

## [Practical Information and Code of Conduct]

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[All sites listed on the geotrail and throughout Newborough Warren are listed as part of a protected site so hammering and intentionally damaging outcrops is forbidden - please help us preserve this wonderful site.]

Be aware of the tides on Llanddwyn Island as access across the causeway will be cut off around high tide. We recommend planning the Coed trail around high tide and Ynys trail around low tide.

Full geotrail (from/to beach car park): 7 km

Coed trail (sites 1-10): 2.7 km walk

Ynys trail (sites 11-18): 2.7 km walk]

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0300 065 3000

[www.cyfoedhnaturiol.cymru](http://www.cyfoedhnaturiol.cymru)

[www.naturalresources.wales](http://www.naturalresources.wales)

## Geoparc Ynys Môn GeoMôn - Anglesey Geopark

### [What is GeoMôn?

The Isle of Anglesey is recognised as a UNESCO Global Geopark because of its incredibly diverse, spectacular geology. GeoMôn represents the geopark organisation that promotes the natural landscape of Anglesey as a means towards sustainable development, responsible tourism and conservation of our environment.]

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For more information visit  
[www.geomon.co.uk](http://www.geomon.co.uk)



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[Leaflet production credits]

## Cwningar Niwbwrch Newborough Warren Geotrail

[Where land and sea collided - the tectonic beginning of Anglesey]

Where land and sea collided - the tectonic beginning of Anglesey





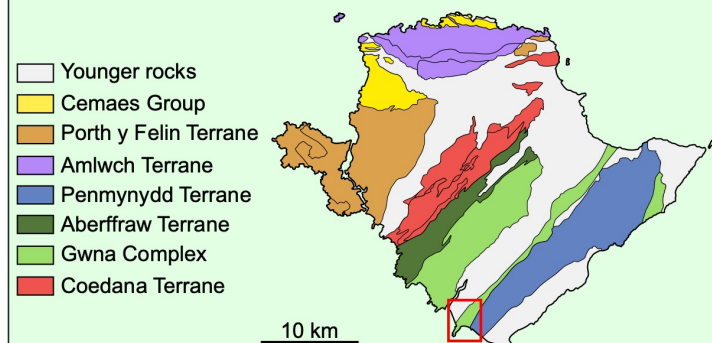
## [The creation of Anglesey] The creation of Anglesey

[The Monian rocks of Anglesey are split between various terranes that cover the majority of the island. They all formed between the Precambrian and Ordovician periods (roughly 600 - 470 million years ago) as part of the same tectonic event that gives Anglesey its nickname - the tectonic island. The rocks formed along the margin of Gondwana - an old supercontinent including South America, Africa, Australia and Antarctica - when the Iapetus Ocean began to subduct below the continent.

The Gwna Complex, which the rocks of Newborough Warren belong to, preserves some of the only remnant fragments of this long lost ocean.]

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## [The lost ocean] The lost ocean

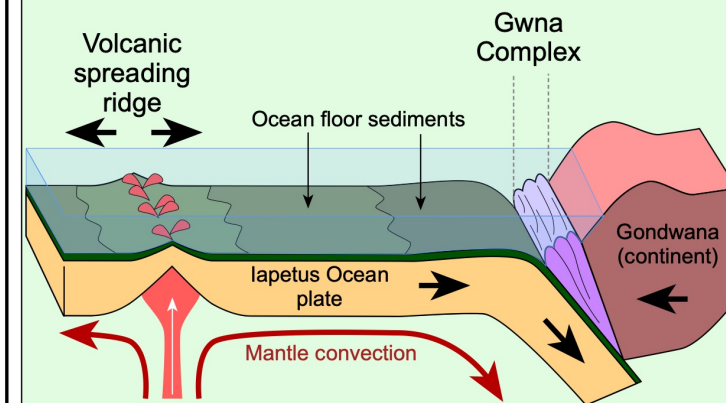
[Oceans form along long volcanic ridges that erupt lavas underwater. As an ocean grows, lava is erupted to fill spaces, creating more ocean floor. This is happening today in the Atlantic Ocean, for example, which continues to push North America further away (very slowly). During its lifespan, a variety of materials build up on the ocean floor and form various sedimentary rocks that reflect different ocean environments.

Eventually, an ocean will effectively run out of room to continue growing, and other continents will push back against it. Because oceanic rocks are much denser than most continental rocks, ocean plates will sink below continents when they collide. The ocean will begin to disappear into the Earth's interior and the colliding forces form a chain of volcanic mountains along the edge of the continent. This is happening today to the Pacific Ocean, for example.]

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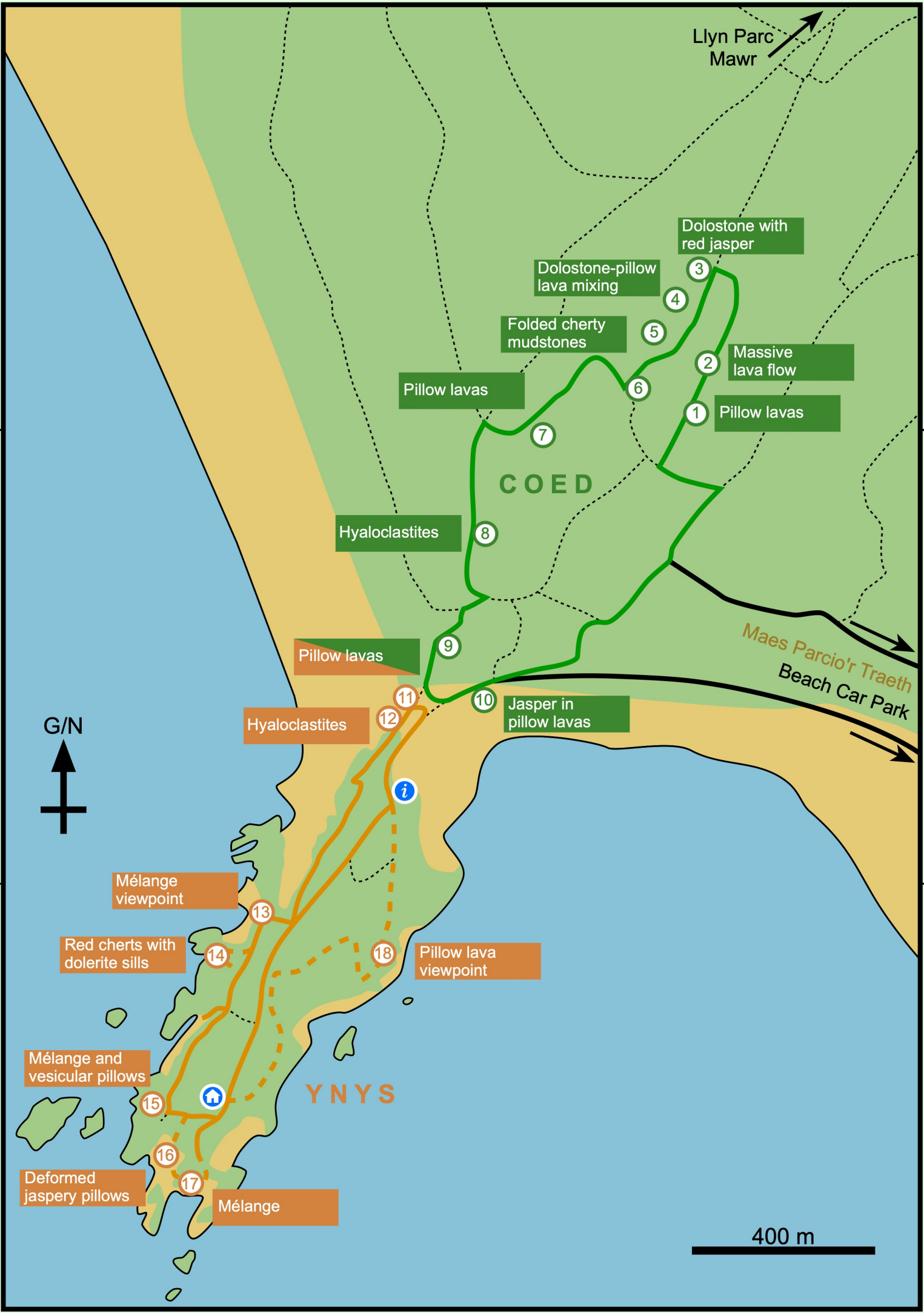
## [The Gwna Complex] The Gwna Complex



[The Gwna Complex is an accretionary complex, meaning that it is composed of an assemblage of rocks that were scraped off the upper surface of the subducting ocean plate under immense tectonic forces. Most of the rocks were intensely deformed and disordered, although some unusually preserved areas - as seen along this trail - still display original ocean volcanic and sedimentary textures and order. This gives us an incredibly rare example of what an ocean floor really looks like.]

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**[Sedimentary rocks]**

Various sedimentary rocks accumulated on the sea floor reflecting changing environments over its lifecycle. Dolostones were the earliest, and were even deposited partly alongside erupting lavas, forming the spectacular mixing at Sites 4 and 5. Cherts and mudstones formed in deep ocean waters and their layers show vivid colours and intricate folds. Sandstones formed near the end of the ocean lifecycle, sourced from eroded material of the colliding continent.]

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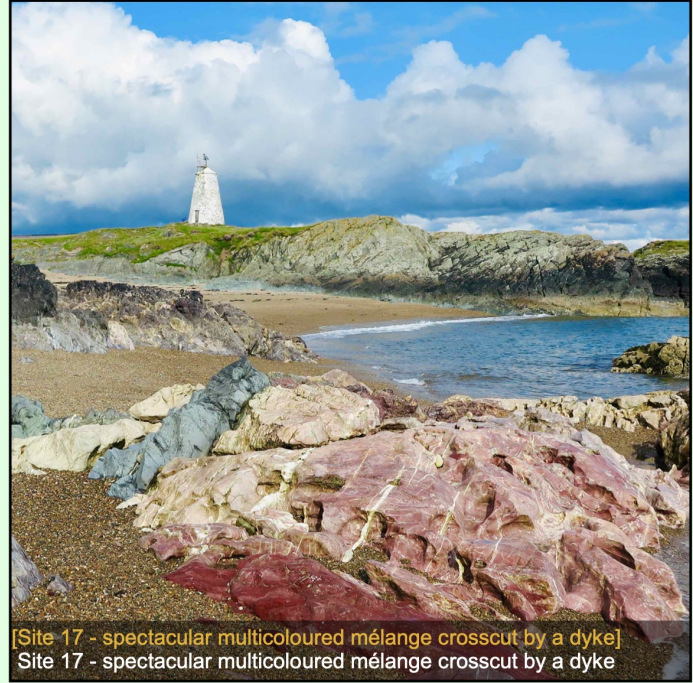
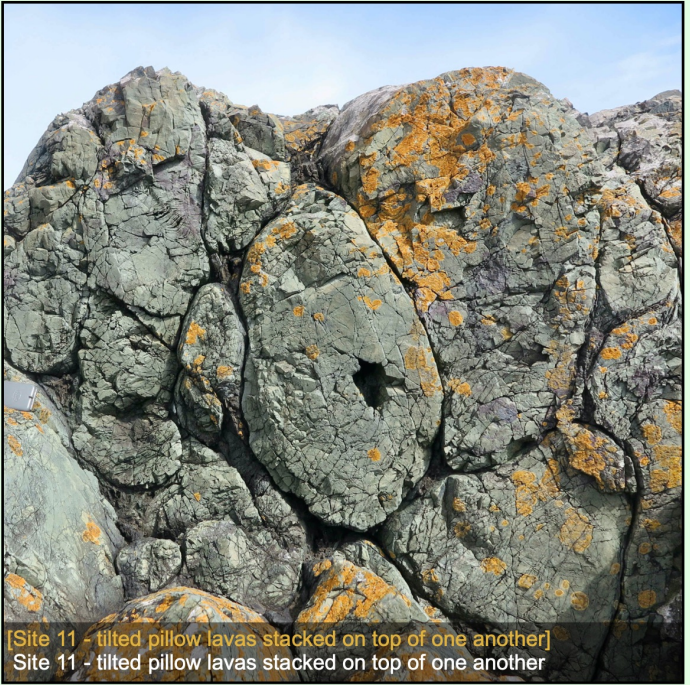
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**[Volcanic rocks]**

All volcanic rocks on the trail are basalt that has formed through various eruptive processes. The spectacular pillow lavas along the casueway and into the forest are remnants of the lost ocean floor. When lava erupts into cold ocean water the outer surface quickly hardens, encasing liquid lava inside like a water balloon. These then sink and stack on top of each other and solidify into the rounded pillow-like shapes seen today. Hyaloclastites form when pillows do not simply settle, and instead shatter into small chaotic fragments.]

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**[Mélange]**

The mélange of Llanddwyn Island is a chaotic assemblage of many different rock types that were highly deformed by the immense tectonic pressures of the ocean-continent collision and the process of being scraped off the ocean plate. The mélange weaves around the relatively undeformed rocks of the causeway and forest, which were largely sheltered from deformation forces by the mélange, preserving the incredible volcanic and sedimentary textures that we see today.]

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