“Sited from Wikipedia”

Victoria Falls (Lozi: *Mosi-oa-Tunya*, "The Smoke That Thunders"; Tonga: *Shungu Namutitima*, "Boiling Water") is a waterfall on the Zambezi River in southern Africa, which provides habitat for several unique species of plants and animals. It is located on the border between Zambia and Zimbabwe[1] and is considered to be one of the world's largest waterfalls due to its width of 1,708 m (5,604 ft).

While it is neither the highest nor the widest waterfall in the world, the Victoria Falls are classified as the largest, based on its combined width of 1,708 metres (5,604 ft)[6] and height of 108 metres (354 ft),[7] resulting in the world's largest sheet of falling water. The Victoria Falls are roughly twice the height of North America's Niagara Falls and well over twice its width. [8]

For a considerable distance upstream from the falls, the Zambezi flows over a level sheet of basalt, in a shallow valley, bounded by low and distant sandstone hills. The river's course is dotted with numerous tree-covered islands, which increase in number as the river approaches the falls. There are no mountains, escarpments, or deep valleys; only a flat plateau extending hundreds of kilometres in all directions.

Victoria Falls Bridge aerial view

The falls are formed as the full width of the river plummets in a single vertical drop into a transverse chasm 1,708 metres (5,604 ft) wide, carved by its waters along a fracture zone in the basalt plateau. The depth of the chasm, called the **First Gorge**, varies from 80 metres (260 ft) at its western end to 108 metres (354 ft) in the centre. The only outlet to the First Gorge is a 110-metre-wide (360 ft) gap about two-thirds of the way across the width of the falls from the western end. The whole volume of the river pours into the Victoria Falls gorges from this narrow cleft.[9]

There are two islands on the crest of the falls that are large enough to divide the curtain of water even at full flood: Boaruka Island (or Cataract Island) near the western bank, and Livingstone Island near the middle — the point from which Livingstone first viewed the falls. At less than full flood, additional islets divide the curtain of water into separate parallel streams. The main streams are named, in order from Zimbabwe (west) to Zambia (east): the *Devil's Cataract*[9] (called *Leaping Water* by some), the *Main Falls*, the *Rainbow Falls* (the highest) and the *Eastern Cataract*.

The River Zambezi, upstream from the falls, experiences a rainy season from late November to early April, and a dry season the rest of the year. The river's annual flood season is February to May with a peak in April,[10] The spray from the falls typically rises to a height of over 400 metres (1,300 ft), and sometimes even twice as high, and is visible from up to 50 km (30 mi) away. At full moon, a "moonbow" can be seen in the spray instead of the usual daylight rainbow. During the flood season, however, it is impossible to see the foot of the falls and most of its face, and the walks along the cliff opposite it are in a constant shower and shrouded in mist. Close to the edge of the cliff, spray shoots upward like inverted rain, especially at Zambia's Knife-Edge Bridge.[11]

As the dry season takes effect, the islets on the crest become wider and more numerous, and in September to January up to half of the rocky face of the falls may become dry and the bottom of the First Gorge can be seen along most of its length. At this time it becomes possible (though not necessarily safe) to walk across some stretches of the river at the crest. It is also possible to walk to the bottom of the First Gorge at the Zimbabwean side. The minimum flow, which occurs in November, is around a tenth of the April figure; this variation in flow is greater than that of other major falls, and causes the Victoria Falls' annual average flow rate to be lower than might be expected based on the maximum flow.[11] In 2019 unusually low rain lowered the water to a small and thin fall only. Global climate change and changed climate patterns are suggested to have caused this.[12] Victoria Falls is facing the worst drought in a century.[13]

Gorges[edit]

First Gorge, from Zambian side

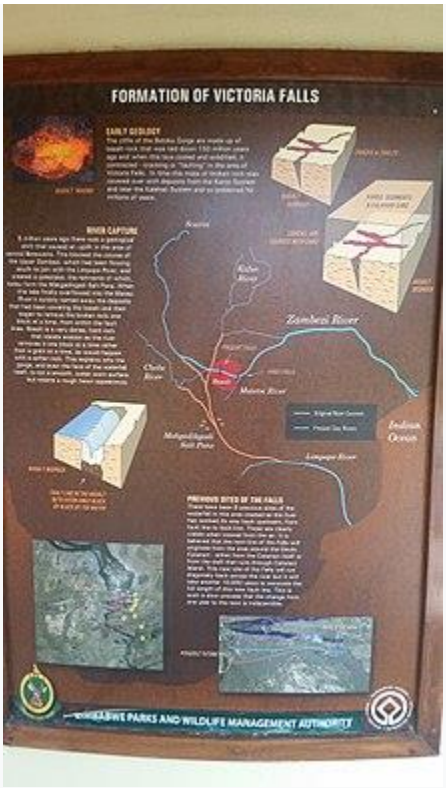
The entire volume of the Zambezi River pours through the First Gorge's 110-metre-wide (360 ft) exit for a distance of about 150 metres (490 ft), then enters a zigzagging series of gorges designated by the order in which the river reaches them. Water entering the *Second Gorge* makes a sharp right turn and has carved out a deep pool there called the *Boiling Pot*. Reached via a steep footpath from the Zambian side, it is about 150 m (500 ft) across. Its surface is smooth at low water, but at high water is marked by enormous, slow swirls and heavy boiling turbulence.[11] Objects and animals that are swept over the falls, including the occasional hippopotamus, crocodile, or human, are frequently found swirling about here or washed up at the north-east end of the Second Gorge. This is where the bodies of Mrs Moss and Mr Orchard, mutilated by crocodiles, were found in 1910 after two canoes were capsized by a hippo at Long Island above the falls.[14]

Victoria Falls from the Zimbabwe side

The principal gorges are

- **First Gorge**: the one the river falls into at Victoria Falls
- **Second Gorge**: 250 metres (820 ft) south of falls, 2.15 kilometres (1.34 mi) long, spanned by the Victoria Falls Bridge
- **Third Gorge**: 600 metres (2,000 ft) south, 1.95 kilometres (1.21 mi) long, containing the Victoria Falls Power Station
- **Fourth Gorge**: 1.15 kilometres (0.71 mi) south, 2.25 kilometres (1.40 mi) long
- **Fifth Gorge**: 2.25 kilometres (1.40 mi) south, 3.2 kilometres (2.0 mi) long
- **Songwe Gorge**: 5.3 kilometres (3.3 mi) south, 3.3 kilometres (2.1 mi) long named after the small Songwe River coming from the north-east, and the deepest at 140 metres (460 ft), the level of the river in them varies by up to 20 metres (66 ft) between wet and dry seasons.[11]

Formation[edit]



Victoria Falls National Park marker

The Upper Zambezi River originally drained south through present day Botswana to join the Limpopo River.[15][16] A general uplift of the land between Zimbabwe and The Kalahari desert about 2 million years ago blocked this drainage route, and a large paleo lake known as Lake Makgadikgadi formed between the Kalahari and the Batoka Basaltic Plateau of Zimbabwe and Zambia. This lake was originally endorheic and had no natural outlet. Under wetter climate conditions about 20,000 years BP, it eventually overflowed and began to drain to the east, cutting the Batoka Gorge through the basalt as it went.[17][18][19]

The recent geological history of Victoria Falls can be seen in the overall form of the Batoka Gorge, with its six individual gorges and eight past positions of the falls. The east–west oriented gorges imply structural control with alignment along joints of shatter zones, or faults with 50 metres (160 ft) of vertical displacement as is the case of the second and fifth gorges. Headward erosion along these structural lines of weakness would establish a new fall line and abandonment of the earlier line. North-south oriented joints control the south flowing sections of the river. One of these is the "Boiling Pot", which links the First Gorge with the Second Gorge.[20]:147,149[11]

The falls may have already started cutting back the next major gorge, at the dip in one side of the "Devil's Cataract", between the western river bank and Cataract Island. The lip in the current falls is lowest here and carries the greatest concentration of water at flood stage.[20]:149

Satellite image showing the broad Zambezi falling into the narrow cleft and subsequent series of zigzagging gorges (top of picture is north).

The sedimentary sequence overlying the basalt at the Zambezi River margins is called the Victoria Falls Formation, which consists of gravel, the Pipe sandstone, Kalahari Sands, and aeolian sand and alluvium. A 15–45

m scarp bounds the river about 5–6 km from the main channel, and a series of river terraces are evident between the scarp and the channel.[20]:144–145

Further geological history of the course of the Zambezi River is in the article of that name.

History[edit]

Geological history[edit]

The basalt plateau of Victoria Falls, over which the Zambezi River flows, was formed during the Jurassic Era, around 200 million years ago.

Pre-colonial history[edit]

Early Stone Age Acheulean stone artefacts and Oldowan tools were excavated at archaeological sites around the falls, as well as Sangoan tools and Lupemban artefacts dating to the Middle Stone Age.[21] Early Iron Age pottery was excavated at a vlei site near Masuma Dam in the early 1960s.[22] Evidence for iron smelting was also found in a settlement dated to the late 1st millennium AD.[23]

The southern Tonga people known as the Batoka/Tokalea called the falls *Shungu na mutitima*. The Matabele, later arrivals, named them *aManz' aThunqayo*, and the Batswana and Makololo (whose language is used by the Lozi people) call them *Mosi-o-Tunya*. All these names mean essentially "the smoke that thunders".[24]

A map drawn by Nicolas de Fer in 1715 shows the fall clearly marked in the correct position. It also shows dotted lines denoting trade routes that David Livingstone followed 140 years later.[25] A map from c. 1750 drawn by Jacques Nicolas Bellin for Abbé Antoine François Prevost d'Exiles marks the falls as "cataractes" and notes a settlement to the north of the Zambezi as being friendly with the Portuguese at the time.[26]

In November 1855, David Livingstone was the first European who saw the falls, when he travelled from the upper Zambezi to the mouth of the river between 1852 and 1856. The falls were well known to local tribes, and Voortrekker hunters may have known of them, as may the Arabs under a name equivalent to "the end of the world". Europeans were sceptical of their reports, perhaps thinking that the lack of mountains and valleys on the plateau made a large falls unlikely.[27][28]

Livingstone had been told about the falls before he reached them from upriver and was paddled across to a small island that now bears the name Livingstone Island in Zambia. Livingstone had previously been impressed by the Ngonye Falls further upstream, but found the new falls much more impressive, and gave them their English name in honour of Queen Victoria. He wrote of the falls, "No one can imagine the beauty of the view from anything witnessed in England. It had never been seen before by European eyes; but scenes so lovely must have been gazed upon by angels in their flight."[11]

In 1860, Livingstone returned to the area and made a detailed study of the falls with John Kirk. Other early European visitors included Portuguese explorer Serpa Pinto, Czech explorer Emil Holub, who made the first detailed plan of the falls and its surroundings in 1875 (published in 1880),[29] and British artist Thomas Baines, who executed some of the earliest paintings of the falls. Until the area was opened up by the building of the railway in 1905, though, the falls were seldom visited by other Europeans. Some writers believe that the Portuguese priest Gonçalo da Silveira was the first European to catch sight of the falls back in the sixteenth century.[30][31]

Statistics[edit]


"The Smoke that Thunders", rainy season, 1972 ... and dry season, September 2003

Size and flow rate of *Victoria Falls* with *Niagara* and *Iguazu* for comparison

Parameters	*Victoria Falls*		*Niagara Falls*		*Iguazu Falls*	
Height in meters and feet:[3]	108 m	360 ft	51 m	167 ft	64–82 m	210–269 ft
Width in meters and feet:[3]	1,708 m	5,604 ft	1,203 m	3,947 ft	2,700 m	8,858 ft
Flow rate units (vol/s):	**m^3/s**	**cu ft/s**	**m^3/s**	**cu ft/s**	**m^3/s**	**cu ft/s**
Mean annual flow rate:[3]	1,088	38,430	2,407	85,000	1,746	61,600
Mean monthly flow – max.:[10]	3,000	105,944				
Mean monthly flow – min.:[10]	300	10,594				
Mean monthly flow – 10 yr. max.:[10]	6,000	211,888				
Highest recorded flow:[3]	12,800	452,000	6,800	240,000	45,700	1,614,000

Notes: See references for explanation of measurements.
For water, cubic metres per second = tonnes per second.
Half the water approaching Niagara is diverted for hydroelectric power.
Iguazu has two drops; height given for biggest drop and total height.
10 falls have greater or equal flow rates, but are not as high as Iguazu and Victoria Falls.[10]


ZAMBIA
Lake Kariba
Victoria Falls
ZIMBABWE
BOTSWANA
SOUTH AFRICA