

CATHEDRAL CAVE

The Catlins, Otago, New Zealand

At 199 meters in total passage length, Cathedral Cave is one of the finest examples of a sea cave in New Zealand and is currently one of the 30 longest known sea caves in the world.



In contrast to limestone caves which form by the chemical action of water slowly dissolving calcite in the rock (a process known as dissolution), sea caves are formed by the mechanical action of waves eroding or collapsing the rock. Many sea caves form along weaknesses, such as fractures or faults, in hard rocks otherwise resistant to erosion. Because there is a limit to how far the wave energy can travel through a cave before losing its erosive power, there is also a limit to how far a sea cave can tunnel into a cliff. This is why many of the longest sea caves in the world have several entrances or form a tunnel through a headland. In the Catlins, this maximum distance into the cliff seems to be about 150 meters.

Cathedral Cave is formed in resistant Jurassic sandstone (about 160 million years old) of the Murihiku terrane, although the cave is much younger (tens to hundreds of thousands of years). The sedimentary layers are tilted slightly to the northeast (into the cliff). Stresses acting on the rocks when they were buried created near-vertical fractures, perpendicular to the sedimentary layers. It is these fractures that the waves exploit to form the cave. These horizontal and vertical planes of weakness explain the blocky cross sections of the cave. The cave originally formed as two separate caves, which later joined at the back to create a cave almost twice as long. Places with particularly high ceilings (such as at cross section B) are formed by roof collapse. In time, such features can create skylights, such as Jacks Blowhole near Jacks Bay.

