

MailOnline

Geologists warn another earthquake could tear Tokyo in two after weakening of fault line below capital

By [Daily Mail Reporter](#)

Last updated at 5:15 PM on 21st March 2011

Geologists have warned that another powerful earthquake could inflict terrible damage on Tokyo because the Size 9 monster which struck on March 11 has altered the earth's surface.

The quake has put pressure on the fault lines near the Japanese capital and experts have suggested that a size 7.5 magnitude earthquake could hit.

The structure of the tectonic plates and fault lines around the city makes it unlikely that Tokyo, home to 13million people, would be hit by a quake anywhere near the intensity of the one 10 days ago, said Roger Musson of the British Geological Survey.



Bustling: The busy Japanese capital Tokyo has 13million people living in its centre - and it could be hit by another earthquake very soon

But given the vast population - the capital and its surroundings are home to 39million people (including in

the suburbs) - any strong tremor could be devastating.

'Even if you've got, let's say, a 7.5, that would be serious,' the seismologist said.

Japan is located on the Ring of Fire, an arc of volcanoes and fault lines spanning the Pacific Basin, and is regularly hit by earthquakes.

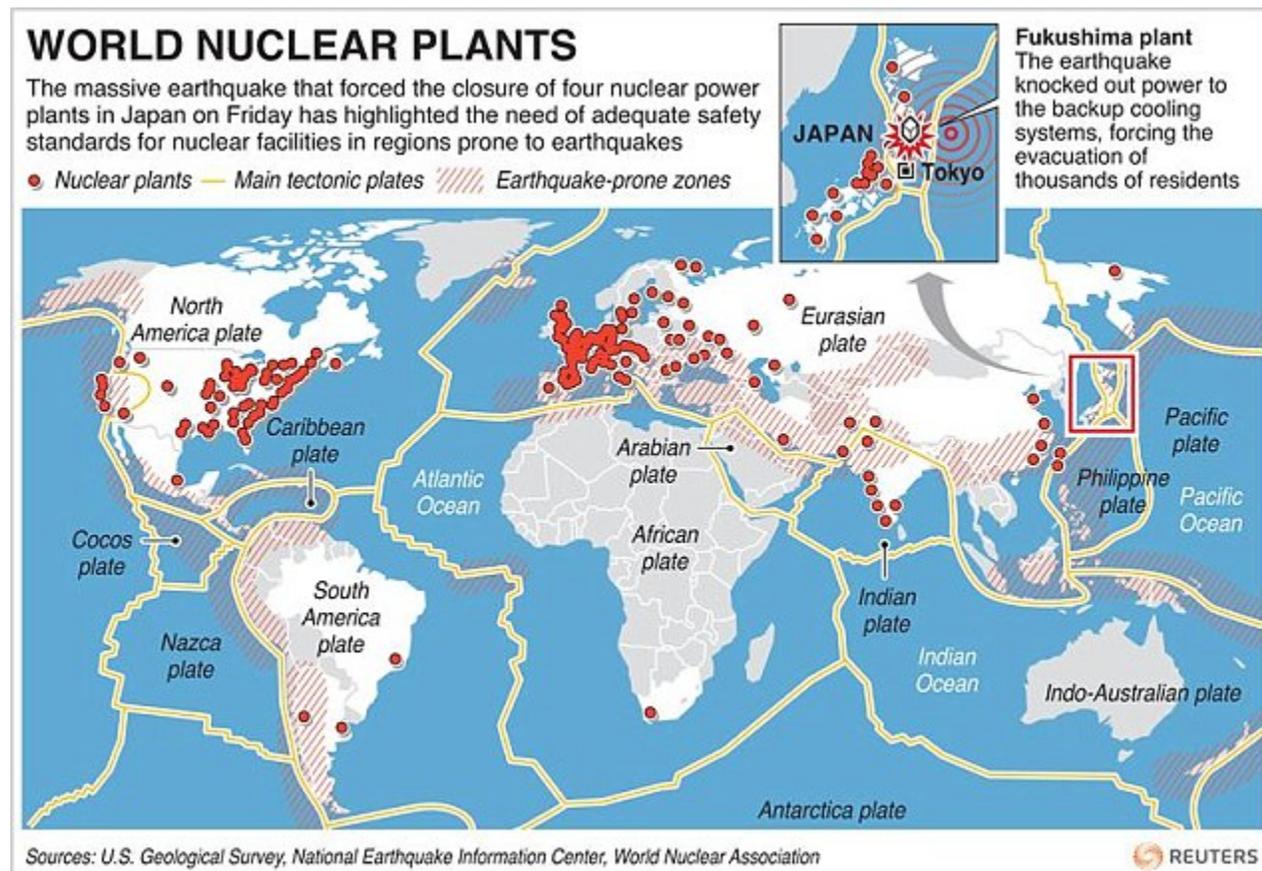
But before the last quake - the largest to hit the country since it started keeping records 130 years ago - few geologists considered Japan to be a strong candidate for a 9-plus earthquake, said Andrew Moore, of Earlham College in Richmond, Indiana.

There is mounting evidence, however, that Japan has been struck by several severe quakes in the last 3,500 years - most in the northern reaches of the country.

Sand deposits indicate that several quakes have spawned 30-foot-high (9-metre-high) waves that slammed into the northern island of Hokkaido, he said, the most recent in the 17th century.

Similar deposits underlie the city of Sendai - the area rocked last week - with the most recent from an 869 A.D. tsunami that killed 1,000 people and washed more than 2.5 miles (three kilometres) inland.

And even weaker quakes that hit Tokyo in the past have caused significant damage.



Ring of fire



Earthquake graphic

SEISMICALLY ACTIVE - JAPAN'S LONG HISTORY OF EARTHQUAKES

Earthquakes are common in Japan, one of the world's most seismically active areas.

The country accounts for about 20 per cent of the world's earthquakes of magnitude 6 or greater.

Several continental and oceanic plates - the Pacific Plate, Philippine Plate, Eurasian Plate and North American Plate - meet in the Japan area, which is why there are so many volcanoes and hot springs across the nation.

Located in a volcanic zone so active it is nicknamed the Pacific Ring of Fire, catastrophic earthquakes occur several times each century.

Japan has suffered an estimated 200 recorded tsunamis in its history due to earthquakes that take place below or close to the Pacific Ocean.

In October 2004, an earthquake with a magnitude of 6.8 struck the Niigata region in northern Japan, killing 65 people and injuring more than 3,000.

That was the deadliest quake since a magnitude 7.3 tremor hit the city of Kobe in 1995, killing more than 6,400.

But the tremor from March 11 changed the coastal landscape - and not just above sea-level.

It created a trench in the sea floor 240 miles long (380 kilometres long) and 120 miles wide (190 kilometres wide) as one tectonic plate dove 30 feet (nine metres) beneath another, said Eric Fielding of NASA's Jet Propulsion Laboratory.

While that relieved stress at the breaking point, it appears to have piled pressure on to adjacent segments, said Brian Atwater, a geologist with the U.S. Geological Survey.

That added strain could now trigger a strong, deadly aftershock on Tokyo's doorstep.

It's a common occurrence after strong quakes and happened after the 2004 mega-earthquake and tsunami off Indonesia that killed 230,000 people in a dozen nations.

Three months later, an 8.6-magnitude quake erupted farther down the fault line, killing 1,000 people on sparsely populated Nias island.

'But it's difficult to say,' said Atwater. 'There are good examples of such stresses leading to other earthquakes, big earthquakes, and there are good examples of that not happening.'

Scientists are studying the March 11 quake and ongoing seismic activity to determine where new strains might be building.

'When the main shock is this big, you get a football-shaped region where aftershocks are fair game. It extends in all directions,' including toward Tokyo, USGS seismologist Susan Hough and other experts said.

But, they acknowledge, it's hard to keep up.

Ross Stein, of the USGS, said: 'We are drinking from a fire hose here. The input data keeps changing and augmenting.'

His focus now is on the fragment of the Pacific tectonic plate lodged beneath Tokyo - movement of which is believed to have caused a 7.3-magnitude quake in 1855 that killed an estimated 7,000 people.

'We believe the faults which bound the fragment were brought closer to failure by the magnitude-9 quake,' Ross said.

Places:

[Indonesia](#),
[Japan](#)

Organisations:

[National Aeronautics and Space Administration](#)

Comments (9)

[Newest](#)

[Oldest](#)

[Best rated](#)

[Worst rated](#)

[View all](#)

Remember that this is just a normal part of the activities of an active earth. The mantle convects beneath the crust and moves it around very slowly. Sometimes the plates slide past each other, sometimes they ride under each other, and sometimes they stick, then jerk free. It will happen until the end of earth's heat, so we have to accept that. Not easy, I know. But we are just fleas on a dog's back.

- Nicko, London, 22/3/2011 07:15

Click to rate Rating 10

[Report abuse](#)

Soon you would be able to buy an apartment in Tokyo with the change in your pocket.

- Frank, Dublin, 22/3/2011 01:11

Click to rate Rating 3

[Report abuse](#)

It has been suggested, with strong physical proof, that the so-called Eurasian Plate is, itself, made up of more than one plate. One of them is the East Asian or "Chinese" Plate which pushed onto the main Eurasian Plate. This gives rise to those high mountains in Asia and the frequent shocks and earthquakes in South-western China, around the Sichuan/Tibetan area. Another is the Indian Sub-continental Plate. Can someone comment on this ??

- Ishkandar, London, 22/3/2011 00:34

Click to rate Rating 1

[Report abuse](#)

The joy of uninformed news and comments. Japan's buildings are made to stand against earthquakes that would toppled down most of the cities around the world, UK included. There are earthquakes virtually every day in Japan. They were there before this happened, they'll continue to happen. What killed people wasn't the earthquake, it was the tsunami. Virtually everything was standing until the tsunami hit.

- Alex, Wexford, Ireland, 21/3/2011 19:51

Click to rate Rating 10

[Report abuse](#)

The Japanese tsunami of 1700 originated from an earthquake in North America with a magnitude of 8.7 to 9.2. It was long considered an orphan tsunami because there was no earthquake close enough for the Japanese to tie it into. It's only been fairly recently (in a book from 2005) that evidence was presented that tied the tsunami in with an earthquake from across the Atlantic. Frightening to think that an earthquake from halfway across the world could bring in waves tall enough to devastate entire villages.

- Me, US, 21/3/2011 17:10

Click to rate Rating 6

[Report abuse](#)

Yes, we know. The Japanese issued a warning several days ago, which you have already reported. And they have experienced some large aftershocks (inc one of 6.6). If I were a US seismologist, I would be focusing on the fault lines on the bits of the US that are on the Pacific Rim right now because there have been big earthquakes in Chile, New Zealand, China and Japan. Who's likely to be next?

- Cynic, London, 21/3/2011 17:00

Click to rate __ Rating 6

[Report abuse](#)

The views expressed in the contents above are those of our users and do not necessarily reflect the views of MailOnline.

[Today's headlines](#)

[Most Read](#)

- [BUDGET 2011: Fuel Duty and income tax cut along with red tape and costs for business](#)
- [Women lie in road in bid to block Downing Street exit in protest at 'devastating' Budget](#)
- ['I don't know what he's shooting at but he can't hit us': Allied forces obliterate Gaddafi's air force](#)
- [Secret shame of Egypt's army: Women protesters were forced to have 'virginity checks' after being arrested in Tahrir Square](#)
- [The Fukushima Fifty: First pictures emerge from inside Japan's stricken nuclear power plant](#)
- [Six protesters killed after security forces attack Syrian mosque](#)
- ['Don't go into the forest': Helpers told not to search for missing Sian O'Callaghan as police follow 'significant lines of inquiry'](#)
- [Spring in our steps: It's hotter than Corfu, Malaga and Milan and there's more to come...](#)
- [Midsomer Murders race row producer to quit ITV1 show at the end of the series](#)
- [Paedophile jailed after husband and wife realised they were attacked by the same man](#)
- [Rapist caught 25 years after church attack when forensic officers take samples at his home following burglary](#)
- [Old Aged Punisher: 79-year-old woman delivers rough justice to burglar, 21, by punching him in her front room](#)
- ['Earthquake in Milton Keynes causes £17 worth of damage': Police launch investigation into officers who sent email mocking residents of estate](#)
- [The secret scourge of pregorexia: Mother who suffered eating disorder during pregnancy finally cured by having child](#)
- [Schoolboy, 15, drowns on fishing trip after inflatable dinghy springs leak and sinks](#)
- [Astronaut in space forced to leave answerphone message for Scottish aristocrat](#)
- [Yellow Brick Road murder: Police release artist's impressions of two men seen in woods on day she was killed](#)
- [Postmaster and wife he is accused of killing 'had loving and affectionate relationship'](#)
- [Student tracks down iPhone using GPS tracking technology](#)
- [British squatter, 35, accused of being a 'riot tourist' faces two years in jail for 'hurling a stone at a policeman'](#)
- [Homeowner who put up security gates after series of burglaries ordered to tear them down because they are 6in too tall](#)
- [Why our babies are just like infant Neanderthals](#)
- [Tiny clothing fibres 'link shotgun killings of two couples to former labourer'](#)
- [Caught on camera: Dramatic moment terrified boy, 10, was rescued as he sank into mud](#)
- [MORE HEADLINES](#)

- [Osborne: 'I'm the man with a plan'... Chancellor's Budget cuts fuel duty, reduces income tax and slashes red tape and business costs](#)
- ['Don't go into the forest': Helpers told not to search for missing Sian O'Callaghan as police follow 'significant lines of inquiry'](#)
- [I can't bay-leaf it: Supermarket spice game peppering shelves with rude words](#)
- [BUDGET DAY 2011 £320 tax cuts for millions: Osborne to increase amount you earn before paying tax... but where will he find the cash?](#)
- [Police chief accused of making lewd remarks is found hanged at his home](#)
- [Canoe conwoman Anne Darwin and road rage killer Tracie Andrews to 'move in together'](#)
- [Caught in the act, Silvio Berlusconi's arresting bunga bunga girls](#)
- [Contaminated Tokyo tap water is 'unfit for babies' as Japan radiation 'heads to Britain' from Fukushima plant](#)
- [Yellow Brick Road murder victim Jia Ashton 'may have been killed by colleague at chocolate factory'](#)
- [Drop-top cop: Highway patrol officer falls off his motorbike and lands in the back of a convertible](#)
- [Boy, you are one big baby! Lu Hao, the three-year-old who weighs a staggering 132lbs - and he's still growing](#)
- [Naked woman, 27, rescued from cliffs after getting stuck trying to reach nudist beach](#)
- ['I don't know what he's shooting at but he can't hit us': Allied forces obliterate Gaddafi's air force](#)
- [How the 'awesome views' of a girl in a bikini upset the Advertising Standards Authority](#)

- [Paedophile, 65, jailed after husband and wife realised they were BOTH attacked by him when they were children](#)
- [Watch your step: The crazy paving that's leaving holidaymakers all at sea](#)
- [At last, Osborne to bring Budget relief to drivers after pump prices reach record highs](#)
- [Sam Cam captures Downing Street rat... in a sketch to be auctioned for charity](#)
- [Our ace in the pack: Lone British female Typhoon pilot takes to skies to keep up the pressure on Colonel Gaddafi](#)
- [Women lie in road in bid to block Downing Street exit in protest at 'devastating' Budget](#)
- ['Merciless executions': Farmhand accused of shotgun murders of two couples four years apart in the Eighties](#)
- [Back in black: Jailed Met commander Ali Dizaei's wife ditches blonde hair and red lipstick for his appeal](#)
- [Tory husband and wife who posed with golliwogs on Facebook forced out of Conservative party](#)
- [Patient, 30, collapses and dies at dentist after 'suffering allergic reaction to mouthwash'](#)
- [MOST READ IN DETAIL](#)

Ads by Google:

[72 Hour Emergency Kits](#) Stay Safe 72 Hours After Disaster Buy Directly from the Manufacturer. www.QuakeKare.com

[Epson PowerLite 1775W](#) Ultra-slim and bright. And ultra-easy to set up! www.Epson.com

[Strongest & Weakest Banks](#) Download Our Free Report & Find Out How Safe Your Bank Is Now www.MoneyandMarkets.com

[Bernanke's Secret Plan](#) Free Report Reveals Shocking Debt Solution To End Financial Crisis! UncommonWisdomDaily.com

[HAZ Standards](#) Keep Your Employees Up To Date & Safe On OSHA Industry Standards! www.safetyservicescompany.com

[Survival Kit](#) Always Be Prepared. Find Deals On Compact Emergency Survival Kits! LocalXpress.com

[The Complete Bug Out Bag](#) Be ready for just about any kind of disaster with an Echo-Sigma system Echo-Sigma.com

[Emergency Preparedness](#) Use HouseLogic's Tips & Advice To Improve Emergency Preparedness. www.houselogic.com/Emergency

Published by Associated Newspapers Ltd

Part of the Daily Mail, The Mail on Sunday & Metro Media Group

GlamEntertainment

© [Associated Newspapers Ltd](#)

