

## National

# Malta 'is vulnerable' to a devastating megastorm

Power station and water plants at risk from inevitable event – expert

Sarah Carabott

Malta has been hit by storms so powerful that traces in the coastal sediment remain till this very day, thousands of years later.

If such inclement weather were to hit again, it could leave its mark on infrastructure around the coastline, including the power station and reverse osmosis plants.

An ongoing study on sediment samples taken from different spots around the Maltese coasts is uncovering evidence of massive storm events going back to pre-history. It also indicates that, if such extreme storms were to repeat themselves today, they would be no less harmful.

"These are not regular storms but they are so extreme they leave signs that are still evident after thousands of years," Patrick J. Schembri, from the Department of Biology, said.

Popularly called 50-year or 100-year storms, there is evidence that, eventually, whether a tsunami or an extreme storm, at some point or another we're going to have one of these storms.

"The impact will be significant not only on people or property and offshore installations, like buoys and fish farms, but, most especially, on the infrastructure around the coastline, including the power station and the reverse osmosis plants.

**"They are so extreme they leave signs that are still evident after thousands of years"**

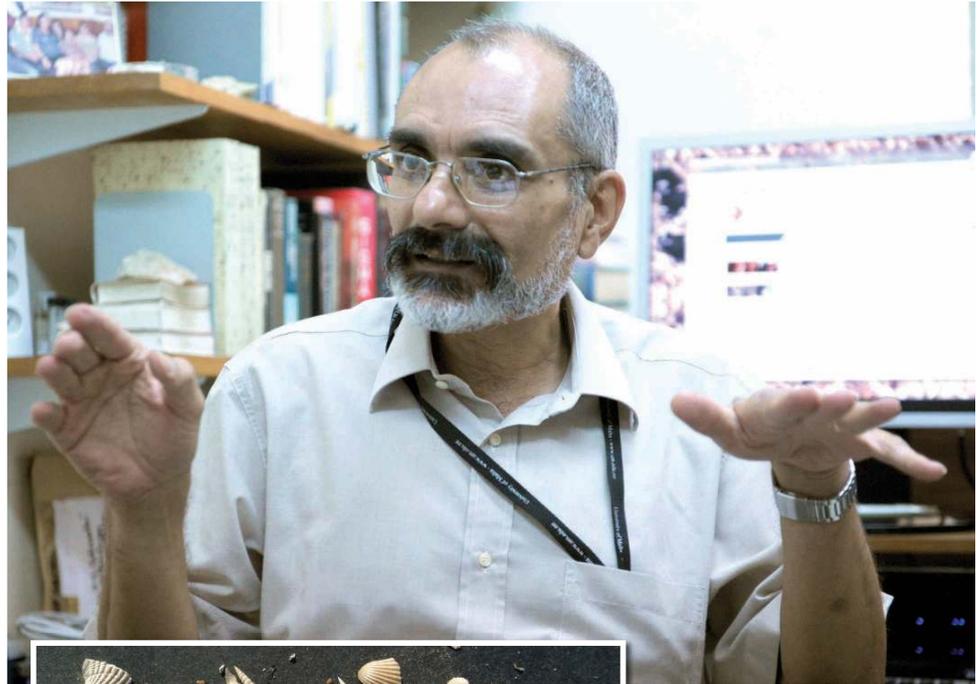
"If their sea water intake point is damaged or blocked, it might not only cause mechanical damage but also bring operations to a halt."

Together with Katrin Fenech, from the Department of Classics of Archaeology, Prof. Schembri is examining remains of past coastal life dating back hundreds to thousands of years. These remains are mostly molluscs found buried as deep as 18 metres in coastal sediment that accumulated on the sea floor over the centuries.

"We are digging out cores around the Maltese coast. The topmost deposit is the most recent while the sediment at the bottom will hold the oldest evidence.

"By studying the animal remains in these cores we can learn what happened in the past.

"For example, in calm conditions there would either be land or sea snails but whenever there was some huge storm, there would be a whole mixture of molluscs because the very large waves would have mixed everything up," Prof. Schembri noted. The study forms part of a larger



Above: Patrick J. Schembri from the Department of Biology. Photo: Jason Borg.



Left: sample from a core at a depth of more than six metres, where the area was a lagoon with plenty of mollusc remains. Photo provided by Katrin Fenech

five-year project called 'Fragility and sustainability in restricted island environments: adaptation, culture change and collapse in prehistory'.

By delving back to the first occupation of Neolithic farmers about 5,000BC, Malta has been chosen to solve an ancient puzzle: how do some cultures manage to sustain their civilisation for millennia when others collapse because of the changing environmental conditions?

This European Research Council project brings together an international team from the Queen's University Belfast, the

University of Cambridge, the University of Malta, the Superintendence of Cultural Heritage and Heritage Malta.

Different specialists are closely examining the environment of the Maltese islands to reconstruct past environments through remains of pollen, snails and other animals and plants.

Human skeletal remains will also be examined for data on diet and disease.

The part that Prof. Schembri and Dr Fenech are working on is ongoing but it is already evident that there have been major events, whether storms or tsunamis. While

storms are usually predictable, tsunamis are not.

The findings are complimentary to evidence found by the University of Portsmouth where scientists established that the northeastern coast of the UK was once struck by 20-metre high waves.

The team, which published a paper in the international journal *Zeitschrift für Geomorphologie*, identified boulders that had been detached from the shoreline and clifftops, some of which split after a big impact and were carried inland for distances of up to 100 metres.

One question that remains to be answered in relation to the Maltese island's shores.

While the Portsmouth scientists are basing their data on the strength required to move the boulders, Prof. Schembri and Dr Fenech focus on the type of animals and other remains found in the sediment.

## What measures have been taken?

The power station and the reverse osmosis plants, which the country depends on for its day-to-day running, are safe from an extreme storm, according to the companies that run them.

"Our reverse osmosis plants were designed and built at an adequate distance and at a safe altitude from the shoreline to ensure that they are not affected by adverse sea conditions," the Water Services Corporation said when contacted.

This was reiterated by a spokesman for Enemalta who said electricity generation installations were not directly exposed to the effects of such open sea conditions. New installations were subject to a rigorous risk assessment, he added.

## What is a 50- or 100-year storm?

Statistically, the chances of such a storm in any given year is two per cent for a 50-year and one per cent for a 100-year storm.

This does not mean that it is only likely to occur once in a 100-year period but sometimes the interval between such events is only a few years.

In fact, there is more than a 50 per cent chance of one or more 100-year storms occurring in any 100-year period.

A 100-year storm can even happen two years in a row.

Data is collected over a number of years to draw up a frequency analysis that would determine recurrence intervals.