

洞爺カルデラ  
の  
中のふしぎ

---

The Mysteries Lurking  
in the Toya Caldera

# 洞爺カルデラの中の 不思議へようこそ!

Welcome to the mysteries lurking in the Toya Caldera!

約11万年前、巨大な噴火が陥没地形をつくりました。

この“洞爺カルデラ”に水がたまり、洞爺湖が誕生しました。

今では、このカルデラが多くの生きものたちのふるさとです。

さあ、「鳥の目」「魚の目」で洞爺カルデラの中の不思議な旅に出かけましょう!

Approximately 110,000 years ago, a massive eruption created a depressed geological formation. The water that accumulated in the Toya Caldera formed Lake Toya. This caldera is now home to a wide array of creatures. Let's go on a mysterious journey into the Toya Caldera where we will explore it from the views of birds and fish!

不思議  
01



鳥帽子岩

斜面にそびえる溶岩の巨塔

P4

Mystery 01 Eboshiiwa  
Giant tower of lava standing on a slope

不思議  
02



青淵

巨大噴火の跡を残す岩壁

P8

Mystery 02 Aobuchi  
The rock wall that remains to this day as a remnant of the mammoth eruption

不思議  
03



財田扇状地

水の流れが創った恵みの大地

P10

Mystery 03 Takarada alluvial fan  
A land of many natural blessings created by the flow of water

不思議  
04



湖底の巨木

湖底に眠る巨木は、なぜ沈んだのか?

P12

Mystery 04 A giant tree on the bottom of the lake  
Why did the giant tree standing on the bottom of the lake become submerged?

不思議  
05



島になれなかった島

5つ目の中島? 幻の溶岩ドーム

P16

Mystery 05 The island that could not be an island  
Is this the fifth island of Nakajima? A phantom lava dome

不思議  
06



スジエビ・ヨシノボリ

洞爺湖の古くからの住人

P17

Mystery 06 Lake prawns and freshwater goby  
Long-time residents of Lake Toya

不思議  
07



サクラマス

最後の旅に挑む、洞爺湖の王者

P18

Mystery 07 Cherry salmon  
The kings of Lake Toya who dare to embark on their final journey of life

不思議  
08



凍てつく北の湖

一瞬で消える湖面の芸術

P19

Mystery 08 Frozen northern lake  
Art on the surface of the lake that vanishes in an instant

不思議  
09



湖底の秘密

湧き上がる小さな泡

P20

Mystery 09 The secret at the bottom of the lake  
Small bubbles that spring up

不思議  
10



亀岩の穴

巨岩にできた謎の穴

P21

Mystery 10 The holes in Kameiwa (Turtle Rocks)  
Mysterious holes on gigantic rocks

不思議  
11



湖の霧がつなぐ水の循環

見えない水が潤す大地

P22

Mystery 11 Water circulation connected by fog over the lake  
Land moistened by invisible water

不思議  
01

烏帽子岩

Eboshiiwa

# 斜面にそびえる 溶岩の巨塔

Giant tower of lava  
standing on a slope



烏帽子岩から見下ろす浅瀬には、貴重な水生植物の森が帯のように連なっています。  
The forest of aquatic plants linearly inhabit the shallow areas that can be looked down on from Eboshiiwa.

## 洞爺湖を見下ろす巨岩

ここでは洞爺カルデラができるずっと以前から、火山活動が繰り返されていました。

尾根にそびえる烏帽子岩は、その痕跡のひとつです。

約300万年前、地下深くからのぼってきたマグマが、地表に出る前に冷えて固まりました。

周囲の柔らかな地層は風雨で削られました。

マグマが固まった部分だけが塔のように残りました。

## An enormous rock looking down over Lake Toya

Volcanic activities occurred here repeatedly long before the Toya Caldera was created. Eboshiiwa, which stands on the ridge, is one of the remnants from the eruption. Approximately three million years ago, magma rising up from deep underground hardened before appearing on the surface of the ground. Although the surrounding soft geologic strata have been eroded by rain and wind, part of the lava has remained hard and developed the appearance of a tower.



洞爺湖で見られる水生植物は10種類以上。ここにはクロモの群落が。  
More than 10 different varieties of aquatic plants can be observed around Lake Toya. Esthwaite waterweed grows in colonies in the lake.



紅葉に色づく青淵の岩壁  
The rock wall of Aobuchi tinted by autumn leaves.

## 巨大噴火の跡を残す岩壁

ここは通称「青淵」。

岩壁は、標高約 150mの高さから、水深約 150mまで、ほとんど垂直に落ち込んでいます。

この岸壁は、約11万年前の巨大噴火で残った固い岩盤が、ほぼそのままの形で見られる場所。

神秘的な湖水の青さが際立ちます。

The rock wall that remains to this day as a remnant of the mammoth eruption

This place is commonly called Aobuchi. The rock wall falls almost vertically from a height of approximately 150 meters to a depth of roughly 150 meters in the water.

The hard bedrock produced after the massive eruption approximately 110,000 years ago can be observed since the remaining quay wall looks almost as it did in the old days.

The blue of the lake stands out.



道のすぐ横に、垂直に落ち込む崖が湖底まで続きます。  
The cliff falls straight down to the bottom of the lake right beside the road.



たからだ  
**財田扇状地**  
**水の流れた創った恵みの大地**

洞爺湖の北岸には、扇状地が広がっています。

ここを流れるソウベツ川は、もともと「ポロベツ（アイヌ語で『大きい・川』の意）」あるいは「おおかわ大川」と呼ばれていました。その名のとおり、洞爺湖に流れ込む一番大きな川です。

洞爺湖の北東、竹山の南の分水嶺（洞爺湖町と伊達市大滝区の境界）を源流に、途中はやつきで早月川と合流して洞爺湖へと注いでいます。

水の流れは大地を削り、土砂を湖へ押し流してきました。

川に運ばれた粒の小さい土砂が堆積し、稲作に適した土壌になります。



A land of many natural blessings created by the flow of water

The alluvial fan extends to the northern shore of Lake Toya

The Sobetsu River that runs here was once called “poro-pet” (large river in the Ainu language) or “okawa” (large river in the Japanese language). As the name suggests, it is the largest river flowing into Lake Toya. Its source can be found in the northeastern part of Lake Toya or the flood - control channel located in the southern part of Takeyama (i.e., the boundary between Toyako Town and Otaki Ward, Date City), and it joins together with the Hayatsuki River on its way to Lake Toya. The flow of the river erodes the land, pushing the earth and sand into the lake. The fine earth and sand that flows along the river has accumulated to make the soil suitable for rice cultivation.

# 湖底に眠る巨木は、 なぜ沈んだのか？

Why did the giant tree  
standing on the bottom of the  
lake become submerged?

## 湖底に立つ、1本の巨木

洞爺湖北岸の沖の湖底に、人知れず1本の巨木が立っています。大人が両腕を回しても届かないほどの幹周り。根本は土砂に埋まっていますが、高さは10mほどでしょうか。『洞爺村史』（1976年）によると、洞爺湖北岸の沖合に何か所か、立ったままの木々の姿が見えたそうですが、木材として珍重されたため、1938年頃からわずか数年で採りつくされた、とあります。水位の上昇で水没してしまったのか、地すべりで湖に引き込まれたのか？ はるか昔の出来事が、謎の巨木の科学的調査で、明らかになるかもしれません。

### A giant tree stands on the bottom of the lake.

On the bottom of Lake Toya off the north coast, a giant tree stands hidden.

The trunk's girth is so large that an adult would not be able to wrap their arms around it.

Although the roots are beneath earth and sand, it measures approximately 10 meters in height.

According to the History of Toya Village (1976), standing trees could be seen on the north offshore of Lake Toya at several sites. Once the timber was evaluated, all of the trees were cut down over a span of several years starting around 1938.

Did the land go under the sea due to the rising water level or were the trees pulled down due to a landslide? A scientific survey on the mysterious giant tree may reveal what occurred inside the Toya Caldera many years ago.



ろうさんじゆ  
記念保護樹木「老三樹」の沖には、スプーンですくいとられたような、深く落ち込んだ謎の水中地形が見られます。  
A spoon-like and deeply hollowed mysterious topography can be observed under the water off the conserved memorial tree named "Rosanju."



エゾヤマザクラ、セン(ハリギリ)、ヤマグワ、の3本の木が同じ場所から育っている「老三樹」。明治時代の開拓の物語があります。  
Rosanju is the spot where three different tree species—sargent's cherry, castor aralia and Chinese mulberry—grow from the same spot in the ground. These trees remain to tell the story of reclamation in the Meiji era.



不思議  
05

島になれなかった島

The island that could  
not be an island



## 5つ目の中島? 幻の溶岩ドーム

洞爺湖の「中島」は「大島」「観音島」「弁天島」「饅頭島」の4つの島々の総称です。

この北東の水中に、ごつごつした岩が重なり合い、山になっている場所があります。

“山頂”が水面下1.5mのため、陸からは見えません。

この水中の山の正体は、約5万年前の火山活動でできた溶岩ドーム。

わずかに高さが足りず、島にはなれませんでした。

洞爺湖の湖底には、火山活動が作った起伏に富んだ岩山がたくさん隠されています。

## Is this the fifth island of Nakajima? A phantom lava dome

Nakajima, which is located on Lake Toya, is comprised of four islands—Oshima, Kannonjima, Bentenjima and Manjūjima. Beneath the water in the northeastern part of the lake, there is a mountain formed by a pile of rocks. Since the summit of this mountain is around 1.5 meters below the surface of the lake, it is not visible from land.

This mountain is actually a lava dome formed by volcanic activity that occurred approximately 50,000 years ago. Since the summit is beneath the water's surface, it cannot be considered an island.

At the bottom of Lake Toya, numerous mountains made of rock with upward and downward slopes, which were created due to volcanic activity, maintain a quiet existence.



あと数十m高ければ、島になれていたかも?  
(写真は中島の大島、饅頭島)

If it were just a few meters taller in height, these rocks could be called an island.

不思議  
06

スジエビ・ヨシノボリ

Lake prawns and  
freshwater goby



## 洞爺湖の古くからの住人

大きさ5～10 cmのヨシノボリは、

昆虫や小さな魚を好みます。

胸びれが吸盤のような形で、水の流れが強くても平気。

水底の縄張りをバトロールしながら暮らしています。

スジエビも昔から洞爺湖で見られる生きもの。

水中の枯枝や流木を住処にしています。

## Long-time residents of Lake Toya

Freshwater goby, which measure between 5 and 10 centimeters in length, like to eat insects and small fish.

Their pectoral fins are shaped like suckers to enable them to swim against the strong currents of the lake. These fish live at the bottom of the lake while patrolling its territory.

Lake prawns have also been observed in Lake Toya for a long time. They inhabit the spaces or hollows of dead branches and driftwood in the water.



ソウベツ川河口、スジエビの「マンション」。  
A “condominium” for lake prawns at the  
mouth of the Sobetsu River

不思議  
07

サクラマス

Cherry salmon



不思議  
08

凍てつく北の湖

Frozen northern lake



## 最後の旅に挑む、洞爺湖の王者

サクラマスはサケ科の魚で、1920年代から洞爺湖に放流されるようになりました。ソウベツ川で孵化したサクラマスの子どもの一部は、エサを求めて洞爺湖に降ります。50~70cmに育ち、産卵期を迎えると、ソウベツ川の河口から遡上を始めます。ふるさとの川まで戻る理由は謎ですが「水の匂いを記憶する」「磁気を感じ取る」等が考えられています。

### The kings of Lake Toya who dare to embark on their final journey of life

Cherry salmon are in the Salmonidae family, and these fish have been released into Lake Toya since the 1920s. Some of the fry that hatch in the Sobetsu River make the journey to Lake Toya in search of food. During the spawning season, cherry salmon reach a length of 50 to 70 cm before beginning their journey from the mouth of the Sobetsu River. Although it is unknown why these fish are able to return to the river where they were born, some say the fish memorize the scent of the water or feel some sort of magnetism.



遡上するサクラマス  
Cherry salmon making their spawning run up the river

## 一瞬で消える湖面の芸術

洞爺湖は周囲約40km、最大深度約180mの不凍湖。湖の水は温度変化により循環するため、冬の間も全面凍結することはありません。それでも気温-10℃以下に冷え込んだ日の翌朝は、水の流れの緩やかな浅瀬の一部で水面が凍ることがあります。ほんのわずかな時間で消えてしまう、洞爺湖ならではの表情です。

### Art on the surface of the lake that vanishes in an instant

The circumference of this unfrozen lake is approximately 40 km and it is roughly 180 m in depth. Since lake water circulates according to changes in the temperature of the lake, lakes are unlikely to freeze. Thus, the day after a day in which the temperature drops below -10°C, some shallow areas of the lake may freeze. This is a phenomenon unique to Lake Toya since the ice vanishes in an instant.



1年でも限られた季節にしか見られない、湖上の氷  
The ice on the surface of the lake that can only be seen in certain seasons during the year.

不思議  
09

湖底の秘密

The secret at the bottom  
of the lake



## 湧き上がる小さな泡

藻の間に見える、無数の銀色の粒。  
湖底の数か所で見られる気泡です。  
湧きあがっているのはごく微量。  
ヨシノボリが周りを泳ぎ回っています。  
湧水が出ているのか、  
湖底から発生した気体なのかまだ謎のままです。

### Small bubbles that spring up

Countless silver bubbles observed between colonies of algae  
Bubbles observed in several spots at the bottom of the lake  
Very small amounts of bubbles springing up  
Freshwater goby swimming around the bubbles

It is still unknown whether these bubbles indicate a spring coming out from the bottom of the lake or the presence of gas at the bottom of the lake.



砂地の部分からも気泡が。  
Bubbles also come out from the sand

不思議  
10

亀岩の穴

The holes in Kameiwa  
(Turtle Rocks)



## 巨岩にできた謎の穴

洞爺湖の水位が下がる冬期間、浮見堂近くで、  
亀岩と呼ばれている岩々を間近に見ることができます。  
岩の側面に目を凝らすと、  
握りこぶしより大きめの穴が、ところどころに。  
人為的にあけられたものか、それとも自然の力であいたのか、  
今はまだ明らかになっていません。

### Mysterious holes on gigantic rocks

During the winter when the water level of Lake Toya falls, rocks called "Kameiwa" can be observed up close near Ukimido.

If you look closely at the sides of these rocks, holes larger than a clenched fist can be seen here and there.

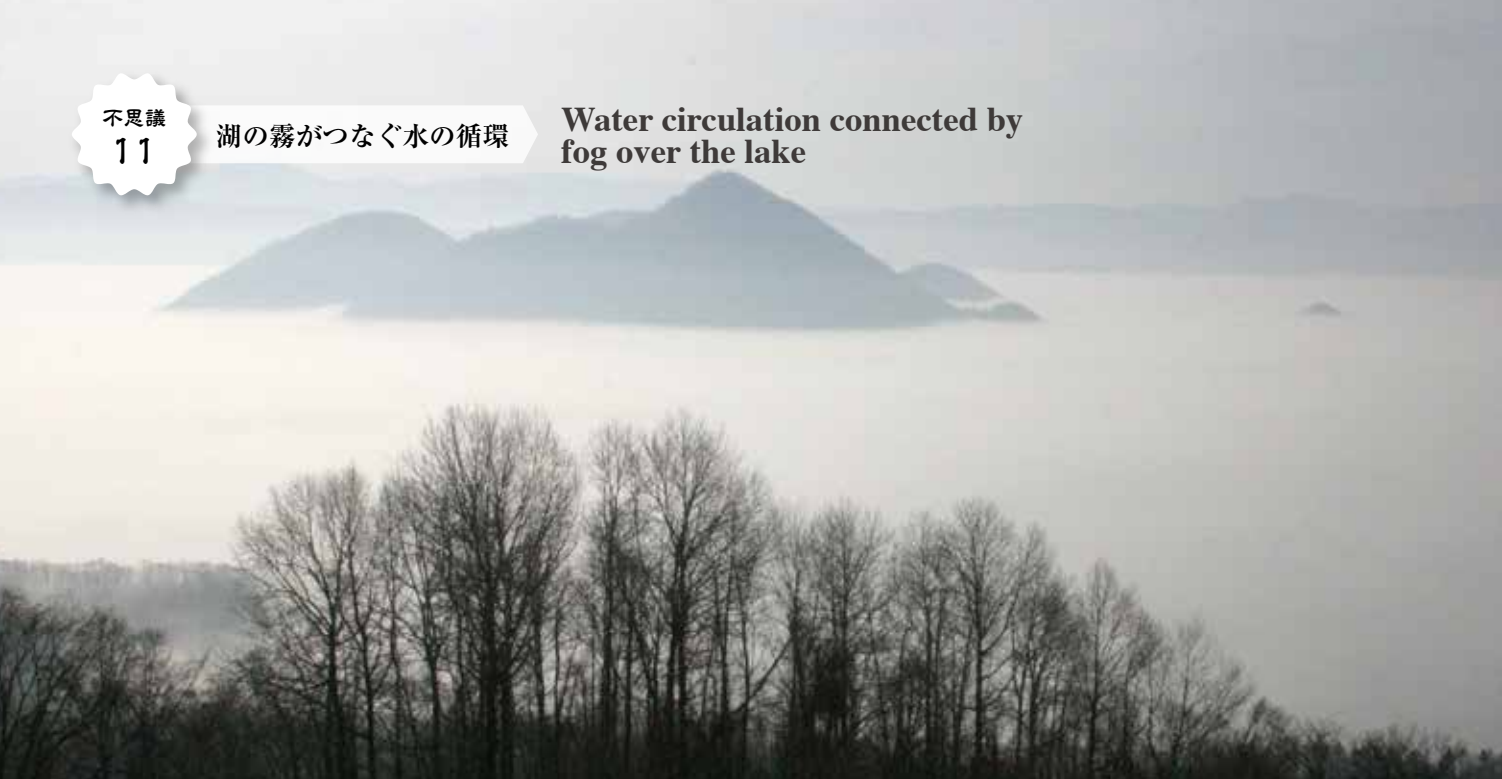
It remains a mystery whether these holes were created by man or by nature.



水の流れで角が削れ、丸みをおびた岩々が連なります。  
Rocks rounded by the power of water extend offshore.



まるで舞台のように、沖へ続く亀岩。  
Kameiwa extending offshore like a passage to a stage.



## 見えない水が潤す大地

湖に貯えられた水は、  
周辺大地の温度変化を緩やかにします。  
冬には暖かい空気を、夏には涼しい空気を、  
水分と一緒に湖の周りに送っています。  
乾燥から守られた畑では、  
昔から豆や根菜類が作られました。  
見えない水が、生きものが暮らす実りの大地を潤しています。

### Land moistened by invisible water

Water kept in the lake moderates the change of temperature of the land around the lake.

Warm air in winter and cool air in summer is sent around lake along with moisture.

Beans and root vegetables grown in farming fields protected from drying have been cultivated since long ago.

Invisible water moistens the rich land, which yields great harvests and is home to various creatures.



早朝、霧に覆われる長いも畑  
Chinese yams covered by fog early in the morning



霧の中、羽を休めるハイタカ  
Eurasian sparrowhawk resting its wings in the fog



初版発行 令和2年(2020年)3月

企画・発行 北海道洞爺湖町  
(ジオパーク推進課)

所在地 北海道虻田郡洞爺湖町栄町58番地

写真撮影 金谷千賀子  
関 勝 則  
高 田 修  
平井 佳之

Production: Toyako Town  
Sakaemachi 58, Toyako-cho, Abuta-gun, Hokkaido  
Date of publication: March 2020  
Photos courtesy of: Chikako Kanaya  
Katsunori Seki  
Osamu Takada  
Yoshiyuki Hirai



United Nations  
Educational, Scientific and  
Cultural Organization

• **Toya-Usu**  
• UNESCO  
• Global Geopark  
•