

How earthquake scientists prepare for the 'big one'

Level 3 • Advanced

1 Warmer

Match the natural disasters with the years in which they happened.

- | | |
|---|---------|
| 1. 160,000 people died in the earthquake in Haiti. | a. AD79 |
| 2. Floods killed up to four million people in China. | b. 1883 |
| 3. 227,000 people died in the Asian tsunami. | c. 1931 |
| 4. 36,000 people were killed by the eruption of the Krakatoa volcano. | d. 2003 |
| 5. Mount Vesuvius erupted and buried the town of Pompeii. | e. 2004 |
| 6. Up to 70,000 people died in the European heatwave. | f. 2010 |

2 Key words

Fill the gaps in the sentences using these key words from the text.

seismologist	sanitation	aftermath	distil	utility
back-to-back	designated	repeatedly	looting	utilities

- If things happen _____, they happen one after the other.
- A _____ is a scientist who studies earthquakes.
- _____ are public services such as gas, water and electricity.
- A _____ area is marked, agreed or given a name for a particular purpose.
- If something happens _____, it happens many times.
- The _____ of something bad or important are the effects and results experienced afterwards.
- _____ consists of the systems that supply water and deal with human waste.
- _____ is the action of stealing things from houses or shops after a disaster such as a fire or a flood.
- _____ is the state of being useful.
- If you _____ water, you boil it and then cool it again so it is safe to drink.

3 Find the information

Find the following information in the text as quickly as possible.

- What was the magnitude of the earthquake Ann Bostrom experienced in Atlanta?
- In which country did the Sulawesi earthquake happen?
- Which of the four earthquake scientists has a box of emergency boat rations?
- Which one keeps a few hundred dollars in small notes?
- Which one might drink water from his jacuzzi?
- Which one works in post-disaster settings?

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'I'd drink my jacuzzi': how earthquake scientists prepare for the 'big one'

After major earthquakes rock California, four earthquake scientists in areas of high seismic risk reveal their own plans for when the worst hits

Katharine Gammon
14 July, 2019

1 Two back-to-back earthquakes, of magnitude 6.4 and 7.1, hit southern California in less than 24 hours recently, and seismologists have warned of an increased chance of more shaking in the near future. We spoke to four earthquake scientists living in high-risk areas to see what the people who think about earthquakes the most plan to do after a 'big one' hits.

Roland Burgmann, professor of earth and planetary science at the University of California, Berkeley

2 When it comes to earthquake preparedness, you have to think about how you'll do as a family or neighbourhood without utilities or outside help for at least three days. And you may not be able to get back inside your house if it's not safe. Our camping stuff was stored in the garage, but instead, I took it all and moved it outside so we could camp, cook and live in our garden. I also put a big box of survival gear in the boot of my car.

3 And then you're supposed to store water as well – so that's where the jacuzzi comes in. It's not usually water you'd want to drink or cook with, but it is a huge water supply. Our barbecue has propane tanks, which would allow me to cook food using the jacuzzi water for a few weeks without power. It's not what I would usually use to drink from, since we've been sitting in it, but when it comes to an emergency, it would work.

Ann Bostrom, professor in environmental policy at the University of Washington, Seattle

4 We used to live in Atlanta, and while we were there, we had a rare 5.0 earthquake. I was sitting in the kitchen, working, when the house started shaking. I couldn't work out what it was, so I walked over to my computer and logged on to the US Geological Survey website. Studies show that people tend not to drop, cover and hold, which is what you're supposed to do. Instead, they do what I did and freeze.

5 When we moved back to Seattle, I knew I'd have to prepare for the risk of large earthquakes. I study risk perception, and it's really hard to think

about preparing for a high-consequence but low-probability event. It might or might not happen in your lifetime – or even your child's lifetime.

6 In our household, we have a designated meeting spot should a quake happen during the workday, a generator, a box of emergency boat rations, a water heater and a rain barrel that could provide backup water supplies, and tinned goods.

Joseph Wartman, Natural Hazards Reconnaissance Facility director; and professor, University of Washington, Seattle

7 My work takes me to immediate post-disaster settings, so I have witnessed, repeatedly, the on-the-ground realities of what the world is like after a major natural-hazard event, and this has informed my "planning". Last autumn, for instance, I travelled to Indonesia in the aftermath of the Sulawesi earthquake. It was there that I saw thousands of people who had survived the quake but who were suffering because of lack of sanitation, medical services and housing, and had to wait for relief efforts that spanned many weeks.

8 This has taught me that we must not only make it through the event but also its aftermath. My plan is a full tank of petrol in the car, as I plan to leave the area for days or weeks, provided that road damage does not close the motorways. In the case of Seattle, I expect that there will be no water, nor electricity, nor fuel available for quite a while after a major earthquake.

9 And when I leave the house, I will close the door, but I will not be too concerned about locking it because I know from experience in past disasters that there will be no looting, only people searching for food, bottled water and other essentials for survival.

Christine Goulet, executive director for applied science at the Southern California Earthquake Center, Los Angeles

10 As a scientist, I assess everything in my house for its utility. I keep two spare tanks for my gas grill so in case of an earthquake, I can use the grill to cook food. I used to have an on-demand tankless water heater – but I got rid of it because I want to use my water heater as a tank for water. It holds 40 gallons, which is a great supply – though you want to make sure it's strapped down.

11 The biggest thing, especially in LA, will be water. I'm in the process of putting a pool in my garden, and if you distil the water to remove salts, I would

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not be shy about drinking pool water. Plus, with the salt in it, it's already useful for cooking pasta. I keep a few hundred dollars in small notes, one- and five-dollar notes, because if we do have power cuts and you have 20-dollar notes only, you won't be able to purchase anything.

- 12 I sleep with a hammer under my bed so I can break out of a window in my house. They sell earthquake hammers that also include a key to

the gas main in the street – you'd need a tool to remove the plate and turn off the gas in the case of a gas-line break. In my car, I always keep running shoes, a warm shirt and a few gallons of water. You never know where you're going to end up, and you may have to walk home.

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4 Comprehension check

Choose the best answer according to the text.

- How did Ann Bostrom find out what was going on during the earthquake she experienced in Atlanta?
 - She froze.
 - She looked out of the window and saw that everything was shaking.
 - She logged on to the US Geological Survey website.
- What is the problem with risk perception of earthquakes according to Ann Bostrom?
 - You never know when they are going to happen.
 - They have severe consequences but probably won't happen.
 - It's hard to think about something that might not happen in your lifetime.
- What has Joseph Wartman learnt from his experiences in Indonesia?
 - The aftermath is much worse than the earthquake.
 - People need to plan for the aftermath.
 - It will take weeks or even months for everything to return to normal.
- Why did Christine Goulet get rid of her tankless water heater?
 - because it was an on-demand water heater
 - because she wanted a tank that water could be stored in
 - because it wasn't strapped down

5 Find the word

Find the following words and phrases in the text.

- a noun meaning *great size, importance or effect* that is also used to indicate the strength of an earthquake (para 1)
- a noun meaning *the state of being ready for something* (para 2)
- a two-word phrasal verb meaning *be able to understand something or solve a problem* (para 4)
- a noun meaning *equipment that can be used when extra help is needed* (para 6)
- a noun meaning *food, clothes and money given to people who are in a bad situation* (para 7)
- a verb meaning *buy* (para 11)
- a noun meaning *a tool used for hitting things* (para 12)
- a two-word phrasal verb meaning *escape* (para 12)

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6 Synonyms

Match the synonyms from the text.

- | | |
|-------------------------|---------------------|
| 1. earthquake scientist | a. rare |
| 2. supplies | b. earthquake |
| 3. low-probability | c. seismologist |
| 4. quake | d. major earthquake |
| 5. 'big one' | e. store |
| 6. keep | f. rations |

7 Word-building

Fill the gaps in the sentences using the correct form of the word in brackets at the end of each sentence.

1. Earthquakes are a high-consequence but low-_____ event. [PROBABLE]
2. A _____ is a useful piece of equipment in the aftermath of an earthquake. [GENERATE]
3. There is often a lack of sanitation, medical services and _____ in the aftermath of an earthquake. [HOUSE]
4. One of the seismologists keeps a big box of _____ gear in the boot of his car. [SURVIVE]
5. Joseph Wartman's work takes him to immediate post-disaster _____. [SET]
6. Roland Burgmann is a professor of earth and _____ science. [PLANET]

8 Discussion

Discuss the statements.

- There's no point in preparing for something that might never happen.
- It's crazy to live in an area of the world that is affected by earthquakes.
- Earthquakes, floods, tsunamis and tornadoes are all the result of human activity.

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KEY

1 Warmer

1. f
2. c
3. e
4. b
5. a
6. d

2 Key words

1. back-to-back
2. seismologist
3. utilities
4. designated
5. repeatedly
6. aftermath
7. sanitation
8. looting
9. utility
10. distil

3 Find the information

1. 5.0
2. Indonesia
3. Ann Bostrom
4. Christine Goulet
5. Roland Burgmann
6. Joseph Wartman

4 Comprehension check

1. c
2. c
3. b
4. b

5 Find the word

1. magnitude
2. preparedness
3. work out
4. backup
5. relief
6. purchase
7. hammer
8. break out

6 Synonyms

1. c
2. f
3. a
4. b
5. d
6. e

7 Word-building

1. probability
2. generator
3. housing
4. survival
5. settings
6. planetary