

# Rocky wonderland

Some would say it has taken 25 million years,  
but Waitaki has finally been declared New Zealand's first  
Unesco Global Geopark. by ERIC TRUMP • photograph by JOSEPHINE JOHNSTON

The Valley of the Whales:  
A cake of frozen time,  
with its cross-bedded and  
lemony limestone slabs.

**N**ew Zealand is at once young and volatile, ancient and settled. Its surface cracks and steams with earthquakes and geothermal springs, bubbles and boils with volcanoes and mud pools.

On the other hand, this is old country. New Zealand, with New Caledonia, the Chatham Islands and a few others, are peaks of sunken Zealandia, Te Riu-a-Māui, Earth's most recently recognised continent. Zealandia is 94% under water, half the size of Australia, and a billion years old.

Zealandia began as a thin strip of land joined to the eastern slopes of Gondwana, the ancient Southern Hemisphere supercontinent. About 80 million years ago, it gradually undocked from what would become Australia, unzipping the Tasman Sea and rafting northward from its birthplace in the Antarctic Circle into the ancestral-Pacific. For the next 40 million years or so, in a process called thermal subsidence, Zealandia stretched and cooled,

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losing buoyancy to such an extent that it almost entirely sank beneath the water.

Its land area was at a minimum 23 million years ago, during the Duntroonian geological stage of maximum marine inundation, the “Oligocene Drowning”. Imagine Central Otago and Fiordland as part of an archipelago in a warm sea. Beginning at the same time, a new boundary formed between the Australian and Pacific tectonic plates. Their grinding together lifted and continues to lift New Zealand, thrusting the Southern Alps upward 10 to 20 millimetres a year.

One shallow seabed that was blanketed in millions of years of greensand, mud, and marine snow – those expired sponges, coral, diatoms, plankton and sea urchins that drifted down to form limestone – was in the Waitaki District. This stunning, 7214-sq-km porthole into New Zealand's watery past straddles the border between Otago and Canterbury and stretches from the Pacific almost to the Southern Alps.

As of May, it is also New Zealand's first, and Australasia's only, Unesco Global Geopark, one of only 19 in the Southern Hemisphere. The Unesco Global Geoparks Council certified what is now called

the Waitaki Whitestone Geopark and recognised its “exceptional insights into the history of Earth’s eighth continent”. Unesco defines a global geopark as a single, unified geographical region, with “landscapes of international significance” that are managed to promote education, protection, and sustainable development. There are 195 global geoparks in 48 countries.

#### GETTING CERTIFIED

The Waitaki Whitestone Trust was established in 2018 to co-ordinate with the Waitaki District Council, Tourism Waitaki, iwi and local landowners in the lengthy application process for global geopark certification. They had to fill out evaluation sheets and draft a co-management plan

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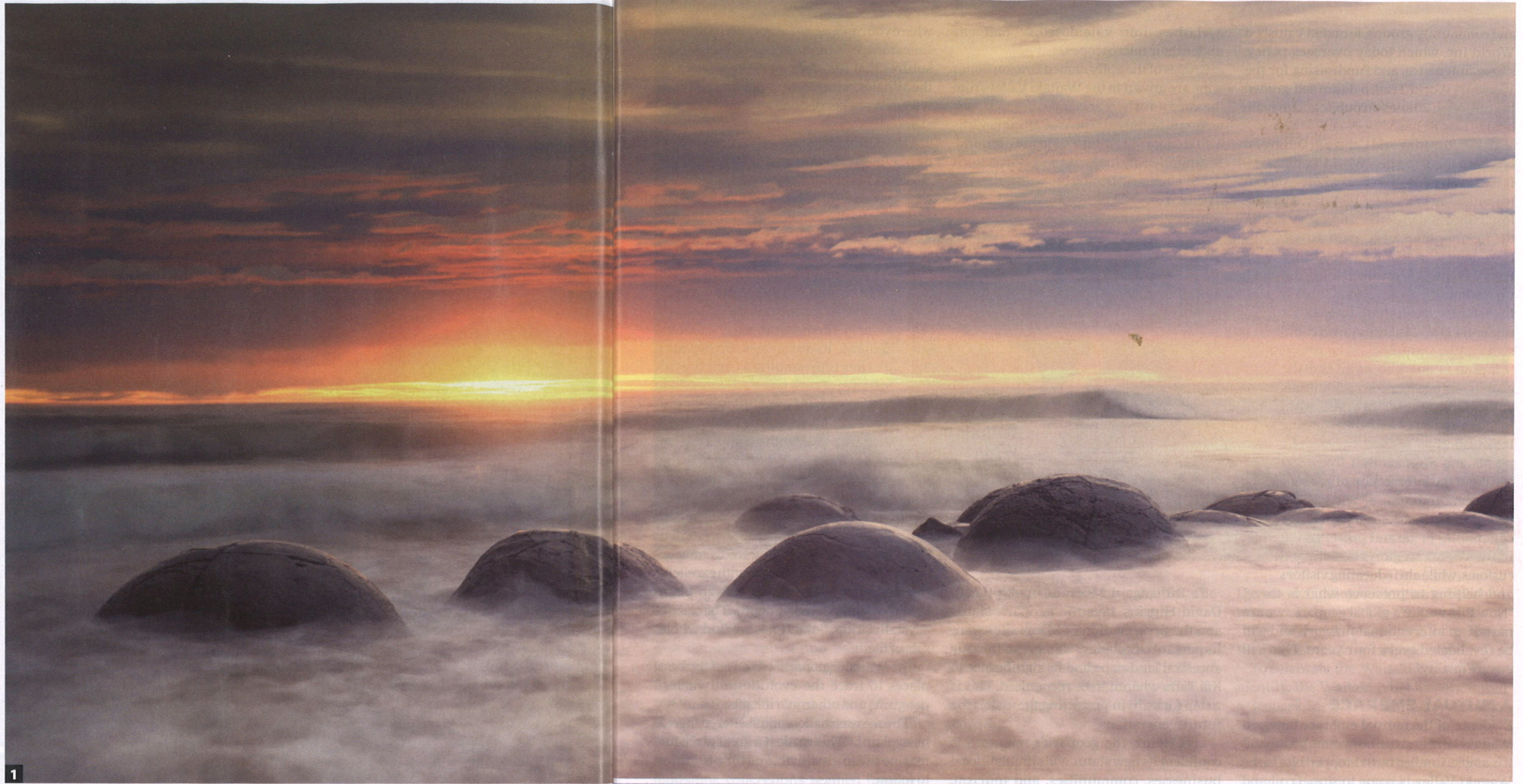
involving local communities, for example. In 2019, the trust submitted its application, but had to wait two years for a response because of the Covid pandemic. After a few more steps, the executive board of Unesco at a meeting in Paris endorsed Waitaki as a global geopark.

“We are absolutely thrilled,” says Helen Jansen, chair of the Waitaki Whitestone Geopark Trust. “What began as a mostly volunteer operation is now allowing us to put a magnifying glass for the entire world on an important part of New Zealand’s whenua.”

That the Waitaki had something special to offer the world emerged years before, when palaeontologist Ewan Fordyce and his colleagues at the University of Otago geology department began extracting exquisite fossils there. A number of finds were discovered by accident when excavators broke up limestone for fertiliser and construction.

Fordyce, working with local landowners

1. The Moeraki Boulders, visited last year by two Unesco evaluators. 2. The geological formation known as the Waipata Earthquakes. 3. Campbells Bay. 4. The Omarama Clay Cliffs.



and community groups, founded Vanished World Inc, which today oversees policy, site maintenance, and fundraising for the Vanished World Trail, a 34km self-guided tour through 20 sites on public and private land in North Otago.

The Vanished World Centre in Duntroon is where the Vanished World Trail starts. It is also an education hub where you can learn about Waitaki's history, examine fossil finds and visit the "Discovery Room" to dig for your very own fossil. Next door to the centre is the trail's first geosite, Brewery Hole, the unassuming entrance to a sunken limestone cavern that spreads out under the town. In theory, you could swim under Duntroon.

Jansen is quick to point out the geopark is not just for rockhounds and fossil hunters. "We also want to tell the story of how this amazing landscape has shaped the people, plants and animals that live here. It's about the intersection of geology, geography and culture." She says the new global geopark status will foster community pride and preservation in the Waitaki region's culture and customs, while also educating visitors and helping to preserve what is there. "Now that we are a global geopark, we are part of an international network and will be revalidated every four years. This will ensure quality."

### A MUTUAL EMBRACE

Evidence of the mutual embrace between Waitaki land and the humans who inhabit it is ample. Cradled by flat-topped bluffs, the Waitaki Valley is home to stonefruit and berry orchards. Macraes, New Zealand's largest gold mine, continues to extract the precious metal.

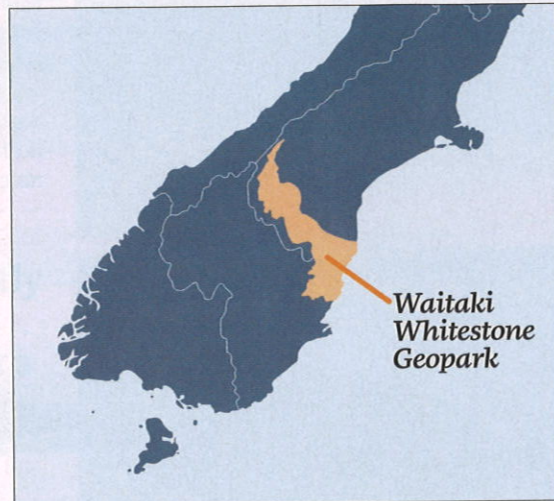
The headquarters of the Waitaki geopark trust are in Ōamaru, the Waitaki District seat and international capital of steampunk, the Victorian futurist aesthetic. Ōamaru's limestone (or whitestone) buildings are quarried nearby and glow hazily in the evening sun.

The city was also an internationally known centre of the 19th-century diatom craze. Diatoms are single-celled algae of different shapes encased in crystalline shells – jewels of the sea that fell to the ocean floor and formed diatomite.

"Diatomists" from around the world descended on sites near Ōamaru to collect rock containing the microfossils and arrange them, sometimes with pigs'

eyelashes, into kaleidoscopic patterns under their microscopes.

Grapes of the aptly named Dragon Bones wine are grown in the Waitaki Valley from the same soil where ancient bones and shark teeth still lie buried. The Waitaki Valley was a vital Māori hunting and fishing ground. A reminder of this is at the Takiroa Rock Art Shelter near Duntroon, with its images dating from 1400 to 1900 painted in red ochre and charcoal.



Waitaki  
Whitestone  
Geopark

Te Rūnanga o Moeraki upoko (head) David Higgins says the geopark status and the preservation of Māori sites were important accolades. "It's great for our ancestral landscape and its significance to Kāi Tahu whānui to be recognised. This is a step forward in protecting these sites for future generations."

Lisa Heinz, the geopark's manager, is confident its new status will stimulate local businesses, communities, and tourism, though it will not translate into any funding from Unesco. "The geopark will be internationally known, so people will know they're in a world-class park with a lot of places to visit. They'll need places to stay and eat. I hope they move slowly through and stay a while, rather than zipping through to the Southern Alps or the Pacific."

### IN A VANISHED WORLD

When you drive or bike along the Vanished World Trail, it is obvious why Unesco describes the area as a "geological wonderland" and why director Andrew Adamson filmed scenes from *The Chronicles of Narnia: The Lion, The Witch, and the Wardrobe* here – whether it's the Elephant Rocks, giant limestone dollops worn away by wind and rain to resemble well-tongued mineral licks; Earthquakes, a landslide area

where you can clamber around tumbledown limestone in search of the telltale wavy sutures that signify bone; or the Valley of the Whales, which is a cake of frozen time, with its cross-bedded and lemony limestone slabs.

The University of Otago geology department in Dunedin has worked closely with the Vanished World Centre's educational efforts and has been plucking fossils from the limestone for years. In fact, the building where it is housed is made from Ōamaru limestone.

Marcus Richards is the department's palaeontological curator. Its geology museum features a large geological map of New Zealand, its variegated streaks and patches representing a complicated mélange of rock types.

"You know, if you can do geology in New Zealand, you can do it anywhere," Richards says, with an appreciative grin at the map. When it came to the Waitaki District, he is all enthusiasm.

"I love the place to bits. This limestone makes my heart sing," he says, holding a piece of Waitaki limestone as yellow as turmeric. "The bones are pristine with excellent

presentation. The stone hasn't been baked or compacted at depth. There's no crystallisation. Sometimes we find whole sets of teeth."

The Waitaki geopark was one of the best places to trace the evolution of whales, penguins and other marine life.

"The sea was shallow and sheltered there," he explains. "This made it a great place for marine life to give birth, and for predators to follow."

Richards conjures a time when the whale-fall of baleens disintegrated where golden tussock now grows; a time when shark-toothed dolphins chased kairuku, an extinct giant penguin, where swallows now nest in honeycombed limestone.

You can view the ancient bones of these marine creatures at the geology museum, which has 60,000 fossils listed in its catalogues, or on the Vanished World Trail itself. Anatini ("place of many caves") is a gorge littered with limestone boulders. Displayed beneath Plexiglas at the university are the jawbone, shoulder blade, and vertebrae of a baleen whale.

Other narratives of the land can be read once you leave the enchantments of Duntroon. The Waitaki District has more than 40 sites to visit. The haunting Clay Cliffs, near Ōmarama, for example, are



The Elephant Rocks: Giant limestone dollops worn away by wind and rain to resemble well-tongued mineral licks.

a mix of clay, gravel conglomerate and sandstone from an ancient lakebed. Wind and rain have eroded the original deposit into Seussian spires and box canyons, leaving what looks like a drip castle rising from the bush.

Along the Pacific Coast are the Moeraki Boulders, or Kaihinaki, the te reo word for "food baskets". These spherical marvels, resembling buoys washed ashore, are mudstone concretions seamed together with caramel-coloured calcite and lifted up with the sea bottom millions of years ago.

Sometimes a concretion bears a hidden treasure. In 1983, an amateur collector discovered a plesiosaur inside a concretion at Katiki Beach, near the Moeraki Boulders. This is a marine reptile that looks like a tortoise mixed with a snake. Fordyce had the honour of naming it Kaiwhekea Katiki ("squid eater"). The fossil is the only example of its species ever found in New Zealand.

Travelling north along the wild coastline, you will encounter Campbells Bay. Vectoring out to sea are a multitude of burrows dug into Ototara limestone about 30 million years ago.

The burrows have expanded through erosion and look like miniature seaside versions of the Elephant Rocks.

Last year, the Waitaki Whitestone Geopark Trust hosted two Unesco evaluators, Ánchel Belmonte Ribas, from Spain, and Nickolas Zouros, from Greece. They needed to "taste the land and culture" for themselves, as Belmonte put it, to ascertain whether it qualified as a global geopark.

### "It's great for our ancestral landscape and its significance to Kāi Tahu whānui to be recognised."

Over three days, they visited the Vanished World Centre, an education programme at a local school, the Elephant Rocks, and the Moeraki Boulders. Then, they soared over the Waitaki District in a helicopter.

"Flying over Waitaki was a top moment for me," said Belmonte from his home in Spain. "New Zealand as a whole is a geopark, but I think any traveller to the Antipodes must visit the Waitaki District." The geopark satisfied every criterion the

Unesco evaluation committee established. His favourite place? The Waitaki River.

"I will never forget my time there. I hope I can come back for more one day."

To celebrate the Waitaki District's new identity, the Waitaki trust has organised a Geopark Festival for the last weekend of October.

Geopark manager Heinz said the festival would take place across the entire district. "Local community groups and businesses will put on their own events, like guided tours."

There will be storytelling and workshops on Waitaki's cultural and geological heritage sites, and restaurants will focus on local ingredients. "We'll have lots of activities happening everywhere."

Someone sure to be somewhere in the geopark at the end of October is Waitaki mayor Gary Kircher. He knows the place well, having spent several months at Anatini working on the first of the *Narnia* films.

"Unesco Global Geopark status gives us a brand that embraces all of our attractions, from geological sites to recent history involving mana whenua and European settlers," he says. "The geopark will let us tell our many stories. This has been a long time coming – some would say it's been 25 million years." ■