The Day A Tsunami Hit The Coast Of Cornwall

Written by Andy Owen

It was just after 9.30am in Lisbon, Portugal.

Everything was, as it always was in this city - legendary for its wealth, prosperity and sophistication.

It was one of the most beautiful cities in Europe, with an estimated population of 275,000.

But all that was about to change in an instant.

Within minutes, this great thriving city-port of Lisbon, capital of Portugal and the vast Portuguese empire - and seat of learning in Europe, would be reduced to rubble.

Out to the west of the city in the Atlantic Ocean, about 120 miles west-south-west of Cape St. Vincent, one of the deadliest earthquakes in history - approaching nine on the Richter scale - took place.

Lisbon and its surrounding areas were about to be devastated.

It was November 1st, 1755. All Saints' Day.

The earthquake lasted between three and six minutes, causing 16-foot wide fissures in the city centre.

Thousands of terrified residents rushed towards the open space of the docks for safety and, as they got there, they watched as the sea receded, revealing a plain of mud littered with all kinds of cargo and rubbish - even shipwrecks.

Just a few minutes later, all of those people were dead.

The earthquake generated a massive tsunami that stormed ashore and overwhelmed all the boats in the harbour, carrying them up the Tagus river at a speed of 80 mph - on waves high enough to top a seven-storey building.

Lisbon never stood a chance. It was engulfed.

The wave might just as well have been cement. Large public buildings and about 12,000 dwellings in the city were literally smashed to bits.

As it was All Saints’ Day, a large part of the population were attending mass at the moment the earthquake hit.

The great cathedrals - Basilica de Santa Maria, Sao Vincente de Fora, Sao Paulo, Santa Catarina and the Misericordia were all unable to withstand the seismic shock and totally collapsed, killing or injuring thousands of worshippers.

This awesome earthquake and subsequent tsunami killed 60,000 people in Lisbon alone. Almost all the coastal towns and villages of the Algarve were also heavily damaged, except Faro, which was protected by the sandy banks of Ria Formosa.

Severe shaking was felt in North Africa where the quake caused heavy loss of life in towns of Algeria and Morocco - more than 400 miles south of Lisbon.

Tsunamis 66-feet high swept along the coast of North Africa. The town of Algiers was completely destroyed. Tangiers suffered great loss of life and extensive damage.

10,000 people lost their lives in Morocco.

In Lagos, the waves reached the top of the city walls. On the island of Madeira, Funchal and many smaller settlements, suffered significant damage. Almost all of the ports in the Azores archipelago suffered huge destruction from the tsunami - and in Spain, the Atlantic Coast of Andalucia, was badly hit, with a 65-foot high wave hitting Cadiz, killing a third of its residents.

But, soon it was to be Cornwall's turn...

It took 4 hours for the tsunamis to travel the 1,000 kilometres to reach the Cornish coast.

At two o' clock in the afternoon, three very large waves hit the coast.

The worse effects were felt in Mount's Bay, where it is known that many people died.

One giant wave at St Michael's Mount was noticed when the sea suddenly receded – and after 10 minutes the sea came rushing back as a wall of water nearly 10 foot high.

It continued to rise and fall for the next five hours.

In Penzance, the sea rose eight feet.

It was worse at Newlyn, where a ten-foot rise was reported.

St Ives and Hayle also experienced similar sudden rises in sea level.

The 18th-century French writer Arnold Boscowitz claimed that a great loss of life and property occurred on the Cornish coast that afternoon, although there is no official record of the overall death toll.

William Borlase (1758) gave a vivid account of the tsunami.

"On the 1st of November, 1755, about two o'clock in the afternoon, the Barometer being at the highest I have noted it for three years past, the sea, about half an hour after ebb, was observed, at the pier of St Michael's Mount, to rise suddenly, and then to retire.

This attracted the attention of the spectators, and to their great amazement, ten minutes after, the sea rose nearly six feet, coming in from the South-East extremely rapid; it then ebbed away with the same rapidity to the Westward for about ten minutes, till it was near six feet lower than before.

It then returned again, and fell again in the same space of time, and continued the agitation, alternately rising and falling, each retreat and advance nearly of the space of ten minutes, till five hours and a half after it began.

During this agitation the Seyn-boats, riding at the head of the pier, were whirled some one way, some another; and the fishermen endeavouring to bring some boats into the pier, they were hurried in and out of the mouth of the pier, as the Sea advanced and retired, with an impetuosity not to be resisted; and yet no life, or boat, or ship was lost.

The first and second fluxes and refluxes were not so violent as the third and fourth, at which time the Sea was as rapid as that of a mill-stream descending to an under-shot wheel, and the rebounds of the Sea continued in their full fury for two hours; they then grew fainter gradually, and the whole commotion ceased about low-water.

In Penzance pier, three miles West of the Mount, the tide rose eight feet, and in Newlyn pier, one mile farther West, ten feet high, the water coming from the South-East, being as it were accumulated by the Western head-lands, which form Gwavas Lake near the last-mentioned pier; but no material damage was done at either place.

The same agitation, though somewhat later in the day, was observed in the Northern Channel at the pier of St Ives, where the highest water rose betwixt eight and nine feet, and in Heyl Harbour adjoining, one rise was seven feet, the rest little more than two.

All this while there was not the least trembling or motion of the earth perceived in any parts near us; but on the same day, about ten o'clock in the morning, the most dreadful Earthquake even known happened on the Western coasts of Portugal and Spain.

The city of Lisbon was destroyed, 30,000 persons, some say more, lost their lives, St Ubes, Sevil, Cadiz, St Lucar, Oporto, Faro, were greatly damaged, and many lives lost. Ships sixty leagues distant from Lisbon, to the West, felt the shock in the same degree as if they had struck upon rocks.

The Tagus rose from ten and twenty to thirty feet perpendicular, ebbing and flowing several times, but every time decreasing; and between the agitation of the Sea, and the violent shaking of the earth, the desolations of that country are not to be expressed, and have never yet been exactly estimated".

At Lamorna Cove, it was reported that the sea rushed in '*with such impetuosity, that large rounded blocks of granite from below low-water mark were swept along like pebbles, and many of them deposited far beyond high water mark. One large block, weighing probably 6 or 8 ton, was borne repeatedly to and fro several feet above the level of high water, and at length deposited about ten feet above that level in the stream, where it still lies.*'

There is no doubt, that although Cornwall's worst tsunami caused serious damage and loss of life, it could have been so much worse.

Considering the height of the waves that hit the Portuguese, Spanish and North African coasts a few hours before, the 10-foot high waves here, although destructive, were much less damaging.

What's more, it was also fortunate that the tsunami in Mount's Bay came shortly after ebb tide.

This significantly reduced the impact.

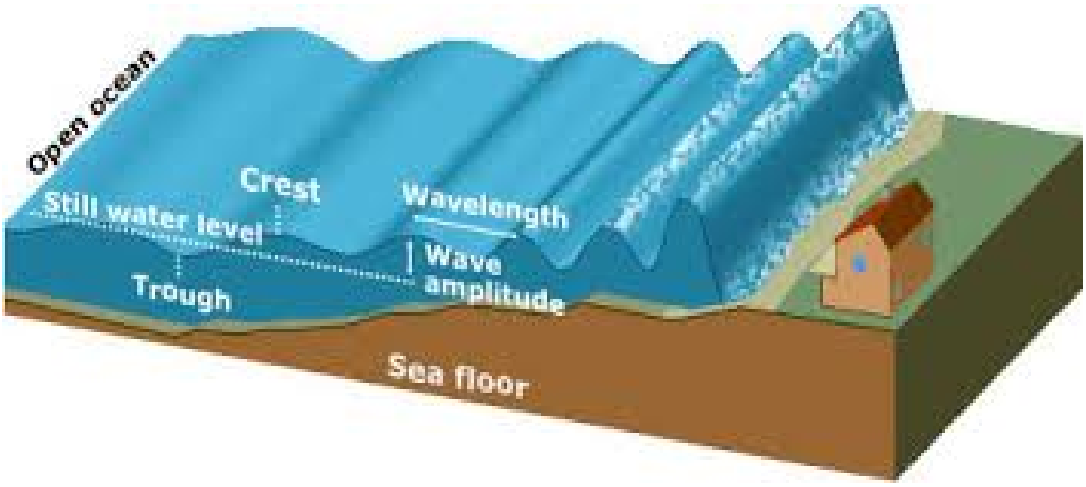
As I understand it, tsunamis arrive at a coastline as a series of successive crests (high water levels) and troughs (low water levels) - usually occurring 10 to 45 minutes apart.

As they enter the shallow waters of coastlines, bays, or harbours, their speed decreases to about 50-60 km/h.

For example, in 15 metres of water, the speed of a tsunami will be only 45 km/h.

However, 100 or more kilometres away, another tsunami wave travels in deep water towards the same shore at a much greater speed and behind it, there is another wave, travelling even faster.

As the tsunami waves become compressed near the coast, the wavelength is shortened and the wave energy is directed upward - thus increasing their heights considerably.



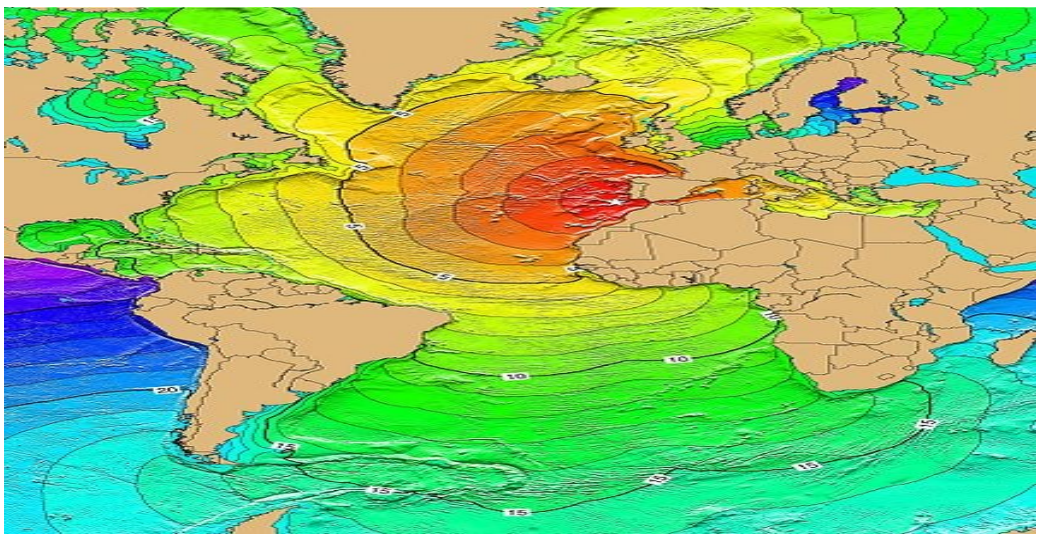
Depending on the water depth and the coastal configuration, the waves may undergo extensive refraction - another process that may converge their energy to particular areas on the shore and thus increase the heights even more.

Even if a tsunami wave may have been 1 metre or less in the deep ocean, it may grow into a huge 30-35 metre wave when it sweeps over the shore.

Given this, it is strange that the waves had lost most of their destructive power by the time they reached Britain. 60-foot high waves, or even half that height, would have crashed over the tip of Cornwall causing massive devastation, leaving much of the coast underwater and wiping the Scilly Isles completely off the map.

The loss of life would have been off the scale.

Considering everything, it seems to me, that Cornwall got very lucky that day.



2016 animation of the tsunami from The National Oceanic and Atmospheric Administration.