of a lifetime.

See you soon on Mount Batur!

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