GEOLOGICAL ATTRACTIONS

JERNHATTEN
Please park in the parking area between Havmølleåen and Jernhatten
GPS: 56°14’40.49”N, 10°46’48.66”Ø

STUBBE LAKE
Please park in the parking area at Møllebækvej in Gravlev. There is a marked trail to Stubbe lake bird reserve with access to the lakeshore.
GPS: 56°16’22.40”N, 10°43’43.53”Ø

HASSENSØR
Please park in the parking area at the sluice near Øer Maritime Ferieby. There is a hiking trail along the beach.
GPS: 56° 9’11.66”N, 10°41’3.38”Ø

EBELTOFT FERRY PORT
Please park in the parking area west of the harbour
GPS: 56° 9’41.16”N, 10°39’36.75”Ø

STRANDKÆR
Please park in the parking area at Øvre Strandkær visitor centre. Toilet.
GPS: 56°13’36.17”N, 10°34’18.19”Ø

ÅRHUS PLANTATION
Please park in the parking area at Agri Bavnehøj. Toilet. There is a trail along Agri Bavnehøjvej to the east.
GPS: 56°13’43.28”N, 10°31’50.49”Ø

STABELHØJENE, AGRI BAVNEHØJ AND TREHØJE
Please park in the parking area at
Stabelhøjene, GPS: 56°14’11.09”N, 10°31’31.81”Ø
Agri Bavnehøj, GPS: 56°13’43.28”N, 10°31’50.49”Ø
Trehøje, GPS: 56°12’17.49”N, 10°31’56.36”Ø

FUGLSØ BEACH
Please park in the parking area at Fuglsø Beach. Toilet.
GPS: 56°10’56.58”N, 10°32’29.64”Ø

TINGHULEN
Please park in the parking area between Tinghulen and Helligkilde.
GPS: 56°12’55.47”N, 10°31’45.85”Ø

HESTEHAVE FOREST AND KALØ
Please park in the parking area at Slotskroen. Toilets are located at the back of Slotskroen.
GPS: 56°16’59.94”N, 10°28’48.68”Ø

ACCESS AND CONDUCT

Please note that the National Park Mols Bjerge includes both private and public areas, with different rules of access. You are welcome as our guest, but please note that access to private areas may be restricted.

When in National Park Mols Bjerge please observe the rules of access in:

PUBLIC AREAS
Access is allowed 24 hours a day.

PRIVATE AREAS FROM 6.00 A.M. UNTIL SUNSET

- **You are allowed to go by foot and by bike on roads and distinct trails**
- **Your are allowed to go by mountain bike where it is possible to go by standard bike**
- **You are allowed to go by foot in uncultivated areas, if the areas appear as nature**
- **You are not allowed to be on cultivated areas with grass, crops, corn etc. as well as ploughed or harrowed areas**
- **You are not allowed to be on fenced-off areas by default. However if the fence has gates you are allowed to be there.**
- **You are allowed to go by foot on the beach**

If you are unsure, please stay on the roads or distinct trails. A friendly request at the landowner may have a positive outcome

Please pay consideration to private landowners. Responsible behaviour is in the interest of all – also of nature!

Nationalpark Mols Bjerge
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8410 Rønde
www.nationalparkmolsbjerge.dk

Text: Geologist Jette Sørensen, Photo: Jette Sørensen, , Bo Skaarup, Map: Geologist Jette Sørensen, Print: GP-Tryk, Grenaa, Layout: Nationalpark Mols Bjerge

PHOTO: EBELTOFT FERRY PORT

NATIONALPARK MOLS BJERGE

DANMARKS NATIONALPARKER

PHOTO: HJELM

National Park Mols Bjerge

Mols Bjerge National Park covers an area of 180 km2 of large forests, moors and open dry grasslands as well as lakes, coastal areas and the sea. The park area extends from the coast of Kattegat in the east to the forests at Kalø in the west, from the winding inlets in the south across the magnificent moraine formations of the hills of Mols Bjerge to the outwash plains of the Ice Age in the north. The National Park also includes the town of Ebeltoft as well as various villages and holiday cottage areas.

The objective of the National Park is to preserve, strengthen and develop nature, the countryside, the cultural surroundings, the distinctive geological features and to provide visitors with excellent opportunities of outdoor activites and information about the area.

Welcome! Please visit Mols Bjerge National Park’s web site, in which you also find links to the other national parks in Denmark: www.nationalparkmolsbjerge.dk.

A National Park, shaped by ice and water

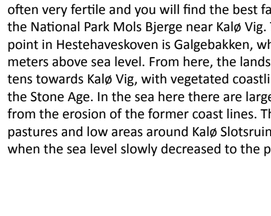
In the Quaternary time, which is the period of the last 2.5 million years, climate changes have caused several shifts between cold ice ages and warmer interglacial periods. During each ice age, the ice sheets and glaciers in the Scandinavian highlands grew and spread out over the surrounding lower lying land and sea, including Denmark. Each ice age shaped the landscape anew, but without destroying the former landscape completely.
In the last part of the last ice age, the Weichselian glacial period, the main ice sheet from the north east came all the way across Jutland to the central ridge region. When the main Weichselian ice sheet over Denmark retreated, the edge of the ice sheet, at about 20,000 years ago, was located above Helgenæs, Mols Bjerge and the area around Rønde. In a number of subsequent brief advances, the lateral moraines, formed of deposits of material transported by the ice, were pushed together. The ice disappeared from Djursland again, but about 18,000 years ago, it came back to these areas, this time from the southeast (Baltic advance) and reached southern Djursland. Along the ice edge, the hills previously created by the ice movements, were pressed together and the great lateral moraines near Ebeltoft and Kalø Vig were shaped into their present form.

At the base of the ice moraine clay, which is a mix of clay, sand, gravel and stones, was deposited, and in the melt water lakes in front of the ice, sand and gravel carried by melt water rivers was deposited. The ice brought material from the north, northeast, east and southeast of Denmark and mixed this with local material. Thus, the stones at the beach have an interesting story to tell about the movement of the ice: Kinnediabas (from the area Kinnekulien, Sweden), rhomb porphyry and larvikite came from the areas north and northeast of Denmark, the red Baltic quartz porphyry and sandstone came from the east and southeast areas, while flint and lime are local material from East Djursland. When the ice started melting, large ice blocks were buried under layers of sand and gravel, and it took thousands of years before it was melted completely. The holes, in which the ice was situated, are known as kettle holes today.

In the Stone Age, about 8000 years ago, the sea level was about 3-4 meters lower than today, and southern Djursland looked very different, with several inlets that ran inland. However, the fact that the sea level slowly decreased again, to the level of today. That is why, the former coastlines from the Stone Age sea are visible inland as relict clifflines, with the former flat, marine foreshores in front.

In Mols Bjerge a number of Bronze Age mounds were built 3,000-4,000 years ago on the highest points in the landscape. Stabelhøjene rise to 133 – 135 meters, Agri Bavnehøj to 137 meters and Trehøje to 127 m above sea level and provide impressive views over the landscape and sea of the National Park. From Stabelhøjene there is a particularly fine view over Kalø Vig and the lateral moraine surrounding it.
From Agri Bavnehøj you can see to the south across a very hilly landscape from the last ice age, and to the north to conifer plantations on the sandy, relatively infertile Tirstrup Hedeslette area, where the melt water from the ice age deposited large amounts of sand and gravel. From Trehøje you have a panorama from Aarhus to Ebeltoft, with impressive views of the 3 inlets Kalø Vig, Begtrup Vig and Ebeltoft Vig, as well as the east coast of Jutland.

Hestehaveskoven and the small peninsula, on which Kalø Slotsruin is situated, is part of the moraine landscape, left at the feet of the grand lateral moraine hills around Kalø Vig, when the ice from the Baltic ice sheet melted. The moraine soil was created under the ice and consists of a mix of limy clay, sand, gravel and stones. The humus soil, which forms on these moraine deposits, is often very fertile and you will find the best farm land in the National Park Mols Bjerge near Kalø Vig. The highest point in Hestehaveskoven is Galgebakken, which is 34 meters above sea level. From here, the landscape flattens towards Kalø Vig, with vegetated coastlines from the Stone Age. In the sea here there are large stones from the erosion of the former coast lines. The beach pastures and low areas around Kalø Slotsruin were created, when the sea level slowly decreased to the present level.



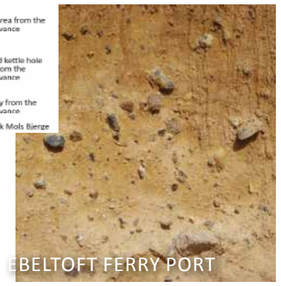
Tinghulen is the largest kettle hole of those in the Mols Bjerge National Park that do not have water in them. The former thingstead (open air court) of the 3 municipalities that meet here is located in the kettle hole. The size of Tinghulen is overwhelming for visitors, and a popular attraction, above all for children that have fun running up and down the steep hillsides.

Along Fulgsø Strand there are a number of cliffs, which were completely exposed until few years ago, due to erosion. The cliffs are now overgrown and only the stones on the beach are witnesses to the erosion. On one of the stones on the shoreline, you see striations from the time, when the stone was dragged across other stones by the ice. You will also find kinnediabas, rhomb porphyry and larvikite, as well as red Baltic quartz porphyry and sandstone on the beach.
Near the parking area at Fuglsø Strand, water often runs across the road. This water comes from a small spring in the field. Such a spring is created when water from higher sand layers in the hill penetrates the hillside. Mols Bjerge is full of such springs and they were earlier regarded to be sacred.

Aarhus Plantation has changed quite a lot in the past years, since many conifer trees were cut down, in order to make the original shapes from the kettle holes more visible within the landscape. Along the road from Strandkær to Agri you pass several impressive kettle holes, in which stagnated ice was buried and slowly melted. The landscape is further characterized by lovely valleys, which eroded in connection with the melting of the ice. Some kettle holes are now lakes and swamps.

The area around Strandkær is not only an access road to the Mols Bjerge, but also a geologically interesting place. The landscape from the road to the hills constitutes a significant crossover from the flat, marine foreland, created after the highest sea level in the Stone Age, to the remains of the old cliffs. Here, where the sea meets the hills, the soil changes from poor and lime deficient to one that is more fertile.

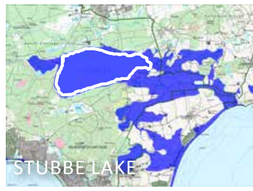
Jernhatten is an isolated hill area with a southern part, eroded in the Stone Age and consisting of steep hillsides. The hill consists of ice age sediments and dislocated floes of Kerteminde Marl, eroded by the ice from older and lower layers. The dislocated floes of the limey Kerteminde Marl was earlier dug out of small rift in the western part of Jernhatten and used as lime supplement in the surrounding fields. Immediately north and south of Jernhatten you will find hollows, which were covered by the sea in the Stone Age. From the hollow, south of Jernhatten the water was lead all the way to Stubbe Sø. In Rugård Klint, near the Sønderskoven north of Jernhatten, parts of the geological layer series are exposed. The layers of clay have caused landslides in many places. This is primarily visible in the area of „Hullerne“, where the landslides stretch several hundred meters into the land and trees tilt to the centre of the central part of the slide. As time goes by the trees are pushed on to the beach, where they lay as bleached logs.
Most stones on the beach from Jernhatten to Rugård are flint stones, transported here from the north by the ice and melt water, with lime forming a layer directly beneath the surface of the ground.



Ebeltoft Ferry port is a very interesting place and is situated at an exposed cliff. Visitors get the opportunity to see distinct geology of the National Park in this particular place. At the bottom of the cliff brown and grey moraine clay from the last ice advance – the Baltic advance – is pressed together and above it brown moraine clay is visible. The moraine sediments are characterized by different sizes of grain and are visible with both small and larger stones.
On the beach you will find blocks from this cliff, e. g. kinnediabas, rhomb porphyry and larvikite from older ice advances from the north and northeast and red Baltic quartz porphyry and sandstone from the Baltic advance from the southeast.

Stubbe Lake is both the largest lake on Djursland, and the biggest kettle hole in the National Park Mols Bjerge. When the ice from the last ice sheet stagnated over the southern part of Djursland, a large hole was left at Stubbe Lake. During the Stone Age, the kettle hole was the inner part of a small inlet, which stretched from the coast south of Jernhatten, through the river valley at Havmølle Å, to the present Stubbe Sø. In these low areas, sediments from the sea are hidden beneath the surface and you may be lucky to find mussels in the soil.

The map shows the course of the Stone Age sea at the lake Stubbe Sø. The present Stubbe Sø is marked with a white line.



The southern part of the peninsula Ebeltoft consists of a low marine foreland from the time when the Stone Age Sea retracted. North of the town Øer the former coastline of the Stone Age Sea is visible. The sea reached the cliffs, and the beach stretched along Elsegårde Skov towards Elsegårde Strand. When the sea level started to decrease, it left sandy and poor soil, which consists of mussels and sand gravel.
The stones on the beach are most flint stones and lime pieces, transported here from the north by the ice. However, there are other significant indicator blocks here, such as rhomb porphyry and kinnediabas, transported here with the ice from Norway and Sweden. Further red Baltic quartz porphyry came from the south and southeast.